

GP Batteries

Product Specification

Model No.: 180SCK

Document Number: BQS6019

Revision: 00

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1. SCOPE

This specification governs the performance of the following GP Nickel-Cadmium Cylindrical Cell and its stack-up batteries which constitute less than 20 unit cells.

Cell Size: SC

The data involving nominal voltage and the approximate weight of stack-up batteries shall be equal to the value of the unit cell multiplied by the number of cells in the battery. For example, a stack-up battery consists of five unit cells:

Nominal Voltage of unit cell = 1.2V

Thus, nominal voltage of stack-up battery = 1.2V x 5 = 6.0V

2. RATINGS

Description	Unit	Specification	Conditions
Nominal Voltage	V/cell	1.2	Unit cell
Typical Capacity	mAh	1,980	Standard Charge / Discharge
Nominal Capacity	mAh	1,800	Standard Charge / Discharge
Standard Charge	mA	180 (0.1C)	$T_a = 0 \sim 45^\circ\text{C}$ (see Note 1)
	hr	14	
Fast Charge	mA	900 (0.5C) ~ 1800 (1C) with charge termination control	- $\Delta V = 10 \sim 20\text{mV/ cell}$ Timer cutoff = 120% input capacity
	hr	2.4 approx. (0.5C) 1.2 approx. (1C) (see Note 2)	
Discharge Cut-off Voltage	V/cell	1.0	Unit cell
Maximum Discharging Current	A	0.18~29 (Continuous) 58 (Momentary)	
Storage Temperature	°C	-20 ~ 60 (within 1 wk) -20 ~ 35	Discharge state, open circuit
Typical Weight	g	51.0	Unit cell

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3. PERFORMANCE

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

Ambient Temperature, T_a : $20 \pm 5^\circ\text{C}$

Relative Humidity : $65 \pm 20\%RH$

Notes : Standard Charge / Discharge Condition

Charge : 180mA (0.1C) x 14hrs

Discharge : 360mA (0.2C) to 1.0V/cell

Test	Unit	Specification	Conditions	Remarks
Capacity	mAh	$\geq 1,800$	Standard Charge / Discharge	Up to 3 cycles are allowed
Open Circuit Voltage (OCV)	V/cell	≥ 1.2	Within 1hr after standard charge	Unit cell
Internal Impedance (Ri)	m Ω /cell	Average: 8 Range: 7-10	Upon fully charge at 1kHz	Unit cell
High Rate Discharge (1C)	min	≥ 54	Charge at 1C to $-\Delta V$, rest within 15 mins, discharge to 1V	
High Rate Discharge (5C)	min	≥ 8.4	Charge at 1C to $-\Delta V$, rest within 15 mins, discharge to 1V	
Continuous Overcharge	N/A	No conspicuous deformation and/or leakage	180mA maximum current	
Charge Retention	mAh	$\geq 1,440$	Standard Charge, Storage: 28 days, Standard Discharge	
IEC Cycles Test	Cycle	≥ 500	IEC60285 (1999) 4.4.1	(see Note 3)
Accelerated Cycle Life	Cycle	≥ 400	Charge: 900mA (0.5C) x 2.4 hours Discharge: 900mA (0.5C) to 1V/cell End of life: 80% of nominal capacity	

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Test	Unit	Specification	Conditions	Remarks
Leakage	N/A	No Leakage	After battery is fully discharged. Battery is placed under load. The battery should be monitored for a period up to 2 months but not less than 10 days	
Short Circuit	N/A	Leakage & deformation may occur, but no explosion is allowed	After standard charge, short circuit for 1 hour. (leading wire= 3.1mm ² x 20mm)	
Vibration Resistance	N/A	$\Delta V < 0.02V/\text{cell}$ ΔR_i (Internal impedance) $< 5m\Omega/\text{cell}$	Charge at 0.1C for 14hrs, and then leave for 24hrs, check battery before / after vibration Amplitude: 1.5mm Vibration: 3000CPM (any direction for 60mins)	Unit cell
Impact Resistance	N/A	$\Delta V < 0.02V/\text{cell}$ ΔR_i (Internal impedance) $< 5m\Omega/\text{cell}$	Charge at 0.1C for 14hrs, and then leave for 24hrs, check battery before / after drop Height: 50cm Thickness of the wooden board: 30mm Direction is not specified Test for 3 times	Unit cell

4. CONFIGURATIONS, DIMENSIONS AND MARKINGS

Please refer to its Data Sheet.

5. EXTERNAL APPEARANCE

The cell / battery shall be free from cracks, scars, breakage, rust, discoloration, leakage and deformation.

6. WARRANTY

1 year limited warranty against workmanship and material defects.

7. CAUTION

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1. Reverse charging is not acceptable.
2. Charge before use, although the cells / batteries are delivered in a charged state.
3. Do not charge / discharge with more than the specified current.
4. Do not short circuit the cell / battery. Permanent damage to the cell / battery may result.
5. Do not incinerate or mutilate the cell / battery.
6. Do not solder directly to the cell / battery.
7. The life expectancy may be reduced if the cell / battery is subjected to adverse conditions like: extreme temperature, deep cycling, excessive overcharge / overdischarge.
8. Store the cell / battery in a cool dry place. Always discharge the cell / battery before bulk storage or shipment.

- Notes :
1. T_a : Ambient Temperature
 2. Approximate charge time from discharged state, for reference only.
 3. IEC60285(1999) 4.4.1 Cycle Life Test :

Cycle No.	Charge	Rest	Discharge
1	0.1C x 16hrs	none	0.25C x 2hrs20mins
2 - 48	0.25C x 3hrs10mins	none	0.25C x 2hrs20mins
49	0.25C x 3hrs10mins	none	0.25C to 1.0V/cell
50	0.1C x 16hrs	1- 4hr(s)	0.2C to 1.0V/cell
Cycle 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3hrs			