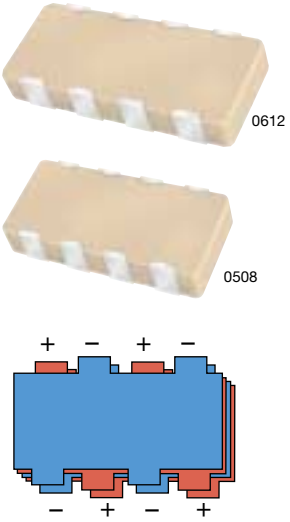
Low Inductance Capacitors

0612/0508 IDC (InterDigitated Capacitors)

GENERAL DESCRIPTION

- Very low equivalent series inductance (ESL), surface mountable, high speed decoupling capacitor in 0612 and 0508 case size.
- Measured inductances of 120 pH (for 0612) and 95 pH (for 0508) are the lowest in the FR4 mountable device family.
- Opposing current flow creates opposing magnetic fields. This causes the fields to cancel, effectively reducing the equivalent series inductance.
- Perfect solution for decoupling high speed microprocessors by allowing the engineers to lower the power delivery inductance of the entire system through the use of eight vias.
- Overall reduction in decoupling components due to very low series inductance and high capacitance.



HOW TO ORDER

W	3	L	1	6	D	225	M	A	T	3	A
Style	**Case Size** 2 = 0508 3 = 0612	**Low Inductance** ESL = 95pH ESL = 120pH	**Number of Caps**	**Voltage** 4 = 4V 6 = 6.3V Z = 10V Y = 16V	**Dielectric** C = X7R D = X5R	**Capacitance Code** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** K = ±10% M = ±20%	**Failure Rate** A = N/A	**Termination** T = Plated Ni and Solder	**Packaging** Available 1=7" Reel 3=13" Reel	**Thickness** Max. Thickness mm (in.) A=0.95 (0.037) S=0.55 (0.022)

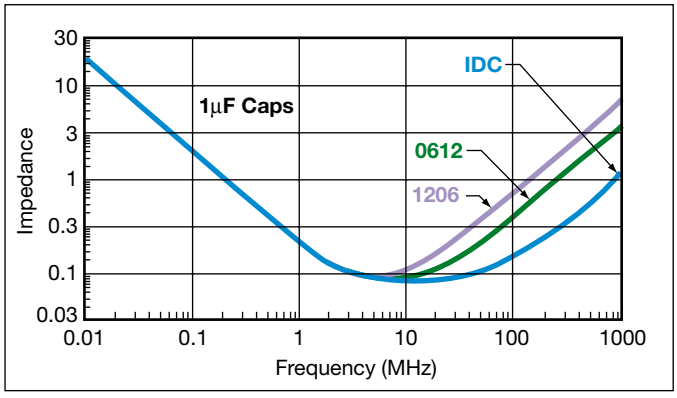
PERFORMANCE CHARACTERISTICS

Capacitance Tolerance	±20% Preferred (10% Available)
Operation Temperature Range	X7R = -55°C to +125°C; X5R = -55°C to +85°C
Temperature Coefficient	±15% (0VDC)
Voltage Ratings	4, 6.3, 10, 16 VDC
Dissipation Factor	4V, 6.3V = 6.5% max; 10V = 5.0% max; 16V = 3.5% max
Insulation Resistance (@+25°C, RVDC)	100,000MΩ min, or 1,000MΩ per µF min.,whichever is less

Dielectric Strength	No problems observed after 2.5 x RVDC for 5 seconds at 50mA max current
CTE (ppm/C)	12.0
Thermal Conductivity	4-5W/M K
Terminations Available	Plated Nickel and Solder
Max. Thickness	0.037" (0.95mm)

TYPICAL ESL AND IMPEDANCE

Package Style	Measured Inductance (pH)
1206 MLCC	1200
0612 LICC	450
0612 IDC	**120**
0508 IDC	**95**



Low Inductance Capacitors

0612/0508 IDC (InterDigitated Capacitors)

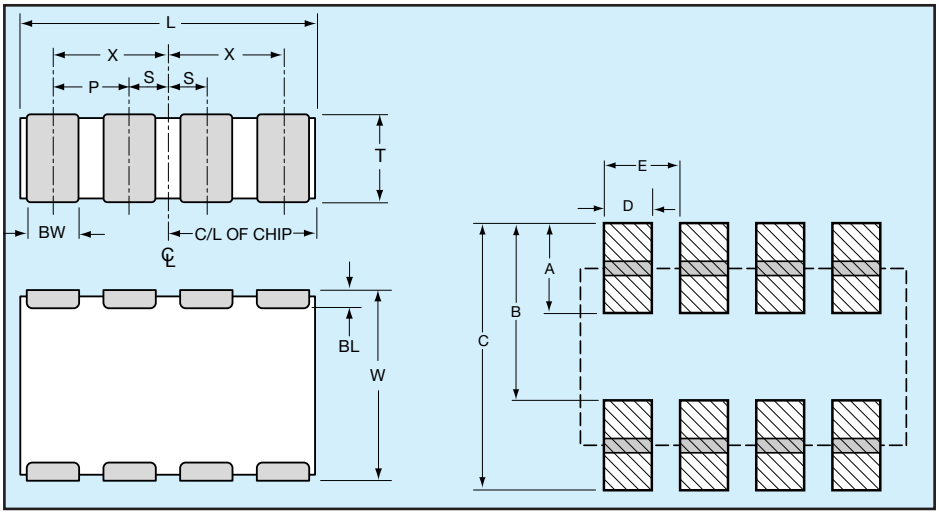
SIZE		Thin 0508				0508				Thin 0612				0612			
Length	MM (in.)	2.03 ± 0.20 (0.080 ± 0.008)				2.03 ± 0.20 (0.080 ± 0.008)				3.20 ± 0.20 (0.126 ± 0.008)				3.20 ± 0.20 (0.126 ± 0.008)			
Width	MM (in.)	1.27 ± 0.20 (0.050 ± 0.008)				1.27 ± 0.20 (0.050 ± 0.008)				1.60 ± 0.20 (0.063 ± 0.008)				1.60 ± 0.20 (0.063 ± 0.008)			
Terminal Pitch	MM (in.)	0.508 REF 0.020 REF				0.508 REF 0.020 REF				0.76 REF 0.030 REF				0.76 REF 0.030 REF			
Thickness	MM (in.)	0.55 MAX. (0.022) MAX.				0.95 MAX. (0.037) MAX.				0.55 MAX. (0.022) MAX.				0.95 MAX. (0.037) MAX.			
Inductance (pH)		95				95				120				120			
WVDC		4	6.3	10	16	4	6.3	10	16	4	6.3	10	16	4	6.3	10	16
CAP (uF) and Thickness																	
0.047																	
0.068																	
0.10																	
0.22																	
0.33																	
0.47																	
0.68																	
1.0																	
1.5																	
2.2																	
3.3																	

Consult factory for additional requirements

= X7R

= X5R

PHYSICAL DIMENSIONS AND PAD LAYOUT



PHYSICAL CHIP DIMENSIONS millimeters (inches)

0612

L	W	T	BW	BL	P	X	S
3.20 ± 0.20 (0.126 ± 0.008)	1.60 ± 0.20 (0.063 ± 0.008)	1.22 MAX. (0.048 MAX.)	0.41 ± 0.10 (0.016 ± 0.004)	0.18 $^{+0.25}_{-0.08}$ (0.007 $^{+0.010}_{-0.003}$)	0.76 REF (0.030 REF)	1.14 ± 0.10 (0.045 ± 0.004)	0.38 ± 0.10 (0.015 ± 0.004)

0508

L	W	T	BW	BL	P	X	S
2.03±0.20 (0.080±0.008)	1.27±0.20 (0.050±0.008)	0.965 MAX. (0.038 MAX.)	0.254±0.10 (0.010±0.004)	0.18 $^{+0.25}_{-0.08}$ (0.007 $^{+0.010}_{-0.003}$)	0.508 REF (0.020 REF)	0.76±0.10 (0.030±0.004)	0.254±0.10 (0.010±.0.004)

PAD LAYOUT DIMENSIONS

0612

A	B	C	D	E
0.89 (0.035)	1.65 (0.065)	2.54 (0.100)	0.46 (0.018)	0.76 (0.030)

0508

A	B	C	D	E
0.64 (0.025)	1.27 (0.050)	1.91 (0.075)	0.28 (0.011)	0.51 (0.020)