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Description :		Model NO. :	



Lithium Ion (C-LiFePO₄) Secondary Cell Delivery Specification Product Model: IFR13N0-EP1500

To : _____

President Office	Sales Division	QA Division	RD Division

Customer

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1 Application Range

This specification is applied to lithium ion (C-LiFePO₄) cell and used as series and parallel cell pack's power supply for power bank or likewise application.

2 General Specification

2.1	Type	Cylindrical
2.2	Model	IFR13N0-EP1500
2.3	Rate Capacity	Typical: 1500mAh Minimum: 1430mAh in std charging/discharging
2.4	Nominal Voltage	3.2 – 3.3 V
2.5	Internal Resistance	< 58mΩ
2.6	Weight	< 42g
2.7	Charging (23°C)	1 st step (CC mode):Constant current 1C(max.) to 3.65V limit 2 nd step (CV mode):Constant voltage 3.65V with current taper to 40mA cutoff
2.8	Constant Discharging (23°C)	1.5C (max.)
2.9	Peak Discharging (23°C)	18C (max.)
2.10	STD Discharging Cutoff Voltage	2.5V±0.10V. Based on the discharging C-rate, can be lower to 2.1±0.10V.
2.11	Operating Temperature and Humidity Range	Charging : 0~45°C,45~85%RH Discharging : -20~60°C,45~85%RH
2.12	Storage Temperature and Humidity Range	-20~35°C,45~85%RH (within 1 Year) -20~40°C,45~85%RH (within 6 Month) -20~45°C,45~85%RH (within 1 Month) -20~50°C,45~85%RH (within 1 Week)
2.13	Cycle Life (Single cell)	1C Charging 1.5C Discharging >2000cycle (more than 80% capacity residue)
2.14	Energy Density	Gravimetric: 112 Wh/kg Volumetric: 281 Wh/l

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Appearance and Dimensions

2.1 Appearance

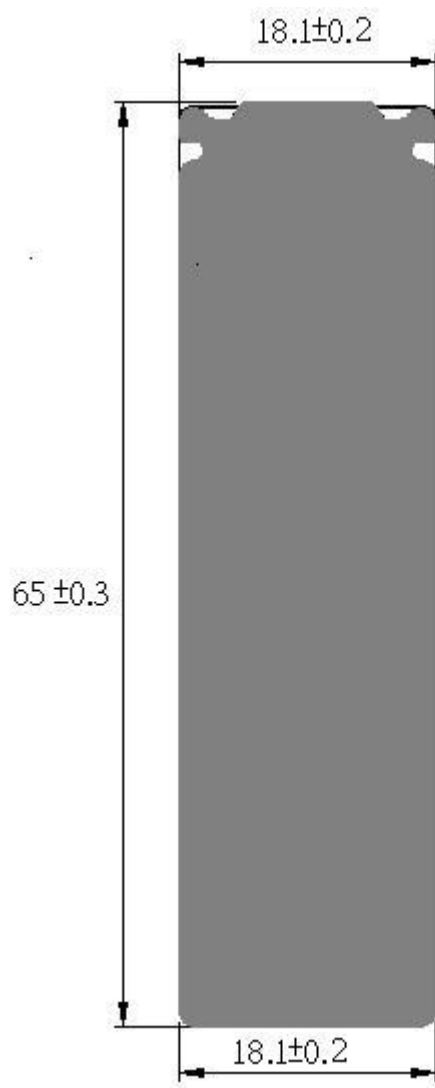
No abnormal stain, No abnormal scratch, No abnormal damage

3.2 Typical Dimension

Typical Diameter: 17.9~18.3mm (with tubing)

Typical Height: 64.7~65.3mm

Reference appearance and dimensions are in following drawing



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4 Standard Test Condition

4.1 Environmental Condition

4.1.1 Cells to be used for testing are those 2 weeks after shipment from our factory and are not to be further used.

4.1.2 Cells to be used for testing shall not be cycled.

4.1.3 Unless otherwise specified, all tests states in this specification shall be conducted at temperature $20\pm 5^{\circ}\text{C}$ and humidity $65\pm 20\% \text{RH}$

4.2 Measuring Equipment

4.2.1 Voltmeter: with precision $\pm 5\text{mV}$ or superior, with internal resistance $1\text{k}\Omega/\text{v}$ or more

4.2.2 Ammeter: with precision $\pm 5\text{mA}$ or superior, with total resistance (including ammeter and external lead wire) $10\text{m}\Omega$ or under.

4.2.3 Calipers: with precision $\pm 0.02\text{mm}$ or superior

4.2.4 Internal Resistance Meter: 1kHz sinewave, AC, 4 terminal methods.

4.2.5 Balance: with precision $\pm 0.02\text{g}$ or superior

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5 Test Method and Judgment Criteria

Item No.	Test Item	Test Method	Judgment Criteria	Remark
5.1	Appearance	Visual check	No abnormal stain, No abnormal scratch, No abnormal damage	
5.2	Dimension	Calipers	As Item 3.2	
5.3	Open Circuit Voltage	Measure open circuit voltage within 1 hour after quick charge	> 3.3V	
5.4	Internal Resistance	any status	< 58mΩ	
5.5	Initial Discharge Capacity	1C Charge and 1C discharge within 1 hour to measure the discharge capacity	1C discharge time more than 52 minutes or Discharge capacity reach to 1260mAh	90%
5.6	Charge Discharge Cycle Life	0.5C charge and 1C discharge for 1000 cycles to measure the discharge capacity	1C Discharge time more than 46 minutes or Discharge capacity reach to 1120mAh	80%
5.7	Low Temperature Capacity	0.2C charge at 23°C±3°C and 0.2C discharge within 96 hr at 0°C±3°C to measure the discharge capacity	0.2C Discharge time more than 217 minutes or Discharge capacity reach to 1050mAh	75%
5.8	Self-Discharge	0.2C charge and stored at temperature of 23°C±3°C for 21 days 0.2C discharge within 1 hour to measure the discharge capacity	0.2C Discharge time more than 260 minutes or Discharge capacity reach to 1260mAh	90%
5.9	Leakage	1C charge and stored at the temperature of 40°C±5°C and 80±5%RH for 96h 1C discharge to measure the discharge capacity	No leakage by visual inspection, Capacity recovery rate ≧ 85%	
5.10	Vibration	1C Charge and stand for 24 hours, vibrate the cell with vibration: 10 Hz psd: 0.015; 40 Hz psd: 0.015; 400Hz psd: 0.00015 Direction: X/Y/Z axis for 60mins	More than 3.3V	
5.11	Drop	1C Charge and stand for 24 hours, drop the cell at a height of 1.0m randomly for 3 times, 1C discharge to measure the discharge capacity	Capacity recovery rate ≧ 85%	