

MULTILAYER CERAMIC CAPACITORS



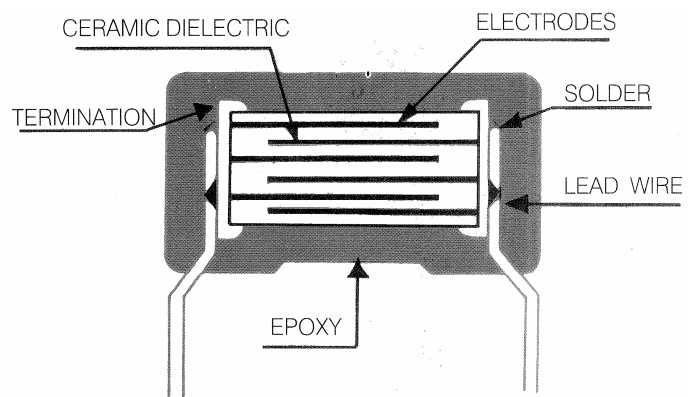
EPOXY COATED RADIAL TYPE

APPLICATION

NPO: Temperature compensation type. Have little or no change in capacitance with variation in temperature. Hence, they are used in radio-frequency oscillators, precision timing circuits, ultra stable amplifiers, etc.

X7R: Temperature stable type for by-pass and decoupling in radio and television receivers, computers servo systems, audio tone, and coupling, etc., where moderate capacitance variations are permissible and dissipation factor is not critical.

Z5U / Y5V: General type for by-pass and filtering applications.



1. Lead Shape:

RD15 RD20 RD25	RD16 RD21 RD26 RD31	RD18	RD17 RD22 RD27 RD32

2. Lead Space (F)

Code	Lead Space (mm/inch)	
2	2.54 ± 0.8	0.1 ± 0.032
5	5.08 ± 0.8	0.2 ± 0.032

3. Lead Length (ℓ)

Code	Lead Length	Remark
6	6mm ± 1mm	Specified lead length available upon request.
9	9mm ± 1mm	
L	25.4mm min.	

4. Body Size & Dimension

Size Code	Lead Style Available	Capacitance Range (PF)				Dimensions (mm)					
		NPO	X7R	Z5U	Y5V	L max.	W max.	T max.	ℓ min.	d ± 0.05	F ± 0.8
R15	L	1 ~	100 ~	1,000 ~	10,000 ~	3.8	3.8	2.5	25.4	0.5	2.54
	A, H	1,000	33,000	220,000	220,000	3.8	5.5	2.5	25.4	0.5	5.08
R20	Y	1,000 ~	39,000 ~	220,000	220,000 ~	5	6	3	25.4	0.5	2.54
	A, H	6,800	330,000	1,500,000	1,500,000	5	6	3	25.4	0.5	5.08

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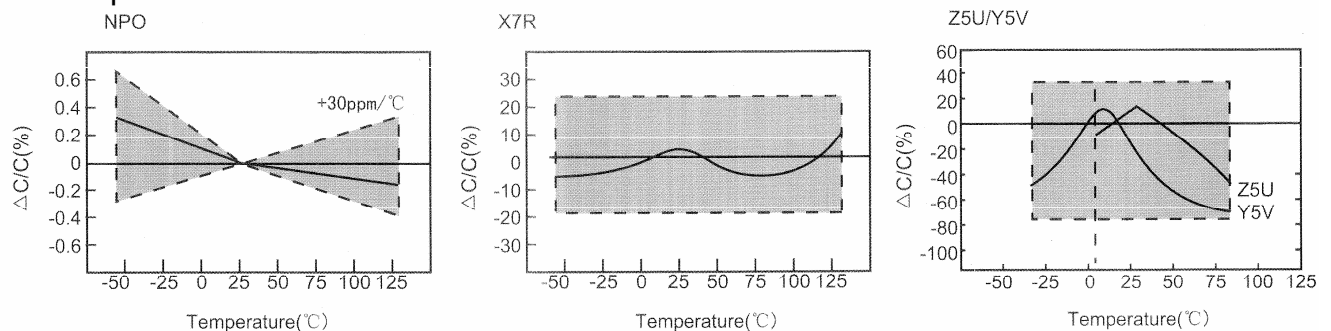
EPOXY COATED RADIAL TYPE

Part number designation

RD15	Z	104	M	500	B	25	B
SIZE	T.C.	Capacitance Code	Tolerance	Rated Voltage	Packing	Lead Length	Colors
RD15	N = NPO	2 significant digits	J = $\pm 0.5\%$	160 = 16V	Bulk		Yellow
RD20	B = X7R	+ no. of zeros.	K = $\pm 10\%$	250 = 25V	T/B		Blue
	Z = Z5U	100 = 10 pF	M = $\pm 20\%$	500 = 50V	T/R		
	Y = Y5V	101 = 100 pF	Z = + 80%	101 = 100V			
		102 = 1,000 pF	-20%	251 = 250V			
		223 = 22,000 pF					
		104 = 100,000 pF					

TYPICAL PERFORMANCE CHARACTERISTICS

1. Temperature Characteristics



2. Specifications

Temperature Coefficient:

NPO: $0 \pm 30\text{ppm}/^\circ\text{C}$ to, -55°C to $+125^\circ\text{C}$

X7R: $\pm 15\%$, -55°C to $+125^\circ\text{C}$

Z5U: $+22\%$, -56% , -10°C to $+85^\circ\text{C}$

Y5V: $+22\%$, -82% , -30°C to $+85^\circ\text{C}$

Capacitance Test 25°C

NPO: 1VRMS max at 1KHz

(1MHz for 100pF or less)

X7R: 1VRMS max at 1KHz

Z5U: 1VRMS max at 1KHz

Y5V: 1VRMS max at 1KHz

Dissipation Factor 25°C

NPO: 0.15% max at 1KHz, 1VRMS max.

(1MHz for 100pF or less)

X7R: 2.5% max at 1KHz, 1VRMS max.

Z5U: 5% max at 1KHz, 1VRMS max.

Y5V: 5% max at 1KHz, 1VRMS max.

Dielectric Strength 25°C (Flash Test)

NPO and X7R : 300% rated voltage for 5 seconds

with 50mA max. charging current.

Z5U and Y5V: 250% rated voltage for 5 seconds with

50mA max. charging current.

Life Test (1,000hrs)

NPO: $\leq \pm 3\%$ at 200% rated voltage, 125°C

X7R: $\leq \pm 12.5\%$ at 200% rated voltage, 125°C

Z5U: $\leq \pm 30\%$ at 200% rated voltage, 85°C

Y5V: $\leq \pm 30\%$ at 200% rated voltage, 85°C

Insulation Resistance 25°C

NPO and X7R: 100GΩ or 1,000MΩ-MFD whichever is less.

Z5U and Y5V : 10GΩ or 100MΩ-MFD whichever is less.

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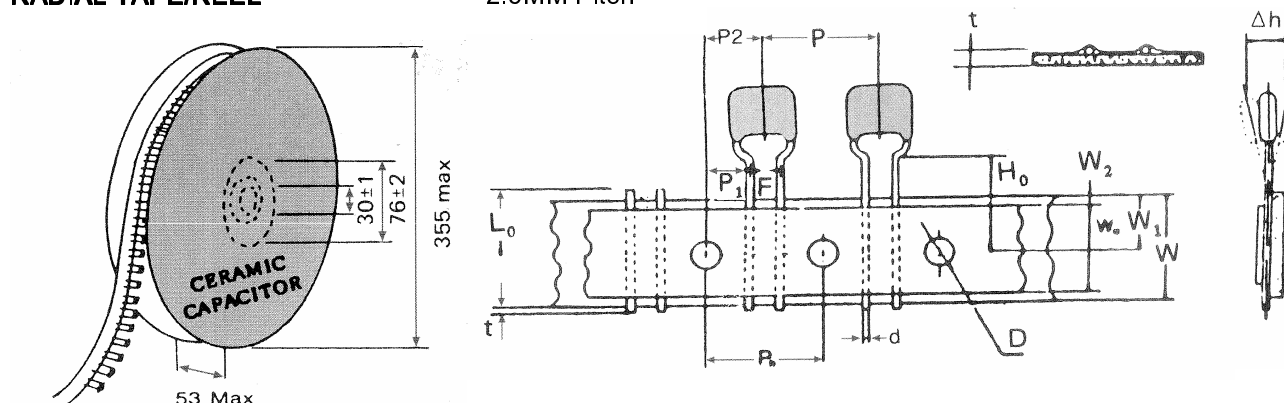


EPOXY COATED RADIAL TYPE

RADIAL TAPED TYPE FOR AUTOMATIC INSERTION

RADIAL TAPE/REEL

2.5MM Pitch



2.5mm Pitch

Quantity: 2,500pcs/ Reel; 2,000pcs/ Box

Unit: mm

Symbol	P	P ₀	P ₁	P ₂	d	F	Δh	W	W ₀	W ₁	W ₂	H ₀	ℓ	D ₀	t	L ₀
Dimension	12.7	12.7	5.1	6.35	0.5	2.5	0	18	12	9	1.5	16	1	4	0.7	11
Tolerance	±1	±0.3	±0.7	±1.3	±0.05	±1	±2	+1 -0.5	±1	±0.5	±1.5	±0.5	Max.	±0.2	±0.2	Max.

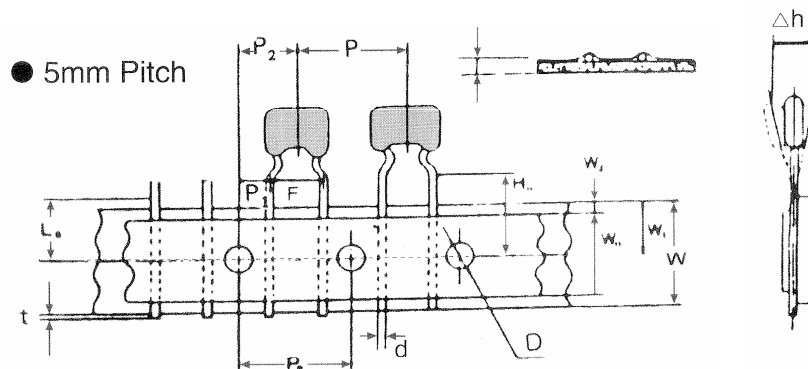
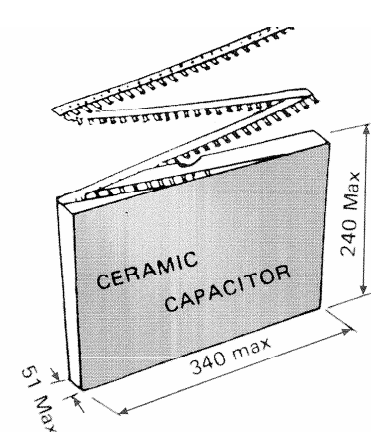
5mm Pitch

Quantity: 2,500pcs/ Reel; 2,000pcs/ Box

Unit: mm

Symbol	P	P ₀	P ₁	P ₂	d	F	Δh	W	W ₀	W ₁	W ₂	H ₀	ℓ	D ₀	t	L ₀
Dimension	12.7	12.7	3.85	6.35	0.5	5.0	0	18	12	9	1.5	16	1	4	0.7	11
Tolerance	±1	±0.3	±0.7	±1.3	±0.05	±1	±2	+1 -0.5	±1	±0.5	±1.5	±0.5	Max.	±0.2	±0.2	Max.

Radial Tape/ Box

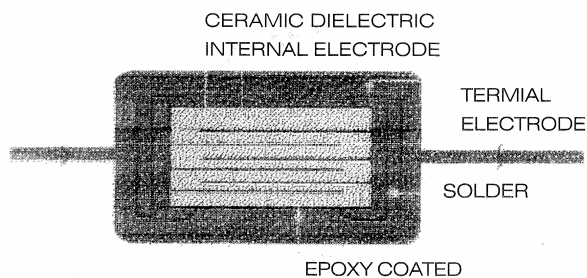


MULTILAYER CERAMIC CAPACITORS



EPOXY COATED AXIAL TYPE

CONSTRUCTION:



Part number designation

A	Y5V	104	Z	500	TB
Product	T.C.	Capacitance Code	Tolerance	Working Voltage	Packing
A = Axial type (Conformal coated)	COG (NPO)	2 significant digits + no. of zeros.	J = $\pm 0.5\%$	250 = 25V	T/B = Tape & Box
	X7R	100 = 10 pF	K = $\pm 10\%$	500 = 50V	T/R = Tape & Reel
	Z5U	101 = 100 pF	M = $\pm 20\%$	101 = 100V	
	Y5V	102 = 1,000 pF	Z = +80% -20%		
		223 = 22,000 pF			
		104 = 100,000 pF			

Product Specification:

Capacitance Range: 10pF to 22 μ F

Capacitance Tolerance:

NPO: J = $\pm 5\%$

K = $\pm 10\%$

X7R: K = $\pm 10\%$

M = $\pm 20\%$

Z5U: M = $\pm 20\%$

Z = +80% - 20%

Y5V: Z = +80% - 20%

Working Voltage: 25, 50VDC

Temperature Characteristics:

NPO: 0 $\pm$ 30 ppm/ $^{\circ}$ C, -55 $^{\circ}$ C to +125 $^{\circ}$ C

X7R: $\pm$ 15% Δ C, -55 $^{\circ}$ C to +125 $^{\circ}$ C

Z5U: +22% to -56% Δ C, -10 $^{\circ}$ C to +85 $^{\circ}$ C

Y5V: +22% to -82% Δ C, +30 $^{\circ}$ C to +85 $^{\circ}$ C

Capacitance:

NPO: 1.2Vrms maximum and 1MHz for value above 1,000pF

X7R: 1.0Vrms $\pm$ 0.2Vrms and 1KHz

Z5U, Y5V: 0.5Vrms $\pm$ 0.1Vrms and 1KHz

Measurement Condition are as capacitance test at 25 $^{\circ}$ C

Dielectric Strength:

NPO, X7R: 250% rated voltage with 50mA max, charging current.

Z5U, Y5V: 200% rated voltage with 50mA max. charging current.

Insulation Resistance:

When measured at 25 $^{\circ}$ C and rated voltage, the following min.values will be met:

NPO, X7R: 100K Megohms or 1000 Megohm-Microfarads whichever is less.

Z5U, Y5V: 10K Megohms or 1000 Megohm-Microfarads

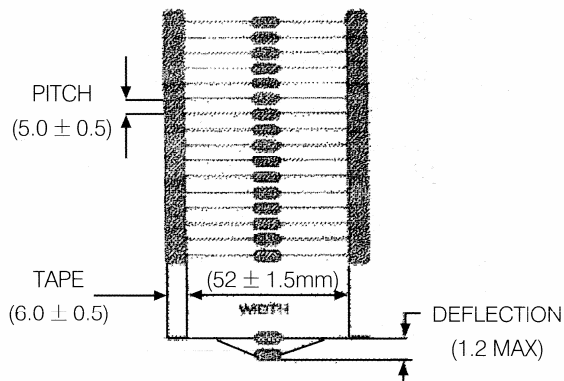
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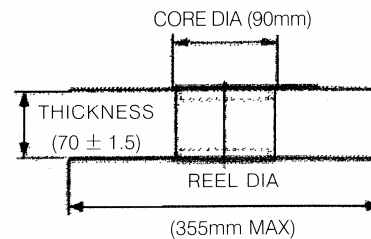
EPOXY COATED AXIAL TYPE

Packing Specification

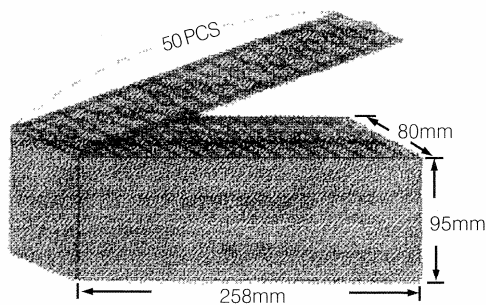
Tape:



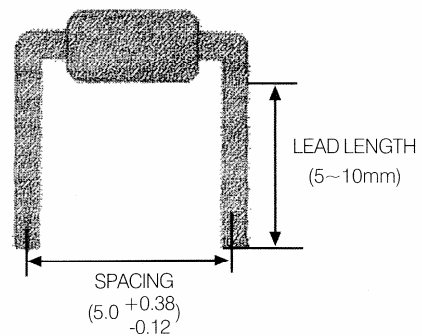
Reel:



Ammo pack:



Lead forming:



Packing Quantity:

SIZE	Q'ty	TAPING TYPE		BULK TYPE
		Per Reel	Per Box	Per Box
A15		10,000	5,000	1,000
A20		10,000	5,000	1,000