



Specification Approval Sheet

Name: LiFePO4 Battery

Model:31383-1

SPEC:IFR-26650-4S3P 12.8V 9.9Ah-PCM

Number:8174260403003

Project: /

Approved By	Checkup	Make
Shaopeng Yi	Rongzhong Peng	Yuanhui LIU
2019-10-14	2019-10-14	2019-10-14

Customer Confirmation	Signature	Date
	Company Name :	
	Stamp :	
Please sign back specification before bulk order		

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Amendment Records

Revision	Description	Issued Date	Approved By
A0	New release	2019-9-17	Yuanhui LIU
A1	1.Change NTC model 2.Change the PCM parameter 3.Change Voltage at end of discharge	2019-10-14	Yuanhui LIU

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This document describes the performance characteristics and testing methods for LiFePO₄ battery produced by Tenergy Corporation.

2 Product type and model number**2.1 Product type**LiFePO₄ Battery**2.2 Model number**

31383-1

3 Rated performance**Form 1: Battery rated performance**

No	Item	Rated performance	Remark
1	Rated capacity	Nominal 9900mAh Min 9750mAh-5%	Standard discharge after standard charge
2	Nominal voltage	12.8V	Mean operation voltage during standard discharge after standard charge
3	Voltage at end of discharge	8.8V	Discharge cut-off voltage
4	Charging voltage	13.8V	
5	Shipments voltage	13.2±0.15V	SOC≤30 %
6	Impedance	<80mΩ	
7	Standard charge	Constant current 0.2C ₅ A Constant voltage 13.8V Cut-off current ≤0.02C ₅ A	
8	Standard discharge	Constant current 0.2 C ₅ A End voltage 8.8V	
9	Maximum Charge Current	Constant current 4A Constant voltage 13.8V Cut-off current ≤0.02C ₅ A	
10	Maximum discharge Current	Constant current 0.5C ₅ A End voltage 8.8V	
11	Maximum continuous discharge current	≤8A	
13	Operation temperature range	Charge: -20 to 65°C Discharge: -40~70°C	60±25%R.H. Charging and discharging at sub-zero or above 45°C will cause degradation of the battery performance and cycle life. Power efficiency at sub-zero temperature will also be much lower than room temperature. Use battery at above 0°C is highly recommended for performance and cycle life.
14	Cycle life	>800cycles	Charging/discharging in the below condition: Charge: standard charge Discharge: 0.2C ₅ A to 8.8V Rest time between charge/discharge:30min Until the discharge capacity <80% of NC
15	Storage temperature	≤1 month: -20 ~ 45°C ≤3 months: -10 ~ 30°C	60±25%R.H Best 10~25°C for long-time storage

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		≤ 1 year: 0 ~ 30°C	
16	Weight	Approx:1.3kg	
17	Dimension(mm)	Thickness*Width*Height (max)	66*96*152mm
17	output wire length (mm)	Excluding the connector	145 \pm 5mm/105 \pm 5mm

4 Electrical performances

Form 2: Battery electrical performances

No	Items	Test procedure	Requirements
1	Nominal voltage	The average value of the working voltage during the whole discharge process.	12.8V
2	Discharge performance	The discharge capacity of the battery, measured with 0.2 C ₅ A down to 8.8V within 1 hour after a standard charge at 25 \pm 5°C	Discharge \geq Minimum capacity
3	Capacity retention	After 28 days storage at 25 \pm 5°C, after having been standard charged and discharged at 0.2 C ₅ A to 8.8V (the residual capacity is above 85% of nominal capacity)	Discharge time \geq 4.25h
4	Cycle life	Charging/discharging in the below condition: Charge: standard charge at 25 \pm 5°C Discharge: 0.2C ₅ A to 8.8V Rest time between charge/discharge: 30min Until the discharge capacity < 80% of NC	> 800 cycles
5	Storage	(Within 3 months after manufactured) The battery is charged with 0.2C ₅ A to 40-50% capacity and stored at ambient temperature 25 \pm 5°C, 65 \pm 20%RH for 12 months. After the 12 months storage period the cell is fully charged and discharged to 8.8V with 0.2 C ₅ A	Discharge time \geq 4h

5 Standard test conditions

Test should be conducted with new batteries within one week after shipment from our factory and the batteries shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of 20 \pm 5°C and relative humidity of 45~85%. If it is judged that the test results are not affected by such conditions, the tests may be conducted at temperature 15~30°C and humidity 25~85%RH.

6 Cautions in use

To ensure proper use of the battery please read the manual carefully before using it.

6.1 Handling

Do not expose to, dispose of the battery in fire.

Do not put the battery in a charger or equipment with wrong terminals connected.

Avoid shorting the battery.

Avoid excessive physical shock or vibration.

Do not disassemble or deform the battery.

Do not immerse in water.

Do not use the battery mixed with other different make, type, or model batteries.



Keep out of the reach of children. **Do not allow children to replace batteries without adult supervision.**

6.2 Charge and discharge

Battery must be charged in appropriate charger only.

Never use a modified or damaged charger.

Do not leave battery in charge over 24 hours.

6.3 Storage

Store the battery in a cool, dry and well-ventilated area.

6.4 Disposal

Regulations vary for different countries, Dispose of in accordance with local regulations.

7 Battery operation instruction

7.1 Charging

Charging current: Cannot surpass the biggest charging current which in this specification book stipulated.

Charging voltage: Does not have to surpass the highest amount which in this specification book stipulated to decide the voltage.

Charging temperature: The battery must charge in the ambient temperature scope which this specification book stipulated. Use the constant electric current and constant voltage to charge. Do not reverse charge. When the positive electrode and the cathode meet together, damage can be made for the battery.

7.2 Discharging current

The discharging current does not have to surpass this specification book stipulation the biggest discharging current, the oversized electric current electric discharge can cause the battery capacity play to reduce and to cause the battery heat.

7.3 Electric discharge temperature

The battery discharge must carry on in the ambient temperature scope which this specification book stipulated.

7.4 Over-discharges

Short time of excessively discharge will not affect the usage. But the long time excess discharge can damage the battery performance and cause the function losing. When the battery is not used for a long time, because of its automatic flashover characteristic, it may excessively discharges. To prevent excessively discharge occur, the battery should maintain certain electric quantity.

7.5 Storing the batteries

The battery should store in the product specification book stipulation temperature range. If has surpasses above for six months the long time storage, suggested you should carry on additional charge to the battery.

8 Other the chemical reaction

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.

9 Note



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Any other items which are not covered in this specification shall be agreed by both parties.

10 PCM performance

10.1 Electrical characteristics

Form 3: PCB electrical characteristics



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Item	Content	Criterion
Over charge Protection	Over charge detection voltage	$3.750 \pm 0.030V$
	Detection delay time	$1 \pm 0.5S$
	Over charge release voltage	$3.550 \pm 0.050V$
Secondary protection	Secondary overcharge protection detection voltage	$3.825 \pm 0.030V$ (30A Max)
	Delay time of secondary overcharge protection detection	$1.5 \pm 0.5S$
Over discharge protection	Over discharge detection voltage	$2.200 \pm 0.050V$
	Detection delay time	$0.6 \pm 0.2S$
	Over discharge release voltage	$2.700 \pm 0.100V$
	Rated operational current	$\leq 15A$
balance	Balanced open voltage	$3.50 \pm 0.030V$
	Balanced current	$35 \pm 5mA$
Over current protection	Primary Overcurrent Protection Current	$30 \pm 3A$
	Detection delay time	$1 \pm 0.5S$
	Secondary overcurrent protection current	$60 \pm 6A$
	Detection delay time	$50-150mS$
	Release of Protection Conditions	Disconnect load
	Charge overcurrent	$6 \pm 3A$
	Detection delay time	$1 \pm 0.5S$
Short protection	Detection condition	$>120A$
	Detection delay time	$150 \sim 350\mu S$
	Release condition	Cut short circuit
Interior resistance	Main loop electrify resistance	$\leq 50m\Omega$
Current consumption	Current consume in normal operation	$\leq 30\mu A$
NTC	NTC: /	/
PCB Dimension(L*W*H)mm	RYD-04S-089 V1.0 2L-FR4-Z1.0 77.4*51.6*1.6mm 喷锡	



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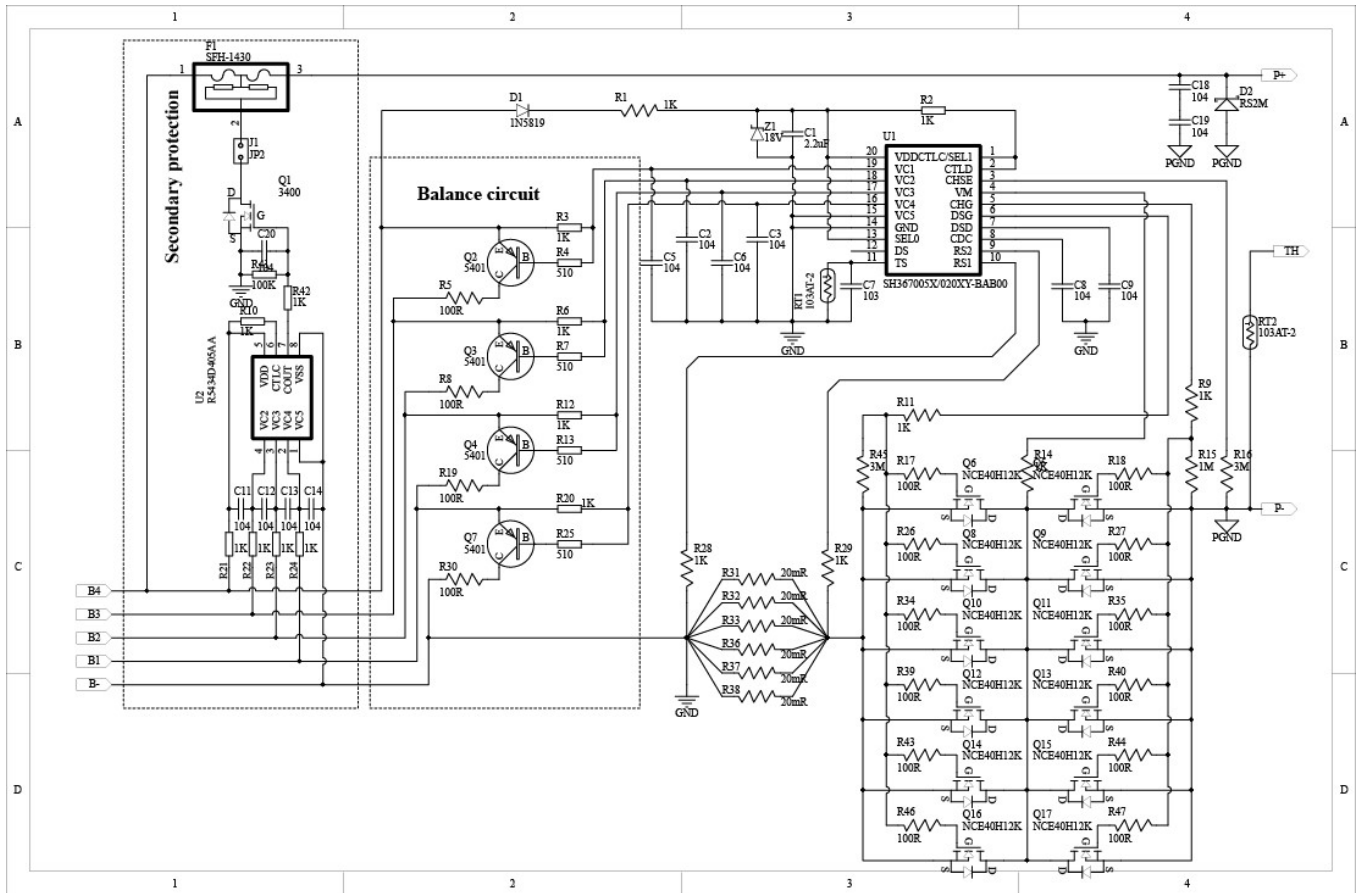
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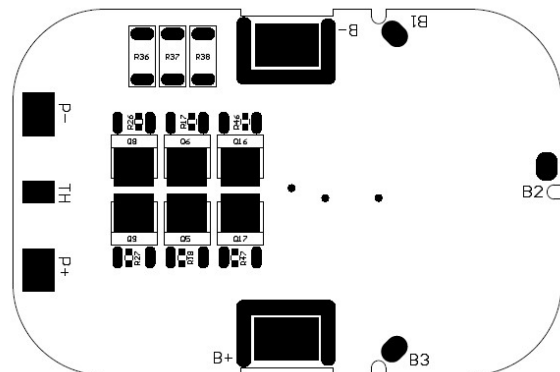
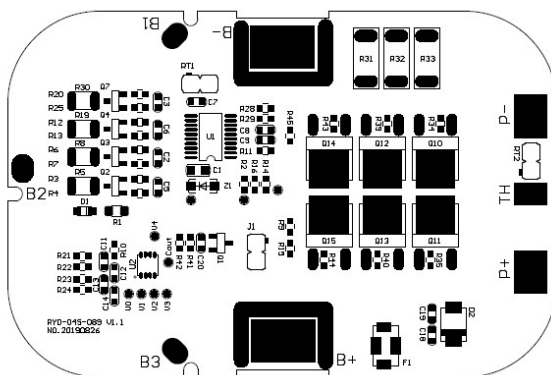
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10.2 Application Circuit



10.4 PCB Layout



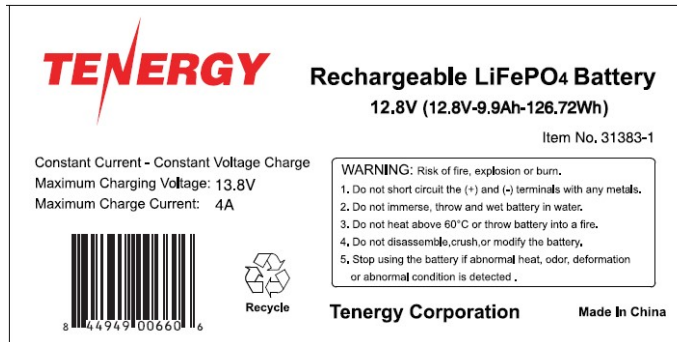


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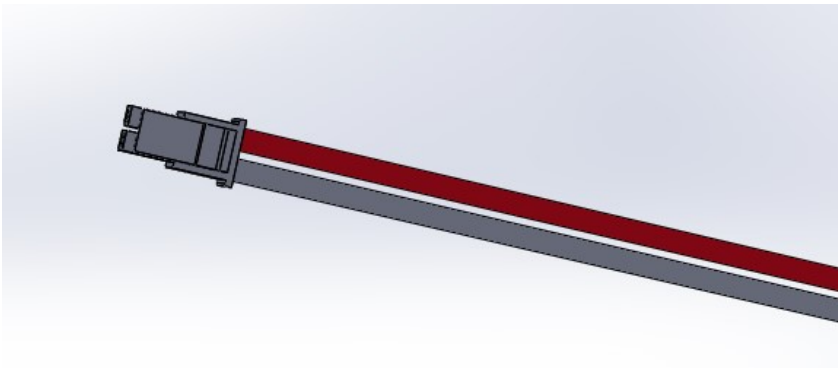
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11 Label

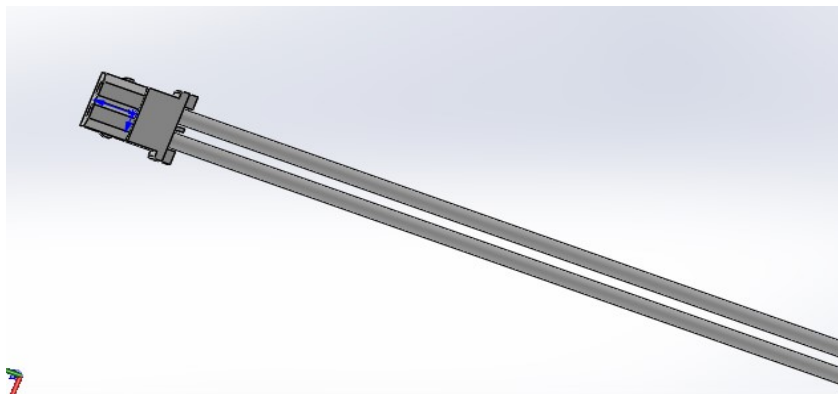


11.1 IConnector drawing:

Con-Molex 0436450200-2P (430300038端子)



Con-Molex Mini-SPOX50375023-2P (08701039 端子)





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12 Battery pack drawings

Drawing 1: Battery pack drawings

