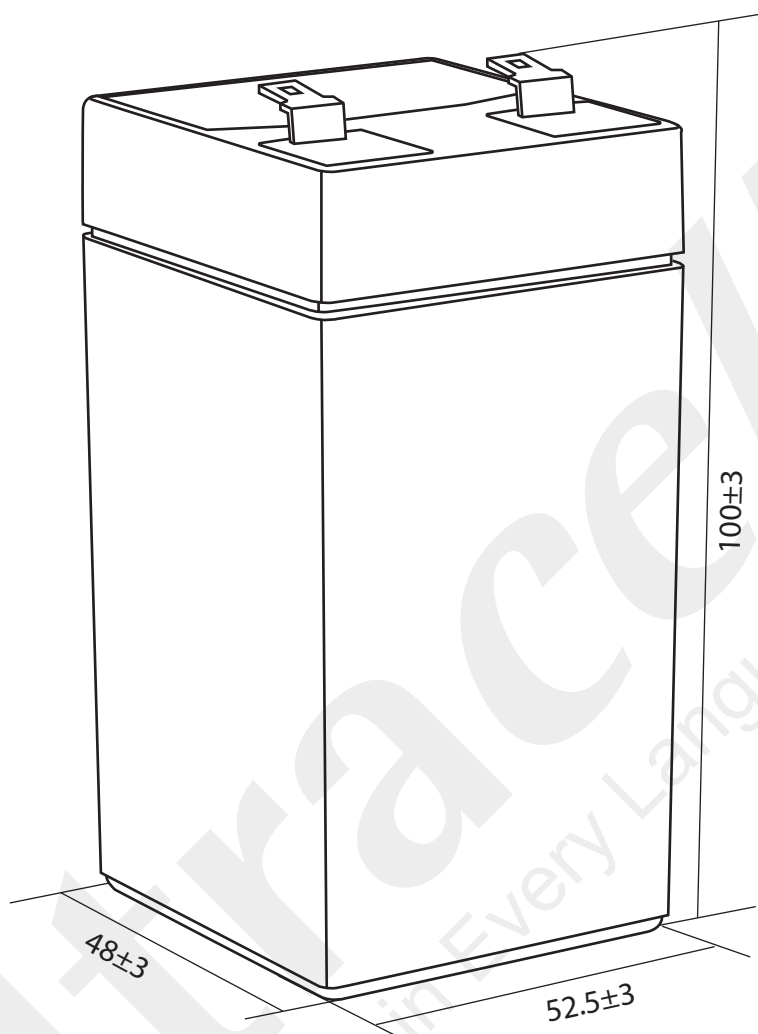
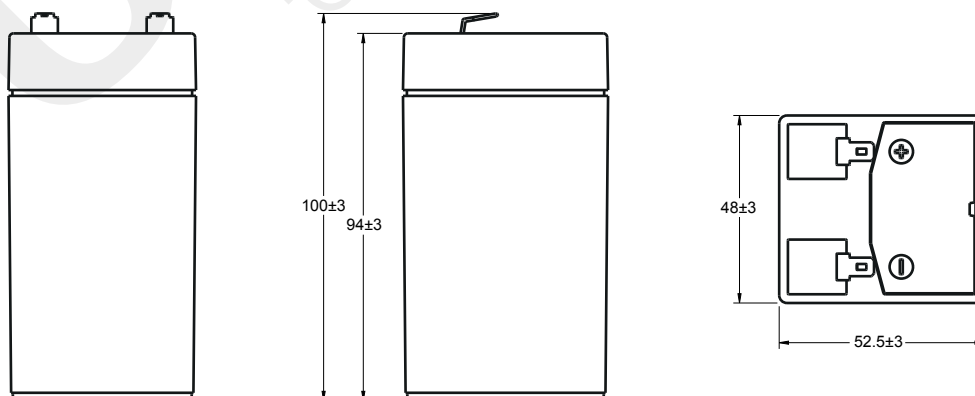




Technical Dimensions (mm)

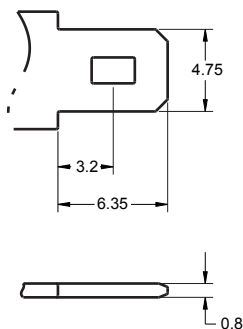


Image

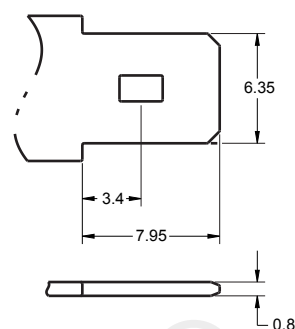


Terminal Dimensions (mm)

Standard Terminal: F1



Optional Terminal: F2



Technical Specification

Output	Nominal Voltage	4V
	Nominal Capacity (20HR)	4.5Ah
Terminal Type	Standard Terminal	F1
	Optional Terminal	F2
Container Material	Standard Option	ABS
	Flame Retardant Option (FR)	ABS (UL94:VO)
Rated Capacity	(20HR 1.75V/cell, 25°C)	4.50 Ah/0.225A
	(10HR 1.75V/cell, 25°C)	4.26 Ah/0.426A
	(5HR 1.75V/cell, 25°C)	3.84 Ah/0.768A
	(3HR 1.75V/cell, 25°C)	3.36 Ah/1.12A
	(1HR 1.60V/cell, 25°C)	2.80 Ah/2.80A
Max Discharge Current	68A (5s)	
Internal Resistance	Approx 15mΩ	
Discharge Characteristics	Operating Temp Range	Discharge: -15 ~ 50°C
		Charge: 0 ~ 40°C
		Storage: -15 ~ 40°C
	Nominal Operating Temp Range	25 ± 3°C
	Cycle Use	Initial Charging Current less than 1.35A. Voltage 4.8V ~ 5.0V @ 25°C Temp. Coefficient -10mV/°C
	Standby Use	Initial Charging Current less than 1.35A. Voltage 4.5V ~ 4.6V @ 25°C Temp. Coefficient -6mV/°C
	Capacity affected by Temperature	40°C 103%
		25°C 100%
		0°C 86%
Design Floating Life at 20°C	5 Years	

Self Discharge

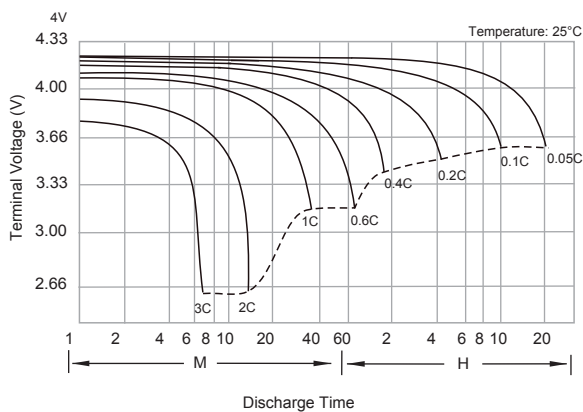
Ultracell® UL batteries may be stored for up to 6 months at 25°C and then a refresh charge is required. For higher temperatures the time intervals will be shorter.

Constant Current Discharge / Constant Power Discharge At 25°C (Amperes & Watts/Cell)

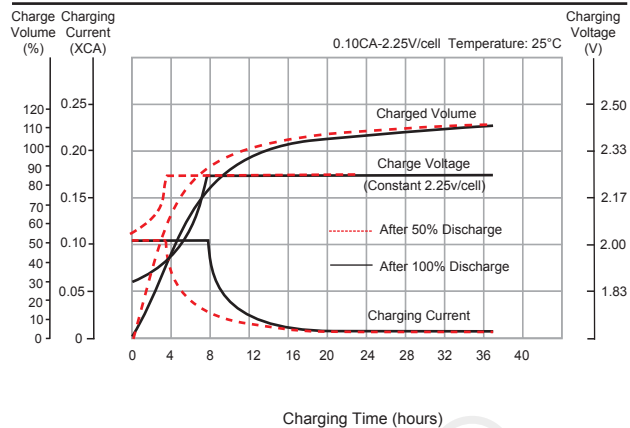
A = Amperes W = Watts

F.V/TIME	5 min	10 min	15 min	20 min	30 min	45 min	60 min	90 min	2 hours	3 hours	4 hours	5 hours	6 hours	8 hours	10 hours	20 hours
A	W															
1.85V/cell	12.8	8.74	6.97	5.67	4.19	3.08	2.53	1.87	1.49	1.09	0.876	0.747	0.646	0.509	0.416	0.220
	24.1	16.6	13.3	10.9	8.10	5.97	4.93	3.66	2.91	2.14	1.73	1.48	1.28	1.01	0.826	0.440
1.80V/cell	13.7	9.27	7.31	5.89	4.32	3.16	2.60	1.91	1.51	1.11	0.889	0.758	0.656	0.516	0.421	0.223
	25.7	17.5	13.9	11.3	8.32	6.11	5.03	3.72	2.96	2.17	1.75	1.49	1.30	1.02	0.837	0.445
1.75V/cell	14.4	9.64	7.55	6.06	4.43	3.23	2.65	1.95	1.54	1.12	0.901	0.768	0.663	0.522	0.426	0.225
	26.8	18.1	14.3	11.5	8.49	6.22	5.12	3.78	3.00	2.20	1.77	1.51	1.31	1.03	0.844	0.450
1.70V/cell	15.1	10.0	7.81	6.23	4.55	3.30	2.70	1.98	1.56	1.14	0.913	0.778	0.671	0.527	0.430	0.227
	27.8	18.7	14.7	11.8	8.67	6.34	5.19	3.83	3.04	2.23	1.79	1.53	1.32	1.04	0.853	0.454
1.67V/cell	15.7	10.3	8.00	6.36	4.63	3.36	2.74	2.01	1.58	1.15	0.922	0.785	0.677	0.531	0.433	0.229
	28.5	19.1	15.0	12.0	8.80	6.42	5.26	3.88	3.07	2.25	1.80	1.54	1.33	1.05	0.858	0.457
1.60V/cell	16.6	10.7	8.27	6.55	4.75	3.44	2.80	2.05	1.61	1.17	0.938	0.797	0.687	0.539	0.439	0.231
	29.6	19.7	15.4	12.3	9.00	6.54	5.36	3.94	3.12	2.28	1.83	1.56	1.35	1.06	0.868	0.462

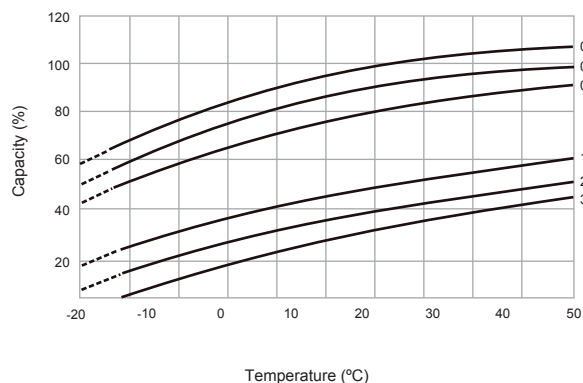
Discharge Characteristics



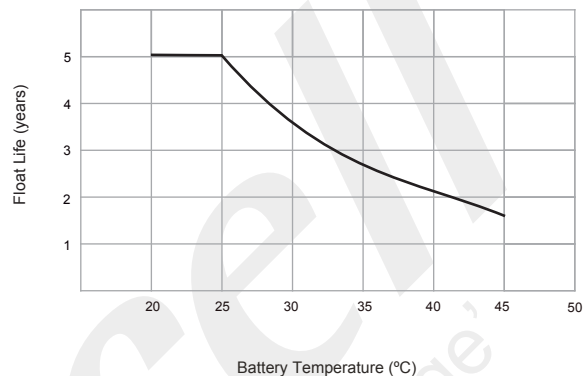
Float Charging Characteristics



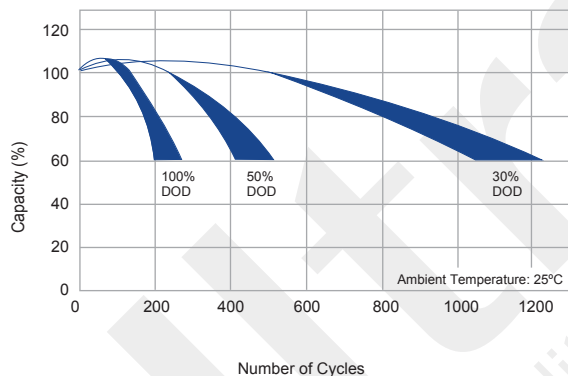
Temperature Effects in Relation to Battery Capacity



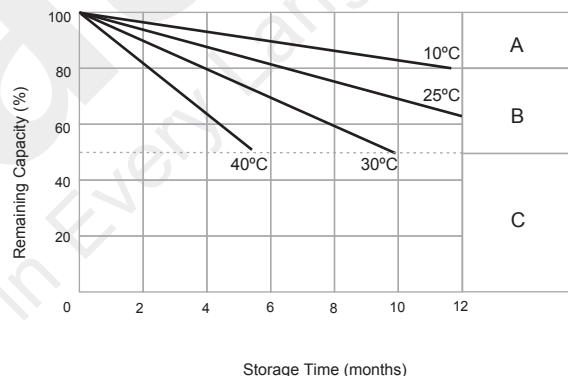
Effects of Temperature on Long Term Float Life



Cycle Life in Relation to Depth of Discharge



General Relation of Capacity vs. Storage Time



General Relation of Capacity vs. Storage Time (Notes)

- A) No supplementary charge required.
(Carryout supplementary charge before use if 100% capacity is required.)
- B) Supplementary charge required before use. Optional charging way as below:
 1. Charged for above 3 days at limited current 0.25CA and constant voltage 2.25V/cell.
 2. Charged for above 20 hours at limited current 0.25CA and constant voltage 2.45V/cell.
 3. Charged for 8 ~ 10 hours at limited current 0.05 CA.
- C) Supplementary charge may often fail to recover the capacity.
The battery should never be left standing till this is reached.