IDC Low Inductance Capacitors (RoHS)

0306/0612/0508 IDC (InterDigitated Capacitors)

GENERAL DESCRIPTION

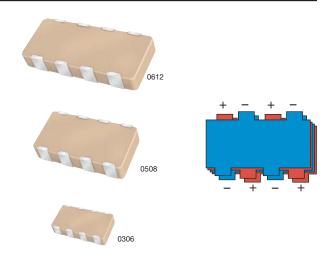
Inter-Digitated Capacitors (IDCs) are used for both semiconductor package and board level decoupling. The equivalent series inductance (ESL) of a single capacitor or an array of capacitors in parallel determines the response time of a Power Delivery Network (PDN). The lower the ESL of a PDN, the faster the response time. A designer can use many standard MLCCs in parallel to reduce ESL or a low ESL Inter-Digitated Capacitor (IDC) device. These IDC devices are available in versions with a maximum height of 0.95mm or 0.55mm.

IDCs are typically used on packages of semiconductor products with power levels of 15 watts or greater. Inter-Digitated Capacitors are used on CPU, GPU, ASIC, and ASSP devices produced on 0.13µ, 90nm, 65nm, and 45nm processes. IDC devices are used on both ceramic and organic package substrates. These low ESL surface mount capacitors can be placed on the bottom side or the top side of a package substrate. The low profile 0.55mm maximum height IDCs can easily be used on the bottom side of BGA packages or on the die side of packages under a heat spreader.

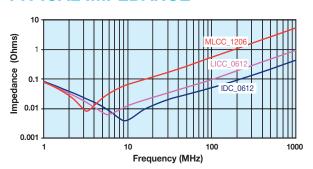
IDCs are used for board level decoupling of systems with speeds of 300MHz or greater. Low ESL IDCs free up valuable board space by reducing the number of capacitors required versus standard MLCCs. There are additional benefits to reducing the number of capacitors beyond saving board space including higher reliability from a reduction in the number of components and lower placement costs based on the need for fewer capacitors.

The Inter-Digitated Capacitor (IDC) technology was developed by AVX. This is the second family of Low Inductance MLCC products created by AVX. IDCs are a cost effective alternative to AVX's first generation low ESL family for high-reliability applications known as LICA (Low Inductance Chip Array).

AVX IDC products are available with a lead-free finish of plated Nickel/Tin.



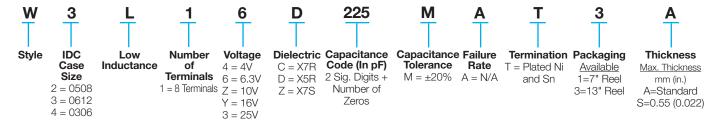
TYPICAL IMPEDANCE







HOW TO ORDER



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

PERFORMANCE CHARACTERISTICS

| Capacitance Tolerance | ±20% Preferred |
|-----------------------------------------|-------------------------------------------------------------------------|
| Operation | X7R = -55°C to +125°C |
| Temperature Range | X5R = -55°C to +85°C |
| | X7S = -55°C to +125°C |
| Temperature Coefficient | ±15% (0VDC), ±22% (X7S) |
| Voltage Ratings | 4, 6.3, 10, 16, 25 VDC |
| Dissipation Factor | ≤ 6.3V = 6.5% max; 10V = 5.0% max; ≥ 16V = 3.5% max |
| Insulation Resistance (@+25°C, RVDC) | 100,000M Ω min, or 1,000M Ω 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 |

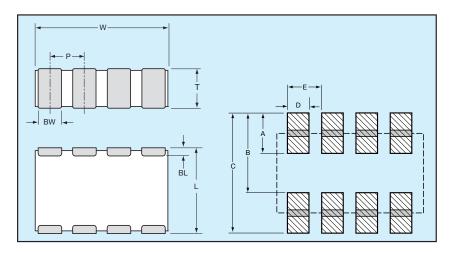


IDC Low Inductance Capacitors (RoHS)

0306/0612/0508 IDC (InterDigitated Capacitors)

| SIZE | 03 | 06 | | Th | in 05 | 808 | | | | 0508 | 3 | | | Thin | 0612 |) | | | 0612 | | | THICK 0612 | | | | | |
|-------------------|-------|-----|---|-----|---------|-----|----|----------|-----|---------|----|----|----------|------|------|----|---|------|---------|----|------|------------|-----|----|----|--|--|
| Max. mm | 0.0 | | | | 0.55. | | | | | 0.95 | | | | | 55 | | | 0.95 | | | 1.22 | | | | | | |
| Thickness (in.) | (0.0) | | | _ | (0.022) | _ | | <u> </u> | _ | (0.037) | | | <u> </u> | (0.0 | _ | | | _ | (0.037) | | | (0.048) | | | | | |
| WVDC | 4 | 6.3 | 4 | 6.3 | 10 | 16 | 25 | 4 | 6.3 | 10 | 16 | 25 | 4 | 6.3 | 10 | 16 | 4 | 6.3 | 10 | 16 | 25 | 4 | 6.3 | 10 | 16 | | |
| Cap (µF) 0.010 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.022 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.033 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.047 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.068 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.10 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.22 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.33 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.47 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.68 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

PHYSICAL DIMENSIONS AND PAD LAYOUT



Consult factory for additional requirements



PHYSICAL CHIP DIMENSIONS millimeters (inches)

| SIZE | W | L | BW | BL | Р |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0306 | 1.60 ± 0.20 | 0.82 ± 0.10 | 0.25 ± 0.10 | 0.20 ± 0.10 | 0.40 ± 0.05 |
| | (0.063 ± 0.008) | (0.032 ± 0.006 | (0.010 ± 0.004) | (0.008± 0.004) | (0.015 ± 0.002) |
| 0508 | 2.03 ± 0.20 | 1.27 ± 0.20 | 0.30 ± 0.10 | 0.25 ± 0.15 | 0.50 ± 0.05 |
| | (0.080 ± 0.008) | (0.050 ± 0.008) | (0.012 ± 0.004) | (0.010± 0.006) | (0.020 ± 0.002) |
| 0612 | 3.20 ± 0.20 | 1.60 ± 0.20 | 0.50 ± 0.10 | 0.25 ± 0.15 | 0.80 ± 0.10 |
| | (0.126 ± 0.008) | (0.063 ± 0.008) | (0.020 ± 0.004) | (0.010 ± 0.006) | (0.031 ± 0.004) |

PAD LAYOUT DIMENSIONS

| SIZE | Α | В | С | D | Е | | |
|------|---------|---------|---------|---------|---------|--|--|
| 0306 | 0.38 | 0.89 | 1.27 | 0.20 | 0.40 | | |
| | (0.015) | (0.035) | (0.050) | (0.008) | (0.015) | | |
| 0508 | 0.64 | 1.27 | 1.91 | 0.28 | 0.50 | | |
| | (0.025) | (0.050) | (0.075) | (0.011) | (0.020) | | |
| 0612 | 0.89 | 1.65 | 2.54 | 0.45 | 0.80 | | |
| | (0.035) | (0.065) | (0.010) | (0.018) | (0.031) | | |



IDC Low Inductance Capacitors (SnPb)

0306/0612/0508 IDC with Sn/Pb Termination

GENERAL DESCRIPTION

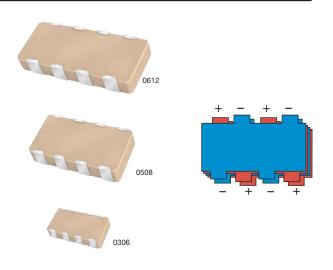
Inter-Digitated Capacitors (IDCs) are used for both semiconductor package and board level decoupling. The equivalent series inductance (ESL) of a single capacitor or an array of capacitors in parallel determines the response time of a Power Delivery Network (PDN). The lower the ESL of a PDN, the faster the response time. A designer can use many standard MLCCs in parallel to reduce ESL or a low ESL Inter-Digitated Capacitor (IDC) device. These IDC devices are available in versions with a maximum height of 0.95mm or 0.55mm.

IDCs are typically used on packages of semiconductor products with power levels of 15 watts or greater. Inter-Digitated Capacitors are used on CPU, GPU, ASIC, and ASSP devices produced on 0.13µ, 90nm, 65nm, and 45nm processes. IDC devices are used on both ceramic and organic package substrates. These low ESL surface mount capacitors can be placed on the bottom side or the top side of a package substrate. The low profile 0.55mm maximum height IDCs can easily be used on the bottom side of BGA packages or on the die side of packages under a heat spreader.

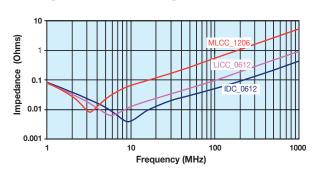
IDCs are used for board level decoupling of systems with speeds of 300MHz or greater. Low ESL IDCs free up valuable board space by reducing the number of capacitors required versus standard MLCCs. There are additional benefits to reducing the number of capacitors beyond saving board space including higher reliability from a reduction in the number of components and lower placement costs based on the need for fewer capacitors.

The Inter-Digitated Capacitor (IDC) technology was developed by AVX. This is the second family of Low Inductance MLCC products created by AVX. IDCs are a cost effective alternative to AVX's first generation low ESL family for high-reliability applications known as LICA (Low Inductance Chip Array).

AVX IDC products are available with a lead termination for high reliability military and aerospace applications that must avoid tin whisker reliability issues.

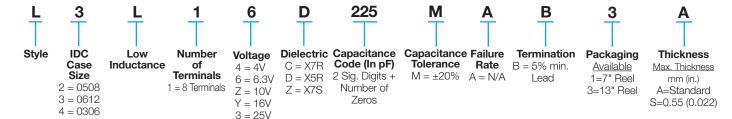


TYPICAL IMPEDANCE



Not RoHS Compliant

HOW TO ORDER



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

PERFORMANCE CHARACTERISTICS

| Capacitance Tolerance | ±20% Preferred |
|-------------------------|-------------------------------|
| Operation | X7R = -55°C to +125°C |
| Temperature Range | X5R = -55°C to $+85$ °C |
| | X7S = -55°C to +125°C |
| Temperature Coefficient | ±15% (0VDC), ±22% (X7S) |
| Voltage Ratings | 4, 6.3, 10, 16, 25 VDC |
| Dissipation Factor | \leq 6.3V = 6.5% max; |
| | 10V = 5.0% max; |
| | ≥ 16V = 3.5% max |
| Insulation Resistance | 100,000MΩ min, or 1,000MΩ per |
| (@+25°C, RVDC) | 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 |

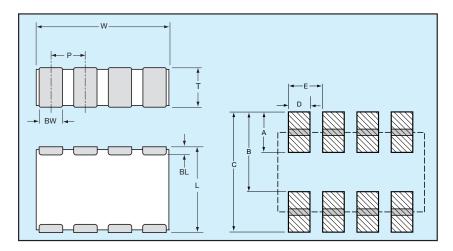


IDC Low Inductance Capacitors (SnPb)

0306/0612/0508 IDC with Sn/Pb Termination

| SIZE | 03 | 06 | | Th | in 05 | 08 | | | | 0508 | 3 | | | Thin | 0612 | | | | 0612 | | | 1 | HICH | C 061 | 2 |
|-------------------|-------|-----|---|-----|---------|----|----|---|-----|---------|----|----|---|------|------|----|---|------|---------|----|------|---------|------|--------------|----|
| Max. mm | 0. | | | | 0.55. | | | | | 0.95 | | | | | 55 | | | 0.95 | | | 1.22 | | | | |
| Thickness (in.) | (0.0) | | | _ | (0.022) | | | | _ | (0.037) | | | | (0.0 | | | | _ | (0.037) | | | (0.048) | | | |
| WVDC | 4 | 6.3 | 4 | 6.3 | 10 | 16 | 25 | 4 | 6.3 | 10 | 16 | 25 | 4 | 6.3 | 10 | 16 | 4 | 6.3 | 10 | 16 | 25 | 4 | 6.3 | 10 | 16 |
| Сар (µF) 0.010 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.022 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.033 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.047 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.068 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.33 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.47 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.68 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.3 | | | | | | | | | | | | | | | | | | | | | | | | | |

PHYSICAL DIMENSIONS AND PAD LAYOUT



Consult factory for additional requirements



PHYSICAL CHIP DIMENSIONS millimeters (inches)

| SIZE | W | L | BW | BL | Р |
|------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0306 | 1.60 ± 0.20 | 0.82 ± 0.10 | 0.25 ± 0.10 | 0.20 ± 0.10 | 0.40 ± 0.05 |
| | (0.063 ± 0.008) | (0.032 ± 0.006 | (0.010 ± 0.004) | (0.008± 0.004) | (0.015 ± 0.002) |
| 0508 | 2.03 ± 0.20 | 1.27 ± 0.20 | 0.30 ± 0.10 | 0.25 ± 0.15 | 0.50 ± 0.05 |
| | (0.080 ± 0.008) | (0.050 ± 0.008) | (0.012 ± 0.004) | (0.010± 0.006) | (0.020 ± 0.002) |
| 0612 | 3.20 ± 0.20 | 1.60 ± 0.20 | 0.50 ± 0.10 | 0.25 ± 0.15 | 0.80 ± 0.10 |
| | (0.126 ± 0.008) | (0.063 ± 0.008) | (0.020 ± 0.004) | (0.010 ± 0.006) | (0.031 ± 0.004) |

PAD LAYOUT DIMENSIONS

| SIZE | А | В | С | D | Е | | |
|------|---------|---------|---------|---------|---------|--|--|
| 0306 | 0.38 | 0.89 | 1.27 | 0.20 | 0.40 | | |
| | (0.015) | (0.035) | (0.050) | (0.008) | (0.015) | | |
| 0508 | 0.64 | 1.27 | 1.91 | 0.28 | 0.50 | | |
| | (0.025) | (0.050) | (0.075) | (0.011) | (0.020) | | |
| 0612 | 0.89 | 1.65 | 2.54 | 0.45 | 0.80 | | |
| | (0.035) | (0.065) | (0.010) | (0.018) | (0.031) | | |



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

AVX:

```
W2L14C105KAT1A W2L14C474MAT1S W2L16C334MAT1A W2L16C473KAT1A W2L16C473MAT1F
W2L16C684KAT2A W2L16C684MAT1F W2L16D105MAT1A W2L1YC104KAT1A W2L1YC104MAT1A
W2L1YC473KAT1A W2L1ZC104MAT1A W2L1ZC473MAT1A W2L1ZC473MAT1F W2L1ZC474MAT1F
W3L14C225KAT1A W3L16C105KAT1A W3L16C105MAT1A W3L16C155KAT1A W3L16C224MAT1F
W3L16C225MAT1F W3L16C225MAT3A W3L16C334MAT1S W3L16C474MAT1S W3L1YC104MAT1A
W3L1YC104MAT1F W3L1YC104MAT1S W3L1YC224MAT1A W3L1YC224MAT1S W3L1YC473MAT1A
W3L1YC474MAT1A W3L1YC474MAT1F W3L1ZC104MAT1A W3L1ZC104MAT1S W3L1ZC105KAT1A
W3L1ZC105MAT1A W3L1ZC105MAT1F W3L1ZC224MAT1A W3L1ZC473MAT1A W3L1ZC474MAT3S
W3L1ZC684MAT1A W2L16C473MAT1A W2L1ZD474MAT1S W3L14D335MAT1A W2L14D155MAT1A
W3L14C105MAT1S W3L1YC105MAT1A W2L16C104MAT1A W2L46C104KAT1A W2L1ZC224MAT1A
L2L1ZC334MAB3S L3L1YC474MAB1A W2L1YC473MAT1S L3L1YC104MAB1A W2L14C105MAT1A
W3L14C225MAT1A W2L1ZC104MAT1S W2L1ZC474MAT1A W3L16D225MAT1A W2L1YC473MAT1A
W2L1YC224MAT1A W2L1ZC224MAT1S W2L1ZC334MAT1A W2L1ZC473KAT1A W2L1ZD104MAT1A
W2L1ZD105MAT3A W2L14C334MAT1A W2L14C473MAT1S W2L16C104MAT1S W2L16C473MAT1AF
W2L16C473MAT1S W2L16C474MAT1A W2L16C683MAT1A W2L16C683MAT1AF W2L16C684MAT1AF
W2L16D105MAT1AF W2L16D105MAT3A W2L16D474MAT1S W3L1YC104MAT1AF W3L1YC473MAT3A
W3L1YD474MAT1A W3L1ZC474MAT1S W3L14C155KAT1A W3L14C155MAT1A W3L16C155MAT1A
W3L16C225MAT1AF W3L16C473MAT1F W3L16C473MAT3A W3L16C684MAT1A L2L16C684MAB1A
W2L16C684MAT3S W2L16C684MAT1S L2L1ZD334MAB3S W2L14Z225MAT1A W2L13C473KAT1S
L2L1ZC334MAB1S L2L1ZC224MAB1A L2L1ZC474MAB1A W2L14C474KAT1S L3L13C473MAB1A
```

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Kyocera AVX: W2L13C104MAT1A