



# SAFETY STANDARD RECOGNIZED CERAMIC CAPACITOR

**SAFETY  
STANDARD  
RECOGNIZED  
CERAMIC  
CAPACITOR**



*Innovator  
in Electronics*

**Murata  
Manufacturing Co., Ltd.**

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        ( **NEW** 125°C Guaranteed)

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### ■GENERAL DESCRIPTION OF CERAMIC CAPACITORS

Ceramic capacitors are produced by sandwiching a ceramic-dielectric layer of titanium oxide (TiO<sub>2</sub>) or barium titanate (BaTiO<sub>3</sub>) between two electrodes. Special features include high reliability, compact size, large capacitance, excellent high-frequency characteristics, and simple mass production. Furthermore, their low cost enables wide application in electronic circuits designed for by-pass, coupling, and resonant functions.

Ceramic capacitors are divided into two distinctive types

according to structure—monolithic and disc type.

The latter type is available in a larger variety, with rated voltages of 50V, 250V, 1kV, 2kV, 3.15kV, and 6.3kV, besides AC voltage. Murata has meanwhile developed its original BC capacitors—semiconductive ceramic capacitors which are much more compact in size and much larger in capacitance than conventional ceramic capacitors. BC capacitors are available in rated voltages of 12V, 16V, 25V, and 50V.

### ■MURATA'S DISC TYPE CERAMIC CAPACITORS

DESCRIPTION	SERIES	TYPE			TRATED VOLT-AGE	CAPACITANCE RANGE (pF)								
		1	2	3		1	10	100	1000	10000	100000	500000		
CERAMIC CAPACITOR	DD100	○	○	—	50V	1				47000				
	DD10				500V									
BC CAPACITOR	DD300 DD400	—	—	○	12V									
					16V				1000				470000	
					25V									
					50V									
HIGH-VOLTAGE CERAMIC CAPACITOR	CONVENTIONAL HIGH-VOLTAGE HR	○	○	○	250V									
					500V									
					1kV		10		10000					
					2kV									
					3.15kV									
					6.3kV									
SAFETY STANDARD RECOGNIZED CERAMIC CAPACITOR	KH KX MX PRODUCTS WHICH ARE BASED ON THE STANDARDS OF THE ELECTRICAL APPLIANCE AND MATERIAL CONTROL LAW OF JAPAN	—	○	—	125VAC									
					250VAC				100		10000			





### ■DESIGN KIT

As for KH type and KX type, design kit is available.



Please contact us for detail.

**MURATA'S SAFETY STANDARD RECOGNIZED CERAMIC CAPACITORS**

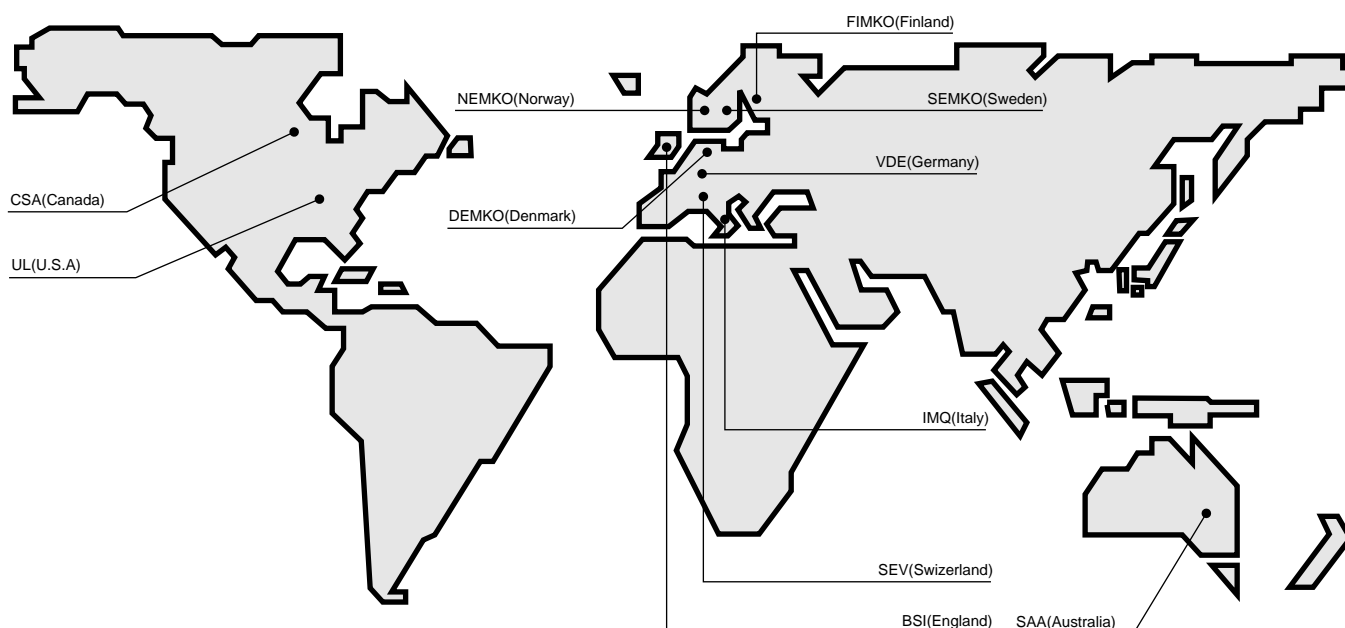
**1. Table of Safety Standard Recognized Products**

Type (Rated Voltage)	Photo	Temp Characteristic	CAPACITANCE RANGE (pF)													
			100	150	220	330	470	680	1000	1500	2200	3300	3900	4700	6800	10000
KH Type (250VAC)	<b>NEW</b> 	B	●	●	●	●	●	●								
		E							●	●	●	●	●			
		F														●
KX Type (250VAC)	<b>NEW</b> 	B	●	●	●	●	●	●								
		E							●	●	●	●	●			
MX Type (125VAC)		B	●	●	●											
		E							●	●						
		F										●	●			
Products Which Are Based on The Standards of The Electrical appliance and Material Control Law of Japan (250VAC)		E							●	●	●	●				
		F											●	●		

**2. Safety Standard Marking**

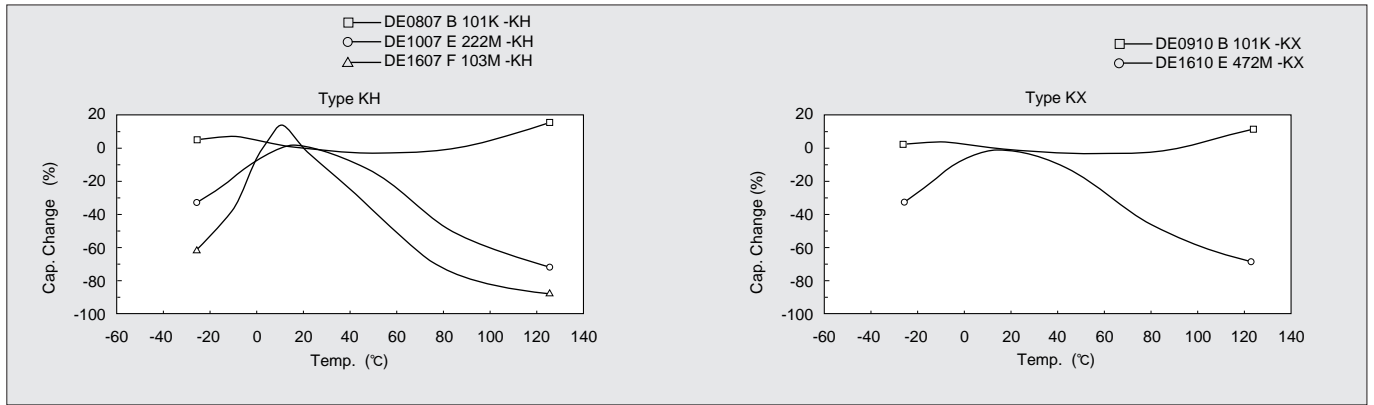
VDE Approval Mark		UL Recognized Mark	
SEV Approval Mark	 MJ502	CSA Recognized Mark	
SEMKO Approval Mark		FIMKO Approval Mark	
IMQ Approval Mark		NEMKO Approval Mark	
BSI Approval Mark	BS415	DEMKO Approval Mark	

Special Features Application Fields	Status of Recognition									
	BSI	VDE	SEV	SEMKO	FIMKO	NEMKO	IMQ	UL	CSA	SAA
<p>We design capacitors in much more compact size than KC type, having reduced the diameter by 20% max. Operating temperature range guaranteed up to 125°C (UL/CSA : 85°C).</p> <p>Recognized by IEC384-14 2nd edition (1993) Class X1, Y2 and also dominant safety standards in major countries (standards in 10 countries) throughout the world, this type is compatible for both European and North American continents. Adaptable as antenna-coupling, across-the-line, or line-by-pass component. Coated with flame-retardant epoxy resin (conforming to UL94V-0 standards).</p>	◎	◎	◎	◎	◎	◎	—	◎	◎	◎
<p>We design capacitors in much more compact size than KD type, having reduced the diameter by 20% max. Operating temperature range guaranteed up to 125°C (UL/CSA : 85°C).</p> <p>Recognized by IEC384-14 2nd edition (1993) Class X1, Y1 and also dominant safety standards in major countries (standards in 10 countries).throughout the world.</p> <p>Possible to use with a component in appliance requiring reinforced insulation and double insulation based on IEC65 and IEC950.</p> <p>Application in antenna-coupling. across-the-line, or line-by-pass component. Coated with flame-retardant epoxy resin (Conforming to UL94V-0 standards).</p>	◎	◎	◎	◎	◎	◎	◎	◎	◎	—
<p>Highly reliable dual-dielectric structure.</p> <p>Recognized by UL double protection capacitor. Accordingly, a this type can replace by 2 single isolation capacitors in appliance requiring double protection. Also recognized by CSA. Coated with flame-retardant epoxy resin (conforming to UL94V-0 standards).</p>	—	—	—	—	—	—	—	◎	◎	—
<p>This type are based on JIS-C-5154 standards under Class B2, and is available for application in Japanese AC power-supply circuits.</p> <p>Coated with flame-retardant epoxy resin (conforming to UL94V-0 standards).</p>	—————									

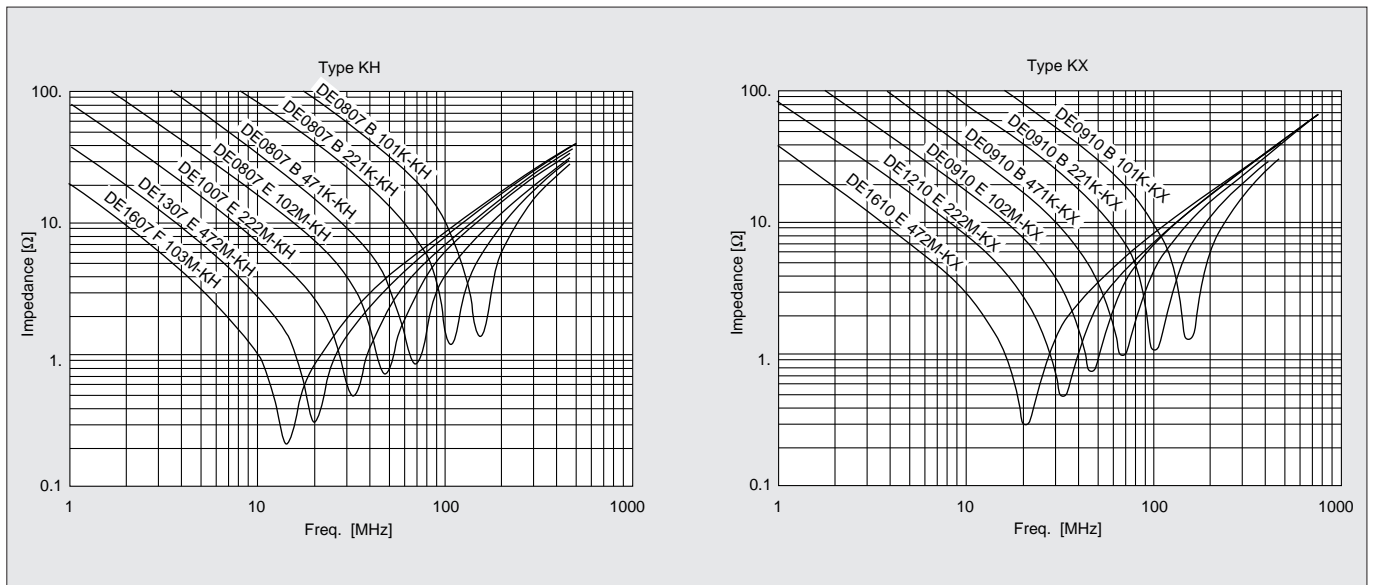


### 3. Typical Characteristics

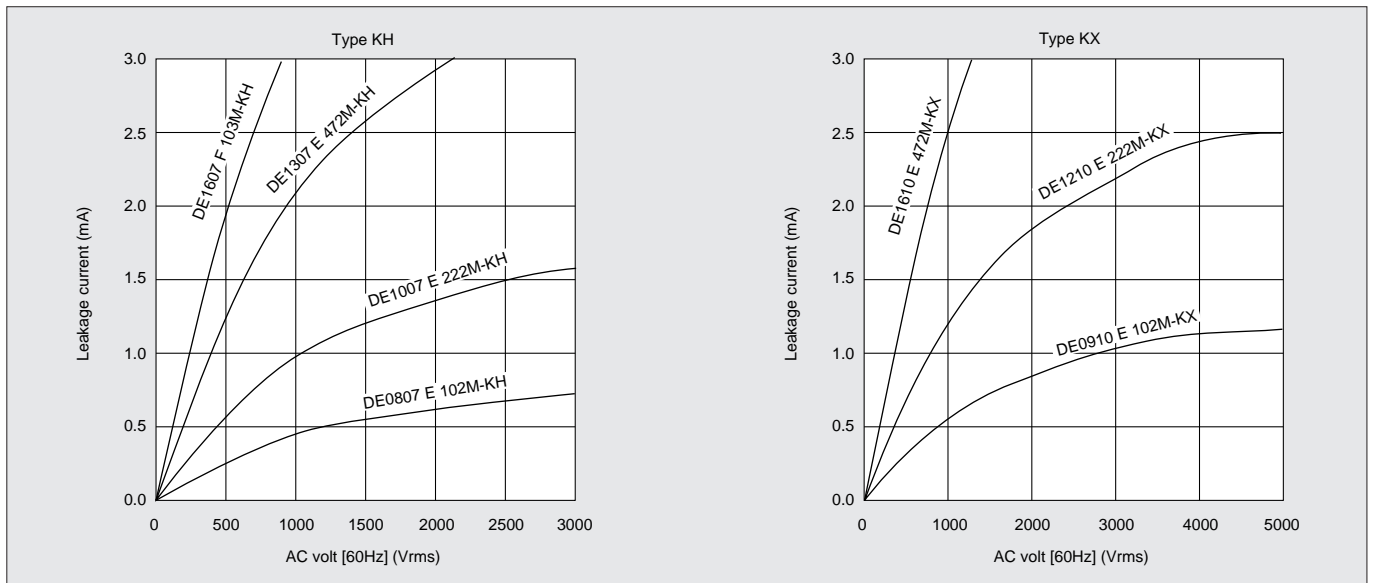
#### ■Capacitance-Temp. Char.



#### ■Impedance-Freq. Char.



#### ■Leakage Current (23°C)



#### 4. Part Numbering (\*Please specify the part number when ordering)



##### ① Type

DEXXXX

The first two digits represent maximum body diameter ;  
the next two digits represent lead space.

(Example) 

16	10
----	----

└───┬───┘ Lead space : 10mm

└──────────┘ Maximum body diameter : 16mm

##### ② Lead Configuration

Code	configuration
No code	Straight Long
-1	Straight Short
-979	Taping
-486	
-477	
-452	

##### ③ Temperature Characteristics

Code	Cap. Change	Temp. Range
B	±10%	-25°C to +85°C
E	+20% -55%	
F	+30% -80%	

##### ④ Capacitance

The first two digits represent significant figures ; the last digit represents the multiplier of 10 in pF.

(Example)

472=47×10<sup>2</sup>=4700pF

##### ⑤ Capacitance Tolerance

Code	Tolerance
K	±10%
M	±20%
Z	+80% -20%

##### ⑥ Rated Voltage

Code	Rated Voltage
AC125	125VAC
AC250	250VAC

\*Omit KH, KX type (Rated Voltage : 250VAC)

##### ⑦ Type Designation

Code	Type Designation
-KH	KH Type
-KX	KX Type
-MX	MX Type

\*Apply to KH, KX and MX types only.

**5. Taping Specification** (Apply to KH type, KX type and product which are based on the standards of the electrical appliance and material control law of Japan.)

● **12.7mm pitch / lead spacing 5mm taping**  
(Lead Code : -979) Vertical crimped type

● **15mm pitch / lead spacing 7.5mm taping**  
(Lead Code : -486) Vertical crimped type

● **30mm pitch / lead spacing 7.5mm taping**  
(Lead Code : -477) Vertical crimped type

● **25.4mm pitch / lead spacing 10.0mm taping**  
(Lead Code : -452) Vertical crimped type

Item	Code	-979	-486	-477	-452
Pitch of component	P	12.7	15.0	30.0	25.4
Pitch of sprocket hole	P <sub>0</sub>	12.7±0.3	15.0±0.3	15.0±0.3	12.7±0.3
Lead spacing	F	5.0 <sup>+0.8</sup> <sub>-0.2</sub>	7.5±1.0	7.5±1.0	10.0±1.0
Length from hole center to component center	P <sub>2</sub>	6.35±1.3	7.5±1.5	7.5±1.5	—
Length from hole center to lead	P <sub>1</sub>	3.85±0.7	3.75±1.0	3.75±1.0	7.7±1.5
Body diameter	D	See the individual product specification			
Deviation along tape, left or right	ΔS	0±1.0	0±2.0		
Carrier tape width	W	18.0±0.5			
Position of sprocket hold	W <sub>1</sub>	9.0±0.5			
Lead distance between reference and bottom planes	H <sub>0</sub>	18.0 <sup>+2.0</sup> <sub>0</sub>			
Protrusion length	ℓ	+0.5 to -1.0			
Diameter of sprocket hole	φD <sub>0</sub>	4.0±0.1			
Lead diameter	φd	0.6 <sup>+0.06</sup> <sub>-0.05</sub>			0.6 <sup>+0.1</sup> <sub>-0.05</sub>
Total tape thickness	t <sub>1</sub>	0.6±0.3			
Total thickness, tape and lead wire	t <sub>2</sub>	1.5max.			
Body thickness	T	See the individual product specification			
Proton to cut in case of defect	L	11.0 <sup>+0</sup> <sub>-1.0</sub>			
Hold down tape width	W <sub>0</sub>	11.5min.			
Hold down tape position	W <sub>2</sub>	1.5±1.5			
Coating extension on lead	e	Up to the end of crimp			
Deviation across tape, front	Δh <sub>1</sub>	1.0 max.	2.0 max.		
Deviation across tape, rear.	Δh <sub>2</sub>				

**6. Packaging Styles**

Bulk	Taping
Polyethylene Bag	Ammo Pack

■ **MINIMUM QUANTITY** (Order in Sets Only)

[Bulk] 1,000pcs.

[Taping]

1,500pcs. (Lead Code : -979)

1,000pcs. (Lead Code : -486\*)

400pcs. (Lead Code : -477, -452)

\*900pcs. for KH type

■ **MINIMUM ORDER QUANTITY**

2,000pcs.

\* "Minimum Quantity" means the numbers of units of each delivery or order.

The quantity should be an integral multiple of the "minimum quantity".

(Please note that the actual delivery quantity in a package may change in case.)





# CERAMIC CAPACITOR

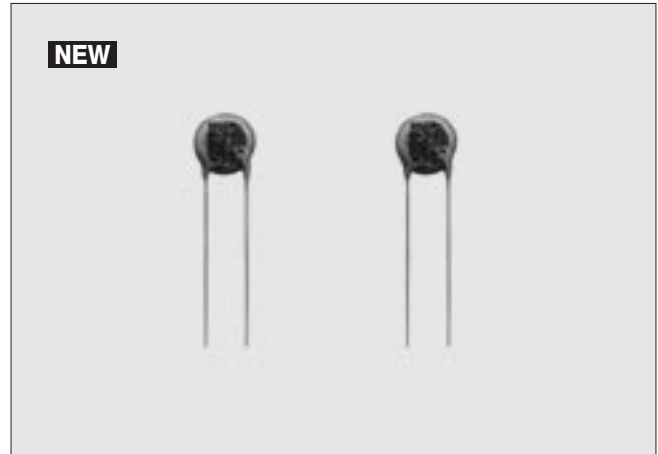


## Safety Standard Recognized Ceramic Capacitor Type KH

### 125°C Guaranteed Recognized in 10 Countries

#### FEATURES

1. We design capacitors in much more compact size than KC type, having reduced the diameter by 20% max.
2. Operating temperature range guaranteed up to 125°C (UL / CSA : 85°C)
3. IEC384-14 2nd edition (1993) Class X1, Y2
4. The type KH is recognized by UL / CSA / BSI / SEMKO / SEV / VDE / FIMKO / NEMKO / DEMKO / SAA.  
Besides these recognitions, it is based on the standard of the electrical appliance and material control law of Japan and JIS-C-5154 (general rules of AC mains supply capacitors of electronic equipment)
5. Coated with flame-retardant epoxy resin (conforming to UL94V-0 standards).
6. Automatic insertion can be, and save costs.



#### STANDARD NO. RECOGNIZED NO.

	Standard No.	Recognized No.		Rated Voltage
		Japan	Taiwan	
UL	UL 1414	E37921		250VAC
CSA	C22.2 No.1	LR36214	LR44559	
BSI	BSEN60065 (1994)	227636		
SEMKO	IEC384-14 2nd edition (1993)	9503155		
SEV		94, 1 00952		
VDE		83663, 83665,	83664, 83666	
		83667	83668	
FIMKO		180451	180450	
NEMKO		P95100388 P95100518		
DEMKO		113878JJa		
SAA	AS3250	CS6529N		

#### MARKING

Item	Example
UL Approval Mark	
CSA Approval Mark	
BSI Approval Mark	BS415
SEMKO Approval Mark	
SEV Approval Mark	
VDE Approval Mark	
FIMKO Approval Mark	
NEMKO Approval Mark	
DEMKO Approval Mark	
IEC384-14 Class Code	X1, Y2
Rated Voltage Mark	250~
Type Designation	KH
Nominal Capacitance	
Capacitance Tolerance	
Manufacturer's Identification *	
Manufactured Date Code	

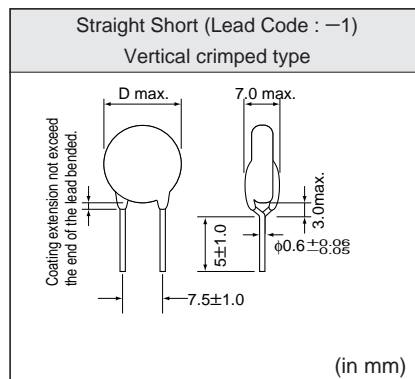
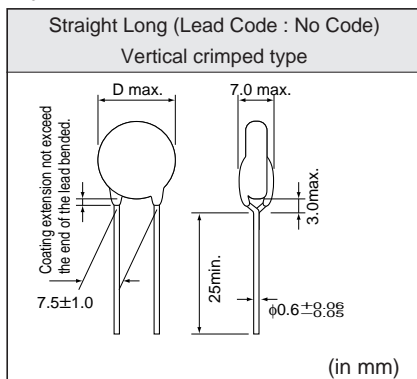
One side marking

For DE1307E472M-KH

\* : Made in Japan. : Made in Taiwan.

#### DIMENSIONS

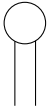

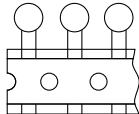
##### Bulk



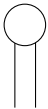

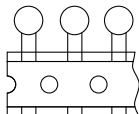
- For nominal body diameter (D), please see "STANDARD LIST".
- Please see page 7 on detailed taping specification

**STANDARD LIST**

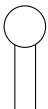

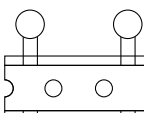
**B Characteristic**

Nominal Capacitance (pF)	Maximum Body Dia. D(mm)	Part Number (□ : means optional lead code shown on the right.)	Lead Configuration / Lead Code		
			Straight Long	Straight Short	Taping
					 Lead space F : 7.5 Pitch of component P : 15.0
100	8	DE0807 □ B 101K -KH	No Code	-1	-486
150		DE0807 □ B 151K -KH			
220		DE0807 □ B 221K -KH			
330		DE0807 □ B 331K -KH			
470		DE0807 □ B 471K -KH			
680	9	DE0907 □ B 681K -KH			

**E Characteristic**

Nominal Capacitance (pF)	Maximum Body Dia. D(mm)	Part Number (□ : means optional lead code shown on the right.)	Lead Configuration / Lead Code		
			Straight Long	Straight Short	Taping
					 Lead space F : 7.5 Pitch of component P : 15.0
1000	8	DE0807 □ E 102M -KH	No Code	-1	-486
1500	9	DE0907 □ E 152M -KH			
2200	10	DE1007 □ E 222M -KH			
3300	12	DE1207 □ E 332M -KH			
4700	13	DE1307 □ E 472M -KH			

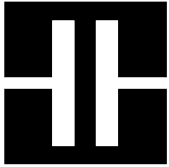
**F Characteristic**

Nominal Capacitance (pF)	Maximum Body Dia. D(mm)	Part Number (□ : means optional lead code shown on the right.)	Lead Configuration / Lead Code		
			Straight Long	Straight Short	Taping
					 Lead space F : 7.5 Pitch of component P : 30.0
10000	16	DE1607 □ F 103M -KH	No Code	-1	-477

•We have obtained the capacitance under 100pF.

Please feel free to ask us in detail.

•Please contact us for other specification.



# CERAMIC CAPACITOR

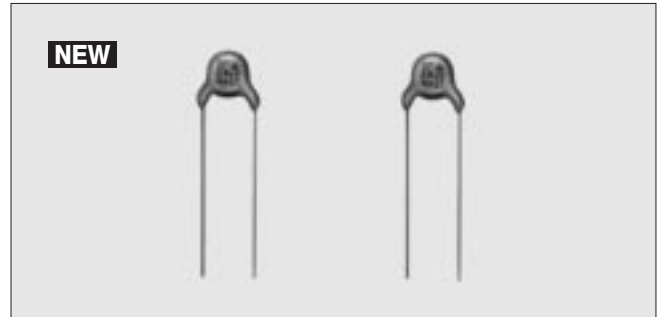


## Safety Standard Recognized Ceramic Capacitor Type KX

### 125°C Guaranteed Recognized in 10 Countries

#### FEATURES

1. We design capacitors in much more compact size than KD type, having reduced the diameter by 20% max.
2. Operating temperature range guaranteed up to 125°C (UL / CSA : 85°C)
3. IEC 384-14 2nd edition (1993) Class X1, Y1.
4. The type KX is recognized by UL / CSA / BSI / SEMKO / SEV / VDE / FIMKO / NEMKO / DEMKO / IMQ.
5. Possible to use with a component in appliance requiring reinforced insulation and double insulation based on IEC65 and IEC 950.
6. Coated with flame-retardant epoxy resin (conforming to UL94V-0 standards).
7. Automatic insertion can be, and save costs.



#### STANDARD NO. RECOGNIZED NO.

	Standard No.	Recognized No.		Rated Voltage	
		Japan	Taiwan		
UL	UL 1414	E37921		250VAC	
CSA	C22.2 No.0, No.1	LR36214	LR44559		
BSI	BS EN60065 (1994)	227859			
SEMKO	IEC384-14 2nd edition (1993)	9511179			
SEV		95, 1 10103			
VDE		89763, 89767	89764, 89768		
FIMKO		184022-01...02			
NEMKO		P95102392			
DEMKO		304138			
IMQ		V4069	-		

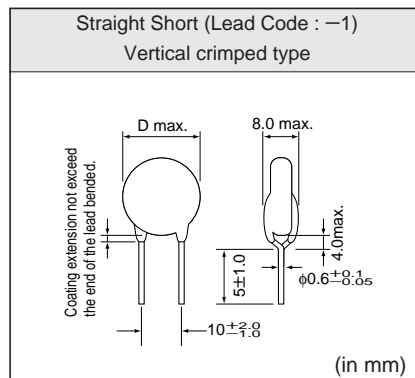
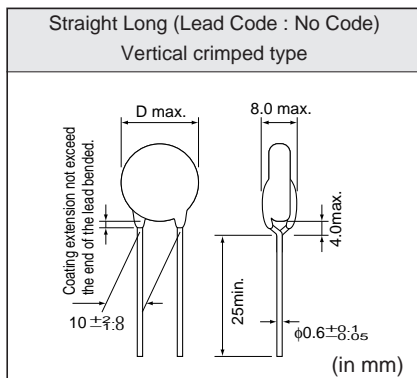
#### MARKING

Item		Example
UL Approval Mark		
CSA Approval Mark		
BSI Approval Mark	BS415	
SEMKO Approval Mark		
SEV Approval Mark		
VDE Approval Mark		
IMQ Approval Mark		
FIMKO Approval Mark		
NEMKO Approval Mark		
DEMKO Approval Mark		
IEC384-14 Class Code	X1, Y1	For DE1210E222M-KX
Rated Voltage Mark	250~	
Type Designation	KX	
Nominal Capacitance		
Capacitance Tolerance		
Manufacturer's Identification *		
Manufactured Date Code		

\* : Made in Japan. : Made in Taiwan.

#### DIMENSIONS

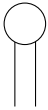

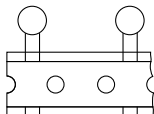
•Bulk



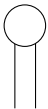

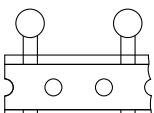
- For nominal body diameter (D), please see "STANDARD LIST".
- Please see page 7 on detailed taping specification

■STANDARD LIST

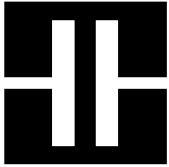
B Characteristic

Nominal Capacitance (pF)	Maximum Body Dia. D(mm)	Part Number (□ : means optional lead code shown on the right.)	Lead Configuration / Lead Code		
			Straight Long	Straight Short	Taping
					 Lead space F : 10.0 Pitch of component P : 25.4
100	9	DE0910 □ B 101K -KX	No Code	-1	-452
150		DE0910 □ B 151K -KX			
220		DE0910 □ B 221K -KX			
330		DE0910 □ B 331K -KX			
470		DE0910 □ B 471K -KX			
680	10	DE1010 □ B 681K -KX			

E Characteristic

Nominal Capacitance (pF)	Maximum Body Dia. D(mm)	Part Number (□ : means optional lead code shown on the right.)	Lead Configuration / Lead Code		
			Straight Long	Straight Short	Taping
					 Lead space F : 10.0 Pitch of component P : 25.4
1000	9	DE0910 □ E 102M -KX	No Code	-1	-452
1500	11	DE1110 □ E 152M -KX			
2200	12	DE1210 □ E 222M -KX			
3300	14	DE1410 □ E 332M -KX			
3900	15	DE1510 □ E 392M -KX			
4700	16	DE1610 □ E 472M -KX			

- We have obtained the capacitance under 100pF . Please feel free to ask us in detail.
- Please contact us for other specification.



# CERAMIC CAPACITOR



## Safety Standard Recognized Ceramic Capacitor Type MX

=Double Protection=  
=Dual Element=

### FEATURES

1. Possible to use with a piece of part for UL double protection and CSA double-isolated appliance because of dual structure dielectric.
2. Coated with flame-retardant epoxy resin (conforming to UL94V-0 standards).

### STANDARD NO. RECOGNIZED NO.

	Standard No.	Recognized No.	Rated Voltage
UL	UL1414	E37921	125VAC
CSA	C22.2 No.0, No.1	LR36214	125VAC

MX type is recognized double protection capacitor in UL and dual element type capacitor in CSA.

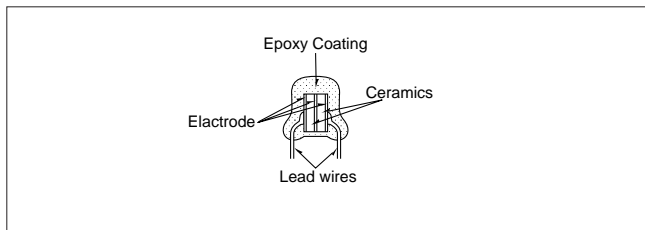
### DIMENSIONS

• Bulk

Straight Long (Lead Code : No Code)	
Type	D (mm)
DE1110	11
DE1210	12
DE1310	13
DE1610	16
DE1910	19

\*10.0 max. for DE1110 B 101K AC125.

### CONSTRUCTION



### STANDARD LIST

B Characteristic

Nominal Capacitance (pF)	Maximum Body Dia. D(mm)	Lead Configuration
		Straight Long
100	11	DE1110 B 101K AC125-MX
220	11	DE1110 B 221K AC125-MX
470	12	DE1210 B 471K AC125-MX

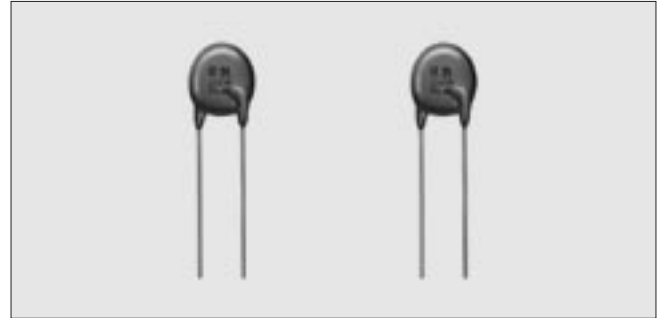
E Characteristic

Nominal Capacitance (pF)	Maximum Body Dia. D(mm)	Lead Configuration
		Straight Long
1000	13	DE1310 E 102M AC125-MX
2200	16	DE1610 E 222M AC125-MX

F Characteristic

Nominal Capacitance (pF)	Maximum Body Dia. D(mm)	Lead Configuration
		Straight Long
3300	16	DE1610 F 332M AC125-MX
4700	19	DE1910 F 472M AC125-MX

Please contact us for other specification.



### MARKING

Item	Example
CSA Monogram	
UL Recognized Mark	
Type Designation	MX
Nominal Capacitance	332 M
Capacitance Tolerance	M3 65
Manufacturer's Identification	
Manufactured Date Code	DE1610F332M AC 125-MX



# CERAMIC CAPACITOR



## Ceramic Capacitor For A.C. Power-Supply

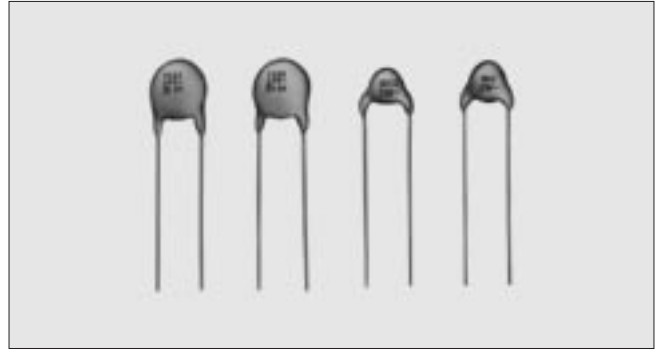
Products which are Based on the Standards of the Electrical Appliance And Material Control Law of Japan

### FEATURES

1. Coated with flame-retardant epoxy resin (Conforming to UL94V-0 standards).
2. Automatic insertion can be, and save costs.
3. This type are based on the standard of the electrical appliance and material control law of Japan and JIS-C-5154 (general rules of AC mains supply capacitors of electronic equipment).

### CONFORMABLE-STANDARDS

- The standards of the electrical appliance and material control law of Japan, separated table 4.
- JIS-C-5154

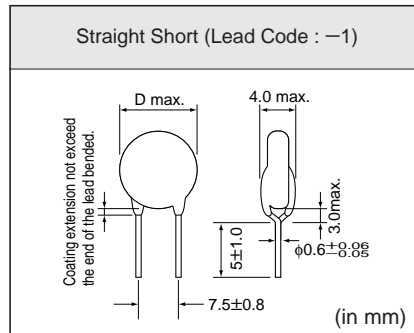
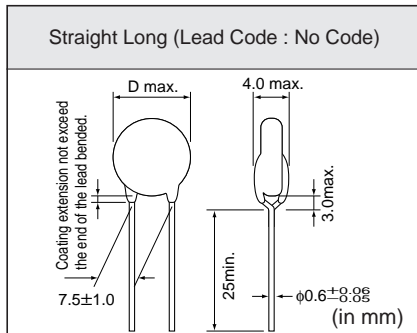


### MARKING

Item	Example
① Nominal Capacitance	
② Capacitance Tolerance	
③ Rated Voltage	
*④ Manufacturer's Identification	
*⑤ Manufactured Date Code	

\*④ is omitted when max. body diameter is less than 8mm, and ⑤ is omitted when max. body diameter is less than 9mm. But ⑤ appears only on E222Z type.

### DIMENSIONS



- Please refer to "STANDARD LIST" for nominal body diameter (D)
- Please refer to page 7 for detailed taping specification.

### STANDARD LIST

E Characteristic / F Characteristic

Nominal Capacitance (pF)	Maximum Body Dia. D(mm)	Part Number (□ : means optional lead code shown on the right.)	Lead Configuration / Lead Code			
			Straight Long	Straight Short	Taping	
					Lead space F : 5.0 Pitch of component P : 12.7	Lead space F : 7.5 Pitch of component P : 15.0
1000	7	DE0707□E 102 Z AC250	No Code	-1	-979 *	-486
2200	8	DE0807□E 222 Z AC250				
3300	9	DE0907□E 332 Z AC250				
4700	11	DE1107□E 472 Z AC250	No Code	-1	-979 *	-486
4700	8	DE0807□F 472 Z AC250				
10000	11	DE1107□F 103 Z AC250				

\*In this case, type is DEXX05. (example : DE0705-979 E 102 Z AC250)

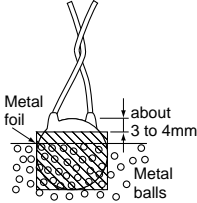
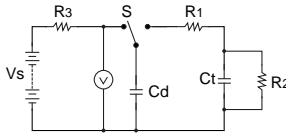
Please contact us for other specification.

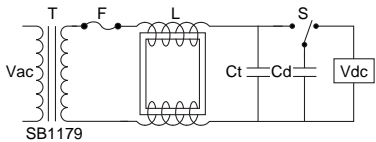
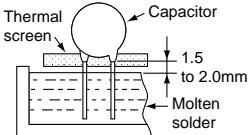
### 8.SPECIFICATION AND TEST METHOD

#### 8-1. KH Type, KX Type

(1) Operating Temperature Range : -25 to +125°C(-25 to +85°C in case of the standard of UL / CSA)

(2) Performance Tests

Item		Specification	Testing Method																				
1	Capacitance	Within specified tolerance.	The capacitance shall be measured at 20°C with 1±0.1kHz and 5Vrms max.																				
2	Dissipation Factor (D.F.)	<table border="1"> <thead> <tr> <th>Char.</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>B,E</td> <td>D.F.≤2.5%</td> </tr> <tr> <td>F</td> <td>D.F.≤5.0%</td> </tr> </tbody> </table>	Char.	Specification	B,E	D.F.≤2.5%	F	D.F.≤5.0%	The dissipation factor shall be measured at 20°C with 1±0.1kHz and 5Vrms max.														
Char.	Specification																						
B,E	D.F.≤2.5%																						
F	D.F.≤5.0%																						
3	Insulation Resistance (I.R.)	10000MΩ min.	The insulation resistance shall be measured with 500±50 VDC within 60±5 sec. of charging.																				
4	Dielectric Strength	No failure.	The capacitors shall not be damage when Test voltage of Table 1 are applied between the lead wires for 60 sec. (Charge / discharge current≤50mA) <Table 1> <table border="1"> <thead> <tr> <th>Type</th> <th>Test voltage</th> </tr> </thead> <tbody> <tr> <td>KH</td> <td>2600VAC</td> </tr> <tr> <td>KX</td> <td>4000VAC</td> </tr> </tbody> </table>	Type	Test voltage	KH	2600VAC	KX	4000VAC														
	Type	Test voltage																					
KH	2600VAC																						
KX	4000VAC																						
Body Insulation	No failure.	First, the terminals of the capacitor shall be connected together. Then, as shown in Figure below, a metal foil shall be closely wrapped around the body of the capacitor to the distance of about 3 to 4mm from each terminal. Then, the capacitor shall be inserted into a container filled with metal balls of about 1mm diameter. Finally, AC voltage of Table 1 is applied for 60 sec. between the capacitor lead wires and metal balls. (Charge / discharge current≤50mA) 																					
5	Temperature Characteristic	<table border="1"> <thead> <tr> <th>Char.</th> <th>Capacitance Change</th> </tr> </thead> <tbody> <tr> <td>B</td> <td>Within ±10%</td> </tr> <tr> <td>E</td> <td>Within ±20%</td> </tr> <tr> <td>F</td> <td>Within ±30%</td> </tr> </tbody> </table> <p>Temperature characteristic guarantee is -25 to +85°C</p>	Char.	Capacitance Change	B	Within ±10%	E	Within ±20%	F	Within ±30%	The capacitance measurement shall be made at each step specified in Table 2. <Table 2> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+20±2</td> </tr> <tr> <td>2</td> <td>-25±2</td> </tr> <tr> <td>3</td> <td>+20±2</td> </tr> <tr> <td>4</td> <td>+85±2</td> </tr> <tr> <td>5</td> <td>+20±2</td> </tr> </tbody> </table>	Step	Temperature (°C)	1	+20±2	2	-25±2	3	+20±2	4	+85±2	5	+20±2
Char.	Capacitance Change																						
B	Within ±10%																						
E	Within ±20%																						
F	Within ±30%																						
Step	Temperature (°C)																						
1	+20±2																						
2	-25±2																						
3	+20±2																						
4	+85±2																						
5	+20±2																						
6	Discharge Test ( I )	Appearance	No marked defect.																				
		I.R.	1000MΩ min.																				
		Dielectric Strength	Per Item 4.																				
			As in Figure 1, discharge is made 50 times at 5 sec. intervals from the capacitor (Cd) charged at DC voltage of specified.  <p>&lt;Figure 1&gt;</p> <p>Ct: Capacitor under test                      Cd: 0.001μF                      S: High-voltage switch                      R1: 1000Ω                      R2: 100MΩ                      R3: Surge resistance                      Vs: 10kVDC</p>																				

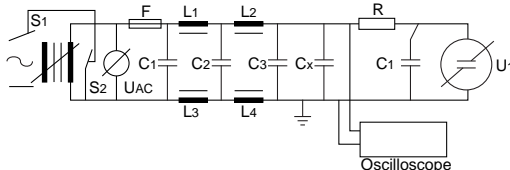
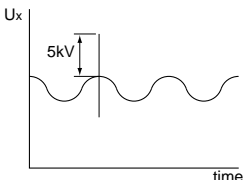
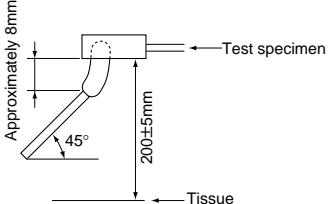
Item		Specification	Testing Method									
7	Discharge Test ( II )	The cheesecloth around capacitors shall not glow or flame.	<p>A single layer of cheesecloth is to be placed around the body of the test capacitor. Each sample is to be subjected to four discharges from a dump capacitor charged to a voltage that, when discharged, placed 5kV across the capacitor under test. The interval between successive discharges is to be 5 sec. 240V, 60Hz potential is to be applied across the capacitor under test and is to be maintained for 30 sec. after the fourth discharge, unless the circuit is opened in a shorter time by breakdown of the test capacitor. The direct current supply is to be adjusted to provide a potential in accordance with the following.</p> $V_{dc} = \frac{5000 (C_d + C_t)}{C_d} (V)$  <p style="text-align: center;">&lt;Figure 2&gt;</p> <p>Vdc : Variable direct-current voltage source                      S : High-voltage switch                      L : Choke coil of approximately 3mH and 0.03Ω                      F : Plug fuse rated 30A and 250V                      Vac : Supply source rated 240V, 60Hz and 30A                      Ct : Capacitor under test                      Cd : Dump Capacitor</p> <p>Capacitance value and D.F. are as follows.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Cap. value of Ct</td> <td style="text-align: center;">0 to 0.005μF</td> <td style="text-align: center;">0.0051 to 0.05μF</td> </tr> <tr> <td style="text-align: center;">Cap. value of Cd</td> <td style="text-align: center;">0.005μF</td> <td style="text-align: center;">0.05μF</td> </tr> <tr> <td style="text-align: center;">D.F. of Cd</td> <td style="text-align: center;">0.5% max.</td> <td style="text-align: center;">0.5% max.</td> </tr> </table>	Cap. value of Ct	0 to 0.005μF	0.0051 to 0.05μF	Cap. value of Cd	0.005μF	0.05μF	D.F. of Cd	0.5% max.	0.5% max.
Cap. value of Ct	0 to 0.005μF	0.0051 to 0.05μF										
Cap. value of Cd	0.005μF	0.05μF										
D.F. of Cd	0.5% max.	0.5% max.										
8	Soldering Effect	Appearance	<p>As in figure, the lead wires shall be immersed solder of 350±10°C or 260±5°C up to 1.5 to 2.0mm from the root of terminal for 3.5±0.5 sec (10±1 sec. for 260±5°C).                      Pre-treatment:                      Capacitor shall be stored at 85±2°C for 1 hour, then placed at *1 room condition for 24±2 hours before initial measurements.                      Post-treatment:                      Capacitor shall be stored for 1 to 2 hours at *1 room condition.</p> 									
		Capacitance Change										
		I.R.										
		Dielectric Strength										
9	Humidity (Under Steady State)	Appearance	<p>Set the capacitor for 500±12 hours at 40±2°C in 90 to 95% humidity.                      Pre-treatment:                      Capacitor shall be stored at 85±2°C for 1 hour, then placed at *1 room condition for 24±2 hours before initial measurements.                      Post-treatment:                      Capacitor shall be stored for 1 to 2 hours at *1 room condition.</p>									
		Capacitance Change		Char.	Capacitance Change							
				B	Within ±10%							
		D.F.		E,F	Within ±15%							
				Char.	Specification							
		B,E		D.F. ≤5.0%								
F	D.F. ≤7.5%											
I.R.	3000MΩ min.											
Dielectric Strength	Per Item 4.											

\*1 "room condition" temperature : 15 to 35°C, humidity: 45 to 75%, atmospheric pressure: 86 to 106kPa



Item		Specification	Testing Method						
10	Humidity Loading	Appearance	No marked defect						
		Capacitance Change	<table border="1"> <thead> <tr> <th>Char.</th> <th>Capacitance Change</th> </tr> </thead> <tbody> <tr> <td>B</td> <td>Within <math>\pm 10\%</math></td> </tr> <tr> <td>E,F</td> <td>Within <math>\pm 15\%</math></td> </tr> </tbody> </table>	Char.	Capacitance Change	B	Within $\pm 10\%$	E,F	Within $\pm 15\%$
			Char.	Capacitance Change					
		B	Within $\pm 10\%$						
		E,F	Within $\pm 15\%$						
D.F.	<table border="1"> <thead> <tr> <th>Char.</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>B,E</td> <td>D.F.<math>\leq 5.0\%</math></td> </tr> <tr> <td>F</td> <td>D.F.<math>\leq 7.5\%</math></td> </tr> </tbody> </table>	Char.	Specification	B,E	D.F. $\leq 5.0\%$	F	D.F. $\leq 7.5\%$		
	Char.	Specification							
B,E	D.F. $\leq 5.0\%$								
F	D.F. $\leq 7.5\%$								
I.R.	3000M $\Omega$ min.								
Dielectric Strength	Per Item 4								
11	Life	Appearance	No marked defect						
		Capacitance Change	Within $\pm 20\%$						
		I.R.	3000M $\Omega$ min.						
		Dielectric Strength	Per Item 4						
			Impulse Voltage Each individual capacitor shall be subjected to a 5kV (KXtype: 8kV) impulses for three times. After the capacitors are applied to life test.						
			<p style="text-align: right;"> <math>T_1 = 1.2\mu\text{sec.} = 1.67T</math>  <math>T_2 = 50\mu\text{sec.}</math> </p>						
			Apply a voltage of table 3 for 1000 hours at $125\pm 2^\circ\text{C}$ , 50% RH max.						
			<Table 3> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Applied voltage</th> </tr> </thead> <tbody> <tr> <td>425VAC, except that once each hour the voltage is increased to 1000VAC for 0.1 sec.</td> </tr> </tbody> </table>	Applied voltage	425VAC, except that once each hour the voltage is increased to 1000VAC for 0.1 sec.				
Applied voltage									
425VAC, except that once each hour the voltage is increased to 1000VAC for 0.1 sec.									
			Pre-treatment: Capacitor shall be stored at $85\pm 2^\circ\text{C}$ for 1 hour, then placed at *1room condition for $24\pm 2$ hours before initial measurements. Post-treatment: Capacitor shall be stored for $24\pm 2$ hours at *1room condition.						
12	Flame Test	The capacitor flame discontinue as follows.	The capacitor shall be subjected to applied flame for 15 sec. and then removed for 15 sec. until 5 cycle.						
		<table border="1"> <thead> <tr> <th>Cycle</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1 to 4</td> <td>30 sec. max.</td> </tr> <tr> <td>5</td> <td>60 sec. max.</td> </tr> </tbody> </table>		Cycle	Time	1 to 4	30 sec. max.	5	60 sec. max.
Cycle	Time								
1 to 4	30 sec. max.								
5	60 sec. max.								
			<p style="text-align: right;">(in mm)</p>						
13	Strength of Lead	Pull	Lead wire shall not cut off. Capacitor shall not be broken.						
		Bending	Lead wire shall not cut off.						
			As a figure,fix the body of capacitor, apply a tensile weight gradually to each lead wire in the radial direction of capacitor up to 10N and keep it for $10\pm 1$ sec.						
			Each lead wire shall be subjected to 5N weight and then a $90^\circ$ bend, at the point of egress, in one direction, return to original position, and then a $90^\circ$ bend in the opposite direction at the rate of one bend in 2 to 3 sec.						

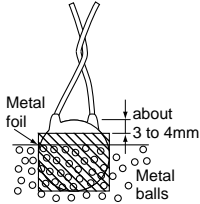
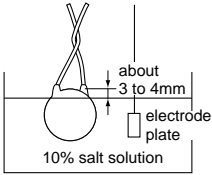
\*1 "room condition" temperature: 15 to  $35^\circ\text{C}$ , humidity: 45 to 75%, atmospheric perssure: 85 to 106kPa

Item	Specification	Testing Method
<p>14 Active Flammability</p>	<p>The cheese-cloth shall not be on fire.</p>	<p>The specimens shall be individually wrapped in at least one but more than two complete layers of cheese-cloth. The specimens shall be subjected to 20 discharges. The interval between successive discharges shall be 5 sec. The UAC shall be maintained for 2 min. after the last discharge.</p>  <p> <math>C_{1,2} : 1\mu F \pm 10\%</math>  <math>C_3 : 0.33\mu F \pm 5\% \text{ 10kV}</math>  <math>C_1 : 3\mu F \pm 5\% \text{ 10kV}</math>  <math>C_x : \text{Capacitor}</math>  <math>F : \text{Fuse, Rated 10A}</math> </p> <p> <math>L_1 \text{ to } 4 : 1.5\text{mH} \pm 20\%</math>  <math>16\text{A Rod core choke}</math>  <math>R : 100\Omega \pm 2\%</math>  <math>U_{AC} : U_R \pm 5\%</math>  <math>U_R : \text{Rated Voltage}</math>  <math>U_t : \text{Voltage impressed on the tank capacitor } C_t</math> </p> 
<p>15 Passive Flammability</p>	<p>The burning time shall not be exceeded the time 30 sec. The tissue paper shall not ignite.</p>	<p>The capacitor under test shall be held in the flame in the position which best promotes burning. Each specimen shall only be exposed once to the flame. Time of exposure to flame: 30 sec.</p> <p>                     Length of flame : <math>12 \pm 1\text{mm}</math>                      Gas burner : Length 35mm min.                      Inside Dia. : <math>0.5 \pm 0.1\text{mm}</math>                      Outside Dia. : 0.9mm max.                      Gas : Butane gas Purity 95% min.                 </p> 

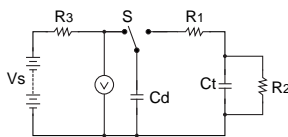
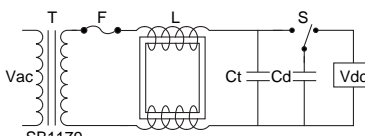
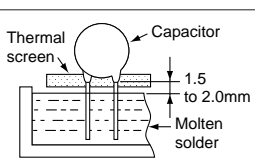
8—2. MX type, Products which are based on the standards of the electrical appliance and material control law of Japan

(1) Operating Temperature Range : -25 to +85°C

(2) Performance Tests

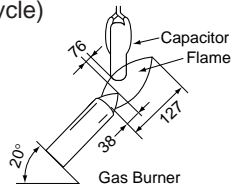
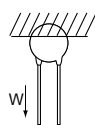
Item		Specification	Testing Method	Application																			
1	Capacitance	Within specified tolerance.	The capacitance shall be measured at 20°C with 1±0.1kHz and 5Vrms max.	MX type, *																			
2	Dissipation Factor (D.F.)	<table border="1"> <thead> <tr> <th>Char.</th> <th>Specification</th> </tr> </thead> <tbody> <tr> <td>B,E</td> <td>D.F.≤2.5%</td> </tr> <tr> <td>F</td> <td>D.F.≤5.0%</td> </tr> </tbody> </table>	Char.		Specification	B,E	D.F.≤2.5%	F	D.F.≤5.0%	The dissipation factor shall be measured at 20°C with 1±0.1kHz and 5Vrms max.													
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B,E	D.F.≤2.5%																						
F	D.F.≤5.0%																						
3	Insulation Resistance( I.R.)	10000MΩ min.	The insulation resistance shall be measured with 500±50 VDC within 60±5 sec. of charging.																				
4	Dielectric Strength Between lead wires	No failure.	<p>The capacitors shall not be damage when Test voltage of Table 1 are applied between the lead wires for 60 sec. (Charge / discharge current≤50mA)</p> <p style="text-align: center;">&lt;Table 1&gt;</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Test voltage</th> </tr> </thead> <tbody> <tr> <td>MX</td> <td>3500VAC</td> </tr> <tr> <td>*</td> <td>1500VAC</td> </tr> </tbody> </table>	Type	Test voltage	MX	3500VAC	*	1500VAC														
	Type	Test voltage																					
MX	3500VAC																						
*	1500VAC																						
	Body Insulation	No failure.	<p>[Method of using metal foil : MX type] First, the terminals of the capacitor shall be connected together. Then, as shown in Figure below, a metal foil shall be closely wrapped around the body of the capacitor to the distance of about 3 to 4mm from each terminal.</p>  <p>Then, the capacitor shall be inserted into a container filled with metal balls of about 1 mm diameter. Finally, AC voltage of Table 1 is applied for 60 sec. between the capacitor lead wires and metal balls. (Charge / discharge curren≤50mA)</p> <p>[Salt water immersion method : *] First, the terminals of the capacitor shall be connected together. Then, as shown in Figure below, the capacitor shall be immersed into 10% salt solution up to a position of about 3 to 4mm apart from the terminals.</p>  <p>Finally, AC voltage of Table 1 is applied for 60 sec. between the capacitor lead wires and electrode plate. (Charge / discharge current≤50mA)</p>																				
5	Temperature Characteristic	<table border="1"> <thead> <tr> <th>Char.</th> <th>Capacitance Change</th> </tr> </thead> <tbody> <tr> <td>B</td> <td>Within ±10%</td> </tr> <tr> <td>E</td> <td>Within ±20%</td> </tr> <tr> <td>F</td> <td>Within ±30%</td> </tr> </tbody> </table>	Char.	Capacitance Change	B	Within ±10%	E	Within ±20%	F	Within ±30%	<p>The capacitance measurement shall be made at each step specified in Table 2.</p> <p style="text-align: center;">&lt;Table 2&gt;</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+20±2</td> </tr> <tr> <td>2</td> <td>-25±2</td> </tr> <tr> <td>3</td> <td>+20±2</td> </tr> <tr> <td>4</td> <td>+85±2</td> </tr> <tr> <td>5</td> <td>+20±2</td> </tr> </tbody> </table>	Step	Temperature (°C)	1	+20±2	2	-25±2	3	+20±2	4	+85±2	5	+20±2
Char.	Capacitance Change																						
B	Within ±10%																						
E	Within ±20%																						
F	Within ±30%																						
Step	Temperature (°C)																						
1	+20±2																						
2	-25±2																						
3	+20±2																						
4	+85±2																						
5	+20±2																						

\*Products which are based on the Standards of the Electrical Appliance and Material Control Law of Japan

Item		Specification	Testing Method	Application										
6	Discharge Test ( I )	Appearance	No marked defect.	<p>As in Figure 1, discharge is made 50 times at 5 sec. intervals from the capacitor (Cd) charged at DC voltage of specified.</p>  <p>&lt;Figure 1&gt;</p> <p>Ct : Capacitor under test      R2 : 100MΩ                      S : High-voltage switch      R3 : Surge resistance                      R1 : 1000Ω</p> <table border="1"> <thead> <tr> <th></th> <th>*2</th> <th>MX</th> </tr> </thead> <tbody> <tr> <td>Cd</td> <td>0.001μF</td> <td>0.0005μF</td> </tr> <tr> <td>Vs</td> <td>10kVDC</td> <td>20kVDC</td> </tr> </tbody> </table>		*2	MX	Cd	0.001μF	0.0005μF	Vs	10kVDC	20kVDC	MX type,*2
			*2		MX									
		Cd	0.001μF		0.0005μF									
Vs	10kVDC	20kVDC												
I.R.	1000MΩ min.													
Dielectric Strength	Per Item 4.													
7	Discharge Test ( II )	The cheesecloth around capacitors shall not glow or flame.	<p>A single layer of cheesecloth is to be placed around the body of the test capacitor. Each sample is to be subjected to four discharges from a dump capacitor charged to a voltage that, when discharged, placed 10kV across the capacitor under test. The interval between successive discharges is to be 5 sec. 240V, 60Hz potential is to be applied across the capacitor under test and is to be maintained for 30 sec. after the fourth discharge, unless the circuit is opened in a shorter time by breakdown of the test capacitor.</p> <p>The direct current supply is to be adjusted to provide a potential in accordance with the following.</p> $V_{dc} = \frac{10000 (C_d + C_t)}{C_d} (V)$  <p>&lt;Figure 2&gt;</p> <p>Vdc : Variable direct-current voltage source                      S : High-voltage switch                      L : Choke coil of approximately 3mH and 0.03Ω                      F : Plug fuse rated 30A and 250V                      Vac : Supply source rated 240V, 60Hz and 30A                      Ct : Capacitor under test                      Cd : Dump Capacitor</p> <p>Capacitance value and D.F. are as follows.</p> <table border="1"> <tbody> <tr> <td>Cap. value of Ct</td> <td>0 to 0.0025μF</td> <td>0.00251 to 0.025μF</td> </tr> <tr> <td>Cap. value of Cd</td> <td>0.0025μF</td> <td>0.025μF</td> </tr> <tr> <td>D.F. of Cd</td> <td>0.5% max.</td> <td>0.5% max.</td> </tr> </tbody> </table>	Cap. value of Ct	0 to 0.0025μF	0.00251 to 0.025μF	Cap. value of Cd	0.0025μF	0.025μF	D.F. of Cd	0.5% max.	0.5% max.	MX type	
			Cap. value of Ct	0 to 0.0025μF	0.00251 to 0.025μF									
Cap. value of Cd	0.0025μF	0.025μF												
D.F. of Cd	0.5% max.	0.5% max.												
8	Soldering Effect	Appearance	No marked defect.	<p>As in figure, the lead wires shall be immersed solder of 350±10°C up to 1.5 to 2.0mm from the root of terminal for 3.5±0.5 sec.</p>  <p>Pre-treatment:                      Capacitor shall be stored at 85±2°C for 1 hour, then placed at *1 room condition for 24±2 hours before initial measurements.</p> <p>Post-treatment:                      Capacitor shall be stored for 24±2 hours at *1 room condition.</p>	MX type,*2									
I.R.		1000MΩ min.												
Dielectric Strength		Per Item 4.												

\*1 "room condition" temperature : 15 to 35°C, humidity : 45 to 75%, atmospheric pressure : 86 to 106kPa

\*2 Products which are based on the Standards of the Electrical Appliance and Material Control Law of Japan

Item		Specification		Testing Method	Application							
9	Humidity (Under Steady State)	Appearance	No marked defect		Set the capacitor for 500±12 hours at 40±2°C in 90 to 95% humidity. Pre-treatment : Capacitor shall be stored at 85±2°C for 1 hour, then placed at *1 room condition for 24±2 hours before initial measurements. Post-treatment : Capacitor shall be stored for 1 to 2 hours at *1 room condition.	MX type						
		I.R.	1000MΩ min.									
		Dielectric Strength	Per Item 4									
10	Humidity Insulation	Capacitance Change	Char.	Capacitance Change	The capacitor shall be subjected to 40±2°C, relative humidity of 90 to 98% for 8 hours, and then removed in room temperature for 16 hours until 5 cycles. Pre-treatment : Capacitor shall be stored at 85±2°C for 1 hour, then placed at *1 room condition for 24±2 hours before initial measurements. Post-treatment : Capacitor shall be stored for 1 to 2 hours at *1 room condition.	*2						
			E	Within ±20%								
		F	Within ±30%									
		D.F.	Char.	Specification								
E	D.F. ≤5.0%											
F	D.F. ≤7.5%											
I.R.	1000MΩ min.											
Dielectric Strength	Per Item 4											
11	Life	Appearance	No marked defect		Apply a voltage of table 3 for 1500 hours at 85±2°C, 50% RH max.  <div style="text-align: center;">                     &lt;Table 3&gt;  <table border="1" style="margin: auto;"> <thead> <tr> <th>Type</th> <th>Applied voltage</th> </tr> </thead> <tbody> <tr> <td>MX</td> <td>440V AC, except that once each hour the voltage is increased to 880V AC for 0.1 sec.</td> </tr> <tr> <td>*2</td> <td>500V AC, except that once each hour the voltage is increased to 1000V AC for 0.1 sec.</td> </tr> </tbody> </table> </div>	Type	Applied voltage	MX	440V AC, except that once each hour the voltage is increased to 880V AC for 0.1 sec.	*2	500V AC, except that once each hour the voltage is increased to 1000V AC for 0.1 sec.	MX type,*2
		Type	Applied voltage									
		MX	440V AC, except that once each hour the voltage is increased to 880V AC for 0.1 sec.									
		*2	500V AC, except that once each hour the voltage is increased to 1000V AC for 0.1 sec.									
I.R.	Type	Specification										
MX	500MΩ min.											
*2	1000MΩ min.											
Dielectric Strength	Per Item 4											
Discharge Test ( II ) (Application : MX type)	Per Item 6											
12	Flame Test	The capacitor flame discontinue as follows.		The capacitor shall be subjected to applied flame for 15 sec. and then removed for 15 sec. until 5 cycle (*2 : 3 cycle)  								
		Type	Cycle		Time							
MX	1 to 4	30 sec. max.										
	5	60 sec. max.										
*2	1 to 2	15 sec. max.										
	3	60 sec. max.										
13	Strength of Lead	Pull	Lead wire shall not cut off. Capacitor shall not be broken.		As a figure, fix the body of capacitor, apply a tensile weight gradually to each lead wire in the radial direction of capacitor up to 10N and keep it for 10±1 sec.  							
		Bending	Lead wire shall not cut off.									
				Each lead wire shall be subjected to 5N weight and then a 90° bend, at the point of egress, in one direction, return to original position, and then a 90° bend in the opposite direction at the rate of one bend in 2 to 3 sec.								

\*1 "room condition" temperature : 15 to 35°C, humidity : 45 to 75%, atmospheric pressure : 86 to 106kPa

\*2 Products which are based on the Standards of the Electrical Appliance and Material Control Law of Japan

**■PRECAUTION****1. Operating voltage**

Be sure to use a capacitor only within its rated operating voltage range.

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

**2. Operating temperature and self-generated heat**

Keep the surface temperature of a capacitor within the rated operating temperature range. Be sure to take into account the heat produced by the capacitor itself.

When a capacitor is used in a high-frequency circuit, pulse voltage circuit or the like, it may produce heat due to dielectric loss. Keep such self-generated temperature below 20°C.

**3. 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. 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 5 to 40°C and 20 to 70% RH. Use capacitors within 6 months.

**4. Vibration and impact**

Do not expose a capacitor or its leads to excessive shock or vibration during use.

Failure to follow the above cautions may result, worst case, in a short circuit and fuming when the product is used.

**■NOTICE****Soldering**

When soldering this product to a PC board, do not exceed the solder heat resistance specification (written in 8. specification and test method) 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.

**■ISO9000 CERTIFICATIONS**

Manufacturing plants of these products in this catalog have obtained the ISO9000 quality system certificate.

Plant	Certified Date	Organization	Registration No.	Applied Standard
<b>Izumo Murata Manufacturing Co.,Ltd</b>	May. 11. '95	RCJ *1	RCJ-93M-05A	ISO9001
<b>Taiwan Murata Electronics Co.,Ltd</b>	Nov. 26. '93	BCIQ *2	5E8Y001-00	ISO9002

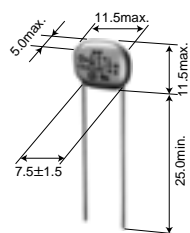
\*1 RCJ : Reliability Center for Electronic Component of Japan

\*2 BCIQ : Bureau of Commodity Inspection & Quarantine

**MURATA'S SAFETY STANDARD PRODUCTS**

**UL / CSA Recognized Type for Antenna-Coupling**

- UL File No. E37921
- CSA File No. LR92026



(mm)

Application	Part Number	Circuit	Capacitor		Resistance Range
			Cap.	Temp. Char.	
UL / CSA Recognized	B2R131C131R□□M-121MF-141MG		130pF	Y5P	MF : 1 to 2MΩ MG : 2.5 to 4MΩ 3.2 to 5.2MΩ
	B2R131C271R□□M-121MF-141MG		270pF	Y5U	
	B2R131C471R□□M-121MF-141MG		470pF	Y5U	

□□ : Resistance Example : R=1 to 2MΩ → B2R131C131R1-2M-121MF

•Common Specification, Rated voltage : 125VAC, Rated Wattage : 1/2W, Capacitance Tolerance : ±10%

**Note:**

1. Export Control  
〈For customers outside Japan〉  
Murata products should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destructive weapons (nuclear weapons, chemical or biological weapons, or missiles), or any other weapons.  
〈For customers in Japan〉  
For products which are controlled items subject to “the Foreign Exchange and Foreign Trade Control Law” of Japan, the export license specified by the law is required for export.
  2. Please contact our sales representatives or engineers before using our products listed in this catalog for the applications requiring especially high reliability what defects might directly cause damage to other party's life, body or property (listed below) or for other applications not specified in this catalog.
    - ① Aircraft equipment
    - ② Aerospace equipment
    - ③ Undersea equipment
    - ④ Medical equipment
    - ⑤ Transportation equipment (automobiles, trains, ships,etc.)
    - ⑥ Traffic signal equipment
    - ⑦ Disaster prevention / crime prevention equipment
    - ⑧ Data-processing equipment
    - ⑨ Applications of similar complexity or with reliability requirements comparable to the applications listed in the above
  3. Product specifications in this catalog are as of February 1997, and are subject to change or stop the supply without notice. Please confirm the specifications before ordering any product. If there are any questions, please contact our sales representatives or engineers.
  4. The categories and specifications listed in this catalog are for information only. Please confirm detailed specifications by checking the product specification document or requesting for the approval sheet for product specification, before ordering.
  5. 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 third party's intellectual property rights and other related rights in consideration of your using 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.
  6. None of ozone depleting substances (ODS) under the Montreal Protocol is used in manufacturing process of us.
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***muRata* Murata Manufacturing Co., Ltd.**

**Head office**

2-26-10, Tenjin Nagaokakyo-shi, Kyoto 617-8555, Japan Phone:81-75-951-9111

**Marketing Group**1874 Sumiyoshi-cho Kizuki, Nakahara-ku Kawasaki, 211-0021, Japan  
Phone:81-44-422-5153 Fax:81-44-433-0798