Safety Standard Certified Ceramic Capacitors/ High Voltage Ceramic Capacitors





Innovator in Electronics

Murata Manufacturing Co., Ltd.

EU RoHS Compliant

- · All the products in this catalog comply with EU RoHS.
- EU RoHS is "the European Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment."
- · For more details, please refer to our website 'Murata's Approach for EU RoHS' (http://www.murata.com/info/rohs.html).



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Part Numbering

Safety Standard Certified Ceramic Capacitors

(Part Number) DE 2 E3 KY 102 M N3 A F

Product ID

Product ID	
DE	Safety Standard Certified Ceramic Capacitors/ High Voltage Ceramic Capacitors

2 Series Category

Code	Outline	Contents
1	Safety Standard	Class X1, Y1
2	Certified	Class X1, Y2
J	250Vac (r.m.s.)	-Products based on the Electrical Appliance and Material Safety Law of Japan-

For Electrical Appliance and Material Safety Law of Japan, the first three digits (①Product ID and ②Series Category) express "Series Name."

For Safety Certified Capacitors, the first three digits express product code. The fourth figure expresses certified type shown in **4** Safety Standard Certified Type column.

3Temperature Characteristics

Code	Temperature Characteristics	Cap. Change or Temp. Coeff.	Temperature Range
В3	В	±10%	
E3	Е	+20%,-55%	-25 to +85℃
F3	F	+30%,-80%	
1X	SL	+350 to −1000ppm/°C	+20 to +85℃

4 Rated Voltage/Safety Standard Certified Type

Code	Rated Voltage
E2	250Vac (r.m.s.)
КН	X1, Y2; 250Vac (r.m.s.) (Safety Standard Certified Type KH)
КҮ	X1, Y2; 250Vac (r.m.s.), 300Vac (r.m.s.) (Safety Standard Certified Type KY)
кх	X1, Y1; 250Vac (r.m.s.), 300Vac (r.m.s.) (Safety Standard Certified Type KX)

5Capacitance

Expressed by three figures. The unit is pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros that follow the two numbers.

6Capacitance Tolerance

Code	Capacitance Tolerance
J	±5%
K	±10%
M	±20%
Z	+80%, -20%

Lead Style

	Lead	Dimensions (mm)		
Code	Style	Lead Spacing	Lead Diameter	Pitch of Components
A2		5		
А3	Vertical	7.5	ø0.6±0.05	
A 4	Crimp Long	10		_
A 5		10	ø0.6+0.1,-0.05	
B2		5		
В3	Vertical Crimp Short	7.5	ø0.6±0.05	
B4		10		_
B5		10	ø0.6+0.1, −0.05	
СЗ	Straight Long	7.5	ø0.6±0.05	_
D3	Straight Short	7.5	ø0.6±0.05	_
N2		5		12.7
N3	Vertical	7.5	ø0.6±0.05	15
N4	Crimp Taping	10		25.4
N5		10	ø0.6+0.1, −0.05	25.4
N7		7.5	ø0.6±0.05	30
P3	Straight Taping	7.5	ø0.6±0.05	15

Packaging

Code	Packaging
Α	Ammo Pack Taping
В	Bulk

9Individual Specification Code

For part number that cannot be identified without "Individual Specification," it is added at the end of part number, expressed by three-digit alphanumerics.

Malogen-free Compatible Product



High Voltage Ceramic Capacitors (500V-6.3kV)

Product ID

Product ID	
DE	High Voltage Ceramic Capacitors (500V-6.3kV) / Safety Standard Certified Ceramic Capacitors

Series Category

Code	Outline	Contents
Α		Class 1 (Char. SL) DC1-3.15kV Rated
В		Class 2 DC1-3.15kV Rated
С		Class 1, 2 DC6.3kV Rated
н	High Voltage	High Temperature Guaranteed, Low-dissipation Factor (Char. R, C)
s		High Temperature Guaranteed, Low-dissipation Factor (Char. D)
F		LCD Backlight Inverter Circuit

The first three digits (Product ID and Series Category) express "Series Name."

3Temperature Characteristics

Code	Temperature Characteristics	Cap. Change or Temp. Coeff.	Temperature Range	
В3	В	±10%		
E3	Е	+20%, -55%	–25 to +85°C	
F3	F	+30%, -80%		
C3	С	±20% -2	–25 to +85°C	
	C	+15%, -30%	+85 to +125°C	
R3	R	±15%	–25 to +85°C	
		+15%, -30%	+85 to +125°C	
D3	D	+20%, -30%	-25 to +125°C	
1X	SL	+350 to -1000ppm/°C	+20 to +85°C	
2C	СН	0±60ppm/°C	+20 to +85°C	

4 Rated Voltage

Code	Rated Voltage
2H	500Vdc
3A	1kVdc
3D	2kVdc
3F	3.15kVdc
3J	6.3kVdc
LH	6.3kVp-p

6 Capacitance

Expressed by three figures. The unit is pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros that follow the two numbers.

6Capacitance Tolerance

Code	Capacitance Tolerance	
С	±0.25pF	
D	±0.5pF	
J	±5%	
K	±10%	
Z	+80%, -20%	

Lead Style

	Lead		Dimensions (mm)		
Code	Style	Lead Spacing	Lead Diameter	Pitch of Components	
A2	Vertical	5			
A3	Crimp	7.5	ø0.6±0.05	_	
A 4	Long	10			
B2/J2	Vertical	5			
B3/J3	Crimp	7.5	ø0.6±0.05	_	
B4	Short	10			
C1	Straight Long	5	ø0.5±0.05		
C3		7.5	ø0.6±0.05	_	
C4		10			
CD		7.5	ø0.5±0.05		
D1	0	5	ø0.5±0.05		
D3	Straight Short	7.5	ø0.6±0.05	_	
DD	Onlore	7.5	ø0.5±0.05		
N2	Vertical	5		12.7	
N3	Crimp Taping	7.5	ø0.6±0.05	15	
N7		7.5		30	
P2	Straight	5	ø0.6±0.05	12.7	
P3	Taping	7.5	ØU.0±0.03	15	

8 Packaging

Code	Packaging
Α	Ammo Pack Taping
В	Bulk

Individual Specification Code

For part number that cannot be identified without "Individual Specification," it is added at the end of part number, expressed by three-digit alphanumerics.



Safety Standard Certified Ceramic Capacitors for Automotive

Product ID

Product ID	
DE	Safety Standard Certified Ceramic Capacitors/ High Voltage Ceramic Capacitors

Series Category

Code	Outline	Contents
6	Safety Standard Certified	Class X1, Y2

The first three digits express product code. The fourth figure expresses certified type shown in **4** Safety Standard Certified Type column.

3Temperature Characteristics

Code	Temperature Characteristics	Cap. Change or Temp. Coeff.	Temperature Range
В3	В	±10%	-25 to +85°C
E3	Е	+20%,-55%	-25 to +65 C

Pated Voltage/Safety Standard Certified Type

Code	Rated Voltage	
KJ	X1, Y2; 300Vac (r.m.s.),	
	(Safety Standard Certified Type KJ)	

6 Capacitance

Expressed by three figures. The unit is pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros that follow the two numbers.

6Capacitance Tolerance

Code	Capacitance Tolerance	
K	±10%	
М	±20%	

Lead Style

		Lead	Dimensions (mm)			
	Code	Style	Lead Spacing	Lead Diameter	Pitch of Components	
•	А3	Vertical Crimp Long	7.5	ø0.6±0.05	_	
	В3	Vertical Crimp Short			_	
	N3	Vertical Crimp Taping			15	

8 Packaging

Code	Packaging	
Α	Ammo Pack Taping	
В	Bulk	

Individual Specification Code

For part number that cannot be identified without "Individual Specification," it is added at the end of part number, expressed by three-digit alphanumerics.



Safety Standard Certified Ceramic Capacitors



Type KY (Basic Insulation) -Class X1, Y2- (Recommend)

■ Features

- 1. Compact size; diameter 25% less than Type KH.
- 2. Operating temperature range guaranteed up to 125 degrees C.
- 3. Dielectric strength:

AC2000V (for lead spacing F=5mm) AC2600V (for lead spacing F=7.5mm)

- 4. Class X1/Y2 capacitors certified by UL/CSA/VDE/BSI/SEMKO/DEMKO/FIMKO/NEMKO/ESTI/NSW/CQC.
- Coated with flame-retardant epoxy resin (conforming to UL94V-0 standard).
 We recommend a halogen-free product* as our standard item.
 - * Cl=900ppm max., Br=900ppm max. and Cl+Br=1500ppm max.
- 6. Taping available for automatic insertion.
- 7. AC300V Rated Voltage item are newly added.

■ Applications

- Ideal for use as X/Y capacitors for AC line filters and primary-secondary coupling on switching power supplies and AC adapters.
- 2. Ideal for use on D-A isolation and noise absorption for DAA modems without transformers.

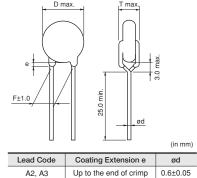
Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids. Only Murata products clearly stipulated as "for Automotive use" on its catalog can be used for automobile applications such as power train and safety equipment.

■ Standard Certification

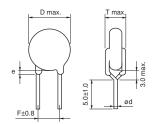
	Standard No.	Certified No.	Rated Voltage
UL	UL60384-14	E37921	
CSA	CSA E60384-14	1283280	
VDE	IEC 60384-14	40006273	
VDE	EN 60384-14	40006273	
	EN 60065 (8.8, 14.2)		
BSI	IEC 60384-14	KM 37901	
	EN 60384-14		250Vac (r.m.s.)
SEMKO		1207848	
DEMKO	IEC 60384-14	D01002	250 vac (1.111.5.)
FIMKO	EN 60384-14	24197	
NEMKO	EN 00304-14	P12215094	
ESTI		12.0102	
NSW	IEC 60384-14 AS3250	6824	
CQC	GB/T14472	CQC06001017446 CQC06001017447	

- The certification number might change due to revision of the application standard and changes in the range of acquisition.
 Please contact us when the certification of South Korean Safety Standard
- Please contact us when the certification of South Korean Safety Standard is necessary.









(in mm)

[Bulk] Vertical Crimp Short (B2, B3)

Lead Code	Coating Extension e	ød
B2, B3	Up to the end of crimp	0.6±0.05

	Standard No.	Certified No.	Rated Voltage
UL	UL60384-14	E37921	
CSA	CSA E60384-14	1283280	
VDE	IEC 60384-14	40006273	
VDE	EN 60384-14	40000273	
	EN 60065 (8.8, 14.2)		
BSI	IEC 60384-14	KM 37901	
	EN 60384-14		
SEMKO		1207848	200\/aa /r m a \
DEMKO	IEC 60384-14	D01002	300Vac (r.m.s.)
FIMKO	EN 60384-14	24197	
NEMKO	EN 00304-14	P12215094	
ESTI		12.0102	
NSW	IEC 60384-14 AS3250	6824	
CQC	IEC 60384-14	CQC12001079706	
CQC	IEC 00304-14	CQC12001079940	

The certification number might change due to revision of the application standard and changes in the range of acquisition.



■ Marking

Example	Item	
	① Type Designation	KY
	② Nominal Capacitance	
	(Under 100pF: Actual v	alue,
2 - 472M 3	100pF and over: 3 digit	system)
	3 Capacitance Toleranc	е
① / KY250~	4 Company Name Code)
X1Y2 HF	€8: Made in Taiwan €15	: Made in Thailand
$5 \rightarrow 0D (M8 \neq 4)$	5 Manufactured Date Co	ode
	Class Code	X1Y2
	Rated Voltage Mark	250~, 300~
	Halogen Free Mark	IF

Rated Voltage 250Vac

■ Lead Spacing F=7.5mm

Part Number	AC Rated Voltage	Temp. Char.	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DE21XKY100J□□□M02F	250Vac(r.m.s.)	SL	10pF±5%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE21XKY150J□□□M02F	250Vac(r.m.s.)	SL	15pF±5%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE21XKY220J□□□M02F	250Vac(r.m.s.)	SL	22pF±5%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE21XKY330J□□□M02F	250Vac(r.m.s.)	SL	33pF±5%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE21XKY470J□□□M02F	250Vac(r.m.s.)	SL	47pF±5%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE21XKY680J□□□M02F	250Vac(r.m.s.)	SL	68pF±5%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2B3KY101K□□□M02F	250Vac(r.m.s.)	В	100pF±10%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2B3KY151K□□□M02F	250Vac(r.m.s.)	В	150pF±10%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2B3KY221K□□□M02F	250Vac(r.m.s.)	В	220pF±10%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2B3KY331K□□□M02F	250Vac(r.m.s.)	В	330pF±10%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2B3KY471K□□□M02F	250Vac(r.m.s.)	В	470pF±10%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2B3KY681K□□□M02F	250Vac(r.m.s.)	В	680pF±10%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2E3KY102M M02F	250Vac(r.m.s.)	Е	1000pF±20%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2E3KY152M M02F	250Vac(r.m.s.)	E	1500pF±20%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2E3KY222M□□□M02F	250Vac(r.m.s.)	Е	2200pF±20%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2E3KY332M DM02F	250Vac(r.m.s.)	Е	3300pF±20%	9.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2E3KY472M□□□M02F	250Vac(r.m.s.)	Е	4700pF±20%	10.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2F3KY103M□□□M02F	250Vac(r.m.s.)	F	10000pF±20%	14.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A

Three blank columns are filled with the lead and packaging codes. Please refer to the 3 columns on the right for the appropriate code. Individual specification code "M02" expresses "simplicity marking and guarantee of dielectric strength between lead wires: AC2600V."

Murata part numbers might be changed depending on lead code or any other changes. Therefore, please specify only the type name (KY) and capacitance of products in the parts list when it is required for applying safety standard of electric equipment.

Lead Spacing F=5mm

Part Number	AC Rated Voltage	Temp. Char.	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DE21XKY100J	250Vac(r.m.s.)	SL	10pF±5%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE21XKY150J	250Vac(r.m.s.)	SL	15pF±5%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE21XKY220J□□□M01F	250Vac(r.m.s.)	SL	22pF±5%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE21XKY330J□□□M01F	250Vac(r.m.s.)	SL	33pF±5%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE21XKY470J□□□M01F	250Vac(r.m.s.)	SL	47pF±5%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE21XKY680J□□□M01F	250Vac(r.m.s.)	SL	68pF±5%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE2B3KY101K□□□M01F	250Vac(r.m.s.)	В	100pF±10%	7.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE2B3KY151K□□□M01F	250Vac(r.m.s.)	В	150pF±10%	7.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE2B3KY221K□□□M01F	250Vac(r.m.s.)	В	220pF±10%	7.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE2B3KY331K□□□M01F	250Vac(r.m.s.)	В	330pF±10%	7.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE2B3KY471K□□□M01F	250Vac(r.m.s.)	В	470pF±10%	7.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE2B3KY681K□□□M01F	250Vac(r.m.s.)	В	680pF±10%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE2E3KY102M DM01F	250Vac(r.m.s.)	Е	1000pF±20%	7.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A

Continued from the preceding page.

Part Number	AC Rated Voltage	Temp. Char.	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DE2E3KY152M DM01F	250Vac(r.m.s.)	Е	1500pF±20%	7.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE2E3KY222M DM01F	250Vac(r.m.s.)	E	2200pF±20%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE2E3KY332M□□□M01F	250Vac(r.m.s.)	Е	3300pF±20%	9.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DE2E3KY472M□□□M01F	250Vac(r.m.s.)	Е	4700pF±20%	10.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A

Three blank columns are filled with the lead and packaging codes. Please refer to the 3 columns on the right for the appropriate code.

Individual specification code "M01" expresses "simplicity marking and guarantee of dielectric strength between lead wires: AC2000V."

Murata part numbers might be changed depending on lead code or any other changes. Therefore, please specify only the type name (KY) and capacitance of products in the parts list when it is required for applying safety standard of electric equipment.

Rated Voltage 300Vac

■ Lead Spacing F=7.5mm

Part Number	AC Rated Voltage	Temp. Char.	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DE2B3KY101K□□□U02F	300Vac(r.m.s.)	В	100pF±10%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2B3KY151K□□□U02F	300Vac(r.m.s.)	В	150pF±10%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2B3KY221K□□□U02F	300Vac(r.m.s.)	В	220pF±10%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2B3KY331K□□□U02F	300Vac(r.m.s.)	В	330pF±10%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2B3KY471K□□□U02F	300Vac(r.m.s.)	В	470pF±10%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2B3KY681K□□□U02F	300Vac(r.m.s.)	В	680pF±10%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2E3KY102M□□U02F	300Vac(r.m.s.)	E	1000pF±20%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2E3KY152M□□□U02F	300Vac(r.m.s.)	E	1500pF±20%	7.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2E3KY222M□□□U02F	300Vac(r.m.s.)	E	2200pF±20%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2E3KY332M□□□U02F	300Vac(r.m.s.)	E	3300pF±20%	9.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2E3KY472M□□□U02F	300Vac(r.m.s.)	E	4700pF±20%	10.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DE2F3KY103M□□□U02F	300Vac(r.m.s.)	F	10000pF±20%	14.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A

Three blank columns are filled with the lead and packaging codes. Please refer to the 3 columns on the right for the appropriate code. Individual specification code "U02" expresses "simplicity marking and guarantee of dielectric strength between lead wires: AC2600V."

Murata part numbers might be changed depending on lead code or any other changes. Therefore, please specify only the type name (KY) and capacitance of products in the parts list when it is required for applying safety standard of electric equipment.



Safety Standard Certified Ceramic Capacitors



Type KH (Basic Insulation) -Class X1, Y2-

Features

- 1. Operating temperature range guaranteed up to 125 degrees C.
- 2. Dielectric strength: AC2600V
- 3. Class X1/Y2 capacitors certified by UL/CSA/VDE/BSI/SEMKO/DEMKO/FIMKO/NEMKO/
- 4. Coated with flame-retardant epoxy resin (conforming to UL94V-0 standard).
 - Please contact us when a halogen-free product* is necessary.
 - * Cl=900ppm max., Br=900ppm max. and CI+Br=1500ppm max.
- 5. Taping available for automatic insertion.

Applications

Ideal for use as X/Y capacitors for AC line filters and primary-secondary coupling on switching power supplies and AC adapters.

Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids. Only Murata products clearly stipulated as "for Automotive use" on its catalog can be used for automobile applications such as power train and safety equipment.

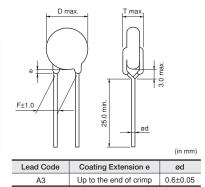
■ Standard Certification

	Standard No.	Certified No.	Rated Voltage
UL	UL60384-14	E37921	
CSA	CSA E60384-14	1343805	
VDE	IEC 60384-14	40002796	
VDE	EN 60384-14	40002796	
	EN 60065 (8.8, 14.2)		
BSI	IEC 60384-14	KM 37901	
	EN 60384-14		250\/aa (r m a)
SEMKO		1200285	250Vac (r.m.s.)
DEMKO	IEC 60384-14	D01006	
FIMKO	EN 60384-14	24195	
NEMKO	EN 00304-14	P12215095	
ESTI		12.0104	
NSW	IEC 60384-14	6529	
NOW	AS3250	0020	

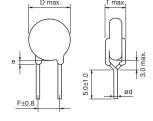
- The certification number might change due to revision of the application standard and changes in the range of acquisition.
- · Please contact us when the certification of Chinese Safety Standard or South Korean Safety Standard is necessary.



Vertical Crimp Long (A3)







(in mm)

[Bulk] Vertical Crimp Short (B3)

Lead Code	Coating Extension e	ød
В3	Up to the end of crimp	0.6±0.05

■ Marking

Example	Item	
	1 Type Designation	KH
	② Nominal Capacitance (Marked with 3 figures)	
	③ Capacitance Tolerance	
2	4 Company Name Code ©8: Made in Taiwan @15: Made	in Thailand
① KH472M 3	5 Manufactured Date Code	
X1Y2 🙊 \	UL Approval Mark	<i>9</i> 7
/ BSI 📛 \	CSA Approval Mark	®
(F) (M8-)4	VDE Approval Mark	<u>M</u>
$\sqrt{9}$ \mathbb{S} \mathbb{N} 65 \neq \mathbb{S}	BSI Approval Mark	BSI
250~ (D)	SEMKO Approval Mark	(S)
	DEMKO Approval Mark	(D)
	FIMKO Approval Mark	FI
	NEMKO Approval Mark	N
	ESTI Approval Mark	MJ502
	Class Code	X1Y2
	Rated Voltage Mark	250~



Part Number	AC Rated Voltage	Temp. Char.	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DE2B3KH101K	250Vac(r.m.s.)	В	100pF±10%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE2B3KH151K	250Vac(r.m.s.)	В	150pF±10%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE2B3KH221K	250Vac(r.m.s.)	В	220pF±10%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE2B3KH331K□□□	250Vac(r.m.s.)	В	330pF±10%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE2B3KH471K□□□	250Vac(r.m.s.)	В	470pF±10%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE2B3KH681K□□□	250Vac(r.m.s.)	В	680pF±10%	9.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE2E3KH102M□□□	250Vac(r.m.s.)	E	1000pF±20%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE2E3KH152M□□□	250Vac(r.m.s.)	Е	1500pF±20%	9.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE2E3KH222M□□□	250Vac(r.m.s.)	Е	2200pF±20%	10.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE2E3KH332M□□□	250Vac(r.m.s.)	Е	3300pF±20%	12.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE2E3KH472M□□□	250Vac(r.m.s.)	E	4700pF±20%	13.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE2F3KH103M□□□	250Vac(r.m.s.)	F	10000pF±20%	16.0mm max.	7.5	7.0mm max.	A3B	B3B	N7A

Three blank columns are filled with the lead and packaging codes. Please refer to the 3 columns on the right for the appropriate code.

Murata part numbers might be changed depending on lead code or any other changes. Therefore, please specify only the type name (KH) and capacitance of products in the parts list when it is required for applying safety standard of electric equipment.



Safety Standard Certified Ceramic Capacitors



Type KX New Small Size (Reinforced Insulation) -Class X1, Y1- (Recommend)

Features

- We design capacitors much more compact in size than current Type KX, having reduced the diameter by 20% max.
- 2. Operating temperature range guaranteed up to 125 degrees C.
- 3. Dielectric strength: AC4000V
- 4. Class X1/Y1 capacitors certified by UL/CSA/VDE/BSI/SEMKO/DEMKO/FIMKO/NEMKO/ ESTI/IMQ/CQC.
- Can be use with a component in appliances requiring reinforced insulation and double insulation based on UL1492, IEC60065 and IEC60950.
- 6. Coated with flame-retardant epoxy resin (conforming to UL94V-0 standard).
 - We recommend a halogen-free product* as our standard item.
 - * Cl=900ppm max., Br=900ppm max. and Cl+Br=1500ppm max.
- 7. Taping available for automatic insertion.
- 8. AC300V Rated Voltage item are newly added.

Applications

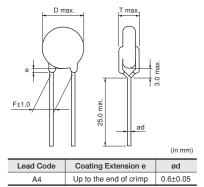
- Ideal for use as X/Y capacitors for AC line filters and primary-secondary coupling on switching power supplies and AC adapters.
- Ideal for use on D-A isolation and noise absorption for DAA modems without transformers.

Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids. Only Murata products clearly stipulated as "for Automotive use" on its catalog can be used for automobile applications such as power train and safety equipment.

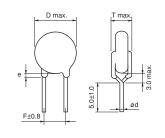
*: Small sized Type KX differs from current Type KX in electrical characteristics, such as the voltage dependency, capacitance temperature dependency, and Dielectric strength.

Therefore, before replacing current Type KX, please make a performance check by equipment. Please also refer to Notice (Rating) item 2, "Performance Check by Equipment," below.









(in mm)

Lead Code	Lead Code Coating Extension e		
B4	Up to the end of crimp	0.6±0.05	



■ Standard Certification Rated Voltage (AC250V) B, E Char.

	Standard No.	Certified No.
UL	UL60384-14	E37921
CSA	CSA E60384-14	1343810
VDE	IEC 60384-14	40002831
VDE	EN 60384-14	40002631
	EN 60065 (8.8, 14.2)	
BSI	IEC 60384-14	KM 37901
	EN 60384-14	
SEMKO		1200074
DEMKO	 IEC 60384-14	D01004
FIMKO	EN 60384-14	24191
NEMKO	EN 60364-14	P12215096
ESTI		12.0094
IMQ	EN 60384-14	V4069
000	GB/T14472	CQC02001001556
CQC	GB/114472	CQC04001011643

- The certification number might change due to revision of the application standard and changes in the range of acquisition.
- Please contact us when the certification of South Korean Safety Standard is necessary.

■ Marking Rated Voltage (AC250V) B, E Char.

Example	Item			
	① Type Designation KX			
	② Nominal Capacitance (3 digit system	n)		
2 / 472M \ 3	③ Capacitance Tolerance			
① 	4 Company Name Code			
X1Y1 H	€8: Made in Taiwan €15: Made in Thaila	and		
$5 \rightarrow 0D \text{ M8} \neq 4$	⑤ Manufactured Date Code			
	Class Code X1Y1			
	Rated Voltage Mark 250~			
	Halogen Free Mark HF			

■ Standard Certification Rated Voltage (AC300V) B, E Char.

	Standard No.	Certified No.
UL	UL60384-14	E37921
CSA	CSA E60384-14	1343810
VDE	IEC 60384-14 EN 60384-14	40002831
BSI	EN 60065 (8.8, 14.2) IEC 60384-14 EN 60384-14	KM 37901
SEMKO		1200074
DEMKO	IEC 60384-14	D01004
FIMKO		24191
NEMKO	EN 60384-14	P12215096
ESTI		12.0094
IMQ	EN 60384-14	V4069
CQC	IEC 60384-14	CQC12001079735 CQC12001079941

• The certification number might change due to revision of the application standard and changes in the range of acquisition.

■ Marking Rated Voltage (AC300V) B, E Char.

Example	Item			
	① Type Designation	KX		
	② Nominal Capacitance	(3 digit system)		
② ✓ 472M \ 3	③ Capacitance Tolerance			
⊕ ← KX300~ \	4 Company Name Code	9		
X1Y1 HF	€8: Made in Taiwan €15	: Made in Thailand		
$5 \rightarrow 0D \text{ M8} \neq 4$	5 Manufactured Date Co	ode		
	Class Code	X1Y1		
	Rated Voltage Mark	300~		
	Halogen Free Mark	HF		

Rated Voltage 250Vac

Part Number	AC Rated Voltage	Temp. Char.	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DE1B3KX101K□□□N01F	250Vac(r.m.s.)	В	100pF±10%	7.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1B3KX151K□□□N01F	250Vac(r.m.s.)	В	150pF±10%	7.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1B3KX221K□□□N01F	250Vac(r.m.s.)	В	220pF±10%	8.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1B3KX331K□□□N01F	250Vac(r.m.s.)	В	330pF±10%	7.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1B3KX471K□□□N01F	250Vac(r.m.s.)	В	470pF±10%	7.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1B3KX681K□□□N01F	250Vac(r.m.s.)	В	680pF±10%	8.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1E3KX102M□□□N01F	250Vac(r.m.s.)	Е	1000pF±20%	7.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1E3KX152M□□□N01F	250Vac(r.m.s.)	Е	1500pF±20%	8.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1E3KX222M□□□N01F	250Vac(r.m.s.)	Е	2200pF±20%	9.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1E3KX332M□□□N01F	250Vac(r.m.s.)	Е	3300pF±20%	10.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1E3KX472M□□□N01F	250Vac(r.m.s.)	Е	4700pF±20%	12.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A

Three blank columns are filled with the lead and packaging codes. Please refer to the 3 columns on the right for the appropriate code.

Murata part numbers might be changed depending on lead code or any other changes. Therefore, please specify only the type name (KX) and capacitance of products in the parts list when it is required for applying safety standard of electric equipment.

Please contact us when less than 100pF capacitance product is necessary.



Rated Voltage 300Vac

Part Number	AC Rated Voltage	Temp. Char.	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DE1B3KX101K□□□P01F	300Vac(r.m.s.)	В	100pF±10%	7.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1B3KX151K□□□P01F	300Vac(r.m.s.)	В	150pF±10%	7.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1B3KX221K□□□P01F	300Vac(r.m.s.)	В	220pF±10%	8.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1B3KX331K□□□P01F	300Vac(r.m.s.)	В	330pF±10%	7.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1B3KX471K□□□P01F	300Vac(r.m.s.)	В	470pF±10%	7.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1B3KX681K□□□P01F	300Vac(r.m.s.)	В	680pF±10%	8.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1E3KX102M□□□P01F	300Vac(r.m.s.)	Е	1000pF±20%	7.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1E3KX152M□□□P01F	300Vac(r.m.s.)	E	1500pF±20%	8.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1E3KX222M□□□P01F	300Vac(r.m.s.)	Е	2200pF±20%	9.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1E3KX332M□□□P01F	300Vac(r.m.s.)	Е	3300pF±20%	10.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A
DE1E3KX472M□□□P01F	300Vac(r.m.s.)	Е	4700pF±20%	12.0mm max.	10.0	7.0mm max.	A4B	B4B	N4A

Three blank columns are filled with the lead and packaging codes. Please refer to the 3 columns on the right for the appropriate code.

Murata part numbers might be changed depending on lead code or any other changes. Therefore, please specify only the type name (KX) and capacitance of products in the parts list when it is required for applying safety standard of electric equipment.

Safety Standard Certified Ceramic Capacitors



Type KX (Reinforced Insulation) -Class X1, Y1-

Features

- Operating temperature range guaranteed up to 125 degrees C.
- 2. Dielectric strength: AC4000V
- Class X1/Y1 capacitors certified by UL/CSA/VDE/BSI/SEMKO/DEMKO/FIMKO/NEMKO/ ESTI/IMQ.
- Can be use with a component in appliances requiring reinforced insulation and double insulation based on UL1492, IEC60065 and IEC60950.
- 5. Coated with flame-retardant epoxy resin (conforming to UL94V-0 standard).
 - Please contact us when a halogen-free product* is necessary.
 - * Cl=900ppm max., Br=900ppm max. and Cl+Br=1500ppm max.
- 6. Taping available for automatic insertion.

Applications

Ideal for use as X/Y capacitors for AC line filters and primary-secondary coupling on switching power supplies and AC adapters.

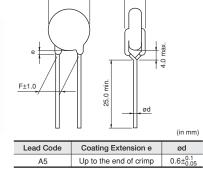
Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids. Only Murata products clearly stipulated as "for Automotive use" on its catalog can be used for automobile applications such as power train and safety equipment.

■ Standard Certification

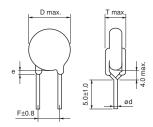
	Standard No.	Certified No.	Rated Voltage
UL	UL60384-14	E37921	
CSA	CSA E60384-14	1343810	
VDE	IEC 60384-14	40002831	
VDE	EN 60384-14	40002631	
	EN 60065 (8.8, 14.2)		250Vac (r.m.s.)
BSI	IEC 60384-14	KM 37901	
	EN 60384-14		
SEMKO		1200074	
DEMKO	IEC 60394 14	D01004	
FIMKO	IEC 60384-14	24191	
NEMKO	EN 60384-14	P12215096	
ESTI		12.0094	
IMQ	EN 60384-14	V4069	

- The certification number might change due to revision of the application standard and changes in the range of acquisition.
- Please contact us when the certification of Chinese Safety Standard or South Korean Safety Standard is necessary.









(in mm)

[Bulk] Vertical Crimp Short (B5)

Lead Code	Coating Extension e	ød
B5	Up to the end of crimp	0.6±0.1 0.05

■ Marking

Example	Item				
Example	1 Type Designation	KX			
	② Nominal Capacitance (Under 100pF: Actual value, 100pF and over:	Marked with 3 figures)			
	③ Capacitance Tolerance				
2	4 Company Name Code ©8: Made in Taiwan @15: Ma	ade in Thailand			
	Manufactured Date Code				
① KX222M 3	UL Approval Mark	<i>9</i> 7			
/ BSI 🖺 \	CSA Approval Mark	®			
	VDE Approval Mark	<u> </u>			
$\sqrt{\frac{\text{MJ502}}{\text{Cl}}}$ $\sqrt{\text{N}}$ $\sqrt{\text{M8}} + 4$	BSI Approval Mark	BSI			
250~ D 65 - 5	SEMKO Approval Mark	<u>S</u>			
	DEMKO Approval Mark	(D)			
	FIMKO Approval Mark	FI			
	NEMKO Approval Mark	N			
	ESTI Approval Mark	MJ502			
	IMQ Approval Mark	(h)			
	Class Code	X1Y1			
	Rated Voltage Mark	250~			

Part Number	AC Rated Voltage	Temp. Char.	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DE1B3KX101K□□□	250Vac(r.m.s.)	В	100pF±10%	9.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A
DE1B3KX151K□□□	250Vac(r.m.s.)	В	150pF±10%	9.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A
DE1B3KX221K□□□	250Vac(r.m.s.)	В	220pF±10%	9.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A
DE1B3KX331K□□□	250Vac(r.m.s.)	В	330pF±10%	9.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A
DE1B3KX471K□□□	250Vac(r.m.s.)	В	470pF±10%	9.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A
DE1B3KX681K□□□	250Vac(r.m.s.)	В	680pF±10%	10.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A
DE1E3KX102M□□□A01	250Vac(r.m.s.)	Е	1000pF±20%	8.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A
DE1E3KX152M□□□A01	250Vac(r.m.s.)	E	1500pF±20%	9.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A
DE1E3KX222M□□□A01	250Vac(r.m.s.)	E	2200pF±20%	10.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A
DE1E3KX332M□□□A01	250Vac(r.m.s.)	E	3300pF±20%	12.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A
DE1E3KX392M□□□A01	250Vac(r.m.s.)	Е	3900pF±20%	13.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A
DE1E3KX472M□□□A01	250Vac(r.m.s.)	E	4700pF±20%	15.0mm max.	10.0	8.0mm max.	A5B	B5B	N5A

Three blank columns are filled with the lead and packaging codes. Please refer to the 3 columns on the right for the appropriate code.

Murata part numbers might be changed depending on lead code or any other changes. Therefore, please specify only the type name (KX) and capacitance of products in the parts list when it is required for applying safety standard of electric equipment.



Operating Temperature Range: -40 to +125°C (Except for UL/VDE, -25 to +125°C)

No.	Ite	em		Specifications	Test Method		
1	Appearance and Dimensions		No visible defect, and dimensions are within specified range.		The capacitor should be visually inspected for evidence of defect. Dimensions should be measured with slide calipers.		
2	Marking		To be easily le	gible	The capacitor should be visually inspected.		
3	Capacitance		Within specifie	d tolerance			
4	Dissipation Fac	ctor (D.F.)	Char. B, E F SL	Specifications D.F.≤2.5% D.F.≤5.0% Q≥400+20C*¹(C<30pF)	The capacitance, dissipation factor and Q should be measure at 20°C with 1±0.1kHz (char. SL: 1±0.1MHz) and AC5V(r.m.s. max.		
5	Insulation Resi	stance (I.R.)	10000MΩ min.		The insulation resistance should be measured with DC500 \pm 50V within 60 \pm 5 sec. of charging. The voltage should be applied to the capacitor through a resistor of 1M Ω .		
		Between Lead Wires	No failure		The capacitor should not be damaged when the test voltages from Table 1 are applied between the lead wires for 60 sec. <table 1=""> Type Test Voltage KY For lead spacing F=5mm AC2000V(r.m.s.) For lead spacing F=7.5mm AC2600V(r.m.s.) KH AC2600V(r.m.s.) KX AC4000V(r.m.s.)</table>		
6		Body Insulation	No failure		First, the terminals of the capacitor should be connected together. Then, as shown in the figure at right, a metal foil should be closely wrapped around the body of the capacitor to the distance of about 3 to 6mm from each terminal. Then, the capacitor should be inserted into a container filled with metal balls of about 1mm diameter. Finally, AC voltage from Table 2 is applied for 60 sec. between the capacitor lead wires and metal balls. Type Test Voltage KY AC2600V(r.m.s.)		
			Char	Capacitance Change	KH AC2600V(r.m.s.) KX AC4000V(r.m.s.)		
7	Temperature C	Characteristics	Char.	Capacitance Change	specified in Table 3. <table 3=""></table> Step Temperature (°C) 1 20±2 2 -25±2 3 20±2 4 85±2 5 20±2		
8	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 molten solder for 2±0.5 sec. The depth of immersion is up to about 1.5 to 2.0mm 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		

 $^{^{\}star 1}$ "C" expresses nominal capacitance value (pF).



Continued from the preceding page.

Vo.	Ite	m	Specifications	Test Method			
		Appearance	No marked defect	As shown in the figure, the lead			
		Capacitance Change	Within ±10%	wires should be immersed in solder of 350±10°C or 260±5°C up to 1.5 to 2.0mm from the root of			
	Soldering	I.R.	1000MΩ min.	terminal for 3.5±0.5 sec. (10±1			
9	Effect (Non-Preheat)	Dielectric Strength	Per Item 6	sec. for 260±5°C). Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed a room condition*2 for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*4			
		Appearance	No marked defect	First the capacitor should be			
		Capacitance Change	Within ±10%	stored at 120+0/-5°C for 60+0/-5 sec. Then, as in the figure, the lead			
	0.14.2	I.R.	1000MΩ min.	wires should be immersed in			
10	Soldering Effect (On-Preheat)	Dielectric Strength	Per Item 6	solder of 260+0/-5°C up to 1.5 to 2.0mm from the root of terminal for 7.5+0/-1 sec. Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*2 for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*2			
		Appearance	No marked defect				
		Capacitance	Within the specified tolerance	The capacitor should be firmly soldered to the supporting lead wire and vibrated at a frequency range of 10 to 55Hz, 1.5mm in			
11	Vibration Resistance	D.F. Q	Char. Specifications B, E D.F. ≤2.5% F D.F. ≤5.0% SL Q≥400+20C*¹(C<30pF)	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.			
		Appearance	No marked defect				
		Capacitance Change	Char. Capacitance Change B Within ±10% E, F Within ±15% SL Within ± 5%				
12	Humidity (Under Steady State)	D.F. Q	Char. Specifications B, E D.F.≤5.0% F D.F.≤7.5% SL Q≥275+5/2C*¹(C<30pF)	Set the capacitor for 500±12 hrs. at 40±2°C in 90 to 95% relative humidity. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*2			
		I.R.	3000MΩ min.				
		Dielectric Strength	Per Item 6				
		Appearance	No marked defect				
		Capacitance Change	Char. Capacitance Change B Within ±10% E, F Within ±15% SL Within ± 5%				
13	Humidity Loading	D.F. Q	Char. Specifications B, E D.F.≤5.0% F D.F.≤7.5% SL Q≥275+5/2C*¹(C<30pF)	Apply the rated voltage for 500±12 hrs. at 40±2°C in 90 to 95% relative humidity. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*4			
		I.R.	3000M $Ω$ min.				
		Dielectric Strength	Per Item 6				

^{*1 &}quot;C" expresses nominal capacitance value (pF).





^{*2 &}quot;Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

Continued from the preceding page.

No.	. Ite	em	Specifications	Test Method
	Canacitance		No marked defect	Impulse Voltage
			Within ±20%	Each individual capacitor should be subjected to a 5kV (Type KX: 8kV) impulses for three times. Then the capacitors are applied to life test.
		I.R.	3000M $Ω$ min.	100 (%)
14	Life	Dielectric Strength	Per Item 6	Front time (T1) =1.2µs=1.67T Time to half-value (T2) =50µs 30 1 Apply a voltage from Table 4 for 1000 hrs. at 125+2/-0°C, and relative humidity of 50% max.
				<table 4=""></table>
				Applied Voltage
				170% of Rated Voltage except that once each hour the voltage is increased to AC1000V(r.m.s.) for 0.1 sec.
				Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*2
15	Robustness of Terminations	Tensile	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 and keep it for 10±1 sec.
		Bending	not be broken.	Each lead wire should be subjected to 5N 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.
				The capacitor should be individually wrapped in at least one but not more than two complete layers of cheesecloth. The capacitor should be subjected to 20 discharges. The interval between successive discharges should be 5 sec. The UAC should be maintained for 2 min. after the last discharge.
16	Active Flamma	bility	The cheesecloth should not be on fire.	C1,2 : 1μF±10% C3 : 0.033μF±5% 10kV L1 to 4 : 1.5mH±20% 16A Rod core choke Ct : 3μF±5% 10kV R : 100Ω±2% Cx : Capacitor under test UAC : UR±5% F : Fuse, Rated 10A UR : Rated Voltage Ut : Voltage applied to Ct

^{*2 &}quot;Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa





Continued from the preceding page.

No.	Ite	em		Specifications			Test M	ethod	
17	Passive Flamm	nability	_	ne should not exceed 30 sec. er should not ignite.	Gas Cutside Dia. 0.9mm r : Butane gas Purity 95° Test Specimen Tissue About 10mm Thick Board		mm min. . 0.5±0.1mm ia. 0.9mm max. Is Purity 95% min.		
		Appearance	No marked def	The capacitor should be subjected to 5 temperature cycles,					
		Capacitance Change	Char. B E, F SL	Capacitance Change Within ±10% Within ±20% Within ± 5%		Step 1	cutively to 2 immersion <temperature< p=""> -40+0/-3</temperature<>	ure Cycle> e (°C)	Time (min)
						2	Room tem		3
			Char.	Specifications	-	3 4	125+3/-0 Room tem		30
18	Temperature and	D.F. Q	B, E F SL	D.F.≤5.0% D.F.≤7.5% Q≥275+5/2C*¹(C<30pF) Q≥350 (C≥30pF)			<immersio< td=""><td>n Cycle></td><td>Cycle time: 5 cycles</td></immersio<>	n Cycle>	Cycle time: 5 cycles
	Immersion Cycle	I.R.	3000M $Ω$ min.			Step	Temperature (°C)	Time (min)	Immersion Water
						1	65+5/-0	15	Clean water
						2	0±3	15	Salt water
		Dielectric Strength	Per Item 6		ro Po	oom con st-treatm	should be stored at 8 dition*2 for 24±2 hrs.		,



^{*1 &}quot;C" expresses nominal capacitance value (pF).
*2 "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

AC250V Ceramic Capacitor Non Safety Certified Type



DEJ Series Based on the Electrical Appliance and Material Safety Law of Japan

■ Features

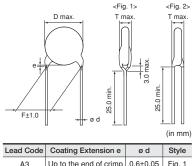
- 1. This type is based on the electrical appliance and material safety law of Japan (separated table 4).
- 2. Coated with flame-retardant epoxy resin (conforming to UL94V-0 standard).
 - Please contact us when a halogen-free product* is necessary.
 - * Cl=900ppm max., Br=900ppm max. and CI+Br=1500ppm max.
- 3. Taping available for automatic insertion.

Applications

Ideal for use on AC line filters and primary-secondary coupling for switching power supplies and AC adapters.

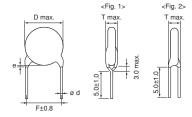
Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids. Only Murata products clearly stipulated as "for Automotive use" on its catalog can be used for automobile applications such as power train and safety equipment.





Lead Code	Coating Extension e	ø d	Style
А3	Up to the end of crimp	0.6±0.05	Fig. 1
C3	3.0 max.	0.6±0.05	Fig. 2





[Bulk] Vertical Crimp Short (B3) Straight Short (D3)

Lead Code	Coating Extension e	ø d	Style
В3	Up to the end of crimp	0.6±0.05	Fig. 1
D3	3.0 max.	0.6±0.05	Fig. 2

(in mm)

■ Marking

	Temp. Char.	E, F
Nominal Body Diameter	ø7-8mm	102Z 250~ 16
Nomina Body D	ø9-11mm	332Z 250~ © 16
Non	ninal Capacitance	Marked with 3 figures
Capa	acitance Tolerance	Marked with code
	Rated Voltage	Marked with code
Manufacturer's Identification		Marked with €¹ (omitted for nominal body diameter ø8mm and under)
Manu	factured Date Code	Abbreviation

Part Number	AC Rated Voltage	Temp. Char.	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping (1)	Lead Package Taping (2)
DEJE3E2102Z□□□	250Vac(r.m.s.)	E	1000pF+80/-20%	7.0mm max.	7.5	4.0mm max.	C3B	D3B	N2A	P3A
DEJE3E222Z□□□	250Vac(r.m.s.)	Е	2200pF+80/-20%	8.0mm max.	7.5	4.0mm max.	A3B	B3B	N2A	N3A
DEJE3E2332Z□□□	250Vac(r.m.s.)	Е	3300pF+80/-20%	9.0mm max.	7.5	4.0mm max.	A3B	B3B	N2A	N3A
DEJE3E2472Z□□□	250Vac(r.m.s.)	Е	4700pF+80/-20%	11.0mm max.	7.5	4.0mm max.	A3B	B3B	N2A	N3A
DEJF3E2472Z□□□	250Vac(r.m.s.)	F	4700pF+80/-20%	8.0mm max.	7.5	4.0mm max.	A3B	B3B	N2A	N3A
DEJF3E2103Z□□□	250Vac(r.m.s.)	F	10000pF+80/-20%	11.0mm max.	7.5	4.0mm max.	A3B	B3B	N2A	N3A

Three blank columns are filled with the lead and packaging codes. Please refer to the 3 columns on the right for the appropriate code. Taping (1): Lead spacing F=5.0mm, Taping (2): Lead spacing F=7.5mm.



DEJ Series Specifications and Test Methods

Operating Temperature Range: -25 to +85°C

No.	Ite	em		Specifications	Test Method	
1	Appearance an	d Dimensions	No visible defe	ect, and dimensions are within e.	The capacitor should be visually inspected for evidence of defect. Dimensions should be measured with slide calipers.	
2	Marking		To be easily le	gible	The capacitor should be visually inspected.	
3	Capacitance		Within specifie	d tolerance	The capacitance should be measured at 20°C with 1±0.1kHz and AC5V(r.m.s.) max.	
4	Dissipation Fac (D.F.)	ctor	Char. E F	Specifications D.F.≦2.5% D.F.≦5.0%	The dissipation factor should be measured at 20°C with 1±0.1kHz and AC5V(r.m.s.) max.	
5	Insulation Resi	stance (I.R.)	10000M Ω min.		The insulation resistance should be measured with DC500±50V within 60±5 sec. of charging.	
		Between Lead Wires	No failure		The capacitor should not be damaged when AC1500V(r.m.s.) are applied between the lead wires for 60 sec.	
6	Dielectric Strength	Body Insulation	No failure		First, the terminals of the capacitor should be connected together. Then, as shown in the figure at right, the capacitor should be immersed into 10% salt solution up to a position of about 3 to 4mm apart from the terminals. Finally, AC1500V(r.m.s.) is applied for 60 sec. between the capacitor lead wires and electrode plate.	
7	Temperature C	haracteristics	Char. E F	Capacitance Change Within ±25% Within ±30%	The capacitance measurement should be made at each step specified in Table 1. Capacitance Table 1. Capacitance Table 1. Step	
		Appearance	No marked def	fect	As in Figure 1, discharge is made 50 times at 5 sec. intervals	
		I.R.	1000M Ω min.		from the capacitor (Cd) charged at DC voltage of specified.	
8	Discharge Test	Dielectric Strength	Per Item 6		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
9	Solderability of	Leads		uld be soldered with uniform coating rection over 3/4 of the circumferential	The lead wire of a capacitor should be dipped into molten solder for 2±0.5 sec. The depth of immersion is up to about 1.5 to 2.0mm 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	





DEJ Series Specifications and Test Methods

Continued from the preceding page.

No.	Ite	em	Specifications	Test Method		
		Appearance	No marked defect	As shown in the figure, the lead Thermal Capacitor		
	Soldering	I.R.	1000M Ω min.	wires should be immersed in solder of 350±10°C up to 1.5 to 2.0mm from the root of terminal for 3.5±0.5 sec. Molten Solder		
10	Effect (Non-Preheat)	Dielectric Strength	Per Item 6	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 4 to 24 hrs. at room condition.*¹		
		Appearance	No marked defect	First the capacitor should be Thermal Capacitor		
		I.R.	1000MΩ min.	stored at 120+0/-5°C for Screen 60+0/-5 sec. Then as in the figure, the lead		
11	Soldering Effect (On-Preheat)	Dielectric Strength	Per Item 6	Then, as in the figure, the lead wires should be immersed in solder of 260+0/-5°C up to 1.5 to 2.0mm from the root of terminal for 7.5+0/-1 sec. Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 4 to 24 hrs. at room condition.*¹		
		Appearance	No marked defect	The capacitor should be firmly soldered to the supporting lead		
	Vibration Resistance	Capacitance	Within the specified tolerance	wire and vibrated at a frequency range of 10 to 55Hz, 1.5mm in		
12		D.F.	Char. Specifications E D.F.≤2.5% F D.F.≤5.0%	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.		
13	Solvent Resistance	Appearance	No marked defect	The capacitor should be immersed into a isopropyl alcohol for 30±5 sec.		
		Appearance	No marked defect			
	Humidity	Capacitance Change	Char. Capacitance Change E Within ±20% F Within ±30%	Set the capacitor for 500±12 hrs. at 40±2°C in 90 to 95% relative humidity.		
14	(Under Steady State)	D.F.	Char. Specifications E D.F. ≤5.0% F D.F. ≤7.5%	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹		
		I.R.	1000MΩ min.			
		Dielectric Strength	Per Item 6			
		Appearance	No marked defect			
		Capacitance Change	Char. Capacitance Change E Within ±20% F Within ±30%	The capacitor should be subjected to 40±2°C, relative humidity of 90 to 98% for 8 hrs., and then removed in room temperature for 16 hrs. until 5 cycles are completed.		
15	Humidity Insulation	D.F.	Char.SpecificationsED.F.≦5.0%FD.F.≦7.5%	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. Post-treatment:		
		I.R.	1000MΩ min.	Capacitor should be stored for 1 to 2 hrs. at room condition.*1		
		Dielectric Strength	Per Item 6			

 $^{^{\}star 1}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa





DEJ Series Specifications and Test Methods

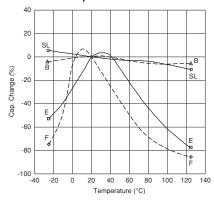
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No.	Ite	em		Specifications		Test M	lethod		
		Appearance	No marked de	fect					
		Capacitance Change	Char. E F	Capacitance Change Within ±20% Within ±30%	Apply the rated voltage for 500±12 hrs. at 40±2°C in 90 relative humidity.			10±2°C in 90 to 95%	
16	Humidity Loading	D.F.	Char. E F	Specifications D.F.≤5.0% D.F.≤7.5%	room cor Post-treatn	r should be stored at a adition*1 for 24±2 hrs. nent:	before initia	al measurements.	
		I.R.	1000MΩ min.		Capacitor should be stored for 1 to 2 hrs. at roo		at room condition.		
		Dielectric Strength	Per Item 6						
		Appearance	No marked de	fect		Itage from Table 2 for	1500 hrs.	at 85±2°C, relative	
		Capacitance Change	Char. E F	Capacitance Change Within ±20% Within ±30%		<tab Applied V(r.m.s.), except that</tab 	Voltage once each		
17	Life	I.R.	1000M Ω min.			eased to AC1000V(r.m	n.s.) for 0.1	sec.	
		Dielectric Strength	Per Item 6		room cor Post-treatr	r should be stored at addition*1 for 24±2 hrs.	before initia	al measurements.	
			The capacitor	flame discontinued as follows.	to applied	itor should be subject flame for 15 sec. and or 15 sec. until 3 cycle	then	Capacitor	
18	Flame Test	ame Test		Time (sec.)	are comple	are completed.			
			1 to 2	15 max. 60 max.					
				- Coman	G	ias Burner: Inside Dia. 9.5	, å	(in mm)	
19	Robustness of Terminations	Tensile	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, apply a tensile weight gradually to each lead wire in the radial direction of the capacitor up to 10N and keep it for 10±1 sec. Each lead wire should be subjected to 5N of weight and bent				
		Bending			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.				
		Appearance	No marked de	fect		itor should be subject		perature cycles,	
		0	Char.	Capacitance Change	tnen conse	cutively to 2 immersion	,		
		Capacitance Change	E	Within ±20%	-	<temperat< td=""><td></td><td></td></temperat<>			
			F	Within ±30%	Step 1	Temperatur -25+0/-3	_ , _ ,	Time (min)	
			Char.	Specifications	2	Room ten		3	
		D.F.	E	D.F.≦5.0%	3 4	85+3/-0 Room ten		30	
			F	D.F.≦7.5%				Cycle time: 5 cycles	
	Temperature and	I.R.	1000M Ω min.			<immersio< td=""><td>on Cycle></td><td></td></immersio<>	on Cycle>		
20	Immersion Cycle				Step	Temperature (°C)	Time (min)	Immersion Water	
					1	65+5/-0	15	Clean water	
		B			2	0±3	15	Salt	
		Dielectric Strength	Per Item 6				1	water Cycle time: 2 cycles	
					room cor Post-treatn	r should be stored at and ition*1 for 24±2 hrs.		1 hr., then placed at	

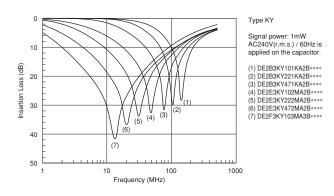
 $^{^{\}star 1}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

Safety Certified Ceramic Capacitors Characteristics Data (Typical Example)

■ Capacitance - Temperature Characteristics



■ Insertion Loss - Frequency Characteristics

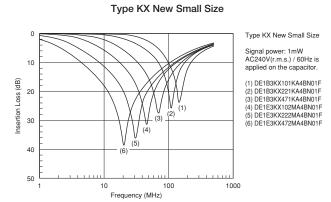


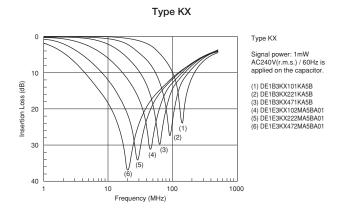
Type KH

Type KH

Signal power: 1mW AC240V(r.m.s.) / 60Hz is applied on the capacitor.

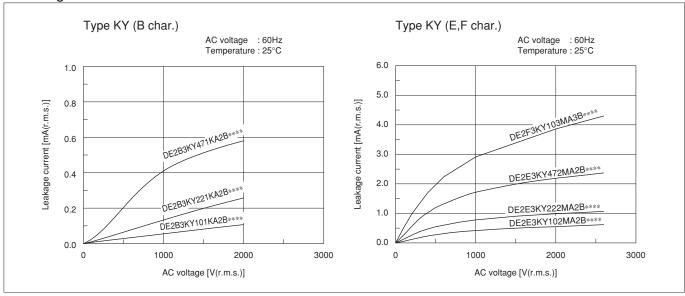
(1) DE2B3KH101KA3B (2) DE2B3KH221KA3B (3) DE2B3KH21KA3B (4) DE2E3KH102MA3B (5) DE2E3KH222MA3B (6) DE2E3KH22MA3B (7) DE2F3KH3MA3B (7) DE2F3KH103MA3B

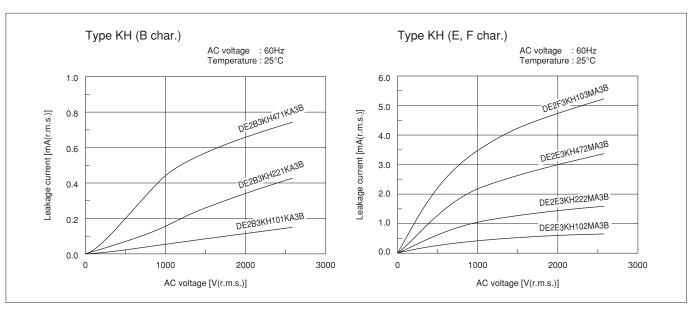


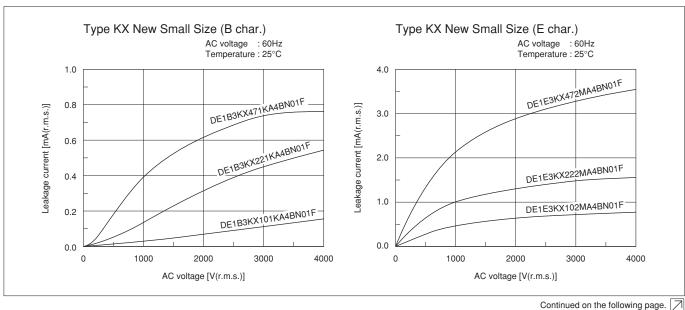


Safety Certified Ceramic Capacitors Characteristics Data (Typical Example)

■ Leakage Current Characteristics



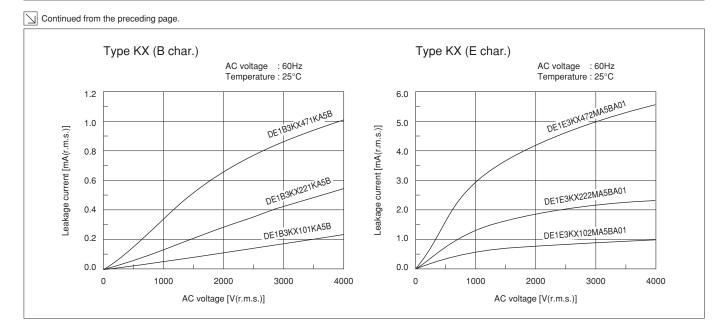








Safety Certified Ceramic Capacitors Characteristics Data (Typical Example)

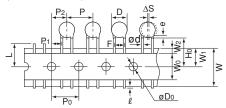




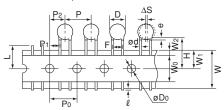
Safety Certified Ceramic Capacitors Packaging

■ Taping Specifications

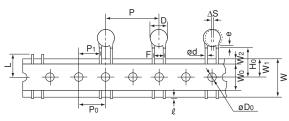
• 12.7mm pitch / lead spacing 5mm taping Vertical crimp type (Lead Code: N2)



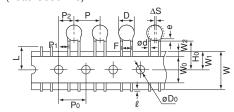
15mm pitch / lead spacing 7.5mm taping Straight type (Lead Code: P3)



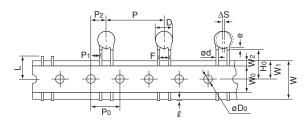
25.4mm pitch / lead spacing 10.0mm taping Vertical crimp type (Lead Code: N4, N5)

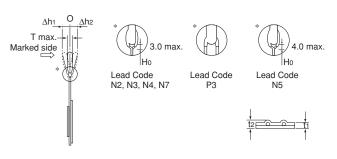


• 15mm pitch / lead spacing 7.5mm taping Vertical crimp type (Lead Code: N3)



30mm pitch / lead spacing 7.5mm taping Vertical crimp type (Lead Code: N7)





Item	Code	N2	N3	P3	N7	N4	N5
Pitch of component	Р	12.7±1.0	12.7±1.0 15.0±2.0 30.0±2.0 25.4±2.0				
Pitch of sprocket hole	P ₀	12.7±0.3	7±0.3 15.0±0.3 12.7±0.3				±0.3
Lead spacing	F	5.0 ^{+0.8} _{-0.2}		7.5±1.0		10.0	±1.0
Length from hole center to component center	P ₂	6.35±1.3		7.5±1.5		_	_
Length from hole center to lead	P1	3.85±0.7		3.75±1.0		7.7±	:1.5
Body diameter	D		See th	e individual pı	oduct specific	cations.	
Deviation along tape, left or right	ΔS	0±1.0			0±2.0		
Carrier tape width	W			18.0	±0.5		
Position of sprocket hole	W ₁		9.0±0.5				
Lead distance between reference	Ho	$18.0^{+2.0}_{-0}$ — $18.0^{+2.0}_{-0}$					
and bottom planes	Н	— 20.0 ^{+1.5} —					
Protrusion length	ℓ	+0.5 to -1.0					
Diameter of sprocket hole	øD0			4.0:	±0.1		
Lead diameter	ød			0.6±0.05			$0.6^{+0.1}_{-0.05}$
Total tape thickness	t1			0.6:	±0.3		
Total thickness, tape and lead wire	t2			1.5	max.		
Body thickness	Т		See th	e individual pı	oduct specific	cations.	
Portion to cut in case of defect	L			11.0	+0 -1.0		
Hold down tape width	W ₀			11.5	min.		
Hold down tape position	W2	1.5±1.5					
Coating extension on lead	е	Up to the e	nd of crimp	3.0 max.	Up t	to the end of c	rimp
Deviation across tape, front	Δh1						
Deviation across tape, rear	∆h2	1.0 max.	max. 2.0 max.				

Continued on the following page.



(in mm)

Safety Certified Ceramic Capacitors Packaging

Ontinued from the preceding page.

■ Packaging Styles

Bulk Taping Polyethylene Bag Ammo Pack

■ Minimum Quantity (Order in Sets Only)

[Bulk]			(pcs./Bag)
	Body Dia. D	Lead Code A□, C□	Lead Code B□, D□
	(11111)	Long	Short
Type KY	7	250 *	500
Type KH	8 to 11	250	500
Type KX (New Small Size)	12 to 14	200	250
DEJ Series	15, 16	100	200
	8, 9	250	500
Type KX	10	100	250
	12 to 15	100	200

^{*} Lead Spacing F=5.0mm (Code: A2): 500pcs.

[Taping]	(pcs	s./Ammo Pack)	
Lead Code	N2	N3, P3	N4, N5, N7
Type KY	1,000	900	_
Type KH	_	900	400
Type KX (New Small Size)	_	_	500
Type KX	_	_	500
DEJ Series	1,500	1,000	_



Safety Certified Ceramic Capacitors **(1)** Caution

■ ①Caution (Rating)

1. Operating Voltage

When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the Vp-p value of the applied voltage or the Vo-p that contains DC bias within the rated voltage range.

When the voltage is applied to the circuit, starting or stopping may generate irregular voltage for a transit period because of resonance or switching. Be sure to use a capacitor with a rated voltage range that includes these irregular voltages.

Voltage	DC Voltage	DC+AC Voltage	AC Voltage	Pulse Voltage (1)	Pulse Voltage (2)
Positional Measurement	Vo-p	Vo-p	Vp-p	Vp-p	Vp-p

2. Operating Temperature and Self-generated Heat (Apply to B/E/F Char.)

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself. When the capacitor is used in a highfrequency current, pulse current or similar current, it may have self-generated heat due to dielectric loss. Applied voltage load should be such that self-generated heat is within 20°C under the condition where the capacitor is subjected to an atmospheric temperature of 25°C. When measuring, use a thermocouple of small thermal capacity-K of ø0.1mm under conditions where the capacitor is not affected by radiant heat from other components or wind from surroundings. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability. (Never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

3. Test Condition for Withstanding Voltage

(1) Test Equipment

Test equipment for AC withstanding voltage should be used with the performance of the wave similar to 50/60Hz sine wave.

If the distorted sine wave or overload exceeding the specified voltage value is applied, a defect may be caused.





Safety Certified Ceramic Capacitors **(1)** Caution

Continued from the preceding page.

(2) Voltage Applied Method

When the withstanding voltage is applied, the capacitor's lead or terminal should be firmly connected to the output of the withstanding voltage test equipment, and then the voltage should be raised from near zero to the test voltage.

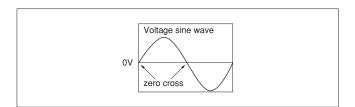
If the test voltage without the raise from near zero voltage would be applied directly to capacitor, test voltage should be applied with the zero cross.* At the end of the test time, the test voltage should be reduced to near zero, and then capacitor's lead or terminal should be taken off the output of the withstanding voltage test equipment. If the test voltage without the raise from near zero voltage would be applied directly to capacitor, the surge voltage may rise, and therefore, a defect may be caused.

*ZERO CROSS is the point where voltage sine wave passes 0V. See the figure at right.

4. Fail-Safe

When the capacitor is broken, failure may result in a short circuit. Be sure to provide an appropriate fail-safe function like a fuse on your product if failure could result in an electric shock, fire or fuming.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.



Safety Certified Ceramic Capacitors (1) Caution

■ **①**Caution (Storage and Operating Condition)

Operating and Storage Environment

The insulating coating of capacitors does not form a perfect seal; therefore, do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. Also, avoid exposure to moisture. Before cleaning, bonding, or molding this product, verify that these processes do not affect product quality by testing the performance of a cleaned, bonded or molded product in the intended equipment. Store the capacitors where the temperature and relative humidity do not exceed -10 to 40 degrees centigrade and 15 to 85%.

Use capacitors within 6 months after delivery. Check the solderability after 6 months or more.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

■ ①Caution (Soldering and Mounting)

1. Vibration and Impact

Do not expose a capacitor or its lead wires to excessive shock or vibration during use. Excessive shock or vibration may cause fatigue destruction of lead wires mounted on the circuit board.

Please take measures to hold a capacitor on the circuit boards by adhesive, molding resin or another coating.

Please confirm there is no influence of holding measures on the product with the intended equipment.

2. Soldering

When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specifications of the capacitor. Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element.

Soldering the capacitor with a soldering iron should be performed in the following conditions.

Temperature of iron-tip: 400 degrees C. max.

Soldering iron wattage: 50W max. Soldering time: 3.5 sec. max.

3. Bonding, Resin Molding and Coating

For bonding, molding or coating this product, verify that these processes do not affect the quality of the capacitor by testing the performance of the bonded, molded or coated product in the intended equipment. When the amount of applications, dryness/hardening conditions of adhesives and molding resins containing organic solvents (ethyl acetate, methyl ethyl ketone, toluene, etc). are unsuitable, the outer coating resin of a capacitor is damaged by the organic solvents and it may result, worst case, in a short circuit. The variation in thickness of adhesive, molding resin

or coating may cause outer coating resin cracking and/or ceramic element cracking of a capacitor in a temperature cycling.

4. Treatment after Bonding, Resin Molding and Coating When the outer coating is hot (over 100 degrees C.) after soldering, it becomes soft and fragile. Therefore, please be careful not to give it mechanical stress.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

■ **①**Caution (Handling)

Vibration and Impact

Do not expose a capacitor or its lead wires to excessive shock or vibration during use. Excessive shock or vibration may cause fatigue destruction of lead wires mounted on the circuit board.

Please take measures to hold a capacitor on the circuit boards by adhesive, molding resin or another coating.

Please confirm there is no influence of holding measures on the product with the intended equipment.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.



Safety Certified Ceramic Capacitors Notice

■ Notice (Soldering and Mounting)

Cleaning (ultrasonic cleaning)

To perform ultrasonic cleaning, observe the following conditions.

Rinse bath capacity: Output of 20 watts per liter or less.

Rinsing time: 5 min. maximum.

Do not vibrate the PCB/PWB directly.

Excessive ultrasonic cleaning may lead to fatigue destruction of the lead wires.

■ Notice (Rating)

- 1. Capacitance Change of Capacitors
- (1) For SL char.

Capacitance might change a little depending on a surrounding temperature or an applied voltage. Please contact us if you use a strict constant time circuit.

(2) For B/E/F char.

Capacitors have an aging characteristic, whereby the capacitor continually decreases its capacitance slightly if the capacitor is left on for a long time. Moreover, capacitance might change greatly depending on the surrounding temperature or an applied voltage. Therefore, it is not likely to be suitable for use in a constant time circuit

Please contact us if you need detailed information.

Performance Check by Equipment
 Before using a capacitor, check that there is no problem in the equipment's performance and the specifications.

Generally speaking, CLASS 2 (B/E/F char.) ceramic capacitors have voltage dependence characteristics and temperature dependence characteristics in capacitance, so the capacitance value may change depending on the operating condition in the equipment. Therefore, be sure to confirm the apparatus performance of receiving influence in the capacitance value change of a capacitor, such as leakage current and noise suppression characteristic.

Moreover, check the surge-proof ability of a capacitor in the equipment, if needed, because the surge voltage may exceed specific value by the inductance of the circuit.



High Voltage Ceramic Capacitors



DES Series (125°C Guaranteed/Low-dissipation Factor/DC500V-1kV)

Features

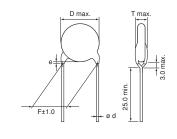
- Low dissipation factor series that can be used for power supplies with an increased switching frequency.
- 2. The allowable power in the 100 to 300kHz band is improved to approximately one and a half times that of the DEH series while remaining the same size.
- 3. Operating temperature range is guaranteed up to 125 degrees C.
- Coated with flame-retardant epoxy resin (equivalent to UL94V-0 standard).
 Please contact us when a halogen-free product* is necessary.
 - * Cl=900ppm max., Br=900ppm max. and Cl+Br=1500ppm max.
- 5. Taping available for automatic insertion.

Applications

Ideal for use on high-frequency pulse circuits such as snubber circuits for switching power supplies.

Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids. Only Murata products clearly stipulated as "for Automotive use" on its catalog can be used for automobile applications such as power train and safety equipment.

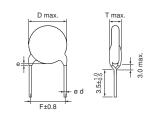




(in mm)

Lead Code	Coating Extension e	ø d
A2, A3	Up to the end of crimp	0.6±0.05





(in mm)

Lead Code	Coating Extension e	ød	
J2, J3	Up to the end of crimp	0.6±0.05	

■ Marking

■ Marking					
Rated Voltage Nominal Body Diameter	DC500V	DC1kV			
ø6mm	SD 101 66	S D 101 1KV 66			
ø7-9mm	S D 102K 66	S D 471K 1KV 66			
ø10-17mm	S D 222K (M 66	S D 152K 1KV (M66			
Series Code	Abbreviation (S)				
Temperature Characteristic	Marked with code				
Nominal Capacitance	Marked with 3 figures				
Capacitance Tolerance	Marked with code (omitted for nominal body diameter ø6mm)				
Rated Voltage	Marked with code (omitted for DC500V)				
Manufacturer's Identification	Marked with (M (omitted for nominal body diameter ø9mm and under)				
Manufactured Date Code	Abbreviation				

D Characteristics

Part Number	DC Rated Voltage	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DESD32H101K□□□	500Vdc	100pF±10%	6.0mm max.	5.0	4.0mm max.	A2B	J2B	N2A
DESD32H151K□□□	500Vdc	150pF±10%	6.0mm max.	5.0	4.0mm max.	A2B	J2B	N2A
DESD32H221K□□□	500Vdc	220pF±10%	6.0mm max.	5.0	4.0mm max.	A2B	J2B	N2A
DESD32H331K□□□	500Vdc	330pF±10%	6.0mm max.	5.0	4.0mm max.	A2B	J2B	N2A
DESD32H471K□□□	500Vdc	470pF±10%	6.0mm max.	5.0	4.0mm max.	A2B	J2B	N2A
DESD32H681K□□□	500Vdc	680pF±10%	6.0mm max.	5.0	4.0mm max.	A2B	J2B	N2A
DESD32H102K□□□	500Vdc	1000pF±10%	8.0mm max.	5.0	4.0mm max.	A2B	J2B	N2A
DESD32H152K□□□	500Vdc	1500pF±10%	9.0mm max.	5.0	4.0mm max.	A2B	J2B	N2A
DESD32H222K□□□	500Vdc	2200pF±10%	10.0mm max.	5.0	4.0mm max.	A2B	J2B	N2A
DESD32H332K□□□	500Vdc	3300pF±10%	12.0mm max.	7.5	4.0mm max.	A3B	J3B	N3A
DESD32H472K□□□	500Vdc	4700pF±10%	14.0mm max.	7.5	4.0mm max.	A3B	J3B	N7A
DESD33A101K□□□	1000Vdc	100pF±10%	6.0mm max.	5.0	4.5mm max.	A2B	J2B	N2A
DESD33A151K□□□	1000Vdc	150pF±10%	6.0mm max.	5.0	4.5mm max.	A2B	J2B	N2A
DESD33A221K□□□	1000Vdc	220pF±10%	6.0mm max.	5.0	4.5mm max.	A2B	J2B	N2A
DESD33A331K□□□	1000Vdc	330pF±10%	6.0mm max.	5.0	4.5mm max.	A2B	J2B	N2A
DESD33A471K□□□	1000Vdc	470pF±10%	7.0mm max.	5.0	4.5mm max.	A2B	J2B	N2A
DESD33A681K□□□	1000Vdc	680pF±10%	8.0mm max.	5.0	4.5mm max.	A2B	J2B	N2A
DESD33A102K□□□	1000Vdc	1000pF±10%	9.0mm max.	5.0	4.5mm max.	A2B	J2B	N2A
DESD33A152K□□□	1000Vdc	1500pF±10%	10.0mm max.	5.0	4.5mm max.	A2B	J2B	N2A
DESD33A222K□□□	1000Vdc	2200pF±10%	12.0mm max.	7.5	4.5mm max.	A3B	J3B	N3A
DESD33A332K□□□	1000Vdc	3300pF±10%	14.0mm max.	7.5	4.5mm max.	A3B	J3B	N7A
DESD33A472K□□□	1000Vdc	4700pF±10%	17.0mm max.	7.5	4.5mm max.	A3B	J3B	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.



DES Series Specifications and Test Methods

No.	o. Item		Specifications	Test Method		
1	Operating Temperature Range		-25 to +125°C			
2	Appearance and Dimensions		No visible defect, 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 (DC1kV) or DC voltage of 250% of the rated voltage (DC500V) 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±0.2kHz and AC5V(r.m.s.) max.		
7	Dissipation Factor	(D.F.)	0.3% max.	The dissipation factor should be measured at 20°C with 1±0.2kHz and AC5V(r.m.s.) max.		
	Temperature Characteristics		Within +20/-30% (Temp. range: -25 to +125°C)	The capacitance measurement should be made at each step specified in the Table.		
8			Pre-treatment: Capacitor should be stored room condition* for 24±2 hr Step 1	•		
			Temp. (°C) 20±2	-25±3 20±2 125±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 and keep it for 10±1 sec.		
		Bending	Oapacitor should not be broken.	Each lead wire should be subjected to 5N 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.		
		Appearance	No marked defect	The capacitor should be firmly soldered to the supporting lead		
10	Vibration Resistance	Capacitance	Within specified tolerance	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		
		D.F.	0.3% max.	from 10Hz to 55Hz and back to 10Hz. Apply for a total of 6 hrs., 2 hrs. each in 3 mutually perpendicular directions.		
11	1 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	Appearance		No marked defect	The lead wire should be immersed into the melted solder of		
	Soldering Effect (Non-Preheat)	Capacitance Change	Within ±10%	350±10°C up to about 1.5 to 2mm from the main body for 3.5±0.5 sec. Pre-treatment:		
		Dielectric Strength (Between Lead Wires)	Per item 4.	Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 24±2 hrs. at room condition.*		

 $^{^{\}star}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa





DES Series Specifications and Test Methods

Continued from the preceding page.

No.		Item	Specifications	Test Method				
		Appearance	No marked defect	First the capacitor should be				
	Soldering Effect (On-Preheat)	Capacitance Change	Within ±10%	stored at 120+0/-5°C for 60+0/-5 sec. Then, as in the figure, the lead Thermal Screen 1.5 1.5 1.5				
13		Dielectric Strength (Between Lead Wires)	Per item 4.	wires should be immersed in solder of 260+0/-5°C up to 1.5 to 2.0mm from the root of terminal for 7.5+0/-1 sec. Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 24±2 hrs. at room condition.*				
		Appearance	No marked defect	The capacitor should be subjected to 5 temperature cycles.				
		Capacitance Change	Within ±10%	<temperature cycle=""> Step Temperature (°C) Time (min) 1 -25±3 30</temperature>				
		D.F.	0.4% max.	2 Room Temp. 3				
14	Temperature	I.R.	1000MΩ min.	3 125±3 30 4 Room Temp. 3				
		Dielectric Strength (Between Lead Per item 4. Wires)		Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 24±2 hrs. at room condition.*				
		Appearance	No marked defect	Set the capacitor for 500+24/-0 hrs. at 40±2°C in 90 to 95%				
15	Humidity (Under	Capacitance Change	Within ±10%	relative humidity. Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed				
	Steady State)	D.F.	0.4% max.	at room condition* for 24±2 hrs. before initial measurements.				
		I.R.	1000MΩ min.	Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*				
		Appearance	No marked defect	Apply the rated voltage for 500+24/-0 hrs. at 40±2°C in 90 to				
16	Humidity	Capacitance Change	Within ±10%	95% relative humidity. (Charge/Discharge current≦50mA) Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed				
	Loading	D.F.	0.6% max.	at room condition* for 24±2 hrs. before initial measurements.				
		I.R.	1000MΩ min.	Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*				
		Appearance	No marked defect	Apply a DC voltage of 200% of the rated voltage (DC500V) or				
		Capacitance Change	Within ±10%	DC voltage of 150% of the rated voltage (DC1kV) for 1000 +48/-0 hrs. at 125±2°C with a relative humidity of 50% max. (Charge/Discharge current≤50mA)				
17	Life	D.F.	0.4% max.	Pre-treatment:				
.,	Lite	I.R.	2000M Ω min.	Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs.				

^{* &}quot;Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa



High Voltage Ceramic Capacitors



DEH Series (125°C Guaranteed/Low-dissipation Factor/DC500V-3.15kV)

■ Features

- 1. Reduced heat dissipation permitted due to small dielectric loss of the ceramic material.
- 2. Operating temperature range is guaranteed up to 125 degrees C.
- Coated with flame-retardant epoxy resin (equivalent to UL94V-0 standard).
 Please contact us when a halogen-free product* is necessary.
 - * Cl=900ppm max., Br=900ppm max. and Cl+Br=1500ppm max.
- 4. Taping available for automatic insertion.

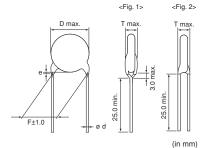
Applications

Ideal for use on high-frequency pulse circuits such as a horizontal resonance circuit for CTV and snubber circuits for switching power supplies.

Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids. Only Murata products clearly stipulated as "for Automotive use" on its catalog can be used for automobile applications such as power train and safety equipment.



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



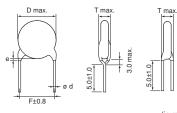
 Lead Code
 Coating Extension e
 ø d
 Style

 A2, A3, A4
 Up to the end of crimp
 0.6±0.05
 Fig. 1

 C3
 3.0 max.
 0.6±0.05
 Fig. 2

<Fig. 1>





(in mm)

<Fig. 2>

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

Lead Code	Coating Extension e	ø d	Style
B2, B3, B4	Up to the end of crimp	0.6±0.05	Fig. 1
D3	3.0 max.	0.6±0.05	Fig. 2

Marking

	Rated Voltage	DC500V	DC1-3.15kV			
Nominal Body Diameter	Temp. Char.	С	R			
ø6mm		HR 471 66				
ø7-9mm		HR C 152K 66	HR R 102K 1KV 66			
	ø10-21mm	HR C 472K (M66	HR R 272K 3KV M66			
High Tempe	erature Guaranteed Code	HR				
Temper	ature Characteristics	Marked with code (omitted for nominal body diameter ø6mm)				
Non	ninal Capacitance	Marked with 3 figures				
Capa	acitance Tolerance	Marked with code (omitted for nominal body diameter ø6mm)				
Rated Voltage	DC500V	Omitted				
DC1-3.15kV		Marked with code (for DC3.15kV, marked with 3KV)				
Manufa	cturer's Identification	Marked with (omitted for nominal body diameter ø9mm and under)				
Manu	factured Date Code	Abbreviation				



DC500V, C Characteristics

Part Number	DC Rated Voltage	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEHC32H331K□□□	500Vdc	330pF±10%	6.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEHC32H471K□□□	500Vdc	470pF±10%	6.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEHC32H681K□□□	500Vdc	680pF±10%	7.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEHC32H102K□□□	500Vdc	1000pF±10%	8.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEHC32H152K□□□	500Vdc	1500pF±10%	9.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEHC32H222K□□□	500Vdc	2200pF±10%	10.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEHC32H332K□□□	500Vdc	3300pF±10%	12.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEHC32H472K□□□	500Vdc	4700pF±10%	14.0mm max.	10.0	4.0mm max.	A4B	B4B	-

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

DC1-3.15kV, R Characteristics

Part Number	DC Rated Voltage	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEHR33A221K□□□	1000Vdc	220pF±10%	7.0mm max.	5.0	4.5mm max.	A2B	B2B	N2A
DEHR33A331K□□□	1000Vdc	330pF±10%	7.0mm max.	5.0	4.5mm max.	A2B	B2B	N2A
DEHR33A471K□□□	1000Vdc	470pF±10%	7.0mm max.	5.0	4.5mm max.	A2B	B2B	N2A
DEHR33A681K□□□	1000Vdc	680pF±10%	8.0mm max.	5.0	4.5mm max.	A2B	B2B	N2A
DEHR33A102K□□□	1000Vdc	1000pF±10%	9.0mm max.	5.0	4.5mm max.	A2B	B2B	N2A
DEHR33A152K□□□	1000Vdc	1500pF±10%	11.0mm max.	5.0	4.5mm max.	A2B	B2B	N2A
DEHR33A222K□□□	1000Vdc	2200pF±10%	13.0mm max.	7.5	4.5mm max.	A3B	B3B	N3A
DEHR33A332K□□□	1000Vdc	3300pF±10%	15.0mm max.	7.5	4.5mm max.	A3B	B3B	N7A
DEHR33A472K□□□	1000Vdc	4700pF±10%	17.0mm max.	7.5	4.5mm max.	A3B	B3B	N7A
DEHR33D221K□□□	2000Vdc	220pF±10%	7.0mm max.	7.5	5.0mm max.	C3B	D3B	P3A
DEHR33D271K□□□	2000Vdc	270pF±10%	7.0mm max.	7.5	5.0mm max.	C3B	D3B	P3A
DEHR33D331K□□□	2000Vdc	330pF±10%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEHR33D391K□□□	2000Vdc	390pF±10%	8.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEHR33D471K□□□	2000Vdc	470pF±10%	9.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEHR33D561K□□□	2000Vdc	560pF±10%	9.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEHR33D681K□□□	2000Vdc	680pF±10%	10.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEHR33D821K□□□	2000Vdc	820pF±10%	11.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEHR33D102K□□□	2000Vdc	1000pF±10%	12.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEHR33D122K□□□	2000Vdc	1200pF±10%	12.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEHR33D152K□□□	2000Vdc	1500pF±10%	12.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEHR33D182K□□□	2000Vdc	1800pF±10%	14.0mm max.	7.5	5.0mm max.	A3B	B3B	N7A
DEHR33D222K□□□	2000Vdc	2200pF±10%	15.0mm max.	7.5	5.0mm max.	A3B	B3B	N7A
DEHR33D272K□□□	2000Vdc	2700pF±10%	17.0mm max.	7.5	5.0mm max.	A3B	B3B	N7A
DEHR33D332K□□□	2000Vdc	3300pF±10%	19.0mm max.	10.0	5.0mm max.	A4B	B4B	-
DEHR33D392K□□□	2000Vdc	3900pF±10%	20.0mm max.	10.0	5.0mm max.	A4B	B4B	-
DEHR33D472K□□□	2000Vdc	4700pF±10%	21.0mm max.	10.0	5.0mm max.	A4B	B4B	-
DEHR33F151K□□□	3150Vdc	150pF±10%	7.0mm max.	7.5	6.0mm max.	C3B	D3B	P3A
DEHR33F181K□□□	3150Vdc	180pF±10%	7.0mm max.	7.5	6.0mm max.	C3B	D3B	P3A
DEHR33F221K□□□	3150Vdc	220pF±10%	7.0mm max.	7.5	6.0mm max.	C3B	D3B	P3A
DEHR33F271K□□□	3150Vdc	270pF±10%	7.0mm max.	7.5	6.0mm max.	C3B	D3B	P3A
DEHR33F331K□□□	3150Vdc	330pF±10%	8.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEHR33F391K□□□	3150Vdc	390pF±10%	9.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEHR33F471K□□□	3150Vdc	470pF±10%	10.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEHR33F561K□□□	3150Vdc	560pF±10%	10.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEHR33F681K□□□	3150Vdc	680pF±10%	11.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEHR33F821K□□□	3150Vdc	820pF±10%	12.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEHR33F102K□□□	3150Vdc	1000pF±10%	13.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEHR33F122K□□□	3150Vdc	1200pF±10%	14.0mm max.	7.5	6.0mm max.	A3B	B3B	N7A
DEHR33F152K□□□	3150Vdc	1500pF±10%	15.0mm max.	7.5	6.0mm max.	A3B	B3B	N7A
DEHR33F182K□□□	3150Vdc	1800pF±10%	16.0mm max.	7.5	6.0mm max.	A3B	B3B	N7A

Continued from the preceding page.

Part Number	DC Rated Voltage	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEHR33F222K□□□	3150Vdc	2200pF±10%	17.0mm max.	7.5	6.0mm max.	A3B	B3B	N7A
DEHR33F272K□□□	3150Vdc	2700pF±10%	19.0mm max.	10.0	6.0mm max.	A4B	B4B	-

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



DEH Series Specifications and Test Methods

No.	1	Item	Specifications	Test Method		
1	Operating Temper	ature Range	-25 to +125°C			
2	Appearance and D	Dimensions	No visible defect, 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.		
		Between Lead Wires	No failure	The capacitor should not be damaged when DC voltage of 200% of the rated voltage (DC1 to 3.15kV) or DC voltage of 250% of the rated voltage (DC500V) is applied between the lead wires for 1 to 5 sec. (Charge/Discharge current≦50mA)		
4	Dielectric Strength	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±0.2kHz and AC5V(r.m.s.) max.		
7	Dissipation Factor	(D.F.)	Char. R: 0.2% max. Char. C: 0.3% max.	The dissipation factor should be measured at 20°C with 1±0.2kHz and AC5V(r.m.s.) max.		
8	8 Temperature Characteristics		T. C. Temp. Char. -25 to +85°C +85 to +125°C	•		
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	Capacitor should not be broken.	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.		
		Appearance	No marked defect	The capacitor should be firmly soldered to the supporting lead		
10	Vibration	Capacitance	Within specified tolerance	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		
	Resistance	D.F.	Char. R: 0.2% max. Char. C: 0.3% max.	from 10Hz to 55Hz and back to 10Hz. Apply for a total of 6 hrs. 2 hrs. each in 3 mutually perpendicular directions.		
11	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		
		Appearance	No marked defect	The lead wire should be immersed into the melted solder of		
	Soldering Effect	Capacitance Change	Within ±10%	350±10°C up to about 1.5 to 2mm from the main body for 3.5±0.5 sec. Pre-treatment:		
12	Soldering Effect (Non-Preheat)	Dielectric Strength (Between Lead Wires)	Per item 4.	Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 24±2 hrs. at room condition.*		

[&]quot; "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

Continued on the following page.





DEH Series Specifications and Test Methods

Ontinued from the preceding page.

No.		Item	Specifications	Test Method
		Appearance Capacitance Change	No marked defect Within ±10%	First the capacitor should be stored at 120+0/-5°C for 60+0/-5 sec. Thermal Capacitor Screen 1.5
13	Soldering Effect (On-Preheat)	Dielectric Strength (Between Lead Wires)	Per item 4.	Then, as in the figure, the lead wires should be immersed in solder of 260+0/-5°C up to 1.5 to 2.0mm from the root of terminal for 7.5+0/-1 sec. Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 24±2 hrs. at room condition.*
		Appearance	No marked defect	The capacitor should be subjected to 5 temperature cycles.
		Capacitance Change	Within ±10%	<pre><temperature cycle=""></temperature></pre>
		D.F.	0.4% max.	2 Room Temp. 3
14	Temperature	I.R.	1000MΩ min.	3 125±3 30 4 Room Temp. 3
		Dielectric Strength (Between Lead Wires)	Per item 4.	Cycle time: 5 cycles Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 24±2 hrs. at room condition.*
		Appearance	No marked defect	Set the capacitor for 500 +24/-0 hrs. at 40±2°C in 90 to 95%
15	Humidity (Under Steady State)	Capacitance Change	Within ±10%	relative humidity. Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed
		D.F.	0.4% max.	at room condition* for 24±2 hrs. before initial measurements.
		I.R.	1000MΩ min.	Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*
		Appearance	No marked defect	Apply the rated voltage for 500+24/-0 hrs. at 40±2°C in 90 to
16	Humidity	Capacitance Change	Within ±10%	95% relative humidity. (Charge/Discharge current≦50mA) Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed at
	Loading	D.F.	0.6% max.	room condition* for 24±2 hrs. before initial measurements.
		I.R.	1000MΩ min.	Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*
		Appearance	No marked defect	Apply a DC voltage of 200% of the rated voltage (DC500V) or
		Capacitance Change	Within ±10%	DC voltage of 150% of the rated voltage (DC1 to 3.15kV) for 1000 +48/-0 hrs. at 125±2°C with a relative humidity of 50% max.
		D.F.	0.4% max.	(Charge/Discharge current≦50mA)
17	Life	I.R.	2000MΩ min.	Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs.

 $^{^{\}star}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa



High Voltage Ceramic Capacitors



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

■ Features

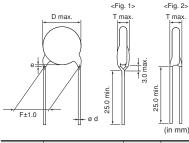
- 1. Temperature compensating type ceramics realize lower heat dissipation than DEH/DES series.
- 2. Operating temperature range is guaranteed up to 125 degrees C.
- 3. Coated with flame-retardant epoxy resin (equivalent to UL94V-0 standard). Please contact us when a halogen-free product* is necessary.
 - * Cl=900ppm max., Br=900ppm max. and CI+Br=1500ppm max.
- 4. Taping available for automatic insertion.

Applications

- 1. Ideal for use as the ballast in backlighting 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.

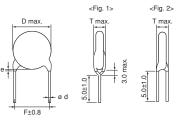
Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids. Only Murata products clearly stipulated as "for Automotive use" on its catalog can be used for automobile applications such as power train and safety equipment.





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





(in mm)

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

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.	SL
Nominal Body Diameter	
ø4.5-5mm	68 1KV
ø6mm	39 3KV 66
ø7-9mm	181J 2KV 66
ø10-16mm	391J 3KV (M 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 (for 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	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEA1X3A100J□□□	1000Vdc	10pF±5%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEA1X3A120J□□□	1000Vdc	12pF±5%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEA1X3A150J□□□	1000Vdc	15pF±5%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEA1X3A180J□□□	1000Vdc	18pF±5%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEA1X3A220J□□□	1000Vdc	22pF±5%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEA1X3A270J□□□	1000Vdc	27pF±5%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEA1X3A330J□□□	1000Vdc	33pF±5%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEA1X3A390J□□□	1000Vdc	39pF±5%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEA1X3A470J□□□	1000Vdc	47pF±5%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEA1X3A560J□□□	1000Vdc	56pF±5%	5.0mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEA1X3A680J□□□	1000Vdc	68pF±5%	5.0mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEA1X3A820J□□□	1000Vdc	82pF±5%	6.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEA1X3A101J□□□	1000Vdc	100pF±5%	6.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEA1X3A121J□□□	1000Vdc	120pF±5%	6.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEA1X3A151J□□□	1000Vdc	150pF±5%	7.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEA1X3A181J□□□	1000Vdc	180pF±5%	7.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEA1X3A221J□□□	1000Vdc	220pF±5%	8.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEA1X3A271J□□□	1000Vdc	270pF±5%	9.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEA1X3A331J□□□	1000Vdc	330pF±5%	10.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEA1X3A391J□□□	1000Vdc	390pF±5%	10.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEA1X3A471J□□□	1000Vdc	470pF±5%	11.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEA1X3A561J□□□	1000Vdc	560pF±5%	12.0mm max.	7.5	4.0mm max.	A3B	B3B	N3A
DEA1X3D100J□□□	2000Vdc	10pF±5%	4.5mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEA1X3D120J□□□	2000Vdc	12pF±5%	4.5mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEA1X3D150J□□□	2000Vdc	15pF±5%	4.5mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEA1X3D180J□□□	2000Vdc	18pF±5%	4.5mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEA1X3D220J□□□	2000Vdc	22pF±5%	4.5mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEA1X3D270J□□□	2000Vdc	27pF±5%	4.5mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEA1X3D330J□□□	2000Vdc	33pF±5%	4.5mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEA1X3D390J□□□	2000Vdc	39pF±5%	5.0mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEA1X3D470J□□□	2000Vdc	47pF±5%	6.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEA1X3D560J□□□	2000Vdc	56pF±5%	6.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEA1X3D680J□□□	2000Vdc	68pF±5%	6.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEA1X3D820J□□□	2000Vdc	82pF±5%	7.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEA1X3D101J	2000Vdc	100pF±5%	7.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEA1X3D121J□□□	2000Vdc	120pF±5%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEA1X3D151J□□□	2000Vdc	150pF±5%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEA1X3D181J□□□	2000Vdc	180pF±5%	9.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEA1X3D221J□□□	2000Vdc	220pF±5%	10.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEA1X3D271J□□□	2000Vdc	270pF±5%	11.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEA1X3D331J□□□	2000Vdc	330pF±5%	12.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEA1X3D391J□□□	2000Vdc	390pF±5%	13.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEA1X3D471J□□□	2000Vdc	470pF±5%	14.0mm max.	7.5	5.0mm max.	A3B	B3B	N7A
DEA1X3D561J□□□	2000Vdc	560pF±5%	15.0mm max.	7.5	5.0mm max.	A3B	B3B	N7A
DEA1X3F100J□□□	3150Vdc	10pF±5%	5.0mm max.	7.5	6.0mm max.	CDB	DDB	P3A
DEA1X3F120J□□□	3150Vdc	12pF±5%	5.0mm max.	7.5	6.0mm max.	CDB	DDB	P3A
DEA1X3F150J□□□	3150Vdc	15pF±5%	5.0mm max.	7.5	6.0mm max.	CDB	DDB	P3A
DEA1X3F180J□□□	3150Vdc	18pF±5%	5.0mm max.	7.5	6.0mm max.	CDB	DDB	P3A
DEA1X3F220J□□□	3150Vdc	22pF±5%	5.0mm max.	7.5	6.0mm max.	CDB	DDB	P3A
DEA1X3F270J□□□	3150Vdc	27pF±5%	6.0mm max.	7.5	6.0mm max.	C3B	D3B	P3A
DEA1X3F330J□□□	3150Vdc	33pF±5%	6.0mm max.	7.5	6.0mm max.	C3B	D3B	P3A
DEA1X3F390J□□□	3150Vdc	39pF±5%	6.0mm max.	7.5	6.0mm max.	C3B	D3B	P3A
DEA1X3F470J□□□	3150Vdc	47pF±5%	7.0mm max.	7.5	6.0mm max.	C3B	D3B	P3A
DEATA3F4703	3130 Vuc	p0,0						
DEA1X3F560J	3150Vdc	56pF±5%	7.0mm max.	7.5	6.0mm max.	C3B	D3B	P3A

muRata

Continued from the preceding page.

Part Number	DC Rated Voltage	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEA1X3F820J□□□	3150Vdc	82pF±5%	8.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEA1X3F101J□□□	3150Vdc	100pF±5%	9.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEA1X3F121J□□□	3150Vdc	120pF±5%	10.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEA1X3F151J□□□	3150Vdc	150pF±5%	11.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEA1X3F181J□□□	3150Vdc	180pF±5%	11.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEA1X3F221J□□□	3150Vdc	220pF±5%	12.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEA1X3F271J□□□	3150Vdc	270pF±5%	14.0mm max.	7.5	6.0mm max.	A3B	B3B	N7A
DEA1X3F331J□□□	3150Vdc	330pF±5%	15.0mm max.	7.5	6.0mm max.	A3B	B3B	N7A
DEA1X3F391J□□□	3150Vdc	390pF±5%	16.0mm max.	7.5	6.0mm max.	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	Test Method		
1	Operating Temper	ature Range	-25 to +125°C			
2	Appearance and D	Dimensions	No visible defect, 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.		
		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)		
4	Dielectric Strength	Body Insulation	The capacitor is placed in the container with metal balls of diameter 1 mm 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	10000M Ω min.	The insulation resistance should be measured with DC500±50V within 60±5 sec. of charging.		
6	Capacitance Within specified tolerance		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.		
0			+350 to -1000ppm/°C (Temp. range: +20 to +85°C)	The capacitance measurement should be made at each step specified in the Table.		
8	Temperature Char	acteristics	Step 1 Temp. (°C) 20±2	2 3 4 5 -25±3 20±2 85±2 20±2		
9	Strength of Lead	Pull	Lead wire should not be cut off.	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	- Capacitor should not be broken.	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.		
		Appearance	No marked defect	The capacitor should be firmly soldered to the supporting lead		
10	Vibration Resistance	Capacitance	Within specified tolerance	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		
	nesistance	Q	400+20C*2min. (30pF under) 1000 min. (30pF min.)	from 10Hz to 55Hz and back to 10Hz. Apply for a total of 6 hrs., 2 hrs. each in 3 mutually perpendicular directions.		
11	Solderability of Le	ads	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		
		Appearance	No marked defect	The lead wire should be immersed into the melted solder of		
12	Soldering Effect	Capacitance Change	Within ±2.5%	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.		
	(Non-Preheat)	Dielectric Strength (Between Lead Wires)	Per item 4.	(Body of ø5mm and under: 5±0.5 sec.) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*1		

^{*1 &}quot;Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

Continued on the following page.





^{*2 &}quot;C" expresses nominal capacitance value (pF).

DEA Series Specifications and Test Methods

Continued from the preceding page.

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

^{*1 &}quot;Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa *2 "C" expresses nominal capacitance value (pF).

High Voltage Ceramic Capacitors



DEB Series (Class 2/DC1k-3.15kV)

■ Features

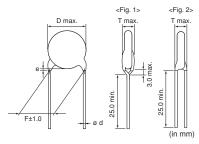
- 1. Small size and high capacitance
- Coated with flame-retardant epoxy resin (equivalent to UL94V-0 standard).
 Please contact us when a halogen-free product* is necessary.
 - * Cl=900ppm max., Br=900ppm max. and Cl+Br=1500ppm max.
- 3. Taping available for automatic insertion.

Applications

Ideal for use on decoupling circuits for power supplies.

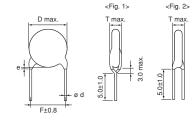
Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids. Only Murata products clearly stipulated as "for Automotive use" on its catalog can be used for automobile applications such as power train and safety equipment.





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





(in mm)

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

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

■ Marking			
Temp. Char. Nominal Body Diameter	В	E	F
ø4.5-5mm	221 3KV	102 1KV	102 2KV
ø6mm	331 3KV 66	102 2KV 66	222 1KV 66
ø7-9mm	102K 3KV 66	102Z 3KV 66	472Z 2KV 66
ø10-16mm	B 332K 3KV (M 66	E 472Z 3KV (M 66	103Z 2KV (M 66
Temperature Characteristics	Marked with code for char. B a	nd E (omitted for nominal body di	ameter ø9mm and under)
Nominal Capacitance	Marked with 3 figures		
Capacitance Tolerance	Marked with code (omitted for	nominal body diameter ø6mm and	d under)
Rated Voltage	Marked with code (for DC3.15k	(V, marked with 3KV)	
Manufacturer's Identification	Marked with (omitted for no	minal body diameter ø9mm and u	nder)
Manufactured Date Code	Abbreviation (omitted for noming	nal body diameter ø5mm and und	er)

B Characteristics

Part Number	DC Rated Voltage	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEBB33A101K□□□	1000Vdc	100pF±10%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEBB33A151K□□□	1000Vdc	150pF±10%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEBB33A221K□□□	1000Vdc	220pF±10%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEBB33A331K□□□	1000Vdc	330pF±10%	4.5mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEBB33A471K□□□	1000Vdc	470pF±10%	5.0mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEBB33A681K□□□	1000Vdc	680pF±10%	6.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEBB33A102K□□□	1000Vdc	1000pF±10%	6.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEBB33A152K□□□	1000Vdc	1500pF±10%	8.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEBB33A222K□□□	1000Vdc	2200pF±10%	9.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEBB33A332K□□□	1000Vdc	3300pF±10%	10.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEBB33A472K□□□	1000Vdc	4700pF±10%	12.0mm max.	7.5	4.0mm max.	A3B	B3B	N3A
DEBB33A682K□□□	1000Vdc	6800pF±10%	15.0mm max.	7.5	4.0mm max.	A3B	B3B	N7A
DEBB33D101K□□□	2000Vdc	100pF±10%	4.5mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEBB33D151K□□□	2000Vdc	150pF±10%	4.5mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEBB33D221K□□□	2000Vdc	220pF±10%	4.5mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEBB33D331K□□□	2000Vdc	330pF±10%	5.0mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEBB33D471K□□□	2000Vdc	470pF±10%	6.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEBB33D681K□□□	2000Vdc	680pF±10%	7.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEBB33D102K□□□	2000Vdc	1000pF±10%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEBB33D152K□□□	2000Vdc	1500pF±10%	9.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEBB33D222K□□□	2000Vdc	2200pF±10%	10.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEBB33D332K□□□	2000Vdc	3300pF±10%	12.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A
DEBB33D472K□□□	2000Vdc	4700pF±10%	15.0mm max.	7.5	5.0mm max.	A3B	B3B	N7A
DEBB33F101K□□□	3150Vdc	100pF±10%	5.0mm max.	7.5	6.0mm max.	CDB	DDB	РЗА
DEBB33F151K□□□	3150Vdc	150pF±10%	5.0mm max.	7.5	6.0mm max.	CDB	DDB	РЗА
DEBB33F221K□□□	3150Vdc	220pF±10%	5.0mm max.	7.5	6.0mm max.	CDB	DDB	РЗА
DEBB33F331K□□□	3150Vdc	330pF±10%	6.0mm max.	7.5	6.0mm max.	C3B	D3B	РЗА
DEBB33F471K□□□	3150Vdc	470pF±10%	7.0mm max.	7.5	6.0mm max.	C3B	D3B	РЗА
DEBB33F681K□□□	3150Vdc	680pF±10%	8.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEBB33F102K□□□	3150Vdc	1000pF±10%	9.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEBB33F152K□□□	3150Vdc	1500pF±10%	11.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEBB33F222K□□□	3150Vdc	2200pF±10%	13.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEBB33F332K□□□	3150Vdc	3300pF±10%	15.0mm max.	7.5	6.0mm max.	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.

E Characteristics

Part Number	DC Rated Voltage	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEBE33A102Z□□□	1000Vdc	1000pF+80/-20%	5.0mm max.	5.0	4.0mm max.	C1B	D1B	P2A
DEBE33A222Z□□□	1000Vdc	2200pF+80/-20%	7.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEBE33A472Z□□□	1000Vdc	4700pF+80/-20%	9.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEBE33A103Z□□□	1000Vdc	10000pF+80/-20%	13.0mm max.	7.5	4.0mm max.	A3B	B3B	N3A
DEBE33D102Z□□□	2000Vdc	1000pF+80/-20%	6.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEBE33D222Z□□□	2000Vdc	2200pF+80/-20%	8.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEBE33D472Z□□□	2000Vdc	4700pF+80/-20%	11.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEBE33D103Z□□□	2000Vdc	10000pF+80/-20%	16.0mm max.	7.5	5.0mm max.	A3B	B3B	N7A
DEBE33F102Z□□□	3150Vdc	1000pF+80/-20%	7.0mm max.	7.5	6.0mm max.	C3B	D3B	P3A
DEBE33F222Z□□□	3150Vdc	2200pF+80/-20%	10.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A
DEBE33F472Z□□□	3150Vdc	4700pF+80/-20%	13.0mm max.	7.5	6.0mm max.	A3B	B3B	N3A

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



F Characteristics

Part Number	DC Rated Voltage	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEBF33A222Z□□□	1000Vdc	2200pF+80/-20%	6.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEBF33A472Z□□□	1000Vdc	4700pF+80/-20%	7.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEBF33A103Z□□□	1000Vdc	10000pF+80/-20%	10.0mm max.	5.0	4.0mm max.	A2B	B2B	N2A
DEBF33D102Z□□□	2000Vdc	1000pF+80/-20%	5.0mm max.	5.0	5.0mm max.	C1B	D1B	P2A
DEBF33D222Z□□□	2000Vdc	2200pF+80/-20%	7.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEBF33D472Z□□□	2000Vdc	4700pF+80/-20%	9.0mm max.	5.0	5.0mm max.	A2B	B2B	N2A
DEBF33D103Z□□□	2000Vdc	10000pF+80/-20%	12.0mm max.	7.5	5.0mm max.	A3B	B3B	N3A

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



DEB Series Specifications and Test Methods

No.	ı	Item	Specifications	Test Method		
1	Operating Temper	ature Range	-25 to +85°C			
2	Appearance and D	Dimensions	No visible defect, 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.		
		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)		
4	Dielectric Strength Body Insulation No failure		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 DC voltage of 1.3kV 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	6 Capacitance Within specified tolerance		Within specified tolerance	The capacitance should be measured at 20°C with 1±0.2kHz and AC5V(r.m.s.) max.		
7	Dissipation Factor	(D.F.)	Char. B, E: 2.5% max. Char. F: 5.0% max.	The dissipation factor should be measured at 20°C with 1±0.2kHz and AC5V(r.m.s.) max.		
	3 Temperature Characteristics		Char. B: Within ±10% Char. E: Within +20/-55% Char. F: Within +30/-80%	The capacitance measurement should be made at each step specified in the Table.		
8			Pre-treatment: Capacitor should be stored room condition* for 24±2 hr. Step 1 Temp. (°C) 20±2	•		
9	Strength of Lead	Pull	Lead wire should not be cut off.	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	Capacitor should not be broken.	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.		
		Appearance	No marked defect	The capacitor should be firmly soldered to the supporting lead		
10	Vibration	Capacitance	Within specified tolerance	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		
	Resistance	D.F.	Char. B, E: 2.5% max. Char. F: 5.0% max.	from 10Hz to 55Hz and back to 10Hz. Apply for a total of 6 hrs., 2 hrs. each in 3 mutually perpendicular directions.		
11	Solderability of Le	ads	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		
		Appearance	No marked defect	The lead wire should be immersed into the melted solder of		
12	Soldering Effect	Capacitance Change	Char. B: Within ±5% Char. E: Within ±15% Char. F: Within ±20%	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.)		
12	(Non-Preheat)	Dielectric Strength (Between Lead Wires)	Per item 4.	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 4 to 24 hrs. at room condition.*		

 $^{^{\}star}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

Continued on the following page.





DEB Series Specifications and Test Methods

Continued from the preceding page.

۷o.		Item	Specifications	Test Method			
		Appearance Capacitance Change	No marked defect Char. B: Within ±5% Char. E: Within ±15% Char. F: Within ±20%	First the capacitor should be stored at 120+0/-5°C for 60+0/-5 sec. Then, as in the figure, the lead Thermal Screen 1.5 Capacitor to 2.0mr			
13	Soldering Effect (On-Preheat)	Dielectric Strength (Between Lead Wires)	Per item 4.	wires should be immersed in solder of 260+0/-5°C up to 1.5 to 2.0mm from the root of terminal for 7.5+0/-1 sec. Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 4 to 24 hrs. at room condition.*			
		Appearance	No marked defect	The capacitor should be subjected to 5 temperature cycles,			
		Capacitance Change	Char. B: Within ±10% Char. E: Within ±20% Char. F: Within ±30%	then consecutively to 2 immersion cycles. <temperature cycle=""> Step Temperature (°C) Time (min) 1 -25±3 30</temperature>			
		D.F.	Char. B, E: 4.0% max. Char. F: 7.5% max.	2 Room Temp. 3 3 85±3 30			
	Temperature	I.R.	2000MΩ min.	4 Room Temp. 3 Cycle time: 5 cycles			
14	and Immersion Cycle	d Immersion	<pre><immersion cycle=""></immersion></pre>				
			(Between Lead Per item 4.		2 0±3 15 Salt water Cycle time: 2 cycles Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 4 to 24 hrs. at room condition.*		
		Appearance	No marked defect	Set the capacitor for 500+24/-0 hrs. at 40±2°C in 90 to 95%			
15	Humidity (Under	Capacitance Change	Char. B: Within ±10% Char. E: Within ±20% Char. F: Within ±30%	relative humidity. Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition* for 24±2 hrs.			
	Steady State)	D.F.	Char. B, E: 5.0% max. Char. F: 7.5% max.	before initial measurements. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*			
		I.R.	1000MΩ min.	Toom containen.			
		Appearance	No marked defect	Apply the rated voltage for 500+24/-0 hrs. at 40±2°C in 90 to			
16	Humidity Loading	Capacitance Change	Char. B: Within ±10% Char. E: Within ±20% Char. F: Within ±30%	95% relative humidity. (Charge/Discharge current≤50mA) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition* for 24±2 hrs.			
	Loading	D.F.	Char. B, E: 5.0% max. Char. F: 7.5% max.	before initial measurements. Post-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition* for 24±2 hrs.			
		I.R.	500M Ω min.	then placed at room condition for 24±2 his.			
		Appearance	No marked defect	Apply a DC voltage of 150% of the rated voltage for			
17	Life	Capacitance Change	Char. B: Within ±10% Char. E: Within ±20% Char. F: Within ±30%	1000+48/-0 hrs. at 85±2°C with a relative humidity of 50% max. (Charge/Discharge current≦50mA) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition* for 24±2 hrs.			
		D.F.	Char. B, E: 4.0% max. Char. F: 7.5% max.	before initial measurements. Post-treatment: Capacitor should be stored at 85±2°C for 1 hr.,			
		I.R.	2000MΩ min.	then placed at room condition* for 24±2 hrs.			

 $^{^{\}star}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa



High Voltage Ceramic Capacitors



DEC Series (Class 1, 2/DC6.3kV)

■ Features

Coated with flame-retardant epoxy resin (equivalent to UL94V-0 standard).

Please contact us when a halogen-free product* is necessary.

* Cl=900ppm max., Br=900ppm max. and Cl+Br=1500ppm max.

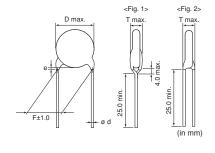
■ Applications

- 1. Ideal for use as the ballast in backlighting inverters for liquid crystal displays (SL Char.).
- 2. Ideal for use on high voltage circuits such as Cockcroft circuits (B Char.).

Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids. Only Murata products clearly stipulated as "for Automotive use" on its catalog can be used for automobile applications such as power train and safety equipment.



Straight Long (Fig. 2)



Lead Code	Coating Extension e	ø d	Style
А3	Up to the end of crimp	0.6±0.05	Fig. 1
C4	3.0 max.	0.6±0.05	Fig. 2

Marking

Temp. Char. Nominal Body Diameter	SL	В	Е
ø7mm	10J 6KV		
ø8-9mm	47J 6KV 66	331K 6KV 66	
ø10-15mm	151J 6KV (M 66	B 102K 6KV (M 66	222Z 6KV (M 66
Temperature Characteristics	Marked with code for char. B (c	omitted for nominal body diameter	r ø9mm and under)
Nominal Capacitance	Under 100pF: Actual value, 10	0pF and over: Marked with 3 figur	res
Capacitance Tolerance	Marked with code		
Rated Voltage	Marked with code (for DC6.3k\	/, marked with 6KV)	
Manufacturer's Identification	Marked with (omitted for no	minal body diameter ø9mm and u	ınder)
Manufactured Date Code	Abbreviation (omitted for nomin	nal body diameter ø7mm)	



SL Characteristics

Part Number	DC Rated Voltage	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	
DEC1X3J100JA3BMS1	6300Vdc	10pF±5%	7.0mm max.	7.5	7.0mm max.	
DEC1X3J100JC4BMS1	6300Vdc	10pF±5%	7.0mm max.	10.0	7.0mm max.	
DEC1X3J120JA3B	6300Vdc	12pF±5%	8.0mm max.	7.5	7.0mm max.	
DEC1X3J120JC4B	6300Vdc	12pF±5%	8.0mm max.	10.0	7.0mm max.	
DEC1X3J150JA3B	6300Vdc	15pF±5%	8.0mm max.	7.5	7.0mm max.	
DEC1X3J150JC4B	6300Vdc	15pF±5%	8.0mm max.	10.0	7.0mm max.	
DEC1X3J180JA3B	6300Vdc	18pF±5%	9.0mm max.	7.5	7.0mm max.	
DEC1X3J180JC4B	6300Vdc	18pF±5%	9.0mm max.	10.0	7.0mm max.	
DEC1X3J220JA3B	6300Vdc	22pF±5%	9.0mm max.	7.5	7.0mm max.	
DEC1X3J220JC4B	6300Vdc	22pF±5%	9.0mm max.	10.0	7.0mm max.	
DEC1X3J270JA3B	6300Vdc	27pF±5%	9.0mm max.	7.5	7.0mm max.	
DEC1X3J270JC4B	6300Vdc	27pF±5%	9.0mm max.	10.0	7.0mm max.	
DEC1X3J330JA3B	6300Vdc	33pF±5%	9.0mm max.	7.5	7.0mm max.	
DEC1X3J330JC4B	6300Vdc	33pF±5%	9.0mm max.	10.0	7.0mm max.	
DEC1X3J390JA3B	6300Vdc	39pF±5%	9.0mm max.	7.5	7.0mm max.	
DEC1X3J390JC4B	6300Vdc	39pF±5%	9.0mm max.	10.0	7.0mm max.	
DEC1X3J470JA3B	6300Vdc	47pF±5%	9.0mm max.	7.5	7.0mm max.	
DEC1X3J470JC4B	6300Vdc	47pF±5%	9.0mm max.	10.0	7.0mm max.	
DEC1X3J560JC4B	6300Vdc	56pF±5%	10.0mm max.	10.0	7.0mm max.	
DEC1X3J680JC4B	6300Vdc	68pF±5%	12.0mm max.	10.0	7.0mm max.	
DEC1X3J820JC4B	6300Vdc	82pF±5%	12.0mm max.	10.0	7.0mm max.	
DEC1X3J101JC4B	6300Vdc	100pF±5%	13.0mm max.	10.0	7.0mm max.	
DEC1X3J121JC4B	6300Vdc	120pF±5%	14.0mm max.	10.0	7.0mm max.	
DEC1X3J151JC4B	6300Vdc	150pF±5%	15.0mm max.	10.0	7.0mm max.	

B Characteristics

Part Number	DC Rated Voltage	Capacitance	Capacitance Body Dia. D		Body Thickness T
DECB33J101KC4B	6300Vdc 100pF±10% 9.0		9.0mm max.	10.0	7.0mm max.
DECB33J151KC4B	6300Vdc	150pF±10%	9.0mm max.	10.0	7.0mm max.
DECB33J221KC4B	6300Vdc	220pF±10%	9.0mm max.	10.0	7.0mm max.
DECB33J331KC4B	6300Vdc	330pF±10%	9.0mm max.	10.0	7.0mm max.
DECB33J471KC4B	4B 6300Vdc 470		10.0mm max.	10.0	7.0mm max.
DECB33J681KC4B	6300Vdc	680pF±10%	11.0mm max.	10.0	7.0mm max.
DECB33J102KC4B	6300Vdc	1000pF±10%	13.0mm max.	10.0	7.0mm max.

E Characteristics

Part Number	DC Rated Voltage Capacitance		Body Dia. D	Lead Spacing F (mm)	Body Thickness T	
DECE33J102ZC4B	6300Vdc	1000pF+80/-20%	11.0mm max.	10.0	7.0mm max.	
DECE33J222ZC4B	6300Vdc	2200pF+80/-20%	15.0mm max.	10.0	7.0mm max.	



DEC Series Specifications and Test Methods

No.		Item	Specifications	Test Method		
1	Operating Temper	ature Range	-25 to +85°C			
2	Appearance and [Dimensions	No visible defect, 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.		
		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)		
4	Dielectric Strength	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 DC voltage of 1.3kV 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±0.2kHz (Char. SL: 1±0.2MHz) and AC5V(r.m.s.) max.		
7	Q		Char. SL: 400+20C*2min. (30pF under) 1000 min. (30pF min.)	The dissipation factor and Q should be measured at 20°C with 1±0.2kHz (Char. SL: 1±0.2MHz) and AC5V(r.m.s.) max.		
	Dissipation Factor	(D.F.)	Char. B, E: 2.5% max.			
			Char. SL: +350 to -1000ppm/°C (Temp. range: +20 to +85°C) Char. B: Within ±10% Char. E: Within +20/-55%	The capacitance measurement should be made at each step specified in the Table.		
8	Temperature Characteristics		Step 1	at 85±2°C for 1 hr., then placed at rs. before measurements. (Char. B, E) 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 and keep it for 10±1 sec. Each lead wire should be subjected to 5N of weight and bent		
		Bending		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.		
		Appearance	No marked defect	The capacitor should be firmly soldered to the supporting lead		
	Vibration	Capacitance	Within specified tolerance	wire and vibrated at a frequency range of 10 to 55Hz, 1.5mm in		
10	Resistance	Q	Char. SL: 400+20C*2min. (30pF under) 1000 min. (30pF min.)	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.		
		D.F.	Char. B, E: 2.5% max.			
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		
		Appearance	No marked defect	The lead wire should be immersed into the melted solder of		
	Soldering Effect	Capacitance Change	Char. SL: Within ±2.5% Char. B: Within ±5% Char. E: Within ±15%	350±10°C up to about 1.5 to 2mm from the main body for 3.5±0.5 sec. Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr.,		
12	Soldering Effect (Non-Preheat)	Change Char. E: Within ±5% Char. E: Within ±15%		then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ (Char. SL) Post-treatment: Capacitor should be stored for 4 to 24 hrs. at room condition.*¹ (Char. B, E)		

 $^{^{\}star 1}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

Continued on the following page.





 $^{^{\}star_2}$ "C" expresses nominal capacitance value (pF).

DEC Series Specifications and Test Methods

Continued from the preceding page.

		em Specifications		Test Method				
		Appearance	No marked defect	First the capacitor should be				
		Capacitance Change	Char. SL: Within ±2.5% Char. B: Within ±5% Char. E: Within ±15%	stored at 120+0/-5°C for 60+0/-5 sec. Then, as in the figure, the lead wires should be immersed in				
13	Soldering Effect (On-Preheat)	Dielectric Strength (Between Lead Wires)	Per item 4.	solder of 260+0/-5°C up to 1.5 to 2.0mm from the root of terminal for 7.5+0/-1 sec. Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ (Char. SL) Post-treatment: Capacitor should be stored for 4 to 24 hrs. at room condition.*¹ (Char. B, E)				
		Appearance	No marked defect	The capacitor should be subjected to 5 temperature cycles,				
		Capacitance Change	Char. SL: Within ±3% Char. B: Within ±10% Char. E: Within ±20%	<pre>then consecutively to 2 immersion cycles. </pre> <pre></pre> <pre></pre> <pre>Step Temperature (°C) Time (min)</pre>				
		Q	Char. SL: 275+5/2C*2min. (30pF under) 350 min. (30pF min.)	1 -25±3 30 2 Room Temp. 3				
		D.F.	Char. B, E: 4.0% max.	3 85±3 30 4 Room Temp. 3				
	Temperature	I.R.	2000MΩ min.	4 Room Temp. 3 Cycle time: 5 cycles				
14	and Immersion			<immersion cycle=""></immersion>				
	Cycle			Step Temperature (°C) Time (min) Immersion Water 1 65+5/-0 15 Clean water				
		Dielectric Strength		2 0±3 15 Salt water				
				Cycle time: 2 cycles				
		Wires)		Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 4 to 24 hrs. at room condition.*¹				
		Appearance	No marked defect	Set the capacitor for 500+24/-0 hrs. at 40±2°C in 90 to 95% relative humidity. Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr.,				
	Humidity (Under	Capacitance Change	Char. SL: Within ±5% Char. B: Within ±10%					
15	Humidity (Under Steady State)	Change	Char. E: Within ±20%					
		Q	Char. E: Within ±20% Char. SL: 275+5/2C*2min. (30pF under) 350 min. (30pF min.)	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E)				
			Char. SL: 275+5/2C*2min. (30pF under)	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*1 for 24±2 hrs.				
		Q	Char. SL: 275+5/2C*2min. (30pF under) 350 min. (30pF min.)	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at				
		Q D.F.	Char. SL: 275+5/2C*2min. (30pF under) 350 min. (30pF min.) Char. B, E: 5.0% max.	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹				
		Q D.F. I.R.	Char. SL: 275+5/2C*2min. (30pF under) 350 min. (30pF min.) Char. B, E: 5.0% max. 1000MΩ min.	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ Apply the rated voltage for 500+24/-0 hrs. at 40±2°C in 90 to 95% relative humidity. (Charge/Discharge current≦50mA.) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs.				
16		Q D.F. I.R. Appearance Capacitance	Char. SL: 275+5/2C*2min. (30pF under) 350 min. (30pF min.) Char. B, E: 5.0% max. 1000MΩ min. No marked defect Char. SL: Within ±7.5% Char. B: Within ±10%	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ Apply the rated voltage for 500+24/-0 hrs. at 40±2°C in 90 to 95% relative humidity. (Charge/Discharge current≦50mA.) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ (Char. SL)				
16	Steady State) Humidity	Q D.F. I.R. Appearance Capacitance Change	Char. SL: 275+5/2C*2min. (30pF under) 350 min. (30pF min.) Char. B, E: 5.0% max. 1000MΩ min. No marked defect Char. SL: Within ±7.5% Char. B: Within ±10% Char. E: Within ±20% Char. SL: Under in the content of	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ Apply the rated voltage for 500+24/-0 hrs. at 40±2°C in 90 to 95% relative humidity. (Charge/Discharge current≤50mA.) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ (Char. SL) Post-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs.				
16	Steady State) Humidity	Q D.F. I.R. Appearance Capacitance Change	Char. SL: 275+5/2C*²min. (30pF under) 350 min. (30pF min.) Char. B, E: 5.0% max. 1000MΩ min. No marked defect Char. SL: Within ±7.5% Char. B: Within ±10% Char. E: Within ±20% Char. SL: 100+10/3C*²min. (30pF under) 200 min. (30pF min.)	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ Apply the rated voltage for 500+24/-0 hrs. at 40±2°C in 90 to 95% relative humidity. (Charge/Discharge current≦50mA.) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ (Char. SL) Post-treatment: Capacitor should be stored at 85±2°C for 1 hr.,				
16	Steady State) Humidity	Q D.F. I.R. Appearance Capacitance Change Q D.F.	Char. SL: 275+5/2C*²min. (30pF under) 350 min. (30pF min.) Char. B, E: 5.0% max. 1000MΩ min. No marked defect Char. SL: Within ±7.5% Char. B: Within ±10% Char. E: Within ±20% Char. SL: 100+10/3C*²min. (30pF under) 200 min. (30pF min.) Char. B, E: 5.0% max.	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ Apply the rated voltage for 500+24/-0 hrs. at 40±2°C in 90 to 95% relative humidity. (Charge/Discharge current≦50mA.) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ (Char. SL) Post-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs.				
16	Steady State) Humidity	Q D.F. I.R. Appearance Capacitance Change Q D.F. I.R.	Char. SL: 275+5/2C*²min. (30pF under) 350 min. (30pF min.) Char. B, E: 5.0% max. 1000MΩ min. No marked defect Char. SL: Within ±7.5% Char. B: Within ±10% Char. E: Within ±20% Char. SL: 100+10/3C*²min. (30pF under) 200 min. (30pF min.) Char. B, E: 5.0% max. 500MΩ min.	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ Apply the rated voltage for 500+24/-0 hrs. at 40±2°C in 90 to 95% relative humidity. (Charge/Discharge current≦50mA.) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ (Char. SL) Post-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. (Char. B, E) Apply a DC voltage of 150% of the rated voltage for 1000+48/-0 hrs. at 85±2°C with a relative humidity of 50% max. (Charge/Discharge current≦50mA.) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr.,				
16	Steady State) Humidity	Q D.F. I.R. Appearance Capacitance Change Q D.F. I.R. Appearance Capacitance	Char. SL: 275+5/2C*²min. (30pF under) 350 min. (30pF min.) Char. B, E: 5.0% max. 1000MΩ min. No marked defect Char. SL: Within ±7.5% Char. B: Within ±10% Char. E: Within ±20% Char. SL: 100+10/3C*²min. (30pF under) 200 min. (30pF min.) Char. B, E: 5.0% max. 500MΩ min. No marked defect Char. SL: Within ±3% Char. B: Within ±10%	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ Apply the rated voltage for 500+24/-0 hrs. at 40±2°C in 90 to 95% relative humidity. (Charge/Discharge current≤50mA.) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ (Char. SL) Post-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. (Char. B, E) Apply a DC voltage of 150% of the rated voltage for 1000+48/-0 hrs. at 85±2°C with a relative humidity of 50% max. (Charge/Discharge current≤50mA.) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at				
_	Steady State) Humidity Loading	Q D.F. I.R. Appearance Capacitance Change Q D.F. I.R. Appearance Capacitance Change	Char. SL: 275+5/2C*²min. (30pF under) 350 min. (30pF min.) Char. B, E: 5.0% max. 1000MΩ min. No marked defect Char. SL: Within ±7.5% Char. B: Within ±10% Char. E: Within ±20% Char. SL: 100+10/3C*²min. (30pF under) 200 min. (30pF min.) Char. B, E: 5.0% max. 500MΩ min. No marked defect Char. SL: Within ±3% Char. B: Within ±10% Char. B: Within ±10% Char. E: Within ±20% Char. SL: 275+5/2C*²min. (30pF under)	Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ Apply the rated voltage for 500+24/-0 hrs. at 40±2°C in 90 to 95% relative humidity. (Charge/Discharge current≤50mA.) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E) Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*¹ (Char. SL) Post-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. (Char. B, E) Apply a DC voltage of 150% of the rated voltage for 1000+48/-0 hrs. at 85±2°C with a relative humidity of 50% max. (Charge/Discharge current≤50mA.) Pre-treatment: Capacitor should be stored at 85±2°C for 1 hr., then placed at room condition*¹ for 24±2 hrs. before initial measurements. (Char. B, E)				

 $^{^{\}star_1}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa



^{*2 &}quot;C" expresses nominal capacitance value (pF).

High Voltage Ceramic Capacitors



DEF Series (Only for LCD Backlight Inverter Circuit/6.3kVp-p)

■ Features

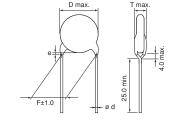
- 1. Compact size: Diameter is 20% less than DEC series.
- 2. Low self-heating at high frequency and high voltage due to low dielectric loss of the ceramic material.
- 3. Operating temperature range is guaranteed up to 105 degrees C.
- 4. Coated with flame-retardant epoxy resin (equivalent to UL94V-0 standard). Please contact us when a halogen-free product* is necessary.
 - * CI=900ppm max., Br=900ppm max. and CI+Br=1500ppm max.
- 5. Taping available for automatic insertion.

Applications

Ideal for use in LCD backlight inverters.

Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids. Only Murata products clearly stipulated as "for Automotive use" on its catalog can be used for automobile applications such as power train and safety equipment.



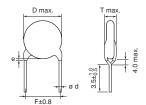


(in mm)

Lead Code	Coating Extension
A3	Up to the end of cr

n e rimp 0.6±0.05





[Bulk] Vertical Crimp Short (J3)

Lead Code Coating Extension e		ø d
J3	Up to the end of crimp	0.6±0.05

Marking

- Marking					
Temp. Char. Nominal Body Diameter	СН	SL			
ø7-9mm	10J 6K~ 66	33J 6K~ 66			
Temperature Characteristics	Upper horizontal line	-			
Nominal Capacitance	Actual value				
Capacitance Tolerance	Marked with code				
Rated Voltage	Marked with code (Marked with 6K~)				
Manufactured Date Code	Abbreviation				

SL Characteristics

Part Number	Rated Voltage	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEF1XLH100J□□□	6300Vdc(p-p)	10pF±5%	7.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF1XLH120J□□□	6300Vdc(p-p)	12pF±5%	7.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF1XLH150J□□□	6300Vdc(p-p)	15pF±5%	7.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF1XLH180J□□□	6300Vdc(p-p)	18pF±5%	7.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF1XLH220J□□□	6300Vdc(p-p)	22pF±5%	7.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF1XLH270J□□□	6300Vdc(p-p)	27pF±5%	8.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF1XLH330J□□□	6300Vdc(p-p)	33pF±5%	9.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF1XLH390J□□□	6300Vdc(p-p)	39pF±5%	9.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF1XLH470J□□□	6300Vdc(p-p)	47pF±5%	9.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A

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



CH Characteristics

Part Number	Rated Voltage	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DEF2CLH020C□□□	6300Vdc(p-p)	2.0pF±0.25pF	7.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF2CLH030C□□□	6300Vdc(p-p)	3.0pF±0.25pF	7.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF2CLH040C□□□	6300Vdc(p-p)	4.0pF±0.25pF	7.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF2CLH050D□□□	6300Vdc(p-p)	5.0pF±0.5pF	7.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF2CLH060D□□□	6300Vdc(p-p)	6.0pF±0.5pF	7.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF2CLH070D□□□	6300Vdc(p-p)	7.0pF±0.5pF	8.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF2CLH080D□□□	6300Vdc(p-p)	8.0pF±0.5pF	8.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF2CLH090D□□□	6300Vdc(p-p)	9.0pF±0.5pF	8.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A
DEF2CLH100J□□□	6300Vdc(p-p)	10pF±5%	8.0mm max.	7.5	6.0mm max.	A3B	J3B	N3A

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



DEF Series Specifications and Test Methods

No.		Item	Specifications	Test Method		
1	Operating Temper	rature Range	-25 to +105°C			
2	Appearance and Dimensions		No visible defect, 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.		
		Between Lead Wires	No failure	The capacitor should not be damaged when DC12.6kV is applied between the lead wires for 1 to 5 sec. (Charge/Discharge current≦50mA)		
4	Dielectric Strength	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 2.0mm off the metal balls as shown in the figure at right, and DC voltage of 1.3kV 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 Cha	racteristics	Char. CH: 0±60ppm/°C Char. SL: +350 to -1000ppm/°C (Temp. range: +20 to +85°C)	The capacitance measurement should be made at each step specified in the Table.		
			Step 1 Temp. (°C) 20±2	2 3 4 5 -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 and keep it for 10±1 sec.		
		Bending		Each lead wire should be subjected to 5N 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.		
		Appearance	No marked defect	The capacitor should be firmly soldered to the supporting lead		
10	Vibration	Capacitance	Within specified tolerance	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		
	Resistance	Q	400+20C*2min. (30pF under) 1000 min. (30pF min.)	from 10Hz to 55Hz and back to 10Hz. Apply for a total of 6 hrs., 2 hrs. each in 3 mutually perpendicular directions.		
11	1 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 2.0mm 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		
		Appearance	No marked defect			
12	Soldering Effect	Capacitance Change	Within ±2.5%	The lead wire should be immersed into the melted solder of 350±10°C up to about 1.5 to 2.0mm from the main body for 3.5±0.5 sec.		
12	(Non-Preheat) Claring Change Dielectric Strength (Between Lead Wires)		Per item 4.	.5±0.5 sec. lost-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*1		

 $^{^{\}star 1}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

Continued on the following page.





^{*2 &}quot;C" expresses nominal capacitance value (pF).

DEF Series Specifications and Test Methods

Continued from the preceding page.

No.		Item	Specifications	Test Method			
		Appearance Capacitance Change	No marked defect Within ±2.5%	First the capacitor should be stored at 120+0/-5°C for 60+0/-5 sec. Then, as in the figure, the lead wires should be immersed in 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 room condition.*1			
13	Soldering Effect (On-Preheat)	Dielectric Strength (Between Lead Wires)	Per item 4.				
		Appearance	No marked defect	The capacitor should be subjected to 5 temperature cycles,			
		Capacitance Change	Within ±3%	then consecutively to 2 immersion cycles. <temperature cycle=""></temperature>			
		Q	200+10C*2min. (10pF under) 275+5/2C*2min. (10pF min. and 30pF under) 350 min. (30pF min.)	Step Temperature (°C) Time (min) 1 -25±3 30 2 Room Temp. 3			
14	Temperature	I.R.	2000MΩ min.	3 105±3 30 4 Room Temp. 3			
	and immersion Cycle			Cycle time: 5 cycles Immersion Cycle> Step Temperature (°C) Time (min) Immersion Water			
		Dielectric Strength (Between Lead Wires)	5	1 65+5/-0 15 Clean water			
			Per item 4.	2 0±3 15 Salt water			
				Cycle time: 2 cycles Post-treatment: Capacitor should be stored for 4 to 24 hrs. at room condition.*1			
		Appearance	No marked defect				
	Humidity (Under	Capacitance Change	Within ±5%	Set the capacitor for 500 +24/-0 hrs. at 40±2°C in 90 to 95% relative humidity.			
15	Steady State)	Q	200+10C*2min. (10pF under) 275+5/2C*2min. (10pF min. and 30pF under) 350 min. (30pF min.)	Post-treatment: Capacitor should be stored for 1 to 2 hrs. at			
		I.R.	1000MΩ min.				
		Appearance	No marked defect	Apply 6.3kVp-p at the frequency in the Table for 1000+48/-0			
		Capacitance Change	Within ±3%	hrs. at 105±2°C with a relative humidity of 50% max. (Charge/Discharge current≦50mA.) <frequency></frequency>			
16	Life	Q	200+10C*2min. (10pF under) 275+5/2C*2min. (10pF min. and 30pF under) 350 min. (30pF min.)	Capacitance (pF) Frequency (kHz) to 10 100 12 to 22 45			
		I.R.	2000MΩ min.	27 to 47 33 Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*1			

 $^{^{\}star 1}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

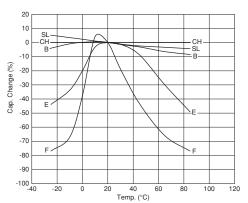


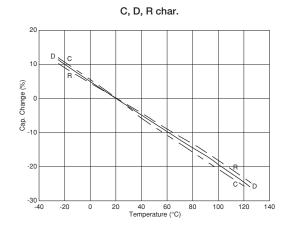
^{*2 &}quot;C" expresses nominal capacitance value (pF).

High Voltage Ceramic Capacitors Characteristics Data (Typical Example)

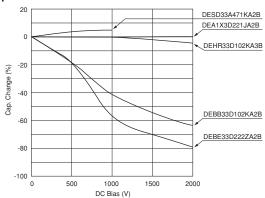
■ Capacitance - Temperature Characteristics

CH, SL, B, E, F char.





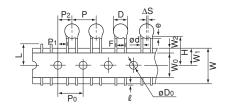
■ Capacitance - DC Bias Characteristics



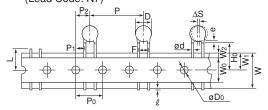
High Voltage Ceramic Capacitors Packaging

■ Taping Specifications

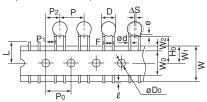
• 15.0mm pitch / lead spacing 7.5mm taping Straight type (Lead Code: P3)



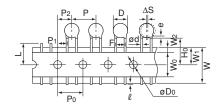
• 30.0mm pitch / lead spacing 7.5mm taping Vertical crimp type (Lead Code: N7)



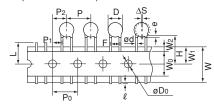
• 12.7mm pitch / lead spacing 5.0mm taping Vertical crimp type (Lead Code: N2)

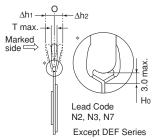


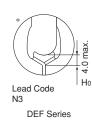
● 15.0mm pitch / lead spacing 7.5mm taping Vertical crimp type (Lead Code: N3)



• 12.7mm pitch / lead spacing 5.0mm taping Straight type (Lead Code: P2)









Item	Code	P3	N3	N7	P2	N2	
Pitch of component	Р	15.0	±2.0	30.0±2.0	12.7	±1.0	
Pitch of sprocket hole	P ₀		15.0±0.3		12.7	±0.3	
Lead spacing	F		7.5±1.0		5.0)+0.8 -0.2	
Length from hole center to component center	P ₂	7.5±1.5 6.35±1.3					
Length from hole center to lead	P1		3.75±1.0		3.85	±0.7	
Body diameter	D		See the indi	vidual product sp	pecifications.		
Deviation along tape, left or right	ΔS	0±2.0 0±1.0					
Carrier tape width	W	18.0±0.5					
Position of sprocket hole	W ₁	9.0±0.5					
Lead distance between reference	Н	20.0 ^{+1.5}	_		20.0 +1.5		
and bottom planes	Ho	$-$ 18.0 $^{+2.0}_{-0}$ $-$ 18.0 $^{+6}_{-0}$				18.0 ^{+2.0}	
Protrusion length	ℓ			+0.5 to -1.0			
Diameter of sprocket hole	øD0			4.0±0.1			
Lead diameter	ød			0.6±0.05			
Total tape thickness	t1			0.6±0.3			
Total thickness, tape and lead wire	t2			1.5 max.			
Body thickness	Т		See the indi	vidual product sp	ecifications.		
Portion to cut in case of defect	L			11.0 +0			
Hold down tape width	Wo			11.5 min.			
Hold down tape position	W2			1.5±1.5			
Coating extension on lead	е	3.0	max. (Vertical	crimp type: Up to	o the end of crim	ıp)	
Deviation across tape, front	∆h1		2.0 max.		1.0 (
Deviation across tape, rear	∆h2		Z.U IIIaX.		1.01	IIax.	

(in:mm)

High Voltage Ceramic Capacitors Packaging

Continued from the preceding page.

■ Packaging Styles



■ Minimum Quantity (Order in Sets Only)

[Bulk]			(pcs./Bag)
	Body Dia. D (mm)	Lead Code A□, C□	Lead Code B□, D□, J□
	(11111)	Long	Short
	4.5 to 6	500	500
DE0.0	7	250 *1	500
DES Series	8 to 11	250	500
DEH Series	12	200 *2	250 *3
DEA Series	13, 14	200	250
DEB Series	15 to 18	100	200
	19 to 21	50	100
DE0.0 :	7 to 9	250	500
DEC Series	10, 11	100	_
DEF Series	12 to 15	100	_

^{*1} Lead Spacing F=5.0mm (Code: A2): 500pcs.

^{*3} Rated Voltage DC500V (Code: 2H): 500pcs.

[Taping]	(pcs./Ammo Pack			
Lead Code	N2, P2	N3, P3	N7	
DES Series	1,500	1,000	500	
DEH Series	1,500	900 *4	500	
DEA Series	1,500	900 *4	500	
DEB Series	1,500	900 *4	500	
DEF Series	_	900	_	

^{*4} Rated Voltage DC1kV (Code: 3A): 1,000pcs.



^{*2} Rated Voltage DC500V (Code: 2H): 250pcs.

■ **(Caution (Rating)**

<DES/DEH/DEA/DEB/DEC Series>

1. Operating Voltage

When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the Vp-p value of the applied voltage or the Vo-p that contains DC bias within the rated voltage range.

When the voltage is applied to the circuit, starting or stopping may generate irregular voltage for a transit period because of resonance or switching. Be sure to use a capacitor with a rated voltage range that includes these irregular voltages.

When using the low-dissipation DEA (SL Char.) /DEC (SL Char.) /DEH (C, R Char.) /DES (D Char.) series in a high-frequency and high-voltage circuit, be sure to read the instructions in item 4.

When DC-rated capacitors are to be used in input circuits from commercial power source (AC filter), be sure to use Safety Certified Capacitors because various regulations on withstand voltage or impulse withstand established for each type of equipment should be taken into consideration.

Voltage	DC Voltage	DC+AC Voltage	AC Voltage	Pulse Voltage (1)	Pulse Voltage (2)
Positional Measurement	Vo-p	Vo-p	Vp-p	Vp-p	Vp-p

2. Operating Temperature and Self-generated Heat

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself. When the capacitor is used in a high-frequency current, pulse current or similar current, it may self-generate heat due to dielectric loss. The frequency of the applied sine wave voltage should be less than 300kHz. The applied voltage load (*) should be such that the capacitor's self-generated heat is within 20°C in an atmospheric temperature of 25°C. When measuring, use a thermocouple of small thermal capacity-K of Ø0.1mm in conditions where the capacitor is not affected by radiant heat from other components or surrounding ambient fluctuations.

Excessive heat may lead to deterioration of the capacitor's characteristics and reliability. (Never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

*Before using the low-dissipation DEA/DEC (SL Char.)
/DEH/DES series, be sure to read the instructions in item 4.

3. Fail-Safe

When the capacitor is broken, failure may result in a short circuit. Be sure to provide an appropriate fail-safe function like a fuse on your product if failure could follow an electric shock, fire or fume.

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4. Load Reduction and Self-generated Heat During Application of High-frequency and High-voltage Due to the low self-heating characteristics of lowdissipation capacitors, the allowable electric power of these capacitors is generally much higher than that of B characteristic capacitors. However, if the self-heating temperature is 20°C under a high-frequency voltage whose peak-to-peak value equals the capacitor's rated voltage, the capacitor's power consumption may exceed its allowable electric power.

Therefore, when using the DEA/DEC (SL Char.) /DEH /DES series in a high-frequency and high-voltage circuit with a frequency of 1kHz or higher, make sure that the Vp-p values including the DC bias, do not exceed the applied voltage value specified in Table 1. Also make sure that the self-heating temperature (the difference between the capacitor's surface temperature and the capacitor's ambient temperature) at an ambient temperature of 25°C does not exceed the value specified in Table 1.

As shown in Fig. 2, the self-heating temperature depends on the ambient temperature. Therefore, if you are not able to set the ambient temperature to approximately 25°C, please contact our sales representatives or product engineers.

<Table 1> Allowable Conditions at High frequency

Occion	Temp.	DC	Allowab at High-	Capacitor's		
Series	Char.	Voltage Applied		Self-heating Temp. (25°C Ambient Temp.) *1	Ambient Temp. *2	
	С	500V	500Vp-p 20°C Max.			
		1kV	800Vp-p	20°C Max.		
		IKV	1000Vp-p	5°C Max.		
DEH	R	2kV	1400Vp-p	20°C Max.		
		ZKV	2000Vp-p	5°C Max.		
		3.15kV	1600Vp-p	20°C Max.		
		3.13KV	3150Vp-p	5°C Max.	-25 to +85°C	
		1kV	1000Vp-p		-23 to +65 C	
DEA	SL	2kV	2000Vp-p	5°C Max.		
		3.15kV	3150Vp-p			
DEC	SL	6.3kV	6300Vp-p	5°C Max.		
		500V	500Vp-p	15°C Max.		
DES	D	1kV	800Vp-p	15 O IVIAX.		
		11//	1000Vp-p	5°C Max.		

^{*1} Fig. 1 shows the relationship between the applied voltage and the allowable selfheating temperature regarding 1 to 3.15kV rated voltage of the DEH series R characteristic and 1kV rated voltage of the DES series D characteristic.

We are offering free software, The Capacitor Selection Tool: by Voltage Form, which will assist you in selecting a suitable capacitor.

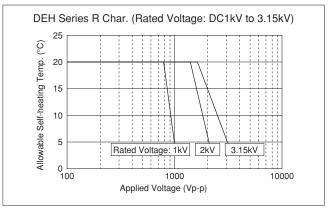
The software can be downloaded from Murata's Web site (http://www.murata.com/products/design_support/mmcsv/ index.html).

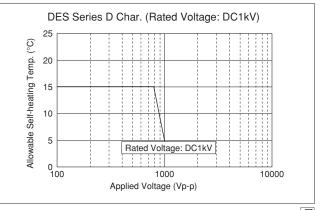
By inputting capacitance values and applied voltage waveform of the specific capacitor series, this software will calculate the capacitor's power consumption and list suitable capacitors.

When the result of this software is different from the measurement result of the self-heating temperature on your side, please contact our sales representatives or product engineers.

FAILURE TO FOLLOW THE ABOVE CAUTIONS (ITEMS 1 TO 4) MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

<Fig. 1> Relationship Between Applied Voltage and Self-heating Temperature (Allowable Self-heating Temp. at 25°C Ambient Temp.)





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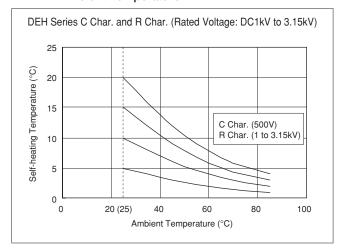


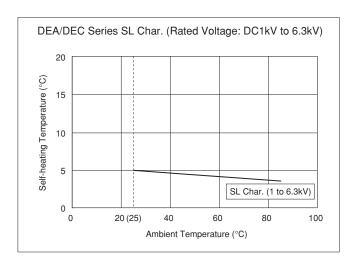
^{*2} When the ambient temperature is 85 to 125°C, the applied voltage needs to be further reduced. If the DEA/DEH/DES series needs to be used at an ambient temperature of 85 to 125°C, please contact our sales representatives or product

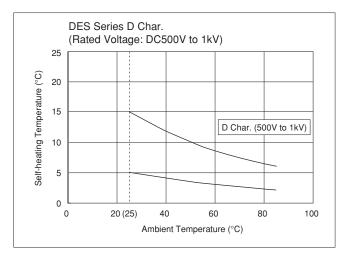
^{*3} Fig. 3 shows reference data on the allowable voltage - frequency characteristics for a sine wave voltage.

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<Fig. 2> Dependence of Self-heating Temperature on **Ambient Temperature**







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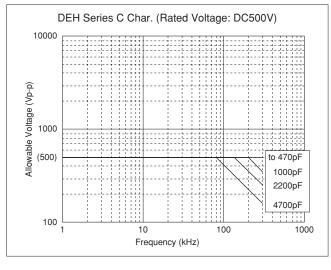


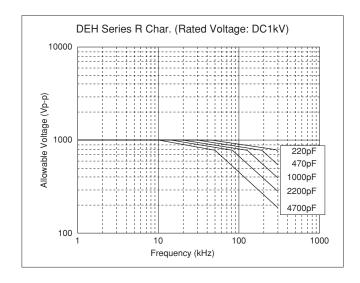
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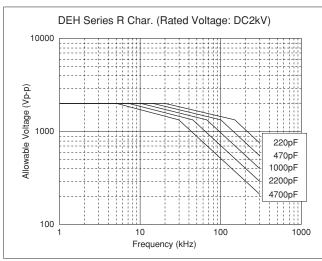
<Fig. 3> Allowable Voltage (Sine Wave Voltage) - Frequency Characteristics (At Ambient Temperature of 85°C or less) Because of the influence of harmonics, when the applied voltage is a rectangular wave or pulse wave voltage (instead of a sine wave voltage), the heat generated by the capacitor is higher than the value obtained by application of the sine wave with the same fundamental frequency.

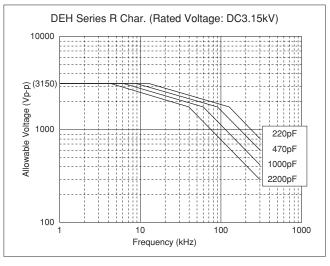
Roughly calculated for reference, the allowable voltage for a rectangular wave or pulse wave corresponds approximately

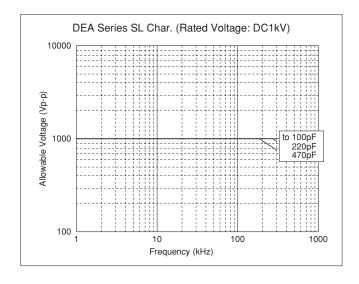
to the allowable voltage for a sine wave whose fundamental frequency is twice as large as that of the rectangular wave or pulse wave. This allowable voltage, however, varies depending on the voltage and current waveforms. Therefore, you are requested to make sure that the selfheating temperature is not higher than the value specified in Table 1.

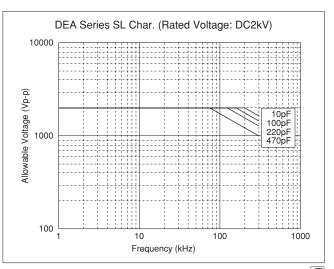












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<Fig. 3 (continued)> Allowable Voltage (Sine Wave Voltage) -Frequency Characteristics (At Ambient Temperature of 85°C or less)

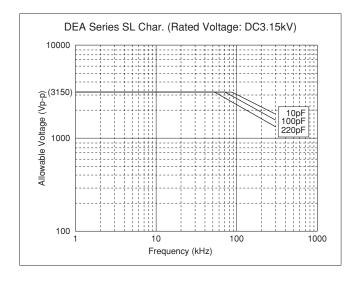
Because of the influence of harmonics, when the applied voltage is a rectangular wave or pulse wave voltage (instead of a sine wave voltage), the heat generated by the capacitor is higher than the value obtained by application of the sine wave with the same fundamental frequency.

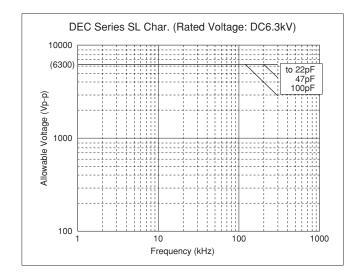
Roughly calculated for reference, the allowable voltage for a rectangular wave or pulse wave corresponds

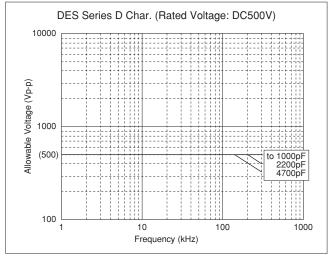
approximately to the allowable voltage for a sine wave whose fundamental frequency is twice as large as that of the rectangular wave or pulse wave.

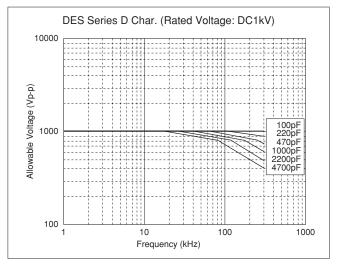
This allowable voltage, however, varies depending on the voltage and current waveforms.

Therefore, you are requested to make sure that the self-heating temperature is not higher than the value specified in Table 1.







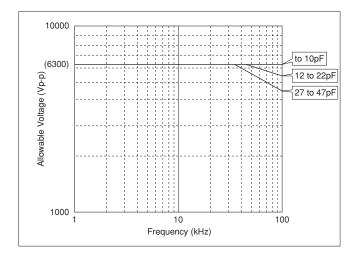


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<DEF Series>

1. Operating Voltage

The frequency of the applied sine wave voltage should be less than 100kHz. The applied voltage should be less than the value shown in the figure below. For non-sine wave that includes a harmonic frequency, please contact our sales representatives or product engineers.



The temperature of the surface of the capacitor: below the upper limit of its rated operating temperature range (including self-heating).

The capacitor can be applied at a maximum of 6.3kVp-p at 100kHz when the lamp is turned on.

Voltage	AC Voltage
Positional Measurement	Vp-p

2. Operating Temperature and Self-generated Heat Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself. When the capacitor is used in a highfrequency current, pulse current or similar current, it may self-generate heat due to dielectric loss. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability. (Never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

3. Fail-Safe

When the capacitor is broken, failure may result in a short circuit. Be sure to provide an appropriate fail-safe function like a fuse on your product if failure could result in an electric shock, fire or fume.

■ ①Caution (Storage and Operating Condition)

Operating and Storage Environment
The insulating coating of capacitors does not form a perfect seal; therefore, do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. Also, avoid exposure to moisture. Before cleaning, bonding or molding this product, verify that these processes do not affect product quality by testing the performance of a cleaned, bonded or molded product in the intended equipment. Store the capacitors where the

temperature and relative humidity do not exceed -10

Use capacitors within 6 months after delivery. Check the solderability after 6 months or more.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

■ ①Caution (Soldering and Mounting)

to 40 degrees centigrade and 15 to 85%.

1. Vibration and Impact

Do not expose a capacitor or its lead wires to excessive shock or vibration during use. Excessive shock or vibration may cause fatigue destruction of lead wires mounted on the circuit board.

Please take measures to hold a capacitor on the circuit boards by adhesive, molding resin or another coating.

Please confirm there is no influence of holding measures on the product with the intended equipment.

2. Soldering

When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specification of the capacitor. Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element.

Soldering the capacitor with a soldering iron should be performed in following conditions.

Temperature of iron-tip: 400 degrees C. max.

Soldering iron wattage: 50W max. Soldering time: 3.5 sec. max.

3. Bonding, Resin Molding and Coating

For bonding, molding or coating this product, verify that these processes do not affect the quality of the capacitor by testing the performance of the bonded, molded or coated product in the intended equipment. When the amount of applications, dryness/hardening conditions of adhesives and molding resins containing organic solvents (ethyl acetate, methyl ethyl ketone, toluene, etc). are unsuitable, the outer coating resin of a capacitor is damaged by the organic solvents and it may result, worst case, in a short circuit. The variation in thickness of adhesive, molding resin

or coating may cause outer coating resin cracking and/or ceramic element cracking of a capacitor in a temperature cycling.

4. Treatment after Bonding, Resin Molding and Coating When the outer coating is hot (over 100 degrees C.) after soldering, it becomes soft and fragile. Therefore, please be careful not to give it mechanical stress.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

■ **(**Caution (Handling)

Vibration and Impact

Do not expose a capacitor or its lead wires to excessive shock or vibration during use. Excessive shock or vibration may cause fatigue destruction of lead wires mounted on the circuit board.

Please take measures to hold a capacitor on the circuit boards by adhesive, molding resin or another coating.

Please confirm there is no influence of holding measures on the product with the intended equipment.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.



High Voltage Ceramic Capacitors Notice

■ Notice (Soldering and Mounting)

Cleaning (ultrasonic cleaning)

To perform ultrasonic cleaning, observe the following conditions.

Rinse bath capacity: Output of 20 watts per liter or less.

Rinsing time: 5 min. maximum.

Do not vibrate the PCB/PWB directly.

Excessive ultrasonic cleaning may lead to fatigue

destruction of the lead wires.

■ Notice (Rating)

Capacitance Change of Capacitors

- DEA/DEC/DEF Series (Temp. Char. CH, SL)
 Capacitance might change a little depending on the surrounding temperature or an applied voltage.

 Please contact us if you intend to use this product in a strict time constant circuit.
- 2. DEB/DEC Series (Temp. Char. B, E, F) Capacitors have an aging characteristic, whereby the capacitor continually decreases its capacitance slightly if the capacitor is left on for a long time. Moreover, capacitance might change greatly depending on the surrounding temperature or an applied voltage. Therefore, it is not likely to be suitable for use in a time constant circuit. Please contact us if you need detailed information.

3. DEH/DES Series

Capacitance might change greatly depending on the surrounding temperature or an applied voltage. Therefore, it is not likely to be suitable for use in a time constant circuit. Please contact us if you need detailed information.



Safety Standard Certified Ceramic Capacitors for Automotive



Type KJ -Class X1, Y2- (For Automotive Use/AC Line Filter of PHEV/EV Charger)

Features

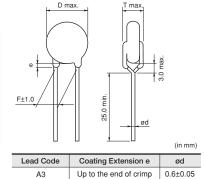
- 1. Capacitors designed for AC line filters for PHEV/EV.
- 2. Meet AEC-Q200
- 3. Heat cycle: 1000cycle (-55/+125 deg.)
- 4. Class X1/Y2 capacitors certified by UL/ENEC(VDE).
- 5. Rated Voltage: AC300V
- Coated with flame-retardant epoxy resin (conforming to UL94V-0 standard).
- Available product for RoHS Restriction (EU Directive 2002/95/EC).
- 8. Taping available for automatic insertion.

Applications

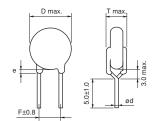
- Ideal for use as Y capacitors for AC line filters and primary-secondary coupling on battery chargers for PHEV/EV.
- 2. Ideal for use as a filter capacitor for DC-DC converters for PHEV/EV and HEV.











(in mm)

[Bulk] Vertical Crimp Short (B3)

Lead Code	Coating Extension e	ød
В3	Up to the end of crimp	0.6±0.05

Standard Certification

	Standard No.	Certified No.	Rated Voltage		
UL	UL 60384-14	E37921	AC300V(r.m.s.)		
ENEC (VDE)	EN 60384-14	40031217			

Marking

Example	Item			
	① Type Designation KJ			
2 472M 3 0 + KJ300~	② Nominal Capacitance (Marked with 3 figures)			
	③ Capacitance Tolerance			
X1 Y2	4 Company Name Code 615: Made in Thailand			
5 — 1D (M15/4)	⑤ Manufactured Date Code			
	Class Code X1Y2			
	Rated Voltage Mark	300~		

Part Number	AC Rated Voltage	Temp.	Capacitance	Body Dia. D	Lead Spacing F (mm)	Body Thickness T	Lead Package Long Bulk	Lead Package Short Bulk	Lead Package Taping
DE6B3KJ101K□□□	300Vac(r.m.s.)	В	100pF±10%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE6B3KJ151K□□□	300Vac(r.m.s.)	В	150pF±10%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE6B3KJ221K□□□	300Vac(r.m.s.)	В	220pF±10%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE6B3KJ331K□□□	300Vac(r.m.s.)	В	330pF±10%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE6B3KJ471K□□□	300Vac(r.m.s.)	В	470pF±10%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE6B3KJ681K□□□	300Vac(r.m.s.)	В	680pF±10%	9.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE6E3KJ102M□□□	300Vac(r.m.s.)	E	1000pF±20%	7.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE6E3KJ152M□□□	300Vac(r.m.s.)	E	1500pF±20%	8.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE6E3KJ222M□□□	300Vac(r.m.s.)	E	2200pF±20%	9.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE6E3KJ332M□□□	300Vac(r.m.s.)	E	3300pF±20%	10.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A
DE6E3KJ472M□□□	300Vac(r.m.s.)	Е	4700pF±20%	12.0mm max.	7.5	7.0mm max.	A3B	B3B	N3A

Three blank columns are filled with the lead and packaging codes. Please refer to the 3 columns on the right for the appropriate code.

Murata part numbers might be changed depending on lead code or any other changes. Therefore, please specify only the type name (KJ) and capacitance of products in the parts list when it is required for applying safety standard of electric equipment.

Ор	Operating Temperature Range: -40 to +125°C					
No.	No. Item		Specifications	Test Method		
1	Appearance and Dimensions		No visible defect, and dimensions are within specified range.	The capacitor should be visually inspected for evidence of defect. Dimensions should be measured with slide calipers.		
2	2 Marking		To be easily legible	The capacitor should be visually inspected.		
3	Capacitance		Within specified tolerance			
4	Dissipation Factor (D.F.)		Char. Specifications B, E D.F.≦2.5%	The dissipation factor should be measured at 20°C with 1±0.1kHz and AC5V(r.m.s.) max.		
5	5 Insulation Resistance (I.R.)		10000M Ω min.	The insulation resistance should be measured with DC500±50V within 60±5 sec. of charging. The voltage should be applied to the capacitor through a resistor of 1MΩ.		
		Between Lead Wires	The capacitor should not be damaged when the te from Table 1 are applied between the lead wires form Table 1 are applied between the lead wires form Table 1> Type Test Voltage KJ AC2600V(r.m.s.)			
6	Dielectric Strength	Body Insulation	No failure	First, the terminals of the capacitor should be connected together. Then, as shown in the figure at right, a metal foil should be closely wrapped around the body of the capacitor to the distance of about 3 to 4mm from each terminal. Then, the capacitor should be inserted into a container filled with metal balls of about 1mm diameter. Finally, AC voltage from Table 2 is applied for 60 sec. between the capacitor lead wires and metal balls. 		

^{* &}quot;Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

Continued on the following page.





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No.	11	em	Specifications	Test Method	
NO.	IL		·		
10	Vibration	Appearance Capacitance	No marked defect Within the specified tolerance	Solder the capacitor and gum up the body to the test jig (glass epoxy board) by resin (adhesive). Resin (Adhesive)	
		D.F.	Char. Specifications B, E D.F.≦2.5%	The capacitor should be firmly soldered to the supporting lea wire, 1.5mm in total amplitude, with about a 20 minutes rate of vibration change from 10Hz to 2000Hz and back to 10Hz. This motion should be applied 12 times in each of 3 mutually perpendicular directions (total of 36 times). The acceleration is 5g max.	
		Appearance	No marked defect	Solder the capacitor and gum	
		Capacitance	Within the specified tolerance	up the body to the test ijig (glass epoxy board) by Resin (Adhesive)	
11	Mechanical Shock	D.F.	Char. Specifications B, E D.F.≦5.0%	resin (adhesive). Three shocks in each direction should be applied along 3 mutually perpendicular axes to and from of the test specimen (18 abacks)	
		I.R.	10000MΩ min.	(18 shocks). The specified test pulse should be half-sine and should have a duration: 0.5ms, peak value: 100g and velocity change: 4.7m/s.	
		Appearance	No marked defect		
	Humidity	Capacitance Change	Char. Capacitance Change B Within ±10% E Within ±15%	Set the capacitor for 1000±12 hrs. at 85±3°C in 80 to 85% relative humidity.	
12	(Under Steady State)	D.F.	Char. Specifications B, E D.F.≦5.0%	Pre-treatment: Capacitor should be stored at 125±3°C for 1hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment:	
		I.R.	3000MΩ min.	Capacitor should be stored for 1 to 2 hrs. at room condition.*	
		Dielectric Strength	Per Item 6		
		Appearance	No marked defect	A 1 II	
13	Humidity Loading	Capacitance Change	Char. Capacitance Change B Within ±10% E Within ±15%	Apply the rated voltage for 1000±12 hrs. at 85±3°C in 80 to 85% relative humidity. Pre-treatment:	
		D.F.	Char. Specifications B, E D.F.≦5.0%	Capacitor should be stored at 125±3°C for 1hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition.*	
		I.R.	3000M $Ω$ min.	·	
		Appearance	No marked defect	Impulse Voltage	
	Life	Capacitance Change	Within ±20%	Each individual capacitor should be subjected to a 5kV impulses for three times. Then the capacitors are applied to life test.	
		I.R.	3000M $Ω$ min.	100 (%) 90 Front time (T1) =1.2µs=1.67T	
14		Dielectric Strength	Per Item 6	Time to half-value (T2) =50μs 30 1 Apply a voltage from Table 4 for 1000 hrs. at 125+2/-0°C, and relative humidity of 50% max. <table 4=""> Applied Voltage AC510V(r.m.s.), except that once each hour the voltage is increased to AC1000V(r.m.s.) for 0.1 sec. Pre-treatment: Capacitor should be stored at 125±3°C for 1hr., then placed at room condition* for 24±2 hrs. before initial measurements. Post-treatment:</table>	

 $^{^{\}star}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

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No.	Ite	em	Specifications	Test Method
15	Robustness of Terminations	Tensile	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 and keep it for 10±1 sec.
		Bending	not be broken.	Each lead wire should be subjected to 5N of weight and bent 90° at the point of egress, in one direction, then returend to its original position and bent 90° in the opposite direction at the rate of one bend in 2 to 3 sec.
				The capacitor should be individually wrapped in at least one, but not more than two, complete layers of cheesecloth. The capacitor should be subjected to 20 discharges. The interval between successive discharges should be 5 sec. The UAC should be maintained for 2 min. after the last discharge.
				S1
16	Active Flamma	bility	The cheesecloth should not catch on fire.	C1,2 : 1μF±10%
				Jx SkV
				The capacitor under test should be held in the flame in the position that best promotes burning. Each specimen should only be exposed once to the flame. Time of exposure to flame: 30 sec. Length of flame: 12±1mm Gas burner: Length 35mm min. Inside Dia. 0.5±0.1mm
17			The burning time should not exceed 30 sec. The tissue paper should not ignite.	Outside Dia. 0.9mm max. : Butane gas Purity 95% min. Test Specimen
				——Tissue ——About 10mm Thick Board
		Appearance	No marked defect	The capacitor should be subjected to 1000 temperature cycles.
18	Temperature Cycle	Capacitance Change	Char. Capacitance Change B Within ±10% E Within ±20%	Step Temperature (°C) Time (min) 1 -55+0/-3 30 2 Room temp. 3
		D.F.	Char. Specifications B, E D.F.≤5.0%	3 125+3/-0 30
		I.R.	3000MΩ min.	Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed
			5555H22 HHII.	at room condition* for 24±2 hrs.
		Dielectric Strength	Per Item 6	Post-treatment: Capacitor should be stored for 24±2 hrs. at room condition.*

 $^{^{\}star}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

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Capacitor should be stored for 24±2 hrs. at room condition.*





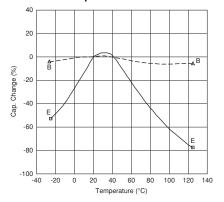
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No.	lo. Item		Specifications	Test Method			
	High	Capacitance Change	Within ±20%	Set the capacitor for 1000±12 hrs. at 150±3°C.			
19	Temperature Exposure (Storage)	D.F.	Char.SpecificationsB, ED.F.≦5.0%	Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs. Post-treatment:			
		I.R.	1000MΩ min.	Capacitor should be stored for 24±2 hrs. at room condition.*			
	Thermal Shock	Appearance	No marked defect except color change of outer coating.	The capacitor should be subjected to 300 cycles.			
20		Capacitance Change	Char. Capacitance Change B Within ±10% E Within ±20%	Step Temperature (°C) Time (min) 1 -55+0/-3 30 2 125+3/-0 30 Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed			
		D.F.	Char. Specifications B, E D.F.≦5.0%	at room condition* for 24±2 hrs. Post-treatment:			
		I.R.	3000M $Ω$ min.	Capacitor should be stored for 24±2 hrs. at room condition.*			
		Appearance	No marked defect				
21	Resistance to Solvents	Capacitance Change	Char. Capacitance Change B Within ±10% E Within ±20%	Per MIL-STD-202 Method 215 Solvent 1: 1 part (by volume) of isopropyl alcohol 3 parts (by volume) of mineral spirits Solvent 2: Terpene defluxer Solvent 3: 42 parts (by volume) of water 1 part (by volume) of propylene glycol monomethyl ether 1 part (by volume) of monoethanolomine			
		D.F.	Char. Specifications B, E D.F.≦5.0%				
		I.R.	3000M $Ω$ min.				
22		Appearance	No marked defect				
	Biased Humidity	Capacitance Change	Char. Capacitance Change B Within ±10% E Within ±15%	Apply the rated voltage and DC1.3+0.2/-0V (add 6.8kΩ resistor) at 85±3°C and 80 to 85% humidity for 1000±12 hrs. Pre-treatment: Capacitor should be stored at 125±3°C for 1hr., then placed			
		D.F.	Char.SpecificationsB, ED.F.≦5.0%	at room condition* for 24±2 hrs. Post-treatment: Capacitor should be stored for 24±2 hrs. at room condition.*			
		I.R.	3000M $Ω$ min.				
		Appearance	No marked defect	Apply 24 hrs. of heat (25 to 65°C) and humidity (80 to 98%) treatment shown below, 10 consecutive times.			
23	Moisture Resistance	Capacitance Change	Char. Capacitance Change B Within ±10% E Within ±20%	Pre-treatment: Capacitor should be stored at 125±3°C for 1 hr., then placed at room condition* for 24±2 hrs.			
		D.F.	Char. Specifications B, E D.F.≦5.0%	Post-treatment: Capacitor should be stored for 24±2 hrs. at room condition.* Humidity Humidity Humidity Humidity Humidity			
		I.R.	3000M Ω min.	90-98% 80-98% 80-98% 80-98% 90-98% 65 60 65 60 60 65 60 60 65 60 60 60 60 60 60 60 60 60 60 60 60 60			

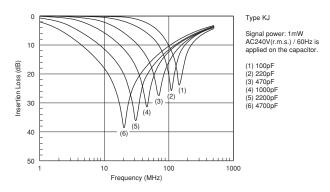
 $^{^{\}star}$ "Room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

Safety Certified Ceramic Capacitors for Automotive Characteristics Data (Typical Example)

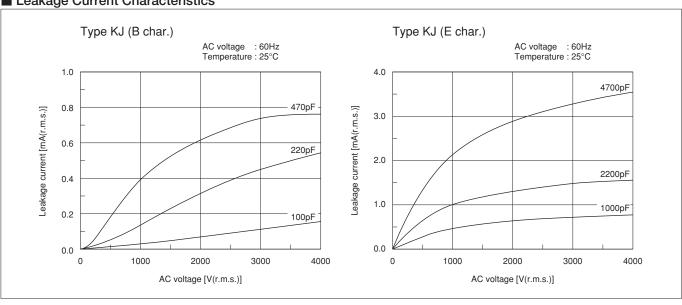
■ Capacitance - Temperature Characteristics



■ Insertion Loss - Frequency Characteristics



■ Leakage Current Characteristics

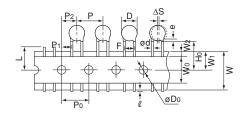


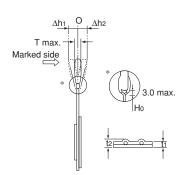


Safety Certified Ceramic Capacitors for Automotive Packaging

■ Taping Specifications

 15mm pitch / lead spacing 7.5mm taping Vertical crimp type (Lead Code: N3)





Item	Code	N3	
Pitch of component		15.0±2.0	
Pitch of sprocket hole		15.0±0.3	
Lead spacing	F	7.5±1.0	
Length from hole center to component center	P ₂	7.5±1.5	
Length from hole center to lead	P ₁	3.75±1.0	
Body diameter	D	See the individual product specifications	
Deviation along tape, left or right	ΔS	0±2.0	
Carrier tape width	W	18.0±0.5	
Position of sprocket hole		9.0±0.5	
Lead distance between reference and bottom planes		18.0 ^{+2.0}	
Protrusion length		+0.5 to -1.0	
Diameter of sprocket hole		4.0±0.1	
Lead diameter		0.6±0.05	
Total tape thickness		0.6±0.3	
Total thickness, tape and lead wire	t2	1.5 max.	
Body thickness	Т	7.0 max.	
Portion to cut in case of defect		11.0+0	
Hold down tape width		11.5 min.	
Hold down tape position		1.5±1.5	
Coating extension on lead		Up to the end of crimp	
Deviation across tape, front		0.0	
Deviation across tape, rear		2.0 max.	

(in mm)

■ Packaging Styles

Bulk	Taping
Polyethylene Bag	Ammo Pack
	Murata Products

■ Minimum Quantity (Order in Sets Only)

[Bulk]	(pcs./Bag)	
Body Dia. D (mm)	Lead Code A3	Lead Code B3
(11111)	Long	Short
7 to 10	250	500
12	200	250

[Taping]
Lead Code: N3
700pcs./Ammo Pack



Safety Certified Ceramic Capacitors for Automotive **(A)** Caution

■ ①Caution (Rating)

1. Operating Voltage

When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the Vp-p value of the applied voltage or the Vo-p that contains DC bias within the rated voltage range.

When the voltage is applied to the circuit, starting or stopping may generate irregular voltage for a transit period because of resonance or switching. Be sure to use a capacitor with a rated voltage range that includes these irregular voltages.

Voltage	DC Voltage	DC+AC Voltage	AC Voltage	Pulse Voltage (1)	Pulse Voltage (2)
Positional Measurement	Vo-p	Vo-p	Vp-p	Vp-p	Vp-p

2. Operating Temperature and Self-generated Heat

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself. When the capacitor is used in a highfrequency current, pulse current or similar current, it may have self-generated heat due to dielectric loss. Applied voltage load should be such that self-generated heat is within 20°C under the condition where the capacitor is subjected to an atmospheric temperature of 25°C. When measuring, use a thermocouple of small thermal capacity-K of Ø0.1mm under conditions where the capacitor is not affected by radiant heat from other components or wind from surroundings. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability. (Never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

3. Test Condition for Withstanding Voltage

(1) Test Equipment

Test equipment for AC withstanding voltage should be used with the performance of the wave similar to 50/60Hz sine wave.

If the distorted sine wave or overload exceeding the specified voltage value is applied, a defect may be caused.

Continued on the following page.





Safety Certified Ceramic Capacitors for Automotive (1) Caution

Continued from the preceding page.

(2) Voltage Applied Method

When the withstanding voltage is applied, the capacitor's lead or terminal should be firmly connected to the output of the withstanding voltage test equipment, and then the voltage should be raised from near zero to the test voltage.

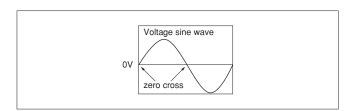
If the test voltage without the raise from near zero voltage would be applied directly to capacitor, test voltage should be applied with the zero cross.* At the end of the test time, the test voltage should be reduced to near zero, and then capacitor's lead or terminal should be taken off the output of the withstanding voltage test equipment. If the test voltage without the raise from near zero voltage would be applied directly to capacitor, the surge voltage may rise, and therefore, a defect may be caused.

*ZERO CROSS is the point where voltage sine wave passes 0V. See the figure at right.

4. Fail-Safe

When the capacitor is broken, failure may result in a short circuit. Be sure to provide an appropriate fail-safe function like a fuse on your product if failure could result in an electric shock, fire or fuming.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.



Safety Certified Ceramic Capacitors for Automotive (1) Caution

■ **①**Caution (Storage and Operating Condition)

Operating and Storage Environment

The insulating coating of capacitors does not form a perfect seal; therefore, do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. Also, avoid exposure to moisture. Before cleaning, bonding, or molding this product, verify that these processes do not affect product quality by testing the performance of a cleaned, bonded or molded product in the intended equipment. Store the capacitors where the temperature and relative humidity do not exceed -10 to 40 degrees centigrade and 15 to 85%.

Use capacitors within 6 months after delivery. Check the solderability after 6 months or more.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

■ ①Caution (Soldering and Mounting)

1. Vibration and Impact

Do not expose a capacitor or its lead wires to excessive shock or vibration during use. Excessive shock or vibration may cause fatigue destruction of lead wires mounted on the circuit board.

Please take measures to hold a capacitor on the circuit boards by adhesive, molding resin or another coating.

Please confirm there is no influence of holding measures on the product with the intended equipment.

2. Soldering

When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specifications of the capacitor. Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element.

Soldering the capacitor with a soldering iron should be performed in the following conditions.

Temperature of iron-tip: 400 degrees C. max.

Soldering iron wattage: 50W max. Soldering time: 3.5 sec. max.

3. Bonding, Resin Molding and Coating

For bonding, molding or coating this product, verify that these processes do not affect the quality of the capacitor by testing the performance of the bonded, molded or coated product in the intended equipment. When the amount of applications, dryness/hardening conditions of adhesives and molding resins containing organic solvents (ethyl acetate, methyl ethyl ketone, toluene, etc). are unsuitable, the outer coating resin of a capacitor is damaged by the organic solvents and it may result, worst case, in a short circuit. The variation in thickness of adhesive, molding resin

The variation in thickness of adhesive, molding resin or coating may cause outer coating resin cracking and/or ceramic element cracking of a capacitor in a temperature cycling.

4. Treatment after Bonding, Resin Molding and Coating When the outer coating is hot (over 100 degrees C.) after soldering, it becomes soft and fragile. Therefore, please be careful not to give it mechanical stress.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.

■ **①**Caution (Handling)

Vibration and Impact

Do not expose a capacitor or its lead wires to excessive shock or vibration during use. Excessive shock or vibration may cause fatigue destruction of lead wires mounted on the circuit board.

Please take measures to hold a capacitor on the circuit boards by adhesive, molding resin or another coating.

Please confirm there is no influence of holding measures on the product with the intended equipment.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND CAUSE FUMING OR PARTIAL DISPERSION WHEN THE PRODUCT IS USED.



Safety Certified Ceramic Capacitors for Automotive Notice

■ Notice (Soldering and Mounting)

Cleaning (ultrasonic cleaning)

To perform ultrasonic cleaning, observe the following conditions.

Rinse bath capacity: Output of 20 watts per liter or less.

Rinsing time: 5 min. maximum.

Do not vibrate the PCB/PWB directly.

Excessive ultrasonic cleaning may lead to fatigue destruction of the lead wires.

■ Notice (Rating)

Capacitance Change of Capacitors
 Capacitors have an aging characteristic, whereby
 the capacitor continually decreases its
 capacitance slightly if the capacitor is left on
 for a long time. Moreover, capacitance might
 change greatly depending on the surrounding
 temperature or an applied voltage. Therefore,
 it is not likely to be suitable for use in a constant
 time circuit.

Please contact us if you need detailed information.

Performance Check by Equipment
 Before using a capacitor, check that there is no problem in the equipment's performance and the specifications.

Generally speaking, CLASS 2 ceramic capacitors have voltage dependence characteristics and temperature dependence characteristics in capacitance. Therefore, the capacitance value may change depending on the operating condition in the equipment. Therefore, be sure to confirm the apparatus performance of receiving influence in the capacitance value change of a capacitor, such as leakage current and noise suppression characteristic.

Moreover, check the surge-proof ability of a capacitor in the equipment, if needed, because the surge voltage may exceed specific value by the inductance of the circuit.



Safety Certified Ceramic Capacitors/High Voltage Ceramic Capacitors ISO9000 Certifications

Manufacturing plants that produce the products in this catalog have obtained the ISO9000 quality system certificate.

Plant	Applied Standard
Izumo Murata Manufacturing Co., Ltd.	ISO9001
Murata Electronics (Thailand), Ltd.	ISO9001
Taiwan Murata Electronics Co., Ltd.	ISO9001



⚠Note:

Export Control

<For customers outside Japan>

No Murata products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to (1) any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or (2) goods or systems specially designed or intended for military end-use or utilization by military end-users.

For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

- 2. Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.
 - 1 Aircraft equipment
- ② Aerospace equipment④ Power plant equipment
- ③ Undersea equipment⑤ Medical equipment
- Transportation equipment (vehicles, trains, ships, etc.)
- Traffic signal equipment
- Disaster prevention / crime prevention equipment
- 3. Product specifications in this catalog are as of December 2013. They are subject to change or our products in it may be discontinued without advance notice.

 Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.
- 4. Please read rating and 🛆 CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.
- 5. This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.
- 6. Please note that unless otherwise specified, we shall assume no responsibility whatsoever for any conflict or dispute that may occur in connection with the effect of our and/or a third party's intellectual property rights and other related rights in consideration of your use of our products and/or information described or contained in our catalogs. In this connection, no representation shall be made to the effect that any third parties are authorized to use the rights mentioned above under licenses without our consent.
- 7. No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.



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OOO «ЛайфЭлектроникс" "LifeElectronics" LLC

ИНН 7805602321 КПП 780501001 P/C 40702810122510004610 ФАКБ "АБСОЛЮТ БАНК" (ЗАО) в г.Санкт-Петербурге К/С 3010181090000000703 БИК 044030703

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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