

# Radial Lead Type Monolithic Ceramic Capacitors



● Part Numbering

Radial Lead Type Monolithic Ceramic Capacitors



① Product ID

② Series/Terminal

Product ID	Series/Terminal	
<b>RP</b>	<b>E</b>	Radial Lead Type Monolithic Ceramic Capacitors (DC25V-DC100V)
<b>RH</b>	<b>E/D</b>	Radial Lead Type Monolithic Ceramic Capacitors 150°C max. (for Automotive) (DC50V-DC100V)
<b>RD</b>	<b>E</b>	Radial Lead Type Monolithic Ceramic Capacitors (For Commercial Use Only) (DC25V-DC630V)

③ Temperature Characteristics

Code	Temperature Characteristics	Reference Temperature	Temperature Range	Capacitance Change or Temperature Coefficient	Operating Temperature Range
<b>5C</b>	<b>C0G*</b>	25°C	25 to 125°C	0±30ppm/°C	-55 to 125°C
<b>5G</b>	<b>X8G*</b>	25°C	25 to 150°C	0±30ppm/°C	-55 to 150°C
<b>C7</b>	<b>X7S</b>	25°C	-55 to 125°C	±22%	-55 to 125°C
<b>D7</b>	<b>X7T</b>	25°C	-55 to 125°C	+22, -33%	-55 to 125°C
<b>F1</b>	<b>F</b>	20°C	-25 to 85°C	+30, -80%	-25 to 85°C
<b>F5</b>	<b>Y5V</b>	25°C	-30 to 85°C	+22, -82%	-30 to 85°C
<b>L8</b>	<b>X8L</b>	25°C	-55 to 125°C	±15%	-55 to 150°C
			125 to 150°C	+15, -40%	
<b>R7</b>	<b>X7R</b>	25°C	-55 to 125°C	±15%	-55 to 125°C

\* Please refer to table for Capacitance change under reference temperature.

• Capacitance change from each temperature

Char.	Nominal Values (ppm/°C) *1	Capacitance Change from 25°C (%)					
		-55°C		-30°C		-10°C	
		Max.	Min.	Max.	Min.	Max.	Min.
<b>C0G</b>	0±30	0.58	-0.24	0.40	-0.17	0.25	-0.11
<b>X8G</b>							

\*1: Nominal values denote the temperature coefficient within a range of 25 to 125°C.

④ Rated Voltage

Code	Rated Voltage
<b>1E</b>	DC25V
<b>1H</b>	DC50V
<b>2A</b>	DC100V
<b>2E</b>	DC250V
<b>2W</b>	DC450V
<b>2J</b>	DC630V

⑤ Capacitance Tolerance

Code	Capacitance Tolerance	Temperature Characteristics	Capacitance Step
<b>C</b>	±0.25pF	C0G	≤5pF : 1pF Step
<b>D</b>	±0.5pF		6 to 9pF : 1pF Step
<b>J</b>	±5%	C0G/X8G	≥10 : E12 Series
<b>K</b>	±10%	X7S/X7T/X7R/ X8L	E6 Series
<b>M</b>	±20%	X7S/X7T/X7R/ X8L	E3 Series
<b>Z</b>	+80%, -20%	F/Y5V	E3 Series

⑥ Capacitance

Expressed by three-digit alphanumerics. 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.

If there is a decimal point, it is expressed by the capital letter "R."  
 In this case, all figures are significant digits.

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⑦ Dimensions (LxW)

Code	Dimensions (LxW)
<b>0</b>	4.0X3.5mm or 5.0X3.5mm (Depends on Part Number List)
<b>1</b>	4.0X3.5mm or 4.5X3.5mm or 5.0X3.5mm (Depends on Part Number List)
<b>2</b>	5.0X3.5mm or 5.5X4.0mm or 5.7X4.5mm (Depends on Part Number List)
<b>3</b>	5.0X4.5mm or 5.5X5.0mm or 6.0X5.5mm (Depends on Part Number List)
<b>5</b>	7.5X7.5mm*
<b>6</b>	10.0X10.0mm
<b>7</b>	12.5X12.5mm
<b>8</b>	7.5X5.5mm
<b>U</b>	7.7X12.5mm*
<b>W</b>	5.5X7.5mm

\* DC630V: W+0.5mm

⑧ Lead Style

Code	Lead Style	Lead Spacing
<b>A2</b>	Straight Long	2.5mm
<b>B1</b>	Straight Long	5.0mm
<b>C1</b>	Straight Long	10.0mm
<b>DB</b>	Straight Taping	2.5mm
<b>E1/E2</b>	Straight Taping	5.0mm
<b>K1</b>	Inside Crimp	5.0mm
<b>M1/M2</b>	Inside Crimp Taping	5.0mm
<b>P1</b>	Outside Crimp	2.5mm
<b>S1/S2</b>	Outside Crimp Taping	2.5mm

Lead distance between reference and bottom planes.

M1, S1: H<sub>0</sub> = 16.0±0.5mm

M2, S2: H<sub>0</sub> = 20.0±0.5mm

E1: H = 17.5±0.5mm

E2: H = 20.0±0.5mm

⑨ Individual Specification Code

Expressed by three-digit alphanumerics

⑩ Packaging

Code	Packaging
<b>A</b>	Ammo Pack
<b>B</b>	Bulk

# Radial Lead Type Monolithic Ceramic Capacitors



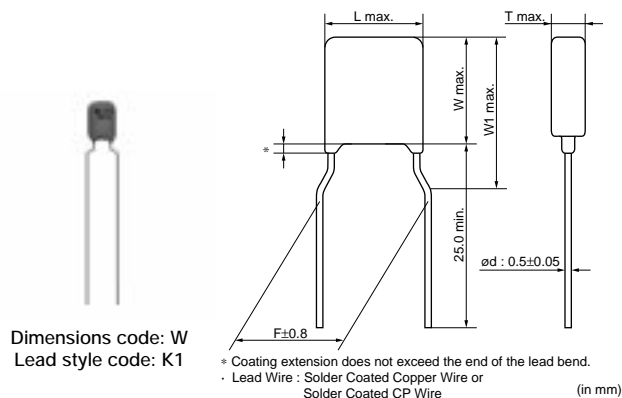
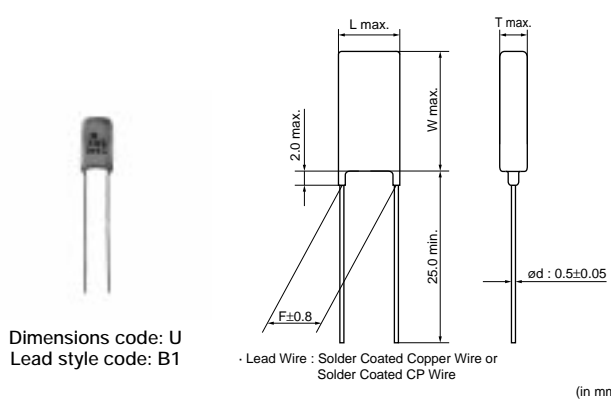
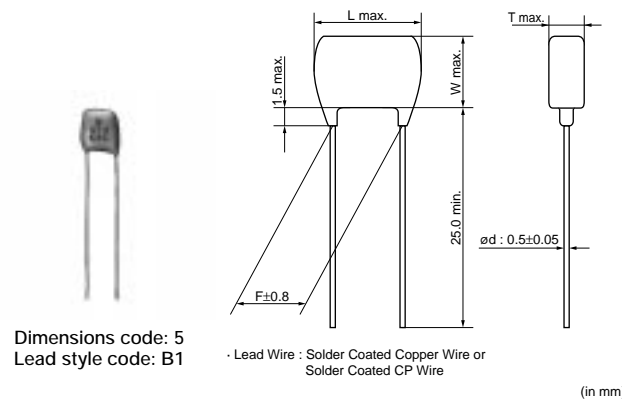
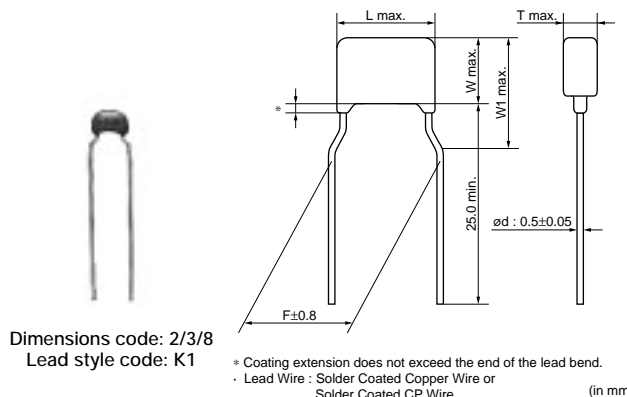
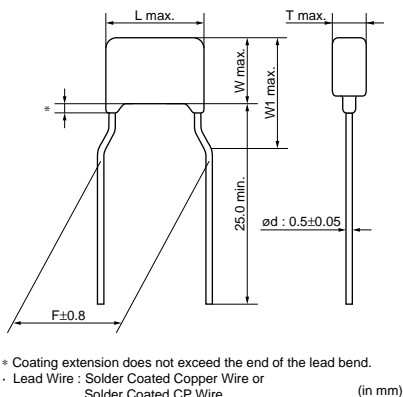
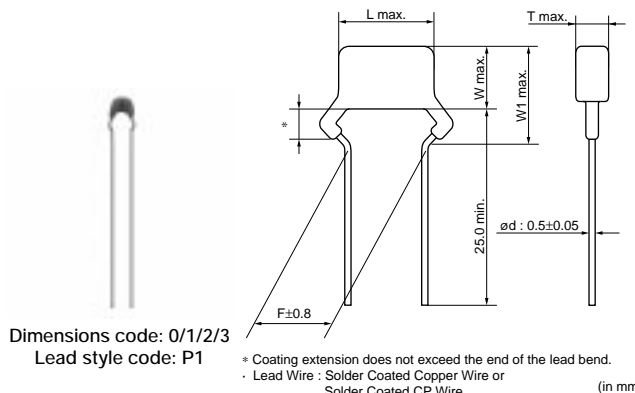
## RDE Series (For Commercial Use Only) (DC25V-DC630V)

### ■ Features

1. Small size and large capacitance
2. Low ESR characteristics for high frequency
3. Coated with epoxy resin whose flammability is equivalent to UL94V-0

### ■ Applications

General electronic equipment  
 (Do not use for automotive-related power train and safety equipment.)



### ■ Dimensions

Dimensions and Lead Style Code	DC Rated Voltage	Dimensions (mm)					
		L	W	W1	T	F	d
0P1/0S1	25V/50V/100V	5.0	3.5	6.0	See the individual product specifications	2.5	0.5
0K1/0M1	25V/50V/100V	4.0	3.5	6.0		5.0	0.5
1P1/1S1	25V/50V/100V	5.0	3.5	5.0		2.5	0.5
1K1/1M1	25V/50V/100V	4.5	3.5	5.0		5.0	0.5
2P1/2S1	25V/50V/100V	5.5	4.0	6.0		2.5	0.5
	25V/50V/100V	5.5	4.0	6.0		5.0	0.5
2K1/2M1	250V/630V	5.0	3.5	5.0		5.0	0.5
	25V/50V/100V	5.5	5.0	7.5		2.5	0.5
3P1/3S1	25V/50V/100V	5.5	5.0	7.5		5.0	0.5
	250V/630V	5.0	4.5	6.3		5.0	0.5
5B1/5E1	250V/630V	7.5	7.5*	-		5.0	0.5
8K1/8M1	250V/630V	7.5	5.5	8.0		5.0	0.5
UB1/UE1	250V/630V	7.7	12.5*	-		5.0	0.5
WK1/WM1	25V/100V	5.5	7.5	10.0	5.0	0.5	

\*DC630V: W+0.5mm

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**Marking**

Dimensions Code	Type	Temperature Compensating Type	High Dielectric Constant Type									
	Rated Voltage	DC50V, DC100V	DC25V		DC50V				DC100V		DC250V	DC630V
	Temp. Char.	C0G	X7S	X7R	X7S	X7R	F	Y5V	X7S	X7R	X7R	
0		A 102J		104K	-		473	103Z	-		-	-
1		-	224K	-	-	224K	-	-	-	224K	-	-
2	Individual Specification Code A□□	-	M 475 K2C	-	M 475 K5C	M 105 K5C	-	-	-	M 105 K1C	103K	-
	Individual Specification Code C□□	-									M 153 K4C	M 153 K7C
3, 8, W		-	M 226 K2C	-	-	M 335 K5C	-	-	M 225 K1C	-	M 104 K4C	M 104 K7C
5, U		-	-	-	-	-	-	-	-	-	M 474 K4C	M 474 M7C
Temperature Characteristics		Marked with code (C0G char.: A, X7S/X7R char.: C, F/Y5V char.: F) A part is omitted (Please refer to the marking example.)										
Nominal Capacitance		Under 100pF: Actual value 100pF and over: Marked with 3 figures										
Capacitance Tolerance		Marked with code A part is omitted (Please refer to the marking example.)										
Rated Voltage		Marked with code (DC25V: 2, DC50V: 5, DC100V: 1, DC250V: 4, DC630V: 7) Lower horizontal line for F char. A part is omitted (Please refer to the marking example.)										
Manufacturer's Identification		Marked with M A part is omitted (Please refer to the marking example.)										

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**Temperature Compensating Type, C0G Characteristics**

Part Number	Temp. Char.	Rated Voltage (Vdc)	Capacitance (pF)	Dimensions LxW (mm)	Dimension T (mm)	Lead Space F (mm)	Lead Style Code Bulk	Lead Style Code Taping (1)	Lead Style Code Taping (2)
RDE5C1H100J0□□C03□	C0G	50	10 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H100J0□□C03□	C0G	50	10 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H120J0□□C03□	C0G	50	12 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H120J0□□C03□	C0G	50	12 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H150J0□□C03□	C0G	50	15 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H150J0□□C03□	C0G	50	15 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H180J0□□C03□	C0G	50	18 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H180J0□□C03□	C0G	50	18 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H220J0□□C03□	C0G	50	22 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H220J0□□C03□	C0G	50	22 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H270J0□□C03□	C0G	50	27 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H270J0□□C03□	C0G	50	27 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H330J0□□C03□	C0G	50	33 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H330J0□□C03□	C0G	50	33 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H390J0□□C03□	C0G	50	39 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H390J0□□C03□	C0G	50	39 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H470J0□□C03□	C0G	50	47 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H470J0□□C03□	C0G	50	47 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H560J0□□C03□	C0G	50	56 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H560J0□□C03□	C0G	50	56 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-

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Part Number	Temp. Char.	Rated Voltage (Vdc)	Capacitance (pF)	Dimensions LxW (mm)	Dimension T (mm)	Lead Space F (mm)	Lead Style Code Bulk	Lead Style Code Taping (1)	Lead Style Code Taping (2)
RDE5C1H680J0□□C03□	COG	50	68 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H680J0□□C03□	COG	50	68 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H820J0□□C03□	COG	50	82 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H820J0□□C03□	COG	50	82 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H101J0□□C03□	COG	50	100 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H101J0□□C03□	COG	50	100 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H121J0□□C03□	COG	50	120 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H121J0□□C03□	COG	50	120 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H151J0□□C03□	COG	50	150 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H151J0□□C03□	COG	50	150 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H181J0□□C03□	COG	50	180 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H181J0□□C03□	COG	50	180 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H221J0□□C03□	COG	50	220 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H221J0□□C03□	COG	50	220 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H271J0□□C03□	COG	50	270 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H271J0□□C03□	COG	50	270 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H331J0□□C03□	COG	50	330 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H331J0□□C03□	COG	50	330 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H391J0□□C03□	COG	50	390 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H391J0□□C03□	COG	50	390 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H471J0□□C03□	COG	50	470 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H471J0□□C03□	COG	50	470 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H561J0□□C03□	COG	50	560 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H561J0□□C03□	COG	50	560 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H681J0□□C03□	COG	50	680 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H681J0□□C03□	COG	50	680 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H821J0□□C03□	COG	50	820 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H821J0□□C03□	COG	50	820 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C1H102J0□□C03□	COG	50	1000 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C1H102J0□□C03□	COG	50	1000 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A100J0□□C03□	COG	100	10 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A100J0□□C03□	COG	100	10 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A120J0□□C03□	COG	100	12 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A120J0□□C03□	COG	100	12 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A150J0□□C03□	COG	100	15 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A150J0□□C03□	COG	100	15 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A180J0□□C03□	COG	100	18 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A180J0□□C03□	COG	100	18 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A220J0□□C03□	COG	100	22 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A220J0□□C03□	COG	100	22 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A270J0□□C03□	COG	100	27 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A270J0□□C03□	COG	100	27 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A330J0□□C03□	COG	100	33 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A330J0□□C03□	COG	100	33 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A390J0□□C03□	COG	100	39 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A390J0□□C03□	COG	100	39 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A470J0□□C03□	COG	100	47 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A470J0□□C03□	COG	100	47 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A560J0□□C03□	COG	100	56 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A560J0□□C03□	COG	100	56 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A680J0□□C03□	COG	100	68 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A680J0□□C03□	COG	100	68 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A820J0□□C03□	COG	100	82 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A820J0□□C03□	COG	100	82 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A101J0□□C03□	COG	100	100 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A101J0□□C03□	COG	100	100 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A121J0□□C03□	COG	100	120 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-

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Part Number	Temp. Char.	Rated Voltage (Vdc)	Capacitance (pF)	Dimensions LxW (mm)	Dimension T (mm)	Lead Space F (mm)	Lead Style Code Bulk	Lead Style Code Taping (1)	Lead Style Code Taping (2)
RDE5C2A121J0□□C03□	C0G	100	120 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A151J0□□C03□	C0G	100	150 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A151J0□□C03□	C0G	100	150 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A181J0□□C03□	C0G	100	180 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A181J0□□C03□	C0G	100	180 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A221J0□□C03□	C0G	100	220 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A221J0□□C03□	C0G	100	220 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A271J0□□C03□	C0G	100	270 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A271J0□□C03□	C0G	100	270 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A331J0□□C03□	C0G	100	330 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A331J0□□C03□	C0G	100	330 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A391J0□□C03□	C0G	100	390 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A391J0□□C03□	C0G	100	390 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A471J0□□C03□	C0G	100	470 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A471J0□□C03□	C0G	100	470 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A561J0□□C03□	C0G	100	560 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A561J0□□C03□	C0G	100	560 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A681J0□□C03□	C0G	100	680 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A681J0□□C03□	C0G	100	680 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A821J0□□C03□	C0G	100	820 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A821J0□□C03□	C0G	100	820 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDE5C2A102J0□□C03□	C0G	100	1000 ±5%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDE5C2A102J0□□C03□	C0G	100	1000 ±5%	5.0 x 3.5	2.5	2.5	P1	S1	-

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
 The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

### High Dielectric Constant Type, X7R/X7S Characteristics

Part Number	Temp. Char.	Rated Voltage (Vdc)	Capacitance	Dimensions LxW (mm)	Dimension T (mm)	Lead Space F (mm)	Lead Style Code Bulk	Lead Style Code Taping (1)	Lead Style Code Taping (2)
RDER71E104K0□□C03□	X7R	25	0.10μF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71E104K0□□C03□	X7R	25	0.10μF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDEC71E224K0□□C03□	X7S	25	0.22μF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDEC71E224K0□□C03□	X7S	25	0.22μF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDEC71E474K0□□C03□	X7S	25	0.47μF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDEC71E474K0□□C03□	X7S	25	0.47μF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDEC71E105K0□□C03□	X7S	25	1.0μF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDEC71E105K0□□C03□	X7S	25	1.0μF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDEC71E225K1□□C03□	X7S	25	2.2μF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RDEC71E225K1□□C03□	X7S	25	2.2μF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RDEC71E475K2□□C03□	X7S	25	4.7μF ±10%	5.5 x 4.0	3.15	2.5	P1	S1	-
RDEC71E475K2□□C03□	X7S	25	4.7μF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDEC71E106K2□□C03□	X7S	25	10.0μF ±10%	5.5 x 4.0	3.15	2.5	P1	S1	-
RDEC71E106K2□□C03□	X7S	25	10.0μF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDEC71E226K3□□C03□	X7S	25	22.0μF ±10%	5.5 x 5.0	4.0	2.5	P1	S1	-
RDEC71E226K3□□C03□	X7S	25	22.0μF ±10%	5.5 x 5.0	4.0	5.0	K1	M1	-
RDEC71E476MW□□C03□	X7S	25	47.0μF ±20%	5.5 x 7.5	4.0	5.0	K1	M1	-
RDER71H221K0□□C03□	X7R	50	220pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H221K0□□C03□	X7R	50	220pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H331K0□□C03□	X7R	50	330pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H331K0□□C03□	X7R	50	330pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H471K0□□C03□	X7R	50	470pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H471K0□□C03□	X7R	50	470pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H681K0□□C03□	X7R	50	680pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H681K0□□C03□	X7R	50	680pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H102K0□□C03□	X7R	50	1000pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-

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Part Number	Temp. Char.	Rated Voltage (Vdc)	Capacitance	Dimensions LxW (mm)	Dimension T (mm)	Lead Space F (mm)	Lead Style Code Bulk	Lead Style Code Taping (1)	Lead Style Code Taping (2)
RDER71H102K0□□C03□	X7R	50	1000pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H152K0□□C03□	X7R	50	1500pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H152K0□□C03□	X7R	50	1500pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H222K0□□C03□	X7R	50	2200pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H222K0□□C03□	X7R	50	2200pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H332K0□□C03□	X7R	50	3300pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H332K0□□C03□	X7R	50	3300pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H472K0□□C03□	X7R	50	4700pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H472K0□□C03□	X7R	50	4700pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H682K0□□C03□	X7R	50	6800pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H682K0□□C03□	X7R	50	6800pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H103K0□□C03□	X7R	50	10000pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H103K0□□C03□	X7R	50	10000pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H153K0□□C03□	X7R	50	15000pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H153K0□□C03□	X7R	50	15000pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H223K0□□C03□	X7R	50	22000pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H223K0□□C03□	X7R	50	22000pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H333K0□□C03□	X7R	50	33000pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H333K0□□C03□	X7R	50	33000pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H473K0□□C03□	X7R	50	47000pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H473K0□□C03□	X7R	50	47000pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H683K0□□C03□	X7R	50	68000pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H683K0□□C03□	X7R	50	68000pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H104K0□□C03□	X7R	50	0.10μF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER71H104K0□□C03□	X7R	50	0.10μF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER71H154K1□□C03□	X7R	50	0.15μF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RDER71H154K1□□C03□	X7R	50	0.15μF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RDER71H224K1□□C03□	X7R	50	0.22μF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RDER71H224K1□□C03□	X7R	50	0.22μF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RDER71H334K1□□C03□	X7R	50	0.33μF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RDER71H334K1□□C03□	X7R	50	0.33μF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RDER71H474K1□□C03□	X7R	50	0.47μF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RDER71H474K1□□C03□	X7R	50	0.47μF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RDER71H684K2□□C03□	X7R	50	0.68μF ±10%	5.5 x 4.0	3.15	2.5	P1	S1	-
RDER71H684K2□□C03□	X7R	50	0.68μF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDER71H105K2□□C03□	X7R	50	1.0μF ±10%	5.5 x 4.0	3.15	2.5	P1	S1	-
RDER71H105K2□□C03□	X7R	50	1.0μF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDER71H155K2□□C03□	X7R	50	1.5μF ±10%	5.5 x 4.0	3.15	2.5	P1	S1	-
RDER71H155K2□□C03□	X7R	50	1.5μF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDER71H225K2□□C03□	X7R	50	2.2μF ±10%	5.5 x 4.0	3.15	2.5	P1	S1	-
RDER71H225K2□□C03□	X7R	50	2.2μF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDER71H335K3□□C03□	X7R	50	3.3μF ±10%	5.5 x 5.0	4.0	2.5	P1	S1	-
RDER71H335K3□□C03□	X7R	50	3.3μF ±10%	5.5 x 5.0	4.0	5.0	K1	M1	-
RDEC71H475K2□□C03□	X7S	50	4.7μF ±10%	5.5 x 4.0	3.15	2.5	P1	S1	-
RDEC71H475K2□□C03□	X7S	50	4.7μF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDER72A102K0□□C03□	X7R	100	1000pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER72A102K0□□C03□	X7R	100	1000pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER72A152K0□□C03□	X7R	100	1500pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER72A152K0□□C03□	X7R	100	1500pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER72A222K0□□C03□	X7R	100	2200pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER72A222K0□□C03□	X7R	100	2200pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER72A332K0□□C03□	X7R	100	3300pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER72A332K0□□C03□	X7R	100	3300pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER72A472K0□□C03□	X7R	100	4700pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER72A472K0□□C03□	X7R	100	4700pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDER72A682K0□□C03□	X7R	100	6800pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDER72A682K0□□C03□	X7R	100	6800pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-

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Part Number	Temp. Char.	Rated Voltage (Vdc)	Capacitance	Dimensions LxW (mm)	Dimension T (mm)	Lead Space F (mm)	Lead Style Code Bulk	Lead Style Code Taping (1)	Lead Style Code Taping (2)
RD72A103K0□□C03□	X7R	100	10000pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RD72A103K0□□C03□	X7R	100	10000pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RD72A153K0□□C03□	X7R	100	15000pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RD72A153K0□□C03□	X7R	100	15000pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RD72A223K0□□C03□	X7R	100	22000pF ±10%	4.0 x 3.5	2.5	5.0	K1	M1	-
RD72A223K0□□C03□	X7R	100	22000pF ±10%	5.0 x 3.5	2.5	2.5	P1	S1	-
RD72A333K1□□C03□	X7R	100	33000pF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RD72A333K1□□C03□	X7R	100	33000pF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RD72A473K1□□C03□	X7R	100	47000pF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RD72A473K1□□C03□	X7R	100	47000pF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RD72A683K1□□C03□	X7R	100	68000pF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RD72A683K1□□C03□	X7R	100	68000pF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RD72A104K1□□C03□	X7R	100	0.10µF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RD72A104K1□□C03□	X7R	100	0.10µF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RD72A154K2□□C03□	X7R	100	0.15µF ±10%	5.5 x 4.0	3.15	2.5	P1	S1	-
RD72A154K2□□C03□	X7R	100	0.15µF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RD72A224K1□□C03□	X7R	100	0.22µF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RD72A224K1□□C03□	X7R	100	0.22µF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RD72A334K1□□C03□	X7R	100	0.33µF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RD72A334K1□□C03□	X7R	100	0.33µF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RD72A474K1□□C03□	X7R	100	0.47µF ±10%	4.5 x 3.5	3.15	5.0	K1	M1	-
RD72A474K1□□C03□	X7R	100	0.47µF ±10%	5.0 x 3.5	3.15	2.5	P1	S1	-
RD72A684K2□□C03□	X7R	100	0.68µF ±10%	5.5 x 4.0	3.15	2.5	P1	S1	-
RD72A684K2□□C03□	X7R	100	0.68µF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RD72A105K2□□C03□	X7R	100	1.0µF ±10%	5.5 x 4.0	3.15	2.5	P1	S1	-
RD72A105K2□□C03□	X7R	100	1.0µF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDEC72A155K3□□C03□	X7S	100	1.5µF ±10%	5.5 x 5.0	4.0	2.5	P1	S1	-
RDEC72A155K3□□C03□	X7S	100	1.5µF ±10%	5.5 x 5.0	4.0	5.0	K1	M1	-
RDEC72A225K3□□C03□	X7S	100	2.2µF ±10%	5.5 x 5.0	4.0	2.5	P1	S1	-
RDEC72A225K3□□C03□	X7S	100	2.2µF ±10%	5.5 x 5.0	4.0	5.0	K1	M1	-
RDEC72A475MW□□C03□	X7S	100	4.7µF ±20%	5.5 x 7.5	4.0	5.0	K1	M1	-
RD72E102K2□□A11□	X7R	250	1000pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72E152K2□□A11□	X7R	250	1500pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72E222K2□□A11□	X7R	250	2200pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72E332K2□□A11□	X7R	250	3300pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72E472K2□□A11□	X7R	250	4700pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72E682K2□□A11□	X7R	250	6800pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72E103K2□□A11□	X7R	250	10000pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72E153K2□□C11□	X7R	250	15000pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72E223K2□□C11□	X7R	250	22000pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72E333K2□□C11□	X7R	250	33000pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72E473K2□□C11□	X7R	250	47000pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72E683K3□□C11□	X7R	250	68000pF ±10%	5.0 x 4.5	3.15	5.0	K1	M1	-
RD72E104K3□□C11□	X7R	250	0.10µF ±10%	5.0 x 4.5	3.15	5.0	K1	B1	-
RD72E154K8□□C11□	X7R	250	0.15µF ±10%	7.5 x 5.5	3.15	5.0	K1	M1	-
RD72E224K8□□C11□	X7R	250	0.22µF ±10%	7.5 x 5.5	3.15	5.0	K1	M1	-
RD72E334K5□□C13□	X7R	250	0.33µF ±10%	7.5 x 7.5	4.0	5.0	B1	E1	-
RD72E474K5□□C13□	X7R	250	0.47µF ±10%	7.5 x 7.5	4.0	5.0	B1	E1	-
RD72E105MU□□C13□	X7R	250	1.0µF ±20%	7.7 x 12.5	4.0	5.0	B1	E1	-
RD72J102K2□□C11□	X7R	630	1000pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72J152K2□□C11□	X7R	630	1500pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72J222K2□□C11□	X7R	630	2200pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72J332K2□□C11□	X7R	630	3300pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72J472K2□□C11□	X7R	630	4700pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72J682K2□□C11□	X7R	630	6800pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72J103K2□□C11□	X7R	630	10000pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-
RD72J153K2□□C11□	X7R	630	15000pF ±10%	5.0 x 3.5	3.15	5.0	K1	M1	-

Continued on the following page. ↗

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Part Number	Temp. Char.	Rated Voltage (Vdc)	Capacitance	Dimensions LxW (mm)	Dimension T (mm)	Lead Space F (mm)	Lead Style Code Bulk	Lead Style Code Taping (1)	Lead Style Code Taping (2)
RDER72J223K3□□C11□	X7R	630	22000pF ±10%	5.0 x 4.5	3.15	5.0	K1	M1	-
RDER72J333K3□□C11□	X7R	630	33000pF ±10%	5.0 x 4.5	3.15	5.0	K1	M1	-
RDER72J473K3□□C11□	X7R	630	47000pF ±10%	5.0 x 4.5	3.15	5.0	K1	M1	-
RDER72J683K8□□C11□	X7R	630	68000pF ±10%	7.5 x 5.5	3.15	5.0	K1	M1	-
RDER72J104K8□□C11□	X7R	630	0.10μF ±10%	7.5 x 5.5	3.15	5.0	K1	M1	-
RDER72J154K5□□C13□	X7R	630	0.15μF ±10%	7.5 x 8.0	4.0	5.0	B1	E1	-
RDER72J224K5□□C13□	X7R	630	0.22μF ±10%	7.5 x 8.0	4.0	5.0	B1	E1	-
RDER72J474MU□□C13□	X7R	630	0.47μF ±20%	7.7 x 13.0	4.0	5.0	B1	E1	-

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
 The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

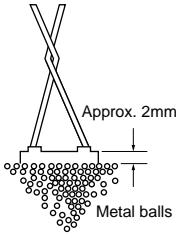
### High Dielectric Constant Type, F/Y5V Characteristics

Part Number	Temp. Char.	Rated Voltage (Vdc)	Capacitance	Dimensions LxW (mm)	Dimension T (mm)	Lead Space F (mm)	Lead Style Code Bulk	Lead Style Code Taping (1)	Lead Style Code Taping (2)
RDEF11H103Z0□□C01□	F	50	10000pF +80/-20%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDEF11H103Z0□□C01□	F	50	10000pF +80/-20%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDEF51H103Z0□□C03□	Y5V	50	10000pF +80/-20%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDEF51H103Z0□□C03□	Y5V	50	10000pF +80/-20%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDEF11H223Z0□□C01□	F	50	22000pF +80/-20%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDEF11H223Z0□□C01□	F	50	22000pF +80/-20%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDEF51H223Z0□□C03□	Y5V	50	22000pF +80/-20%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDEF51H223Z0□□C03□	Y5V	50	22000pF +80/-20%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDEF11H473Z0□□C01□	F	50	47000pF +80/-20%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDEF11H473Z0□□C01□	F	50	47000pF +80/-20%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDEF51H473Z0□□C03□	Y5V	50	47000pF +80/-20%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDEF51H473Z0□□C03□	Y5V	50	47000pF +80/-20%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDEF11H104Z0□□C01□	F	50	0.10μF +80/-20%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDEF11H104Z0□□C01□	F	50	0.10μF +80/-20%	5.0 x 3.5	2.5	2.5	P1	S1	-
RDEF51H104Z0□□C03□	Y5V	50	0.10μF +80/-20%	4.0 x 3.5	2.5	5.0	K1	M1	-
RDEF51H104Z0□□C03□	Y5V	50	0.10μF +80/-20%	5.0 x 3.5	2.5	2.5	P1	S1	-

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
 The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

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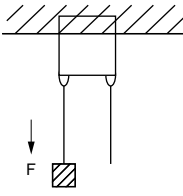
## Specifications and Test Methods

No.	Item	Specifications		Test Method												
		Temperature Compensating Type	High Dielectric Constant Type													
1	Operating Temperature Range	-55 to +125°C	Char. X7R, X7S: -55 to +125°C Char. F: -25 to +85°C Char. Y5V: -30 to +85°C	-												
2	Appearance	No defects or abnormalities		Visual inspection												
3	Dimension and Marking	See previous pages		Visual inspection, Vernier Caliper												
4	Dielectric Strength	Between Terminals	No defects or abnormalities	The capacitors should not be damaged when test voltages of Table are applied between the terminals for 1 to 5 sec. (Charge/Discharge current ≤ 50mA)  Temperature Compensating Type <table border="1" style="font-size: small;"> <thead> <tr> <th>Rated Voltage</th> <th>Test Voltage</th> </tr> </thead> <tbody> <tr> <td>DC50V, DC100V</td> <td>300% of the rated voltage</td> </tr> </tbody> </table> High Dielectric Constant Type <table border="1" style="font-size: small;"> <thead> <tr> <th>Rated Voltage</th> <th>Test Voltage</th> </tr> </thead> <tbody> <tr> <td>DC25V, DC50V</td> <td>250% of the rated voltage</td> </tr> <tr> <td>DC100V, DC250V</td> <td>200% of the rated voltage</td> </tr> <tr> <td>DC630V</td> <td>150% of the rated voltage</td> </tr> </tbody> </table>	Rated Voltage	Test Voltage	DC50V, DC100V	300% of the rated voltage	Rated Voltage	Test Voltage	DC25V, DC50V	250% of the rated voltage	DC100V, DC250V	200% of the rated voltage	DC630V	150% of the rated voltage
		Rated Voltage	Test Voltage													
DC50V, DC100V	300% of the rated voltage															
Rated Voltage	Test Voltage															
DC25V, DC50V	250% of the rated voltage															
DC100V, DC250V	200% of the rated voltage															
DC630V	150% of the rated voltage															
Body Insulation	No defects or abnormalities	The capacitor is placed in a container with metal balls of 1mm diameter so that each terminal, short-circuited, is kept approximately 2mm from the balls as shown in the figure, and 250% of the rated voltage (200% of the rated voltage in case of rated voltage: DC100V, DC250V, DC630V) is impressed for 1 to 5 sec. between capacitor terminals and metal balls. (Charge/Discharge current ≤ 50mA) <div style="text-align: right; margin-top: 10px;">  </div>														
5	Insulation Resistance	Between Terminals	Rated Voltage: DC25V, DC50V, DC100V 10,000MΩ min. or 500MΩ • μF min. whichever is smaller Rated Voltage: DC250V, DC630V 10,000MΩ min. or 100MΩ • μF min. whichever is smaller	The insulation resistance should be measured with a DC voltage not exceeding the rated voltage (DC500±50V in case of rated voltage: DC630V) at normal temperature and humidity and within 2 min. of charging. (Charge/Discharge current ≤ 50mA)												
6	Capacitance	Within the specified tolerance		The capacitance, Q/D.F. should be measured at 25°C at the frequency and voltage shown in the table.												
7	Q/Dissipation Factor (D.F.)	30pF min.: Q ≥ 1,000 30pF max.: Q ≥ 400+20C C: Nominal capacitance (pF)	Char. X7R: 0.025 max. Char. F, Y5V: 0.05 max. Char. X7S: 0.125 max.	Temperature Compensating Type <table border="1" style="font-size: small;"> <thead> <tr> <th rowspan="2">Item</th> <th colspan="2">Capacitance</th> </tr> <tr> <th>C ≤ 1000pF</th> <th>C &gt; 1000pF</th> </tr> </thead> <tbody> <tr> <td>Frequency</td> <td>1 ± 0.1MHz</td> <td>1 ± 0.1kHz</td> </tr> <tr> <td>Voltage</td> <td>AC0.5 to 5V (r.m.s.)</td> <td>AC1 ± 0.2V (r.m.s.)</td> </tr> </tbody> </table>	Item	Capacitance		C ≤ 1000pF	C > 1000pF	Frequency	1 ± 0.1MHz	1 ± 0.1kHz	Voltage	AC0.5 to 5V (r.m.s.)	AC1 ± 0.2V (r.m.s.)	
				Item		Capacitance										
C ≤ 1000pF	C > 1000pF															
Frequency	1 ± 0.1MHz	1 ± 0.1kHz														
Voltage	AC0.5 to 5V (r.m.s.)	AC1 ± 0.2V (r.m.s.)														
High Dielectric Constant Type <table border="1" style="font-size: small;"> <thead> <tr> <th rowspan="2">Item</th> <th colspan="2">Capacitance</th> </tr> <tr> <th>C ≤ 10μF</th> <th>C &gt; 10μF</th> </tr> </thead> <tbody> <tr> <td>Frequency</td> <td>1 ± 0.1kHz</td> <td>120 ± 24Hz</td> </tr> <tr> <td>Voltage</td> <td>AC1 ± 0.2V (r.m.s.)</td> <td>AC0.5 ± 0.1V (r.m.s.)</td> </tr> </tbody> </table>	Item	Capacitance		C ≤ 10μF	C > 10μF	Frequency	1 ± 0.1kHz	120 ± 24Hz	Voltage	AC1 ± 0.2V (r.m.s.)	AC0.5 ± 0.1V (r.m.s.)					
Item		Capacitance														
	C ≤ 10μF	C > 10μF														
Frequency	1 ± 0.1kHz	120 ± 24Hz														
Voltage	AC1 ± 0.2V (r.m.s.)	AC0.5 ± 0.1V (r.m.s.)														

Continued on the following page.

## Specifications and Test Methods

Continued from the preceding page.

No.	Item		Specifications		Test Method												
			Temperature Compensating Type	High Dielectric Constant Type													
8	Capacitance Temperature Characteristics	Capacitance Change	Within the specified tolerance (Table A on last column)	Within the specified tolerance (Table B on last column)	The capacitance change should be measured after 5 min. at each specified temperature stage. (1) Temperature Compensating Type The temperature coefficient is determined using the capacitance measured in step 3 as a reference. When cycling the temperature sequentially from step 1 through 5 (-55 to +125°C) the capacitance should be within the specified tolerance for the temperature coefficient and capacitance change as shown in Table A. The capacitance drift is calculated by dividing the differences between the maximum and minimum measured values in step 1, 3 and 5 by the cap. value in step 3. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>25±2</td> </tr> <tr> <td>2</td> <td>-55±3</td> </tr> <tr> <td>3</td> <td>25±2</td> </tr> <tr> <td>4</td> <td>125±3</td> </tr> <tr> <td>5</td> <td>25±2</td> </tr> </tbody> </table> (2) High Dielectric Constant Type The ranges of capacitance change compared with the 25°C (Char. F: 20°C) value over the temperature ranges as shown in Table B should be within the specified ranges. • Pretreatment (for high dielectric constant type) Perform a heat treatment at 150+0/-10°C for 1 hr., and then let sit at room temperature for 24±2 hrs.	Step	Temperature (°C)	1	25±2	2	-55±3	3	25±2	4	125±3	5	25±2
		Step	Temperature (°C)														
		1	25±2														
2	-55±3																
3	25±2																
4	125±3																
5	25±2																
Temperature Coefficient	Within the specified tolerance (Table A on last column)																
Capacitance Drift	Within ±0.2% or ±0.05pF, whichever is larger																
9	Terminal Strength	Tensile Strength	Termination not to be broken or loosened		As in the figure, fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N and then keep the force applied for 10±1 sec. 												
		Bending Strength	Termination not to be broken or loosened														
10	Vibration Resistance	Appearance	No defects or abnormalities		The capacitor is soldered securely to a supporting terminal and a 10 to 55Hz vibration of 1.5mm peak-peak amplitude is applied for 6 hrs. total, 2 hrs. in each mutually perpendicular direction. Allow 1 min. to cycle the frequency from 10Hz to 55Hz and the converse.												
		Capacitance	Within the specified tolerance														
		Q/D.F.	30pF min.: $Q \geq 1,000$ 30pF max.: $Q \geq 400 + 20C$ C: Nominal capacitance (pF)	Char. X7R: 0.025 max. Char. F, Y5V: 0.05 max. Char. X7S: 0.125 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 terminal of a capacitor is dipped into a 25% ethanol (JIS-K-8101) solution of rosin (JIS-K-5902) and then into molten solder for 2±0.5 sec. In both cases the depth of dipping is up to about 1.5mm to 2mm from the terminal body. Temp. of solder: 245±5°C Lead Free Solder (Sn-3.0Ag-0.5Cu) 235±5°C H60A or H63A Eutectic Solder													
12	Resistance to Soldering Heat	Appearance	No defects or abnormalities		The lead wire is immersed in the melted solder 1.5mm to 2mm from the main body at 350±10°C for 3.5±0.5 sec. The specified items are measured after 24±2 hrs. • Pretreatment (for high dielectric constant type) Perform a heat treatment at 150+0/-10°C for 1 hr., and then let sit at room temperature for 24±2 hrs.												
		Capacitance Change	Within ±2.5% or ±0.25pF (whichever is larger)	Char. X7R, X7S: Within ±10% Char. F, Y5V: Within ±20%													
		Dielectric Strength (Between Terminals)	No defects														

Continued on the following page.

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## Specifications and Test Methods

Continued from the preceding page.

No.	Item	Specifications		Test Method																
		Temperature Compensating Type	High Dielectric Constant Type																	
13	Temperature Cycle	Appearance	No defects or abnormalities		The capacitor should be subjected to 5 temperature cycles. Remove and set for 24±2 hrs. at room temperature, then measure. <table border="1" style="margin-top: 10px; width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Time (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Min. Operating Temp. ±3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room Temp.</td> <td>3 max.</td> </tr> <tr> <td>3</td> <td>Max. Operating Temp. ±3</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room Temp.</td> <td>3 max.</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Pretreatment (for high dielectric constant type)                      Perform a heat treatment at 150+0/-10°C for 1 hr., and then let sit at room temperature for 24±2 hrs.</li> </ul>	Step	Temperature (°C)	Time (min)	1	Min. Operating Temp. ±3	30±3	2	Room Temp.	3 max.	3	Max. Operating Temp. ±3	30±3	4	Room Temp.	3 max.
		Step	Temperature (°C)	Time (min)																
		1	Min. Operating Temp. ±3	30±3																
		2	Room Temp.	3 max.																
		3	Max. Operating Temp. ±3	30±3																
4	Room Temp.	3 max.																		
Capacitance Change	Within ±5% or ±0.5pF (whichever is larger)	Char. X7R, X7S: Within ±12.5% Char. F, Y5V: Within ±30%																		
Q/D.F.	30pF min.: Q≥350 10pF to 30pF: Q≥275+5C/2 10pF max.: Q≥200+10C C: Nominal capacitance (pF)	Char. X7R: 0.05 max. Char. F, Y5V: 0.075 max. Char. X7S: 0.2 max.																		
Insulation Resistance	Rated Voltage: DC25V, DC50V, DC100V 1,000MΩ, 50MΩ • μF min. (whichever is smaller) Rated Voltage: DC250V, DC630V 1,000MΩ, 10MΩ • μF min. (whichever is smaller)																			
Dielectric Strength (Between Terminals)	No defects or abnormalities																			
14	Humidity (Steady State)	Appearance	No defects or abnormalities		Set the capacitor at 40±2°C and relative humidity of 90 to 95% for 500±2 <sub>0</sub> hrs. Remove and set for 24±2 hrs. at room temperature, then measure. <ul style="list-style-type: none"> <li>Pretreatment (for high dielectric constant type)                      Perform a heat treatment at 150+0/-10°C for 1 hr., and then let sit at room temperature for 24±2 hrs.</li> </ul>															
		Capacitance Change	Within ±5% or ±0.5pF (whichever is larger)	Char. X7R, X7S: Within ±15% Char. F, Y5V: Within ±30%																
		Q/D.F.	30pF min.: Q≥350 10pF to 30pF: Q≥275+5C/2 10pF max.: Q≥200+10C C: Nominal capacitance (pF)	Char. X7R: 0.05 max. Char. F, Y5V: 0.075 max. Char. X7S: 0.2 max.																
		Insulation Resistance	Rated Voltage: DC25V, DC50V, DC100V 1,000MΩ, 50MΩ • μF min. (whichever is smaller) Rated Voltage: DC250V, DC630V 1,000MΩ, 10MΩ • μF min. (whichever is smaller)																	
15	Humidity Load	Appearance	No defects or abnormalities		Apply the rated voltage for 500±2 <sub>0</sub> hrs. at 40±2°C and in 90 to 95% humidity. Remove and set for 24±2 hrs. at room temperature, then measure. (Charge/Discharge current ≤50mA) <ul style="list-style-type: none"> <li>Pretreatment (for high dielectric constant type)                      Perform a heat treatment at 150+0/-10°C for 1 hr., and then let sit at room temperature for 24±2 hrs.</li> </ul>															
		Capacitance Change	Within ±7.5% or ±0.75pF (whichever is larger)	Char. X7R, X7S: Within ±15% Char. F, Y5V: Within ±30%																
		Q/D.F.	30pF min.: Q≥200 30pF max.: Q≥100+10C/3 C: Nominal capacitance (pF)	Char. X7R: 0.05 max. Char. F, Y5V: 0.075 max. Char. X7S: 0.2 max.																
		Insulation Resistance	Rated Voltage: DC25V, DC50V, DC100V 500MΩ or 25MΩ • μF min. (whichever is smaller) Rated Voltage: DC250V, DC630V 1,000MΩ or 10MΩ • μF min. (whichever is smaller)																	
16	High Temperature Load	Appearance	No defects or abnormalities		Apply voltage in Table for 1000±4 <sub>8</sub> hrs. at the maximum operating temperature±3°C. Remove and set for 24±2 hrs. at room temperature, then measure. (Charge/Discharge current ≤50mA) <table border="1" style="margin-top: 10px; width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Rated Voltage</th> <th>Test Voltage</th> </tr> </thead> <tbody> <tr> <td>DC25V, DC50V DC100V, DC250V</td> <td>150% of the rated voltage</td> </tr> <tr> <td>DC630V</td> <td>120% of the rated voltage</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Pretreatment (for high dielectric constant type)                      Apply test voltage for 1 hr., at test temperature.                      Remove and set for 24±2 hrs. at room temperature.</li> </ul>	Rated Voltage	Test Voltage	DC25V, DC50V DC100V, DC250V	150% of the rated voltage	DC630V	120% of the rated voltage									
		Rated Voltage	Test Voltage																	
		DC25V, DC50V DC100V, DC250V	150% of the rated voltage																	
		DC630V	120% of the rated voltage																	
Capacitance Change	Within ±3% or ±0.3pF (whichever is larger)	Char. X7R, X7S: Within ±15% Char. F, Y5V: Within ±30%																		
Q/D.F.	30pF min.: Q≥350 10pF to 30pF: Q≥275+5C/2 10pF max.: Q≥200+10C C: Nominal capacitance (pF)	Char. X7R: 0.05 max. Char. F, Y5V: 0.075 max. Char. X7S: 0.2 max.																		
Insulation Resistance	Rated Voltage: DC25V, DC50V, DC100V 1,000MΩ, 50MΩ • μF min. (whichever is smaller) Rated Voltage: DC250V, DC630V 1,000MΩ, 10MΩ • μF min. (whichever is smaller)																			
17	Solvent Resistance	Appearance	No defects or abnormalities		The capacitor should be fully immersed, unagitated, in reagent at 20 to 25°C for 30±5 sec. and then removed gently. Marking on the surface of the capacitor should immediately be visually examined. Reagent: <ul style="list-style-type: none"> <li>Isopropyl alcohol</li> </ul>															
		Marking	Legible																	

Table A

Char.	Nominal Values (ppm/°C) *1	Capacitance Change from 25°C (%)					
		-55°C		-30°C		-10°C	
		Max.	Min.	Max.	Min.	Max.	Min.
<b>COG</b>	0±30	0.58	-0.24	0.40	-0.17	0.25	-0.11

\*1: Nominal values denote the temperature coefficient within a range of 25 to 125°C

Table B

Char.	Temp. Range	Reference Temp.	Cap. Change Rate
<b>X7R</b>	-55 to +125°C	25°C	Within ±15%
<b>X7S</b>			Within ±22%
<b>Y5V</b>			Within ±32%
<b>F</b>	-25 to + 85°C	20°C	Within ±38%

# Radial Lead Type Monolithic Ceramic Capacitors



## RDE Series Large Capacitance and High Allowable Ripple Current (For Commercial Use Only) (DC250V-DC630V)

### ■ Features

- Higher capacitance with DC-Bias; approximately 40% higher than X7R under loaded rated voltage.
- Applicable for use as a DC smoothing capacitor in LED Bulb Lighting circuits after the bridge rectifier circuit  
 AC100V input: 250V rating type  
 maximum capacitance of X7T, 250V is 2.2 micro F  
 though X7R, 630V is 0.47 micro F.  
 AC200V input: 450V rating type  
 maximum capacitance of X7T, 450V is 1.2 micro F  
 though X7R, 630V is 0.47 micro F.
- Allowable higher ripple current
- Reduces acoustic noise  
 Approximately 15dB reduction in comparison to leaded X7R characteristics parts.  
 Approximately 30dB reduction in comparison to SMD X7T characteristics part because the contact area is smaller than a SMD.
- Maximum capacitance is doubled by the dual chip structure in the leaded component construction.

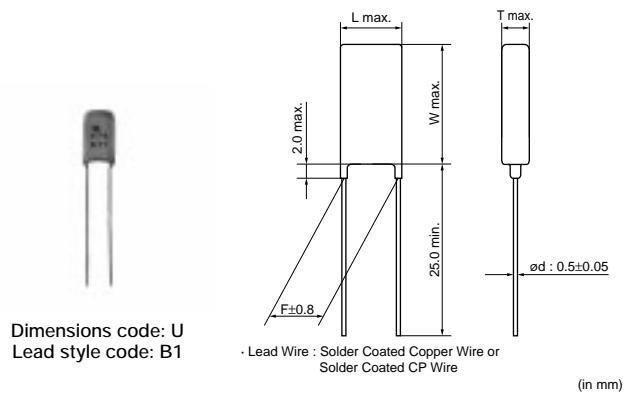
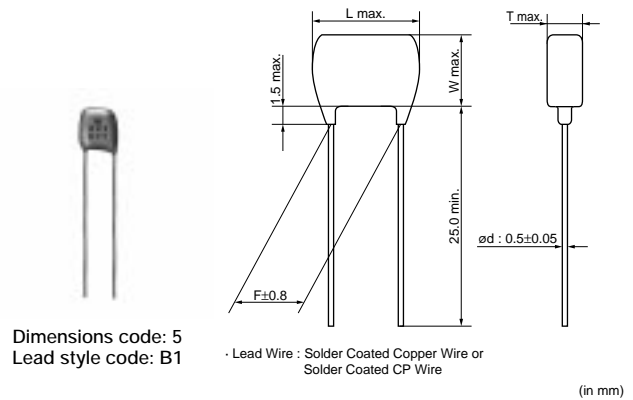
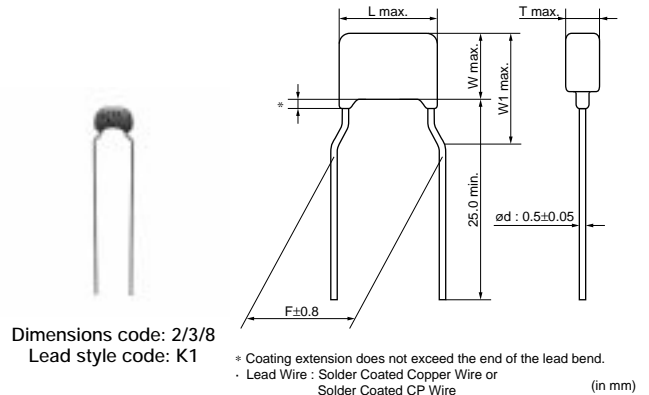
### ■ Applications

- DC smoothing capacitor for LED bulb
- PFC capacitor for general use SMPS
- Replace Al-E capacitor for long-life equipment

### ■ Dimensions

Dimensions and Lead Style Code	DC Rated Voltage	Dimensions (mm)					
		L	W	W1	T	F	d
<b>2K1/2M1</b>	250V/450V/630V	5.5	4.0	6.0	See the individual product specifications	5.0	0.5
<b>3K1/3M1</b>	250V/450V/630V	5.5	5.0	7.5		5.0	0.5
<b>5B1/5E1</b>	250V/450V/630V	7.5	7.5*	-		5.0	0.5
<b>8K1/8M1</b>	250V/450V/630V	7.5	5.5	8.0		5.0	0.5
<b>UB1/UE1</b>	250V/450V/630V	7.7	12.5*	-		5.0	0.5

\*DC630V: W+0.5mm



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**Marking**

Dimensions Code	Rated Voltage	DC250V	DC450V	DC630V
	Temp. Char.	X7T		
2				
3, 8				
5, U				
Temperature Characteristics		Marked with code (X7T char.: 7)		
Nominal Capacitance		Marked with 3 figures		
Capacitance Tolerance		Marked with code		
Rated Voltage		Marked with code (DC250V: 4, DC450V: 9, DC630V: 7)		
Manufacturer's Identification		Marked with		

**High Dielectric Constant Type, X7T Characteristics**

Part Number	Temp. Char.	Rated Voltage (Vdc)	Capacitance	Dimensions LxW (mm)	Dimension T (mm)	Lead Space F (mm)	Lead Style Code Bulk	Lead Style Code Taping (1)	Lead Style Code Taping (2)
RDED72E333K2□□C11□	X7T	250	33000pF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDED72E473K2□□C11□	X7T	250	47000pF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDED72E683K2□□C11□	X7T	250	68000pF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDED72E104K3□□C11□	X7T	250	0.10µF ±10%	5.5 x 5.0	4.0	5.0	K1	M1	-
RDED72E154K3□□C11□	X7T	250	0.15µF ±10%	5.5 x 5.0	4.0	5.0	K1	M1	-
RDED72E224K8□□C11□	X7T	250	0.22µF ±10%	7.5 x 5.5	4.0	5.0	K1	M1	-
RDED72E334K8□□C11□	X7T	250	0.33µF ±10%	7.5 x 5.5	4.0	5.0	K1	M1	-
RDED72E474K5□□C13□	X7T	250	0.47µF ±10%	7.5 x 7.5	4.5	5.0	B1	E1	-
RDED72E684K5□□C13□	X7T	250	0.68µF ±10%	7.5 x 7.5	4.5	5.0	B1	E1	-
RDED72E105K5□□C13□	X7T	250	1.0µF ±10%	7.5 x 7.5	4.5	5.0	B1	E1	-
RDED72E225MU□□C13□	X7T	250	2.2µF ±20%	7.7 x 12.5	4.5	5.0	B1	E1	-
RDED72W103K2□□C11□	X7T	450	10000pF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDED72W153K2□□C11□	X7T	450	15000pF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDED72W223K2□□C11□	X7T	450	22000pF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDED72W333K2□□C11□	X7T	450	33000pF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDED72W473K2□□C11□	X7T	450	47000pF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDED72W683K3□□C11□	X7T	450	68000pF ±10%	5.5 x 5.0	4.0	5.0	K1	M1	-
RDED72W104K3□□C11□	X7T	450	0.10µF ±10%	5.5 x 5.0	4.0	5.0	K1	M1	-
RDED72W154K8□□C11□	X7T	450	0.15µF ±10%	7.5 x 5.5	4.0	5.0	K1	M1	-
RDED72W224K5□□C13□	X7T	450	0.22µF ±10%	7.5 x 7.5	4.5	5.0	B1	E1	-
RDED72W334K5□□C13□	X7T	450	0.33µF ±10%	7.5 x 7.5	4.5	5.0	B1	E1	-
RDED72W474K5□□C13□	X7T	450	0.47µF ±10%	7.5 x 7.5	4.5	5.0	B1	E1	-
RDED72W564K5□□C13□	X7T	450	0.56µF ±10%	7.5 x 7.5	4.5	5.0	B1	E1	-
RDED72W105MU□□C13□	X7T	450	1.0µF ±20%	7.7 x 12.5	4.5	5.0	B1	E1	-
RDED72W125MU□□C13□	X7T	450	1.2µF ±20%	7.7 x 12.5	4.5	5.0	B1	E1	-
RDED72J103K2□□C11□	X7T	630	10000pF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDED72J153K2□□C11□	X7T	630	15000pF ±10%	5.5 x 4.0	3.15	5.0	K1	M1	-
RDED72J223K3□□C11□	X7T	630	22000pF ±10%	5.5 x 5.0	4.0	5.0	K1	M1	-
RDED72J333K3□□C11□	X7T	630	33000pF ±10%	5.5 x 5.0	4.0	5.0	K1	M1	-
RDED72J473K3□□C11□	X7T	630	47000pF ±10%	5.5 x 5.0	4.0	5.0	K1	M1	-
RDED72J683K8□□C11□	X7T	630	68000pF ±10%	7.5 x 5.5	4.0	5.0	K1	M1	-
RDED72J104K5□□C13□	X7T	630	0.10µF ±10%	7.5 x 8.0	4.5	5.0	B1	E1	-
RDED72J154K5□□C13□	X7T	630	0.15µF ±10%	7.5 x 8.0	4.5	5.0	B1	E1	-
RDED72J224K5□□C13□	X7T	630	0.22µF ±10%	7.5 x 8.0	4.5	5.0	B1	E1	-

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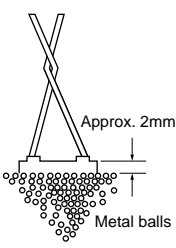
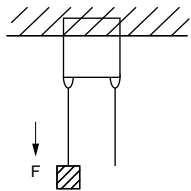
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Part Number	Temp. Char.	Rated Voltage (Vdc)	Capacitance	Dimensions LxW (mm)	Dimension T (mm)	Lead Space F (mm)	Lead Style Code Bulk	Lead Style Code Taping (1)	Lead Style Code Taping (2)
<b>RDED72J274K5□□C13□</b>	X7T	630	0.27μF ±10%	7.5 x 8.0	4.5	5.0	B1	E1	-
<b>RDED72J474MU□□C13□</b>	X7T	630	0.47μF ±20%	7.7 x 13.0	4.5	5.0	B1	E1	-
<b>RDED72J564MU□□C13□</b>	X7T	630	0.56μF ±20%	7.7 x 13.0	4.5	5.0	B1	E1	-

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
 The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)



## Specifications and Test Methods

No.	Item	Specifications	Test Method												
1	Operating Temperature Range	-55 to +125°C	-												
2	Appearance	No defects or abnormalities	Visual inspection												
3	Dimension and Marking	See previous pages	Visual inspection, Vernier Caliper												
4	Dielectric Strength	Between Terminals No defects or abnormalities	The capacitor should not be damaged when voltage in Table is applied between the terminations for 1 to 5 sec. (Charge/Discharge current $\leq 50\text{mA}$ ) <table border="1" style="margin: 5px 0;"> <thead> <tr> <th>Rated Voltage</th> <th>Test Voltage</th> </tr> </thead> <tbody> <tr> <td>DC250V</td> <td>200% of the rated voltage</td> </tr> <tr> <td>DC450V</td> <td>150% of the rated voltage</td> </tr> <tr> <td>DC630V</td> <td>120% of the rated voltage</td> </tr> </tbody> </table>	Rated Voltage	Test Voltage	DC250V	200% of the rated voltage	DC450V	150% of the rated voltage	DC630V	120% of the rated voltage				
	Rated Voltage	Test Voltage													
DC250V	200% of the rated voltage														
DC450V	150% of the rated voltage														
DC630V	120% of the rated voltage														
		Body Insulation No defects or abnormalities	The capacitor is placed in a container with metal balls of 1mm diameter so that each terminal, short-circuit, is kept approximately 2mm from the balls as shown in the figure, and 200% of the rated DC voltage is impressed for 1 to 5 sec. between capacitor terminals and metal balls. (Charge/Discharge current $\leq 50\text{mA}$ ) 												
5	Insulation Resistance	Between Terminals More than 10,000MΩ or 100MΩ · μF, Whichever is smaller	The insulation resistance should be measured with DC500±50V (DC250±25V in case of rated voltage: DC250V, DC450V) at normal temperature and humidity and within 2 min. of charging. (Charge/Discharge current $\leq 50\text{mA}$ )												
6	Capacitance	Within the specified tolerance	The capacitance/D.F. should be measured at the frequency of 1±0.1kHz and a voltage of AC1±0.2V(r.m.s.).												
7	Dissipation Factor (D.F.)	0.01 max.													
8	Capacitance Temperature Characteristics	Within +22/-33%	The capacitance change should be measured after 5 min. at each specified temperature stage. <table border="1" style="margin: 5px 0;"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>25±2</td> </tr> <tr> <td>2</td> <td>-55±3</td> </tr> <tr> <td>3</td> <td>25±2</td> </tr> <tr> <td>4</td> <td>125±3</td> </tr> <tr> <td>5</td> <td>25±2</td> </tr> </tbody> </table>	Step	Temperature (°C)	1	25±2	2	-55±3	3	25±2	4	125±3	5	25±2
Step	Temperature (°C)														
1	25±2														
2	-55±3														
3	25±2														
4	125±3														
5	25±2														
9	Terminal Strength	Tensile Strength Termination not to be broken or loosened	As in the figure, fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N and then keep the force applied for 10±1 sec. 												
		Bending Strength Termination not to be broken or loosened	Each lead wire should be subjected to a force of 2.5N and then bent 90° at the point of egress in one direction. Each wire is then returned to the original position and bent 90° in the opposite direction at the rate of one bend per 2 to 3 sec.												
10	Vibration Resistance	Appearance	The capacitor should be firmly soldered to the supporting lead wire and vibrated at a frequency range of 10 to 55Hz, 1.5mm in total amplitude, with about a 1 minute rate of vibration change from 10Hz to 55Hz and back to 10Hz. Apply for a total of 6 hrs., 2 hrs. each in 3 mutually perpendicular directions.												
		Capacitance													
		D.F.													

Continued on the following page.

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## Specifications and Test Methods

Continued from the preceding page.

No.	Item	Specifications	Test Method	
11	Solderability of Leads	Lead wire should be soldered with uniform coating on the axial direction over 3/4 of the circumferential direction.	The terminal of a capacitor is dipped into a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight proportion) and then into molten solder (JIS-Z-3282) for 2±0.5 sec. In both cases the depth of dipping is up to about 1.5 to 2mm from the terminal body. Temp. of solder: 245±5°C Lead Free Solder (Sn-3.0Ag-0.5Cu) 235±5°C H60A or H63A Eutectic Solder	
12	Resistance to Soldering Heat	Appearance	No defects or abnormalities	
		Capacitance Change		Within ±10%
		Dielectric Strength (Between Terminals)		No defects
13	Temperature Cycle	Appearance	No defects or abnormalities	
		Capacitance Change		Within ±7.5%
		D.F.		0.01 max.
		Insulation Resistance		More than 10,000MΩ or 100MΩ · μF (Whichever is smaller)
		Dielectric Strength (Between Terminals)		No defects or abnormalities
14	Humidity (Steady State)	Appearance	No defects or abnormalities	
		Capacitance Change		Within ±12.5%
		D.F.		0.02 max.
		Insulation Resistance		More than 1,000MΩ or 10MΩ · μF (Whichever is smaller)
15	Humidity Load	Appearance	No defects or abnormalities	
		Capacitance Change		Within ±12.5%
		D.F.		0.02 max.
		Insulation Resistance		More than 1,000MΩ or 10MΩ · μF (Whichever is smaller)
16	High Temperature Load	Appearance	No defects or abnormalities	
		Capacitance Change		Within ±12.5%
		D.F.		0.02 max.
		Insulation Resistance		More than 1,000MΩ or 10MΩ · μF (Whichever is smaller)
17	Solvent Resistance	Appearance	No defects or abnormalities	
		Marking		Legible

The capacitor should be subjected to 5 temperature cycles.

Step	Temperature (°C)	Time (min)
1	-55±3	30±3
2	Room Temp.	3 max.
3	125±3	30±3
4	Room Temp.	3 max.

• Pretreatment  
 Perform a heat treatment at 150+0/-10°C for 1 hr., and then let sit at room temperature for 24±2 hrs.

Set the capacitor at 40±2°C and relative humidity of 90 to 95% for 500 ±2<sub>0</sub> hrs. Remove and set for 24±2 hrs. at room temperature, then measure.

• Pretreatment  
 Perform a heat treatment at 150+0/-10°C for 1 hr., and then let sit at room temperature for 24±2 hrs.

Apply the rated voltage at 40±2°C and relative humidity of 90 to 95% for 500 ±2<sub>0</sub> hrs. Remove and set for 24±2 hrs. at room temperature, then measure. (Charge/Discharge current ≤ 50mA)

• Pretreatment  
 Perform a heat treatment at 150+0/-10°C for 1 hr., and then let sit at room temperature for 24±2 hrs.

Apply voltage in Table for 1000 ±4<sub>8</sub> hrs. at the maximum operating temperature. Remove and set for 24±2 hrs. at room temperature, then measure. (Charge/Discharge current ≤ 50mA)

Rated Voltage	Test Voltage
DC250V	150% of the rated voltage
DC450V	130% of the rated voltage
DC630V	120% of the rated voltage

• Pretreatment  
 Apply test voltage for 1 hr., at test temperature. Remove and set for 24±2 hrs. at room temperature.

The capacitor should be fully immersed, unagitated, in reagent at 20 to 25 °C for 30±5 sec. and then removed gently. Marking on the surface of the capacitor should immediately be visually examined.  
 Reagent :  
 • Isopropyl alcohol

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# Mouser Electronics

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## Murata:

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[RDER72H682K2K1C11B](#) [RDER72D153K2K1C11B](#) [RDER72H153K2K1C11B](#) [RDER72D474K5B1C13B](#)  
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