



## MULTILAYER CERAMIC CHIP CAPACITORS



### **CKC Series Commercial Grade 2 in 1 Array**

**Type:**

**CKCN27 [EIA CC0302]  
CKCM25 [EIA CC0504]  
CKCL22 [EIA CC0805]**

**Issue date:  
Jan 2014**



## REMINDERS

Please read before using this product

### SAFETY REMINDERS



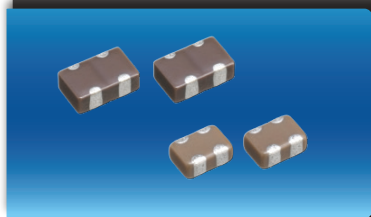
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(Example)

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



## CKC Series 2in1 Array

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

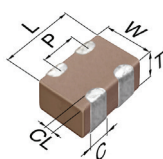


### Features



- Multiple capacitors are fitted in a single product, contributing to reduced installation costs.
- The electrostatic capacity range and shape are designed to meet the demands of the cellular phone market.
- Unique electrode construction reduces crosstalk.
- Also available in soft termination.

### Shape & Dimensions



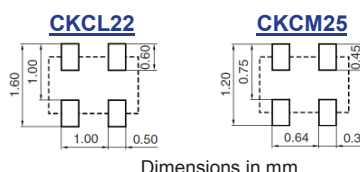
|   |                  |
|---|------------------|
| L | Body Length      |
| W | Body Width       |
| T | Body Height      |
| C | Terminal Width   |
| P | Terminal Spacing |

### Applications



- Cellular telephone interface
- Interface cable circuit
- PC and peripherals
- CPU bus line
- High frequency circuit
- Noise bypass circuit

### PC Board Pattern



### Catalog Number Construction

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

#### Series Name

#### Dimensions L x W (mm)

| 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 | Temperature Coefficient or Capacitance Change | Temperature Range |
|-----------------------------|-----------------------------------------------|-------------------|
| C0G                         | 0±30 ppm/°C                                   | -55 to +125°C     |
| CH                          | 0±60 ppm/°C                                   | -25 to +85°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)

| Code | Voltage (DC) | Code | Voltage (DC) |
|------|--------------|------|--------------|
| 0J   | 6.3V         | 1E   | 25V          |
| 1A   | 10V          | 1H   | 50V          |
| 1C   | 16V          | 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 = 1,00nF = 1μF

#### Capacitance Tolerance

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

#### Nominal Thickness

| Code | Thickness |
|------|-----------|
| 045  | 0.45 mm   |
| 060  | 0.60 mm   |
| 080  | 0.80 mm   |
| 085  | 0.85 mm   |
| 100  | 1.00 mm   |

#### Packaging Style

| Code | Style                |
|------|----------------------|
| A    | 178" Reel, 4mm Pitch |
| B    | 178" Reel, 2mm Pitch |

#### Special Reserved Code

| Code    | Description       |
|---------|-------------------|
| A, B, C | TDK Internal Code |
| K       | Soft Termination  |



## Capacitance Range Chart

## CKCN27(C0906)[EIA CC0302]

### Capacitance Range Chart

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

| Capacitance (pF) | Code | Tolerance     | JB           | X5R          |
|------------------|------|---------------|--------------|--------------|
|                  |      |               | 0J<br>(6.3V) | 0J<br>(6.3V) |
| 100,000          | 104  | M: $\pm 20\%$ |              |              |

Standard Thickness

0.45 mm



## Capacitance Range Chart

## CKCM25(C1310)[EIA CC0504]

### Capacitance Range Chart

Temperature Characteristics: C0G ( $0 \pm 30\text{ppm}/^\circ\text{C}$ ), CH ( $0 \pm 60\text{ppm}/^\circ\text{C}$ )  
Rated Voltage: 100V (2A), 50V (1H)

| Capacitance (pF) | Code | Tolerance           | C0G          |             | CH          |
|------------------|------|---------------------|--------------|-------------|-------------|
|                  |      |                     | 2A<br>(100V) | 1H<br>(50V) | 1H<br>(50V) |
| 10               | 100  | F: $\pm 1\text{pF}$ |              |             |             |
| 15               | 150  | K: $\pm 10\%$       |              |             |             |
| 22               | 220  | M: $\pm 20\%$       |              |             |             |
| 33               | 330  |                     |              |             |             |
| 47               | 470  |                     |              |             |             |
| 68               | 680  |                     |              |             |             |
| 100              | 101  |                     |              |             |             |

### Capacitance Range Chart

Temperature Characteristics: JB ( $\pm 10\%$ ), X5R ( $\pm 15\%$ ), X7R ( $\pm 15\%$ ), X8R ( $\pm 15\%$ )  
Rated Voltage: 50V (1H), 25V (1E), 16V (1C), 10V (1A), 6.3V (0J)

| Capacitance (pF) | Code | Tolerance           | JB          |             |             |             |              | X5R         |             |             |             |              | X7R         |             | X8R         |
|------------------|------|---------------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|
|                  |      |                     | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) | 1A<br>(10V) | 0J<br>(6.3V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) | 1A<br>(10V) | 0J<br>(6.3V) | 1H<br>(50V) | 1E<br>(25V) | 1H<br>(50V) |
| 220              | 221  | F: $\pm 1\text{pF}$ |             |             |             |             |              |             |             |             |             |              |             |             |             |
| 330              | 331  | K: $\pm 10\%$       |             |             |             |             |              |             |             |             |             |              |             |             |             |
| 470              | 471  | M: $\pm 20\%$       |             |             |             |             |              |             |             |             |             |              |             |             |             |
| 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 ( $0 \pm 30\text{ppm}/^\circ\text{C}$ ), CH ( $0 \pm 60\text{ppm}/^\circ\text{C}$ ), JB ( $\pm 10\%$ )

Rated Voltage: 100V (2A), 50V (1H), 25V (1E), 16V (1C), 10V (1A), 6.3V (0J)

| Capacitance<br>(pF) | Code | Tolerance                        | C0G          |             | CH          | JB          |             |             |             |              |
|---------------------|------|----------------------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
|                     |      |                                  | 2A<br>(100V) | 1H<br>(50V) | 1H<br>(50V) | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) | 1A<br>(10V) | 0J<br>(6.3V) |
| 10                  | 100  | F: ± 1pF<br>K: ± 10%<br>M: ± 20% |              |             |             |             |             |             |             |              |
| 15                  | 150  |                                  |              |             |             |             |             |             |             |              |
| 22                  | 220  |                                  |              |             |             |             |             |             |             |              |
| 33                  | 330  |                                  |              |             |             |             |             |             |             |              |
| 47                  | 470  |                                  |              |             |             |             |             |             |             |              |
| 68                  | 680  |                                  |              |             |             |             |             |             |             |              |
| 100                 | 101  |                                  |              |             |             |             |             |             |             |              |
| 150                 | 151  |                                  |              |             |             |             |             |             |             |              |
| 220                 | 221  |                                  |              |             |             |             |             |             |             |              |
| 330                 | 331  |                                  |              |             |             |             |             |             |             |              |
| 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 Chart

Temperature Characteristics: X5R ( $\pm 15\%$ ), X7R ( $\pm 15\%$ )

Rated Voltage: 100V (2A), 50V (1H), 25V (1E), 16V (1C), 10V (1A), 6.3V (0J)

| Capacitance (pF) | Code | Tolerance                                             | X5R         |             |             |             |              | X7R          |             |             |             |
|------------------|------|-------------------------------------------------------|-------------|-------------|-------------|-------------|--------------|--------------|-------------|-------------|-------------|
|                  |      |                                                       | 1H<br>(50V) | 1E<br>(25V) | 1C<br>(16V) | 1A<br>(10V) | 0J<br>(6.3V) | 2A<br>(100V) | 1H<br>(50V) | 1E<br>(25V) | 1A<br>(10V) |
| 470              | 471  | F: $\pm 1\text{pF}$<br>K: $\pm 10\%$<br>M: $\pm 20\%$ |             |             |             |             |              |              |             |             |             |
| 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 +125°C, 0±30 ppm/°C)

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number          |                        |
|-------------|------|----------------|-----------------------|-------------------------|------------------------|
|             |      |                |                       | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V |
| 10 pF       | 1310 | 0.60 ± 0.10    | ± 1pF                 | CKCM25C0G2A100F060AK    | CKCM25C0G1H100F060AK   |
|             |      | 0.66 max.      | ± 1pF                 |                         | CKCM25C0G1H100F060AA   |
|             | 2012 | 0.85 ± 0.15    | ± 1%                  | CKCL22C0G2A100F085AK    | CKCL22C0G1H100F085AA   |
|             |      |                |                       |                         | CKCL22C0G1H100F085AK   |
| 15 pF       | 1310 | 0.60 ± 0.10    | ± 10%                 | CKCM25C0G2A150K060AK    | CKCM25C0G1H150K060AK   |
|             |      | 0.66 max.      | ± 10%                 |                         | CKCM25C0G1H150K060AA   |
|             | 2012 | 1.00 max.      | ± 10%                 | CKCL22C0G1H150K100AA    | CKCL22C0G1H150K100AA   |
|             |      |                |                       |                         |                        |
| 22 pF       | 1310 | 0.60 ± 0.10    | ± 10%                 | CKCM25C0G2A220K060AK    | CKCM25C0G1H220K060AK   |
|             |      | 0.66 max.      | ± 10%                 |                         | CKCM25C0G1H220K060AA   |
|             | 2012 | 0.85 ± 0.15    | ± 10%                 | CKCL22C0G1H220K085AA    | CKCL22C0G1H220K085AA   |
|             |      |                |                       | CKCL22C0G2A220K085AK    | CKCL22C0G1H220K085AK   |
| 33 pF       | 1310 | 0.60 ± 0.10    | ± 10%                 | CKCM25C0G2A330K060AK    | CKCM25C0G1H330K060AK   |
|             |      | 0.66 max.      | ± 10%                 |                         | CKCM25C0G1H330K060AA   |
|             | 2012 | 1.00 max.      | ± 10%                 | CKCL22C0G1H330K100AA    | CKCL22C0G1H330K100AA   |
|             |      |                |                       |                         |                        |
| 47 pF       | 1310 | 0.60 ± 0.10    | ± 10%                 | CKCM25C0G2A470K060AK    | CKCM25C0G1H470K060AK   |
|             |      | 0.66 max.      | ± 10%                 |                         | CKCM25C0G1H470K060AA   |
|             | 2012 | 0.85 ± 0.15    | ± 10%                 | CKCL22C0G1H470K085AA    | CKCL22C0G1H470K085AA   |
|             |      |                |                       | CKCL22C0G2A470K085AK    | CKCL22C0G1H470K085AK   |
| 68 pF       | 1310 | 0.60 ± 0.10    | ± 10%                 | CKCM25C0G2A680K060AK    | CKCM25C0G1H680K060AK   |
|             |      | 0.66 max.      | ± 10%                 |                         | CKCM25C0G1H680K060AA   |
|             | 2012 | 1.00 max.      | ± 10%                 | CKCL22C0G1H680K100AA    | CKCL22C0G1H680K100AA   |
|             |      |                |                       |                         |                        |
| 100 pF      | 1310 | 0.60 ± 0.10    | ± 10%                 | CKCM25C0G2A101K060AK    | CKCM25C0G1H101K060AK   |
|             |      | 0.66 max.      | ± 10%                 |                         | CKCM25C0G1H101K060AA   |
|             | 2012 | 0.85 ± 0.15    | ± 10%                 | CKCL22C0G1H101K085AA    | CKCL22C0G1H101K085AA   |
|             |      |                |                       | CKCL22C0G2A101K085AK    | CKCL22C0G1H101K085AK   |
| 150 pF      | 2012 | 1.00 max.      | ± 10%                 |                         | CKCL22C0G1H151K100AA   |
| 220 pF      | 2012 | 0.85 ± 0.15    | ± 10%                 |                         | CKCL22C0G1H221K085AA   |
| 330 pF      | 2012 | 1.00 max.      | ± 10%                 | CKCL22C0G2A221K085AK    | CKCL22C0G1H221K085AK   |
| 470 pF      | 2012 | 0.85 ± 0.15    | ± 10%                 |                         | CKCL22C0G1H331K100AA   |
|             |      |                |                       |                         | CKCL22C0G1H471K085AA   |
|             |      |                |                       | CKCL22C0G2A471K085AK    | CKCL22C0G1H471K085AK   |

### Class 1 (Temperature Compensating)

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

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number          |                        |
|-------------|------|----------------|-----------------------|-------------------------|------------------------|
|             |      |                |                       | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V |
| 10 pF       | 1310 | 0.66 max.      | ± 1pF                 |                         | CKCM25CH1H100F060AA    |
|             | 2012 | 1.00 max.      | ± 1pF                 |                         | CKCL22CH1H100F100AA    |
| 15 pF       | 1310 | 0.66 max.      | ± 10%                 |                         | CKCM25CH1H150K060AA    |
|             | 2012 | 1.00 max.      | ± 10%                 |                         | CKCL22CH1H150K100AA    |
| 22 pF       | 1310 | 0.66 max.      | ± 10%                 |                         | CKCM25CH1H220K060AA    |
|             | 2012 | 1.00 max.      | ± 10%                 |                         | CKCL22CH1H220K100AA    |
| 33 pF       | 1310 | 0.66 max.      | ± 10%                 |                         | CKCM25CH1H330K060AA    |
|             | 2012 | 1.00 max.      | ± 10%                 |                         | CKCL22CH1H330K100AA    |
| 47 pF       | 1310 | 0.66 max.      | ± 10%                 |                         | CKCM25CH1H470K060AA    |
|             | 2012 | 1.00 max.      | ± 10%                 |                         | CKCL22CH1H470K100AA    |
| 68 pF       | 1310 | 0.66 max.      | ± 10%                 |                         | CKCM25CH1H680K060AA    |
|             | 2012 | 1.00 max.      | ± 10%                 |                         | CKCL22CH1H680K100AA    |
| 100 pF      | 1310 | 0.66 max.      | ± 10%                 |                         | CKCM25CH1H101K060AA    |
|             | 2012 | 1.00 max.      | ± 10%                 |                         | CKCL22CH1H101K100AA    |
| 150 pF      | 2012 | 1.00 max.      | ± 10%                 |                         | CKCL22CH1H151K100AA    |
| 220 pF      | 2012 | 1.00 max.      | ± 10%                 |                         | CKCL22CH1H221K100AA    |
| 330 pF      | 2012 | 1.00 max.      | ± 10%                 |                         | CKCL22CH1H331K100AA    |
| 470 pF      | 2012 | 1.00 max.      | ± 10%                 |                         | CKCL22CH1H471K100AA    |



## Capacitance Range Table

### Class 2 (Temperature Stable)

Temperature Characteristics: JB (-25 to +85°C, ±10%)

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number          |                        |                        |                        |
|-------------|------|----------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|
|             |      |                |                       | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V | Rated Voltage Edc: 25V | Rated Voltage Edc: 16V |
| 1 nF        | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25JB1H102M060AA    |                        |                        |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22JB1H102M085AA    |                        |                        |
| 2.2 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25JB1H222M060AA    |                        |                        |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22JB1H222M085AA    |                        |                        |
| 4.7 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25JB1H472M060AA    |                        |                        |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22JB1H472M085AA    |                        |                        |
| 10 nF       | 1310 | 0.60 ± 0.10    | ± 20%                 |                         |                        | CKCM25JB1E103M060AA    |                        |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22JB1H103M085AA    |                        |                        |
| 22 nF       | 1310 | 0.60 ± 0.10    | ± 20%                 |                         |                        |                        | CKCM25JB1C223M060AA    |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22JB1H223M085AA    |                        |                        |
| 47 nF       | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22JB1H473M085AA    | CKCL22JB1E473M085AA    |                        |
| 100 nF      | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22JB1H104M085AB    | CKCL22JB1E104M085AA    |                        |
| 220 nF      | 2012 | 0.85 ± 0.15    | ± 20%                 |                         |                        |                        | CKCL22JB1C224M085AA    |
| 1 µF        | 2012 | 0.85 ± 0.15    | ± 20%                 |                         |                        |                        | CKCL22JB1C105M085AB    |

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number         |                         |
|-------------|------|----------------|-----------------------|------------------------|-------------------------|
|             |      |                |                       | Rated Voltage Edc: 10V | Rated Voltage Edc: 6.3V |
| 47 nF       | 1310 | 0.60 ± 0.10    | ± 20%                 | CKCM25JB1A473M060AA    |                         |
| 100 nF      | 0906 | 0.45 ± 0.05    | ± 20%                 |                        | CKCN27JB0J104M045BK     |
|             | 1310 | 0.60 ± 0.10    | ± 20%                 |                        | CKCM25JB0J104M060AA     |
| 220 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                        | CKCM25JB0J224M060AA     |
| 470 nF      | 1310 | 0.80 ± 0.10    | ± 20%                 |                        | CKCM25JB0J474M080AA     |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 | CKCL22JB1A474M085AA    |                         |
| 1 µF        | 1310 | 0.80 ± 0.10    | ± 20%                 |                        | CKCM25JB0J105M080AA     |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                        | CKCL22JB0J105M085AA     |
| 2.2 µF      | 2012 | 0.85 ± 0.15    | ± 20%                 |                        | CKCL22JB0J225M085AA     |

### Class 2 (Temperature Stable)

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

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number          |                        |                        |                        |
|-------------|------|----------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|
|             |      |                |                       | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V | Rated Voltage Edc: 25V | Rated Voltage Edc: 16V |
| 1 nF        | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X5R1H102M060AA   |                        |                        |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22X5R1H102M085AA   |                        |                        |
| 2.2 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X5R1H222M060AA   |                        |                        |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22X5R1H222M085AA   |                        |                        |
| 4.7 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X5R1H472M060AA   |                        |                        |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22X5R1H472M085AA   |                        |                        |
| 10 nF       | 1310 | 0.60 ± 0.10    | ± 20%                 |                         |                        | CKCM25X5R1E103M060AA   |                        |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22X5R1H103M085AA   |                        |                        |
| 22 nF       | 1310 | 0.60 ± 0.10    | ± 20%                 |                         |                        |                        | CKCM25X5R1C223M060AA   |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22X5R1H223M085AA   |                        | CKCM25X5R1C223M060AK   |
| 47 nF       | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22X5R1H473M085AA   | CKCL22X5R1E473M085AA   |                        |
| 100 nF      | 2012 | 0.85 ± 0.15    | ± 20%                 |                         | CKCL22X5R1H104M085AB   | CKCL22X5R1E104M085AA   |                        |
| 220 nF      | 2012 | 0.85 ± 0.15    | ± 20%                 |                         |                        |                        | CKCL22X5R1C224M085AA   |
|             |      |                |                       |                         |                        |                        | CKCL22X5R1C224M085AK   |
| 1 µF        | 2012 | 0.85 ± 0.15    | ± 20%                 |                         |                        |                        | CKCL22X5R1C105M085AC   |



## Capacitance Range Table

### Class 2 (Temperature Stable)

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

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number                       |                                      |
|-------------|------|----------------|-----------------------|--------------------------------------|--------------------------------------|
|             |      |                |                       | Rated Voltage Edc: 10V               | Rated Voltage Edc: 6.3V              |
| 47 nF       | 1310 | 0.60 ± 0.10    | ± 20%                 | <a href="#">CKCM25X5R1A473M060AA</a> |                                      |
|             |      |                |                       | <a href="#">CKCM25X5R1A473M060AK</a> |                                      |
| 100 nF      | 0906 | 0.45 ± 0.05    | ± 20%                 |                                      | <a href="#">CKCN27X5R0J104M045BK</a> |
|             | 1310 | 0.60 ± 0.10    | ± 20%                 |                                      | <a href="#">CKCM25X5R0J104M060AA</a> |
|             |      |                |                       |                                      | <a href="#">CKCM25X5R0J104M060AK</a> |
| 220 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                                      | <a href="#">CKCM25X5R0J224M060AA</a> |
|             |      |                |                       |                                      | <a href="#">CKCM25X5R0J224M060AK</a> |
|             |      |                |                       |                                      | <a href="#">CKCM25X5R0J474M080AA</a> |
| 470 nF      | 1310 | 0.80 ± 0.10    | ± 20%                 |                                      | <a href="#">CKCM25X5R0J474M080AK</a> |
|             |      |                |                       |                                      |                                      |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 | <a href="#">CKCL22X5R1A474M085AA</a> |                                      |
| 1 µF        | 1310 | 0.80 ± 0.10    | ± 20%                 |                                      | <a href="#">CKCM25X5R0J105M080AA</a> |
|             |      |                |                       |                                      | <a href="#">CKCM25X5R0J105M080AK</a> |
|             |      |                |                       |                                      | <a href="#">CKCL22X5R0J105M085AA</a> |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                                      | <a href="#">CKCL22X5R0J105M085AK</a> |
|             |      |                |                       |                                      | <a href="#">CKCL22X5R0J225M085AA</a> |
| 2.2 µF      | 2012 | 0.85 ± 0.15    | ± 20%                 |                                      | <a href="#">CKCL22X5R0J225M085AK</a> |

### Class 2 (Temperature Stable)

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

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number                       |                                      |                                      |                                      |
|-------------|------|----------------|-----------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|             |      |                |                       | Rated Voltage Edc: 100V              | Rated Voltage Edc: 50V               | Rated Voltage Edc: 25V               | Rated Voltage Edc: 16V               |
| 470 pF      | 2012 | 0.85 ± 0.15    | ± 20%                 | <a href="#">CKCL22X7R2A471M085AK</a> |                                      |                                      |                                      |
| 1 nF        | 1310 | 0.60 ± 0.10    | ± 20%                 |                                      | <a href="#">CKCM25X7R1H102M060AA</a> |                                      |                                      |
|             |      |                |                       |                                      | <a href="#">CKCM25X7R1H102M060AK</a> |                                      |                                      |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 | <a href="#">CKCL22X7R2A102M085AK</a> | <a href="#">CKCL22X7R1H102M085AA</a> |                                      |                                      |
| 2.2 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                                      | <a href="#">CKCM25X7R1H222M060AA</a> |                                      |                                      |
|             |      |                |                       |                                      | <a href="#">CKCM25X7R1H222M060AK</a> |                                      |                                      |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 | <a href="#">CKCL22X7R2A222M085AK</a> | <a href="#">CKCL22X7R1H222M085AA</a> |                                      |                                      |
| 4.7 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                                      | <a href="#">CKCM25X7R1H472M060AA</a> |                                      |                                      |
|             |      |                |                       |                                      | <a href="#">CKCM25X7R1H472M060AK</a> |                                      |                                      |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 | <a href="#">CKCL22X7R2A472M085AK</a> | <a href="#">CKCL22X7R1H472M085AA</a> |                                      |                                      |
| 10 nF       | 1310 | 0.60 ± 0.10    | ± 20%                 |                                      |                                      | <a href="#">CKCM25X7R1E103M060AA</a> |                                      |
|             |      |                |                       |                                      |                                      | <a href="#">CKCM25X7R1E103M060AK</a> |                                      |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 | <a href="#">CKCL22X7R2A103M085AK</a> | <a href="#">CKCL22X7R1H103M085AA</a> |                                      |                                      |
| 22 nF       | 1310 | 0.60 ± 0.10    | ± 20%                 |                                      | <a href="#">CKCL22X7R1H223M085AA</a> |                                      |                                      |
|             |      |                |                       |                                      | <a href="#">CKCL22X7R1H223M085AK</a> |                                      |                                      |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                                      | <a href="#">CKCL22X7R1H223M085AA</a> |                                      |                                      |
| 47 nF       | 1310 | 0.60 ± 0.10    | ± 20%                 |                                      | <a href="#">CKCL22X7R1H473M085AA</a> | <a href="#">CKCL22X7R1E473M085AA</a> |                                      |
|             |      |                |                       |                                      | <a href="#">CKCL22X7R1H473M085AK</a> | <a href="#">CKCL22X7R1E473M085AK</a> |                                      |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                                      | <a href="#">CKCL22X7R1H104M085AA</a> | <a href="#">CKCL22X7R1E104M085AA</a> |                                      |
| 100 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                                      | <a href="#">CKCL22X7R1H104M085AA</a> | <a href="#">CKCL22X7R1E104M085AA</a> |                                      |
|             |      |                |                       |                                      | <a href="#">CKCL22X7R1H104M085AK</a> | <a href="#">CKCL22X7R1E104M085AK</a> |                                      |
|             | 2012 | 0.85 ± 0.15    | ± 20%                 |                                      |                                      |                                      | <a href="#">CKCL22X7R1A224M085AA</a> |
| 220 nF      | 2012 | 0.85 ± 0.15    | ± 20%                 |                                      |                                      |                                      | <a href="#">CKCL22X7R1A224M085AK</a> |



## Capacitance Range Table

### Class 2 (Temperature Stable)

Temperature Characteristics: X8R (-55 to +125°C, ±15%)

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number          |                        |                        |                        |
|-------------|------|----------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|
|             |      |                |                       | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V | Rated Voltage Edc: 25V | Rated Voltage Edc: 16V |
| 220 pF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X8R1H221M060AK   |                        |                        |
|             |      | 0.66 max.      | ± 20%                 |                         | CKCM25X8R1H221M060AA   |                        |                        |
| 330 pF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X8R1H331M060AK   |                        |                        |
| 470 pF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X8R1H471M060AK   |                        |                        |
|             |      | 0.66 max.      | ± 20%                 |                         | CKCM25X8R1H471M060AA   |                        |                        |
| 680 pF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X8R1H681M060AK   |                        |                        |
| 1 nF        | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X8R1H102M060AK   |                        |                        |
|             |      | 0.66 max.      | ± 20%                 |                         | CKCM25X8R1H102M060AA   |                        |                        |
| 1.5 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X8R1H152M060AK   |                        |                        |
| 2.2 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X8R1H222M060AK   |                        |                        |
|             |      | 0.66 max.      | ± 20%                 |                         | CKCM25X8R1H222M060AA   |                        |                        |
| 3.3 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X8R1H332M060AK   |                        |                        |
| 4.7 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X8R1H472M060AK   |                        |                        |
|             |      | 0.66 max.      | ± 20%                 |                         | CKCM25X8R1H472M060AA   |                        |                        |
| 6.8 nF      | 1310 | 0.60 ± 0.10    | ± 20%                 |                         | CKCM25X8R1H682M060AK   |                        |                        |
|             |      | 0.66 max.      | ± 20%                 |                         | CKCM25X8R1H682M060AA   |                        |                        |

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