ABCO Multilayer Ceramic Capacitor

CMC1608-00 for Ceramic Capacitor Series

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▣ Types of Capacitor and Dielectric Material

1. C0G

The capacitor of this kind dielectric material is considered as Class I capacitor, including general capacitor and high frequency C0G capacitor. The electrical properties of C0G capacitor are the most stable one and have little change with temperature, voltage and time. They are suited for applications where low-losses and high-stability are required, such as filters, oscillators, and timing circuits.

2. X7R、X5R

The capacitor of this kind dielectric material has high dielectric constant. The capacitor made of this kind material is considered as Class Ⅱ capacitor whose capacitance is higher than that of class Ⅰ. These capacitors are classified as having a semi-stable temperature characteristic and used over a wide temperature range, such in these kinds of circuits, DC-blocking, decoupling, bypassing, frequency discriminating etc.

3. Y5V

The capacitor made of this kind of material is the highest dielectric constant of all ceramic capacitors. They are used over a moderate temperature range in application where high capacitance is required because of its unstable temperature coefficient, but where moderate losses and capacitance changes can be tolerated. Its capacitance and dissipation factors are sensible to measuring conditions, such as temperature and voltage, etc

CMC Series

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▣ Ordering Code

CMC	1608	C	P	-	100	J	C0G	251	-	00
①	②	③	④		⑤	⑥	⑦	⑧		⑨

① Type
CMC

② Dimensions(mm)
1608 : 1.60(L) × 0.80(W)

③ Thickness(mm)	
C	0.80(T)

④ Packing	
P	Paper Tape
E	Plastic Tape

⑤ Capacitance	
0R5	0.5pF
1R0	1pF
100	10pF
101	100pF
102	1000pF
103	0.01μF
104	0.1μF
105	1.0μF
106	10μF

⑥ Tolerance	
B	±0.1pF
C	±0.25pF
D	±0.5pF
F	±1%
G	±2%
J	±5%
K	±10%
M	±20%
Z	-20/80%

⑦ Dielectrics		
Material	Temperature Range	Capacitance change
C0G	-55℃~+125℃	0±30ppm/℃
X7R	-55℃~+125℃	±15%
X5R	-55℃~+85℃	±15%
Y5V	-30℃~+85℃	+22/-82%

⑧ Rated voltage	
6R3	6.3V_{DC}
100	10V_{DC}
160	16V_{DC}
250	25V_{DC}
500	50V_{DC}
101	100V_{DC}
201	200V_{DC}
251	250V_{DC}

⑨ Internal Code
00

CMC1608-00 Series

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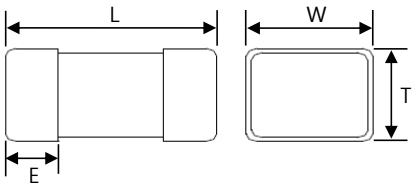
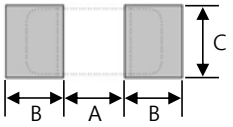
▣ Dimensions



Series	L(mm)	W(mm)	T(mm)	E(mm)
CMC1608-00	1.60±0.10	0.80±0.10	0.80±0.10	0.2~0.6
CMC1608-00*	1.60±0.20	0.80±0.20	0.80±0.20	0.2~0.6

* The product size of 1uF and above.

▣ Recommended PC Board Pattern



A(mm)	B(mm)	C(mm)
0.6~0.8	0.6~0.8	0.6~0.8

▣ Electrical Characteristics

1) C0G type.

Part No.	Capacitance	Thickness (mm)	Tol.[1]	Temperature Range (℃)	Rated Voltage[2] (V_{DC})
CMC1608CP - 0R5B[1]C0G251[2] - 00	0.5pF	C=0.8±0.10	B=±0.1pF C=±0.25pF	-55℃~+125℃, 0±30ppm/℃	250=25V_{DC} 500=50V_{DC} 101=100V_{DC} 251=250V_{DC}
CMC1608CP - 1R0B[1]C0G251[2] - 00	1.0pF				
CMC1608CP - 2R0B[1]C0G251[2] - 00	2.0pF				
CMC1608CP - 3R0B[1]C0G251[2] - 00	3.0pF				
CMC1608CP - 4R0B[1]C0G251[2] - 00	4.0pF				
CMC1608CP - 5R0D[1]C0G251[2] - 00	5.0pF		D=±0.5pF		
CMC1608CP - 6R0D[1]C0G251[2] - 00	6.0pF				
CMC1608CP - 7R0D[1]C0G251[2] - 00	7.0pF				
CMC1608CP - 8R0D[1]C0G251[2] - 00	8.0pF				
CMC1608CP - 9R0D[1]C0G251[2] - 00	9.0pF				
CMC1608CP - 100J[1]C0G251[2] - 00	10pF		F=±1% G=±2% J=±5% K=±10%		
CMC1608CP - 120J[1]C0G251[2] - 00	12pF				
CMC1608CP - 150J[1]C0G251[2] - 00	15pF				
CMC1608CP - 180J[1]C0G251[2] - 00	18pF				
CMC1608CP - 200J[1]C0G251[2] - 00	20pF				
CMC1608CP - 220J[1]C0G251[2] - 00	22pF				
CMC1608CP - 270J[1]C0G251[2] - 00	27pF				
CMC1608CP - 300J[1]C0G251[2] - 00	30pF				
CMC1608CP - 330J[1]C0G251[2] - 00	33pF				
CMC1608CP - 390J[1]C0G251[2] - 00	39pF				
CMC1608CP - 470J[1]C0G251[2] - 00	47pF				
CMC1608CP - 560J[1]C0G251[2] - 00	56pF				
CMC1608CP - 680J[1]C0G251[2] - 00	68pF				
CMC1608CP - 820J[1]C0G251[2] - 00	82pF				
CMC1608CP - 101J[1]C0G251[2] - 00	100pF				
CMC1608CP - 121J[1]C0G251[2] - 00	120pF				
CMC1608CP - 151J[1]C0G251[2] - 00	150pF				
CMC1608CP - 181J[1]C0G251[2] - 00	180pF				

▣ Electrical Characteristics

1) C0G type.

Part No.	Capacitance	Thickness (mm)	Tol.[1]	Temperature Range (℃)	Rated Voltage[2] (V_{DC})
CMC1608CP - 201J[1]C0G251[2] - 00	200pF	C=0.8±0.10	F=±1% G=±2% J=±5% K=±10%	-55℃~+125℃, 0±30ppm/℃	250=25V_{DC} 500=50V_{DC} 101=100V_{DC} 251=250V_{DC}
CMC1608CP - 221J[1]C0G251[2] - 00	220pF				
CMC1608CP - 271J[1]C0G251[2] - 00	270pF				
CMC1608CP - 331J[1]C0G251[2] - 00	330pF				
CMC1608CP - 391J[1]C0G251[2] - 00	390pF				
CMC1608CP - 471J[1]C0G251[2] - 00	470pF				
CMC1608CP - 561J[1]C0G101[2] - 00	560pF				250=25V_{DC} 500=50V_{DC} 101=100V_{DC}
CMC1608CP - 681J[1]C0G101[2] - 00	680pF				
CMC1608CP - 821J[1]C0G101[2] - 00	820pF				
CMC1608CP - 102J[1]C0G500[2] - 00	1000pF				250=25V_{DC} 500=50V_{DC}
CMC1608CP - 152J[1]C0G500[2] - 00	1500pF				
CMC1608CP - 182J[1]C0G250[2] - 00	1800pF				250=25V_{DC}
CMC1608CP - 222J[1]C0G250[2] - 00	2200pF				

2) X7R type.

Part No.	Capacitance	Thickness (mm)	Tol.[1]	Temperature Range (℃)	Rated Voltage[2] (V_{DC})
CMC1608CP - 101J[1]X7R251[2] - 00	100pF	C=0.8±0.10	J=±5% K=±10% M=±20%	-55℃~+125℃, ±15%	101=100V_{DC} 251=250V_{DC}
CMC1608CP - 121J[1]X7R251[2] - 00	120pF				
CMC1608CP - 151J[1]X7R251[2] - 00	150pF				
CMC1608CP - 181J[1]X7R251[2] - 00	180pF				
CMC1608CP - 201J[1]X7R251[2] - 00	200pF				
CMC1608CP - 221J[1]X7R251[2] - 00	220pF				6R3=6.3V_{DC} 100=10V_{DC} 160=16V_{DC} 250=25V_{DC} 500=50V_{DC} 101=100V_{DC} 251=250V_{DC}
CMC1608CP - 271J[1]X7R251[2] - 00	270pF				
CMC1608CP - 331J[1]X7R251[2] - 00	330pF				
CMC1608CP - 391J[1]X7R251[2] - 00	390pF				
CMC1608CP - 471J[1]X7R251[2] - 00	470pF				
CMC1608CP - 561J[1]X7R251[2] - 00	560pF				
CMC1608CP - 681J[1]X7R251[2] - 00	680pF				
CMC1608CP - 821J[1]X7R251[2] - 00	820pF				
CMC1608CP - 102J[1]X7R251[2] - 00	1000pF				
CMC1608CP - 152J[1]X7R251[2] - 00	1500pF				
CMC1608CP - 182J[1]X7R251[2] - 00	1800pF				
CMC1608CP - 222J[1]X7R251[2] - 00	2200pF				
CMC1608CP - 272J[1]X7R251[2] - 00	2700pF				
CMC1608CP - 332J[1]X7R251[2] - 00	3300pF				
CMC1608CP - 472J[1]X7R251[2] - 00	4700pF				
CMC1608CP - 562J[1]X7R251[2] - 00	5600pF				
CMC1608CP - 682J[1]X7R251[2] - 00	6800pF				

▣ Electrical Characteristics

2) X7R type.

Part No.	Capacitance	Thickness (mm)	Tol.[1]	Temperature Range (℃)	Rated Voltage[2] (V_{DC})
CMC1608CP - 103J[1]X7R101[2] - 00	0.010μF	C=0.8±0.10	J=±5% K=±10% M=±20%	-55℃~+125℃, ±15%	6R3=6.3V_{DC} 100=10V_{DC} 160=16V_{DC} 250=25V_{DC} 500=50V_{DC} 101=100V_{DC}
CMC1608CP - 153J[1]X7R101[2] - 00	0.015μF				
CMC1608CP - 183J[1]X7R101[2] - 00	0.018μF				
CMC1608CP - 223J[1]X7R101[2] - 00	0.022μF				
CMC1608CP - 273J[1]X7R500[2] - 00	0.027μF				6R3=6.3V_{DC} 100=10V_{DC} 160=16V_{DC} 250=25V_{DC} 500=50V_{DC}
CMC1608CP - 333J[1]X7R500[2] - 00	0.033μF				
CMC1608CP - 393J[1]X7R500[2] - 00	0.039μF				
CMC1608CP - 473J[1]X7R500[2] - 00	0.047μF				
CMC1608CP - 563J[1]X7R500[2] - 00	0.056μF				
CMC1608CP - 683J[1]X7R500[2] - 00	0.068μF				
CMC1608CP - 104J[1]X7R500[2] - 00	0.10μF				
CMC1608CP - 154J[1]X7R500[2] - 00	0.15μF				
CMC1608CP - 184J[1]X7R500[2] - 00	0.18μF				
CMC1608CP - 224J[1]X7R500[2] - 00	0.22μF				
CMC1608CP - 274J[1]X7R500[2] - 00	0.27μF				
CMC1608CP - 334J[1]X7R500[2] - 00	0.33μF				
CMC1608CP - 474J[1]X7R500[2] - 00	0.47μF				
CMC1608CP - 684J[1]X7R250[2] - 00	0.68μF				6R3=6.3V_{DC}, 100=10V_{DC}, 160=16V_{DC}, 250=25V_{DC}
CMC1608CP - 105J1[1]X7R250[2] - 00	1.00μF	C=0.8±0.20			
CMC1608CP - 225J[1]X7R160[2] - 00	2.20μF				6R3=6.3V_{DC}, 100=10V_{DC} 160=16V_{DC}
CMC1608CP - 475J[1]X7R100[2] - 00	4.70μF				6R3=6.3V_{DC}, 100=10V_{DC}
CMC1608CP - 106J[1]X7R6R3[2] - 00	10μF				6R3=6.3V_{DC}

3) X5R type.

Part No.	Capacitance	Thickness (mm)	Tol.[1]	Temperature Range (℃)	Rated Voltage[2] (V_{DC})
CMC1608CP - 221J[1]X5R500[2] - 00	220pF	C=0.8±0.10	J=±5% K=±10% M=±20%	-55℃~+85℃, ±15%	6R3=6.3V_{DC} 100=10V_{DC} 160=16V_{DC} 250=25V_{DC} 500=50V_{DC}
CMC1608CP - 271J[1]X5R500[2] - 00	270pF				
CMC1608CP - 331J[1]X5R500[2] - 00	330pF				
CMC1608CP - 391J[1]X5R500[2] - 00	390pF				
CMC1608CP - 471J[1]X5R500[2] - 00	470pF				
CMC1608CP - 561J[1]X5R500[2] - 00	560pF				
CMC1608CP - 681J[1]X5R500[2] - 00	680pF				
CMC1608CP - 821J[1]X5R500[2] - 00	820pF				
CMC1608CP - 102J[1]X5R500[2] - 00	1000pF				
CMC1608CP - 152J[1]X5R500[2] - 00	1500pF				
CMC1608CP - 182J[1]X5R500[2] - 00	1800pF				

▣ Electrical Characteristics

3) X5R type.

Part No.	Capacitance	Thickness (mm)	Tol.[1]	Temperature Range (℃)	Rated Voltage[2] (V_{DC})
CMC1608CP - 222J[1]X5R500[2] - 00	2200pF	C=0.8±0.10	J=±5% K=±10% M=±20%	-55℃~+85℃, ±15%	6R3=6.3V_{DC} 100=10V_{DC} 160=16V_{DC} 250=25V_{DC} 500=50V_{DC}
CMC1608CP - 272J[1]X5R500[2] - 00	2700pF				
CMC1608CP - 332J[1]X5R500[2] - 00	3300pF				
CMC1608CP - 472J[1]X5R500[2] - 00	4700pF				
CMC1608CP - 562J[1]X5R500[2] - 00	5600pF				
CMC1608CP - 682J[1]X5R500[2] - 00	6800pF				
CMC1608CP - 103J[1]X5R500[2] - 00	0.010μF				
CMC1608CP - 153J[1]X5R500[2] - 00	0.015μF				
CMC1608CP - 183J[1]X5R500[2] - 00	0.018μF				
CMC1608CP - 223J[1]X5R500[2] - 00	0.022μF				
CMC1608CP - 273J[1]X5R500[2] - 00	0.027μF				
CMC1608CP - 333J[1]X5R500[2] - 00	0.033μF				
CMC1608CP - 393J[1]X5R500[2] - 00	0.039μF				
CMC1608CP - 473J[1]X5R500[2] - 00	0.047μF				
CMC1608CP - 563J[1]X5R500[2] - 00	0.056μF				
CMC1608CP - 683J[1]X5R500[2] - 00	0.068μF				
CMC1608CP - 104J[1]X5R500[2] - 00	0.10μF				
CMC1608CP - 154J[1]X5R500[2] - 00	0.15μF				
CMC1608CP - 184J[1]X5R500[2] - 00	0.18μF				
CMC1608CP - 224J[1]X5R500[2] - 00	0.22μF				
CMC1608CP - 274J[1]X5R500[2] - 00	0.27μF				
CMC1608CP - 334J[1]X5R500[2] - 00	0.33μF				
CMC1608CP - 474J[1]X5R500[2] - 00	0.47μF				
CMC1608CP - 684J[1]X5R250[2] - 00	0.68μF				6R3=6.3V_{DC}, 100=10V_{DC}, 160=16V_{DC}, 250=25V_{DC}
CMC1608CP - 105J[1]X5R250[2] - 00	1.00μF	C=0.8±0.20			
CMC1608CP - 225J[1]X5R160[2] - 00	2.20μF				6R3=6.3V_{DC}, 100=10V_{DC}, 160=16V_{DC}
CMC1608CP - 475J[1]X5R100[2] - 00	4.70μF				6R3=6.3V_{DC}, 100=10V_{DC}
CMC1608CP - 106J[1]X5R6R3[2] - 00	10μF				6R3=6.3V_{DC}

4) Y5V type.

Part No.	Capacitance	Thickness (mm)	Tol.[1]	Temperature Range (℃)	Rated Voltage[2] (V_{DC})
CMC1608CP - 102M[1]Y5V500[2] - 00	1000pF	C=0.8±0.10	M=±20% Z=-20/+80%	-30℃~+85℃, +22/-82%	100=10V_{DC} 160=16V_{DC} 250=25V_{DC} 500=50V_{DC}
CMC1608CP - 152M[1]Y5V500[2] - 00	1500pF				
CMC1608CP - 182M[1]Y5V500[2] - 00	1800pF				
CMC1608CP - 222M[1]Y5V500[2] - 00	2200pF				
CMC1608CP - 272M[1]Y5V500[2] - 00	2700pF				
CMC1608CP - 332M[1]Y5V500[2] - 00	3300pF				

▣ Electrical Characteristics

4) Y5V type.

Part No.	Capacitance	Thickness (mm)	Tol.[1]	Temperature Range (℃)	Rated Voltage[2] (V_{DC})
CMC1608CP - 472M[1]Y5V500[2] - 00	4700pF	C=0.8±0.10	M=±20% Z=-20/+80%	-30℃~+85℃, +22/-82%	100=10V_{DC} 160=16V_{DC} 250=25V_{DC} 500=50V_{DC}
CMC1608CP - 562M[1]Y5V500[2] - 00	5600pF				
CMC1608CP - 682M[1]Y5V500[2] - 00	6800pF				
CMC1608CP - 103M[1]Y5V500[2] - 00	0.010μF				
CMC1608CP - 153M[1]Y5V500[2] - 00	0.015μF				
CMC1608CP - 183M[1]Y5V500[2] - 00	0.018μF				
CMC1608CP - 223M[1]Y5V500[2] - 00	0.022μF				
CMC1608CP - 273M[1]Y5V500[2] - 00	0.027μF				
CMC1608CP - 333M[1]Y5V500[2] - 00	0.033μF				
CMC1608CP - 393M[1]Y5V500[2] - 00	0.039μF				
CMC1608CP - 473M[1]Y5V500[2] - 00	0.047μF				
CMC1608CP - 563M[1]Y5V500[2] - 00	0.056μF				
CMC1608CP - 683M[1]Y5V500[2] - 00	0.068μF				
CMC1608CP - 104M[1]Y5V500[2] - 00	0.10μF				
CMC1608CP - 154M[1]Y5V500[2] - 00	0.15μF				
CMC1608CP - 184M[1]Y5V500[2] - 00	0.18μF				
CMC1608CP - 224M[1]Y5V500[2] - 00	0.22μF				
CMC1608CP - 274M[1]Y5V500[2] - 00	0.27μF				
CMC1608CP - 334M[1]Y5V500[2] - 00	0.33μF				
CMC1608CP - 474M[1]Y5V500[2] - 00	0.47μF				
CMC1608CP - 684M[1]Y5V250[2] - 00	0.68μF				100=10V_{DC} 160=16V_{DC} 250=25V_{DC}
CMC1608CP - 105M[1]Y5V250[2] - 00	1.00μF	C=0.8±0.20			
CMC1608CP - 225M[1]Y5V160[2] - 00	2.20μF				100=10V_{DC}, 160=16V_{DC}
CMC1608CP - 475M[1]Y5V100[2] - 00	4.70μF				100=10V_{DC}

1. Test Methods

- Capacitance

Dielectrics	Specification	Testing Condition
C0G	Within the specified tolerance A : ±0.05pF, B : ±0.1pF, C : ±0.25pF, D : ±0.5pF, J : ±5%	1.0±0.2Vrms, 1MHz±10% (C>1000 pF, 1.0±0.2Vrms, 1KHz±10%)
X7R, X5R	Within the specified tolerance J : ±5%, K : ±10%, M : ±20%	1.0±0.2Vrms, 1MHz±10% (Cp > 10uF, 0.5±0.1Vrms, 120±24Hz)
Y5V	Within the specified tolerance M : ±20%, Z : -20%/+80%	1.0±0.2Vrms, 1MHz±10% (Cp > 10uF, 0.5±0.1Vrms, 120±24Hz)
Note : Test temperature 25℃+3℃, Test humidity <70%RH. ClassⅡ capacitor need de-aging treatment. (Condition: capacitor in 150℃ heat treatment for 1 hour, measure placed after 48h.)		