Test Report issued under the responsibility of:

TÜVRheinland®

TEST REPORT
IEC 62133
Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications

Report Number. .....:	50048523 001
Date of issue .....:	2016-08-31
Total number of pages.....	26 pages
Applicant's name.....:	**GlobTek, Inc.**
Address .....:	186 Veterans Dr. Northvale, NJ 07647, USA
Test specification:	
Standard .....:	IEC 62133: 2012 (Second Edition)
Test procedure .....:	CB Scheme
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC62133B
Test Report Form(s) Originator ....:	UL(Demko)
Master TRF.....:	Dated 2013-03

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description .....:	Li-ion Polymer Battery
Trade Mark .....:	GlobTek, Inc.
Manufacturer.....:	**Same as applicant**
Address .....:	**Same as applicant**
Model/Type reference .....:	BL0750F5030481S1PC*C (*=A, B, C, J, K, L, M, N, P, Q, R, T, U, V, 1, 2, 3, 4, 5, 6, 7, 8, 9)
Ratings .....:	DC 3.7V, 700mAh, 2.59Wh

Testing procedure and testing location:		
☒ **CB Testing Laboratory:**	TÜV Rheinland (Shenzhen) Co., Ltd.	
Testing location/ address .....:	East of F/1, F/2~F/4, Building 1, Cybio Technology Building No. 6 Langshan No.2 Road, North Hi-tech Industry Park 518057 Shenzhen Nanshan District CHINA	
☐ **Associated CB Testing Laboratory:**		
Testing location/ address .....:		
Tested by (name + signature).....:	Crystal Ye	Crystal Ye
Approved by (name + signature) .....:	Charlie Zeng	Charlie Zeng
☐ **Testing procedure: TMP**		
Testing location/ address .....:		
Tested by (name + signature).....:		
Approved by (name + signature) .....:		
☐ **Testing procedure: WMT**		
Testing location/ address .....:		
Tested by (name + signature).....:		
Witnessed by (name + signature) ....:		
Approved by (name + signature) .....:		
☐ **Testing procedure: SMT**		
Testing location/ address .....:		
Tested by (name + signature).....:		
Approved by (name + signature) .....:		
Supervised by (name + signature)...:		

List of Attachments (including a total number of pages in each attachment):

Attachment 1: Photo documentation (4 pages)

Summary of testing:

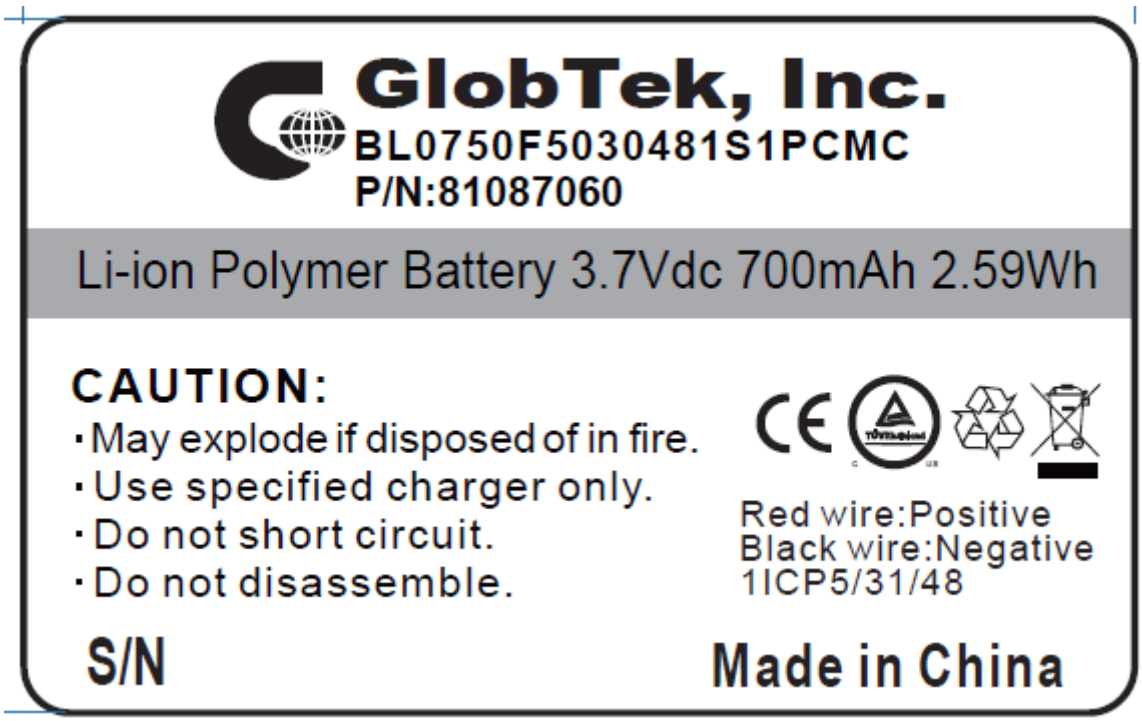
Tests performed (name of test and test clause):	**Testing location:**
cl.5.6.2 Design recommendation (Lithium system); cl.8.1 Charging procedure for test purposes (for Cells and Batteries); cl.8.2.1 Continuous charging at constant voltage (Cells); cl.8.3.1 External short circuit (Cells); cl.8.3.2 External short circuit (Batteries); cl.8.3.3 Free fall (Cells and Batteries); cl.8.3.4 Thermal abuse (Cells); cl.8.3.5 Crush (Cells); cl.8.3.6 Over-charging of battery; cl.8.3.7 Forced discharge (Cells); cl.8.3.8 Transport tests (Cells) cl.8.3.8 Transport tests (Cells) cl.8.3.9 Forced internal short circuit (cells) The electrolyte of the cell used in the battery doesn't belong to polymer; cl.8.3.9 was evaluated according to this standard. Tests are made with the number of cells and batteries specified in IEC 62133: 2012 (Second Edition) Table 2.	**TÜV Rheinland (Shenzhen) Co., Ltd.** East of F/1, F/2~F/4, Building 1, Cybio Technology Building No. 6 Langshan No.2 Road, North Hi-tech Industry Park 518057 Shenzhen Nanshan District CHINA

Summary of compliance with National Differences:

BE, BY, CH, CN, DE, DK, FI, FR, GB, HU, JP, KR, NL, NO, SE, SG.
BE=Belgium, BY=Belarus, CH=Switzerland, CN=China, DE=Germany, DK=Denmark, FI=Finland, FR=France, GB=United Kingdom, HU=Hungary, JP=Japan, KR=Republic of Korea, NL=The Netherlands, NO=Norway, SE=Sweden, SG=Singapore.

☒**The product fulfils the requirements of EN62133: 2013**

Copy of marking plate:



The date code marked on marking label included in S/N no., see below:

1. MMYYGXXXXX
MM =month (01, 02……12)
YY= Year (16, 17……)
G=G (GlobTek)
XXXXX= serial number（00001……..999999）
2. YYYY MM
MM =month (01, 02……12)
YYYY= Year (2016, 2017……)

Test item particulars.....:	
Classification of installation and use.....:	N/A
Supply connection.....:	DC connector
Recommend charging method declared by the manufacturer ..... :	Charging the battery with 140mA constant current and 4.2V constant voltage until the current reduces to 7mA at ambient 20°C±5°C.
Discharge current (0.2 I_t A) ..... :	140mA
Specified final voltage ..... :	3.0V
Chemistry ..... :	☐ nickel systems ..... ☒ lithium systems
Recommend of charging limit for lithium system	
Upper limit charging voltage per cell.....:	4.2V
Maximum charging current.....:	700mA
Charging temperature upper limit.....:	45°C
Charging temperature lower limit.....:	0°C
Polymer cell electrolyte type ..... :	☐ gel polymer ☐ solid polymer ☒ N/A
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	June 29, 2016
Date (s) of performance of tests.....:	June 29, 2016 – August 10, 2016

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☒ **Yes** ☐ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... :	**1. GlobTek (Suzhou) Co., Ltd.** Building 4, No. 76, Jinling East Road, Suzhou Industrial Park, Jiangsu 215021, P.R. China

General product information:

This battery is constructed with single lithium-ion cell (1S1P), and has overcharge, over-discharge, over current and short-circuits proof circuit.

Model different:

The models are identical except the connectors type, see below:

Definition of variable for model BL0750F5030481S1PC*C, the "*" means the connector type, see below.

Variable:	Range of variable:	Content:
*	A, B, C, J, K, L, M, N, P, Q, R, T, U, V, 1, 2, 3, 4, 5, 6, 7, 8, 9	A = Strip + tin, B = Button, C = Contacts, J = 2p JST, K =3p JST, L = 4p JST, M = 2p Molex, N = 3p Molex, P = 4p Molex, Q = 6 contacts Molex, R = Multiple connectors, T= 2p Tyco, U = 3p Tyco, V = 4p Tyco, 1 = 1p connector, 2 =2p connector, 3 = 3p connector, 4 = 4p connector, 5 =5p connector, 6 = 6p connector, 7 = 7p connector, 8 =8p connector, 9 = 9p connector.

The main features of the battery are shown as below (clause 8.1.1):

Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
BL0750F5030481S1PC*C	700mAh	3.7V	140mA	140mA	700mA	1050mA	4.2V	3.0V

The main features of the battery are shown as below (clause 8.1.2):

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
BL0750F5030481S1PC*C	4.2V	35mA	0°C	45°C

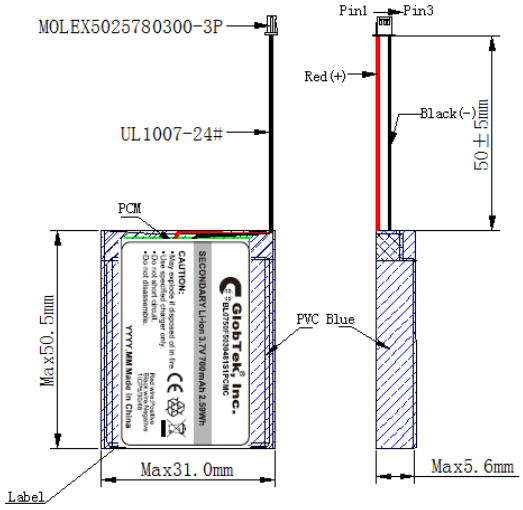
The main features of the cell in the battery are shown as below (clause 8.1.1):

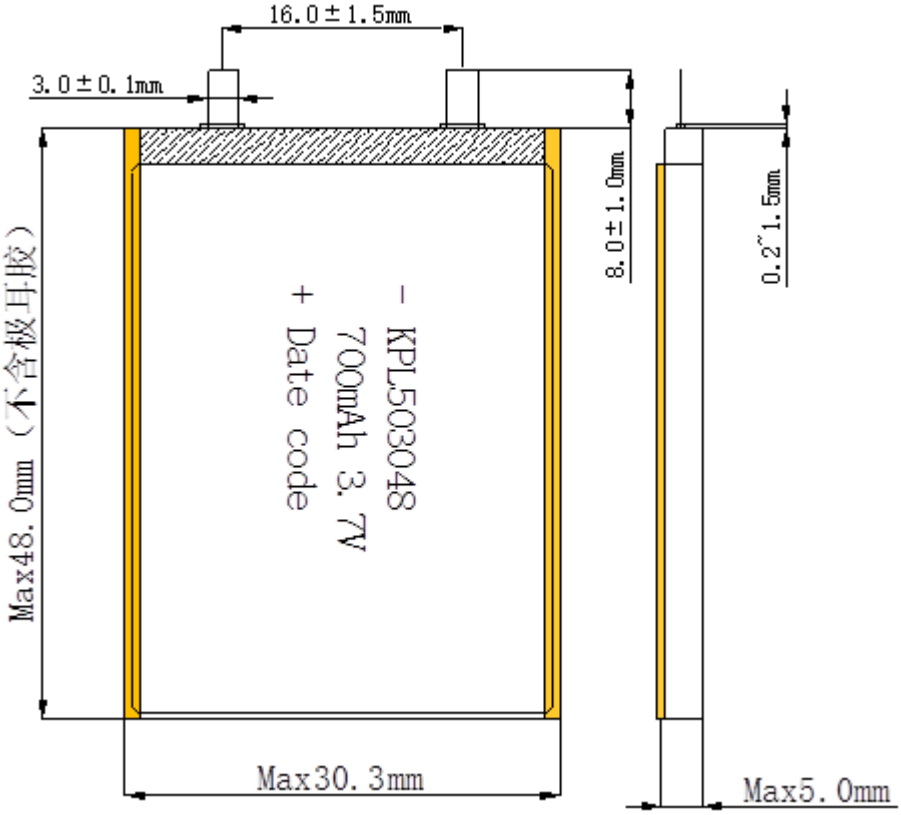
Model	Nominal capacity	Nominal voltage	Nominal Charge Current	Nominal Discharge Current	Maximum Charge Current	Maximum Discharge Current	Maximum Charge Voltage	Cut-off Voltage
GP503048	700mAh	3.7V	140mA	140mA	700mA	1050mA	4.2V	3.0V

The main features of the cell in the battery are shown as below (clause 8.1.2):

Model	Upper limit charge voltage	Taper-off current	Lower charge temperature	Upper charge temperature
GP503048	4.2V	35mA	0°C	45°C

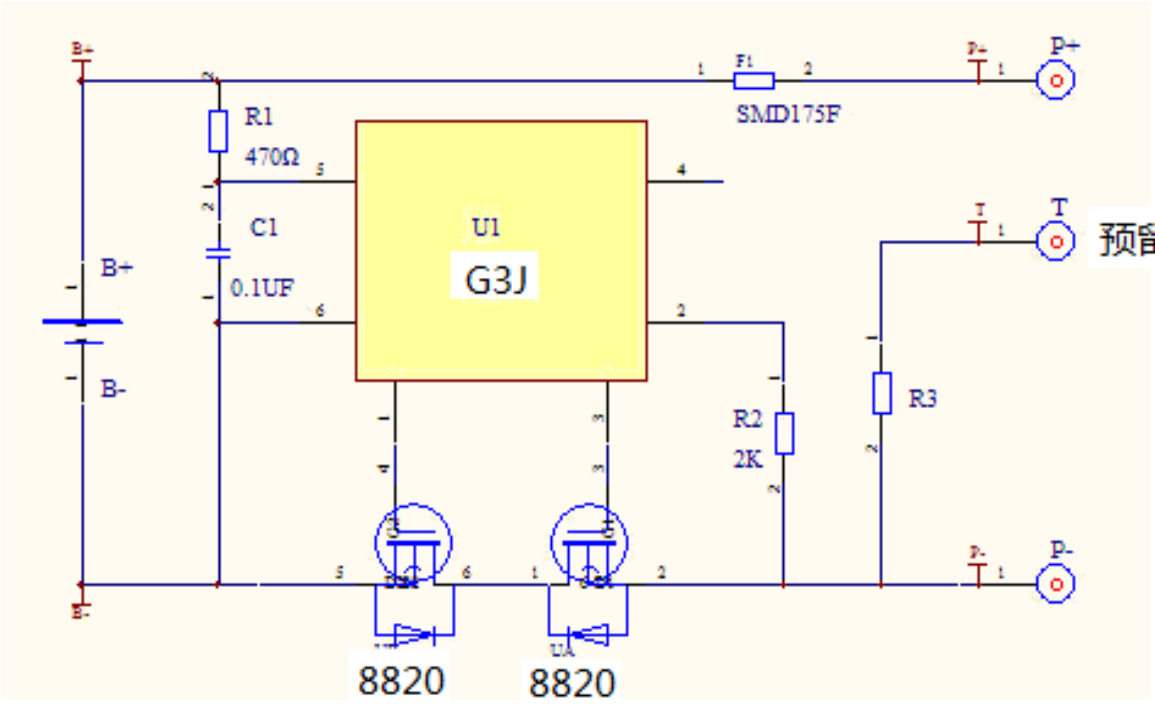
Construction:





Cell and Battery (Unit: mm)

Circuit diagram:



IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
4	**Parameter measurement tolerances**		**P**
	Parameter measurement tolerances		P
5	**General safety considerations**		**P**
5.1	General		P
5.2	Insulation and wiring		P
	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding electrical contact surfaces) is not less than 5 MΩ	No metal case exists.	N/A
	Insulation resistance (MΩ) ..... :		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		P
	Orientation of wiring maintains adequate creepage and clearance distances between conductors		P
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		P
5.3	Venting		P
	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and self-ignition	Venting mechanism exists on narrow side of the pouch cell.	P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		N/A
5.4	Temperature/voltage/current management		P
	Batteries are designed such that abnormal temperature rise conditions are prevented	Overcharge, over discharge, over current and short-circuit proof circuit used in this battery. See tests of clause 8.	P
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer	See above.	P
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that associated chargers are designed to maintain charging within the temperature, voltage and current limits specified	The charging limits specified in the user manual.	P
5.5	Terminal contacts		P

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminals have a clear polarity marking on the external surface of the battery	DC connector used. The design of the external connector prevents reverse polarity connections.	P
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance		P
	Terminal contacts are arranged to minimize the risk of short circuits		P
5.6	Assembly of cells into batteries		P
5.6.1	If there is more than one battery housed in a single battery case, cells used in the assembly of each battery have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer	Single cell battery.	N/A
	Each battery has an independent control and protection		N/A
	Manufacturers of cells make recommendations about current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly		N/A
	Batteries that are designed for the selective discharge of a portion of their series connected cells incorporate separate circuitry to prevent the cell reversal caused by uneven discharges		N/A
	Protective circuit components are added as appropriate and consideration given to the end-device application		N/A
	When testing a battery, the manufacturer of the battery provides a test report confirming the compliance according to this standard		N/A
5.6.2	Design recommendation for lithium systems only		P
	For the battery consisting of a single cell or a single cellblock: - Charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Clause 8.1.2, Table 4; or		N/A
	- Charging voltage of the cell does not exceed the different upper limit of the charging voltage determined through Clause 8.1.2, NOTE 1.	Charging voltage: 4.2V, not exceed 4.2V specified in Clause 8.1.2, Table 4.	P

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - The voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, by monitoring the voltage of every single cell or the single cellblocks; or		N/A
	- The voltages of any one of the single cells or single cellblocks does not exceed the different upper limit of the charging voltage, determined through Clause 8.1.2, NOTE 1, by monitoring the voltage of every single cell or the single cellblocks		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - Charging is stopped when the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks; or		N/A
	- Charging is stopped when the upper limit of the different charging voltage, determined through Clause 8.1.2, NOTE 1, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks		N/A
5.7	Quality plan		P
	The manufacturer prepares and implements a quality plan that defines procedures for the inspection of materials, components, cells and batteries and which covers the whole process of producing each type of cell or battery	Complied. ISO 9001: 2008 certificate provided.	P

6	**Type test conditions**		**P**
	Tests were made with the number of cells or batteries specified in Table 1 for nickel-cadmium and nickel-metal hydride systems and Table 2 for lithium systems, using cells or batteries that are not more than six months old	Complied. Table 2 for Lithium system.	P
	Unless noted otherwise in the test methods, testing was conducted in an ambient of 20°C ± 5°C.	Tests are carried out at 20°C ± 5°C.	P

7	**Specific requirements and tests (nickel systems)**		**N/A**
7.1	Charging procedure for test purposes	Lithium system.	N/A
7.2	Intended use		N/A
7.2.1	Continuous low-rate charging (cells)		N/A
	Results: No fire. No explosion		N/A

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.2	Vibration		N/A
	Results: No fire. No explosion. No leakage	(See Table 7.2.2)	N/A
7.2.3	Moulded case stress at high ambient temperature		N/A
	Oven temperature (°C) ..... :		—
	Results: No physical distortion of the battery casing resulting in exposure if internal components		N/A
7.2.4	Temperature cycling		N/A
	Results: No fire. No explosion. No leakage.		N/A
7.3	Reasonably foreseeable misuse		N/A
7.3.1	Incorrect installation cell		N/A
	The test was carried out using: - Four fully charged cells of the same brand, type, size and age connected in series, with one of them reversed; or		N/A
	- A stabilized dc power supply.		N/A
	Results: No fire. No explosion..... :	(See Table 7.3.1)	N/A
7.3.2	External short circuit		N/A
	The cells or batteries were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		N/A
	Results: No fire. No explosion..... :	(See Table 7.3.2)	N/A
7.3.3	Free fall		N/A
	Results: No fire. No explosion.		N/A
7.3.4	Mechanical shock (crash hazard)		N/A
	Results: No fire. No explosion. No leakage.		N/A
7.3.5	Thermal abuse		N/A
	Oven temperature (°C) ..... :		—
	Results: No fire. No explosion.		N/A
7.3.6	Crushing of cells		N/A
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or		N/A
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
	The cell is prismatic type and a second set of samples was tested, rotated 90° around longitudinal axis compared to the first set		N/A
	Results: No fire. No explosion..... :	(See Table 7.3.6)	N/A
7.3.7	Low pressure		N/A
	Chamber pressure (kPa)..... :		—
	Results: No fire. No explosion. No leakage.		N/A
7.3.8	Overcharge		N/A
	Results: No fire. No explosion..... :	(See Table 7.3.8)	N/A
7.3.9	Forced discharge		N/A
	Results: No fire. No explosion..... :	(See Table 7.3.9)	N/A
8	**Specific requirements and tests (lithium systems)**		**P**
8.1	Charging procedures for test purposes		P
8.1.1	First procedure: This charging procedure applied to tests other than those specified in 8.1.2		P
8.1.2	Second procedure: This charging procedure applied to the tests of 8.3.1, 8.3.2, 8.3.4, 8.3.5, and 8.3.9		P
	If a cell's specified upper and/or lower charging temperature exceeds values for the upper and/or lower limit test temperatures of Table 4, the cells were charged at the specified values plus 5 °C for the upper limit and minus 5 °C for the lower limit	Charge temperature range 0-45°C declared. 45°C used for upper limit tests; -5°C used for lower limit tests.	P
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1) ..... :		P
	For a different upper limit charging voltage (i.e. other than for lithium cobalt oxide systems at 4,25 V), the applied upper limit charging voltage and upper limit charging temperatures were adjusted accordingly	The upper limit charging voltage: 4.2V	P
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1) ..... :		P
8.2	Intended use		P
8.2.1	Continuous charging at constant voltage (cells)	Tested complied.	P
	Results: No fire. No explosion..... :	(See Table 8.2.1)	P
8.2.2	Moulded case stress at high ambient temperature (battery)	No moulded case exists.	N/A
	Oven temperature (°C)..... :		—

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
	Results: No physical distortion of the battery casing resulting in exposure of internal components		N/A
8.3	Reasonably foreseeable misuse		P
8.3.1	External short circuit (cell)		P
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		P
	Results: No fire. No explosion..... :	(See Table 8.3.1)	P
8.3.2	External short circuit (battery)		P
	The batteries were tested until one of the following occurred: - 24 hours elapsed; or		P
	- The case temperature declined by 20% of the maximum temperature rise		N/A
	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		N/A
	Results: No fire. No explosion..... :	(See Table 8.3.2)	P
8.3.3	Free fall		P
	Results: No fire. No explosion.	No fire. No explosion.	P
8.3.4	Thermal abuse (cells)		P
	The cells were held at 130°C ± 2°C for: - 10 minutes; or	Tested complied.	P
	- 30 minutes for large cells (gross mass of more than 500 g as defined in IEC 62281)		N/A
	Oven temperature (°C)..... :	130°C	—
	Gross mass of cell (g) ..... :	<500g, small cell.	—
	Results: No fire. No explosion.	No fire. No explosion.	P
8.3.5	Crush (cells)		P
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or	Tested complied.	P
	- An abrupt voltage drop of one-third of the original voltage has been obtained; or		N/A
	- 10% of deformation has occurred compared to the initial dimension		N/A
	Results: No fire. No explosion..... :	(See Table 8.3.5)	P

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	Over-charging of battery		P
	Test was continued until the temperature of the outer casing: - Reached steady state conditions (less than 10°C change in 30-minute period); or		N/A
	- Returned to ambient		P
	Results: No fire. No explosion..... :	(See Table 8.3.6)	P
8.3.7	Forced discharge (cells)		P
	Results: No fire. No explosion..... :	(See Table 8.3.7)	P
8.3.8	Transport tests	Tested complied.	P
	Manufacturer's documentation provided to show compliance with UN Recommendations on Transport of Dangerous Goods		P
8.3.9	Design evaluation – Forced internal short circuit (cells)		P
	The cells complied with national requirement for ..... :		—
	The pressing was stopped upon: - A voltage drop of 50 mV has been detected; or		P
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached		P
	Results: No fire ..... :	(See Table 8.3.9)	P
9	**Information for safety**		**P**
	The manufacturer of secondary cells ensures that information is provided about current, voltage and temperature limits of their products.	Information for safety mentioned in manufacturer's specifications.	P
	The manufacturer of batteries ensures that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards.	Information for safety mentioned in manufacturer's specifications.	P
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		N/A
	As appropriate, information relating to hazard avoidance resulting from a system analysis is provided to the end user ..... :		N/A
10	**Marking**		**P**
10.1	Cell marking		N/A
	Cells marked as specified in the applicable cell standards: IEC 61951-1, IEC 61951-2 or IEC 61960.	The final product is battery.	N/A

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
10.2	Battery marking		P
	Batteries marked in accordance with the requirements for the cells from which they are assembled.	The battery is marked in accordance with IEC 61960, also see page 4.	P
	Batteries marked with an appropriate caution statement.		P
10.3	Other information		P
	Storage and disposal instructions marked on or supplied with the battery.		N/A
	Recommended charging instructions marked on or supplied with the battery.	Information for recommended charging instructions mentioned in manufacturer's specifications.	P
11	**Packaging**		**P**
	The materials and packaging design are chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants.		P
Annex A	**Charging range of secondary lithium ion cells for safe use**		**P**
A.1	General		P
A.2	Safety of lithium-ion secondary battery	Complied.	P
A.3	Consideration on charging voltage	Complied.	P
A.3.1	General		P
A.3.2	Upper limit charging voltage		P
A.3.2.1	General	4.2V specified by client.	P
A.3.2.2	Explanation of safety viewpoint		P
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied	4.25V applied.	P
A.4	Consideration of temperature and charging current		P
A.4.1	General		P
A.4.2	Recommended temperature range	See A.4.2.2.	P
A.4.2.1	General		P
A.4.2.2	Safety consideration when a different recommended temperature range is applied	Charging temperature range declared by client is: 0-45°C	P
A.4.3	High temperature range	Charging high temperature declared by client is: 45°C.	P
A.4.3.1	General		N/A

IEC 62133: 2012			
Clause	Requirement + Test	Result - Remark	Verdict
A.4.3.2	Explanation of safety viewpoint		N/A
A.4.3.3	Safety considerations when specifying charging conditions in high temperature range		N/A
A.4.3.4	Safety consideration when specifying new upper limit in high temperature range		N/A
A.4.4	Low temperature range	Low temperature declared by client is 0°C	P
A.4.4.1	General		P
A.4.4.2	Explanation of safety viewpoint		P
A.4.4.3	Safety considerations, when specifying charging conditions in low temperature range		P
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range	-5°C applied.	N/A
A.4.5	Scope of the application of charging current		P
A.5	Sample preparation		P
A.5.1	General		P
A.5.2	Insertion procedure for nickel particle to generate internal short		P
	The insertion procedure carried out at 20°C±5°C and under -25 °C of dew point		P
A.5.3	Disassembly of charged cell		P
A.5.4	Shape of nickel particle		P
A.5.5	Insertion of nickel particle to cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle to winding core		N/A
A.5.5.2	Mark the position of nickel particle on the both end of winding core of the separator		N/A
A.5.6	Insertion of nickel particle to prismatic cell		P

	TABLE: Critical components information				P
Object/part no.	**Manufacturer/ trademark**	**Type/model**	**Technical data**	**Standard**	**Mark(s) of conformity 1)**
Cell		GP503048	3.7V, 700mAh	IEC62133: 2012	Tested with appliance
- Positive electrode		124μm	$LiCoO_2$, PVDF, NMP, Conductive Additive, Aluminum Foil	--	--
- Negative electrode		137μm	Graphite, CMC, SBR, H_2O, Conductive Additive, Copper Foil	--	--
- Separator	Senior	16μm	Thickness: 16μm, Nylon, PP, shutdown temperature: 128-135°C	--	--
- Electrolyte	Guangzhou Tinci Materials Technology Co., Ltd	TC-2011	DMC, EC, PC, EMC	--	--
- Aluminium plastic film	SHOWA DENKO K.K	0.113mm	113±10%um	--	--
IC(U1)	SII	G3J	VCU=4.28±0.025V, VDL=3.0±0.05V	--	Tested with appliance
MOSFET (U2)	FORTUNE	FS8820P	VDS=20V, ID=6.5A	--	Tested with appliance
PCB	Interchangeable	Interchangeable	V-0, Min. 130ºC	UL 796	UL approved
Lead wire	Interchangeable	Interchangeable	Min. 24AWG, 80ºC, Min. 300V, VW-1	UL 758	UL approved
Tape inside	Interchangeable	Interchangeable	Min. 130ºC	UL 510	UL approved
Connector	Interchangeable	Interchangeable	Min. V-2	UL 94	UL approved
PTC	Tyco Electronics Corp	microSMD175 (17)	6Vdc, Hold Current=1.75 (A), I_T=3.5(A), At 25 ºC.	UL 1434	UL approved

Supplementary information:

1) Provided evidence ensures the agreed level of compliance.

7.2.1	TABLE: Continuous low rate charge (cells)				N/A
Model	**Recommended charging method, (CC, CV, or CC/CV)**	**Recommended charging voltage V_c, (Vdc)**	**Recommended charging current I_{rec}, (A)**	**OCV at start of test, (Vdc)**	**Results**

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

7.2.2	TABLE: Vibration		N/A
Model	**OCV at start of test, (Vdc)**	**Results**	

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

7.3.1	TABLE: Incorrect installation (cells)		N/A
Model	**OCV of reversed cell, (Vdc)**	**Results**	

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

7.3.2	TABLE: External short circuit				N/A
Model	**Ambient (at 20°C ± 5ºC or 55°C ± 5°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature rise ΔT, (°C)**	**Results**

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

7.3.6	TABLE: Crush		N/A
Model	**OCV at start of test, (Vdc)**	**OCV at removal of crushing force, (Vdc)**	**Results**

Supplementary information: - No fire or explosion - No leakage - Leakage - Fire - Explosion - Bulge - Others (please explain)

7.3.8	**TABLE: Overcharge**			**N/A**
Model	**OCV prior to charging, (Vdc)**	**Maximum charge current, (A)**	**Time for charging, (hours)**	**Results**
Supplementary information: - No fire or explosion - No leakage - Leakage - Fire - Explosion - Bulge - Others (please explain)				

7.3.9	**TABLE: Forced discharge (cells)**			**N/A**
Model	**OCV before application of reverse charge, (Vdc)**	**Measured reverse charge I_t, (A)**	**Time for reversed charge, (minutes)**	**Results**
Supplementary information: - No fire or explosion - No leakage - Leakage - Fire - Explosion - Bulge - Others (please explain)				

8.2.1	TABLE: Continuous charging at constant voltage (cells)			P
Model	**Recommended charging voltage V_c, (Vdc)**	**Recommended charging current I_{rec}, (mA)**	**OCV at start of test, (Vdc)**	**Results**
Cell #61	4.2	140	4.17	P
Cell #62	4.2	140	4.18	P
Cell #63	4.2	140	4.16	P
Cell #64	4.2	140	4.17	P
Cell #65	4.2	140	4.19	P
Supplementary information: - No fire or explosion - No leakage				

8.3.1	TABLE: External short circuit (cell)				P
Model	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature ~~rise ΔT~~, (°C)**	**Results**
Samples charged at charging temperature upper limit (45°C)					
Cell #1	23.7	4.17	0.089	96.7	P
Cell #2	23.7	4.18	0.074	97.0	P
Cell #3	23.7	4.17	0.090	106.8	P
Cell #4	23.7	4.17	0.091	112.6	P
Cell #5	23.7	4.17	0.078	107.7	P
Samples charged at charging temperature lower limit (-5°C)					
Cell #6	24.4	4.17	0.081	90.7	P
Cell #7	24.4	4.17	0.086	101.8	P
Cell #8	24.4	4.16	0.080	106.9	P
Cell #9	24.4	4.18	0.091	94.7	P
Cell #10	24.4	4.18	0.078	96.7	P
Supplementary information: - No fire or explosion					

8.3.2	TABLE: External short circuit (battery)				P
Model	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature rise ΔT, ~~(°C)~~**	**Results**
Samples charged at charging temperature upper limit (45°C)					
Battery #1	55.3	4.17	0.079	2.0	P
Battery #2	55.3	4.18	0.082	2.7	P
Battery #3	55.3	4.18	0.079	1.9	P
Battery #4	55.3	4.16	0.069	1.7	P
Battery #5	55.3	4.17	0.091	1.9	P
Samples charged at charging temperature lower limit (-5°C)					
Battery #6	55.3	4.18	0.090	0.2	P
Battery #7	55.3	4.17	0.090	0.5	P
Battery #8	55.3	4.18	0.087	0.3	P
Battery #9	55.3	4.17	0.076	0.9	P
Battery #10	55.3	4.18	0.091	1.1	P
Supplementary information: - No fire or explosion					

8.3.5	TABLE: Crush				P
Model	**OCV at start of test, (Vdc)**	**OCV at removal of crushing force, (Vdc)**	**Width/ diameter of cell before crush, (mm)**	**Required deformation for crush, (mm)**	**Results**
Samples charged at charging temperature upper limit (45°C)					
Cell #11	4.18	4.16	--	--	P
Cell #12	4.16	4.16	--	--	P
Cell #13	4.17	4.17	--	--	P
Cell #14	4.18	4.17	--	--	P
Cell #15	4.19	4.19	--	--	P
Note: **A 13kN force applied at the wide side of prismatic cells.** **No voltage abrupt drop occurred.** **Supplementary information:** - No fire or explosion					

8.3.6	TABLE: Over-charging of battery			P
Constant charging current (A).....:		1.4		—
Supply voltage (Vdc).....:		5.0		—

Model	OCV before charging, (Vdc)	Resistance of circuit, (mΩ)	Maximum outer casing temperature, (°C)	Results
Battery #11	3.26	0.09	32.1	P
Battery #12	3.27	0.09	33.2	P
Battery #13	3.25	0.09	30.8	P
Battery #14	3.26	0.09	35.1	P
Battery #15	3.27	0.09	30.4	P

Supplementary information:

- No fire or explosion

8.3.7	TABLE: Forced discharge (cells)			P

Model	OCV before application of reverse charge, (Vdc)	Measured Reverse charge I_t, (mA)	Time for reversed charge, (minutes)	Results
Cell #16	3.24	700	90	P
Cell #17	3.25	700	90	P
Cell #18	3.27	700	90	P
Cell #19	3.26	700	90	P
Cell #20	3.25	700	90	P

Supplementary information:

- No fire or explosion

8.3.8 T-5	TABLE: External short circuit (cell)				P
Model	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature ~~rise ΔT~~, (°C)**	**Results**
Cell #21	55.3	4.17	0.090	103.2	P
Cell #22	55.3	4.17	0.090	115.1	P
Cell #23	55.3	4.16	0.090	112.0	P
Cell #24	55.3	4.16	0.090	114.4	P
Cell #25	55.3	4.18	0.090	113.8	P
Cell #26	55.3	4.17	0.090	105.7	P
Cell #27	55.3	4.17	0.090	112.4	P
Cell #28	55.3	4.16	0.090	110.3	P
Cell #29	55.3	4.17	0.090	108.1	P
Cell #30	55.3	4.18	0.090	110.0	P

Supplementary information:

The external short-circuit test of 10 pcs samples performed after the test of Altitude, Thermal cycling, Vibration and Shock in sequence.

-No excessive temperature rise, no rupture, no explosion and no fire.

8.3.9	TABLE: Forced internal short circuit (cells)					P
Model	**Chamber ambient, (°C)**	**OCV at start of test, (Vdc)**	**Particle location [1)]**	**Maximum applied pressure, (N)**	**Voltage drop, (mV)**	**Results**
Cell #49	10	4.044	1	406.5	0.3	P
Cell #50	10	4.035	1	407.4	2.9	P
Cell #51	10	4.043	1	407.2	3.5	P
Cell #52	10	4.033	2	406.6	4.1	P
Cell #53	10	4.040	2	156.6	101.9	P
Cell #54	45	4.080	1	404.9	2.9	P
Cell #55	45	4.099	1	404.6	0.3	P
Cell #56	45	4.086	1	405.0	1.0	P
Cell #57	45	4.091	2	404.1	0.3	P
Cell #58	45	4.084	2	405.7	0.3	P

Supplementary information:

[1)] Identify one of the following:

1: Nickel particle inserted between positive and negative (active material) coated area.

2: Nickel particle inserted between positive aluminium foil and negative active material coated area.

- No fire

-- End of Report --

Product: Li-ion Polymer Battery

Type Designation: BL0750F5030481S1PC*C (*=A, B, C, J, K, L, M, N, P, Q, R, T, U, V, 1, 2, 3, 4, 5, 6, 7, 8, 9)

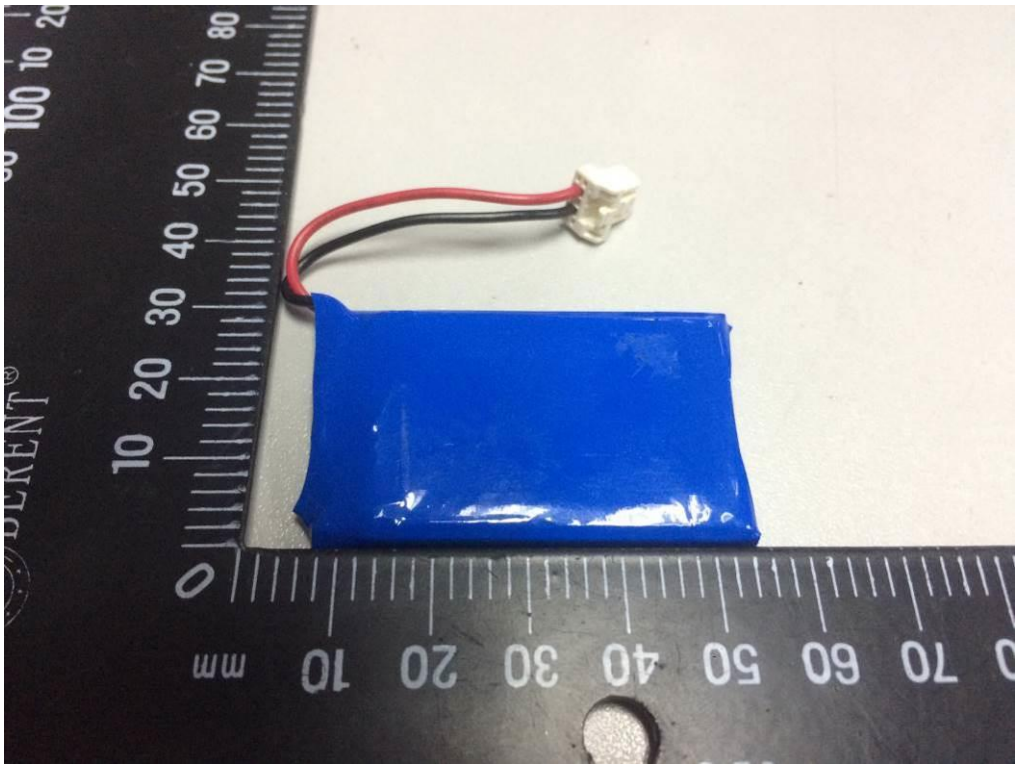


Figure 1 Front view of battery

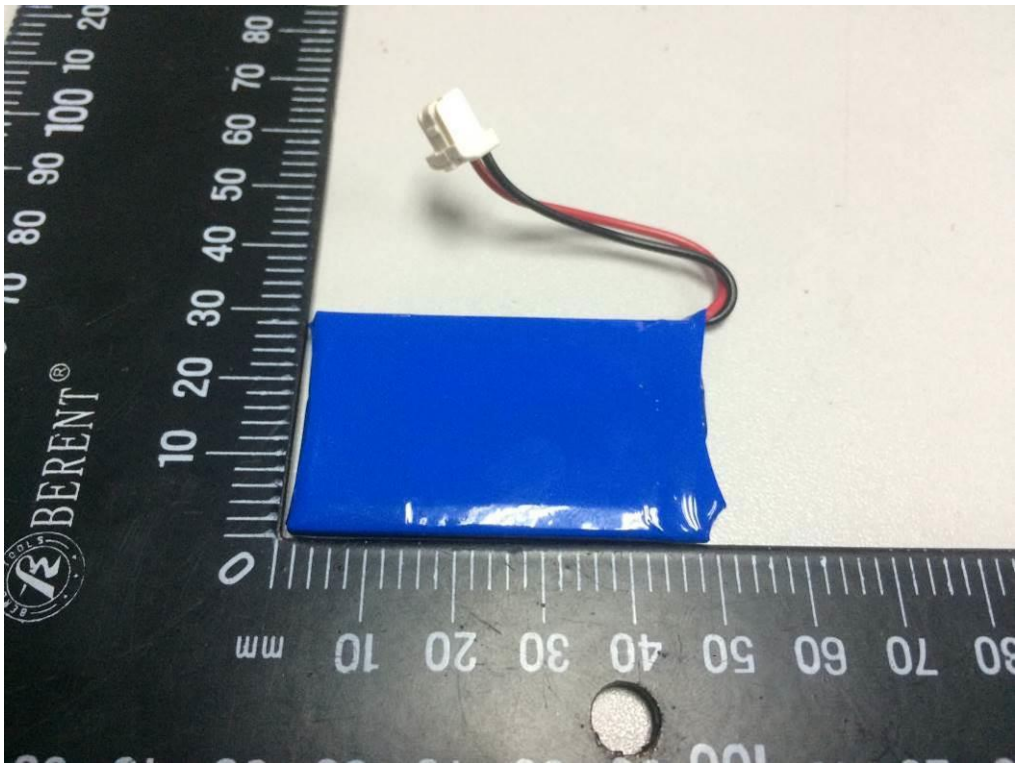


Figure 2 Back view of battery

Product: Li-ion Polymer Battery

Type Designation: BL0750F5030481S1PC*C (*=A, B, C, J, K, L, M, N, P, Q, R, T, U, V, 1, 2, 3, 4, 5, 6, 7, 8, 9)

Figure 3 Internal view of battery -1

Figure 4 Internal view of battery -2

Product: Li-ion Polymer Battery

Type Designation: BL0750F5030481S1PC*C (*=A, B, C, J, K, L, M, N, P, Q, R, T, U, V, 1, 2, 3, 4, 5, 6, 7, 8, 9)

Figure 5 Component view of PCM

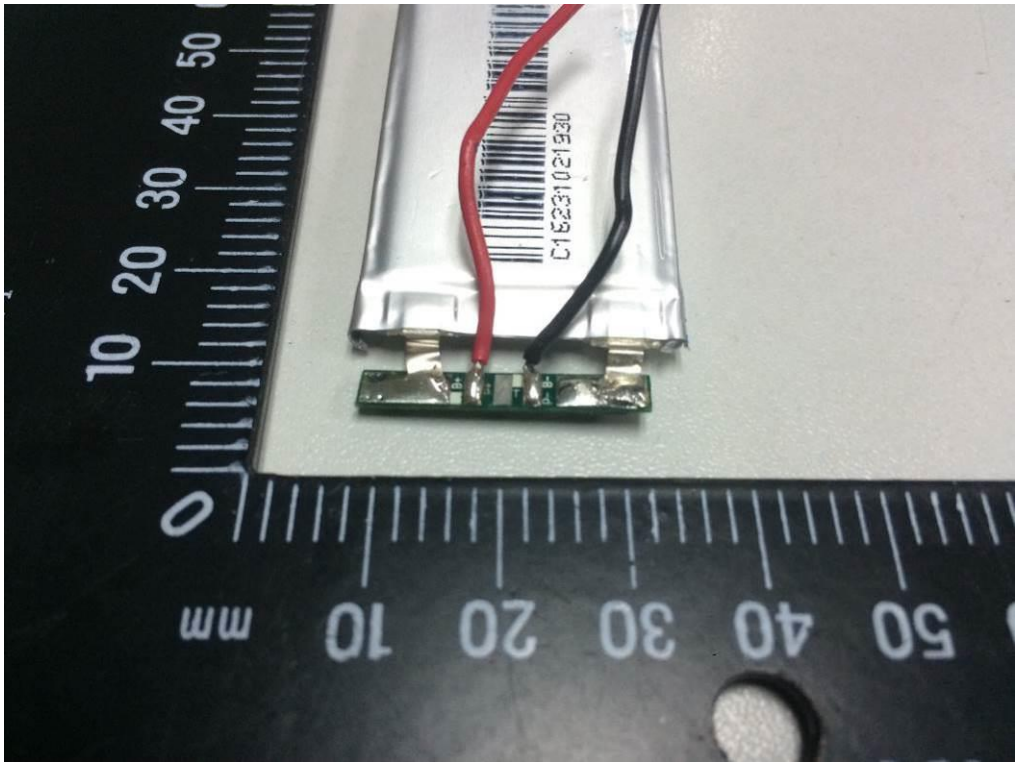


Figure 6 Trace view of PCM

Product: Li-ion Polymer Battery

Type Designation: BL0750F5030481S1PC*C (*=A, B, C, J, K, L, M, N, P, Q, R, T, U, V, 1, 2, 3, 4, 5, 6, 7, 8, 9)

Figure 7 Front view of cell

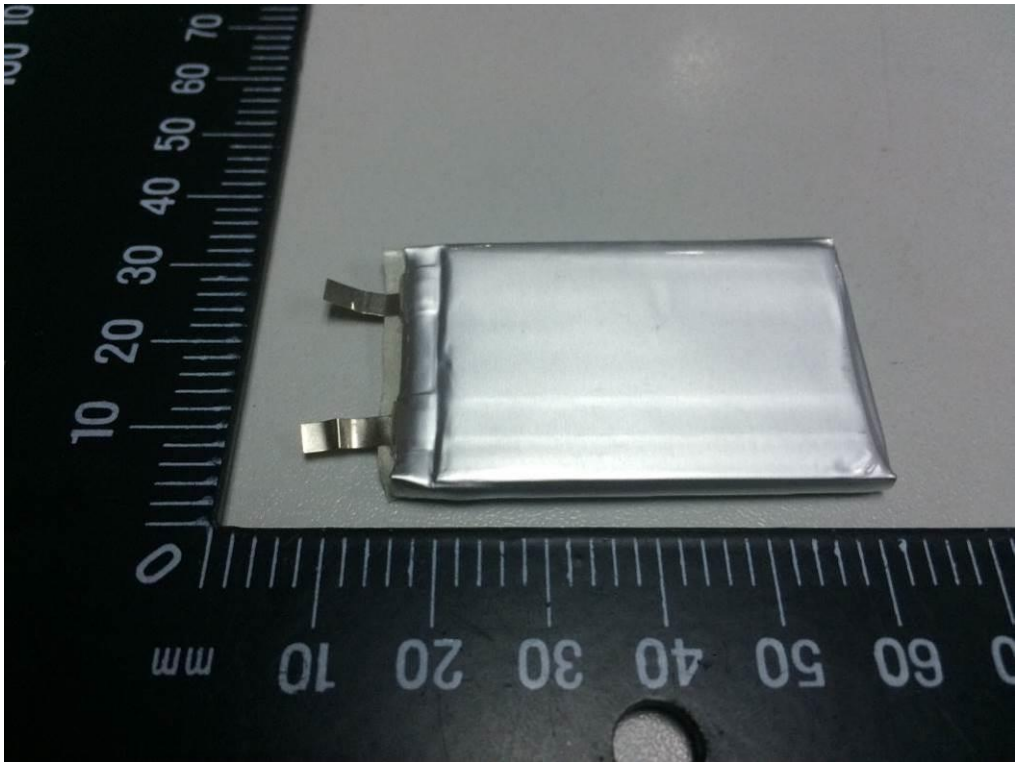


Figure 8 Rear view of cell