

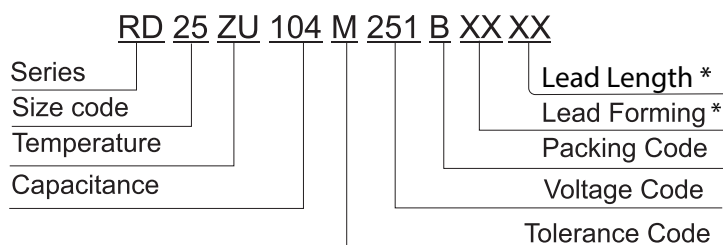
■ INTRODUCTION

Radial Leaded Multilayer Ceramic Capacitors are made with a superior epoxy coating for moisture and mechanical protection. The small size is suitable for a wide range of applications, including: data processing, telecommunications, instrumentation, and industrial controls.

■ FEATURES

- Epoxy Coating
- Minature Size
- Auto Insertable
- Reliable

■ PART NUMBER EXAMPLE



*omit for standard leads and taped product

■ SIZE CODE & CAPACITANCE RANGE

Size Code	Dimensions (mm)			Voltage Vdc	Voltage Code	C0G/NPO (pf)	X7R (μf)	X5R (μf)	Y5V (μf)	Z5U (μf)
	Wmax	Hmax	Tmax							
RD2 *	4.0	4.0	2.5	6.3V	60			1.50~10.00	4.70~22.00	
				10V	100			0.33~4.70	2.20~10.00	
				16V	160		0.22~2.20	0.15~2.2	1.00~4.70	
				25V	250		0.10~1.50	0.10~1.0	0.47~2.20	0.47~2.22
				50V	500	1~10,000	0.00022~0.33	0.10~1.0	0.1~1.00	0.1~1.00
				100V	101	1~4,700	0.00022~0.10			
				250V	251	100~2,700	0.001~0.033			
RD3 *	5.1	5.1	4.0	6.3V	60			10~22.00	47~100.0	
				10V	100			6.80~10.00	22~47.0	
				16V	160		0.30~0.47	1.5~10.00	10~22	
				25V	250		0.68~2.20		4.7~10	
				50V	500	3,900~33,000	0.47~1.00		2.2~4.7	
				100V	101	3,900~10,000	0.033~0.47			
				250V	251	3,000~8,200	0.015~0.15			
				500V	501	100~3,300	0.001~0.033			

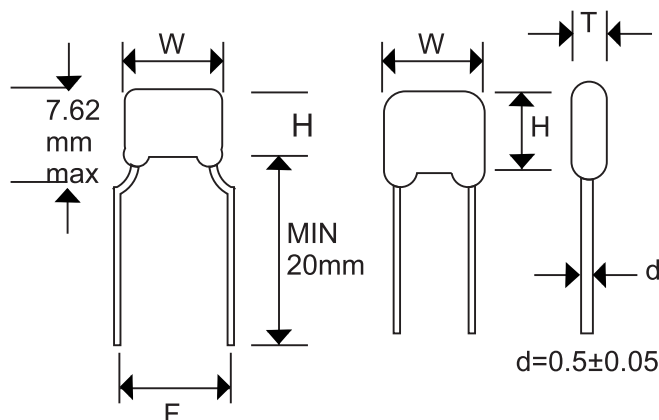
*2 = 2.5mm ±1mm Lead Spacing, F Dimension

*5 = 5.0mm ±1mm Lead Spacing, F Dimension

Note: Contact RFE for capacitance and voltage combinations not shown above.

■ CAPACITANCE CODE EXAMPLES

Code	1R0	100	330	221	102	222	103	104	224	105
Capacitance in pF	1.0pF	10pF	33pF	220pF	1,000pF	2,200pF	10,000pF	100,000pF	220,000pF	
Capacitance in μF				0.00022μF	0.001μF	0.0022μF	0.01μF	0.1μF	0.22μF	1.0μF



■ TOLERANCE CODE

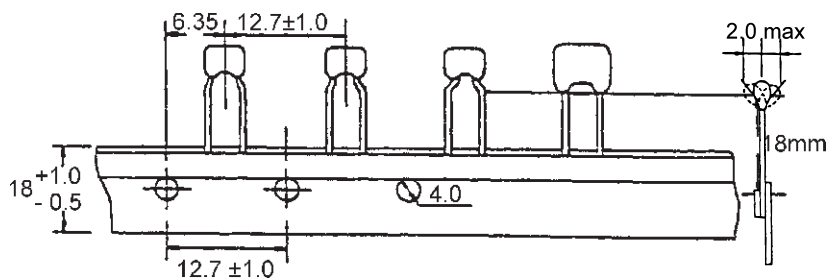
Code	Cap. Tol.
C	$\pm 0.25\text{pF}$
D	$\pm 0.5\text{pF}$
F	$\pm 1\%$
G	$\pm 2\%$
J	$\pm 5\%$
K	$\pm 10\%$
M	$\pm 20\%$
Z	$\pm 80\%, -20\%$

■ TEMPERATURE COEFFICIENT

Code	Temp. Charact.	Temperature Range	Capacitance Change
CG	C0G/NPO	-55 ~ 125°C	0 \pm 30 ppm/°C
X5R	X5R	-55 ~ 85°C	$\pm 15\%$
XR	X7R	-55 ~ 125°C	$\pm 15\%$
YV	Y5V	-30 ~ 85°C	+22%, -82%
ZU	Z5U	+10 ~ 85°C	+22%, -56%

*See other RD Series for C0G/NPO

■ TAPING & PACKAGING

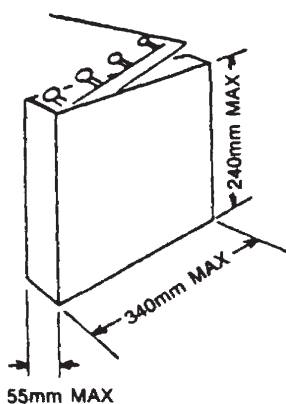


■ PACKAGING CODE

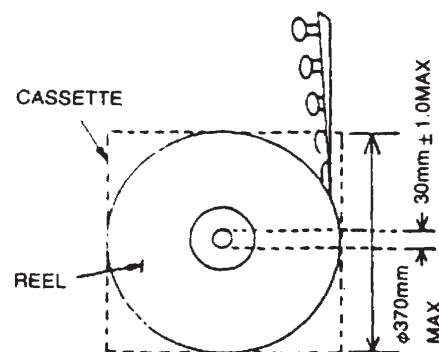
Code	Style	Quantity
B	BULK	1000
A	AMMO	3000
R	REEL	3000

■ LEAD FORMING

Code	Stand off forming
KO	Kink Out
KI	Kink In



AMMO BOX



REEL-PACK

■ LEAD LENGTH EXAMPLE (BULK ONLY)

Code	20	4.0	4.5	5.0	5.5
Length (mm)	standard	4 \pm 1	4.5 \pm 1	5 \pm 1	5.5 \pm 1

■ ELECTRICAL CHARACTERISTICS C0G/NPO

Dielectric Code / EIA	C0G/NPO (pF)	X7R/X5R (μf)	Y5V/Z5U (μf)
Temperature Characteristic	0 ±30ppm/°C, C>20pF 0 + 120/ -40 ppm/°C, C>20pF	ΔC ±15% maximum over - 55°C to +125°C (+85°C, X5R)	ΔC ±22%/-82% maximum over - 30°C to +85°C
Operating Temperature Range	-55°C to +125°C	- 55°C to +125°C	-30°C to +85°C
Measuring Conditions for Capacitance and D.F.	1 MHz, 1Vrms, C < 1000 pF	1 KHz, 1Vrms	1 KHz, 0.5Vrms
Dissipation Factor (D.F.) and Tangent of Loss Angle	≤0.1%	≤2.5%	≤5.0%
Insulation Resistance (I.R.) after 60 secs, charging at rated voltage, 25°C, 55% RH max.	≤100G ohms or ≤ 1000MμF Whichever is less	≥100G ohms or ≥ 1000MμF Whichever is less	≥10G ohms or ≥ 1000MμF Whichever is less
Voltage Proof 25°C, 1 - 5 secs.	2.5 x Rated Voltage	2.5 x Rated Voltage	2.5 x Rated Voltage
Capacitance Aging	0	2.5% per decade hour	7% per decade hour

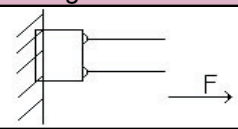
■ ENVIRONMENTAL CHARACTERISTICS X7R/Y5V

Test	Test Condition	Post-Test Inspection Requirements																							
Solderability	Solder 60Sn/40Pb, 235 ±5°C Immersion 2 ±0.5 sec. Depth of Immersion: 1.5 - 2.0mm	At least 95% of leads should be well tinned																							
Resistance to Soldering Heat	Immersion in solder bath at 260 ±5°C for 10 ± 1 sec. Recovery: 24 ±2 hours. (NPO) 48 ± 4 hours (X7R, Y5V)	No visible damage <table><tr><td></td><td>NPO</td><td>X7R</td><td colspan="2">Y5V</td></tr><tr><td>ΔC/°C</td><td>≤±5%</td><td>±10%</td><td colspan="2">±20%</td></tr></table>					NPO	X7R	Y5V		ΔC/°C	≤±5%	±10%	±20%											
	NPO	X7R	Y5V																						
ΔC/°C	≤±5%	±10%	±20%																						
Rapid Change of Temperature	-55 to +125°C (NPO, X7R) -25 to +85°C (Y5V) 5 cycles, duration: 30 mins. Recovery: 24 ±2 hours. (NPO) 48 ± 4 hours (X7R, Y5V)	No visible damage																							
Endurance	1000 hrs. at maximum temperature with 1.5 x rated voltage applied. Recovery: 24 ±2 hours. (NPO) 48 ± 4 hours (X7R, Y5V)	No visible damage <table><tr><td></td><td>NPO</td><td>X7R</td><td colspan="2">Y5V</td></tr><tr><td>ΔC/°C</td><td>≤±2%</td><td>±20%</td><td colspan="2">±30%</td></tr><tr><td>DF</td><td>≤±0.3%</td><td>±5%</td><td colspan="2">±10%</td></tr><tr><td>IR</td><td colspan="4">R.C >25S</td></tr></table>					NPO	X7R	Y5V		ΔC/°C	≤±2%	±20%	±30%		DF	≤±0.3%	±5%	±10%		IR	R.C >25S			
	NPO	X7R	Y5V																						
ΔC/°C	≤±2%	±20%	±30%																						
DF	≤±0.3%	±5%	±10%																						
IR	R.C >25S																								

■ STORAGE

1. The storage conditions < 40°C, < 70% R.H.
2. After opening the package, please store in desiccators.

■ LEAD PULL AND SOLDERABILITY

Parameter	Specification	Measuring Condition
Strength of Termination	Termination not to be broken or loosened. Force: 2 LB Min. Keep time: 10±1 sec.	
Solderability of Leads	Lead wire to be soldered vertically up to the coating end point. At least 75% of lead surface is covered.	Solder temperature: 260 ±5°C. Dipping: 2 ±0.5 sec. (Containing Ag 2~5%) (Flux shall be used)