

Radial & Axial

Features

This widely used ceramic capacitors includes both monolithic and multilayer types to provide a wide capacitance range of 1pF through 1μF in respectively one standard size and shape(Radial & Axial).

Applications

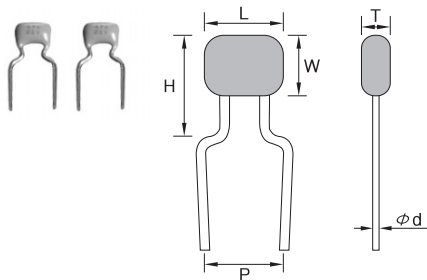
The class1 temperature compensating(C0G) products can be used in circuits to stabilize frequency and temperature characteristics.

The X7R, Z5U, Y5V dielectrics are optimum for by pass capacitors.

Shape and Dimensions

Bulk Type

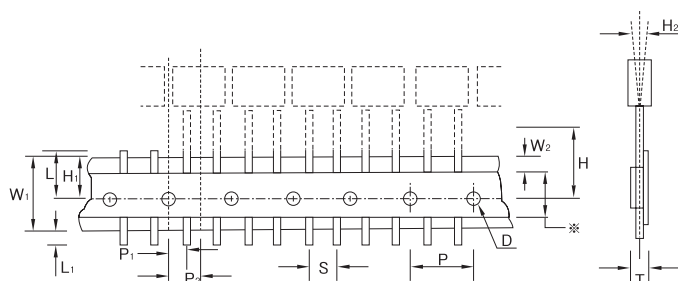
Radial Type



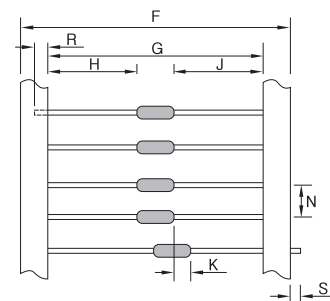
CODE	L Max.	W Max.	T Max.	H Max.	P ±0.7	Ød	Color	Marking
051B	5.5	5.5	3.2	6.4	5	0.5	Orange or Gold	Ex) 104
077B	7.7	7.6		9.2				

Flat Type

Radial Type



Axial Type



Code	Dimensions	Tolerance	Code	Dimensions	Tolerance
D(Ø)	4	±0.3	P1	3.85	±0.7
H	16	±0.5	P2	6.35	±1.3
H1	9	+0.76, -0.5	T	0.9	Max.
H2	0	±2	W1	18	±0.5
L	11	Max.	W2	0	+0.6 Max.
L1	1.5	Max.	S	5	±0.7
P	12.7	±0.3	*	No adhesive may be exposed	

Code	Dimensions	Tolerance
F	64.8	-0, +2
G	50.8-53.3	
H	=J	±1.2
J	=H	±1.2
K	0.8	Max.
N	5	±0.4
R	3.2	Min.

How to Order(Product Identification)

CA 2633 Y5V 104 Z 500 F



- 1 Type**
CR : Radial Lead Type
CA : Axial Lead Type
- 2 Dimension Code**
The number shows the maximum length of "L" by 1/10 in millimeter, and the alphabet means lead difference.(Refer to above diagram)

3 Temperature Coefficient Code

Temperature Characteristic	Temperature Range	Capacitance Change or Temperature Coefficient
C0G	-55 to 125°C	0±30ppm/°C
X7R	-55 to 125°C	±15%
Z5U	10°C to 85°C	+22, -56%
Y5V	-30 to 85°C	+22, -82%

4 Capacitance Code(Pico Farads)

First two digits are significant; third digit denotes number of zeros.
Ex.) 101 = 100pF, 1R5 = 1.5pF, 103 = 10,000pF

5 Capacitance Tolerance Code

Code	Tolerance	Remark
J	± 5.0 %	C0G
K	±10 %	X7R, C0G
M	± 20 %	Z5U, X7R
Z	+80, -20%	Z5U, Y5V

6 Rated Voltage Code

Code	250	500	101
Volt	DC 25V	DC 50V	DC 100V

7 Packing Code

Code	B	R	F
Packing	Bulk	Reel Pack	Flat Pack

Reliability and Test Conditions

No.	Item	Characteristic				Test Methods and Conditions		
		Temperature Compensating Type		High Dielectric Constant Type				
1.	Operating Temperature Range	C0G : -55 to +125°C		X7R : -55 to +125°C Z5U : +10 to +85°C				
2.	Insulation Resistance	More than 10,000MΩ or 500Ω,F(whichever is smaller)				Applied the rated voltage for 2 minute		
3.	Dielectric Strength	No detects or abnormalities				- C0G : The rated voltage ×300% - X7R, Z5U, Y5V : ×250%		
4.	Capacitance	Within the specified tolerance				Temperature Compensating Type		
5.	Dissipation Factor	30pF Min. : Q≥1,000(DF≤0.1%)		Char. 50V Min. 25V 16V 10V		Cap. Testing Frequency Testing Voltage		
		30pF Max. : Q≥400+20C (DF≤1/(400+20C))		X7R ≤2.5% ≤3% ≤3.5% ≤5.0% Z5V ≤4.0% - - - Y5V ≤5% ≤7% ≤9% ≤12.5% (≤220pF) (≥220pF) (≤220pF) (≥220pF)		C0G (C≤1000pF) 1±0.1kHz 0.5 to 5V rms C0G (C)1000pF 1±0.1kHz 1±0.2V rms X7R, Z5U, Y5V (C≤10pF 10V Min.) 1±0.1kHz 1±0.2V rms		
6.	Terminal Strength	No evidence of damage to body of device or looseness of terminals.				A static load of 10N(1kgf) : applied to one terminal in the axial direction and acting in a direction away from the body for 1 to 5 secs.		

No.	Item	Characteristic					Test Methods and Conditions
		Temperature Compensating Type	High Dielectric Constant Type				
7.	Resistance to Soldering Heat	Appearance	No marked defect				- Soldering Temp : 260±5°C - Immersion Time : 5±0.5sec - Take it out and set it for 24±2 hours (temperature compensating type) or 48±4 hours (high dielectric constant type) then measure.
	Capacitance Change	Within ±2.5% or ±0.25pF (whichever is larger)	X7R : ≤± 7.5% Z5U, Y5V : ≤± 20%				
	Dissipation Factor(or Q)	30pF Min. : Q≥1,000 (DF≤0.1%) 30pF Max. : Q≥400+20C (DF≤1/(400+20C))	Char. 50V Min.	25V	16V	10V	
8.	Temperature Cycle	Appearance	No marking defects				- Temperature : 40±2°C - Humidity : 90~95%RH - Hour : 500±12hrs - Test Voltage : Tge rated voltage - Take it out and set it for 24±2 hours (temperature compensating) or 48±4 hours (high dielectric constant type) at room temperature, then measure. The charge/discharge current is less than 50mA.
	Capacitance Change	Within ±2.5% or ±0.25pF	X7R : Within ± 7.5% Z5U, Y5V : Within ± 20%				
	Dissipation Factor(or Q)	30pF Min. : Q≥1,000 (DF≤0.1%) 30pF Max. : Q≥400+20C (DF≤1/(400+20C))	Char. 50V Min.	25V	16V	10V	
9.	Humidity Load	Appearance	No marking defects				- Testing Time : 1000±12hrs - Applied Voltage : Rated Voltage × 200% - Temperature : COG, X7R → 125±3°C Z5U, Y5V → 85±3°C
	Capacitance Change	Within ±7.5% or ±0.75pF (whichever is larger)	X7R : Within ±12.5% Z5U : Within ±30% Y5V : Within ±30%, -40% (Y5V/1.0μF, 2.2μF, 4.7μF/10V) Within ±30% (others)				
	Dissipation Factor(or Q)	30pF Min. : Q≥200 (DF≤0.5%) 30pF Max. : Q≥100+10/3C (DF≤1/(100+10/3C))	Char. 50V Min.	25V	16V	10V	
10.	High Temperature Load	Appearance	No marked defect				- Soldering Temp : 260±5°C - Immersion Time : 5±0.5sec - Take it out and set it for 24±2 hours (temperature compensating type) or 48±4 hours (high dielectric constant type) then measure.
	Capacitance change	Within ±3% or ±0.3pF (whichever is larger)	X7R : Within ±12.5%, Z5U : Within ±30% Y5V : Within ±30% (Cap. < 1.0μF) Within ±30%, -40% (Cap. ≥ 1.0μF)				
	Dissipation Factor(or Q)	30pF Min. : Q≥1,000 (DF≤0.1%) 30pF Max. : Q≥400+20C (DF≤1/(400+20C))	Char. 50V Min.	25V	16V	10V	

No.	Item	Characteristic					Test Methods and Conditions
		Temperature Compensating Type	High Dielectric Constant Type				
10	High Temperature Load	Dissipation Factor(or Q)	30pF Min. : Q≥350 (DF≤0.3%) 10pF≤Cp≤30pF: Q≥275+5/2C (DF≤1/(275+5/2C)) 10pF Max. : Q≥200+10C (DF≤1/(200+10C))	Char. 50V Min.	25V	16V	10V
				X7R	≤5%	≤5%	≤5%
11	Capacitance Temperature Characteristics	Capacitance Change	Reference Temp. 25°C	Char.	Temp. Range	Reference Temp.	Cap. Change
				X7R	-55 to +125°C	25°C	Within ±15%
12	The regulation of environmental pollution materials	Temperature Coefficient	COG	Char.	Temp. Range	Temperature Coefficient	
				X7R	-55 to +125°C	±30ppm/°C	
13	The regulation about destructive materials of the ozone layer	Temperature Coefficient	COG	Char.	Temp. Range	Temperature Coefficient	
				X7R	-55 to +125°C	±30ppm/°C	

Take it out and set it for 24±2 hours (temperature compensating) or 48±4 hours (high dielectric constant type) at room temperature, then measure. The charge/discharge current is less than 50mA.

(1) Temperature Compensating Type : The temperature coefficient is determined using the capacitance measured in step 3 as a reference. When cycling the temperature sequentially from step 1 through 5. (SL -25 to 85°C) the capacitance shall be within the specified tolerance for the temperature coefficient. The capacitance drift is calculated dividing the difference between the maximum measured values in the step 1, 3 and 5 by Cap. value in step 3.

Step	Temperature(°C)
1	25±2
2	-55±3
3	25±2
4	125±3(or COG)
5	25±2

(2) High Dielectric Constant Type : The ranges of capacitance change compared with the 25°C value over the temperature range shown in the table shall be in the specified range.

Packing Quantity

Unit : pcs

Radial Type			Axial Type		
Inner Box	Outer Box	Remark	Inner Box	Outer Box	Remark
2,500	15,000	Packing set on the basis of flat tapping	5,000	50,000	Packing set on the basis of flat tapping

Capacitance Range

Type Char.	Radial								Axial			
	COG		X7R		Z5U	Y5V		COG	X7R	Z5U	Y5V	
Cap(pF) \ Volt	50	100	50	100	50	16	50	50	50	50	50	
1												
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