1. APPLICABILITY

The specification is applicable to GP lithium ion rechargeable pack.

GP Model : 18650-33FP
Pack Size : Diameter = 19mm Max and Height = 69.2mm Max (Dimension is with cell sleeve)
Chemistry : Lithium mixed oxide
Certifications : UN38.3

This battery has integrated protection circuit module (PCM) and may not fit into all devices designed for use with unprotected 18650s.

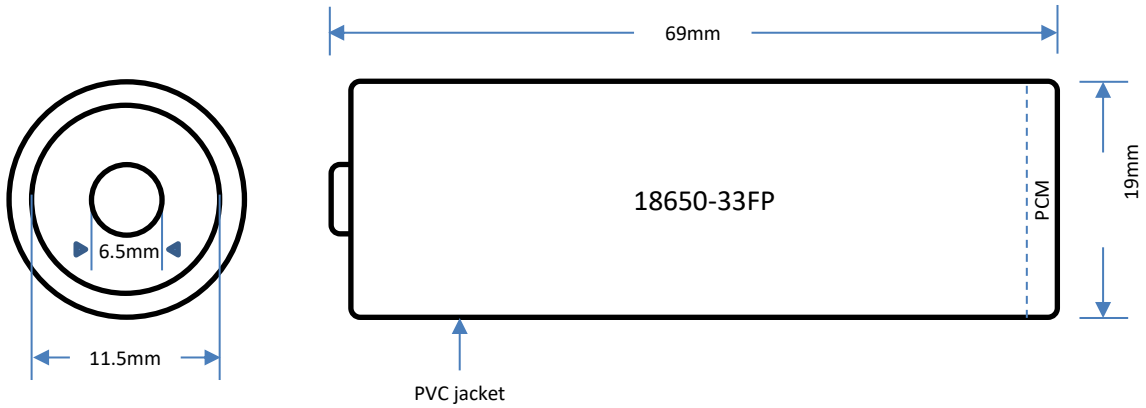
2. BATTERY PACK SPECIFICATION

No.	Item	Specification
1	Nominal Capacity min	3350mAh
2	Minimum Capacity	3250mAh; charge CC 0.3C, then CV 4.24V until 50mA; discharge 0.2C to 2.47V
3	Normal Voltage	3.63V
4	O.C.V	25-30% SOC
5	Charge Ending Voltage	4.2±0.05V (Battery)
6	Discharge Ending Voltage	2.5±0.1V (Battery)
7	Standard charging method	0.3C constant current charge to 4.2V, then constant voltage 4.2V charge till charged current declines to ≤ 50mA
8	Charge current	Standard charge: 0.3C
		Rapid charge: 0.5C
9	charging Time	Standard charge: 4~5 h
		Rapid charge: 2.5~3.5 h
10	Max. Charging Current	0.5C (1625mA)
11	Standard discharging Current	-20°C - 50°C 0.2C constant current discharge to 2.5V.
12	Max. Discharging Current	1.5C (4875mA) 5°C - 50°C
13	Operating environment	Charging: 0°C - 45°C, max.90%RH Discharging: -20°C - 50°C, max.90%RH
14	Cell Initial Impedance	≤70mΩ
15	Battery pack Production Impedance	≤110mΩ

16	Battery pack Weight	About 52g
17	Over-charging Protection	4.30±0.050V
18	Overcharge recovery voltage	4.1±0.050V
19	Over-discharging Protection	2.5±0.1V
20	Over-discharge recovery voltage	2.9±0.100V
21	Discharge Current Protection	7-15A
22	Short circuit Protection	Yes

3. CONFIGURATION AND DIMENSIONS

Please refer to the drawing. (Dimension is with cell sleeve)



4. CELL RATINGS

4.1	Rated voltage	3.63V
4.2	Capacity	3350mAh (Nominal) 3250mAh (minimum)
4.3	Standard charge	charging at constant current of 0.3C. The cell shall then be charged at constant voltage of 4.20V while tapering the charge current. Charging shall be terminated when the charging current has tapered to 50mA. For test purposes, charging shall be performed at 24°C ± 2°C.
4.4	Standard discharge	discharging at a constant current of 0.2C to 2.5V. Discharging is to be performed at 24°C ± 2°C unless otherwise noted (such as capacity versus temperature).
4.5	Maximum charge current	0.5C (1625mA)
4.6	Maximum discharge current	0.5C (1625mA) -20°C - 5°C 1.5C (4875mA) 5°C - 45°C 1.5C (4875mA) 45°C - 50°C
4.7	Internal impedance	≤ 70mΩ
4.8	Cell weight	≤ 49.0g
4.9	Operating temperature	0°C – 45°C (charge) -20°C – 50°C (discharge, cell skin temperature ~60°C)
4.10	Storage temperature (for shipping state)	-20°C - 50°C (1 month) -20°C - 45°C (3 months) -20°C - 20°C (1 year)

5. TYPICAL CHARACTERISTICS

5.1 STANDARD TEST CONDITIONS

Standard Charge

"Standard Charge" The cell should be charged at constant current of 0.3C and then be charged at constant voltage of 4.20V. Tapering the charge current until charging current reach 50mA. Charging shall be performed at 24ºC ± 2ºC.

Standard Discharge

"Standard Discharge" The cell should be discharged at a constant current of 0.2C until reaching 2.5V. Discharging shall be performed at 24ºC ± 2ºC.

5.2 Electrochemical Characteristics

NO.	Item	Criterion	Test Method
1	Initial AC Impedance	≤70 mΩ, with PTC	Cell shall be measured at 1kHz after standard charge
2	Initial Capacity	≥3250mAh	Cell shall be standard charged and standard discharged within 1h after full charge.
3	Cycle life	≥75% of min capacity	Charge：0.3C to 4.2V Discharge：0.5C to 2.5V Cycle: 300 times Cell shall then be standard charged and standard discharged to measure the 301st discharge energy.
4	Self-discharge	Discharging capacity is not less than 90% min capacity	After Standard Charging, test condition： Temperature：24±2°C Storage Time：30days Then 0.2C discharge to ending voltage

5.3 Environment Characteristics

NO.	Item	Criterion	Test Method
1	Constant temperature and constant humidity test	No explosion, no fire， no leakage. Discharging capacity is not less than 60% initial capacity	After Standard Charging, test condition: Temperature: 40 ± 5°C Relative Humidity: 90 - 95%RH Storage Time: 48 hours Then return to room temperature for 2 hours, then 1C discharged to ending voltage
2	Vibration test	No explosion, no fire, no leakage	After Standard Charging, fixed the cell to vibration table, then subjected to vibration test for 30 minutes per axis of XYZ axes Frequency rate: 1oct/min Vibration frequency: 10Hz - 30Hz Excursion (single amplitude): 0.38mm Vibration frequency: 30Hz - 55Hz Excursion (single amplitude): 0.19mm
3	Shock test	No explosion, no fire, no leakage	After Standard Charging, test condition: Acceleration: 100m/s2 Pulse lasting time: <16ms Shock times: 1000 ± 10 times

5.4 Safety Characteristics

NO.	Item	Criterion	Test Method
1	Overcharge test	No explosion, no fire	Discharge: 1C to 2.5V Charge: 1C last for 2.5H
2	Short-circuit test	No explosion, no fire	After Standard Charging, short circuit the positive and negative, and the resistance of copper wire is not more than 80mΩ, when the temperature falls 10°C lower than

			the peak, stop testing
3	Thermal test	No explosion, no fire	Put cell into a hot box, test condition: Temperature Rate: 5±2°C /min Ending temperature: 130°C ± 2°C Keep temperature for 30 minutes, then stop testing
Note: Above testing of safe characteristics must be with protective equipment.			

6. WARRANTY

One year limited warranty against workmanship and material defects. For application use on this battery pack, please contact your nearest GP Sales and Marketing office or Distributors.

7. CHARGE STATE OF CELL BEFORE SHIPMENT

25 to 30% SOC prior to delivery.

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 4.25V. 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 2.49V per cell.
- Never allow the battery to get wet or be immersed in water.
- After 3 months storage, battery may require some cycling to recover capacity. GP Batteries will not be liable to accidents caused by improper use.