



智弘科技

Jhih-Hong Technology Co., Ltd.

SPECIFICATION FOR APPROVAL

MODEL NAME : JHT CR2450P

JHT P/N : 3CR2450030100

DATE : 2025/05/27

REVISION : A2



JHT APPROVAL :		
EDITOR	CHECK	APPROVED
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REVISION AND UPDATES

REVISED	DESCRIPTION	DATE
A	First issue	2024/02/21
A1	Del 4.3 & 4.6.2 & 5.3.3 Adjust characteristics	2025/02/14
A2	Remove the word "MIT" Modify file content	2025/05/27

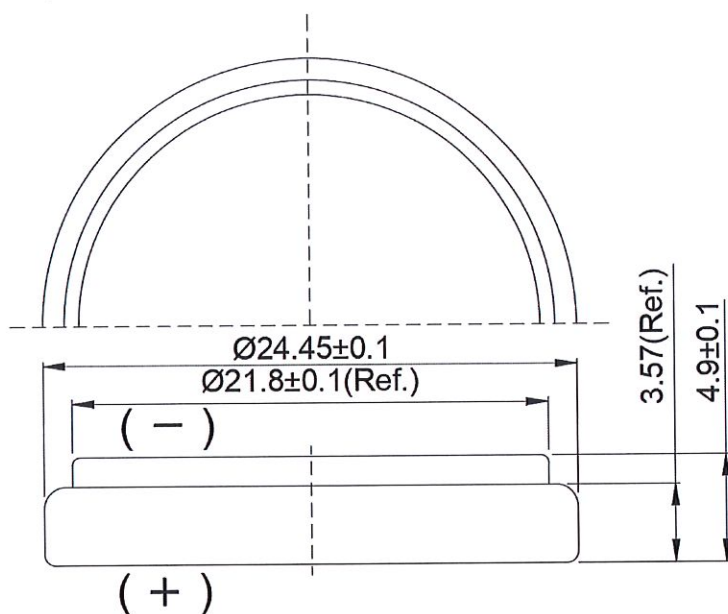
1 Applicable range

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

2 Nominal specification

2.1 Battery type	CR2450P
2.2 Nominal voltage	3.0 volts
2.3 Standard capacity	600 mAh (Load:7.5k ohm, End voltage 2.0V, at 23±2°C)
2.4 Mass	Refer to Drawing 1
2.5 Dimension	Refer to Drawing 1
2.6 Operation temperature	From -20°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. 6.4 g

3 Indication

3.1 Below items are indicated on battery

3.1.1 Model code	CR2450P
3.1.2 Nominal voltage	3V
3.1.3 Polarity	+ (– shall not be indicated)
3.1.4 Brand	The brand name of "JHT"
3.1.5 Battery system	is used Lithium
3.1.6 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 1-1.

4.3 Closed circuit voltage

After storage in measuring circumstance at least 2 hours, this shall be measured with voltage meter described in item 5.3.3. Closed circuit voltage should confirm to Table 1-2.

4.4 Discharge duration

After storage in measuring atmosphere at least 8 hours, batteries are discharged by load resistance described in Table 1-3. Discharge time is calculated from beginning until reaching the cut off voltage described in Table 1-3. Discharge condition should be corresponded with Table 1-3.

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 1-1

4.5.2 Discharge duration

After storage term described on Table 1-3, sample batteries should be storage in measuring atmosphere at least 8 hours. Then batteries are discharged by load resistance described in Table 1-3

Table 1. CR2450P Characteristics

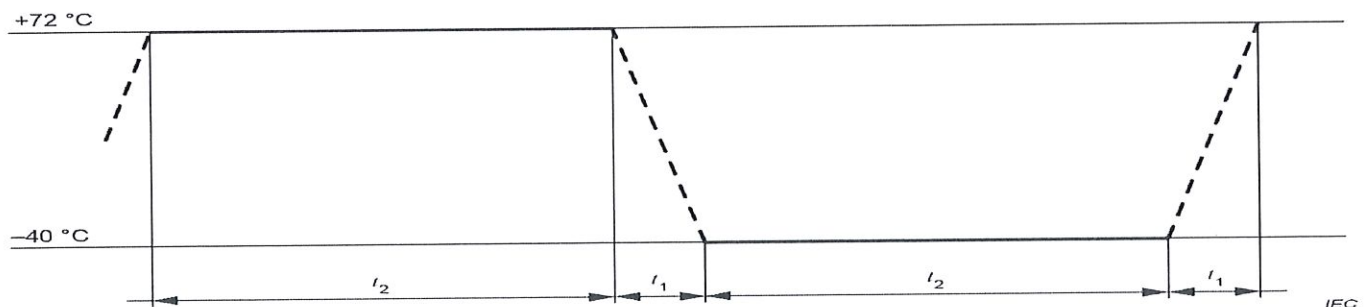
Test Items			Test method	Initial	After 1 year
1	Open circuit voltage	$23 \pm 2^{\circ}\text{C}$		3.0 V	3.0 V
2	Closed circuit voltage	$23 \pm 2^{\circ}\text{C}$	After DOD40%(88 mAh) discharged Load: $1\text{K}\Omega$ Load Time: 3 sec	2.6 V	
3	Discharge duration	$23 \pm 2^{\circ}\text{C}$	Load : $7.5\text{k}\Omega$ End V : 2.0V	1500h	1470h

4.5.3 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 an 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

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 ($23\pm 2^{\circ}\text{C}$) and room humidity ($45\pm 10\%\text{RH}$).

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 manufacture 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

pecifications, 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	A.Q.L.:0.65
		Others	ANSI/ASQC	General I	Single	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

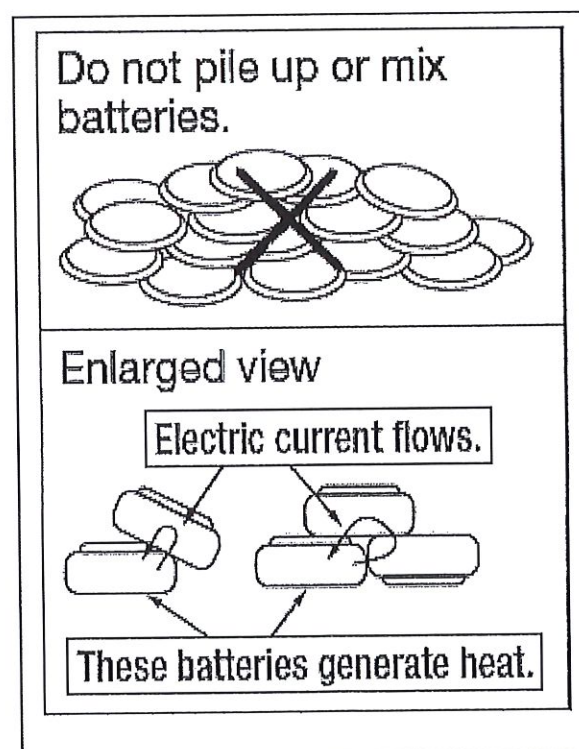
Small-sized batteries can easily be swallowed. They must be kept out of the reach of small children. In addition, in the design of equipment using batteries, the care should be taken to ensure that batteries are NOT easy removable for children. Also, do not touch the liquid leaked out of battery. If 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.



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 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 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.

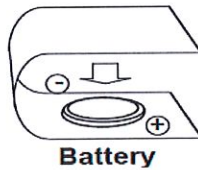
Please ensure the above precautions are strictly observed by related divisions including production departments, seal departments and external subcontractors. For additional details and information, please contact our sales representatives.

! WARNING

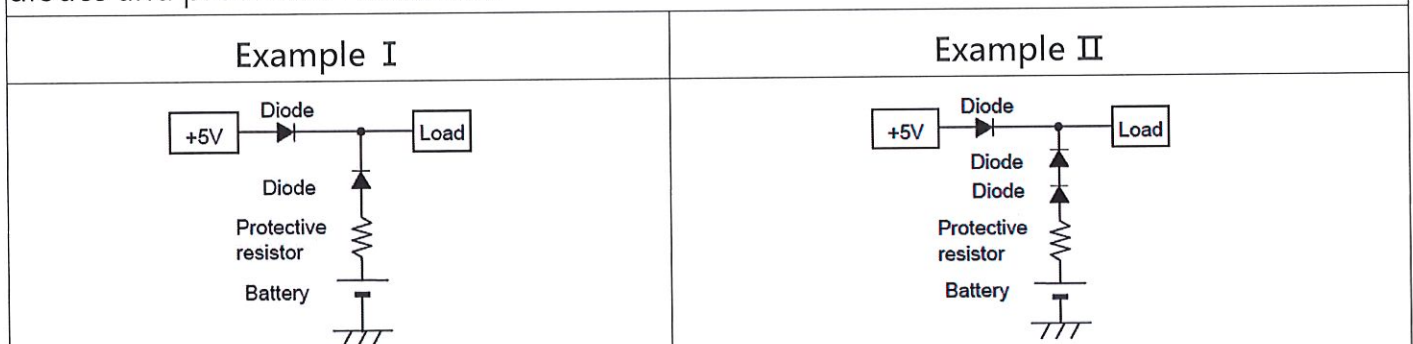
The battery may be regulated by national or local regulation. Please follow the instructions of proper regulation. As electric capacity is left in a discarded battery and it comes into contact with other metal, it could lead to distortion, leakage, overheating, or explosion, so make sure to cover the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

Example of battery insulating

Friction Tape



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 as small as possible. Please keep the charged capacity due to leakage current to within 1% of nominal capacity.

- **Supplied voltage to load**

Because a diode and a resistance generate the voltage drop on operating, please take into consideration these voltage drops for supplied voltage to load. Please choose diodes with leak current as small as possible. Please keep the charged capacity due to leakage current to within 1% of nominal capacity.

- **Supplied voltage to load**

Protective resistance is used to prevent the battery from being charged by large surges of current during diode 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 $R \geq (5V - 3V) / 10mA = 0.2k \text{ ohm}$, meaning that at least 0.2k ohm is required.

! CAUTION

For storage

(1) 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.

(2) 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 $10^6 \Omega$, 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.

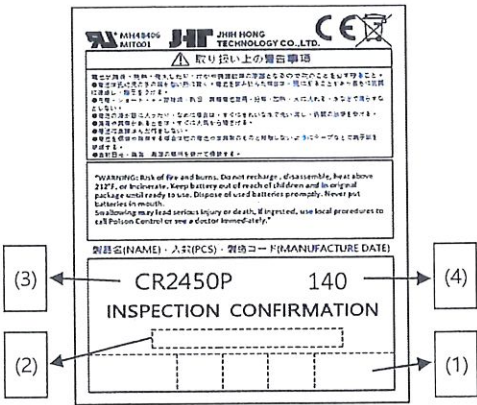

(8) Lithium primary batteries continuously indicate high voltage even toward the end of their service life. As such, they may be mistakenly judged as yet being strong. In case of multiple batteries are used in an application or equipment, all batteries should be replaced at the same time when the one 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.


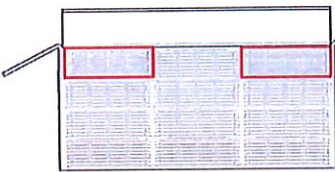
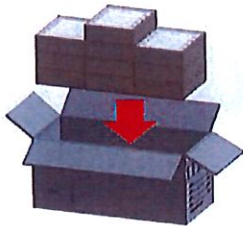
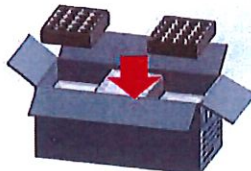
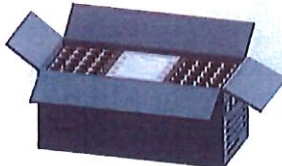


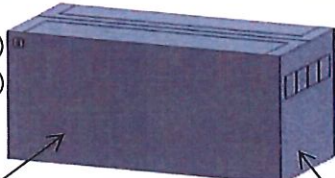
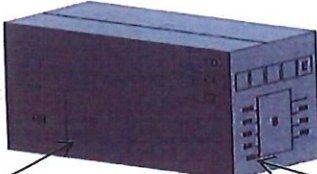
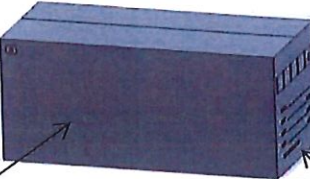



JHT CR2450P 包裝圖 / JHT CR2450P Package

智弘標籤	<p>內包 A</p> <p>Inner pack A</p>	<p>標籤說明: 尺寸:128(L)mm*95(W)mm (白底黑字) 位置:放置於綠色蓋盤上方 內容(印章): (1)QA合格 (2)生產製令 (3)電池型號 (4)內包數量・尾數包按照實際數量填寫</p> <p>Label description: Dimensions : 128(L)mm*95(W)mm (Black text on white background) Position : Place it above the green lid tray Content (Stamp) : (1) QA Pass (2) Production Order (3) Battery Model (4) Inner pack Quantity : Fill in the actual quantity for the final (remaining) pack</p> <p>範例 Sample</p> 
JHT Label	<p>外箱 B</p> <p>Outer box B</p>	<p>標籤說明: 尺寸:70(L)mm*100(W)mm (白底黑字) 位置:覆蓋正唛正面印刷 內容 TYPE : JHT CR2450P BRAND : JHT DATE CODE :D/C代表2025年5月份生產 LOT NO.: 生產製令 Q'TY : 按實際數量填寫 N.W. : 尾數按實際重量填寫(或直接印刷) G.W. : 尾數按實際重量填寫(或直接印刷) C/NO.: 箱數/總箱數(按實際箱數填寫,範例: A01/A05,A02/A05,...不同批次依英文字母區分) QR Code :TYPE:JHT CR2450P;LOT NO: 20250516XXX;Q'TY:1400PCS;C/NO:A02</p> <p>Label Description : Size : 70(L)mm*100(W)mm (white background with black text) Position: Printed on the front of the main label Content:TYPE: JHT CR2450P BRAND: JHT DATE CODE: D/C indicates production in May 2025 LOT NO.: Production Order Q'TY: Fill in according to actual quantity N.W.: Fill in actual net weight (or directly printed) G.W.: Fill in actual gross weight (or directly printed) C/NO.: Carton number/Total number of cartons (fill in according to actual number of cartons, e.g., A01/A05, A02/A05,... Different batches are distinguished by letters) QR Code :TYPE:JHT CR2450P;LOT NO: 20250516XXX;Q'TY:1400PCS;C/NO:A02</p> <p>範例 Sample</p> 

JHT CR2450P 包裝圖 / JHT CR2450P Package

智弘標籤	外箱 C	<p>標籤說明: 尺寸:60(L)mm*20(W)mm (白底黑字) 位置:(C1)黏貼於側唛正面右側・D標籤下方・ 只有尾數箱或最後一箱需貼此標籤 (C2)黏貼於側唛正面右側・C1標籤下方・ 只有尾數箱需貼此標籤</p> <p>範例 Sample</p> <p>(1)</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> 此箱附有出貨檢驗報告 This carton includes a shipping inspection report. </div>
	Outer box C	<p>Label Description : Size : 60(L)mm*20(W)mm (Black text on white background) Position : (C1) Affixed to the front right side of the side label, below the D label. Only required for remainder cartons or the final carton. (C2) Affixed to the front right side of the side label, below the C1 label. Only required for remainder cartons.</p> <p>(2)</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> 尾 數 箱 remainder carton </div>
JHT Label	外箱 D	<p>標籤說明: 尺寸:30(Φ)mm (綠底白字) 位置:黏貼於側唛正面右上角 內容:RoHS Compliant</p> <p>範例 Sample</p> <div style="border: 1px solid black; border-radius: 50%; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 10px auto;"> RoHS Compliant </div>
	Outer box D	<p>Label Description : Size : 30(Φ)mm (White text on green background) Position : Affixed to the top right corner of the front side of the side label Content : RoHS Compliant</p>
歐盟電池法規	外箱 E	<p>標籤或印刷說明: 字體尺寸:CE字的高度至少要5mm・而CE字的長度合計不得超過12mm・CE字體的寬度應不少於5分之1 印刷位置:印刷於正唛正面包裝標示右側・側唛反面左上角・ 正唛反面包裝標示右側 標籤位置:黏貼於正唛正面包裝標示上方・側唛反面左上角</p> <p>範例 Sample</p> <div style="border: 1px solid black; padding: 10px; text-align: center; margin: 10px auto; width: 150px;"> CE </div>
EU Battery Regulation	Outer box E	<p>Label or Printing Instructions : Font Size : The height of the "CE" mark must be at least 5mm. The total length of the "CE" characters must not exceed 12mm, and the width of the "CE" characters must be no less than one-fifth of their height. Printing Location : Printed on the right side of the front label on the main packaging.Upper left corner of the reverse side of the side label.Right side of the back label on the main packaging. Label Placement : Affixed above the front label on the main packaging.Upper left corner of the reverse side of the side label.</p>

JHT CR2450P 包裝圖 / JHT CR2450P Package

完成品圖示 Finished product icon	內包 Inner pack					
	內箱 Inner box	<p>右示意圖為側唛向剖面圖 (1)將電池平放，每層放三包，最上面一層中間放一包電池 (2)左右空餘位置使用泡沫板、海綿、舊托盤等填充物填充</p> <p>The right diagram shows the side view of the stacking layout. (1) Place the batteries flat, three packs per layer, with one battery pack placed in the center of the top layer. (2) Fill the empty spaces on the left and right sides with cushioning materials such as foam boards, sponges, or used pallets.</p>  <p>填充物 Filler</p>				
	外箱 Outerbox	<div><div><p>10個內包 10 inner</p><p>1400PCS (10個內包) 放入紙箱 1400PCS (10 pcs included) put in carton</p></div><div><p>填充物 Filler</p><p>空隙處使用填充物填充，填充物使用泡沫板、海綿、舊托盤等 Fill the gaps with fillers Filling materials include foam board, sponge, old pallets, etc.</p></div><div><p>填裝完成 Filling completed</p></div><div><p>封箱完成 Sealing completed</p></div></div> <div><div><p>(標籤) (Label)</p><p>側唛正面 Front side of the side label.</p><p>正唛正面 Front side of the main label.</p></div><div><p>(標籤) (Label)</p><p>側唛反面 Reverse side of the side label.</p><p>正唛反面 Reverse side of the main label.</p></div><div><p>(印刷) (Print)</p><p>側唛正面 Front side of the side label.</p><p>正唛正面 Front side of the main label.</p></div><div><p>(印刷) (Print)</p><p>側唛反面 Reverse side of the side label.</p><p>正唛反面 Reverse side of the main label.</p></div></div>				
核准 Approve		審核 Check		制訂 Create		制訂日期 Create date 2025/5/20