MULTILAYER CERAMIC CHIP CAPACITORS

# CLL Series
# Commercial Grade
# Ultra Low Inductance

**Type:**

**CLLC1A [EIA CC0603]**
**CLLE1A [EIA CC0805]**
**CLLG1A [EIA CC1206]**

**Issue date:**
**Dec 2014**

# REMINDERS

Please read before using this product

## SAFETY REMINDERS

### REMINDERS

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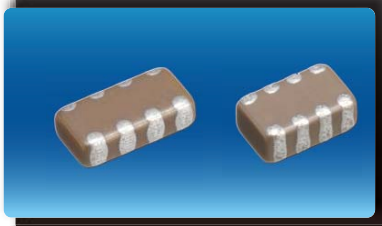
(Example)

| Catalog Issued date | Catalog Number | Item Description (On Delivery Label) |
|---|---|---|
| Prior to January 2013 | C1608C0G1E103J | C1608C0G1E103JT000N |
| January 2013 and Later | C1608C0G1E103J080AA | C1608C0G1E103JT000N |



# CLL Series

## Ultra Low Inductance

Type: CLLC1A [EIA CC0603], CLLE1A [EIA CC0805], CLLG1A [EIA CC1206]

Lead Free | RoHS COMPLIANT | Ecological

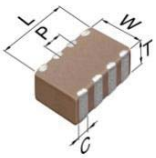
### Features

- Features a unique internal structure that cancels magnetic fields to reduce equivalent series inductance.
- Eight side terminal electrodes in one capacitor.
- Small and low profile design enables undersurface mounting for semiconductor packages.

### Applications

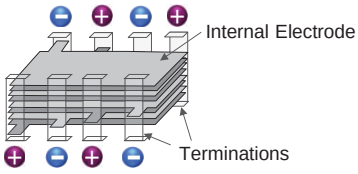
- Decoupling CPU power line
- High speed digital IC, decoupling
- GPU, CPU

### Shape & Dimensions




| | |
|---|---|
| L | Body Length |
| W | Body Width |
| T | Body Height |
| C | Terminal Width |
| P | Terminal Spacing |

### Design Structure




### Catalog Number Construction

CLL • E1A • X7S • 0G • 685 • M • 050 • A • C

**Series Name**

**Dimensions L x W (mm)**

| Code | Length | Width |
|---|---|---|
| C1A | 1.60 ± 0.10 | 0.80 ± 0.10 |
| E1A | 2.00 ± 0.15 | 1.25 ± 0.15 |
| G1A | 3.20 ± 0.15 | 1.60 ± 0.15 |

**Temperature Characteristics**

| Temperature Characteristics | Capacitance Change | Temperature Range |
|---|---|---|
| X6S | ±22% | -55 to +105°C |
| X7R | ±15% | -55 to +125°C |
| X7S | ±22% | -55 to +125°C |

**Rated Voltage (DC)**

| Code | Voltage (DC) |
|---|---|
| 0G | 4.0V |
| 0J | 6.3V |
| 1A | 10V |

**Nominal Capacitance (pF)**

The capacitance is expressed in three digit codes and in units of pico Farads (pF). The first and second digits identify the first and second significant figures of the capacitance. The third digit identifies the multiplier. R designates a decimal point.

Ex. 0R2 = 0.2pF; 103 = 10,000pF; 105 = 1,000,000pF = 100nF = 1µF

**Capacitance Tolerance**

| Code | Tolerance |
|---|---|
| M | ± 20% |

**Nominal Thickness**

| Code | Thickness |
|---|---|
| 050 | 0.50 mm |
| 055 | 0.55 mm |
| 085 | 0.85 mm |

**Packaging Style**

| Code | Style |
|---|---|
| A | 178 mm Reel, 4 mm Pitch |

**Special Reserved Code**

| Code | Description |
|---|---|
| C | TDK Internal Code |

## Capacitance Range Chart

# CLLC1A(1608) [EIA CC0603]

**Capacitance Range Chart**

Temperature Characteristics: X6S (± 22%), X7R (±15%), X7S (± 22%)
Rated Voltage: 4V (0G)

| Capacitance (pF) | Code | Tolerance | X6S | X7R | X7S |
|---|---|---|---|---|---|
| | | | 0G (4V) | 0G (4V) | 0G (4V) |
| 47,000 | 473 | M: ± 20% | | | |
| 100,000 | 104 | | | | |
| 330,000 | 334 | | | | |
| 470,000 | 474 | | | | |
| 680,000 | 684 | | | | |
| 1,000,000 | 105 | | | | |
| 2,200,000 | 225 | | | | |
| 4,700,000 | 475 | | | | |

## Capacitance Range Chart

# CLLE1A(2012) [EIA CC0805]

**Capacitance Range Chart**

Temperature Characteristics: X7R (±15%), X7S (± 22%)
Rated Voltage: 10V (1A), 6.3V (0J), 4V (0G)

| Capacitance (pF) | Code | Tolerance | X7R | | | X7S | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1A (10V) | 0J (6.3V) | 0G (4V) | 1A (10V) | 0J (6.3V) | 0G (4V) |
| 47,000 | 473 | M: ± 20% | | | | | | |
| 100,000 | 104 | | | | | | | |
| 150,000 | 154 | | | | | | | |
| 220,000 | 224 | | | | | | | |
| 330,000 | 334 | | | | | | | |
| 470,000 | 474 | | | | | | | |
| 680,000 | 684 | | | | | | | |
| 1,000,000 | 105 | | | | | | | |
| 1,500,000 | 155 | | | | | | | |
| 2,200,000 | 225 | | | | | | | |
| 4,700,000 | 475 | | | | | | | |
| 6,800,000 | 685 | | | | | | | |

## Capacitance Range Chart

# CLLG1A(3216) [EIA CC1206]

**Capacitance Range Chart**

Temperature Characteristics: X7R (±15%),
Rated Voltage: 10V (1A), 6.3V (0J)

| Capacitance (pF) | Code | Tolerance | X7R | |
|---|---|---|---|---|
| | | | 1A (10V) | 0J (6.3V) |
| 1,000,000 | 105 | M: ± 20% | | |
| 2,200,000 | 225 | | | |

Standard Thickness

0.50 mm

0.85 mm

## Capacitance Range Table

**Class 2 (Temperature Stable)**

Temperature Characteristics: X6S (-55 to +105ºC, ±22%)

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | |
|---|---|---|---|---|---|---|
| | | | | Rated Voltage Edc: 10V | Rated Voltage Edc: 6.3V | Rated Voltage Edc: 4.0V |
| 4.7 µF | 1608 | 0.50 ± 0.05 | ± 20% | | | CLLC1AX6S0G475M050AC |

**Class 2 (Temperature Stable)**

Temperature Characteristics: X7R (-55 to +125ºC, ±15%)

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | |
|---|---|---|---|---|---|---|
| | | | | Rated Voltage Edc: 10V | Rated Voltage Edc: 6.3V | Rated Voltage Edc: 4.0V |
| 47 nF | 2012 | 0.50 ± 0.05 | ± 20% | | | CLLE1AX7R0G473M050AC |
| 100 nF | 1608 | 0.50 ± 0.05 | ± 20% | | | CLLC1AX7R0G104M050AC |
| | 2012 | 0.50 +0.05/-0.10 | ± 20% | CLLE1AX7R1A104M050AC | | |
| | | 0.50 ± 0.05 | ± 20% | | | CLLE1AX7R0G104M050AC |
| 150 nF | 2012 | 0.50 +0.05/-0.10 | ± 20% | CLLE1AX7R1A154M050AC | | |
| 220 nF | 2012 | 0.50 +0.05/-0.10 | ± 20% | CLLE1AX7R1A224M050AC | | |
| 330 nF | 2012 | 0.50 +0.05/-0.10 | ± 20% | CLLE1AX7R1A334M050AC | | |
| 470 nF | 2012 | 0.50 +0.05/-0.10 | ± 20% | | CLLE1AX7R0J474M050AC | |
| 680 nF | 2012 | 0.50 +0.05/-0.10 | ± 20% | | CLLE1AX7R0J684M050AC | |
| 1 µF | 2012 | 0.85 ± 0.10 | ± 20% | | CLLE1AX7R0J105M085AC | CLLE1AX7R0G105M085AC |
| | 3216 | 0.85 ± 0.10 | ± 20% | CLLG1AX7R1A105M085AC | | |
| 1.5 µF | 2012 | 0.85 ± 0.10 | ± 20% | | CLLE1AX7R0J155M085AC | |
| 2.2 µF | 3216 | 0.85 ± 0.10 | ± 20% | | CLLG1AX7R0J225M085AC | |

**Class 2 (Temperature Stable)**

Temperature Characteristics: X7S (-55 to +125ºC, ±22%)

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number | | |
|---|---|---|---|---|---|---|
| | | | | Rated Voltage Edc: 10V | Rated Voltage Edc: 6.3V | Rated Voltage Edc: 4.0V |
| 47 nF | 1608 | 0.50 ± 0.05 | ± 20% | | | CLLC1AX7S0G473M050AC |
| | 2012 | 0.50 ± 0.05 | ± 20% | | | CLLE1AX7S0G473M050AC |
| 100 nF | 1608 | 0.50 ± 0.05 | ± 20% | | | CLLC1AX7S0G104M050AC |
| | 2012 | 0.50 ± 0.05 | ± 20% | | | CLLE1AX7S0G104M050AC |
| 150 nF | 2012 | 0.50 ± 0.05 | ± 20% | CLLE1AX7S1A154M050AC | | |
| 220 nF | 2012 | 0.50 ± 0.05 | ± 20% | CLLE1AX7S1A224M050AC | | |
| 330 nF | 1608 | 0.50 +0.05/-0.10 | ± 20% | | | CLLC1AX7S0G334M050AC |
| | 2012 | 0.50 ± 0.05 | ± 20% | CLLE1AX7S1A334M050AC | | |
| 470 nF | 1608 | 0.50 +0.05/-0.10 | ± 20% | | | CLLC1AX7S0G474M050AC |
| | 2012 | 0.50 ± 0.05 | ± 20% | | CLLE1AX7S0J474M050AC | |
| 680 nF | 1608 | 0.50 +0.05/-0.10 | ± 20% | | | CLLC1AX7S0G684M050AC |
| | 2012 | 0.50 ± 0.05 | ± 20% | | CLLE1AX7S0J684M050AC | |
| 1 µF | 1608 | 0.50 +0.05/-0.10 | ± 20% | | | CLLC1AX7S0G105M050AC |
| | 2012 | 0.50 +0.05/-0.10 | ± 20% | | | CLLE1AX7S0G105M050AC |
| 1.5 µF | 2012 | 0.50 +0.05/-0.10 | ± 20% | | | CLLE1AX7S0G155M050AC |
| | | 0.85 ± 0.10 | ± 20% | | CLLE1AX7S0J155M085AC | |
| 2.2 µF | 1608 | 0.50 ± 0.05 | ± 20% | | | CLLC1AX7S0G225M050AC |
| | 2012 | 0.50 +0.05/-0.10 | ± 20% | | | CLLE1AX7S0G225M050AC |
| | | 0.85 ± 0.10 | ± 20% | | | CLLE1AX7S0G225M085AC |
| 4.7 µF | 2012 | 0.50 ± 0.05 | ± 20% | | | CLLE1AX7S0G475M050AC |
| | | 0.85 ± 0.10 | ± 20% | | | CLLE1AX7S0G475M085AC |
| 6.8 µF | 2012 | 0.50 ± 0.05 | ± 20% | | | CLLE1AX7S0G685M050AC |

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