

UN38.3 Test Report

Recommendations on the TRANSPORT OF

DANGEROUS GOODS

(Manual of Tests and Criteria, Fifth revised edition)

Customer: Lenovo Model: L10M4E21

Rating: 14.88V, 41Wh/2800mAh

FAX: +886-3-5695931

Approved By	Checked By	Prepared By
Samh	Fu-long.	Bettywn

SIMPLO TECHNOLOGY CO., LTD.

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

TEL: +886-3-5695920



SIMPLO ELECTRONICS (Changshu), LTD.

ADD: No.2 Dong Nan Road, Changshu, Jingsu Province. China

TEL: +86-512-52302255 FAX: +86-512-52302277



SIMPLO ELECTRONICS (CHONGQING),LTD.

ADD: No.2 Zongbao Avenue, Shapingba Distnet, Chongqing, China

TEL: +86-23-61718899 FAX: +86-23-61210488



SIMPLO ELECTRONICS (SHANGHAI), LTD.

ADD: No.28, Sanzhuang Road., Songjiang Export Processing Zone, Shanghai

TEL: +86-21-57748286 FAX: +86-21-57748285





1. Purpose of the Test:

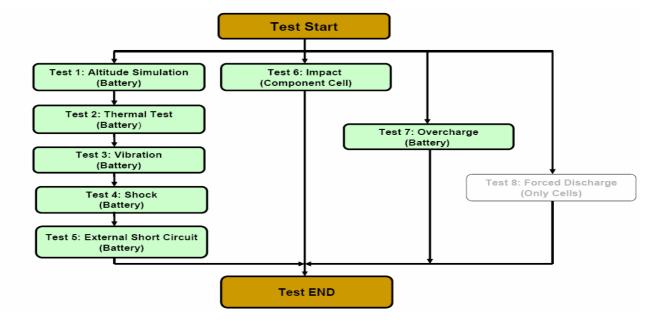
To test each cell/battery is of the type proved to meet the requirements in the Recommendations on the TRANSPORT OF DANGEROUS GOODS, Manual of Tests and Criteria, Fifth revised edition.

2. Test Quantity:

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





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

- 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

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



5. Test Equipment:

SMP SIMPLO TECHNOLOGY CO., LTD. Revised date: 2011-07-25

Address: No. 471, Sec.2, Pa Teh Rd., Hu Kou, Hsin Chu Hsien 303 Taiwan Date:2011-07-25

TEL: +886-3-5695920; FAX: +886-3-5695931 Project No.: L10M4E21 4S1P

Test Instruments Reference List

Used	Instrument ID	Instrument Name	Туре	Range Used	Manufacturer	Calibration Date_Last	Calibration Date Next	Remarks
	Pretest							
٧	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	
	ML-055	Learning	711	0~18V 0~8A	SMP	2011/3/14	2012/3/14	
		e Simulation						
	ML-522	Altitude		Kpa:30~90	新匠	2010/10/29	2011/10/29	
٧	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2011/7/4	2012/7/4	
	ML-494	Electronic Balance	XS1220M-SCS	1-1000 gf	CHUANHUA	2010/10/29	2011/10/29	
٧	ML-550	Data Logger	313	15~35 ℃; 30~80 %RH	CENTER	2010/12/21	2011/12/21	
	T.2 Therma	al Test						
٧	ML-018	Thermal Shock	WSF-602	T:-40 to 120°C	WIT	2010/8/31	2011/8/31	
٧	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2011/7/4	2012/7/4	
٧	ML-494	Electronic Balance	XS1220M-SCS	1-1000 gf	CHUANHUA	2010/10/29	2011/10/29	
	T.3 Vibration	on						
٧	ML-233	Vibration	KD-9636-EM- 300F2K-30N80	F:5~2000Hz G:0.2~20G	King Design	2010/12/10	2011/12/10	
٧	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2011/7/4	2012/7/4	
٧	ML-494	Electronic Balance	XS1220M-SCS	1-1000 gf	CHUANHUA	2010/10/29	2011/10/29	
٧	ML-552	Data Logger	313	15~35 ℃;30~80 %RH	CENTER	2010/12/21	2011/12/21	
	T.4 Shock							
٧	ML-056	Shock	DP-1200-25	G:10~600G	King Design	2010/12/24	2011/12/24	
٧	ML-257	Multimeter	HP 34401A	Note 1	Agilent	2011/7/4	2012/7/4	
٧	ML-494	Electronic Balance	XS1220M-SCS	1-1000 gf	CHUANHUA	2010/10/29	2011/10/29	
٧	ML-551	Data Logger	313	15~35 ℃; 30~80 %RH	CENTER	2010/12/21	2011/12/21	
		al Short Circuit		, , , , , , , , , , , , , , , , , , , ,				
٧	ML-534	mΩ Hitester	3540	1mΩ ~ 30kΩ	YEOW LONG	2010/12/2	2011/12/2	
	ML-339	Data Acquisition	MX100-E-1D	1-100 Vdc, -50 to 150°C	Yokogawa	2011/7/1	2012/7/1	
٧	ML-521	Chamber	WIT IPC-1000(3F)	-20 to 150℃	WIT	2010/12/2	2011/12/2	
		(Component cell)						
	ML-340	Data Acquisition	MX100-E-1D	1-100 Vdc, -50 to 150℃	Yokogawa	2011/5/26	2012/5/26	
		Impact Tester			JYI SHENG	2011/3/11	2012/3/11	
	T.7 Overch		G G T O O O O				22121211	
	ML-139	Power Supply	GC50-30D	0~50V 0.1~30A	LOCK	2011/3/4	2012/3/4	
	ML-140	Power Supply	GC50-30D GC50-30D	0~50V 0.1~30A 0~50V 0.1~30A	LOCK LOCK	2011/3/4 2011/3/4	2012/3/4	
	ML-141 ML-142	Power Supply Power Supply	GC50-30D GC50-30D	0~50V 0.1~30A 0~50V 0.1~30A	LOCK	2011/3/4	2012/3/4	
-	ML-142 ML-143	Power Supply Power Supply	GC50-30D GC50-30D	0~50V 0.1~30A 0~50V 0.1~30A	LOCK	2011/3/4	2012/3/4	
	ML-143 ML-549	Data Logger	313	15~35 °C; 30~80 %RH	CENTER	2010/12/21	2012/3/4	-
_								

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.



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

Control No.: SLEU-1107003 **UN 38.3 Test Datasheet**

Customer: Lenovo Model name: L10M4E21 4S1P Test duration:2011/07/01~2011/07/25 Reviewer: Esmond

Test Sample Identification:

Used	Sample No.	Sample State	Used	Sample No.	Sample State	Used	Sample No.	Sample State
٧	01~04	1 Cycle, Fully charged	٧	05~08	50 Cycle, Fully charged			25Cycle, Fully charged
٧	09~12	1 Cycle, Fully charged	٧	13~16	50 Cycle, Fully charged			25Cycle, Fully charged
٧	01C~05C	1 Cycle, 50% charged			1 Cycle, 50% charged			

T.1 Altitud	de Simulation		Start time: 07 / 14 / 08 Finish time: 07 / 14 / 14	: 24 : 44 Ambient	temp.: 24	.1 °C	Operator: Betty	Reviewer: Esmond	
		Sample N	o.: 01		Sample No.: 05				
	Before	After	Variation	Results		Before	After	Variation	Results
Mass (g)	228.6	228.6	Mass loss % 0.00%		Mass (g)	228.5	228.4	Mass loss % 0.04%	Р
OCV (V)	17.19	17.19	Remained OCV% 100.00%	r	OCV (V)	17.19	17.19	Remained OCV% 100.00%	P
		Sample N	o.: 02				Sample N	o.: 06	
	Before	After	Variation	Results		Before	After	Variation	Results
Mass (g)	228.5	228.5	Mass loss % 0.00%	Р	Mass (g)	228.5	228.4	Mass loss % 0.04%	Р
OCV (V)	17.19	17.19	Remained OCV% 100.00%	P	OCV (V)	17.18	17.18	Remained OCV% 100.00%	P
		Sample N	lo.: 03		Sample No.: 07				
	Before	After	Variation	Results		Before	After	Variation	Results
Mass (g)	228.6	228.6	Mass loss % 0.00%	Р	Mass (g)	228.4	228.4	Mass loss % 0.00%	Р
OCV (V)	17.18	17.18	Remained OCV% 100.00%		OCV (V)	17.19	17.19	Remained OCV% 100.00%	,
		Sample N	o.: 04		Sample No.: 08				
	Before	After	Variation	Results		Before	After	Variation	Results
Mass (g)	228.6	228.6	Mass loss % 0.00%	Р	Mass (g)	228.3	228.3	Mass loss % 0.00%	Р
OCV (V)	17.19	17.19	Remained OCV% 100.00%		OCV (V)	17.19	17.18	Remained OCV% 99.94%	r

T.2 Thern	nal Test		Start time: 07 / 14 / Finish time: 07 / 21 /	15:16 10:17 Ambien	temp.:	24.1 °C	Operator: Betty	Reviewer: Esmono	ı	
		Sample N	o.: 01				Sample N	lo.: 05		
	Before	After	Variation	Results		Before	After	Variation	Results	
Mass (g)	228.6	228.5	Mass loss % 0.0		Mass (g)	228.4	228.3	Mass loss % 0.04%	Р	
OCV (V)	17.19	16.97	Remained OCV% 98.7	74%	OCV (V)	17.19	16.96	Remained OCV% 98.69%	-	
		Sample N	o.: 02				Sample N	lo.: 06		
	Before	After	Variation	Results		Before	After	Variation	Results	
Mass (g)	228.5	228.5	Mass loss % 0.0	0% P	Mass (g)	228.4	228.3	Mass loss % 0.04%	Р	
OCV (V)	17.19	17.01	Remained OCV% 98.9	95%	OCV (V)	17.18	16.97	Remained OCV% 98,78%		
		Sample N	lo.: 03		Sample No.: 07					
	Before	After	Variation	Results		Before	After	Variation	Results	
Mass (g)	228.6	228.5	Mass loss % 0.0		Mass (g)	228.4	228.3	Mass loss % 0.04%	Р	
OCV (V)	17.18	17.00	Remained OCV% 98.9	95%	OCV (V)	17.19	16.97	Remained OCV% 98.74%	-	
		Sample N	o.: 04				Sample N	o.: 08		
	Before	After	Variation	Results		Before	After	Variation	Results	
Mass (g)	228.6	228.6	Mass loss % 0.0	0% P	Mass (g)	228.3	228.2	Mass loss % 0.04%	Р	
OCV (V)	17.19	16.98	Remained OCV% 98.7	78%	OCV (V)	17.18	16.96	Remained OCV% 98.70%	l ^P	

T.3 Vibrat	ion		Start time: 07 / 21 / 11 Finish time: 07 / 22 / 10	Ambian	t temp.:	24.3 °C	Operator: Betty	Reviewer: Esmond		
		Sample N	lo.: 01			Sample No.: 05				
	Before	After	Variation	Results	\Box	Before	After	Variation	Results	
Mass (g)	228.5	228.4	Mass loss % 0.04%	Р	Mass (g)	228.3	228.2	Mass loss % 0.04%	Р	
OCV (V)	16.97	16.96	Remained OCV% 99.94%	-	OCV (V)	16.96	16.96	Remained OCV% 100.00%	Р	
		Sample N	lo.: 02				Sample N	lo.: 06		
	Before	After	Variation	Results	\Box	Before	After	Variation	Results	
Aass (g)	228.5	228.4	Mass loss % 0.04%	Р	Mass (g)	228.3	228.3	Mass loss % 0.00%	Р	
OCV (V)	17.01	17.01	Remained OCV% 100.00%	P	OCV (V)	16.97	16.97	Remained OCV% 100.00%	P	
		Sample I	No.: 03				Sample N	lo.: 07		
	Before	After	Variation	Results	\Box	Before	After Variation		Results	
Mass (g)	228.5	228.5	Mass loss % 0.00%	Р	Mass (g)	228.3	228.2	Mass loss % 0.04%	Р	
OCV (V)	17.00	17.00	Remained OCV% 100.00%	-	OCV (V)	16.97	16.96	Remained OCV% 99.94%	-	
		Sample N	lo.: 04				Sample N	o.: 08		
	Before	After	Variation	Results	\Box	Before	After	Variation	Results	
Mass (g)	228.6	228.5	Mass loss % 0.04%	Р	Mass (g)	228.2	228.2	Mass loss % 0.00%	Р	
OCV (V)	16.98	16.97	Remained OCV% 99,94%	Ρ	OCV (V)	16.96	16.96	Remained OCV% 100.00%	P	



(< 170℃) Results

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: SLEU1107003

T.4 Shoc	k				Finish tir	me: 07/	22 / 13 22 / 15		Ambient	temp.:	25.6	t	Operator				r: Esmond	ı
				Sample N	0.: 0	-						,		Sample N	0.: 0	5		
		erof		ter	L	Variation		Res	ults			fore	After			Variation		Results
Mass (g) OCV (V)		96		8.4 .96		loss % ed OCV%	0.00%	,	P	Mass (g) OCV (V)	16.	8.2 .96		8.2 .96		loss % ed OCV%	0.00%	P
. (.,			-	Sample N			10010070			,				Sample N		6	10010070	
$\overline{}$	Bet	fore		ter		Variation	1	Res	ults		Bet	fore		ter		Variation	, I	Results
Mass (g)	22	8.4	22	8.4	Mass	loss %	0.00%		Р	Mass (g)	22	8.3	22	8.2	Mass	loss %	0.04%	Р
OCV (V)	17.	01	17.	.00	Remaine	Remained OCV% 99,94%		1 '	-	OCV (V)	16.	.97	16	.97	Remain	ed OCV%	100.00%	P
				Sample N	o.: 0	_								Sample N	o.: 0	7		
	Bet	fore	Af	ter		Variation			sults		Bet	fore	Af	ter		Variation	1	Results
Mass (g)		8.5		8.4		loss %	0.04%		P	Mass (g)	223			8.1		loss %	0.04%	Р
OCV (V)	17.	.00		.99	Remained OCV% 99.94%				OCV (V)	16.	.96		.95		ed OCV%	99.94%		
				Sample N		4								Sample N		8		
		erof		ter		Variation		Res	sults			fore		ter		Variation		Results
Mass (g)	22			8.5		loss %	0.00%		Р	Mass (g)	22			8.1		loss %	0.04%	P
OCV (V)	16.	.97	16.	.97	Remaine	ed OCV%	100.00%			OCV (V)	16.	.96	16	.96	Remain	ed OCV%	100.00%	
Resist (<100 OCV before	lmΩ) ore test/		4.3		3.6		5.3		3.5		3.7		3.6		1.2		4.9	
circu	iit(V)	16.96	0.00	17.00	0.00	16.99	0.00	16.97	0.00	16.96	0.00	16.97	0.00	16.95	0.00	16.96	0.00	
Max T (< 17		55	5.2	55	5.2	55	5.1	55	5.2	55	.0	58	5.0	55	5.0	55	5.2	
Resi	ults		P		P		P		P		Р		P		P		P	
T.6 Impa	efore		ple No.:	01C			20 / 15 21 / 08 02C	: 36	Ambient ple No.: 3.72	•	25.3 Sam	*C ple No.:	Operator 04C	-,	ple No.:		r: Esmond	ı
test Max T														\vdash			ł	
(< 17	0℃)		96.9			95.4			95.3			94.3		<u> </u>	98.9		I	
Resi	uits	Sam	P ple No.:	06C	Sam	P ple No.:	07C	Sam	P ple No.:	08C	Sam	P ple No.:	09C	Sam	P ple No.:	10C	l	
OCV b		- Jani	p. 2 110.1		Salli	p. 2 11411	3.0	Salli	F.2 11011	300	5311	p.2 11911		- Calli	p. 0 11011		İ	
Max T	emp.																1	

T.7 Overcharge		Start tim Finish tir		10 : 27 15 : 44 Ambient	temp.: 24.6	℃ Operator	: Betty	Reviewer: Esmond
	Sample No.: 09	Sample No.: 10	Sample No.: 1	1 Sample No.: 12	Sample No.: 13	Sample No.: 14	Sample No.: 15	Sample No.: 16
OCV before test(V)	17.19	17.19	17.19	17.18	17.19	17.18	17.19	17.19
Results	Р	P	P	P	Р	P	Р	P



7. Equipment for Test:



