

UN Test Report

Name of Sample	Lithium Ion Battery 4NCR18650-1-T0995
Consignor	SANYO Energy(Suzhou) CO.,LTD
Manufacturer	SANYO Energy(Suzhou) CO.,LTD
Test Method	United Nations "Recomenndations on the TRANSPORT OF DANGEROUS GOODS"
Criterion	United Nations "Recomenndations on the TRANSPORT OF DANGEROUS GOODS"
Appearance	Black rectangular parallelepiped
Test Date	2011/03/18 – 2011/04/19
Test Items	Altitude simulation, Thermal test, Vibration test, Shock test, External short circuit, Overcharged
Conclusion	The sample has passed the items of UN38.3.
Remark	Certification by Similar Model: 4NCR18650-1-T0995 Ratio of (4NCR18650-1-T0995)/(NCR-B/433AE) [Wh rating ratio]: 97.6%, [Voltage ratio]: 100%
Consignor Address	No.86 Sunwu Road, Xukou, Wuzhong District, Suzhou City, Jiangsu Province 215164, China

Sanyo Energy(Suzou) Co.,Ltd.

K. Morina
Approval

A. Tsutsui
Check

zheng Jie
Writing

CONFIDENTIAL

Date:December 12,2012

B: Checklist for Judging New Type Battery or not

Confirmation of presence of change in “The element which is given influence”

(Change ⇒ ○、No change ⇒ —)

When there is no change in all items, it is NOT considered to be a New Type Battery.

Model which UN regulation test has completed	NCR-B/433AE
Target model which is not a new type	4NCR18650-1-T0995

Test Item (Function)	The element which is given influence	Presence of change
T1:Altitude Simulation (Decompression load)	▪Crimped part, Gasket (Cell) ▪Gas Release Vent, Cell Case (Cell) ▪Pack (Plastic) Case ▪Holding Member(Insulator, Insulation Tape, Both Sides Tape) ▪Coating materials	—
T2: Thermal Shock (Repetition of high temp. and low temp.)	▪Crimped part, Gasket (Cell) ▪Gas Release Vent, Cell Case (Cell) ▪Finished state of Wound Electrodes (Cell) ▪Pack (Plastic) Case ▪Holding Member(Insulator, Insulation Tape, Both Sides Tape) ▪Coating materials	—
T3: Vibration (Vibration load)	▪Finished state of Wound Electrodes (Cell) ▪Electric wiring member ▪Electronic Parts on a circuit board ▪Cell Holding Member (Adhesive, Both Sides Tape, Lib of Plastic Case)	—
T4: Shock(Shock load)	▪Wiring Member ▪Electronic Parts on a circuit board ▪Cell Holding Member(Adhesive, Both Sides Tape, Lib of Plastic Case) ▪Finished state of Wound Electrodes (Cell)	—
T5: External Short Circuit(Short current)	▪Over-voltage Protection ▪Current Control Device ▪Safety Device of cell (Cell) ▪Lead Tab	—
T6(Cell): Impact(Crash load)	▪Separator (Cell) ▪Insulation State in a cell (Cell)	—
T7(Pack): Overcharge(Charge load)	▪Overcharge Protection ▪Thermal Device ▪Safety Device of cell (Cell)	—
Wh of cell	Is Wh difference of cell less than 20%?	—
Voltage of cell	Is increase of cell voltage less than 20%?	—
Judgment result	New Type or not	New Not new

Sanyo Energy(Suzou) Co.,Ltd.

K. Morina

approval

A. Tsutsumi

Check

zheng Jie

Writing

Certificate of UN test for Lithium ion battery

Customer Model : L12S4E01
Product Code : F12431585
Product Name : 4NCR18650-1-T0995



We declare that this battery passed UN test.

Manual of Tests and Criteria (38.3 Lithium batteries)		Test results	Note	Number of test batteries	
No.	Test item				
T 1	Altitude simulation	Pass		First cycle fully charged 4 batteries	After 50 cycles fully charged 4 batteries
T 2	Thermal test	Pass			
T 3	Vibration	Pass			
T 4	Shock	Pass			
T 5	External short circuit	Pass			
T 6	Impact	Pass		First cycle 50% charged 5 cells for cylindrical cell, 10 cells for prismatic cell,	
T 7	Overcharge	Pass	For battery only	First cycle fully charged 4 batteries	After 50 cycles, fully charged 4 batteries
T 8	Forced discharge	—	For cell only	For cell only.	

*The test data may contain additional test result other than above table.

Lithium ion battery Specification

Item	Nominal value	Note
Watt-hour rating / Rated capacity	41 Wh / 2.9 Ah	
Nominal voltage	14.4 V	
Lithium equivalent content	3.48 g	

Above test procedures are compliant to the following manual.

(Manual of Tests and Criteria ST/SG/AC.10/11/Rev.5, PartIII, sub-section 38.3)

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检验报告

Test Report

No. B1135-4

共9页第2页

序号 No	检测项目 Name of Test Items	标准要求或标准款号 Standard Requirement or the Clause Number of Standard	检验结果 Test Result	本项结论 Test Conclusion	备注 Remark
1	高度模拟试检 Altitude simulation	试检和标准手册38.3(5 th) 38.3 Test T-1 UN Manual of Tests and Criteria Section (5 th) 38.3 Test T-1	见附表1 See Appendix 1	合格 Passed	/
2	热测试检 Thermal test	试检和标准手册38.3(5 th) 38.3 Test T-2 UN Manual of Tests and Criteria Section (5 th) 38.3 Test T-2	见附表2 See Appendix 2	合格 Passed	/
3	振动试检 Vibration test	试检和标准手册38.3(5 th) 38.3 Test T-3 UN Manual of Tests and Criteria Section (5 th) 38.3 Test T-3	见附表3 See Appendix 3	合格 Passed	/
4	冲击试检 Shock	试检和标准手册38.3(5 th) 38.3 Test T-4 UN Manual of Tests and Criteria Section (5 th) 38.3 Test T-4	见附表4 See Appendix 4	合格 Passed	/
5	外短路试检 External short circuit	试检和标准手册38.3(5 th) 38.3 Test T-5 UN Manual of Tests and Criteria Section (5 th) 38.3 Test T-5	见附表5 See Appendix 5	合格 Passed	/
6	冲撞试检 Impact	试检和标准手册38.3(5 th) 38.3 Test T-6 UN Manual of Tests and Criteria Section (5 th) 38.3 Test T-6	见附表6 See Appendix 6	合格 Passed	/
7	过充电试检 Overcharge	试检和标准手册38.3(5 th) 38.3 Test T-7 UN Manual of Tests and Criteria Section (5 th) 38.3 Test T-7	见附表7 See Appendix 7	合格 Passed	/
检验环境条件 / Test Environment Condition			环境温度: 20-25℃ / Ambient Temperature: 20-25℃		
分包检验状况 Subcontracted Test Condition	检测项目 Test Items	/			
	分包实验室 Subcontracted Laboratory	名称 Name	/	邮编 Post Code	/
		地址 Address	/	电话 Tel	/

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检验报告 -----附表1

Test Report

No. B1135-4

Appendix 1

共9页第3页

序号 No	T-1	检测项目名称 Name of Test Items		高度模拟试检 Altitude simulation				
样品 编号 Sample No	样品状态 Sample Status	试检前 Before		试检后 After		质量 Mass Loss (%)	剩余电压 Residual OCV (%)	其他 现象 Other Event
		质量 Weight (g)	开路电压 OCV (V)	质量 Weight (g)	开路电压 OCV (V)			
1	首次充满 Initial 100% charge	212.70	16.655	212.69	16.621	0.00%	99.8%	0
2	首次充满 Initial 100% charge	212.63	16.657	212.62	16.623	0.00%	99.8%	0
3	首次充满 Initial 100% charge	212.45	16.657	212.44	16.624	0.00%	99.8%	0
4	首次充满 Initial 100% charge	212.63	16.656	212.63	16.622	0.00%	99.8%	0
5	50次充满 50cycles 100% charge	213.04	16.578	213.02	16.557	0.01%	99.9%	0
6	50次充满 50cycles 100% charge	212.48	16.577	212.49	16.556	0.00%	99.9%	0
7	50次充满 50cycles 100% charge	212.92	16.578	212.92	16.558	0.00%	99.9%	0
8	50次充满 50cycles 100% charge	212.48	16.578	212.47	16.557	0.00%	99.9%	0
备注: L-漏液, V-漏气, D-解体, R-破裂, F-起火, 0-无漏液, 无漏气, 无解体, 无破裂, 无起火 Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, 0-No leakage, no venting, no disassembly, no rupture & no fire.								

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检验报告 -----附表2

Test Report

No. B1135-4

Appendix 2

共9页第4页

序号 No	T-2	检测项目名称 Name of Test Items		热测试检 Thermal test				
样品 编号 Sample No	样品状态 Sample Status	试检前 Before		试检后 After		质量 Mass Loss (%)	剩余电压 Residual OCV (%)	其他 现象 Other Event
		质量 Weight (g)	开路电压 OCV (V)	质量 Weight (g)	开路电压 OCV (V)			
1	首次充满 Initial 100% charge	212.69	16.621	212.64	16.322	0.00%	99.9%	0
2	首次充满 Initial 100% charge	212.62	16.623	212.58	16.323	0.00%	99.9%	0
3	首次充满 Initial 100% charge	212.44	16.624	212.38	16.325	0.02%	99.9%	0
4	首次充满 Initial 100% charge	212.63	16.622	212.58	16.322	0.02%	99.9%	0
5	50次充满 50cycles 100% charge	213.02	16.557	212.99	16.318	0.00%	100.0%	0
6	50次充满 50cycles 100% charge	212.49	16.556	212.45	16.318	0.00%	100.0%	0
7	50次充满 50cycles 100% charge	212.92	16.558	212.87	16.318	0.00%	100.0%	0
8	50次充满 50cycles 100% charge	212.47	16.557	212.43	16.317	0.00%	100.0%	0
备注: L-漏液, V-漏气, D-解体, R-破裂, F-起火, 0-无漏液, 无漏气, 无解体, 无破裂, 无起火 Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, 0-No leakage, no venting, no disassembly, no rupture & no fire.								

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检验报告 -----附表3

Test Report

No. B1135-4

Appendix 3

共9页第5页

序号 No	T-3	检测项目名称 Name of Test Items		振动试检 Vibration test				
样品 编号 Sample No	样品状态 Sample Status	试检前 Before		试检后 After		质量 Mass Loss (%)	剩余电压 Residual OCV (%)	其他 现象 Other Event
		质量 Weight (g)	开路电压 OCV (V)	质量 Weight (g)	开路电压 OCV (V)			
1	首次充满 Initial 100% charge	212.64	16.322	212.67	16.308	-0.01%	99.9%	0
2	首次充满 Initial 100% charge	212.58	16.323	212.61	16.309	-0.01%	99.9%	0
3	首次充满 Initial 100% charge	212.38	16.325	212.41	16.312	-0.01%	99.9%	0
4	首次充满 Initial 100% charge	212.58	16.322	212.60	16.309	-0.01%	99.9%	0
5	50次充满 50cycles 100% charge	212.99	16.318	213.01	16.305	-0.01%	99.9%	0
6	50次充满 50cycles 100% charge	212.45	16.318	212.47	16.304	-0.01%	99.9%	0
7	50次充满 50cycles 100% charge	212.87	16.318	212.90	16.304	-0.01%	99.9%	0
8	50次充满 50cycles 100% charge	212.43	16.317	212.45	16.304	-0.01%	99.9%	0
备注: L-漏液, V-漏气, D-解体, R-破裂, F-起火, 0-无漏液, 无漏气, 无解体, 无破裂, 无起火 Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, 0-No leakage, no venting, no disassembly, no rupture & no fire.								

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检验报告 -----附表4

Test Report

No. B1135-4

Appendix 4

共9页第6页

序号 No	T-4	检测项目名称 Name of Test Items		冲击试检 Shock				
样品 编号 Sample No	样品状态 Sample Status	试检前 Before		试检后 After		质量 Mass Loss (%)	剩余电压 Residual OCV (%)	其他 现象 Other Event
		质量 Weight (g)	开路电压 OCV (V)	质量 Weight (g)	开路电压 OCV (V)			
1	首次充满 Initial 100% charge	212.67	16.308	212.63	16.254	-0.01%	99.9%	0
2	首次充满 Initial 100% charge	212.61	16.309	212.60	16.256	-0.01%	99.9%	0
3	首次充满 Initial 100% charge	212.41	16.312	212.42	16.260	-0.01%	99.9%	0
4	首次充满 Initial 100% charge	212.60	16.309	212.61	16.255	-0.01%	99.9%	0
5	50次充满 50cycles 100% charge	213.01	16.305	213.02	16.251	-0.01%	99.9%	0
6	50次充满 50cycles 100% charge	212.47	16.304	212.47	16.251	-0.01%	99.9%	0
7	50次充满 50cycles 100% charge	212.90	16.304	212.89	16.251	-0.01%	99.9%	0
8	50次充满 50cycles 100% charge	212.45	16.304	212.44	16.251	-0.01%	99.9%	0
备注: L-漏液, V-漏气, D-解体, R-破裂, F-起火, 0-无漏液, 无漏气, 无解体, 无破裂, 无起火 Note: L-Leakage, V-Venting, D-Disassembly, R-Rupture, F-Fire, 0-No leakage, no venting, no disassembly, no rupture & no fire.								

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检验报告 -----附表5

Test Report

No. B1135-4

Appendix 5

共9页第7页

序号 No	T-5	检测项目名称 Name of Test Items	外短路试检 External short circuit
样品编号 Sample No	样品状态 Sample Status	样品表面最高温度 Max. External Temperature (°C)	其他现象 Other Event
1	首次充满 Initial 100% charge	55.6	0
2	首次充满 Initial 100% charge	55.7	0
3	首次充满 Initial 100% charge	55.9	0
4	首次充满 Initial 100% charge	55.7	0
5	50次充满 50cycles 100% charge	55.5	0
6	50次充满 50cycles 100% charge	55.5	0
7	50次充满 50cycles 100% charge	55.7	0
8	50次充满 50cycles 100% charge	55.4	0
备注：D-解体，R-破裂，F-起火，0-无解体，无破裂，无起火 Note: D-Disassembly, R-Rupture, F-Fire, 0-No disassembly, no rupture & no fire.			

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检验报告 -----附表6

Test Report

No. B1135-4

Component cell:NCR18650

Appendix 6

共9页第8页

序号 No	T-6	检测项目名称 Name of Test Items	冲撞试检 Impact
样品编号 Sample No	样品状态 Sample Status	样品表面最高温度 Max. External Temperature (°C)	其他现象 Other Event
11	首次半充(横向) Initial 50% charge (horizontal)	137	0
12	首次半充(横向) Initial 50% charge (horizontal)	132	0
13	首次半充(横向) Initial 50% charge (horizontal)	134	0
14	首次半充(横向) Initial 50% charge (horizontal)	132	0
15	首次半充(横向) Initial 50% charge (horizontal)	132	0
16	首次半充(纵向) Initial 50% charge (vertical)	84	0
17	首次半充(纵向) Initial 50% charge (vertical)	83	0
18	首次半充(纵向) Initial 50% charge (vertical)	86	0
19	首次半充(纵向) Initial 50% charge (vertical)	90	0
20	首次半充(纵向) Initial 50% charge (vertical)	87	0
备注: D-解体, R-破裂, F-起火, 0-无解体, 无破裂, 无起火 Note: D-Disassembly, R-Rupture, F-Fire, 0-No disassembly, no rupture & no fire.			

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检验报告 -----附表7

Test Report

Appendix 7

No. B1135-4

共9页第9页

序号 No	T-7	检测项目名称 Name of Test Items	过充电试检 Overcharge
样品编号 Sample No	样品状态 Sample Status	试检现象 Event	
9	首次充满 Initial 100% charge	0	
10	首次充满 Initial 100% charge	0	
11	首次充满 Initial 100% charge	0	
12	首次充满 Initial 100% charge	0	
13	50次充满 50cycles 100% charge	0	
14	50次充满 50cycles 100% charge	0	
15	50次充满 50cycles 100% charge	0	
16	50次充满 50cycles 100% charge	0	
备注： D-解体， F-起火， 0-无解体， 无起火 Note: D-Disassembly, F-Fire, 0-No disassembly & no fire.			