



# Defense & Aerospace

## MIL-PRF-32535 Qualified MLCCs



### Why Choose KEMET

KEMET Electronics Corporation is a leading global supplier of electronic components. We offer our customers the broadest selection of capacitor technologies in the industry, along with an expanding range of electromechanical devices, electromagnetic compatibility solutions and supercapacitors. Our vision is to be the preferred supplier of electronic component solutions for customers demanding the highest standards of quality, delivery and service.

### Features & Benefits

- Patented base-metal electrode (BME) technology
- Qualified per MIL-PRF-32535 (QPL)
- Standard reliability ("M" Level)
- High reliability ("T" Level)
- 100% voltage conditioning
- DC voltages up to 200 V
- 0402-2220 case sizes
- Available capacitance tolerances of  $\pm 0.1\text{pF}$ ,  $\pm 0.25\text{pF}$ ,  $\pm 0.5\text{pF}$ ,  $\pm 1\%$ ,  $\pm 2\%$ ,  $\pm 5\%$ ,  $\pm 10\%$
- Multiple termination options
- Non-polar device, minimizing installation concerns
- Laser marked

### Product Checklist

- Are you currently using MLCCs qualified to MIL-PRF-55681 or MIL-PRF-123?
- What is the maximum operating temperature?
- What are the capacitance and voltage requirements?
- Are there any size constraints?
- Are there any specific termination finish requirements?

For more information, samples and engineering kits, please visit us at [www.kemet.com](http://www.kemet.com) or call 1.877.myKEMET.

MIL-PRF-32535 is DLA's (Defense Logistics Agency) first capacitor specification for defense and aerospace that capitalizes on the industry's leading base-metal electrode (BME) technology. KEMET's MIL-PRF-32535 utilizes BME technology to deliver up to an 18-fold increase in capacitance for COG and BP dielectrics, compared to the offerings in MIL-PRF-123 and MIL-PRF-55681 using Precious Metal Electrode (PME) ceramic capacitors.

### Applications

- Guidance systems
- Communications
- Targeting systems
- Early warning systems
- Filtering
- Decoupling
- Bypass
- RC timing circuits



### Electrical/Physical Characteristics

Series	Grade	Case Size	Operating Temperature	Temp. Coeff	Maximum DC Voltage	Capacitance
MIL-PRF-32535 (COG/BP)	M-Level T-Level	0402 – 2220	-55°C to +125°C	0 $\pm$ 30 ppm/°C	200 V	1.0 pF – 180 nF

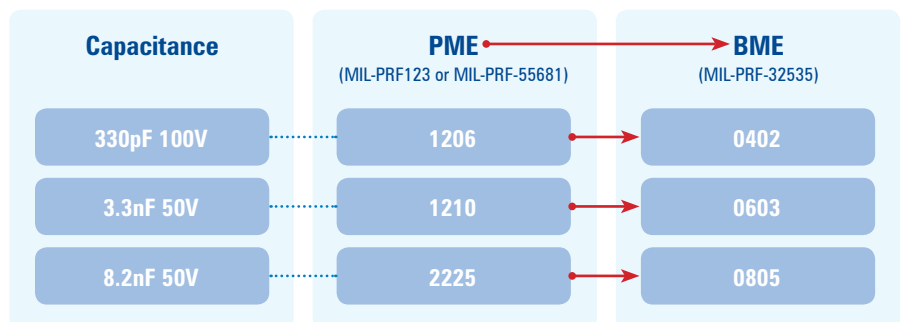
### MIL-PRF-32535 Ordering Information

M32535	04	E1	Z	104	J	R	M	B
MIL Prefix	Slash Sheet	Characteristic/ Dielectric	Rated Voltage (VDC)	Capacitance Code (pF)	Capacitance Tolerance	Termination <sup>1,2</sup>	Product Level	Electrode
	02 = 0402 03 = 0603 04 = 0805 05 = 1206 06 = 1210 07 = 1812 08 = 2220	E1 = COG BP = BP	V = 4 W = 6.3 X = 10 Y = 16 Z = 25 A = 50 B = 100 C = 200	Two significant digits + number of zeros. Use 9 for 1.0 – 9.9 pF e.g., 2.2 pF = 229	B = $\pm 0.1\text{ pF}$ C = $\pm 0.25\text{ pF}$ D = $\pm 0.5\text{ pF}$ F = $\pm 1\%$ G = $\pm 2\%$ J = $\pm 5\%$ K = $\pm 10\%$	D = Sn/Pb solder dipped G = Nickel gold plating R = Flexible termination with solder plating V = Flexible termination with nickel gold plating Z = Solder plated	M = M Level T = T Level	B = BME

<sup>1</sup>Termination options D, R, V, and L are not available in EIA 0402 case size.

<sup>2</sup>Termination option D is not available in EIA 0603 case size.

### Same Capacitance and Voltage in Smaller Case Size





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### Performance & Reliability

Inspection	Test Method	MIL-PRF-32535 M-Level	MIL-PRF-32535 T-Level
<b>In-Process Inspection</b>			
Nondestructive internal examination (pre-termination)	MIL-PRF-32535 Method 4.6.1	Not required	Yes (100%)
Visual examination (post-termination)	MIL-PRF-32535 Method 4.6.2	Not required	Yes (100%)
<b>Group A Inspection</b>			
Thermal shock	MIL-PRF-32535 Method 4.6.3	Not required	Yes (100%)
Nondestructive internal examination (case sizes ≥ 0805 only)	MIL-PRF-32535 Method 4.6.1	Not required	Yes (100%)
Voltage conditioning	MIL-PRF-32535 Method 4.6.3	Yes (100%)	Yes (100%)
Visual and mechanical inspection	MIL-PRF-32535 Method 4.6.2	Yes (per inspection lot)	Yes (production lot sample)
Destructive physical analysis (DPA)	MIL-PRF-32535 Method 4.6.8	Not required	Yes (production lot sample)
Solderability (solder dipped and solder plated terminations only)	MIL-PRF-32535 Method 4.6.11	Yes (per inspection lot)	Yes (production lot sample)
Wire Bond strength (gold plated terminations only)	MIL-PRF-32535 Method 4.6.12	Yes (per inspection lot)	Yes (production lot sample)
<b>Group B Inspection</b>			
Thermal shock	MIL-PRF-32535 Method 4.6.3	Yes (periodic)	Yes (production lot sample)
Life	MIL-PRF-32535 Method 4.6.16	Yes (periodic)	Yes (production lot sample)
Temperature humidity bias (load humidity)	MIL-PRF-32535 Method 4.6.15	Yes (periodic)	Yes (production lot sample)
Voltage - temperature limits / temperature characteristic	MIL-PRF-32535 Method 4.6.14	Yes (periodic)	Yes (production lot sample)
Dielectric Breakdown Voltage (UVBD)	MIL-PRF-32535 Method 4.6.17	Yes (periodic)	Yes (production lot sample)
<b>Group C Inspection</b>			
Board flex	MIL-PRF-32535 Method 4.6.9	Yes (periodic)	Yes (periodic)
Shear stress	MIL-PRF-32535 Method 4.6.10	Yes (periodic)	Yes (periodic)
Resistance to soldering heat	MIL-PRF-32535 Method 4.6.13	Yes (periodic)	Yes (periodic)