High Voltage Class 1 Ceramic AC and DC Disc Capacitors, 10 kV_{DC} to 50 kV_{DC} / 7 kV_{AC} to 34 kV_{AC}, Screw Terminal Mounting

FEATURES

- Low dissipation factor of 0.2 % at 1 kHz
- N4700 (T3M) class 1, strontium-based ceramic dielectric
- Negligible piezoelectric / electrostrictive effect
- Low inductance
- High insulation resistance
- Epoxy coating
- Screw terminal mounting
- Ceramic singlelayer capacitor
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb e4 RoHS COMPLIANT

DESIGN SUPPORT TOOLS

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3D Models Available

APPLICATIONS

- High voltage power supplies
- CO_2 lasers
- X-ray equipment
- Welding equipment
- Industrial

QUICK REFERENCE DATA

DESCRIPTION	VALUE					
Ceramic Class	1					
Ceramic Dielectric	N4700					
Type	715C10KT###	715C15KT###	715C20KT###	715C30KT###	715C40KT###	715C50KT###
Voltage (V_{DC})	10 000	15 000	20 000	30 000	40 000	50 000
Min. Capacitance (pF)	560	370	200	190	100	100
Max. Capacitance (pF)	8000	5300	4000	2700	2000	1700
Mounting	Screw terminal					

DIELECTRIC STRENGTH

150 % of rated voltage, charging current limited to 50 mA

DISSIPATION FACTOR tan δ

$\leq 2 \times 10^{-3}$ (1 kHz)

INSULATION RESISTANCE

Min. 200 000 MΩ or 1000 ΩF min. at 25 °C

CORONA LIMIT

< 5 pC at 50 % of rated AC voltage

OPERATING TEMPERATURE RANGE

-30 °C to +85 °C

CAPACITANCE RANGE

100 pF to 8 nF

CAPACITANCE TOLERANCES

± 20 %

CERAMIC DIELECTRIC

N4700 (class 1)

RATED VOLTAGE (1)

- 10 kV_{DC} (7 kV_{RMS})
- 15 kV_{DC} (10 kV_{RMS})
- 20 kV_{DC} (14 kV_{RMS})
- 30 kV_{DC} (20 kV_{RMS})
- 40 kV_{DC} (27 kV_{RMS})
- 50 kV_{DC} (34 kV_{RMS})

Note

(1) All kV_{RMS} values up to 60 Hz

MATERIAL

Capacitor elements made from class 1 ceramic in a molded epoxy case. Screw terminals: brass, silver plated.

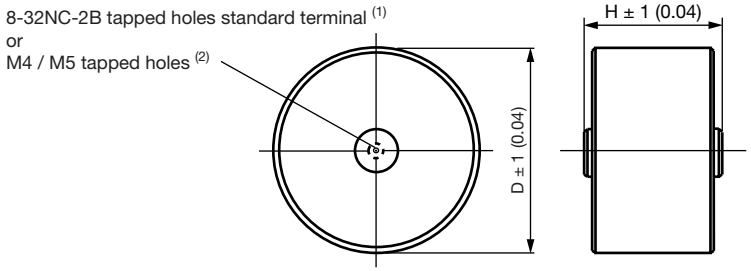
MARKING

Type designator, capacitance value, rated DC voltage, ceramic material code, production date code, Cera-Mite logo.

POWER DISSIPATION

Limit to 20 °C rise above ambient, measured on case.

DIMENSIONS in millimeters (inches)



Notes

(1) Use #8-32, 3/16" long screw to prevent bottoming

(2) To order metric terminals add “M4” or “M5” suffix to model number, use screw length of 4 mm or 5 mm respectively to prevent bottoming

ORDERING INFORMATION				
715C15KTD33	**15 kV_{DC}**	**3300 pF**	**± 20 %**	**N4700**
MODEL	RATED VOLTAGE	CAPACITANCE VALUE	TOLERANCE	CERAMIC

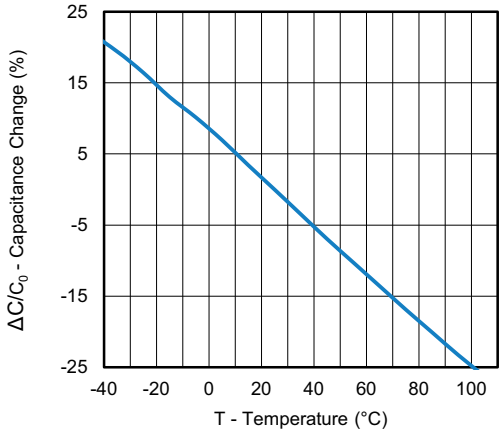
SAP PART NUMBER, ELECTRICAL, AND DIMENSIONAL DATA

MODEL	CERAMIC	CAPACITANCE VALUES (pF)	RATED VOLTAGE (kV_{DC})	RATED VOLTAGE (kV_{RMS})	D ± 1 mm (0.04")	H WITH #8-32 TERMINALS ± 1 mm (0.04")	H WITH M4 METRIC TERMINALS ± 1 mm (0.04")	H WITH M5 METRIC TERMINALS ± 1 mm (0.04")
715C10KT###								
715C10KTT56	N4700	560	10	7	21 (0.83)	18 (0.71)	16 (0.63)	n/a
715C10KTT68		680			21 (0.83)			
715C10KTT82		820			25 (0.98)			
715C10KTD10		1000			25 (0.98)			
715C10KTD12		1200			30 (1.18)			
715C10KTD18		1800			30 (1.18)			
715C10KTD22		2200			37 (1.46)			19 (0.75)
715C10KTD28		2800			37 (1.46)			
715C10KTD39		3900			44 (1.73)			
715C10KTD50		5000			52 (2.05)			
715C10KTD68		6800			56 (2.20)			
715C10KTD80		8000			60 (2.36)			
715C15KT###								
715C15KTT37	N4700	370	15	10	21 (0.83)	20 (0.79)	18 (0.71)	n/a
715C15KTT56		560			25 (0.98)			
715C15KTT75		750			30 (1.18)			
715C15KTD10		1000			32 (1.26)			
715C15KTD11		1100			32 (1.26)			
715C15KTD15		1500			37 (1.46)			
715C15KTD19		1900			37 (1.46)			22 (0.87)
715C15KTD27		2700			44 (1.73)			
715C15KTD33		3300			48 (1.89)			
715C15KTD34		3400			52 (2.05)			
715C15KTD47		4700			56 (2.20)			
715C15KTD53		5300			60 (2.36)			

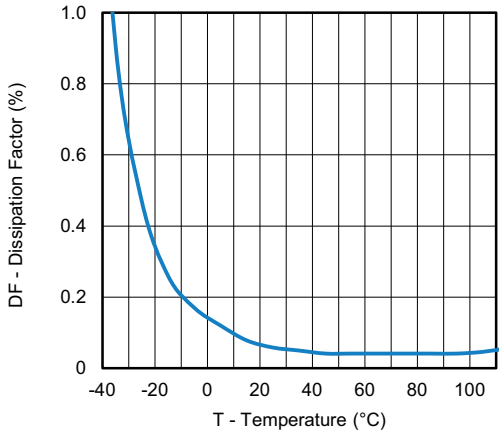
SAP PART NUMBER, ELECTRICAL, AND DIMENSIONAL DATA

MODEL	CERAMIC	CAPACITANCE VALUES (pF)	RATED VOLTAGE (kV_{DC})	RATED VOLTAGE (kV_{RMS})	D ± 1 mm (0.04")	H WITH #8-32 TERMINALS ± 1 mm (0.04")	H WITH M4 METRIC TERMINALS ± 1 mm (0.04")	H WITH M5 METRIC TERMINALS ± 1 mm (0.04")
715C20KT###								
715C20KTT20	N4700	200	20	14	21 (0.83)	23 (0.91)	21 (0.83)	n/a
715C20KTT28		280			21 (0.83)			
715C20KTT40		400			25 (0.98)			
715C20KTT56		560			25 (0.98)			
715C20KTT70		700			30 (1.18)			
715C20KTT88		880			30 (1.18)			
715C20KTD10		1000			32 (1.26)			24 (0.94)
715C20KTD14		1400			37 (1.46)			
715C20KTD17		1700			44 (1.73)			
715C20KTD22		2200			48 (1.89)			
715C20KTD25		2500			48 (1.89)			
715C20KTD33		3300			56 (2.20)			
715C20KTD40		4000			60 (2.36)			
715C30KT###								
715C30KTT19	N4700	190	30	20	21 (0.83)	27 (1.06)	25 (0.98)	n/a
715C30KTT20		200			21 (0.83)			
715C30KTT33		330			25 (0.98)			
715C30KTT40		400			32 (1.26)			29 (1.14)
715C30KTT59		590			32 (1.26)			
715C30KTT70		700			37 (1.46)			
715C30KTT94		940			37 (1.46)			
715C30KTD12		1200			44 (1.73)			
715C30KTD15		1500			48 (1.89)			
715C30KTD17		1700			48 (1.89)			
715C30KTD22		2200			56 (2.20)			
715C30KTD27		2700			60 (2.36)			
715C40KT###								
715C40KTT10	N4700	100	40	27	21 (0.83)	31 (1.22)	29 (1.14)	n/a
715C40KTT14		140			21 (0.83)			
715C40KTT20		200			25 (0.98)			
715C40KTT30		300			32 (1.26)			33 (1.30)
715C40KTT40		400			32 (1.26)			
715C40KTT44		440			32 (1.26)			
715C40KTT56		560			37 (1.46)			
715C40KTT70		700			37 (1.46)			
715C40KTT85		850			44 (1.73)			
715C40KTD10		1000			44 (1.73)			
715C40KTD13		1300			48 (1.89)		n/a	
715C40KTD15		1500			52 (2.05)			
715C40KTD20		2000			60 (2.36)			
715C50KT###								
715C50KTT10	N4700	100	50	34	21 (0.83)	34 (1.34)	32 (1.26)	n/a
715C50KTT15		150			21 (0.83)			
715C50KTT20		200			25 (0.98)			
715C50KTT33		330			30 (1.18)			
715C50KTT40		400			32 (1.26)			35 (1.38)
715C50KTT47		470			37 (1.46)			
715C50KTT56		560			37 (1.46)			
715C50KTT70		700			44 (1.73)		n/a	
715C50KTT85		850			44 (1.73)			
715C50KTD10		1000			48 (1.89)			
715C50KTD13		1300			52 (2.05)			
715C50KTD15		1500			56 (2.20)			
715C50KTD17		1700			60 (2.36)			

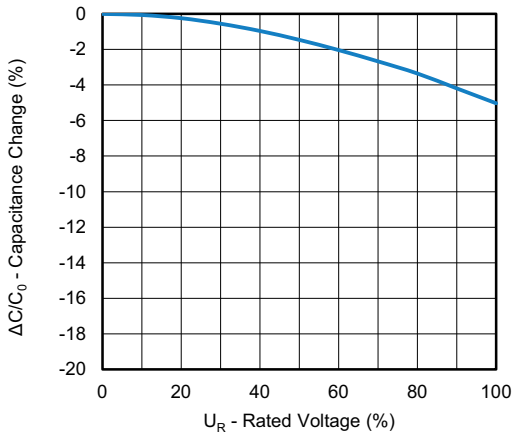
CAPACITANCE CHANGE VS. TEMPERATURE (typical)



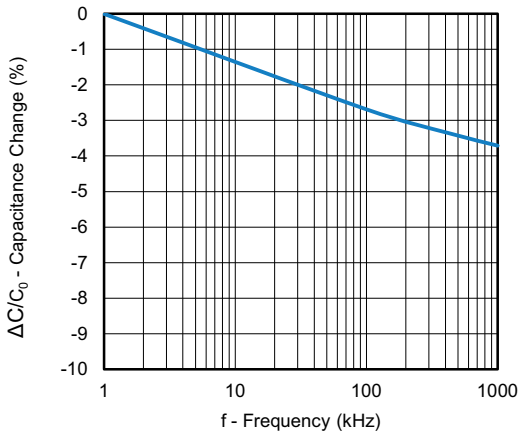
DISSIPATION FACTOR VS. TEMPERATURE (typical)



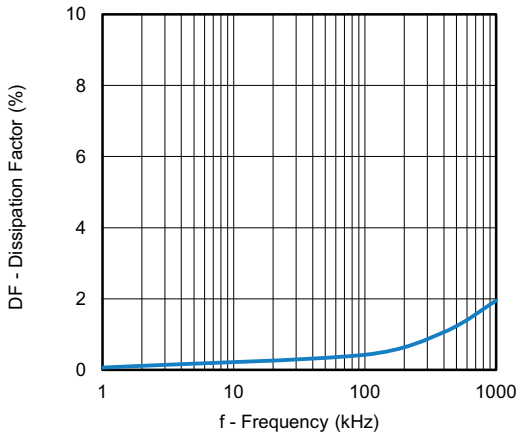
CAPACITANCE CHANGE VS. VOLTAGE (typical)



CAPACITANCE CHANGE VS. FREQUENCY (typical)



DISSIPATION FACTOR VS. FREQUENCY (typical)



TEST METHODS

NO.	ITEM	SPECIFICATION	SAMPLE SIZE	TEST METHOD
100 % TEST LOT BY LOT				
1	Appearance	No remarkable damage	100 %	Visual check
2	Capacitance	Within the specified tolerance	100 %	Measured at 22 °C ± 2 °C with max. 5 V_{RMS} at 1.0 kHz ± 0.1 kHz
3	Dissipation factor	0.2 % max.	100 %	Measured at 22 °C ± 2 °C with max. 5 V_{RMS} at 1.0 kHz ± 0.1 kHz
4	Insulation resistance	200 GΩ min.	100 %	Measured with DC 180 V within 60 s of charging
5	Dielectric strength between terminals	No failure	100 %	Tested with 150 % of rated DC-voltage for min. 3 s in insulating fluid or oil (charge / discharge current < 50 mA)
SAMPLE TEST LOT BY LOT				
6	Partial discharge	5 pC max.	10 pieces	Measured with 50 % of rated AC voltage
7	Temperature characteristics	ΔC = -4700 ppm/K ± 1000 ppm/K (temp. range: +20 °C to +85 °C)	2 pieces	Measured at 20 °C / 50 °C / 85 °C / 20 °C Capacitance change at 85 °C shall not exceed the specified limit
8	Strength of terminals	#8-32 and M4: > 1.5 Nm; M5: > 2 Nm	10 pieces	Tested with a torque meter
9	Life test	No failure	3 pieces	Tested with 125 % of rated DC voltage for 100 h +24 h / -0 h at 85 °C ± 2 °C in oil
TYPE TEST / ON DEMAND TEST				
10	Dielectric strength between terminals	No failure	100 %	Tested with 150 % of rated AC voltage for min. 30 s in insulating fluid or oil
11	Lightning pulse 1.2/50 µs	No failure	100 %	Tested with 150 % of rated DC voltage 5 x positive plus 1 x negative
12	Temperature cycle	No failure (no. 1 to 6 within spec. after test)	5 pieces per lot	10 cycles -30 °C / +85 °C Dwell 60 min., rise / fall 60 min.
13	Humidity	No failure (no. 1 to 5 within spec. after test)	5 pieces per lot	Tested with 0 applied voltage for 500 h +24 h / -0 h at 93 % ± 2 % RH and 40 °C ± 2 °C
DESTRUCTIVE TEST / RELEASE TEST				
14	AC breakdown	No failure < 200 % of rated AC voltage	10 pieces per lot	Raise AC voltage with 500 V/s ± 100 V/s until breakdown. Tested in insulating fluid or oil
15	DC breakdown	No failure < 200 % of rated DC voltage	10 pieces per lot	Raise DC voltage with 500 V/s ± 100 V/s until breakdown. Tested in insulating fluid or oil
16	Lightning pulse 1.2/50 µs	No failure < 200 % of rated DC voltage	10 pieces per lot	Start at 150 % of rated DC voltage 1 x positive plus 1 x negative Raise voltage by 5 kV per step
17	Life test	No failure	5 pieces per lot	Tested with 125 % of rated DC voltage for 250 h +24 h / -0 h at 85 °C ± 2 °C in oil

RELATED DOCUMENTS

General Information	www.vishay.com/doc?23140

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