File MH48131 Project 10CA59371

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REPORT

On

COMPONENT - Lithium Batteries

Globtek (Hong Kong) Ltd Kowloon, HK

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File MH48131	Vol. 1	Sec. 1	Page 1	Issued:	2011-04-07
		and Report			

DESCRIPTION

PRODUCT COVERED:

USR Component - Secondary, Rechargeable Lithium Polymer cells as noted below.

Model Number	Chemistry	Shape/Type
SR524148	Lithium Cobalt Oxide(LiCoO2)	Prismatic/Polymer

ELECTRICAL RATING:

See also Conditions of Acceptability for charge limit specifications.

Model Number	Voltage (Nominal), Vdc	Capacity, (Nominal), mAh		
SR524148	3.7	1000		

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

USR indicates compliance with the requirements outlined in UL 1642, Standard for Lithium Batteries.

Use - For use only in products where the acceptability of the combination is determined by Underwriters Laboratories Inc.

File MH48131	Vol. 1	Sec. 1	Page 2	Issued:	2011-04-07
		and Report			

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

 The cells are intended for use at ordinary temperatures where anticipated high temperature excursions are not expected to exceed 100°C (212°F) or as noted below.

Model	Manufacturer's Maximum Specified Charge and Discharge
	Temperature, °C
SR524148	Charge: 45
	Discharge: 50

- 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), A	Maximum Charging Voltage (Vc), V dc
SR524148	0.5 x 3	4.2

File MH48131	Vol. 1	Sec. 1	Page 3	Issued:	2011-04-07
		and Report			

- 7. Fire and/or explosion resulted when these cells were subjected to the crush test and impact test. These cells shall be provided with a mechanical enclosure that prevents either crush or impact of the cells in the end use application and special precautions should be taken when handling these cells during installation and disposal to prevent crush and impact to the cells.
- 8. The following marking and instruction information is provided as guidance for replaceable battery packs that can be installed by other than trained technicians that would employ the cells covered in this report. These marking and instruction recommendations do not apply to the cells themselves. The need to include these markings and instructions shall be determined in the end use application.
 - A. A user replaceable lithium ion battery pack that employs these cells shall be marked with the following or equivalent:

"WARNING - Risk of Fire, Explosion, and Burns. Do No Disassembly, Crush, Heat Above [(manufacturer's recommended charge/discharge temperature)/(100C (212F))] or Incinerate.

B. The packaging of a user replaceable lithium ion battery pack that employs these cells shall be marked with the following or equivalent:

"CAUTION - Risk of Fire and Burns. Do No Disassemble, Heat Above [(manufacturer's recommended charge/discharge temperature)/ (100°C (212°F))] or Incinerate. Keep Battery Out of Reach of Children and in Original Package Until Ready to Use. Dispose of Used Batteries Promptly According to Local Recycling or Waste Regulations.

C. Instructions packaged with a user replaceable lithium ion battery pack that uses these cells shall include the following or equivalent:

"CAUTION - The battery used in this device may present a risk of fire or explosion when heated above [(manufacturer's recommended charge/discharge temperature)/(100°C (212°F))] or incinerated. 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."

The instructions shall also include information regarding how to replace the battery pack ending with the following statement or equivalent:

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

File MH48131	Vol. 1	Sec. 1	Page 4	Issued:	2011-04-07
		and Report			

MARKINGS/INSTRUCTIONS:

Recognized Company, Model designation, 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 Section General for details of date code.

See Section General for details of manufacturer's marking for cells manufactured at more than one factory location.

File MH48131 Vol. 1 Sec. 1 Page 5 Issued: 2011-04-07 and Report

Lithium-Ion Polymer Cells - FIG. 1

General - See ILL. 1 to ILL. 2 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 ±0.5mm			Case Matl. M	Method	Case
		Length	Width	Thick- ness	mm	Sealing	Material
SR524148	Nylon + Aluminium + PP	48.0	41.0	5.2	0.152	Heating	N/A

2. Electrode Assemblies - Consists of positive and negative electrodes shaped in flat plates within the case and constructed as noted below.

Model No.	Positive	e Electrode	Negative	e Electrode	Negative Electrode/ Positive Electrode Capacity ratio
	Drawing	Dimensions,	Drawing	Dimensions,	(Ah_{NE}/Ah_{PE})
	No.	mm	No.	mm	
SR524148	See ILL.	546 * 38	See ILL.	655 * 39	1.07 - 1.10
	1		2		

3. Current Collectors - At the positive electrode consists of: Aluminium film

At the negative electrode consists of: Copper film

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

Cell	Separat	Туре	Report Reference		eport Reference Dimensions, mm		Minimum
Model	or Mfg.	Designati	(UnListed (UnListed Component)		Extension	
		on	File	Issue	Width	Length	Beyond
			Number	Date			Electrodes,
							mm
SR5241	USA	2325	MH48131,	2011-04-	42.0	0.025	1.5
48	Celgard		Vol.2,	08			
			Sec.1				

File MH48131	Vol. 1	Sec. 1	Page 6	Issued:	2011-04-07
		and Report			

5. Electrolyte - Constructed as noted below.

Cell Model	Generic Composition	Drawing No.
SR524148	EC+EMC+DMC+LiPF6	See ILL.1 of Test
		Reference 1

6. Electrode Tabs - Are constructed as noted below.

Model	Tab Dimension			
SR524148	Width x Length: 3±0.2 x 20±5 mm			

7. Venting Mechanism - Pressure build up within the cells is prevented by a venting mechanism constructed as follows: It relieves pressure through the seam of cell.

8. Insulators - Consist of the follow parts as noted below: Information on the materials employed, location and construction are as noted in the illustrations below.

Model	Insulation Parts	Ill. Nos.
SR524148	Insulation Tape near Electrode Tabs - R/C (OANZ2),	
	35 by 15 mm. See Fig.2 for the location.	





TEST RECORD NO. 1

SAMPLES:

Samples of the Secondary, Rechargeable Lithium Polymer cell, Model SR524148 as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

Model	Cell Chemistry	Cell Shape	Energy Density, mAh/mm ³	Nominal Voltage Rating, V dc	Capacity, mAh	Maximum Charging Current, mA	Maximum Charging Voltage, V dc
SR524148	Lithium- ion	Prismatic Polymer	0.09772	3.7	1000	500	4.2

GENERAL:

Test results relate only to the items tested.

Tests for Fresh cells were considered covered as follows:

	UL 1642.	Complied,	
Test	Section	Y, N Or N/A	Comments
Short Circuit Test: (At Room Temperature)	10	Y	Complied
Short Circuit Test: (At 55°C)	10	Y	Complied
Abnormal Charging Test:(Secondary)	11	Y	Complied
Crush Test:	13	Y	Complied
Impact Test:	14	Y	Complied
Shock Test:	15	Y	Complied
Vibration Test:	16	Y	Complied
Heating Test:	17	Y	Complied
Temperature Cycling Test:	18	Y	Complied
Low Pressure (Altitude Simulation) Test:	19	Y	Complied
Projectile Test:	20	Y	Complied

	UL 1642,	Complied,	
Test	Section	Y, N Or N/A	Comments
Samples And Preconditioning:	7	Y	Complied
Short Circuit Test: (At Room Temperature)	10	Y	Complied
Short Circuit Test: (At 55°C)	10	Y	Complied
Abnormal Charging Test:(Secondary)	11	Y	Complied
Crush Test:	13	N	Not Complied C of A mentioned
Impact Test:	14	Ν	Not Complied C of A mentioned
Shock Test:	15	Y	Complied
Vibration Test:	16	Y	Complied
Heating Test:	17	Y	Complied
Temperature Cycling Test:	18	Y	Complied
Low Pressure (Altitude Simulation) Test:	19	Y	Complied

Tests for Charge-Discharge cycled samples were considered covered as follows:

The test methods and results of the above tests have been reviewed and found in accordance with the requirements in the Standard for Lithium Batteries, UL 1642, Fourth Edition, Dated September 19, 2005 and contains revisions through and including November 25, 2009.

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in Standard for Lithium Batteries, UL 1642, Fourth Edition dated September 19, 2005 with revised date November 25, 2009 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 Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

CONCLUSION

Samples of the components covered by this Report have been found to comply with the requirements covering the category and the components are found to comply with UL's applicable requirements. The description and test result in this Report are only applicable to the sample(s) investigated by UL and does not signify the product(s) described as being covered under UL's Follow-Up Service Program. When covered under UL's Follow-Up Service Program, the manufacturer is authorized to use the Recognized Marking on such products which comply with UL's Follow-Up Service Procedure and any other applicable requirements of Underwriters Laboratories Inc. The Recognized Component Mark of Underwriters Laboratories Inc. on the product, or the Recognized Marking symbol on the product and the Recognized Component 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.

This Report is intended solely for the use of UL and the Applicant for establishment of UL certification coverage of the product under UL's Follow-Up Service. Any use of the Report other than to indicate that the sample(s) of the product covered by the Report has been found to comply with UL's applicable requirements is not authorized and renders the Report null and void. UL shall not incur any obligation or liability for any loss, expense, or punitive damages, arising out of or in connection with the use or reliance upon the contents of this Report to anyone other than the Applicant as provided in the agreement between UL and Applicant. Any use or reference to UL's name or certification mark(s) by anyone other than the Applicant in accordance with the agreement is prohibited without the express written approval of UL. Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

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