

FEATURES

- LOW COST, GENERAL PURPOSE, 2000 HOURS AT 85°C
- NEW EXPANDED CV RANGE (up to 6800μF)
- ANTI-SOLVENT (2 MINUTES)
- DESIGNED FOR AUTOMATIC MOUNTING AND REFLOW SOLDERING

CHARACTERISTICS

Rated Voltage Range	4.0 ~ 100 Vdc
Rated Capacitance Range	0.1 ~ 6800μF
Operating Temp. Range	-40 ~ +85°C
Capacitance Tolerance	±20%(M), ±10%(K)**
Max. Leakage Current After 2 Minutes @ 20°C	0.01CV or 3μA, whichever is greater

Tanδ @ 120Hz/20°C	W.V. (Vdc)	4.0	6.3	10	16	25	35	50	63	100
	3mm Dia.	0.40	0.35	0.24	0.19	0.16	0.14	0.14	-	-
	4 ~ 6.3 mm Dia.	0.35	0.26	0.20	0.16	0.14	0.12	0.10	0.10	0.10
	8 x 6.5mm Case Size	-	0.35	0.26	0.20	0.16	0.14	0.12	-	0.18
	8mm Dia ~ up	C < 1000μF	0.40	0.30	0.24	0.20	0.16	0.14	0.12	0.10
		C = 1500μF	-	0.31	0.25	0.21	-	0.15	-	-
		C = 2200μF	-	0.32	0.32	-	0.18	-	-	-
		C = 3300μF	-	0.34	-	0.24	-	-	-	-
		C = 4700μF	-	-	0.36	-	-	-	-	-
		C = 6800μF	-	0.40	-	-	-	-	-	-
Low Temperature Stability Impedance Ratio @ 120Hz	W.V. (Vdc)	4.0	6.3	10	16	25	35	50	63	100
	Z-25°C/Z +20°C	7	3	3	2	2	2	2	2	2
	Z-40°C/Z +20°C	15	8	6	4	4	3	3	3	3
Load LifeTest 85°C 2,000 Hours	Capacitance Change	Within ±25% of initial measured value								
	Tanδ	Less than 200% of specified max. value								
	Leakage Current	Less than specified max. value								



SURFACE MOUNT

NACE	101	M	16V	6.3x5.5	TR	13	E
							Lead Free (Pb) Finish Optional 97% Sn (min.), 3% Bi (max.)
							330mm (13") Reel
							Tape & Reel
							Size in mm
							Working Voltage
							Tolerance Code M=20%, K=10%
							Capacitance Code in μF, first 2 digits are significant
							Third digit is no. of zeros, "R" indicates decimal for values under 10μF
							Series

MAXIMUM E.S.R. (Ω) AT 20°C AND 120Hz

Cap (μ F)	Working Voltage (Vdc)								
	4.0	6.3	10	16	25	35	50	63	100
0.1	-	-	-	-	-	-	1660	1660	-
0.22	-	-	-	-	-	-	754	754	-
0.33	-	-	-	-	-	-	503	503	-
0.47	-	-	-	-	-	-	353	353	-
1.0	-	-	-	-	-	-	166	166	166
2.2	-	-	-	-	-	-	90.4	75.4	75.4
3.3	-	-	-	-	-	-	60.3	50.3	50.3 90.4†
4.7	-	-	-	-	4.94	42.3	35.3	35.3	35.3
10	-	-	-	26.5	23.2	19.9	16.6	16.6	16.6
22	30.1	26.5* 18.1	15.1	12.1	10.6	9.05	7.54 9.05†	7.54	7.54
33	17.6	12.6	10.1	8.04	7.04	6.04 7.04†	5.03 6.04†	6.04	5.03
47	12.4	8.47	7.06	5.65	4.95	4.24 4.95†	3.53	4.24	-
68	8.54	5.86	4.88	3.91	3.42	2.93	2.44	-	-
100	5.80	3.98	3.32	2.66 3.32†	2.32 2.66†	1.99	1.99	1.99	-
150	3.87	2.66	2.21	1.77	1.55	1.33	-	-	1.11
220	2.64	1.96	1.51 1.99†	1.21	1.21	1.06	0.91	0.91	-
330	1.76	1.31 1.76†	1.21	1.01	0.81	0.71	0.60	-	-
470	1.42	1.06	0.85	0.71	0.57	0.49	0.43	0.43	-
680	-	0.59	-	0.49	-	0.34	-	-	-
1000	0.67	0.50	0.40	-	0.27	-	0.20	-	-
1500	-	0.35	-	0.24	-	0.17	-	-	-
2200	-	-	0.24	-	0.14	-	-	-	-
3300	-	0.17	-	0.12	-	-	-	-	-
4700	-	-	0.13	-	-	-	-	-	-
6800	-	0.10	-	-	-	-	-	-	-

MAXIMUM RIPPLE CURRENT (mA rms AT 120Hz AND 85°C)

Cap (μ F)	Working Voltage (Vdc)								
	4.0	6.3	10	16	25	35	50	63	100
0.1	-	-	-	-	-	-	1.0	1.0	-
0.22	-	-	-	-	-	-	2.3	2.3	-
0.33	-	-	-	-	-	-	3.5	3.5	-
0.47	-	-	-	-	-	-	4.0* 5.5	5.0	-
1.0	-	-	-	-	-	-	8* 10	10	10
2.2	-	-	-	-	-	8*	15	15	20
3.3	-	-	-	-	-	10*	18	20	28 50†
4.7	-	-	-	-	12* 19	20	23	23	35
10	-	-	-	20* 25	28	30	34	34	50
22	19*	21* 31	35	39	52	54	58 120†	70	120
33	26	39	43	57	63	60 130†	65† 85	160	190
47	34	47	59	68	68	70 165†	90	170	330
68	52	63	66	75	80	110	120	-	-
100	61	71	76	86 200†	91† 130	130	200	280	-
150	74	78	88	135	200	220	-	-	560
220	82	95	150 250†	150	250	270	320	410	-
330	80	150 300†	280	280	310	340	520	-	-
470	150	300	300	330	430	590	925	700	-
680	-	300	-	450	-	610	-	-	-
1000	330	330	450	-	660	-	940	-	-
1500	-	450	-	710	-	1060	-	-	-
2200	-	-	730	-	1150	-	-	-	-
3300	-	750	-	1200	-	-	-	-	-
4700	-	-	1260	-	-	-	-	-	-
6800	-	1330	-	-	-	-	-	-	-

*3x5.5mm Case Size, †8x6.5mm Case Size

RIPPLE CURRENT CORRECTION FACTOR

Frequency Hz	100<F≤1K	1K<F≤10K	10K<F≤100K	F≥100K
C≤4.7 μ F	1.0	1.3	1.5	2.0
4.7 μ F<C≤33 μ F	1.0	1.2	1.3	1.45
C>33 μ F	1.0	1.1	1.2	1.3



STANDARD PRODUCT AND CASE SIZE TABLE DØxL (mm)

Cap. (µF)	Code	Working Voltage (Vdc)								
		4.0	6.3	10	16	25	35	50	63	100
0.1	R10							3x5.5 4x5.5*	4x5.5*	
0.22	R22							3x5.5 4x5.5*	4x5.5*	
0.33	R33							3x5.5 4x5.5*	4x5.5*	
0.47	R47							3x5.5 4x5.5*	4x5.5*	
1.0	1R0							3x5.5 4x5.5*	4x5.5*	4x6.3*
2.2	2R2						3x5.5	4x5.5*	4x5.5*	6.3x6.3*
3.3	3R3						3x5.5	4x5.5*	5x5.5*	6.3x6.3* 8x6.5
4.7	4R7					3x5.5 4x5.5	4x5.5*	5x5.5*	5x5.5*	6.3x6.3*
10	100				3x5.5 4x5.5*	5x5.5	5x5.5*	6.3x5.5*	6.3x5.5*	6.3x8*
22	220	3x5.5	3x5.5 4x5.5*	5x5.5*	5x5.5*	6.3x5.5	6.3x5.5*	6.3x6.3* 8x6.5	6.3x8*	8x10.5*
33	330	4x5.5*	5x5.5*	5x5.5*	6.3x5.5*	6.3x5.5	6.3x6.3* 8x6.5	6.3x8* 8x6.5	8x10.5*	10x10.5*
47	470	4x5.5*	5x5.5*	6.3x5.5	6.3x5.5*	6.3x6.3	6.3x6.3* 8x6.5	6.3x8*	8x10.5*	12.5x14
68	680	5x5.5*	6.3x5.5*	6.3x5.5*	6.3x5.5*	6.3x6.3	6.3x8	8x10.5*		
100	101	5x5.5*	6.3x5.5*	6.3x5.5*	6.3x5.5* 8x6.5	6.3x8 8x6.5	6.3x8	8x10.5*	10x10.5*	
150	151	6.3x5.5*	6.3x5.5*	6.3x6.3*	6.3x8*	8x10.5	8x10.5* 10x8*			16x17
220	221	6.3x5.5*	6.3x6.3*	6.3x8* 8x6.5	6.3x8*	8x10.5 10x8	8x10.5	10x10.5	12.5x14	
330	331	6.3x6.3	6.3x8* 8x6.5	8x10.5*	8x10.5 10x8	8x10.5	10x10.5	12.5x14		
470	471	6.3x8*	8x10.5	8x10.5 10x8	8x10.5	10x10.5	12.5x14	16x17	16x17	
680	681		10x8*		10x10.5*		12.5x14			
1000	102	10x8	8x10.5*	10x10.5*		12.5x14		16x17		
1500	152		10x10.5*		12.5x14		16x17			
2200	222			12.5x14		16x17				
3300	332		12.5x14		16x17					
4700	472			16x17						
6800	682		16x17							

*Items available in optional 10% tolerance

LINK TO COMPLETE CASE
DIMENSIONS & LEAD STYLES

