

# SPECIFICATION FOR APPROVAL

**PRODUCT: SPSCAP**

**SERIES: SCE**

**MODEL: SCE0500C0-0002R7SPD**

**Rev: 1.0**

Prepared	Checked	Approved

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## 1. Scope

These are the specifications of SPSCAP (Electric Double Layer Capacitor) which you are using, please review this document and approve it.

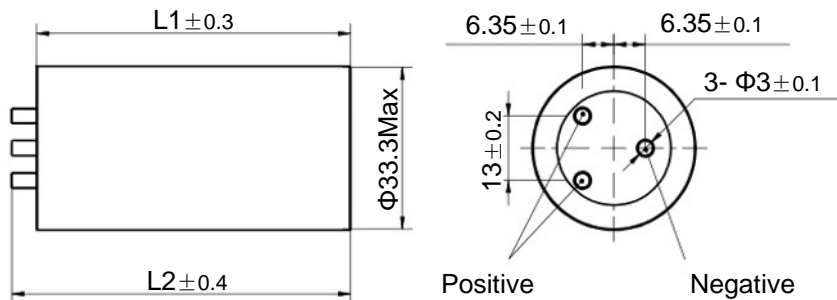
## 2. Construction and Dimensions

### 1) Construction

Inside structure: wound anode and cathode electrode with separator

Outer structure: aluminum case, insulating sleeve

### 2) Dimensions



Part Number	Dimension(mm)		
	D(Max)	L1	L2
SCE0500C0-0002R7SPD	33.3	79.8	84.7

## 3. Part Number Naming System

SCE	0500	C	0	-	0002	R	7	SPD	
Product Series		Nominal Capacitance (F)		Dash	Rated Voltage (V)		Terminal Design		
S	Single	0500	500		0002	2	SP	Soldering Pillar	
C	Cylindrical	C	Decimal		R	Decimal			
E	Energy	0	0.0		7	0.7	D	Improved Part	

#### 4. General Characteristics Specifications

Items	Specification
Rated Voltage (V DC)	2.7
Surge Voltage (V DC)	2.85
Operating Temp. (°C)	-40 ~ +65
Rated Capacitance (F)	500
Capacitance Tolerance	-10% ~ +20%
ESR Max. (AC@1KHz,mΩ)	1.5
ESR Max.(DC, mΩ)	2.5
Maximum Continuous Current ( $\Delta T=15^{\circ}\text{C}$ , A)	27
Maximum Continuous Current ( $\Delta T=40^{\circ}\text{C}$ , A)	43
Maximum Peak Current (A) (1s)	300
Max.LC (Room Temp. after 72hrs, mA)	1.0
Typical Thermal Resistance ( $R_{th}$ Housing, °C/W)	8.4
Typical Thermal Capacitance ( $C_{th}$ , J/°C)	100
Weight (g)	90
Energy Stored (WH)	0.51

## 5. Reliability Specifications

Item		Specification		Condition
Temp. Characteristics	Capacitance	Step. 2	Change within 5% of Initial Value	Step 1: +25±2°C,1h Step 2: +65±2°C,1h Step 3: -25±2°C,1h Step 4: -40±2°C,1h
	ESR		Less than 150% of spec Value	
	Capacitance	Step. 3	Change within 5% of Initial Value	
	ESR		Less than 150% of spec Value	
	Capacitance	Step. 4	Change within 5% of Initial Value	
	ESR		Less than 150% of spec Value	
Vibration Test	Capacitance	Initial Value		Amplitude: 1.5mm Frequency: 10-55Hz Direction: X,Y,Z Time: each direction 2hrs, total 6hrs
	ESR	Initial Value		
	Appearance	Not Marked Defect		
Thermal Cycle	Capacitance	Initial Value		Temp.: -40°C ~ +65°C Cycle times: 6 Test Time (One Cycle) : -40°C 2hrs,+65°C 2hrs,Temp change 2hrs
	ESR	Initial Value		
	Appearance	Not Marked Defect		
Humidity Test	Capacitance	Change within 20% of Initial Value		Temp.: +40±2°C Humidity: 90-95%RH Test Time: 240±8hrs
	ESR	Less than 200% of spec Value		
	Appearance	Not Marked Defect		
DC Life	Capacitance	Change within 20% of Initial Value		Temp.: +65±2°C Voltage: 2.7V Time: 1,500hrs
	ESR	Less than 200% of spec Value		
	Appearance	Not Marked Defect		
Shelf Life	Capacitance	Change within 20% of Initial Value		Temp.: +70±2°C Time: 1,000hrs
	ESR	Less than 200% of spec Value		
	Appearance	Not Marked Defect		
Cycle Life	Capacitance	Change within 20% of Initial Value		Temp.: +25±2°C Cycles times: 1,000,000
	ESR	Less than 200% of spec Value		
	Appearance	Not Marked Defect		

## 6. Measuring Method

### 1) Charge and Discharge procedure

(figure 6-1)

- A) Charge the capacitor using constant current I to rated voltage  $V_0$
- B) Keep rated voltage 5 min
- C) Discharge the capacitor using constant current I to half rated voltage, record discharge time  $T_1$  during voltage change from  $V_1$  to  $V_2$
- D) Rest 2-5s, record voltage change  $\Delta V$
- E) Discharge it to a very low voltage around 0.01V
- F)  $V_1=85\% V_0$   $V_2=50\% V_0$

### 2) Capacitance

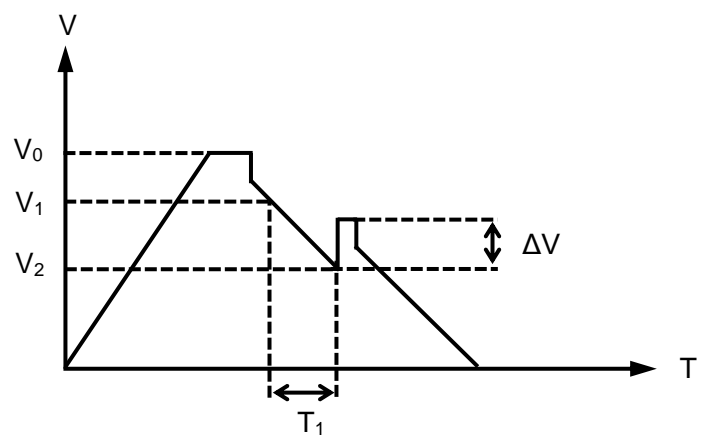
$$C = I \cdot T_1 / (V_1 - V_2)$$

C: Capacitance (F)

I: Constant Discharge Current (A)

$T_1$ : Discharge Time (S)

$V_1 - V_2$ : Voltage Change (V)



### 3) DC ESR

$$\text{DC ESR} = \Delta V / I$$

DC ESR: DC Equivalent Series Resistance ( $\Omega$ )

$\Delta V$ : Voltage Change (V)

I: Constant Discharge Current (A)

### 4) AC ESR

Measure AC ESR using LCR meter

Frequency: 1KHz

Voltage: fully discharge

**REMARK: SPSCAP CAPACITORS SHOULD BE DISCHARGED WITH RESISTOR FOR 12 HOURS OR MORE BEFORE EACH TIME MEASUREMENT OF CAPACITANCE OR ESR.**

## 7. Environmental Management

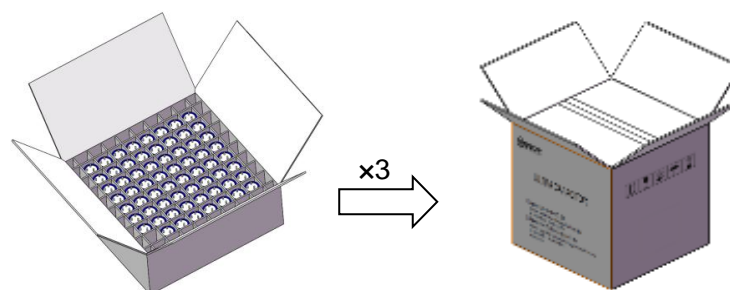
All SPSCAP products are RoHS compliant product.

## 8. Cautions for Use

Please notice below points when you start use SPSCAP.

- 1) The SPSCAP gets polarity through aging/testing process before it is packed, so please mount it in accordance with its polarity to maintain the best condition;
- 2) Please only apply SPSCAP at rated voltage. If you apply more than rated voltage, capacitor will be damaged or broken due to electrolyte inside will be electrolyzed;
- 3) Ambient temperature greatly affects the lifetime of the capacitor, by reducing the temperature by 10°C, lifetime can be approximately doubled;
- 4) Storage: In long term storage, please store SPSCAP in following condition:
  - Temp.: 15 ~ 35°C
  - Humidity: 40 ~ 75 %RH
  - No-dust, non-acidic and/or non-alkaline atmosphere
  - Avoid direct sun light
- 5) Do not disassemble SPSCAP. It contains electrolyte;
- 6) Avoid serious mechanical impacts onto capacitor, such as force or twist capacitor;
- 7) Please contact us if you want to subject SPSCAP to severe vibrating conditions exceeding rated specification;
- 8) Please contact us if you want to connect a certain number of single capacitor to make a module;
- 9) Over-rated voltage may be applied to a single SPSCAP in series connection due to the deviation of capacitance and ESR of each SPSCAP. Please inform us if you are using SPSCAP in series connection and please design so as not to apply over-rated voltage to each capacitor, and use SPSCAP from same date code/lot.

## 9. Packing



Package Drawing

Part Number	Quantity (pcs)	Box Size ( W x L x H ) mm	Gross Weight (Kg)
SCE0500C0-0002R7SPD	192	350x350x325	20.28