

# Super Pulse Cell Capacitor

## Model SPC0920

### 1. Scope

This data sheet describes the mechanical design and performance of EVE (Super Pulse Cell Capacitor) model SPC0920, optimized for extreme temperatures, used in an ES battery system.

### 2. Mechanical characteristics

Physical:

Length	21.0 mm. max
Diameter	9.0 mm. max
Weight:	3.5 gr. max

### 3. Electrical characteristics

#### 3.1 Discharge

Discharge capacity (at RT):

When charged to 3.67V:	30 A*sec
When charged to 3.90V:	45 A*sec
Discharged end current:	2.5V (discharge below 2.5V at RT and discharge below 2.0V at -40°C may increase the SPC internal impedance)

Maximum discharge current: Continuous: 150mA  
Pulse: 500mA

#### 3.2 Charge (constant current)

Max. charge voltage:	3.95V
Max. charging current:	6 mA

3.3 Cell impedance: Less than 500 mOhm (at RT @ 1kHz)

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### 3. 4 Shelf life

Shelf life at different storage temperature to 80% of initial capacity, used in an ES battery system.

Temperature	SPC	SPC in ES battery system
RT	1 years	>10 years
60 °C	2 weeks	10 years
80 °C	1 weeks	1 year

### 3. 5 Self discharge in ES battery.

at RT:                    2  $\mu$ A

at 80°C :                5  $\mu$ A

### 3. 5 Number of charge-discharge cycles to 80% of initial capacity (DOD: Depth of Discharge).

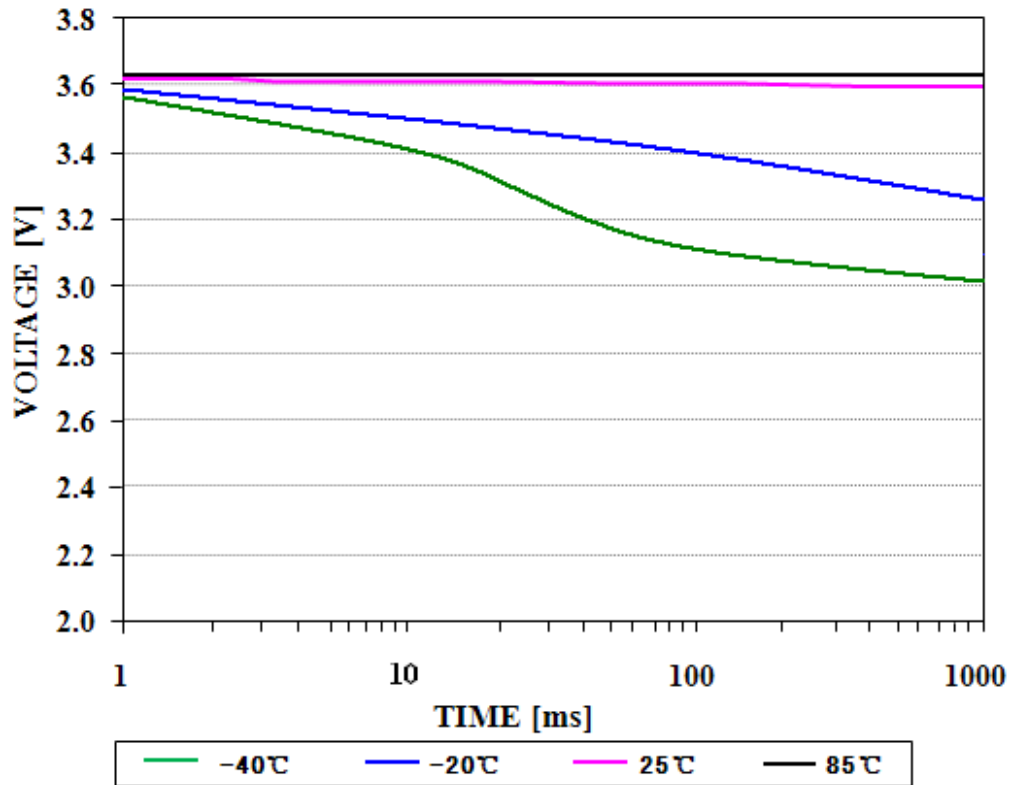
	100% DOD	10% DOD	1% DOD
Charged to 3.67V	1000	10000	100000
Charged to 3.90V	800	8000	80000

DOD( Depth of Discharge)

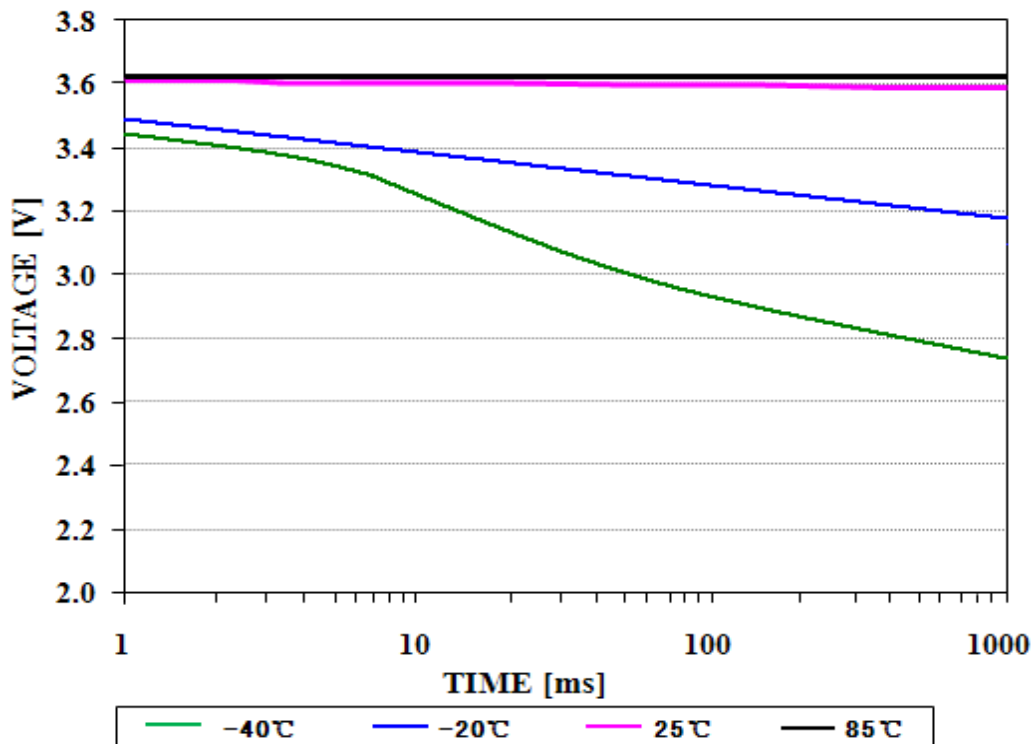
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## 3.7 Performance Data

Voltage curves for SPC0920 at Li/SOCl<sub>2</sub> potential (3.67V), 45mA

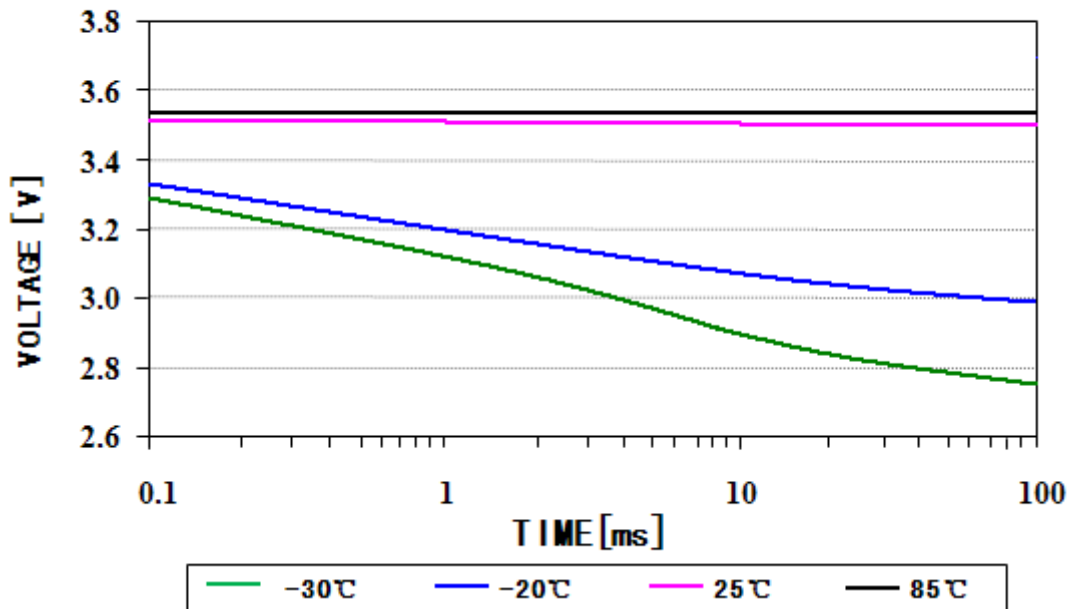


Voltage curves for SPC0920 at Li/SOCl<sub>2</sub> potential (3.67V), 70mA

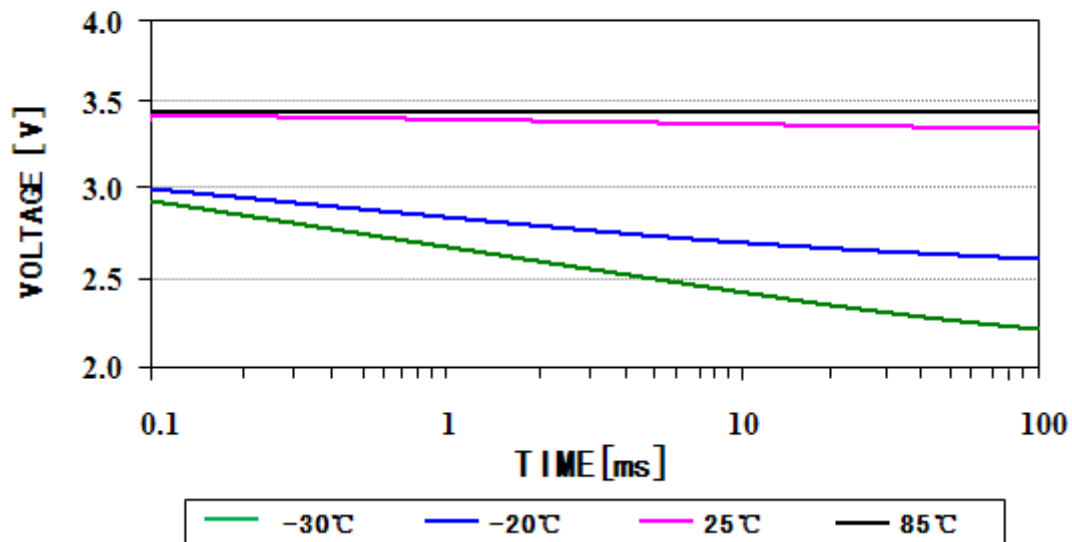


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Voltage curves for SPC0920 at Li/SOCl<sub>2</sub> potential (3.67V), 200mA

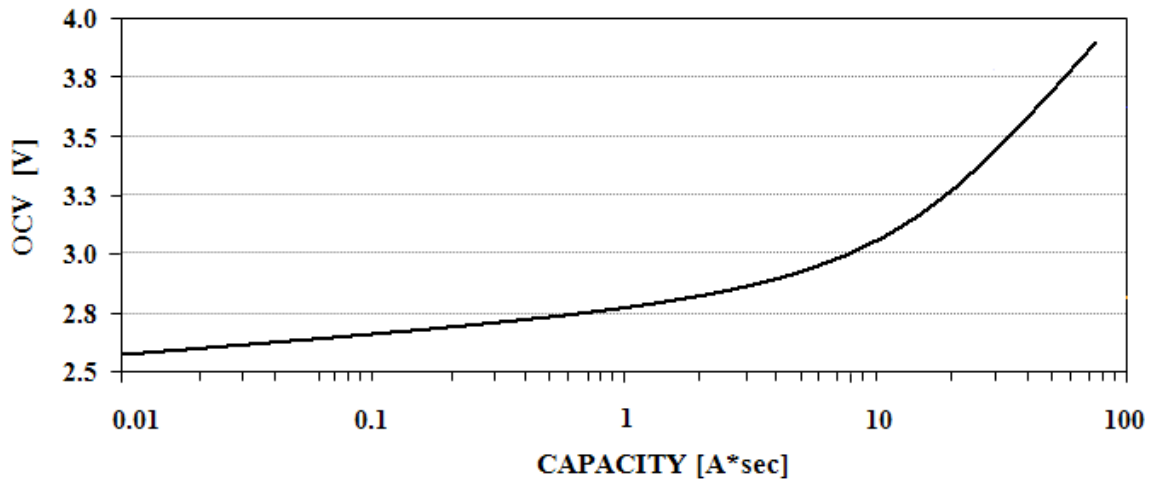


Voltage curves for SPC0920 at Li/SOCl<sub>2</sub> potential (3.67V), 420mA



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Discharge capacity vs. OCV for SPC0920 (at RT, 15mA discharge)



### 3.8 Safety tests:

The SPC successfully passed the following safets:

- Short circuit at RT and 55°C
- Compression
- Impact
- Overcharge
- High temperature exposure
- Shock and vibration
- Nail penetratio
- Forced discharge

EVE Batteries performed the tests according to UL 1642 specification for lithium batteries.

The SPC is not restricted for air transportation.

### 3.9 Safety tests:

Test Item	SPC0920 used Independently	SPC0920 in ES battery system
Operating Temperature	-30°C to 60°C	-40°C to 85°C
Storage Temperature	-30°C to 60°C	-30°C to 60°C

#### Warning:

- The SPC0920 is designed for use in a ES battery system or in low charge current as specified only.
- The SPC0920 may explode or violently vent if over-charge above 4.4V.
- Do not charge the SPC1530 higher than 4.1 V, over discharge, short circuit, heat above 100°C, incinerate or expose content to water.
- Charging the SPC0920 at above 3.95 V may lead to capacity loss and / or