DATA SHEET

NAME	**BATTERY CAPACITOR**
ITEM	2.7V 33,000F(Ø60 × L102) Part No. CB2R7339W60102ATBHE
APPLICATION	-
REMARK	-

COMPANY	SAMWHA CAPACITOR
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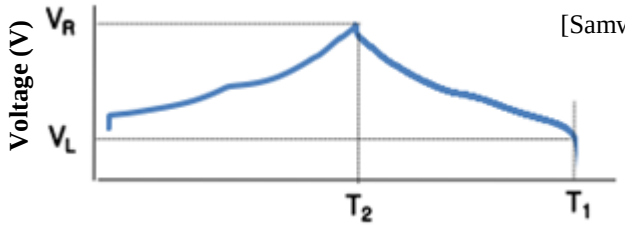
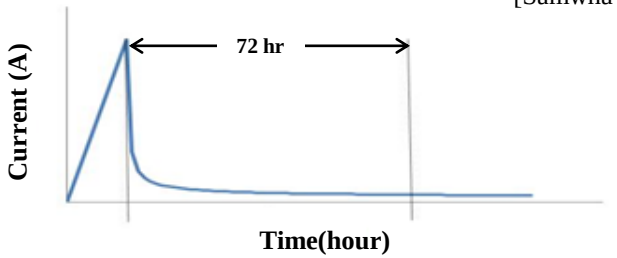
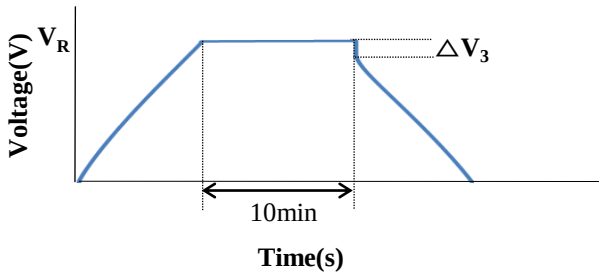
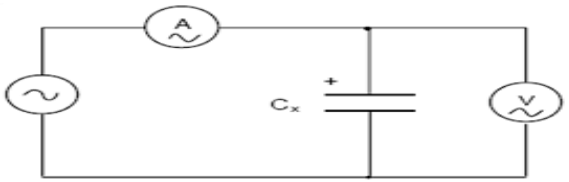
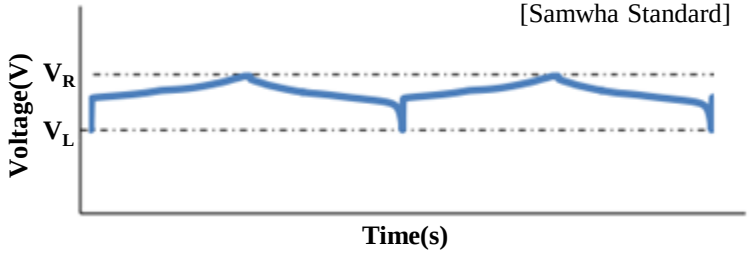
CB2R7339W60102ATBHE		
Item	**Unit**	**Specification**
Capacitance (25℃, 2.7~1.6V)	F	33,000
Capacity(25℃, 2.7~1.6V)	Ah	9.8
Usable Energy Density(25℃, 2.7~1.6V)	Wh	20.2
Rated Voltage, V_R	V	2.7
Max. Current	A	30
ESR (DC / AC,1kHz)	mΩ	<1.2 / <1.0
Usable Specific Power(P_d)	W/kg	1090
Dimensions	mm	60Φ x 102mm
Weight	kg	0.67
Operating Temperature Range	℃	-20 ~ +50
Capacitance Change	%	Within ±40% of initial value
Internal Resistance Change	%	Less than 200% of initial value
Max. Leakage Current, L_C (after 72h)	mA	<11
Cycle Life(25℃)	cycle	15,000

1. Electrical Performance

No	Item	Unit	Specification	Test Conditions and Methods
1	Capacitance at 20℃	F	33,000	[Samwha Standard]  $E = \frac{\frac{1}{2} \times C \times (V_R^2 - V_L^2)}{3600}$ (Wh) 1) Charging is performed by constant current of 1mA/F. 2) Charging is performed for duration of 30 minutes a rated voltage. 3) Discharge use a constant current load device and measure the time for the terminal voltage from V_R to V_L at the current density of 1mA/F.
2	Capacitance Tolerance at 20℃	%	-10 / +20	-
3	Rated voltage	V	2.7	-
4	Leakage current after 72 hour	mA	<11	[Samwha Standard]  The battery capacitor is charged with the rated voltage for 72hours. Then, leakage current is measured by current measurement equipment.

No	Item		Unit	Specification	Test Conditions and Methods
5	Internal resistance (ESR)	DC	mΩ	<1.2	[Samwha Standard]  $R_D = \frac{\Delta V_3}{I}$
		AC 1kHz	mΩ	<1.0	[IEC 62391-1]  $R_A = \frac{\Delta V}{I}$ 1) The internal resistance R_A of a capacitor shall be calculated by the above formula. 2) The frequency of the measuring voltage shall be 1kHz. 3) The AC current shall be from 1mA to 10mA.
6	Operating temperature		℃	-20 ~ +50	Operating temperature range shall be -20 ~ +50℃.
7	Energy density	Gravimetric	Wh/kg	30.1	2.7~1.6V
8	Power density	Gravimetric	W/kg	1090	-

2. Reliability

<table>
<tr><th>No</th><th colspan="2">Item</th><th>Unit</th><th>Specification</th><th>Test Conditions and Methods</th></tr>
<tr><td rowspan="2">1</td><td rowspan="2">Temperature Characteristic</td><td>Capacitance change</td><td>%</td><td>Within ± 40 % of initial specified value at +20℃</td><td rowspan="2">[Samwha Standard]
<table><tr><th>Temperature(℃)</th><th>Keep Time</th></tr><tr><td>+ 20 ± 2</td><td>-</td></tr><tr><td>- 20 ± 2</td><td>2 hr</td></tr><tr><td>+ 20 ± 2</td><td>15 min</td></tr><tr><td>+ 50 ± 2</td><td>2 hr</td></tr></table>Measure electrical characteristics after exposing capacitor to each temperature atmosphere for 2 hours or 15 minutes.</td></tr>
<tr><td>Internal resistance change</td><td>%</td><td>Less than 200 % of initial specified value at +20℃</td></tr>
<tr><td>2</td><td colspan="2">Shelf life after 1000 hours no load test same as endurance</td><td>%</td><td>Same as endurance</td><td>[Samwha Standard]
Temperature : 50±2℃
Duration : 1000 +72/-0 hour</td></tr>
<tr><td rowspan="3">3</td><td rowspan="3">Cycle life (at 25℃)</td><td>Cycle</td><td>Cycle</td><td>15,000</td><td rowspan="3">[Samwha Standard]
 
where V_R is the rated voltage of 2.7V
V_L is the low voltage of 1.6V
Condition the capacitor at 25±3℃ until thermal equilibrium is reached. Initialize the voltage on the capacitor at V_L(1.6V). Then charge the capacitor at a current 45A to V_R. Maintain voltage V_R on the capacitor for 10±0.50 s. Then discharge the capacitor to V_L at current 45A. Hold at V_L for 10 ± 0.50 s. This defines a cycle(see Figure). Repeat this cycle throughout the testing.</td></tr>
<tr><td>Capacitance change</td><td>%</td><td>Within ± 40 %of initial specified value</td></tr>
<tr><td>Internal resistance change</td><td>%</td><td>Less than 200 % of initial specified value</td></tr>
</table>

No	Item		Unit	Specification	Test Conditions and Methods
4	Damp heat	Capacitance change	%	Within ± 30 %of initial specified value	[Samwha Standard] Temperature : 50± 2℃ Relative humidity : 90%~95% Duration : 240± 8 hours
		Internal resistance change	%	Within ± 200 %of initial specified value	

3. Dimensions

Part number	Capacitance (F)	Dimension(mm)		
		D (± 0.2)	L (± 0.3)	H (± 0.7)
CB2R7339W60102ATBHE	33,000	60.2	102.5	15