

Data Sheet

Customer: _____

Product: Aluminum Electrolytic Capacitors – AE5R Series AEC-Q200 version available

Size : 4x5mm ~ 8x5mm

Issued Date: 16-Oct-2023

Edition: Ver. 1

Record of change

Date	Ver.	Description	Page
16-Oct-2023	1		

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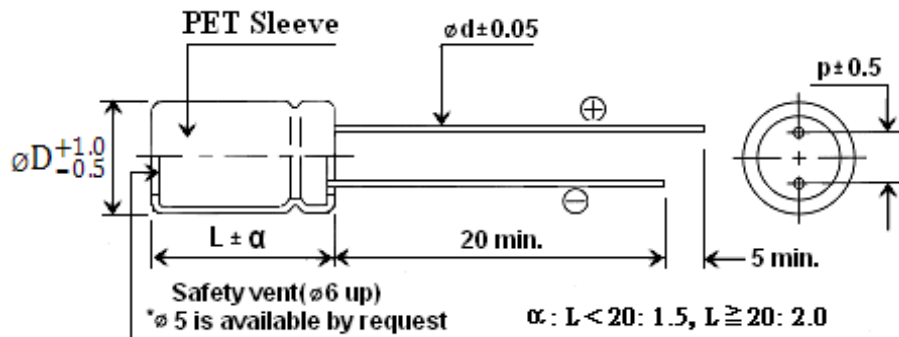
Prepared by	Checked by	Approved by	Accepted by (customer)
16-Oct-2023	16-Oct-2023	16-Oct-2023	
<i>Andy Hsu</i>	<i>Hwa Wu</i>	<i>Hwa Wu</i>	

- Ultra miniature Radial Type 5mm Height
- Designed for use in VCRs, car radios, Car stereos.
- AEC-Q200 version available

Characteristics

Voltage Range	4 ~ 50 V							
Capacitance Range	0.1 ~ 220uF							
Temperature Range	-40 ~ + 105°C							
Capacitance Tolerance	±20% at 120Hz , 20°C(10% Tol. is available upon request)							
Leakage Current	I≤0.01CV or 3uA, whichever is greater (After 2 minutes)							
Dissipation Factor	Rated Voltage (V)	4V	6.3V	10V	16V	25V	35V	50V
	Dissipation Factor(tanδ)max	0.35	0.24	0.20	0.16	0.14	0.12	0.10
(at 20°C, 120Hz)								
Stability at Low Temperature	Impedance ration at 120Hz							
	Rated Voltage (V)	4V	6.3V	10V	16V	25V	35V	50V
	Z-25°C/Z 20°C	7	4	3	2	2	2	2
	Z-40°C/Z 20°C	15	8	6	4	4	3	3
Load Life (size 8x5mm is 85°C 1000hrs)	After the rated voltage has been applied for 1000 hours at 105°C	Capacitance change	Within ±20% of initial value					
		D.F. tanδ	200% or less of initial specified value					
		Leakage current	Less than Initial specified value					
Shelf Life (size 8x5mm is 85°C 500hrs)	After storage for 1000 hours at 105°C with no voltage applied, the capacitor shall meet the specified limit in load life. Pre-treatment for measurement shall be conducted after application of DC working voltage for 30 minutes.							

Diagram of dimensions



D ϕ	4	5	6.3	8
p	1.5	2.0	2.5	3.5
d ϕ	0.45			

Ripple Current Coefficients

Frequency (Hz)	50(60)	120	1K	≥10K
Cap.(uF) / Hz	Multiplier			
Cap. ≤ 10	0.65	1.0	1.30	1.50
10 < Cap. ≤ 100	0.8	1.0	1.15	1.20

Case Size of Standard Products & Maximum Ripple Current mA rms 105°C 120Hz

Cap. \ WV	4		6.3		10		16		25		35		50		
uF	Size	R.C.	Size	R.C.	Size	R.C.	Size	R.C.	Size	R.C.	Size	R.C.	Size	R.C.	
0.1												→	4x5	1.0	
0.22		ALL BLANK VOLTAGE ON SLEEVE MARKING IS SAME VOLTAGE “→” POINT TO											→	4x5	2.0
0.33													→	4x5	2.8
0.47													→	4x5	4.0
1													→	4x5	8.0
2.2													→	4x5	10
3.3													→	4x5	17
4.7							→	4x5	16	4x5	18	5x5	20		
10					→	4x5	23	4x5	27	5x5	30	6.3x5	33		
22					4x5	28	5x5	37	5x5	42	6.3x5	46	6.3x5	48	
33		→	→	→	5x5	41	5x5	49	6.3x5	53	8x5	62			
47	4x5	34	5x5	45	5x5	45	6.3x5	58	6.3x5	60	8x5	80			
100	5x5	50	6.3x5	56	6.3x5	70	6.3x5	85	8x5	95					
220	6.3x5	80	6.3x5	90	8x5	95									

*Size 8x5 is 85°C only.

Unit: mm

Part Numbering System

AE5R SERIES	101 CAPACITANCE	M TOL.	25 W.V.	A PACKAGE	- SIZE	T1 LEAD SPACE
	IN 3DIGITS	K= ± 10%	0G= 4V	B= Bulk	Omit if only	Omit if Bulk
	010= 1.0uF	M= ± 20%	0J= 6.3V	C5= Cut 5mm	one size	T1= L/S 2.5mm Taped
	4R7= 4.7 uF		10= 10V	A= Ammo Pack	A=Smaller	TA= Lead forming space 5mm Taped
	101= 100uF		25= 25V	R= Tape&Reel	size	T35= L/S 3.5mm Taped
	221= 220uF		50= 50V	F5= Lead formed & cut 5mm		T2=L/S 5mm Taped

Reliability for Car- Tronics

AEC Q-200_REV D

Endurance Characteristic:

No.	Item	Conditions	Specification		Reference	
1	High Temperature Load Life Test	Capacitor is placed in the highest temperature with rated voltage for 5000+72/-0Hrs.	Capacitance change	Within $\pm 30\%$ of initial value	MIL-STD-202 Method 108	
			Tan δ	Less than 300% of specified value		
			Leakage Current	Within specified value		
			Appearance	No abnormality		
2	High Temperature Exposure (Storage)	Capacitor is placed in the highest temperature for 1000+48/-0Hrs.	Capacitance change	Within $\pm 30\%$ of initial value	MIL-STD-202 Method108	
			Tan δ	Less than 300% of specified value		
			Leakage Current	Within specified value		
			Appearance	No abnormality		
3	Temperature Cycling	Step1: Max. rated temperature $\pm 3/-3^{\circ}\text{C}$ (30 \pm 3mins) Step2: Min. rated temperature $\pm 3/-3^{\circ}\text{C}$ (30 \pm 3mins) Max.transfer time: 1min According to the step1 to step2, and do 1000cycles	Capacitance change	Within $\pm 10\%$ of initial value	JESD22 Method JA-104	
			Tan δ	Within specified value		
			Leakage Current	Within specified value		
			Appearance	No abnormality		
4	Biased Humidity	Capacitor is placed at the temperature of $85\pm 3^{\circ}\text{C}$, and humidity of 85% with rated voltage for 1000Hrs	Capacitance change	Within $\pm 20\%$ of initial value	MIL-STD-202 Method 103	
			Tan δ	Less than 150% of specified value		
			Leakage Current	Within specified value		
			Appearance	No abnormality		
5	Physical Dimension		Appearance	No abnormality	JESD22 Method JB-100	
6	Resistance To Solvent	1.The capacitor shall be immersed into the isopropyl. 2.Immersion time: 3 +0.5/-0 minutes at $25\pm 5^{\circ}\text{C}$. 3.Use wool brush to brush capacitor for 10 times. Conduct the steps 1~3 for 3 cycles.	Print cannot fall off or ambiguous		MIL-STD-202 Method 215	
7	Mechanical Shock	Capacitor is placed on the PCB and fixed.Conditions as below:		Capacitance change	Within $\pm 10\%$ of initial value	MIL-STD-202 Method 213
		Test items	For automobile	Tan δ	Within specified value	
		Acceleration speed	100g(1000 m/s ²)	Leakage Current	Within specified value	
		Shocking direction	X-Y-Z three axles (6 planes)	Appearance	No abnormality	
		Duration(D)(ms)	6			
		Velocity(m/s)	3.75			
		Wave	Half sine			
Test times	18times (3*6=18)					
8	Vibration	Capacitor is placed in the PCB and fixed. Setting the acceleration (5g)and frequency (10-2000Hz) according to the test condition ,vibration 4Hrs from three directions (X-Y-Z).	Capacitance change	Within $\pm 10\%$ of initial value	MIL-STD-202 Method 204	
			Tan δ	Within specified value		
			Leakage Current	Within specified value		
			Appearance	No abnormality		

No.	Item	Conditions	Specification	Reference																																																
9	Resistance to Soldering Heat	<p>According to the Control standard operating of Jarson, test twice.</p>	<table border="1"> <tr> <td>Capacitance change</td> <td>Within ±10% of initial value</td> </tr> <tr> <td>Tanδ</td> <td>Within specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> <tr> <td>Appearance</td> <td>No abnormality</td> </tr> </table>	Capacitance change	Within ±10% of initial value	Tanδ	Within specified value	Leakage Current	Within specified value	Appearance	No abnormality	MIL-ST D- 202 Method 210																																								
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10	Solderability test (SMD)	<p>Solderability test 1: Solder bath temperature: 235±5°C Duration:5±0/-0.5s Solderability test 2:Solder bath temperature:260±5°C Duration:7±0.5s</p>	Sn is more than 95% in the surface of terminal	J-STD-002B																																																
11	Electrical Characterization	Whether there is abnormality about electrical characterization in the test that under the ensurance temperature(the lowest ,the highest, atmospheric temperature).	Appearance: No abnormality	User Spec.																																																
12	Board Flex	Capacitor is placed in the PCB and pressed to deviate from Original fulcrum more than 2mm for 60 (+5) s.	<table border="1"> <tr> <td>Capacitance change</td> <td>Within ±10% of initial value</td> </tr> <tr> <td>Tanδ</td> <td>Within specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> <tr> <td>Appearance</td> <td>No abnormality</td> </tr> </table>	Capacitance change	Within ±10% of initial value	Tanδ	Within specified value	Leakage Current	Within specified value	Appearance	No abnormality	AEC-Q 200-005																																								
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13	Terminal Strength (SMD)	Test condition: Capacitor is placed in the PCB by solder paste and do high temperature test (Reflow) to endurance the power of 1.8kg for 60S,no dropping condition.	<table border="1"> <tr> <td>Capacitance change</td> <td>Within ±10% of initial value</td> </tr> <tr> <td>Tanδ</td> <td>Within specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> <tr> <td>Appearance</td> <td>No abnormality</td> </tr> </table>	Capacitance change	Within ±10% of initial value	Tanδ	Within specified value	Leakage Current	Within specified value	Appearance	No abnormality	AEC-Q 200-006																																								
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Leakage Current	Within specified value																																																			
Appearance	No abnormality																																																			
14	Surge Voltage	Capacitor is placed at 15°C~35°C with surge voltage for 30±5(charging) and 330s(discharging),do surge voltage test continuity for 1000 times. Applying voltage:	<table border="1"> <tr> <td>Capacitance change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Tanδ</td> <td>Less than 175% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> <tr> <td>Appearance</td> <td>No abnormality</td> </tr> </table>	Capacitance change	Within ±20% of initial value	Tanδ	Less than 175% of specified value	Leakage Current	Within specified value	Appearance	No abnormality	AEC-Q 200-007																																								
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