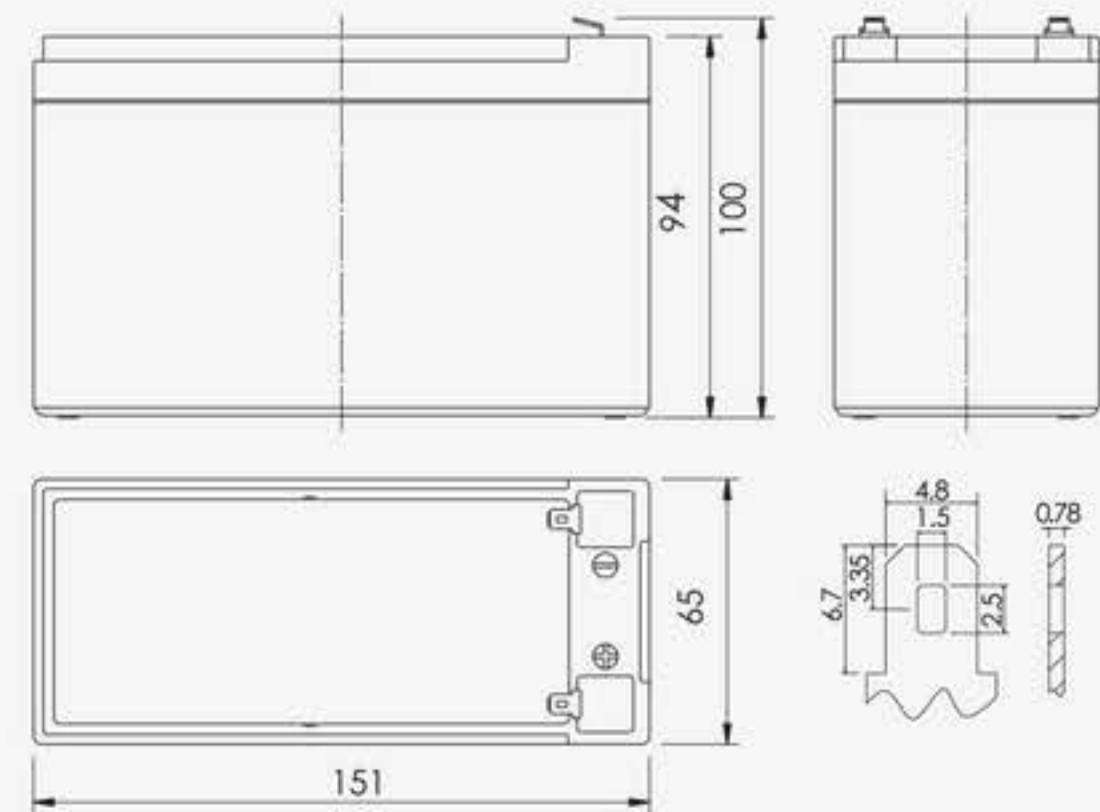




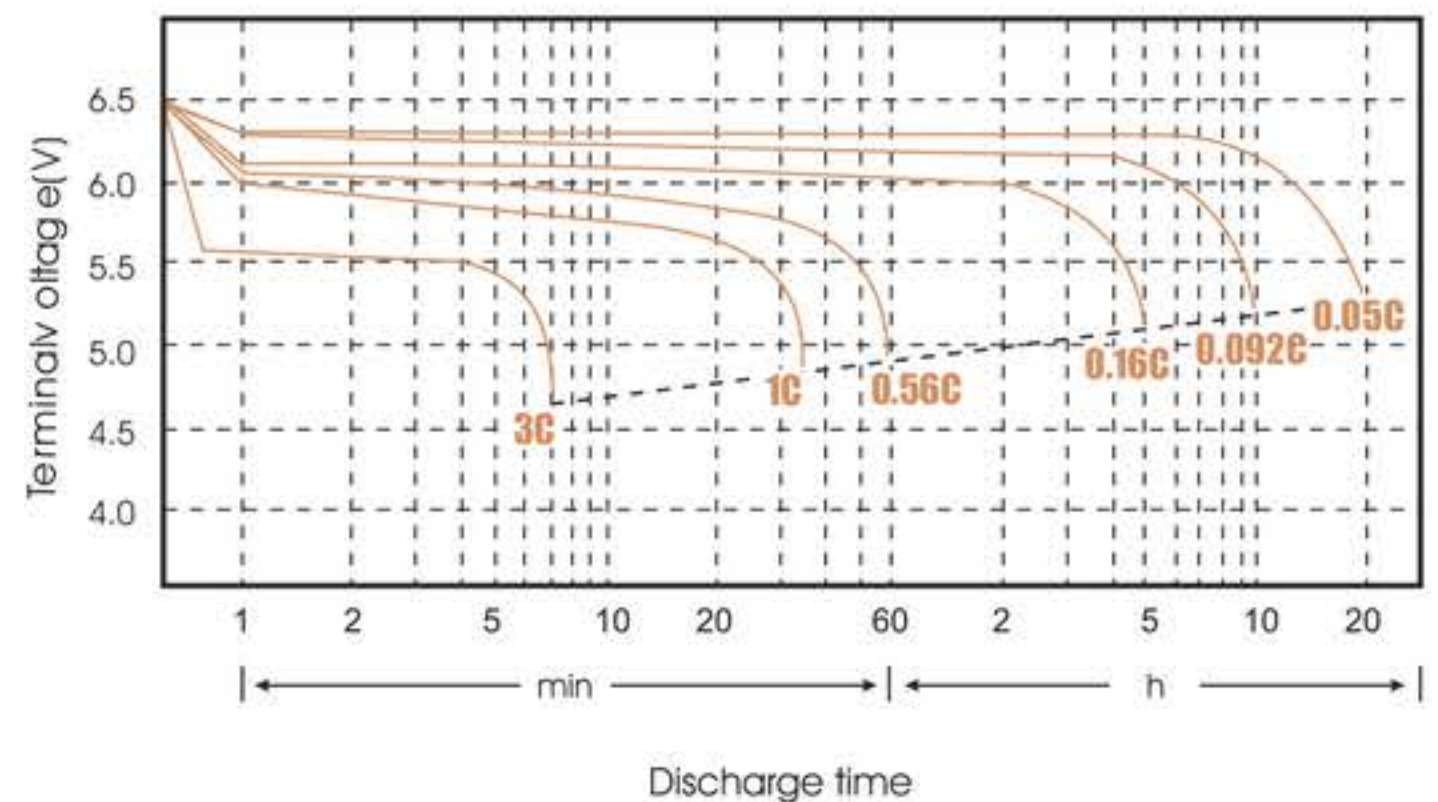
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		7.0Ah
Dimensions	Total Height (with terminals)	3.94inches(100mm)
	Height	3.70inches(94mm)
	Length	5.94inches(151mm)
	Width	2.56inches(65mm)
Weight		Approx. 4.4pound(2.0kg)

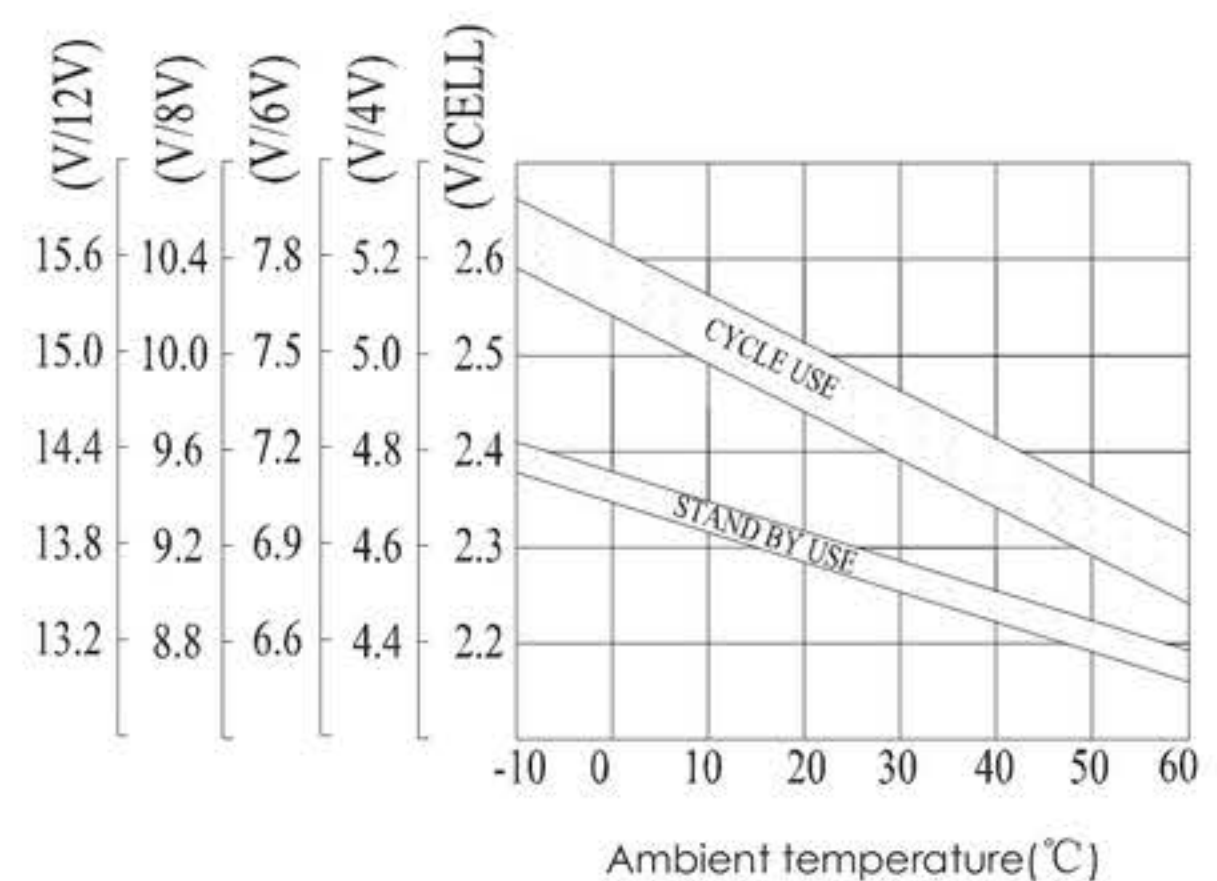
Characteristics

Capacity 77°F(25°C)	20 hour rate (0.35A)	7.0Ah
	10 hour rate (0.65A)	6.5Ah
	5 hour rate (1.12A)	5.6Ah
	1 hour rate (4.20A)	4.2Ah
	15 minute Rate (12.3A)	3.1Ah
Internal Resistance	Full charged Battery 77°F(25°C)	26mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacityafter 3 month storage	91%
	Capacityafter 6 month storage	81%
	Capacityafter 12 month storage	60%
Max. Discharge Current 77°F(25°C)	105A(5S)	
Terminal	F1\F2	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 2.1A Voltage 14.4~14.7V/7 F(25 C)
	Float	Voltage 13.5~13.8V/7 F(25 C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	26.67	16.94	13.58	7.56	4.62	2.61	1.80	1.44	1.22	0.67	0.35
9.90	26.04	16.45	13.09	7.35	4.50	2.52	1.78	1.43	1.21	0.66	0.35
10.20	24.85	15.75	12.67	7.21	4.38	2.49	1.76	1.41	1.20	0.65	0.35
10.50	23.80	15.12	12.18	7.14	4.27	2.45	1.75	1.40	1.19	0.65	0.35
10.80	22.40	14.98	11.55	6.93	4.13	2.38	1.72	1.37	1.18	0.64	0.34

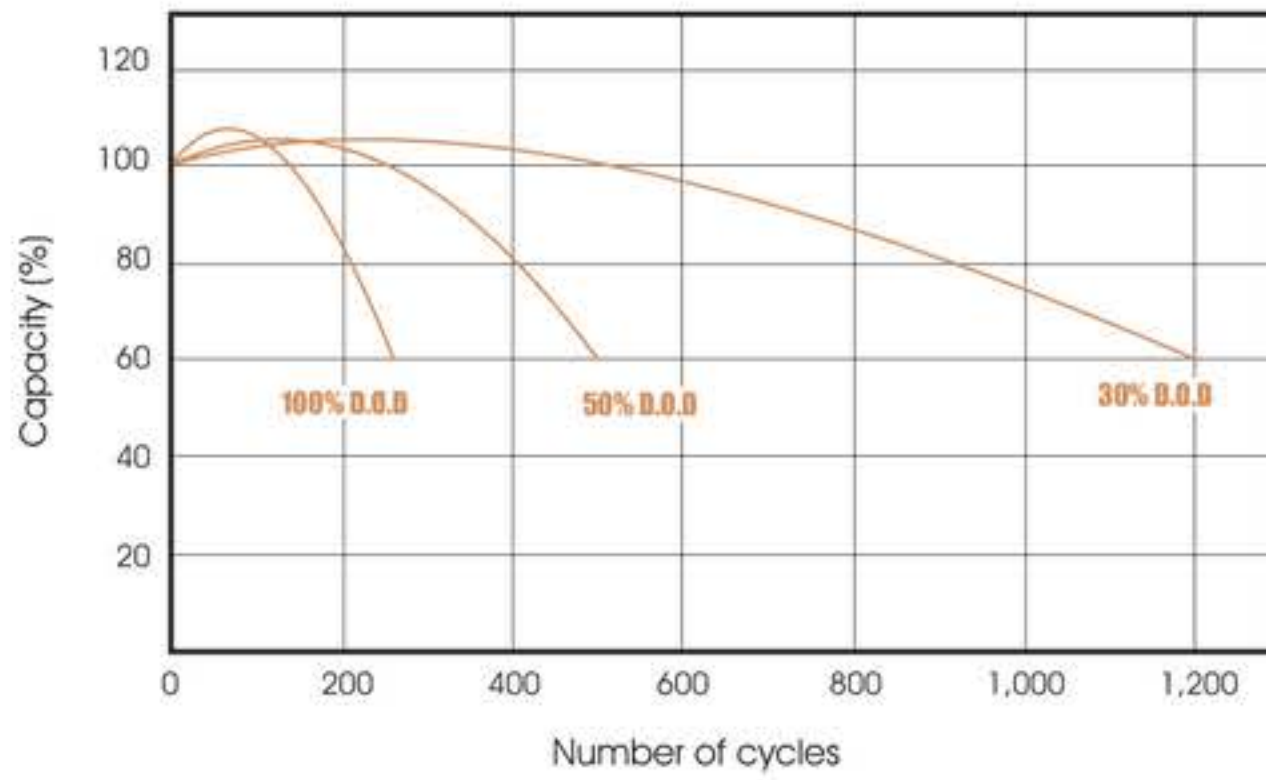
Constant Power Discharge (WATTS PER CELL@25°C)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	297.10	190.41	154.27	86.18	53.31	30.52	21.39	17.17	14.52	7.95	4.26
9.90	290.35	185.06	148.83	84.16	52.03	29.48	21.18	17.04	14.49	7.89	4.24
10.20	277.33	177.35	144.18	82.63	50.62	29.12	20.95	16.88	14.39	7.83	4.23
10.50	265.85	170.55	138.73	81.90	49.45	28.76	20.88	16.73	14.23	7.83	4.21
10.80	250.43	169.27	131.69	79.56	47.91	27.97	20.58	16.33	14.08	7.66	4.14

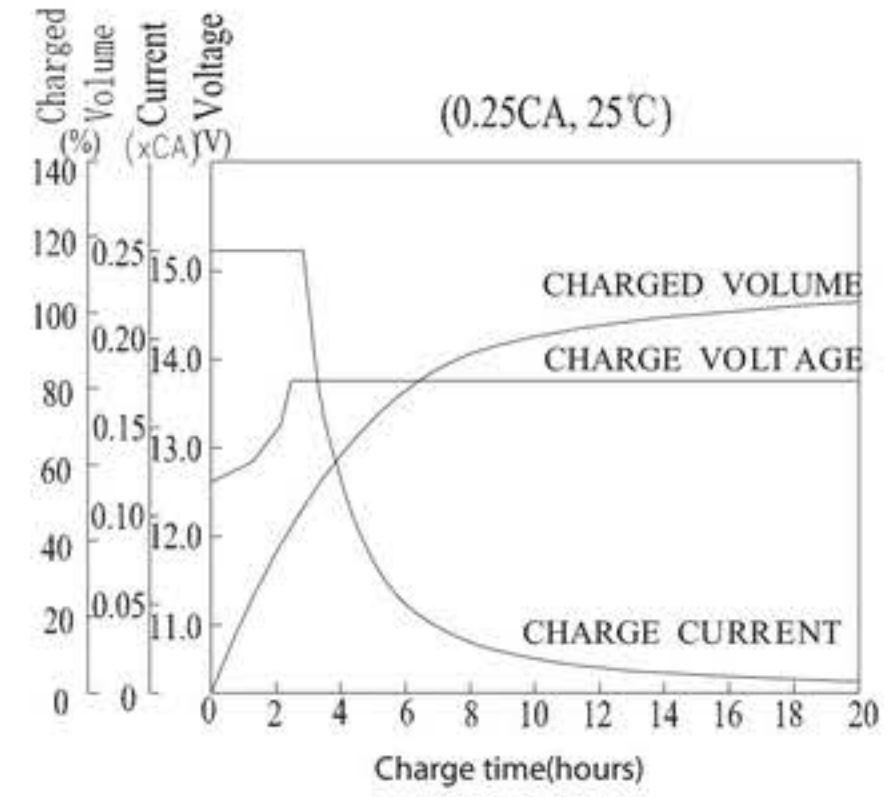


The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

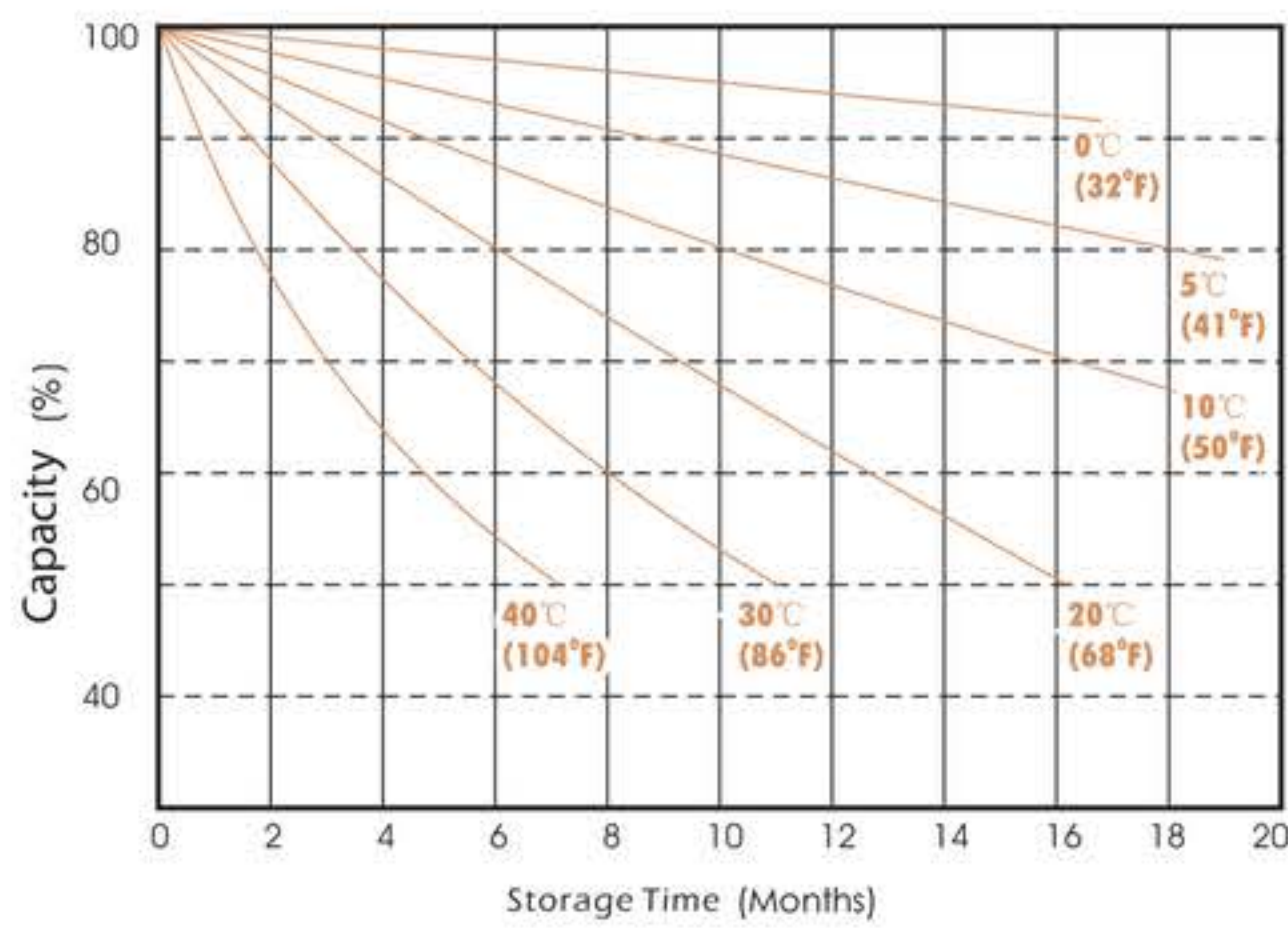
Cycle service life in relation to depth of discharge



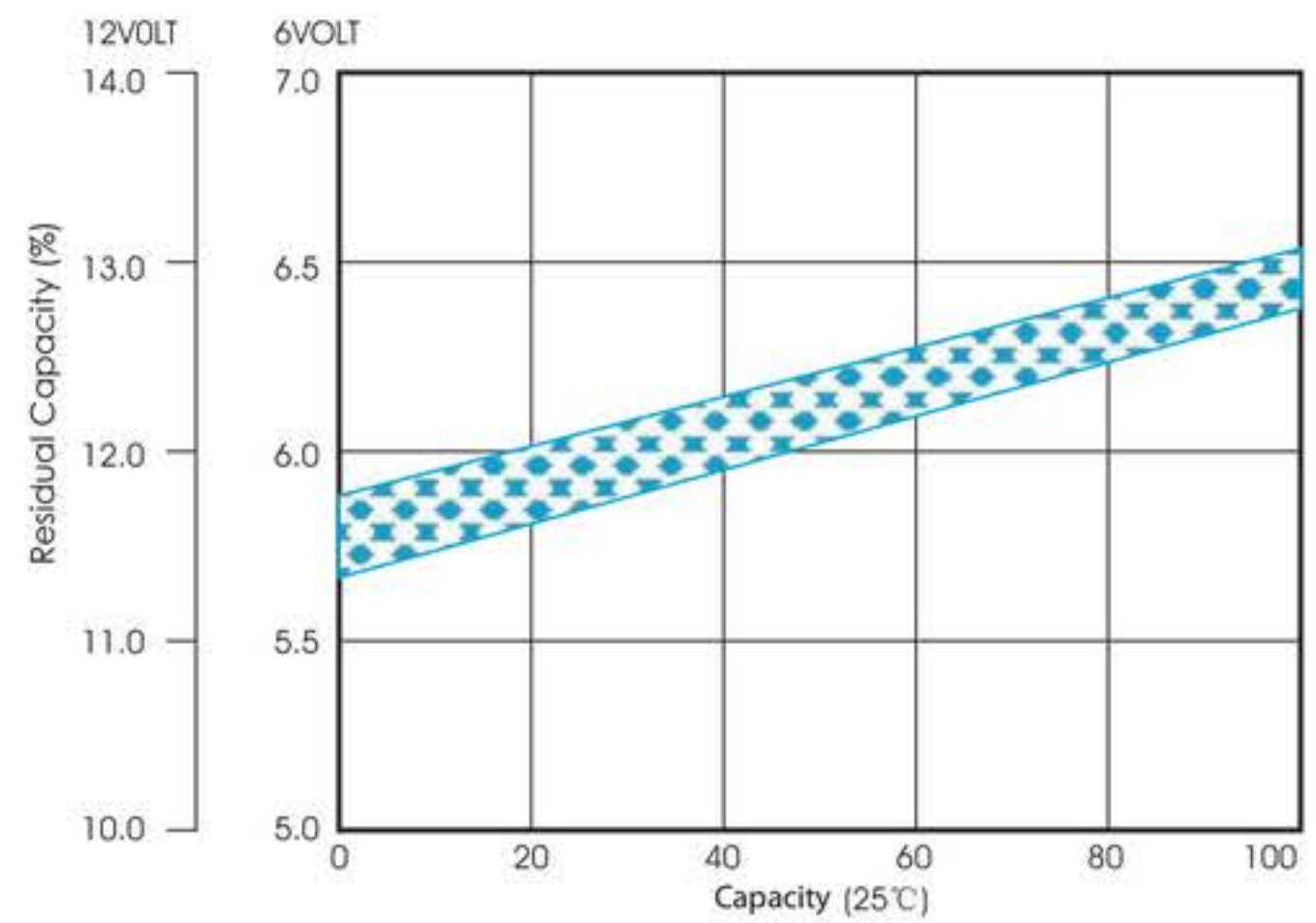
Constant voltage charge characteristic



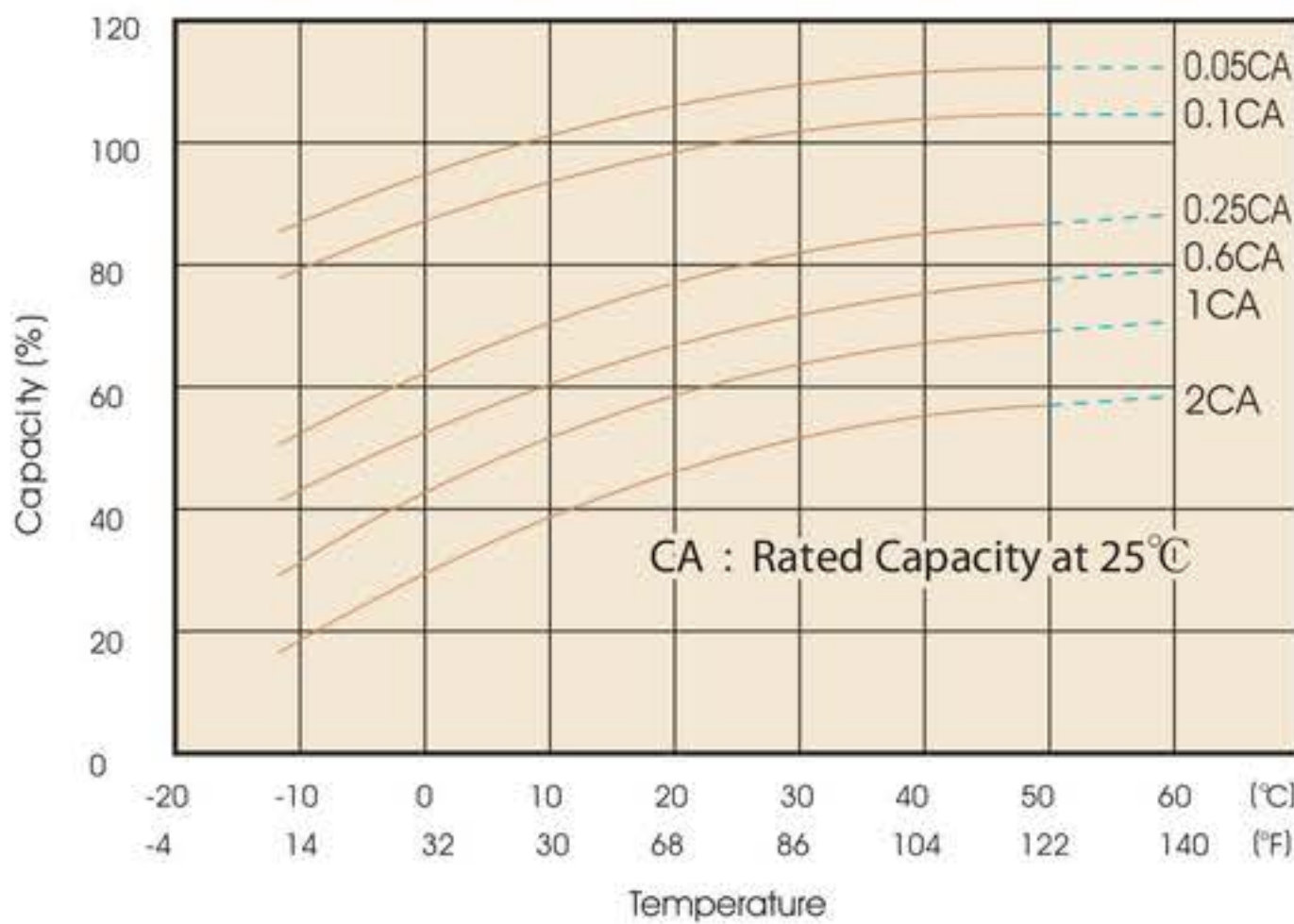
Self-Discharge Characteristics.



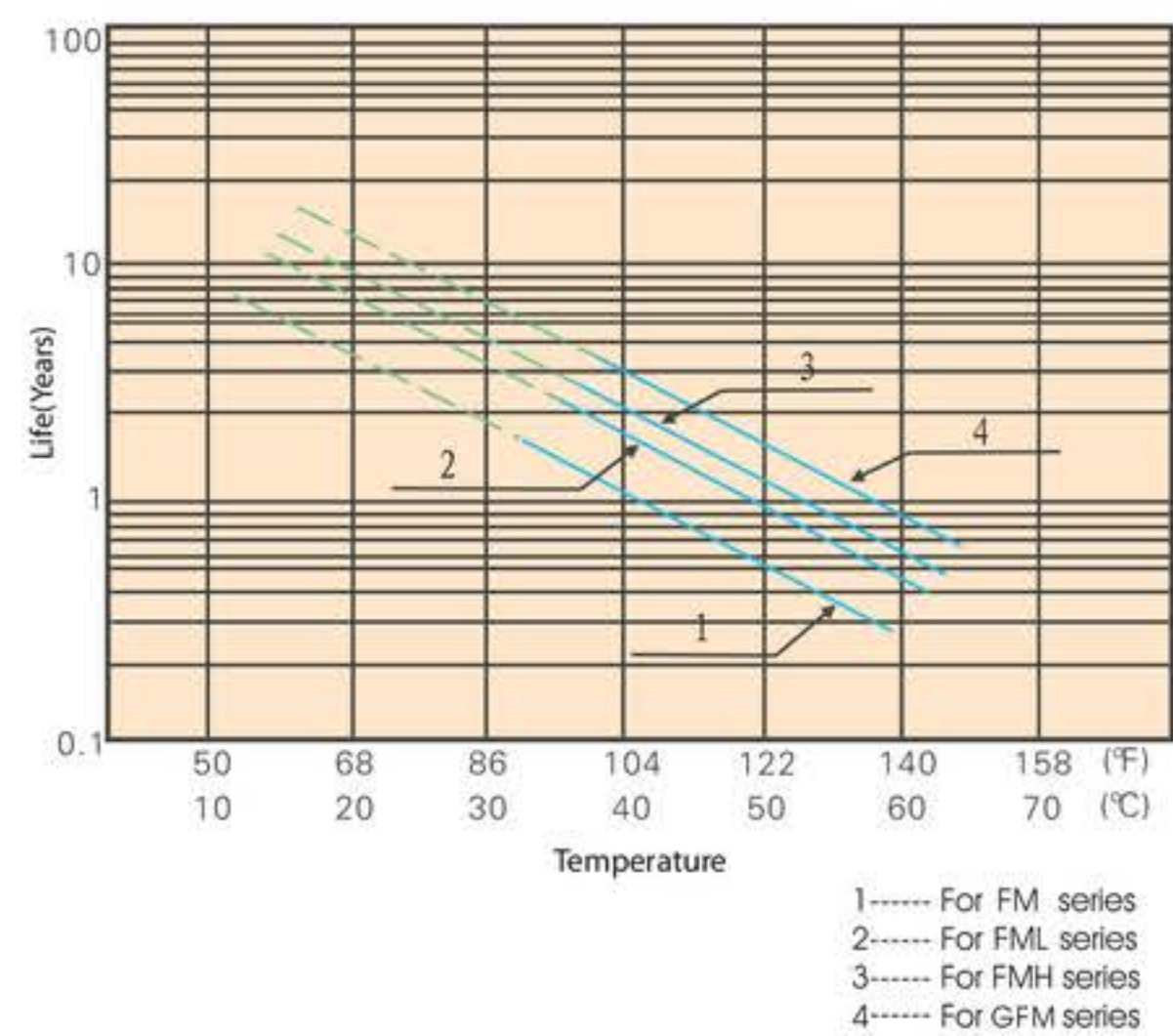
Relationship of OCV and Residual Capacity % (25°C)

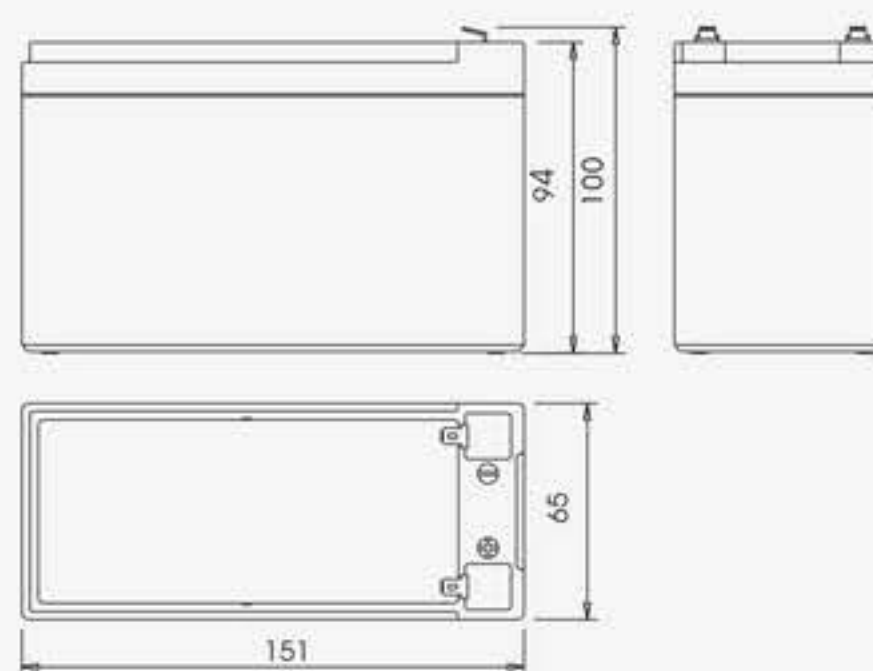


Temperature effects on capacity



Temperature effects on float life





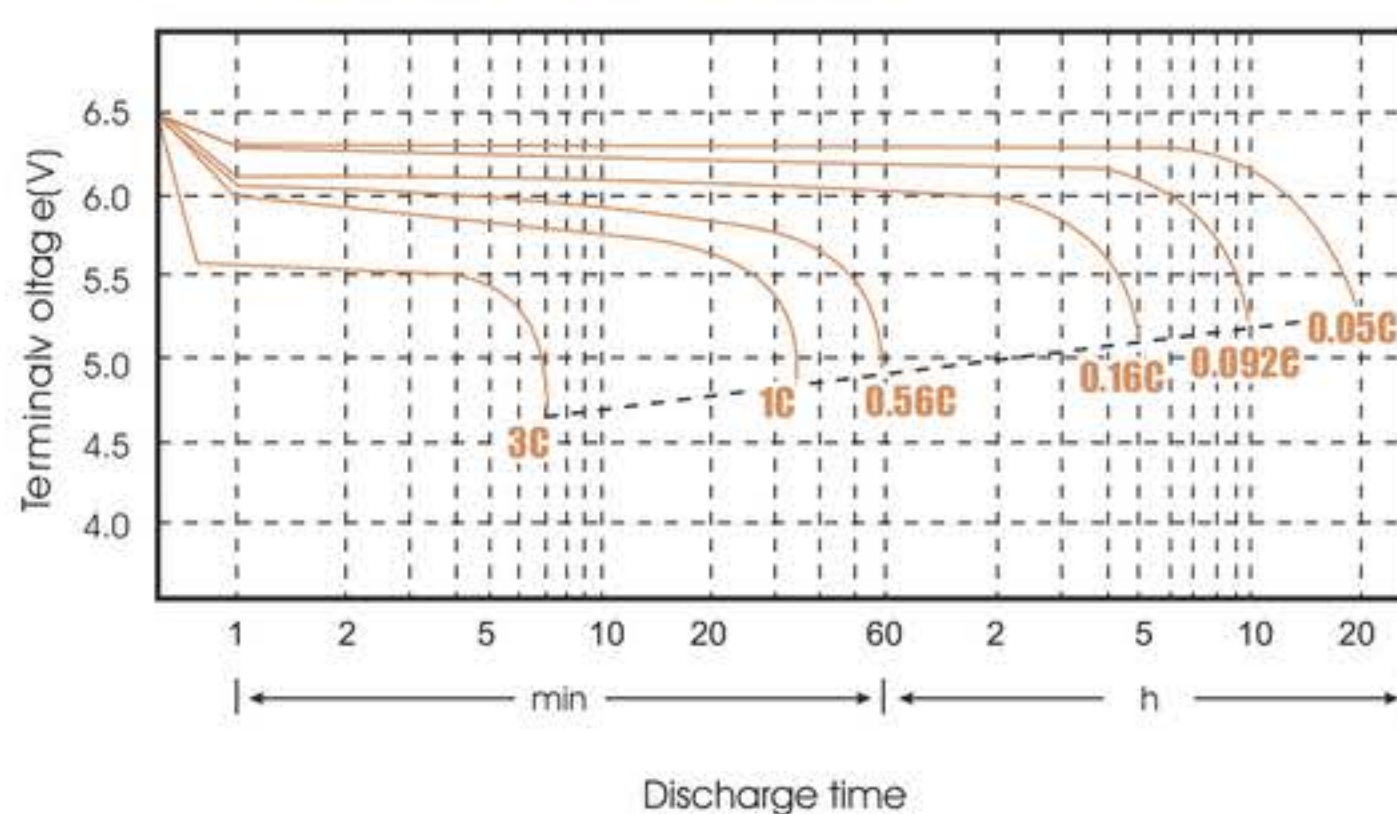
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		9Ah
Dimensions	Total Height (with terminals)	3.94inches(100mm)
	Height	3.70inches(94mm)
	Length	5.94inches(151mm)
	Width	2.56inches(65mm)
Weight		Approx. 5.52pound(2.51kg)

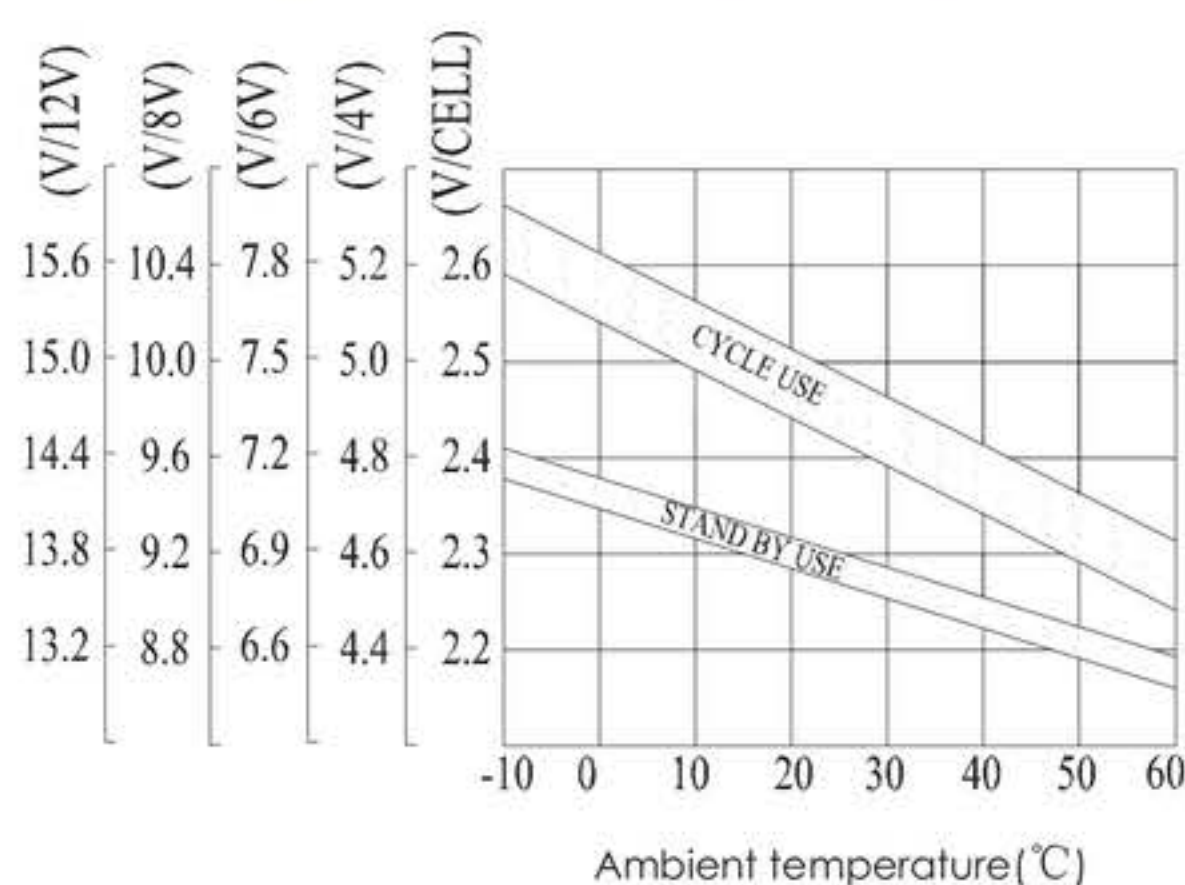
Characteristics

Capacity 77°F(25°C)	20 hour rate (0.45A)	9.0Ah
	10 hour rate (0.83A)	8.3Ah
	5 hour rate (1.44A)	7.2Ah
	1 hour rate (5.4A)	5.4Ah
	15 minute Rate (15.6 A)	3.9 Ah
Internal Resistance	Full charged Battery 77°F(25°C)	13mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	135A(5S)	
Terminal	F1/F2	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 2.7A Voltage 14.4~14.7V/77°F(25°C)
	Float	Voltage 13.5~13.8V/77°F(25°C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

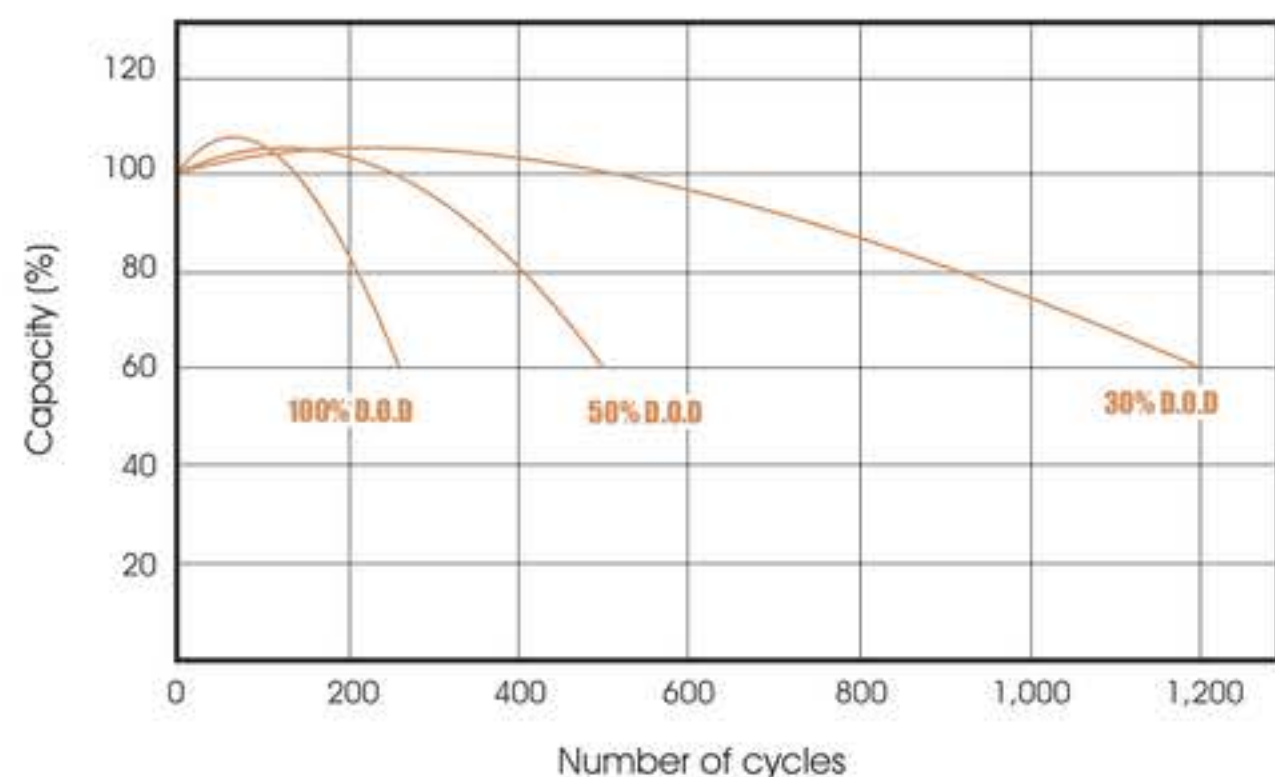
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	34.29	21.78	17.46	9.72	5.94	3.36	2.31	1.85	1.57	0.86	0.46
9.90	33.48	21.15	16.83	9.45	5.79	3.24	2.29	1.84	1.56	0.85	0.45
10.20	31.95	20.25	16.29	9.27	5.63	3.20	2.26	1.82	1.55	0.84	0.45
10.50	30.60	19.44	15.66	9.18	5.49	3.15	2.25	1.80	1.53	0.84	0.45
10.80	28.80	19.26	14.85	8.91	5.31	3.06	2.21	1.76	1.51	0.82	0.44

Constant Power Discharge (WATTS PER CELL@25°C)

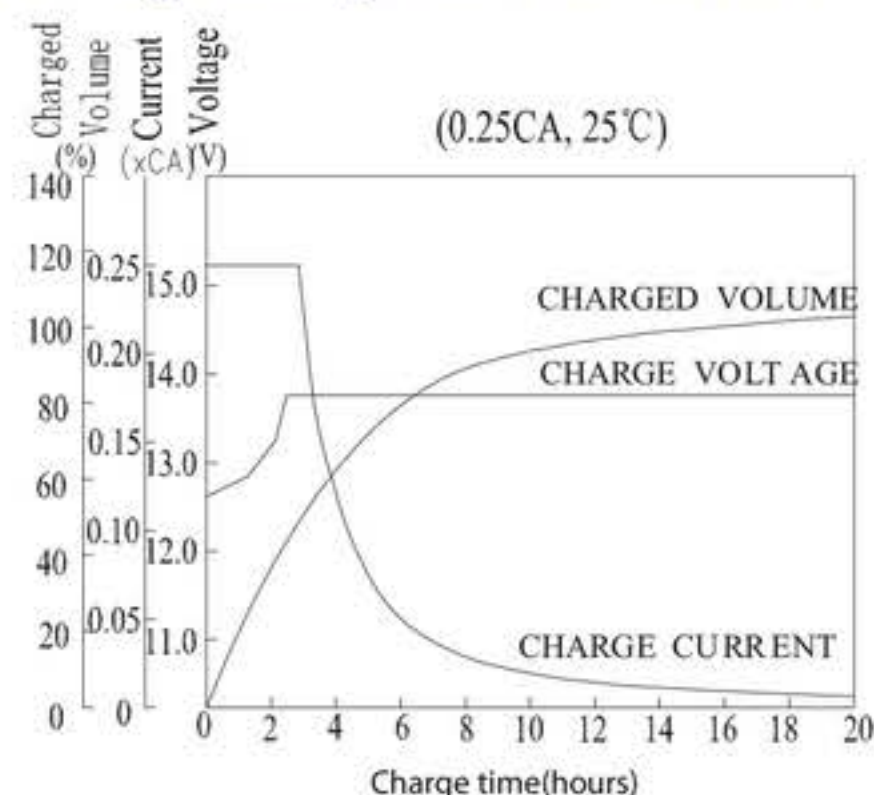
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	381.99	244.81	198.35	110.81	68.55	39.23	27.50	22.08	18.67	10.23	5.48
9.90	373.30	237.94	191.36	108.20	66.90	37.90	27.23	21.90	18.63	10.15	5.46
10.20	356.56	228.02	185.38	106.23	65.08	37.45	26.94	21.71	18.50	10.07	5.44
10.50	341.80	219.28	178.37	105.29	63.57	36.98	26.84	21.51	18.30	10.07	5.42
10.80	321.98	217.64	169.31	102.29	61.60	35.96	26.46	20.99	18.10	9.85	5.33

The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

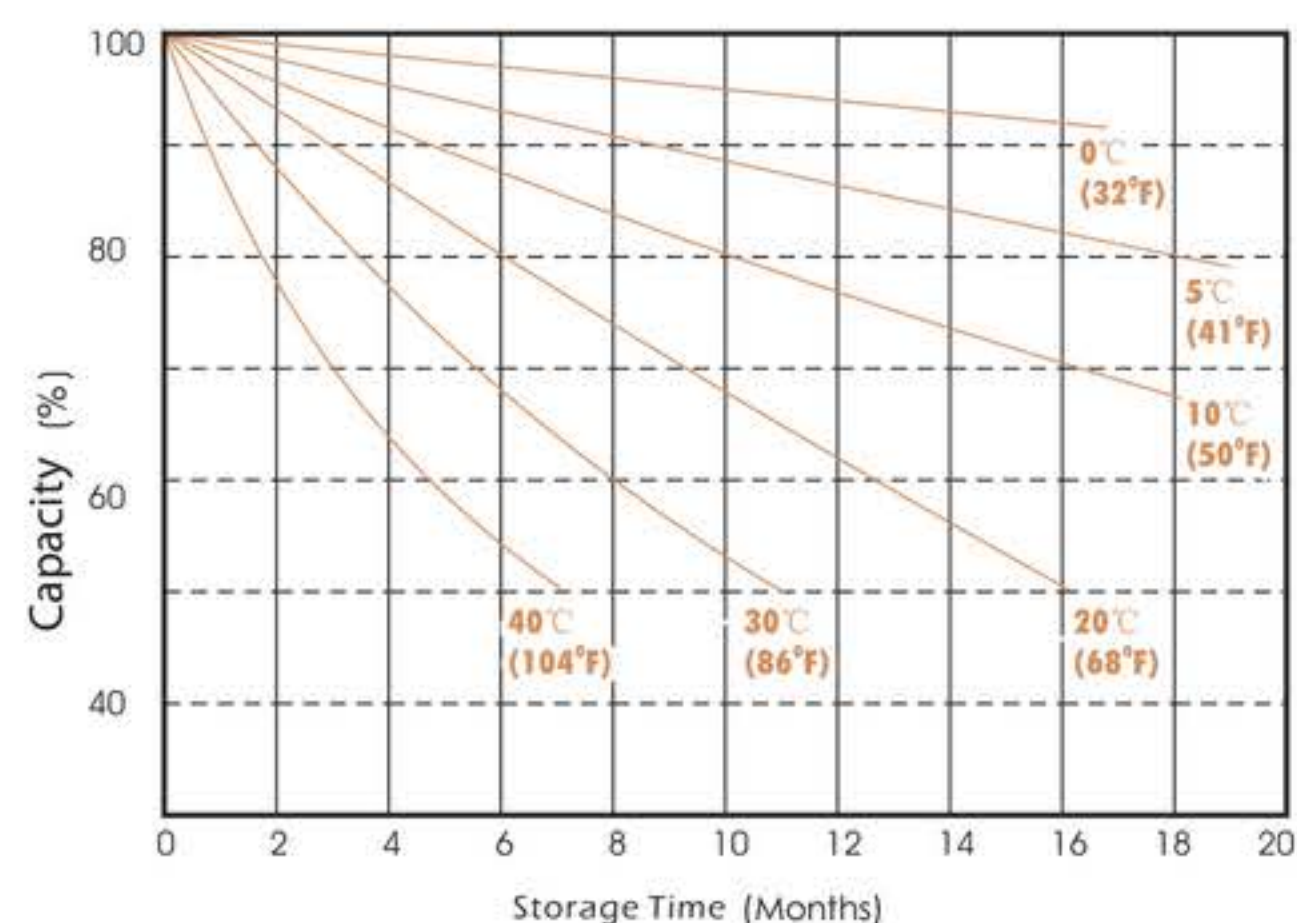
Cycle service life in relation to depth of discharge



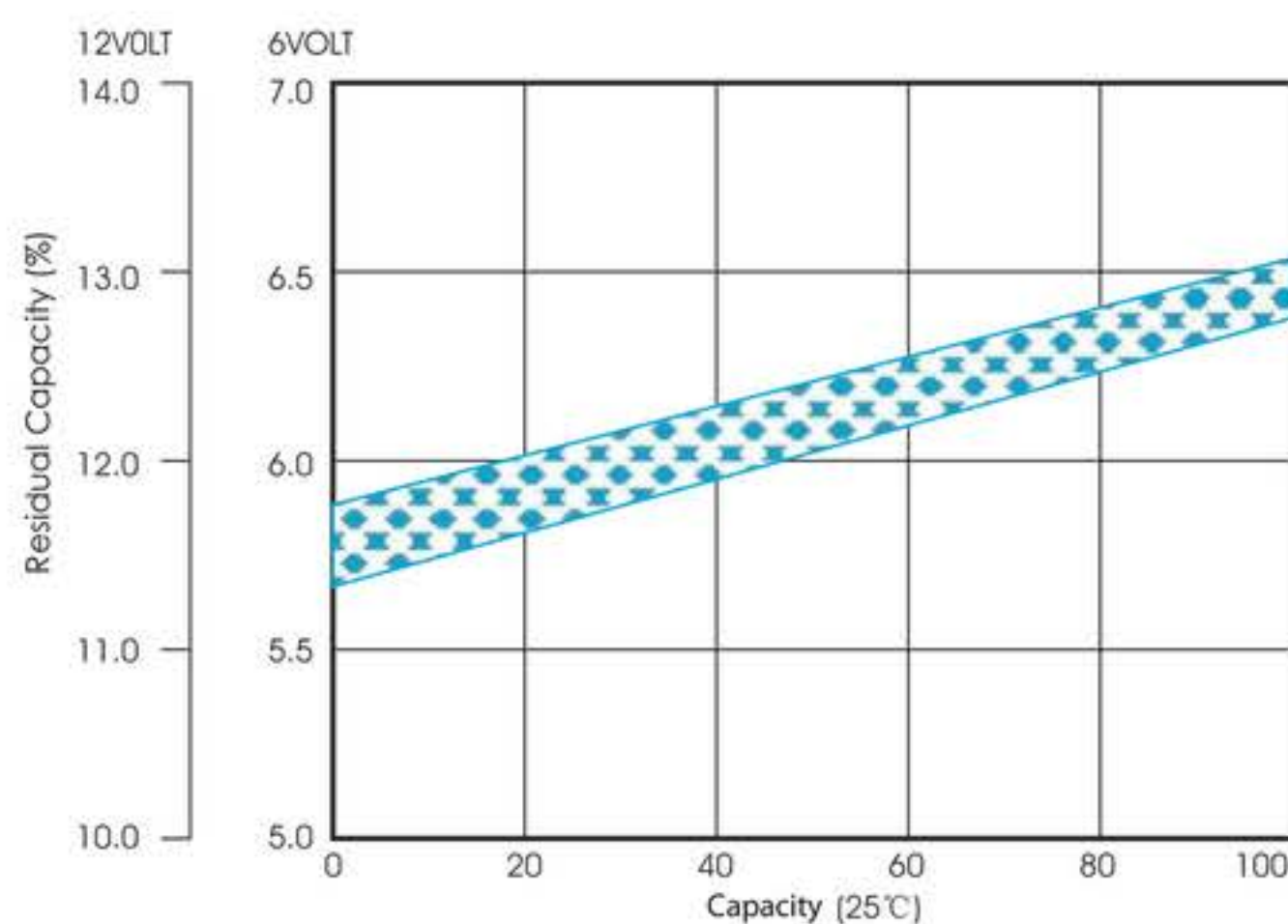
Constant voltage charge characteristic



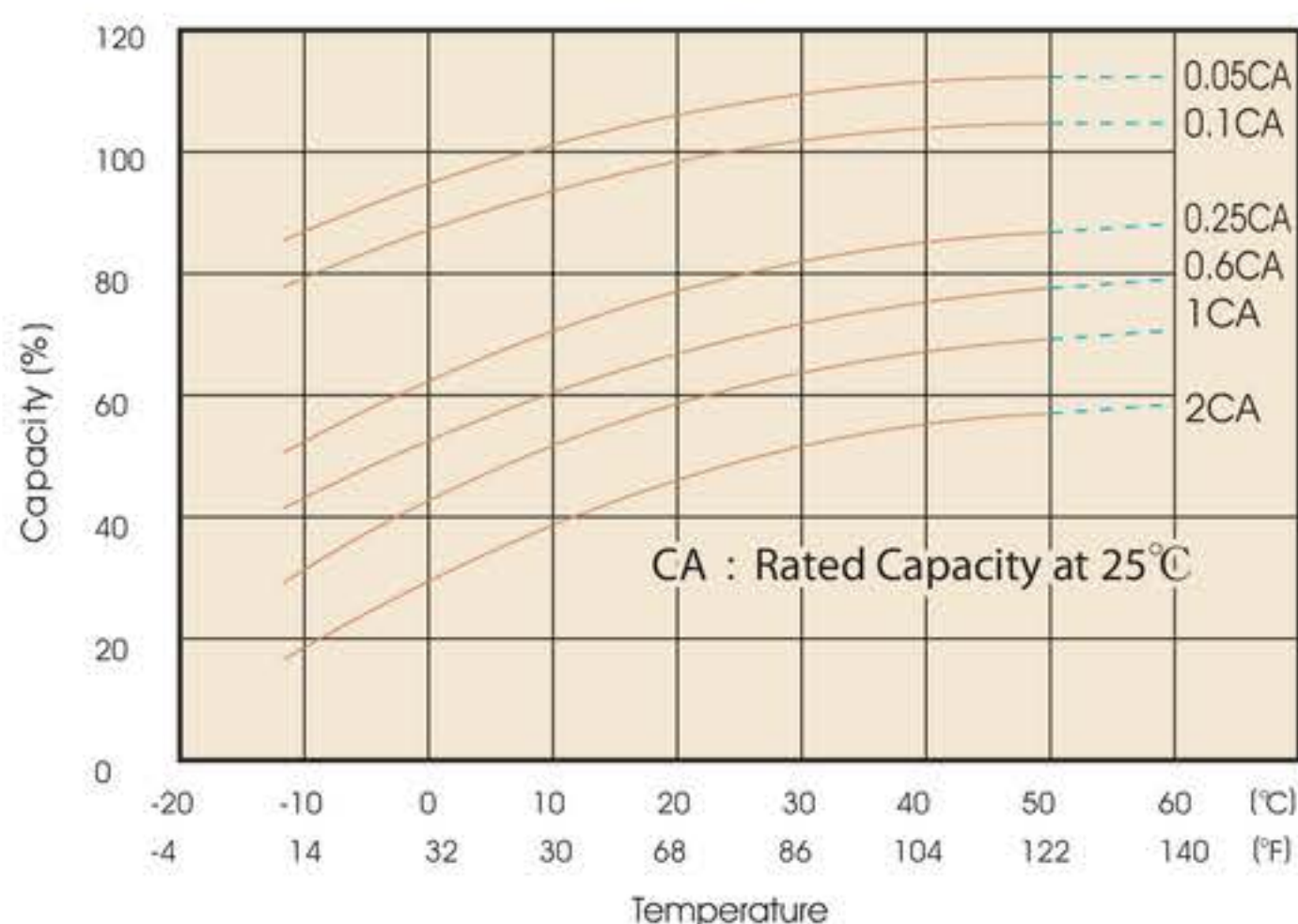
Self-Discharge Characteristics.



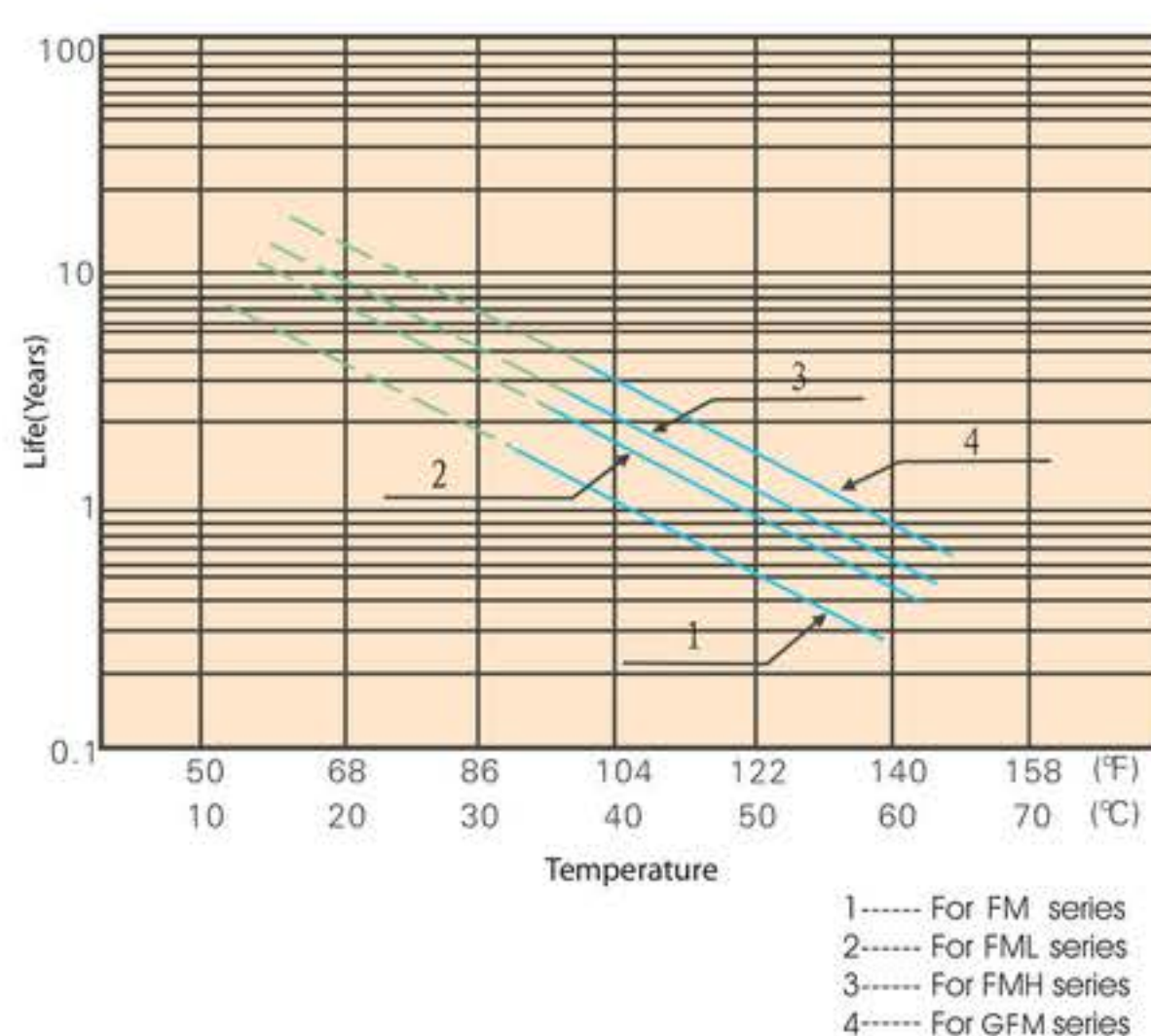
Relationship of OCV and Residual Capacity % (25°C)

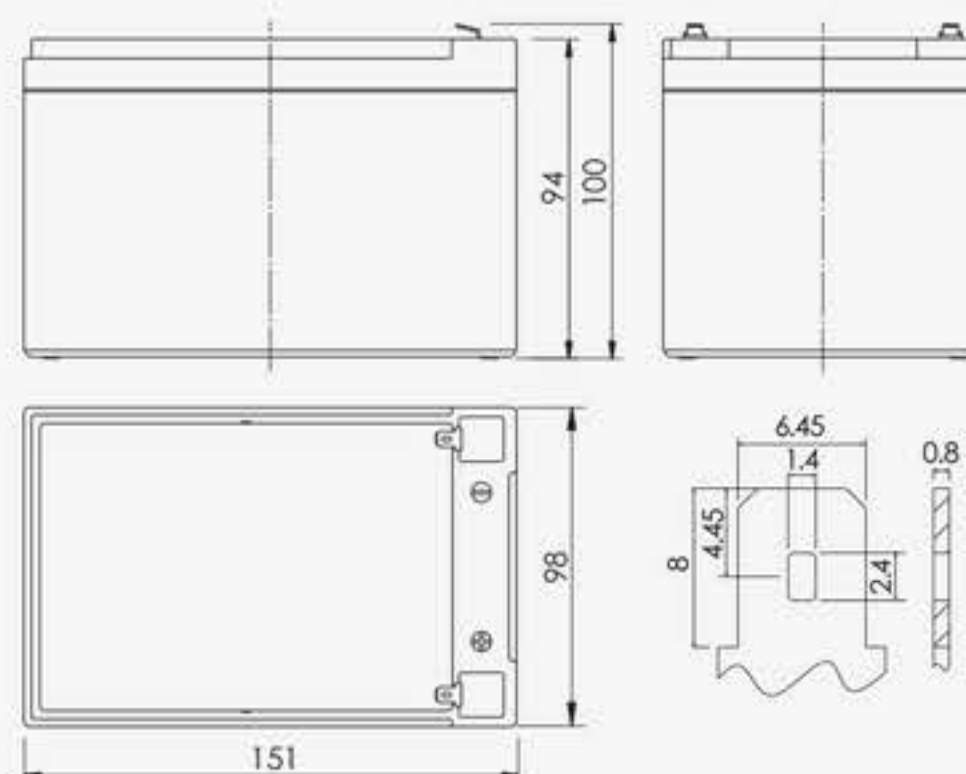


Temperature effects on capacity



Temperature effects on float life





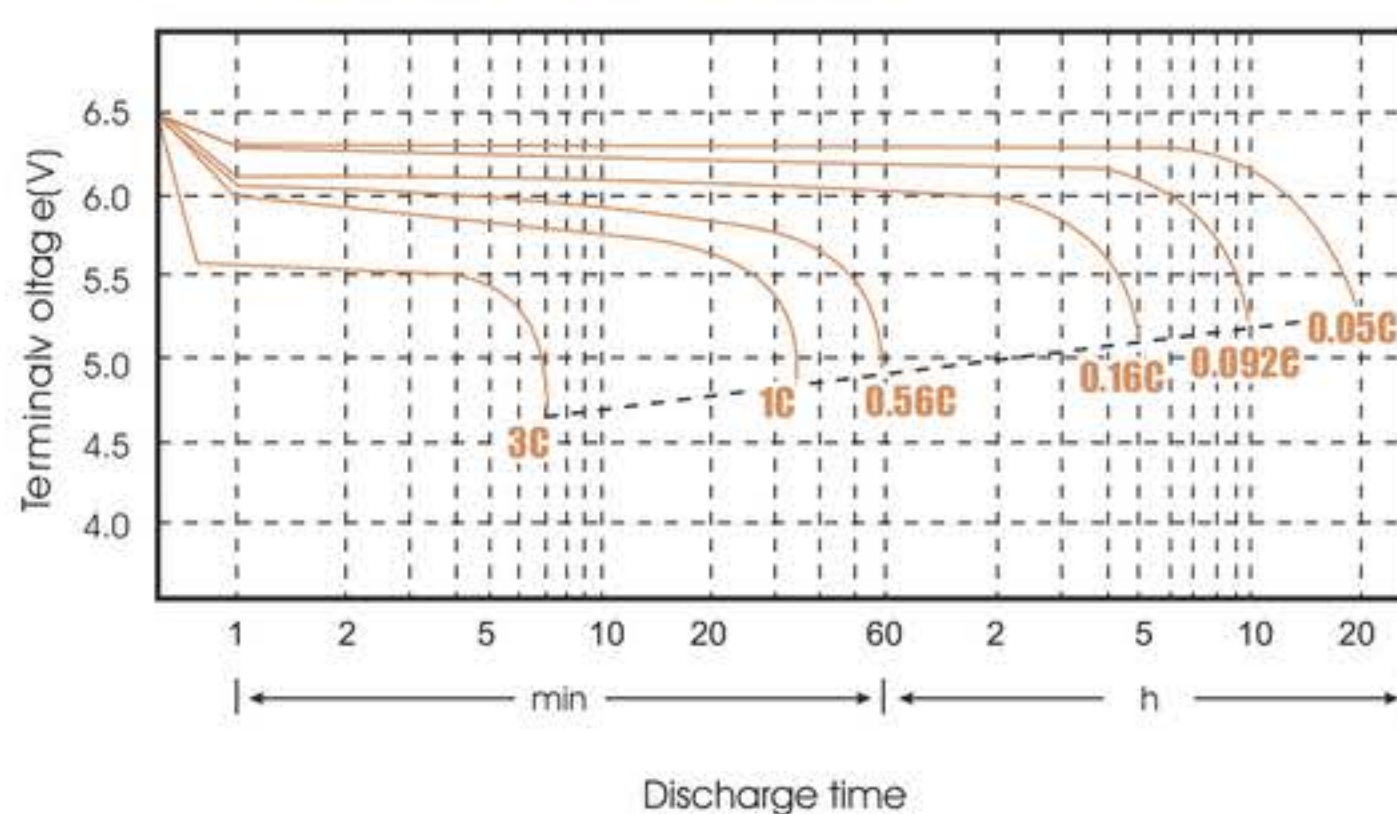
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		12Ah
Dimensions	Total Height (with terminals)	3.94inches(100mm)
	Height	3.70inches(94mm)
	Length	5.94inches(151mm)
	Width	3.86inches(98mm)
Weight		Approx. 7.92pound(3.60kg)

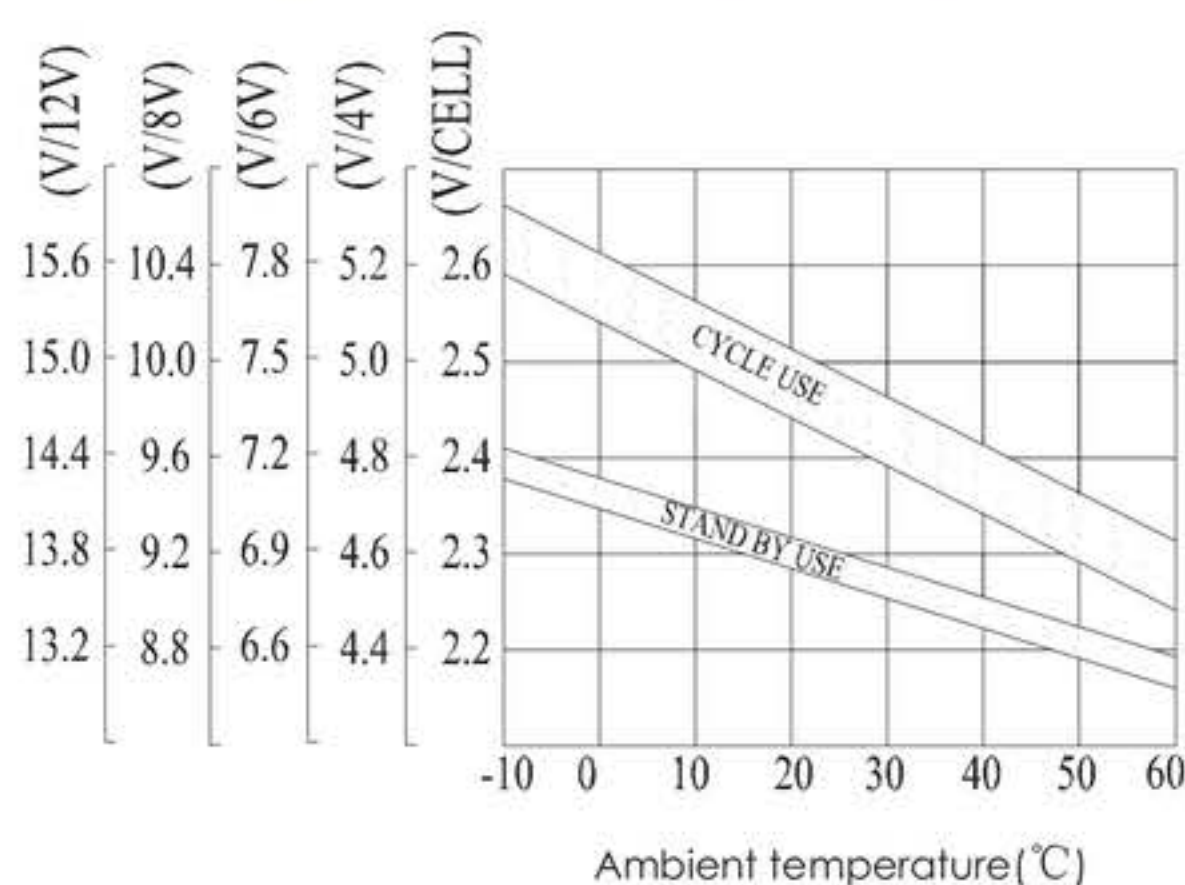
Characteristics

Capacity 77°F(25°C)	20 hour rate (600mA) 10 hour rate (1.12A) 5 hour rate (1.92A) 1 hour rate (7.20A)	12.0Ah 11.2Ah 9.6Ah 7.2Ah
	15 minute Rate (21.1A)	5.3Ah
Internal Resistance	Full charged Battery 77°F(25°C)	17mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C) 77°F(25°C) 32°F(0°C) 5°F(-15°C)	102% 100% 85% 65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage Capacity after 6 month storage Capacity after 12 month storage	91% 81% 60%
Max. Discharge Current 77°F(25°C)	180A(5S)	
Terminal	F2	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 3.6A Voltage 14.4~14.7V/77 F(25 C)
	Float	Voltage 13.5~13.8V/77 F(25 C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

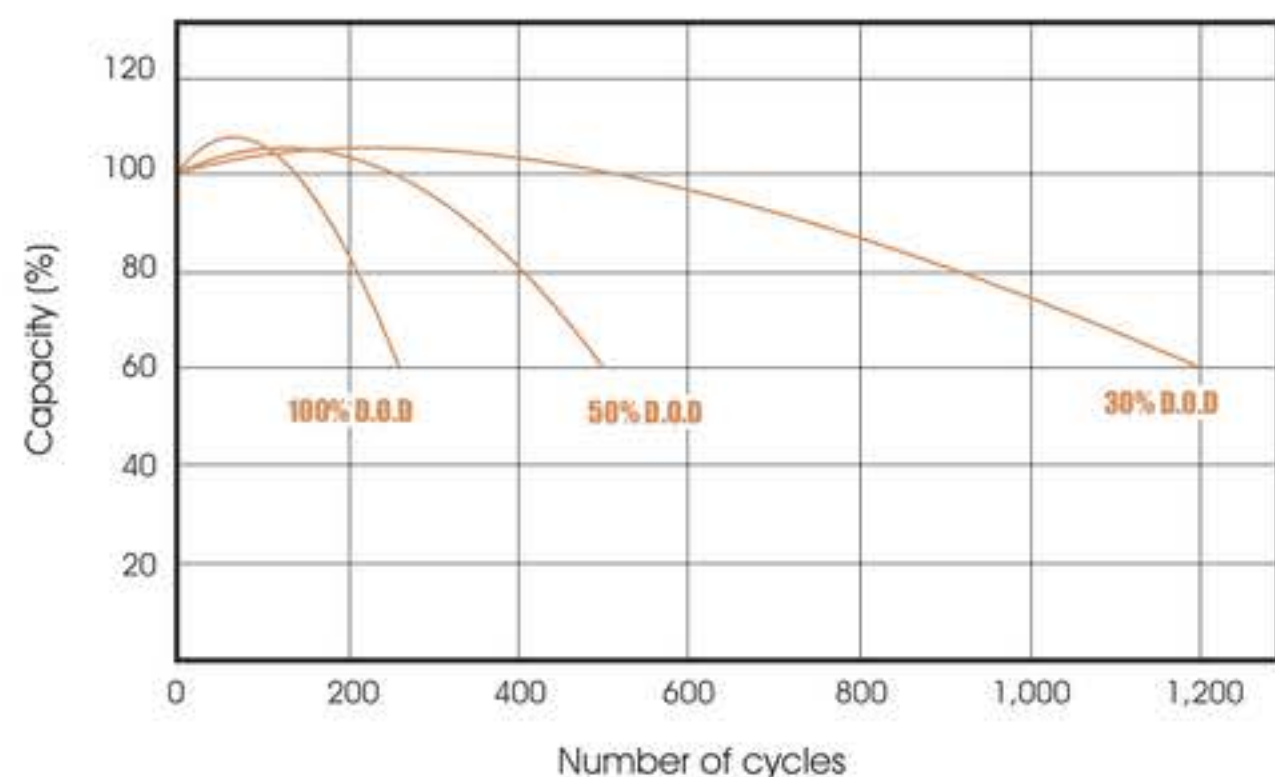
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	45.72	29.04	23.28	12.96	7.92	4.48	3.08	2.47	2.09	1.14	0.61
9.90	44.64	28.20	22.44	12.60	7.72	4.32	3.05	2.45	2.08	1.13	0.61
10.20	42.60	27.00	21.72	12.36	7.50	4.26	3.01	2.42	2.06	1.12	0.60
10.50	40.80	25.92	20.88	12.24	7.32	4.20	3.00	2.40	2.04	1.12	0.60
10.80	38.40	25.68	19.80	11.88	7.08	4.08	2.95	2.34	2.02	1.09	0.59

Constant Power Discharge (WATTS PER CELL@25°C)

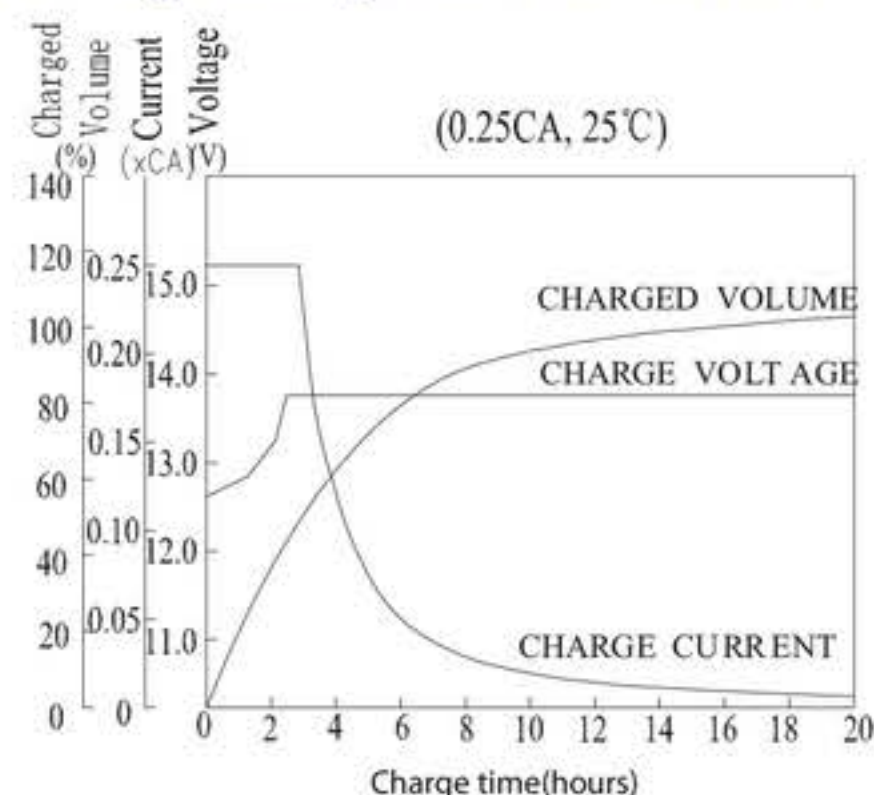
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	509.32	326.41	264.46	147.74	91.40	52.31	36.67	29.44	24.89	13.63	7.30
9.90	497.74	317.25	255.14	144.27	89.20	50.54	36.30	29.20	24.84	13.53	7.28
10.20	475.42	304.02	247.17	141.65	86.78	49.93	35.92	28.94	24.66	13.43	7.25
10.50	455.74	292.38	237.82	140.39	84.77	49.31	35.79	28.68	24.40	13.43	7.22
10.80	429.31	290.18	225.75	136.38	82.13	47.94	35.28	27.99	24.14	13.13	7.10

The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

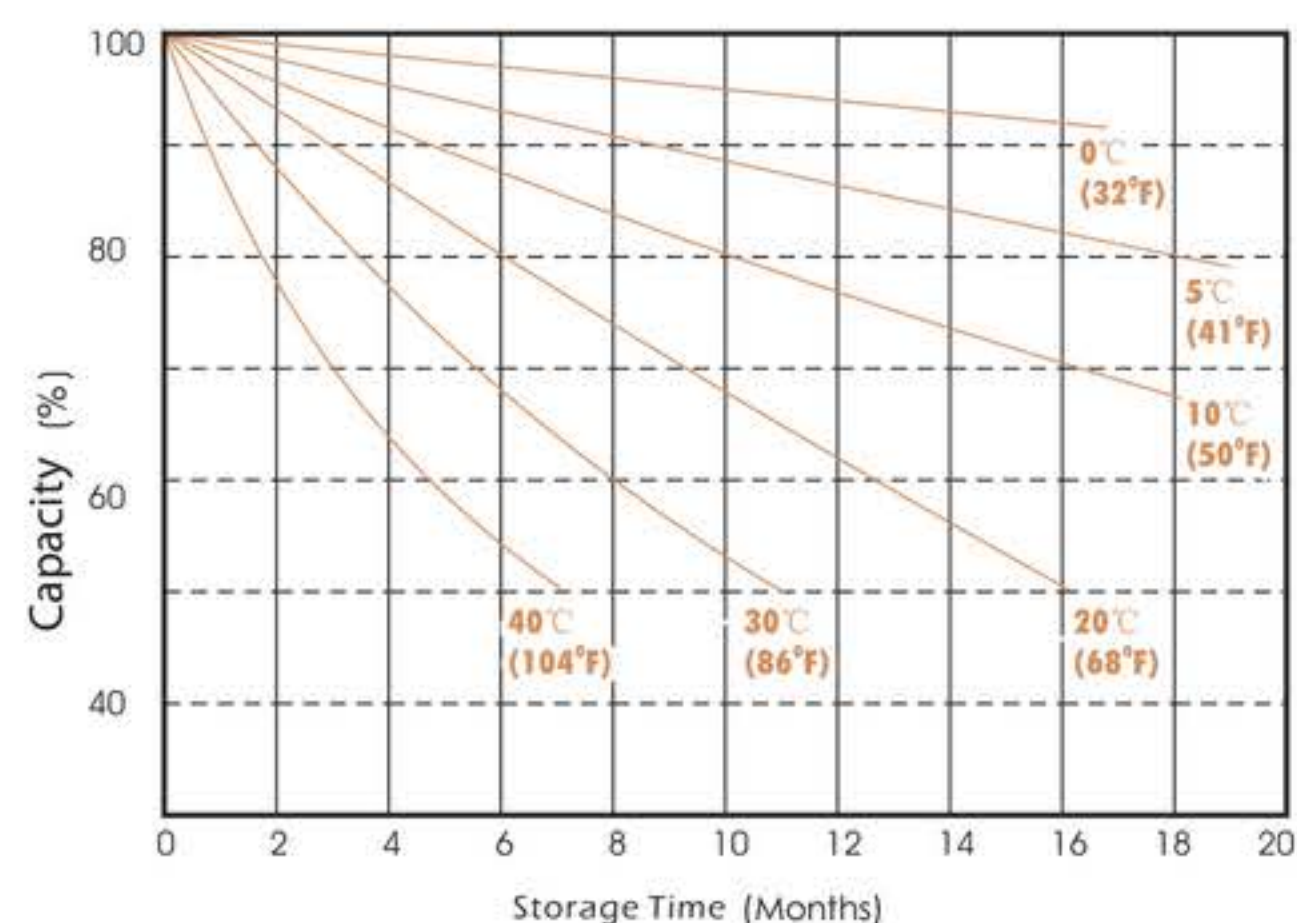
Cycle service life in relation to depth of discharge



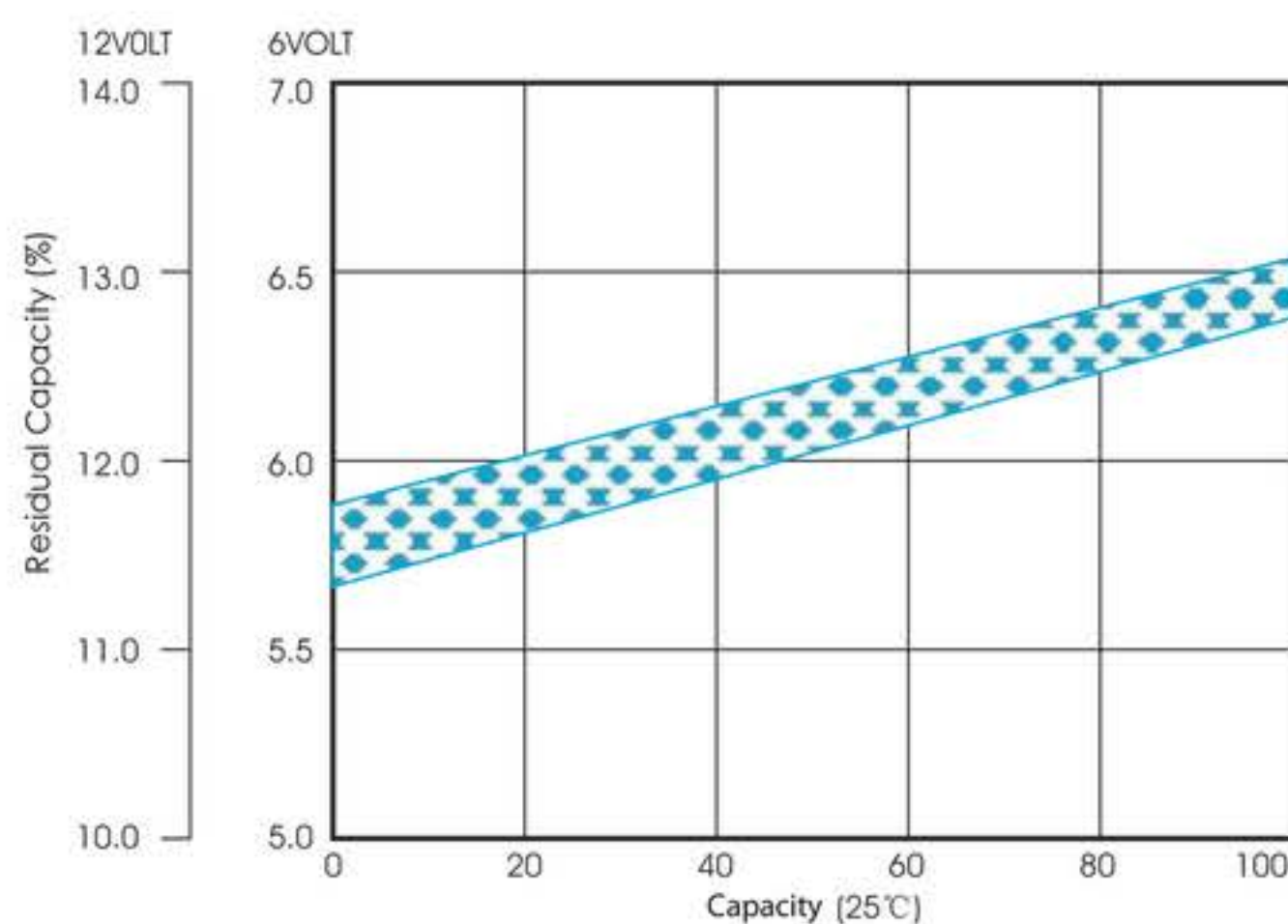
Constant voltage charge characteristic



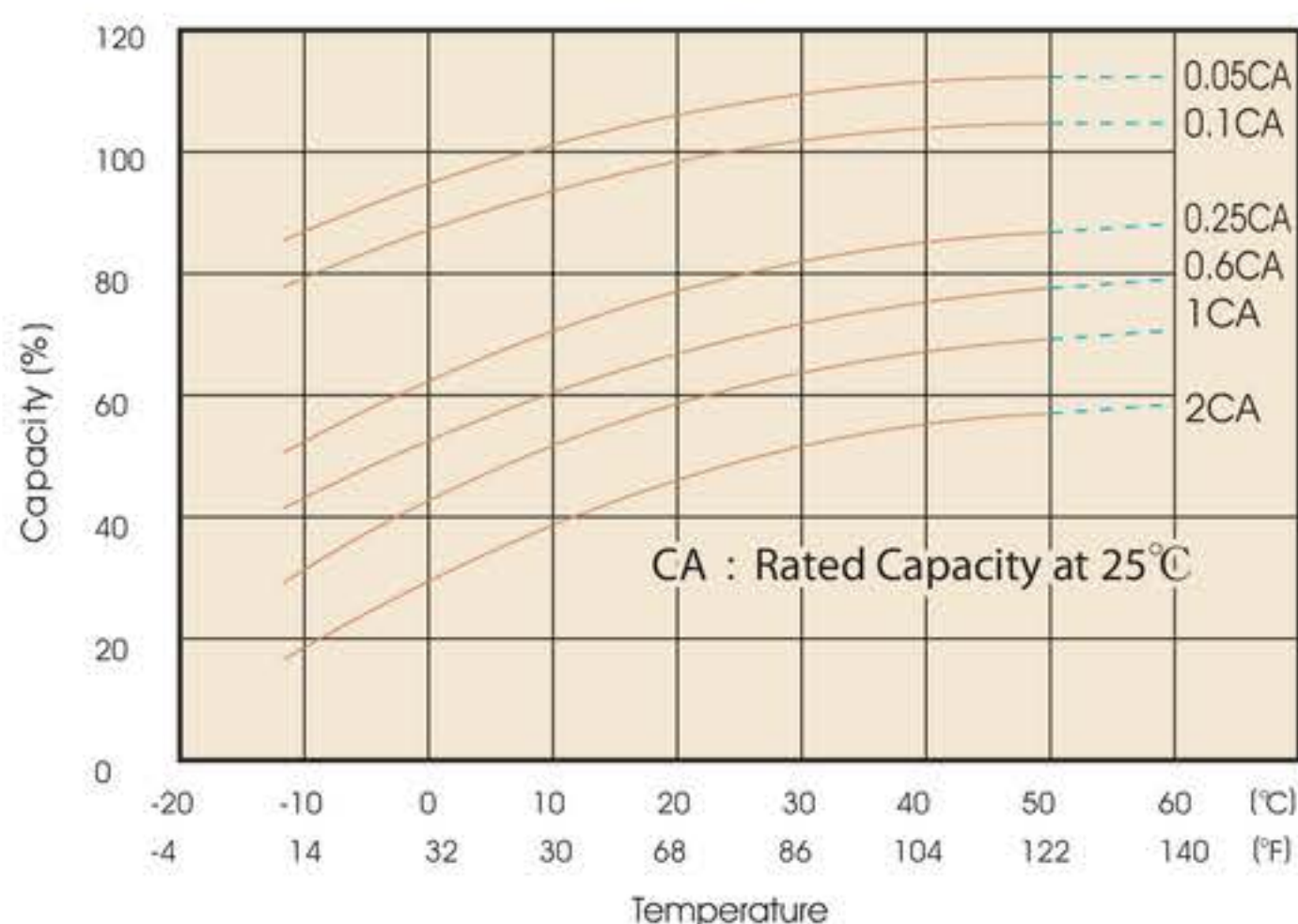
Self-Discharge Characteristics.



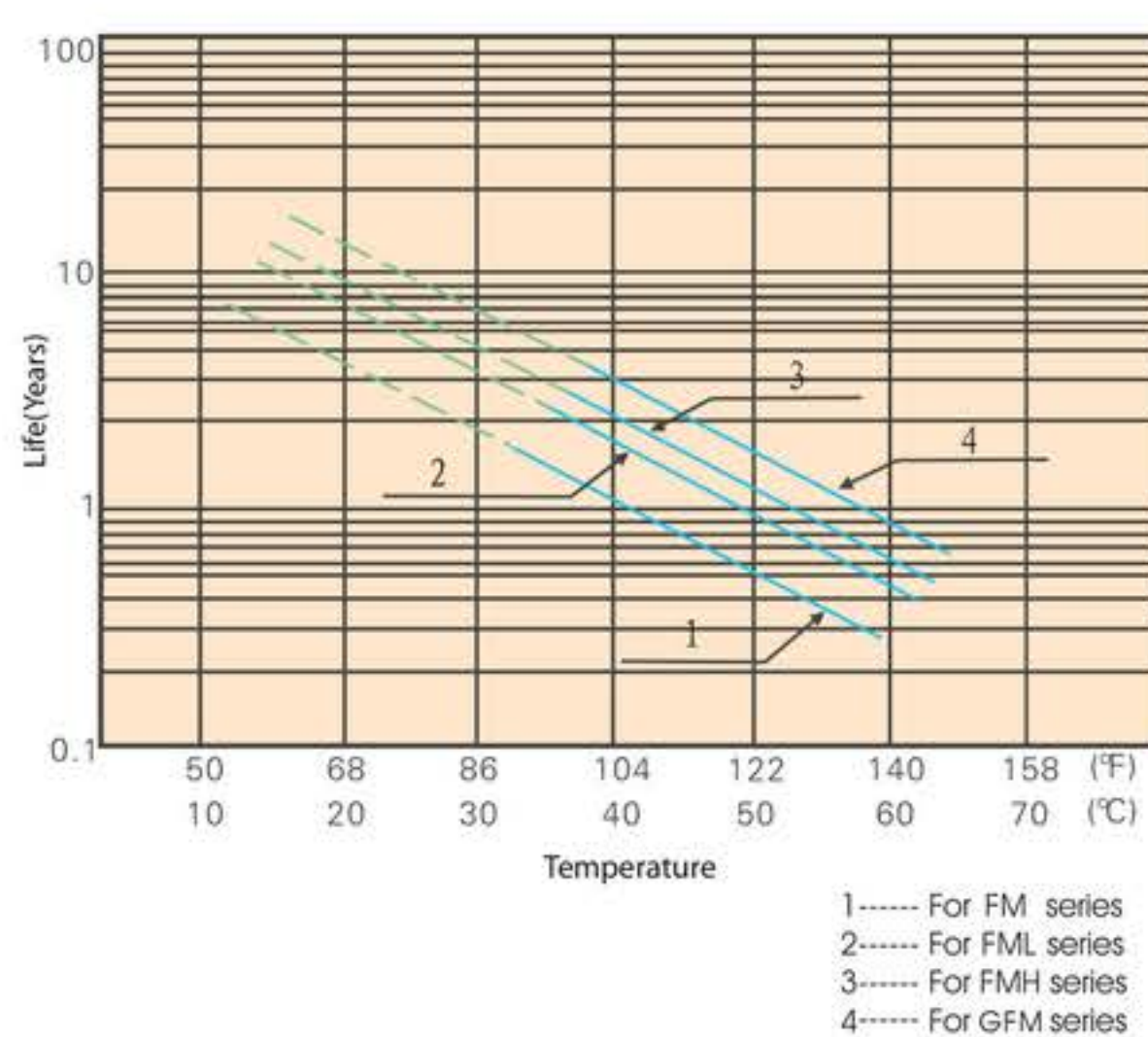
Relationship of OCV and Residual Capacity % (25°C)

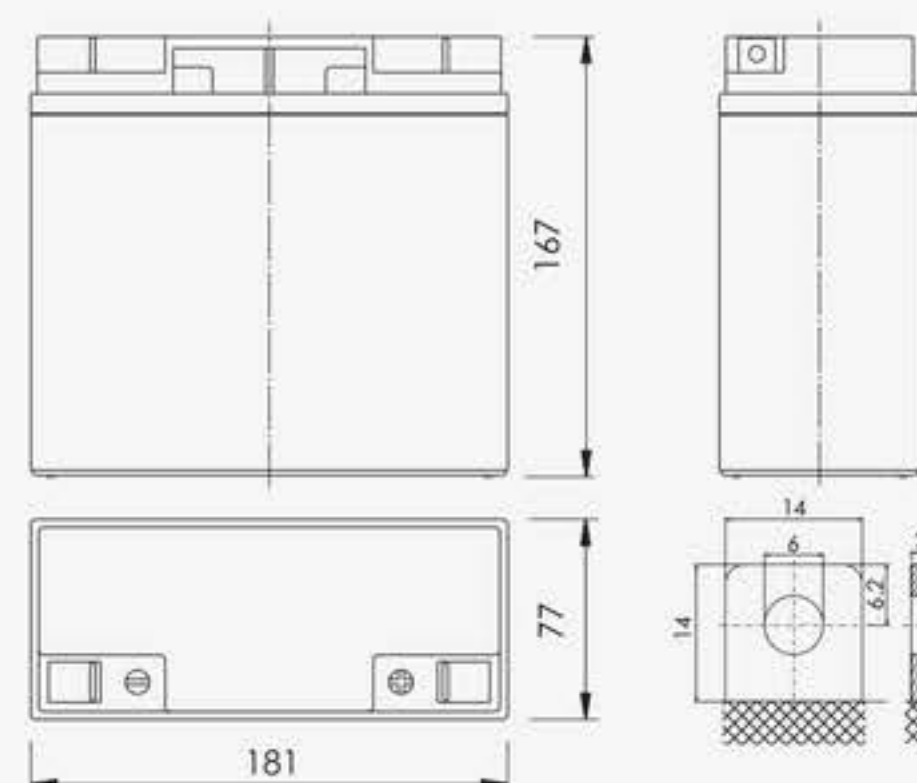


Temperature effects on capacity



Temperature effects on float life





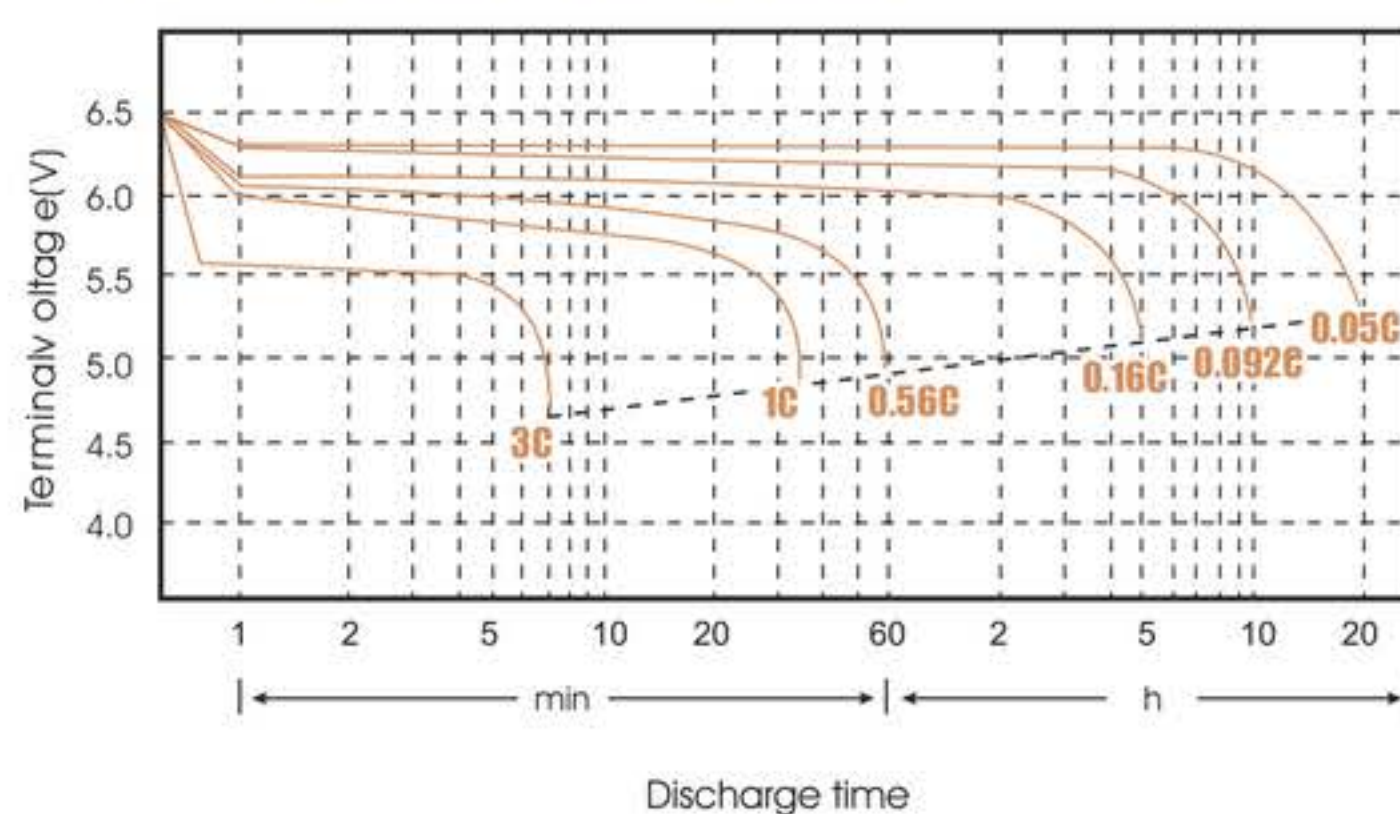
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		18Ah
Dimensions	Total Height (with terminals)	6.57inches (167mm)
	Height	6.57inches (167mm)
	Length	7.13inches (181mm)
	Width	3.03inches (77mm)
Weight		Approx. 11.22pound (5.1kg)

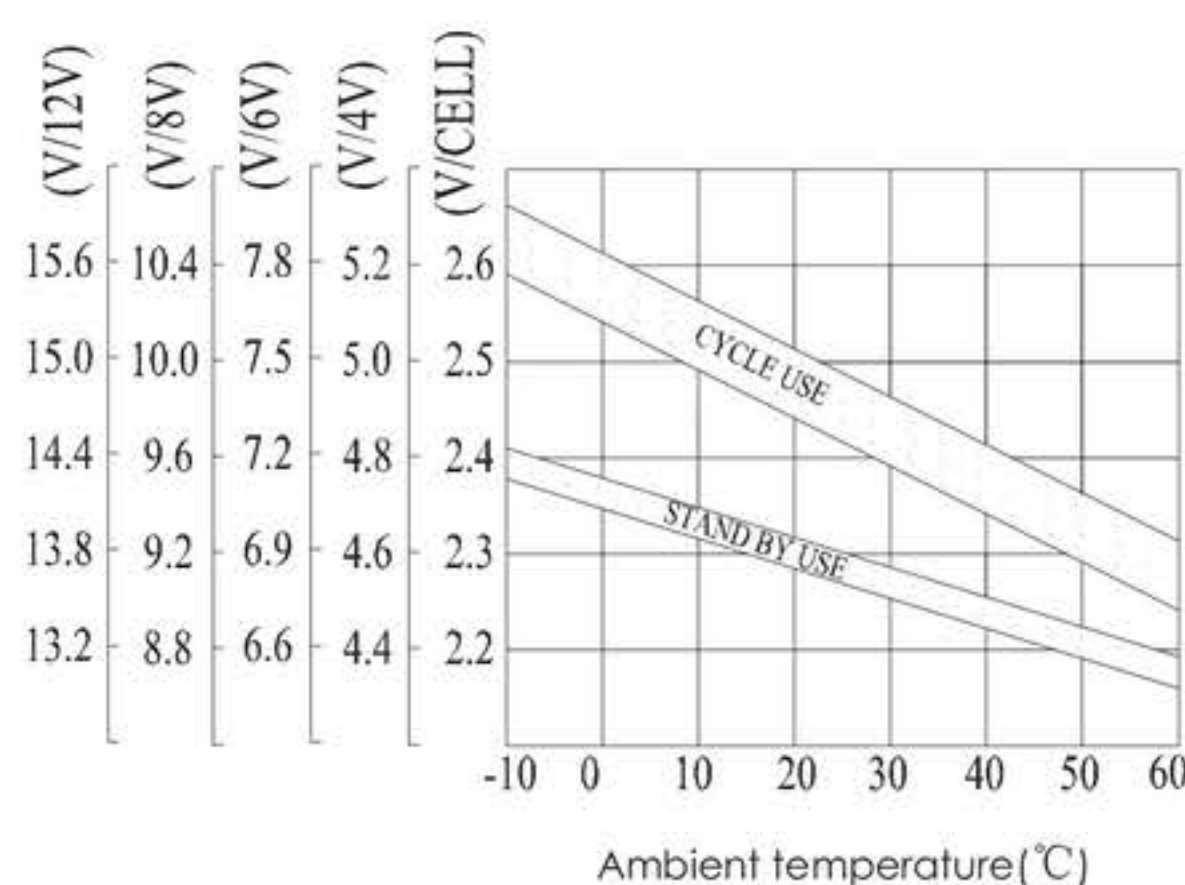
Characteristics

Capacity 77°F(25°C)	20 hour rate (0.9A)	18.0Ah
	10 hour rate (1.67A)	16.7Ah
	5 hour rate (2.88A)	14.4Ah
	1 hour rate (10.8A)	10.8Ah
	15 minute Rate (31.8A)	7.9Ah
Internal Resistance	Full charged Battery 77°F(25°C)	14mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current	77°F(25°C)	270A(5S)
Terminal	B1/M4	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 5.4A Voltage 14.4~14.7V77°F(25°C)
	Float	Voltage 13.5~13.8V77°F(25°C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

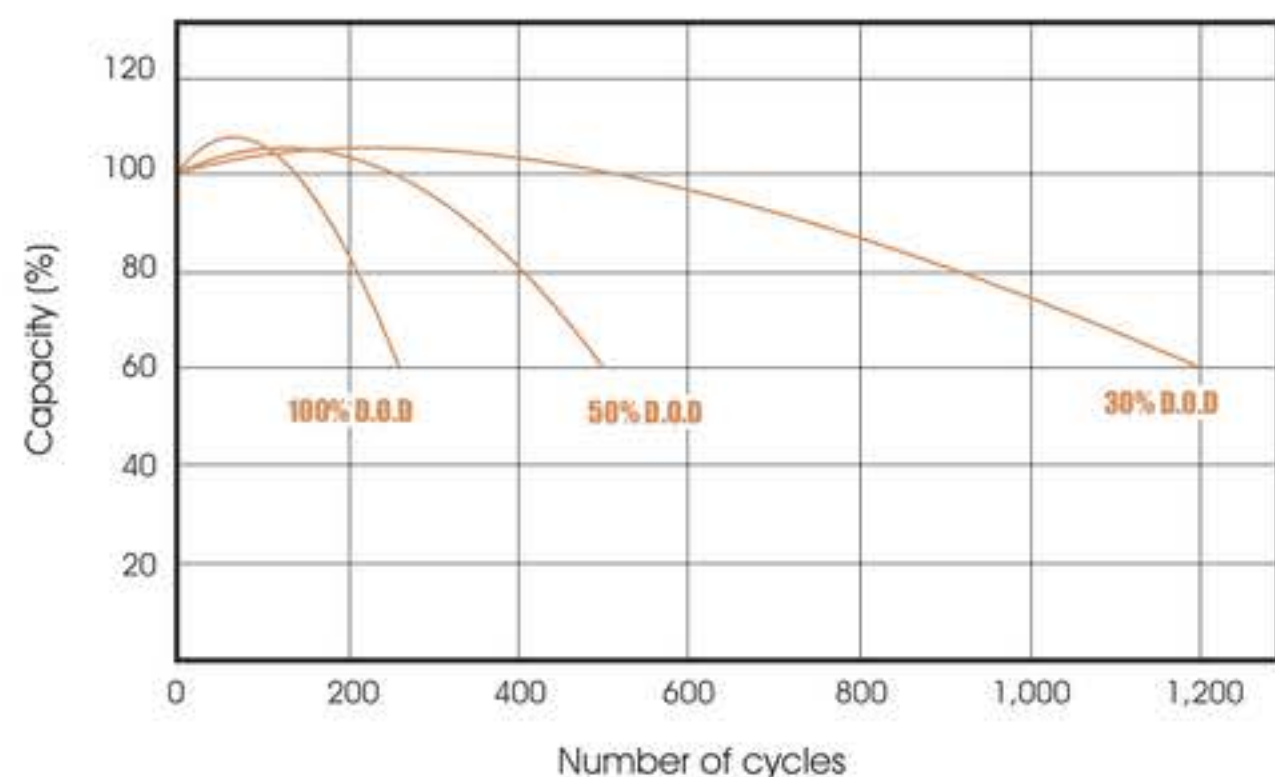
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	68.58	43.56	34.92	19.44	11.88	6.71	4.63	3.71	3.13	1.71	0.91
9.90	66.96	42.30	33.66	18.90	11.57	6.48	4.57	3.67	3.12	1.70	0.91
10.20	63.90	40.50	32.58	18.54	11.25	6.39	4.52	3.64	3.10	1.68	0.90
10.50	61.20	38.88	31.32	18.36	10.98	6.30	4.50	3.60	3.06	1.68	0.90
10.80	57.60	38.52	29.70	17.82	10.62	6.12	4.43	3.51	3.02	1.64	0.88

Constant Power Discharge (WATTS PER CELL@25°C)

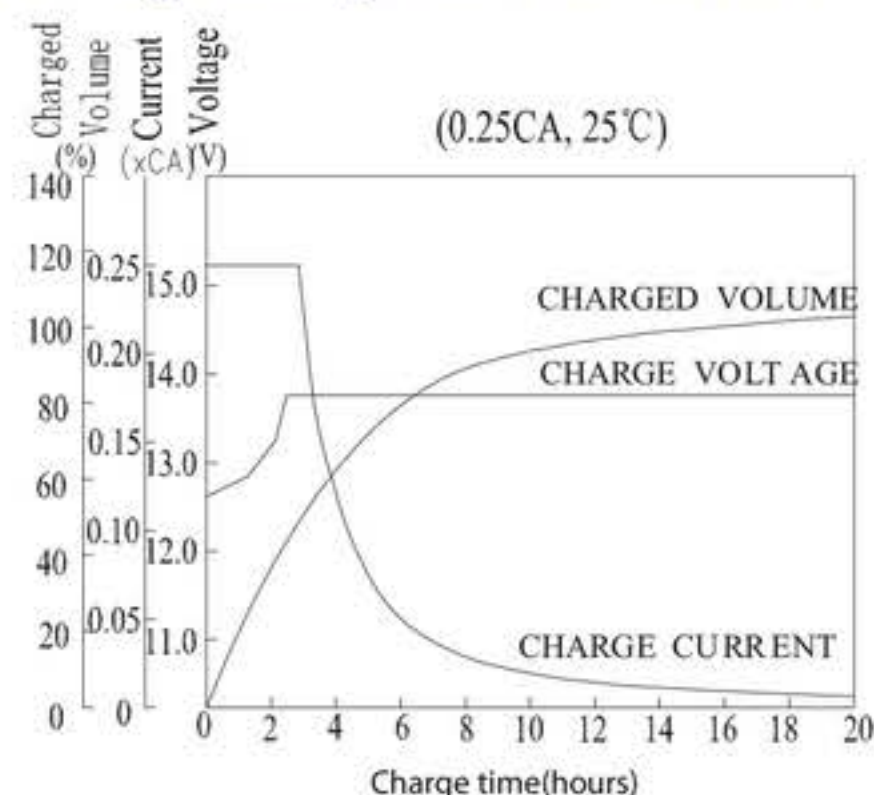
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	763.98	489.61	396.69	221.62	137.10	78.47	55.00	44.16	37.33	20.45	10.95
9.90	746.60	475.88	382.71	216.41	133.80	75.80	54.45	43.81	37.25	20.30	10.91
10.20	713.12	456.03	370.76	212.47	130.16	74.89	53.88	43.41	36.99	20.14	10.88
10.50	683.60	438.57	356.73	210.59	127.15	73.96	53.69	43.02	36.60	20.14	10.84
10.80	643.97	435.28	338.62	204.57	123.19	71.91	52.91	41.98	36.21	19.70	10.65

The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

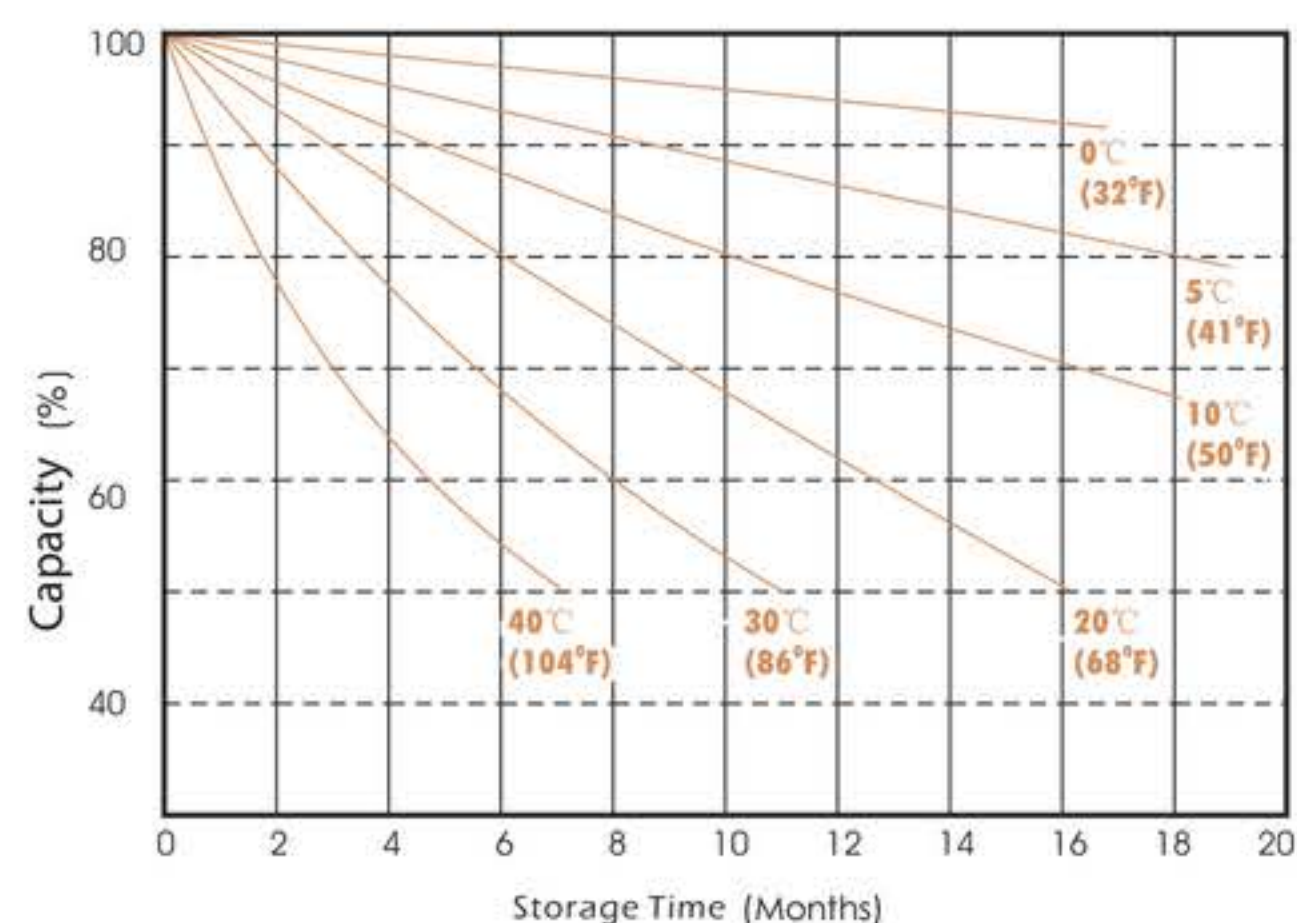
Cycle service life in relation to depth of discharge



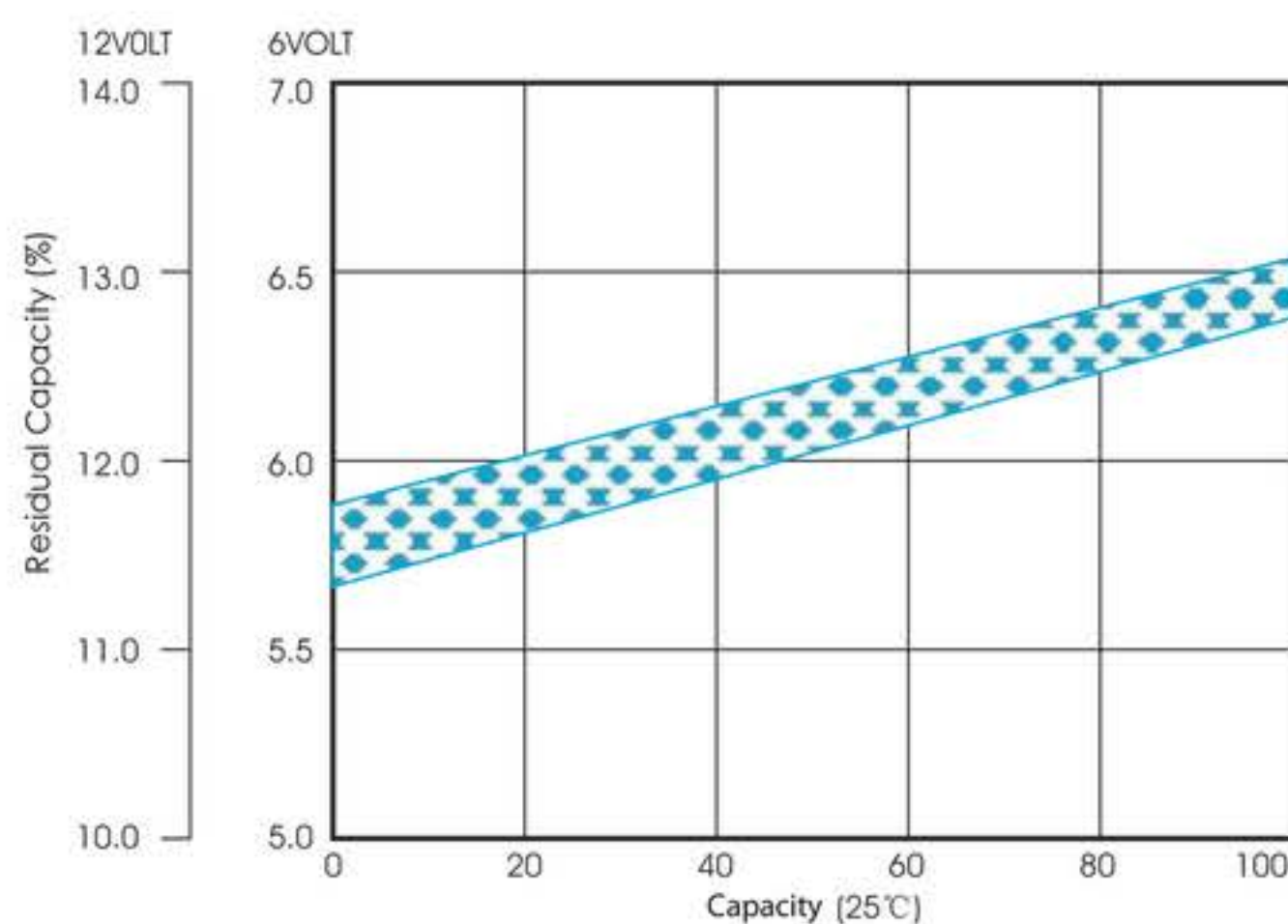
Constant voltage charge characteristic



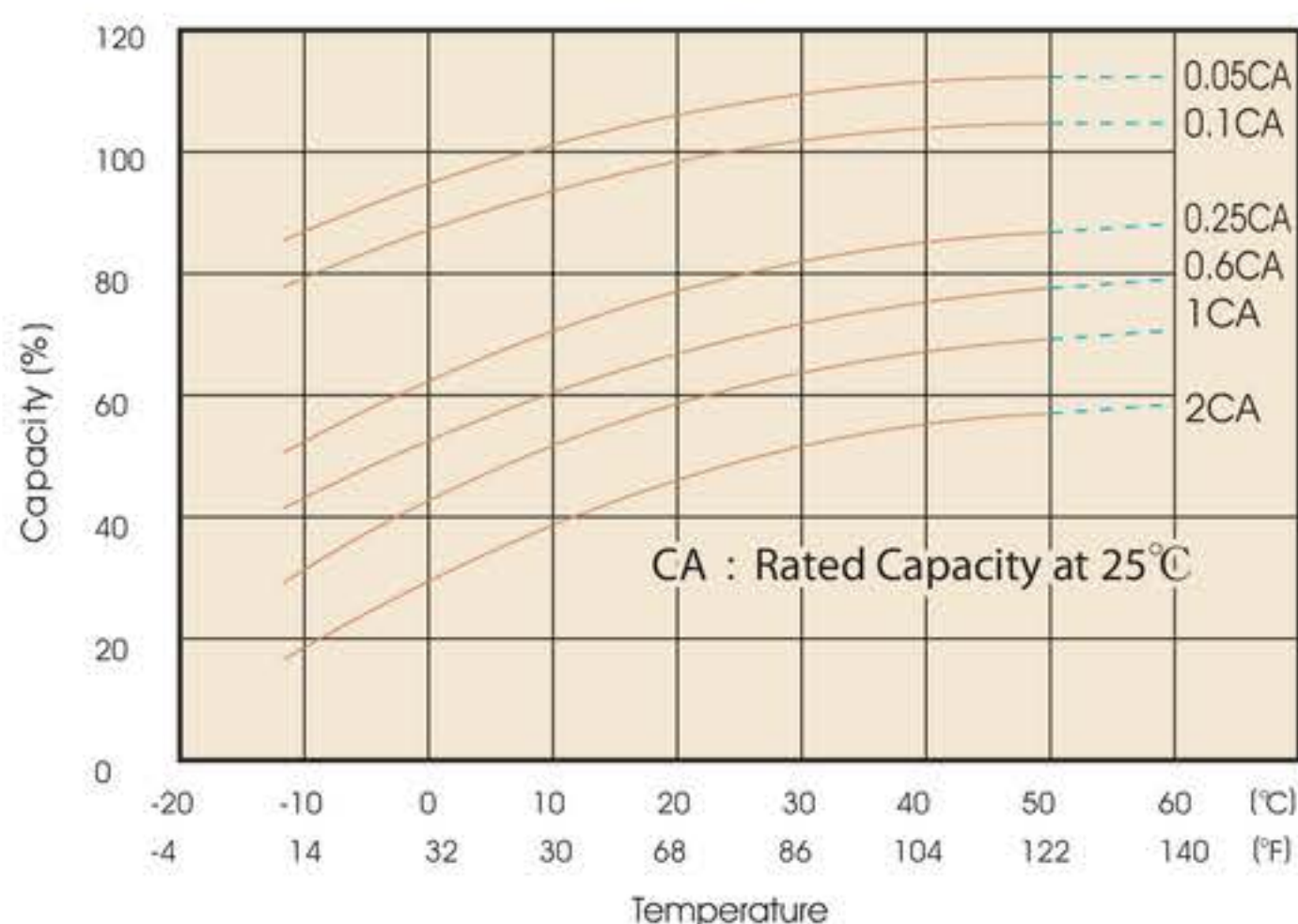
Self-Discharge Characteristics.



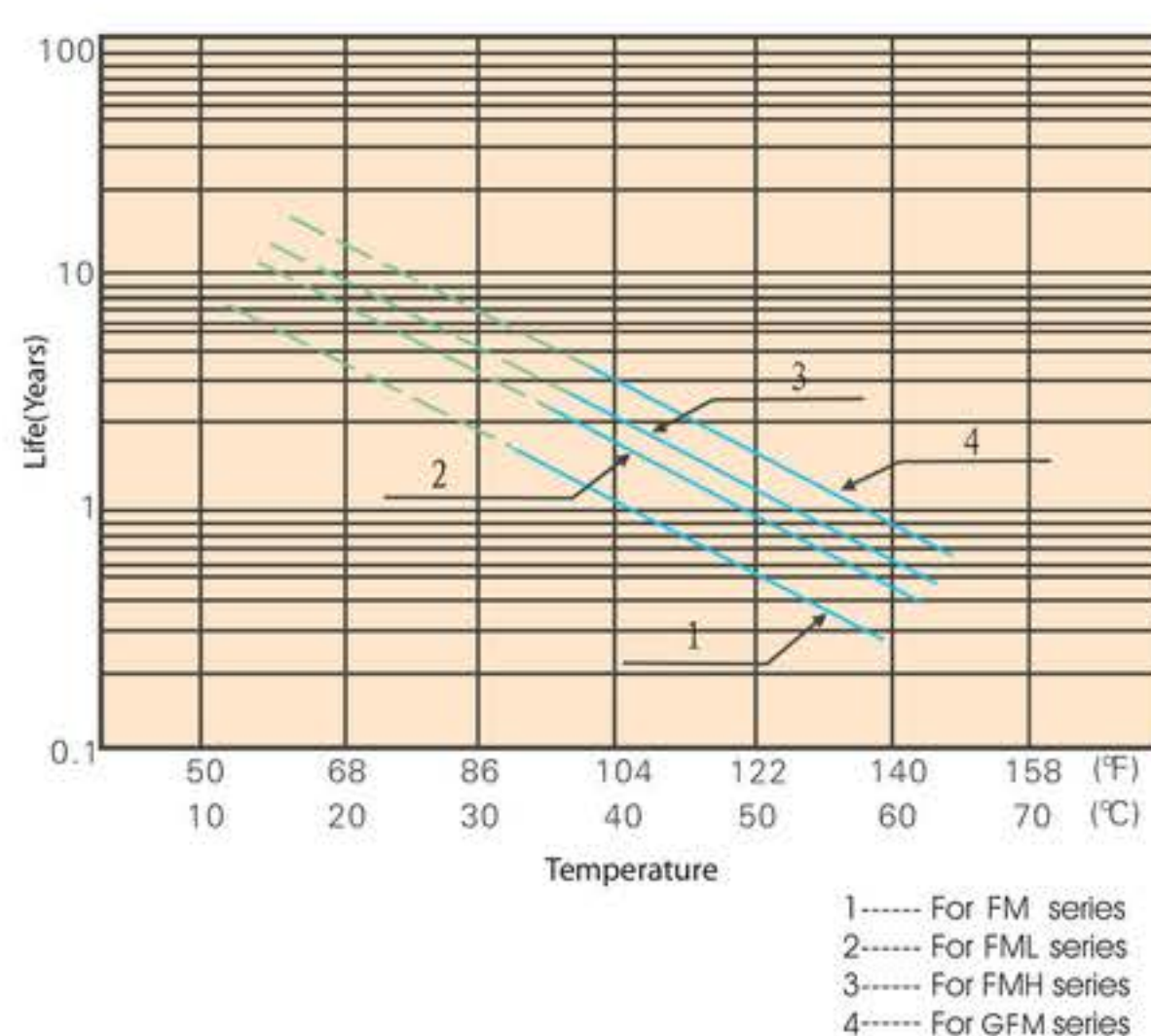
Relationship of OCV and Residual Capacity % (25°C)

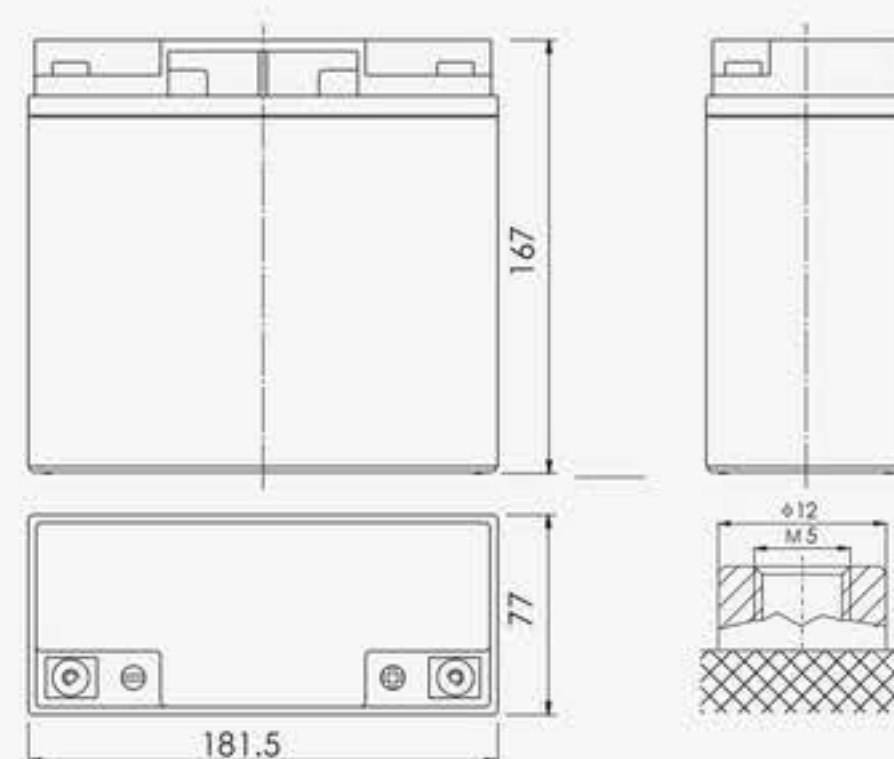


Temperature effects on capacity



Temperature effects on float life





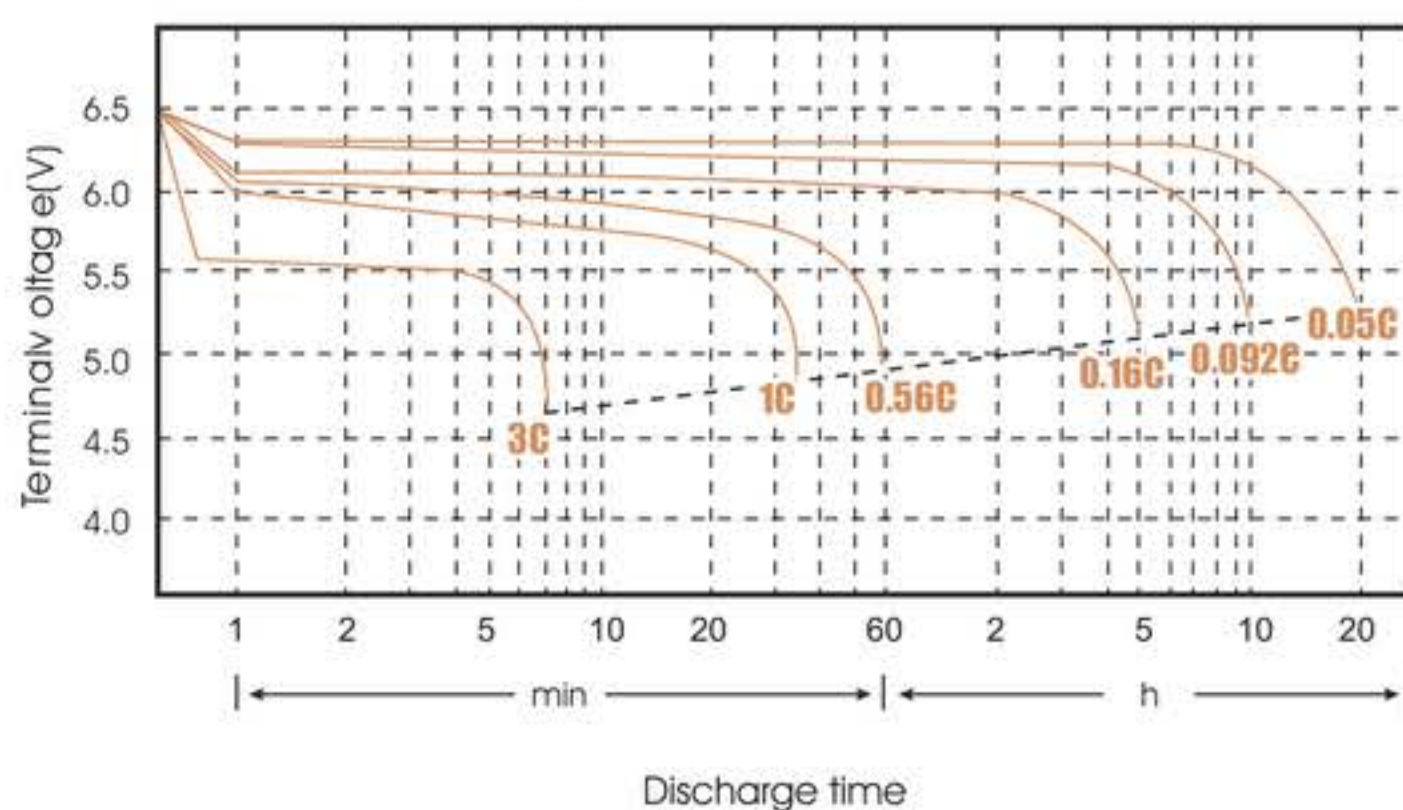
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		22Ah
Dimensions	Total Height (with terminals)	6.57inches (167mm)
	Height	6.57inches (167mm)
	Length	7.15inches (181.5mm)
	Width	3.03inches (77mm)
Weight		Approx. 13.86pound (6.3kg)

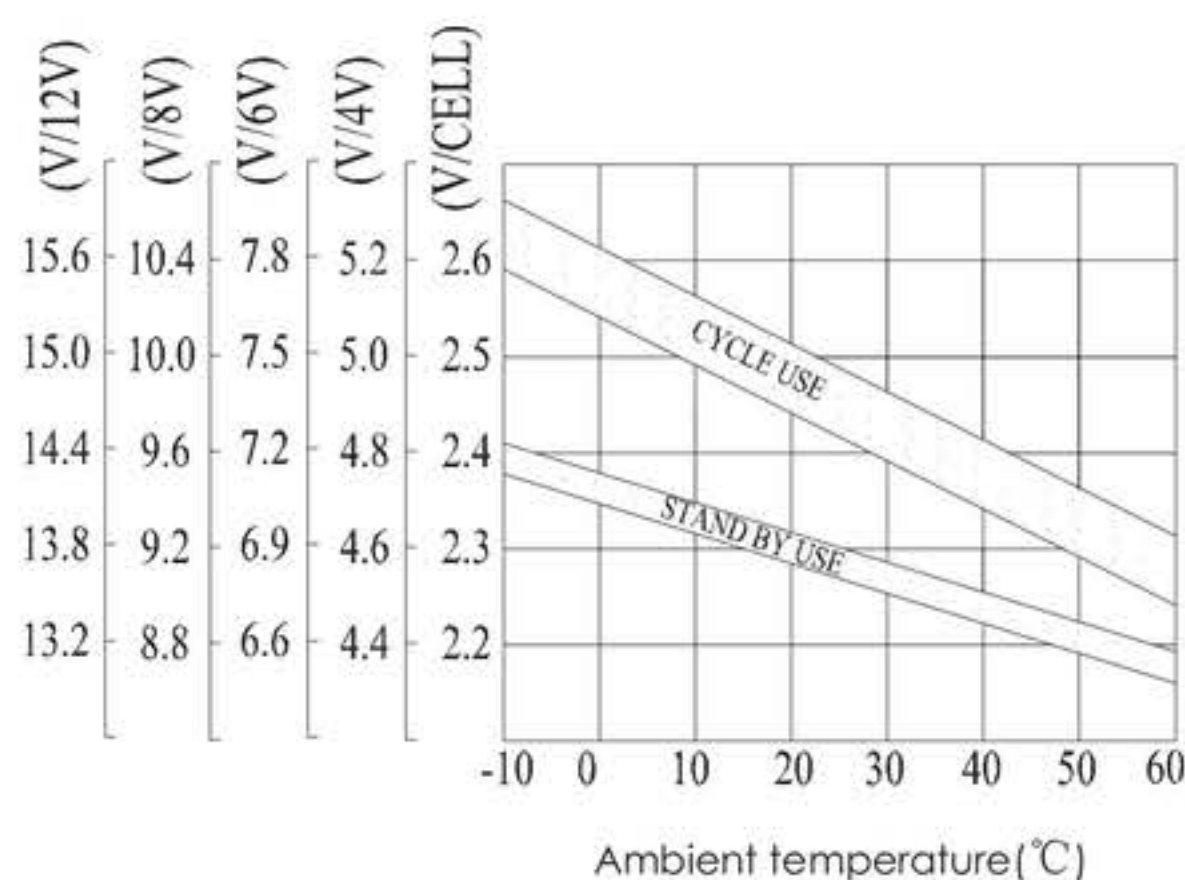
Characteristics

Capacity 77°F(25°C)	20 hour rate (1.1A)	22Ah
	10 hour rate (2.05A)	20.5Ah
	5 hour rate (3.52A)	17.6Ah
	1 hour rate (13.2A)	13.2Ah
	15 minute Rate (38.7A)	9.7Ah
Internal Resistance	Full charged Battery 77°F(25°C)	12mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	330A(5S)	
Terminal	M4	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 6.6A Voltage 14.4~14.7V/77 F(25 C)
	Float	Voltage 13.5~13.8V/77 F(25 C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

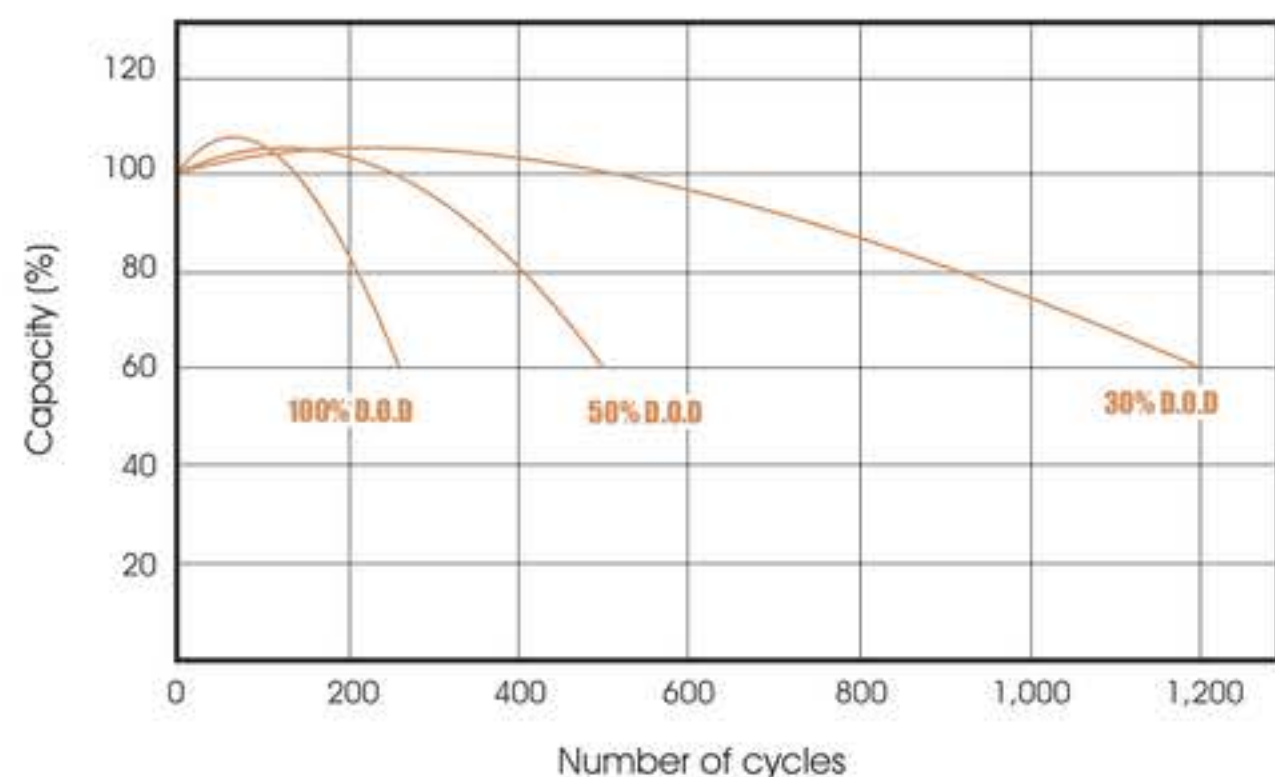
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	83.82	53.24	42.68	23.76	14.52	8.21	5.65	4.53	3.83	2.09	1.11
9.90	81.84	51.70	41.14	23.10	14.15	7.92	5.59	4.49	3.81	2.07	1.11
10.20	78.10	49.50	39.82	22.66	13.75	7.81	5.52	4.44	3.78	2.05	1.10
10.50	74.80	47.52	38.28	22.44	13.42	7.70	5.50	4.40	3.74	2.05	1.10
10.80	70.40	47.08	36.30	21.78	12.98	7.48	5.41	4.29	3.70	2.00	1.08

Constant Power Discharge (WATTS PER CELL@25°C)

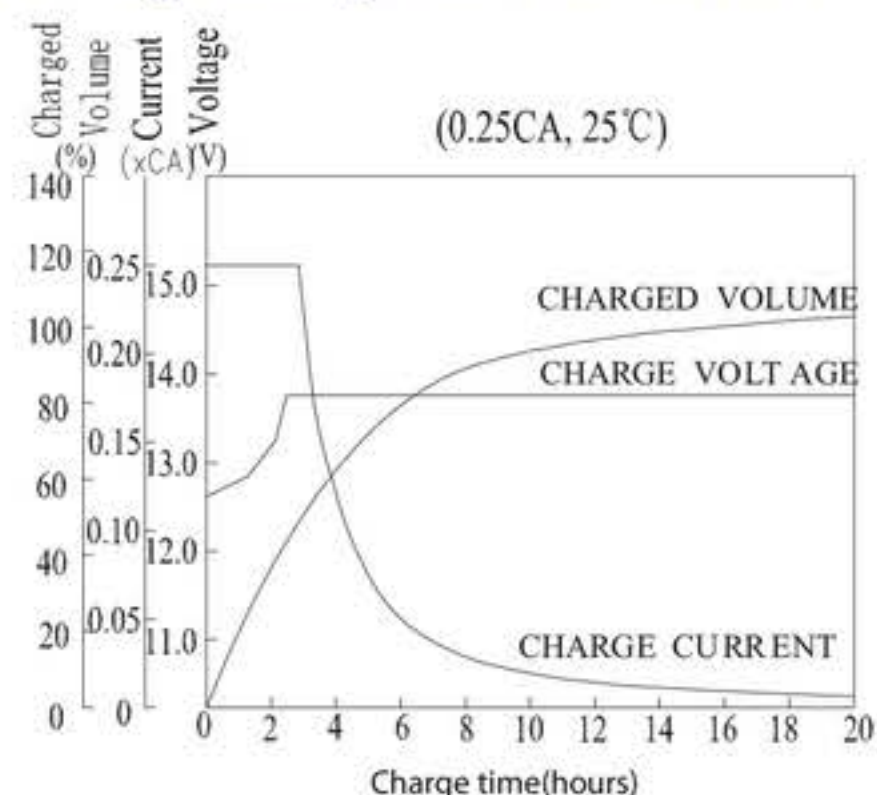
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	933.75	598.42	484.84	270.86	167.56	95.91	67.23	53.98	45.63	25.00	13.39
9.90	912.52	581.63	467.76	264.50	163.53	92.65	66.55	53.54	45.53	24.81	13.34
10.20	871.60	557.37	453.15	259.68	159.09	91.53	65.85	53.06	45.21	24.62	13.29
10.50	835.52	536.03	436.01	257.39	155.40	90.40	65.62	52.58	44.73	24.62	13.24
10.80	787.07	532.00	413.87	250.03	150.57	87.89	64.67	51.31	44.25	24.07	13.02

The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

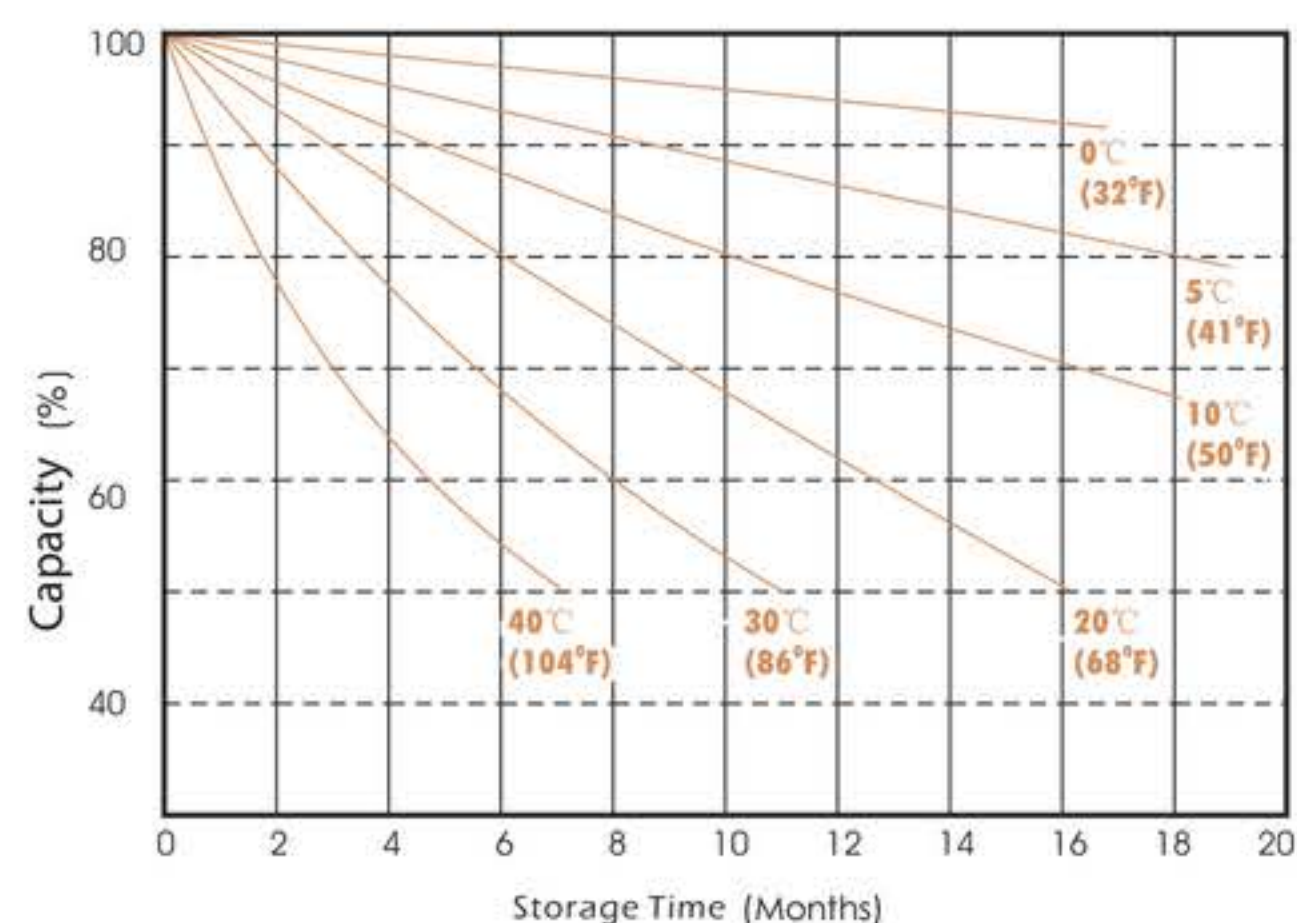
Cycle service life in relation to depth of discharge



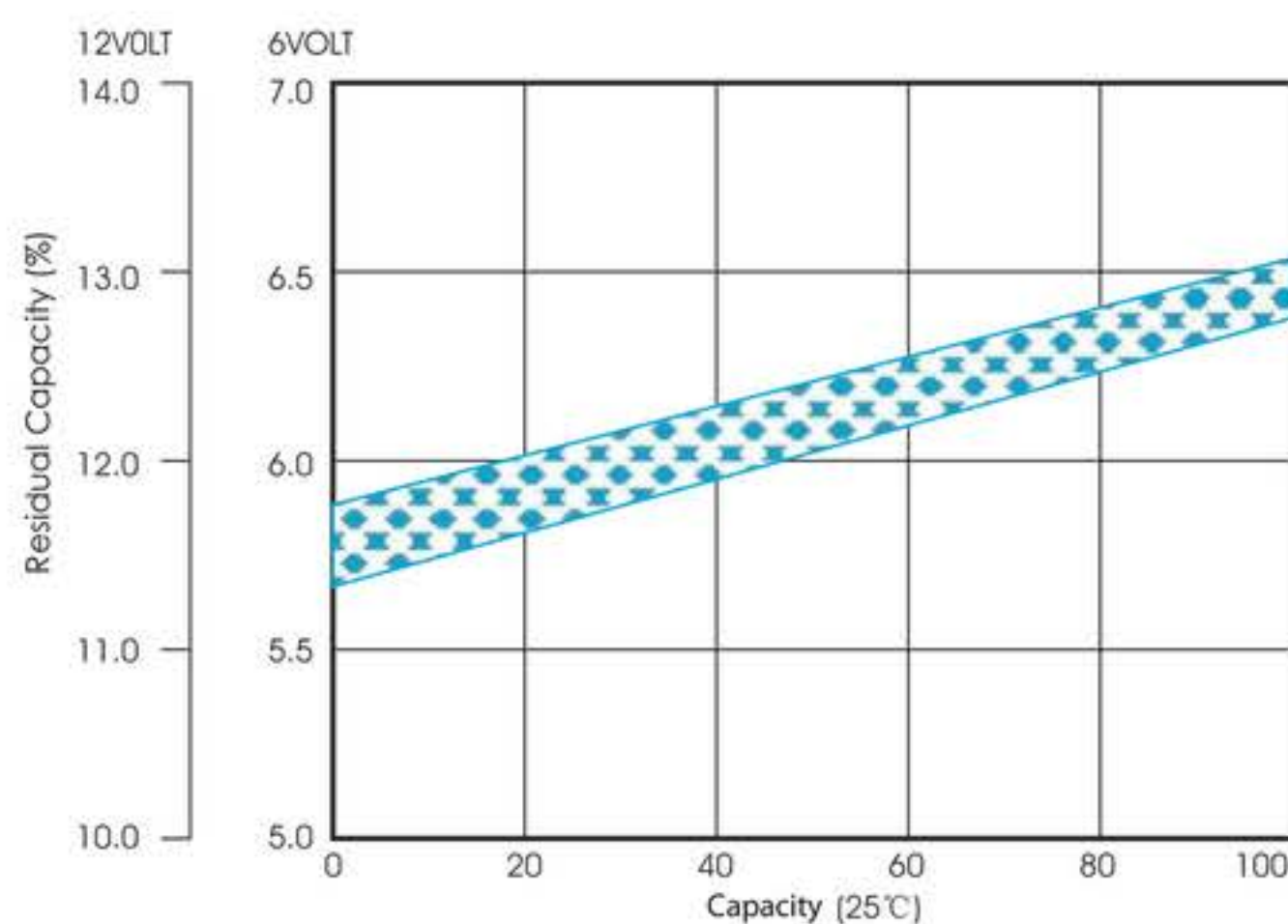
Constant voltage charge characteristic



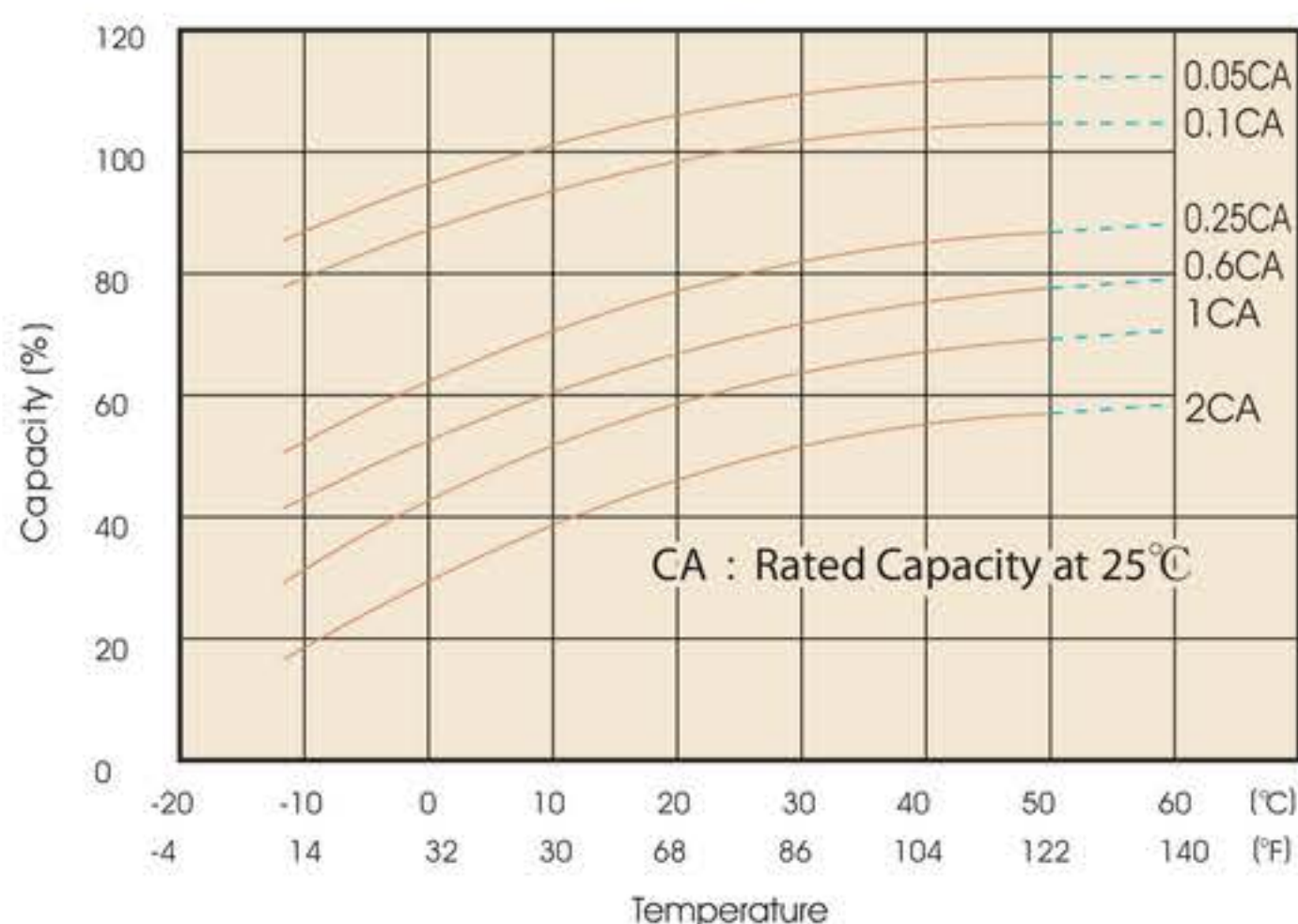
Self-Discharge Characteristics.



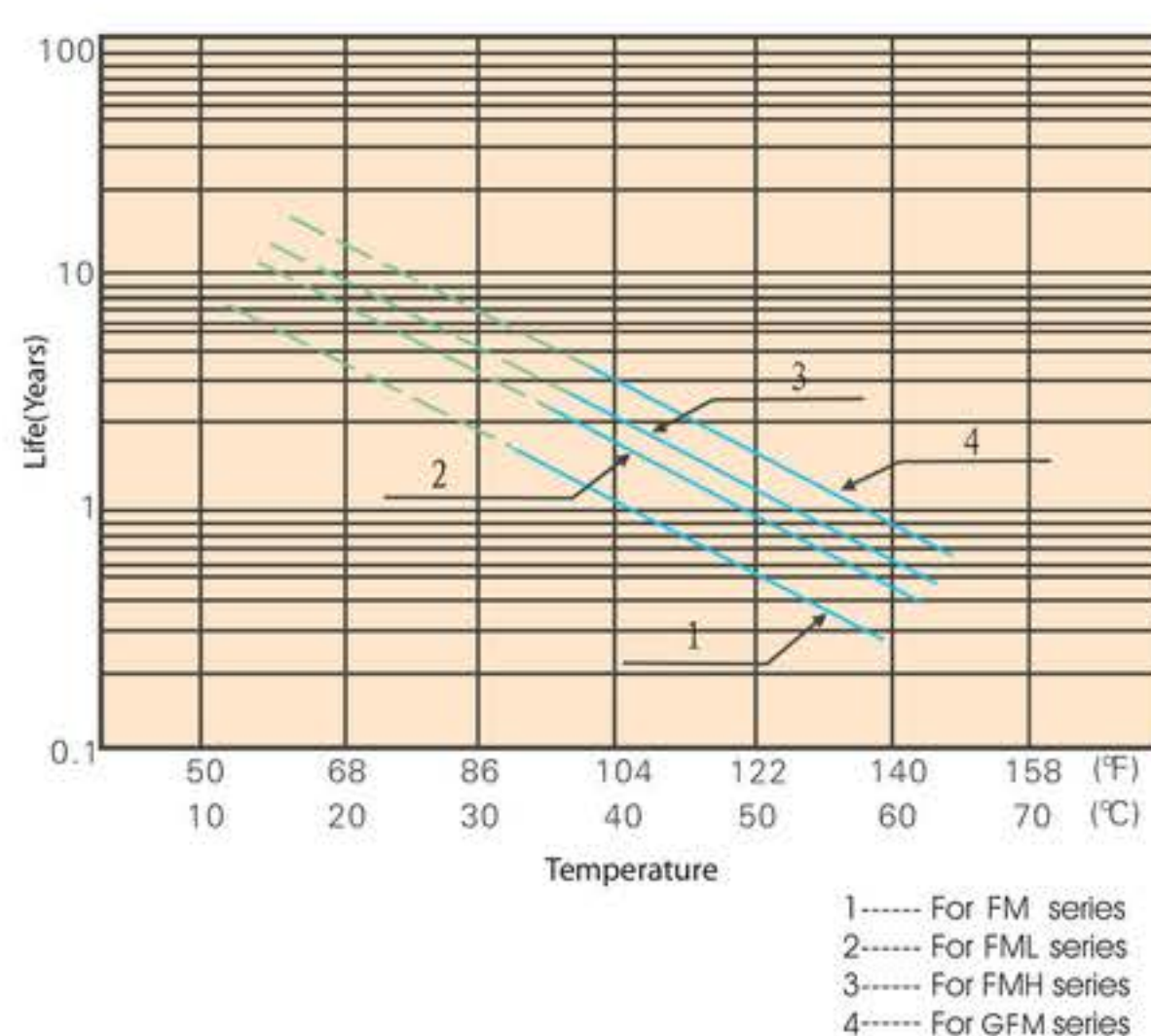
Relationship of OCV and Residual Capacity % (25°C)

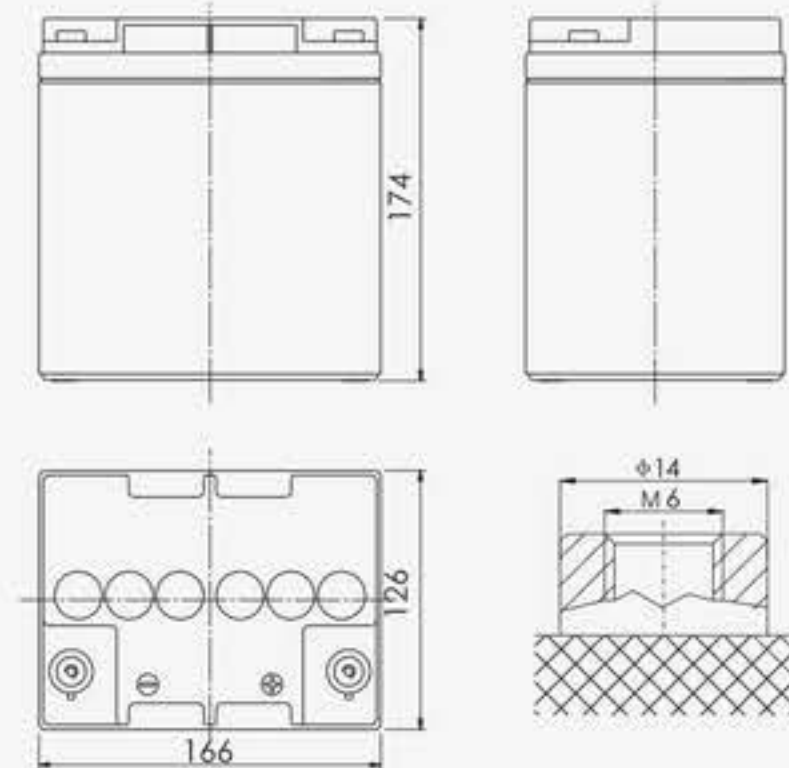


Temperature effects on capacity



Temperature effects on float life





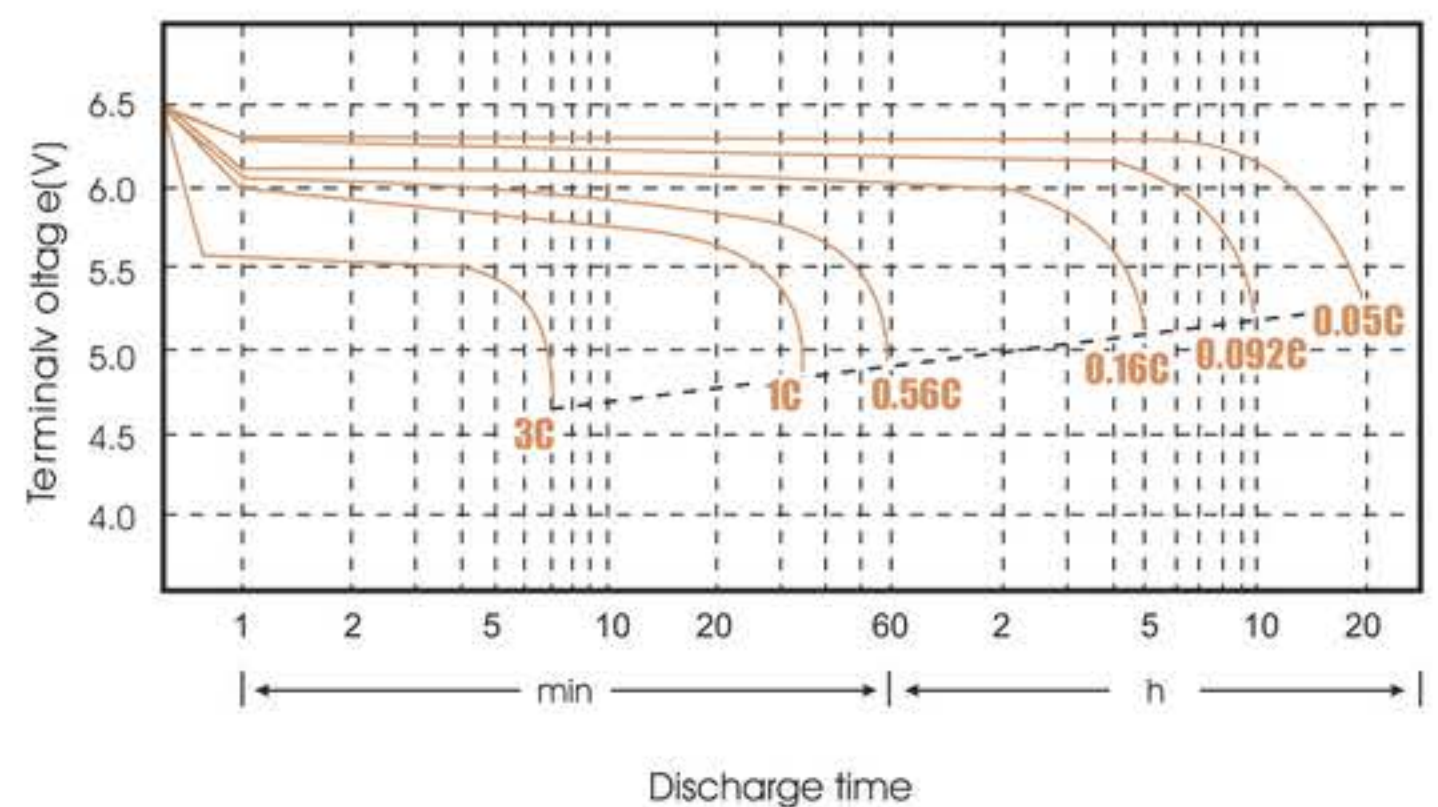
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		24Ah
Dimensions	Total Height (with terminals)	6.85inches(174mm)
	Height	6.85inches(174mm)
	Length	6.54inches(166mm)
	Width	4.96inches(126mm)
Weight		Approx. 17.82pound(8.1kg)

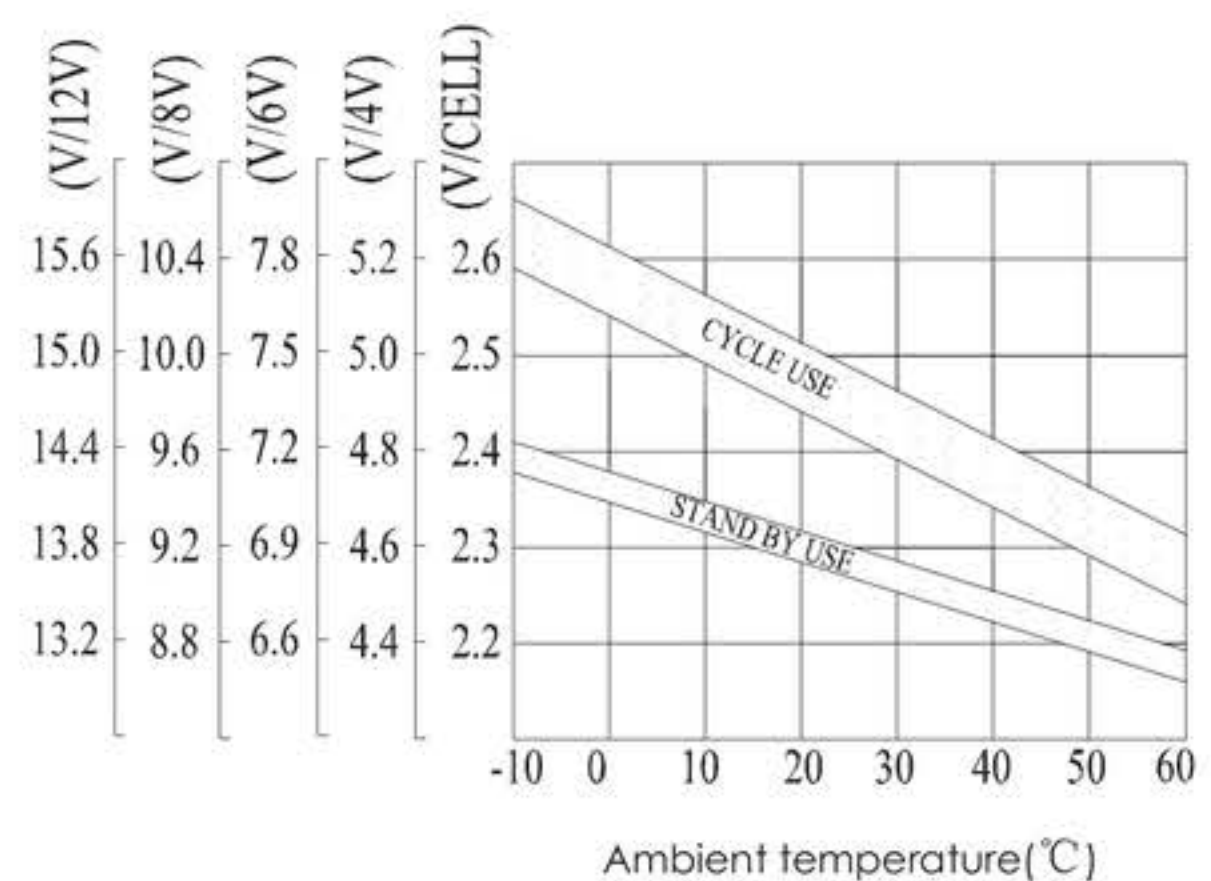
Characteristics

Capacity 77 F(25 C)	20 hour rate (1.20A)	24Ah
	10 hour rate (2.23A)	22.3Ah
	5 hour rate (3.84A)	19.2Ah
	1 hour rate (14.4A)	14.4Ah
	15 minute Rate (42.2 A)	10.55Ah
Internal Resistance	Full charged Battery 77°F(25°C)	12mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	360A(5S)	
Terminal		M1
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 7.2A Voltage 14.4~14.7V/77 F(25 C)
	Float	Voltage 13.5~13.8V/77 F(25 C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	91.44	58.08	46.56	25.92	15.84	8.95	6.17	4.94	4.18	2.28	1.22
9.90	89.28	56.40	44.88	25.20	15.43	8.64	6.10	4.90	4.16	2.26	1.21
10.20	85.20	54.00	43.44	24.72	15.00	8.52	6.03	4.85	4.13	2.24	1.21
10.50	81.60	51.84	41.76	24.48	14.64	8.40	6.00	4.80	4.08	2.24	1.20
10.80	76.80	51.36	39.60	23.76	14.16	8.16	5.90	4.68	4.03	2.19	1.18

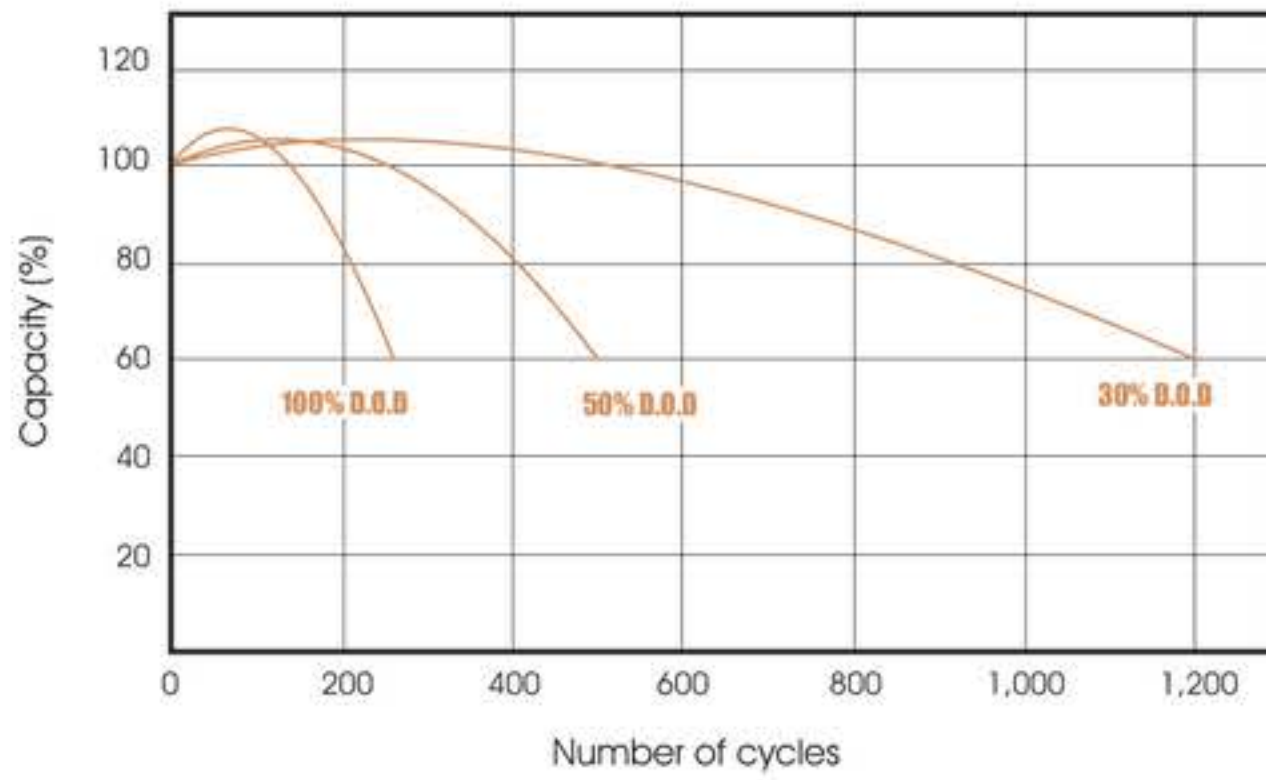
Constant Power Discharge (WATTS PER CELL@25°C)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	1018.64	652.82	528.92	295.49	182.79	104.63	73.34	58.88	49.78	27.27	14.60
9.90	995.47	634.50	510.29	288.54	178.39	101.07	72.60	58.41	49.67	27.06	14.55
10.20	950.83	608.04	494.35	283.29	173.55	99.85	71.84	57.89	49.32	26.85	14.50
10.50	911.47	584.76	475.65	280.79	169.53	98.62	71.58	57.36	48.80	26.86	14.45
10.80	858.62	580.37	451.49	272.76	164.26	95.88	70.55	55.97	48.28	26.26	14.20

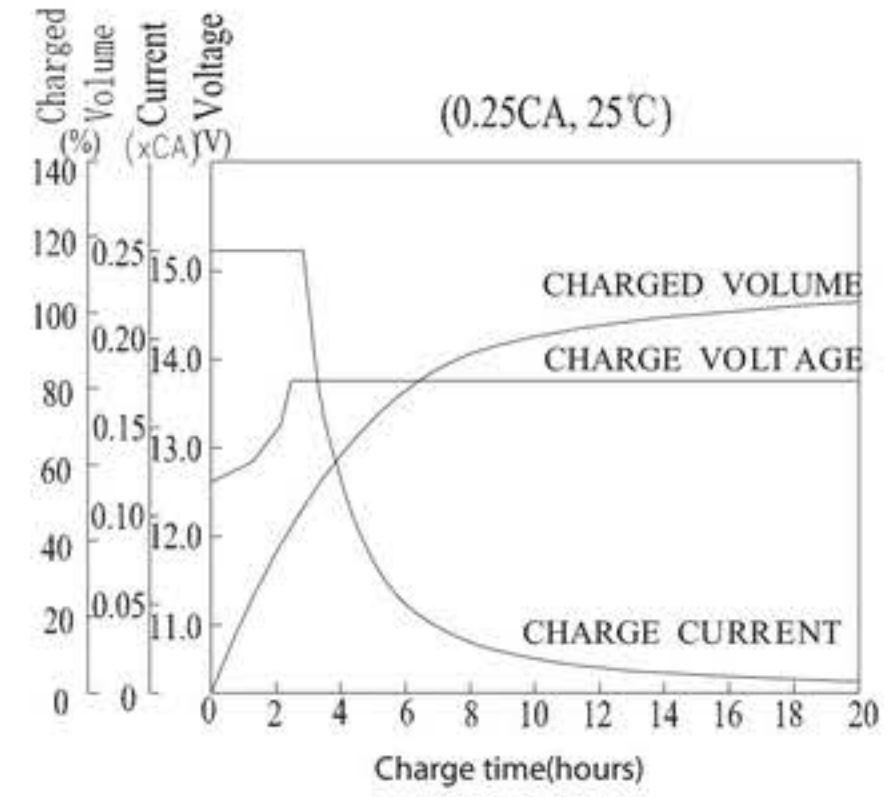


The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

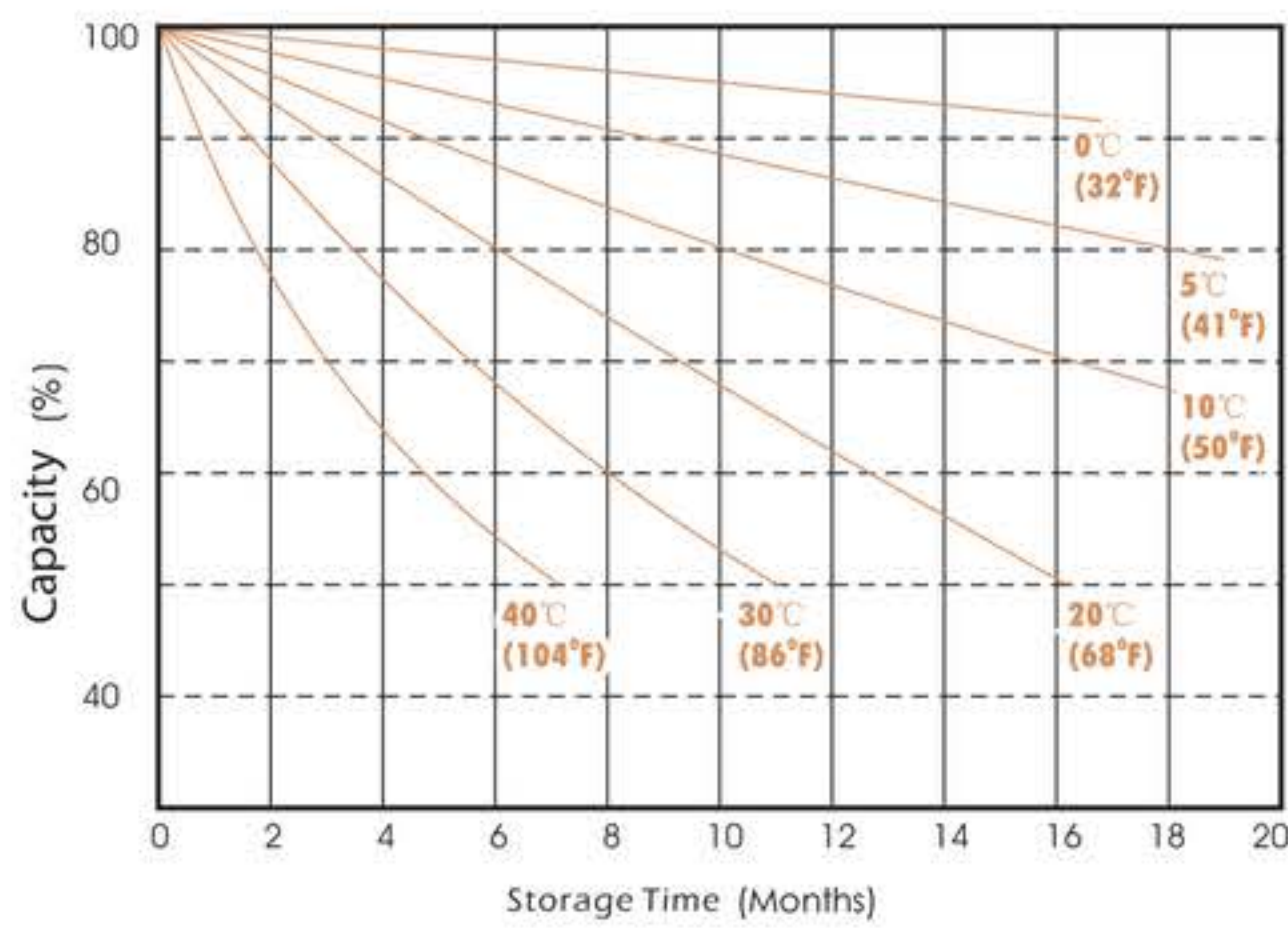
Cycle service life in relation to depth of discharge



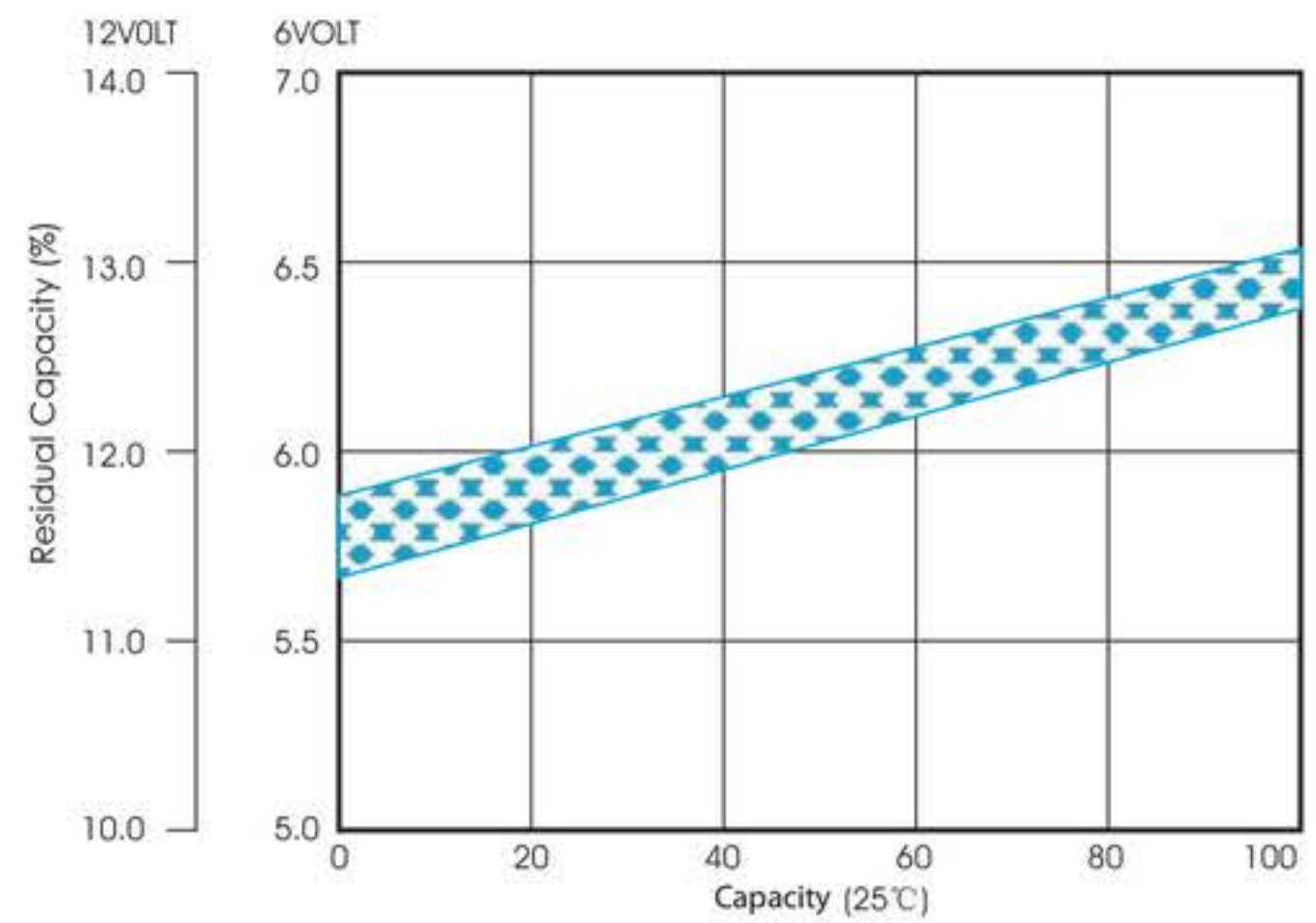
Constant voltage charge characteristic



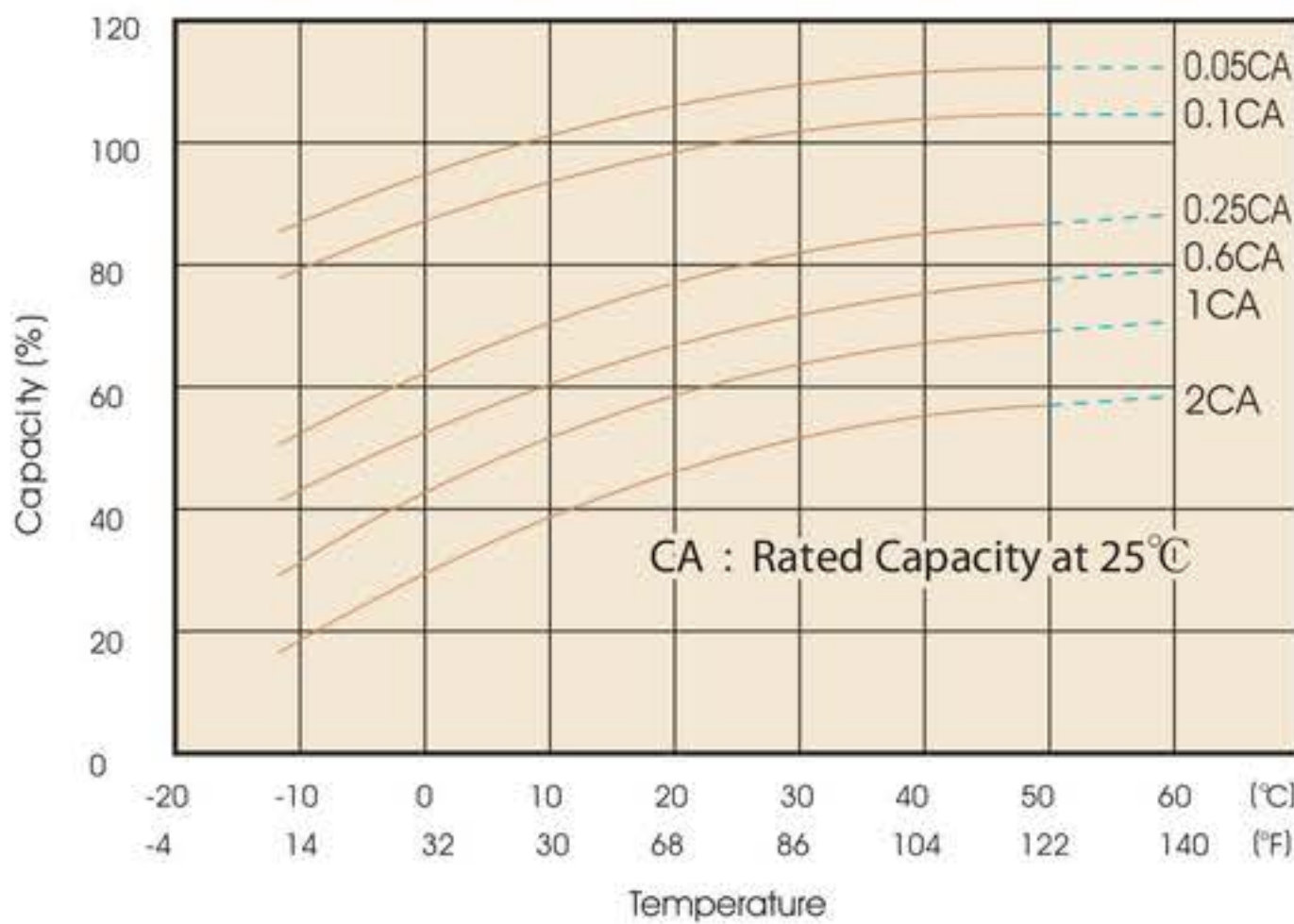
Self-Discharge Characteristics.



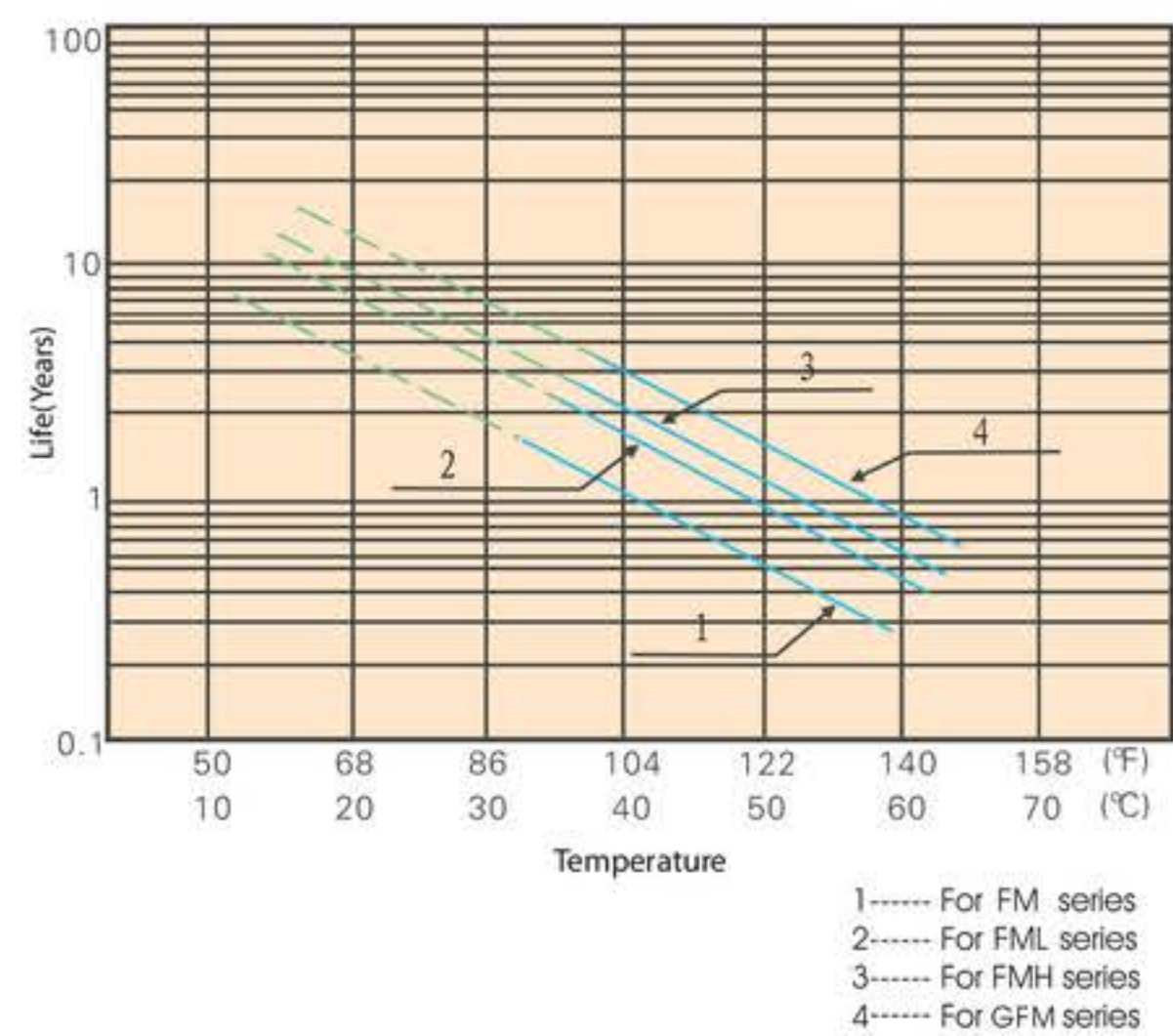
Relationship of OCV and Residual Capacity % (25°C)

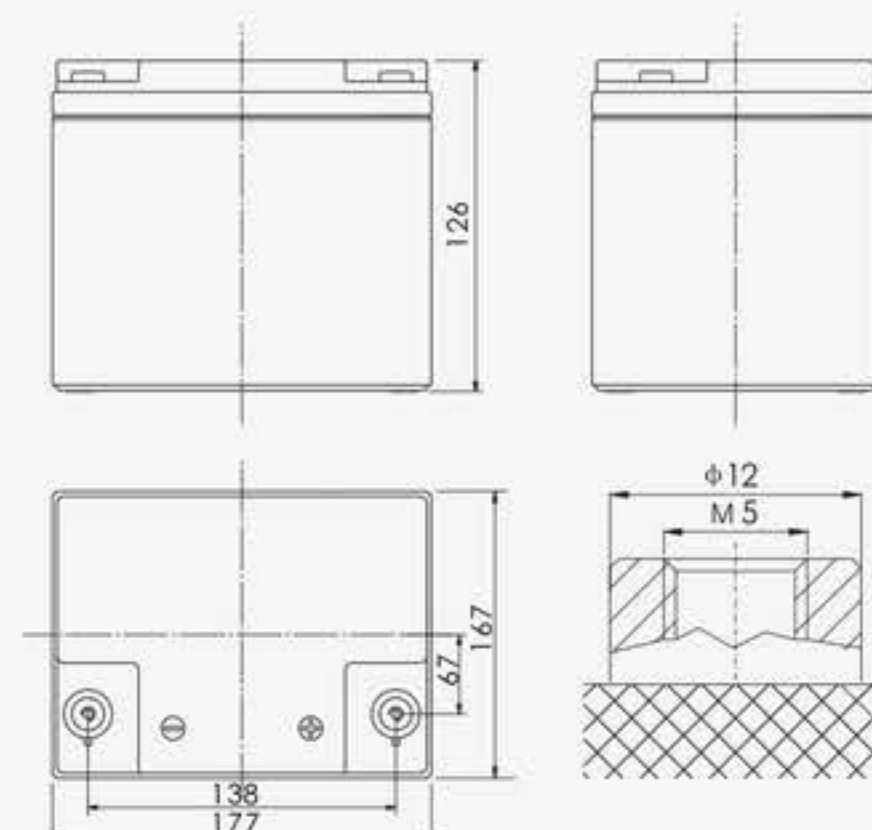


Temperature effects on capacity



Temperature effects on float life





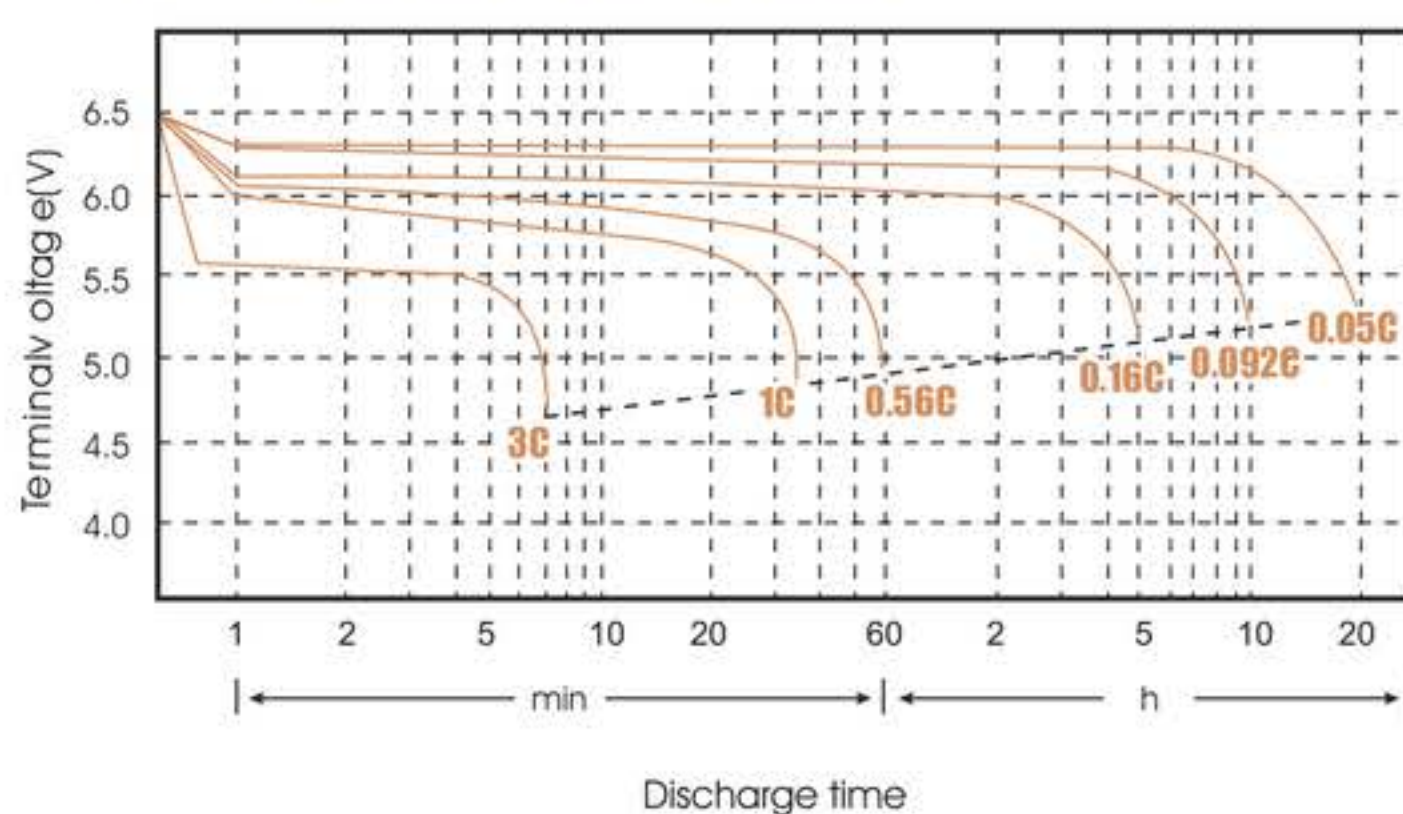
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		26Ah
Dimensions	Total Height (with terminals)	4.96inches(126mm)
	Height	4.96inches(126mm)
	Length	6.97inches(177mm)
	Width	6.57inches(167mm)
Weight		Approx. 18.48pound(8.4kg)

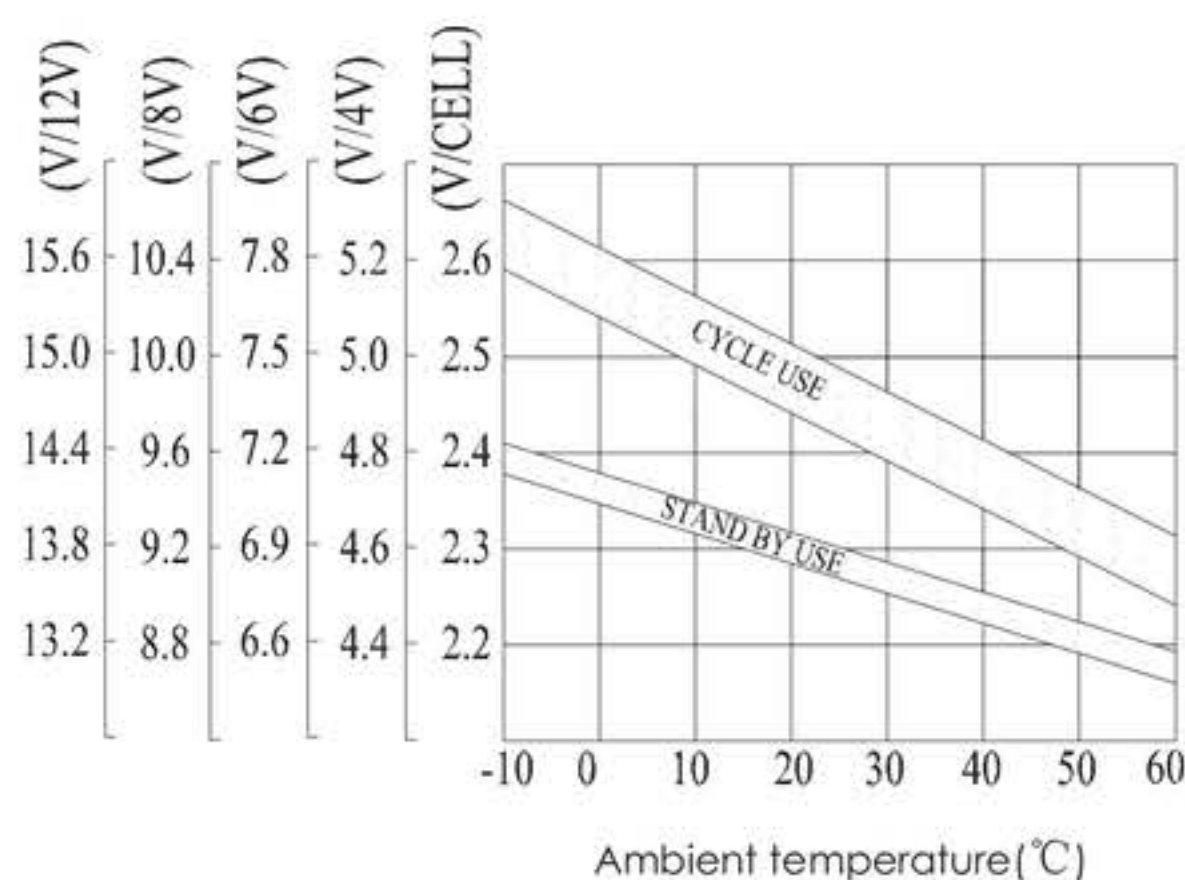
Characteristics

Capacity 77 F(25 C)	20 hour rate (1.30A)	26.0Ah
	10 hour rate (2.41A)	24.1Ah
	5 hour rate (4.16A)	20.8Ah
	1 hour rate (15.6A)	15.6Ah
	15 minute Rate (45.72A)	11.43Ah
Internal Resistance	Full charged Battery 77°F(25°C)	10mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	390A(5S)	
Terminal	M4	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 7.8A Voltage 14.4~14.7V/77 F(25 C)
	Float	Voltage 13.5~13.8V/77 F(25 C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

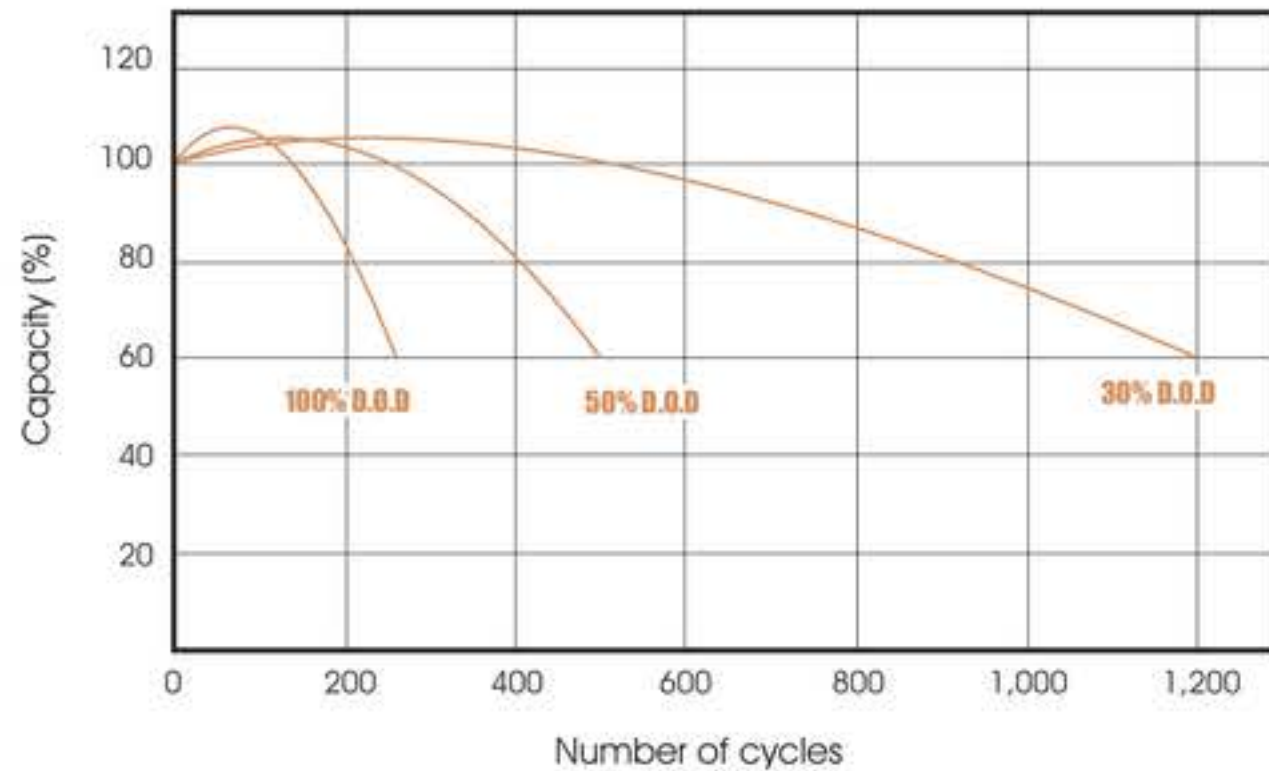
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	99.06	62.92	50.44	28.08	17.16	9.70	6.68	5.36	4.52	2.47	1.32
9.90	96.72	61.10	48.62	27.30	16.72	9.36	6.60	5.30	4.51	2.45	1.31
10.20	92.30	58.50	47.06	26.78	16.25	9.23	6.53	5.25	4.47	2.43	1.31
10.50	88.40	56.16	45.24	26.52	15.86	9.10	6.50	5.20	4.42	2.43	1.30
10.80	83.20	55.64	42.90	25.74	15.34	8.84	6.40	5.07	4.37	2.37	1.28

Constant Power Discharge (WATTS PER CELL@25°C)

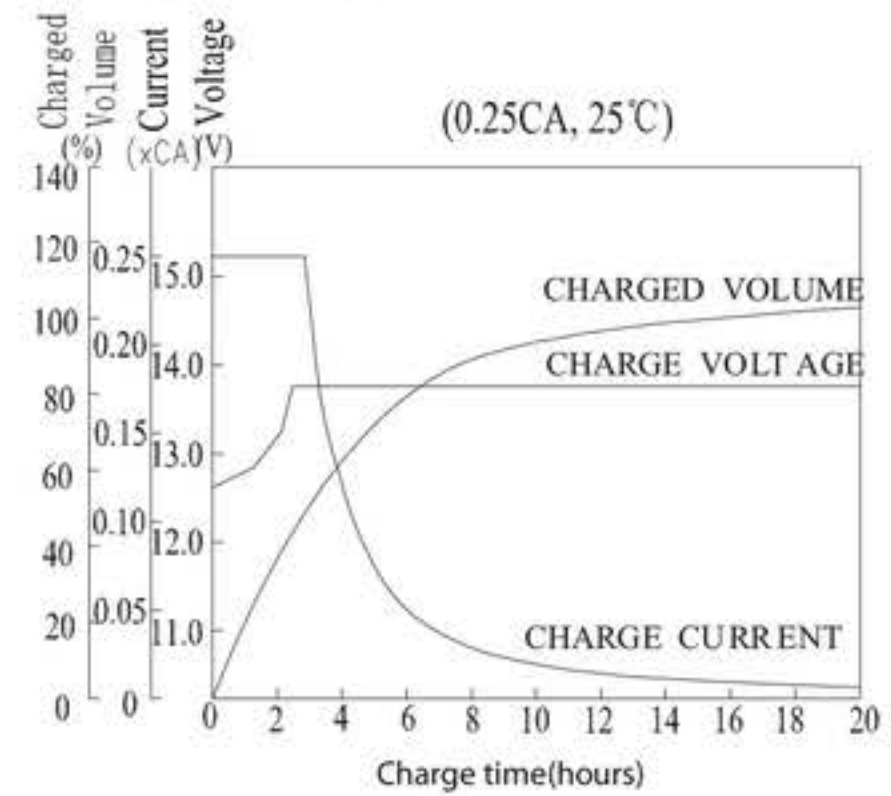
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	1103.53	707.22	573.00	320.11	198.03	113.35	79.45	63.79	53.93	29.54	15.82
9.90	1078.43	687.38	552.81	312.59	193.26	109.49	78.65	63.28	53.81	29.32	15.76
10.20	1030.07	658.71	535.54	306.90	188.01	108.18	77.82	62.71	53.43	29.09	15.71
10.50	987.43	633.48	515.28	304.18	183.66	106.83	77.55	62.14	52.86	29.10	15.65
10.80	930.18	628.73	489.12	295.50	177.94	103.87	76.43	60.64	52.30	28.45	15.39

The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

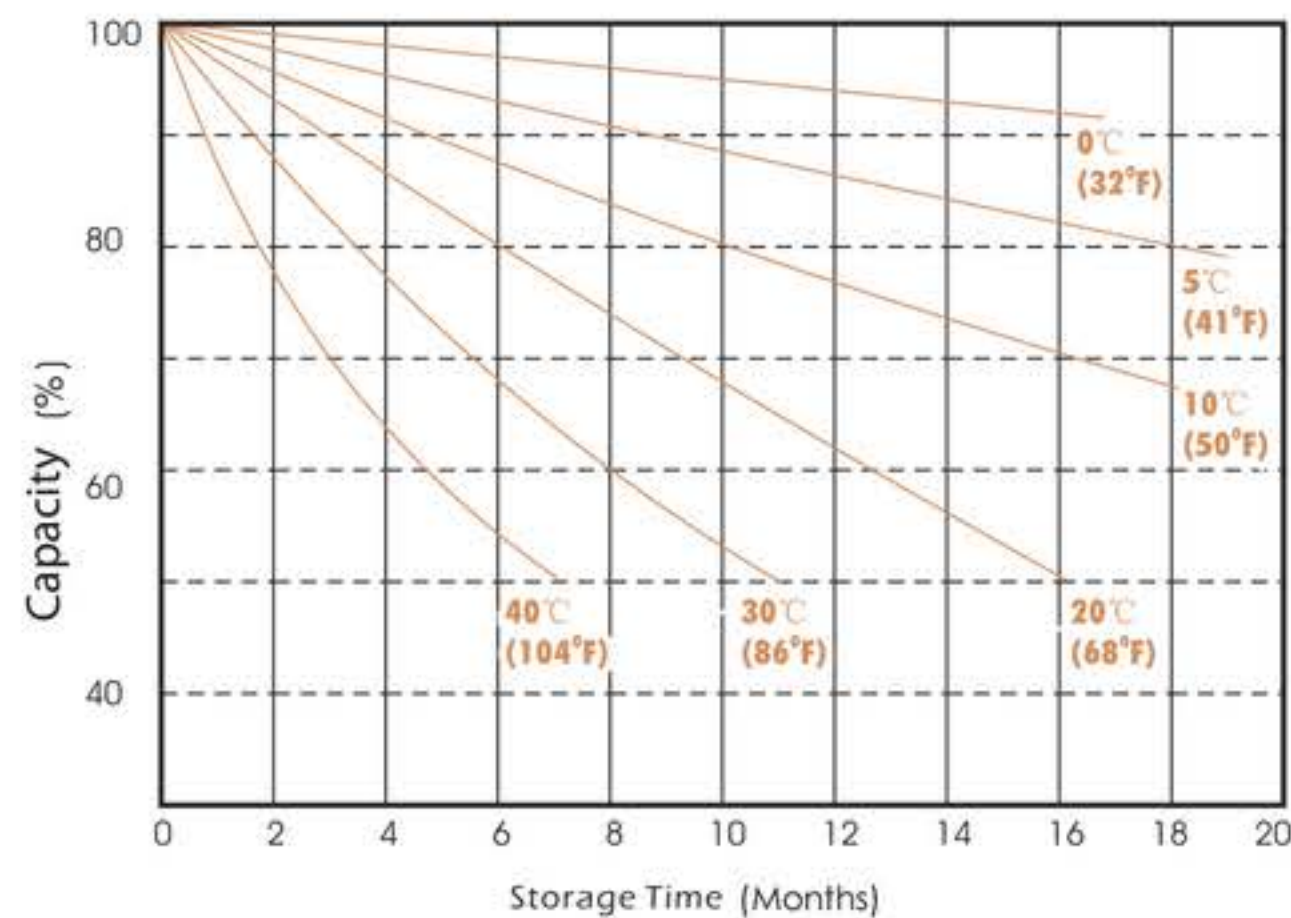
Cycle service life in relation to depth of discharge



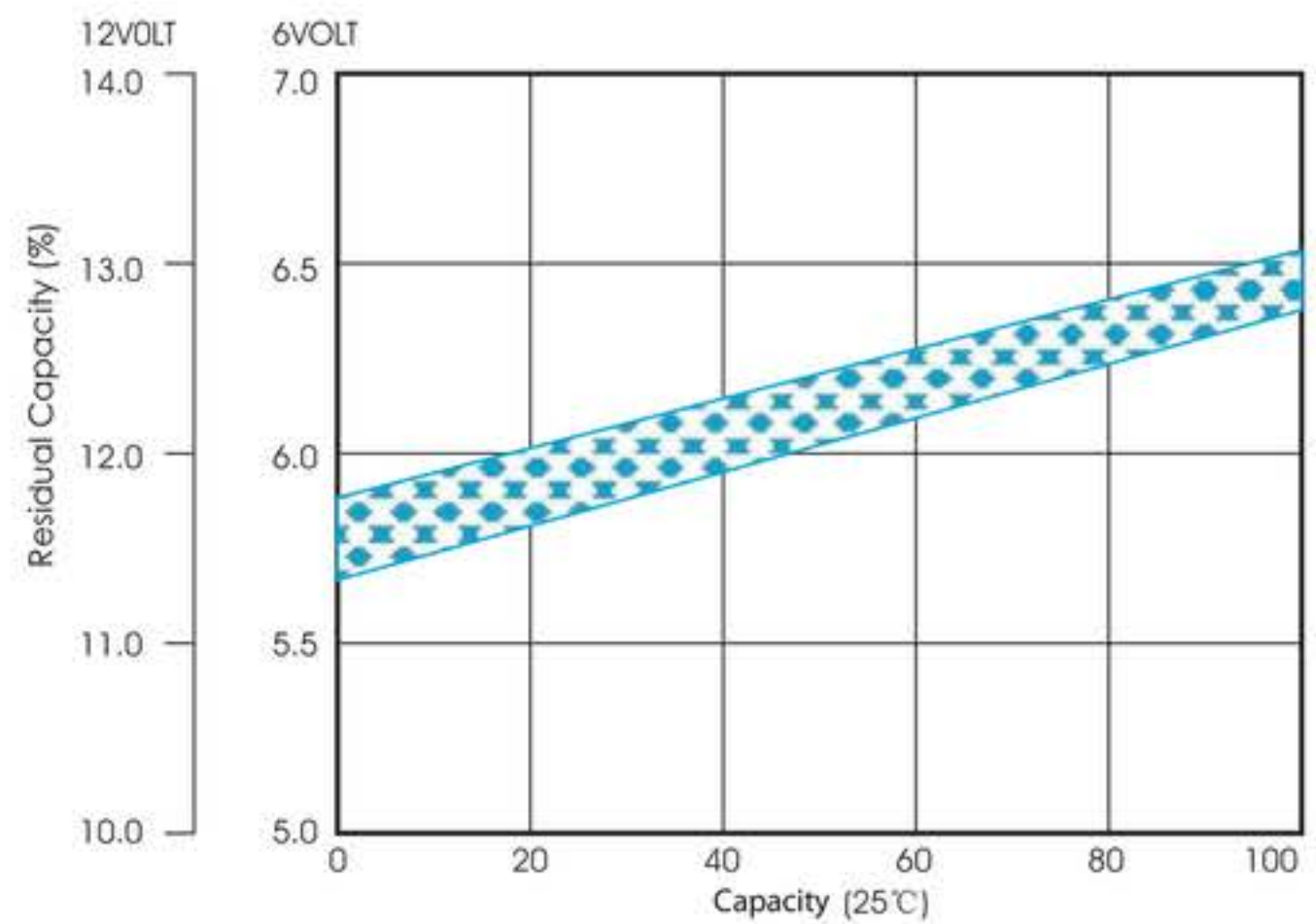
Constant voltage charge characteristic



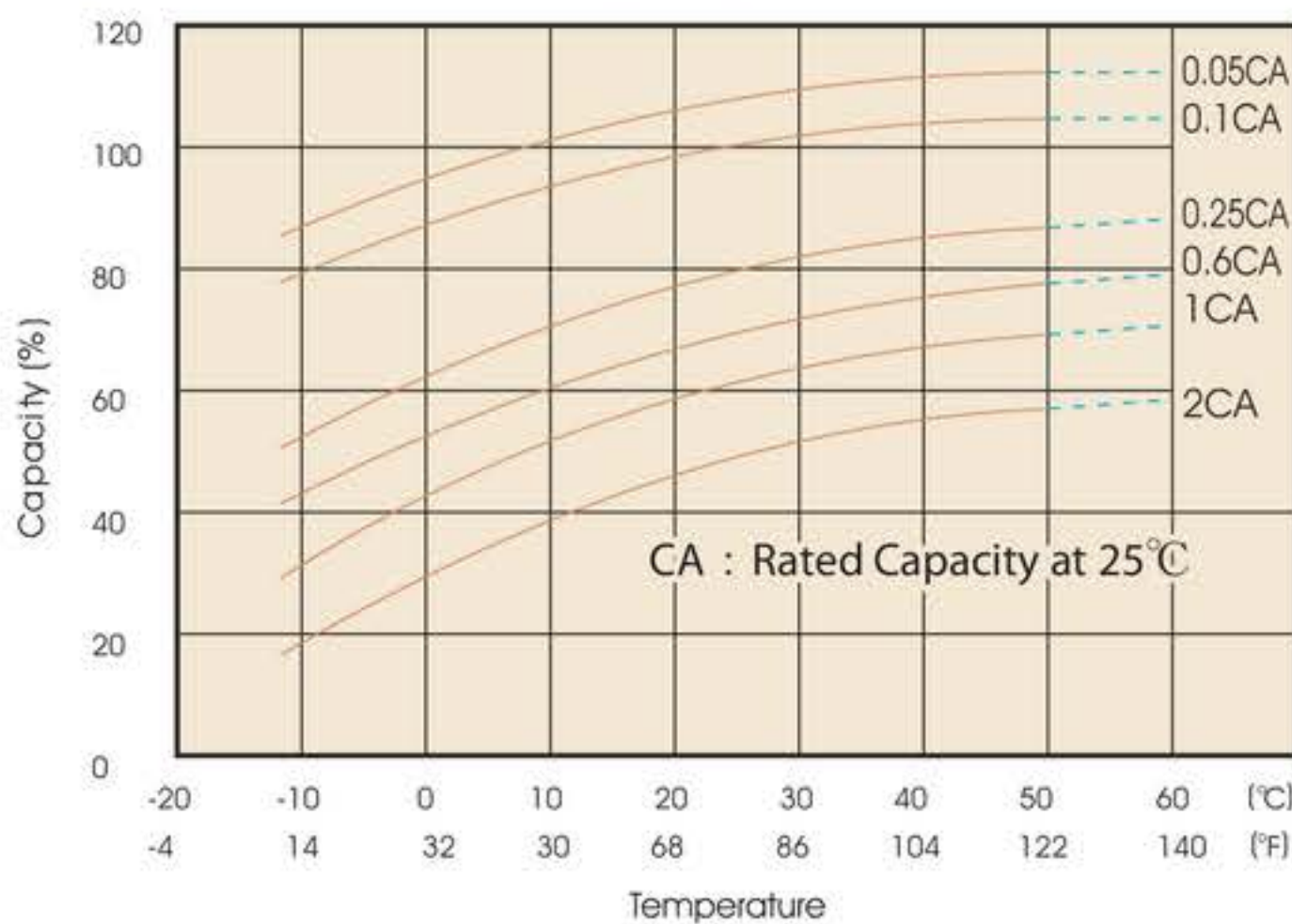
Self-Discharge Characteristics.



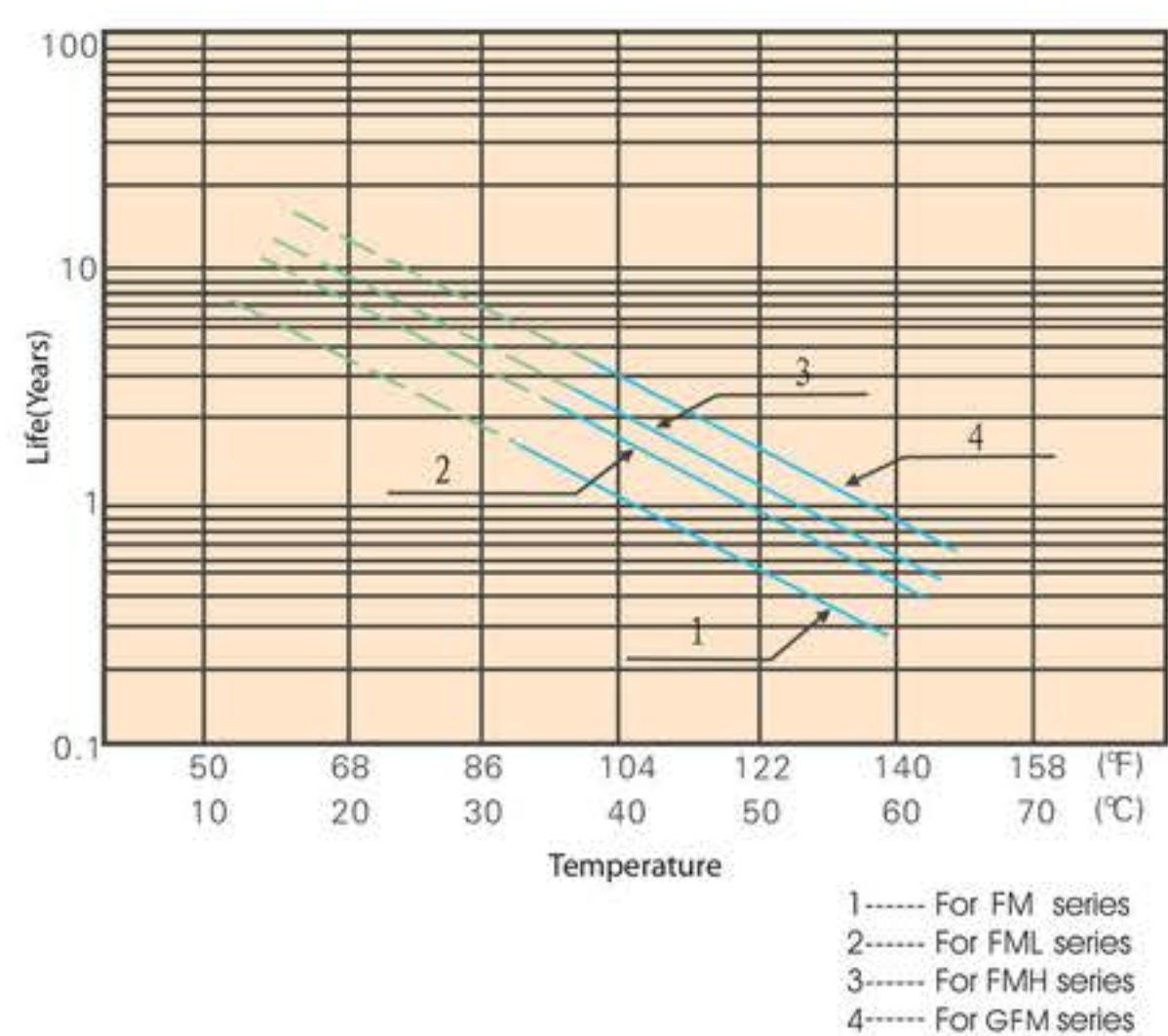
Relationship of OCV and Residual Capacity % (25°C)

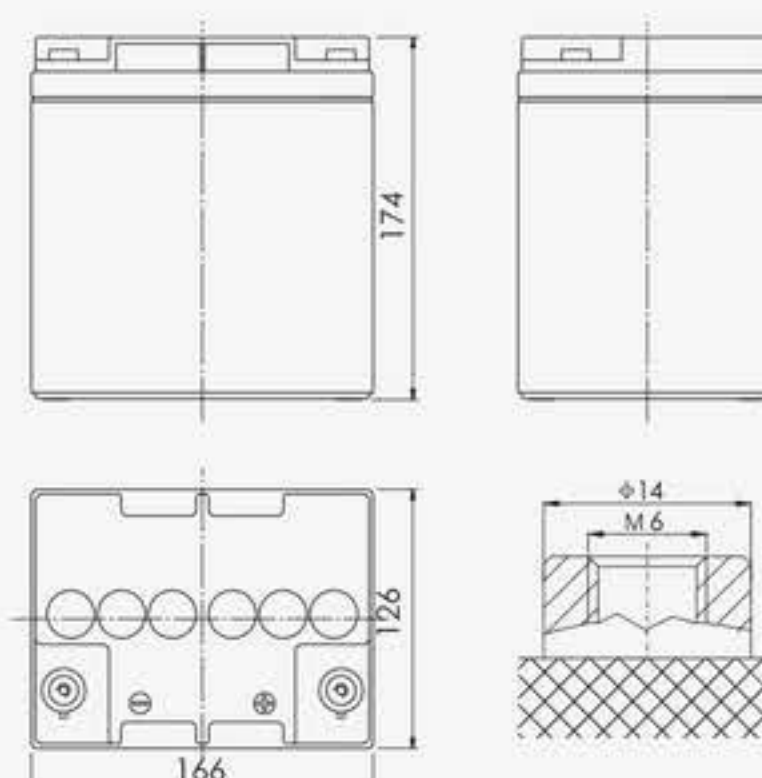


Temperature effects on capacity



Temperature effects on float life





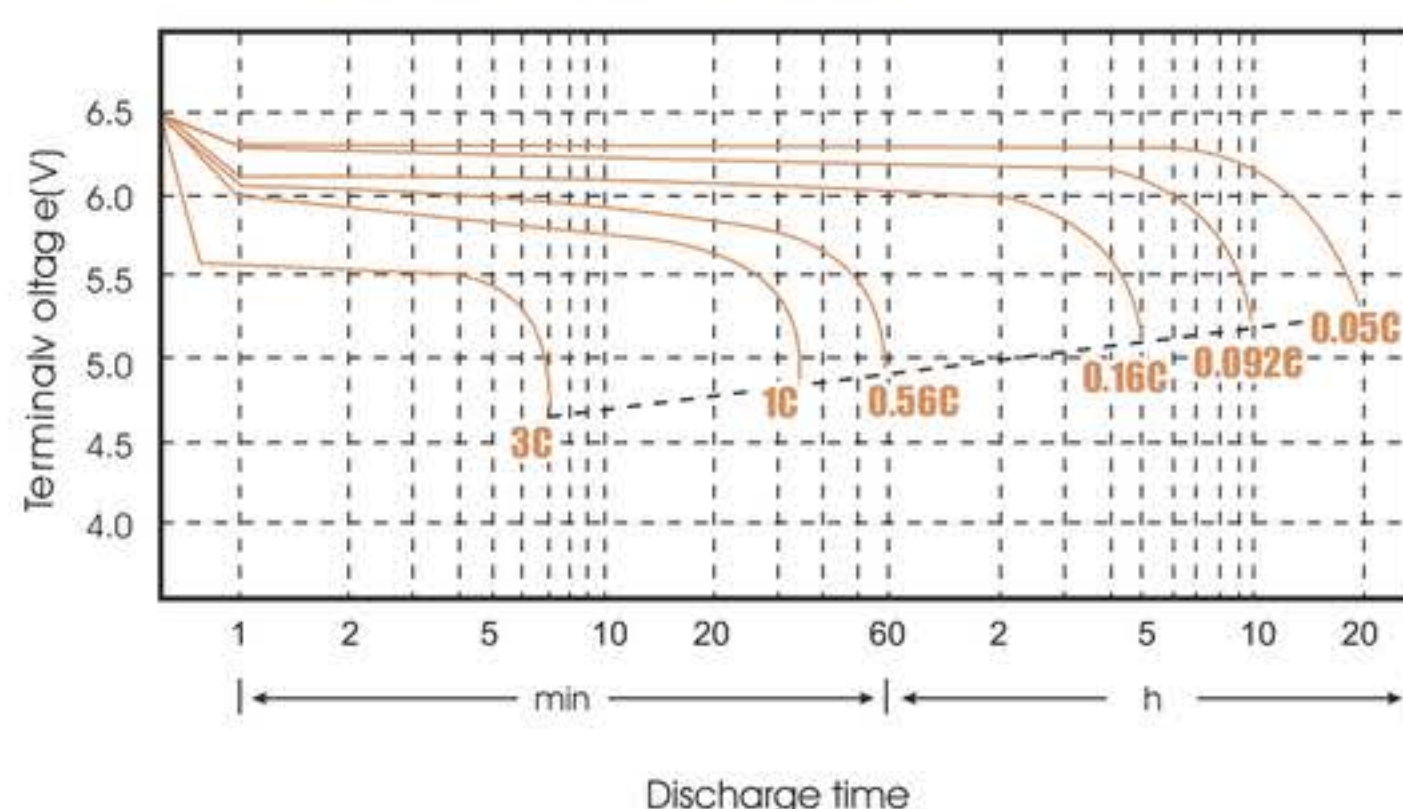
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		28Ah
Dimensions	Total Height (with terminals)	6.85inches(174mm)
	Height	6.85inches(174mm)
	Length	6.54inches(166mm)
	Width	4.96inches(126mm)
Weight		Approx. 20.9pound(9.5kg)

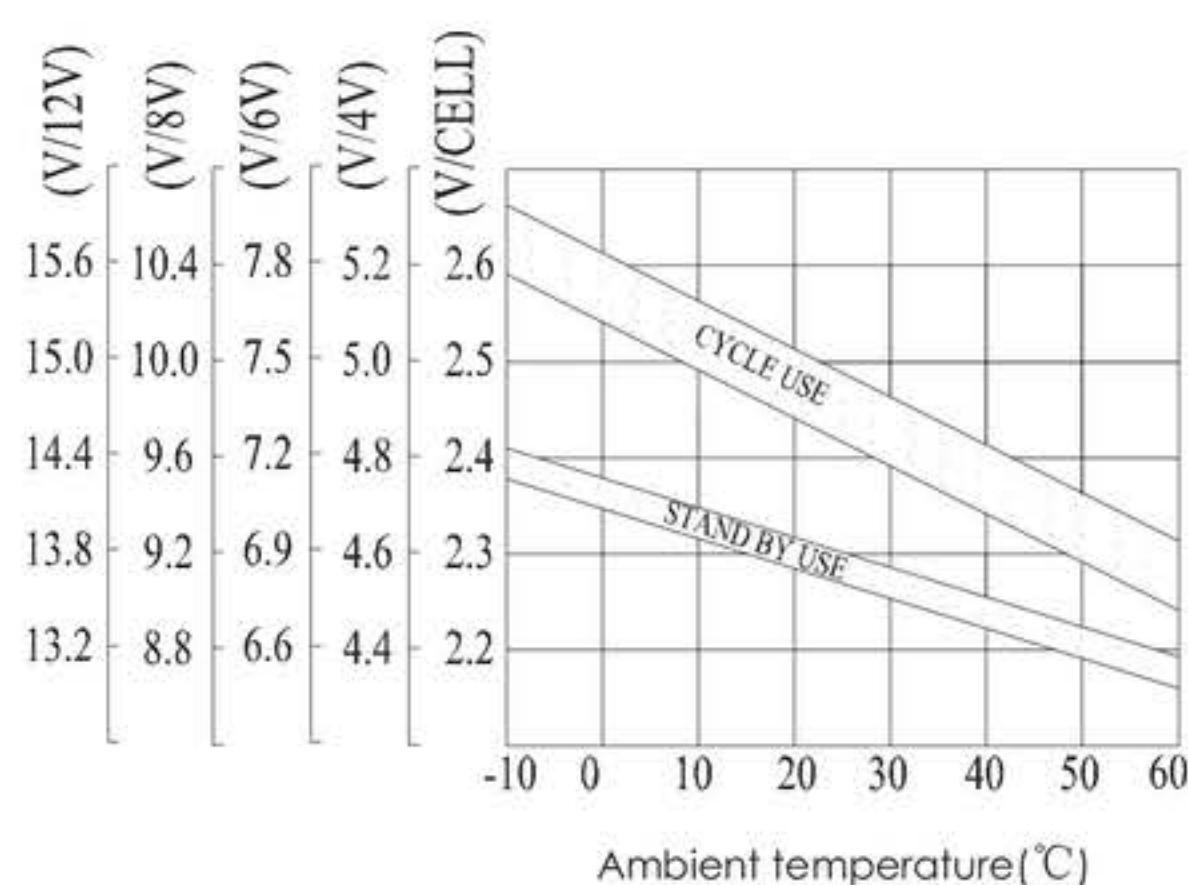
Characteristics

Capacity 77 F(25 C)	20 hour rate (1.40A)	28Ah
	10 hour rate (2.60A)	26Ah
	5 hour rate (4.48A)	22.4Ah
	1 hour rate (16.8A)	16.8Ah
	15 minute Rate (49.2 A)	12.3Ah
Internal Resistance	Full charged Battery 77°F(25°C)	11mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	420A(5S)	
Terminal	M1	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 8.4A Voltage 14.4~14.7V/77 F(25 C)
	Float	Voltage 13.5~13.8V/77 F(25 C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

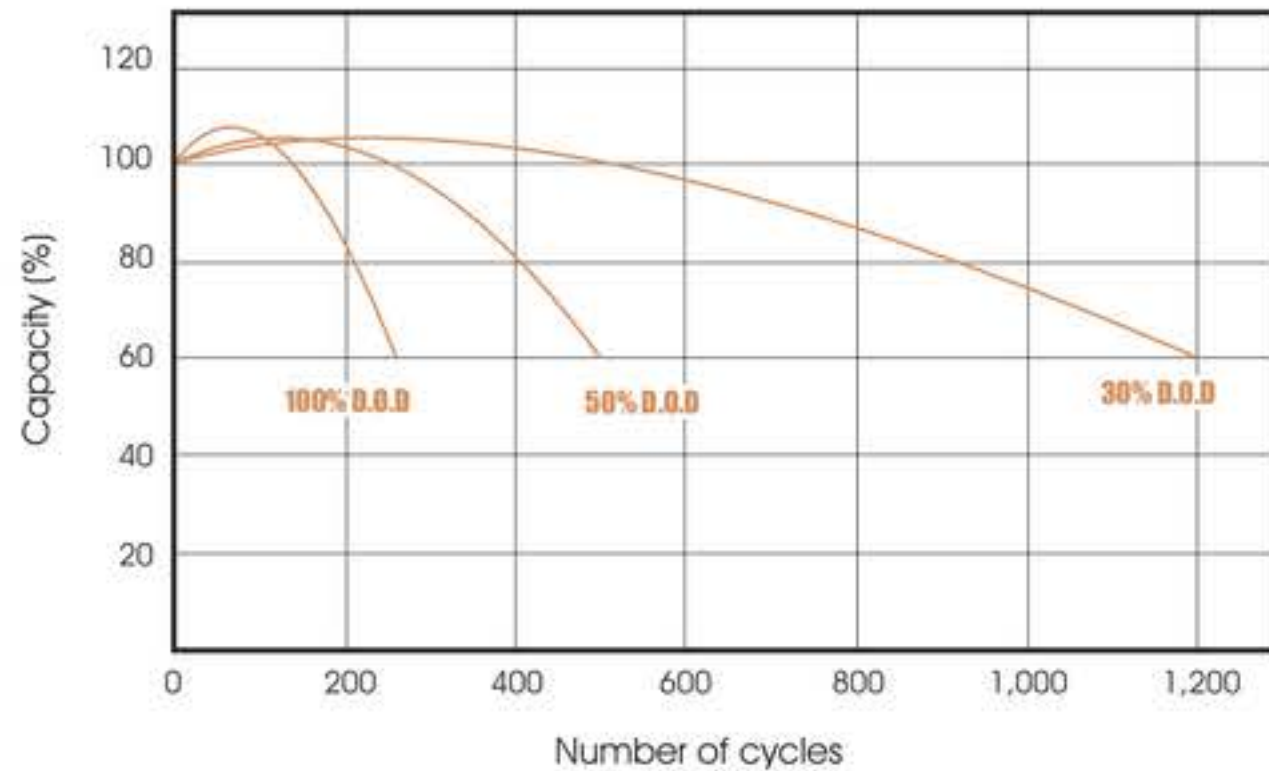
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	106.68	67.76	54.32	30.24	18.48	10.44	7.20	5.77	4.87	2.66	1.42
9.90	104.16	65.80	52.36	29.40	18.00	10.08	7.11	5.71	4.85	2.64	1.41
10.20	99.40	63.00	50.68	28.84	17.50	9.94	7.03	5.66	4.82	2.62	1.41
10.50	95.20	60.48	48.72	28.56	17.08	9.80	7.00	5.60	4.76	2.61	1.40
10.80	89.60	59.92	46.20	27.72	16.52	9.52	6.89	5.46	4.70	2.55	1.38

Constant Power Discharge (WATTS PER CELL@25°C)

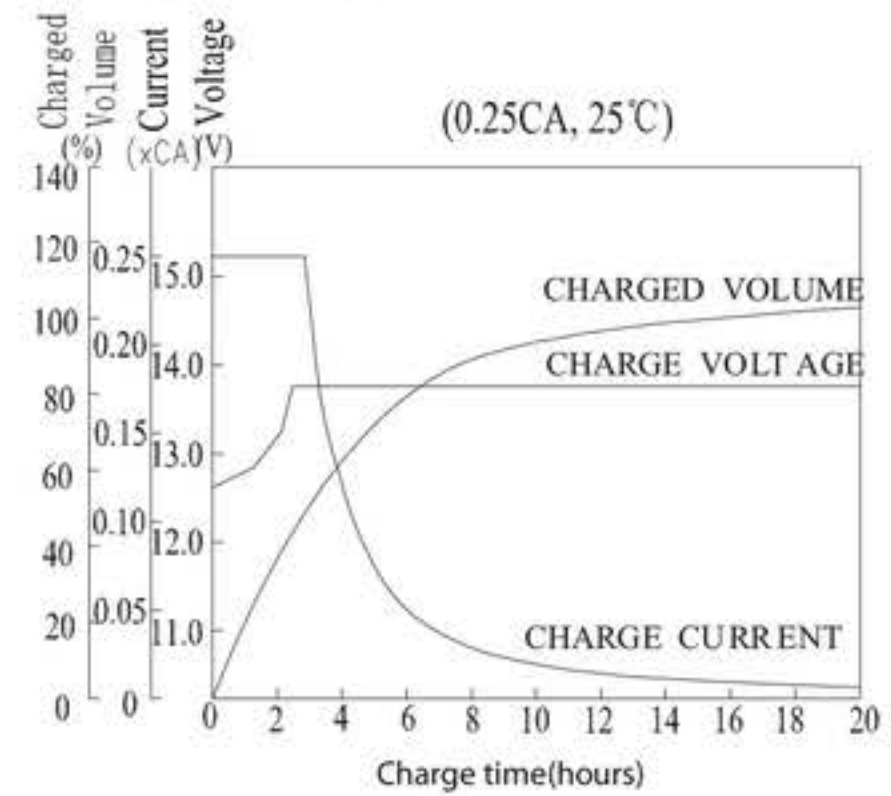
F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.60	1188.42	761.62	617.08	344.74	213.26	122.06	85.56	68.70	58.07	31.81	17.04
9.90	1161.38	740.25	595.33	336.63	208.13	117.92	84.70	68.14	57.95	31.57	16.98
10.20	1109.30	709.38	576.74	330.51	202.48	116.50	83.81	67.53	57.54	31.33	16.92
10.50	1063.38	682.21	554.92	327.58	197.79	115.05	83.51	66.92	56.93	31.33	16.86
10.80	1001.73	677.10	526.74	318.23	191.63	111.86	82.31	65.30	56.32	30.64	16.57

The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

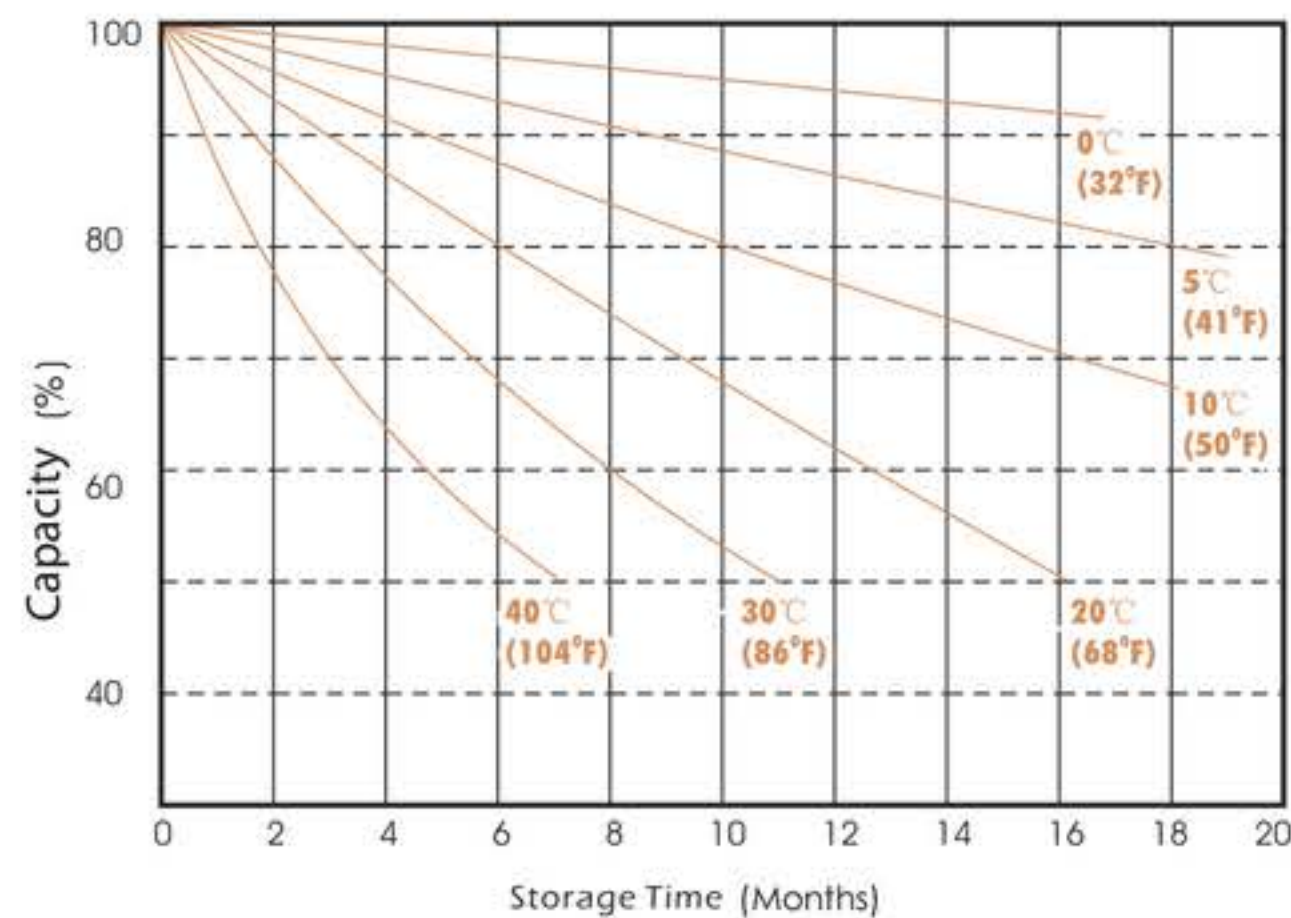
Cycle service life in relation to depth of discharge



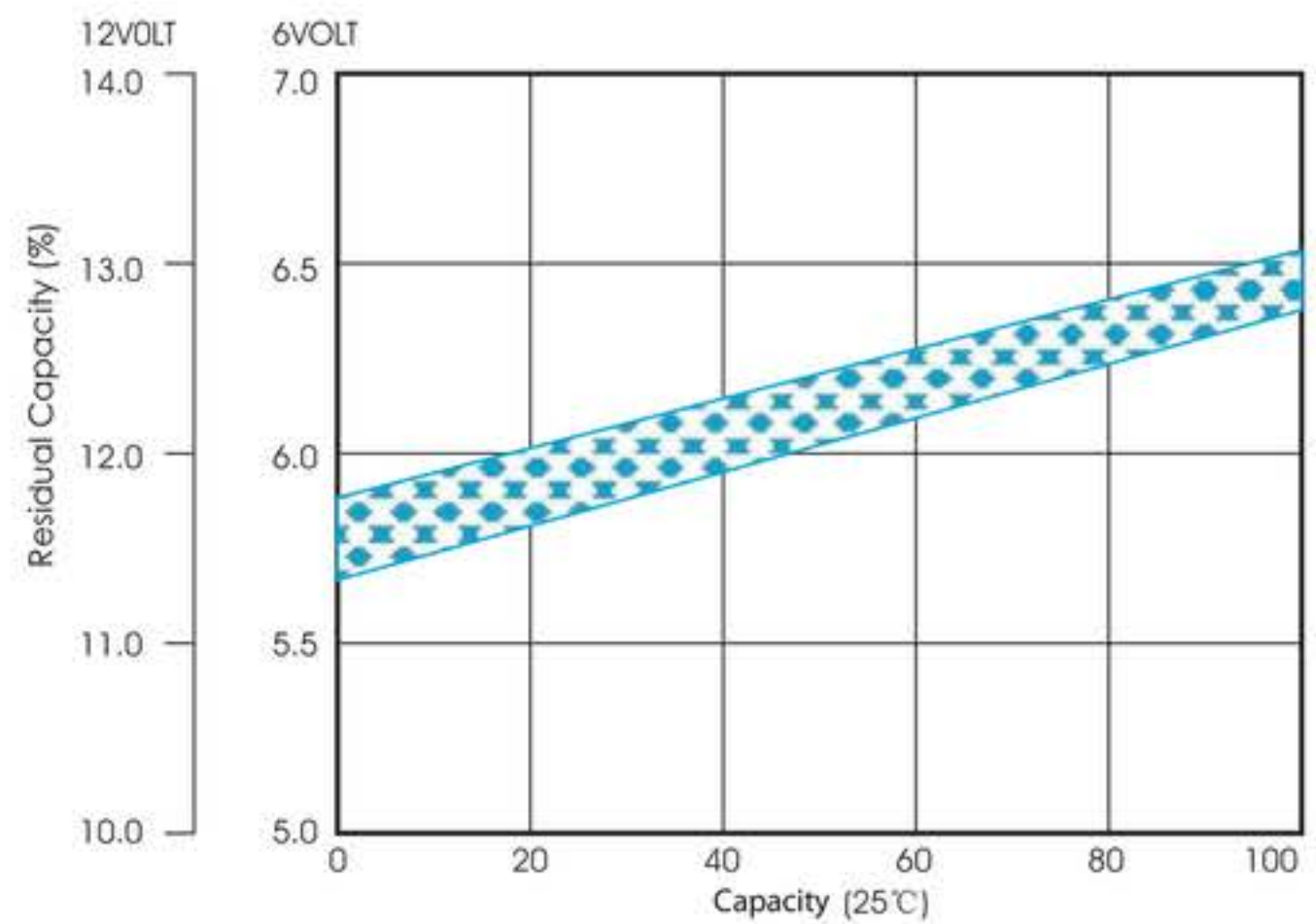
Constant voltage charge characteristic



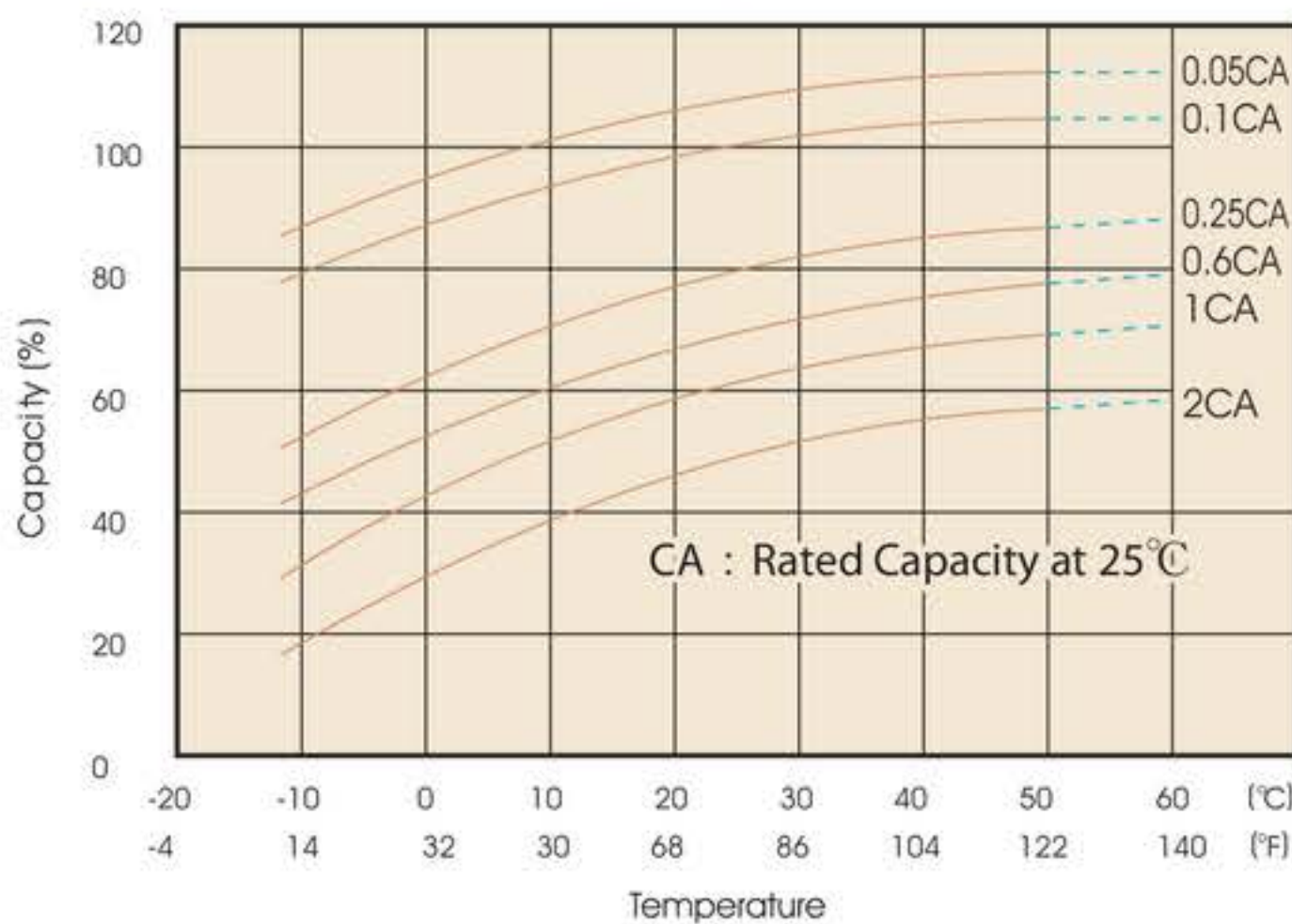
Self-Discharge Characteristics.



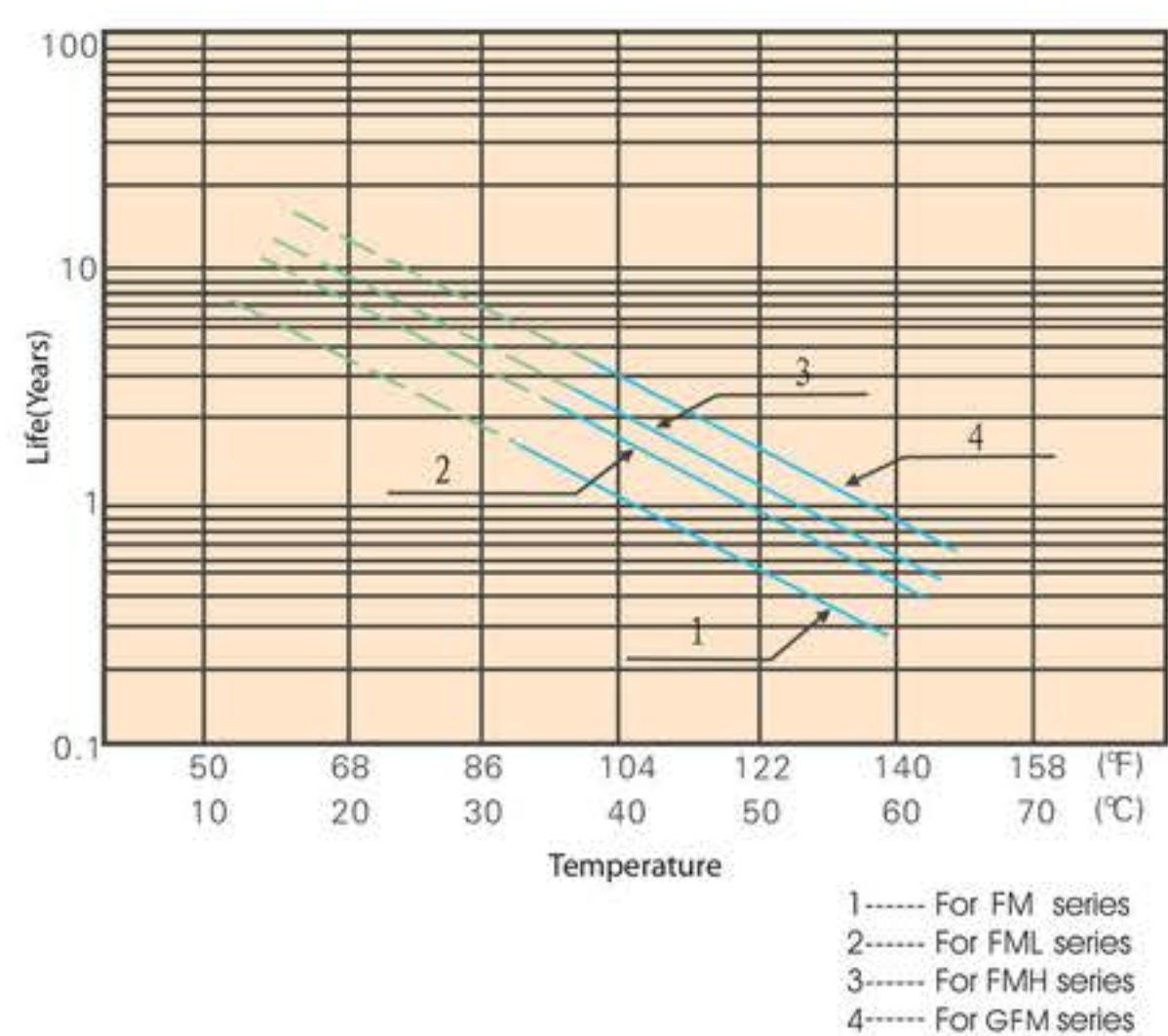
Relationship of OCV and Residual Capacity % (25°C)

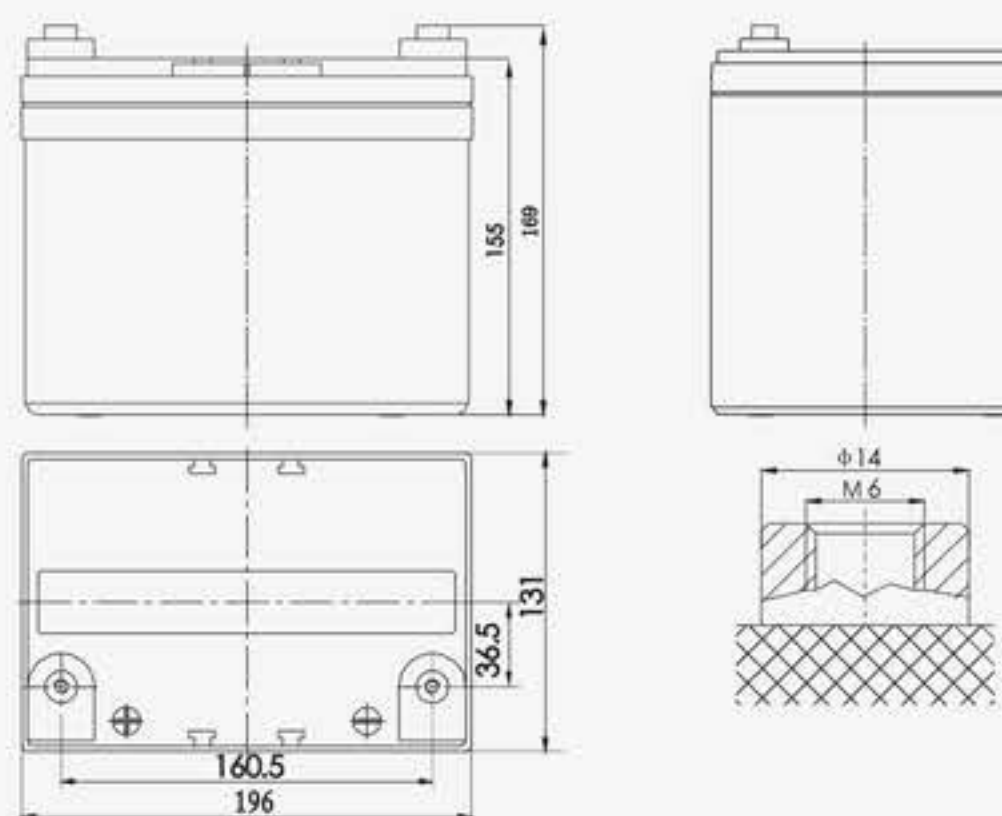


Temperature effects on capacity



Temperature effects on float life





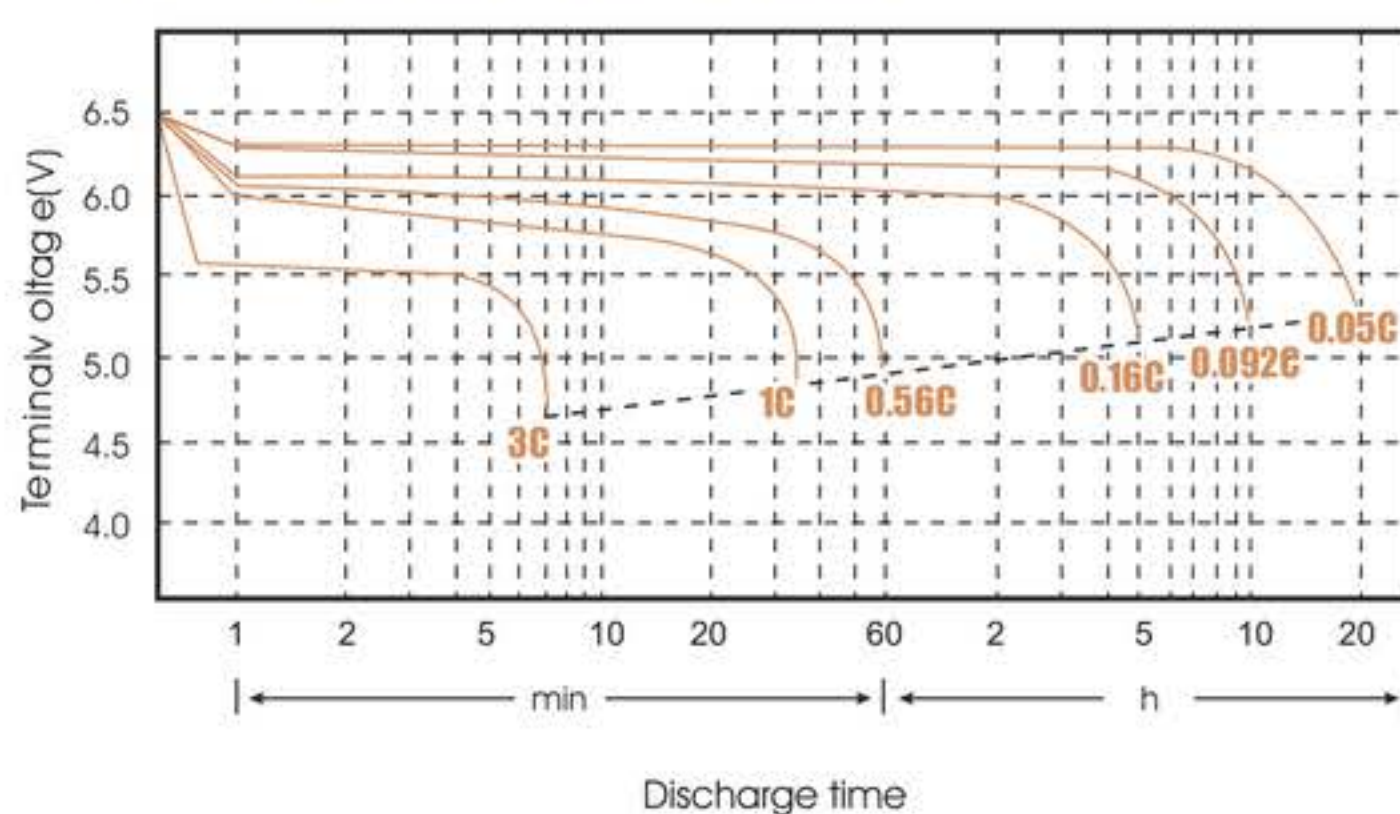
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		33Ah
Dimensions	Total Height (with terminals)	6.65inches (169mm)
	Height	6.10inches (155mm)
	Length	7.72inches (196mm)
	Width	5.16inches (131mm)
Weight		Approx. 22.22pound(10.1kg)

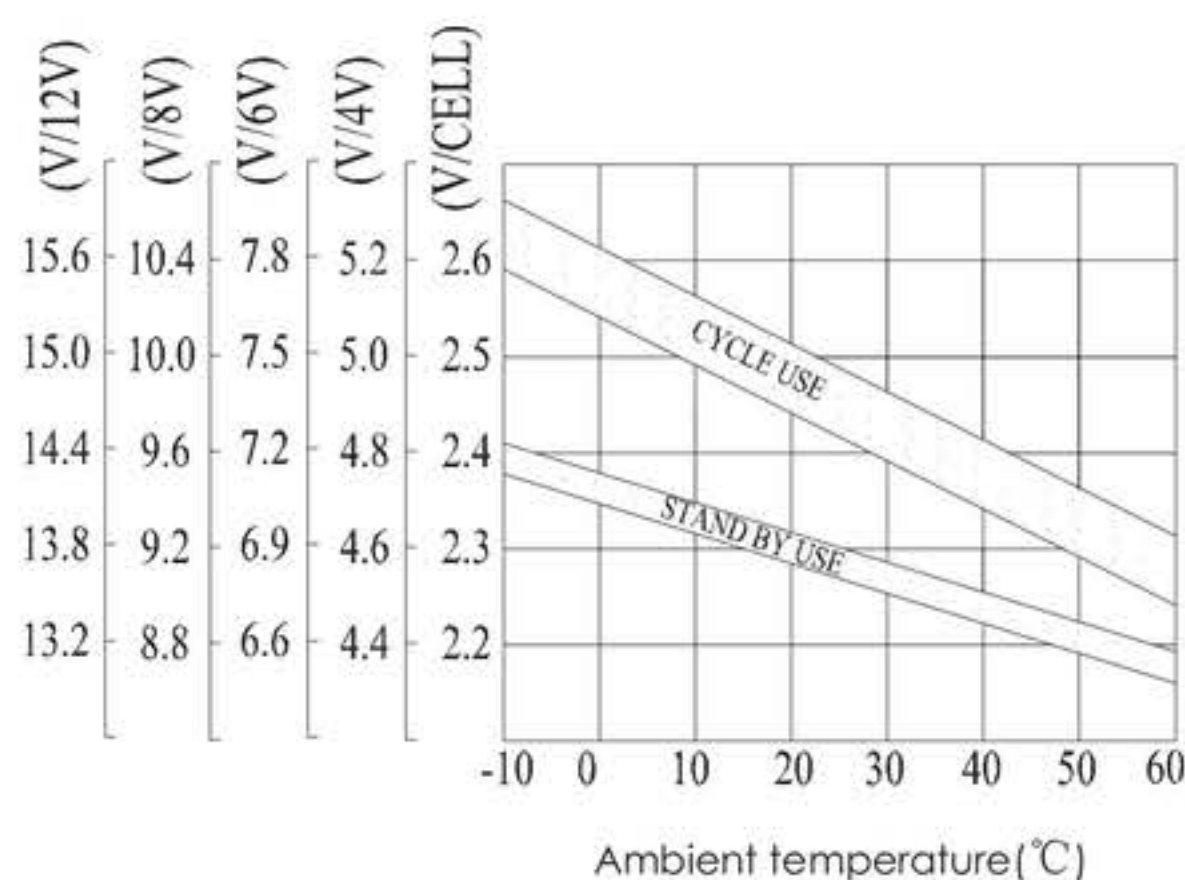
Characteristics

Capacity 77°F(25°C)	20 hour rate (1.65A)	33.0Ah
	10 hour rate (3.05A)	30.5Ah
	5 hour rate (5.28A)	26.4Ah
	1 hour rate (19.8A)	19.8Ah
	15 minute Rate(54.4A)	13.6Ah
Internal Resistance	Full charged Battery 77°F(25°C)	9mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	330A(5S)	
Terminal		M1
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 9.9A Voltage 14.4~14.7V/77 F(25 C)
	Float	Voltage 13.5~13.8V/77 F(25 C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

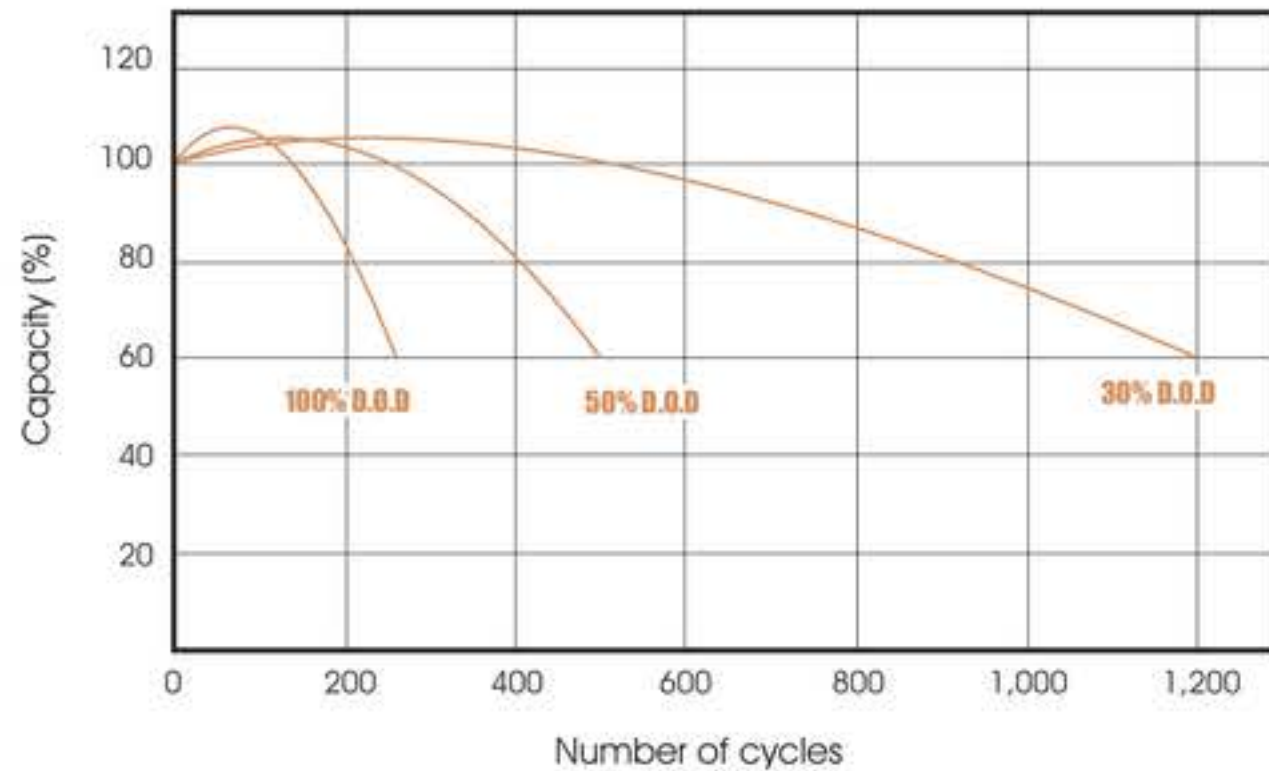
F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	70.9	53.7	35.5	26.3	19.3	12.5	8.41	5.87	3.95	3.26	2.78	1.47
1.70	67.7	51.1	33.4	24.8	18.7	12.1	8.25	5.73	3.83	3.20	2.71	1.43
1.80	57.0	44.9	29.3	23.4	17.3	11.6	7.87	5.45	3.63	3.04	2.59	1.39

Constant Power Discharge (WATTS PER CELL@25°C)

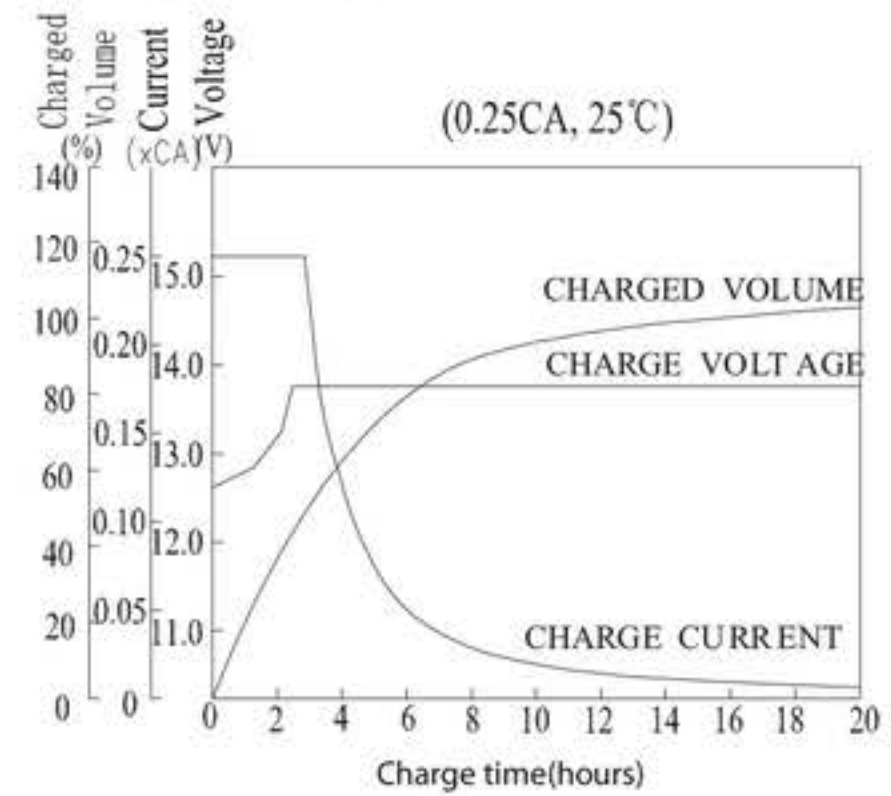
F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	129	98.5	65.2	48.3	39.2	23.0	16.2	10.9	7.35	6.08	5.19	2.78
1.65	127	97.5	64.5	47.9	38.8	22.8	16.1	10.8	7.28	6.06	5.16	2.76
1.67	127	96.5	63.0	47.2	38.5	22.6	16.1	10.7	7.22	6.05	5.14	2.74
1.70	125	94.5	62.4	46.5	37.8	22.4	16.0	10.7	7.17	6.03	5.12	2.73
1.75	117	93.1	61.4	45.7	36.2	22.1	15.8	10.6	7.13	6.0	5.09	2.71
1.80	109	86.3	56.4	45.2	35.4	21.9	15.6	10.4	6.94	5.84	4.96	2.65
1.85	90.0	78.7	52.4	41.7	35.1	21.0	15.1	9.7	6.68	5.51	4.72	2.51

The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

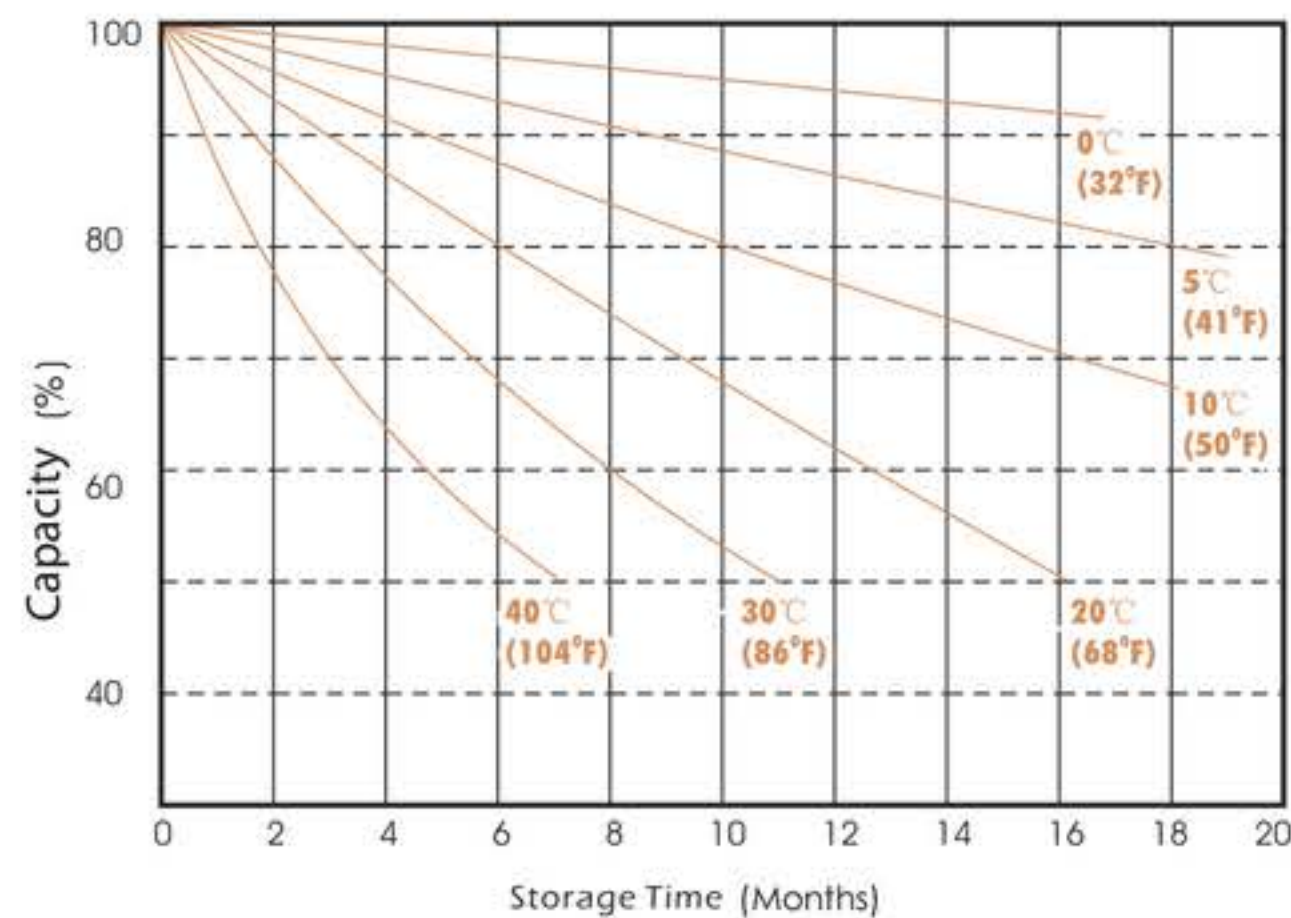
Cycle service life in relation to depth of discharge



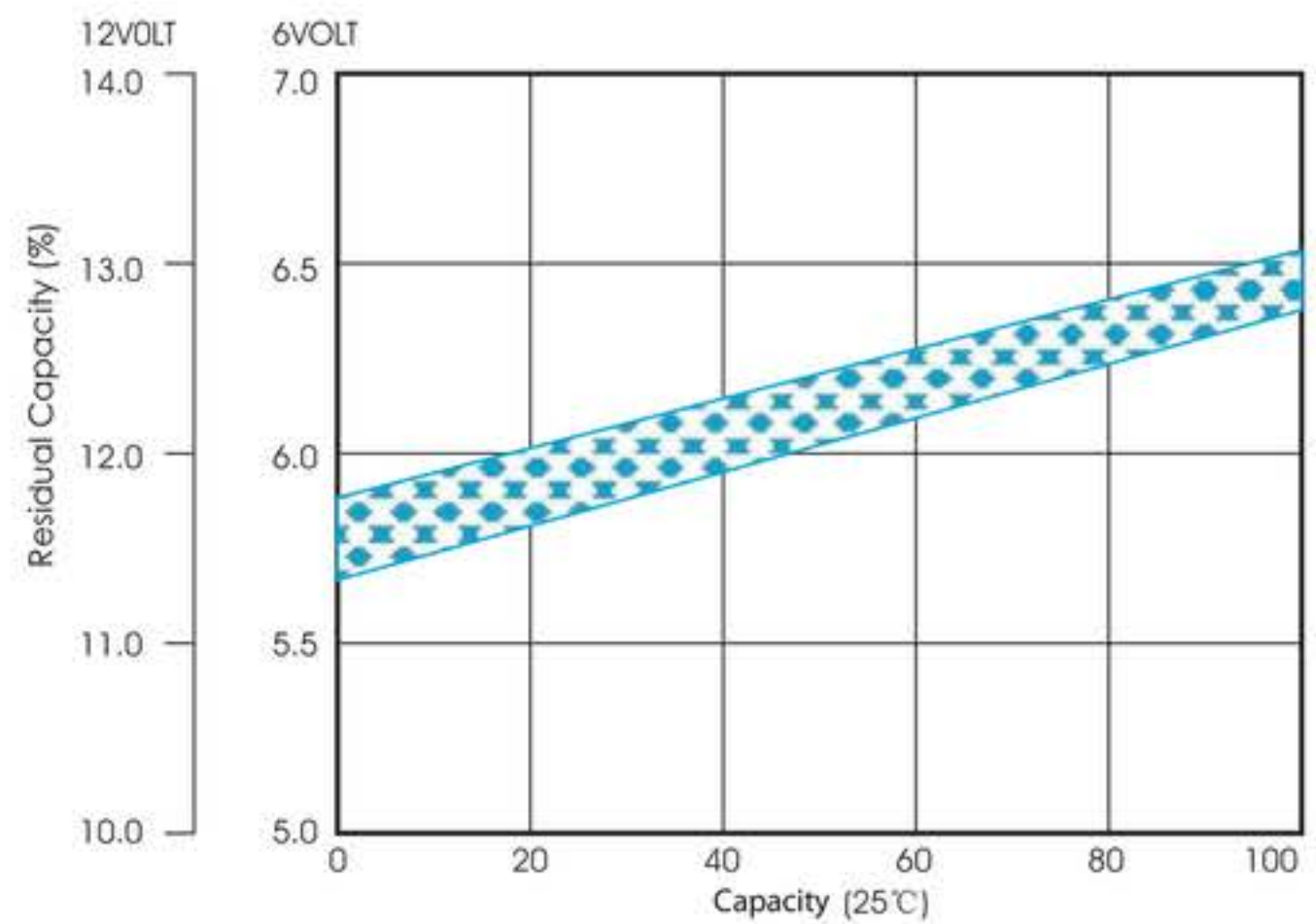
Constant voltage charge characteristic



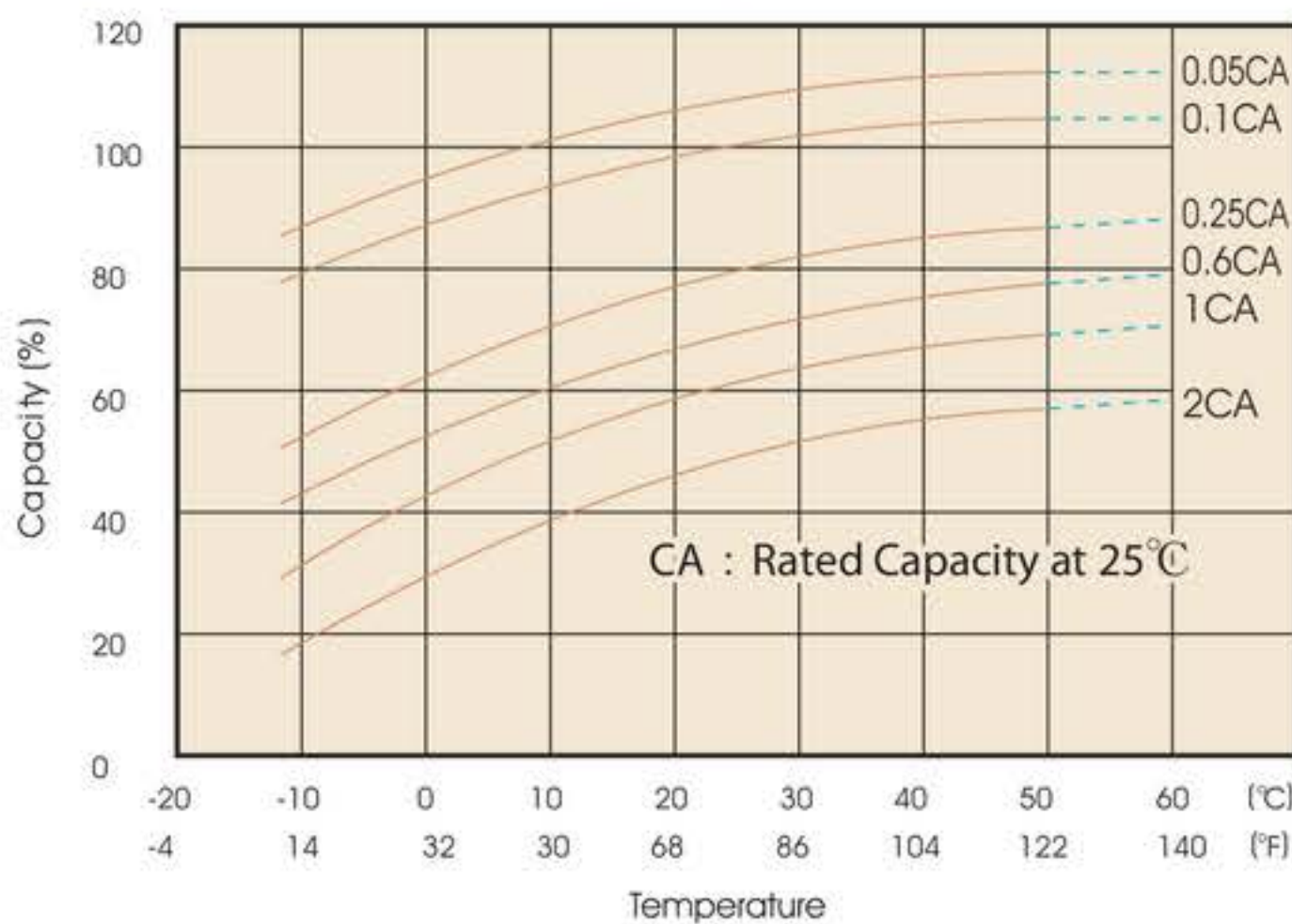
Self-Discharge Characteristics.



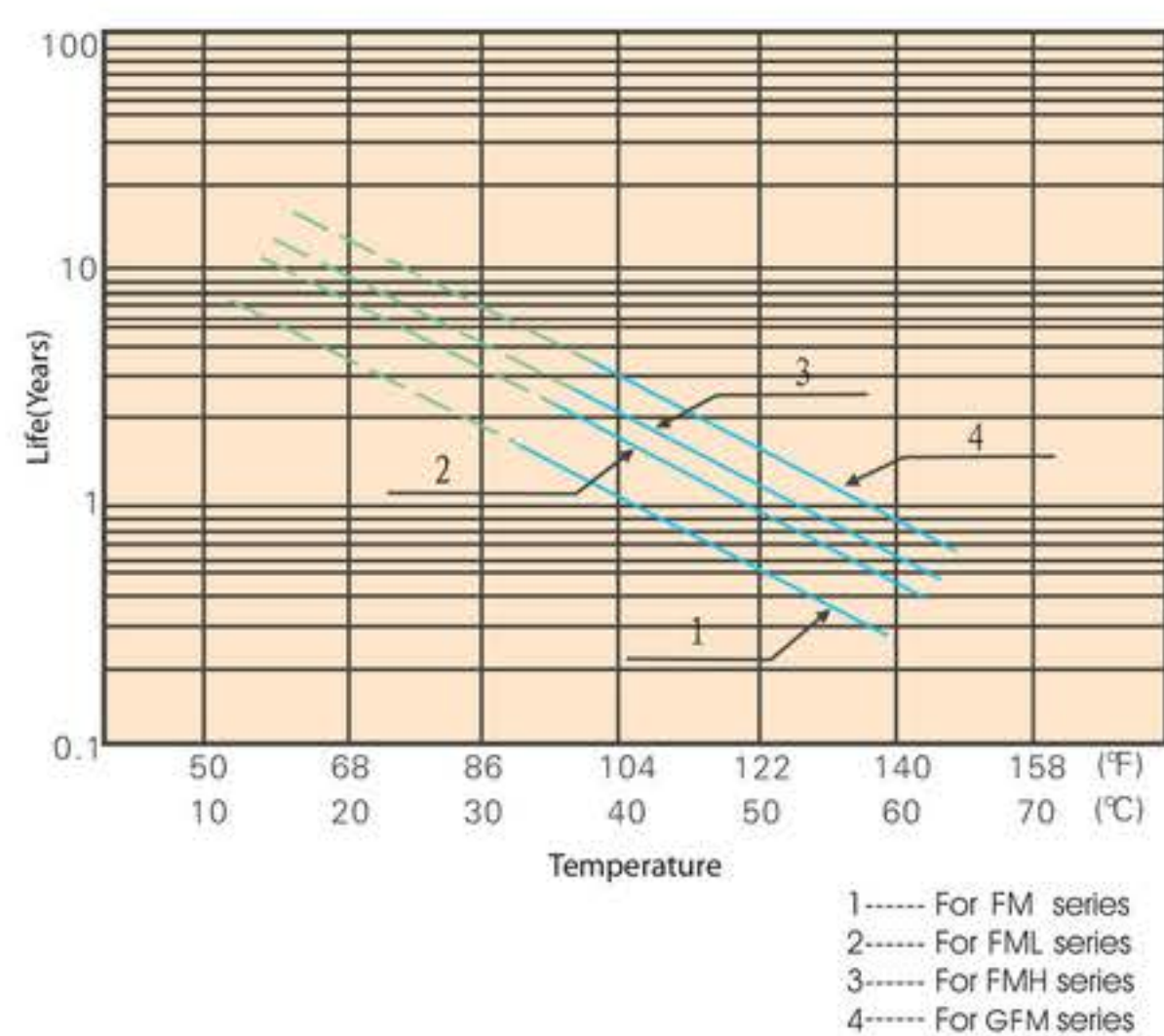
Relationship of OCV and Residual Capacity % (25°C)

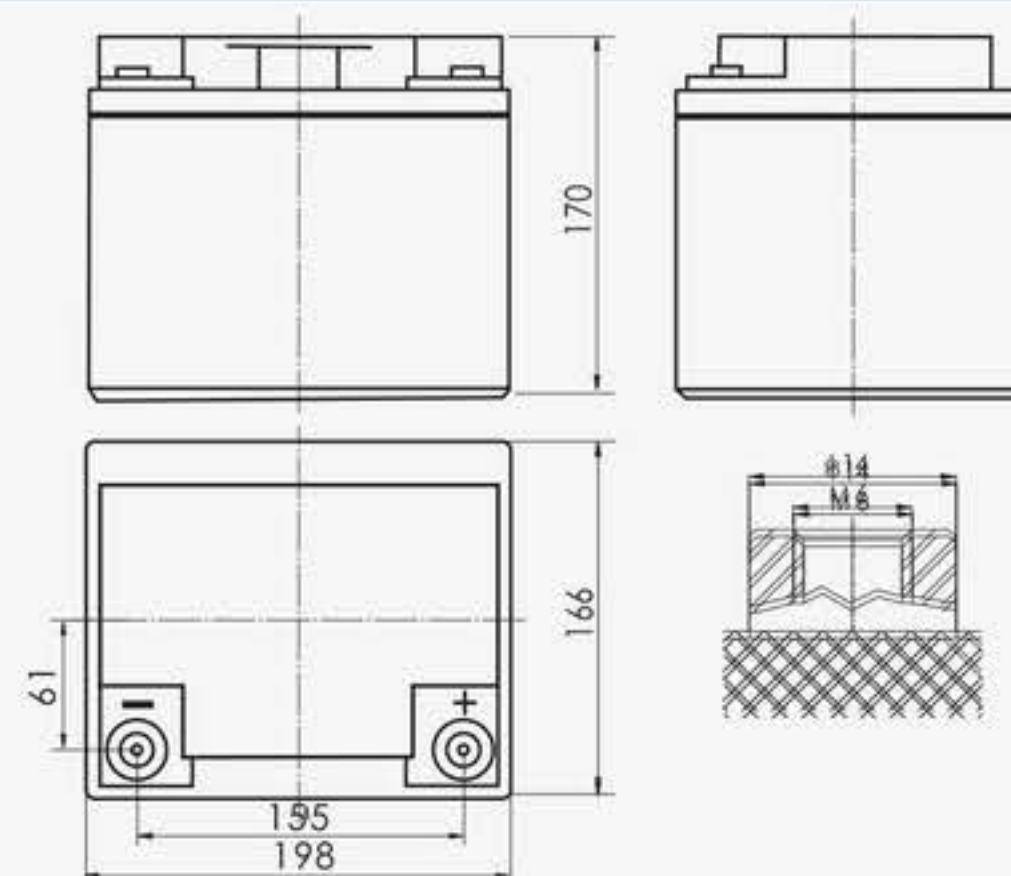


Temperature effects on capacity



Temperature effects on float life





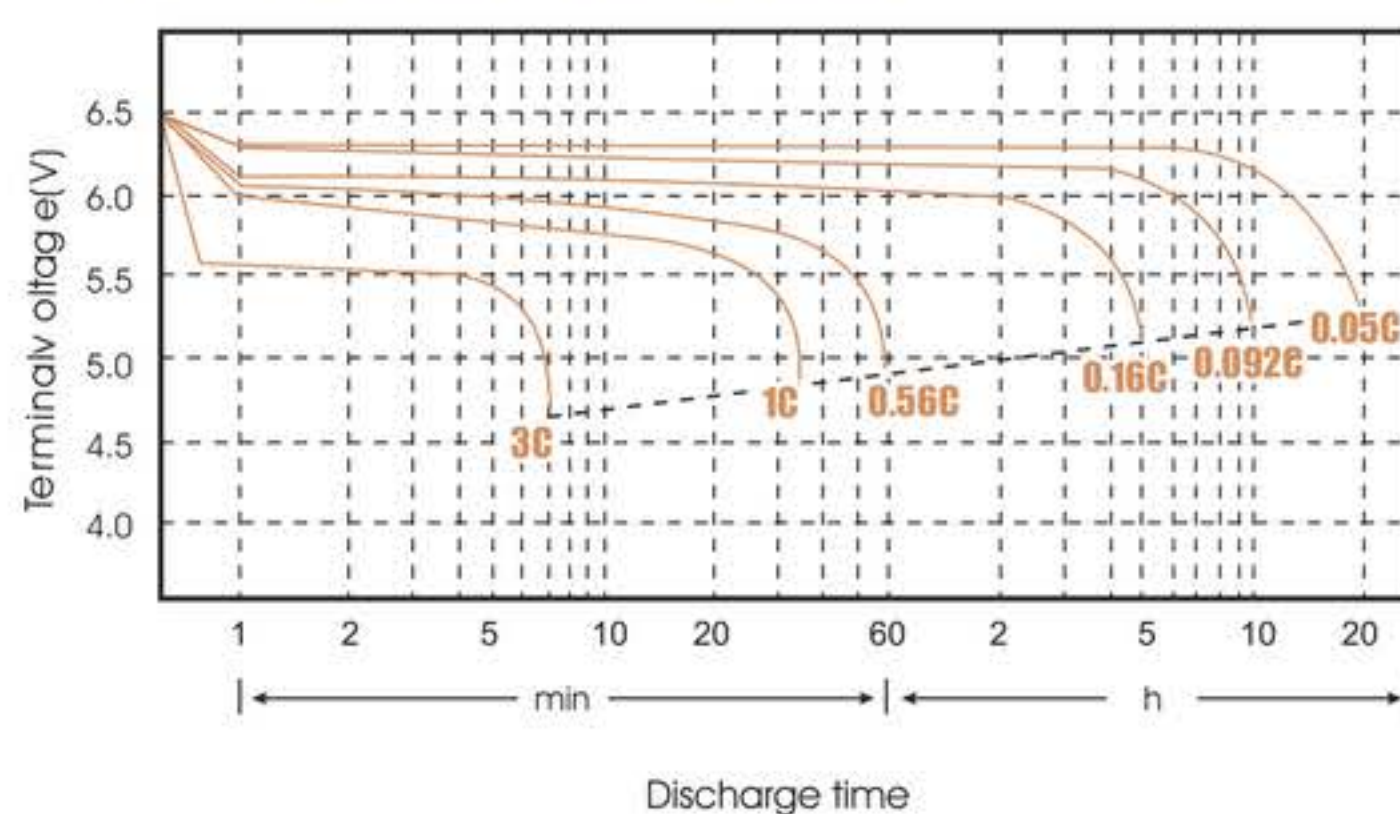
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		40Ah
Dimensions	Total Height (with terminals)	6.70inches (170mm)
	Height	6.70inches (170mm)
	Length	7.80inches (198mm)
	Width	6.54inches (166mm)
Weight		Approx. 30.18pound(13.7kg)

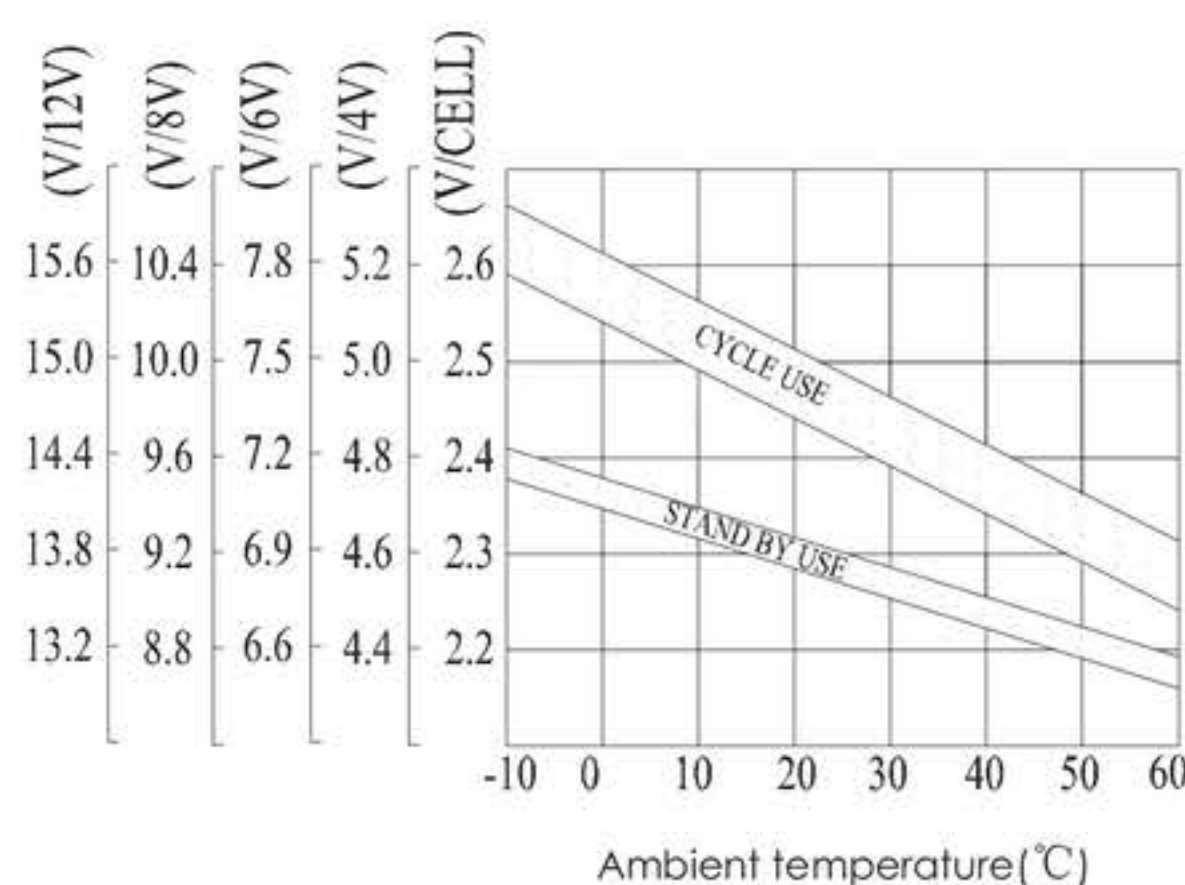
Characteristics

Capacity 77°F(25°C)	20 hour rate (2.00A)	40.0Ah
	10 hour rate (3.60A)	36.0Ah
	5 hour rate (6.40A)	32.0Ah
	1 hour rate (24.0A)	24.0Ah
	15 minute Rate (66.0A)	16.5Ah
Internal Resistance	Full charged Battery 77°F(25°C)	7mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	400A(5S)	
Terminal	M1	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 12.0A Voltage 14.4~14.7V/77 F(25 C)
	Float	Voltage 13.5~13.8V/77 F(25 C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

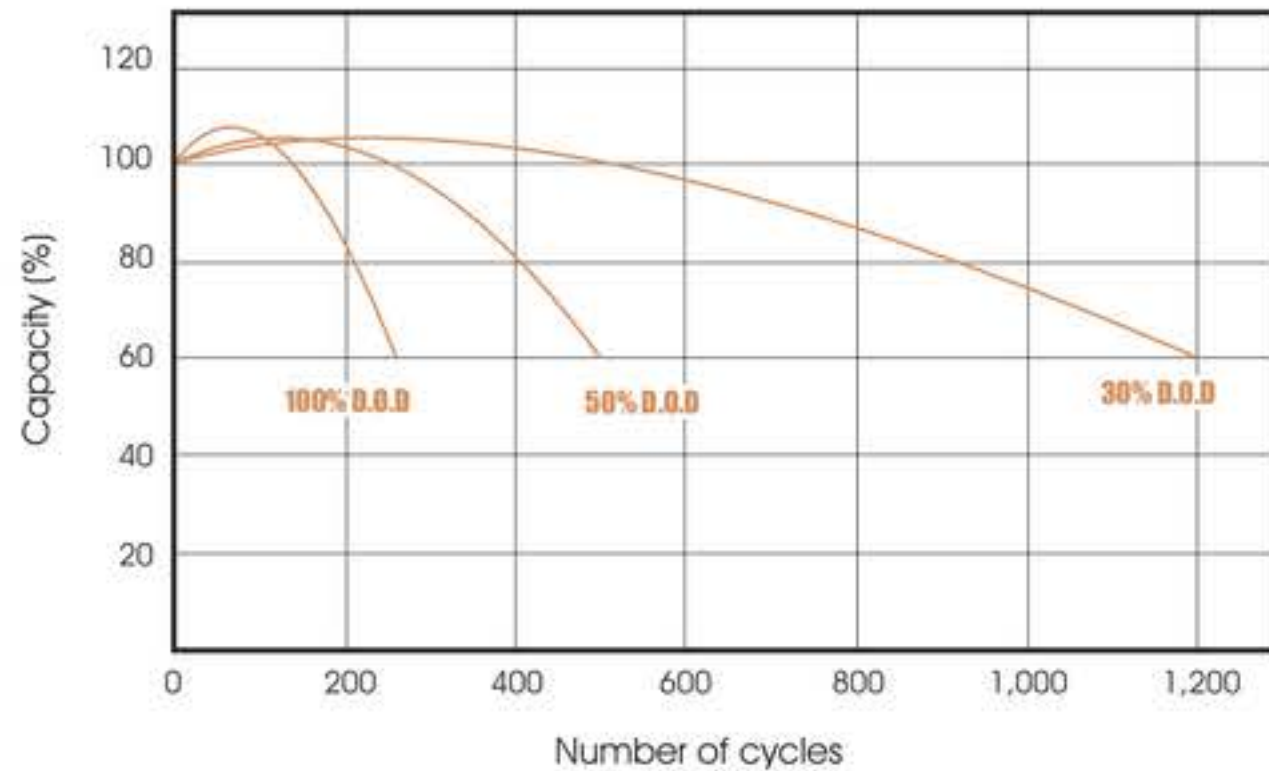
F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	81.7	64.0	40.3	30.2	23.5	14.1	10.3	6.81	4.53	4.06	3.24	1.86
1.70	77.0	60.3	38.1	28.3	22.5	13.7	10.0	6.54	4.36	3.91	3.11	1.78
1.80	64.4	51.5	35.1	26.1	21.8	13.2	9.51	6.23	4.08	3.68	2.92	1.68

Constant Power Discharge (WATTS PER CELL@25°C)

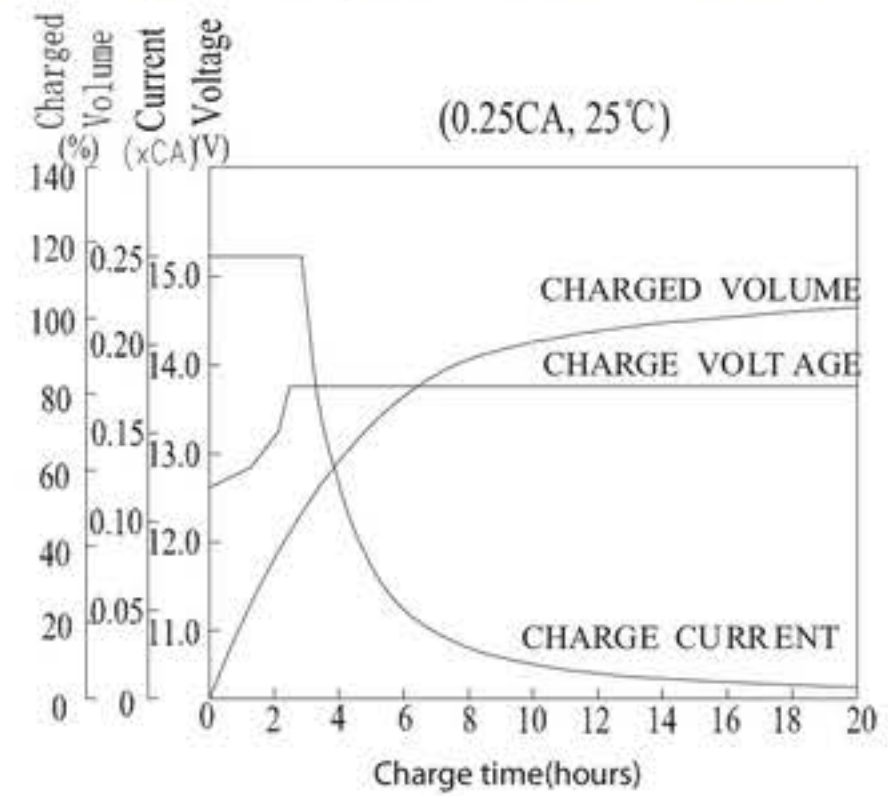
F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	150	119	73.9	55.5	46.9	26.6	18.9	12.7	8.42	7.12	6.09	3.07
1.65	146	116	73.4	55.0	45.5	25.8	18.7	12.5	8.36	7.05	6.00	3.05
1.67	144	114	72.4	54.0	44.8	25.7	18.6	12.4	8.27	6.97	5.94	3.02
1.70	142	112	71.2	53.1	44.1	25.5	18.4	12.2	8.16	6.91	5.86	2.96
1.75	134	107	70.9	52.2	43.8	25.3	18.3	12.1	8.08	6.84	5.71	2.91
1.80	123	99.0	67.5	50.3	43.0	24.8	17.9	11.9	7.81	6.61	5.60	2.82
1.85	102	87.0	61.4	47.8	40.0	23.9	17.4	11.3	7.59	6.32	5.39	2.74

The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

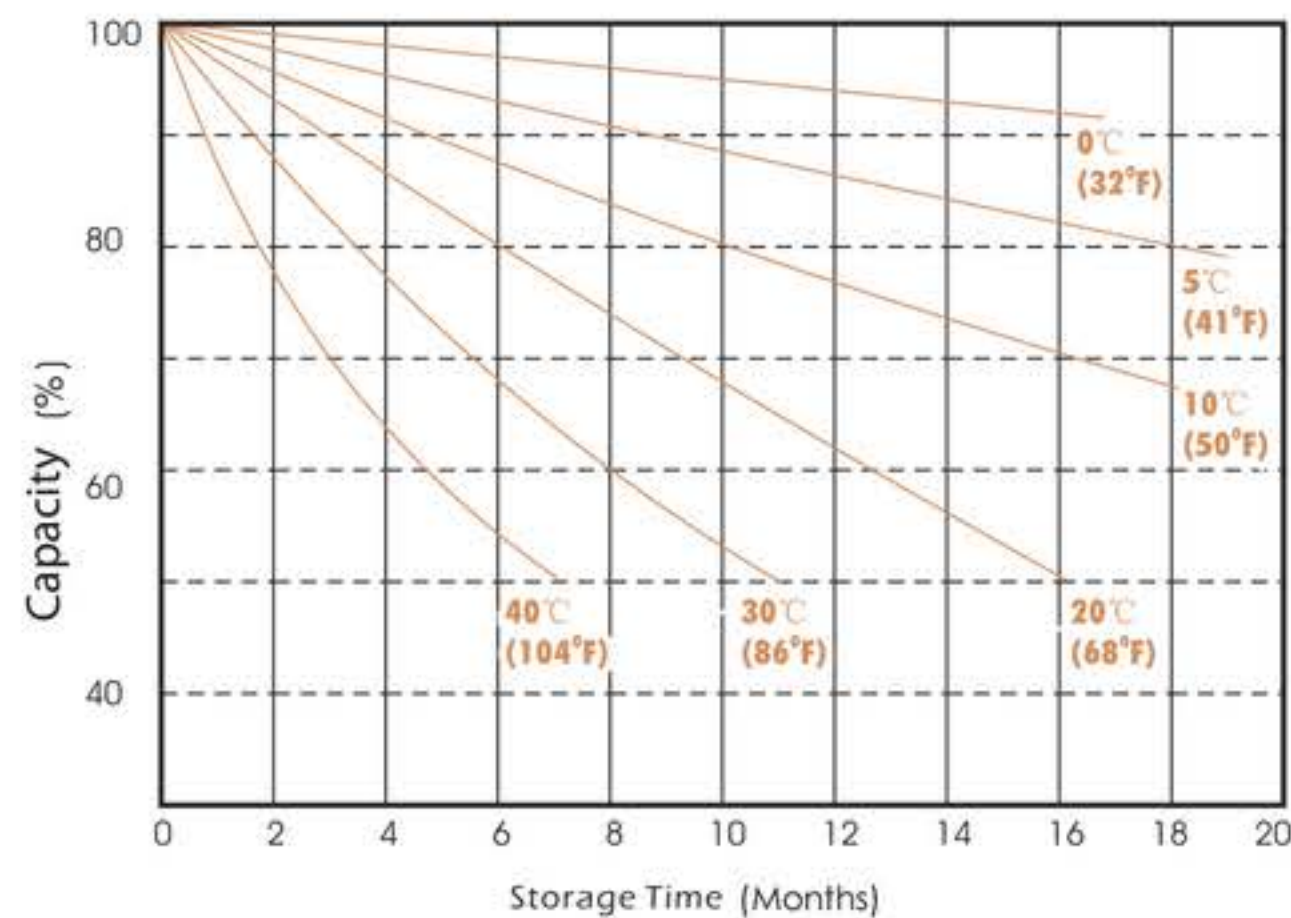
Cycle service life in relation to depth of discharge



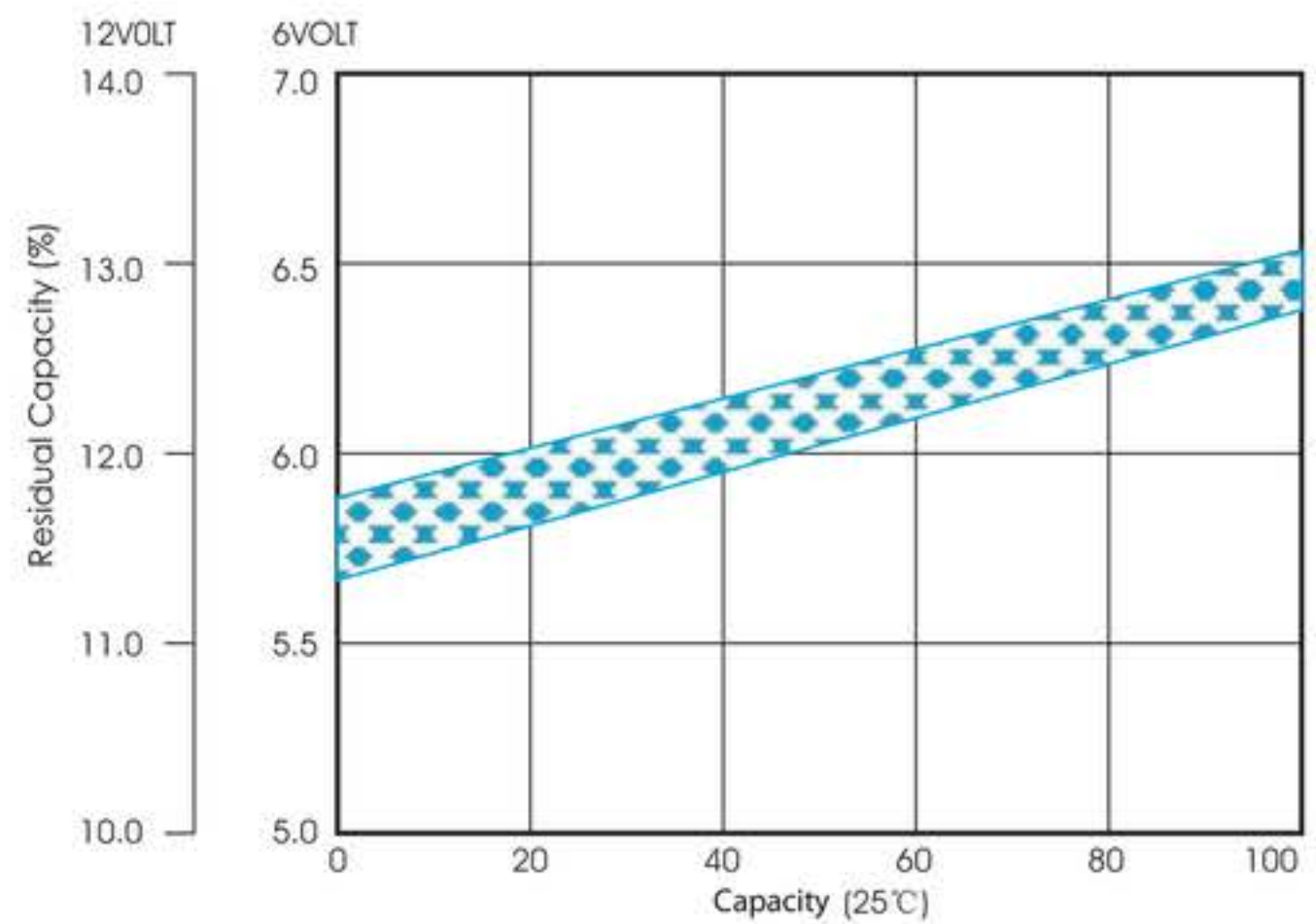
Constant voltage charge characteristic



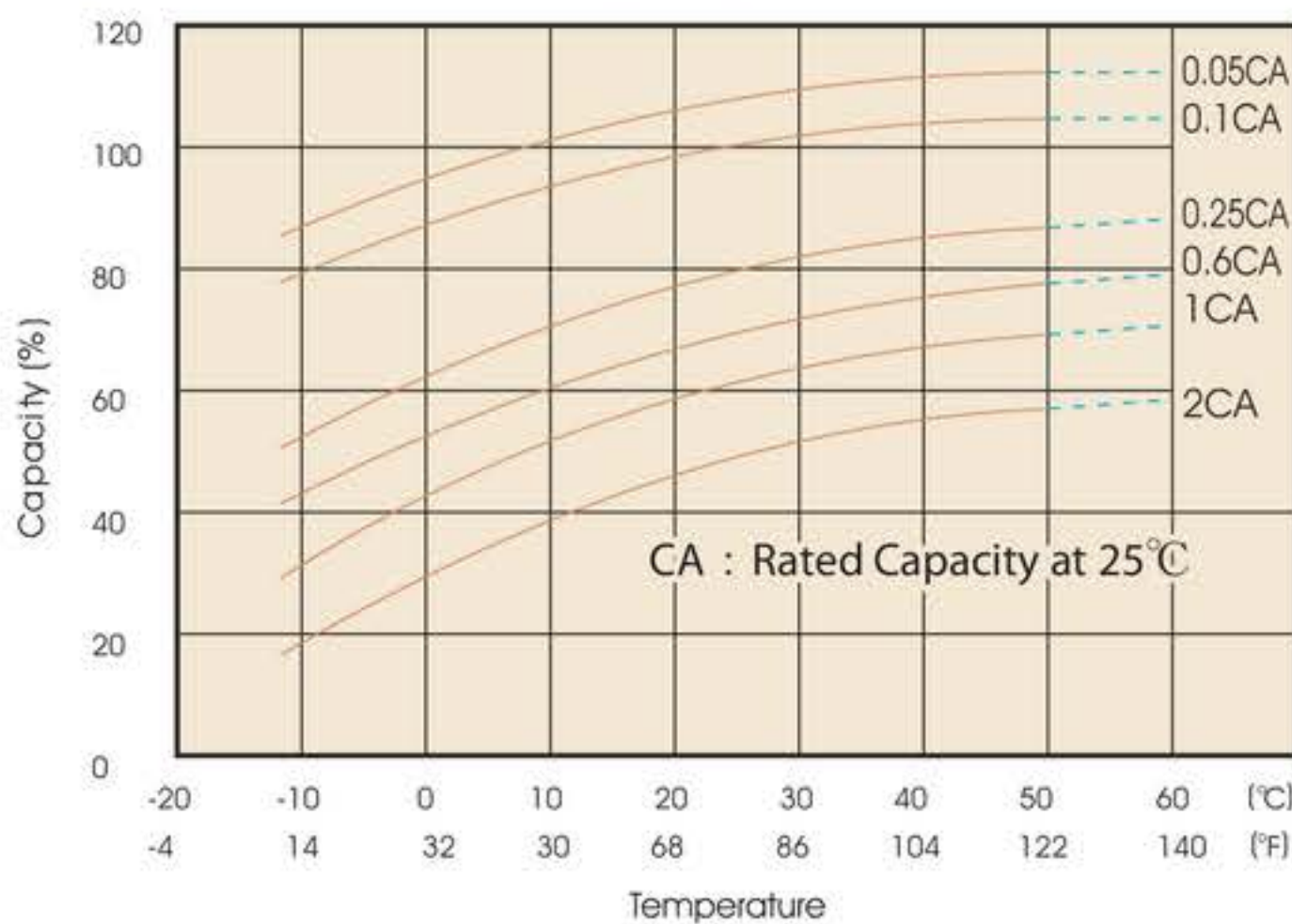
Self-Discharge Characteristics.



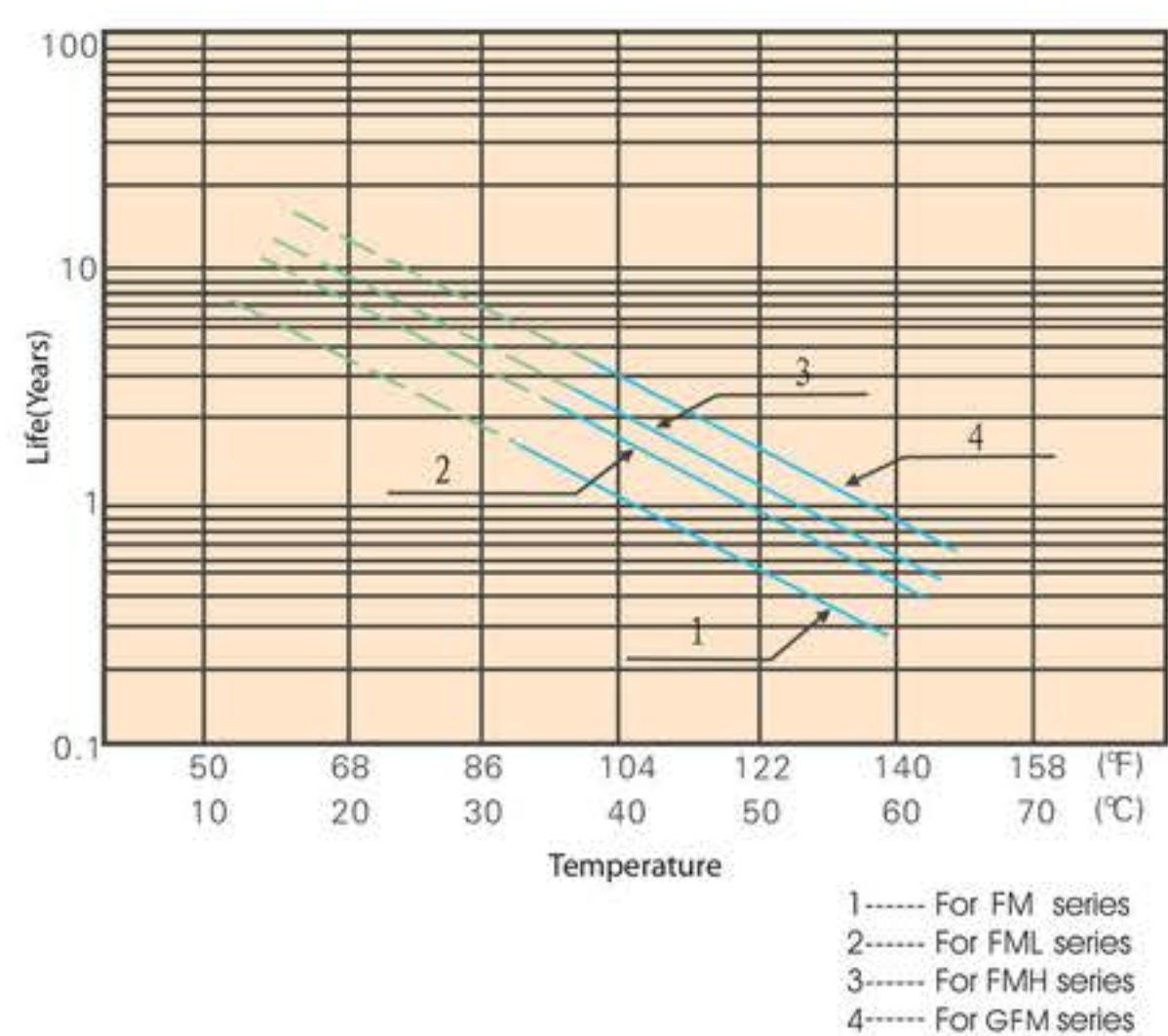
Relationship of OCV and Residual Capacity % (25°C)

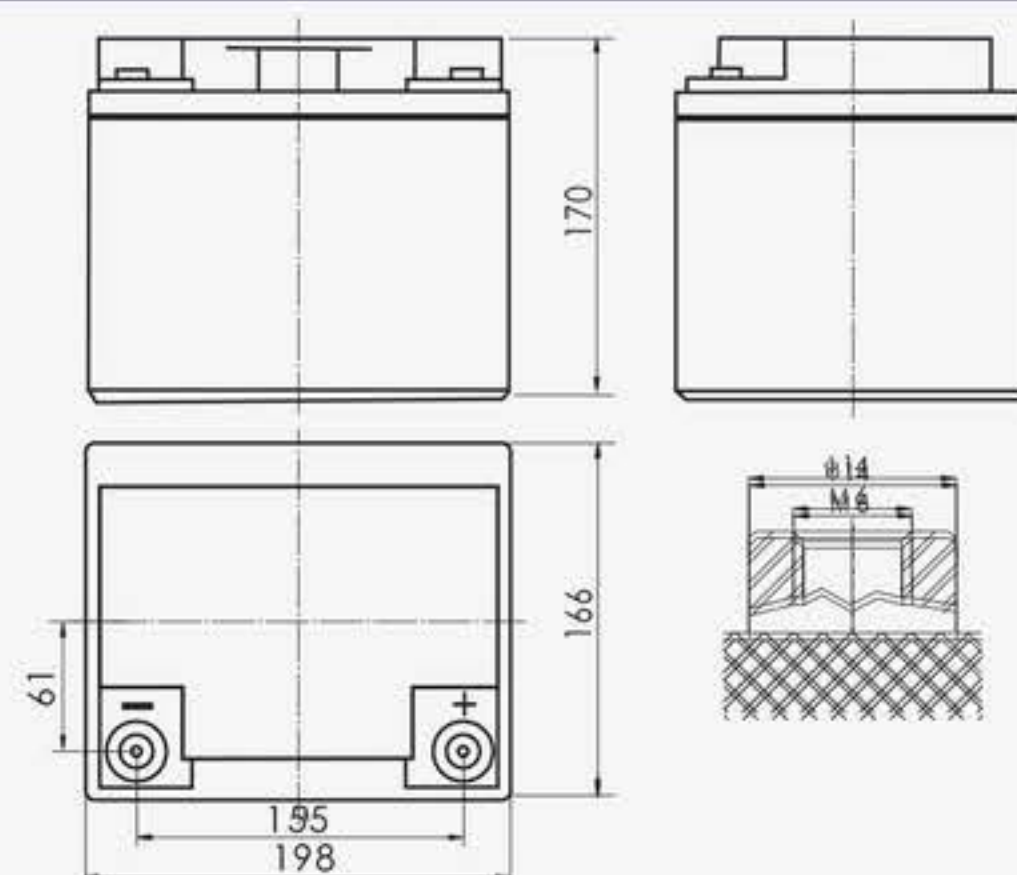


Temperature effects on capacity



Temperature effects on float life





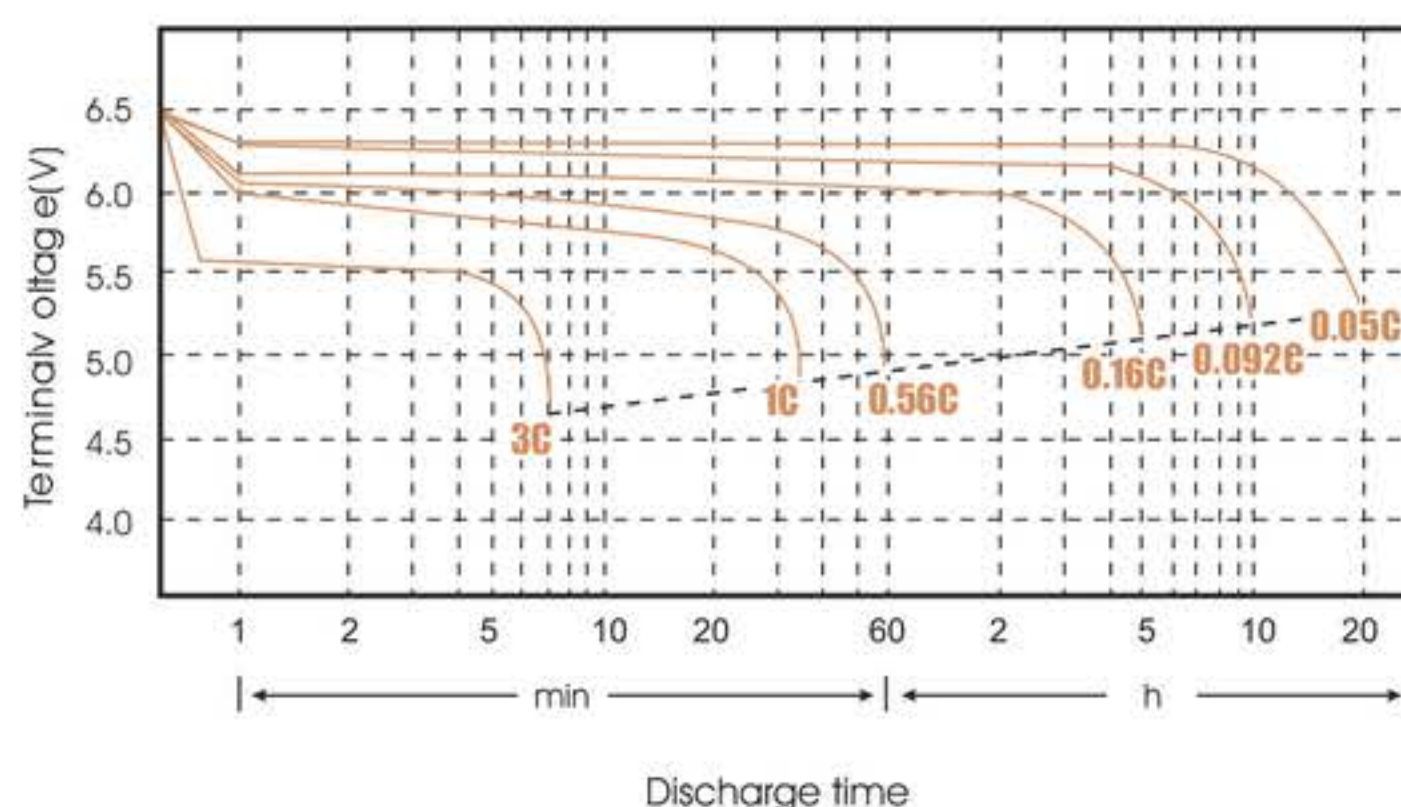
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		45Ah
Dimensions	Total Height (with terminals)	6.70inches (170mm)
	Height	6.70inches (170mm)
	Length	7.80inches (198mm)
	Width	6.54inches (166mm)
Weight		Approx. 30.36pound(13.8kg)

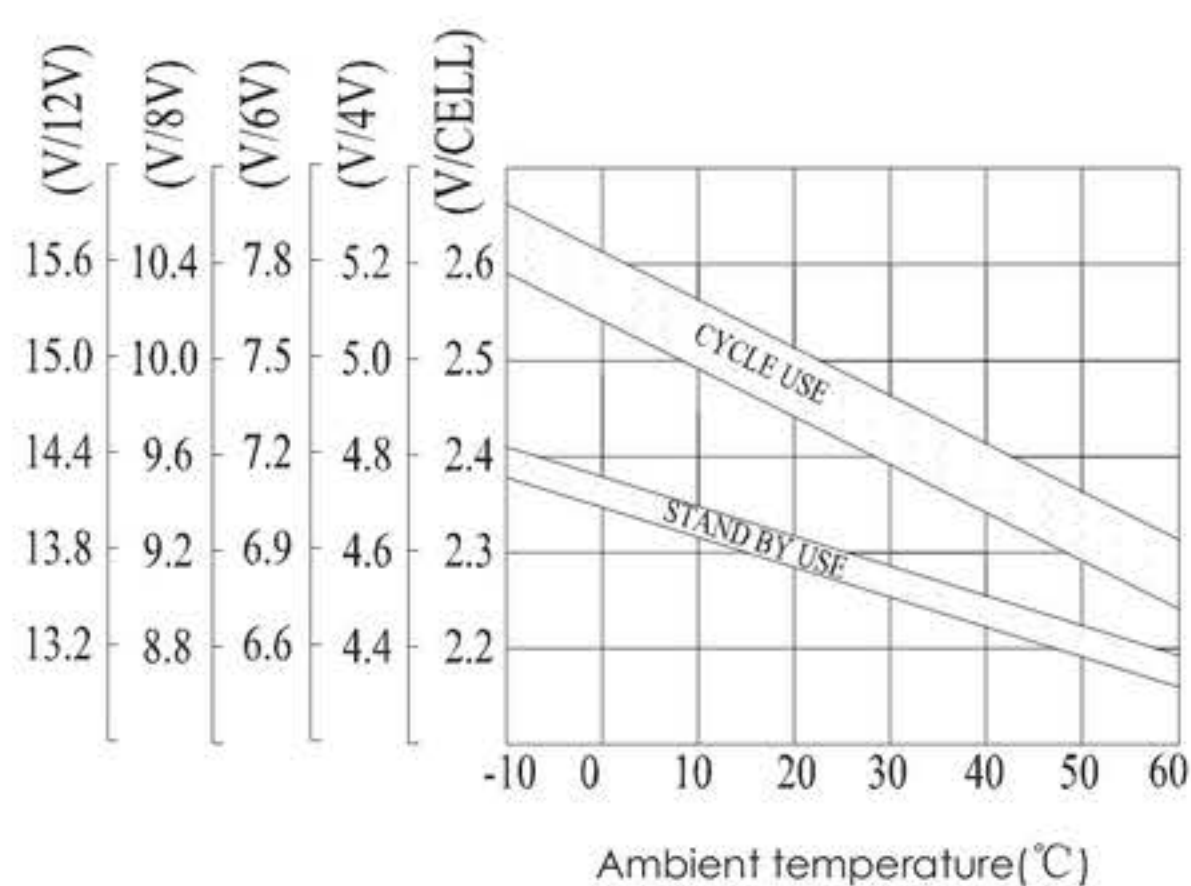
Characteristics

Capacity 77°F(25°C)	20 hour rate (2.25A)	45.0Ah
	10 hour rate (4.05A)	40.5Ah
	5 hour rate (7.20A)	36.0Ah
	1 hour rate (27.0A)	27.0Ah
	15 minute Rate (74.4A)	18.6Ah
Internal Resistance	Full charged Battery 77°F(25°C)	6.5mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	450A(5S)	
Terminal	M1	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 13.5A Voltage 14.4~14.7V/77°F(25°C)
	Float	Voltage 13.5~13.8V/77°F(25°C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	97.7	75.6	45.9	36.0	24.39	17.01	11.75	7.88	5.58	4.41	3.78	1.95
1.70	92.3	70.7	39.1	34.1	23.36	16.61	11.25	7.61	5.36	4.32	3.67	1.91
1.80	77.9	61.7	35.3	32.2	22.23	15.89	10.62	7.20	5.04	4.14	3.57	1.88

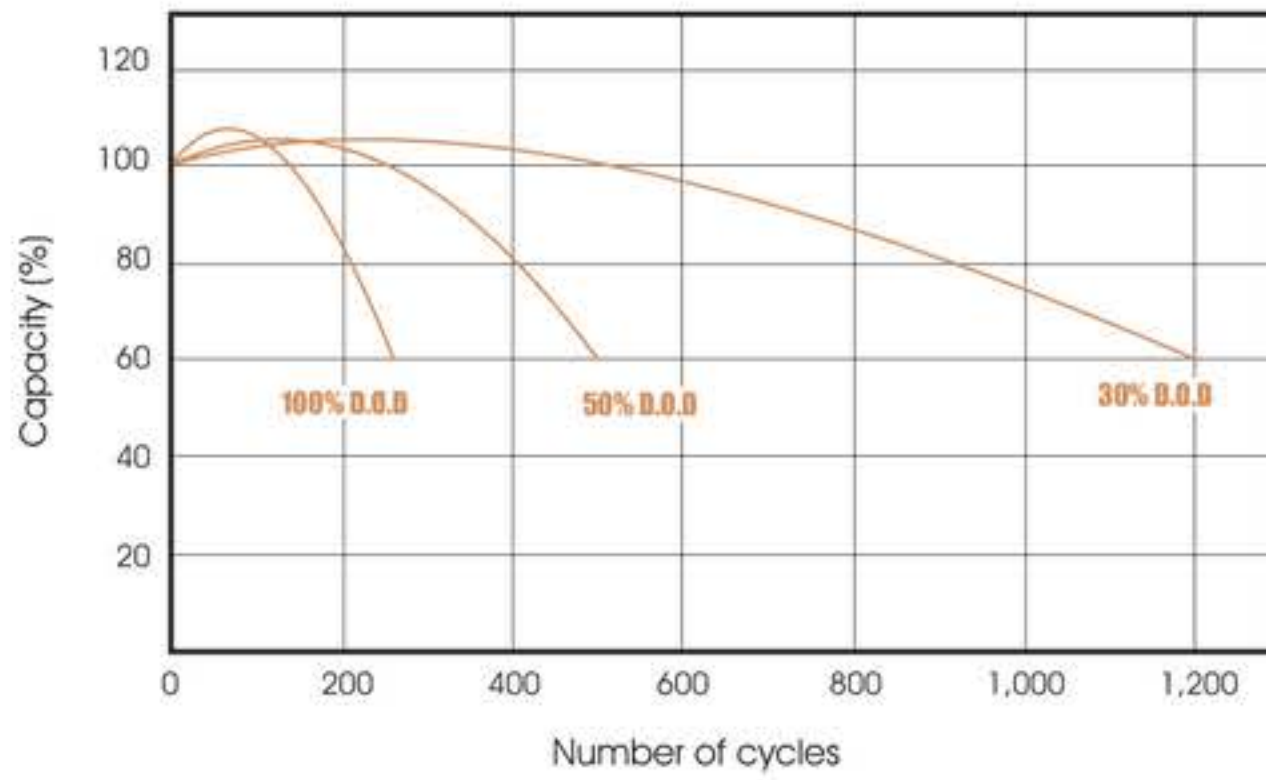
Constant Power Discharge (WATTS PER CELL@25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	169	134	83.1	62.4	52.8	29.9	21.3	14.3	9.47	8.01	6.85	3.45
1.65	164	131	82.6	61.9	51.2	29.0	21.0	14.1	9.41	7.93	6.75	3.43
1.67	162	128	81.5	60.8	50.4	28.9	20.9	14.0	9.30	7.84	6.68	3.40
1.70	160	126	80.1	59.7	49.6	28.7	20.7	13.7	9.18	7.77	6.59	3.33
1.75	151	120	79.8	58.7	49.3	28.5	20.6	13.6	9.09	7.70	6.42	3.27
1.80	138	111	75.9	56.6	48.4	27.9	20.1	13.4	8.79	7.44	6.30	3.17
1.85	115	99.0	69.1	53.8	45.0	26.9	19.6	12.7	8.54	7.11	6.06	3.08

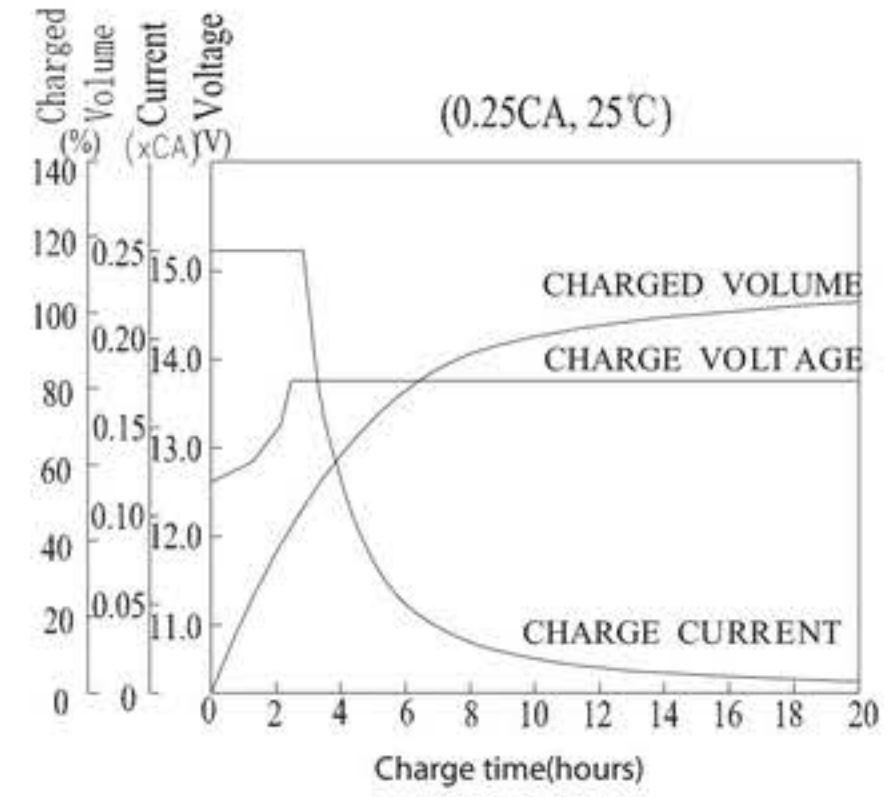


The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

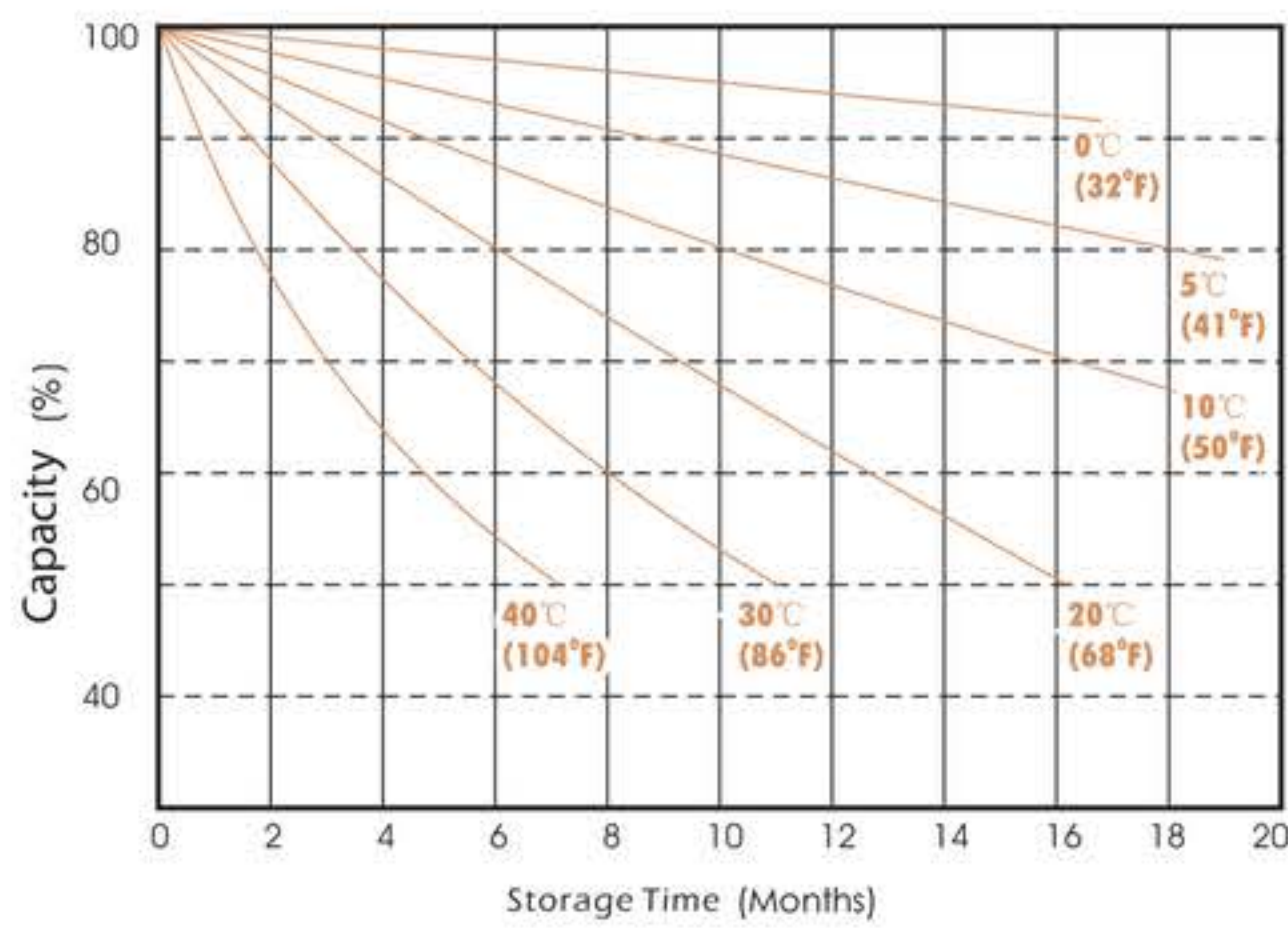
Cycle service life in relation to depth of discharge



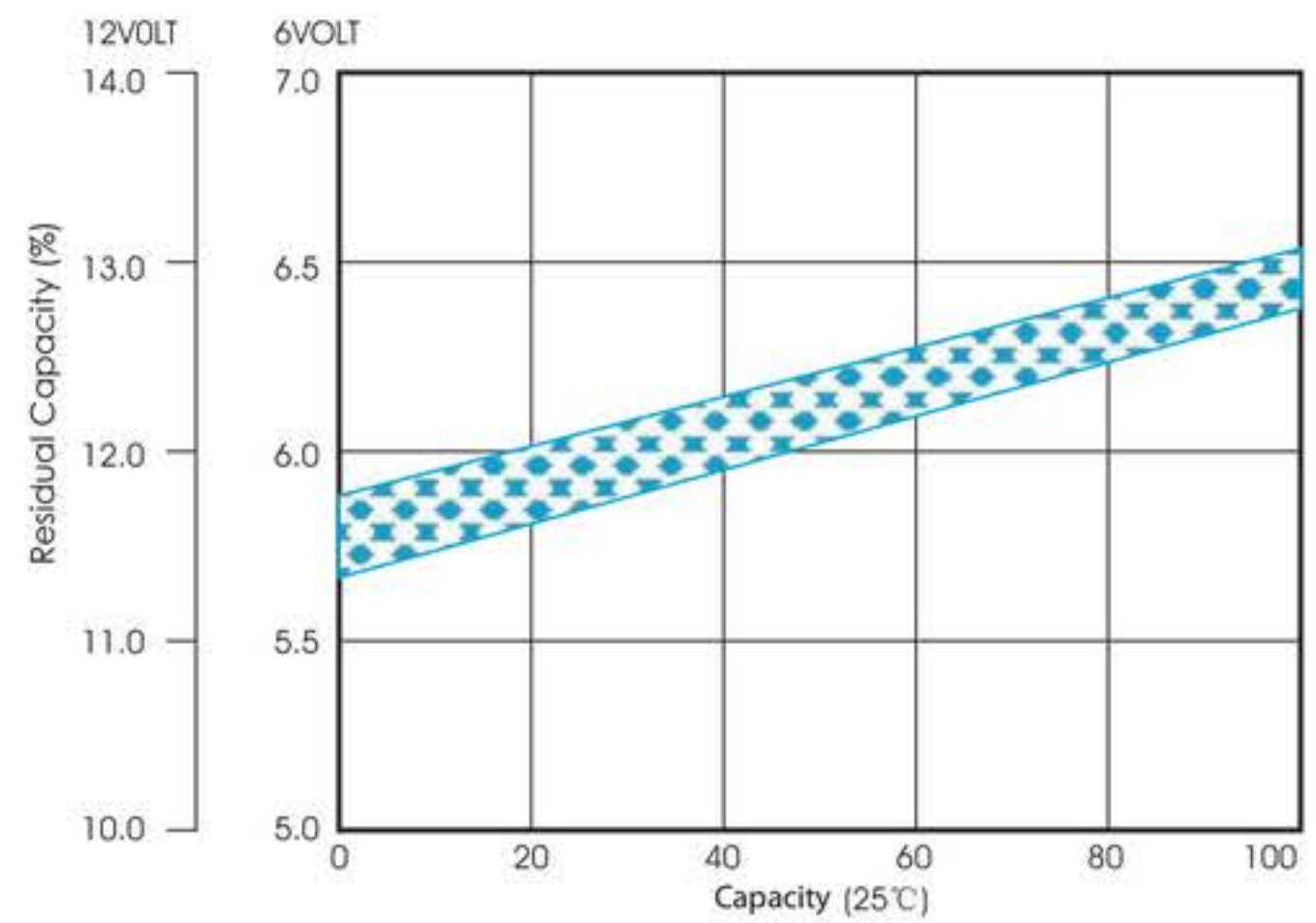
Constant voltage charge characteristic



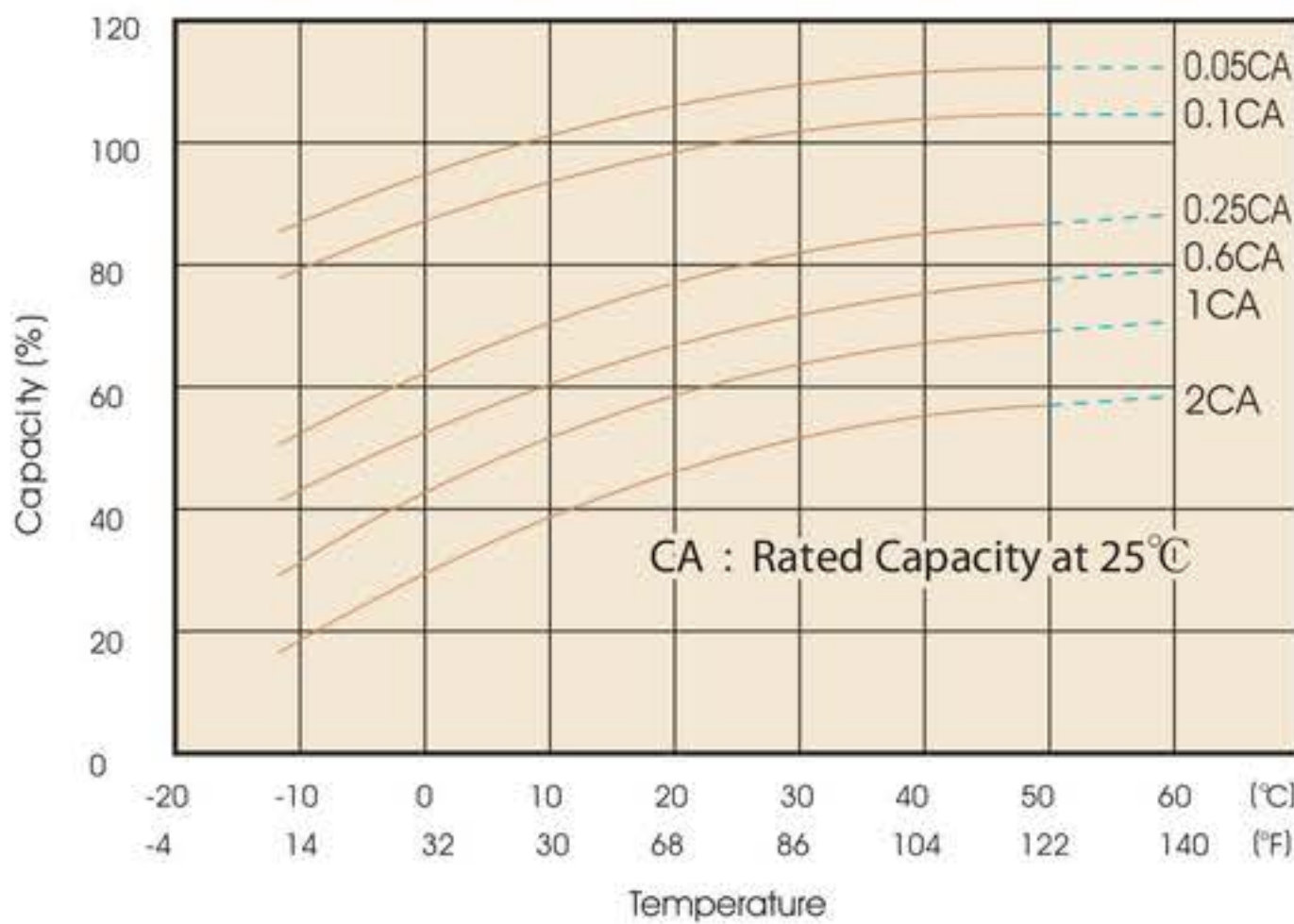
Self-Discharge Characteristics.



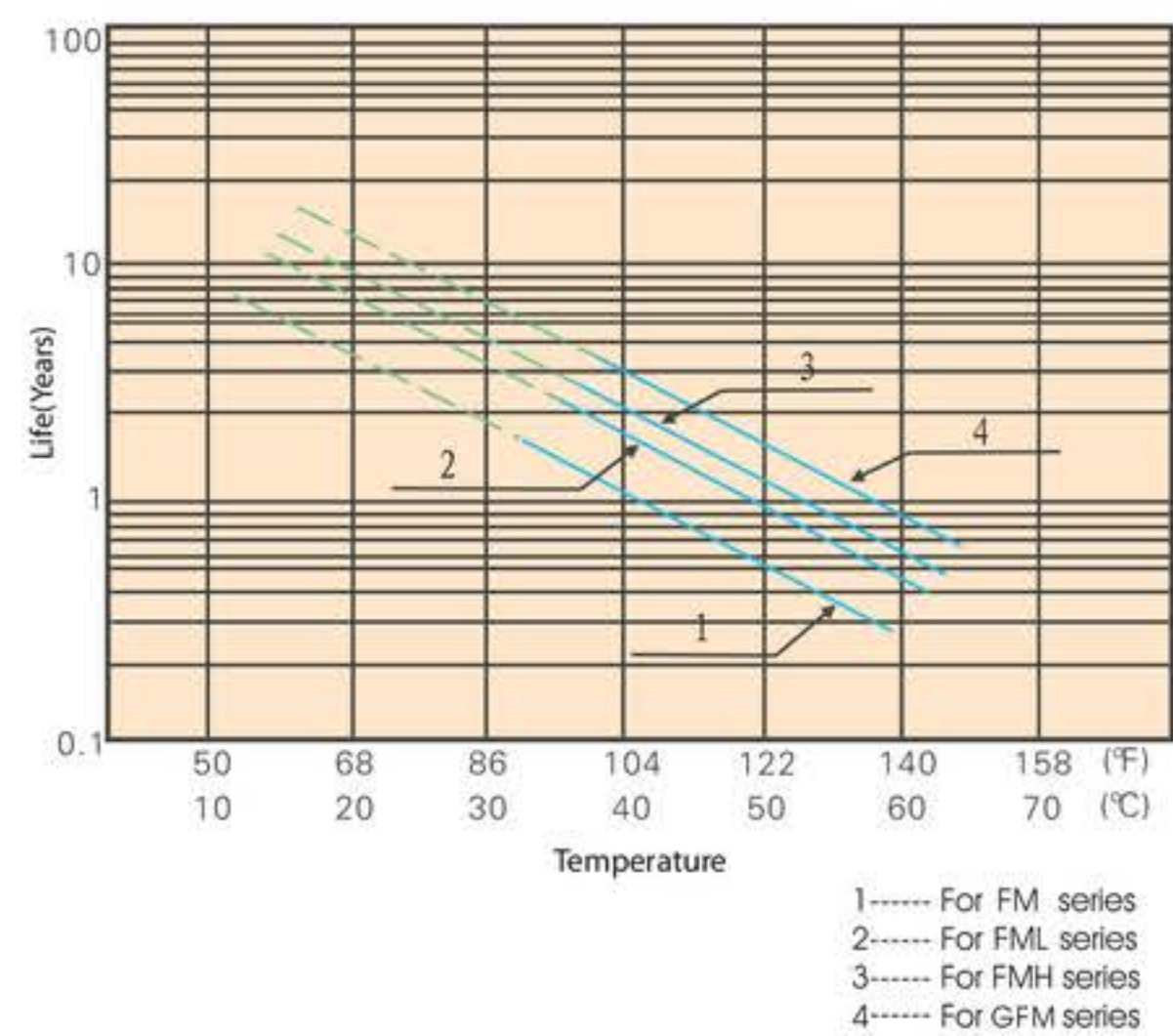
Relationship of OCV and Residual Capacity % (25°C)

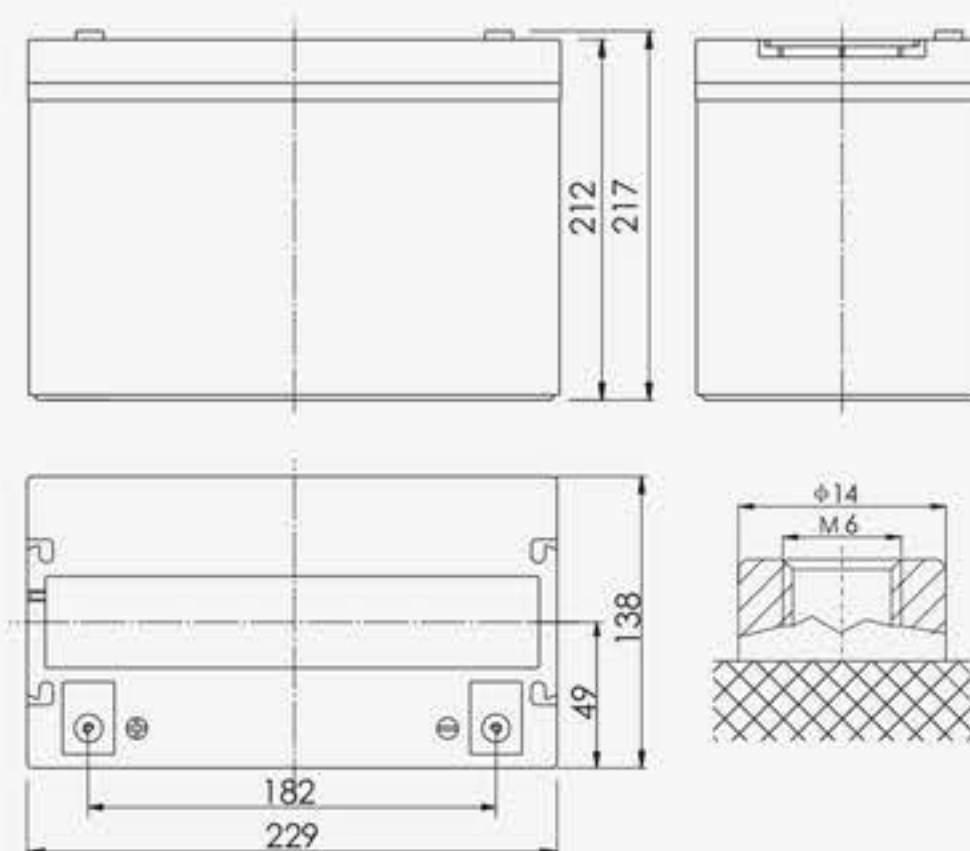


Temperature effects on capacity



Temperature effects on float life





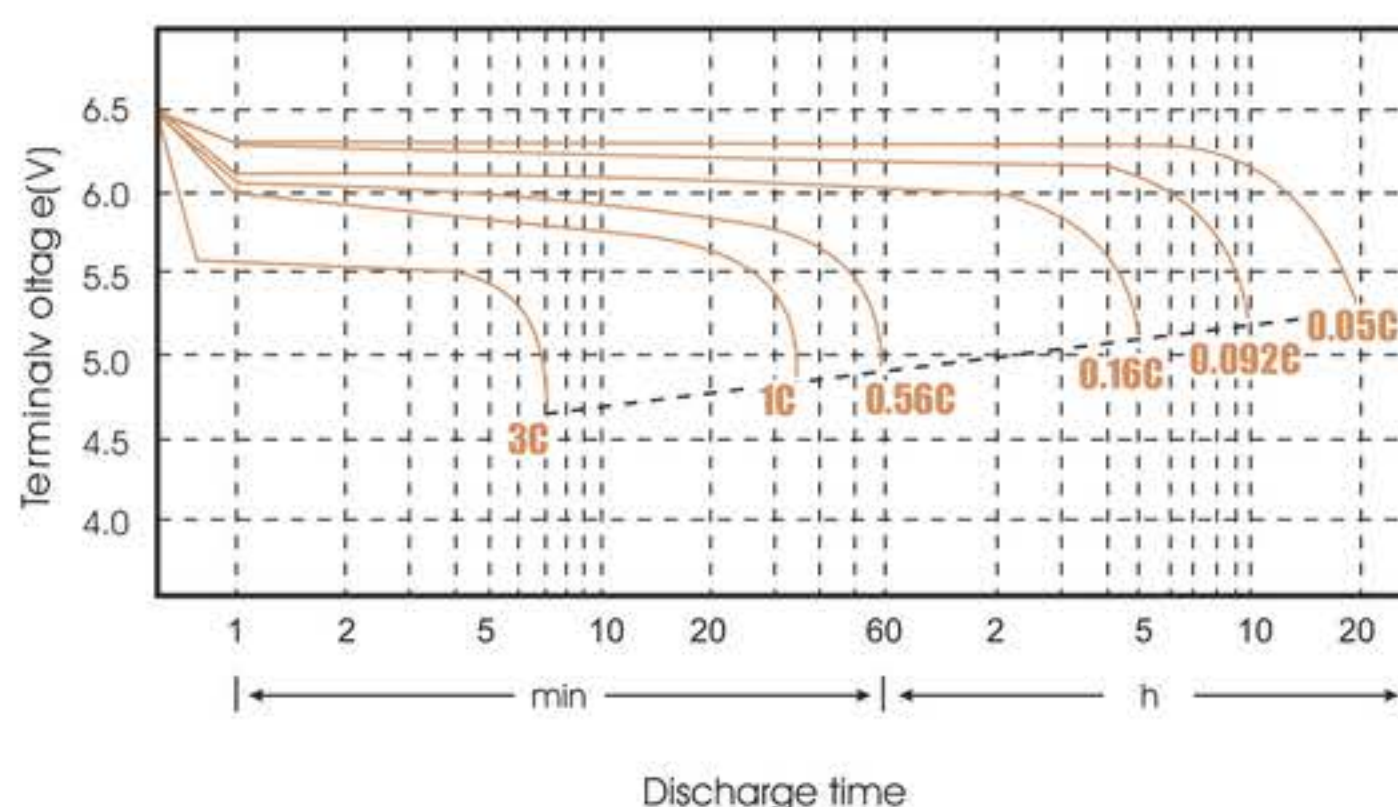
Specifications

Nominal Voltage	12V
Rated Capacity(20 hour rate)	50Ah
Dimensions	Total Height (with terminals) 8.39inches (213mm) Height 8.19inches (208mm) Length 9.02inches (229mm) Width 5.43inches (138mm)
Weight	Approx. 35.64pound(16.2kg)

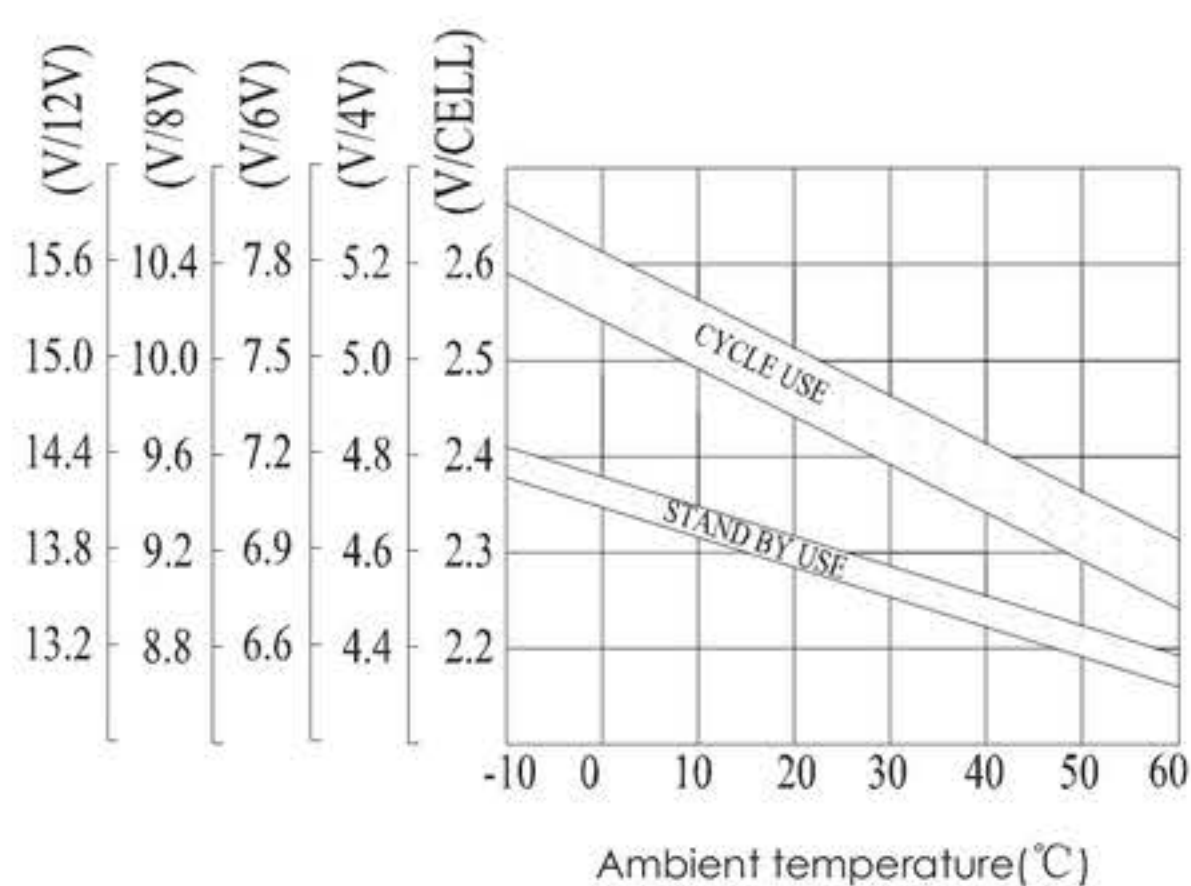
Characteristics

Capacity 77°F(25°C)	20 hour rate (2.5A) 50Ah 10 hour rate (4.6A) 46Ah 5 hour rate (8.0A) 40Ah 1 hour rate (30A) 30Ah 15 minute Rate (87.2A) 21.8Ah
Internal Resistance	Full charged Battery 77°F(25°C) 8.3mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C) 102% 77°F(25°C) 100% 32°F(0°C) 85% 5°F(-15°C) 65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage 91% Capacity after 6 month storage 81% Capacity after 12 month storage 60%
Max. Discharge Current 77°F(25°C)	500A(5S)
Terminal	M1
Charge (Constant Voltage)	Cycle Initial Charging Current less than 15A Voltage 14.4~14.7V/77°F(25°C) Float Voltage 13.5~13.8V/77°F(25°C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	108.5	84.0	51.0	40.1	27.10	18.90	13.05	8.75	6.20	4.90	4.21	2.17
1.70	102.5	78.5	43.4	37.9	25.95	18.45	12.50	8.45	5.95	4.80	4.08	2.13
1.80	86.5	68.5	39.2	35.8	24.70	17.65	11.80	8.00	5.60	4.60	3.97	2.09

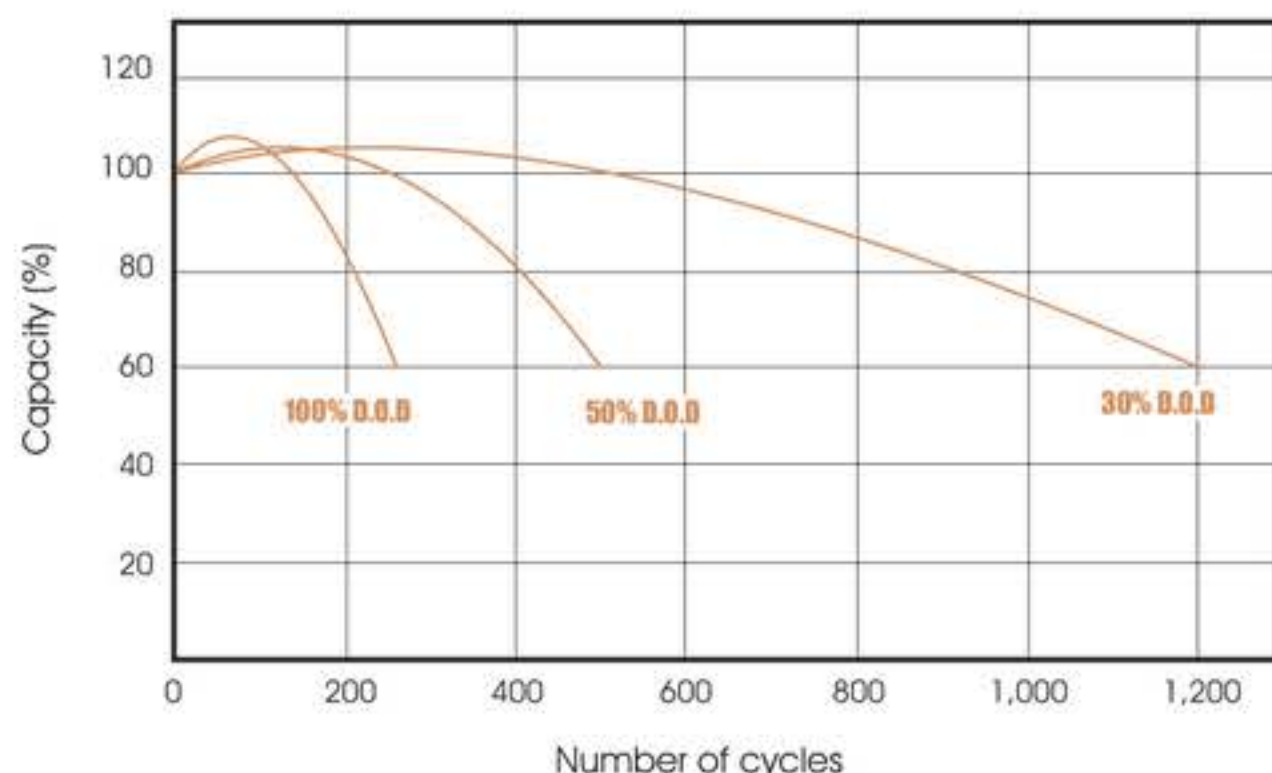
Constant Power Discharge (WATTS PER CELL@25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	223	173	103	79.8	64.5	38.4	27.2	17.6	10.9	9.1	7.92	4.15
1.65	210	165	101	78.6	63.0	37.6	26.6	17.3	10.9	9.1	7.92	4.15
1.67	204	160	101	77.9	62.2	37.2	26.4	17.1	10.9	9.1	7.92	4.15
1.70	199	157	100	77.0	61.5	36.9	26.1	17.0	10.9	9.1	7.92	4.15
1.75	187	151	98	75.3	60.2	35.8	25.5	16.8	10.8	9.0	7.85	4.15
1.80	174	144	97	73.3	58.6	34.8	24.9	16.6	10.7	8.9	7.61	4.07
1.85	144	121	78	66.9	56.4	33.7	24.2	15.5	10.6	8.4	7.29	3.84

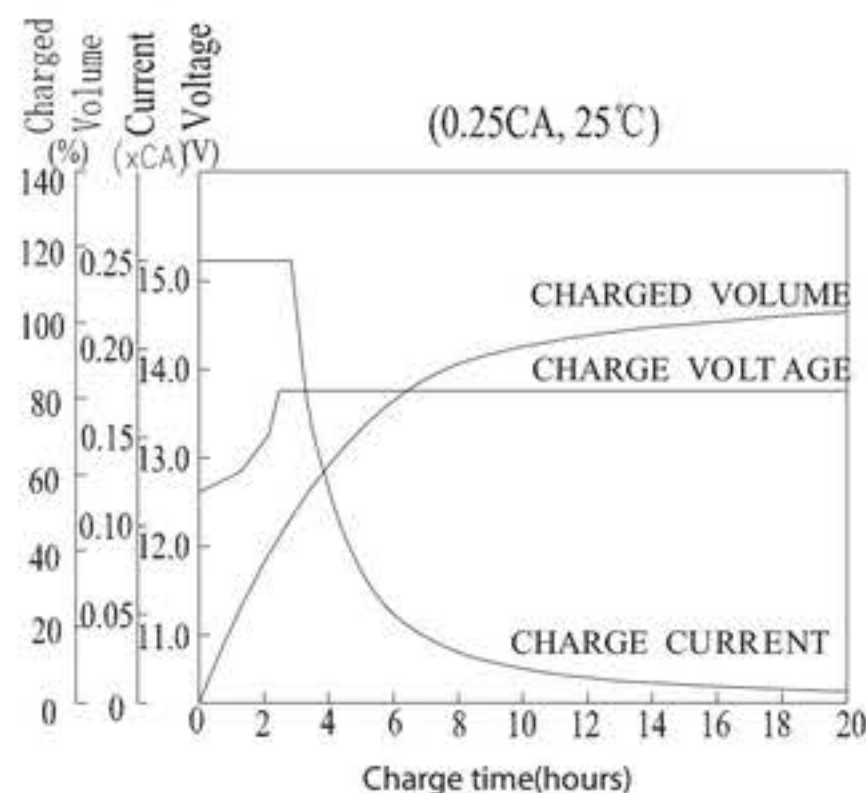


The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

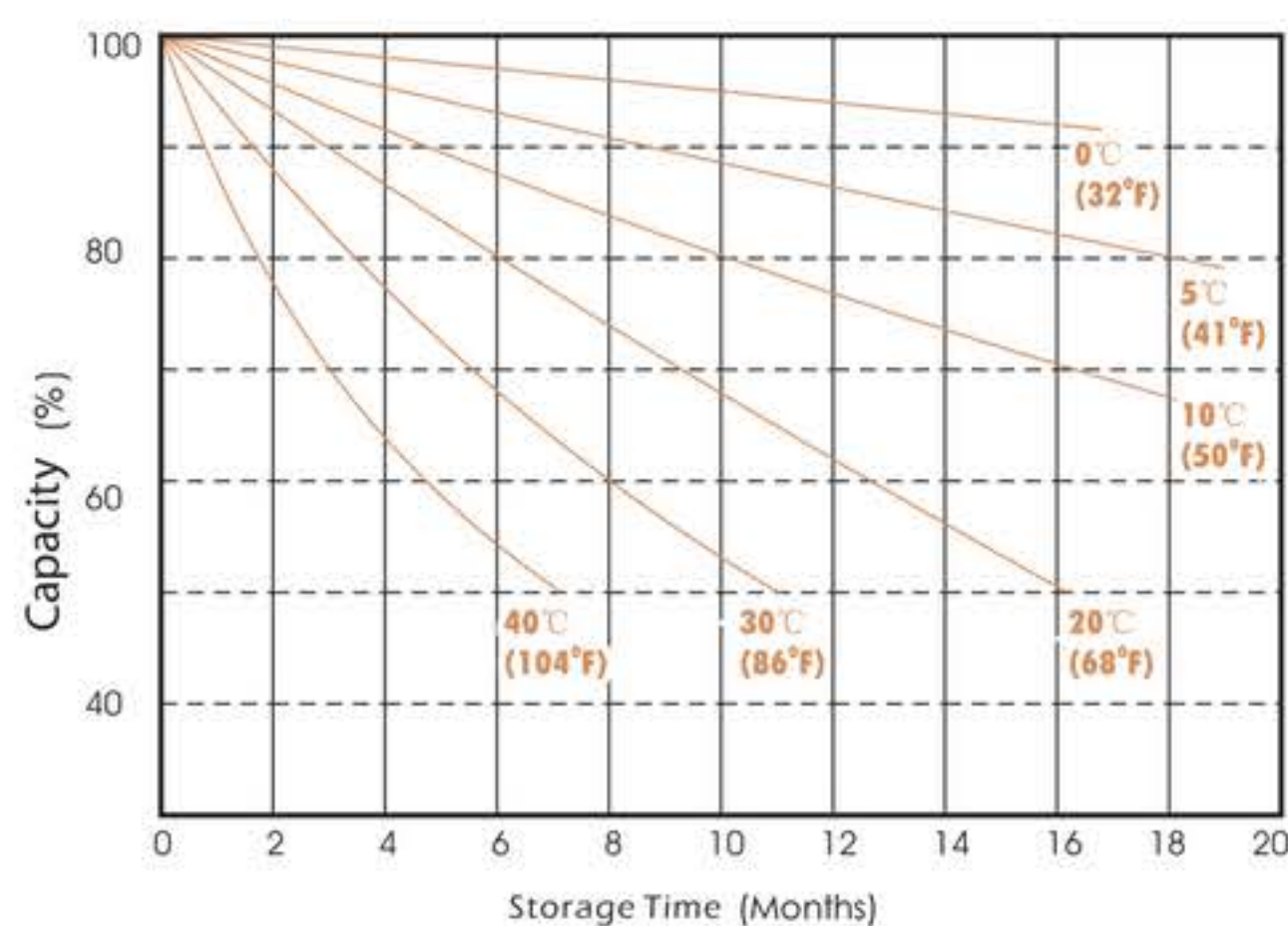
Cycle service life in relation to depth of discharge



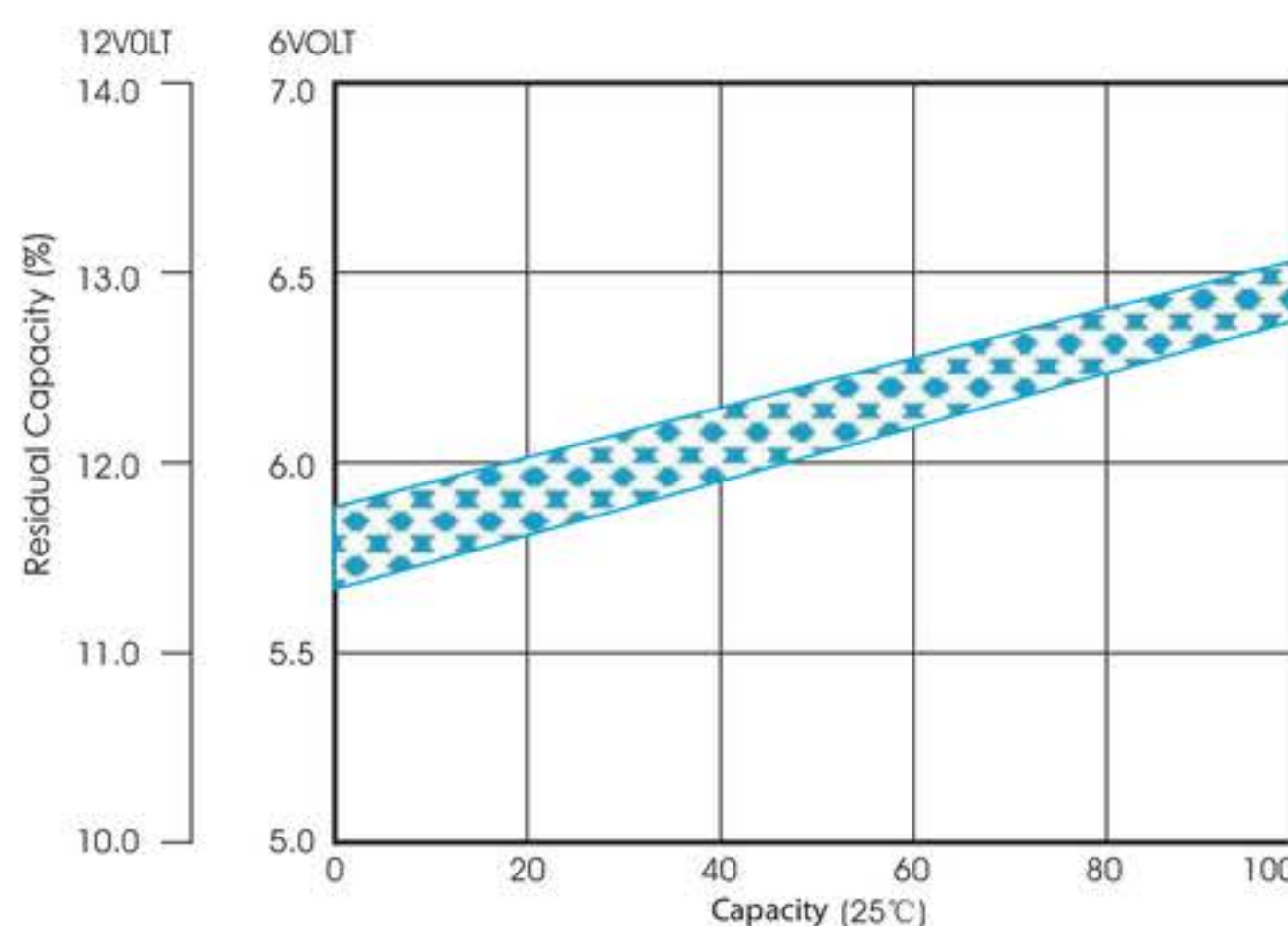
Constant voltage charge characteristic



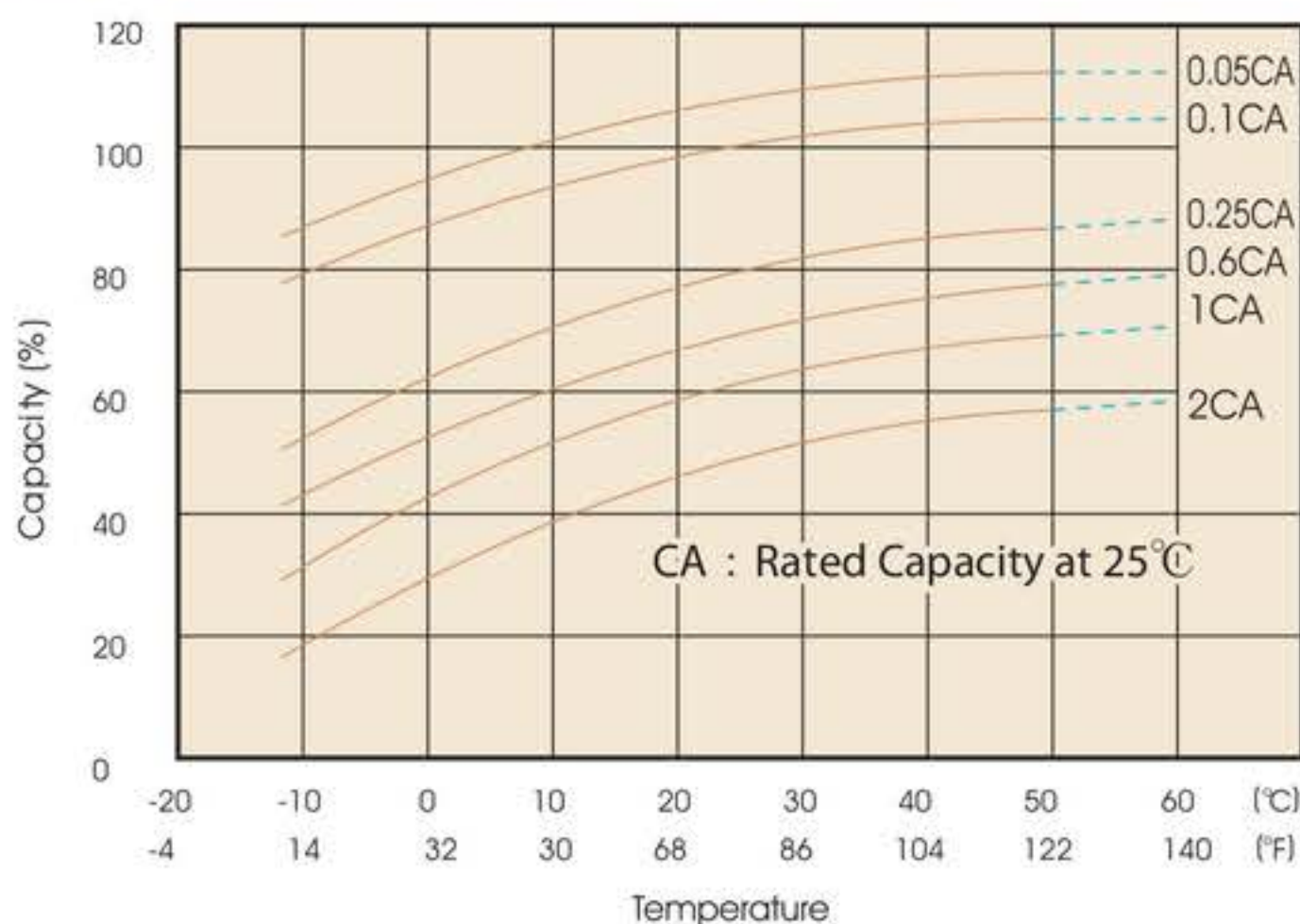
Self-Discharge Characteristics.



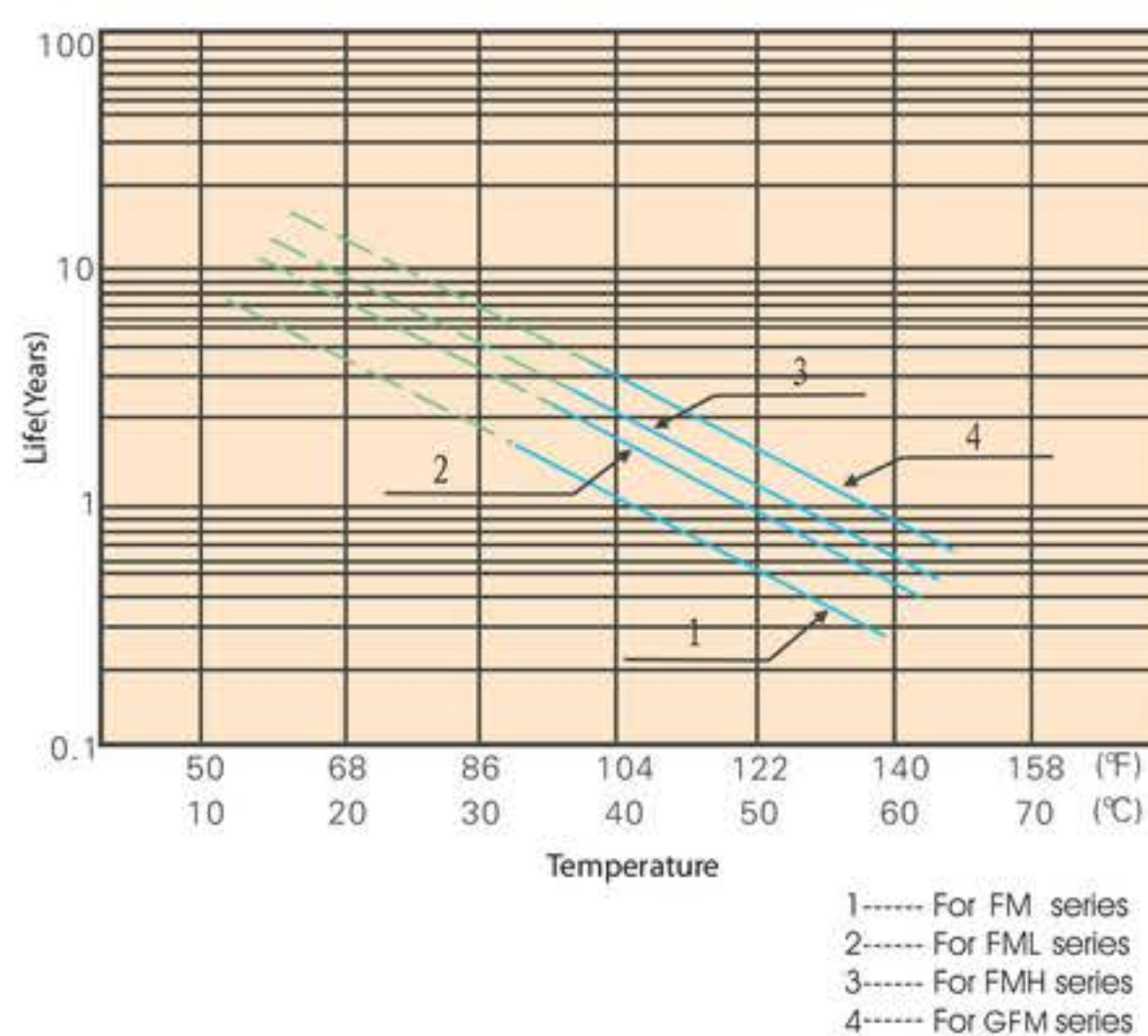
Relationship of OCV and Residual Capacity % (25°C)

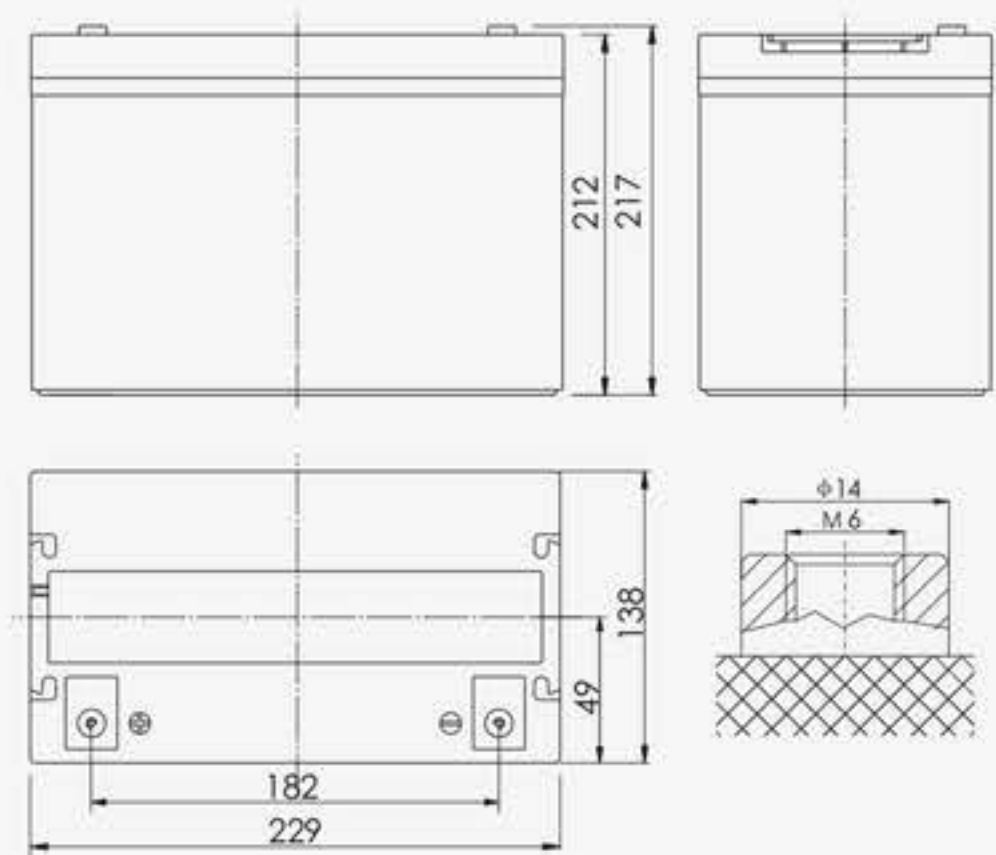


Temperature effects on capacity



Temperature effects on float life





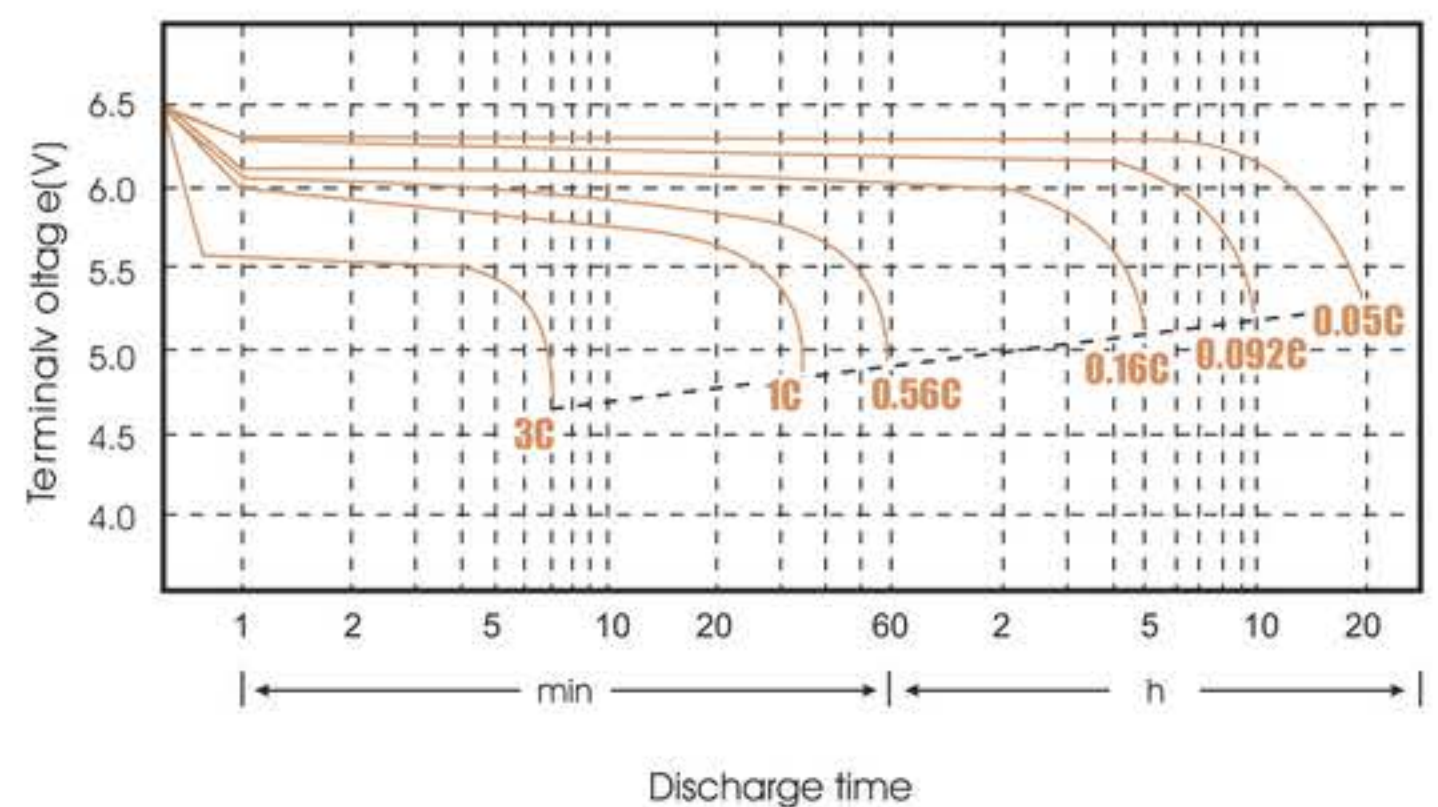
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		55Ah
Dimensions	Total Height (with terminals)	8.54inches (217mm)
	Height	8.35inches (212mm)
	Length	9.02inches (229mm)
	Width	5.43inches (138mm)
Weight		Approx. 41.6pound(18.9kg)

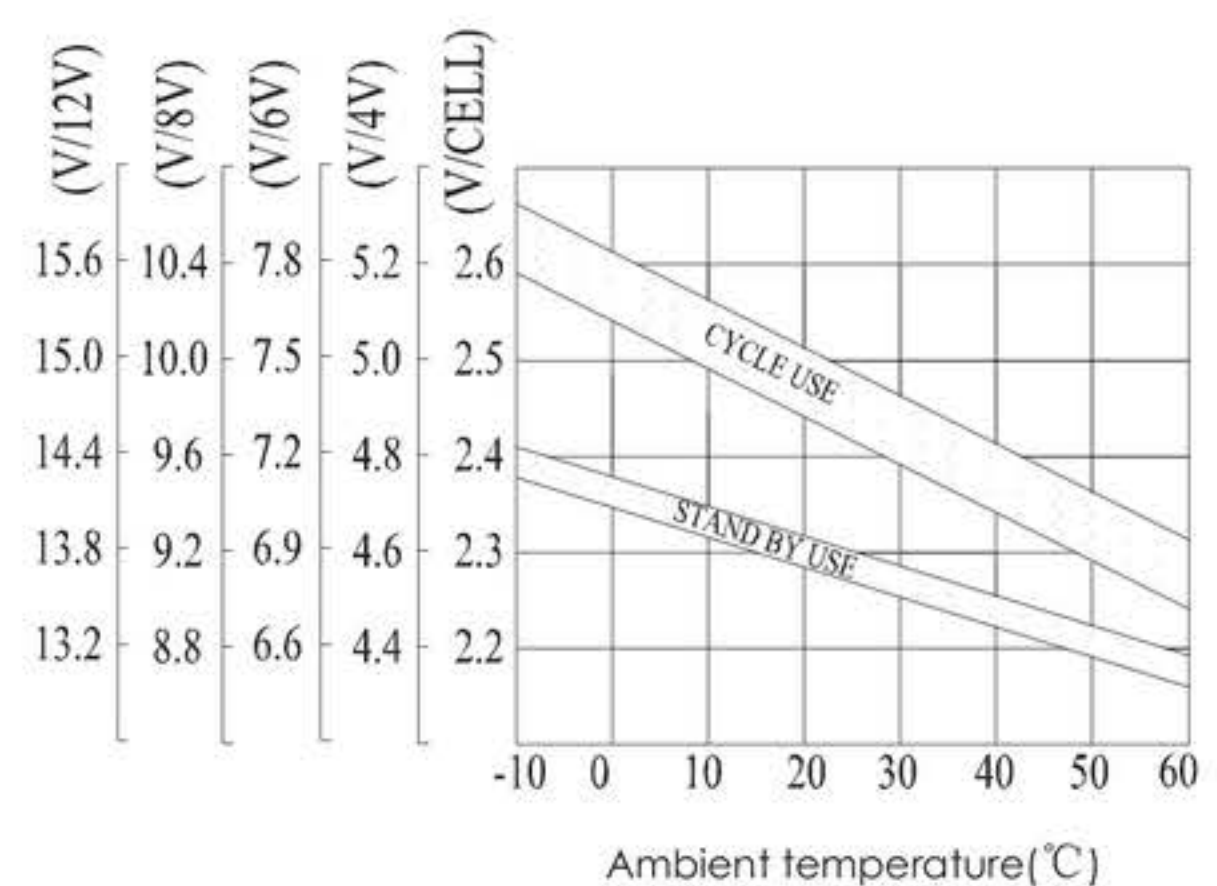
Characteristics

Capacity 77°F(25°C)	20 hour rate (2.75A) 10 hour rate (5.06A) 5 hour rate (8.8A) 1 hour rate (33A)	55Ah 50.6Ah 44Ah 33Ah
	15 minute Rate (96.0A)	24.0Ah
Internal Resistance	Full charged Battery 77°F(25°C)	7mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	550A(5S)	
Terminal		M1
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 16.5A Voltage 14.4~14.7V/77°F(25°C)
	Float	Voltage 13.5~13.8V/77°F(25°C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	119.4	92.4	56.1	44.1	29.8	20.79	14.36	9.63	6.82	5.39	4.63	2.38
1.70	112.8	86.4	47.7	41.6	28.5	20.30	13.75	9.30	6.55	5.27	4.49	2.34
1.80	95.2	75.4	43.1	39.3	27.2	19.42	12.98	8.80	6.16	5.06	4.36	2.30

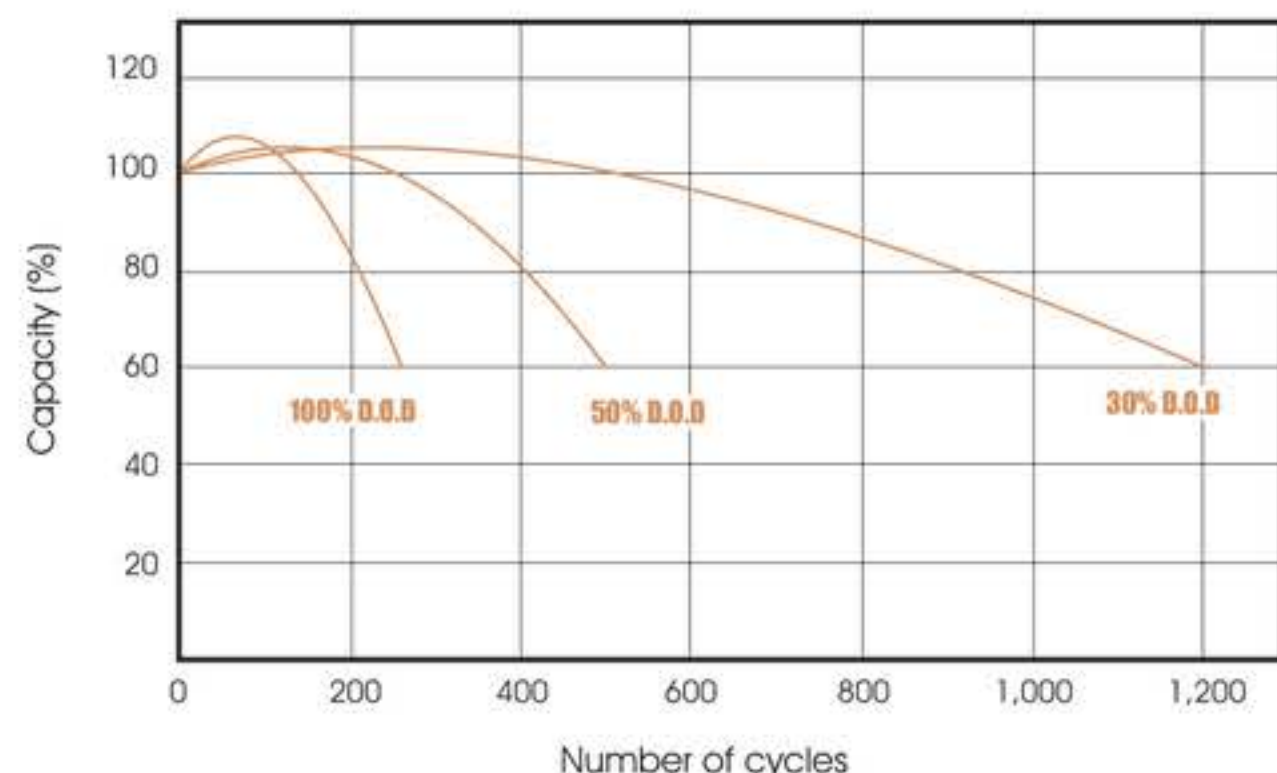
Constant Power Discharge (WATTS PER CELL@25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	245	190	113	87.8	71.0	42.2	29.9	19.4	12.0	10.0	8.71	4.57
1.65	231	182	111	86.5	69.3	41.4	29.3	19.0	12.0	10.0	8.71	4.57
1.67	224	176	111	85.7	68.4	40.9	29.0	18.8	12.0	10.0	8.71	4.57
1.70	219	173	110	84.7	67.7	40.6	28.7	18.7	12.0	10.0	8.71	4.57
1.75	206	166	108	82.8	66.2	39.4	28.1	18.5	11.9	10.0	8.64	4.57
1.80	191	158	107	80.6	64.5	38.3	27.4	18.3	11.8	9.79	8.37	4.48
1.85	158	133	86	73.6	62.0	37.1	26.6	17.1	11.7	9.24	8.02	4.22

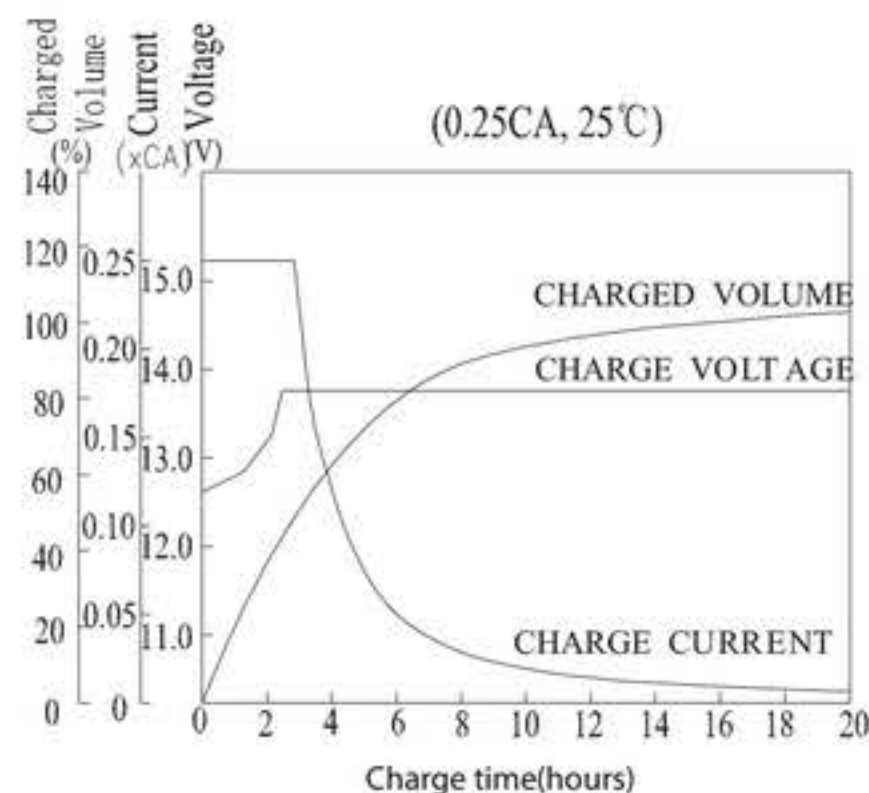


The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

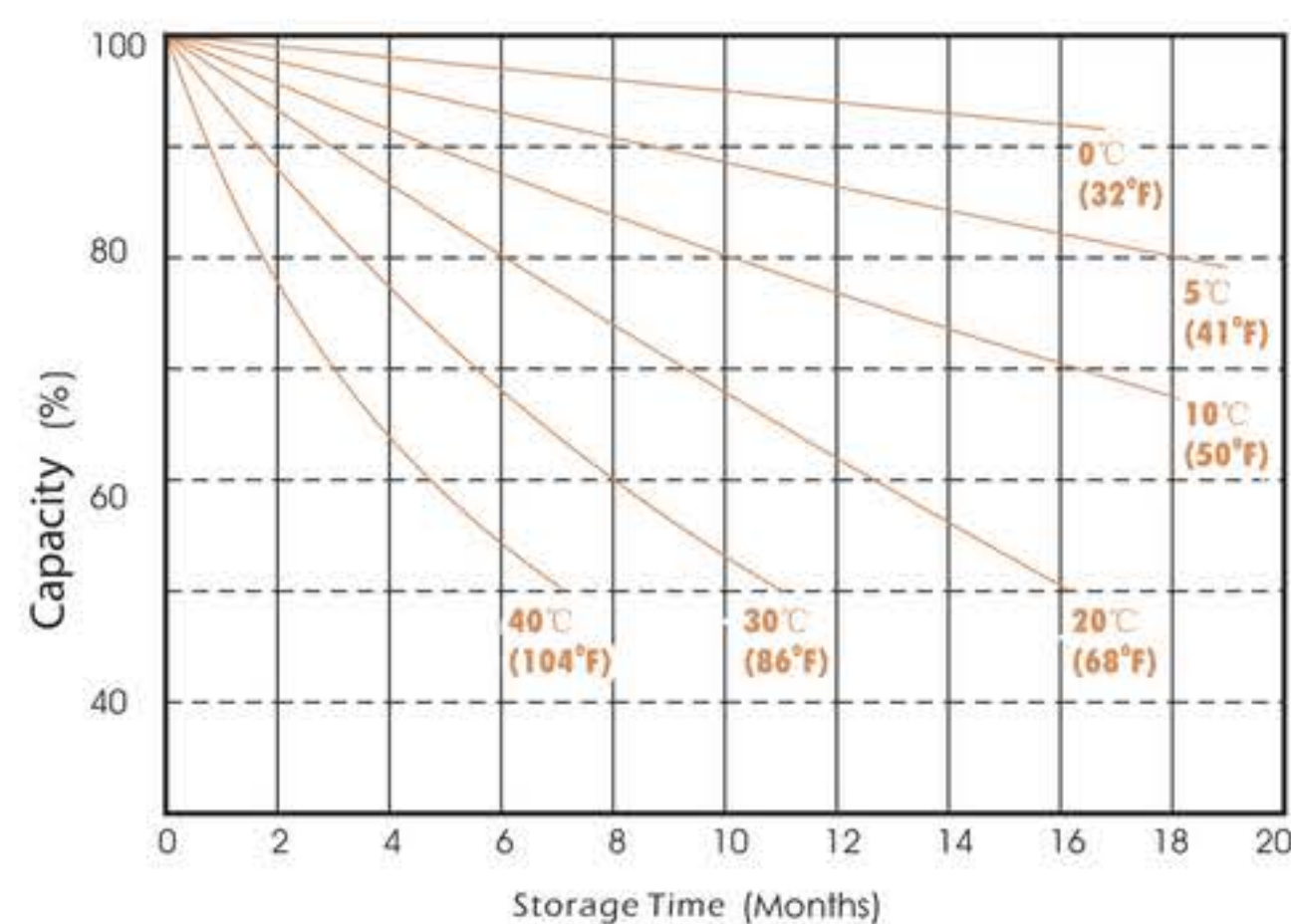
Cycle service life in relation to depth of discharge



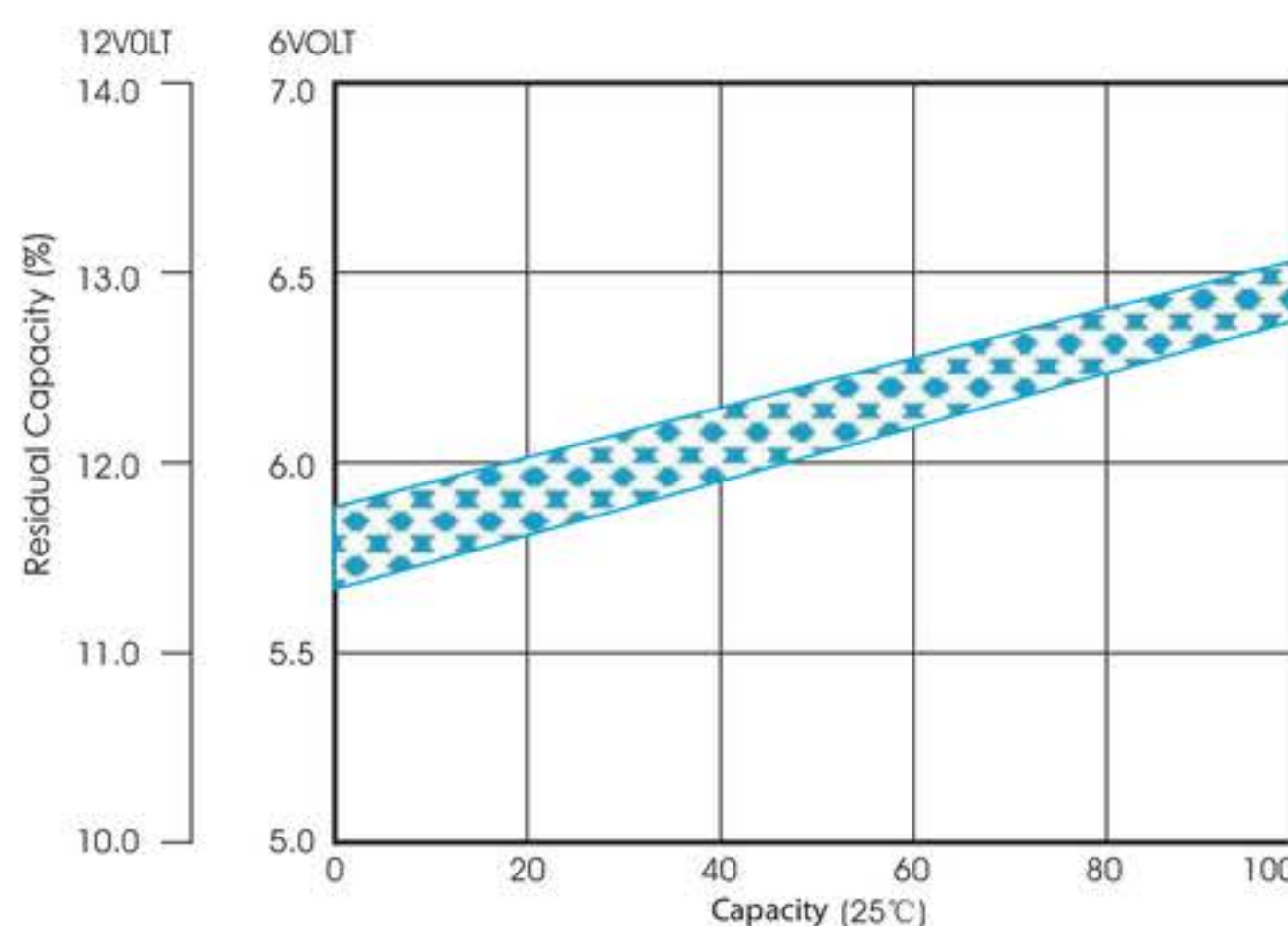
Constant voltage charge characteristic



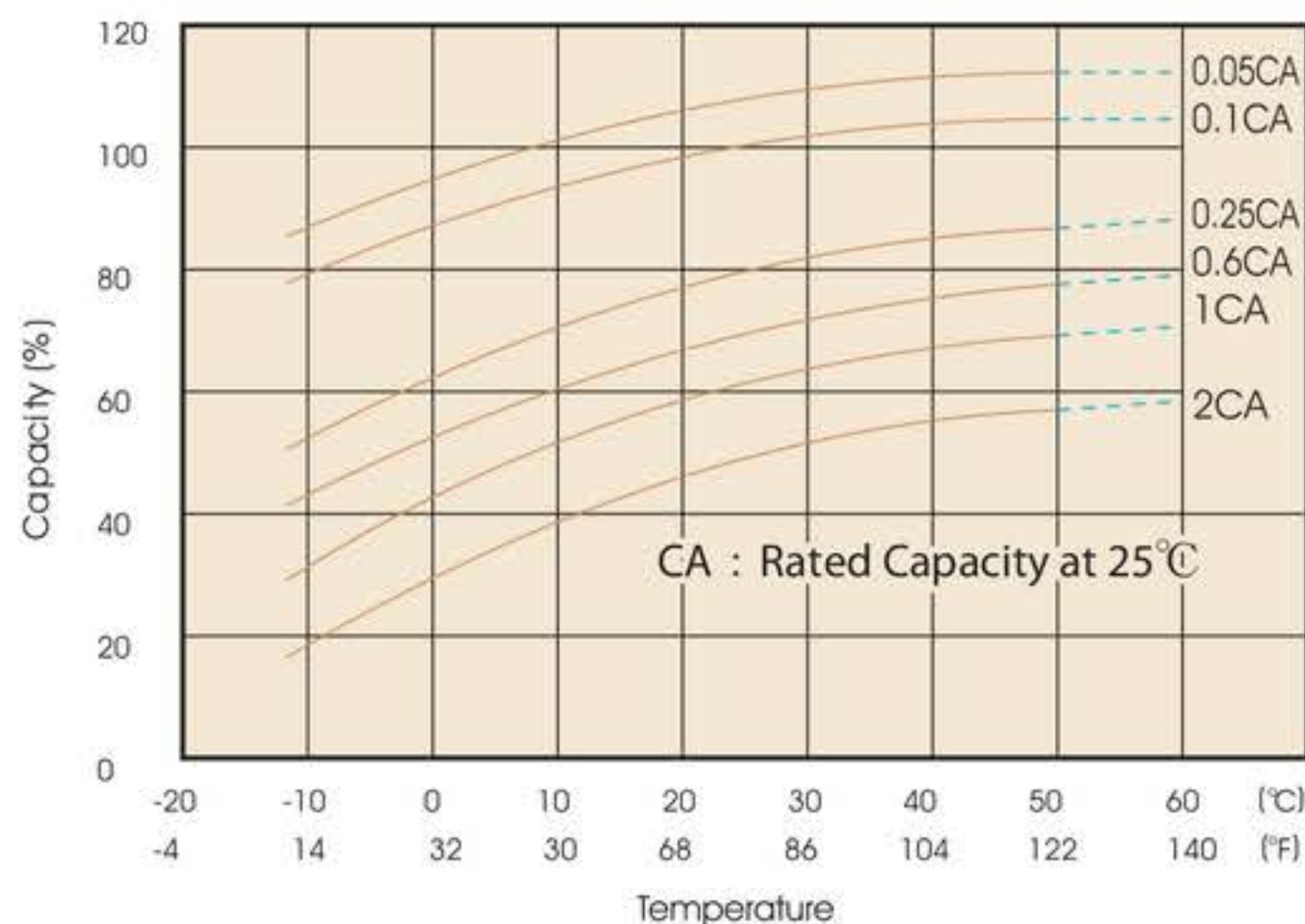
Self-Discharge Characteristics.



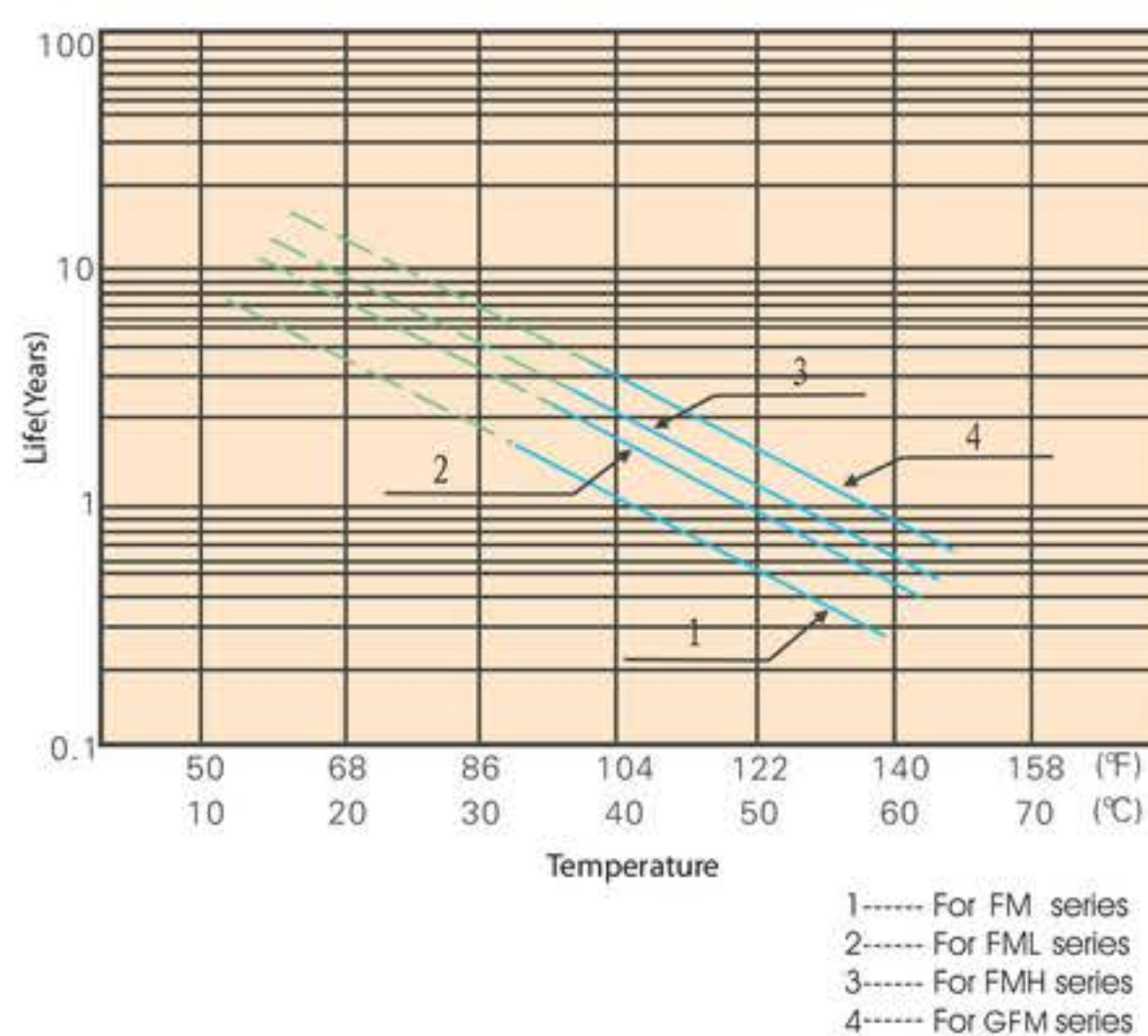
Relationship of OCV and Residual Capacity % (25°C)

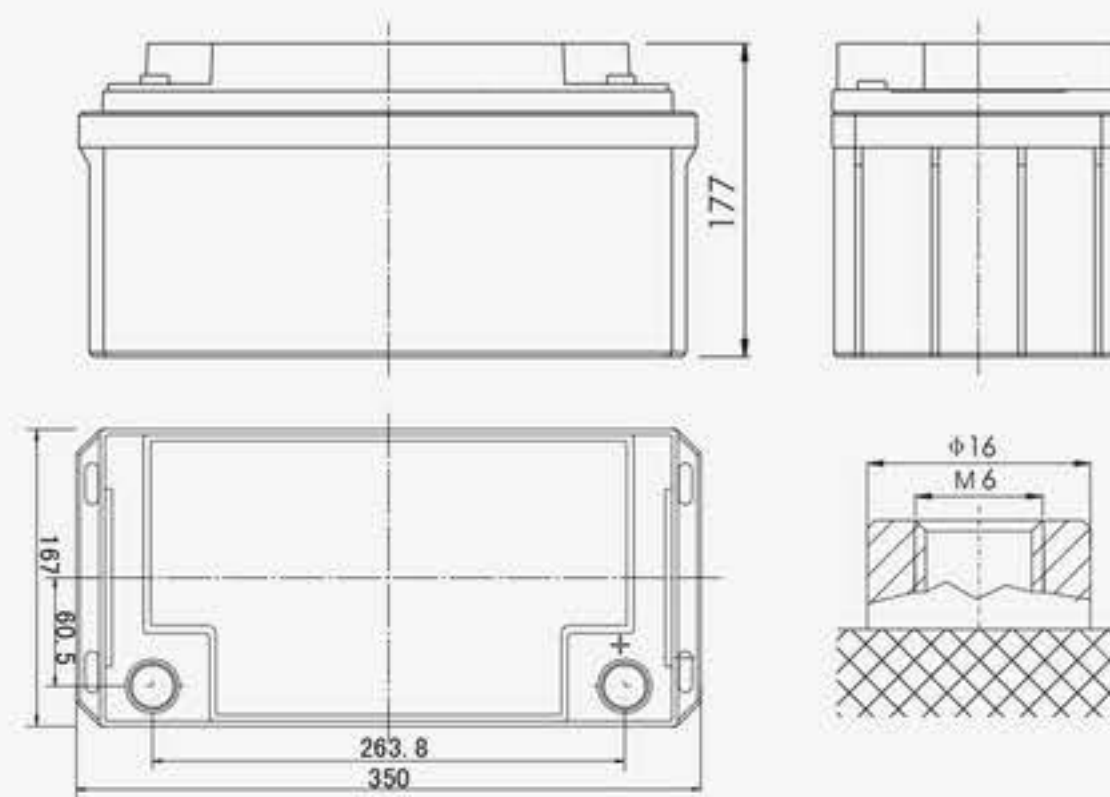


Temperature effects on capacity



Temperature effects on float life





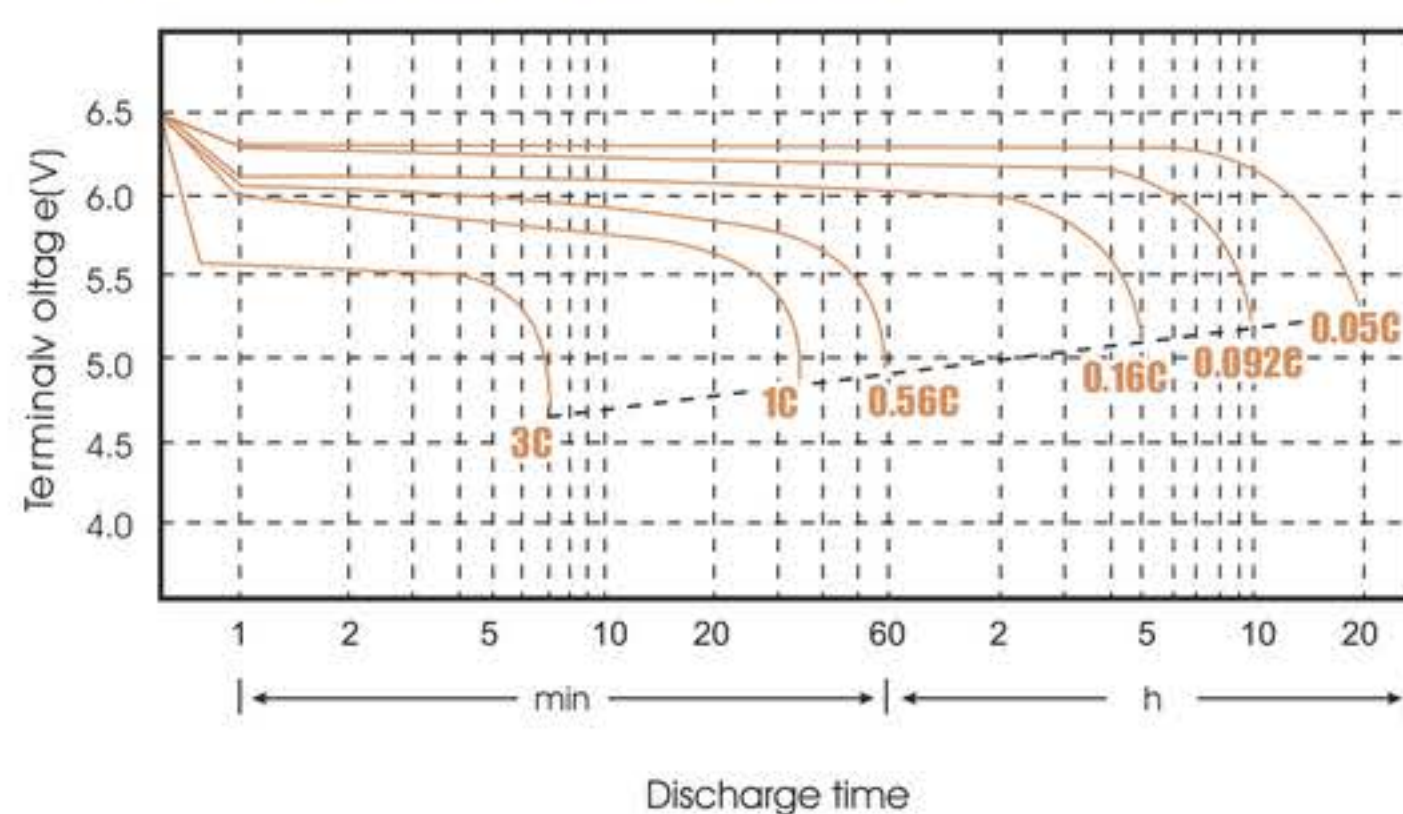
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		65Ah
Dimensions	Total Height (with terminals)	6.97inches (177mm)
	Height	6.97inches (177mm)
	Length	13.8inches (350mm)
	Width	6.57inches (167mm)
Weight		Approx. 43.78pound(19.9kg)

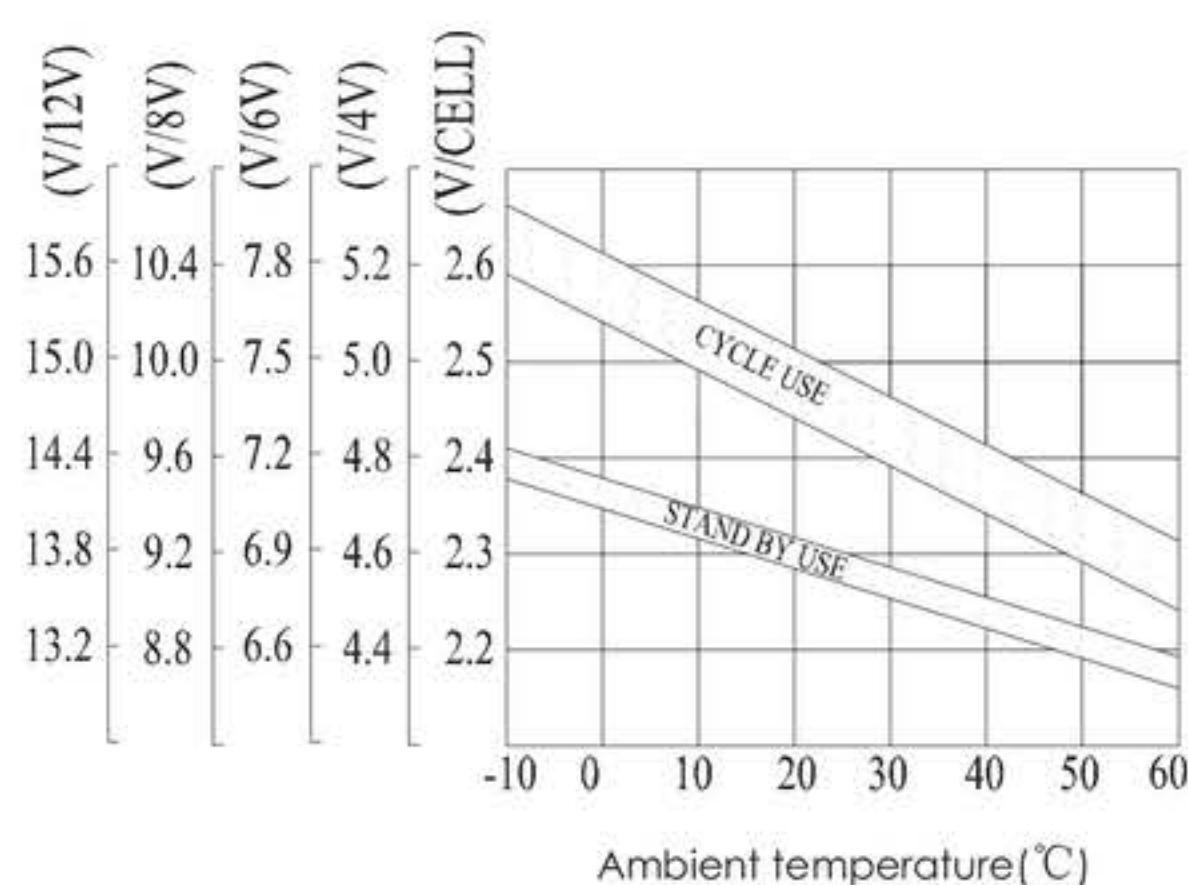
Characteristics

Capacity 77°F(25°C)	20 hour rate (3.25A) 10 hour rate (6.10A) 5 hour rate (10.4A) 1 hour rate (39.0A)	65Ah 61Ah 52Ah 39Ah
	15 minute Rate (107A)	26.8Ah
Internal Resistance	Full charged Battery 77°F(25°C)	7.5mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C) 77°F(25°C) 32°F(0°C) 5°F(-15°C)	102% 100% 85% 65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage Capacity after 6 month storage Capacity after 12 month storage	91% 81% 60%
Max. Discharge Current 77°F(25°C)	650A(5S)	
Terminal	M2/B5/B11	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 19.5A Voltage 14.4~14.7V/77°F(25°C)
	Float	Voltage 13.5~13.8V/77°F(25°C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

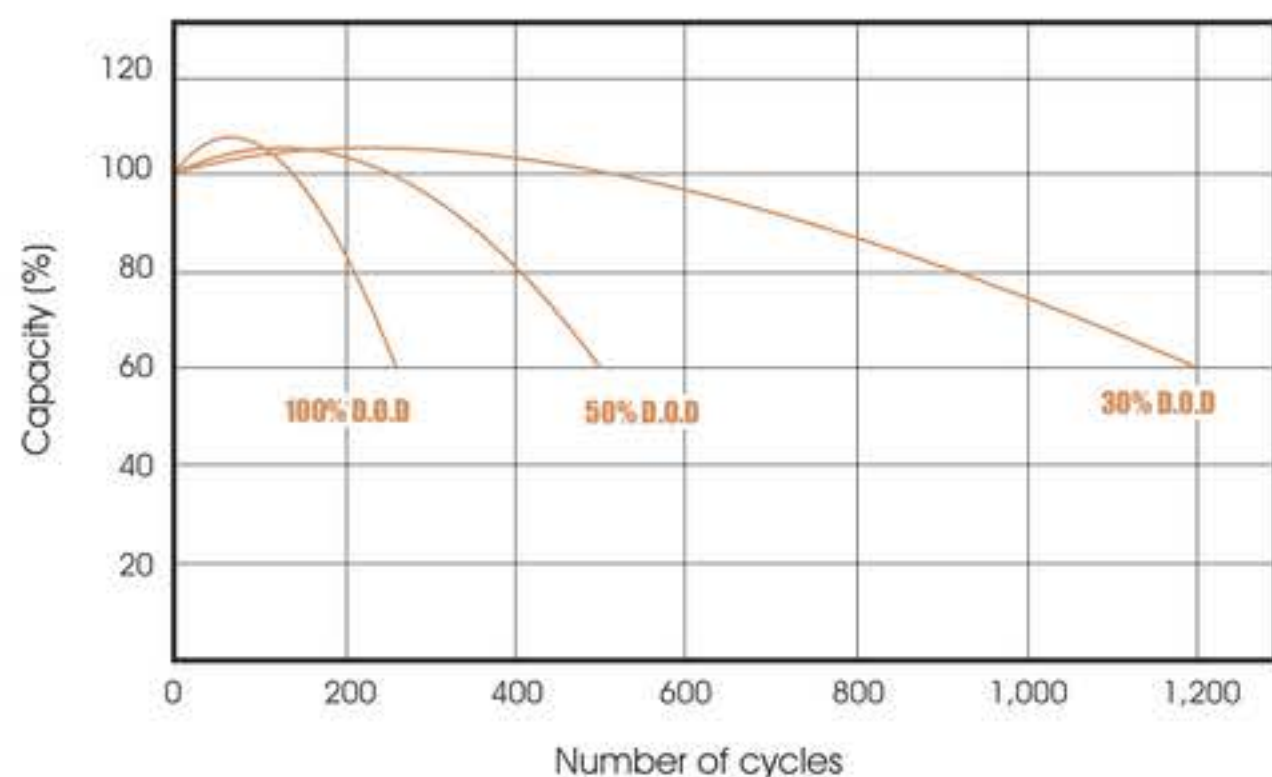
F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	140	106	68.2	51.7	35.0	24.4	16.6	11.3	7.65	6.53	5.45	2.85
1.70	133	101	64.8	48.8	34.1	23.5	16.3	10.9	7.43	6.26	5.27	2.78
1.80	112	88.4	54.0	46.1	33.6	22.5	15.3	10.5	7.06	5.98	5.04	2.72

Constant Power Discharge (WATTS PER CELL@25°C)

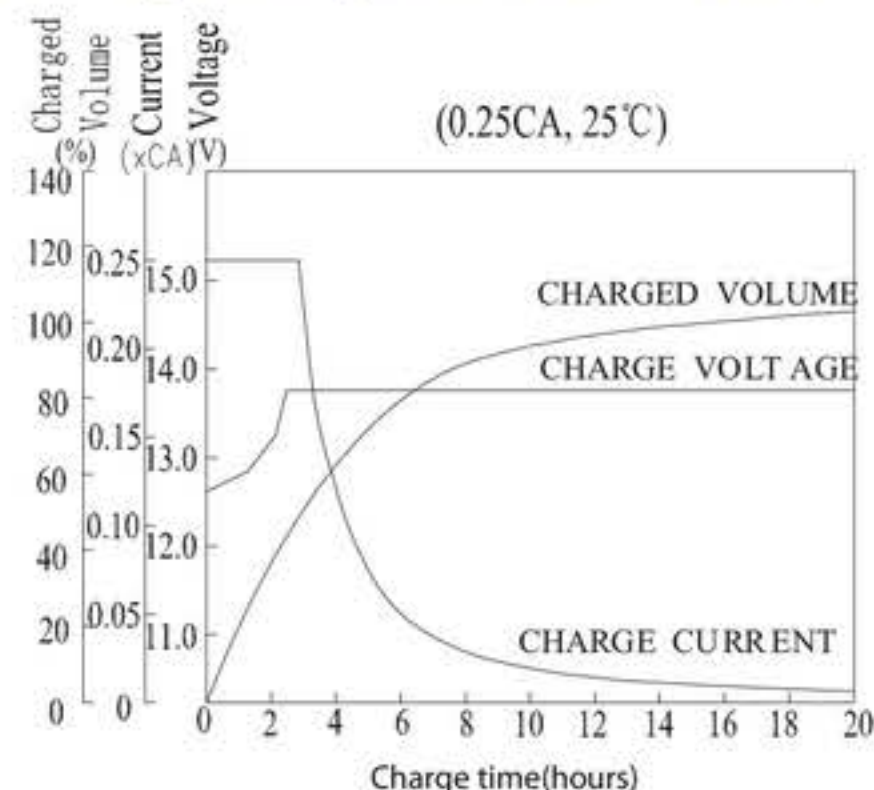
F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	254	194	127	95.2	77.2	45.3	31.8	20.9	14.2	11.8	10.2	5.35
1.65	251	192	124	94.3	76.4	44.7	31.5	20.7	14.1	11.6	10.1	5.33
1.67	250	190	123	92.9	75.6	44.2	31.4	20.6	14	11.5	10.0	5.31
1.70	246	187	121	91.5	75.0	43.6	31.2	20.3	13.9	11.3	9.94	5.29
1.75	230	182	111	90.0	74.8	43.1	30.8	20.1	13.8	11.2	9.88	5.27
1.80	214	170	104	89.0	74.4	42.4	30.1	20	13.5	11.0	9.65	5.25
1.85	177	149	96.0	82.1	69.2	41.4	29.7	19.1	13.0	10.9	9.42	4.95

The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

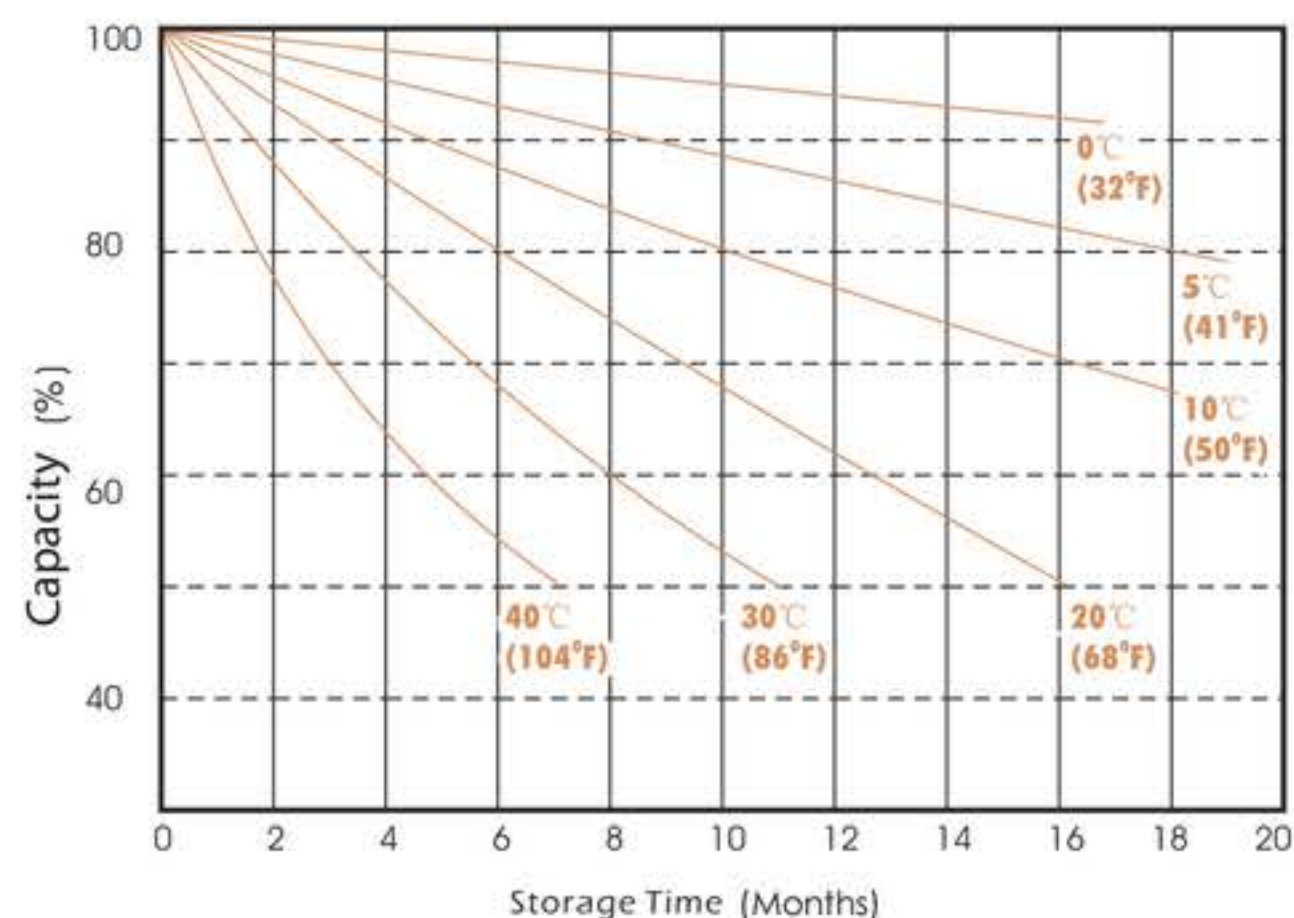
Cycle service life in relation to depth of discharge



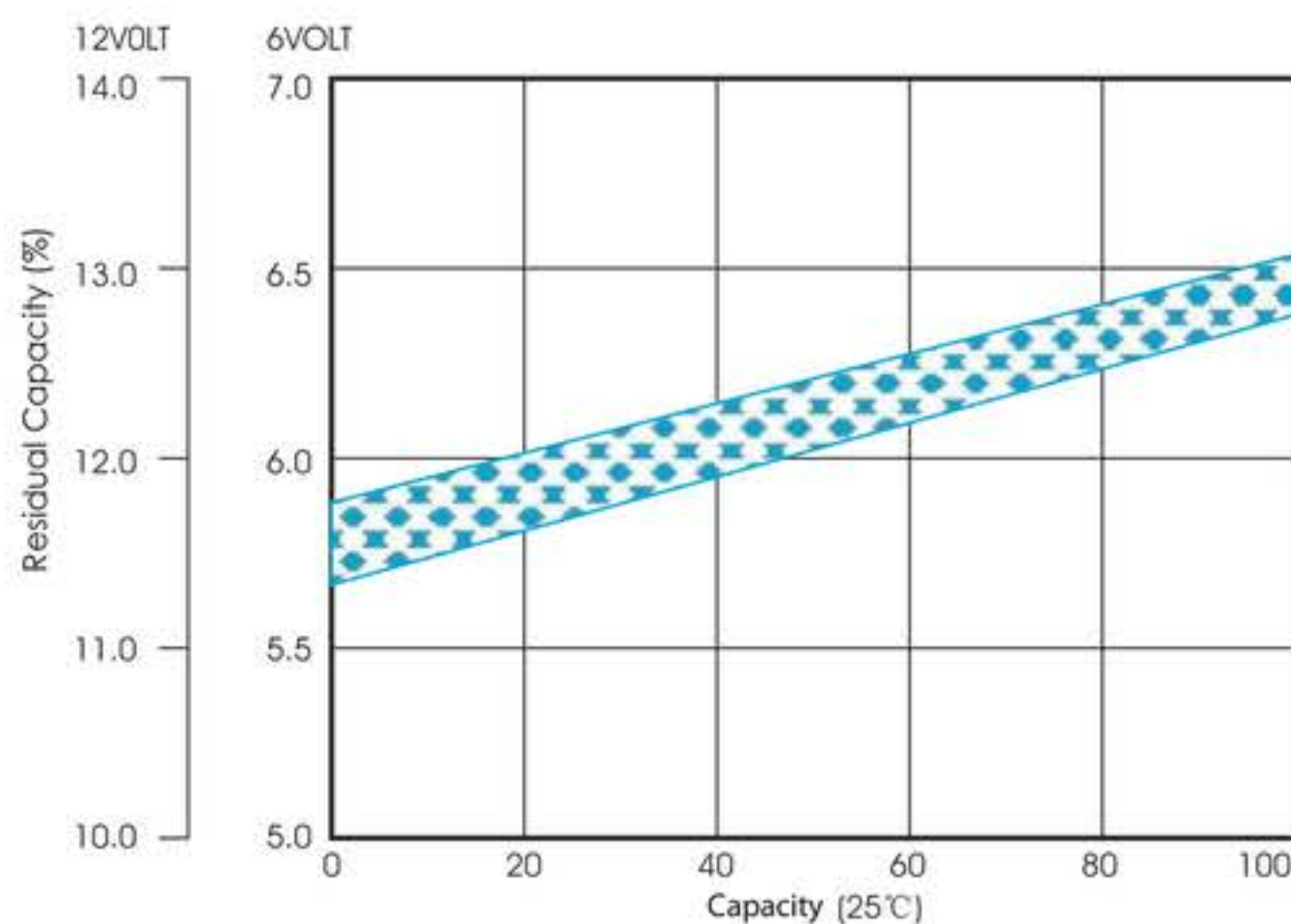
Constant voltage charge characteristic



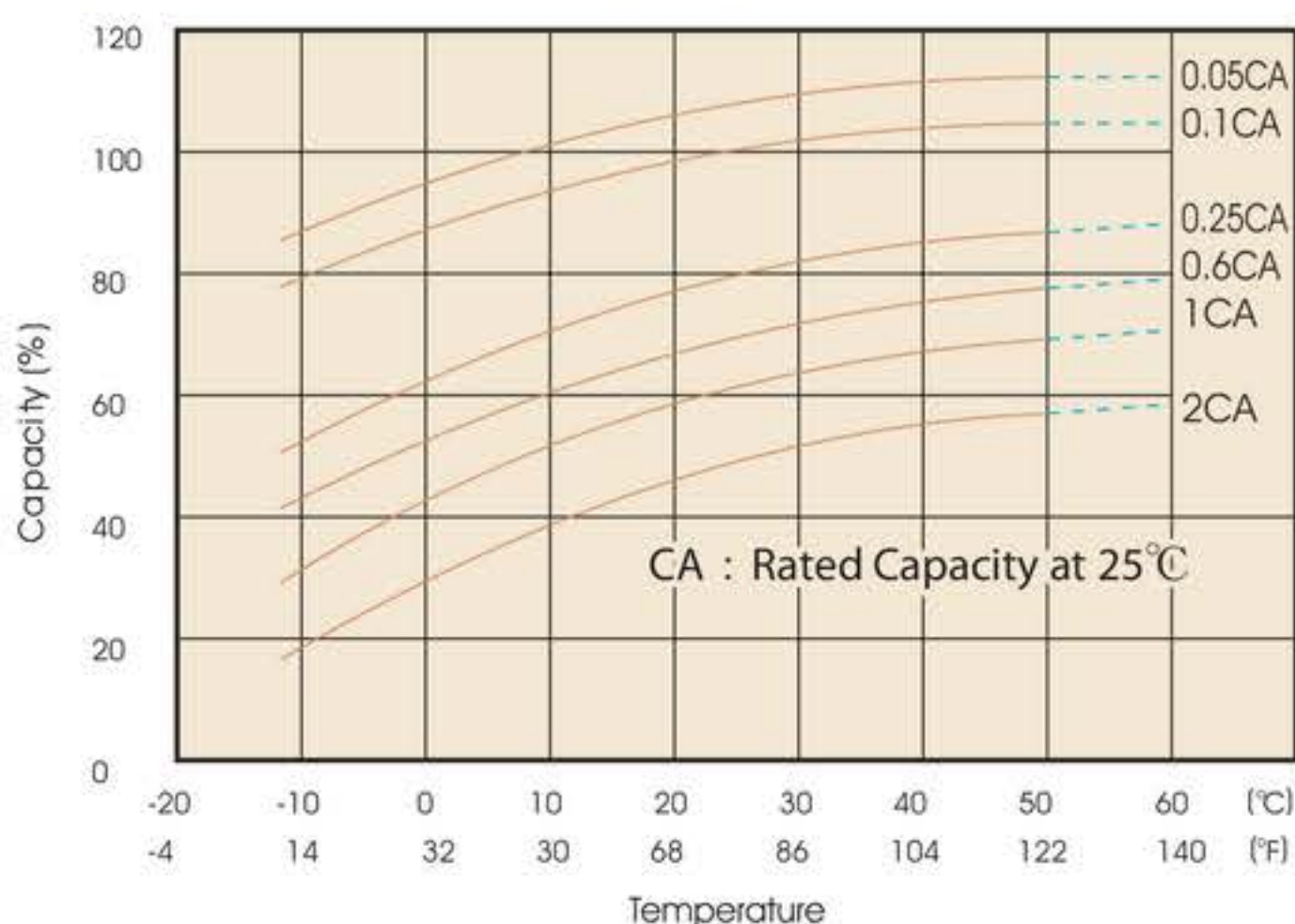
Self-Discharge Characteristics.



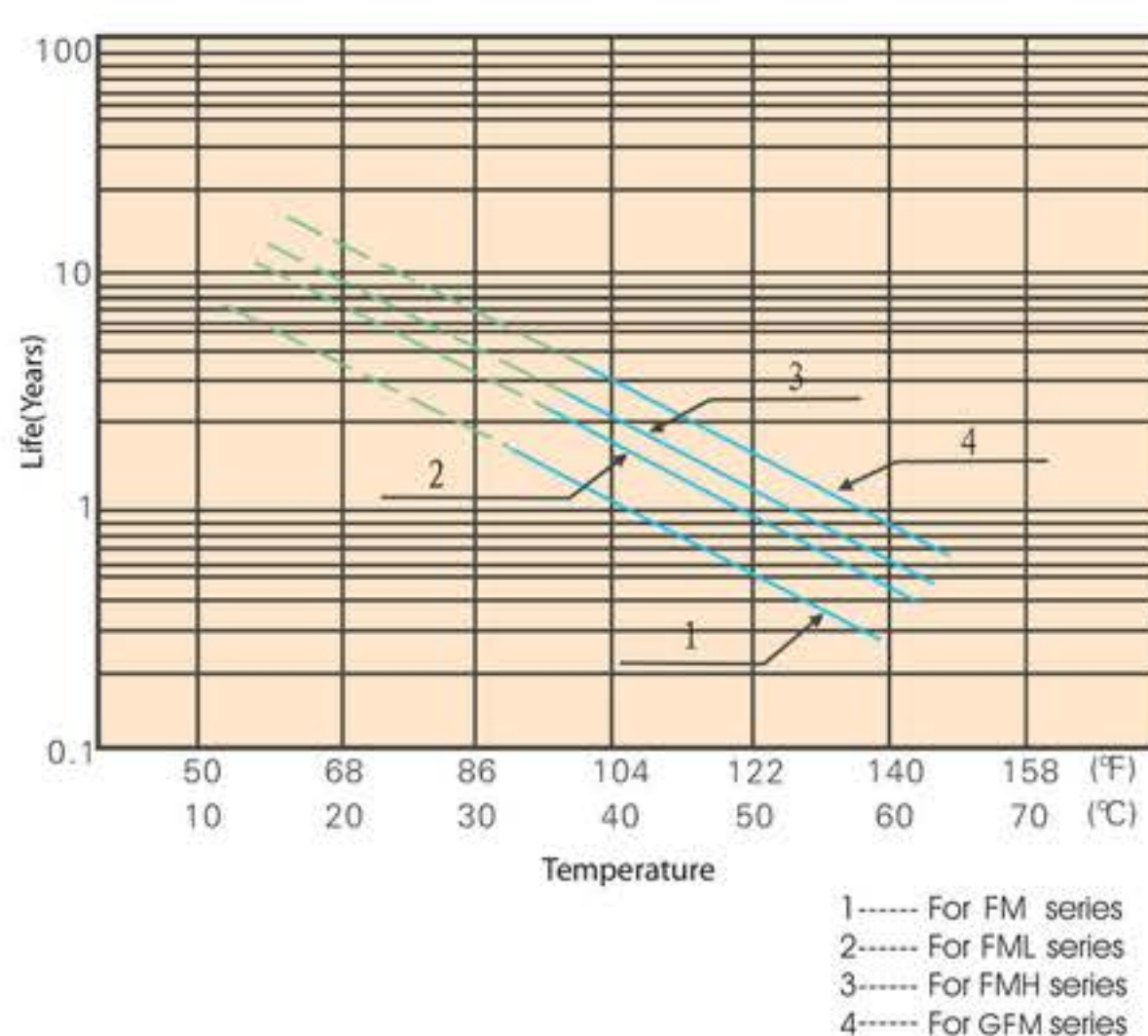
Relationship of OCV and Residual Capacity % (25°C)

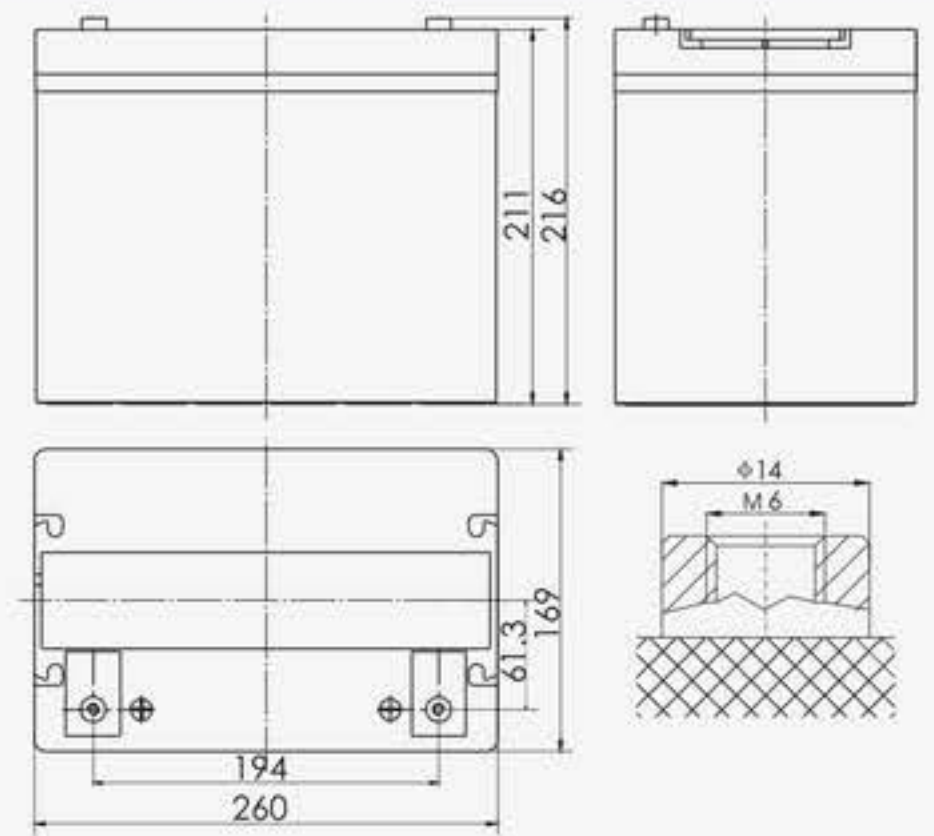


Temperature effects on capacity



Temperature effects on float life





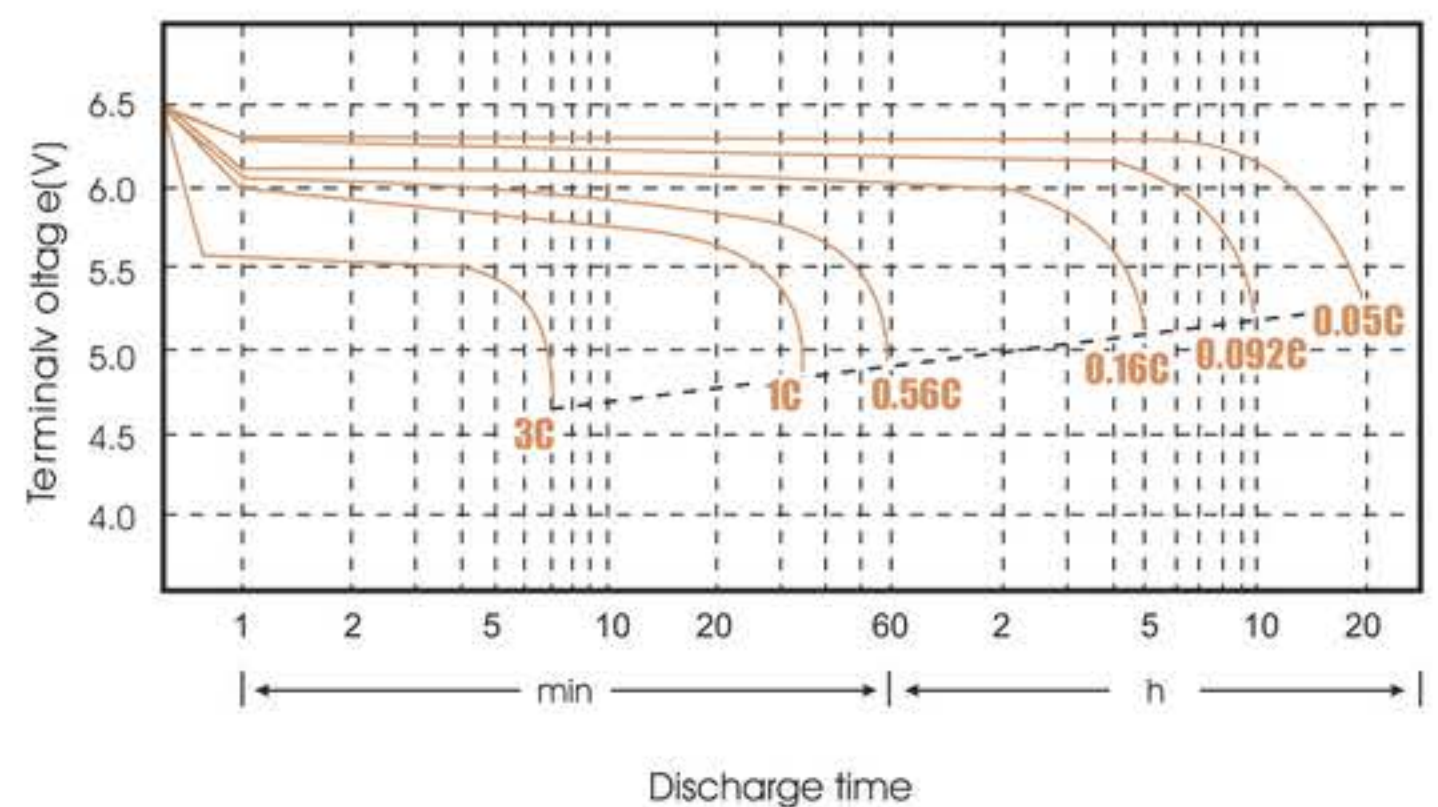
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		70Ah
Dimensions	Total Height (with terminals)	8.51inches (216mm)
	Height	8.31inches (211mm)
	Length	10.24inches(260mm)
	Width	6.65inches (169mm)
Weight		Approx. 46.2pound(21kg)

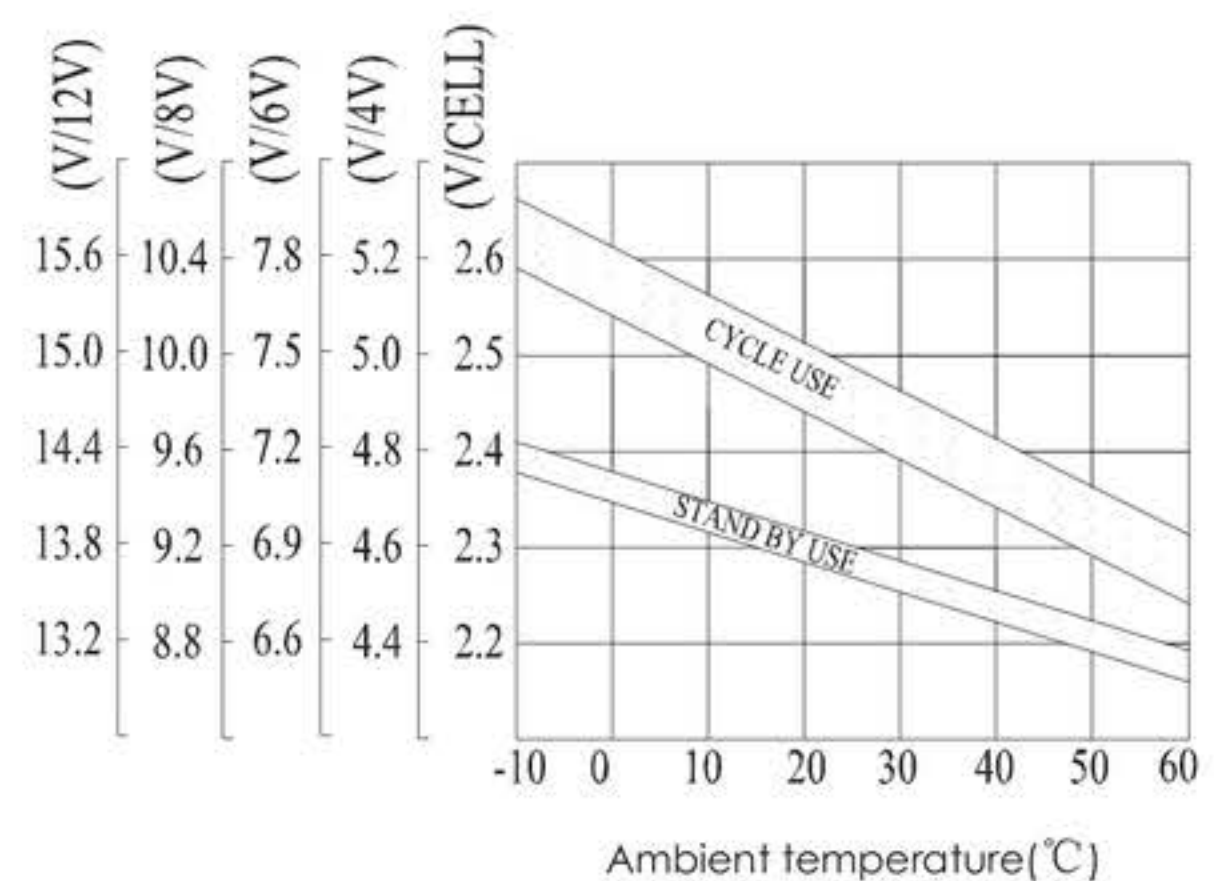
Characteristics

Capacity 77°F(25°C)	20 hour rate (3.5A)	70.0Ah
	10 hour rate (6.44A)	64.4Ah
	5 hour rate (11.2A)	56.0Ah
	1 hour rate (42A)	42.0Ah
	15 minute Rate (114A)	28.5Ah
Internal Resistance	Full charged Battery 77°F(25°C)	7.5mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	665A(5S)	
Terminal	M1	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 21A Voltage 14.4~14.7V/77 F(25 C)
	Float	Voltage 13.5~13.8V/77 F(25 C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	151.9	117.6	71.4	56.1	37.9	26.46	18.27	12.25	8.68	6.86	5.89	3.03
1.70	143.5	109.9	60.8	53.0	36.3	25.83	17.50	11.83	8.33	6.71	5.71	2.98
1.80	121.1	95.9	54.9	50.1	34.6	24.71	16.52	11.20	7.84	6.44	5.55	2.93

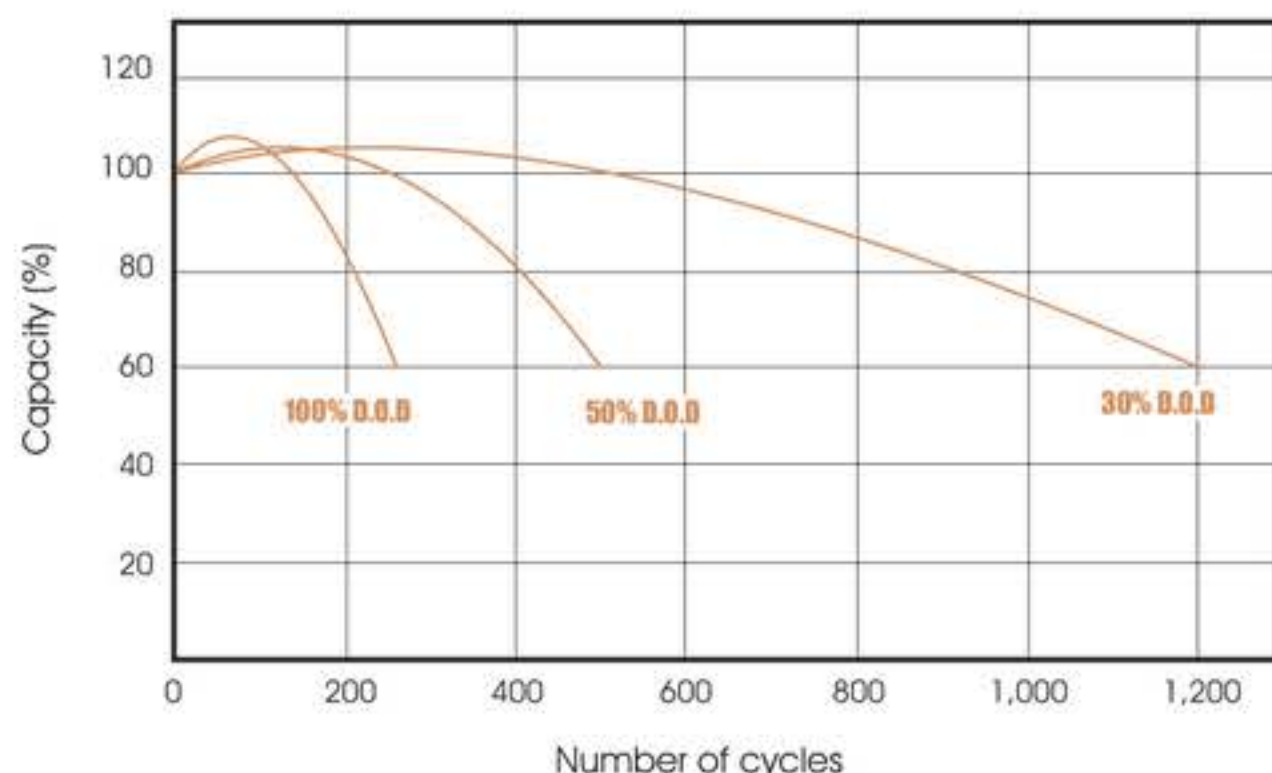
Constant Power Discharge (WATTS PER CELL@25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	273	209	137	103	83.2	48.8	34.3	22.5	15.3	12.7	11.0	5.76
1.65	271	207	133	102	82.3	48.2	33.9	22.3	15.2	12.5	10.9	5.74
1.67	269	204	132	100	81.2	47.6	33.8	22.2	15.1	12.4	10.7	5.72
1.70	265	202	130	98.9	80.7	46.9	33.6	21.8	14.9	12.1	10.7	5.69
1.75	247	196	119	97.1	80.5	46.4	33.1	21.7	14.8	12.0	10.7	5.67
1.80	231	183	112	96.1	80.1	45.6	32.4	21.6	14.6	11.9	10.4	5.66
1.85	190	161	104	88.4	74.5	44.6	32.0	20.5	14.0	11.8	10.2	5.33

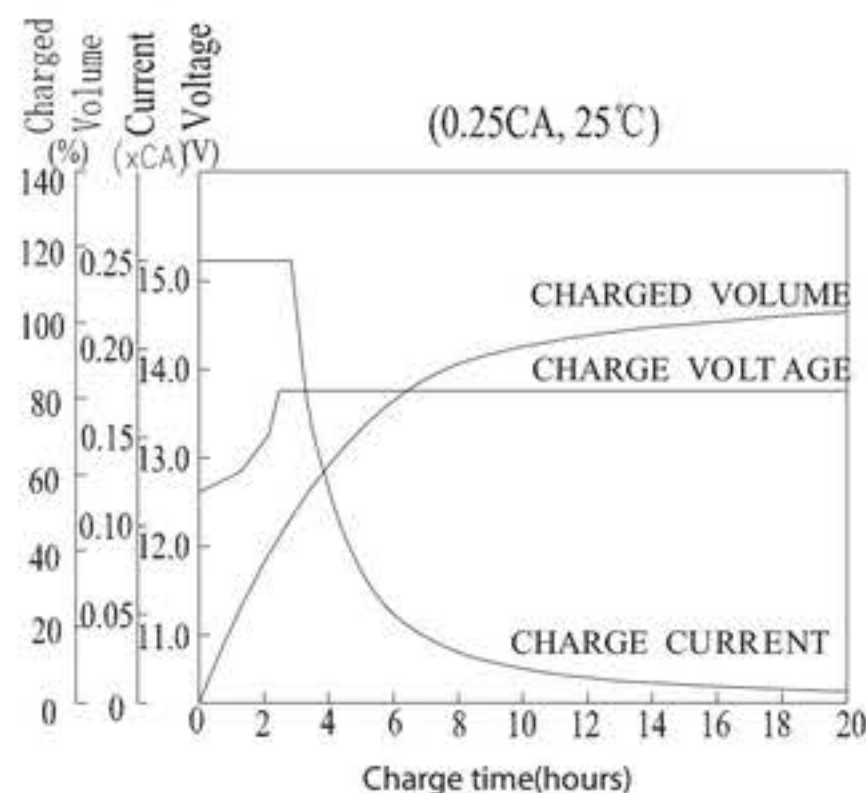


The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

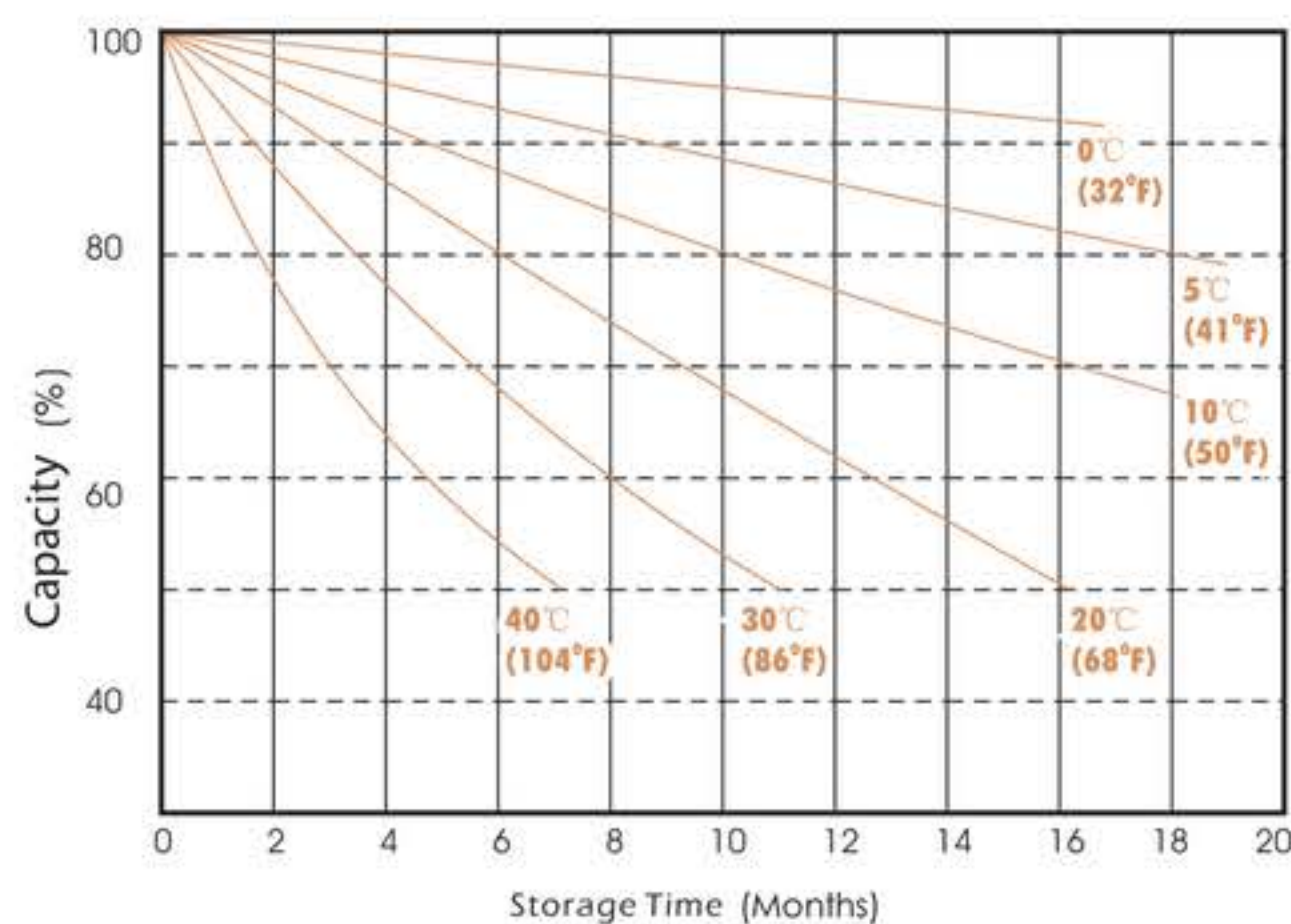
Cycle service life in relation to depth of discharge



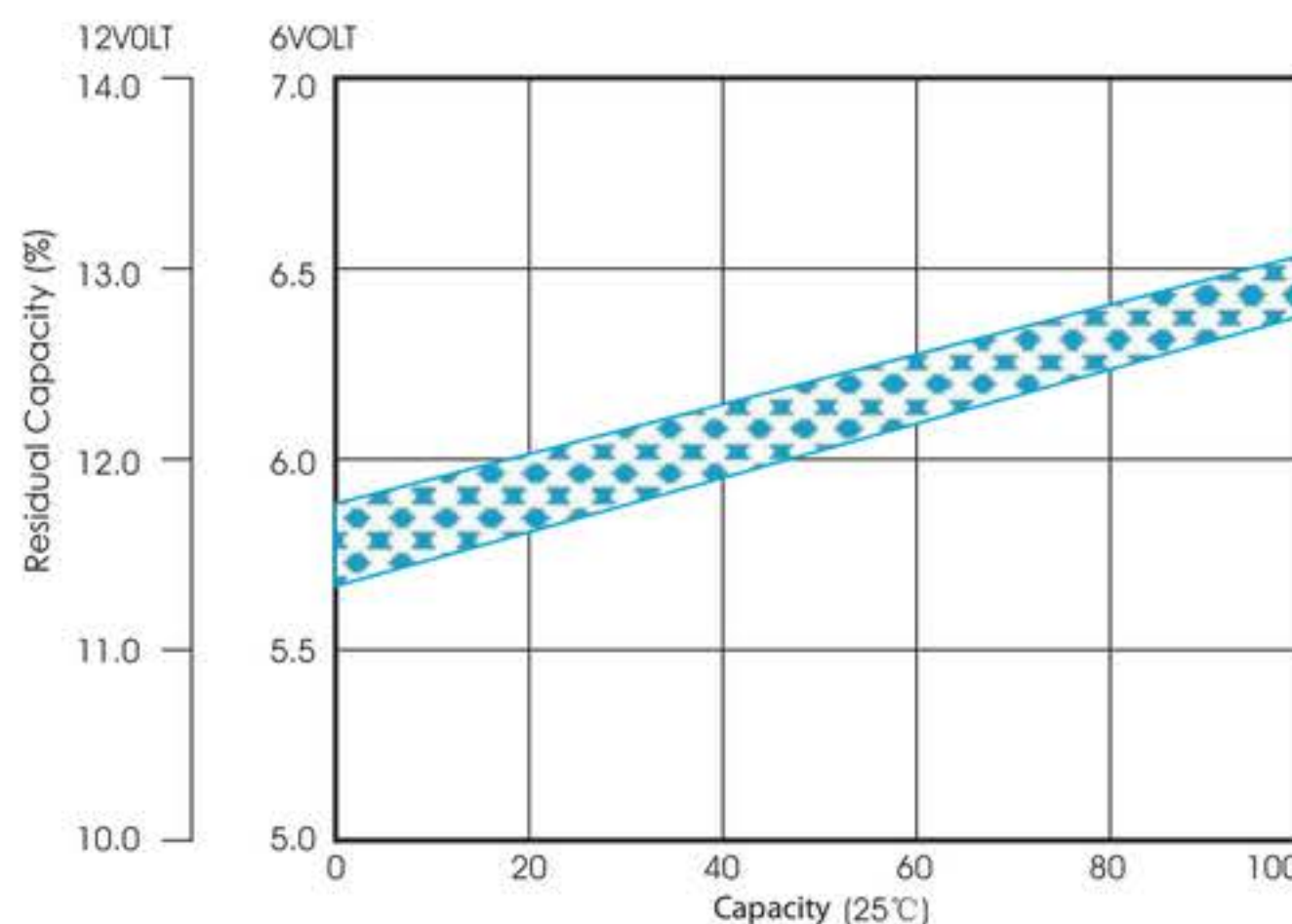
Constant voltage charge characteristic



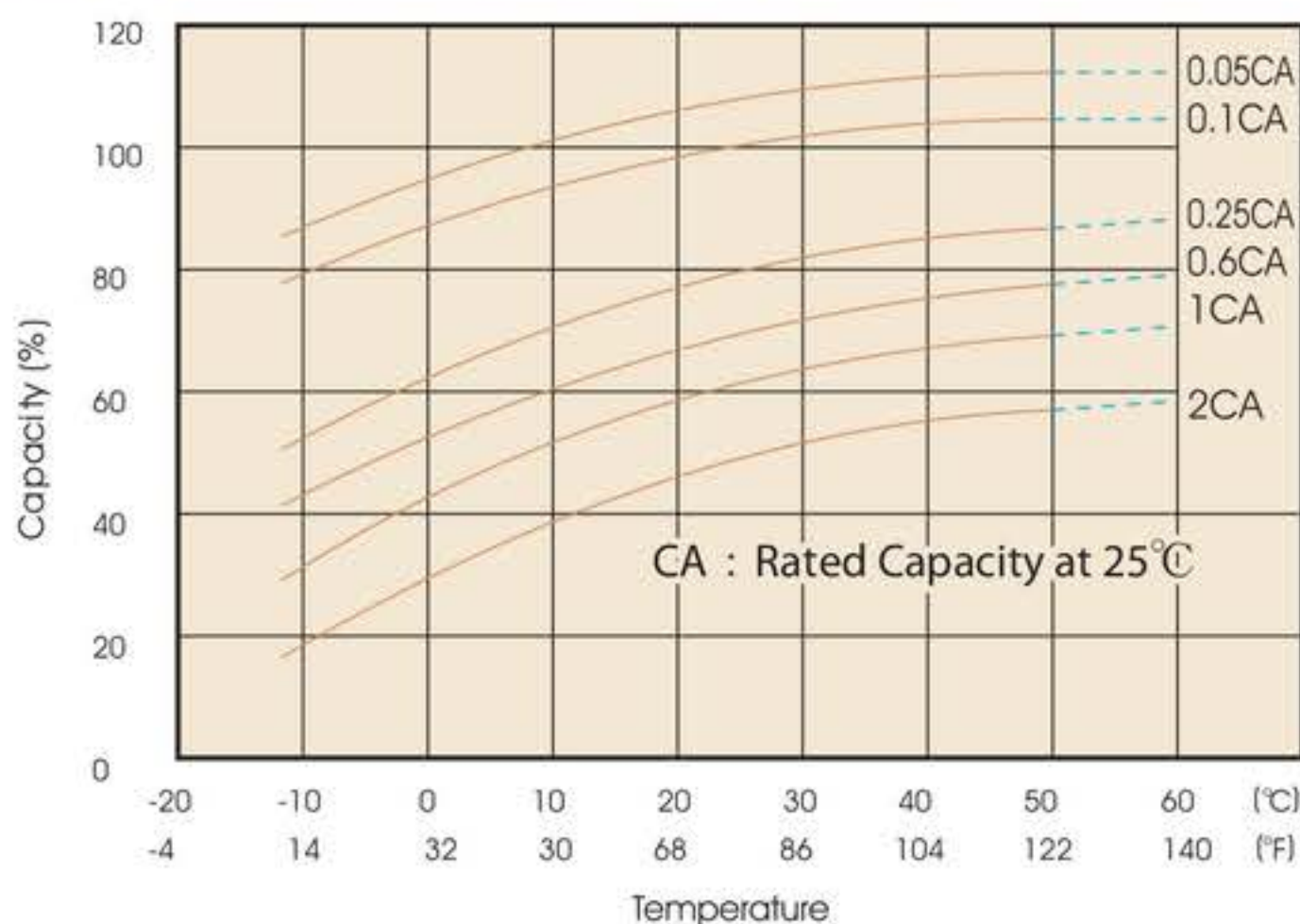
Self-Discharge Characteristics.



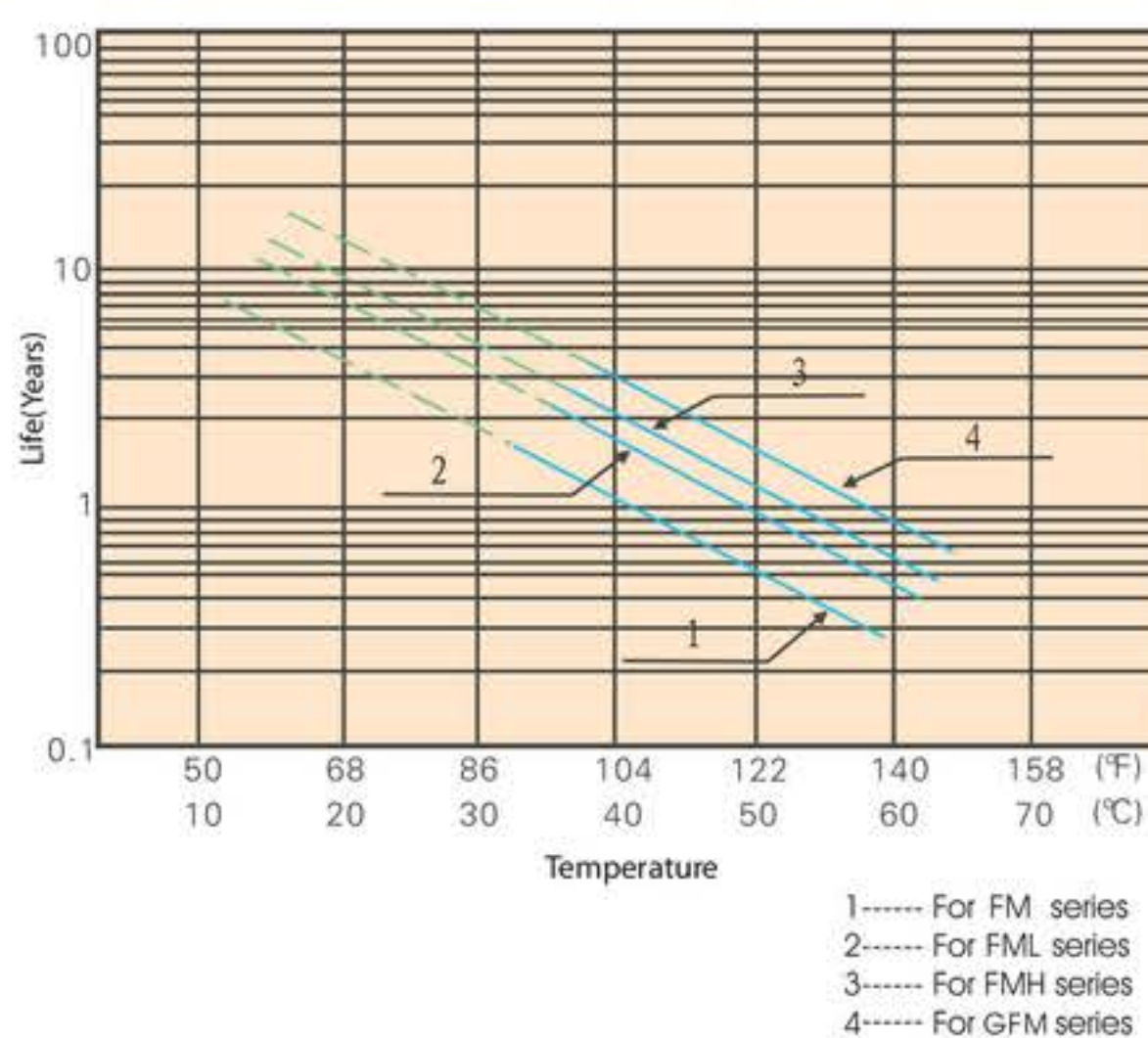
Relationship of OCV and Residual Capacity % (25°C)

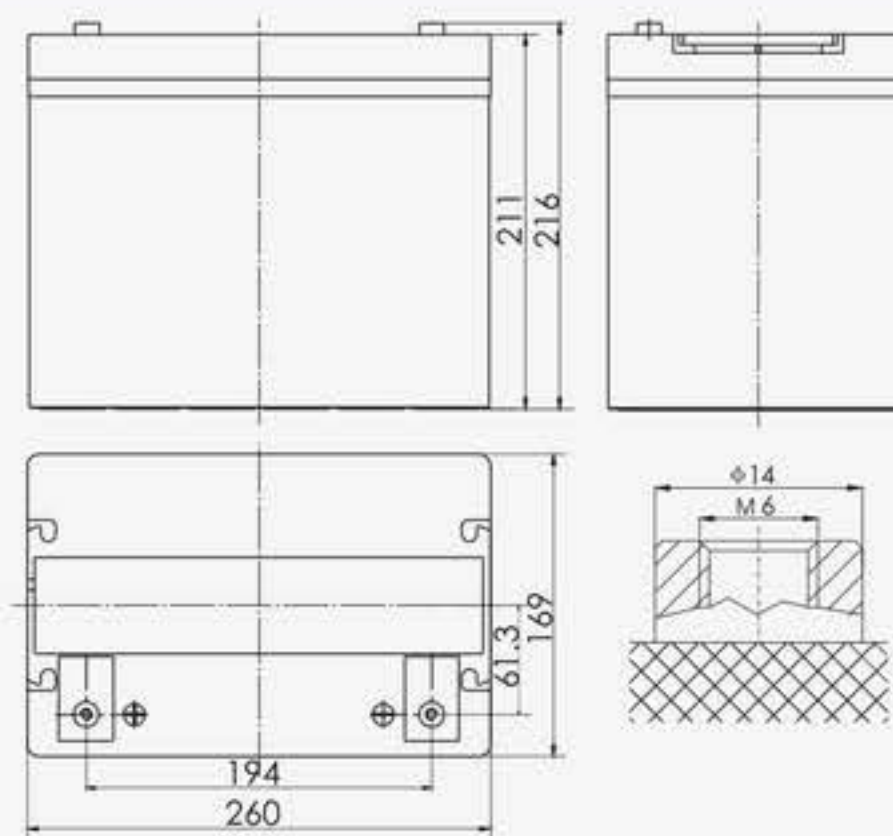


Temperature effects on capacity



Temperature effects on float life





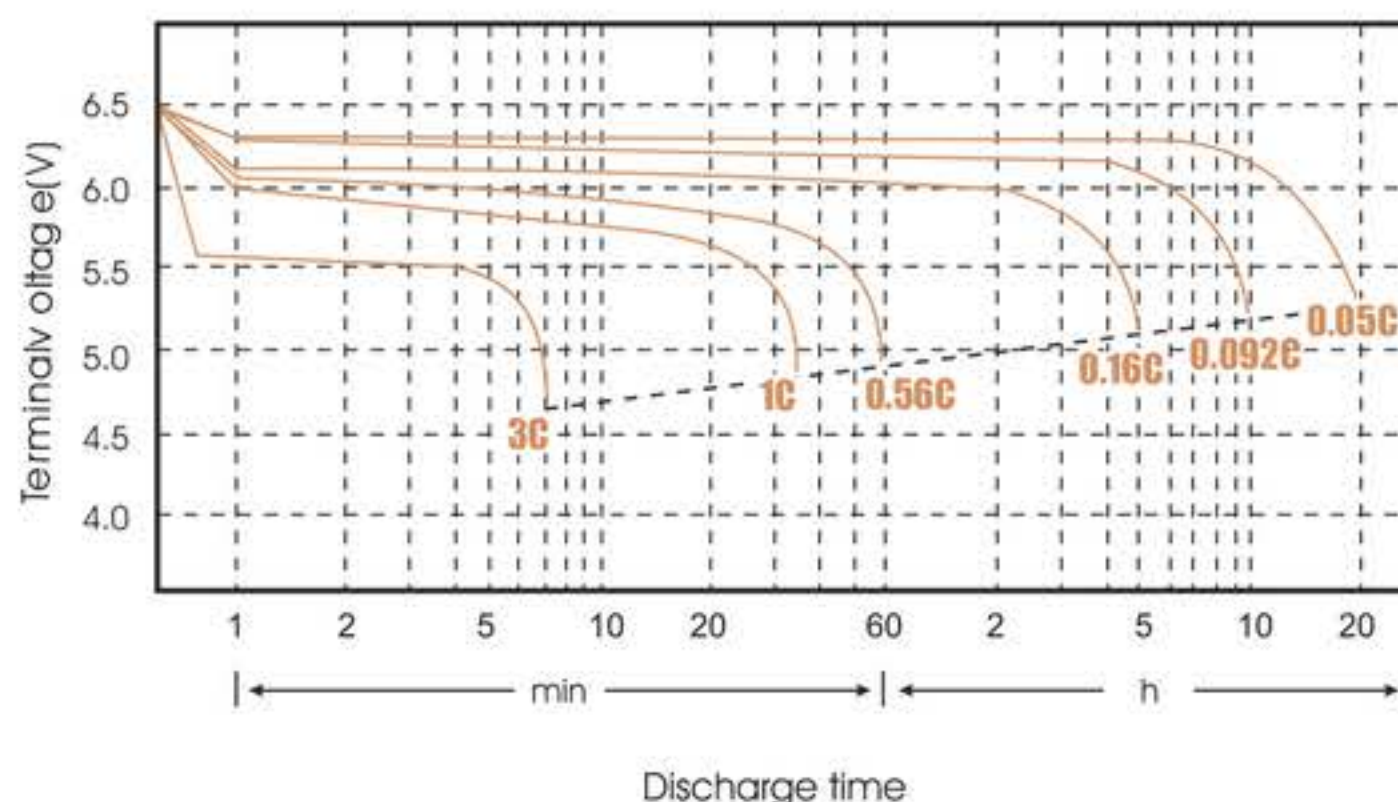
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		75Ah
Dimensions	Total Height (with terminals)	8.51inches (216mm)
	Height	8.31inches (211mm)
	Length	10.24inches(260mm)
	Width	6.65inches (169mm)
Weight		Approx. 48.4pound(22kg)

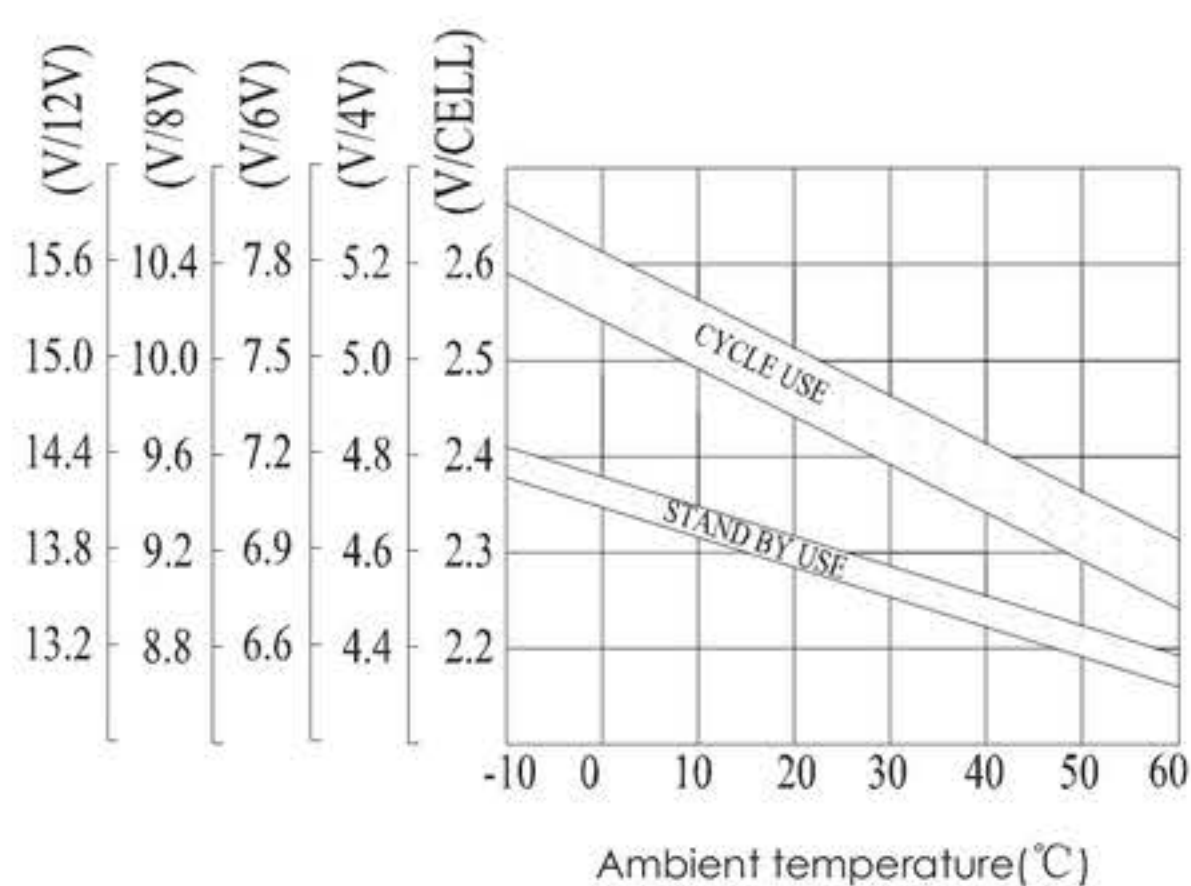
Characteristics

Capacity 77°F(25°C)	20 hour rate (3.75A)	75Ah
	10 hour rate (6.8A)	68Ah
	5 hour rate (12A)	60Ah
	1 hour rate (45A)	45Ah
	15 minute Rate (122A)	30.5Ah
Internal Resistance	Full charged Battery 77°F(25°C)	7mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	675A(5S)	
Terminal	M1	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 22.5A Voltage 14.4~14.7V/77°F(25°C)
	Float	Voltage 13.5~13.8V/77°F(25°C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	162.8	126.0	76.5	60.1	40.7	28.35	19.58	13.13	9.30	7.35	6.31	3.25
1.70	153.8	117.8	65.1	56.8	38.9	27.68	18.75	12.68	8.93	7.19	6.12	3.19
1.80	129.8	102.8	58.8	53.6	37.1	26.48	17.70	12.00	8.40	6.90	5.95	3.14

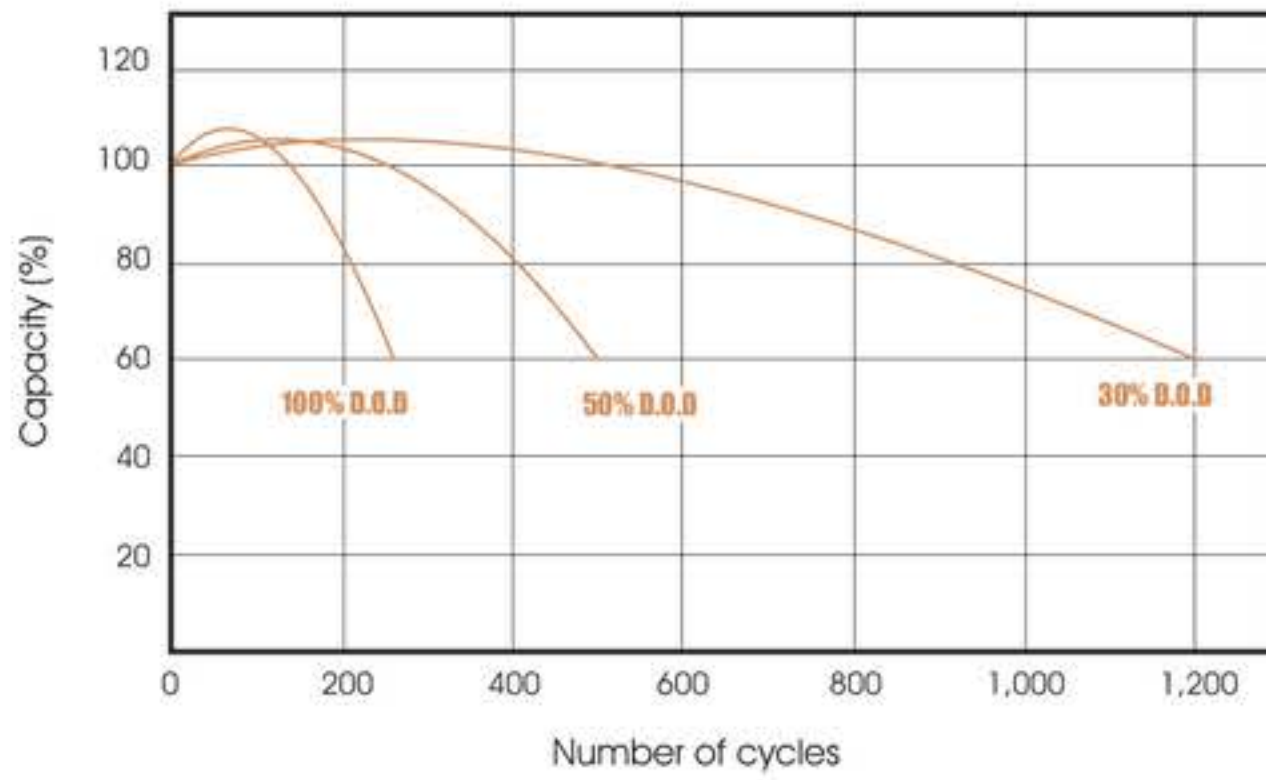
Constant Power Discharge (WATTS PER CELL@25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	293	224	147	110	89.1	52.3	36.7	24.1	16.4	13.6	11.8	6.17
1.65	290	222	143	109	88.2	51.6	36.3	23.9	16.3	13.4	11.7	6.15
1.67	288	219	142	107	87.0	51.0	36.2	23.8	16.2	13.3	11.5	6.13
1.70	284	216	140	106	86.5	50.3	36.0	23.4	16.0	13.0	11.5	6.10
1.75	265	210	128	104	86.3	49.7	35.5	23.2	15.9	12.9	11.5	6.08
1.80	247	196	120	103	85.8	48.9	34.7	23.1	15.6	12.7	11.1	6.06
1.85	204	172	111	94.7	79.8	47.8	34.3	22.0	15.0	12.6	10.9	5.71

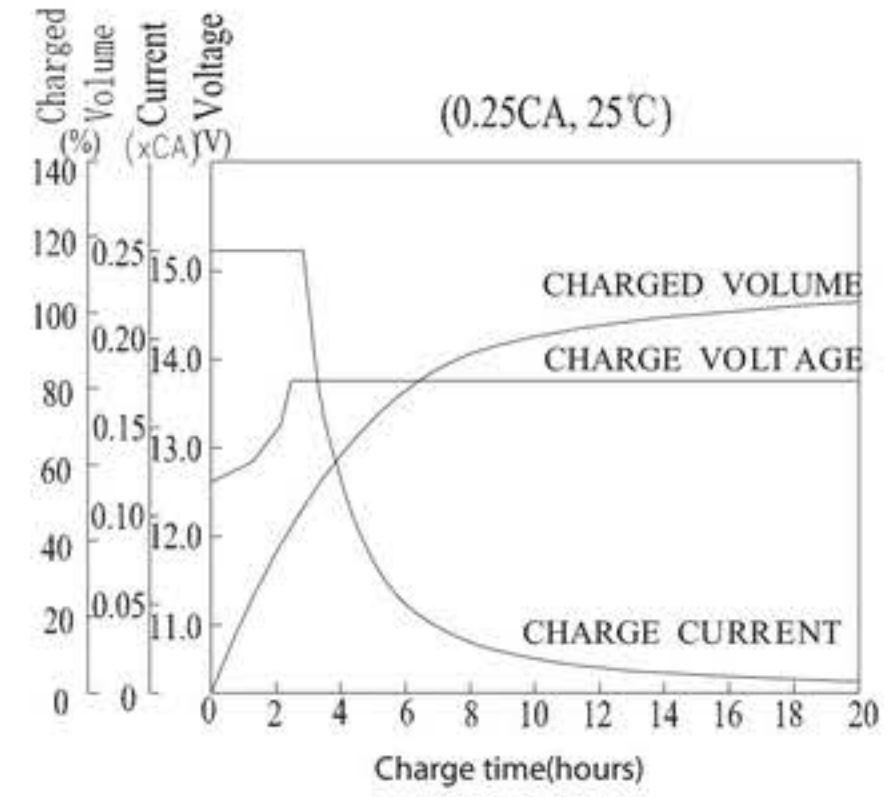


The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

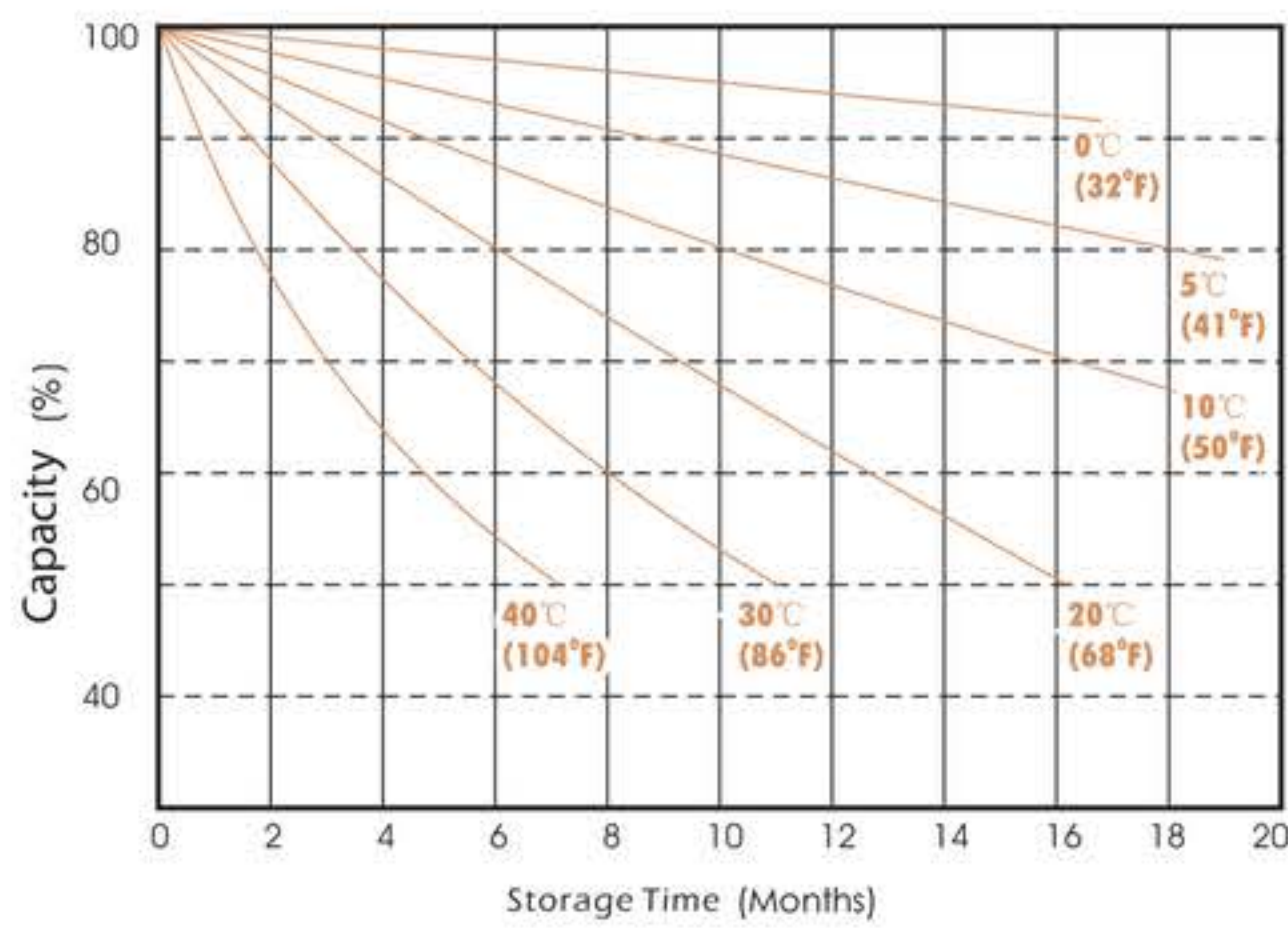
Cycle service life in relation to depth of discharge



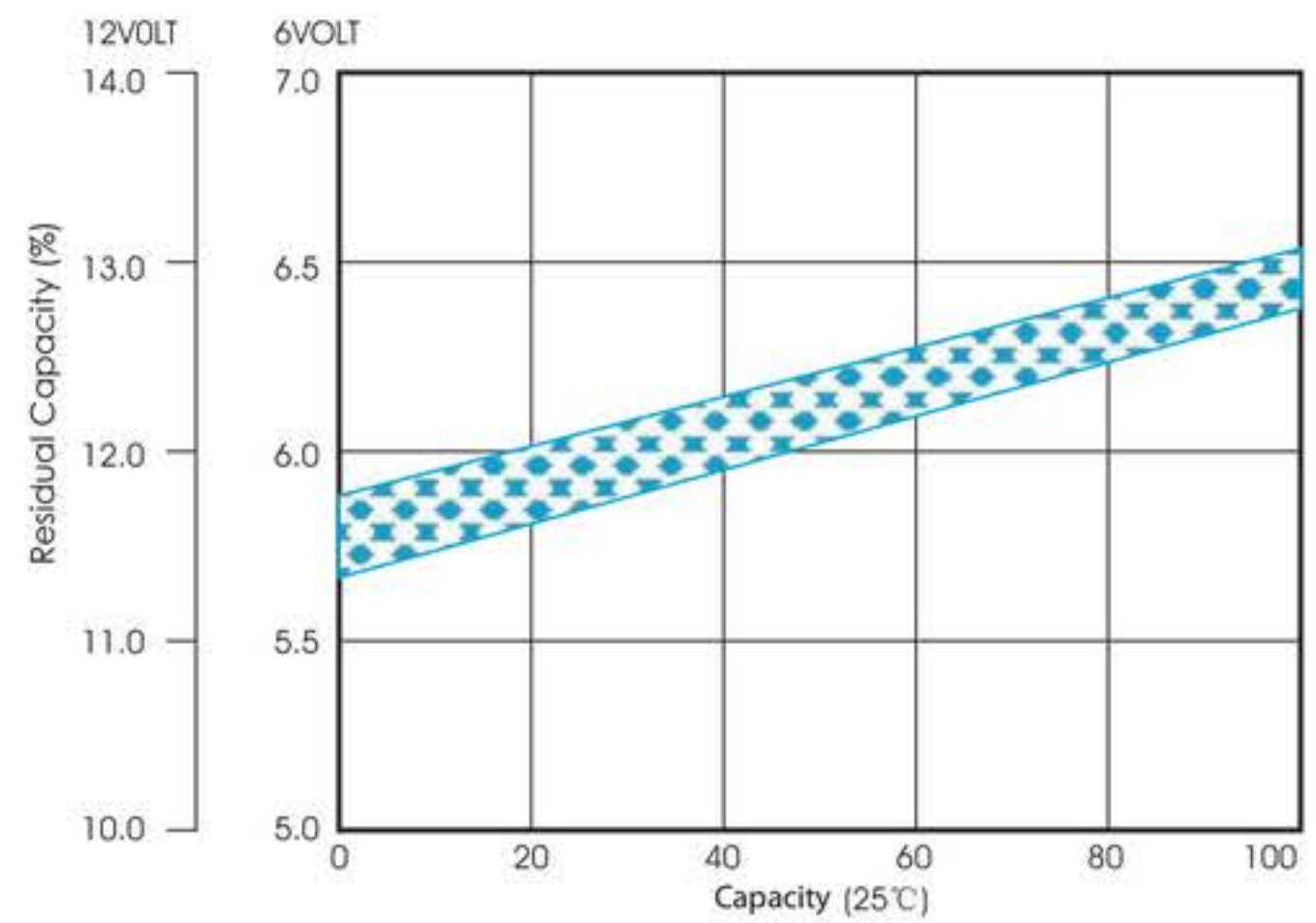
Constant voltage charge characteristic



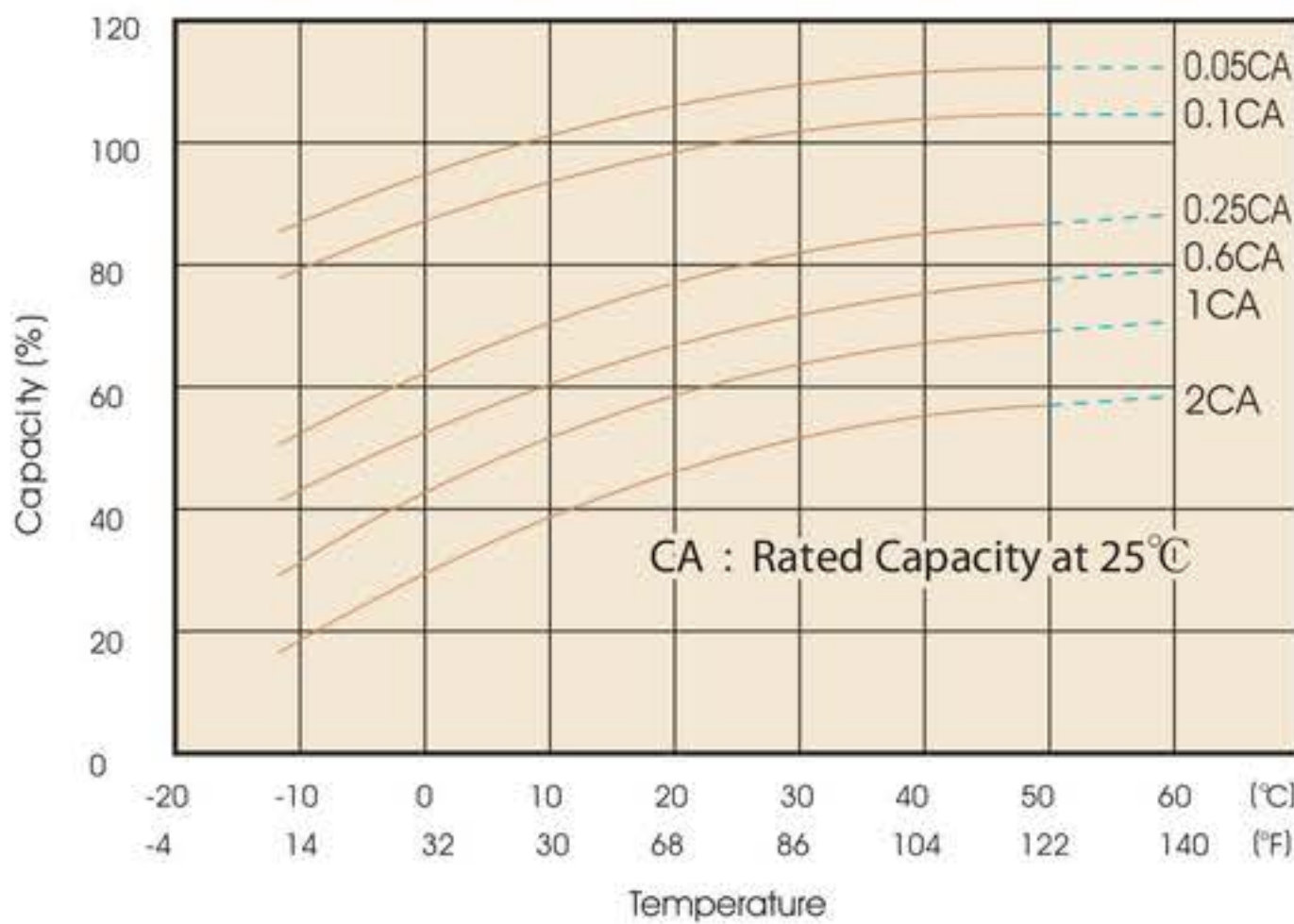
Self-Discharge Characteristics.



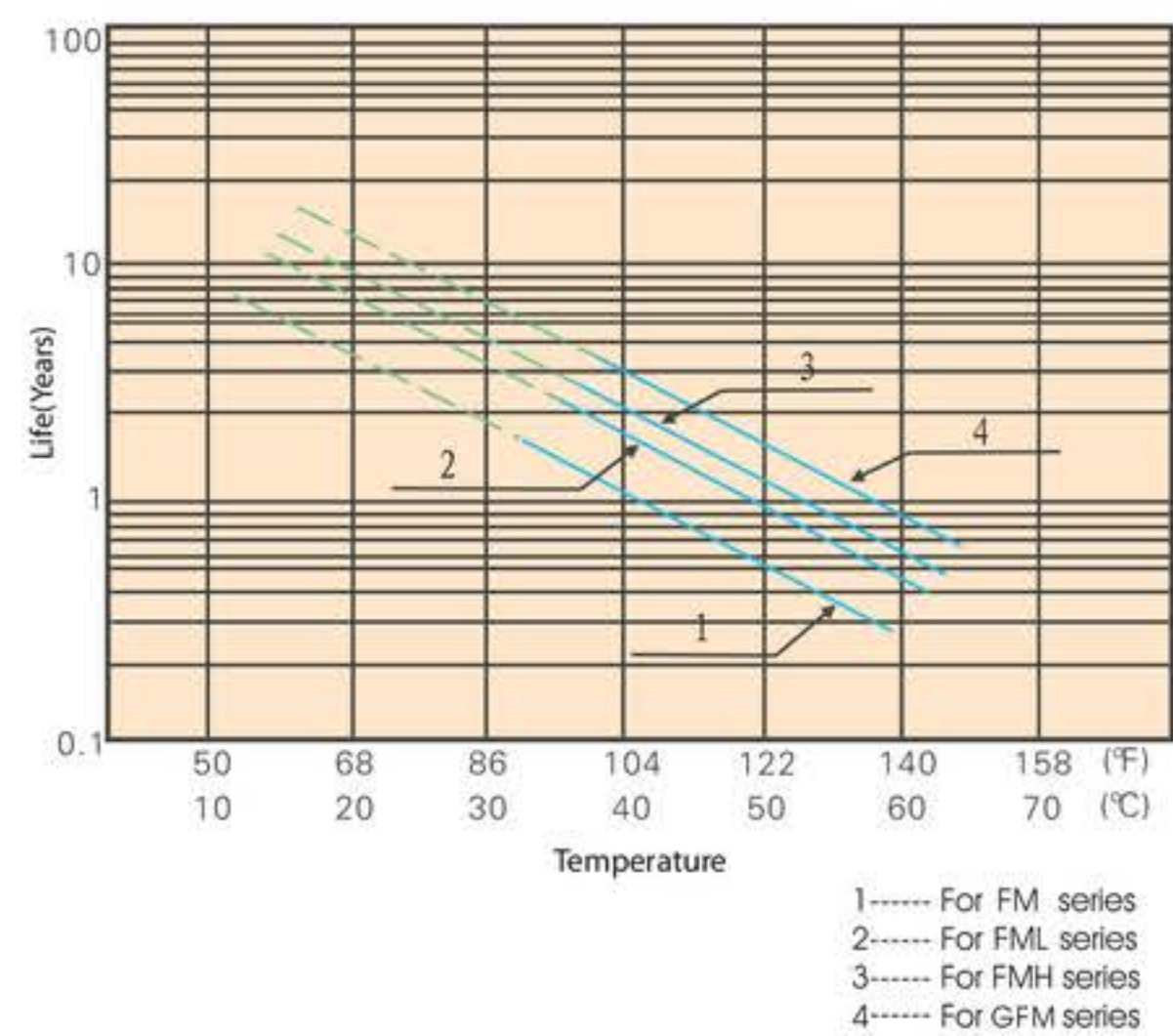
Relationship of OCV and Residual Capacity % (25°C)

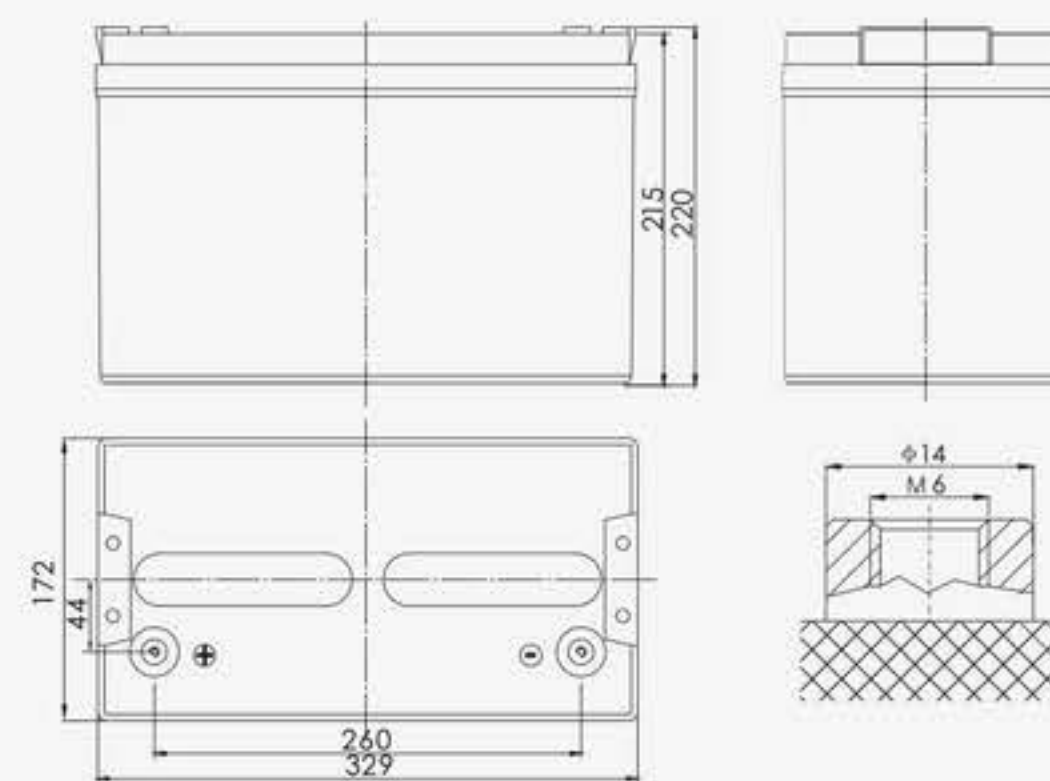


Temperature effects on capacity



Temperature effects on float life





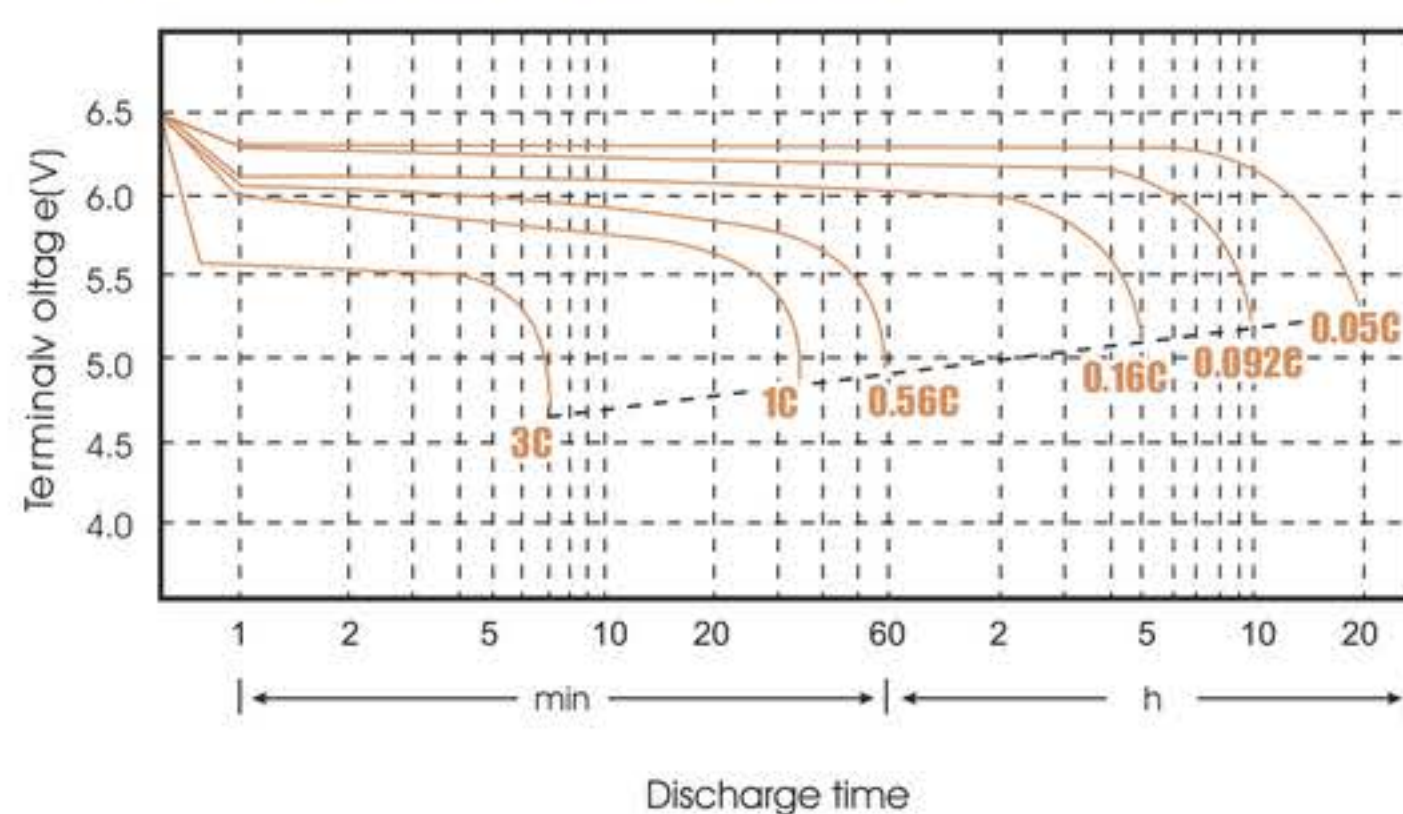
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		100Ah
Dimensions	Total Height (with terminals)	8.66inches (220mm)
	Height	8.46inches (215mm)
	Length	12.95inches (329mm)
	Width	6.77inches (172mm)
Weight		Approx. 60.94pound(27.7kg)

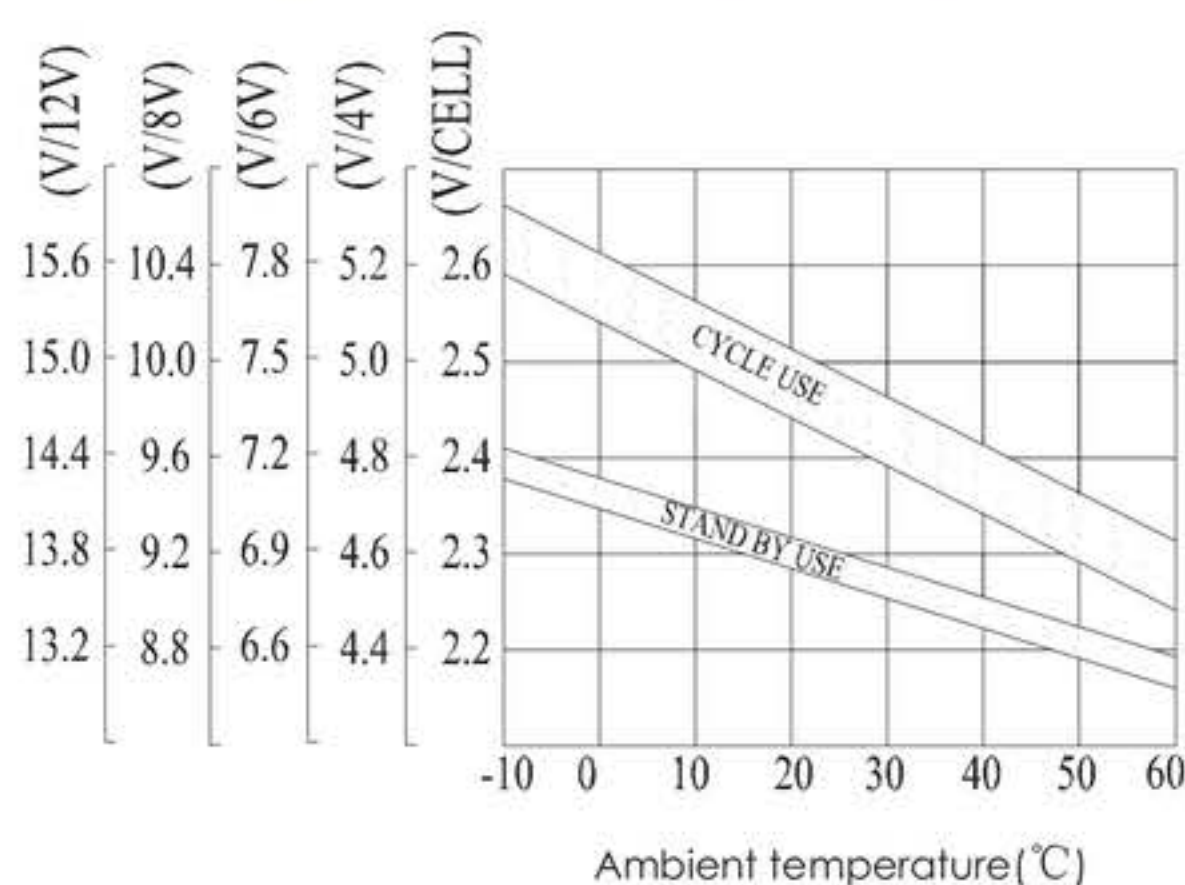
Characteristics

Capacity 77°F(25°C)	20 hour rate (5.0A) 10 hour rate (9.2A) 5 hour rate (16.0A) 1 hour rate (60.0A)	100Ah 92Ah 80Ah 60Ah
	15 minute Rate(164A)	41Ah
Internal Resistance	Full charged Battery 77°F(25°C)	5mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C) 77°F(25°C) 32°F(0°C) 5°F(-15°C)	102% 100% 85% 65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage Capacity after 6 month storage Capacity after 12 month storage	91% 81% 60%
Max. Discharge Current 77°F(25°C)	800A(5S)	
Terminal	M2	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 30A Voltage 14.4~14.7V/77°F(25°C)
	Float	Voltage 13.5~13.8V/77°F(25°C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

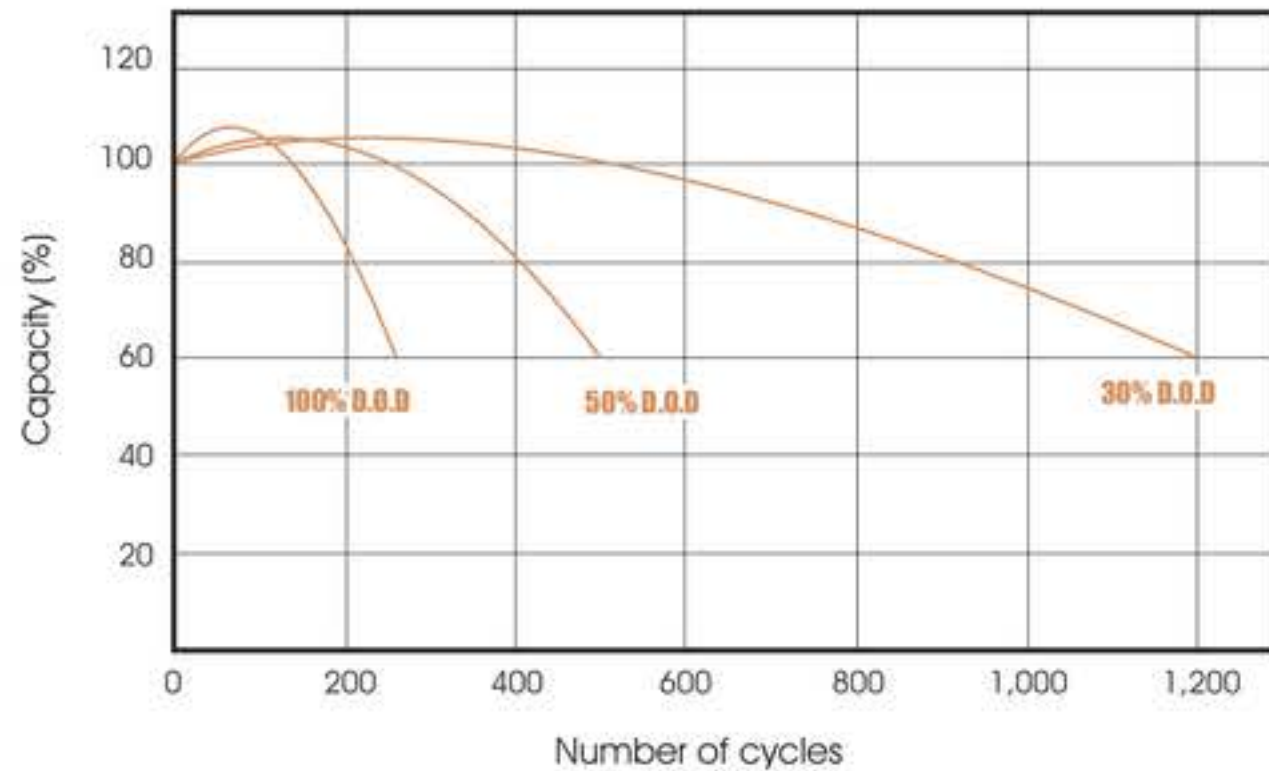
F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	217	168	102	80.1	54.2	37.8	26.1	17.5	12.4	9.80	8.41	4.33
1.70	205	157	86.8	75.7	51.9	36.9	25.0	16.9	11.9	9.59	8.16	4.25
1.80	173	137	78.4	71.5	49.4	35.3	23.6	16.0	11.2	9.20	7.93	4.18

Constant Power Discharge (WATTS PER CELL@25°C)

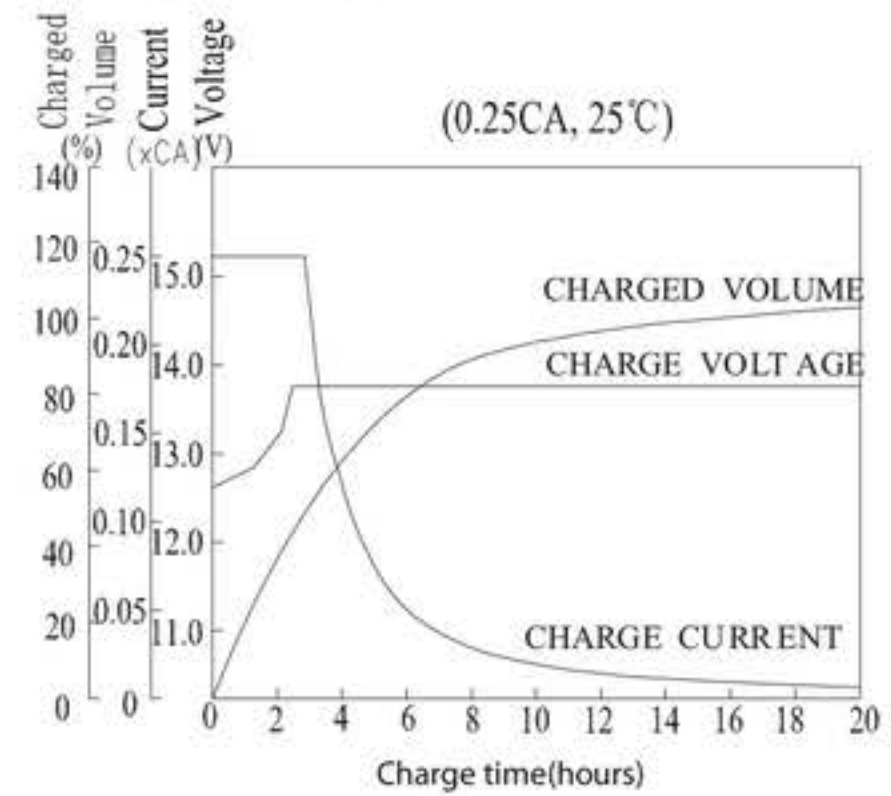
F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	394	307	191	148	119	70.0	49.1	32.4	22.9	18.3	15.7	8.11
1.65	389	304	185	146	115	69.1	49	32.2	22.8	18.2	15.6	8.1
1.67	386	302	173	144	114	68.8	48.6	31.9	22.7	18.2	15.5	8.09
1.70	379	291	162	142	111	68.4	47.7	31.6	22.3	18.1	15.4	8.07
1.75	346	274	156	141	108	67.9	46.4	31.0	21.7	18.0	15.3	8.06
1.80	330	264	151	138	107	66.6	46.1	30.5	21.4	17.7	15.2	8.04
1.85	273	231	141	127	104	64.2	45.0	29.5	20.1	16.9	14.4	7.62

The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

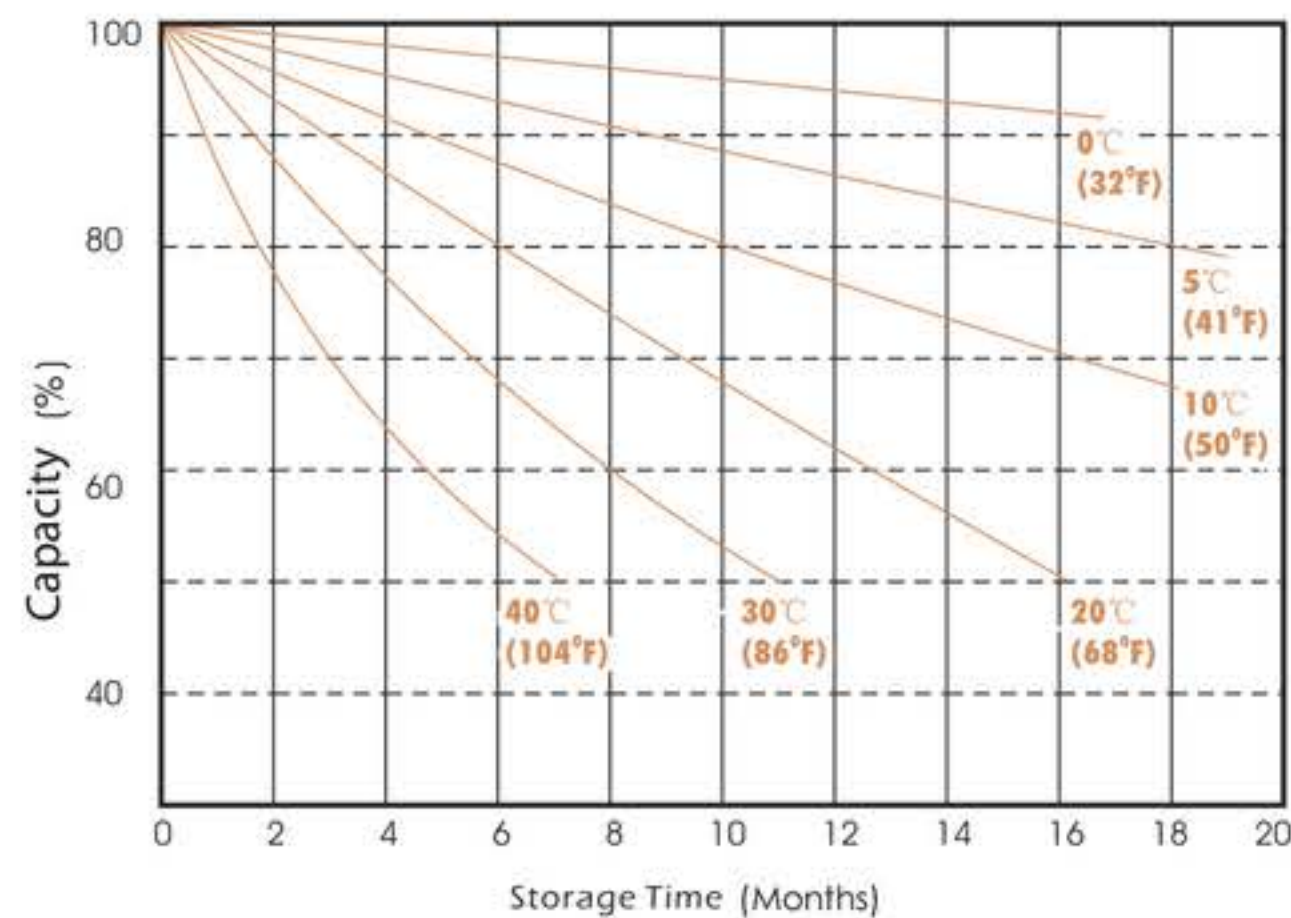
Cycle service life in relation to depth of discharge



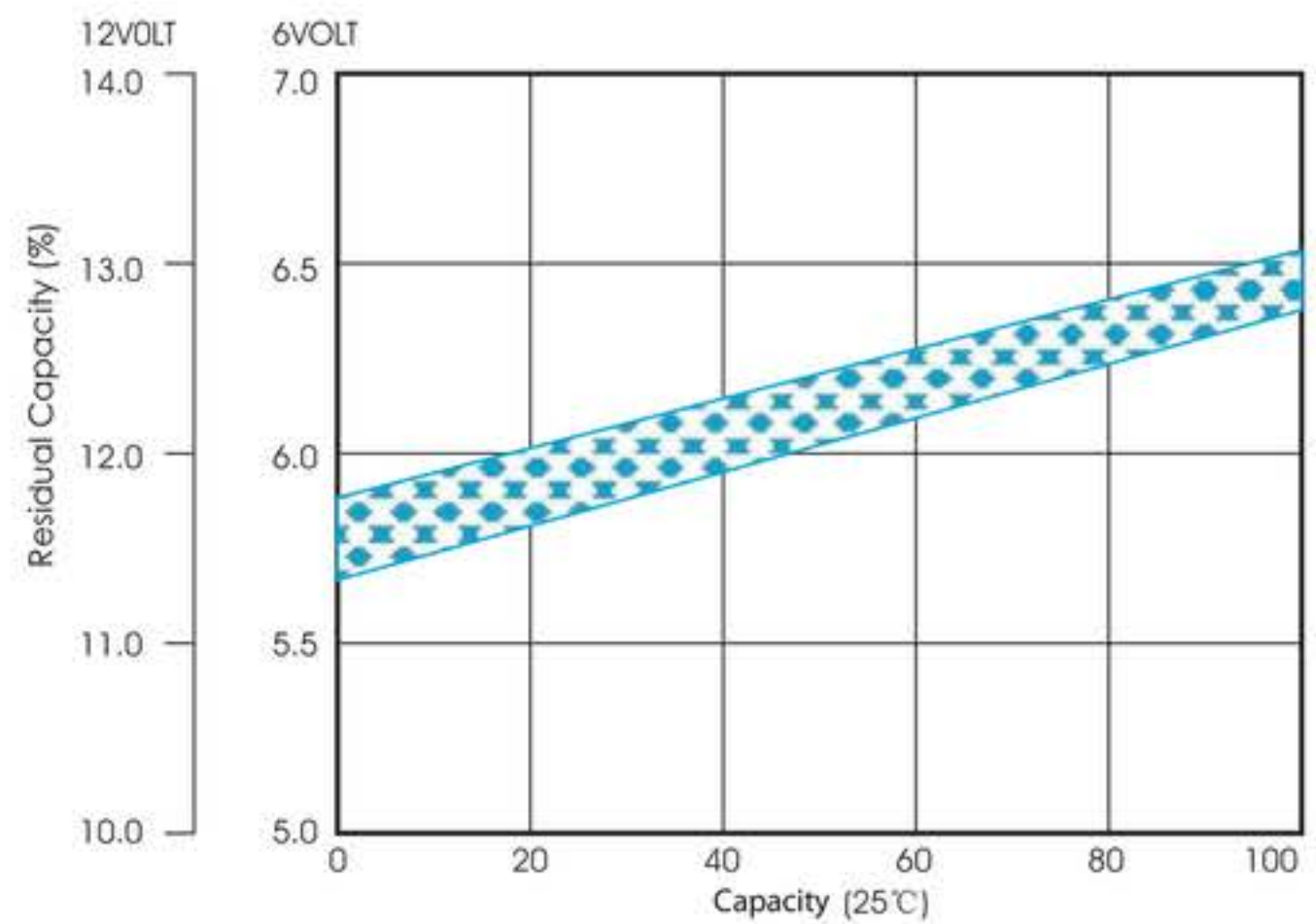
Constant voltage charge characteristic



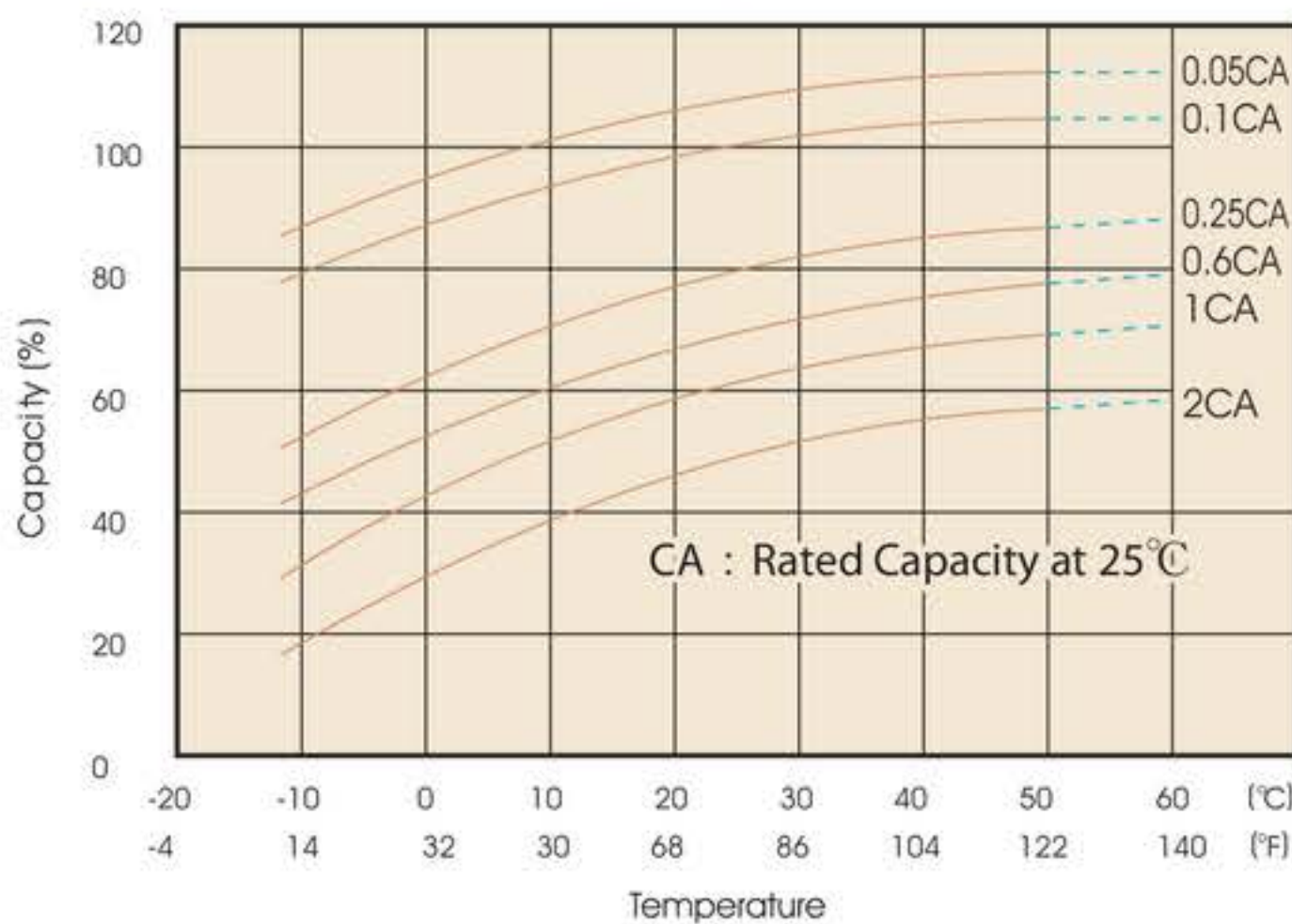
Self-Discharge Characteristics.



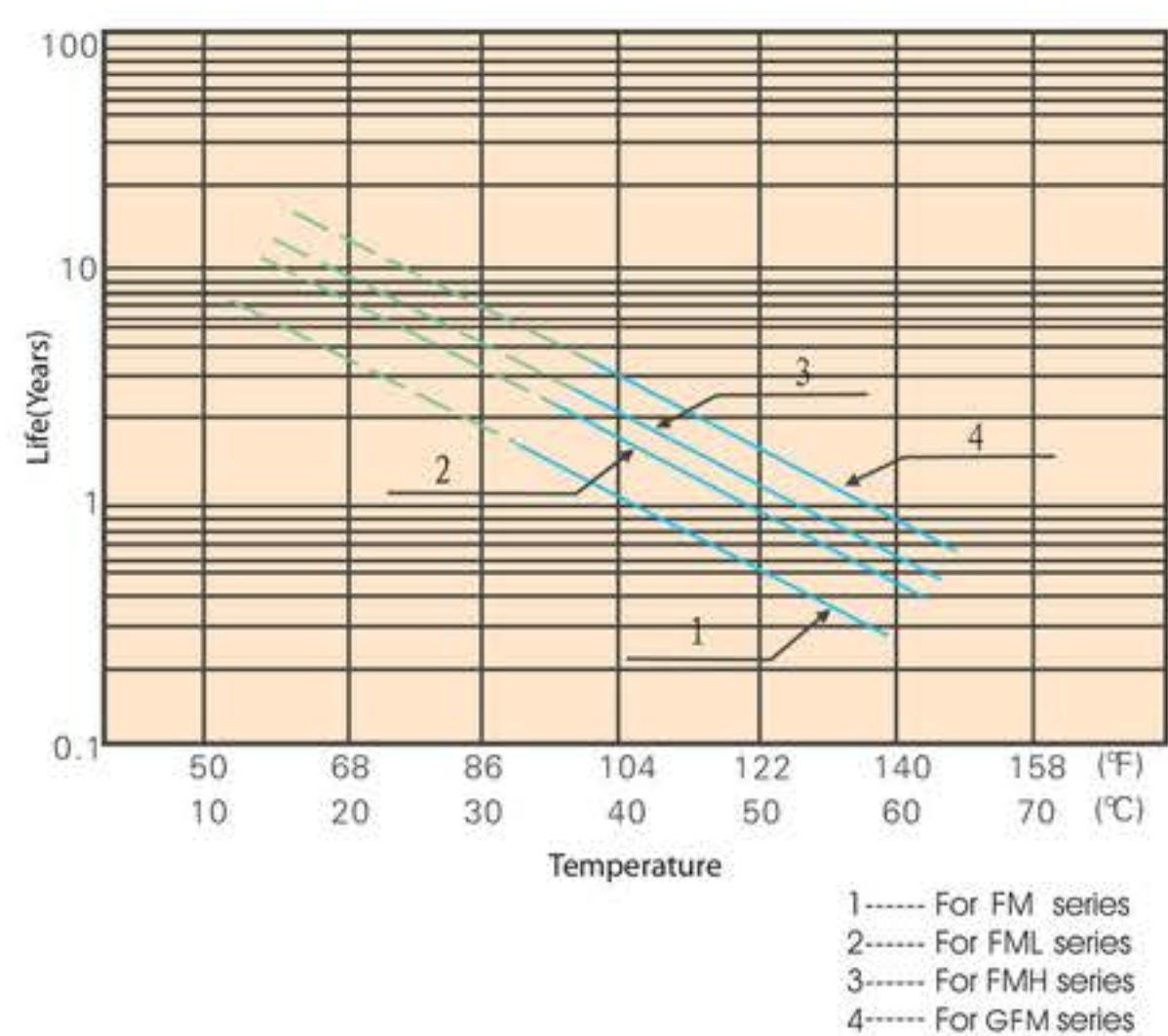
Relationship of OCV and Residual Capacity % (25°C)

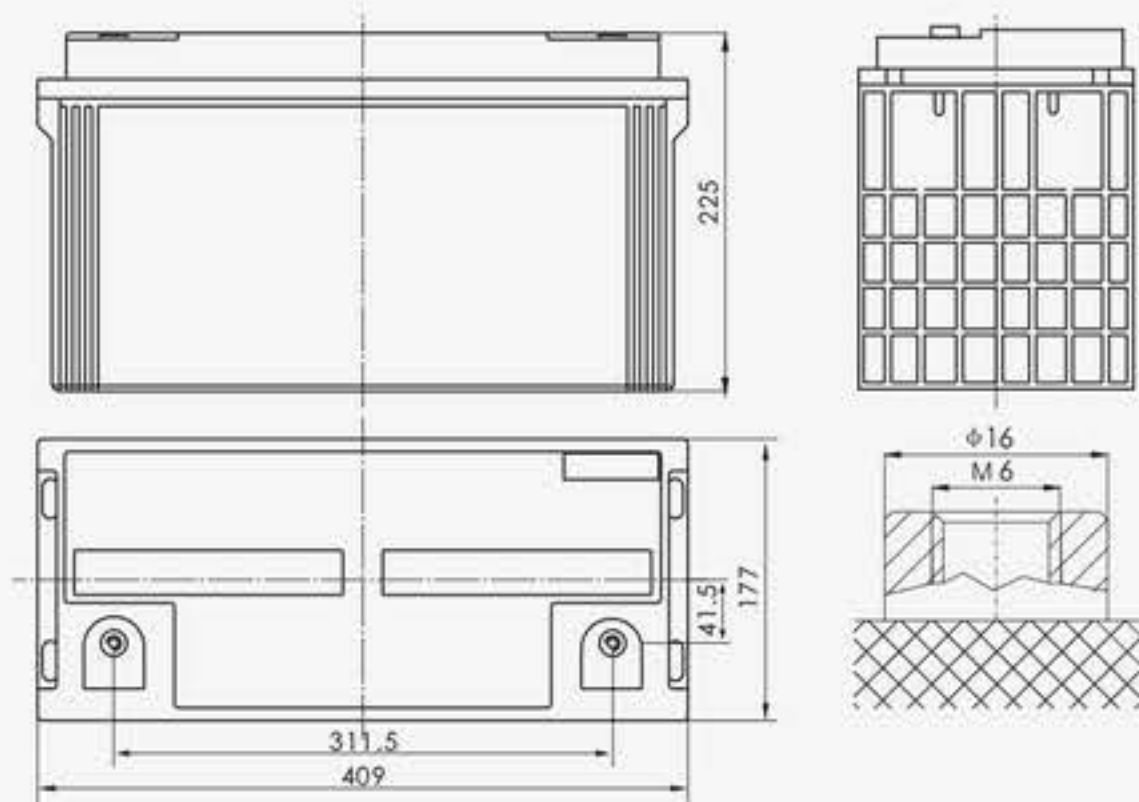


Temperature effects on capacity



Temperature effects on float life





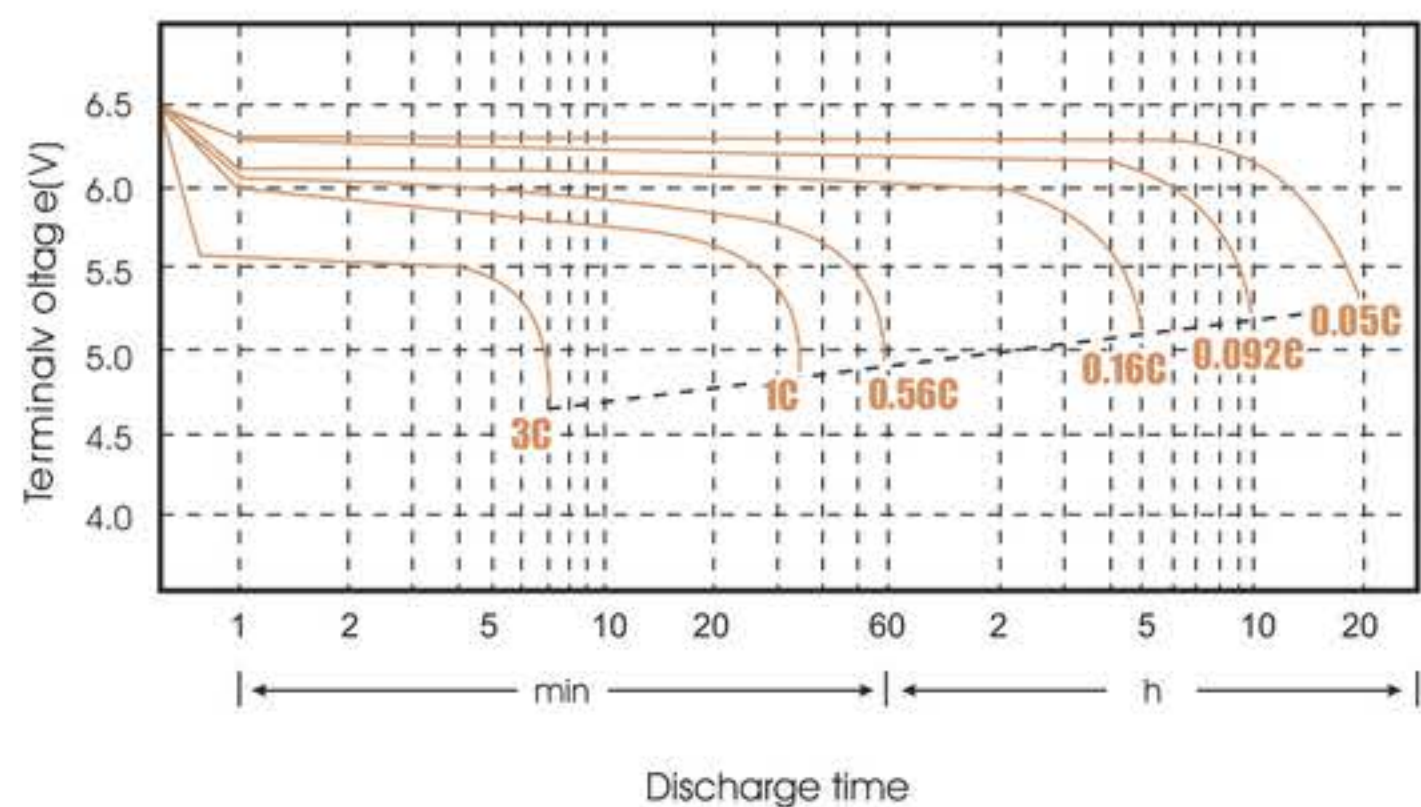
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		120Ah
Dimensions	Total Height (with terminals)	8.86inches (225mm)
	Height	8.86inches (225mm)
	Length	16.1inches (409mm)
	Width	6.97inches (177mm)
Weight		Approx. 79.2pound(36kg)

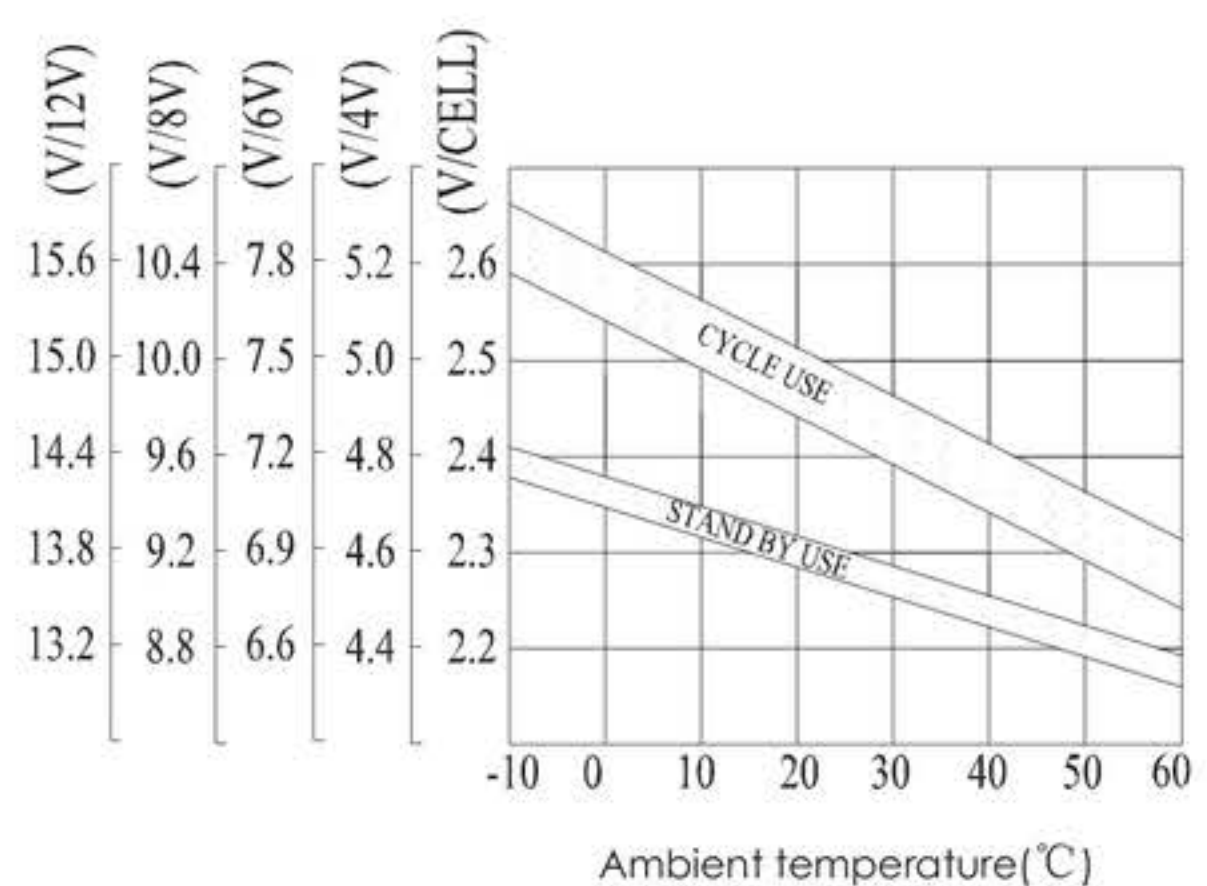
Characteristics

Capacity 77°F(25°C)	20 hour rate (6.0A) 10 hour rate (11A) 5 hour rate (19.2A) 1 hour rate (72A)	120Ah 110Ah 96Ah 72Ah
	15 minute Rate(196.8A)	49.2Ah
Internal Resistance	Full charged Battery 77°F(25°C)	4.0mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	960A(5S)	
Terminal	M3	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 36A Voltage 14.4~14.7V/77°F(25°C)
	Float	Voltage 13.5~13.8V/77°F(25°C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	261	202	122	96.1	65.2	45.3	31.2	21.0	14.8	11.7	10.1	5.20
1.70	246	189	104	90.9	62.4	44.2	30.0	20.3	14.3	11.5	9.80	5.09
1.80	207	165	94.1	85.8	59.3	42.4	28.3	19.2	13.4	11.0	9.50	5.02

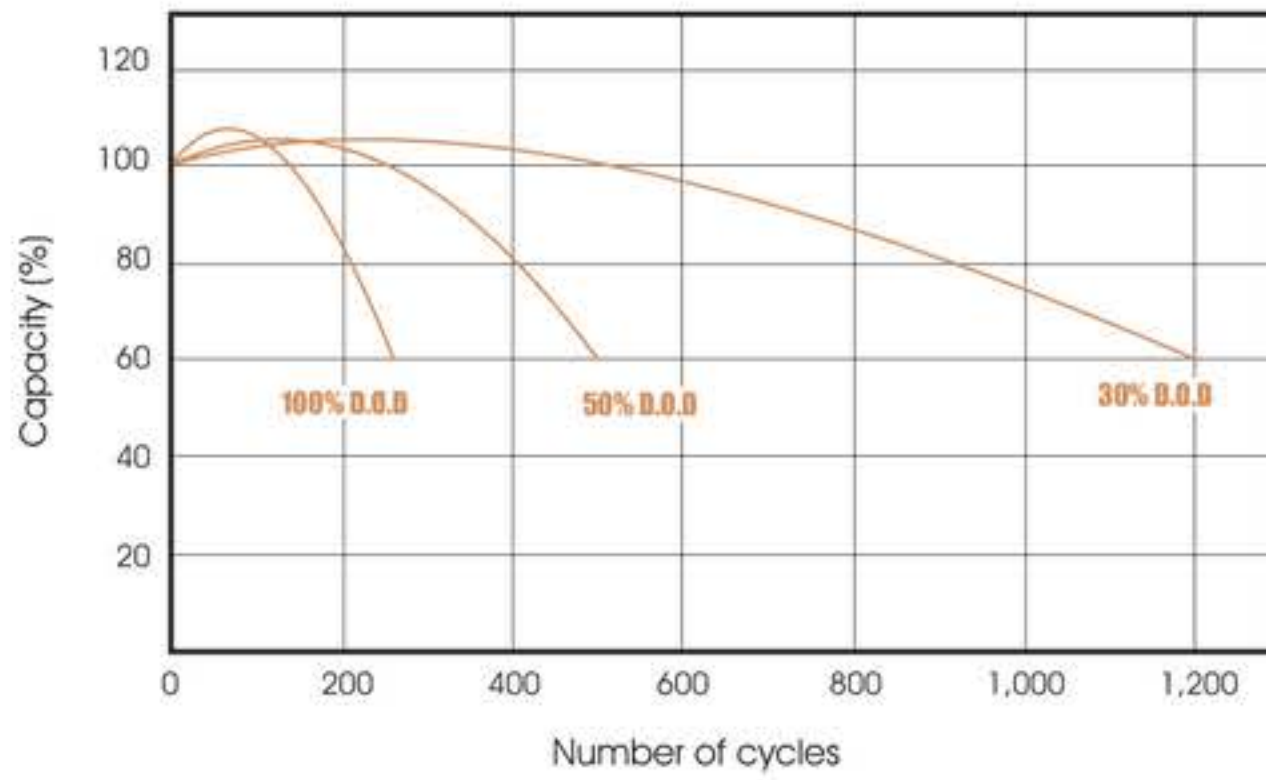
Constant Power Discharge (WATTS PER CELL@25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	473	368	229	178	143	84.0	58.9	38.9	27.5	22.0	18.8	9.73
1.65	467	365	222	175	138	82.9	58.8	38.6	27.4	21.8	18.7	9.72
1.67	463	362	208	173	137	82.6	58.3	38.3	27.2	21.8	18.6	9.71
1.70	455	349	194	170	133	82.1	57.2	37.9	26.8	21.7	18.5	9.68
1.75	415	329	187	169	130	81.5	55.7	37.2	26.0	21.6	18.4	9.67
1.80	396	317	181	166	128	79.9	55.3	36.6	25.7	21.2	18.3	9.65
1.85	328	277	169	152	125	77.0	54.0	35.4	24.1	20.3	17.3	9.14

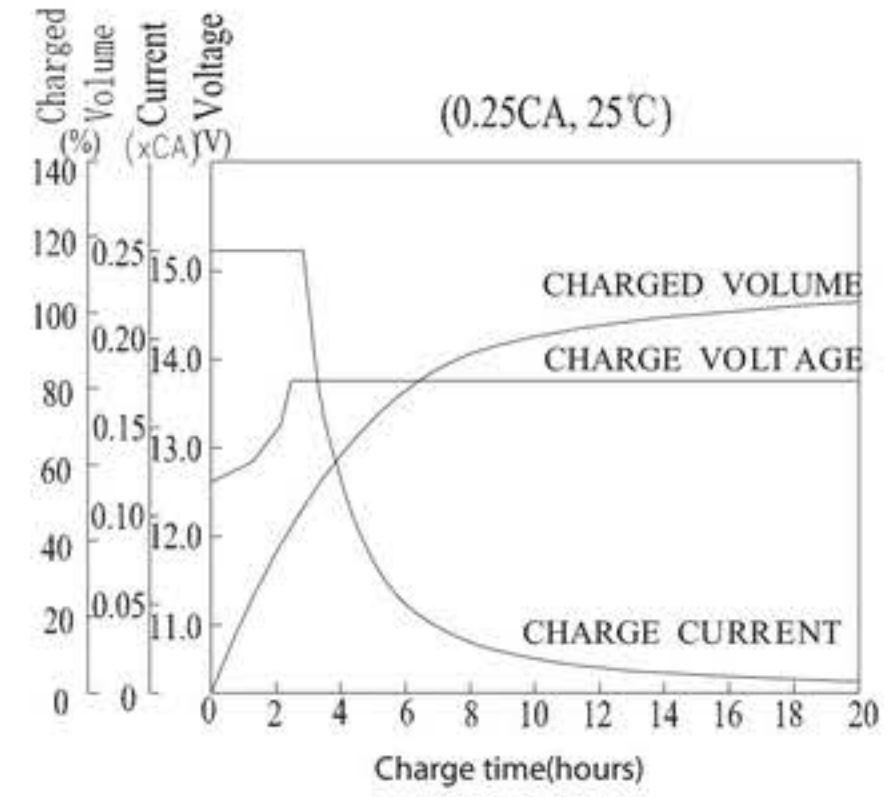


The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

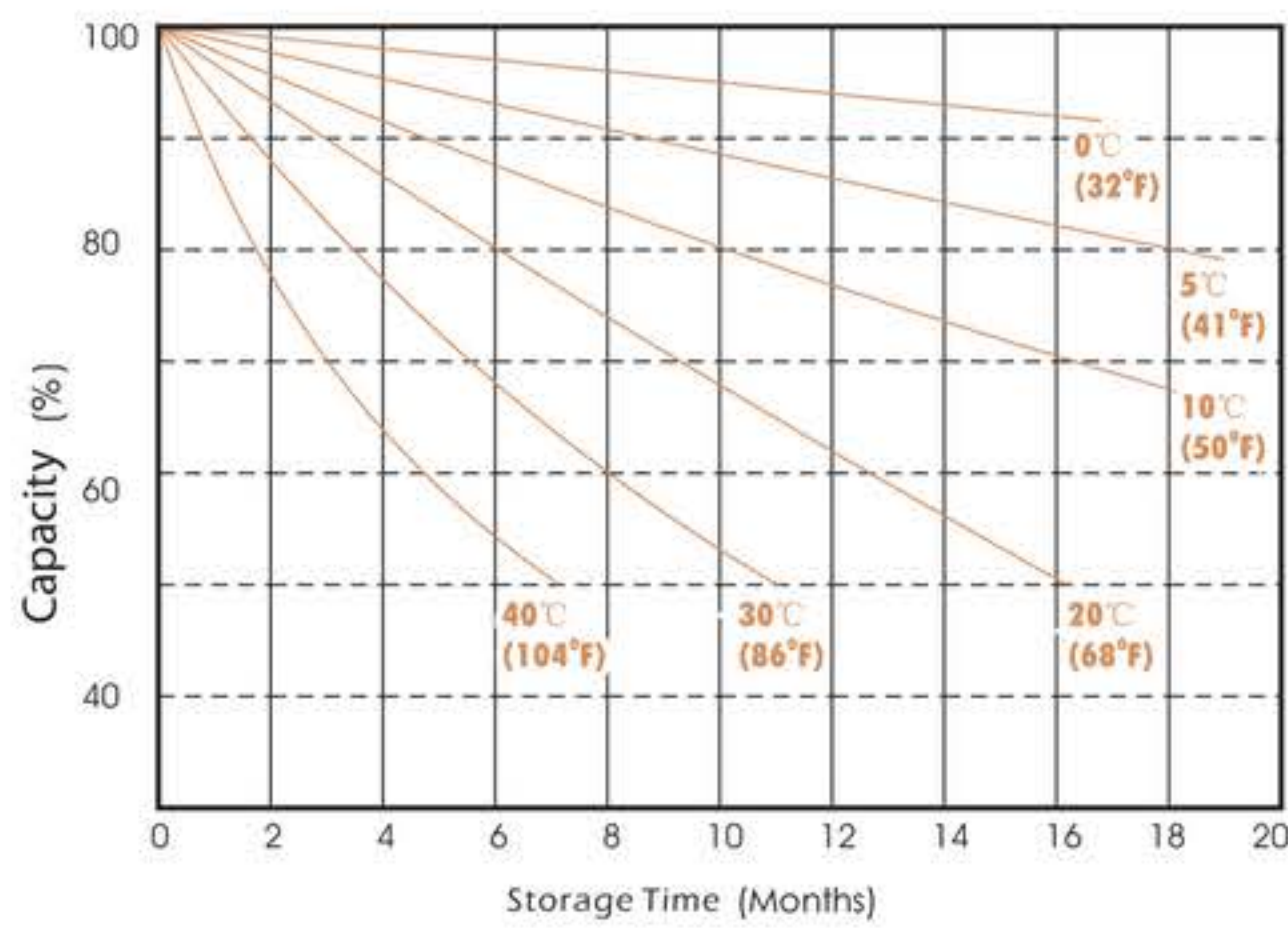
Cycle service life in relation to depth of discharge



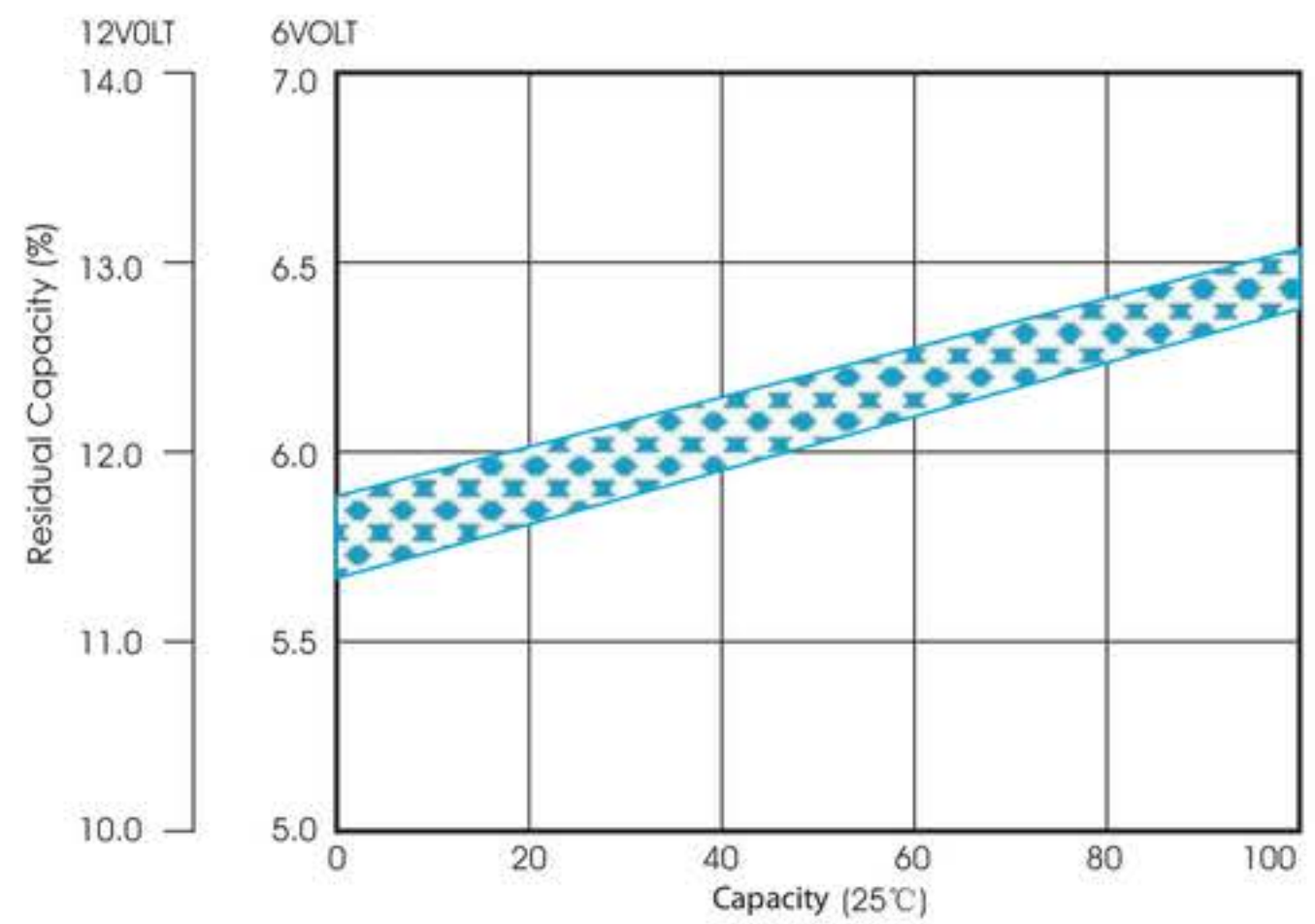
Constant voltage charge characteristic



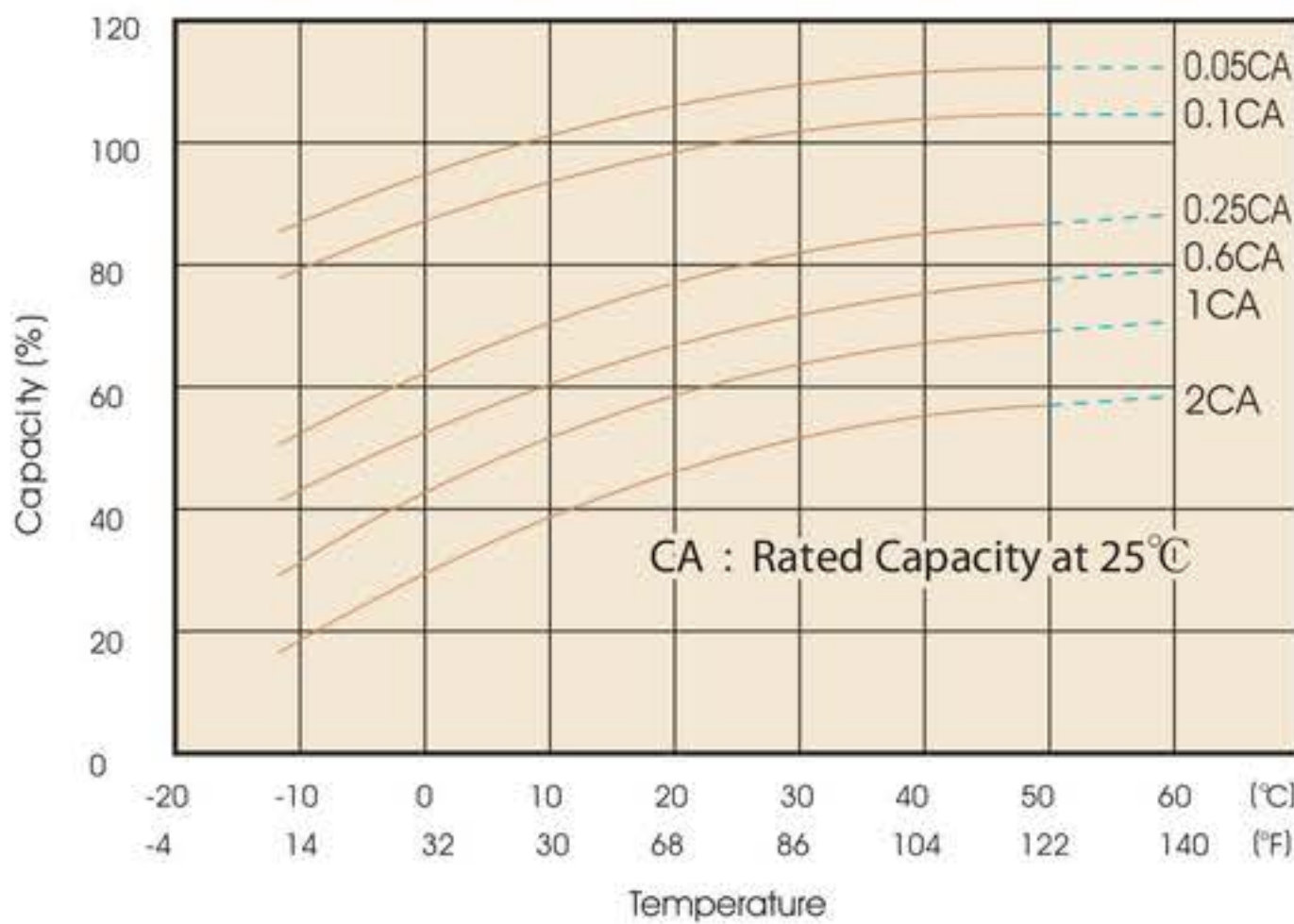
Self-Discharge Characteristics.



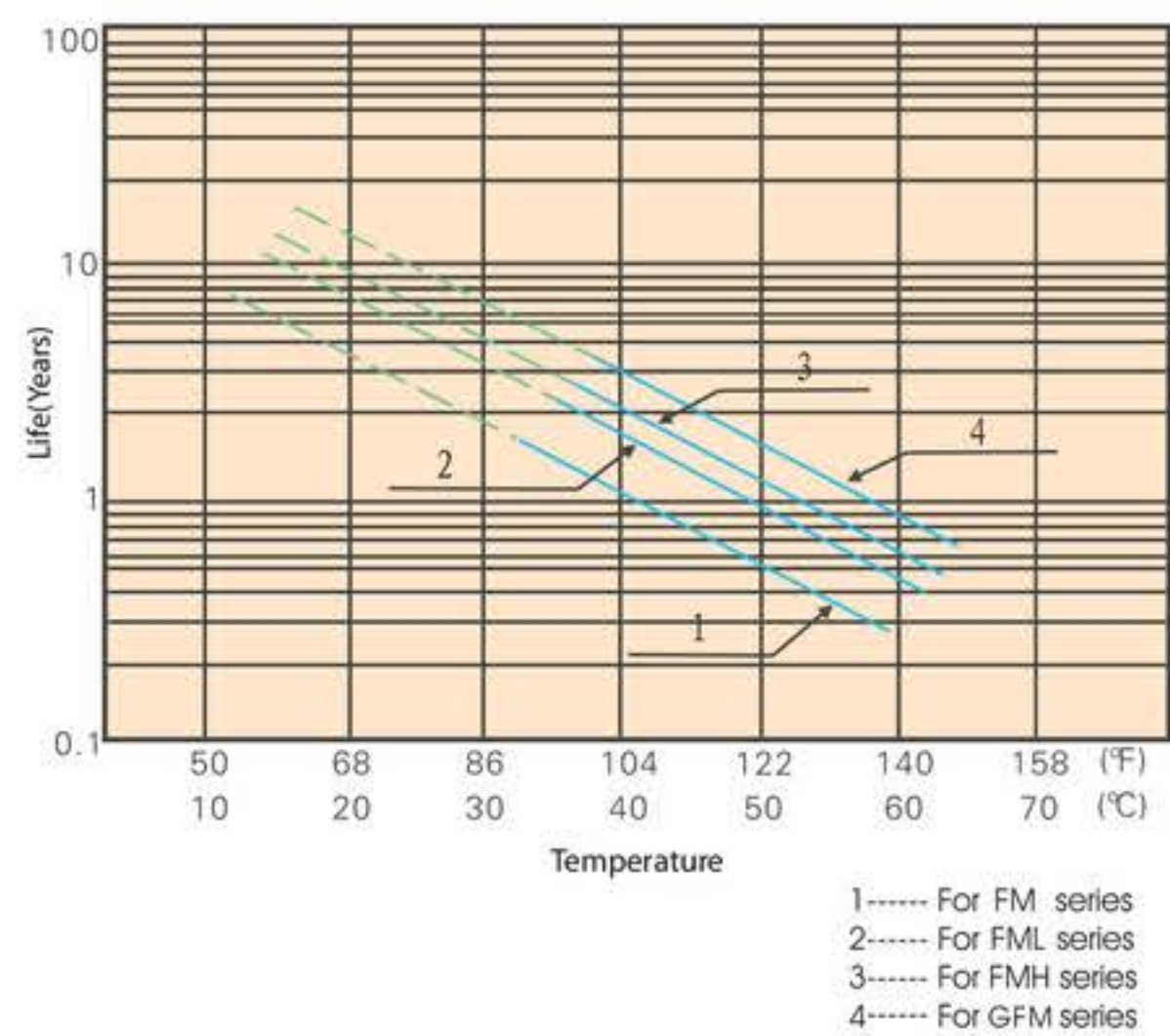
Relationship of OCV and Residual Capacity % (25°C)

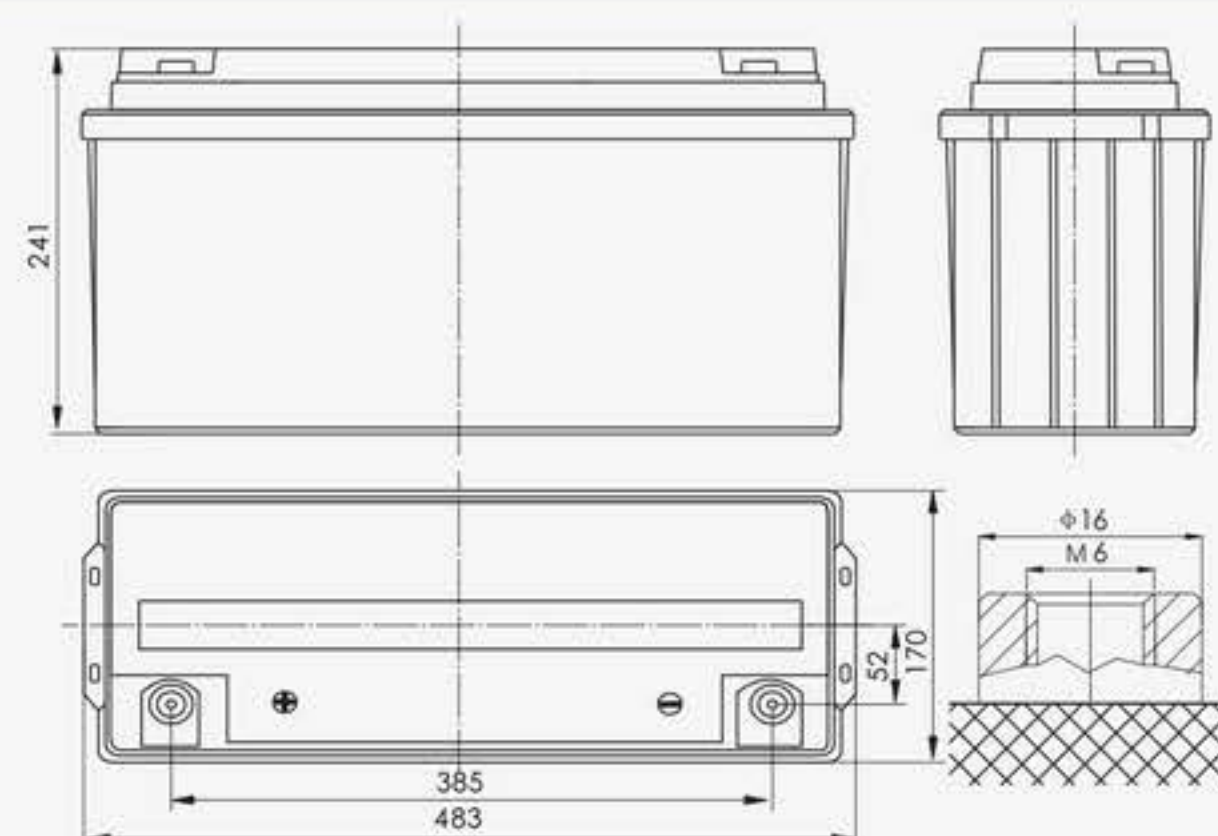


Temperature effects on capacity



Temperature effects on float life





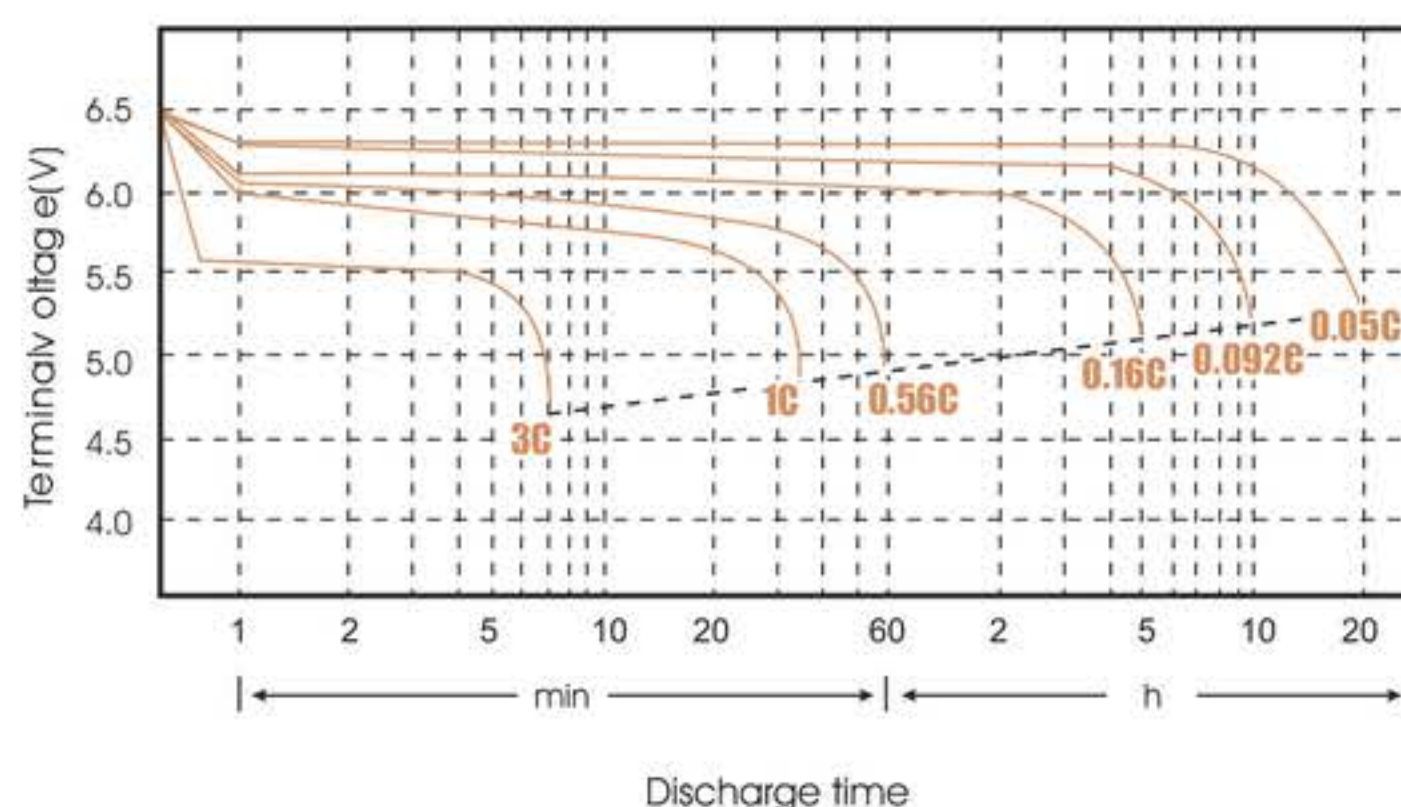
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		150Ah
Dimensions	Total Height (with terminals)	9.49inches (241mm)
	Height	9.49inches (241mm)
	Length	19.02inches (483mm)
	Width	6.69inches (170mm)
Weight		Approx. 103.18Pound(46.9kg)

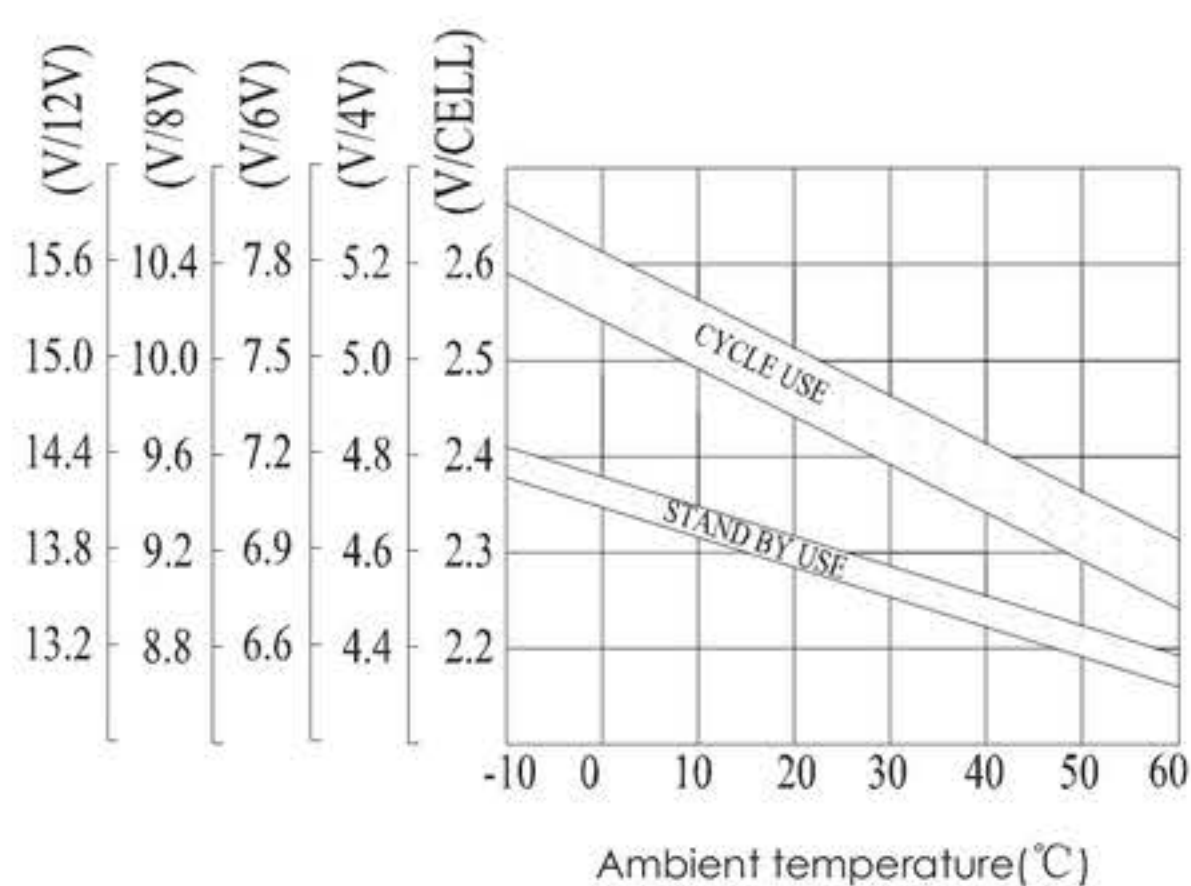
Characteristics

Capacity 77°F(25°C)	20 hour rate (7.5A)	150Ah
	10 hour rate (13.8A)	138Ah
	5 hour rate (24.0A)	120Ah
	1 hour rate (90.0A)	90Ah
	15 minute Rate (246A)	61.5Ah
Internal Resistance	Full charged Battery 77°F(25°C)	3.0mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 monthstorage	91%
	Capacity after 6 monthstorage	81%
	Capacity after 12 monthstorage	60%
Max. Discharge Current 77°F(25°C)	1000A(5S)	
Terminal	M5	
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 45A Voltage 14.4~14.7V/77°F(25°C)
	Float	Voltage 13.5~13.8V/77°F(25°C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	325.5	252.0	153.0	120.2	81.3	56.70	39.15	26.25	18.60	14.70	12.62	6.50
1.70	307.5	235.5	130.2	113.6	77.9	55.35	37.50	25.35	17.85	14.39	12.24	6.38
1.80	259.5	205.5	117.6	107.3	74.1	52.95	35.40	24.00	16.80	13.80	11.90	6.27

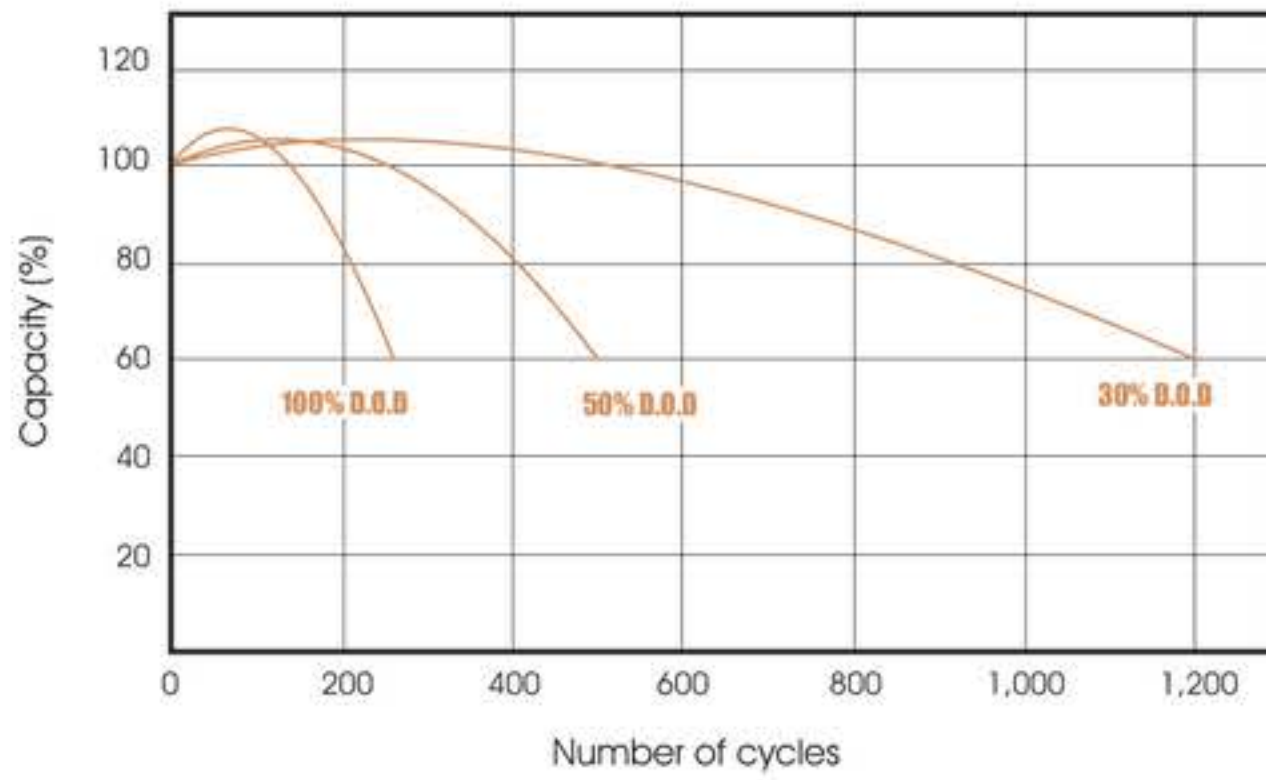
Constant Power Discharge (WATTS PER CELL@25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	583	454	286	219	178	106	73.7	48.6	33.5	27.8	23.7	12.2
1.65	576	451	282	217	175	104	72.0	48.1	33.4	27.6	23.6	12.1
1.67	571	450	276	213	172	103	71.3	47.8	33.3	27.5	23.5	12.0
1.70	560	441	247	210	168	102	70.4	47.1	33.1	27.2	23.3	11.9
1.75	519	411	234	208	162	101	69.6	46.5	32.5	27.0	23.1	11.8
1.80	487	391	214	205	159	100	68.7	45.2	32.1	26.5	22.9	11.6
1.85	404	342	208	188	148	95.5	67.8	44.0	29.9	25.2	21.4	11.4

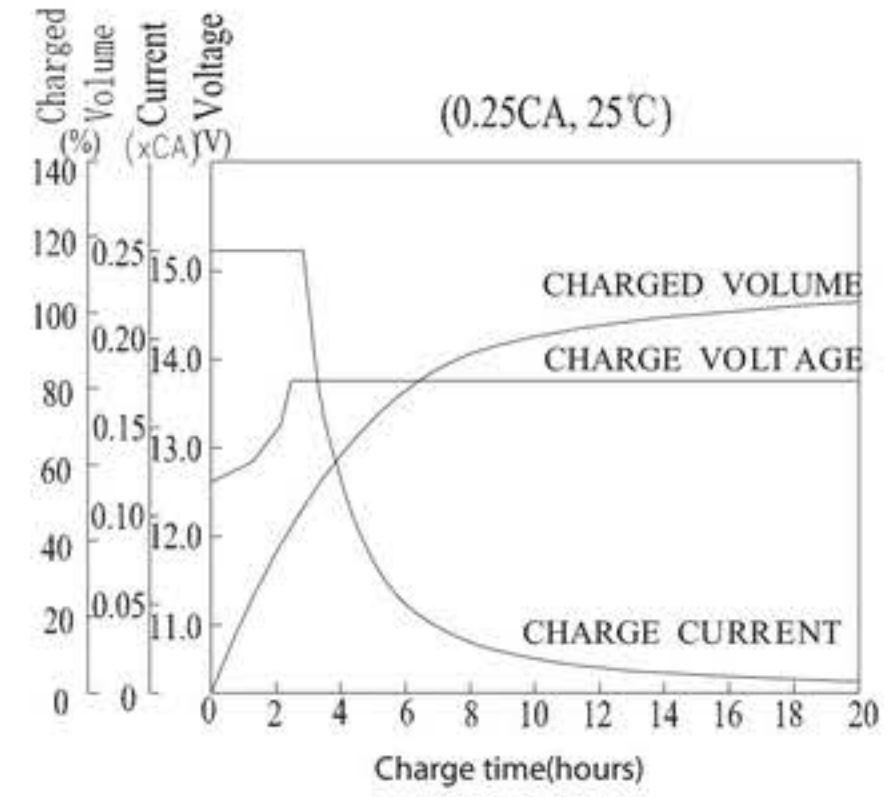


The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

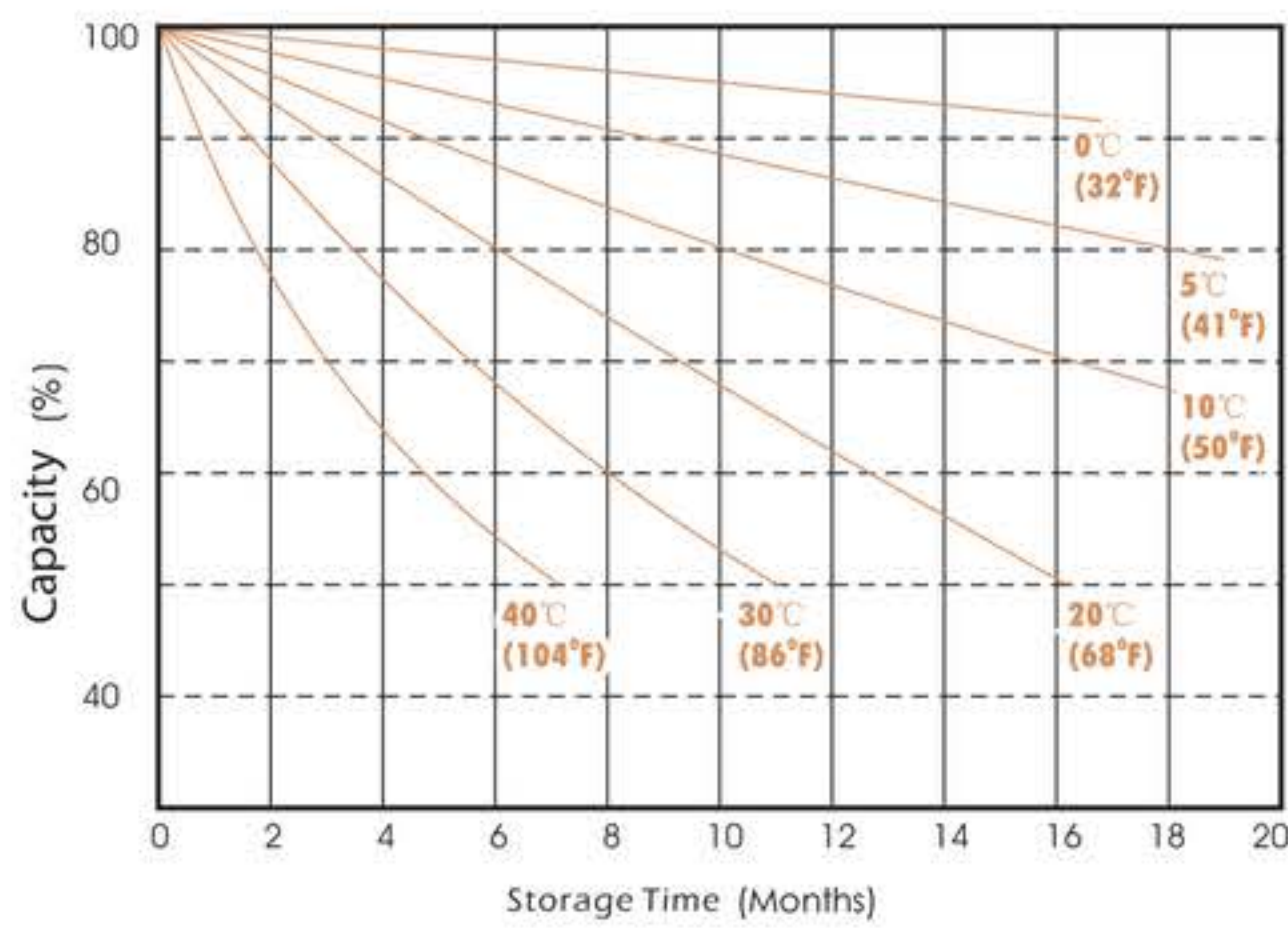
Cycle service life in relation to depth of discharge



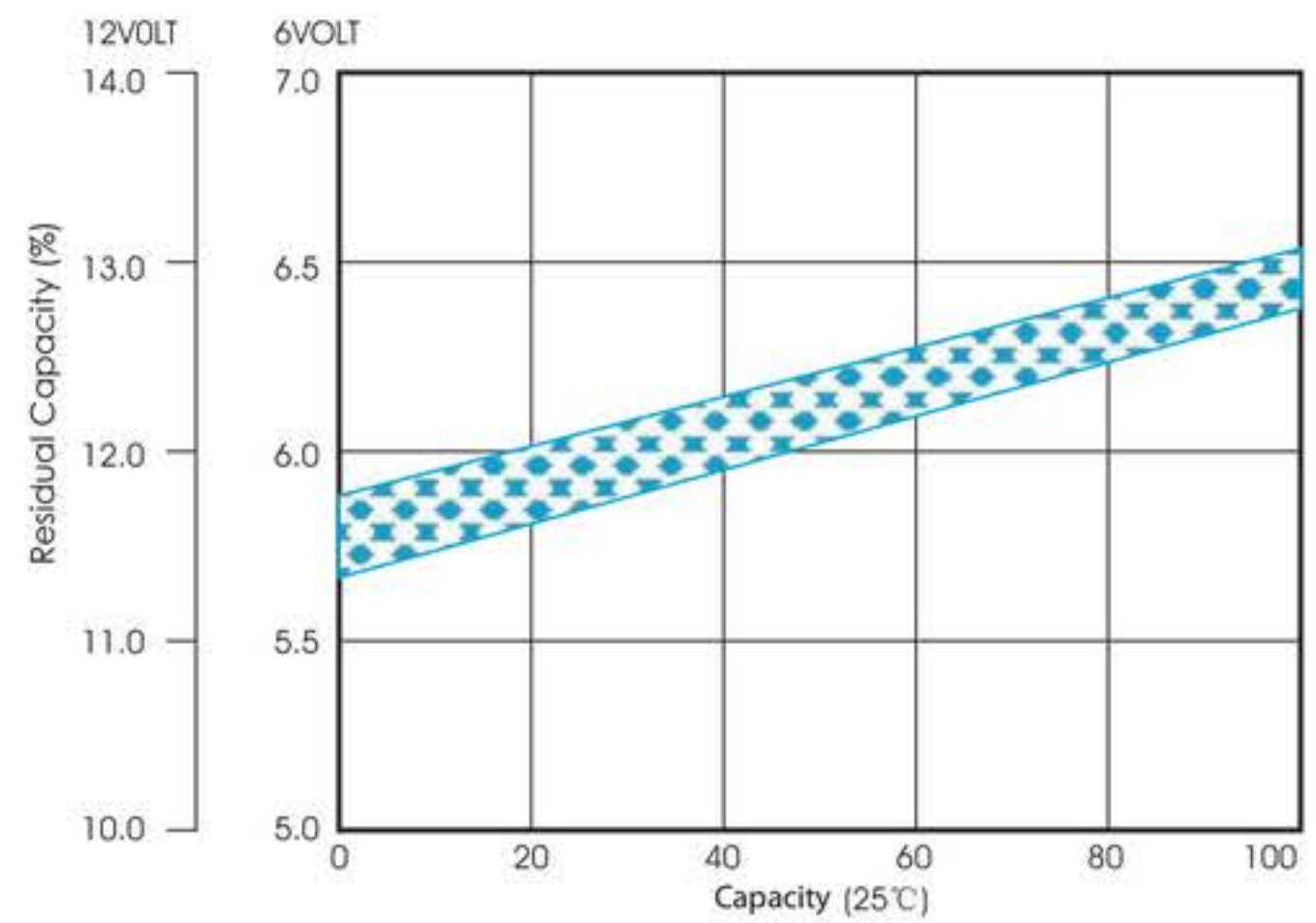
Constant voltage charge characteristic



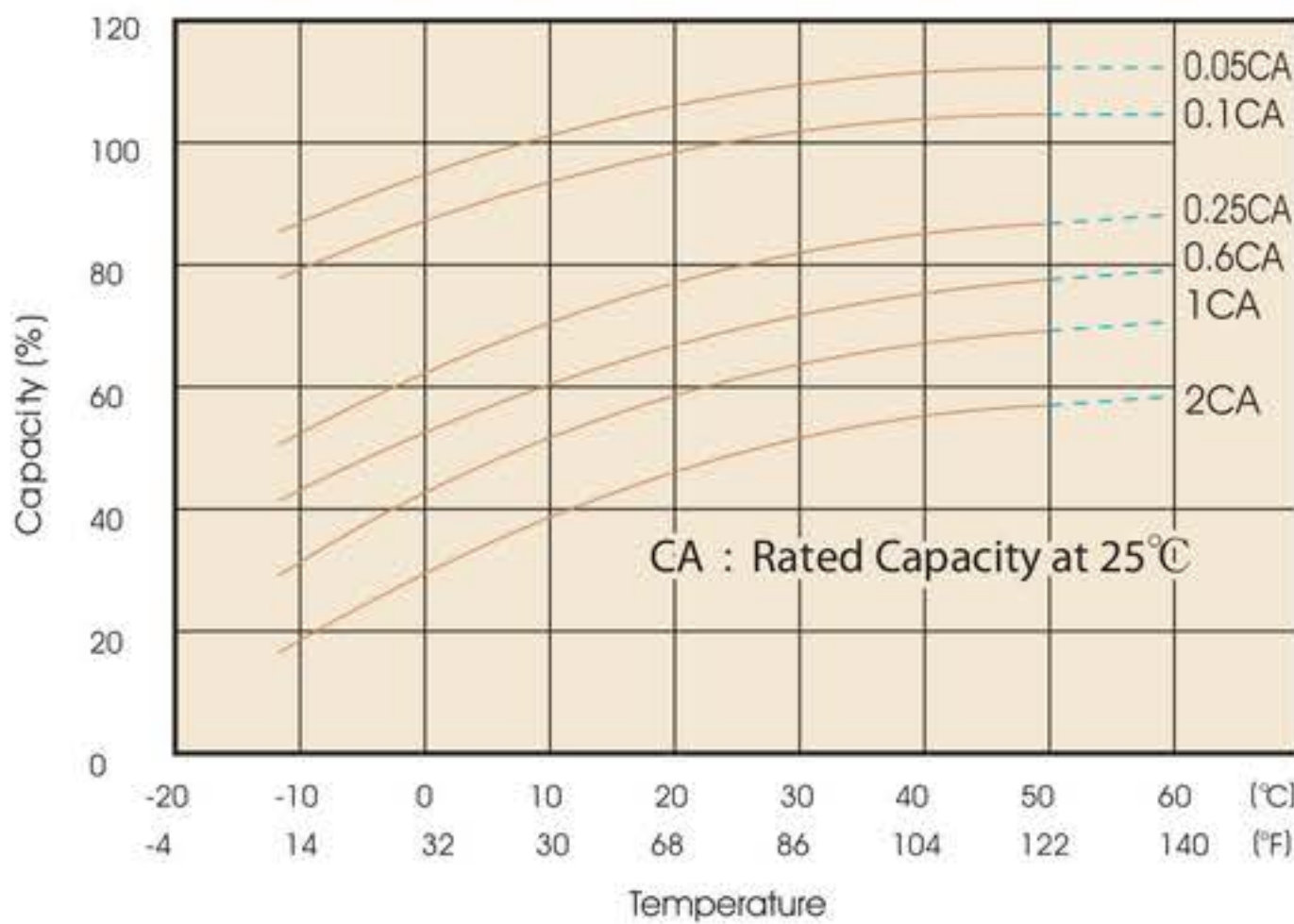
Self-Discharge Characteristics.



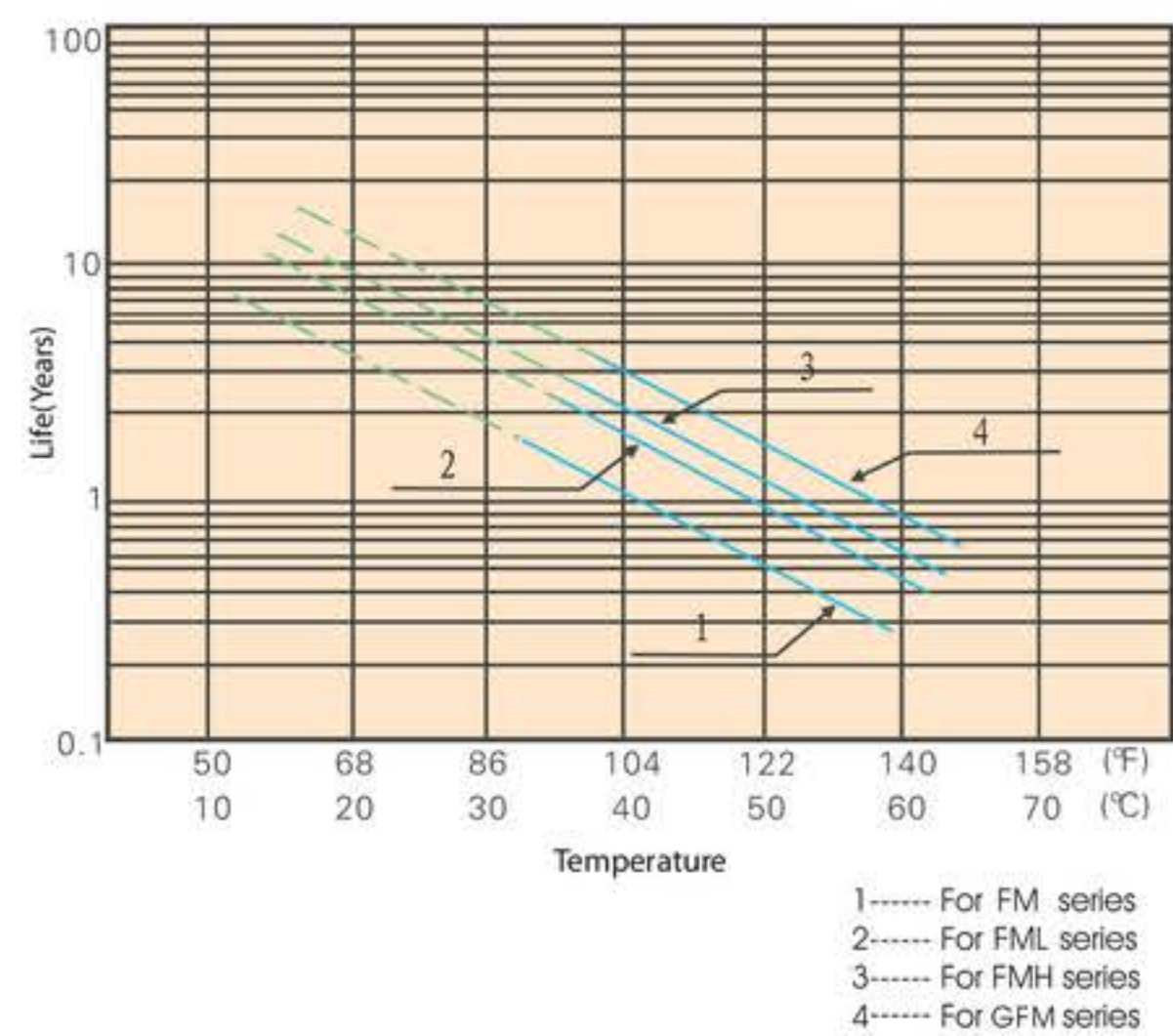
Relationship of OCV and Residual Capacity % (25°C)

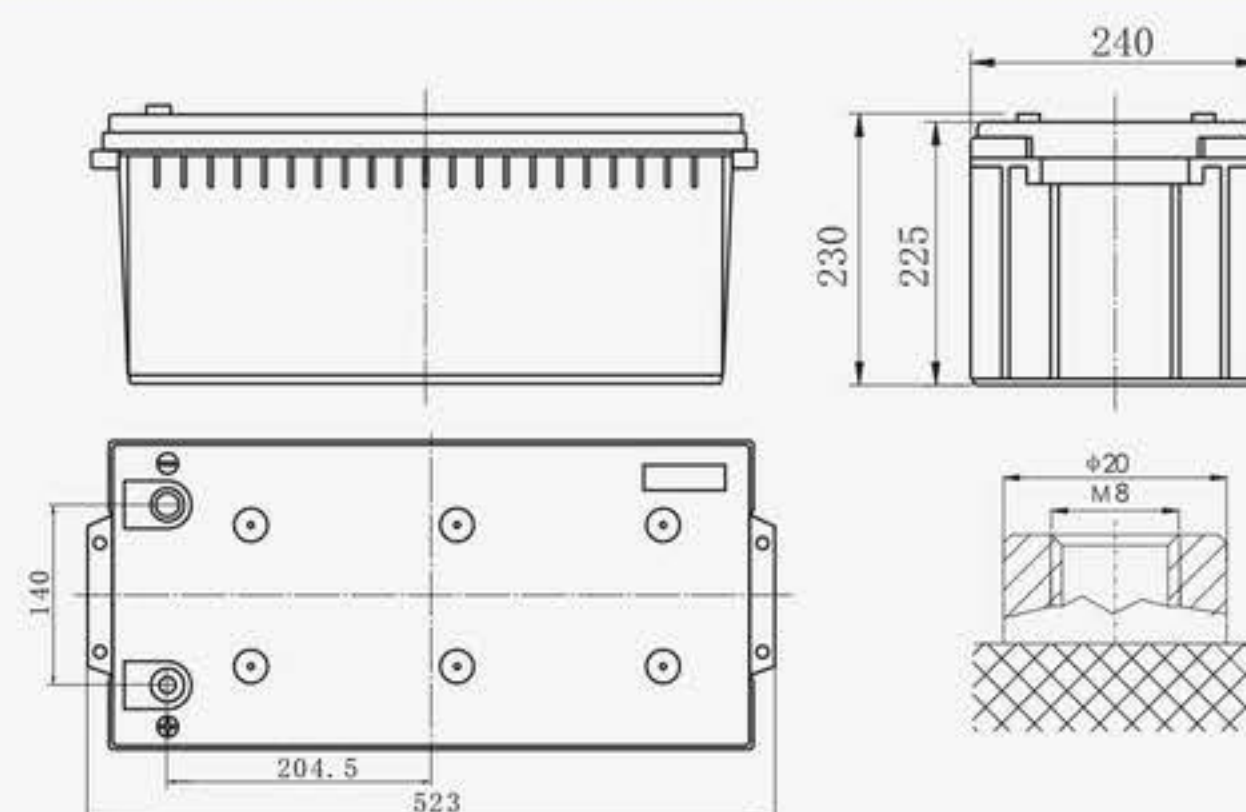


Temperature effects on capacity



Temperature effects on float life





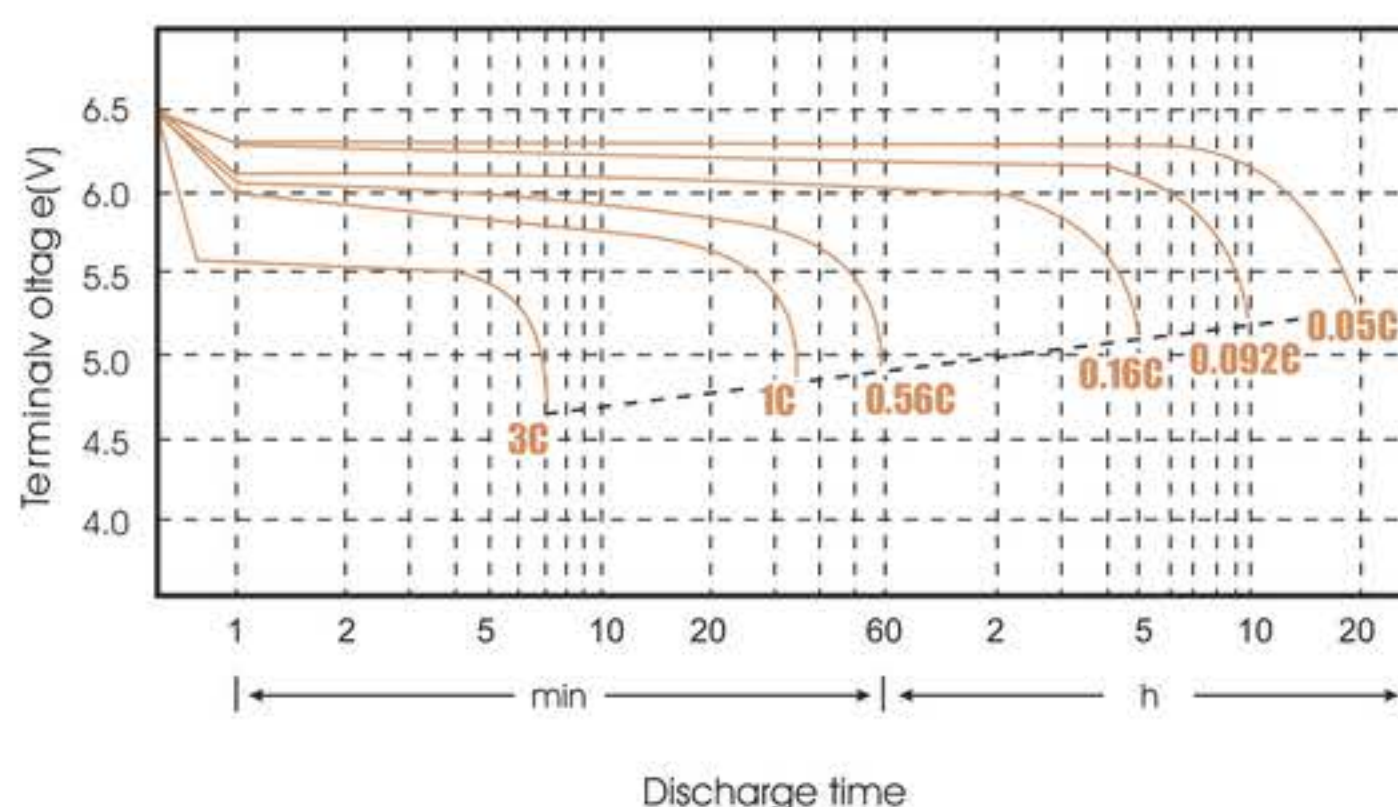
Specifications

Nominal Voltage		12V
Rated Capacity(20 hour rate)		200Ah
Dimensions	Total Height (with terminals)	9.06inches (230mm)
	Height	8.86inches (225mm)
	Length	20.59inches (523mm)
	Width	9.45inches (240mm)
Weight		Approx.130.68Pound(59.4kg)

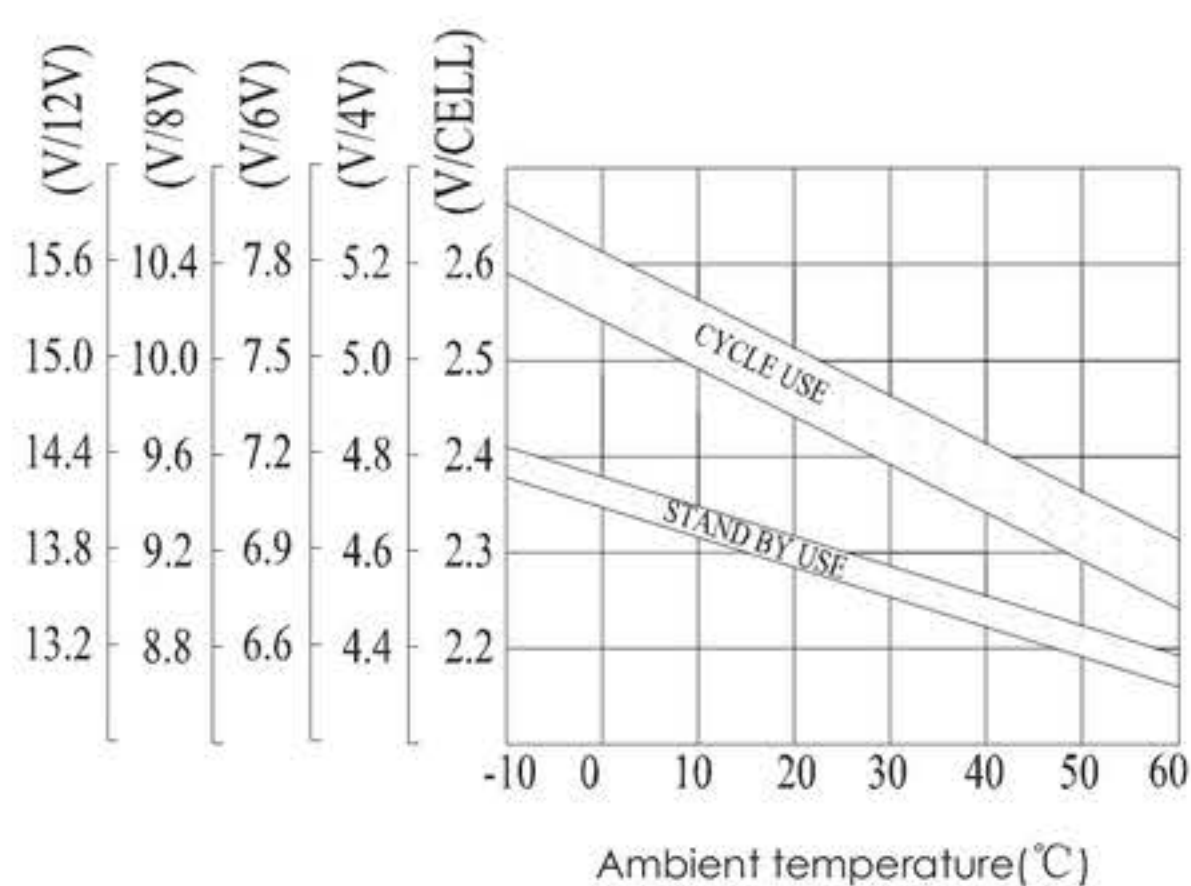
Characteristics

Capacity 77°F(25°C)	20 hour rate (10.0A)	200Ah
	10 hour rate (18.4A)	184Ah
	5 hour rate (32.0A)	160Ah
	1 hour rate (120.0A)	120Ah
	15 minute Rate (328A)	82.0Ah
Internal Resistance	Full charged Battery 77°F(25°C)	3.0mΩ
Capacity affected by Temperature (20 hour rate)	104°F(40°C)	102%
	77°F(25°C)	100%
	32°F(0°C)	85%
	5°F(-15°C)	65%
Self-Discharge 77°F(20°C)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77°F(25°C)	1333A(5S)	
Terminal		M3
Charge (Constant Voltage)	Cycle	Initial Charging Current less than 60A Voltage 14.4~14.7V/77°F(25°C)
	Float	Voltage 13.5~13.8V/77°F(25°C)

Discharge Curves 77 °F(25 °C)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.65	386	299	189	143	109	74.3	51.5	34.2	23.5	20.3	16.5	8.90
1.70	364	286	177	134	103	72.2	50.0	33.5	23.0	19.5	16.1	8.64
1.80	305	244	146	128	98	68.9	48.3	32.1	21.8	18.4	15.6	8.35

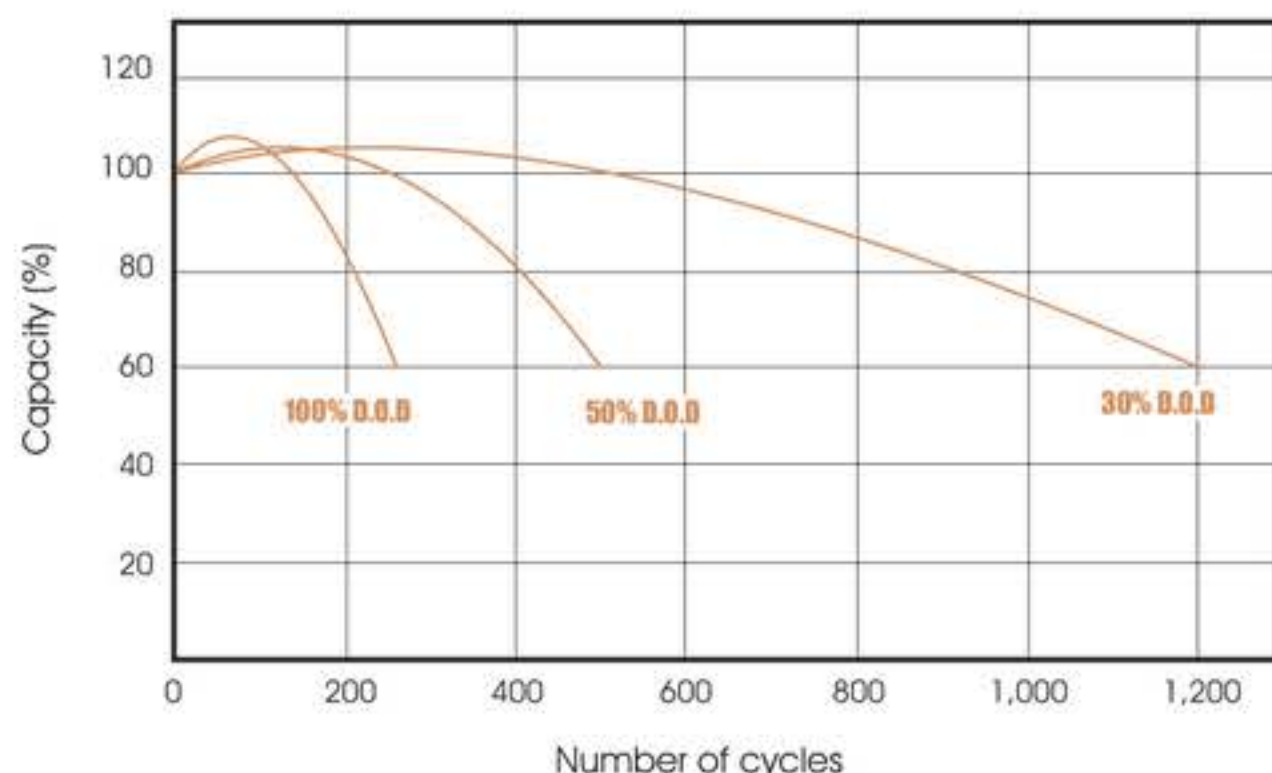
Constant Power Discharge (WATTS PER CELL@25°C)

F.V/Time	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	8Hour	10Hour	12Hour	24Hour
1.60	697	545	349	263	231	138	95.8	63.2	43.5	37.3	30.8	15.8
1.65	691	541	343	260	228	136	94.6	63.0	43.3	36.8	30.6	15.6
1.67	685	540	338	256	223	135	94.0	62.8	43.2	36.2	30.5	15.5
1.70	672	529	331	252	219	134	93.2	62.6	43.0	36.0	30.3	15.4
1.75	629	499	296	250	216	133	92.8	62.0	42.5	35.1	30.0	15.3
1.80	584	469	281	246	211	130	92.1	61.4	41.7	34.4	29.8	15.1
1.85	485	410	257	226	207	124	89.3	57.2	38.9	32.8	27.8	14.8

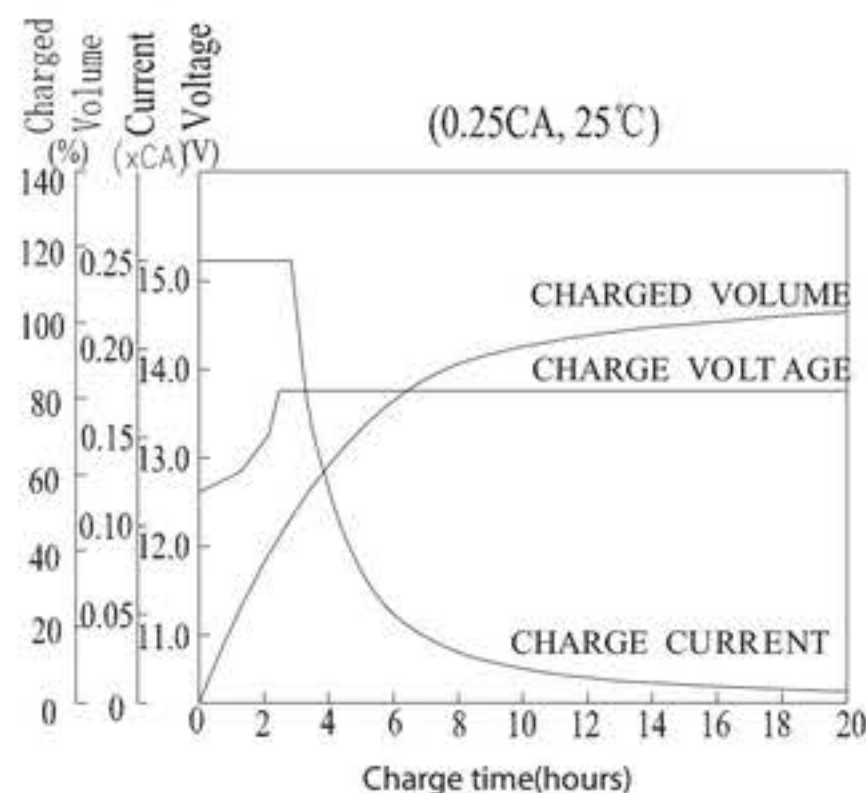


The operating environment temperature above 40°C should be avoided. After long term storage, The battery actual capacity would be less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles. To get the longest life, KSTAR battery should be fully charged before storage.

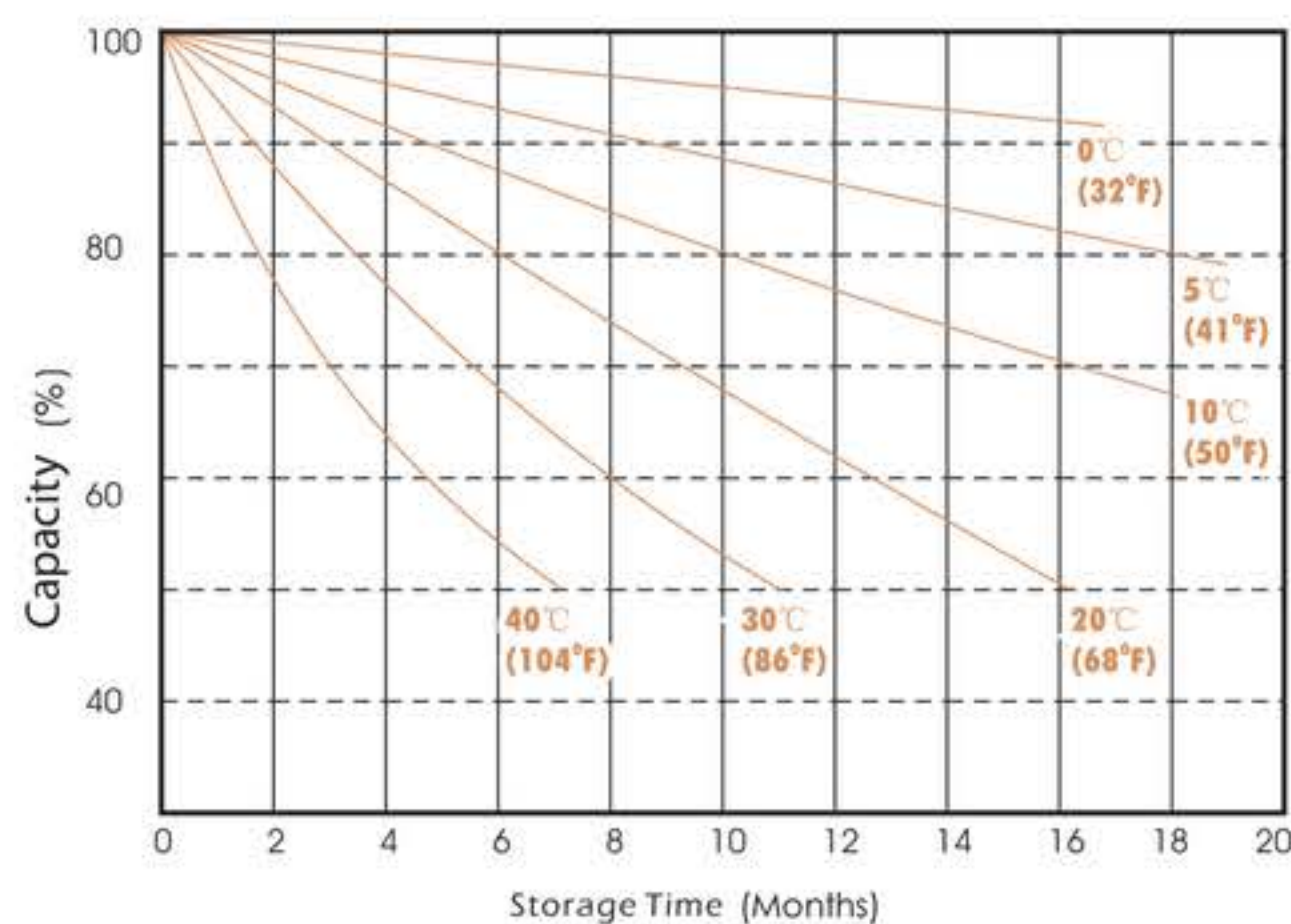
Cycle service life in relation to depth of discharge



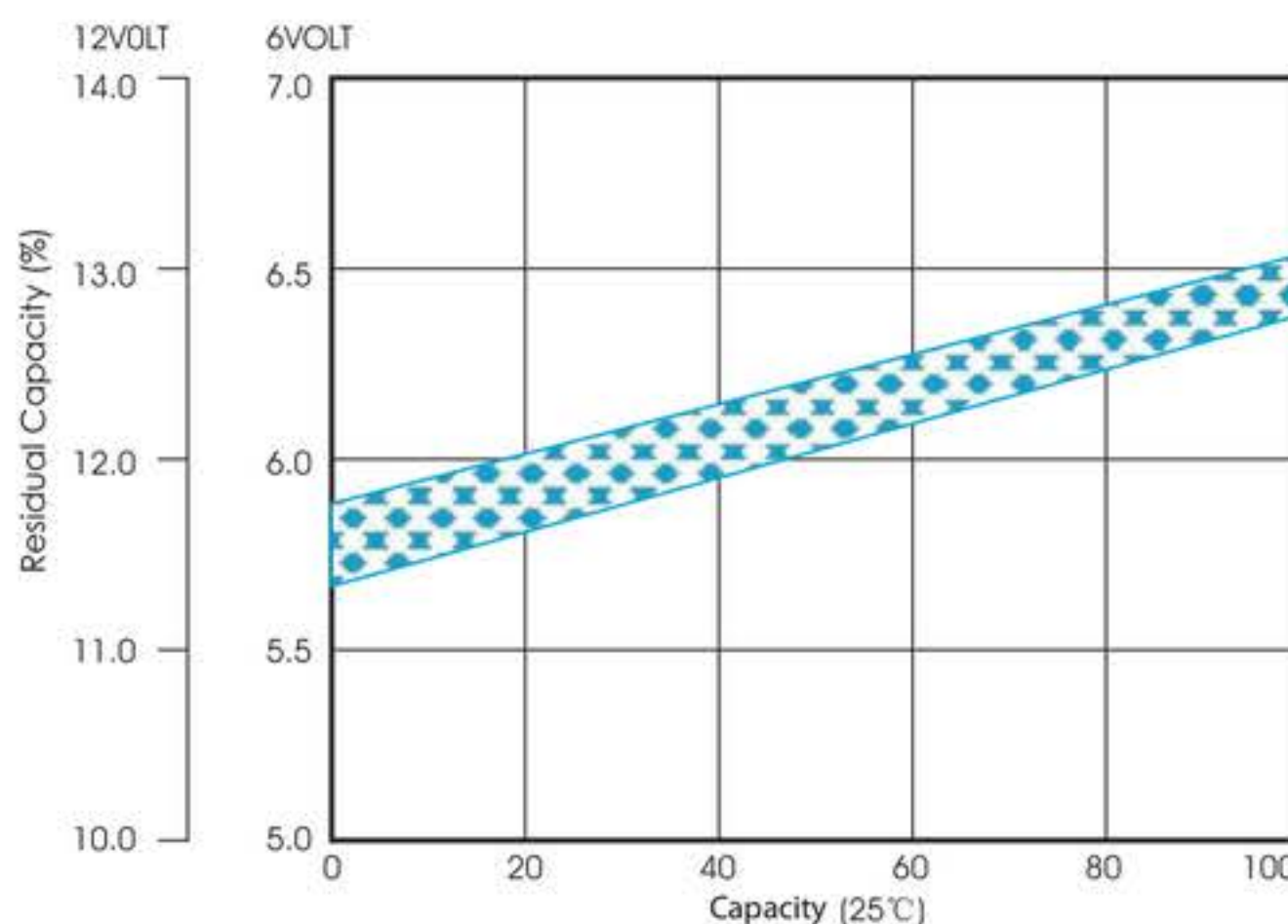
Constant voltage charge characteristic



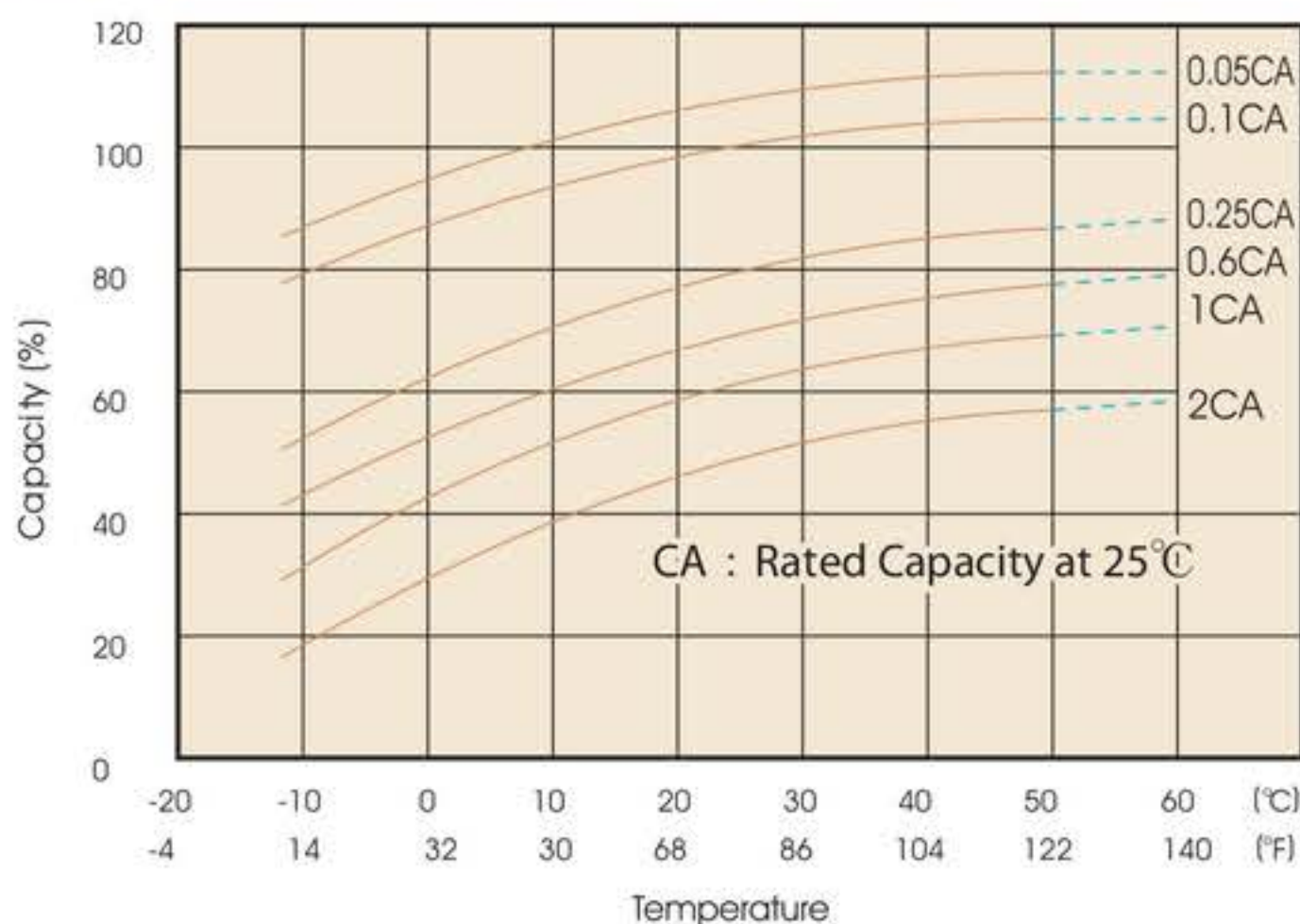
Self-Discharge Characteristics.



Relationship of OCV and Residual Capacity % (25°C)



Temperature effects on capacity



Temperature effects on float life

