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.

REMINDERS

Please read this before using the product.

SAFETY REMINDERS

⚠ REMINDERS

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8. The descriptions in this catalog apply as of April 2010.

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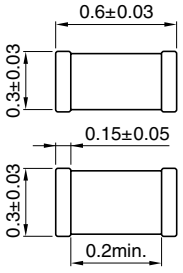
General Multilayer Ceramic Chip Capacitors
C Series C0603 (EIA CC0201) Type

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



Dimensions in mm

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 Edc

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.

CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)

TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)

RATED VOLTAGE Edc: 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 Edc: 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 Edc: 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 Edc: 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.

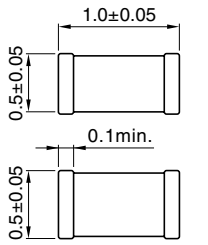
C Series C1005(EIA CC0402) Type

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



Dimensions in mm

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 Edc

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.

CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)

TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)

RATED VOLTAGE Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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.

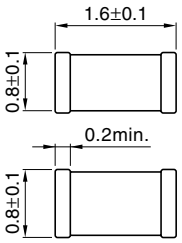
C Series C1608 (EIA CC0603) Types

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 Edc

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.

CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)

TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)

RATED VOLTAGE Edc: 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(±10%), X5R/X7R(±15%)

RATED VOLTAGE Edc: 50V

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

RATED VOLTAGE Edc: 25V

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

RATED VOLTAGE Edc: 16V

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

TEMPERATURE CHARACTERISTICS: JB(±10%), X5R(±15%), X6S(±22%)

RATED VOLTAGE Edc: 25V

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

RATED VOLTAGE Edc: 16V

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

RATED VOLTAGE Edc: 10V

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

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.

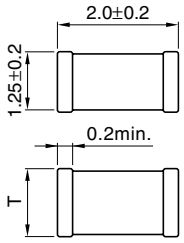
C Series C2012 (EIA CC0805) Type

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 Edc

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.

CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)

TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)

RATED VOLTAGE Edc: 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 Edc: 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 Edc: 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 Edc: 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(±10%), X5R(±15%), X6S(±22%)

RATED VOLTAGE Edc: 50V

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

RATED VOLTAGE Edc: 25V

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

RATED VOLTAGE Edc: 16V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.	
			Temperature characteristics: JB	Temperature characteristics: X5R
330,000	±10%	0.6±0.10	C2012JB1C334K	C2012X5R1C334K
	±20%	0.6±0.10	C2012JB1C334M	C2012X5R1C334M
470,000	±10%	0.6±0.10	C2012JB1C474K	C2012X5R1C474K
	±20%	0.6±0.10	C2012JB1C474M	C2012X5R1C474M
680,000	±10%	0.8+0.15,–0.10	C2012JB1C684K	C2012X5R1C684K
	±20%	0.8+0.15,–0.10	C2012JB1C684M	C2012X5R1C684M
1,000,000	±10%	0.8+0.15,–0.10	C2012JB1C105K	C2012X5R1C105K
	±20%	0.8+0.15,–0.10	C2012JB1C105M	C2012X5R1C105M
3,300,000	±10%	1.25±0.20	C2012JB1C335K	C2012X5R1C335K
	±20%	1.25±0.20	C2012JB1C335M	C2012X5R1C335M
4,700,000	±10%	1.25±0.20	C2012JB1C475K	C2012X5R1C475K
	±20%	1.25±0.20	C2012JB1C475M	C2012X5R1C475M
6,800,000	±10%	1.25±0.10	C2012JB1C685K	C2012X5R1C685K
	±20%	1.25±0.10	C2012JB1C685M	C2012X5R1C685M
10,000,000	±10%	0.85±0.10	C2012JB1C106K	C2012X5R1C106K
	±20%	0.85±0.10	C2012JB1C106M	C2012X5R1C106M
	±10%	1.25±0.10	C2012JB1C106K	C2012X5R1C106K
	±20%	1.25±0.10	C2012JB1C106M	C2012X5R1C106M
22,000,000	±10%	1.25±0.20	C2012JB1C226K	C2012X5R1C226K
	±20%	1.25±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	—
22,000,000	±20%	0.85±0.10	C2012JB0J226M	C2012X5R0J226M	—
	±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 Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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.

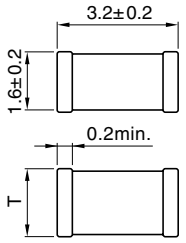
C Series C3216 (EIA CC1206) Type

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



Dimensions in mm

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 Edc

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.

CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)

TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)

RATED VOLTAGE Edc: 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 Edc: 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 Edc: 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 Edc: 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(±10%), X5R(±15%)

RATED VOLTAGE Edc: 50V

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

RATED VOLTAGE Edc: 25V

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

RATED VOLTAGE Edc: 16V

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

RATED VOLTAGE Edc: 10V

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

RATED VOLTAGE Edc: 6.3V

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

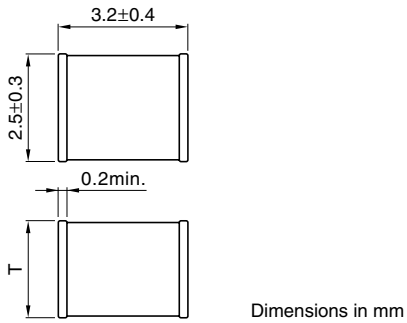
C Series C3225(EIA CC1210) Type

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 Edc

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.

CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)

TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)

RATED VOLTAGE Edc: 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 Edc: 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 Edc: 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 Edc: 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(±10%), X5R(±15%)

RATED VOLTAGE Edc: 10V

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

RATED VOLTAGE Edc: 6.3V

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

TEMPERATURE CHARACTERISTICS: X5R/X7R(±15%)

RATED VOLTAGE Edc: 50V

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

RATED VOLTAGE Edc: 25V

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

RATED VOLTAGE Edc: 16V

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

TEMPERATURE CHARACTERISTICS: X5R(±15%)

RATED VOLTAGE Edc: 10V

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

RATED VOLTAGE Edc: 6.3V

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

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%	1.15±0.10	C3225JF1H475Z	C3225Y5V1H475Z
10,000,000	+80,–20%	1.6±0.15	C3225JF1H106Z	C3225Y5V1H106Z

RATED VOLTAGE Edc: 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 Edc: 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 Edc: 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 Edc: 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.

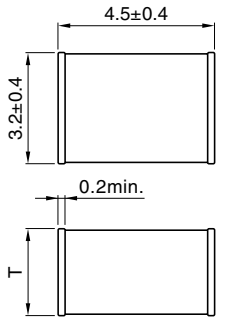
C Series C4532(EIA CC1812) Type

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 Edc

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.

CAPACITANCE RANGES: CLASS 1 (TEMPERATURE COMPENSATION)

TEMPERATURE CHARACTERISTICS: CH(0±60ppm/°C), C0G(0±30ppm/°C)

RATED VOLTAGE Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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 Edc: 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

TEMPERATURE CHARACTERISTICS: X5R(±15%)

RATED VOLTAGE Edc: 10V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No. Temperature characteristics: X5R
100,000,000	±20%	2.8±0.30	C4532X5R1A107M

RATED VOLTAGE Edc: 6.3V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No. Temperature characteristics: X5R
100,000,000	±20%	2.8±0.30	C4532X5R0J107M

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
10,000,000	+80,–20%	2.0±0.20	C4532JF1H106Z	C4532Y5V1H106Z

RATED VOLTAGE Edc: 25V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No. Temperature characteristics: JF	Temperature characteristics: Y5V
22,000,000	+80,–20%	2.0±0.20	C4532JF1E226Z	C4532Y5V1E226Z

RATED VOLTAGE Edc: 16V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No. Temperature characteristics: JF	Temperature characteristics: Y5V
47,000,000	+80,–20%	2.5±0.30	C4532JF1C476Z	C4532Y5V1C476Z

RATED VOLTAGE Edc: 10V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No. Temperature characteristics: JF	Temperature characteristics: Y5V
100,000,000	+80,–20%	2.5±0.30	C4532JF1A107Z	C4532Y5V1A107Z

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

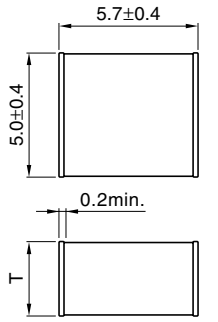
C Series C5750(EIA CC2220) Type

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 Edc

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.

CAPACITANCE RANGES: CLASS 2

TEMPERATURE CHARACTERISTICS: JB(±10%), X5R/X7R(±15%)

RATED VOLTAGE Edc: 25V

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

TEMPERATURE CHARACTERISTICS: X5R/X7R(±15%)

RATED VOLTAGE Edc: 50V

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

RATED VOLTAGE Edc: 16V

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

TEMPERATURE CHARACTERISTICS: X5R(±15%)

RATED VOLTAGE Edc: 10V

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

RATED VOLTAGE Edc: 6.3V

Capacitance (pF)	Tolerance	Thickness T (mm)	Part No.
			Temperature characteristics: X5R
100,000,000	±20%	2.8±0.30	C5750X5R0J107M

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
22,000,000	+80,–20%	2.0±0.20	C5750JF1H226Z	C5750Y5V1H226Z

RATED VOLTAGE Edc: 25V

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

RATED VOLTAGE Edc: 16V

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

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

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

TDK:

C1608X8R2A153K C2012X8R1E224K C1005X8R1E103K C2012X8R2A223K C1608X8R2A103K C1608X8R2A102K C1608X8R1H102K C1608X8R1H103K C1608X8R1H222K C1608X8R1H223K C3216X8R1H474K C1608X8R2A472K C2012SL1A473J C1608SL1A153J C1005SL1A392J C1005SL1A272J C1005SL1A152J C1005SL1A332J C1005SL1A122J C1005SL1A182J C1005SL1A222J C3216X8R2A154K C3225X8R1E335K C2012X8R1E334K C3216X8R1E105K C1608X8R1E104K C1005X8R1H471K C1005X8R1H472K C1005X8R1H222K C1005X8R1H221K C1608X8R1H472K C1608X8R1H473K C3225X8R1E225K C3216X8R1E474K C3216X8R2A473K C1005X8R1H102K C1608X8R2A222K C3216X8R2A104K C3216X8R1H224K C0603X6S0G104K C0603X6S0G104M C1005X7S2A103K C1005X7S2A103M C1608X7S2A104K C1608X7S2A104M C2012X7S2A105K C2012X7S2A105M C2012X7S2A474K C2012X7S2A474M C3216X7S2A225K C3216X7S2A225M C3225X7S2A335K C3225X7S2A335M C5750X7S2A106M C3216SL1A154J C2012SL1A683J C3216SL1A224J C2012SL1A333J C1608SL1A223J C1608X6S0G106M C2012X6S0G476M C3216X6S1A476M C3216X6S0J476M C3216X6S0G107M C3225X7S1H685K C3225X7S1H685M C3225X6S0J476M C3225X6S0J107M C3225X6S0G107M C1005X7S2A102K C1005X7S2A102M C1005X7S2A152K C1005X7S2A152M C1005X7S2A222K C1005X7S2A222M C1005X7S2A332K C1005X7S2A332M C1005X7S2A472K C1005X7S2A472M C1005X7S2A682K C1005X7S2A682M C1608X7S2A333K C1608X7S2A333M C1608X7S2A473K C1608X7S2A473M C1608X7S2A683K C1608X7S2A683M C2012X7S2A154K C2012X7S2A154M C2012X7S2A224K C2012X7S2A224M C2012X7S2A334K C2012X7S2A334M C3225X7S2A475K C3225X7S2A475M C5750X7S2A156M C1005X6S0G475M C1005X6S0G105M C1005X8R1E682K C1005X8R1H151K