



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 NO: LE-CU-13-10-010

UN38.3 Test Report

Recommendations on the TRANSPORT OF DANGEROUS GOODS

(Manual of Tests and Criteria, Fifth revised edition, Amend 1)

Customer: Lenovo
Model: L12M4E55
Rating: 14.88V, 41Wh, 2800mAh
Test duration: 2013/9/9~2013/10/3

Approved By	Checked By	Prepared By

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1. Purpose of the Test:

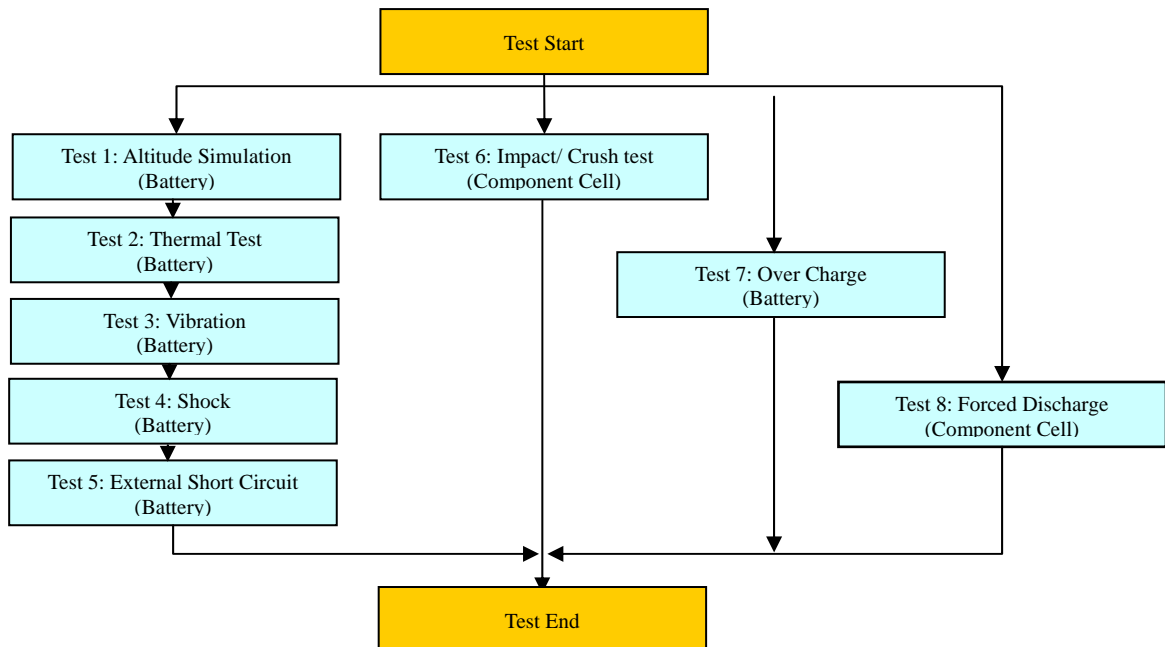
To test each cell/battery is of the type proved to meet the requirements in the Recommendations on the TRANSPORT OF DANGEROUS GOODS, Manual of Tests and Criteria, Fifth revised edition, Amend 1.

2. Test Quantity:

- 2.1 Four batteries, at first cycle, in fully charged states. (T.1~T.5 test only)
- 2.2 Four batteries, after fifty cycles ending in fully charged states. (T.1~T.5 test only)
- 2.3 Five component cells, at first cycle at 50% of the design rated capacity. (T.6 test only)
- 2.4 Four batteries, at first cycle, in fully charged states. (T.7 test only)
- 2.5 Four batteries, after fifty cycles ending in fully charged states. (T.7 test only)
- 2.6 Ten component cells, at first cycle in fully discharge states. (T.8 test only)
- 2.7 Ten component cells, after fifty cycles ending in fully discharged states. (T.8 test only)

3. Test procedure:

- 3.1 All detail related test procedure shall be follow Standard Operation Procedure of SMP subjected CW01-5916 Rev.4 issue documentation.
- 3.2 Test flow shall be follow below statement.





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Control NO: LE-CU-13-10-010

4. Test Result:

4.1 T.1 ~T4 Test results: **Pass**

4.1.1 Batteries meet requirement regard mass loss was less then 0.1% and voltage loss less 10% relating original situation.

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

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

4.2.1 All Batteries can meet requirement subjected external temperature does not exceed 170 .

4.2.2 All Batteries no disassembly, no rupture and no fire within six hours.

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

4.3.1 All cells can meet requirement subjected external temperature does not exceed 170 .

4.3.2 All cells no disassembly and no fire within six hours of this test.

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

4.4.1 All batteries can meet no disassembly and no fire within seven days of the test.

4.5 T.8 Test results: **Pass**

4.5.1 All rechargeable cells can meet no disassembly and no fire within seven days of the test.



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Control NO: LE-CU-13-10-010

5. Test Equipment:

SMP 新世電子(常熟)有限公司
 SIMPLO TECHNOLOGY CO., LTD.

Revised date: 2013/10/09

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Address : No.2 Dong Nan Avenue, Changshu, Jingsu Province, China

Date: 2013/9/9~2013/10/3

TEL: 0512-52302255

FAX: 0512-52302277

Model name: L12M4E55

Test Instruments Reference List

Used	Instrument ID	Instrument Name	Type	Range Used	Manufacturer	Calibration Date_Las	Calibration Date_Next	Remarks
	Pratest							
V	C602M00/S1053	Learning	GW-T-2010-24	0~20V 0~10A	GW INSTRUK	2013/10/09	2014/10/8	
V	C602M00/S1054	Learning	GW-T-2010-24	0~20V 0~10A	GW INSTRUK	2013/10/09	2014/10/8	
	Low Pressure Test							
V	C602M00/0462	Altitude	SVT-110	Kpa: 0~99Kpa	HSIN JIANG	2013/9/26	2013/9/25	
V	C602M00/10293	mQ Hitester	3561	R: 10~310mQ V: 20~20V	HIOKI	2013/10/09	2014/10/8	
V	C602M00/C0482	Electronic Balance	XS1220M-SCS	1220g±0.001g	CHENGZHU	2013/9/26	2013/9/25	
V	C602M00/T0412	Thermo Meter	TA218	T: -10℃~70℃ RH: 25%~98%	KTJ	2013/9/26	2013/9/25	
	Thermal Test							
V	C602M00/0150	Thermal Shock	KSKB-415TBS	T: 65℃ to 150℃	KSON	2013/9/26	2013/9/25	
V	C602M00/12093	mQ Hitester	3561	R: 10~310mQ V: 20~20V	HIOKI	2013/10/09	2014/10/8	
V	C602M00/C0482	Electronic Balance	XS1220M-SCS	1220g±0.001g	CHENGZHU	2013/9/26	2013/9/25	
V	C602M00/T0412	Thermo Meter	TA218	T: -10℃~70℃ RH: 25%~98%	KTJ	2013/9/26	2013/9/25	
	Vibration Test							
V	C602M00/0197	Vibration	EM-200F2K 25N50	F: 3~2000Hz G: 0.2~55G	King Design	2013/3/15	2014/3/14	
V	C602M00/0052	Vibration	EM-200F2K 25N50	F: 3~2000Hz G: 0.2~55G	King Design	2013/3/15	2014/3/14	
V	C602M00/12093	mQ Hitester	3561	R: 10~310mQ V: 20~20V	HIOKI	2013/10/09	2014/10/8	
V	C602M00/C0482	Electronic Balance	XS1220M-SCS	1220g±0.001g	CHENGZHU	2013/9/26	2014/9/25	
	Shock Test							
V	C602M00/0570	Shock	HS 15/45	G: 10~2000G	Lansmont	2013/9/14	2014/9/13	
V	C602M00/12093	mQ Hitester	3561	R: 10~310mQ V: 20~20V	HIOKI	2013/10/09	2013/10/08	
V	C602M00/C0482	Electronic Balance	XS1220M-SCS	1220g±0.001g	CHENGZHU	2013/9/26	2014/9/25	
	External Short Circuit Test							
V	C602M00/12093	mQ Hitester	3561	R: 10~310mQ V: 20~20V	HIOKI	2013/10/09	2013/10/08	
V	C602M00/0207	Data logger	34970A	V: 0~300V, T: -150℃~1200℃	Agilent	2013/9/26	2014/9/25	
V	C602M00/0518	chamber	WIT TH-2P-E	-40℃ to 150℃	WIT	2013/9/26	2014/9/25	
V	C602M00/T0412	Thermo Meter	TA218	T: -10℃~70℃ RH: 25%~98%	KTJ	2013/9/26	2014/9/25	
	Impact Test/Cursh Test							
V	C602M00/0743	Cursh Test	BE-6047	1.0KN~15.0KN	BELL	2013/10/8	2014/10/07	
V	C602M00/0589	Data logger	34970A	V: 0~300V, T: -150℃~1200℃	Agilent	2013/9/26	2014/9/25	
V	C602M00/1204	Impact test	100-372	H: 60~80cm	JYI SHENG	Note1		
V	C602M00/T0412	Thermo Meter	TA218	T: -10℃~70℃ RH: 25%~98%	KTJ	2013/9/26	2014/9/25	
	Overcharge Test							
V	C602M00/P0779	Power Supply	D86024	0~60V 0~24A	MOTECH	2013/1/12	2014/1/11	
V	C602M00/P0777	Power Supply	D86024	0~60V 0~24A	MOTECH	2013/1/12	2014/1/11	
V	C602M00/P0775	Power Supply	D86024	0~60V 0~24A	MOTECH	2013/1/12	2014/1/11	
V	C602M00/P0781	Power Supply	D86024	0~60V 0~24A	MOTECH	2013/1/12	2014/1/11	
V	C602M00/T0412	Thermo Meter	TA218	T: -10℃~70℃ RH: 25%~98%	KTJ	2013/9/26	2013/9/25	
	Froced Discharge Test							
V	C602M00/0207	Data logger	34970A	V: 0~300V, T: -150℃~1200℃	Agilent	2013/9/26	2013/9/27	
V	C602M00/LD762	Electronic LOAD	3311F	60V/60A, 300W	PRODIGIT	2013/5/14	2014/5/13	
V	C602M00/P0481	Power Supply	E3633A	0~8V/20A 0~20V, 10A	AGILENT	2013/4/20	2014/4/19	

Note 1: DC Voltage: 0.1~1000V; AC Voltage: 0.5~700V at 60Hz, 1kHz; Resistance: 10 Ω-10MΩ; DC current: 0.1mA-3A; AC current: 0.01mA-3A at 60Hz, 0.01mA-1A, at 1kHz

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Control NO: LE-CU-13-10-010

6. T.1~T8 detail reports:

Control No.: LE-CU-13-10-010

UN 38.3 Test Datasheet

Customer:Lenovo

Model name: L12M4E55

Test duration:2013/9/9~2013/10/3

Reviewer:Evil_Xu

Test Sample identification:

Used	Sample No.	Sample state	Used	Sample No.	Sample state	Used	Sample No.	Sample state
V	1~4	1 Cycle, Fully charged	V	5~8	50 Cycle, Fully charged			25Cycle, Fully charged
V	9~12	1 Cycle, Fully charged	V	13~16	50 Cycle, Fully charged			25Cycle, Fully charged
V	1~5C	1 Cycle, 50% charged	V	06~15C	1 Cycle, 0% charged	V	16~25C	50 Cycle, 0% charged

T.1 Altitude Simulation

Start time:2013/9/23 08:20
 Finish time:2013/9/24 08:40

Ambient temp.: 18.5 ℃

Operator :Happy_Gu

Reviewer: Evil_Xu

Sample No.: 1					Sample No.: 2					
	Before	After	variation	Results		Before	After	variation	Results	
Mass (g)	222.864	222.841	Mass loss %	0.01%	P	Mass (g)	223.751	223.729	Mass loss %	0.01%
OCV(V)	17.130	17.106	Remained OCV%	99.86%		OCV(V)	17.146	17.112	Remained OCV%	99.80%
Sample No.: 3					Sample No.: 4					
Mass (g)	221.716	221.708	Mass loss %	0.01%	P	Mass (g)	221.917	221.906	Mass loss %	0.00%
OCV(V)	17.121	17.102	Remained OCV%	99.89%		OCV(V)	17.116	17.097	Remained OCV%	99.89%
Sample No.: 5					Sample No.: 6					
Mass (g)	222.467	222.443	Mass loss %	0.01%	P	Mass (g)	222.261	222.236	Mass loss %	0.01%
OCV(V)	17.132	17.109	Remained OCV%	99.87%		OCV(V)	17.114	17.099	Remained OCV%	99.91%
Sample No.: 7					Sample No.: 8					
Mass (g)	222.674	222.651	Mass loss %	0.01%	P	Mass (g)	223.017	223.002	Mass loss %	0.01%
OCV(V)	17.101	17.086	Remained OCV%	99.91%		OCV(V)	17.137	17.108	Remained OCV%	99.89%

T.2 Thermal Test

Start time:2013/9/24 09:20
 Finish time:2013/9/30 15:40

Ambient temp.: 19.3 ℃

Operator :Happy_Gu

Reviewer: Evil_Xu

Sample No.: 1					Sample No.: 2					
	Before	After	variation	Results		Before	After	variation	Results	
Mass (g)	222.841	222.817	Mass loss %	0.01%	P	Mass (g)	223.729	223.705	Mass loss %	0.01%
OCV(V)	17.106	16.911	Remained OCV%	98.86%		OCV(V)	17.112	16.896	Remained OCV%	98.74%
Sample No.: 3					Sample No.: 4					
Mass (g)	221.708	221.688	Mass loss %	0.01%	P	Mass (g)	221.906	221.887	Mass loss %	0.01%
OCV(V)	17.102	16.906	Remained OCV%	98.85%		OCV(V)	17.097	16.907	Remained OCV%	98.89%
Sample No.: 5					Sample No.: 6					
Mass (g)	222.443	222.421	Mass loss %	0.01%	P	Mass (g)	222.236	222.221	Mass loss %	0.01%
OCV(V)	17.109	16.901	Remained OCV%	98.78%		OCV(V)	17.099	16.894	Remained OCV%	98.80%
Sample No.: 7					Sample No.: 8					
Mass (g)	222.651	222.628	Mass loss %	0.01%	P	Mass (g)	223.002	222.988	Mass loss %	0.01%
OCV(V)	17.086	16.903	Remained OCV%	98.93%		OCV(V)	17.108	16.897	Remained OCV%	98.77%

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Control NO: LE-CU-13-10-010

T.3 Vibration

Start time:2013/9/30 16:10
 Finish time:2013/10/1 08:40

Ambient temp.: 18.2 ℃

Operator :Happy_Gu Reviewer:Evil_Xu

Sample No.: 1					Sample No.: 2					
	Before	After	variation	Results		Before	After	variation	Results	
Mass (g)	222.817	222.801	Mass loss %	0.01%	P	Mass (g)	223.705	223.686	Mass loss %	0.01%
OCV (V)	16.911	16.894	Remained OCV%	99.90%		OCV (V)	16.896	16.871	Remained OCV%	99.89%
Sample No.: 3					Sample No.: 4					
	Before	After	variation	Results		Before	After	variation	Results	
Mass (g)	221.688	221.669	Mass loss %	0.01%	P	Mass (g)	221.887	221.865	Mass loss %	0.01%
OCV (V)	16.906	16.885	Remained OCV%	99.88%		OCV (V)	16.907	16.873	Remained OCV%	99.80%
Sample No.: 5					Sample No.: 6					
	Before	After	variation	Results		Before	After	variation	Results	
Mass (g)	222.421	222.403	Mass loss %	0.01%	P	Mass (g)	222.221	222.206	Mass loss %	0.01%
OCV (V)	16.901	16.873	Remained OCV%	99.83%		OCV (V)	16.884	16.868	Remained OCV%	99.89%
Sample No.: 7					Sample No.: 8					
	Before	After	variation	Results		Before	After	variation	Results	
Mass (g)	222.629	222.607	Mass loss %	0.01%	P	Mass (g)	222.988	222.964	Mass loss %	0.01%
OCV (V)	16.903	16.880	Remained OCV%	99.86%		OCV (V)	16.887	16.871	Remained OCV%	99.89%

T.4 Shock

Start time:2013/10/1 09:30
 Finish time:2013/10/1 17:20

Ambient temp.: 20.1 ℃

Operator :Happy_Gu Reviewer:Evil_Xu

Sample No.: 1					Sample No.: 2					
	Before	After	variation	Results		Before	After	variation	Results	
Mass (g)	222.801	222.787	Mass loss %	0.01%	P	Mass (g)	223.686	223.662	Mass loss %	0.01%
OCV (V)	16.894	16.869	Remained OCV%	99.85%		OCV (V)	16.871	16.848	Remained OCV%	99.83%
Sample No.: 3					Sample No.: 4					
	Before	After	variation	Results		Before	After	variation	Results	
Mass (g)	221.669	221.646	Mass loss %	0.01%	P	Mass (g)	221.865	221.848	Mass loss %	0.01%
OCV (V)	16.885	16.857	Remained OCV%	99.83%		OCV (V)	16.873	16.847	Remained OCV%	99.89%
Sample No.: 5					Sample No.: 6					
	Before	After	variation	Results		Before	After	variation	Results	
Mass (g)	222.408	222.389	Mass loss %	0.01%	P	Mass (g)	222.206	222.185	Mass loss %	0.01%
OCV (V)	16.873	16.849	Remained OCV%	99.86%		OCV (V)	16.868	16.845	Remained OCV%	99.86%
Sample No.: 7					Sample No.: 8					
	Before	After	variation	Results		Before	After	variation	Results	
Mass (g)	222.607	222.581	Mass loss %	0.01%	P	Mass (g)	222.964	222.941	Mass loss %	0.01%
OCV (V)	16.880	16.853	Remained OCV%	99.84%		OCV (V)	16.871	16.846	Remained OCV%	99.89%

T.5 External Short Circuit

Start time:2013/10/1 17:40
 Finish time:2013/10/2 09:10

Ambient temp.: 20.6 ℃

Operator :Happy_Gu Reviewer:Evil_Xu

	Sample No.: 1	Sample No.: 2	Sample No.: 3	Sample No.: 4	Sample No.: 5	Sample No.: 6	Sample No.: 7	Sample No.: 8
Resistance (<100mΩ)	56.4	58.1	57.2	55.9	57.1	58.3	56.1	57.7
OCV before test/ after short circuit(V)	16.869 16.868	16.843 16.842	16.857 16.855	16.847 16.846	16.849 16.848	16.845 16.845	16.853 16.851	16.846 16.845
Max Temp. (< 170℃)	56.2	54.5	53.8	55.2	56.5	59.1	56.2	57.1
Results	P	P	P	P	P	P	P	P

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Control NO: LE-CU-13-10-010

T.6 Impact /Crush (Component cell)

Impact-Cylindrical cells greater than 20mm in diameter

Crush- Prismatic, pouch, coin/button cells and cylindrical cells not more than 20mm in diameter

Start time:2013/9/10 08:20

Ambient temp.: 19 ℃

Operator :Happy_Gu

Reviewer:Evil_Xu

Finish time:2013/9/10 16:50

	Sample No.: 1C	Sample No.: 2C	Sample No.: 3C	Sample No.: 4C	Sample No.: 5C
OCV before test(V)	3.801	3.801	3.802	3.801	3.802
Max Temp. (< 170℃)	89.7	86.5	88.6	83.4	86.4
Results	P	P	P	P	P

T.7 Overcharge

Start time:2013/9/23 10:20

Ambient temp.: 17.9 ℃

Operator :Happy_Gu

Reviewer:Evil_Xu

Finish time:2013/10/2 10:30

	Sample No.: 9	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)	17.107	17.135	17.126	17.123	17.138	17.119	17.106	17.114
Results	P	P	P	P	P	P	P	P

T.8 Forced discharge

Start time:2013/9/11 09:10

Ambient temp.: 17.6 ℃

Operator :Happy_Gu

Reviewer:Evil_Xu

Finish time:2013/9/19 10:30

	Sample No.: 06C	Sample No.: 07C	Sample No.: 08C	Sample No.: 09C	Sample No.: 10C
OCV after test(V)	3.181	3.186	3.180	3.184	3.185
Results	P	P	P	P	P
	Sample No.: 11C	Sample No.: 12C	Sample No.: 13C	Sample No.: 14C	Sample No.: 15C
OCV before test(V)	3.183	3.188	3.180	3.187	3.183
Results	P	P	P	P	P
	Sample No.: 16C	Sample No.: 17C	Sample No.: 18C	Sample No.: 19C	Sample No.: 20C
OCV before test(V)	3.189	3.186	3.181	3.189	3.191
Results	P	P	P	P	P
	Sample No.: 21C	Sample No.: 22C	Sample No.: 23C	Sample No.: 24C	Sample No.: 25C
OCV before test(V)	3.182	3.183	3.185	3.188	3.191
Results	P	P	P	P	P

7. Test sample:



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