No,ST11A-0366

SPECIFICATIONS
for Aluminum Electrolytic Capacitors

SHG400V2.2uF Φ6.3X11L

Part No. SHG2G2R2M-06311

User's Product Name:

User's Drawing No.

Manufacturer's Drawing No,ST11A-0366

Issuing date : JAN 06, 2013

Receipt Stamp

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Approved by： Wang Zhiwei

SHG Series

Aluminum Electrolytic Capacitors

Item Name	Rating	Case size	SHELL LIFE
SHG2G2R2M-06311	SHG400V2.2uF	Φ6.3X11L	5000 hours

1. Operating Temp. Range

-25℃ ～ +105℃

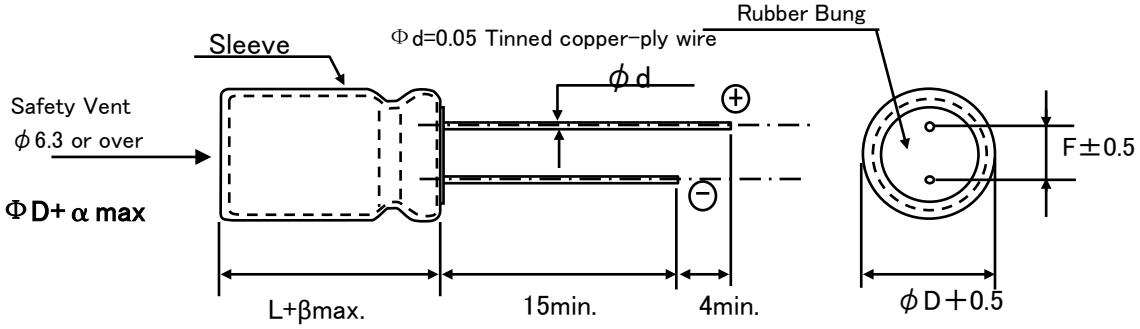
2. Electrical Characteristics

See Table 1.

【Table 1】

Rated Voltage VDC	Surge Voltage VDC	Nominal Static Capacitance (μF)	Tolerance on Capacitance (%)	Dissipation Factor (tan δ)max 20℃ 120Hz	Leakage Current 5min. 20℃ (μA)max	Impedance(Ω) $100KH_Z$ 20℃	Permissible Ripple Current (mArms)max 105℃100KHz
400	500	2.2	-20～+20	0.24	42.6	5.500	55

3. Dimensions



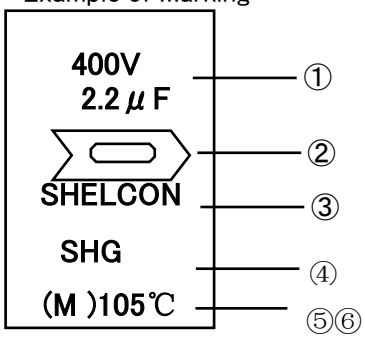
Unit(mm)

φD+0.5Max	L+1.5Max	F±0.5	d±0.05
6.3	11	5.0	0.5

4. Marking

Following items are printed with white color on coffee color sleeve

Example of Marking



① Rated voltage & Nominal Capacitance
② Polarity (negative)
③ Trade Mark
④ series
⑤ Symbol of Capacitance Tolerance (M)
⑥ Max Operating Temp.

5.MULTIPLIER FOR RIPPLE CURRENT

①. Frequency Coefficient

Freq.(Hz) / Cap(μF)	120Hz	1KHz	10KHz	100KHz or more
2.2	0.40	0.70	0.90	1.00

②. Temperature Coefficient

Ambient Temperature(℃)	40	60	70	85	105
Coefficient	2.40	2.10	1.78	1.65	1.00

6. Characteristics

<table>
<tr><th>No.</th><th>Item</th><th>Performance</th><th>Test Method</th></tr>
<tr><td>1</td><td>Leakage Current</td><td>I= 42.6 μA (I=0.02CV+25)
I= Max Leakage Current
C=Ctatic Capacitor: V=Rated Voltage</td><td>Protection Resistor : 1000±10Ω
Applied Volt : Rated Voltage
Mesauring time : 5minutes</td></tr>
<tr><td>2</td><td>Static Capacitance</td><td>1.76 ～ 2.64 μF</td><td>Measured Frequency : 120Hz±20%

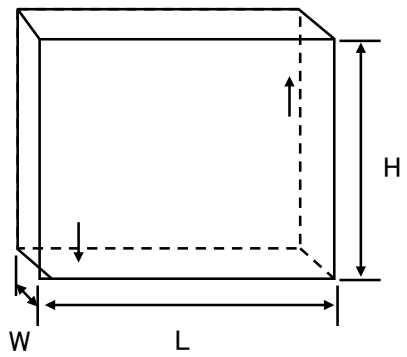
Measured Voltage
≤ 0.5Vrms, 1.5 ～ 2.0VDC</td></tr>
<tr><td>3</td><td>Dissiption Factor (tanδ)</td><td>0.24 and Under</td><td>Same as condition of Capacitors</td></tr>
<tr><td>4</td><td>High Temp. Load Charac- teristics</td><td><table><tr><td>Leakage Current</td><td>≦the value specified in Table 1</td></tr><tr><td>Cap. Change</td><td>≦ ±20% of initial value</td></tr><tr><td>Dissipation Factor</td><td>≦200% of value specified in Table</td></tr><tr><td>Appearance</td><td>No remarkable abnormality</td></tr></table></td><td>Test Temp. : 105±2℃
Applied voltage: Rated voltage
Test Time :5,000 hours
+72, −0 hours</td></tr>
<tr><td>5</td><td>High Temp. no load Charac- teristics</td><td><table><tr><td>Leakage Current</td><td>≦the value specified in Table 1</td></tr><tr><td>Cap. Change</td><td>≦ ±20% of initial value</td></tr><tr><td>Dissipation Factor</td><td>≦200% of value specified in Table</td></tr><tr><td>Appearance</td><td>No remarkable abnormality</td></tr></table></td><td>Test Temp. : 105±2℃
No voltage applied
Test Time :1000 hours
+24, −0 hurs</td></tr>
<tr><td>6</td><td>Terminal Strength</td><td><table><tr><td>Tensile Strength</td><td>45N {4.5kg}</td></tr><tr><td>Bending Strength</td><td>25N {2.5kg}</td></tr></table></td><td>Keeping time
Tensile 1～5sec
Bending 30±5sec</td></tr>
<tr><td>7</td><td>Impedance Ratio</td><td><table><tr><td>W V</td><td>400</td></tr><tr><td>Z(−25℃)/Z(+20℃)</td><td>3</td></tr><tr><td>Z(−40℃)/Z(+20℃)</td><td>6</td></tr></table></td><td></td></tr>
<tr><td>8</td><td>Temperature Charac - teristics</td><td><table><tr><th>Stage</th><th>Item</th><th>Performance</th></tr><tr><td>2,3</td><td>Impedance Ratio</td><td>less than the value mentioned in 5-7,</td></tr><tr><td>5</td><td>Cap, Change</td><td>≦±25% against value in stage 4</td></tr></table>
After the capacitor is held at tempereture of each stage and reaches temperature stability, measure performance.
<table><tr><th>Stage</th><th>Test Temp(℃)</th></tr><tr><td>1</td><td>20±2</td></tr><tr><td>2</td><td>−25±3;</td></tr><tr><td>3</td><td>−40±3;</td></tr><tr><td>4</td><td>20±2</td></tr><tr><td>5</td><td>105±2</td></tr><tr><td>6</td><td>20±2</td></tr></table></td><td></td></tr>
<tr><td>9</td><td>Surge Voltage</td><td><table><tr><td>Item</td><td>Perforemance</td></tr><tr><td>Leakage Current</td><td>≤ the initial specified value</td></tr><tr><td>Cap, Change</td><td>≤ ±15% against value before test</td></tr><tr><td>Dissipation Factor</td><td>≤ the initial specified value</td></tr><tr><td>Appearance</td><td>No remakable abnormality</td></tr></table>Test Temp. 15～35℃ Test volt. Surge Volt.Specified in 2
Voltage apply. 1,000times of chage for 30±5sec, under frequency of 6±0.5sec, and discharge for 5min30sec.</td><td></td></tr>
</table>

6-2. Characteristics

<table>
<tr><th>No.</th><th>Item</th><th>Performance</th><th>Test Method</th></tr>
<tr><td>10</td><td>Vibration Resistance</td><td>
<table>
<tr><td>Capacitance</td><td>Stability required</td></tr>
<tr><td>Cap. Change</td><td>≤±5% of the initial specified value</td></tr>
<tr><td>Appearance</td><td>No remarkable abnormality</td></tr>
</table>
Frequency : 10～55Hz/1min. Width of vibration, 1.5mm Direction and duration X, Y and Z directions, each for 2 hours (Total 9 hours)
</td><td></td></tr>
<tr><td>11</td><td>Solderbility</td><td>3/4 area of surrounding directions of surface should be covered with new solder.</td><td>Solder: Sn-Ag, Sn-Cu Type
Soldering Temp : 240±5℃
Dipping degree : 2～2.5mm
Flux : Ethanol solution (JIS K8101) or Isopropylalchol (JIS K8839) solution of Rosin (JIS K5902)</td></tr>
<tr><td>12</td><td>Resistance to Soldering</td><td>
<table>
<tr><td>Leakage Current</td><td>≦ Initial specified value</td></tr>
<tr><td>Cap. Change</td><td>≦±10% of initial value</td></tr>
<tr><td>Dissipation Factor</td><td>≦ Initial specified in value</td></tr>
<tr><td>Appearance</td><td>No remarkable abnormality</td></tr>
</table>
</td><td>Soldering Temp. 280±5℃
Soldering Time . 10±1sec.</td></tr>
<tr><td>13</td><td>Resistance to Humidity</td><td>
<table>
<tr><td>Leakage Current</td><td>≦ Initial specified value</td></tr>
<tr><td>Cap. Change</td><td>≦±15% of initial value</td></tr>
<tr><td>Dissipation Factor</td><td>≦ Initial spesified value</td></tr>
<tr><td>Appearance</td><td>No remarkable abnormality</td></tr>
</table>
</td><td>Test Temp. : 40±2℃
Humidity 90～95%
Test Time : 500 ± 8 hours
After the above condition,restored to normal temp, and then measured.</td></tr>
<tr><td>14</td><td>Perssure valve moment charact-erstics</td><td>There must not be thing ignition, scattering the resolution that that case works safely</td><td>Dcmethod: impress the reverse voltage and of 1A, I cancel an electric current.</td></tr>
</table>

7 Packing method

5-1 Packaging shape, size, quantity



Component size	Quanity per
6.3X11	20000pcs.

8 Related Standards JIS C 5141

9 Marking on packing box

① Item name
② Series name
③ Rated Voltage
④ Nominal Static Capacitance
⑤ Case size
⑥ Lot No.
⑦ Quantity

10 Soldeing

8-1 Soldering by soldering iron

Temperature of iron top : 270～350℃
Operating time : within 3 sec.

8-2 Flow soldering.

Preheat : PCB surface temperature 120℃±5℃
Solder Temp : 260℃±5℃
Solder Dipping Temp. : 2～4sec.

11 Cleaning of PC boad after soldering

Using follwing solvents is possible but make sure followingcondition
Solvent
IPA or Alcoholic agent like Pinealpha ST-100S, Cleanthrough 750H, 750L, 710M, 750K, or Technocare FRW-14～17

① Cleaning should be made by ultrasonic within 5min, at the temperature less then 60℃.
② Control of pollution is necessary (conductivity,pH, specific gravity, water volume)
③ Please do not keep near cleaning agent. Please do not store in air-tight container. Please let it dry by hot air at the temperature less than maximum operating temp.

12 The situation of using

Please do not use a condenser in the next use environment.
① One circumference environment(weatherability) condition.
(a) Direct water,salt water and environment oil works or become a dew condensation state.
(b) Environment full of harmful gas (a hydrogen chloride, sulfurous acid. nitrous acid hydrochloric acid, ammonia).
(c) Ozone, infrared rays and the environment where radioactive rays are done collation of
② Vibration shock condition is extreme environment more than rule ranges of delivery specifications.

13 A country of origin

A country of origin of an SHG series alminum electrolysis condenser of specifications: China

14 Effective life for storage

Storage conditions:

① Temperature range must be between 5-35℃

② Relative humidity must be less than 75%

③ Must be stored indoor

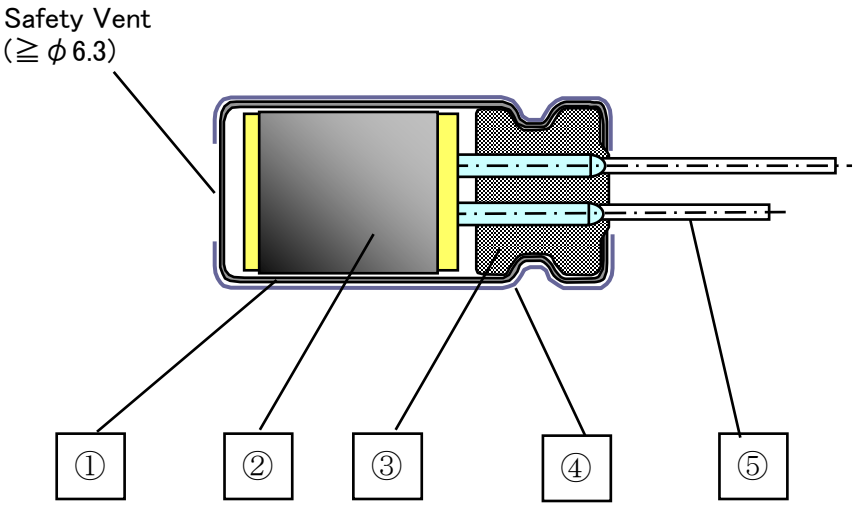
④ Must be free from water, oil or salt water

⑤ Must be free from toxic gasses (hydrogen sulfide, sulfurous acid, chlorine, ammonium, etc.)

⑥ Must be free from ozone, ultraviolet rays or any other radiation

⑦ Must be kept in capacitor original package

Aluminum Electrolytic Capacitor
SHG Series Structure



No.	Name	Material
①	Case	Aluminum
②	Element (Electrode)	High Purity Aluminum foil
	(Separator)	Manila hemp pulp
	(Electrolyte)	---
③	Rubber Bung	Synthetic Rubber
④	Sleeve	PET
⑤	Lead Wire	Tin plated Steel Wire

Controls of ozone layer destructive chemical materials

Regulated materials : CFCs, Halon, Carbon Tetrachloride, 1.1.1-Trichloroethane

The products and parts do not include the above materials

The products and parts are not used the above materials on process.

The products and parts are not used PBBOs (Poly Bromo Bi-phenyl Oxides).

All materials are mentioned as existing chemical material in the "Law of examine and control of Production of Chemical Material"

The products are not listed in Appendix 1 of Export Trade Rule and Regulation

A condenser of this series supports RoHS regulation.