

# Safety recognized ceramic capacitors

## Specifications test methods

### Specifications Test Methods

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No.	Item	Specifications	Testing Method								
13	Humidity Loading	Appearance	No marked defect.								
		Capacitance Change	C: Within $\pm 2.5\%$ L: Within $\pm 5.0\%$ X, B, E: Within $\pm 10\%$ F: Within $\pm 15\%$								
		D.F.	<table border="1"> <thead> <tr> <th>Char.</th> <th>Specifications</th> </tr> </thead> <tbody> <tr> <td>C, L</td> <td><math>Q \geq 275 + 5/2C_R</math> (<math>C_R &lt; 30\text{pF}</math>) <math>Q \geq 350</math> (<math>C_R \geq 30\text{pF}</math>)</td> </tr> <tr> <td>X, B, E</td> <td><math>\tan\delta \leq 0.050</math></td> </tr> <tr> <td>F</td> <td><math>\tan\delta \leq 0.075</math></td> </tr> </tbody> </table>	Char.	Specifications	C, L	$Q \geq 275 + 5/2C_R$ ( $C_R < 30\text{pF}$ ) $Q \geq 350$ ( $C_R \geq 30\text{pF}$ )	X, B, E	$\tan\delta \leq 0.050$	F	$\tan\delta \leq 0.075$
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X, B, E	$\tan\delta \leq 0.050$										
F	$\tan\delta \leq 0.075$										
I. R.	3000M $\Omega$ min.										
Dielectric Strength	Per Item 6.										
			Apply the rated voltage for 500 $\pm$ 12 hrs. at 40 $\pm$ 2°C in 90 to 95% relative humidity. Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition <sup>1</sup> .								
14	Life	Appearance	No marked defect.								
		Capacitance Change	Within $\pm 20\%$								
		I. R.	3000M $\Omega$ min.								
		Dielectric Strength	Per Item 6.								
			Impulse Voltage Each individual capacitor should be subjected to a 5kV (Type WD: 8kV) impulses for three times. After the capacitors are applied to life test.  <p>Front time (T1) = 1.2<math>\mu</math>s = 1.67T Time to half-value (T2) = 50<math>\mu</math>s</p>								
			Apply a voltage of Table 4 for 1000 hrs. at 125 $\pm$ 2/-0°C, and relative humidity of 50% max.  <Table 4> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Applied Voltage</th> </tr> </thead> <tbody> <tr> <td>AC425V(r.m.s.), except that once each hour the voltage is increased to AC1000V(r.m.s.) for 0.1 sec.</td> </tr> </tbody> </table> Post-treatment: Capacitor should be stored for 1 to 2 hrs. at room condition <sup>1</sup> .	Applied Voltage	AC425V(r.m.s.), except that once each hour the voltage is increased to AC1000V(r.m.s.) for 0.1 sec.						
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15	Flame Test	The capacitor flame discontinues as follows.	The capacitor should be subjected to applied flame for 15 sec. and then removed for 15 sec. until 5 cycles are completed.								
		<table border="1"> <thead> <tr> <th>Cycle</th> <th>Time (sec.)</th> </tr> </thead> <tbody> <tr> <td>1 to 4</td> <td>30 max.</td> </tr> <tr> <td>5</td> <td>60 max.</td> </tr> </tbody> </table>	Cycle	Time (sec.)	1 to 4	30 max.	5	60 max.			
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16	Robustness of Terminations	Tensile	As shown in the figure at right, fix the body of the capacitor and apply a tensile weight gradually to each lead wire in the radial direction of the capacitor up to 10N and keep it for 10 $\pm$ 1 sec.								
		Bending	Lead wire should not be cut off. Capacitor should not be broken.  Each lead wire should be subjected to 5N weight and then a 90° bend, at the point of egress, in one direction, return to original position, and then apply a 90° bend in the opposite direction at the rate of one bend in 2 to 3 sec.								

<sup>1</sup> "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

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