HITANO
ENTERPRISE CORP. ®

Data Sheet

Customer:

Product: Conductive Polymer Aluminum Solid Capacitor
SMD Type Endurance 105℃ 10,000Hours – AELS Series
AEC-Q200 version available
Size : 6.3x5.8mm ~ 10x12.7mm

Issued Date: 16-Oct-2023

Edition: Ver. 1

Record of change

Date	Ver.	Description	Page
16-Oct-2023	1	Add.	

HITANO ENTERPRISE CORP.

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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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AELS SERIES

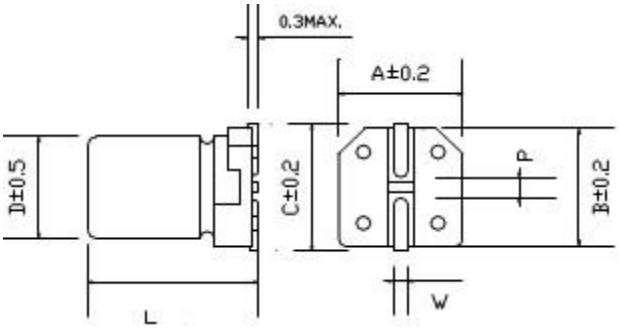
Features

- SMD TYPE. Conductive Polymer Aluminum Solid Capacitors
- This type has lowest ESR level and excellent performance at high frequency through low profile.
- Ideal capacitor for digital and high frequency devices.
- Load life 105℃ **10,000** hours assured.
- AEC-Q200 version available

Characteristics

Voltage Range	2.5 ~100VDC	
Capacitance Range	10uF ~ 1500uF	
Temperature Range	-55 ~ +105℃	
Capacitance Tolerance	M=+20%/-20% , K=+10%/-10% (at 20**℃** , 120Hz)	
Leakage Current	Capacitance(μF) x Rated Voltage(Vdc) After 2minutes, see standard rating	
Dissipation Factor (tanδ) 20℃ 120Hz	See standard rating	
ESR (at 100K~300K Hz, 20℃)	See standard rating	
Endurance (Rated Voltage at 105℃ 10,000h, restored to 20℃)	Appearance	≦No significant damage
	Capacitance Change (μF)	Within ±20% of initial measured value
	Dissipation Factor (tanδ)	≦150% of an initial specified value
	ESR (mΩ)	≦150% of an initial specified value
	Leakage Current (μA)	≦Initial specified value
Moisture Resistance (Test at 60℃, 90~95RH for 1000hrs, L.C. should be tested after voltage treatment)	Capacitance Change (μF)	Within ±20% of initial measured value
	Dissipation Factor (tanδ)	≦150% of an initial specified value
	ESR (mΩ)	≦150% of an initial specified value
	Leakage Current (μA)	≦Initial specified value
Resistance to Soldering Heat	Capacitance Change (μF)	Within ±10% of initial measured value
	Dissipation Factor (tanδ)	≦130% of an initial specified value
	ESR (mΩ)	≦130% of an initial specified value
	Leakage Current (μA)	≦Initial specified value

Diagram of dimensions



Lead Spacing And Diameter

Case Size	ϕD	L	A	B	C	W	P±0.2
C6	6.3	5.8±0.5	6.5	6.5	7.2	0.5 ~ 0.8	2.1
C8	6.3	7.7±0.5	6.5	6.5	7.2	0.5 ~ 0.8	2.1
C10	6.3	9.2±0.5	6.5	6.5	7.2	0.5 ~ 0.8	2.1
C12	6.3	11.5±0.5	6.5	6.5	7.2	0.5 ~ 0.8	2.1
D8	8	7.7±0.5	8.3	8.3	9.0	0.8 ~ 1.1	3.2
D10	8	9.4±0.5	8.3	8.3	9.0	0.8 ~ 1.1	3.2
D12	8	11.7±0.5	8.3	8.3	9.0	0.8 ~ 1.1	3.2
F11	10	10.7+0.5	10.3	10.3	11.0	0.8 ~ 1.1	4.6
F13	10	12.7±0.5	10.3	10.3	11.0	0.8 ~ 1.1	4.6

Frequency coefficient for ripple current

Frequency	120Hz≦f<1KHz	1KHz≦f<10KHz	10KHz≦f<100KHz	100KHz≦f<500KHz
Coefficient	0.05	0.3	0.7	1

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Ripple Current: mA /rms at 100kHz, 105^{0}C

W.V.(V)	Capacitance (μF)	Size ϕDxL(mm)	Size Code	Tanδ (120Hz,20C)	L.C. (μA)	E.S.R. (100k-300kHz,mΩ,20^{0}C MAX)	Rated R.C (mArms at 100kHz, 105^{0}C)
2.5(0E)	330	6.3x7.7	C8	0.1	300	14	3200
	390	6.3x7.7	C8	0.1	300	14	3200
	470	6.3x7.7	C8	0.1	300	14	3600
	560	6.3x7.7	C8	0.1	300	14	3600
	680	8x7.7	D8	0.1	340	9	5000
	680	8x11.7	D12	0.1	340	8	4500
	820	8x7.7	D8	0.1	410	9	5000
	820	8x11.7	D12	0.1	410	8	5400
	1000	8x7.7	D8	0.1	500	9	5000
	1500	8x11.7	D12	0.1	750	8	5400
	1500	10x12.7	F13	0.1	750	8	5500
4(0G)	100	6.3x7.7	C8	0.1	300	16	2200
	220	8x7.7	D8	0.1	300	11	5000
	330	6.3x7.7	C8	0.1	300	16	3700
	330	8x7.7	D8	0.1	300	11	5000
	390	6.3x7.7	C8	0.1	312	16	3700
	560	8x7.7	D8	0.1	448	11	5000
	560	8x11.7	D12	0.1	448	9	5400
	680	8x7.7	D8	0.1	544	11	5000
	680	10x10.7	F11	0.1	544	11	5200
	1200	8x11.7	D12	0.1	960	9	5400
	1200	10x12.7	F13	0.1	960	9	5500
	1500	8x11.7	D12	0.1	1200	9	5400
6.3(0J)	82	6.3x7.7	C8	0.1	300	20	2200
	100	6.3x7.7	C8	0.1	300	20	2500
	150	8x7.7	D8	0.1	300	15	2600
	180	8x7.7	D8	0.1	300	15	2600
	220	6.3x7.7	C8	0.1	300	14	3200
	220	6.3x7.7	C8	0.1	300	14	3200
	270	6.3x7.7	C8	0.1	340	14	3200
	330	6.3x7.7	C8	0.1	415	14	3200
	330	8x7.7	D8	0.1	415	15	4500
	390	8x7.7	D8	0.1	491	9	4500
	470	8x7.7	D8	0.1	592	9	4500
	470	8x11.7	D12	0.1	592	9	4300
	560	8x7.7	D8	0.1	705	9	4500
	560	8x11.7	D12	0.1	706	9	4800
	680	10x12.7	F13	0.1	856	9	5200
	820	8x11.7	D12	0.1	1033	9	5100
	820	10x12.7	F13	0.1	1033	9	5500
	1000	8x11.7	D12	0.1	1260	9	5100
	1000	10x12.7	F13	0.1	1260	9	5500
10V	47	6.3x7.7	C8	0.1	300	16	2100
	56	6.3x7.7	C8	0.1	300	16	2100
	100	6.3x7.7	C8	0.1	300	16	2500
	100	6.3x7.7	C8	0.1	300	16	2700
	120	6.3x7.7	C8	0.1	300	16	2900
	120	8x7.7	D8	0.1	300	16	2600
	150	8x7.7	D8	0.1	300	16	3000
	180	6.3x7.7	C8	0.1	360	16	3300
	220	6.3x7.7	C8	0.1	440	16	3300
	220	6.3x7.7	C8	0.1	440	16	3500

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W.V.(V)	Capacitance (μF)	Size ϕDxL(mm)	Size Code	Tanδ (120Hz,20C)	L.C. (μA)	E.S.R. (100k-300kHz,mΩ,20^{0}C MAX)	Rated R.C (mArms at 100kHz, 105^{0}C)
10V	270	6.3x7.7	C8	0.1	540	16	3800
	270	10x7.7	F8	0.1	540	14	3500
	330	8x7.7	D8	0.1	660	14	3300
	330	8x11.7	D12	0.1	660	14	4000
	330	10x7.7	D8	0.1	660	14	3600
	560	10x12.7	D13	0.1	1120	12	5300
	1000	10x12.7	D13	0.1	2000	12	5500
	1500	10x12.7	D13	0.1	3000	12	5500
16 V	33	6.3x7.7	C8	0.1	300	18	2000
	39	6.3x7.7	C8	0.1	300	18	2500
	56	8x7.7	D8	0.1	300	18	2300
	82	8x7.7	D8	0.1	300	18	2300
	100	6.3x7.7	C8	0.1	320	24	2600
	100	10x7.7	F8	0.1	320	18	3200
	150	8x7.7	D8	0.1	480	18	3200
	150	10x7.7	F8	0.1	480	18	3200
	180	8x11.7	D12	0.1	576	18	3700
	180	10x7.7	F8	0.1	576	18	3600
	220	6.3x7.7	C8	0.1	704	24	3200
	220	8x11.7	D12	0.1	704	18	3700
	220	10x7.7	F8	0.1	704	18	3900
	270	8x7.7	D8	0.1	864	18	3200
	270	8x11.7	D12	0.1	864	14	4400
	330	10x12.7	F13	0.1	1056	14	4800
	470	10x12.7	F13	0.1	1504	14	6100
	560	8x11.7	D12	0.1	1792	14	5000
	820	10x12.7	F13	0.1	2640	12	6100
	1000	10x12.7	F13	0.1	3200	12	6100
20V	390	8x11.7	D12	0.1	200	14	5000
	560	10x12.7	F13	0.1	224	20	5000
25V	10	6.3x7.7	C8	0.1	200	40	2100
	22	6.3x7.7	C8	0.1	200	40	2100
	22	8x7.7	D8	0.1	200	40	1800
	27	6.3x7.7	C8	0.1	200	40	2100
	47	6.3x7.7	C8	0.1	200	30	2800
	56	6.3x7.7	C8	0.1	200	30	2800
	68	6.3x7.7	C8	0.1	200	30	2800
	100	6.3x7.7	C8	0.1	200	22	3100
	100	8x9.4	D10	0.1	200	18	4000
	100	8x11.7	D12	0.1	200	24	3300
	220	6.3x9.4	C10	0.1	200	24	4000
	220	8x11.7	D12	0.1	200	18	4400
	330	6.3x11.5	C12	0.1	200	24	3800
	330	8x11.7	D12	0.1	200	16	4800
	330	10x12.7	F13	0.1	200	14	5000
	390	10x12.7	F13	0.1	200	16	4800
	470	10x12.7	F13	0.1	235	16	5000
	820	10x12.7	F13	0.1	410	16	5000
35V	10	6.3x7.7	C8	0.1	200	40	1700
	56	8x9.4	D10	0.1	200	25	3000

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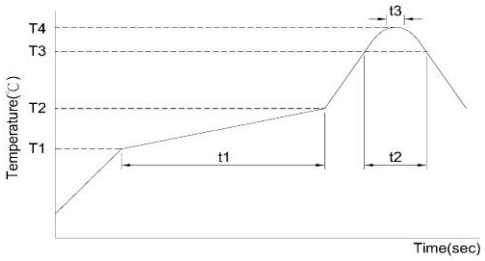
Ripple Current: mA /rms at 100kHz, 105^{0}C

W.V.(V)	Capacitance (μF)	Size ϕDxL(mm)	Size Code	Tanδ (120Hz,20C)	L.C. (μA)	E.S.R. (100k-300kHz,mΩ,20^{0}C MAX)	Rated R.C (mArms at 100kHz, 105^{0}C)
35V	100	6.3x7.7	C8	0.1	200	26	2500
	100	8x9.4	D10	0.1	200	25	3000
	150	10x12.7	F13	0.1	200	28	2600
	220	8x11.7	D12	0.1	200	26	2600
	470	10x12.7	F13	0.1	329	24	4200
50v	12	6.3x7.7	C8	0.1	200	40	1300
	22	8x7.7	D8	0.1	200	35	1500
	39	8x11.7	D12	0.1	200	26	2300
	47	6.3x7.7	C8	0.1	200	24	2100
	47	8x11.7	D12	0.1	200	26	2300
	82	10x12.7	F13	0.1	200	24	2800
	100	8x11.7	D12	0.1	200	24	3000
	100	10x10.7	F11	0.1	200	22	3500
63v	8.2	6.3x7.7	C8	0.1	200	40	1200
	12	8x7.7	D8	0.1	200	35	1500
	33	8x11.7	D12	0.1	200	27	2300
	56	10x12.7	F13	0.1	200	24	2700
80v	10	6.3x7.7	C8	0.1	200	50	1800
	12	6.3x9.2	C10	0.1	200	35	2000
	15	6.3x11.5	C12	0.1	200	30	2300
	22	6.3x11.5	C12	0.1	200	22	2500
	22	8x9.4	D10	0.1	200	22	2500
	33	8x11.5	D12	0.1	200	22	2800
	47	10x10.7	F11	0.1	200	20	2800
	56	10x12.7	F13	0.1	200	20	3000
100v	10	6.3x9.4	C10	0.1	200	35	2000
	12	6.3x9.4	C10	0.1	200	35	2100
	15	6.3x11.5	C12	0.1	200	23	2200
	15	8x9.4	D10	0.1	200	23	2500
	22	8x11.5	D12	0.1	200	20	2600
	33	10x10.7	F11	0.1	200	20	2800
	47	10x12.7	F13	0.1	200	20	3000

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 ±30% of initial value	MIL-STD-202 Method 108
			Tanδ	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 ±30% of initial value	MIL-STD-202 Method108
			Tanδ	Less than 300% of specified value	
			Leakage Current	Within specified value	
			Appearance	No abnormality	
3	Temperature Cycling	Step1: Max. rated temperature±3/-3℃(30±3mins) Step2: Min. rated temperature±3/-3℃(30±3mins) Max.transfer time: 1min According to the step1 to step2, and do 1000cycles	Capacitance change	Within ±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±3℃, and humidity of 85% with rated voltage for 1000Hrs	Capacitance change	Within ±20% of initial value	MIL-STD-202 Method 103
			Tanδ	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±5℃. 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: Test items: For automobile Acceleration speed: 100g(1000 m/s²) Shocking direction: X-Y-Z three axles (6 planes) Duration(D)(ms): 6 Velocity(m/s): 3.75 Wave: Half sine Test times: 18times (3*6=18)	Capacitance change	Within ±10% of initial value	MIL-STD-202 Method 213
			Tanδ	Within specified value	
			Leakage Current	Within specified value	
			Appearance	No abnormality	
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 ±10% of initial value	MIL-STD-202 Method 204
			Tan δ	Within specified value	
			Leakage Current	Within specified value	
			Appearance	No abnormality	

<table>
<tr><th>No.</th><th>Item</th><th>Conditions</th><th colspan="2">Specification</th><th>Reference</th></tr>
<tr><td>9</td><td>Resistance to Soldering Heat</td><td>According to the Control standard operating of Jarson, test twice.
 

<table>
<tr><td colspan="2">Rated voltage (V)</td><td colspan="2">4~50</td><td>63 up</td><td colspan="2">4~100</td></tr>
<tr><td colspan="2">Case size (φ)</td><td colspan="2">4~6.3</td><td>4~6.3</td><td colspan="2">8~12.5</td></tr>
<tr><td rowspan="2">Preheat</td><td>Temp.(T1~T2,℃)</td><td colspan="5">150-180</td></tr>
<tr><td>Time (t1)(Max,secs)</td><td colspan="5">100</td></tr>
<tr><td rowspan="2">Duration</td><td>Temp.(T3,℃)</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,℃)</td><td colspan="2">260</td><td>250</td><td colspan="2">250</td></tr>
<tr><td>Time (t3,secs)</td><td colspan="5">5</td></tr>
<tr><td colspan="2">Reflow cycles</td><td colspan="5">2 or less</td></tr>
</table></td><td>Capacitance change</td><td>Within ±10% of initial value</td><td rowspan="4">MIL-STD- 202 Method 210</td></tr>
<tr><td></td><td></td><td>Tanδ</td><td>Within specified value</td></tr>
<tr><td></td><td></td><td>Leakage Current</td><td>Within specified value</td></tr>
<tr><td></td><td></td><td>Appearance</td><td>No abnormality</td></tr>
<tr><td>10</td><td>Solderability test (SMD)</td><td>Solderability test 1: Solder bath temperature: 235±5℃ Duration:5±0/-0.5s
Solderability test 2:Solder bath temperature:260±5℃ Duration:7±0.5s</td><td colspan="2">Sn is more than 95% in the surface of terminal</td><td>J-STD-002B</td></tr>
<tr><td>11</td><td>Electrical Characterization</td><td>Whether there is abnormality about electrical characterization in the test that under the ensurance temperature(the lowest ,the highest, atmospheric temperature).</td><td colspan="2">Appearance: No abnormality</td><td>User Spec.</td></tr>
<tr><td>12</td><td>Board Flex</td><td>Capacitor is placed in the PCB and pressed to deviate from Original fulcrum more than 2mm for 60（+5）s.</td><td>Capacitance change</td><td>Within ±10% of initial value</td><td rowspan="4">AEC-Q200-005</td></tr>
<tr><td></td><td></td><td>Tanδ</td><td>Within specified value</td></tr>
<tr><td></td><td></td><td>Leakage Current</td><td>Within specified value</td></tr>
<tr><td></td><td></td><td>Appearance</td><td>No abnormality</td></tr>
<tr><td>13</td><td>Terminal Strength (SMD)</td><td>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.</td><td>Capacitance change</td><td>Within ±10% of initial value</td><td rowspan="4">AEC-Q200-006</td></tr>
<tr><td></td><td></td><td>Tanδ</td><td>Within specified value</td></tr>
<tr><td></td><td></td><td>Leakage Current</td><td>Within specified value</td></tr>
<tr><td></td><td></td><td>Appearance</td><td>No abnormality</td></tr>
<tr><td>14</td><td>Surge Voltage</td><td>Capacitor is placed at 15℃~35℃ with surge voltage for 30±5(charging) and 330s(discharging),do surge voltage test continuity for 1000 times.
Applying voltage:
<table>
<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></td><td>Capacitance change</td><td>Within ±20% of initial value</td><td rowspan="4">AEC-Q200-007</td></tr>
<tr><td></td><td></td><td>Tanδ</td><td>Less than 175% of specified value</td></tr>
<tr><td></td><td></td><td>Leakage Current</td><td>Within specified value</td></tr>
<tr><td></td><td></td><td>Appearance</td><td>No abnormality</td></tr>
</table>