CERTIFICATE OF COMPLIANCE

Certificate Number	20180924-MH48245
Report Reference	MH48245-20110119
Issue Date	2018-SEPTEMBER-24
Issued to:	GLOBTEK INC 186 VETERANS DR NORTHVALE NJ 07647
This is to certify that representative samples of	COMPONENT - BATTERIES, HOUSEHOLD AND COMMERCIAL Lithium ion Battery, Models GS-1907, and BL2600C1865003S1PGQG. Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	Standard for Safety of Household and commercial Batteries, UL 2054
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

The UL Recognized Component Mark generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark: , may be used in conjunction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceding the recognitions or under "Markings" for the individual recognitions.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

DESCRIPTION

PRODUCT COVERED:

*USR - Lithium ion Battery, Models GS-1907 and **BL2600C1865003S1PGQG**.

ELECTRICAL RATING:

Model	Voltage (Nominal), Vdc	Capacity (Nominal), Ah/Wh
*GS-1907, and **BL2600C1865003S1PGQG**	11.1	2.6 Ah/ 28.86 Wh
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
*GS-1907, and **BL2600C1865003S1PGQG**	ICR18650-26++	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
*GS-1907, and **BL2600C1865003S1PGQG**	0.52	12.6	0.52	12.6

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 November 11, 2009.

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
*GS-1907, and **BL2600C1865003S1PGQG**	15.6	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)
*GS-1907, and **BL2600C1865003S1PGQG**	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	Ambient Use Temperatures, C
*GS-1907, and **BL2600C1865003S1PGQG**	0~45 ℃ for charge, -10~50 ℃ for discharge

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, ℃
Cell (measured on Casing)	ICR18650-26++	100
PWB	--	105

7. The battery pack does not employ a protective a mechanical enclosure in accordance with the enclosure 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.

The battery pack does not employ a fire enclosure with V-1 flammability The suitability of the battery pack enclosure’s flammability shall be determined in end product evaluation.

*Lithium ion Battery, Model GS-1907 and **BL2600C1865003S1PGQG**, Fig. 1 to Fig.5.

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

Battery Pack Model	Cell Manufacturer	Cell Model	R/C Cells, Y or N*	File Reference	
				File No.	Report Date
*GS-1907, and **BL2600C1865003S1PGQG**	SAMSUNG SDI CO LTD	ICR18650-26++	Y	MH21015	2000-06-20
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.					

Connections to cell terminals are constructed as noted below:

Pack Model No.	Description	Ills. No. or description
*GS-1907, and **BL2600C1865003S1PGQG**	Cell To Cell: Resistance Welding Cell to PCM: Soldering	Fig. 4

The battery pack is wrapped by the R/C (QMFZ2) material, rated minimum 80 degree C, HF-2 or V-2.

2. 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
*GS-1907, and **BL2600C1865003S1PGQG**	MOSFET	G1, G2 on PWB	VISHAY	SI4435	--
	Control IC	U4	Seiko Instruments Inc.	S-8254	--
	Control IC	U3	Texas Instruments lnc.	TL494C	
	MOSFET	Q1	Texas Instruments lnc.	LM358	

See the following illustrations for details of protective circuitry:

Battery Pack Model Number	Illustration Number
*GS-1907, **and BL2600C1865003S1PGQG**	ILL. 1 for PCB Layout

3. External Connector – Constructed as noted below:
Polymer material employed on connector is with minimum flammability Class V-2, or R/C (ECBT2).

4. Insulation tape / foam – Insulation to prevent shorting of connections, between cells, and other parts within the battery pack are provided by the following:

Battery Pack Model Number	R/C Insulating Sheet Manufacturer	Insulation tape / foam	Illustration No.
*GS-1907, and **BL2600C1865003S1PGQG**	Various	Various, R/C (OANZ2) marked "flame retardant" or evaluated for flammability Class V-2	Fig. 3, Fig4

5. Printed Wiring Board – R/C (ZPMV2), V-0, 105C, by various manufacturers of equivalent recognized component

6. Internal Wiring & Output wiring – R/C (AVLV2), rated min 22 AWG, 300V, 80 °C.

TEST RECORD NO. 3

GENERAL:

Testing was not considered necessary under this test record, as there were no alterations to the physical battery pack. Alternate model name BL2600C18650H3S1PGQG was corrected to be BL2600C1865003S1PGQG. Model BL2600C1865003S1PGQG is identical to previously tested model GS-1907, except for model name.

The test methods and results 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 and, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report. Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

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