



新普科技股份有限公司
新世電子(常熟)有限公司
新普科技(重慶)有限公司
兆普電子(上海)有限公司

Control Number : SLEU-1308001

UN38.3 Test Report

Recommendations on the TRANSPORT OF DANGEROUS GOODS


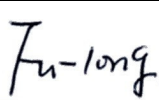

(Manual of Tests and Criteria, Fifth revised edition)

Customer : Lenovo

Model : ASM P/N 45N1728

FRU P/N 45N1729

Rating : 3.75V , 8.8Ah / 33Wh

Approved By	Checked By	Prepared By
		

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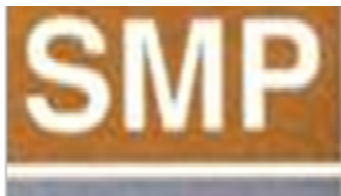
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1. Purpose of the Test :

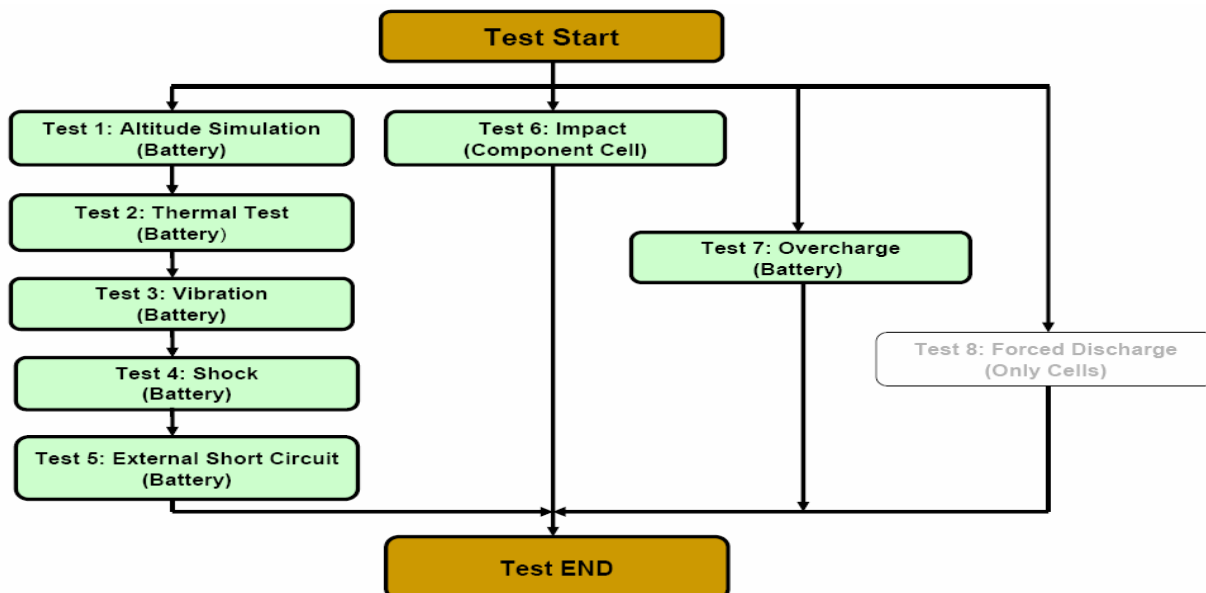
To test each cell/battery is of the type proved to meet the requirements in the Recommendations on the TRANSPORT OF DANGEROUS GOODS, Manual of Tests and Criteria, Fifth revised edition.

2. Test Quantity :

- 2.1 Four batteries, at first cycle, in fully charged states. (for T.1~T.5 test)
- 2.2 Four batteries, after fifty cycles ending in fully charged states. (for T.1~T.5 test)
- 2.3 Ten component cells, at first cycle at 50% of the design rated capacity. (for T.6 test)
- 2.4 Four batteries, at first cycle, in fully charged states. (for T.7 test)
- 2.5 Four batteries, after fifty cycles ending in fully charged states. (for T.7 test)

3. Test Procedure :

- 3.1 All detail related test procedure shall be follow TRANSPORT OF DANGEROUS GOODS, Manual of Tests and Criteria, Fifth revised edition.
- 3.2 Test flow shall be follow below statement.





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4. Test Result :

4.1 T.1 ~T.4 Test results: **Pass**

4.1.1 All batteries could meet the requirement, mass loss less than 0.1% and voltage drop less than 10% after the test.

4.1.2 No leakage, no venting, no disassembly, no rupture and no fire.

4.2 T.5 Test results: **Pass**

4.2.1 All batteries could meet the requirement, external temperature did not exceed 170°C.

4.2.2 All batteries were no disassembly, no rupture and no fire during the test and within six hours after the test.

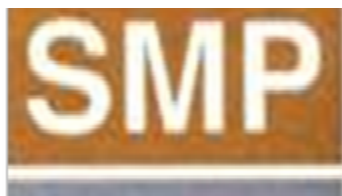
4.3 T.6 Test results: **Pass**

4.3.1 All component cells could meet the requirement, external temperature did not exceed 170°C.

4.3.2 All component cells were no disassembly and no fire during the test and within six hours after the test.

4.4 T.7 Test result: **Pass**

4.4.1 All batteries could meet no disassembly and no fire during the test and within seven days after the test.



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Control Number : SLEU-1308001

5. Test Equipment :

SMP SIMPLO TECHNOLOGY CO., LTD.

Revised date: 2013-08-01

Address : No. 471, Sec.2, Pa Teh Rd., Hu Kou, Hsin Chu Hsien 303 Taiwan

Date: 2013-08-01

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Project No.: ASM P/N 45N1728

FRU P/N 45N1729

Test Instruments Reference List

Used	Instrument ID	Instrument Name	Type	Range Used	Manufacturer	Calibration Date Last	Calibration Date Next	Remarks
Pretest								
V	ML-761	Learning	715C	0~18V 0~8A	SMP	2013/3/28	2014/3/28	
V	ML-762	Learning	715C	0~18V 0~8A	SMP	2013/3/22	2014/3/22	
V	ML-763	Learning	715C	0~18V 0~8A	SMP	2013/3/22	2014/3/22	
T.1 Altitude Simulation								
V	ML-522	Altitude		Kpa:30~90	新匠	2012/8/31	2013/8/31	
V	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2013/3/8	2014/3/8	
V	ML-494	Electronic Balance	XS1220M-SCS	1~1000 gf	CHUANHUA	2012/8/31	2013/8/31	
V	ML-550	Data Logger	313	15~35 °C; 30~80 %RH	CENTER	2012/10/19	2013/10/19	
T.2 Thermal Test								
V	ML-789	Thermal Shock	GTST-080-65-AW	T:-40 to 120 °C	GF	2013/2/18	2014/2/18	
V	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2013/3/8	2014/3/8	
V	ML-494	Electronic Balance	XS1220M-SCS	1~1000 gf	CHUANHUA	2012/8/31	2013/8/31	
T.3 Vibration								
V	ML-233	Vibration	KD-9636-EM-300F2K-30N80	F:5~2000Hz G:0.2~20G	King Design	2012/10/17	2013/10/17	
V	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2013/3/8	2014/3/8	
V	ML-494	Electronic Balance	XS1220M-SCS	1~1000 gf	CHUANHUA	2012/8/31	2013/8/31	
V	ML-552	Data Logger	313	15~35 °C; 30~80 %RH	CENTER	2012/10/19	2013/10/19	
T.4 Shock								
V	ML-056	Shock	DP-1200-25	G:10~600G	King Design	2012/10/17	2013/10/17	
V	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2013/3/8	2014/3/8	
V	ML-494	Electronic Balance	XS1220M-SCS	1~1000 gf	CHUANHUA	2012/8/31	2013/8/31	
V	ML-551	Data Logger	313	15~35 °C; 30~80 %RH	CENTER	2012/10/19	2013/10/19	
T.5 External Short Circuit								
V	ML-534	mΩ Hitester	3540	1mΩ ~ 30kΩ	YEOW LONG	2012/10/5	2013/10/5	
V	ML-339	Data Acquisition	MX100-E-1D	1~100 Vdc, -50 to 150 °C	Yokogawa	2013/6/5	2014/6/5	
V	ML-521	Chamber	WIT IPC-1000(3F)	-20 to 150 °C	WIT	2012/10/25	2013/10/25	
T.6 Impact (Component cell)								
V	ML-340	Data Acquisition	MX100-E-1D	1~100 Vdc, -50 to 150 °C	Yokogawa	2013/3/21	2014/3/21	
V	ML-076	Impact Tester			JYI SHENG	2013/1/15	2014/1/15	
T.7 Overcharge								
V	ML-481	Power Supply	DS10014	1~100Vdc, 0.3~14.4A	MOTECH	2013/6/5	2014/6/5	
V	ML-482	Power Supply	DS10014	1~100Vdc, 0.3~14.4A	MOTECH	2013/6/5	2014/6/5	
V	ML-483	Power Supply	DS10014	1~100Vdc, 0.3~14.4A	MOTECH	2013/6/5	2014/6/5	
V	ML-484	Power Supply	DS10014	1~100Vdc, 0.3~14.4A	MOTECH	2013/6/5	2014/6/5	
V	ML-485	Power Supply	DS10014	1~100Vdc, 0.3~14.4A	MOTECH	2013/6/5	2014/6/5	
V	ML-486	Power Supply	DS10014	1~100Vdc, 0.3~14.4A	MOTECH	2013/6/5	2014/6/5	
V	ML-487	Power Supply	DS6024	1~60 Vdc, 0.3~24A	MOTECH	2013/6/5	2014/6/5	
V	ML-488	Power Supply	DS6024	1~60 Vdc, 0.3~24A	MOTECH	2013/6/5	2014/6/5	
V	ML-489	Power Supply	DS6024	1~60 Vdc, 0.3~24A	MOTECH	2013/6/5	2014/6/5	
V	ML-490	Power Supply	DS6024	1~60 Vdc, 0.3~24A	MOTECH	2013/6/5	2014/6/5	
V	ML-549	Data Logger	313	15~35 °C; 30~80 %RH	CENTER	2012/10/19	2013/10/19	
Note 1: DC Voltage: 0.1~1000V; AC Voltage: 0.5~700V at 60Hz, 1kHz; Resistance: 10Ω~10MΩ; DC Current: 0.1mA~3A; AC Current: 0.01~3A at 60Hz, 0.01~1A, at 1kHz.								

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Control Number : SLEU-1308001

6. T.1~T.7 Detail Reports:

Control No.: SLEU-1308001

UN 38.3 Test Datasheet

Customer: Lenovo

Model name: ASM P/N 45N1728 1S2P

Test duration: 2013/07/11~2013/08/01

Reviewer: Esmond

Test Sample Identification:

FRU P/N 45N1729

Used	Sample No.	Sample State	Used	Sample No.	Sample State	Used	Sample No.	Sample State
V	01~04	1 Cycle, Fully charged	V	05~08	50 Cycle, Fully charged			25Cycle, Fully charged
V	09~12	1 Cycle, Fully charged	V	13~16	50 Cycle, Fully charged			25Cycle, Fully charged
V	01C~10C	1 Cycle, 50% charged			1 Cycle, 50% charged			

T.1 Altitude Simulation

Start time: 07 / 22 / 08 : 22
Finish time: 07 / 22 / 15 : 41

Ambient temp.: 25.3 °C

Operator: Betty

Reviewer: Esmond

Sample No.: 01					Sample No.: 05						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.9	157.9	Mass loss %	0.00%	P	Mass (g)	157.4	157.4	Mass loss %	0.00%	P
OCV (V)	4.28	4.28	Remained OCV%	100.00%		OCV (V)	4.28	4.28	Remained OCV%	100.00%	
Sample No.: 02					Sample No.: 06						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.9	157.9	Mass loss %	0.00%	P	Mass (g)	157.5	157.4	Mass loss %	0.06%	P
OCV (V)	4.28	4.28	Remained OCV%	100.00%		OCV (V)	4.27	4.27	Remained OCV%	100.00%	
Sample No.: 03					Sample No.: 07						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.6	157.6	Mass loss %	0.00%	P	Mass (g)	157.6	157.6	Mass loss %	0.00%	P
OCV (V)	4.27	4.27	Remained OCV%	100.00%		OCV (V)	4.27	4.27	Remained OCV%	100.00%	
Sample No.: 04					Sample No.: 08						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.8	157.8	Mass loss %	0.00%	P	Mass (g)	157.4	157.3	Mass loss %	0.06%	P
OCV (V)	4.28	4.28	Remained OCV%	100.00%		OCV (V)	4.28	4.28	Remained OCV%	100.00%	

T.2 Thermal Test

Start time: 07 / 22 / 15 : 31
Finish time: 07 / 29 / 12 : 24

Ambient temp.: 24.5 °C

Operator: Betty

Reviewer: Esmond

Finish date: 07/29/2012 12:24

Sample No.: 01					Sample No.: 05						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.9	157.8	Mass loss %	0.06%	P	Mass (g)	157.4	157.3	Mass loss %	0.06%	P
OCV (V)	4.28	4.23	Remained OCV%	98.83%		OCV (V)	4.28	4.23	Remained OCV%	98.83%	
Sample No.: 02					Sample No.: 06						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.9	157.9	Mass loss %	0.00%	P	Mass (g)	157.4	157.3	Mass loss %	0.06%	P
OCV (V)	4.28	4.22	Remained OCV%	98.60%		OCV (V)	4.27	4.21	Remained OCV%	98.59%	
Sample No.: 03					Sample No.: 07						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.6	157.5	Mass loss %	0.06%	P	Mass (g)	157.6	157.6	Mass loss %	0.00%	P
OCV (V)	4.27	4.22	Remained OCV%	98.83%		OCV (V)	4.27	4.21	Remained OCV%	98.59%	
Sample No.: 04					Sample No.: 08						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.8	157.7	Mass loss %	0.06%	P	Mass (g)	157.3	157.2	Mass loss %	0.06%	P
OCV (V)	4.28	4.22	Remained OCV%	98.60%		OCV (V)	4.28	4.21	Remained OCV%	98.36%	

T.3 Vibration

Start time: 07 / 29 / 12 : 51
Finish time: 07 / 30 / 10 : 52

Ambient temp.: 24.2 °C

Operator: Betty

Reviewer: Esmond

Sample No.: 01					Sample No.: 05						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.8	157.8	Mass loss %	0.00%	P	Mass (g)	157.3	157.2	Mass loss %	0.06%	P
OCV (V)	4.23	4.23	Remained OCV%	100.00%		OCV (V)	4.23	4.23	Remained OCV%	100.00%	
Sample No.: 02					Sample No.: 06						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.9	157.8	Mass loss %	0.06%	P	Mass (g)	157.3	157.3	Mass loss %	0.00%	P
OCV (V)	4.22	4.22	Remained OCV%	100.00%		OCV (V)	4.21	4.21	Remained OCV%	100.00%	
Sample No.: 03					Sample No.: 07						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.5	157.5	Mass loss %	0.00%	P	Mass (g)	157.6	157.5	Mass loss %	0.06%	P
OCV (V)	4.22	4.22	Remained OCV%	100.00%		OCV (V)	4.21	4.21	Remained OCV%	100.00%	
Sample No.: 04					Sample No.: 08						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.7	157.6	Mass loss %	0.06%	P	Mass (g)	157.2	157.2	Mass loss %	0.00%	P
OCV (V)	4.22	4.22	Remained OCV%	100.00%		OCV (V)	4.21	4.21	Remained OCV%	100.00%	

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Control Number : SLEU-1308001

T.4 Shock		Start time: 07/30/ 11:34				Ambient temp.: 24.3 ℃		Operator: Betty		Reviewer: Esmond	
		Finish time: 07/30/ 15:26									
Sample No.: 01						Sample No.: 05					
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.8	157.8	Mass loss %	0.00%	P	Mass (g)	157.2	157.2	Mass loss %	0.00%	P
OCV (V)	4.23	4.23	Remained OCV%	100.00%		OCV (V)	4.23	4.23	Remained OCV%	100.00%	
Sample No.: 02						Sample No.: 06					
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.8	157.8	Mass loss %	0.00%	P	Mass (g)	157.3	157.2	Mass loss %	0.06%	P
OCV (V)	4.22	4.21	Remained OCV%	99.76%		OCV (V)	4.21	4.20	Remained OCV%	99.76%	
Sample No.: 03						Sample No.: 07					
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.5	157.4	Mass loss %	0.06%	P	Mass (g)	157.5	157.4	Mass loss %	0.06%	P
OCV (V)	4.22	4.21	Remained OCV%	99.76%		OCV (V)	4.21	4.21	Remained OCV%	100.00%	
Sample No.: 04						Sample No.: 08					
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	157.6	157.6	Mass loss %	0.00%	P	Mass (g)	157.2	157.1	Mass loss %	0.06%	P
OCV (V)	4.22	4.21	Remained OCV%	99.76%		OCV (V)	4.21	4.21	Remained OCV%	100.00%	

T.5 External Short Circuit			Start time: 07/30/ 16 : 09				Ambient temp.: 24.6 ℃				Operator: Betty				Reviewer: Esmond					
			Finish time: 07/31/ 11 : 35		Sample No.: 01		Sample No.: 02		Sample No.: 03		Sample No.: 04		Sample No.: 05		Sample No.: 06		Sample No.: 07		Sample No.: 08	
Resistance (<100mΩ)			55.3		57.6		53.9		55.3		56.8		59.4		53.6		56.5			
OCV before test after short circuit(V)			4.23	0.00	4.21	0.00	4.21	0.00	4.21	0.00	4.23	0.00	4.20	0.00	4.21	0.00	4.21	0.00		
Max Temp. (<170℃)			55.3		55.1		55.3		55.3		55.2		55.2		55.3		55.3			
Results			P		P		P		P		P		P		P		P			

T.6 Impact (Component cell)		Start time: 07 / 31 / 08 : 17		Ambient temp.: 25.1 ℃		Operator: Betty		Reviewer: Esmond	
Finish time: 07 / 31 / 16 : 27		Sample No.: 02C		Sample No.: 03C		Sample No.: 04C		Sample No.: 05C	
OCV before test(V)	3.74	3.74	3.75	3.75	3.75	3.75			
Max Temp. (< 170℃)	91.6	92.3	92.7	91.9	90.6				
Results	P	P	P	P	P				
Sample No.: 06C		Sample No.: 07C		Sample No.: 08C		Sample No.: 09C		Sample No.: 10C	
OCV before test(V)	3.75	3.75	3.75	3.75	3.75	3.75			
Max Temp. (< 170℃)	92.8	95.4	93.9	92.3	88.6				
Results	P	P	P	P	P				

T.7 Overcharge		Start time: 07 / 24 / 08 : 45		Finish time: 08 / 01 / 16 : 51		Ambient temp.: 24.2 ℃		Operator: Betty		Reviewer: Esmond	
	Sample No.: 09	Sample No.: 10	Sample No.: 11	Sample No.: 12	Sample No.: 13	Sample No.: 14	Sample No.: 15	Sample No.: 16			
OCV before test(V)	4.28	4.28	4.28	4.27	4.28	4.27	4.27	4.28			
Results	P	P	P	P	P	P	P	P			

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Control Number : SLEU-1308001

7. Equipment for Test:



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