PRODUCT SPECIFICATION

Rechargeable Polymer Lithium Ion Battery

Model: GEB251218RH15

Received Marking

Customer's Name :

Signature :

Company Stamp :

Prepared by	Checked by	Approved by

1. Scope

This specification is applied to GEB Lithium Ion Polymer Battery manufactured by General Electronics Battery Co. Ltd.

2. Product and Model

2.1 Product ： Polymer Lithium Ion Battery

2.2 Model ： GEB251218RH15

3. Ratings

Item		Rating	Note
3.1 Capacity	Nominal	20mAh	Standard charge, 0.5C discharge, 3.0V/cell cut off
3.2 Nominal Voltage		3.7V	Average voltage at 0.20C discharge
3.3 Standard Charge Condition		1C(20mA),4.2V(CC-CV), 1mA	Total charging time is no more than 2.5h
3.4 Maximum Charge Current		3C(60mA)	
3.5 Maximum Charge Voltage		4.2V	
3.6 Maximum Discharge Current		15C(300mA)	Continuous Current
3.7 Discharge Cut-off Voltage		3.0V	
3.8 Voltage as of shipment		3.7-3.9V	
3.9 Cell Weight		Approx.0.7g	
3.10 Operating Temperature	Charge	0~45℃	90%RH Max.
	Discharge	-20~60℃	90%RH Max.
3.11 Storage Temperature	1 month	-20~45℃	Recommended storage temperature: 20℃ or less, at the shipment state
	3 month	-20~35℃	
	1 year	-20~20℃	

4. Outline Dimensions and Appearance

4.1 Outline Dimensions

See attached drawing for GEB251218RH15 (Fig.1).

Thickness ： Max 2.70mm (Measured with weighting 300gf at 23±2℃)

Width ： Max 12.5mm（measured with weighting 300gf at 23±2℃）

Length ： Max 18.5mm（without sealant）

This thickness will be swelling when high temperature storage or operation in high temperature.

4.2 Appearance

There shall be no such defect as remarkable scratches, breaks, crack, discoloration, leakage, or deformation, which may adversely affect commercial value of the cell.

5. Performance

5.1 Standard Test Condition

Test should be conducted with new batteries within one month after shipment from our factory and the cells shall not be cycled more than five times before the test. Test condition shall be at 25±2℃ and 65±20%RH as long as there is no doubt. The humidity can be any condition unless it affects the test results.

5.2 Measuring Instrument or Apparatus

5.2.1 Dimension Measuring Instrument

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

5.2.2 Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance more than 10 MΩ/V

5.2.3 Ammeter

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

5.2.4 Impedance Meter

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

5.3 Standard Charge Definition

Standard charge is defined by charging for 2.5hrs at 4.20V of constant voltage and 1C(20mA) of constant current.

5.4 Rest Period

Unless otherwise defined, 10min rest period after full charge, 10min rest period after discharge.

5.5 Standard Discharge Definition

Standard Discharge is defined by discharging at 1C (20mA) down to 3.0V.

5.6 Initial Performance Test

Item	Test Condition	Criteria
Open-Circuit Voltage	The open-circuit voltage shall be measured within 7hours after standard charge.	4.15V or more
AC Impedance Resistance	The Impedance shall be measured in an alternating current method (1kHz LCR meter) after standard charge at 25±2℃.	500mΩ or less (bare cell)
Initial Capacity	The capacity on 1C(20mA)discharge to 3.0V shall be measured after standard charge at 25±2℃.	20mAh or more

5.7 Electrical Performance

5.7.1 Discharge Rate Capabilities

Discharge Capacity is measured with the various currents in under table and 3.0V cut-off after rated charge.

Discharge Current	1C(20mA)	15C(300mA)
Discharge Capacity	100%	85%

5.7.2 Temperature Dependence of Capacity (Discharge)

Cells shall charge at 25±2℃ and cold and increase the temperature in 30mins. Keep in 1 hour before discharge. The discharge current is listed at below table under respective discharge temperatures. The capacities are to be measured with constant discharge current 10mA (3.0V cut-off) after standard charge at 25±2℃.

Discharge Temperature	-10℃	0℃	25℃	45℃
Discharge rate	0.2C	0.2C	1.0C	1.0C
Discharge Capacity	60%	85%	100%	95%

5.8 Safety Performance

Item	Test Condition	Criteria
Overcharge Test	After standard discharge, cells are charged at constant current of 20mA and constant voltage of 5.0V while tapering the charge current. Charging is continued for 48 hours.	No explosion, no fire, no smoke.
Nail Test	A nail (diameter: 2.0mm) is penetrated vertically through the center of a fully charged cell and left for 6 hours.	No explosion, no fire, no smoke.

5.9 Mechanical Performance

Item	Test Condition	Criteria
Vibration Test	After standard charge, cells are to be tested as following conditions: Amplitude:0.8mm Frequency:10~55Hz(sweep:1Hz/min) Direction: X/Y/Z axis for 90~100min. The battery is to be tested in three mutually perpendicular to each axis.	No leakage, or remarkable defective appearance. Recovery Capacity ≥ 90% Initial capacity
Drop Test	Drop cells in the shipment condition (50% discharge)from 1.2m height onto 5cm or thicker concrete with p-tile on it 3 times each of X, Y, and Z directions at 25±2℃.	No leakage. Recovery Capacity ≥ 90% Initial capacity

6. Period of Warranty

The period of warranty is one year from the date of shipment. GEB guarantees to give a replacement in case of cells with defects proven due to manufacturing process instead of the customer's abuse and misuse.

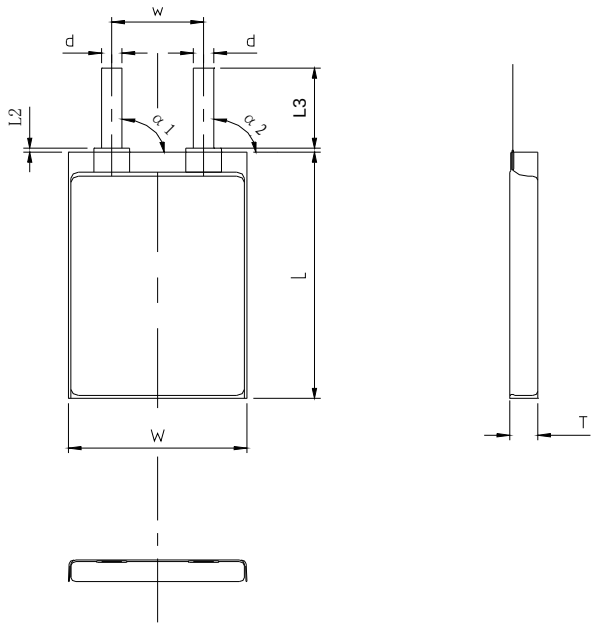
7. Shipment

Cells shall be shipped in 50% state of charge.

8. Others

Any matters that this specification doesn't cover should be conferred between the customer and GEB.

Fig.1 Dimensional Drawing of GEB251218RH15



Item	Item
T	Max. 2.7mm
W	Max.12.5mm
L	Max 18.5mm
L2	0.5-1.0mm
L3	8.0±1.0 mm
w'	5.0±1.0 mm
d	1.5±1.0 mm
α1	90±5°
α2	90±5°