

リチウムイオン電池認証書 (類似機種用) Lithium-ion (polymer) rechargeable cell or battery Certification for Similar Models

No. :QA-AVG4070

Date: 2014/12/09

1. 単電池/cell (シングルセル/single cell シングルセルバッテリー/single cell battery)
組電池/battery(pack) (セル構成/composition of cell : 2P5S)
2. 機種名/customer model name : BL1840B Sony model name : LIPW010
3. 顧客名/customer : Makita Corporation
4. 定格/rated

項目/item	規格値/specification	備考/remarks
公称電圧/nominal voltage	18 V	
定格容量/rated capacity	4000 mAh	
ワット時定格値(Wh) /Watt-hour rating	72 Wh	

5. 類似機種及び試験結果/Similar Model and Test Result

- 1) 類似機種名/Similar Model (Sony model name) : LIPW006 (18 V 4000 mAh 72 Wh)
- 2) 試験結果/Test Result

国連勧告テスト結果/Test results of the UN Recommendations on the Transport of Dangerous Goods

国連勧告テスト及び判定基準 (38.3 リチウム電池)		テスト結果/ test results	備考/remarks
NO	テスト項目 test item		
T1	高度シミュレーション (Altitude simulation)	OK	
T2	温度試験 (Thermal test)	OK	
T3	振動 (Vibration)	OK	
T4	衝撃 (Shock)	OK	
T5	外部短絡 (External short circuit)	OK	
T6	圧壊 (Crush)	OK	
T7	過充電 (Overcharge)	OK	単電池は対象外/for battery only
T8	強制放電 (Forced discharge)	OK	

試験実施日/Tested Date : 2012/09/19~2012/10/10 (T6:2013/09/12, T8:2012/10/25~2012/11/02)

梱包試験類似機種/Sony's similar model name for packing: LIPW005

梱包試験実施日/Tested Date for Package : 2012/12/07~2012/12/10


上記テスト結果は国連勧告試験(UN Manual of Tests and Criteria 5th revised edition Amendment 1, Part III, subsection 38.3)に従い確認した結果であることを証明いたします。

We, Sony Energy Devices Corporation, hereby certify that above results are confirmed in accordance with the Manual of Tests and Criteria of the UN Recommendations on the Transport of Dangerous Goods, 5th revised edition Amendment 1, Part III, subsection 38.3.

- 3) 類似機種とのワット時定格値 (Wh)、電圧比率/Ratios for Watt-hour rating, Voltage
類似機種に対して、ワット時定格値(Wh)の変化が20%以内、且つ電圧の増加が20%以内であることを証明します。

We certify the change of the subject model to the similar model is in Watt-hour rating of less than 20% and the increase in voltage of less than 20%.

LIPW010/LIPW006 : ワット時定格値 (Wh) 比/Watt-hour rating Ratio=100%、
電圧比/Voltage Ratio=100%


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A : Checklist for Judging New Type Cell or not

When there is no change in all items, it is NOT considered to be a New Type Cell.

(Change ⇒ ○, No change ⇒ -)

Battery Pack Model : LIPW010 Component Cell Model : US18650VTC4

Check item	The element which is given influence	Presence of change
Safety parts and mechanical components	Are the safety parts and mechanical components of this cell the same as those of the test completion cell?	—
Cathode material system	Is cathode material system of this cell the same as that of the test completion cell?	—
Anode material system	Is anode material system of this cell the same as that of the test completion cell?	—
Electrolyte material system	Is electrolyte material system of this cell the same as that of the test completion cell?	—
Mass of cathode material	Is mass difference of the design center of each cell concerning cathode less than 20%?	—
Mass of anode material	Is mass difference of the design center of each cell concerning anode less than 20%?	—
Mass of electrolyte	Is mass difference of the design center of each cell concerning electrolyte less than 20%?	—
Mass of cell	Is mass difference of the cell less than 20%?	—
Judgment result	New Type or not	Not new

B : Checklist for Judging New Type Battery or not

Confirmation of presence of change in “The element which is given influence”

(Change ⇒ ○, No change ⇒ -)

When there is no change in all items, it is NOT considered to be a New Type Battery.

Battery Pack Model : LIPW010

Test Item (Function)	The element which is given influence	Presence of change
T1 : Altitude Simulation (Decompression load)	<ul style="list-style-type: none"> • Crimped part, Gasket (Cell) • Gas Release Vent, Cell Case (Cell) • Pack (Plastic) Case • Holding Member (Insulator, Insulation Tape, Both Sides Tape) • Coating materials 	-
T2 : Thermal Shock (Repetition of high temp. and low temp.)	<ul style="list-style-type: none"> • Crimped part, Gasket (Cell) • Gas Release Vent, Cell Case (Cell) • Finished state of Wound Electrodes (Cell) • Pack (Plastic) Case • Holding Member (Insulator, Insulation Tape, Both Sides Tape) • Coating materials 	-
T3 : Vibration (Vibration load)	<ul style="list-style-type: none"> • Finished state of Wound Electrodes (Cell) • Electric wiring member • Electronic Parts on a circuit board • Cell Holding Member (Adhesive, Both Sides Tape, Lib of Plastic Case) 	-
T4 : Shock (Shock load)	<ul style="list-style-type: none"> • Wiring Member • Electronic Parts on a circuit board • Cell Holding Member (Adhesive, Both Sides Tape, Lib of Plastic Case) • Finished state of Wound Electrodes (Cell) 	-
T5 : External Short Circuit (Short current)	<ul style="list-style-type: none"> • Over-voltage Protection • Current Control Device • Safety Device of cell (Cell) • Lead Tab 	-
T6(Cell) : Impact/Crush (Crash load)	<ul style="list-style-type: none"> • Separator (Cell) • Insulation State in a cell (Cell) 	-
T7(Pack) : Overcharge (Charge load)	<ul style="list-style-type: none"> • Overcharge Protection • Thermal Device • Safety Device of cell (Cell) 	-
T8(Cell) : Forced Discharge (Over discharge load)	<ul style="list-style-type: none"> • Finished state of Wound Electrodes (Cell) 	-
Mass of battery pack	Is mass difference of the battery pack less than 20%?	-
Judgment result	New Type or not	Not new

国連勧告試験 結果 1

Test Result of UN Recommendations Part 1

機種名/Sony Model Name	LIPW006		
使用セル/Cell Model Name	US18650VT4	構成/Configuration	2P5S
試験場所/Test Company	ソニーエナジー・デバイス 株式会社 郡山事業所		
住所/ Address	〒963-0531 福島県郡山市日和田町高倉下杉下1-1	電話/Tel	+81-24-958-3811
試験室/Test Room	安全性試験室/野外試験室	試験期間/Test Dates	T1~T5, T7: 2012/09/19~2012/10/10 T6: 2013/09/12 T8: 2012/10/25~2012/11/02
判定基準/Criterion	UN Manual of Tests and Criteria 5th revised edition Amendment 1, Part III, subsection 38.3		

試験名称/Test Name		T1: 高度シミュレーション試験 Altitude Simulation						
番号 No.	サンプル状態 Conditions	試験前/Before		試験後/After		質量減少率 / Mass Loss <%以下>	OCV維持率/ Residual OCV <90%以上>	現象確認/ Occurrence
		Mass(g)	OCV (V)	Mass(g)	OCV (V)			
1	初回サイクル 満充電/ First cycle, fully charged	636.6	20.96	636.6	20.93	0.00	99.9	N
2		637.4	20.96	637.3	20.93	0.02	99.9	N
3		637.7	20.96	637.7	20.93	0.00	99.9	N
4		635.3	20.97	635.3	20.94	0.00	99.9	N
5	50回サイクル 満充電/ After 50 cycles, fully charged	635.4	20.97	635.4	20.95	0.00	99.9	N
6		637.2	20.97	637.2	20.95	0.00	99.9	N
7		637.0	20.98	637.0	20.97	0.00	100.0	N
8		636.7	20.99	636.7	20.97	0.00	99.9	N

試験名称/Test Name		T2: 温度試験 Thermal						
番号 No.	サンプル状態 Conditions	試験前/Before		試験後/After		質量減少率 / Mass Loss <%以下>	OCV維持率/ Residual OCV <90%以上>	現象確認/ Occurrence
		Mass(g)	OCV (V)	Mass(g)	OCV (V)			
1	初回サイクル 満充電/ First cycle, fully charged	636.7	20.91	636.5	20.62	0.03	98.6	N
2		637.5	20.91	637.3	20.63	0.03	98.7	N
3		637.8	20.92	637.6	20.64	0.03	98.7	N
4		635.4	20.92	635.2	20.64	0.03	98.7	N
5	50回サイクル 満充電/ After 50 cycles, fully charged	635.5	20.94	635.4	20.69	0.02	98.8	N
6		637.3	20.93	637.1	20.69	0.03	98.9	N
7		637.1	20.95	636.9	20.71	0.03	98.9	N
8		636.8	20.96	636.6	20.72	0.03	98.9	N

試験名称/Test Name		T3: 振動試験 Vibration						
番号 No.	サンプル状態 Conditions	試験前/Before		試験後/After		質量減少率 / Mass Loss <%以下>	OCV維持率/ Residual OCV <90%以上>	現象確認/ Occurrence
		Mass(g)	OCV (V)	Mass(g)	OCV (V)			
1	初回サイクル 満充電/ First cycle, fully charged	636.5	20.62	636.5	20.62	0.00	100.0	N
2		637.3	20.63	637.3	20.63	0.00	100.0	N
3		637.6	20.64	637.6	20.63	0.00	100.0	N
4		635.2	20.64	635.2	20.64	0.00	100.0	N
5	50回サイクル 満充電/ After 50 cycles, fully charged	635.4	20.69	635.4	20.68	0.00	100.0	N
6		637.1	20.69	637.1	20.68	0.00	100.0	N
7		636.9	20.71	636.9	20.71	0.00	100.0	N
8		636.6	20.72	636.6	20.71	0.00	100.0	N

質量減少率/ Mass Loss (%)	<input type="checkbox"/> 電池質量 ≤ 1g: 0.5%以下 <input type="checkbox"/> 1g < 電池質量 ≤ 75g: 0.2%以下 <input checked="" type="checkbox"/> 75g < 電池質量 : 0.1%以下
現象/Occurrence	破断:R <Rupture> 発火:F <Fire> 破裂:D <Disassembly> 弁作動:V <Venting> 漏液:L <Leakage> 異常なし:N <No rupture, No fire, No disassembly, No venting, No leakage>

国連勧告試験 結果 2

Test Result of UN Recommendations Part 2

試験名称/Test Name		T4: 衝撃試験 Shock				質量減少率 / Mass Loss <%以下>	OCV維持率 / Residual OCV <90%以上>	現象確認 / Occurrence
番号 No.	サンプル状態 Conditions	試験前 / Before		試験後 / After				
		Mass (g)	OCV (V)	Mass (g)	OCV (V)			
1	初回サイクル 満充電 / First cycle, fully charged	636.7	20.60	636.6	20.60	0.02	100.0	N
2		637.4	20.61	637.4	20.61	0.00	100.0	N
3		637.8	20.62	637.7	20.62	0.02	100.0	N
4		635.4	20.62	635.4	20.62	0.00	100.0	N
5	50回サイクル 満充電 / After 50 cycles, fully charged	635.6	20.67	635.5	20.67	0.02	100.0	N
6		637.3	20.67	637.3	20.67	0.00	100.0	N
7		637.1	20.69	637.1	20.69	0.00	100.0	N
8		636.8	20.71	636.8	20.71	0.00	100.0	N
質量減少率 / Mass Loss (%)		<input type="checkbox"/> 電池質量 ≤ 1g: 0.5%以下 <input type="checkbox"/> 1g < 電池質量 ≤ 75g: 0.2%以下 <input checked="" type="checkbox"/> 75g < 電池質量 : 0.1%以下						
現象 / Occurrence		破断:R <Rupture> 発火:F <Fire> 破裂:D <Disassembly> 弁作動:V <Venting> 漏液:L <Leakage> 異常なし:N <No rupture, No fire, No disassembly, No venting, No leakage>						

試験名称/Test Name		T5: 外部短絡試験 External Short Circuit					
番号 No.	サンプル状態 Conditions	最大表面温度 / Max. Surface Temperature (°C)	現象確認 / Occurrence	番号 No.	サンプル状態 Conditions	最大表面温度 / Max. Surface Temperature (°C)	現象確認 / Occurrence
		170°C ≥				170°C ≥	
1	初回サイクル 満充電 / First cycle, fully charged	71.0°C	N	5	50回サイクル 満充電 / After 50 cycles, fully charged	61.0°C	N
2		66.2°C	N	6		60.3°C	N
3		61.4°C	N	7		70.1°C	N
4		66.0°C	N	8		66.9°C	N
現象 / Occurrence		破断:R <Rupture> 発火:F <Fire> 破裂:D <Disassembly> 異常なし:N <No rupture, No fire, No disassembly>					

試験名称/Test Name		T6: 衝突 (Impact) / 圧壊 (Crush)	
番号 No.	サンプル状態 Conditions	最大表面温度 / Max. Surface Temperature (°C)	現象確認 / Occurrence
		170°C ≥	
1	初回サイクル 50%充電 / First cycle, 50% charged	23°C	N
2		22°C	N
3		22°C	N
4		23°C	N
5		23°C	N
現象 / Occurrence		発火:F <Fire> 破裂:D <Disassembly> 異常なし:N <No fire, No disassembly>	

試験名称/Test Name		T7: 過充電 Overcharge			
番号 No.	サンプル状態 Conditions	現象確認 / Occurrence	番号 No.	サンプル状態 Conditions	現象確認 / Occurrence
2	N	6	N		
3	N	7	N		
4	N	8	N		
現象 / Occurrence		発火:F <Fire> 破裂:D <Disassembly> 異常なし:N <No fire, No disassembly>			

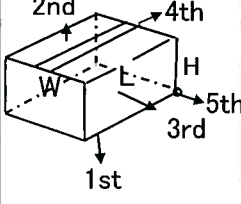
* Temperature Measurement by Thermolabel

国連勧告試験 結果 3

Test Result of UN Recommendations Part 3

試験名称/Test Name		T8:強制放電 Forced Discharge			
番号 No.	サンプル状態 Conditions	現象確認/Occurrence	番号 No.	サンプル状態 Conditions	現象確認/Occurrence
1	初回サイクル 完全放電 / First cycle, fully discharged	N	11	50回サイクル 完全放電 / After 50 cycles, fully discharged	N
2		N	12		N
3		N	13		N
4		N	14		N
5		N	15		N
6		N	16		N
7		N	17		N
8		N	18		N
9		N	19		N
10		N	20		N
現象/Occurrence		破断:R <Rupture> 発火:F <Fire> 破裂:D <Disassembly> 異常なし:N <No rupture, No fire, No disassembly>			

試験場所/ Test Company	索尼电子(无锡)有限公司			
住所/ Address	中国江苏省无锡市新区长江路27号	電話/ Tel	86-510-85239269	
試験室/ Test Room	SEW国联劝告試験室	試験期間/ Test Dates	2012.12.07~2012.12.10	試験番号/ Test No
機種名/ Sony Model Name	LIPW005	梱包入り数/ Quantity	10 pcs	
使用セル/ Cell Model Name	US18650VT3	構成/ Configuration	2P5S	梱包製造所/ Package Factory
包装等級/ Packing Group	等級Ⅱ/Packing Group Number II			
寸法・質量/ Dimensions and Gross Weight	長辺/Length (L)	短辺 /Wide (W)	高さ/Height (H)	質量/Gross Weight (kg)
	441 mm	178 mm	160 mm	7.3 kg

■ 落下試験/Drop Test			
試験設備	HORAD PD-315		
試験条件/ Test condition	落下高さ/ Drop height	1.2m	試験結果 /Occurrence
落下姿勢(方向)/ Five (one for each drop) 	1回目の落下試験	底面を水平に/ flat on the bottom	著しい破損なし/No Leakage, No damage liable to affect safety during
	2回目の落下試験	天面を水平に/ flat on the top	著しい破損なし/No Leakage, No damage liable to affect safety during
	3回目の落下試験	長側面を水平に/ flat on the long side	著しい破損なし/No Leakage, No damage liable to affect safety during
	4回目の落下試験	短側面を水平に/ flat on the short side	著しい破損なし/No Leakage, No damage liable to affect safety during
	5回目の落下試験	コーナー(角)※/ on a corner	著しい破損なし/No Leakage, No damage liable to affect safety during
※コーナー: 容器が最も破損を受ける方向を選択			
判定基準/ Criterion	外装容器及び袋の場合、外装容器の最も外側の層に輸送中の安全を脅かすようないかなる破損が生じてはならない。		判定/ Judgment
			合格/OK

■ 積み重ね試験/Stacking Test			
試験条件/Test condition	No	試験結果 /Occurrence	
試験荷重値/Weight Load	135 kg	1	漏洩・破損・歪みなし/No leakage, No distortion, No deterioration
		2	漏洩・破損・歪みなし/No leakage, No distortion, No deterioration
		3	漏洩・破損・歪みなし/No leakage, No distortion, No deterioration
判定基準/ Criterion	試供品は漏洩があってはならない。試供品は、輸送の安全性を損なうような劣化、又はその強度を減じたり、又は輸送物の積み重ねを不安定にするような歪みが生じてはならない。		判定/ Judgment
			合格/OK

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 Quality Assurance Department
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総合判定
合格/OK