File MH65016
Project 4789869773

April 19, 2021

REPORT

on

COMPONENT - LITHIUM BATTERIES – COMPONENT
(BBCV2)

JIANGXI DONGTENG LITHIUM CO. LTD

Jiangxi, China

DESCRIPTION

PRODUCT COVERED:

USR Component – Secondary, lithium-ion cells as noted below.

Model Number	Chemistry	Shape/Type
All Models	$LiNi_{0.5}Co_{0.2}Mn_{0.3}O_2+6C===Li_xC_6+Li_{1-x}Ni_{0.5}Co_{0.2}Mn_{0.3}O_2$	Cylindrical/Lithium-ion

ELECTRICAL RATING:

See also Conditions of Acceptability for charge limit specifications.

Model Number	Voltage (Nominal), Vdc	Capacity, (Nominal), **mAh**
INR14500-800	3.7	**800**
INR18650-1500	**3.7**	**1500**
INR18650-1800	**3.7**	**1800**
INR18650-2000	**3.7**	**2000**
INR18650-2200	**3.7**	**2200**
INR18650-2500	**3.7**	**2500**
INR18650-2600	**3.7**	**2600**
INR18500-1200	**3.7**	**1200**
INR18500-1400	**3.7**	**1400**
INR18500-1600	**3.7**	**1600**
INR18500-1900	**3.7**	**1900**
INR14650-1100	**3.7**	**1100**
INR21700-3000	**3.7**	**3000**
INR21700-4000	**3.7**	**4000**
INR21700-4500	**3.7**	**4500**
INR14430-650	**3.7**	**650**

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

USR indicates compliance with the requirements outlined in UL 1642, Standard for Lithium Batteries, Sixth edition, Dated September 29, 2020.

Use - For use only in products where the acceptability of the combination is determined by UL LLC.

Conditions of Acceptability - The use of these cells may be considered generally acceptable under the conditions given below:

1. The cells should be used within their manufacturer's specified temperature ranges as noted in Table below:

Models	Manufacturer Specified Temperature ranges	
INR14500-800, **INR18650-1500, INR18650-1800, INR18650-2000, INR18650-2200, INR18650-2500, INR18650-2600, INR18500-1200, INR18500-1400, INR18500-1600, INR18500-1900, INR14650-1100, INR21700-3000, INR21700-4000, INR21700-4500, INR14430-650**	Charging Temperature Range	0~45°C
	Discharging Temperature Range	-10~60°C
	Upper Limit Charging Voltage	4.2Vdc
	Upper charging Temp limit(T3)	45°C
	Lower charging Temp limit(T2)	0°C

The end product shall be designed to prevent the high temperature excursions on cell surface from exceeding 100℃ (212℉).

2. These cells are to be used only in devices where servicing of the cell circuit and installation and replacement of the lithium-ion cells will be done by a trained technician. These cells are intended to be installed in a protective enclosure in the end use application that prevents access to the cells and associated cell circuitry by the user during charging and discharging of the cells.

3. These cells shall be installed within an enclosure that provides mechanical protection in the end use application, so that they protected from physical abuse that could result in damage to the cells including internal short circuits or shorting of terminals. Enclosures provided in the end use application shall prevent access to the cells through the use of simple tools or through openings.

4. The suitability of these cells for multi cell applications including series or parallel connections shall be determined in the end use. Cells used in multi-cell applications shall be of the same type, ratings and age to prevent the potential for explosions and fire due to cell imbalance.

5. For cells intended for series applications, protection shall be provided in the end use application to prevent cell reversal due to a forced discharge condition. A forced discharge test shall be conducted in the end use application for series connected cell applications.

6. These cells have been subjected to an abnormal charge test which subjects the cells to a constant current (CC) charge method followed by a constant voltage (CV) charge method. The test limit parameters for the abnormal charge test are outlined in the table below. The charging circuit in the end use application shall limit the charging current and charging voltage to the levels noted in the table under both normal and single fault condition. If the charging current and voltage in the end use application cannot be maintained at or below the levels noted in the table or if the charging method is different from the CC/CV method noted above, additional evaluation and testing may be necessary.

Model	Maximum Charging Current (Ic), mA	Maximum Charging Voltage (Vc), V dc
INR14500-800	400	4.2
INR18650-1500	**750**	**4.2**
INR18650-1800	**900**	**4.2**
INR18650-2000	**1000**	**4.2**
INR18650-2200	**1100**	**4.2**
INR18650-2500	**1250**	**4.2**
INR18650-2600	**1300**	**4.2**
INR18500-1200	**600**	**4.2**
INR18500-1400	**700**	**4.2**
INR18500-1600	**800**	**4.2**
INR18500-1900	**950**	**4.2**
INR14650-1100	**550**	**4.2**
INR21700-3000	**1500**	**4.2**
INR21700-4000	**2000**	**4.2**
INR21700-4500	**2250**	**4.2**
INR14430-650	**325**	**4.2**

MARKINGS/INSTRUCTIONS:

The Recognized Company name, trade name or trademark, File number “MH65016” or other descriptive markings or traceable ID code; Catalog number or model designation or equivalent; and date of manufacturer on the cell

The cell or smallest package containing the cell shall be marked with the UL Recognition Mark.

The date of manufacture may be in the form of a code. See below for details of date code.

Date Code: YYYYMMDD
YYYY: Four digits, presents the year, 13, 14, 15…
MM: Two digits, presents the month, 01, 02 … 12
DD： Two digits, presents the day, 01, 02 ….

Lithium-ion Cylindrical Cells - Fig(s) 1 - 2

General – See Ill(s). _1~5__ for additional details of construction.

1. Cell Case – Consists of material, overall dimensions, and sealing methods, as noted below.

Model	Case Material	Case Dimensions, mm		Case Matl. Thickness, mm	Method of Sealing
--	--	Length	OD	--	--
INR14500-800	Ni-plated steel	49	13.9	0.25	crimping
INR18650-1500	Ni-plated steel	65.3	18.4	0.25	3-5um
INR18650-1800		65.3	18.4	0.25	3-5um
INR18650-2000		65.3	18.4	0.25	3-5um
INR18650-2200		65.3	18.4	0.25	3-5um
INR18650-2500		65.3	18.4	0.25	3-5um
INR18650-2600		65.3	18.4	0.25	3-5um
INR18500-1200		49	18.3	0.25	3-5um
INR18500-1400		49	18.3	0.25	3-5um
INR18500-1600		49	18.3	0.25	3-5um
INR18500-1900		49	18.3	0.25	3-5um
INR14650-1100		65.1	14.1	0.25	3-5um
INR21700-3000		70.7	21.8	0.25	3-5um
INR21700-4000		70.7	21.8	0.25	3-5um
INR21700-4500		70.7	21.8	0.25	3-5um
INR14430-650		42.2	14	0.25	3-5um

2. Cell Lid - Consists of: Al welding plate/PP gasket/CID/top plate. Secured to case by crimping.

3. Electrode Assemblies – Consists of positive and negative electrodes shaped in a “jelly roll” within the case and constructed as noted below.

Model No.	Positive Electrode		Negative Electrode		Negative Electrode/ Positive Electrode Capacity ratio
-	Drawing No.	Dimensions, mm	Drawing No.	Dimensions, mm	(Ah_{NE}/Ah_{PE})
INR14500-800	ILL.2	(367±1)*(39.5±0.3)	ILL.2	425*(40.5±0.3)	⩾1.08
INR18650-1500	III.6	615*57	III.6	680*59	≥1.06
INR18650-1800	III.6	646*57	III.6	712*59	≥1.06
INR18650-2000	III.6	672*57	III.6	739*59	≥1.06
INR18650-2200	III.6	663*57	III.6	730*59	≥1.06
INR18650-2500	III.6	646*57.5	III.6	712*59	≥1.06
INR18650-2600	III.6	646*57.5	III.6	712*59	≥1.06
INR18500-1200	III.6	624*40.5	III.6	683*42	≥1.06
INR18500-1400	III.6	624*40.5	III.6	683*42	≥1.06
INR18500-1600	III.6	624*40.5	III.6	683*42	≥1.06
INR18500-1900	III.6	624*42	III.6	683*43	≥1.06
INR14650-1100	III.6	367*55.5	III.6	425*57.5	≥1.06
INR21700-3000	III.6	1260*63	III.6	1343*64.5	≥1.06
INR21700-4000	III.6	1260*63	III.6	1343*64.5	≥1.06
INR21700-4500	III.6	1260*63	III.6	1343*64.5	≥1.06
INR14430-650	III.6	369*33.5	III.6	423*34.5	≥1.06

4. Current Collectors – At the positive electrode consists of: Al
   At the negative electrode consists of: Cu

5. Separator – Unlisted Component Separator constructed as noted below. The separator is sized to extend beyond the electrodes as noted below for reliable insulation.

Cell Model	Separator Mfg.	Type Design ation	Report Reference (UnListed Component)		Dimensions, mm		Minimum Extension Beyond Electrodes, mm
--	--	--	File Number	Issue Date	Width	Length	--
INR14500-800	Shenzhen Jinglitai Technology Co. LTD	ND16	MH65017	2021-04-19	43	890	0.5mm
INR18650-1500	Shenzhen Jinglitai Technology Co. LTD	ND20	MH65017	2021-04-19	61	1470	0.5
INR18650-1800		ND16			61	1534	0.5
INR18650-2000		ND16			61	1570	0.5
INR18650-2200		ND16			61	1570	0.5
INR18650-2500		ND14			61	1534	0.5
INR18650-2600		ND14			61	1534	0.5
INR18500-1200		ND20			44.5	1476	0.5
INR18500-1400		ND16			44.5	1476	0.5
INR18500-1600		ND16			44.5	1476	0.9
INR18500-1900		ND14			44.5	1476	0.5
INR14650-1100		ND16			44.5	935	0.5
INR21700-3000		ND20			66	2780	0.5
INR21700-4000		ND20			66	2780	0.5
INR21700-4500		ND20			66	2780	0.5
INR14430-650		ND16			37	931	0.5

6. Electrolyte – Constructed as noted below.

Cell Model	Generic Composition	Drawing No.
INR14500-800	LiPF6/EC/EMC/DMC	TR1, ILL.1
INR18650-1500, INR18650-1800, INR18650-2000, INR18650-2200, INR18650-2500, INR18650-2600, INR18500-1200, INR18500-1400, INR18500-1600, INR18500-1900, INR14650-1100, INR21700-3000, INR21700-4000, INR21700-4500, INR14430-650	LiPF6/EC/EMC/DMC	TR1, ILL.1

7. Protection Mechanism – Located within cell. Consist of either one or a combination of the methods outlined below.

a. PTC (optional) – R/C (XPGU2) located below cell cover and its integral leads are secured to cell circuit by:

Cell Model	PTC Manufacturer	PTC Model No.
INR14500-800, INR18500-1900, INR18500-1600, INR14430-650, INR18500-1400	HUIZHOU JUDING ELECTRONICS CO LTD(E482764)	JD-D1

b. Circuit Interrupt Device (CID) – (Pressure activated protection mechanism that opens cell circuit when pressure within the cell reaches a certain limit.) Constructed as noted below. The circuit interrupt device is located within the cell cover as shown in the illustration(s).

Cell Model	CID Ills. No.
INR14500-800	Ill.5
INR18650-1500, INR18650-1800, INR18650-2000, INR18650-2200, INR18650-2500, INR18650-2600, INR18500-1200, INR18500-1400, INR18500-1600, INR18500-1900, INR14650-1100, INR21700-3000, INR21700-4000, INR21700-4500, INR14430-650	Ill.7

8. Insulators – Consists of the following parts within the cell:
Information on the materials employed, location and construction information are as noted in the illustrations below.

Cell Model	Insulation Parts	Ill. Nos.
INR14500-800, INR14650-1100, INR14430-650	Top Insulators: PET Bottom Insulators：PET	Ill.4
INR18650-1500, INR18650-1800, INR18650-2000, INR18650-2200, INR18650-2500, INR18650-2600, INR18500-1200, INR18500-1400, INR18500-1600, INR18500-1900,	Top Insulators: PET Bottom Insulators：PET	Ill.9
INR21700-3000, INR21700-4000, INR21700-4500,	Top Insulators: PET Bottom Insulators：PET	Ill.10

9. Electrode Tabs – Are constructed as noted below.

Model	Tab Ill Nos. Ill.3
INR14500-800	Positive Tab (Al): (51 ± 1)*4*0.1mm Negative Tab (Ni/Ni): (50 ± 1)*4*0.08mm/(46 ± 1)*4*0.08mm
INR18650-1500	Positive Tab (Al): 59*4*0.1mm Negative Tab (Ni)：49&59*4*0.08mm
INR18650-1800	Positive Tab (Al): 59*4*0.1mm Negative Tab (Ni)：49&59*4*0.08mm
INR18650-2000	Positive Tab (Al): 59*4*0.1mm Negative Tab (Ni)：49&59*4*0.08mm
INR18650-2200	Positive Tab (Al): 59*4*0.1mm Negative Tab (Ni)：49&59*4*0.08mm
INR18650-2500	Positive Tab (Al): 59*4*0.1mm Negative Tab (Ni)：49&59*4*0.08mm
INR18650-2600	Positive Tab (Al): 59*4*0.1mm Negative Tab (Ni)：49&59*4*0.08mm
INR18500-1200	Positive Tab (Al): 54*4*0.1mm Negative Tab (Ni)：49*4*0.08mm
INR18500-1400	Positive Tab (Al): 54*4*0.1mm Negative Tab (Ni)：49*4*0.08mm
INR18500-1600	Positive Tab (Al): 54*4*0.1mm Negative Tab (Ni)：49*4*0.08mm
INR18500-1900	Positive Tab (Al): 54*4*0.1mm Negative Tab (Ni)：49*4*0.08mm
INR14650-1100	Positive Tab (Al): 59*4*0.1mm Negative Tab (Ni)：49&59*4*0.08mm
INR21700-3000	Positive Tab (Al): 78*5*0.1mm Negative Tab (Ni)：65&54*4*0.08mm
INR21700-4000	Positive Tab (Al): 78*5*0.1mm Negative Tab (Ni)：65&54*4*0.08mm
INR21700-4500	Positive Tab (Al): 78*5*0.1mm Negative Tab (Ni)：65&54*4*0.08mm
INR14430-650	Positive Tab (Al): 47*4*0.1mm Negative Tab (Ni)：43*4*0.08mm

10. Vent Mechanism – The vent mechanism is constructed as noted below

Model	Vent Ill. No.
INR14500-800	Ill.5
INR18650-1500, INR18650-1800, INR18650-2000, INR18650-2200, INR18650-2500, INR18650-2600, INR18500-1200, INR18500-1400, INR18500-1600, INR18500-1900, INR14650-1100, INR21700-3000, INR21700-4000, INR21700-4500, INR14430-650	Ill.8