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

## BATTERY TRANSPORTION INFORMATION

Name of cell, battery or product manufacturer, as applicable:
Item Number : CR2050W
Item Name : CR2050W
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: +81-24-955-7854
e-mail: tmm-qa-compliance@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: +81-24-955-7854
e-mail: tmm-qa-compliance@murata.com
Website: https://www.murata.com/en-global/group/tohokumurata

A unique test report identification number:
UN38.3-CR2050W REV

Date of the test report:
20-Jun-23

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
Cell or Battery Weight : 4.2 g
LC or W/h rating : 0.097 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 Batteries**

Signature with name and title of signatory as an indication of the validity of information provided:

Yukiko Haraguchi
Tohoku Quality Assurance Group
Senior Manager Yukiko Haraguchi

Date document was generated:
20-Jun-23

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 transportion.

For product quotations and sales inquiries, please contact the dedicated form on the Murata Manufacturing website.
Contact to:<https://www.murata.com/en-global/contactform>

**Tohoku Murata Manufacturing Co., Ltd.**
1-1 Shimosugishita, Takakura, Hiwada-machi,
Koriyama-shi, Fukushima 963-0531 JAPAN
Phone: +81 24 955 7834 / Fax: +81 24 958 5827



# リチウム電池認証書／Lithium cell or battery Certification

No: UN38.3-CR2050W REV
Date: June 20,2023

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．機種名／Model Name：CR2050W Cell Type： CR2050W (muRata) (Made in Japan)

Murata Model Name： CR2050W

3．顧 客 名／Customer： Murata Manufacturing Co.,Ltd.

4．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~T6, T8)： 2023/02/27 - 2023/03/22
梱包試験実施日／Tested Date for Package： 2016/01/07～2016/01/14

5．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 | 345mAh | |
| 総リチウム含有量／Aggregated lithium content | 0.097g | |

上記テスト結果は国連勧告試験 (UN Manual of Tests and Criteria 7th revied edition , 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, 7th revised edition, Part Ⅲ, subsection 38.3.

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

# 国連勧告試験 結果 1

Test Result of UN Recommendations Part 1

| | | | | | |
|---|---|---|---|---|---|
| 機種名 / Murata Model Name | CR2050W (Made in Japan) | | | | |
| 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 | 2023/02/27 - 2023/03/22 | |
| 判定基準 / Criterion | UN Manual of Tests and Criteria 7th revised edition, 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 | 4.153 | 3.189 | 4.153 | 3.189 | 0.00 | 100.0 | N |
| 2 | | 4.157 | 3.191 | 4.157 | 3.191 | 0.00 | 100.0 | N |
| 3 | | 4.148 | 3.193 | 4.148 | 3.193 | 0.00 | 100.0 | N |
| 4 | | 4.152 | 3.189 | 4.152 | 3.189 | 0.00 | 100.0 | N |
| 5 | | 4.165 | 3.196 | 4.166 | 3.196 | 0.00 | 100.0 | N |
| 6 | | 4.157 | 3.197 | 4.158 | 3.197 | -0.01 | 100.0 | N |
| 7 | | 4.158 | 3.188 | 4.158 | 3.188 | 0.00 | 100.0 | N |
| 8 | | 4.150 | 3.197 | 4.151 | 3.197 | 0.00 | 100.0 | N |
| 9 | | 4.164 | 3.181 | 4.164 | 3.181 | 0.00 | 100.0 | N |
| 10 | | 4.152 | 3.185 | 4.152 | 3.185 | -0.01 | 100.0 | N |
| 11 | 完全放電 / Fully discharged | 4.160 | | 4.160 | | 0.00 | | N |
| 12 | | 4.159 | | 4.159 | | 0.00 | | N |
| 13 | | 4.168 | | 4.168 | | 0.00 | | N |
| 14 | | 4.176 | | 4.176 | | 0.00 | | N |
| 15 | | 4.156 | | 4.156 | | 0.00 | | N |
| 16 | | 4.150 | | 4.151 | | -0.01 | | N |
| 17 | | 4.156 | | 4.156 | | 0.00 | | N |
| 18 | | 4.157 | | 4.157 | | 0.00 | | N |
| 19 | | 4.163 | | 4.163 | | 0.00 | | N |
| 20 | | 4.168 | | 4.168 | | 0.00 | | 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 | 4.153 | 3.189 | 4.153 | 3.225 | 0.01 | 101.1 | N |
| 2 | | 4.157 | 3.191 | 4.157 | 3.228 | 0.01 | 101.2 | N |
| 3 | | 4.148 | 3.193 | 4.148 | 3.231 | 0.00 | 101.2 | N |
| 4 | | 4.152 | 3.189 | 4.152 | 3.227 | 0.00 | 101.2 | N |
| 5 | | 4.166 | 3.196 | 4.165 | 3.232 | 0.01 | 101.1 | N |
| 6 | | 4.158 | 3.197 | 4.157 | 3.232 | 0.01 | 101.1 | N |
| 7 | | 4.158 | 3.188 | 4.158 | 3.226 | 0.00 | 101.2 | N |
| 8 | | 4.151 | 3.197 | 4.151 | 3.233 | 0.00 | 101.1 | N |
| 9 | | 4.164 | 3.181 | 4.163 | 3.222 | 0.00 | 101.3 | N |
| 10 | | 4.152 | 3.185 | 4.152 | 3.223 | 0.01 | 101.2 | N |
| 11 | 完全放電 / Fully discharged | 4.160 | | 4.160 | | 0.00 | | N |
| 12 | | 4.159 | | 4.159 | | 0.00 | | N |
| 13 | | 4.168 | | 4.168 | | 0.00 | | N |
| 14 | | 4.176 | | 4.176 | | 0.00 | | N |
| 15 | | 4.156 | | 4.156 | | 0.00 | | N |
| 16 | | 4.151 | | 4.151 | | 0.00 | | N |
| 17 | | 4.156 | | 4.155 | | 0.00 | | N |
| 18 | | 4.157 | | 4.157 | | 0.00 | | N |
| 19 | | 4.163 | | 4.162 | | 0.00 | | N |
| 20 | | 4.168 | | 4.168 | | 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><br>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 | | 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 | 4.153 | 3.225 | 4.153 | 3.226 | -0.01 | 100.0 | N |
| 2 | | 4.157 | 3.228 | 4.157 | 3.229 | -0.01 | 100.0 | N |
| 3 | | 4.148 | 3.231 | 4.148 | 3.232 | 0.00 | 100.0 | N |
| 4 | | 4.152 | 3.227 | 4.152 | 3.227 | 0.00 | 100.0 | N |
| 5 | | 4.165 | 3.232 | 4.166 | 3.232 | -0.01 | 100.0 | N |
| 6 | | 4.157 | 3.232 | 4.158 | 3.233 | -0.01 | 100.0 | N |
| 7 | | 4.158 | 3.226 | 4.158 | 3.226 | 0.00 | 100.0 | N |
| 8 | | 4.151 | 3.233 | 4.151 | 3.234 | 0.00 | 100.0 | N |
| 9 | | 4.163 | 3.222 | 4.164 | 3.222 | -0.01 | 100.0 | N |
| 10 | | 4.152 | 3.223 | 4.152 | 3.224 | -0.01 | 100.0 | N |
| 11 | 完全放電 / Fully discharged | 4.160 | | 4.160 | | 0.00 | | N |
| 12 | | 4.159 | | 4.159 | | 0.00 | | N |
| 13 | | 4.168 | | 4.168 | | 0.00 | | N |
| 14 | | 4.176 | | 4.176 | | 0.00 | | N |
| 15 | | 4.156 | | 4.156 | | 0.00 | | N |
| 16 | | 4.151 | | 4.151 | | 0.00 | | N |
| 17 | | 4.155 | | 4.156 | | 0.00 | | N |
| 18 | | 4.157 | | 4.157 | | 0.00 | | N |
| 19 | | 4.162 | | 4.163 | | 0.00 | | N |
| 20 | | 4.168 | | 4.168 | | 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 | 4.153 | 3.226 | 4.153 | 3.226 | 0.00 | 100.0 | N |
| 2 | | 4.157 | 3.229 | 4.158 | 3.228 | -0.01 | 100.0 | N |
| 3 | | 4.148 | 3.232 | 4.148 | 3.232 | 0.00 | 100.0 | N |
| 4 | | 4.152 | 3.227 | 4.152 | 3.225 | 0.00 | 99.9 | N |
| 5 | | 4.166 | 3.232 | 4.165 | 3.232 | 0.00 | 100.0 | N |
| 6 | | 4.158 | 3.233 | 4.158 | 3.233 | 0.00 | 100.0 | N |
| 7 | | 4.158 | 3.226 | 4.158 | 3.226 | 0.00 | 100.0 | N |
| 8 | | 4.151 | 3.234 | 4.151 | 3.234 | 0.00 | 100.0 | N |
| 9 | | 4.164 | 3.222 | 4.164 | 3.222 | 0.00 | 100.0 | N |
| 10 | | 4.152 | 3.224 | 4.152 | 3.224 | 0.00 | 100.0 | N |
| 11 | 完全放電 / Fully discharged | 4.160 | | 4.160 | | 0.00 | | N |
| 12 | | 4.159 | | 4.159 | | 0.00 | | N |
| 13 | | 4.168 | | 4.167 | | 0.00 | | N |
| 14 | | 4.176 | | 4.176 | | -0.01 | | N |
| 15 | | 4.156 | | 4.156 | | 0.00 | | N |
| 16 | | 4.151 | | 4.151 | | 0.00 | | N |
| 17 | | 4.156 | | 4.156 | | 0.00 | | N |
| 18 | | 4.157 | | 4.157 | | 0.00 | | N |
| 19 | | 4.163 | | 4.163 | | 0.00 | | N |
| 20 | | 4.168 | | 4.168 | | 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><br>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 3

Test Result of UN Recommendations Part 3

| 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 | 61.4℃ | N |
| 2 | | 59.7℃ | N |
| 3 | | 59.2℃ | N |
| 4 | | 58.6℃ | N |
| 5 | | 58.0℃ | N |
| 6 | | 59.8℃ | N |
| 7 | | 58.7℃ | N |
| 8 | | 59.2℃ | N |
| 9 | | 58.7℃ | N |
| 10 | | 59.5℃ | N |
| 11 | 完全放電 / Fully discharged | 58.0℃ | N |
| 12 | | 57.8℃ | N |
| 13 | | 57.8℃ | N |
| 14 | | 57.8℃ | N |
| 15 | | 57.5℃ | N |
| 16 | | 58.7℃ | N |
| 17 | | 58.3℃ | N |
| 18 | | 58.8℃ | N |
| 19 | | 58.2℃ | N |
| 20 | | 58.9℃ | N |
| 現象 / Occurrence | | 破断:R 〈Rupture〉 発火:F 〈Fire〉 破裂:D 〈Disassembly〉<br>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〉 | |

muRata
INNOVATOR IN ELECTRONICS

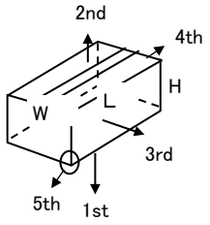
# 国連勧告試験　梱包結果

## 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㈱評価室/ Industrial Design OCTO | 試験期間/ Test Dates | 2016/01/07～2016/01/14 | 試験番号 /Test No | AB－1601－001 |
| モデル名/ Model Name | CR2050W | | 梱包入り数 /Quantity | | 500 pcs |
| セルタイプ/ Cell Type | CR2050W | 構成/ Configuration | 単セル/ Single Cell | 梱包製造所/ 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) | 質量 /Gross Weight (kg) | |
| | 342 mm | 183 mm | 150 mm | 2.8 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 | 1．2m | 試験結果 /Occurrence | |
| 落下姿勢(方向）/ Five (one for each drop) | 1回目の落下試験 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 | **合格/OK** |




## 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 | 57kg | 2 | 漏洩・破損・歪みなし/ No leakage, No distortion, No deterioration | |
| 試験荷重値/Weight Load | 155 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** |