Lithium Battery Safety Document – Section II or Section IB Shipments

AWB or Tracking Number: SEE BILL OF LADING (BOL) FOR TRACKING INFORMATION

This document may be used to comply with the additional documentation requirements of the IATA DGR.

WARNING: LITHIUM BATTERIES THAT HAVE BEEN RECALLED BY THE MANUFACTURER FOR SAFETY REASONS **MUST NOT** BE SHIPPED BY AIR.

Terminology:

- Cell – *electrochemical unit, consisting of an anode and a cathode, capable of generating electrical current*
- Battery – *assembly of cells*
- Lithium ion cells/batteries – *generally rechargeable – includes lithium polymer cells/batteries*
- Lithium metal cells/batteries – *non-rechargeable*

This shipment contains lithium cells or batteries in the following configuration (check applicable description):

Lithium Ion - Maximum of • **20 Watt-hours per cell or** • **100 Watt-hours per battery**	**Lithium Metal – Maximum of** • **1 gram of lithium metal per cell or** • **2 grams of lithium metal per battery**
☐ **Cells or batteries only (Lithium ion batteries in compliance with Section II of PI 965, UN 3480) -** *Cells or batteries in a package, without electronic equipment:* **Package Limit:** ≤2.7 Wh = 2.5 kg; or >2.7 Wh but ≤ 20 Wh = 8 cells; or >2.7 Wh but ≤ 100 Wh = 2 batteries	☐ **Cells or batteries only (Lithium metal batteries in compliance with Section II of PI 968, UN 3090) -** *Cells or batteries in a package, without electronic equipment.* **Package Limit:** ≤0.3 g = 2.5 kg; or >0.3 g but ≤ 1 g = 8 cells; or >0.3 g but ≤ 2g = 2 batteries
☐ **Cells or batteries only (Lithium ion batteries in compliance with Section IB of PI 965, UN 3480) -** *Cells or batteries in a package, without electronic equipment* *Packages must be limited to 10 kg net weight of batteries.*	☐ **Cells or batteries only (Lithium metal batteries in compliance with Section IB of PI 968, UN 3090) -** *Cells or batteries in a package, without electronic equipment* *Packages must be limited to 2.5 kg net weight of batteries.***.**
☐ **Packed with equipment (Lithium ion batteries in compliance with Section II of PI 966, UN 3481) -** *Cells or batteries contained in a package with associated electronic equipment.* *Packages must be limited to 5 kg net weight of batteries.*	☐ **Packed with equipment (Lithium metal batteries in compliance with Section II of PI 969, UN 3091) -** *Cells or batteries contained in a package with associated battery-powered equipment – with the batteries not installed in the equipment.* *Packages must be limited to 5 kg net weight of batteries.*
☐ **Contained in equipment (Lithium ion batteries in compliance with Section II of PI 967, UN 3481) -** *Cells or batteries installed in equipment.* *Packages must be limited to 5 kg net weight of batteries.*	☒ **Contained in equipment (Lithium metal batteries in compliance with Section II of PI 970, UN 3091) -** *Cells or batteries installed in equipment.* *Packages must be limited to 5 kg net weight of batteries.*

- This package must be handled with care. A flammability hazard exists if the package is damaged.
- If this package is damaged in transportation, it must not be loaded until the condition of the contents can be verified. The batteries contained in this package must be inspected for damage and may only be repacked if they are intact and protected against short circuits.
- For more information about the batteries contained in this package, call the following telephone number:

CHEMTREC for Lithium Battery Information Number:
For EMERGENCY information call 800-424-9300 or outside the United States call 703-527-3887

This product is a consumer product which is used in a hermetically sealed state. So, it is not an object of the SDS system. This document is provided to customers as reference information for the safe handling of the product. The information and recommendations set forth are made in good faith and are believed to be accurate at the date of preparation. Panasonic Corporation makes no warranty expressed or implied.

PRODUCT SAFETY DATA SHEET

1 Chemical product and company identification

Name of Product : Manganese dioxide lithium battery
Name of Company : Panasonic Corporation
Address : 1-1 Matsushita-cho, Moriguchi-city, Osaka, 570-8511, Japan
Emergency Contact : +81-6-6994-4560 (Working hours)
+81-6-6991-1141 (Holiday)

2 Hazards identification

GHS Classification : Not applicable
Toxicity : Vapor generated from burning batteries, may irritate eyes, skin and throat.
Hazard : Electrolyte and lithium metal are inflammable.
Risk of explosion by fire if batteries are disposed in fire or heated above 100 degrees C.
Stacking or jumbling batteries may cause external short circuits, heat generation, fire or explosion.

3 Composition/information of ingredients

Component	Material	CAS No.	Content (%)
Positive electrode	Manganese dioxide	1313-13-9	12 - 50
Negative electrode	Lithium metal	7439-93-2	0.5 - 6
Electrolyte	1,2-dimethoxyethane	110-71-4	1.5 - 3.5
	Lithium Perchlorate	7791-03-9	0.2 - 0.7
	Organic electrolyte	-	2.5 - 7
Others (Steel or Plastic parts)	Steel	7439-89-6, 7440-47-3	30 - 85
	Polypropylene	9003-07-0	0.5 - 10

Lithium content per cell

Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)	Model Number	Lithium content(g)
CR1025	0.008	CR2012	0.02	CR2330	0.08	CR2412	0.03
CR1216	0.008	CR2016	0.03	CR2354	0.17	CR2430	0.09
CR1220	0.01	CR2025	0.05			CR2450	0.18
CR1612	0.01	CR2032	0.07			CR2450A	0.16
CR1616	0.02	CR2032A	0.06			CR2477	0.29
CR1620	0.02	CR2032B	0.06			CR3032	0.15
CR1632	0.04	CR2050A	0.10				
		CR2050B2	0.10				

4 First aid measures (in case of electrolyte leakage from the battery)

Eye contact	:	Flush the eyes with plenty of clean water for at least 15 minutes immediately, without rubbing. Get immediate medical treatment. If appropriate procedures are not taken, this may cause eye injury.
Skin contact	:	Wash the contact areas off immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin.
Inhalation	:	Remove to fresh air immediately. Get medical treatment immediately.

5 Firefighting measures

Fire extinguishing agent	:	Alcohol-resistant foam and dry sand are effective.
Extinguishing method	:	Since vapor, generated from burning batteries may make eyes, nose and throat irritates, be sure to extinguish the fire on the windward side. Wear the respiratory protection equipment in some cases.

6 Accidental release measures (in case of electrolyte leakage from the battery)

Take up with absorbent cloth, treat cloth as inflammable.
Move the battery away from the fire.

7 Handling and storage

Handling :

- When packing the batteries, do not allow battery terminals to contact each other, or contact with other metals. Be sure to pack batteries by providing partitions in the packaging box, or in a separate plastic bag so that the single batteries are not mixed together.
- Use strong material for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation.
- Do not short-circuit, recharge, deform, throw into fire or disassemble.
- Do not mix different type of batteries.
- Do not solder directly onto batteries.
- Insert the battery correctly in electrical equipment.

Storage :

- Do not let water penetrate into packaging boxes during their storage and transportation.
- Do not store the battery in places of the high temperature or under direct sunlight.
- Please also avoid the places of high humidity. Be sure not to expose the battery to condensation, rain or frozen condition

8. Exposure controls and personal protection

Acceptable concentration	:	Not specified about Lithium Battery.
Facilities	:	Nothing in particular.

Protective Equipment (in case of electrolyte leakage from the battery)

Respiratory Protection	:	Self-Contained Breathing Apparatus for organic gases
Hand Protection	:	Safety gloves.
Eye Protection	:	Safety goggle

9. Physical and chemical properties

Appearance	:	Coin shape
Nominal Voltage	:	3 V

10. Stability and reactivity

Since batteries utilize a chemical reaction they are actually considered a chemical product.
As such, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, the various usage conditions such as discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage.

11. Toxicological information (in case of electrolyte leakage from the battery)

Acute toxicity	:	Oral(rat) LD50 > 2000mg/kg (estimated)
Irritation	:	Irritating to eye and skin.
Mutagenicity	:	Not specified.
Chronic toxicity	:	Not specified.

12. Ecological information

In case of the worn out battery was disposed in land, the battery case may be corroded, and leak electrolyte. However, there is no environmental impact information.
Mercury (Hg), Cadmium (Cd) and Lead (Pb) are not used in cell.

13. Disposal considerations

When the battery is worn out, dispose of it under the ordinance of each local government.

14. Transport information

During the transportation of a large amount of batteries by ship, trailer or railway, do not leave them in the places of high temperatures and do not allow them to be exposed to condensation.

During the transportation do not allow packages to be dropped or damaged.

Proper shipping name : Lithium metal batteries

UN Number, UN Class : UN3090, Class9 (for the Air transport by PI968 Section IA or IB)

: Exemption (for the Marine transport and the Air transport by Section II of PI 968, 969 or 970)
Even though the cells are classified as lithium metal batteries (UN3090 or UN3091), they are not subject to some requirements of Dangerous Goods Regulations because they meet the following:

1. for cells, the lithium content is not more than 0.3g ;
2. each cell is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, PartⅢ, sub-section 38.3.
3. each cell is manufactured in ISO9001 certified factory.

Please refer to the following reference information about concrete ways of transportation. Actual content of packaging label and shipping documents varies by shipping companies. Make sure to confirm in advance with your shipping company.

Information of reference

	Reference	Packing Instruction(PI)/ Special provision(SP)	Note
Air transport	IATA DGR	PI 968 Section Ⅰ A	Cells, Cargo Aircraft only; Net quantity per package Max. 35kg
		PI 968 Section Ⅰ B	Cells, Cargo Aircraft only; net quantity per package Max. 2.5kg
		PI 968 Section Ⅱ	Cells, Cargo Aircraft only, not more than one package in any single consignment; net quantity per package Max. 2.5kg
		PI 969 Section Ⅱ	Cells packed with equipment
		PI 970 Section Ⅱ	Cells contained in equipment, button cell batteries
Marine transport	IMDG Code	SP 188	

15. Regulatory information

- IATA Dangerous Goods Regulations 61th Edition (IATA DGR)
- IMO International Maritime Dangerous Goods Code 2018 Edition (IMDG Code)
- UN Recommendations on the Transportation of Dangerous Goods, Model Regulations
- UN Recommendations on the Transportation of Dangerous Goods, Manual of Tests and Criteria
- EU Battery Directive (2006/66/EC, 2013/56/EU)
- Regulation (EC) No. 1907/2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
- State of California Regulations - Best management practices for Perchlorate Materials
- Act on Preventing Environmental Pollution of Mercury (Japan)

16. Other information

This PSDS is provided to customers as reference information in order to handle batteries safely.
It is necessary for the customer to take appropriate measures depending on the actual situation such as the individual handling, based on this information.

In California only, packages that contain CR lithium coin cells and the Owners/Operating Instructions of products that contain CR lithium coin cells must include the following statement: "Perchlorate Material - special handling may apply,
See http://www.dtsc.ca.gov/hazardouswaste/perchlorate".
The effective date for this Perchlorate label is July 1, 2006 for non-consumer products and January 1, 2007 for consumer products.

Prepared by : Engineering Department
Energy Device Business Division
Panasonic Corporation

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

Document No. SDS-CR-004-E

Safety Data Sheet

Note : SDS is not applicable to the products hermetically sealed. Under normal conditions of use, the battery is contained in a hermetically-sealed case, therefore the information herein contained is provided for your information only.
The information and recommendations set forth herein are made in good faith and are believed to be accurate as of the date of preparation. However, Tohoku Murata Manufacturing Co., Ltd. MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THIS INFORMATION AND DISCLAIMS ALL LIABILITY FROM RELIANCE ON.

1. Product and company Identification

Product Name	Coin manganese dioxide lithium batteries
Model Name	CR1216%, CR1220%, CR1616%, CR1620%, CR1632%, CR2016%, CR2025%, CR2032%, CR2430%, CR2450%, CR2477% CR2032W%, CR2050S%, CR2050W%, CR2450S%, CR2450W%, CR2477W% CR2032X%, CR2450X%, CR2477X%, CR3677X% CR2032R%, CR2450R%
Brand	murata
Company Name	Tohoku Murata Manufacturing Co., Ltd.
Company Address	1-1 Shimosugishita, Takakura, Hiwada-machi, Koriyama-shi, Fukushima 963-0531 JAPAN
Information Telephone	Japan +81 24 955 7834 FAX +81 24 958 5827
Emergency Telephone	Japan +81 24 958 3811 Tohoku Murata Manufacturing Co., Ltd.
Date Revised	January 1, 2020
Issued Department	Product Department 4 , Energy Device Division , Module Business Unit Tohoku Murata Manufacturing Co., Ltd.

The model name attached % means that valid for all models which the singular/plural digits of alphanumeric or marks (including a space) attached after the model name.

2. Hazard identification

The important hazards and adverse effects of the chemical product	No information available	
Chemical product- specific hazards	No information available	
Outline of an anticipated emergency	Hazard	Coin manganese dioxide lithium batteries contain flammable materials such as organic solvent and metallic lithium. If battery was disposed in fire, or battery temperature exceeded 100℃, explosion or ignition of the battery may be caused. When short-circuit is caused by jumbling the batteries, explosion or ignition may be caused due to heat generation.
	Toxicity	When battery is burned, generated vapor may cause eyes, skin and respiratory irritation.

3. Composition/information on ingredients

Portion	Ingredient	CAS No.	Content ratio wt%
Cathode	Manganese Dioxide	1313-13-9	20~40 wt%
Anode	Metallic Lithium	7439-93-2	1~3 wt% (Li < 0.3g *)
Electrolyte	Dimethoxyethane	110-71-4	1~6 wt%
	Propylene Carbonate	108-32-7	2~9wt%
	Lithium Perchlorate	7791-03-9	0.3~0.9wt%
	Acid Phthalic Anhydride	85-44-9	0~0.1wt%
Others	Heavy metal such as Mercury, Cadmium and Lead are not added in the battery.		

* CR3677X%: Metallic Lithium weight exceeds 0.3g to 1g or less.

4. First aid measures

Swallowing	Ingestion of a battery can be harmful. Contents of an opened battery can cause serious chemical burns of mouth, esophagus and gastrointestinal tract. In either case, do not induce vomiting nor give food or drink. Seek medical attention immediately.
Skin Contact	Contents of an opened battery can cause skin irritation. Wash skin with soap and water. If inflammation was caused on the skin, seek the medical attention.
Eye Contact	Contents of an opened battery can cause eye irritation. Immediately flush eyes thoroughly with water for several minutes. Seek medical attention.
Inhalation	Contents of an opened battery can cause respiratory irritation. Provide fresh air and call a doctor.

5. Fire fighting measures

Extinguishing Media	Powder, Carbon dioxide and Dry sand. Metallic Lithium contained in a battery reacts with water strongly, as a result, generates hydrogen gas. Extinguishing by water may cause explosion.

6. Accidental release measures (In the case that electrolyte is leaked from battery.)

Personal precautions	Temporary inhalation of odor and attaching of electrolyte to skin does not cause serious health hazard. Be sure the ventilation and washing out of electrolyte quickly.
Environmental precautions	Wipe off with dry cloth and keep away from fire.

7. Precautions for safe handling and use

Handling	Since improper battery handling may cause leakage, overheating or explosion of the battery, the following precautions shall be observed. (1) Keep batteries away from children. Swallowing a battery can cause chemical burn or penetration of the mucous membrane tissue, in the worst case, may result in death. If infant happens to swallow a battery, seek medical attention immediately to take it out. (2) Do not short. (3) Insert batteries with positive (+) and negative (-) terminals correctly oriented. (4) Do not mix different type batteries or mix new and old ones together. (5) Do not directly heat, solder or throw into fire. (6) Do not modify, deform or disassemble the battery. (7) Do not have children replace batteries unsupervised by adults. (8) In case of swallowed battery, seek medical attention immediately. (9) This battery is not designed for recharging. To do so can cause leakage or explosion.
Storage	Store in a cool, well-ventilated area. Do not store batteries at high-temperatures or high-humidity. Proper storage temperature is +10℃~+25℃. It is preferable not to exceed +30℃. Avoid extremely higher or lower humidity (95% or more, 40% or less). Elevated temperature can result in shortened battery life. Avoid exposure to sunlight to prevent performance deterioration, swelling or leakage. Since short circuit can cause burn hazard and leak or explode hazard, do not batteries jumbled in bulk containers. Avoid to contact water, metallic chain or metallic chip which may result in short-circuit.

8. Exposure controls/personal protection

N/A

9 Physical and chemical properties

Condition	Solid
Appearance	Coin Shape
Nominal voltage	3 V

10. Stability and reactivity

Stability : Stable under normal conditions of use.
Condition to avoid : See Section 7.

11. Toxicological information

Under normal conditions of use, there is no risk to life and health, because ingredients of battery is hermetical sealed with metal case.

12. Ecological information

When exhausted battery is buried in the ground, it is confirmed that outflow of metal contained in the battery has been seldom found. But we have no ecological information.

13. Disposal considerations

When battery is disposed, isolate positive (+) and negative (-) terminals of the battery to avoid those terminals touch each other.
Batteries may be short-circuited when piled up or mixed the batteries in disorder.
Dispose in accordance with applicable federal, state and local regulations

14. Transport information

UN Dangerous Goods List

UN No.	Name and Description	Class or division	Special provision	Packing instruction
3090	LITHIUM METAL BATTERIES	9	188 230 310 376 377 384	P903 P908 P909 P910

【Sea transportation】

All lithium metal cells shipping from Tohoku Murata Manufacturing Co., Ltd. and their packing condition conform to the following regulations and meet the requirements, therefore they can be shipped as exemption from Class 9 Dangerous goods.

Outline of IMO-IMDG Code 2018 SP188

- For a lithium metal cell, aggregate lithium content is not more than 1g.
- Each cell is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria 6th revised edition Amendment 1, Part Ⅲ, subsection 38.3.
- Cells shall be packed in inner packagings that completely enclose the cell.
- Each package shall be capable of withstanding a 1.2m drop test in any orientation without damage to cells contained therein, without shifting of the contents so as to allow battery to battery contact and without release of contents.
- Package shall not exceed 30kg gross mass.
- The specified information shall be indicated on each package.
- Each cell shall be manufactured under quality program specified by the United Nations.

【Air transportation】

For air transportation, it is necessary to comply with IATA DGR 61st Edition (Dangerous Goods Regulations, 61st Edition)

Dangerous Goods List on IATA DGR

UN No.	Proper Shipping Name/Description	Class or division	Packing Instruction	Passenger Aircraft	Cargo Aircraft	S.P.
3090	LITHIUM METAL BATTERIES	9	PI968 (Section IA)	Forbidden	Max Net Qty /Package 35kg	A88 A99 A154 A164 A183 A201 A206
			PI968 (Section IB)	Forbidden	Max Net Qty /Package 2.5 kg	
			PI968 (Section II)	Forbidden	Max Net Qty /Package 2.5 kg & Single package for single consignment	

※As all of murata Coin manganese dioxide lithium batteries contain lithium metals less than 1.0g, Packing Instruction 969/970 can be applicable to the products that murata Coin manganese dioxide lithium batteries are assembled into.
The equipment is excluded from dangerous goods regulation.

When our cell or battery is contained in equipment or packed with equipment, it is classified into UN3091.

※For the details of indication on package and document required for transportation, please refer to IATA DGR 61st Edition (Dangerous Goods Regulations, 61st Edition).

*Related regulation, Issued documents

- International Air Transport Association (IATA):Dangerous Goods Regulations, 61st Edition
- International Civil Aviation Organization (ICAO): Technical Instructions for the Safe Transport of Dangerous Goods by Air, 2019-2020 Edition
- International Maritime Organization (IMO): International Maritime Dangerous Goods (IMDG) Code, 2018 Edition
- U.S. Department of Transportation (DOT) 49 CFR
- UN(SP188) : UN(United Nations):Recommendations on the Transport of Dangerous Goods: Model Regulations 20th revised edition

15. Regulatory information

- EU Directive 2006/66/EC and 2013/56/EU
- CA Lithium Perchlorate Regulation

16. Other information

If you need further information, please contact your local sales representative.

Panasonic

No. 2019-0000003483

Lithium Battery Test Summary / UN38.3 試験結果要約

Product manufacturer Panasonic Corporation

Address/住所 1-1 Matsushita-cho, Moriguchi City, Osaka 570-8511, Japan

Telephone/電話番号 +81-6-6994-4560

e-mail un38.3_microbattery@ml.jp.panasonic.com

URL https://www.panasonic.com/global/home.html

Test laboratory Panasonic Corporation

Address/住所 1-1 Matsushita-cho, Moriguchi City, Osaka 570-8511, Japan

Telephone/電話番号 +81-6-6994-4560

e-mail un38.3_microbattery@ml.jp.panasonic.com

URL https://www.panasonic.com/global/home.html

Description of Product / 製品情報

Model Number/品番 CR2032

Type/タイプ Lithium metal cell

Physical description/物理特性 Non-rechargeable, Coin

Mass/質量 2.9 g

Lithium content/リチウム含有量 0.07 g

Watt-hour rating/ワット時定格値 Not applicable

Nominal Voltage/公称電圧 3.0 V

Nominal Capacity/公称容量 225 mAh

Test Results / 結果

Identification number/番号 CP0008-10

Date of test report/レポート発行日 2008/08/05

Reference edition/参照 UN Manual of Tests and Criteria 4th Amendment 1 edition

UN Manual of Tests and Criteria 国連勧告テスト判定基準	Results 結果	Remarks 備考
T1 : Altitude simulation /高度ｼｭﾐﾚｰｼｮﾝ	Pass / 合格	
T2 : Thermal Test / 温度試験	Pass / 合格	
T3 : Vibration / 振動	Pass / 合格	
T4 : Shock / 衝撃	Pass / 合格	
T5 : External short circuit / 外部短絡	Pass / 合格	
T6 : Impact / 衝突､Crush / 圧壊	Pass / 合格	Impact / 衝突
T7 : Overcharge / 過充電	-	for rechargeable batteries only / 充電式電池のみ
T8 : Forced discharge / 強制放電	Pass / 合格	

Hereby we certify that this model of Lithium battery meets the requirements of each test in theUN Manual of Tests and Criteria Part III, sub-section 38.3.
上記テストは国連勧告テスト(Manual of Tests and Criteria, Part III, sub-section 38.3.)に従い確認された結果であることを証明致します。

Signature: K. Amano

Name and Title: Kazuyuki Amano / Manager
Energy Device Business Division

210-06829+A0

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//14T1BWW
Item Name : CR2032//14T1BWW
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:
UN38.3-012

Date of the test report:
1-Apr-19

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:

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	:0.060g
Cell or Battery Weight	: 3.1 g
Physical description	
:Lithium Metal Battery Cell(Coin shaped)	

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

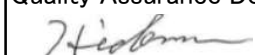
PRODUCT CLASSIFICATION FOR TRANSPORT (According to UN - DGP)

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



Date document was generated:
28-Nov-19

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.

210-06828+A0

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（類似機種用）

Lithium cell or battery Certification for Similar Models

No: UN38.3-012
Date: April 1, 2019

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 Nam‹CR2032 Cell Type： CR2032 (muRata) (Made in Indonesia)

Murata Product Name Coin mnganese dioxide lithium batteries (Internal part name: CR2032//14T1BWW)

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	3V	
公称容量／Nominal capacity	220mAh	
総リチウム含有量／Aggregated lithium content	0.060g	
状態 / Condition	Solid	
外観 / Appearance	Coin Shape	

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/	備考／Remarks
NO	テスト項目Test item	Test results	
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： 2016/02/05～2016/02/06

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.

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

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

セルタイプ / Cell Type	CR2032(Made in Indonesia)		
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	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	T1-5,8：2007.11.05～12.04 T6：2013.10.16～10.23
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	3.117	3.260	3.117	3.260	0.00	100.0	N
2		3.130	3.252	3.129	3.252	0.00	100.0	N
3		3.137	3.254	3.137	3.254	0.00	100.0	N
4		3.133	3.258	3.133	3.258	0.00	100.0	N
5		3.108	3.250	3.108	3.250	0.00	100.0	N
6		3.118	3.262	3.118	3.262	0.00	100.0	N
7		3.100	3.256	3.100	3.256	0.00	100.0	N
8		3.110	3.261	3.110	3.261	0.00	100.0	N
9		3.110	3.246	3.110	3.246	0.00	100.0	N
10		3.115	3.254	3.115	3.254	0.00	100.0	N
11	完全放電 / Fully discharged	3.111		3.111		0.00		N
12		3.130		3.130		0.00		N
13		3.131		3.131		0.00		N
14		3.135		3.135		0.00		N
15		3.133		3.133		0.00		N
16		3.124		3.124		0.00		N
17		3.118		3.118		0.00		N
18		3.122		3.122		0.00		N
19		3.130		3.130		0.00		N
20		3.140		3.140		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	3.117	3.262	3.116	3.257	0.01	99.9	N
2		3.129	3.254	3.129	3.250	0.00	99.9	N
3		3.137	3.255	3.137	3.251	0.00	99.9	N
4		3.133	3.259	3.133	3.255	0.00	99.9	N
5		3.108	3.252	3.108	3.246	0.00	99.8	N
6		3.118	3.263	3.118	3.259	0.00	99.9	N
7		3.100	3.257	3.100	3.254	0.00	99.9	N
8		3.110	3.262	3.110	3.258	0.00	99.9	N
9		3.110	3.247	3.110	3.243	0.01	99.9	N
10		3.115	3.255	3.115	3.251	0.00	99.9	N
11	完全放電 / Fully discharged	3.111		3.111		0.00		N
12		3.130		3.129		0.00		N
13		3.131		3.131		0.00		N
14		3.135		3.135		0.00		N
15		3.133		3.133		0.00		N
16		3.124		3.124		0.00		N
17		3.118		3.118		0.00		N
18		3.122		3.122		0.00		N
19		3.130		3.130		0.00		N
20		3.140		3.140		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>

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	3.116	3.258	3.116	3.258	0.00	100.0	N
2		3.129	3.250	3.129	3.250	0.00	100.0	N
3		3.137	3.252	3.137	3.252	0.00	100.0	N
4		3.133	3.255	3.133	3.255	0.00	100.0	N
5		3.108	3.247	3.108	3.247	0.00	100.0	N
6		3.118	3.260	3.118	3.260	0.00	100.0	N
7		3.100	3.255	3.100	3.255	0.00	100.0	N
8		3.110	3.258	3.110	3.258	0.00	100.0	N
9		3.110	3.244	3.110	3.244	0.00	100.0	N
10		3.115	3.251	3.115	3.251	0.00	100.0	N
11	完全放電 / Fully discharged	3.111		3.111		0.00		N
12		3.129		3.129		0.00		N
13		3.131		3.131		0.00		N
14		3.135		3.135		0.00		N
15		3.133		3.133		0.00		N
16		3.124		3.124		0.00		N
17		3.118		3.118		0.00		N
18		3.122		3.122		0.00		N
19		3.130		3.130		0.00		N
20		3.140		3.140		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	3.116	3.258	3.116	3.258	0.00	100.0	N
2		3.129	3.250	3.129	3.250	0.00	100.0	N
3		3.137	3.252	3.137	3.252	0.00	100.0	N
4		3.133	3.255	3.133	3.255	0.00	100.0	N
5		3.108	3.247	3.108	3.247	0.00	100.0	N
6		3.118	3.260	3.118	3.260	0.00	100.0	N
7		3.100	3.255	3.100	3.255	0.00	100.0	N
8		3.110	3.259	3.110	3.259	0.00	100.0	N
9		3.110	3.244	3.110	3.244	0.00	100.0	N
10		3.115	3.252	3.115	3.252	0.00	100.0	N
11	完全放電 / Fully discharged	3.111		3.111		0.00		N
12		3.129		3.129		0.00		N
13		3.131		3.131		0.00		N
14		3.135		3.135		0.00		N
15		3.133		3.133		0.00		N
16		3.124		3.124		0.00		N
17		3.118		3.118		0.00		N
18		3.122		3.122		0.00		N
19		3.130		3.130		0.00		N
20		3.140		3.140		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>

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	60℃	N
2		60℃	N
3		60℃	N
4		60℃	N
5		60℃	N
6		60℃	N
7		60℃	N
8		60℃	N
9		60℃	N
10		60℃	N
11	完全放電 / Fully discharged	57℃	N
12		57℃	N
13		57℃	N
14		57℃	N
15		57℃	N
16		57℃	N
17		57℃	N
18		57℃	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>	

* T6: Temperature Measurement by Thermolabel

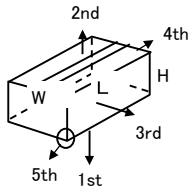
国連勧告試験　梱包結果

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	2015/12/17～2015/12/25	試験番号 /Test No	AB－1512－001
モデル名/ Model Name	CR2032		梱包入り数 /Quantity		1400 pcs
セルタイプ/ Cell Type	CR2032	構成/ Configuration	単セル/ Single Cell	梱包製造地/ Package Location	Indonesia
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	5.4 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	114kg	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