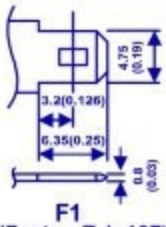
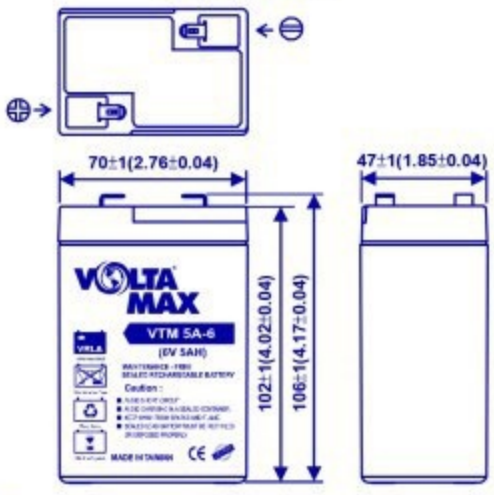
VTM 5A-6

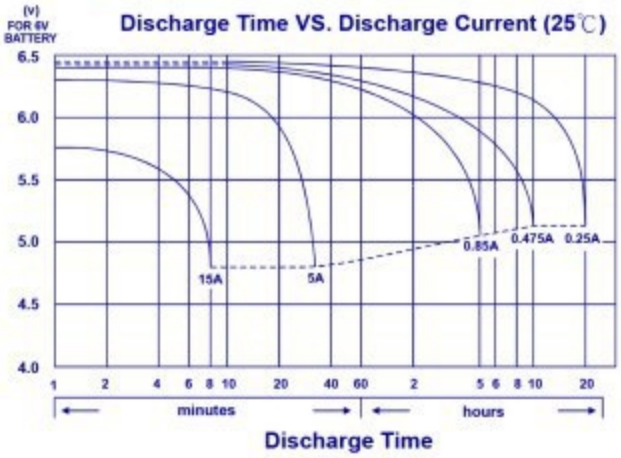
Dimensions mm(inch)



F1
(Faston Tab 187)



Discharge Time VS. Discharge Current (25℃)



Discharge Time

Specifications

Nominal Voltage(V)				**6V**
Nominal Capacity				
20 hour rate	(0.25A	to	5.25V)	5Ah
10 hour rate	(0.475A	to	5.25V)	4.75Ah
5 hour rate	(0.85A	to	5.1V)	4.25Ah
1 C	(5A	to	4.8V)	2.83Ah
3 C	(15A	to	4.8V)	2Ah
Weight				Approx.230g(1.83Lbs.)
Internal Resistance (at 1KHz)				Approx. 19 mΩ
Maximum Discharge Current for 5 seconds:				75A
Charging Methods at 25℃(77℉)				
Cycle use:				
Charging Voltage				7.20 to 7.50V
Coefficient -5.0mV/℃/cell				
Maximum Charging Current :				1.5A
Standby use:				
Float Charging Voltage				6.75 to 6.90V
Coefficient -3.0mV/℃/cell				
Operating Temperature Range				
Charge	-15℃(5℉)	to	40℃(104℉)	
Discharge	-15℃(5℉)	to	50℃(122℉)	
Storage	-15℃(5℉)	to	40℃(104℉)	
Charge Retention (shelf life) at 20℃(68℉)				
1 month				92%
3 month				90%
6 month				80%
Case Material				ABS UL94 HB
Terminal				F1 (Faston Tab 187)

- PERFORMANCE DATA

Discharge Rates in Watts to Various End Voltages at 25℃(77℉)

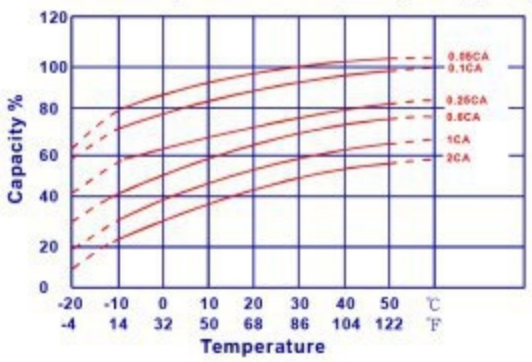
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	23.8	26.8	29.0	31.0	31.8	32.8	34.0
10	min	17.0	19.2	20.5	21.5	22.0	22.5	23.0
15	min	14.1	15.6	16.2	16.5	16.7	16.8	17.0
30	min	8.18	9.15	9.52	9.70	9.80	9.92	10.03
60	min	4.20	4.77	5.13	5.43	5.53	5.65	5.73
120	min	2.48	2.77	2.90	3.00	3.05	3.12	3.18
180	min	1.97	2.17	2.27	2.35	2.38	2.43	2.48
240	min	1.60	1.73	1.80	1.85	1.88	1.92	1.95
300	min	1.46	1.56	1.60	1.64	1.65	1.68	1.72
600	min	0.855	0.913	0.940	0.960	0.968	0.978	0.992
1200	min	0.432	0.468	0.498	0.510	0.513	0.520	0.527

- Discharge Rates in Amperes to Various End Voltages at 25℃(77℉)

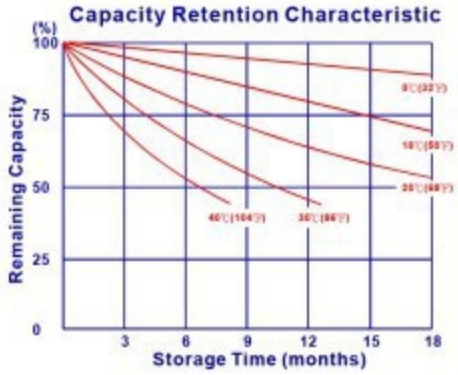
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	15.3	17.6	18.9	19.5	19.7	19.9	20.2
10	min	10.5	11.7	11.9	12.1	12.2	12.3	12.4
15	min	7.86	8.52	9.01	9.22	9.29	9.37	9.45
30	min	4.39	4.94	5.11	5.25	5.30	5.35	5.41
60	min	2.39	2.64	2.76	2.87	2.9	2.94	2.97
120	min	1.34	1.46	1.52	1.56	1.57	1.59	1.61
180	min	1.10	1.16	1.19	1.21	1.22	1.23	1.24
240	min	0.855	0.911	0.936	0.962	0.968	0.975	0.983
300	min	0.790	0.826	0.839	0.851	0.855	0.860	0.866
600	min	0.437	0.464	0.476	0.485	0.489	0.493	0.498
1200	min	0.229	0.243	0.251	0.257	0.260	0.263	0.267

All data on the spec. sheet is an average value:
The tolerance range : X<6min(+15%~-15%), 6min≦X<10min(+12%~-12%),10min ≦X < 60min(+8% ~-8%), X≧60min(+5%~-5%)

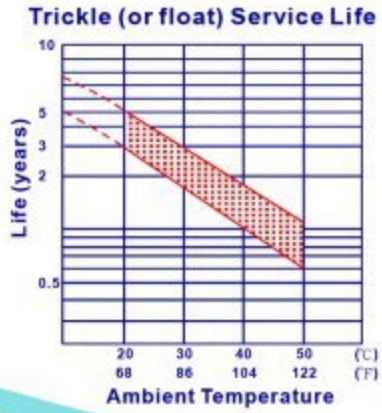
Effect of Temperature on Capacity 25℃(77℉)



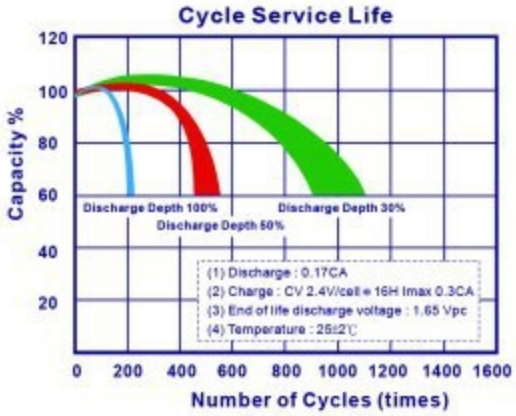
Capacity Retention Characteristic



Trickle (or float) Service Life

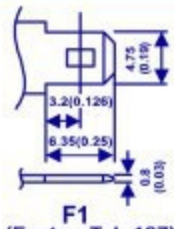


Cycle Service Life

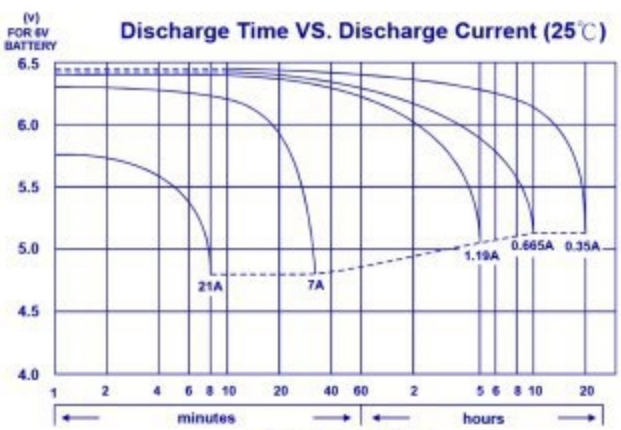


VTM 7A-6

Dimensions mm(inch)



F1
(Faston Tab 187)



Specifications

Nominal Voltage(V)	6V

Nominal Capacity

20 hour rate	(0.35A	to	5.25V)	7Ah
10 hour rate	(0.665A	to	5.25V)	6.65Ah
5 hour rate	(1.19A	to	5.1V)	5.95Ah
1 C	(7A	to	4.8V)	3.97Ah
3 C	(21A	to	4.8V)	2.8Ah

Weight	Approx.1.2kg(2.64Lbs.)
Internal Resistance (at 1KHz)	Approx. 12 mΩ
Maximum Discharge Current for 5 seconds:	105A

Charging Methods at 25℃(77℉)

Cycle use:	
Charging Voltage	7.20 to 7.50V
Coefficient -5.0mV/℃/cell	
Maximum Charging Current :	2.1A
Standby use:	
Float Charging Voltage	6.75 to 6.90V
Coefficient -3.0mV/℃/cell	

Operating Temperature Range

Charge	-15℃(5℉)	to	40℃(104℉)
Discharge	-15℃(5℉)	to	50℃(122℉)
Storage	-15℃(5℉)	to	40℃(104℉)

Charge Retention (shelf life) at 20℃(68℉)

1 month	92%
3 month	90%
6 month	80%

Case Material	ABS UL94 HB
Terminal	F1 (Faston Tab 187)

VOLTA MAX

- PERFORMANCE DATA

Discharge Rates in Watts to Various End Voltages at 25℃(77°F)

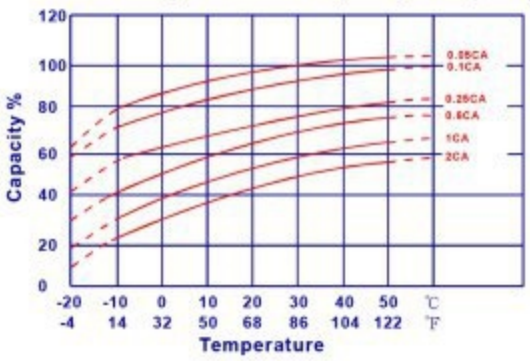
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	45.2	50.3	52.7	54.8	55.8	56.7	58.2
10	min	30.7	32.2	33.7	34.8	35.7	36.2	37.2
15	min	24.5	25.5	26.2	26.8	27.0	27.5	28.2
30	min	13.0	13.7	14.1	14.5	14.6	14.7	14.9
60	min	8.43	8.73	8.97	9.15	9.22	9.30	9.45
120	min	4.21	4.39	4.63	5.22	5.27	5.32	5.40
180	min	3.27	3.45	3.60	3.73	3.77	3.82	3.87
240	min	2.87	3.01	3.10	3.15	3.17	3.20	3.23
300	min	2.47	2.54	2.63	2.68	2.70	2.72	2.73
600	min	1.45	1.50	1.53	1.55	1.56	1.56	1.57
1200	min	0.694	0.718	0.737	0.750	0.755	0.760	0.770

- Discharge Rates in Amperes to Various End Voltages at 25℃(77°F)

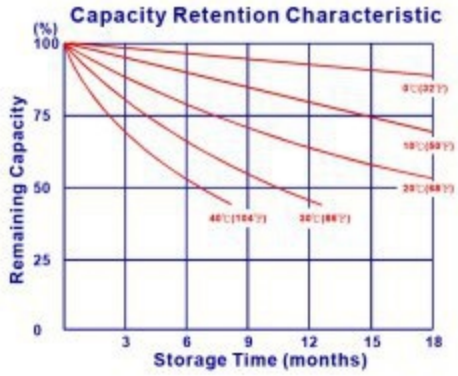
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	23.5	26.4	28.1	29.7	30.5	31.3	32.6
10	min	16.2	17.0	18.2	18.6	18.8	19.1	19.8
15	min	12.5	13.1	13.6	13.9	14.0	14.2	14.5
30	min	6.61	6.92	7.14	7.30	7.38	7.45	7.61
60	min	3.98	4.13	4.25	4.36	4.39	4.42	4.48
120	min	2.05	2.14	2.21	2.27	2.29	2.32	2.35
180	min	1.63	1.69	1.75	1.80	1.82	1.84	1.87
240	min	1.30	1.37	1.42	1.45	1.46	1.47	1.49
300	min	1.11	1.16	1.23	1.25	1.26	1.27	1.28
600	min	0.650	0.680	0.721	0.728	0.732	0.737	0.747
1200	min	0.341	0.357	0.377	0.382	0.384	0.387	0.392

All data on the spec. sheet is an average value:
The tolerance range : X<6min(+15%~-15%), 6min≦X<10min(+12%~-12%),10min ≦X < 60min(+8% ~-8%), X≧60min(+5%~-5%)

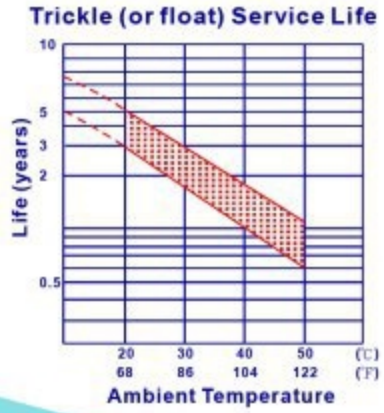
Effect of Temperature on Capacity 25℃(77°F)



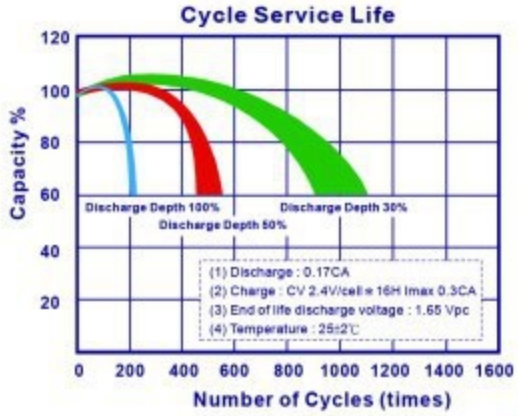
Capacity Retention Characteristic



Trickle (or float) Service Life

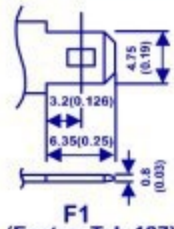


Cycle Service Life

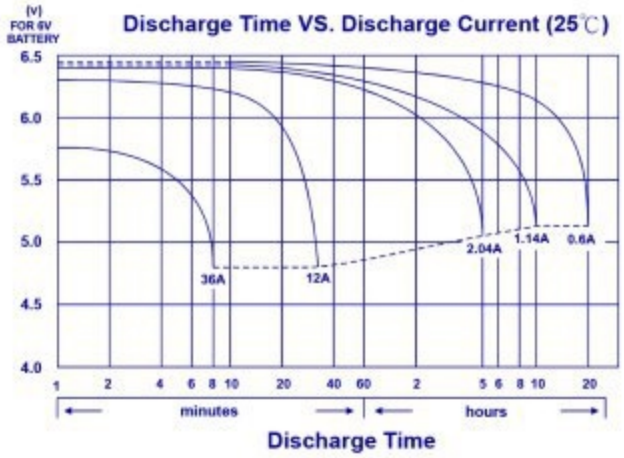


VTM 12A-6

Dimensions mm(inch)



F1
(Faston Tab 187)



Specifications

Nominal Voltage(V)	6V

Nominal Capacity

20 hour rate	(0.6A	to	5.25V)	12Ah
10 hour rate	(1.14A	to	5.25V)	11.4Ah
5 hour rate	(2.04A	to	5.1V)	10.2Ah
1 C	(12A	to	4.8V)	6.8Ah
3 C	(36A	to	4.8V)	4.8Ah

Weight	Approx.1.84kg(4.05Lbs.)
Internal Resistance (at 1KHz)	Approx. 6 mΩ
Maximum Discharge Current for 5 seconds:	180A

Charging Methods at 25℃(77℉)

Cycle use:	
Charging Voltage	7.20 to 7.50V
Coefficient -5.0mV/℃/cell	
Maximum Charging Current :	3.6A
Standby use:	
Float Charging Voltage	6.75 to 6.90V
Coefficient -3.0mV/℃/cell	

Operating Temperature Range

Charge	-15℃(5℉)	to	40℃(104℉)
Discharge	-15℃(5℉)	to	50℃(122℉)
Storage	-15℃(5℉)	to	40℃(104℉)

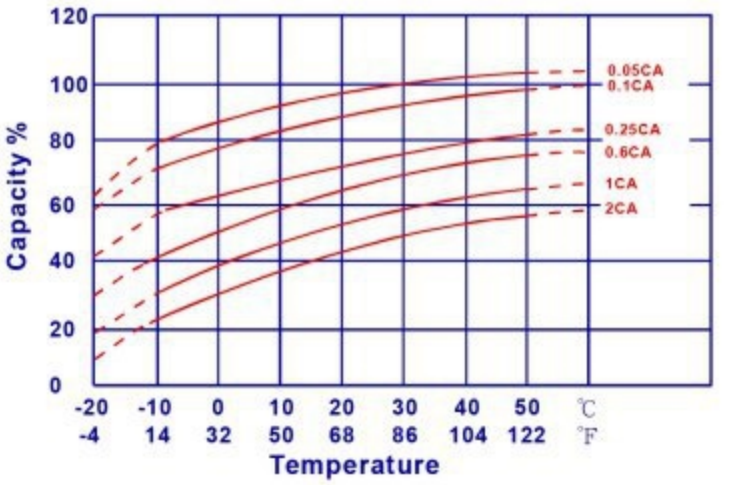
Charge Retention (shelf life) at 20℃(68℉)

1 month	92%
3 month	90%
6 month	80%

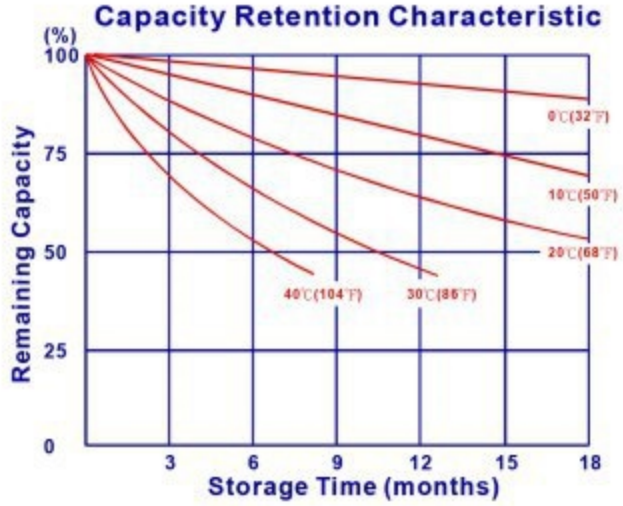
Case Material	ABS UL94 HB
Terminal	F1 (Faston Tab 187)

VOLTA MAX

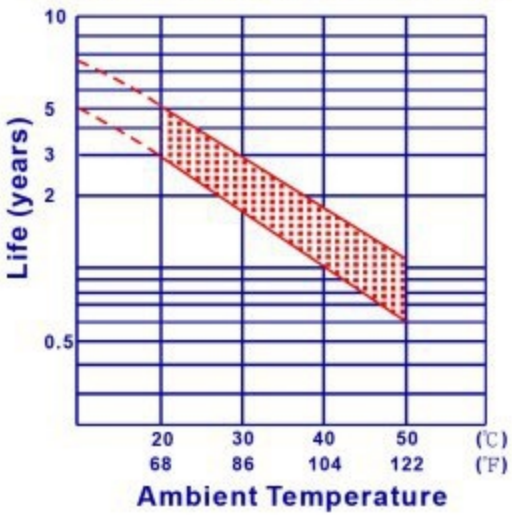
Effect of Temperature on Capacity 25℃(77℉)



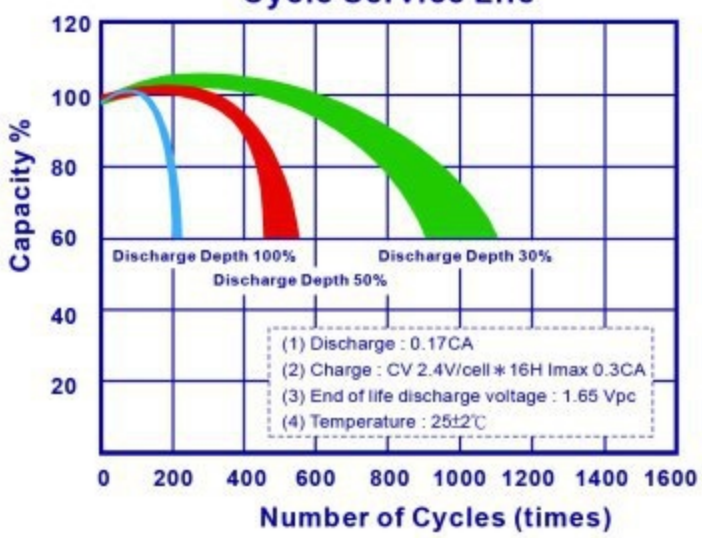
Capacity Retention Characteristic



Trickle (or float) Service Life

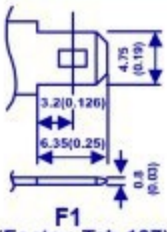


Cycle Service Life

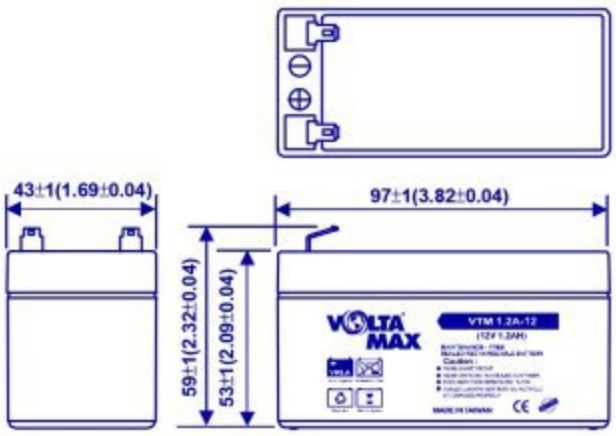


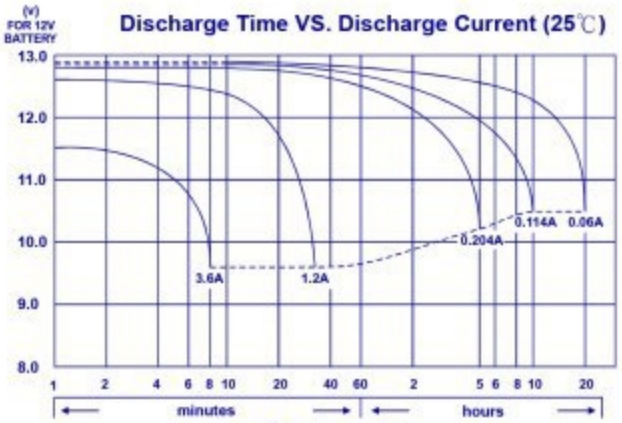
VTM 1.2A-12

Dimensions mm(inch)



F1
(Faston Tab 187)





Specifications

Nominal Voltage(V)				12V
Nominal Capacity				
20 hour rate	(0.06A	to	10.50V)	1.2Ah
10 hour rate	(0.114A	to	10.50V)	1.14Ah
5 hour rate	(0.204A	to	10.20V)	1.02Ah
1 C	(1.2A	to	9.60V)	0.68Ah
3 C	(3.6A	to	9.60V)	0.48Ah
Weight				Approx. 564g(1.24Lbs.)
Internal Resistance (at 1KHz)				Approx. 75.4 mΩ
Maximum Discharge Current for 5 seconds:				18A
Charging Methods at 25℃(77℉)				
Cycle use:				
Charging Voltage				14.4 to 15.0V
Coefficient -5.0mV/℃/cell				
Maximum Charging Current :				0.36A
Standby use:				
Float Charging Voltage				13.5 to 13.8V
Coefficient -3.0mV/℃/cell				
Operating Temperature Range				
Charge	-15℃(5℉)	to	40℃(104℉)	
Discharge	-15℃(5℉)	to	50℃(122℉)	
Storage	-15℃(5℉)	to	40℃(104℉)	
Charge Retention (shelf life) at 20℃(68℉)				
1 month				92%
3 month				90%
6 month				80%
Case Material				ABS UL94 HB
Terminal				F1 (Faston Tab 187)

- PERFORMANCE DATA

Discharge Rates in Watts to Various End Voltages at 25℃(77℉)

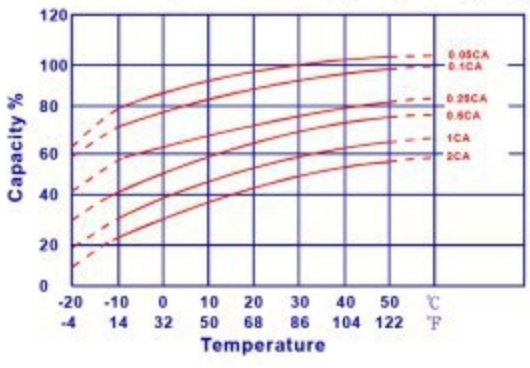
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	7.18	7.82	8.27	8.65	8.80	8.98	9.28
10	min	4.62	5.00	5.30	5.52	5.58	5.67	5.77
15	min	3.65	3.87	4.05	4.20	4.25	4.32	4.38
30	min	2.15	2.25	2.32	2.37	2.38	2.42	2.45
60	min	1.32	1.39	1.43	1.47	1.48	1.50	1.52
120	min	0.747	0.808	0.847	0.875	0.887	0.900	0.915
180	min	0.533	0.573	0.602	0.623	0.633	0.645	0.657
240	min	0.435	0.470	0.495	0.513	0.520	0.528	0.537
300	min	0.420	0.442	0.457	0.468	0.472	0.477	0.482
600	min	0.220	0.233	0.243	0.250	0.252	0.255	0.258
1200	min	0.123	0.126	0.129	0.130	0.131	0.131	0.132

- Discharge Rates in Amperes to Various End Voltages at 25℃(77℉)

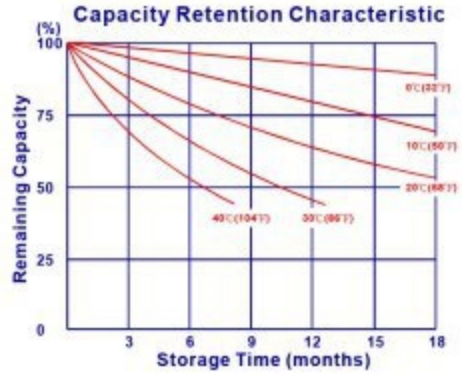
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	3.49	4.11	4.57	4.94	5.09	5.26	5.51
10	min	2.12	2.43	2.63	2.81	2.88	2.96	3.11
15	min	1.71	1.95	2.09	2.20	2.24	2.29	2.35
30	min	0.931	1.06	1.17	1.24	1.26	1.29	1.32
60	min	0.680	0.716	0.735	0.759	0.765	0.772	0.779
120	min	0.392	0.415	0.429	0.440	0.444	0.449	0.456
180	min	0.272	0.291	0.302	0.311	0.314	0.318	0.324
240	min	0.223	0.238	0.247	0.254	0.257	0.260	0.264
300	min	0.207	0.219	0.226	0.231	0.233	0.236	0.238
600	min	0.112	0.117	0.121	0.124	0.125	0.126	0.127
1200	min	0.0615	0.0624	0.0631	0.0637	0.0639	0.0642	0.0646

All data on the spec. sheet is an average value:
The tolerance range : X<6min(+15%~-15%), 6min≦X<10min(+12%~-12%),10min ≦X < 60min(+8% ~-8%), X≧60min(+5%~-5%)

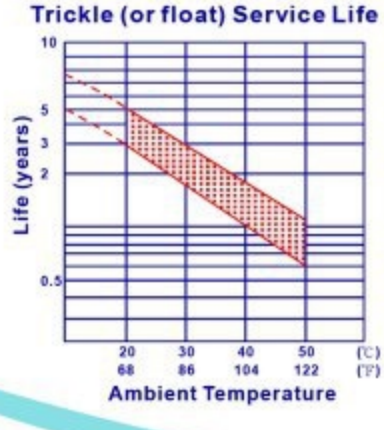
Effect of Temperature on Capacity 25℃(77℉)



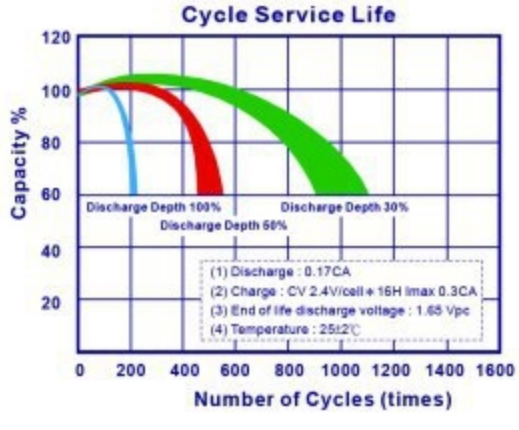
Capacity Retention Characteristic



Trickle (or float) Service Life

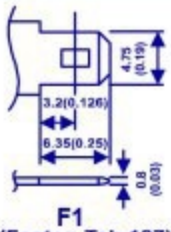


Cycle Service Life

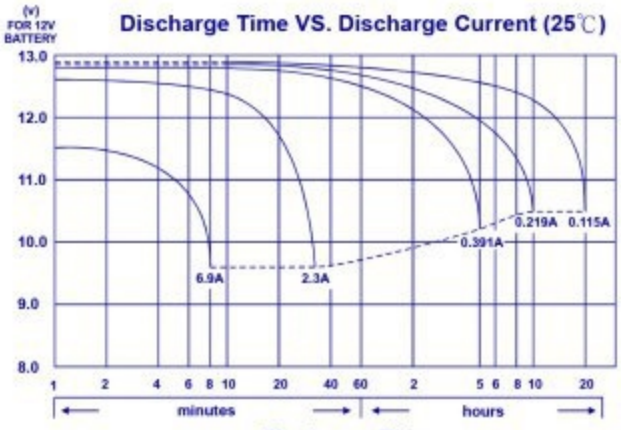


VTM 2.3A-12

Dimensions mm(inch)



F1
(Faston Tab 187)



Specifications

Nominal Voltage(V)	12V

Nominal Capacity

20 hour rate	(0.115A	to	10.50V)	2.3Ah
10 hour rate	(0.219A	to	10.50V)	2.185Ah
5 hour rate	(0.391A	to	10.20V)	1.955Ah
1 C	(2.3A	to	9.60V)	1.303Ah
3 C	(6.9A	to	9.60V)	0.92Ah

Weight	Approx. 1.04kg(2.29Lbs.)
Internal Resistance (at 1KHz)	Approx. 37 mΩ
Maximum Discharge Current for 5 seconds:	34.5A

Charging Methods at 25℃(77℉)

Cycle use:	
Charging Voltage	14.4 to 15.0V
Coefficient -5.0mV/℃/cell	
Maximum Charging Current :	0.69A
Standby use:	
Float Charging Voltage	13.5 to 13.8V
Coefficient -3.0mV/℃/cell	

Operating Temperature Range

Charge	-15℃(5℉)	to	40℃(104℉)
Discharge	-15℃(5℉)	to	50℃(122℉)
Storage	-15℃(5℉)	to	40℃(104℉)

Charge Retention (shelf life) at 20℃(68℉)

1 month	92%
3 month	90%
6 month	80%

Case Material	ABS UL94 HB
Terminal	F1 (Faston Tab 187)

- PERFORMANCE DATA

Discharge Rates in Watts to Various End Voltages at 25℃(77℉)

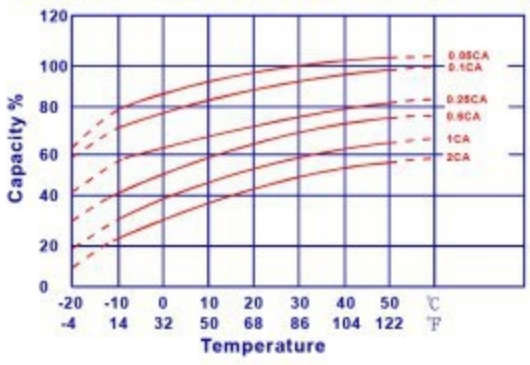
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	11.8	13.9	15.3	16.4	16.7	17.2	17.8
10	min	7.82	9.38	10.1	10.6	10.8	11.1	11.4
15	min	6.87	7.90	8.28	8.53	8.63	8.75	8.90
30	min	3.95	4.25	4.43	4.58	4.63	4.70	4.78
60	min	2.27	2.45	2.60	2.72	2.75	2.80	2.85
120	min	1.36	1.50	1.56	1.62	1.64	1.67	1.70
180	min	1.08	1.21	1.24	1.27	1.28	1.29	1.30
240	min	0.863	0.960	0.988	1.01	1.02	1.03	1.04
300	min	0.702	0.777	0.808	0.837	0.848	0.858	0.869
600	min	0.415	0.453	0.468	0.480	0.483	0.488	0.493
1200	min	0.230	0.242	0.248	0.253	0.255	0.257	0.258

- Discharge Rates in Amperes to Various End Voltages at 25℃(77℉)

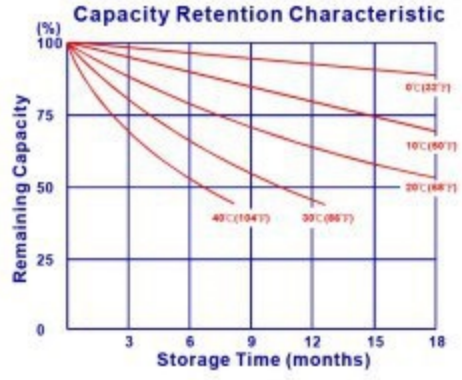
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	9.08	9.36	9.62	9.82	9.95	10.1	10.4
10	min	4.76	5.45	5.68	5.87	5.94	6.03	6.15
15	min	3.89	4.15	4.27	4.38	4.42	4.47	4.53
30	min	2.02	2.17	2.24	2.30	2.32	2.35	2.39
60	min	1.23	1.34	1.39	1.42	1.43	1.45	1.47
120	min	0.668	0.731	0.765	0.796	0.809	0.826	0.849
180	min	0.508	0.562	0.587	0.609	0.618	0.628	0.643
240	min	0.411	0.449	0.472	0.491	0.497	0.505	0.513
300	min	0.364	0.383	0.396	0.405	0.409	0.414	0.419
600	min	0.217	0.226	0.232	0.237	0.238	0.240	0.242
1200	min	0.114	0.118	0.121	0.123	0.124	0.125	0.126

All data on the spec. sheet is an average value:
The tolerance range : X<6min(+15%~-15%), 6min≦X<10min(+12%~-12%),10min ≦X < 60min(+8% ~-8%), X≧60min(+5%~-5%)

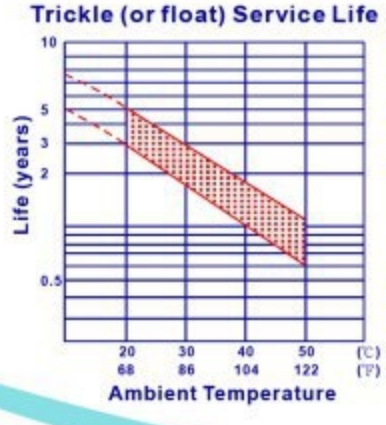
Effect of Temperature on Capacity 25℃(77℉)



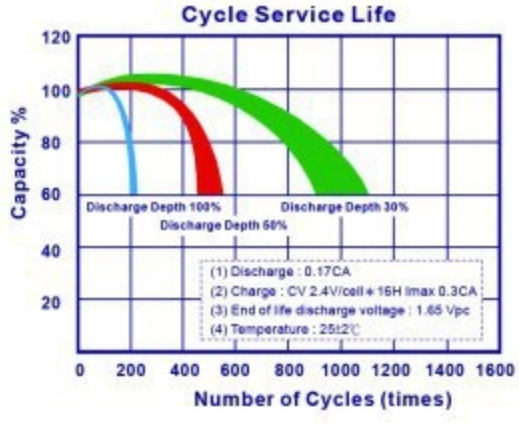
Capacity Retention Characteristic



Trickle (or float) Service Life

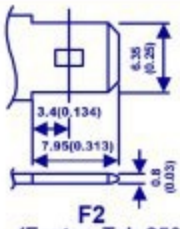


Cycle Service Life

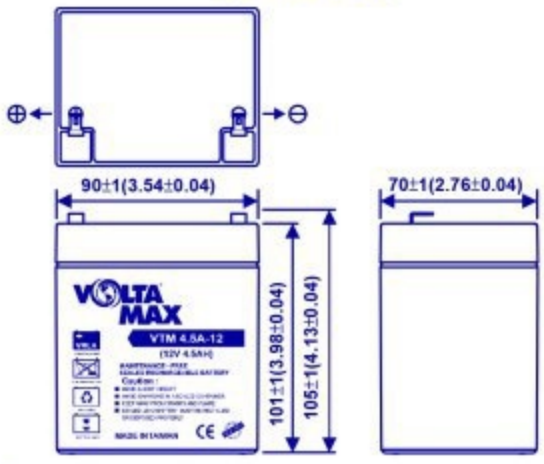


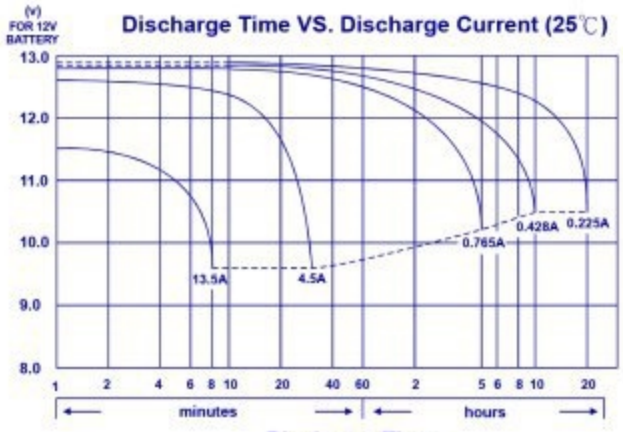
VTM 4.5A-12

Dimensions mm(inch)



F2
(Faston Tab 250)

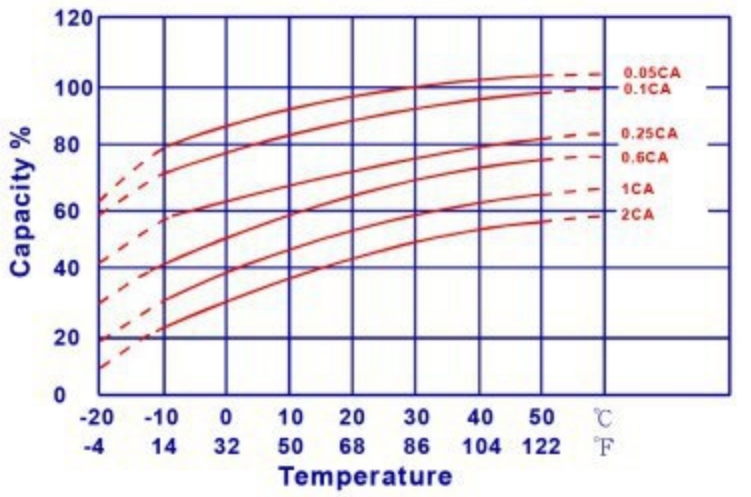




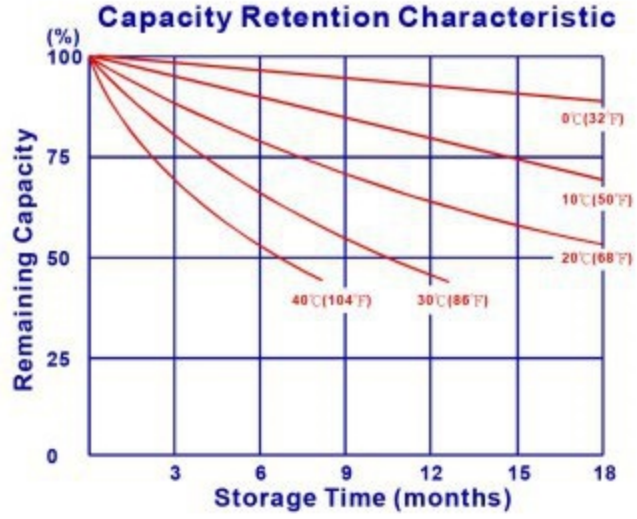
Specifications

Nominal Voltage(V)				**12V**
Nominal Capacity				
20 hour rate	(0.225A	to	10.50V)	4.5Ah
10 hour rate	(0.428A	to	10.50V)	4.275Ah
5 hour rate	(0.765A	to	10.20V)	3.825Ah
1 C	(4.5A	to	9.60V)	2.55Ah
3 C	(13.5A	to	9.60V)	1.8Ah
Weight				Approx. 1.60kg(3.52Lbs.)
Internal Resistance (at 1KHz)				Approx. 35 mΩ
Maximum Discharge Current for 5 seconds:				67.5A
Charging Methods at 25℃(77℉)				
Cycle use:				
Charging Voltage				14.4 to 15.0V
Coefficient -5.0mV/℃/cell				
Maximum Charging Current :				1.35A
Standby use:				
Float Charging Voltage				13.5 to 13.8V
Coefficient -3.0mV/℃/cell				
Operating Temperature Range				
Charge	-15℃(5℉)	to	40℃(104℉)	
Discharge	-15℃(5℉)	to	50℃(122℉)	
Storage	-15℃(5℉)	to	40℃(104℉)	
Charge Retention (shelf life) at 20℃(68℉)				
1 month				92%
3 month				90%
6 month				80%
Case Material				ABS UL94 HB
Terminal				F2 (Faston Tab 250)

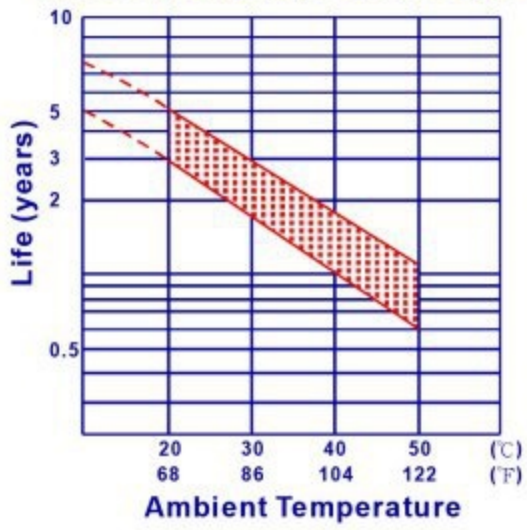
Effect of Temperature on Capacity 25℃(77℉)



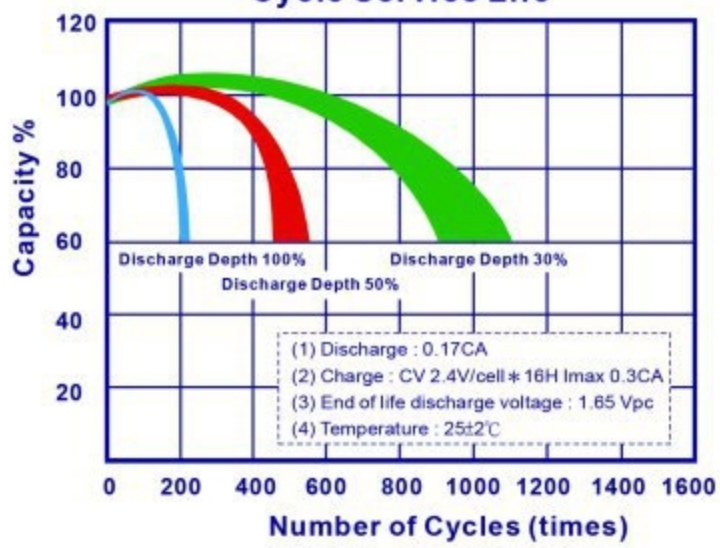
Capacity Retention Characteristic



Trickle (or float) Service Life

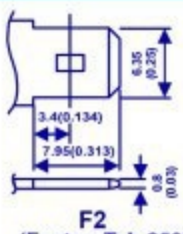


Cycle Service Life

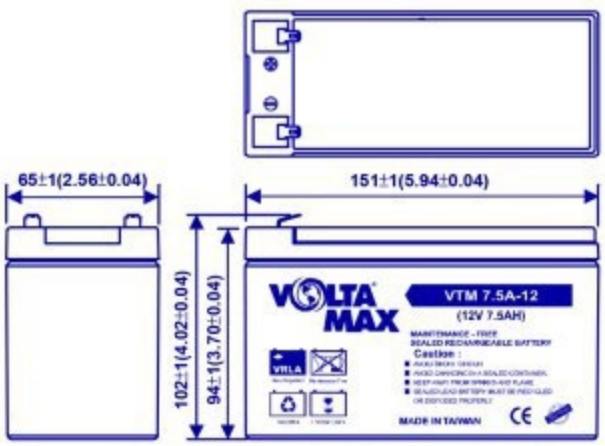


VTM 7.5A-12

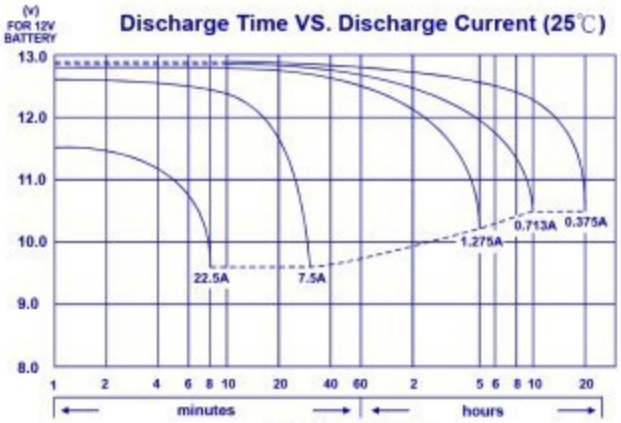
Dimensions mm(inch)



F2
(Faston Tab 250)



Discharge Time VS. Discharge Current (25℃)



Discharge Time

Specifications

Nominal Voltage(V)				**12V**
Nominal Capacity				
20 hour rate	(0.375A	to	10.50V)	7.5Ah
10 hour rate	(0.713A	to	10.50V)	7.125Ah
5 hour rate	(1.275A	to	10.20V)	6.375Ah
1 C	(7.5A	to	9.60V)	4.25Ah
3 C	(22.5A	to	9.60V)	3Ah
Weight				**Approx. 2.3kg(5.06Lbs.)**
Internal Resistance (at 1KHz)				**Approx. 19 mΩ**
Maximum Discharge Current for 5 seconds:				**112.5A**
Charging Methods at 25℃(77℉)				
Cycle use:				
Charging Voltage				**14.4 to 15.0V**
Coefficient -5.0mV/℃/cell				
Maximum Charging Current :				**2.25A**
Standby use:				
Float Charging Voltage				**13.5 to 13.8V**
Coefficient -3.0mV/℃/cell				
Operating Temperature Range				
Charge	-15℃(5℉)	to	40℃(104℉)	
Discharge	-15℃(5℉)	to	50℃(122℉)	
Storage	-15℃(5℉)	to	40℃(104℉)	
Charge Retention (shelf life) at 20℃(68℉)				
1 month				92%
3 month				90%
6 month				80%
Case Material				**ABS UL94 HB**
Terminal				**F2 (Faston Tab 250)**

VOLTA MAX

- PERFORMANCE DATA

Discharge Rates in Watts to Various End Voltages at 25℃(77℉)

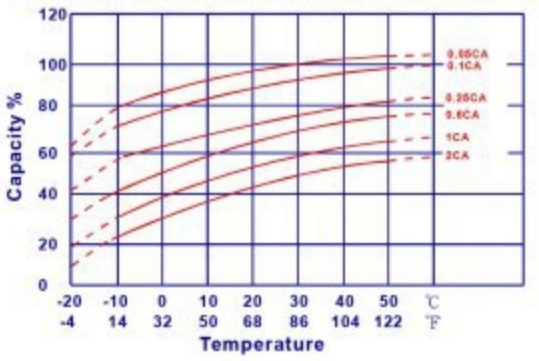
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	45.0	49.6	53.0	55.9	57.0	58.0	60.5
10	min	33.5	36.7	38.6	38.9	39.4	39.6	40.8
15	min	25.0	27.0	28.5	29.5	29.8	30.1	30.6
30	min	15.7	16.5	17.0	17.5	17.7	17.9	18.1
60	min	9.92	10.2	10.4	10.6	10.6	10.6	10.8
120	min	5.37	5.54	5.65	5.75	5.77	5.83	5.89
180	min	3.82	3.94	4.04	4.13	4.17	4.22	4.26
240	min	2.96	3.09	3.18	3.23	3.25	3.28	3.32
300	min	2.47	2.56	2.65	2.72	2.75	2.77	2.79
600	min	1.38	1.44	1.52	1.54	1.54	1.55	1.57
1200	min	0.728	0.760	0.800	0.808	0.811	0.817	0.826

- Discharge Rates in Amperes to Various End Voltages at 25℃(77℉)

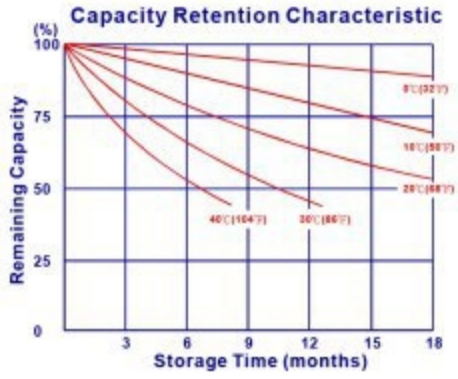
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	24.8	27.7	30.1	32.2	33.0	33.8	35.6
10	min	17.5	19.2	20.4	20.8	21.0	21.3	22.0
15	min	14.2	15.1	15.6	15.9	16.0	16.2	16.5
30	min	8.61	8.92	9.14	9.30	9.38	9.45	9.61
60	min	4.96	5.11	5.23	5.34	5.37	5.40	5.46
120	min	2.62	2.71	2.78	2.84	2.86	2.89	2.92
180	min	1.83	1.89	1.95	2.00	2.02	2.04	2.07
240	min	1.42	1.49	1.54	1.57	1.58	1.59	1.61
300	min	1.19	1.24	1.31	1.33	1.34	1.35	1.36
600	min	0.654	0.683	0.724	0.732	0.736	0.741	0.751
1200	min	0.339	0.355	0.375	0.380	0.382	0.385	0.390

All data on the spec. sheet is an average value:
The tolerance range : X<6min(+15%~-15%), 6min≦X<10min(+12%~-12%),10min ≦X < 60min(+8% ~-8%), X≧60min(+5%~-5%)

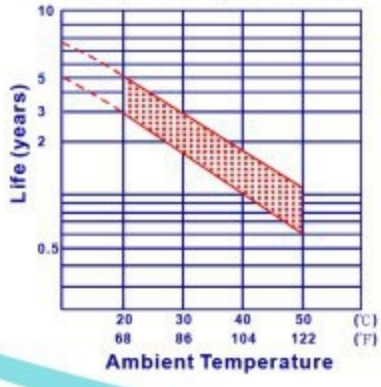
Effect of Temperature on Capacity 25℃(77℉)



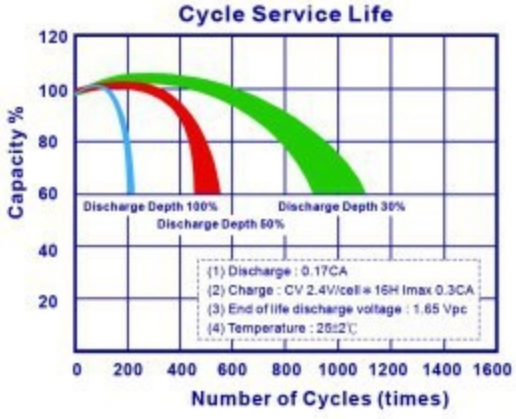
Capacity Retention Characteristic



Trickle (or float) Service Life

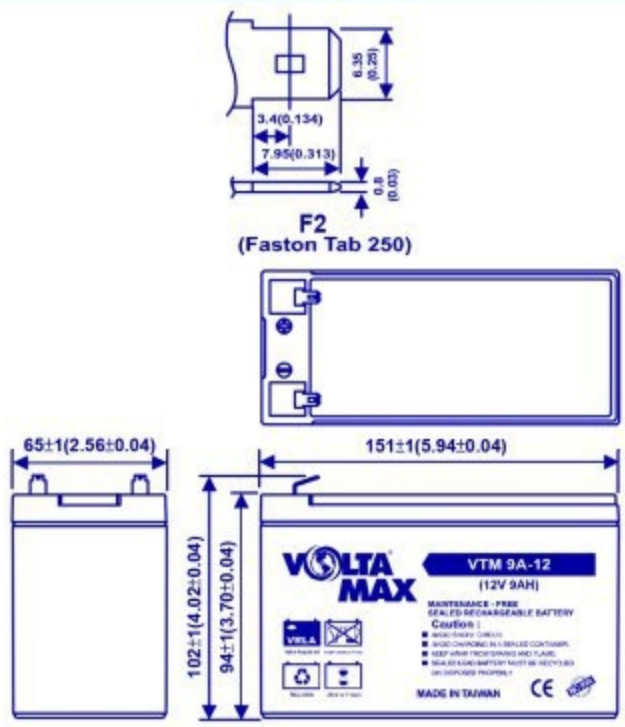


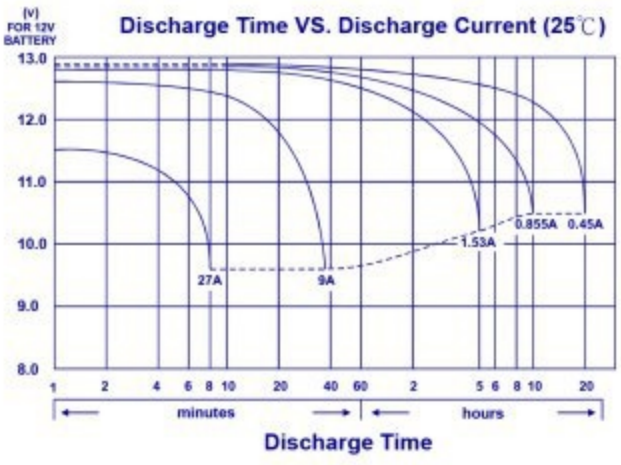
Cycle Service Life



VTM 9A-12

Dimensions mm(inch)





Specifications

Nominal Voltage(V)				**12V**
Nominal Capacity				
20 hour rate	(0.45A	to	10.50V)	9Ah
10 hour rate	(0.855A	to	10.50V)	8.55Ah
5 hour rate	(1.53A	to	10.20V)	7.65Ah
1 C	(9A	to	9.60V)	5.7Ah
3 C	(27A	to	9.60V)	3.6Ah
Weight				Approx. 2.7kg(5.94Lbs.)
Internal Resistance (at 1KHz)				Approx. 14 mΩ
Maximum Discharge Current for 5 seconds:				135A

Charging Methods at 25℃(77°F)

Cycle use:	
Charging Voltage	14.4 to 15.0V
Coefficient -5.0mV/℃/cell	
Maximum Charging Current :	2.7A
Standby use:	
Float Charging Voltage	13.5 to 13.8V
Coefficient -3.0mV/℃/cell	

Operating Temperature Range

Charge	-15℃(5°F)	to	40℃(104°F)
Discharge	-15℃(5°F)	to	50℃(122°F)
Storage	-15℃(5°F)	to	40℃(104°F)

Charge Retention (shelf life) at 20℃(68°F)

1 month	92%
3 month	90%
6 month	80%
Case Material	ABS UL94 HB
Terminal	F2 (Faston Tab 250)

VOLTA MAX

- PERFORMANCE DATA

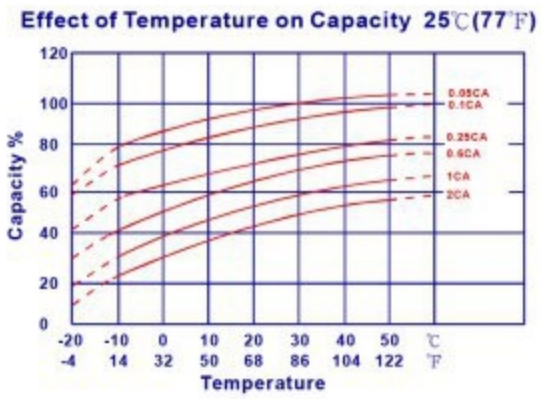
Discharge Rates in Watts to Various End Voltages at 25℃(77℉)

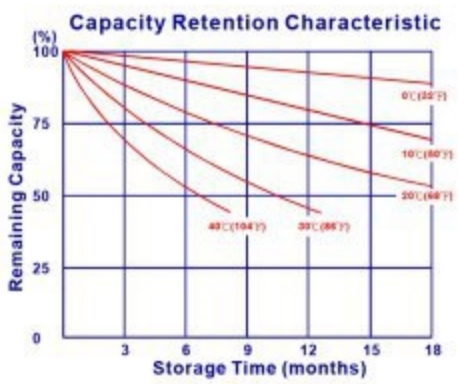
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	342	361	388	407	419	427	448
10	min	219	234	252	264	271	277	290
15	min	181	187	194	200	204	208	216
30	min	94.7	97.3	102	106	107	108	114
60	min	59.8	62.4	64.2	65.8	66.7	67.6	68.8
120	min	32.4	33.4	34.1	34.9	35.2	35.4	35.7
180	min	25.2	26.1	26.9	27.7	28.0	28.5	29.1
240	min	20.4	21.2	21.8	22.4	22.7	23.1	23.5
300	min	17.3	17.9	18.3	18.6	18.7	18.9	19.1
600	min	9.73	10.1	10.3	10.5	10.6	10.7	10.8
1200	min	5.12	5.29	5.41	5.44	5.46	5.48	5.51

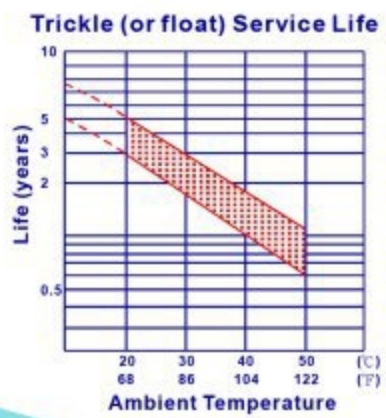
- Discharge Rates in Amperes to Various End Voltages at 25℃(77℉)

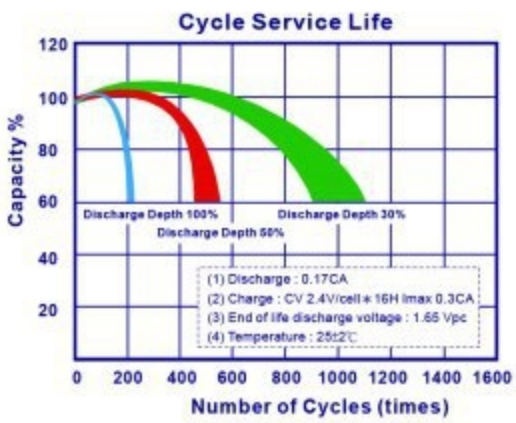
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	30.4	32.6	35.0	36.7	37.4	38.5	40.3
10	min	19.1	20.4	21.9	22.9	23.4	24.1	25.2
15	min	14.3	14.9	15.8	16.5	16.8	17.3	18.0
30	min	8.09	8.45	8.93	9.35	9.54	9.77	10.2
60	min	5.17	5.29	5.37	5.45	5.48	5.52	5.57
120	min	2.63	2.72	2.78	2.84	2.86	2.89	2.93
180	min	2.12	2.18	2.23	2.27	2.29	2.31	2.34
240	min	1.69	1.74	1.77	1.80	1.81	1.82	1.83
300	min	1.46	1.51	1.53	1.55	1.56	1.57	1.58
600	min	0.827	0.841	0.855	0.866	0.871	0.877	0.884
1200	min	0.427	0.442	0.451	0.456	0.459	0.462	0.466

All data on the spec. sheet is an average value:
The tolerance range : X<6min(+15%~-15%), 6min≦X<10min(+12%~-12%),10min ≦X < 60min(+8% ~-8%), X≧60min(+5%~-5%)







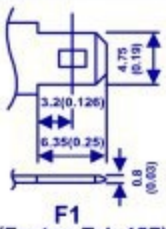


VTM 12A-12

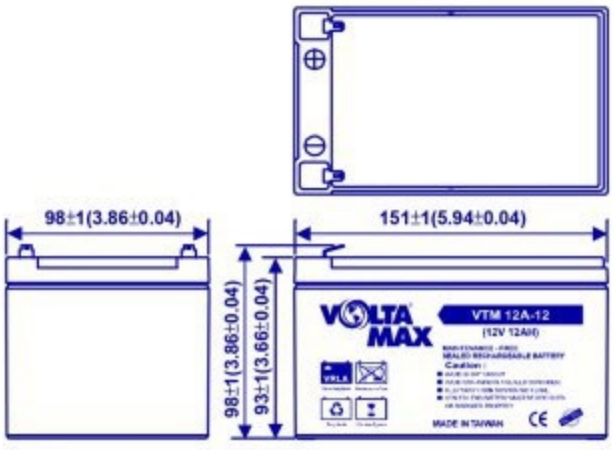
Specifications

Nominal Voltage(V)				**12V**
Nominal Capacity				
20 hour rate	(0.6A	to	10.50V)	12Ah
10 hour rate	(1.14A	to	10.50V)	11.4Ah
5 hour rate	(2.04A	to	10.20V)	10.2Ah
1 C	(12A	to	9.60V)	6.4Ah
3 C	(36A	to	9.60V)	4.2Ah
Weight				Approx. 3.75kg(8.25Lbs.)
Internal Resistance (at 1KHz)				Approx. 13 mΩ
Maximum Discharge Current for 5 seconds:				180A
Charging Methods at 25℃(77℉)				
Cycle use:				
Charging Voltage				14.4 to 15.0V
Coefficient -5.0mV/℃/cell				
Maximum Charging Current :				3.6A
Standby use:				
Float Charging Voltage				13.5 to 13.8V
Coefficient -3.0mV/℃/cell				
Operating Temperature Range				
Charge	-15℃(5℉)	to	40℃(104℉)	
Discharge	-15℃(5℉)	to	50℃(122℉)	
Storage	-15℃(5℉)	to	40℃(104℉)	
Charge Retention (shelf life) at 20℃(68℉)				
1 month				92%
3 month				90%
6 month				80%
Case Material				ABS UL94 HB
Terminal				F1 (Faston Tab 187)

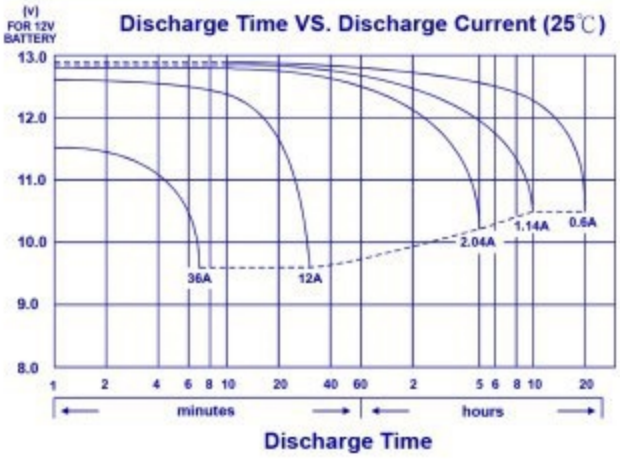
Dimensions mm(inch)



F1
(Faston Tab 187)



Discharge Time VS. Discharge Current (25℃)



Discharge Time

- PERFORMANCE DATA

Discharge Rates in Watts to Various End Voltages at 25℃(77℉)

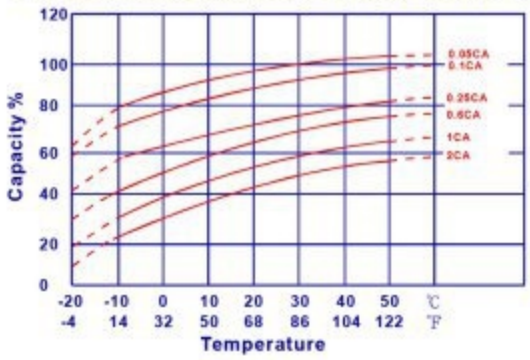
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	67.6	75.2	80.8	86.7	89.3	91.9	97.0
10	min	48.0	52.5	54.9	57.3	58.2	59.5	61.0
15	min	38.6	41.0	42.6	44.1	44.5	45.4	46.6
30	min	22.2	23.6	24.6	25.4	25.7	25.9	26.3
60	min	15.8	16.3	16.7	17.0	17.2	17.3	17.5
120	min	8.63	8.92	9.04	9.14	9.18	9.24	9.32
180	min	5.65	5.87	6.05	6.20	6.27	6.35	6.42
240	min	4.78	4.88	4.96	5.06	5.12	5.20	5.26
300	min	3.96	4.08	4.18	4.30	4.33	4.38	4.48
600	min	2.34	2.40	2.44	2.47	2.48	2.50	2.52
1200	min	1.19	1.21	1.25	1.26	1.28	1.29	1.32

- Discharge Rates in Amperes to Various End Voltages at 25℃(77℉)

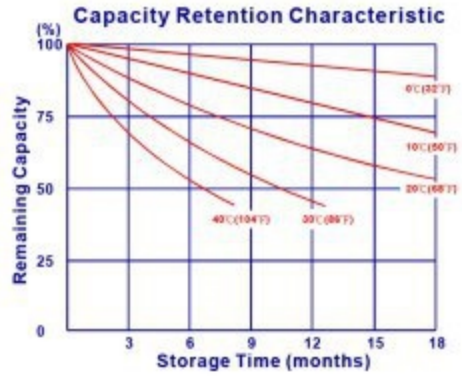
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	37.2	41.4	44.5	47.7	49.1	50.6	53.4
10	min	25.7	28.1	29.4	30.7	31.2	31.9	32.7
15	min	19.8	21.3	22.1	22.9	23.2	23.5	24.2
30	min	11.4	12.1	12.6	13.0	13.1	13.3	13.5
60	min	8.21	8.40	8.52	8.63	8.68	8.74	8.82
120	min	4.21	4.36	4.47	4.56	4.59	4.63	4.68
180	min	2.87	3.06	3.13	3.19	3.22	3.25	3.29
240	min	2.38	2.43	2.47	2.52	2.55	2.58	2.62
300	min	1.97	2.03	2.08	2.14	2.16	2.19	2.23
600	min	1.16	1.18	1.20	1.22	1.23	1.24	1.25
1200	min	0.592	0.599	0.618	0.627	0.634	0.642	0.656

All data on the spec. sheet is an average value:
The tolerance range : X<6min(+15%~-15%), 6min≦X<10min(+12%~-12%),10min ≦X < 60min(+8% ~-8%), X≧60min(+5%~-5%)

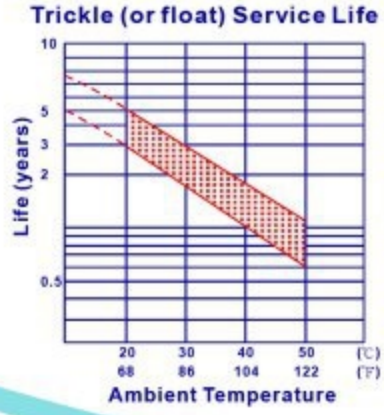
Effect of Temperature on Capacity 25℃(77℉)



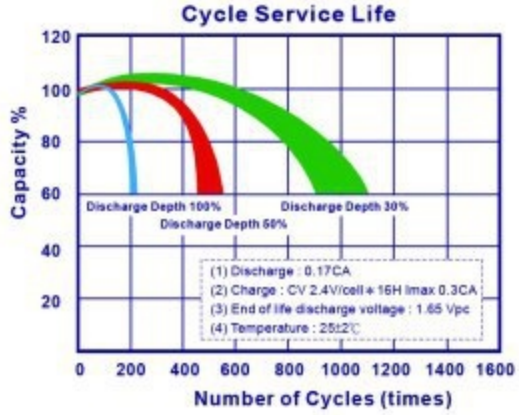
Capacity Retention Characteristic



Trickle (or float) Service Life



Cycle Service Life



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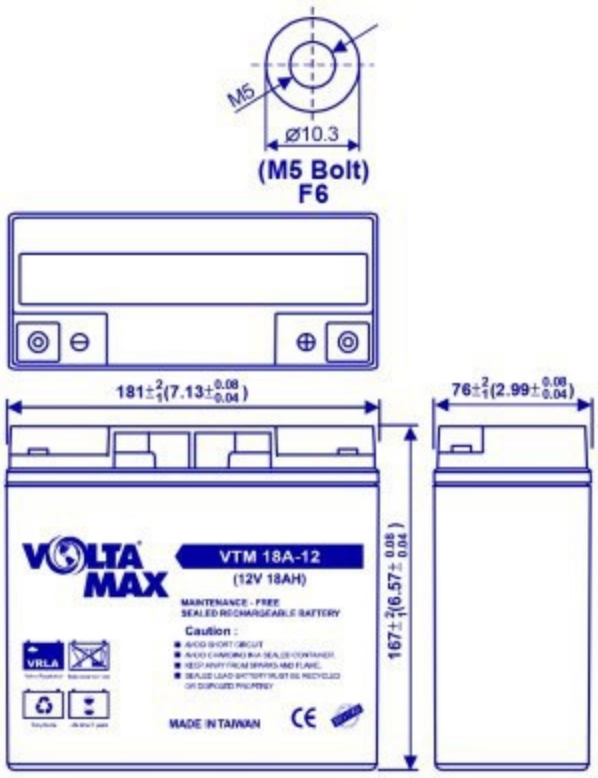
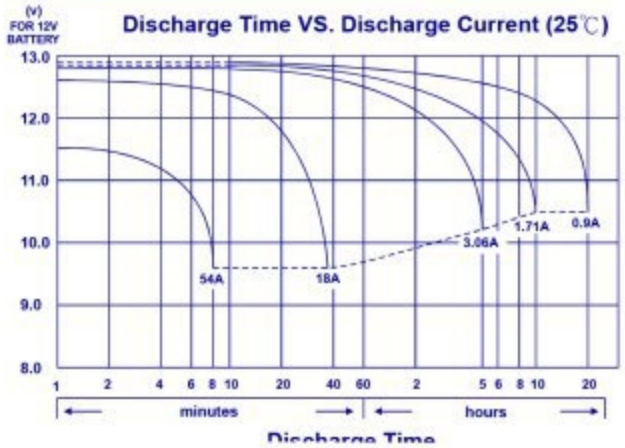
Dimensions mm(inch)





Specifications

Nominal Voltage(V)	12V

Nominal Capacity

20 hour rate	(0.9A	to	10.50V)	18Ah
10 hour rate	(1.71A	to	10.50V)	17.1Ah
5 hour rate	(3.06A	to	10.20V)	15.3Ah
1 C	(18A	to	9.60V)	11.4Ah
3 C	(54A	to	9.60V)	7.2Ah

Weight	Approx. 5.6kg(12.32Lbs.)
Internal Resistance (at 1KHz)	Approx. 10.5 mΩ
Maximum Discharge Current for 5 seconds:	270A

Charging Methods at 25℃(77℉)

Cycle use:	
Charging Voltage	14.4 to 15.0V
Coefficient -5.0mV/℃/cell	
Maximum Charging Current :	5.4A
Standby use:	
Float Charging Voltage	13.5 to 13.8V
Coefficient -3.0mV/℃/cell	

Operating Temperature Range

Charge	-15℃(5℉)	to	40℃(104℉)
Discharge	-15℃(5℉)	to	50℃(122℉)
Storage	-15℃(5℉)	to	40℃(104℉)

Charge Retention (shelf life) at 20℃(68℉)

1 month	92%
3 month	90%
6 month	80%

Case Material	ABS UL94 HB
Terminal	F6

Description of torque value of hard ware for the terminals:

Recommended torque value	M5: 5 N-m (51kgf-cm)
Maximum allowable torque value	M5: 6 N-m (61kgf-cm)

VOLTA MAX

- PERFORMANCE DATA

Discharge Rates in Watts to Various End Voltages at 25℃(77°F)

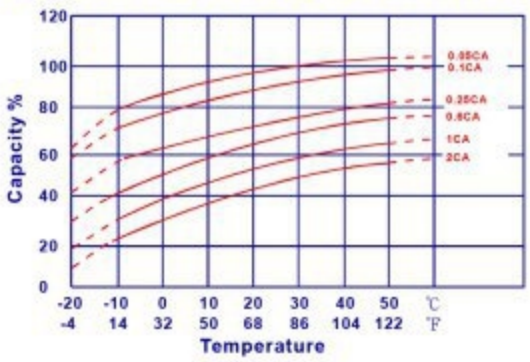
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	98.9	116	128	135	137	139	141
10	min	67.0	77.1	84.5	89.1	90.2	91.7	92.9
15	min	57.2	64.5	69.4	72.5	73.3	74.2	75.1
30	min	32.7	35.1	37.7	39.4	39.8	40.3	40.8
60	min	18.8	19.8	20.7	21.3	21.5	21.8	22.2
120	min	11.9	12.4	12.7	13.1	13.2	13.3	13.5
180	min	8.75	9.10	9.33	9.53	9.60	9.68	9.78
240	min	6.63	6.93	7.12	7.27	7.32	7.38	7.46
300	min	5.82	6.05	6.17	6.27	6.30	6.35	6.41
600	min	3.40	3.52	3.60	3.67	3.68	3.72	3.75
1200	min	1.77	1.83	1.88	1.92	1.93	1.95	1.96

- Discharge Rates in Amperes to Various End Voltages at 25℃(77°F)

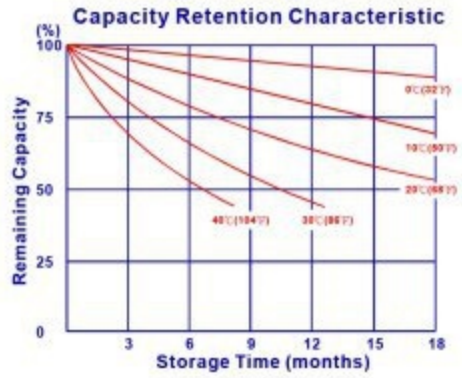
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	62.6	68.3	71.9	75.1	76.4	77.8	80.2
10	min	38.6	41.8	44.3	46.5	47.4	48.4	50.1
15	min	31.9	34.6	36.3	37.7	38.2	38.8	39.7
30	min	17.4	18.7	19.8	20.7	21.0	21.4	21.9
60	min	9.74	10.3	10.7	11.0	11.1	11.3	11.5
120	min	5.98	6.23	6.39	6.53	6.58	6.64	6.72
180	min	4.35	4.52	4.64	4.73	4.76	4.80	4.85
240	min	3.43	3.52	3.58	3.62	3.63	3.65	3.68
300	min	2.96	3.02	3.07	3.11	3.12	3.14	3.16
600	min	1.73	1.77	1.80	1.82	1.83	1.84	1.85
1200	min	0.893	0.914	0.931	0.946	0.952	0.959	0.962

All data on the spec. sheet is an average value:
The tolerance range : X<6min(+15%~-15%), 6min≦X<10min(+12%~-12%),10min ≦X < 60min(+8% ~-8%), X≧60min(+5%~-5%)

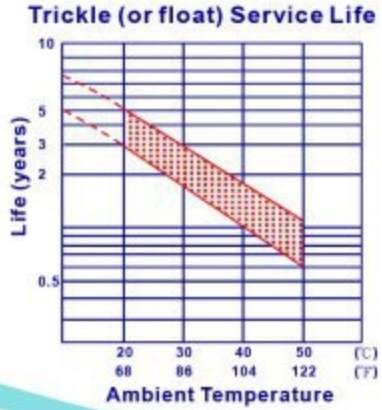
Effect of Temperature on Capacity 25℃(77°F)



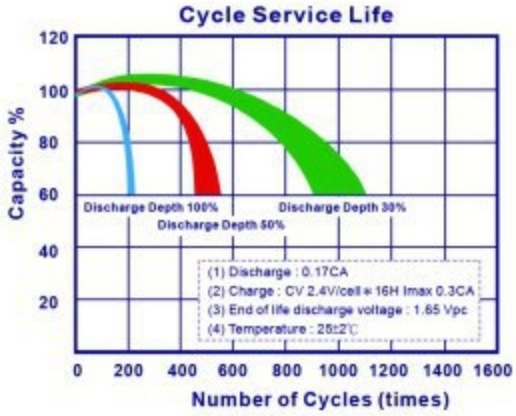
Capacity Retention Characteristic



Trickle (or float) Service Life



Cycle Service Life



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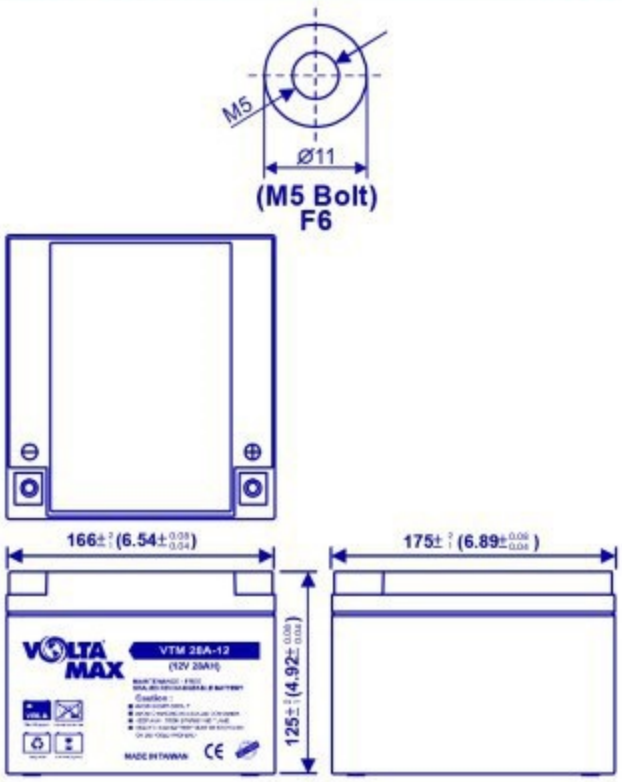
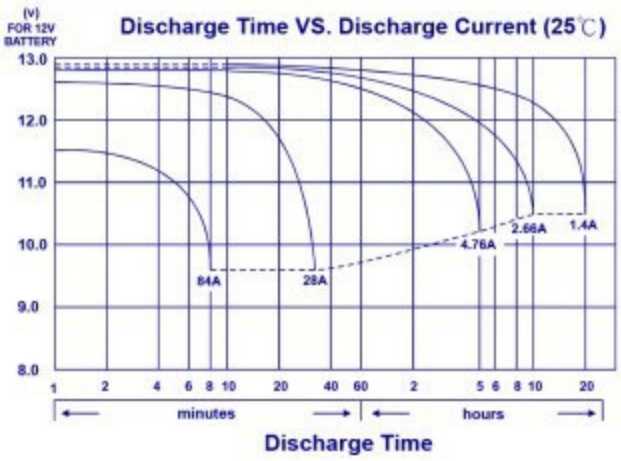
Dimensions mm(inch)





Specifications

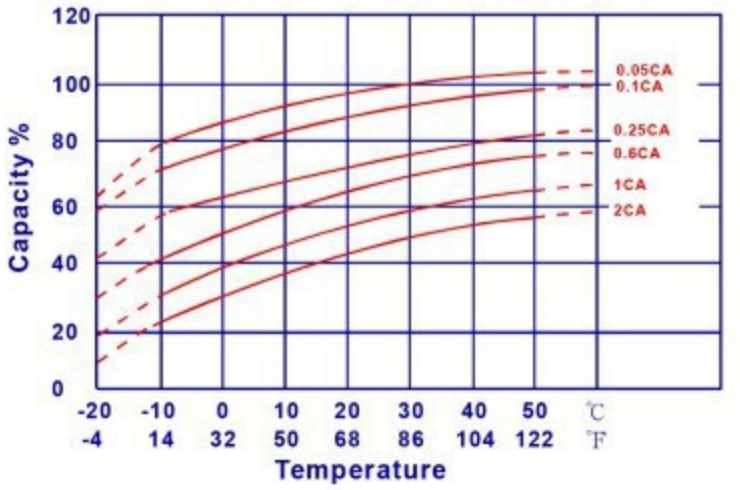
Nominal Voltage(V)				12V
Nominal Capacity				
20 hour rate	(1.4A	to	10.50V)	28Ah
10 hour rate	(2.66A	to	10.50V)	26.6Ah
5 hour rate	(4.76A	to	10.20V)	23.8Ah
1 C	(28A	to	9.60V)	15.87Ah
3 C	(84A	to	9.60V)	11.2Ah
Weight				Approx. 9.3kg(20.46Lbs.)
Internal Resistance (at 1KHz)				Approx. 11 mΩ
Maximum Discharge Current for 5 seconds:				420A
Charging Methods at 25℃(77℉)				
Cycle use:				
Charging Voltage				14.4 to 15.0V
Coefficient -5.0mV/℃/cell				
Maximum Charging Current :				8.4A
Standby use:				
Float Charging Voltage				13.5 to 13.8V
Coefficient -3.0mV/℃/cell				
Operating Temperature Range				
Charge	-15℃(5℉)	to	40℃(104℉)	
Discharge	-15℃(5℉)	to	50℃(122℉)	
Storage	-15℃(5℉)	to	40℃(104℉)	
Charge Retention (shelf life) at 20℃(68℉)				
1 month				92%
3 month				90%
6 month				80%
Case Material				ABS UL94 HB
Terminal				F6

Description of torque value of hard ware for the terminals:

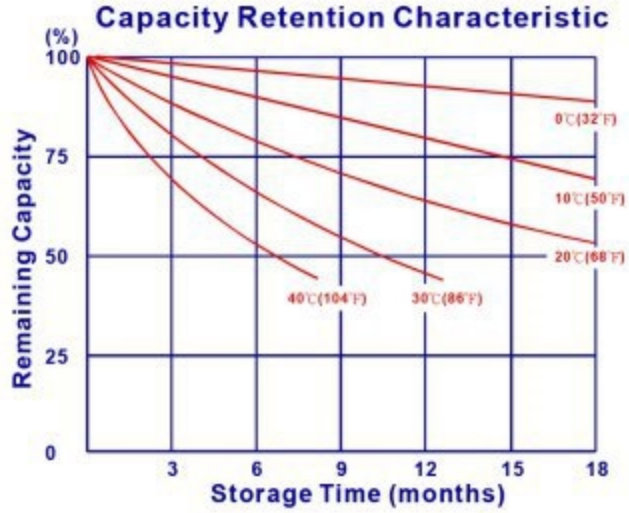
Recommended torque value	M5: 5 N-m (51kgf-cm)
Maximum allowable torque value	M5: 6 N-m (61kgf-cm)

VOLTA MAX

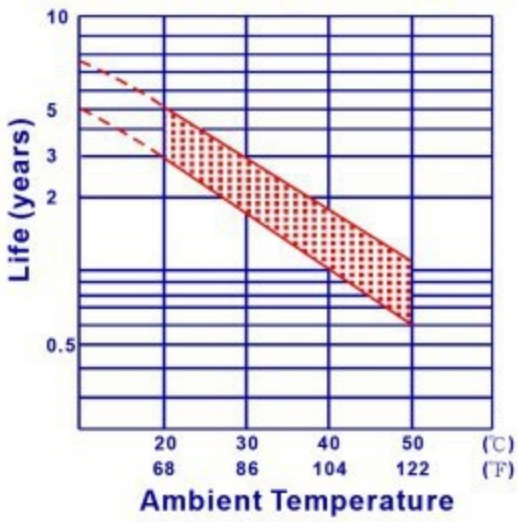
Effect of Temperature on Capacity 25℃(77℉)



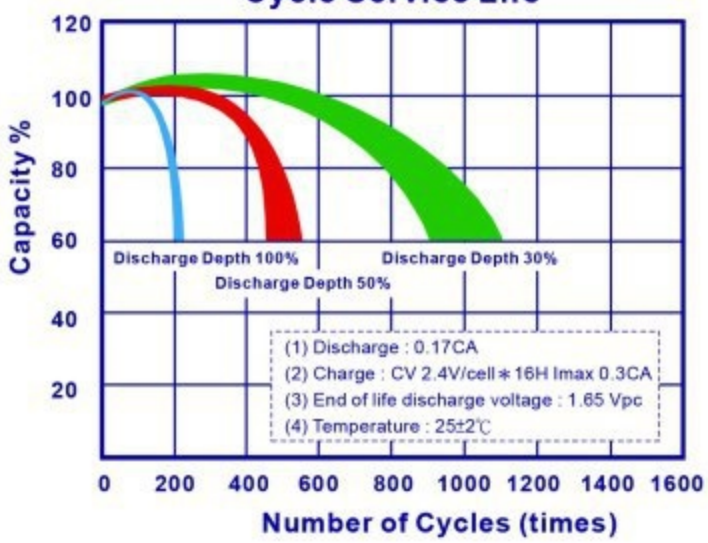
Capacity Retention Characteristic



Trickle (or float) Service Life



Cycle Service Life



VOLTA MAX

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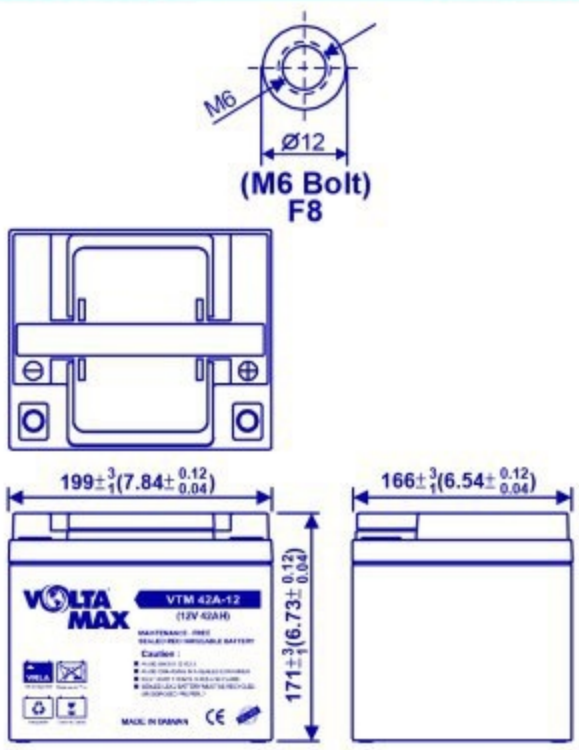
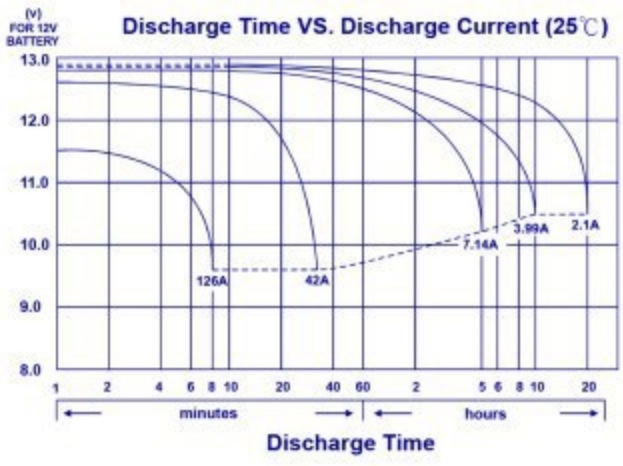
Dimensions mm(inch)





Specifications

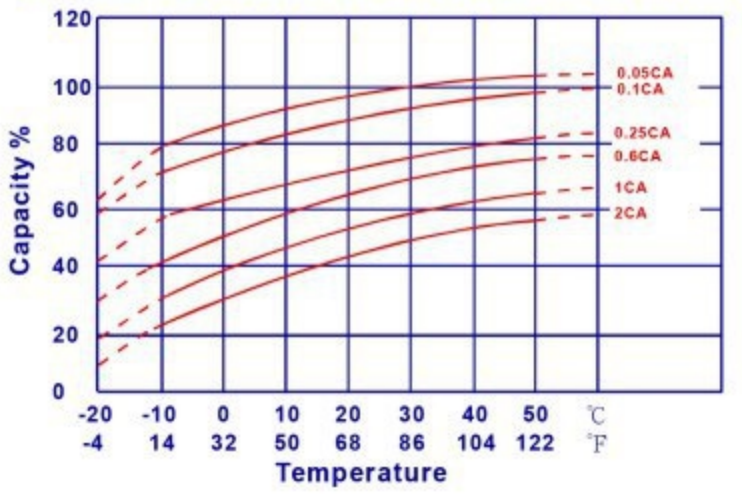
Nominal Voltage(V)				**12V**
Nominal Capacity				
20 hour rate	(2.1A	to	10.50V)	42Ah
10 hour rate	(3.99A	to	10.50V)	39.9Ah
5 hour rate	(7.14A	to	10.20V)	35.7Ah
1 C	(42A	to	9.60V)	23.8Ah
3 C	(126A	to	9.60V)	16.8Ah
Weight				Approx. 13.4kg(29.5Lbs.)
Internal Resistance (at 1KHz)				Approx. 7.5 mΩ
Maximum Discharge Current for 5 seconds:				630A
Charging Methods at 25℃(77℉)				
Cycle use:				
Charging Voltage				14.4 to 15.0V
Coefficient -5.0mV/℃/cell				
Maximum Charging Current :				12.6A
Standby use:				
Float Charging Voltage				13.5 to 13.8V
Coefficient -3.0mV/℃/cell				
Operating Temperature Range				
Charge	-15℃(5℉)	to	40℃(104℉)	
Discharge	-15℃(5℉)	to	50℃(122℉)	
Storage	-15℃(5℉)	to	40℃(104℉)	
Charge Retention (shelf life) at 20℃(68℉)				
1 month				92%
3 month				90%
6 month				80%
Case Material				ABS UL94 HB
Terminal				F8

Description of torque value of hard ware for the terminals:

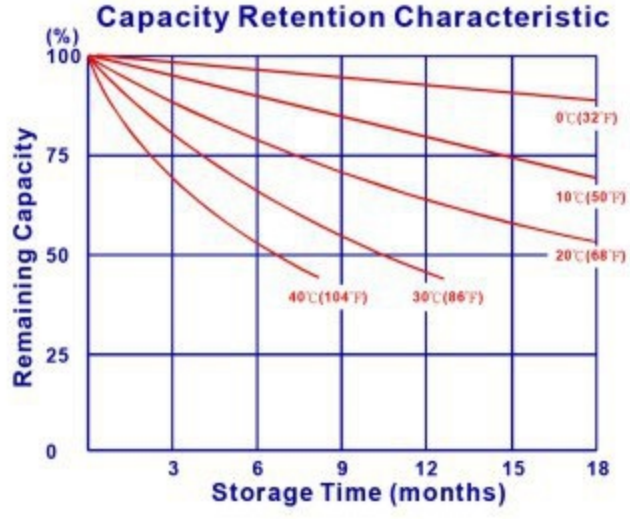
Recommended torque value	M6: 7 N-m (71kgf-cm)
Maximum allowable torque value	M6: 9 N-m (92kgf-cm)

VOLTA MAX

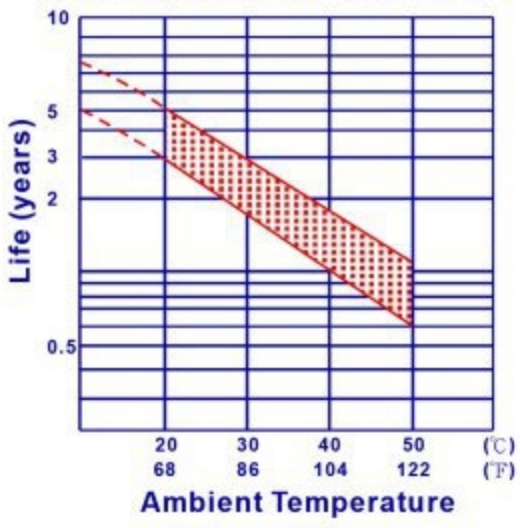
Effect of Temperature on Capacity 25℃(77°F)



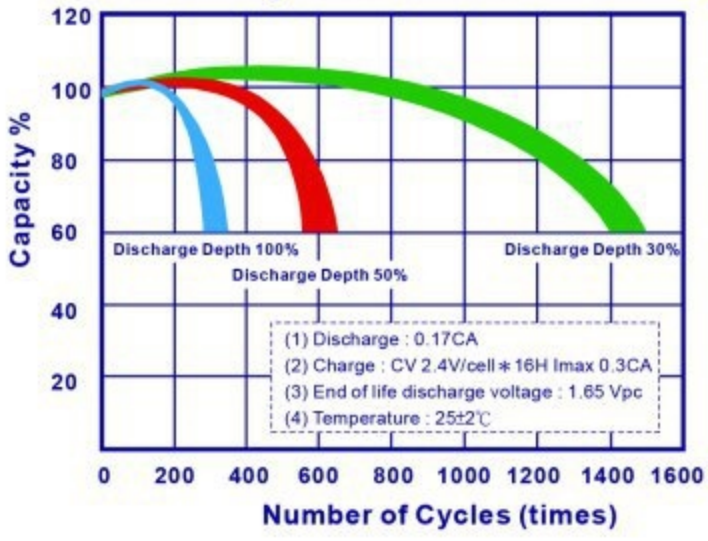
Capacity Retention Characteristic



Trickle (or float) Service Life



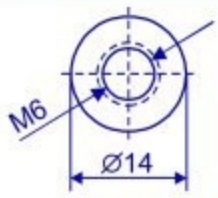
Cycle Service Life



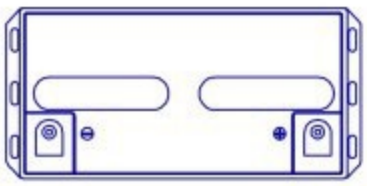
VOLTA MAX

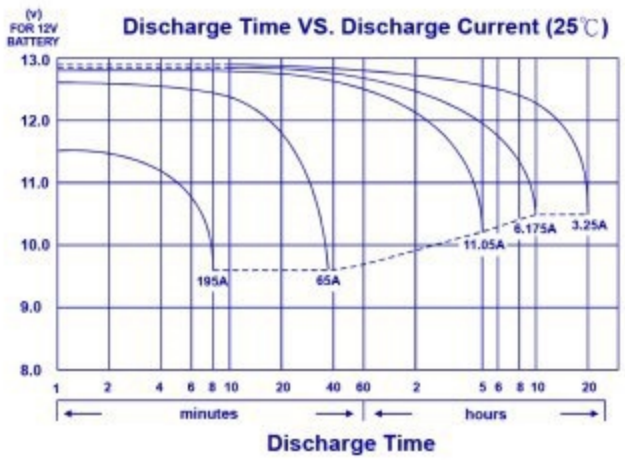
VTM 65A-12

Dimensions mm(inch)



(M6 Bolt)
F8





Specifications

Nominal Voltage(V)				12V
Nominal Capacity				
20 hour rate	(3.25A	to	10.50V)	65Ah
10 hour rate	(6.175A	to	10.50V)	61.75Ah
5 hour rate	(11.05A	to	10.20V)	55.25Ah
1 C	(65A	to	9.60V)	41.17Ah
3 C	(195A	to	9.60V)	26Ah
Weight				Approx. 20.9kg(45.98Lbs.)
Internal Resistance (at 1KHz)				Approx. 7 mΩ
Maximum Discharge Current for 5 seconds:				780A
Charging Methods at 25℃(77℉)				
Cycle use:				
Charging Voltage				14.4 to 15.0V
Coefficient -5.0mV/℃/cell				
Maximum Charging Current :				19.5A
Standby use:				
Float Charging Voltage				13.5 to 13.8V
Coefficient -3.0mV/℃/cell				
Operating Temperature Range				
Charge	-15℃(5℉)	to	40℃(104℉)	
Discharge	-15℃(5℉)	to	50℃(122℉)	
Storage	-15℃(5℉)	to	40℃(104℉)	
Charge Retention (shelf life) at 20℃(68℉)				
1 month				98%
3 month				94%
6 month				85%
Case Material				ABS UL94 HB
Terminal				F8

Description of torque value of hard ware for the terminals:

Recommended torque value	M6: 7 N-m (71kgf-cm)
Maximum allowable torque value	M6: 9 N-m (92kgf-cm)

VOLTA MAX

- PERFORMANCE DATA

Discharge Rates in Watts to Various End Voltages at 25℃(77℉)

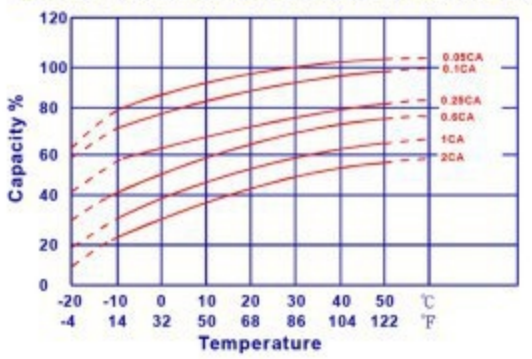
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	249	275	320	371	380	396	432
10	min	203	230	251	274	282	290	309
15	min	170	190	207	215	218	224	231
20	min	150	158	171	173	180	185	193
30	min	113	124	134	138	141	143	148
60	min	72.5	76.5	82.3	83.7	84.0	84.3	85.0
90	min	58.3	60.2	61.5	62.0	62.3	62.5	62.8
120	min	45.7	48.0	49.0	49.5	49.7	49.8	50.0
180	min	32.4	33.5	34.0	34.3	34.5	34.7	35.0
240	min	26.0	27.2	27.5	27.7	27.8	28.0	28.2
300	min	21.7	22.6	23.1	23.2	23.3	23.4	23.4
480	min	14.9	15.5	15.8	15.9	16.0	16.0	16.0
600	min	12.5	12.9	13.2	13.2	13.3	13.3	13.3
1200	min	6.54	6.76	6.86	6.87	6.89	6.91	6.94

- Discharge Rates in Amperes to Various End Voltages at 25℃(77℉)

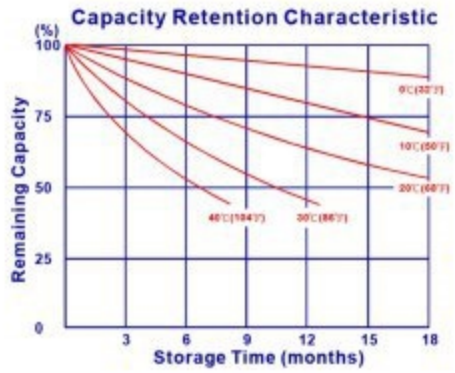
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	137	151	177	208	213	224	245
10	min	102	123	135	149	154	158	169
15	min	91.0	100	109	116	119	122	129
20	min	61.4	82.5	89.3	92.5	94.0	96.5	101
30	min	50.7	63.6	68.5	71.5	73.4	74.7	77.2
60	min	36.6	38.5	41.5	42.5	43.0	43.6	44.2
90	min	29.5	31.1	31.8	32.2	32.8	33.0	33.4
120	min	23.1	24.3	24.8	25.0	25.3	25.5	25.8
180	min	16.2	17.0	17.3	17.5	17.7	17.8	18.0
240	min	13.0	13.6	13.8	13.9	14.0	14.1	14.2
300	min	10.8	11.3	11.5	11.6	11.7	11.8	11.9
480	min	7.43	7.73	7.87	7.92	7.94	7.96	7.98
600	min	6.19	6.43	6.54	6.58	6.60	6.61	6.63
1200	min	3.24	3.35	3.40	3.41	3.42	3.43	3.44

All data on the spec. sheet is an average value:
The tolerance range : X<6min(+15%~-15%), 6min≦X<10min(+12%~-12%),10min ≦X < 60min(+8% ~-8%), X≧60min(+5%~-5%)

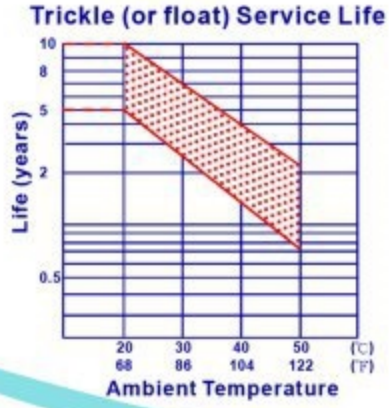
Effect of Temperature on Capacity 25℃(77℉)



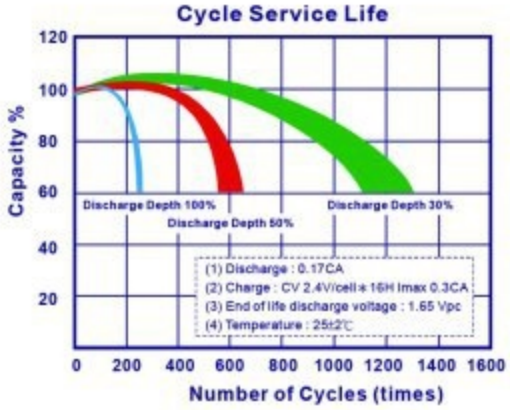
Capacity Retention Characteristic



Trickle (or float) Service Life



Cycle Service Life



VTM 100A-12

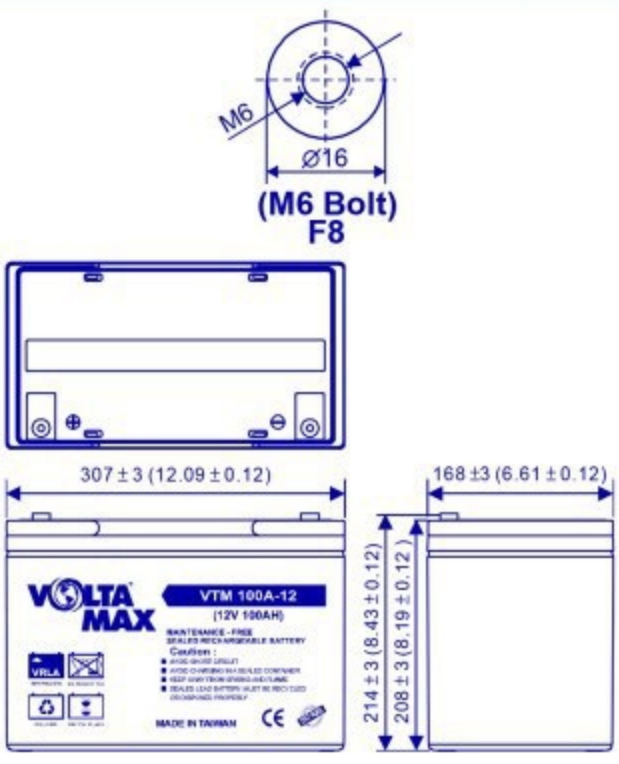
Specifications

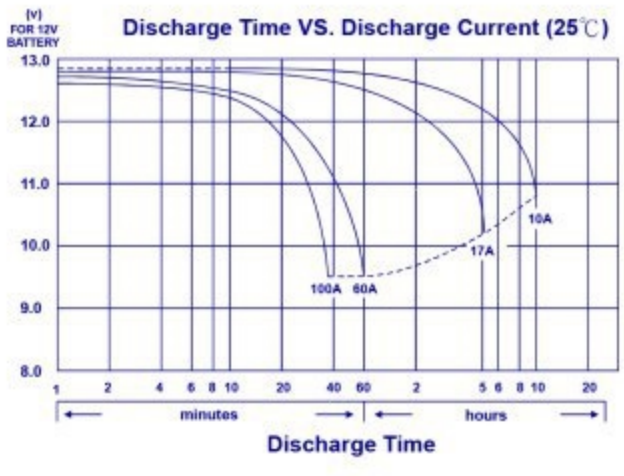
Nominal Voltage(V)	12V
Nominal Capacity	
10 hour rate (10A to 10.80V)	100Ah
5 hour rate (17A to 10.20V)	85Ah
1 hour rate (60A to 9.60V)	60Ah
1 C (100A to 9.60V)	63.33Ah
Weight	Approx. 29.5kg(64.9Lbs.)
Internal Resistance (at 1KHz)	Approx. 5 mΩ
Maximum Discharge Current for 5 seconds:	1200A
Charging Methods at 25℃(77°F)	
Cycle use:	
Charging Voltage	14.4 to 15.0V
Coefficient -5.0mV/℃/cell	
Maximum Charging Current :	30A
Standby use:	
Float Charging Voltage	13.5 to 13.8V
Coefficient -3.0mV/℃/cell	
Design Life	12 years
Operating Temperature Range	
Charge -15℃(5°F) to 40℃(104°F)	
Discharge -15℃(5°F) to 50℃(122°F)	
Storage -15℃(5°F) to 40℃(104°F)	
Charge Retention (shelf life) at 20℃(68°F)	
1 month	98%
3 month	94%
6 month	85%
Case Material	ABS UL94 HB
Terminal	F8

Description of torque value of hard ware for the terminals:

Recommended torque value	M6: 7 N-m (71kgf-cm)
Maximum allowable torque value	M6: 9 N-m (92kgf-cm)

Dimensions mm(inch)





- PERFORMANCE DATA

Discharge Rates in Watts to Various End Voltages at 25℃(77℉)

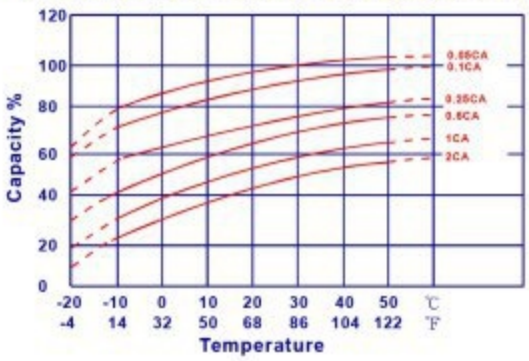
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	458	512	549	584	600	617	649
10	min	348	380	407	432	443	455	477
15	min	277	301	320	338	346	354	370
30	min	163	174	183	191	195	199	206
60	min	112	116	119	122	123	125	126
120	min	66.3	69.5	72.0	73.5	74.5	75.7	77.2
180	min	47.2	49.7	51.8	52.2	53.0	54.0	55.2
240	min	35.2	37.3	39.3	41.3	42.0	42.8	43.8
300	min	31.3	32.8	34.2	35.2	35.5	36.0	36.7
600	min	18.0	19.2	20.0	20.8	21.2	21.5	21.8
1200	min	10.4	10.7	11.0	11.2	11.3	11.4	11.5

- Discharge Rates in Amperes to Various End Voltages at 25℃(77℉)

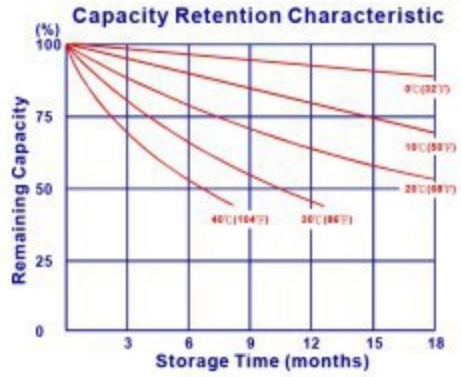
Time \ End Voltage		1.85V	1.80V	1.75V	1.70V	1.67V	1.65V	1.60V
5	min	202	267	305	336	346	358	375
10	min	159	188	209	226	234	243	257
15	min	119	146	165	179	184	190	198
30	min	71.2	83.7	92.1	101	103	106	111
60	min	43.6	50.8	56.5	60.6	61.5	63.0	64.9
120	min	25.8	29.3	32.5	35.6	36.4	37.3	38.5
180	min	22.6	23.7	24.8	25.7	26.1	26.5	27.2
240	min	18.3	19.1	19.8	20.5	20.8	21.1	21.6
300	min	16.1	16.7	17.2	17.6	17.8	17.9	18.1
600	min	9.71	10.0	10.2	10.4	10.5	10.6	10.7
1200	min	5.09	5.26	5.38	5.48	5.53	5.57	5.64

All data on the spec. sheet is an average value:
The tolerance range : X<6min(+15%~-15%), 6min≦X<10min(+12%~-12%),10min ≦X < 60min(+8% ~-8%), X≧60min(+5%~-5%)

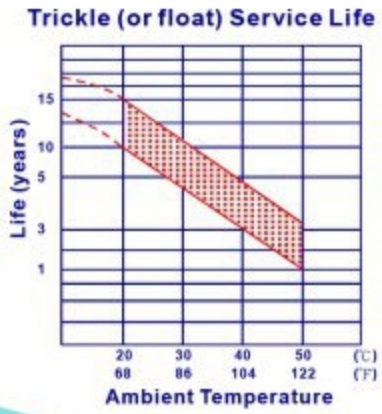
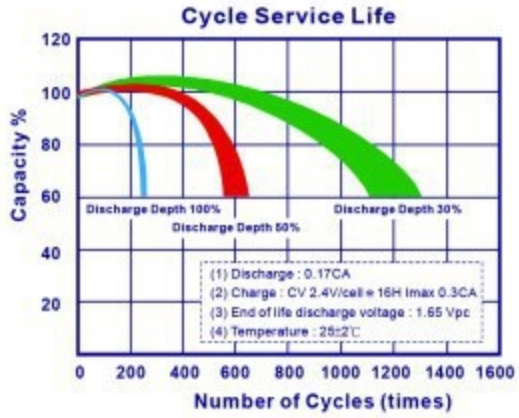
Effect of Temperature on Capacity 25℃(77℉)



Capacity Retention Characteristic



Trickle (or float) Service Life



Cycle Service Life