

# MSJ 150

**2V 150Ah**

MSJ 150 is a long service life battery up to 20 years expected life under normal float charge. As with all CSB batteries, all are rechargeable, highly efficient, leak proof and maintenance free.



## Specification

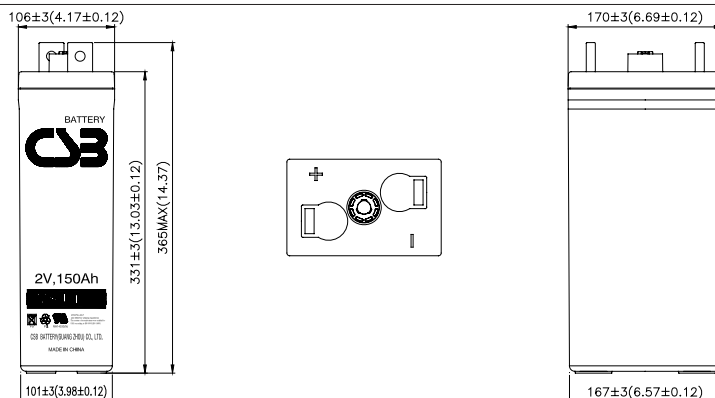
|                                            |                                                                                                                                                            |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cells Per Unit                             | 1                                                                                                                                                          |
| Voltage Per Unit                           | 2                                                                                                                                                          |
| Capacity                                   | 150Ah @ 10hr-rate to 1.80V per cell @25 °C (77°F)                                                                                                          |
| Weight                                     | Approx. 13.56 kg(29.99 lbs)                                                                                                                                |
| Maximum Discharge Current                  | 900A(5sec)                                                                                                                                                 |
| Internal Resistance                        | Approx. 0.74 mΩ                                                                                                                                            |
| Operating Temperature Range                | Discharge: -20°C~50°C (-4°F~122°F)<br>Charge: 0°C~40°C (32°F~104°F)<br>Storage: -20°C~40°C (-4°F~104°F)                                                    |
| Nominal Operating Temperature Range        | 25°C±3°C (77°F±5°F)                                                                                                                                        |
| Float Charging Voltage                     | 2.23±0.02/Cell at 25 °C (77°F) Temp.<br>Coefficient ±3.3mV/°C (± 1.8mV/°F)                                                                                 |
| Recommended Maximum Charging Current Limit | 45A                                                                                                                                                        |
| Equalization and Cycle Service             | 2.35V Temps coefficient ±3.3mV/°C (± 1.8mV/°F)                                                                                                             |
| Terminal                                   | Pb-Ca-Sn Alloy(L / Recessed Terminal)                                                                                                                      |
| Container Material                         | The container and cover are made of flame retardant plastics which meet ABS(UL 94-V0/File E88637) specifications. The oxygen index level is higher than 28 |



CSB-manufactured batteries are UL-recognized components under UL924 and UL1989. CSB is also certified by ISO 9001 and ISO 14001.

## Dimensions

Unit:(mm)



## Constant Current Discharge Characteristics Unit:A (25°C ,77°F)

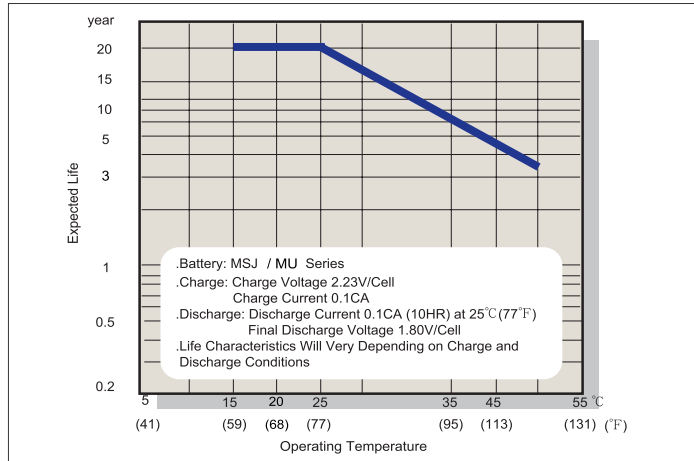
| F.V/Time | 15MIN | 30MIN | 60MIN | 2HR  | 3HR  | 4HR  | 5HR  | 6HR  | 8HR  | 10HR |
|----------|-------|-------|-------|------|------|------|------|------|------|------|
| 1.60V    | 238   | 158   | 97.0  | 58.0 | 43.0 | 34.0 | 29.0 | 25.0 | 20.0 | 16.9 |
| 1.65V    | 227   | 152   | 93.0  | 55.0 | 41.0 | 33.0 | 28.0 | 24.0 | 19.3 | 16.2 |
| 1.70V    | 211   | 143   | 91.0  | 54.0 | 40.0 | 32.0 | 27.0 | 23.0 | 19.0 | 16.0 |
| 1.75V    | 188   | 127   | 84.0  | 52.0 | 38.0 | 30.9 | 26.0 | 23.0 | 18.4 | 15.5 |
| 1.80V    | 161   | 117   | 79.0  | 49.0 | 37.0 | 30.6 | 25.0 | 22.0 | 17.9 | 15.0 |
| 1.83V    | 136   | 106   | 73.0  | 46.0 | 35.0 | 28.0 | 24.0 | 21.0 | 17.0 | 14.5 |

## Constant Power Discharge Characteristics Unit:W (25°C ,77°F)

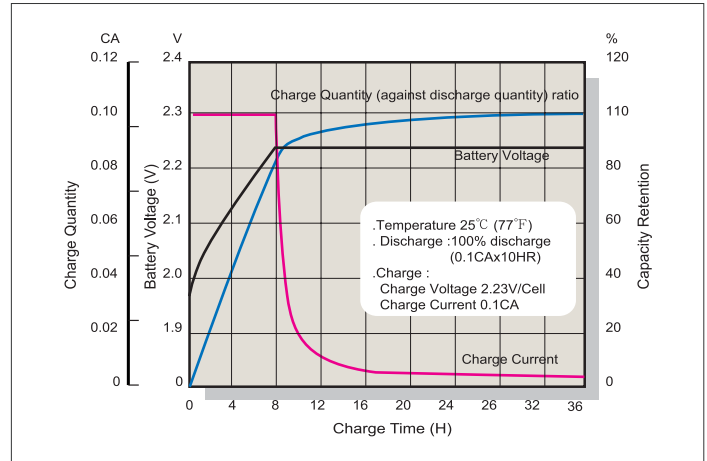
| F.V/Time | 15MIN | 30MIN | 60MIN | 2HR  | 3HR  | 4HR  | 5HR  | 6HR  | 8HR  | 10HR |
|----------|-------|-------|-------|------|------|------|------|------|------|------|
| 1.60V    | 417   | 281   | 173   | 104  | 78.0 | 63.0 | 53.0 | 47.0 | 37.4 | 32.0 |
| 1.65V    | 413   | 280   | 172   | 102  | 76.5 | 62.0 | 52.5 | 46.5 | 37.0 | 31.5 |
| 1.70V    | 380   | 260   | 167   | 101  | 75.0 | 61.0 | 52.0 | 46.0 | 36.5 | 31.0 |
| 1.75V    | 342   | 234   | 156   | 97.0 | 73.0 | 58.0 | 50.0 | 43.0 | 36.0 | 30.0 |
| 1.80V    | 294   | 216   | 147   | 93.0 | 70.0 | 57.0 | 48.0 | 42.6 | 35.0 | 29.0 |
| 1.83V    | 249   | 195   | 136   | 87.0 | 66.0 | 53.0 | 46.0 | 40.0 | 33.0 | 28.0 |

- All mentioned values are average values.
- Cycle Information : 300~400 cycles@DOD80%, 600~700 cycles@DOD50%, 900~1200 cycles@DOD30%
- Tolerance: X<6min(+15%~-15%), 6min ≤ X<10min(+12%~-12%), 10min ≤ X<60min(+8%~-8%), X ≥ 60min(+5%~-5%)

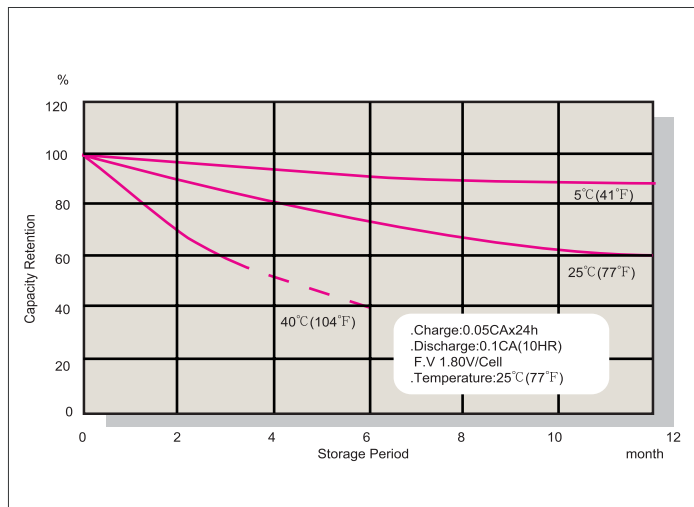
## Expected Life V.S Operating Temperature



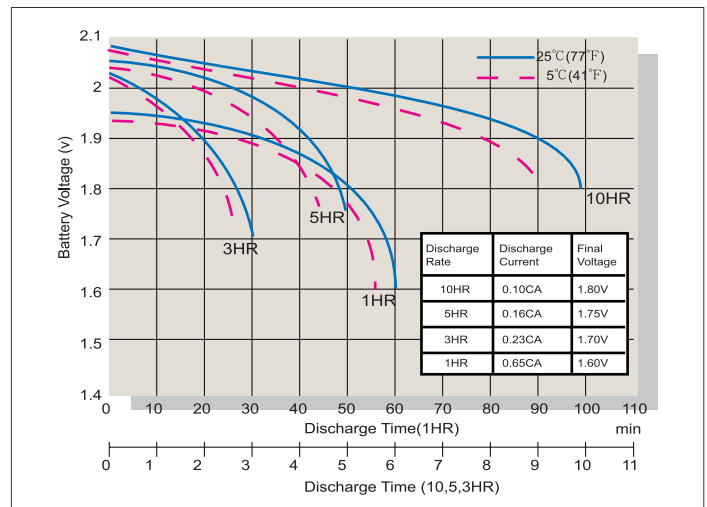
## Typical Constant Voltage Charge Characteristics



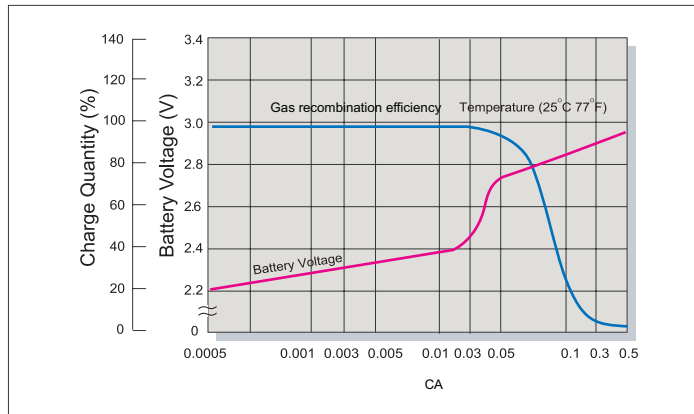
## Capacity Retention Characteristics



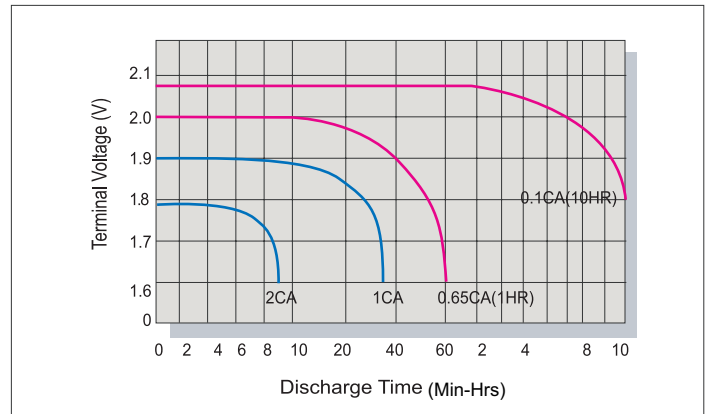
## Discharge Characteristics



## Oxygen Recombination Efficiency Chart



## Terminal Voltage (V) and Discharge Time 25°C (77°F)



## Charging Procedures

| Application | Charge Voltage (V/Cell) |           |                 | Max. Charge Current |
|-------------|-------------------------|-----------|-----------------|---------------------|
|             | Temperature             | Set Point | Allowable Range |                     |
| Standby     | 25°C (77°F)             | 2.23      | 2.21~2.25       | 0.3C                |

## Discharge Current VS. Discharge Voltage

| Discharge Current (A) | Final Discharge Voltage (V/Cell) |
|-----------------------|----------------------------------|
| 0.05C > A             | 1.90                             |
| 0.15C > A ≥ 0.05C     | 1.80                             |
| 0.20C > A ≥ 0.15C     | 1.75                             |
| 0.40C > A ≥ 0.20C     | 1.70                             |
| A > 0.40C             | 1.60                             |

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