



1.Scope :

This specification covers polarized aluminium electrolytic capacitors with solid electrolyte for use in electronic equipment.

2. Reference Standard :

JIS C 5101-4-2 1998 Aluminium electrolytic capacitors with solid electrolyte

3. Operating Temperature Range :

-55 °C~+105 °C

4. Style:Radial Leaded

voltage:6.3VDC

Capacitance:220uF/270uF/330uF/470uF/560uF/680uF.

Tolerance:±20%

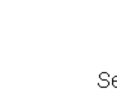
5. Lead Forming Type , Lead Spacing and Lead Length

Capacitance	Lead Forming Type	Lead Spacing (mm)	Lead Length (mm)
220uF/270uF/330uF	Long Lead	2.0	Long Lead
	Taping	5.0	
	Cutting	2.0	3.3
		2.0	3.1

Capacitance	Lead Forming Type	Lead Spacing (mm)	Lead Length (mm)
470uF/560uF/680uF	Long Lead	2.5	Long Lead
	Taping	5.0	
	Cutting	2.5	3.3
		2.5	3.1

6. Case Dimension Code

Part number	6308
Dimension (mm)	6.3x8



7. Marking

Unless otherwise specified capacitor shall be clearly marked the following items on its aluminium that enamel by nylon laminate.

(1) Rated Voltage

(2) Rated Capacitance

(3) Negative Polarity

(4) Series

(5) Date Code

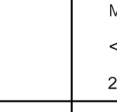



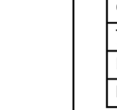
Table - 1 PERFORMANCE

			<table><tr><td>Capacitance</td><td>220uF</td><td>270uF</td><td>330uF</td><td>470uF</td><td>560uF</td><td>680uF</td></tr><tr><td>WV (V.dc)</td><td>6.3</td><td>6.3</td><td>6.3</td><td>6.3</td><td>6.3</td><td>6.3</td></tr><tr><td>Tan δ</td><td>0.12</td><td>0.10</td><td>0.10</td><td>0.10</td><td>0.10</td><td>0.10</td></tr></table>	Capacitance	220uF	270uF	330uF	470uF	560uF	680uF	WV (V.dc)	6.3	6.3	6.3	6.3	6.3	6.3	Tan δ	0.12	0.10	0.10	0.10	0.10	0.10
Capacitance	220uF	270uF	330uF	470uF	560uF	680uF																		
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Tan δ	0.12	0.10	0.10	0.10	0.10	0.10																		
4	ESR	<p>< Condition ></p> <p>Measuring Frequency : 100 ~ 300 kHz ± 10%</p> <p>Measuring Voltage : Not more than 0.5 Vrms +2.1 ~ 2.5 V.DC</p> <p>Measuring Temperature : 25 ± 10 °C</p> <table><tr><td>Capacitance :</td><td>220μF</td><td>270μF</td><td>330μF</td><td>470μF</td><td>680μF</td></tr><tr><td>8mΩ Max</td><td>11mΩ Max</td><td>8mΩ Max</td><td>17mΩ Max</td><td>8mΩ Max</td><td>8mΩ Max</td></tr></table>					Capacitance :	220μF	270μF	330μF	470μF	680μF	8mΩ Max	11mΩ Max	8mΩ Max	17mΩ Max	8mΩ Max	8mΩ Max						
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8mΩ Max	11mΩ Max	8mΩ Max	17mΩ Max	8mΩ Max	8mΩ Max																			
5	Leakage Current	<p>< Condition ></p> <p>The rated voltage shall be applied between terminals of capacitor such that the terminal voltage will reach the rated voltage with in two minute and the leakage current shall be measured at following time after the voltage has reached the rated voltage across a 1000 ±10 Ω series protection resistor. Then the current value shall not exceed value calculated from following formula.</p> <p>< Criteria ></p> <table><tr><td>Rated</td><td>6.3V / 220 μF</td><td>6.3V / 270μF</td><td>6.3V / 330 μF</td></tr><tr><td>LC (2 Minute)</td><td>300 μA</td><td>500 μA</td><td>500 μA</td></tr></table> <table><tr><td>Rated</td><td>6.3V / 470 μF</td><td>6.3V / 560 μF</td><td>6.3V / 680 μF</td></tr><tr><td>LC (2 Minute)</td><td>592 μA</td><td>706 μA</td><td>500 μA</td></tr></table>					Rated	6.3V / 220 μF	6.3V / 270μF	6.3V / 330 μF	LC (2 Minute)	300 μA	500 μA	500 μA	Rated	6.3V / 470 μF	6.3V / 560 μF	6.3V / 680 μF	LC (2 Minute)	592 μA	706 μA	500 μA		
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TMCE33 Conductive Polymer Aluminum Solid Capacitors

6	Temperature Characteristics	<p><Condition></p> <p>Step 1 : Measure impedance at +20 ±2 °C , 100 kHz ±20%</p> <p>Step 2 : Measure impedance at -25 ±2 °C , 100 kHz ±20%</p> <p>Step 3 : Measure impedance at -55 ±2 °C , 100 kHz ±20%</p> <p><Criteria></p> <p>Impedance ratio of the -25 °C and -55 °C values to the +20 °C value shall be not exceed the following values.</p> <table><tr><td>Z(-25 °C)/Z(+20 °C)</td><td>1.15</td></tr><tr><td>Z(-55 °C)/Z(+20 °C)</td><td>1.25</td></tr></table>	Z(-25 °C)/Z(+20 °C)	1.15	Z(-55 °C)/Z(+20 °C)	1.25
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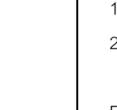


		for 1~2 hours before measurement. [Cr : Nominal Capacitance(μF)]										
		<Criteria>										
		<table><tr><td>Leakage Current</td><td>Not more than the specified value</td></tr><tr><td>Capacitance Change</td><td>Within ±20% of the initial value</td></tr><tr><td>Tanδ</td><td>Not more than 150% of the specified value</td></tr><tr><td>ESR</td><td>Not more than 150% of the specified value</td></tr><tr><td>Appearance</td><td>Notable changes shall not be found</td></tr></table>	Leakage Current	Not more than the specified value	Capacitance Change	Within ±20% of the initial value	Tanδ	Not more than 150% of the specified value	ESR	Not more than 150% of the specified value	Appearance	Notable changes shall not be found
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Appearance	Notable changes shall not be found											
		This test simulates overvoltage at abnormal situations, and not be hypothesizing that overvoltage is always applied.										



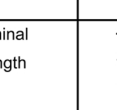
TMCE33 Conductive Polymer Aluminum Solid Capacitors

9	Vibration Test	<p><Condition></p> <p>Testing shall be done out in 3 AXIS for 2 hours each (total 6 hours) as below. Fix lead wire at a point not more than 4mm from the body, use mounting device separately for the one with a diameter 12.5mm and greater or with a length 25mm and longer.</p> <div><p>Vibration frequency range : 10 ~ 55 Hz</p><p>Peak to peak amplitude : 1.5 mm</p><p>Sweep rate : 10~55~10 Hz, about 1 min.</p></div> <p><Criteria></p> <table><tr><td>Capacitance (During test)</td><td>Measured value shall be stable. (The time for one end to the other of the vibration frequency within last 30 minutes at direction.)</td></tr><tr><td>Capacitance Change</td><td>Within ±5% of the initial value</td></tr><tr><td>Appearance</td><td>Notable changes shall not be found</td></tr></table>	Capacitance (During test)	Measured value shall be stable. (The time for one end to the other of the vibration frequency within last 30 minutes at direction.)	Capacitance Change	Within ±5% of the initial value	Appearance	Notable changes shall not be found
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10	Solderability Test	<p><Condition></p> <p>1. Test method is refer to EIAJ ED-4701.</p> <p>2. Material :</p> <p>(1) Solder : Sn / 3.0 Ag / 0.5 Cu (Weight %)</p> <p>(2) Flux : Rosin 25% , IPA 75%</p> <p>3. Test condition : Take a capacitor subjected to the above pre-treatment , leave it for at least 2 hours at room temperature, and then, immersion for 3~5 seconds in the prescribe flux.</p> <table><tr><td>Solder Temp</td><td>235 ± 5 °C</td></tr><tr><td>Immersion depth</td><td>2 m / m</td></tr><tr><td>Immersion Time</td><td>3 seconds</td></tr></table> <p><Criteria></p>	Solder Temp	235 ± 5 °C	Immersion depth	2 m / m	Immersion Time	3 seconds
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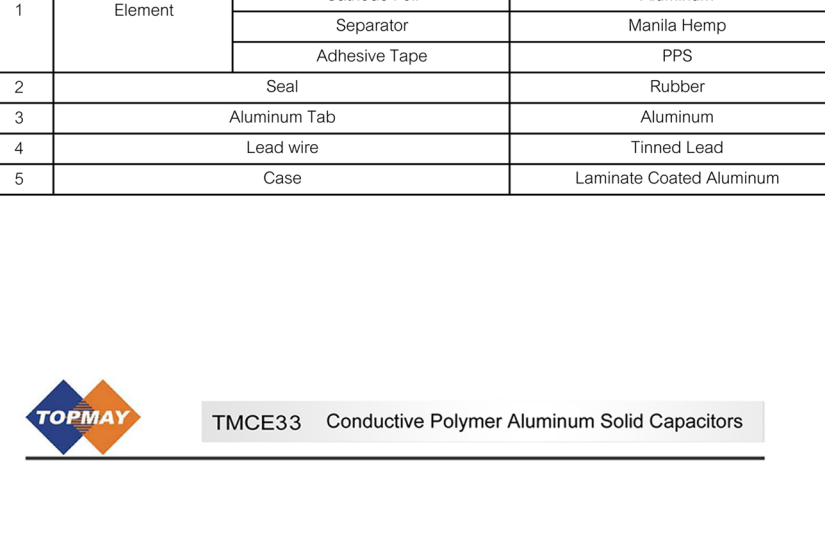
		<p><Criteria></p> <p>After test , the capacitor shall be left for 1-2 hours under the room temperature and normal humidity before measurement.</p> <table><tr><td>Leakage Current</td><td>Not more than the specified value</td></tr><tr><td>Capacitance</td><td>Within +/- 10 % of the initial value</td></tr><tr><td>Tanδ</td><td>Not more than the specified value</td></tr><tr><td>ESR</td><td>Not more than the specified value</td></tr><tr><td>Appearance</td><td>Notable changes shall not be found</td></tr></table>	Leakage Current	Not more than the specified value	Capacitance	Within +/- 10 % of the initial value	Tanδ	Not more than the specified value	ESR	Not more than the specified value	Appearance	Notable changes shall not be found
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12	Resistance to Damp Heat (Steady State)	<p><Condition></p> <p>Humidity Test :</p> <p>Capacitor shall be exposed for 1000 ±24 hours in an atmosphere of 90~95% R.H. at 60 ±2 °C, the characteristic change shall meet the following requirement.</p> <p>After test , the capacitor shall be left for 1-2 hours under the room temperature and normal humidity before measurement.</p> <p><Criteria></p>										



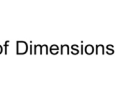
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Leakage Current	Not more than the specified value											
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13	Terminal Strength	<div><Condition> 1. Tensile Strength of Terminals The body of capacitor shall be fixed and the tensile force of following table shall be applied to the terminal in lead out direction of the terminal for 10 ±1seconds. 2. Bending Strenght of Terminals The body of capacitor shall be held in such a way that the regular lead out axis of leadwire terminal becomes vertical. The weight of following table shall be suspended from the end of terminal. In this condition , after the body of sample is bent through 90 degrees , it shall be returned to the original position. Next the body shall be revers bent through 90 degrees and again returned to the original position. <table><tr><th>Diameter of lead wire</th><th>Tensile force N(kgf)</th><th>Bending force N(kgf)</th></tr><tr><td>0.5 mm and less</td><td>5(0.51)</td><td>2.5(0.25)</td></tr><tr><td>0.6 mm to 0.8 mm</td><td>10(1.0)</td><td>5(0.51)</td></tr></table> <Criteria> Notable changes shall not be found , as breakage or looseness in the terminal.</div>	Diameter of lead wire	Tensile force N(kgf)	Bending force N(kgf)	0.5 mm and less	5(0.51)	2.5(0.25)	0.6 mm to 0.8 mm	10(1.0)	5(0.51)	
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8. Construction and Material Details



Part Number	Rated Voltage (Vdc)	Rated Capacitance (μF)	Case Size ϕD×L (mm)	ESR	Rated	Tanδ	Leakage Current (μA)
				100 KHz~ to 300KHz	Ripple Current		
				(mΩ2max)	(mAmps/105°C100KHz)		
3-221M6.3VP2B	6.3 (0J)	220	5×8	11	3200	0.12	300
3-271M6.3VP2B	6.3 (0J)	270	5×8	8	4180	0.10	500
3-331M6.3VP2B	6.3 (0J)	330	5×8	17	3390	0.10	500
3-471M6.3VP2.5B	6.3 (0J)	470	6.3×8	8	4700	0.10	592
	6.3						



9. Table -2 Standard Ratings

Part Number	Rated Voltage (Vdc)	Rated Capacitance (μF)	Case Size φD×L (mm)	ESR	Rated	Tanδ	Leakage Current (μA)
				100 KHz~to 300KHz (mΩmax)	Ripple Current (mA rms/105°C100KHz)		
TMCE33-221M6.3VP2B	6.3 (0J)	220	5×8	11	3200	0.12	300
TMCE33-271M6.3VP2B	6.3 (0J)	270	5×8	8	4180	0.10	500
TMCE33-331M6.3VP2B	6.3 (0J)	330	5×8	17	3390	0.10	500
TMCE33-471M6.3VP2.5B	6.3 (0J)	470	6.3×8	8	4700	0.10	592
TMCE33-561M6.3VP2.5B	6.3 (0J)	560	6.3×8	8	4700	0.10	706
TMCE33-681M6.3VP2.5B	6.3 (0J)	680	6.3×8	8	4700	0.10	500

10. Diagram of Dimensions (unit : mm.)

Code : NN

