DATA SHEET

PRODUCTS	**Green-Cap** (Electric Double Layer Capacitor)
ITEM	DS 2.7V 10F (Ø10 × L30) Part No. DS5U106W10030BB
REMARK	

COMPANY	SAMWHA ELECTRIC
TEL	82-43-261-0200
ADDRESS	3, Bongmyeong-ro, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do, Korea

Approved by *k. c. Eom*

Technical team manager

DATA SHEET

Green-Cap

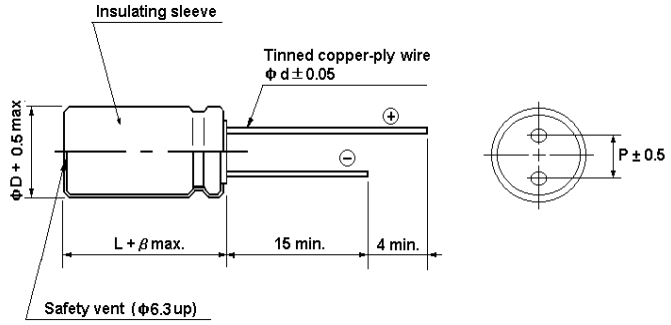
- Green-Cap is brand of SAMWHA's electric double layer capacitor(EDLC).
- Electric double layer capacitor(EDLC) is a next generation energy storage device.

DS5U106W10030BB

FEATURE

- Endurance : 2.7V 65℃ 1000hours
- The small size and high capacitance, low resistance
- Charge and discharge efficiency are higher than in batteries

DIMENSIONS



ØD	L	P	Ød	β
10	30	5.0	0.6	2.0

PRODUCTS SPECIFICATION

Rated Voltage	Capacitance (F)	ESR, 1kHz (mΩ)	ESR, DC (mΩ)	L/C(72hr) (mA Max.)	Specific Energy		Weight (g)	Volume (mℓ)	Dimension Ø D × L (㎜)
					(Wh/kg)	(Wh/L)			
2.7	10	25	45	0.027	3.49	4.30	2.9	2.4	10 × 30

PRODUCTS CHARACTRISTIC

CAPACITANCE	
Nominal Capacitance	10 F
Capacitance tolerance	0 ~ +20%
VOLTAGE	
Rated voltage	2.7V
Surge voltage	2.85V
TEMPERATURE	
Operating temperature range	-40~+65℃
Storage temperature range	-40~+65℃
Temperature characteristics	
Capacitance change	±5% (at 20℃)
Internal resistance change	±50% (at 20℃)
RESISTANCE	
AC ESR(1KHz)	25 mΩ
DC ESR	45 mΩ
CURRENT	
Leakage current After 72hr at 25℃. Initial leakage current can be higher.	0.027 mA
Maximum continuous current	0.66 A
Maximum peak current (1 sec.)	9.3 A

ENDURANCE	
Endurance After 1,000hr application of rated voltage at 65℃	
Capacitance change	Within ±30% of specified value
Internal resistance change	Within 100% of specified value
Life test After 10 years at rated voltage and 25℃	
Capacitance change	< 30%
Internal resistance change	< 100%
CYCLES	
Capacitors cycles between rated voltage under constant current at 25℃ (500,000cycles)	
Capacitance change	< 30%
Internal resistance change	< 100%
MARKING	
SAMWHA trade mark & series identification	
Rated voltage	
Capacitance value (Marking)	
Sleeve color : Black Print color : Gold	

PERFORMANCE

Test environmental conditions

- Ambient temperature : 25±2℃, Relative humidity : 60~70%, Air pressure : 86~106kPa

<table>
<tr><th>No</th><th>ITEM</th><th>TEST CONDITION</th><th>SPECIFICATION</th></tr>
<tr><td>1</td><td>Rated voltage</td><td></td><td>See the table “PRODUCTS CHARACTRISTIC”</td></tr>
<tr><td>2</td><td>Capacitance (tolerance)</td><td>To see measure method (See No. 11)</td><td>See the table “PRODUCTS CHARACTRISTIC”</td></tr>
<tr><td>3</td><td>Internal resistance</td><td>To see measure method (See No. 12)</td><td>See the table “PRODUCTS CHARACTRISTIC”</td></tr>
<tr><td>4</td><td>Leakage current
(After 72hr at 25℃)</td><td>To see measure method (See No. 13)</td><td>See the table “PRODUCTS CHARACTRISTIC”</td></tr>
<tr><td>5</td><td>Temperature characteristics</td><td>
<table>
<tr><th>STEP</th><th>TEMPERATURE(℃)</th><th>TIME</th></tr>
<tr><td>1</td><td>20 ±2</td><td></td></tr>
<tr><td>2</td><td>-40 ±2</td><td>2hr</td></tr>
<tr><td>3</td><td>20 ±2</td><td>15 min</td></tr>
<tr><td>4</td><td>65 ±2</td><td>2 hr</td></tr>
</table>
Step-1
Capacitance, ESR and leakage current shall be measured.
Step-2, 4
After the capacitor being stored for 2hours, capacitance and ESR and leakage current shall be measured.
Step-3
After the capacitor being stored for 15min, capacitance and ESR and leakage current shall be measured.</td><td>• Capacitance change within ±5% of initial value
• Internal resistance change ≤ 50% of initial value
• Leakage current ≤ specified value</td></tr>
<tr><td>6</td><td>Resistance to soldering heat</td><td>• Solder : HSE-02 SR-34
• Flux : 25% by weight of rosin in methanol
• Solder temperature : 260±5℃
• Immersion depth : 2.0 mm
• Immersion speed : 25±2.5 mm/sec.</td><td>• No visible damage
• Capacitance change within ±10% of initial value
• Internal resistance change ≤ 20% of initial value
• Leakage current ≤ specified value</td></tr>
</table>

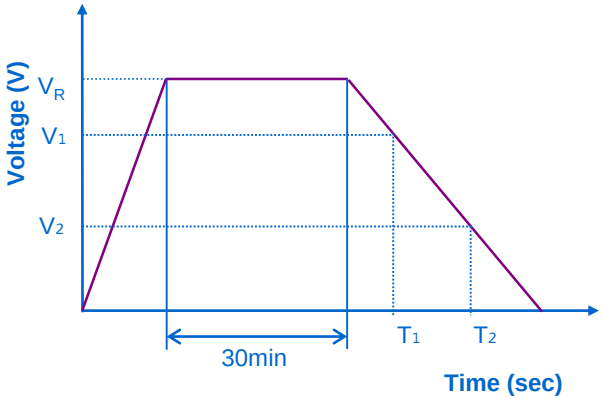
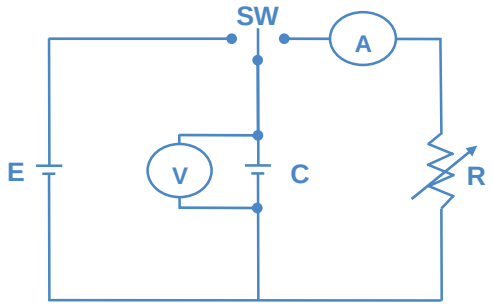
PERFORMANCE

Test environmental conditions

- Ambient temperature : 25±2℃, Relative humidity : 60~70%, Air pressure : 86~106kPa

<table>
<tr><th>No</th><th>ITEM</th><th>TEST CONDITION</th><th>SPECIFICATION</th></tr>
<tr><td>7</td><td>Endurance</td><td>• Temperature : 65℃ ±2℃
• Applied voltage : rated voltage
• Duration : 1000 +72/-0 hours</td><td>• No visible damage
• Capacitance change within ±30% of specified value
• Internal resistance change ≤ 100% of specified value
• Leakage current ≤ specified value</td></tr>
<tr><td>8</td><td>Shelf life</td><td>•Temperature : 65℃ ±2℃
• Duration : 1000 +72/-0 hours</td><td>• No visible damage
• Capacitance change within ±30% of specified value
• Internal resistance change ≤ 100% of specified value
• Leakage current ≤ specified value</td></tr>
<tr><td>9</td><td>Cycle life</td><td><table><tr><th>STEP</th><th>VOLTAGE(V)</th><th>TIME (sec.)</th></tr><tr><td>1</td><td>Charge to Rated Voltage</td><td>20 ± 1</td></tr><tr><td>2</td><td>Rest to Rated Voltage</td><td>10 ± 0.5</td></tr><tr><td>3</td><td>Discharge to Rated Voltage ×1/2</td><td>About(20 ± 1)</td></tr><tr><td>4</td><td>Rest to Rated Voltage ×1/2</td><td>10 ± 0.5</td></tr></table>• Cycle : 500,000 cycles</td><td>• No visible damage
• Capacitance change within ±30% of specified value
• Internal resistance change ≤ 100% of specified value
• Leakage current ≤ specified value</td></tr>
<tr><td>10</td><td>Damp heat
(steady state)</td><td>• Temperature : 40±2℃
• Relative humidity : 90%~95%
• Duration : 240±8 hours</td><td>• No visible damage
• Capacitance change within ±30% of specified value
• Internal resistance change ≤ 100% of specified value
• Leakage current ≤ specified value</td></tr>
</table>

Measuring Method Of Characteristics

11	Capacitance	1) Charging is performed by constant current followed by constant voltage charging. 2) Charging is performed for duration of 30 minutes at rated voltage. 3) Discharge use a constant current load device and measure the time for the terminal voltage to drop from V_1 to V_2 upon discharge at 1mA/F. ($V_1 = 0.8 \times V_R$, $V_2 = 0.4 \times V_R$) 4) The capacitance can be obtained by the following equation. $C = \frac{I \times (T_2 - T_1)}{V_1 - V_2} (F)$  
12	ESR	The AC Resistance is used. 1) The Frequency of the measuring voltage shall be 1kHz. 2) The AC current shall be from 1 to 10mA.
13	Leakage current	1) Charging is performed by constant current followed by constant voltage charging 2) Charging is performed for duration of 72 hours at rated voltage. 3) Then, Leakage current is measured by current measurement equipment.

• **Please contact SAMWHA Green-Cap directly for any technical specifications critical to application.**