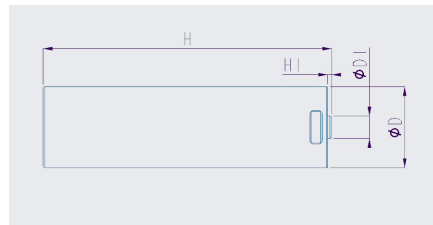


PRODUCT SPECIFICATION 18650 3400mAh Type-C

1. Reference Standard

This product complies with National Standard GB 31241-2014 « Portable electronic products using lithium-ion batteries and battery packs. Safety requirements » of PRC.

2. Product basic information

| Product basic information | | | |
|---------------------------|--|--|---|
| Item | | Description | |
| 1 | Batteries | 18650 3400mAh | |
| 2 | Nominal Voltage | 3.7V | |
| 3 | Normal Capacity | 3350mAh | |
| 4 | Minimum Capacity | 3250mAh | |
| 5 | Combination | Integrated Molding | |
| 6 | Additional features | Type-C charging/ Type-C discharge/ Electric quantity display (key press) | |
| 7 | Max Continuous Discharge Electric Current | 15A | |
| 8 | Maximum instantaneous discharge current(30S) | 17A | |
| 9 | Measure | Height: 71.1±0.6mm Diameter: 18.8±0.15mm AnodeH Height: 1.0±0.5mm AnodeH Diameter: 6.0±0.15mm |  |
| 10 | Weight | ≈55,4g | |
| 11 | protective film | / | |
| 12 | Operating temperature range | charge: 0 ~ +45°C discharge electricity: -20 ~ +60°C | |
| 13 | Storage temperature range | 1 month -20°C ~50°C | |
| 14 | Impedance | ≤100mΩ | |
| 15 | Open Voltage | >3.5V | |

| Electrical Characteristics | | | |
|----------------------------|--------|-------------------------------------|-------------------------------|
| Item | Symbol | Content | Criterion |
| Over charge Protection | VCU | Over charge detection voltage | 4.3±0.05V |
| | TCU | Over charge detection delay time | 200ms Max |
| | VCL | Over charge release voltage | 4.1±0.05V |
| Over discharge protection | VDL | Over discharge detection voltage | 2.50±0.1V |
| | TDL | Over discharge detection delay time | 80ms Max |
| | VDU1 | Over discharge release voltage | 2.90±0.1V |
| Over current protection | TOC1 | Detection delay time | 14ms Max |
| | ICP | Over current detection current | 21-40A |
| | CREL | Release condition | Remove load,charge activation |
| Short protection | TSIP | Detection delay time | 200us Max |
| | CREL | Release condition | Remove load,charge activation |

| | | | |
|--------------------------|------|------------------------------------|--------------------------------------|
| Temperature protection | THOT | High temperature protection | / |
| | TCOL | Low temperature protection | / |
| PTC Secondary protection | IPTC | PTC Over current detection current | / |
| Current consumption | IPD | Sleep mode | <25μA |
| | IopI | operate without load | <50μA |
| | Iwl | With load | <200μA |
| Charge function | IINS | USB charging current | 900MA±100mA |
| | TINS | USB Charging time | 4-5H |
| | IEXT | External charging current | 1625mA Max |
| | TEXT | External charging time | 0.5C/500mA |
| Discharge function | VUSB | Type-C Discharge voltage | 5V±0.25V |
| | IUSB | Type-C Discharge current | 1.2A MAX |
| LED display function | DCHR | Charging status | Marquee(Green) |
| | DPod | Power display | Release the button for three seconds |
| | DFUL | Charging full status | Four Green light |
| | DDIS | Discharge status | Marquee(Green) |
| | DLOW | Low battery status | / |
| Light function | FLUX | Luminous Flux | / |
| | TLIG | Lighting time | / |

| Item | | Description | |
|------|---------------|--|------|
| 1 | short-circuit | 10 5mΩ Short circuit the outside of the battery for 10 minutes. The external circuit should be less than 5mΩ. The battery should not explode or catch fire. | pass |
| 2 | Overcharge | 23±5°C 1C 10V 10V 0A 10°C At 23±5°C, the battery was charged to 10V with 1C current, and then the current was reduced to 0A with constant voltage of 10V. the temperature change of the battery was monitored, and the experiment was stopped when the battery temperature dropped-the peak value was about 10°C lower. The battery should not catch fire or explode. | pass |
| 3 | overdischarge | 23±5°C 30Ω 24 At 23±5°C, after discharging to the termination voltage according to the standard discharge requirements, the battery shall be discharged with an external 30Ω load for 24 hours without explosion, fire and liquid leakage. | pass |
| 4 | heat | 85±2°C 120min Place the battery in an incubator at 85±2°C and keep the temperature for 120min. The battery should not explode or catch fire | pass |
| 5 | acupuncture | φ3mm-φ8mm 10-40mm/S Use φ3mm-φ8mm high temperature resistant steel needles, at a speed of 10-40mm/S, to penetrate at least the battery cell from the direction perpendicular to the battery plate (the steel needles stay in the battery), and the battery will not explode or catch fire. | pass |
| 6 | squeeze | 85% 5min 50% Apply pressure perpendicular to the battery arrangement direction, squeeze the battery to 85% of the original size of the battery module, and then squeeze 50% of the original size of the battery module after 5 minutes | pass |

2.1 Schematic diagram

2.2 PCB Bill Of Material PCB

2.3 Normal Test Conditions

Temperature: 23±3°C

Relative Humidity: 45-85%RH

Atmospheric pressure: 86 -106 KPa

2.4 Rated capacity:

Rated capacity Cap. Under $23\pm3^{\circ}\text{C}$, the capacity obtained when a cell is discharged at 5-hours rate to voltage 2.50 V, which is signed Cap, the unit is mAh.

2.5 Standard charge method

Under $23\pm3^{\circ}\text{C}$, it can be charged to 4.2V with constant current of 0.2C, and then, charged continuously with constant voltage of 4.2V until the charged current is 0.01C.

2.6 Standard discharge method

Under $23\pm3^{\circ}\text{C}$, it can be discharged to 2.50 V with constant current of 0.2C.

2.7 Reliability test requirements:

| Item | Test Methods and Condition | Criteria |
|----------------------------------|--|---|
| Vibration | During the experiment, the vibration instrument was set at $F=20\text{HZ}$; $I = 90\%$; $T=30\text{min}$, and the 1C discharge capacity of the battery was recorded after the experiment | 1. after test, 1C capacity should be no less than 98% of it before test internal resistance discrepancy should be no more than 3mR. 2. Battery appearance should not be obvious nick and breakage, leak smoke and burst. |
| Shock Drop | Hang the battery in one meter high in the air let the cells fall down by six sides (Anode and Cathode side, crosswise sides) 1 time each, all together 6 times. | 1. after test, 1C capacity should be no less than 98% of it before test internal resistance discrepancy should be no more than 3mR. 2. Battery appearance should not be obvious nick and breakage, leak smoke and burst. |
| Shock Drop in product | Battery is assembled into the product and hang the product in two meter high in the air let the cells fall down by six sides (Anode and Cathode side, crosswise sides) 1 time each, all together 6 times. | 1. after test, 1C capacity should be no less than 98% of it before test internal resistance discrepancy should be no more than 3mR. 2. Battery appearance should not be obvious nick and breakage, leak smoke and burst. |
| Cycle Life | Measured the initial capacity of battery. Then conduct 0.5C charge and 1C discharge cycle measured the final condition of battery. | The 300th discharge capacity \geq Initial capacity *80% |
| High Temperature Characteristics | Under the temperature of $25\pm2^{\circ}\text{C}$, after charging the battery with 0.2C then put the battery into the constant temperature and humidity oven with $55\pm2^{\circ}\text{C}$ for 2h, then discharge with 1C to 2.75V. | The discharge time is required $\geq 51\text{min}$ and the battery should no deformation and smoking. |
| Low Temperature Characteristics | Under the temperature of $25\pm2^{\circ}\text{C}$, after charging the battery with 0.2C, then put the battery into the constant temperature and humidity oven with $-10\pm2^{\circ}\text{C}$ for 16~24h, then discharge with 0.2C to 2.75V. | The discharge time is required $\geq 3\text{h}$ and the battery should no deformation and smoking |

3. Storage and Shipment Requirement

| Item | Requirement |
|---|--|
| Short period less than 1 month | $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$, 65% \pm 25%RH |
| Long period more than 3 month | $0\sim+35^{\circ}\text{C}$, 65% \pm 25%RH |
| Recommend storage | $23\pm3^{\circ}\text{C}$, 65% \pm 5%RH |
| Long time storage : If the cell is stored for a long time, the cell's storage voltage should be 3.8V--4.0V . Also, it is recommended to charge the cell every three months. | |

3.1 packaging

The other outside the package indicate the product name, model, quantity, manufacturer, production date, „Handle with care“, „keep dry“, „up“, etc.

3.2 quality guarantee period (12)

Within the warranty period because of the quality problem of the battery itself, our company will be change, such as its customers for the operating error caused by the problem, not to change.

Any issues not covered in this specification should be discussed between the customer and our company.

4. Warning and Cautions

Danger warning (it should be described in manual or instruction for users, indicated especially) to prevent the possibility of the battery from leaking, heating, explosion. Please observe the following precautions:

Please use 0.2C current to charge up 60% capacity after the battery placed 3 months

Don't immerse the battery in water and seawater. Please put it in cool and dry environment if no using.

Do not discard or leave the battery near a heat source as fire or heater

Being charged, using the battery charger specifically for that purpose

Don't reverse the positive and negative terminals

Don't connect the battery to an electrical outlet directly.

Don't connect the positive and negative terminal directly with metal objects such as wire. Short terminals of battery is strictly prohibited, it may damage battery.

Do not transport and store the battery together with metal objects such as necklaces, hairpins.

Do not strike , throw or trample the battery.

Do not directly solder the battery and pierce the battery with a nail or other sharp object

Do not use lithium ion battery and others different lithium polymer battery model in mixture

Prohibition of use of damaged cells

Don't bend or fold sealing edge. Don't open or deform folding edge Don't fillet the end of the folding edge

Don't fall, hit, bend battery body.

Battery pack designing and packing Prohibition injury batteries.

Never disassemble the cells

The battery replacement shall be done only by either cells supplier or device supplier and never be done by the user.

Keep the battery away from babies.

Caution

- Do not use or leave the battery at very high temperature conditions (for example, strong direct sunlight or a vehicle in extremely hot conditions). Otherwise, it can overheat or fire or its performance will be degenerate and its service life will be decreased.
 - Do not use it in a location where is electrostatic and magnetic greatly, otherwise, the safety devices may be damaged, causing hidden trouble of safety.
 - If the battery leaks, and the electrolyte get into the eyes. Do not wipe eyes, instead, rinse the eyes with clean running water, and immediately seek medical attention. Otherwise, eyes injury can result.
 - If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or battery charge and stop using it.
 - In case the battery terminals are dirt, clean the terminals with a dry cloth before use. Otherwise power failure or charge failure may occur due to the poor connection with the instrument.
- Prohibition of use of damaged cells
- Be aware discharged batteries may cause fire; tape the terminals to insulate them.

5. Note

Note (1): The customer is requested to contact in advance if and when the variations of the operating conditions described in this document. Additional experimentation may be required to verify performance and safety under such conditions.

Note (2): take no responsibility for any accident when the cell is used under conditions outside of this specification.

Note (3): inform the customer in writing of improvement(s) regarding proper use and handling of the cell if it is deemed necessary. Energy reserves the right to revise this specification before the customer signs the datasheet. If a revision is required, notify the customer.