

# MULTILAYER CERAMIC CHIP CAPACITORS

## C series, C1608 [EIA CC0603] type

### 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.

### PRODUCT IDENTIFICATION

C 1005 C0G 1E 100 D X XXX  
 (1) (2) (3) (4) (5) (6) (7) (8)

(1) Series name

(2) Dimensions LxW

1005	1.0×0.5mm
1608	1.6×0.8mm
2012	2.0×1.25mm
3216	3.2×1.6mm

(3) Capacitance temperature characteristics

#### Class 1 (Temperature compensation)

Temperature characteristics	Temperature coefficient	Temperature range
C0G*	0±30ppm/°C	-55 to +125°C
SL	+350 to -1000ppm/°C	+20 to +85°C

\*Please contact us for order.

#### Class 2 (Temperature stable and general purpose)

Temperature characteristics	Capacitance change	Temperature range
X7R	±15%	-55 to +125°C
X5R	±15%	-55 to +85°C
Z5U	+22, -56%	+10 to +85°C
Y5V	+22, -82%	-30 to +85°C
B	±10%	-25 to +85°C
D	+20, -30%	-25 to +85°C
F	+30, -80%	-25 to +85°C

(4) Rated voltage Edc

0J	6.3V
1A	10V
1C	16V
1E	25V
1H	50V
1N	75V
3F	3kV

### CAPACITANCE RANGE AND RATED VOLTAGE

Type	Capacitance range	Rated voltage Edc
C1005	0.5 to 100000pF	6.3 to 50V
C1608	0.5pF to 1μF	6.3 to 50V
C2012	0.5pF to 2.2μF	6.3 to 50V
C3216	1100pF to 10μF	6.3 to 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	1000pF
0R5	0.5pF
3R5	3.5pF

(6) Capacitance tolerance

Symbol	Tolerance	Applicable capacitance range
C	±0.25pF	10pF or less
D	±0.5pF	
F	±1pF	
J	±5%	Over 10pF
K	±10%	
M	±20%	
Z	+80, -20%	

(7) Packaging style

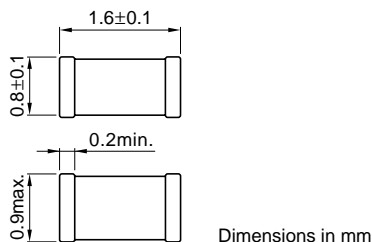
T	Taping (reel)
B	Bulk

(8) TDK internal code

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## SHAPES AND DIMENSIONS



## CAPACITANCE RANGES

### CLASS 1 (TEMPERATURE COMPENSATION)

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

SL(+350 to -1000ppm/°C)

RATED VOLTAGE E<sub>dc</sub>: 50V

Capacitance (pF)	Tolerance	Thickness (mm)	Part No.
0.5	±0.25pF	0.8±0.1	C1608XX*1H0R5C
0.75	±0.25pF	0.8±0.1	C1608XX1HR75C
1	±0.25pF	0.8±0.1	C1608XX1H010C
	±0.5pF	0.8±0.1	C1608XX1H010D
1.5	±0.25pF	0.8±0.1	C1608XX1H1R5C
	±0.25pF	0.8±0.1	C1608XX1H020C
2	±0.5pF	0.8±0.1	C1608XX1H020D
	±0.25pF	0.8±0.1	C1608XX1H030C
3	±0.5pF	0.8±0.1	C1608XX1H030D
	±0.25pF	0.8±0.1	C1608XX1H040C
4	±0.5pF	0.8±0.1	C1608XX1H040D
	±0.25pF	0.8±0.1	C1608XX1H050C
5	±0.5pF	0.8±0.1	C1608XX1H050D
	±0.5pF	0.8±0.1	C1608XX1H060D
6	±1pF	0.8±0.1	C1608XX1H060F
	±0.5pF	0.8±0.1	C1608XX1H070D
7	±1pF	0.8±0.1	C1608XX1H070F
	±0.5pF	0.8±0.1	C1608XX1H080D
8	±1pF	0.8±0.1	C1608XX1H080F
	±0.5pF	0.8±0.1	C1608XX1H090D
9	±1pF	0.8±0.1	C1608XX1H090F
	±0.5pF	0.8±0.1	C1608XX1H100D
10	±1pF	0.8±0.1	C1608XX1H100F
	±5%	0.8±0.1	C1608XX1H110J
12	±5%	0.8±0.1	C1608XX1H120J
	±10%	0.8±0.1	C1608XX1H120K
13	±5%	0.8±0.1	C1608XX1H130J
15	±5%	0.8±0.1	C1608XX1H150J
	±10%	0.8±0.1	C1608XX1H150K
16	±5%	0.8±0.1	C1608XX1H160J
18	±5%	0.8±0.1	C1608XX1H180J
	±10%	0.8±0.1	C1608XX1H180K
20	±5%	0.8±0.1	C1608XX1H200J
22	±5%	0.8±0.1	C1608XX1H220J
	±10%	0.8±0.1	C1608XX1H220K
24	±5%	0.8±0.1	C1608XX1H240J
27	±5%	0.8±0.1	C1608XX1H270J
	±10%	0.8±0.1	C1608XX1H270K
30	±5%	0.8±0.1	C1608XX1H300J
33	±5%	0.8±0.1	C1608XX1H330J
	±10%	0.8±0.1	C1608XX1H330K
36	±5%	0.8±0.1	C1608XX1H360J

Capacitance (pF)	Tolerance	Thickness (mm)	Part No.
39	±5%	0.8±0.1	C1608XX*1H390J
	±10%	0.8±0.1	C1608XX1H390K
43	±5%	0.8±0.1	C1608XX1H430J
	±5%	0.8±0.1	C1608XX1H470J
47	±10%	0.8±0.1	C1608XX1H470K
	±5%	0.8±0.1	C1608XX1H510J
56	±5%	0.8±0.1	C1608XX1H560J
	±10%	0.8±0.1	C1608XX1H560K
62	±5%	0.8±0.1	C1608XX1H620J
68	±5%	0.8±0.1	C1608XX1H680J
	±10%	0.8±0.1	C1608XX1H680K
75	±5%	0.8±0.1	C1608XX1H750J
82	±5%	0.8±0.1	C1608XX1H820J
	±10%	0.8±0.1	C1608XX1H820K
91	±5%	0.8±0.1	C1608XX1H910J
100	±5%	0.8±0.1	C1608XX1H101J
	±10%	0.8±0.1	C1608XX1H101K
110	±5%	0.8±0.1	C1608XX1H111J
120	±5%	0.8±0.1	C1608XX1H121J
	±10%	0.8±0.1	C1608XX1H121K
130	±5%	0.8±0.1	C1608XX1H131J
150	±5%	0.8±0.1	C1608XX1H151J
	±10%	0.8±0.1	C1608XX1H151K
160	±5%	0.8±0.1	C1608XX1H161J
180	±5%	0.8±0.1	C1608XX1H181J
	±10%	0.8±0.1	C1608XX1H181K
200	±5%	0.8±0.1	C1608XX1H201J
220	±5%	0.8±0.1	C1608XX1H221J
	±10%	0.8±0.1	C1608XX1H221K
240	±5%	0.8±0.1	C1608XX1H241J
270	±5%	0.8±0.1	C1608XX1H271J
	±10%	0.8±0.1	C1608XX1H271K
300	±5%	0.8±0.1	C1608XX1H301J
330	±5%	0.8±0.1	C1608XX1H331J
	±10%	0.8±0.1	C1608XX1H331K
360	±5%	0.8±0.1	C1608XX1H361J
390	±5%	0.8±0.1	C1608XX1H391J
	±10%	0.8±0.1	C1608XX1H391K
430	±5%	0.8±0.1	C1608XX1H431J
470	±5%	0.8±0.1	C1608XX1H471J
	±10%	0.8±0.1	C1608XX1H471K
510	±5%	0.8±0.1	C1608XX1H511J
560	±5%	0.8±0.1	C1608XX1H561J
	±10%	0.8±0.1	C1608XX1H561K
620	±5%	0.8±0.1	C1608XX1H621J
680	±5%	0.8±0.1	C1608SL1H681J
	±10%	0.8±0.1	C1608SL1H681K
750	±5%	0.8±0.1	C1608SL1H751J
820	±5%	0.8±0.1	C1608SL1H821J
	±10%	0.8±0.1	C1608SL1H821K
910	±5%	0.8±0.1	C1608SL1H911J
1000	±5%	0.8±0.1	C1608SL1H102J
	±10%	0.8±0.1	C1608SL1H102K

\*XX: Temperature characteristics COG or SL

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## CAPACITANCE RANGES

### CLASS 2 (TEMPERATURE STABLE)

#### TEMPERATURE CHARACTERISTICS: X7R ( $\pm 15\%$ )

##### RATED VOLTAGE Edc: 50V

Capacitance (pF)	Tolerance	Thickness (mm)	Part No.
220	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H221K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H221M
270	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H271K
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H331K
330	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H331M
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H391K
390	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H471K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H471M
560	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H561K
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H681K
680	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H681M
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H821K
1000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H102K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H102M
1200	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H122K
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H152K
1500	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H152M
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H182K
2200	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H222K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H222M
2700	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H272K
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H332K
3300	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H332M
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H392K
3900	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H472K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H472M
5600	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H562K
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H682K
6800	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H682M
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H822K
8200	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H103K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H103M
10000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H123K
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H153K
12000	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H153M
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H183K
15000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1H223K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1H223M

##### RATED VOLTAGE Edc:25V

Capacitance (pF)	Tolerance	Thickness (mm)	Part No.
27000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1E273K
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1E333K
33000	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1E333M
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1E393K
39000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1E473K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1E473M

##### RATED VOLTAGE Edc:16V

Capacitance (pF)	Tolerance	Thickness (mm)	Part No.
56000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1C563K
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1C683K
68000	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1C683M
	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1C823K
82000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X7R1C104K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X7R1C104M

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## CAPACITANCE RANGES

### CLASS 2 (TEMPERATURE STABLE)

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

##### RATED VOLTAGE Edc: 10V

Capacitance (pF)	Tolerance	Thickness (mm)	Part No.
120000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R1A124K
150000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R1A154K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X5R1A154M
180000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R1A184K
220000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R1A224K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X5R1A224M

##### RATED VOLTAGE Edc: 6.3V

Capacitance (pF)	Tolerance	Thickness (mm)	Part No.
270000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R0J274K
330000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R0J334K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X5R0J334M
390000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R0J394K
470000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R0J474K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X5R0J474M
560000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R0J564K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X5R0J564M
680000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R0J684K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X5R0J684M
820000	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R0J824K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X5R0J824M
1000000 [1 $\mu$ F]	$\pm 10\%$	0.8 $\pm$ 0.1	C1608X5R0J105K
	$\pm 20\%$	0.8 $\pm$ 0.1	C1608X5R0J105M

#### TEMPERATURE CHARACTERISTICS: Y5V (+22, -82%)

##### RATED VOLTAGE Edc: 50V

Capacitance (pF)	Tolerance	Thickness (mm)	Part No.
1000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H102Z
1500	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H152Z
2200	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H222Z
3300	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H332Z
4700	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H472Z
6800	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H682Z
10000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H103Z
15000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H153Z
22000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H223Z
33000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H333Z
47000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H473Z
68000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1H683Z

##### RATED VOLTAGE Edc: 25V

Capacitance (pF)	Tolerance	Thickness (mm)	Part No.
100000 [0.1 $\mu$ F]	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1E104Z

##### RATED VOLTAGE Edc: 16V

Capacitance (pF)	Tolerance	Thickness (mm)	Part No.
150000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1C154Z
220000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1C224Z
330000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1C334Z

##### RATED VOLTAGE Edc: 10V

Capacitance (pF)	Tolerance	Thickness (mm)	Part No.
470000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1A474Z
680000	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1A684Z
1000000 [1 $\mu$ F]	+80, -20%	0.8 $\pm$ 0.1	C1608Y5V1A105Z