

Ni-Cd Specification and Characteristics

Usage Instruction

Battery packs and cells should be delivered in discharged condition and be correctly charged according to the specifications before testing or using.

Never mix charged and discharged **SBS** batteries together.

Rechargeable cells or battery packs should not be used with dry cells or other type of rechargeable batteries.

Avoid throwing cells into fire or disassembling them.

Avoid directly soldering onto cells.

Observe correct polarity.

Charge according to our specifications.

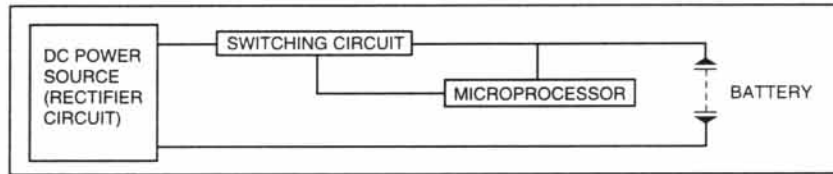
Use only within specified working temperature range.

Store in dry and cool place.

Standard Charging

Quasi-constant current charging

Quasi-constant current charge is effectively employed for **SBS** battery. By inserting rederting resistors between the DC power supply and the battery, an approximately constant current is produced and kept above the specified value at the end of charge time by adjusting the resistance of the resistor.



TEMPERATURE SENSOR RAPID CHARGE CIRCUIT

A sensor is attached to the cell, which will terminate the quick charge mode when the temperature exceeds the specified value.

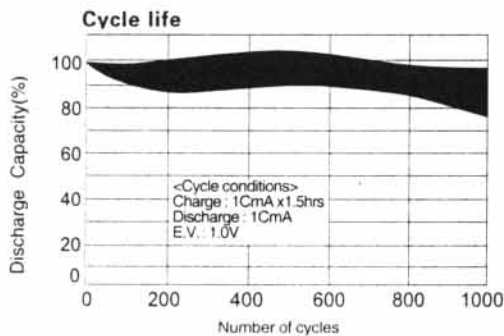
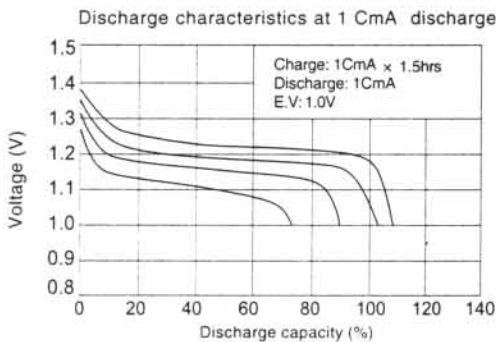
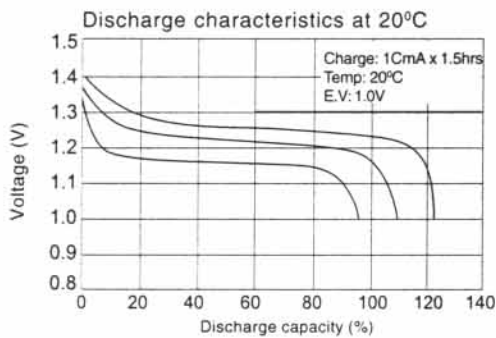
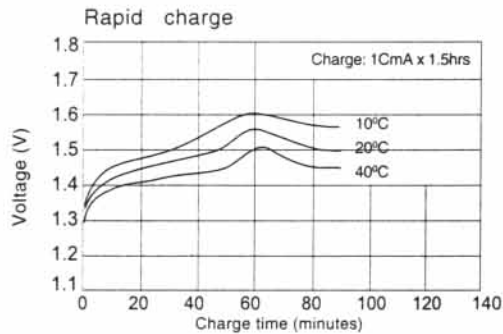
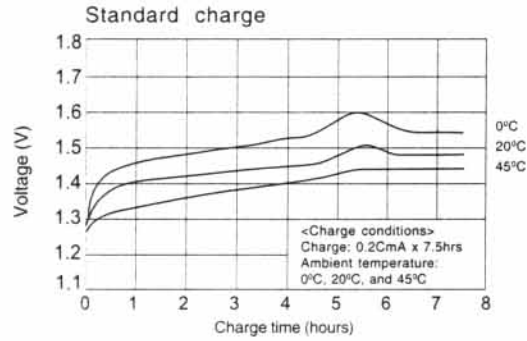
Combined with a simple charger as shown in the figure below, the fast charge **SBS** batteries controlled by temperature sensors are able to obtain a full charge within approximately one hour.

-ΔV SENSOR FAST CHARGE CIRCUIT

The charge voltage increases to a peak point at the end of charge period and then to fall. At the point where the voltage drops by ΔV , charge is terminated automatically. With this system, 100% charge capacity(nominal) is maintained in a wide temperature range(0-45°C).

Charge Method	Cycle(repeated) Use				
	Quasi-constant-current charge	Timer-control charge	-ΔV cut off charge	Temperature cut off charge	Trickle charge
Operations V =Battery voltage I =Charge current T =Battery temperature					
Features	Simple and economical charge method widely used for long charge time with low charge current	More reliable charge with additional charge timer Simple and economical	The extra safety and reliable typical charge control system Very good battery protection	Economical and safety charge method Reliable to overcharge at low temperature and end charge at high temperature	Simple and economical charge method used for continuous long charge
No.of output terminals	2	2	2	3	2
Charge time	15 hours	6 to 8 hours	1 to 2 hours	1 to 2 hours	30 hours or longer
Charge current	0.1 CmA	0.2 CmA	0.5 to 1 CmA	0.5 to 1 CmA	frequent charger 1/20 to 1/30 CmA
Charge level at charge control		approx.120%	approx.110 to 120%	approx.100 To 150%	
Application examples	Cordless Phone Shaver	R/C Toys Wireless equipment	Cellular Phones High-Tech Electric Products	Portable Power Racing Toys	Emergency lighting Timer

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CHARGING CHARACTERISTICS

During charging, the voltage of **SBS** batteries increases as charging proceeds. It then decreases slightly in the final stage due to heat generation inside the cell, eventually reaches an equilibrium. The voltage also varies widely according to the ambient temperature.

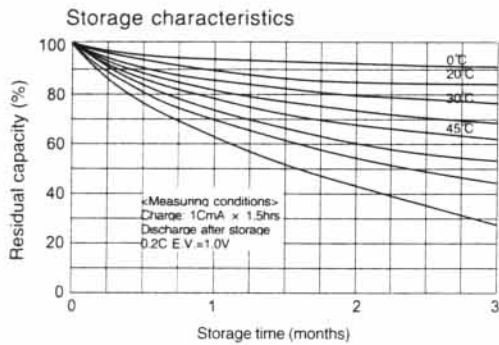
DISCHARGING CHARACTERISTICS

It remains at approximately 1.2V for 85% of the discharge period, although the operating voltage of **SBS** batteries varies slightly depending on discharge current,

CYCLE CHARACTERISTICS

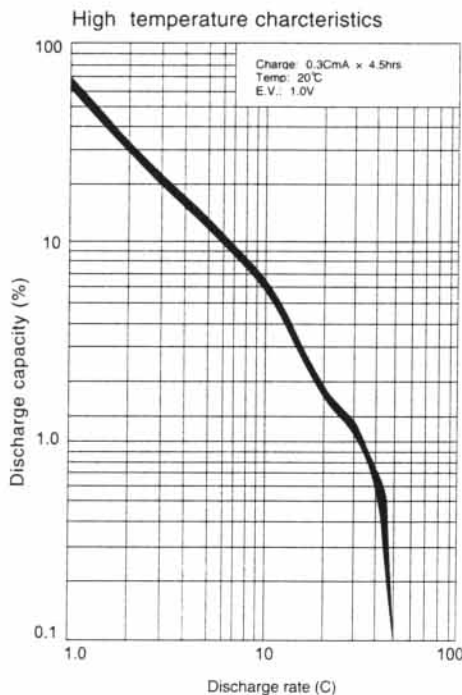
The life of **SBS** battery depends on the conditions of use. However, under normal operation standard batteries can withstand over 800 charge/discharge cycles.

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STORAGE CHARACTERISTICS

The self-discharge of **SBS** batteries accelerates as the temperature increases. However, **SBS** batteries have minimal deterioration in battery performance even after long-term storage. Moreover, the cell capacity that decreased through discharging during storage can be easily restored to its original level by recharging.



HIGH RATE DISCHARGE CHARACTERISTICS

APPLICABLE FOR POWER TOOLS

The performance of **SBS** battery remains satisfactory at a discharge rate as high as 10C, 20C, etc., which has made U power successful in this field.

HIGH TEMPERATURE CHARACTERISTICS

APPLICABLE FOR EMERGENCY LIGHTING

At 25°C the H-type **SBS** battery exhibits maximum capacity, and maintains more than 90% capacity at a temperature of 60°C.

