

FILE NAME: SPECIFICATIONS OF  
SEALED NICKEL CADMIUM  
BATTERIES

MODEL: KRMR 15/49 AA1000mAh

Specification No.: S/RONDA0273-1

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### 1. SCOPE

The specifications governs the performance of the following **RONDA** Nickel-Cadmium Cylindrical cell and its battery pack.(Refer to the attached figure 1 )

Rated capacity: 1000mAh

Designation: KRMR15/49 AA(D: 14.5<sup>0</sup><sub>-1.0</sub>mm H: 48.5<sup>0</sup><sub>-1.0</sub>mm)

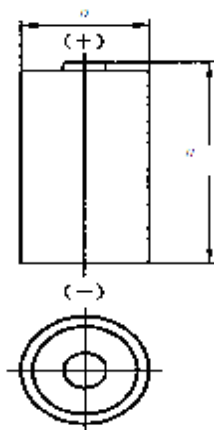


Figure 1- Jacketed cylindrical cells

### 2. DATA OF BATTERY PACK

The data of battery pack, including voltage and weight, is almost equivalent to the multiple numbers of the relevant single cells.

Example: Battery pack consisting three single cells

Nominal voltage of single cell = 1.2V

Nominal voltage of battery pack = 1.2V × 3 = 3.6V

### 3. RATINGS

Table 1 - Ratings of the cells

Description	Unit	Specification	Conditions
Nominal Voltage	V/Cell	1.2	Single cell
Rated Capacity	mAh	1000	Standard Charge/Discharge

### 4. PERFORMANCE

Unless otherwise stated, tests should be done within one month of delivery under the following conditions:

Ambient Temperature: 20 ± 5°C

Relative Humidity: 65 ± 20%

Standard Charge/Discharge Conditions:

Preparative: Prior to charging, the cell shall be discharged by 200mA(0.2I<sub>r</sub>A) to 1.0V

Charge: 100mA(0.1I<sub>r</sub>A) × 16hours

Stand in charged condition:1~4h

Discharge: 200mA(0.2I<sub>r</sub>) to 1.0V/Cell

Table 2 – Performance and test methods<sup>b</sup>

Test Item	Unit	Specification	Test Conditions	Remarks	
Discharge performance	20 °C <sup>a</sup>	h	≥ 5	Standard Charge/Discharge	/
		min	≥ 54	After Standard Charge, stored for 1~4h, then discharged by 1000mA (1.0I <sub>r</sub> ) to 0.9V.	/
	-18 °C	h	≥ 3	After Standard Charge, stored for 16~24h in -18 ± 2 °C, then discharged by 200mA (0.2I <sub>r</sub> ) to 1.0V in -18 ± 2 °C.	/
Charge (capacity) retention	h/min	≥ 3h15min	After Standard Charge, stored on open circuit for a period of 28days, then discharged by 200mA (0.2I <sub>r</sub> ) to 1.0V.	/	
Endurance in cycles	cycle	≥ 500	Appendix-table 3		
Permanent charge endurance	h	≥ 3	Appendix-table 4	/	
Over charge	h	≥ 5	Charge:100mA(0.1I <sub>r</sub> ) for 28d; Storage: 1~4h Discharge:200mA(0.2I <sub>r</sub> ) to 1.0V	/	
Safety device operation	Not disrupt or burst		Undergo a forced discharge at constant current 200mA(0.2I <sub>r</sub> ) to 0V. Then discharged by 1000mA (1.0I <sub>r</sub> ) for 60min.	/	
Storage <sup>A</sup>	hour	≥ 5	Stored on open circuit for 12 months. Then standard charge/discharge.	/	
Internal resistance	mΩ	≤ 26	Within 1~4h after standard Charge (1000Hz)	/	
Weight	g	21.9(approx)	/	Reference	
Vibration	No leakage, no fire, no explosion		IEC 62133 2002 4.2.2	/	
Free fall	No fire, no explosion		IEC 62133 2002 4.3.3	/	

a) Five cycles is permitted

b) Unless otherwise stated, the cell shall be discharged by 200mA(0.2I<sub>r</sub>) to 1.0V before test.

**Notice:** Test conditions is drawn according to IEC 61951-1 2006; Please refer to the related description of the standard.

## 5. CONFIGURATION, DIMENSIONS AND MARKINGS

Please refer to the attached drawing.

## 6. EXTERNAL APPEARANCE

The cell/battery shall be free from cracks, scars, breakage, rust, discoloration, leakage nor deformation.

## 7. CAUTION

- (1) Reverse charging is not acceptable.
- (2) Charge before use. The cells/batteries are delivered in an uncharged state.
- (3) Do not charge/discharge with more than our specified current.
- (4) Prevent short circuit, do not incinerate or disassemble the cell/battery.
- (5) Do not solder directly to the cell/battery for a long time.

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(6) The life expectancy may be reduced if the cell/battery is subjected adverse conditions like: extreme temperature, deep cycling, excessive overcharge/ over-discharge.

(7) Store the cell/battery in a cool and dry place. Always discharge batteries before assemble or solder.

(8) Always discharge batteries before bulk storage or shipment.

(9) Do not mix batteries of different types and capacities.

### Appendix

#### A) Endurance in cycles

Prior to the endurance on cycle test ,the cell shall be discharged at 200mA(0.2I<sub>A</sub>) to 1.0V. The following test shall be carried out in accordance with the conditions specified in Table 3.

**Table 3 Endurance in cycles**

Cycle number	Charge	Stand in charged condition	Discharge
1	0.1I <sub>A</sub> for 16h	none	0.25I <sub>A</sub> for 2h20min
2~48	0.25I <sub>A</sub> for 3h10min	none	0.25I <sub>A</sub> for 2h20min
49	0.25I <sub>A</sub> for 3h10min	none	0.25I <sub>A</sub> to 1.0V
50	0.1I <sub>A</sub> for 16h	1h~4h	0.20I <sub>A</sub> to 1.0V <sup>a</sup>

a) Cycles 1 to 50 shall be repeated until the discharge duration on any 50th Cycle becomes less than 3h or the cell voltage drops below 1.0V during 1~48<sup>th</sup> cycle.

#### B) Permanent charge endurance

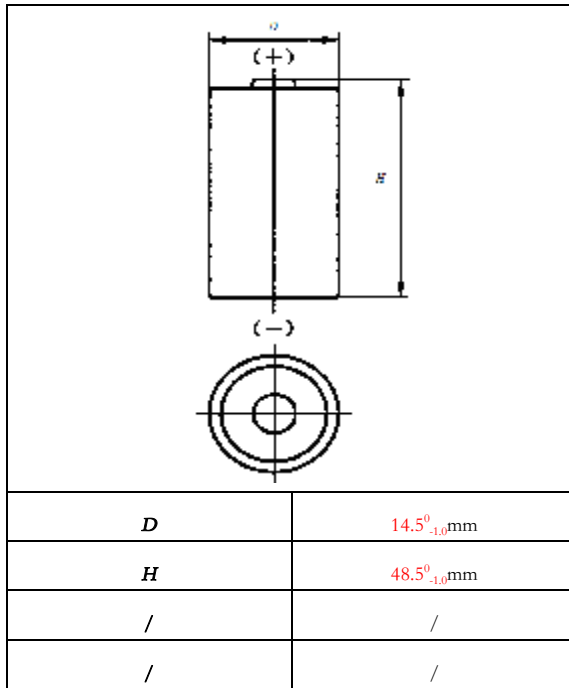
Prior to the endurance on cycle test ,the cell shall be discharged at 200mA(0.2I<sub>A</sub>) to 1.0V. The following test shall be carried out in accordance with the conditions specified in Table 4.

**Table 4 Permanent charge endurance**

Cycle number	Charge	Discharge <sup>a</sup>
1	0.051I <sub>A</sub> for 91days	0.2I <sub>A</sub> to 1.0V
2	0.051I <sub>A</sub> for 91days	0.2I <sub>A</sub> to 1.0V
3	0.051I <sub>A</sub> for 91days	0.2I <sub>A</sub> to 1.0V
4	0.051I <sub>A</sub> for 91days	0.2I <sub>A</sub> to 1.0V

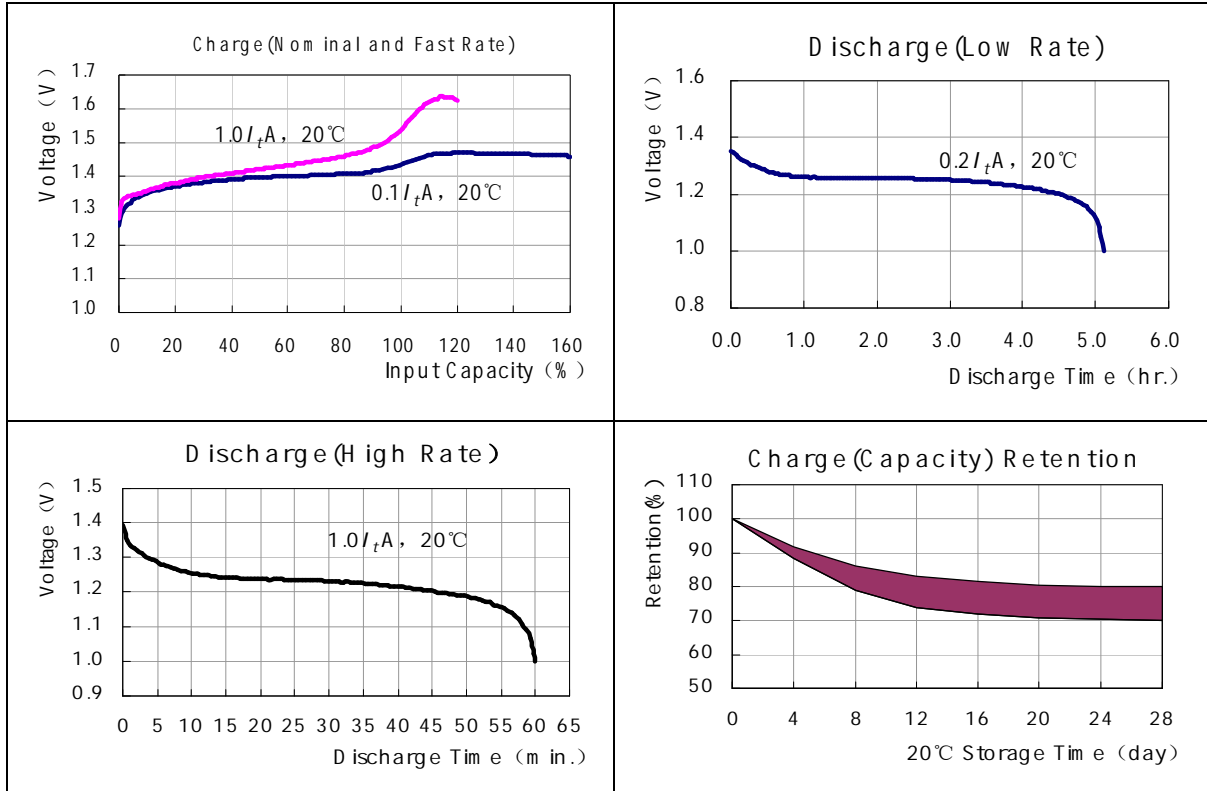
a) The discharge is carried out immediately upon completion of discharge.

### Base Data:



Nominal voltage		1.2V	
Capacity comparison(mAh)		0.2I <sub>t</sub> A	1.0I <sub>t</sub> A
		1000	900
Weight(g)		21.9	
Internal Impedance at 1000Hz (After Charge;mΩ)		≤ 26	
Charge current	Standard	100mA	
	Rapid	1000mA	
Charge time	Standard	16h	
	Rapid	72min, plus 2h by 0.1I <sub>t</sub> A	
Temperature Ambient	charge	Standard	0~+35°C
		Rapid	+10~+35°C
	Discharge		-20~+45°C
	Storage		-20~+35°C

### Electrical Performance:



**NOTICE:** Manufacturer reserves the right to alter or amend the design, model and specification without prior to notice.

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 版 次: A1  
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#### 1. 范围

本规格书适用于下述的朗达牌 Ni-Cd 圆柱型电池单体及电池组的全部性能指标.

额定容量: 1000mAh

电池型号: KRMR 15/49 AA ( $D: 14.5^{0}_{-1.0}mm$   $H: 48.5^{0}_{-1.0}mm$ )

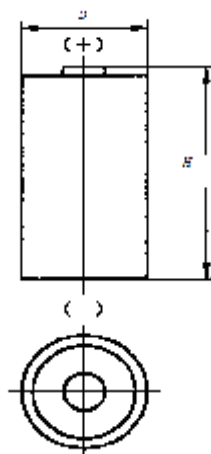


图 1 带防护外套的圆柱型密封镍镉可充单体电池

#### 2. 组合电池的指标

组合电池的电压、重量等数据, 近似等于单体电池数与对应值之乘积。

例如: 组合电池包括三个单体电池

单体电池的额定电压=1.2V

则电池组的额定电压=1.2V×3=3.6V

#### 3. 额定性能

表 1 电池的额定性能

项目	单位	指标	备注
标称电压	V	1.2	单体
额定容量	mAh	1000	标准充放

#### 4. 电池性能与测试方法

除非另有说明, 测试须在发货后一个月内在下述条件下进行:

环境温度:  $20 \pm 5^{\circ}C$

相对湿度:  $65 \pm 20\%$

标准充放条件:

准备: 充电前电池要以  $0.2I_A$  恒流放电至终点电压 1.0V;

充电:  $100mA(0.1I_A)$  充 16 小时;

搁置: 1~4 小时;

放电:  $200mA(0.2I_A)$  至 1.0V。

电池性能和测试方法见表 2

表 2 电池性能及测试方法<sup>2)</sup>

测试项目	单位	标准	测试方法	备注	
放电性能	20°C <sup>1)</sup>	h	≥5	标准充放	/
		min	≥54	标准充电后搁置 1~4 小时,以 1000mA(1.0I <sub>A</sub> )放电至 0.9V。	/
	-18°C	h	≥3	标准充电后在-18°C±2°C 搁置 16~24 小时,以 200mA(0.2I <sub>A</sub> )放电至 1.0V。	/
荷电保持率	h/min	≥3h15min	标准充电后,开路搁置 28 天(20 °C±2°C),随后标准放电(0.2I <sub>A</sub> )至 1.0V。	/	
循环寿命	Cycle	≥500	见附录 表 3	/	
耐充电寿命	h	≥3	见附录 表 4	/	
过充测试	h	≥5	充电: 100mA(0.1I <sub>A</sub> ) 充电 28 天 搁置: 1~4 小时 放电: 200mA(0.2I <sub>A</sub> )至 1.0V	/	
安全装置操作	/	无爆炸、无破裂	以 200mA(0.2I <sub>A</sub> ) 放电至 0V 后再以 1000mA(1.0 I <sub>A</sub> )强制放电 60 分钟。	/	
贮存 <sup>1)</sup>	h	≥5	以 200mA(0.2I <sub>A</sub> )放电至 1.0V 后搁置 12 个月,再进行标准充放。	/	
内阻	mΩ	≤26	电池应以 0.2I <sub>A</sub> 放电至 1.0V,然后标准充电,搁置 1~4 小时;在频率为 1.0kHz±0.1kHz 的交流电流下测电池内阻。	/	
重量	g	21.9(大约)	/	参考	
碰撞试验	不漏液、不着火、不爆炸		IEC 62133 2002 4.2.2	/	
自由落体	不着火、不爆炸		IEC 62133 2002 4.3.3	/	

1) 允许最多测试五次 2) 如未特别说明电池在测试前必须以 0.2I<sub>A</sub> 恒流放电至终点电压 1.0V

注: 本规格书中的测试方法根据 IEC 61951-1 2006 制订, 详细测试方法请参考该标准的相关条款。

## 5. 电池外观尺寸

参见附图

## 6. 外观

无裂缝、疤痕、破裂、锈蚀、脏污、漏液、变形

## 7. 使用注意事项

- 1) 勿将电池反极充电;
- 2) 如电池已带电,初次用前先放电后再充电;
- 3) 避免以高于指定的电流充放电;
- 4) 防止电池短路,不要拆解或焚烧电池;



- 5) 勿在电池上直接锡焊焊接；
- 6) 如极端高温、大于规定的过充、过放电，电池的使用寿命可能会下降；
- 7) 电池应存放于凉爽阴凉处，电池在组装或焊接前应将电池放电；
- 8) 建议在运输或散装贮存时将电池放电；
- 9) 不要将不同类型或不同容量的电池组合使用。

**附录**
**1) 循环寿命测试**

循环寿命试验前，电池应以  $0.2I_A$  放电至终止电压 1.0V，然后，在环境温度  $20^\circ\text{C} \pm 5^\circ\text{C}$  下作循环寿命测试；测试循环见表 3。

**表 3 循环寿命**

循环次数	充电	充电态搁置	放电
1	$0.1I_A$ 16h	无	$0.25I_A$ 2h20min
2~48	$0.25I_A$ 3h10min	无	$0.25I_A$ 2h20min
49	$0.25I_A$ 3h10min	无	$0.25I_A$ 放电至 1.0V
50	$0.1I_A$ 16h	1h~4h	$0.20I_A$ 放电至 1.0V <sup>b)</sup>

循环至任何第 50 次放电时间不足 3 小时或在 1~48 个循环中电压降至 1.0V 以下为止。

**2) 耐充电寿命测试**

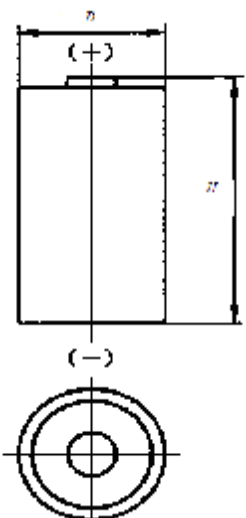
测试前以  $0.2I_A$  放电至终止电压 1.0V，然后，在  $20^\circ\text{C} \pm 5^\circ\text{C}$  的环境温度下根据表 4 做耐充电寿命测试。

**表 4 耐充电寿命**

循环次数	充电	放电 <sup>a)</sup>
1	$0.05I_A$ 91d	$0.2I_A$ 放电至 1.0V
2	$0.05I_A$ 91d	$0.2I_A$ 放电至 1.0V
3	$0.05I_A$ 91d	$0.2I_A$ 放电至 1.0V
4	$0.05I_A$ 91d	$0.2I_A$ 放电至 1.0V

### KRMR 15/49 AA1000 毫安时

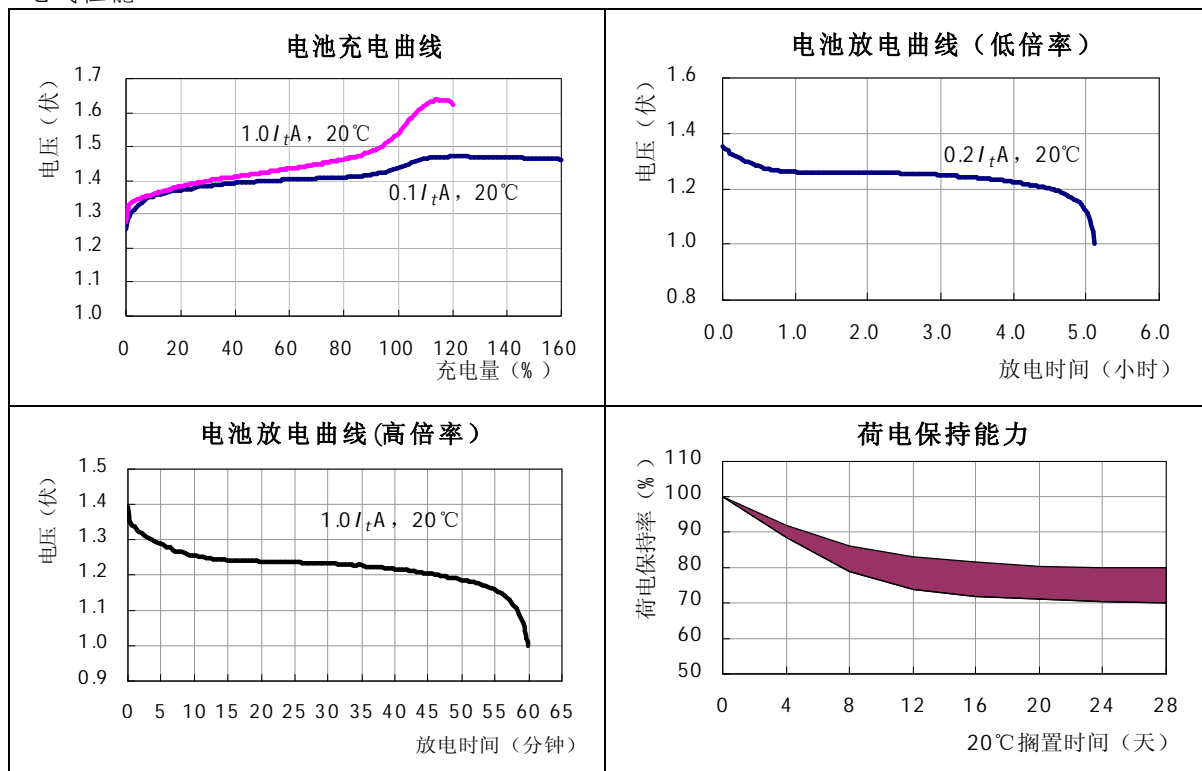
基础数据:



D	14.5 <sup>0</sup> <sub>-1.0</sub> mm
H	48.5 <sup>0</sup> <sub>-1.0</sub> mm
/	/
/	/

标称电压		1.2V	
容量对比(mAh)		0.2I <sub>t</sub> A	1.0I <sub>t</sub> A
		1000	900
重量 (g)		21.9	
内阻 (在 1000Hz 下) (充电后; mΩ)		≤26	
充电电流	标准	100mA	
	快速	1000mA	
充电时间	标准	16 小时	
	快速	72 分钟, 加标准充电 (0.1I <sub>t</sub> A) 2 小时	
使用 温度	充电	标准	0~+35°C
		快速	+10~+35°C
	放电	-20~+45°C	
	贮存	-20~+35°C	

电气性能:



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