

# SEALED ENERGY SYSTEMS

72, HSIDC INDUSTRIAL ESTATE, AMBALA CANTT 133001, INDIA

Tel:0091-171-2699054 Fax:0091-171-2698054

SPEC. NO.	SE302	ISSUE DATE	2010-1-25		
DESCRIPTION	Lithium Ion Battery ( model No. SE302)	EDITION	0	PAGE	1/5

## 1. Applicability

The specification is applicable to SES Lithium Ion Rechargeable Batteries (SES model no. : SE302)

## 2. Ratings

### 2.1 Cell

2.1.1 Type of Cell	: Sealed Lithium-ion cylindrical Rechargeable battery
2.1.2 Cell Model	: SES (SE.LC-18650)
2.1.3 Cell Size	: 18650
2.1.4 Cell Minimum capacity	: 2200mAh
2.1.5 Number of cell used	: 8PCS

### 2.2 Pack

2.2.1 Rated voltage	: 14.4V
2.2.2 Typical capacity	: 4400 mAh
2.2.3 Minimum capacity	: 4250 mAh (0.5C charging & 0.2C discharging)
2.2.4 Standard charge	: 600mA x 8hours to 17.2V
2.2.5 Quick charge current	: 4000mA to 17.6V(330mA end)
2.2.6 Maximum charging voltage	: 18.00V
2.2.7 Standard discharge	: 1290mA (discharge end of 12.0V)
2.2.8 Maximum discharge current	: 7500mA
2.2.9 Replace No.	: NON
2.2.10 Battery Pack Color	: Black Platic.
2.2.11 Operating temperature	: 0 – 45°C (standard charge) 10 – 45°C (quick charge) -20 – 60°C (standard discharge)
2.2.12 Storage temperature	: -20 - 50°C (1 week) -20 - 45°C (1 month) -20 - 40°C (6 months) -20 - 35°C (1 year)

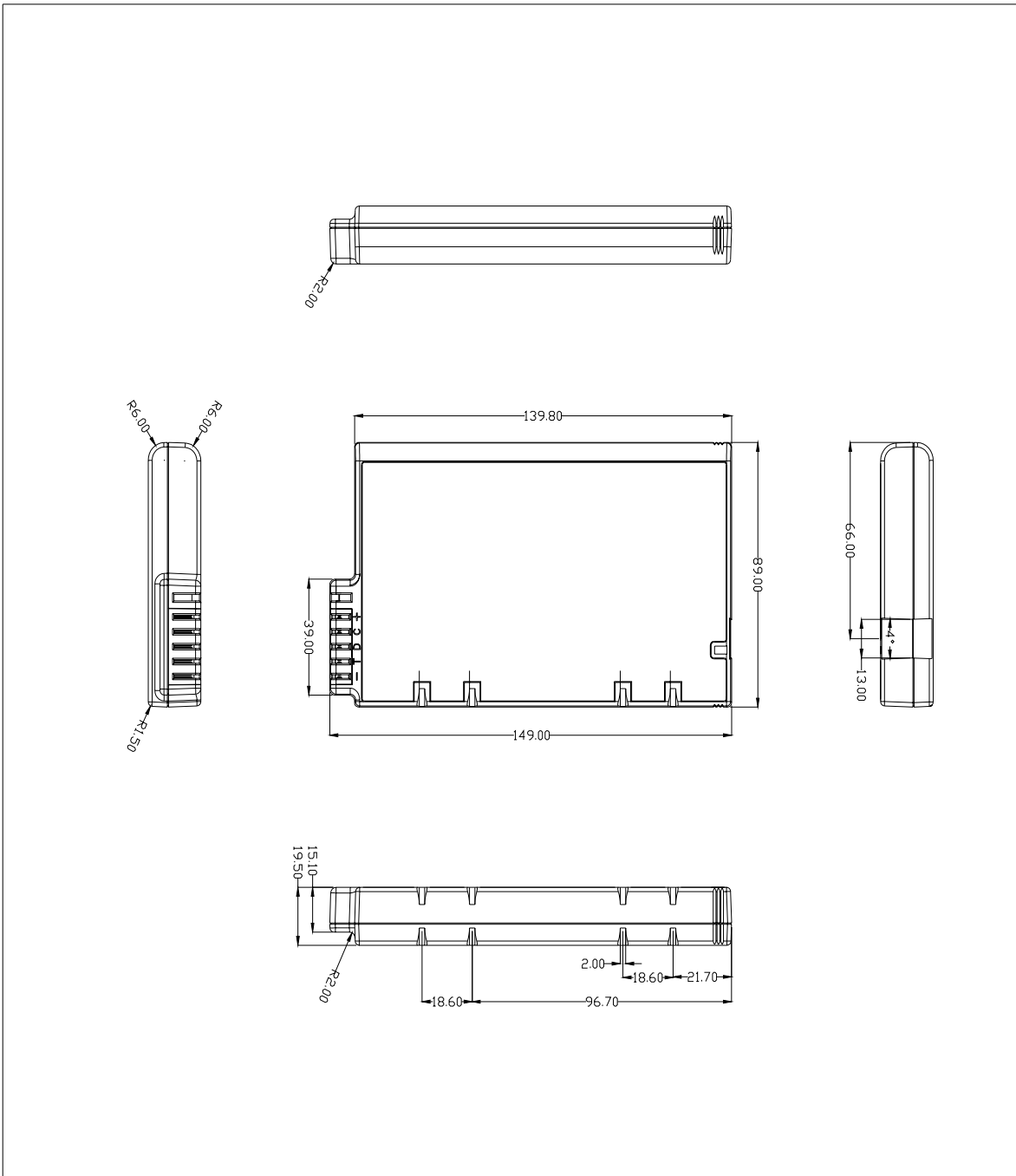
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### 3. Configuration and dimensions



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## 4. Test conditions

Unless otherwise specified, all tests should be conducted within one month of delivery under the following conditions :

Ambient temperature : 20 +/- 5°C.

Relative humidity : 65 +/- 20%.

## 5. Performance

Item	Criteria	Test conditions
Capacity	Above 4350mAh	Standard charge and standard discharge
Internal impedance	Less than 340mohm	Measure AC impedance at 1kHz
Cycle life **	Above 4500mAh	300 cycles charging/discharging is repeated in the below condition. <ul style="list-style-type: none"><li>● Charging: 4500mA to 17.4V</li><li>● Rest time: 20min</li><li>● Discharging: 4350mA to 12V</li><li>● Temperature: 25±2°C</li></ul>
Leakage resistance	No leakage	Visually inspect battery pack after standard charge and storage at 25°C for 14 days.
Drop test	No fire, no explosion, no leakage (max. weight loss 0.1%)	Drop battery pack after standard charged onto a bakelite floor from a height of 50 cm for 6 times.
Vibration test	No fire, no explosion, no leakage (max. weight loss 0.1%)	The battery pack is vibrated in triaxial direction with 4 mm amplitude of frequency 30 Hz (1 Hz per minute) for 1 minute in triaxial direction.
Short circuit test	No fire, no explosion, cell temperature shall not exceed 150 °C	External short circuit
Dimensions	Refer to drawing of SE302	Measured by calipers
Battery weight	Approx. 433g	Measured by balance
Appearance	No crack, no leakage, no deformation	Visual inspection

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Note: \*\* Data provided under "Cycle Life" in this document is our best estimate based on the technical data supplied by battery cell manufacturer in the Product Specification Form.

## 6. Material of Case

A non-inflammable material , ABS plastic casing.

## 7. Warranty

One year limited warranty against workmanship and material defects.  
Manufacturer reserves the right to alter, amend the design, model and specification without prior notice.

## 8. Charge state of cell before shipment

Charge from 10% to 50% according to delivery condition.

## 9. Safety precaution

Please follow the safety precaution carefully as improper handling of lithium ion batteries may result in injury or damage from electrolyte leakage, heating ignition or explosion. To ensure safety, consult with Sealed Energy Systems regarding the charge and discharge specifications, equipment structure, warning labels and other important details when designing equipment to use Sealed Energy Systems rechargeable lithium ion batteries.

Never charge the battery above 18.00V.

Never reverse charge the battery.

Never heat or incinerate the battery.

Never pierce, crush or cause mechanical damage to the battery.

Never charge a battery at high temperature condition, such as at or near a fire.

Never short circuit the battery.

Never discharge a battery to below 3.0V per cell.

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Never allow the battery to get wet or be immersed in water.

For long period of storage, temperature should be below 45°C.

After long period of storage, battery may required some cycling to recover capacity.

## 10. SAFETY DEVICE AND ABUSE REQUIREMENT

Circuitry protection as described below has been presented inside the battery pack to insure safety in case of misuse.

### Overcharge Voltage Protection

At a charge voltage greater than  $4.3 \pm 0.1V$  per cell, the overcharge protection should engage interrupting the charge current.

### Over Discharge Protection

When a voltage less than  $2.25 \pm 0.25V$  per cell is reached upon discharge, the over discharge protection device should engage. The resulting discharge current should be below  $1\mu A$ .

### Over Discharge/Short Circuit Protection

When discharge current exceeds 5.8A the over discharge current protection should engage interrupting the discharge current.

### Over Current Protection

When battery load current exceeds 7A at 20°C, the Polyswitch (PTC) shall trip abruptly to a highly resistive state limiting current to milliamps. The device shall remain in the tripped state until the fault is corrected or removed.