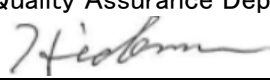


LITHIUM CELLS OR BATTERIES TEST SUMMARY IN ACCORDANCE WITH SUB-SECTION 38.3 OF MANUAL OF TEST AND CRITERIA

BATTERY TRANSPORTATION INFORMATION

Name of cell, battery or product manufacturer, as applicable: Item Number : CR2032-HE8/AAWW Item Name : CR2032-HE8/AAWW Item Description : Lithium Metal Battery Cell	Cell, battery or product manufacturer's contact information to include address, phone number, email address and website for more information: Tohoku Murata Manufacturing Co., Ltd. 1-1 Shimosugishita, Takakura, Hiwada-machi, Koriyama-shi, Fukushima, 963-0531 Japan Phone: +81-24-955-7834 e-mail: tmm-unr-smry@murata.com Website: https://www.murata.com/en-global/group/tohokumurata	
Name of the test laboratory to include address, phone number, email address and website for more information: Tohoku Murata Manufacturing Co., Ltd. 1-1 Shimosugishita, Takakura, Hiwada-machi, Koriyama-shi, Fukushima, 963-0531 Japan Phone: +81-24-955-7834 e-mail: tmm-unr-smry@murata.com Website: https://www.murata.com/en-global/group/tohokumurata	A unique test report identification number: UN38.3-312	Date of the test report: 11-Dec-20
Description of cell or battery to include at a minimum: Lithium ion or Lithium metal cell or battery; Mass; Watt-hour rating, or lithium content; Physical description of the cell/battery; and Model Cell/battery Type : Lithium Metal Cell or Battery : Cell LC or W/h rating : 0.06g Cell or Battery Weight : 3.5 g Physical description : Lithium Metal Battery Cell(Coin shaped)	List of tests conducted and results (i.e., pass/fail): Test T.1: Altitude Simulation : Pass Test T.2: Thermal Test : Pass Test T.3: Vibration : Pass Test T.4: Shock : Pass Test T.5: External short circuit : Pass Test T.6: Impact : Pass Test T.7: Overcharge : Not applicable Test T.8: Forced discharge : Pass Testing additional comments:	
Reference to assembled battery testing requirements, if applicable (i.e., 38.3.3;(f) and 38.3.3;(g): Not Applicable	Reference to the revised edition of the Manual of Test and Criteria used and to amendments thereto, if any: Revision 6 Amendment 1	
PRODUCT CLASSIFICATION FOR TRANSPORT (According to UN - DGP)		
UN Classification: UN3090	Proper Shipping Name: Lithium Metal Battery Cell	
Signature with name and title of signatory as an indication of the validity of information provided: Hideaki Takahashi Quality Assurance Department 	This document remains valid as long as no changes, modification, or additions are made to the model(s) described in this document, after being transported from a Tohoku Murata Manufacturing. The model(s) has (have) been classified according to the applicable transport regulations and the UN Manual of Tests and Criteria as of the date of the certification, The model(s) must be packed, labeled, and documented according to country and other international regulations for transportation.	
Date document was generated: 11-Dec-20		

Tohoku Murata Manufacturing Co., Ltd.
1-1 Shimosugishita, Takakura, Hiwada-machi,
Koriyama-shi, Fukushima 963-0531 JAPAN
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リチウム電池認証書（類似機種用）

1 of 6 Page

Lithium cell or battery Certification for Similar Models

No: UN38.3-312

Date: Dec 11, 2020

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 : ）
2. モデル名／Model Name: CR2032-HE8 Cell Type : CR2032 (muRata) (Made in Indonesia)
- Murata Product Name CR2032-HE8/AAWW
3. 顧客名／Customer : Murata Manufacturing Co.,Ltd.
4. 定格／Rated

項目／Item	規格値／Specification	備考／Remarks
公称電圧／Nominal voltage	3.0V	
公称容量／Nominal capacity	220mAh	
総リチウム含有量／Aggregated lithium content	0.060g	

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

1) 類似機種名／Similar Model (Model name) : CR2032 (3.0V 200mAh)

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)	－	一次電池は対象外／Primary battery is not applied.
T8	強制放電 (Forced discharge)	OK	

試験実施日／Tested Date(T1～T5, T8) : 2007/11/05～2007/12/04

(T6) : 2013/10/16～2013/10/23

梱包試験実施日／Tested Date for Package : 2016/01/07～2016/01/13

上記テスト結果は国連勧告試験 (UN Manual of Tests and Criteria 6th 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, Tohoku Murata Manufacturing Co., Ltd., 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, 6th revised edition Amendment 1, Part Ⅲ, subsection 38.3.

3) 類似機種との正極、負極、電解液質量比率／Mass Ratios for Cathode, Anode, and Electrolyte

- 類似機種に対して、正極、負極、電解液質量はいずれも20%以内もしくは0.1g以内の変化率を証明します。

We certify the mass ratios of the subject model to the similar model are within 20% or 0.1g for Cathode, Anode, and Electrolyte.

CR2032(220)／CR2032(200) : 正極質量比／Cathode Mass Ratio = 100%、

負極質量比／Anode Mass Ratio = 110%、電解液質量／Electrolyte Mass Ratio = 106%



Hideaki Takahashi
Quality Assurance Department
Tohoku Murata Manufacturing Co., Ltd.

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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: ○○○○○○ Component Cell Model: ◎◎◎◎◎

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%?	—
Judgment result	New Type or not	Not new

国連勧告試験 結果 1

Test Result of UN Recommendations Part 1

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機種名 / Murata Model Name		CR2032 (Made in Indonesia)						
試験場所 / Test Company		株式会社 東北村田製作所 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		2020/09/10 - 2020/10/14	
判定基準 / Criterion		UN Manual of Tests and Criteria 6th revised edition Amendment 1, Part Ⅲ, sub-section 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 <0.2%以下>	OCV維持率 / Residual OCV 90%以上	現象 / Occurrence
		mass (g)	OCV (V)	mass (g)	OCV (V)			
1	未放電 / Undischarged	3.064	3.245	3.064	3.244	0.02	100.0	N
2		3.045	3.275	3.045	3.273	0.01	99.9	N
3		3.026	3.230	3.025	3.229	0.02	100.0	N
4		3.069	3.231	3.069	3.230	0.02	100.0	N
5		3.057	3.240	3.057	3.239	0.02	100.0	N
6		3.050	3.235	3.050	3.234	0.02	100.0	N
7		3.055	3.242	3.054	3.241	0.02	100.0	N
8		3.044	3.239	3.044	3.238	0.02	100.0	N
9		3.044	3.240	3.043	3.239	0.02	100.0	N
10		3.061	3.240	3.060	3.239	0.02	100.0	N
11	完全放電 / Fully discharged	3.062		3.062		0.02		N
12		3.062		3.061		0.01		N
13		3.046		3.046		0.02		N
14		3.052		3.052		0.02		N
15		3.055		3.054		0.01		N
16		3.053		3.053		0.02		N
17		3.041		3.041		0.01		N
18		3.051		3.050		0.02		N
19		3.061		3.060		0.02		N
20		3.050		3.050		0.01		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 <0.2%以下>	OCV維持率 / Residual OCV 90%以上	現象 / Occurrence
		mass (g)	OCV (V)	mass (g)	OCV (V)			
1	未放電 / Undischarged	3.064	3.245	3.063	3.256	0.01	100.3	N
2		3.045	3.273	3.044	3.274	0.02	100.0	N
3		3.026	3.230	3.025	3.247	0.02	100.5	N
4		3.069	3.230	3.069	3.246	0.01	100.5	N
5		3.057	3.239	3.057	3.251	0.02	100.4	N
6		3.050	3.235	3.050	3.250	0.01	100.5	N
7		3.055	3.241	3.054	3.253	0.02	100.4	N
8		3.044	3.238	3.043	3.252	0.02	100.4	N
9		3.043	3.239	3.043	3.252	0.02	100.4	N
10		3.061	3.240	3.060	3.252	0.02	100.4	N
11	完全放電 / Fully discharged	3.062		3.062		0.00		N
12		3.061		3.061		0.01		N
13		3.046		3.046		0.01		N
14		3.052		3.052		0.02		N
15		3.055		3.055		0.01		N
16		3.053		3.053		0.01		N
17		3.041		3.041		0.01		N
18		3.051		3.050		0.02		N
19		3.060		3.060		0.00		N
20		3.050		3.050		0.01		N
質量減少率 / Mass Loss (%)		□ 電池質量 < 1g: 0.5%以下 ■ 1g ≤ 電池質量 ≤ 75g: 0.2%以下 □ 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

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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 <0. 2%以下>	OCV維持率 / Residual OCV 90%以上	現象 / Occurrence
		mass (g)	OCV (V)	mass (g)	OCV (V)			
1	未放電 / Undischarged	3.063	3.256	3.063	3.257	0.03	100.0	N
2		3.044	3.274	3.044	3.275	0.00	100.0	N
3		3.025	3.247	3.025	3.248	-0.01	100.0	N
4		3.069	3.246	3.069	3.246	0.00	100.0	N
5		3.057	3.251	3.055	3.252	0.04	100.0	N
6		3.050	3.250	3.050	3.252	0.00	100.0	N
7		3.054	3.253	3.053	3.255	0.03	100.0	N
8		3.043	3.252	3.043	3.254	0.00	100.1	N
9		3.043	3.252	3.042	3.253	0.03	100.0	N
10		3.060	3.252	3.060	3.253	0.01	100.0	N
11	完全放電 / Fully discharged	3.062		3.062		0.00		N
12		3.061		3.061		0.00		N
13		3.046		3.046		-0.01		N
14		3.052		3.052		-0.01		N
15		3.055		3.055		0.00		N
16		3.053		3.053		0.00		N
17		3.041		3.041		-0.01		N
18		3.050		3.050		-0.01		N
19		3.060		3.060		0.00		N
20		3.050		3.050		0.00		N
試験名称 / Test Name		T4:衝撃試験 Shock						
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 <0. 2%以下>	OCV維持率 / Residual OCV 90%以上	現象 / Occurrence
		mass (g)	OCV (V)	mass (g)	OCV (V)			
1	未放電 / Undischarged	3.063	3.257	3.061	3.257	0.07	100.0	N
2		3.044	3.275	3.044	3.276	0.01	100.0	N
3		3.025	3.248	3.025	3.248	0.00	100.0	N
4		3.069	3.246	3.069	3.246	0.00	100.0	N
5		3.055	3.251	3.053	3.251	0.07	100.0	N
6		3.050	3.251	3.050	3.252	-0.01	100.0	N
7		3.053	3.254	3.052	3.252	0.04	100.0	N
8		3.043	3.254	3.043	3.250	0.01	99.9	N
9		3.042	3.254	3.040	3.252	0.09	100.0	N
10		3.060	3.253	3.058	3.253	0.06	100.0	N
11	完全放電 / Fully discharged	3.062		3.062		0.00		N
12		3.061		3.061		0.00		N
13		3.046		3.046		0.01		N
14		3.052		3.052		0.01		N
15		3.055		3.055		0.00		N
16		3.053		3.053		0.00		N
17		3.041		3.041		0.00		N
18		3.050		3.050		0.00		N
19		3.060		3.060		0.01		N
20		3.050		3.050		0.00		N
質量減少率 / Mass Loss (%)		□ 電池質量 < 1g: 0.5%以下 ■ 1g ≤ 電池質量 ≤ 75g: 0.2%以下 □ 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>						

QMJ-19-01-06-F011-2, 改定2019/04/05

国連勧告試験 結果 3
Test Result of UN Recommendations Part 3

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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 170℃≧	現象確認/ Occurrence
1	未放電 / Undischarged	62℃	N
2		63℃	N
3		62℃	N
4		61℃	N
5		62℃	N
6		63℃	N
7		63℃	N
8		65℃	N
9		62℃	N
10		60℃	N
11	完全放電 / Fully discharged	58℃	N
12		58℃	N
13		58℃	N
14		58℃	N
15		57℃	N
16		57℃	N
17		57℃	N
18		58℃	N
19		57℃	N
20		57℃	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: 圧壊試験 Crash	
番号 No.	サンプル状態 Conditions	最大表面温度 / Max. Surface Temperature 170℃≥	現象確認/ Occurrence
1	未放電 / Undischarged	170℃以下	N
2		170℃以下	N
3		170℃以下	N
4		170℃以下	N
5		170℃以下	N
6	完全放電 / Fully discharged	170℃以下	N
7		170℃以下	N
8		170℃以下	N
9		170℃以下	N
10		170℃以下	N

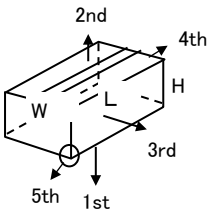
試験名称	T7: 過充電 Overcharge
対象外 / Not Applicable	

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	
1	完全放電 / Fully discharged	N	
2		N	
3		N	
4		N	
5		N	
6		N	
7		N	
8		N	
9		N	
10		N	
【現象 / Occurrence】		発火: F <Fire> 破裂: D <Disassembly> 異常なし: N <No fire, No disassembly>	

Test Result of UN Recommendations for Package

試験場所/ Test Company	株式会社 東北村田製作所/Tohoku Murata Manufacturing Co., Ltd.					
住所/ Address	〒963-0531 福島県郡山市日和田町高倉下杉下1-1 1-1, Shimosugishita, Takakura, Hiwada-machi, Koriyama Fukushima 963-0531 Japan				電話/ Tel	+81-24-958-3811
試験室/ Test Room	オクト産業(株)評価室/ Industrial Design OCTO	試験期間/ Test Dates	2016/01/07～2016/01/13		試験番号 /Test No	AB－1601－002
モデル名/ Model Name	CR2032-HE8			梱包入り数 /Quantity		250 pcs
セルタイプ/ Cell Type	CR2032	構成/ Configuration	単セル/ Single Cell	梱包製造地/ Package Location	Japan	
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)	
	363 mm		185 mm		150 mm	
					質量 /Gross Weight (kg)	
					1.6 kg	

落下試験/Drop Test

試験設備/ Test equipment	DT-100B		
試験条件/ Test condition	落下高さ /Drop height	1. 2 m	試験結果 /Occurrence
落下姿勢(方向) / Five (one for each drop) 	1回目の落下試験 The first drop test	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 transportation
	2回目の落下試験 The second drop test	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 transportation
	3回目の落下試験 The third drop test	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 transportation
	4回目の落下試験 The fourth drop test	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 transportation
	5回目の落下試験 The fifth drop test	コーナー（角）※/ On a corner	著しい破損なし/No Leakage, No damage liable to affect safety during transportation
	※容器が最も破損を受ける方向を選択/Use the direction of carton which may have the most serious damage.		
	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。 /On the outmost layer of the exterior container or bag, there shall be no damage which shall badly affect safety during transportation.	判定/ Judgment

積み重ね試験/Stacking Test

試験条件/ Test condition		No	試験結果 /Occurrence	
3mの想定段数算出/ Equivalent package number stacked up 3m		20段	1	漏洩・破損・歪みなし/ No leakage, No distortion, No deterioration
試験荷重値算出/ Examination load calculation value		38kg	2	漏洩・破損・歪みなし/ No leakage, No distortion, No deterioration
試験荷重値/Weight Load		65 kg	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、又は輸送物の積重ねを不安定にするような歪みが生じてはならない。 No leakage, no deterioration which may affect badly safety transportation, no distortion which may cause unstable stacking.		判定/ Judgment	合格/OK

総合判定
合格/OK