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# MSJ 650 ▶ 2V 650Ah

MSJ 650 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.



MH14533(N)



No.:041005117



CSB-manufactured VRLA batteries are UL-recognized components under UL924 and UL1989.

CSB is also certified by ISO 9001 and ISO 14001.

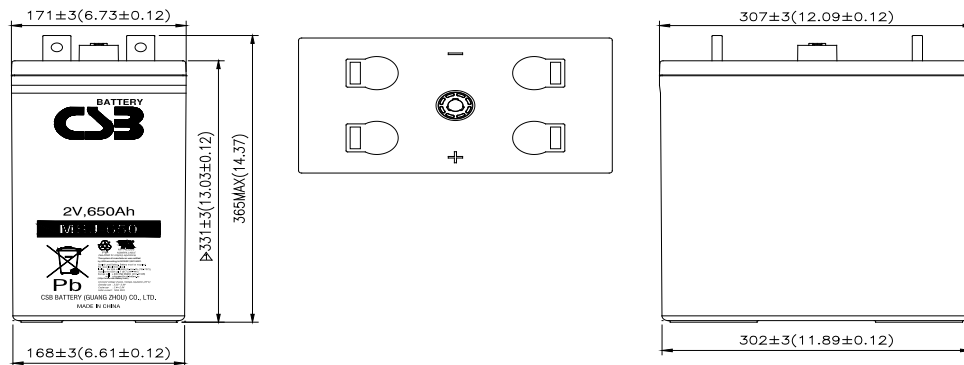
## ► Specification

Cells Per Unit	1
Voltage Per Unit	2
Capacity	650Ah @ 10hr-rate to 1.80V per cell @25 °C (77°F)
Weight	Approx. 46.6 kg(102.74 lbs)
Maximum Discharge Current	3900A(5sec)
Internal Resistance	Approx. 0.81m Ω
Operating Temperature Range	Discharge: -20°C~50°C(-4°F~122°F) Charge: 0°C~40°C(32°F~104°F) 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. Coefficient ±3.3mV/°C(±1.8mV/°F)
Recommended Maximum Charging Current Limit	195A
Equalization / Cycle Use Charging Voltage	2.35V Temps coefficient ±3.3mV/°C(±1.8mV/°F)
Terminal	Pb-Ca-Sn Alloy L 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

## ► Dimensions :

Unit: mm (inch)

Overall Height (H)	Container height (h)	Length (L)	Width (W)
365±3 (14.37±0.12)	331±3 (13.03±0.12)	307±3 (12.09±0.12)	171±3 (6.73±0.12)



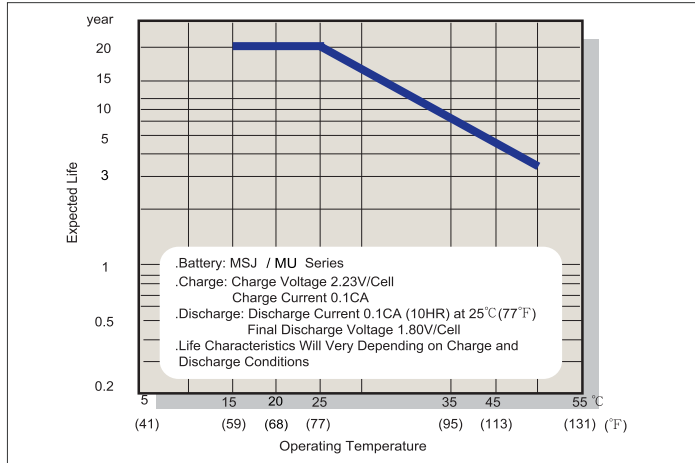
## Constant Current Discharge Characteristics Unit:A (25°C, 77°F)

F.V/Time	15MIN	30MIN	60MIN	2HR	3HR	4HR	5HR	6HR	8HR	10HR
1.60V	1032	685	420	250	186	148	125	108	87.0	73.0
1.67V	982	658	402	241	178	143	120	105	83.0	70.0
1.70V	915	620	394	237	174	142	118	103	82.0	69.0
1.75V	813	551	363	224	165	134	113	98.0	79.0	68.0
1.80V	699	508	342	213	159	133	109	96.0	78.0	65.0
1.83V	592	458	316	202	151	122	104	91.0	74.0	62.0

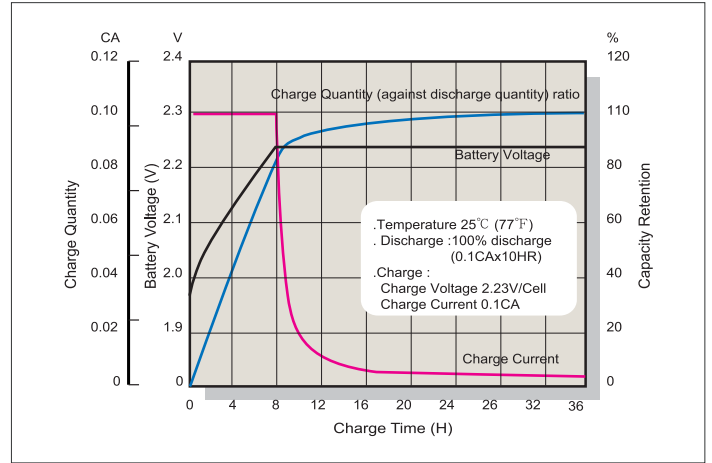
## Constant Power Discharge Characteristics Unit:W (25°C, 77°F)

F.V/Time	15MIN	30MIN	60MIN	2HR	3HR	4HR	5HR	6HR	8HR	10HR
1.60V	1807	1218	750	451	338	272	230	204	163	138
1.67V	1790	1212	748	445	337	269	228	202	161	137
1.70V	1647	1127	724	438	326	265	225	198	159	135
1.75V	1481	1015	676	419	315	256	216	189	155	131
1.80V	1274	936	637	400	302	248	209	185	150	127
1.83V	1078	844	588	377	287	229	200	174	143	124

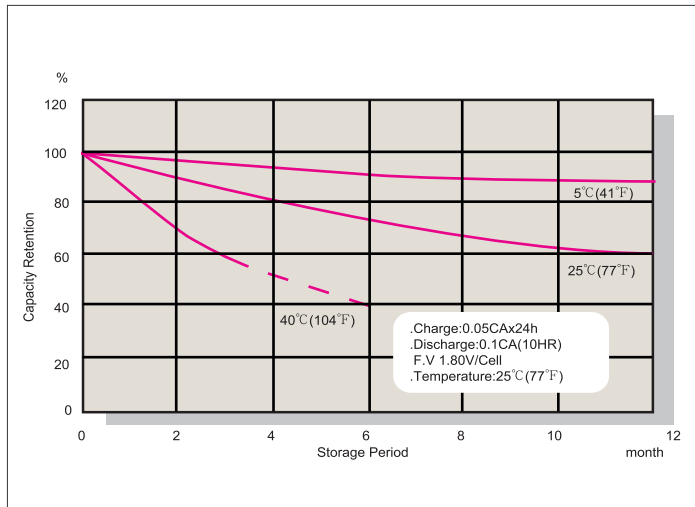
### Expected Life V.S Operating Temperature



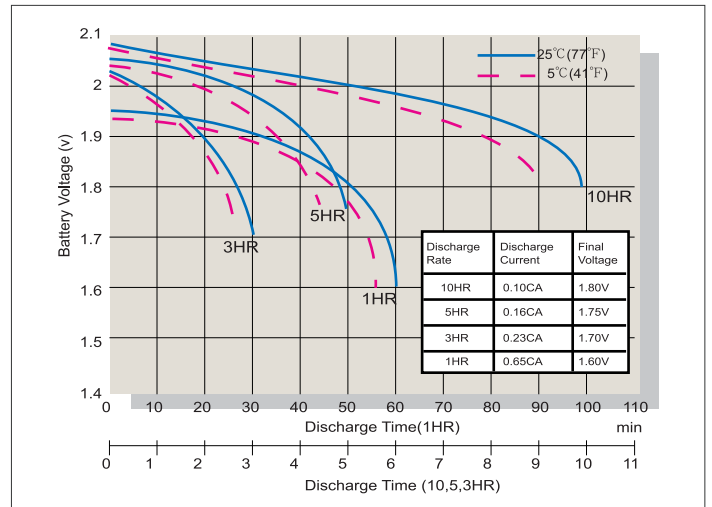
### Typical Constant Voltage Charge Characteristics



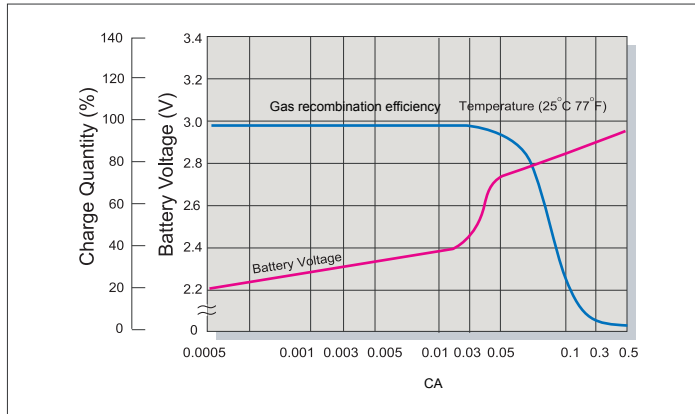
### Capacity Retention Characteristics



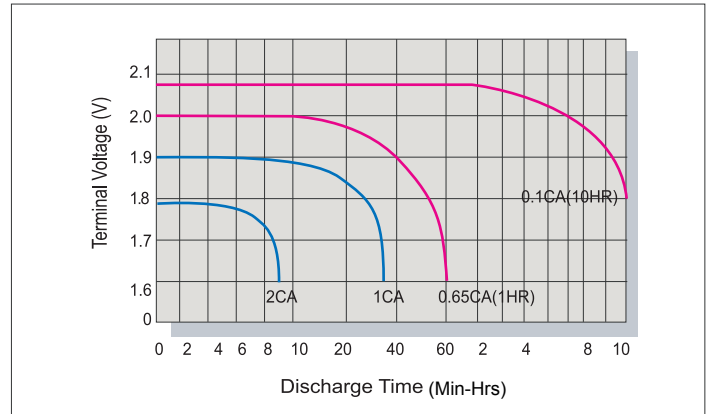
### Discharge Characteristics



### 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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