

Data Sheet

Customer: _____

Product: Aluminum Electrolytic Capacitors – AEKH Series

Load life 5000~10000 hrs at 105°C

AEC-Q200 version available

Size : 5x11mm ~ 18x31.5mm

Issued Date: 16-Oct-2023

Edition: Ver. 1

Record of change

Date	Ver.	Description	Page
16-Oct-2023	1		

HITANO ENTERPRISE CORP.

7F-7, No. 3, Wu Chuan 1st Road, New Taipei Industrial Park,

New Taipei City, TAIWAN, R.O.C.

Tel: +886 2 2299 1331 (Rep.)

Fax: +886 2 2298 2466, 2298 2969

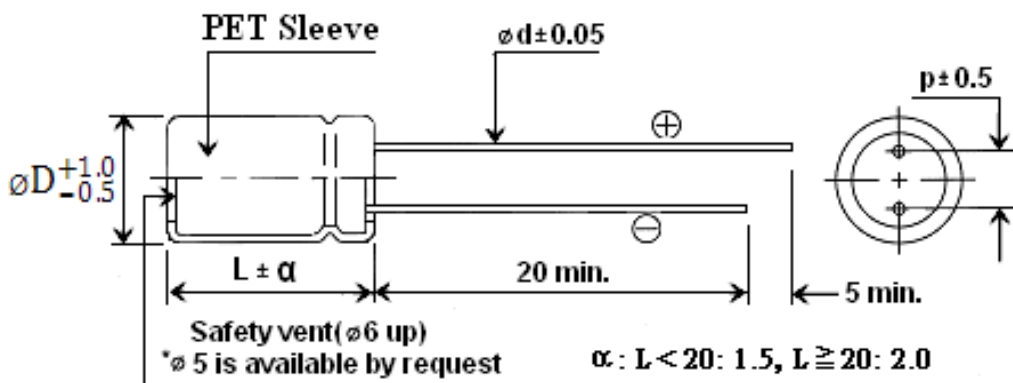
Prepared by	Checked by	Approved by	Accepted by (customer)
16-Oct-2023	16-Oct-2023	16-Oct-2023	
<i>Andy Hsu</i>	<i>Hwa Wu</i>	<i>Hwa Wu</i>	

- Used in electronic ballast, switching power supply, industrial measuring instruments.
- higher ripple current
- Load life 5000~10000 hrs at 105°C
- Safety vent construction design.
- **AEC-Q200 version available**

Characteristics

Voltage Range	10 to 50 VDC		160 to 450 VDC															
Capacitance Range	6.8 to 3300uF		6.8 to 220uF															
Temperature Range	-40 to +105°C		-40 to +105°C															
Leakage Current	I ≤ 0.01CV or 3uA, whichever is greater 1 minutes after Rated Voltage applied		I ≤ 0.04CV+100uA 1 minutes after Rated Voltage applied															
Capacitance Tolerance	±20% at 120Hz, 20°C (10% Tol. is available upon request)																	
Dissipation Factor	Working Voltage (V)	10	16	25	35	50	160	200	250	350	400	450						
	tanδ(%) max	19	16	14	12	10	15	15	15	20	20	20						
Low Temperature Characteristic (120Hz)	Working Voltage (V)	10	16	25	35	50	160	200	250	350	400	450						
	Z-25°C/Z +20°C	4	3	2	2	2	3	3	3	6	6	6						
	Z-40°C/Z +20°C	6	4	3	3	3	6	6	6	6	6	-						
Load life :	Test conditions Duration time : as right Ambient temperature : +105°C Applied voltage : Rated DC working voltage After test requirement at +20°C Capacitance change : ≤ ±20% of the initial measured value Dissipation factor : ≤ 200% of the initial specified value Leakage current : ≤ The initial specified value																	
	<table border="1"> <thead> <tr> <th>Dφ</th> <th>Life hours</th> </tr> </thead> <tbody> <tr> <td>< 8φ</td> <td>5,000</td> </tr> <tr> <td>8φ</td> <td>8,000</td> </tr> <tr> <td>≥ 10</td> <td>10,000</td> </tr> </tbody> </table> For standard size											Dφ	Life hours	< 8φ	5,000	8φ	8,000	≥ 10
Dφ	Life hours																	
< 8φ	5,000																	
8φ	8,000																	
≥ 10	10,000																	
Shelf life (at 105°C)	Test conditions Duration time : 1000Hrs Ambient temperature : +105°C Applied voltage : None After test requirement at +20°C: Same limits as Load life. Pre-treatment for measurements 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

Frequency(Hz)	120	1K	10K	≥100K
Multiplier	0.50	0.80	0.85	1.0

Multiplier for R.C. vs Temperature

Temp.(°C)	45	60	70	85	95	105
Multiplier.	2.10	1.90	1.65	1.40	1.25	1.00

Dimensions, Maximum Permissible Ripple Current & Impedance

WV Cap(μF)	10		16		25		35		50	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
6.8									5x11	75
10							5x11	65	5x11	97
22					5x11	100	5x11	125	6.3x11	130
33			5x11	115	5x11	130	6.3x11	178	8x11.5	241
47	5x11	100	5x11	145	6.3x11	160	8x11.5	240	8x11.5	287
									10x12.5	300
68	5x11	130	6.3x11	200	8x11.5	230	8x11.5	270	10x12.5	356
100	6.3x11	190	8x11.5	245	8x11.5	327	10x12.5	390	10x16	500
150	6.3x11	220	8x11.5	300	10x12.5	460	10x16	632	10x20	747
220	6.3x11	270	8x11.5	420	10x16	580	10x20	760	13x20	977
			10x12.5	495	8x11.5	440				
330	8x11.5	390	8x16/10x12.5	500	10x20	805	13x20	1035	13x25	1150
470	10x12.5	540	10x16	730	10x20	950	13x25	1100	16x25	1552
1000	10x16	900	13x20	1173	13x25	1552	16x31.5	1932	18x31.5	2093
2200	13x20	1540	16x25	2093	16x31.5	2400				
3300	16x25	1900								

WV Cap(μF)	160		200		250		350		400		450	
	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple	Size	Ripple
6.8							10x20	270	10x20	270	13x20	240
10	10x16	280	10x20/10x16	310	10x20	320	13x20	350	13x20	350	13x25	430
22	10x20	450	10x20	470	13x20	490	13x25	600	16x25	690	16x25	710
33	13x20	610	13x20	620	13x25	750	16x21	820	18x21	870	18x25	950
47	13x20	680	13x20	910	16x21	930	18x21	1020	18x25	1130	18x31.5	1120
68	13x25	1100	16x25	1190	18x21	1300	18x25	1400	18x31.5	1460		
100	18x21	1310	18x21	1380	18x25	1500						
150	18x25	1780	18x25	1800	18x31.5	1870						
220	18x25	2290	18x31.5	2350								

Ripple Current (mA, rms) at 105°C 100KHz

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 ± 3 mins) Step2: Min. rated temperature $\pm 3/-3^{\circ}\text{C}$ (30 ± 3 mins) 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-STD-202 Method 210																																				
			Capacitance change	Within ±10% of initial value																																												
			Tanδ	Within specified value																																												
			Leakage Current	Within specified value																																												
Appearance	No abnormality																																															
<table border="1"> <tr> <td>Rated voltage (V)</td> <td>4~50</td> <td>63 up</td> <td>4~100</td> </tr> <tr> <td>Case size (φ)</td> <td>4~6.3</td> <td>4~6.3</td> <td>8~12.5</td> </tr> <tr> <td rowspan="2">Preheat</td> <td>Temp.(T1~T2,°C)</td> <td colspan="2">150-180</td> </tr> <tr> <td>Time (t1)(Max,secs)</td> <td colspan="2">100</td> </tr> <tr> <td rowspan="2">Duration</td> <td>Temp.(T3,°C)</td> <td>217</td> <td>230</td> <td>217</td> <td>217</td> <td>230</td> </tr> <tr> <td>Time (t2)(Max,secs)</td> <td>90</td> <td>60</td> <td>60</td> <td>60</td> <td>40</td> </tr> <tr> <td rowspan="2">Peak</td> <td>Temp.(T4,°C)</td> <td>260</td> <td>250</td> <td>250</td> <td></td> <td></td> </tr> <tr> <td>Time (t3,secs)</td> <td colspan="5">5</td> </tr> <tr> <td>Reflow cycles</td> <td colspan="5">2 or less</td> </tr> </table>		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				
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)	<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.	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	<p>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:</p> <table border="1"> <tr> <td>W.V.</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <td>S.V.</td> <td>7.3</td> <td>11.5</td> <td>18.4</td> <td>28.8</td> <td>40.3</td> <td>57.5</td> <td>72.5</td> </tr> <tr> <td>W.V.</td> <td>80</td> <td>100</td> <td>160</td> <td>200</td> <td>250</td> <td>400</td> <td>450</td> </tr> <tr> <td>S.V.</td> <td>92</td> <td>115</td> <td>184</td> <td>230</td> <td>288</td> <td>440</td> <td>495</td> </tr> </table>	W.V.	6.3	10	16	25	35	50	63	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	S.V.	92	115	184	230	288	440	495	Capacitance change	Within ±20% of initial value	AEC-Q 200-007											
			W.V.	6.3	10	16	25	35	50	63																																						
			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																																						
			S.V.	92	115	184	230	288	440	495																																						
Tanδ	Less than 175% of specified value																																															
Leakage Current	Within specified value																																															
Appearance	No abnormality																																															