

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 : SLEU1108001

## UN38.3 Test Report


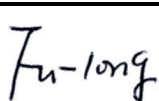

### Recommendations on the TRANSPORT OF DANGEROUS GOODS

(Manual of Tests and Criteria, Fifth revised edition)

**Customer : Lenovo**

**Model : L11M6Y01**

**Rating : 10.8V , 48Wh / 4400mAh**

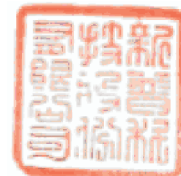
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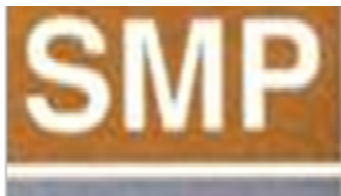
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## 1. Purpose of the Test :

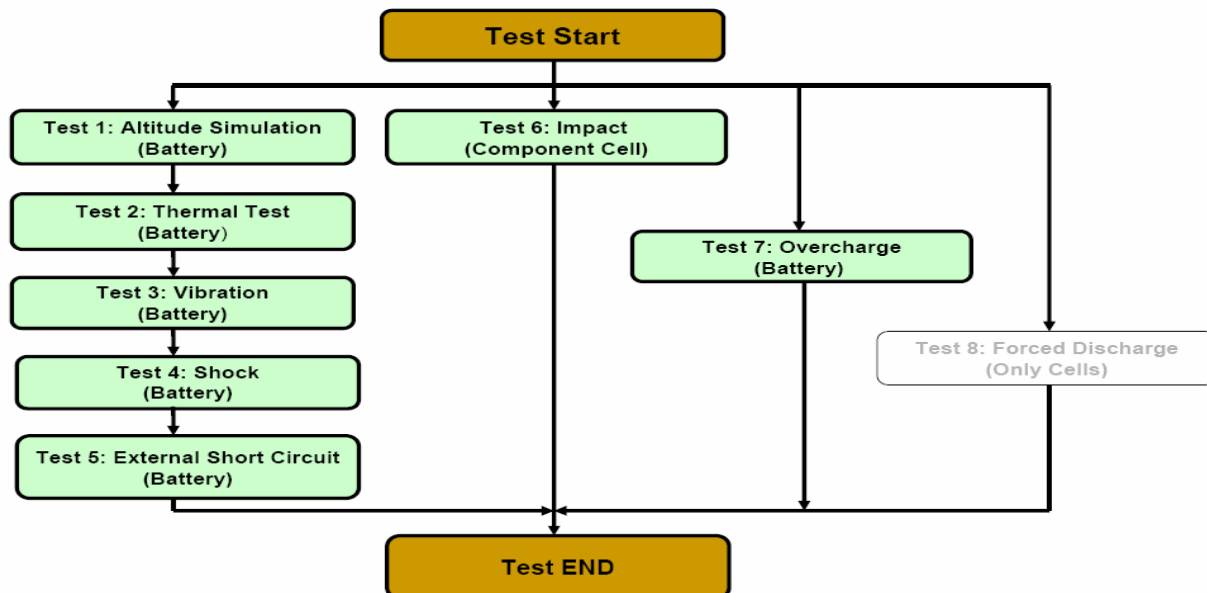
To test each cell/battery is of the type proved to meet the requirements in the Recommendations on the TRANSPORT OF DANGEROUS GOODS, Manual of Tests and Criteria, Fifth revised edition.

## 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.

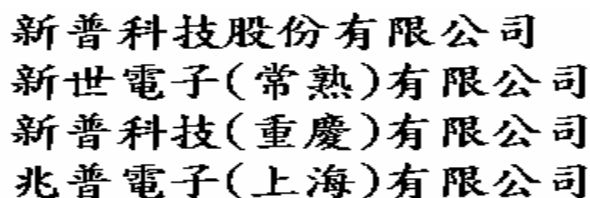
##### 4.3 T.6 Test results: **Pass**

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.



## 5. Test Equipment :



Date:2011-08-11

Project No.: L11M6Y01 3S2P

Used	Instrument ID	Instrument Name	Type	Range Used	Manufacturer	Calibration Date_Last	Calibration Date_Next	Remarks
	<b>Pretest</b>							
V	ML-052	Learning	711	0~18V 0~8A	SMP	2011/3/11	2012/3/11	
V	ML-053	Learning	711	0~18V 0~8A	SMP	2011/3/14	2012/3/14	
V	ML-055	Learning	711	0~18V 0~8A	SMP	2011/3/14	2012/3/14	
	<b>T.1 Altitude Simulation</b>							
V	ML-522	Altitude		Kpa:30~90	新匠	2010/10/29	2011/10/29	
V	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2011/7/4	2012/7/4	
V	ML-494	Electronic Balance	XS1220M-SCS	1-1000 gf	CHUANHUA	2010/10/29	2011/10/29	
V	ML-550	Data Logger	313	15~35 ℃ ; 30~80 %RH	CENTER	2010/12/21	2011/12/21	
	<b>T.2 Thermal Test</b>							
V	ML-018	Thermal Shock	WSF-602	T:-40 to 120℃	WIT	2010/8/31	2011/8/31	
V	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2011/7/4	2012/7/4	
V	ML-494	Electronic Balance	XS1220M-SCS	1-1000 gf	CHUANHUA	2010/10/29	2011/10/29	
	<b>T.3 Vibration</b>							
V	ML-233	Vibration	KD-9636-EM-300F2K-30N80	F:5~2000Hz G:0.2~20G	King Design	2010/12/10	2011/12/10	
V	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2011/7/4	2012/7/4	
V	ML-494	Electronic Balance	XS1220M-SCS	1-1000 gf	CHUANHUA	2010/10/29	2011/10/29	
V	ML-552	Data Logger	313	15~35 ℃ ; 30~80 %RH	CENTER	2010/12/21	2011/12/21	
	<b>T.4 Shock</b>							
V	ML-056	Shock	DP-1200-25	G:10~600G	King Design	2010/12/24	2011/12/24	
V	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2011/7/4	2012/7/4	
V	ML-494	Electronic Balance	XS1220M-SCS	1-1000 gf	CHUANHUA	2010/10/29	2011/10/29	
V	ML-551	Data Logger	313	15~35 ℃ ; 30~80 %RH	CENTER	2010/12/21	2011/12/21	
	<b>T.5 External Short Circuit</b>							
V	ML-534	mΩ Hitester	3540	1mΩ ~ 30kΩ	YEOW LONG	2010/12/2	2011/12/2	
V	ML-339	Data Acquisition	MX100-E-1D	1-100 Vdc, -50 to 150℃	Yokogawa	2011/7/1	2012/7/1	
V	ML-521	Chamber	WIT IPC-1000(3F)	-20 to 150℃	WIT	2010/12/2	2011/12/2	
	<b>T.6 Impact ( Component cell )</b>							
V	ML-340	Data Acquisition	MX100-E-1D	1-100 Vdc, -50 to 150℃	Yokogawa	2011/5/26	2012/5/26	
V	ML-076	Impact Tester			JYI SHENG	2011/3/11	2012/3/11	
	<b>T.7 Overcharge</b>							
V	ML-139	Power Supply	GC50-30D	0~50V 0.1~30A	LOCK	2011/3/4	2012/3/4	
V	ML-140	Power Supply	GC50-30D	0~50V 0.1~30A	LOCK	2011/3/4	2012/3/4	
V	ML-141	Power Supply	GC50-30D	0~50V 0.1~30A	LOCK	2011/3/4	2012/3/4	
V	ML-142	Power Supply	GC50-30D	0~50V 0.1~30A	LOCK	2011/3/4	2012/3/4	
V	ML-143	Power Supply	GC50-30D	0~50V 0.1~30A	LOCK	2011/3/4	2012/3/4	
V	ML-549	Data Logger	313	15~35 ℃ ; 30~80 %RH	CENTER	2010/12/21	2011/12/21	

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 : SLEU1108001

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

Control No.: SLEU-1108001

UN 38.3 Test Datasheet

Customer: Lenovo

Model name: L11M6Y01 3S2P

Test duration: 2011/07/19~2011/08/11

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: 08 / 02 / 08 : 11  
Finish time: 08 / 02 / 14 : 26

Ambient temp.: 24.5 °C

Operator: Betty

Reviewer: Esmond

Sample No.: 01					Sample No.: 05				
Before	After	Variation		Results	Before	After	Variation		Results
Mass (g)	290.5	290.5	Mass loss %	0.00%	Mass (g)	290.5	290.4	Mass loss %	0.03%
OCV (V)	12.59	12.59	Remained OCV%	100.00%	OCV (V)	12.59	12.59	Remained OCV%	100.00%
Sample No.: 02					Sample No.: 06				
Before	After	Variation		Results	Before	After	Variation		Results
Mass (g)	290.6	290.6	Mass loss %	0.00%	Mass (g)	290.4	290.3	Mass loss %	0.03%
OCV (V)	12.59	12.59	Remained OCV%	100.00%	OCV (V)	12.58	12.58	Remained OCV%	100.00%
Sample No.: 03					Sample No.: 07				
Before	After	Variation		Results	Before	After	Variation		Results
Mass (g)	290.4	290.4	Mass loss %	0.00%	Mass (g)	290.6	290.6	Mass loss %	0.00%
OCV (V)	12.59	12.58	Remained OCV%	99.92%	OCV (V)	12.59	12.59	Remained OCV%	100.00%
Sample No.: 04					Sample No.: 08				
Before	After	Variation		Results	Before	After	Variation		Results
Mass (g)	290.6	290.6	Mass loss %	0.00%	Mass (g)	290.5	290.5	Mass loss %	0.00%
OCV (V)	12.58	12.58	Remained OCV%	100.00%	OCV (V)	12.59	12.58	Remained OCV%	99.92%

### T.2 Thermal Test

Start time: 08 / 02 / 15 : 32  
Finish time: 08 / 09 / 10 : 42

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)	290.5	290.4	Mass loss %	0.03%	Mass (g)	290.4	290.3	Mass loss %	0.03%
OCV (V)	12.59	12.37	Remained OCV%	98.28%	OCV (V)	12.59	12.36	Remained OCV%	98.20%
Sample No.: 02					Sample No.: 06				
Before	After	Variation		Results	Before	After	Variation		Results
Mass (g)	290.6	290.6	Mass loss %	0.00%	Mass (g)	290.3	290.2	Mass loss %	0.03%
OCV (V)	12.59	12.41	Remained OCV%	98.57%	OCV (V)	12.58	12.37	Remained OCV%	98.33%
Sample No.: 03					Sample No.: 07				
Before	After	Variation		Results	Before	After	Variation		Results
Mass (g)	290.4	290.3	Mass loss %	0.03%	Mass (g)	290.6	290.5	Mass loss %	0.03%
OCV (V)	12.58	12.40	Remained OCV%	98.57%	OCV (V)	12.59	12.37	Remained OCV%	98.28%
Sample No.: 04					Sample No.: 08				
Before	After	Variation		Results	Before	After	Variation		Results
Mass (g)	290.6	290.6	Mass loss %	0.00%	Mass (g)	290.5	290.4	Mass loss %	0.03%
OCV (V)	12.58	12.37	Remained OCV%	98.33%	OCV (V)	12.58	12.36	Remained OCV%	98.23%

### T.3 Vibration

Start time: 08 / 09 / 11 : 41  
Finish time: 08 / 10 / 10 : 16

Ambient temp.: 24.6 °C

Operator: Betty

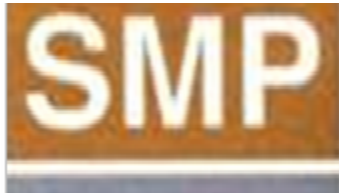
Reviewer: Esmond

Sample No.: 01					Sample No.: 05				
Before	After	Variation		Results	Before	After	Variation		Results
Mass (g)	290.4	290.4	Mass loss %	0.00%	Mass (g)	290.3	290.2	Mass loss %	0.03%
OCV (V)	12.37	12.36	Remained OCV%	99.92%	OCV (V)	12.36	12.36	Remained OCV%	100.00%
Sample No.: 02					Sample No.: 06				
Before	After	Variation		Results	Before	After	Variation		Results
Mass (g)	290.6	290.5	Mass loss %	0.03%	Mass (g)	290.2	290.2	Mass loss %	0.00%
OCV (V)	12.41	12.41	Remained OCV%	100.00%	OCV (V)	12.37	12.37	Remained OCV%	100.00%
Sample No.: 03					Sample No.: 07				
Before	After	Variation		Results	Before	After	Variation		Results
Mass (g)	290.3	290.3	Mass loss %	0.00%	Mass (g)	290.5	290.4	Mass loss %	0.03%
OCV (V)	12.40	12.40	Remained OCV%	100.00%	OCV (V)	12.37	12.36	Remained OCV%	99.92%
Sample No.: 04					Sample No.: 08				
Before	After	Variation		Results	Before	After	Variation		Results
Mass (g)	290.6	290.6	Mass loss %	0.00%	Mass (g)	290.4	290.4	Mass loss %	0.00%
OCV (V)	12.37	12.36	Remained OCV%	99.92%	OCV (V)	12.36	12.36	Remained OCV%	100.00%

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Control Number : SLEU1108001

T.4 Shock		Start time: 08 / 10 / 13 : 34	Ambient temp.: 25.1 ℃	Operator: Betty	Reviewer: Esmond
		Finish time: 08 / 10 / 15 : 42			
		Sample No.: 01	Sample No.: 05		
	Before	After	Variation	Results	
Mass (g)	290.4	290.3	Mass loss %	0.03%	P
OCV (V)	12.36	12.36	Remained OCV%	100.00%	P
		Sample No.: 02	Sample No.: 06		
	Before	After	Variation	Results	
Mass (g)	290.5	290.5	Mass loss %	0.00%	P
OCV (V)	12.41	12.41	Remained OCV%	100.00%	P
		Sample No.: 03	Sample No.: 07		
	Before	After	Variation	Results	
Mass (g)	290.3	290.3	Mass loss %	0.00%	P
OCV (V)	12.40	12.39	Remained OCV%	99.92%	P
		Sample No.: 04	Sample No.: 08		
	Before	After	Variation	Results	
Mass (g)	290.6	290.6	Mass loss %	0.00%	P
OCV (V)	12.36	12.36	Remained OCV%	100.00%	P

T.5 External Short Circuit		Start time: 08 / 10 / 17 : 12		Ambient temp.: 25.2 ℃		Operator: Betty		Reviewer: Esmond	
		Finish time: 08 / 11 / 09 : 27							
	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)	55.9	58.4	59.3	56.7	56.7	54.3	55.2	56.2	
OCV before test after short circuit(V)	12.36 0.00	12.41 0.00	12.39 0.00	12.35 0.00	12.36 0.00	12.37 0.00	12.36 0.00	12.36 0.00	
Max Temp. (< 170℃)	55.2	55.1	55.0	55.1	55.1	55.0	55.1	55.1	
Results	P	P	P	P	P	P	P	P	

T.6 Impact (Component cell)		Start time: 08 / 03 / 17 : 18	Ambient temp.: 25.3 ℃	Operator: Betty	Reviewer: Esmond
		Finish time: 08 / 04 / 09 : 42			
	Sample No.: 01C	Sample No.: 02C	Sample No.: 03C	Sample No.: 04C	Sample No.: 05C
OCV before test(V)	3.59	3.60	3.59	3.60	3.60
Max Temp. (< 170℃)	92.3	92.9	93.7	95.2	91.6
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)					
Max Temp. (< 170℃)					
Results					

T.7 Overcharge		Start time: 08 / 03 / 09 : 51		Ambient temp.: 24.3 ℃		Operator: Betty		Reviewer: Esmond	
		Finish time: 08 / 11 / 16 : 27							
	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)	12.59	12.59	12.58	12.59	12.59	12.58	12.59	12.59	
Results	P	P	P	P	P	P	P	P	





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Control Number : SLEU1108001

## 7. Equipment for Test:

