

DATA SHEET

SURFACE-MOUNT CERAMIC MULTILAYER CAPACITORS

C-Array

NP0/X7R/Y5V

16 V TO 50 V

sizes 0508 (4 x 0402) / 0612 (4 x 0603)

RoHS compliant & Halogen Free



SCOPE

This specification describes NP0/X7R/Y5V 4-capacitor Array with lead-free terminations.

APPLICATIONS

- Professional electronics
- High density consumer electronics

FEATURES

- Supplied in tape on reel
- Nickel-barrier end termination
- 0508 (4x0402) / 0612 (4x0603) capacitors (of the same capacitance value) per array
- Less than 50% board space of an equivalent discrete component
- High volumetric efficiency
- Increased throughput, by time saved in mounting
- RoHS compliant
- Halogen Free compliant

ORDERING INFORMATION - GLOBAL PART NUMBER, PHYCOMP

CTC & I2NC

All part numbers are identified by the series, size, tolerance, TC material, packing style, voltage, process code, termination and capacitance value. Please note that 12 digits ordering code will expire at the end of 2010.

YAGEO BRAND ordering code

GLOBAL PART NUMBER (PREFERRED)

CA XXXX X X XXX X **B** X XXX
 (1) (2) (3) (4) (5) (6) (7)

(1) SIZE – INCH BASED (METRIC)

0508 (1220)
 0612 (1632)

(2) TOLERANCE

J = ±5%
 K = ±10%
 M = ±20%
 Z = -20% to +80%

(3) PACKING STYLE

R = Paper/PE taping reel; Reel 7 inch
 P = Paper/PE taping reel; Reel 13 inch

(4) TC MATERIAL

NPO
 X5R
 X7R
 Y5V

(5) RATED VOLTAGE

7 = 16 V
 8 = 25 V
 9 = 50 V
 0 = 100V

(6) PROCESS

N = NPO
 B = class 2 material

(7) CAPACITANCE VALUE

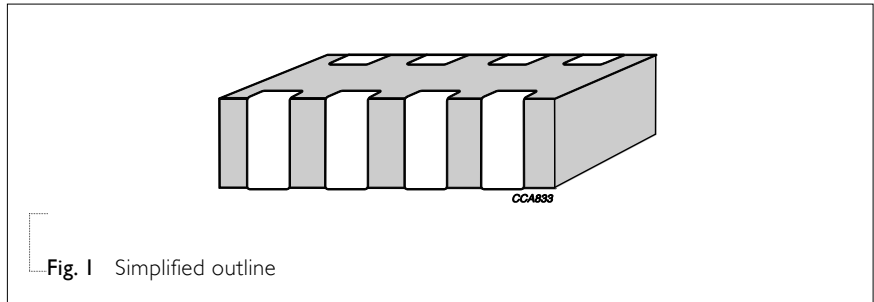
2 significant digits+number of zeros
 The 3rd digit signifies the multiplying factor, and letter R is decimal point
 Example: 121 = 12 × 10¹ = 120 pF

CONSTRUCTION

The capacitor consists of a rectangular block of ceramic dielectric in which a number of interleaved metal electrodes are contained. This structure gives rise to a high capacitance per unit volume.

The inner electrodes are connected to the two end terminations and finally covered with a layer of plated tin (NiSn).

The terminations are lead-free. An outline of the structure is shown in Fig.1.

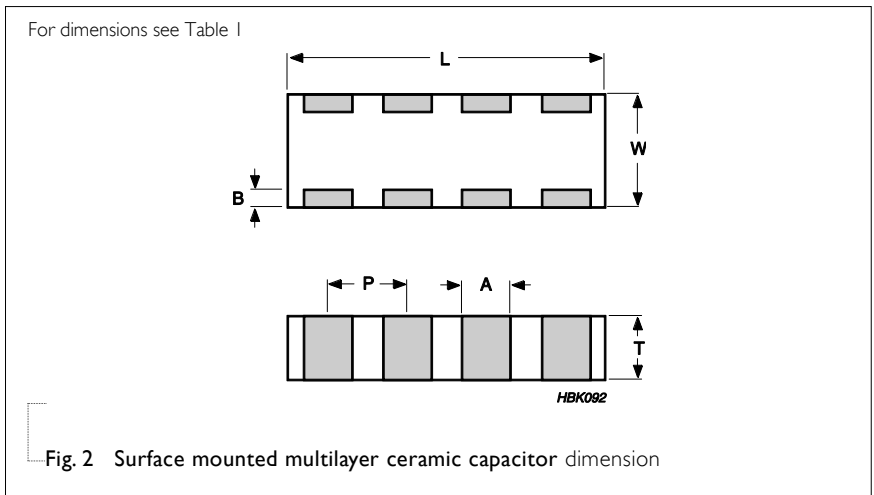


DIMENSIONS

Table I

TYPE	0508 (4 X 0402)	0612 (4 X 0603)
L (mm)	2.0 ±0.15	3.2 ±0.15
W (mm)	1.25 ±0.15	1.60 ±0.15
T _{min.} (mm)	0.50	0.70
T _{max.} (mm)	0.70	0.90
A (mm)	0.28 ±0.10	0.4 ±0.10
B (mm)	0.2 ±0.10	0.3 ±0.20
P (mm)	0.5 ±0.10	0.8 ±0.10

OUTLINES



CAPACITANCE RANGE & THICKNESS FOR 4C-ARRAY
Table 2 Temperature characteristic material from NP0

CAPACITANCE	0508 (4 x 0402)		0612 (4 x 0603)	
	50 V	100V	50 V	100V
10 pF	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1
15 pF	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1
18 pF	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1
22 pF	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1
33 pF	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1
39 pF	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1
47 pF	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1
56 pF	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1
68 pF	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1
82 pF	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1
100 pF	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1
120 pF	0.6±0.1		0.8±0.1	0.8±0.1
150 pF	0.6±0.1		0.8±0.1	0.8±0.1
180 pF	0.6±0.1		0.8±0.1	0.8±0.1
220 pF	0.6±0.1		0.8±0.1	0.8±0.1
270 pF			0.8±0.1	0.8±0.1
330 pF			0.8±0.1	0.8±0.1
390 pF			0.8±0.1	0.8±0.1
470 pF			0.8±0.1	0.8±0.1
560 pF				
680 pF				
820 pF				
1.0 nF				

NOTE

Values in shaded cells indicate thickness class in mm

CAPACITANCE RANGE & THICKNESS FOR 4C-ARRAY
Table 3 Temperature characteristic material from X7R

CAPACITANCE	0508 (4 x 0402)			0612 (4 x 0603)			
	16 V	25 V	50 V	16 V	25 V	50 V	100V
1.0 nF	0.6±0.1	0.6±0.1	0.6±0.1	0.8±0.1	0.8±0.1	0.8±0.1	
1.2 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	
1.5 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	
1.8 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	
2.2 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	
2.7 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	
3.3 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	
3.9 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	
4.7 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	
5.6 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	
6.8 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	
8.2 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	
10 nF	0.6±0.1	0.6±0.1		0.8±0.1	0.8±0.1	0.8±0.1	0.85±0.1
12 nF	0.6±0.1			0.8±0.1	0.8±0.1	0.8±0.1	0.85±0.1
15 nF	0.6±0.1			0.8±0.1	0.8±0.1	0.8±0.1	0.85±0.1
18 nF	0.6±0.1			0.8±0.1	0.8±0.1	0.8±0.1	0.85±0.1
22 nF	0.6±0.1			0.8±0.1	0.8±0.1	0.8±0.1	0.85±0.1
27 nF	0.6±0.1			0.8±0.1	0.8±0.1	0.8±0.1	
33 nF	0.6±0.1			0.8±0.1	0.8±0.1	0.8±0.1	
47 nF	0.6±0.1			0.8±0.1	0.8±0.1	0.8±0.1	
56 nF	0.6±0.1			0.8±0.1	0.8±0.1	0.8±0.1	
68 nF	0.6±0.1			0.8±0.1	0.8±0.1	0.8±0.1	
82 nF	0.6±0.1			0.8±0.1	0.8±0.1	0.8±0.1	
100 nF	0.6±0.1			0.8±0.1	0.8±0.1	0.8±0.1	
220 nF				0.8±0.1			
470 nF				0.8±0.1			

NOTE

Values in shaded cells indicate thickness class in mm

CAPACITANCE RANGE & THICKNESS FOR 4C-ARRAY

Table 4 Temperature characteristic material from Y5V

CAPACITANCE		0612 (4 x 0603)
		25 V
10 nF		
22 nF		
47 nF		0.6±0.1
100 nF		

NOTE

Values in shaded cells indicate thickness class in mm

THICKNESS CLASSES AND PACKING QUANTITY

Table 5

SIZE CODE	THICKNESS CLASSIFICATION	TAPE WIDTH	QUANTITY PER REEL	Ø180 MM / 7 INCH Paper	Ø180 MM / 13 INCH Paper
0508	0.6 ±0.1 mm	8 mm	8 mm	4,000	20,000
0612	0.8 ±0.1 mm	8 mm	8 mm	4,000	15,000

ELECTRICAL CHARACTERISTICS
4C-ARRAY DIELECTRIC CAPACITORS; NISN TERMINATIONS

Unless otherwise stated all electrical values apply at an ambient temperature of 20 ± 1 °C, an atmospheric pressure of 86 to 106 kPa, and a relative humidity of 63 to 67%.

Table 6

DESCRIPTION	VALUE	
Capacitance range	10 pF to 100 nF	
Rated voltage	NP0	50 V
	X7R	16 V to 50 V
	Y5V	0612: 25 V
Capacitance tolerance	NP0	$\pm 5\%$, $\pm 10\%$
	X7R	$\pm 10\%$, $\pm 20\%$
	Y5V	-20% to $+80\%$
Dissipation factor (D.F.)	NP0	$\leq 0.1\%$
	X7R	16 V $\leq 3.5\%$, 25V $\leq 2.5\%$, 50V $\leq 2.5\%$ 0508/12nF~100nF/16V, Df $\leq 5\%$
	Y5V	0508 $\leq 9\%$, 0612 $\leq 7\%$
Insulation resistance after 1 minute at U_r (DC)	$R_{ins} \geq 10 \text{ G}\Omega$ or $R_{ins} \times C_r \geq 500$ seconds whichever is less	
Maximum capacitance change as a function of temperature (temperature characteristic/coefficient):	NP0	$\pm 30 \text{ ppm}/^\circ\text{C}$
	X7R	$\pm 15\%$
	Y5V	$+22\%$ to -82%
Operating temperature range:	NP0	-55 °C to $+125$ °C
	X7R	-55 °C to $+125$ °C
	Y5V	-30 °C to $+85$ °C