



MSJ 650

2V 650Ah

MSJ-650 is a Long service life battery with 15 years expected life under normal float charge.

As with all CSB batteries, all are rechargeable, highly efficient, leak proof and maintenance free.



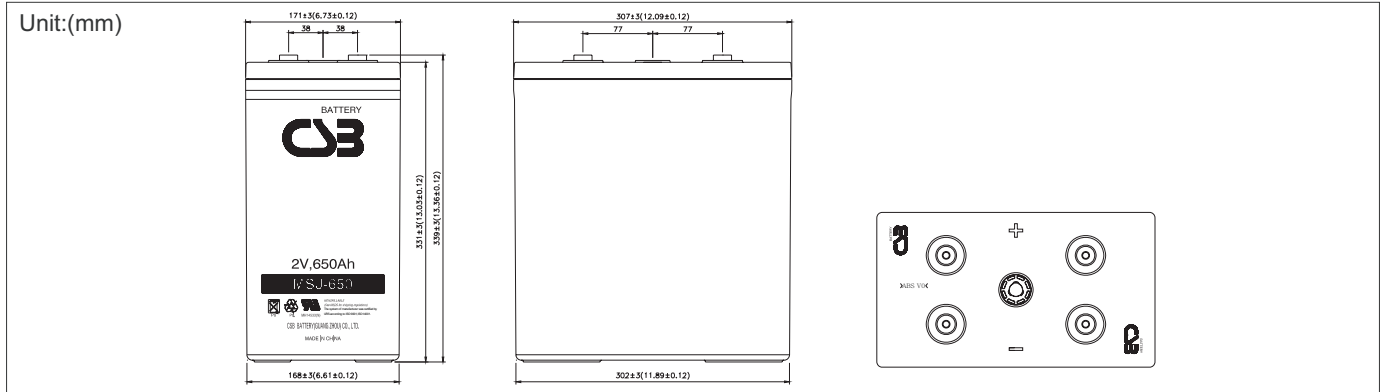
Specification

Cells Per Unit	1
Voltage Per Unit	2
Capacity	650Ah @ 10hr-rate to 1.80V per cell @25 °C (77°F)
Weight	Approx. 46.4kg(102.3lbs)
Maximum Discharge Current	3900A(5sec)
Internal Resistance	Approx. 0.37 mΩ
Operating Temperature Range	Discharge: -15°C~50°C (5°F~122°F) Charge: -15~40°C (5°F~104°F) Storage: -15°C~40°C (5°F~104°F)
Nominal Operating Temperature Range	25°C±3°C(77°F±5°F)
Float Charging Voltage	2.23±0.02/Cell AT25°C(77°F) Temp. Coefficient-3.3mV/°C(-1.8mV/°F)
Recommended Maximum Charging Current Limit	195A
Equalization and Cycle Service	2.35V Temps coefficient -3.3mV/°C(-1.8mV/°F)
Terminal	Pb-Ca-Sn Alloy
Container Material	The container and cover are made of flame retardant plastics which meet UL-94V-0 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



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

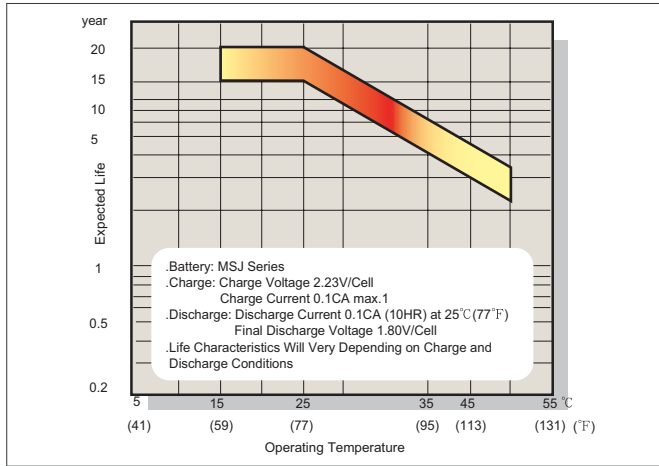
F.V/Time	60MIN	2HR	3HR	4HR	5HR	6HR	8HR	10HR
1.60V	420.00	250.00	186.00	148.00	125.00	108.00	87.00	73.00
1.65V	402.00	241.00	178.00	143.00	120.00	105.00	83.00	70.00
1.70V	394.00	237.00	174.00	142.00	118.00	103.00	82.00	69.00
1.75V	363.00	224.00	165.00	134.00	113.00	98.00	79.00	68.00
1.80V	342.00	213.00	159.00	133.00	109.00	96.00	78.00	65.00
1.83V	316.00	202.00	151.00	122.00	104.00	91.00	74.00	62.00

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

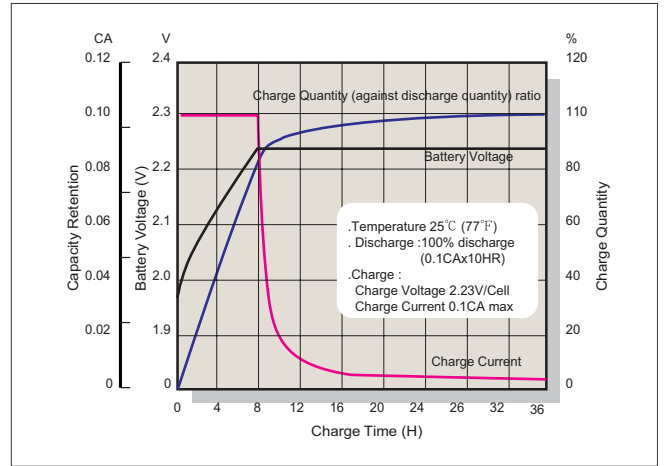
F.V/Time	60MIN	2HR	3HR	4HR	5HR	6HR	8HR	10HR
1.60V	750.00	451.00	338.00	272.00	230.00	204.00	163.00	138.00
1.65V	748.00	445.00	337.00	269.00	228.00	202.00	161.00	137.00
1.70V	724.00	438.00	326.00	265.00	225.00	198.00	159.00	135.00
1.75V	676.00	419.00	315.00	256.00	216.00	189.00	155.00	131.00
1.80V	637.00	400.00	302.00	248.00	209.00	185.00	150.00	127.00
1.83V	588.00	377.00	287.00	229.00	200.00	174.00	143.00	124.00

● All mentioned values are average values.

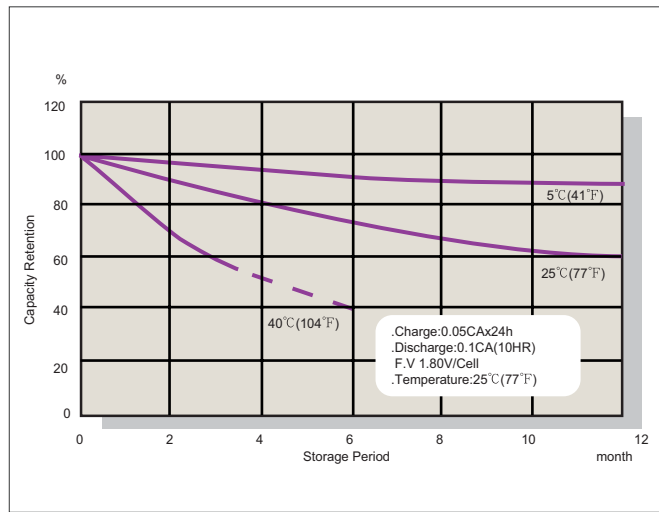
Expected Life V.S Operating Temperature



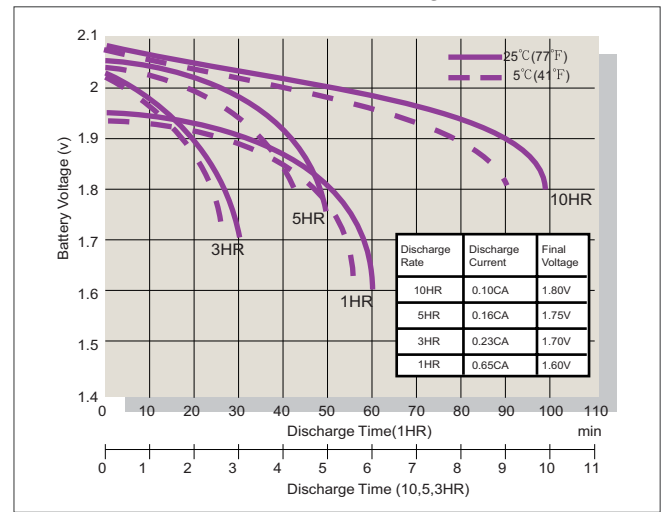
Typical Constant Voltage Charge Characteristics



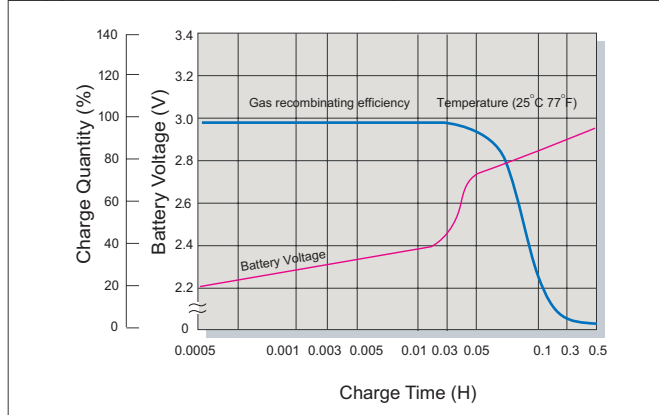
Capacity Retention Characteristics



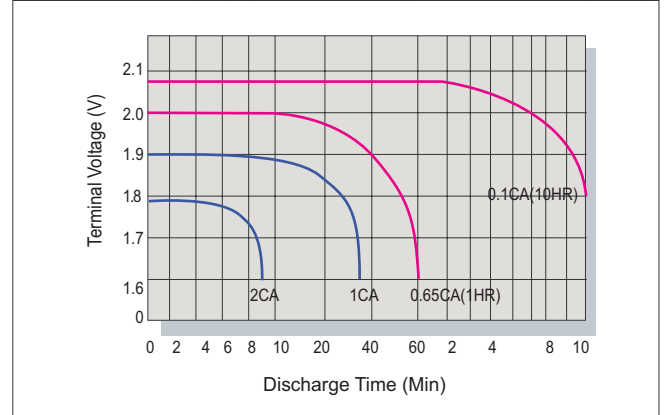
Discharge Characteristics



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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