PRODUCT SPECIFICATION

No:HW16120710

CUSTOMER：Blume	**DATE：2016-12-7**

PARTNAME： Conductive Polymer Hybrid Aluminum Electrolytic Capacitors

Series/Spec： GP SERIES

User
Approved by

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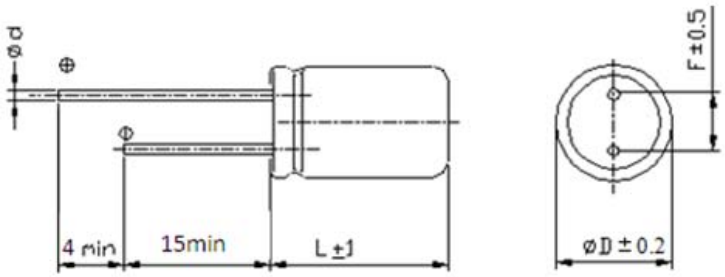
Table

PART No.	Rated Voltage (VDC)	Capacitance (μF/120Hz)	Dimension (D×L, mm)	tg δ	Leakage Current (μA/2min)	ESR +25℃ 100KHz (mΩ)	Ripple Current at 105℃ 100KHz (mA rms)
-	35	220	8*11.5	0.10	385.0	36	2300
-	25	100	6.3*9	0.14	125.0	55	1100
-	50	47	6.3*8	0.10	117.5	55	970
*	63	100	10*12.5	0.10	315.0	55	2350

1、Scope

GP Conductive Polymer Hybrid type(Standard Type)------Radial type

2、Case size table



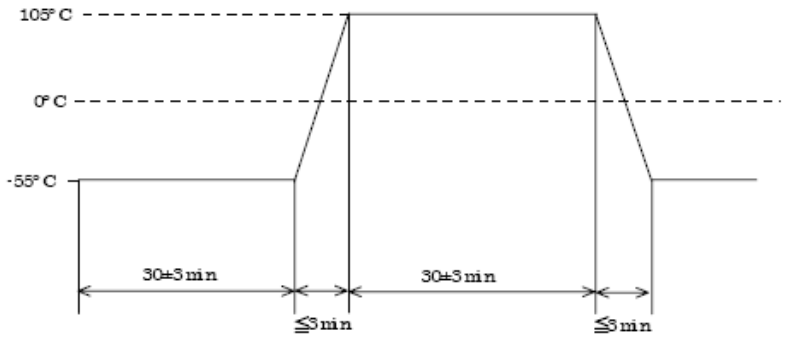
单位 unit:mm

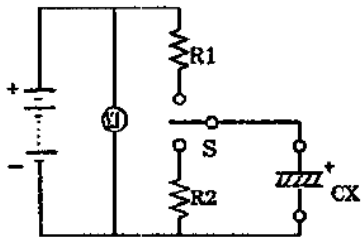
φD	4	5	5.5	6.3	8	10
F	1.5	2.0	2.5	2.5	3.5	5
d	0 45	0.	0.5	0.6	0.6	0.6

3、Specifications

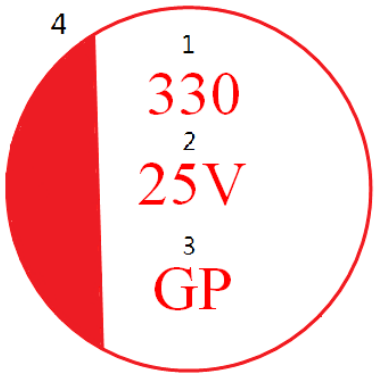
<table>
<tr><td>Items</td><td>Characteristics</td></tr>
<tr><td>Operating temperature Range</td><td>-55℃ ~+105℃</td></tr>
<tr><td>Rated voltage Range</td><td>6.3V ~100VDC</td></tr>
<tr><td>Nominal Capacitance Rang</td><td>1~ 3300μF</td></tr>
<tr><td>Nominal Capacitance Tolerance</td><td>±20%（25℃，120Hz）</td></tr>
<tr><td>Leakage Current</td><td>I≤0.05CV(μA) or 80μA, whichever is greater
at 25℃， after 2 minutes
I：Leakage Current (μA)、C：Electrostatic capacity (μF)、V：Rated voltage (VDC)</td></tr>
<tr><td>Dissipation factor (Max)</td><td>25℃, 120Hz
<table>
<tr><td>Rated voltage (VDC)</td><td>6.3~10V</td><td>12~25V</td><td>35~100V</td></tr>
<tr><td>Tgδ</td><td>0.18</td><td>0.14</td><td>0.10</td></tr>
</table></td></tr>
<tr><td>ESR</td><td>≤Not to exceed the value specified</td></tr>
<tr><td>Characteristics of impedance ratio at high temp. and low temp.</td><td>Based the value at 100KHZ.
Z（-25℃）/Z（+25℃）≤1.5
Z（-55℃）/Z（+25℃）≤2.0</td></tr>
</table>

4、Tests

Load Life	After 5000 hours' application of rated voltage at 105℃±2℃, the capacitor shall meet the following requirement:	
	Capacitance Change	Within ±25% of the initial value
	Dissipation Factor	Not to exceed 200% of the value specified
	Equivalent Series Resistance	Not to exceed 200% of the value specified
	Leakage Current	Not to exceed the value specified
Damp heat(Steady state)	60℃±5℃ , 90~95% RH, 240 hours, No applied voltage.	
	Capacitance Change	Within ±25% of the initial value
	Dissipation Factor	Not to exceed 200% of the value specified
	Equivalent Series Resistance	Not to exceed 200% of the value specified
	Leakage Current	Not to exceed the value specified
Shelf Life	After storage for 1000 hours at +105℃±2℃ with no voltage applied and then being stabilized at +25℃ the capacitor shall not exceed the specified values listed below.	
	Capacitance Change	Within ±25% of the initial value
	Dissipation Factor	Not to exceed 200% of the value specified
	Equivalent Series Resistance	Not to exceed 200% of the value specified
	Leakage Current	Not to exceed the value specified
Rapid temperature change	The characteristics of a capacitor kept under the temperature cycle indicated in Figure1 for 5 cycles . And then the capacitor shall be subjected to standard atmospheric conditions for 1to 2hours, after which measurement shall be made. 	
	Capacitance Change	Within ±15% of the initial value
	Dissipation Factor	Not to exceed 150% of the value specified
	Equivalent Series Resistance	Not to exceed 150% of the value specifie
	Leakage Current	Not to exceed the value specified

<table>
<tr><td rowspan="5">Low temperature test</td><td colspan="2">The capacitor shall be stored at a temperature of -55℃ for 72±2hours。And then the capacitor shall be subjected to standard atmospheric conditions for 1 to 2hours, after which measurements shall be made</td></tr>
<tr><td>Capacitance Change</td><td>Within ±25% of the initial value</td></tr>
<tr><td>Dissipation Factor</td><td>Not to exceed 150% of the value specified</td></tr>
<tr><td>Equivalent Series Resistance</td><td>Not to exceed 150% of the value specified</td></tr>
<tr><td>Leakage Current</td><td>Not to exceed the value specified</td></tr>
<tr><td rowspan="5">Surge test</td><td colspan="2">The capacitor shall be subjected to 1000cycles at 15~35℃,each consisting of a charge period of 30±5sec, followed by a discharge period of approx. 5min30sec. And the capacitor shall be stored under standard conditions thermal to obtain stability,after which measurements shall be made.measurement circuit
<table>
<tr><td rowspan="3"> 
</td><td>SV: Surge voltage</td><td>V1: DC voltmeter</td></tr>
<tr><td>R1:Protective series resistor（1KΩ）</td><td>R2: Discharge resistor</td></tr>
<tr><td>CX: Test capacitor</td><td>S:Switch</td></tr>
</table>
Voltage Setting
<table>
<tr><td>RATED VOLTAGE(VDC)</td><td>25</td><td>50</td><td>63</td><td>35</td></tr>
<tr><td>SURGE VOLTAGE(VDC)</td><td>28.75</td><td>57.50</td><td>72.45</td><td>40.25</td></tr>
</table></td></tr>
<tr><td>Capacitance Change</td><td>Within ±15% of the initial value</td></tr>
<tr><td>Dissipation Factor</td><td>Not to exceed 150% of the value specified</td></tr>
<tr><td>Equivalent Series Resistance</td><td>Not to exceed 150% of the value specified</td></tr>
<tr><td>Leakage Current</td><td>Not to exceed the value specified</td></tr>
</table>

5、Marking



1： Rated capacitance
2： Rated voltage
3： Series
4： Polarity

6、Guidelines For Using Aluminum Electrolytic Capacitor

Upon using Conductive Polymer Hybrid Aluminum Electrolytic Capacitors，please proper handing and observing to following important points will insure optimum capacitor performance and long life.

6.1．DC electrolytic capacitors are polarized.

Make sure of the polarity. The polarity is marked on the body of the capacitor .Application of the reversed voltage cause a short circuit or damage to the capacitor. Use bipolar capacitors when the polarity is not determined or unknown. Note that DC electrolytic capacitors can not be used for AC application.

6.2．Do not apply voltage greater than rated voltage.

If a voltage exceeding the rated voltage is applied, the leakage current will increase, which damage the capacitor. Recommended working voltage is 70 to 80 percent of rated voltage. Using capacitors at recommended working voltage prolongs capacitor life.

6.3．Do not allow excessive ripple current through the capacitor.

The flow of ripple current over permissible ripple current will cause heat of the capacitor, which may decrease the capacitance and damage the capacitor. Ripple current on the capacitor must be at or bellow allowable level.

6.4．Use specially designed capacitors for the circuits where charge and discharge are frequency repeated.

In the circuit subjected to rapid charge cycles, capacitors may be damaged; its life may be shortened by capacitance decrease, heat rise, etc. Be sure and use special capacitors in these applications.

6.5．Operating temperature range.

The characteristics of capacitors change with the operating temperature. The capacitance and leakage current increase and tgδ decrease at higher temperatures. The capacitance and leakage current decrease and tgδ at increase lower temperature. Usage at lower temperature will ensure longer life.

6.6．Check operating frequency.

The capacitance of electrolytic capacitors is usually measured at 100Hz or 120Hz. However, remember that capacitance decrease and tgδ increase as the applied frequency becomes higher whereas the ambient temperature becomes higher.

6.7．To keep good solderbility, Please send the product storage period in one year of less than control.

6.8．The capacitor case is not insulated from the cathode terminal.

The capacitor’s case and cathode terminal connect through the electrolyte. If the case is to be completely insulated, that insulation must be at the capacitor’s mounting point.

6.9．Do not apply excessive force to the terminals and leads.

The excessive strong force applied to the terminals and lead wires may cause leads to break or terminals to separate and, in turn, cause the internal contact to fail.

Hazardous substances management table of contents

Type	Name(English)	Test result	
		Yes	No
Level A-I	Lead and its compounds		ND
	Cadmium and its compounds		ND
	Mercury and its compounds		ND
	Hexavalent chromium and its compounds		ND
	Polybrominated biphenyls		ND
	Polybrominated diphenylethers		ND
Level A-II	Polychlorinated biphenyls (PCB)		No
	Polychlorinated naphthalene (PCN)		No
	Polychlorinated terphenyls (PCT)		No
	Short-chain Chlorinated paraffin (SCCP)		No
	Asbestos and its compounds		No
	Ozone Depleting Substances		No
	Azo compounds		No
	Nickel and its compounds		No
	Specific Organic tin compounds		No
	Arsenic and its compounds		No
	Formaldehydes		No
Level B	Poly vinyl chloride(PVC)		No
	Phthalates		ND
	Beryllium and its compounds		No
	Antimony and its compounds		No
	Selenium and its compounds		No
	Palladium and its compounds		No
	Bismuth and its compounds		No
	Other chlorinated flame retardants		No
	Other brominates flame retardants		No

7.Test data

Spe.	Size	Initial Test									
25V100μF	6.3×9	C(μF/120Hz)	97.84	98.65	100.30	100.20	99.73	99.39	98.95	101.80	99.73	101.40
		DF(%)	2.18	2.25	2.23	2.03	2.21	2.28	2.25	2.13	2.19	2.38
		I(μA/1min)	2.25	1.78	1.62	1.57	1.93	2.53	2.75	2.58	2.11	1.98
		ESR(mΩ/100KHz)	35.0	32.3	34.2	34.1	34.9	34.6	34.4	32.2	33.4	33.1
50V47μF	6.3×8	C(μF/120Hz)	43.73	45.24	43.64	43.56	43.68	44.20	44.18	44.39	45.66	44.20
		DF(%)	1.00	1.40	1.02	1.02	1.02	1.03	1.00	1.01	1.04	1.07
		I(μA/1min)	1.23	1.13	1.07	1.19	1.25	1.54	1.61	1.88	2.05	1.67
		ESR(mΩ/100KHz)	22.5	22.1	23.6	22.7	21.8	23.0	22.1	23.2	22.4	21.9
35V220μF	8×11.5	C(μF/120Hz)	202.5	201.1	201.5	202.0	201.1	204.9	202.3	205.1	204.2	202.0
		DF(%)	1.17	1.21	1.20	1.20	1.22	1.14	1.17	1.31	1.29	1.19
		I(μA/1min)	3.6	3.4	4.7	6.8	5.3	6.4	5.1	5.9	5.1	5.7
		ESR(mΩ/100KHz)	11.4	11.3	11.8	11.3	11.4	11.3	11.6	11.5	11.2	11.4
63V100μF	10×12.5	C(μF/120Hz)	93.11	93.27	92.98	93.03	93.33	94.54	94.11	94.36	94.39	94.20
		DF(%)	1.00	1.00	1.06	1.08	1.00	1.01	0.94	0.96	0.92	0.95
		I(μA/1min)	2.9	2.3	2.1	2.4	2.2	2.6	2.3	2.9	2.4	2.8
		ESR(mΩ/100KHz)	14.2	15.1	14.6	14.7	13.3	14.5	14.1	15.0	14.8	13.9