



智弘科技
Jhih-Hong Technology Co., Ltd.

SPECIFICATION FOR APPROVAL

MODEL NAME: JHT CR2477W (MIT)

JHT P/N: 3CR2477010100

DATE: 2025/01/10

REVISION: A

REMARK:



JHT APPROVAL:

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REVISION AND UPDATES

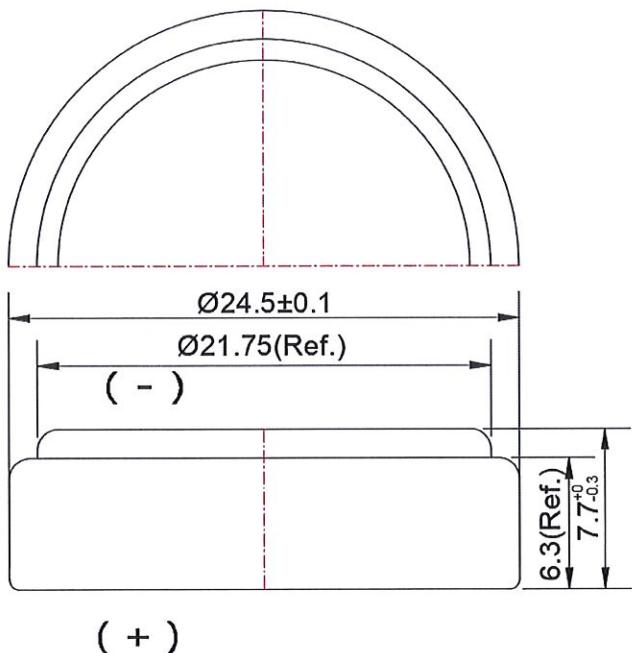
JHT P/N	3CR2477010100	JHT POWER IN PARTNERSHIP
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1. Applicable range

This specification applies to manganese dioxide lithium batteries which are delivered to from Jhih Hong technology Taiwan.

2. Nominal specification

2.1. Battery type	CR2477W
2.2. Nominal voltage	3.0 volts
2.3. Standard capacity	1000 mAh (Load:4.7k ohm, End voltage 2.0V, at 20±2°C)
2.4. Mass	Refer to Drawing 1
2.5. Dimension	Refer to Drawing 1
2.6. Operation temperature	From -40°C to 85°C
2.7. Recommendable storage	Temperature 5°C to 35°C Humidity \leq 60%RH



Drawing 1

Terminal:	Positive terminal material : Nickel plated stainless steel
	Negative terminal material : Nickel plated stainless steel
Weight :	Approx. 9.5 g

3. Indication

3.1. Below items are indicated on battery

Model code (control code)	CR2477W (x)
Nominal voltage	3V
Polarity	+ (- shall not be indicated)
Brand	The brand name of "JHT"
Battery system	is used Lithium
Production country	Made in Taiwan

3.2. Production date

Shown on minus side of battery

First digit indicate end digit of production year; Second digit indicate production month (January=1~September=9, October=X, November=Y, December=Z)

Example : 11 (January/2021), 1X (October/2021)

3.3 Recommended periods of use shall be 60 months after date of production.

3.4 Base on the specification condition, the battery performance is warranted one year. (Table 1.)

4. Test condition and performance

4.1. External dimensions

This shall be measured with caliper described in item 5.3.1. Do not short cells by caliper. Dimensions should confirm to drawing 1

4.2. Open circuit voltage

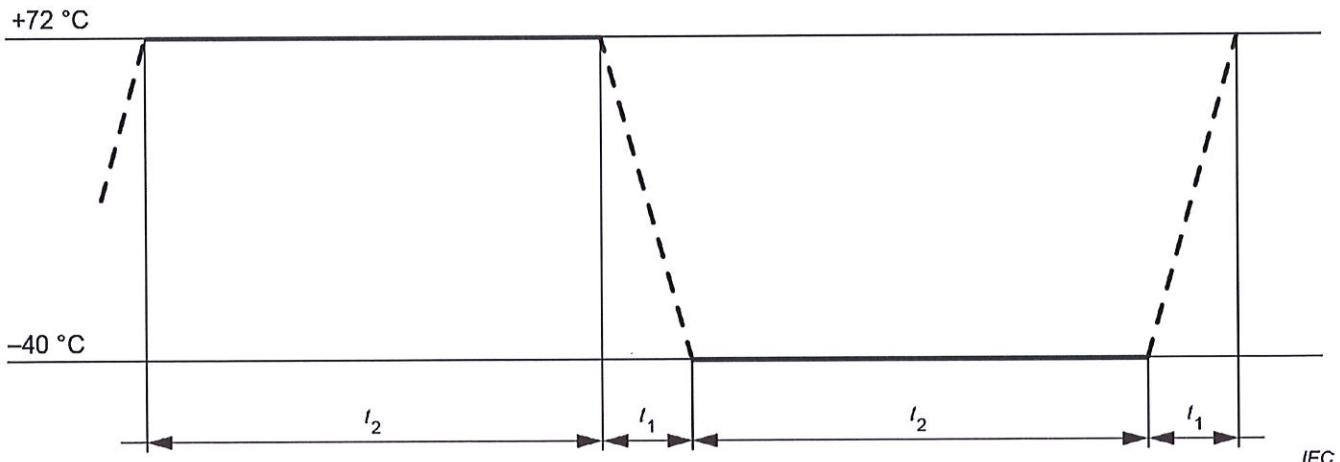
After storage in measuring circumstance at least 2 hours, this shall be measured with voltage meter described in item 5.3.2. Open circuit voltage should confirm to Table 1.

4.3. Anti-leakage

Test cells and batteries shall be stored for at least 6h at a test temperature of 72°C, followed by storage for at least 6h at a test temperature of -40°C. The maximum time for transfer to each temperature shall be 30min. Each test cell and battery shall undergo this procedure 10times. This is then followed by storage for at least 24h at ambient temperature.

For large cells and batteries the duration of exposure to the test temperatures shall be at least 12h instead of 6h.

The test shall be conducted using the test cells and batteries previously subjected to the altitude test.



Key

$t_1 \leq 30 \text{ min}$

$t_2 \geq 6 \text{ h (12 h for large cells and batteries)}$

NOTE The figure shows one of ten cycles

4.4. Discharge duration	After storage in measuring atmosphere at least 8 hours, batteries are discharged by load resistance described in Table 1. Discharge time is calculated from beginning until reaching closed circuit voltage described in Table 1. Discharge condition should be corresponded with Table 1
4.5. Storage characteristics	
4.5.1. Open circuit voltage	After storage term described on Table 1, sample batteries should be storage in measuring atmosphere at least 4 hours. Then open circuit voltage should be measured with voltage meter described in item 5.3.2. This should be corresponded with Table 1.

4.5.2. Discharge duration	After storage term described on Table 1, sample batteries should be storage in measuring atmosphere at least 8 hours. Then batteries are discharged by load resistance described in Table 1.
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Table 1. CR2477W characteristics

Items	Test method	Temperature	Load	Initial	After 1 year
1 Open circuit voltage	Voltage between terminals (Min.)	20±2°C		3.0 V	3.0 V
2 Discharge duration	Continuous discharge (Min)	20±2°C	Load: 4.7kΩ End V: 2.0V	1600h	1568h

5. Test conditions and equipment

- 5.1. Initial test Initial test must be done within 2 months from delivery.
- 5.2. Temperature and humidity Unless specified the condition, test should be carried out in room temperature (20±2°C) and room humidity (45±10%RH).

5.3. Measuring equipment

- 5.3.1. Dimension Micrometer is defined by JIS B7502 or equivalent with even more accurate one must be used for dimension measurement.
For one digit decimals tolerance, caliper with 0.05mm accuracy which is defined JIS B7507 or higher accuracy equipment must be used.
- 5.3.2. Voltage Voltage meter is defined by JIS C1102 class 0.2 or higher, and more than 10Mohm impedance must be used.
- 5.3.3. Load resistance includes all resistance of discharge circuit, and tolerance is less than 0.5%.
- 5.3.4. Visual inspection is carried out by naked eye

6. Operation and modification of this specification

Modification must be carried out after the prior mutual agreement
Any accidents caused by non-described items in this specification must be discussed and solved mutually.

7. Important notes (Warranty)

- 7.1. The batteries are warranted to conform to the description contained in this specification for a period of twelve 【12】 months from the ex-factory date and any claim by customer (apparatus manufacturer or distributor) must be within such period. During that warranty period, if the batteries are proved to become defective, non-defective and conforming batteries will be supplied in due course at sole expense of JHT upon JHT's own determination that this is apparently caused by negligence of JHT.
- 7.2. Confirm and assure the matching and reliability of batteries on actual set or unit application with customer's responsibility.

7.3. JHT shall not warrant or be responsible in any case where customer fails to carry out proper handling, operating, installation, testing, service and checkout of the batteries and/or to follow the instructions, cautions, warning, notes provided in this specifications, or other JHT's reasonable instructions or advise.

7.4. This product specification will be validated assuming that it is accepted when it is not returned within six month from the date of issue

8. Specification For Inspections

JHT guarantees that the products supplied by us will satisfy this specification of the inspections. If the products do not meet this specification of inspections, JHT shall immediately confirm the cause of the problem and shall take measure.

1. Quality Standard In accordance with the product specification.
2. Unit of Inspections One cell shall be one unit of inspection.
3. Definition of Lot In principle, a group of products, which are manufactured by the same production systems, and are with the same lot code marking.
4. Test Method In accordance with the product specification.
5. Sampling Plan In accordance with the table below. And this is applied only to the initial test.

Inspection Item		Inspection Plan	Sampling Level		Criterion	
1	Dimensions (Height Diameter)	Specified Number sampling	n=5	Single	C=0	
2	Open Circuit Voltage	Specified Number sampling	n=5	Single	C=0	
3	Service Life	Specified Number sampling	n=5	Single	C=0	
4	Appearances	Major Defect	ANSI/ASQC	General I	Single	
		Others	ANSI/ASQC	General I	Single	
					A.Q.L.: 0.65	
					A.Q.L.: 2.5	

Major Defect: Defect that functionally influences on characteristics of the products.

Others: Defect that is not categorized in Major Defect

9. Leakage levels and classification (followed by IEC60086-3)

The visual examination shall be carried out under a diffuse white light of 900 lx to 1 100 lx at the surface of the battery to be inspected. Little salting found near the gasket, affecting less than 10 % of the perimeter of the gasket, detected while observing at a magnification of x15. The leak is not detectable with the naked eye (S1 level)

Safety Instructions

This battery contains lithium metal, organic solvent and other combustible materials. Hence, improper handling of the battery could lead to distortion, leakage, overheating, explosion, or fire and cause human injury or equipment trouble. Please strictly observe each of the following instructions to prevent the accidents.

1. Do not swallow batteries

Small-sized batteries can easily be swallowed. They must be kept out of the reach of small children. In addition, in the design of equipment using batteries, the care should be taken to ensure that batteries are NOT easy removable for children. Also, do not touch the liquid leaked out of battery. If the liquid comes into eyes or mouth, immediately rinse with plenty of water and consult a physician.

2. Do not dispose of batteries in fire or water

Disposal of batteries in fire or water is extremely dangerous with a risk of explosion and violent flaring.

3. Do not stack or jumble batteries

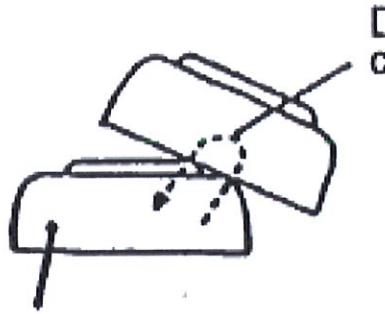
Stacking or jumbling batteries diagram as shown at below, may cause short-circuit, heat generation, fire or explosion. Avoid contact between positive (+) and negative (-) battery poles, and contact with other metal surfaces, as this can cause short circuits with intense current flows and heat.

Example of stacked and jumbled batteries



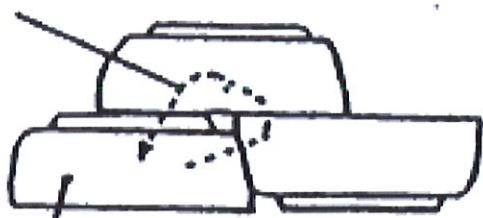
- Contact between battery poles form a discharge circuit and lead to heat generation, fire or explosion.

Enlargement



Discharge and heat generation

Discharge circuit



Discharge and heat generation

4. Do not disassemble batteries

Separator or gasket could be damaged. This could cause distortion, leakage, overheating, explosion or fire. Also, this can generate a gas that may irritate the throat. Lithium may also react with moisture to generate heat and fire.

5. Do not heat batteries

Heating the battery more than 100°C (212°F) centigrade could increase the internal pressure leading to distortion, leakage, overheating, explosion or fire.

6. Do not mix different types of batteries

Using different batteries together, i.e. different type or new and used or different manufacturer could cause over discharge due to difference in voltage and electrical capacities. If using two or more batteries connected in series or in parallel even same batteries, please consult with JHT before using.

7. Do not recharge batteries

The battery is not designed to be charged by any electrical source. Attempting to charge batteries may result in internal generation of gases, which may lead to swelling, explosion or fire.

8. Insert the batteries in the correct polarity position

Depending on the application device, incorrect insertion of batteries, with positive (+) and negative (-) poles reversed, may result in short circuits and the risk of heat generation, fire or explosion.

9. Do not solder the terminal or wire to the battery directly

Heat from soldering may damage of insulating materials, or cause a melting of lithium in the battery. This could cause distortion, leakage, internal short circuits which may lead to fire or explosion. Even then, the temperature of soldering iron must be below 350°C and the soldering time must be less than 5 seconds as low and short as possible. Do not use soldering bath, because the board with battery could stop on the bath or the battery could drop into the bath. Moreover notice not to solder excessively, because excessive solder could be overflow to the portion on the board leading to short or charge of the using.

10. Never bring fire close to battery liquid

When leakage or strange smell are suspected, keep the battery away from a fire immediately because the leaked liquid could catch fire.

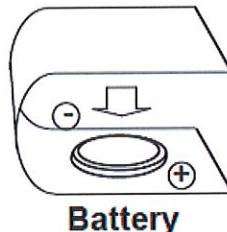
Please ensure the above precautions are strictly observed by related divisions including production departments, seal departments and external subcontractors. For additional details and information, please contact our sales representatives.

! WARNING

The battery may be regulated by national or local regulation. Please follow the instructions of proper regulation. As electric capacity is left in a discarded battery and it comes into contact with other metal, it could lead to distortion, leakage, overheating, or explosion, so make sure to cover the positive (+) and negative (-) terminals with friction tape or some other insulator before disposal.

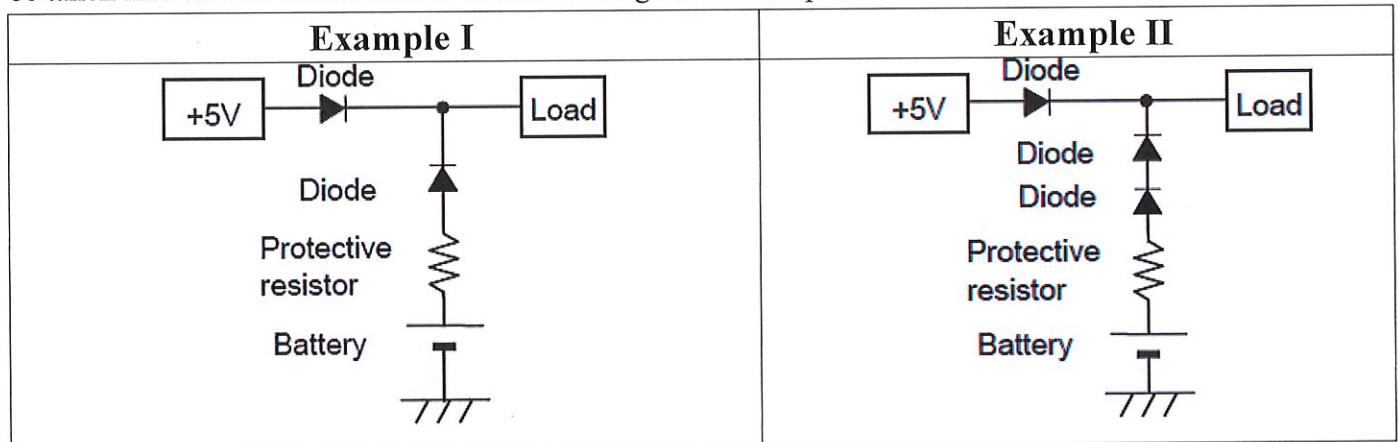
Example of battery insulating

Friction Tape



Battery

This is a primary battery and cannot be charged. When used as memory or RTC back-up applications, be sure to use diodes to prevent charging from the main power source or other batteries, and protective resistance to regulate the current as shown in the figure below. Note that the points described below should be taken into careful consideration when selecting diodes and protective resistance.



- **Using diodes to prevent charging**

Please choose diodes with leak current at small as possible. Please keep the charged capacity due to leakcurrent to within 1% of nominal capacity.

- **Supplied voltage to load**

Because a diodes and a resistance generate the voltage drop on operating, please take into considerationthese voltage drops for supplied voltage to load.

- **Supplied voltage to load**

Protective resistance is used to prevent the battery from being charge by large surges of current during diodes failure. For example, a battery is used in simple circuit (I) in combination with a main power source 5 volt. Since the permitted charge current is 10mA and this battery voltage is 3V, let resistance be $R \geq (5V-3V)/10mA = 0.2k$ ohm, meaning that at least 0.2k ohm is required.

! CAUTION

For storage

• Do not store the battery in hot and high humid place

Store the battery at a constant temperature of 35°C or less in order to prevent deterioration from heat.

Keep the battery away from high humidity such as 85%RH or higher in order to prevent dew condensations on the battery that may cause to electrical leakage.

• Never use or leave the battery in hot place

Keep the battery away from heat sources i.e. boiler, radiator and etc., and from direct sunlight. Otherwise this may cause distortion, leakage, overheating, explosion or fire of the battery.

For better usage

- (1) Use gold-plated or nickel-plated steel or stainless steel strips for terminals in order to keep good conductivity with the battery surface. Terminal made of gold-plated phosphor bronze will ensure stable conductivity.
- (2) Apply and keep the contact pressure more than 2N for stable conductivity.
- (3) Before inserting battery, check the terminal contact surface on both the equipment and the batteries are clean, and also check that they are not deformed. If the contact surfaces are dirty, clean up and dry them thoroughly before inserting battery.
- (4) If battery touch with any antistatic conductive materials include packing bags, trays, mats, sheets, films and resin cases, for example, have a resistance of 10^3 to 10^6 Ω , it may cause of short-circuit since both the positive and the negative terminal of the battery may contact batteries or battery attached PCB in close to those materials.
- (5) When the lithium battery has short-circuit, even slightly. A certain amount of time is required for recovering its voltage completely. If the electrical characteristics of the battery are measured at a time before a sufficient time has passed, it may indicate unstable values due to the battery was in recovering mode.
- (6) Even if battery of the same size or same shape, they made differ in type or grade. When replacing batteries. Confirm that they are correct type by checking the identification symbol (designated by IEC standards) which is marked on the battery and its packages.
- (7) When multiple batteries are used in series in applications or equipment, it may occur that the one battery has a polarity inversion at the end of operation life. That behavior happen when the battery had consumed its capacity earlier than other batteries. Therefore, that is not failure of battery.
- (8) Lithium primary batteries continuously indicate high voltage even toward the end of their service life. As such, they may be mistakenly judged as yet being strong. In case of multiple batteries are used in an application or equipment, all batteries should be replaced at the same time when the one of those batteries shows it has totally consumed even other batteries seems still operating, since the remaining capacity in other batteries must be also quite little at the time.

For equipment design

- (1) Avoid batteries close in heat source, and isolate with flame or water.
- (2) Please contact us in case of using multiple batteries.