



## Tenergy 7.4V 3000mAh Lithium Polymer Battery

<b>Product Name:</b>	Tenergy Lithium Polymer Battery
<b>Product Number:</b>	31143
<b>Battery Size:</b>	7.4V/3000Ah
<b>Battery Chemistry:</b>	Lithium Polymer
<b>Dimension:</b>	Length: 103mm
	Width: 56mm
	Thickness: 12mm

### 1. Scope

This specification is applied to the reference battery in this Specification and manufactured by Tenergy Corp.

### 2. Product Specification

Table 1

No.	Item	General Parameter		Remark
1	Rated Capacity	Typical	3100mAh	Standard discharge (0.2C) after Standard charge
		Minimum	3000mAh	
2	Nominal Voltage	7.4V		Mean Operation Voltage
3	Voltage at end of Discharge	6V		Discharge Cut-off Voltage



**Tenergy Corporation**

436 Kato Terrace

Fremont CA 94539 USA

Tel: 510-687-0388 Fax: 510-687-0328

[www.TenergyBattery.com](http://www.TenergyBattery.com) email: sales@tenergybattery.com

4	Charging Voltage	8.4±0.02V	
5	Internal Impedance	≤150mΩ	Internal resistance measured at AC 1KHz after 50% charge  The measure must uses the new batteries that within one week after shipment and cycles less than 5 times
6	Standard charge	Constant Current 0.2C Constant Voltage 8.4V 0.01 C cut-off	Charge time : Approx 7.0h
7	Standard discharge	Constant current 0.2 C end voltage 6V	
8	Fast charge	Constant Current 0.5C Constant Voltage 8.4V 0.01 C cut-off	Charge time : Approx 4.0h
9	Fast discharge	Constant current 1C end voltage 6V	
10	Maximum Continuous Charge Current	1 C	
11	Maximum Continuous Discharge Current	4A	
12	Operation Temperature Range	Charge: 0~45°C	60±25%R.H.  Bare Cell
		Discharge: -20~60°C	
13	Storage Temperature Range	Less than 1 year: -20~25°C	60±25%R.H.  at the shipment state
		less than 3 months: -20~40°C	

Specifications and data are subject to change without notice. Contact Tenergy for latest information.

©2009 Tenergy Corporation. All rights reserved.



14	Weight	Approx: 125g	
15	Pack Dimension Max	Height: 103 mm	Initial Dimension
		Width: 56 mm	
		Thickness: 12 mm	

### 3. Performance and Test Conditions

#### 3.1 Standard Test Conditions

Test should be conducted with new batteries within one week after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise specified, test and measurement shall be done under temperature of  $20\pm 5^{\circ}\text{C}$  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  $15\sim 30^{\circ}\text{C}$  and humidity 25~85%RH.

#### 3.2 Measuring Instrument or Apparatus

##### 3.2.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

##### 3.2.2 Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance more than  $10\text{k}\Omega/\text{V}$ .

##### 3.2.3 Ammeter

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than  $0.01\Omega$ .

##### 3.2.4 Impedance Meter

Impedance shall be measured by a sinusoidal alternating current method (1kHz LCR meter).

#### 3.3 Standard Charge\Discharge

##### 3.3.1 Standard Charge : Test procedure and its criteria are referred as follows:



Charging shall consist of charging at a 0.2C constant current rate until the cell reaches 8.4V. The cell shall then be charged at constant voltage of 8.4 volts while tapering the charge current. Charging shall be terminated when the charging current has tapered to 0.01 C. Charge time: Approx 4.0h, the cell shall demonstrate no permanent degradation when charged between 0 °C and 45 °C.

### 3.3.2 Standard Discharge

Cells shall be discharged at a constant current of 0.2 C to 6 volts @ 20° ± 5C

3.3.3 If no otherwise specified, the rest time between Chare and Discharge amount to 30min.

### 3.4 Appearance

There shall be no such defect as flaw, crack, rust, leakage, which may adversely affect commercial value of battery.

### 3.5 Initial Performance Test

Table 2

Item	Test Method and Condition	Requirements
(1) Open-Circuit Voltage	The open-circuit voltage shall be measured within 24 hours after standard charge	≥8.1V
(2) Internal impedance	Internal resistance measured at AC 1KHz after 50% charge	≤150mΩ
(3) Minimal Rated Capacity	The capacity on 0.2C discharge till the voltage tapered to 6V shall be measured after rested for 30min then finish standard charge	Discharge Capacity ≥3000mAh

### 3.6 Temperature Dependence of discharge capacity

Cells shall be charged per 3.3.1 and discharged @0.2 C to 6 volts, except to be discharged at temperatures per Table 3. Cells shall be stored for 3 hours at the test temperature prior to discharging and then shall be discharged at the test temperature. The capacity of a cell at each temperature shall be compared to the



capacity achieved at 23 °C and the percentage shall be calculated. Each cell shall meet or exceed the requirements of Table 3.

Table 3

Discharge Temperature	-10□	0□	23□	60□
Discharge Capacity (0.2 C)	50%	80%	100%	95%

3.7 Cycle Life and Leakage-Proof

Table 4

No.	Item	Criteria	Test Conditions
1	Cycle Life	Higher than 70% of the Initial Capacities of the Cells	Carry out 300cycle Charging/Discharging in the below condition. □Charge: Standard Charge, per 3.3.1 □Discharge: 0.5 C to 6 V □Rest Time between charge/discharge: 30min. □Temperature: 20±5□
2	Leakage-Proof	No leakage (visual inspection)	After full charge with standard charge, store at 60±3□, 60±10%RH for 1 month.

**4. Mechanical characteristics and Safety Test**

Table 5

(Mechanical characteristics)



No.	Items	Test Method and Condition	Criteria
1	Vibration Test	After standard charging, fixed the cell to vibration table and subjected to vibration cycling that the frequency is to be varied at the rate of 1Hz per minute between 10Hz an 55Hz, the excursion of the vibration is 1.6mm. The cell shall be vibrated for 30 minutes per axis of XYZ axes.	No leakage No fire
2	Drop Test	The cell is to be dropped from a height of 1 meter twice onto concrete ground.	No explosion, No fire, no leakage.

Table 6 (Safety Test)

Item	Battery Condition	Test Method	Requirements
Crush	Fresh, Fully charged	Crush between two flat plates. Applied force is about 13kN (1.72Mpa) for 30min.	No explosion, No fire
Short Circuit	Fresh, Fully charged	Each test sample battery, in turn, is to be short-circuited by connecting the (+) and (-) terminals of the battery with a Cu wire having a maximum resistance load of 0.1Ω. Tests are to be conducted at room temperature (20±2°C ).	No explosion, No fire The Temperature of the surface of the Cells are lower than 150°C
Short Circuit	Fresh, Fully charged	Each test sample battery, in turn, is to be short-circuited by connecting the (+) and (-) terminals of the battery with a Cu wire having a maximum resistance load of 0.1Ω. Tests are to be conducted at temperature (60±2°C )	No explosion, No fire The Temperature of the surface of the Cells are lower than

Specifications and data are subject to change without notice. Contact Tenergy for latest information.

©2009 Tenergy Corporation. All rights reserved.



**Tenergy Corporation**

436 Kato Terrace

Fremont CA 94539 USA

Tel: 510-687-0388 Fax: 510-687-0328

[www.TenergyBattery.com](http://www.TenergyBattery.com) email: sales@tenergybattery.com

			150°C
Impact	Fresh, Fully charged	A 56mm diameter bar is inlayed into the bottom of a 10kg weight. And the weight is to be dropped from a height of 1m onto a sample battery and then the bar will be across the center of the sample.	No explosion, No fire
Forced Discharge	Fresh, Fully charged	Discharge at a current of 1 C for 2.5h.	No explosion, No fire
Nail Pricking	Fresh, Fully charged	Prick through the sample battery with a nail having a diameter of 3mm and remain 2h.	No explosion, No fire

PCB specification

**Electrical characteristics**

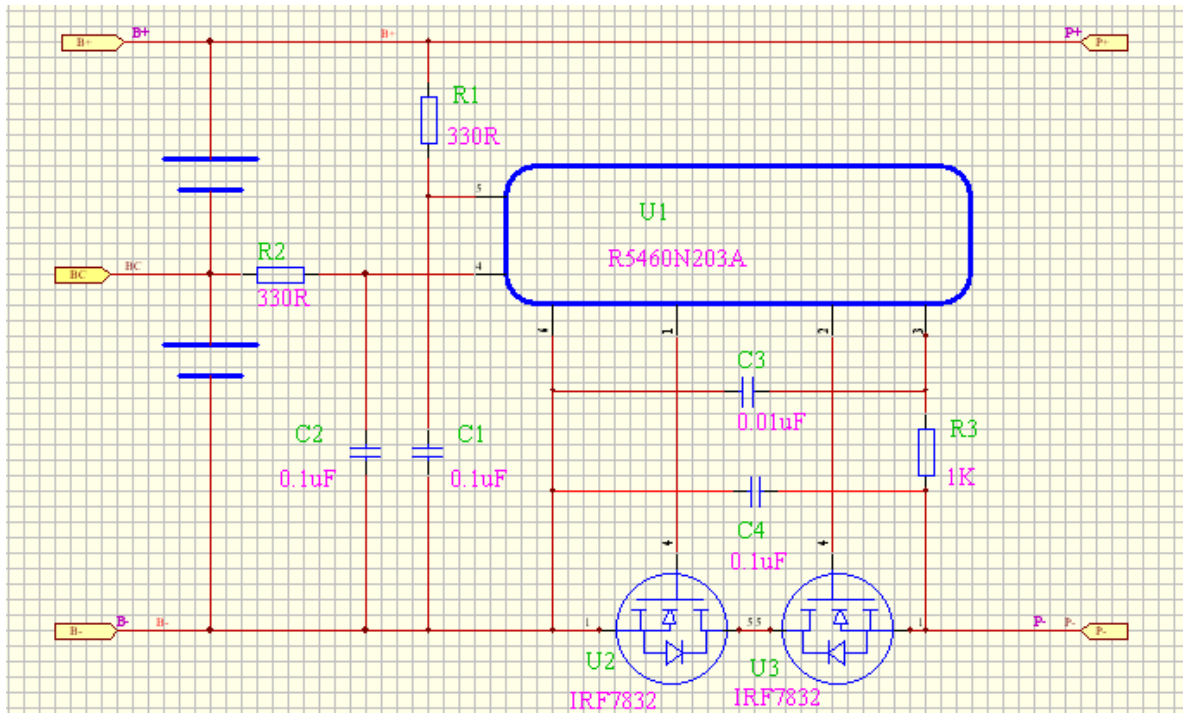
Top t=25°

Item	Content	Criterion
Over charge Protection	Over charge detection voltage	4.35±0.025V
	Over charge release voltage	4.15±0.05V
	Over charge detection delay time	1000ms
Over discharge protection	Over discharge detection voltage	2.3±0.08V
	Over discharge release voltage	3.0±0.05V
	Rated operational current	7A

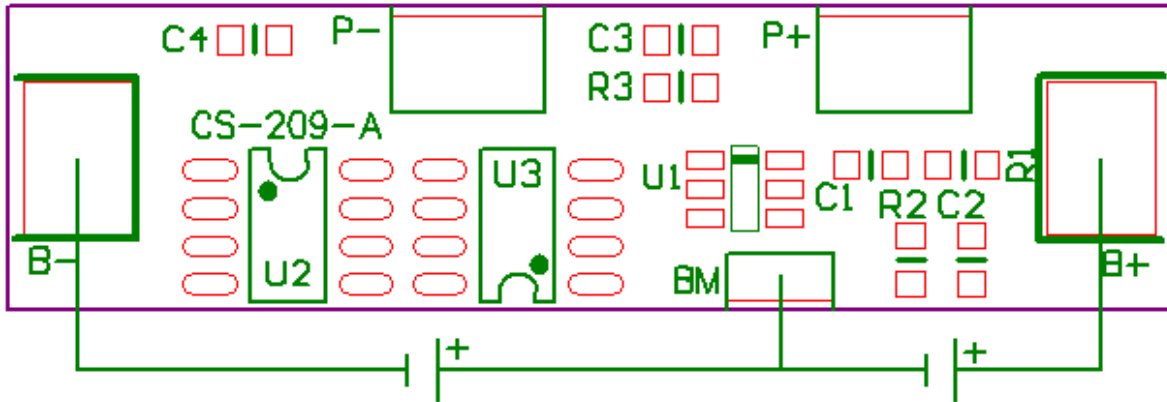
Specifications and data are subject to change without notice. Contact Tenergy for latest information.

©2009 Tenergy Corporation. All rights reserved.

Over current protection	Over current detection current	13-23A
	Release condition	Cut load
	Detection delay time	12ms
Short protection	Detection condition	Exterior short circuit
	Release condition	Cut short circuit
Interior resistance	Main loop electrify resistance	VC=4.2V ; RDS≤15mΩ
Current consumption	Current consume in normal operation	6μA Max
Dimension (L*W*H)	38*10*0.8mm	

**Application Circuit**




**PCB Layout****Terminal explanations**

- 1、 B+ : Connected to the second battery's positive terminal
- 2、 BM/COM : Connected to the first battery's positive terminal
- 3、 B- : Connected to the first battery's negative terminal
- 4、 P+ : Connected to the battery's output or the charger's positive terminal
- 5、 P- : Connected to the battery's output or the charger's negative terminal



**Tenergy Corporation**

436 Kato Terrace Fremont CA 94539

Tel: 510.687.0388 Fax: 510.687.0328

[www.TenergyBattery.com](http://www.TenergyBattery.com) email: sales@tenergybattery.com

---