Shenzhen Fest Technology Co.,Ltd
Cylindrical Li-Mn Battery Specification

Model: IMR-26650 4200mAh 40Amps

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Contents

1. General

1.0 Scope

This specification defines the characteristics of a Li-Mn rechargeable battery, IMR-26650, 4200 mAh - Graphite cell, manufactured by Shenzhen Fest Technology Co.,Ltd.

1.1 Safety Standards and Regulations

IEC 61960 International Electrotechnical Commission, Secondary Lithium Cells and Batteries for Portable Applications.

IEC 62133 International Electrotechnical Commission, Safety Requirements for Portable Sealed Secondary Cells, and for Batteries made from them, for use in Portable Applications.

IEC 62281 Safety of Primary and Secondary Lithium Cells during Transport.

UL 1642 Standard for Safety of Lithium Batteries.

UN ST/SG/AC.10/11/Rev 3 Recommendations on the Transport of Dangerous Goods, Manual of Tests and Critera.

1.2 Specifications

26650 Li-Mn Battery Power Cell, 4200mAh

2. Applied Product Name and Product Designation

2.0 Name

Li-Mn rechargeable battery, 26650 size, LiPF6 electrolyte, Manganese Spinel structure cathode.

2.1 Designation

I M R 26650

1 2 3 4

1:Indicates the negative electrode system.

The letter 'I' defines the Li-Mn system with an intercalation electrode.

2:Indicates the positive electrode system.

The letter 'M' defines a manganese Spinel-based electrode.

3:Indicates the shape of cell

The letter 'R' defines a cylindrical (round) shaped cell.

4:Indicates the diameter and overall height of cell.

First two numerical figures define the diameter, approximately 26mm.

Following three numerical figures define overall height, approximately 65mm.

2.2 Rated Specification

Definitions of items are described in accordance with IEC 61960.

Items			Specifications	Remark
1	Rated charge（4A）		Limiting 4.0 A, 120 min and constant 4.2V charge at 23±2$^{238}_{92}$C	Reference Rated charge.
2	Rated discharge		0.8A	Constant 0.8 A discharge until 2.5V at 23±2$^{238}_{92}$C.
3	Rated capacity		4200mAh	Minimum of rated discharge capacity after recommended
4	Nominal voltage		3.7V	Mean voltage during rated
5	Shipping voltage		4.03±0.01V	Nominal. Approximate state of charge = 80%.
6	Internal resistance at shipping		≤20mΩ	By AC 1 kHz.
7	End of charge voltage		4.20±0.05V	
8	End of discharge voltage		2.5V	Discharge voltage used for
9	Charging time		120min	Rated charge.
10	Maximum continuous charging current		4A	
	Maximum continuous discharging current		40A	
	Maximum pulse discharging current		60A	
11	Operating temperature	charging	-10～45$^{238}_{92}$C	
		discharging	-20～60$^{238}_{92}$C	
12	Storage temperature		-20-35°C	The recommended storage temperature is 23±2°C
13	Shelf life		12months	Typical value at 23±2°C, from ship state.
14	Self-discharge rate /month		≤0.5%	
15	Certificates			CE、UL、RoHS、CB

3. Dimension and Appearance

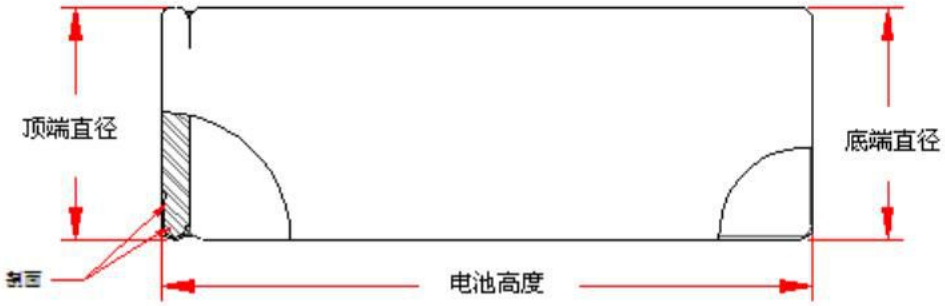
3.0 Shape

Cylindrical（26650）

3.1 Dimensions

Overall Height: 67.00 ±0.50 mm

Diameter (incl. label): 26.00 ± 0.30mm (top end), 26.10 ± 0.30 mm (bottom end)



3.2 Weight

91.0±2g

3.3 Cell Marking

IMR-26650: IEC designation

+/-: Cell polarity

4.0 Performance

1) The cells used in the following tests are sampled after 3 days storage.

2) All tests are carried out at 23°C ±2°C, and at a relative humidity between 45% and 85% except where otherwise noted.4.1 Performance

4.1 Electrical Performance

Items				EFCriteria	Conditions
1a	Discharge capacity and energy (Rate capability at 23°C)	0.8A	mAh	⩾4100	Discharge capacity and energy at 0.8A to 2.5V after rated charge (C1)
		4A	mAh	⩾4000	Discharge capacity and energy at 4A to 2.5V after rated charge (C2).
		10A	mAh	⩾3900	Discharge capacity and energy at 10A to 2.5V after rated charge (C3).
		15A	mAh	⩾3800	Discharge capacity and energy at 15A to 2.5V after rated charge (C4).
		20A	mAh	⩾3700	Discharge capacity and energy at 20A to 2.5V after rated charge (C5).
		25A	mAh	⩾3500	Discharge capacity and energy at 25A to 2.5V after rated charge (C5).
		40A	mAh	⩾3000	Discharge capacity and energy at 40A to 2.5V after rated charge (C5).

1b	Discharge capacity (Rate capability at 55°C)	4A	mAh	≥3900	Discharge capacity and energy at 4A to 2.5V after rated charge (C10).
2	Rated energy density	Volumetric	Wh/l	400.0	Calculated energy density based on max. volume and weight specifications using 4A discharge to 2.5V at 23°C after rated charge.
		Gravimetric	Wh/kg	160.0	

4.2 Safety Performance

Items		UL1642 Testing Conditions	UL1642 Standard	EF Standard
1	Short Circuit @ 20℃	Short circuit cell using a total external resistance 0.1 ohm until cell has ignited or burned out,or in the fully discharged state (0.1V) cell temperature has returned to ±10°C of ambient temperature and then be examined.	The samples shall not explode or catch fire. The temperature of the exterior cell or battery casing shall not exceed 150°C .	in accordance with UL1642 criteria
2	Short Circuit @ 55℃	While in preheated oven and cell temperature reaches 55 ± 5 °C, Short circuit cell using a total external resistance ◡ 0.1 ohm until cell has ignited or burned out,or in the fully discharged state (◡ 0.1V) cell temperature has returned to ±10°C of ambient temperature and then be examined.	The samples shall not explode or catch fire. The temperature of the exterior cell or battery casing shall not exceed 150°C .	in accordance with UL1642 criteria
3	Abnormal Charging	Each test sample battery is to be discharged at a constant current of 0.2 C/1 hour, to a manufacturer specified discharge endpoint voltage. The cell or battery is then to be charged with a constant maximum specified output voltage and a current limit of three times the maximum charging current, Ic, specified by the manufacturer. Charging duration is to be 7 hours or the time required to reach the manufacturer's specified end-of-charge condition, whichever is greater.	The samples shall not explode or catch fire.	in accordance with UL1642 criteria
4	Crush	A battery is to be crushed between two flat plates. The force for the crushing is to be applied by a hydraulic ram with a 1.25 inch (32mm) diameter piston. The crushing is to be continued until a pressure reach to 17.2 MPa, applied force of 13	The samples shall not explode or catch fire.	in accordance with UL1642 criteria

		kN.Once the maximum pressure has been obtained it is to be released.		
5	Impact	A test sample battery is to be placed on a flat surface. A 5/8 inch(15.8 mm) diameter bar is to be placed across the center of the sample. A 20 pound (9.1 kg) weight is to be dropped from a height of 24± 1 inch (610 ± 15 mm) onto the sample.	The samples shall not explode or catch fire.	in accordance with UL1642 criteria
6	Shock	Each cell shall be subjected to a total of three shocks of equal magnitude. Each shock is to be applied in a direction normal to the face of the cell. For each shock the cell is to be accelerated in such a manner that during the initial 3 milliseconds the minimum average acceleration is 75 g (where g is the local acceleration due to gravity). The peak acceleration shall be between 125 and 175 g.	The samples shall not explode or catch fire. In addition, the sample shall not vent or leak.	in accordance with UL1642 criteria
7	Vibration	The frequency is to be varied at the rate of 1 hertz per minute between 10 and 55 hertz, and return in not less than 90 nor more than 100 minutes. The battery is to be tested in three mutually perpendicular directions. For a battery that has only two axes of symmetry, the battery is to be tested perpendicular to each axis.	The samples shall not explode or catch fire. In addition the sample shall not vent or leak.	in accordance with UL1642 criteria
8	Drop	Drop height of 0.9 meters. Drop each cell three times on bottom onto a plastic plate then Drop each cell three times on side onto concrete surface, and Drop each cell three times on header onto a plastic plate.	The sample shall not explode , catch fire , no leakage ,weight less , and disassemble.	/
9	Heating	A battery is to be heated in a gravity convection or circulating air oven with an initial temperature of 20 ±5°C . The temperature of the oven is to be raised at a rate of 5 ±2°C per minute to a temperature of 130 ±2°C and remain for 10 minutes. The sample shall return to room temperature (20±5°C) and then be examined.	The samples shall not explode or catch fire.	in accordance with UL1642 criteria
10	Temperat-ure	The batteries are to be placed in a test chamber and subjected to the following cycles:	The samples shall not explode or catch fire. In	in accordance with UL1642

	Cycling	a)30min ramp to 70 ±3°C, for 4h; b)30min ramp to 20 ±3°C, for 2h; c)30min ramp to -40 ±3°C, for 4h; d)30min ramp to 20 ±3°C; e) Repeat cycle 9times; f) Measurements taken after 10 cycles and 7 days storage at 20± 5 °C	addition, the samples shall not vent or leak.	criteria
11	Low Pressue	Sample batteries are to be stored for 6 hours at an absolute pressure of 11.6 kPa (1.68 psi) and a temperature of 20±3°C.	The samples shall not explode or catch fire as a result of the Low Pressure Test. In addition ,the samples shall not vent or leak.	in accordance with UL1642 criteria
12	Projectile	The sample is to be heated and shall remain on the screen until it explodes or the cell or battery has ignited and burned out.	No part of an exploding cell or battery shall penetrate the wire screen such that some or all of the cell or battery protrudes through the screen.	in accordance with UL1642 criteria

5. Warning and Recommendation for Using the Li-Mn Rechargeable Battery

5.0 Prohibition Clause

1) Do not disassemble the cell;
2) Do not crush the cell;
3) Do not heat above 100°C(212°F)
4) Do not incinerate the cell;
5) Keep battery out of reach of children and in original package until ready to use;
6) Never put batteries in mouth. If swallowed, contact your physician or local poison control center.
7) Dispose of used batteries promptly according to local recycling or waste regulations,or into this company recycling.
8) Use of another battery may present a risk of fire or explosion.
9) Do not solder lead directly to the body.
10) Do not short(+) and (-)terminal of the cell with kind of metal.
11) Do not add strong shock,nor drop the cell.
12) Do not stub the cell with a nail etc.,nor make a hole in the cell.

13) Do not put into a microwave oven, nor high temperature container.

14) Do not connect cell to wall sockets and cigarette wall sockets etc. in vehicle.

5.1 Charging

1) Charge within the limits of -10～45$^{238}_{92}$C cell surface temperature.

2) Do not charge reversal

3) Charge only with charge exclusively designed for this battery.

5.2 Discharging

1) Discharge within the limits of -20～60$^{238}_{92}$C cell surface temperature.

2) Avoid discharging below 2.5V.

5.3 Storage

1) Recommended temperature for long term store within the limits of -20～35$^{238}_{92}$C ambient temperature area,and condition in Container is also included.

2) Use within 3months (90days) after shipping.

6. Package and transport

1) Check before delivery

Check the voltage, inner residence and the protection circuit.

2) Package and deliver the battery

Before the delivery, the battery must be packed firmly, and kept 80% rating capacity (about 24V). During the transport, please avoid badly shaken, crush, compact, sun beating on, and choose suitable transport vehicles.

7. Appendix

7.0 Dangers

1) Forbid disassemble the battery;

2) Forbid short-circuit the battery;

3) Forbid heating or burning the battery;

4) Don’t use the battery near the heat;

5） Forbid wetting the battery;

6) Avoid charging near the heat;

7) Don’t charge under abnormal conditions;

8) Forbid piercing the battery;

9) Forbid impacting the battery;

10) Don’t deform the battery;

11) Don’t add strong shock nor drop the battery;

12) Don’t make a hole in the battery;

13) Do not reverse the positive and negative connections.

7.1 Warning

1) Don’t mix with other primary nor secondary battery;

2) Keep battery out of children’s reach;

3) Don’t keep the battery in the charging for a long time;

4) Don’t put it into microwave oven or any other pressure apparatus;

5) Don’t use the battery close fire;

6) Don’t use the abnormal battery.

7.2 Attentions

1) Kept away from the strong sunshine;

2) Kept away from the heavy-statics;

3) The recommended charge temperature is -10～45$^{238}_{92}$C.

4) Please read the product specification before using the battery.