

High Voltage Ceramic Chip Capacitors Type CMH

Δ Features

- Rated Voltage: 100 VAC, 4000VDC
- Chip Size: 0805, 1206, 1210, 1808, 1812, 2220, 2225

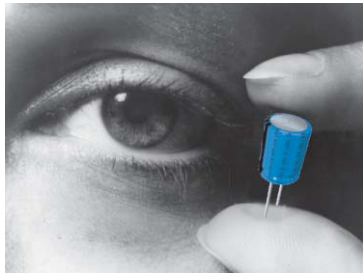
Δ Applications

- Modems
- LAN / WAN Interface
- Industrial Controls
- Power Supply
- Back-Lighting Inverter
- Telecom Devices

Δ Electrical

Dielectric Code	EIA IEC	COG 1BCG	X7R 2R1	Z5U 2E6
Temperature Characteristics		0±30ppm/°C, C>20pF 0-40+120ppm/°C, C>20pF	ΔC ± 15% maximum over -55°C tp +125°C	ΔC +22%, -56% maximum over -55°C tp +125°C
Operating Temperature Range		-55°C to +125°C	-55°C to +125°C	-10°C to +85°C
Measuring Conditions for Capacitance and D.F.		1MHz, 1Vrms, C≤1000pF 1KHz, 1Vrms, C>1000pF	1KHz, 1Vrms	1KHz, 0.5Vrms
Dissipation Factor (D.F.) and Tangent of Loss Angle (tan δ)		≤0.1% for C≥30pF ≤100% / (400+20C) for C≥30pF	≤2.5%	≤4.0%
Insulation Resistance (I.R.) UR<500V: I.R. after 60secs. Charging at UR (DC) UR≥500V: I.R. after 60 secs. Charging at 500V (DC) 25°C, 55% RH max.		≥100GΩ or ≥1000MΩ·μF whichever is less	≥10GΩ or ≥100MΩ·μF whichever is less	≥10GΩ or ≥100MΩ·μF whichever is less
Withstanding Voltage, 25°C, 1-5sec.	Rated Voltage		Rated Voltage	Rated Voltage
	≤100V 2.5xUR 200V/250V 2.0xUR 500V 1.5xUR 1KV≤UR≤3KV 1.2xUR >3KV 1.1xUR		≤100V 2.5xUR 200V/250V 2.0xUR 500V 1.5xUR ≥1KV 1.2xUR	≤100V 2.5xUR 200V/250V 1.5xUR
Capacitance Aging		Not Applicable	≈1.5% per decade hour	≈5% per decade hour

Surface Mount Capacitors

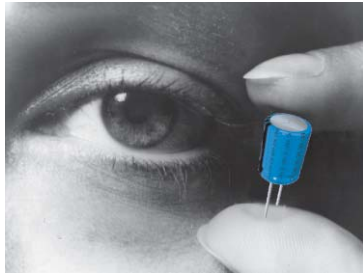


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Δ Environmental

Test	Test Conditions	Post-Test Inspection Requirements			
Solderability	Immersed in Solder bath at 245 ± 5°C for 5 ± 0.5 sec.	No Visible Damage At least 75% of termination area should be well tinned			
Resistance to Soldering Heat	Immersed in Solder bath at 260 ± 5°C for 10 ± 1 sec. Recovery: 6 ~ 24hr. (COG) 24 ± 2hr. (X7R, Z5U)	No Visible Damage At least 75% of termination area should be well tinned			
			COG(1BCG)	X7R(2R1)	Z5U(2E6)
		ΔC/C	≤±1% or ±1pF whichever is larger	≤±1%	≤-10%+20%
Rapid Change of Temperature	-55°C to +125°C, 5 cycles (COG,X7R) Duration: 30 Min. Recovery: 6 ~ 24hr. (COG) 24 ± 2hr. (X7R, Z5U)	No Visible Damage			
			COG(1BCG)	X7R(2R1)	
		ΔC/C	≤±1% or ±1pF whichever is larger	≤±15%	
		D.F.	≤2.0x initial requirement	≤1.5x initial requirement	
		I.R.	≥0.25x initial requirement		
Edurance (Life Test)	1000+48-0 hr. at maximum temperature with ≤3KV: 1.2 x rated voltage applied >3KV: 1.2 x rated voltage applied Recovery: 6 ~ 24hr. (COG) 24 ± 2hr. (X7R, Z5U)	No Visible Damage			
			COG(1BCG)	X7R(2R1)	
		ΔC/C	≤±1% or ±1pF whichever is larger	≤±15%	
		D.F.	≤2.0x initial requirement	≤1.5x initial requirement	
		I.R.	≥0.25x initial requirement		
Humidity Test (Damp heat, steady state)	500+24-0 hr. at 40 ± 2°C, 90~95% RH Recovery: 6 ~ 24hr. (COG) 24 ± 2hr. (X7R, Z5U)	No Visible Damage			
			COG(1BCG)	X7R(2R1)	
		ΔC/C	≤±2% or ±2pF whichever is larger	≤±15%	
		D.F.	≤2.0x initial requirement	≤7x initial requirement	
		I.R.	≥0.25x initial requirement		
Adhesion Strength of Termination	Capacitors mounted on a substrate. A force of 5N applied perpendicular to the place of substrate and parallel the line joining the center of terminations for 10±1 sec.	No Visible Damage			
Resistance to Flexure Stress	Capacitors mounted on a substrate. The board shall then be bent by 1mm at a rate of 1mm/sec.	No Visible Damage Change in capacitance is less than 10%			

Surface Mount Capacitors

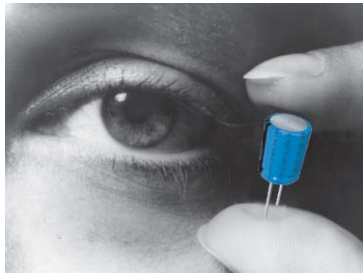


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Δ Dimensions

	Size	Length / Width	Volt	Capacitance		
NPO	1812	L: 5.70±0.040mm (0.224±0.016) W: 2.80±0.030mm (0.112±0.012)	100	10pF±0.015µF		
			250	10pF±0.012µF		
			500	10pF±6800pF		
			1000	10pF±4700µF		
			2000	10pF±1200µF		
			3000	10pF±470µF		
	1808	L: 4.50±0.030mm (0.177±0.012) W: 3.20±0.030mm (0.126±0.012)	100	10pF±3300pF		
			250	10pF±3300pF		
			500	10pF±3300pF		
			1000	3pF±2200pF		
			2000	3pF±560pF		
			3000	3pF±470pF		
	1210	L: 3.20±0.030mm (0.126±0.012) W: 2.50±0.030mm (0.100±0.012)	4000	3pF±100pF		
			100	10pF±0.010µF		
			250	10pF±6800pF		
			500	10pF±4700pF		
			1000	10pF±2200pF		
			2000	10pF±560pF		
	1206	L: 3.20±0.020mm (0.126±0.008) W: 1.60±0.020mm (0.063±0.008)	3000	10pF±220pF		
			100	10pF±4700pF		
			250	10pF±3900pF		
500			10pF±2200pF			
1000			10pF±1500pF			
2000			10pF±270pF			
0805	L: 2.00±0.020mm (0.080±0.008) W: 1.20±0.020mm (0.050±0.008)	3000	10pF±68pF			
		100	10pF±1800pF			
		250	10pF±1200pF			
0603	L: 1.60±0.015mm (0.063±0.006) W: 0.80±0.015mm (0.032±0.006)	500	10pF±470pF			
		100	10pF±1000pF			
		100	10pF±1000pF			
Z5U	1210	L: 3.20±0.030mm (0.126±0.012) W: 2.50±0.030mm (0.100±0.012)	100	0.22pF±0.56µF		
			1206	L: 3.20±0.020mm (0.126±0.008) W: 1.60±0.020mm (0.063±0.008)	100	0.10pF±0.47µF
					0805	L: 1.60±0.015mm (0.063±0.006) W: 0.80±0.015mm (0.032±0.006)

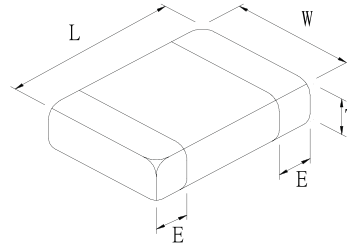
Surface Mount Capacitors



Type	CMH
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High Voltage Ceramic Chip Capacitors
Type CMH

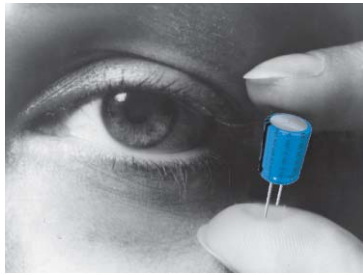
Δ Dimensions



Size		0805	1206	1210	1808	1812	2211	2220	2225
(L) Length	mm	2.00±0.30	3.20±0.20	3.20±0.30	4.50±0.30	4.50±0.30	5.70±0.40	5.70±0.40	5.70±0.40
	(in)	(0.080±0.008)	(0.126±0.008)	(0.126±0.012)	(0.177±0.012)	(0.177±0.012)	(0.224±0.016)	(0.224±0.016)	(0.224±0.016)
(W) Width	mm	1.20±0.25	1.60±0.25	2.50±0.30	2.00±0.25	3.20±0.30	2.80±0.30	5.00±0.40	6.30±0.40
	(in)	(0.050±0.008)	(0.063±0.008)	(0.100±0.012)	(0.080±0.008)	(0.126±0.012)	(0.112±0.012)	(0.200±0.016)	(0.248±0.016)
(E) Termination	mm	0.50±0.20	0.50±0.20	0.50±0.20	0.64±0.38	0.64±0.38	0.85±0.55	0.85±0.55	0.85±0.55
	(in)	(0.020±0.008)	(0.020±0.008)	(0.020±0.008)	(0.025±0.015)	(0.025±0.015)	(0.033±0.022)	(0.033±0.022)	(0.033±0.022)
(T) Thickness	mm	1.40	1.80	2.20	2.20	2.70	2.70	3.00	3.00
	(in)	(0.055)	(0.071)	(0.087)	(0.087)	(0.106)	(0.106)	(0.118)	(0.118)

X7R	Size	Length / Width	Volt		Capacitance	
	2225	L: 5.70±0.040mm (0.224±0.016) W: 6.30±0.040mm (0.248±0.016)	100	1000pF±1.5µF	1000pF±0.82µF	1000pF±0.33µF
			250	1000pF±0.56µF	1000pF±0.022µF	1000pF±4700pF
			500	1000pF±1.5µF	1000pF±0.68µF	1000pF±0.1µF
			1000	1000pF±0.27µF	1000pF±0.01µF	1000pF±5600pF
			2000	1000pF±1.0µF	470pF±0.47µF	470pF±0.15µF
			3000	470pF±0.056µF	470pF±4700pF	470pF±2700µF
	2220	L: 5.70±0.040mm (0.224±0.016) W: 5.00±0.040mm (0.200±0.016)	100	150pF±0.047µF	150pF±0.047µF	150pF±0.068µF
			250	150pF±0.01µF	150pF±2200pF	150pF±1800pF
			500	150pF±0.047µF	100pF±0.33µF	100pF±0.22µF
			1000	150pF±0.068µF	100pF±0.056µF	220pF±0.01µF
			2000	150pF±0.01µF	220pF±1800pF	100pF±0.18µF
			3000	150pF±2200pF	100pF±0.1µF	100pF±0.047µF
	1812	L: 5.70±0.040mm (0.224±0.016) W: 2.80±0.030mm (0.112±0.012)	100	100pF±0.01µF	100pF±0.01µF	100pF±0.047µF
			250	100pF±0.047µF	100pF±0.01µF	100pF±0.01µF
			500	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF
			1000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF
			2000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF
			3000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF
	1808	L: 4.50±0.030mm (0.177±0.012) W: 3.20±0.030mm (0.126±0.012)	100	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF
			250	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF
			500	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF
			1000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF
			2000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF
			3000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF
1210	L: 3.20±0.030mm (0.126±0.012) W: 2.50±0.030mm (0.100±0.012)	100	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		250	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		500	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		1000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		2000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		3000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
1206	L: 3.20±0.020mm (0.126±0.008) W: 1.60±0.020mm (0.063±0.008)	100	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		250	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		500	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		1000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		2000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		3000	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
0805	L: 2.00±0.020mm (0.080±0.008) W: 1.20±0.020mm (0.050±0.008)	100	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		250	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
		500	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	
0603	L: 1.60±0.015mm (0.063±0.006) W: 0.80±0.015mm (0.032±0.006)	100	100pF±0.01µF	100pF±0.01µF	100pF±0.01µF	

Surface Mount Capacitors



High Voltage Ceramic Chip Capacitors
Type CMH

Δ Ordering

CMH 1808 CG - 101 J - 302 ER
(1) (2) (3) (4) (5) (6) (7)

(1)	Series	CMH:	
			0805 1206 1210
(2)	Size Code		1808 1812 2220 2225
(3)	Dielectric Code	CG:	COG (1BCG)
		XR:	X7R (2R1)
(4)	Capacitance Code	Capacitance expressed in pF. First two digits are significant figures. The third Digit denotes number of zeros. Use R for decimal point for values less than 10pF. (eg. R47: 0.47pF)	
(5)	Tolerance Code	Code	Tolerance
		C	±0.25pF
		D	±0.5pF
		F	±1%
		G	±2%
		J	±5%
		K	±10%
		M	±20%
		Z	+80% -20%
		Other Tolerances Available Upon Request	
(6)	Rated Voltage Code	302:	3000V
(7)	Packaging Code	PR:	Tape and Reel, Cardboard Tape
		ER:	Tape and Reel, Embossed Tape
		No Code:	Bulk

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