

**FILE NAME: SPECIFICATIONS OF  
SEALED NICKEL CADMIUM  
BATTERIES**

**MODEL: DS23/43 SC1800mAh**

**Specification No. : S/0873-1**

**EDITION: A0**

**DATE: 2011-12-21**

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<b>EDITION</b>	<b>AMENDMENT</b>		<b>DATE OF ISSUE</b>
<b>A 0</b>			<b>2011-12-21</b>
<b>Drawn</b>	<b>Checked</b>	<b>Reviewed</b>	<b>Approved</b>

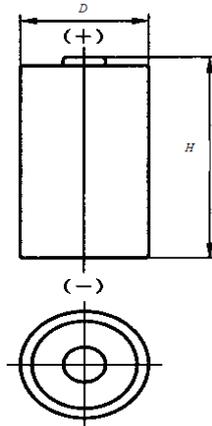
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**1. SCOPE**

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

Rated capacity: **1800mAh**

Designation: **DS 23/43 SC** ( $D: 23.0^{+0}_{-1.0}$ mm  $H: 42.5^{+0}_{-1.0}$ 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	<b>1800</b>	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 **360mA**(0.2I<sub>t</sub>A) to 1.0V

Charge: **180mA**(0.1I<sub>t</sub>A)×16hours

Stand in charged condition:1~4h

Discharge: 360mA (0.2I<sub>A</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 1800mA (1.0I <sub>A</sub> ) to 0.9V.	/
	-18°C	h	≥3	After Standard Charge, stored for 16~24h in -18±2°C, then discharged by 360mA (0.2I <sub>A</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 360mA (0.2I <sub>A</sub> ) to 1.0V.	/	
Endurance in cycles	cycle	≥1800	Appendix-table 3	/	
Permanent charge endurance	h	≥3	Appendix-table 4	/	
Over charge	h	≥5	Charge: 180mA (0.1I <sub>A</sub> ) for 28d; Storage: 1~4h Discharge: 360mA (0.2I <sub>A</sub> ) to 1.0V	/	
Safety device operation	Not disrupt or burst		Undergo a forced discharge at constant current 360mA (0.2I <sub>A</sub> ) to 0V. Then discharged by 1800mA (1.0I <sub>A</sub> ) for 60min.	/	
Storage <sup>A</sup>	hour	≥5	Stored on open circuit for 12 months. Then standard charge/discharge.	/	
Internal resistance	mΩ	≤12	Within 1~4h after standard Charge (1000Hz)	/	
Weight	g	44 (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 360mA (0.2I<sub>A</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.

(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 **360mA**(0.2I<sub>t</sub>A) 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>t</sub> A for 16h	none	0.25I <sub>t</sub> A for 2h20min
2~48	0.25I <sub>t</sub> A for 3h10min	none	0.25I <sub>t</sub> A for 2h20min
49	0.25I <sub>t</sub> A for 3h10min	none	0.25I <sub>t</sub> A to 1.0V
50	0.1I <sub>t</sub> A for 16h	1h~4h	0.20I <sub>t</sub> A 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**

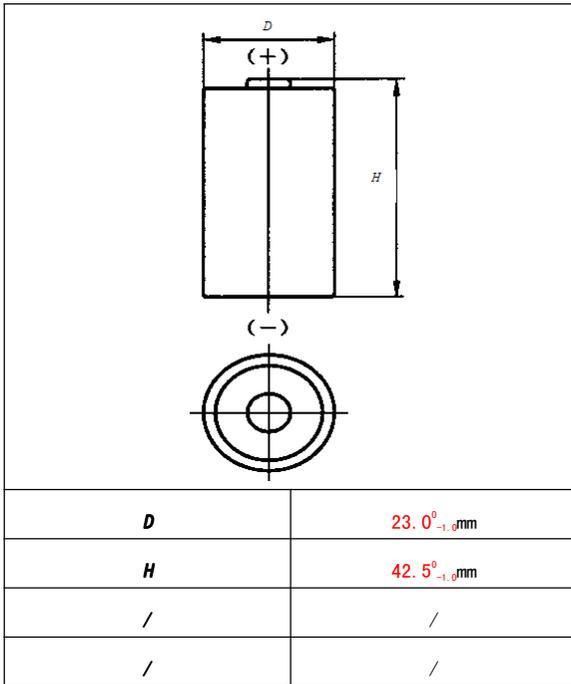
Prior to the endurance on cycle test ,the cell shall be discharged at **360mA**(0.2I<sub>t</sub>A) to 1.0V. The following test shall be carried out in accordance with the conditions specified in Table 4.

**Table 4 Permanent charge endurance**

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

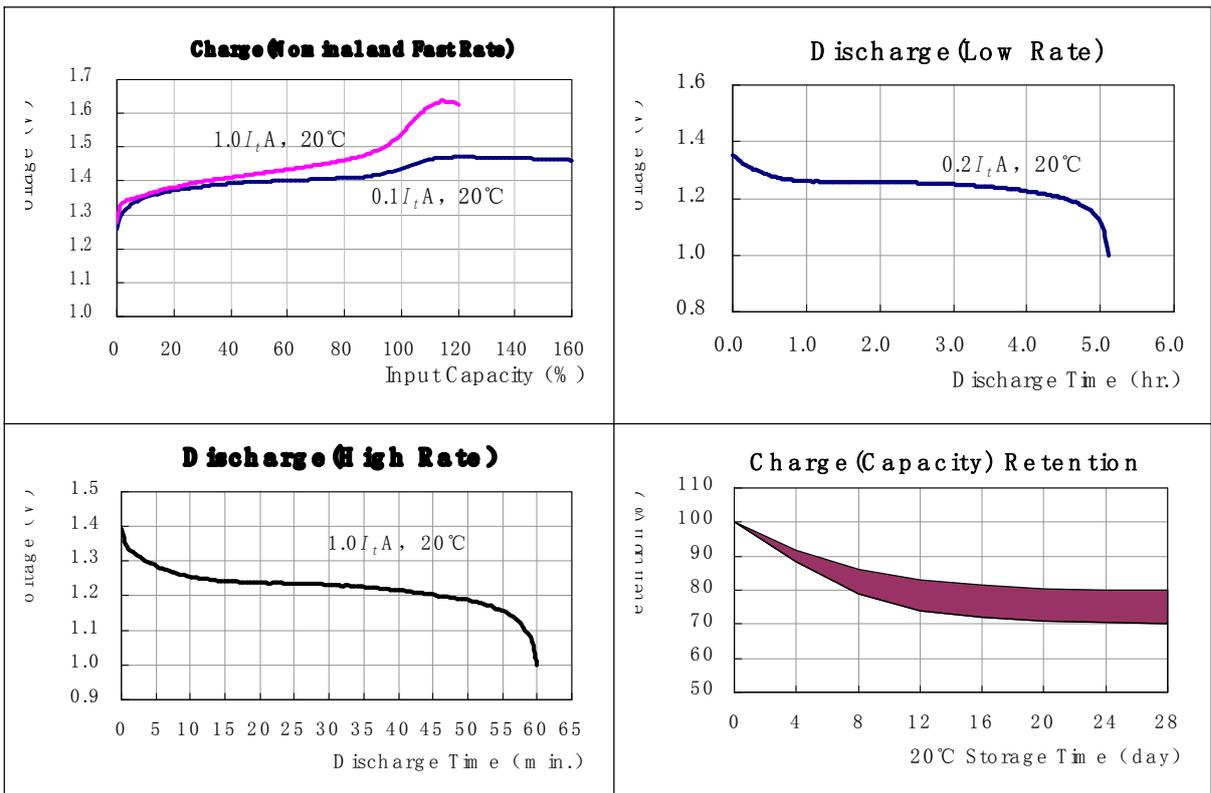
a) The discharge is carried out immediately upon completion of discharge.

Base Data:



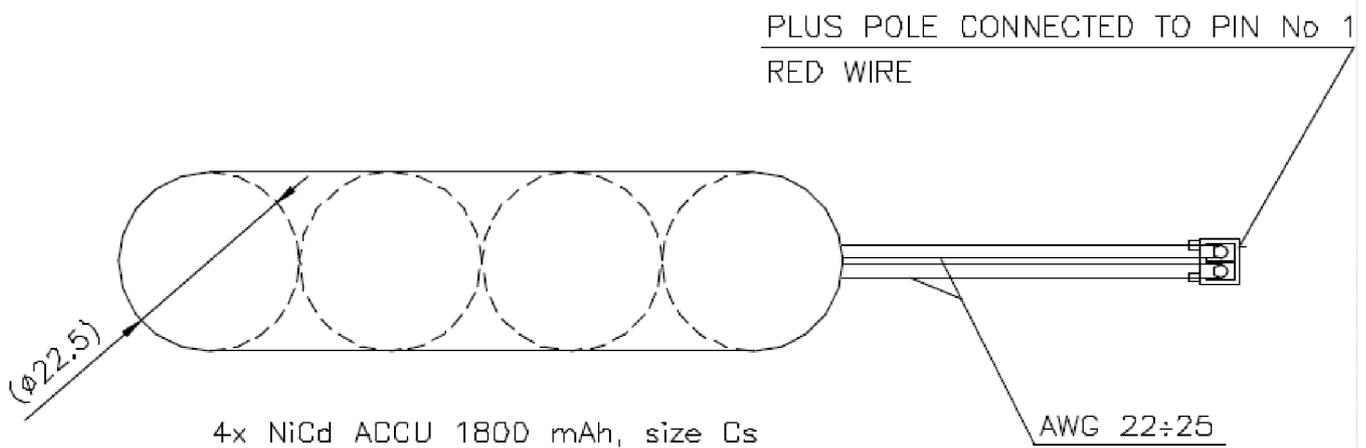
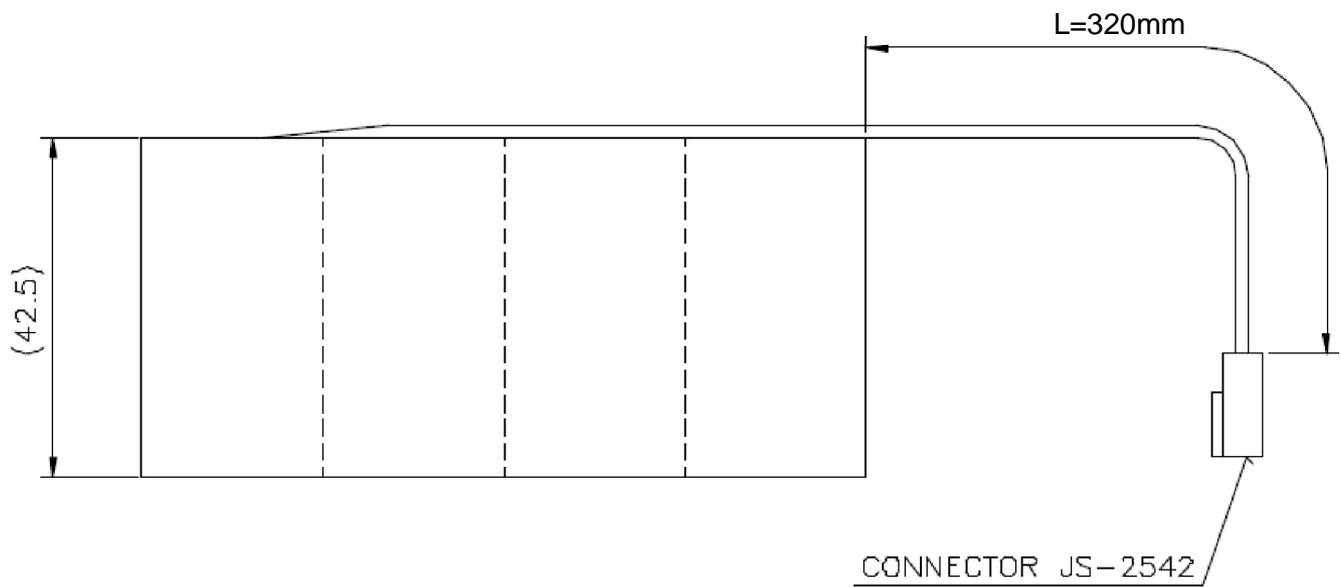
<b>Nominal voltage</b>		1.2V		
<b>Capacity comparison (mAh)</b>		0.2I <sub>t</sub> A	1.0I <sub>t</sub> A	
		1800	1620	
<b>Weight (g)</b>		44		
<b>Internal Impedance at 1000Hz (After Charge; mΩ)</b>		≤12		
<b>Charge current</b>	<b>Standard</b>	180mA		
	<b>Rapid</b>	/		
<b>Charge time</b>	<b>Standard</b>	16h		
	<b>Rapid</b>	72min, plus 2h by 0.1I <sub>t</sub> A		
<b>Temperature</b>	<b>Ambient</b>	<b>charge</b>	<b>Standard</b>	0~+35°C
			<b>Rapid</b>	+10~+35°C
	<b>Discharge</b>		-20~+45°C	
	<b>Storage</b>		-20~+35°C	

Electrical Performance:



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**Battery pack 4,8V / 1800mAh**



4x NiCd ACCU 1800 mAh, size Cs

AWG 22÷25

CONNECTOR ASSEMBLY : 1 Pc HOUSING JS-2542-H (2 POLES)  
2 Pcs TERMINAL JS-2542-T

MANUFACTURER : JIUH SHIUH PRECISION INDUSTRY CO., LTD.

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