

Multilayer Ceramic Chip Capacitors

General use

C series

Type: C0603[EIA CC0201]
C1005[EIA CC0402]
C1608[EIA CC0603]
C2012[EIA CC0805]
C3216[EIA CC1206]
C3225[EIA CC1210]
C4532[EIA CC1812]
C5750[EIA CC2220]

Issue date: April 2010

- All specifications are subject to change without notice.
 - Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.
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REMINDERS

Please read this before using the product.

SAFETY REMINDERS

REMINDERS

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General Multilayer Ceramic Chip Capacitors

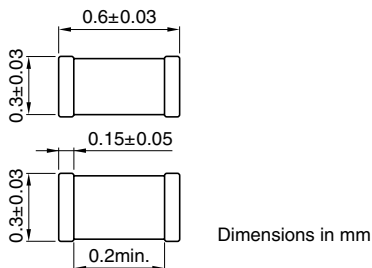
C Series C0603 (EIA CC0201) Type

Conformity to RoHS Directive

FEATURES

- High capacitance has been achieved through precision technologies that enable the use of multiple thinner ceramic dielectric layers.
- A monolithic structure ensures superior mechanical strength and reliability.
- High-accuracy automatic mounting is facilitated through the maintenance of very precise dimensional tolerances.
- Composed of only ceramics and metals, these capacitors provide extremely dependable performance, exhibiting virtually no degradation even when subjected to temperature extremes.
- Low stray capacitance ensures high conformity with nominal values, thereby simplifying the circuit design process.
- Low residual inductance assures superior frequency characteristics.
- Because electrostatic capacity has been obtained up to the electrolytic capacitor range, these capacitors offer long service life and are optimally suited for power supply designs that require high levels of reliability.
- Owing to their low ESR and excellent frequency characteristics, these products are optimally suited for high frequency and high-density type power supplies.

SHAPES AND DIMENSIONS



PRODUCT IDENTIFICATION

| | | | | | | |
|-----|------|-----|-----|-----|-----|-----|
| C | 0603 | CH | 1E | 100 | D | □ |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |

(1) Series name

(2) Dimensions L×W

| | |
|------|-----------|
| 0603 | 0.6×0.3mm |
|------|-----------|

(3) Capacitance temperature characteristics

Class 1 (Temperature compensation)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| CH | 0±60ppm/°C | -25 to +85°C |
| C0G | 0±30ppm/°C | -55 to +125°C |

Class 2 (Temperature stable and general purpose)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| JB | ±10% | -25 to +85°C |
| JF | +30, -80% | -25 to +85°C |
| X7R | ±15% | -55 to +125°C |
| X5R | ±15% | -55 to +85°C |
| Y5V | +22, -82% | -30 to +85°C |

(4) Rated voltage E_{dc}

| | |
|----|------|
| 0J | 6.3V |
| 1A | 10V |
| 1C | 16V |
| 1E | 25V |

(5) Nominal capacitance

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.

| | |
|-----|---------|
| 010 | 1pF |
| 100 | 10pF |
| 102 | 1,000pF |
| 0R5 | 0.5pF |

(6) Capacitance tolerance

| Symbol | Tolerance | Applicable capacitance range |
|--------|-----------|------------------------------|
| C | ±0.25pF | 10pF or less |
| D | ±0.5pF | |
| J | ±5% | Over 10pF |
| K | ±10% | |
| M | ±20% | |
| Z | +80, -20% | |

(7) Packaging style

| | |
|---|---------------|
| T | Taping (reel) |
| B | Bulk |

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

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CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)**TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)**RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: CH | Temperature characteristics: C0G |
| 0.5 | ±0.25pF | 0.30±0.03 | C0603CH1E0R5C | C0603C0G1E0R5C |
| 0.75 | ±0.25pF | 0.30±0.03 | C0603CH1ER75C | C0603C0G1ER75C |
| 1 | ±0.25pF | 0.30±0.03 | C0603CH1E010C | C0603C0G1E010C |
| 1.5 | ±0.25pF | 0.30±0.03 | C0603CH1E1R5C | C0603C0G1E1R5C |
| 2 | ±0.25pF | 0.30±0.03 | C0603CH1E020C | C0603C0G1E020C |
| 3 | ±0.25pF | 0.30±0.03 | C0603CH1E030C | C0603C0G1E030C |
| 4 | ±0.25pF | 0.30±0.03 | C0603CH1E040C | C0603C0G1E040C |
| 5 | ±0.25pF | 0.30±0.03 | C0603CH1E050C | C0603C0G1E050C |
| 6 | ±0.5pF | 0.30±0.03 | C0603CH1E060D | C0603C0G1E060D |
| 7 | ±0.5pF | 0.30±0.03 | C0603CH1E070D | C0603C0G1E070D |
| 8 | ±0.5pF | 0.30±0.03 | C0603CH1E080D | C0603C0G1E080D |
| 9 | ±0.5pF | 0.30±0.03 | C0603CH1E090D | C0603C0G1E090D |
| 10 | ±0.5pF | 0.30±0.03 | C0603CH1E100D | C0603C0G1E100D |
| 12 | ±5% | 0.30±0.03 | C0603CH1E120J | C0603C0G1E120J |
| 15 | ±5% | 0.30±0.03 | C0603CH1E150J | C0603C0G1E150J |
| 18 | ±5% | 0.30±0.03 | C0603CH1E180J | C0603C0G1E180J |
| 22 | ±5% | 0.30±0.03 | C0603CH1E220J | C0603C0G1E220J |
| 27 | ±5% | 0.30±0.03 | C0603CH1E270J | C0603C0G1E270J |
| 33 | ±5% | 0.30±0.03 | C0603CH1E330J | C0603C0G1E330J |
| 39 | ±5% | 0.30±0.03 | C0603CH1E390J | C0603C0G1E390J |
| 47 | ±5% | 0.30±0.03 | C0603CH1E470J | C0603C0G1E470J |
| 56 | ±5% | 0.30±0.03 | C0603CH1E560J | C0603C0G1E560J |
| 68 | ±5% | 0.30±0.03 | C0603CH1E680J | C0603C0G1E680J |
| 82 | ±5% | 0.30±0.03 | C0603CH1E820J | C0603C0G1E820J |
| 100 | ±5% | 0.30±0.03 | C0603CH1E101J | C0603C0G1E101J |

CAPACITANCE RANGES: CLASS 2**TEMPERATURE CHARACTERISTICS: JB(±10%), X5R/X7R(±15%)**RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 100 | ±10% | 0.30±0.03 | C0603JB1E101K | C0603X5R1E101K | C0603X7R1E101K |
| 150 | ±10% | 0.30±0.03 | C0603JB1E151K | C0603X5R1E151K | C0603X7R1E151K |
| 220 | ±10% | 0.30±0.03 | C0603JB1E221K | C0603X5R1E221K | C0603X7R1E221K |
| 330 | ±10% | 0.30±0.03 | C0603JB1E331K | C0603X5R1E331K | C0603X7R1E331K |
| 470 | ±10% | 0.30±0.03 | C0603JB1E471K | C0603X5R1E471K | C0603X7R1E471K |
| 680 | ±10% | 0.30±0.03 | C0603JB1E681K | C0603X5R1E681K | C0603X7R1E681K |
| 1,000 | ±10% | 0.30±0.03 | C0603JB1E102K | C0603X5R1E102K | C0603X7R1E102K |
| 1,500 | ±10% | 0.30±0.03 | C0603JB1E152K | C0603X5R1E152K | C0603X7R1E152K |
| 2,200 | ±10% | 0.30±0.03 | C0603JB1E222K | C0603X5R1E222K | C0603X7R1E222K |
| 3,300 | ±10% | 0.30±0.03 | C0603JB1E332K | C0603X5R1E332K | C0603X7R1E332K |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 4,700 | ±10% | 0.30±0.03 | C0603JB1C472K | C0603X5R1C472K | C0603X7R1C472K |

TEMPERATURE CHARACTERISTICS: JB(±10%), X5R(±15%)RATED VOLTAGE E_{dc}: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 6,800 | ±10% | 0.30±0.03 | C0603JB1A682K | C0603X5R1A682K |
| 10,000 | ±10% | 0.30±0.03 | C0603JB1A103K | C0603X5R1A103K |

RATED VOLTAGE Edc: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 15,000 | ±10% | 0.30±0.03 | C0603JB0J153K | C0603X5R0J153K |
| | ±20% | 0.30±0.03 | C0603JB0J153M | C0603X5R0J153M |
| 22,000 | ±10% | 0.30±0.03 | C0603JB0J223K | C0603X5R0J223K |
| | ±20% | 0.30±0.03 | C0603JB0J223M | C0603X5R0J223M |
| 33,000 | ±10% | 0.30±0.03 | C0603JB0J333K | C0603X5R0J333K |
| | ±20% | 0.30±0.03 | C0603JB0J333M | C0603X5R0J333M |
| 47,000 | ±10% | 0.30±0.03 | C0603JB0J473K | C0603X5R0J473K |
| | ±20% | 0.30±0.03 | C0603JB0J473M | C0603X5R0J473M |
| 68,000 | ±10% | 0.30±0.03 | C0603JB0J683K | C0603X5R0J683K |
| | ±20% | 0.30±0.03 | C0603JB0J683M | C0603X5R0J683M |
| 100,000 | ±10% | 0.30±0.03 | C0603JB0J104K | C0603X5R0J104K |
| | ±20% | 0.30±0.03 | C0603JB0J104M | C0603X5R0J104M |

TEMPERATURE CHARACTERISTICS: JF(+30, -80%), Y5V(+22, -82%)
RATED VOLTAGE Edc: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 10,000 | +80,-20% | 0.30±0.03 | C0603JF1C103Z | C0603Y5V1C103Z |

• For more information about the products of other capacitance or data, please contact us.

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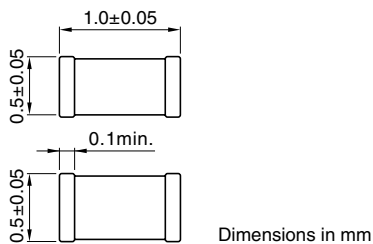
C Series C1005(EIA CC0402) Type

Conformity to RoHS Directive

FEATURES

- High capacitance has been achieved through precision technologies that enable the use of multiple thinner ceramic dielectric layers.
- A monolithic structure ensures superior mechanical strength and reliability.
- High-accuracy automatic mounting is facilitated through the maintenance of very precise dimensional tolerances.
- Composed of only ceramics and metals, these capacitors provide extremely dependable performance, exhibiting virtually no degradation even when subjected to temperature extremes.
- Low stray capacitance ensures high conformity with nominal values, thereby simplifying the circuit design process.
- Low residual inductance assures superior frequency characteristics.
- Because electrostatic capacity has been obtained up to the electrolytic capacitor range, these capacitors offer long service life and are optimally suited for power supply designs that require high levels of reliability.
- Owing to their low ESR and excellent frequency characteristics, these products are optimally suited for high frequency and high-density type power supplies.

SHAPES AND DIMENSIONS



PRODUCT IDENTIFICATION

C 1005 CH 1H 100 D □
 (1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions L×W

| | |
|------|-----------|
| 1005 | 1.0×0.5mm |
|------|-----------|

(3) Capacitance temperature characteristics

Class 1 (Temperature compensation)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| CH | 0±60ppm/°C | -25 to +85°C |
| C0G | 0±30ppm/°C | -55 to +125°C |

Class 2 (Temperature stable and general purpose)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| JB | ±10% | -25 to +85°C |
| JF | +30, -80% | -25 to +85°C |
| X7R | ±15% | -55 to +125°C |
| X5R | ±15% | -55 to +85°C |
| Y5V | +22, -82% | -30 to +85°C |
| X6S | ±22% | -55 to +105°C |

(4) Rated voltage E_{dc}

| | |
|----|------|
| 0G | 4V |
| 0J | 6.3V |
| 1A | 10V |
| 1C | 16V |
| 1E | 25V |
| 1H | 50V |

(5) Nominal capacitance

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.

| | |
|-----|---------|
| 010 | 1pF |
| 100 | 10pF |
| 102 | 1,000pF |
| 0R5 | 0.5pF |

(6) Capacitance tolerance

| Symbol | Tolerance | Applicable capacitance range |
|--------|-----------|------------------------------|
| C | ±0.25pF | 10pF or less |
| D | ±0.5pF | |
| J | ±5% | Over 10pF |
| K | ±10% | |
| M | ±20% | |
| Z | +80, -20% | |

(7) Packaging style

| | |
|---|---------------|
| T | Taping (reel) |
| B | Bulk |

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

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CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)
TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)

 RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: CH | Temperature characteristics: C0G |
| 0.5 | ±0.25pF | 0.5±0.05 | C1005CH1H0R5C | C1005C0G1H0R5C |
| 0.75 | ±0.25pF | 0.5±0.05 | C1005CH1HR75C | C1005C0G1HR75C |
| 1 | ±0.25pF | 0.5±0.05 | C1005CH1H010C | C1005C0G1H010C |
| 1.5 | ±0.25pF | 0.5±0.05 | C1005CH1H1R5C | C1005C0G1H1R5C |
| 2 | ±0.25pF | 0.5±0.05 | C1005CH1H020C | C1005C0G1H020C |
| 3 | ±0.25pF | 0.5±0.05 | C1005CH1H030C | C1005C0G1H030C |
| 4 | ±0.25pF | 0.5±0.05 | C1005CH1H040C | C1005C0G1H040C |
| 5 | ±0.25pF | 0.5±0.05 | C1005CH1H050C | C1005C0G1H050C |
| 6 | ±0.5pF | 0.5±0.05 | C1005CH1H060D | C1005C0G1H060D |
| 7 | ±0.5pF | 0.5±0.05 | C1005CH1H070D | C1005C0G1H070D |
| 8 | ±0.5pF | 0.5±0.05 | C1005CH1H080D | C1005C0G1H080D |
| 9 | ±0.5pF | 0.5±0.05 | C1005CH1H090D | C1005C0G1H090D |
| 10 | ±0.5pF | 0.5±0.05 | C1005CH1H100D | C1005C0G1H100D |
| 12 | ±5% | 0.5±0.05 | C1005CH1H120J | C1005C0G1H120J |
| 15 | ±5% | 0.5±0.05 | C1005CH1H150J | C1005C0G1H150J |
| 18 | ±5% | 0.5±0.05 | C1005CH1H180J | C1005C0G1H180J |
| 22 | ±5% | 0.5±0.05 | C1005CH1H220J | C1005C0G1H220J |
| 27 | ±5% | 0.5±0.05 | C1005CH1H270J | C1005C0G1H270J |
| 33 | ±5% | 0.5±0.05 | C1005CH1H330J | C1005C0G1H330J |
| 39 | ±5% | 0.5±0.05 | C1005CH1H390J | C1005C0G1H390J |
| 47 | ±5% | 0.5±0.05 | C1005CH1H470J | C1005C0G1H470J |
| 56 | ±5% | 0.5±0.05 | C1005CH1H560J | C1005C0G1H560J |
| 68 | ±5% | 0.5±0.05 | C1005CH1H680J | C1005C0G1H680J |
| 82 | ±5% | 0.5±0.05 | C1005CH1H820J | C1005C0G1H820J |
| 100 | ±5% | 0.5±0.05 | C1005CH1H101J | C1005C0G1H101J |
| 120 | ±5% | 0.5±0.05 | C1005CH1H121J | C1005C0G1H121J |
| 150 | ±5% | 0.5±0.05 | C1005CH1H151J | C1005C0G1H151J |
| 180 | ±5% | 0.5±0.05 | C1005CH1H181J | C1005C0G1H181J |
| 220 | ±5% | 0.5±0.05 | C1005CH1H221J | C1005C0G1H221J |
| 270 | ±5% | 0.5±0.05 | C1005CH1H271J | C1005C0G1H271J |
| 330 | ±5% | 0.5±0.05 | C1005CH1H331J | C1005C0G1H331J |
| 390 | ±5% | 0.5±0.05 | C1005CH1H391J | C1005C0G1H391J |
| 470 | ±5% | 0.5±0.05 | C1005CH1H471J | C1005C0G1H471J |
| 560 | ±5% | 0.5±0.05 | C1005CH1H561J | C1005C0G1H561J |
| 680 | ±5% | 0.5±0.05 | C1005CH1H681J | C1005C0G1H681J |
| 820 | ±5% | 0.5±0.05 | C1005CH1H821J | C1005C0G1H821J |
| 1,000 | ±5% | 0.5±0.05 | C1005CH1H102J | C1005C0G1H102J |

CAPACITANCE RANGES: CLASS 2
TEMPERATURE CHARACTERISTICS: JB(±10%), X5R/X7R(±15%)

 RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 220 | ±10% | 0.5±0.05 | C1005JB1H221K | C1005X5R1H221K | C1005X7R1H221K |
| 330 | ±10% | 0.5±0.05 | C1005JB1H331K | C1005X5R1H331K | C1005X7R1H331K |
| 470 | ±10% | 0.5±0.05 | C1005JB1H471K | C1005X5R1H471K | C1005X7R1H471K |
| 680 | ±10% | 0.5±0.05 | C1005JB1H681K | C1005X5R1H681K | C1005X7R1H681K |
| 1,000 | ±10% | 0.5±0.05 | C1005JB1H102K | C1005X5R1H102K | C1005X7R1H102K |
| 1,500 | ±10% | 0.5±0.05 | C1005JB1H152K | C1005X5R1H152K | C1005X7R1H152K |
| 2,200 | ±10% | 0.5±0.05 | C1005JB1H222K | C1005X5R1H222K | C1005X7R1H222K |
| 3,300 | ±10% | 0.5±0.05 | C1005JB1H332K | C1005X5R1H332K | C1005X7R1H332K |
| 4,700 | ±10% | 0.5±0.05 | C1005JB1H472K | C1005X5R1H472K | C1005X7R1H472K |
| 6,800 | ±10% | 0.5±0.05 | C1005JB1H682K | C1005X5R1H682K | C1005X7R1H682K |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 10,000 | ±10% | 0.5±0.05 | C1005JB1E103K | C1005X5R1E103K | C1005X7R1E103K |
| 15,000 | ±10% | 0.5±0.05 | C1005JB1E153K | C1005X5R1E153K | C1005X7R1E153K |
| 22,000 | ±10% | 0.5±0.05 | C1005JB1E223K | C1005X5R1E223K | C1005X7R1E223K |
| 33,000 | ±10% | 0.5±0.05 | C1005JB1E333K | C1005X5R1E333K | C1005X7R1E333K |
| 47,000 | ±10% | 0.5±0.05 | C1005JB1E473K | C1005X5R1E473K | C1005X7R1E473K |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 68,000 | ±10% | 0.5±0.05 | C1005JB1C683K | C1005X5R1C683K | C1005X7R1C683K |
| 100,000 | ±10% | 0.5±0.05 | C1005JB1C104K | C1005X5R1C104K | C1005X7R1C104K |

TEMPERATURE CHARACTERISTICS: JB(±10%), X5R(±15%), X6S(±22%)
RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 150,000 | ±10% | 0.5±0.05 | C1005JB1C154K | C1005X5R1C154K |
| | ±20% | 0.5±0.05 | C1005JB1C154M | C1005X5R1C154M |
| 220,000 | ±10% | 0.5±0.05 | C1005JB1C224K | C1005X5R1C224K |
| | ±20% | 0.5±0.05 | C1005JB1C224M | C1005X5R1C224M |
| 470,000 | ±10% | 0.5±0.05 | C1005JB1C474K | C1005X5R1C474K |
| | ±20% | 0.5±0.05 | C1005JB1C474M | C1005X5R1C474M |
| 1,000,000 | ±10% | 0.5±0.05 | C1005JB1C105K | C1005X5R1C105K |
| | ±20% | 0.5±0.05 | C1005JB1C105M | C1005X5R1C105M |

RATED VOLTAGE E_{dc}: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X6S |
| 330,000 | ±10% | 0.5±0.05 | C1005JB1A334K | C1005X5R1A334K | — |
| | ±20% | 0.5±0.05 | C1005JB1A334M | C1005X5R1A334M | — |
| 470,000 | ±10% | 0.5±0.05 | C1005JB1A474K | C1005X5R1A474K | — |
| | ±20% | 0.5±0.05 | C1005JB1A474M | C1005X5R1A474M | — |
| 680,000 | ±10% | 0.5±0.05 | C1005JB1A684K | C1005X5R1A684K | — |
| | ±20% | 0.5±0.05 | C1005JB1A684M | C1005X5R1A684M | — |
| 1,000,000 | ±10% | 0.5±0.05 | C1005JB1A105K | C1005X5R1A105K | C1005X6S1A105K |
| | ±20% | 0.5±0.05 | C1005JB1A105M | C1005X5R1A105M | C1005X6S1A105M |
| 2,200,000 | ±10% | 0.5±0.05 | C1005JB1A225K | C1005X5R1A225K | — |
| | ±20% | 0.5±0.05 | C1005JB1A225M | C1005X5R1A225M | — |

RATED VOLTAGE E_{dc}: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X6S |
| 680,000 | ±10% | 0.5±0.05 | C1005JB0J684K | C1005X5R0J684K | — |
| | ±20% | 0.5±0.05 | C1005JB0J684M | C1005X5R0J684M | — |
| 1,000,000 | ±10% | 0.5±0.05 | C1005JB0J105K | C1005X5R0J105K | C1005X6S0J105K |
| | ±20% | 0.5±0.05 | C1005JB0J105M | C1005X5R0J105M | C1005X6S0J105M |
| 1,500,000 | ±10% | 0.5±0.05 | C1005JB0J155K | C1005X5R0J155K | — |
| | ±20% | 0.5±0.05 | C1005JB0J155M | C1005X5R0J155M | — |
| 2,200,000 | ±10% | 0.5±0.05 | C1005JB0J225K | C1005X5R0J225K | — |
| | ±20% | 0.5±0.05 | C1005JB0J225M | C1005X5R0J225M | — |
| 3,300,000 | ±20% | 0.5±0.10 | C1005JB0J335M | C1005X5R0J335M | — |
| 4,700,000 | ±20% | 0.5±0.15 | C1005JB0J475M | C1005X5R0J475M | — |

RATED VOLTAGE E_{dc}: 4V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X6S |
| 2,200,000 | ±10% | 0.5±0.05 | — | — | C1005X6S0G225K |
| | ±20% | 0.5±0.05 | — | — | C1005X6S0G225M |
| 3,300,000 | ±20% | 0.5±0.10 | C1005JB0G335M | C1005X5R0G335M | — |
| 4,700,000 | ±20% | 0.5±0.15 | C1005JB0G475M | C1005X5R0G475M | — |

TEMPERATURE CHARACTERISTICS: JF(+30, -80%), Y5V(+22, -82%)

 RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 100,000 | +80,-20% | 0.5±0.05 | C1005JF1E104Z | C1005Y5V1E104Z |
| 220,000 | +80,-20% | 0.5±0.05 | C1005JF1E224Z | C1005Y5V1E224Z |

 RATED VOLTAGE E_{dc}: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 470,000 | +80,-20% | 0.5±0.05 | C1005JF1A474Z | C1005Y5V1A474Z |

 RATED VOLTAGE E_{dc}: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 1,000,000 | +80,-20% | 0.5±0.05 | C1005JF0J105Z | C1005Y5V0J105Z |

• For more information about the products of other capacitance or data, please contact us.

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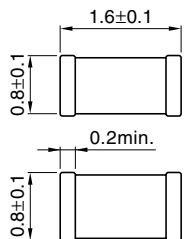
C Series C1608 (EIA CC0603) Types

Conformity to RoHS Directive

FEATURES

- High capacitance has been achieved through precision technologies that enable the use of multiple thinner ceramic dielectric layers.
- A monolithic structure ensures superior mechanical strength and reliability.
- High-accuracy automatic mounting is facilitated through the maintenance of very precise dimensional tolerances.
- Composed of only ceramics and metals, these capacitors provide extremely dependable performance, exhibiting virtually no degradation even when subjected to temperature extremes.
- Low stray capacitance ensures high conformity with nominal values, thereby simplifying the circuit design process.
- Low residual inductance assures superior frequency characteristics.
- Because electrostatic capacity has been obtained up to the electrolytic capacitor range, these capacitors offer long service life and are optimally suited for power supply designs that require high levels of reliability.
- Owing to their low ESR and excellent frequency characteristics, these products are optimally suited for high frequency and high-density type power supplies.

SHAPES AND DIMENSIONS



Dimensions in mm



PRODUCT IDENTIFICATION

C 1608 CH 1H 100 D □
(1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions L×W

| | |
|------|-----------|
| 1608 | 1.6×0.8mm |
|------|-----------|

(3) Capacitance temperature characteristics

Class 1 (Temperature compensation)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| CH | 0±60ppm/°C | -25 to +85°C |
| C0G | 0±30ppm/°C | -55 to +125°C |

Class 2 (Temperature stable and general purpose)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| JB | ±10% | -25 to +85°C |
| JF | +30, -80% | -25 to +85°C |
| X7R | ±15% | -55 to +125°C |
| X5R | ±15% | -55 to +85°C |
| Y5V | +22, -82% | -30 to +85°C |
| X6S | ±22% | -55 to +105°C |

(4) Rated voltage E_{dc}

| | |
|----|------|
| 0G | 4V |
| 0J | 6.3V |
| 1A | 10V |
| 1C | 16V |
| 1E | 25V |
| 1H | 50V |

(5) Nominal capacitance

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.

| | |
|-----|---------|
| 010 | 1pF |
| 100 | 10pF |
| 102 | 1,000pF |
| 0R5 | 0.5pF |

(6) Capacitance tolerance

| Symbol | Tolerance | Applicable capacitance range |
|--------|-----------|------------------------------|
| C | ±0.25pF | 10pF or less |
| D | ±0.5pF | |
| J | ±5% | Over 10pF |
| K | ±10% | |
| M | ±20% | |
| Z | +80, -20% | |

(7) Packaging style

| | |
|---|---------------|
| T | Taping (reel) |
| B | Bulk |

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

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CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)
TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)

 RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: CH | Temperature characteristics: C0G |
| 0.5 | ±0.25pF | 0.8±0.10 | C1608CH1H0R5C | C1608C0G1H0R5C |
| 0.75 | ±0.25pF | 0.8±0.10 | C1608CH1HR75C | C1608C0G1HR75C |
| 1 | ±0.25pF | 0.8±0.10 | C1608CH1H010C | C1608C0G1H010C |
| 1.5 | ±0.25pF | 0.8±0.10 | C1608CH1H1R5C | C1608C0G1H1R5C |
| 2 | ±0.25pF | 0.8±0.10 | C1608CH1H020C | C1608C0G1H020C |
| 3 | ±0.25pF | 0.8±0.10 | C1608CH1H030C | C1608C0G1H030C |
| 4 | ±0.25pF | 0.8±0.10 | C1608CH1H040C | C1608C0G1H040C |
| 5 | ±0.25pF | 0.8±0.10 | C1608CH1H050C | C1608C0G1H050C |
| 6 | ±0.5pF | 0.8±0.10 | C1608CH1H060D | C1608C0G1H060D |
| 7 | ±0.5pF | 0.8±0.10 | C1608CH1H070D | C1608C0G1H070D |
| 8 | ±0.5pF | 0.8±0.10 | C1608CH1H080D | C1608C0G1H080D |
| 9 | ±0.5pF | 0.8±0.10 | C1608CH1H090D | C1608C0G1H090D |
| 10 | ±0.5pF | 0.8±0.10 | C1608CH1H100D | C1608C0G1H100D |
| 12 | ±5% | 0.8±0.10 | C1608CH1H120J | C1608C0G1H120J |
| 15 | ±5% | 0.8±0.10 | C1608CH1H150J | C1608C0G1H150J |
| 18 | ±5% | 0.8±0.10 | C1608CH1H180J | C1608C0G1H180J |
| 22 | ±5% | 0.8±0.10 | C1608CH1H220J | C1608C0G1H220J |
| 27 | ±5% | 0.8±0.10 | C1608CH1H270J | C1608C0G1H270J |
| 33 | ±5% | 0.8±0.10 | C1608CH1H330J | C1608C0G1H330J |
| 39 | ±5% | 0.8±0.10 | C1608CH1H390J | C1608C0G1H390J |
| 47 | ±5% | 0.8±0.10 | C1608CH1H470J | C1608C0G1H470J |
| 56 | ±5% | 0.8±0.10 | C1608CH1H560J | C1608C0G1H560J |
| 68 | ±5% | 0.8±0.10 | C1608CH1H680J | C1608C0G1H680J |
| 82 | ±5% | 0.8±0.10 | C1608CH1H820J | C1608C0G1H820J |
| 100 | ±5% | 0.8±0.10 | C1608CH1H101J | C1608C0G1H101J |
| 120 | ±5% | 0.8±0.10 | C1608CH1H121J | C1608C0G1H121J |
| 150 | ±5% | 0.8±0.10 | C1608CH1H151J | C1608C0G1H151J |
| 180 | ±5% | 0.8±0.10 | C1608CH1H181J | C1608C0G1H181J |
| 220 | ±5% | 0.8±0.10 | C1608CH1H221J | C1608C0G1H221J |
| 270 | ±5% | 0.8±0.10 | C1608CH1H271J | C1608C0G1H271J |
| 330 | ±5% | 0.8±0.10 | C1608CH1H331J | C1608C0G1H331J |
| 390 | ±5% | 0.8±0.10 | C1608CH1H391J | C1608C0G1H391J |
| 470 | ±5% | 0.8±0.10 | C1608CH1H471J | C1608C0G1H471J |
| 560 | ±5% | 0.8±0.10 | C1608CH1H561J | C1608C0G1H561J |
| 680 | ±5% | 0.8±0.10 | C1608CH1H681J | C1608C0G1H681J |
| 820 | ±5% | 0.8±0.10 | C1608CH1H821J | C1608C0G1H821J |
| 1,000 | ±5% | 0.8±0.10 | C1608CH1H102J | C1608C0G1H102J |
| 1,500 | ±5% | 0.8±0.10 | C1608CH1H152J | C1608C0G1H152J |
| 2,200 | ±5% | 0.8±0.10 | C1608CH1H222J | C1608C0G1H222J |
| 3,300 | ±5% | 0.8±0.10 | C1608CH1H332J | C1608C0G1H332J |
| 4,700 | ±5% | 0.8±0.10 | C1608CH1H472J | C1608C0G1H472J |
| 6,800 | ±5% | 0.8±0.10 | C1608CH1H682J | C1608C0G1H682J |
| 10,000 | ±5% | 0.8±0.10 | C1608CH1H103J | C1608C0G1H103J |

CAPACITANCE RANGES: CLASS 2**TEMPERATURE CHARACTERISTICS: JB($\pm 10\%$), X5R/X7R($\pm 15\%$)**RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|------------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 10,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1H103K | C1608X5R1H103K | C1608X7R1H103K |
| 15,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1H153K | C1608X5R1H153K | C1608X7R1H153K |
| 22,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1H223K | C1608X5R1H223K | C1608X7R1H223K |
| 33,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1H333K | C1608X5R1H333K | C1608X7R1H333K |
| 47,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1H473K | C1608X5R1H473K | C1608X7R1H473K |
| 68,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1H683K | C1608X5R1H683K | C1608X7R1H683K |
| 100,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1H104K | C1608X5R1H104K | C1608X7R1H104K |
| | $\pm 20\%$ | 0.8 \pm 0.10 | C1608JB1H104M | C1608X5R1H104M | C1608X7R1H104M |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|------------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 150,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1E154K | C1608X5R1E154K | C1608X7R1E154K |
| | $\pm 20\%$ | 0.8 \pm 0.10 | C1608JB1E154M | C1608X5R1E154M | C1608X7R1E154M |
| 220,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1E224K | C1608X5R1E224K | C1608X7R1E224K |
| | $\pm 20\%$ | 0.8 \pm 0.10 | C1608JB1E224M | C1608X5R1E224M | C1608X7R1E224M |
| 330,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1E334K | C1608X5R1E334K | C1608X7R1E334K |
| | $\pm 20\%$ | 0.8 \pm 0.10 | C1608JB1E334M | C1608X5R1E334M | C1608X7R1E334M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|------------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 470,000 | $\pm 10\%$ | 0.8+0.15, -0.1 | C1608JB1C474K | C1608X5R1C474K | C1608X7R1C474K |
| | $\pm 20\%$ | 0.8+0.15, -0.1 | C1608JB1C474M | C1608X5R1C474M | C1608X7R1C474M |
| 680,000 | $\pm 10\%$ | 0.8+0.15, -0.1 | C1608JB1C684K | C1608X5R1C684K | C1608X7R1C684K |
| | $\pm 20\%$ | 0.8+0.15, -0.1 | C1608JB1C684M | C1608X5R1C684M | C1608X7R1C684M |
| 1,000,000 | $\pm 10\%$ | 0.8+0.15, -0.1 | C1608JB1C105K | C1608X5R1C105K | C1608X7R1C105K |
| | $\pm 20\%$ | 0.8+0.15, -0.1 | C1608JB1C105M | C1608X5R1C105M | C1608X7R1C105M |

TEMPERATURE CHARACTERISTICS: JB($\pm 10\%$), X5R($\pm 15\%$), X6S($\pm 22\%$)RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|------------------|------------|------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 470,000 | $\pm 10\%$ | 0.8+0.15, -0.1 | C1608JB1E474K | C1608X5R1E474K |
| | $\pm 20\%$ | 0.8+0.15, -0.1 | C1608JB1E474M | C1608X5R1E474M |
| 680,000 | $\pm 10\%$ | 0.8+0.15, -0.1 | C1608JB1E684K | C1608X5R1E684K |
| | $\pm 20\%$ | 0.8+0.15, -0.1 | C1608JB1E684M | C1608X5R1E684M |
| 1,000,000 | $\pm 10\%$ | 0.8+0.15, -0.1 | C1608JB1E105K | C1608X5R1E105K |
| | $\pm 20\%$ | 0.8+0.15, -0.1 | C1608JB1E105M | C1608X5R1E105M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|------------------|------------|------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 2,200,000 | $\pm 10\%$ | 0.5 \pm 0.05 | C1608JB1C225K | C1608X5R1C225K |
| | $\pm 20\%$ | 0.5 \pm 0.05 | C1608JB1C225M | C1608X5R1C225M |
| 4,700,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1C475K | C1608X5R1C475K |
| | $\pm 20\%$ | 0.8 \pm 0.10 | C1608JB1C475M | C1608X5R1C475M |

RATED VOLTAGE E_{dc}: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | 品名 | | |
|------------------|------------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X6S |
| 2,200,000 | $\pm 10\%$ | 0.5 \pm 0.05 | C1608JB1A225K | C1608X5R1A225K | C1608X6S1A225K |
| | $\pm 20\%$ | 0.5 \pm 0.05 | C1608JB1A225M | C1608X5R1A225M | C1608X6S1A225M |
| 4,700,000 | $\pm 10\%$ | 0.5 \pm 0.05 | C1608JB1A475K | C1608X5R1A475K | — |
| | $\pm 20\%$ | 0.5 \pm 0.05 | C1608JB1A475M | C1608X5R1A475M | — |
| 4,700,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1A475K | C1608X5R1A475K | C1608X6S1A475K |
| | $\pm 20\%$ | 0.8 \pm 0.10 | C1608JB1A475M | C1608X5R1A475M | C1608X6S1A475M |
| 10,000,000 | $\pm 10\%$ | 0.8 \pm 0.10 | C1608JB1A106K | C1608X5R1A106K | — |
| | $\pm 20\%$ | 0.8 \pm 0.10 | C1608JB1A106M | C1608X5R1A106M | — |

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RATED VOLTAGE Edc: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X6S |
| 1,500,000 | ±10% | 0.8±0.10 | C1608JB0J155K | C1608X5R0J155K | — |
| | ±20% | 0.8±0.10 | C1608JB0J155M | C1608X5R0J155M | — |
| 2,200,000 | ±10% | 0.5±0.05 | — | — | C1608X6S0J225K |
| | ±20% | 0.5±0.05 | — | — | C1608X6S0J225M |
| | ±10% | 0.8±0.10 | C1608JB0J225K | C1608X5R0J225K | — |
| | ±20% | 0.8±0.10 | C1608JB0J225M | C1608X5R0J225M | — |
| 3,300,000 | ±10% | 0.8±0.10 | C1608JB0J335K | C1608X5R0J335K | — |
| | ±20% | 0.8±0.10 | C1608JB0J335M | C1608X5R0J335M | — |
| 4,700,000 | ±10% | 0.5±0.05 | C1608JB0J475K | C1608X5R0J475K | — |
| | ±20% | 0.5±0.05 | C1608JB0J475M | C1608X5R0J475M | — |
| | ±10% | 0.8±0.10 | C1608JB0J475K | C1608X5R0J475K | C1608X6S0J475K |
| | ±20% | 0.8±0.10 | C1608JB0J475M | C1608X5R0J475M | C1608X6S0J475M |
| 6,800,000 | ±10% | 0.8±0.10 | C1608JB0J685K | C1608X5R0J685K | — |
| | ±20% | 0.8±0.10 | C1608JB0J685M | C1608X5R0J685M | — |
| 10,000,000 | ±10% | 0.8±0.10 | C1608JB0J106K | C1608X5R0J106K | — |
| | ±20% | 0.8±0.10 | C1608JB0J106M | C1608X5R0J106M | — |

RATED VOLTAGE Edc: 4V

| Capacitance (pF) | Tolerance | Thickness T (mm) | 品名 | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X6S |
| 4,700,000 | ±10% | 0.5±0.05 | — | — | C1608X6S0G475K |
| | ±20% | 0.5±0.05 | — | — | C1608X6S0G475M |
| 10,000,000 | ±10% | 0.8±0.10 | — | — | C1608X6S0G106K |
| | ±20% | 0.8±0.10 | — | — | C1608X6S0G106M |

TEMPERATURE CHARACTERISTICS: JF(+30, -80%), Y5V(+22, -82%)
RATED VOLTAGE Edc: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 100,000 | +80,-20% | 0.8±0.10 | C1608JF1H104Z | C1608Y5V1H104Z |
| 220,000 | +80,-20% | 0.8±0.10 | C1608JF1H224Z | C1608Y5V1H224Z |
| 470,000 | +80,-20% | 0.8±0.10 | C1608JF1H474Z | C1608Y5V1H474Z |

RATED VOLTAGE Edc: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 1,000,000 | +80,-20% | 0.8±0.10 | C1608JF1E105Z | C1608Y5V1E105Z |

RATED VOLTAGE Edc: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 2,200,000 | +80,-20% | 0.8±0.10 | C1608JF1C225Z | C1608Y5V1C225Z |

RATED VOLTAGE Edc: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 4,700,000 | +80,-20% | 0.8±0.10 | C1608JF0J475Z | C1608Y5V0J475Z |
| 10,000,000 | +80,-20% | 0.8+0.15,-0.10 | C1608JF0J106Z | C1608Y5V0J106Z |

• For more information about the products of other capacitance or data, please contact us.

• All specifications are subject to change without notice.
Please read the precautions before using this catalog.

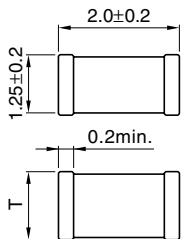
C Series C2012 (EIA CC0805) Type

Conformity to RoHS Directive

FEATURES

- High capacitance has been achieved through precision technologies that enable the use of multiple thinner ceramic dielectric layers.
- A monolithic structure ensures superior mechanical strength and reliability.
- High-accuracy automatic mounting is facilitated through the maintenance of very precise dimensional tolerances.
- Composed of only ceramics and metals, these capacitors provide extremely dependable performance, exhibiting virtually no degradation even when subjected to temperature extremes.
- Low stray capacitance ensures high conformity with nominal values, thereby simplifying the circuit design process.
- Low residual inductance assures superior frequency characteristics.
- Because electrostatic capacity has been obtained up to the electrolytic capacitor range, these capacitors offer long service life and are optimally suited for power supply designs that require high levels of reliability.
- Owing to their low ESR and excellent frequency characteristics, these products are optimally suited for high frequency and high-density type power supplies.

SHAPES AND DIMENSIONS



Dimensions in mm



PRODUCT IDENTIFICATION

C 2012 CH 1H 103 J □
(1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions L×W

| | |
|------|------------|
| 2012 | 2.0×1.25mm |
|------|------------|

(3) Capacitance temperature characteristics

Class 1 (Temperature compensation)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| CH | 0±60ppm/°C | -25 to +85°C |
| C0G | 0±30ppm/°C | -55 to +125°C |

Class 2 (Temperature stable and general purpose)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| JB | ±10% | -25 to +85°C |
| JF | +30, -80% | -25 to +85°C |
| X7R | ±15% | -55 to +125°C |
| X5R | ±15% | -55 to +85°C |
| Y5V | +22, -82% | -30 to +85°C |
| X6S | ±22% | -55 to +105°C |

(4) Rated voltage E_{dc}

| | |
|----|------|
| 0G | 4V |
| 0J | 6.3V |
| 1A | 10V |
| 1C | 16V |
| 1E | 25V |
| 1H | 50V |

(5) Nominal capacitance

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.

| | |
|-----|---------|
| 010 | 1pF |
| 100 | 10pF |
| 102 | 1,000pF |

(6) Capacitance tolerance

| | |
|---|-----------|
| J | ±5% |
| K | ±10% |
| M | ±20% |
| Z | +80, -20% |

(7) Packaging style

| | |
|---|---------------|
| T | Taping (reel) |
| B | Bulk |

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.
Please read the precautions before using this catalog.

CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)**TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)**RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: CH | Temperature characteristics: C0G |
| 680 | ±5% | 0.60±0.10 | C2012CH1H681J | C2012C0G1H681J |
| 820 | ±5% | 0.60±0.10 | C2012CH1H821J | C2012C0G1H821J |
| 1,000 | ±5% | 0.60±0.10 | C2012CH1H102J | C2012C0G1H102J |
| 1,500 | ±5% | 0.60±0.10 | C2012CH1H152J | C2012C0G1H152J |
| 2,200 | ±5% | 0.60±0.10 | C2012CH1H222J | C2012C0G1H222J |
| 3,300 | ±5% | 0.60±0.10 | C2012CH1H332J | C2012C0G1H332J |
| 4,700 | ±5% | 0.60±0.10 | C2012CH1H472J | C2012C0G1H472J |
| 6,800 | ±5% | 0.60±0.10 | C2012CH1H682J | C2012C0G1H682J |
| 10,000 | ±5% | 0.60±0.10 | C2012CH1H103J | C2012C0G1H103J |
| 15,000 | ±5% | 0.85±0.10 | C2012CH1H153J | C2012C0G1H153J |
| 22,000 | ±5% | 1.25±0.10 | C2012CH1H223J | C2012C0G1H223J |
| 33,000 | ±5% | 1.25±0.10 | C2012CH1H333J | C2012C0G1H333J |

CAPACITANCE RANGES: CLASS 2**TEMPERATURE CHARACTERISTICS: JB(±10%), X5R/X7R(±15%)**RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 150,000 | ±10% | 1.25±0.10 | C2012JB1H154K | C2012X5R1H154K | C2012X7R1H154K |
| | ±20% | 1.25±0.10 | C2012JB1H154M | C2012X5R1H154M | C2012X7R1H154M |
| 220,000 | ±10% | 1.25±0.10 | C2012JB1H224K | C2012X5R1H224K | C2012X7R1H224K |
| | ±20% | 1.25±0.10 | C2012JB1H224M | C2012X5R1H224M | C2012X7R1H224M |
| 330,000 | ±10% | 1.25±0.10 | C2012JB1H334K | C2012X5R1H334K | C2012X7R1H334K |
| | ±20% | 1.25±0.10 | C2012JB1H334M | C2012X5R1H334M | C2012X7R1H334M |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 470,000 | ±10% | 1.25±0.10 | C2012JB1E474K | C2012X5R1E474K | C2012X7R1E474K |
| | ±20% | 1.25±0.10 | C2012JB1E474M | C2012X5R1E474M | C2012X7R1E474M |
| 680,000 | ±10% | 1.25±0.10 | C2012JB1E684K | C2012X5R1E684K | C2012X7R1E684K |
| | ±20% | 1.25±0.10 | C2012JB1E684M | C2012X5R1E684M | C2012X7R1E684M |
| 1,000,000 | ±10% | 1.25±0.10 | C2012JB1E105K | C2012X5R1E105K | C2012X7R1E105K |
| | ±20% | 1.25±0.10 | C2012JB1E105M | C2012X5R1E105M | C2012X7R1E105M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 330,000 | ±10% | 0.85±0.10 | C2012JB1C334K | C2012X5R1C334K | C2012X7R1C334K |
| | ±20% | 0.85±0.10 | C2012JB1C334M | C2012X5R1C334M | C2012X7R1C334M |
| 1,500,000 | ±10% | 1.25±0.10 | C2012JB1C155K | C2012X5R1C155K | C2012X7R1C155K |
| | ±20% | 1.25±0.10 | C2012JB1C155M | C2012X5R1C155M | C2012X7R1C155M |
| 2,200,000 | ±10% | 1.25±0.10 | C2012JB1C225K | C2012X5R1C225K | C2012X7R1C225K |
| | ±20% | 1.25±0.10 | C2012JB1C225M | C2012X5R1C225M | C2012X7R1C225M |

TEMPERATURE CHARACTERISTICS: JB($\pm 10\%$), X5R($\pm 15\%$), X6S($\pm 22\%$)
RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 150,000 | $\pm 10\%$ | 0.85 \pm 0.10 | C2012JB1H154K | C2012X5R1H154K |
| | $\pm 20\%$ | 0.85 \pm 0.10 | C2012JB1H154M | C2012X5R1H154M |
| 220,000 | $\pm 10\%$ | 0.85+0.15,-0.10 | C2012JB1H224K | C2012X5R1H224K |
| | $\pm 20\%$ | 0.85+0.15,-0.10 | C2012JB1H224M | C2012X5R1H224M |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 150,000 | $\pm 10\%$ | 0.6 \pm 0.10 | C2012JB1E154K | C2012X5R1E154K |
| | $\pm 20\%$ | 0.6 \pm 0.10 | C2012JB1E154M | C2012X5R1E154M |
| 220,000 | $\pm 10\%$ | 0.6 \pm 0.10 | C2012JB1E224K | C2012X5R1E224K |
| | $\pm 20\%$ | 0.6 \pm 0.10 | C2012JB1E224M | C2012X5R1E224M |
| 330,000 | $\pm 10\%$ | 0.8+0.15,-0.10 | C2012JB1E334K | C2012X5R1E334K |
| | $\pm 20\%$ | 0.8+0.15,-0.10 | C2012JB1E334M | C2012X5R1E334M |
| 470,000 | $\pm 10\%$ | 0.8+0.15,-0.10 | C2012JB1E474K | C2012X5R1E474K |
| | $\pm 20\%$ | 0.8+0.15,-0.10 | C2012JB1E474M | C2012X5R1E474M |
| 1,000,000 | $\pm 10\%$ | 1.25 \pm 0.10 | C2012JB1E105K | C2012X5R1E105K |
| | $\pm 20\%$ | 1.25 \pm 0.10 | C2012JB1E105M | C2012X5R1E105M |
| 1,500,000 | $\pm 10\%$ | 1.25 \pm 0.10 | C2012JB1E155K | C2012X5R1E155K |
| | $\pm 20\%$ | 1.25 \pm 0.10 | C2012JB1E155M | C2012X5R1E155M |
| 2,200,000 | $\pm 10\%$ | 1.25 \pm 0.10 | C2012JB1E225K | C2012X5R1E225K |
| | $\pm 20\%$ | 1.25 \pm 0.10 | C2012JB1E225M | C2012X5R1E225M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 330,000 | $\pm 10\%$ | 0.6 \pm 0.10 | C2012JB1C334K | C2012X5R1C334K |
| | $\pm 20\%$ | 0.6 \pm 0.10 | C2012JB1C334M | C2012X5R1C334M |
| 470,000 | $\pm 10\%$ | 0.6 \pm 0.10 | C2012JB1C474K | C2012X5R1C474K |
| | $\pm 20\%$ | 0.6 \pm 0.10 | C2012JB1C474M | C2012X5R1C474M |
| 680,000 | $\pm 10\%$ | 0.8+0.15,-0.10 | C2012JB1C684K | C2012X5R1C684K |
| | $\pm 20\%$ | 0.8+0.15,-0.10 | C2012JB1C684M | C2012X5R1C684M |
| 1,000,000 | $\pm 10\%$ | 0.8+0.15,-0.10 | C2012JB1C105K | C2012X5R1C105K |
| | $\pm 20\%$ | 0.8+0.15,-0.10 | C2012JB1C105M | C2012X5R1C105M |
| 3,300,000 | $\pm 10\%$ | 1.25 \pm 0.20 | C2012JB1C335K | C2012X5R1C335K |
| | $\pm 20\%$ | 1.25 \pm 0.20 | C2012JB1C335M | C2012X5R1C335M |
| 4,700,000 | $\pm 10\%$ | 1.25 \pm 0.20 | C2012JB1C475K | C2012X5R1C475K |
| | $\pm 20\%$ | 1.25 \pm 0.20 | C2012JB1C475M | C2012X5R1C475M |
| 6,800,000 | $\pm 10\%$ | 1.25 \pm 0.10 | C2012JB1C685K | C2012X5R1C685K |
| | $\pm 20\%$ | 1.25 \pm 0.10 | C2012JB1C685M | C2012X5R1C685M |
| 10,000,000 | $\pm 10\%$ | 0.85 \pm 0.10 | C2012JB1C106K | C2012X5R1C106K |
| | $\pm 20\%$ | 0.85 \pm 0.10 | C2012JB1C106M | C2012X5R1C106M |
| | $\pm 10\%$ | 1.25 \pm 0.10 | C2012JB1C106K | C2012X5R1C106K |
| | $\pm 20\%$ | 1.25 \pm 0.10 | C2012JB1C106M | C2012X5R1C106M |
| 22,000,000 | $\pm 10\%$ | 1.25 \pm 0.20 | C2012JB1C226K | C2012X5R1C226K |
| | $\pm 20\%$ | 1.25 \pm 0.20 | C2012JB1C226M | C2012X5R1C226M |

RATED VOLTAGE Edc: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X6S |
| 680,000 | ±10% | 0.6±0.10 | C2012JB1A684K | C2012X5R1A684K | — |
| | ±20% | 0.6±0.10 | C2012JB1A684M | C2012X5R1A684M | — |
| 1,000,000 | ±10% | 0.85±0.10 | C2012JB1A105K | C2012X5R1A105K | — |
| | ±20% | 0.85±0.10 | C2012JB1A105M | C2012X5R1A105M | — |
| 1,500,000 | ±10% | 0.85±0.10 | C2012JB1A155K | C2012X5R1A155K | — |
| | ±20% | 0.85±0.10 | C2012JB1A155M | C2012X5R1A155M | — |
| 2,200,000 | ±10% | 0.8+0.15,-0.10 | C2012JB1A225K | C2012X5R1A225K | — |
| | ±20% | 0.8+0.15,-0.10 | C2012JB1A225M | C2012X5R1A225M | — |
| 3,300,000 | ±10% | 1.25±0.10 | C2012JB1A335K | C2012X5R1A335K | — |
| | ±20% | 1.25±0.10 | C2012JB1A335M | C2012X5R1A335M | — |
| 4,700,000 | ±10% | 1.25±0.10 | C2012JB1A475K | C2012X5R1A475K | — |
| | ±20% | 1.25±0.10 | C2012JB1A475M | C2012X5R1A475M | — |
| 6,800,000 | ±10% | 1.25±0.10 | C2012JB1A685K | C2012X5R1A685K | — |
| | ±20% | 1.25±0.10 | C2012JB1A685M | C2012X5R1A685M | — |
| 10,000,000 | ±10% | 0.85±0.10 | C2012JB1A106K | C2012X5R1A106K | C2012X6S1A106K |
| | ±20% | 0.85±0.10 | C2012JB1A106M | C2012X5R1A106M | C2012X6S1A106M |
| | ±10% | 1.25±0.10 | C2012JB1A106K | C2012X5R1A106K | — |
| | ±20% | 1.25±0.10 | C2012JB1A106M | C2012X5R1A106M | — |
| 15,000,000 | ±10% | 1.25±0.10 | C2012JB1A156K | C2012X5R1A156K | — |
| | ±20% | 1.25±0.10 | C2012JB1A156M | C2012X5R1A156M | — |
| 22,000,000 | ±20% | 0.85±0.10 | C2012JB1A226M | C2012X5R1A226M | — |
| | ±10% | 1.25±0.20 | C2012JB1A226K | C2012X5R1A226K | C2012X6S1A226K |
| | ±20% | 1.25±0.20 | C2012JB1A226M | C2012X5R1A226M | C2012X6S1A226M |

RATED VOLTAGE Edc: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X6S |
| 1,000,000 | ±10% | 0.6±0.10 | C2012JB0J105K | C2012X5R0J105K | — |
| | ±20% | 0.6±0.10 | C2012JB0J105M | C2012X5R0J105M | — |
| 3,300,000 | ±10% | 0.85+0.15,-0.10 | C2012JB0J335K | C2012X5R0J335K | — |
| | ±20% | 0.85+0.15,-0.10 | C2012JB0J335M | C2012X5R0J335M | — |
| 4,700,000 | ±10% | 0.85+0.15,-0.10 | C2012JB0J475K | C2012X5R0J475K | — |
| | ±20% | 0.85+0.15,-0.10 | C2012JB0J475M | C2012X5R0J475M | — |
| 6,800,000 | ±10% | 1.25±0.20 | C2012JB0J685K | C2012X5R0J685K | — |
| | ±20% | 1.25±0.20 | C2012JB0J685M | C2012X5R0J685M | — |
| 10,000,000 | ±10% | 0.85±0.10 | — | — | C2012X6S0J106K |
| | ±20% | 0.85±0.10 | — | — | C2012X6S0J106M |
| | ±10% | 1.25±0.20 | C2012JB0J106K | C2012X5R0J106K | — |
| | ±20% | 1.25±0.20 | C2012JB0J106M | C2012X5R0J106M | — |
| 15,000,000 | ±20% | 1.25±0.20 | C2012JB0J156M | C2012X5R0J156M | — |
| | ±20% | 0.85±0.10 | C2012JB0J226M | C2012X5R0J226M | — |
| 22,000,000 | ±10% | 1.25±0.20 | C2012JB0J226K | C2012X5R0J226K | C2012X6S0J226K |
| | ±20% | 1.25±0.20 | C2012JB0J226M | C2012X5R0J226M | C2012X6S0J226M |

RATED VOLTAGE Edc: 4V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X6S |
| 22,000,000 | ±20% | 0.85±0.10 | — | — | C2012X6S0G226M |

TEMPERATURE CHARACTERISTICS: X5R/X7R(±15%)
RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 680,000 | ±10% | 1.25±0.10 | C2012X5R1E684K | C2012X7R1E684K |
| | ±20% | 1.25±0.10 | C2012X5R1E684M | C2012X7R1E684M |
| 1,000,000 | ±10% | 1.25±0.10 | C2012X5R1E105K | C2012X7R1E105K |
| | ±20% | 1.25±0.10 | C2012X5R1E105M | C2012X7R1E105M |
| 1,500,000 | ±10% | 1.25±0.20 | C2012X5R1E155K | C2012X7R1E155K |
| | ±20% | 1.25±0.20 | C2012X5R1E155M | C2012X7R1E155M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 1,000,000 | ±10% | 0.85±0.10 | C2012X5R1C105K | C2012X7R1C105K |
| | ±20% | 0.85±0.10 | C2012X5R1C105M | C2012X7R1C105M |
| 1,500,000 | ±10% | 1.25±0.10 | C2012X5R1C155K | C2012X7R1C155K |
| | ±20% | 1.25±0.10 | C2012X5R1C155M | C2012X7R1C155M |
| 2,200,000 | ±10% | 1.25±0.20 | C2012X5R1C225K | C2012X7R1C225K |
| | ±20% | 1.25±0.20 | C2012X5R1C225M | C2012X7R1C225M |

TEMPERATURE CHARACTERISTICS: X5R(±15%)
RATED VOLTAGE E_{dc}: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|----------------------------------|--|
| | | | Temperature characteristics: X5R | |
| 4,700,000 | ±10% | 0.85±0.10 | C2012X5R0J475K | |
| | ±20% | 0.85±0.10 | C2012X5R0J475M | |
| 15,000,000 | ±20% | 0.85+0.15,-0.10 | C2012X5R0J156M | |

TEMPERATURE CHARACTERISTICS: JF(+30, -80%), Y5V(+22, -82%)
RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 1,000,000 | +80,-20% | 0.85±0.10 | C2012JF1H105Z | C2012Y5V1H105Z |
| 2,200,000 | +80,-20% | 1.25±0.20 | C2012JF1H225Z | C2012Y5V1H225Z |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 4,700,000 | +80,-20% | 1.25±0.20 | C2012JF1E475Z | C2012Y5V1E475Z |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 10,000,000 | +80,-20% | 1.25±0.20 | C2012JF1C106Z | C2012Y5V1C106Z |

RATED VOLTAGE E_{dc}: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 22,000,000 | +80,-20% | 1.25±0.20 | C2012JF0J226Z | C2012Y5V0J226Z |

• For more information about the products of other capacitance or data, please contact us.

• All specifications are subject to change without notice.
Please read the precautions before using this catalog.

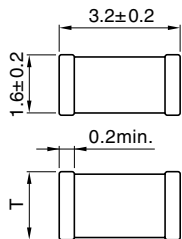
C Series C3216 (EIA CC1206) Type

Conformity to RoHS Directive

FEATURES

- High capacitance has been achieved through precision technologies that enable the use of multiple thinner ceramic dielectric layers.
- A monolithic structure ensures superior mechanical strength and reliability.
- High-accuracy automatic mounting is facilitated through the maintenance of very precise dimensional tolerances.
- Composed of only ceramics and metals, these capacitors provide extremely dependable performance, exhibiting virtually no degradation even when subjected to temperature extremes.
- Low stray capacitance ensures high conformity with nominal values, thereby simplifying the circuit design process.
- Low residual inductance assures superior frequency characteristics.
- Because electrostatic capacity has been obtained up to the electrolytic capacitor range, these capacitors offer long service life and are optimally suited for power supply designs that require high levels of reliability.
- Owing to their low ESR and excellent frequency characteristics, these products are optimally suited for high frequency and high-density type power supplies.

SHAPES AND DIMENSIONS



PRODUCT IDENTIFICATION

C 3216 CH 1H 103 J □
 (1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions L×W

| | |
|------|-----------|
| 3216 | 3.2×1.6mm |
|------|-----------|

(3) Capacitance temperature characteristics

Class 1 (Temperature compensation)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| CH | 0±60ppm/°C | -25 to +85°C |
| C0G | 0±30ppm/°C | -55 to +125°C |

Class 2 (Temperature stable and general purpose)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| JB | ±10% | -25 to +85°C |
| JF | +30, -80% | -25 to +85°C |
| X7R | ±15% | -55 to +125°C |
| X5R | ±15% | -55 to +85°C |
| Y5V | +22, -82% | -30 to +85°C |

(4) Rated voltage E_{dc}

| | |
|----|------|
| 0J | 6.3V |
| 1A | 10V |
| 1C | 16V |
| 1E | 25V |
| 1H | 50V |

(5) Nominal capacitance

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.

| | |
|-----|---------|
| 010 | 1pF |
| 100 | 10pF |
| 102 | 1,000pF |

(6) Capacitance tolerance

| | |
|---|-----------|
| J | ±5% |
| K | ±10% |
| M | ±20% |
| Z | +80, -20% |

(7) Packaging style

| | |
|---|---------------|
| T | Taping (reel) |
| B | Bulk |

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.
 Please read the precautions before using this catalog.

CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)**TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)**RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: CH | Temperature characteristics: C0G |
| 4,700 | ±5% | 0.60±0.10 | C3216CH1H472J | C3216C0G1H472J |
| 6,800 | ±5% | 0.60±0.10 | C3216CH1H682J | C3216C0G1H682J |
| 10,000 | ±5% | 0.60±0.10 | C3216CH1H103J | C3216C0G1H103J |
| 15,000 | ±5% | 0.60±0.10 | C3216CH1H153J | C3216C0G1H153J |
| 22,000 | ±5% | 0.60±0.10 | C3216CH1H223J | C3216C0G1H223J |
| 33,000 | ±5% | 0.85±0.10 | C3216CH1H333J | C3216C0G1H333J |
| 47,000 | ±5% | 1.15±0.10 | C3216CH1H473J | C3216C0G1H473J |
| 56,000 | ±5% | 1.15±0.10 | C3216CH1H563J | C3216C0G1H563J |
| 68,000 | ±5% | 1.60±0.20 | C3216CH1H683J | C3216C0G1H683J |
| 100,000 | ±5% | 1.60±0.20 | C3216CH1H104J | C3216C0G1H104J |

CAPACITANCE RANGES: CLASS 2**TEMPERATURE CHARACTERISTICS: JB(±10%), X5R/X7R(±15%)**RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 470,000 | ±10% | 1.6±0.15 | C3216JB1H474K | C3216X5R1H474K | C3216X7R1H474K |
| | ±20% | 1.6±0.15 | C3216JB1H474M | C3216X5R1H474M | C3216X7R1H474M |
| 680,000 | ±10% | 1.6±0.15 | C3216JB1H684K | C3216X5R1H684K | C3216X7R1H684K |
| | ±20% | 1.6±0.15 | C3216JB1H684M | C3216X5R1H684M | C3216X7R1H684M |
| 1,000,000 | ±10% | 1.6±0.15 | C3216JB1H105K | C3216X5R1H105K | C3216X7R1H105K |
| | ±20% | 1.6±0.15 | C3216JB1H105M | C3216X5R1H105M | C3216X7R1H105M |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 1,500,000 | ±10% | 1.6±0.15 | C3216JB1E155K | C3216X5R1E155K | C3216X7R1E155K |
| | ±20% | 1.6±0.15 | C3216JB1E155M | C3216X5R1E155M | C3216X7R1E155M |
| 2,200,000 | ±10% | 1.6±0.15 | C3216JB1E225K | C3216X5R1E225K | C3216X7R1E225K |
| | ±20% | 1.6±0.15 | C3216JB1E225M | C3216X5R1E225M | C3216X7R1E225M |
| 3,300,000 | ±10% | 1.6±0.15 | C3216JB1E335K | C3216X5R1E335K | C3216X7R1E335K |
| | ±20% | 1.6±0.15 | C3216JB1E335M | C3216X5R1E335M | C3216X7R1E335M |
| 4,700,000 | ±10% | 1.6±0.15 | C3216JB1E475K | C3216X5R1E475K | C3216X7R1E475K |
| | ±20% | 1.6±0.15 | C3216JB1E475M | C3216X5R1E475M | C3216X7R1E475M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 2,200,000 | ±10% | 1.15±0.15 | C3216JB1C225K | C3216X5R1C225K | C3216X7R1C225K |
| | ±20% | 1.15±0.15 | C3216JB1C225M | C3216X5R1C225M | C3216X7R1C225M |
| 3,300,000 | ±10% | 0.85±0.15 | C3216JB1C335K | C3216X5R1C335K | C3216X7R1C335K |
| | ±20% | 0.85±0.15 | C3216JB1C335M | C3216X5R1C335M | C3216X7R1C335M |
| 4,700,000 | ±10% | 1.15±0.15 | C3216JB1C475K | C3216X5R1C475K | C3216X7R1C475K |
| | ±20% | 1.15±0.15 | C3216JB1C475M | C3216X5R1C475M | C3216X7R1C475M |
| 6,800,000 | ±10% | 1.6±0.15 | C3216JB1C685K | C3216X5R1C685K | C3216X7R1C685K |
| | ±20% | 1.6±0.15 | C3216JB1C685M | C3216X5R1C685M | C3216X7R1C685M |
| 10,000,000 | ±10% | 1.6±0.15 | C3216JB1C106K | C3216X5R1C106K | C3216X7R1C106K |
| | ±20% | 1.6±0.15 | C3216JB1C106M | C3216X5R1C106M | C3216X7R1C106M |

TEMPERATURE CHARACTERISTICS: JB($\pm 10\%$), X5R($\pm 15\%$)
RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 470,000 | $\pm 10\%$ | 0.85 \pm 0.10 | C3216JB1H474K | C3216X5R1H474K |
| | $\pm 20\%$ | 0.85 \pm 0.10 | C3216JB1H474M | C3216X5R1H474M |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 1,000,000 | $\pm 10\%$ | 0.85+0.15,-0.10 | C3216JB1E105K | C3216X5R1E105K |
| | $\pm 20\%$ | 0.85+0.15,-0.10 | C3216JB1E105M | C3216X5R1E105M |
| 1,500,000 | $\pm 10\%$ | 0.85+0.15,-0.10 | C3216JB1E155K | C3216X5R1E155K |
| | $\pm 20\%$ | 0.85+0.15,-0.10 | C3216JB1E155M | C3216X5R1E155M |
| 3,300,000 | $\pm 10\%$ | 0.85+0.15,-0.10 | C3216JB1E335K | C3216X5R1E335K |
| | $\pm 20\%$ | 0.85+0.15,-0.10 | C3216JB1E335M | C3216X5R1E335M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 1,000,000 | $\pm 10\%$ | 0.85 \pm 0.10 | C3216JB1C105K | C3216X5R1C105K |
| | $\pm 20\%$ | 0.85 \pm 0.10 | C3216JB1C105M | C3216X5R1C105M |
| 1,500,000 | $\pm 10\%$ | 0.85 \pm 0.10 | C3216JB1C155K | C3216X5R1C155K |
| | $\pm 20\%$ | 0.85 \pm 0.10 | C3216JB1C155M | C3216X5R1C155M |

RATED VOLTAGE E_{dc}: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 2,200,000 | $\pm 10\%$ | 0.85 \pm 0.10 | C3216JB1A225K | C3216X5R1A225K |
| | $\pm 20\%$ | 0.85 \pm 0.10 | C3216JB1A225M | C3216X5R1A225M |
| 3,300,000 | $\pm 10\%$ | 0.85+0.15,-0.10 | C3216JB1A335K | C3216X5R1A335K |
| | $\pm 20\%$ | 0.85+0.15,-0.10 | C3216JB1A335M | C3216X5R1A335M |

RATED VOLTAGE E_{dc}: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 10,000,000 | $\pm 10\%$ | 1.6 \pm 0.15 | C3216JB0J106K | C3216X5R0J106K |
| | $\pm 20\%$ | 1.6 \pm 0.15 | C3216JB0J106M | C3216X5R0J106M |
| 15,000,000 | $\pm 20\%$ | 1.6 \pm 0.15 | C3216JB0J156M | C3216X5R0J156M |
| 22,000,000 | $\pm 20\%$ | 0.85 \pm 0.10 | C3216JB0J226M | C3216X5R0J226M |
| 33,000,000 | $\pm 20\%$ | 1.3 \pm 0.15 | C3216JB0J336M | C3216X5R0J336M |
| 47,000,000 | $\pm 20\%$ | 1.6 \pm 0.15 | C3216JB0J476M | C3216X5R0J476M |

TEMPERATURE CHARACTERISTICS: X5R/X7R(±15%)

RATED VOLTAGE Edc: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 3,300,000 | ±10% | 1.15±0.15 | C3216X5R1C335K | C3216X7R1C335K |
| | ±20% | 1.15±0.15 | C3216X5R1C335M | C3216X7R1C335M |
| 4,700,000 | ±10% | 1.6±0.15 | C3216X5R1C475K | C3216X7R1C475K |
| | ±20% | 1.6±0.15 | C3216X5R1C475M | C3216X7R1C475M |

TEMPERATURE CHARACTERISTICS: X5R(±15%)

RATED VOLTAGE Edc: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. |
|---------------------|-----------|---------------------|----------------------------------|
| | | | Temperature characteristics: X5R |
| 15,000,000 | ±20% | 1.6±0.15 | C3216X5R0J156M |

TEMPERATURE CHARACTERISTICS: JF(+30, -80%), Y5V(+22, -82%)

RATED VOLTAGE Edc: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 4,700,000 | +80,-20% | 1.6±0.15 | C3216JF1H475Z | C3216Y5V1H475Z |

RATED VOLTAGE Edc: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 10,000,000 | +80,-20% | 1.6±0.15 | C3216JF1E106Z | C3216Y5V1E106Z |

RATED VOLTAGE Edc: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 22,000,000 | +80,-20% | 1.6±0.20 | C3216JF1C226Z | C3216Y5V1C226Z |

RATED VOLTAGE Edc: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 47,000,000 | +80,-20% | 1.6±0.15 | C3216JF0J476Z | C3216Y5V0J476Z |

• For more information about the products of other capacitance or data, please contact us.

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Please read the precautions before using this catalog.

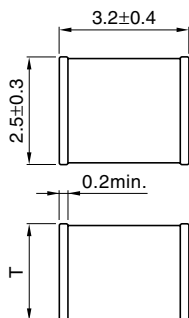
C Series C3225(EIA CC1210) Type

Conformity to RoHS Directive

FEATURES

- High capacitance has been achieved through precision technologies that enable the use of multiple thinner ceramic dielectric layers.
- A monolithic structure ensures superior mechanical strength and reliability.
- High-accuracy automatic mounting is facilitated through the maintenance of very precise dimensional tolerances.
- Composed of only ceramics and metals, these capacitors provide extremely dependable performance, exhibiting virtually no degradation even when subjected to temperature extremes.
- Low stray capacitance ensures high conformity with nominal values, thereby simplifying the circuit design process.
- Low residual inductance assures superior frequency characteristics.
- Because electrostatic capacity has been obtained up to the electrolytic capacitor range, these capacitors offer long service life and are optimally suited for power supply designs that require high levels of reliability.
- Owing to their low ESR and excellent frequency characteristics, these products are optimally suited for high frequency and high-density type power supplies.

SHAPES AND DIMENSIONS



Dimensions in mm



PRODUCT IDENTIFICATION

C 3225 CH 1H 104 J □
(1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions L×W

| | |
|------|-----------|
| 3225 | 3.2×2.5mm |
|------|-----------|

(3) Capacitance temperature characteristics

Class 1 (Temperature compensation)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| CH | 0±60ppm/°C | -25 to +85°C |
| C0G | 0±30ppm/°C | -55 to +125°C |

Class 2 (Temperature stable and general purpose)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| JB | ±10% | -25 to +85°C |
| JF | +30, -80% | -25 to +85°C |
| X7R | ±15% | -55 to +125°C |
| X5R | ±15% | -55 to +85°C |
| Y5V | +22, -82% | -30 to +85°C |

(4) Rated voltage E_{dc}

| | |
|----|------|
| 0J | 6.3V |
| 1A | 10V |
| 1C | 16V |
| 1E | 25V |
| 1H | 50V |

(5) Nominal capacitance

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.

| | |
|-----|---------|
| 010 | 1pF |
| 100 | 10pF |
| 102 | 1,000pF |

(6) Capacitance tolerance

| | |
|---|-----------|
| J | ±5% |
| K | ±10% |
| M | ±20% |
| Z | +80, -20% |

(7) Packaging style

| | |
|---|---------------|
| T | Taping (reel) |
| B | Bulk |

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.
Please read the precautions before using this catalog.

CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)**TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)**RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: CH | Temperature characteristics: C0G |
| 22,000 | ±5% | 1.25±0.20 | C3225CH1H223J | C3225C0G1H223J |
| 33,000 | ±5% | 1.6±0.20 | C3225CH1H333J | C3225C0G1H333J |
| 47,000 | ±5% | 2.0±0.20 | C3225CH1H473J | C3225C0G1H473J |
| 68,000 | ±5% | 2.0±0.20 | C3225CH1H683J | C3225C0G1H683J |
| 100,000 | ±5% | 2.5±0.30 | C3225CH1H104J | C3225C0G1H104J |

CAPACITANCE RANGES: CLASS 2**TEMPERATURE CHARACTERISTICS: JB(±10%), X5R/X7R(±15%)**RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 470,000 | ±10% | 1.15±0.10 | C3225JB1H474K | C3225X5R1H474K | C3225X7R1H474K |
| | ±20% | 1.15±0.10 | C3225JB1H474M | C3225X5R1H474M | C3225X7R1H474M |
| 1,000,000 | ±10% | 1.6±0.15 | C3225JB1H105K | C3225X5R1H105K | C3225X7R1H105K |
| | ±20% | 1.6±0.15 | C3225JB1H105M | C3225X5R1H105M | C3225X7R1H105M |
| 1,500,000 | ±10% | 2.0±0.20 | C3225JB1H155K | C3225X5R1H155K | C3225X7R1H155K |
| | ±20% | 2.0±0.20 | C3225JB1H155M | C3225X5R1H155M | C3225X7R1H155M |
| 2,200,000 | ±10% | 2.0±0.20 | C3225JB1H225K | C3225X5R1H225K | C3225X7R1H225K |
| | ±20% | 2.0±0.20 | C3225JB1H225M | C3225X5R1H225M | C3225X7R1H225M |
| 3,300,000 | ±10% | 2.5±0.20 | C3225JB1H335K | C3225X5R1H335K | C3225X7R1H335K |
| | ±20% | 2.5±0.20 | C3225JB1H335M | C3225X5R1H335M | C3225X7R1H335M |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 1,500,000 | ±10% | 1.15±0.10 | C3225JB1E155K | C3225X5R1E155K | C3225X7R1E155K |
| | ±20% | 1.15±0.10 | C3225JB1E155M | C3225X5R1E155M | C3225X7R1E155M |
| 2,200,000 | ±10% | 1.15±0.10 | C3225JB1E225K | C3225X5R1E225K | C3225X7R1E225K |
| | ±20% | 1.15±0.10 | C3225JB1E225M | C3225X5R1E225M | C3225X7R1E225M |
| 3,300,000 | ±10% | 1.6±0.15 | C3225JB1E335K | C3225X5R1E335K | C3225X7R1E335K |
| | ±20% | 1.6±0.15 | C3225JB1E335M | C3225X5R1E335M | C3225X7R1E335M |
| 4,700,000 | ±10% | 2.0±0.20 | C3225JB1E475K | C3225X5R1E475K | C3225X7R1E475K |
| | ±20% | 2.0±0.20 | C3225JB1E475M | C3225X5R1E475M | C3225X7R1E475M |
| 6,800,000 | ±10% | 2.0±0.20 | C3225JB1E685K | C3225X5R1E685K | C3225X7R1E685K |
| | ±20% | 2.0±0.20 | C3225JB1E685M | C3225X5R1E685M | C3225X7R1E685M |
| 10,000,000 | ±10% | 2.5±0.20 | C3225JB1E106K | C3225X5R1E106K | C3225X7R1E106K |
| | ±20% | 2.5±0.20 | C3225JB1E106M | C3225X5R1E106M | C3225X7R1E106M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 15,000,000 | ±20% | 2.5±0.20 | C3225JB1C156M | C3225X5R1C156M | C3225X7R1C156M |
| 22,000,000 | ±20% | 2.5±0.20 | C3225JB1C226M | C3225X5R1C226M | C3225X7R1C226M |

TEMPERATURE CHARACTERISTICS: JB($\pm 10\%$), X5R($\pm 15\%$)
RATED VOLTAGE E_{dc}: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 15,000,000 | $\pm 20\%$ | 2.3 \pm 0.20 | C3225JB1A156M | C3225X5R1A156M |
| 22,000,000 | $\pm 20\%$ | 2.3 \pm 0.20 | C3225JB1A226M | C3225X5R1A226M |
| 33,000,000 | $\pm 20\%$ | 2.0 \pm 0.20 | C3225JB1A336M | C3225X5R1A336M |
| 47,000,000 | $\pm 20\%$ | 2.5 \pm 0.20 | C3225JB1A476M | C3225X5R1A476M |

RATED VOLTAGE E_{dc}: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R |
| 68,000,000 | $\pm 20\%$ | 2.0 \pm 0.20 | C3225JB0J686M | C3225X5R0J686M |
| 100,000,000 | $\pm 20\%$ | 2.5 \pm 0.40 | C3225JB0J107M | C3225X5R0J107M |

TEMPERATURE CHARACTERISTICS: X5R/X7R($\pm 15\%$)
RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 2,200,000 | $\pm 10\%$ | 2.0 \pm 0.20 | C3225X5R1H225K | C3225X7R1H225K |
| | $\pm 20\%$ | 2.0 \pm 0.20 | C3225X5R1H225M | C3225X7R1H225M |
| 3,300,000 | $\pm 10\%$ | 2.5 \pm 0.30 | C3225X5R1H335K | C3225X7R1H335K |
| | $\pm 20\%$ | 2.5 \pm 0.30 | C3225X5R1H335M | C3225X7R1H335M |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 6,800,000 | $\pm 10\%$ | 2.5 \pm 0.20 | C3225X5R1E685K | C3225X7R1E685K |
| | $\pm 20\%$ | 2.5 \pm 0.20 | C3225X5R1E685M | C3225X7R1E685M |
| 10,000,000 | $\pm 10\%$ | 2.5 \pm 0.30 | C3225X5R1E106K | C3225X7R1E106K |
| | $\pm 20\%$ | 2.5 \pm 0.30 | C3225X5R1E106M | C3225X7R1E106M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 10,000,000 | $\pm 10\%$ | 2.0 \pm 0.20 | C3225X5R1C106K | C3225X7R1C106K |
| | $\pm 20\%$ | 2.0 \pm 0.20 | C3225X5R1C106M | C3225X7R1C106M |
| 15,000,000 | $\pm 20\%$ | 2.5 \pm 0.30 | C3225X5R1C156M | C3225X7R1C156M |
| 22,000,000 | $\pm 20\%$ | 2.5 \pm 0.30 | C3225X5R1C226M | C3225X7R1C226M |

TEMPERATURE CHARACTERISTICS: X5R($\pm 15\%$)
RATED VOLTAGE E_{dc}: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|----------------------------------|--|
| | | | Temperature characteristics: X5R | |
| 15,000,000 | $\pm 20\%$ | 2.0 \pm 0.20 | C3225X5R1A156M | |
| 22,000,000 | $\pm 20\%$ | 2.3 \pm 0.30 | C3225X5R1A226M | |

RATED VOLTAGE E_{dc}: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|----------------------------------|--|
| | | | Temperature characteristics: X5R | |
| 22,000,000 | $\pm 20\%$ | 1.6 \pm 0.15 | C3225X5R0J226M | |
| 33,000,000 | $\pm 20\%$ | 2.0 \pm 0.20 | C3225X5R0J336M | |
| 47,000,000 | $\pm 20\%$ | 2.5 \pm 0.40 | C3225X5R0J476M | |

TEMPERATURE CHARACTERISTICS: JF(+30, -80%), Y5V(+22, -82%)
RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 4,700,000 | +80,-20% | 1.15±0.10 | C3225JF1H475Z | C3225Y5V1H475Z |
| 10,000,000 | +80,-20% | 1.6±0.15 | C3225JF1H106Z | C3225Y5V1H106Z |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 10,000,000 | +80,-20% | 1.3±0.20 | C3225JF1E106Z | C3225Y5V1E106Z |
| 22,000,000 | +80,-20% | 2.0±0.20 | C3225JF1E226Z | C3225Y5V1E226Z |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 22,000,000 | +80,-20% | 1.3±0.20 | C3225JF1C226Z | C3225Y5V1C226Z |
| 47,000,000 | +80,-20% | 2.3±0.20 | C3225JF1C476Z | C3225Y5V1C476Z |

RATED VOLTAGE E_{dc}: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 22,000,000 | +80,-20% | 1.15±0.10 | C3225JF1A226Z | C3225Y5V1A226Z |
| 47,000,000 | +80,-20% | 2.0±0.20 | C3225JF1A476Z | C3225Y5V1A476Z |

RATED VOLTAGE E_{dc}: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 100,000,000 | +80,-20% | 2.5±0.40 | C3225JF0J107Z | C3225Y5V0J107Z |

• For more information about the products of other capacitance or data, please contact us.

• All specifications are subject to change without notice.
Please read the precautions before using this catalog.

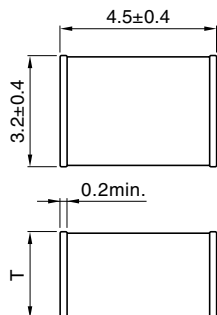
C Series C4532(EIA CC1812) Type

Conformity to RoHS Directive

FEATURES

- High capacitance has been achieved through precision technologies that enable the use of multiple thinner ceramic dielectric layers.
- A monolithic structure ensures superior mechanical strength and reliability.
- High-accuracy automatic mounting is facilitated through the maintenance of very precise dimensional tolerances.
- Composed of only ceramics and metals, these capacitors provide extremely dependable performance, exhibiting virtually no degradation even when subjected to temperature extremes.
- Low stray capacitance ensures high conformity with nominal values, thereby simplifying the circuit design process.
- Low residual inductance assures superior frequency characteristics.
- Because electrostatic capacity has been obtained up to the electrolytic capacitor range, these capacitors offer long service life and are optimally suited for power supply designs that require high levels of reliability.
- Owing to their low ESR and excellent frequency characteristics, these products are optimally suited for high frequency and high-density type power supplies.

SHAPES AND DIMENSIONS



Dimensions in mm



PRODUCT IDENTIFICATION

C 4532 CH 1H 104 J □
(1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions L×W

| | |
|------|-----------|
| 4532 | 4.5×3.2mm |
|------|-----------|

(3) Capacitance temperature characteristics

Class 1 (Temperature compensation)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| CH | 0±60ppm/°C | -25 to +85°C |
| C0G | 0±30ppm/°C | -55 to +125°C |

Class 2 (Temperature stable and general purpose)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| JB | ±10% | -25 to +85°C |
| JF | +30, -80% | -25 to +85°C |
| X7R | ±15% | -55 to +125°C |
| X5R | ±15% | -55 to +85°C |
| Y5V | +22, -82% | -30 to +85°C |

(4) Rated voltage E_{dc}

| | |
|----|-----|
| 1A | 10V |
| 1C | 16V |
| 1E | 25V |
| 1H | 50V |

(5) Nominal capacitance

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.

| | |
|-----|---------|
| 010 | 1pF |
| 100 | 10pF |
| 102 | 1,000pF |

(6) Capacitance tolerance

| | |
|---|-----------|
| J | ±5% |
| K | ±10% |
| M | ±20% |
| Z | +80, -20% |

(7) Packaging style

| | |
|---|---------------|
| T | Taping (reel) |
| B | Bulk |

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.
Please read the precautions before using this catalog.

CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)**TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)**RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: CH | Temperature characteristics: C0G |
| 47,000 | ±5% | 1.6±0.15 | C4532CH1H473J | C4532C0G1H473J |
| 68,000 | ±5% | 1.6±0.15 | C4532CH1H683J | C4532C0G1H683J |
| 100,000 | ±5% | 2.0±0.2 | C4532CH1H104J | C4532C0G1H104J |
| 150,000 | ±5% | 2.5±0.3 | C4532CH1H154J | C4532C0G1H154J |
| 220,000 | ±5% | 3.2±0.3 | C4532CH1H224J | C4532C0G1H224J |

CAPACITANCE RANGES: CLASS 2**TEMPERATURE CHARACTERISTICS: JB(±10%), X5R/X7R(±15%)**RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 1,500,000 | ±10% | 1.6±0.15 | C4532JB1H155K | C4532X5R1H155K | C4532X7R1H155K |
| | ±20% | 1.6±0.15 | C4532JB1H155M | C4532X5R1H155M | C4532X7R1H155M |
| 2,200,000 | ±10% | 1.6±0.15 | C4532JB1H225K | C4532X5R1H225K | C4532X7R1H225K |
| | ±20% | 1.6±0.15 | C4532JB1H225M | C4532X5R1H225M | C4532X7R1H225M |
| 3,300,000 | ±10% | 2.0±0.20 | C4532JB1H335K | C4532X5R1H335K | C4532X7R1H335K |
| | ±20% | 2.0±0.20 | C4532JB1H335M | C4532X5R1H335M | C4532X7R1H335M |
| 4,700,000 | ±10% | 2.3±0.20 | C4532JB1H475K | C4532X5R1H475K | C4532X7R1H475K |
| | ±20% | 2.3±0.20 | C4532JB1H475M | C4532X5R1H475M | C4532X7R1H475M |
| 6,800,000 | ±10% | 2.5±0.30 | C4532JB1H685K | C4532X5R1H685K | C4532X7R1H685K |
| | ±20% | 2.5±0.30 | C4532JB1H685M | C4532X5R1H685M | C4532X7R1H685M |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 10,000,000 | ±10% | 2.5±0.30 | C4532JB1E106K | C4532X5R1E106K | C4532X7R1E106K |
| | ±20% | 2.5±0.30 | C4532JB1E106M | C4532X5R1E106M | C4532X7R1E106M |
| 15,000,000 | ±20% | 2.5±0.30 | C4532JB1E156M | C4532X5R1E156M | C4532X7R1E156M |
| 22,000,000 | ±20% | 2.5±0.30 | C4532JB1E226M | C4532X5R1E226M | C4532X7R1E226M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|------------------|-----------|------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 22,000,000 | ±20% | 2.0±0.20 | C4532JB1C226M | C4532X5R1C226M | C4532X7R1C226M |
| 33,000,000 | ±20% | 2.5±0.30 | C4532JB1C336M | C4532X5R1C336M | C4532X7R1C336M |

TEMPERATURE CHARACTERISTICS: X5R/X7R(±15%)RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|------------------|-----------|------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 4,700,000 | ±10% | 2.0±0.20 | C4532X5R1H475K | C4532X7R1H475K |
| | ±20% | 2.0±0.20 | C4532X5R1H475M | C4532X7R1H475M |
| 6,800,000 | ±10% | 2.5±0.30 | C4532X5R1H685K | C4532X7R1H685K |
| | ±20% | 2.5±0.30 | C4532X5R1H685M | C4532X7R1H685M |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|------------------|-----------|------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 15,000,000 | ±20% | 2.8±0.30 | C4532X5R1E156M | C4532X7R1E156M |
| 22,000,000 | ±20% | 2.5±0.30 | C4532X5R1E226M | C4532X7R1E226M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|------------------|-----------|------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 15,000,000 | ±20% | 2.0±0.20 | C4532X5R1C156M | C4532X7R1C156M |

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TEMPERATURE CHARACTERISTICS: X5R($\pm 15\%$)

RATED VOLTAGE Edc: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. |
|------------------|------------|------------------|----------------|
| 100,000,000 | $\pm 20\%$ | 2.8 \pm 0.30 | C4532X5R1A107M |

RATED VOLTAGE Edc: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. |
|------------------|------------|------------------|----------------|
| 100,000,000 | $\pm 20\%$ | 2.8 \pm 0.30 | C4532X5R0J107M |

TEMPERATURE CHARACTERISTICS: JF(+30, -80%), Y5V(+22, -82%)

RATED VOLTAGE Edc: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. |
|------------------|--------------|------------------|----------------|
| 10,000,000 | +80, -20% | 2.0 \pm 0.20 | C4532JF1H106Z |
| | | | C4532Y5V1H106Z |

RATED VOLTAGE Edc: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. |
|------------------|--------------|------------------|----------------|
| 22,000,000 | +80, -20% | 2.0 \pm 0.20 | C4532JF1E226Z |
| | | | C4532Y5V1E226Z |

RATED VOLTAGE Edc: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. |
|------------------|--------------|------------------|----------------|
| 47,000,000 | +80, -20% | 2.5 \pm 0.30 | C4532JF1C476Z |
| | | | C4532Y5V1C476Z |

RATED VOLTAGE Edc: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. |
|------------------|--------------|------------------|----------------|
| 100,000,000 | +80, -20% | 2.5 \pm 0.30 | C4532JF1A107Z |
| | | | C4532Y5V1A107Z |

• For more information about the products of other capacitance or data, please contact us.

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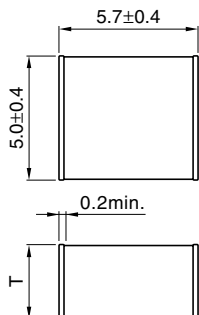
C Series C5750(EIA CC2220) Type

Conformity to RoHS Directive

FEATURES

- High capacitance has been achieved through precision technologies that enable the use of multiple thinner ceramic dielectric layers.
- A monolithic structure ensures superior mechanical strength and reliability.
- High-accuracy automatic mounting is facilitated through the maintenance of very precise dimensional tolerances.
- Composed of only ceramics and metals, these capacitors provide extremely dependable performance, exhibiting virtually no degradation even when subjected to temperature extremes.
- Low stray capacitance ensures high conformity with nominal values, thereby simplifying the circuit design process.
- Low residual inductance assures superior frequency characteristics.
- Because electrostatic capacity has been obtained up to the electrolytic capacitor range, these capacitors offer long service life and are optimally suited for power supply designs that require high levels of reliability.
- Owing to their low ESR and excellent frequency characteristics, these products are optimally suited for high frequency and high-density type power supplies.

SHAPES AND DIMENSIONS



Dimensions in mm



PRODUCT IDENTIFICATION

C 5750 JB 1E 106 K □
(1) (2) (3) (4) (5) (6) (7)

(1) Series name

(2) Dimensions L×W

| | |
|------|-----------|
| 5750 | 5.7×5.0mm |
|------|-----------|

(3) Capacitance temperature characteristics

Class 2 (Temperature stable and general purpose)

| Temperature characteristics | Capacitance change | Temperature range |
|-----------------------------|--------------------|-------------------|
| JB | ±10% | -25 to +85°C |
| JF | +30, -80% | -25 to +85°C |
| X7R | ±15% | -55 to +125°C |
| X5R | ±15% | -55 to +85°C |
| Y5V | +22, -82% | -30 to +85°C |

(4) Rated voltage E_{dc}

| | |
|----|-----|
| 1A | 10V |
| 1C | 16V |
| 1E | 25V |
| 1H | 50V |

(5) Nominal capacitance

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.

| | |
|-----|---------|
| 010 | 1pF |
| 100 | 10pF |
| 102 | 1,000pF |

(6) Capacitance tolerance

| | |
|---|-----------|
| K | ±10% |
| M | ±20% |
| Z | +80, -20% |

(7) Packaging style

| | |
|---|---------------|
| T | Taping (reel) |
| B | Bulk |

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

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CAPACITANCE RANGES: CLASS 2**TEMPERATURE CHARACTERISTICS: JB($\pm 10\%$), X5R/X7R($\pm 15\%$)**RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | | |
|---------------------|------------|---------------------|---------------------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: JB | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 10,000,000 | $\pm 10\%$ | 2.0 \pm 0.20 | C5750JB1E106K | C5750X5R1E106K | C5750X7R1E106K |
| | $\pm 20\%$ | 2.0 \pm 0.20 | C5750JB1E106M | C5750X5R1E106M | C5750X7R1E106M |

TEMPERATURE CHARACTERISTICS: X5R/X7R($\pm 15\%$)RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 10,000,000 | $\pm 10\%$ | 2.3 \pm 0.20 | C5750X5R1H106K | C5750X7R1H106K |
| | $\pm 20\%$ | 2.3 \pm 0.20 | C5750X5R1H106M | C5750X7R1H106M |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|------------|---------------------|----------------------------------|----------------------------------|
| | | | Temperature characteristics: X5R | Temperature characteristics: X7R |
| 33,000,000 | $\pm 20\%$ | 2.0 \pm 0.20 | C5750X5R1C336M | C5750X7R1C336M |
| 47,000,000 | $\pm 20\%$ | 2.3 \pm 0.20 | C5750X5R1C476M | C5750X7R1C476M |

TEMPERATURE CHARACTERISTICS: X5R($\pm 15\%$)RATED VOLTAGE E_{dc}: 10V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. |
|---------------------|------------|---------------------|----------------------------------|
| | | | Temperature characteristics: X5R |
| 68,000,000 | $\pm 20\%$ | 2.3 \pm 0.20 | C5750X5R1A686M |
| 100,000,000 | $\pm 20\%$ | 2.8 \pm 0.30 | C5750X5R1A107M |

RATED VOLTAGE E_{dc}: 6.3V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. |
|---------------------|------------|---------------------|----------------------------------|
| | | | Temperature characteristics: X5R |
| 100,000,000 | $\pm 20\%$ | 2.8 \pm 0.30 | C5750X5R0J107M |

TEMPERATURE CHARACTERISTICS: JF(+30, -80%), Y5V(+22, -82%)RATED VOLTAGE E_{dc}: 50V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 22,000,000 | +80,-20% | 2.0 \pm 0.20 | C5750JF1H226Z | C5750Y5V1H226Z |

RATED VOLTAGE E_{dc}: 25V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 47,000,000 | +80,-20% | 2.0 \pm 0.20 | C5750JF1E476Z | C5750Y5V1E476Z |

RATED VOLTAGE E_{dc}: 16V

| Capacitance (pF) | Tolerance | Thickness T (mm) | Part No. | |
|---------------------|-----------|---------------------|---------------------------------|----------------------------------|
| | | | Temperature characteristics: JF | Temperature characteristics: Y5V |
| 100,000,000 | +80,-20% | 2.5 \pm 0.30 | C5750JF1C107Z | C5750Y5V1C107Z |

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