

# Primary Lithium Battery

1.5 V, Pack of 4



## 1. Scope:

This specification is applicable to RND 305-00010 lithium/iron disulfide battery.

## 2. Law & Regulation Compliances:

This product complies with EU's battery directive (2013/56/EU).

Packaging materials comply with EU's directive on packaging materials and waste (94/62/EC)

## 3. General:

### 3.1 Type designation

IEC	FR10G445
ANSI	24LF
Common	FR03, AAA

### 3.2 Chemical system: Li/FeS<sub>2</sub>

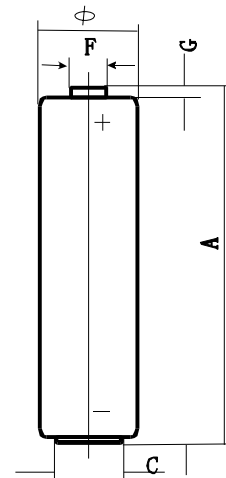
### 3.3 Nominal voltage: 1.5 V

### 3.4 Weight: Approximate 7.5 g

### 3.5 Dimension (mm)

The dimensions shall be in accordance with the below figures both prior to and after service output test.  
Measuring equipment shall be with an accuracy  $\pm 0.05\text{mm}$  at least.

/	min	max
$\Phi$	9.8	10.50
A	43.50	44.50
C	4.3	-
F	-	3.80
G	0.8	-



### 3.6 Capacity: Approximate 1200 mAh (50 mA, 24h/d, 23°C $\pm$ 2°C, e.v.= 0.8V)

### 3.7 Operation temperature : -30°C~60°C

Recommend storage temperature : Not exceed 30°C

## 4. Electrical Characteristics

Unless otherwise stated, all measurements are to be performed at a **Standard Environment** of

**23 ± 2°C**  
**55 ± 20% RH.**

All samples are normalized for 8 hours at least at the above environment prior to measurement. The digital voltmeter (DCM) is with the precision of 1mV (internal resistance not less than 1 Megohm). The load resistance of the total circuit is accurate within ±0.5% of the specified value.

### 4.1 Open circuit voltage and closed circuit voltage (Load resistance 50Ω, 0.1~0.5S)

/	OCV(V)	CCV(V)
Initial	> 1.70	> 1.62
Stored 1 year	> 1.70	> 1.62

### 4.2 Service output

Load	600mA	1.2 W/0.65 W	400 mW	50 mA	
Test mode	24h/d	2s/28s 5 m/h 24 h/d	4 m/15 m 8 h/d	1h/12h, 24h/d	
End voltage	0.9V	1.05 V	1.0 V	0.9 V	
Unit	min	pulse	min	h	
Applications	Reference	Digital still camera	High intensity lighting	Digital Audio	
Initial	Normal	115	170	240	25
	MAD	80	120	140	18.6
Stored 1 year	Normal	105	140	220	24
	MAD	60	100	120	18

m: minute h: hour d: day

Remark: 1) The initial discharge test shall commence within 30 days of manufacture. During stored period, the cells shall be stored under 20±2°C, RH 55±20% conditions.

2) - The batteries shall not leak during the service life test before the end voltage reached.

3) MAD: minimum average duration--our guarantee discharge value.

4)Normal: normal data, it's our normal daily value, battereis dicharge value are on this as base to be upper or lower.

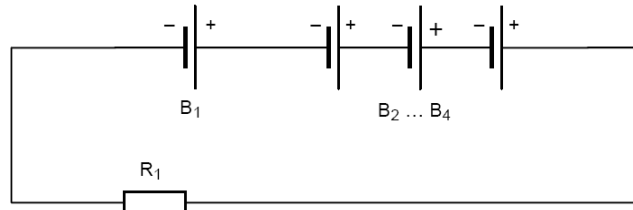
## **5. Leakage Resistance**

### 5.1 Overdischarge

Test conditions: test battery(B1) shall be predischarged to 50 % depth of discharge. It shall then be connected in series with three undischarged additional single cell batteries(B2,B3,B4) of the same type. A resistive load R1(3.9Ω) connected in series with the assembly of batteries , R1 is 3.9 The test shall be continued for 24 h.

Number of test samples: 9 batteries

Requirement: no explosion and no fire during this test.



### 5.2 High temperature leakage test

Test conditions: store 20 days under  $60 \pm 2^\circ\text{C}$  , then store 4~24h under standard environment.

Number of test samples: 24 batteries

Requirement: No visible leakage; No explosion.

## **6. Security Characteristics**

### 6.1 User Drop Test

This test simulates the situation when a battery is accidentally dropped.

Test conditions: Undischarged test batteries shall be dropped from a height of 1 m onto a concrete surface. Each test battery shall be dropped six times, twice in each of the three axes. The test batteries shall be stored for 1 h afterwards.

Number of test sets: 5 batteries

Requirement: No fire, No explosion.

### 6.2 Short-circuit explosion-proof characteristics

This test simulates an external short circuit of a battery during daily handling of batteries.

Test conditions: Positive and negative terminals of an undischarged battery shall be connected directly. The circuit shall be completed for 24 h or until the battery case temperature has returned to ambient. The resistance of the inter-connecting circuitry shall not exceed  $0,1 \Omega$ .

Number of test samples: 5 batteries

Requirement: No fire or explosion; Leakage is allowable.

### 6.3 Incorrect installation

This test simulates incorrect installation of a battery in a series application.

Test conditions: 4 undischarged batteries are used per test. 3 batteries are placed correctly in series; the 4<sup>th</sup> battery is reversed with respect to polarity. The circuit is maintained until venting occurs or the reversed battery temperature has returned to ambient.

Number of test sets: 5 (20 batteries)

Requirement: No fire or explosion; Leakage is allowable.

## **7. Expiry Date:**

10 years at 21°C

## **8. Expiry Date Marking:**

8.1 Unless otherwise specified, each battery will carry a manufacturing date code followed by month and year of manufacturing for domestic and manufacturing date code followed by month and year of expiry for export. (Shelf life 10 years)

## **9. Packaging Requirements**

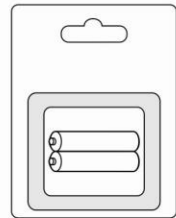
9.1 The total of heavy metal lead, cadmium, mercury, and hexavalent chromium concentration shall not exceed 100 ppm in Packaging materials and printing inks. Ozone depleting substances (ODS) shall not be used in the manufacturing of any packaging.

The printing on each cell label is legible and permanent. Label defects, if any, shall conform to mutually agreed upon limit samples.

9.2 It is recommended that packaging for shipment and sales according with Packaging Specification of Pairdeer battery. Shipment package example as next page:

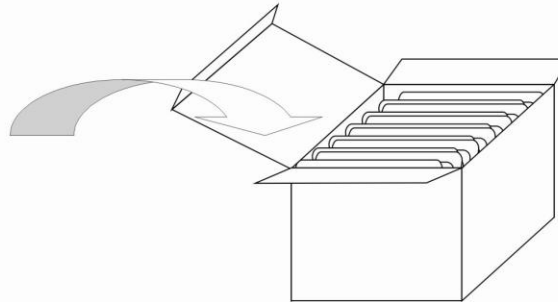
9.3 Otherwise packaging for shipment and sales shall conform to the mutually agreed to Packaging Specification of the designated customers.

1



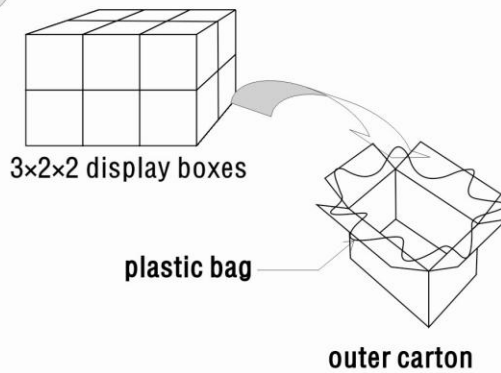
FR03 2pcs-card

2



10 cards in a display box

3

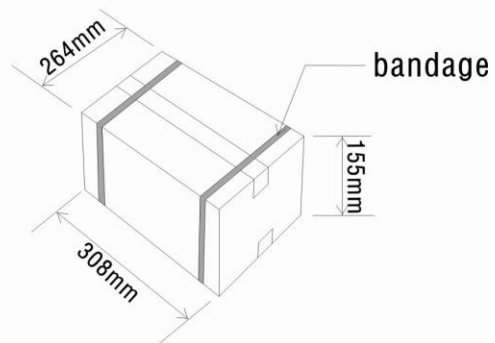


3x2x2 display boxes

plastic bag

outer carton

4

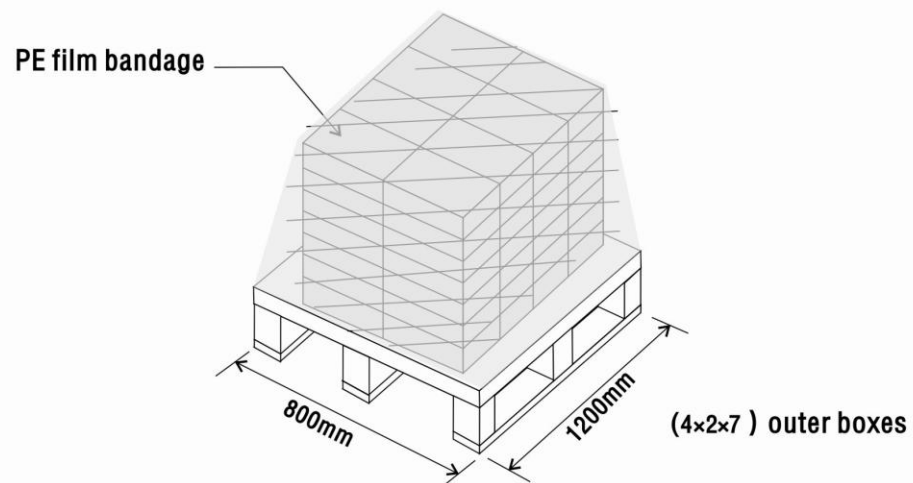


bandage

155mm

Gross weight: about 3.2kg

5



PE film bandage

800mm

1200mm

(4x2x7) outer boxes

## 10. Component / Information of Ingredients

Chemical Nature: Lithium/iron disulfide battery

MATERIALS	APPROXIMATE PERCENT OF TOTAL WEIGHT (%)	CAS NO.	MATERIALS	APPROXIMATE PERCENT OF TOTAL WEIGHT (%)	CAS NO.
FeS <sub>2</sub> (iron disulfide)	30	12068-85-8	PE	4.6	9002-88-4
Li (lithium)	6.1	7439-93-2	Al (aluminum)	5.2	7429-90-5
Organic Electrolyte	11.5	-	Ni (nickel)	1.0	7440-02-0
Fe(iron)	27.5	7439-89-6	Carbon	1.4	7782-42-5

Chart 1. Discharge diagram

