TDK

MULTILAYER CERAMIC CHIP CAPACITORS

# C Series / CKC Series
# Soft Termination Capacitors

Type:

C2012 [EIA CC0805]
C3216 [EIA CC1206]
C3225 [EIA CC1210]
C4532 [EIA CC1812]
C5750 [EIA CC2220]
C7563 [EIA CC3025]
CKCN27 [EIA CC0302]
CKCM25 [EIA CC0504]
CKCL22 [EIA CC0805]

Issue date: January 2013

**TDK MLCC**
**Global Catalog**

Version A13

# REMINDERS

Please read before using this product

## SAFETY REMINDERS

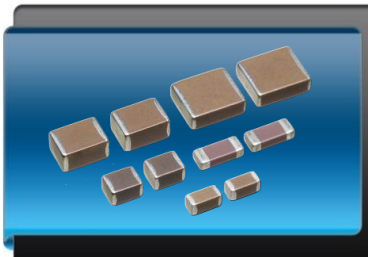
### REMINDERS

1. If you intend to use a product listed in this catalog for a purpose that may cause loss of life or other damage, you must contact our company's sales window.
2. We may modify products or discontinue production of a product listed in this catalog without prior notification.
3. We provide "Delivery Specification" that explain precautions for the specifications and safety of each product listed in this catalog. We strongly recommend that you exchange these delivery specifications with customers that use one of these products.
4. If you plan to export a product listed in this catalog, keep in mind that it may be a restricted item according to the "Foreign Exchange and Foreign Trade Control Law". In such cases, it is necessary to acquire export permission in harmony with this law.
5. Any reproduction or transferring of the contents of this catalog is prohibited without prior permission from our company.
6. We are not responsible for problems that occur related to the intellectual property rights or other rights of our company or a third party when you use a product listed in this catalog. We do not grant license of these rights.
7. This catalog only applies to products purchased through our company or one of our company's official agencies. This catalog does not apply to products that are purchased through other third parties.

For catalogs issued January 2013 and later, the product thickness and packing specifications are described at the end of the ordering name following the product tolerance.
Since the existing ordering name could not clearly express the product thickness and packing specifications, it has been changed to a new product description method that solves this inconvenience.
Please be aware that the last five digits of the ordering name on the delivery label and those in the brochure differ.
No changes have been made to TDK item description on delivery label.

(Example)

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



# C Series

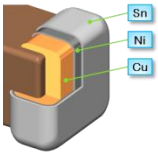
## Soft Termination Capacitors

Type: C2012 [EIA CC0805], C3216 [EIA CC1206], C3225 [EIA CC1210], C4532 [EIA CC1812], C5750 [EIA CC2220], C7563 [EIA CC3025]

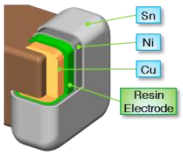
### Features

- Conductive resin layer inside the terminal electrode absorbs external stress from thermal or mechanical sources.
- Improved board bending resistance and drop resistance prevents crack occurrence within the ceramic component.
- Reduce risk of solder cracks due to thermal shock and temperature cycling as well as improved board adherences.

Standard Product



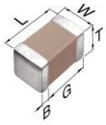

Soft Termination




### Applications

- Switching power supply
- Telecom base station
- Electronic circuits mounted on alumina substrate
- SMT application which requires bending robustness in which solder joint reliability is problematic

### Shape & Dimensions




| | |
|---|---|
| L | Body Length |
| W | Body Width |
| T | Body Height |
| B | Terminal Width |
| G | Terminal Spacing |

### Part Number Construction

C • 7563 • X7S • 1C • 107 • M • 280 • L • E

**Series Name**

**Dimensions L x W (mm)**

| Case Code | Length | Width | Terminal |
|---|---|---|---|
| C2012 | 2.00 ± 0.20 | 1.25 ± 0.20 | 0.20 min. |
| C3216 | 3.20 ± 0.20 | 1.60 ± 0.20 | 0.20 min. |
| C3225 | 3.20 ± 0.40 | 2.50 ± 0.30 | 0.20 min. |
| C4532 | 4.50 ± 0.40 | 3.20 ± 0.40 | 0.20 min. |
| C5750 | 5.70 ± 0.40 | 5.00 ± 0.40 | 0.20 min. |
| C7563 | 7.50 ± 0.50 | 6.30 ± 0.50 | 0.20 min. |

*Dimension tolerance are typical values

**Temperature Characteristics**

| Temperature Characteristics | Capacitance Change | Temperature Range |
|---|---|---|
| X7R | ±15% | -55 to +125°C |
| X7S | ±22% | -55 to +125°C |
| X7T | +22/-33% | -55 to +125°C |

**Rated Voltage (DC)**

| Voltage Code | Voltage (DC) |
|---|---|
| 1C | 16V |
| 1E | 25V |
| 1V | 35V |
| 1H | 50V |
| 2A | 100V |
| 2E | 250V |
| 2W | 450V |
| 2J | 630V |

**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 = 1,000nF = 1µF

**Capacitance Tolerance**

| Tolerance Code | Tolerance |
|---|---|
| K | ± 10% |
| M | ± 20% |

**Nominal Thickness**

| Thickness Code | Thickness |
|---|---|
| 085 | 0.85 mm |
| 115 | 1.15 mm |
| 125 | 1.25 mm |
| 130 | 1.30 mm |
| 160 | 1.60 mm |
| 200 | 2.00 mm |
| 230 | 2.30 mm |
| 250 | 2.50 mm |
| 280 | 2.80 mm |

**Packaging Style**

| Packaging Code | Style |
|---|---|
| A | 178mm Reel / 4mm Pitch |
| K | 178mm Reel / 8mm Pitch |
| L | 330mm Reel / 12mm Pitch |

**Special Reserved Code**

| Code | Description |
|---|---|
| E | Soft Termination |

## Capacitance Range Chart

# EIA CC0805 [C2012]

**Capacitance Range Chart**

Temperature Characteristics: X7R (±15%), X7S (±22%), X7T (+22/-33%)
Rated Voltage: 450V (2W), 250V (2E), 100V (2A), 50V (1H), 35V (1V), 25V (1E), 16V (1C)

| Capacitance (pF) | Cap Code | Tolerance | X7R | | | | | X7S | X7T | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2E (250V) | 1H (50V) | 1V (35V) | 1E (25V) | 1C (16V) | 2A (100V) | 2W (450V) | 2E (250V) |
| 10,000 | 103 | K: ± 10% | | | | | | | | |
| 22,000 | 223 | M: ± 20% | | | | | | | | |
| 47,000 | 473 | | | | | | | | | |
| 100,000 | 104 | | | | | | | | | |
| 220,000 | 224 | | | | | | | | | |
| 470,000 | 474 | | | | | | | | | |
| 1,000,000 | 105 | | | | | | | | | |
| 2,200,000 | 225 | | | | | | | | | |
| 4,700,000 | 475 | | | | | | | | | |

Standard Thickness
- 0.85 mm
- 1.25 mm

## Capacitance Range Chart

# EIA CC1206 [C3216]

**Capacitance Range Chart**

Temperature Characteristics: : X7R (±15%), X7S (±22%), X7T (+22/-33%)
Rated Voltage: 630V (2J), 450V (2W), 250V (2E), 100V (2A), 50V (1H), 35V (1V), 25V (1E)

| Capacitance (pF) | Cap Code | Tolerance | X7R | | | | | | X7S | X7T | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2J (630V) | 2E (250V) | 2A (100V) | 1H (50V) | 1V (35V) | 1E (25V) | 2A (100V) | 2J (630V) | 2W (450V) | 2E (250V) |
| 10,000 | 103 | K: ± 10% | | | | | | | | | | |
| 22,000 | 223 | M: ± 20% | | | | | | | | | | |
| 47,000 | 473 | | | | | | | | | | | |
| 100,000 | 104 | | | | | | | | | | | |
| 220,000 | 224 | | | | | | | | | | | |
| 470,000 | 474 | | | | | | | | | | | |
| 1,000,000 | 105 | | | | | | | | | | | |
| 2,200,000 | 225 | | | | | | | | | | | |
| 4,700,000 | 475 | | | | | | | | | | | |
| 10,000,000 | 106 | | | | | | | | | | | |

Standard Thickness
- 1.15 mm
- 1.30 mm
- 1.60 mm

## Capacitance Range Chart

# EIA CC1210[C3225]

**Capacitance Range Chart**

Temperature Characteristics: : X7R (±15%), X7S (±22%), X7T (+22/-33%)
Rated Voltage: 630V (2J), 450V (2W), 250V (2E), 100V (2A), 50V (1H)

| Capacitance (pF) | Cap Code | Tolerance | X7R | | | X7S | | X7T | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2J (630V) | 2E (250V) | 2A (100V) | 2A (100V) | 1H (50V) | 2J (630V) | 2W (450V) |
| 47,000 | 473 | K: ± 10% | | | | | | | |
| 100,000 | 104 | M: ± 20% | | | | | | | |
| 220,000 | 224 | | | | | | | | |
| 2,200,000 | 225 | | | | | | | | |
| 4,700,000 | 475 | | | | | | | | |
| 10,000,000 | 106 | | | | | | | | |

Standard Thickness
- 1.60 mm
- 2.00 mm
- 2.30 mm
- 2.50 mm

## Capacitance Range Chart

# EIA CC1812 [C4532]

**Capacitance Range Chart**

Temperature Characteristics: : X7R (±15%), X7T (+22/-33%)
Rated Voltage: 630V (2J), 450V (2W), 250V (2E)

| Capacitance (pF) | Cap Code | Tolerance | X7R | X7T | | |
|---|---|---|---|---|---|---|
| | | | 2E (250V) | 2J (630V) | 2W (450V) | 2E (250V) |
| 220,000 | 224 | K: ± 10%<br>M: ± 20% | | 2.00 mm | | |
| 470,000 | 474 | | 2.30 mm | | 2.30 mm | |
| 1,000,000 | 105 | | | | | 2.50 mm |

Standard Thickness
- 2.00 mm
- 2.30 mm
- 2.50 mm

## Capacitance Range Chart

# EIA CC2220 [C5750]

**Capacitance Range Chart**

Temperature Characteristics: X7R (±15%), X7S (±22%), X7T (+22/-33%)
Rated Voltage: 630V (2J), 450V (2W), 250V (2E), 100V (2A)

| Capacitance (pF) | Cap Code | Tolerance | X7R | X7S | X7T | | |
|---|---|---|---|---|---|---|---|
| | | | 2E (250V) | 2A (100V) | 2J (630V) | 2W (450V) | 2E (250V) |
| 470,000 | 474 | K: ± 10%<br>M: ± 20% | | | 2.50 mm | | |
| 1,000,000 | 105 | | 2.30 mm | | | 2.50 mm | |
| 2,200,000 | 225 | | | | | | 2.50 mm |
| 10,000,000 | 106 | | | 2.30 mm | | | |

Standard Thickness
- 2.30 mm
- 2.50 mm

## Capacitance Range Chart

# EIA CC3025 [C7563]

**Capacitance Range Chart**

Temperature Characteristics: X7S (±22%)
Rated Voltage: 50V (1H), 16V (1C)

| Capacitance (pF) | Cap Code | Tolerance | X7S | |
|---|---|---|---|---|
| | | | 1H (50V) | 1C (16V) |
| 22,000,000 | 226 | M: ± 20% | 2.30 mm | |
| 100,000,000 | 107 | | | 2.80 mm |

Standard Thickness
- 2.30 mm
- 2.80 mm

# Capacitance Range Table

## Class 2 (Temperature Stable)

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

| Capacitance | Case Size | Thickness (mm) | Capacitance Tolerance | TDK Part Number | | | |
|---|---|---|---|---|---|---|---|
| | | | | Rated Voltage Edc: 630V | Rated Voltage Edc: 250V | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V |
| 10 nF | 2012 | 1.25 +0.25/-0.20 | ± 10% | | C2012X7R2E103K125AE | | |
| | | | ± 20% | | C2012X7R2E103M125AE | | |
| | 3216 | 1.15 ± 0.15 | ± 10% | C3216X7R2J103K115AE | | | |
| | | | ± 20% | C3216X7R2J103M115AE | | | |
| 22 nF | 2012 | 1.25 +0.25/-0.20 | ± 10% | | C2012X7R2E223K125AE | | |
| | | | ± 20% | | C2012X7R2E223M125AE | | |
| | 3216 | 1.30 ± 0.20 | ± 10% | C3216X7R2J223K130AE | | | |
| | | | ± 20% | C3216X7R2J223M130AE | | | |
| 47 nF | 3225 | 2.00 +0.30/-0.20 | ± 10% | C3225X7R2J473K200AE | | | |
| | | | ± 20% | C3225X7R2J473M200AE | | | |
| 100 nF | 3216 | 1.60 +0.30/-0.20 | ± 10% | | C3216X7R2E104K160AE | | |
| | | | ± 20% | | C3216X7R2E104M160AE | | |
| | 3225 | 2.00 +0.30/-0.20 | ± 10% | | C3225X7R2E104K200AE | | |
| | | | ± 20% | | C3225X7R2E104M200AE | | |
| 220 nF | 3225 | 2.00 +0.30/-0.20 | ± 10% | | C3225X7R2E224K200AE | | |
| | | | ± 20% | | C3225X7R2E224M200AE | | |
| 470 nF | 2012 | 1.25 +0.25/-0.20 | ± 10% | | | | C2012X7R1H474K125AE |
| | | | ± 20% | | | | C2012X7R1H474M125AE |
| | 3216 | 1.60 +0.30/-0.20 | ± 10% | | | C3216X7R2A474K160AE | |
| | | | ± 20% | | | C3216X7R2A474M160AE | |
| | 4532 | 2.30 +0.30/-0.20 | ± 10% | | C4532X7R2E474K230KE | | |
| | | | ± 20% | | C4532X7R2E474M230KE | | |
| 1 µF | 2012 | 1.25 +0.25/-0.20 | ± 10% | | | | C2012X7R1H105K125AE |
| | | | ± 20% | | | | C2012X7R1H105M125AE |
| | 3216 | 1.60 +0.30/-0.20 | ± 10% | | | C3216X7R2A105K160AE | C3216X7R1H105K160AE |
| | | | ± 20% | | | C3216X7R2A105M160AE | C3216X7R1H105M160AE |
| | 5750 | 2.30 +0.30/-0.20 | ± 10% | | C5750X7R2E105K230KE | | |
| | | | ± 20% | | C5750X7R2E105M230KE | | |
| 2.2 µF | 3216 | 1.60 +0.30/-0.20 | ± 10% | | | | C3216X7R1H225K160AE |
| | | | ± 20% | | | | C3216X7R1H225M160AE |
| | 3225 | 2.30 +0.30/-0.20 | ± 10% | | | C3225X7R2A225K230AE | |
| | | | ± 20% | | | C3225X7R2A225M230AE | |

| Capacitance | Case Size | Thickness (mm) | Capacitance Tolerance | TDK Part Number | | |
|---|---|---|---|---|---|---|
| | | | | Rated Voltage Edc: 35V | Rated Voltage Edc: 25V | Rated Voltage Edc: 16V |
| 2.2 µF | 2012 | 1.25 +0.25/-0.20 | ± 10% | C2012X7R1V225K125AE | | |
| | | | ± 20% | C2012X7R1V225M125AE | | |
| 4.7 µF | 2012 | 1.25 +0.25/-0.20 | ± 10% | | C2012X7R1E475K125AE | C2012X7R1C475K125AE |
| | | | ± 20% | | C2012X7R1E475M125AE | C2012X7R1C475M125AE |
| | 3216 | 1.60 +0.30/-0.20 | ± 10% | C3216X7R1V475K160AE | | |
| | | | ± 20% | C3216X7R1V475M160AE | | |
| 10 µF | 3216 | 1.60 +0.30/-0.20 | ± 10% | | C3216X7R1E106K160AE | |
| | | | ± 20% | | C3216X7R1E106M160AE | |
| 2.2 µF | 3225 | 2.30 +0.30/-0.20 | ± 10% | | | C3225X7R2A225K230AE |
| | | | ± 20% | | | C3225X7R2A225M230AE |

# Capacitance Range Table

## Class 2 (Temperature Stable)

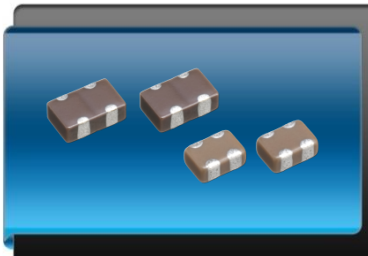
Temperature Characteristics: X7S (-55 to +125ºC, ±22%)

| Capacitance | Case Size | Thickness (mm) | Capacitance Tolerance | TDK Part Number | | |
|---|---|---|---|---|---|---|
| | | | | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V | Rated Voltage Edc: 16V |
| 220 nF | 2012 | 0.85 ± 0.15 | ± 10% | C2012X7S2A224K085AE | | |
| | | | ± 20% | C2012X7S2A224M085AE | | |
| 470 nF | 2012 | 1.25 +0.25/-0.20 | ± 10% | C2012X7S2A474K125AE | | |
| | | | ± 20% | C2012X7S2A474M125AE | | |
| 1 µF | 2012 | 1.25 +0.25/-0.20 | ± 10% | C2012X7S2A105K125AE | | |
| | | | ± 20% | C2012X7S2A105M125AE | | |
| 2.2 µF | 3216 | 1.60 +0.30/-0.20 | ± 10% | C3216X7S2A225K160AE | | |
| | | | ± 20% | C3216X7S2A225M160AE | | |
| 4.7 µF | 3225 | 2.00 +0.30/-0.20 | ± 10% | C3225X7S2A475K200AE | | |
| | | | ± 20% | C3225X7S2A475M200AE | | |
| | | 2.30 +0.30/-0.20 | ± 10% | | C3225X7S1H475K230AE | |
| | | | ± 20% | | C3225X7S1H475M230AE | |
| 10 µF | 3225 | 2.50 ± 0.30 | ± 10% | | C3225X7S1H106K250AE | |
| | | | ± 20% | | C3225X7S1H106M250AE | |
| | 5750 | 2.30 +0.30/-0.20 | ± 10% | C5750X7S2A106K230KE | | |
| | | | ± 20% | C5750X7S2A106M230KE | | |
| 22 µF | 7563 | 2.30 ± 0.20 | ± 20% | | C7563X7S1H226M230LE | |
| 100 µF | 7563 | 2.80 ± 0.30 | ± 20% | | | C7563X7S1C107M280LE |

## Class 2 (Temperature Stable)

Temperature Characteristics: X7T (-55 to +125ºC, +22/-33%)

| Capacitance | Case Size | Thickness (mm) | Capacitance Tolerance | TDK Part Number | | |
|---|---|---|---|---|---|---|
| | | | | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V | Rated Voltage Edc: 25V |
| 10 nF | 2012 | 0.85 ± 0.15 | ± 10% | | C2012X7T2W103K085AE | |
| | | | ± 20% | | C2012X7T2W103M085AE | |
| 22 nF | 2012 | 1.25 +0.25/-0.20 | ± 10% | | C2012X7T2W223K125AE | |
| | | | ± 20% | | C2012X7T2W223M125AE | |
| 47 nF | 2012 | 1.25 +0.25/-0.20 | ± 10% | | C2012X7T2W473K125AE | C2012X7T2E473K125AE |
| | | | ± 20% | | C2012X7T2W473M125AE | C2012X7T2E473M125AE |
| | 3216 | 1.60 +0.30/-0.20 | ± 10% | C3216X7T2J473K160AE | | |
| | | | ± 20% | C3216X7T2J473M160AE | | |
| 100 nF | 2012 | 1.25 +0.25/-0.20 | ± 10% | | | C2012X7T2E104K125AE |
| | | | ± 20% | | | C2012X7T2E104M125AE |
| | 3216 | 1.60 +0.30/-0.20 | ± 10% | | C3216X7T2W104K160AE | |
| | | | ± 20% | | C3216X7T2W104M160AE | |
| | 3225 | 1.60 +0.30/-0.20 | ± 10% | C3225X7T2J104K160AE | | |
| | | | ± 20% | C3225X7T2J104M160AE | | |
| 220 nF | 3216 | 1.60 +0.30/-0.20 | ± 10% | | | C3216X7T2E224K160AE |
| | | | ± 20% | | | C3216X7T2E224M160AE |
| | 3225 | 2.00 +0.30/-0.20 | ± 10% | | C3225X7T2W224K200AE | |
| | | | ± 20% | | C3225X7T2W224M200AE | |
| | 4532 | 2.00 +0.30/-0.20 | ± 10% | C4532X7T2J224K200KE | | |
| | | | ± 20% | C4532X7T2J224M200KE | | |
| 470 nF | 4532 | 2.30 +0.30/-0.20 | ± 10% | | C4532X7T2W474K230KE | |
| | | | ± 20% | | C4532X7T2W474M230KE | |
| | 5750 | 2.50 ± 0.30 | ± 10% | C5750X7T2J474K250KE | | |
| | | | ± 20% | C5750X7T2J474M250KE | | |
| 1 µF | 4532 | 2.50 ± 0.30 | ± 10% | | | C4532X7T2E105K250KE |
| | | | ± 20% | | | C4532X7T2E105M250KE |
| | 5750 | 2.50 ± 0.30 | ± 10% | | C5750X7T2W105K250KE | |
| | | | ± 20% | | C5750X7T2W105M250KE | |
| 2.2 µF | 5750 | 2.50 ± 0.30 | ± 10% | | | C5750X7T2E225K250KE |
| | | | ± 20% | | | C5750X7T2E225M250KE |



# CKC Series

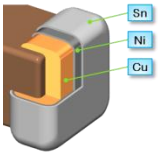
## 2in1 Soft Termination Array Capacitors

Type: CKCN27 [EIA CC0302], CKCM25 [EIA CC0504], CKCL22 [EIA CC0805]

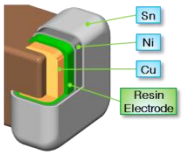
### Features

- Conductive resin layer inside the terminal electrode absorbs external stress from thermal or mechanical sources.
- Improved board bending resistance and drop resistance prevents crack occurrence within the ceramic component.
- Reduce risk of solder cracks due to thermal shock and temperature cycling as well as improved board adherences.

Standard Product



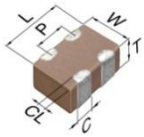

Soft Termination




### Applications

- Switching power supply
- Telecom base station
- Electronic circuits mounted on alumina substrate
- SMT application which requires bending robustness in which solder joint reliability is problematic

### Shape & Dimensions




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

### Part Number Construction

CKC • L22 • X5R • 0J • 225 • M • 085 • A • K

**Series Name**

**Dimensions L x W (mm)**

| Case Code | Length | Width |
|---|---|---|
| N27 | 0.90 ± 0.05 | 0.60 ± 0.05 |
| M25 | 1.37 ± 0.15 | 1.00 ± 0.15 |
| L22 | 2.00 ± 0.15 | 1.25 ± 0.15 |

**Temperature Characteristics**

| Temperature Characteristics | Capacitance Change | Temperature Range |
|---|---|---|
| C0G | 0±30 ppm/°C | -55 to +125°C |
| JB | ±10% | -25 to +85°C |
| X5R | ±15% | -55 to +85°C |
| X7R | ±15% | -55 to +125°C |
| X8R | ±15% | -55 to +150°C |

**Rated Voltage (DC)**

| Voltage Code | Voltage (DC) |
|---|---|
| 0J | 6.3V |
| 1A | 10V |
| 1C | 16V |
| 1E | 25V |
| 1H | 50V |
| 2A | 100V |

**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 = 1,000nF = 1µF

**Capacitance Tolerance**

| Tolerance Code | Tolerance |
|---|---|
| F | ± 1pF |
| K | ± 10% |
| M | ± 20% |

**Nominal Thickness**

| Thickness Code | Thickness |
|---|---|
| 045 | 0.45 mm |
| 060 | 0.60 mm |
| 080 | 0.80 mm |
| 085 | 0.85 mm |

**Packaging Style**

| Packaging Code | Style |
|---|---|
| A | 178mm Reel / 4mm Pitch |
| B | 178mm Reel / 2mm Pitch |

**Special Reserved Code**

| Code | Description |
|---|---|
| K | Soft Termination |

## Capacitance Range Chart

# CKCN27(C0906)[EIA CC0302]

**Capacitance Range Chart**

Temperature Characteristics: JB (± 10%), X5R (±15%),
Rated Voltage: 6.3V (0J)

| Capacitance (pF) | Cap Code | Tolerance | JB | X5R |
|---|---|---|---|---|
| | | | 0J (6.3V) | 0J (6.3V) |
| 100,000 | 104 | M: ± 20% | | |

Standard Thickness
0.45 mm

## Capacitance Range Chart

# CKCM25(C1310)[EIA CC0504]

**Capacitance Range Chart**

Temperature Characteristics: C0G (0 ± 30ppm/ºC), X5R (±15%), X7R (±15%), X8R (±15%)
Rated Voltage: 100V (2A), 50V (1H), 25V (1E), 16V (1C), 10V (1A), 6.3V (0J),

| Capacitance (pF) | Cap Code | Tolerance | C0G | | X5R | | | X7R | | X8R |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2A (100V) | 1H (50V) | 1C (16V) | 1A (10V) | 0J (6.3V) | 1H (50V) | 1E (25V) | 1H (50V) |
| 10 | 100 | F: ± 1pF<br>K: ± 10%<br>M: ± 20% | | | | | | | | |
| 15 | 150 | | | | | | | | | |
| 22 | 220 | | | | | | | | | |
| 33 | 330 | | | | | | | | | |
| 47 | 470 | | | | | | | | | |
| 68 | 680 | | | | | | | | | |
| 100 | 101 | | | | | | | | | |
| 220 | 221 | | | | | | | | | |
| 330 | 331 | | | | | | | | | |
| 470 | 471 | | | | | | | | | |
| 680 | 681 | | | | | | | | | |
| 1,000 | 102 | | | | | | | | | |
| 1,500 | 152 | | | | | | | | | |
| 2,200 | 222 | | | | | | | | | |
| 3,300 | 332 | | | | | | | | | |
| 4,700 | 472 | | | | | | | | | |
| 6,800 | 682 | | | | | | | | | |
| 10,000 | 103 | | | | | | | | | |
| 22,000 | 223 | | | | | | | | | |
| 47,000 | 473 | | | | | | | | | |
| 100,000 | 104 | | | | | | | | | |
| 220,000 | 224 | | | | | | | | | |
| 470,000 | 474 | | | | | | | | | |
| 1,000,000 | 105 | | | | | | | | | |

Standard Thickness
0.60 mm
0.80 mm

## Capacitance Range Chart

# CKCL22(2012) [EIA CC0805]

**Capacitance Range Chart**

Temperature Characteristics: C0G (0 ± 30ppm/ºC), X5R (±15%), X7R (±15%)
Rated Voltage: 100V (2A), 50V (1H), 25V (1E), 16V (1C), 10V (1A), 6.3V (0J)

| Capacitance (pF) | Cap Code | Tolerance | C0G | | X5R | | | X7R | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2A (100V) | 1H (50V) | 1C (16V) | 1A (10V) | 0J (6.3V) | 2A (100V) | 1H (50V) | 1E (25V) | 1A (10V) |
| 10 | 100 | F: ± 1pF<br>K: ± 10%<br>M: ± 20% | | | | | | | | | |
| 22 | 220 | | | | | | | | | | |
| 47 | 470 | | | | | | | | | | |
| 100 | 101 | | | | | | | | | | |
| 220 | 221 | | | | | | | | | | |
| 470 | 471 | | | | | | | | | | |
| 1,000 | 102 | | | | | | | | | | |
| 2,200 | 222 | | | | | | | | | | |
| 4,700 | 472 | | | | | | | | | | |
| 10,000 | 103 | | | | | | | | | | |
| 22,000 | 223 | | | | | | | | | | |
| 47,000 | 473 | | | | | | | | | | |
| 100,000 | 104 | | | | | | | | | | |
| 220,000 | 224 | | | | | | | | | | |
| 470,000 | 474 | | | | | | | | | | |
| 1,000,000 | 105 | | | | | | | | | | |
| 2,200,000 | 225 | | | | | | | | | | |

Standard Thickness
0.85 mm

# Capacitance Range Table

## Class 1 (Temperature Compensating)

Temperature Characteristics: C0G (-55 to 125ºC, 0±30 ppm/ºC)

| Capacitance | Case Size | Thickness (mm) | Capacitance Tolerance | TDK Part Number | |
|---|---|---|---|---|---|
| | | | | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V |
| 10 pF | 1310 | 0.60 ± 0.10 | ± 1pF | CKCM25C0G2A100F060AK | CKCM25C0G1H100F060AK |
| | 2012 | 0.85 ± 0.15 | ± 1pF | CKCL22C0G2A100F085AK | CKCL22C0G1H100F085AK |
| 15 pF | 1310 | 0.60 ± 0.10 | ± 10% | CKCM25C0G2A150K060AK | CKCM25C0G1H150K060AK |
| 22 pF | 1310 | 0.60 ± 0.10 | ± 10% | CKCM25C0G2A220K060AK | CKCM25C0G1H220K060AK |
| | 2012 | 0.85 ± 0.15 | ± 10% | CKCL22C0G2A220K085AK | CKCL22C0G1H220K085AK |
| 33 pF | 1310 | 0.60 ± 0.10 | ± 10% | CKCM25C0G2A330K060AK | CKCM25C0G1H330K060AK |
| 47 pF | 1310 | 0.60 ± 0.10 | ± 10% | CKCM25C0G2A470K060AK | CKCM25C0G1H470K060AK |
| | 2012 | 0.85 ± 0.15 | ± 10% | CKCL22C0G2A470K085AK | CKCL22C0G1H470K085AK |
| 68 pF | 1310 | 0.60 ± 0.10 | ± 10% | CKCM25C0G2A680K060AK | CKCM25C0G1H680K060AK |
| 100 pF | 1310 | 0.60 ± 0.10 | ± 10% | CKCM25C0G2A101K060AK | CKCM25C0G1H101K060AK |
| | 2012 | 0.85 ± 0.15 | ± 10% | CKCL22C0G2A101K085AK | CKCL22C0G1H101K085AK |
| 220 pF | 2012 | 0.85 ± 0.15 | ± 10% | CKCL22C0G2A221K085AK | CKCL22C0G1H221K085AK |
| 470 pF | 2012 | 0.85 ± 0.15 | ± 10% | CKCL22C0G2A471K085AK | CKCL22C0G1H471K085AK |

## Class 1 (Temperature Compensating)

Temperature Characteristics: CH (-25 to 85ºC, 0±60 ppm/ºC)

| Capacitance | Case Size | Thickness (mm) | Capacitance Tolerance | TDK Part Number |
|---|---|---|---|---|
| | | | | Rated Voltage Edc: 6.3V |
| 100 nF | 0906 | 0.45 ± 0.05 | ± 20% | CKCN27JB0J104M045BK |

## Class 2 (Temperature Stable)

Temperature Characteristics: X5R (-55 to +85ºC, ±15%)

| Capacitance | Case Size | Thickness (mm) | Capacitance Tolerance | TDK Part Number | | |
|---|---|---|---|---|---|---|
| | | | | Rated Voltage Edc: 16V | Rated Voltage Edc: 10V | Rated Voltage Edc: 6.3V |
| 22 nF | 1310 | 0.60 ± 0.10 | ± 20% | CKCM25X5R1C223M060AK | | |
| 47 nF | 1310 | 0.60 ± 0.10 | ± 20% | | CKCM25X5R1A473M060AK | |
| 100 nF | 0906 | 0.45 ± 0.05 | ± 20% | | | CKCN27X5R0J104M045BK |
| | 1310 | 0.60 ± 0.10 | ± 20% | | | CKCM25X5R0J104M060AK |
| 220 nF | 1310 | 0.60 ± 0.10 | ± 20% | | | CKCM25X5R0J224M060AK |
| | 2012 | 0.85 ± 0.15 | ± 20% | CKCL22X5R1C224M085AK | | |
| 470 nF | 1310 | 0.80 ± 0.10 | ± 20% | | | CKCM25X5R0J474M080AK |
| | 2012 | 0.85 ± 0.15 | ± 20% | | CKCL22X5R1A474M085AK | |
| 1 µF | 1310 | 0.80 ± 0.10 | ± 20% | | | CKCM25X5R0J105M080AK |
| | 2012 | 0.85 ± 0.15 | ± 20% | | | CKCL22X5R0J105M085AK |
| 2.2 µF | 2012 | 0.85 ± 0.15 | ± 20% | | | CKCL22X5R0J225M085AK |

## Class 2 (Temperature Stable)

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

| Capacitance | Case Size | Thickness (mm) | Capacitance Tolerance | TDK Part Number | | | |
|---|---|---|---|---|---|---|---|
| | | | | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V | Rated Voltage Edc: 25V | Rated Voltage Edc: 10V |
| 470 pF | 2012 | 0.85 ± 0.15 | ± 20% | CKCL22X7R2A471M085AK | | | |
| 1 nF | 1310 | 0.60 ± 0.10 | ± 20% | | CKCM25X7R1H102M060AK | | |
| | 2012 | 0.85 ± 0.15 | ± 20% | CKCL22X7R2A102M085AK | CKCL22X7R1H102M085AK | | |
| 2.2 nF | 1310 | 0.60 ± 0.10 | ± 20% | | CKCM25X7R1H222M060AK | | |
| | 2012 | 0.85 ± 0.15 | ± 20% | CKCL22X7R2A222M085AK | CKCL22X7R1H222M085AK | | |
| 4.7 nF | 1310 | 0.60 ± 0.10 | ± 20% | | CKCM25X7R1H472M060AK | | |
| | 2012 | 0.85 ± 0.15 | ± 20% | CKCL22X7R2A472M085AK | CKCL22X7R1H472M085AK | | |
| 10 nF | 1310 | 0.60 ± 0.10 | ± 20% | | | CKCM25X7R1E103M060AK | |
| | 2012 | 0.85 ± 0.15 | ± 20% | CKCL22X7R2A103M085AK | CKCL22X7R1H103M085AK | | |
| 22 nF | 2012 | 0.85 ± 0.15 | ± 20% | | CKCL22X7R1H223M085AK | | |
| 47 nF | 2012 | 0.85 ± 0.15 | ± 20% | | CKCL22X7R1H473M085AK | CKCL22X7R1E473M085AK | |
| 100 nF | 2012 | 0.85 ± 0.15 | ± 20% | | CKCL22X7R1H104M085AK | CKCL22X7R1E104M085AK | |
| 220 nF | 2012 | 0.85 ± 0.15 | ± 20% | | | | CKCL22X7R1A224M085AK |

## Capacitance Range Table

### Class 2 (Temperature Stable)

Temperature Characteristics: X8R (-55 to +150ºC, ±15%)

| Capacitance | Case Size | Thickness (mm) | Capacitance Tolerance | TDK Part Number Rated Voltage Edc: 50V |
|---|---|---|---|---|
| 220 pF | 1310 | 0.60 ± 0.10 | ± 20% | CKCM25X8R1H221M060AK |
| 330 pF | 1310 | 0.60 ± 0.10 | ± 20% | CKCM25X8R1H331M060AK |
| 470 pF | 1310 | 0.60 ± 0.10 | ± 20% | CKCM25X8R1H471M060AK |
| 680 pF | 1310 | 0.60 ± 0.10 | ± 20% | CKCM25X8R1H681M060AK |
| 1 nF | 1310 | 0.60 ± 0.10 | ± 20% | CKCM25X8R1H102M060AK |
| 1.5 nF | 1310 | 0.60 ± 0.10 | ± 20% | CKCM25X8R1H152M060AK |
| 2.2 nF | 1310 | 0.60 ± 0.10 | ± 20% | CKCM25X8R1H222M060AK |
| 3.3 nF | 1310 | 0.60 ± 0.10 | ± 20% | CKCM25X8R1H332M060AK |
| 4.7 nF | 1310 | 0.60 ± 0.10 | ± 20% | CKCM25X8R1H472M060AK |
| 6.8 nF | 1310 | 0.60 ± 0.10 | ± 20% | CKCM25X8R1H682M060AK |