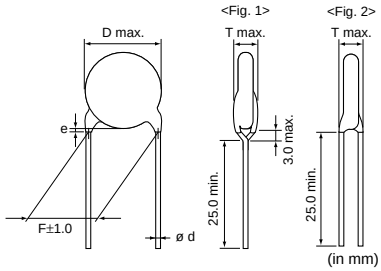
Safety Recognized / High Voltage Ceramic Capacitors

DEA Series (125 deg. C Guaranteed/Class 1/DC1k-3.15kV)

■ Features

1. Temperature compensating type ceramics realize low heat dissipation than DEH/DES series.
2. Operating temperature range is guaranteed up to 125 degree C.
3. Coated with flame-retardant epoxy resin (equivalent to UL94V-0 standard).
4. Taping available for automatic insertion.
5. Available product for RoHS Restriction (EU Directive 2002/95/EC).

[Bulk]
Vertical Crimp Long (Fig. 1)
Straight Long (Fig. 2)



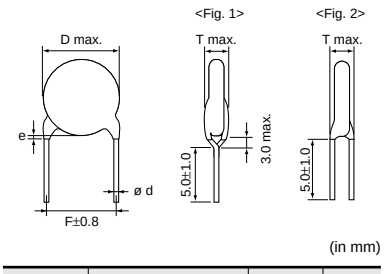
(in mm)

Lead Code	Coating Extension e	ø d	Style
A2, A3	Up to the end of crimp	0.6±0.05	Fig. 1
C1, CD	3.0 max.	0.5±0.05	Fig. 2
C3	3.0 max.	0.6±0.05	Fig. 2

■ Applications

1. Ideal for use as the ballast in back lighting inverters for liquid crystal display.
2. Ideal for use on high frequency pulse circuits such as a horizontal resonance circuit for CTV and snubber circuits for switching power supplies.

[Bulk]
Vertical Crimp Short (Fig. 1)
Straight Short (Fig. 2)



(in mm)

Lead Code	Coating Extension e	ø d	Style
B2, B3	Up to the end of crimp	0.6±0.05	Fig. 1
D1, DD	3.0 max.	0.5±0.05	Fig. 2
D3	3.0 max.	0.6±0.05	Fig. 2

■ Marking

Temp. Char. / Nominal Body Diameter	SL
ø4.5-5mm	68 1KV
ø6mm	39 3KV 66
ø7-9mm	181J 2KV 66
ø10-16mm	391J 3KV Ⓜ 66
Nominal Capacitance	Under 100pF : Actual value, 100pF and over : Marked with 3 figures
Capacitance Tolerance	Marked with code (omitted for nominal body diameter ø6mm and under)
Rated Voltage	Marked with code (In case of DC3.15kV, marked with 3KV)
Manufacturer's Identification	Marked with Ⓜ (omitted for nominal body diameter ø9mm and under)
Manufactured Date Code	Abbreviation (omitted for nominal body diameter ø5mm and under)

SL Characteristics

Part Number	DC Rated Voltage (Vdc)	Capacitance (pF)	Body Dia. D (mm)	Lead Spacing F (mm)	Body Thickness T (mm)	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEA1X3A100J□□□	1000	10 ±5%	4.5	5.0	4.0	C1B	D1B	P2A
DEA1X3A120J□□□	1000	12 ±5%	4.5	5.0	4.0	C1B	D1B	P2A
DEA1X3A150J□□□	1000	15 ±5%	4.5	5.0	4.0	C1B	D1B	P2A
DEA1X3A180J□□□	1000	18 ±5%	4.5	5.0	4.0	C1B	D1B	P2A
DEA1X3A220J□□□	1000	22 ±5%	4.5	5.0	4.0	C1B	D1B	P2A
DEA1X3A270J□□□	1000	27 ±5%	4.5	5.0	4.0	C1B	D1B	P2A
DEA1X3A330J□□□	1000	33 ±5%	4.5	5.0	4.0	C1B	D1B	P2A
DEA1X3A390J□□□	1000	39 ±5%	4.5	5.0	4.0	C1B	D1B	P2A
DEA1X3A470J□□□	1000	47 ±5%	4.5	5.0	4.0	C1B	D1B	P2A
DEA1X3A560J□□□	1000	56 ±5%	5	5.0	4.0	C1B	D1B	P2A
DEA1X3A680J□□□	1000	68 ±5%	5	5.0	4.0	C1B	D1B	P2A
DEA1X3A820J□□□	1000	82 ±5%	6	5.0	4.0	A2B	B2B	N2A
DEA1X3A101J□□□	1000	100 ±5%	6	5.0	4.0	A2B	B2B	N2A
DEA1X3A121J□□□	1000	120 ±5%	6	5.0	4.0	A2B	B2B	N2A
DEA1X3A151J□□□	1000	150 ±5%	7	5.0	4.0	A2B	B2B	N2A
DEA1X3A181J□□□	1000	180 ±5%	7	5.0	4.0	A2B	B2B	N2A
DEA1X3A221J□□□	1000	220 ±5%	8	5.0	4.0	A2B	B2B	N2A
DEA1X3A271J□□□	1000	270 ±5%	9	5.0	4.0	A2B	B2B	N2A
DEA1X3A331J□□□	1000	330 ±5%	10	5.0	4.0	A2B	B2B	N2A
DEA1X3A391J□□□	1000	390 ±5%	10	5.0	4.0	A2B	B2B	N2A
DEA1X3A471J□□□	1000	470 ±5%	11	5.0	4.0	A2B	B2B	N2A
DEA1X3A561J□□□	1000	560 ±5%	12	7.5	4.0	A3B	B3B	N3A
DEA1X3D100J□□□	2000	10 ±5%	4.5	5.0	5.0	C1B	D1B	P2A
DEA1X3D120J□□□	2000	12 ±5%	4.5	5.0	5.0	C1B	D1B	P2A
DEA1X3D150J□□□	2000	15 ±5%	4.5	5.0	5.0	C1B	D1B	P2A
DEA1X3D180J□□□	2000	18 ±5%	4.5	5.0	5.0	C1B	D1B	P2A
DEA1X3D220J□□□	2000	22 ±5%	4.5	5.0	5.0	C1B	D1B	P2A
DEA1X3D270J□□□	2000	27 ±5%	4.5	5.0	5.0	C1B	D1B	P2A
DEA1X3D330J□□□	2000	33 ±5%	4.5	5.0	5.0	C1B	D1B	P2A
DEA1X3D390J□□□	2000	39 ±5%	5	5.0	5.0	C1B	D1B	P2A
DEA1X3D470J□□□	2000	47 ±5%	6	5.0	5.0	A2B	B2B	N2A
DEA1X3D560J□□□	2000	56 ±5%	6	5.0	5.0	A2B	B2B	N2A
DEA1X3D680J□□□	2000	68 ±5%	6	5.0	5.0	A2B	B2B	N2A
DEA1X3D820J□□□	2000	82 ±5%	7	5.0	5.0	A2B	B2B	N2A
DEA1X3D101J□□□	2000	100 ±5%	7	5.0	5.0	A2B	B2B	N2A
DEA1X3D121J□□□	2000	120 ±5%	8	5.0	5.0	A2B	B2B	N2A
DEA1X3D151J□□□	2000	150 ±5%	8	5.0	5.0	A2B	B2B	N2A
DEA1X3D181J□□□	2000	180 ±5%	9	5.0	5.0	A2B	B2B	N2A
DEA1X3D221J□□□	2000	220 ±5%	10	5.0	5.0	A2B	B2B	N2A
DEA1X3D271J□□□	2000	270 ±5%	11	5.0	5.0	A2B	B2B	N2A
DEA1X3D331J□□□	2000	330 ±5%	12	7.5	5.0	A3B	B3B	N3A
DEA1X3D391J□□□	2000	390 ±5%	13	7.5	5.0	A3B	B3B	N3A
DEA1X3D471J□□□	2000	470 ±5%	14	7.5	5.0	A3B	B3B	N7A
DEA1X3D561J□□□	2000	560 ±5%	15	7.5	5.0	A3B	B3B	N7A
DEA1X3F100J□□□	3150	10 ±5%	5	7.5	6.0	CDB	DDB	P3A
DEA1X3F120J□□□	3150	12 ±5%	5	7.5	6.0	CDB	DDB	P3A
DEA1X3F150J□□□	3150	15 ±5%	5	7.5	6.0	CDB	DDB	P3A
DEA1X3F180J□□□	3150	18 ±5%	5	7.5	6.0	CDB	DDB	P3A
DEA1X3F220J□□□	3150	22 ±5%	5	7.5	6.0	CDB	DDB	P3A
DEA1X3F270J□□□	3150	27 ±5%	6	7.5	6.0	C3B	D3B	P3A
DEA1X3F330J□□□	3150	33 ±5%	6	7.5	6.0	C3B	D3B	P3A
DEA1X3F390J□□□	3150	39 ±5%	6	7.5	6.0	C3B	D3B	P3A
DEA1X3F470J□□□	3150	47 ±5%	7	7.5	6.0	C3B	D3B	P3A
DEA1X3F560J□□□	3150	56 ±5%	7	7.5	6.0	C3B	D3B	P3A

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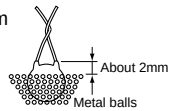
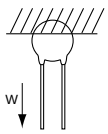
Part Number	DC Rated Voltage (Vdc)	Capacitance (pF)	Body Dia. D (mm)	Lead Spacing F (mm)	Body Thickness T (mm)	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEA1X3F680J□□□	3150	68 ±5%	8	7.5	6.0	A3B	B3B	N3A
DEA1X3F820J□□□	3150	82 ±5%	8	7.5	6.0	A3B	B3B	N3A
DEA1X3F101J□□□	3150	100 ±5%	9	7.5	6.0	A3B	B3B	N3A
DEA1X3F121J□□□	3150	120 ±5%	10	7.5	6.0	A3B	B3B	N3A
DEA1X3F151J□□□	3150	150 ±5%	11	7.5	6.0	A3B	B3B	N3A
DEA1X3F181J□□□	3150	180 ±5%	11	7.5	6.0	A3B	B3B	N3A
DEA1X3F221J□□□	3150	220 ±5%	12	7.5	6.0	A3B	B3B	N3A
DEA1X3F271J□□□	3150	270 ±5%	14	7.5	6.0	A3B	B3B	N7A
DEA1X3F331J□□□	3150	330 ±5%	15	7.5	6.0	A3B	B3B	N7A
DEA1X3F391J□□□	3150	390 ±5%	16	7.5	6.0	A3B	B3B	N7A

Three blank columns are filled with the lead and packaging codes. Please refer to the three columns on the right for the appropriate code.

DEA Series Specifications and Test Methods

No.	Item		Specifications	Testing Method
1	Operating Temperature Range		-25 to +125°C	
2	Appearance and Dimensions		No marked defect on appearance form and dimensions are within specified range.	The capacitor should be visually inspected for evidence of defect. Dimensions should be measured with slide calipers.
3	Marking		To be easily legible	The capacitor should be visually inspected.
4	Dielectric Strength	Between Lead Wires	No failure	The capacitor should not be damaged when DC voltage of 200% of the rated voltage is applied between the lead wires for 1 to 5 sec. (Charge/Discharge current≦50mA)
		Body Insulation	No failure	The capacitor is placed in the container with metal balls of diameter 1mm so that each lead wire, short circuited, is kept about 2mm off the metal balls as shown in the figure at right, and AC1250V(r.m.s.) <50/60Hz> is applied for 1 to 5 sec. between capacitor lead wires and metal balls. (Charge/Discharge current≦50mA) 
5	Insulation Resistance (I.R.)	Between Lead Wires	10000MΩ min.	The insulation resistance should be measured with DC500±50V within 60±5 sec. of charging.
6	Capacitance		Within specified tolerance	The capacitance should be measured at 20°C with 1±0.2MHz and AC5V(r.m.s.) max.
7	Q		400+20C*2min. (30pF under) 1000 min. (30pF min.)	The Q should be measured at 20°C with 1±0.2MHz and AC5V(r.m.s.) max.
8	Temperature Characteristics		+350 to -1000ppm/°C (Temp. range: +20 to +85°C)	The capacitance measurement should be made at each step specified in Table.

Step	1	2	3	4	5
Temp. (°C)	20±2	-25±3	20±2	85±2	20±2

9	Strength of Lead	Pull	Lead wire should not be cut off. Capacitor should not be broken.	As shown in the figure at right, fix the body of the capacitor and apply a tensile weight gradually to each lead wire in the radial direction of the capacitor up to 10N (5N for lead diameter 0.5mm), and keep it for 10±1 sec. 
		Bending		Each lead wire should be subjected to 5N (2.5N for lead diameter 0.5mm) of weight and bent 90° at the point of egress, in one direction, then returned to its original position and bent 90° in the opposite direction at the rate of one bend in 2 to 3 sec.
10	Vibration Resistance	Appearance	No marked defect	The capacitor should be firmly soldered to the supporting lead wire and vibrated at a frequency range of 10 to 55Hz, 1.5mm in total amplitude, with about a 1 minute rate of vibration change from 10Hz to 55Hz and back to 10Hz. Apply for a total of 6 hrs., 2 hrs. each in 3 mutually perpendicular directions.
		Capacitance	Within specified tolerance	
		Q	400+20C*2min. (30pF under) 1000 min. (30pF min.)	
11	Solderability of Leads		Lead wire should be soldered with uniform coating on the axial direction over 3/4 of the circumferential direction.	The lead wire of a capacitor should be dipped into a ethanol solution of 25wt% rosin and then into molten solder for 2±0.5 sec. In both cases the depth of dipping is up to about 1.5 to 2mm from the root of lead wires. Temp. of solder: Lead Free Solder (Sn-3Ag-0.5Cu) 245±5°C H63 Eutectic Solder 235±5°C
12	Soldering Effect (Non-Preheat)	Appearance	No marked defect	The lead wire should be immersed into the melted solder of 350±10°C (Body of ø5mm and under: 270±5°C) up to about 1.5 to 2mm from the main body for 3.5±0.5 sec. (Body of ø5mm and under: 5±0.5 sec.) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at *1room condition.
		Capacitance Change	Within ±2.5%	
		Dielectric Strength (Between Lead Wires)	Per item 4.	

*1 "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

*2 "C" expresses nominal capacitance value (pF)

Continued on the following page.

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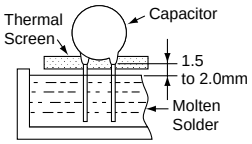
DEA Series Specifications and Test Methods

Continued from the preceding page.

No.	Item		Specifications	Testing Method
13	Soldering Effect (On-Preheat)	Appearance	No marked defect	First the capacitor should be stored at 120+0/-5°C for 60+0/-5 sec. Then, as in figure, the lead wires should be immersed solder of 260+0/-5°C up to 1.5 to 2.0mm from the root of terminal for 7.5+0/-1 sec. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at *1room condition. 
		Capacitance Change	Within ±2.5%	
		Dielectric Strength (Between Lead Wires)	Per item 4.	
14	Temperature Cycle	Appearance	No marked defect	The capacitor should be subjected to 5 temperature cycles. <Temperature cycle> (Step 1: -25±3, 30 / Step 2: Room Temp., 3 / Step 3: 125±3, 30 / Step 4: Room Temp., 3) Cycle time: 5 cycle Post-treatment: Capacitor should be stored for 1 to 2 hrs. at *1room condition.
		Capacitance Change	Within ±5%	
		Q	275+5/2C*2min. (30pF under) 350 min. (30pF min.)	
		I.R.	1000MΩ min.	
		Dielectric Strength (Between Lead Wires)	Per item 4.	
15	Humidity (Under Steady State)	Appearance	No marked defect	Set the capacitor for 500 +24/-0 hrs. at 40±2°C in 90 to 95% relative humidity. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at *1room condition.
		Capacitance Change	Within ±5%	
		Q	275+5/2C*2min. (30pF under) 350 min. (30pF min.)	
		I.R.	1000MΩ min.	
16	Humidity Loading	Appearance	No marked defect	Apply the rated voltage for 500 +24/-0 hrs. at 40±2°C in 90 to 95% relative humidity. (Charge/Discharge current≦50mA) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at *1room condition.
		Capacitance Change	Within ±5%	
		Q	275+5/2C*2min. (30pF under) 350 min. (30pF min.)	
		I.R.	1000MΩ min.	
17	Life	Appearance	No marked defect	Apply a DC voltage of 150% of the rated voltage for 1000 +48/-0 hrs. at 125±2°C with a relative humidity of 50% max. (Charge/Discharge current≦50mA) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at *1room condition.
		Capacitance Change	Within ±3%	
		Q	275+5/2C*2min. (30pF under) 350 min. (30pF min.)	
		I.R.	2000MΩ min.	

*1 "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

*2 "C" expresses nominal capacitance value (pF)

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