

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 : SLEU1304004

UN38.3 Test Report


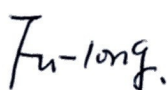

Recommendations on the TRANSPORT OF DANGEROUS GOODS

(Manual of Tests and Criteria, Fifth revised edition)

Customer : Lenovo

Model : L13M3F01

Rating : 11.25V , 36Wh / 3200mAh

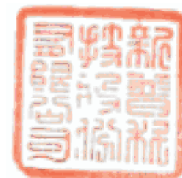
Approved By	Checked By	Prepared By
		

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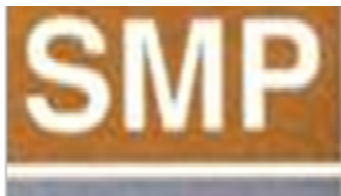
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1. Purpose of the Test :

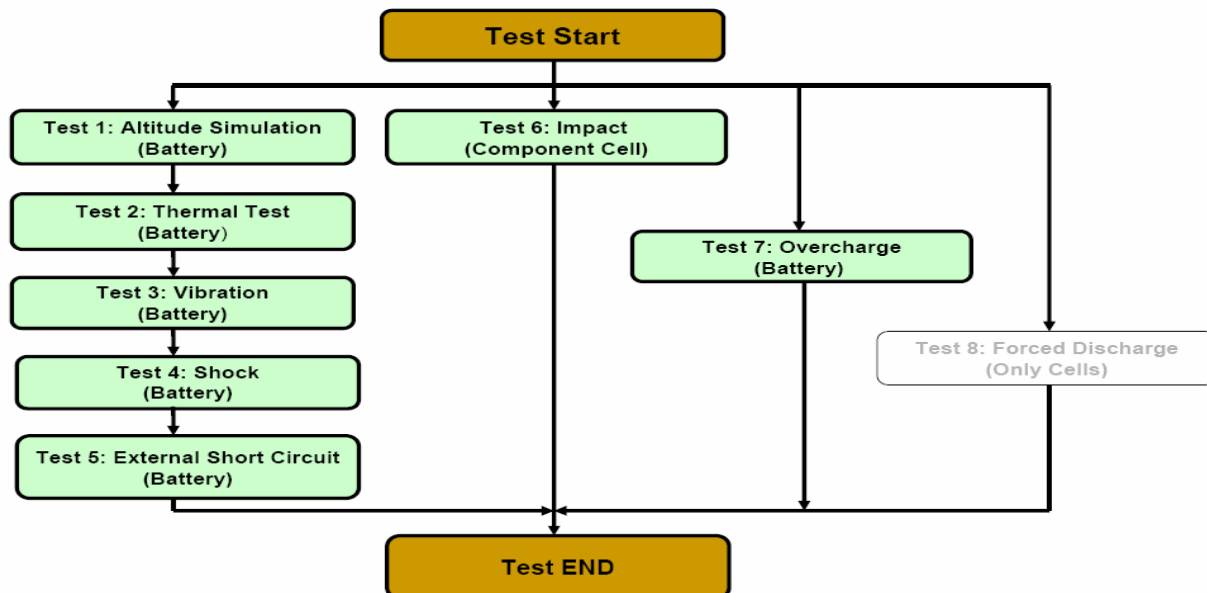
To test each cell/battery is of the type proved to meet the requirements in the Recommendations on the TRANSPORT OF DANGEROUS GOODS, Manual of Tests and Criteria, Fifth revised edition.

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 Five 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 : SLEU1304004

5. Test Equipment :

SMP SIMPLO TECHNOLOGY CO., LTD.

Revised date: 2013-04-18

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

Date:2013-04-18

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Project No.: L13M3F01 3S1P

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	2012/7/6	2013/7/6	
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	2012/7/6	2013/7/6	
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	2012/7/6	2013/7/6	
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	2012/7/6	2013/7/6	
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	2012/6/27	2013/6/27	
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	2012/4/26	2013/4/26	
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	2012/6/27	2013/6/27	
V	ML-482	Power Supply	DS10014	1-100Vdc, 0.3-14.4A	MOTECH	2012/6/27	2013/6/27	
V	ML-483	Power Supply	DS10014	1-100Vdc, 0.3-14.4A	MOTECH	2012/6/27	2013/6/27	
V	ML-484	Power Supply	DS10014	1-100Vdc, 0.3-14.4A	MOTECH	2012/6/27	2013/6/27	
V	ML-485	Power Supply	DS10014	1-100Vdc, 0.3-14.4A	MOTECH	2012/6/27	2013/6/27	
V	ML-486	Power Supply	DS10014	1-100Vdc, 0.3-14.4A	MOTECH	2012/6/27	2013/6/27	
V	ML-487	Power Supply	DS6024	1-60 Vdc, 0.3-24A	MOTECH	2012/6/27	2013/6/27	
V	ML-488	Power Supply	DS6024	1-60 Vdc, 0.3-24A	MOTECH	2012/6/27	2013/6/27	
V	ML-489	Power Supply	DS6024	1-60 Vdc, 0.3-24A	MOTECH	2012/6/27	2013/6/27	
V	ML-490	Power Supply	DS6024	1-60 Vdc, 0.3-24A	MOTECH	2012/6/27	2013/6/27	
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 : SLEU1304004

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

Control No.: SLEU-1304004

UN 38.3 Test Datasheet

Customer: Lenovo

Model name: L13M3F01 3S1P

Test duration: 2013/03/25~2013/04/18

Reviewer: Esmond

Test Sample Identification:

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~05C	1 Cycle, 50% charged			1 Cycle, 50% charged			

T.1 Altitude Simulation			Start time: 04 / 09 / 09 : 17		Finish time: 04 / 09 / 15 : 36		Ambient temp.: 25.2 °C		Operator: Betty		Reviewer: Esmond	
Sample No.: 01						Sample No.: 05						
	Before	After	Variation		Results		Before	After	Variation		Results	
Mass (g)	159.8	159.7	Mass loss %	0.06%	P	Mass (g)	159.5	159.5	Mass loss %	0.00%	P	
OCV (V)	12.99	12.99	Remained OCV%	100.00%		OCV (V)	12.99	12.99	Remained OCV%	100.00%		
Sample No.: 02						Sample No.: 06						
	Before	After	Variation		Results		Before	After	Variation		Results	
Mass (g)	159.6	159.6	Mass loss %	0.00%	P	Mass (g)	159.6	159.5	Mass loss %	0.06%	P	
OCV (V)	13.00	12.99	Remained OCV%	99.92%		OCV (V)	13.00	12.99	Remained OCV%	99.92%		
Sample No.: 03						Sample No.: 07						
	Before	After	Variation		Results		Before	After	Variation		Results	
Mass (g)	159.5	159.4	Mass loss %	0.06%	P	Mass (g)	159.5	159.4	Mass loss %	0.06%	P	
OCV (V)	12.99	12.98	Remained OCV%	99.92%		OCV (V)	12.99	12.99	Remained OCV%	100.00%		
Sample No.: 04						Sample No.: 08						
	Before	After	Variation		Results		Before	After	Variation		Results	
Mass (g)	159.6	159.6	Mass loss %	0.00%	P	Mass (g)	159.4	159.3	Mass loss %	0.06%	P	
OCV (V)	12.99	12.99	Remained OCV%	100.00%		OCV (V)	12.99	12.98	Remained OCV%	99.92%		

T.2 Thermal Test			Start time: 04 / 09 / 14 : 22		Ambient temp.: 24.3 °C		Operator: Betty		Reviewer: Esmond		
Sample No.: 01					Sample No.: 05						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	159.7	159.6	Mass loss %	0.06%	P	Mass (g)	159.5	159.4	Mass loss %	0.06%	P
OCV (V)	12.99	12.77	Remained OCV%	98.31%		OCV (V)	12.99	12.79	Remained OCV%	98.46%	
Sample No.: 02					Sample No.: 06						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	159.6	159.6	Mass loss %	0.00%	P	Mass (g)	159.5	159.4	Mass loss %	0.06%	P
OCV (V)	12.99	12.78	Remained OCV%	98.38%		OCV (V)	12.99	12.79	Remained OCV%	98.46%	
Sample No.: 03					Sample No.: 07						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	159.4	159.3	Mass loss %	0.06%	P	Mass (g)	159.4	159.3	Mass loss %	0.06%	P
OCV (V)	12.98	12.77	Remained OCV%	98.38%		OCV (V)	12.99	12.77	Remained OCV%	98.31%	
Sample No.: 04					Sample No.: 08						
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	159.6	159.5	Mass loss %	0.06%	P	Mass (g)	159.3	159.2	Mass loss %	0.06%	P
OCV (V)	12.99	12.77	Remained OCV%	98.31%		OCV (V)	12.98	12.76	Remained OCV%	98.31%	

T.3 Vibration			Start time: 04 / 16 / 12 : 37		Ambient temp.: 24.7 °C		Operator: Betty		Reviewer: Esmond		
Sample No.: 01						Sample No.: 05					
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	159.6	159.5	Mass loss %	0.06%	P	Mass (g)	159.4	159.3	Mass loss %	0.06%	P
OCV (V)	12.77	12.77	Remained OCV%	100.00%		OCV (V)	12.79	12.79	Remained OCV%	100.00%	
Sample No.: 02						Sample No.: 06					
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	159.6	159.5	Mass loss %	0.06%	P	Mass (g)	159.4	159.4	Mass loss %	0.00%	P
OCV (V)	12.78	12.77	Remained OCV%	99.92%		OCV (V)	12.79	12.79	Remained OCV%	100.00%	
Sample No.: 03						Sample No.: 07					
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	159.3	159.3	Mass loss %	0.00%	P	Mass (g)	159.3	159.2	Mass loss %	0.06%	P
OCV (V)	12.77	12.76	Remained OCV%	99.92%		OCV (V)	12.77	12.77	Remained OCV%	100.00%	
Sample No.: 04						Sample No.: 08					
	Before	After	Variation		Results		Before	After	Variation		Results
Mass (g)	159.5	159.4	Mass loss %	0.06%	P	Mass (g)	159.2	159.2	Mass loss %	0.00%	P
OCV (V)	12.77	12.77	Remained OCV%	100.00%		OCV (V)	12.76	12.76	Remained OCV%	100.00%	

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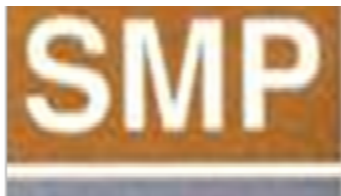
Control Number : SLEU1304004

T.4 Shock		Start time: 04 / 17 / 11 : 34	Finish time: 04 / 17 / 15 : 37		Ambient temp.: 24.6 °C	Operator: Betty	Reviewer: Esmond
Sample No.: 01		Before	After	Variation	Results	Sample No.: 05	
Mass (g)	159.5	159.5	Mass loss %	0.00%	P	Mass (g)	159.3
OCV (V)	12.77	12.76	Remained OCV%	99.92%		OCV (V)	12.79
Sample No.: 02		Before	After	Variation	Results	Sample No.: 06	
Mass (g)	159.5	159.5	Mass loss %	0.00%	P	Mass (g)	159.4
OCV (V)	12.77	12.77	Remained OCV%	100.00%		OCV (V)	12.79
Sample No.: 03		Before	After	Variation	Results	Sample No.: 07	
Mass (g)	159.3	159.2	Mass loss %	0.06%	P	Mass (g)	159.2
OCV (V)	12.76	12.76	Remained OCV%	100.00%		OCV (V)	12.77
Sample No.: 04		Before	After	Variation	Results	Sample No.: 08	
Mass (g)	159.4	159.4	Mass loss %	0.00%	P	Mass (g)	159.2
OCV (V)	12.77	12.77	Remained OCV%	100.00%		OCV (V)	12.76

T.5 External Short Circuit			Start time: 04/ 17 / 16 : 23		Ambient temp.: 23.2 °C		Operator: Betty		Reviewer: Esmond									
			Finish time: 04/ 18 / 11 : 47															
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)			56.3		52.4		55.2		53.6		53.9		51.7		54.5		56.8	
OCV before test/ after short circuit(V)			12.76 0.00		12.77 0.00		12.76 0.00		12.77 0.00		12.78 0.00		12.79 0.00		12.77 0.00		12.75 0.00	
Max Temp. (< 170℃)			55.0		55.2		55.1		55.2		55.2		55.1		55.0		55.2	
Results			P		P		P		P		P		P		P		P	

T.6 Impact (Component cell)		Start time: 04 / 12 / 11 : 16	Finish time: 04 / 12 / 15 : 34		Ambient temp.: 24.6 °C	Operator: Betty	Reviewer: Esmond
OCV before test(V)	3.75	3.76	3.76	3.75	3.76		
Max Temp. (< 170°C)	94.3	98.4	99.6	93.9	95.7		
Results	P	P	P	P	P		
OCV before test(V)							
Max Temp. (< 170°C)							
Results							

T.7 Overcharge		Start time: 04 / 10 / 08 : 42		Finish time: 04 / 18 / 15 : 38		Ambient temp.: 24.1 °C		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)	12.99	13.00	12.99	12.99	12.99	13.00	12.99	12.99			
Results	P	P	P	P	P	P	P	P			



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Control Number : SLEU1304004

7. Equipment for Test:



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