

AVX Surface Mount Ceramic Capacitor Products



Version 8.1



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Ceramic Chip Capacitors



Table of Contents

How to Order - AVX Part Number Explanation	2-3
C0G (NP0) Dielectric	
General Specifications	4
Specifications and Test Methods	5
Capacitance Range	6-7
U Dielectric	
RF/Microwave C0G (NP0) Capacitors (RoHS) General Information and Capacitance Range	8-10
RF/Microwave C0G (NP0) Capacitors (Sn/Pb) General Information and Capacitance Range	11-12
Designer Kits	13
X8R Dielectric	
General Specifications	14-15
X7R Dielectric	
General Specifications	16
Specifications and Test Methods	17
Capacitance Range	18-19
X7S Dielectric	
General Specifications	20
Specifications and Test Methods	21
Capacitance Range	22
X5R Dielectric	
General Specifications	23
Specifications and Test Methods	24
Capacitance Range	25
Y5V Dielectric	
General Specifications	26
Specifications and Test Methods	27
Capacitance Range	28
MLCC Tin/Lead Termination (LD Series)	
General Specifications	29
Capacitance Range	30-35
MLCC Low Profile	
General Specifications / Capacitance Range	36
Automotive MLCC	
General Specifications	37-38
Capacitance Range	39-41
APS for COTS+ Applications	
General Specifications	42
Capacitance Range	43-44
MLCC with FLEXITERM®	
General Description	45
Specifications and Test Methods	46-47
Capacitance Range	48-49
FLEXISAFE MLC Chips	
General Specifications and Capacitance Range	50
Capacitor Array	
Capacitor Array (IPC)	51-54
Automotive Capacitor Array (IPC)	55
Multi-Value Capacitor Array (IPC)	56
Part and Pad Layout Dimensions	57
Low Inductance Capacitors	
Introduction	58-59
LICC (Low Inductance Chip Capacitors)	60-63
IDC (InterDigitated Capacitors)	64-67
LGA Low Inductance Capacitors	68-69
LICA (Low Inductance Decoupling Capacitor Arrays)	70-71
High Voltage MLC Chips	
600V to 5000V Applications	72-73
Tin/Lead Termination "B" - 600V to 5000V Applications	74-75
MIL-PRF-55681/Chips	
CDR01 thru CDR06	76-77
CDR31 thru CDR35	78-81
Packaging of Chip Components	82
Embossed Carrier Configuration - 8 & 12mm Tape	83
Paper Carrier Configuration - 8 & 12mm Tape	84
Bulk Case Packaging	85
Basic Capacitor Formulas	86
General Description	87-91
Surface Mounting Guide	92-96



How to Order



Part Number Explanation

Commercial Surface Mount Chips

EXAMPLE: 08055A101JAT2A

0805	5	A	101	J*	A	T	2	A
Size (L" x W")	Voltage	Dielectric	Capacitance	Tolerance	Failure Rate	Terminations	Packaging	Special Code
0201 0402 0603 0805 1206 1210 1812 1825 2220 2225	4 = 4V 6 = 6.3V Z = 10V Y = 16V 3 = 25V D = 35V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	A = NP0(C0G) C = X7R D = X5R F = X8R G = Y5V U = U Series W = X6S Z = X7S	2 Sig. Fig + No. of Zeros Examples: 100 = 10 pF 101 = 100 pF 102 = 1000 pF 223 = 22000 pF 224 = 220000 pF 105 = 1µF 106 = 10µF 107 = 100µF For values below 10 pF, use "R" in place of Decimal point, e.g., 9.1 pF = 9R1.	B = ±.10 pF C = ±.25 pF D = ±.50 pF F = ±1% (≥ 10 pF) G = ±2% (≥ 10 pF) J = ±5% K = ±10% M = ±20% Z = +80%, -20% P = +100%, -0%	A = N/A 4 = Automotive	T = Plated Ni and Sn 7 = Gold Plated U = Conductive Expoxy for Hybrid Applications Z = FLEXITERM® X = FLEXITERM® with 5% min lead (X7R & X8R only)	Available 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass. 9 = Bulk	A = Std.
	Contact Factory for Special Voltages F = 63V 9 = 300V * = 75V X = 350V E = 150V 8 = 400V V = 250V					Contact Factory For 1 = Pd/Ag Term	Contact Factory For Multiples	

* B, C & D tolerance for ≤10 pF values.
Standard Tape and Reel material (Paper/Embossed) depends upon chip size and thickness.
See individual part tables for tape material type for each capacitance value.

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.
For Tin/Lead Terminations, please refer to LD Series

High Voltage MLC Chips

EXAMPLE: 1808AA271KA11A

1808	A	A	271	K	A	T	1	A
AVX Style	Voltage	Temperature Coefficient	Capacitance Code	Capacitance Tolerance	Failure Rate	Termination	Packaging/ Marking	Special Code
0805 1206 1210 1808 1812 1825 2220 2225 3640	C = 600V/630V A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V J = 4000V K = 5000V	A = C0G C = X7R	(2 significant digits + no. of zeros) Examples: 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105	C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	A=Not Applicable	1= Pd/Ag T = Plated Ni and Sn B = 5% Min Pb Z = FLEXITERM® X = FLEXITERM® with 5% min lead (X7R only)	1 = 7" Reel 3 = 13" Reel 9 = Bulk	A = Standard

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.
For Tin/Lead Terminations, please refer to LD Series

How to Order

Part Number Explanation



Capacitor Array

EXAMPLE: W2A43C103MAT2A

W	2	A	4	3	C	103	M	A	T	2A
Style W = RoHS L = SnPb	Case Size 1 = 0405 2 = 0508 3 = 0612	Array	Number of Caps	Voltage Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V	Dielectric A = NP0 C = X7R D = X5R	Capacitance Code (In pF) 2 Sig Digits + Number of Zeros	Capacitance Tolerance J = ±5% K = ±10% M = ±20%	Failure Rate A = Commercial 4 = Automotive	Termination Code T = Plated Ni and Sn Z = FLEXITERM® B = 5% min lead X = FLEXITERM® with 5% min lead	Packaging & Quantity Code 2A = 7" Reel (4000) 4A = 13" Reel (10000) 2F = 7" Reel (1000)

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

Low Inductance Capacitors (LICC)

EXAMPLE: 0612ZD105MAT2A

0612	Z	D	105	M	A	T	2	A
Size 0306 0508 0612 LD16 LD17 LD18	Voltage 6 = 6.3V Z = 10V Y = 16V 3 = 25V 5 = 50V	Dielectric C = X7R D = X5R	Capacitance Code (In pF) 2 Sig. Digits + Number of Zeros	Capacitance Tolerance K = ±10% M = ±20%	Failure Rate A = N/A	Terminations T = Plated Ni and Sn B = 5% min lead	Packaging Available 2 = 7" Reel 4 = 13" Reel	Thickness See Page 63 for Codes

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

Interdigitated Capacitors (IDC)

EXAMPLE: W3L16D225MAT3A

W	3	L	1	6	D	225	M	A	T	3	A
Style W = RoHS L = SnPb	Case Size 2 = 0508 3 = 0612	Low Inductance ESL = 50pH ESL = 60pH	Number of Terminals 1 = 8 Terminals	Voltage 4 = 4V 6 = 6.3V Z = 10V Y = 16V	Dielectric C = X7R D = X5R	Capacitance Code (In pF) 2 Sig. Digits + Number of Zeros	Capacitance Tolerance M = ±20%	Failure Rate A = N/A	Termination T = Plated Ni and Sn B = 5% min Lead	Packaging Available 1 = 7" Reel 3 = 13" Reel	Thickness Max. Thickness mm (in.) A=0.95 (0.037) S=0.55 (0.022)

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

Low Inductance Decoupling Capacitor Arrays (LICA)

EXAMPLE: LICA3T183M3FC4AA

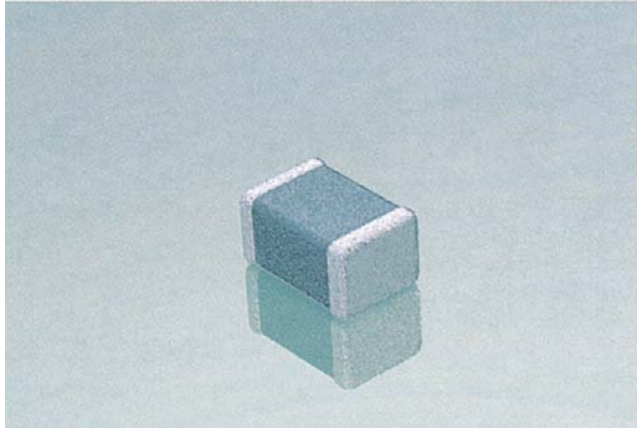
LICA	3	T	102	M	3	F	C	4	A	A
Style & Size 5V = 9 10V = Z 25V = 3	Voltage 5V = 9 10V = Z 25V = 3	Dielectric D = X5R T = T55T S = High K T55T	Cap/Section (EIA Code) 102 = 1000 pF 103 = 10 nF 104 = 100 nF	Capacitance Tolerance M = ±20% P = GMV	Height Code 6 = 0.500mm 3 = 0.650mm 1 = 0.875mm 5 = 1.100mm 7 = 1.600mm	Termination F = C4 Solder Balls- 97Pb/3Sn H = C4 Solder Balls-Low ESR P = Cr-Cu-Au N = Cr-Ni-Au X = None	Reel Packaging M = 7" Reel R = 13" Reel 6 = 2"x2" Waffle Pack 8 = 2"x2" Black Waffle Pack 7 = 2"x2" Waffle Pack w/ termination facing up A = 2"x2" Black Waffle Pack w/ termination facing up C = 4"x4" Waffle Pack	# of Caps/Part 1 = one 2 = two 4 = four	Inspection Code A = Standard B = Established Reliability Testing	Code Face A = Bar B = No Bar C = Dot, S55S Dielectrics D = Triangle

NOTE: Contact factory for availability of Termination and

C0G (NP0) Dielectric



General Specifications



C0G (NP0) is the most popular formulation of the “temperature-compensating,” EIA Class I ceramic materials. Modern C0G (NP0) formulations contain neodymium, samarium and other rare earth oxides.

C0G (NP0) ceramics offer one of the most stable capacitor dielectrics available. Capacitance change with temperature is $0 \pm 30\text{ppm}/^\circ\text{C}$ which is less than $\pm 0.3\%$ ΔC from -55°C to $+125^\circ\text{C}$. Capacitance drift or hysteresis for C0G (NP0) ceramics is negligible at less than $\pm 0.05\%$ versus up to $\pm 2\%$ for films. Typical capacitance change with life is less than $\pm 0.1\%$ for C0G (NP0), one-fifth that shown by most other dielectrics. C0G (NP0) formulations show no aging characteristics.

PART NUMBER (see page 2 for complete part number explanation)

0805

Size
(L" x W")

5

Voltage
6.3V = 6
10V = Z
16V = Y
25V = 3
50V = 5
100V = 1
200V = 2
500V = 7

A

Dielectric
C0G (NP0) = A

101

Capacitance Code (In pF)
2 Sig. Digits + Number of Zeros

J

Capacitance Tolerance
B = $\pm 10\text{ pF}$ ($< 10\text{ pF}$)
C = $\pm 25\text{ pF}$ ($< 10\text{ pF}$)
D = $\pm 50\text{ pF}$ ($< 10\text{ pF}$)
F = $\pm 1\%$ ($\geq 10\text{ pF}$)
G = $\pm 2\%$ ($\geq 10\text{ pF}$)
J = $\pm 5\%$
K = $\pm 10\%$

A

Failure Rate
A = Not Applicable

T

Terminations
T = Plated Ni and Sn
7 = Gold Plated

2

Packaging
2 = 7" Reel
4 = 13" Reel
7 = Bulk Cass.
9 = Bulk

A

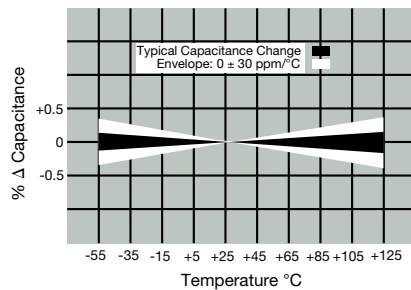
Special Code
A = Std. Product

Contact Factory For
1 = Pd/Ag Term

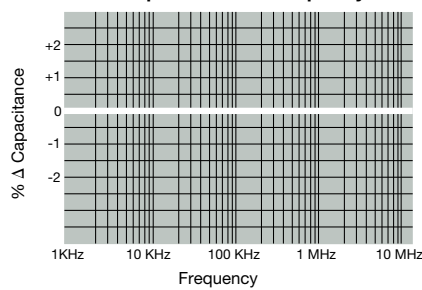
Contact Factory For
Multiples

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers. Contact factory for non-specified capacitance values.

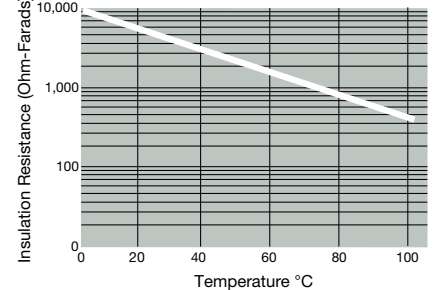
Temperature Coefficient



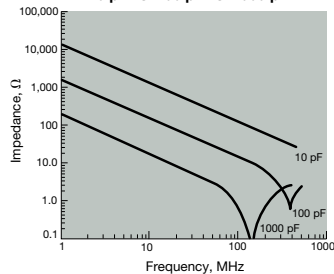
Δ Capacitance vs. Frequency



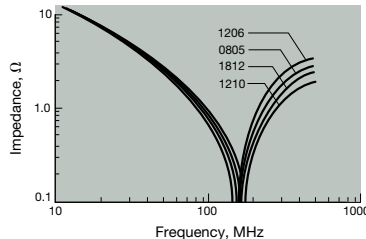
Insulation Resistance vs Temperature



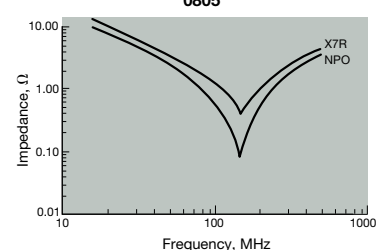
Variation of Impedance with Cap Value
Impedance vs. Frequency
0805 - C0G (NP0)
10 pF vs. 100 pF vs. 1000 pF



Variation of Impedance with Chip Size
Impedance vs. Frequency
1000 pF - C0G (NP0)



Variation of Impedance with Ceramic Formulation
Impedance vs. Frequency
1000 pF - C0G (NP0) vs X7R
0805



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