



# Data Sheet

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Version: A-0 (Trial version)

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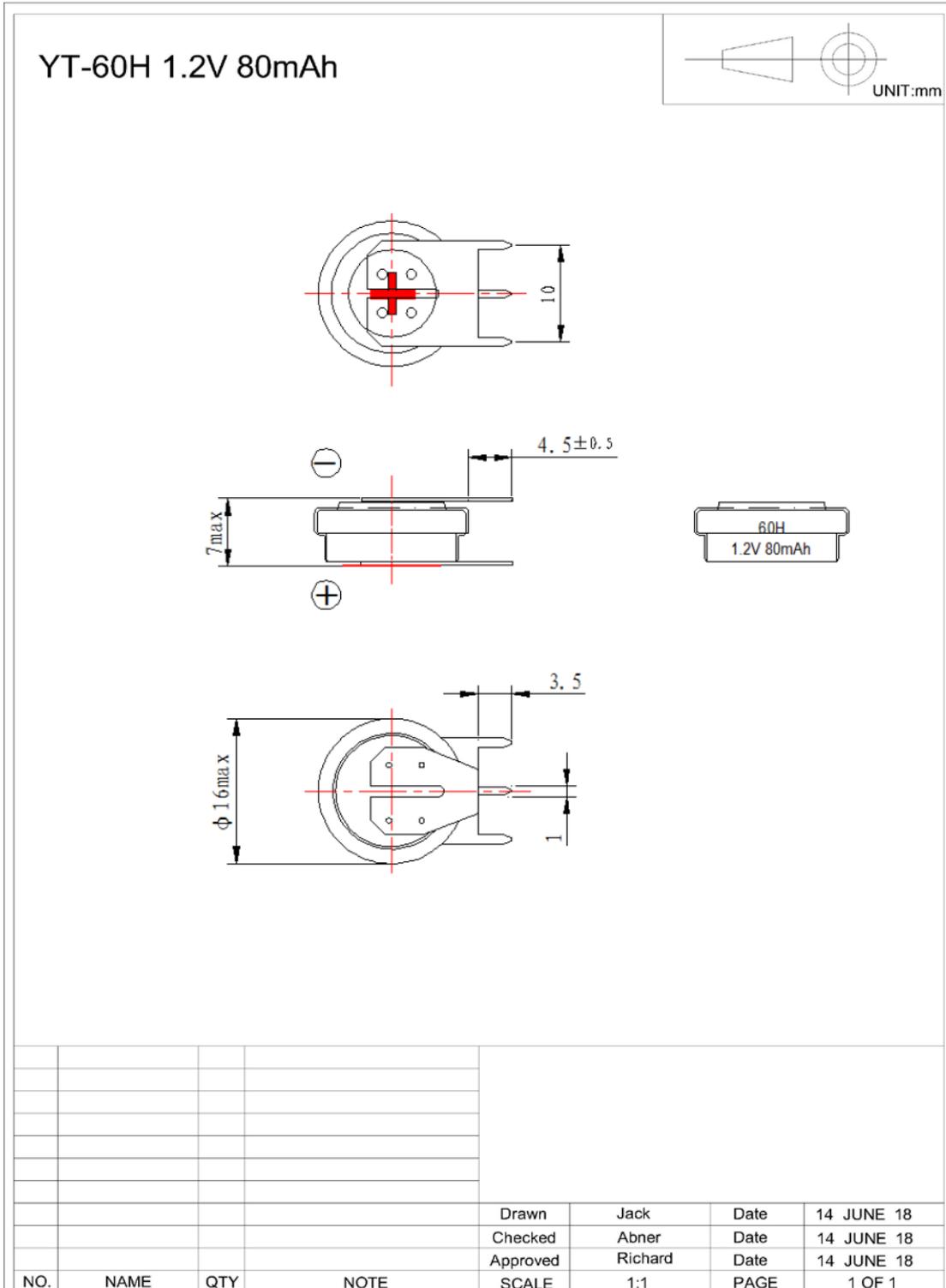
## 1.Preface

This document describes the product specification of the Nickel-Metal Hydride battery supplied by YUNTONG.

## 2.Battery configuration.

2.1 Model : YT-60H 1.2V 80mAh

2.2 Assembly Drawing.



|                     |                                  |
|---------------------|----------------------------------|
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### 3. Specification

| NO. | Items                     | Standard                                  | Remarks  |
|-----|---------------------------|---|--|
| 1.  | Typical capacity          | 80mAh                                     | Discharge Current:0.2C<br>Cut-off voltage:1.0V |
| 2.  | Minimum capacity          | 76mAh                                     |  |
| 3.  | Nominal voltage           | 1.2V                                      |  |
| 4.  | Discharge cut-off voltage | 1.0V                                      |  |
| 5   | Standard Charge           | 0.1C CC(constant current) charge 16 hours |  |
| 6   | Charge Current            | 4~16mA                                    |  |
|     | Charging voltage          | 1.45~1.65V/CELL                           |  |
| 7   | Rapid Charge              | 6.5 hours approx.(MAX 0.2C)               |  |
| 8   | Discharge current         | Standard: 0.2C                            | 1.0V/ cut off                                  |
|     |                           | Max: 0.5C                                 |  |
| 9   | Internal Impedance        | Max: 500 mΩ                               | (AC 1KHz after standard charge)                |
| 10  | Energy                    | 0.096Wh                                   |  |
| 11  | Weight                    | approx : /g                               |  |
| 13  | Operating Temperature.    | charge :0 ~ +45°C                         | Forbid to outrun provision scope a work.       |
|     |                           | Discharge: -10 ~+45°C                     |  |
| 13  | Storage Temperature       | 0 ~ +25°C                                 | See the section 5 <sup>th</sup>                |

### 4. PERFORMANCE

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

Ambient Temperature Ta: 20±5°C

Relative Humidity: 65±20%RH

|                     |                                  |
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Notes: Standard Charge/Discharge Condition:

Charge: 8mA(0.1C)×16hrs

Discharge: 16mA(0.2C) to 1.0V/cell

| Description                     | Unit   | Specification            | Conditions  | Remarks           |
|---------------------------------|--------|--------------------------|---|-------------------|
| Open circuit voltage            | v      | ≥1.25                    | Standard Charge , 1hr rest                                    | Unit cell         |
| Internal impedance(Ri)          | mΩ     | ≤500                     | Upon fully charge (1KHZ)                                      | Unit cell         |
| Low rate Discharge (0.2C)       | minute | ≥285                     | Standard Charge , 0.5hr rest before discharge                 | Allow to 5 cycles |
| Overcharge                      | N/A    | No leakage, no explosion | Cell is discharged with 0.2C to1.0V,then 0.1C for 48 hours    |                   |
| Charged Storage Characteristics | minute | ≥150min                  | Standard charge Storage: 28 days<br>Standard discharge (0.2C) |                   |
| IEC Cycles Test                 | Cycle  | ≥500                     | /   | (see note 1)      |

## 5. Storage and Shipment Requirement

| Item.               | Requirement. |
|---------------------|--------------|
| Storage temperature | 0~+25°C      |
| Humidity            | 60±15%RH     |

Please activate the battery once every 3 months according to the following method:

Charge at 0.1C for 15 hrs, rest 15 min, then discharge with 0.2C to 1.0V/cell, rest 15 min, then charge at 0.2C to 150min.

## 6. Scope:

All data involves voltage and weight to stack-up battery are equal to the value of unit cell time the number of unit cell which consisted in the stack-up batteries

Example: Stack-up batteries consisting E unit cells series

Nominal voltage of unit cell=1.2V

Nominal voltage of stack-up batteries =1.2V×1=1.2V

## 7. Warranty Time.

Warranty time is six (6) months from the date when the Nickel-Metal Hydride battery ship out from YUNTONG factory. But If the Nickel-Metal Hydride battery is found to have a problem due to use outside of YUNTONG recommended specification, YUNTONG will have no responsibility for the battery.

## 8. Others.

Any matters that this specification does not cover should be conferred between both parties.

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## Notes:

1. Approximate charge time from discharged rate, for reference only IEC 61951-2 (2003)

IEC Cycle Life Test:

| Cycle No. | Charge          | Rest  | Discharge          |
|-----------|-----------------|-------|--------------------|
| 1         | 0.1 C, 16h      | none  | 0.25C, 2h 20min    |
| 2—48      | 0.25C, 3h 10min | none  | 0.25C, 2h 20min    |
| 49        | 0.25C, 3h 10min | none  | 0.25C to 1.0V/cell |
| 50        | 0.1C, 16h       | 1h-4h | 0.2C to 1.0V/cell  |

Cycles 1 to 50 shall be repeated until the discharge duration on any 50<sup>th</sup> cycle becomes less than 3hrs. The number of cycles obtained when the test is completed shall be not less than 500 times.

## 2. EXTERNAL APPEARANCE

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

## 3. ELECTRICITY RETAINS:

Normal conditions with electricity retain 50%, if have special demands, confirm after negotiate

## 4. WARRANTY

One year limited warranty against workmanship and material defects.

## 5. WARRANTY

5.1 Do not reverse charge batteries

5.2 Do not short circuit batteries, permanent damage to batteries may result

5.3 Do not subject batteries to adverse condition such as extreme temperature, deep cycling and excessive

5.4 Store batteries in a cool dry place, Always discharge batteries before bulk storage or shipment.

5.5 Do not solder directly to cells or batteries.

5.6 If find any noise, excessive temperature or leakage from a battery, please stop its use.

5.7 Do not incinerate or mutilates batteries, may burst or release toxic material.

5.8 Do not mix new batteries in use with semi-used batteries, over-discharge may occur.

5.9 Do not remove the outer sleeve from a battery pack nor cut into its housing.

5.10 Never put a battery into water or seawater

## 6. CAUTION

6.1 Batteries should be charged prior to use

6.2 For charging methods please referred to our technical handbook

6.3 Use the correct charger for Ni-MH batteries

6.4 Avoid batteries being used in an airtight compartment. Ventilation should be provided inside the battery compartment, otherwise batteries may generate hydrogen gas, which could cause an explosion if exposed to an ignition source

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6.5 Do not attempt to take batteries apart or subject them to pressure or impact. Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing upon contact

6.6 Keep away from children. If swallowed, contact a physician at once.

6.7 When using a new battery for the first time or after long term storage, please fully charge the battery before use

6.8 When using a new battery in use with semi-used batteries, over-discharge may occur.

6.9 When the battery is hot, please do not touch it and handle it, until it has cooled down.

6.10 When find battery power down during use, please switch off the device to avoid over discharge.

6.11 Unplug a battery by holding the connector itself and not by pulling at its cord.

6.12 After use, if the battery is hot. Before recharging it, allow it to cool in a well-ventilated place out of direct sunlight.

## 7、STORAGE

7.1 In order to ensure the battery to maintain the capacity level, We suggest Ni-MH battery and battery pack should be stored under the condition of 0 ~ 25 °C, low humidity, no corrosive gases .

7.2 Ni-MH battery to avoid the high temperature or high humidity storage, otherwise it would lead to the battery leakage, rust, and the lower capacity

7.3 The long-term storage may lead to NIMH batteries and battery packs to reduce the capacity and need 1-3 charge / discharge cycles to reach the maximum discharge capacity.

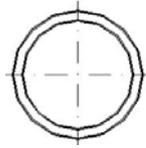
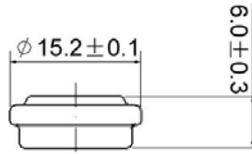
7.4 Three months after placing the battery need to be charge/discharge for one cycles.

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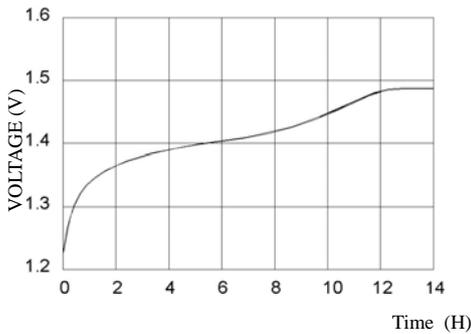
## Specification of 60H button NI-MH battery

### 一. BATTERY DRAWING

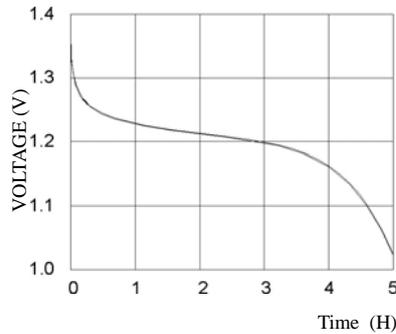


### 二. MAIN PERFORMANCE:

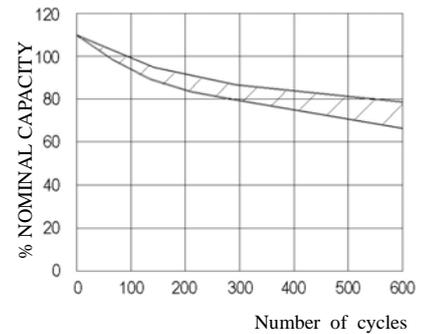
TYPICAL CHARGE CURVE (8mA)



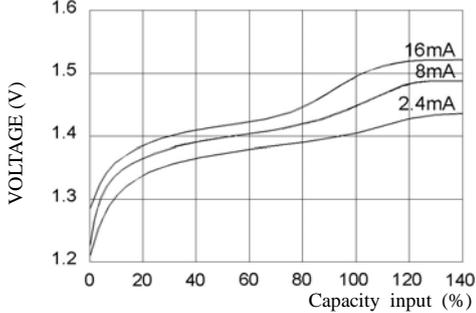
TYPICAL DISCHARGE CURVE (16mA)



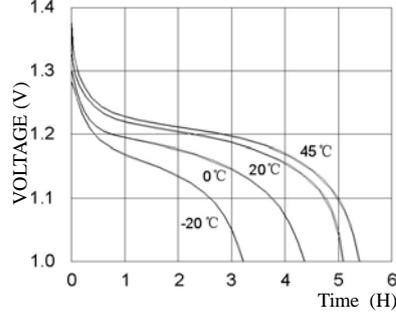
CYCLE LIFE CURVE



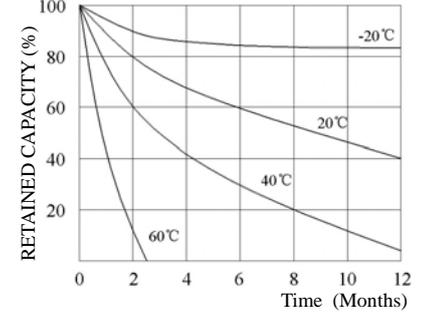
TYPICAL CHARGE CURVE AT VARIOUS CURRENTS



DISCHARGE CURVE AT VARIOUS TEMPERATURES (16mA)



SELF DISCHARGE RATE AT VARIOUS TEMPERATURES



### 三. SPECIFICATION:

#### 1. APPLICATION

This specification applies to the Ni-MH batteries

Model : 60H

#### 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/0.2CmA
- 3.3 Typical weight : 3.2g
- 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 : 0.2C 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   | ≤900                       | Upon fully charge (1KHz)                              |                            |
| High rate Discharge(0.5C) | Minute      | ≥60                        | Standard charge Before discharge                      |                            |
| Discharge Current         | mA          | 40                         | Maximum continuous Discharge current                  |                            |
| Over charge               |             | No leakage Not explosion   | 2.4mA(0.03C) charge one year                          |                            |
| Charge Retention          | mAh         | 64                         | Standard charge; Storage: 28 days; Standard discharge |                            |
| Cycle Life                | Cycle       | ≥500                       | IEC285(1993)4.4.1                                     |                            |
| Leakage                   |             | No leakage nor Deformation | Fully charge at 8mA, Stand 14 days                    |                            |

Note 2 IEC285(1993)4.4.1 cycle life

| Cycle number | Charge      | Rest | Discharge   |
|--------------|-------------|------|-------------|
| 1-50         | 8mA for 14h |      | 16mA for 5h |

50 cycles of test as in the following table condition is repeated, The discharge time of the 100<sup>th</sup>,200<sup>th</sup>,400<sup>th</sup>,500<sup>th</sup> is more than 5 hours. (Ambient temperature is 20 ± 5°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 0.2CmA 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.