

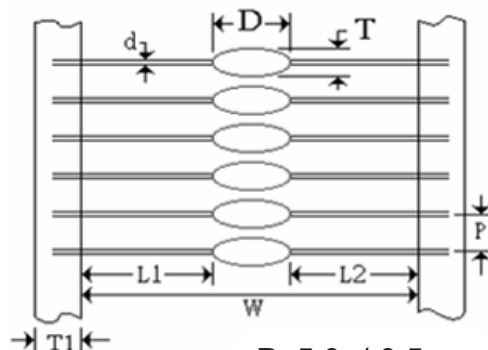
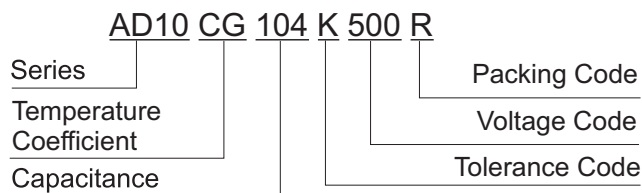
### INTRODUCTION

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
- Operating Temperature Range -55 to 125°C
- Temperature Characteristics  $0 \pm 30$  PPM/°C

### PART NUMBER EXAMPLE



P=5.0+/-0.5mm  
T1=6.0+/-0.3mm  
W=52+/-1  
L1=L2=24

### SIZE CODE & CAPACITANCE RANGE

Size Code	Dimensions (mm)		Voltage Vdc	Voltage Code	C0G / NPO (pF)
	T (max)	D (max)			
AD10	2.6	4.0	6.3V	060	
			10V	100	
			16V	160	
			25V	250	
			50V	500	1 ~ 10,000
			100V	101	1 ~ 4,700
AD15	3.1	5.1	250V	251	100 ~ 2,700
			6.3V	60	
			10V	100	
			16V	160	
			25V	250	
			50V	500	3,900 ~ 33,000
			100V	101	3,900 ~ 10,000
			250V	251	3,300 ~ 8,200
	500V	501	100 ~ 3,300		

### CAPACITANCE CODE

Code	1R0	3R3	100	470	101	102	222	103	333
Capacitance	1.0pF	3.3pF	10pF	47pF	100pF	1000pF	2200pF	10000pF	33000 pF

■ TOLERANCE CODE

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

■ TEMPERATURE COEFFICIENT

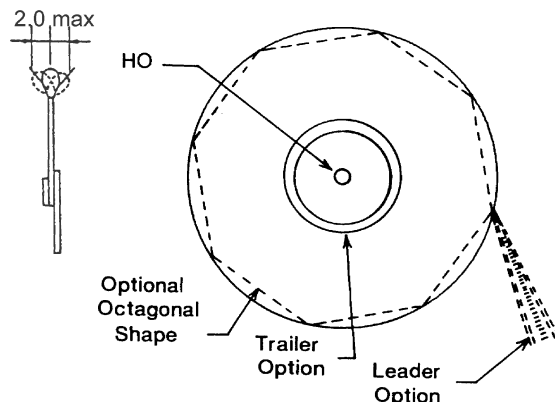
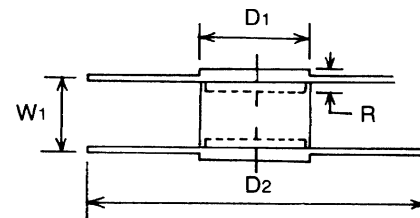
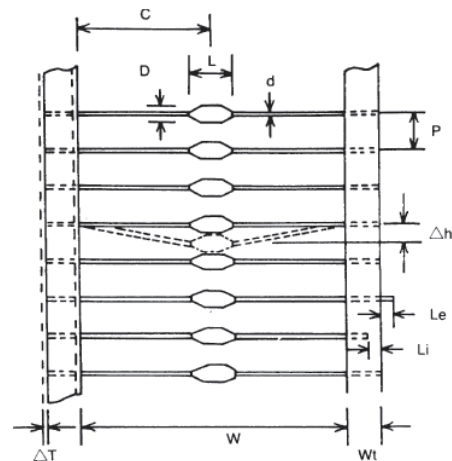
Code	Temp. Charact.	Temperature Range	Capacitance Change
CG	C0G/NPO	-55 ~ 125°C	0±30 ppm/°C
X5R	X5R	-55 ~ 85°C	±15°C
XR	X7R	-55 ~ 125°C	±15°C
YV	Y5V	-30 ~ 85°C	+22°C, -82%
ZU	Z5U	+10 ~ 85°C	+22°C, -56%

\* See other AD Series for X5R, X7R, Y5V, Z5U

■ 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

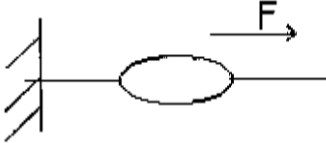
#### C0G/NPO

Parameter	Specification	Measuring Condition
Capacitance	With the specified tolerance	Shall be measured at 25°C ± 2°C at the frequency and voltage
Q	C ≥ 30pF : Q ≥ 1000 C < 30pF : Q ≥ 400+20xC (C is nominal capacitance)	C ≤ 1000pF@1MHz ± 20%, 1±0.2Vrms C > 1000pF@1MHz ± 10%, 1±0.2Vrms
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: 260 ± 5°C Dipping: 2 ± 0.5 sec. (containing Ag 2~5%) (Flux shall be used)

### ELECTRICAL CHARACTERISTICS

#### C0G/NPO

Item	Specification	Measuring Condition	Measuring Condition															
		<b>Resistance to Soldering heat</b>	<b>Thermal shock</b>															
$\Delta C$	$\pm 2.5\%$ or $\pm 0.25\text{pF}$ (Whichever is greater)	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 $10 \pm 0.5\text{sec}$																
Q	$C \geq 30\text{pF}$ : $Q \geq 1000$ $C < 30\text{pF}$ : $Q \geq 400 + 20 \times C$ (C is nominal capacitance)	Let sit at room temperature for $24 \pm 2\text{hrs}$ . then measure.	Perform the five cycles according to the four heat treatments listed in the following table. Remove and let sit at room temperature for $24 \pm 2\text{hrs}$ ., then measure.															
I.R.	More than $10\text{G}\Omega$ or $500\text{M}\Omega \cdot \mu\text{F}$ Whichever is less  16Vdc product: More than $10\text{G}\Omega$ or $100\text{M}\Omega \cdot \mu\text{F}$ whichever is less	Perform the initial measurement.																
		<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>		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
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Temp. ( $^\circ\text{C}$ )	Min. Operating Temp.	Room Temp.	Max. Operating Temp.	Room Temp.														
Time	$30 \pm 3$	15	$30 \pm 3$	15														
		Perform the initial measurement.																

Item	Specification	Measuring Condition	Measuring Condition
		<b>Moisture resistance (Steady state)</b>	<b>High temperature loading</b>
$\Delta C$	(Whichever is greater) $\pm 5\%$ or $\pm 0.5\text{pF}$ (Moisture resistance) $\pm 3\%$ or $\pm 0.5\text{pF}$ (High temperature loading)	Apply the rated DC voltage at $40 \pm 2^\circ\text{C}$ and 90 to 95% R.H. for $500^{+24}$ hrs.	Apply 200% of the rated DC voltage for $1000^{+48}$ hrs at the maximum operating temperature $\pm 2^\circ\text{C}$ . Remove and let sit at room temperature for $24 \pm 2\text{hrs}$ ., then measure.
Q	$C \geq 30\text{pF}$ : $Q \geq 350$ $10\text{pF} > C < 30\text{pF}$ : $Q \geq 275 + \frac{5}{2} \times C$ $C \leq 10\text{pF}$ : $Q \geq 200 + 10 \times C$ (C is nominal capacitance)	Remove and let sit at room temperature for $24 \pm 2\text{hrs}$ ., then measure.	The charge/discharge current is less than 50mA.
I.R.	More than $1000\text{M}\Omega$ or $50\text{M}\Omega \cdot \mu\text{F}$ Whichever is less  16Vdc product: More than $1000\text{M}\Omega$ or $10\text{M}\Omega \cdot \mu\text{F}$ whichever is less	Perform the initial measurement.	Perform the initial measurement. * 100% for 100V~500V over.

- Withstanding voltage: No defects
- Exterior: No abnormalities