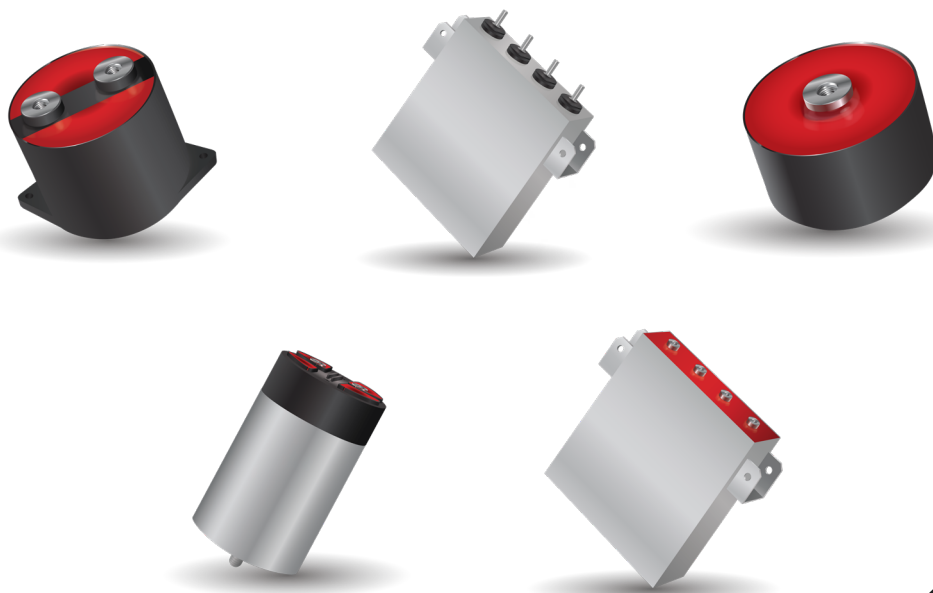




Medium Power Film Capacitors



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MEDIUM POWER FILM CAPACITORS

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*RoHS Compliant Series as Standard

In 1979, TPC (formerly LCC, then THOMSON-CSF PASSIVE COMPONENTS) developed **CONTROLLED SELF-HEALING technology** for medium power capacitors.

These capacitors made great advances over previous technologies by combining the benefits of Controlled Self-Healing process with superior energy densities, making it one of the most compact capacitors on the market for 1/2 CV2.

TPC produces both dry-wound and impregnated capacitors for medium voltage filtering, covering the whole spectrum from 75Vdc to 3kVdc.

With CONTROLLED SELF-HEALING, the capacitance is divided into several million elementary capacitor elements protected by "fuse gates". Weak points of the dielectric are insulated and the capacitor continues functioning normally without any short circuit or explosion.

The capacitor acts like a battery. It "consumes" a certain amount of the capacitance through the gradual breakdown of the individual capacitance cells. Over the operating life of the capacitor, the capacitance gradually decreases. At the end of the capacitor's life, the nominal capacitance will decrease down to either 2%, 5% or can be determined per customer requirements.

INTRODUCTION

General Description

DC FILTERING

The FF series use a wound metallized polypropylene or polyester dielectric. Dry segmented, wet segmented and wet non segmented metallization solutions have been developed to insure the controlled self healing process. The FF series are able to operate at a very high dielectric strength up to 105°C hot spot temperature. (see specific description) For more informations about the controlled self healing process and its features and advantages, see a complete presentation.

AN ALTERNATIVE TO ELECTROLYTICS

FF series capacitors are an ideal alternative to electrolytic capacitors, because they can withstand much higher levels of surge voltage, very high rms currents and offer longer lifetimes (see section on lifetime as well as determination tables and application notes).

APPLICATIONS

The FF series capacitors are specifically designed for DC filtering and low reactive power. Main applications are: power supplies, motors, drives, electric utilities, induction heating, people movers, tramways, metro systems, unit supported power supplies, etc.

LIFETIME EXPECTANCY

One unique feature of the segmented metallized technology is how the capacitor acts at the end of its lifetime. Unlike electrolytic capacitors, which are a short circuit failure mode, film capacitors only experience a parametric loss of capacitance of about 2%, with no catastrophic failure mode. The capacitor gradually loses capacitance over its lifetime (like a battery), and eventually becomes an open circuit.

Lifetime, therefore, as it is defined here, is a function of several elements:

- Decrease in capacitance limit (-2% in the example above)
- Average applied voltage (expressed as a ratio vs nominal rated voltage)
- Average hot spot temperature

By changing any of these parameters we can change the defined "lifetime" of the capacitor. The capacitor will continue to function even beyond the preestablished limit for capacitance decrease. See lifetime expectancy tables in the individual series data sheets to help in this determination.

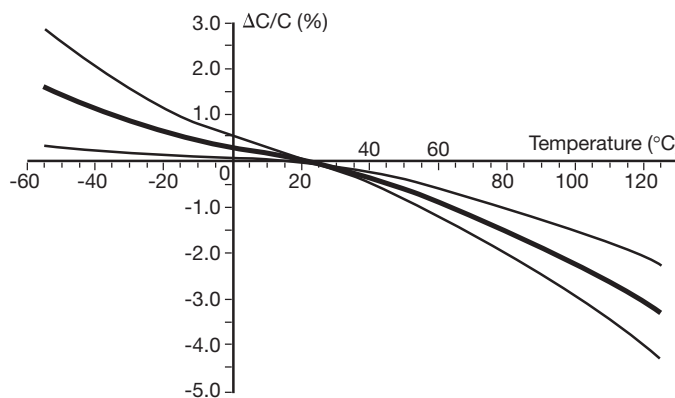
STANDARDS

IEC 61071-1, IEC 61071-2:	Power electronic capacitors
IEC 60068-1:	Environmental testing
IEC 60077:	Rules for electric traction equipment
UL 94:	Fire requirements
NF F 16-101:	Fire and smoke requirements
NF F 16-102:	Fire and smoke requirements
EN 45545-2:	Railways applications – Fire protection on railway vehicles Part 2: Requirements for fire behavior of materials and components
IEC 60384-2:	Fixed metallized polyester capacitors
IEC 61881:	Railway applications, rolling stock equipment, capacitors for power electronics

ELECTRICAL CHARACTERISTICS FOR POLYPROPYLENE AND POLYESTER DIELECTRIC CAPACITANCE FOR POLYPROPYLENE DIELECTRIC

Polypropylene has a constant dielectric constant, irrespective of frequency up to 1 MHz: $\epsilon_r = 2.2$

POLYPROPYLENE DIELECTRIC CAPACITANCE vs TEMPERATURE



GRAPH 1

TANGENT OF LOSS ANGLE ($\tan \delta_0$) FOR POLYPROPYLENE DIELECTRIC

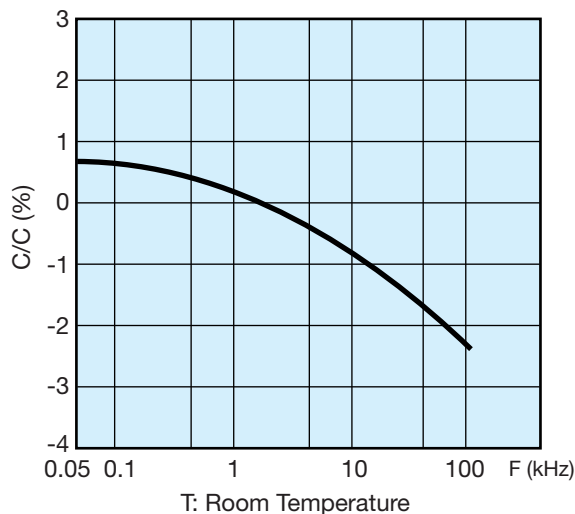
Polypropylene has a constant dielectric loss factor of 2×10^{-4} irrespective of temperature and frequency (up to 1 MHz).

INTRODUCTION

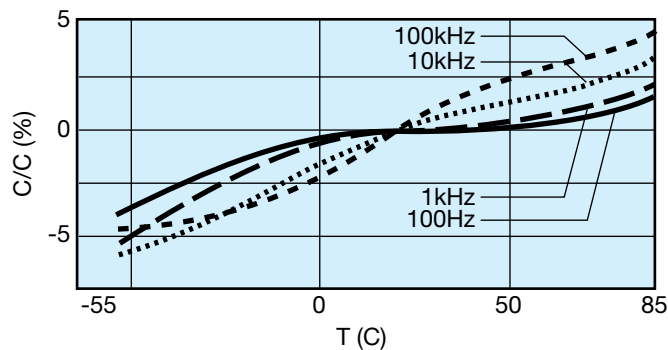
General Description

CAPACITANCE FOR POLYESTER DIELECTRIC

Capacitance of polyester capacitors is a function of temperature and frequency (see the curves).



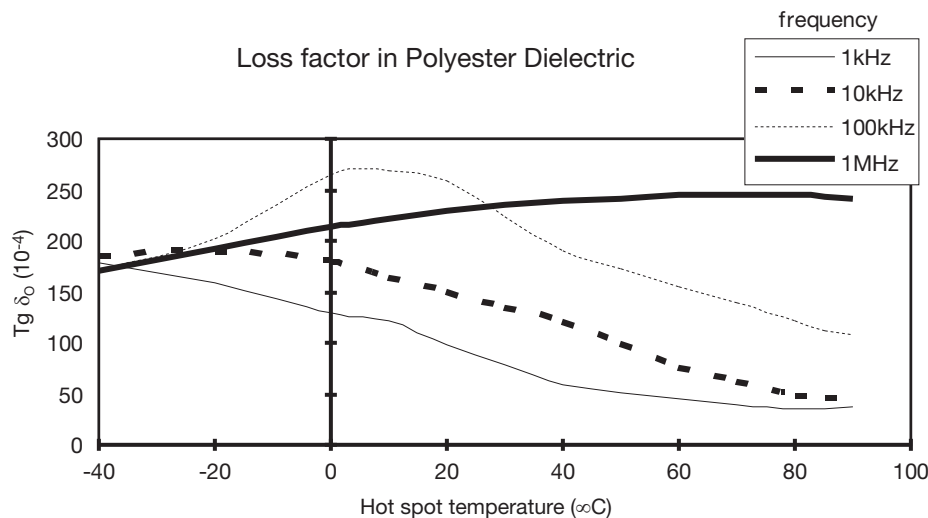
GRAPH 2



GRAPH 3

TANGENT OF LOSS ANGLE (TAN δ_0) FOR POLYESTER DIELECTRIC

Dielectric loss factor of polyester is a function of temperature and frequency (see the curves).



GRAPH 4

HOT SPOT TEMPERATURE

The maximum operating (hot spot) temperature of film capacitors can be calculated in the following manner:

The loss factor of the capacitor is made up of the sum of two components. The first represents electrical losses in the dielectric and the second component represents the Joule heating effect in the external connection and foils ($R_s \cdot C \cdot 2 \pi f$).

For all applications, the temperature in the hot spot must be lower than the maximum operating temperature for the particular capacitor series.

$$\theta_{\text{hot spot}} = \theta_{\text{ambient}} + [tg\delta_0 \cdot Q + R_s \cdot (I_{\text{rms}})^2] \cdot R_{\text{th}}$$

With:

Q : Reactive power in Var

R_s in Ohm

I_{rms} in Ampere

R_{th} : R_{th} ambient / hot spot in °C/W

$tg \delta_0 (10^{-4})$ is the tangent of loss angle [see $\tan \delta_0$ page 2 (polypropylene) and graph 4 above (polyester)]

DC FILTERING

FM* RoHS Compliant



PACKAGING MATERIAL

- Self-extinguishing plastic case
(V₀ = in accordance with UL 94) filled thermosetting resin.
- Self-extinguishing thermosetting resin
(V₀ = in accordance with UL 94;
I3F2 = in accordance with NF F 16-101).

STANDARDS

- IEC 61071-1, IEC 61071-2: Power electronic capacitors
IEC 60384-16: Fixed metallized polypropylene film dielectric DC capacitors
IEC 60384-16-1: Fixed metallized polypropylene film dielectric DC capacitors Assessment level E
IEC 60384-17: Fixed metallized polypropylene film dielectric AC and pulse capacitors
IEC 60384-17-1: Fixed metallized polypropylene film dielectric AC and pulse capacitors Assessment level E

HOW TO ORDER

FM	A	6	V	0335	K	02	L
Series	Case	Dielectric	Voltage	Capacitance EIA Code	Tolerances	Lead Type	Lead Length
	A K B L C M D N E P F Q G R H S J	6 = Polypropylene	D = 250V I = 400V J = 550V Q = 600V E = 630V A = 700V B = 800V C = 900V K = 1000V L = 1100V P = 1200V U = 1250V M = 1600V N = 2000V	0103 = 0.01µF	J = ±5% K = ±10% M = ±20%	02 = 2 Leads	L = 22mm 2 = 3.5 mm

FM is non-inductively wound with metallized or double side metallized (for voltage greater than 630V) polypropylene film as dielectric, encapsulated in plastic case and sealed with thermosetting resin. They are ideal for high frequency and high pulse-rise-time circuit, and find wide application in high voltage power supplies, snubber and electronic lighting ballasts

APPLICATIONS

- High reliability at high current stress
- Self-healing properties
- Flame retardant plastic case and epoxy resin
- Low losses, high dv/dt capability
- High moisture resistance
- High stability of capacitance and long life

WORKING TEMPERATURE

Operating Temperature Range: -40°C to +105°C

LIFETIME EXPECTANCY

One unique feature of this technology (as opposed to aluminum electrolytics) is how the capacitor reacts at the end of its lifetime.

Unlike aluminum electrolytic film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 2% from initial value, with no risk of short circuit.

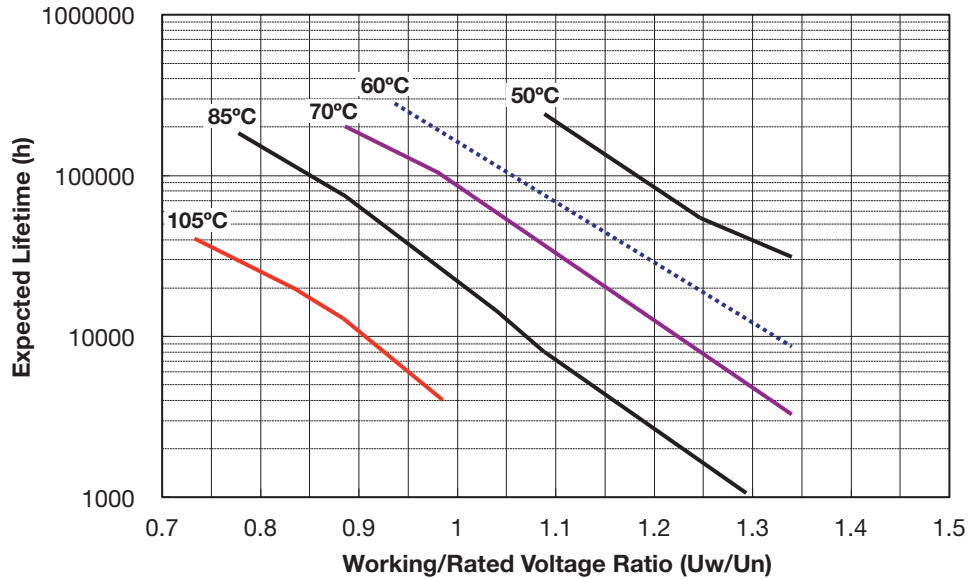
The capacitor continues to be functional even after this 2% decrease.

DC FILTERING

FM* RoHS Compliant

LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE

Expected Lifetime Curves (FM Series)



DIMENSIONS

Case Ref	W (mm)	H (mm)	T (mm)	P (mm)	d (mm)
A	13	11	5	10	0.6
B	13	12	6	10	0.6
C	18	11	5	15	0.8
D	18	12	6	15	0.8
E	18	13.5	6	15	0.8
F	18	13.5	7.5	15	0.8
G	18	14.5	8	15z	0.8
H	18	14.5	8.5	15	0.8
J	18	16	10	15	0.8
K	18	18	10	15	0.8
L	18	19	11	15	0.8
M	26	13.5	6	22.5	0.8
N	26	16.5	7	22.5	0.8
P	26	17	8.5	22.5	0.8
Q	26	19	10	22.5	0.8
R	26	20	11	22.5	0.8
S	26	23	13	22.5	0.8

GENERAL DESCRIPTION

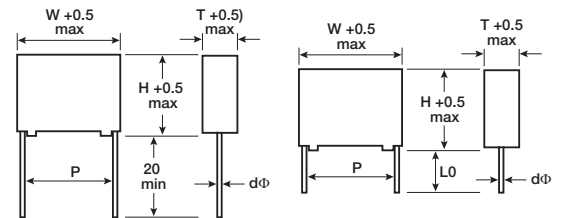


Fig. 1

Fig. 2

DC FILTERING

FM* RoHS Compliant



ELECTRICAL CHARACTERISTICS

Items	Characteristics
Climatic category	40/105/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x V _n dc
Capacitance range C _n	0.01µF to 0.47µF
Capacitance Tolerances:	±5%, ±10%
Rated DC Voltage:	250V to 2000V
Dielectric:	Polypropylene
Insulation Resistance:	> 30,000 MΩ (C ≤ 0.33µF), > 10,000 MΩ*µF/C after 1 minute

RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Cap (µF) ±5%	Rated Voltage (V)	Part Number	Case Code	W ±0.50 (mm)	H ±0.50 (mm)	T ±0.50 (mm)	P ±1.00 (mm)	d ±0.50 (mm)	V/µs (Volt/sec)	I Peak (A)	I rms (A)	Packaging Method (Fig 1)		Packaging Method (Fig 2)	
												Qty	Box Dimension (mm)	Qty	Box Dimension (mm)
Vndc = 250V Voltage Code: D															
0.010	250	FMA6D0103 * 02L	A	13.0	11.0	5.0	10.0	0.6	76.0	0.8	1.0	1200	180*170*120	850	360*170*35
0.015	250	FMA6D0153 * 02L	A	13.0	11.0	5.0	10.0	0.6	76.0	1.1	1.2	1200	180*170*120	850	360*170*35
0.022	250	FMA6D0223 * 02L	A	13.0	11.0	5.0	10.0	0.6	76.0	1.7	1.5	1200	180*170*120	850	360*170*35
0.033	250	FMA6D0333 * 02L	A	13.0	11.0	5.0	10.0	0.6	76.0	2.5	1.8	1200	180*170*120	850	360*170*35
0.047	250	FMB6D0473 * 02L	B	13.0	12.0	6.0	10.0	0.6	76.0	3.6	2.1	1000	180*170*120	700	360*170*35
0.068	250	FMB6D0683 * 02L	B	13.0	12.0	6.0	10.0	0.6	76.0	5.2	2.3	1000	180*170*120	700	360*170*35
0.100	250	FMB6D0104 * 02L	B	13.0	12.0	6.0	10.0	0.6	76.0	7.6	2.4	1000	180*170*120	700	360*170*35
0.100	250	FMC6D0104 * 02L	C	18.0	11.0	5.0	15.0	0.6	45.0	4.5	2.4	1000	180*170*120	600	360*170*35
0.150	250	FMD6D0154 * 02L	D	18.0	12.0	6.0	15.0	0.8	45.0	6.8	2.8	800	180*170*120	500	360*170*35
0.220	250	FMF6D0224 * 02L	F	18.0	13.5	7.5	15.0	0.8	45.0	9.9	3.3	600	180*170*120	410	360*170*35
0.330	250	FMF6D0334 * 02L	F	18.0	13.5	7.5	15.0	0.8	45.0	14.9	3.7	600	180*170*120	410	360*170*35
0.470	250	FMG6D0474 * 02L	H	18.0	14.5	8.5	15.0	0.8	45.0	21.2	4.2	500	180*170*120	350	360*170*35
Vndc = 630V Voltage Code: E															
0.010	630	FMA6E0103 * 02L	A	13.0	11.0	5.0	10	0.6	3000	30.0	2.2	1200	180*170*120	850	360*170*35
0.012	630	FMA6E0123 * 02L	A	13.0	11.0	5.0	10	0.6	3000	36.0	2.5	1200	180*170*120	850	360*170*35
0.015	630	FMA6E0153 * 02L	A	13.0	11.0	5.0	10	0.6	3000	45.0	2.8	1200	180*170*120	850	360*170*35
0.018	630	FMA6E0183 * 02L	A	13.0	11.0	5.0	10	0.6	3000	54.0	3.0	1200	180*170*120	850	360*170*35
0.010	630	FMC6E0103 * 02L	C	18.0	11.0	5.0	15	0.8	2500	25.0	2.2	1000	180*170*120	600	360*170*35
0.012	630	FMC6E0123 * 02L	C	18.0	11.0	5.0	15	0.8	2500	30.0	2.5	1000	180*170*120	600	360*170*35
0.015	630	FMC6E0153 * 02L	C	18.0	11.0	5.0	15	0.8	2500	37.5	3.3	1000	180*170*120	600	360*170*35
0.018	630	FMC6E0183 * 02L	C	18.0	11.0	5.0	15	0.8	2500	45.0	3.4	1000	180*170*120	600	360*170*35
0.022	630	FMC6E0223 * 02L	C	18.0	11.0	5.0	15	0.8	2500	55.5	3.7	1000	180*170*120	600	360*170*35
0.027	630	FMD6E0273 * 02L	D	18.0	12.0	6.0	15	0.8	2500	67.5	4.0	800	180*170*120	500	360*170*35
0.030	630	FMD6E0303 * 02L	D	18.0	12.0	6.0	15	0.8	2500	75.0	4.3	800	180*170*120	500	360*170*35
0.033	630	FMD6E0333 * 02L	D	18.0	12.0	6.0	15	0.8	2500	82.5	4.5	800	180*170*120	500	360*170*35
0.039	630	FMF6E0393 * 02L	F	18.0	13.5	7.5	15	0.8	2500	97.5	4.8	600	180*170*120	410	360*170*35
0.047	630	FMF6E0473 * 02L	F	18.0	13.5	7.5	15	0.8	2500	117.5	5.3	600	180*170*120	410	360*170*35
0.051	630	FMF6E0513 * 02L	F	18.0	13.5	7.5	15	0.8	2500	127.5	5.8	600	180*170*120	410	360*170*35
0.056	630	FMF6E0563 * 02L	F	18.0	13.5	7.5	15	0.8	2500	140.0	6.3	600	180*170*120	410	360*170*35
0.068	630	FMG6E0683 * 02L	G	18.0	14.5	8.0	15	0.8	2500	170.0	6.7	500	180*170*120	380	360*170*35
0.082	630	FMH6E0823 * 02L	H	18.0	14.5	8.5	15	0.8	2500	205.0	7.2	500	180*170*120	350	360*170*35
0.100	630	FMJ6E0104 * 02L	J	18.0	16.0	10.0	15	0.8	2500	250.0	7.5	400	180*170*120	300	360*170*35
0.120	630	FML6E0124 * 02L	L	18.0	19.0	11.0	15	0.8	2500	300.0	8.0	300	180*170*120	270	360*170*35

* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.



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TDS-MDPWR-0019 | Rev 1

DC FILTERING

FM* RoHS Compliant



RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Cap (μ F) $\pm 5\%$	Rated Voltage (V)	Part Number	Case Code	W ± 0.50 (mm)	H ± 0.50 (mm)	T ± 0.50 (mm)	P ± 1.00 (mm)	d ± 0.50 (mm)	V/ μ s (Volt/sec)	I Peak (A)	I rms (A)	Packaging Method (Fig 1)		Packaging Method (Fig 2)	
												Qty	Box Dimension (mm)	Qty	Box Dimension (mm)
Vndc = 1000V Voltage Code: K															
0.010	1000	FMA6K0103 * 02L	A	13.0	11.0	5.0	10	0.6	4500	45.0	2.6	1200	180*170*120	850	360*170*35
0.012	1000	FMA6K0123 * 02L	A	13.0	11.0	5.0	10	0.6	4500	54.0	2.9	1200	180*170*120	850	360*170*35
0.015	1000	FMA6K0153 * 02L	A	13.0	11.0	5.0	10	0.6	4500	67.5	3.2	1200	180*170*120	850	360*170*35
0.018	1000	FMA6K0183 * 02L	A	13.0	11.0	5.0	10	0.6	4500	81.0	3.4	1200	180*170*120	850	360*170*35
0.010	1000	FMC6K0103 * 02L	C	18.0	11.0	5.0	15	0.8	3200	32.0	2.4	1000	180*170*120	600	360*170*35
0.012	1000	FMC6K0123 * 02L	C	18.0	11.0	5.0	15	0.8	3200	38.4	2.7	1000	180*170*120	600	360*170*35
0.015	1000	FMC6K0153 * 02L	C	18.0	11.0	5.0	15	0.8	3200	48.0	3.0	1000	180*170*120	600	360*170*35
0.018	1000	FMC6K0183 * 02L	C	18.0	11.0	5.0	15	0.8	3200	57.6	3.2	1000	180*170*120	600	360*170*35
0.022	1000	FMC6K0223 * 02L	C	18.0	11.0	5.0	15	0.8	3200	70.4	3.6	1000	180*170*120	600	360*170*35
0.027	1000	FMD6K0273 * 02L	D	18.0	12.0	6.0	15	0.8	3200	86.4	3.9	800	180*170*120	500	360*170*35
0.030	1000	FMD6K0303 * 02L	D	18.0	12.0	6.0	15	0.8	3200	96.0	4.5	800	180*170*120	500	360*170*35
0.033	1000	FMD6K0333 * 02L	D	18.0	12.0	6.0	15	0.8	3200	105.6	5.1	800	180*170*120	500	360*170*35
0.039	1000	FMF6K0393 * 02L	F	18.0	13.5	7.5	15	0.8	3200	124.8	5.6	600	180*170*120	410	360*170*35
0.047	1000	FMF6K0473 * 02L	F	18.0	13.5	7.5	15	0.8	3200	150.4	6.0	600	180*170*120	410	360*170*35
0.051	1000	FMF6K0513 * 02L	F	18.0	13.5	7.5	15	0.8	3200	163.2	6.4	600	180*170*120	410	360*170*35
0.056	1000	FMF6K0563 * 02L	F	18.0	13.5	7.5	15	0.8	3200	179.2	6.7	600	180*170*120	410	360*170*35
0.068	1000	FMG6K0683 * 02L	G	18.0	14.5	8.0	15	0.8	3200	217.6	7.1	500	180*170*120	380	360*170*35
0.082	1000	FMH6K0823 * 02L	H	18.0	14.5	8.5	15	0.8	3200	262.4	7.4	500	180*170*120	350	360*170*35
0.100	1000	FMJ6K0104 * 02L	J	18.0	16.0	10.0	15	0.8	3200	320.0	7.8	400	180*170*120	300	360*170*35
0.120	1000	FML6K0124 * 02L	L	18.0	19.0	11.0	15	0.8	3200	384.0	8.5	300	180*170*120	270	360*170*35
Vndc = 1250V Voltage Code: U															
0.01	1250	FMA6U0103 * 02L	A	13.0	11.0	5.0	10.0	0.6	4600	46.0	2.8	1200	180*170*120	850	360*170*35
0.012	1250	FMA6U0123 * 02L	A	13.0	11.0	5.0	10.0	0.6	4600	55.2	3.1	1200	180*170*120	850	360*170*35
0.015	1250	FMA6U0153 * 02L	A	13.0	11.0	5.0	10.0	0.6	4600	69.0	3.3	1200	180*170*120	850	360*170*35
0.018	1250	FMA6U0183 * 02L	A	13.0	11.0	5.0	10.0	0.6	4600	82.8	2.6	1200	180*170*120	850	360*170*35
0.01	1250	FMC6U0103 * 02L	C	18.0	11.0	5.0	15.0	0.8	3300	33.0	2.8	1000	180*170*120	600	360*170*35
0.012	1250	FMC6U0123 * 02L	C	18.0	11.0	5.0	15.0	0.8	3300	39.6	3.0	1000	180*170*120	600	360*170*35
0.015	1250	FMC6U0153 * 02L	C	18.0	11.0	5.0	15.0	0.8	3300	49.5	3.2	1000	180*170*120	600	360*170*35
0.018	1250	FMC6U0183 * 02L	C	18.0	11.0	5.0	15.0	0.8	3300	59.4	3.6	1000	180*170*120	600	360*170*35
0.022	1250	FMD6U0223 * 02L	D	18.0	12.0	6.0	15.0	0.8	3300	72.6	4.0	800	180*170*120	500	360*170*35
0.027	1250	FME6U0273 * 02L	E	18.0	13.5	6.0	15.0	0.8	3300	89.1	4.5	600	180*170*120	500	360*170*35
0.030	1250	FMF6U0303 * 02L	F	18.0	13.5	7.5	15.0	0.8	3300	99.0	4.9	600	180*170*120	410	360*170*35
0.033	1250	FMF6U0333 * 02L	F	18.0	13.5	7.5	15.0	0.8	3300	108.9	5.4	600	180*170*120	410	360*170*35
0.039	1250	FMG6U0393 * 02L	G	18.0	14.5	8.0	15.0	0.8	3300	128.7	5.8	500	180*170*120	380	360*170*35
0.047	1250	FMG6U0473 * 02L	G	18.0	14.5	8.0	15.0	0.8	3300	155.1	6.3	500	180*170*120	380	360*170*35
0.051	1250	FMH6U0513 * 02L	H	18.0	14.5	8.5	15.0	0.8	3300	168.3	6.7	500	180*170*120	350	360*170*35
0.056	1250	FMH6U0563 * 02L	H	18.0	14.5	8.5	15.0	0.8	3300	184.8	7.0	500	180*170*120	350	360*170*35
0.068	1250	FMJ6U0683 * 02L	J	18.0	16.0	10.0	15.0	0.8	3300	224.4	7.4	400	180*170*120	300	360*170*35
0.082	1250	FMK6U0823 * 02L	K	18.0	18.0	10.0	15.0	0.8	3300	270.6	7.8	300	180*170*120	300	360*170*35
0.100	1250	FML6U0104 * 02L	L	18.0	19.0	11.0	15.0	0.8	3300	330.0	8.0	300	180*170*120	270	360*170*35

* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.

DC FILTERING

FM* RoHS Compliant



RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Cap (μ F) $\pm 5\%$	Rated Voltage (V)	Part Number	Case Code	W ± 0.50 (mm)	H ± 0.50 (mm)	T ± 0.50 (mm)	P ± 1.00 (mm)	d ± 0.50 (mm)	V/ μ s (Volt/sec)	I Peak (A)	I rms (A)	Packaging Method (Fig 1)		Packaging Method (Fig 2)	
												Qty	Box Dimension (mm)	Qty	Box Dimension (mm)
Vndc = 1600V Voltage Code: M															
0.01	1600	FMD6M0103 * 02L	D	18.0	12.0	6.0	15.0	0.8	5800	58.0	2.5	800	180*170*120	500	360*170*35
0.012	1600	FMF6M0123 * 02L	F	18.0	13.5	7.5	15.0	0.8	5800	69.6	2.9	600	180*170*120	410	360*170*35
0.015	1600	FMF6M0153 * 02L	F	18.0	13.5	7.5	15.0	0.8	5800	87.0	3.4	600	180*170*120	410	360*170*35
0.018	1600	FMH6M0183 * 02L	H	18.0	14.5	8.5	15.0	0.8	5800	104.4	3.8	500	180*170*120	350	360*170*35
0.022	1600	FMH6M0223 * 02L	H	18.0	14.5	8.5	15.0	0.8	5800	127.6	4.3	500	180*170*120	350	360*170*35
0.027	1600	FMJ6M0273 * 02L	J	18.0	16.0	10.0	15.0	0.8	5800	156.6	4.7	400	180*170*120	300	360*170*35
0.033	1600	FML6M0333 * 02L	L	18.0	19.0	11.0	15.0	0.8	5800	191.4	5.4	300	180*170*120	270	360*170*35
0.033	1600	FMN6M0333 * 02L	N	26.0	16.5	7.0	22.5	0.8	3000	99.0	5.8	400	180*170*120	290	360*170*35
0.039	1600	FMP6M0393 * 02L	P	26.0	17.0	8.5	22.5	0.8	3000	117.0	6.2	300	180*170*120	240	360*170*35
0.047	1600	FMP6M0473 * 02L	P	26.0	17.0	8.5	22.5	0.8	3000	141.0	6.5	300	180*170*120	240	360*170*35
0.056	1600	FMQ6M0563 * 02L	Q	26.0	19.0	10.0	22.5	0.8	3000	168.0	7.0	250	180*170*120	200	360*170*35
0.068	1600	FMR6M0683 * 02L	R	26.0	10.0	11.0	22.5	0.8	3000	204.0	7.6	200	180*170*120	180	360*170*35
0.082	1600	FMR6M0823 * 02L	R	26.0	20.0	11.0	22.5	0.8	3000	246.0	8.1	200	180*170*120	180	360*170*35
0.100	1600	FMS6M0104 * 02L	S	26.0	23.0	13.0	22.5	0.8	3000	300.0	8.7	100	180*170*120	150	360*170*35
Vndc = 2000V Voltage Code: N															
0.010	2000	FMF6N0103 * 02L	F	18.0	13.5	7.5	15.0	0.8	9000	90.0	3.0	600	180*170*120	410	360*170*35
0.012	2000	FMH6N0123 * 02L	H	18.0	14.5	8.5	15.0	0.8	9000	108.0	3.2	500	180*170*120	350	360*170*35
0.015	2000	FMJ6N0153* 02L	J	18.0	16.0	10.0	15.0	0.8	9000	135.0	3.5	400	180*170*120	300	360*170*35
0.010	2000	FMM6N0103 * 02L	M	26.0	13.5	6.0	22.5	0.8	3500	35.0	2.8	400	180*170*120	350	360*170*35
0.012	2000	FMM6N0123 * 02L	M	26.0	13.5	6.0	22.5	0.8	3500	42.0	3.0	400	180*170*120	350	360*170*35
0.015	2000	FMN6N0153 * 02L	N	26.0	16.5	7.0	22.5	0.8	3500	52.5	3.3	400	180*170*120	290	360*170*35
0.018	2000	FMN6N0183 * 02L	N	26.0	16.5	7.0	22.5	0.8	3500	63.0	3.8	400	180*170*120	290	360*170*35
0.022	2000	FMP6N0223 * 02L	P	26.0	17.0	8.5	22.5	0.8	3500	77.0	4.3	300	180*170*120	240	360*170*35
0.027	2000	FMQ6N0273 * 02L	Q	26.0	19.0	10.0	22.5	0.8	3500	94.5	4.9	250	180*170*120	200	360*170*35
0.033	2000	FMQ6N0333 * 02L	Q	26.0	19.0	10.0	22.5	0.8	3500	115.5	5.7	250	180*170*120	200	360*170*35
0.039	2000	FMR6N0393 * 02L	R	26.0	20.0	11.0	22.5	0.8	3500	136.5	6.5	200	180*170*120	180	360*170*35
0.047	2000	FMS6N0473 * 02L	S	26.0	23.0	13.0	22.5	0.8	3500	164.5	7.0	100	180*170*120	150	360*170*35
0.056	2000	FMS6N0563 * 02L	S	26.0	23.0	13.0	22.5	0.8	3500	196.0	8.2	100	180*170*120	150	360*170*35

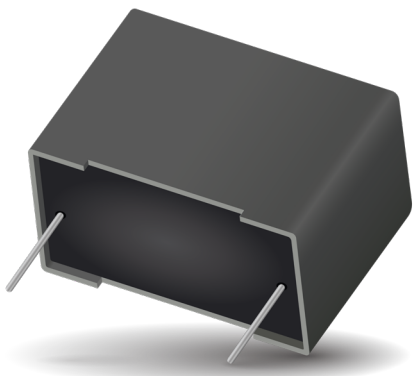
* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

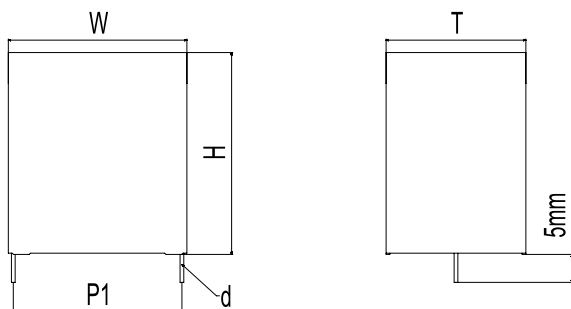
KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.

DC FILTERING

FB* RoHS Compliant



DIMENSIONS



STANDARDS

- IEC 61071-1: Power electronic capacitors
- IEC 61071-2: Power electronic capacitors
- IEC 60384-16: Fixed metallized polypropylene film dielectric DC capacitors
- IEC 60384-16-1: Fixed metallized polypropylene film dielectric DC capacitors Assessment level E
- IEC 60384-17: Fixed metallized polypropylene film dielectric AC and pulse capacitors
- IEC 60384-17-1: Fixed metallized polypropylene film dielectric AC and pulse capacitors
- EN CZDS2.E514026 Certificate: E514026 (approved by UL)

HOW TO ORDER

FB	27	E*	6	I	0335	K	C
Series	Pitch	Case Size	Type	Voltage	Cap	Tolerance	Lead Type
FB	27 = 27.5mm 37 = 37.5mm	E* for P=27.5mm F* for P=37.5mm	6 = Standard 105°C 7 = THB Grade IIIB - 105°C 8 = THB 2000H - 125°C	I = 450V H = 500V J = 550V Q = 600V A = 700V B = 800V C = 900V K = 1000V L = 1100V P = 1200V	µF Code	K = ±10% M = ±20% J = ±5% refer Factory	C = 2 pins 5mm L = 2 pins 20mm min

* THB - Temperature Humidity Bias

GENERAL DESCRIPTION

The FB series uses a non-impregnated metallized polypropylene dielectric specially treated to have a very high dielectric strength in operation condition up to 125°C.

FB series performance characteristics make them a viable alternative to aluminum electrolytic technology due to much lower ESR and much higher surge voltage capability (dv/dt).

GENERAL CHARACTERISTICS

- Able to Withstand Harsh Environment Conditions

FEATURES & BENEFITS

- High Performance DC Filter
- Low ESR, High Peak & RMS Current
- THB Compliance
- Able to Withstand Harsh Environment Conditions (THB Compliance)

APPLICATIONS

- Renewable Energy Inverter
- Motor Drives
- Industrial Power Supply
- UPS System

OPERATING TEMPERATURE RANGE

- Operating temperature range : -40°C to + 105°C (Type 6 and 7)
- Operating temperature range : -40°C to + 125°C (Type 8)

PACKAGING MATERIAL

Self-extinguishing plastic case (V0 = in accordance with UL 94) filled thermosetting resin.

Self-extinguishing thermosetting resin (V0 = in accordance with UL 94).

LIFE EXPECTANCY

One unique feature of this technology (versus aluminum electrolytics) is how the capacitor reacts at the end of its lifetime.

Unlike aluminum electrolytic film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 2% from initial value, with no risk of short circuit.

The capacitor continues to be functional even after this 2% decrease.

DC FILTERING

FB *RoHS Compliant



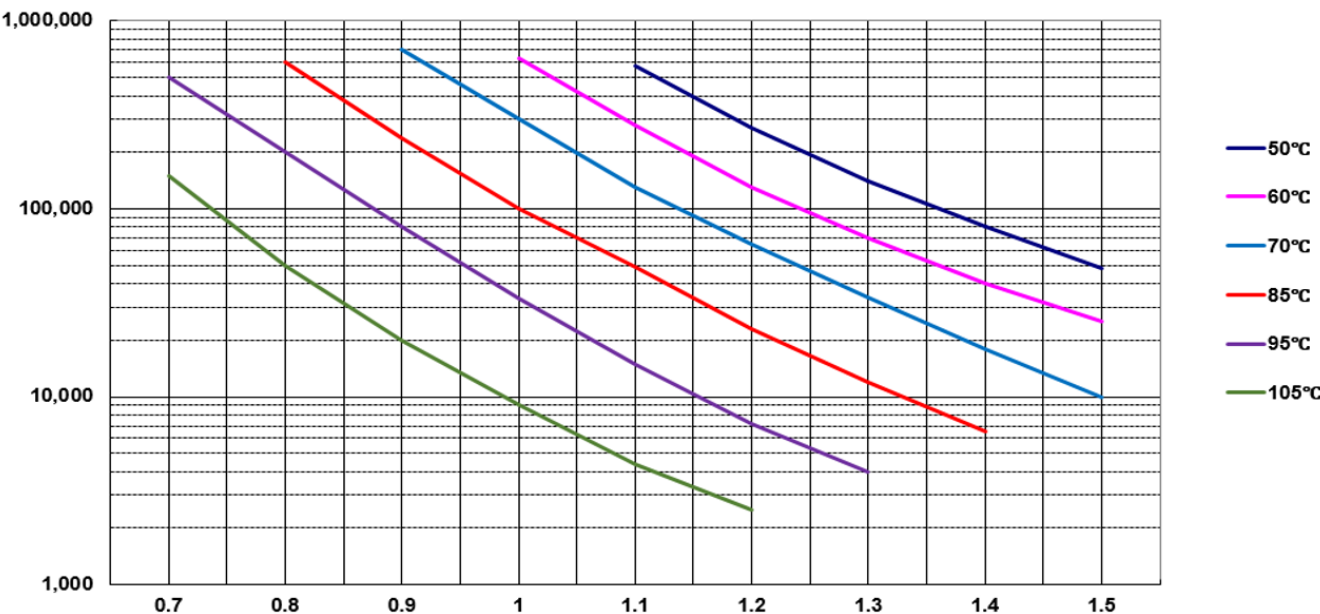
POLYPROPYLENE DIELECTRIC FOR INDUSTRIAL DC FILTERING

These capacitors have been designed primarily for high and medium power DC filtering applications.

ELECTRICAL CHARACTERISTICS – POLYPROPYLENE DIELECTRIC

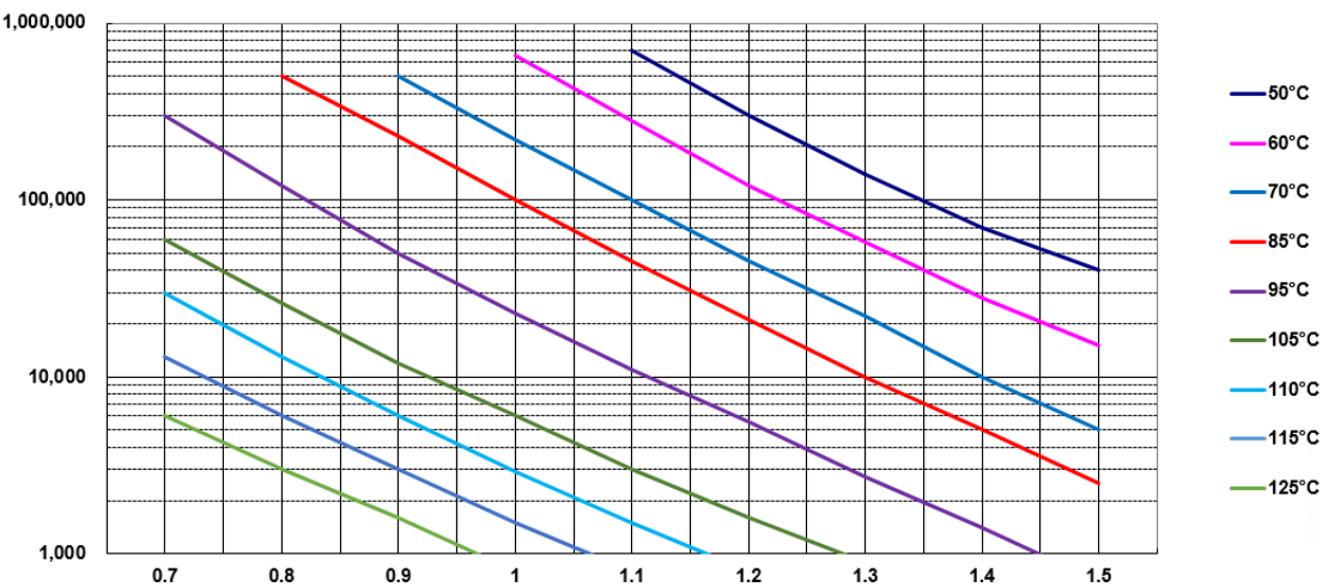
Items	Characteristics		
	Standard - 105°C	THB Grade IIIB - 105°C	THB 2000H - 125°C
Application	DC Filtering / DC Link		
Reference Standard	IEC 61071		
Climatic Category	40/85/56 IEC 60068-1		40/105/56 IEC 60068-1
Operating Temperature Range	-40°C ~ +105°C (85°C ~105°C, decreasing factor 1.25% per °C for Rated Voltage)		-40°C ~ +125°C (85°C ~125°C, decreasing factor 1.11% per °C for Rated Voltage)
Upper Temperature Tmax	105°C		125°C
Lower Temperature Tmin	-40°C		-55°C
Rated Voltage	450Vdc ~ 1200Vdc		450Vdc ~ 1100Vdc
Capacitance Range	1uF ~ 220uF		
Capacitance Tolerance	±10% at +25°C		
Dissipation Factor (DF)	≤0.002 (0.2%) at 1KHz; C ≤20uF at 25°C		
	≤0.003 (0.3%) at 1KHz; C >20uF at 25°C		
	≤0.004 (0.4%) at 1KHz; C >80uF at 25°C		
Test Voltage Between Terminals	1.5 x rated voltage for 10s (terminal to terminal)		
Test Voltage Terminal to Case	3.0kVrms 50 Hz for 10 sec at +25°C		
Insulation Resistance	IR x C≥30,000 Seconds at 100VDC 1 minute at +25°C		
Life Expectancy	100,000 hours at Un @ Hot-Spot temperature T=+85°C		100,000 hours at Un @ Hot-Spot temperature T=+85°C
			20,000 hours at Un @ Hot-Spot temperature T=+105°C
			5,000 hours at Un @ Hot-Spot temperature T=+115°C
			4,000 hours at Un @ Hot-Spot temperature T=+125°C
Protection	Solvent resistant plastic case UL94 V-0 Thermosetting resin sealing UL 94 V-0 compliant		
Installation	Any position		
Leads	Tinned copper wires, standard lead wire length 5 ±1mm		
Packaging	Packed in cardboard boxes with protection for the terminals		
RoHS Compliant	Compliant with the restricted substance requirements of Directive 2011/65/EU		
Storage Conditions	Storage time: ≤ 24 months from the date marked on the label package		
	Temperature and relative humidity should be -10°C ~ +40°C and not more than 75%RH.		
	RH ≤ 85% for 30 days randomly distributed throughout the year		
Humidity Test	Test conditions & performance:		
	Temperature: +40°C±2°C		
	Relative humidity (RH): 93% ±2%		
	Test duration: 56 days		
	Capacitance change: ≤±5% DF change (@tgδ): ≤50 X 10 ⁻⁴ at 1KHz		
	Insulation resistance: ≥50% of initial limit		
Endurance Test	Test conditions & performance:		
	Temperature: +85°C±2°C		
	Voltage applied: 1.3 X VR (d.c.)		
	Test duration: 1000 Hours		
	Capacitance change: ≤±5% DF change (@ tgδ): ≤50 X 10 ⁻⁴ at 1KHz		
	Insulation resistance: ≥50% of initial limit		
High Temperature High Humidity		Test conditions & performance:	Test conditions & performance:
		Temperature: +85°C±2°C	Temperature: +85°C±2°C
		Relative humidity (RH): 85% ±2%	Relative humidity (RH): 85% ±2%
		Voltage applied: Rated Voltage	Voltage applied: Rated Voltage
		Test duration: 1000 Hours	Test duration: 2000 Hours
		Capacitance change: ≤±10%	Capacitance change: ≤±10%
		DF change (Δ tgδ): ≤80 X 10 ⁻⁴ at 1KHz	DF change (Δ tgδ): ≤80 X 10 ⁻⁴ at 1KHz
		Insulation resistance: ≥50% of initial limit	Insulation resistance: ≥50% of initial limit
THB Test (Damp heat test with loading)	Test conditions & performance:		
	Temperature: +85°C±2°C Relative humidity (RH): 85% ±2%		
	Loading Voltage: Rated Voltage (DC)		
	Test duration: 1000 hours		
	Capacitance change: ≤±5%		

Expected Life Curve at Hot Spot Temperature (T_{HS})



For Standard & THB Grade IIIB - 105°C

Expected Life Curve at Hot Spot Temperature (T_{HS})



For THB 2000H - 125°C

DC FILTERING

FB - Standard 105°C *RoHS Compliant



CASE CODE

Case Code	Dimensions									
	W		H		T		P1		d	
	± 0.8(0.03)		± 0.8(0.03)		± 0.8(0.03)		± 1.0(0.04)		± 0.05(0.002)	
	mm	in	mm	in	mm	in	mm	in	mm	in
EC	32.0	(1.26)	18.0	(0.71)	9.0	(0.35)	27.5	(1.08)	0.8	(0.03)
E1	32.0	(1.26)	20.0	(0.79)	11.0	(0.43)	27.5	(1.08)	0.8	(0.03)
E2	32.0	(1.26)	22.0	(0.87)	13.0	(0.51)	27.5	(1.08)	0.8	(0.03)
EK	32.0	(1.26)	24.0	(0.94)	14.0	(0.55)	27.5	(1.08)	0.8	(0.03)
EJ	32.0	(1.26)	24.5	(0.96)	13.0	(0.51)	27.5	(1.08)	0.8	(0.03)
EE	32.0	(1.26)	24.5	(0.96)	15.0	(0.59)	27.5	(1.08)	0.8	(0.03)
E3	32.0	(1.26)	28.0	(1.10)	14.0	(0.55)	27.5	(1.08)	0.8	(0.03)
E4	32.0	(1.26)	28.0	(1.10)	18.0	(0.71)	27.5	(1.08)	0.8	(0.03)
EL	32.0	(1.26)	30.0	(1.18)	16.0	(0.63)	27.5	(1.08)	0.8	(0.03)
E6	32.0	(1.26)	33.0	(1.30)	18.0	(0.71)	27.5	(1.08)	0.8	(0.03)
E9	32.0	(1.26)	37.0	(1.46)	22.0	(0.87)	27.5	(1.08)	0.8	(0.03)
FV	42.0	(1.65)	28.0	(1.10)	17.0	(0.67)	37.5	(1.48)	1.0	(0.04)
FW	42.0	(1.65)	30.0	(1.18)	17.0	(0.67)	37.5	(1.48)	1.0	(0.04)
F3	42.0	(1.65)	32.0	(1.26)	19.0	(0.75)	37.5	(1.48)	1.0	(0.04)

RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight																			
					W	H	T	P1	d																												
	uF				V	± 0.8	± 0.8	± 0.8	± 1.0										± 0.05	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs						
Voltage Vndc 450V																			Voltage Code I																		
3.3	450	FB27EC6I0335KC	I	EC	32.0	18	9.0	27.5	0.8	65	215	4.0	30.7	41.7	12	180	4,320	7																			
4.0	450	FB27EC6I0405KC	I	EC	32.0	18	9.0	27.5	0.8	65	260	4.4	25.3	41.7	12	180	4,320	7																			
5.0	450	FB27E16I0505KC	I	E1	32.0	20	11	27.5	0.8	65	325	4.9	20.2	35.7	14	150	3,600	8																			
6.0	450	FB27E16I0605KC	I	E1	32.0	20	11	27.5	0.8	65	390	5.8	16.9	35.7	14	150	3,600	8																			
7.0	450	FB27E26I0705KC	I	E2	32.0	22	13	27.5	0.8	65	455	6.2	14.5	33.3	15	120	2,400	10																			
8.0	450	FB27E26I0805KC	I	E2	32.0	22	13	27.5	0.8	65	520	6.9	12.6	33.3	15	120	2,400	10																			
10.0	450	FB27EJ6I0106KC	I	EJ	32.0	24.5	13	27.5	0.8	65	650	8.0	10.1	31.3	16	120	2,400	12																			
12.0	450	FB27E36I0126KC	I	E3	32.0	28	14	27.5	0.8	65	780	9.0	8.4	27.8	18	110	2,200	16																			
13.0	450	FB27E36I0136KC	I	E3	32.0	28	14	27.5	0.8	65	845	9.3	7.8	27.8	18	110	2,200	16																			
15.0	450	FB27EL6I0156KC	I	EL	32.0	30	16	27.5	0.8	65	975	10.6	6.7	26.3	18	100	2,000	19																			
15.0	450	FB27E46I0156KC	I	E4	32.0	28	18	27.5	0.8	65	975	11.2	6.7	23.8	19	90	1,800	19																			
16.0	450	FB27E46I0166KC	I	E4	32.0	28	18	27.5	0.8	65	1040	11.5	6.3	23.8	19	90	1,800	19																			
18.0	450	FB27E66I0186KC	I	E6	32.0	33	18	27.5	0.8	65	1170	12.8	5.6	21.7	21	90	1,800	23																			
20.0	450	FB27E66I0206KC	I	E6	32.0	33	18	27.5	0.8	65	1300	13.5	5.1	21.7	21	90	1,800	23																			
22.0	450	FB27E96I0226KC	I	E9	32.0	37	22	27.5	0.8	65	1430	14.1	4.6	17.2	23	70	840	32																			
25.0	450	FB27E96I0256KC	I	E9	32.0	37	22	27.5	0.8	65	1625	16.9	4.0	17.2	23	70	840	32																			
28.0	450	FB27E96I0286KC	I	E9	32.0	37	22	27.5	0.8	65	1820	17.9	3.6	17.2	23	70	840	32																			
20.0	450	FB37FV6I0206KC	I	FV	42.0	28	17	37.5	1.0	35	700	8.5	13.8	20.0	12	63	2,520	26																			
25.0	450	FB37F36I0256KC	I	F3	42.0	32	19	37.5	1.0	35	875	9.5	11.1	17.9	13	56	2,240	31																			
Voltage Vndc 500V																			Voltage Code H																		
3.3	500	FB27EC6H0335KC	H	EC	32.0	18.0	9.0	27.5	0.8	65	215	4.1	28.4	41.7	12	180	4,320	7																			
4.0	500	FB27EC6H0405KC	H	EC	32.0	18.0	9.0	27.5	0.8	65	260	4.5	23.4	41.7	12	180	4,320	7																			
5.0	500	FB27E16H0505KC	H	E1	32.0	20.0	11.0	27.5	0.8	65	325	5.5	18.7	35.7	14	150	3,600	8																			
6.0	500	FB27E16H0605KC	H	E1	32.0	20.0	11.0	27.5	0.8	65	390	6.0	15.6	35.7	14	150	3,600	8																			
7.0	500	FB27E26H0705KC	H	E2	32.0	22.0	13.0	27.5	0.8	65	455	6.7	13.4	33.3	15	120	2,400	10																			
8.0	500	FB27E26H0805KC	H	E2	32.0	22.0	13.0	27.5	0.8	65	520	7.2	11.7	33.3	15	120	2,400	10																			
10.0	500	FB27EJ6H0106KC	H	EJ	32.0	24.5	13.0	27.5	0.8	65	650	8.3	9.4	31.3	16	120	2,400	12																			
12.0	500	FB27E36H0126KC	H	E3	32.0	28.0	14.0	27.5	0.8	65	780	9.6	7.8	27.8	18	110	2,200	16																			
13.0	500	FB27E36H0136KC	H	E3	32.0	28.0	14.0	27.5	0.8	65	845	10.0	7.2	27.8	18	110	2,200	16																			
15.0	500	FB27EL6H0156KC	H	EL	32.0	30.0	16.0	27.5	0.8	65	975	11.0	6.2	26.3	18	100	2,000	19																			
15.0	500	FB27E46H0156KC	H	E4	32.0	28.0	18.0	27.5	0.8	65	975	11.0	6.2	23.8	19	90	1,800	19																			



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RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
16.0	500	FB27E46H0166KC	H	E4	32.0	28.0	18.0	27.5	0.8	65	1040	12.0	5.9	23.8	19	90	1,800	19
18.0	500	FB27E66H0186KC	H	E6	32.0	33.0	18.0	27.5	0.8	65	1170	13.3	5.2	21.7	21	90	1,800	23
20.0	500	FB27E66H0206KC	H	E6	32.0	33.0	18.0	27.5	0.8	65	1300	14.0	4.7	21.7	21	90	1,800	23
22.0	500	FB27E96H0226KC	H	E9	32.0	37.0	22.0	27.5	0.8	65	1430	16.5	4.3	17.2	23	70	840	32
25.0	500	FB27E96H0256KC	H	E9	32.0	37.0	22.0	27.5	0.8	65	1625	17.6	3.7	17.2	23	70	840	32
28.0	500	FB27E96H0286KC	H	E9	32.0	37.0	22.0	27.5	0.8	65	1820	18.6	3.3	17.2	23	70	840	32
20.0	500	FB37FV6H0206KC	H	FV	42.0	28.0	17.0	37.5	1.0	35	700	8.8	12.8	20.0	12	63	2,520	26
25.0	500	FB37F36H0256KC	H	F3	42.0	32.0	19.0	37.5	1.0	35	875	10.5	10.2	17.9	13	56	2,240	31
Voltage Vndc 550V																		
3.0	550	FB27EC6J0305KC	J	EC	32.0	18.0	9.0	27.5	0.8	65	195	4.1	28.1	41.7	12	180	4,320	7
4.0	550	FB27E16J0405KC	J	E1	32.0	20.0	11.0	27.5	0.8	65	260	5.2	21.1	35.7	14	150	3,600	8
5.0	550	FB27E26J0505KC	J	E2	32.0	22.0	13.0	27.5	0.8	65	325	6.0	16.9	33.3	15	120	2,400	10
6.0	550	FB27E26J0605KC	J	E2	32.0	22.0	13.0	27.5	0.8	65	390	6.5	14.0	33.3	15	120	2,400	10
7.0	550	FB27EK6J0705KC	J	EK	32.0	24.0	14.0	27.5	0.8	65	455	7.5	12.0	29.4	17	110	2,200	13
8.0	550	FB27EK6J0805KC	J	EK	32.0	24.0	14.0	27.5	0.8	65	520	8.0	10.5	29.4	17	110	2,200	13
9.0	550	FB27E36J0905KC	J	E3	32.0	28.0	14.0	27.5	0.8	65	585	8.8	9.4	27.8	18	110	2,200	16
10.0	550	FB27E36J0106KC	J	E3	32.0	28.0	14.0	27.5	0.8	65	650	9.2	8.4	27.8	18	110	2,200	16
12.0	550	FB27EL6J0126KC	J	EL	32.0	30.0	16.0	27.5	0.8	65	780	10.4	7.0	26.3	18	100	2,000	19
12.0	550	FB27E46J0126KC	J	E4	32.0	28.0	18.0	27.5	0.8	65	780	10.9	7.0	23.8	19	90	1,800	19
15.0	550	FB27E66J0156KC	J	E6	32.0	33.0	18.0	27.5	0.8	65	975	12.8	5.6	21.7	21	90	1,800	23
20.0	550	FB27E96J0206KC	J	E9	32.0	37.0	22.0	27.5	0.8	65	1300	16.6	4.2	17.2	23	70	840	32
22.0	550	FB27E96J0226KC	J	E9	32.0	37.0	22.0	27.5	0.8	65	1430	17.4	3.8	17.2	23	70	840	32
Voltage Vndc 600V																		
2.0	600	FB27EC6Q0205KC	Q	EC	32.0	18.0	9.0	27.5	0.8	65	130	3.6	36.1	41.7	12	180	4,320	7
2.2	600	FB27EC6Q0225KC	Q	EC	32.0	18.0	9.0	27.5	0.8	65	143	3.8	32.8	41.7	12	180	4,320	7
3.0	600	FB27E16Q0305KC	Q	E1	32.0	20.0	11.0	27.5	0.8	65	195	4.8	24.1	35.7	14	150	3,600	8
3.3	600	FB27E16Q0335KC	Q	E1	32.0	20.0	11.0	27.5	0.8	65	215	5.1	21.9	35.7	14	150	3,600	8
4.0	600	FB27E16Q0405KC	Q	E1	32.0	20.0	11.0	27.5	0.8	65	260	5.6	18.1	35.7	14	150	3,600	8
5.0	600	FB27E26Q0505KC	Q	E2	32.0	22.0	13.0	27.5	0.8	65	325	6.4	14.5	33.3	15	120	2,400	10
6.0	600	FB27EJ6Q0605KC	Q	EJ	32.0	24.5	13.0	27.5	0.8	65	390	7.3	12.0	31.3	16	120	2,400	12
7.0	600	FB27EE6Q0705KC	Q	EE	32.0	24.5	15.0	27.5	0.8	65	455	8.2	10.3	28.6	18	110	2,200	13
7.0	600	FB27E36Q0705KC	Q	E3	32.0	28.0	14.0	27.5	0.8	65	455	8.4	10.3	27.8	18	110	2,200	16
8.0	600	FB27E36Q0805KC	Q	E3	32.0	28.0	14.0	27.5	0.8	65	520	8.9	9.0	27.8	18	110	2,200	16
9.0	600	FB27EL6Q0905KC	Q	EL	32.0	30.0	16.0	27.5	0.8	65	585	9.7	8.0	26.3	18	100	2,000	19
10.0	600	FB27E46Q0106KC	Q	E4	32.0	28.0	18.0	27.5	0.8	65	650	10.8	7.2	23.8	19	90	1,800	19
11.0	600	FB27E66Q0116KC	Q	E6	32.0	33.0	18.0	27.5	0.8	65	715	11.8	6.6	21.7	21	90	1,800	23
12.0	600	FB27E66Q0126KC	Q	E6	32.0	33.0	18.0	27.5	0.8	65	780	12.4	6.0	21.7	21	90	1,800	23
15.0	600	FB27E96Q0156KC	Q	E9	32.0	37.0	22.0	27.5	0.8	65	975	15.5	4.8	17.2	23	70	840	32
18.0	600	FB27E96Q0186KC	Q	E9	32.0	37.0	22.0	27.5	0.8	65	1170	17.0	4.0	17.2	23	70	840	32
15.0	600	FB37F36Q0156KC	Q	F3	42.0	32.0	19.0	37.5	1.0	35	525	9.2	13.2	17.9	13	56	2,240	31
Voltage Vndc 700V																		
2.0	700	FB27EC6A0205KC	A	EC	32.0	18.0	9.0	27.5	0.8	65	130	3.6	36.1	41.7	12	180	4,320	7
3.0	700	FB27E16A0305KC	A	E1	32.0	20.0	11.0	27.5	0.8	65	195	4.8	24.1	35.7	14	150	3,600	8
3.3	700	FB27E16A0335KC	A	E1	32.0	20.0	11.0	27.5	0.8	65	215	5.1	21.9	35.7	14	150	3,600	8
4.0	700	FB27E16A0405KC	A	E1	32.0	20.0	11.0	27.5	0.8	65	260	5.6	18.1	35.7	14	150	3,600	8
5.0	700	FB27E26A0505KC	A	E2	32.0	22.0	13.0	27.5	0.8	65	325	6.4	14.5	33.3	15	120	2,400	10
6.0	700	FB27EJ6A0605KC	A	EJ	32.0	24.5	13.0	27.5	0.8	65	390	7.3	12.0	31.3	16	120	2,400	12
7.0	700	FB27EE6A0705KC	A	EE	32.0	24.5	15.0	27.5	0.8	65	455	8.2	10.3	28.6	18	110	2,200	13
7.0	700	FB27E36A0705KC	A	E3	32.0	28.0	14.0	27.5	0.8	65	455	8.2	10.3	27.8	18	110	2,200	16
8.0	700	FB27E36A0805KC	A	E3	32.0	28.0	14.0	27.5	0.8	65	520	8.9	9.0	27.8	18	110	2,200	16
9.0	700	FB27EL6A0905KC	A	EL	32.0	30.0	16.0	27.5	0.8	65	585	9.7	8.0	26.3	18	100	2,000	19
10.0	700	FB27E46A0106KC	A	E4	32.0	28.0	18.0	27.5	0.8	65	650	10.8	7.2	23.8	19	90	1,800	19
11.0	700	FB27E66A0116KC	A	E6	32.0	33.0	18.0	27.5	0.8	65	715	11.8	6.6	21.7	21	90	1,800	23
12.0	700	FB27E66A0126KC	A	E6	32.0	33.0	18.0	27.5	0.8	65	780	12.4	6.0	21.7	21	90	1,800	23
15.0	700	FB27E96A0156KC	A	E9	32.0	37.0	22.0	27.5	0.8	65	975	15.5	4.8	17.2	23	70	840	32

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RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak	I _{rms}	ESR 10KHz	R _{th}	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
18.0	700	FB27E96A0186KC	A	E9	32.0	37.0	22.0	27.5	0.8	65	1170	17.0	4.0	17.2	23	70	840	32
15.0	700	FB37F36A0156KC	A	F3	42.0	32.0	19.0	37.5	1.0	35	525	9.2	13.2	17.9	13	56	2,240	31
Voltage V _{ndc} 800V																		
2.0	800	FB27EC6B0205KC	B	EC	32.0	18.0	9.0	27.5	0.8	65	130	3.9	31.6	41.7	12	180	4,320	7
3.0	800	FB27E16B0305KC	B	E1	32.0	20.0	11.0	27.5	0.8	65	195	5.2	21.1	35.7	14	150	3,600	8
4.0	800	FB27EJ6B0405KC	B	EJ	32.0	24.5	13.0	27.5	0.8	65	260	6.4	15.8	31.3	16	120	2,400	12
5.0	800	FB27EK6B0505KC	B	EK	32.0	24.0	14.0	27.5	0.8	65	325	7.3	12.6	29.4	17	110	2,200	13
5.0	800	FB27E36B0505KC	B	E3	32.0	28.0	14.0	27.5	0.8	65	325	7.5	12.6	27.8	18	110	2,200	16
5.0	800	FB27EE6B0505KC	B	EE	32.0	24.5	15.0	27.5	0.8	65	325	7.4	12.6	28.6	18	110	2,200	13
6.0	800	FB27EL6B0605KC	B	EL	32.0	30.0	16.0	27.5	0.8	65	390	8.5	10.5	26.3	18	100	2,000	19
7.0	800	FB27EL6B0705KC	B	EL	32.0	30.0	16.0	27.5	0.8	65	455	9.2	9.0	26.3	18	100	2,000	19
8.0	800	FB27E46B0805KC	B	E4	32.0	28.0	18.0	27.5	0.8	65	520	10.3	7.9	23.8	19	90	1,800	19
9.0	800	FB27E66B0905KC	B	E6	32.0	33.0	18.0	27.5	0.8	65	585	11.4	7.0	21.7	21	90	1,800	23
10.0	800	FB27E66B0106KC	B	E6	32.0	33.0	18.0	27.5	0.8	65	650	12.1	6.3	21.7	21	90	1,800	23
12.0	800	FB27E96B0126KC	B	E9	32.0	37.0	22.0	27.5	0.8	65	780	14.8	5.3	17.2	23	70	840	32
14.0	800	FB27E96B0146KC	B	E9	32.0	37.0	22.0	27.5	0.8	65	910	16.0	4.5	17.2	23	70	840	32
14.0	800	FB37F36B0146KC	B	F3	42.0	32.0	19.0	37.5	1.0	35	490	9.5	12.3	17.9	13	56	2,240	31
Voltage V _{ndc} 900V																		
1.0	900	FB27EC6C0105KC	C	EC	32.0	18.0	9.0	27.5	0.8	65	65	2.9	56.2	41.7	12	180	4,320	7
2.0	900	FB27E16C0205KC	C	E1	32.0	20.0	11.0	27.5	0.8	65	130	4.5	28.1	35.7	14	150	3,600	8
2.5	900	FB27E26C0255KC	C	E2	32.0	22.0	13.0	27.5	0.8	65	163	5.2	22.5	33.3	15	120	2,400	10
3.0	900	FB27E26C0305KC	C	E2	32.0	22.0	13.0	27.5	0.8	65	195	5.7	18.7	33.3	15	120	2,400	10
3.5	900	FB27EJ6C0355KC	C	EJ	32.0	24.5	13.0	27.5	0.8	65	228	6.3	16.1	31.3	16	120	2,400	12
4.0	900	FB27EE6C0405KC	C	EE	32.0	24.5	15.0	27.5	0.8	65	260	7.1	14.0	28.6	18	110	2,200	13
4.5	900	FB27E36C0455KC	C	E3	32.0	28.0	14.0	27.5	0.8	65	293	7.6	12.5	27.8	18	110	2,200	16
5.5	900	FB27EL6C0555KC	C	EL	32.0	30.0	16.0	27.5	0.8	65	358	8.6	10.2	26.3	18	100	2,000	19
6.0	900	FB27E46C0605KC	C	E4	32.0	28.0	18.0	27.5	0.8	65	390	9.5	9.4	23.8	19	90	1,800	19
7.0	900	FB27E66C0705KC	C	E6	32.0	33.0	18.0	27.5	0.8	65	455	10.7	8.0	21.7	21	90	1,800	23
9.0	900	FB27E96C0905KC	C	E9	32.0	37.0	22.0	27.5	0.8	65	585	13.6	6.2	17.2	23	70	840	32
10.0	900	FB27E96C0106KC	C	E9	32.0	37.0	22.0	27.5	0.8	65	650	14.4	5.6	17.2	23	70	840	32
10.0	900	FB37F36C0106KC	C	F3	42.0	32.0	19.0	37.5	1.0	35	350	8.5	15.4	17.9	13	56	2,240	31
Voltage V _{ndc} 1000V																		
1.0	1000	FB27EC6K0105KC	K	EC	32.0	18.0	9.0	27.5	0.8	65	65	3.1	50.6	41.7	12	180	4,320	7
1.8	1000	FB27E16K0185KC	K	E1	32.0	20.0	11.0	27.5	0.8	65	117	4.5	28.1	35.7	14	150	3,600	8
2.0	1000	FB27E26K0205KC	K	E2	32.0	22.0	13.0	27.5	0.8	65	130	4.9	25.3	33.3	15	120	2,400	10
2.2	1000	FB27E26K0225KC	K	E2	32.0	22.0	13.0	27.5	0.8	65	143	5.1	23.0	33.3	15	120	2,400	10
3.0	1000	FB27EK6K0305KC	K	EK	32.0	24.0	14.0	27.5	0.8	65	195	6.4	16.9	29.4	17	110	2,200	13
3.3	1000	FB27E36K0335KC	K	E3	32.0	28.0	14.0	27.5	0.8	65	215	6.9	15.3	27.8	18	110	2,200	16
4.0	1000	FB27EL6K0405KC	K	EL	32.0	30.0	16.0	27.5	0.8	65	260	7.8	12.6	26.3	18	100	2,000	19
5.0	1000	FB27E46K0505KC	K	E4	32.0	28.0	18.0	27.5	0.8	65	325	9.1	10.1	23.8	19	90	1,800	19
6.0	1000	FB27E66K0605KC	K	E6	32.0	33.0	18.0	27.5	0.8	65	390	10.4	8.4	21.7	21	90	1,800	23
7.0	1000	FB27E96K0705KC	K	E9	32.0	37.0	22.0	27.5	0.8	65	455	12.7	7.2	17.2	23	70	840	32
8.0	1000	FB27E96K0805KC	K	E9	32.0	37.0	22.0	27.5	0.8	65	520	13.5	6.3	17.2	23	70	840	32
7.0	1000	FB37FW6K0705KC	K	FW	42.0	30.0	17.0	37.5	1.0	35	245	7.3	19.8	19.2	12	63	2,520	27
8.0	1000	FB37F36K0805KC	K	F3	42.0	32.0	19.0	37.5	1.0	35	280	8.0	17.3	17.9	13	56	2,240	31
Voltage V _{ndc} 1100V																		
1.0	1100	FB27EC6L0105KC	L	EC	32.0	18.0	9.0	27.5	0.8	65	65	3.2	46.0	41.7	12	180	4,320	7
1.5	1100	FB27E16L0155KC	L	E1	32.0	20.0	11.0	27.5	0.8	65	98	4.3	30.7	35.7	14	150	3,600	8
2.0	1100	FB27E26L0205KC	L	E2	32.0	22.0	13.0	27.5	0.8	65	130	5.1	23.0	33.3	15	120	2,400	10
2.2	1100	FB27EJ6L0225KC	L	EJ	32.0	24.5	13.0	27.5	0.8	65	143	5.5	20.9	31.3	16	120	2,400	12
3.0	1100	FB27E36L0305KC	L	E3	32.0	28.0	14.0	27.5	0.8	65	195	6.9	15.3	27.8	18	110	2,200	16
3.3	1100	FB27EL6L0335KC	L	EL	32.0	30.0	16.0	27.5	0.8	65	215	7.4	13.9	26.3	18	100	2,000	19
4.0	1100	FB27E46L0405KC	L	E4	32.0	28.0	18.0	27.5	0.8	65	260	8.5	11.5	23.8	19	90	1,800	19
4.5	1100	FB27E66L0455KC	L	E6	32.0	33.0	18.0	27.5	0.8	65	293	9.5	10.2	21.7	21	90	1,800	23
5.0	1100	FB27E66L0505KC	L	E6	32.0	33.0	18.0	27.5	0.8	65	325	10.0	9.2	21.7	21	90	1,800	23



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RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
6.0	1100	FB27E96L0605KC	L	E9	32.0	37.0	22.0	27.5	0.8	65	390	12.3	7.7	17.2	23	70	840	32
7.0	1100	FB27E96L0705KC	L	E9	32.0	37.0	22.0	27.5	0.8	65	455	13.3	6.6	17.2	23	70	840	32
7.0	1100	FB37F36L0705KC	L	F3	42.0	32.0	19.0	37.5	1.0	35	245	7.9	18.0	17.9	13	56	2,240	31
Voltage Vndc 1200V																		
Voltage Code P																		
1.0	1200	FB27E16P0105KC	P	E1	32.0	20.0	11.0	27.5	0.8	65	65	3.8	39.1	35.7	14	150	3,600	8
1.2	1200	FB27E16P0125KC	P	E1	32.0	20.0	11.0	27.5	0.8	65	78	4.0	35.1	35.7	14	150	3,600	8
1.5	1200	FB27E26P0155KC	P	E2	32.0	22.0	13.0	27.5	0.8	65	98	4.6	28.1	33.3	15	120	2,400	10
2.0	1200	FB27EJ6P0205KC	P	EJ	32.0	24.5	13.0	27.5	0.8	65	130	5.5	21.1	31.3	16	120	2,400	12
2.2	1200	FB27E36P0225KC	P	E3	32.0	28.0	14.0	27.5	0.8	65	143	6.1	19.2	27.8	18	110	2,200	16
3.0	1200	FB27EL6P0305KC	P	EL	32.0	30.0	16.0	27.5	0.8	65	195	7.4	14.0	26.3	18	100	2,000	19
3.3	1200	FB27E46P0335KC	P	E4	32.0	28.0	18.0	27.5	0.8	65	215	8.1	12.8	23.8	19	90	1,800	19
4.0	1200	FB27E66P0405KC	P	E6	32.0	33.0	18.0	27.5	0.8	65	260	9.3	10.5	21.7	21	90	1,800	23
5.0	1200	FB27E96P0505KC	P	E9	32.0	37.0	22.0	27.5	0.8	65	325	11.7	8.4	17.2	23	70	840	32
4.5	1200	FB37FW6P0455KC	P	FW	42.0	30.0	17.0	37.5	1.0	35	158	6.4	25.6	19.2	12	63	2,520	27
5.5	1200	FB37F36P0555KC	P	F3	42.0	32.0	19.0	37.5	1.0	35	193	7.3	20.9	17.9	13	56	2,240	31

DC FILTERING

FB - THB Grade IIIB - 105°C *RoHS Compliant



CASE CODE

Case Code	Dimensions									
	W ± 0.8(0.03)		H ± 0.8(0.03)		T ± 0.8(0.03)		P1 ± 1.0(0.04)		d ± 0.05(0.002)	
	mm	in	mm	in	mm	in	mm	in	mm	in
EC	32.0	(1.26)	18.0	(0.71)	9.0	(0.35)	27.5	(1.08)	0.8	(0.03)
E1	32.0	(1.26)	20.0	(0.79)	11.0	(0.43)	27.5	(1.08)	0.8	(0.03)
E2	32.0	(1.26)	22.0	(0.87)	13.0	(0.51)	27.5	(1.08)	0.8	(0.03)
EK	32.0	(1.26)	24.0	(0.94)	14.0	(0.55)	27.5	(1.08)	0.8	(0.03)
EJ	32.0	(1.26)	24.5	(0.96)	13.0	(0.51)	27.5	(1.08)	0.8	(0.03)
EE	32.0	(1.26)	24.5	(0.96)	15.0	(0.59)	27.5	(1.08)	0.8	(0.03)
E3	32.0	(1.26)	28.0	(1.10)	14.0	(0.55)	27.5	(1.08)	0.8	(0.03)
E4	32.0	(1.26)	28.0	(1.10)	18.0	(0.71)	27.5	(1.08)	0.8	(0.03)
EL	32.0	(1.26)	30.0	(1.18)	16.0	(0.63)	27.5	(1.08)	0.8	(0.03)
E6	32.0	(1.26)	33.0	(1.30)	18.0	(0.71)	27.5	(1.08)	0.8	(0.03)
E9	32.0	(1.26)	37.0	(1.46)	22.0	(0.87)	27.5	(1.08)	0.8	(0.03)
FV	42.0	(1.65)	28.0	(1.10)	17.0	(0.67)	37.5	(1.48)	1.0	(0.04)
FW	42.0	(1.65)	30.0	(1.18)	17.0	(0.67)	37.5	(1.48)	1.0	(0.04)
F3	42.0	(1.65)	32.0	(1.26)	19.0	(0.75)	37.5	(1.48)	1.0	(0.04)

RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	d ± 0.05									
					mm	mm	mm	mm	mm									
uF	V									V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
Voltage Vndc 450V										Voltage Code I								
3.3	450	FB27EC7I0335KC	I	EC	32.0	18	9.0	27.5	0.8	65	215	4.0	30.7	41.7	12	180	4,320	7
4.0	450	FB27EC7I0405KC	I	EC	32.0	18	9.0	27.5	0.8	65	260	4.4	25.3	41.7	12	180	4,320	7
5.0	450	FB27E17I0505KC	I	E1	32.0	20	11.0	27.5	0.8	65	325	4.9	20.2	35.7	14	150	3,600	8
6.0	450	FB27E17I0605KC	I	E1	32.0	20	11.0	27.5	0.8	65	390	5.8	16.9	35.7	14	150	3,600	8
7.0	450	FB27E27I0705KC	I	E2	32.0	22	13.0	27.5	0.8	65	455	6.2	14.5	33.3	15	120	2,400	10
8.0	450	FB27E27I0805KC	I	E2	32.0	22	13.0	27.5	0.8	65	520	6.9	12.6	33.3	15	120	2,400	10
10.0	450	FB27EJ7I0106KC	I	EJ	32.0	24.5	13.0	27.5	0.8	65	650	8.0	10.1	31.3	16	120	2,400	12
12.0	450	FB27E37I0126KC	I	E3	32.0	28	14.0	27.5	0.8	65	780	9.0	8.4	27.8	18	110	2,200	16
13.0	450	FB27E37I0136KC	I	E3	32.0	28	14.0	27.5	0.8	65	845	9.3	7.8	27.8	18	110	2,200	16
15.0	450	FB27EL7I0156KC	I	EL	32.0	30	16.0	27.5	0.8	65	975	10.6	6.7	26.3	18	100	2,000	19
15.0	450	FB27E47I0156KC	I	E4	32.0	28	18.0	27.5	0.8	65	975	11.2	6.7	23.8	19	90	1,800	19
16.0	450	FB27E47I0166KC	I	E4	32.0	28	18.0	27.5	0.8	65	1040	11.5	6.3	23.8	19	90	1,800	19
18.0	450	FB27E67I0186KC	I	E6	32.0	33	18.0	27.5	0.8	65	1170	12.8	5.6	21.7	21	90	1,800	23
20.0	450	FB27E67I0206KC	I	E6	32.0	33	18.0	27.5	0.8	65	1300	13.5	5.1	21.7	21	90	1,800	23
22.0	450	FB27E97I0226KC	I	E9	32.0	37	22.0	27.5	0.8	65	1430	14.1	4.6	17.2	23	70	840	32
25.0	450	FB27E97I0256KC	I	E9	32.0	37	22.0	27.5	0.8	65	1625	16.9	4.0	17.2	23	70	840	32
28.0	450	FB27E97I0286KC	I	E9	32.0	37	22.0	27.5	0.8	65	1820	17.9	3.6	17.2	23	70	840	32
20.0	450	FB37FV7I0206KC	I	FV	42.0	28	17.0	37.5	1.0	35	700	8.5	13.8	20.0	12	63	2,520	26
25.0	450	FB37F37I0256KC	I	F3	42.0	32	19.0	37.5	1.0	35	875	9.5	11.1	17.9	13	56	2,240	31
Voltage Vndc 500V										Voltage Code H								
3.3	500	FB27EC7H0335KC	H	EC	32.0	18	9.0	27.5	0.8	65	215	4.1	28.4	41.7	12	180	4,320	7
4.0	500	FB27EC7H0405KC	H	EC	32.0	18	9.0	27.5	0.8	65	260	4.5	23.4	41.7	12	180	4,320	7
5.0	500	FB27E17H0505KC	H	E1	32.0	20	11.0	27.5	0.8	65	325	5.5	18.7	35.7	14	150	3,600	8
6.0	500	FB27E17H0605KC	H	E1	32.0	20	11.0	27.5	0.8	65	390	6.0	15.6	35.7	14	150	3,600	8
7.0	500	FB27E27H0705KC	H	E2	32.0	22	13.0	27.5	0.8	65	455	6.7	13.4	33.3	15	120	2,400	10
8.0	500	FB27E27H0805KC	H	E2	32.0	22	13.0	27.5	0.8	65	520	7.2	11.7	33.3	15	120	2,400	10
10.0	500	FB27EJ7H0106KC	H	EJ	32.0	24.5	13.0	27.5	0.8	65	650	8.3	9.4	31.3	16	120	2,400	12
12.0	500	FB27E37H0126KC	H	E3	32.0	28	14.0	27.5	0.8	65	780	9.6	7.8	27.8	18	110	2,200	16
13.0	500	FB27E37H0136KC	H	E3	32.0	28	14.0	27.5	0.8	65	845	10.0	7.2	27.8	18	110	2,200	16

DC FILTERING

FB - THB Grade IIIB - 105°C *RoHS Compliant



RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
15.0	500	FB27EL7H0156KC	H	EL	32.0	30	16.0	27.5	0.8	65	975	11.0	6.2	26.3	18	100	2,000	19
15.0	500	FB27E47H0156KC	H	E4	32.0	28	18.0	27.5	0.8	65	975	11.0	6.2	23.8	19	90	1,800	19
16.0	500	FB27E47H0166KC	H	E4	32.0	28	18.0	27.5	0.8	65	1040	12.0	5.9	23.8	19	90	1,800	19
18.0	500	FB27E67H0186KC	H	E6	32.0	33	18.0	27.5	0.8	65	1170	13.3	5.2	21.7	21	90	1,800	23
20.0	500	FB27E67H0206KC	H	E6	32.0	33	18.0	27.5	0.8	65	1300	14.0	4.7	21.7	21	90	1,800	23
22.0	500	FB27E97H0226KC	H	E9	32.0	37	22.0	27.5	0.8	65	1430	16.5	4.3	17.2	23	70	840	32
25.0	500	FB27E97H0256KC	H	E9	32.0	37	22.0	27.5	0.8	65	1625	17.6	3.7	17.2	23	70	840	32
28.0	500	FB27E97H0286KC	H	E9	32.0	37	22.0	27.5	0.8	65	1820	18.6	3.3	17.2	23	70	840	32
20.0	500	FB37FV7H0206KC	H	FV	42.0	28	17.0	37.5	1.0	35	700	8.8	12.8	20.0	12	63	2,520	26
25.0	500	FB37F37H0256KC	H	F3	42.0	32	19.0	37.5	1.0	35	875	10.5	10.2	17.9	13	56	2,240	31
Voltage Vndc 550V																		
3.0	550	FB27EC7J0305KC	J	EC	32.0	18	9.0	27.5	0.8	65	195	4.1	28.1	41.7	12	180	4,320	7
4.0	550	FB27E17J0405KC	J	E1	32.0	20	11.0	27.5	0.8	65	260	5.2	21.1	35.7	14	150	3,600	8
5.0	550	FB27E27J0505KC	J	E2	32.0	22	13.0	27.5	0.8	65	325	6.0	16.9	33.3	15	120	2,400	10
6.0	550	FB27E27J0605KC	J	E2	32.0	22	13.0	27.5	0.8	65	390	6.5	14.0	33.3	15	120	2,400	10
7.0	550	FB27EK7J0705KC	J	EK	32.0	24	14.0	27.5	0.8	65	455	7.5	12.0	29.4	17	110	2,200	13
8.0	550	FB27EK7J0805KC	J	EK	32.0	24	14.0	27.5	0.8	65	520	8.0	10.5	29.4	17	110	2,200	13
9.0	550	FB27E37J0905KC	J	E3	32.0	28	14.0	27.5	0.8	65	585	8.8	9.4	27.8	18	110	2,200	16
10.0	550	FB27E37J0106KC	J	E3	32.0	28	14.0	27.5	0.8	65	650	9.2	8.4	27.8	18	110	2,200	16
12.0	550	FB27EL7J0126KC	J	EL	32.0	30	16.0	27.5	0.8	65	780	10.4	7.0	26.3	18	100	2,000	19
12.0	550	FB27E47J0126KC	J	E4	32.0	28	18.0	27.5	0.8	65	780	10.9	7.0	23.8	19	90	1,800	19
15.0	550	FB27E67J0156KC	J	E6	32.0	33	18.0	27.5	0.8	65	975	12.8	5.6	21.7	21	90	1,800	23
20.0	550	FB27E97J0206KC	J	E9	32.0	37	22.0	27.5	0.8	65	1300	16.6	4.2	17.2	23	70	840	32
22.0	550	FB27E97J0226KC	J	E9	32.0	37	22.0	27.5	0.8	65	1430	17.4	3.8	17.2	23	70	840	32
Voltage Vndc 600V																		
2.0	600	FB27EC7Q0205KC	Q	EC	32.0	18	9.0	27.5	0.8	65	130	3.6	36.1	41.7	12	180	4,320	7
2.2	600	FB27EC7Q0225KC	Q	EC	32.0	18	9.0	27.5	0.8	65	143	3.8	32.8	41.7	12	180	4,320	7
3.0	600	FB27E17Q0305KC	Q	E1	32.0	20	11.0	27.5	0.8	65	195	4.8	24.1	35.7	14	150	3,600	8
3.3	600	FB27E17Q0335KC	Q	E1	32.0	20	11.0	27.5	0.8	65	215	5.1	21.9	35.7	14	150	3,600	8
4.0	600	FB27E17Q0405KC	Q	E1	32.0	20	11.0	27.5	0.8	65	260	5.6	18.1	35.7	14	150	3,600	8
5.0	600	FB27E27Q0505KC	Q	E2	32.0	22	13.0	27.5	0.8	65	325	6.4	14.5	33.3	15	120	2,400	10
6.0	600	FB27EJ7Q0605KC	Q	EJ	32.0	24.5	13.0	27.5	0.8	65	390	7.3	12.0	31.3	16	120	2,400	12
7.0	600	FB27EE7Q0705KC	Q	EE	32.0	24.5	15.0	27.5	0.8	65	455	8.2	10.3	28.6	18	110	2,200	13
7.0	600	FB27E37Q0705KC	Q	E3	32.0	28	14.0	27.5	0.8	65	455	8.4	10.3	27.8	18	110	2,200	16
8.0	600	FB27E37Q0805KC	Q	E3	32.0	28	14.0	27.5	0.8	65	520	8.9	9.0	27.8	18	110	2,200	16
9.0	600	FB27EL7Q0905KC	Q	EL	32.0	30	16.0	27.5	0.8	65	585	9.7	8.0	26.3	18	100	2,000	19
10.0	600	FB27E47Q0106KC	Q	E4	32.0	28	18.0	27.5	0.8	65	650	10.8	7.2	23.8	19	90	1,800	19
11.0	600	FB27E67Q0116KC	Q	E6	32.0	33	18.0	27.5	0.8	65	715	11.8	6.6	21.7	21	90	1,800	23
12.0	600	FB27E67Q0126KC	Q	E6	32.0	33	18.0	27.5	0.8	65	780	12.4	6.0	21.7	21	90	1,800	23
15.0	600	FB27E97Q0156KC	Q	E9	32.0	37	22.0	27.5	0.8	65	975	15.5	4.8	17.2	23	70	840	32
18.0	600	FB27E97Q0186KC	Q	E9	32.0	37	22.0	27.5	0.8	65	1170	17.0	4.0	17.2	23	70	840	32
15.0	600	FB37F37Q0156KC	Q	F3	42.0	32	19.0	37.5	1.0	35	525	9.2	13.2	17.9	13	56	2,240	31
Voltage Vndc 700V																		
2.0	700	FB27EC7A0205KC	A	EC	32.0	18	9.0	27.5	0.8	65	130	3.6	36.1	41.7	12	180	4,320	7
3.0	700	FB27E17A0305KC	A	E1	32.0	20	11.0	27.5	0.8	65	195	4.8	24.1	35.7	14	150	3,600	8
3.3	700	FB27E17A0335KC	A	E1	32.0	20	11.0	27.5	0.8	65	215	5.1	21.9	35.7	14	150	3,600	8
4.0	700	FB27E17A0405KC	A	E1	32.0	20	11.0	27.5	0.8	65	260	5.6	18.1	35.7	14	150	3,600	8
5.0	700	FB27E27A0505KC	A	E2	32.0	22	13.0	27.5	0.8	65	325	6.4	14.5	33.3	15	120	2,400	10
6.0	700	FB27EJ7A0605KC	A	EJ	32.0	24.5	13.0	27.5	0.8	65	390	7.3	12.0	31.3	16	120	2,400	12
7.0	700	FB27EE7A0705KC	A	EE	32.0	24.5	15.0	27.5	0.8	65	455	8.2	10.3	28.6	18	110	2,200	13
7.0	700	FB27E37A0705KC	A	E3	32.0	28	14.0	27.5	0.8	65	455	8.2	10.3	27.8	18	110	2,200	16
8.0	700	FB27E37A0805KC	A	E3	32.0	28	14.0	27.5	0.8	65	520	8.9	9.0	27.8	18	110	2,200	16
9.0	700	FB27EL7A0905KC	A	EL	32.0	30	16.0	27.5	0.8	65	585	9.7	8.0	26.3	18	100	2,000	19
10.0	700	FB27E47A0106KC	A	E4	32.0	28	18.0	27.5	0.8	65	650	10.8	7.2	23.8	19	90	1,800	19

DC FILTERING

FB - THB Grade IIIB - 105°C *RoHS Compliant



RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
11.0	700	FB27E67A0116KC	A	E6	32.0	33	18.0	27.5	0.8	65	715	11.8	6.6	21.7	21	90	1,800	23
12.0	700	FB27E67A0126KC	A	E6	32.0	33	18.0	27.5	0.8	65	780	12.4	6.0	21.7	21	90	1,800	23
15.0	700	FB27E97A0156KC	A	E9	32.0	37	22.0	27.5	0.8	65	975	15.5	4.8	17.2	23	70	840	32
18.0	700	FB27E97A0186KC	A	E9	32.0	37	22.0	27.5	0.8	65	1170	17.0	4.0	17.2	23	70	840	32
15.0	700	FB37F37A0156KC	A	F3	42.0	32	19.0	37.5	1.0	35	525	9.2	13.2	17.9	13	56	2,240	31
Voltage Vndc 800V																		
2.0	800	FB27EC7B0205KC	B	EC	32.0	18	9.0	27.5	0.8	65	130	3.9	31.6	41.7	12	180	4,320	7
3.0	800	FB27E17B0305KC	B	E1	32.0	20	11.0	27.5	0.8	65	195	5.2	21.1	35.7	14	150	3,600	8
4.0	800	FB27EJ7B0405KC	B	EJ	32.0	24.5	13.0	27.5	0.8	65	260	6.4	15.8	31.3	16	120	2,400	12
5.0	800	FB27EK7B0505KC	B	EK	32.0	24	14.0	27.5	0.8	65	325	7.3	12.6	29.4	17	110	2,200	13
5.0	800	FB27E37B0505KC	B	E3	32.0	28	14.0	27.5	0.8	65	325	7.5	12.6	27.8	18	110	2,200	16
5.0	800	FB27EE7B0505KC	B	EE	32.0	24.5	15.0	27.5	0.8	65	325	7.4	12.6	28.6	18	110	2,200	13
6.0	800	FB27EL7B0605KC	B	EL	32.0	30	16.0	27.5	0.8	65	390	8.5	10.5	26.3	18	100	2,000	19
7.0	800	FB27EL7B0705KC	B	EL	32.0	30	16.0	27.5	0.8	65	455	9.2	9.0	26.3	18	100	2,000	19
8.0	800	FB27E47B0805KC	B	E4	32.0	28	18.0	27.5	0.8	65	520	10.3	7.9	23.8	19	90	1,800	19
9.0	800	FB27E67B0905KC	B	E6	32.0	33	18.0	27.5	0.8	65	585	11.4	7.0	21.7	21	90	1,800	23
10.0	800	FB27E67B0106KC	B	E6	32.0	33	18.0	27.5	0.8	65	650	12.1	6.3	21.7	21	90	1,800	23
12.0	800	FB27E97B0126KC	B	E9	32.0	37	22.0	27.5	0.8	65	780	14.8	5.3	17.2	23	70	840	32
14.0	800	FB27E97B0146KC	B	E9	32.0	37	22.0	27.5	0.8	65	910	16.0	4.5	17.2	23	70	840	32
14.0	800	FB37F37B0146KC	B	F3	42.0	32	19.0	37.5	1.0	35	490	9.5	12.3	17.9	13	56	2,240	31
Voltage Vndc 900V																		
1.0	900	FB27EC7C0105KC	C	EC	32.0	18	9.0	27.5	0.8	65	65	2.9	56.2	41.7	12	180	4,320	7
2.0	900	FB27E17C0205KC	C	E1	32.0	20	11.0	27.5	0.8	65	130	4.5	28.1	35.7	14	150	3,600	8
2.5	900	FB27E27C0255KC	C	E2	32.0	22	13.0	27.5	0.8	65	163	5.2	22.5	33.3	15	120	2,400	10
3.0	900	FB27E27C0305KC	C	E2	32.0	22	13.0	27.5	0.8	65	195	5.7	18.7	33.3	15	120	2,400	10
3.5	900	FB27EJ7C0355KC	C	EJ	32.0	24.5	13.0	27.5	0.8	65	228	6.3	16.1	31.3	16	120	2,400	12
4.0	900	FB27EE7C0405KC	C	EE	32.0	24.5	15.0	27.5	0.8	65	260	7.1	14.0	28.6	18	110	2,200	13
4.5	900	FB27E37C0455KC	C	E3	32.0	28	14.0	27.5	0.8	65	293	7.6	12.5	27.8	18	110	2,200	16
5.5	900	FB27EL7C0555KC	C	EL	32.0	30	16.0	27.5	0.8	65	358	8.6	10.2	26.3	18	100	2,000	19
6.0	900	FB27E47C0605KC	C	E4	32.0	28	18.0	27.5	0.8	65	390	9.5	9.4	23.8	19	90	1,800	19
7.0	900	FB27E67C0705KC	C	E6	32.0	33	18.0	27.5	0.8	65	455	10.7	8.0	21.7	21	90	1,800	23
9.0	900	FB27E97C0905KC	C	E9	32.0	37	22.0	27.5	0.8	65	585	13.6	6.2	17.2	23	70	840	32
10.0	900	FB27E97C0106KC	C	E9	32.0	37	22.0	27.5	0.8	65	650	14.4	5.6	17.2	23	70	840	32
10.0	900	FB37F37C0106KC	C	F3	42.0	32	19.0	37.5	1.0	35	350	8.5	15.4	17.9	13	56	2,240	31
Voltage Vndc 1000V																		
1.0	1000	FB27EC7K0105KC	K	EC	32.0	18	9.0	27.5	0.8	65	65	3.1	50.6	41.7	12	180	4,320	7
1.8	1000	FB27E17K0185KC	K	E1	32.0	20	11.0	27.5	0.8	65	117	4.5	28.1	35.7	14	150	3,600	8
2.0	1000	FB27E27K0205KC	K	E2	32.0	22	13.0	27.5	0.8	65	130	4.9	25.3	33.3	15	120	2,400	10
2.2	1000	FB27E27K0225KC	K	E2	32.0	22	13.0	27.5	0.8	65	143	5.1	23.0	33.3	15	120	2,400	10
3.0	1000	FB27EK7K0305KC	K	EK	32.0	24	14.0	27.5	0.8	65	195	6.4	16.9	29.4	17	110	2,200	13
3.3	1000	FB27E37K0335KC	K	E3	32.0	28	14.0	27.5	0.8	65	215	6.9	15.3	27.8	18	110	2,200	16
4.0	1000	FB27EL7K0405KC	K	EL	32.0	30	16.0	27.5	0.8	65	260	7.8	12.6	26.3	18	100	2,000	19
5.0	1000	FB27E47K0505KC	K	E4	32.0	28	18.0	27.5	0.8	65	325	9.1	10.1	23.8	19	90	1,800	19
6.0	1000	FB27E67K0605KC	K	E6	32.0	33	18.0	27.5	0.8	65	390	10.4	8.4	21.7	21	90	1,800	23
7.0	1000	FB27E97K0705KC	K	E9	32.0	37	22.0	27.5	0.8	65	455	12.7	7.2	17.2	23	70	840	32
8.0	1000	FB27E97K0805KC	K	E9	32.0	37	22.0	27.5	0.8	65	520	13.5	6.3	17.2	23	70	840	32
7.0	1000	FB37FW7K0705KC	K	FW	42.0	30	17.0	37.5	1.0	35	245	7.3	19.8	19.2	12	63	2,520	27
8.0	1000	FB37F37K0805KC	K	F3	42.0	32	19.0	37.5	1.0	35	280	8.0	17.3	17.9	13	56	2,240	31
Voltage Vndc 1100V																		
1.0	1100	FB27EC7L0105KC	L	EC	32.0	18	9.0	27.5	0.8	65	65	3.2	46.0	41.7	12	180	4,320	7
1.5	1100	FB27E17L0155KC	L	E1	32.0	20	11.0	27.5	0.8	65	98	4.3	30.7	35.7	14	150	3,600	8
2.0	1100	FB27E27L0205KC	L	E2	32.0	22	13.0	27.5	0.8	65	130	5.1	23.0	33.3	15	120	2,400	10
2.2	1100	FB27EJ7L0225KC	L	EJ	32.0	24.5	13.0	27.5	0.8	65	143	5.5	20.9	31.3	16	120	2,400	12
3.0	1100	FB27E37L0305KC	L	E3	32.0	28	14.0	27.5	0.8	65	195	6.9	15.3	27.8	18	110	2,200	16

DC FILTERING

FB - THB Grade IIIB - 105°C *RoHS Compliant



RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak	I _{rms}	ESR 10KHz	R _{th}	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
3.3	1100	FB27EL7L0335KC	L	EL	32.0	30	16.0	27.5	0.8	65	215	7.4	13.9	26.3	18	100	2,000	19
4.0	1100	FB27E47L0405KC	L	E4	32.0	28	18.0	27.5	0.8	65	260	8.5	11.5	23.8	19	90	1,800	19
4.5	1100	FB27E67L0455KC	L	E6	32.0	33	18.0	27.5	0.8	65	293	9.5	10.2	21.7	21	90	1,800	23
5.0	1100	FB27E67L0505KC	L	E6	32.0	33	18.0	27.5	0.8	65	325	10.0	9.2	21.7	21	90	1,800	23
6.0	1100	FB27E97L0605KC	L	E9	32.0	37	22.0	27.5	0.8	65	390	12.3	7.7	17.2	23	70	840	32
7.0	1100	FB27E97L0705KC	L	E9	32.0	37	22.0	27.5	0.8	65	455	13.3	6.6	17.2	23	70	840	32
7.0	1100	FB37F37L0705KC	L	F3	42.0	32	19.0	37.5	1.0	35	245	7.9	18.0	17.9	13	56	2,240	31
					Voltage V _{ndc} 1200V					Voltage Code P								
1.0	1200	FB27E17P0105KC	P	E1	32.0	20	11.0	27.5	0.8	65	65	3.8	39.1	35.7	14	150	3,600	8
1.2	1200	FB27E17P0125KC	P	E1	32.0	20	11.0	27.5	0.8	65	78	4.0	35.1	35.7	14	150	3,600	8
1.5	1200	FB27E27P0155KC	P	E2	32.0	22	13.0	27.5	0.8	65	98	4.6	28.1	33.3	15	120	2,400	10
2.0	1200	FB27EJ7P0205KC	P	EJ	32.0	24.5	13.0	27.5	0.8	65	130	5.5	21.1	31.3	16	120	2,400	12
2.2	1200	FB27E37P0225KC	P	E3	32.0	28	14.0	27.5	0.8	65	143	6.1	19.2	27.8	18	110	2,200	16
3.0	1200	FB27EL7P0305KC	P	EL	32.0	30	16.0	27.5	0.8	65	195	7.4	14.0	26.3	18	100	2,000	19
3.3	1200	FB27E47P0335KC	P	E4	32.0	28	18.0	27.5	0.8	65	215	8.1	12.8	23.8	19	90	1,800	19
4.0	1200	FB27E67P0405KC	P	E6	32.0	33	18.0	27.5	0.8	65	260	9.3	10.5	21.7	21	90	1,800	23
5.0	1200	FB27E97P0505KC	P	E9	32.0	37	22.0	27.5	0.8	65	325	11.7	8.4	17.2	23	70	840	32
4.5	1200	FB37FW7P0455KC	P	FW	42.0	30	17.0	37.5	1.0	35	158	6.4	25.6	19.2	12	63	2,520	27
5.5	1200	FB37F37P0555KC	P	F3	42.0	32	19.0	37.5	1.0	35	193	7.3	20.9	17.9	13	56	2,240	31

DC FILTERING

FB - THB 2000H 125°C *RoHS Compliant



CASE CODE

Case Code	Dimensions									
	W ± 0.8(0.03)		H ± 0.8(0.03)		T ± 0.8(0.03)		P1 ± 1.0(0.04)		d ± 0.05(0.002)	
	mm	in	mm	in	mm	in	mm	in	mm	in
EC	32.0	(1.26)	18.0	(0.71)	9.0	(0.35)	27.5	(1.08)	0.8	(0.03)
E1	32.0	(1.26)	20.0	(0.79)	11.0	(0.43)	27.5	(1.08)	0.8	(0.03)
E2	32.0	(1.26)	22.0	(0.87)	13.0	(0.51)	27.5	(1.08)	0.8	(0.03)
EK	32.0	(1.26)	24.0	(0.94)	14.0	(0.55)	27.5	(1.08)	0.8	(0.03)
EJ	32.0	(1.26)	24.5	(0.96)	13.0	(0.51)	27.5	(1.08)	0.8	(0.03)
EE	32.0	(1.26)	24.5	(0.96)	15.0	(0.59)	27.5	(1.08)	0.8	(0.03)
E3	32.0	(1.26)	28.0	(1.10)	14.0	(0.55)	27.5	(1.08)	0.8	(0.03)
E4	32.0	(1.26)	28.0	(1.10)	18.0	(0.71)	27.5	(1.08)	0.8	(0.03)
EL	32.0	(1.26)	30.0	(1.18)	16.0	(0.63)	27.5	(1.08)	0.8	(0.03)
E6	32.0	(1.26)	33.0	(1.30)	18.0	(0.71)	27.5	(1.08)	0.8	(0.03)
E9	32.0	(1.26)	37.0	(1.46)	22.0	(0.87)	27.5	(1.08)	0.8	(0.03)
FV	42.0	(1.65)	28.0	(1.10)	17.0	(0.67)	37.5	(1.48)	1.0	(0.04)
FW	42.0	(1.65)	30.0	(1.18)	17.0	(0.67)	37.5	(1.48)	1.0	(0.04)
F3	42.0	(1.65)	32.0	(1.26)	19.0	(0.75)	37.5	(1.48)	1.0	(0.04)

RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	d ± 0.05									
					mm	mm	mm	mm	mm									
uF	V									V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
Voltage Code I Vndc at 85°C = 450Vdc; Vop105 at 105°C = 351Vdc; Vop115 at 115°C = 301Vdc; Vop125 at 125°C = 252Vdc																		
3.3	450	FB27EC8I0335KC	I	EC	32.0	18	9.0	27.5	0.8	65	215	4.7	22.1	41.7	12	180	4,320	7
4.0	450	FB27EC8I0405KC	I	EC	32.0	18	9.0	27.5	0.8	65	260	5.1	18.2	41.7	12	180	4,320	7
5.0	450	FB27E18I0505KC	I	E1	32.0	20	11.0	27.5	0.8	65	325	6.2	14.6	35.7	14	150	3,600	8
6.0	450	FB27E18I0605KC	I	E1	32.0	20	11.0	27.5	0.8	65	390	6.8	12.1	35.7	14	150	3,600	8
7.0	450	FB27E28I0705KC	I	E2	32.0	22	13.0	27.5	0.8	65	455	7.6	10.4	33.3	15	120	2,400	10
8.0	450	FB27E28I0805KC	I	E2	32.0	22	13.0	27.5	0.8	65	520	8.1	9.1	33.3	15	120	2,400	10
10.0	450	FB27EJ8I0106KC	I	EJ	32.0	24.5	13.0	27.5	0.8	65	650	9.4	7.3	31.3	16	120	2,400	12
12.0	450	FB27E38I0126KC	I	E3	32.0	28	14.0	27.5	0.8	65	780	10.9	6.1	27.8	18	110	2,200	16
13.0	450	FB27E38I0136KC	I	E3	32.0	28	14.0	27.5	0.8	65	845	11.3	5.6	27.8	18	110	2,200	16
15.0	450	FB27EL8I0156KC	I	EL	32.0	30	16.0	27.5	0.8	65	975	12.5	4.9	26.3	18	100	2,000	19
15.0	450	FB27E48I0156KC	I	E4	32.0	28	18.0	27.5	0.8	65	975	12.7	5.2	23.8	19	90	1,800	19
16.0	450	FB27E48I0166KC	I	E4	32.0	28	18.0	27.5	0.8	65	1040	13.6	4.6	23.8	19	90	1,800	19
18.0	450	FB27E68I0186KC	I	E6	32.0	33	18.0	27.5	0.8	65	1170	14.6	4.3	21.7	21	90	1,800	23
20.0	450	FB27E68I0206KC	I	E6	32.0	33	18.0	27.5	0.8	65	1300	15.4	3.9	21.7	21	90	1,800	23
22.0	450	FB27E98I0226KC	I	E9	32.0	37	22.0	27.5	0.8	65	1430	16.5	4.3	17.2	23	70	840	32
25.0	450	FB27E98I0256KC	I	E9	32.0	37	22.0	27.5	0.8	65	1625	17.6	3.7	17.2	23	70	840	32
28.0	450	FB27E98I0286KC	I	E9	32.0	37	22.0	27.5	0.8	65	1820	18.6	3.3	17.2	23	70	840	32
20.0	450	FB37FV8I0206KC	I	FV	42.0	28	17.0	37.5	1.0	35	700	10.9	8.4	20.0	12	63	1,260	26
25.0	450	FB37F38I0256KC	I	F3	42.0	32	19.0	37.5	1.0	35	875	12.9	6.8	17.9	13	56	1,120	31
Voltage Code Q Vndc at 85°C = 600Vdc; Vop105 at 105°C = 468Vdc; Vop115 at 115°C = 402Vdc; Vop125 at 125°C = 336Vdc																		
2.0	600	FB27EC8Q0205KC	Q	EC	32.0	18	9.0	27.5	0.8	65	130	4.1	28.1	41.7	12	180	4,320	7
2.2	600	FB27EC8Q0225KC	Q	EC	32.0	18	9.0	27.5	0.8	65	143	4.3	25.5	41.7	12	180	4,320	7
3.0	600	FB27E18Q0305KC	Q	E1	32.0	20	11.0	27.5	0.8	65	195	5.5	18.7	35.7	14	150	3,600	8
3.3	600	FB27E18Q0335KC	Q	E1	32.0	20	11.0	27.5	0.8	65	195	5.7	17.0	35.7	14	150	3,600	8
4.0	600	FB27E18Q0405KC	Q	E1	32.0	20	11.0	27.5	0.8	65	260	6.3	14.0	35.7	14	150	3,600	8
5.0	600	FB27E28Q0505KC	Q	E2	32.0	22	13.0	27.5	0.8	65	325	7.3	11.2	33.3	15	120	2,400	10
6.0	600	FB27EJ8Q0605KC	Q	EJ	32.0	24.5	13.0	27.5	0.8	65	390	8.3	9.4	31.3	16	120	2,400	12
7.0	600	FB27EE8Q0705KC	Q	EE	32.0	24.5	15.0	27.5	0.8	65	455	9.3	8.0	28.6	18	110	2,200	13
7.0	600	FB27E38Q0705KC	Q	E3	32.0	28	14.0	27.5	0.8	65	520	9.5	8.0	27.8	18	110	2,200	16

DC FILTERING

FB - THB 2000H 125°C *RoHS Compliant

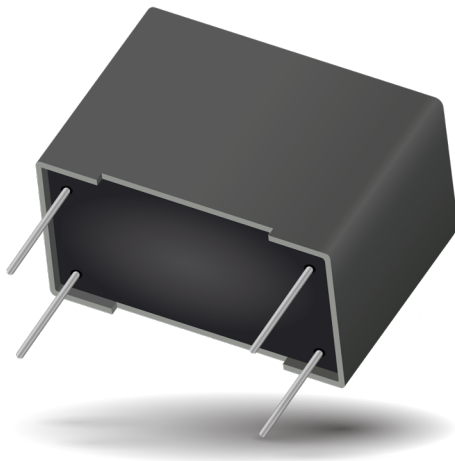


RATING & PART NUMBER REFERENCE

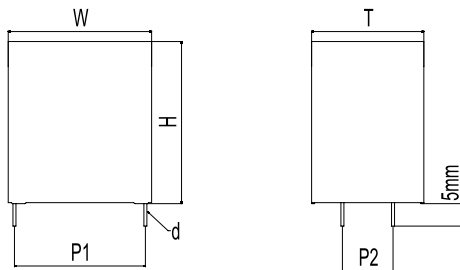
Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions					dv/dt	Peak	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
8.0	600	FB27E38Q0805KC	Q	E3	32.0	28	14.0	27.5	0.8	65	520	10.1	7.0	27.8	18	110	2,200	16
9.0	600	FB27EL8Q0905KC	Q	EL	32.0	30	16.0	27.5	0.8	65	585	11.0	6.2	26.3	18	100	2,000	19
10.0	600	FB27E48Q0106KC	Q	E4	32.0	28	18.0	27.5	0.8	65	650	12.2	5.6	23.8	19	90	1,800	19
11.0	600	FB27E68Q0116KC	Q	E6	32.0	33	18.0	27.5	0.8	65	715	13.4	5.1	21.7	21	90	1,800	23
12.0	600	FB27E68Q0126KC	Q	E6	32.0	33	18.0	27.5	0.8	65	780	14.0	4.7	21.7	21	90	1,800	23
15.0	600	FB27E98Q0156KC	Q	E9	32.0	37	22.0	27.5	0.8	65	975	15.5	4.8	17.2	23	70	840	32
18.0	600	FB27E98Q0186KC	Q	E9	32.0	37	22.0	27.5	0.8	65	1170	17.0	4.0	17.2	23	70	840	32
15.0	600	FB37F38Q0156KC	Q	F3	42.0	32	19.0	37.5	1.0	35	525	11.4	8.7	17.9	13	56	1,120	31
Voltage Code A Vndc at 85°C = 700Vdc; Vop105 at 105°C = 546Vdc; Vop115 at 115°C = 469Vdc; Vop125 at 125°C = 392Vdc																		
2.0	700	FB27EC8A0205KC	A	EC	32.0	18	9.0	27.5	0.8	65	130	4.4	24.6	41.7	12	180	4,320	7
3.0	700	FB27E18A0305KC	A	E1	32.0	20	11.0	27.5	0.8	65	195	5.8	16.4	35.7	14	150	3,600	8
4.0	700	FB27EJ8A0405KC	A	EJ	32.0	24.5	13.0	27.5	0.8	65	260	7.2	12.3	31.3	16	120	2,400	12
5.0	700	FB27EK8A0505KC	A	EK	32.0	24	14.0	27.5	0.8	65	325	8.3	9.8	29.4	17	110	2,200	13
5.0	700	FB27E38A0505KC	A	E3	32.0	28	14.0	27.5	0.8	65	325	8.6	9.8	27.8	18	110	2,200	16
5.0	700	FB27EE8A0505KC	A	EE	32.0	24.5	15.0	27.5	0.8	65	325	8.4	9.8	28.6	18	110	2,200	13
6.0	700	FB27EL8A0605KC	A	EL	32.0	30	16.0	27.5	0.8	65	390	9.6	8.2	26.3	18	100	2,000	19
7.0	700	FB27EL8A0705KC	A	EL	32.0	30	16.0	27.5	0.8	65	455	10.4	7.0	26.3	18	100	2,000	19
8.0	700	FB27E48A0805KC	A	E4	32.0	28	18.0	27.5	0.8	65	520	11.7	6.1	23.8	19	90	1,800	19
9.0	700	FB27E68A0905KC	A	E6	32.0	33	18.0	27.5	0.8	65	585	13.0	5.5	21.7	21	90	1,800	23
10.0	700	FB27E68A0106KC	A	E6	32.0	33	18.0	27.5	0.8	65	650	13.7	4.9	21.7	21	90	1,800	23
12.0	700	FB27E98A0126KC	A	E9	32.0	37	22.0	27.5	0.8	65	780	14.8	5.3	17.2	23	70	840	32
14.0	700	FB27E98A0146KC	A	E9	32.0	37	22.0	27.5	0.8	65	910	16.0	4.5	17.2	23	70	840	32
14.0	700	FB37F38A0146KC	A	F3	42.0	32	19.0	37.5	1.0	35	490	11.7	8.1	17.9	13	56	1,120	31
Voltage Code C Vndc at 85°C = 900Vdc; Vop105 at 105°C = 702Vdc; Vop115 at 115°C = 603Vdc; Vop125 at 125°C = 504Vdc																		
1.0	900	FB27EC8C0105KC	C	EC	32.0	18	9.0	27.5	0.8	65	65	3.5	39.3	41.7	12	180	4,320	7
1.8	900	FB27E18C0185KC	C	E1	32.0	20	11.0	27.5	0.8	65	117	5.1	21.9	35.7	14	150	3,600	8
2.0	900	FB27E28C0205KC	C	E2	32.0	22	13.0	27.5	0.8	65	130	5.5	19.7	33.3	15	120	2,400	10
2.2	900	FB27E28C0225KC	C	E2	32.0	22	13.0	27.5	0.8	65	143	5.8	17.9	33.3	15	120	2,400	10
3.0	900	FB27EK8C0305KC	C	EK	32.0	24	14.0	27.5	0.8	65	195	7.2	13.1	29.4	17	110	2,200	13
3.3	900	FB27E38C0335KC	C	E3	32.0	28	14.0	27.5	0.8	65	215	7.8	11.9	27.8	18	110	2,200	16
4.0	900	FB27EL8C0405KC	C	EL	32.0	30	16.0	27.5	0.8	65	260	8.8	9.8	26.3	18	100	2,000	19
5.0	900	FB27E48C0505KC	C	E4	32.0	28	18.0	27.5	0.8	65	325	10.3	7.9	23.8	19	90	1,800	19
6.0	900	FB27E68C0605KC	C	E6	32.0	33	18.0	27.5	0.8	65	390	11.8	6.6	21.7	21	90	1,800	23
7.0	900	FB27E98C0705KC	C	E9	32.0	37	22.0	27.5	0.8	65	455	12.7	7.2	17.2	23	70	840	32
8.0	900	FB27E98C0805KC	C	E9	32.0	37	22.0	27.5	0.8	65	520	13.5	6.3	17.2	23	70	840	32
7.0	900	FB37FW8C0705KC	C	FW	42.0	29	17.0	37.5	1.0	35	245	8.9	13.0	19.2	12	63	1,260	27
8.0	900	FB37F38C0805KC	C	F3	42.0	32	19.0	37.5	1.0	35	280	9.9	11.4	17.9	13	56	1,120	31
Voltage Code L Vndc at 85°C = 1100Vdc; Vop105 at 105°C = 858Vdc; Vop115 at 115°C = 737Vdc; Vop125 at 125°C = 616Vdc																		
1.0	1100	FB27E18L0105KC	L	E1	32.0	20	11.0	27.5	0.8	65	65	4.5	27.3	35.7	14	150	3,600	8
1.2	1100	FB27E18L0125KC	L	E1	32.0	20	11.0	27.5	0.8	65	78	4.5	27.3	35.7	14	150	3,600	8
1.5	1100	FB27E28L0155KC	L	E2	32.0	22	13.0	27.5	0.8	65	98	5.2	21.9	33.3	15	120	2,400	10
2.0	1100	FB27EJ8L0205KC	L	EJ	32.0	24.5	13.0	27.5	0.8	65	130	6.2	16.4	31.3	16	120	2,400	12
2.2	1100	FB27E38L0225KC	L	E3	32.0	28	14.0	27.5	0.8	65	143	7.0	14.9	27.8	18	110	2,200	16
3.0	1100	FB27EL8L0305KC	L	EL	32.0	30	16.0	27.5	0.8	65	195	8.3	10.9	26.3	18	100	2,000	19
3.3	1100	FB27E48L0335KC	L	E4	32.0	28	18.0	27.5	0.8	65	215	9.2	9.9	23.8	19	90	1,800	19
4.0	1100	FB27E68L0405KC	L	E6	32.0	33	18.0	27.5	0.8	65	260	10.6	8.2	21.7	21	90	1,800	23
5.0	1100	FB27E98L0505KC	L	E9	32.0	37	22.0	27.5	0.8	65	325	13.3	6.6	17.2	23	70	840	32
4.5	1100	FB37FW8L0455KC	L	FW	42.0	29	17.0	37.5	1.0	35	158	7.8	16.9	19.2	12	63	1,260	27
5.5	1100	FB37F38L0555KC	L	F3	42.0	32	19.0	37.5	1.0	35	193	9.0	13.8	17.9	13	56	1,120	31

DC FILTERING

FE* RoHS Compliant



DIMENSIONS



STANDARDS

- IEC 61071-1: Power electronic capacitors
- IEC 61071-2: Power electronic capacitors
- IEC 60384-16: Fixed metallized polypropylene film dielectric DC capacitors
- IEC 60384-16-1: Fixed metallized polypropylene film dielectric DC capacitors Assessment level E
- IEC 60384-17: Fixed metallized polypropylene film dielectric AC and pulse capacitors
- IEC 60384-17-1: Fixed metallized polypropylene film dielectric AC and pulse capacitors
- EN CZDS2.E514026 Certificate: E514026 (approved by UL)

HOW TO ORDER

FE	52	G*	6	I	0137	K	B
Series	Pitch	Case Size	Type	Voltage	Cap µF Code	Tolerance	Lead Type
FE	37 = 37.5mm 52 = 52.5mm	F* for P=37.5mm G* for P=52.5mm	6 = Standard 105°C 7 = THB Grade IIIB 105°C 8 = THB 2000H 125°C	I = 450V H = 500V J = 550V Q = 600V A = 700V B = 800V C = 900V K = 1000V L = 1100V P = 1200V		K = ±10% M = ±20% J = ±5%, refer factory	A = 4 pins P2=10.2mm B = 4 pins P2=20.3mm

* THB - Temperature Humidity Bias

GENERAL DESCRIPTION

The FE series uses a non-impregnated metallized polypropylene dielectric specially treated to have a very high dielectric strength in operation condition up to 125°C.

FE series performance characteristics make them a viable alternative to aluminum electrolytic technology due to much lower ESR and much higher surge voltage capability (dv/dt).

GENERAL CHARACTERISTICS

- Able to Withstand Harsh Environment Conditions

FEATURES & BENEFITS

- High Performance DC Filter
- Low ESR, High Peak & RMS Current
- THB Grade IIIB
- Able to Withstand Harsh Environment Conditions (THB Grade IIIB)

APPLICATIONS

- Renewable Energy Inverter
- Motor Drives
- Industrial Power Supply
- UPS System

OPERATING TEMPERATURE RANGE

- Operating temperature range : -40°C to + 105°C (Type 6 and 7)
- Operating temperature range : -40°C to + 125°C (Type 8)

PACKAGING MATERIAL

Self-extinguishing plastic case (V0 = in accordance with UL 94) filled thermosetting resin.

Self-extinguishing thermosetting resin (V0 = in accordance with UL 94).

LIFE EXPECTANCY

One unique feature of this technology (versus aluminum electrolytics) is how the capacitor reacts at the end of its lifetime.

Unlike aluminum electrolytic film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 2% from initial value, with no risk of short circuit.

The capacitor continues to be functional even after this 2% decrease.

DC FILTERING

FE *RoHS Compliant



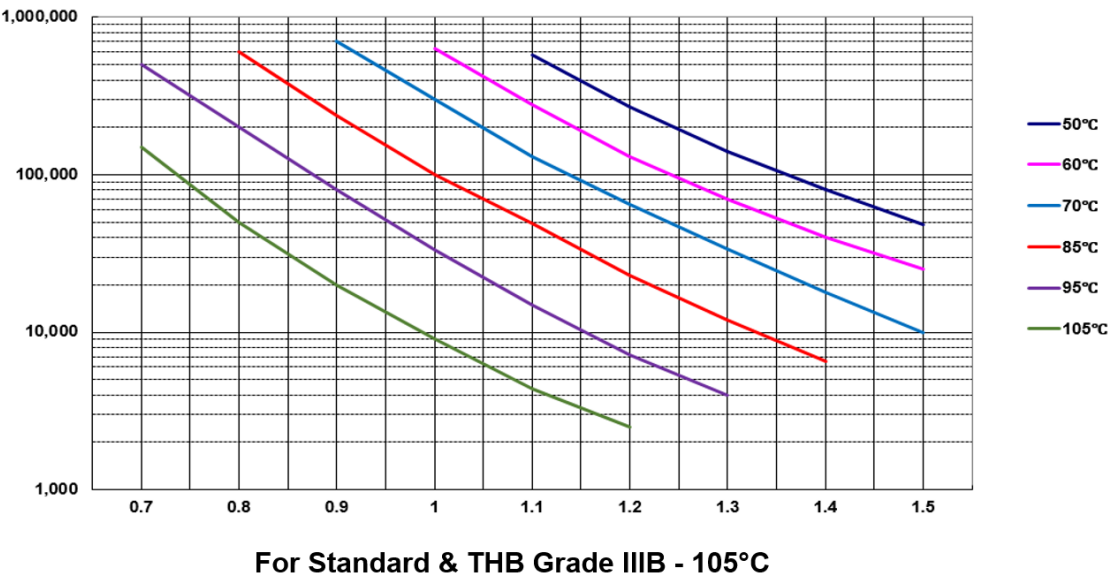
POLYPROPYLENE DIELECTRIC FOR INDUSTRIAL DC FILTERING

These capacitors have been designed primarily for high and medium power DC filtering applications.

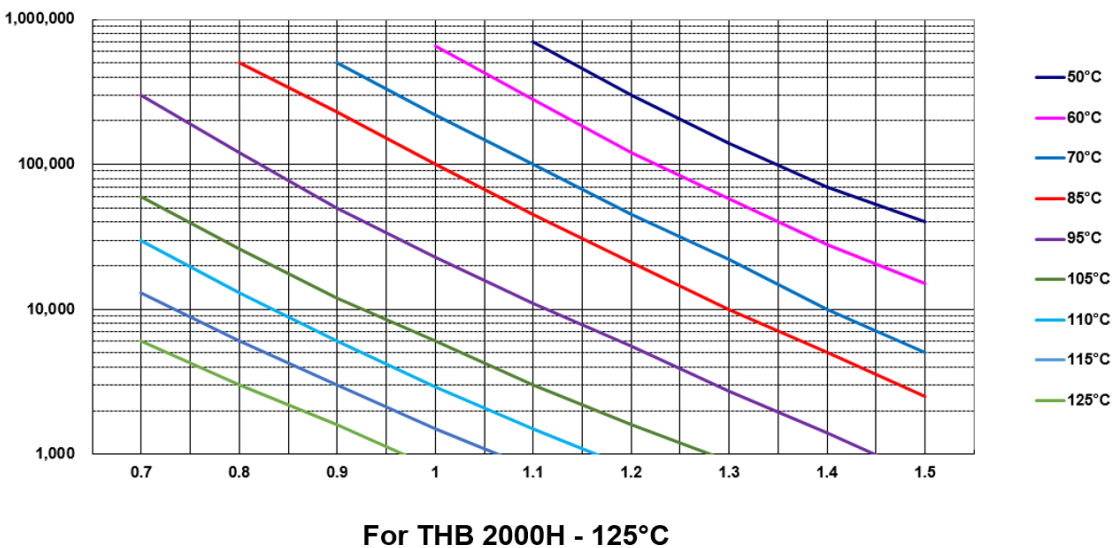
ELECTRICAL CHARACTERISTICS – POLYPROPYLENE DIELECTRIC

Items	Characteristics		
	Standard - 105°C	THB Grade IIIB - 105°C	THB 2000H - 125°C
Application	DC Filtering / DC Link		
Reference Standard	IEC 61071		
Climatic Category	40/85/56 IEC 60068-1		40/105/56 IEC 60068-1
Operating Temperature Range	-40°C ~ +105°C (85°C ~ 105°C, decreasing factor 1.25% per °C for Rated Voltage)		-40°C ~ +125°C (85°C ~ 125°C, decreasing factor 0.75% per °C for Rated Voltage)
Upper Temperature Tmax	105°C		125°C
Lower Temperature Tmin	-40°C		-55°C
Rated Voltage	450Vdc ~ 1200Vdc		450Vdc ~ 1100Vdc
Capacitance Range	1uF ~ 220uF		
Capacitance Tolerance	±10% at +25°C		
Dissipation Factor (DF)	≤0.002 (0.2%) at 1KHz; C ≤20uF at 25°C		
	≤0.003 (0.3%) at 1KHz; C >20uF at 25°C		
	≤0.004 (0.4%) at 1KHz; C >80uF at 25°C		
Test Voltage Between Terminals	1.5 x rated voltage for 10s (terminal to terminal)		
Test Voltage Terminal to Case	3.0kVrms 50 Hz for 10 sec at +25°C		
Insulation Resistance	IR x C ≥30,000 Seconds at 100VDC 1 minute at +25°C		
Life Expectancy	100,000 hours at Un @ Hot-Spot temperature T=+85°C		100,000 hours at Un @ Hot-Spot temperature T=+85°C
			20,000 hours at Un @ Hot-Spot temperature T=+105°C
			5,000 hours at Un @ Hot-Spot temperature T=+115°C
			4,000 hours at Un @ Hot-Spot temperature T=+125°C
Protection	Solvent resistant plastic case UL94 V-0 Thermosetting resin sealing UL 94 V-0 compliant		
Installation	Any position		
Leads	Tinned copper wires, standard lead wire length 5 ±1mm		
Packaging	Packed in cardboard boxes with protection for the terminals		
RoHS Compliant	Compliant with the restricted substance requirements of Directive 2011/65/EU		
Storage Conditions	Storage time: ≤ 24 months from the date marked on the label package		
	Temperature and relative humidity should be -10°C ~ +40°C and not more than 75%RH.		
	RH ≤ 85% for 30 days randomly distributed throughout the year		
Humidity Test	Test conditions & performance:		
	Temperature: +40°C±2°C		
	Relative humidity (RH): 93% ±2%		
	Test duration: 56 days		
	Capacitance change: ≤±5% DF change (@tgδ): ≤50 X 10 ⁻⁴ at 1KHz		
Endurance Test	Test conditions & performance:		
	Temperature: +85°C±2°C		
	Voltage applied: 1.3 X VR (d.c.)		
	Test duration: 1000 Hours		
	Capacitance change: ≤±5% DF change (@ tgδ): ≤50 X 10 ⁻⁴ at 1KHz		
High Temperature High Humidity	Insulation resistance: ≥50% of initial limit		
		Test conditions & performance:	Test conditions & performance:
		Temperature: +85°C±2°C	Temperature: +85°C±2°C
		Relative humidity (RH): 85% ±2%	Relative humidity (RH): 85% ±2%
		Voltage applied: Rated Voltage	Voltage applied: Rated Voltage
		Test duration: 1000 Hours	Test duration: 2000 Hours
		Capacitance change: ≤±10%	Capacitance change: ≤±10%
		DF change (@ tgδ): ≤80 X 10 ⁻⁴ at 1KHz	DF change (@ tgδ): ≤80 X 10 ⁻⁴ at 1KHz
		Insulation resistance: ≥50% of initial limit	Insulation resistance: ≥50% of initial limit
THB Test (Damp heat test with loading)	Test conditions & performance:		
	Temperature: +85°C±2°C Relative humidity (RH): 85% ±2%		
	Loading Voltage: Rated Voltage (DC)		
	Test duration: 1000 hours		
	Capacitance change: ≤±5%		

Expected Life Curve at Hot Spot Temperature (T_{HS})



Expected Life Curve at Hot Spot Temperature (T_{HS})



DC FILTERING

FE - Standard 105°C *RoHS Compliant



CASE CODE

Case Code	Dimensions											
	W ± 0.8(0.03)		H ± 0.8(0.03)		T ± 0.8(0.03)		P1 ± 1.0(0.04)		P2 ± 1.0(0.04)		d ± 0.05(0.002)	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
FK	42.0	(1.65)	37.0	(1.46)	22.0	(0.87)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
FL	42.0	(1.65)	37.0	(1.46)	28.0	(1.10)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
F6	42.0	(1.65)	40.0	(1.57)	20.0	(0.79)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
FR	42.0	(1.65)	43.0	(1.69)	28.0	(1.10)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
F8	42.0	(1.65)	44.0	(1.73)	24.0	(0.94)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
F9	42.0	(1.65)	45.0	(1.77)	30.0	(1.18)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FX	42.0	(1.65)	45.0	(1.77)	35.0	(1.38)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FN	42.0	(1.65)	50.0	(1.97)	35.0	(1.38)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FT	42.0	(1.65)	55.0	(2.17)	40.0	(1.57)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FS	42.0	(1.65)	60.0	(2.36)	45.0	(1.77)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
G9	57.5	(2.26)	45.0	(1.77)	25.0	(0.98)	52.5	(2.07)	10.2	(0.40)	1.2	(0.05)
GA	57.5	(2.26)	45.0	(1.77)	30.0	(1.18)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GC	57.5	(2.26)	50.0	(1.97)	35.0	(1.38)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GE	57.5	(2.26)	55.0	(2.17)	45.0	(1.77)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GF	57.5	(2.26)	60.0	(2.36)	35.0	(1.38)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GH	57.5	(2.26)	65.0	(2.56)	35.0	(1.38)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GI	57.5	(2.26)	65.0	(2.56)	45.0	(1.77)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)

RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05									
					mm	mm	mm	mm	mm	mm									
uF	V										V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
					Voltage Vndc 450V						Voltage Code I								
30	450	FE37FK6I0306KA	I	FK	42.0	37	22.0	37.5	10.2	1.2	35	1050	11.0	9.2	14.3	14	49	1,176	40
35	450	FE37FK6I0356KA	I	FK	42.0	37	22.0	37.5	10.2	1.2	35	1225	13.3	7.9	14.3	14	49	1,176	40
40	450	FE37F6I0406KA	I	F6	42.0	40	20	37.5	10.2	1.2	35	1400	14.4	6.9	13.9	14	56	1,344	41
40	450	FE37FK6I0406KA	I	FK	42.0	37	22	37.5	10.2	1.2	35	1400	14.2	6.9	14.3	14	49	1,176	40
50	450	FE37FL6I0506KA	I	FL	42.0	37	28	37.5	10.2	1.2	35	1750	17.2	5.5	12.2	15	42	1,008	52
55	450	FE37F86I0556KA	I	F8	42.0	44	24	37.5	10.2	1.2	35	1925	18.1	5.0	12.2	15	49	1,176	52
60	450	FE37FR6I0606KA	I	FR	42.0	43	28	37.5	10.2	1.2	35	2100	18.9	4.6	11.8	16	42	1,008	60
65	450	FE37F96I0656KB	I	F9	42.0	45	30	37.5	20.3	1.2	35	2275	19.6	4.3	10.0	16	35	840	65
70	450	FE37F96I0706KB	I	F9	42.0	45	30	37.5	20.3	1.2	35	2450	20.7	4.0	10.0	16	35	840	65
80	450	FE37FX6I0806KB	I	FX	42.0	45	35	37.5	20.3	1.2	35	2800	24.1	3.5	9.1	17	35	840	82
90	450	FE37FN6I0906KB	I	FN	42.0	50	35	37.5	20.3	1.2	35	3150	27.9	3.1	8.3	17	28	672	88
110	450	FE37FT6I0117KB	I	FT	42.0	55	40	37.5	20.3	1.2	35	3850	30.9	2.5	7.7	18	28	672	110
120	450	FE37FT6I0127KB	I	FT	42.0	55	40	37.5	20.3	1.2	35	4200	32.3	2.3	7.7	18	28	672	110
140	450	FE37FS6I0147KB	I	FS	42.0	60	45	37.5	20.3	1.2	35	4900	34.9	2.0	7.1	20	21	504	134
80	450	FE52G96I0806KA	I	G9	57.5	45	25	52.5	10.2	1.2	20	1600	17.3	7.3	9.1	14	30	1,080	70
100	450	FE52GA6I0107KB	I	GA	57.5	45	30	52.5	20.3	1.2	20	2000	19.4	5.9	8.0	15	25	900	88
130	450	FE52GC6I0137KB	I	GC	57.5	50	35	52.5	20.3	1.2	20	2600	23.6	4.5	6.9	17	20	720	114
160	450	FE52GF6I0167KB	I	GF	57.5	60	35	52.5	20.3	1.2	20	3200	28.2	3.7	6.1	18	20	720	138
170	450	FE52GE6I0177KB	I	GE	57.5	55	45	52.5	20.3	1.2	20	3400	30.9	3.4	5.4	19	15	540	162
180	450	FE52GH6I0187KB	I	GH	57.5	65	35	52.5	20.3	1.2	20	3600	31.9	3.3	5.7	18	20	720	145
180	450	FE52GE6I0187KB	I	GE	57.5	55	45	52.5	20.3	1.2	20	3600	31.9	3.3	5.4	19	15	540	162
210	450	FE52GI6I0217KB	I	GI	57.5	65	45	52.5	20.3	1.2	20	4200	35.4	2.8	5.1	20	15	540	189
220	450	FE52GI6I0227KB	I	GI	57.5	65	45	52.5	20.3	1.2	20	4400	37.3	2.7	5.1	20	15	540	189
					Voltage Vndc 500V						Voltage Code H								
30	500	FE37FK6H0306KA	H	FK	42.0	37	22	37.5	10.2	1.2	35	1050	12.8	8.5	14.3	14	49	1,176	40
35	500	FE37FK6H0356KA	H	FK	42.0	37	22	37.5	10.2	1.2	35	1225	13.8	7.3	14.3	14	49	1,176	40
40	500	FE37F66H0406KA	H	F6	42.0	40	20	37.5	10.2	1.2	35	1400	15.0	6.4	13.9	14	56	1,344	41
40	500	FE37FK6H0406KA	H	FK	42.0	37	22	37.5	10.2	1.2	35	1400	14.8	6.4	14.3	14	49	1,176	40
50	500	FE37FL6H0506KA	H	FL	42.0	37	28	37.5	10.2	1.2	35	1750	17.9	5.1	12.2	15	42	1,008	52
55	500	FE37F86H0556KA	H	F8	42.0	44	24	37.5	10.2	1.2	35	1925	18.8	4.7	12.2	15	49	1,176	52
60	500	FE37FR6H0606KA	H	FR	42.0	43	28	37.5	10.2	1.2	35	2100	20.0	4.3	11.8	16	42	1,008	60

DC FILTERING

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RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
65	500	FE37F96H0656KB	H	F9	42.0	45	30	37.5	20.3	1.2	35	2275	22.5	3.9	10.0	16	35	840	65
70	500	FE37F96H0706KB	H	F9	42.0	45	30	37.5	20.3	1.2	35	2450	23.4	3.7	10.0	16	35	840	65
80	500	FE37FX6H0806KB	H	FX	42.0	45	35	37.5	20.3	1.2	35	2800	26.2	3.2	9.1	17	35	840	82
90	500	FE37FN6H0906KB	H	FN	42.0	50	35	37.5	20.3	1.2	35	3150	29.0	2.8	8.3	17	28	672	88
110	500	FE37FT6H0117KB	H	FT	42.0	55	40	37.5	20.3	1.2	35	3850	33.4	2.3	7.7	18	28	672	110
120	500	FE37FT6H0127KB	H	FT	42.0	55	40	37.5	20.3	1.2	35	4200	34.9	2.1	7.7	18	28	672	110
140	500	FE37FS6H0147KB	H	FS	42.0	60	45	37.5	20.3	1.2	35	4900	39.1	1.8	7.1	20	21	504	134
80	500	FE52G96H0806KA	H	G9	57.5	45	25	52.5	10.2	1.2	20	1600	18.0	6.8	9.1	14	30	1,080	70
100	500	FE52GA6H0107KB	H	GA	57.5	45	30	52.5	20.3	1.2	20	2000	21.5	5.4	8.0	15	25	900	88
130	500	FE52GC6H0137KB	H	GC	57.5	50	35	52.5	20.3	1.2	20	2600	26.4	4.2	6.9	17	20	720	114
160	500	FE52GF6H0167KB	H	GF	57.5	60	35	52.5	20.3	1.2	20	3200	31.2	3.4	6.1	18	20	720	138
170	500	FE52GE6H0177KB	H	GE	57.5	55	45	52.5	20.3	1.2	20	3400	33.1	3.2	5.4	19	15	540	162
180	500	FE52GH6H0187KB	H	GH	57.5	65	35	52.5	20.3	1.2	20	3600	34.1	3.0	5.7	18	20	720	145
180	500	FE52GE6H0187KB	H	GE	57.5	55	45	52.5	20.3	1.2	20	3600	35.1	3.0	5.4	19	15	540	162
210	500	FE52GI6H0217KB	H	GI	57.5	65	45	52.5	20.3	1.2	20	4200	38.9	2.6	5.1	20	15	540	189
220	500	FE52GI6H0227KB	H	GI	57.5	65	45	52.5	20.3	1.2	20	4400	39.8	2.5	5.1	20	15	540	189
Voltage Vndc 550V										Voltage Code J									
30	550	FE37FK6J0306KA	J	FK	42.0	37	22	37.5	10.2	1.2	35	1050	13.5	7.7	14.3	14	49	1,176	40
40	550	FE37F86J0406KA	J	F8	42.0	44	24	37.5	10.2	1.2	35	1400	16.9	5.8	12.2	15	49	1,176	52
50	550	FE37FR6J0506KA	J	FR	42.0	43	28	37.5	10.2	1.2	35	1750	19.2	4.6	11.8	16	42	1,008	60
60	550	FE37F96J0606KB	J	F9	42.0	45	30	37.5	20.3	1.2	35	2100	22.8	3.8	10.0	16	35	840	65
70	550	FE37FN6J0706KB	J	FN	42.0	50	35	37.5	20.3	1.2	35	2450	27.0	3.3	8.3	17	28	672	88
80	550	FE37FT6J0806KB	J	FT	42.0	55	40	37.5	20.3	1.2	35	2800	30.0	2.9	7.7	18	28	672	110
90	550	FE37FT6J0906KB	J	FT	42.0	55	40	37.5	20.3	1.2	35	3150	31.9	2.6	7.7	18	28	672	110
100	550	FE37FT6J0107KB	J	FT	42.0	55	40	37.5	20.3	1.2	35	3500	33.6	2.3	7.7	18	28	672	110
110	550	FE37FS6J0117KB	J	FS	42.0	60	45	37.5	20.3	1.2	35	3850	36.6	2.1	7.1	20	21	504	134
120	550	FE37FS6J0127KB	J	FS	42.0	60	45	37.5	20.3	1.2	35	4200	38.2	1.9	7.1	20	21	504	134
70	550	FE52G96J0706KA	J	G9	57.5	45	25	52.5	10.2	1.2	20	1400	17.8	7.0	9.1	14	30	1,080	70
80	550	FE52GA6J0806KB	J	GA	57.5	45	30	52.5	20.3	1.2	20	1600	20.2	6.1	8.0	15	25	900	88
90	550	FE52GC6J0906KB	J	GC	57.5	50	35	52.5	20.3	1.2	20	1800	23.1	5.4	6.9	17	20	720	114
110	550	FE52GC6J0117KB	J	GC	57.5	50	35	52.5	20.3	1.2	20	2200	25.6	4.4	6.9	17	20	720	114
130	550	FE52GF6J0137KB	J	GF	57.5	60	35	52.5	20.3	1.2	20	2600	29.7	3.8	6.1	18	20	720	138
140	550	FE52GF6J0147KB	J	GF	57.5	60	35	52.5	20.3	1.2	20	2800	30.8	3.5	6.1	18	20	720	138
140	550	FE52GH6J0147KB	J	GH	57.5	65	35	52.5	20.3	1.2	20	2800	31.7	3.5	5.7	18	20	720	145
140	550	FE52GE6J0147KB	J	GE	57.5	55	45	52.5	20.3	1.2	20	2800	32.6	3.5	5.4	19	15	540	162
150	550	FE52GE6J0157KB	J	GE	57.5	55	45	52.5	20.3	1.2	20	3000	33.7	3.3	5.4	19	15	540	162
170	550	FE52GI6J0177KB	J	GI	57.5	65	45	52.5	20.3	1.2	20	3400	36.9	2.9	5.1	20	15	540	189
190	550	FE52GI6J0197KB	J	GI	57.5	65	45	52.5	20.3	1.2	20	3800	39.0	2.6	5.1	20	15	540	189
Voltage Vndc 600V										Voltage Code Q									
22	600	FE37F66Q0226KA	Q	F6	42.0	40	20	37.5	10.2	1.2	35	770	12.7	9.0	13.9	14	56	1,344	41
25	600	FE37F66Q0256KA	Q	F6	42.0	40	20	37.5	10.2	1.2	35	875	13.5	7.9	13.9	14	56	1,344	41
30	600	FE37FL6Q0306KA	Q	FL	42.0	37	28	37.5	10.2	1.2	35	1050	15.8	6.6	12.2	15	42	1,008	52
33	600	FE37F86Q0336KA	Q	F8	42.0	44	24	37.5	10.2	1.2	35	1155	16.6	6.0	12.2	15	49	1,176	52
35	600	FE37FR6Q0356KA	Q	FR	42.0	43	28	37.5	10.2	1.2	35	1225	17.4	5.6	11.8	16	42	1,008	60
40	600	FE37F96Q0406KB	Q	F9	42.0	45	30	37.5	20.3	1.2	35	1400	20.1	4.9	10.0	16	35	840	65
45	600	FE37F96Q0456KB	Q	F9	42.0	45	30	37.5	20.3	1.2	35	1575	21.3	4.4	10.0	16	35	840	65
45	600	FE37FX6Q0456KB	Q	FX	42.0	45	35	37.5	20.3	1.2	35	1575	22.4	4.4	9.1	17	35	840	82
50	600	FE37FX6Q0506KB	Q	FX	42.0	45	35	37.5	20.3	1.2	35	1750	23.6	4.0	9.1	17	35	840	82
50	600	FE37FN6Q0506KB	Q	FN	42.0	50	35	37.5	20.3	1.2	35	1750	24.6	4.0	8.3	17	28	672	88
60	600	FE37FT6Q0606KB	Q	FT	42.0	55	40	37.5	20.3	1.2	35	2100	28.1	3.3	7.7	18	28	672	110
70	600	FE37FT6Q0706KB	Q	FT	42.0	55	40	37.5	20.3	1.2	35	2450	30.4	2.8	7.7	18	28	672	110
75	600	FE37FS6Q0756KB	Q	FS	42.0	60	45	37.5	20.3	1.2	35	2625	32.6	2.6	7.1	20	21	504	134
80	600	FE37FS6Q0806KB	Q	FS	42.0	60	45	37.5	20.3	1.2	35	2800	33.7	2.5	7.1	20	21	504	134
85	600	FE37FS6Q0856KB	Q	FS	42.0	60	45	37.5	20.3	1.2	35	2975	34.7	2.3	7.1	20	21	504	134
45	600	FE52G96Q0456KA	Q	G9	57.5	45	25	52.5	10.2	1.2	20	900	15.4	9.3	9.1	14	30	1,080	70
50	600	FE52G96Q0506KA	Q	G9	57.5	45	25	52.5	10.2	1.2	20	1000	16.2	8.4	9.1	14	30	1,080	70
55	600	FE52GA6Q0556KB	Q	GA	57.5	45	30	52.5	20.3	1.2	20	1100	18.1	7.6	8.0	15	25	900	88



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RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
60	600	FE52GA6Q0606KB	Q	GA	57.5	45	30	52.5	20.3	1.2	20	1200	18.9	7.0	8.0	15	25	900	88
65	600	FE52GC6Q0656KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1300	21.2	6.4	6.9	17	20	720	114
70	600	FE52GC6Q0706KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1400	22.0	6.0	6.9	17	20	720	114
75	600	FE52GC6Q0756KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1500	22.8	5.6	6.9	17	20	720	114
80	600	FE52GC6Q0806KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1600	23.6	5.2	6.9	17	20	720	114
90	600	FE52GF6Q0906KB	Q	GF	57.5	60	35	52.5	20.3	1.2	20	1800	26.7	4.6	6.1	18	20	720	138
100	600	FE52GF6Q1070KB	Q	GF	57.5	60	35	52.5	20.3	1.2	20	2000	28.1	4.2	6.1	18	20	720	138
110	600	FE52GH6Q1170KB	Q	GH	57.5	65	35	52.5	20.3	1.2	20	2200	30.3	3.8	5.7	18	20	720	145
110	600	FE52GE6Q1170KB	Q	GE	57.5	55	45	52.5	20.3	1.2	20	2200	31.2	3.8	5.4	19	15	540	162
130	600	FE52GI6Q1370KB	Q	GI	57.5	65	45	52.5	20.3	1.2	20	2600	34.8	3.2	5.1	20	15	540	189
Voltage Vndc 700V											Voltage Code A								
22	700	FE37F66A0226KA	A	F6	42.0	40	20	37.5	10.2	1.2	35	770	12.7	9.0	13.9	14	56	1,344	41
25	700	FE37F66A0256KA	A	F6	42.0	40	20	37.5	10.2	1.2	35	875	13.5	7.9	13.9	14	56	1,344	41
30	700	FE37FL6A0306KA	A	FL	42.0	37	28	37.5	10.2	1.2	35	1050	15.8	6.6	12.2	15	42	1,008	52
33	700	FE37F86A0336KA	A	F8	42.0	44	24	37.5	10.2	1.2	35	1155	16.6	6.0	12.2	15	49	1,176	52
40	700	FE37F96A0406KB	A	F9	42.0	45	30	37.5	20.3	1.2	35	1400	20.1	4.9	10.0	16	35	840	65
45	700	FE37FX6A0456KB	A	FX	42.0	45	35	37.5	20.3	1.2	35	1575	22.4	4.4	9.1	17	35	840	82
50	700	FE37FN6A0506KB	A	FN	42.0	50	35	37.5	20.3	1.2	35	1750	24.6	4.0	8.3	17	28	672	88
60	700	FE37FT6A0606KB	A	FT	42.0	55	40	37.5	20.3	1.2	35	2100	28.1	3.3	7.7	18	28	672	110
70	700	FE37FT6A0706KB	A	FT	42.0	55	40	37.5	20.3	1.2	35	2450	30.4	2.8	7.7	18	28	672	110
75	700	FE37FS6A0756KB	A	FS	42.0	60	45	37.5	20.3	1.2	35	2625	32.6	2.6	7.1	20	21	504	134
80	700	FE37FS6A0806KB	A	FS	42.0	60	45	37.5	20.3	1.2	35	2800	33.7	2.5	7.1	20	21	504	134
85	700	FE37FS6A0856KB	A	FS	42.0	60	45	37.5	20.3	1.2	35	2975	34.7	2.3	7.1	20	21	504	134
45	700	FE52G96A0456KA	A	G9	57.5	45	25	52.5	10.2	1.2	20	900	15.4	9.3	9.1	14	30	1,080	70
50	700	FE52G96A0506KA	A	G9	57.5	45	25	52.5	10.2	1.2	20	1000	16.2	8.4	9.1	14	30	1,080	70
55	700	FE52GA6A0556KB	A	GA	57.5	45	30	52.5	20.3	1.2	20	1100	18.1	7.6	8.0	15	25	900	88
60	700	FE52GA6A0606KB	A	GA	57.5	45	30	52.5	20.3	1.2	20	1200	18.9	7.0	8.0	15	25	900	88
65	700	FE52GC6A0656KB	A	GC	57.5	50	35	52.5	20.3	1.2	20	1300	21.2	6.4	6.9	17	20	720	114
70	700	FE52GC6A0706KB	A	GC	57.5	50	35	52.5	20.3	1.2	20	1400	22.0	6.0	6.9	17	20	720	114
75	700	FE52GC6A0756KB	A	GC	57.5	50	35	52.5	20.3	1.2	20	1500	22.8	5.6	6.9	17	20	720	114
80	700	FE52GC6A0806KB	A	GC	57.5	50	35	52.5	20.3	1.2	20	1600	23.6	5.2	6.9	17	20	720	114
90	700	FE52GF6A0906KB	A	GF	57.5	60	35	52.5	20.3	1.2	20	1800	26.7	4.6	6.1	18	20	720	138
100	700	FE52GF6A1070KB	A	GF	57.5	60	35	52.5	20.3	1.2	20	2000	28.1	4.2	6.1	18	20	720	138
110	700	FE52GH6A1170KB	A	GH	57.5	65	35	52.5	20.3	1.2	20	2200	30.3	3.8	5.7	18	20	720	145
110	700	FE52GE6A1170KB	A	GE	57.5	55	45	52.5	20.3	1.2	20	2200	31.2	3.8	5.4	19	15	540	162
130	700	FE52GI6A1370KB	A	GI	57.5	65	45	52.5	20.3	1.2	20	2600	34.8	3.2	5.1	20	15	540	189
Voltage Vndc 800V											Voltage Code B								
15	800	FE37F66B0156KA	B	F6	42.0	40	20	37.5	10.2	1.2	35	525	11.2	11.5	13.9	14	56	1,344	41
20	800	FE37FL6B0206KA	B	FL	42.0	37	28	37.5	10.2	1.2	35	700	13.8	8.6	12.2	15	42	1,008	52
22	800	FE37FL6B0226KA	B	FL	42.0	37	28	37.5	10.2	1.2	35	770	14.4	7.9	12.2	15	42	1,008	52
25	800	FE37F86B0256KA	B	F8	42.0	44	24	37.5	10.2	1.2	35	875	15.4	6.9	12.2	15	49	1,176	52
25	800	FE37FR6B0256KA	B	FR	42.0	43	28	37.5	10.2	1.2	35	875	15.7	6.9	11.8	16	42	1,008	60
30	800	FE37F96B0306KB	B	F9	42.0	45	30	37.5	20.3	1.2	35	1050	18.6	5.8	10.0	16	35	840	65
35	800	FE37FX6B0356KB	B	FX	42.0	45	35	37.5	20.3	1.2	35	1225	21.1	4.9	9.1	17	35	840	82
40	800	FE37FN6B0406KB	B	FN	42.0	50	35	37.5	20.3	1.2	35	1400	23.6	4.3	8.3	17	28	672	88
45	800	FE37FT6B0456KB	B	FT	42.0	55	40	37.5	20.3	1.2	35	1575	26.0	3.8	7.7	18	28	672	110
50	800	FE37FT6B0506KB	B	FT	42.0	55	40	37.5	20.3	1.2	35	1750	27.4	3.5	7.7	18	28	672	110
55	800	FE37FT6B0556KB	B	FT	42.0	55	40	37.5	20.3	1.2	35	1925	28.8	3.1	7.7	18	28	672	110
60	800	FE37FS6B0606KB	B	FS	42.0	60	45	37.5	20.3	1.2	35	2100	31.2	2.9	7.1	20	21	504	134
65	800	FE37FS6B0656KB	B	FS	42.0	60	45	37.5	20.3	1.2	35	2275	32.5	2.7	7.1	20	21	504	134
30	800	FE52G96B0306KA	B	G9	57.5	45	25	52.5	10.2	1.2	20	600	13.4	12.2	9.1	14	30	1,080	70
35	800	FE52G96B0356KA	B	G9	57.5	45	25	52.5	10.2	1.2	20	700	14.5	10.5	9.1	14	30	1,080	70
40	800	FE52GA6B0406KB	B	GA	57.5	45	30	52.5	20.3	1.2	20	800	16.5	9.1	8.0	15	25	900	88
45	800	FE52GA6B0456KB	B	GA	57.5	45	30	52.5	20.3	1.2	20	900	17.5	8.1	8.0	15	25	900	88
50	800	FE52GC6B0506KB	B	GC	57.5	50	35	52.5	20.3	1.2	20	1000	19.9	7.3	6.9	17	20	720	114
55	800	FE52GC6B0556KB	B	GC	57.5	50	35	52.5	20.3	1.2	20	1100	20.9	6.7	6.9	17	20	720	114
60	800	FE52GC6B0606KB	B	GC	57.5	50	35	52.5	20.3	1.2	20	1200	21.8	6.1	6.9	17	20	720	114

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RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
70	800	FE52GF6B0706KB	B	GF	57.5	60	35	52.5	20.3	1.2	20	1400	25.1	5.2	6.1	18	20	720	138
75	800	FE52GF6B0756KB	B	GF	57.5	60	35	52.5	20.3	1.2	20	1500	26.0	4.9	6.1	18	20	720	138
85	800	FE52GH6B0856KB	B	GH	57.5	65	35	52.5	20.3	1.2	20	1700	28.5	4.3	5.7	18	20	720	145
85	800	FE52GE6B0856KB	B	GE	57.5	55	45	52.5	20.3	1.2	20	1700	29.3	4.3	5.4	19	15	540	162
100	800	FE52GI6B0107KB	B	GI	57.5	65	45	52.5	20.3	1.2	20	2000	32.6	3.7	5.1	20	15	540	189
110	800	FE52GI6B0117KB	B	GI	57.5	65	45	52.5	20.3	1.2	20	2200	34.2	3.3	5.1	20	15	540	189
Voltage Vndc 900V																			
14	900	FE37F66C0146KA	C	F6	42.0	40	20	37.5	10.2	1.2	35	490	11.5	11.0	13.9	14	56	1,344	41
15	900	FE37F66C0156KA	C	F6	42.0	40	20	37.5	10.2	1.2	35	525	11.9	10.2	13.9	14	56	1,344	41
18	900	FE37FL6C0186KA	C	FL	42.0	37	28	37.5	10.2	1.2	35	630	13.9	8.5	12.2	15	42	1,008	52
20	900	FE37FL6C0206KA	C	FL	42.0	37	28	37.5	10.2	1.2	35	700	14.6	7.7	12.2	15	42	1,008	52
20	900	FE37F86C0206KA	C	F8	42.0	44	24	37.5	10.2	1.2	35	700	14.6	7.7	12.2	15	49	1,176	52
25	900	FE37F96C0256KB	C	F9	42.0	45	30	37.5	20.3	1.2	35	875	18.0	6.1	10.0	16	35	840	65
30	900	FE37FX6C0306KB	C	FX	42.0	45	35	37.5	20.3	1.2	35	1050	20.7	5.1	9.1	17	35	840	82
35	900	FE37FN6C0356KB	C	FN	42.0	50	35	37.5	20.3	1.2	35	1225	23.4	4.4	8.3	17	28	672	88
40	900	FE37FT6C0406KB	C	FT	42.0	55	40	37.5	20.3	1.2	35	1400	26.0	3.8	7.7	18	28	672	110
50	900	FE37FS6C0506KB	C	FS	42.0	60	45	37.5	20.3	1.2	35	1750	30.2	3.1	7.1	20	21	504	134
25	900	FE52G96C0256KA	C	G9	57.5	45	25	52.5	10.2	1.2	20	500	13.0	13.0	9.1	14	30	1,080	70
35	900	FE52GA6C0356KB	C	GA	57.5	45	30	52.5	20.3	1.2	20	700	16.4	9.3	8.0	15	25	900	88
45	900	FE52GC6C0456KB	C	GC	57.5	50	35	52.5	20.3	1.2	20	900	20.0	7.2	6.9	17	20	720	114
50	900	FE52GC6C0506KB	C	GC	57.5	50	35	52.5	20.3	1.2	20	1000	21.1	6.5	6.9	17	20	720	114
60	900	FE52GF6C0606KB	C	GF	57.5	60	35	52.5	20.3	1.2	20	1200	24.7	5.4	6.1	18	20	720	138
65	900	FE52GH6C0656KB	C	GH	57.5	65	35	52.5	20.3	1.2	20	1300	26.4	5.0	5.7	18	20	720	145
70	900	FE52GE6C0706KB	C	GE	57.5	55	45	52.5	20.3	1.2	20	1400	28.2	4.6	5.4	19	15	540	162
80	900	FE52GI6C0806KB	C	GI	57.5	65	45	52.5	20.3	1.2	20	1600	31.0	4.1	5.1	20	15	540	189
85	900	FE52GI6C0856KB	C	GI	57.5	65	45	52.5	20.3	1.2	20	1700	31.9	3.8	5.1	20	15	540	189
Voltage Vndc 1000V																			
12	1000	FE37F66K0126KA	K	F6	42.0	40	20	37.5	10.2	1.2	35	420	11.2	11.5	13.9	14	56	1,344	41
12	1000	FE37FK6K0126KA	K	FK	42.0	37	22	37.5	10.2	1.2	35	420	11.0	11.5	14.3	14	49	1,176	40
14	1000	FE37FK6K0146KA	K	FK	42.0	37	22	37.5	10.2	1.2	35	490	11.9	9.9	14.3	14	49	1,176	40
15	1000	FE37F86K0156KA	K	F8	42.0	44	24	37.5	10.2	1.2	35	525	13.3	9.2	12.2	15	49	1,176	52
16	1000	FE37FR6K0166KA	K	FR	42.0	43	28	37.5	10.2	1.2	35	560	14.0	8.6	11.8	16	42	1,008	60
18	1000	FE37F96K0186KB	K	F9	42.0	45	30	37.5	20.3	1.2	35	630	16.1	7.7	10.0	16	35	840	65
20	1000	FE37F96K0206KB	K	F9	42.0	45	30	37.5	20.3	1.2	35	700	17.0	6.9	10.0	16	35	840	65
22	1000	FE37FX6K0226KB	K	FX	42.0	45	35	37.5	20.3	1.2	35	770	18.7	6.3	9.1	17	35	840	82
25	1000	FE37FN6K0256KB	K	FN	42.0	50	35	37.5	20.3	1.2	35	875	20.8	5.5	8.3	17	28	672	88
30	1000	FE37FT6K0306KB	K	FT	42.0	55	40	37.5	20.3	1.2	35	1050	23.8	4.6	7.7	18	28	672	110
35	1000	FE37FS6K0356KB	K	FS	42.0	60	45	37.5	20.3	1.2	35	1225	25.7	4.0	7.7	18	28	672	110
40	1000	FE37FS6K0406KB	K	FS	42.0	60	45	37.5	20.3	1.2	35	1400	28.5	3.5	7.1	20	21	504	134
25	1000	FE52G96K0256KA	K	G9	57.5	45	25	52.5	10.2	1.2	20	500	13.7	11.7	9.1	14	30	1,080	70
30	1000	FE52GA6K0306KB	K	GA	57.5	45	30	52.5	20.3	1.2	20	600	16.0	9.8	8.0	15	25	900	88
35	1000	FE52GA6K0356KB	K	GA	57.5	45	30	52.5	20.3	1.2	20	700	17.3	8.4	8.0	15	25	900	88
40	1000	FE52GC6K0406KB	K	GC	57.5	50	35	52.5	20.3	1.2	20	800	19.9	7.3	6.9	17	20	720	114
45	1000	FE52GF6K0456KB	K	GF	57.5	60	35	52.5	20.3	1.2	20	900	22.5	6.5	6.1	18	20	720	138
50	1000	FE52GF6K0506KB	K	GF	57.5	60	35	52.5	20.3	1.2	20	1000	23.7	5.9	6.1	18	20	720	138
55	1000	FE52GH6K0556KB	K	GH	57.5	65	35	52.5	20.3	1.2	20	1100	25.6	5.3	5.7	18	20	720	145
57	1000	FE52GE6K0576KB	K	GE	57.5	55	45	52.5	20.3	1.2	20	1140	26.8	5.1	5.4	19	15	540	162
65	1000	FE52GI6K0656KB	K	GI	57.5	65	45	52.5	20.3	1.2	20	1300	29.4	4.5	5.1	20	15	540	189
70	1000	FE52GI6K0706KB	K	GI	57.5	65	45	52.5	20.3	1.2	20	1400	30.5	4.2	5.1	20	15	540	189
Voltage Vndc 1100V																			
8	1100	FE37F66L0805KA	L	F6	42.0	40	20	37.5	10.2	1.2	35	280	9.6	15.7	13.9	14	56	1,344	41
9	1100	FE37F66L0905KA	L	F6	42.0	40	20	37.5	10.2	1.2	35	315	10.2	14.0	13.9	14	56	1,344	41
10	1100	FE37FK6L0106KA	L	FK	42.0	37	22	37.5	10.2	1.2	35	350	10.6	12.6	14.3	14	49	1,176	40
10	1100	FE37FL6L0106KA	L	FL	42.0	37	28	37.5	10.2	1.2	35	350	11.4	12.6	12.2	15	42	1,008	52
12	1100	FE37FL6L0126KA	L	FL	42.0	37	28	37.5	10.2	1.2	35	420	12.5	10.5	12.2	15	42	1,008	52
12	1100	FE37F86L0126KA	L	F8	42.0	44	24	37.5	10.2	1.2	35	420	12.5	10.5	12.2	15	49	1,176	52
13	1100	FE37F86L0136KA	L	F8	42.0	44	24	37.5	10.2	1.2	35	455	13.0	9.7	12.2	15	49	1,176	52

DC FILTERING

FE - Standard 105°C *RoHS Compliant



RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
15	1100	FE37FR6L0156KA	L	FR	42.0	43	28	37.5	10.2	1.2	35	525	14.2	8.4	11.8	16	42	1,008	60
16	1100	FE37F96L0166KB	L	F9	42.0	45	30	37.5	20.3	1.2	35	560	16.0	7.9	10.0	16	35	840	65
18	1100	FE37FX6L0186KB	L	FX	42.0	45	35	37.5	20.3	1.2	35	630	17.7	7.0	9.1	17	35	840	82
20	1100	FE37FN6L0206KB	L	FN	42.0	50	35	37.5	20.3	1.2	35	700	19.5	6.3	8.3	17	28	672	88
27	1100	FE37FT6L0276KB	L	FT	42.0	55	40	37.5	20.3	1.2	35	945	23.6	4.7	7.7	18	28	672	110
35	1100	FE37FS6L0356KB	L	FS	42.0	60	45	37.5	20.3	1.2	35	1225	27.9	3.6	7.1	20	21	504	134
25	1100	FE52GA6L0256KB	L	GA	57.5	45	30	52.5	20.3	1.2	20	500	15.3	10.6	8.0	15	25	900	88
30	1100	FE52GC6L0306KB	L	GC	57.5	50	35	52.5	20.3	1.2	20	600	18.1	8.9	6.9	17	20	720	114
40	1100	FE52GF6L0406KB	L	GF	57.5	60	35	52.5	20.3	1.2	20	800	22.3	6.7	6.1	18	20	720	138
45	1100	FE52GH6L0456KB	L	GH	57.5	65	35	52.5	20.3	1.2	20	900	24.3	5.9	5.7	18	20	720	145
47	1100	FE52GE6L0476KB	L	GE	57.5	55	45	52.5	20.3	1.2	20	940	25.6	5.7	5.4	19	15	540	162
50	1100	FE52GI6L0506KB	L	GI	57.5	65	45	52.5	20.3	1.2	20	1000	27.1	5.3	5.1	20	15	540	189
55	1100	FE52GI6L0556KB	L	GI	57.5	65	45	52.5	20.3	1.2	20	1100	28.4	4.8	5.1	20	15	540	189
Voltage Vndc 1200V																			
8	1200	FE37F66P0805KA	P	F6	42.0	40	20	37.5	10.2	1.2	35	280	10.0	14.4	13.9	14	56	1,344	41
10	1200	FE37FL6P0106KA	P	FL	42.0	37	28	37.5	10.2	1.2	35	350	11.9	11.5	12.2	15	42	1,008	52
11	1200	FE37F86P0116KA	P	F8	42.0	44	24	37.5	10.2	1.2	35	385	12.5	10.5	12.2	15	49	1,176	52
12	1200	FE37FR6P0126KA	P	FR	42.0	43	28	37.5	10.2	1.2	35	420	13.3	9.6	11.8	16	42	1,008	60
13	1200	FE37FR6P0136KA	P	FR	42.0	43	28	37.5	10.2	1.2	35	455	13.8	8.9	11.8	16	42	1,008	60
14	1200	FE37F96P0146KB	P	F9	42.0	45	30	37.5	20.3	1.2	35	490	15.6	8.2	10.0	16	35	840	65
15	1200	FE37FX6P0156KB	P	FX	42.0	45	35	37.5	20.3	1.2	35	525	16.9	7.7	9.1	17	35	840	82
16	1200	FE37FX6P0166KB	P	FX	42.0	45	35	37.5	20.3	1.2	35	560	17.5	7.2	9.1	17	35	840	82
18	1200	FE37FN6P0186KB	P	FN	42.0	50	35	37.5	20.3	1.2	35	630	19.4	6.4	8.3	17	28	672	88
22	1200	FE37FT6P0226KB	P	FT	42.0	55	40	37.5	20.3	1.2	35	770	22.3	5.2	7.7	18	28	672	110
23	1200	FE37FT6P0236KB	P	FT	42.0	55	40	37.5	20.3	1.2	35	805	22.8	5.0	7.7	18	28	672	110
30	1200	FE37FS6P0306KB	P	FS	42.0	60	45	37.5	20.3	1.2	35	1050	27.0	3.8	7.1	20	21	504	134
15	1200	FE52G96P0156KA	P	G9	57.5	45	25	52.5	10.2	1.2	20	300	11.6	16.3	9.1	14	30	1,080	70
20	1200	FE52GA6P0206KB	P	GA	57.5	45	30	52.5	20.3	1.2	20	400	14.3	12.2	8.0	15	25	900	88
25	1200	FE52GC6P0256KB	P	GC	57.5	50	35	52.5	20.3	1.2	20	500	17.2	9.8	6.9	17	20	720	114
33	1200	FE52GF6P0336KB	P	GF	57.5	60	35	52.5	20.3	1.2	20	660	21.1	7.4	6.1	18	20	720	138
38	1200	FE52GH6P0386KB	P	GH	57.5	65	35	52.5	20.3	1.2	20	760	23.4	6.4	5.7	18	20	720	145
40	1200	FE52GE6P0406KB	P	GE	57.5	55	45	52.5	20.3	1.2	20	800	24.6	6.1	5.4	19	15	540	162
45	1200	FE52GI6P0456KB	P	GI	57.5	65	45	52.5	20.3	1.2	20	900	26.8	5.4	5.1	20	15	540	189

DC FILTERING

FE - THB Grade IIIB 105°C *RoHS Compliant



CASE CODE

Case Code	Dimensions											
	W ± 0.8(0.03)		H ± 0.8(0.03)		T ± 0.8(0.03)		P1 ± 1.0(0.04)		P2 ± 1.0(0.04)		d ± 0.05(0.002)	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
FK	42.0	(1.65)	37.0	(1.46)	22.0	(0.87)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
FL	42.0	(1.65)	37.0	(1.46)	28.0	(1.10)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
F6	42.0	(1.65)	40.0	(1.57)	20.0	(0.79)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
FR	42.0	(1.65)	43.0	(1.69)	28.0	(1.10)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
F8	42.0	(1.65)	44.0	(1.73)	24.0	(0.94)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
F9	42.0	(1.65)	45.0	(1.77)	30.0	(1.18)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FX	42.0	(1.65)	45.0	(1.77)	35.0	(1.38)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FN	42.0	(1.65)	50.0	(1.97)	35.0	(1.38)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FT	42.0	(1.65)	55.0	(2.17)	40.0	(1.57)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FS	42.0	(1.65)	60.0	(2.36)	45.0	(1.77)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
G9	57.5	(2.26)	45.0	(1.77)	25.0	(0.98)	52.5	(2.07)	10.2	(0.40)	1.2	(0.05)
GA	57.5	(2.26)	45.0	(1.77)	30.0	(1.18)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GC	57.5	(2.26)	50.0	(1.97)	35.0	(1.38)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GE	57.5	(2.26)	55.0	(2.17)	45.0	(1.77)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GF	57.5	(2.26)	60.0	(2.36)	35.0	(1.38)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GH	57.5	(2.26)	65.0	(2.56)	35.0	(1.38)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GI	57.5	(2.26)	65.0	(2.56)	45.0	(1.77)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)

RATING & PART NUMBER REFERENCE

Cap	Rated	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight										
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05																			
					mm	mm	mm	mm	mm	mm																			
uF	V										V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs										
Voltage Vndc 450V																				Voltage Code I									
30	450	FE37FK7I0306KA	I	FK	42.0	37	22	37.5	10.2	1.2	35	1050	11.0	9.2	14.3	14	49	1,176	40										
35	450	FE37FK7I0356KA	I	FK	42.0	37	22	37.5	10.2	1.2	35	1225	13.3	7.9	14.3	14	49	1,176	40										
40	450	FE37F67I0406KA	I	F6	42.0	40	20	37.5	10.2	1.2	35	1400	14.4	6.9	13.9	14	56	1,344	41										
40	450	FE37FK7I0406KA	I	FK	42.0	37	22	37.5	10.2	1.2	35	1400	14.2	6.9	14.3	14	49	1,176	40										
50	450	FE37FL7I0506KA	I	FL	42.0	37	28	37.5	10.2	1.2	35	1750	17.2	5.5	12.2	15	42	1,008	52										
55	450	FE37F87I0556KA	I	F8	42.0	44	24	37.5	10.2	1.2	35	1925	18.1	5.0	12.2	15	49	1,176	52										
60	450	FE37FR7I0606KA	I	FR	42.0	43	28	37.5	10.2	1.2	35	2100	18.9	4.6	11.8	16	42	1,008	60										
65	450	FE37F97I0656KB	I	F9	42.0	45	30	37.5	20.3	1.2	35	2275	19.6	4.3	10.0	16	35	840	65										
70	450	FE37F97I0706KB	I	F9	42.0	45	30	37.5	20.3	1.2	35	2450	20.7	4.0	10.0	16	35	840	65										
80	450	FE37FX7I0806KB	I	FX	42.0	45	35	37.5	20.3	1.2	35	2800	24.1	3.5	9.1	17	35	840	82										
90	450	FE37FN7I0906KB	I	FN	42.0	50	35	37.5	20.3	1.2	35	3150	27.9	3.1	8.3	17	28	672	88										
110	450	FE37FT7I0117KB	I	FT	42.0	55	40	37.5	20.3	1.2	35	3850	30.9	2.5	7.7	18	28	672	110										
120	450	FE37FT7I0127KB	I	FT	42.0	55	40	37.5	20.3	1.2	35	4200	32.3	2.3	7.7	18	28	672	110										
140	450	FE37FS7I0147KB	I	FS	42.0	60	45	37.5	20.3	1.2	35	4900	34.9	2.0	7.1	20	21	504	134										
80	450	FE52G97I0806KA	I	G9	57.5	45	25	52.5	10.2	1.2	20	1600	17.3	7.3	9.1	14	30	1,080	70										
100	450	FE52GA7I0107KB	I	GA	57.5	45	30	52.5	20.3	1.2	20	2000	19.4	5.9	8.0	15	25	900	88										
130	450	FE52GC7I0137KB	I	GC	57.5	50	35	52.5	20.3	1.2	20	2600	23.6	4.5	6.9	17	20	720	114										
160	450	FE52GF7I0167KB	I	GF	57.5	60	35	52.5	20.3	1.2	20	3200	28.2	3.7	6.1	18	20	720	138										
170	450	FE52GE7I0177KB	I	GE	57.5	55	45	52.5	20.3	1.2	20	3400	30.9	3.4	5.4	19	15	540	162										
180	450	FE52GH7I0187KB	I	GH	57.5	65	35	52.5	20.3	1.2	20	3600	31.9	3.3	5.7	18	20	720	145										
180	450	FE52GE7I0187KB	I	GE	57.5	55	45	52.5	20.3	1.2	20	3600	31.9	3.3	5.4	19	15	540	162										
210	450	FE52GI7I0217KB	I	GI	57.5	65	45	52.5	20.3	1.2	20	4200	35.4	2.8	5.1	20	15	540	189										
220	450	FE52GI7I0227KB	I	GI	57.5	65	45	52.5	20.3	1.2	20	4400	37.3	2.7	5.1	20	15	540	189										
Voltage Vndc 500V																				Voltage Code H									
30	500	FE37FK7H0306KA	H	FK	42.0	37	22	37.5	10.2	1.2	35	1050	12.8	8.5	14.3	14	49	1,176	40										
35	500	FE37FK7H0356KA	H	FK	42.0	37	22	37.5	10.2	1.2	35	1225	13.8	7.3	14.3	14	49	1,176	40										
40	500	FE37F67H0406KA	H	F6	42.0	40	20	37.5	10.2	1.2	35	1400	15.0	6.4	13.9	14	56	1,344	41										
40	500	FE37FK7H0406KA	H	FK	42.0	37	22	37.5	10.2	1.2	35	1400	14.8	6.4	14.3	14	49	1,176	40										
50	500	FE37FL7H0506KA	H	FL	42.0	37	28	37.5	10.2	1.2	35	1750	17.9	5.1	12.2	15	42	1,008	52										

DC FILTERING

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RATING & PART NUMBER REFERENCE

Cap	Rated	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
55	500	FE37F87H0556KA	H	F8	42.0	44	24	37.5	10.2	1.2	35	1925	18.8	4.7	12.2	15	49	1,176	52
60	500	FE37FR7H0606KA	H	FR	42.0	43	28	37.5	10.2	1.2	35	2100	20.0	4.3	11.8	16	42	1,008	60
65	500	FE37F97H0656KB	H	F9	42.0	45	30	37.5	20.3	1.2	35	2275	22.5	3.9	10.0	16	35	840	65
70	500	FE37F97H0706KB	H	F9	42.0	45	30	37.5	20.3	1.2	35	2450	23.4	3.7	10.0	16	35	840	65
80	500	FE37FX7H0806KB	H	FX	42.0	45	35	37.5	20.3	1.2	35	2800	26.2	3.2	9.1	17	35	840	82
90	500	FE37FN7H0906KB	H	FN	42.0	50	35	37.5	20.3	1.2	35	3150	29.0	2.8	8.3	17	28	672	88
110	500	FE37FT7H0117KB	H	FT	42.0	55	40	37.5	20.3	1.2	35	3850	33.4	2.3	7.7	18	28	672	110
120	500	FE37FT7H0127KB	H	FT	42.0	55	40	37.5	20.3	1.2	35	4200	34.9	2.1	7.7	18	28	672	110
140	500	FE37FS7H0147KB	H	FS	42.0	60	45	37.5	20.3	1.2	35	4900	39.1	1.8	7.1	20	21	504	134
80	500	FE52G97H0806KA	H	G9	57.5	45	25	52.5	10.2	1.2	20	1600	18.0	6.8	9.1	14	30	1,080	70
100	500	FE52GA7H0107KB	H	GA	57.5	45	30	52.5	20.3	1.2	20	2000	21.5	5.4	8.0	15	25	900	88
130	500	FE52GC7H0137KB	H	GC	57.5	50	35	52.5	20.3	1.2	20	2600	26.4	4.2	6.9	17	20	720	114
160	500	FE52GF7H0167KB	H	GF	57.5	60	35	52.5	20.3	1.2	20	3200	31.2	3.4	6.1	18	20	720	138
170	500	FE52GE7H0177KB	H	GE	57.5	55	45	52.5	20.3	1.2	20	3400	33.1	3.2	5.4	19	15	540	162
180	500	FE52GH7H0187KB	H	GH	57.5	65	35	52.5	20.3	1.2	20	3600	34.1	3.0	5.7	18	20	720	145
180	500	FE52GE7H0187KB	H	GE	57.5	55	45	52.5	20.3	1.2	20	3600	35.1	3.0	5.4	19	15	540	162
210	500	FE52GI7H0217KB	H	GI	57.5	65	45	52.5	20.3	1.2	20	4200	38.9	2.6	5.1	20	15	540	189
220	500	FE52GI7H0227KB	H	GI	57.5	65	45	52.5	20.3	1.2	20	4400	39.8	2.5	5.1	20	15	540	189
Voltage Vndc 550V																			
30	550	FE37FK7J0306KA	J	FK	42.0	37	22	37.5	10.2	1.2	35	1050	13.5	7.7	14.3	14	49	1,176	40
40	550	FE37F87J0406KA	J	F8	42.0	44	24	37.5	10.2	1.2	35	1400	16.9	5.8	12.2	15	49	1,176	52
50	550	FE37FR7J0506KA	J	FR	42.0	43	28	37.5	10.2	1.2	35	1750	19.2	4.6	11.8	16	42	1,008	60
60	550	FE37F97J0606KB	J	F9	42.0	45	30	37.5	20.3	1.2	35	2100	22.8	3.8	10.0	16	35	840	65
70	550	FE37FN7J0706KB	J	FN	42.0	50	35	37.5	20.3	1.2	35	2450	27.0	3.3	8.3	17	28	672	88
80	550	FE37FT7J0806KB	J	FT	42.0	55	40	37.5	20.3	1.2	35	2800	30.0	2.9	7.7	18	28	672	110
90	550	FE37FT7J0906KB	J	FT	42.0	55	40	37.5	20.3	1.2	35	3150	31.9	2.6	7.7	18	28	672	110
100	550	FE37FT7J0107KB	J	FT	42.0	55	40	37.5	20.3	1.2	35	3500	33.6	2.3	7.7	18	28	672	110
110	550	FE37FS7J0117KB	J	FS	42.0	60	45	37.5	20.3	1.2	35	3850	36.6	2.1	7.1	20	21	504	134
120	550	FE37FS7J0127KB	J	FS	42.0	60	45	37.5	20.3	1.2	35	4200	38.2	1.9	7.1	20	21	504	134
70	550	FE52G97J0706KA	J	G9	57.5	45	25	52.5	10.2	1.2	20	1400	17.8	7.0	9.1	14	30	1,080	70
80	550	FE52GA7J0806KB	J	GA	57.5	45	30	52.5	20.3	1.2	20	1600	20.2	6.1	8.0	15	25	900	88
90	550	FE52GC7J0906KB	J	GC	57.5	50	35	52.5	20.3	1.2	20	1800	23.1	5.4	6.9	17	20	720	114
110	550	FE52GC7J0117KB	J	GC	57.5	50	35	52.5	20.3	1.2	20	2200	25.6	4.4	6.9	17	20	720	114
130	550	FE52GF7J0137KB	J	GF	57.5	60	35	52.5	20.3	1.2	20	2600	29.7	3.8	6.1	18	20	720	138
140	550	FE52GF7J0147KB	J	GF	57.5	60	35	52.5	20.3	1.2	20	2800	30.8	3.5	6.1	18	20	720	138
140	550	FE52GH7J0147KB	J	GH	57.5	65	35	52.5	20.3	1.2	20	2800	31.7	3.5	5.7	18	20	720	145
140	550	FE52GE7J0147KB	J	GE	57.5	55	45	52.5	20.3	1.2	20	2800	32.6	3.5	5.4	19	15	540	162
150	550	FE52GE7J0157KB	J	GE	57.5	55	45	52.5	20.3	1.2	20	3000	33.7	3.3	5.4	19	15	540	162
170	550	FE52GI7J0177KB	J	GI	57.5	65	45	52.5	20.3	1.2	20	3400	36.9	2.9	5.1	20	15	540	189
190	550	FE52GI7J0197KB	J	GI	57.5	65	45	52.5	20.3	1.2	20	3800	39.0	2.6	5.1	20	15	540	189
Voltage Vndc 600V																			
22	600	FE37F67Q0226KA	Q	F6	42.0	40	20	37.5	10.2	1.2	35	770	12.7	9.0	13.9	14	56	1,344	41
25	600	FE37F67Q0256KA	Q	F6	42.0	40	20	37.5	10.2	1.2	35	875	13.5	7.9	13.9	14	56	1,344	41
30	600	FE37FL7Q0306KA	Q	FL	42.0	37	28	37.5	10.2	1.2	35	1050	15.8	6.6	12.2	15	42	1,008	52
33	600	FE37F87Q0336KA	Q	F8	42.0	44	24	37.5	10.2	1.2	35	1155	16.6	6.0	12.2	15	49	1,176	52
35	600	FE37FR7Q0356KA	Q	FR	42.0	43	28	37.5	10.2	1.2	35	1225	17.4	5.6	11.8	16	42	1,008	60
40	600	FE37F97Q0406KB	Q	F9	42.0	45	30	37.5	20.3	1.2	35	1400	20.1	4.9	10.0	16	35	840	65
45	600	FE37F97Q0456KB	Q	F9	42.0	45	30	37.5	20.3	1.2	35	1575	21.3	4.4	10.0	16	35	840	65
45	600	FE37FX7Q0456KB	Q	FX	42.0	45	35	37.5	20.3	1.2	35	1575	22.4	4.4	9.1	17	35	840	82
50	600	FE37FX7Q0506KB	Q	FX	42.0	45	35	37.5	20.3	1.2	35	1750	23.6	4.0	9.1	17	35	840	82
50	600	FE37FN7Q0506KB	Q	FN	42.0	50	35	37.5	20.3	1.2	35	1750	24.6	4.0	8.3	17	28	672	88
60	600	FE37FT7Q0606KB	Q	FT	42.0	55	40	37.5	20.3	1.2	35	2100	28.1	3.3	7.7	18	28	672	110
70	600	FE37FT7Q0706KB	Q	FT	42.0	55	40	37.5	20.3	1.2	35	2450	30.4	2.8	7.7	18	28	672	110

DC FILTERING

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RATING & PART NUMBER REFERENCE

Cap	Rated	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
75	600	FE37FS7Q0756KB	Q	FS	42.0	60	45	37.5	20.3	1.2	35	2625	32.6	2.6	7.1	20	21	504	134
80	600	FE37FS7Q0806KB	Q	FS	42.0	60	45	37.5	20.3	1.2	35	2800	33.7	2.5	7.1	20	21	504	134
85	600	FE37FS7Q0856KB	Q	FS	42.0	60	45	37.5	20.3	1.2	35	2975	34.7	2.3	7.1	20	21	504	134
45	600	FE52G97Q0456KA	Q	G9	57.5	45	25	52.5	10.2	1.2	20	900	15.4	9.3	9.1	14	30	1,080	70
50	600	FE52G97Q0506KA	Q	G9	57.5	45	25	52.5	10.2	1.2	20	1000	16.2	8.4	9.1	14	30	1,080	70
55	600	FE52GA7Q0556KB	Q	GA	57.5	45	30	52.5	20.3	1.2	20	1100	18.1	7.6	8.0	15	25	900	88
60	600	FE52GA7Q0606KB	Q	GA	57.5	45	30	52.5	20.3	1.2	20	1200	18.9	7.0	8.0	15	25	900	88
65	600	FE52GC7Q0656KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1300	21.2	6.4	6.9	17	20	720	114
70	600	FE52GC7Q0706KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1400	22.0	6.0	6.9	17	20	720	114
75	600	FE52GC7Q0756KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1500	22.8	5.6	6.9	17	20	720	114
80	600	FE52GC7Q0806KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1600	23.6	5.2	6.9	17	20	720	114
90	600	FE52GF7Q0906KB	Q	GF	57.5	60	35	52.5	20.3	1.2	20	1800	26.7	4.6	6.1	18	20	720	138
100	600	FE52GF7Q0107KB	Q	GF	57.5	60	35	52.5	20.3	1.2	20	2000	28.1	4.2	6.1	18	20	720	138
110	600	FE52GH7Q0117KB	Q	GH	57.5	65	35	52.5	20.3	1.2	20	2200	30.3	3.8	5.7	18	20	720	145
110	600	FE52GE7Q0117KB	Q	GE	57.5	55	45	52.5	20.3	1.2	20	2200	31.2	3.8	5.4	19	15	540	162
130	600	FE52GI7Q0137KB	Q	GI	57.5	65	45	52.5	20.3	1.2	20	2600	34.8	3.2	5.1	20	15	540	189
Voltage Vndc 700V																			
22	700	FE37F67A0226KA	A	F6	42.0	40	20	37.5	10.2	1.2	35	770	12.7	9.0	13.9	14	56	1,344	41
25	700	FE37F67A0256KA	A	F6	42.0	40	20	37.5	10.2	1.2	35	875	13.5	7.9	13.9	14	56	1,344	41
30	700	FE37FL7A0306KA	A	FL	42.0	37	28	37.5	10.2	1.2	35	1050	15.8	6.6	12.2	15	42	1,008	52
33	700	FE37F87A0336KA	A	F8	42.0	44	24	37.5	10.2	1.2	35	1155	16.6	6.0	12.2	15	49	1,176	52
40	700	FE37F97A0406KB	A	F9	42.0	45	30	37.5	20.3	1.2	35	1400	20.1	4.9	10.0	16	35	840	65
45	700	FE37FX7A0456KB	A	FX	42.0	45	35	37.5	20.3	1.2	35	1575	22.4	4.4	9.1	17	35	840	82
50	700	FE37FN7A0506KB	A	FN	42.0	50	35	37.5	20.3	1.2	35	1750	24.6	4.0	8.3	17	28	672	88
60	700	FE37FT7A0606KB	A	FT	42.0	55	40	37.5	20.3	1.2	35	2100	28.1	3.3	7.7	18	28	672	110
70	700	FE37FT7A0706KB	A	FT	42.0	55	40	37.5	20.3	1.2	35	2450	30.4	2.8	7.7	18	28	672	110
75	700	FE37FS7A0756KB	A	FS	42.0	60	45	37.5	20.3	1.2	35	2625	32.6	2.6	7.1	20	21	504	134
80	700	FE37FS7A0806KB	A	FS	42.0	60	45	37.5	20.3	1.2	35	2800	33.7	2.5	7.1	20	21	504	134
85	700	FE37FS7A0856KB	A	FS	42.0	60	45	37.5	20.3	1.2	35	2975	34.7	2.3	7.1	20	21	504	134
45	700	FE52G97A0456KA	A	G9	57.5	45	25	52.5	10.2	1.2	20	900	15.4	9.3	9.1	14	30	1,080	70
50	700	FE52G97A0506KA	A	G9	57.5	45	25	52.5	10.2	1.2	20	1000	16.2	8.4	9.1	14	30	1,080	70
55	700	FE52GA7A0556KB	A	GA	57.5	45	30	52.5	20.3	1.2	20	1100	18.1	7.6	8.0	15	25	900	88
60	700	FE52GA7A0606KB	A	GA	57.5	45	30	52.5	20.3	1.2	20	1200	18.9	7.0	8.0	15	25	900	88
65	700	FE52GC7A0656KB	A	GC	57.5	50	35	52.5	20.3	1.2	20	1300	21.2	6.4	6.9	17	20	720	114
70	700	FE52GC7A0706KB	A	GC	57.5	50	35	52.5	20.3	1.2	20	1400	22.0	6.0	6.9	17	20	720	114
75	700	FE52GC7A0756KB	A	GC	57.5	50	35	52.5	20.3	1.2	20	1500	22.8	5.6	6.9	17	20	720	114
80	700	FE52GC7A0806KB	A	GC	57.5	50	35	52.5	20.3	1.2	20	1600	23.6	5.2	6.9	17	20	720	114
90	700	FE52GF7A0906KB	A	GF	57.5	60	35	52.5	20.3	1.2	20	1800	26.7	4.6	6.1	18	20	720	138
100	700	FE52GF7A0107KB	A	GF	57.5	60	35	52.5	20.3	1.2	20	2000	28.1	4.2	6.1	18	20	720	138
110	700	FE52GH7A0117KB	A	GH	57.5	65	35	52.5	20.3	1.2	20	2200	30.3	3.8	5.7	18	20	720	145
110	700	FE52GE7A0117KB	A	GE	57.5	55	45	52.5	20.3	1.2	20	2200	31.2	3.8	5.4	19	15	540	162
130	700	FE52GI7A0137KB	A	GI	57.5	65	45	52.5	20.3	1.2	20	2600	34.8	3.2	5.1	20	15	540	189
Voltage Vndc 800V																			
15	800	FE37F67B0156KA	B	F6	42.0	40	20	37.5	10.2	1.2	35	525	11.2	11.5	13.9	14	56	1,344	41
20	800	FE37FL7B0206KA	B	FL	42.0	37	28	37.5	10.2	1.2	35	700	13.8	8.6	12.2	15	42	1,008	52
22	800	FE37FL7B0226KA	B	FL	42.0	37	28	37.5	10.2	1.2	35	770	14.4	7.9	12.2	15	42	1,008	52
25	800	FE37F87B0256KA	B	F8	42.0	44	24	37.5	10.2	1.2	35	875	15.4	6.9	12.2	15	49	1,176	52
25	800	FE37FR7B0256KA	B	FR	42.0	43	28	37.5	10.2	1.2	35	875	15.7	6.9	11.8	16	42	1,008	60
30	800	FE37F97B0306KB	B	F9	42.0	45	30	37.5	20.3	1.2	35	1050	18.6	5.8	10.0	16	35	840	65
35	800	FE37FX7B0356KB	B	FX	42.0	45	35	37.5	20.3	1.2	35	1225	21.1	4.9	9.1	17	35	840	82
40	800	FE37FN7B0406KB	B	FN	42.0	50	35	37.5	20.3	1.2	35	1400	23.6	4.3	8.3	17	28	672	88
45	800	FE37FT7B0456KB	B	FT	42.0	55	40	37.5	20.3	1.2	35	1575	26.0	3.8	7.7	18	28	672	110
50	800	FE37FT7B0506KB	B	FT	42.0	55	40	37.5	20.3	1.2	35	1750	27.4	3.5	7.7	18	28	672	110
55	800	FE37FT7B0556KB	B	FT	42.0	55	40	37.5	20.3	1.2	35	1925	28.8	3.1	7.7	18	28	672	110
60	800	FE37FS7B0606KB	B	FS	42.0	60	45	37.5	20.3	1.2	35	2100	31.2	2.9	7.1	20	21	504	134
65	800	FE37FS7B0656KB	B	FS	42.0	60	45	37.5	20.3	1.2	35	2275	32.5	2.7	7.1	20	21	504	134
30	800	FE52G97B0306KA	B	G9	57.5	45	25	52.5	10.2	1.2	20	600	13.4	12.2	9.1	14	30	1,080	70

DC FILTERING

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RATING & PART NUMBER REFERENCE

Cap	Rated	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
35	800	FE52G97B0356KA	B	G9	57.5	45	25	52.5	10.2	1.2	20	700	14.5	10.5	9.1	14	30	1,080	70
40	800	FE52GA7B0406KB	B	GA	57.5	45	30	52.5	20.3	1.2	20	800	16.5	9.1	8.0	15	25	900	88
45	800	FE52GA7B0456KB	B	GA	57.5	45	30	52.5	20.3	1.2	20	900	17.5	8.1	8.0	15	25	900	88
50	800	FE52GC7B0506KB	B	GC	57.5	50	35	52.5	20.3	1.2	20	1000	19.9	7.3	6.9	17	20	720	114
55	800	FE52GC7B0556KB	B	GC	57.5	50	35	52.5	20.3	1.2	20	1100	20.9	6.7	6.9	17	20	720	114
60	800	FE52GC7B0606KB	B	GC	57.5	50	35	52.5	20.3	1.2	20	1200	21.8	6.1	6.9	17	20	720	114
70	800	FE52GF7B0706KB	B	GF	57.5	60	35	52.5	20.3	1.2	20	1400	25.1	5.2	6.1	18	20	720	138
75	800	FE52GF7B0756KB	B	GF	57.5	60	35	52.5	20.3	1.2	20	1500	26.0	4.9	6.1	18	20	720	138
85	800	FE52GH7B0856KB	B	GH	57.5	65	35	52.5	20.3	1.2	20	1700	28.5	4.3	5.7	18	20	720	145
85	800	FE52GE7B0856KB	B	GE	57.5	55	45	52.5	20.3	1.2	20	1700	29.3	4.3	5.4	19	15	540	162
100	800	FE52GI7B0107KB	B	GI	57.5	65	45	52.5	20.3	1.2	20	2000	32.6	3.7	5.1	20	15	540	189
110	800	FE52GI7B0117KB	B	GI	57.5	65	45	52.5	20.3	1.2	20	2200	34.2	3.3	5.1	20	15	540	189
Voltage Vndc 900V																			
										Voltage Code C									
14	900	FE37F67C0146KA	C	F6	42.0	40	20	37.5	10.2	1.2	35	490	11.5	11.0	13.9	14	56	1,344	41
15	900	FE37F67C0156KA	C	F6	42.0	40	20	37.5	10.2	1.2	35	525	11.9	10.2	13.9	14	56	1,344	41
18	900	FE37FL7C0186KA	C	FL	42.0	37	28	37.5	10.2	1.2	35	630	13.9	8.5	12.2	15	42	1,008	52
20	900	FE37FL7C0206KA	C	FL	42.0	37	28	37.5	10.2	1.2	35	700	14.6	7.7	12.2	15	42	1,008	52
20	900	FE37F87C0206KA	C	F8	42.0	44	24	37.5	10.2	1.2	35	700	14.6	7.7	12.2	15	49	1,176	52
25	900	FE37F97C0256KB	C	F9	42.0	45	30	37.5	20.3	1.2	35	875	18.0	6.1	10.0	16	35	840	65
30	900	FE37FX7C0306KB	C	FX	42.0	45	35	37.5	20.3	1.2	35	1050	20.7	5.1	9.1	17	35	840	82
35	900	FE37FN7C0356KB	C	FN	42.0	50	35	37.5	20.3	1.2	35	1225	23.4	4.4	8.3	17	28	672	88
40	900	FE37FT7C0406KB	C	FT	42.0	55	40	37.5	20.3	1.2	35	1400	26.0	3.8	7.7	18	28	672	110
50	900	FE37FS7C0506KB	C	FS	42.0	60	45	37.5	20.3	1.2	35	1750	30.2	3.1	7.1	20	21	504	134
25	900	FE52G97C0256KA	C	G9	57.5	45	25	52.5	10.2	1.2	20	500	13.0	13.0	9.1	14	30	1,080	70
35	900	FE52GA7C0356KB	C	GA	57.5	45	30	52.5	20.3	1.2	20	700	16.4	9.3	8.0	15	25	900	88
45	900	FE52GC7C0456KB	C	GC	57.5	50	35	52.5	20.3	1.2	20	900	20.0	7.2	6.9	17	20	720	114
50	900	FE52GC7C0506KB	C	GC	57.5	50	35	52.5	20.3	1.2	20	1000	21.1	6.5	6.9	17	20	720	114
60	900	FE52GF7C0606KB	C	GF	57.5	60	35	52.5	20.3	1.2	20	1200	24.7	5.4	6.1	18	20	720	138
65	900	FE52GH7C0656KB	C	GH	57.5	65	35	52.5	20.3	1.2	20	1300	26.4	5.0	5.7	18	20	720	145
70	900	FE52GE7C0706KB	C	GE	57.5	55	45	52.5	20.3	1.2	20	1400	28.2	4.6	5.4	19	15	540	162
80	900	FE52GI7C0806KB	C	GI	57.5	65	45	52.5	20.3	1.2	20	1600	31.0	4.1	5.1	20	15	540	189
85	900	FE52GI7C0856KB	C	GI	57.5	65	45	52.5	20.3	1.2	20	1700	31.9	3.8	5.1	20	15	540	189
Voltage Vndc 1000V																			
										Voltage Code K									
12	1000	FE37F67K0126KA	K	F6	42.0	40	20	37.5	10.2	1.2	35	420	11.2	11.5	13.9	14	56	1,344	41
12	1000	FE37FK7K0126KA	K	FK	42.0	37	22	37.5	10.2	1.2	35	420	11.0	11.5	14.3	14	49	1,176	40
14	1000	FE37FK7K0146KA	K	FK	42.0	37	22	37.5	10.2	1.2	35	490	11.9	9.9	14.3	14	49	1,176	40
15	1000	FE37F87K0156KA	K	F8	42.0	44	24	37.5	10.2	1.2	35	525	13.3	9.2	12.2	15	49	1,176	52
16	1000	FE37FR7K0166KA	K	FR	42.0	43	28	37.5	10.2	1.2	35	560	14.0	8.6	11.8	16	42	1,008	60
18	1000	FE37F97K0186KB	K	F9	42.0	45	30	37.5	20.3	1.2	35	630	16.1	7.7	10.0	16	35	840	65
20	1000	FE37F97K0206KB	K	F9	42.0	45	30	37.5	20.3	1.2	35	700	17.0	6.9	10.0	16	35	840	65
22	1000	FE37FX7K0226KB	K	FX	42.0	45	35	37.5	20.3	1.2	35	770	18.7	6.3	9.1	17	35	840	82
25	1000	FE37FN7K0256KB	K	FN	42.0	50	35	37.5	20.3	1.2	35	875	20.8	5.5	8.3	17	28	672	88
30	1000	FE37FT7K0306KB	K	FT	42.0	55	40	37.5	20.3	1.2	35	1050	23.8	4.6	7.7	18	28	672	110
35	1000	FE37FT7K0356KB	K	FT	42.0	55	40	37.5	20.3	1.2	35	1225	25.7	4.0	7.7	18	28	672	110
40	1000	FE37FS7K0406KB	K	FS	42.0	60	45	37.5	20.3	1.2	35	1400	28.5	3.5	7.1	20	21	504	134
25	1000	FE52G97K0256KA	K	G9	57.5	45	25	52.5	10.2	1.2	20	500	13.7	11.7	9.1	14	30	1,080	70
30	1000	FE52GA7K0306KB	K	GA	57.5	45	30	52.5	20.3	1.2	20	600	16.0	9.8	8.0	15	25	900	88
35	1000	FE52GA7K0356KB	K	GA	57.5	45	30	52.5	20.3	1.2	20	700	17.3	8.4	8.0	15	25	900	88
40	1000	FE52GC7K0406KB	K	GC	57.5	50	35	52.5	20.3	1.2	20	800	19.9	7.3	6.9	17	20	720	114
45	1000	FE52GF7K0456KB	K	GF	57.5	60	35	52.5	20.3	1.2	20	900	22.5	6.5	6.1	18	20	720	138
50	1000	FE52GF7K0506KB	K	GF	57.5	60	35	52.5	20.3	1.2	20	1000	23.7	5.9	6.1	18	20	720	138
55	1000	FE52GH7K0556KB	K	GH	57.5	65	35	52.5	20.3	1.2	20	1100	25.6	5.3	5.7	18	20	720	145
57	1000	FE52GE7K0576KB	K	GE	57.5	55	45	52.5	20.3	1.2	20	1140	26.8	5.1	5.4	19	15	540	162
65	1000	FE52GI7K0656KB	K	GI	57.5	65	45	52.5	20.3	1.2	20	1300	29.4	4.5	5.1	20	15	540	189
70	1000	FE52GI7K0706KB	K	GI	57.5	65	45	52.5	20.3	1.2	20	1400	30.5	4.2	5.1	20	15	540	189
Voltage Vndc 1100V																			
										Voltage Code L									
8	1100	FE37F67L0805KA	L	F6	42.0	40	20	37.5	10.2	1.2	35	280	9.6	15.7	13.9	14	56	1,344	41

DC FILTERING

FE - THB Grade IIIB 105°C *RoHS Compliant



RATING & PART NUMBER REFERENCE

Cap	Rated	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak Current	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
9	1100	FE37F67L0905KA	L	F6	42.0	40	20	37.5	10.2	1.2	35	315	10.2	14.0	13.9	14	56	1,344	41
10	1100	FE37FK7L0106KA	L	FK	42.0	37	22	37.5	10.2	1.2	35	350	10.6	12.6	14.3	14	49	1,176	40
10	1100	FE37FL7L0106KA	L	FL	42.0	37	28	37.5	10.2	1.2	35	350	11.4	12.6	12.2	15	42	1,008	52
12	1100	FE37FL7L0126KA	L	FL	42.0	37	28	37.5	10.2	1.2	35	420	12.5	10.5	12.2	15	42	1,008	52
12	1100	FE37F87L0126KA	L	F8	42.0	44	24	37.5	10.2	1.2	35	420	12.5	10.5	12.2	15	49	1,176	52
13	1100	FE37F87L0136KA	L	F8	42.0	44	24	37.5	10.2	1.2	35	455	13.0	9.7	12.2	15	49	1,176	52
15	1100	FE37FR7L0156KA	L	FR	42.0	43	28	37.5	10.2	1.2	35	525	14.2	8.4	11.8	16	42	1,008	60
16	1100	FE37F97L0166KB	L	F9	42.0	45	30	37.5	20.3	1.2	35	560	16.0	7.9	10.0	16	35	840	65
18	1100	FE37FX7L0186KB	L	FX	42.0	45	35	37.5	20.3	1.2	35	630	17.7	7.0	9.1	17	35	840	82
20	1100	FE37FN7L0206KB	L	FN	42.0	50	35	37.5	20.3	1.2	35	700	19.5	6.3	8.3	17	28	672	88
27	1100	FE37FT7L0276KB	L	FT	42.0	55	40	37.5	20.3	1.2	35	945	23.6	4.7	7.7	18	28	672	110
35	1100	FE37FS7L0356KB	L	FS	42.0	60	45	37.5	20.3	1.2	35	1225	27.9	3.6	7.1	20	21	504	134
25	1100	FE52GA7L0256KB	L	GA	57.5	45	30	52.5	20.3	1.2	20	500	15.3	10.6	8.0	15	25	900	88
30	1100	FE52GC7L0306KB	L	GC	57.5	50	35	52.5	20.3	1.2	20	600	18.1	8.9	6.9	17	20	720	114
40	1100	FE52GF7L0406KB	L	GF	57.5	60	35	52.5	20.3	1.2	20	800	22.3	6.7	6.1	18	20	720	138
45	1100	FE52GH7L0456KB	L	GH	57.5	65	35	52.5	20.3	1.2	20	900	24.3	5.9	5.7	18	20	720	145
47	1100	FE52GE7L0476KB	L	GE	57.5	55	45	52.5	20.3	1.2	20	940	25.6	5.7	5.4	19	15	540	162
50	1100	FE52GI7L0506KB	L	GI	57.5	65	45	52.5	20.3	1.2	20	1000	27.1	5.3	5.1	20	15	540	189
55	1100	FE52GI7L0556KB	L	GI	57.5	65	45	52.5	20.3	1.2	20	1100	28.4	4.8	5.1	20	15	540	189
Voltage Vndc 1200V										Voltage Code P									
8	1200	FE37F67P0805KA	P	F6	42.0	40	20	37.5	10.2	1.2	35	280	10.0	14.4	13.9	14	56	1,344	41
10	1200	FE37FL7P0106KA	P	FL	42.0	37	28	37.5	10.2	1.2	35	350	11.9	11.5	12.2	15	42	1,008	52
11	1200	FE37F87P0116KA	P	F8	42.0	44	24	37.5	10.2	1.2	35	385	12.5	10.5	12.2	15	49	1,176	52
12	1200	FE37FR7P0126KA	P	FR	42.0	43	28	37.5	10.2	1.2	35	420	13.3	9.6	11.8	16	42	1,008	60
13	1200	FE37FR7P0136KA	P	FR	42.0	43	28	37.5	10.2	1.2	35	455	13.8	8.9	11.8	16	42	1,008	60
14	1200	FE37F97P0146KB	P	F9	42.0	45	30	37.5	20.3	1.2	35	490	15.6	8.2	10.0	16	35	840	65
15	1200	FE37FX7P0156KB	P	FX	42.0	45	35	37.5	20.3	1.2	35	525	16.9	7.7	9.1	17	35	840	82
16	1200	FE37FX7P0166KB	P	FX	42.0	45	35	37.5	20.3	1.2	35	560	17.5	7.2	9.1	17	35	840	82
18	1200	FE37FN7P0186KB	P	FN	42.0	50	35	37.5	20.3	1.2	35	630	19.4	6.4	8.3	17	28	672	88
22	1200	FE37FT7P0226KB	P	FT	42.0	55	40	37.5	20.3	1.2	35	770	22.3	5.2	7.7	18	28	672	110
23	1200	FE37FT7P0236KB	P	FT	42.0	55	40	37.5	20.3	1.2	35	805	22.8	5.0	7.7	18	28	672	110
30	1200	FE37FS7P0306KB	P	FS	42.0	60	45	37.5	20.3	1.2	35	1050	27.0	3.8	7.1	20	21	504	134
15	1200	FE52G97P0156KA	P	G9	57.5	45	25	52.5	10.2	1.2	20	300	11.6	16.3	9.1	14	30	1,080	70
20	1200	FE52GA7P0206KB	P	GA	57.5	45	30	52.5	20.3	1.2	20	400	14.3	12.2	8.0	15	25	900	88
25	1200	FE52GC7P0256KB	P	GC	57.5	50	35	52.5	20.3	1.2	20	500	17.2	9.8	6.9	17	20	720	114
33	1200	FE52GF7P0336KB	P	GF	57.5	60	35	52.5	20.3	1.2	20	660	21.1	7.4	6.1	18	20	720	138
38	1200	FE52GH7P0386KB	P	GH	57.5	65	35	52.5	20.3	1.2	20	760	23.4	6.4	5.7	18	20	720	145
40	1200	FE52GE7P0406KB	P	GE	57.5	55	45	52.5	20.3	1.2	20	800	24.6	6.1	5.4	19	15	540	162
45	1200	FE52GI7P0456KB	P	GI	57.5	65	45	52.5	20.3	1.2	20	900	26.8	5.4	5.1	20	15	540	189

DC FILTERING

FE - THB 2000H 125°C *RoHS Compliant



CASE CODE

Case Code	Dimensions											
	W ± 0.8(0.03)		H ± 0.8(0.03)		T ± 0.8(0.03)		P1 ± 1.0(0.04)		P2 ± 1.0(0.04)		d ± 0.05(0.002)	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
FK	42.0	(1.65)	37.0	(1.46)	22.0	(0.87)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
FL	42.0	(1.65)	37.0	(1.46)	28.0	(1.10)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
F6	42.0	(1.65)	40.0	(1.57)	20.0	(0.79)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
FR	42.0	(1.65)	43.0	(1.69)	28.0	(1.10)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
F8	42.0	(1.65)	44.0	(1.73)	24.0	(0.94)	37.5	(1.48)	10.2	(0.40)	1.2	(0.05)
F9	42.0	(1.65)	45.0	(1.77)	30.0	(1.18)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FX	42.0	(1.65)	45.0	(1.77)	35.0	(1.38)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FN	42.0	(1.65)	50.0	(1.97)	35.0	(1.38)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FT	42.0	(1.65)	55.0	(2.17)	40.0	(1.57)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
FS	42.0	(1.65)	60.0	(2.36)	45.0	(1.77)	37.5	(1.48)	20.3	(0.80)	1.2	(0.05)
G9	57.5	(2.26)	45.0	(1.77)	25.0	(0.98)	52.5	(2.07)	10.2	(0.40)	1.2	(0.05)
GA	57.5	(2.26)	45.0	(1.77)	30.0	(1.18)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GC	57.5	(2.26)	50.0	(1.97)	35.0	(1.38)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GE	57.5	(2.26)	55.0	(2.17)	45.0	(1.77)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GF	57.5	(2.26)	60.0	(2.36)	35.0	(1.38)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GH	57.5	(2.26)	65.0	(2.56)	35.0	(1.38)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)
GI	57.5	(2.26)	65.0	(2.56)	45.0	(1.77)	52.5	(2.07)	20.3	(0.80)	1.2	(0.05)

RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
uF	V				W ± 0.8 mm	H ± 0.8 mm	T ± 0.8 mm	P1 ± 1.0 mm	P2 ± 1.0 mm	d ± 0.05 mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
Voltage Code I Vndc at 85°C = 450Vdc; Vop105 at 105°C = 351Vdc; Vop115 at 115°C = 301Vdc; Vop125 at 125°C = 252Vdc																			
30	450	FE37FK8I0306KA	I	FK	42.0	37	22	37.5	10.2	1.2	35	1050	15.8	5.6	14.3	14	49	588	40
35	450	FE37FK8I0356KA	I	FK	42.0	37	22	37.5	10.2	1.2	35	1225	17.0	4.8	14.3	14	49	588	40
40	450	FE37F68I0406KA	I	F6	42.0	40	20	37.5	10.2	1.2	35	1400	18.5	4.2	13.9	14	56	672	41
40	450	FE37FK8I0406KA	I	FK	42.0	37	22	37.5	10.2	1.2	35	1400	18.2	4.2	14.3	14	49	588	40
50	450	FE37FL8I0506KA	I	FL	42.0	37	28	37.5	10.2	1.2	35	1750	22.0	3.4	12.2	15	42	504	52
55	450	FE37F88I0556KA	I	F8	42.0	44	24	37.5	10.2	1.2	35	1925	23.1	3.1	12.2	15	49	588	52
60	450	FE37FR8I0606KA	I	FR	42.0	43	28	37.5	10.2	1.2	35	2100	24.6	2.8	11.8	16	42	504	60
65	450	FE37F98I0656KB	I	F9	42.0	45	30	37.5	20.3	1.2	35	2275	27.7	2.6	10.0	16	35	420	65
70	450	FE37F98I0706KB	I	F9	42.0	45	30	37.5	20.3	1.2	35	2450	28.8	2.4	10.0	16	35	420	65
80	450	FE37FX8I0806KB	I	FX	42.0	45	35	37.5	20.3	1.2	35	2800	32.3	2.1	9.1	17	35	420	82
90	450	FE37FN8I0906KB	I	FN	42.0	50	35	37.5	20.3	1.2	35	3150	33.5	2.1	8.3	17	28	336	88
110	450	FE37FT8I0117KB	I	FT	42.0	55	40	37.5	20.3	1.2	35	3850	35.2	2.1	7.7	18	28	336	110
120	450	FE37FT8I0127KB	I	FT	42.0	55	40	37.5	20.3	1.2	35	4200	36.8	1.9	7.7	18	28	336	110
140	450	FE37FS8I0147KB	I	FS	42.0	60	45	37.5	20.3	1.2	35	4900	41.2	1.6	7.1	20	21	252	134
80	450	FE52G98I0806KA	I	G9	57.5	45	25	52.5	10.2	1.2	20	1600	21.2	4.9	9.1	14	30	360	70
100	450	FE52GA8I0107KB	I	GA	57.5	45	30	52.5	20.3	1.2	20	2000	25.3	3.9	8.0	15	25	300	88
130	450	FE52GC8I0137KB	I	GC	57.5	50	35	52.5	20.3	1.2	20	2600	31.1	3.0	6.9	17	20	240	114
160	450	FE52GF8I0167KB	I	GF	57.5	60	35	52.5	20.3	1.2	20	3200	36.8	2.4	6.1	18	20	240	138
170	450	FE52GE8I0177KB	I	GE	57.5	55	45	52.5	20.3	1.2	20	3400	36.5	2.5	6.1	19	15	180	162
180	450	FE52GH8I0187KB	I	GH	57.5	65	35	52.5	20.3	1.2	20	3600	38.6	2.4	5.7	18	20	240	145
180	450	FE52GE8I0187KB	I	GE	57.5	55	45	52.5	20.3	1.2	20	3600	39.6	2.4	5.4	19	15	180	162
210	450	FE52GI8I0217KB	I	GI	57.5	65	45	52.5	20.3	1.2	20	4200	44.0	2.0	5.1	20	15	180	189
220	450	FE52GI8I0227KB	I	GI	57.5	65	45	52.5	20.3	1.2	20	4400	45.0	1.9	5.1	20	15	180	189
Voltage Code Q Vndc at 85°C = 600Vdc; Vop105 at 105°C = 468Vdc; Vop115 at 115°C = 402Vdc; Vop125 at 125°C = 336Vdc																			
22	600	FE37F68Q0226KA	Q	F6	42.0	40	20	37.5	10.2	1.2	35	770	15.6	5.9	13.9	14	56	672	41
25	600	FE37F68Q0256KA	Q	F6	42.0	40	20	37.5	10.2	1.2	35	875	16.6	5.2	13.9	14	56	672	41
30	600	FE37FL8Q0306KA	Q	FL	42.0	37	28	37.5	10.2	1.2	35	1050	19.4	4.3	12.2	15	42	504	52
33	600	FE37F88Q0336KA	Q	F8	42.0	44	24	37.5	10.2	1.2	35	1155	20.4	4.0	12.2	15	49	588	52
35	600	FE37FR8Q0356KA	Q	FR	42.0	43	28	37.5	10.2	1.2	35	1225	21.4	3.7	11.8	16	42	504	60
40	600	FE37F98Q0406KB	Q	F9	42.0	45	30	37.5	20.3	1.2	35	1400	24.8	3.3	10.0	16	35	420	65
45	600	FE37F98Q0456KB	Q	F9	42.0	45	30	37.5	20.3	1.2	35	1575	26.3	2.9	10.0	16	35	420	65

DC FILTERING

FE - THB 2000H 125°C *RoHS Compliant



RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
45	600	FE37FX8Q0456KB	Q	FX	42.0	45	35	37.5	20.3	1.2	35	1575	27.6	2.9	9.1	17	35	420	82
50	600	FE37FX8Q0506KB	Q	FX	42.0	45	35	37.5	20.3	1.2	35	1750	29.0	2.6	9.1	17	35	420	82
50	600	FE37FN8Q0506KB	Q	FN	42.0	50	35	37.5	20.3	1.2	35	1750	28.5	3.0	8.3	17	28	336	88
60	600	FE37FT8Q0606KB	Q	FT	42.0	55	40	37.5	20.3	1.2	35	2100	29.6	3.0	7.7	18	28	336	110
70	600	FE37FT8Q0706KB	Q	FT	42.0	55	40	37.5	20.3	1.2	35	2450	32.0	2.5	7.7	18	28	336	110
75	600	FE37FS8Q0756KB	Q	FS	42.0	60	45	37.5	20.3	1.2	35	2625	34.4	2.4	7.1	20	21	252	134
80	600	FE37FS8Q0806KB	Q	FS	42.0	60	45	37.5	20.3	1.2	35	2800	35.5	2.2	7.1	20	21	252	134
85	600	FE37FS8Q0856KB	Q	FS	42.0	60	45	37.5	20.3	1.2	35	2975	36.6	2.1	7.1	20	21	252	134
45	600	FE52G98Q0456KA	Q	G9	57.5	45	25	52.5	10.2	1.2	20	900	18.1	6.7	9.1	14	30	360	70
50	600	FE52G98Q0506KA	Q	G9	57.5	45	25	52.5	10.2	1.2	20	1000	19.1	6.0	9.1	14	30	360	70
55	600	FE52GA8Q0556KB	Q	GA	57.5	45	30	52.5	20.3	1.2	20	1100	21.4	5.5	8.0	15	25	300	88
60	600	FE52GA8Q0606KB	Q	GA	57.5	45	30	52.5	20.3	1.2	20	1200	22.3	5.0	8.0	15	25	300	88
65	600	FE52GC8Q0656KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1300	25.0	4.6	6.9	17	20	240	114
70	600	FE52GC8Q0706KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1400	26.0	4.3	6.9	17	20	240	114
75	600	FE52GC8Q0756KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1500	26.9	4.0	6.9	17	20	240	114
80	600	FE52GC8Q0806KB	Q	GC	57.5	50	35	52.5	20.3	1.2	20	1600	27.8	3.8	6.9	17	20	240	114
90	600	FE52GF8Q0906KB	Q	GF	57.5	60	35	52.5	20.3	1.2	20	1800	31.4	3.3	6.1	18	20	240	138
100	600	FE52GF8Q0107KB	Q	GF	57.5	60	35	52.5	20.3	1.2	20	2000	33.1	3.0	6.1	18	20	240	138
110	600	FE52GH8Q0117KB	Q	GH	57.5	65	35	52.5	20.3	1.2	20	2200	34.3	3.0	5.7	18	20	240	145
110	600	FE52GE8Q0117KB	Q	GE	57.5	55	45	52.5	20.3	1.2	20	2200	35.3	3.0	5.4	19	15	180	162
130	600	FE52GI8Q0137KB	Q	GI	57.5	65	45	52.5	20.3	1.2	20	2600	39.4	2.5	5.1	20	15	180	189
Voltage Code A Vndc at 85°C = 700Vdc; Vop105 at 105°C = 546Vdc; Vop115 at 115°C = 469Vdc; Vop125 at 125°C = 392Vdc																			
15	700	FE37F68A0156KA	A	F6	42.0	40	20	37.5	10.2	1.2	35	525	13.8	7.6	13.9	14	56	672	41
20	700	FE37FL8A0206KA	A	FL	42.0	37	28	37.5	10.2	1.2	35	700	17.0	5.7	12.2	15	42	504	52
22	700	FE37FL8A0226KA	A	FL	42.0	37	28	37.5	10.2	1.2	35	770	17.8	5.2	12.2	15	42	504	52
25	700	FE37F88A0256KA	A	F8	42.0	44	24	37.5	10.2	1.2	35	875	19.0	4.6	12.2	15	49	588	52
25	700	FE37FR8A0256KA	A	FR	42.0	43	28	37.5	10.2	1.2	35	875	19.3	4.6	11.8	16	42	504	60
30	700	FE37F98A0306KB	A	F9	42.0	45	30	37.5	20.3	1.2	35	1050	22.9	3.8	10.0	16	35	420	65
35	700	FE37FX8A0356KB	A	FX	42.0	45	35	37.5	20.3	1.2	35	1225	26.0	3.3	9.1	17	35	420	82
40	700	FE37FN8A0406KB	A	FN	42.0	50	35	37.5	20.3	1.2	35	1400	27.2	3.2	8.3	17	28	336	88
45	700	FE37FT8A0456KB	A	FT	42.0	55	40	37.5	20.3	1.2	35	1575	27.4	3.5	7.7	18	28	336	110
50	700	FE37FT8A0506KB	A	FT	42.0	55	40	37.5	20.3	1.2	35	1750	28.9	3.1	7.7	18	28	336	110
55	700	FE37FT8A0556KB	A	FT	42.0	55	40	37.5	20.3	1.2	35	1925	30.3	2.8	7.7	18	28	336	110
60	700	FE37FS8A0606KB	A	FS	42.0	60	45	37.5	20.3	1.2	35	2100	32.9	2.6	7.1	20	21	252	134
65	700	FE37FS8A0656KB	A	FS	42.0	60	45	37.5	20.3	1.2	35	2275	34.2	2.4	7.1	20	21	252	134
30	700	FE52G98A0306KA	A	G9	57.5	45	25	52.5	10.2	1.2	20	600	15.8	8.8	9.1	14	30	360	70
35	700	FE52G98A0356KA	A	G9	57.5	45	25	52.5	10.2	1.2	20	700	17.1	7.5	9.1	14	30	360	70
40	700	FE52GA8A0406KB	A	GA	57.5	45	30	52.5	20.3	1.2	20	800	19.5	6.6	8.0	15	25	300	88
45	700	FE52GA8A0456KB	A	GA	57.5	45	30	52.5	20.3	1.2	20	900	20.7	5.9	8.0	15	25	300	88
50	700	FE52GC8A0506KB	A	GC	57.5	50	35	52.5	20.3	1.2	20	1000	23.5	5.3	6.9	17	20	240	114
55	700	FE52GC8A0556KB	A	GC	57.5	50	35	52.5	20.3	1.2	20	1100	24.6	4.8	6.9	17	20	240	114
60	700	FE52GC8A0606KB	A	GC	57.5	50	35	52.5	20.3	1.2	20	1200	25.7	4.4	6.9	17	20	240	114
70	700	FE52GF8A0706KB	A	GF	57.5	60	35	52.5	20.3	1.2	20	1400	28.4	4.1	6.1	18	20	240	138
75	700	FE52GF8A0756KB	A	GF	57.5	60	35	52.5	20.3	1.2	20	1500	29.4	3.8	6.1	18	20	240	138
85	700	FE52GH8A0856KB	A	GH	57.5	65	35	52.5	20.3	1.2	20	1700	32.3	3.4	5.7	18	20	240	145
85	700	FE52GE8A0856KB	A	GE	57.5	55	45	52.5	20.3	1.2	20	1760	33.2	3.4	5.4	19	15	180	162
100	700	FE52GI8A0107KB	A	GI	57.5	65	45	52.5	20.3	1.2	20	2000	36.9	2.9	5.1	20	15	180	189
110	700	FE52GI8A0117KB	A	GI	57.5	65	45	52.5	20.3	1.2	20	2200	38.7	2.6	5.1	20	15	180	189
Voltage Code C Vndc at 85°C = 900Vdc; Vop105 at 105°C = 702Vdc; Vop115 at 115°C = 603Vdc; Vop125 at 125°C = 504Vdc																			
12	900	FE37F68C0126KA	C	F6	42.0	40	20	37.5	10.2	1.2	35	420	13.8	7.6	13.9	14	56	672	41
12	900	FE37FK8C0126KA	C	FK	42.0	37	22	37.5	10.2	1.2	35	420	13.6	7.6	14.3	14	49	588	40
14	900	FE37FK8C0146KA	C	FK	42.0	37	22	37.5	10.2	1.2	35	490	14.7	6.5	14.3	14	49	588	40
15	900	FE37F88C0156KA	C	F8	42.0	44	24	37.5	10.2	1.2	35	525	16.4	6.1	12.2	15	49	588	52
16	900	FE37FR8C0166KA	C	FR	42.0	43	28	37.5	10.2	1.2	35	560	17.3	5.7	11.8	16	42	504	60
18	900	FE37F98C0186KB	C	F9	42.0	45	30	37.5	20.3	1.2	35	630	19.9	5.1	10.0	16	35	420	65
20	900	FE37F98C0206KB	C	F9	42.0	45	30	37.5	20.3	1.2	35	700	20.9	4.6	10.0	16	35	420	65
22	900	FE37FX8C0226KB	C	FX	42.0	45	35	37.5	20.3	1.2	35	770	23.0	4.1	9.1	17	35	420	82



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.kyocera-avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

TDS-MDPWR-0007 | Rev 1

DC FILTERING

FE - THB 2000H 125°C *RoHS Compliant

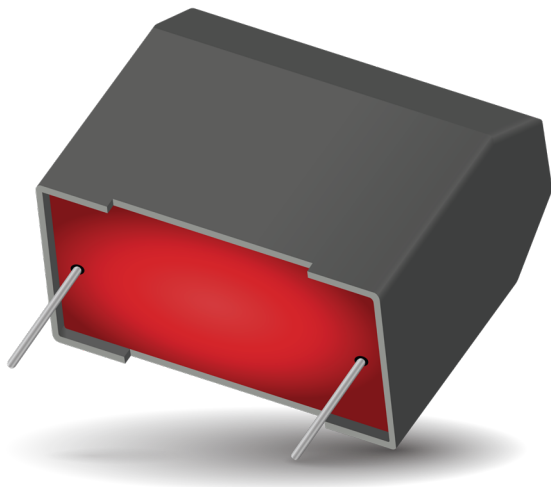


RATING & PART NUMBER REFERENCE

Cap	Rated Voltage	KAVX PN	Voltage Code	Case Code	Dimensions						dv/dt	Peak	Irms	ESR 10KHz	Rth	ESL	SPQ	MOQ	Estimated Weight
					W ± 0.8	H ± 0.8	T ± 0.8	P1 ± 1.0	P2 ± 1.0	d ± 0.05									
uF	V				mm	mm	mm	mm	mm	mm	V/us	A	A	mΩ	°C/W	nH	pcs	pcs	g/pcs
25	900	FE37FN8C0256KB	C	FN	42.0	50	35	37.5	20.3	1.2	35	875	24.1	4.1	8.3	17	28	336	88
30	900	FE37FT8C0306KB	C	FT	42.0	55	40	37.5	20.3	1.2	35	1050	25.0	4.1	7.7	18	28	336	110
35	900	FE37FT8C0356KB	C	FT	42.0	55	40	37.5	20.3	1.2	35	1225	27.0	3.6	7.7	18	28	336	110
40	900	FE37FS8C0406KB	C	FS	42.0	60	45	37.5	20.3	1.2	35	1400	30.0	3.1	7.1	20	21	252	134
25	900	FE52G98C0256KA	C	G9	57.5	45	25	52.5	10.2	1.2	20	500	16.2	8.4	9.1	14	30	360	70
30	900	FE52GA8C0306KB	C	GA	57.5	45	30	52.5	20.3	1.2	20	600	18.9	7.0	8.0	15	25	300	88
35	900	FE52GA8C0356KB	C	GA	57.5	45	30	52.5	20.3	1.2	20	700	20.4	6.0	8.0	15	25	300	88
40	900	FE52GC8C0406KB	C	GC	57.5	50	35	52.5	20.3	1.2	20	800	23.5	5.3	6.9	17	20	240	114
45	900	FE52GF8C0456KB	C	GF	57.5	60	35	52.5	20.3	1.2	20	900	26.5	4.7	6.1	18	20	240	138
50	900	FE52GH8C0506KB	C	GH	57.5	60	35	52.5	20.3	1.2	20	1000	28.0	4.2	6.1	18	20	240	138
55	900	FE52GH8C0556KB	C	GH	57.5	65	35	52.5	20.3	1.2	20	1100	29.0	4.2	5.7	18	20	240	145
57	900	FE52GE8C0576KB	C	GE	57.5	55	45	52.5	20.3	1.2	20	1140	30.4	4.0	5.4	19	15	180	162
65	900	FE52GI8C0656KB	C	GI	57.5	65	45	52.5	20.3	1.2	20	1300	33.3	3.5	5.1	20	15	180	189
70	900	FE52GI8C0706KB	C	GI	57.5	65	45	52.5	20.3	1.2	20	1400	33.7	3.4	5.1	20	15	180	189
Voltage Code L Vndc at 85°C = 1100Vdc; Vop105 at 105°C = 858Vdc; Vop115 at 115°C = 737Vdc; Vop125 at 125°C = 616Vdc																			
8	1100	FE37F68L0805KA	L	F6	42.0	40	20	37.5	10.2	1.2	35	280	12.3	9.5	13.9	14	56	672	41
10	1100	FE37FL8L0106KA	L	FL	42.0	37	28	37.5	10.2	1.2	35	350	14.7	7.6	12.2	15	42	504	52
11	1100	FE37F88L0116KA	L	F8	42.0	44	24	37.5	10.2	1.2	35	385	15.4	6.9	12.2	15	49	588	52
12	1100	FE37FR8L0126KA	L	FR	42.0	43	28	37.5	10.2	1.2	35	420	16.4	6.3	11.8	16	42	504	60
13	1100	FE37FR8L0136KA	L	FR	42.0	43	28	37.5	10.2	1.2	35	455	17.0	5.8	11.8	16	42	504	60
14	1100	FE37F98L0146KB	L	F9	42.0	45	30	37.5	20.3	1.2	35	490	19.2	5.4	10.0	16	35	420	65
15	1100	FE37FX8L0156KB	L	FX	42.0	45	35	37.5	20.3	1.2	35	525	20.8	5.1	9.1	17	35	420	82
16	1100	FE37FX8L0166KB	L	FX	42.0	45	35	37.5	20.3	1.2	35	560	21.5	4.8	9.1	17	35	420	82
18	1100	FE37FN8L0186KB	L	FN	42.0	50	35	37.5	20.3	1.2	35	630	22.4	4.8	8.3	17	28	336	88
22	1100	FE37FT8L0226KB	L	FT	42.0	55	40	37.5	20.3	1.2	35	770	25.7	3.9	7.7	18	28	336	110
23	1100	FE37FT8L0236KB	L	FT	42.0	55	40	37.5	20.3	1.2	35	805	26.3	3.8	7.7	18	28	336	110
30	1100	FE37FS8L0306KB	L	FS	42.0	60	45	37.5	20.3	1.2	35	1050	31.2	2.9	7.1	20	21	252	134
15	1100	FE52G98L0156KA	L	G9	57.5	45	25	52.5	10.2	1.2	20	300	13.7	11.7	9.1	14	30	360	70
20	1100	FE52GA8L0206KB	L	GA	57.5	45	30	52.5	20.3	1.2	20	400	16.9	8.8	8.0	15	25	300	88
25	1100	FE52GC8L0256KB	L	GC	57.5	50	35	52.5	20.3	1.2	20	500	20.3	7.0	6.9	17	20	240	114
33	1100	FE52GF8L0336KB	L	GF	57.5	60	35	52.5	20.3	1.2	20	660	24.9	5.3	6.1	18	20	240	138
38	1100	FE52GH8L0386KB	L	GH	57.5	65	35	52.5	20.3	1.2	20	760	26.4	5.0	5.7	18	20	240	145
40	1100	FE52GE8L0406KB	L	GE	57.5	55	45	52.5	20.3	1.2	20	800	27.9	4.8	5.4	19	15	180	162
45	1100	FE52GI8L0456KB	L	GI	57.5	65	45	52.5	20.3	1.2	20	900	30.3	4.2	5.1	20	15	180	189

DC FILTERING

FFB* RoHS Compliant



PACKAGING MATERIAL

Self-extinguishing plastic case (V0 = in accordance with UL 94) filled thermosetting resin.

Self-extinguishing thermosetting resin (V0 = in accordance with UL 94; I3F2 = in accordance with NF F 16-101).

STANDARDS

- IEC 61071-1, IEC 61071-2: Power electronic capacitors
- IEC 60384-16: Fixed metallized polypropylene film dielectric DC capacitors
- IEC 60384-16-1: Fixed metallized polypropylene film dielectric DC capacitors Assessment level E
- IEC 60384-17: Fixed metallized polypropylene film dielectric AC and pulse capacitors
- IEC 60384-17-1: Fixed metallized polypropylene film dielectric AC and pulse capacitors Assessment level E
- IEC 60384-2: Fixed metallized polyester capacitors

The FFB series uses a metallized polypropylene or polyester dielectric with the controlled self-healing process, specially treated to have a very high dielectric strength in operating conditions up to 105°C.

This is a dry solution for polypropylene and dry or wet for polyester.

The FFB has been designed for printed circuit board mounting. Furthermore, their performances allow to be a very interesting alternative to electrolytic technology because they can withstand much higher levels of surge voltage.

APPLICATIONS

The FFB capacitor is particularly designed for DC filtering, low reactive power.

HOT SPOT CALCULATION

See *Hot Spot Temperature*, page 3.

$$\theta_{\text{hot spot}} = \theta_{\text{ambient}} + (P_d + P_t) \times R_{th}$$

with P_d (Dielectric losses) = $Q \times \text{tg}\delta_0$

$$Q \times \text{tg}\delta_0 \Rightarrow \left[\frac{1}{2} \times C_n \times (V_{\text{peak to peak}})^2 \times f \right] \times \text{tg}\delta_0$$

$\text{tg}\delta_0$ (tan delta)

For polypropylene, $\text{tg}\delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures.

For polyester, $\text{tg}\delta_0$ values are shown in graph 4 on page 3.

$$P_t \text{ (Thermal losses)} = R_s \times (I_{rms})^2$$

where C_n in Farad I_{rms} in Ampere f in Hertz
 V in Volt R_s in Ohm θ in °C
 R_{th} in °C/W

OPERATING TEMPERATURE RANGE

(according to the power to be dissipated) -55°C to +105°C

LIFETIME EXPECTANCY

One unique feature of this technology (as opposed to electrolytics) is how the capacitor reacts at the end of its lifetime. Unlike aluminum, electrolytics film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 2%, with no risk of short circuit.

Please note that this is theoretical, however, as the capacitor continues to be functional even after this 2% decrease.

DC FILTERING

FFB *RoHS Compliant RoHS Compliant



HOW TO ORDER

FFB

Series

1

Case Size

1
2
3
4
5

4

Dielectric

4 = Polyester
6 = Polypropylene

D

Voltage Code

D = 75Vdc
E = 100Vdc
H = 300Vdc
I = 400Vdc
J = 525Vdc
A = 720Vdc
C = 900Vdc
L = 1100Vdc

0336

Capacitance Code

0 + pF code
0336 = 33µF
0686 = 68µF
0117 = 110µF
etc.

K

Capacitance Tolerances

K = ±10%

--

Lead Styles

-- = 2 Leaded
JC = 4 Leaded

Consult Factory for Special Options

GENERAL DESCRIPTION

CASE STYLE: P0; 18; 19; 26; R68

2 LEADED STYLE

General Tolerance: ± 0.5mm

CASE STYLE: R68

4 LEADED STYLE

General Tolerance: ± 0.5mm

DIMENSIONS: millimeters

Case Size	Case Style	Length (mm)	Width (mm)	Height (mm)	Dimensions lead (mm)	LS (mm)
1	P0	31.1	13.0	22.4	Ø 0.80	27.5
2	18	31.1	14.9	25.7	Ø 0.80	27.5
3	19	31.1	17.3	29.8	Ø 0.80	27.5
4	26	31.1	20.8	31.3	Ø 1.00	27.5
5	R68 2 Leaded Style	32.0	22.0	37.0	Ø 1.00	27.5
	R68 4 Leaded Style	32.0	22.0	37.0	1.20 x 0.60	27.5

DC FILTERING

FFB *RoHS Compliant – Polyester Dielectric RoHS Compliant

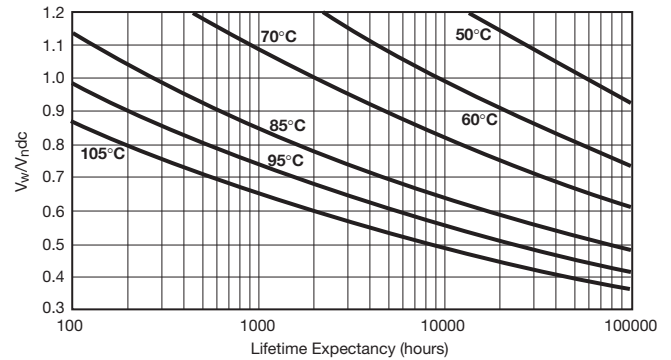


POLYESTER DIELECTRIC FOR LOW VOLTAGE DC FILTERING

ELECTRICAL CHARACTERISTICS – POLYESTER DIELECTRIC

Items	Characteristics
Climatic category	55/105/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x V _n dc
Capacitance range C _n	6.2μF to 110μF
Tolerance on C _n	±10%
Rated DC voltage V _n dc	75 to 400 V
Dielectric	polyester
Max Stray Inductance	20nH

LIFETIME EXPECTANCY vs VOLTAGE AND HOT SPOT TEMPERATURE – POLYESTER DIELECTRIC



V_w = Permanent working or operating DC voltage.

RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number	Capacitance (μF)	Case Style	I _{rms} max. (A)	R _s (mΩ)	R _{th} (°C/W)	Typical Weight (g)
V_ndc 75V Vrms max.: 45 volts Voltage Code: D						
FFB14D0336K~	33	PO	3	3	40.7	15
FFB24D0476K~	47	18	4.3	2	33.3	20
FFB34D0686K~	68	19	6.2	1.7	29.9	25
FFB44D0826K~	82	26	7.4	1.6	26.7	32
FFB54D0117K~	110	R68 (2 terminals)	10	1.4	22.9	40
FFB54D0117KJC	110	R68 (4 terminals)	10	1.4	22.9	40
V_ndc 100V Vrms max.: 60 volts Voltage Code: E						
FFB14E0206K~	20	PO	2.6	3	40.5	15
FFB24E0276K~	27	18	3.5	2.5	33.3	20
FFB34E0396K~	39	19	5	2	29.8	25
FFB44E0476K~	47	26	6	1.7	26.6	32
FFB54E0686K~	68	R68 (2 terminals)	9	1.4	22.8	40
FFB54E0686KJC	68	R68 (4 terminals)	9	1.4	22.8	40
V_ndc 300V Vrms max.: 90 volts Voltage Code: H						
FFB14H0755K~	7.5	PO	2.4	16	40.7	15
FFB24H0116K~	11	18	3.6	11	33.5	20
FFB34H0166K~	16	19	5.2	8	29.9	25
FFB44H0186K~	18	26	6	7	27.1	32
FFB54H0276K~	27	R68 (2 terminals)	9	5	22.9	40
FFB54H0276KJC	27	R68 (4 terminals)	9	5	22.9	40
V_ndc 400V Vrms max.: 105 volts Voltage Code: I						
FFB14I0625K~*	6.2	PO	2.5	17	40.5	15
FFB24I0755K~*	7.5	18	3.1	14	33.5	20
FFB34I0126K~*	12	19	5	9	29.9	25
FFB44I0156K~*	15	26	6.2	7	26.4	32
FFB54I0206K~*	20	R68 (2 terminals)	8.2	5.5	22.8	40
FFB54I0206KJC*	20	R68 (4 terminals)	8.2	5.5	22.8	40

(*) Polyester dielectric film wet silicone

DC FILTERING

FFB *RoHS Compliant – Polypropylene Dielectric RoHS Compliant



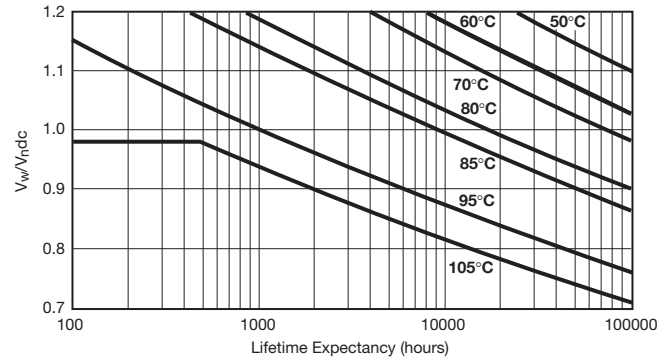
POLYPROPYLENE DIELECTRIC FOR INDUSTRIAL DC FILTERING

These capacitors have been designed principally for high and medium power DC filtering applications.

ELECTRICAL CHARACTERISTICS – POLYPROPYLENE DIELECTRIC

Climatic category	55/105/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x V _n dc
Capacitance range C _n	1.5μF to 13μF
Tolerance on C _n	±10%
Rated DC voltage V _n dc	525 to 1100 V
Dielectric	polypropylene

LIFETIME EXPECTANCY VS VOLTAGE AND HOT SPOT TEMPERATURE – POLYPROPYLENE DIELECTRIC



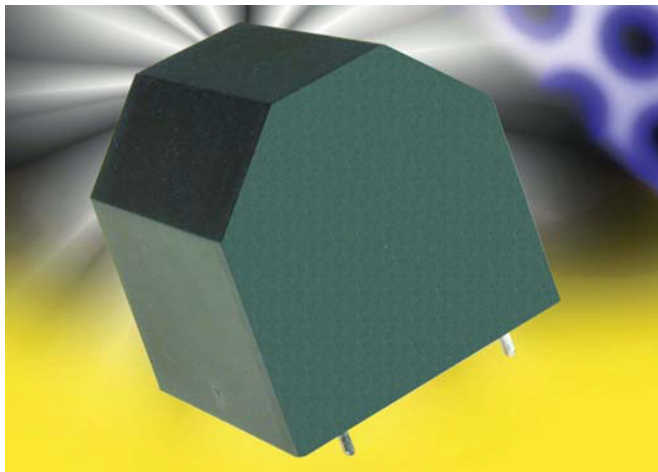
V_w = Working DC Voltage • V_n = Rated DC Voltage

RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Part Number	Capacitance (μF)	Case Style	I _{rms} max. (A)	R _s (mΩ)	R _{th} (°C/W)	Typical Weight (g)
V _n dc 525V Vrms max.: 105 volts Voltage Code: J						
FFB16J0395K-	3.9	PO	5.1	30	45.7	15
FFB26J0565K-	5.6	18	7.4	21	36.4	20
FFB36J0825K-	8.2	19	10.9	15	32.6	25
FFB46J0106K-	10	26	12	12	29.8	32
FFB56J0136K-	13	R68 (2 terminals)	12	9	24.3	40
FFB56J0136KJC	13	R68 (4 terminals)	16.7	9	24.3	40
V _n dc 720V Vrms max.: 120 volts Voltage Code: A						
FFB16A0335K-	3.3	PO	5.0	31	45.0	15
FFB26A0435K-	4.3	18	6.5	24	36.2	20
FFB36A0625K-	6.2	19	9.4	17	32.7	25
FFB46A0755K-	7.5	26	11.4	14	29.9	32
FFB56A0106K-	10	R68 (2 terminals)	12	11	24.2	40
FFB56A0106KJC	10	R68 (4 terminals)	15.2	11	24.2	40
V _n dc 900V Vrms max.: 150 volts Voltage Code: C						
FFB16C0205K-	2	PO	3.6	41	45.7	15
FFB26C0275K-	2.7	18	4.9	30	36.6	20
FFB36C0395K-	3.9	19	7.2	21	32.9	25
FFB46C0515K-	5.1	26	9.3	16	29.7	32
FFB56C0685K-	6.8	R68 (2 terminals)	12	12	24.1	40
FFB56C0685KJC	6.8	R68 (4 terminals)	12.5	12	24.1	40
V _n dc 1100V Vrms max.: 180 volts Voltage Code: L						
FFB16L0155K-	1.5	PO	3.3	45	45.2	15
FFB26L0185K-	1.8	18	3.9	40	36.5	20
FFB36L0245K-	2.4	19	5.3	28	33.4	25
FFB46L0305K-	3	26	6.6	23	30.2	32
FFB56L0475K-	4.7	R68 (2 terminals)	10.3	15	24.1	40
FFB56L0475KJC	4.7	R68 (4 terminals)	10.3	15	24.1	40

DC FILTERING

FFV3* RoHS Compliant



APPLICATIONS

The FFV3 capacitors are particularly designed for DC filtering, low reactive power.

STANDARDS

- IEC 61071-1, IEC 61071-2: Power electronic capacitors
- IEC 60384-16: Fixed metallized polypropylene film dielectric DC capacitors
- IEC 60384-16-1: Fixed metallized polypropylene film dielectric DC capacitors Assessment level E
- IEC 60384-17: Fixed metallized polypropylene film dielectric AC and pulse capacitors
- IEC 60384-17-1: Fixed metallized polypropylene film dielectric AC and pulse capacitors Assessment level E
- IEC 60384-2: Fixed metallized polyester capacitors

LIFETIME EXPECTANCY

One unique feature of this technology (as opposed to electrolytics) is how the capacitor reacts at the end of its lifetime. Unlike aluminum, electrolytics film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 2%, with no risk of short circuit.

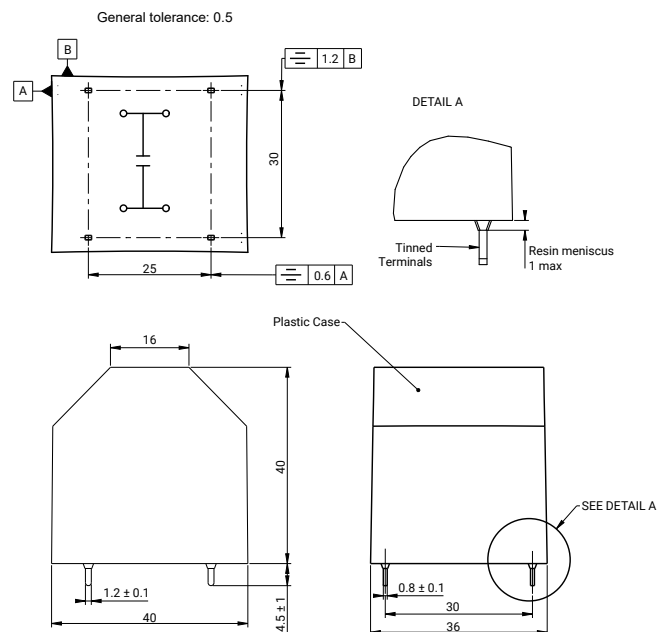
Please note that this is theoretical, however, as the capacitor continues to be functional even after this 2% decrease.

PACKAGING MATERIAL

Self-extinguishing plastic case (V-0 = in accordance with UL 94; certified classifications according to EN 45545-2) filled with thermosetting resin.

Self-extinguishing thermosetting resin (V-0 = in accordance with UL 94; certified classifications according to EN 45545-2).

The series uses a metallized polypropylene or polyester dielectric, with the controlled self-healing process, specially treated to have a very high dielectric strength in operating conditions up to 105°C. This is a dry solution for polypropylene and dry or wet for polyester. The FFV3 has been designed for printed circuit board mounting.



HOT SPOT TEMPERATURE CALCULATION

$$\Theta_{\text{hot spot}} = \Theta_{\text{ambient}} + (P_d + P_j) \times (R_{\text{th}} + 7.4) \text{ or}$$

$$\Theta_{\text{hot spot}} = \Theta_{\text{case}} + (P_d + P_j) \times R_{\text{th}}$$

$$\text{Dielectric losses} = P_d = Q \times \text{tg} \delta_0$$

$$P_d = [1/2 \times C_n \times (V_{\text{peak to peak}})^2 \times f] \times \text{tg} \delta_0$$

for polypropylene $\text{tg} \delta_0 = 2.10^{-4}$

for polyester $\text{tg} \delta_0$ value is shown in graph 4 page 3

$$\text{Joules losses } P_j = R_s \times I_{\text{rms}}^2$$

C_n in Farad I_{rms} in Ampere f in Hertz

V in Volt R_s in Ohm θ in °C

R_{th} in °C/W R_{th} : R_{th} case/hot spot in °C/W

DC FILTERING

FFV3* for Low Voltage Applications **RoHS Compliant**



HOW TO ORDER

FFV3

Series

4

Dielectric

4 = Polyester
6 = Polypropylene

D

Voltage Code

D = 75Vdc J = 525Vdc
E = 100Vdc A = 720Vdc
F = 160Vdc C = 900Vdc
H = 300Vdc L = 1100Vdc
I = 400Vdc

K

Capacitance Tolerances
K = $\pm 10\%$

--

Lead Styles
-- = Standard

Consult Factory
for Special
Options



ELECTRICAL CHARACTERISTICS – POLYESTER DIELECTRIC

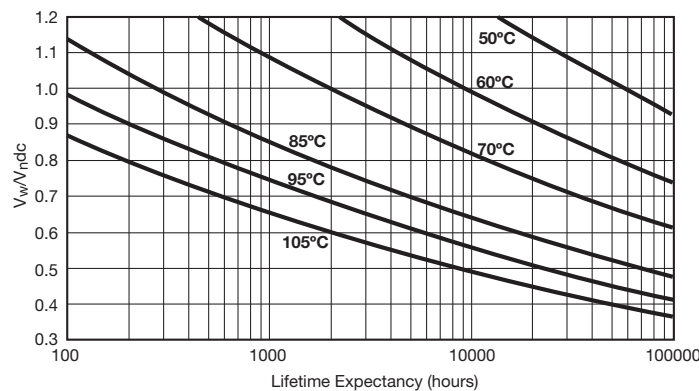
Items	Characteristics
Climatic category	40/105/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x V_n dc during 10s
Test voltage between terminals and case @ 25°C "	@ 4 kVrms @ 50 Hz during 1 min.
Capacitance range C_n	30 μ F to 160 μ F
Tolerance on C_n	$\pm 10\%$
Rated DC voltage V_n dc	75 to 400 V
Dielectric	Polyester
Max Stray Inductance	15nH

RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number	Capacitance (μ F)	I_{rms} max. (A)	I^2t_{10} shots (A ² s)	I^2t_{1000} shots (A ² s)	R_s (m Ω)	R_{th} (°C/W)	Typical Weight (g)
V_ndc = 75 V V_{rms} = 45 v max Voltage Code: D							
FFV34D0137K--	130	23	370	37	0.56	5.6	90
FFV34D0167K--	160	28	560	56	0.47	5	90
V_ndc = 100 V V_{rms} = 60 v max Voltage Code: E							
FFV34E0806K--	80	19	250	25	0.67	6.2	90
FFV34E0107K--	100	24	390	39	0.55	5.4	90
V_ndc = 160 V V_{rms} = 75 v max Voltage Code: F							
FFV34F0556K--	55	17	180	18	0.77	6.6	90
FFV34F0656K--	65	20	260	26	0.66	6	90
V_ndc = 300 V V_{rms} = 90 v max Voltage Code: H							
FFV34H0406K--	40	20	150	15	2.80	9.6	90
FFV34H0506K--	50	26	230	23	2.25	8.5	90
V_ndc = 400 V V_{rms} = 105 v max Voltage Code: I							
FFV34I0306K--*	30	17	110	11	2.93	9.9	90
FFV34I0406K--*	40	23	200	20	2.21	8.4	90

(*) Polyester dielectric film wet silicone

LIFETIME EXPECTANCY VS V_w/V_n AND HOT SPOT TEMPERATURE POLYESTER DIELECTRIC



V_w = Permanent working or operating DC voltage.

DC FILTERING

FFV3* DC for Medium and High Voltage Applications **RoHS Compliant**

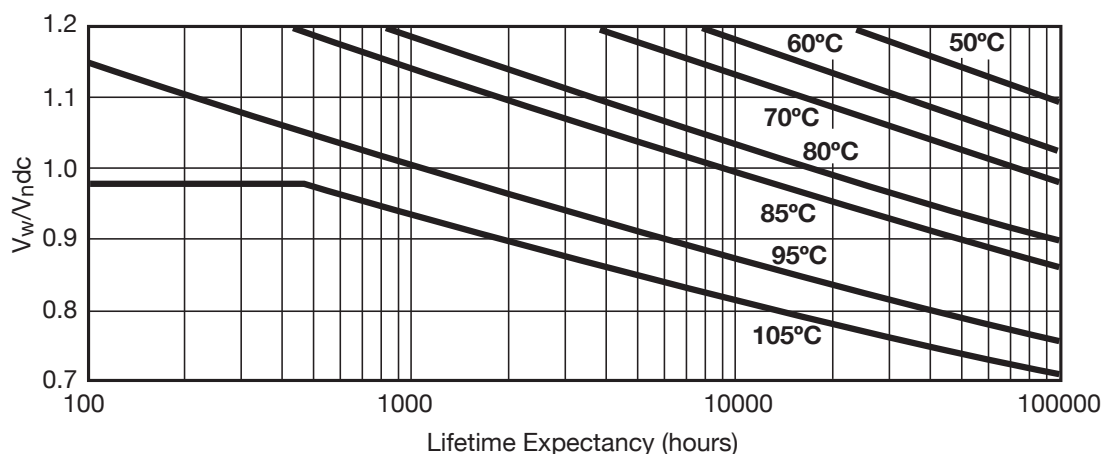
DC FILTERING ELECTRICAL CHARACTERISTICS – POLYPROPYLENE DIELECTRIC

Items	Characteristics
Climatic category	40/105/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x $V_{n,dc}$ during 10s
Test voltage between terminals and case @ 25°C "	@ 4 kVrms @ 50 Hz during 1 min.
Capacitance range C_n	6 μ F to 25 μ F
Tolerance on C_n	$\pm 10\%$
Rated DC voltage $V_{n,dc}$	500 to 1100 V
Dielectric	Polypropylene
Max Stray Inductance	15nH

RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Part Number	Capacitance (μ F)	$I_{rms\ max.}$ (A)	$I^2t_{10\ shots}$ (A ² s)	$I^2t_{1000\ shots}$ (A ² s)	R_s (m Ω)	R_{th} (°C/W)	Typical Weight (g)
$V_{n,dc} = 500\ V$ $V_{rms} = 105\ v\ max$ Voltage Code: J							
FFV36J0206K-	20	27	3200	320	5.88	3.5	90
FFV36J0256K-	25	33	5000	500	4.72	3.1	90
$V_{n,dc} = 700\ V$ $V_{rms} = 120\ v\ max$ Voltage Code: A							
FFV36A0146K-	14	21	2000	200	7.34	3.7	90
FFV36A0206K-	20	30	4200	420	5.15	3.1	90
$V_{n,dc} = 900\ V$ $V_{rms} = 150\ v\ max$ Voltage Code: C							
FFV36C0106K-	10	19	1600	160	8.21	3.4	90
FFV36C0136K-	13	25	2800	280	6.33	2.9	90
$V_{n,dc} = 1100\ V$ $V_{rms} = 180\ v\ max$ Voltage Code: L							
FFV36L0605K-	6	13	800	80	11.4	3.7	90
FFV36L0905K-	9	20	1900	190	7.61	2.9	90

LIFETIME EXPECTANCY VS V_w/V_n AND HOT SPOT TEMPERATURE POLYPROPYLENE DIELECTRIC

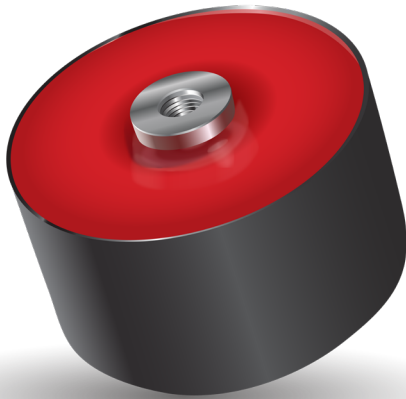


V_w = Permanent working or operating DC voltage.

DC FILTERING

FFG Design (FFH-RoHS Compliant)

DC FILTERING



GENERAL DESCRIPTION

The FFG series uses a non-impregnated metallized dielectric, which features a controlled self-healing process.

PACKAGING MATERIAL

Self-extinguishing plastic case (V-0 = in accordance with UL 94; certified classifications according to EN 45545-2) filled with thermosetting resin.

Self-extinguishing thermosetting resin (V-0 = in accordance with UL 94; certified classifications according to EN 45545-2).

STANDARDS

- IEC 61071-1, IEC 61071-2: Power electronic capacitors
- IEC 60068-1: Environmental testing
- UL 94: Test for Flammability of Plastic Materials for Parts in Devices and Appliances

HOT SPOT CALCULATION

$$\theta_{\text{hot spot}} = \theta_{\text{terminal}} + (P_d + P_t) \times R_{th}$$

with P_d (Dielectric losses) = $Q \times \text{tg}\delta_0$ where $\text{tg}\delta_0 = 2 \times 10^{-4}$ and $Q = I_{\text{rms}}^2 / (C \cdot 2 \cdot \pi \cdot f)$
 P_t (Thermal losses) = $R_s \times I_{\text{rms}}^2$

where C_n in Farad I_{rms} in Ampere f in Hertz
 V in Volt R_s in Ohm θ in °C
 R_{th} in °C/W

HOW TO ORDER

FFG
Series
FFG = Standard
FFH = RoHS Compliant

8
Case Size
8

6
Dielectric
6 = Polypropylene

K
Voltage Code
K = 600Vdc
B = 800Vdc
C = 900Vdc
L = 1000Vdc
U = 1200Vdc
N = 1900Vdc

0376
Capacitance EIA Code

K
Capacitance Tolerances
K = ±10%

--
Voltage Range
-- = < 1kV
J7 = ≥ 1kV

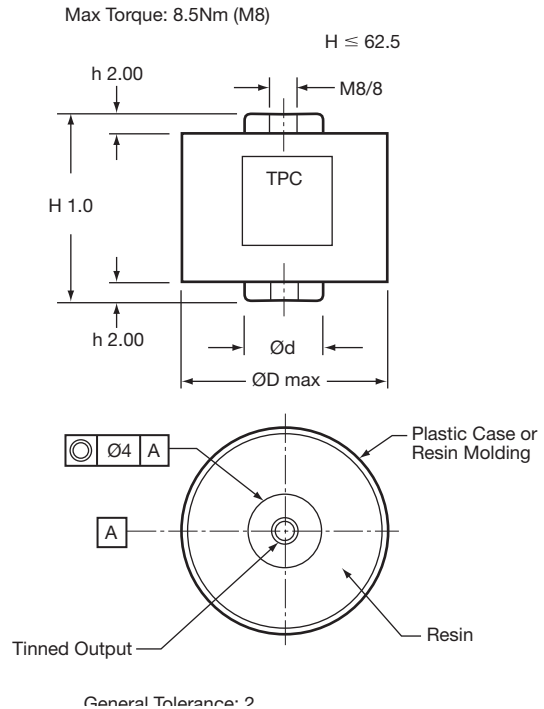
Not RoHS Compliant



Please select correct termination style.

DIMENSIONS (CASE SIZES)

plastic case – Terminals: threaded insert M8 filled with thermosetting resin



DC FILTERING

FFG (FFH RoHS Compliant)

ELECTRICAL CHARACTERISTICS

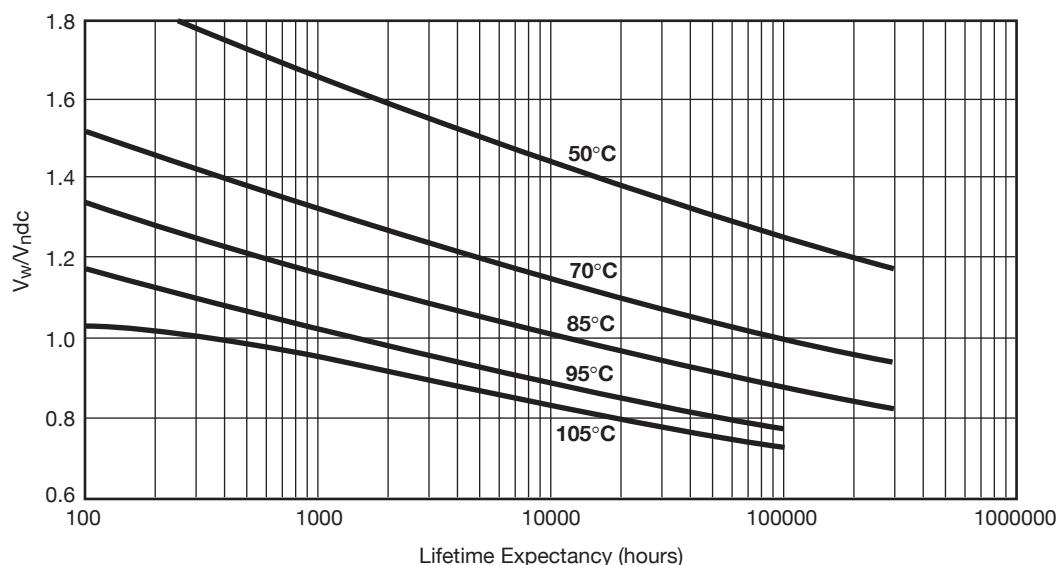
Items	Characteristics
Operating temperature:	-40°C + 105°C
Storage temperature:	-55°C + 85°C
Capacitance range:	16μF to 160μF
Rated DC voltage V _{ndc} :	600 to 900 V
Capacitance tolerance:	±10%
Test voltage between terminals:	@ 25°C: 1.5 x U _n dc during 10s
Test voltage between terminals and case:	@ 25°C: @ 4 kVrms @ 50 Hz during 1 mn (test type)
Dielectric:	Polypropylene

RATINGS AND PART NUMBER REFERENCE (600V TO 900V)

Part Number	C _n (μF)	Height ±1 (mm)	h ±2 (mm)	D max (mm)	d ±0.50 (mm)	I ² t max (A ² s)	I _{rms} max (A)	R _s (mΩ)	R _{th} (°C/W)	Typical Weight (g)
U _{ndc} 600 V (Voltage Code K)										
FFG86K0376K-	37	52	5	60	22	4	28	1.3	10.1	190
FFG86K0586K-	58	52	5	72	22	10	44	1	6.4	260
FFG86K0806K-	80	52	5	82	22	20	61	0.7	4.9	320
FFG86K0167K-	160	62.5	5	92	22	32	76	0.8	5.8	475
U _n dc 800 V (Voltage Code B)										
FFG86B0236K-	23	52	5	60	22	3	26	1.7	10.1	190
FFG86B0376K-	37	52	5	72	22	8	43	1.2	6.5	260
FFG86B0516K-	51	52	5	82	22	15	59	0.9	4.8	320
FFG86B0107K-	100	62.5	5	92	22	24	73	1	5.9	475
U _n dc 900 V (Voltage Code C)										
FFG86C0166K-	16	52	5	60	22	2.8	27	2	9.8	190
FFG86C0266K-	26	52	5	72	22	7	44	1.3	6.5	260
FFG86C0356K-	35	52	5	82	22	13	60	1	4.8	320
FFG86C0706K-	70	62.5	5	92	22	20	75	1.2	5.8	475

Dimensions millimeters

LIFETIME EXPECTANCY vs HOT SPOT TEMPERATURE AND VOLTAGE



V_w = Permanent working or operating DC voltage.

DC FILTERING

FFG (FFH RoHS Compliant)



ELECTRICAL CHARACTERISTICS

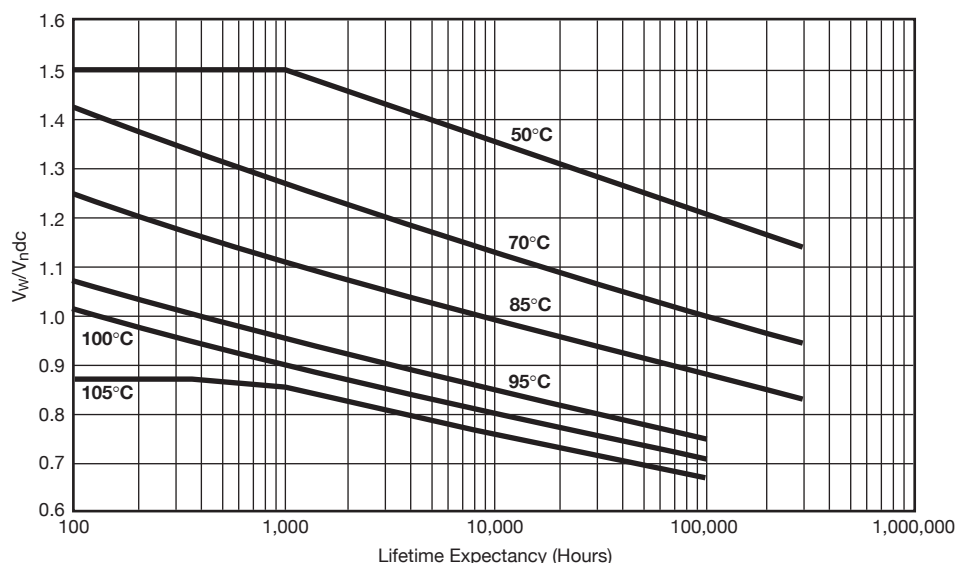
Items	Characteristics
Operating temperature:	-40°C + 105°C
Storage temperature:	-55°C + 85°C
Capacitance range:	5μF to 110μF
Rated DC voltage V _{ndc} :	1000 to 1900 V
Capacitance tolerance:	±10%
Test voltage between terminals:	@ 25°C: 1.5 x U _{n,dc} during 10s
Test voltage between terminals and case:	@ 25°C: @ 4 kVrms @ 50 Hz during 1 mn (test type)
Dielectric:	Polypropylene

RATINGS AND PART NUMBER REFERENCE (1000V TO 1900V)

Part Number	C _n (μF)	Height ±1 (mm)	h ±2 (mm)	D max (mm)	d ±0.50 (mm)	I ² t max (A2s)	I _{rms} max (A)	R _s (mΩ)	R _{th} (°C/W)	Typical Weight (g)
U_{n,dc} 1000 V (Voltage Code K)										
FFG86L0256KJ7	25	52	5	60	22	1.9	21	3.6	9.9	190
FFG86L0406KJ7	40	52	5	72	22	5	34	2.32	6.4	260
FFG86L0556KJ7	55	52	5	82	22	9.5	46	1.74	4.7	320
FFG86L0117KJ7	110	62.5	5	92	22	14.9	58	1.86	5.7	475
U_{n,dc} 1200 V (Voltage Code U)										
FFG86U0176KJ7	17	52	5	60	22	1.3	19	4.33	9.9	190
FFG86U0276KJ7	27	52	5	72	22	3.3	30	2.8	6.5	260
FFG86U0376KJ7	37	52	5	82	22	6.2	41	2.1	4.8	320
FFG86U0766KJ7	76	62.5	5	92	22	10.3	53	2.2	5.6	475
U_{n,dc} 1900 V (Voltage Code N)										
FFG86N0505KJ7	5	52	5	60	22	1.7	19	2.77	11.3	190
FFG86N0905KJ7	9	52	5	72	22	5.5	35	1.63	6.6	260
FFG86N0126KJ7	12	52	5	82	22	9.9	46	1.27	5	320
FFG86N0256KJ7	25	62.5	5	92	22	18	63	1.2	5.2	475

Dimensions millimeters

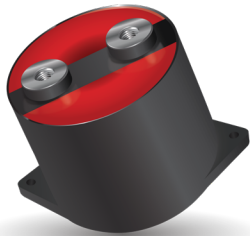
LIFETIME EXPECTANCY vs HOT SPOT TEMPERATURE AND VOLTAGE



V_w = Permanent working or operating DC voltage.

DC FILTERING

FFVE/FFVI (FFWE/FFWI RoHS Compliant)



Not RoHS Compliant



Please select correct termination style.

GENERAL DESCRIPTION

The FFV capacitor is specifically designed for DC filtering, low reactive power.

The series uses a non-impregnated metallized polypropylene or polyester dielectric, which features a controlled self-healing process, specially treated to have a very high dielectric strength in operating conditions up to 105°C.

The FFV special design gives this series a very low level of stray inductance (18 nH to 40 nH).

Furthermore, the performance levels of the FFVE capacitor makes them a very interesting alternative to electrolytic technology, because they can withstand much higher levels of surge voltage, very high rms current ratings, and longer lifetimes.

PACKAGING MATERIAL

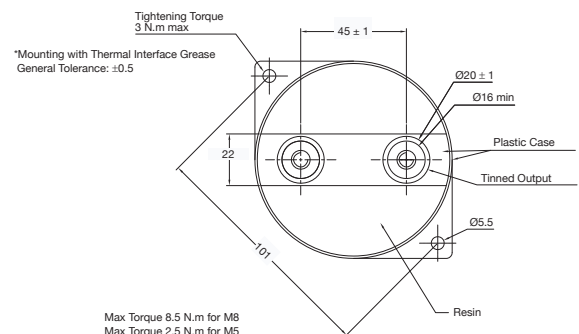
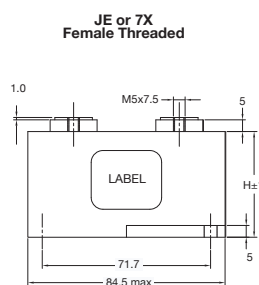
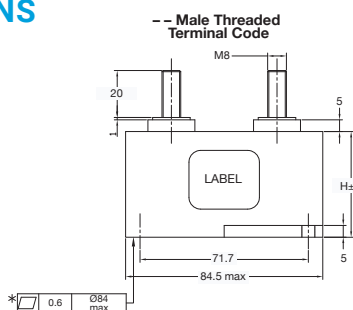
Self-extinguishing plastic case (V0 = in accordance with UL 94) filled thermosetting resin.

Self-extinguishing thermosetting resin (V0 = in accordance with UL 94; I3F1 = in accordance with NF F 16-101).

FFVE capacitors meet the Level 2 requirement of the fire behavior standard NF F 16-102.

DIMENSIONS

Also available with threaded female connections - M5 x 7.5mm max Torque 2.5Nm



HOW TO ORDER

FFVE

Series

FFVE = Standard
FFVI = Standard
FFWE = RoHS Compliant
FFWI = RoHS Compliant

6

Dielectric

4 = Polyester
6 = Polypropylene

H

Voltage Code

H = 300V L = 1000V
I = 400V (FFVE/FFWE)
J = 500V L = 1100V
K = 600V (FFVI/FFWI)
A = 700V U = 1200V
B = 800V N = 1900V
C = 900V

0187

Capacitance Code

0 + pF code
0187 = 180µF
0356 = 35µF
etc.

K

Capacitance Tolerances
K = ±10%

--

Terminal Code

-- or J7 = Male Threaded
JE or 7X = Female Threaded
See Ratings and Part Reference Tables for details

HOT SPOT CALCULATION

See Hot Spot Temperature, page 3.

$$\theta_{\text{hot spot}} = \theta_{\text{case}} + (P_d + P_t) \times R_{\text{th}}$$

with P_d (Dielectric losses) = $Q \times \text{tg}\delta_0$
 $Q \times \text{tg}\delta_0 \Rightarrow \left[\frac{1}{2} \times C_n \times (V_{\text{peak to peak}})^2 \times f \right] \times \text{tg}\delta_0$
 $\text{tg}\delta_0$ (tan delta)

For polypropylene, $\text{tg}\delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures. For polyester, $\text{tg}\delta_0$ values are shown in graph 4 on page 3.

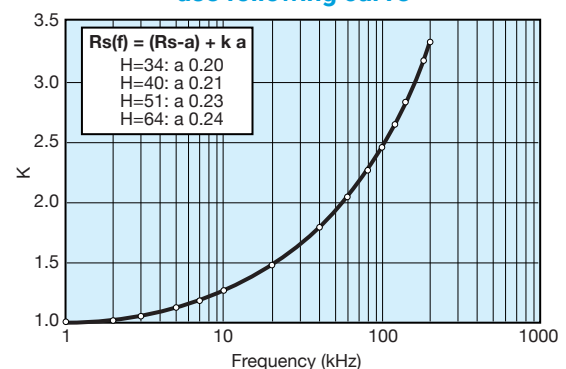
$$P_t \text{ (Thermal losses)} = R_s \times (I_{\text{rms}})^2$$

where C_n in Farad I_{rms} in Ampere f in Hertz
 V in Volt R_s in Ohm θ in °C
 R_{th} in °C/W

θ_{case} = bottom center of case

Rs(f) vs FREQUENCY

For frequency higher than 1 kHz use following curve



DC FILTERING

FFVE/FFVI (FFWE/FFWI RoHS Compliant)

ELECTRICAL CHARACTERISTICS – FFVE/FFWE POLYESTER DIELECTRIC

Items	Characteristics
Working temperature	-40°C to +105°C (according to the power to be dissipated)
Capacitance range	100μF to 400μF
Capacitance tolerance	±10%
Rated DC voltage	300 to 400 V
Test voltage between terminals @ 25°C	1.5 x V _n dc 10s
Insulation voltage between shorted terminals and earth	7 kVrms/60sec/50Hz
Dielectric	Polyester

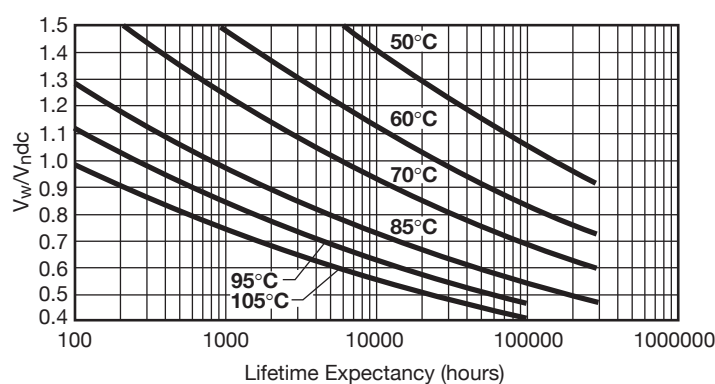
RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number*	Capacitance (μF)	Height (mm)	I _{rms} max. (A)	L _s max. (nH)	R _s (mΩ)	R _{th} (°C/W)	Typical Weight (g)
V_ndc 300 volts (Voltage Code H)							
FFVE4H0187K-	180	34	100	18	0.8	4.7	300
FFVE4H1956K-	195	34	100	18	0.8	4.4	300
FFVE4H0257K-	250	40	100	25	0.6	5.2	350
FFVE4H0357K-	350	51	100	32	0.8	7.2	420
FFVE4H0407K-	400	51	110	32	0.8	7.1	420
V_ndc 400 volts (Voltage Code I)							
FFVE4I0107K-	100	34	80	18	0.7	4.7	300
FFVE4I0127K-	120	34	100	18	0.6	4.1	300
FFVE4I0157K-	150	40	100	25	0.7	5.0	350
FFVE4I0187K-	180	51	80	32	1.0	8.5	420
FFVE4I0227K-	220	51	100	32	0.9	7.2	420

*Change “-” to “JE” for female connectors M5 x 7.5mm

Dimensions millimeters

LIFETIME EXPECTANCY FFVE POLYESTER



V_w = Permanent working or operating DC voltage.

DC FILTERING

FFVE/FFVI (FFWE/FFWI RoHS Compliant)

ELECTRICAL CHARACTERISTICS – FFVE/FFWE POLYPROPYLENE DIELECTRIC

Items	Characteristics
Working temperature	-40°C to +105°C (according to the power to be dissipated)
Capacitance range	12μF to 220μF
Capacitance tolerance	±10%
Rated DC voltage	600 to 1900 V
Test voltage between terminals @ 25°C	1.5 x $V_{n,dc}$ 10s
Insulation voltage between shorted terminals and earth	7 kVrms/60sec/50Hz
Dielectric	Polypropylene

RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Part Number*	Capacitance (μF)	Height (mm)	Irms max. (A)	Ls max. (nH)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
$V_{n,dc}$ 600 volts (Voltage Code K)							
FFVE6K0256K--	25	34	90	18	0.7	4.3	300
FFVE6K0107K--	100	40	100	25	0.6	4.8	350
FFVE6K0157K--	150	51	110	32	0.9	6.9	420
FFVE6K0227K--	220	64	100	40	1.0	8.4	500
$V_{n,dc}$ 800 volts (Voltage Code B)							
FFVE6B0666K--	66	40	100	25	0.7	4.7	350
FFVE6B0107K--	100	51	90	32	1.0	6.7	420
FFVE6B0147K--	140	64	100	40	1.3	8.4	500
$V_{n,dc}$ 900 volts (Voltage Code C)							
FFVE6C0126K--	12	34	70	18	0.9	4.4	300
FFVE6C0386K--	38	34	100	18	1.6	3.9	300
FFVE6C0476K--	47	40	100	25	0.8	4.6	350
FFVE6C0706K--	70	51	100	32	1.2	6.7	420
FFVE6C0107K--	100	64	90	40	1.1	8.2	500
$V_{n,dc}$ 1000 volts (Voltage Code L)							
FFVE6L0666KJ7	66	40	70	25	1.5	5.1	350
FFVE6L0107KJ7	100	51	64	32	2.0	7.3	420
FFVE6L0147KJ7	140	64	51	40	2.5	9.2	500
$V_{n,dc}$ 1200 volts (Voltage Code U)							
FFVE6U0476KJ7	47	40	66	25	1.7	4.9	350
FFVE6U0706KJ7	70	51	59	32	2.4	7.2	420
FFVE6U0107KJ7	100	64	49	40	2.9	8.9	500
$V_{n,dc}$ 1900 volts (Voltage Code N)							
FFVE6N0156KJ7	15	40	73	25	1.1	5.2	350
FFVE6N0246KJ7	24	51	73	32	1.3	6.5	420
FFVE6N0356KJ7	35	64	67	40	1.6	8.4	500

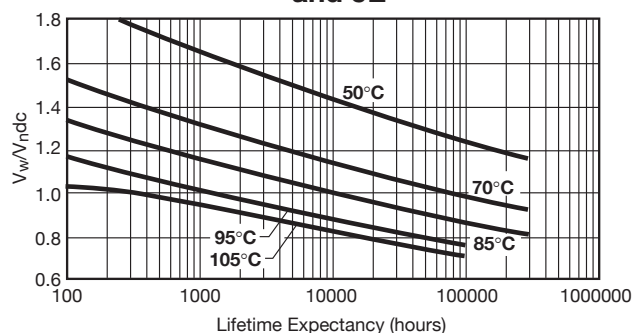
*Change "--" to "JE" for female connectors M5 x 7.5mm

Dimensions millimeters

*Change "J7" to "7X" for female connectors M5 x 7.5mm

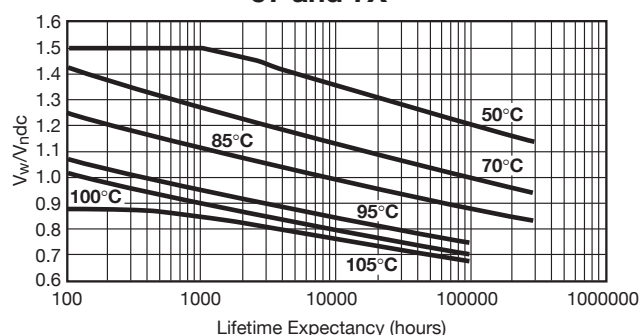
LIFETIME EXPECTANCY FOR FFVE POLYPROPYLENE

-- and JE



V_w : permanent working or operating DC-voltage.

J7 and 7X



V_w : permanent working or operating DC-voltage.

DC FILTERING

FFVE/FFVI (FFWE/FFWI RoHS Compliant)

ELECTRICAL CHARACTERISTICS – FFVE/FFWE POLYPROPYLENE DIELECTRIC

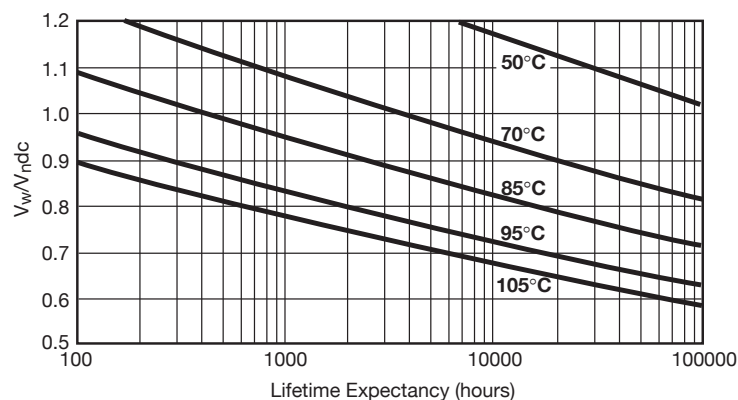
Items	Characteristics
Working temperature	-40°C to +105°C (according to the power to be dissipated)
Capacitance range	47μF to 275μF
Capacitance tolerance	±10%
Rated DC voltage	500 to 1100V
Test voltage between terminals @ 25°C	1.25 x V _n dc 10s
Insulation voltage between shorted terminals and earth	7 kVrms/60sec/50Hz
Dielectric	Polypropylene

RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Part Number*	Capacitance (μF)	Height (mm)	Irms max. (A)	Ls max. (nH)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
V_ndc 500 volts (Voltage Code J)							
FFVI6J1256K-	125	40	90	25	0.6	5.0	350
FFVI6J0207K-	200	51	90	32	0.8	6.7	420
FFVI6J2756K-	275	64	90	40	0.9	8.7	500
V_ndc 700 volts (Voltage Code A)							
FFVI6A0107K-	100	40	100	25	0.6	4.8	350
FFVI6A0157K-	150	51	100	32	0.9	6.9	420
FFVI6A0227K-	220	64	100	40	1.0	8.4	500
V_ndc 900 volts (Voltage Code C)							
FFVI6C0666K-	66	40	100	25	0.7	4.7	350
FFVI6C0107K-	100	51	90	32	1.0	6.7	420
FFVI6C0147K-	140	64	100	40	1.3	8.4	500
V_ndc 1100 volts (Voltage Code L)							
FFVI6L0476K-	47	40	100	25	0.8	4.6	350
FFVI6L0706K-	70	51	100	32	1.2	6.7	420
FFVI6L0107K-	100	64	90	40	1.1	8.2	500

Dimensions millimeters

LIFETIME EXPECTANCY FOR FFVI



V_w: permanent working or operating DC-voltage.

DC FILTERING

FFVS* RoHS Compliant

Low Inductance Range Capacitor for Power Electronics



FFVS series is a specific range of DC filtering capacitors designed for use in high frequency, high ripple applications beyond the limits of standard FFVE or FFVI.

Typical applications include DC power supply for induction heating, resonant DC power supply for scanner, X-ray machines, etc.

Due to the sophisticated internal design, stray inductance is extremely low, between 8 and 13nH.

FFVS products are RoHS compliant.

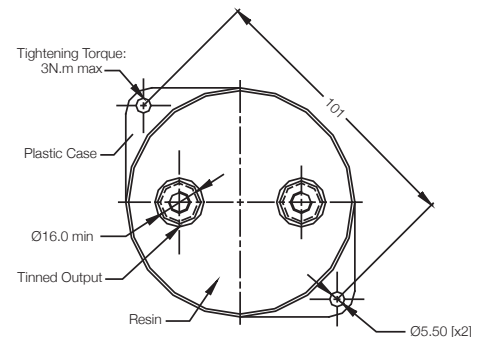
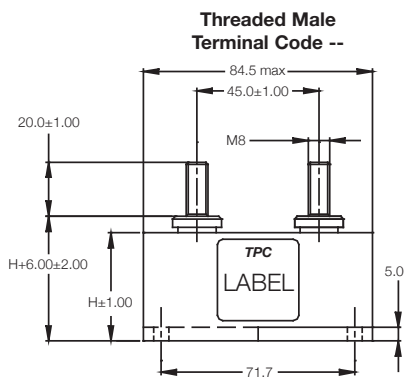
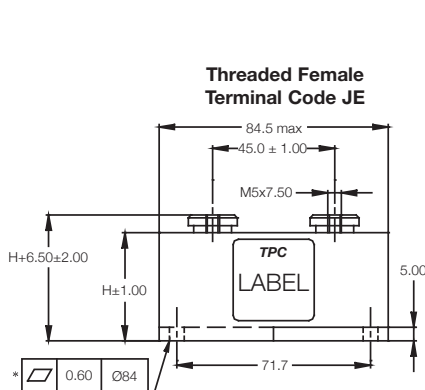
PACKAGING MATERIAL

Self extinguishing plastic case (V0: in accordance with UL 94) filled thermosetting resin.

Self extinguishing thermosetting resin (V0: in accordance with UL 94; I3F1: in accordance with NF F 16-101).

DIMENSIONS

Threaded female terminals version M5 x 7.5mm are also available, To order, the suffix becomes "JE" instead of "--"



HOW TO ORDER

FFVS

Series

6

Dielectric
6 = Polypropylene

K

Voltage Code
K = 600V
B = 800V
C = 900V
L = 1000V
U = 1200V
N = 1900V

0226

Capacitance Code
Capacitance Values with 2 significant digits:
0 + pF code
0226 = 22µF
0147 = 140µF
etc.
Capacitance Values with 3 significant digits:
1956 = 195µF
1286 = 138µF
1356 = 135µF

K

Capacitance Tolerances
K = ±10%

--

Terminal Code
-- = Male Threaded
JE = Female Threaded



HOT SPOT CALCULATION

See Hot Spot Temperature, page 3.

$$\theta_{\text{hot spot}} = \theta_{\text{case}} + (P_d + P_t) \times R_{th}$$

with P_d (Dielectric losses) = $Q \times \text{tg} \delta_0$
 $Q \times \text{tg} \delta_0 \Rightarrow \left[\frac{1}{2} \times C_n \times (V_{\text{peak to peak}})^2 \times f \right] \times \text{tg} \delta_0$
 $\text{tg} \delta_0$ (tan delta)

For polypropylene, $\text{tg} \delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures. For polyester, $\text{tg} \delta_0$ values are shown in graph 4 on page 3.

$$P_t \text{ (Thermal losses)} = R_s \times (I_{\text{rms}})^2$$

where C_n in Farad
 V in Volt
 R_{th} in °C/W
 I_{rms} in Ampere
 R_s in Ohm
 f in Hertz
 θ in °C

θ_{case} = bottom center of case



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.kyocera-avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

TDS-MDPWR-0015 | Rev 1

DC FILTERING

FFVS* RoHS Compliant

Low Inductance Range Capacitor for Power Electronics



ELECTRICAL CHARACTERISTICS

Items	Characteristics
Working temperature	-40°C +105°C (according to the power to be dissipated)
Capacitance range C_N	22 μ F to 200 μ F
Tolerance on C_N	$\pm 10\%$
Rated dc voltage U_N dc	600V to 1900V
Test voltage between terminals @ 25°C: 1.5 x U_N dc during 10s	
Insulation voltage between shorted terminals and earth (type test) @ 4 kVrms @ 50Hz during 1 min.	

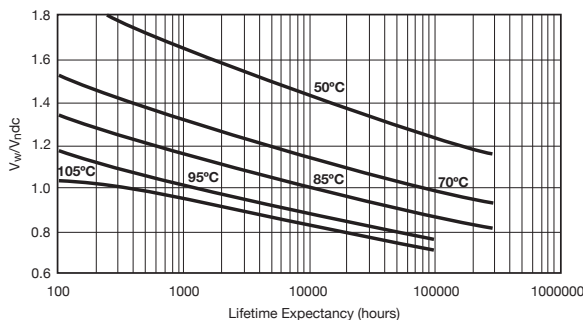
RATINGS AND PART NUMBER REFERENCE

Part Number	Capacitance (μ F)	Height mm	I_{rms} (A)	I^2t (A ² s)	L_s max. (nH)	R_s (m Ω)	R_{th} (°C/W)	Typical Weight (g)
U_N dc 600 volts (Voltage Code K)								
FFVS6K0226K-	22	34	78	11.5	8	0.74	4.2	320
FFVS6K0906K-	90	40	84	24	9	0.60	4.9	345
FFVS6K0147K-	140	51	82	23.5	11	0.83	6.8	405
FFVS6K1956K-	195	64	84	24	13	1.04	8.6	475
U_N dc 800 volts (Voltage Code B)								
FFVS6B0586K-	58	40	83	19	9	0.72	4.9	345
FFVS6B0926K-	92	51	83	19	11	0.99	6.7	405
FFVS6B1286K-	128	64	84	19.5	13	1.25	8.5	475
U_N dc 900 volts (Voltage Code C)								
FFVS6C0306K-	30	34	56	7	8	1.55	4.2	320
FFVS6C0406K-	40	40	85	16.5	9	0.85	5.0	345
FFVS6C0656K-	65	51	86	17	11	1.15	6.7	405
FFVS6C0906K-	90	64	87	17	13	1.46	8.5	475
U_N dc 1000 volts (Voltage Code L)								
FFVS6L0536K-	53	40	61	9.5	9	1.56	4.9	345
FFVS6L0956K-	95	51	63	11	11	1.98	6.7	405
FFVS6L1356K-	135	64	65	11.5	13	2.42	8.3	475
U_N dc 1200 volts (Voltage Code U)								
FFVS6U0406K-	40	40	57	7.5	9	1.77	4.9	345
FFVS6U0656K-	65	51	57	7.5	11	2.38	6.8	405
FFVS6U0866K-	86	64	58	7	13	3.02	8.5	475
U_N dc 1900 volts (Voltage Code N)								
FFVS6N0146K-	14	40	66	12.5	10	1.05	4.9	345
FFVS6N0226K-	22	51	68	13.5	13	1.26	6.3	405
FFVS6N0326K-	32	64	68	13.5	16	1.58	8.1	475

Dimensions millimeters

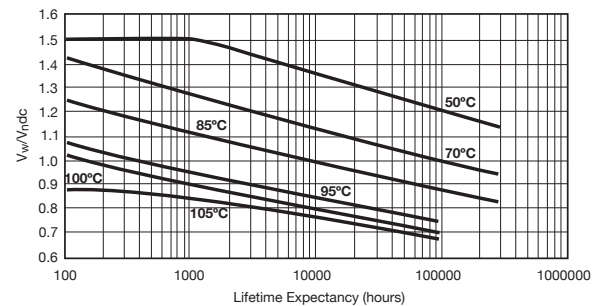
LIFETIME EXPECTANCY

FFVS for 600V, 800V and 900V



V_w : permanent working or operating DC-voltage.

FFVS for 1000V, 1200V and 1900V



V_w : permanent working or operating DC-voltage.

DC FILTERING

FFLR 600Vdc to 3800Vdc* RoHS Compliant



The FFLR series is specifically designed for DC filtering applications such as DC link. This range offers solutions for voltage from 600V up to 3800V.

The Self Healing Technology, essential to ensure a safe and reliable behavior, is achieved using a fully dry solution with polypropylene metalized film. Standard designs proposed in this catalogue are covering a wide range of voltage and capacitance values.

In case of specific requirements about shape and performances, please feel free to contact your local KYOCERA AVX representative.

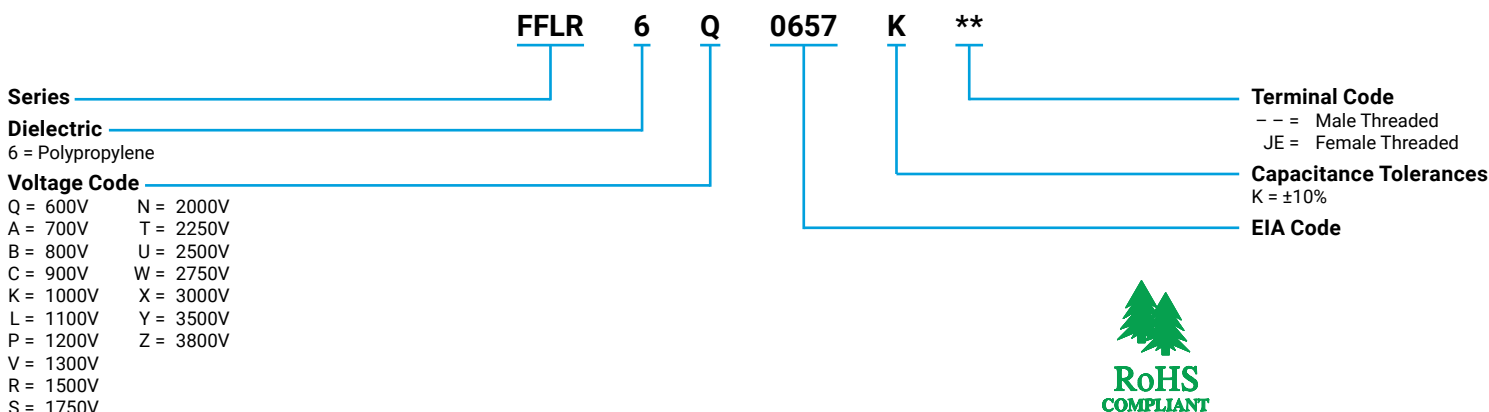
STANDARDS

- IEC 61071: Power electronic capacitors
- IEC 60068-2: Environmental testing
- IEC 61373: Shock and vibrations
- UL 94: Fire requirements
- UL810: CZDS2.E514026

PACKAGING MATERIAL

- Aluminum cylindrical case filled polyurethane resin.
- Self extinguishing polyurethane resin (V0 : in accordance with UL94)
- Self extinguishing plastic cover (V0 : in accordance with UL94)
- RoHS components
- M6/10 Female connections or M8/20 Male connections

HOW TO ORDER



DEFINITIONS

C_n (μF)	capacitance	nominal value of the capacitance measured at $\theta_{amb} = 25 \pm 10^\circ\text{C}$
U_r (V)	rated DC voltage	maximum operating peak voltage of either polarity (non-reversing type waveform), for which the capacitor has been designed for continuous operation
U_w (V)	working voltage	value of the maximum operating recurrent voltage for a given hot spot temperature and an expected lifetime
U_p (V)	ripple voltage	peak-to-peak alternating component of the unidirectional voltage
L_s (nH)	parasitic inductance	capacitor series self-inductance
R_s (mΩ)	series resistance	capacitor series resistance due to galvanic circuit
I_{rms} (A)	RMS current	RMS current value for continuous operation under natural convection generating 40°C overheating
θ_{amb} (°C)	cooling air temperature	Temperature of the cooling air measured at the hottest position of the capacitor, under steady-state conditions, midway between two units Note If only one unit is involved, it is the temperature measured at a point approximately 0.1 m away from the capacitor container and at two-thirds of the height from its base
θ_{HS} (°C)	hot spot temperature	highest temperature obtained inside the case of the capacitor in thermal equilibrium
I²t (A²s)	integral of action	maximum repetitive integral of action that galvanic circuit is able to withstand

CHARACTERISTICS

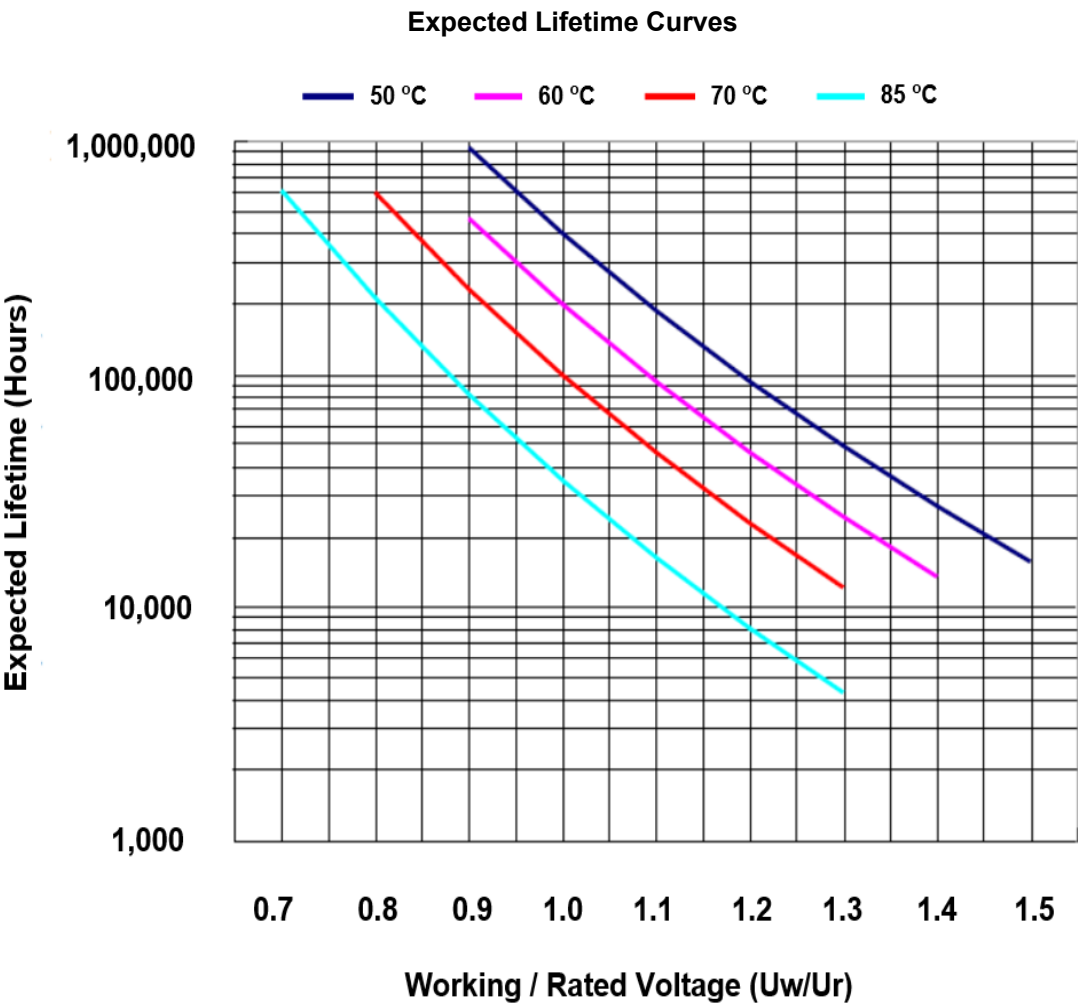
Capacitance range C_n	105μF to 3000μF
Tolerance on C_n	±10%
Rated DC voltage U_n	600 to 3800V
Lifetime at U_n and 65°C hot-spot temperature and ΔC / C < 2%	100,000h
Parasitic inductance L_s	35 to 60nH
Maximum rms current I_{rms}	up to 112A _{rms}
Test voltage between terminals @ 25°C	1.5 x U _n for 10s
Test voltage between terminals and Case @ 25°C	4kVrms @ 50Hz for 10s
Dielectric	polypropylene
Climatic Category	40 / 85 / 56 (IEC 60068)
Working temperature	-40°C / +85°C (according to the power dissipated)
Storage temperature	-40°C / +85°C
Calorific value	40 MJ/kg

DC FILTERING

FFLR 600Vdc to 3800Vdc* RoHS Compliant



LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE

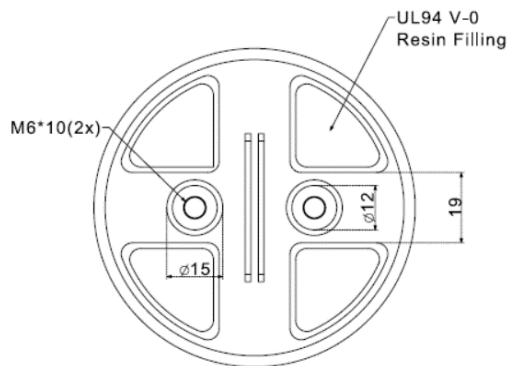
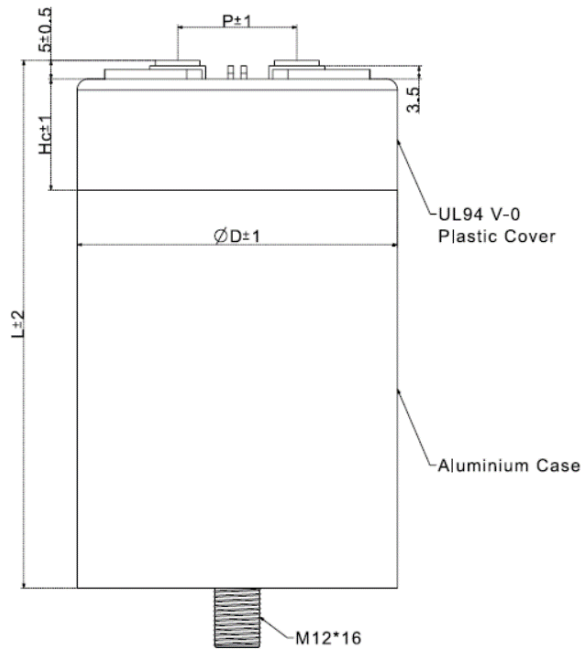


DC FILTERING

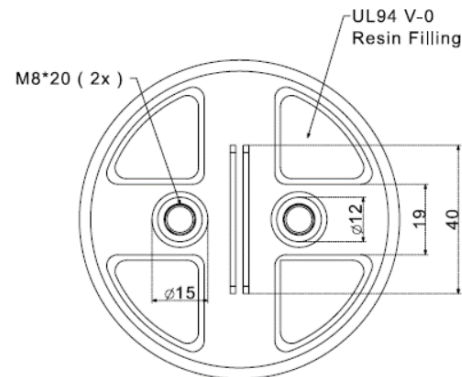
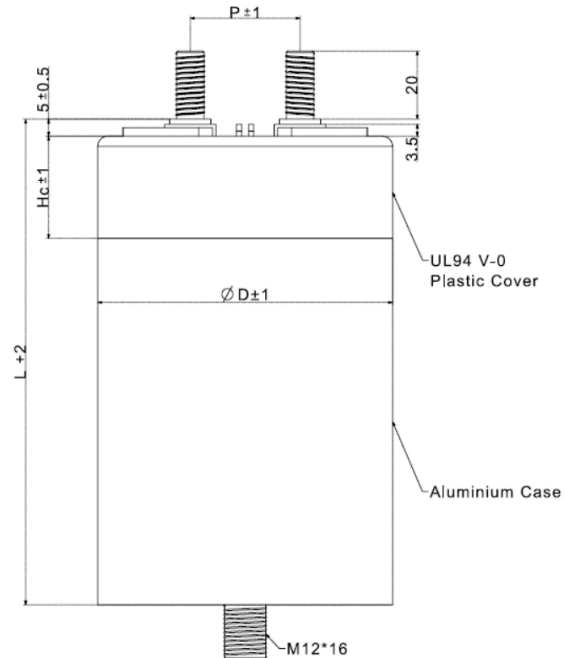
FFLR 600Vdc to 3800Vdc* RoHS Compliant

DIMENSIONS

FEMALE TERMINALS



MALE TERMINALS



D (mm)	75	86	100	116	136
P (mm)	32	32	32	50	50
Dt (mm)	12	12	12	15	15
Hc (mm)	30	30	40	40	40

Max Torque (Nm)	
M6	4.5
M8	8.5
M12	15

D (mm)	Distance terminal to terminal (mm)		Distance terminal to case (mm)	
	Creepage	Clearance	Creepage	Clearance
75	35	20	48	46
86	35	20	52	50
100	35	20	67	65
116	50	35	67	65
136	50	35	77	75

MECHANICAL MOUNTING

Capacitors enclosure presents a M12 x 16 bolt in order to fix the capacitor. Over height (H) more than 1.5 x D (diameter of tube), we recommend to clamp (constraint < 35daN), just below the plastic cover, the capacitor in order to limit oscillations in case of potential Shock&Vibration stress.

DC FILTERING

FFLR 600Vdc to 3800Vdc* RoHS Compliant



RATINGS AND PART NUMBER REFERENCE

C (μF)	Un (V)	PN	Voltage Code	Dimensions			Irms	Peak	ESR	ESL	Thermal Res *C/W	dv/dt
				D	L	P	10KHz 50%	Current	1KHz			
				mm	mm	mm	A	A	mΩ	nH		V/us
650	600	FFLR6Q0657K**	Q	86.0	100.0	32.0	70.0	3,900	1.2	60	5.0	6
800	600	FFLR6Q0807K**	Q	86.0	126.0	32.0	75.0	6,400	1.5	60	3.6	8
900	600	FFLR6Q0907K**	Q	86.0	126.0	32.0	75.0	7,200	1.4	60	3.6	8
1000	600	FFLR6Q0108K**	Q	86.0	161.0	32.0	60.0	7,500	1.0	65	3.7	8
1150	600	FFLR6Q1157K**	Q	86.0	161.0	32.0	65.0	8,625	0.9	65	3.7	8
220	700	FFLR6A0227K**	A	75.0	80.0	32.0	50.0	3,080	2.6	40	7.2	14
270	700	FFLR6A0277K**	A	75.0	80.0	32.0	50.0	3,780	2.5	40	7.2	14
300	700	FFLR6A0307K**	A	86.0	80.0	32.0	55.0	4,200	2.4	40	6.5	14
360	700	FFLR6A0367K**	A	86.0	80.0	32.0	56.0	5,040	2.2	40	6.5	14
420	700	FFLR6A0427K**	A	86.0	100.0	32.0	58.0	2,940	2.5	50	4.2	7
450	700	FFLR6A0457K**	A	86.0	100.0	32.0	65.0	3,150	2.3	50	4.6	7
500	700	FFLR6A0507K**	A	86.0	100.0	32.0	65.0	3,500	2.2	50	4.6	7
550	700	FFLR6A0557K**	A	86.0	126.0	32.0	65.0	3,300	2.5	60	4.1	6
680	700	FFLR6A0687K**	A	86.0	126.0	32.0	70.0	3,400	2.1	60	4.1	5
290	800	FFLR6B0297K**	B	75.0	100.0	32.0	50.0	3,045	4.0	60	4.0	11
300	800	FFLR6B0307K**	B	86.0	100.0	32.0	60.0	2,550	2.5	60	3.8	9
390	800	FFLR6B0397K**	B	86.0	100.0	32.0	62.0	3,315	2.9	60	3.6	9
450	800	FFLR6B0457K**	B	86.0	126.0	32.0	65.0	3,600	2.4	60	3.2	8
520	800	FFLR6B0527K**	B	86.0	126.0	32.0	65.0	3,900	2.2	60	3.2	8
850	800	FFLR6B0857K**	B	86.0	200.0	32.0	60.0	4,250	1.8	50	3.6	5
1000	800	FFLR6B0108K**	B	116.0	126.0	50.0	65.0	7,000	1.8	60	2.6	7
1600	800	FFLR6B0168K**	B	116.0	180.0	50.0	75.0	9,600	3.0	65	3.4	6
480	900	FFLR6C0487K**	C	86.0	142.5	32.0	65.0	4,080	2.0	50	4.2	9
1000	900	FFLR6C0108K**	C	116.0	142.5	50.0	68.0	7,000	1.6	80	3.0	7
1500	900	FFLR6C0158K**	C	116.0	180.0	50.0	60.0	12,000	2.0	65	4.8	8
1800	900	FFLR6C0188K**	C	116.0	230.0	50.0	100.0	14,400	0.8	60	2.4	8
900	1000	FFLR6K0907K**	K	116.0	142.0	50.0	72.0	10,800	2.9	85	2.6	12
1300	1000	FFLR6K0138K**	K	116.0	230.0	50.0	100.0	9,750	1.5	100	2.4	8
1600	1000	FFLR6K0168K**	K	116.0	230.0	50.0	100.0	8,000	1.5	75	2.1	5
170	1100	FFLR6L0177K**	L	75.0	100.0	32.0	50.0	1,700	3.2	60	3.8	10
240	1100	FFLR6L0247K**	L	86.0	100.0	32.0	55.0	3,000	1.7	50	3.8	13
300	1100	FFLR6L0307K**	L	86.0	142.5	32.0	58.0	2,550	2.0	60	2.7	9
330	1100	FFLR6L0337K**	L	86.0	142.5	32.0	60.0	2,805	3.0	60	3.3	9
400	1100	FFLR6L0407K**	L	86.0	142.5	32.0	60.0	3,400	2.8	60	3.3	9
420	1100	FFLR6L0427K**	L	86.0	142.5	32.0	58.0	3,570	2.3	85	3.0	9
500	1100	FFLR6L0507K**	L	86.0	180.0	32.0	72.0	6,000	1.5	80	3.0	12
600	1100	FFLR6L0607K**	L	86.0	230.0	32.0	65.0	6,300	2.5	60	2.0	11
720	1100	FFLR6L0727K**	L	116.0	155.0	50.0	69.0	9,360	3.2	85	2.6	13
800	1100	FFLR6L0807K**	L	116.0	160.0	50.0	80.0	8,800	1.5	55	2.4	11
1000	1100	FFLR6L0108K**	L	116.0	180.0	50.0	85.0	10,000	2.2	50	2.5	10
1100	1100	FFLR6L0118K**	L	116.0	230.0	50.0	90.0	9,900	1.3	60	2.1	9
1600	1100	FFLR6L0168K**	L	116.0	340.0	50.0	100.0	12,000	2.3	100	2.4	8
1700	1100	FFLR6L0178K**	L	136.0	230.0	50.0	110.0	10,200	1.5	60	1.7	6
2000	1100	FFLR6L0208K**	L	136.0	260.0	50.0	120.0	12,000	1.2	60	1.3	6
2200	1100	FFLR6L0228K**	L	136.0	340.0	50.0	120.0	13,200	1.2	60	1.0	6
420	1200	FFLR6P0427K**	P	86.0	180.0	32.0	60.0	4,200	3.0	70	3.2	10
540	1200	FFLR6P0547K**	P	86.0	230.0	32.0	60.0	5,400	2.5	85	3.3	10
950	1200	FFLR6P0957K**	P	116.0	230.0	50.0	90.0	9,500	1.5	75	2.1	10
1000	1200	FFLR6P0108K**	P	116.0	230.0	50.0	90.0	10,000	1.5	75	2.1	10
1200	1200	FFLR6P0128K**	P	116.0	260.0	50.0	70.0	12,000	0.8	50	1.5	10
250	1300	FFLR6V0257K**	V	86.0	142.5	32.0	40.0	2,000	4.0	85	5.4	8
330	1300	FFLR6V0337K**	V	86.0	180.0	32.0	55.0	4,950	2.6	80	3.4	15
420	1300	FFLR6V0427K**	V	116.0	126.0	50.0	50.0	6,300	2.3	40	2.1	15
470	1300	FFLR6V0477K**	V	116.0	161.0	50.0	65.0	5,640	1.5	80	7.1	12
570	1300	FFLR6V0577K**	V	116.0	161.0	50.0	70.0	6,270	1.3	80	7.1	11
1100	1300	FFLR6V0118K**	V	116.0	340.0	50.0	85.0	9,900	2.7	200	2.1	9
185	1750	FFLR6S1856K**	S	86.0	160.0	32.0	48	2,775	3.7	50	3.6	15
225	1750	FFLR6S2256K**	S	86.0	180.0	32.0	46	3,375	4.4	60	3.3	15
270	1750	FFLR6S0277K**	S	100.0	160.0	32.0	58	4,050	2.6	50	3.3	15
330	1750	FFLR6S0337K**	S	100.0	180.0	32.0	56	4,950	3.1	60	3.1	15
370	1750	FFLR6S0377K**	S	116.0	160.0	50.0	69	5,550	2	50	3.1	15
450	1750	FFLR6S0457K**	S	116.0	180.0	50.0	65	5,850	2.4	60	2.9	13
520	1750	FFLR6S0527K**	S	116.0	230.0	50.0	89	5,720	1.2	40	3.2	11
670	1750	FFLR6S0677K**	S	116.0	270.0	50.0	86	6,030	1.4	50	2.9	9
820	1750	FFLR6S0827K**	S	116.0	340.0	50.0	85	6,560	1.7	60	2.5	8

**Insert -- for male terminals or JE for female terminals

DC FILTERING

FFLR 600Vdc to 3800Vdc* RoHS Compliant



RATINGS AND PART NUMBER REFERENCE

C (μF)	Un (V)	PN	Voltage Code	Dimensions			Irms	Peak	ESR	ESL	Thermal Res	dv/dt
				D	L	P	10KHz 50%	Current	1KHz		*C/W	
				mm	mm	mm	A	A	mΩ		nH	V/us
140	2000	FFLR6N0147K**	N	86.0	155.0	32.0	45	2,520	4.2	50	3.6	18
170	2000	FFLR6N0177K**	N	86.0	180.0	32.0	43	3,060	5	60	3.3	18
205	2000	FFLR6N2056K**	N	100.0	155.0	32.0	55	3,690	3	50	3.3	18
250	2000	FFLR6N0257K**	N	100.0	180.0	32.0	52	4,000	3.5	60	3.1	16
280	2000	FFLR6N0287K**	N	116.0	155.0	50.0	65	4,480	2.3	50	3.1	16
350	2000	FFLR6N0357K**	N	116.0	180.0	50.0	62	5,250	2.6	60	2.9	15
400	2000	FFLR6N0407K**	N	116.0	240.0	50.0	85	5,600	1.3	40	3.2	14
510	2000	FFLR6N0517K**	N	116.0	290.0	50.0	82	6,630	1.5	50	2.9	13
620	2000	FFLR6N0627K**	N	116.0	340.0	50.0	81	7,440	1.8	60	2.5	12
110	2250	FFLR6T0117K**	T	86.0	155.0	32.0	43	1,760	4.7	50	3.6	16
135	2250	FFLR6T1356K**	T	86.0	180.0	32.0	41	2,160	5.5	60	3.3	16
160	2250	FFLR6T0167K**	T	100.0	155.0	32.0	52	2,560	3.3	50	3.3	16
195	2250	FFLR6T1956K**	T	100.0	180.0	32.0	49	2,925	4	60	3.1	15
220	2250	FFLR6T0227K**	T	116.0	155.0	50.0	62	3,300	2.5	50	3.1	15
270	2250	FFLR6T0277K**	T	116.0	180.0	50.0	59	4,050	3	60	2.9	15
310	2250	FFLR6T0317K**	T	116.0	240.0	50.0	81	4,340	1.4	40	3.2	14
400	2250	FFLR6T0407K**	T	116.0	290.0	50.0	79	5,200	1.7	50	2.9	13
490	2250	FFLR6T0497K**	T	116.0	340.0	50.0	78	6,125	2	60	2.5	12.5
85	2500	FFLR6U0856K**	U	86.0	160.0	32.0	40	1,530	5.2	50	3.6	18
105	2500	FFLR6U1056K**	U	86.0	180.0	32.0	39	1,890	6.1	60	3.3	18
120	2500	FFLR6U0127K**	U	100.0	160.0	32.0	49	2,160	3.8	50	3.3	18
150	2500	FFLR6U0157K**	U	100.0	180.0	32.0	47	2,700	4.4	60	3.1	18
170	2500	FFLR6U0177K**	U	116.0	160.0	50.0	59	3,400	2.8	50	3.1	20
210	2500	FFLR6U0217K**	U	116.0	180.0	50.0	56	4,200	3.3	60	2.9	20
230	2500	FFLR6U0237K**	U	116.0	240.0	50.0	77	4,600	1.6	40	3.2	20
300	2500	FFLR6U0307K**	U	116.0	290.0	50.0	75	5,400	1.9	50	2.9	18
380	2500	FFLR6U0387K**	U	116.0	340.0	50.0	75	6,460	2.2	60	2.5	17
70	2750	FFLR6W0706K**	W	86.0	160.0	32.0	39	1,400	5.7	50	3.6	20
85	2750	FFLR6W0856K**	W	86.0	180.0	32.0	37	1,700	6.8	60	3.3	20
100	2750	FFLR6W0107K**	W	100.0	160.0	32.0	47	2,000	4.1	50	3.3	20
125	2750	FFLR6W1256K**	W	100.0	180.0	32.0	45	2,500	4.8	60	3.1	20
140	2750	FFLR6W0147K**	W	116.0	160.0	50.0	56	2,800	3	50	3.1	20
170	2750	FFLR6W0177K**	W	116.0	180.0	50.0	53	3,060	3.6	60	2.9	18
190	2750	FFLR6W0197K**	W	116.0	240.0	50.0	74	3,230	1.7	40	3.2	17
250	2750	FFLR6W0257K**	W	116.0	290.0	50.0	73	4,000	2	50	2.9	16
310	2750	FFLR6W0317K**	W	116.0	340.0	50.0	72	4,960	2.4	60	2.5	16
58	3000	FFLR6X0586K**	X	86.0	160.0	32.0	37	1,276	6.3	50	3.6	22
70	3000	FFLR6X0706K**	X	86.0	180.0	32.0	35	1,540	7.6	60	3.3	22
85	3000	FFLR6X0856K**	X	100.0	160.0	32.0	45	2,040	4.4	50	3.3	24
105	3000	FFLR6X1056K**	X	100.0	180.0	32.0	43	2,520	5.2	60	3.1	24
115	3000	FFLR6X1156K**	X	116.0	160.0	50.0	54	2,760	3.3	50	3.1	24
145	3000	FFLR6X1456K**	X	116.0	180.0	50.0	51	3,480	3.9	60	2.9	24
160	3000	FFLR6X0167K**	X	116.0	240.0	50.0	72	3,520	1.8	40	3.2	22
210	3000	FFLR6X0217K**	X	116.0	290.0	50.0	70	4,620	2.1	50	2.9	22
260	3000	FFLR6X0267K**	X	116.0	340.0	50.0	69	5,460	2.5	60	2.5	21
60	3500	FFLI6Y0606K**	Y	100.0	160.0	32.0	60	1,500	2.5	50	3.3	25
75	3500	FFLI6Y0756K**	Y	100.0	180.0	32.0	58	1,875	2.9	60	3.1	25
85	3500	FFLI6Y0856K**	Y	116.0	160.0	50.0	72	2,210	1.9	50	3.1	26
105	3500	FFLI6Y1056K**	Y	116.0	180.0	50.0	68	2,730	2.2	60	3	26
115	3500	FFLI6Y1156K**	Y	116.0	240.0	50.0	89	2,875	1.2	40	3.3	25
150	3500	FFLI6Y0157K**	Y	116.0	290.0	50.0	88	3,750	1.3	50	2.9	25
190	3500	FFLI6Y0197K**	Y	116.0	340.0	50.0	88	4,560	1.6	60	2.5	24
53	3800	FFLI6Z0536K**	Z	100.0	160.0	32.0	59	1,484	2.6	50	3.3	28
66	3800	FFLI6Z0666K**	Z	100.0	180.0	32.0	56	1,848	3	60	3.1	28
72	3800	FFLI6Z0726K**	Z	116.0	160.0	50.0	69	2,160	2	50	3.1	30
90	3800	FFLI6Z0906K**	Z	116.0	180.0	50.0	66	2,700	2.3	60	3	30
100	3800	FFLI6Z0107K**	Z	116.0	240.0	50.0	88	2,700	1.2	40	3.3	27
130	3800	FFLI6Z0137K**	Z	116.0	290.0	50.0	86	3,380	1.4	50	2.9	26
165	3800	FFLI6Z1656K**	Z	116.0	340.0	50.0	87	4,125	1.6	60	2.5	25

**Insert -- for male terminals or JE for female terminals

DC FILTERING

FFLI 800V to 1400Vdc* RoHS Compliant



The FFLI series is specifically designed for DC filtering applications such as DC link. This range offers solutions for voltage from 800V up to 1400V.

The Controlled Self Healing Technology, essential to ensure a safe and reliable behaviour, is achieved using a fully dry solution with polypropylene metallized and segmented film. Standard designs proposed in this catalogue are covering a wide range of voltage and capacitance values.

In case of specific requirements about shape and performances, please feel free to contact your local KYOCERA AVX representative.

STANDARDS

- IEC 61071: Power electronic capacitors
- IEC 61881: Railway applications, rolling stock equipment, capacitors for power electronics
- IEC 60068-2: Environmental testing
- IEC 61373: Shock and vibrations
- UL 94: Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

PACKAGING MATERIAL

Aluminium cylindrical case filled with thermosetting resin.

Self extinguishing thermosetting resin (V-0 : in accordance with UL94; certified classifications according to EN 45545-2)

Self extinguishing plastic cover (V-0 : in accordance with UL94; certified classifications according to EN 45545-2)

RoHS components

M6/10 Female connections or M8/20 Male connections

HOW TO ORDER

FFLI

Series

6

Dielectric
6 = Polypropylene

L

Voltage Code
B = 800V
L = 1000V
U = 1150V
Q = 1400V

0337

Capacitance
EIA Code

K

Capacitance
Tolerances
K = $\pm 10\%$

--

Terminal Code
-- = Male Threaded
JE = Female Threaded

RoHS
COMPLIANT

DEFINITIONS

C_n (μF)	capacitance	nominal value of the capacitance measured at $\theta_{amb} = 25 \pm 10^\circ\text{C}$
U_n (V)	rated DC voltage	maximum operating peak voltage of either polarity (non-reversing type waveform), for which the capacitor has been designed for continuous operation
U_w (V)	working voltage	value of the maximum operating recurrent voltage for a given hot spot temperature and an expected lifetime
U_r (V)	ripple voltage	peak-to-peak alternating component of the unidirectional voltage
L_s (nH)	parasitic inductance	capacitor series self-inductance
R_s (mΩ)	series resistance	capacitor series resistance due to galvanic circuit
I_{rms} (A)	RMS current	RMS current value for continuous operation under natural convection generating 40°C overheating
θ_{amb} (°C)	cooling air temperature	temperature of the cooling air measured at the hottest position of the capacitor, under steady-state conditions, midway between two units NOTE If only one unit is involved, it is the temperature measured at a point approximately 0.1 m away from the capacitor container and at two-thirds of the height from its base
θ_{HS} (°C)	hot spot temperature	highest temperature obtained inside the case of the capacitor in thermal equilibrium
I²t (A²s)	integral of action	maximum repetitive integral of action that galvanic circuit is able to withstand

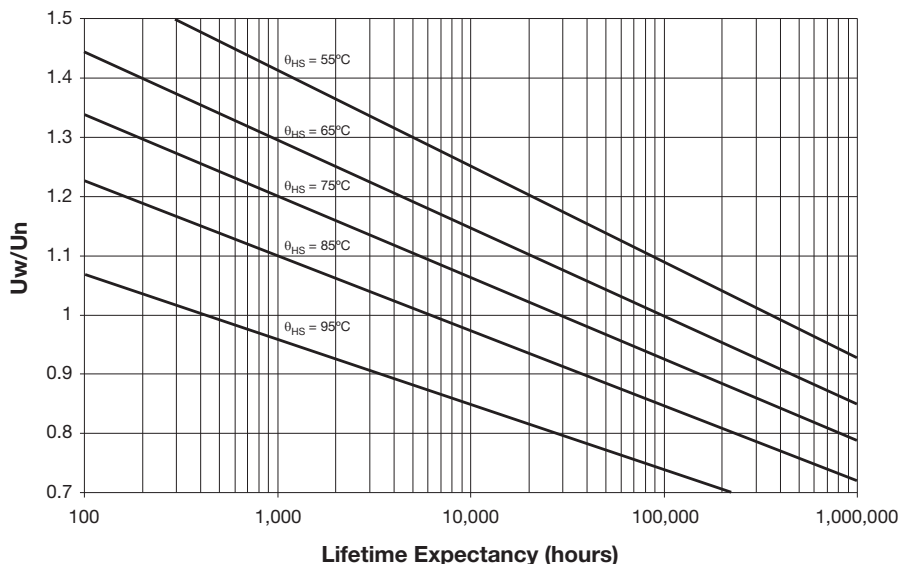
CHARACTERISTICS

Capacitance range C_n	105μF to 3000μF
Tolerance on C_n	$\pm 10\%$
Rated DC voltage U_n	800 to 1400V
Lifetime at U_n and 65°C hot-spot temperature and ΔC / C < 2%	100,000h
Parasitic inductance L_s	35 to 60nH
Maximum rms current I_{rms}	up to 112A _{rms}
Test voltage between terminals @ 25°C	1.5 x U _n for 10s
Test voltage between terminals and Case @ 25°C	4kVrms @ 50Hz for 10s
Dielectric	polypropylene
Climatic Category	40 / 95 / 56 (IEC 60068)
Working temperature	-40°C / +95°C (according to the power dissipated)
Storage temperature	-40°C / +85°C
Calorific value	40 MJ/kg

DC FILTERING

FFLI 800V to 1400Vdc* RoHS Compliant

LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE



HOW TO CHOSE THE RIGHT CAPACITOR

The capacitor lifetime depends on the working voltage and the hot spot temperature.

Our caps are designed to meet 100000 hours lifetime at rated voltage and 65°C hot spot temperature. In accordance with operating conditions, please calculate the hot spot temperature and deduce from this calculation if the obtained lifetime can suit the application.

1. From the tables, select a capacitor with required capacitance

C_n and voltage U_n .

Calculate the maximum ripple voltage allowed for the selected cap:

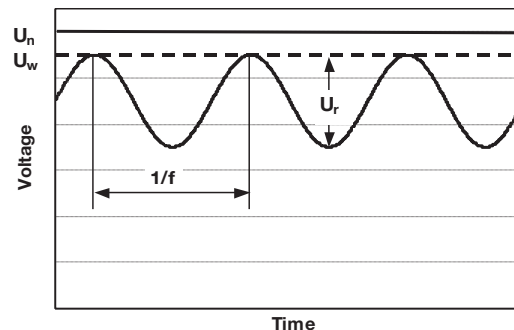
$$U_{rmax} = 0.2U_n$$

If $U_r > U_{rmax}$, select a capacitor with higher rated voltage

Make sure I_{rms} application $< I_{rms}$ table

Copy out:

- serial resistance (Rs): see table of values
- thermal resistances Rth



2. Hot spot temperature calculation

Total losses are calculated as follow: $P_t = P_j + P_d$

Joule losses: $P_j = R_s \times I_{rms}^2$

Dielectric losses: $P_d = Q \times \tan \delta_0$ with

- $Q(\text{reactive power}) = \frac{I_{rms}^2}{C\omega}$ for a sinusoidal waveform

- $\tan \delta_0 = 2 \times 10^{-4}$ (dielectric losses of polypropylene)

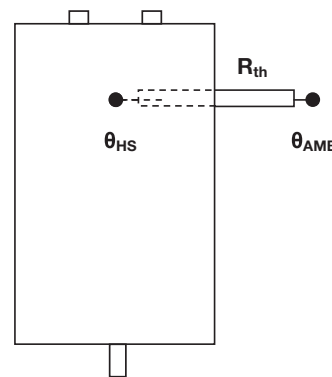
Hot spot temperature will be:

$$\theta_{HS} = \theta_{amb} + (P_j + P_d) \times R_{th}$$

θ_{HS} **absolute maximum is 95°C**

If temperature is higher than 95°C, come back to #1 and start again with another selection.

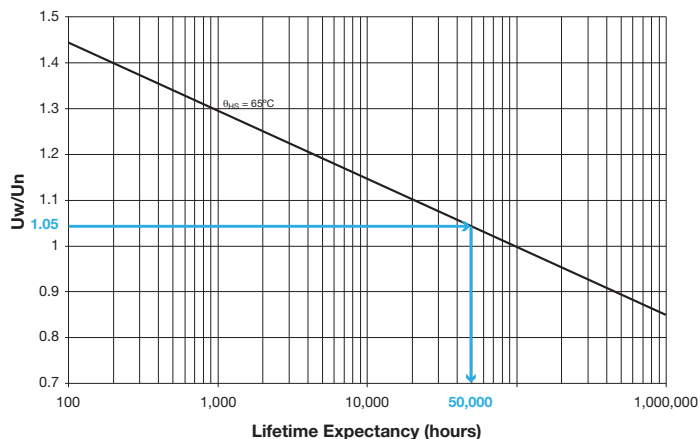
R_{th} : thermal resistance between case and ambient air



DC FILTERING

FFLI 800V to 1400Vdc* RoHS Compliant

3. Refer to the curve and deduce the lifetime vs U_w/U_n ratio



eg: rated voltage 1000V
working voltage 1050V
 $\rho = 1.05 \Rightarrow$ lifetime 50,000 hours
@ 65°C hot spot temperature

Please, find a calculation form at the end of the catalog

MTBF CALCULATION

Based on Return Of Experience from the field of more than 30 years, we have established the following relation. The failure rate λ_B depends on hot spot temperature θ_{HS} and charge ratio ρ .

$$\rho = U_w/U_n$$

$$\lambda_B = 3 \times 10^{2.75(\rho-1)} \times e^{\left(3.2 \left(\frac{\theta_{HS}+273}{358}\right)^{30}\right)} \times 10^{-9} \text{ in failures/hour}$$

GENERAL FAILURE RATE

$\lambda = \lambda_B \times \pi_Q \times \pi_E$ failures/hour • π_Q , π_B and π_E see following tables

Qualification	Qualification factor π_Q
Product qualified on IEC61071 and internal qualification	1
Product qualified on IEC61071	2
Product answering on another norm	5
Product without qualification	15

Environment	Environment factor π_E
On ground (good conditions)	1
On ground (fixed materials)	2
On ground (on board)	4
On ship	9
On plane	15

Environment	Environment factor π_B
Favorable	1
Unfavourable	5

MEAN TIME BETWEEN FAILURE (MTBF)

$$MTBF = 1/\lambda \text{ hours}$$

SURVIVAL FUNCTION

$$N = N_0 \times \exp(-\lambda t)$$

N is the number of pieces still working after t hours.

N_0 is the number of pieces at the origin ($t = 0$)

FAILURE MODE

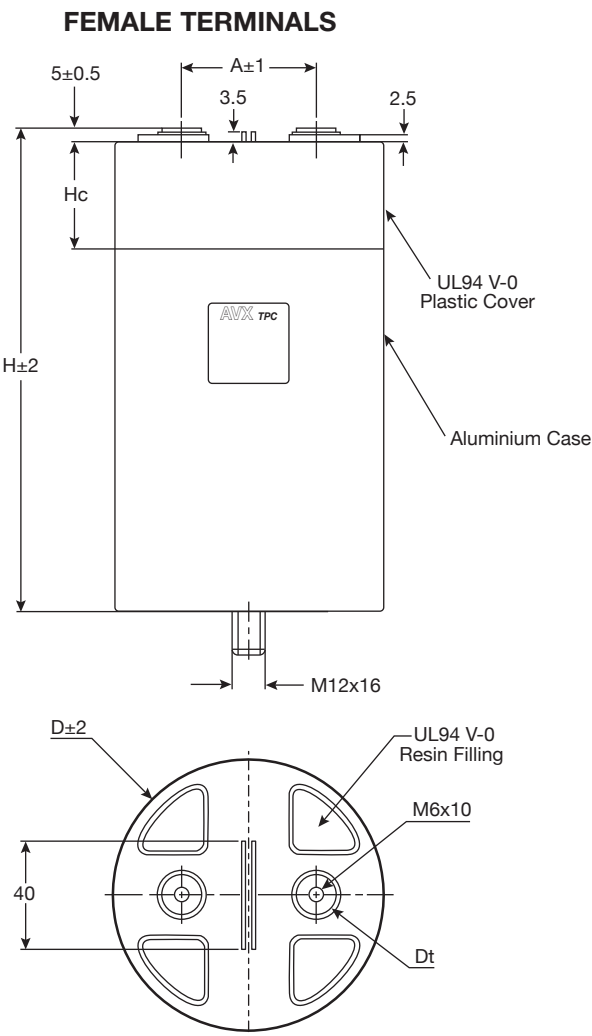
Main failure mode due to KYOCERA AVX's **Controlled Self-Healing Technology** is only losses of capacitance. Thanks to **Controlled Self-Healing solution** to interrupt self-healing process in order to prevent avalanche effect due to polypropylene molecular cracking producing gas and potential explosion in confined box for none **Controlled Self-Healing capacitors**.

DC FILTERING

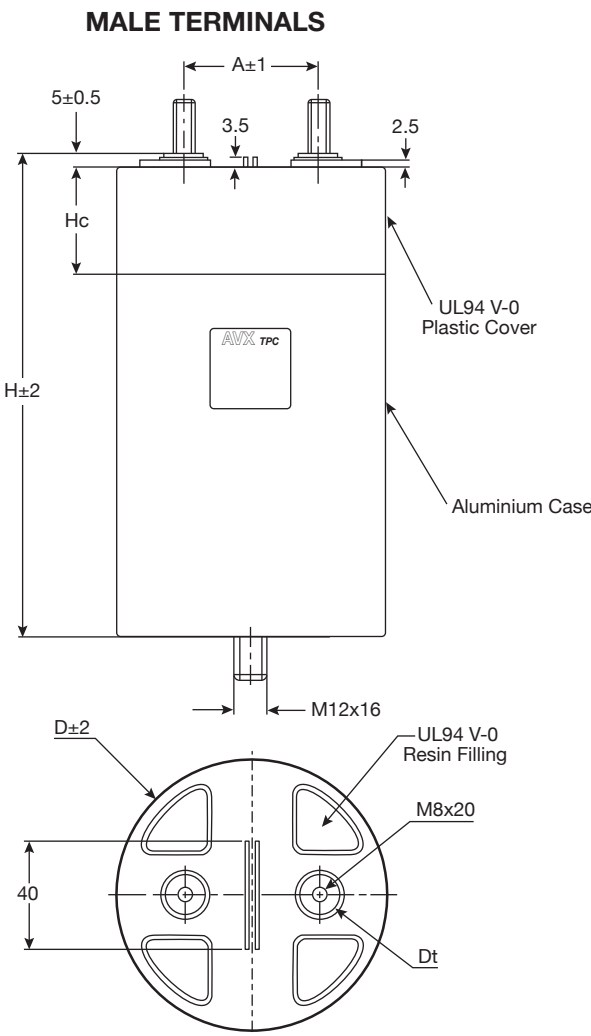
FFLI 800V to 1400Vdc* RoHS Compliant



DIMENSIONS



D (mm)	75	85	100	116
A (mm)	32	32	50	50
Dt (mm)	12	12	15	15
Hc (mm)	30	30	40	40



	Max Torque (Nm)
M6	4.5
M8	8.5
M12	15

D (mm)	Distance terminal to terminal (mm)		Distance terminal to case (mm)	
	creepage	clearance	creepage	clearance
75	40	19	47	45
85	40	19	52	50
100	55	34	59	57
116	55	34	67	65

MECHANICAL MOUNTING

Capacitors enclosure presents a M12 x 16 bolt in order to fix the capacitor. Over height (H) more than 1.5 x D (diameter of tube), we recommend to clamp (constraint < 35daN), just below the plastic cover, the capacitor in order to limit oscillations in case of potential Shock&Vibration stress.

DC FILTERING

FFLI 800V to 1400Vdc* RoHS Compliant



RATINGS AND PART NUMBER REFERENCE

Part Number	Capacitance (μF)	D	H	I _{rms} (A)	I ² t (A ² s)	Typical L _s (nH)	Typical R _s (mΩ)	R _{th} (°C/W)	Typical Weight (g)
U_ndc 800V									
FFLI6B0297K**	290	75	105	54	13	35	3.1	4.5	600
FFLI6B0397K**	390	85	105	66	24	35	2.3	4.0	700
FFLI6B0507K**	500	75	155	49	13	50	4.1	4.0	850
FFLI6B0687K**	680	85	155	59	24	50	3.1	3.7	1100
FFLI6B0817K**	810	85	180	58	24	60	3.5	3.4	1300
FFLI6B1007K**	1000	100	155	73	52	50	2.2	3.4	1500
FFLI6B1207K**	1200	100	180	70	52	60	2.5	3.3	1800
FFLI6B1357K**	1350	116	155	86	95	50	1.7	3.2	2000
FFLI6B1607K**	1600	116	180	80	95	60	2.0	3.1	2400
FFLI6B1907K**	1900	116	240	112	320	40	1.1	2.9	3200
FFLI6B2407K**	2400	116	290	111	320	50	1.2	2.7	3900
FFLI6B3007K**	3000	116	340	109	320	60	1.4	2.4	4500
U_ndc 1000V									
FFLI6L0197K**	190	75	105	49	8	35	3.7	4.5	600
FFLI6L0267K**	260	85	105	60	16	35	2.8	4.0	700
FFLI6L0337K**	330	75	155	45	8	50	4.9	4.0	850
FFLI6L0457K**	450	85	155	54	16	50	3.7	3.7	1100
FFLI6L0547K**	540	85	180	53	16	60	4.2	3.4	1300
FFLI6L0657K**	650	100	155	66	33	50	2.7	3.4	1500
FFLI6L0787K**	780	100	180	64	33	60	3.0	3.3	1800
FFLI6L0907K**	900	116	155	79	66	50	2.0	3.2	2000
FFLI6L1107K**	1100	116	180	75	66	60	2.3	3.1	2400
FFLI6L1307K**	1300	116	240	107	210	40	1.2	2.9	3200
FFLI6L1607K**	1600	116	290	103	210	50	1.4	2.7	3900
FFLI6L2007K**	2000	116	340	102	210	60	1.6	2.4	4500
U_ndc 1150V									
FFLI6U0157K**	150	75	105	46	7	35	4.2	4.5	600
FFLI6U0207K**	200	85	105	56	12	35	3.2	4.0	700
FFLI6U0267K**	260	75	155	42	7	50	5.6	4.0	850
FFLI6U0357K**	350	85	155	51	12	50	4.2	3.7	1100
FFLI6U0437K**	430	85	180	50	12	60	4.7	3.4	1300
FFLI6U0537K**	530	100	155	64	27	50	2.9	3.4	1500
FFLI6U0637K**	630	100	180	61	27	60	3.3	3.3	1800
FFLI6U0727K**	720	116	155	75	51	50	2.2	3.2	2000
FFLI6U0867K**	860	116	180	72	51	60	2.5	3.1	2400
FFLI6U1007K**	1000	116	240	99	160	40	1.4	2.9	3200
FFLI6U1307K**	1300	116	290	99	160	50	1.5	2.7	3900
FFLI6U1607K**	1600	116	340	99	160	60	1.7	2.4	4500
U_ndc 1400V									
FFLI6Q1056K**	105	75	105	43	5	35	4.9	4.5	600
FFLI6Q0147K**	140	85	105	51	9	35	3.8	4.0	700
FFLI6Q1856K**	185	75	155	40	5	50	6.4	4.0	850
FFLI6Q0257K**	250	85	155	47	9	50	4.8	3.7	1100
FFLI6Q0307K**	300	85	180	46	9	60	5.5	3.4	1300
FFLI6Q0367K**	360	100	155	58	19	50	3.5	3.4	1500
FFLI6Q0447K**	440	100	180	56	19	60	3.9	3.3	1800
FFLI6Q0507K**	500	116	155	69	36	50	2.6	3.2	2000
FFLI6Q0607K**	600	116	180	66	36	60	3.0	3.1	2400
FFLI6Q0707K**	700	116	240	96	120	40	1.5	2.9	3200
FFLI6Q0907K**	900	116	290	93	120	50	1.7	2.7	3900
FFLI6Q1107K**	1100	116	340	91	120	60	2.0	2.4	4500

**Insert - for male terminals or JE for female terminals

DC FILTERING

FFLI 800V to 1400Vdc* RoHS Compliant



CALCULATION FORM

SPECIFICATION

Capacitance	C (μF)	
Working voltage	U _w (V)	
Rms current	I _{rms} (A _{rms})	
Frequency	f (Hz)	
Ripple voltage	U _r (V)	
Ambient temperature	θ _{amb} (°C)	
Lifetime @ U _w , I _{rms} and θ _{amb}	hours	
Parasitic inductance	L (nH)	
Cooling conditions		

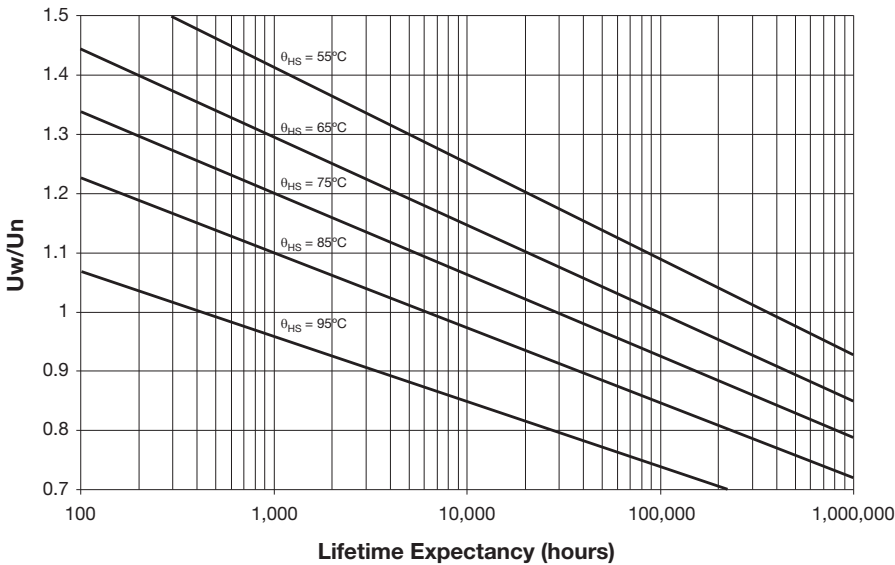
Your choice

PN		
Capacitance	C (μF)	
Rated voltage	U _n (V)	
Serial resistance	R _s (mΩ)	
between hot spot and case	R _{th} (°C/W)	

CALCULATIONS

Maximum ripple voltage	U _{rmax} = 0.2 U _n	U _{rmax} = V
The maximum ripple voltage of the selected capacitor must be in any case higher than the ripple voltage of your application		
Ratio U _w /U _n	ρ = U _w /U _n	ρ =
Joule losses	P _j = R _s × I _{rms2}	P _j = W
Dielectric losses	P _d = Q × tgδ0 = Q × 2.10 ⁻⁴	P _d = W
Hot spot temperature	θ _{HS} = θ _{amb} + (P _j + P _d) × R _{th}	θ _{HS} = °C
The hot spot temperature must be in any case lower than 95°C		

LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE



Expected lifetime at hot spot calculated and U = U_w



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DC FILTERING

FFLI HV 1500V to 3800Vdc* RoHS Compliant



The FFLI series is specifically designed for DC filtering applications such as DC link. This high voltage range offers solutions for voltage from 1500V up to 3800V.

The **Controlled Self Healing Technology**, essential to ensure a safe and reliable behavior, is achieved using a wet solution with both polypropylene metallized film and oil (without free oil). Standard designs proposed in this catalogue are covering a wide range of voltage and capacitance values.

In case of specific requirements about shape and performances, please feel free to contact your local KYOCERA AVX representative.

PACKAGING MATERIAL

Aluminium cylindrical case filled thermosetting resin.

Self extinguishing thermosetting resin (V-0 : in accordance with UL94; certified classification according to EN 45545-2)

Self extinguishing plastic cover (V-0: in accordance with UL94; certified classification according to EN 45545-2)

RoHS components

M6/10 Female connections or M8/20 Male connections

HOW TO ORDER

FFLI	6	L	0257	K	--
Series	Dielectric 6 = Polypropylene	Voltage Code R = 1500V S = 1750V N = 2000V T = 2250V P = 2500V W = 2750V X = 3000V Y = 3500V Z = 3800V	Capacitance EIA Code 	Capacitance Tolerances K = ±10%	Terminal Code -- = Male Threaded JE = Female Threaded

STANDARDS

- IEC 61071: Power electronic capacitors
- IEC 61881: Railway applications, rolling stock equipment, capacitors for power electronics
- IEC 60068-2: Environmental testing
- IEC 61373: Shock and vibrations
- UL 94: Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

DEFINITIONS

C_n (μF)	capacitance	nominal value of the capacitance measured at $\theta_{amb} = 25 \pm 10^\circ\text{C}$
U_n (V)	rated DC voltage	maximum operating peak voltage of either polarity (non-reversing type waveform), for which the capacitor has been designed for continuous operation
U_w (V)	working voltage	value of the maximum operating recurrent voltage for a given hot spot temperature and an expected lifetime
U_r (V)	ripple voltage	peak-to-peak alternating component of the unidirectional voltage
L_s (nH)	parasitic inductance	capacitor series self-inductance
R_s (mΩ)	series resistance	capacitor series resistance due to galvanic circuit
I_{rms} (A)	RMS current	RMS current value for continuous operation under natural convection generating 30°C overheating
θ_{amb} (°C)	cooling air temperature	temperature of the cooling air measured at the hottest position of the capacitor, under steady-state conditions, midway between two units NOTE If only one unit is involved, it is the temperature measured at a point approximately 0.1 m away from the capacitor container and at two-thirds of the height from its base
θ_{HS} (°C)	hot spot temperature	highest temperature obtained inside the case of the capacitor in thermal equilibrium
I^2t (A²s)	integral of action	maximum repetitive integral of action that galvanic circuit is able to withstand

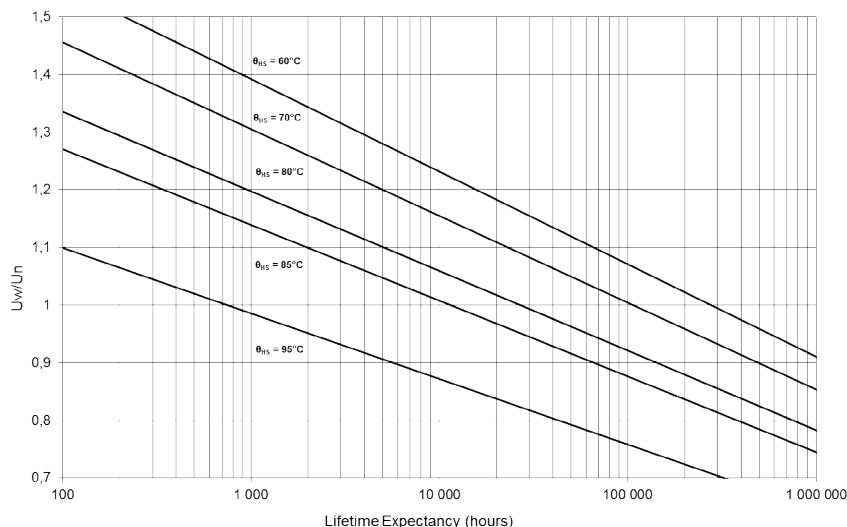
CHARACTERISTICS

Capacitance range C_n	53μF to 1100μF
Tolerance on C_n	±10%
Rated DC voltage U_n	1500 to 3800V
Lifetime at U_n and 70°C hot-spot temperature and $\Delta C / C < 2\%$	100,000h
Parasitic inductance L_s	40 to 60nH
Maximum rms current I_{rms}	up to 92A _{rms}
Test voltage between terminals @ 25°C	1.5 x U_n for 10 _s
Test voltage between terminals and Case @ 25°C	9kV _{rms} @ 50Hz for 10s
Dielectric	polypropylene
Climatic Category	40 / 95 / 56 (IEC 60068)
Working temperature	-40°C / +95°C (according to the power dissipated)
Storage temperature	-40°C / +95°C
Calorific value	40 MJ/kg

DC FILTERING

FLLI HV 1500V to 3800Vdc* RoHS Compliant

LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE



HOW TO CHOSE THE RIGHT CAPACITOR

The capacitor lifetime depends on the working voltage and the hot spot temperature.

Our caps are designed to meet 100000 hours lifetime at rated voltage and 70°C hot spot temperature. In accordance with operating conditions, please calculate the hot spot temperature and deduce from this calculation if the obtained lifetime can suit the application.

1. From the tables, select a capacitor with required capacitance

C_n and voltage U_n .

Calculate the maximum ripple voltage allowed for the selected cap:

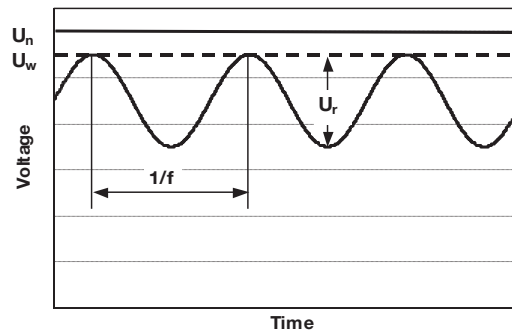
$$U_{rmax} = 0.2U_n$$

If $U_r > U_{rmax}$, select a capacitor with higher rated voltage

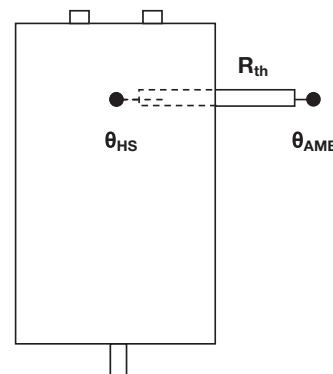
Make sure I_{rms} application < I_{rms} table

Copy out:

- serial resistance (R_s): see table of values
- thermal resistances R_{th}



R_{th} : between case and ambient air



2. Hot spot temperature calculation

Total losses are calculated as follow: $P_t = P_j + P_d$

Joule losses: $P_j = R_s \times I_{rms}^2$

Dielectric losses: $P_d = Q \times \tan \delta_0$ with

- $Q(\text{reactive power}) = \frac{I_{rms}^2}{C\omega}$ for a sinusoidal waveform

- $\tan \delta_0 = 2 \times 10^{-4}$ (dielectric losses of polypropylene)

Hot spot temperature will be:

$$\theta_{HS} = \theta_{amb} + (P_j + P_d) \times R_{th}$$

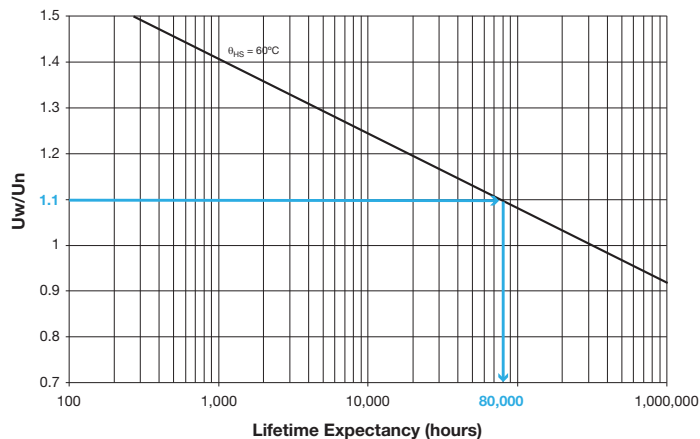
θ_{HS} **absolute maximum is 95°C**

If temperature is higher than 95°C, come back to #1 and start again with another selection.

DC FILTERING

FFLI HV 1500V to 3800Vdc* RoHS Compliant

3. Refer to the curve and deduce the lifetime vs U_w/U_n ratio



eg: rated voltage 2000V
working voltage 2200V
 $\rho = 1.1 \Rightarrow$ lifetime 80,000 hours @ 60°C hot spot temperature

Please, find a calculation form at the end of the catalog

MTBF CALCULATION

The failure rate λ_B depends on hot spot temperature θ_{HS} and charge ratio ρ .

$$\rho = U_w/U_n$$

$$\lambda_B = 3 \times 10^{2.75(\rho-1)} \times e^{\left(3.2 \left(\frac{\theta_{HS} + 273}{358}\right)^{30}\right)} \times 10^{-9} \text{ in failures/hour}$$

GENERAL FAILURE RATE

$\lambda = \lambda_B \times \pi_Q \times \pi_B \times \pi_E$ failures/hour • π_Q , π_B and π_E see following tables

Qualification	Qualification factor π_Q
Product qualified on IEC61071 and internal qualification	1
Product qualified on IEC61071	2
Product answering on another norm	5
Product without qualification	15

Environment	Environment factor π_E
On ground (good conditions)	1
On ground (fixed materials)	2
On ground (on board)	4
On ship	9
On plane	15

Environment	Environment factor π_B
Favorable	1
Unfavourable	5

MEAN TIME BETWEEN FAILURE (MTBF)

$$\text{MTBF} = 1/\lambda \text{ hours}$$

SURVIVAL FUNCTION

$$N = N_0 \times \exp(-\lambda t)$$

N is the number of pieces still working after t hours.

N_0 is the number of pieces at the origin ($t = 0$)

FAILURE MODE

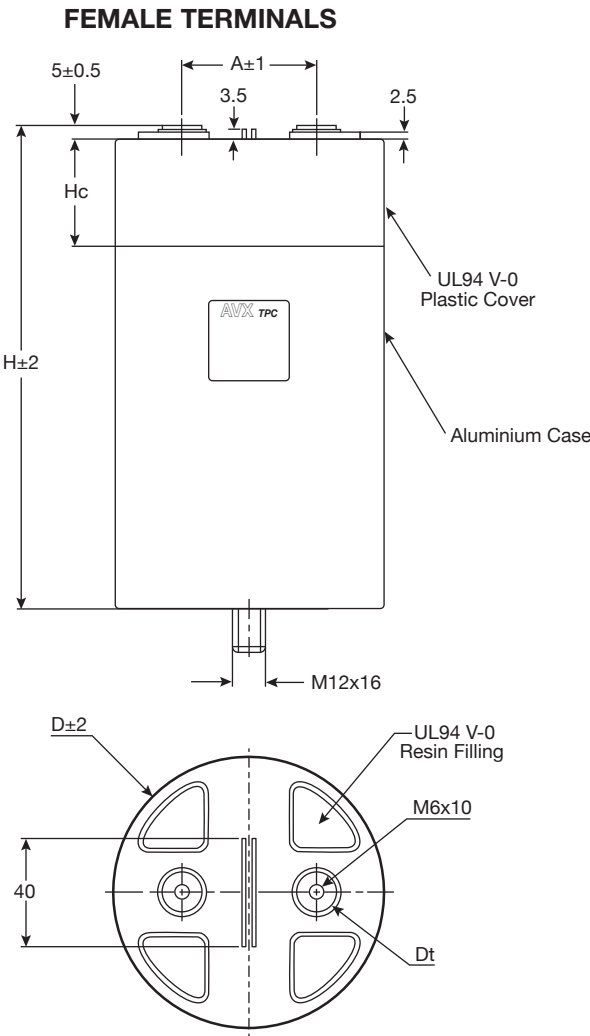
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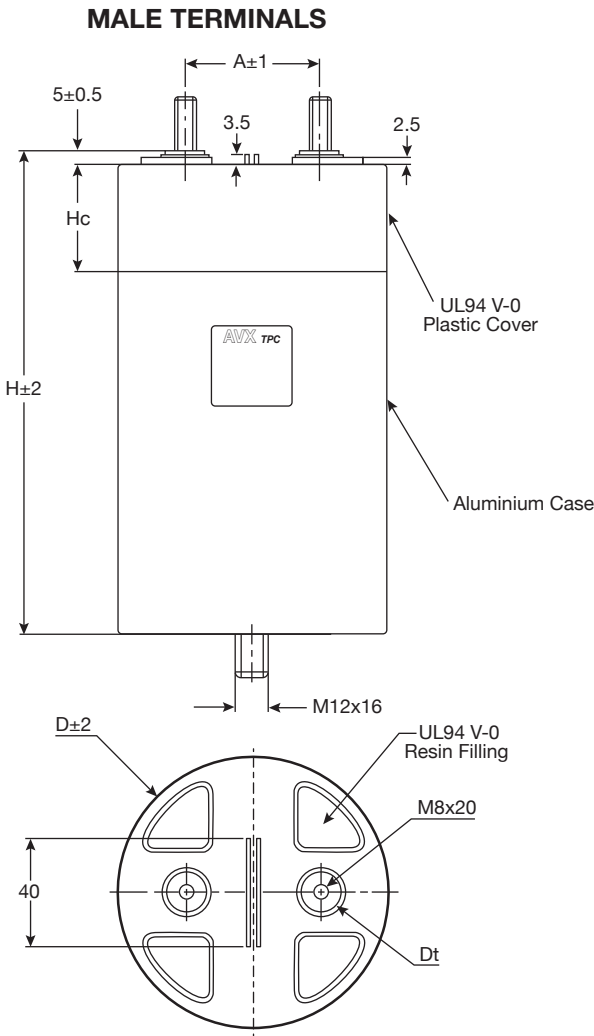
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DIMENSIONS



D (mm)	85	100	116	116
A (mm)	32	50	50	50
Dt (mm)	12	15	15	15
Hc (mm)	30	40	40	40



	Max Torque (Nm)
M6	4.5
M8	8.5
M12	15

D (mm)	Distance terminal to terminal (mm)		Distance terminal to case (mm)	
	creepage	clearance	creepage	clearance
85	40	19	52	50
100	55	34	59	57
116	55	34	67	65

MECHANICAL MOUNTING

Capacitors enclosure presents a M12 x 16 bolt in order to fix the capacitor. Over height (H) more than 1.5 x D (diameter of tube), we recommend to clamp (constraint < 35daN), just below the plastic cover, the capacitor in order to limit oscillations in case of potential Shock&Vibration stress.



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DC FILTERING

FFLI HV 1500V to 3800Vdc* RoHS Compliant



RATINGS AND PART NUMBER REFERENCE

Part Number	Capacitance (μF)	D	H	I _{rms} (A)	I ² t (A ² s)	Typical L _s (nH)	Typical R _s (mΩ)	R _{th} (°C/W)	Typical Weight (g)
U_n = 1500V									
FFLI6R0257K**	250	85	155	51	11	50	3.2	3.6	1100
FFLI6R0317K**	310	85	180	49	11	60	3.8	3.3	1300
FFLI6R0377K**	370	100	155	62	24	50	2.3	3.3	1500
FFLI6R0457K**	450	100	180	59	24	60	2.7	3.1	1800
FFLI6R0517K**	510	116	155	74	45	50	1.8	3.1	2000
FFLI6R0627K**	620	116	180	70	45	60	2.1	2.9	2400
FFLI6R0707K**	700	116	240	92	140	40	1.1	3.2	3200
FFLI6R0907K**	900	116	290	90	140	50	1.3	2.9	3900
FFLI6R1107K**	1100	116	340	89	140	60	1.5	2.5	4500
U_n = 1750Vdc									
FFLI6S1856K**	185	85	155	48	8	50	3.7	3.6	1100
FFLI6S2256K**	225	85	180	46	8	60	4.4	3.3	1300
FFLI6S0277K**	270	100	155	58	18	50	2.6	3.3	1500
FFLI6S0337K**	330	100	180	56	18	60	3.1	3.1	1800
FFLI6S0377K**	370	116	155	69	33	50	2.0	3.1	2000
FFLI6S0457K**	450	116	180	65	33	60	2.4	2.9	2400
FFLI6S0527K**	520	116	240	89	108	40	1.2	3.2	3200
FFLI6S0677K**	670	116	290	86	108	50	1.4	2.9	3900
FFLI6S0827K**	820	116	340	85	108	60	1.7	2.5	4500
U_n = 2000Vdc									
FFLI6N0147K**	140	85	155	45	6	50	4.2	3.6	1100
FFLI6N0177K**	170	85	180	43	6	60	5.0	3.3	1300
FFLI6N0206K**	205	100	155	55	13	50	3.0	3.3	1500
FFLI6N0257K**	250	100	180	52	13	60	3.5	3.1	1800
FFLI6N0287K**	280	116	155	65	25	50	2.3	3.1	2000
FFLI6N0357K**	350	116	180	62	25	60	2.6	2.9	2400
FFLI6N0407K**	400	116	240	85	82	40	1.3	3.2	3200
FFLI6N0517K**	510	116	290	82	82	50	1.5	2.9	3900
FFLI6N0627K**	620	116	340	81	82	60	1.8	2.5	4500
U_n = 2250Vdc									
FFLI6T0117K**	110	85	155	43	5	50	4.7	3.6	1100
FFLI6T1356K**	135	85	180	41	5	60	5.5	3.3	1300
FFLI6T0167K**	160	100	155	52	10	50	3.3	3.3	1500
FFLI6T0187K**	195	100	180	49	10	60	4.0	3.1	1800
FFLI6T0227K**	220	116	155	62	20	50	2.5	3.1	2000
FFLI6T0277K**	270	116	180	59	20	60	3.0	2.9	2400
FFLI6T0317K**	310	116	240	81	64	40	1.4	3.2	3200
FFLI6T0407K**	400	116	290	79	64	50	1.7	2.9	3900
FFLI6T0497K**	490	116	340	78	64	60	2.0	2.5	4500
U_n = 2500Vdc									
FFLI6P0856K**	85	85	155	40	4	50	5.2	3.6	1100
FFLI6P1056K**	105	85	180	39	4	60	6.1	3.3	1300
FFLI6P0127K**	120	100	155	49	8	50	3.8	3.3	1500
FFLI6P0157K**	150	100	180	47	8	60	4.4	3.1	1800
FFLI6P0177K**	170	116	155	59	16	50	2.8	3.1	2000
FFLI6P0217K**	210	116	180	56	16	60	3.3	2.9	2400
FFLI6P0237K**	230	116	240	77	50	40	1.6	3.2	3200
FFLI6P0307K**	300	116	290	75	50	50	1.9	2.9	3900
FFLI6P0387K**	380	116	340	75	50	60	2.2	2.5	4500
U_n = 2750Vdc									
FFLI6W0706K**	70	85	155	39	3.3	50	5.7	3.6	1100
FFLI6W0856K**	85	85	180	37	3.3	60	6.8	3.3	1300
FFLI6W0107K**	100	100	155	47	7	50	4.1	3.3	1500
FFLI6W1256K**	125	100	180	45	7	60	4.8	3.1	1800
FFLI6W0147K**	140	116	155	56	13	50	3.0	3.1	2000
FFLI6W0177K**	170	116	180	53	13	60	3.6	2.9	2400
FFLI6W0197K**	190	116	240	74	42	40	1.7	3.2	3200
FFLI6W0257K**	250	116	290	73	42	50	2.0	2.9	3900
FFLI6W0317K**	310	116	340	72	42	60	2.4	2.5	4500
U_n = 3000Vdc									
FFLI6X0586K**	58	85	155	37	2.7	50	6.3	3.6	1100
FFLI6X0706K**	70	85	180	35	2.7	60	7.6	3.3	1300
FFLI6X0856K**	85	100	155	45	6	50	4.4	3.3	1500
FFLI6X1056K**	105	100	180	43	6	60	5.2	3.1	1800
FFLI6X1156K**	115	116	155	54	11	50	3.3	3.1	2000
FFLI6X1456K**	145	116	180	51	11	60	3.9	2.9	2400
FFLI6X0167K**	160	116	240	72	35	40	1.8	3.2	3200
FFLI6X0217K**	210	116	290	70	35	50	2.1	2.9	3900
FFLI6X0267K**	260	116	340	69	35	60	2.5	2.5	4500
U_n = 3500Vdc									
FFLI6Y0606K**	60	100	155	60	17	50	2.5	3.3	1500
FFLI6Y0756K**	75	100	180	58	17	60	2.9	3.1	1800
FFLI6Y0856K**	85	116	155	72	34	50	1.9	3.1	2000
FFLI6Y1056K**	105	116	180	68	34	60	2.2	3.0	2400
FFLI6Y1156K**	115	116	240	89	110	40	1.2	3.3	3200
FFLI6Y0157K**	150	116	290	88	106	50	1.3	2.9	3900
FFLI6Y0197K**	190	116	340	88	110	60	1.6	2.5	4500
U_n = 3800Vdc									
FFLI6Z0536K**	53	100	155	59	15	50	2.6	3.3	1500
FFLI6Z0666K**	66	100	180	56	15	60	3.0	3.1	1800
FFLI6Z0726K**	72	116	155	69	28	50	2.0	3.1	2000
FFLI6Z0906K**	90	116	188	66	28	60	2.3	3.0	2400
FFLI6Z0107K**	100	116	240	88	95	40	1.2	3.3	3200
FFLI6Z0137K**	130	116	290	86	92	50	1.4	2.9	3900
FFLI6Z1656K**	165	116	340	87	95	60	1.5	2.5	4500

**Insert -- for male terminals or JE for female terminals



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.kyocera-avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

DC FILTERING

FFLI HV 1500V to 3800Vdc* RoHS Compliant



CALCULATION FORM

SPECIFICATION

Capacitance	C (μF)	
Working voltage	U _w (V)	
Rms current	I _{rms} (Arms)	
Frequency	f (Hz)	
Ripple voltage	U _r (V)	
Ambient temperature	θ _{amb} (°C)	
Lifetime @ U _w , I _{rms} and θ _{amb}	hours	
Parasitic inductance	L (nH)	

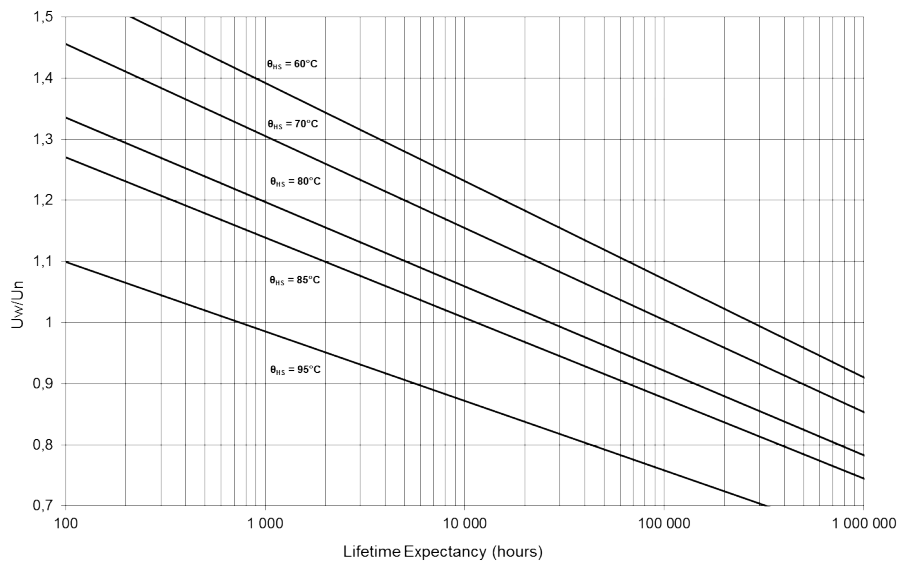
Your choice

PN		
Capacitance	C (μF)	
Rated voltage	U _n (V)	
Serial resistance	R _s (mΩ)	
between hot spot and case	R _{th} (°C/W)	

CALCULATIONS

Maximum ripple voltage	U _{rmax} = 0.2 U _n	U _{rmax} =	V
The maximum ripple voltage of the selected capacitor must be in any case higher than the ripple voltage of your application			
Ratio U _w /U _n	ρ = U _w /U _n	ρ =	
Joule losses	P _j = R _s x I _{rms} ²	P _j =	W
Dielectric losses	P _d = Q x t g δ 0 = Q x 2.10 ⁻⁴	P _d =	W
Hot spot temperature	θ _{HS} = θ _{amb} + (P _j + P _d) x R _{th}	θ _{HS} =	°C
The hot spot temperature must be in any case lower than 95°C			

LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE



Expected lifetime at hot spot calculated at U_w



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Medium Power Film Capacitors

FFPC 800Vdc to 3800Vdc



GENERAL DESCRIPTION

The FFPC series is specifically designed for DC filtering applications such as DC link or resonant filters for voltages up to 3800V.

The safe and reliable **Controlled Self Healing Technology** makes this series particularly suitable for power converters in traction, drives and renewable energy areas.

FFPC use a dry solution or a wet solution (without free oil) with polypropylene metallized film.

Standard designs proposed in this catalogue are covering a wide range of voltage and capacitance values.

In case of specific requirements about shape and performances, feel free to contact your local KYOCERA AVX representative.

PACKAGING MATERIAL

Rectangular resin filled plastic case (PA66 30% GF)

2 or 4 terminals M12x30mm

The plastic case and the thermosetting resin are self-extinguishing materials. These two housing materials have the UL Recognition at V-0 level according to the UL 94 standard and have certified classifications according to the EN 45545-2 standard.

STANDARDS

- IEC 61071: Power electronic capacitors
- IEC 61881: Railway applications, rolling stock equipment, capacitors for power electronics
- IEC 60068-2: Environmental testing
- UL 94: Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
- EN 45545-2: Railway applications – Fire protection on railway vehicles
Part 2: Requirements for fire behavior of materials and components

HOW TO ORDER

FFPC	2	B	1697	K	--
T	T	T	T	T	T
Series	Terminals Numbers	Voltage	Capacitance EIA code	Capacitance tolerance	Terminal Code
	2 4	B = 800V S = 1900V C = 900V N = 2000V L = 1000V T = 2300V U = 1100V P = 2550V V = 1250V W = 2800V Q = 1350V X = 3000V R = 1500V Y = 3500V M = 1750V Z = 3800V		K = ±10%	-- = Male Threaded JE = Female Threaded

Medium Power Film Capacitors

FFPC 800Vdc to 3800Vdc

DEFINITIONS

C_n (μF)	capacitance	nominal value of the capacitance measured at $\theta_{amb} = 25 \pm 10^\circ\text{C}$
U_n (V)	rated DC voltage	maximum operating peak voltage of either polarity (non-reversing type waveform), for which the capacitor has been designed for continuous operation
U_w (V)	working voltage	value of the maximum operating recurrent voltage for a given hot spot temperature and an expected lifetime
U_r (V)	ripple voltage	peak-to-peak alternating component of the unidirectional voltage
L_s (nH)	parasitic inductance	capacitor series self-inductance
R_s (mΩ)	series resistance	capacitor series resistance due to galvanic circuit
I_{rms} (A)	RMS current	rms current value @ 100Hz for continuous operation under natural convection generating 20°C overheating
θ_{amb} (°C)	cooling air temperature	temperature of the cooling air measured at the hottest position of the capacitor, under steady-state conditions, midway between two units NOTE If only one unit is involved, it is the temperature measured at a point approximately 0,1 m away from the capacitor container and at two-thirds of the height from its base
θ_{HS} (°C)	hot spot temperature	highest temperature obtained inside the case of the capacitor in thermal equilibrium

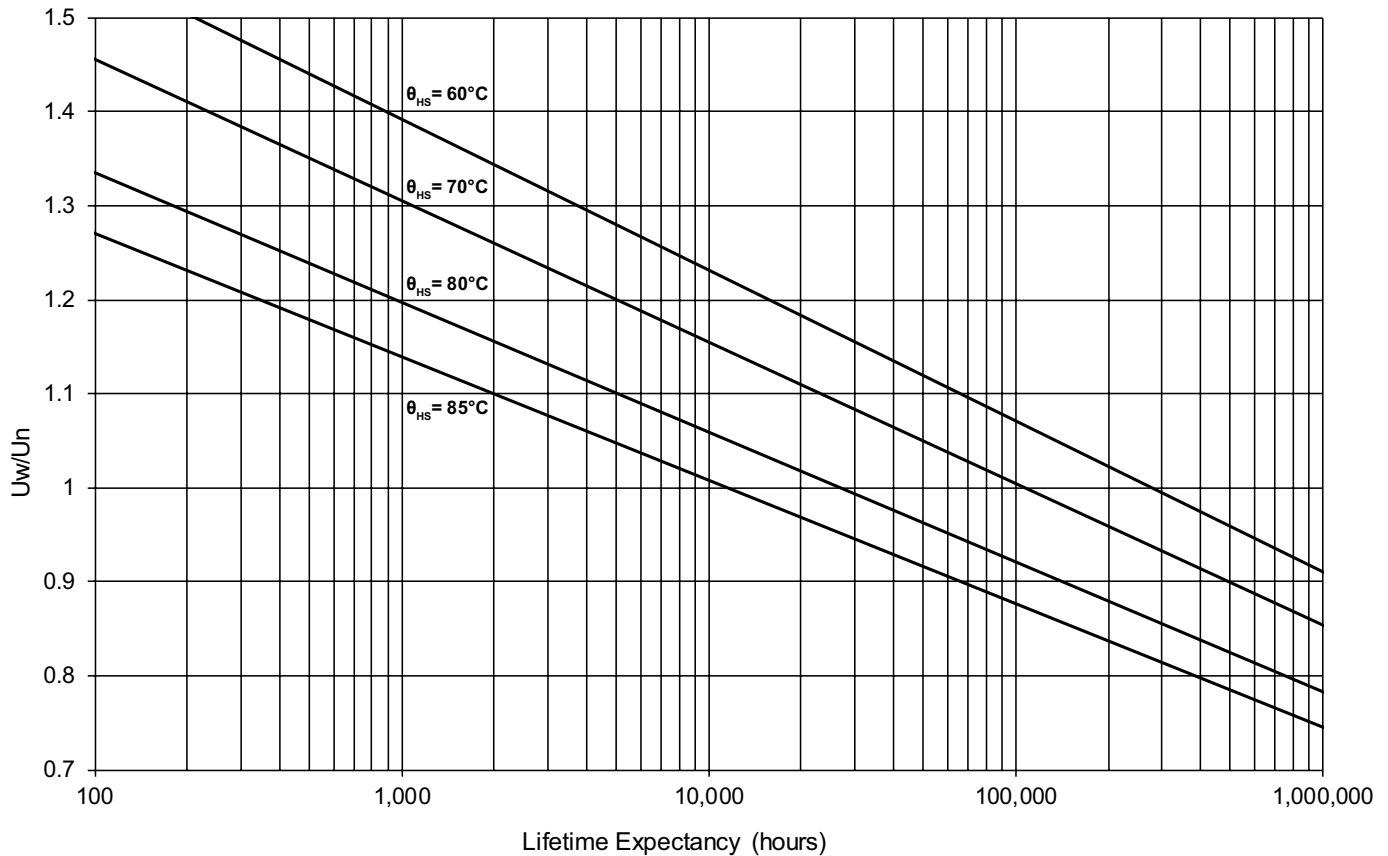
CHARACTERISTICS

Capacitance range C_n	95μF to 5060μF
Tolerance on C_n	±10%
Rated DC voltage U_n	800 to 3800V
Lifetime at U_n and 70°C hot-spot temperature and $\Delta C/C < 2\%$	100,000h
Typical parasitic inductance L_s	35nH to 85nH
Maximum rms current $I_{rms\ max}$	up to 155A _{rms} for 2 terminals up to 300A _{rms} for 4 terminals
Test voltage between terminals @ 25°C	1.5 x U_n for 10s
Test voltage between terminals and Case @ 25°C	9 kV _{rms} @ 50Hz for 10s
Dielectric	polypropylene
Climatic Category	40 / 85 / 56 (IEC 60068)
Working temperature	-40°C / +85°C (according to the power dissipated)
Storage temperature	-40°C / +85°C
Calorific value	40 MJ/kg

Medium Power Film Capacitors

FFPC 800Vdc to 3800Vdc

LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURES



HOW TO CHOOSE THE RIGHT CAPACITOR

The capacitor lifetime depends on the working voltage and the hot spot temperature.

Our caps are designed to meet 100000 hours lifetime at rated voltage and 70°C hot spot temperature. In accordance with operating conditions, please calculate the hot spot temperature and deduce from this calculation if the obtained lifetime can suit the application.

1- From the tables, select a capacitor with required capacitance C_n and voltage U_n .

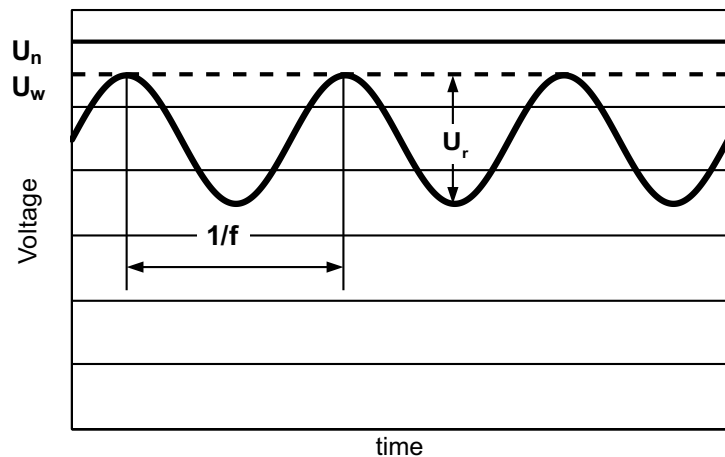
Calculate the maximum ripple voltage allowed for the selected cap : $U_{rmax} = 0,2U_n$

If $U_r > U_{rmax}$, select a capacitor with higher rated voltage

Make sure $I_{rms \text{ application}} < I_{rms \text{ table}}$

Copy out:

- serial resistance (R_s) : see table of values
- thermal resistance R_{th} : see table of values



Medium Power Film Capacitors

FFPC 800Vdc to 3800Vdc

2- Hot spot temperature calculation

Total losses are calculated as follow: $P_t = P_j + P_d$

Joule losses: $P_j = R_s \times I_{rms}^2$

Dielectric losses: $P_d = Q \times \text{tg}\delta\omega$ with

- Q (reactive power) $\frac{I_{rms}^2}{\omega C}$ for a sinusoidal waveform

- $\text{tg}\delta\omega = 2 \times 10^{-4}$ (dielectric losses of polypropylene)

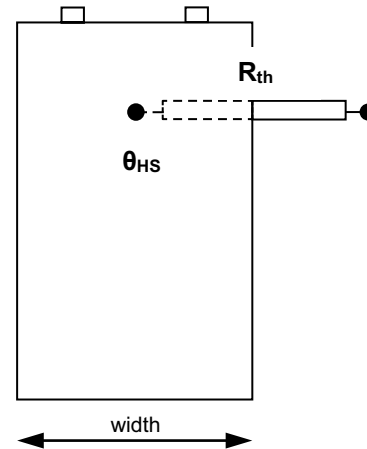
Hot spot temperature will be:

$$\theta_{HS} = \theta_{amb} + (P_j + P_d) \times R_{th}$$

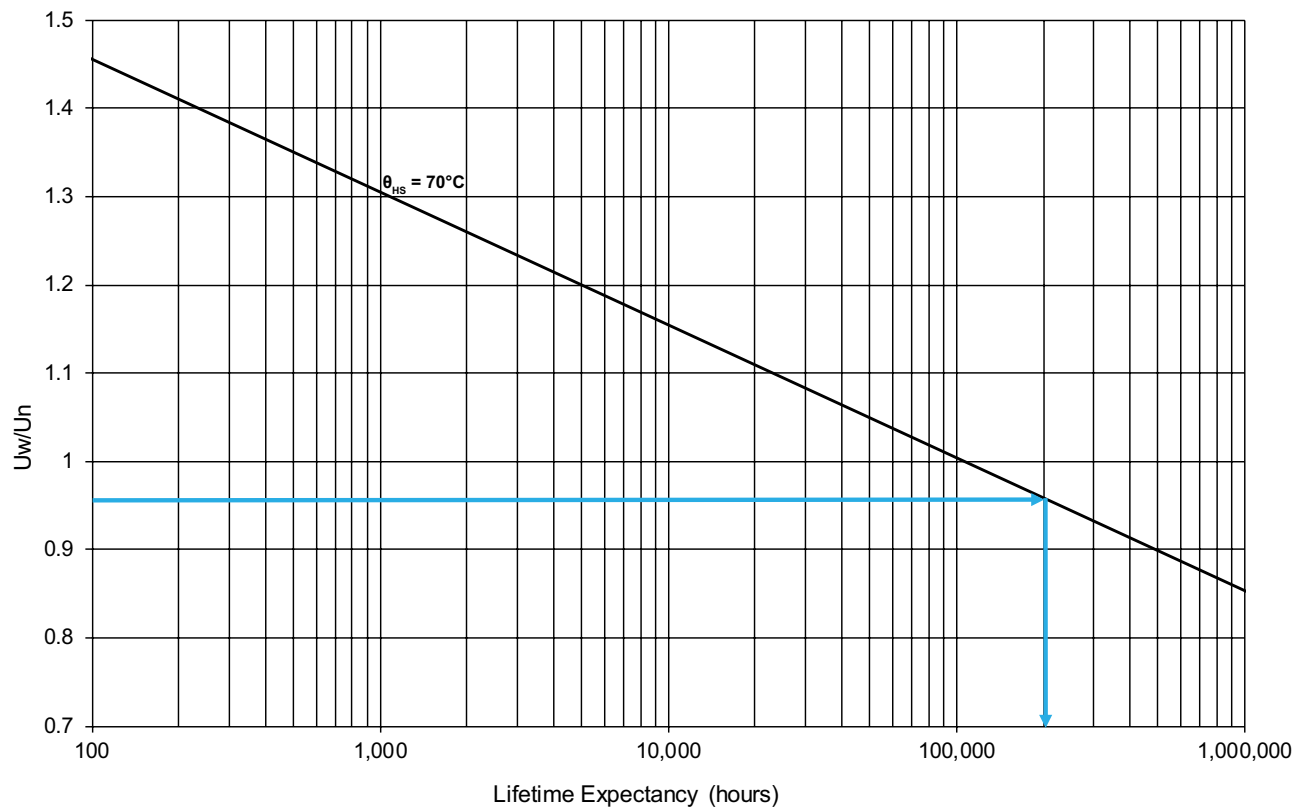
θ_{HS} absolute maximum is 85°C

If temperature is higher than 85°C, come back to #1 and start again with another selection.

R_{th} : thermal resistance between hot spot and ambient air



3- Refer to the curve and deduce the lifetime vs U_w/U_n ratio



Eg: rated voltage 2000V
working voltage 1900V
 $\rho = U_w / U_n = 0,95$ lifetime is 200 000hours @ 70°C hot spot temperature

You will find a calculation form at the end of the catalogue

Medium Power Film Capacitors

FFPC 800Vdc to 3800Vdc

THERMAL RESISTANCE

R_{th} (°C/W): Thermal resistance between hot spot and ambient temperatures (Natural air cooling)

Height (mm)	R_{th} (°C/W)
109	2,9
187	2,2
262,5	1,4



For confined area, capacitor working in a closed cabinet, a thermal test under real conditions is necessary to evaluate the thermal resistance.

PARASITIC INDUCTANCE

Measurement @ 1MHz

Height (mm)	Typical Ls (nH)	
	2 terminals	4 terminals
109	45	35
187	65	55
262,5	85	75

MTBF CALCULATION

The failure rate λ_B depends on hot spot temperature θ_{HS} and charge ratio ρ .

$$\rho = U_w / U_n$$

$$\lambda_B \text{ in failures/hour} = 3 \times 10^{2,75 (\rho-1)} \times e^{\left(3,2 \left(\frac{\theta_{HS} + 273}{358} \right)^{30}\right)} \times 10^{-9}$$

GENERAL FAILURE RATE

$\lambda = \lambda_B \times \pi_Q \times \pi_B \times \pi_E$ failures/hour π_Q, π_B and π_E see following tables

Qualification	Qualification factor π_Q
Product qualified on IEC61071 and internal qualification	1
Product qualified on IEC61071	2
Product answering on another norm	5
Product without qualification	15

Environment	Environment factor π_E
On ground (good conditions)	1
On ground (fixed materials)	2
On ground (on board)	4
On ship	9
On plane	15

Environment	Environment factor π_B
Favorable	1
Unfavorable	5

MEAN TIME BETWEEN FAILURE (MTBF)

MTBF = 1/ λ hours

SURVIVAL FUNCTION

$$N = N_0 \times \exp(-\lambda t)$$

N is the number of pieces still working after t hours

N_0 is the number of pieces at the origin (t=0)

FAILURE MODE

Main failure mode due to KYOCERA AVX's **Controlled Self-Healing Technology** is only losses of capacitance.

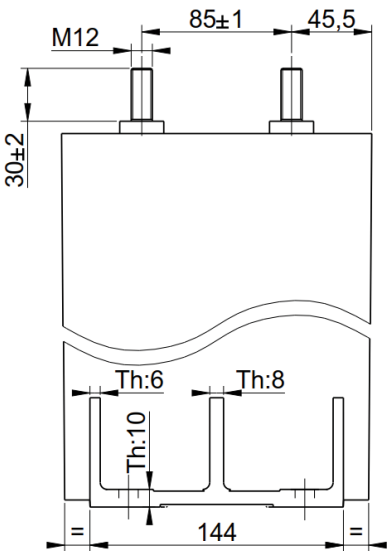
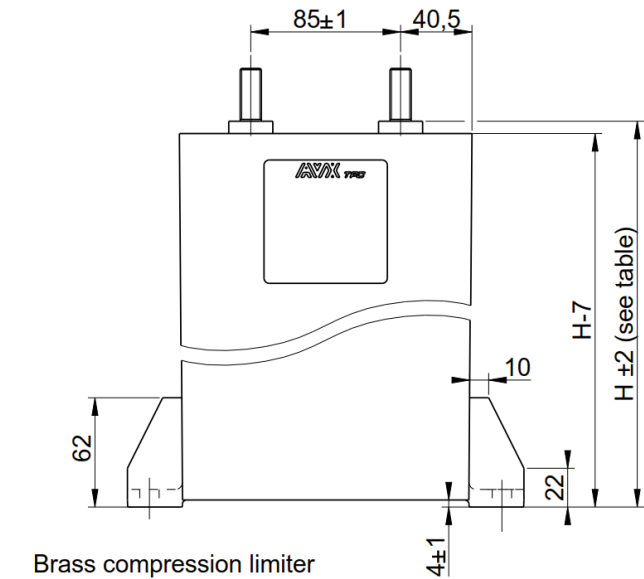
Thanks to **Controlled Self-healing** solution to interrupt self-healing process in order to prevent avalanche effect due to polypropylene molecular cracking producing gas and potential explosion in confined box for none **Controlled Self-Healing capacitors**.

Medium Power Film Capacitors

FFPC 800Vdc to 3800Vdc



MALE TERMINALS VERSION DIMENSIONS

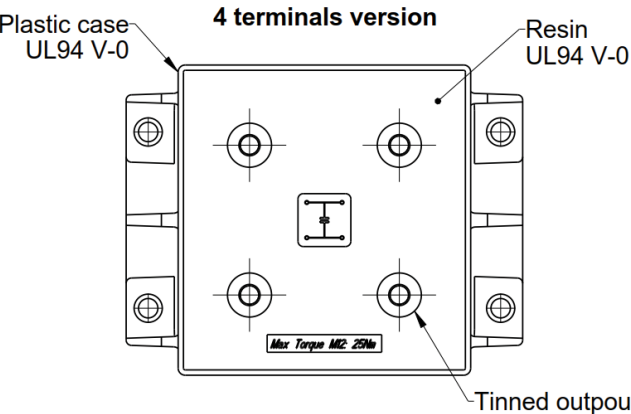
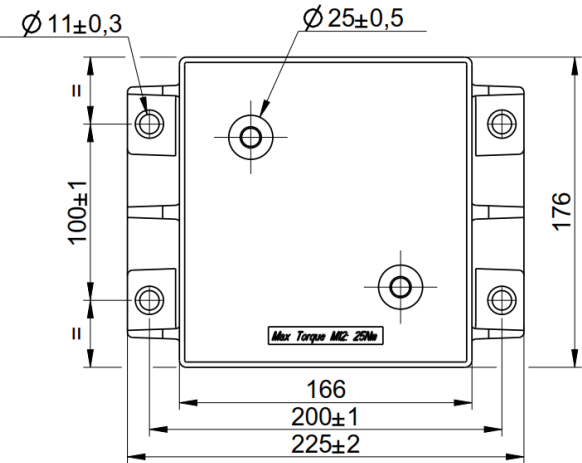


Max Torque M12: 25Nm

General tolerances: ±3

H (mm)	Weight (Kg)
109	4.2
187	6.8
262.5	9.3

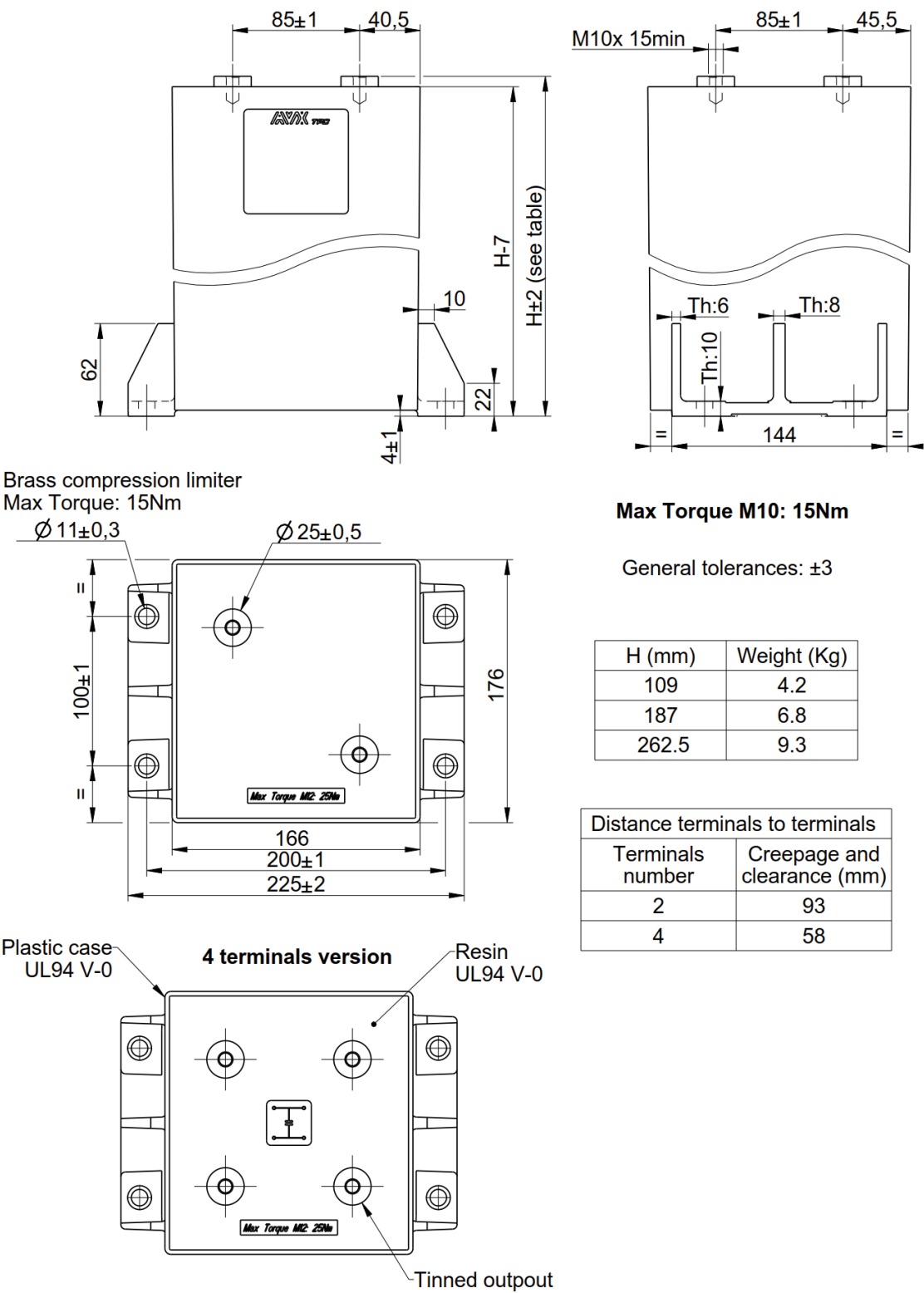
Distance terminals to terminals	
Terminals number	Creepage and clearance (mm)
2	93
4	58



Medium Power Film Capacitors FFPC 800Vdc to 3800Vdc



FEMALE TERMINALS VERSION DIMENSIONS



Medium Power Film Capacitors

FFPC 800Vdc to 3800Vdc

TABLE OF VALUES

Part Number	U _n (Vdc)	C (μF)	H (mm)	R _s (mΩ)	I _{rms} (A)
FFPC*B1697K ^{oo}	800	1690	109	1,50	65
FFPC*B3377K ^{oo}	800	3370	187	0,78	103
FFPC*B5067K ^{oo}	800	5060	262,5	0,56	155
FFPC*C1367K ^{oo}	900	1360	109	1,67	61
FFPC*C2727K ^{oo}	900	2720	187	0,87	97
FFPC*C4087K ^{oo}	900	4080	262,5	0,61	146
FFPC*L1127K ^{oo}	1000	1120	109	1,83	58
FFPC*L2237K ^{oo}	1000	2230	187	0,95	92
FFPC*L3357K ^{oo}	1000	3350	262,5	0,67	139
FFPC*U0907K ^{oo}	1100	900	109	2,05	54
FFPC*U1797K ^{oo}	1100	1790	187	1,06	87
FFPC*U2687K ^{oo}	1100	2680	262,5	0,74	131
FFPC*V0697K ^{oo}	1250	690	109	2,32	50
FFPC*V1387K ^{oo}	1250	1380	187	1,19	81
FFPC*V2067K ^{oo}	1250	2060	262,5	0,83	123
FFPC*Q0627K ^{oo}	1350	620	109	2,44	49
FFPC*Q1247K ^{oo}	1350	1240	187	1,26	78
FFPC*Q1857K ^{oo}	1350	1850	262,5	0,87	119
FFPC*R0647K ^{oo}	1500	640	109	1,68	57
FFPC*R1287K ^{oo}	1500	1280	187	0,88	91
FFPC*R1917K ^{oo}	1500	1910	262,5	0,62	137
FFPC*M0477K ^{oo}	1750	470	109	1,94	52
FFPC*M0947K ^{oo}	1750	940	187	1,01	83
FFPC*M1417K ^{oo}	1750	1410	262,5	0,70	126
FFPC*S0417K ^{oo}	1900	410	109	2,08	50
FFPC*S0827K ^{oo}	1900	820	187	1,08	80
FFPC*S1227K ^{oo}	1900	1220	262,5	0,75	121
FFPC*N0367K ^{oo}	2000	360	109	2,23	47
FFPC*N0717K ^{oo}	2000	710	187	1,15	76
FFPC*N1077K ^{oo}	2000	1070	262,5	0,80	116
FFPC*T0287K ^{oo}	2300	280	109	2,51	44
FFPC*T0567K ^{oo}	2300	560	187	1,29	71
FFPC*T0847K ^{oo}	2300	840	262,5	0,89	108
FFPC*P0227K ^{oo}	2550	220	109	2,83	40
FFPC*P0437K ^{oo}	2550	430	187	1,45	65
FFPC*P0657K ^{oo}	2550	650	262,5	1,00	100
FFPC*W0187K ^{oo}	2800	180	109	3,12	38
FFPC*W0367K ^{oo}	2800	360	187	1,59	61
FFPC*W0537K ^{oo}	2800	530	262,5	1,10	93
FFPC*X0157K ^{oo}	3000	150	109	3,40	36
FFPC*X0307K ^{oo}	3000	300	187	1,74	58
FFPC*X0457K ^{oo}	3000	450	262,5	1,19	88
FFPC*Y0117K ^{oo}	3500	110	109	1,76	39
FFPC*Y0227K ^{oo}	3500	220	187	0,91	63
FFPC*Y0337K ^{oo}	3500	330	262,5	0,64	96
FFPC*Z0956K ^{oo}	3800	95	109	1,90	37
FFPC*Z0197K ^{oo}	3800	190	187	0,98	59
FFPC*Z2856K ^{oo}	3800	285	262,5	0,69	91

* Insert terminal number (2 or 4)

^{oo} insert "-" for male terminals or "JE" for female terminals

Medium Power Film Capacitors

FFPC 800Vdc to 3800Vdc



CALCULATION FORM SPECIFICATION

Capacitance	C (μF)	
Working voltage	U _w (V)	
Rms current	I _{rms} (A _{rms})	
Frequency	f (Hz)	
Ripple voltage	U _r (V)	
Ambient temperature	Θ _{amb} (°C)	
Lifetime @ U _w , I _{rms} and Θ _{amb}	hours	
Parasitic inductance	L (nH)	

YOUR CHOICE

PN		
Capacitance	C (μF)	
Rated voltage	U _n (V)	
Serial resistance	R _s (mΩ)	
Thermal resistance between hot spot and ambient air	R _{th} (°C/W)	

CALCULATIONS

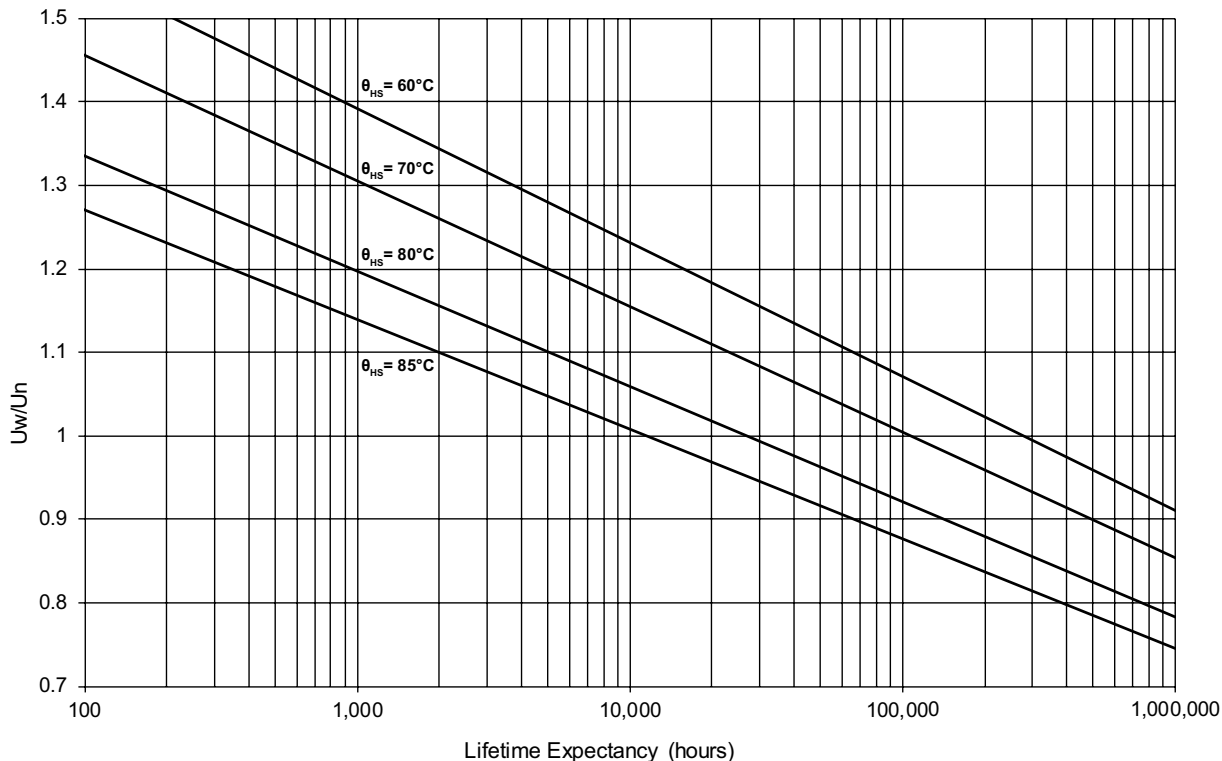
Maximum ripple voltage	$U_{rmax} = 0,2 \times U_n$	U _{rmax} =	V
------------------------	-----------------------------	---------------------	---

The maximum ripple voltage of the selected capacitor must be in any case higher than the ripple voltage of your application

Ratio U _w / U _n	$\rho = U_w / U_n$	ρ =	
Joule losses	$P_j = R_s \times I_{rms}^2$	P _j =	W
Dielectric losses	$P_d = Q \times \tan \delta_0 = Q \times 2.10^{-4}$	P _d =	W
Hot spot temperature	$\Theta_{HS} = \Theta_{amb} + (P_j + P_d) \times R_{th}$	Θ _{HS} =	°C

The hot spot temperature must be in any case lower than 85°C

LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE



Expected lifetime at hot spot calculated and $U=U_w$	
--	--

Medium Power Film Capacitors

FFPC 800Vdc to 3800Vdc



This questionnaire lists the information we require to prepare an offer according to your exact requirements

Company / Name / Email	Project / Quantity
------------------------	--------------------

Applications	DC Filtering		Discharge*		Protection*		Tuning
Capacitance (μF)							
Tolerance (%)							
Operating Voltage	Vpeak		Vch		Vpeak	Vdc	Vrms
Ripple Voltage (peak to peak)	V						
Working frequency (Hz)							
Operating current	Arms		Apeak		Arms		Arms
Maximum Current/Duration	Arms	s			Apeak		
Discharge			Aperiodic	Oscillatory			
Pulse Duration (5% Ipeak)							
Time to Ipeak (μs)							
Ringing Frequency (Hz)							
Reversal Voltage (%)							
Repetition Rate			shots/min/hour/day		Hz		
Hold Time @ Full Voltage (s)							
Fault Peak Current/nb shots	Apeak	shots	Apeak	shots			
Fault Reversal Voltage (%)							
Lifetime Expectancy	hours		shots		hours		hours
Maximum Inductance (nH)							
Test Voltage between Terminals (V)							
Test Voltage between Shorted Terminals and Case (V)							
Maximum Surge Voltage (MSV)							
MSV Duration / Frequency	s	/years			s	/year	

Due to the particularities of varying waveforms in such application, more information on the exact nature of waveform is generally required for a full analysis.

Description			
Dimensions (mm) / Shape	Operating Position	Terminas	
Section: Height	vertical, horizontal, inclined, and upside down	Type	Quantity
rectangular, cylindrical			

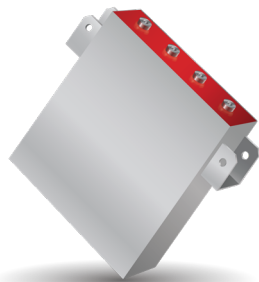
Thermal Characteristics					
Storage Temperature (°C)		Operating Temperature (°C)		Cooling Method	
min.		min.		Natural Convection	
average		average		Forced Air (m/s)	
max.		max.		Water	

Remarks



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TDS-MDPWR-0003 | Rev 1



GENERAL DESCRIPTION

The FFLC series is specifically designed for DC filtering applications such as DC link or resonant filters.

Large case sizes up to 35 liters and high specific energy up to 240J/l together with safe and reliable **Controlled Self Healing Technology** make this series particularly suitable for power converters in traction, drives and renewable energy areas.

FFLC uses polypropylene metallized segmented film and it is fully dry technology.

Standard designs proposed in this catalogue are covering a wide range of voltage and capacitance.

STANDARDS

- IEC 61071: Power electronic capacitors
- IEC 61881: Railway applications, rolling stock equipment, capacitors for power electronics
- IEC 60068-2: Environmental testing
 - UL 94: Tests for Flammability of Plastic Materials for Parts in Devices and Appliances
- EN 45545-2: Railways applications – Fire protection on railway vehicles – Part 2 : Requirements for fire behaviour of materials and components

PACKAGING MATERIAL

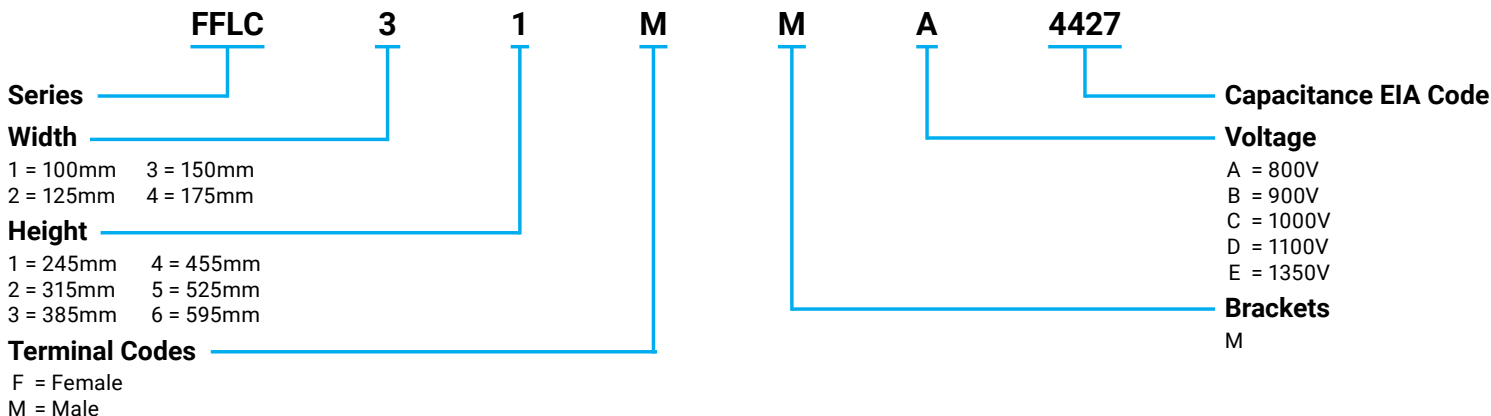
Non-painted rectangular resin filled aluminum case

Self extinguishing thermosetting protection resin (V-0: in accordance with UL 94; certified classifications according to EN 45545-2)

Mounting brackets

4 M8/15 Female connections or M12/30 Male connections

HOW TO ORDER



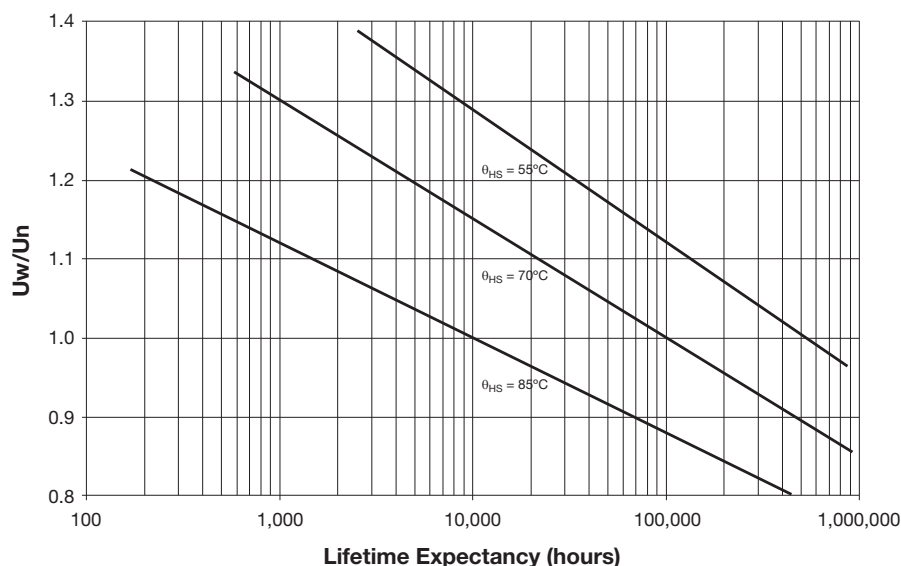
DEFINITIONS

C_n	capacitance	nominal value of the capacitance measured at $\theta_{amb} = 25 \pm 10^\circ\text{C}$
U_n	rated DC voltage	maximum operating peak voltage of either polarity (non-reversing type waveform), for which the capacitor has been designed for continuous operation
U_w	working voltage	value of the maximum operating recurrent voltage for a given hot spot temperature and an expected lifetime
U_r	ripple voltage	peak-to-peak alternating component of the unidirectional voltage
L_s	parasitic inductance	capacitor series self-inductance
R_s	capacitor series resistance	capacitor series resistance due to galvanic circuit
I_{rms}	thermal 1	RMS current value for continuous operation under natural convection generating 20°C overheating
I_{rms}	thermal 2	rms current value for continuous operation under forced air generating 20°C overheating
$\theta_{amb} (^\circ\text{C})$	cooling air temperature	temperature of the cooling air measured at the hottest position of the capacitor, under steady-state conditions, midway between two units NOTE If only one unit is involved, it is the temperature measured at a point approximately 0.1 m away from the capacitor container and at two-thirds of the height from its base
$\theta_{HS} (^\circ\text{C})$	hot spot temperature	highest temperature obtained inside the case of the capacitor in thermal equilibrium

CHARACTERISTICS

Capacitance range C_n	1750 μF to 20600 μF
Tolerance on C_n	$\pm 10\%$
Rated DC voltage U_n	800 to 1350V
Lifetime at U_n and 70°C hot-spot temperature and $\Delta C / C < 2\%$	100,000h
Parasitic inductance L_s	32 to 55nH
Maximum rms current I_{rms}	up to 400A _{rms}
Test voltage between terminals @ 25°C	$1.5 \times U_n$ for 10s
Test voltage between terminals and Case @ 25°C	4kV _{rms} @ 50Hz for 10s
Dielectric	polypropylene
Climatic Category	40 / 85 / 56 (IEC 60068)
Working temperature	$-40^\circ\text{C} / +85^\circ\text{C}$ (according to the power dissipated)
Storage temperature	$-40^\circ\text{C} / +85^\circ\text{C}$
Calorific value	27 MJ/kg

LIFETIME EXPECTANCY VS. HOT SPOT TEMPERATURE AND VOLTAGE



HOW TO CHOSE THE RIGHT CAPACITOR

The capacitor lifetime depends on the working voltage and the hot spot temperature.

Our caps are designed to meet 100000 hours lifetime at rated voltage and 70°C hot spot temperature. In accordance with operating conditions, please calculate the hot spot temperature and deduce from this calculation if the obtained lifetime can suit the application.

1. From the tables, select a capacitor with required capacitance

C_n and voltage U_n .

Calculate the maximum ripple voltage allowed for the selected cap:

$$U_{rmax} = 0.2U_n$$

If $U_r > U_{rmax}$, select a capacitor with higher rated voltage

Make sure I_{rms} application < I_{rms} table

Copy out:

- serial resistance (R_s): see table of values
- thermal resistances R_{th1} and R_{th2} (depending on cooling conditions)

2. Hot spot temperature calculation

Total losses are calculated as follow: $P_t = P_j + P_d$

Joule losses: $P_j = R_s \times I_{rms}^2$

Dielectric losses: $P_d = Q \times \text{tg}\delta_0$ with

- $Q(\text{reactive power}) = \frac{I_{rms}^2}{C\omega}$ for a sinusoidal waveform

- $\text{tg}\delta_0 = 2 \times 10^{-4}$ (dielectric losses of polypropylene)

Hot spot temperature will be:

$$\theta_{HS} = \theta_{amb} + (P_j + P_d) \times (R_{th1} + R_{th2})$$

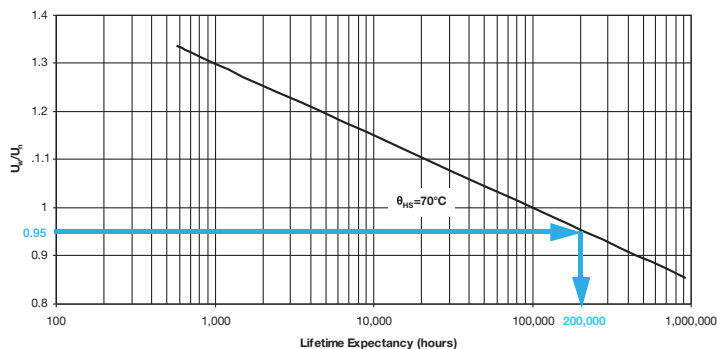
θ_{HS} **absolute maximum is 85°C**

If temperature is higher than 85°C, come back to #1 and start again with another selection.

R_{th1} : Thermal resistance between hot spot and case

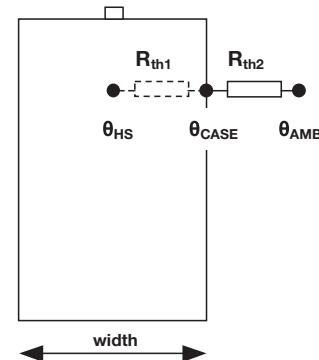
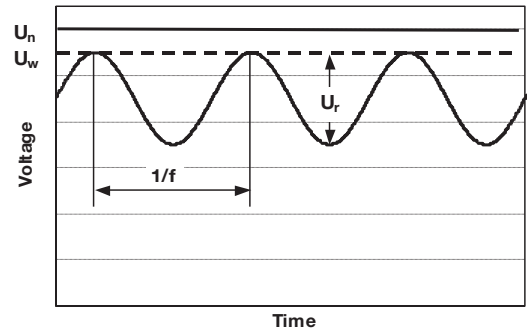
R_{th2} : Thermal resistance between case and ambient air

3. Refer to the curve and deduce the lifetime vs U_w/U_n ratio



eg: rated voltage 1000V
working voltage 950V
 $\rho = 0.95 \Rightarrow$ lifetime 200,000 hours
@ 70°C hot spot temperature

Please, find a calculation form at the end of the catalog



DC FILTERING

FFLC

THERMAL RESISTANCES

R_{th1} (°C/W): Thermal resistance between hot spot and case

Height (mm)	Rth1 (°C/W)			
	Width (mm)			
	100	125	150	175
245	0.56	0.67	0.76	0.82
315	0.41	0.49	0.56	0.6
385	0.3	0.36	0.41	0.44
455	0.25	0.3	0.34	0.37
525	0.2	0.24	0.27	0.3
595	0.17	0.21	0.24	0.26

R_{th2} (°C/W): Thermal resistance between case and ambient air under natural convection and forced air

Height (mm)	Rth2 (°C)							
	Natural air cooling				Forced air cooling >2m/s			
	Width (mm)				Width (mm)			
	100	125	150	175	100	125	150	175
245	0.47	0.44	0.42	0.40	0.23	0.22	0.21	0.20
315	0.36	0.35	0.33	0.31	0.18	0.17	0.16	0.16
385	0.30	0.28	0.27	0.25	0.15	0.14	0.13	0.13
455	0.25	0.24	0.23	0.22	0.13	0.12	0.11	0.11
525	0.22	0.21	0.20	0.19	0.11	0.10	0.10	0.09
595	0.19	0.18	0.17	0.16	0.10	0.09	0.09	0.08



For confined area, capacitor working in a closed cabinet, a thermal test under real conditions is necessary to evaluate the thermal resistance.

PARASITIC INDUCTANCE VS SIZE

Measurement @ 1MHz

Height (mm)	L _s (nH)			
	Width (mm)			
	100	125	150	175
245	32	34	35	37
315	34	36	38	40
385	36	39	41	44
455	38	41	44	48
525	40	43	47	51
595	42	46	51	55

MTBF CALCULATION

Low inductance design available on request

Based on Return Of Experience from the field of more than 30 years, we have established the following relation.

$$\rho = U_w / U_n$$

$$\lambda_B = 3 \times 10^{2.75(\rho-1)} \times e^{\left(3.2 \left(\frac{\theta_{HS} + 273}{358}\right)^{30}\right)} \times 10^{-9} \text{ in failures/hour}$$

GENERAL FAILURE RATE

$\lambda = \lambda_B \times \pi_Q \times \pi_B \times \pi_E$ failures/hour • π_Q , π_B and π_E see following tables

Qualification	Qualification factor π_Q
Product qualified on IEC61071 and internal qualification	1
Product qualified on IEC61071	2
Product answering on another norm	5
Product without qualification	15

Environment	Environment factor π_E
On ground (good conditions)	1
On ground (fixed materials)	2
On ground (on board)	4
On ship	9
On plane	15

Environment	Environment factor π_B
Favorable	1
Unfavourable	5

MEAN TIME BETWEEN FAILURE (MTBF)

MTBF = 1/λ hours

SURVIVAL FUNCTION

$$N = N_0 \times \exp(-\lambda t)$$

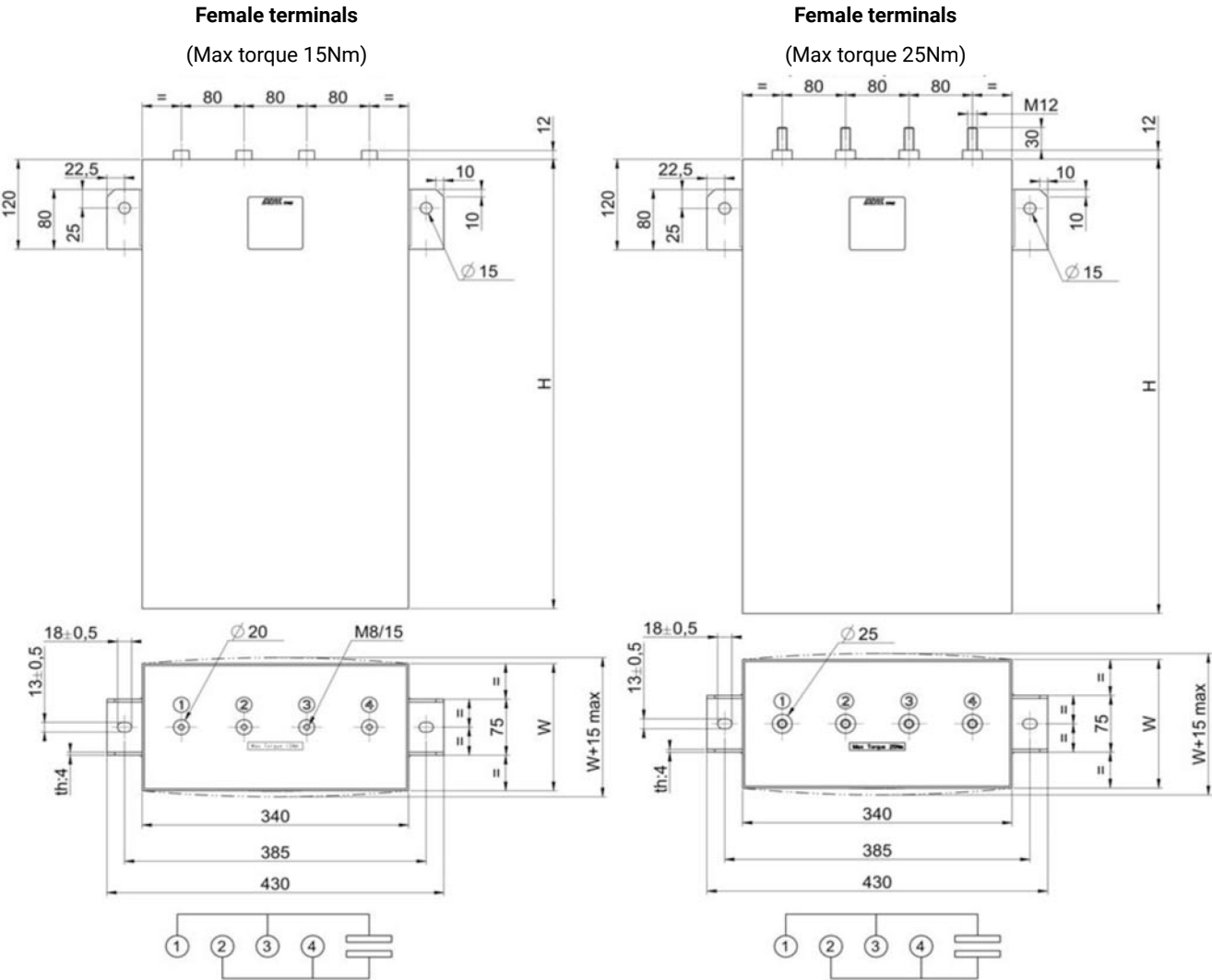
N is the number of pieces still working after t hours.

N_0 is the number of pieces at the origin (t = 0)

FAILURE MODE

Main failure mode due to KYOCERA AVX's **Controlled Self-Healing Technology** is only losses of capacitance. Thanks to **Controlled Self-Healing solution** to interrupt self-healing process in order to prevent avalanche effect due to polypropylene molecular cracking producing gas and potential explosion in confined box for none **Controlled Self-Healing capacitors**.

DIMENSIONS



Available standard dimensions (other dimensions on request for specific design)
H (mm): 245, 315, 385, 455, 525 and 595
W (mm): 100, 125, 150 and 175

WEIGHT VS SIZE

Weight (kg)				
Height	Width			
	100	125	150	175
245	12	15	17.5	20.5
315	15	18.5	22.5	26
385	18.5	23	27.5	32
455	21.5	27	32.5	37.5
525	25	31.5	37.5	42.5
595	28.5	35	41.5	48.5

DC FILTERING

FFLC

TABLE OF VALUES

Part Number	Capacitance (μF)	Width (mm)	Height (mm)	R _s (mΩ)	I _{rms} Thermal 1 (A)	I _{rms} Thermal 2 (A)
U _n = 800Vdc						
FFLC11 * MA4777	4,770	100	245	0.27	270	306
FFLC12 * MA6087	6,080	100	315	0.23	333	380
FFLC21 * MA6557	6,550	125	245	0.29	249	276
FFLC13 * MA7817	7,810	100	385	0.20	400	400
FFLC31 * MA8317	8,310	150	245	0.32	231	255
FFLC22 * MA8337	8,330	125	315	0.25	310	348
FFLC14 * MA9117	9,110	100	455	0.19	400	400
FFLC41 * MA1008	10,000	175	245	0.35	218	240
FFLC32 * MA1068	10,600	150	315	0.27	288	320
FFLC23 * MA1078	10,700	125	385	0.22	380	400
FFLC15 * MA1098	10,900	100	525	0.17	400	400
FFLC16 * MA1228	12,200	100	595	0.17	400	400
FFLC24 * MA1258	12,500	125	455	0.20	400	400
FFLC42 * MA1278	12,700	175	315	0.29	274	299
FFLC33 * MA1368	13,600	150	385	0.23	355	395
FFLC25 * MA1498	14,900	125	525	0.18	400	400
FFLC34 * MA1598	15,900	150	455	0.21	400	400
FFLC43 * MA1648	16,400	175	385	0.25	338	374
FFLC26 * MA1678	16,700	125	595	0.22	400	400
FFLC35 * MA1898	18,900	150	525	0.20	400	400
FFLC44 * MA1918	19,100	175	455	0.23	385	400
FFLC36 * MA2118	21,100	150	595	0.19	400	400
FFLC45 * MA2288	22,800	175	525	0.21	400	400
FFLC46 * MA2558	25,500	175	595	0.20	400	400
U _n = 900Vdc						
FFLC11 * MB3847	3,840	100	245	0.29	261	296
FFLC12 * MB4897	4,890	100	315	0.25	323	368
FFLC21 * MB5277	5,270	125	245	0.31	240	267
FFLC13 * MB6287	6,280	100	385	0.21	310	400
FFLC31 * MB6707	6,700	150	245	0.34	222	245
FFLC22 * MB6717	6,710	125	315	0.27	300	337
FFLC14 * MB7337	7,330	100	455	0.20	400	400
FFLC41 * MB8077	8,070	175	245	0.37	209	231
FFLC32 * MB8537	8,530	150	315	0.29	278	309
FFLC23 * MB8627	8,620	125	385	0.23	369	400
FFLC15 * MB8737	8,730	100	525	0.18	400	400
FFLC16 * MB9777	9,770	100	595	0.17	400	400
FFLC24 * MB1018	10,100	125	455	0.21	400	400
FFLC42 * MB1038	10,300	175	315	0.32	264	289
FFLC33 * MB1108	11,000	150	385	0.25	344	383
FFLC25 * MB1258	12,500	125	525	0.19	400	400
FFLC34 * MB1288	12,800	150	455	0.23	393	400
FFLC43 * MB1328	13,200	175	385	0.27	327	362
FFLC26 * MB1348	13,400	125	595	0.18	400	400
FFLC35 * MB1528	15,200	150	525	0.21	400	400
FFLC44 * MB1548	15,400	175	455	0.24	373	400
FFLC36 * MB1718	17,100	150	595	0.20	400	400
FFLC45 * MB1848	18,400	175	525	0.22	400	400
FFLC46 * MB2068	20,600	175	595	0.21	400	400

* Insert F for female terminals or M for male terminals

DC FILTERING

FFLC



TABLE OF VALUES

Part Number	Capacitance (μF)	Width (mm)	Height (mm)	R _s (mΩ)	I _{rms} Thermal 1 (A)	I _{rms} Thermal 2 (A)
U _n = 1000Vdc						
FFLC11 * MC3167	3,160	100	245	0.30	253	287
FFLC12 * MC4027	4,020	100	315	0.26	314	358
FFLC21 * MC4337	4,330	125	245	0.33	232	258
FFLC13 * MC5177	5,170	100	385	0.23	385	400
FFLC31 * MC5517	5,510	150	245	0.37	215	237
FFLC22 * MC5527	5,520	125	315	0.28	291	326
FFLC14 * MC6037	6,030	100	455	0.21	400	400
FFLC41 * MC6647	6,640	175	245	0.40	202	223
FFLC32 * MC7017	7,010	150	315	0.31	269	299
FFLC23 * MC7097	7,090	125	385	0.24	358	400
FFLC15 * MC7187	7,180	100	525	0.19	400	400
FFLC16 * MC8047	8,040	100	595	0.18	400	400
FFLC24 * MC8277	8,270	125	455	0.22	400	400
FFLC42 * MC8467	8,460	175	315	0.34	255	279
FFLC33 * MC9027	9,020	150	385	0.26	334	372
FFLC25 * MC9857	9,850	125	525	0.20	400	400
FFLC34 * MC1058	10,500	150	455	0.24	382	400
FFLC43 * MC1098	10,900	175	385	0.29	317	351
FFLC26 * MC1108	11,000	125	595	0.19	400	400
FFLC35 * MC1258	12,500	150	525	0.22	400	400
FFLC44 * MC1278	12,700	175	455	0.26	362	400
FFLC36 * MC1408	14,000	150	595	0.21	400	400
FFLC45 * MC1518	15,100	175	525	0.23	400	400
FFLC46 * MC1698	16,900	175	595	0.22	400	400
U _n = 1100Vdc						
FFLC11 * MD2537	2,530	100	245	0.33	243	276
FFLC12 * MD3227	3,220	100	315	0.28	303	345
FFLC21 * MD3487	3,480	125	245	0.36	223	248
FFLC13 * MD4147	4,140	100	385	0.24	373	400
FFLC31 * MD4427	4,420	150	245	0.40	206	227
FFLC22 * MD4437	4,430	125	315	0.31	280	314
FFLC14 * MD4837	4,830	100	455	0.22	400	400
FFLC41 * MD5347	5,340	175	245	0.44	194	214
FFLC32 * MD5637	5,630	150	315	0.34	259	288
FFLC23 * MD5697	5,690	125	385	0.26	346	392
FFLC15 * MD5757	5,750	100	525	0.20	400	400
FFLC16 * MD6447	6,440	100	595	0.19	400	400
FFLC24 * MD6647	6,640	125	455	0.24	395	400
FFLC42 * MD6797	6,790	175	315	0.37	245	269
FFLC33 * MD7247	7,240	150	385	0.28	323	359
FFLC25 * MD7907	7,900	125	525	0.22	400	400
FFLC34 * MD8447	8,440	150	455	0.26	370	400
FFLC43 * MD8737	8,730	175	385	0.31	306	339
FFLC26 * MD8857	8,850	125	595	0.20	400	400
FFLC35 * MD1018	10,100	150	525	0.23	400	400
FFLC44 * MD1028	10,200	175	455	0.28	350	388
FFLC36 * MD1138	11,300	150	595	0.22	400	400
FFLC45 * MD1218	12,100	175	525	0.25	400	400
FFLC46 * MD1368	13,600	175	595	0.23	400	400

* Insert F for female terminals or M for male terminals

DC FILTERING

FFLC

TABLE OF VALUES

Part Number	Capacitance (μF)	Width (mm)	Height (mm)	R _s (mΩ)	I _{rms} Thermal 1 (A)	I _{rms} Thermal 2 (A)
U _n = 1350Vdc						
FFLC11 * ME1757	1,750	100	245	0.37	228	259
FFLC12 * ME2237	2,230	100	315	0.32	285	325
FFLC21 * ME2407	2,400	125	245	0.41	208	232
FFLC13 * ME2867	2,860	100	385	0.27	353	400
FFLC31 * ME3057	3,050	150	245	0.46	192	212
FFLC22 * ME3067	3,060	125	315	0.35	263	210
FFLC14 * ME3347	3,340	100	455	0.24	400	400
FFLC41 * ME3677	3,670	175	245	0.51	180	199
FFLC32 * ME3887	3,880	150	315	0.38	242	270
FFLC23 * ME3927	3,920	125	385	0.28	334	378
FFLC15 * ME3987	3,980	100	525	0.22	400	400
FFLC16 * ME4457	4,450	100	595	0.21	400	400
FFLC24 * ME4587	4,580	125	455	0.26	374	400
FFLC42 * ME4687	4,680	175	315	0.42	229	251
FFLC33 * ME4997	4,990	150	385	0.32	303	337
FFLC25 * ME5457	5,450	125	525	0.24	400	400
FFLC34 * ME5827	5,820	150	455	0.29	349	393
FFLC43 * ME6017	6,010	175	385	0.35	287	318
FFLC26 * ME6107	6,100	125	595	0.22	400	400
FFLC35 * ME6937	6,930	150	525	0.26	400	400
FFLC44 * ME7017	7,010	175	455	0.31	329	365
FFLC36 * ME7767	7,760	150	595	0.24	400	400
FFLC45 * ME8357	8,350	175	525	0.28	383	400
FFLC46 * ME9357	9,350	175	595	0.26	400	400

* Insert F for female terminals or M for male terminals

DC FILTERING

FFLC

CALCULATION FORM SPECIFICATION

Your choice

Capacitance	C (μF)	
Working voltage	U _w (V)	
Rms current	I _{rms} (Arms)	
Frequency	f (Hz)	
Ripple voltage	U _r (V)	
Ambient temperature	θ _{amb} (°C)	
Lifetime @ U _w , I _{rms} and θ _{amb}	hours	
Parasitic inductance	L (nH)	
Cooling conditions		

PN		
Capacitance	C (μF)	
Rated voltage	U _n (V)	
Serial resistance	R _s (mΩ)	
Thermal resistance between hot spot and case	R _{th1} (°C/W)	
Thermal resistance between case and ambient air	R _{th2} (°C/W)	

CALCULATIONS

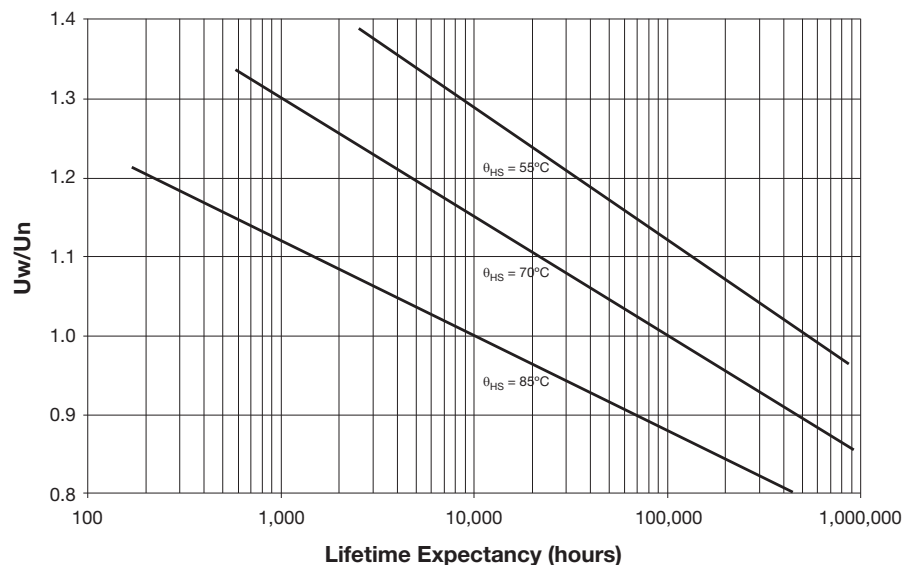
Maximum ripple voltage	U _{rmax} = 0.2 U _n	U _{rmax} =	V
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The maximum ripple voltage of the selected capacitor must be in any case higher than the ripple voltage of your application

Ratio V _w /V _n	ρ = U _w /U _n	ρ =	
Joule losses	P _j = R _s I _{rms} ²	P _j =	W
Dielectric losses	P _d = Qxtgδ0=Qx 2.10 ⁻⁴	P _d =	W
Hot spot temperature	θ _{HS} = θ _{amb} + (P _j + P _d) × (R _{th1} + R _{th2})	θ _{HS} =	°C

The hot spot temperature must be in any case lower than 85°C

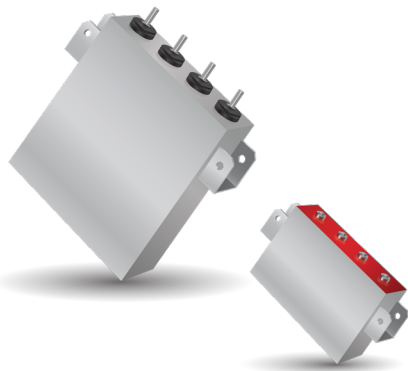
LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE



Expected lifetime at hot spot calculated and U = U_w

DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc



The FFHV and FTHV series are specifically designed for DC filtering applications such as DC link or resonant filters for voltages up to 2300V.

These capacitors are proposed in 2 different versions: resin top for the FFHV series and hermetic case for the FTHV.

Large case sizes up to 36 liters and high specific energy up to 455J/l* together with safe and reliable **Controlled Self Healing Technology** make this series particularly suitable for power converters in traction, drives, renewable energy and power transmission areas.

*for 100,000 hours and 70°C hot spot temperature

FFHV and FTHV use a wet solution with polypropylene metallized film and oil (without free oil).

Standard designs proposed in this catalogue are covering a wide range of voltage and capacitance values.

In case of specific requirements about shape and performances, feel free to contact your local KYOCERA AVX representative.

PACKAGING MATERIAL

FFHV	FTHV
Non-painted rectangular resin filled aluminium case Mounting brackets M8/17 female connections or M12/30 male connections 2 or 4 connections Self-extinguishing thermosetting protection resin (V-0: in accordance with UL 94 certified classifications according to EN 45545-2)	Non-painted rectangular aluminium hermetic case Mounting brackets M8/17 female terminals or M12/30 male terminals 2 or 4 terminals Self-extinguishing thermosetting technology body (certified classifications according to EN 45545-2)

STANDARDS

FFHV	FTHV
IEC 61071: Power electronic capacitors IEC 61881: Railway applications, rolling stock equipment, capacitors for power electronics IEC 61373: Railways application, rolling stock equipment, shock and vibrations tests IEC 60068-2: Environmental testing. Part 2: Tests UL 94: Tests for flammability of Plastic Materials for Parts in Devices and Appliances EN 45545-2: Railways applications – Fire protection on railway vehicles. Part 2 : Requirements for fire behavior of materials and components	IEC 61071: Power electronic capacitors IEC 61881: Railway applications, rolling stock equipment, capacitors for power electronics IEC 61373: Railways application, rolling stock equipment, shock and vibrations tests IEC 60068-2: Environmental testing. Part 2: Tests EN 45545-2: Railways applications – Fire protection on railway vehicles. Part 2: Requirements for fire behavior of materials and components behavior (FFHV and FTHV)

HOW TO ORDER

D ↑	FFHV ↑ Series FFHV: resin top	1 ↑ Section and Option 1 = 340x125 2 connexions 2 = 340x125 4 connexions 3 = 340x175 2 connexions 4 = 340x175 4 connexions	1 ↑ Height 1 = 230mm 2 = 295mm 3 = 370mm 4 = 450mm 5 = 530mm 6 = 610mm	M ↑ Terminal Code F = Female M = Male	R ↑ Voltage A = 1600V B = 1900V C = 2000V D = 2150V	2637 ↑ Capacitance EIA Code
D ↑	FTHV ↑ Series FTHV: hermetic case	1 ↑ Section and Option 1 = 340x125 2 connexions 2 = 340x125 4 connexions 3 = 340x175 2 connexions 4 = 340x175 4 connexions	1 ↑ Height 1 = 240mm 2 = 305mm 3 = 380mm 4 = 460mm 5 = 540mm 6 = 620mm	M ↑ Terminal Code F = Female M = Male	R ↑ Voltage A = 1600V B = 1900V C = 2000V D = 2150V	2637 ↑ Capacitance EIA Code

DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc

DEFINITIONS

C_n (μF)	capacitance	nominal value of the capacitance measured at $\theta_{amb} = 25 \pm 10^\circ\text{C}$
U_n (V)	rated DC voltage	maximum operating peak voltage of either polarity (non-reversing type waveform), for which the capacitor has been designed for continuous operation
U_w (V)	working voltage	value of the maximum operating recurrent voltage for a given hot spot temperature and an expected lifetime
U_r (V)	ripple voltage	peak-to-peak alternating component of the unidirectional voltage
L_s (nH)	parasitic inductance	capacitor series self-inductance
R_s (mΩ)	series resistance	capacitor series resistance due to galvanic circuit @ ambient temperature
I_{rms} thermal 1 (A)	RMS current	rms current value @ 100Hz for continuous operation under natural convection generating 20°C overheating (255Arms maximum for 2 connexions or terminals and 400Arms maximum for 4 connexions or terminals)
I_{rms} thermal 2 (A)	RMS current	rms current value @ 100Hz for continuous operation under forced air generating 20°C overheating (255A _{rms} maximum for 2 connexions or terminals and 400Arms maximum for 4 connexions or terminals)
θ_{amb} (°C)	cooling air temperature	temperature of the cooling air measured at the hottest position of the capacitor, under steady-state conditions, midway between two units NOTE If only one unit is involved, it is the temperature measured at a point approximately 0,1 m away from the capacitor container and at two-thirds of the height from its base
θ_{HS} (°C)	hot spot temperature	highest temperature obtained inside the case of the capacitor in thermal equilibrium

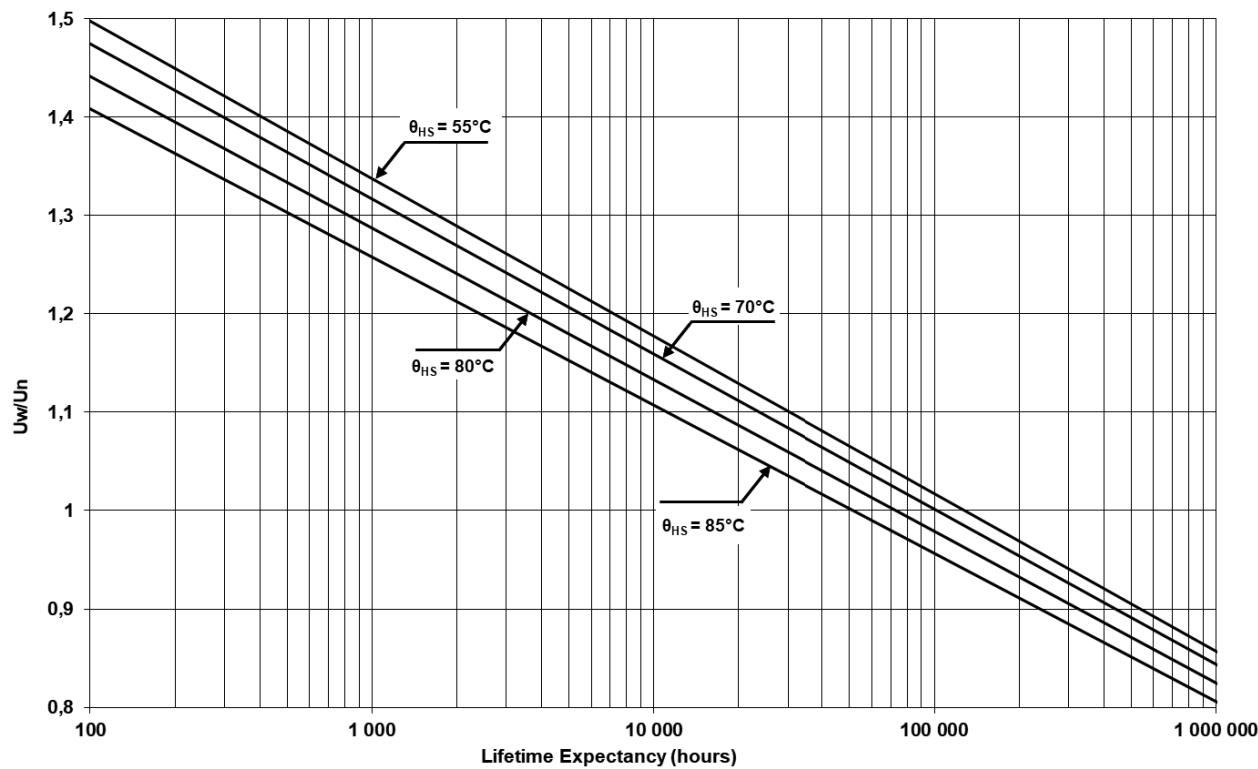
CHARACTERISTICS

Capacitance range C_n	1440μF to 12600μF
Tolerance on C_n	±10%
Rated DC voltage U_n	1600 to 2300V
Lifetime at U_n and $\Delta C / C < 2\%$	FFHV: 100,000h @ 70°C hot spot temperature FTHV: 100,000h @ 85°C hot spot temperature
Parasitic inductance L_s	27nH to 88nH
Maximum rms current I_{rms}	up to 400A _{rms}
Test voltage between terminals @ 25°C	1.5 x U_n for 10s
Test voltage between terminals and Case @ 25°C	7kV _{rms} @ 50Hz for 10s
Dielectric	polypropylene
Climatic Category	FFHV: 40 / 85 / 56 (IEC 60068) FTHV: 40 / 95 / 56 (IEC 60068)
Working temperature	FFHV: -40°C / +85°C (according to the power dissipated) FTHV: -40°C / +95°C (according to the power dissipated)
Storage temperature	-40°C / +85°C
Calorific value	34 MJ/kg

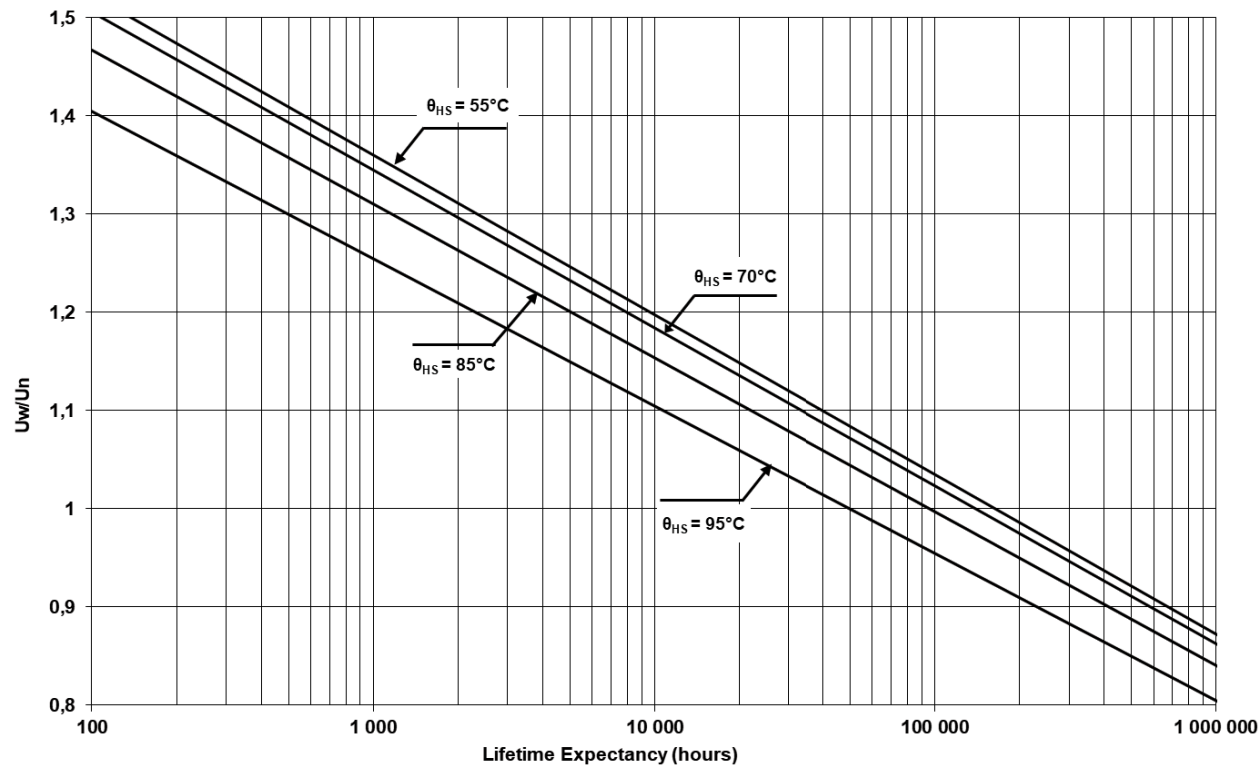
DC FILTERING
FFHV/FTHV 1600Vdc to 2300Vdc



FFHV LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE



FTHV LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE



DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc

HOW TO CHOSE THE RIGHT CAPACITOR

The capacitor lifetime depends on the working voltage and the hot spot temperature.

Our caps are designed to meet 100000 hours lifetime at rated voltage and 70°C (for FFHV) or 85°C (for FTHV) hot spot temperature. In accordance with operating conditions, please calculate the hot spot temperature and deduce from this calculation if the obtained lifetime can suit the application.

1. From the tables, select a capacitor with required capacitance

C_n and voltage U_n .

Calculate the maximum ripple voltage allowed for the selected cap:

$$U_{rmax} = 0.2U_n$$

If $U_r > U_{rmax}$, select a capacitor with higher rated voltage

Make sure $I_{rms} \text{ application} < I_{rms} \text{ table}$

Copy out:

- serial resistance (R_s): see table of values
- thermal resistances R_{th1} and R_{th2} (depending on cooling conditions)

2. Hot spot temperature calculation

Total losses are calculated as follow: $P_t = P_j + P_d$

Joule losses: $P_j = R_s \times I_{rms}^2$

Dielectric losses: $P_d = Q \times \text{tg}\delta_0$ with

- $Q(\text{reactive power}) = \frac{I_{rms}^2}{C\omega}$ for a sinusoidal waveform

- $\text{tg}\delta_0 = 3 \times 10^{-4}$ (dielectric losses of polypropylene)

Hot spot temperature will be:

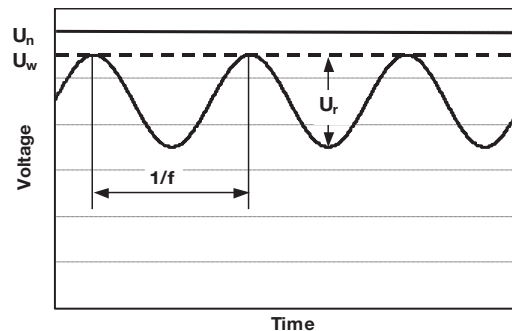
$$\theta_{HS} = \theta_{amb} + (P_j + P_d) \times (R_{th1} + R_{th2})$$

θ_{HS} **absolute maximum is:**

85°C for FFHV

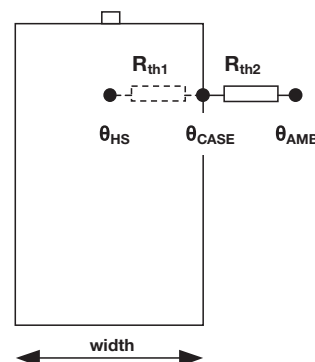
or 95°C for FTHV

If temperature is higher than 85°C, come back to #1 and start again with another selection.



R_{th1} : Thermal resistance between hot spot and case

R_{th2} : Thermal resistance between case and ambient air

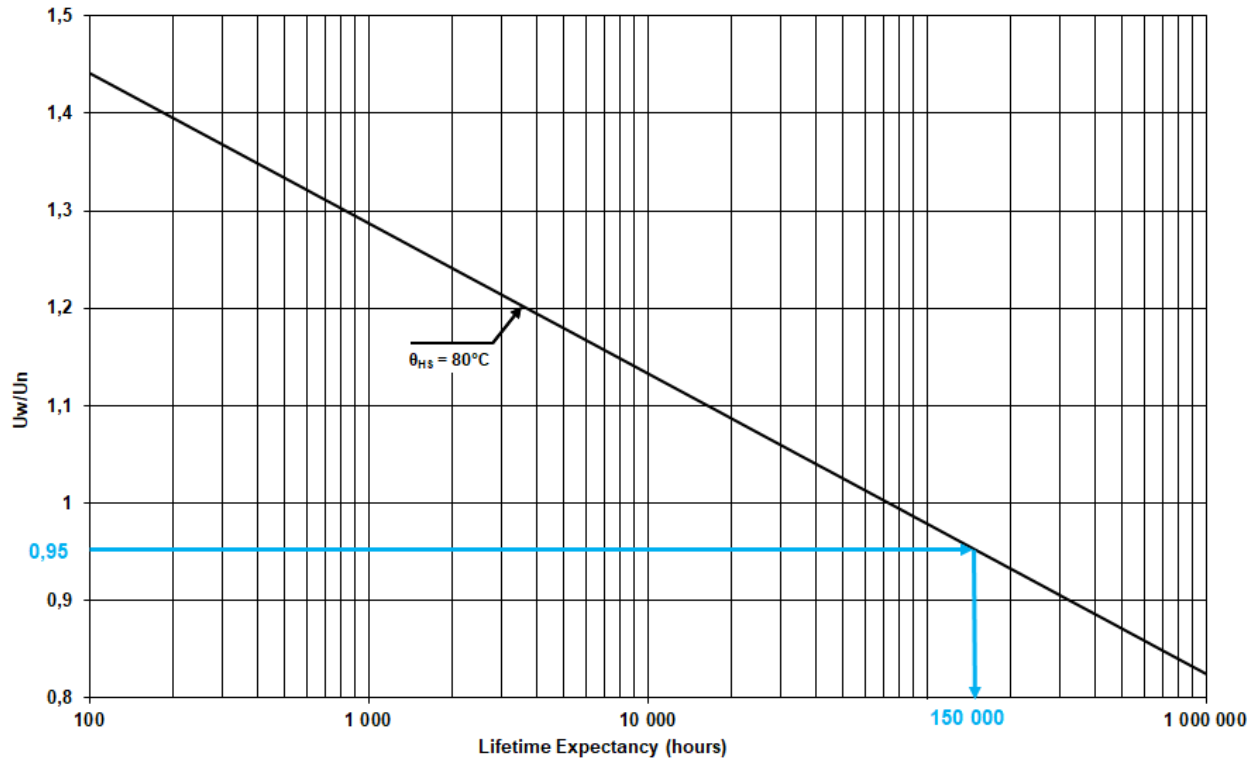


DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc

3. Refer to the curve and deduce the lifetime vs U_w/U_n ratio

FFHV LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE



eg: rated voltage 2000V
working voltage 1900V
 $\rho = 0.95 \Rightarrow$ lifetime 150,000 hours @ 80°C hot spot temperature

Please, find a calculation form at the end of the catalog

DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc

THERMAL RESISTANCES

R_{th1} (°C/W): Thermal resistance between hot spot and case

Rth1 (°C/W)		
Height (mm)	Width (mm)	
	125	175
230/240	0.40	0.41
295/305	0.33	0.36
370/380	0.27	0.30
450/460	0.22	0.26
530/540	0.19	0.22
610/620	0.17	0.19

R_{th2} (°C/W): Thermal resistance between case and ambient air under natural convection and forced air

Height (mm)	Rth2 (°C/W)			
	Natural air cooling		Forced air cooling >2m/s	
	Width (mm)		Width (mm)	
	125	175	125	175
230/240	0.3	0.26	0.15	0.13
295/305	0.25	0.21	0.13	0.11
370/380	0.2	0.18	0.1	0.09
450/460	0.17	0.15	0.09	0.08
530/540	0.15	0.13	0.08	0.07
610/620	0.13	0.11	0.07	0.06



For confined area, capacitor working in a closed cabinet, a thermal test under real conditions is necessary to evaluate the thermal resistance.

PARASITIC INDUCTANCE VS SIZE

Measurement @ 1MHz

Height (mm)	L_s (nH) FFHV resin top			
	Width (mm)			
	2 Connections		4 Connections	
	125	175	125	175
230	70	73	27	30
295	72	77	29	34
370	75	82	32	39
450	79	86	36	43
530	82	91	39	48
610	85	96	42	53

Height (mm)	L_s (nH) FTHV hermetic case			
	Width (mm)			
	2 Connections		4 Connections	
	125	175	125	175
240	73	76	28	31
305	75	80	30	35
380	78	85	33	40
460	82	89	37	44
540	85	94	40	49
620	88	99	43	54

DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc

MTBF CALCULATION

Based on Return Of Experience from the field of more than 30 years, we have established the following relation. The failure rate λ_B depends on hot spot temperature θ_{HS} and charge ratio ρ .

$$\rho = U_w / U_n$$

$$\lambda_B = 3.10^{3.66(\rho-1)} \times e^{4.5\left(\frac{273+\theta_{HS}}{368}\right)^{25}} \times 10^{-9} \text{ in failures/hour}$$

GENERAL FAILURE RATE

$\lambda = \lambda_B \times \pi_Q \times \pi_B \times \pi_E$ failures/hour • π_Q , π_B and π_E see following tables

Qualification	Qualification factor π_Q
Product qualified on IEC61071 and internal qualification	1
Product qualified on IEC61071	2
Product answering on another norm	5
Product without qualification	15

Environment	Environment factor π_E
On ground (good conditions)	1
On ground (fixed materials)	2
On ground (on board)	4
On ship	9
On plane	15

Environment	Environment factor π_B
Favorable	1
Unfavourable	5

MEAN TIME BETWEEN FAILURE (MTBF)

$$MTBF = 1/\lambda \text{ hours}$$

SURVIVAL FUNCTION

$$N = N_0 \times \exp(-\lambda t)$$

N is the number of pieces still working after t hours.

N_0 is the number of pieces at the origin (t = 0)

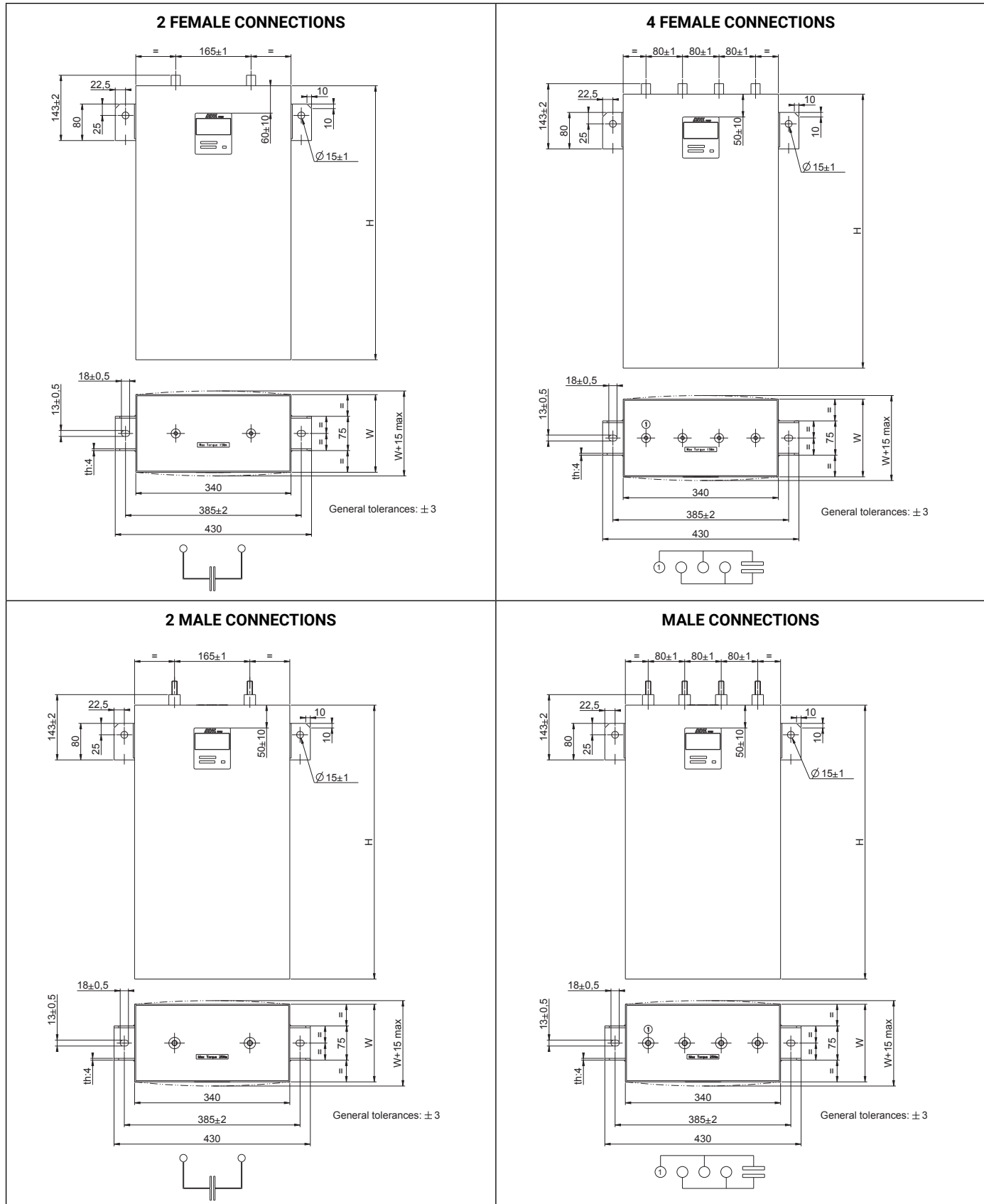
FAILURE MODE

Main failure mode due to KYOCERA AVX's **Controlled Self-Healing Technology** is only losses of capacitance. Thanks to **Controlled Self-Healing** solution to interrupt self-healing process in order to prevent avalanche effect due to polypropylene molecular cracking producing gas and potential explosion in confined box for none **Controlled Self-Healing capacitors**.

DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc

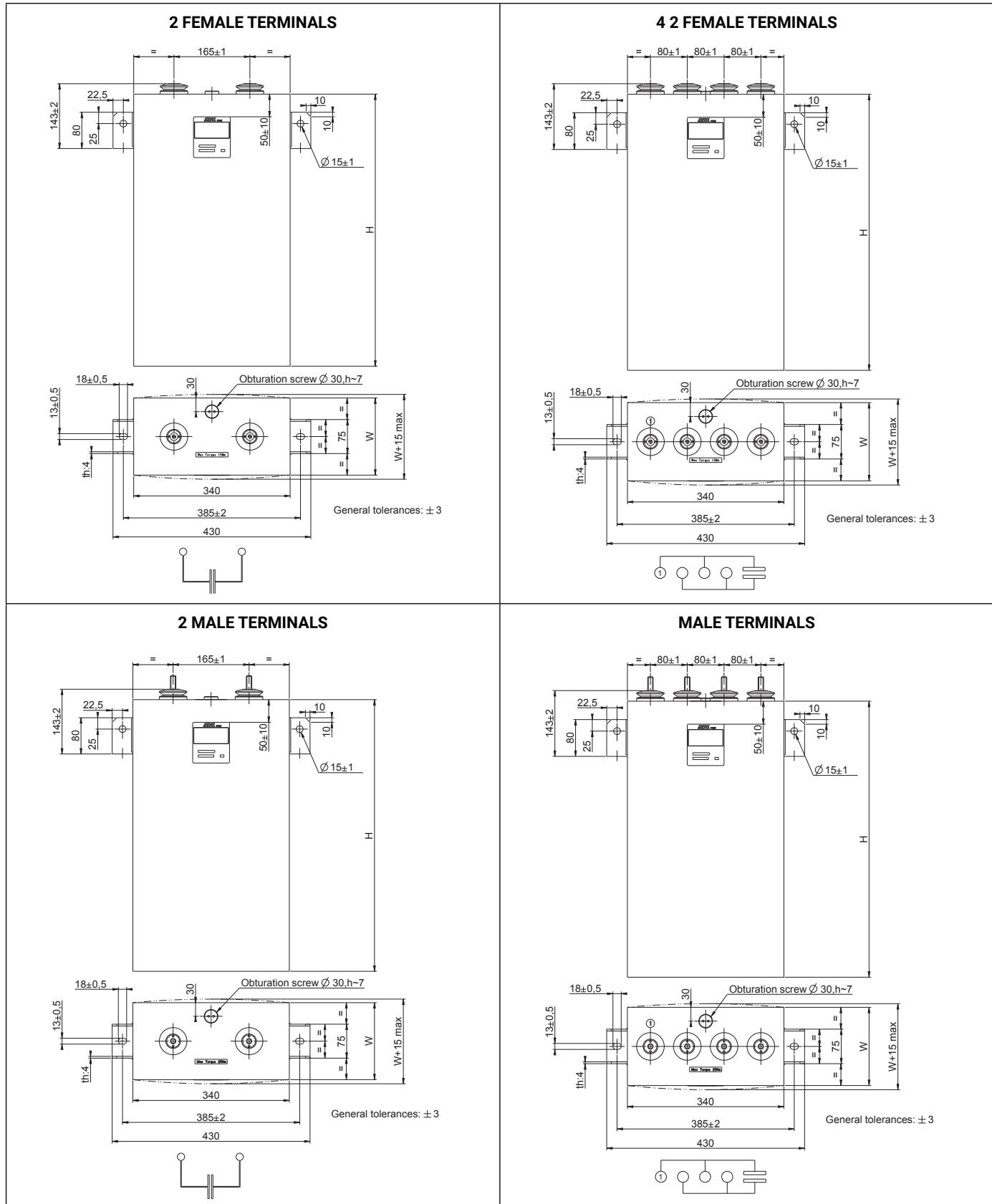
DIMENSIONS



DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc

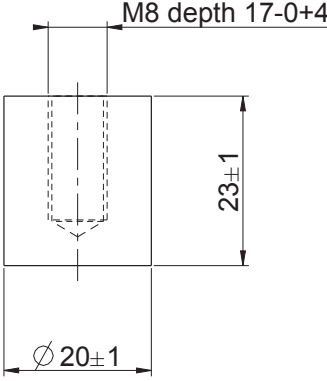
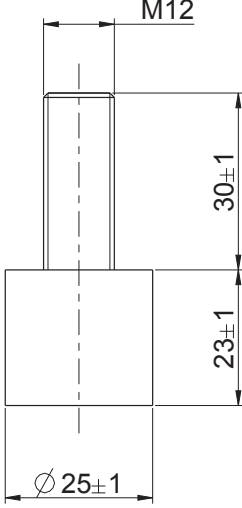
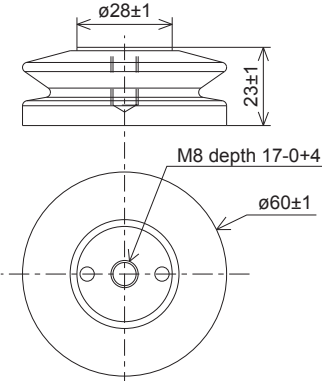
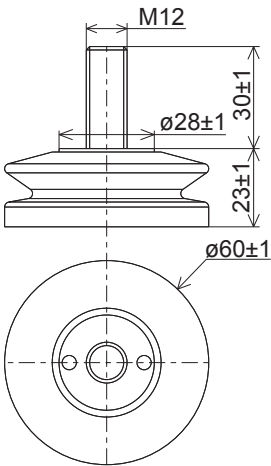
DIMENSIONS



DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc

DIMENSIONS

FEMALE CONNECTIONS (max torque 15Nm) 	MALE CONNECTIONS (max torque 25Nm) 
FEMALE TERMINAL (max torque 15Nm)  Creepage distance : 52mm Air distance : 30mm	MALE TERMINAL (max torque 25Nm)  Creepage distance : 52mm Air distance : 30mm

WEIGHT VS SIZE

Height (mm)	Weight (kg) FFHV resin top			
	Width (mm)			
	2 Connections		4 Connections	
	125	175	125	175
230	13	17.5	13.5	18
295	17	22.5	17.5	23
370	21	27.5	21.5	28
450	25	33.5	25.5	34
530	29	39	29.5	39.5
610	33.5	44.5	34	45

Height (mm)	Weight (kg) FTHV hermetic case			
	Width (mm)			
	2 Connections		4 Connections	
	125	175	125	175
240	14.5	19	15	19.5
305	18	24	18.5	24.5
380	22	29.5	22.5	30
460	26.5	35	27	35.5
540	30.5	40.5	31	41
620	34.5	46	35	46.5

DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc

TABLE OF VALUES

Part Number	Capacitance (μF)	Width (mm)	Height (mm)		R _s (mΩ)	I _{rms} Thermal 1 (A)	I _{rms} Thermal 2 (A)
			FFHV	FTHV			
Un = 1600Vdc							
DF*HV11°A2637	2630	125	230	240	0,42	215	240
DF*HV21°A2637	2630	125	230	240	0,35	230	255
DF*HV12°A3447	3440	125	295	305	0,36	255	255
DF*HV22°A3447	3440	125	295	305	0,29	285	320
DF*HV31°A4127	4120	175	230	240	0,57	205	230
DF*HV41°A4127	4120	175	230	240	0,48	220	245
DF*HV13°A4597	4590	125	370	380	0,32	255	255
DF*HV23°A4597	4590	125	370	380	0,25	345	390
DF*HV32°A5407	5400	175	295	305	0,48	245	255
DF*HV42°A5407	5400	175	295	305	0,39	270	300
DF*HV14°A5747	5740	125	450	460	0,30	255	255
DF*HV24°A5747	5740	125	450	460	0,23	400	400
DF*HV15°A6897	6890	125	530	540	0,29	255	255
DF*HV25°A6897	6890	125	530	540	0,22	400	400
DF*HV33°A7207	7200	175	370	380	0,42	255	255
DF*HV43°A7207	7200	175	370	380	0,33	325	360
DF*HV16°A8047	8040	125	610	620	0,28	255	255
DF*HV26°A8047	8040	125	610	620	0,21	400	400
DF*HV34°A9007	9000	175	450	460	0,39	255	255
DF*HV44°A9007	9000	175	450	460	0,30	375	400
DF*HV35°A1088	10800	175	530	540	0,37	255	255
DF*HV45°A1088	10800	175	530	540	0,28	400	400
DF*HV36°A1268	12600	175	610	620	0,36	255	255
DF*HV46°A1268	12600	175	610	620	0,27	400	400
Un = 1900Vdc							
DF*HV11°B1917	1910	125	230	240	0,46	200	225
DF*HV21°B1917	1910	125	230	240	0,39	210	235
DF*HV12°B2507	2500	125	295	305	0,39	245	255
DF*HV22°B2507	2500	125	295	305	0,32	260	295
DF*HV31°B3007	3000	175	230	240	0,63	195	215
DF*HV41°B3007	3000	175	230	240	0,54	205	225
DF*HV13°B3347	3340	125	370	380	0,34	255	255
DF*HV23°B3347	3340	125	370	380	0,27	320	360
DF*HV32°B3927	3920	175	295	305	0,53	230	255
DF*HV42°B3927	3920	175	295	305	0,44	250	275
DF*HV14°B4177	4170	125	450	460	0,32	255	255
DF*HV24°B4177	4170	125	450	460	0,25	375	400
DF*HV15°B5017	5010	125	530	540	0,31	255	255
DF*HV25°B5017	5010	125	530	540	0,24	400	400
DF*HV33°B5227	5220	175	370	380	0,46	255	255
DF*HV43°B5227	5220	175	370	380	0,37	300	335
DF*HV16°B5847	5840	125	610	620	0,30	255	255
DF*HV26°B5847	5840	125	610	620	0,23	400	400
DF*HV34°B6537	6530	175	450	460	0,42	255	255
DF*HV44°B6537	6530	175	450	460	0,33	350	390
DF*HV35°B7837	7830	175	530	540	0,39	255	255
DF*HV45°B7837	7830	175	530	540	0,30	395	400
DF*HV36°B9147	9140	175	610	620	0,38	255	255
DF*HV46°B9147	9140	175	610	620	0,29	400	400

* Insert F for resin top or T for hermetic case

* Insert F for female terminals or M for male terminals

DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc



TABLE OF VALUES

Part Number	Capacitance (μF)	Width (mm)	Height (mm)		R _s (mΩ)	I _{rms} Thermal 1 (A)	I _{rms} Thermal 2 (A)
			FFHV	FTHV			
Un = 2000Vdc							
DF*HV11°C1627	1620	125	230	240	0.49	190	215
DF*HV21°C1627	1620	125	230	240	0.41	200	225
DF*HV12°C2137	2130	125	295	305	0.42	230	255
DF*HV22°C2137	2130	125	295	305	0.34	245	280
DF*HV31°C2547	2540	175	230	240	0.65	185	210
DF*HV41°C2547	2540	175	230	240	0.56	200	220
DF*HV13°C2847	2840	125	370	380	0.37	255	255
DF*HV23°C2847	2840	125	370	380	0.29	305	340
DF*HV32°C3337	3330	175	295	305	0.55	225	250
DF*HV42°C3337	3330	175	295	305	0.46	240	265
DF*HV14°C3547	3540	125	450	460	0.35	255	255
DF*HV24°C3547	3540	125	450	460	0.27	355	400
DF*HV15°C4257	4250	125	530	540	0.33	255	255
DF*HV25°C4257	4250	125	530	540	0.25	400	400
DF*HV33°C4447	4440	175	370	380	0.48	255	255
DF*HV43°C4447	4440	175	370	380	0.39	290	320
DF*HV16°C4967	4960	125	610	620	0.32	255	255
DF*HV26°C4967	4960	125	610	620	0.24	400	400
DF*HV34°C5557	5550	175	450	460	0.43	255	255
DF*HV44°C5557	5550	175	450	460	0.34	340	375
DF*HV35°C6657	6650	175	530	540	0.41	255	255
DF*HV45°C6657	6650	175	530	540	0.32	385	400
DF*HV36°C7767	7760	175	610	620	0.39	255	255
DF*HV46°C7767	7760	175	610	620	0.3	400	400
Un = 2150Vdc							
DF*HV11°D1447	1440	125	230	240	0,50	180	200
DF*HV21°D1447	1440	125	230	240	0,43	185	210
DF*HV12°D1887	1880	125	295	305	0,42	225	255
DF*HV22°D1887	1880	125	295	305	0,35	240	270
DF*HV31°D2257	2250	175	230	240	0,69	175	195
DF*HV41°D2257	2250	175	230	240	0,60	185	205
DF*HV13°D2517	2510	125	370	380	0,37	255	255
DF*HV23°D2517	2510	125	370	380	0,30	295	335
DF*HV32°D2957	2950	175	295	305	0,57	215	240
DF*HV42°D2957	2950	175	295	305	0,48	230	260
DF*HV14°D3147	3140	125	450	460	0,34	255	255
DF*HV24°D3147	3140	125	450	460	0,27	345	390
DF*HV15°D3777	3770	125	530	540	0,32	255	255
DF*HV25°D3777	3770	125	530	540	0,25	395	400
DF*HV33°D3937	3930	175	370	380	0,49	255	255
DF*HV43°D3937	3930	175	370	380	0,40	280	310
DF*HV16°D4407	4400	125	610	620	0,31	255	255
DF*HV26°D4407	4400	125	610	620	0,24	400	400
DF*HV34°D4917	4910	175	450	460	0,44	255	255
DF*HV44°D4917	4910	175	450	460	0,35	330	365
DF*HV35°D5907	5900	175	530	540	0,42	255	255
DF*HV45°D5907	5900	175	530	540	0,33	375	400
DF*HV36°D6887	6880	175	610	620	0,40	255	255
DF*HV46°D6887	6880	175	610	620	0,31	400	400

* Insert F for resin top or T for hermetic case

° Insert F for female terminals or M for male terminals

DC FILTERING

FFHV/FTHV 1600Vdc to 2300Vdc



CALCULATION FORM

SPECIFICATION

Capacitance	C (μF)	
Working voltage	U _w (V)	
Rms current	I _{rms} (Arms)	
Frequency	f (Hz)	
Ripple voltage	U _r (V)	
Ambient temperature	θ _{amb} (°C)	
Lifetime @ U _w , I _{rms} and θ _{amb}	hours	
Parasitic inductance	L (nH)	
Cooling conditions		

Your choice

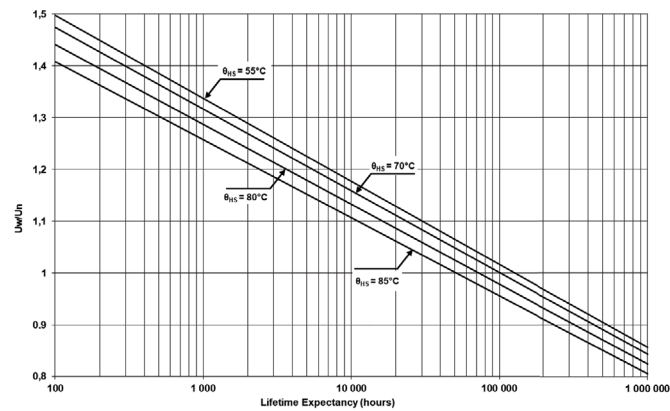
PN		
Capacitance	C (μF)	
Rated voltage	U _n (V)	
Serial resistance	R _s (mΩ)	
Thermal resistance between hot spot and case	R _{th1} (°C/W)	
Thermal resistance between case and ambient air	R _{th2} (°C/W)	

CALCULATIONS

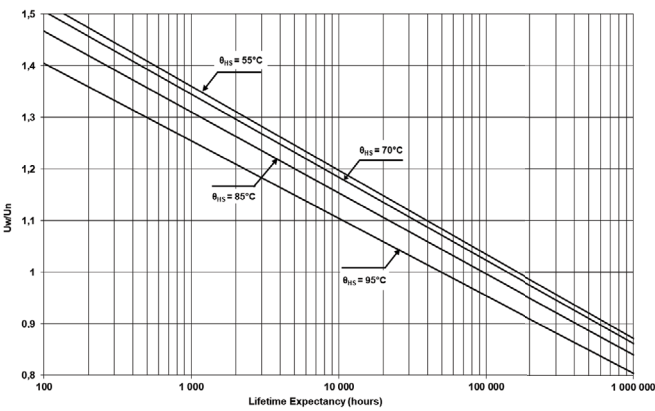
Maximum ripple voltage	U _{rmax} = 0.2 U _n	U _{rmax} =	V
The maximum ripple voltage of the selected capacitor must be in any case higher than the ripple voltage of your application			
Ratio U _w /U _n	ρ = U _w /U _n	ρ =	
Joule losses	P _j = R _s × I _{rms2}	P _j =	W
Dielectric losses	P _d = Q × tgδ0 = Q × 3.10 ⁻⁴	P _d =	W
Hot spot temperature	θ _{HS} = θ _{amb} + (P _j + P _d) × R _{th}	θ _{HS} =	°C

The hot spot temperature must be in any case lower than 85°C for FFHV and 95°C for FTHV

FFHV LIFETIME EXPECTANCY



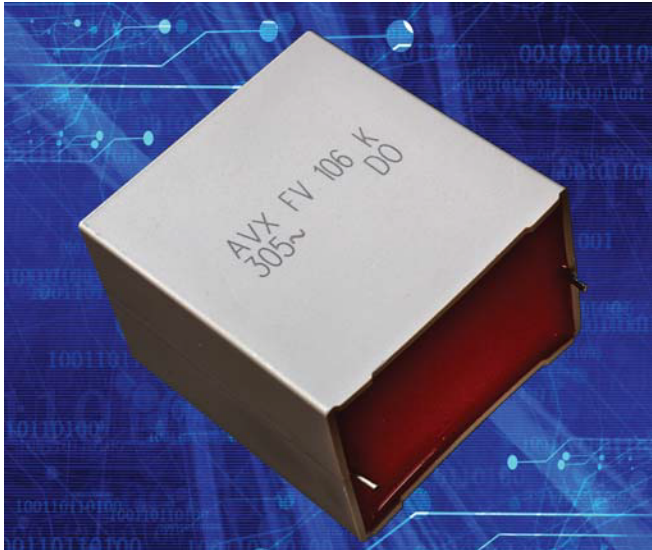
FTHV LIFETIME EXPECTANCY



Expected lifetime at hot spot calculated and U = U_w

AC FILTERING

FV X2* RoHS Compliant



FV are non-inductively wound with metallized polypropylene film as dielectric and electrode, encapsulated in solventresistant and self – extinguishing UL94v0 thermoplastic case, with epoxy resin sealed. They provide interference Suppression with safety approvals. They are suitable for Across-the-line Capacitors, EMI Filters, Spark-Killer Circuits, etc.

APPLICATIONS

- The FV capacitor is suitable for Across-the-line, EMI Filters
- Capacitance Range: 0.01uF ~ 10.0uF
- Capacitance Tolerance: $\pm 10\%$ (K), $\pm 20\%$ (M)
- Rated Voltage: 305Vrms
- Frequency: 50Hz, 60Hz
- Insulation Resistance: $> 15,000M\Omega (\leq 0.33uF)$
 $> 5,000M\Omega (> 0.33uF)$
- Dielectric Strength: 1312VDC for 60sec.
Or 2000vdc for 2sec

Climatic Category: 40/110/56

Passive Flammability Category: B

WORKING TEMPERATURE

Operating Temperature Range: -40°C to $+110^{\circ}\text{C}$

FEATURES

- Self-healing properties.
- High moisture resistance.
- Over voltage stress withstanding.
- Excellent active and passive flame resistant abilities
- Widely used in across-the-line, interference suppression circuit, etc.

STANDARDS

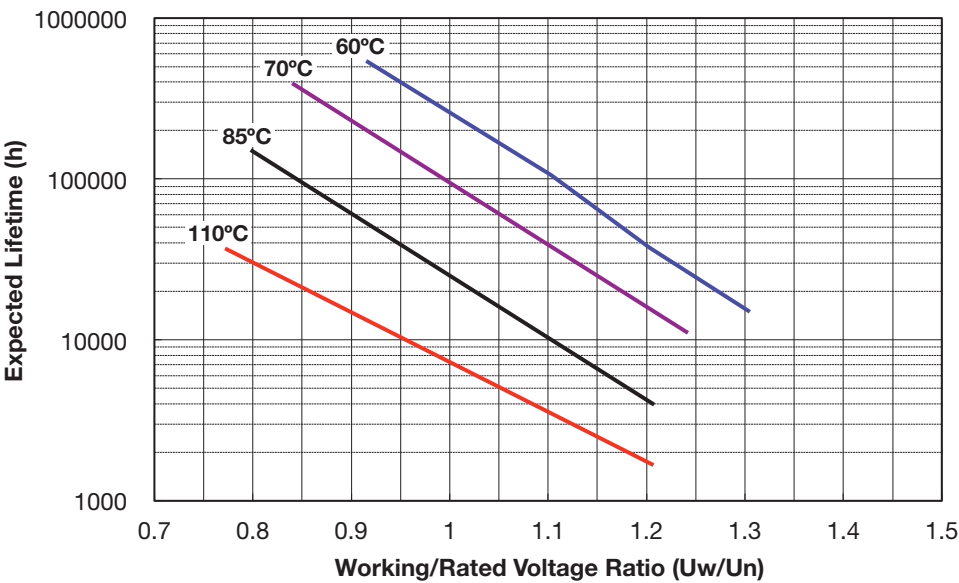
ENEC-VDE: EN60384-14(2005)
UL/CUL: UL60384-14 / CSA E60384-14 (FOWX2.E467744)
KC: K60384-14
CQC: GB/T 14472

HOW TO ORDER

FV	A1	6	H	0103	M	2	L
Series	Case	Dielectric	Voltage	Capacitance EIA Code	Tolerances	Environment Type	Lead Length
	A1-A3 B1 C1-C9 D1-D6 E1-E9 F1-F9	6 = Polypropylene	H = 305V	0103 = 0.01 μ F	K = $\pm 10\%$ M = $\pm 20\%$	2 = standard environment H = THB (temperature humidity bias)	L = 22mm 2 = 3.5 mm T = Tape packaging

LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE

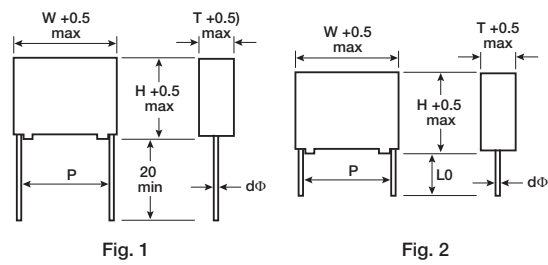
Expected Lifetime Curves



DIMENSIONS

Case Ref	W (mm)	H (mm)	T (mm)	P (mm)	d (mm)
A1	13	11	5	10	0.6
A2	13	12	6	10	0.6
A3	13	16	8	10	0.6
B1	15	13.5	7	12.5	0.8
C1	18	11	5	15	0.6
C2	18	12	6	15	0.6
C3	18	12	6	15	0.8
C4	18	13.5	7.5	15	0.8
C5	18	14	8	15	0.8
C6	18	16	10	15	0.8
C7	18	18	9	15	0.8
C8	18	18	10	15	0.8
C9	18	19	11	15	0.8
D1	26	17	8.5	22.5	0.8
D2	26	19	10	22.5	0.8
D3	26	20	11	22.5	0.8
D4	26	22	12	22.5	0.8
D5	26	23	13	22.5	0.8
D6	26	25	15	22.5	0.8
E1	31	20	11	27.5	0.8
E2	31	22	13	27.5	0.8
E3	31	28	14	27.5	0.8
E4	31	28	18	27.5	0.8
E5	31	28	19.5	27.5	0.8
E6	31	33	18	27.5	0.8
E7	31	35	26	27.5	0.8
E8	31	31	23	27.5	0.8
E9	31	36	22	27.5	0.8
F1	41.5	32	16	37.5	1
F2	41.5	28	19	37.5	1
F3	41.5	32	19	37.5	1
F4	41.5	36	19	37.5	1
F5	41.5	38	20	37.5	1
F6	41.5	40	20	37.5	1
F7	41.5	43	28	37.5	1
F8	41.5	44	24	37.5	1
F9	41.5	45	30	37.5	1

GENERAL DESCRIPTION



AC FILTERING

FV X2* RoHS Compliant



ELECTRICAL CHARACTERISTICS

Climatic category	40/110/56 (IEC 60384-14)
Test voltage between terminals @ 25°C	1312Vdc, 60sec
Capacitance range C _n	0.01μF to 10.0μF
Capacitance Tolerances:	±10%, ±20%
Rated AC Voltage:	305V _{rms}
Dielectric:	Polypropylene
Insulation Resistance:	> 15,000MΩ (≤0.33μF), > 5,000MΩ (> 0.33μF) after 1 minute electrification @ 100 Vdc & 25 °C
Lifetime (ΔC/C < 10%):	100,000hrs @ U _r & 70°C

Temperature Humidity Bias Test	Test Conditions 1: Test Temperature: +60 +/-2°C Test Humidity: 95% ±2% R.H. Loading Voltage: Rated AC Voltage (50Hz) Test Duration :1000 +24/-0 hours After test, allow it stay alone 4 hours at standard temperature and humidity before making measurements. Performance: Capacitance Change Rate (ΔC/C): ≤±10% DF change (tgδ): ≤240*10⁻⁴ at 10 KHz. (C ≤ 1 μF) DF change (tgδ): ≤150*10⁻⁴ at 1 KHz. (C > 1 μF) Insulation Resistance: ≥50% of initial limit Test Conditions 2: Test Temperature: +85 +/-2°C Test Humidity: 85% ±2% R.H. Loading Voltage: Rated AC Voltage (50Hz) Test Duration :1000 +24/-0 hours After test, allow it stay alone 4 hours at standard temperature and humidity before making measurements. Performance: Capacitance Change Rate (ΔC/C): ≤±10% DF change (tgδ): ≤240*10⁻⁴ at 10 KHz. (C ≤ 1 μF) DF change (tgδ): ≤150*10⁻⁴ at 1 KHz. (C > 1 μF) Insulation Resistance: ≥50% of initial limit
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Cap (µF) ±10%	Rated Voltage (V)	Part Number	Case Code	W ±0.50 (mm)	H ±0.50 (mm)	T ±0.50 (mm)	P ±1.00 (mm)	d ±0.50 (mm)	V/µs (Volt/ sec)	I _{peak} (A)	Packaging Method (Fig 1)		Packaging Method (Fig 2)		Packaging Method (Taping)	
V _{rms} = 305V Voltage Code: H											Qty	Box Dimension (mm)	Qty	Box Dimension (mm)	Qty	Box Dimension (mm)
0.010	305	FVA16H0103*22	A1	13.0	11.0	5.0	10.0	0.6	100.0	1.0	NA	NA	850	360*170*35	NA	NA
0.010	305	FVA16H0103*2L	A1	13.0	11.0	5.0	10.0	0.6	100.0	1.0	1200	180*170*120	NA	NA	NA	NA
0.010	305	FVA16H0103*2T	A1	13.0	11.0	5.0	10.0	0.6	100.0	1.0	NA	NA	NA	NA	600	335*265*55
0.015	305	FVA16H0153*22	A1	13.0	11.0	5.0	10.0	0.6	100.0	1.5	NA	NA	850	360*170*35	NA	NA
0.015	305	FVA16H0153*2L	A1	13.0	11.0	5.0	10.0	0.6	100.0	1.5	1200	180*170*120	NA	NA	NA	NA
0.015	305	FVA16H0153*2T	A1	13.0	11.0	5.0	10.0	0.6	100.0	1.5	NA	NA	NA	NA	600	335*265*55
0.022	305	FVA16H0223*22	A1	13.0	11.0	5.0	10.0	0.6	100.0	2.2	NA	NA	850	360*170*35	NA	NA
0.022	305	FVA16H0223*2L	A1	13.0	11.0	5.0	10.0	0.6	100.0	2.2	1200	180*170*120	NA	NA	NA	NA
0.022	305	FVA16H0223*2T	A1	13.0	11.0	5.0	10.0	0.6	100.0	2.2	NA	NA	NA	NA	600	335*265*55
0.033	305	FVA16H0333*22	A1	13.0	11.0	5.0	10.0	0.6	100.0	3.3	NA	NA	850	360*170*35	NA	NA
0.033	305	FVA16H0333*2L	A1	13.0	11.0	5.0	10.0	0.6	100.0	3.3	1200	180*170*120	NA	NA	NA	NA
0.033	305	FVA16H0333*2T	A1	13.0	11.0	5.0	10.0	0.6	100.0	3.3	NA	NA	NA	NA	600	335*265*55
0.047	305	FVA16H0473*22	A1	13.0	11.0	5.0	10.0	0.6	100.0	4.7	NA	NA	850	360*170*35	NA	NA
0.047	305	FVA16H0473*2L	A1	13.0	11.0	5.0	10.0	0.6	100.0	4.7	1200	180*170*120	NA	NA	NA	NA
0.047	305	FVA16H0473*2T	A1	13.0	11.0	5.0	10.0	0.6	100.0	4.7	NA	NA	NA	NA	600	335*265*55
0.047	305	FVA26H0473*22	A2	13.0	12.0	6.0	10.0	0.6	100.0	4.7	NA	NA	700	360*170*35	NA	NA
0.047	305	FVA26H0473*2L	A2	13.0	12.0	6.0	10.0	0.6	100.0	4.7	1000	180*170*120	NA	NA	NA	NA
0.047	305	FVA26H0473*2T	A2	13.0	12.0	6.0	10.0	0.6	100.0	4.7	NA	NA	NA	NA	500	335*265*55
0.056	305	FVA26H0563*22	A2	13.0	12.0	6.0	10.0	0.6	100.0	5.6	NA	NA	700	360*170*35	NA	NA
0.056	305	FVA26H0563*2L	A2	13.0	12.0	6.0	10.0	0.6	100.0	5.6	1000	180*170*120	NA	NA	NA	NA
0.056	305	FVA26H0563*2T	A2	13.0	12.0	6.0	10.0	0.6	100.0	5.6	NA	NA	NA	NA	500	335*265*55
0.068	305	FVA26H0683*22	A2	13.0	12.0	6.0	10.0	0.6	100.0	6.8	NA	NA	700	360*170*35	NA	NA
0.068	305	FVA26H0683*2L	A2	13.0	12.0	6.0	10.0	0.6	100.0	6.8	1000	180*170*120	NA	NA	NA	NA
0.068	305	FVA26H0683*2T	A2	13.0	12.0	6.0	10.0	0.6	100.0	6.8	NA	NA	NA	NA	500	335*265*55
0.082	305	FVA26H0823*22	A2	13.0	12.0	6.0	10.0	0.6	100.0	8.2	NA	NA	700	360*170*35	NA	NA
0.082	305	FVA26H0823*2L	A2	13.0	12.0	6.0	10.0	0.6	100.0	8.2	1000	180*170*120	NA	NA	NA	NA
0.082	305	FVA26H0823*2T	A2	13.0	12.0	6.0	10.0	0.6	100.0	8.2	NA	NA	NA	NA	500	335*265*55
0.100	305	FVA26H0104*22	A2	13.0	12.0	6.0	10.0	0.6	100.0	10.0	NA	NA	700	360*170*35	NA	NA
0.100	305	FVA26H0104*2L	A2	13.0	12.0	6.0	10.0	0.6	100.0	10.0	1000	180*170*120	NA	NA	NA	NA
0.100	305	FVA26H0104*2T	A2	13.0	12.0	6.0	10.0	0.6	100.0	10.0	NA	NA	NA	NA	500	335*265*55
0.220	305	FVA36H0224*22	A3	13.0	16.0	8.0	10.0	0.6	100.0	22.0	NA	NA	500	360*170*35	NA	NA
0.220	305	FVA36H0224*2L	A3	13.0	16.0	8.0	10.0	0.6	100.0	22.0	600	180*170*120	NA	NA	NA	NA
0.220	305	FVA36H0224*2T	A3	13.0	16.0	8.0	10.0	0.6	100.0	22.0	NA	NA	NA	NA	NA	335*265*55
0.220	305	FVB16H0224*22	B1	15.0	13.5	7.0	12.5	0.8	100.0	22.0	NA	NA	520	360*170*35	NA	NA
0.220	305	FVB16H0224*2L	B1	15.0	13.5	7.0	12.5	0.8	100.0	22.0	800	180*170*120	NA	NA	NA	NA
0.220	305	FVB16H0224*2T	B1	15.0	13.5	7.0	12.5	0.8	100.0	22.0	NA	NA	NA	NA	400	335*265*55
0.015	305	FVC16H0153*22	C1	18.0	11.0	5.0	15.0	0.6	100.0	1.5	NA	NA	600	360*170*35	NA	NA
0.015	305	FVC16H0153*2L	C1	18.0	11.0	5.0	15.0	0.6	100.0	1.5	1000	180*170*120	NA	NA	NA	NA
0.015	305	FVC16H0153*2T	C1	18.0	11.0	5.0	15.0	0.6	100.0	1.5	NA	NA	NA	NA	600	335*265*55
0.047	305	FVC16H0473*22	C1	18.0	11.0	5.0	15.0	0.6	100.0	4.7	NA	NA	600	360*170*35	NA	NA
0.047	305	FVC16H0473*2L	C1	18.0	11.0	5.0	15.0	0.6	100.0	4.7	1000	180*170*120	NA	NA	NA	NA
0.047	305	FVC16H0473*2T	C1	18.0	11.0	5.0	15.0	0.6	100.0	4.7	NA	NA	NA	NA	600	335*265*55
0.056	305	FVC16H0563*22	C1	18.0	11.0	5.0	15.0	0.6	100.0	5.6	NA	NA	600	360*170*35	NA	NA
0.056	305	FVC16H0563*2L	C1	18.0	11.0	5.0	15.0	0.6	100.0	5.6	1000	180*170*120	NA	NA	NA	NA
0.056	305	FVC16H0563*2T	C1	18.0	11.0	5.0	15.0	0.6	100.0	5.6	NA	NA	NA	NA	600	335*265*55
0.100	305	FVC16H0104*22	C1	18.0	11.0	5.0	15.0	0.6	100.0	10.0	NA	NA	600	360*170*35	NA	NA
0.100	305	FVC16H0104*2L	C1	18.0	11.0	5.0	15.0	0.6	100.0	10.0	1000	180*170*120	NA	NA	NA	NA
0.100	305	FVC16H0104*2T	C1	18.0	11.0	5.0	15.0	0.6	100.0	10.0	NA	NA	NA	NA	600	335*265*55

* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

Second to last digit "2" can be replaced with "H" for THB version

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.



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TDS-MDPWR-0024 | Rev 1

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RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Cap (µF) ±10%	Rated Voltage (V)	Part Number	Case Code	W ±0.50 (mm)	H ±0.50 (mm)	T ±0.50 (mm)	P ±1.00 (mm)	d ±0.50 (mm)	V/µs (Volt/ sec)	I _{peak} (A)	Packaging Method (Fig 1)		Packaging Method (Fig 2)		Packaging Method (Taping)	
V _{rms} = 305V Voltage Code: H											Qty	Box Dimension (mm)	Qty	Box Dimension (mm)	Qty	Box Dimension (mm)
0.068	305	FVC26H0683*22	C2	18.0	12.0	6.0	15.0	0.6	100.0	6.8	NA	NA	500	360*170*35	NA	NA
0.068	305	FVC26H0683*2L	C2	18.0	12.0	6.0	15.0	0.6	100.0	6.8	800	180*170*120	NA	NA	NA	NA
0.068	305	FVC26H0683*2T	C2	18.0	12.0	6.0	15.0	0.6	100.0	6.8	NA	NA	NA	NA	500	335*265*55
0.082	305	FVC26H0823*22	C2	18.0	11.0	5.0	15.0	0.6	100.0	8.2	NA	NA	600	360*170*35	NA	NA
0.082	305	FVC26H0823*2L	C2	18.0	11.0	5.0	15.0	0.6	100.0	8.2	1000	180*170*120	NA	NA	NA	NA
0.082	305	FVC26H0823*2T	C2	18.0	11.0	5.0	15.0	0.6	100.0	8.2	NA	NA	NA	NA	600	335*265*55
0.150	305	FVC36H0154*22	C3	18.0	12.0	6.0	15.0	0.8	100.0	15.0	NA	NA	500	360*170*35	NA	NA
0.150	305	FVC36H0154*2L	C3	18.0	12.0	6.0	15.0	0.8	100.0	15.0	800	180*170*120	NA	NA	NA	NA
0.150	305	FVC36H0154*2T	C3	18.0	12.0	6.0	15.0	0.8	100.0	15.0	NA	NA	NA	NA	500	335*265*55
0.220	305	FVC46H0224*22	C4	18.0	13.5	7.5	15.0	0.8	100.0	22.0	NA	NA	410	360*170*35	NA	NA
0.220	305	FVC46H0224*2L	C4	18.0	13.5	7.5	15.0	0.8	100.0	22.0	600	180*170*120	NA	NA	NA	NA
0.220	305	FVC46H0224*2T	C4	18.0	13.5	7.5	15.0	0.8	100.0	22.0	NA	NA	NA	NA	400	335*265*55
0.330	305	FVC56H0334*22	C5	18.0	14.0	8.0	15.0	0.8	100.0	33.0	NA	NA	380	360*170*35	NA	NA
0.330	305	FVC56H0334*2L	C5	18.0	14.0	8.0	15.0	0.8	100.0	33.0	500	180*170*120	NA	NA	NA	NA
0.330	305	FVC56H0334*2T	C5	18.0	14.0	8.0	15.0	0.8	100.0	33.0	NA	NA	NA	NA	350	335*265*55
0.470	305	FVC66H0474*22	C6	18.0	16.0	10.0	15.0	0.8	100.0	47.0	NA	NA	300	360*170*35	NA	NA
0.470	305	FVC66H0474*2L	C6	18.0	16.0	10.0	15.0	0.8	100.0	47.0	400	180*170*120	NA	NA	NA	NA
0.470	305	FVC66H0474*2T	C6	18.0	16.0	10.0	15.0	0.8	100.0	47.0	NA	NA	NA	NA	300	335*265*55
0.470	305	FVC76H0474*22	C7	18.0	18.0	9.0	15.0	0.8	100.0	47.0	NA	NA	340	360*170*35	NA	NA
0.470	305	FVC76H0474*2L	C7	18.0	18.0	9.0	15.0	0.8	100.0	47.0	400	180*170*120	NA	NA	NA	NA
0.470	305	FVC76H0474*2T	C7	18.0	18.0	9.0	15.0	0.8	100.0	47.0	NA	NA	NA	NA	300	335*265*55
0.560	305	FVC86H0564*22	C8	18.0	18.0	10.0	15.0	0.8	100.0	56.0	NA	NA	300	360*170*35	NA	NA
0.560	305	FVC86H0564*2L	C8	18.0	18.0	10.0	15.0	0.8	100.0	56.0	300	180*170*120	NA	NA	NA	NA
0.560	305	FVC86H0564*2T	C8	18.0	18.0	10.0	15.0	0.8	100.0	56.0	NA	NA	NA	NA	300	335*265*55
0.680	305	FVC96H0684*22	C9	18.0	19.0	11.0	15.0	0.8	100.0	68.0	NA	NA	270	360*170*35	NA	NA
0.680	305	FVC96H0684*2L	C9	18.0	19.0	11.0	15.0	0.8	100.0	68.0	300	180*170*120	NA	NA	NA	NA
0.680	305	FVC96H0684*2T	C9	18.0	19.0	11.0	15.0	0.8	100.0	68.0	NA	NA	NA	NA	250	335*265*55
0.820	305	FVC96H0824*22	C9	18.0	19.0	11.0	15.0	0.8	100.0	82.0	NA	NA	270	360*170*35	NA	NA
0.820	305	FVC96H0824*2L	C9	18.0	19.0	11.0	15.0	0.8	100.0	82.0	300	180*170*120	NA	NA	NA	NA
0.820	305	FVC96H0824*2T	C9	18.0	19.0	11.0	15.0	0.8	100.0	82.0	NA	NA	NA	NA	250	335*265*55
0.330	305	FVD16H0334*22	D1	26.0	17.0	8.5	22.5	0.8	100.0	33.0	NA	NA	240	360*170*35	NA	NA
0.330	305	FVD16H0334*2L	D1	26.0	17.0	8.5	22.5	0.8	100.0	33.0	300	180*170*120	NA	NA	NA	NA
0.470	305	FVD16H0474*22	D1	26.0	17.0	8.5	22.5	0.8	100.0	47.0	NA	NA	240	360*170*35	NA	NA
0.470	305	FVD16H0474*2L	D1	26.0	17.0	8.5	22.5	0.8	100.0	47.0	300	180*170*120	NA	NA	NA	NA
0.680	305	FVD26H0684*22	D2	26.0	19.0	10.0	22.5	0.8	100.0	68.0	NA	NA	200	360*170*35	NA	NA
0.680	305	FVD26H0684*2L	D2	26.0	19.0	10.0	22.5	0.8	100.0	68.0	250	180*170*120	NA	NA	NA	NA
0.820	305	FVD26H0824*22	D2	26.0	19.0	10.0	22.5	0.8	100.0	82.0	NA	NA	200	360*170*35	NA	NA
0.820	305	FVD26H0824*2L	D2	26.0	19.0	10.0	22.5	0.8	100.0	82.0	250	180*170*120	NA	NA	NA	NA
1.000	305	FVD36H0105*22	D3	26.0	20.0	11.0	22.5	0.8	100.0	100.0	NA	NA	180	360*170*35	NA	NA
1.000	305	FVD36H0105*2L	D3	26.0	20.0	11.0	22.5	0.8	100.0	100.0	200	180*170*120	NA	NA	NA	NA
1.200	305	FVD46H0125*22	D4	26.0	22.0	12.0	22.5	0.8	100.0	120.0	NA	NA	160	360*170*35	NA	NA
1.200	305	FVD46H0125*2L	D4	26.0	22.0	12.0	22.5	0.8	100.0	120.0	100	180*170*120	NA	NA	NA	NA
1.500	305	FVD56H0155*22	D5	26.0	23.0	13.0	22.5	0.8	100.0	150.0	NA	NA	150	360*170*35	NA	NA
1.500	305	FVD56H0155*2L	D5	26.0	23.0	13.0	22.5	0.8	100.0	150.0	100	180*170*120	NA	NA	NA	NA
1.800	305	FVD56H0185*22	D5	26.0	23.0	13.0	22.5	0.8	100.0	180.0	NA	NA	150	360*170*35	NA	NA
1.800	305	FVD56H0185*2L	D5	26.0	23.0	13.0	22.5	0.8	100.0	180.0	100	180*170*120	NA	NA	NA	NA
2.200	305	FVD66H0225*22	D6	26.0	25.0	15.0	22.5	0.8	100.0	220.0	NA	NA	138	360*170*50	NA	NA
2.200	305	FVD66H0225*2L	D6	26.0	25.0	15.0	22.5	0.8	100.0	220.0	100	180*170*120	NA	NA	NA	NA

* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

Second to last digit "2" can be replaced with "H" for THB version

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

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RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Cap (μ F) $\pm 10\%$	Rated Voltage (V)	Part Number	Case Code	W ± 0.50 (mm)	H ± 0.50 (mm)	T ± 0.50 (mm)	P ± 1.00 (mm)	d ± 0.50 (mm)	V/ μ s (Volt/ sec)	I peak (A)	Packaging Method (Fig 1)		Packaging Method (Fig 2)		Packaging Method (Taping)	
V _{rms} = 305V Voltage Code: H											Qty	Box Dimension (mm)	Qty	Box Dimension (mm)	Qty	Box Dimension (mm)
1.000	305	FVE16H0105*22	E1	31.0	20.0	11.0	27.5	0.8	100.0	100.0	NA	NA	150	360*170*35	NA	NA
1.200	305	FVE26H0125*22	E2	31.0	22.0	13.0	27.5	0.8	100.0	120.0	NA	NA	130	360*170*35	NA	NA
1.500	305	FVE26H0155*22	E2	31.0	22.0	13.0	27.5	0.8	100.0	150.0	NA	NA	130	360*170*35	NA	NA
1.800	305	FVE36H0185*22	E3	31.0	28.0	14.0	27.5	0.8	100.0	180.0	NA	NA	125	360*170*50	NA	NA
2.200	305	FVE36H0225*22	E3	31.0	28.0	14.0	27.5	0.8	100.0	220.0	NA	NA	125	360*170*50	NA	NA
2.700	305	FVE46H0275*22	E4	31.0	28.0	18.0	27.5	0.8	100.0	270.0	NA	NA	95	360*170*50	NA	NA
3.000	305	FVE56H0305*22	E5	31.0	28.0	19.5	27.5	0.8	100.0	300.0	NA	NA	85	360*170*50	NA	NA
3.300	305	FVE66H0335*22	E6	31.0	33.0	18.0	27.5	0.8	100.0	330.0	NA	NA	95	360*170*50	NA	NA
3.900	305	FVE76H0395*22	E7	31.0	35.0	26.0	27.5	0.8	100.0	390.0	NA	NA	65	360*170*50	NA	NA
3.900	305	FVE86H0395*22	E8	31.0	31.0	23.0	27.5	0.8	100.0	390.0	NA	NA	75	360*170*50	NA	NA
3.900	305	FVF16H0395*22	F1	41.5	32.0	16.0	37.5	1.0	100.0	390.0	NA	NA	84	360*170*50	NA	NA
3.900	305	FVF26H0395*22	F2	41.5	28.0	19.0	37.5	1.0	100.0	390.0	NA	NA	72	360*170*50	NA	NA
4.700	305	FVE76H0475*22	E7	31.0	35.0	26.0	27.5	0.8	100.0	470.0	NA	NA	65	360*170*50	NA	NA
4.700	305	FVE96H0475*22	E9	31.0	36.0	22.0	27.5	0.8	100.0	470.0	NA	NA	75	360*170*50	NA	NA
4.700	305	FVF36H0475*22	F3	41.5	32.0	19.0	37.5	1.0	100.0	470.0	NA	NA	72	360*170*50	NA	NA
4.700	305	FVF46H0475*22	F4	41.5	36.0	19.0	37.5	1.0	100.0	470.0	NA	NA	72	360*170*50	NA	NA
5.600	305	FVF36H0565*22	F3	41.5	32.0	19.0	37.5	1.0	100.0	560.0	NA	NA	72	360*170*50	NA	NA
5.600	305	FVF56H0565*22	F5	41.5	38.0	20.0	37.5	1.0	100.0	560.0	NA	NA	68	360*170*50	NA	NA
5.600	305	FVF66H0565*22	F6	41.5	40.0	20.0	37.5	1.0	100.0	560.0	NA	NA	56	350*170*80	NA	NA
6.800	305	FVF56H0685*22	F5	41.5	38.0	20.0	37.5	1.0	100.0	680.0	NA	NA	68	360*170*50	NA	NA
6.800	305	FVF76H0685*22	F7	41.5	43.0	28.0	37.5	1.0	100.0	680.0	NA	NA	48	350*170*80	NA	NA
6.800	305	FVF86H0685*22	F8	41.5	44.0	24.0	37.5	1.0	100.0	680.0	NA	NA	42	350*170*80	NA	NA
8.200	305	FVF56H0825*22	F5	41.5	38.0	25.0	37.5	1.0	100.0	820.0	NA	NA	56	360*170*50	NA	NA
8.200	305	FVF66H0825*22	F6	41.5	40.0	20.0	37.5	1.0	100.0	820.0	NA	NA	56	350*170*80	NA	NA
8.200	305	FVF76H0825*22	F7	41.5	43.0	28.0	37.5	1.0	100.0	820.0	NA	NA	48	350*170*80	NA	NA
10.000	305	FVF76H0106*22	F7	41.5	43.0	28.0	37.5	1.0	100.0	1000	NA	NA	48	350*170*80	NA	NA
10.000	305	FVF96H0106*22	F9	41.5	45.0	30.0	37.5	1.0	100.0	1000	NA	NA	44	350*170*80	NA	NA

* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

Second to last digit "2" can be replaced with "H" for THB version

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.

AC FILTERING

FLC* RoHS Compliant



PACKAGING MATERIAL

- Self-extinguishing plastic case
(V₀ = in accordance with UL 94) filled thermosetting resin.
- Self-extinguishing thermosetting resin
(V₀ = in accordance with UL 94).

STANDARDS

IEC 61071-1, IEC 61071-2: Power electronic capacitors
IEC 60384-17: Fixed metallized polypropylene film dielectric AC and pulse capacitors
IEC 60384-17-1: Fixed metallized polypropylene film dielectric AC and pulse capacitors Assessment level E
EN CZDS2.E514026 Certificate: E514026 (approved by UL)

The FLC series uses a non-impregnated metallized polypropylene dielectric specially treated to have a very high dielectric strength in operating conditions up to 85°C.

The FLC has been designed for printed circuit board mounting. They are suitable for output AC filtering for power converters, UPS systems, solar inverters and motor drives etc.

APPLICATIONS

- The FLC capacitor is particularly designed for AC filtering.

HOT SPOT CALCULATION

See Hot Spot Temperature, page 66.

$$\theta_{\text{hot spot}} = \theta_{\text{ambient}} + (P_d + P_t) \times R_{th}$$

with P_d (Dielectric losses) = $Q \times \text{tg}\delta_0$

$$Q \times \text{tg}\delta_0 \Rightarrow \left[\frac{1}{2} \times C_n \times (V_{\text{peak to peak}})^2 \times f \right] \times \text{tg}\delta_0$$

$\text{tg}\delta_0$ (tan delta)

For polypropylene, $\text{tg}\delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures.

$$P_t \text{ (Thermal losses)} = R_s \times (I_{rms})^2$$

where C_n in Farad I_{rms} in Ampere f in Hertz
 V in Volt R_s in Ohm θ in °C
 R_{th} in °C/W

WORKING TEMPERATURE

According to the power to be dissipated
-40°C to +85°C

LIFETIME EXPECTANCY

One unique feature of this technology (as opposed to aluminum electrolytics) is how the capacitor reacts at the end of its lifetime.

Unlike aluminum electrolytic film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 5% from initial value, with no risk of short circuit.

The capacitor continues to be functional even after this 5% decrease.

HOW TO ORDER

FLC

Series

A

Case

A I
B J
C K
D L
E M
F N
G O
H

6

Dielectric
6 = Polypropylene

V

Voltage

H = 300V
I = 350V
A = 250V
L = 400V
M = 450V

0225

Cap µF Code
0225 = 2.5µF
0106 = 10µF

K

Tolerances

J = ±5%
K = ±10%

2

Lead Type

2 = 2 Leads
4 = 4 Leads

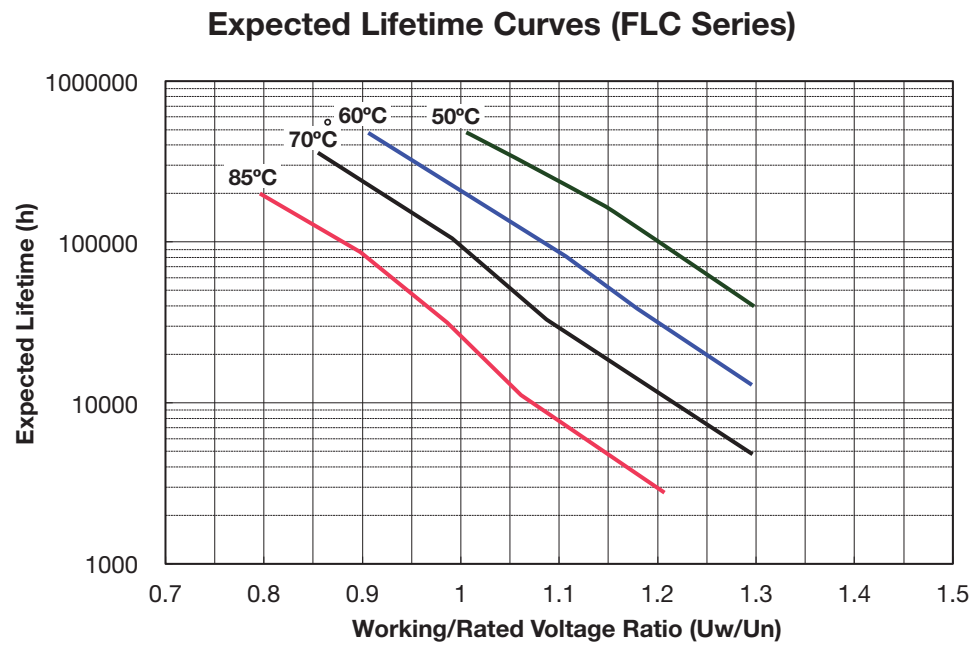
C

Lead Length

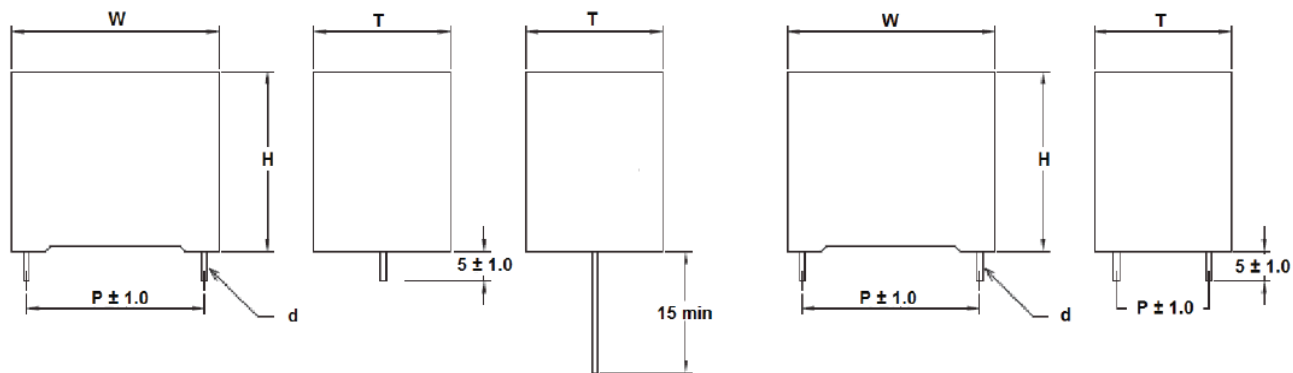
C = 5mm
L = 15mm



LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE



GENERAL DESCRIPTION



DIMENSIONS

Two Terminal Version

Case Ref	W (mm)	H (mm)	T (mm)	P (mm)	d (mm)
A	32	22	13	27.5	0.8
B	32	28	14	27.5	0.8
C	32	33	18	27.5	0.8
D	42.5	40	20	37.5	1.0
E	42.5	43	28	37.5	1.0
F	42.5	44	24	37.5	1.0
G	42.5	45	30	37.5	1.2
H	57.5	45	30	52.5	1.2
I	57.5	50	35	52.5	1.2

Four Terminal Version

Case Ref	W (mm)	H (mm)	T (mm)	P (mm)	P1 (mm)	d (mm)
J	42.5	40	20	37.5	10.2	1.2
K	42.5	43	28	37.5	10.2	1.2
L	42.5	44	24	37.5	10.2	1.2
M	42.5	45	30	37.5	20.3	1.2
N	57.5	45	30	52.5	20.3	1.2
O	57.5	50	35	52.5	20.3	1.2

AC FILTERING

FLC* RoHS Compliant



ELECTRICAL CHARACTERISTICS

Climatic category	40/85/56 (IEC 60068)
Test voltage between terminals @ 25°C	2.15 x V _{rms}
Capacitance range C _n	1.0μF to 50μF
Capacitance Tolerances:	±5%, ±10%
Rated AC Voltage:	V _{rms} 250V to 350V
Dielectric:	Polypropylene
Insulation Resistance:	> 3,000MΩ μF/C after 1 minute electrification @ 100 Vdc & 25°C
Lifetime (ΔC/C < 5%):	100,000hrs @ U _r & 70°C

RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

TWO TERMINAL

Cap (μF)	Rated Voltage (V)	Part Number	Case Code	W ±0.50 (mm)	H ±0.50 (mm)	T ±0.50 (mm)	P ±1.00 (mm)	d ±0.50 (mm)	V/μs (Volt/sec)	I peak (A)	I rms (A)	R _s (mΩ)	ESL (nH)	Rth (°C/W)	Packaging Method	
V _{rms} = 250V Voltage Code: A															Box Qty (mm)	Dimensions
2.2	250	FLCA6A0225K2C	A	32.0	22	13.0	27.5	0.8	25.0	55.0	4.0	17.0	24.0	36.8	130	350*170*80
3.3	250	FLCB6A0335K2C	B	32.0	28	14.0	27.5	0.8	25.0	82.5	6.0	11.6	24.0	23.9	110	350*170*80
5.0	250	FLCC6A0505K2C	C	32.0	33	18.0	27.5	0.8	25.0	125	8.0	8.0	27.0	19.5	95	350*170*80
10.0	250	FLCD6A0106K2C	D	42.5	40	20.0	37.5	1.0	17.0	170	11.0	7.4	30.0	11.2	56	350*170*80
18.0	250	FLCE6A0186K2C	E	42.5	43	28.0	37.5	1.0	17.0	306	12.0	4.0	30.0	17.4	35	350*170*80
20.0	250	FLCG6A0206K2C	G	42.5	45	30.0	37.5	1.2	17.0	340	14.0	3.8	33.0	13.4	44	350*170*80
25.0	250	FLCH6A0256K2C	H	57.5	45	30.0	52.5	1.2	11.0	275	17.0	6.5	35.0	5.3	25	350*170*80
30.0	250	FLCI6A0306K2C	I	57.5	50	35.0	52.5	1.2	11.0	330	20.0	5.4	38.0	4.6	20	350*170*80
40.0	250	FLCI6A0406K2C	I	57.5	50	35.0	52.5	1.2	11.0	440	19.0	5.8	38.0	4.8	20	350*170*80
50.0	250	FLCI6A0506K2C	I	57.5	50	35.0	52.5	1.2	12.0	600	21.0	5.5	38.0	4.1	20	350*170*80
V _{rms} = 300V Voltage Code: H																
1.5	300	FLCA6H0155K2C	A	32.0	22	13.0	27.5	0.8	28.0	42.0	4.0	21.2	24.0	29.5	130	350*170*80
2.5	300	FLCB6H0255K2C	B	32.0	28	14.0	27.5	0.8	28.0	70.0	6.0	14.4	24.0	19.3	110	350*170*80
3.3	300	FLCC6H0335K2C	C	32.0	33	18.0	27.5	0.8	28.0	92.4	8.0	10.6	27.0	14.7	95	350*170*80
10.0	300	FLCF6H0106K2C	F	42.5	44	24.0	37.5	1.0	19.0	190	12.0	6.0	30.0	11.6	42	350*170*80
12.0	300	FLCE6H0126K2C	E	42.5	43	28.0	37.5	1.0	19.0	228	12.0	5.0	30.0	13.9	35	350*170*80
15.0	300	FLCG6H0156K2C	G	42.5	45	30.0	37.5	1.2	19.0	285	12.0	4.2	33.0	16.5	44	350*170*80
20.0	300	FLCH6H0206K2C	H	57.5	45	30.0	52.5	1.2	13.0	260	16.0	6.8	35.0	5.7	25	350*170*80
25.0	300	FLCI6H0256K2C	I	57.5	50	35.0	52.5	1.2	13.0	325	19.0	5.4	38.0	5.1	20	350*170*80
V _{rms} = 350V Voltage Code: I																
1.0	350	FLCA6I0105K2C	A	32.0	22	13.0	27.5	0.8	35.0	35.0	4.0	23.5	24.0	26.6	130	350*170*80
1.8	350	FLCB6I0185K2C	B	32.0	28	14.0	27.5	0.8	35.0	63.0	6.0	16.5	24.0	16.8	110	350*170*80
2.5	350	FLCC6I0255K2C	C	32.0	33	18.0	27.5	0.8	35.0	87.5	8.0	11.3	27.0	13.8	95	350*170*80
7.5	350	FLCF6I0755K2C	F	42.5	44	24.0	37.5	1.0	24.0	180	10.0	7.5	30.0	13.3	42	350*170*80
9.0	350	FLCE6I0905K2C	E	42.5	43	28.0	37.5	1.0	24.0	216	10.0	6.2	30.0	16.1	35	350*170*80
10.0	350	FLCG6I0106K2C	G	42.5	45	30.0	37.5	1.2	24.0	240	10.0	4.8	33.0	20.8	44	350*170*80
12.0	350	FLCH6I0126K2C	H	57.5	45	30.0	52.5	1.2	17.0	204	17.0	6.5	35.0	5.3	25	350*170*80
20.0	350	FLCI6I0206K2C	I	57.5	50	35.0	52.5	1.2	17.0	340	20.0	5.8	38.0	4.3	20	350*170*80
V _{rms} = 400V Voltage Code: L																
1.5	400	FLCA6L0155K2C	A	32.0	22	13.0	27.5	0.8	36.0	54.0	4.0	15.0	25.0	41.6	130	350*170*80
2.2	400	FLCB6L0225K2C	B	32.0	28	14.0	27.5	0.8	36.0	79.2	6.0	11.0	26.0	25.2	110	350*170*80
3.5	400	FLCC6L0355K2C	C	32.0	33	18.0	27.5	0.8	36.0	126.0	8.0	7.0	27.0	22.3	95	350*170*80
7.5	400	FLCD6L0755K2C	D	42.5	40	20.0	37.5	1.0	25.0	187.5	10.0	5.5	30.0	18.1	56	350*170*80
10.0	400	FLCE6L0106K2C	E	42.5	43	28.0	37.5	1.0	25.0	250.0	13.0	4.5	30.0	13.1	35	350*170*80
12.0	400	FLCG6L0126K2C	G	42.5	45	30.0	37.5	1.2	25.0	300.0	16.0	3.5	33.0	11.1	44	350*170*80
16.0	400	FLCH6L0166K2C	H	57.5	45	30.0	52.5	1.2	20.0	320.0	13.0	4.5	35.0	13.1	25	350*170*80
20.0	400	FLCI6L0206K2C	I	57.5	50	35.0	52.5	1.2	20.0	400.0	16.0	3.5	38.0	11.1	20	350*170*80
V _{rms} = 450V Voltage Code: M																
1.00	450	FLCA6M0105K2C	A	32.0	22	13.0	27.5	0.8	40.0	40.0	4.0	12.0	25.0	52.0	130	350*170*80
1.50	450	FLCB6M0155K2C	B	32.0	28	14.0	27.5	0.8	40.0	60.0	6.0	10.0	26.0	27.7	110	350*170*80
2.20	450	FLCC6M0225K2C	C	32.0	33	18.0	27.5	0.8	40.0	88.0	8.0	6.5	27.0	24.0	95	350*170*80
4.70	450	FLCD6M0475K2C	D	42.5	40	20.0	37.5	1.0	35.0	164.5	10.0	5.3	30.0	18.8	56	350*170*80
7.50	450	FLCE6M0755K2C	E	42.5	43	28.0	37.5	1.0	35.0	262.5	12.0	4.6	30.0	15.0	35	350*170*80
8.50	450	FLCG6M0855K2C	G	42.5	45	30.0	37.5	1.2	35.0	297.5	13.0	4.0	33.0	14.8	44	350*170*80
12.0	450	FLCH6M0126K2C	H	57.5	45	30.0	52.5	1.2	28.0	336.0	13.0	4.5	35.0	13.1	25	350*170*80
16.0	450	FLCI6M0166K2C	I	57.5	50	35.0	52.5	1.2	28.0	448.0	16.0	3.5	38.0	11.1	20	350*170*80

* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.kyocera-avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

AC FILTERING

FLC* RoHS Compliant



FOUR TERMINAL

Cap (μF)	Rated Voltage (V)	Part Number	Case Code	W ±0.50 (mm)	H ±0.50 (mm)	T ±0.50 (mm)	P ±1.00 (mm)	P1 ±1.00 (mm)	d ±0.50 (mm)	V/μs (Volt/sec)	I peak (A)	I rms (A)	R _s (mΩ)	ESL (nH)	Rth (°C/W)	Packaging Method	
V _{rms} = 250V Voltage Code: A																Box Qty (mm)	Dimensions
10.0	250	FLCJ6A0106K4C	J	42.5	40	20.0	37.5	10.2	1.2	17.0	170.0	12.0	6.9	30.0	10.1	56	350*170*80
18.0	250	FLCK6A0186K4C	K	42.5	43	28.0	37.5	10.2	1.2	17.0	306.0	13.0	3.5	30.0	16.9	35	350*170*80
20.0	250	FLCM6A0206K4C	M	42.5	45	30.0	37.5	20.3	1.2	17.0	340.0	15.0	3.3	33.0	13.5	44	350*170*80
25.0	250	FLCN6A0256K4C	N	57.5	45	30.0	52.5	20.3	1.2	11.0	275.0	18.0	6.0	35.0	5.1	25	350*170*80
30.0	250	FLCN6A0306K4C	N	57.5	45	30.0	52.5	20.3	1.2	11.0	330.0	21.0	4.9	35.0	4.6	20	350*170*80
40.0	250	FLCO6A0406K4C	O	57.5	50	35.0	52.5	20.3	1.2	11.0	440.0	20.0	5.3	38.0	4.7	20	350*170*80
50.0	250	FLCO6A0506K4C	O	57.5	50	35.0	52.5	20.3	1.2	12.0	600.0	22.0	5.0	38.0	4.1	20	350*170*80
V _{rms} = 300V Voltage Code: H																	
10.0	300	FLCL6H0106K4C	L	42.5	44	24.0	37.5	10.2	1.2	19.0	190.0	13.0	5.5	30.0	10.8	42	350*170*80
12.0	300	FLCK6H0126K4C	K	42.5	43	28.0	37.5	10.2	1.2	19.0	228.0	13.0	4.5	30.0	13.1	35	350*170*80
15.0	300	FLCM6H0156K4C	M	42.5	45	30.0	37.5	20.3	1.2	19.0	285.0	13.0	3.8	33.0	15.6	44	350*170*80
20.0	300	FLCN6H0206K4C	N	57.5	45	30.0	52.5	20.3	1.2	13.0	260.0	17.0	6.3	35.0	5.5	25	350*170*80
25.0	300	FLCO6H0256K4C	O	57.5	50	35.0	52.5	20.3	1.2	13.0	325.0	20.0	4.9	38.0	5.1	20	350*170*80
V _{rms} = 350V Voltage Code: I																	
7.5	350	FLCL6I0755K4C	L	42.5	44	24.0	37.5	10.2	1.2	24.0	180.0	11.0	7.0	30.0	11.8	42	350*170*80
9.0	350	FLCK6I0905K4C	K	42.5	43	28.0	37.5	10.2	1.2	24.0	216.0	11.0	5.7	30.0	14.5	35	350*170*80
10.0	350	FLCM6I0106K4C	M	42.5	45	30.0	37.5	20.3	1.2	24.0	240.0	11.0	4.3	33.0	19.2	44	350*170*80
12.0	350	FLCN6I0126K4C	N	57.5	45	30.0	52.5	20.3	1.2	17.0	204.0	18.0	6.0	35.0	5.1	25	350*170*80
20.0	350	FLCO6I0206K4C	O	57.5	50	35.0	52.5	20.3	1.2	17.0	340.0	21.0	5.3	38.0	4.3	20	350*170*80
V _{rms} = 400V Voltage Code: L																	
7.5	400	FLCJ6L0755K4C	J	42.5	40	20.0	37.5	10.2	1.0	25.0	187.5	11.0	5.5	30.0	15.00	56	350*170*80
10.0	400	FLCK6L0106K4C	K	42.5	43	28.0	37.5	10.2	1.0	25.0	250.0	14.0	4.5	30.0	11.30	35	350*170*80
13.0	400	FLCM6L0136K4C	M	42.5	45	30.0	37.5	20.3	1.2	25.0	325.0	17.0	4.0	33.0	8.60	44	350*170*80
16.0	400	FLCN6L0166K4C	N	57.5	45	30.0	52.5	20.3	1.2	20.0	320.0	14.0	5.0	35.0	10.20	25	350*170*80
20.0	400	FLCO6L0206K4C	O	57.5	50	35.0	52.5	20.3	1.2	20.0	400.0	20.0	4.0	38.0	6.20	20	350*170*80
V _{rms} = 450V Voltage Code: M																	
4.70	450	FLCJ6M0475K4C	J	42.5	40	20.0	37.5	10.2	1.0	35.0	164.5	12.0	5.0	30.0	13.80	56	350*170*80
7.50	450	FLCK6M0755K4C	K	42.5	43	28.0	37.5	10.2	1.0	35.0	262.5	14.0	4.0	30.0	12.70	35	350*170*80
8.50	450	FLCM6M0855K4C	M	42.5	45	30.0	37.5	20.3	1.2	35.0	297.5	14.0	3.5	33.0	14.50	44	350*170*80
12.0	450	FLCN6M0126K4C	N	57.5	45	30.0	52.5	20.3	1.2	28.0	336.0	14.0	4.0	35.0	12.70	25	350*170*80
16.0	450	FLCO6M0166K4C	O	57.5	50	35.0	52.5	20.3	1.2	28.0	448.0	17.0	3.0	38.0	11.50	20	350*170*80

* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.

AC FILTERING

FLA* RoHS Compliant



PACKAGING MATERIAL

- Aluminium can with soft PU

STANDARDS

IEC 61071-1, IEC 61071-2: Power electronic capacitors
EN CYWT2.E514025 Certificate: E514025 (approved by UL)

The FLA series uses metallized polypropylene dielectric, aluminum can, impregnated with soft PU specially treated to have a very high dielectric strength in operating conditions up to 85°C.

The FLA has been designed with overpressure disconnected device. They are suitable for output AC filtering for power converters, UPS systems, solar inverters and motor drives etc.

APPLICATIONS

- The FLA capacitor is particularly designed for AC filtering.

HOT SPOT CALCULATION

See Hot Spot Temperature, page 70.

$$\theta_{\text{hot spot}} = \theta_{\text{ambient}} + (P_d + P_t) \times R_{\text{th}}$$

with P_d (Dielectric losses) = $Q \times \text{tg}\delta_0$
 $Q \times \text{tg}\delta_0 \Rightarrow \left[\frac{1}{2} \times C_n \times (V_{\text{peak to peak}})^2 \times f \right] \times \text{tg}\delta_0$
 $\text{tg}\delta_0$ (tan delta)
 For polypropylene, $\text{tg}\delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures.
 P_t (Thermal losses) = $R_s \times (I_{\text{rms}})^2$

where C_n in Farad I_{rms} in Ampere f in Hertz
 V in Volt R_s in Ohm θ in °C
 R_{th} in °C/W

WORKING TEMPERATURE

According to the power to be dissipated
-40°C to +85°C

LIFETIME EXPECTANCY

One unique feature of this technology (as opposed to aluminum electrolytics) is how the capacitor reacts at the end of its lifetime.

Unlike aluminum electrolytic film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 5% from initial value, with no risk of short circuit.

The capacitor continues to be functional even after this 5% decrease.

HOW TO ORDER

FLA



Series

A1



Case

A1-A2
B1-B4
C1
D1
E1-E8
F1-F5
G1-G6
H1-H2

6



Dielectric

6 = Polypropylene

V



Voltage

A = 250V
H = 330V
L = 450V
M = 480V
J = 550V
R = 600V
N = 660V
O = 690V
P = 850V

0606



Capacitance

EIA Code
0606 = 60uF

K



Tolerances

J = ±5%
K = ±10%

C

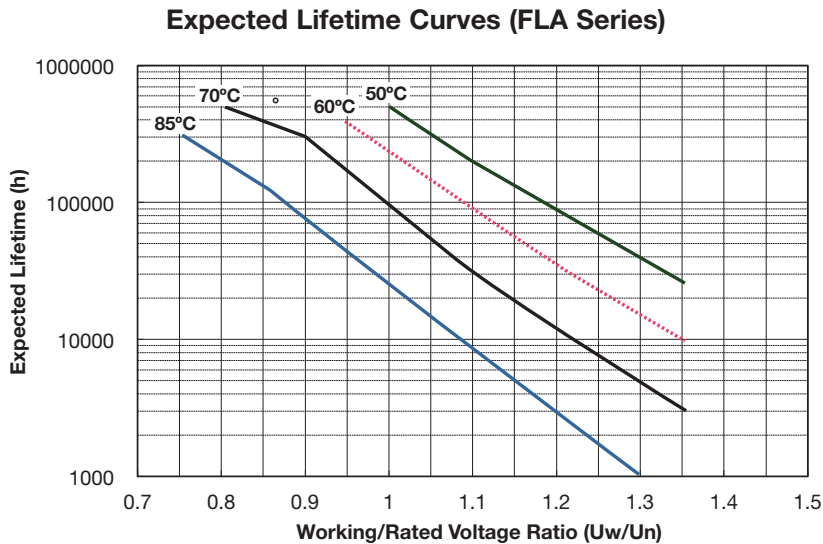


Terminal Code

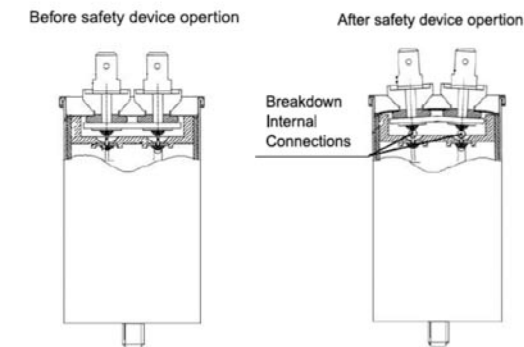
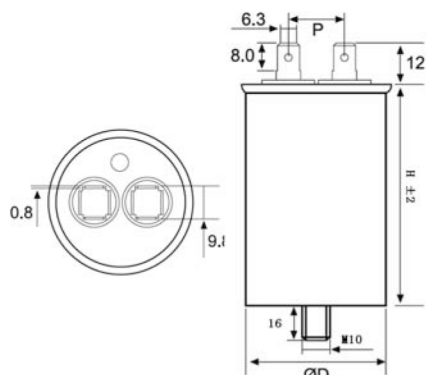
F = Fast-on terminals
H = M8 screw terminals



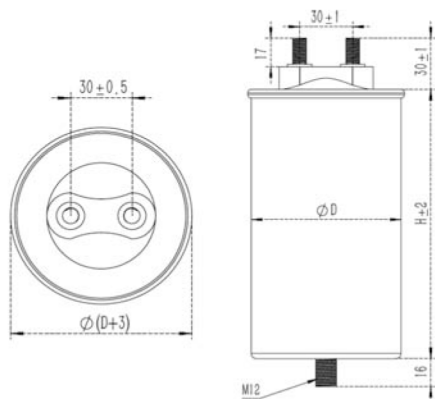
LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE



GENERAL DESCRIPTION



Fast-on terminals



M 8 screw terminals

DIMENSIONS

Case Ref	OD (mm)	H (mm)
A1	45	100
A2	45	125
B1	50	75
B2	50	100
B3	50	125
B4	50	150
C1	55	125
D1	60	130
E1	63.5	70
E2	63.5	75
E3	63.5	80
E4	63.5	100
E5	63.5	125
E6	63.5	150
E7	63.5	165
E8	63.5	197
F1	75	107
F2	75	122
F3	75	152
F4	75	180
F5	75	197
G1	85	122
G2	85	152
G3	85	180
G4	85	197
G5	85	210
G6	85	247
H1	106	210
H2	106	247

INSTALLATION TORQUE

Terminals	Torque Nm
Terminals	Torque Nm
M8	6
Stud of Case	Torque Nm
M10	10
M12	15

AC FILTERING

FLA* RoHS Compliant



POLYPROPYLENE DIELECTRIC FOR INDUSTRIAL AC FILTERING

These capacitors have been designed principally for high and medium power AC filtering applications.

ELECTRICAL CHARACTERISTICS

Climatic category	40/85/56 (IEC 60068)
Test voltage between terminals @ 25°C	2.15 x V _{rms}
Capacitance range C _n	10µF to 600µF
Capacitance Tolerances:	±5%, ±10%
Rated AC Voltage:	V _{rms} 250V to 690V
Dielectric:	Polypropylene
Lifetime (ΔC/C < 5%):	100,000hrs @ U _i & 70°C

RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Cap. (uF)	Rated Voltage V	Part Number	Case Code	OD ±1		H ±2		dv/dt Volt/sec	I peak Amps	I rms Amps	ESR mOhms	ESL nH	Rth °C/W	SPQ	MOQ
Vrms = 250V Voltage code : A															
60	250	FLAB26A0606KF	B2	50	(1.97)	100	(3.94)	16.7	1002	16.0	3.9	175	7.8	15	300
80	250	FLAB26A0806KF	B2	50	(1.97)	100	(3.94)	16.7	1336	16.0	4.4	175	7.8	15	300
100	250	FLAB36A0107KF	B3	50	(1.97)	125	(4.92)	12.6	1260	16.0	4.8	175	6.3	15	300
120	250	FLAC16A0127KF	C1	55	(2.17)	125	(4.92)	12.6	1512	16.0	4.6	175	6.0	15	300
150	250	FLAD36A0157KF	D3	60	(2.36)	125	(4.92)	12.6	1890	16.0	4.3	175	5.3	12	240
150	250	FLAK26A0157KH	K2	76	(2.99)	125	(4.92)	10.8	1620	22.0	3.3	190	4.7	12	240
180	250	FLAK26A0187KH	K2	76	(2.99)	125	(4.92)	11.7	2106	28.0	3.1	200	4.7	12	240
250	250	FLAK36A0257KH	K3	76	(2.99)	150	(5.91)	8.6	2150	30.0	3.4	190	4.3	12	240
300	250	FLAL16A0307KH	L1	86	(3.39)	150	(5.91)	8.6	2580	36.0	3.2	190	4.3	8	160
350	250	FLAK56A0357KH	K5	76	(2.99)	200	(7.87)	10.4	3640	35.0	3.1	200	4.0	12	240
400	250	FLAL36A0407KH	L3	86	(3.39)	200	(7.87)	10.4	4160	40.0	3.0	200	4.0	8	160
500	250	FLAL36A0507KH	L3	86	(3.39)	200	(7.87)	10.8	5400	50.0	3.3	220	2.9	8	160
600	250	FLAL46A0607KH	L4	86	(3.39)	250	(9.84)	8.0	4800	50.0	3.1	200	2.5	8	160
Vrms = 330V Voltage code : H															
50	330	FLAB26H0506KF	B2	50	(1.97)	100	(3.94)	16.7	835	16.0	5.1	175	7.8	15	300
60	330	FLAB36H0606KF	B3	50	(1.97)	125	(4.92)	12.6	756	16.0	5.4	175	6.3	15	300
100	330	FLAD36H0107KF	D3	60	(2.36)	125	(4.92)	12.6	1260	16.0	4.1	175	5.3	12	240
100	330	FLAK26H0107KH	K2	76	(2.99)	125	(4.92)	13.1	1310	30.0	3.8	190	5.2	12	240
120	330	FLAE56H0127KF	E5	63.5	(2.50)	125	(4.92)	7.2	864	16.0	3.8	175	5.5	12	240
150	330	FLAK36H0157KH	K3	76	(2.99)	150	(5.91)	9.0	1350	40.0	3.0	190	4.3	12	240
200	330	FLAL16H0207KH	L1	86	(3.39)	150	(5.91)	13.1	2620	40.0	3.1	200	4.0	8	160
250	330	FLAK56H0257KH	K5	76	(2.99)	200	(7.87)	8.6	2150	40.0	3.9	190	4.0	12	240
300	330	FLAL36H0307KH	L3	86	(3.39)	200	(7.87)	13.1	3930	50.0	3.6	200	2.9	8	160
330	330	FLAL36H0337KH	L3	86	(3.39)	200	(7.87)	13.1	4323	50.0	3.4	200	2.9	8	160
400	330	FLAL46H0407KH	L4	86	(3.39)	250	(9.84)	8.1	3240	50.0	3.6	200	2.5	8	160
Vrms = 450V Voltage code : L															
20	450	FLAB16L0206KF	B1	50	(1.97)	75	(2.95)	35.0	700	16.0	5.2	175	10.5	15	300
30	450	FLAB26L0306KF	B2	50	(1.97)	100	(3.94)	23.3	699	16.0	6.9	175	7.8	15	300
35	450	FLAB26L0356KF	B2	50	(1.97)	100	(3.94)	13.5	473	16.0	6.0	175	7.8	15	300
48	450	FLAB36L0486KF	B3	50	(1.97)	125	(4.92)	10.8	518	16.0	5.2	175	5.3	15	300
50	450	FLAK16L0506KH	K1	76	(2.99)	100	(3.94)	17.1	855	20.0	3.3	190	5.3	12	240
70	450	FLAD36L0706KF	D3	60	(2.36)	125	(4.92)	13.0	910	16.0	4.8	175	5.5	12	240
75	450	FLAD36L0756KF	D3	60	(2.36)	125	(4.92)	11.3	848	16.0	4.4	175	5.5	12	240
100	450	FLAK36L0107KH	K3	76	(2.99)	150	(5.91)	10.8	1080	35.0	4.7	190	4.3	12	240
140	450	FLAL16L0147KH	L1	86	(3.39)	150	(5.91)	13.1	1834	40.0	4.0	200	4.3	8	160
200	450	FLAL36L0207KH	L3	86	(3.39)	200	(7.87)	13.5	2700	40.0	3.7	220	2.9	8	160
210	450	FLAL36L0217KH	L3	86	(3.39)	200	(7.87)	13.5	2835	40.0	3.7	200	2.9	8	160
280	450	FLAL46L0287KH	L4	86	(3.39)	250	(9.84)	8.0	2240	50.0	4.1	220	2.5	8	160
Vrms = 480V Voltage code : M															
20	480	FLAB16M0206KF	B1	50	(1.97)	75	(2.95)	37.5	750	16.0	4.8	175	10.5	15	300
25	480	FLAB26M0256KF	B2	50	(1.97)	100	(3.94)	30.0	750	16.0	4.2	175	7.8	15	300
30	480	FLAB26M0306KF	B2	50	(1.97)	100	(3.94)	25.0	750	16.0	3.9	175	7.8	15	300
40	480	FLAD26M0406KF	D2	60	(2.36)	100	(3.94)	21.3	852	12.0	5.2	175	7.3	12	240

* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.

AC FILTERING

FLA* RoHS Compliant



RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Cap. (uF)	Rated Voltage V	Part Number	Case Code	OD ±1		H ±2		dv/dt Volt/sec	I peak Amps	I rms Amps	ESR mOhms	ESL nH	Rth °C/W	SPQ	MOQ
50	480	FLAC16M0506KF	C1	55	(2.17)	125	(4.92)	17.0	850	14.0	4.6	175	6.0	15	300
60	480	FLAK26M0606KH	K2	76	(2.99)	125	(4.92)	17.6	1056	18.0	3.7	190	4.7	12	240
70	480	FLAK26M0706KH	K2	76	(2.99)	125	(4.92)	15.0	1050	20.0	3.4	190	4.7	12	240
80	480	FLAK36M0806KH	K3	76	(2.99)	150	(5.91)	15.3	1224	30.0	4.2	190	4.3	12	240
100	480	FLAK56M0107KH	K5	76	(2.99)	200	(7.87)	17.1	1710	50.0	4.1	190	4.0	12	240
140	480	FLAK56M0147KH	K5	76	(2.99)	200	(7.87)	17.1	2394	40.0	3.6	200	4.0	12	240
180	480	FLAK66M0187KH	K6	76	(2.99)	250	(9.84)	13.1	2358	40.0	4.8	200	3.0	12	240
250	480	FLAL46M0257KH	L4	86	(3.39)	250	(9.84)	11.7	2925	50.0	4.2	200	2.5	8	160
Vrms = 550V Voltage code : J															
20	550	FLAB26J0206KF	B2	50	(1.97)	100	(3.94)	30.0	600	16.0	6.9	175	7.9	15	300
30	550	FLAB36J0306KF	B3	50	(1.97)	125	(4.92)	25.0	750	16.0	6.6	175	6.3	15	300
40	550	FLAD36J0406KF	D3	60	(2.36)	125	(4.92)	18.8	752	16.0	7.1	175	5.5	15	300
50	550	FLAE56J0506KF	E5	63.5	(2.50)	125	(4.92)	17.0	850	16.0	6.1	175	5.3	12	240
70	550	FLAK36J0706KH	K3	76	(2.99)	150	(5.91)	12.9	903	25.0	4.6	175	4.2	12	240
75	550	FLAK36J0756KH	K3	76	(2.99)	150	(5.91)	12.9	968	25.0	4.4	175	4.3	12	240
100	550	FLAL16J0107KH	L1	86	(3.39)	150	(5.91)	28.2	2820	30.0	3.9	200	4.0	8	160
125	550	FLAL36J0127KH	L3	86	(3.39)	200	(7.87)	22.6	2825	30.0	3.6	200	2.9	8	160
150	550	FLAL36J0157KH	L3	86	(3.39)	200	(7.87)	21.4	3210	40.0	5.0	200	2.9	8	160
200	550	FLAL46J0207KH	L4	86	(3.39)	250	(9.84)	16.1	3220	50.0	4.4	200	2.5	8	160
250	550	FLAM16J0257KH	M1	96	(3.78)	250	(9.84)	14.0	3500	50.0	4.0	240	2.1	6	120
300	550	FLAH36J0307KH	H3	106	(4.17)	250	(9.84)	11.7	3510	50.0	3.7	240	2.0	5	100
Vrms = 600V Voltage code : R															
10	600	FLAB16R0106KF	B1	50	(1.97)	75	(2.95)	35.0	350	16.0	6.4	160	10.5	15	300
20	600	FLAB36R0206KF	B3	50	(1.97)	125	(4.92)	25.0	500	16.0	11.1	160	6.3	15	300
25	600	FLAB36R0256KF	B3	50	(1.97)	125	(4.92)	24.0	600	16.0	6.1	175	6.3	15	300
30	600	FLAD36R0306KF	D3	60	(2.36)	125	(4.92)	20.0	600	16.0	5.4	175	5.3	12	240
35	600	FLAD36R0356KF	D3	60	(2.36)	125	(4.92)	20.0	700	16.0	7.3	175	5.3	12	240
40	600	FLAE56R0406KF	E5	63.5	(2.50)	125	(4.92)	17.5	700	16.0	6.6	175	5.3	12	240
50	600	FLAK36R0506KH	K3	76	(2.99)	150	(5.91)	17.0	850	20.0	5.7	175	4.3	12	240
Vrms = 660V Voltage code : N															
10	660	FLAB36N0106KF	B3	50	(1.97)	125	(4.92)	55.0	550	16.0	5.2	160	10.5	15	300
15	660	FLAD36N0156KF	D3	60	(2.36)	125	(4.92)	28.0	420	16.0	6.2	160	6.3	12	240
20	660	FLAC16N0206KF	C1	55	(2.17)	125	(4.92)	27.5	550	16.0	8.3	175	6.3	12	240
25	660	FLAD36N0256KF	D3	60	(2.36)	125	(4.92)	22.0	550	16.0	7.9	175	5.3	12	240
30	660	FLAE56N0306KF	E5	63.5	(2.50)	125	(4.92)	25.0	750	16.0	6.3	175	5.5	12	240
40	660	FLAK36N0406KH	K3	76	(2.99)	150	(5.91)	22.5	900	30.0	5.2	175	4.6	12	240
50	660	FLAL16N0506KH	L1	86	(3.39)	150	(5.91)	20.0	1000	40.0	4.7	175	4.0	8	160
Vrms = 690V Voltage code : 0															
10	690	FLAB36O0106KF	B3	50	(1.97)	125	(4.92)	55.0	550	16.0	5.2	160	6.3	15	300
15	690	FLAB36O0156KF	B3	50	(1.97)	125	(4.92)	28.0	420	16.0	6.2	160	6.3	15	300
20	690	FLAC16O0206KF	C1	55	(2.17)	125	(4.92)	27.5	550	16.0	8.3	175	6.0	15	300
30	690	FLAE56O0306KF	E5	63.5	(2.50)	125	(4.92)	25.0	750	16.0	6.3	175	5.5	12	240
40	690	FLAK36O0406KH	K3	76	(2.99)	150	(5.91)	28.8	1152	25.0	4.8	190	4.3	12	240
50	690	FLAL16O0506KH	L1	86	(3.39)	150	(5.91)	23.0	1150	30.0	4.3	190	4.0	8	160
70	690	FLAK66O0706KH	K6	76	(2.99)	250	(9.84)	18.0	1260	30.0	3.7	200	2.9	12	240
85	690	FLAL46O0856KH	L4	86	(3.39)	250	(9.84)	18.0	1530	40.0	3.5	220	2.5	8	160
100	690	FLAL46O0107KH	L4	86	(3.39)	250	(9.84)	18.0	1800	40.0	3.3	200	2.5	8	160
125	690	FLAH36O0127KH	H3	106	(4.17)	250	(9.84)	12.5	1563	50.0	4.0	220	2.0	5	100
150	690	FLAH36O0157KH	H3	106	(4.17)	250	(9.84)	12.5	1875	50.0	3.8	240	2.0	5	100
200	690	FLAN16O0207KH	N1	116	(4.57)	250	(9.84)	16.5	3300	60.0	1.6	190	2.0	5	100
Vrms = 850V Voltage code : P															
10	850	FLAK16P0106KH	K1	76	(2.99)	100	(3.94)	60.0	600	22.0	2.7	100	8.8	12	240
13	850	FLAK16P0136KH	K1	76	(2.99)	100	(3.94)	50.0	650	26.0	2.7	120	8.8	12	240
22	850	FLAK36P0226KH	K3	76	(2.99)	150	(5.91)	22.7	500	25.0	4.4	190	6.3	12	240
33	850	FLAK46P0336KH	K4	76	(2.99)	170	(6.69)	45.5	1500	40.0	1.9	120	5.0	12	240
44	850	FLAL26P0446KH	L2	86	(3.39)	170	(6.69)	38.6	1700	43.0	2.1	140	4.2	8	160
68	850	FLAL46P0686KH	L4	86	(3.39)	250	(9.84)	20.6	1400	49.0	2.0	190	3.4	8	160
80	850	FLAL46P0806KH	L4	86	(3.39)	250	(9.84)	21.3	1700	50.0	1.8	190	3.4	8	160
100	850	FLAM16P0107KH	M1	96	(3.78)	250	(9.84)	21.0	2100	56.0	1.8	190	3.0	6	120
150	850	FLAN16P0157KH	N1	116	(4.57)	250	(9.84)	19.3	2900	60.0	1.6	190	2.6	5	100

* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

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KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.kyocera-avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

TDS-MDPWR-0016 | Rev 1

AC FILTERING

FLB* RoHS Compliant



PACKAGING MATERIAL

- Aluminium can with soft PU

STANDARDS

IEC 61071-1, IEC 61071-2: Power electronic capacitors
IEC 60831: Shunt power capacitors of selfhealing type for ac systems having a rated voltage up to and including 1kv
EN CYWT2.E514025 Certificate: E514025 (approved by UL)

LIFETIME EXPECTANCY

One unique feature of this technology (as opposed to aluminum electrolytic) is how the capacitor reacts at the end of its lifetime.

Unlike aluminum electrolytic film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 5% from initial value, with no risk of short circuit.

The capacitor continues to be functional even after this 5% decrease.

The FLB series uses metallized polypropylene dielectric, aluminum can, impregnated with soft PU specially treated to have a very high dielectric strength in operating conditions up to 85°C.

The FLB has been designed with overpressure disconnected device. They are suitable for power factor correction and output AC filtering for power converters, UPS systems, solar inverters and motor drives etc.

APPLICATIONS

- The FLB capacitor is particularly designed for AC filtering and power factor correction.

HOT SPOT CALCULATION

See Hot Spot Temperature, page 75.

$$\theta_{\text{hot spot}} = \theta_{\text{ambient}} + (P_d + P_t) \times R_{th}$$

with P_d (Dielectric losses) = $Q \times \text{tg}\delta_0$

$$Q \times \text{tg}\delta_0 \Rightarrow \left[\frac{1}{2} \times C_n \times (V_{\text{peak to peak}})^2 \times f \right] \times \text{tg}\delta_0$$

$\text{tg}\delta_0$ (tan delta)

For polypropylene, $\text{tg}\delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures.

$$P_t \text{ (Thermal losses)} = R_s \times (I_{\text{rms}})^2$$

where C_n in Farad I_{rms} in Ampere f in Hertz
 V in Volt R_s in Ohm θ in °C
 R_{th} in °C/W

WORKING TEMPERATURE

According to the power to be dissipated
-40°C to +85°C

HOW TO ORDER

FLB

Series

A

Case

A
B
C
D
E
F
G
H
J

6

Dielectric
6 = Polypropylene

V

Voltage

A = 230V
I = 400V
L = 440V
J = 525V
N = 660V
O = 690V

0335

Capacitance
EIA Code
0103 = 0.01µF

K

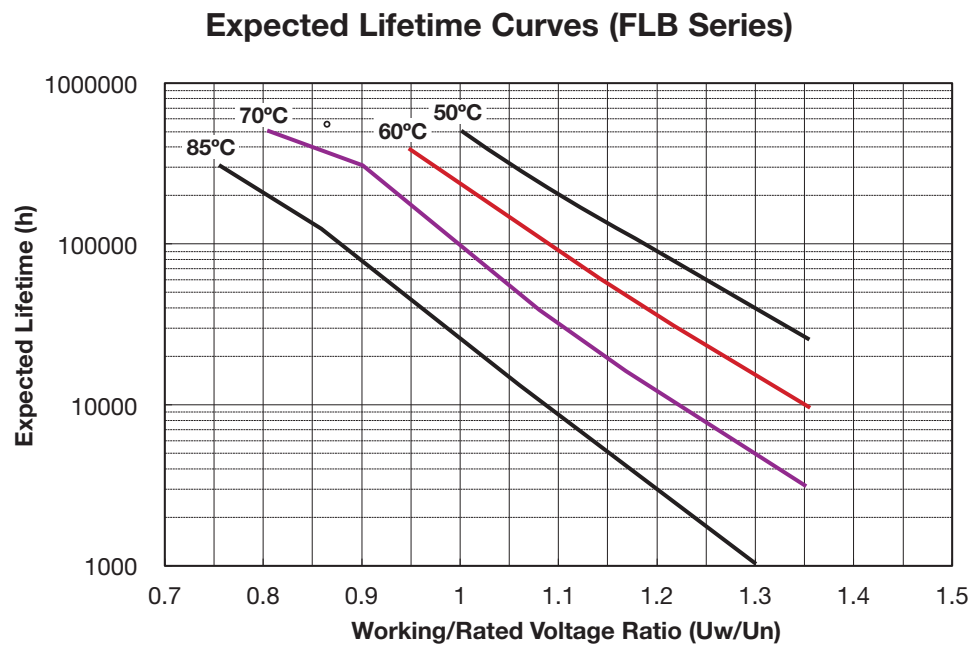
Tolerances

J = ±5%
K = ±10%

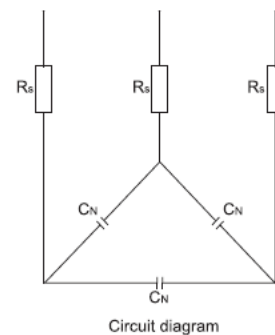
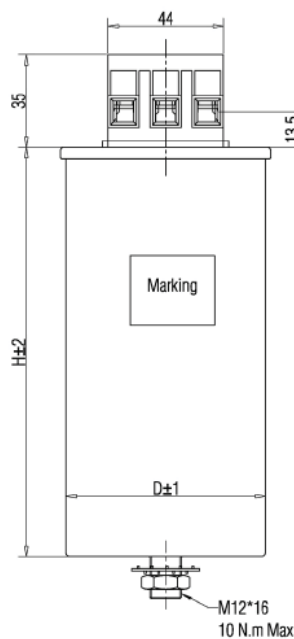
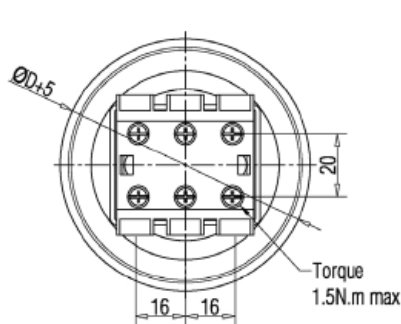
03

Terminal
Code
03 = 3 phase

LIFETIME EXPECTANCY VS HOT SPOT TEMPERATURE AND VOLTAGE



GENERAL DESCRIPTION



* Rs is external discharge resistor selected from following range by customer. KYOCERA AVX doesnt provide external discharge capacitor.

DIMENSIONS

Case Ref	OD (mm)	H (mm)
A	85	200
B	85	265
C	85	350
D	116	160
E	116	200
F	116	230
G	116	265
H	136	200
J	136	230

Vrms	Resistor Range
230V	220kΩ~400kΩ
400V	270kΩ~800kΩ
440V	270kΩ~800kΩ
525V	270kΩ~1200kΩ
660V	800kΩ~2000kΩ
690V	800kΩ~1500kΩ

AC FILTERING

FLB* RoHS Compliant



ELECTRICAL CHARACTERISTICS

Climatic category	-40/D (IEC 60068)
Test voltage between terminals @ 25°C	2.15 x V _{rms}
Capacitance range C _n	3*20.3μF to 3*335μF
Capacitance Tolerances:	±5%, ±10%
Rated AC Voltage:	V _{rms} 230V to 690V
Dielectric:	Polypropylene
Lifetime (ΔC/C ≤ 5%):	100,000hrs @ U _i & 70°C

RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Cap (μF)	Rated Voltage (V)	Part No.	Case Code	Diameter ±2 (mm)	H ±2 (mm)	Output (kvar)	I rms (A)	V/μs (Volt/sec)	I Peak (A)	Packaging Method	
										Box Qty (mm)	Dimension
V _{rms} = 230V Voltage Code: A											
3 x 200.6	230	FLBB6A0207K03	B	85.0	265.0	10.0	25.1	37.0	7530	8	375*285*365
3 x 200.6	230	FLBD6A0207K03	D	116.0	160.0	10.0	25.1	37.0	7530	5	375*285*235
3 x 250.7	230	FLBC6A0257K03	C	85.0	350.0	12.5	31.4	37.0	9420	8	375*285*435
3 x 250.7	230	FLBE6A0257K03	E	116.0	200.0	12.5	31.4	37.0	9420	5	375*285*365
3 x 300.9	230	FLBC6A0307K03	C	85.0	350.0	15.0	37.7	37.0	11310	8	375*285*435
3 x 300.9	230	FLBE6A0307K03	E	116.0	200.0	15.0	37.7	37.0	11310	5	375*285*365
3 x 335.0	230	FLBF6A3356K03	F	116.0	230.0	16.7	41.9	37.0	12570	5	375*285*365
V _{rms} = 400V Voltage Code: I											
3 x 66.3	400	FLBA6I0666K03	A	85.0	200.0	10.0	14.4	65.0	4320	8	375*285*365
3 x 82.9	400	FLBA6I0826K03	A	85.0	200.0	12.5	18.0	65.0	5400	8	375*285*365
3 x 99.5	400	FLBA6I0996K03	A	85.0	200.0	15.0	21.6	65.0	6480	8	375*285*365
3 x 110.7	400	FLBB6I0117K03	B	85.0	265.0	16.7	24.1	65.0	7230	8	375*285*365
3 x 110.7	400	FLBD6I0117K03	D	116.0	160.0	16.7	24.1	65.0	7230	5	375*285*235
3 x 132.6	400	FLBB6I1326K03	B	85.0	265.0	20.0	28.8	65.0	8640	8	375*285*365
3 x 132.6	400	FLBD6I1326K03	D	116.0	160.0	20.0	28.8	65.0	8640	5	375*285*235
3 x 165.8	400	FLBB6I1656K03	B	85.0	265.0	25.0	36.1	65.0	10830	8	375*285*365
3 x 165.8	400	FLBE6I1656K03	E	116.0	200.0	25.0	36.1	65.0	10830	5	375*285*365
3 x 198.9	400	FLBH6I1986K03	H	136.0	200.0	30.0	43.3	65.0	12990	4	375*285*365
V _{rms} = 440V Voltage Code: L											
3 x 68.5	440	FLBA6L0686K03	A	85.0	200.0	12.5	16.4	72.0	4920	8	375*285*365
3 x 77.0	440	FLBA6L0776K03	A	85.0	200.0	14.1	18.5	72.0	5550	8	375*285*365
3 x 77.0	440	FLBD6L0776K03	D	116.0	160.0	14.1	18.5	72.0	5550	5	375*285*235
3 x 82.2	440	FLBA6L0826K03	A	85.0	200.0	15.0	19.7	72.0	5910	8	375*285*365
3 x 92.6	440	FLBA6L0926K03	A	85.0	200.0	16.9	22.2	72.0	6660	8	375*285*365
3 x 103.0	440	FLBB6L1036K03	B	85.0	265.0	18.8	24.7	72.0	7410	8	375*285*365
3 x 103.0	440	FLBD6L1036K03	D	116.0	160.0	18.8	24.7	72.0	7410	5	375*285*235
3 x 109.0	440	FLBB6L1096K03	B	85.0	265.0	20.0	26.2	72.0	7860	8	375*285*365
3 x 109.0	440	FLBD6L1096K03	D	116.0	160.0	20.0	26.2	72.0	7860	5	375*285*235
3 x 123.3	440	FLBB6L1236K03	B	85.0	265.0	22.5	29.5	72.0	8850	8	375*285*365
3 x 123.3	440	FLBD6L1236K03	D	116.0	160.0	22.5	29.5	72.0	8850	5	375*285*235
3 x 137.0	440	FLBB6L1376K03	B	85.0	265.0	25.0	32.8	72.0	9840	8	375*285*365
3 x 137.0	440	FLBE6L1376K03	E	116.0	200.0	25.0	32.8	72.0	9840	5	375*285*365
3 x 154.0	440	FLBB6L1546K03	B	85.0	265.0	28.1	36.9	72.0	11070	8	375*285*365
3 x 154.0	440	FLBE6L1546K03	E	116.0	200.0	28.1	36.9	72.0	11070	5	375*285*365
3 x 164.4	440	FLBC6L1646K03	C	85.0	350.0	30.0	39.4	72.0	11820	8	375*285*435
3 x 164.4	440	FLBE6L1646K03	E	116.0	200.0	30.0	39.4	72.0	11820	5	375*285*365
3 x 180.9	440	FLBH6L1806K03	H	136.0	200.0	33.0	43.3	72.0	12990	2	375*285*365

* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.

AC FILTERING

FLB* RoHS Compliant



RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Cap (μ F)	Rated Voltage (V)	Part No.	Case Code	Diameter ± 2 (mm)	H ± 2 (mm)	Output (kvar)	I rms (A)	V/ μ s (Volt/sec)	I Peak (A)	Packaging Method	
										Box Qty (mm)	Dimension
V _{rms} = 525V Voltage Code: J											
3 x 38.5	525	FLBA6J0386K03	A	85.0	200.0	10	11.0	86.0	3300	8	375*285*365
3 x 48.1	525	FLBA6J0486K03	A	85.0	200.0	12.5	13.7	86.0	4110	8	375*285*365
3 x 53.1	525	FLBA6J0536K03	A	85.0	200.0	13.8	15.2	86.0	4560	8	375*285*365
3 x 57.7	525	FLBA6J0576K03	A	85.0	200.0	15.0	16.5	86.0	4950	8	375*285*365
3 x 77.0	525	FLBB6J0776K03	B	85.0	265.0	20.0	22.0	86.0	6600	8	375*285*365
3 x 77.0	525	FLBD6J0776K03	D	116.0	160.0	20.0	22.0	86.0	6600	5	375*285*235
3 x 96.2	525	FLBB6J0966K03	B	85.0	265.0	25.0	27.5	86.0	8250	8	375*285*365
3 x 96.2	525	FLBE6J0966K03	E	116.0	200.0	25.0	27.5	86.0	8250	5	375*285*365
3 x 115.4	525	FLBF6J1156K03	F	116.0	230.0	30.0	33.0	86.0	9900	5	375*285*365
3 x 115.4	525	FLBH6J1156K03	H	136.0	200.0	30.0	33.0	86.0	9900	2	375*285*365
3 x 138.2	525	FLBG6J1386K03	G	116.0	265.0	35.9	39.5	86.0	11850	5	375*285*365
3 x 138.2	525	FLBJ6J1386K03	J	136.0	230.0	35.9	39.5	86.0	11850	2	375*285*365
3 x 142.8	525	FLBG6J1426K03	G	116.0	265.0	37.1	40.8	86.0	12240	5	375*285*365
3 x 142.8	525	FLBJ6J1426K03	J	136.0	230.0	37.1	40.8	86.0	12240	2	375*285*365
V _{rms} = 660V Voltage Code: N											
3 x 20.3	660	FLBA6N0206K03	A	85.0	200.0	8.33	7.3	108.0	2190	8	375*285*365
3 x 24.4	660	FLBa6N0246K03	A	85.0	200.0	10.0	8.7	108.0	2610	8	375*285*365
3 x 30.4	660	FLBB6N0306K03	B	85.0	265.0	12.5	10.9	108.0	3270	8	375*285*365
3 x 36.5	660	FLBB6N0366K03	B	85.0	265.0	15.0	13.1	108.0	3930	8	375*285*365
3 x 40.7	660	FLBB6N0406K03	B	85.0	265.0	16.7	14.6	108.0	4380	8	375*285*365
3 x 48.7	660	FLBC6N0486K03	C	85.0	350.0	20.0	17.5	108.0	5250	8	375*285*435
3 x 55.8	660	FLBC6N0556K03	C	85.0	350.0	22.9	20.0	108.0	6000	8	375*285*435
V _{rms} = 690V Voltage Code: O											
3 x 27.9	690	FLBB6O0276K03	B	85.0	265.0	12.5	10.5	112.0	3150	8	375*285*365
3 x 33.4	690	FLBB6O0336K03	B	85.0	265.0	15.0	12.5	112.0	3750	8	375*285*365
3 x 44.6	690	FLBC6O0446K03	C	85.0	350.0	20.0	16.7	112.0	5010	8	375*285*435
3 x 55.7	690	FLBC6O0556K03	C	85.0	350.0	25.0	20.9	112.0	6270	8	375*285*435

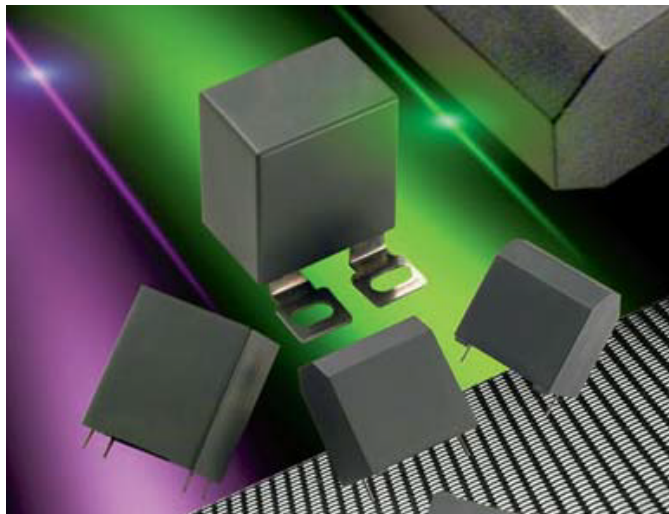
* Insert K for 10% capacitance tolerance (standard); J (+5%) and M (+20%) tolerances available on request.

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.

PROTECTION

FSB* RoHS Compliant



GENERAL DESCRIPTION

Metallized polypropylene dielectric capacitor with controlled self-healing.

Reinforced metallization developed for high impulse currents.

APPLICATIONS

- IGBT protection
- IGBT clamping

PACKAGING MATERIAL

- Plastic case backfilled with thermosetting resin

HOW TO ORDER

FSB

Series

1

Case Size

- 1 = P0 Style
- 2 = 18 Style
- 3 = 19 Style
- 4 = 26 style
- 5 = R28 Style
(2 terminal
or 4 terminal)
- 6-C (Lug Terminals)

6

Dielectric
6 = Polypropylene

U

Voltage
Code

- A = 700V
- B = 850V
- C = 1000V
- U = 1200V
- G = 1500V
- N = 2000V

0154

Capacitance
Code

- 0 + pF code
- 0154 = 0.15 μ F
- 0334 = 0.33 μ F
- 0255 = 2.5 μ F
etc.

J

Capacitance
Tolerances

- J = $\pm 5\%$
- K = $\pm 10\%$
(Case size 6 only)

--

Terminal Code

- = 2 Terminal
- JC = 4 Terminal
(Case Size 5 option only)
- 90 = 90° Terminals
- 18 = 180° Terminals
(Case size 6-C options only)



ELECTRICAL CHARACTERISTICS

Capacitance Range C_n	0.10 μ F to 5.6 μ F
Tolerance on C_n	$\pm 5\%$, $\pm 10\%$
Rated DC Voltage V_n dc	700 to 2000 V
Stray Inductance	≤ 25 nH
RMS Current	I_{rms} max. = up to 28A The currents shown in the tables are maximum. It is necessary to maintain operation within the maximum temperature of the dielectric 85°C. See "Hot spot temperature calculation"
Insulation Resistance	$R_i \times C \geq 30,000$ s
Impulse Current	$I^2.t$ max. = up to 1.69 A ² s Spikes or peak currents in the capacitors may cause a deterioration of the bonding between the metallization and the connections. These bonds are capable of withstanding only a limited amount of energy for each spike. The table shows the maximum energy permitted in the form ($I^2.t$), where I is in Amperes, and t is in seconds.
Note: The formula ($I^2.t$) replaces dv/dt which is less easy to use as it is not an expression of energy ($I = C.dv/dt$). This type of capacitor has been designed to withstand high ($I^2.t$) values.	
Variation of Capacitance with Temperature	$\frac{\Delta C}{C} \leq \pm 2\%$ between -40 and +85°C
Climatic Category	40/085/56 (IEC 68)
Test Voltage Between Terminals @ 25°C	1.6 V_n dc during 10s
Withstanding Voltage Between Terminals and Case @ 25°C	@ 3 kVrms @ 50Hz during 1 min.

PROTECTION

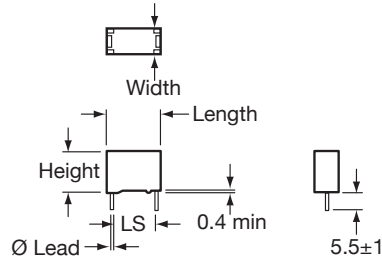
FSB* RoHS Compliant

GENERAL DESCRIPTION

STYLE: P0; 18; 19; 26; R68

ALL CASE SIZES

2 TERMINALS VERSION

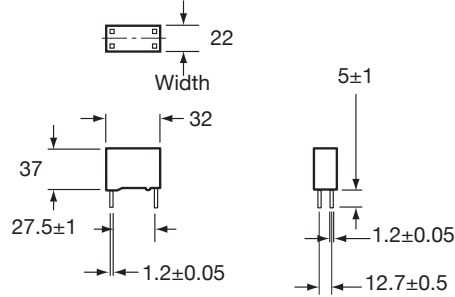


General Tolerance: 0.5mm

STYLE: R68

CASE SIZE 5 ONLY

4 TERMINALS VERSION



General Tolerance: 0.5mm

DIMENSIONS

Case Size	Case Style	Length ±0.50 mm	Width ±0.50 mm	Height ±0.50 mm	Dimensions lead -0.05 mm	LS ±1.00 mm
1	P0	32	13.0	22.0	Ø 0.80	27.5
2	18	32	16.0	25.0	Ø 0.80	27.5
3	19	32	18.0	28.0	Ø 0.80	27.5
4	26	32	21.0	31.0	Ø 1.00	27.5
5	R68 2 Terminals Version	32	22.0	37.0	Ø 1.00	27.5
	R68 4 Terminals Version	32	2.0	37.0	Ø 1.20	27.5

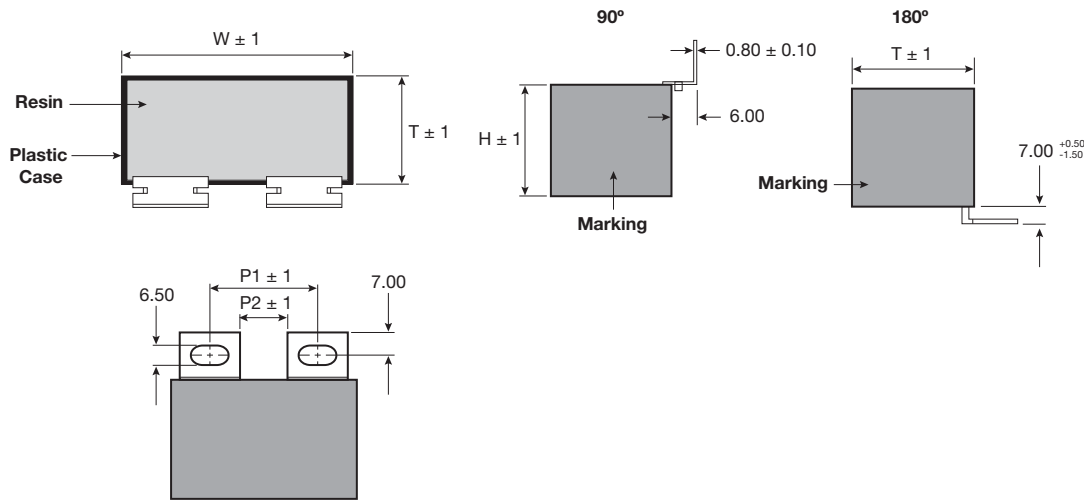
RATINGS AND PART NUMBER REFERENCE

Part Number	Capacitance (µF)	Case Style	Dv/Dt	Irms (A)	Rs (mΩ)	Rth (hotspot/amb.)	ESL (nH)
V_{dc}=1200V V_{peak}=1600V V_{rms}=560v Vs=2000V Voltage Code: U							
FSB16U0154J-	0.15	PO	500	3.0	14.3	45.9	25.0
FSB26U0274J-	0.27	18	500	7.6	8.4	36.8	25.0
FSB36U0394J-	0.39	19	500	11.0	6.2	32.2	25.0
FSB46U0474J-	0.47	26	500	12.0	5.6	29.4	25.0
FSB56U0684J-	0.68	R68 (2 terminals)	500	12.0	3.8	23.7	25.0
FSB56U0684JJC	0.68	R68 (4 terminals)	500	16.7	3.8	23.7	25.0
V_{dc}=1600V V_{peak}=2000V V_{rms}=630v Vs=2300V Voltage Code: M							
FSB16M0134J-	0.13	PO	600	4.6	13.3	44.9	25.0
FSB26M0184J-	0.18	18	600	6.4	9.9	35.9	25.0
FSB36M0244J-	0.24	19	600	8.5	7.8	32.4	25.0
FSB46M0334J-	0.33	26	600	11.7	5.6	28.6	25.0
FSB56M0434J-	0.43	R68 (2 terminals)	600	12.0	4.6	23.8	25.0
FSB56M0434JJC	0.43	R68 (4 terminals)	600	15.2	4.6	23.8	25.0
V_{dc}=2000V V_{peak}=2400V V_{rms}=700v Vs=2600V Voltage Code: N							
FSB16N0104J-	0.10	PO	700	4.2	14.3	44.6	25.0
FSB26N0134J-	0.13	18	700	5.5	11.3	35.7	25.0
FSB36N0184J-	0.18	19	700	7.6	8.5	32.1	25.0
FSB46N0224J-	0.22	26	700	9.3	6.8	29.1	25.0
FSB56N0304J-	0.30	R68 (2 terminals)	700	12.0	5.3	23.8	25.0
FSB56N0304JJC	0.30	R68 (4 terminals)	700	12.7	5.3	23.8	25.0

PROTECTION

FSB* RoHS Compliant

CASE SIZE 6-C



RATINGS AND PART NUMBER REFERENCE FOR LUG TERMINALS

Cap (μ F) $\pm 10\%$	Rated Voltage (V)	Part Number		Case Size	W ± 0.50 (mm)	H ± 0.50 (mm)	T ± 0.50 (mm)	P1 ± 0.50 (mm)	P2 ± 0.50 (mm)	dv/dt Volt/ sec	I peak Amps	I rms Amps	Rs m Ω	ESL nH	Rth °C/W	Packaging Inner Box				
		90°	180°													Qty	Size			
V _{ndc} = 700V V _{peak} = ?V V _{rms} = ?v V _s = ?V																	Voltage Code: A		Qty	Size
1.20	700	FSBA6A0125K90	FSBA6A0125K18	A	42.50	27.5	24.5	23~28	11.0	600.0	720.0	17.5	4.0	18.0	16.4	42	360*170*80			
2.00	700	FSBB6A0205K90	FSBB6A0205K18	B	42.50	35.5	33.5	23~28	11.0	600.0	1200.0	23.5	3.3	20.0	11.3	35	360*170*80			
2.20	700	FSBB6A0225K90	FSBB6A0225K18	B	42.50	35.5	33.5	23~28	11.0	600.0	1320.0	24.0	3.1	20.0	10.8	35	360*170*80			
2.50	700	FSBB6A0255K90	FSBB6A0255K18	B	42.50	35.5	33.5	23~28	11.0	600.0	1500.0	24.5	2.9	20.0	10.1	35	360*170*80			
3.00	700	FSBB6A0305K90	FSBB6A0305K18	B	42.50	45.0	33.0	23~28	11.0	600.0	1800.0	27.5	2.7	20.0	7.7	40	360*170*80			
3.30	700	FSB96A0335K90	FSB96A0335K18	9	42.50	45.0	33.0	23~28	11.0	600.0	1980.0	28.0	2.7	25.0	7.2	40	360*170*80			
3.50	700	FSB96A0355K90	FSB96A0355K18	9	42.50	45.0	33.0	23~28	11.0	600.0	2100.0	28.5	2.6	25.0	7.4	40	360*170*80			
4.00	700	FSB86A0405K90	FSB86A0405K18	8	57.50	45.0	30.0	37~39	24.0	360.0	1440.0	29.0	4.4	35.0	7.9	25	360*170*80			
4.70	700	FSB76A0475K90	FSB76A0475K18	7	57.50	50.0	35.0	37~39	24.0	360.0	1692.0	35.0	4.1	38.0	6.9	20	360*170*80			
5.00	700	FSB76A0505K90	FSB76A0505K18	7	57.50	50.0	35.0	37~39	24.0	360.0	1800.0	37.0	3.9	38.0	6.9	20	360*170*80			
5.60	700	FSB76A0565K90	FSB76A0565K18	7	57.50	50.0	35.0	37~39	24.0	360.0	2016.0	39.0	3.7	38.0	6.5	20	360*170*80			
V _{ndc} = 850V V _{peak} = 1200V V _{rms} = 450v V _s = 1500V																	Voltage Code: B		Qty	Size
0.82	850	FSBA6B0824K90	FSBA6B0824K18	A	42.5	27.5	24.5	23~28	11.0	750.0	615.0	13.0	6.7	18.0	20.7	42	360*170*80			
1.00	850	FSBA6B0105K90	FSBA6B0105K18	A	42.5	27.5	24.5	23~28	11.0	750.0	750.0	15.0	5.5	18.0	18.8	42	360*170*80			
1.50	850	FSBB6B0155K90	FSBB6B0155K18	B	42.5	35.5	33.5	23~28	11.0	750.0	1125.0	22.0	3.9	20.0	13.9	35	360*170*80			
1.75	850	FSBB6B0175K90	FSBB6B0175K18	B	42.5	35.5	33.5	23~28	11.0	750.0	1312.5	24.0	3.4	20.0	12.6	35	360*170*80			
2.00	850	FSB66B0205K90	FSB66B0205K18	6	42.5	45.0	30.0	23~28	11.0	750.0	1500.0	25.0	3.4	25.0	19.1	40	360*170*80			
2.20	850	FSB66B0225K90	FSB66B0225K18	6	42.5	45.0	30.0	23~28	11.0	750.0	1650.0	28.0	3.1	25.0	18.6	40	360*170*80			
2.50	850	FSB66B0255K90	FSB66B0255K18	6	42.5	45.0	30.0	23~28	11.0	750.0	1875.0	28.0	2.7	25.0	17.8	40	360*170*80			
2.50	850	FSB76B0255K90	FSB76B0255K18	7	57.5	50.0	35.0	37~39	24.0	469.0	1172.5	24.0	5.3	38.0	10.7	20	360*170*80			
3.00	850	FSB86B0305K90	FSB86B0305K18	8	57.5	45.0	30.0	37~39	24.0	469.0	1407.0	27.0	4.5	35.0	9.9	25	360*170*80			
3.30	850	FSB86B0335K90	FSB86B0335K18	8	57.5	45.0	30.0	37~39	24.0	469.0	1547.7	27.5	4.1	35.0	9.3	25	360*170*80			
4.00	850	FSB76B0405K90	FSB76B0405K18	7	57.5	50.0	35.0	37~39	24.0	469.0	1876.0	33.0	3.5	38.0	8.0	20	360*170*80			
5.00	850	FSB66B0505K90	FSB66B0505K18	7	57.5	50.0	35.0	37~39	24.0	469.0	2345.0	37.0	2.9	38.0	6.9	20	360*170*80			
V _{ndc} = 1000V V _{peak} = ?V V _{rms} = ?v V _s = ?V																	Voltage Code: C		Qty	Size
0.68	1000	FSBA6C0684K90	FSBA6C0684K18	A	42.5	27.5	24.5	23~28	11.0	870.0	591.6	16.5	4.3	18.0	14.6	42	360*170*80			
0.75	1000	FSBA6C0754K90	FSBA6C0754K18	A	42.5	27.5	24.5	23~28	11.0	870.0	652.5	17.5	4.0	18.0	14.2	42	360*170*80			
1.20	1000	FSBB6C0125K90	FSBB6C0125K18	B	42.5	35.5	33.5	23~28	11.0	870.0	1044.0	23.5	3.3	20.0	9.2	35	360*170*80			
1.50	1000	FSBB6C0155K90	FSBB6C0155K18	B	42.5	35.5	33.5	23~28	11.0	870.0	1305.0	25.0	2.9	20.0	8.9	35	360*170*80			
1.75	1000	FSB96C0175K90	FSB96C0175K18	9	42.5	45.0	33.0	23~28	11.0	870.0	1522.5	27.0	2.7	25.0	7.0	40	360*170*80			
2.00	1000	FSB96C0205K90	FSB96C0205K18	9	42.5	45.0	33.0	23~28	11.0	870.0	1740.0	28.0	2.6	25.0	6.9	40	360*170*80			
2.20	1000	FSB86C0225K90	FSB86C0225K18	8	57.5	45.0	30.0	37~39	24.0	500.0	1100.0	27.5	3.3	35.0	8.1	25	360*170*80			
2.50	1000	FSB96C0255K90	FSB96C0255K18	9	42.5	45.0	33.0	23~28	11.0	750.0	1875.0	24.5	4.0	25.0	6.0	40	360*170*80			
3.00	1000	FSB86C0305K90	FSB86C0305K18	8	57.5	45.0	30.0	37~39	24.0	450.0	1350.0	24.5	4.8	35.0	6.4	25	360*170*80			
3.00	1000	FSB76C0305K90	FSB76C0305K18	7	57.5	50.0	35.0	37~39	24.0	500.0	1500.0	32.0	2.7	38.0	5.7	20	360*170*80			
3.30	1000	FSB86C0335K90	FSB86C0335K18	8	57.5	45.0	30.0	37~39	24.0	450.0	1485.0	25.5	4.6	35.0	6.9	25	360*170*80			

PROTECTION

FSB* RoHS Compliant



RATINGS AND PART NUMBER REFERENCE FOR LUG TERMINALS

Cap (µF) ±10%	Rated Voltage (V)	Part Number		Case Size	W ±0.50 (mm)	H ±0.50 (mm)	T ±0.50 (mm)	P1 ±0.50 (mm)	P2 ±0.50 (mm)	dv/dt Volt/ sec	I peak Amps	I rms Amps	Rs mΩ	ESL nH	Rth °C/W	Packaging Inner Box	
		90°	180°														
3.30	1000	FSB76C0335K90	FSB76C0335K18	7	57.5	50.0	35.0	37~39	24.0	450.0	1485.0	32.5	2.6	38.0	5.5	20	360*170*80
4.00	1000	FSB76C0405K90	FSB76C0405K18	7	57.5	50.0	35.0	37~39	24.0	450.0	1800.0	29.5	4.0	38.0	5.6	20	360*170*80
V _{ndc} = 1200V V _{peak} = 1600V V _{rms} = 560v V _s = 2000V Voltage Code: U Qty Size																	
0.33	1200	FSBA6U0334K90	FSBA6U0334K18	A	42.5	27.5	24.5	23~28	11.0	1000.0	330.0	9.3	7.4	18.0	20.3	42	360*170*80
0.39	1200	FSBA6U0394K90	FSBA6U0394K18	A	42.5	27.5	24.5	23~28	11.0	1000.0	390.0	10.5	6.4	18.0	18.7	42	360*170*80
0.47	1200	FSBA6U0474K90	FSBA6U0474K18	A	42.5	27.5	24.5	23~28	11.0	1000.0	470.0	11.9	5.5	18.0	16.3	42	360*170*80
0.56	1200	FSBA6U0564K90	FSBA6U0564K18	A	42.5	27.5	24.5	23~28	11.0	1000.0	560.0	13.7	4.8	18.0	14.9	42	360*170*80
0.68	1200	FSBB6U0684K90	FSBB6U0684K18	B	42.5	35.5	33.5	23~28	11.0	1000.0	680.0	16.5	4.1	20.0	12.0	35	360*170*80
0.82	1200	FSBB6U0824K90	FSBB6U0824K18	B	42.5	35.5	33.5	23~28	11.0	1000.0	820.0	18.5	3.6	20.0	11.0	35	360*170*80
1.00	1200	FSB66U0105K90	FSB66U0105K18	6	42.5	45.0	30.0	23~28	11.0	1000.0	1000.0	17.3	3.7	25.0	12.3	40	360*170*80
1.20	1200	FSBB6U0125K90	FSBB6U0125K18	B	42.5	35.5	33.5	23~28	11.0	1000.0	1200.0	18.4	3.3	20.0	12.4	35	360*170*80
1.20	1200	FSB66U0125K90	FSB66U0125K18	6	42.5	45.0	30.0	23~28	11.0	1200.0	1440.0	26.0	3.4	25.0	17.5	40	360*170*80
1.50	1200	FSB66U0155K90	FSB66U0155K18	6	42.5	45.0	30.0	23~28	11.0	870.0	1305.0	26.0	3.4	25.0	17.5	40	360*170*80
1.50	1200	FSBB6U0155K90	FSBB6U0155K18	B	42.5	35.5	33.5	23~28	11.0	1000.0	1500.0	21.0	2.8	20.0	11.2	35	360*170*80
2.00	1200	FSB96U0205K90	FSB96U0205K18	9	42.5	45.0	30.0	23~28	11.0	870.0	1740.0	28.0	2.8	25.0	7.2	25	360*170*80
2.00	1200	FSB86U0205K90	FSB86U0205K18	8	57.5	45.0	30.0	37~39	24.0	575.0	1150.0	19.7	2.4	35.0	8.8	25	360*170*80
2.20	1200	FSB86U0225K90	FSB86U0225K18	8	57.5	45.0	30.0	37~39	24.0	500.0	1100.0	21.0	4.2	35.0	8.1	25	360*170*80
2.20	1200	FSB76U0225K90	FSB76U0225K18	7	57.5	50.0	35.0	37~39	24.0	575.0	1265.0	21.4	3.9	38.0	7.6	20	360*170*80
2.50	1200	FSB86U0255K90	FSB86U0255K18	8	57.5	45.0	30.0	37~39	24.0	500.0	1250.0	21.2	4.9	35.0	7.9	25	360*170*80
3.00	1200	FSB76U0305K90	FSB76U0305K18	7	57.5	50.0	35.0	37~39	24.0	575.0	1725.0	32.8	4.3	38.0	6.5	20	360*170*80
3.30	1200	FSB76U0335K90	FSB76U0335K18	7	57.5	50.0	35.0	37~39	24.0	500.0	1650.0	28.2	3.0	38.0	6.2	20	360*170*80
V _{ndc} = 1500V V _{peak} = ?V V _{rms} = ?v V _s = ?V Voltage Code: G Qty Size																	
0.33	1500	FSBA6G0334K90	FSBA6G0334K18	A	42.5	27.5	24.5	23~28	11.00	1220.0	402.6	14.0	6.0	18.0	17.0	42	360*170*80
0.39	1500	FSBA6G0394K90	FSBA6G0394K18	A	42.5	27.5	24.5	23~28	11.00	1220.0	475.8	14.5	5.6	18.0	15.9	42	360*170*80
0.47	1500	FSBB6G0474K90	FSBB6G0474K18	B	42.5	35.5	33.5	23~28	11.00	1220.0	573.4	19.0	4.8	20.0	11.0	35	360*170*80
0.68	1500	FSBB6G0684K90	FSBB6G0684K18	B	42.5	35.5	33.5	23~28	11.00	1220.0	829.6	21.0	4.0	20.0	9.8	35	360*170*80
0.75	1500	FSBB6G0754K90	FSBB6G0754K18	B	42.5	35.5	33.5	23~28	11.00	1220.0	915.0	22.0	3.6	20.0	9.4	35	360*170*80
1.00	1500	FSB96G0105K90	FSB96G0105K18	9	42.5	45.0	33.0	23~28	11.00	1220.0	1220.0	23.0	3.3	25.0	7.4	40	360*170*80
1.20	1500	FSB86G0125K90	FSB86G0125K18	8	57.5	45.0	30.0	37~39	24.00	870.0	1044.0	26.0	3.6	35.0	7.3	25	360*170*80
1.50	1500	FSB76G0155K90	FSB76G0155K18	7	57.5	50.0	35.0	37~39	24.00	725.0	1087.5	29.5	3.3	38.0	5.9	20	360*170*80
1.80	1500	FSB76G0185K90	FSB76G0185K18	7	57.5	50.0	35.0	37~39	24.00	725.0	1305.0	30.5	3.0	38.0	5.6	20	360*170*80
V _{ndc} = 2000V V _{peak} = 2400V V _{rms} = 700v V _s = 2600V Voltage Code: N Qty Size																	
0.10	2000	FSBA6N0104K90	FSBA6N0104K18	A	42.5	27.5	24.5	23~28	11.0	1600.0	160.0	8.5	16.3	18.0	23.6	42	360*170*80
0.15	2000	FSBA6N0154K90	FSBA6N0154K18	A	42.5	27.5	24.5	23~28	11.0	1600.0	240.0	11.0	9.8	18.0	18.8	42	360*170*80
0.22	2000	FSBA6N0224K90	FSBA6N0224K18	A	42.5	27.5	24.5	23~28	11.0	1600.0	352.0	13.5	6.6	18.0	15.3	42	360*170*80
0.33	2000	FSBA6N0334K90	FSBA6N0334K18	A	42.5	27.5	24.5	23~28	11.0	1220.0	402.6	12.5	9.6	18.0	15.1	42	360*170*80
0.33	2000	FSBB6N0334K90	FSBB6N0334K18	B	42.5	35.5	33.5	23~28	11.0	1600.0	528.0	18.0	5.3	20.0	9.8	35	360*170*80
0.39	2000	FSBB6N0394K90	FSBB6N0394K18	B	42.5	35.5	33.5	23~28	11.0	1000.0	390.0	17.5	4.7	20.0	9.4	35	360*170*80
0.47	2000	FSB66N0474K90	FSB66N0474K18	6	42.5	45.0	30.0	23~28	11.0	1600.0	752.0	22.0	6.3	25.0	19.4	40	360*170*80
0.56	2000	FSB66N0564K90	FSB66N0564K18	6	42.5	45.0	30.0	23~28	11.0	1600.0	896.0	23.0	5.2	25.0	17.9	40	360*170*80
0.68	2000	FSB66N0684K90	FSB66N0684K18	6	42.5	45.0	30.0	23~28	11.0	1200.0	816.0	24.0	4.4	25.0	17.3	40	360*170*80
0.68	2000	FSBB6N0684K90	FSBB6N0684K18	B	42.5	35.5	33.5	23~28	11.0	1220.0	829.6	18.0	6.5	20.0	7.1	35	360*170*80
0.82	2000	FSB96N0824K90	FSB96N0824K18	9	42.5	45.0	33.0	23~28	11.0	1220.0	1000.4	20.0	6.0	25.0	7.0	40	360*170*80
0.82	2000	FSB86N0824K90	FSB86N0824K18	8	57.5	45.0	30.0	37~39	24.0	930.0	762.6	24.5	4.0	35.0	7.4	25	360*170*80
1.00	2000	FSB96N0105K90	FSB96N0105K18	9	42.5	45.0	33.0	23~28	11.0	1220.0	1220.0	21.5	5.3	25.0	6.9	40	360*170*80
1.00	2000	FSB76N0105K90	FSB76N0105K18	7	57.5	50.0	35.0	37~39	24.0	930.0	930.0	28.0	3.6	38.0	6.0	20	360*170*80
1.20	2000	FSB86N0125K90	FSB86N0125K18	8	57.5	45.0	30.0	37~39	24.0	725.0	870.0	22.5	5.9	35.0	6.6	25	360*170*80
1.50	2000	FSB76N0155K90	FSB76N0155K18	7	57.5	50.0	35.0	37~39	24.0	725.0	1087.5	26.0	5.2	38.0	4.9	20	360*170*80

* Insert K for 10% capacitance tolerance (standard): J = +5% tolerances available on request.

Last two characters terminal styles 90 = 90° terminals insert 18 = 180°

Values outside this standard range may be available – please contact KYOCERA AVX for any special requirements.

KYOCERA AVX reserves the right to supply capacitors to a tighter capacitance tolerance or higher voltage rating, in the same case size.

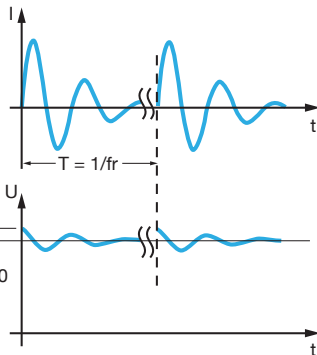
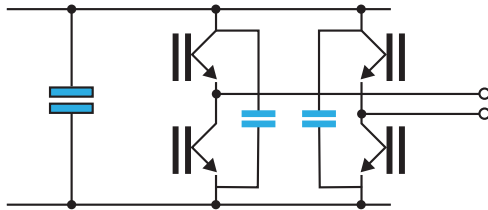
STANDARDS

IEC 61071-1, IEC 61071-2: Power electronic capacitors

TANGENT OF LOSS ANGLE ($\tan\delta_0$) FOR POLYPROPYLENE DIELECTRIC

Polypropylene has a constant dielectric loss factor of 2×10^{-4} irrespective of temperature and frequency (up to 1 MHz).

IGBT SNUBBER



With

L = stray inductance IGBT + capacitor

R = serial resistance IGBT + capacitor

HOT SPOT TEMPERATURE CALCULATION

See *Hot Spot Temperature*, page 3.

$$\theta_{\text{hot spot}} = \theta_{\text{ambient}} + (P_d + P_t) \times R_{\text{th}}$$

with P_d (Dielectric losses) = $Q \times \tan\delta_0$

$$\Rightarrow \left[\frac{1}{2} \times C_n \times (V_{\text{ripple peak to peak}})^2 \times f \right] \times (2 \times 10^{-4})$$

$$P_t \text{ (Thermal losses)} = R_s \times (I_{\text{rms}})^2$$

$$R_{\text{th}} : R_{\text{th ambient}} / \text{hot spot in } ^\circ\text{C/W}$$

where C_n in Farad I_{rms} in Ampere f in Hertz
 V in Volt R_s in Ohm θ in $^\circ\text{C}$

Due to the design of the capacitor and its technology, the thermal impedance between the terminations and the core of the capacitor is low, it is necessary to take care that the capacitor is never overheated by use of wrongly sized connections.

Do not use the capacitor as a heat sink.

Due to the complexity of the IGBT / capacitor thermal exchanges, we recommend that thermal measurements shall be made on the different components. We would be pleased to advise you on specific applications.

WORKING TEMPERATURE

(according to the power to be dissipated) -40°C to $+85^\circ\text{C}$

MARKING

KYOCERA AVX logo

Capacitance and tolerance in clear

Nominal DC voltage in clear

RMS current in clear

Date of manufacture (IEC coding)

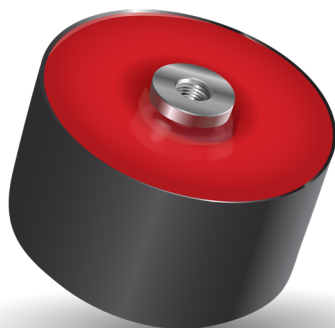
$$I_{\text{eff}} = \sqrt{\left[\frac{C\beta^2 \times U_0}{2j\beta} \right]^2 \times \frac{1}{T} \times \left[\frac{e^{-2\alpha \times T}}{\beta^2 + \alpha^2} \times [\beta \sin(2\beta \times T) - \alpha \times \cos(2\beta \times T)] + \frac{1}{\alpha} \times e^{-2\alpha \times T} + \frac{\alpha}{\beta^2 + \alpha^2} - \frac{1}{\alpha} \right]}$$

with $\beta_0 = \sqrt{\frac{1}{LC}} ; \alpha = \frac{R}{2L} ; \beta = \sqrt{\beta_0^2 - \alpha^2}$

PROTECTION

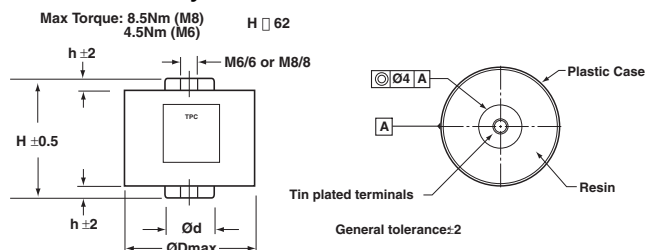
FPX (FPY RoHS Compliant)

PROTECTION

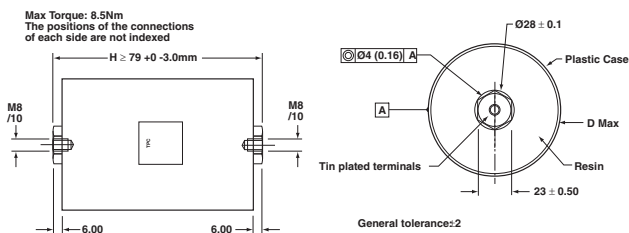


PROTECTION

Plastic Case Style M6 / 6 or M8 / 8



Plastic Case Style M8 / 10



MARKING

Logo

Withstanding surge voltage

Capacitance and tolerance in clear

Nominal DC voltage in clear

RMS current in clear

Date of manufacture (IEC coding)

HOW TO ORDER

FPX	6	6	N	0154	J	--
Series	Case Size	Dielectric	Voltage Code	Capacitance Code	Capacitance Tolerances	Terminal Code
FPX = Standard FPY = RoHS Compliant	Case Size 6 Case Size 8 (See Case Style)	6 = Polypropylene	N = 2000V P = 2500V X = 3500V Z = 4500V Y = 4600V	0 + pF code 0105 = 1.0µF 0335 = 3.5µF 0504 = 0.5µF etc.	J = ± 5%	-- = Standard

Not RoHS Compliant



APPLICATIONS

- Protection of Thyristors
- Protection of Gate Turn-off Thyristor (G.T.O.)
- Clamping (Secondary Snubber)

TECHNOLOGY

Metallized polypropylene dielectric capacitor with controlled self-healing.

Reinforced metallization developed for high impulse currents.

Axial connections specially developed to reduce series inductance and to provide rigid mechanical mounting.

PACKAGING MATERIAL

Cylindrical in plastic case filled with thermosetting resin. Outputs: threaded inserts either M6 or M8.

Terminals: threaded inserts either M6 or M8.

The plastic case and the thermosetting resin are self-extinguishing materials. These two housing materials have the UL Recognition at V-0 level according to the UL 94 standard and have certified classifications according to the EN 45545-2 standard.

HOT SPOT TEMPERATURE CALCULATION

See Hot Spot Temperature, page 3.

$$\theta_{\text{hot spot}} = \theta_{\text{terminals}} + (P_d + P_t) \times R_{th}$$

with

$$P_d \text{ (Dielectric losses)} = Q \times \tan \delta_0$$

$$\Rightarrow \left[\frac{1}{2} \times C_n \times (V_{\text{peak}} \text{ to } V_{\text{peak}})^2 \times f \right] \times (2 \times 10^{-4})$$

$$P_t \text{ (Thermal losses)} = R_s \times (I_{\text{rms}})^2$$

where

C_n in Farads

V in Volts

I_{rms} in Amperes

R_s in Ohms

f in Hertz

θ in °C

R_{th} in °C/W

Due to the design of the capacitor and its technology, the thermal impedance between the terminations and the core of the capacitor is low, it is necessary to take care that the capacitor is never overheated by use of incorrect sized connections.

In the case where the series diodes are screwed to the capacitor, cooling of the diodes must be taken in account.

Do not use the capacitor as a heat sink.

Due to the complexity of the diode/capacitor thermal exchanges, we recommend that thermal measurements shall be made on the different components. We would be pleased to advise you on specific problems.

WORKING TEMPERATURE

(according to the power to be dissipated)

-40°C to +85°C

PROTECTION

FPX (FPY RoHS Compliant)

ELECTRICAL CHARACTERISTICS

Capacitance range C_n	0.5 μ F to 6 μ F
Tolerance on C_n	$\pm 5\%$
Rated DC voltage $V_{n\text{dc}}$	1000 to 3000 V
Peak voltage V_{peak}	1600 to 4000 V
Allowable overvoltage V_s (for 10 s/day)	2000 to 4600 V
Stray inductance	5 to 20 nH
RMS current	I_{rms} max. = up to 160 A The currents shown in the tables are maximum. It is necessary to respect the thermal limits of the dielectric 85°C see "Hot spot temperature calculation"
Insulation resistance	$R_i \times C \geq 30,000 \text{ s}$
Impulse current	$I^2.t$ maxi. = up to 729 A ² .s Spikes or peak currents in the capacitors may cause a deterioration of the bonding between the metallization and the connections. These bonds are capable of withstanding only a limited amount of energy for each spike. The table shows the maximum energy permitted in the form ($I^2.t$), where I is in Ampere, and t is in seconds.
Note: The formula ($I^2.t$) replaces dV/dt which is less easy to use as it is not an expression of energy ($I = C.dV/dt$). This type of capacitor has been designed to withstand high ($I^2.t$) values.	
Variation of capacitance with temperature	$\frac{\Delta C}{C} \leq \pm 2\%$ between -40 and +85°C
Climatic category	40/085/56 (IEC 60068)
Test voltage between terminals @ 25°C	V_s for 10s
Test voltage between terminals and case @ 25°C (Type test)	@ 7 kV _{rms} @ 50 Hz for 1 min.
Dielectric	Polypropylene

PROTECTION

FPX (FPY RoHS Compliant) Table of Values

PROTECTION

Part Number	Cn (μF)	Dimensions					I ² .t max. (A ² .s)	I _{rms} max. (A)	R _s (mΩ)	R _{th} (°C/W)	Typical Weight (g)
		Case Style	H* ±0.5 (mm)	h ±2 (mm)	D max. (mm)	d ±0.5 (mm)					
FPX 2000V V _n dc = 1000V V _{peak} = 1600V V _{rms} = 560V V _s = 2000V (Voltage Code N)											
FPX66N0105J--	1	Plastic case M6/6	52	5	40	18	2	15	2.4	14)	120
FPX86N0205J--	2	Plastic case M8/8	52	5	60	22	8	30	1.2	6.1	190
FPX86N0305J--	3	Plastic case M8/8	52	5	72	22	18	45	0.9	4.5	260
FPX86N0355J--	3.5	Plastic case M8/8	52	5	72	22	25	50	0.85	4.5	260
FPX86N0405J--	4	Plastic case M8/8	52	5	82	22	32	60	0.75	3.5	320
FPX86N0505J--	5	Plastic case M8/8	52	5	82	22	50	70	0.65	2.5	320
FPX 2500V V _n dc = 1300V V _{peak} = 2000V V _{rms} = 700V V _s = 2500V (Voltage Code P)											
FPX66P0504J--	0.5	Plastic case M6/6	52	5	40	18	1	15	3	14	120
FPX86P0105J--	1	Plastic case M8/8	52	5	60	22	3	20	2.3	10.5	190
FPX86P0155J--	1.5	Plastic case M8/8	52	5	60	22	7	30	1.5	6.1	190
FPX86P0205J--	2	Plastic case M8/8	52	5	72	22	12.7	40	1.1	4.5	260
FPX86P0255J--	2.5	Plastic case M8/8	52	5	72	22	20	60	0.89	3.7	260
FPX86P0305J--	3	Plastic case M8/8	52	5	82	22	28	60	0.85	3.2	320
FPX86P0355J--	3.5	Plastic case M8/8	52	5	82	22	39	65	0.78	2.9	320
FPX 3500V V _n dc = 2000V V _{peak} = 2400V V _{rms} = 850V V _s = 3500V (Voltage Code X)											
FPX86X0205J--	2	Plastic case M8/8	62	5	72	22	23	41	1.24	6.1	310
FPX86X0305J--	3	Plastic case M8/8	62	5	92	22	50	62	0.92	3.9	475
FPX86X0355J--	3.5	Plastic case M8/8	62	5	92	22	70	72	0.83	3.4	475
FPX86X0405J--	4	Plastic case M8/8	62	5	92	22	85	80	0.78	3.1	475
FPX 4500V V _n dc = 2500V V _{peak} = 3200V V _{rms} = 1130V V _s = 4500V (Voltage Code Z)											
FPX86Z0904J--	0.9	Plastic case M8/8	62	5	72	22	15	40	1.5	6.2	310
FPX86Z0105J--	1	Plastic case M8/8	62	5	72	22	15	38	1.4	6.2	310
FPX86Z0205J--	2	Plastic case M8/8	62	5	92	22	70	75	0.85	3.1	475
FPX 4600V V _n dc = 3000V V _{peak} = 4000V V _{rms} = 1400V V _s = 4600V (Voltage Code Y)											
FPX86Y0504J--	0.5	Plastic case M8/8	62	5	72	22	7	40	1.7	12	310
FPX86Y0684J--	0.68	Plastic case M8/8	62	5	72	22	14	35	1.59	6.2	310
FPX86Y1254J--	1.25	Plastic case M8/8	62	5	92	22	50	65	1	3.3	475
FPX86Y0155J--	1.5	Plastic case M8/10	79	6	98	—	32	60	1.4	8.3	630
FPX86Y0175J--	1.7	Plastic case M8/10	79	6	98	—	40	70	1.3	7.4	630
FPX86Y0205J--	2	Plastic case M8/10	79	6	98	—	56	80	1.1	6.3	630
FPX86Y0255J--	2.5	Plastic case M8/10	118	6	98	—	200	130	0.8	1.1	1020
FPX86Y0275J--	2.7	Plastic case M8/10	118	6	98	—	232	140	0.7	1.1	1020
FPX86Y0305J--	3	Plastic case M8/10	143	6	98	—	128	100	0.9	1.5	1280
FPX86Y0355J--	3.5	Plastic case M8/10	143	6	98	—	170	110	0.8	1.4	1280
FPX86Y0405J--	4	Plastic case M8/10	143	6	98	—	224	115	0.8	1.4	1280
FPX86Y0455J--	4.5	Plastic case M8/10	163	6	98	—	522	120	0.6	1.7	1500
FPX86Y0505J--	5	Plastic case M8/10	163	6	98	—	600	130	0.6	1.7	1500
FPX86Y0605J--	6	Plastic case M8/10	163	6	98	—	729	160	0.5	1.7	1500

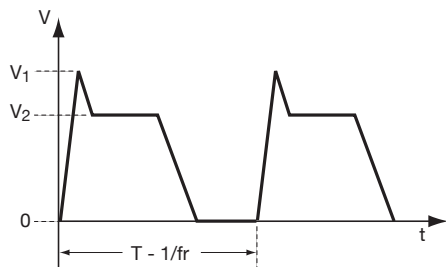
* Tol: +0 / -3mm for H ≥ 118mm

PROTECTION

FPX (FPY RoHS Compliant) General / Application Notes

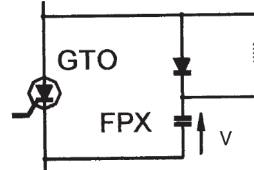
PROTECTION

G.T.O.



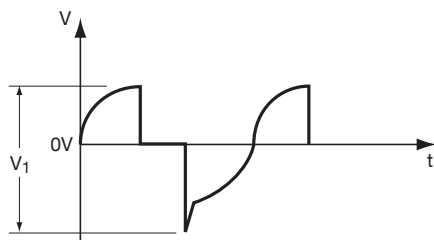
Choice of voltage: $V_1 \leq V_{peak}$
 $V_2 \leq V_{n,dc}$

Maximum overvoltage $\leq V_s$ (10s/day)



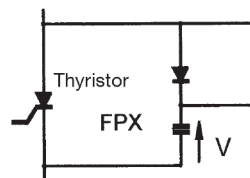
Nominal DC voltage ($V_{n,dc}$) and peak voltage (V_{peak}) are given in the tables.

THYRISTOR



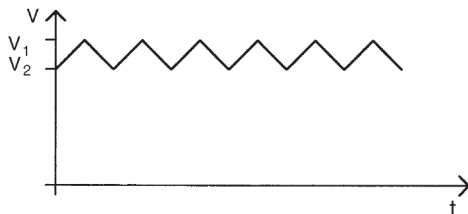
Choice of voltage: $V_1 \leq V_{peak}$

Note that V_1 is the voltage peak to peak and cannot be symmetrical vs 0 V

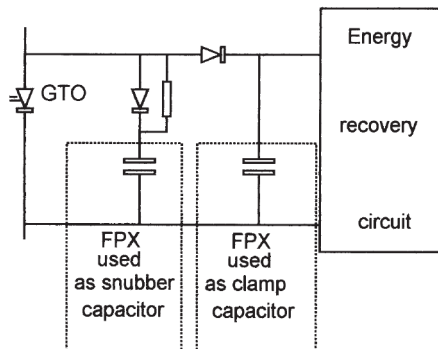


Peak voltage is given in the tables.

CLAMPING

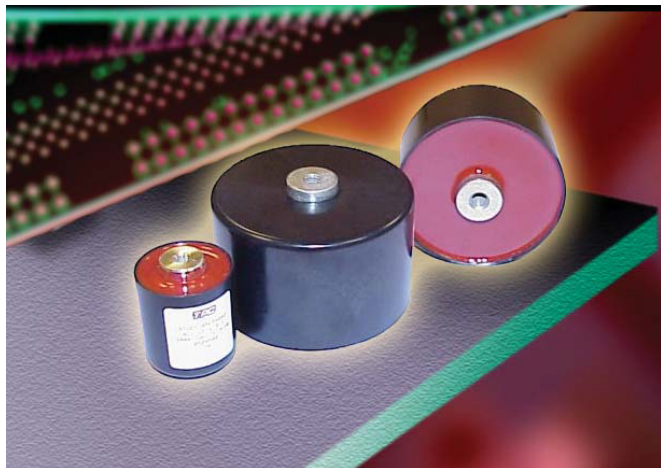


Choice of voltage: $V_1 \leq V_{peak}$
 $V_2 \leq V_{n,dc}$

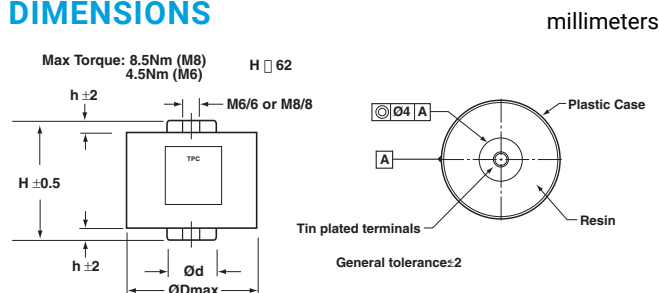


Nominal DC voltage ($V_{n,dc}$) and peak voltage (V_{peak}) are given in the tables.

PROTECTION



DIMENSIONS



MARKING

Logo
Withstanding surge voltage
Capacitance and tolerance in clear
Nominal DC voltage in clear
RMS current in clear
Date of manufacture (IEC coding)

PACKAGING MATERIAL

Cylindrical in plastic case filled with thermosetting resin.
Terminals: threaded inserts either M6 or M8
The plastic case and the thermosetting resin are self-extinguishing materials. These two housing materials have the UL Recognition at V-0 level according to the UL 94 standard and have certified classifications according to the EN 45545-2 standard.

HOW TO ORDER

FPG	8	6	R	0105	J	--
Series FPG = Standard FPH = RoHS Compliant	Case Size Case Size 8	Dielectric 6 = Polypropylene	Voltage Code R = 1500V N = 2000V P = 2500V W = 2600V X = 3500V Z = 4500V Y = 4600V	Capacitance Code 0 = pF code 0105 = 1.0µF 0405 = 4.0µF 0604 = 0.6µF etc.	Capacitance Tolerances J = ± 5%	Terminal Code -- = Standard

Not RoHS Compliant



Metallized polypropylene dielectric capacitor with controlled self-healing.
Reinforced metallization on margins developed for high impulse currents.
Axial connections specially developed to reduce series inductance and to provide rigid mechanical mounting.

APPLICATIONS

- Protection of Gate Turn-off Thyristor (G.T.O.)
- Medium Frequency Tuning

HOT SPOT TEMPERATURE CALCULATION

See *Hot Spot Temperature*, page 3.

$$\theta_{\text{hot spot}} = \theta_{\text{terminals}} + (P_d + P_t) \times R_{th}$$

with

$$P_d \text{ (Dielectric losses)} = Q \times \tan \delta_0 \\ \Rightarrow \left[\frac{1}{2} \times C_n \times (V_{\text{peak to peak}})^2 \times f \right] \times (2 \times 10^{-4})$$

$$P_t \text{ (Thermal losses)} = R_s \times (I_{\text{rms}})^2$$

where

C_n in Farads
 V in Volts
 I_{rms} in Amperes
 R_s in Ohms
 f in Hertz
 θ in °C
 R_{th} in °C/W

Due to the design of the capacitor and its technology, the thermal impedance between the terminations and the core of the capacitor is low, it is necessary to take care that the capacitor is never overheated by use of incorrect sized connections.

In the case where the series diodes are screwed to the capacitor, cooling of the diodes must be taken in account.

Do not use the capacitor as a heat sink.

Due to the complexity of the diode/capacitor thermal exchanges, we recommend that thermal measurements shall be made on the different components. We would be pleased to advise you on specific problems.

WORKING TEMPERATURE

(according to the power to be dissipated)

-40°C to +85°C

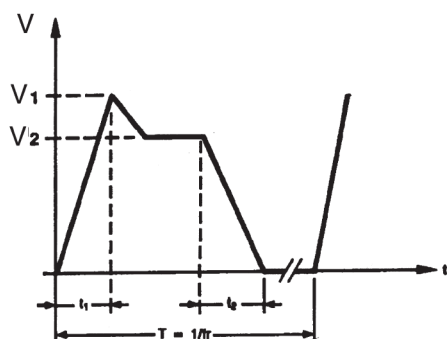
ELECTRICAL CHARACTERISTICS

Capacitance range C_n	0.12 μ F to 6 μ F
Tolerance on C_n	$\pm 5\%$
Rated DC voltage $V_{n,dc}$	800 to 3000 V
Peak voltage V_{peak}	1200 to 4000 V
Allowable overvoltage V_s (for 10 s/day)	1500 to 4600 V
Nominal RMS voltage $V_{n,dc}$	500 to 1400 V
Stray inductance	≈ 10 nH
RMS current	I_{rms} max. = up to 80 A The currents shown in the tables are maximum. It is necessary to respect the thermal limits of the dielectric 85°C see "Hot spot temperature calculation"
Insulation resistance	$R_i \times C \geq 30,000$ s
Impulse current	$I^2.t$ max. given in the tables Spikes or peak currents in the capacitors may cause a deterioration of the bonding between the metallization and the connections. These bonds are capable of withstanding only a limited amount of energy for each spike. The table shows the maximum energy permitted in the form ($I^2.t$), where I is in Ampere, and t is in seconds.
Note: The formula ($I^2.t$) replaces dV/dt which is less easy to use as it is not an expression of energy ($I = C.dV/dt$). This type of capacitor has been designed to withstand high ($I^2.t$) values.	
Variation of capacitance with temperature	$\frac{\Delta C}{C} \leq \pm 2\%$ between -40 and +85°C
Climatic category	40/085/56 (IEC 60068)
Test voltage between terminals @ 25°C	V_s during 10s
Test voltage between terminals and case @ 25°C (Type test)	@ 7 kVrms @ 50 Hz during 1 min.
Dielectric	Polypropylene

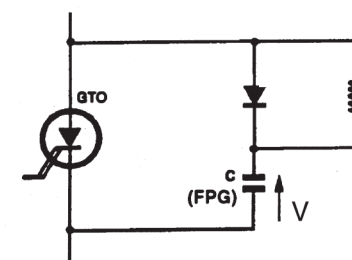
PROTECTION

APPLICATION NOTES

G.T.O. PROTECTION



Choice of voltage: $V_1 \leq V_{peak}$
 $V_2 \leq V_{n,dc}$
 Maximum overvoltage $\leq V_s$ (10 s/day)



FPG: Snubber capacitor

Nominal DC voltage ($V_{n,dc}$) and peak voltage (V_{peak}) are given in the table of values.

PROTECTION

FPG (FPH RoHS Compliant) Table of Values

PROTECTION

Part Number	Cn (μF)	Dimensions					I ² .t max. (A ² .s)	I _{rms} max. (A)	R _s (mΩ)	R _{th} (°C/W)	Typical Weight (g)
		Case Style	H* ±0.5 (mm)	h ±2 (mm)	D max. (mm)	d ±0.5 (mm)					
FPG 1500V V _n dc = 800V V _{peak} = 1200V V _{rms} = 500V V _s = 1500V (Voltage Code R)											
FPG66R0105J-	1	Plastic Case M6/6	52	5	40	18	2	15	2.4	14	120
FPG66R0155J-	1.5	Plastic Case M6/6	52	5	55	18	4.6	20	1.6	10.5	160
FPG86R0205J-	2	Plastic Case M8/8	52	5	60	22	8	30	1.2	6.1	190
FPG86R0305J-	3	Plastic Case M8/8	52	5	72	22	18	45	0.9	4.5	260
FPG86R0355J-	3.5	Plastic Case M8/8	52	5	72	22	25	50	0.85	4.5	260
FPG86R0405J-	4	Plastic Case M8/8	52	5	82	22	32	60	0.75	3.5	320
FPG86R0505J-	5	Plastic Case M8/8	52	5	82	22	50	70	0.65	2.5	320
FPG86R0605J-	6	Plastic Case M8/8	52	5	92	22	73	75	0.6	2.5	400
FPG 2000V V _n dc = 1000V V _{peak} = 1600V V _{rms} = 600V V _s = 2000V (Voltage Code N)											
FPG66N0504J-	0.5	Plastic Case M6/6	52	5	40	18	1	15	3	14	120
FPG86N0105J-	1	Plastic Case M8/8	52	5	60	22	3	20	2.3	10.5	190
FPG86N0155J-	1.5	Plastic Case M8/8	52	5	60	22	7	30	1.5	6.1	190
FPG86N0205J-	2	Plastic Case M8/8	52	5	72	22	12.7	40	1.1	4.5	260
FPG86N0255J-	2.5	Plastic Case M8/8	52	5	72	22	20	60	0.89	3.7	260
FPG86N0305J-	3	Plastic Case M8/8	52	5	82	22	28	60	0.85	3.2	320
FPG86N0355J-	3.5	Plastic Case M8/8	52	5	82	22	39	65	0.78	2.9	320
FPG86N0405J-	4	Plastic Case M8/8	52	5	92	22	50	70	0.7	2.5	400
FPG 2500V V _n dc = 1300V V _{peak} = 2000V V _{rms} = 700V V _s = 2500V (Voltage Code P)											
FPG66P0474J-	0.47	Plastic Case M6/6	62	5	40	18	0.7	15	6	25	160
FPG66P0105J-	1	Plastic Case M6/6	62	5	55	18	2	18	3	13	180
FPG66P0155J-	1.5	Plastic Case M6/6	62	5	60	22	4.5	25	2	10	220
FPG86P0205J-	2	Plastic Case M8/8	62	5	72	22	8	35	1.5	6.5	310
FPG86P0255J-	2.5	Plastic Case M8/8	62	5	72	22	12.5	40	1.3	4.8	310
FPG86P0305J-	3	Plastic Case M8/8	62	5	82	22	18	50	1.15	4.4	410
FPG86P0405J-	4	Plastic Case M8/8	62	5	92	22	32	65	0.95	3.4	475
FPG 2600V V _n dc = 1750V V _{peak} = 2000V V _{rms} = 800V V _s = 2600V (Voltage Code W)											
FPG66W0474J-	0.47	Plastic Case M6/6	62	5	40	18	1.4	12	4.04	28	160
FPG66W0105J-	1	Plastic Case M6/6	62	5	55	18	5.7	21	2.17	10.9	180
FPG66W0155J-	1.5	Plastic Case M6/6	62	5	60	18	12.9	31	1.55	7.7	220
FPG86W0205J-	2	Plastic Case M8/8	62	5	72	22	23	41	1.24	6.1	310
FPG86W0255J-	2.5	Plastic Case M8/8	62	5	82	22	36	51	1.05	4.5	410
FPG86W0305J-	3	Plastic Case M8/8	62	5	92	22	50	62	0.92	3.9	475
FPG86W0355J-	3.5	Plastic Case M8/8	62	5	92	22	70	72	0.83	3.4	475
FPG86W0395J-	3.9	Plastic Case M8/8	62	5	92	22	85	80	0.78	3.1	475
FPG 3500V V _n dc = 2000V V _{peak} = 2400V V _{rms} = 1000V V _s = 3500V (Voltage Code X)											
FPG66X0334J-	0.33	Plastic Case M6/6	62	5	40	18	2	15	2.5	28	160
FPG66X0504J-	0.5	Plastic Case M6/6	62	5	55	18	5	19	2.5	11.2	180
FPG86X0105J-	1	Plastic Case M8/8	62	5	72	22	15	38	1.4	6.2	310
FPG86X0155J-	1.5	Plastic Case M8/8	62	5	82	22	40	56	1.03	3.9	410
FPG86X0205J-	2	Plastic Case M8/8	62	5	92	22	70	75	0.85	3.1	475
FPG 4500V V _n dc = 2500V V _{peak} = 3200V V _{rms} = 1200V V _s = 4500V (Voltage Code Z)											
FPG66Z0224J-	0.22	Plastic Case M6/6	62	5	40	18	1.5	15	3.8	25	160
FPG66Z0474J-	0.47	Plastic Case M6/6	62	5	60	18	7	24	2.16	8.5	220
FPG86Z0684J-	0.68	Plastic Case M8/8	62	5	72	22	14	35	1.59	6.2	310
FPG86Z0105J-	1	Plastic Case M8/8	62	5	82	22	30	52	1.18	4	410
FPG86Z1254J-	1.25	Plastic Case M8/8	62	5	92	22	50	65	1	3.3	475
FPG 4600V V _n dc = 3000V V _{peak} = 4000V V _{rms} = 1400V V _s = 4600V (Voltage Code Y)											
FPG66Y0124J-	0.12	Plastic Case M6/6	62	5	40	18	0.8	15	6	28	160
FPG66Y0224J-	0.22	Plastic Case M6/6	62	5	60	18	3	20	3.48	11	220
FPG86Y0334J-	0.33	Plastic Case M8/8	62	5	72	22	6.8	25	2.42	7.7	310
FPG86Y0474J-	0.47	Plastic Case M8/8	62	5	82	22	13.8	35	1.79	5.2	410
FPG86Y0604J-	0.60	Plastic Case M8/8	62	5	92	22	22	45	1.47	4.2	475

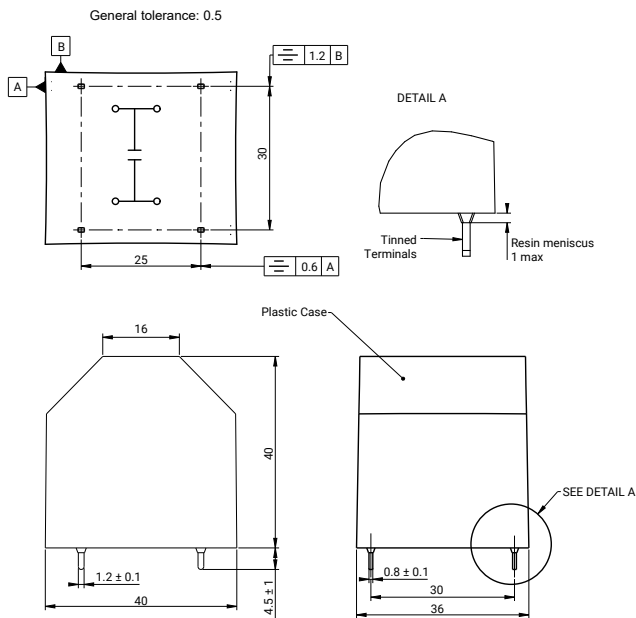
TUNING

FAV* RoHS Compliant



DIMENSIONS

Case Size 3



APPLICATIONS

- High Reactive Energy Tuning for Convertors
- Protection of Semi-Conductors

TECHNOLOGY

Metallized polypropylene film and metal foil.

Dry capacitor.

PACKAGING

Rectangular resin case.

4 leads 1.2 x 0.8mm for printed circuit board mounting.

Self-extinguishing plastic case (V-0 = in accordance with UL 94; certified classification according to EN 45545-2) filled thermosetting resin.

Self-extinguishing thermosetting resin (V-0 = in accordance with UL 94; certified classifications according to EN 45545-2).

(Note that FFV3 and FAV3 are in the same packaging.)

STANDARDS

IEC 61071-1: IEC 61071-2: Power electronic capacitors

IEC 60068-1: Environmental testing

IEC 60077: Rules for electric traction equipment

UL 94: Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

HOT SPOT TEMPERATURE CALCULATION

$$\Theta_{\text{hot spot}} = \Theta_{\text{ambient}} + (P_d + P_j) \times (R_{\text{th}} + 7.4) \text{ or}$$

$$\Theta_{\text{hot spot}} = \Theta_{\text{case}} + (P_d + P_j) \times R_{\text{th}}$$

$$\text{Dielectric losses } P_d = Q \times \text{tg} \delta_0$$

for tuning applications:

$$P_d = (V_{\text{rms}}^2 \times C \times 2 \times \pi \times f) \times 2.10^{-4}$$

For protection applications:

$$P_d = [1/2 \times C_n \times (V_{\text{peak to peak}})^2 \times f] \times 2.10^{-4}$$

$$\text{Joules losses } P_j = R_s \times I_{\text{rms}}^2$$

C_n in Farad I_{rms} in Ampere f in Hertz

V in Volt R_s in Ohm θ in °C

R_{th} in °C/W R_{th} : R_{th} case/hot spot in °C/W

HOW TO ORDER

FAV
Series

3
Case Size
Case Size 3

6
Dielectric
6 = Polypropylene

K
Voltage
Code
K = 600Vdc
B = 800Vdc
L = 1000Vdc
U = 1200Vdc
R = 1500Vdc
N = 2000Vdc

0125
Capacitance Code
0 + pF code
0125 = 1.2µF (1200nF)
0105 = 1.0µF (1000nF)
0154 = 0.15µF (150nF)
etc.

K
Capacitance
Tolerances
K = ±10%

--
Terminal Code
-- = Standard



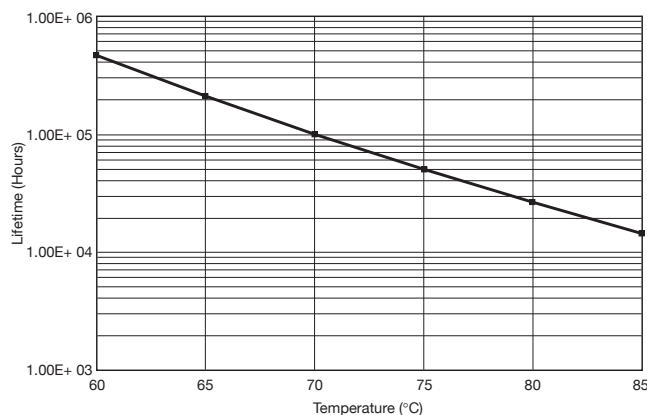
ELECTRICAL CHARACTERISTICS

Climatic category	40/085/56 (IEC 60068)
Working temperature	hot spot temperature: -40°C to +85°C
Hot spot temperature	≤85°C (must be calculated: see below)
Capacitance range C_n	80 to 1200nF
Tolerance	±10%
Rated AC voltage	$V_{n\text{rms}}$ = 300 to 650 V
Rated DC voltage	$V_{n\text{dc}}$ = 600 to 2000 V
Maximum rms current	$I_{\text{rms max}}$ = 10 to 40 Arms
Maximum reactive power	Q_{max} = 7 to 14 kvar
Stray inductance	15 nH
Test voltage between terminals	$1.5 \times V_{n\text{dc}}$ 10s
Withstanding voltage between terminals and case	3000 V_{rms} 60s
Dielectric	Polypropylene

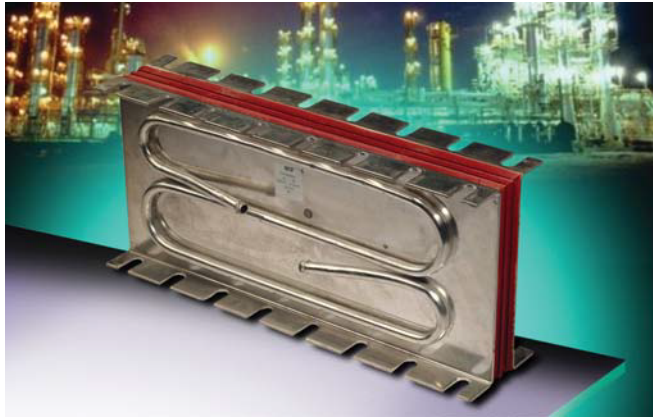
RATINGS AND PART NUMBER REFERENCE

Part Number	Capacitance (nF)	$I_{\text{rms max}}$ (A)	Q_{max} (kV)	R_s (mΩ)	L_s (nH)	R_{th} (°C/W)	Typical Weight (g)
$V_{n\text{dc}}$ 600V V_{rms}: 300V							
FAV36K0125K-	1200	40	12	0.85	5	4	90
FAV36K0105K-	1000	32	10	1	5	4.1	90
$V_{n\text{dc}}$ 800V V_{rms}: 400V							
FAV36B0804K-	800	35	14	0.9	5	4	90
FAV36B0624K-	620	27	11	1.1	5	4.1	90
$V_{n\text{dc}}$ 1000V V_{rms}: 450V							
FAV36L0564K-	560	30	14	1	5	4	90
FAV36L0474K-	470	25	12	1.2	5	4.1	90
$V_{n\text{dc}}$ 1200V V_{rms}: 500V							
FAV36U0334K-	330	21	11	1.4	5	4.2	90
FAV36U0274K-	270	17	9	1.7	5	4.4	90
$V_{n\text{dc}}$ 1500V V_{rms}: 600V							
FAV36R0184K-	180	16	10	1.7	5	4.4	90
FAV36R0154K-	150	13	8	2	5	4.5	90
$V_{n\text{dc}}$ 2000V V_{rms}: 650V							
FAV36N0124K-	120	15	10	1.7	5	4.6	90
FAV36N0104K-	100	12	8	1.9	5	4.9	90
FAV36N0803K-	80	10	7	2	5	5.2	90

LIFETIME EXPECTANCY



TUNING



The FAI series uses metallized polypropylene dielectric specifically designed for very high reactive power.

The FAI's special design gives to this series a very low level of stray inductance.

APPLICATIONS

These capacitors have been designed principally for: low and medium frequency applications (10 kHz to 500 kHz).

MAXIMUM WORKING TEMPERATURE (HOT SPOT)

+85°C: Hot spot temperature must be calculated as function of power dissipation.

HOT SPOT (THERMAL) CALCULATION

See Hot Spot Temperature page 3.

You can calculate the maximum operating (hot spot) temperature of this capacitor in the following manner:

Polypropylene has a constant loss factor ($\text{tg}\delta_0$) of 2×10^{-4} irrespective of temperature and frequency (up to 1 MHz).

The loss factor of the capacitor is made up of the sum of two components. The first represents electrical losses ($\text{tg}\delta_0 = 2.10^{-4}$) and the second represents Joule effect in the connection and foils: $R_s \cdot C \cdot 2\pi F$.

For all applications, the temperature in the hot spot capacitor must be lower than 85°C.

$$\theta_{\text{hot spot}} = \theta_{\text{terminals}} + (\text{tg}\delta_0 \cdot Q + R_s \cdot (I_{\text{rms}})^2) \cdot R_{\text{th}}$$

Heating calculation of hot spot capacitor: FAI6

$$\theta_{\text{hot spot}} = \theta_{\text{water}} + (\text{tg}\delta_0 \cdot Q + R_s \cdot (I_{\text{rms}})^2) \cdot R_{\text{th}}$$

With: $\text{tg}\delta_0 = 2.10^{-4}$

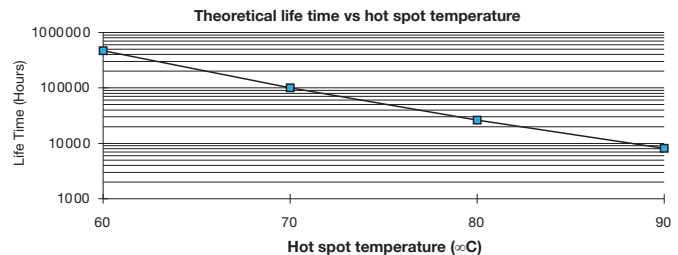
Q in Var

R_s in Ohms

I_{rms} in Amperes

R_{th} in °C/W (water flow = 10 dm³/minute)

Note: The life time depends of hot spot temperature, see following curve.



ELECTRICAL CHARACTERISTICS

Capacitance range C_n	110nF to 60μF
Tolerance	±10%
Rated AC voltage	200 to 650 Vrms
Series parasitic inductance	< 5 nH
Test voltage between terminals @ 25°C	1.2 Vrms 50/60 Hz 10s
Dielectric	Polypropylene

HOW TO ORDER

FAI
Series

1
Case Size
1
2
3
4
5
6

6
Dielectric
6 = Polypropylene

J
Voltage Code
H = 300 Vrms
I = 350 Vrms (Case size 3)
J = 400 Vrms (Case size 4)
K = 500 Vrms
L = 60 Vrms

0114
Capacitance Code
0 + pF code
0114 = 0.11μF (110nF)
0245 = 2.4μF (2400nF)
0405 = 4.0μF (4000nF)
etc.

K
Capacitance Tolerances
K = ±10%

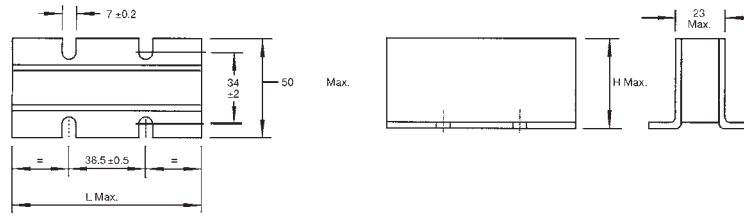
--
Terminal Code
-- = Standard



TUNING

FAI* RoHS Compliant

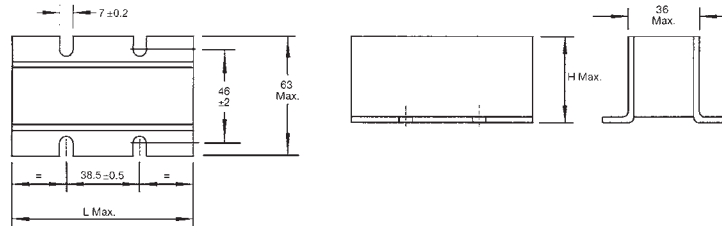
TUNING FAI1 STYLE CASE SIZE 1 DIMENSIONS



Part Number	C (nF)	Irms max (A)	Vrms max (V)	Q max kVARS	Rs (mΩ)	Rth (°C/W)	L max (mm)	H max (mm)	Typical Weight (g)
FAI16J0114K-	110	180	500	100	$8 \times 10^{-4} \times \sqrt{F} + 0.19$	0.86	55	35	125
FAI16J0214K-	210	300	500	150	$5 \times 10^{-4} \times \sqrt{F} + 0.12$	0.67	75	40	195
FAI16J0334K-	330	350	500	175	$5 \times 10^{-4} \times \sqrt{F} + 0.15$	0.54	75	40	195
FAI16J0514K-	510	500	500	250	$4 \times 10^{-4} \times \sqrt{F} + 0.08$	0.49	95	45	275
FAI16J0664K-	660	600	500	300	$3.5 \times 10^{-4} \times \sqrt{F} + 0.06$	0.38	95	45	275

With F in Hz

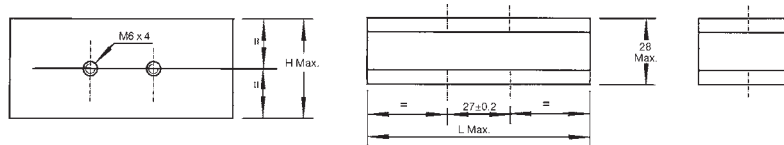
FAI2 STYLE CASE SIZE 2 DIMENSIONS



Part Number	C (nF)	Irms max (A)	Vrms max (V)	Q max kVARS	Rs (mΩ)	Rth (°C/W)	L max (mm)	H max (mm)	Typical Weight (g)
FAI26J0664K-	660	300	500	180	$5 \times 10^{-4} \times \sqrt{F} + 0.25$	0.6	75	40	300
FAI26J0125K-	1200	400	500	200	$5 \times 10^{-4} \times \sqrt{F} + 0.20$	0.56	75	40	300
FAI26J0245K-	2400	500	350	175	$5 \times 10^{-4} \times \sqrt{F} + 0.17$	0.55	75	40	300

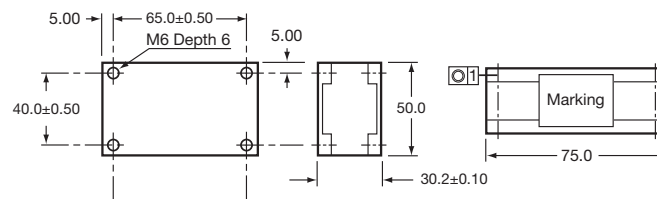
With F in Hz

FAI3 STYLE CASE SIZE 3 DIMENSIONS



Part Number	C (nF)	Irms max (A)	Vrms max (V)	Q max kVARS	Rs (mΩ)	Rth (°C/W)	L max (mm)	H max (mm)	Typical Weight (g)
FAI36J0114K-	110	180	500	100	0.3	0.82	55	35	150
FAI36J0334K-	330	350	500	175	0.15	0.55	75	37	220
FAI36J0514K-	510	500	500	250	0.1	0.3	95	42	315
FAI36J0664K-	660	600	500	300	0.1	0.24	95	42	315

FAI4 STYLE CASE SIZE 4 DIMENSIONS



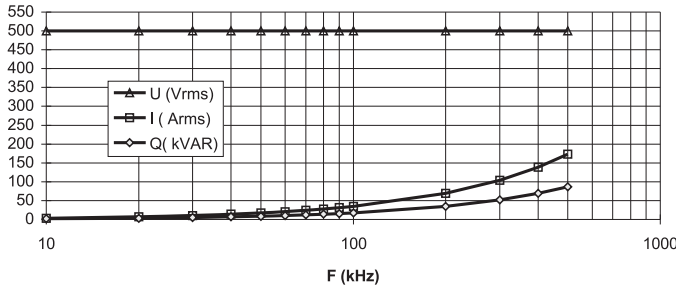
Part Number	C (nF)	Irms max (A)	Vrms max (V)	Q max kVARS	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
FAI46H0405K-	4000	600	300	180	0.13	0.15	315
FAI46I0245K-	2400	500	400	200	0.15	0.20	315
FAI46J0185K-	1800	550	450	230	0.35	0.38	315
FAI46J0125K-	1200	500	500	200	0.20	0.22	315
FAI46J0664K-	660	450	500	220	0.26	0.32	315
FAI46K0334K-	330	380	600	220	0.315	0.315	315
FAI46K0284K-	280	320	600	190	0.37	0.375	315

TUNING

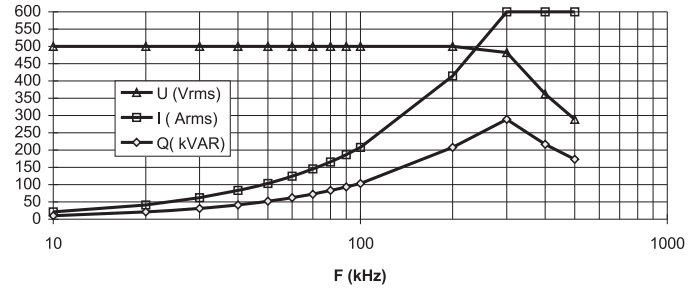
FAI* RoHS Compliant

TUNING

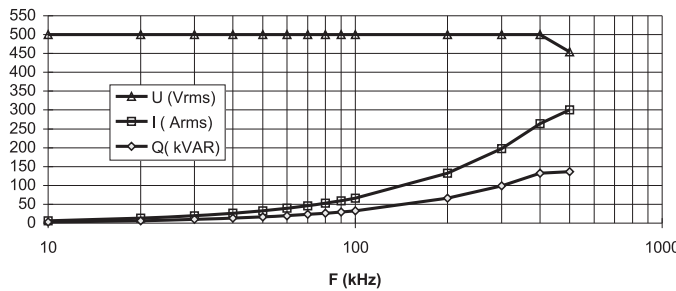
110 nF 500 Vrms
FAI16J0114K--
FAI36J0114K--



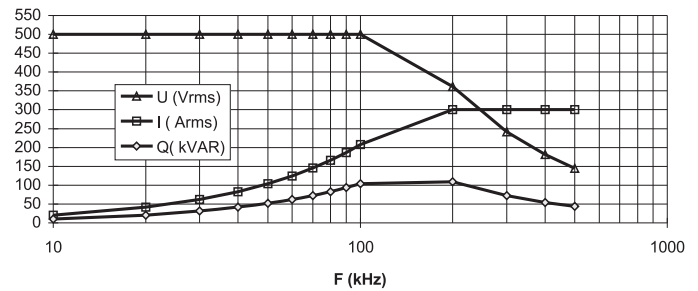
660 nF 500 Vrms
FAI16J0664K--
FAI36J0664K--



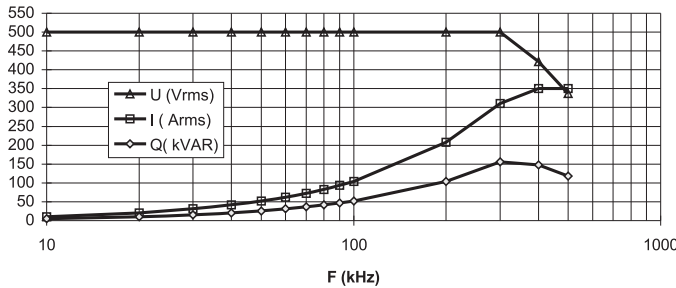
210 nF 500 Vrms
FAI16J0214K--



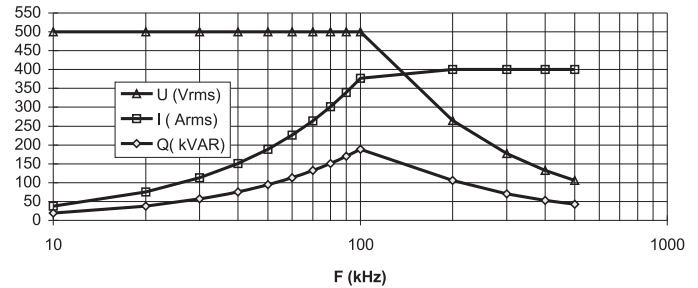
660 nF 500 Vrms
FAI26J0664K--



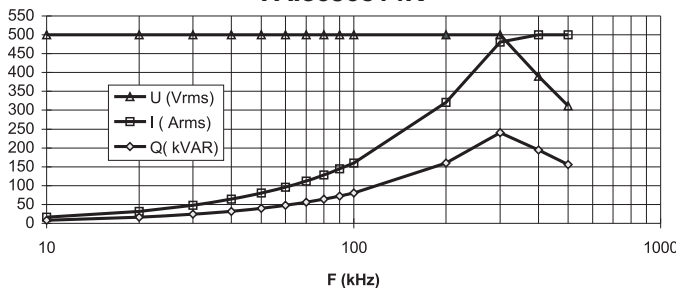
330 nF 500 Vrms
FAI16J0334K--
FAI36J0334K--



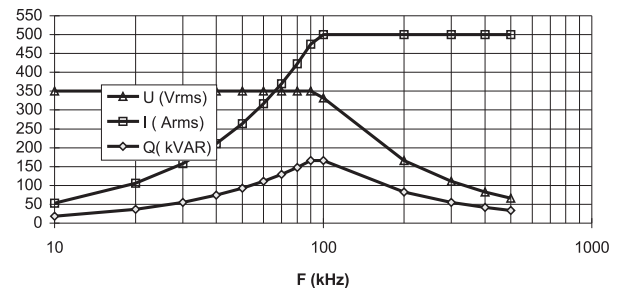
1200 nF 500 Vrms
FAI26J0125K--



510 nF 500 Vrms
FAI16J0514K--
FAI36J0514K--



2400 nF 350 Vrms
FAI26J0245K--

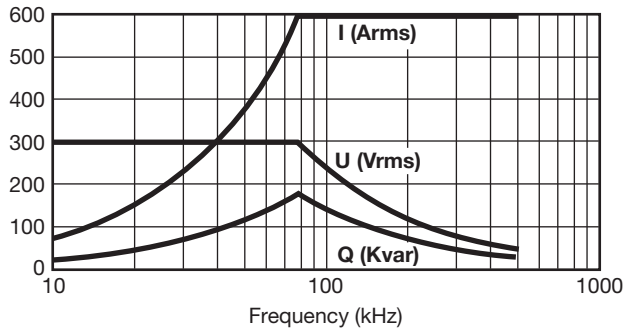


TUNING

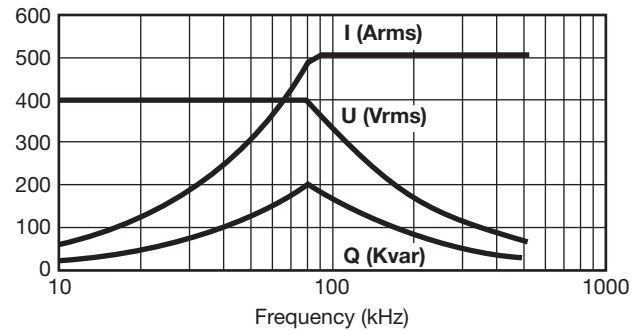
FAI* RoHS Compliant

TUNING

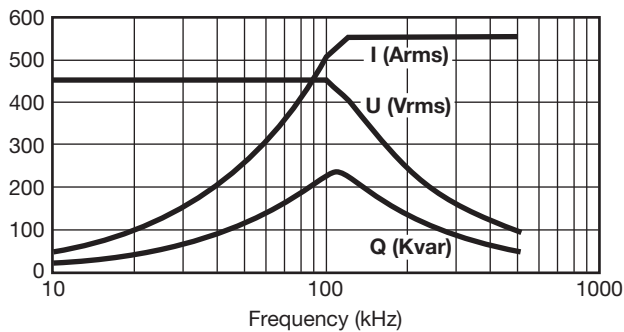
FAI46H0405K--
4000nF±10% 300Vrms



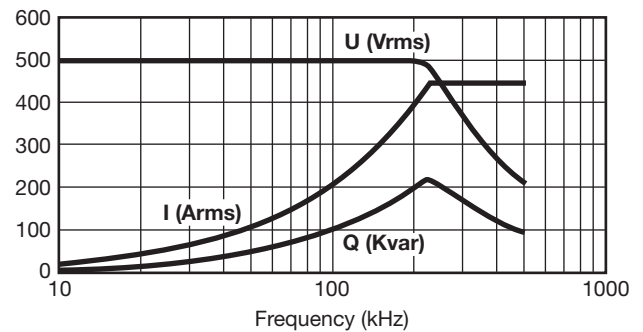
FAI46I0245K--
2400nF±10% 400Vrms



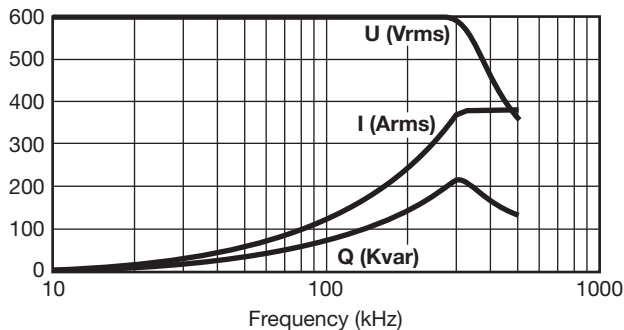
FAI46J0185K--
1800nF±10% 450Vrms



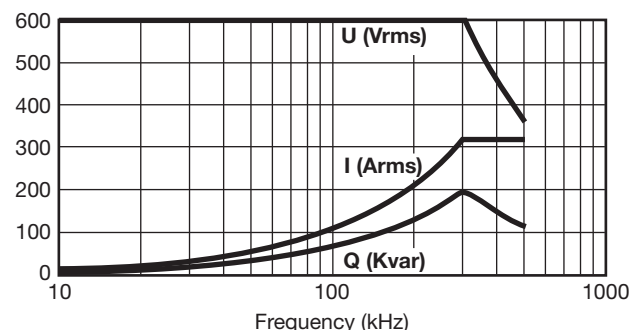
FAI46J0664K--
660nF±10% 500Vrms



FAI46J0334K--
330nF±10% 600Vrms



FAI46J0284K--
280nF±10% 600Vrms



TUNING

FAI* RoHS Compliant

TUNING

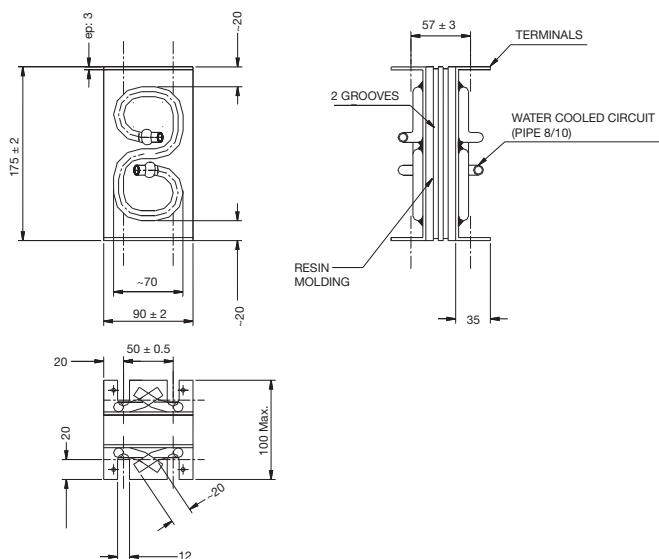
FAI6

Part Number	Width (mm)	Vrms max (V)	C (μF)	Qmax (kVAR)	Irms max (A)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
FAI66F0156K-	90	200	15	160	800	$5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.025$	0.104	1900
FAI66H0126K-		300	12	240	800	$5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.03$	0.104	1900
FAI66I0705K-		400	7	320	800	$5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.035$	0.114	1900
FAI66J0505K-		500	5	320	640	$5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.04$	0.114	1900
FAI66K0355K-		600	3.5	320	530	$5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.05$	0.124	1900
FAI66A0155K-		650	1.5	320	490	$5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.07$	0.134	1900
FAI66F0306K-	190	200	30	240	1200	$2.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.0125$	0.079	3950
FAI66H0246K-		300	24	360	1200	$2.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.015$	0.079	3950
FAI66I0146K-		400	14	480	1200	$2.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.0175$	0.084	3950
FAI66J0106K-		500	10	600	1200	$2.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.02$	0.084	3950
FAI66K0705K-		600	7	640	1070	$2.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.025$	0.089	3950
FAI66A0305K-		650	3	640	985	$2.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.035$	0.094	3950
FAI66F0456K-	290	200	45	320	1600	$2.10^{-4} \times \sqrt{f(\text{Hz})} + 0.0083$	0.072	6100
FAI66H0366K-		300	36	480	1600	$2.10^{-4} \times \sqrt{f(\text{Hz})} + 0.01$	0.072	6100
FAI66I0216K-		400	21	640	1600	$2.10^{-4} \times \sqrt{f(\text{Hz})} + 0.0117$	0.075	6100
FAI66J0156K-		500	15	800	1600	$2.10^{-4} \times \sqrt{f(\text{Hz})} + 0.0133$	0.075	6100
FAI66K1055K-		600	10.5	960	1600	$2.10^{-4} \times \sqrt{f(\text{Hz})} + 0.0167$	0.078	6100
FAI66A0455K-		650	4.5	960	1480	$2.10^{-4} \times \sqrt{f(\text{Hz})} + 0.0233$	0.082	6100
FAI66F0606K-	390	200	60	400	2000	$1.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.00625$	0.067	8200
FAI66H0486K-		300	48	600	2000	$1.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.0075$	0.067	8200
FAI66I0286K-		400	28	800	2000	$1.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.00875$	0.070	8200
FAI66J0206K-		500	20	1000	2000	$1.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.01$	0.070	8200
FAI66K0146K-		600	14	1200	2000	$1.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.0125$	0.072	8200
FAI66A0605K-		650	6	1280	1970	$1.5.10^{-4} \times \sqrt{f(\text{Hz})} + 0.0175$	0.075	8200

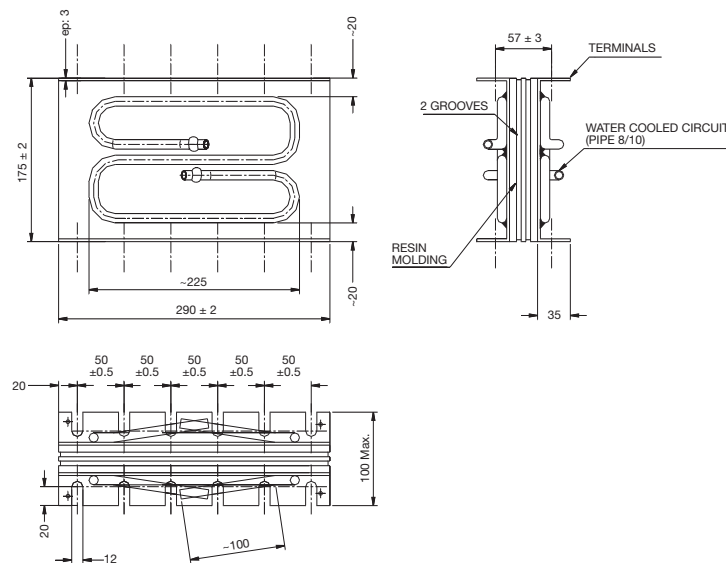
TUNING

CASE SIZE 6 DIMENSIONS

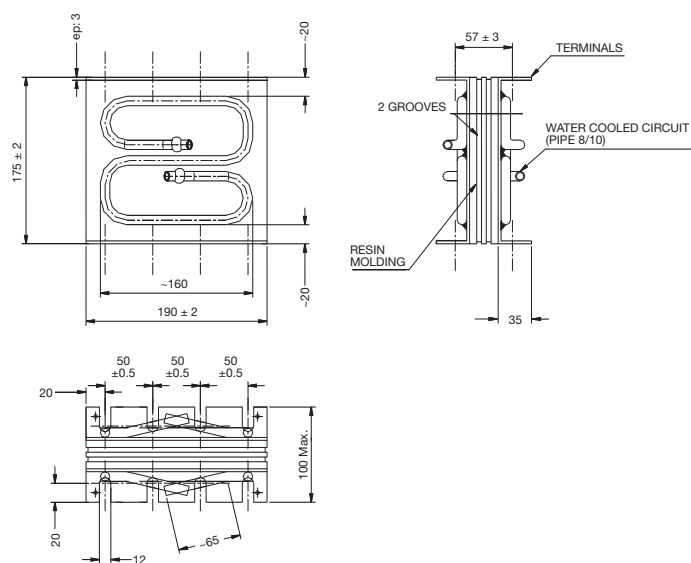
FAI6 WIDTH: 90 (3.543)



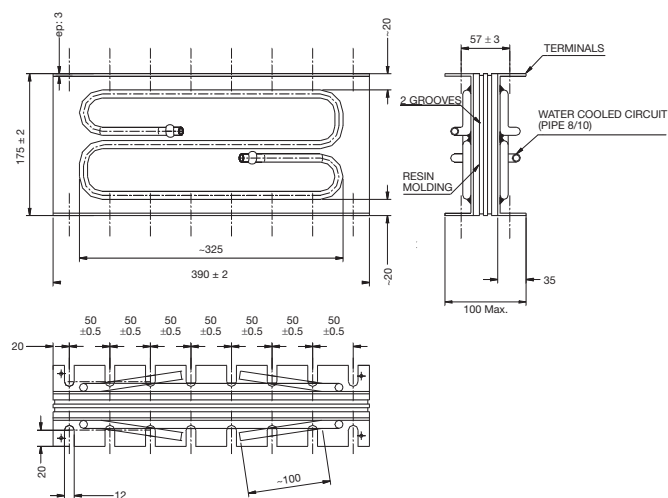
FAI6 WIDTH: 290 (11.417)



FAI6 WIDTH: 190 (7.480)



FAI6 WIDTH: 390 (15.354)

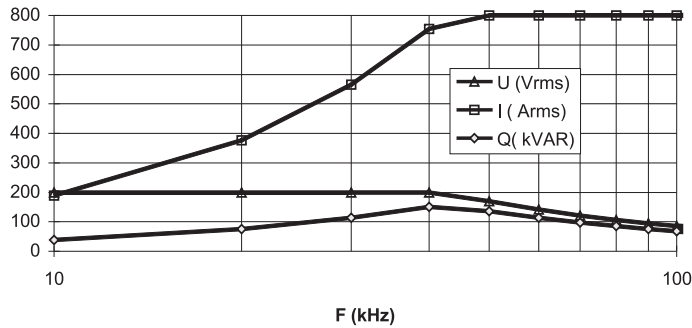


TUNING

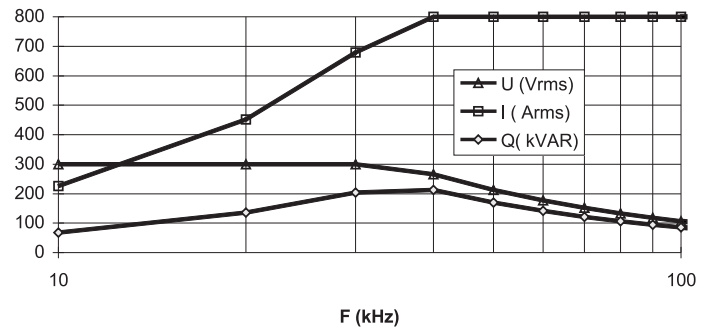
FAI* RoHS Compliant

TUNING

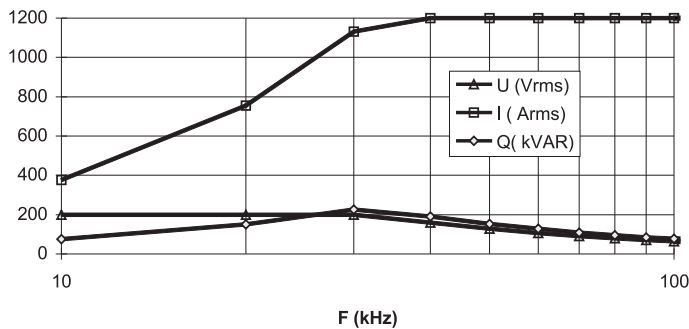
15 μ F 200 Vrms Width 90 mm
FAI66F0156K--



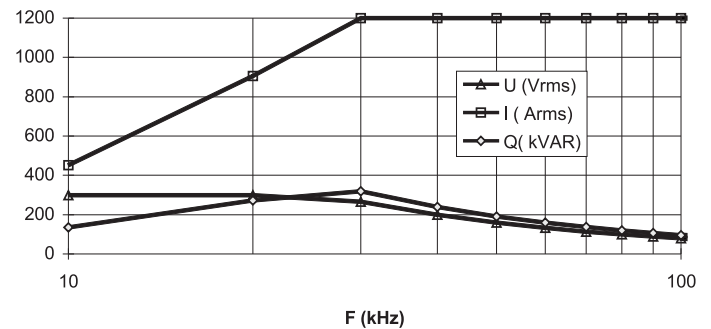
12 μ F 300 Vrms Width 90 mm
FAI66H0126K--



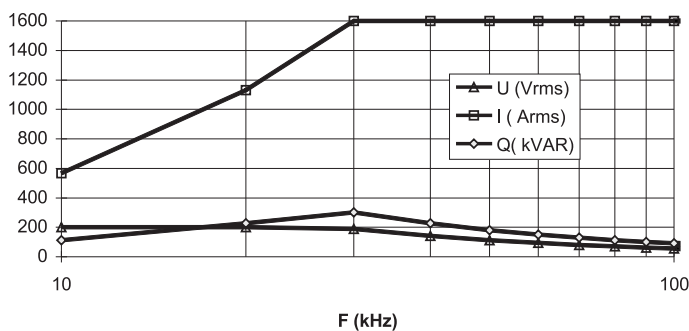
30 μ F 200 Vrms Width 190 mm
FAI66F0306K--



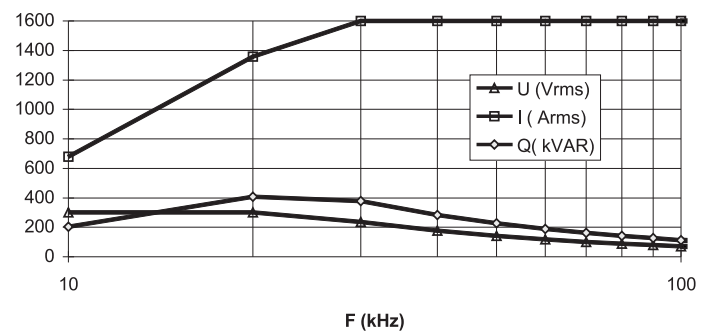
24 μ F 300 Vrms Width 190 mm
FAI66H0246K--



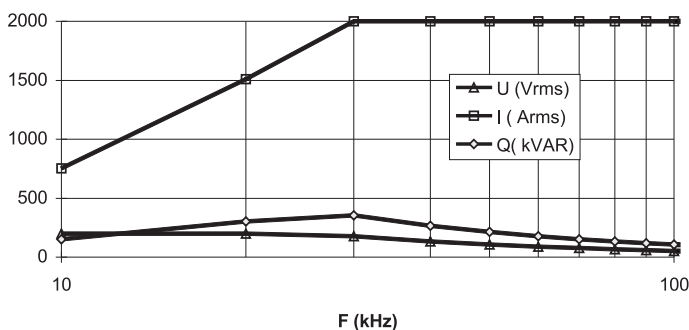
45 μ F 200 Vrms Width 290 mm
FAI66F0456K--



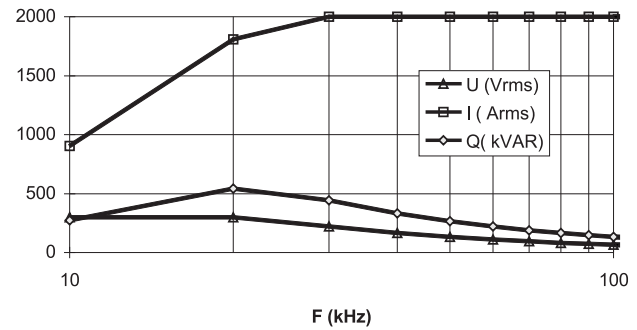
36 μ F 300 Vrms Width 290 mm
FAI66H0366K--



60 μ F 200 Vrms Width 390 mm
FAI66F0606K--



48 μ F 300 Vrms Width 390 mm
FAI66H0486K--

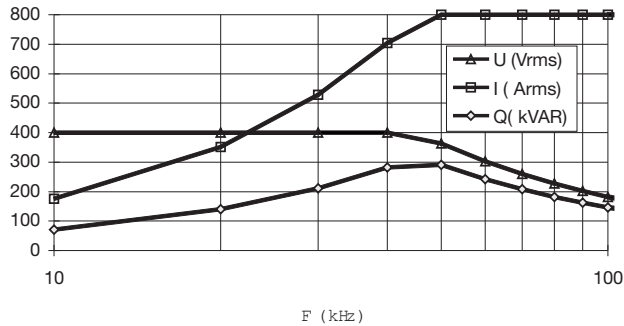


TUNING

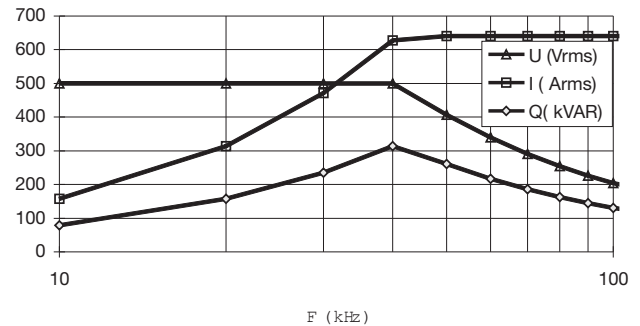
FAI* RoHS Compliant

TUNING

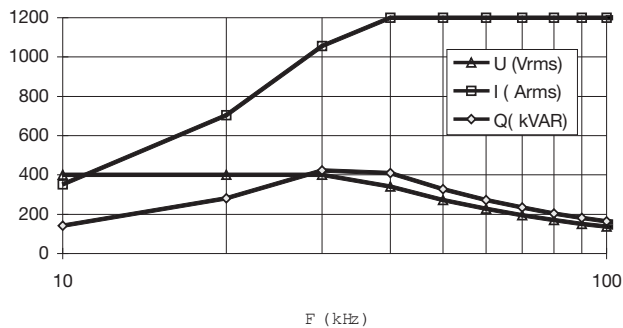
7 μ F 400 Vrms Width 90 mm
FAI66I0705K--



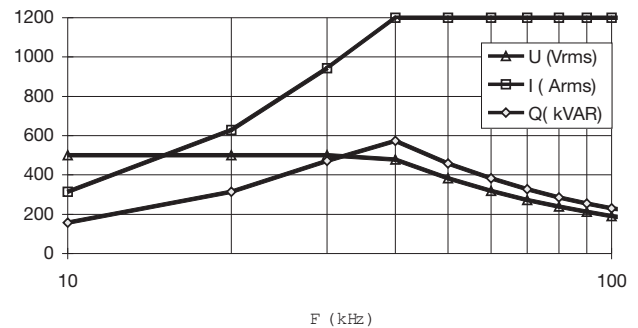
5 μ F 500 Vrms Width 90 mm
FAI66J0505K--



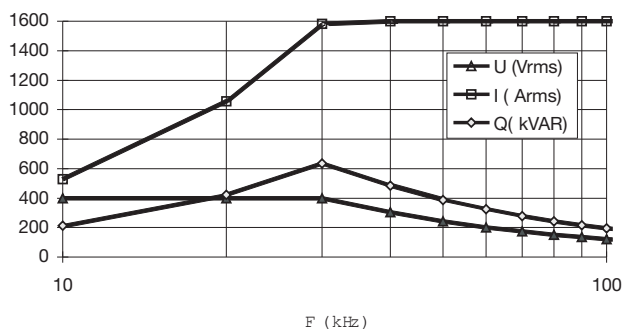
14 μ F 400 Vrms Width 190 mm
FAI66I0146K--



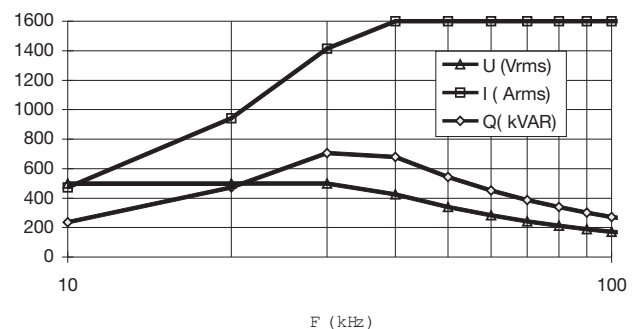
10 μ F 500 Vrms Width 190 mm
FAI66J0106K--



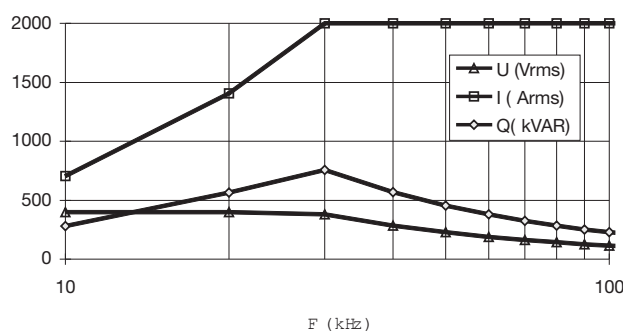
21 μ F 400 Vrms Width 290 mm
FAI66I0216K--



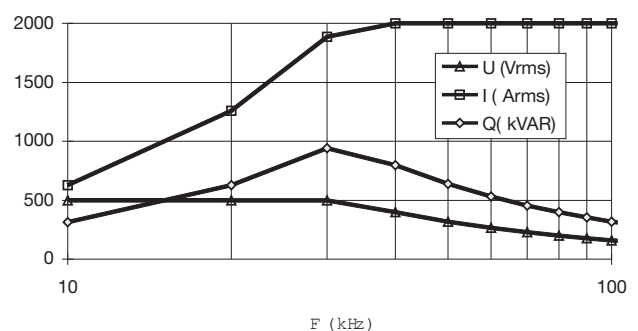
15 μ F 500 Vrms Width 290 mm
FAI66J0156K--



28 μ F 400 Vrms Width 390 mm
FAI66I0286K--



20 μ F 500 Vrms Width 390 mm
FAI66J0206K--

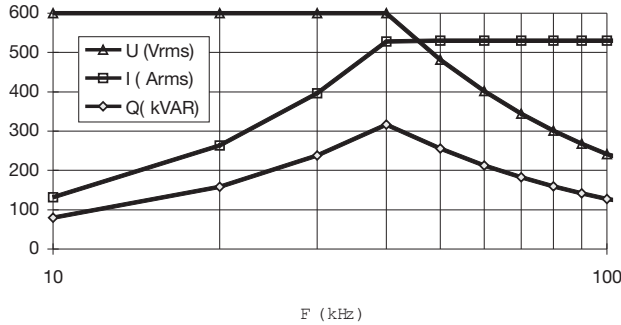


TUNING

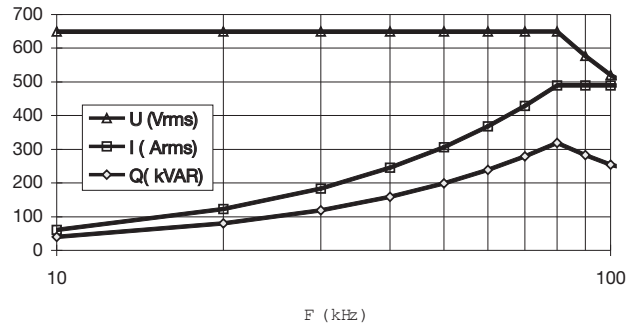
FAI* RoHS Compliant

TUNING

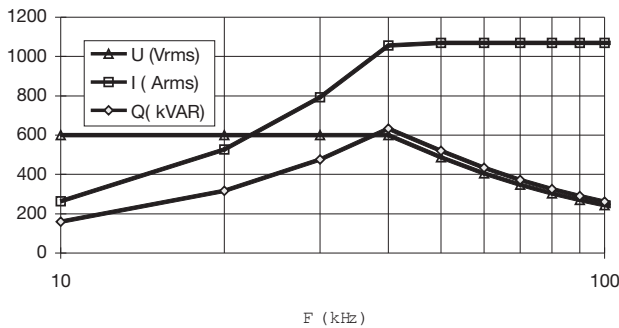
**3.5 μ F 600 Vrms Width 90 mm
FAI66K0355K--**



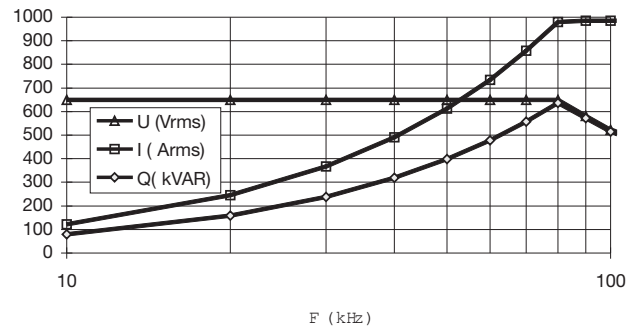
**1.5 μ F 650 Vrms Width 90 mm
FAI66A0155K--**



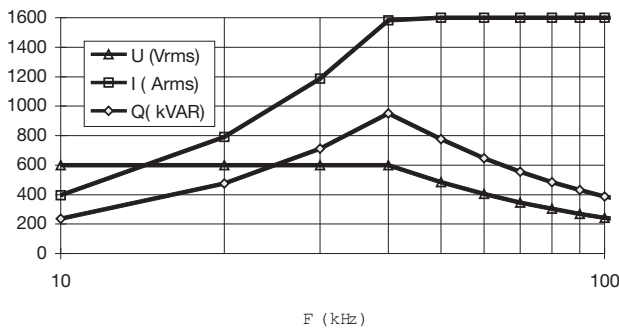
**7 μ F 600 Vrms Width 190 mm
FAI66K0705K--**



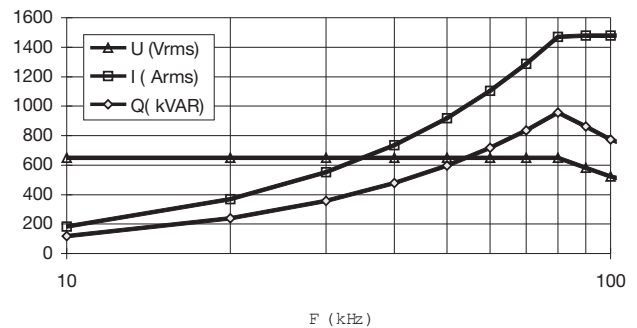
**3 μ F 650 Vrms Width 190 mm
FAI66A0305K--**



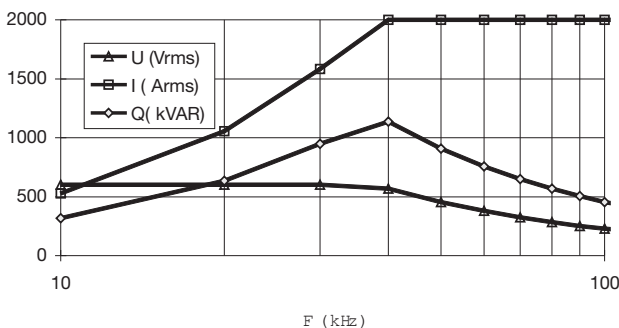
**10.5 μ F 600 Vrms Width 290 mm
FAI66K1055K--**



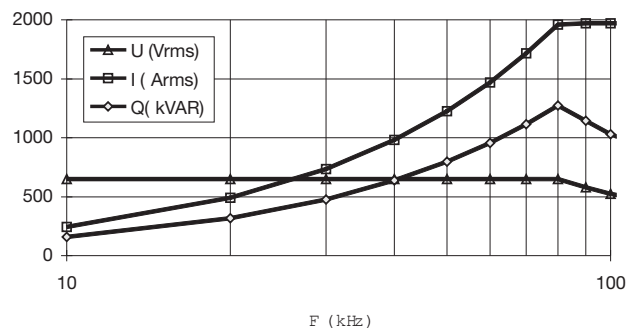
**4.5 μ F 650 Vrms Width 290 mm
FAI66A0455K--**



**14 μ F 600 Vrms Width 390 mm
FAI66K0146K--**



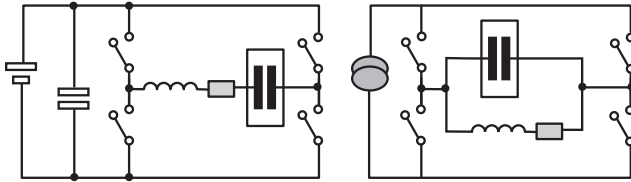
**6 μ F 650 Vrms Width 390 mm
FAI66A0605K--**



INDUCTION HEATING

APPLICATIONS

Local thermal treatment, metallic surface hardening, pipe welding, tin coating treatment,...



FUNCTION, PRODUCTS

DC Filtering

The purpose of this filter is to smooth the low frequency ripple coming from the bridge (up to 360 Hz) and to filter the high frequency ripple coming from the converter (15/20 kHz)*.

*Frequency will be lower than capacitor resonance frequency, on request, TPC can propose specific models for high frequency.

Main criteria are: High rms. current and good behavior against overvoltage are needed.

Products to offer

FFG/FFH	5 to 160µF	600 to 1900Vdc
FFVE/FFWE	12 to 400µF	300 to 1900Vdc
FFVI/FFWI	47 to 275µF	500 to 1100Vdc
FLLI/FFLB	58 to 800µF	680 to 1900Vdc
FFLC	1120 to 8800µF	680 to 1200Vdc

Tuning

In order to obtain the requested frequency, a capacitor is needed to tune with the inductance. The main characteristic of this capacitor is the reactive power (express in kVar) versus frequency.

Products to offer

TRACTION

FAI6	10 kHz ≤ F ≤ 100 kHz	1.5 to 60µF 200 to 650Vrms 160 to 1280kVar
FAI1 to 4	100 kHz ≤ F ≤ 500 kHz	110 to 4000nF 300 to 600Vrms 100 to 300kVar

APPLICATIONS

Speed converter for power for mass transit and/or people mover system.

FUNCTION, PRODUCTS

DC Filtering

The purpose of the product is to filter the high frequency ripple coming from the converter in order to avoid rejection and perturbation on the network.

TPC has developed controlled-self healing range allowing reliable and competitive solution compare electrolytic technology.

See calculation example how to replace electrolytic technology.

Note that on new developments based on IGBT converter, manufacturer wish to have a main DC filter close to the converter and some light filters sprayed on the line.

Products to offer

Main DC Filter	FFLC	1120 to 8800µF	up to 1200Vdc
Additional	FLLI/FFLB	58 to 800µF	up to 1900Vdc
DC Filter	FFVE/FFWE	12 to 400µF	up to 1900Vdc
	FFG/FFV	5 to 160µF	up to 1900Vdc

Protection of semi-conductors

Overvoltage and clamping due to switching of semi-conductors.

Products to offer

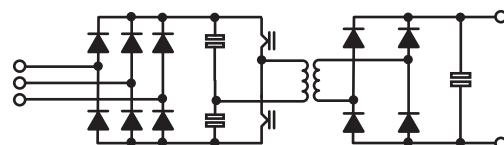
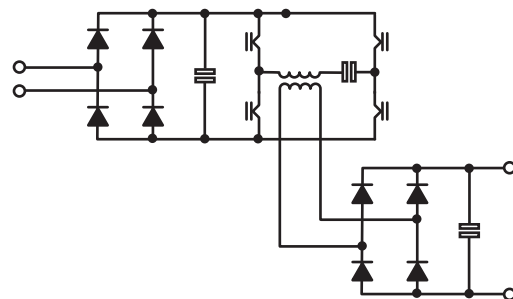
Thyristors and			
GTO snubbers	FPX/FPY	0.5µF to 6µF	up to 4600V*
IGBT clamping	FSB	0.1 to 2.5µF	up to 2kVdc
	FFVE	12 to 400µF	up to 1.9kVdc

*higher voltage on request

POWER SUPPLIES AND RESONANT CONVERTER

APPLICATIONS

Medical	X-ray, scanner power supplies
Traction	Battery charger
Industrial	All application requesting power supplies



FUNCTION, PRODUCTS

DC Filtering

The purpose of this filter is to smooth the low frequency ripple coming from the bridge (up to 360 Hz) and to filter the high frequency ripple coming from the converter (15/20 kHz).

High rms. current and good behavior against overvoltage are needed.

Products to offer

FFB/FFV3	1.5 to 160μF	75 to 1100Vdc
FFG/FFH	5 to 160μF	600 to 1900Vdc
FFVE/FFWE	12 to 400μF	300 to 1900Vdc
FFVI/FFWI	47 to 275μF	500 to 1100Vdc
FFLI/FFLB	58 to 800μF	680 to 1900Vdc

Tuning

In order to obtain the requested frequency, a capacitor is needed to tune with the inductance transformer.

The main characteristic of this capacitor is the reactive power and rms. current.

Products to offer

FAV	80 to 1200nF	up to 650Vrms
FAI1 to 4	110 to 4000nF	up to 600Vrms

Protection of semi-conductors

Overvoltage and clamping due to switching of semi-conductors.

Products to offer

IGBT clamping	FSB	0.1 to 3μF	up to 2kVdc
Mos-Fet transistor protection	FSV	10nF to 150nF	up to 2kVdc

SPEED CONVERTER

APPLICATIONS

Speed converter for medium power (20 to 100kW) Traction: auxiliary converter for air cooling system, light,... Industrial: speed variation

FUNCTION, PRODUCTS

DC Filtering

The purpose of this product is to filter the high frequency ripple coming from the converter in order to avoid rejection and perturbation on the network.

Due to IGBT converter, heavy rms. current and very compact product is requested; film technology is able to achieve these 2 targets.

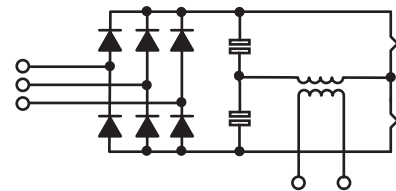
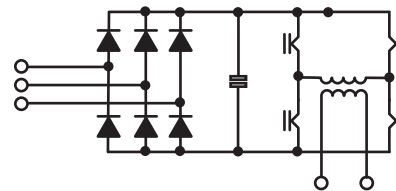
Products to offer

FFLI/FFLB	58 to 800μF	680 to 1900Vdc
FFVE/FFWE	12 to 400μF	300 to 1900Vdc
FFVI/FFWI	47 to 275μF	500 to 1100Vdc
FFB/FFV3	1.5 to 160μF	75 to 1100Vdc

WELDING

APPLICATIONS

Generate, out of the main supply, through a converter (chopper) and a transformer an overvoltage able to create an electrical arc.



FUNCTION, PRODUCTS

DC Filtering

The purpose of this filter is to smooth the low frequency ripple coming from the rectifier (up to 360 Hz) and to filter the high frequency ripple coming from the converter (15/20 kHz).

Products to offer

FFVE/FFWE	12 to 400μF	300 to 1900V
FFVI/FFWI	47 to 275μF	500 to 1100V
FFB/FFV3	1.5 to 160μF	75 to 1100V

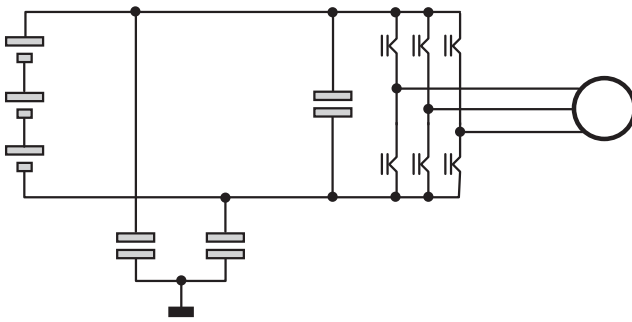
ELECTRICAL VEHICLE

APPLICATIONS

Battery powered car, electric fork lift truck and hybrid electric vehicle.

Due to high rms. current needed through the capacitor, metallized controlled self-healing technology will be an excellent solution.

See calculation example on page 105.



FUNCTION, PRODUCTS

DC Filtering

Between battery and converter, a capacitor is needed.

Its main purpose is to filter the ripple coming from the converter, to avoid damaging the battery.

Metallized Film Capacitors are able to fulfill this function using 2 or 3 cases (only electrolytic can not).

Products to offer

FFVE/FFWE	12 to 400µF	300 to 1900Vdc
FFVI/FFWI	47 to 275µF	500 to 1100Vdc

According to quantity, a custom design could be developed, achieving the total function with a single case.

WIND MILL

APPLICATIONS

Energy power supplied by the wind, new wind mill generation use electronic converter in order to control power, phase and voltage.

FUNCTION, PRODUCTS

DC Filtering

The purpose of the product is to filter voltage ripple.

TPC has developed controlled self-healing range allowing reliable and competitive solution compare electrolytic technology.

See calculation example how to replace electrolytic technology on pages 104 and 105.

Products to offer

FFLC	1120 to 8800µF	up to 1200Vdc
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Protection of semi-conductors

Overvoltage and clamping due to switching of semi-conductors.

Products to offer

Snubbers	FSB	0.1 to 3µF	up to 2kVdc
Clamping	FFVE/FFWE	12 to 400µF	up to 1.9kVdc

ENERGY STORAGE

APPLICATIONS

Medical: cardiac defibrillator

Industrial and military: laser telemetry, flash lamp

FUNCTION, PRODUCTS

DC Filtering

Stored energy is used to generate electrical pulse.

Products to offer

F DV1	5 to 80µF	1000 to 1700V
F DBB	70 to 150µF	1800 to 3000V*

*Specific FDBB can be offered with energy density over more than 1.5J per cc.

FILM TECHNOLOGY TO REPLACE ALUMINUM ELECTROLYTIC TECHNOLOGY

The trend in the industrial and traction market for power conversion is to replace electrolytic capacitors by film technology.

This trend is generated by the many advantages that film technology offers. Among these advantages, we have:

- *High rms. current capabilities up to 1Arms. per µF
- *Overvoltage withstanding up to 2 times the rated voltage
- *Handle a reversal voltage
- *High peak current capabilities
- *No acid inside
- *Long lifetime
- *No storage problem

However, this replacement is not necessarily capacitance but for capacitance by application/Function.

Despite the advantages of film technology, replacement solutions won't be possible for each application, there will be several approaches to do this.

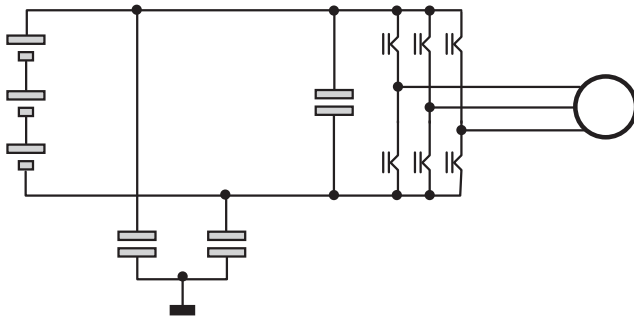
In order to help the use, we will present some examples where film gives a major benefit over electrolytic technology.

1) DC LINK FILTER: HIGH CURRENT DESIGN & CAPACITANCE VALUE DESIGN

1a) Energy supplied with batteries

Applications will be:

electric car
electric fork lift truck



In that case, capacitor will be used as a decoupling capacitor.

Film capacitor is particularly well adapted for this use, because main criteria for DC link capacitor will be rms. current withstanding.

It means that DC link capacitor can be designed on rms. current value.

If we take an electric car in account as example:

Requirement data:

Working voltage:	120Vdc
Ripple voltage allowed:	4Vrms
Rms. current:	80 Arms. @ 20kHz

Minimum capacitance value will be:

$$C = \frac{I_{rms}}{U_{ripple} \times 2 \times \pi \times f} = 159 \mu F$$

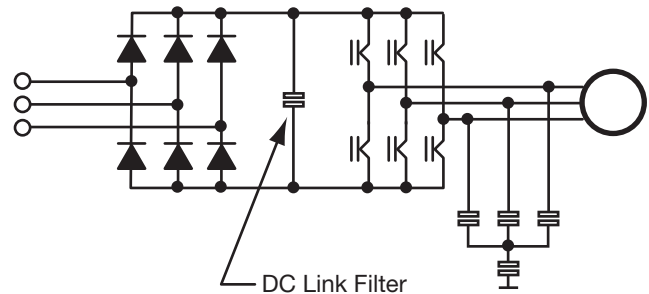
So, it will be easy to find a capacitance value close to these values.

Comparison with electrolytic capacitor.

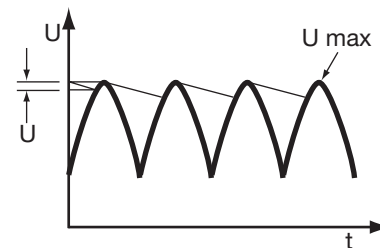
If we take in account 20mA per μF for example, in order to handle 80 Arms, capacitance value minimum would be:

$$C = \frac{80}{0.02} = 4000 \mu F$$

1b) Industrial motor drive, energy supplied from supply network



DC link voltage waveform:



Capacitance value will be defined taken in account that supply frequency is lower than converter frequency.

To determine needed capacitance, we can use the following approached equation:

$$C = \frac{P_{load}}{U_{ripple} \times \left[U_{max} - \frac{U_{ripple}}{2} \right] \times F_{rectifier}}$$

Irms. through capacitor will be (approached expression):

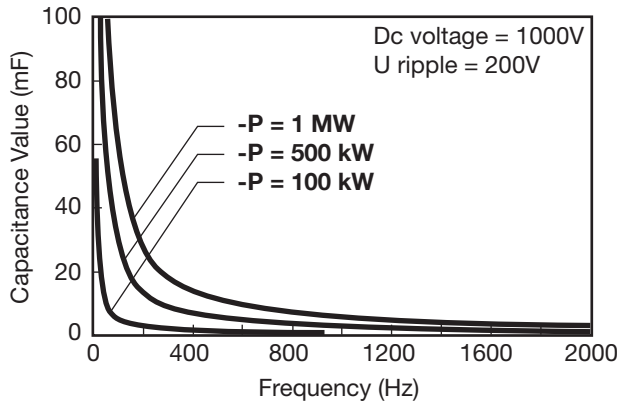
Of course this current doesn't take in account frequency converter current

$$I_{rms} = \frac{U_{ripple}}{2 \times \sqrt{2}} \times C \times 2 \times \pi \times F_{rectifier} = \frac{P_{load} \times \pi}{\left[U_{max} - \frac{U_{ripple}}{2} \right] \sqrt{2}}$$

So, with this approximation, Irms. through the capacitor will be depending of the Power of load, Umax and U ripple.

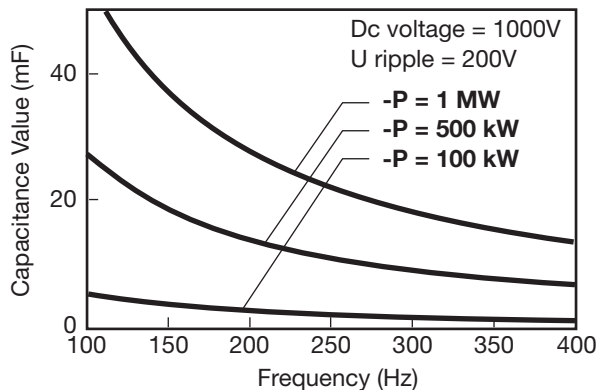
To illustrate, we will take a concrete example:

DC voltage 1000 Volts
U ripple 200 volts



P	I _{rms}
1 MW	2468 Arms
500 kW	1234 Arms
100 kW	247 Arms

It becomes necessary to have a zoom on low frequency:



To compare with electrolytic solution, we will take a current capability of 20mA per μ F for electrolytic capacitors. First case, power at 1Mwatt:

Rms. current is 2468 Arms, which would impose minimum capacitance value of 123.4mF (taking into account 0.02Arms. per μ F).

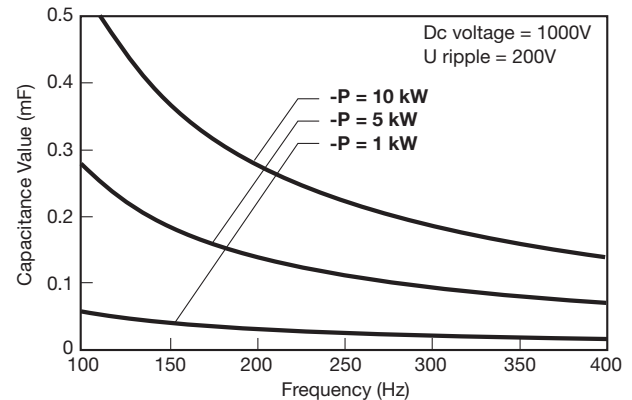
If we look at this value on the curve, we can see that this capacitance value is needed (the given example for film technology) for a rectifier frequency lower than 100Hz.

So, with 3 phases, 6 diodes rectifier, frequency will be 300Hz.

We can see on the 1 megawatt curve that capacitance needed is 18.5mF. Film solution will be almost 4 times smaller than electrolytic solution, with high reliability in addition.

Lower power will give similar results, and for power up to 10 kwatts, capacitance value becomes so small that film technology still constitutes the best solution.

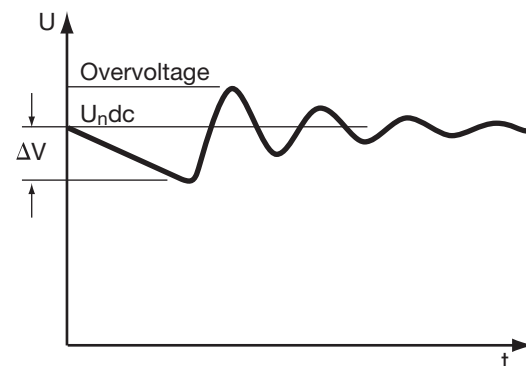
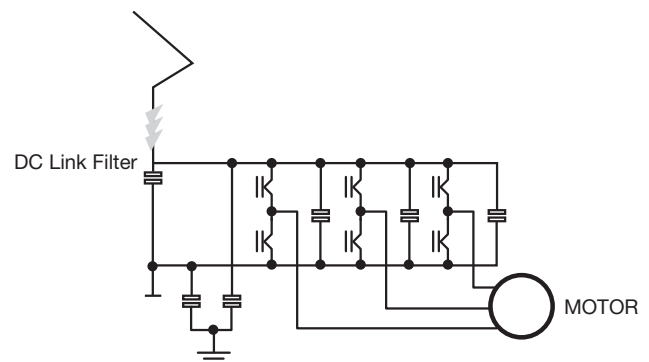
Even at 100Hz rectifier frequency, no more than 555 μ F are needed, supply voltage and ripple still the same than previously.



2) OVERVOLTAGE DESIGN

We will consider light traction application, like metro, tramway, electric buses, ...

DC link voltage wave form:



Due to the principle of carrying the power from the catenary to the train, some contact discontinuity appears between pantograph and catenary.

When contact is not done, energy come from DC link filter, with for effect, to decrease the voltage. So, as soon as the contact is re-established, an overvoltage appears.

$$V(t) = U_{ndc} - \Delta V \times e^{-\alpha t} \times (\cos \omega t + \frac{\alpha}{\omega} \sin \omega t)$$

$$\text{with } \omega = \sqrt{\beta_0^2 - \alpha^2}$$

$$\beta_0 = \frac{1}{\sqrt{L \times C}}$$

$$\alpha = \frac{R}{2 \times L}$$

Worse case would be ΔV = catenary voltage, because overvoltage could almost reach 2 times the rated voltage.

So, film capacitor can handle this kind of overvoltage.

Comparison with electrolytic technology:

Electrolytic handle 1.2 DC voltage max:

So minimum voltage that electrolytic should handle would be:

$$\text{DC voltage of electrolytic technology: } \frac{2 \times 1000V}{1.2} = 1670V$$

4 capacitors 450 Volts in series would be needed.

Volume occupied for 10mF with electrolytic would be: 26 l and Irms. max would be 220Arms.

With film, volume occupied would be 25 l, and rms. current capability would be higher than 500Arms.

In other hand, link to these overvoltages, peak current appear through the capacitor:

So, we have to calculate the energy generated by this overvoltage

$$I^2 t = \int i^2(t) dt.$$

$$i(t) = \frac{C \beta_0^2 V_0}{\omega} e^{-\alpha t} \sin \omega t$$

$$i^2(t) = \frac{C^2 \beta_0^4 V_0^2}{\omega^2} e^{-2\alpha t} \sin^2 \omega t$$

$$\int_0^\infty i^2(t) dt = \left[\frac{1}{4} \frac{e^{-2\alpha t} C^2 \beta_0^4 V_0^2 (-\alpha^2 - \omega^2 + \alpha^2 \cos 2\omega t - \alpha \omega \sin 2\omega t)}{\alpha \omega^2 (\alpha^2 + \omega^2)} \right]_0^\infty$$

After few periods, current becomes null, then:

$$\int_0^\infty i^2(t) dt = [0] - \left[-\frac{1}{4} \frac{C^2 \beta_0^4 V_0^2}{\alpha (\alpha^2 + \omega^2)} \right] = \frac{1}{4} \frac{C^2 \beta_0^4 V_0^2}{\alpha (\alpha^2 + \omega^2)}$$

$$\text{with: } \beta_0 = \frac{1}{\sqrt{L \times C}}; \alpha = \frac{R}{2 \times L}; \omega = \sqrt{\beta_0^2 - \alpha^2}$$

This energy calculation will be used for short circuit discharge between terminal as well. Such discharge will generate a very high peak current and some ringing that electrolytic could not handle.

3) VOLTAGE RATING

Function of the voltage rating needed, film solution will become more and more interesting.

If high capacitance value is requested, film solution will be less competitive. Indeed, if there is no overvoltage, low rms. current, large capacitance value, it will be difficult for film technology to be competitive below 900 volts.

LIFETIME CALCULATION

Film technology allows a very long lifetime expectancy, depending on voltage load conditions (working voltage) and hot spot temperature.

For DC filtering, lifetime meets the curves shown in this catalog.

End of life criteria is a decrease of capacitance value of 2%. However, this is a theoretical end of life, because capacitor can be still used after this point. If application can allow 5% capacitance decrease, lifetime will be widely increased.

Hot spot temperature will be determined with the following expression:

$$\theta_{max_{hotspot}} = \theta_{ambient} + P_{rms} \times \left[R_s + \frac{1}{C \times 2 \times \pi} \times \text{tg} \delta_0 \right] \times R_{th}$$

with: $\theta_{max_{hotspot}}$: the maximum hot spot temperature

$\text{tg} \delta_0$: dielectric losses

R_{th} : Thermal resistance

R_s : Serial resistance

$\theta_{hot spot}$ will be 85°C or 105°C function of the application and the technology.

4) CONCLUSION

This document gives some ways for the engineer designer to do their choice. Of course, for each case a complete calculation will have to be done.

Anyway, if the request is only capacitance value, low voltage, low rms. Current, no overvoltage, no reversal voltage, no peak current, film technology certainly won't be a good solution.

SPECIFIC PRODUCT REQUEST

This questionnaire lists the information we require to prepare an offer according to your exact requirements

Company / Name / Email	Project / Quantity
------------------------	--------------------

Applications	DC Filtering	Discharge*	Protection*	Tuning
Capacitance (µF)				
Tolerance (%)				
Operating Voltage	Vpeak	Vch	Vpeak Vdc	Vrms
Ripple Voltage (peak to peak)	V			
Working Frequency (Hz)				
Operating Current	Arms	Apeak	Arms	Arms
Maximum Current/Duration	Arms s		Apeak	
Discharge		Aperiodic Oscillatory		
Pulse Duration (5% Ipeak)				
Time to Ipeak (µs)				
Ringing Frequency (Hz)				
Reversal Voltage (%)				
Repetition Rate		shots/min/hour/day	Hz	
Hold Time @ Full Voltage (s)				
Fault Peak Current / nb shots	Apeak shots	Apeak shots		
Fault Reversal Voltage (%)				
Lifetime Expectancy	hours	shots	hours	hours
Maximum Inductance (nH)				
Test Voltage between Terminals (V)				
Test Voltage between Shorted Terminals and Case (V)				
Maximum Surge Voltage (MSV)				
MSV Duration / Frequency	s /year		s /year	

*Due to the particularities of varying waveforms in such application, more information on the exact nature of waveform is generally required for a full analysis.

Description			
Dimensions (mm) / Shape		Operating Position	Terminals
Section:	Height:	vertical, horizontal inclined, upside down	type quantity
rectangular, cylindrical			

Thermal Characteristics					
Storage Temperature (°C)		Operating Temperature (°C)		Cooling Method	
min.		min.		Natural Convection	
average		average		Forced Air (m/s)	
max.		max.		Water	

Remarks



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for the scopes of certification 4 (Power system), 6 (Auxiliary systems), 20 (Single railway components)
Power capacitors.

Certificate valid from: 18/10/2013

Certificate valid until: 17/10/2016 *

Current date: 30/10/2013

Certificate-Register-No.: FQA4002634/IRIS



* Providing that the subsequent surveillance audits are successful before the anniversary of this validity date.

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