



## MULTILAYER CERAMIC CHIP CAPACITORS

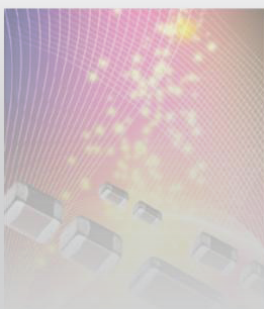


### **CGA Series Automotive Grade High Temperature Application**

**Type:**

- CGA2 [EIA CC0402]**
- CGA3 [EIA CC0603]**
- CGA4 [EIA CC0805]**
- CGA5 [EIA CC1206]**
- CGA6 [EIA CC1210]**
- CGA8 [EIA CC1812]**

**Issue date:**  
**Apr 2014**



## REMINDERS

Please read before using this product

### SAFETY REMINDERS



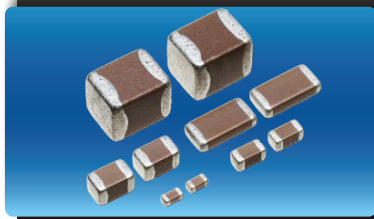
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(Example)

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



## CGA Series

### High Temperature Application

Type: CGA2 [EIA CC0402], CGA3 [EIA CC0603], CGA4 [EIA CC0805], CGA5 [EIA CC1206], CGA6 [EIA CC1210], CGA8 [EIA CC1812]

#### Features



- With a maximum temperature of 150°C and a capacitance change within ±15%, the series is suited for devices that operate in high-temperature environments.
- Excellent DC bias properties.
- AEC-Q200 compliant.

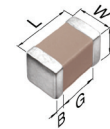
| Parameters            | Specifications  |
|-----------------------|---|
| Temperature           | -55 to 150°C  |
| Characteristics       | ΔC/C: ±15% or 0±30ppm                                   |
| Operating Temperature | -55 to +150°C   |
| Dissipation Factor    | 5% maximum  |
| Insulation Resistance | 10 GΩ or 500 MΩ · μF minimum                            |
| Voltage Proof         | 2.5 · RV or 3 · RV for 1~5s<br>Charge/Discharge ≤ 50 mA |

#### Applications



- Automotive applications (engine rooms)
- Peripheral circuits of IGBT, SiC, GaN used at high temperature environments
- Sensor Module
- Smoothing and decoupling applications for other devices that operate at high temperature

#### Shape & Dimensions



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



Catalog Number Construction

CGA · 6 · P · 3 · X8R · 1C · 106 · K · 250 · A · B

#### Series Name

#### Dimensions L x W (mm)

| Code | Length      | Width       | Terminal  |
|------|-------------|-------------|-----------|
| 2    | 1.00 ± 0.05 | 0.50 ± 0.05 | 0.10 min. |
| 3    | 1.60 ± 0.10 | 0.80 ± 0.10 | 0.20 min. |
| 4    | 2.00 ± 0.20 | 1.25 ± 0.20 | 0.20 min. |
| 5    | 3.20 ± 0.20 | 1.60 ± 0.20 | 0.20 min. |
| 6    | 3.20 ± 0.40 | 2.50 ± 0.30 | 0.20 min. |
| 8    | 4.50 ± 0.40 | 3.20 ± 0.40 | 0.20 min. |

\*Dimension tolerance are typical values

#### Thickness T Code (mm)

| Code | Thickness |
|------|-----------|
| B    | 0.50 mm   |
| C    | 0.60 mm   |
| E    | 0.80 mm   |
| F    | 0.85 mm   |
| H    | 1.15 mm   |
| J    | 1.25 mm   |
| L    | 1.60 mm   |
| M    | 2.00 mm   |
| N    | 2.30 mm   |
| P    | 2.50 mm   |
| R    | 3.20 mm   |

#### Voltage Condition for Life Test

| Symbol | Condition  |
|--------|------------|
| 2      | 2 × R.V.   |
| 3      | 1.5 × R.V. |

#### Temperature Characteristics

| Temperature Characteristics | Temperature Coefficient or Capacitance Change | Temperature Range |
|-----------------------------|---|-------------------|
| NP0                         | 0±30ppm/°C                                    | -55 to +150°C     |
| X8R                         | ±15%  | -55 to +150°C     |

#### Rated Voltage (DC)

| Code | Voltage (DC) |
|------|--------------|
| 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 = 100nF = 1μF

#### Capacitance Tolerance

| Code | Tolerance |
|------|-----------|
| C    | ± 0.25pF  |
| D    | ± 0.50pF  |
| J    | ± 5%      |
| K    | ± 10%     |
| M    | ± 20%     |

#### Nominal Thickness

| Code | Thickness | Code | Thickness |
|------|-----------|------|-----------|
| 050  | 0.50 mm   | 160  | 1.60 mm   |
| 060  | 0.60 mm   | 200  | 2.00 mm   |
| 080  | 0.80 mm   | 230  | 2.30 mm   |
| 085  | 0.85 mm   | 250  | 2.50 mm   |
| 115  | 1.15 mm   | 320  | 3.20 mm   |
| 125  | 1.25 mm   |      |           |

#### Packaging Style

| Code | Style                |
|------|----------------------|
| A    | 178" Reel, 4mm Pitch |
| B    | 178" Reel, 2mm Pitch |
| K    | 178" Reel, 8mm Pitch |

#### Special Reserved Code

| Code | Description       |
|------|-------------------|
| A, B | TDK Internal Code |



## Capacitance Range Chart

## CGA2(1005)[EIA CC0402]

### Capacitance Range Chart

Temperature Characteristics: NPO ( $0 \pm 30\text{ppm}/^\circ\text{C}$ ), X8R ( $\pm 15\%$ )  
 Rated Voltage: 100V (2A), 50V (1H), 25V (1E), 16V (1C)

| Capacitance (pF) | Code | Tolerance              | NPO       |          | X8R       |          |          |          |
|------------------|------|------------------------|-----------|----------|-----------|----------|----------|----------|
|                  |      |                        | 2A (100V) | 1H (50V) | 2A (100V) | 1H (50V) | 1E (25V) | 1C (16V) |
| 1                | 010  | C: $\pm 0.25\text{pF}$ |           |          |           |          |          |          |
| 1.5              | 1R5  | D: $\pm 0.50\text{pF}$ |           |          |           |          |          |          |
| 2                | 020  | J: $\pm 5\%$           |           |          |           |          |          |          |
| 2.2              | 2R2  | K: $\pm 10\%$          |           |          |           |          |          |          |
| 3                | 030  | M: $\pm 20\%$          |           |          |           |          |          |          |
| 3.3              | 3R3  |                        |           |          |           |          |          |          |
| 4                | 040  |                        |           |          |           |          |          |          |
| 4.7              | 4R7  |                        |           |          |           |          |          |          |
| 5                | 050  |                        |           |          |           |          |          |          |
| 6                | 060  |                        |           |          |           |          |          |          |
| 6.8              | 6R8  |                        |           |          |           |          |          |          |
| 7                | 070  |                        |           |          |           |          |          |          |
| 8                | 080  |                        |           |          |           |          |          |          |
| 9                | 090  |                        |           |          |           |          |          |          |
| 10               | 100  |                        |           |          |           |          |          |          |
| 12               | 120  |                        |           |          |           |          |          |          |
| 15               | 150  |                        |           |          |           |          |          |          |
| 18               | 180  |                        |           |          |           |          |          |          |
| 22               | 220  |                        |           |          |           |          |          |          |
| 27               | 270  |                        |           |          |           |          |          |          |
| 33               | 330  |                        |           |          |           |          |          |          |
| 39               | 390  |                        |           |          |           |          |          |          |
| 47               | 470  |                        |           |          |           |          |          |          |
| 56               | 560  |                        |           |          |           |          |          |          |
| 68               | 680  |                        |           |          |           |          |          |          |
| 82               | 820  |                        |           |          |           |          |          |          |
| 100              | 101  |                        |           |          |           |          |          |          |
| 120              | 121  |                        |           |          |           |          |          |          |
| 150              | 151  |                        |           |          |           |          |          |          |
| 180              | 181  |                        |           |          |           |          |          |          |
| 220              | 221  |                        |           |          |           |          |          |          |
| 270              | 271  |                        |           |          |           |          |          |          |
| 330              | 331  |                        |           |          |           |          |          |          |
| 390              | 391  |                        |           |          |           |          |          |          |
| 470              | 471  |                        |           |          |           |          |          |          |
| 560              | 561  |                        |           |          |           |          |          |          |
| 680              | 681  |                        |           |          |           |          |          |          |
| 820              | 821  |                        |           |          |           |          |          |          |
| 1,000            | 102  |                        |           |          |           |          |          |          |
| 1,500            | 152  |                        |           |          |           |          |          |          |
| 2,200            | 222  |                        |           |          |           |          |          |          |
| 3,300            | 332  |                        |           |          |           |          |          |          |
| 4,700            | 472  |                        |           |          |           |          |          |          |
| 6,800            | 682  |                        |           |          |           |          |          |          |
| 10,000           | 103  |                        |           |          |           |          |          |          |
| 15,000           | 153  |                        |           |          |           |          |          |          |
| 22,000           | 223  |                        |           |          |           |          |          |          |
| 33,000           | 333  |                        |           |          |           |          |          |          |
| 47,000           | 473  |                        |           |          |           |          |          |          |

Standard Thickness  
 0.50 mm



## Capacitance Range Chart

## CGA3(1608)[EIA CC0603]

### Capacitance Range Chart

Temperature Characteristics: NPO ( $0 \pm 30\text{ppm}/^\circ\text{C}$ ), X8R ( $\pm 15\%$ )  
 Rated Voltage: 100V (2A), 50V (1H), 25V (1E), 16V (1C)

| Capacitance (pF) | Code | Tolerance              | NPO       |          | Capacitance (pF) | Code | Tolerance              | NPO       |          | X8R       |          |          |          |
|------------------|------|------------------------|-----------|----------|------------------|------|------------------------|-----------|----------|-----------|----------|----------|----------|
|                  |      |                        | 2A (100V) | 1H (50V) |                  |      |                        | 2A (100V) | 1H (50V) | 2A (100V) | 1H (50V) | 1E (25V) | 1C (16V) |
| 1                | 010  | C: $\pm 0.25\text{pF}$ | █         | █        | 1,000            | 102  | C: $\pm 0.25\text{pF}$ | █         | █        | █         | █        |          |          |
| 1.5              | 1R5  | D: $\pm 0.50\text{pF}$ | █         | █        | 1,200            | 122  | D: $\pm 0.50\text{pF}$ | █         | █        |           |          |          |          |
| 2                | 020  | J: $\pm 5\%$           | █         | █        | 1,500            | 152  | J: $\pm 5\%$           | █         | █        |           |          |          |          |
| 2.2              | 2R2  | K: $\pm 10\%$          | █         | █        | 1,800            | 182  | K: $\pm 10\%$          | █         | █        |           |          |          |          |
| 3                | 030  | M: $\pm 20\%$          | █         | █        | 2,200            | 222  | M: $\pm 20\%$          | █         | █        |           |          |          |          |
| 3.3              | 3R3  |                        | █         | █        | 2,700            | 272  |                        | █         | █        |           |          |          |          |
| 4                | 040  |                        | █         | █        | 3,300            | 332  |                        | █         | █        |           |          |          |          |
| 4.7              | 4R7  |                        | █         | █        | 3,900            | 392  |                        | █         | █        |           |          |          |          |
| 5                | 050  |                        | █         | █        | 4,700            | 472  |                        | █         | █        |           |          |          |          |
| 6                | 060  |                        | █         | █        | 5,600            | 562  |                        | █         | █        |           |          |          |          |
| 6.8              | 6R8  |                        | █         | █        | 6,800            | 682  |                        | █         | █        |           |          |          |          |
| 7                | 070  |                        | █         | █        | 8,200            | 822  |                        | █         | █        |           |          |          |          |
| 8                | 080  |                        | █         | █        | 10,000           | 103  |                        | █         | █        |           |          |          |          |
| 9                | 090  |                        | █         | █        | 15,000           | 153  |                        | █         | █        |           |          |          |          |
| 10               | 100  |                        | █         | █        | 22,000           | 223  |                        | █         | █        |           |          |          |          |
| 12               | 120  |                        | █         | █        | 33,000           | 333  |                        | █         | █        |           |          |          |          |
| 15               | 150  |                        | █         | █        | 47,000           | 473  |                        | █         | █        |           |          |          |          |
| 18               | 180  |                        | █         | █        | 68,000           | 683  |                        | █         | █        |           |          |          |          |
| 22               | 220  |                        | █         | █        | 100,000          | 104  |                        | █         | █        |           |          |          |          |
| 27               | 270  |                        | █         | █        | 150,000          | 154  |                        | █         | █        |           |          |          |          |
| 33               | 330  |                        | █         | █        | 220,000          | 224  |                        | █         | █        |           |          |          |          |
| 39               | 390  |                        | █         | █        | 330,000          | 334  |                        | █         | █        |           |          |          |          |
| 47               | 470  |                        | █         | █        | 470,000          | 474  |                        | █         | █        |           |          |          |          |
| 56               | 560  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 68               | 680  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 82               | 820  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 100              | 101  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 120              | 121  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 150              | 151  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 180              | 181  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 220              | 221  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 270              | 271  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 330              | 331  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 390              | 391  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 470              | 471  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 560              | 561  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 680              | 681  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |
| 820              | 821  |                        | █         | █        |                  |      |                        |           |          |           |          |          |          |

Standard Thickness  
 0.80 mm



## Capacitance Range Chart

## CGA4(2012)[EIA CC0805]

### Capacitance Range Chart

Temperature Characteristics: NPO ( $0 \pm 30\text{ppm}/^\circ\text{C}$ ), X8R ( $\pm 15\%$ )  
 Rated Voltage: 100V (2A), 50V (1H), 25V (1E), 16V (1C)

| Capacitance (pF) | Code | Tolerance     | NPO       |          | X8R       |          |          |          |
|------------------|------|---------------|-----------|----------|-----------|----------|----------|----------|
|                  |      |               | 2A (100V) | 1H (50V) | 2A (100V) | 1H (50V) | 1E (25V) | 1C (16V) |
| 1,000            | 102  | J: $\pm 5\%$  | █         |          |           |          |          |          |
| 1,200            | 122  | K: $\pm 10\%$ | █         |          |           |          |          |          |
| 1,500            | 152  | M: $\pm 20\%$ | █         |          |           |          |          |          |
| 1,800            | 182  |               | █         |          |           |          |          |          |
| 2,200            | 222  |               | █         |          |           |          |          |          |
| 2,700            | 272  |               | █         | █        |           |          |          |          |
| 3,300            | 332  |               | █         | █        |           |          |          |          |
| 3,900            | 392  |               | █         | █        |           |          |          |          |
| 4,700            | 472  |               | █         | █        |           |          |          |          |
| 5,600            | 562  |               | █         | █        |           |          |          |          |
| 6,800            | 682  |               | █         | █        |           |          |          |          |
| 8,200            | 822  |               | █         | █        |           |          |          |          |
| 10,000           | 103  |               | █         | █        |           |          |          |          |
| 15,000           | 153  |               |           | █        |           |          |          |          |
| 22,000           | 223  |               |           | █        | █         |          |          |          |
| 33,000           | 333  |               |           | █        | █         |          |          |          |
| 47,000           | 473  |               |           |          | █         |          |          |          |
| 68,000           | 683  |               |           |          | █         | █        |          |          |
| 100,000          | 104  |               |           |          |           | █        |          |          |
| 150,000          | 154  |               |           |          |           | █        |          |          |
| 220,000          | 224  |               |           |          |           | █        | █        |          |
| 330,000          | 334  |               |           |          |           |          | █        |          |
| 470,000          | 474  |               |           |          |           |          | █        |          |
| 680,000          | 684  |               |           |          |           |          | █        | █        |
| 1,000,000        | 105  |               |           |          |           |          |          | █        |

Standard Thickness

- █ 0.60 mm
- █ 0.85 mm
- █ 1.25 mm

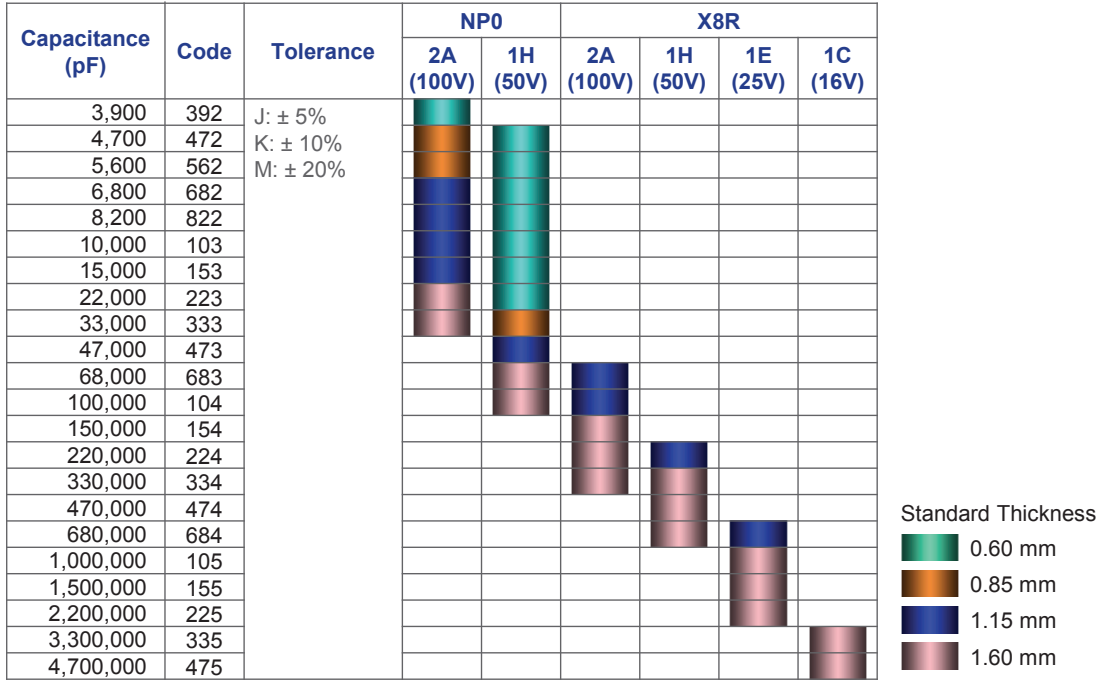


## Capacitance Range Chart

## CGA5(3216)[EIA CC1206]

### Capacitance Range Chart

Temperature Characteristics: NPO (0 ± 30ppm/°C), X8R (±15%)  
 Rated Voltage: 100V (2A), 50V (1H), 25V (1E), 16V (1C)

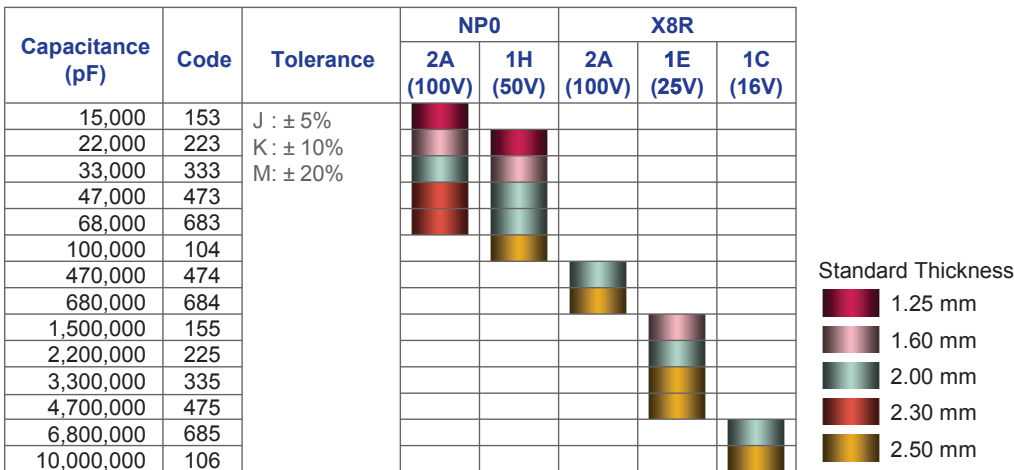


## Capacitance Range Chart

## CGA6(3225)[EIA CC1210]

### Capacitance Range Chart

Temperature Characteristics: NPO (0 ± 30ppm/°C), X8R (±15%)  
 Rated Voltage: 100V (2A), 50V (1H), 25V (1E), 16V (1C)





## Capacitance Range Chart

# CGA8(4532)[EIA CC1812]

### Capacitance Range Chart

Temperature Characteristics: NP0 ( $0 \pm 30\text{ppm}/^\circ\text{C}$ )  
 Rated Voltage: 100V (2A), 50V (1H)

| Capacitance (pF) | Code | Tolerance    | NP0       |          |
|------------------|------|--------------|-----------|----------|
|                  |      |              | 2A (100V) | 1H (50V) |
| 47,000           | 473  | J: $\pm 5\%$ |           |          |
| 68,000           | 683  |              |           |          |
| 100,000          | 104  |              |           |          |
| 150,000          | 154  |              |           |          |
| 220,000          | 224  |              |           |          |

Standard Thickness

- 1.60 mm
- 2.00 mm
- 2.50 mm
- 3.20 mm



## Capacitance Range Chart

# CGA9(5750)[EIA CC2220]

### Capacitance Range Chart

Temperature Characteristics: NP0 ( $0 \pm 30\text{ppm}/^\circ\text{C}$ )  
 Rated Voltage: 100V (2A)

| Capacitance (pF) | Code | Tolerance    | NP0       |
|------------------|------|--------------|-----------|
|                  |      |              | 2A (100V) |
| 150,000          | 154  | J: $\pm 5\%$ |           |

Standard Thickness

- 2.30 mm





## Capacitance Range Table

### Class 1 (Temperature Compensating)

Temperature Characteristics: NP0 (-55 to +150°C, 0±30 ppm/°C)

| 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 pF        | 1005 | 0.50 ± 0.05    | ± 0.25pF              |                         | CGA2B2NP01H010C050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.25pF              | CGA3E2NP02A010C080AA    | CGA3E2NP01H010C080AA   |                        |                        |
| 1.5 pF      | 1005 | 0.50 ± 0.05    | ± 0.25pF              |                         | CGA2B2NP01H1R5C050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.25pF              | CGA3E2NP02A1R5C080AA    | CGA3E2NP01H1R5C080AA   |                        |                        |
| 2 pF        | 1005 | 0.50 ± 0.05    | ± 0.25pF              |                         | CGA2B2NP01H020C050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.25pF              | CGA3E2NP02A020C080AA    | CGA3E2NP01H020C080AA   |                        |                        |
| 2.2 pF      | 1005 | 0.50 ± 0.05    | ± 0.25pF              |                         | CGA2B2NP01H2R2C050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.25pF              | CGA3E2NP02A2R2C080AA    | CGA3E2NP01H2R2C080AA   |                        |                        |
| 3 pF        | 1005 | 0.50 ± 0.05    | ± 0.25pF              |                         | CGA2B2NP01H030C050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.25pF              | CGA3E2NP02A030C080AA    | CGA3E2NP01H030C080AA   |                        |                        |
| 3.3 pF      | 1005 | 0.50 ± 0.05    | ± 0.25pF              |                         | CGA2B2NP01H3R3C050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.25pF              | CGA3E2NP02A3R3C080AA    | CGA3E2NP01H3R3C080AA   |                        |                        |
| 4 pF        | 1005 | 0.50 ± 0.05    | ± 0.25pF              |                         | CGA2B2NP01H040C050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.25pF              | CGA3E2NP02A040C080AA    | CGA3E2NP01H040C080AA   |                        |                        |
| 4.7 pF      | 1005 | 0.50 ± 0.05    | ± 0.25pF              |                         | CGA2B2NP01H4R7C050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.25pF              | CGA3E2NP02A4R7C080AA    | CGA3E2NP01H4R7C080AA   |                        |                        |
| 5 pF        | 1005 | 0.50 ± 0.05    | ± 0.25pF              |                         | CGA2B2NP01H050C050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.25pF              | CGA3E2NP02A050C080AA    | CGA3E2NP01H050C080AA   |                        |                        |
| 6 pF        | 1005 | 0.50 ± 0.05    | ± 0.50pF              |                         | CGA2B2NP01H060D050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.50pF              | CGA3E2NP02A060D080AA    | CGA3E2NP01H060D080AA   |                        |                        |
| 6.8 pF      | 1005 | 0.50 ± 0.05    | ± 0.50pF              |                         | CGA2B2NP01H6R8D050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.50pF              | CGA3E2NP02A6R8D080AA    | CGA3E2NP01H6R8D080AA   |                        |                        |
| 7 pF        | 1005 | 0.50 ± 0.05    | ± 0.50pF              |                         | CGA2B2NP01H070D050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.50pF              | CGA3E2NP02A070D080AA    | CGA3E2NP01H070D080AA   |                        |                        |
| 8 pF        | 1005 | 0.50 ± 0.05    | ± 0.50pF              |                         | CGA2B2NP01H080D050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.50pF              | CGA3E2NP02A080D080AA    | CGA3E2NP01H080D080AA   |                        |                        |
| 9 pF        | 1005 | 0.50 ± 0.05    | ± 0.50pF              |                         | CGA2B2NP01H090D050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.50pF              | CGA3E2NP02A090D080AA    | CGA3E2NP01H090D080AA   |                        |                        |
| 10 pF       | 1005 | 0.50 ± 0.05    | ± 0.50pF              |                         | CGA2B2NP01H100D050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 0.50pF              | CGA3E2NP02A100D080AA    | CGA3E2NP01H100D080AA   |                        |                        |
| 12 pF       | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP01H120J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A120J080AA    | CGA3E2NP01H120J080AA   |                        |                        |
| 15 pF       | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP01H150J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A150J080AA    | CGA3E2NP01H150J080AA   |                        |                        |
| 18 pF       | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP01H180J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A180J080AA    | CGA3E2NP01H180J080AA   |                        |                        |
| 22 pF       | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP01H220J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A220J080AA    | CGA3E2NP01H220J080AA   |                        |                        |
| 27 pF       | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP01H270J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A270J080AA    | CGA3E2NP01H270J080AA   |                        |                        |
| 33 pF       | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP01H330J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A330J080AA    | CGA3E2NP01H330J080AA   |                        |                        |
| 39 pF       | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP01H390J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A390J080AA    | CGA3E2NP01H390J080AA   |                        |                        |
| 47 pF       | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP01H470J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A470J080AA    | CGA3E2NP01H470J080AA   |                        |                        |
| 56 pF       | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP01H560J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A560J080AA    | CGA3E2NP01H560J080AA   |                        |                        |
| 68 pF       | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP01H680J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A680J080AA    | CGA3E2NP01H680J080AA   |                        |                        |
| 82 pF       | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP01H820J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A820J080AA    | CGA3E2NP01H820J080AA   |                        |                        |
| 100 pF      | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP02A101J050BA   | CGA2B2NP01H101J050BA   |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A101J080AA    | CGA3E2NP01H101J080AA   |                        |                        |
| 120 pF      | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP02A121J050BA   | CGA2B2NP01H121J050BA   |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A121J080AA    | CGA3E2NP01H121J080AA   |                        |                        |
| 150 pF      | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP02A151J050BA   | CGA2B2NP01H151J050BA   |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A151J080AA    | CGA3E2NP01H151J080AA   |                        |                        |
| 180 pF      | 1005 | 0.50 ± 0.05    | ± 5%                  |                         | CGA2B2NP02A181J050BA   | CGA2B2NP01H181J050BA   |                        |
|             | 1608 | 0.80 ± 0.10    | ± 5%                  | CGA3E2NP02A181J080AA    | CGA3E2NP01H181J080AA   |                        |                        |



## Capacitance Range Table

### Class 1 (Temperature Compensating)

Temperature Characteristics: NP0 (-55 to +150°C, 0±30 ppm/°C)

| 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      | 1005 | 0.50 ± 0.05      | ± 5%                  | CGA2B2NP02A221J050BA    | CGA2B2NP01H221J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A221J080AA    | CGA3E2NP01H221J080AA   |                        |                        |
| 270 pF      | 1005 | 0.50 ± 0.05      | ± 5%                  | CGA2B2NP02A271J050BA    | CGA2B2NP01H271J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A271J080AA    | CGA3E2NP01H271J080AA   |                        |                        |
| 330 pF      | 1005 | 0.50 ± 0.05      | ± 5%                  | CGA2B2NP02A331J050BA    | CGA2B2NP01H331J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A331J080AA    | CGA3E2NP01H331J080AA   |                        |                        |
| 390 pF      | 1005 | 0.50 ± 0.05      | ± 5%                  | CGA2B2NP02A391J050BA    | CGA2B2NP01H391J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A391J080AA    | CGA3E2NP01H391J080AA   |                        |                        |
| 470 pF      | 1005 | 0.50 ± 0.05      | ± 5%                  | CGA2B2NP02A471J050BA    | CGA2B2NP01H471J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A471J080AA    | CGA3E2NP01H471J080AA   |                        |                        |
| 560 pF      | 1005 | 0.50 ± 0.05      | ± 5%                  |                         | CGA2B2NP01H561J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A561J080AA    | CGA3E2NP01H561J080AA   |                        |                        |
| 680 pF      | 1005 | 0.50 ± 0.05      | ± 5%                  |                         | CGA2B2NP01H681J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A681J080AA    | CGA3E2NP01H681J080AA   |                        |                        |
| 820 pF      | 1005 | 0.50 ± 0.05      | ± 5%                  |                         | CGA2B2NP01H821J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A821J080AA    | CGA3E2NP01H821J080AA   |                        |                        |
| 1 nF        | 1005 | 0.50 ± 0.05      | ± 5%                  |                         | CGA2B2NP01H102J050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A102J080AA    | CGA3E2NP01H102J080AA   |                        |                        |
|             | 2012 | 0.60 ± 0.15      | ± 5%                  | CGA4C2NP02A102J060AA    |                        |                        |                        |
| 1.2 nF      | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A122J080AA    | CGA3E2NP01H122J080AA   |                        |                        |
|             | 2012 | 0.60 ± 0.15      | ± 5%                  | CGA4C2NP02A122J060AA    |                        |                        |                        |
| 1.5 nF      | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A152J080AA    | CGA3E2NP01H152J080AA   |                        |                        |
|             | 2012 | 0.60 ± 0.15      | ± 5%                  | CGA4C2NP02A152J060AA    |                        |                        |                        |
| 1.8 nF      | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A182J080AA    | CGA3E2NP01H182J080AA   |                        |                        |
|             | 2012 | 0.85 ± 0.15      | ± 5%                  | CGA4F2NP02A182J085AA    |                        |                        |                        |
| 2.2 nF      | 1608 | 0.80 ± 0.10      | ± 5%                  | CGA3E2NP02A222J080AA    | CGA3E2NP01H222J080AA   |                        |                        |
|             | 2012 | 0.85 ± 0.15      | ± 5%                  | CGA4F2NP02A222J085AA    |                        |                        |                        |
| 2.7 nF      | 1608 | 0.80 ± 0.10      | ± 5%                  |                         | CGA3E2NP01H272J080AA   |                        |                        |
|             |      | 0.80 ± 0.15/-0.1 | ± 5%                  | CGA3E2NP02A272J080AA    |                        |                        |                        |
|             | 2012 | 0.60 ± 0.15      | ± 5%                  |                         | CGA4C2NP01H272J060AA   |                        |                        |
|             |      | 1.25 ± 0.20      | ± 5%                  | CGA4J2NP02A272J125AA    |                        |                        |                        |
| 3.3 nF      | 1608 | 0.80 ± 0.10      | ± 5%                  |                         | CGA3E2NP01H332J080AA   |                        |                        |
|             |      | 0.80 ± 0.15/-0.1 | ± 5%                  | CGA3E2NP02A332J080AA    |                        |                        |                        |
|             | 2012 | 0.60 ± 0.15      | ± 5%                  |                         | CGA4C2NP01H332J060AA   |                        |                        |
|             |      | 1.25 ± 0.20      | ± 5%                  | CGA4J2NP02A332J125AA    |                        |                        |                        |
| 3.9 nF      | 1608 | 0.80 ± 0.10      | ± 5%                  |                         | CGA3E2NP01H392J080AA   |                        |                        |
|             |      | 0.60 ± 0.15      | ± 5%                  |                         | CGA4C2NP01H392J060AA   |                        |                        |
|             | 2012 | 0.60 ± 0.15      | ± 5%                  | CGA4J2NP02A392J125AA    |                        |                        |                        |
|             |      | 1.25 ± 0.20      | ± 5%                  | CGA4J2NP02A392J125AA    |                        |                        |                        |
|             | 3216 | 0.60 ± 0.15      | ± 5%                  | CGA5C2NP02A392J060AA    |                        |                        |                        |
| 4.7 nF      | 1608 | 0.80 ± 0.10      | ± 5%                  |                         | CGA3E2NP01H472J080AA   |                        |                        |
|             |      | 0.60 ± 0.15      | ± 5%                  |                         | CGA4C2NP01H472J060AA   |                        |                        |
|             | 2012 | 0.60 ± 0.15      | ± 5%                  | CGA4J2NP02A472J125AA    |                        |                        |                        |
|             |      | 1.25 ± 0.20      | ± 5%                  | CGA4J2NP02A472J125AA    |                        |                        |                        |
|             | 3216 | 0.60 ± 0.15      | ± 5%                  |                         | CGA5C2NP01H472J060AA   |                        |                        |
|             |      | 0.85 ± 0.15      | ± 5%                  | CGA5F2NP02A472J085AA    |                        |                        |                        |
| 5.6 nF      | 1608 | 0.80 ± 0.10      | ± 5%                  |                         | CGA3E2NP01H562J080AA   |                        |                        |
|             |      | 0.60 ± 0.15      | ± 5%                  |                         | CGA4C2NP01H562J060AA   |                        |                        |
|             | 2012 | 0.60 ± 0.15      | ± 5%                  | CGA4J2NP02A562J125AA    |                        |                        |                        |
|             |      | 1.25 ± 0.20      | ± 5%                  | CGA4J2NP02A562J125AA    |                        |                        |                        |
|             | 3216 | 0.60 ± 0.15      | ± 5%                  |                         | CGA5C2NP01H562J060AA   |                        |                        |
|             |      | 0.85 ± 0.15      | ± 5%                  | CGA5F2NP02A562J085AA    |                        |                        |                        |
| 6.8 nF      | 1608 | 0.80 ± 0.10      | ± 5%                  |                         | CGA3E2NP01H682J080AA   |                        |                        |
|             |      | 0.60 ± 0.15      | ± 5%                  |                         | CGA4C2NP01H682J060AA   |                        |                        |
|             | 2012 | 0.60 ± 0.15      | ± 5%                  | CGA4J2NP02A682J125AA    |                        |                        |                        |
|             |      | 1.25 ± 0.20      | ± 5%                  | CGA4J2NP02A682J125AA    |                        |                        |                        |
|             | 3216 | 0.60 ± 0.15      | ± 5%                  |                         | CGA5C2NP01H682J060AA   |                        |                        |
|             |      | 1.15 ± 0.15      | ± 5%                  | CGA5H2NP02A682J115AA    |                        |                        |                        |
| 8.2 nF      | 1608 | 0.80 ± 0.10      | ± 5%                  |                         | CGA3E2NP01H822J080AA   |                        |                        |
|             |      | 0.60 ± 0.15      | ± 5%                  |                         | CGA4C2NP01H822J060AA   |                        |                        |
|             | 2012 | 0.60 ± 0.15      | ± 5%                  | CGA4J2NP02A822J125AA    |                        |                        |                        |
|             |      | 1.25 ± 0.20      | ± 5%                  | CGA4J2NP02A822J125AA    |                        |                        |                        |
|             | 3216 | 0.60 ± 0.15      | ± 5%                  |                         | CGA5C2NP01H822J060AA   |                        |                        |
|             |      | 1.15 ± 0.15      | ± 5%                  | CGA5H2NP02A822J115AA    |                        |                        |                        |
| 10 nF       | 1608 | 0.80 ± 0.10      | ± 5%                  |                         | CGA3E2NP01H103J080AA   |                        |                        |
|             |      | 0.60 ± 0.15      | ± 5%                  |                         | CGA4C2NP01H103J060AA   |                        |                        |
|             | 2012 | 0.60 ± 0.15      | ± 5%                  | CGA4J2NP02A103J125AA    |                        |                        |                        |
|             |      | 1.25 ± 0.20      | ± 5%                  | CGA4J2NP02A103J125AA    |                        |                        |                        |
|             | 3216 | 0.60 ± 0.15      | ± 5%                  |                         | CGA5C2NP01H103J060AA   |                        |                        |
|             |      | 1.15 ± 0.15      | ± 5%                  | CGA5H2NP02A103J115AA    |                        |                        |                        |



## Capacitance Range Table

### Class 1 (Temperature Compensating)

Temperature Characteristics: NP0 (-55 to +150°C, 0±30 ppm/°C)

| Capacitance | Size | Thickness (mm) | Capacitance Tolerance | Catalog Number          |                        |                        |                        |
|-------------|------|----------------|-----------------------|-------------------------|------------------------|------------------------|------------------------|
|             |      |                |                       | Rated Voltage Edc: 100V | Rated Voltage Edc: 50V | Rated Voltage Edc: 25V | Rated Voltage Edc: 16V |
| 15 nF       | 2012 | 0.85 ± 0.15    | ± 5%                  |                         | CGA4F2NP01H153J085AA   |                        |                        |
|             |      | 0.60 ± 0.15    | ± 5%                  |                         | CGA5C2NP01H153J060AA   |                        |                        |
|             | 3216 | 1.15 ± 0.15    | ± 5%                  | CGA5H2NP02A153J115AA    |                        |                        |                        |
|             | 3225 | 1.25 ± 0.20    | ± 5%                  | CGA6J2NP02A153J125AA    |                        |                        |                        |
| 22 nF       | 2012 | 1.25 ± 0.20    | ± 5%                  |                         | CGA4J2NP01H223J125AA   |                        |                        |
|             |      | 0.60 ± 0.15    | ± 5%                  |                         | CGA5C2NP01H223J060AA   |                        |                        |
|             | 3216 | 1.60 ± 0.20    | ± 5%                  | CGA5L2NP02A223J160AA    |                        |                        |                        |
|             | 3225 | 1.25 ± 0.20    | ± 5%                  | CGA6J2NP01H223J125AA    |                        |                        |                        |
|             |      | 1.60 ± 0.20    | ± 5%                  | CGA6L2NP02A223J160AA    |                        |                        |                        |
| 33 nF       | 2012 | 1.25 ± 0.20    | ± 5%                  |                         | CGA4J2NP01H333J125AA   |                        |                        |
|             |      | 0.85 ± 0.15    | ± 5%                  |                         | CGA5F2NP01H333J085AA   |                        |                        |
|             | 3216 | 1.60 +0.3/-0.1 | ± 5%                  | CGA5L2NP02A333J160AA    |                        |                        |                        |
|             | 3225 | 1.60 ± 0.20    | ± 5%                  | CGA6L2NP01H333J160AA    |                        |                        |                        |
|             |      | 2.00 ± 0.20    | ± 5%                  | CGA6M2NP02A333J200AA    |                        |                        |                        |
| 47 nF       | 3216 | 1.15 ± 0.15    | ± 5%                  |                         | CGA5H2NP01H473J115AA   |                        |                        |
|             |      | 2.00 ± 0.20    | ± 5%                  |                         | CGA6M2NP01H473J200AA   |                        |                        |
|             | 3225 | 2.30 ± 0.20    | ± 5%                  | CGA6N2NP02A473J230AA    |                        |                        |                        |
|             | 4532 | 1.60 ± 0.20    | ± 5%                  | CGA8L2NP01H473J160KA    |                        |                        |                        |
|             |      | 2.00 ± 0.20    | ± 5%                  | CGA8M2NP02A473J200KA    |                        |                        |                        |
| 68 nF       | 3216 | 1.60 ± 0.20    | ± 5%                  |                         | CGA5L2NP01H683J160AA   |                        |                        |
|             |      | 2.00 ± 0.20    | ± 5%                  |                         | CGA6M2NP01H683J200AA   |                        |                        |
|             | 3225 | 2.30 ± 0.20    | ± 5%                  | CGA6N2NP02A683J230AA    |                        |                        |                        |
|             | 4532 | 1.60 ± 0.20    | ± 5%                  | CGA8L2NP01H683J160KA    |                        |                        |                        |
|             |      | 2.50 ± 0.30    | ± 5%                  | CGA8P2NP02A683J250KA    |                        |                        |                        |
| 100 nF      | 3216 | 1.60 ± 0.20    | ± 5%                  |                         | CGA5L2NP01H104J160AA   |                        |                        |
|             |      | 3225           | 2.50 ± 0.30           | ± 5%                    | CGA6P2NP01H104J250AA   |                        |                        |
|             | 4532 | 2.00 ± 0.20    | ± 5%                  | CGA8M2NP01H104J200KA    |                        |                        |                        |
|             |      | 3.20 ± 0.30    | ± 5%                  | CGA8R2NP02A104J320KA    |                        |                        |                        |
| 150 nF      | 4532 | 2.50 ± 0.30    | ± 5%                  |                         | CGA8P2NP01H154J250KA   |                        |                        |
|             |      | 5750           | 2.30 ± 0.20           | ± 5%                    | CGA9N2NP02A154J230KA   |                        |                        |
| 220 nF      | 4532 | 3.20 ± 0.30    | ± 5%                  |                         | CGA8R2NP01H224J320KA   |                        |                        |

### Class 2 (Temperature Stable)

Temperature Characteristics: X8R (-55 to +150°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 |
| 150 pF      | 1005 | 0.50 ± 0.05    | ± 10%                 | CGA2B2X8R2A151K050BA    | CGA2B2X8R1H151K050BA   |                        |                        |
|             |      |                | ± 20%                 | CGA2B2X8R2A151M050BA    | CGA2B2X8R1H151M050BA   |                        |                        |
| 220 pF      | 1005 | 0.50 ± 0.05    | ± 10%                 | CGA2B2X8R2A221K050BA    | CGA2B2X8R1H221K050BA   |                        |                        |
|             |      |                | ± 20%                 | CGA2B2X8R2A221M050BA    | CGA2B2X8R1H221M050BA   |                        |                        |
| 330 pF      | 1005 | 0.50 ± 0.05    | ± 10%                 | CGA2B2X8R2A331K050BA    | CGA2B2X8R1H331K050BA   |                        |                        |
|             |      |                | ± 20%                 | CGA2B2X8R2A331M050BA    | CGA2B2X8R1H331M050BA   |                        |                        |
| 470 pF      | 1005 | 0.50 ± 0.05    | ± 10%                 | CGA2B2X8R2A471K050BA    | CGA2B2X8R1H471K050BA   |                        |                        |
|             |      |                | ± 20%                 | CGA2B2X8R2A471M050BA    | CGA2B2X8R1H471M050BA   |                        |                        |
| 680 pF      | 1005 | 0.50 ± 0.05    | ± 10%                 | CGA2B2X8R2A681K050BA    | CGA2B2X8R1H681K050BA   |                        |                        |
|             |      |                | ± 20%                 | CGA2B2X8R2A681M050BA    | CGA2B2X8R1H681M050BA   |                        |                        |
| 1 nF        | 1005 | 0.50 ± 0.05    | ± 10%                 | CGA2B2X8R2A102K050BA    | CGA2B2X8R1H102K050BA   |                        |                        |
|             |      |                | ± 20%                 | CGA2B2X8R2A102M050BA    | CGA2B2X8R1H102M050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 10%                 | CGA3E2X8R2A102K080AA    | CGA3E2X8R1H102K080AA   |                        |                        |
|             |      |                | ± 20%                 | CGA3E2X8R2A102M080AA    | CGA3E2X8R1H102M080AA   |                        |                        |
| 1.5 nF      | 1005 | 0.50 ± 0.05    | ± 10%                 | CGA2B2X8R2A152K050BA    | CGA2B2X8R1H152K050BA   |                        |                        |
|             |      |                | ± 20%                 | CGA2B2X8R2A152M050BA    | CGA2B2X8R1H152M050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 10%                 | CGA3E2X8R2A152K080AA    | CGA3E2X8R1H152K080AA   |                        |                        |
|             |      |                | ± 20%                 | CGA3E2X8R2A152M080AA    | CGA3E2X8R1H152M080AA   |                        |                        |
| 2.2 nF      | 1005 | 0.50 ± 0.05    | ± 10%                 | CGA2B2X8R2A222K050BA    | CGA2B2X8R1H222K050BA   |                        |                        |
|             |      |                | ± 20%                 | CGA2B2X8R2A222M050BA    | CGA2B2X8R1H222M050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 10%                 | CGA3E2X8R2A222K080AA    | CGA3E2X8R1H222K080AA   |                        |                        |
|             |      |                | ± 20%                 | CGA3E2X8R2A222M080AA    | CGA3E2X8R1H222M080AA   |                        |                        |
| 3.3 nF      | 1005 | 0.50 ± 0.05    | ± 10%                 | CGA2B3X8R2A332K050BB    | CGA2B2X8R1H332K050BA   |                        |                        |
|             |      |                | ± 20%                 | CGA2B3X8R2A332M050BB    | CGA2B2X8R1H332M050BA   |                        |                        |
|             | 1608 | 0.80 ± 0.10    | ± 10%                 | CGA3E2X8R2A332K080AA    | CGA3E2X8R1H332K080AA   |                        |                        |
|             |      |                | ± 20%                 | CGA3E2X8R2A332M080AA    | CGA3E2X8R1H332M080AA   |                        |                        |



## Capacitance Range Table

### Class 2 (Temperature Stable)

Temperature Characteristics: X8R (-55 to +150°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 |
| 4.7 nF      | 1005        | 0.50 ± 0.05    | ± 10%                 |                         | CGA2B2X8R1H472K050BA   |                        |                        |
|             |             |                | ± 20%                 |                         | CGA2B2X8R1H472M050BA   |                        |                        |
|             | 1608        | 0.80 ± 0.10    | ± 10%                 | CGA3E2X8R2A472K080AA    | CGA3E2X8R1H472K080AA   |                        |                        |
|             |             |                | ± 20%                 | CGA3E2X8R2A472M080AA    | CGA3E2X8R1H472M080AA   |                        |                        |
| 6.8 nF      | 1005        | 0.50 ± 0.05    | ± 10%                 |                         | CGA2B3X8R1H682K050BB   | CGA2B2X8R1E682K050BA   |                        |
|             |             |                | ± 20%                 |                         | CGA2B3X8R1H682M050BB   | CGA2B2X8R1E682M050BA   |                        |
|             | 1608        | 0.80 ± 0.10    | ± 10%                 | CGA3E2X8R2A682K080AA    | CGA3E2X8R1H682K080AA   |                        |                        |
|             |             |                | ± 20%                 | CGA3E2X8R2A682M080AA    | CGA3E2X8R1H682M080AA   |                        |                        |
| 10 nF       | 1005        | 0.50 ± 0.05    | ± 10%                 |                         | CGA2B3X8R1H103K050BB   | CGA2B2X8R1E103K050BA   |                        |
|             |             |                | ± 20%                 |                         | CGA2B3X8R1H103M050BB   | CGA2B2X8R1E103M050BA   |                        |
|             | 1608        | 0.80 ± 0.10    | ± 10%                 | CGA3E2X8R2A103K080AA    | CGA3E2X8R1H103K080AA   |                        |                        |
|             |             |                | ± 20%                 | CGA3E2X8R2A103M080AA    | CGA3E2X8R1H103M080AA   |                        |                        |
| 15 nF       | 1005        | 0.50 ± 0.05    | ± 10%                 |                         |                        | CGA2B3X8R1E153K050BB   |                        |
|             |             |                | ± 20%                 |                         |                        | CGA2B3X8R1E153M050BB   |                        |
|             | 1608        | 0.80 ± 0.10    | ± 10%                 | CGA3E2X8R2A153K080AA    | CGA3E2X8R1H153K080AA   |                        |                        |
|             |             |                | ± 20%                 | CGA3E2X8R2A153M080AA    | CGA3E2X8R1H153M080AA   |                        |                        |
| 22 nF       | 1005        | 0.50 ± 0.05    | ± 10%                 |                         |                        | CGA2B3X8R1E223K050BB   |                        |
|             |             |                | ± 20%                 |                         |                        | CGA2B3X8R1E223M050BB   |                        |
|             | 1608        | 0.80 ± 0.10    | ± 10%                 | CGA3E3X8R2A223K080AB    | CGA3E2X8R1H223K080AA   |                        |                        |
|             |             |                | ± 20%                 | CGA3E3X8R2A223M080AB    | CGA3E2X8R1H223M080AA   |                        |                        |
| 2012        | 1.25 ± 0.20 | ± 10%          | CGA4J2X8R2A223K125AA  |                         |                        |                        |                        |
|             |             | ± 20%          | CGA4J2X8R2A223M125AA  |                         |                        |                        |                        |
| 33 nF       | 1005        | 0.50 ± 0.05    | ± 10%                 |                         |                        |                        | CGA2B3X8R1C333K050BB   |
|             |             |                | ± 20%                 |                         |                        |                        | CGA2B3X8R1C333M050BB   |
|             | 1608        | 0.80 ± 0.10    | ± 10%                 | CGA3E3X8R2A333K080AB    | CGA3E2X8R1H333K080AA   |                        |                        |
|             |             |                | ± 20%                 | CGA3E3X8R2A333M080AB    | CGA3E2X8R1H333M080AA   |                        |                        |
| 2012        | 1.25 ± 0.20 | ± 10%          | CGA4J3X8R2A333K125AB  |                         |                        |                        |                        |
|             |             | ± 20%          | CGA4J3X8R2A333M125AB  |                         |                        |                        |                        |
| 47 nF       | 1005        | 0.50 ± 0.05    | ± 10%                 |                         |                        |                        | CGA2B3X8R1C473K050BB   |
|             |             |                | ± 20%                 |                         |                        |                        | CGA2B3X8R1C473M050BB   |
|             | 1608        | 0.80 ± 0.10    | ± 10%                 |                         | CGA3E2X8R1H473K080AA   |                        |                        |
|             |             |                | ± 20%                 |                         | CGA3E2X8R1H473M080AA   |                        |                        |
| 2012        | 1.25 ± 0.20 | ± 10%          | CGA4J3X8R2A473K125AB  |                         |                        |                        |                        |
|             |             | ± 20%          | CGA4J3X8R2A473M125AB  |                         |                        |                        |                        |
| 68 nF       | 1608        | 0.80 ± 0.10    | ± 10%                 |                         | CGA3E3X8R1H683K080AB   | CGA3E2X8R1E683K080AA   |                        |
|             |             |                | ± 20%                 |                         | CGA3E3X8R1H683M080AB   | CGA3E2X8R1E683M080AA   |                        |
|             | 2012        | 1.25 ± 0.20    | ± 10%                 | CGA4J3X8R2A683K125AB    | CGA4J2X8R1H683K125AA   |                        |                        |
|             |             |                | ± 20%                 | CGA4J3X8R2A683M125AB    | CGA4J2X8R1H683M125AA   |                        |                        |
| 3216        | 1.15 ± 0.15 | ± 10%          | CGA5H2X8R2A683K115AA  |                         |                        |                        |                        |
|             |             | ± 20%          | CGA5H2X8R2A683M115AA  |                         |                        |                        |                        |
| 100 nF      | 1608        | 0.80 ± 0.10    | ± 10%                 |                         | CGA3E3X8R1H104K080AB   | CGA3E2X8R1E104K080AA   |                        |
|             |             |                | ± 20%                 |                         | CGA3E3X8R1H104M080AB   | CGA3E2X8R1E104M080AA   |                        |
|             | 2012        | 1.25 ± 0.20    | ± 10%                 |                         | CGA4J2X8R1H104K125AA   |                        |                        |
|             |             |                | ± 20%                 |                         | CGA4J2X8R1H104M125AA   |                        |                        |
| 3216        | 1.15 ± 0.15 | ± 10%          | CGA5H2X8R2A104K115AA  |                         |                        |                        |                        |
|             |             | ± 20%          | CGA5H2X8R2A104M115AA  |                         |                        |                        |                        |
| 150 nF      | 1608        | 0.80 ± 0.10    | ± 10%                 |                         |                        | CGA3E3X8R1E154K080AB   |                        |
|             |             |                | ± 20%                 |                         |                        | CGA3E3X8R1E154M080AB   |                        |
|             | 2012        | 1.25 ± 0.20    | ± 10%                 |                         | CGA4J3X8R1H154K125AB   |                        |                        |
|             |             |                | ± 20%                 |                         | CGA4J3X8R1H154M125AB   |                        |                        |
| 3216        | 1.60 ± 0.20 | ± 10%          | CGA5L2X8R2A154K160AA  |                         |                        |                        |                        |
|             |             | ± 20%          | CGA5L2X8R2A154M160AA  |                         |                        |                        |                        |



## Capacitance Range Table

### Class 2 (Temperature Stable)

Temperature Characteristics: X8R (-55 to +150°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 nF      | 1608        | 0.80 ± 0.10      | ± 10%                 |                         |                        | CGA3E3X8R1E224K080AB   |                        |
|             |             |                  | ± 20%                 |                         |                        | CGA3E3X8R1E224M080AB   |                        |
|             | 2012        | 1.25 ± 0.20      | ± 10%                 |                         | CGA4J3X8R1H224K125AB   | CGA4J2X8R1E224K125AA   |                        |
|             |             |                  | ± 20%                 |                         | CGA4J3X8R1H224M125AB   | CGA4J2X8R1E224M125AA   |                        |
|             | 3216        | 1.15 ± 0.15      | ± 10%                 |                         | CGA5H2X8R1H224K115AA   |                        |                        |
|             |             |                  | ± 20%                 |                         | CGA5H2X8R1H224M115AA   |                        |                        |
|             | 1.60 ± 0.20 | ± 10%            | CGA5L3X8R2A224K160AB  |                         |                        |                        |                        |
|             |             | ± 20%            | CGA5L3X8R2A224M160AB  |                         |                        |                        |                        |
| 330 nF      | 1608        | 0.80 ± 0.10      | ± 10%                 |                         |                        |                        | CGA3E3X8R1C334K080AB   |
|             |             |                  | ± 20%                 |                         |                        |                        | CGA3E3X8R1C334M080AB   |
|             | 2012        | 1.25 ± 0.20      | ± 10%                 |                         |                        | CGA4J2X8R1E334K125AA   |                        |
|             |             |                  | ± 20%                 |                         |                        | CGA4J2X8R1E334M125AA   |                        |
|             | 3216        | 1.60 ± 0.20      | ± 10%                 | CGA5L3X8R2A334K160AB    | CGA5L2X8R1H334K160AA   |                        |                        |
|             |             |                  | ± 20%                 | CGA5L3X8R2A334M160AB    | CGA5L2X8R1H334M160AA   |                        |                        |
| 470 nF      | 1608        | 0.80 +0.15/-0.10 | ± 10%                 |                         |                        |                        | CGA3E3X8R1C474K080AB   |
|             |             |                  | ± 20%                 |                         |                        |                        | CGA3E3X8R1C474M080AB   |
|             | 2012        | 1.25 ± 0.20      | ± 10%                 |                         |                        | CGA4J3X8R1E474K125AB   |                        |
|             |             |                  | ± 20%                 |                         |                        | CGA4J3X8R1E474M125AB   |                        |
|             | 3216        | 1.60 ± 0.20      | ± 10%                 |                         | CGA5L2X8R1H474K160AA   |                        |                        |
|             |             |                  | ± 20%                 |                         | CGA5L2X8R1H474M160AA   |                        |                        |
|             | 2.00 ± 0.20 | ± 10%            | CGA6M3X8R2A474K200AB  |                         |                        |                        |                        |
|             |             | ± 20%            | CGA6M3X8R2A474M200AB  |                         |                        |                        |                        |
| 680 nF      | 2012        | 1.25 ± 0.20      | ± 10%                 |                         |                        |                        | CGA4J3X8R1C684K125AB   |
|             |             |                  | ± 20%                 |                         |                        |                        | CGA4J3X8R1C684M125AB   |
|             | 3216        | 1.15 ± 0.15      | ± 10%                 |                         |                        | CGA5H2X8R1E684K115AA   |                        |
|             |             |                  | ± 20%                 |                         |                        | CGA5H2X8R1E684M115AA   |                        |
|             |             | 1.60 ± 0.20      | ± 10%                 |                         | CGA5L3X8R1H684K160AB   |                        |                        |
|             |             |                  | ± 20%                 |                         | CGA5L3X8R1H684M160AB   |                        |                        |
|             | 2.50 ± 0.30 | ± 10%            | CGA6P3X8R2A684K250AB  |                         |                        |                        |                        |
|             |             | ± 20%            | CGA6P3X8R2A684M250AB  |                         |                        |                        |                        |
| 1 µF        | 2012        | 1.25 ± 0.20      | ± 10%                 |                         |                        |                        | CGA4J3X8R1C105K125AB   |
|             |             |                  | ± 20%                 |                         |                        |                        | CGA4J3X8R1C105M125AB   |
|             | 3216        | 1.60 ± 0.20      | ± 10%                 |                         | CGA5L3X8R1H105K160AB   | CGA5L2X8R1E105K160AA   |                        |
|             |             |                  | ± 20%                 | CGA5L3X8R1H105M160AB    | CGA5L2X8R1E105M160AA   |                        |                        |
| 1.5 µF      | 3216        | 1.60 ± 0.20      | ± 10%                 |                         |                        | CGA5L3X8R1E155K160AB   |                        |
|             |             |                  | ± 20%                 |                         |                        | CGA5L3X8R1E155M160AB   |                        |
|             | 3225        | 1.60 ± 0.20      | ± 10%                 |                         | CGA6L2X8R1E155K160AA   |                        |                        |
|             |             |                  | ± 20%                 |                         | CGA6L2X8R1E155M160AA   |                        |                        |
| 2.2 µF      | 3216        | 1.60 ± 0.20      | ± 10%                 |                         |                        | CGA5L3X8R1E225K160AB   |                        |
|             |             |                  | ± 20%                 |                         |                        | CGA5L3X8R1E225M160AB   |                        |
|             | 3225        | 2.00 ± 0.20      | ± 10%                 |                         | CGA6M2X8R1E225K200AA   |                        |                        |
|             |             |                  | ± 20%                 |                         | CGA6M2X8R1E225M200AA   |                        |                        |
| 3.3 µF      | 3216        | 1.60 ± 0.20      | ± 10%                 |                         |                        |                        | CGA5L3X8R1C335K160AB   |
|             |             |                  | ± 20%                 |                         |                        |                        | CGA5L3X8R1C335M160AB   |
|             | 3225        | 2.50 ± 0.30      | ± 10%                 |                         |                        | CGA6P2X8R1E335K250AA   |                        |
|             |             |                  | ± 20%                 |                         | CGA6P2X8R1E335M250AA   |                        |                        |
| 4.7 µF      | 3216        | 1.60 ± 0.20      | ± 10%                 |                         |                        |                        | CGA5L3X8R1C475K160AB   |
|             |             |                  | ± 20%                 |                         |                        |                        | CGA5L3X8R1C475M160AB   |
|             | 3225        | 2.50 ± 0.30      | ± 10%                 |                         |                        | CGA6P3X8R1E475K250AB   |                        |
|             |             |                  | ± 20%                 |                         | CGA6P3X8R1E475M250AB   |                        |                        |
| 6.8 µF      | 3225        | 2.00 ± 0.20      | ± 10%                 |                         |                        |                        | CGA6M3X8R1C685K200AB   |
|             |             |                  | ± 20%                 |                         |                        |                        | CGA6M3X8R1C685M200AB   |
| 10 µF       | 3225        | 2.50 ± 0.30      | ± 10%                 |                         |                        |                        | CGA6P3X8R1C106K250AB   |
|             |             |                  | ± 20%                 |                         |                        |                        | CGA6P3X8R1C106M250AB   |