

# SHG Series

## Aluminum Electrolytic Capacitors

| Item Name | Rating             | Case size     | KNSCHA Lifetime |
|-----------|--------------------|---------------|-----------------|
| 01EC4064  | SHG160V100 $\mu$ F | $\Phi$ 13*20L | 10000 hours     |

### 1. Operating Temp. Range

-25°C ~ + 105°C

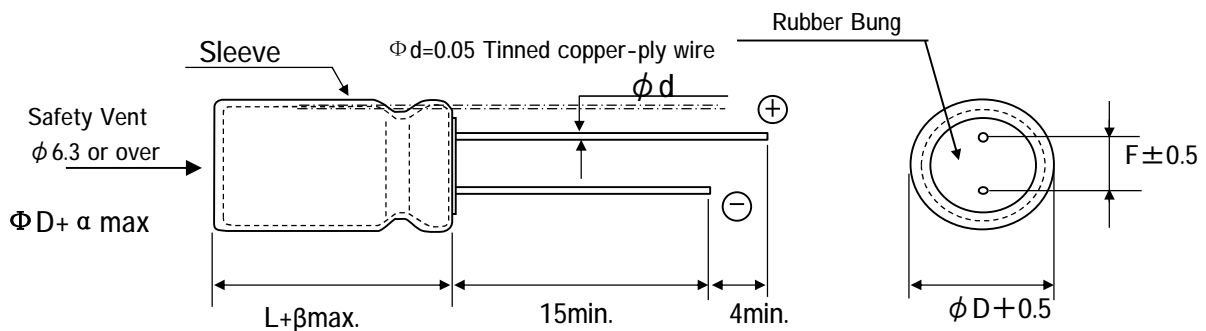
### 2. Electrical Characteristics

See Table 1.

【Table 1】

| Rated Voltage VDC | Surge Voltage VDC | Nominal Static Capacitance ( $\mu$ F) | Tolerance on Capacitance(%) 20°C 120Hz | Dissipation Factor ( $\tan \delta$ )max 20°C 120Hz | Leakage Current 5min. 20°C ( $\mu$ A)max | Permissible Ripple Current (mA)rmsmax 105°C100KHz | Impedance( $\Omega$ ) 100KHz 20°C |
|-------------------|-------------------|---------------------------------------|--|--|--|---|-----------------------------------|
| 160               | 200               | 100                                   | -20~+20                                | 0.20   | 335                                      | 1300  | 2.5                               |

### 3. Dimensions



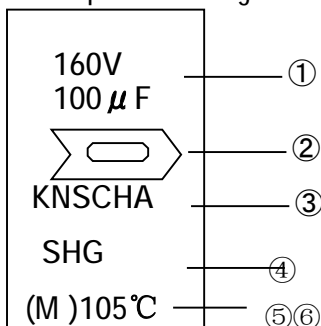
Unit(mm)

|                    |             |             |              |
|--------------------|-------------|-------------|--------------|
| $\phi D + 0.5$ Max | $L + 2$ Max | $F \pm 0.5$ | $d \pm 0.05$ |
| 13                 | 20          | 5.0         | 0.6          |

### 4. Marking

The following items are printed in white on the brown 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)     | 60 (50) | 120  | 1K   | 10K  | 100K |      |
|---------------|---------|------|------|------|------|------|
| Cap( $\mu$ F) | 0.1-47  | 0.75 | 0.80 | 0.85 | 0.90 | 1.00 |
| 68-680        | 0.80    | 0.85 | 0.90 | 0.95 | 1.00 |      |
| 1000-22000    | 0.85    | 0.87 | 0.89 | 0.92 | 1.00 |      |

#### ②. Temperature Coefficient

| Ambient Temperature(°C) | 40   | 60   | 70   | 85   | 105  |
|-------------------------|------|------|------|------|------|
| Coefficient             | 2.40 | 2.10 | 1.78 | 1.65 | 1.00 |

## 6. Characteristics

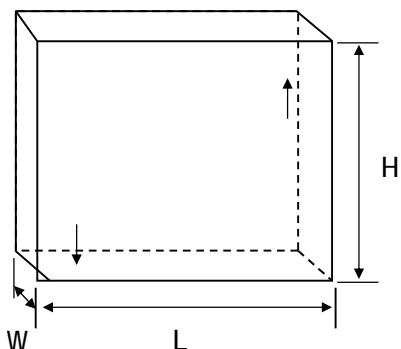
| No.   | Item                               | Performance   | Test Method  |  |  |                                |  |   |  |
|---|------------------------------------|---|--|--|--|--------------------------------|--|---|--|
| 1   | Leakage Current                    | $I = 335.0 \mu A$ ( $I = 0.02CV + 15 \mu A$ )<br>$I =$ Max Leakage Current<br>$C =$ Static Capacitor: $V =$ Rated Voltage   | Protection Resistor : $1000 \pm 10 \Omega$<br>Applied Volt : Rated Voltage<br>Measuring time : 5minutes                |  |  |                                |  |   |  |
| 2   | Static Capacitance                 | 80 ~ 120 $\mu F$  | Measured Frequency : $120 \text{Hz} \pm 20\%$<br>Measured Voltage<br>$\leq 0.5 \text{V}_{\text{rms}}$ , 1.5 ~ 2.0VDC   |  |  |                                |  |   |  |
| 3   | Dissipation Factor (tan $\delta$ ) | 0.20 and Under  | Same as condition of Capacitors  |  |  |                                |  |   |  |
| 4   | High Temp. Load Characteristics    | Leakage Current   | $\leq$ the value specified in Table 1  |  |  |                                |  |   |  |
|   |                                    | Cap. Change   | $\cong \pm 20\%$ of initial value  |  |  |                                |  |   |  |
|   |                                    | Dissipation Factor  | $\leq 200\%$ of value specified in Table   |  |  |                                |  |   |  |
|   |                                    | Appearance  | No remarkable abnormality  |  |  |                                |  |   |  |
|   |                                    |   | Test Temp. : $105 \pm 2^\circ \text{C}$<br>Applied voltage: Rated voltage<br>Test Time : 10,000 hours<br>+72, -0 hours |  |  |                                |  |   |  |
| 5   | High Temp. no load Characteristics | Leakage Current   | $\leq$ the value specified in Table 1  |  |  |                                |  |   |  |
|   |                                    | Cap. Change   | $\cong \pm 20\%$ of initial value  |  |  |                                |  |   |  |
|   |                                    | Dissipation Factor  | $\leq 200\%$ of value specified in Table   |  |  |                                |  |   |  |
|   |                                    | Appearance  | No remarkable abnormality  |  |  |                                |  |   |  |
|   |                                    |   | Test Temp. : $105 \pm 2^\circ \text{C}$<br>No voltage applied<br>Test Time : 1000 hours<br>+24, -0 hours               |  |  |                                |  |   |  |
| 6   | Terminal Strength                  | Tensile Strength  | 45N {4.5kg}  |  |  |                                |  |   |  |
|   |                                    | Bending Strength  | 25N {2.5kg}  |  |  |                                |  |   |  |
|   |                                    |   |  |  |  |                                |  |   |  |
|   |                                    |   | Keeping time<br>Tensile 1~5sec<br>Bending 30 $\pm$ 5sec  |  |  |                                |  |   |  |
| 7   | Impedance Ratio                    | <table border="1"> <thead> <tr> <th>W V</th> <th></th> </tr> </thead> <tbody> <tr> <td>Z-25<math>^\circ \text{C}</math>/Z+20<math>^\circ \text{C}</math></td> <td>3</td> </tr> <tr> <td>Z-40<math>^\circ \text{C}</math>/Z+20<math>^\circ \text{C}</math></td> <td>4</td> </tr> </tbody> </table> | W V  |  | Z-25 $^\circ \text{C}$ /Z+20 $^\circ \text{C}$ | 3                              | Z-40 $^\circ \text{C}$ /Z+20 $^\circ \text{C}$ | 4 |  |
| W V   |                                    |   |  |  |  |                                |  |   |  |
| Z-25 $^\circ \text{C}$ /Z+20 $^\circ \text{C}$  | 3                                  |   |  |  |  |                                |  |   |  |
| Z-40 $^\circ \text{C}$ /Z+20 $^\circ \text{C}$  | 4                                  |   |  |  |  |                                |  |   |  |
| 8   | Temperature Characteristics        | Stage   | Item   | Performance                              | Stage  | Test Temp( $^\circ \text{C}$ ) |  |   |  |
|   |                                    | 2,3   | Impedance Ratio  | less than the value mentioned in 5-7,    | 1  | 20 $\pm$ 2                     |  |   |  |
|   |                                    | 5   | Cap, Change  | $\leq \pm 25\%$ against value in stage 4 | 2  | -25 $\pm$ 3;                   |  |   |  |
|   |                                    | After the capacitor is held at temperature of each stage and reaches temperature stability, measure performance.  |  |  | 3  | -25 $\pm$ 3;                   |  |   |  |
|   |                                    |   |  |  | 4  | 20 $\pm$ 2                     |  |   |  |
|   |                                    |   |  |  | 5  | 105 $\pm$ 2                    |  |   |  |
| 6   | 20 $\pm$ 2                         |   |  |  |  |                                |  |   |  |
| 9   | Surge Voltage                      | Item  | Performance  |  |  |                                |  |   |  |
|   |                                    | Leakage Current   | $\leq$ the initial specified value   |  |  |                                |  |   |  |
|   |                                    | Cap, Change   | $\leq \pm 15\%$ against value before test  |  |  |                                |  |   |  |
|   |                                    | Dissipation Factor  | $\leq$ the initial specified value   |  |  |                                |  |   |  |
|   |                                    | Appearance  | No remarkable abnormality  |  |  |                                |  |   |  |
| Test Temp. 15~35 $^\circ \text{C}$ Test volt. Surge Volt. Specified in 2<br>Voltage apply. 1,000times of charge for 30 $\pm$ 5sec, under frequency of 6 $\pm$ 0.5sec,<br>and discharge for 5min30sec. |                                    |   |  |  |  |                                |  |   |  |

6-2. Characteristics

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

7 Packing method

Packaging shape, size, quantity



| Component size | Quantity per |
|----------------|--------------|
| 13*20          | 8000pcs.     |

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 Leakage current

<Condition>

Connecting the capacitor with a protective resistor ( $1k\Omega\pm 10\Omega$ ) in series for

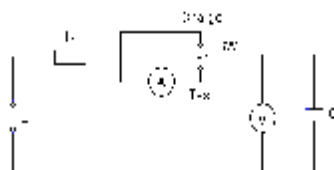
2 minutes, and then, measure leakage current

<Criteria

I : Leakage current ( $\mu A$ )

$I (\mu A) \leq 0.02CV + 15 (\mu A)$  whichever is greater, measurement circuit refer to right drawing.

C: Capacitance ( $\mu F$ )



11 Soldeing  
11-1

Soldering by soldering iron

Temperature of iron top :  $270\sim 350^{\circ}C$

Operating time : within 3 sec.

11-2

Flow soldering.

Preheat : PCB surface temperature  $120^{\circ}C\pm 5^{\circ}C$

Solder Temp :  $260^{\circ}C\pm 5^{\circ}C$

Solder Dipping Temp. :  $2\sim 4$ sec.

12 Cleaning of PC board after soldering

Using following solvents is possible but make sure following condition

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 than  $60^{\circ}C$ .
- 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.

13 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.

14 A country of origin

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

China

15 Effective life for storage

Storage conditions:

① Temperature range must be between  $5\sim 35^{\circ}C$

② Relative humidity must be less than 75%

③ Must be stored indoor

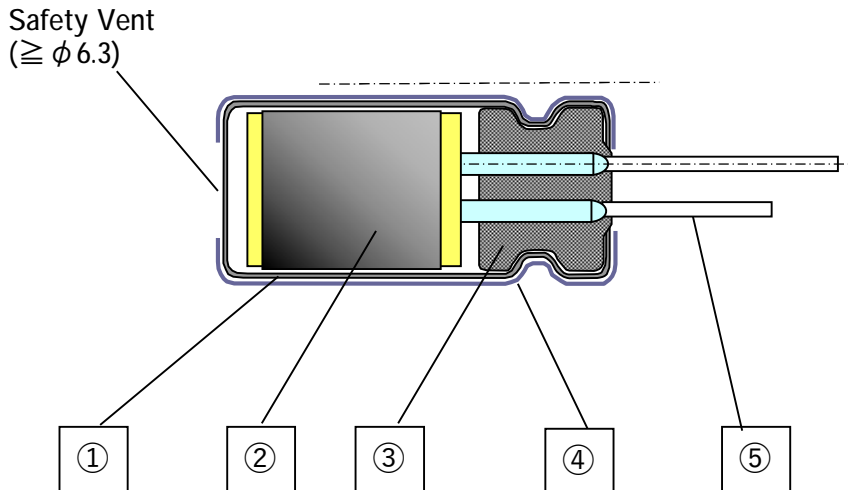
④ Must be free from water, oil or salt water

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.