

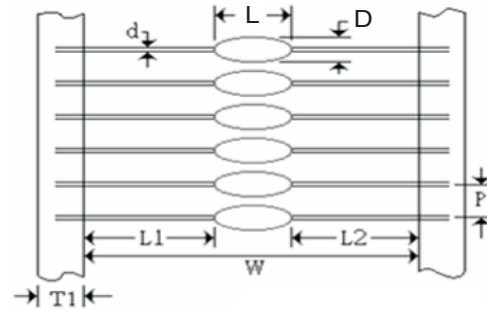
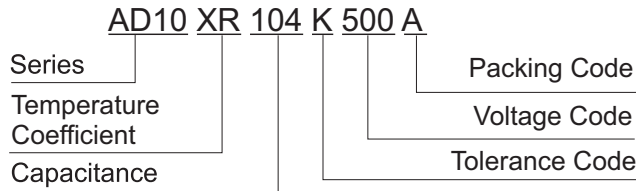
### INTRODUCTION

Axial Leded 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)
	D (max)	L (max)						
AD10	2.6	4.0	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	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	0.0022 μF	0.01 μF	0.047 μF	0.1 μF	1.0 μF	10 μF

### TOLERANCE CODE

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

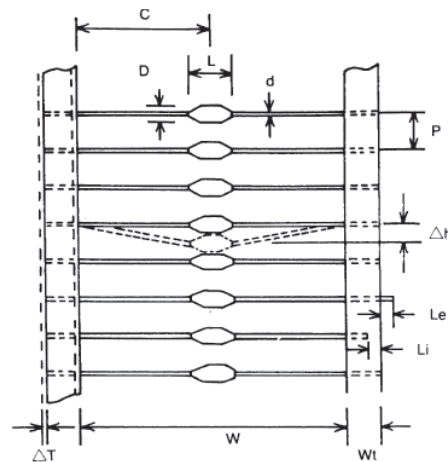
### TEMPERATURE COEFFICIENT

Code	Temp. Charact.	Temperature Range	Capacitance Change
CG	C0G/NPO	-55 ~ 125°C	0±30ppm/°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 X5R, X7R, Y5V, Z5U

### DIMENSIONS

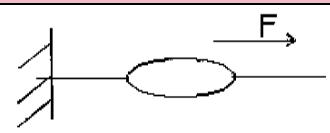
Tape Specification	Symbol	Dimension (mm)
Pitch of component	P	5.08±0.51
Cumulative Tolerance of P Over 6 Consecutive Units		±0.15
Tape Width	Wt	6.0±1.0
Lead Wire Protrusion	Le	1.0 max
Lead Extension into Tape	Li	1.5 max
Offset Between Tapes	ΔT	0.8 max
Width Between Tapes	Wt	52.4±1.5
Lead Diameter	d	0.483
Centered	C	±0.76
Deflection from Nominal Position	Δh	1.2 max



### ELECTRICAL CHARACTERISTICS

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

### 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: 260 ± 5°C Dipping: 2 ± 0.5 sec. (containing Ag 2~5%) (Flux shall be used)

### ELECTRICAL CHARACTERISTICS

Item	Temperature Compensating	Measuring Condition	Measuring Condition															
		<b>Resistance to Soldering heat</b>	<b>Thermal shock</b>															
$\Delta C$	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 $260 \pm 5^\circ\text{C}$ for $10 \pm 0.5$ sec																
D.F.	25V min X7R= 0.03max X7R= 0.055max.(C $\geq$ 1.0uF) Y5V= 0.075max Z5U= 0.09max	Let sit at room temperature for $48 \pm 4$ hrs. then measure.  • Initial measurement for perform a heat treatment at $150 \pm 2^\circ\text{C}$ for 1 hours. Remove and let sit for $48 \pm 4$ 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 $48 \pm 4$ hrs., then measure.  <table border="1"> <thead> <tr> <th>Step</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Temp. (<math>^\circ\text{C}</math>)</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><math>30 \pm 3</math></td> <td>15</td> <td><math>30 \pm 3</math></td> <td>15</td> </tr> </tbody> </table> • Initial measurement for perform a heat treatment at $150 \pm 2^\circ\text{C}$ for 1 hours. Remove and let sit for $48 \pm 4$ hrs. At room temperature.  Perform the initial measurement.	Step	1	2	3	4	Temp. ( $^\circ\text{C}$ )	Min. Operating Temp.	Room Temp.	Max. Operating Temp.	Room Temp.	Time	$30 \pm 3$	15	$30 \pm 3$	15
	Step			1	2	3	4											
	Temp. ( $^\circ\text{C}$ )			Min. Operating Temp.	Room Temp.	Max. Operating Temp.	Room Temp.											
	Time			$30 \pm 3$	15	$30 \pm 3$	15											
16V X7R/X5R=0.05max. Y5V= 0.10max																		
10V max X7R/X5R=0.05max. Y5V= 0.125max																		
6.3V X5R= 0.075max																		
I.R.	More than $10\text{G}\Omega$ or $500\text{M}\Omega \cdot \mu\text{F}$ , whichever is less. 16V dc product: More than $10\text{G}\Omega$ or $100\text{M}\Omega \cdot \mu\text{F}$ , whichever is less.																	

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

### STORAGE

1. The storage conditions  $< 40^\circ\text{C}$ ,  $< 70\%$  R.H.
2. After opening the package, please store in desiccators.