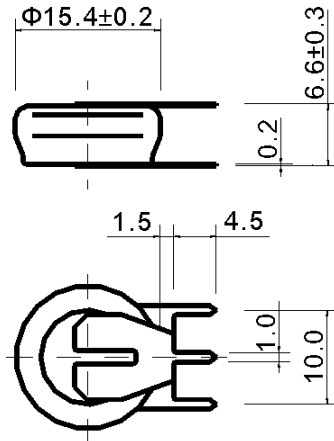


HUALI BATTERY CO.LTD

60H1A3H Ni-MH BUTTON CELL

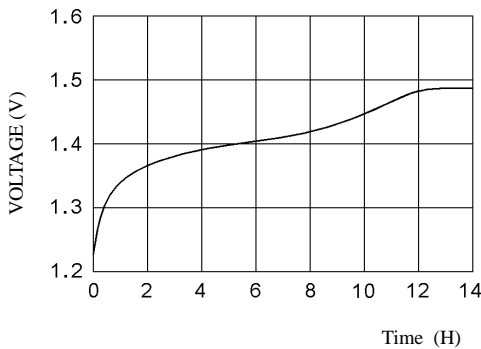
TECHNICAL DATA



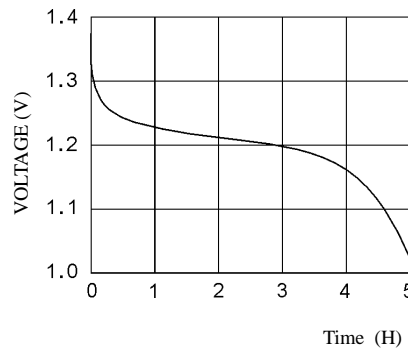
| Model | Voltage | Capacity | Recommended Trickle Charge Current | Nominal Charge Current | Normal Charging Time | Nominal Discharge Current | Weight |
|---------|---------|----------|------------------------------------|------------------------|----------------------|---------------------------|--------|
| 60H1A3H | 1.2V | 80mAh | 2.4~4mA | 8mA | 14~16h | 16mA | 3.6g |

TECHNICAL CHARACTERISTICS

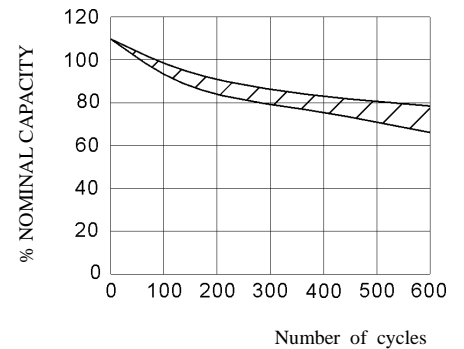
TYPICAL CHARGE CURVE (8mA)



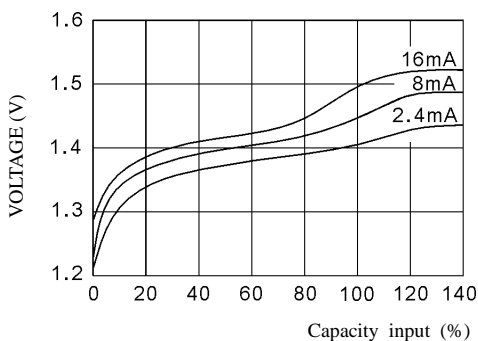
TYPICAL DISCHARGE CURVE (16mA)



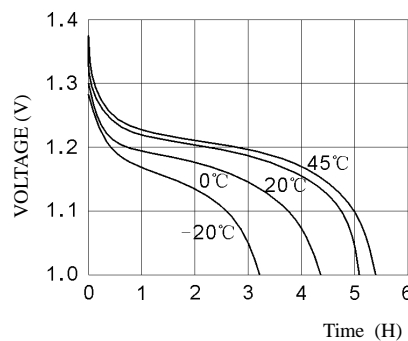
CYCLE LIFE CURVE



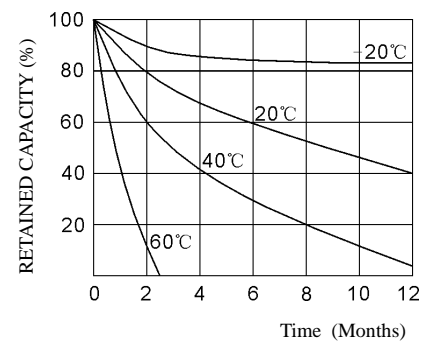
TYPICAL CHARGE CURVE AT VARIOUS CURRENTS



DISCHARGE CURVE AT VARIOUS TEMPERATURES (16mA)



SELF DISCHARGE RATE AT VARIOUS TEMPERATURES



TECHNICAL INFORMATION

1. APPLICATION

This specification applies to the Ni-MH batteries

Model : 60H1A3H

2. CELL AND TYPE

2.1 Cell : Sealed Ni-MH Button Cell

2.2 Type : Button type

2.3 Size type : 1.2V

3. RATINGS

3.1 Nominal voltage : 1.2V

3.2 Nominal capacity : 80mAh

3.3 Typical weight : 3.6g

3.4 Standard charge : 8mA × 14hours

3.5 Rapid charge : 16mA × 6hours

Trickle current : 2.4mA

3.6 Discharge cut-off voltage: 1.0V

3.7 Temperature range for operation (Humidity: Max.85%)

Standard charge 0 ~ +45°C

Rapid charge +10 ~ +45°C

Trickle charge 0 ~ +45°C

Discharge -10 ~ +45°C

3.8 Temperature range for storage (Humidity: Max.85%)

Within 2 years -20 ~ +35°C

Within 6 months -20 ~ +45°C

Within a month -20 ~ +45°C

Within a week -20 ~ +55°C

4. ASSEMBLY & DIMENSIONS

Per attached drawing

5. PERFORMANCE

5.1 TEST CONDITIONS

The test is carried out with new batteries (within a month after delivery)

ambient conditions

Temperature: +25 ± 5°C

Humidity: 60 ± 20%

Note 1

Standard charge : 8mA × 14hours

Standard discharge : 16mA to 1.0V

5.2 TEST METHOD & PERFORMANCE

| Test | Unit | Specification | Conditions | Remarks |
|-----------------------------|------------------|-----------------------------|---|----------------------------|
| Capacity | mAh | ≥ 80 | Standard Charge/discharge | Up to 3 cycles Are allowed |
| Open Circuit Voltage (OCV) | Voltage (V) | ≥ 1.3 | After 1 hour standard Charge | |
| Internal Impedance | m Ω /cell | ≤ 1500 | Upon fully charge (1KHz) | |
| High rate Discharge (40 mA) | Minute | ≥ 60 | Standard charge Before discharge | |
| Discharge Current | mA | 40 | Maximum continuous Discharge current | |
| Over charge | | No leakage Not explosion | 2.4mA charge one year | |
| Charge Retention | mAh | 64 | Standard charge; Storage: 28 days; Standard discharge | |
| Cycle Life | Cycle | ≥ 400 | IEC/CEI61951-2:2001. 4.4 | |
| Leakage | | No leakage nor Deformation | Fully charge at 8mA, Stand 14 days | |

Note 2 IEC/CEI61951-2:2001. 4.4 cycle life

| Cycle number | Charge | Stand in charged Condition | Discharge |
|--------------|------------------|----------------------------|-------------------|
| 1 | 8mA for 16h | None | 20mA for 2h20min |
| 2-48 | 20mA for 3h10min | None | 20mA for 2h20min |
| 49 | 20mA for 3h10min | None | 20mA to 1.0V/cell |
| 50 | 8mA for 16h | 1h to 4h | 16mA to 1.0V/cell |

1. Before the endurance in cycles test, the cell shall be discharged at 16mA to a final voltage of 1.0V/cell.

2. The following endurance test shall then be carried out, in an ambient temperature of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$.

5.3 Humidity

The battery shall not leak during the 14 days which it is submitted to the condition of a temperature of $33 \pm 3^{\circ}\text{C}$ and a relative humidity of $80 \pm 5\%$.

6. OTHERS

6.1 We recommend you to set the cut-off voltage at 1.0V/cell.

6.2 If the cut-off voltage is above 1.1V/cell, the battery may be underutilized resulting insufficient use of the available capacity.

6.3 If it is below 1.0V/cell, the battery may have discharge or reverse charge to the cell.

7. PRECAUTION

The cells shall be delivered in charged condition. Before testing or using, the cell shall be discharged at $20 \pm 5^{\circ}\text{C}$ at a constant current of 16mA to a final voltage of 1.0V/cell.

7.1 Avoid throwing cells into a fire or attempting to disassemble them.

7.2 Avoid short circuiting the cells.

7.3 Avoid direct solidarity to cells.

7.4 Observe correct polarity when connecting.

7.5 Do not charge with more than our specified current.

7.6 Use cells only within the specified working temperature range.

7.7 Store cells in dry and cool place.