

# Preliminary

## Surface Mount Multilayer Ceramic Chip Capacitors (SMD MLCCs) Flexible Termination System (FT-CAP), C0G Dielectric, 10 – 200 VDC (Commercial & Automotive Grade)

### Overview

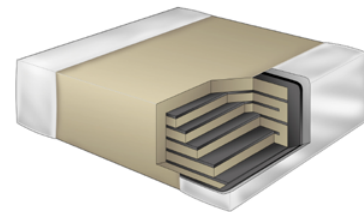
KEMET's Flexible Termination (FT-CAP) Multilayer Ceramic Capacitor in C0G dielectric incorporates a unique, flexible termination system that is integrated with KEMET's standard termination materials. A conductive silver epoxy is utilized between the base metal and nickel barrier layers of KEMET's standard termination system in order to establish pliability while maintaining terminal strength, solderability and electrical performance. This technology was developed in order to address the primary failure mode of MLCCs— flex cracks, which are typically the result of excessive tensile and shear stresses produced during board flexure and thermal cycling. Flexible termination technology inhibits the transfer of board stress to the rigid ceramic body, therefore mitigating flex cracks which can result in low IR or short circuit failures.

Although this technology does not eliminate the potential for mechanical damage that may propagate during extreme environmental and handling conditions, it does provide superior flex performance over standard termination systems.

Manufactured in state-of-the-art ISO/TS 16949:2009 certified facilities, the FT-CAP complements KEMET's Open Mode, Floating Electrode (FE-CAP), Floating Electrode with Flexible Termination (FF-CAP), and KEMET Power Solutions (KPS) product lines by providing a complete portfolio of flex mitigation solutions.

Combined with the stability of C0G dielectric and designed to accommodate all capacitance requirements, these flex-robust devices are RoHS Compliant, offer up to 5 mm of flex-bend capability and exhibit no change in capacitance with respect to time and voltage. Capacitance change with reference to ambient temperature is limited to  $\pm 30$  ppm/°C from -55°C to +125°C.

In addition to commercial grade, automotive grade devices are available which meet the demanding Automotive Electronics Council's AEC-Q200 qualification requirements.



### Ordering Information

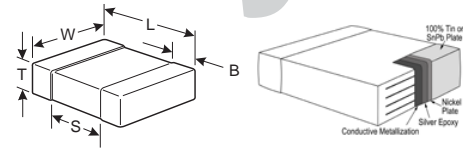
C	1206	X	563	J	3	G	A	C	TU
Ceramic	Case Size (L" x W")	Specification/ Series	Capacitance Code (pF)	Capacitance Tolerance <sup>1</sup>	Rated Voltage (VDC)	Dielectric	Failure Rate/ Design	Termination Finish <sup>2</sup>	Packaging/Grade (C-Spec) <sup>3</sup>
	0603 0805 1206 1210 1812 1825 2220 2225	X = Flexible Termination	2 significant digits + number of zeros. Use 9 for 1.0 – 9.9 pF Use 8 for 0.5 – .99 pF e.g., 2.2 pF = 229 e.g., 0.5 pF = 508	C = $\pm 0.25$ pF D = $\pm 0.5$ pF F = $\pm 1\%$ G = $\pm 2\%$ J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$	8 = 10 V 4 = 16 V 3 = 25 V 5 = 50 V 1 = 100 V 2 = 200 V	G = C0G	A = N/A	C = 100% Matte Sn	Blank = Bulk TU = 7" Reel Unmarked AUTO = Automotive Grade 7" Reel Unmarked

<sup>1</sup> Additional capacitance tolerance offerings may be available. Contact KEMET for details.

<sup>2</sup> Additional termination finish options may be available. Contact KEMET for details.

<sup>3</sup> Additional reeling or packaging options may be available. Contact KEMET for details.

## Dimensions – Millimeters (Inches)



EIA Size Code	Metric Size Code	L Length	W Width	T Thickness	B Bandwidth	S Separation Minimum	Mounting Technique
0603	1608	1.60 (.063) +0.20 (.008) / -0.10 (.004)	0.80 (.032) ± 0.15 (.006)	See Table 2 for Thickness	0.45 (.018) +0.05 (.002) / -0.15 (.006)	0.50 (.020)	Solder Wave OR Solder Reflow
0805	2012	2.10 (.083) +0.30 (.012) / -0.20 (.008)	1.25 (.049) ± 0.20 (.008)		0.50 (0.02) +0.10 (.004) / -0.25 (.010)	0.70 (.028)	
1206	3216	3.30 (.130) ± 0.40 (.016)	1.60 (.063) ± 0.20 (.008)		0.60 (.024) ± 0.25 (.010)	N/A	Solder Reflow Only
1210	3225	3.30 (.130) ± 0.40 (.016)	2.50 (.098) ± 0.20 (.008)		0.60 (.024) ± 0.25 (.010)		
1812	4532	4.50 (.178) ± 0.40 (.016)	3.20 (.126) ± 0.30 (.012)		0.70 (.028) ± 0.35 (.014)		
1825	4564	4.60 (.181) ± 0.40 (.016)	6.40 (.252) ± 0.40 (.016)		0.70 (.028) ± 0.35 (.014)		
2220	5650	5.90 (.232) ± 0.75 (.030)	5.00 (.197) ± 0.40 (.016)		0.70 (.028) ± 0.35 (.014)		
2225	5664	5.90 (.232) ± 0.75 (.030)	6.40 (.248) ± 0.40 (.016)		0.70 (.028) ± 0.35 (.014)		

## Benefits

- -55°C to +125°C operating temperature range
- Superior flex performance (up to 5 mm)
- Pb-Free and RoHS Compliant
- EIA 0603, 0805, 1206, 1210, 1812, 1825, 2220 and 2225 case sizes
- DC voltage ratings of 10 V, 16 V, 25 V, 50 V, 100 V and 200 V
- Capacitance offerings ranging from 0.5 pF up to 0.47 µF
- Available capacitance tolerances of ±0.25 pF, ±0.5 pF, ±1%, ±2%, ±5%, ±10% and ±20%
- No piezoelectric noise
- Extremely low ESR and ESL
- High thermal stability
- High ripple current capability
- Preferred capacitance solution at line frequencies and into the MHz range
- No capacitance change with respect to applied rated DC voltage
- Negligible capacitance change with respect to temperature from -55°C to +125°C
- Non-polar device, minimizing installation concerns
- 100% pure matte tin-plated termination finish allowing for excellent solderability
- Commercial & Automotive (AEC-Q200) grades available

## Applications

Typical applications include critical timing, tuning, circuits requiring low loss, circuits with pulse, high current, decoupling, bypass, filtering, transient voltage suppression and blocking, as well as energy storage in critical and safety relevant circuits without (integrated) current limitation, including those subject to high levels of board flexure or temperature cycling.