

## Surface Mount Multilayer Ceramic Chip Capacitors Array for Commodity Applications



### FEATURES

- High density mounting due to mounting space saving
- Mounting cost saving
- Increased throughput
- Dry sheet manufacturing technology
- Base Metal Electrode system (BME)
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### APPLICATIONS

- For use as a bypass for digital and analog signal line noise
- Computer motherboards and peripherals
- The common electronic circuits

ELECTRICAL SPECIFICATION			
Size	4 x 0603		
Dielectric	COG (NP0)	X7R	Y5V
Capacitance <sup>(1)</sup>	10 pF to 470 pF	180 pF to 100 nF	10 nF to 100 nF
Capacitance Tolerance <sup>(2)</sup>	J ( $\pm 5\%$ ), K ( $\pm 10\%$ )	K ( $\pm 10\%$ ), M ( $\pm 20\%$ )	M ( $\pm 20\%$ ) Z ( $-20\%/+80\%$ )
Rated Voltage (V <sub>DC</sub> )	50 V	16 V, 50 V	50 V
tan $\delta/Q$ <sup>(1)</sup>	Cap. < 30 pF: Q $\geq 400 + 20\text{ C}$ Cap. $\geq 30\text{ pF}$ : Q $\geq 1000$	U <sub>R</sub> = 50 V: $\leq 2.5\%$ U <sub>R</sub> = 16 V: $\leq 3.5\%$	$\leq 5\%$
Insulation Resistance at U <sub>R</sub>	$\geq 10\text{ G}\Omega$	$\geq 10\text{ G}\Omega$ or R x C $\geq 500\ \Omega \times \text{F}$ , whichever is less	
Operating Temperature	-55 °C to +125 °C		-25 °C to +85 °C
Capacitance Change	$\pm 30\text{ ppm}$	$\pm 15\%$	+30 %/-80 %
Termination	Ni/Sn lead (Pb)-free termination		

### Notes

<sup>(1)</sup> Measured at 30 % ~ 70 % related humidity

NP0: apply 1.0 V<sub>RMS</sub>  $\pm 0.2\text{ V}_{\text{RMS}}$ , 1.0 MHz  $\pm 10\%$  at the conditions of 25 °C ambient temperature

X7R: apply 1.0 V<sub>RMS</sub>  $\pm 0.2\text{ V}_{\text{RMS}}$ , 1.0 kHz  $\pm 10\%$  at the conditions of 25 °C ambient temperature

Y5V: apply 1.0 V<sub>RMS</sub>  $\pm 0.2\text{ V}_{\text{RMS}}$ , 1.0 kHz  $\pm 10\%$  at the conditions of 20 °C ambient temperature

<sup>(2)</sup> Preconditioning for X7R, Y5V MLCC: Perform a heat treatment at 150 °C  $\pm 10\text{ }^\circ\text{C}$  for 1 h, then leave in ambient condition for 24 h  $\pm 2\text{ h}$  before measurement.



QUICK REFERENCE DATA				
DIELECTRIC	CASE	MAXIMUM VOLTAGE (V)	CAPACITANCE	
			MINIMUM	MAXIMUM
C0G (NP0)	0612	50	10 pF	470 pF
X7R	0612	50	180 pF	100 nF
Y5V	0612	50	10 nF	100 nF

**Note**

- Detail ratings see “Selection Chart”

ORDERING INFORMATION							
VJ06C4	A	100	J	X	A	C	W1BC
SIZE CODE	DIELECTRIC	CAPACITANCE	TOLERANCE	TERMINATION	RATED VOLTAGE	PACKAGING	PROCESS CODE FOR BASIC COMMODITY
06C4	A = C0G (NP0) Y = X7R V = Y5V	Two significant digits followed by the number of zeros. R is in place of decimal point: 100 = 10 pF 101 = 100 pF	J = ± 5 % K = ± 10 % M = ± 20 % Z = -20 %/ +80 %	X = Ni Barrier	J = 16 V A = 50 V	C = 7" reel/ paper tape	

DIMENSIONS in inches (millimeters)						
SIZE CODE	L	W	T MAX.	S	BW	P
0612 (1632)	0.125 ± 0.006 (3.20 ± 0.15)	0.063 ± 0.006 (1.60 ± 0.15)	0.036 (0.90)	0.012 ± 0.008 (0.30 ± 0.20)	0.016 ± 0.006 (0.40 ± 0.15)	0.031 ± 0.006 (0.80 ± 0.15)



SELECTION CHART					
DIELECTRIC		COG (NP0)	X7R		Y5V
STYLE		VJ06C4			
SIZE CODE		0612 (4 x 0603)			
VOLTAGE V <sub>DC</sub>		50 V	16 V	50 V	50 V
VOLTAGE CODE		A	J	A	A
CAP. CODE	CAP.				
100	10 pF	B			
150	15 pF	B			
220	22 pF	B			
330	33 pF	B			
470	47 pF	B			
680	68 pF	B			
101	100 pF	B			
151	150 pF	B			
181	180 pF	B		B	
221	220 pF	B		B	
271	270 pF	B		B	
331	330 pF	B		B	
391	390 pF	B			
471	470 pF	B		B	
102	1.0 nF			B	
152	1.5 nF			B	
222	2.2 nF			B	
332	3.3 nF			B	
472	4.7 nF			B	
682	6.8 nF			B	
103	10 nF			B	B
153	15 nF		B	B	B
223	22 nF		B	B	B
333	33 nF		B		B
473	47 nF		B		B
683	68 nF		B		
104	100 nF		B		B

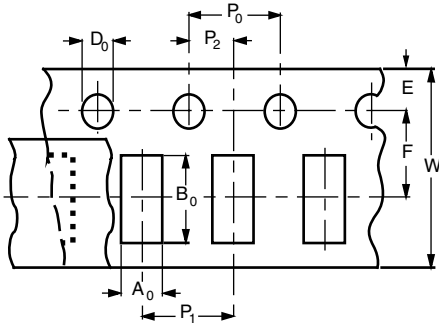
**Note**

- Letters indicate product thickness, see “Packaging Quantities”



PACKAGING QUANTITIES			
SIZE CODE	THICKNESS (mm)	PAPER TAPE	
		7" REEL (C)	13" REEL (P)
06C4 (4 x 0603)	0.80 ± 0.10	4K	-

## PAPER TAPE SPECIFICATIONS

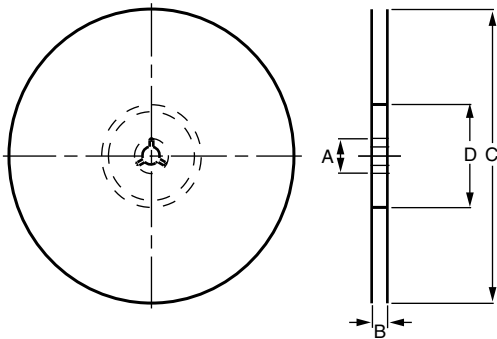


## DIMENSIONS OF PAPER TAPE

in millimeters

SYMBOL	PRODUCT SIZE CODE
	06C4 (4 x 0603)
$A_0$	2.00 ± 0.10
$B_0$	3.50 ± 0.10
$W$	8.00 ± 0.10
$E$	1.75 ± 0.05
$F$	3.50 ± 0.05
$D_0$	1.50 ± 0.05
$P_0$	4.00 ± 0.10
$P_1$	4.00 ± 0.10
$P_2$	2.00 ± 0.05

## REEL SPECIFICATION

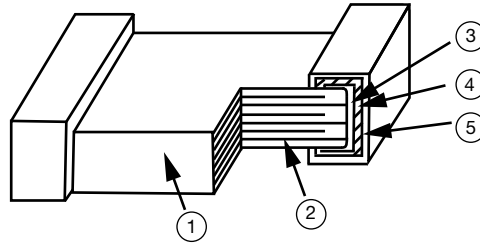


## REEL DIMENSIONS AND TAPE WIDTH

in millimeters

SYMBOL	Ø 180 mm; 7"	Ø 330 mm; 13"
$A$	13.0 ± 0.5	13.0 ± 0.5
$B$	9.0 ± 1.0	9.0 ± 1.0
$C$	178.0 ± 1.0	330.0 ± 1.0
$D$	60.0 ± 1.0	100.0 ± 1.0

CONSTRUCTION		
NO.	NAME	COG (NP0), X7R, Y5V
1	Ceramic material	BaTiO <sub>3</sub> based
2	Inner electrode	Ni
3	Termination	Inner layer
4		Middle layer
5		Outer layer
		Sn (matt)



## STORAGE AND HANDLING CONDITIONS

- (1) To store products at 5 °C to 40 °C ambient temperature and 20 % to 70 % relative humidity conditions.
- (2) The product is recommended to be used within one year after shipment. Check solderability in case of shelf life extension is needed.

### Cautions:

- a. Do not store products in a corrosive environment such as sulfide, chloride gas, or acid. It may cause oxidization of electrode, which easily be resulted in poor soldering.
- b. To store products on the shelf and avoid exposure to moisture.
- c. Do not expose products to excessive shock, vibration, direct sunlight and so on.



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