

Data Sheet

Customer: _____

Product: Aluminum Electrolytic Capacitors – AESX Series

AEC-Q200 version available

Size : 5x11mm ~ 18x41mm

Issued Date: 16-Oct-2023

Edition: Ver. 1

Record of change

Date	Ver.	Description	Page
16-Oct-2023	1		

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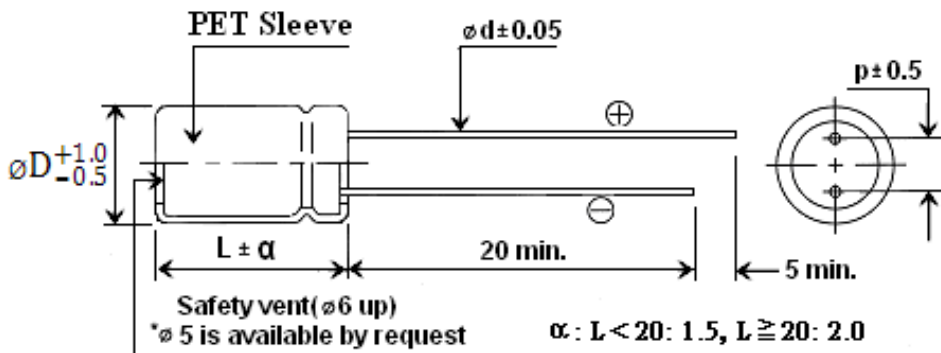
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Prepared by	Checked by	Approved by	Accepted by (customer)
16-Oct-2023	16-Oct-2023	16-Oct-2023	
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- AESX series capacitors are extremely low impedance for high frequency.
- Load life 105°C, 5000 hours assured. (2000 hours for $D \leq 8\text{mm}$ as specified below)
- AEC-Q200 version available

Characteristics

Voltage Range	6.3 ~ 63V				100V				
Capacitance Range	1.0 ~ 10000uF								
Temperature Range	-55 ~ + 105°C				-40 ~ + 105°C				
Leakage Current	I=0.01CV or 3uA, whichever is greater (After 2 minutes)								
Capacitance Tolerance	±20% at 120Hz, 20°C (10% Tol. is available upon request)								
Dissipation Factor	WV	6.3	10	16	25	35	50	63	100
	tan δ	0.20	0.18	0.16	0.14	0.12	0.10	0.09	0.08
For capacitance > 1000uF, add 0.02 for every 1000uF.(at 20°C, 120Hz)									
Stability at Low Temperature (120Hz)	Rated Voltage (V)	6.3	10	16	25	35	50	63	100
	Z-40°C/Z 20°C	6	4	3	3	2	2	2	2
	Z-55°C/Z 20°C	8	6	5	5	4	4	4	3
Load Life After the rated voltage has been applied for 2000~5000 hours at 105°C	2000hrs for $D \leq 8\text{mm}$, 5000hrs for $D \geq 10\text{mm}$				Capacitance change		Within ±25% of initial value		
					D.F. (tanδ)		200% or less of initial specified value		
					Leakage current		Less than initial specified value		
Shelf life (at 105°C)	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.								



Drawing

Dφ	5	6.3	8	10	13	16	18
p	2.0	2.5	3.5	5.0	5.0	7.5	7.5
dφ	0.5	0.5	0.5	0.6	0.6	0.8	0.8

■ Ripple Current Coefficients

Cap(uF)\Freq. (Hz)	60	120	400	1K	10K	>10K
Cap. ≤ 10	0.47	0.59	0.76	0.85	0.97	1
10 < Cap. ≤ 100	0.52	0.62	0.80	0.89	0.97	1
100 < Cap. ≤ 1000	0.58	0.72	0.84	0.90	0.98	1
1000 < Cap.	0.63	0.78	0.87	0.91	0.98	1

Part Numbering System

AESX □ □ □ □ □ □ **B** □ □
Series Capacitance Tolerance Rated Voltage Package Extended Code

Case size & Maximum Ripple Current (mA rms 105°C 100KHz) & Imp. (Ω 20°C 100KHz)

WV Cap.	6.3			10			16			25			
	uF	Size	Imp	RC	Size	Imp	RC	Size	Imp	RC	Size	Imp	RC
10								5x11	4.00	37	5x11	2.10	56
22								5x11	2.00	70	5x11	1.80	120
33								5x11	1.26	130	5x11	1.20	150
47				5x11	1.20	120	5x11	0.52	190	5x11	0.50	220	
68				5x11	0.89	145	5x11	0.45	210	6.3x11	0.39	270	
100	5x11	0.95	185	5x11	0.48	205	6.3x11	0.31	260	6.3x11	0.28	300	
150	6.3x11	0.75	210	6.3x11	0.37	270	6.3x11	0.26	300	8x12	0.19	435	
220	6.3x11	0.55	300	6.3x11	0.28	330	8x12	0.21	455	8x12	0.125	550	
330	8x12	0.30	390	8x12	0.16	430	8x12	0.12	550	10x13	0.082	720	
470	8x12	0.22	430	8x12	0.12	555	10x13	0.095	722	10x16	0.065	1040	
680	8x12	0.18	510	10x13	0.10	660	10x16	0.074	920	10x20	0.052	1280	
1000	10x13	0.10	660	10x16	0.07	1010	10x20 10x25	0.054 0.050	1100 1180	13x20 13x25	0.039 0.038	1530 1580	
1500	10x16 10x20	0.074 0.054	1050 1100	10x20	0.054	1270	10x25 13x20	0.041 0.050	1470 1400	13x25	0.032	2020	
2200	10x25 13x20	0.057 0.050	1300 1400	13x20 13x25	0.050 0.040	1400 1690	13x20 13x25	0.035 0.033	1850 1950	16x25	0.027	2405	
3300	13x20 13x25	0.050 0.048	1400 1500	13x25	0.029	1980	16x25	0.028	2340	16x31.5 18x25	0.020 0.022	2960 3050	
4700	13x25 16x25	0.032 0.030	1800 2100	16x25	0.029	2100	16x31.5	0.022	2650	18x36	0.021	3520	
6800	16x25	0.022	2230	16x31.5	0.025	2600	18x31.5 18x36	0.020 0.022	2700 3000	18x41	0.017	3600	
10000	16x31.5 16x36	0.021 0.019	2600 2740	18x31.5 18x36	0.017 0.022	2770 3000	18x41	0.015	3300				

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 Method 108	
			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	According to the Control standard operating of Jarson, test twice.	Capacitance change	Within ±10% of initial value	MIL-STD-202 Method 210								
			Tanδ	Within specified value									
			Leakage Current	Within specified value									
			Appearance	No abnormality									
			Rated voltage (V)	4~50		63 up	4~100						
		Case size (φ)	4~6.3	4~6.3		8~12.5							
		Preheat	Temp.(T1~T2,°C)	150-180									
			Time (t1)(Max,secs)	100									
		Duration	Temp.(T3,°C)	217		230	217	217	230				
			Time (t2)(Max,secs)	90		60	60	60	40				
Peak	Temp.(T4,°C)	260	250	250									
	Time (t3,secs)	5											
Reflow cycles	2 or less												
10	Solderability test (SMD)	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	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.	Capacitance change	Within ±10% of initial value	AEC-Q 200-005								
			Tanδ	Within specified value									
			Leakage Current	Within specified value									
			Appearance	No abnormality									
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.	Capacitance change	Within ±10% of initial value	AEC-Q 200-006								
			Tanδ	Within specified value									
			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:	Capacitance change	Within ±20% of initial value	AEC-Q 200-007								
			Tanδ	Less than 175% of specified value									
			W.V.	6.3		10	16	25	35	50	63	Leakage Current	Within specified value
			S.V.	7.3		11.5	18.4	28.8	40.3	57.5	72.5		
			W.V.	80		100	160	200	250	400	450	Appearance	No abnormality
			S.V.	92		115	184	230	288	440	495		

