



SPECIFICATION FOR BATTERY

CONFIDENTIAL

Customer: Lenovo

Model Name: L25D3P77

Sunwoda P/N: 1002008808371/1002008808391/1002008808412/1002008808422

Lenovo P/N: SB11M89969

FRU P/N: 5B11M90168

Description: Rechargeable Li-ion Battery PACK 3S1P Min 5065mAh

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1.Revision History

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2.Scope

This specification describes the requirements for a Rechargeable Li-ion Battery pack supplied by SUNWODA Electronic Co., Ltd.

3.Battery Pack Overview

3.1.Cell Main Characteristics

Cell Manufacturer	Cell Model	Nominal Voltage	TypicalCapacity	Minimum Capacity
LWN	615680H3R	3.87V	5168mAh	5065mAh

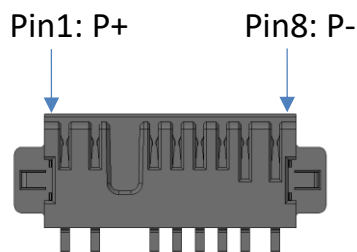
3.2.Compliant Communications

Battery is fully SMBus 1.1 agreement compliant.

3.3.Connector Terminals Definition

Terminal	Name	Description
1	P+	Battery Positive Terminal
2	P+	Battery Positive Terminal
3	CLK	SMBus clock interface I/O pin
4	DATA	SMBus data interface I/O pin
5	ID	Connect 10Kohm $\pm 1\%$ resistor to P-
6	NC	NC
7	P-	Battery Negative Terminal
8	P-	Battery Negative Terminal

Battery pack output port diagram



Pin Number	Description	DEFINITION
Pin 1	P+	P+ BATTERY PACK + TERMINAL
Pin 2	P+	P+ BATTERY PACK + TERMINAL
Pin 3	I2C_CLK	SMBUS CLOCK
Pin 4	IC2C_DATA	SMBUS DATA
Pin 5	TEMP	10k OHM/1% RESISTOR CONNECTED TO GND
Pin 6	NC	/
Pin 7	GND	BATTERY PACK GND TERMINAL
Pin8	GND	BATTERY PACK GND TERMINAL
Connector	Drapho BC54085-S0255-1H DEREN 560811-005H	

4. Production Specification

No.	Items		Rated Performance	Remark	
1	Nominal Voltage		11.61V	3.87V/cell	
2	Typical Capacity		5168mAh	0.2C discharge with 3V/cell cut off voltage at 25 °C ± 3°C (cell's spec)	
			60Wh		
3	Minimum Capacity		5065mAh	0.2C discharge with 3V/cell cut off voltage at 25 °C ± 3°C (cell's spec)	
			58.9Wh		
4	Reserve Capacity		400mWh	From RSOC=0% to TDA	
5	Initial AC Impedance		≤210mΩ	1KHz AC Method	
6	Limited Charging Voltage		13.35V	Upper limited charge voltage 13.35V	
7	End of Discharge Voltage		9V	9V→RSOC 0%	
8	Max Continue Charge Current		1033mA	1033mA CCCV to 4.45V/cell	0°C~15°C
			5168mA	5168mA CC to 4.1V/cell; 2584mA CCCV to 4.45V/cell	15°C~20°C
			6201mA	6201mA CC to 4.2V/cell; 3617mA CCCV to 4.45V/cell	20°C~45°C
			2584mA	2584mA CC to 4.2V/cell, then stop; Reset: max cell voltage ≤ 3900mV	45°C~60°C
9	Max Discharge Current		7222mA	35°C (Ambient); Cell surface temperature ≤ 70°C	
10	Max Continue Discharge Power		65W	from SOC 100% to 0% @ 35°C (Ambient); Cell surface temperature ≤ 70°C	
11	Max Peak Discharge Power		80W for 30S	from SOC 100% to 0% @ 35°C (Ambient); Cell surface temperature ≤ 70°C	
12	CB Maximum Discharge Power		80W	CB Max Discharge Current: 8888mA @ 35°C (Ambient); Cell surface temperature ≤ 70°C	
13	Standard Charge Current		1033mA	Cell surface temperature ≤ 70°C	
14	Standard Discharge Current		1033mA		
15	Storage Temperature	Storage 1 week	-20°C~50°C	If the battery pack (shipping status) store at over the 3 months period, it should be recharged. Humidity ≤ 95% RH	
		Storage 1 months	-20°C~45°C		
		Storage 6 months	-20°C~40°C		
		Storage 1 year	-20°C~35°C		
16	Operating Temperature Range (Charge)		0°C~60°C ± 3°C	Humidity ≤ 95% RH	
			≥ 0°C ± 3°C	Initial low charge temp	
			< 50°C ± 3°C	Initial high charge temp	

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17	Operating Temperature Range (Discharge)	-20℃~60℃ ± 3℃	Humidity ≤ 95% RH
18	Over Temperature Protection (Charge)	60 ± 3℃	
19	Under Temperature Protection (Charge)	-2 ± 3℃	
20	Cycle Life	≥ 70% Cmin at 1000 Cycle	See 10.6 Electrical Characteristics For Detail
21	Battery Pack Weight	Max 225g	
22	Shipping Capacity	25%~30%	By Air
		45%-55%	By Sea & Land
23	BMU Solution	Tenpao_RAJ240047_E108_EC16	

5.Standard SBS Commands

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No.	Function	CMD	Specification				Comments					
1	Remaining Capacity Alarm	0x01	10% of design capacity=600cWh									
2	Remaining Time Alarm	0x02	10 minutes									
3	Relative State Of Charge	0x0D	Remaining Capacity/Full Charge Capacity x 100									
4	Remaining capacity	0x0F	Shall be 0 when the cell stack voltage reaches 3V/cell									
5	Full charge capacity	0x10	Update the value when detect the full charge									
6	Charging current	0x14	0℃~15℃		1033mA		End of Charge Current:258mA					
			15℃~20℃		5168mA							
			20℃~45℃		6201mA							
			45℃~60℃		2584mA							
			Precharge current		517mA							
7	Charging voltage	0x15	0℃~15℃		13350mV							
			15℃~20℃		13350mV							
			20℃~45℃		13350mV							
			45℃~60℃		13350mV							
8	Cycle count	0x17	When the charging capacity exceeds 100% of FullChargeCapacity, CycleCount is added to 1									
9	Design Capacity	0x18	6000cWh									
10	Design Voltage	0x19	11610mV									
11	Manufacture Name	0x20	Sunwoda 2025									
12	Device Name	0x21	LNV-5B11M90168									
13	Device Chemistry	0x22	LION									
14	DFET OFF Function	0x34	Ship Mode Function. See 9.3 Ship Mode For Detail.									
15	Read Battery Info.	0x37	Maker ID		HW ID		FW Version		Data Version			
			byte1 byte0		byte3 byte2		byte5 byte4		byte7 byte6			
			07 00		A8 0C		00 01		04 00			
			Lenovo Spec.									
			Target Schedule		0x37							
			Phase	Lenovo Phase	A0 : Maker ID		A1 : HW ID		FW Version		Data Version	
		byte 1	byte 0	byte 3	byte 2	byte 5	byte 4	byte 7	byte 6			
EP	EVT/SDV	xx	00	xx	xx	1x	00	xx	xx			
SP	FVT/SIV	xx	00	xx	xx	2x	00	xx	xx			
PP	SIT	xx	00	xx	xx	3x	00	xx	xx			
MV	SIT-R/SVT	xx	00	xx	xx	01	01	xx	xx			
MP	SOVP	xx	00	xx	xx	XX	01	xx	xx			

6. Fuel Gauge Board Current Consumption

No.	Function	Specification	Comments
1	Cell voltage sensing input leakage current on each block	$\leq 10\mu\text{A}$	@3.8V/cell
2	Circuit Current Consumption		
	I(normal) @ SMC / SMD=H	$\leq 600\mu\text{A}(\text{typ})$	Operating mode
	I(sleep) @ SMC / SMD=L	$\leq 200\mu\text{A}(\text{typ})$	Sleep mode
	I(shutdown) @ SMC / SMD=L	$\leq 15\mu\text{A}(\text{typ})$	Shutdown Mode

7.Fuel Gauge Accuracy

No.	Function	Specification	Comments
1	Voltage Accuracy	$\pm 20\text{mV}$	@25°C
2	Current Accuracy	$\geq 600\text{mA}$ $\pm 0.5\%$ $< 600\text{mA}$ $\pm 3\text{mA}$	
3	Temperature Accuracy	$\pm 3^\circ\text{C}$	

8.PCBA Protection function (25℃^{第 10 页}±3℃)

8.1.Protection Function (Recovery)

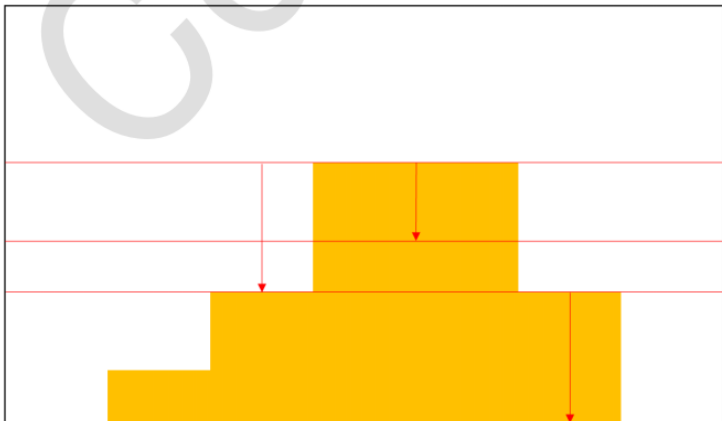
No.	Item	Threshold	Action	
			CFET	DFET
1	Over Cell Voltage Protection (1st)	4.49V ±0.02V / cell Delay time: 2Sec~6Sec	Off	On
		Reset: ≤4.35V±0.02V /cell	On	On
2	Under Cell Voltage Protection	Set: ≤2.70V ±0.02V / cell(<15℃) Delay time: 11Sec~15Sec OR Set: ≤2.80V ±0.02V / cell(>15℃) Delay time: 11Sec~15Sec OR Set: ≤2.50V ±0.02V / cell(for all temp) Delay time: 4Sec~8Sec	On	Off
		Reset: ≥3.10V ±0.02V / cell & Charging Delay time: 0Sec~3Sec	On	On
3	Shutdown Voltage of Cell	Set: ≤2.70V ±0.02V / cell(<15℃) Delay time: 19Sec~23Sec OR Set: ≤2.80V ±0.02V / cell(>15℃) Delay time: 19Sec~23Sec	Off	Off
		Reset: Charge Voltage Input	On	On
4	Pre-Charge Over Current Protection	Set: ≥600mA Delay time: 2Sec~6Sec	Off	On
		Reset1: Current≤-15mA Delay time: 1Sec Reset2: Current>-15mA Delay time≤30Sec	On	On
5	Pre-Charge Timeout Protection	Delay time: 60mins	Off	On
		Reset: Current≤-10mA	On	On
6	SW Over Charge Current Protection	Set: ≥6.8A±0.2A Delay time: 2Sec~6Sec	Off	On
		Reset: Current≤-50mA	On	On

7	SW Over Discharge Current protection	Set: $\geq 10.1A \pm 0.2A$ Delay time: 4Sec~8Sec	On	Off
		Reset: Current $\geq 50mA$	On	On
8	HW Over Discharge Current Protection	Set: $\geq 16.67A(TYP)$ (14.2-20.5) Delay time: 27ms $\pm 10\%$	On	Off
		Reset: Delay time $\leq 30Sec$	On	On
9	HW Discharge Short-Circuit Protection (1st)	Set: $\geq 33.3A(TYP)$ (27-35) Delay time: 600us~1500us	On	Off
		Reset: Delay time $\leq 30Sec$	On	On
10	HW Discharge Short-Circuit Protection (2nd)	Set: $\geq 22.2A(TYP)$ (20.5-27) Delay time: 300us~900us	On	Off
		Reset: Delay time $\leq 30Sec$	On	On
11	Charge Over Temperature Protection of Cell	Set: $> 60^{\circ}C \pm 3^{\circ}C$	Off	On
		Reset: $\leq 50^{\circ}C \pm 3^{\circ}C$	On	On
12	High Temperature Charge Start Protection (Charge inhibit function)	Set: $> 50^{\circ}C \pm 3^{\circ}C$	Off	On
		Reset: $\leq 50^{\circ}C \pm 3^{\circ}C$	On	On
13	Discharge Over Temperature Protection of Cell	Set: $\geq 73^{\circ}C \pm 3^{\circ}C$	Off	Off
		Reset: $\leq 65^{\circ}C \pm 3^{\circ}C$	On	On
14	Over temperature protection of FET	Set: $\geq 98^{\circ}C \pm 3^{\circ}C$	Off	Off
		Reset: $\leq 70^{\circ}C \pm 3^{\circ}C$	On	On
15	Low Temperature Charge Protection	Set: $\leq -2^{\circ}C \pm 3^{\circ}C$	Off	On
		Reset: $\geq 0^{\circ}C \pm 3^{\circ}C$	On	On
16	Low Temperature Discharge Protection	Set: $\leq -20^{\circ}C \pm 3^{\circ}C$	Off	Off
		Reset: $\geq -15^{\circ}C \pm 3^{\circ}C$	On	On
17	Fully Charge Protection	1) Taper Current FC Condition: Max Cell Voltage $\geq 4.4V$ & Average Current $< 258mA$ & Delay Time: 80Sec 2) OCV FC Condition: Max Cell Voltage $\geq 4.43V$ & Delay Time : 60Sec	Off	On
		Reset: RSOC $< 95\%$	On	On

8.2. Protection function (Permanent Failure)

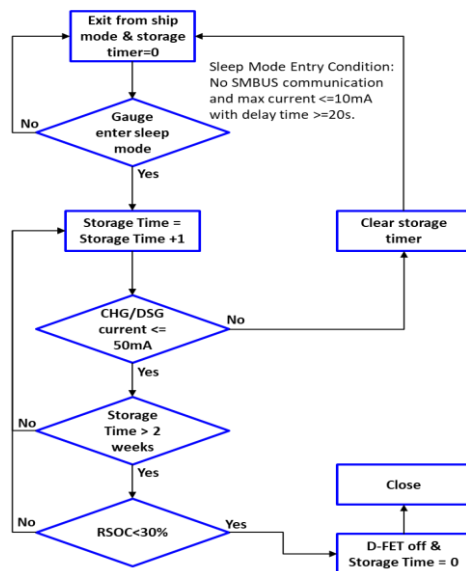
No.	Item	Threshold	Action		
			FUSE	CFET	DFET
1	SW Over Voltage Protection (2nd)	Set: $\geq 4.55V \pm 0.02V$ / cell Delay Time: 4Sec~8Sec	Blow	Off	Off
2	HW Over Voltage Protection (2nd)	Set: $\geq 4.6V \pm 0.025V$ / cell Delay Time: 4.2Sec~7.8Sec	Blow	Off	Off
3	Over Temperature Protection of Cell (2nd)	Set: $\geq 90^{\circ}C \pm 3^{\circ}C$ & Charge Current $\geq 25mA$ OR Discharge Current $\geq 100mA$	Blow	Off	Off
4	Over Temperature Protection of FET (2nd)	Set: $\geq 120^{\circ}C \pm 3^{\circ}C$	Blow	Off	Off
5	D-FET Failure Detection	Set: D-FET Turn Off & Discharge Current $\geq 500mA$ Delay Time: 10Sec~13Sec	Blow	Off	Off
6	C-FET Failure Detection	Set: C-FET Turn Off & Charge Current $\geq 500mA$ Delay Time: 10Sec~13Sec	Blow	Off	Off
7	Thermistor Short Detection	Short Condition: $\geq 150^{\circ}C$ Delay Time: 10Sec~13Sec	Blow	Off	Off
8	Thermistor Open Detection	Open Condition: $\leq -46^{\circ}C$ Delay Time: 10Sec~13Sec	-	Off	Off
9	Cu Deposition Detection	Set: Cell Voltage $\leq 1.3V$ Delay Time: 1Sec~4Sec	-	Off	Off

9.Other Function Description

No.	Item	Condition		Action
1	Charge Mode	Pre-Charge Mode	Min Cell Voltage <3000mV	Charging Current: 517mA
		Smart Charge Mode	Temp: 0°C~15°C	1033mA CCCV to 4.45V/cell
			Temp: 15°C~20°C	5168mA CC to 4.1V/cell; 2584mA CCCV to 4.45V/cell
			Temp: 20°C~45°C	6201mA CC to 4.2V/cell; 3617mA CCCV to 4.45V/cell
			Temp: 45°C~60°C	2584mA CC to 4.2V/cell, then stop; Reset: max cell voltage≤ 3900mV
		Advanced Charge Profile:		
		T1(0°C)≤T2(10°C)≤T5 (15°C) ≤T6 (20°C) ≤T3 (45°C) ≤T4 (60°C)		
		Charging Current  Cell Temperature		

2	Sleep Mode	Entry: 1. No Communication 2. $Current() \leq 10\text{mA}$ 3. No PF and No Safety Alert / Status	BMU goes to sleep mode C-FET turn off
		Exit: 1. Communication with battery OR 2. $Current \geq 10\text{mA}$ OR 3. Abnormal situation: 1) Sbs.Temp $> 73\text{degC}$ 2) Sbs.Temp $< -20\text{degC}$ 3) Sbs.FET Temp $> 98\text{degC}$ 4) Sbs.FET Temp $< -20\text{degC}$ 5) Max cellV $> 4.49\text{V}$ 6) Min cellV $< 2800\text{mV}$	1. BMU goes back to normal mode 2. C-FET turn on. (Depends on present status)
		Note: 1. BMU can't allow CLK pin High with Data pin Low or CLK pin Low with Data pin High. 2. The current condition of sleep mode is no matter current direction. 3. The C-FET is turned off in sleep mode. Normally, the current exit condition is discharge.	
3	Shipping Mode Function	Entry: 1. Write "0x0000" by 0x34 & Write "0x1000" by 0x34 (Command interval less than 5 sec) OR 2. RSOC $< 30\%$ & No detectable charge or discharge current & Storage Time > 2 weeks	1. D-FET off function 0x34 value changes to "0x0100" 2. Both D-FET and C-FET turn off
		Exit: 1. Write "0x2000" by 0x34 & Write "0x4000" by 0x34 (Command interval less than 5 sec) OR 2. BMU receives a SMBus Command after waking up from sleep mode.	1. D-FET off function 0x34 value changes to "0x0000" 2. Both D-FET and C-FET turn on Return to normal mode
		Note: It's necessary to have an interval time that is more than 5sec between entry condition command and exit condition command for turning on/off C/D-FET.	

RSOC<30% storage condition flow chart:



4	Shutdown Mode Function	Common Entry: 1.Min cell voltage continuous <2800mV for 20Sec & Voltage at PACK pin < 1000mV OR 2. 1.Write 0x0010 to 0x00 2.Write 0x0010 to 0x00 This sequence will be canceled if interval time of between Step(a) and Step(b) is over than 5sec RTC Entry: 1. Battery in shipmode and RSOC <= 5% for 2s with RTC function enable. 2. Battery in sleep mode over 1hour and RSOC <= 2% with RTC function enable. 3. TDA=1 for 11sec with RTC function enable (TDA release condition: charge current>50mA and Vcell>3200mV/cell)	Turn D-FET and C-FET turn off
		Exit: Voltage at PACK pin>4V if the charging voltage continues to be applied to Pack+ while the shutdown condition is satisfied, the shutdown will be canceled if Pack+ is equal or larger than (ChargingVoltage – CancelChgVoltOffset) forCancelDela	Both D-FET and C-FET turn on; Return to normal mode
5	96 Hours Function	96hrs function enable: When battery is fully charged 96hrs function disable: 96hours time out. OR Discharge current>5mA for 30Sec OR Discharge current>100mA for 1Sec	
6	Cell Imbalance Function	Max cell voltage>4.20V & (Max cell voltage – Min cell voltage)>500mV & Current=0mA & Delay time>5mins	Set Bit10 (Cell Imbalance Alarm) at Battery Status 0x16

7	Permanent Dual Mode			
Permanent DM	Criterion to Enter		Requested Charge Voltage	Capacity (Approx % of RT Capacity)
	Cycle Count	Adjusted Hrs at High Voltage		
RT	0	0	13.35V	100%
LS1-1	100	960	13.32V	99%
LS1-2	150	1200	13.29V	98%
LS1-3	300	1440	13.26V	97%
LS1-4	350	1680	13.23V	96%
LS1-5	400	1920	13.2V	95%
LS2	SoH FCC < 50% of DesignCapacity() OR SoH FCC < LS1 to LS2 FCC transition threshold(Min FCC: 54%)		13.05V	90%
8	Dynamic Dual Mode			
Dynamic DM	Criterion to Enter		Requested Charge Voltage	Capacity (Approx % of RT Capacity)
	RSOC for last 7days			
RT	RSOC<35%		13.35V	100%
T-LS1-1	35%≤RSOC<40%		13.32V	99%
T-LS1-2	40%≤RSOC<45%		13.29V	98%
T-LS1-3	45%≤RSOC<50%		13.26V	97%
T-LS1-4	50%≤RSOC<55%		13.23V	96%
T-LS1-5	55%≤RSOC<65%		13.2V	95%
T-LS2	65%≤RSOC<90%		13.05V	90%
Exit Condition: RSOC≤20%				
9	PI Mode			
Entry	Criterion to Enter		Requested Charge Voltage	Capacity (Approx % of RT Capacity)
1	RSOC>90% for 14days		12.75V	80%
2	RSOC>90% for 7days & High Temp(>40℃) for 40hours			
Exit condition: RSOC≤50%				

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10. Electrical Characteristics

Standard environmental test condition

Unless otherwise specified, all tests stated in this Product Specification are conducted at below condition:

Temperature : 25 °C ± 3 °C , Humidity: 5%~ 95% RH

No.	Item	Test Method and Condition	Criteria
1	Standard Charge	Charging shall consist of charging at a constant current rate of 1033mA until the battery voltage reaches 4.45V/cell. The battery shall then be charged at constant voltage of 4.45V/cell while tapering the charge current. Charging shall be terminated when the charging current has tapered to 258mA	\
2	Open circuit voltage	After standard charge, measure it within 24 hours	Above 11.1V
3	Initial capacity	After the standard charge, the battery should be discharged at 0.2C constant current to the cut-off voltage of 3V/cell.	≥5065mAh
4	Initial Impedance	The battery is fully charged, with 1KHz sine wave AC 4 terminal measurement method to test the initial.	≤210mΩ
5	Charge retention	When the battery has completed standard charged, it shall be disconnected and put aside for 28 Days at 20°C±5°C, Then measured the capacity with 0.2 C till 3V/cell.	Residual capacity > 85%
6	Cycle Life	Charge battery with specified charge method and discharge battery with 0.5C current until min cell voltage reaches 3V/cell. Repeat to 1000cycles, record remained capacity of 1000th cycle.	Capacity ≥70% of Cmin Thickness Swelling ≤ 10% of initial thickness

11.Safety compliance

No.	Item	Test Method and Condition	Criteria
1	Heat test	The battery is fully charged in accordance with the standard charging method, placed in a gravity convection or circulating air oven. The temperature of the oven is to be raised at a rate of $(5 \pm 2) ^\circ \text{C}/\text{min}$ to a temperature of $(130 \pm 2) ^\circ \text{C}$ and remain for 30 mins at that temperature before the test is discontinued.	No Explosion, No Fire
2	Short between terminal	Short the positive (+) and negative (-) of the pack with copper wire having a maximum resistance load of 0.1Ω at $20 ^\circ \text{C} \pm 5 ^\circ \text{C}$ and $55 ^\circ \text{C} \pm 2 ^\circ \text{C}$ for 2hours after standard charge at $25 ^\circ \text{C} \pm 3 ^\circ \text{C}$.	No rupture, fire, smoke or leakage
3	Reverse charge	Apply a power supply at a reverse polarity, constant voltage and constant current adjusted to 13.35V/ 6201mA condition at $25 ^\circ \text{C} \pm 3 ^\circ \text{C}$ and leave it for 24 hours.	No rupture, fire, smoke or leakage
4	Overcharge performance	Constant current and constant voltage 0.5C/13.47V charge for 48hours at $25 ^\circ \text{C} \pm 3 ^\circ \text{C}$. Then check outside appearance right after rated charge.	No leakage or prominent breakage
5	Thermal cycling	Procedure: Place the fully charged battery at thermal chamber $72 \pm 2 ^\circ \text{C}$ for 6Hr $\leftrightarrow$ $-40 \pm 2 ^\circ \text{C}$ for 6Hrs (Transfer time : 30min), 10cycle take out the battery at $(20 \pm 5) ^\circ \text{C}$ for 24hours	No mass loss (not exceed 0.1%) No leakage, No venting No disassembly, No rupture No fire OCV(open circuit voltage)> 90% of the initial voltage

12.Safety Operating Parameters for GB 31241-2022

安全工作参数 Safety Operating Parameter	符号 Symbol	电池组 Battery Pack
充电限制电压 (Limited charging voltage)	Ucl	13.35V
充电上限电压 (Upper limited charging voltage)	Uup	13.35V
放电截止电压 (Discharge cut-off voltage)	Udo	8.34V
放电终止电压 (Discharge terminate voltage)	Ude	9V
推荐充电电流 (Recommendation charging current)	Icr	1033mA
最大充电电流 (Maximum charging current)	Icm	Max cell voltage > 4.20V &
推荐放电电流 (Recommendation discharging current)	Idr	1033mA
最大放电电流 (Maximum discharging current)	Idm	7222mA
过压充电保护电压 (Over voltage for charge protection)	Ucp	4.49V $\pm$ 0.02V/cell
过流充电保护电流 (Over current for charge protection)	Icp	6.8A $\pm$ 0.2A
欠压放电保护电压 (Low voltage for discharge protection)	Udp	2.80V $\pm$ 0.02V/cell
过流放电保护电流 (Over current for discharge protection)	Idp	10.1A $\pm$ 0.2A
上限充电温度 (Upper limited charging temperature)	Tcm	60°C $\pm$ 3°C
上限放电温度 (Upper limited discharging temperature)	Tdm	60°C $\pm$ 3°C
下限充电温度 (Lower limited charging temperature)	Tcl	0°C $\pm$ 3°C
下限放电温度 (Lower limited discharging temperature)	Tdl	-20°C $\pm$ 3°C
可允许的最高表面温度 (Maximum allowable surface temperature)	Tmax	70°C $\pm$ 3°C
充电截止电流 (Taper current for charging)	-	258mA

13.Safety License

Type	Standard
CQC	GB31241-2022
CB	IEC60950,IEC62368,IEC62133
CE	EN60950,EN62368,EN62133,EN 55032 and EN55024
UL	UL60950-1,UL62368,UL2054
BSMI	CNS 15364/14857-2
PSE	JIS C8712, JIS C8714
KC	K62133
BIS	IS16046, IEC62133
No mercury report	EU Directive 2006/66/EC
MSDS report	
MIC	

16.Safety Instruction

Warnings
.Use the dedicated charger. .Keep away from children to avoid any accidents. .Don't use the independent charger. .Don't leave the battery near the fire or heating source. .Don't throw the battery into the fire or in direct sunlight or immerse into the water. .Don't penetrate the battery with a sharp object such a needle or driver. .Don't impact with heavy objects such as a hammer, weight. .Don't throw or drop the battery on the hard floor. .Don't disassemble the battery or modify the battery including design or electrical circuit. .Don't use seriously cared or deformed battery. . Leakage of the battery is strictly prohibited to use again. .If liquid leaks onto your skin or clothes, wash well with fresh water immediately. .If the battery is needed to be stored for a long period, battery should be removed from the application and stored in a place where humidity and temperature are low.