File MH62737
Project 4788366853

April 26, 2018

REPORT

On

Component - Batteries, Household and Commercial - Component (BBFS2)

GLOBTEK (HONG KONG) LTD

Hong Kong

DESCRIPTION

PRODUCT COVERED:

USR - Lithium-Ion Battery Pack, Model(s): BL2600C18650H3S1PGQG

ELECTRICAL RATING:

Model	Voltage (Nominal), Vdc	Capacity (Nominal), Ah/Wh
BL2600C18650H3S1PGQG	11.1	2.6/28.86
Note: The packs have been tested based upon their electrical ratings but no capacity performance testing has been conducted. In addition, no testing with a host product including a charger has been conducted.		

CELL CHEMISTRY AND CONFIGURATION:

Pack Model	Cell Model	Cell Chemistry and Type#	Number of Cells	Configuration*: X-S/Y-P
BL2600C18650H3S1PGQG	US18650VTC5A	Lithium-ion, Cylindrical	3	3-S/1-P
* - X = No. of cells in series; Y = Number of parallel strings # - e.g. lithium ion cylindrical, lithium ion prismatic, lithium ion polymer (soft pouch), Ni-Cad prismatic, etc.				

MANUFACTURER'S RECOMMENDED CHARGING PARAMETERS:

Model	Standard Charging Current, A	Standard Charging Voltage, Vdc	Maximum Charging Current, A	Maximum Charging Voltage, Vdc
BL2600C18650H3S1PGQG	0.52	12.6	1.0	12.6

GENERAL CONSTRUCTION:

See Section General for general construction details employed on these products.

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

Products indicated as USR have been investigated using requirements contained in the Second Edition of UL 2054, Standard for Household and Commercial Batteries, issue dated October 29, 2004 and contains revisions through and including September 14, 2011.

Condition of Acceptability - When installed in the end product, consideration shall be given to the following:

1. These battery packs have been evaluated based upon manufacturers specifications for charging, discharging and temperature limits. They have not been evaluated in combination with charger(s) or host product(s). Additional evaluation to determine that the compatibility of the host with the battery pack and the charger with the battery pack will needed to ensure that the battery pack is not used outside of its rated limits.

2. The battery pack was subjected to the Abnormal Charging test of UL 2054 which is a high rate charging test for 7 hours minimum based upon the parameters noted in the table below, with acceptable results. The end product evaluation shall determine that the maximum current and the maximum voltage limit noted below are not exceeded under any single fault conditions of the charging circuit.

Abnormal Charging Test Values		
Battery Pack Model	Maximum Abnormal Charging Current, A	Maximum Abnormal Charging Voltage Limit, V
BL2600C18650H3S1PGQG	3.0	12.6

The battery pack was also subjected to the Abusive Overcharge test of UL 2054 with acceptable results. The abusive overcharge test consisted of charging the pack at a constant current charge rate until ultimate results, based upon the parameters noted in the table below.

Abusive Overcharge Test Values		
Battery Pack Model	10 x C5 constant current (CC) charge rate, A	5 x C5 constant current charge rate, A
BL2600C18650H3S1PGQG	5.2	2.6

The need to conduct additional abnormal/abusive charge testing in the end use application shall be determined.

3. The battery pack has been subjected to a short circuit test at both ambient (20 ± 5°C) and 55 ± 2°C, with a resistance load in the range of 80 ± 20 mΩ. The need to conduct additional abnormal discharge testing shall be determined in the end use application.

4. The output of the battery pack has been determined to be a non-limited power source in accordance with the Second Edition of UL 2054. For non-limited power sources, the need for additional protective circuitry and an appropriate fire enclosure for the end product, which is supplied by the battery pack, shall be determined in the end product evaluation.

5. The battery packs have been subjected to temperature testing under maximum load charging and discharging conditions and for use in a maximum ambient as noted below. If used in an ambient in excess of the maximum values noted, additional evaluation may be necessary.

Model	Temperature test charge conditions	Temperature test discharge conditions
BL2600C18650H3S1PGQG	12.6V, 1.0 A	Load 6A

Model	Ambient Use Temperatures, C
BL2600C18650H3S1PGQG	Charge: **0** to 60 degree C; Discharge: -20 to 60 degree C.

6. A temperature test with the battery pack in the end use installation shall be conducted under both maximum charging and discharging conditions. During the temperature test, the following temperature limits on temperature sensitive components shall not be exceeded:

Component	Model No.	Temperature Limits, °C
Cell	US18650VTC5A	100
PWB	Various	105

7. The battery pack did not provide a fire enclosure. A fire enclosure to protect cells and internal circuitry and prevent user access under all conditions of use shall be provided in the end use application.

8. The battery pack does not employ a protective a mechanical enclosure in accordance with the requirements of UL 2054. A mechanical enclosure to protect cells and internal circuitry and prevent user access under all conditions of use shall be provided in the end use application.

9. The end use application shall consider the need for the following markings and instructions or equivalent for the safe use of the battery pack:

Marking:

"Replace battery with (battery Recognized Company or end product manufacturer's name, part number) only. Use of another battery may present a risk of fire or explosion."

or "See Operating or maintenance Instructions for type of battery to be used" or equivalent with instructions for replacement of the correct battery pack provided.

or A symbol indicating the need to refer to the instruction manual may be used instead of the text noted above.

Instructions:

a. A warning notice with the following or equivalent:

"Caution – The battery used in this device may present a risk of fire or chemical burn if mistreated. Do no disassemble, heat above (manufacturer's maximum temperature limit), or incinerate. Replace battery with (battery manufacturer's name or end product manufacturer's name and part number) only. Use of another battery may present a risk of fire or explosion."

b. Complete instructions as to how to replace the battery including the following or equivalent statement:

"Dispose of used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire."

MARKINGS/INSTRUCTIONS:

All markings shall be legible and permanent such as ink stamped, etched, adhesive labels, etc. All adhesive labels shall be R/C (PGDQ2) component marking and labeling systems or printed on R/C (PGJI2) Component Printing Materials.

Nameplate Marking – The Recognized Company, trade name, trademark or other descriptive marking, catalog or model number, electrical rating, and Recognition Marking.

The manufacturer's date code is as follows: YYYYMM

YYYY: “YYYY” represent manufacture year;
MM: “MM” represent manufacture month.

Example: 201709 represent that the battery is manufactured on Sep., 2017.

Factory Location Marking - See Section General for manufacturing location marking.

Cautionary Markings/Instructions - Each 1)battery pack; or 2)the smallest unit package, must be marked with; or 3)instructions provided with each battery, must include the following statements or equivalent:

a. An attention word such as "CAUTION", “WARNING”, or “DANGER”, and a brief description of possible hazards associated with mishandling of the battery pack such as burn hazard, fire hazard, explosion hazard, and
b. A list of actions to take to avoid possible hazards, such as do not crush, disassemble, dispose of in fire, or similar actions.

A lithium ion battery pack shall be marked with the following or equivalent: “CAUTION: Risk of Fire and Burns. Do Not Open, Crush, Heat Above (manufacturer’s specified maximum temperature) or Incinerate. Follow Manufacturer’s Instructions.” This wording or equivalent shall also be included in the instructions packaged with the battery pack.

Charging Marking/Instructions - Recommended charging information is optionally provided on the product, its smallest packaging unit, or the instructions provided with each battery pack, because the product is to be built-in installed/assembled in end product factories and not accessible by general users for charging or carrying as a spare part.

Lithium-Ion Battery Pack, Model: BL2600C18650H3S1PGQG, views of overall battery constructions, see Figs. 1 thru 8 and Ill.1 thru 2.

1. Cell(s) – See tables and information below:

Battery Pack Model	Cell Manufacturer	Cell Model	R/C Cells, Y or N*	File Reference,	
BL2600C18650H3S1PGQG	Tohoku Murata Manufacturing Co., Ltd.	US18650VTC5A	Y	MH12566	2012-11-29
Note: See Cell Chemistry and Configuration Table at beginning of report for information on type of cells, number of cells and their configuration in the battery pack circuit.					

Cells are located within the pack in a manner that would not result in blocking of vents in the event of cell venting. Cells are secured in their enclosure and prevented from movement that would cause damage to connections and short circuit of parts by:

Pack Model No.	Description	Cell Layout Ills. No.
BL2600C18650H3S1PGQG	Wrapped by PVC and Insulation Sheet.	Fig.1~3

Connections to cell terminals are constructed as noted below:

Pack Model No.	Description	Ills. No. or description
BL2600C18650H3S1PGQG	Connected by metal tabs	Fig.4

2. Battery Pack Enclosure/Case – See Table Below:

Battery Pack Model	Overall Dimensions, L x W x H, mm	Minimum thick-ness, mm	Enclosure Material Manufacturer	Enclosure Material Designation	Enclosure material flame rating at Minimum Thickness*
BL2600C18650H3S1PGQG	Ill.1	--	--	--	--
* - V-0, V-1, or compliant with UL746C/UL 60950-1 20 mm Flame Test					

The battery pack does not employ a rigid enclosure, and is only wrapped by a PVC film.

3. Protective Circuitry – Consists of the following Components:

Battery Pack Model No.	Type of Protective Component	Location of Component Within Pack	Component Manufacturer	Component Part No.	Component Ratings
BL2600C18650H3S1PGQG	Fuse	Connected by metal tabs	LITTELFUSE INC (E10480)	LF 10A(451 series)	10A, 125V
	Protection IC (U1)	PWB	TI	BQ40Z50-R2	--
	MOSFET (Q2~Q3)	PWB	AOS	AO4430A	--
	SENSE Resistor (RS1)	PWB	Interchangeable	Interchangeable	10mΩ, 2512□±1%

See the following illustrations for details of protective circuitry:

Battery Pack Model Number	Illustration Number
BL2600C18650H3S1PGQG	Ill.2

4. External Connector – R/C (ECBT2 or RTRT2), in low voltage secondary circuitry (SELV), or copper alloy pins housed in bodies of (QMFZ2) plastic rated minimum V-2 and minimum 80°C.

Inadvertent shorting of connector prevented by the following:

Battery Pack Model Number	Description of Mechanism to Prevent Inadvertent Short Circuiting of Connector Terminals
BL2600C18650H3S1PGQG	R/C connector with recess construction has been used.

5. Printed Circuit Board - R/C (ZPMV2), Min. V-1, 105 degree C.

6. Output wiring – R/C (AVLV2), routed away from sharp edges, rated minimum 80 degree C, minimum 30 V, minimum 22 AWG, insulated with FEP, PTFE, PVC, TFE, neoprene, or polyimide, or surface marked VW-1 or FT-1.

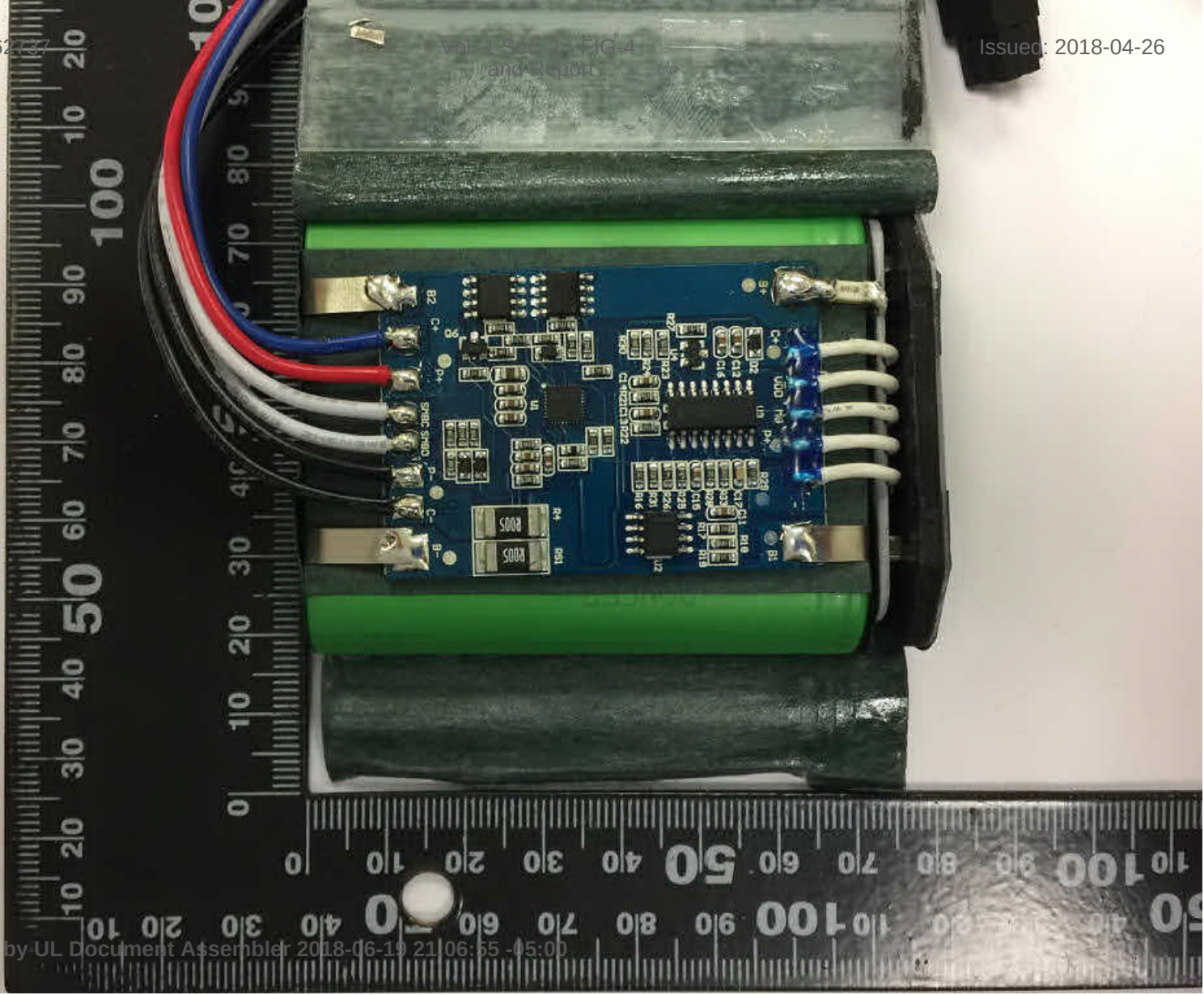
7. Internal Plastic Part Materials – (QMFZ2 or QMTS2), located between cell and other parts, Min. V-2 or HF-2. Except for less than or equal to 2 cm3.

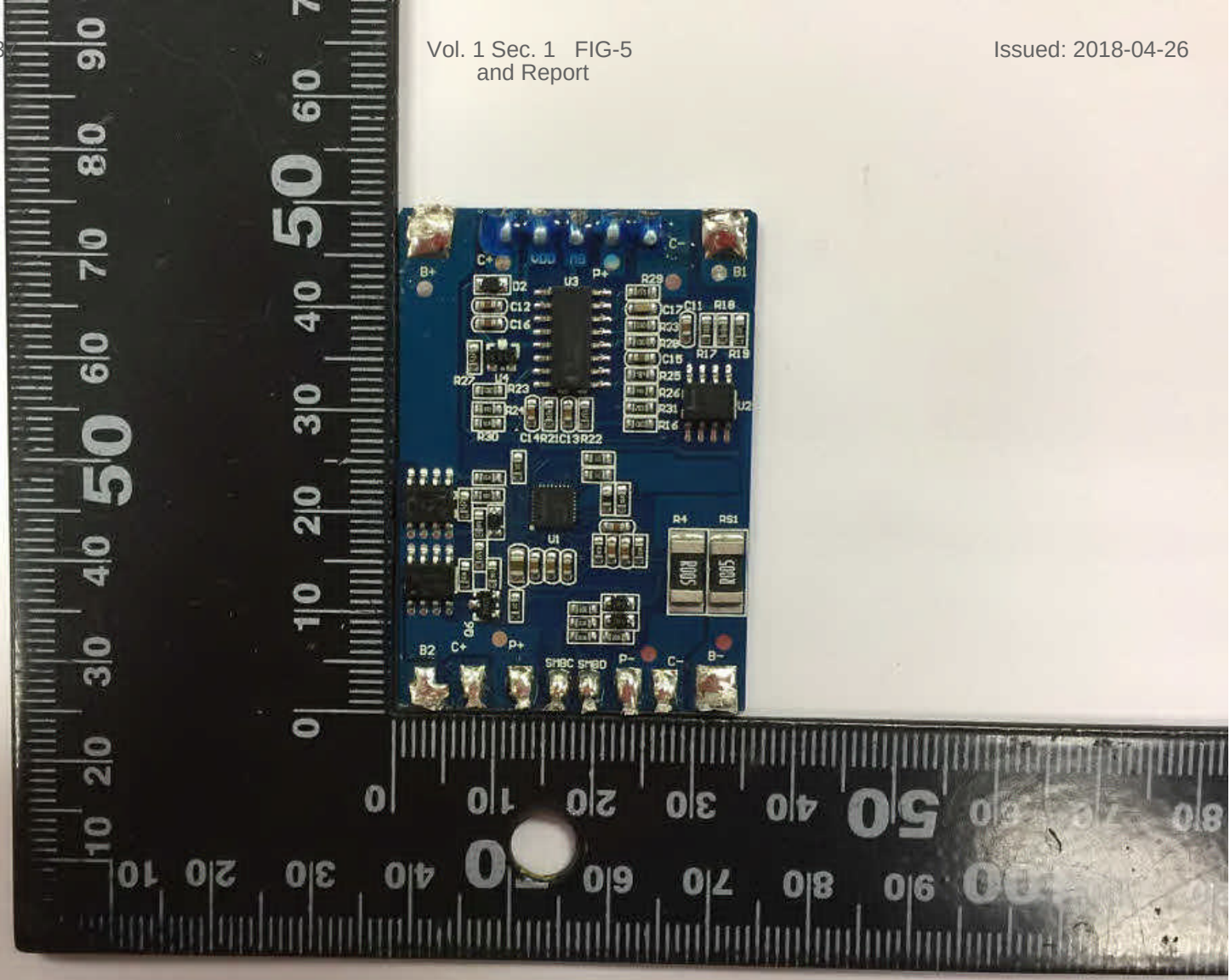
8. Sponge – R/C (QMFZ2 or OANZ2), located between cell and other parts, minimum 105 degree C or designated “Flame Retardant”. Except for less than or equal to 2 cm3.

9. Heat Shrinkable PVC - R/C (YDQS2 or YDPU2), marked minimum VW-1 or FT-1, 80 deg C.


GlobTek, Inc.®
www.globtek.com
Lithium-Ion Battery Pack with
Fuel Gauge and Charger
Part Number:BL2600G18650H3S1PGQG
Voltage:11.1Volts Capacity:2600mAh
Watt Hours:28.86
CAUTION:
May explode if disposed of in fire
Use specified charger only
Do not short circuit
Pin1=Input voltage 16V-20VDC
Pin2=Battery Output Voltage
Pin3,6=DC common for DC
Pin4=SCL(clock data)
Pin5=SDL(data line)
MADE IN CHINA
RoHS 2
201709


GlobTek, Inc.
MADE IN CHINA
RoHS 2
CAUTION!




B+
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C13
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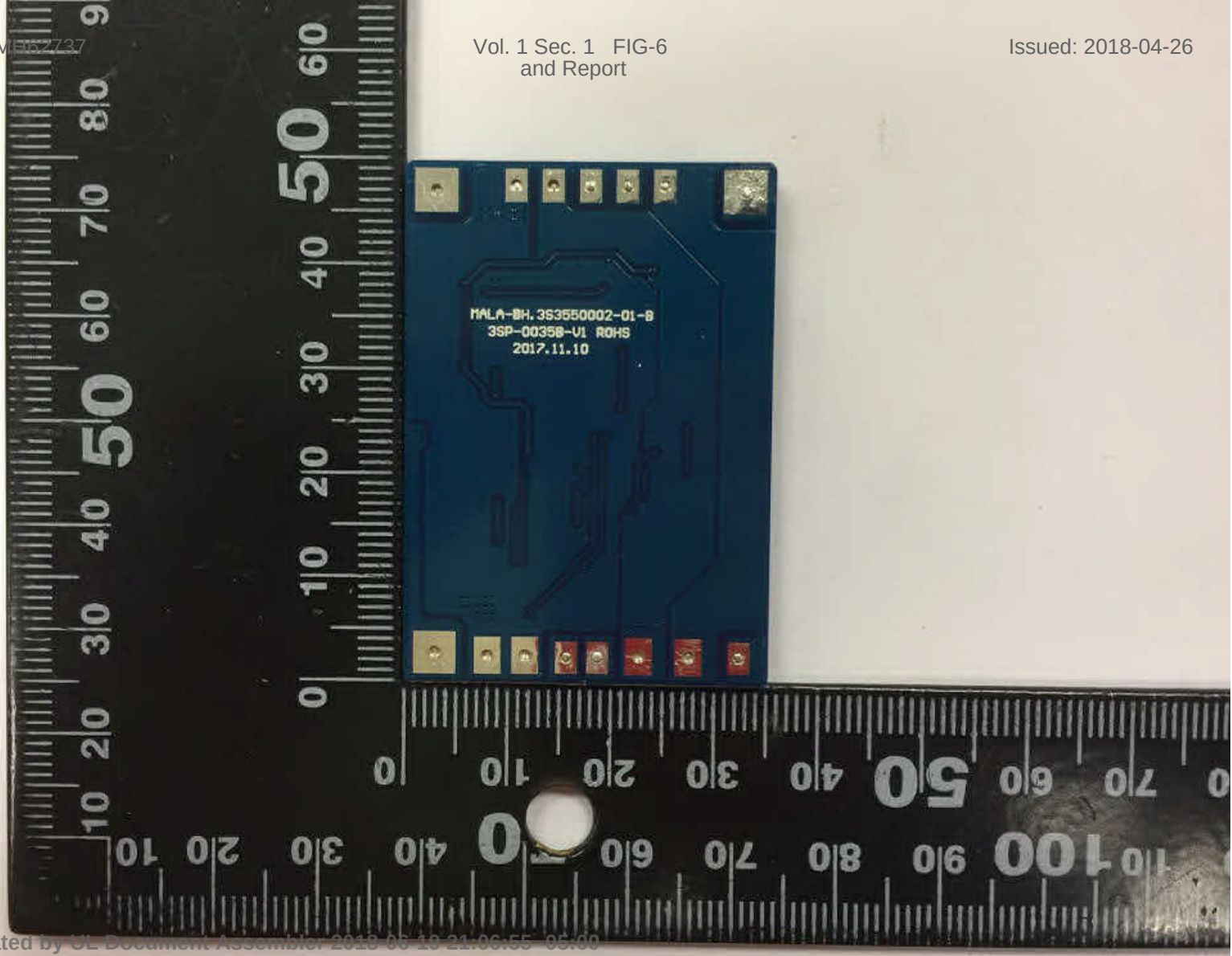
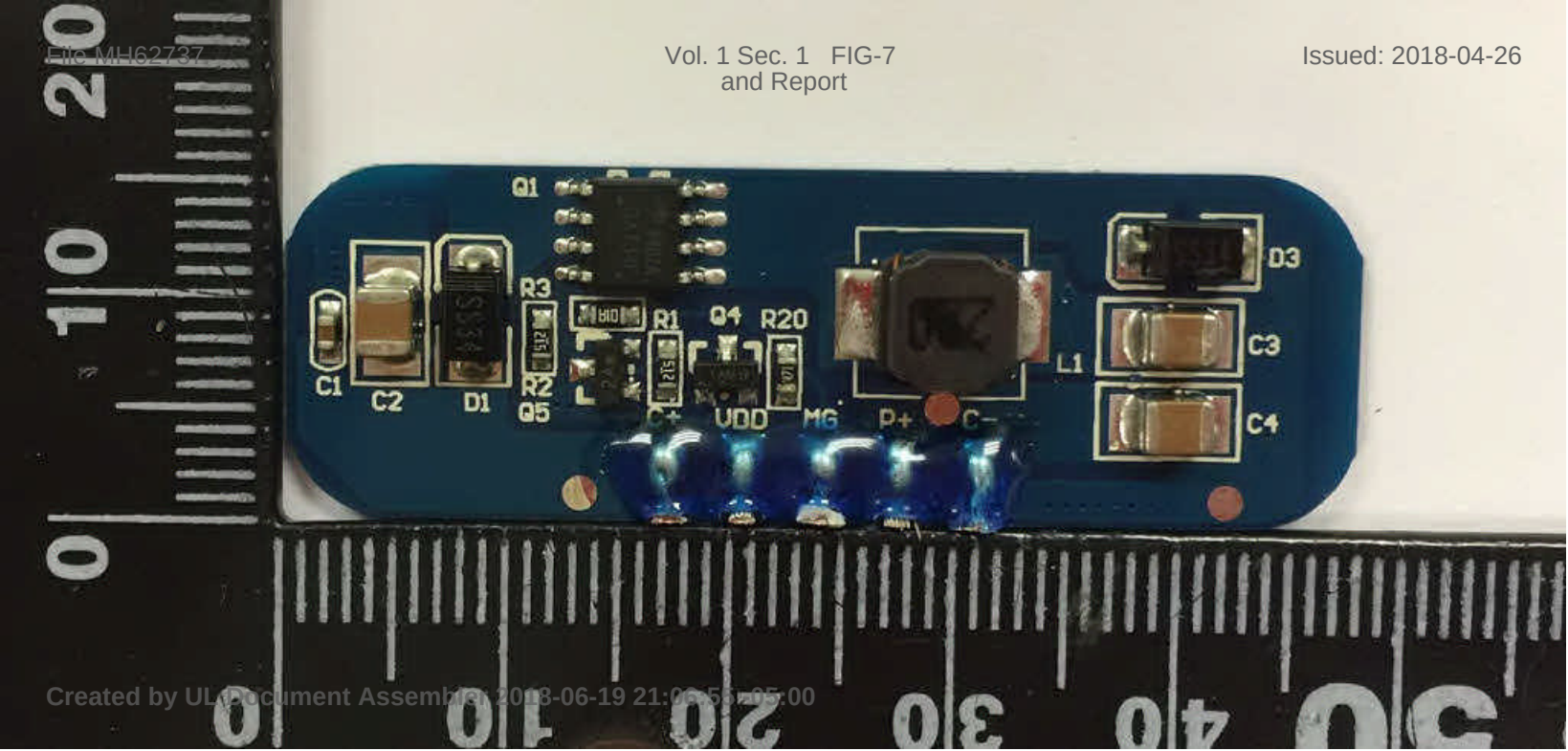
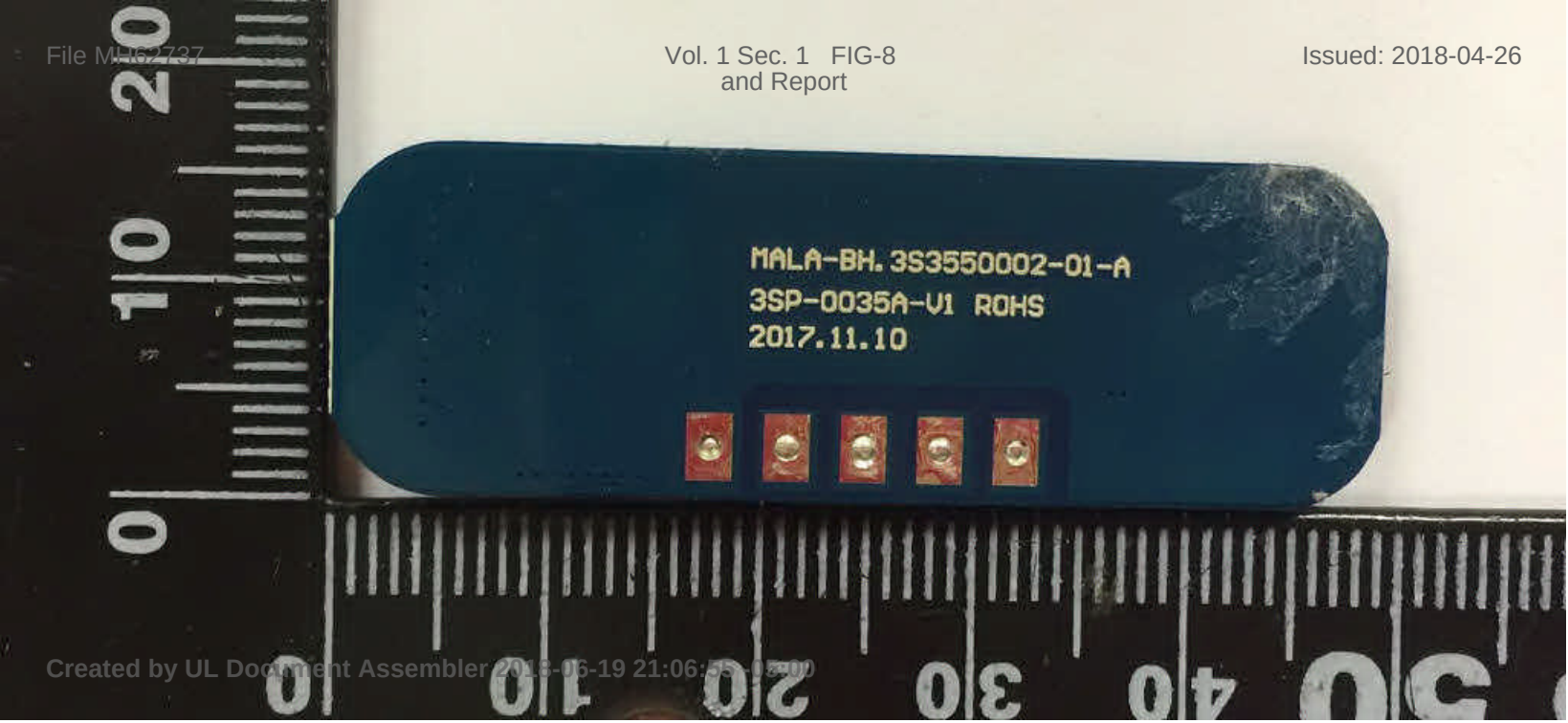
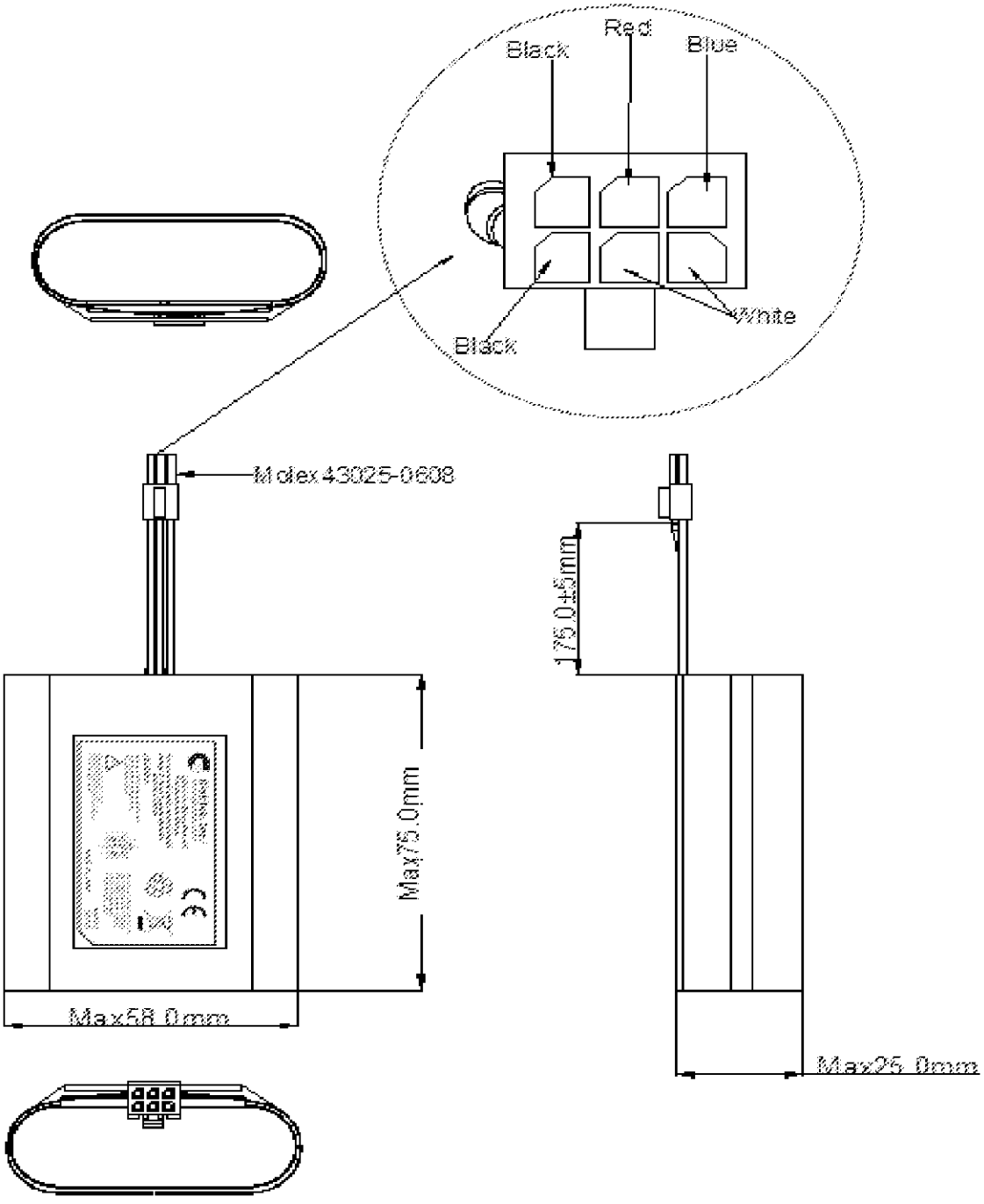






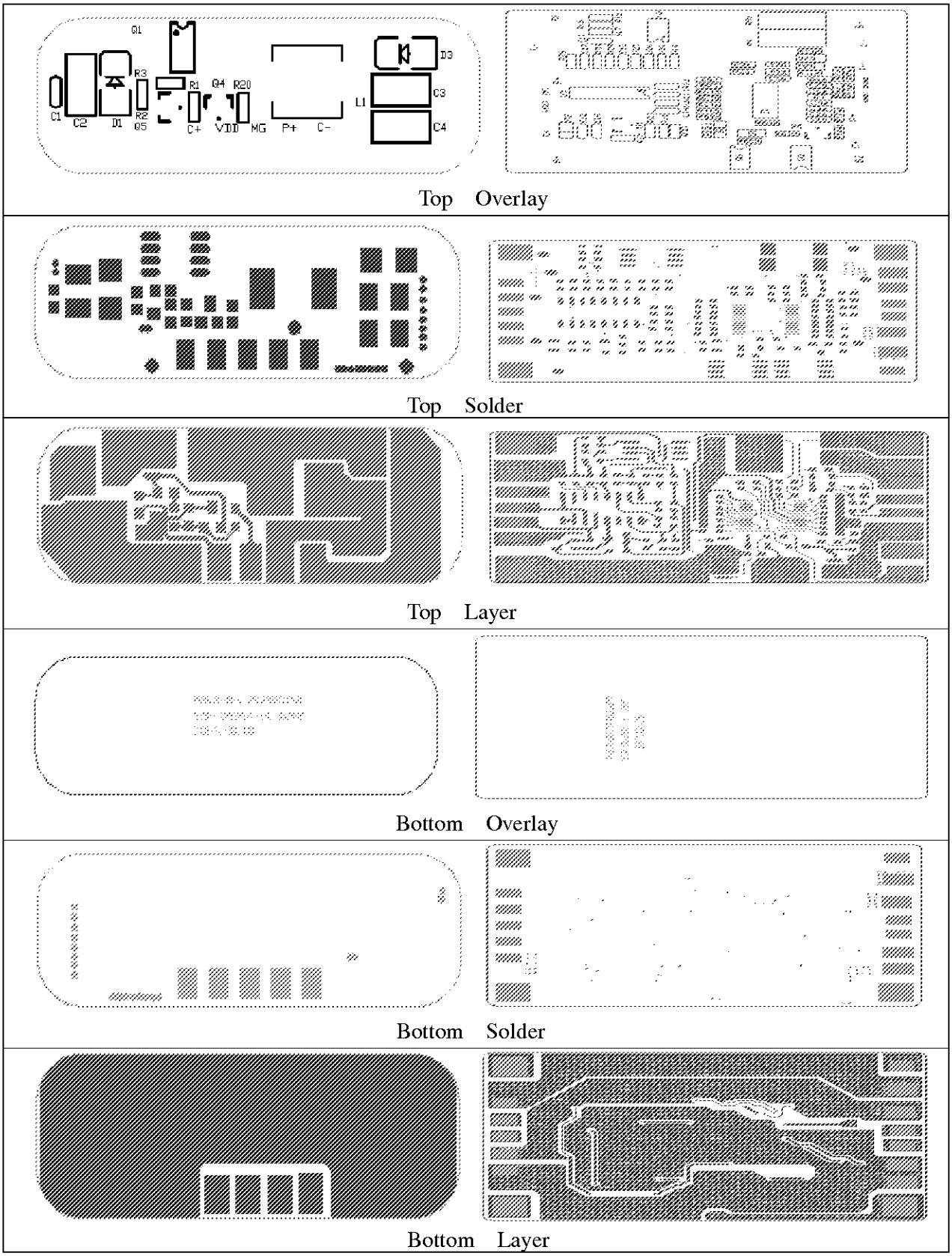
2.Product Dimension 产品尺寸

2.1 Size



2.2 Label

6.6 Layout



TEST RECORD NO. 1

SAMPLES:

Samples of Lithium-Ion Battery Pack, Model as indicated below and constructed as described herein, were submitted by the manufacturer for examination and test.

Model No.	Nominal Voltage, V dc	Capa-city, Ah	Maximum Charging Voltage, V dc	Maximum Charging Current, mA	Maximum discharge Current, mA	Dis-charge Cutoff Voltage, Vdc	Cell Config xS/yP	Cell Mfg.	Cell Model Number
BL2600C18650 H3S1PGQG	11.1	2.6	12.6	1000	6000	6.9	3S/1P	Tohoku Murata Manufacturing Co., Ltd. (MH12566)	US18650VTC5A

GENERAL:

Test results relate only to the items tested.

All test items are conducted at UL.

The following tests were conducted Model BL2600C18650H3S1PGQG.

Sample Models	Test Conducted	UL 2054 Section Reference /	Compliant Results? [Y] [N]	Comments
BL2600C18650H3S1PGQG	Short Circuit Test - At Room Temperature	9.7 - 9.12	Y	-
	Short Circuit Test - At 55 C	9.7 – 9.12	Y	-
	Abnormal Charging Test: (Secondary)	10.10 – 10.13	Y	-
	Abusive Overcharge Test	11	Y	-
	Forced-Discharge test	12	Y	-
	Limited Power Source Test	13	N	CofA added in the report.
	Battery Pack Component Temperature Test Lithium Ion System	13A 4.5	Y	-

The test methods and results of the above tests have been reviewed and found in accordance with the requirements (unless noted otherwise in the table above) in the Standard for Household and Commercial Batteries, UL 2054, Second Edition, including revisions through revision date September 14, 2011.

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the U.S. Standard for Safety of Household and commercial Batteries, UL 2054, Second Edition, including revisions through revision date September 14, 2011, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

TEST RECORD NO. 2

SAMPLES:

Samples of Lithium-Ion Battery Pack, Model as indicated below and constructed as described herein, were submitted by the manufacturer for examination and test.

Model No.	Nominal Voltage, V dc	Capa-city, Ah	Maximum Charging Voltage, V dc	Maximum Charging Current, mA	Maximum discharge Current, mA	Dis-charge Cutoff Voltage, Vdc	Cell Config xS/yP	Cell Mfg.	Cell Model Number
BL2600C18650 H3S1PGQG	11.1	2.6	12.6	1000	6000	6.9	3S/1P	Tohoku Murata Manufacturing Co., Ltd. (MH12566)	US18650VTC5A

GENERAL:

Since applicant need to update the battery specification about change the low charging temperature from 5 degree to 0 degree. After engineering judgment, no additional testing is required.

Report by:
Robust Ma
Associate project engineer

Review by:
Fancy Liang
Project engineer

CONCLUSION

Samples of the component covered by this Report have been found to comply with the requirements covering the category and the component is found to comply with UL's applicable requirements. The description and test result in this Report are only applicable to the samples investigated by UL and does not signify UL certification or that the product described are covered under UL's Follow-Up Service Program. When covered under UL's Follow-Up Service Program, the manufacturer is authorized to use the UL Recognized Mark on such products which comply with UL's Follow-Up Service Procedure and any other applicable requirements of UL LLC. The Recognized Mark of UL LLC on the product, or the UL symbol on the product and the Recognized Mark on the smallest unit container in which the product is packaged, is the only method to identify products investigated by UL to published requirements and manufactured under UL's Recognition and Follow-Up Service.

Report by:
Robust Ma
Associate project engineer

Review by:
Fancy Liang
Project engineer