Specifications and Test Methods

<table>
<tr><th>No.</th><th colspan="2">Item</th><th>Specifications</th><th>Test Methods</th></tr>
<tr><td>1</td><td colspan="2">Operating Temperature Range</td><td>-55 to 125°C</td><td></td></tr>
<tr><td>2</td><td colspan="2">Appearance</td><td>No lifting
No scratch that exposes the ceramic material</td><td>Microscope at 20x magnification</td></tr>
<tr><td>3</td><td colspan="2">Rated Voltage</td><td>100Vdc</td><td></td></tr>
<tr><td>4</td><td colspan="2">Capacitance</td><td>Within the specified tolerance</td><td>MIL-STD-202 Method 305
Measurement Frequency: Temp. Comp.: 1MHz±10%
High Dielectric: 1kHz±10%
Measurement Voltage: 1Vrms</td></tr>
<tr><td>5</td><td colspan="2">Q/Dissipation Factor (D. F.)</td><td>H, 5C: Q≧200
K, R, U, F, 6U: Q≧100
Y, B5: D. F.≦2.5%</td><td>MIL-STD-202 Method 306
Test frequency and voltage are the same as those of the capacitance test.</td></tr>
<tr><td>6</td><td colspan="2">Insulation Resistance (I. R.)</td><td>25°C: 100000MΩ min.
125°C: 10000MΩ min.</td><td>MIL-STD-202 Method 302
Measurement Voltage: Rated Voltage
Measurement Temperature: 25±2°C and 125±2°C
Measurement Time: Within 2 minutes</td></tr>
<tr><td>7</td><td colspan="2">Dielectric Withstanding Voltage (D. W. V.)</td><td>Satisfies the following performance</td><td>MIL-STD-202 Method 301
Measurement Voltage: 250Vdc
Applied Time: 1 to 5 seconds
Charge/Discharge Current: 50mA max.</td></tr>
<tr><td>8</td><td colspan="2">Temperature Characteristics (Temperature Coefficient)</td><td>H, 5C: 0±30ppm/°C
K: -330±120ppm/°C
U, 6U: -750±120ppm/°C
R, F: -750±600ppm/°C
Y, B5: ±10%</td><td>The capacitance change should be measured at each specified temperature stage.
<table><tr><th>Step</th><th>Temp (°C)</th></tr><tr><td>1</td><td>25±2</td></tr><tr><td>2</td><td>-25±3</td></tr><tr><td>3</td><td>25±2</td></tr><tr><td>4</td><td>85±3</td></tr><tr><td>5</td><td>25±2</td></tr></table></td></tr>
<tr><td rowspan="2">9</td><td rowspan="2">Mechanical Strength</td><td>Bond Strength</td><td>Pull force: 3.0g min. (25μmø gold wire)
5.0g min. (38μmø gold wire)
7.0g min. (50μmø gold wire)
No electrode lifting</td><td>MIL-STD-883 Method 2011Condition D
Mount the capacitors on a gold metallized alumina substrate with AuSn (80/20) and bond a 25μmø/38μmø/50μmø gold wire to the capacitor electrode using wedge bonding. Then, pull the wire.</td></tr>
<tr><td>Die Shear Strength</td><td>Complies with MIL-STD-883 Method 2019</td><td>MIL-STD-883 Method 2019
Mount the capacitors on a gold metallized alumina substrate with AuSn (80/20). Apply force in the horizontal direction.</td></tr>
<tr><td rowspan="3">10</td><td rowspan="3">Vibration</td><td>Appearance</td><td>Satisfies the specification "Appearance"</td><td rowspan="3">MIL-STD-202 Method 201
Type of Vibration: 10 to 55 to 10Hz (1 min)
Total Amplitude: 1.5mm
This motion should be applied for a period of 2h in each of 3 mutually perpendicular directions (total of 6h).</td></tr>
<tr><td>Capacitance</td><td>Within the specified tolerance</td></tr>
<tr><td>Q/D. F.</td><td>Initial Value</td></tr>
<tr><td rowspan="5">11</td><td rowspan="5">Thermal Shock</td><td>Appearance</td><td>Satisfies the specification "Appearance"</td><td rowspan="5">MIL-STD-202 Method 107Condition A-1
Note : Temperature in Step 3: 125$^{+3}_{0}$°C
Test time in Step 1 and 3: 30 min
Exposure Time: H, K, R, U, F, 5C, 6U: 24±2h
B5, Y: 48±4h</td></tr>
<tr><td>Capacitance Change</td><td>H, K, R, U, F, 5C, 6U: ≦±5% or ≦±0.5pF (whichever is greater)
B5, Y: ≦±10%</td></tr>
<tr><td>Q/D. F.</td><td>Initial Value</td></tr>
<tr><td>I. R.</td><td>1000MΩ min.</td></tr>
<tr><td>D. W. V.</td><td>Satisfies the specification "D. W. V"</td></tr>
<tr><td rowspan="5">12</td><td rowspan="5">Humidity (No Load)</td><td>Appearance</td><td>Satisfies the specification "Appearance"</td><td rowspan="5">MIL-STD-202 Method 103
Temperature: 60±5°C
Humidity: 90 to 95%RH
Test Time: 1000±12h
Exposure Time: H, K, R, U, F, 5C, 6U: 24±2h
B5, Y: 48±4h</td></tr>
<tr><td>Capacitance Change</td><td>H, K, R, U, F, 5C, 6U: ≦±5% or ≦±0.5pF (whichever is greater)
B5, Y: ≦±10%</td></tr>
<tr><td>Q/D. F.</td><td>H, K, R, U, F, 5C, 6U: Q≧100
Y, B5: D. F.≦2.5%</td></tr>
<tr><td>I. R.</td><td>≧30% of initial value</td></tr>
<tr><td>D. W. V.</td><td>Satisfies the specification "D. W. V"</td></tr>
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Specifications and Test Methods

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No.	Item		Specifications	Test Methods
13	High Temperature Load	Appearance	Satisfies the specification "Appearance"	MIL-STD-202 Method 108 Test Temperature: 125±3°C Applied Voltage: 200% x Rated Voltage Test Time: 1000±12h Exposure Time: H, K, R, U, F, 5C, 6U: 24±2h B5, Y: 48±4h
		Capacitance Change	H, K, R, U, F, 5C, 6U: ≦±5% or ≦±0.5pF (whichever is greater) B5, Y: ≦±10%	
		Q/D. F.	H, K, R, U, F, 5C, 6U: Q≧100 Y, B5: D. F.≦2.5%	
		I. R.	≧30% of initial value	
		D. W. V.	Satisfies the specification "D. W. V"	
14	Humidity Load	Appearance	Satisfies the specification "Appearance"	MIL-STD-202 Method 103 Temperature: 85±2°C Humidity: 85±5%RH Bias Voltage: 1.5V±10% Test Time: 240h Exposure Time: H, K, R, U, F, 5C, 6U: 24±2h B5, Y: 48±4h
		Capacitance Change	H, K, R, U, F, 5C, 6U: ≦±5% or ≦±0.5pF (whichever is greater) B5, Y: ≦±10%	
		Q/D. F.	H, K, R, U, F, 5C, 6U: Q≧100 Y, B5: D. F.≦2.5%	
		I. R.	10000MΩ min.	
		D. W. V.	Satisfies the specification "D. W. V"	

Mounting for testing: The capacitors should be mounted on the substrate as shown below using die bonding and wire bonding when tests No. 10 to 14 are performed.