

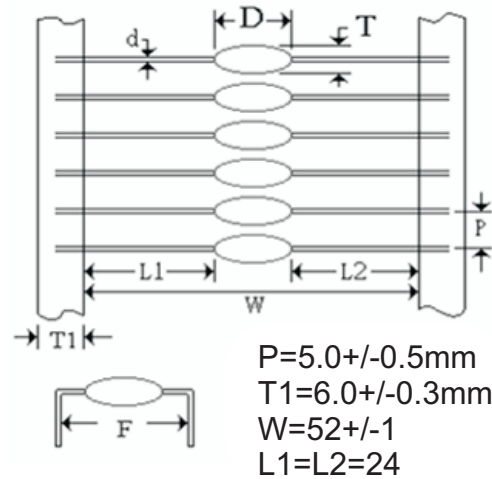
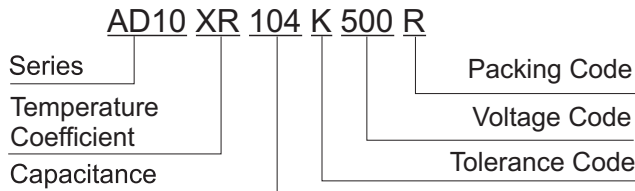
INTRODUCTION

Radial Ledged 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



SIZE CODE & CAPACITANCE RANGE

Size Code	Dimensions (mm)			Voltage Vdc	Voltage Code	X7R (μF)	X5R (μF)	Y5V (μF)	Z5U (μF)
	T (max)	D (max)	F (± 0.8)						
AD10	2.6	4.0	5.0	6.3V	050			1.50~10.00	4.70~22.00
				10V	100			0.33~4.70	2.20~10.00
				16V	160	0.22~2.20	1.00	1.00~4.70	
				25V	250	0.10~1.50	0.22	0.47~2.20	
				50V	500	0.00022~0.33		0.10~1.00	0.22~1.00
				100V	101	0.00022~0.10			
				250V	251	0.001~0.033			
AD15	3.1	5.1	10	6.3V	060		10.00~22.00	47.00	
				10V	100		6.80~10.00	22.00	
				16V	160	0.30~4.70	10.00	10.00	
				25V	250	0.68~2.20	3.30	4.70	
				50V	500	0.47~1.00		2.20	
				100V	101	0.033~0.47			
				250V	251	0.015~0.15			
500V	501	0.001~0.033							

CAPACITANCE CODE

Code	221	102	222	103	473	104	105	106
Capacitance	0.00022 μF	0.001 μF	0.00022 μF	0.01 μF	0.047 μF	0.1 μF	1.0 μF	10 μF

TOLERANCE CODE

Code	Cap. Tol.
C	±0.25pF
D	±0.5pF
F	±1%
G	±2%
J	±5%
K	±10%
M	±20%
Z	±80%, -20%

TEMPERATURE COEFFICIENT

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

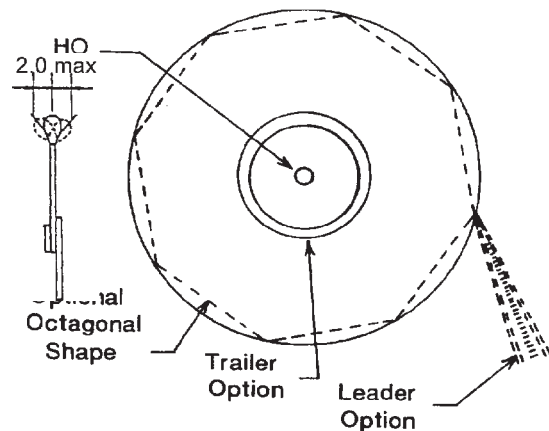
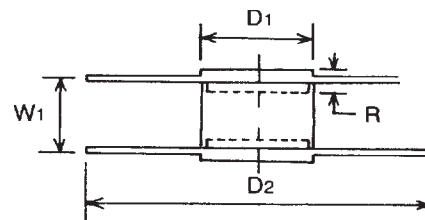
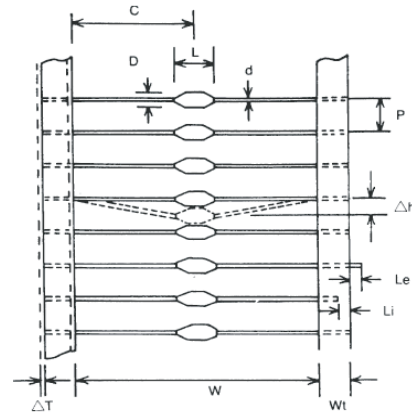
* See other AD Series for COG/NPO

TAPING & PACKAGING

DIMENSIONS

Tape Spec.	Symbol	Dimension (mm)
Pitch of component	P	5.08±0.51
Cumulative Tolerance of P Over 6 Consecutive Units.		±0.15
Tape Width	Wt	6.0±1.0
Lead Wire Protrusion	Le	1.0 max
Lead Extension into Tape	Li	1.5 max
Offset Between Tapes	ΔT	0.8 max
Width Between Tapes	W	52.4±1.5
Lead Diameter	d	0.483

Reel Spec.	Symbol	Dimension (mm)
Centered	C	±0.76
Core Diameter	D1	34.9-92.1 Standard 82
Reel Diameter	D2	360 max Standard 340
Core Width	W1	67(+1.5, -0)
Recess Depth	R	9.5 min. Standard 16
Arbor Hole	H0	13.89-38.10 Standard 17
Deflection from Nominal Position	Δh	1.2 max



ELECTRICAL CHARACTERISTICS

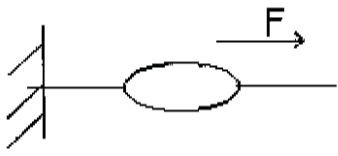
X7R/X5R/Y5V/Z5U

Parameter	Specification	Measuring Condition
Capacitance	With the specified tolerance	Shall be measured at 25°C±2°C at the frequency and voltage X7R/X5R/Y5V @ 1Hz ± 10%, 1±0.2Vrms Z5U @ 1Hz ± 10%, 0.5±0.2Vrms
Dissipation Factor (tanδ)	25V min X7R= 0.03max X7R= 0.055max.(C ≥ 1.0uF) Y5V= 0.075max	
	16V Z5U= 0.09max X7R/X5R=0.05max.	
	10V max Y5V= 0.10max X7R/X5R=0.05max. Y5V= 0.125max	
	6.3V X5R= 0.075max	
Withstanding Voltage	No defects	Applied voltage: Rated voltage X 2.5 100V~500V Rated voltage (over) X 1.5 Duration: 1 to 5 sec. The charge/discharge current is less than 50mA
Insulation Resistance	More than 10GΩ or 500MΩ · μF whichever is less 16Vdc product : More than 10GΩ or 100MΩ · μF whichever is less	Apply rated voltage for 1 minute at 25°C± 2°C and 70% R.H. max 16Vdc product : Measurement voltage is 25Vdc

STORAGE

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

ENVIRONMENTAL AND TEST CHARACTERISTICS

Parameter	Specification	Measuring Condition
Strength of termination	Termination not to be broken or loosened Force : 4 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: 250± 5°C Dipping: 2 ± 0.5 sec. (containing Ag2~5%) (Flux shall be used)

ELECTRICAL CHARACTERISTICS

X7R/X5R/Y5V/Z5U

Item	Temperature Compensating	Measuring Condition	Measuring Condition															
		Resistance to Soldering heat	Thermal shock															
ΔC	X7R/X5R= $\pm 7.5\%$ Y5V= $\pm 20\%$ Z5U= $\pm 20\%$	The lead wire is immersed in the melted solder 1.5mm to 2mm from the main body at $260 \pm 5^\circ C$ for 10 ± 0.5 sec																
D.F.	25V min X7R= 0.03max X7R= 0.055max.(C $\geq 1.0\mu F$) Y5V= 0.075max Z5U= 0.09max	Let sit at room temperature for 48 ± 4 hrs. then measure. • Initial measurement for perform a heat treatment at $150^{+10}_0^\circ C$ for 1 hours. Remove and let sit for 48 ± 4 hrs. At room temperature. Perform the initial measurement.	Perform the five cycles according to the four heat treatments listed in the following table. Remove and let sit at room temperature for 48 ± 4 hrs., then measure. <table border="1" data-bbox="1112 820 1605 953"> <thead> <tr> <th>Step</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Temp. ($^\circ C$)</td> <td>Min. Operating Temp.</td> <td>Room Temp.</td> <td>Max. Operating Temp.</td> <td>Room Temp.</td> </tr> <tr> <td>Time</td> <td>30 ± 3</td> <td>15</td> <td>30 ± 3</td> <td>15</td> </tr> </tbody> </table> • Initial measurement for perform a heat treatment at $150^{+10}_0^\circ C$ for 1 hours. Remove and let sit for 48 ± 4 hrs. At room temperature. Perform the initial measurement.	Step	1	2	3	4	Temp. ($^\circ C$)	Min. Operating Temp.	Room Temp.	Max. Operating Temp.	Room Temp.	Time	30 ± 3	15	30 ± 3	15
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6.3V X5R= 0.075max																		
I.R.	More than $10G \Omega$ or $500M \Omega \cdot \mu F$, whichever is less. 16V dc product: More than $10G \Omega$ or $100M \Omega \cdot \mu F$, whichever is less.																	

Item	Temperature Compensating	Measuring Condition	Measuring Condition
		Moisture resistance (Steady state)	High temperature loading
ΔC	X7R/X5R= $\pm 15\%$ Y5V= $\pm 30\%$ Z5U= $\pm 30\%$	Apply the rated DC voltage at $40 \pm 2^\circ C$ and 90 to 95% R.H. for 500^{+24}_0 hrs.	
D.F.	25V min X7R= 0.06max X7R= 0.11max.(C $\geq 1.0\mu F$) Y5V= 0.1125max Z5U= 0.135max	Remove and let sit at room temperature for 48 ± 4 hrs, then measure. • Initial measurement for perform a heat treatment at $150^{+10}_0^\circ C$ for 1 hours. Remove and let sit for 48 ± 4 hrs. At room temperature. Perform the initial measurement.	Apply the 200% of rated DC voltage for 1000^{+48}_0 hrs. at the maximum operating temperature $\pm 2^\circ C$. Remove and let sit at room temperature for 48 ± 4 hrs., than measure. The charge/discharge current is less than 50mA. • Initial measurement for Apply 200% of the rated DC voltage for 1 hour at the maximum operating temperature $\pm 2^\circ C$. Remove let sit at room temperature for 48 ± 4 hrs. Perform the initial measurement. * 100% for 100V~500V
	16V X7R/X5R=0.10max. Y5V= 0.15max		
	10V max X7R/X5R=0.10max. Y5V= 0.1875max		
	6.3V X5R= 0.15max		
I.R.	More than $1000G \Omega$ or $50M \Omega \cdot \mu F$, whichever is less. 16V dc product: More than $1000G \Omega$ or $10M \Omega \cdot \mu F$, whichever is less.		