

# TECHNICAL SPECIFICATION

## Super Pulse Battery Capacitor

### Model: SLCL1016

Established date: 23 December,2021

	Position	Signature
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### Version Record

NO.	Reviser	Established Date	Version	Revise page	Revised reason
0	Zhang Peng	2021.12.22	A/0	all	Release

## 1. Scope

This specification can be applied in SLCL1016 Super Pulse Battery Capacitor to specify the property index, test method, quality control, points for attention, etc.

## 2. Product type

Super Pulse Battery Capacitor

## 3. Battery system characteristics

Table 1 General characteristics

No.	Items	Criteria	Remark
01	Rated Voltage	3.8 V	
02	Min. Operating Voltage	2.5 V	
03	Rated Capacitance	30F	
04	Capacitance Tolerance	±20%	
05	Surge Voltage	4.2 V	
06	$ESR_{AC}$	250 mΩ	1KHz
07	$ESR_{DC}$	550 mΩ	
08	Rated Charge/discharge Current	0.15A	
09	Max. Charge/discharge Current(≤3sec)	1A	
10	Self-discharge current	≤1μA	3 months
11	Leakage Current	≤3μA	168h
12	Operating Temperature Range	-15~+70°C/85°C(3.5V)	

13	Storage temperature Range	-25~+85°C	
14	Cycle Life	≥500,000 cycles	
15	Weight	2.5±0.5 g	

Table 2 Other performances

No.	Items	Specification/Condition
01	Temperature Characteristics	$ \Delta C/C  \leq 10\%$ , $ESR_{AC} \leq$ specified $ESR_{AC}$ at +70°C $ \Delta C/C  \leq 50\%$ , $ESR_{AC} \leq$ 10 times of specified $ESR_{AC}$ at -15°C
02	High temperature loaded	$ \Delta C/C  \leq 30\%$ , $ESR_{AC} \leq$ 2 times of specified $ESR_{AC}$ at +70°C/ 1000hrs/Rated voltage
03	High temperature storage	$ \Delta C/C  \leq 30\%$ , $ESR_{AC} \leq$ 2 times of specified $ESR_{AC}$ at +85°C/1000hrs
04	Humidity Resistance	+40°C, 90--95%RH, 240h, $ \Delta C/C  \leq 30\%$ , $ESR_{AC} \leq$ 2 times of specified $ESR_{AC}$

#### 4 Appearance

SLCL1016 appearance, no scratch, swelling, deformation, corrosion, electrolyte leakage and other defects.

#### 5 Performance and test conditions

##### 5.1 Test conditions and instruments

### 5.1.1 Standard test conditions

The test shall be performed with capacitors lasting no more than 10 days and, unless otherwise specified, under the following conditions:

temperature:( $23\pm 5$ )°C;

Relative humidity: ( $65 \pm 20$ )%;

Air pressure: 1.0 atm.

### 5.1.2 Measuring instrument requirements

The Inspection Service Provider shall establish and maintain the test equipment and inspection devices that meet the test and inspection requirements. Its accuracy shall meet the requirements and identified by the measurement department can be used within the validity period.

The accuracy of the instrument for measuring dimensions shall not be any less than 0.01 mm;

The accuracy of measuring voltage meter shall not be less than 0.5 and internal resistance shall be not less than  $10\text{k}\Omega/\text{V}$ ;

The accuracy of the instrument used for measuring the weight shall not be any less than 0.05 g;

Current instrument accuracy shall not be less than the 0.5 level;

The measurement principle shall be AC impedance (frequency 1kHz).

## 5.2 Environmental adaptability test items and methods

### 5.2.1 Altitude Simulation

A test Super Pulse Battery Capacitor shall be stored for 6h at an absolute pressure of 11.6KPa(1.68psi) and a temperature of  $20\pm 3$ °C ( $68\pm 5$ °F)

Criteria: The samples shall not explode, catch fire or leak.

### 5.2.2 Thermal Cycling

A test Super Pulse Battery Capacitor shall be stored for at least 6h at test temperature of 72°C, followed by storage for at least 6h at temperature of -40 °C . The maximum time for transfer to each temperature shall be 30 min. Each test and battery shall undergo this procedure 10 times. This is then followed by storage of at least 24h at ambient temperature.

Criteria: The samples shall not explode, catch fire or leak.

### 5.2.3 Vibration test

A test Super Pulse Battery Capacitor shall be firmly secured to the platform of vibration machine without distorting them and in such a manner as to faithfully transmit the vibration. Battery vibration frequency is to be varied at the rate of 1 hertz per minute between 10 and 55 hertz, and return in not less than 90 or more than 100 minutes. The battery is to be tested in three mutually perpendicular directions .

Criteria: The samples shall not explode, catch fire or leak.

### 5.2.4 Free fall

A test Super Pulse Battery Capacitor shall be dropped from 1.0m height onto a concrete surface. Each test battery shall be dropped six times, a prismatic battery once from each of its six faces.

Criteria: The samples shall not explode or catch fire.

#### **Warning:**

The description of the following abuse tests is for demonstration purposes only. During handling and application of lithium batteries, abusive conditions must be avoided. Any application or test requiring performance beyond the limits given hereby must be approved by Fanso.

## 5.3 Safety test

### 5.3.1 Thermal abuse

A test Super Pulse Battery Capacitor shall be placed in an oven and the temperature raised at a rate of 5°C/min to a temperature of 130°C at which the battery shall remain for 10 min.

Criteria: Discharge from the relief valve is allowed, but the samples shall not explode or catch fire.

### 5.3.2 Impact

A test Super Pulse Battery Capacitor is placed on a smooth flat surface. A 5/8 in. (15.8 mm) diameter steel bar was placed across the center of the sample. The length of the bar should be at least as long as the width of the sample. A  $9.1 \pm 0.1$  kg weight is dropped from a height of  $24 \pm 1$  in. ( $610 \pm 25$  mm) on to the sample.

Criteria: The samples shall not explode or catch fire.

### 5.3.3 Crush test

A test Super Pulse Battery Capacitor is crushed between two flat hard surfaces. The crushing was continued until a force of 3000 pounds ( $13\text{kN} \pm 0.78\text{kN}$ ) was applied by hydraulic piston with a diameter of 32mm. press continue until pressure reach up to 17.2Mpa. Once the maximum pressure was obtained, it was released.

Criteria: The samples shall not explode or catch fire.

### 5.3.4 External Short-circuit

The positive and negative sample capacitor is short by copper wire with resistance  $<0.1\Omega$  at the ambient temperature  $23 \pm 5^\circ\text{C}$  until the capacitor catches fire or explodes or until the capacitor is fully discharged to 0.2V, and the housing temperature is relowered to the ambient temperature  $\pm$

10°C.

Criteria: The samples shall not explode or catch fire.

### 5.3.5 Forced discharge test

At the ambient temperature of  $23 \pm 5^\circ\text{C}$ , the termination voltage is discharged at 0.2C, and then the capacitor is reverse charged at 1C current, requiring a charging time of not less than 90min.

Criteria: The samples shall not explode or catch fire.

## 6. Incoming inspection

As for the customer's incoming inspection, FANSO recommended sampling according to GB2828.1-2012 standard.

Table 3 Acceptability quality level

No.	Item	Check level	AQL
1	Dimension	S-3	0.65
2	Appearance	II	0.65
3	Open circuit voltage	II	0.4
4	Load voltage	II	0.4

Table 4 Sampling amount

Lot size	Sampling amount
$\leq 3200$	32
3200~10 000	50
$> 10\ 000$	80



## 7. Storage

Super Pulse Battery Capacitor should be stored in a cool, clean, dry environment, the recommended temperature is  $\leq +30\text{ }^{\circ}\text{C}$ , relative humidity  $\leq 60\%$ , should avoid contact with corrosive materials, away from fire and heat.

## 8. Safety terms

8.1 Before use, do not remove the battery from the original packaging.

8.2 Do not scattered placed the capacitor together in order to avoid accidental short circuit.

8.3 Do not heat the capacitor above  $100\text{ }^{\circ}\text{C}$  or incinerated.

8.4 Do not recharge the capacitor more than 3.95V.

8.5 Do not weld or solder directly to capacitor, should use the capacitor with terminals or wires.

8.6 Do not mix the new and used capacitors or different brand capacitor.

8.7 Do not disassembly or open capacitor.

8.8 Do not short circuit the battery or reversely contact the positive and negative terminals.

8.9 Do not reverse the positive and negative poles of the capacitor with the electrical equipment.

8.10Capacitors can be used in parallel with the power supply, but strict protection measures should be taken to prevent capacitors from countercharging them.

8.11 Do not test environment and safety under extrusion without any protection.

8.12Do not put the capacitor into the water.

8.13 Do not turn or pull the positive (+) and negative (-) pins.

## 9. Transportation

Capacitors need to separate battery capacitors during transportation to prevent short circuits,

transportation should be packaged with hard packaging paper to prevent falling, falling, damage, and need to prevent goods from collapsing and rain from getting wet.

Transportation mode: air transport, sea transport.

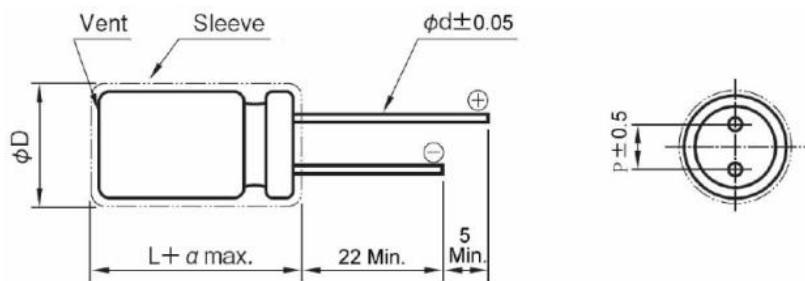
### 10. Statement

If you have any questions on the product specifications, please contact with Wuhan Fanso Technology Co. ltd. Fanso reserves the right to amend the product specification.

### 11. Product mark

Neutral trademark, sprayed with "positive and negative pole logo", "FANSO", "SLCL1016", "YYMMDD ", etc., including "YYMMDD "represents the date of production (month date), such as December 12,2021, spray as" 211222 ".

### 12. Drawing (unit of size: mm)



Model	Items	Criteria	Items	Criteria
SLCL1016	D	$10.0 \pm 0.5$	L	$16.0 \pm 2.0$
	p	$5.0 \pm 0.5$	d	$0.6 \pm 0.5$

### 13.Note

Any other items which are not covered in this specification shall be agreed by both parties.