

# GP Batteries

**Product Specification**

**Model No. : XP18650-30U**

Document Number: Preliminary

Revision: R1

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## Revision History

Revision	Date	Initiator	Reason for Change
00	24 <sup>th</sup> Feb, 2014	Andy Chan	New Issue
01	19 <sup>th</sup> Mar, 2014	Andy Chan	Updated maximum discharge current

Prepared By	Approved By
Andy Chan	David Zheng
Date: 19 <sup>th</sup> Mar, 2014	Date: 19 <sup>th</sup> Mar, 2014

## 1. APPLICABILITY

The specification is applicable to GP Lithium Ion Rechargeable Batteries.

GP Model : XP18650-30U

Cell Size : Cylindrical Cell with Diameter = 18.3 mm Max and Height = 65.4mm Max

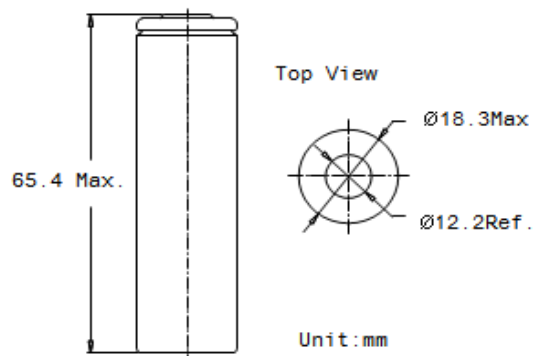
## 2. RATINGS

2.1	Rated voltage	:	3.78 V
2.2	Capacity #	:	3000 mAh (typical) 2900 mAh (minimum)
2.3	Standard charge	:	Constant current at 600 mA with max. voltage of 4.35V ,cutoff current at 60mA
2.4	Standard discharge	:	Constant current at 600 mA to 2.75 V
2.5	Maximum charge current	:	1500 mA
2.6	Maximum discharge current	:	6000 mA
2.7	Internal impedance	:	≤ 70 mohm
2.8	Cell weight	:	≤ 48g
2.7	Operating temperature	:	0°C – 45°C (charge) -20°C – 60°C (discharge)
2.8	Storage temperature	:	-20°C – 45°C (1 month) -20°C – 40°C (6 months) -20°C – 35°C (12 months)

# Based on standard charge/discharge. If the cell is kept as ex-factory status ( ~ 50% of charge), the capacity recovery rate is more than 80%.

## 3. CONFIGURATION AND DIMENSIONS

Please refer to the drawing.



## 4. STANDARD TEST CONDITIONS

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

Ambient Temperature :  $23 \pm 2^{\circ}\text{C}$   
 Relative Humidity :  $65 \pm 20\%$

### TYPICAL CHARACTERISTICS

## 5. TYPICAL CHARACTERISTICS

Item	Criteria	Test Conditions	
Capacity	$\geq 2900 \text{ mAh}$	Standard charge and standard discharge	
Internal Impedance	$\leq 70 \text{ mohm}$	Measure AC impedance at 1kHz within 1 hour after standard charge	
Typical discharge capacity at different temperatures	-20°C	60%	Standard charge cell at $23 \pm 2^{\circ}\text{C}$ . Place cell in the temperature to be tested for 2 hours and then discharge cell at Standard charge.
	0°C	80%	
	25°C	100%	
	45°C	90%	
Cycle Life, 23°C	400 cycles > 70%	Measure discharge capacity after conducting 400 cycles of standard charge/discharge condition	
Storage characteristics	$\geq 80\%$ (retention) $\geq 90\%$ (recovery)	Measure discharge capacity (retention) of cells after standard charge to 100% SOC and stored at $23 \pm 2^{\circ}\text{C}$ for 30 days. After that, charge the cell at standard condition and measure capacity (recovery) under $23 \pm 2^{\circ}\text{C}$ condition	

## 6. WARRANTY

One year limited warranty against workmanship and material defects. The information ( subject to change without prior notice ) contained in this document is for reference only and should not be used as a basis for product guarantee or warranty. For applications other than those described here, please contact your nearest GP Sales and Marketing office or Distributors. Manufacturer reserves the right to alter, amend the design, model and specification without prior notice.

## 7. STATUS OF CELL AS OF EX-FACTORY

Charge from 10% to 40% according to delivery condition.

The cell should be shipped in 3.50-3.85V charging voltage range

## 8. 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 GP regarding the charge and discharge specifications, equipment structure, warning labels and other important details when designing equipment to use GP rechargeable lithium ion batteries.

Never charge the battery above 4.40V.

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 under a blazing sun or near a fire.

Never short circuit the battery.

Never discharge a battery to below 2.50V per cell.

Stop discharge a battery when cell temp above 65°C

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

For long period of storage, temperature should be below 25°C.

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

Protection Circuit Module (PCM)

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The Cell(s) / Battery Pack shall be used with a PCM which can protect Cell(s) / Battery Pack properly. The PCM shall have functions of (a) overcharging protection;(b) over-discharging protection and (c) over current protection, to maintain safety and significant deterioration of cell performance. The over current can occur by external short circuit.

- a. Overcharging prohibition
  - Overcharging prevention function shall work if any one of the cell of the battery reaches 4.40V or above which charging should be stopped.
- b. Overdischarge prohibition
  - Overdischarging prevention function shall work if the Cell(S) / Battery Pack reaches below 2.50V.
  - It is recommended that the dissipation current of PCM shall be designed to minimal such as 0.5 microamperes or less after the over-discharge prevention function works.
  - The protection function shall monitor each cell for controlling the current throughout the time.

#### Design of Protection Circuit Module(PCM)

- a. PCM shall be located away from the gas-release vent of the cell as much as possible.
- b. Circuit pattern of PCM shall be away from each other as much as possible.