Battery Catalogue

Stock code 002518

KSTAR

KSTAR

Website：www.kstarpower.com

CONTACT
Tel: +86-755-86169858
Fax: +86-755-86168482
E-mail: sales@kstarpower.com

HEADQUARTERS
Add: 4/F, No.1 Bldg.Software Park, Keji C. Rd. 2nd, Hi-Tech Industrial Zone, Shenzhen 518057, P.R.China

FACTORIES ADDRESS
Add: Kstar Industrial Park, Guangming Hi-Tech Industrial Zone, Shenzhen, P.R.China.
Add: Kstar Industrial Park, Fumin Industrial Zone, Guanlan Town, Shenzhen, P.R.China.
Add: Kstar Industrial Park, Zhongkai Hi-Tech Industrial Zone, Huizhou, P.R. China.

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Version number: KSD/DC 2016-03

COMPANY PROFILE

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① KSTAR Industrial Park at Guangming Hi-Tech Zone, Shenzhen, China
② KSTAR Industrial Park at Zhongkai Hi-Tech Zone, Huizhou, China
③ KSTAR Industrial Park at Guanlan Fuyuan industrial Zone,Shenzhen,China

Shenzhen KSTAR Science and Technology Co., Ltd. (stock code: 002518), founded in 1993, is a high-tech enterprise, a leading brand in UPS manufacturing in China, a professional integrator and manufacturer of the data center infrastructure, and a leading company in PV inverter.
KSTAR has not only dedicated to the product range of the data center infrastructure, such as UPS, precision cooling air conditioner, power distribution device, battery, network server cabinet, and as well as environmental monitoring system, but also devoted to the innovation and development of the thorough solution for product lines relevant to renewable energy solution, such as PV inverter, PV Array Smart Combiner Box, anti-feedback boxes, DC distribution cabinets, power storage, and monitoring.

KSTAR offers high quality products and full service to more than 90 countries all over the world.

KSTAR batteries—the Best Choice among Chinese first-tier enterprises

In China, KSTAR Battery with national unified certification for the large-scale industry issued by three major application domains, finance, telecommunications, government, is considered as a significant symbol for the mainstream battery brand to indicate its overall strength in the market.

KSTAR with the comprehensive predominance has gotten numerous VRLA batteries national unified certification for the large-scale industry, from those three major domains, including the Ministry of Education, the State Administration of Taxation, Industrial and Commercial Bank of China, China Mobile, China Unicom, Beijing Bank, CITIC Bank, Shenzhen Development Bank. Moreover, Kstar also applied them to the 2008 Beijing Olympics and the 2010 Shanghai World Expo, the Three Gorges Project, the Qinghai-Tibet railway and other projects.

In the China market, KSTAR battery implements to the UPS for years and its quality level of the product has already won the trust of the users.

KSTAR UPS supporting battery has a long application history and wide application ranges, its high quality have won great trust and support from all users.

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Accumulator cell production workshop glimpse

KSTAR MANUFACTURE BASE

For more than 20-year experience, Kstar has not only become a flagship enterprise in UPS industry, but also has transformed into one of technology-wised leading enterprises in energy provider, such as PV Inverter, EV charger, etc.. The R&D and manufacturing foundation of Kstar battery is located at Zhongkai National Hi-Tech Development Zone, Kstar Industrial Park, Huizhou City, Guangdong Province, covering nearly 120,000 square meters with advanced manufacturing equipment and quality control processes as the base, and providing full series of high-quality of VRLA battery, GEL battery products.

Accumulator cell production workshop glimpse

Green Earth, Our Common Family

As an enterprise citizen, Kstar fully understands that the environment will impact on enterprise's sustainable development and Human being's future living greatly. Therefore, products and services from KSTAR group are safe and environmental-friendly throughout all life cycle. With environmental responsibilities on shoulder, KSTAR supplies customer with ECO-Product, and provides staff with a healthy and safe working environment. In order to make greater contributes to the sustainable development of both enterprise and society, KSTAR commits itself to reduce environmental pollution by variety ways.

PRODUCT APPLICATIONS

A partial list of common applications includes:

- Communications Equipment.
- Emergency Alarms And Security Systems.
- Emergency Lighting Systems.
- Electric Wheelchairs.
- Electronic Equipment.
- Geophysical Equipment.
- Medical Equipment.
- Power Tools.
- Solar Powered Systems.
- Telecommunications Systems.
- Toys.
- Uninterruptible Power Supplies.

Value Regulated (Sealed) Construction

The KSTAR valve regulated AGM rechargeable lead acid battery allows safe, trouble free operation in any position. There is never any requirement to refill electrolyte in normal operation. The KSTAR battery is leak-proof.

Ease of Shipment

Sealed construction, the batteries can be shipped by sea, road or air without special handling and packaging precautions.

Maintenance Free Operation

During the float service life, the KSTAR batteries not to be needed to check the specific gravity of the electrolyte or add water.

Cycle or Float Service

Batteries are suitable for either cycling or floating service

Heavy Duty Grids

KSTAR batteries utilize heavy duty calcium-tin alloy grids to extend service life.

Compact Design

Utilizing the best possible raw materials to build a high power-to-weight ratio battery.

Low Self Discharge

KSTAR lead calcium grids minimize capacity loss during storage periods. So the batteries can be stored for long periods of time without recharge at room temperature.

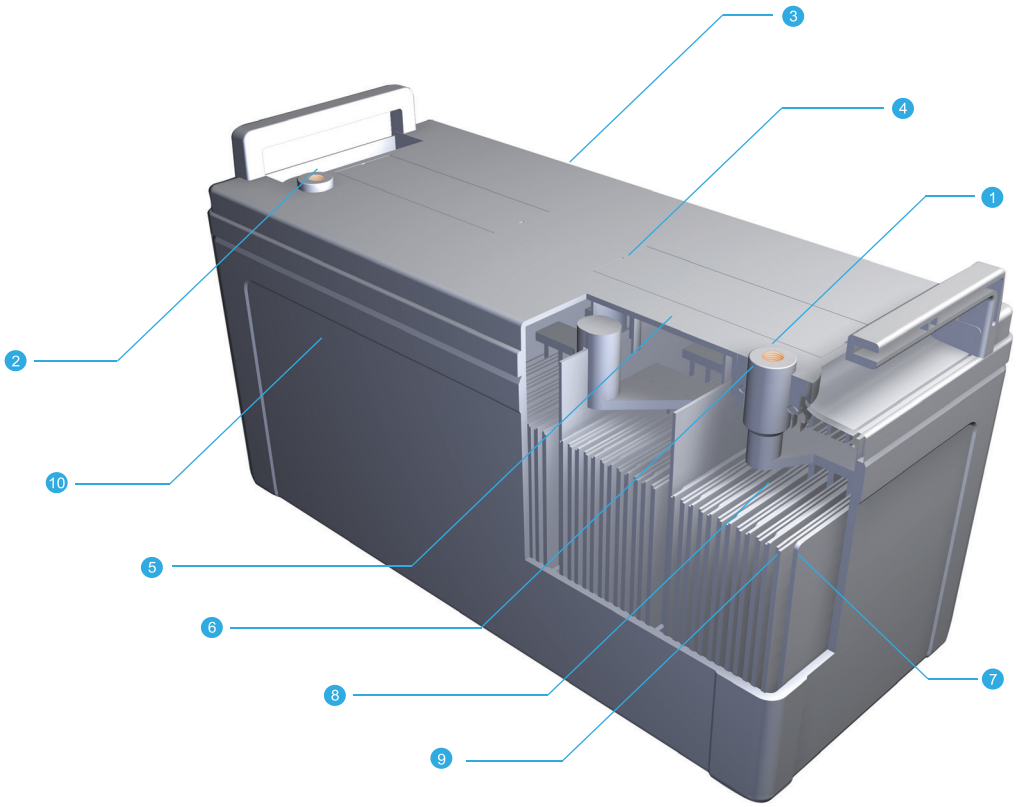
Wide Operating Temperature

KSTAR batteries may be operated over a broad range of ambient temperatures.

High Impact Case

KSTAR batteries utilize high impact resistant and non-conductive plastic cast.

CONSTRUCTION



1. (+)Positive Terminal
2. (-)Negative Terminal
3. Mid Cover
4. Top Cover
5. Satety Valve
6. Elecrtode Pole
7. Negative Plate
8. Positive plate
9. Separator
10. Cantaine

PRINCIPLE OPERATION OF VALVE REGULATED LEAD ACID BATTERY

Positive Plate. $PbO_2+SO_4^{-}+4H^{+}+2e^{-}=PbSO_4+H_2O$
Negative Plate. $Pb+SO_4^{-}+4H^{+}+2e^{-}=PbSO_4+H_2O$
Net. $PbO_2+2SO_4^{-}+4H^{+}+Pb=2PbSO_4+2H_2O$

The gassing and water loss reactions are as follows:

Positive Plate. $H_2O=2H^{+}+1/2O_2+2e^{-}$
Negative Plate. $2H^{+}+2e^{-}=H_2$
Net. $H_2O=H_2+1/2O_2$

It is noted that the gassing reaction only generally occurs to any extent when the battery is almost totally charged.
In the valve regulated battery it is obvious that water loss must be avoided. This is done by limiting the escape of hydrogen and oxygen from the battery. The design therefore accomplishes the recombination of the oxygen formed at the positive plate with the hydrogen formed at the negative plate. The reaction is as follows.

Negative a. $Pb+1/2O_2+H_2SO_4=PbSO_4+H_2O$
Negative b. $PbSO_4+2H^{+}+2e^{-}=Pb+H_2SO_4$
Net Negative. $1/2O_2+2H^{+}+2e^{-}=H_2O$

This virtually eliminates the production of free hydrogen at the negative plate to the action of recombination.
However it is necessary to ensure that correct charging voltages are used.
Because the construction provides a means of recombining the internally generated hydrogen and oxygen and the suppression of the evolution of hydrogen gas to limit the consumption of water from the electrolyte. Therefore the battery requires no addition of water during its normal life time.

Valve regulated batteries are sealed with the exception of a valve that opens when excess pressure builds up inside the battery. The valve automatically reseals itself. The recombination of charge gases is accomplished by allowing oxygen produced at the positive plate to pass through the separator material to the negative plates where the recombination reaction occurs. The valve controls the internal of the battery to optimize this efficiency of the recombination reaction and minimise the possible expense of electrolyte.

NOMINAL CAPACITY

The capacity of an KSTAR battery is the available amount of electrical energy which can be obtained from a fully charged cell.
The capacity of a cell is expressed in ampere hours (AH).Which is a current-time product.
The capacity value is dependent upon the discharge current, the temperature during discharge, the final cut-off voltage and the general history.
The nominal capacity of an KSTAR battery is measured at the 10 hour or 20 hour rate according to types at 25℃ to a cut-off voltage of 1.75 volts per cell.

STORAGE

During storage, batteries gradually lose their capacity due to their self-discharge, their self-discharge rate is low and is typically less than3% per month at 25℃, Althougt the self-discharge rate is low, specific precautions must be taken against the battery over discharging itself by self-discharge when in storage or not operating.

Precautions Against Over Self-discharge

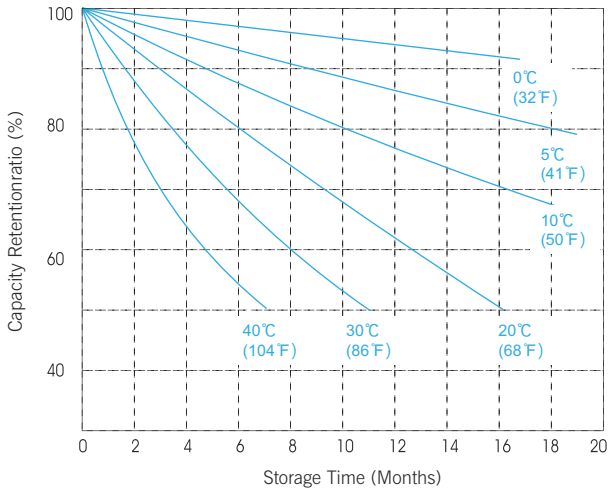
a. The batteries should be stored in a clean, cool and dry place.
b. Storage place should not be affected by sources of radiant heat such as sunshine, heating units, radiators or steam pipes.
c. The recommendable storage temperature: 10~20℃.
d. The recommendable storage humidity: as low as possible.

Charge Advice

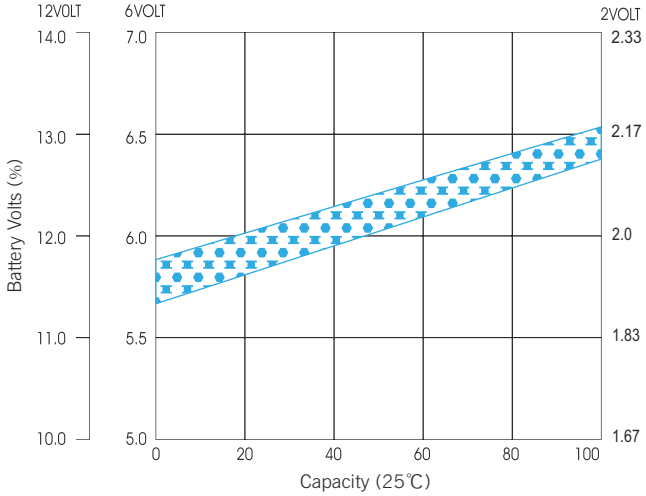
Storage Temperature	Charging Interval
20℃ or less	9 months
20~30℃	6 months
30~40℃	3 months

Temperature above 40℃ should be avoided. After long term storage, all batteries deliver less than the rated capacity. Full capacity will be obtained through several charge/discharge cycles.
For longest life, KSTAR battery should be fully charged before going into storage.

Self-Discharge Characteristics



Open Circuit Voltage and Remaining Capacity



BATTERY DISCHARGING

The capacity of an KSTAR battery is the available amount of electrical energy which can be obtained from a fully charged cell.

The capacity of a battery is expressed in ampere-hours(AH),which is a current-time product. The capacity value is dependent upon the discharge current, the temperature during discharge, the final cut-off voltage and the general history. The nominal capacity of an KSTAR battery is measured at the 10 hour or 20 hour rate according to types at 25℃ to a cut-off voltage of 1.80 volts or 1.75 volts per cell.

Battery Selection

The battery discharge curve may be utilised in battery selection. However it is suggested that a review is made of the data sheet for each battery size or the chart showing the actual ampere hour capacity of each battery size at various discharge times.

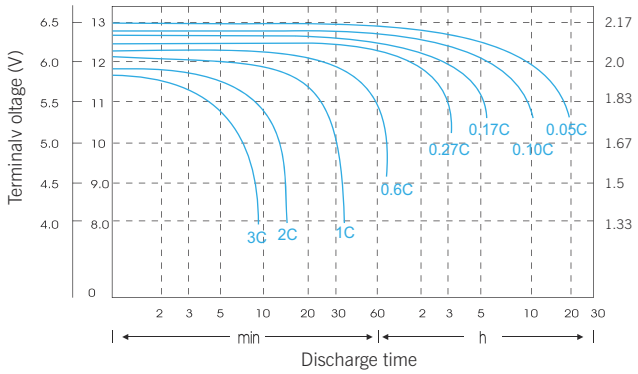
Temperature Effect on discharge Capacity

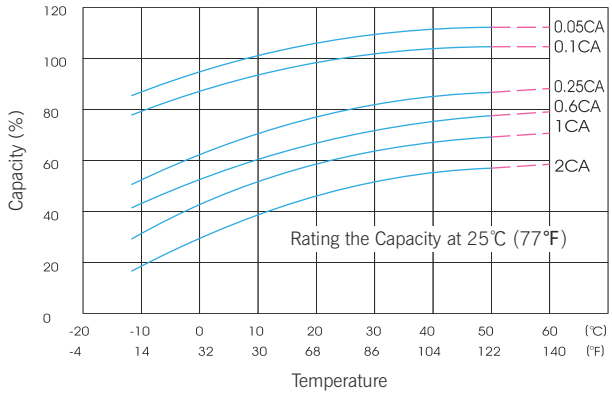
The discharge capacity varies according to the temperature during discharge. At low temperature the discharge capacity decreases and at high temperature it increases. the temperature effects on the discharge capacity at various discharge current rates are shown in the graph.

Final Acceptable Discharge Voltages

battery cut-off voltage is the volts per cell to which a battery may be discharged safely to maximise battery life, this value is specified according to the actual discharge load and run time.As a rule of thumb high amp loads and short run times will tolerate a lower cut off voltage,whereas a low amps long run time discharge will require a higher cut off voltage.

Discharge Characteristic Curve



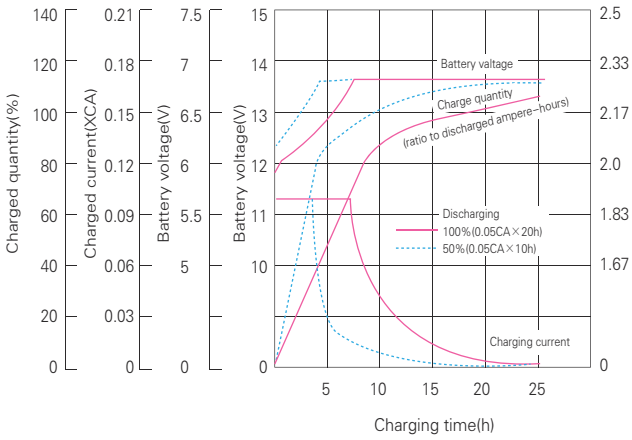


Discharge current	Cut off Volts/Cell
3CA	1.30
1CA	1.30
0.5-1.0 CA	1.55
0.2-0.5 CA	1.70
0.05-0.2CA CA	1.75

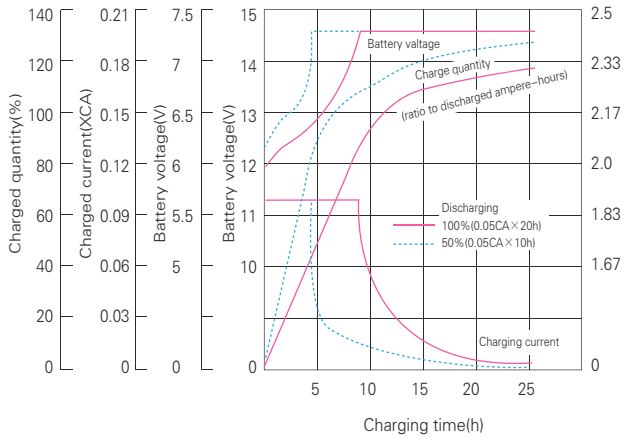
CHARGING CHARACTERISTICS

Charging characteristics by constant voltage which is the most recommendable for KSTAR battery are shown in the graph.

Standby Use



Cycle Use



Application / Charging method	Cyclic Operation	Float Operation	Refresh Charge During storage
Constant Voltage	2.40~2.45vpc Initial current 0.3CA or less	2.25~2.30vpc Initial current 0.3CA or less	2.40~2.45vpc Initial current 0.3CA or less
Constat Current	Charging current approx.0.1CA Charging time control is recommended because an overcharge is more likely to occur.	Not applicable	Charging current: approx. 0.1CA

Charging Method

Ambient Temperature:25℃

Note: it is necessary to ensure that the voltage is correctly set. A voltage set too high will increase the corrosion of the positive plates and shorten battery life. A voltage set too low will lead to sulphation of the plates causing loss of capacity and ultimately shortening the life of the battery.

Effect of Temperature on Charging Voltage

Within the normal operating parameters of 20℃~30℃ voltage compensation for operating temperature may not be necessary.

However, to maximise the life of the battery, temperature compensation for operating temperatures outside this temperature range should be considered.

Charging voltage compensation for battery temperature:

1.Float operation:Vt=V-0.003(t-25)

2.Cyclic operation:Vt=V-0.005(t-25)

(V=Charging voltage at 25℃,

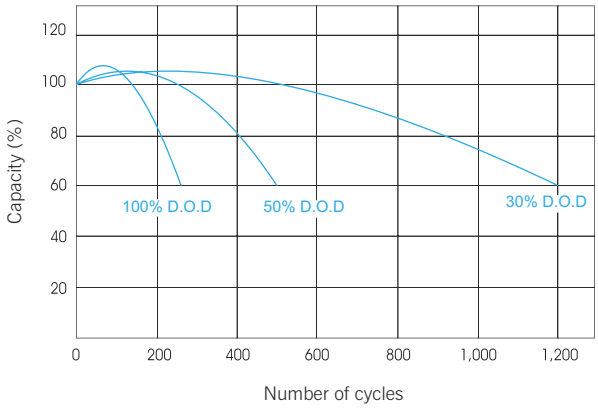
t=Temperature,Vt=Charging voltage at t℃)

BATTERY LIFE

Cyclic Use

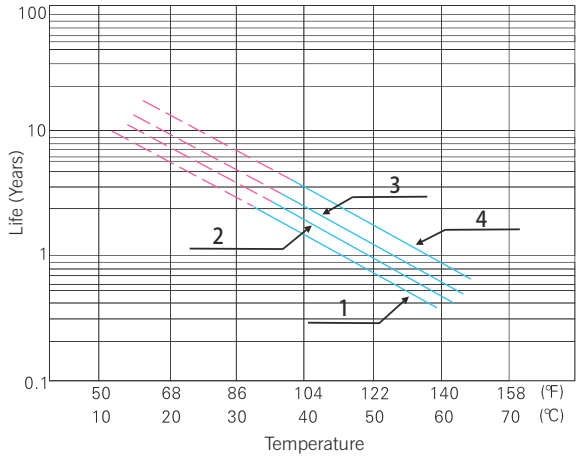
The cycle life is very dependent on the depth of discharge which the battery experiences during each cycle.

The various number of cycles relating to the depth of discharge is shown in the graph.



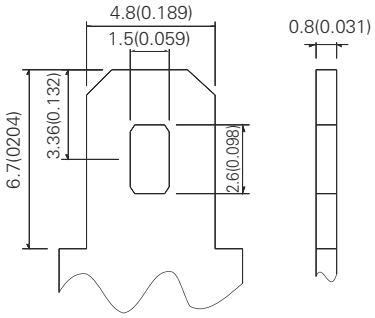
Floating Use

The float use life is very dependent on the temperature at which the battery is float charged. The float life is very long at low temperature (10~20℃)but at higher temperature the float life is shortened.

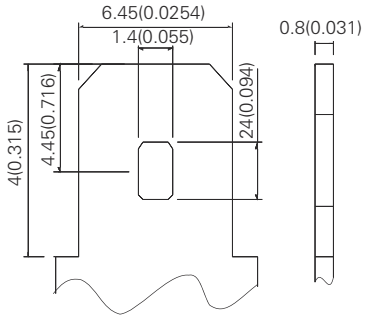


1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

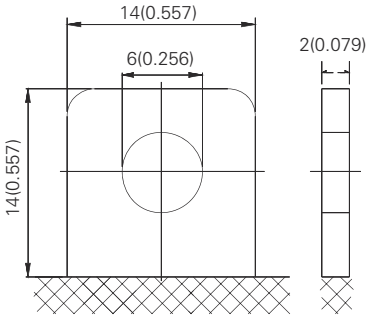
TERMINAL DATA



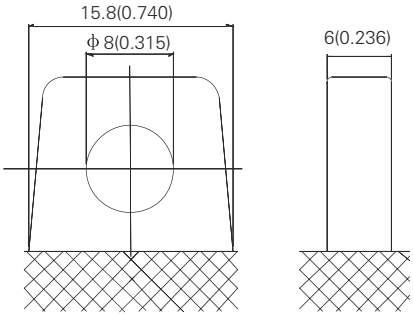
F1



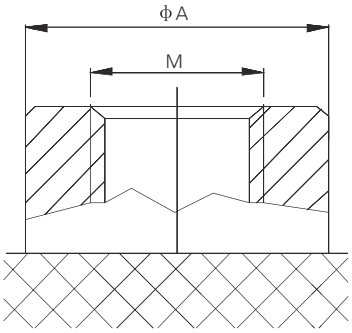
F2



B1



B2



M

Items / Type	ϕ A		M	
M1	14	0.551”	6	0.236”
M2	16	0.630”	6	0.236”
M3	20	0.787”	8	0.315”
M4	12	0.47”	5	0.20”
M5	18	0.71”	8	0.31”
M6	18	0.71”	6	0.236”

BATTERY INDEX

FM Series Battery For General Use

Type	Nominal Voltage (V)	Rated Capacity(Ah)				Dimensions(mm)				Weight Appox (kg)	Terminal type
		20HR	10HR	5HR	1HR	Length	Width	Height	Total Height		
		1.75V/C	1.80V/C	1.75V/C	1.75V/C						
3-FM-1.2	6	1.2	1.1	1.00	0.7	97.5	24.0	52.0	58.0	0.31	F1
3-FM-3	6	3.0	2.7	2.6	1.8	135.0	35.0	60.0	66.0	0.71	F1
3-FM-4	6	4.0	3.7	3.4	2.4	70.0	47.0	100.0	106.0	0.73	F1
3-FM-7	6	7.0	6.5	5.6	4.20	151.0	34.0	95.0	101.0	1.19	F1/F2
6-FM-1.9	12	1.9	1.7	1.60	1.1	178.5	35.0	60.5	66.5	0.90	F1
6-FM-3	12	3.0	2.7	2.6	1.8	135.0	67.5	61.0	67.0	1.28	F1
6-FM-4	12	4.0	3.7	3.4	2.4	90.0	70.0	101.0	107.0	1.44	F1/F2
6-FM-4.5	12	4.5	4.2	3.6	2.7	90.0	70.0	101.0	107.0	1.50	F1/F2
6-FM-5A	12	5.0	4.7	4.0	3.0	90.0	70.0	101.0	107.0	1.65	F1/F2
6-FM-5B	12	5.0	4.7	4.0	3.0	151.5	51.5	93.0	99.0	1.87	F1/F2
6-FM-6	12	6.0	5.6	4.8	3.6	151.0	65.0	94.0	100.0	2.00	F1/F2
6-FM-6.5	12	6.5	6.0	5.2	3.9	151.0	65.0	94.0	100.0	2.12	F1/F2
6-FM-7	12	7.0	6.5	5.6	4.2	151.0	65.0	94.0	100.0	2.20	F1/F2
6-FM-7.2	12	7.2	6.7	5.7	4.3	139.5	48.0	118.0	118.0	2.20	F1/F2
6-FM-7.5	12	7.5	6.9	6.0	4.5	151.0	65.0	94.0	100.0	2.40	F1/F2
6-FM-8	12	8.0	7.4	6.4	4.8	151.0	65.0	94.0	100.0	2.51	F1/F2
6-FM-9	12	9.0	8.3	7.2	5.4	151.0	65.0	94.0	100.0	2.51	F1/F2
6-FM-9S	12	9.0	8.3	7.2	5.4	151.0	65.0	94.0	100.0	2.69	F1/F2
6-FM-12	12	12.0	11.2	9.6	7.2	151.0	98.0	94.0	100.0	3.60	F2
6-FM-14	12	14.0	13.0	11.2	8.4	151.0	98.0	94.0	100.0	4.20	F2
6-FM-15	12	15.0	13.9	12.0	9.0	181.0	77.0	167.0	167.0	4.90	B1/M4
6-FM-17	12	17.0	15.8	13.6	10.2	181.0	77.0	167.0	167.0	5.10	B1/M4
6-FM-18	12	18.0	16.7	14.4	10.8	181.0	77.0	167.0	167.0	5.10	B1/M4
6-FM-20	12	20.0	18.6	16.0	12.0	181.5	77.0	167.0	167.0	6.00	M4
6-FM-22	12	22.0	20.5	17.6	13.2	181.5	77.0	167.0	167.0	6.30	M4
6-FM-24A	12	24.0	22.3	19.2	14.4	166.0	126.0	174.0	174/179	8.00	M1
6-FM-24B	12	24.0	22.3	19.2	14.4	177.0	167.0	126.0	126.0	8.40	B1/M4
6-FM-24C	12	24.0	22.3	19.2	14.4	166.0	126.0	174.0	174.0	8.00	M1
6-FM-26	12	26.0	24.1	20.8	15.6	177.0	167.0	126.0	126.0	8.40	B1/M4
6-FM-28	12	28.0	26.0	22.4	16.8	166.0	126.0	174.0	174.0	9.50	M1

FM Series Battery For General Use

Type	Nominal Voltage (V)	Rated Capacity(Ah)				Dimensions(mm)				Weight Appox (kg)	Terminal type
		20HR	10HR	5HR	1HR	Length	Width	Height	Total Height		
		1.75V/C	1.80V/C	1.75V/C	1.75V/C						
3-FM-180	6	180.0	165.0	144.0	108.0	323.0	178.0	226.0	231.0	27.7	M5
3-FM-200	6	200.0	184.0	160.0	120.0	323.0	178.0	226.0	231.0	28.8	M5
6-FM-33	12	33.0	30.5	26.4	19.8	196.0	131.0	155.0	169.0	10.1	M1
6-FM-38A	12	38.0	34.2	30.4	22.8	198.0	166.0	170.0	170.0	12.0	M1
6-FM-38B	12	38.0	34.2	30.4	22.8	198.0	166.0	175.0	175.0	12.0	M1
6-FM-40	12	40.0	36.0	32.0	24.0	198.0	166.0	170.0	170.0	13.7	M1
6-FM-45	12	45.0	40.5	36.0	27.0	198.0	166.0	170.0	170.0	13.8	M1
6-FM-50	12	50.0	46.0	40.0	30.0	229.0	138.0	208.0	213.0	16.2	M1
6-FM-55	12	55.0	50.6	44.0	33.0	229.0	138.0	212.0	217.0	18.9	M1
6-FM-65A	12	65.0	61.0	52.0	39.0	350.0	167.0	177.0	177.0	20.0	M2
6-FM-65B	12	65.0	61.0	52.0	39.0	330.0	173.0	171.0	176.0	20.0	M3
6-FM-70	12	70.0	64.4	56.0	42.0	260.0	169.0	211.0	216.0	21.4	M1
6-FM-75	12	75.0	68.0	60.0	45.0	260.0	169.0	211.0	216.0	22.0	M1
6-FM-80	12	80.0	72.0	64.0	48.0	260.0	169.0	211.0	216.0	22.5	M1
6-FM-90	12	90.0	82.8	72.0	54.0	307.0	169.0	211.0	216.0	26.6	M2
6-FM-100	12	100.0	92.0	80.0	60.0	329.0	172.0	215.0	220.0	27.7	M2
6-FM-100A	12	100.0	92.0	80.0	60.0	407.0	174.0	208.0	236.0	32.4	M3
6-FM-100B	12	100.0	92.0	80.0	60.0	409.0	177.0	225.0	225.0	32.3	M2
6-FM-120A	12	120.0	110.0	96.0	72.0	407.0	174.0	208.0	236.0	34.5	M3
6-FM-120B	12	120.0	110.0	96.0	72.0	409.0	177.0	225.0	225.0	35.0	M2
6-FM-150A	12	150.0	138.0	120.0	90.0	532.0	207.0	216.0	221.0	47.8	M3
6-FM-150B	12	150.0	138.0	120.0	90.0	483.0	170.0	241.0	241.0	45.0	M2
6-FM-160(S)	12	160.0	144.0	130.0	100.0	341.0	173.0	281.0	288.0	46.1	M5
6-FM-200	12	200.0	184.0	160.0	120.0	523.0	240.0	225.0	230.0	60.3	M3
6-FM-250	12	250	230	200	150	520	269	220	225	69.0	M5

FMH Series For Front Terminal

Type	Nominal Voltage (V)	Rated Capacity(Ah)				Dimensions(mm)				Weight Appox (kg)	Terminal type
		20HR	10HR	5HR	1HR	Length	Width	Height	Total Height		
		1.75V/C	1.80V/C	1.75V/C	1.75V/C						
6-FMH-55	12	55.0	50.0	44.0	33.0	277.0	106.0	222.0	222.0	16.0	M1
6-FMH-75	12	75.0	67.5	60.0	45.0	562.0	114.0	188.0	188.0	29.0	M6
6-FMH-100	12	100.0	93.0	80.0	60.0	395.0	110.0	286.0	286.0	32.3	M6
6-FMH-105	12	105.0	95.0	84.0	63.0	507.0	110.0	227.0	227.0	42.7	M6
6-FMH-150	12	150.0	138.0	120.0	90.0	551.0	110.0	288.0	288.0	45.9	M6

BATTERY INDEX

FML Series For High Cycle Use

Type	Nominal Voltage (V)	Rated Capacity(Ah)				Dimensions(mm)				Weight Appox (kg)	Terminal type
		20HR	10HR	5HR	1HR	Length	Width	Height	Total Height		
		1.75V/C	1.80V/C	1.75V/C	1.75V/C						
3-FML-100	6	100	92	80	60	195	170	206	210	16	M2
3-FML-150	6	150	138	120	90	260	180	247	250	25	M3
3-FML-200	6	200	184	160	120	323	178	226	231	31	M5
6-FML-36	12	36	33.1	28.8	21.6	195	131	155	169	11.4	M1
6-FML-38	12	38.0	34.2	30.4	22.8	198.0	166.0	170.0	170.0	13.2	M1
6-FML-56	12	56.0	51.4	44.8	33.6	229.0	138.0	212.0	217.0	19.0	M1
6-FML-65	12	65.0	61.0	52.0	39.0	350.0	167.0	177.0	177.0	21.5	M2
6-FML-85	12	85	78.2	68	51	260	169	211	216	25.0	M1
6-FML-100	12	100.0	92.0	80.0	60.0	407.0	174.0	208.0	236.0	32.6	M3
6-FML-110	12	110	101	88	66	329	172	215	222	33.5	M5
6-FML-120	12	120.0	110.0	96.0	72.0	407.0	174.0	208.0	236.0	36.5	M3
6-FML-150	12	150	138	120	90	532	207	216	221	50	M5
6-FML-200	12	200.0	184.0	160.0	120.0	523.0	240.0	225.0	230.0	62.5	M3

GFM For Long Life Standby Use

Type	Nominal Voltage (V)	Rated Capacity(Ah)			Dimensions(mm)				Weight Appox (kg)	Terminal type
		10HR	5HR	1HR	Length	Width	Height	Total Height		
		1.80V/C	1.75V/C	1.75V/C						
GFM100	2	100	90	60	171	72	205	210	5.9	M3
GFM200	2	200	180	120	172	111	329	365	13.1	M3
GFM300	2	300	270	180	171	151	330	366	18.0	M3
GFM400	2	400	360	240	210	171	329	363	25.0	M3
GFM500	2	500	450	300	241	172	331	366	29.0	M3
GFM600	2	600	540	360	301	175	331	366	35.0	M3
GFM800	2	800	720	480	410	175	330	365	49.5	M3
GFM1000	2	1000	900	600	475	175	328	365	56.3	M3
GFM1500	2	1500	1350	900	401	351	342	378	92.6	M3
GFM2000	2	2000	1800	1200	491	351	343	383	122.5	M3
GFM3000	2	3000	2700	1800	712	353	341	382	174.0	M3

Solar Energy Deep Circulation Series

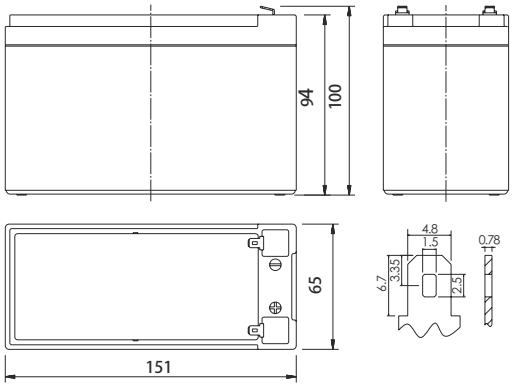
Type	Nominal Voltage (V)	Rated Capacity(Ah)			Dimensions(mm)				Weight Appox (kg)	Terminal type
		10HR	5HR	1HR	Length	Width	Height	Total Height		
		1.80V/C	1.75V/C	1.75V/C						
6-FM-38T	12	34.2	30.4	22.8	198	166	170	170	12.0	M1
6-FM-65T	12	61	52	39	350	167	177	177	20.0	M2
6-FM-100T	12	92	80	60	407	174	208	236	32.5	M3
6-FM-150T	12	138	120	90	532	207	216	221	48.3	M5
6-FM-200T	12	184	160	120	523	240	225	230	60.3	M3
GFM200T	2	200	180	120	172	111	329	365	13.1	M3
GFM300T	2	300	270	180	171	151	330	366	18.0	M3
GFM400T	2	400	360	240	210	171	329	363	25.0	M3
GFM500T	2	500	450	300	241	172	331	366	29.0	M3
GFM600T	2	600	540	360	301	175	331	366	34.6	M3
GFM800T	2	800	720	480	410	175	330	365	49.0	M3
GFM1000T	2	1000	900	600	475	175	328	365	56.3	M3
GFM1500T	2	1500	1350	900	401	351	342	378	92.6	M3
GFM2000T	2	2000	1800	1200	491	351	343	383	123.0	M3

Gel Battery Series(AGM)

Type	Nominal Voltage (V)	Rated Capacity(Ah)			Dimensions(mm)				Weight Appox (kg)	Terminal type
		10HR	5HR	1HR	Length	Width	Height	Total Height		
		1.80V/C	1.75V/C	1.75V/C						
6-FM-38J	12	34.2	30.4	22.8	198	166	170	170	12.2	M1
6-FM-65J	12	61	52	39	350	167	177	177	20.3	M2
6-FM-100J	12	92	80	60	406	173	212	219	33.0	M3
6-FM-150J	12	138	120	90	532	207	216	221	48.6	M5
6-FM-200J	12	184	160	120	523	240	225	230	60.5	M3
GFM200J	2	200	180	120	172	111	329	365	13.3	M3
GFM300J	2	300	270	180	171	151	330	366	18.3	M3
GFM400J	2	400	360	240	210	171	329	363	25.4	M3
GFM500J	2	500	450	300	241	172	331	366	29.5	M3
GFM600J	2	600	540	360	301	175	331	366	35.6	M3
GFM800J	2	800	720	480	410	175	330	365	50.3	M3
GFM1000J	2	1000	900	600	475	175	328	365	59.0	M3
GFM2000J	2	2000	1800	1200	491	351	343	383	124.5	M3

6-FM-7

FM Series
Battery For General Use



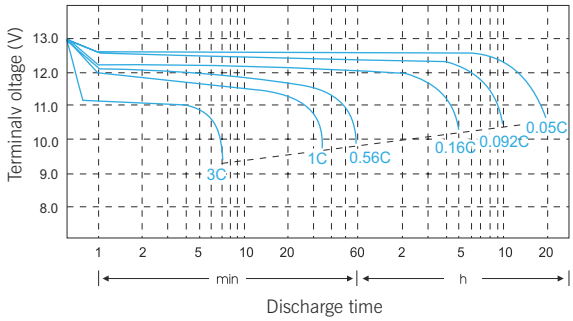
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		7.0Ah
Dimensions	Total Height (with terminals)	3.94 inches(100mm)
	Height	3.70 inches(94mm)
	length	5.94 inches(151mm)
	width	2.56 inches(65mm)
Weight		Approx.4.84 Pound(2.20kg)

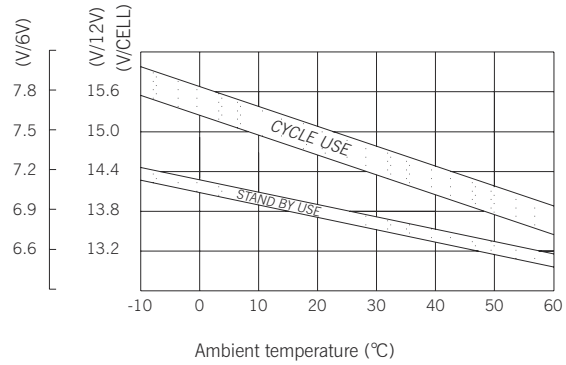
Characteristics

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

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.6	26.7	16.9	13.6	7.56	4.62	2.61	1.80	1.44	1.22	0.67	0.35
9.9	26.0	16.5	13.1	7.35	4.50	2.52	1.78	1.43	1.21	0.66	0.35
10.2	24.9	15.8	12.7	7.21	4.38	2.49	1.76	1.41	1.20	0.65	0.35
10.5	23.8	15.1	12.2	7.14	4.27	2.45	1.75	1.40	1.19	0.65	0.35
10.82	22.4	15.0	11.6	6.93	4.13	2.38	1.72	1.37	1.18	0.64	0.34

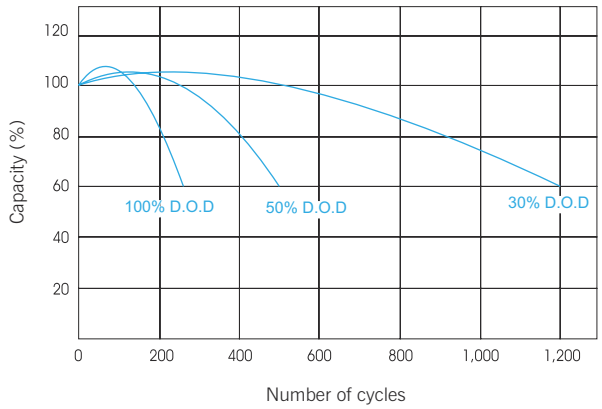
Constant Power Discharge (WATTS PER CELL@25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.6	297	190	154	86.2	53.3	30.5	21.4	17.2	14.5	7.95	4.26
9.9	290	185	149	84.2	52.0	29.5	21.2	17.0	14.5	7.89	4.24
10.2	277	177	144	82.6	50.6	29.1	21.0	16.9	14.4	7.83	4.23
10.5	266	171	139	81.9	49.5	28.8	20.9	16.7	14.2	7.83	4.21
10.82	250	169	132	79.6	47.9	28.0	20.6	16.3	14.1	7.66	4.14

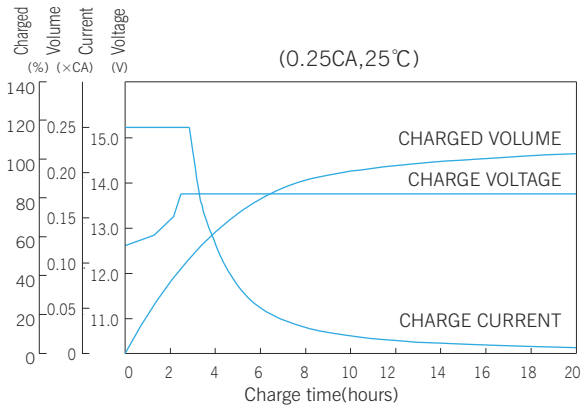
6-FM-7

The operating environment temperature above 40℃ 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.

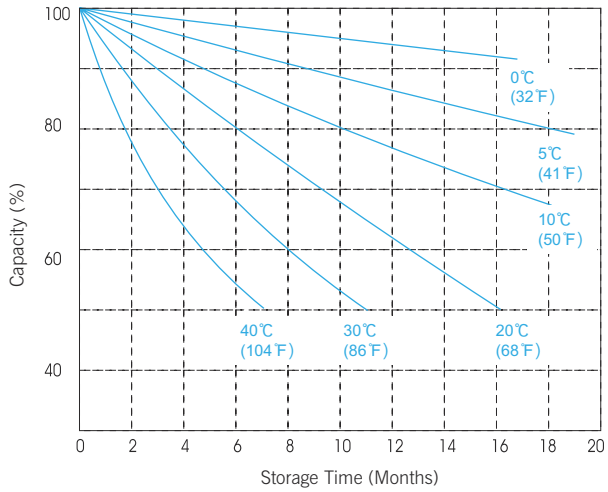
■ Cycle service life in relation to depth of discharge



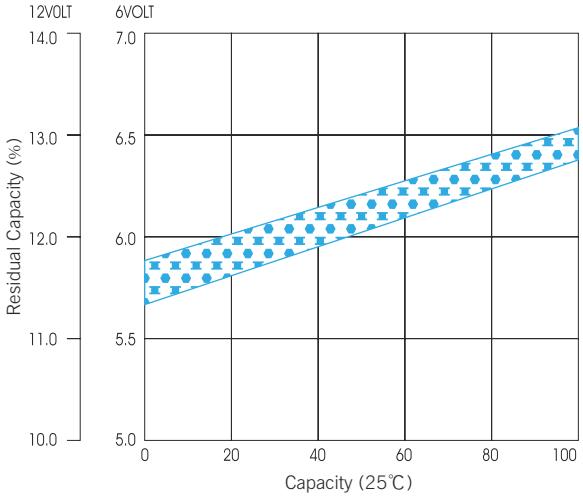
■ Constant voltage charge characteristic



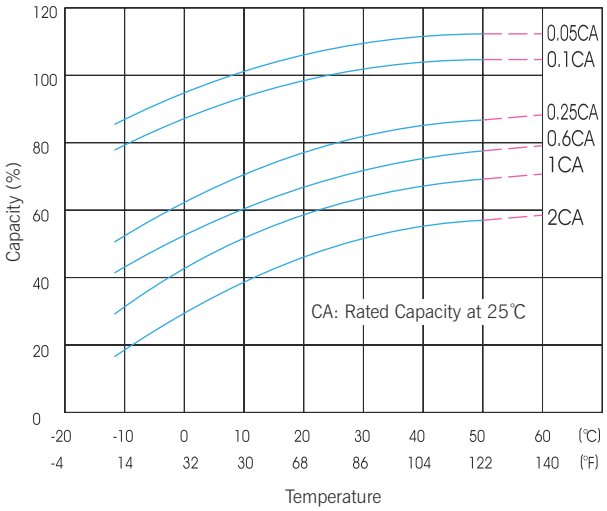
■ Self-Discharge Characteristics



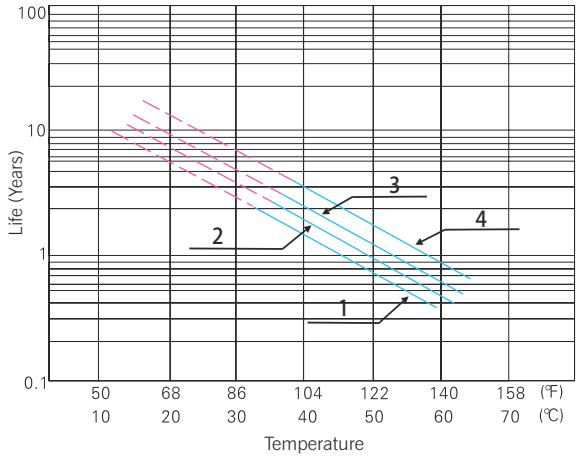
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



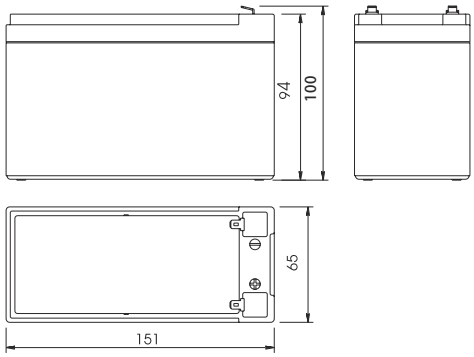
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-9

FM Series
Battery For General Use



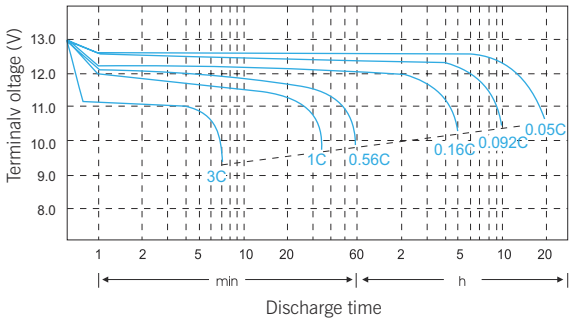
Specifications

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

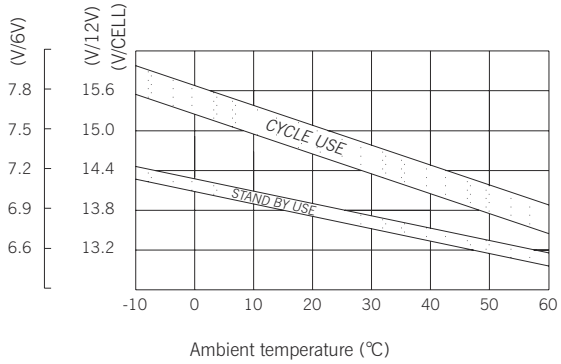
Characteristics

Capacity 77˚F(25℃)	20 hour rate (0.45A)	9.0 Ah
	10 hour rate (0.83A)	8.3 Ah
	5 hour rate (1.44A)	7.2 Ah
	1hour rate (5.40 A)	5.4 Ah
	15Minute Rate (15.6 A)	3.9 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	13 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	135A(5S)	
Terminal	F1 \ F2	
Charge (Constant Voltage) — Cycle	Initial Charging Current less than 27A	
	Voltage 14.4~14.7 V / 77˚F(25℃)	
Charge (Constant Voltage) — Float	Voltage 13.5~13.8V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.6	34.3	21.8	17.5	9.72	5.94	3.36	2.31	1.85	1.57	0.86	0.46
9.9	22.5	21.2	16.8	9.45	5.79	3.24	2.29	1.84	1.56	0.85	0.45
10.2	32.0	20.3	16.3	9.27	5.63	3.20	2.26	1.82	1.56	0.84	0.45
10.5	30.6	19.4	15.7	9.18	5.49	3.15	2.25	1.80	1.53	0.84	0.45
10.8	28.8	19.3	14.9	8.91	5.31	3.06	2.21	1.76	1.51	0.82	0.44

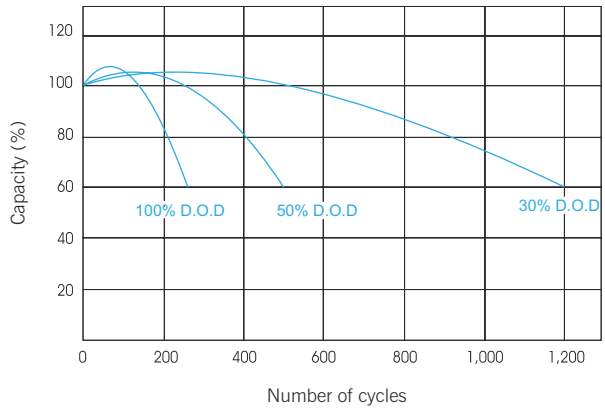
Constant Power Discharge (WATTS PER CELL@25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.6	382	245	198	111	68.6	39.2	27.5	22.1	18.7	10.2	5.48
9.9	373	238	191	108	66.9	37.9	22.2	21.9	18.6	10.2	5.46
10.2	357	228	185	106	65.1	37.5	26.9	21.7	18.5	10.1	5.44
10.5	342	219	178	105	63.6	37.0	26.8	21.5	18.3	10.1	5.42
10.8	322	218	169	102	61.6	36.0	26.5	21.0	18.1	9.85	5.33

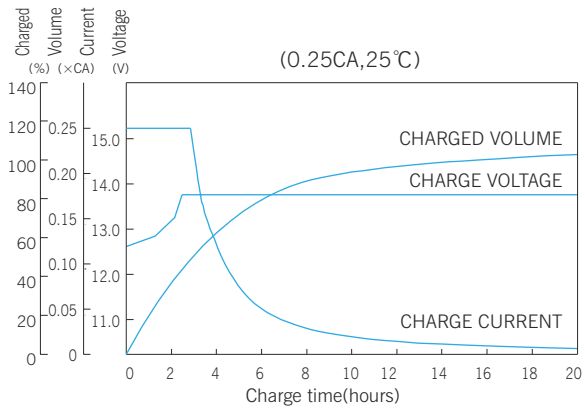
6-FM-9

The operating environment temperature above 40℃ 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.

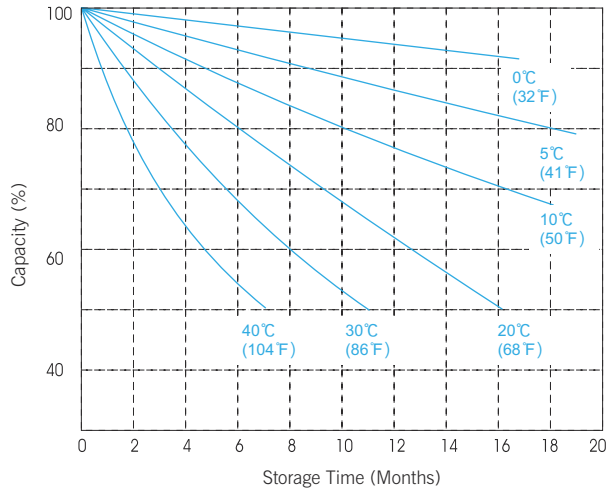
Cycle service life in relation to depth of discharge



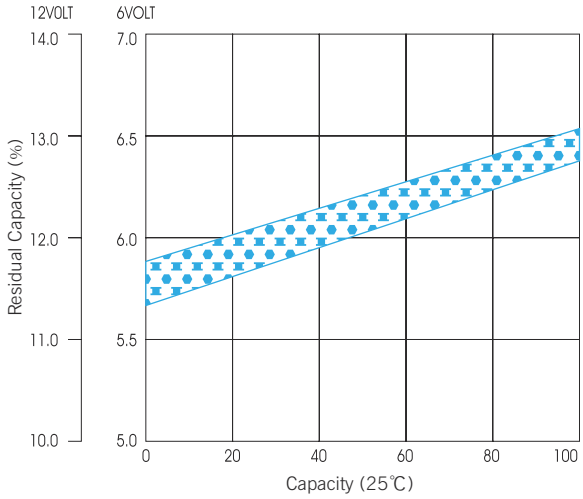
Constant voltage charge characteristic



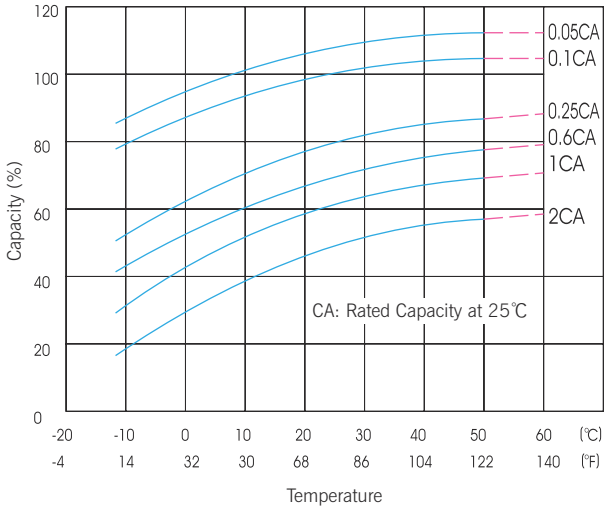
Self-Discharge Characteristics



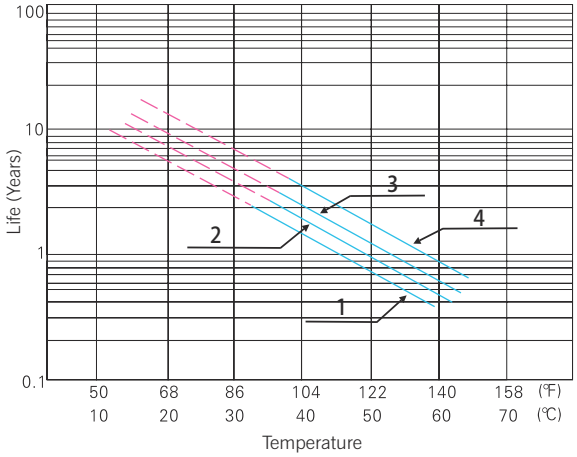
Relationship of OCV and Residual Capacity % (25℃)



Temperature effects on capacity



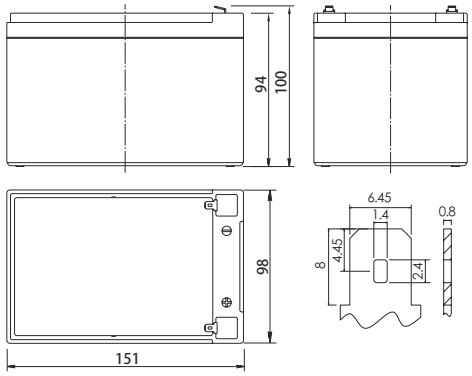
Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-12

FM Series
Battery For General Use



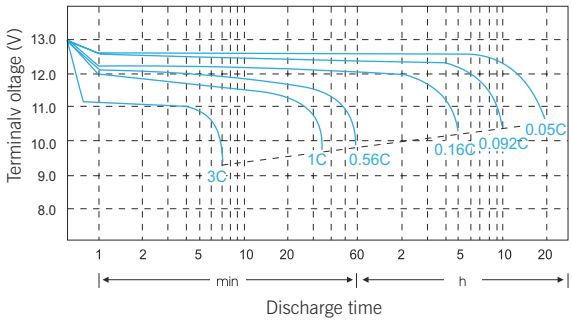
Specifications

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

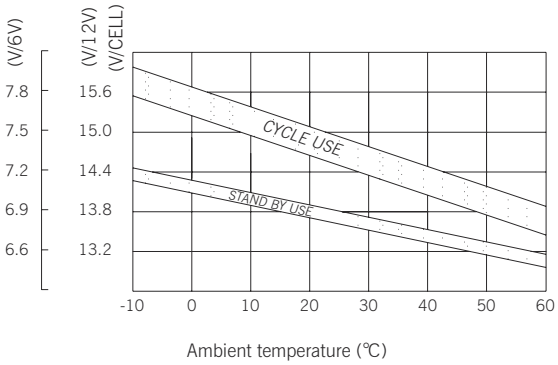
Characteristics

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

Discharge Curves 77˚F (25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.6	45.7	29.0	23.3	13.0	7.92	4.48	3.08	2.47	2.09	1.14	0.61
9.9	44.6	28.2	22.4	12.6	7.72	4.32	3.05	2.45	2.08	1.13	0.61
10.2	42.6	27.0	21.7	12.4	7.50	4.26	3.01	2.42	2.06	1.12	0.60
10.5	40.8	25.9	20.9	12.2	7.32	4.20	3.00	2.40	2.04	1.12	0.60
10.8	38.4	25.7	19.8	11.9	7.08	4.08	2.95	2.34	2.02	1.09	0.59

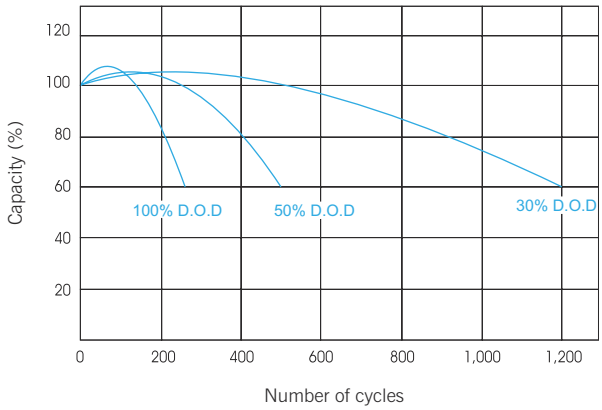
Constant Power Discharge (WATTS PER CELL@25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.6	509	326	264	148	91.4	52.3	36.7	29.4	24.9	13.6	7.30
9.9	498	317	255	144	89.2	50.5	36.3	29.2	24.8	13.5	7.28
10.2	475	304	247	142	86.8	49.9	35.9	28.9	24.7	13.4	7.25
10.5	456	292	238	140	84.8	49.3	35.8	28.7	24.4	13.4	7.22
10.8	429	290	229	136	82.1	47.9	35.3	28.0	24.1	13.1	7.10

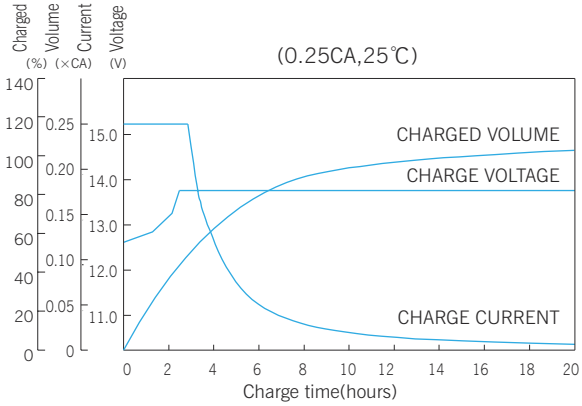
6-FM-12

The operating environment temperature above 40℃ 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.

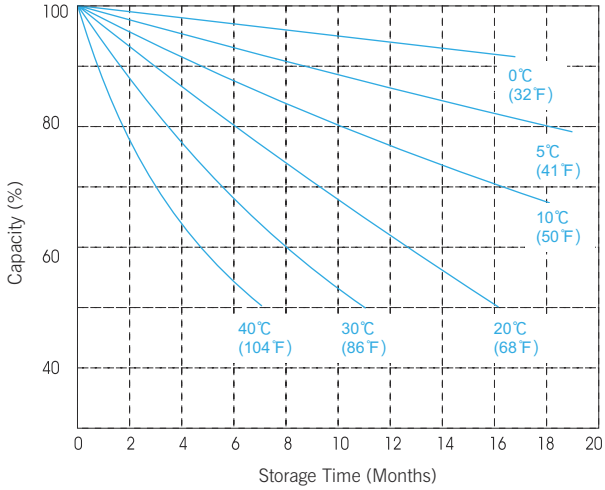
Cycle service life in relation to depth of discharge



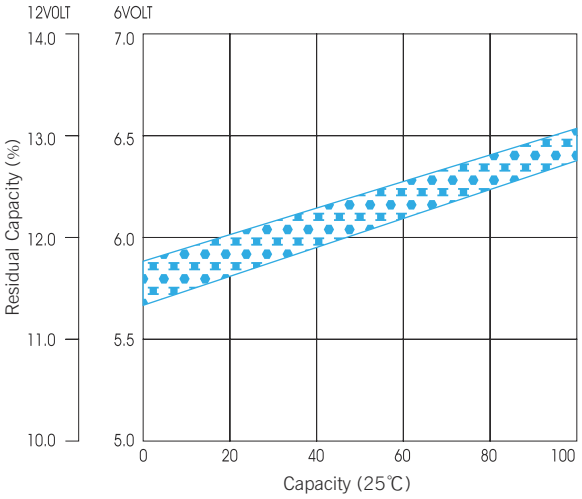
Constant voltage charge characteristic



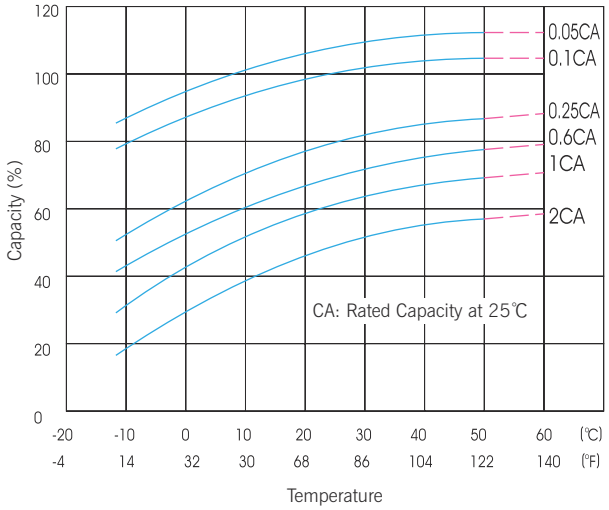
Self-Discharge Characteristics



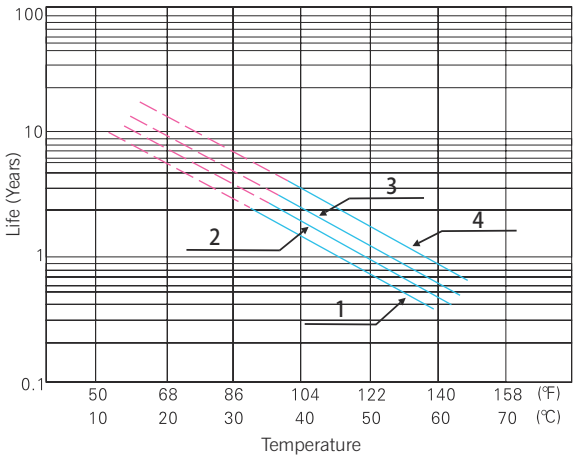
Relationship of OCV and Residual Capacity % (25℃)



Temperature effects on capacity



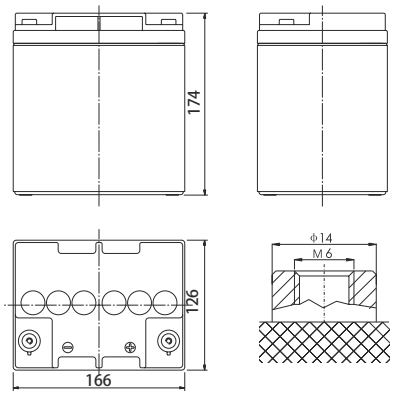
Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-24A

FM Series
Battery For General Use



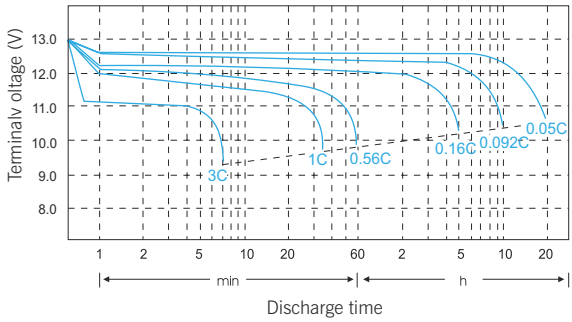
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		24Ah
Dimensions	Total Height (with terminals)	6.85 inches(174mm)
	Height	6.85 inches(174mm)
	length	6.54 inches(166mm)
	width	4.96 inches(126mm)
Weight		Approx.17.6 Pound(8.0kg)

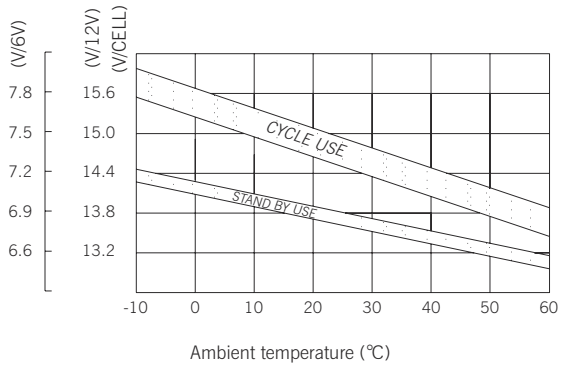
Characteristics

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

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.6	91.4	58.1	46.6	25.9	15.8	8.95	6.17	4.94	4.18	2.28	1.22
9.9	89.3	56.4	44.9	25.2	15.4	8.64	6.10	4.90	4.16	2.26	1.21
10.2	85.2	54.0	43.4	24.7	15.0	8.52	6.03	4.85	4.13	2.24	1.21
10.5	81.6	51.8	41.8	24.3	16.6	8.40	6.00	4.68	4.03	2.12	1.18
10.8	76.8	51.3	39.6	23.7	14.20	8.20	5.90	4.68	4.03	2.19	1.18

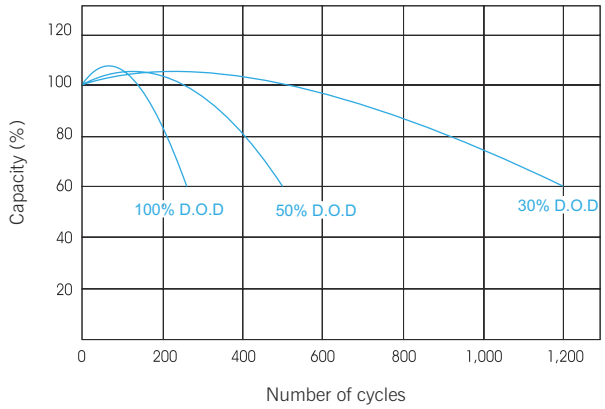
Constant Power Discharge (WATTS PER CELL@25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
9.6	1019	653	529	295	183	105	73.3	58.9	49.8	27.3	16.6
9.9	995	635	510	289	179	101	72.6	58.4	49.7	27.1	14.6
10.2	951	608	494	284	170	98.6	71.6	57.4	48.8	26.9	14.5
10.5	911	585	476	281	170	98.6	71.6	57.4	48.8	26.9	14.5
10.8	859	580	451	273	164	95.9	70.6	56.0	48.3	26.3	14.2

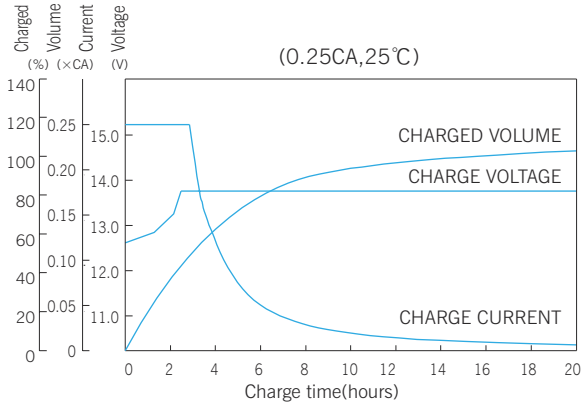
6-FM-24A

The operating environment temperature above 40℃ 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.

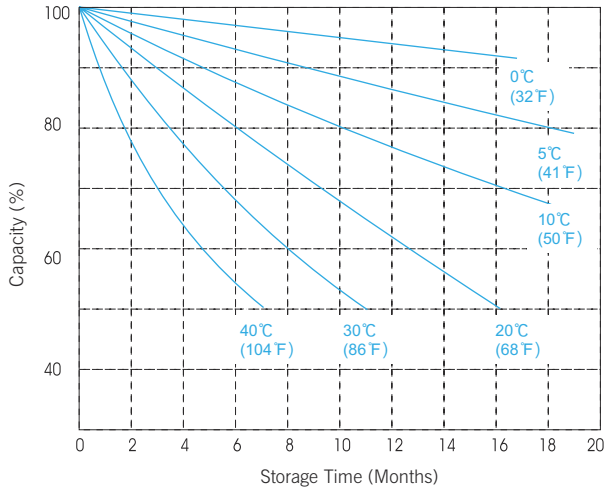
■ Cycle service life in relation to depth of discharge



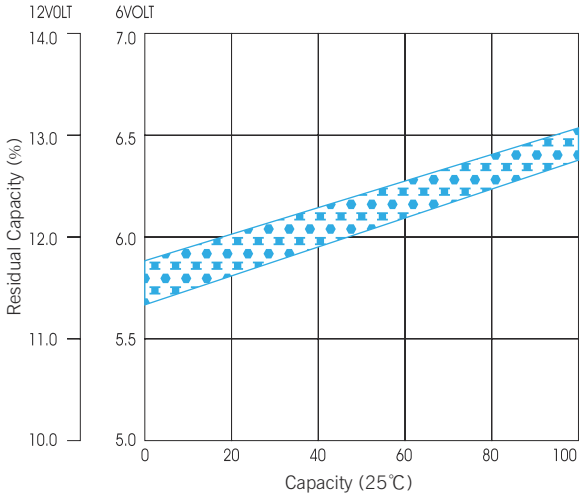
■ Constant voltage charge characteristic



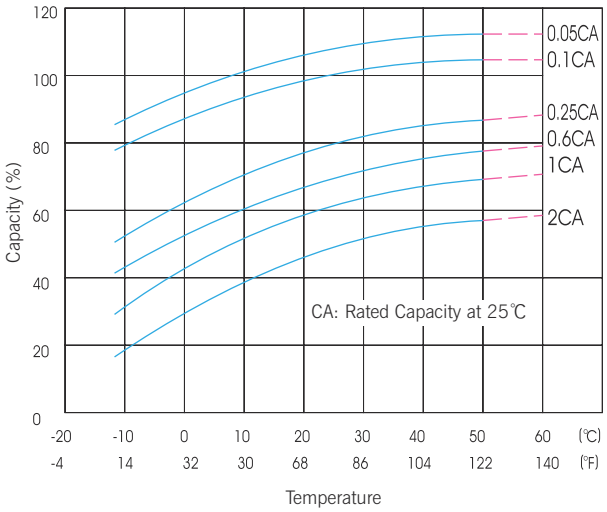
■ Self-Discharge Characteristics



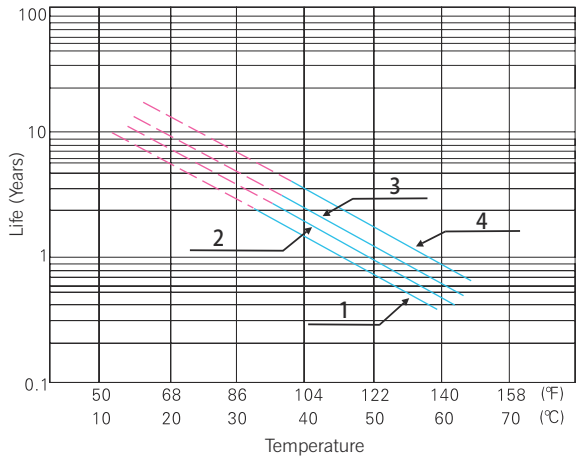
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



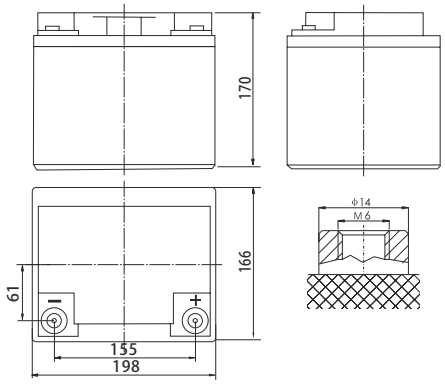
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-38A

FM Series
For General Use



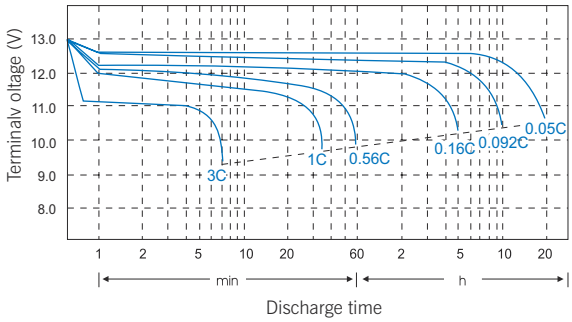
■ Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		38Ah
Dimensions	Total Height (with terminals)	6.70 inches(170mm)
	Height	6.70 inches(170mm)
	length	7.80 inches(198mm)
	width	6.54 inches(166mm)
Weight		Approx.26.4 Pound(12.0kg)

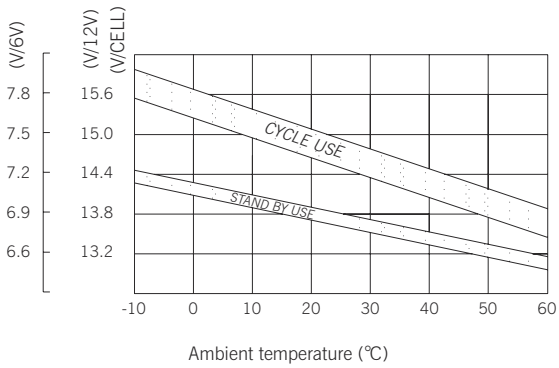
■ Characteristics

Capacity 77˚F(25℃)	20 hour rate (1.90A)	38.0 Ah
	10 hour rate (3.42A)	34.2 Ah
	5 hour rate (6.08A)	30.4 Ah
	1hour rate (22.8A)	22.8 Ah
	15Minute Rate (62.7A)	15.7 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	8 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	380A(5S)	
Terminal	M1	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 11.4A	
	Voltage 14.4~14.7 V / 77˚F(25℃)	
Float	Voltage 13.5~13.8V / 77˚F(25℃)	

■ Discharge Curves 77˚F(25℃)



■ Relationship between charge voltage and temperature



■ Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
1.65	108	77.6	60.8	38.3	28.7	22.3	13.4	9.79	6.47	3.86	1.76
1.70	103	73.1	57.3	36.2	26.9	21.3	13.0	9.50	6.21	3.72	1.69
1.80	81.0	61.2	48.9	33.3	24.8	20.7	12.5	9.03	5.92	3.50	1.59

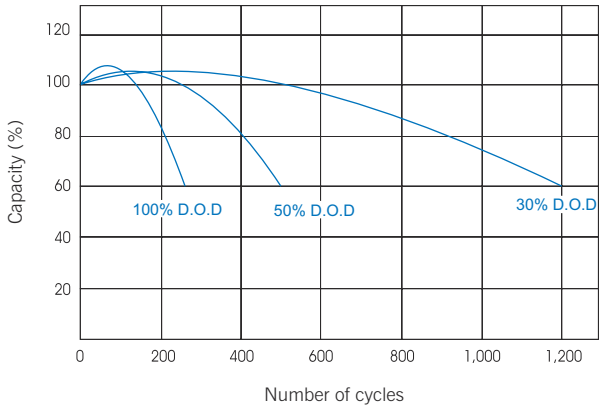
■ Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.6	198	143	113.0	70.2	52.7	44.6	25.3	18.0	12.1	6.76	2.92
1.65	189	139	110.0	69.7	52.3	43.2	24.5	17.8	11.9	6.70	2.90
1.67	186	137	108.0	68.8	51.3	42.6	24.4	17.7	11.8	6.62	2.87
1.7	184	135	106.0	67.6	50.4	41.9	24.2	17.5	11.6	6.56	2.81
1.75	171	127	102.0	67.4	49.6	41.6	24.0	17.4	11.5	6.50	2.76
1.8	151	117	94.1	64.1	47.8	40.9	23.6	17.0	11.3	6.28	2.68
1.85	121	96.9	82.7	58.3	45.4	38	22.7	16.5	10.70	6.00	2.60

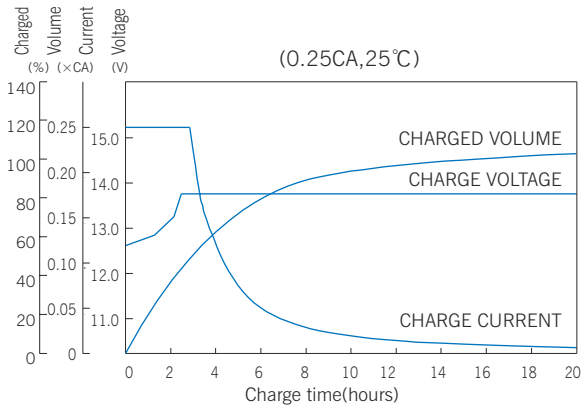
6-FM-38A

The operating environment temperature above 40℃ 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.

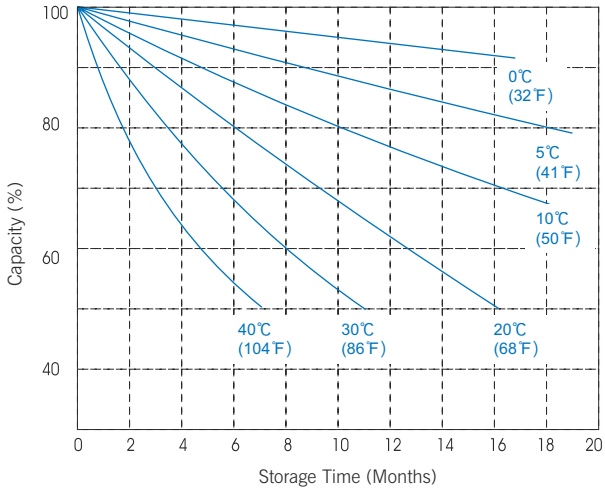
■ Cycle service life in relation to depth of discharge



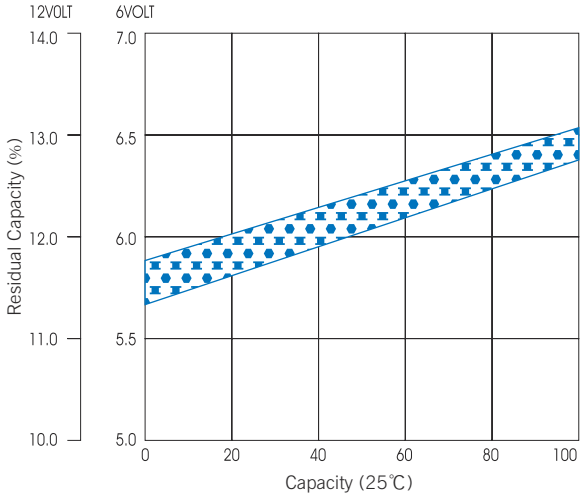
■ Constant voltage charge characteristic



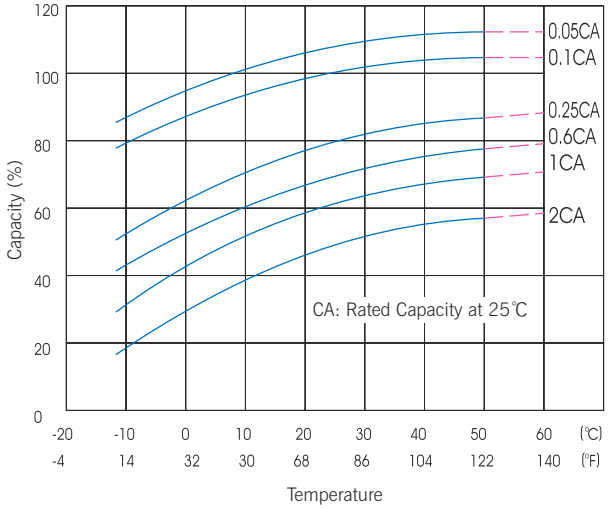
■ Self-Discharge Characteristics



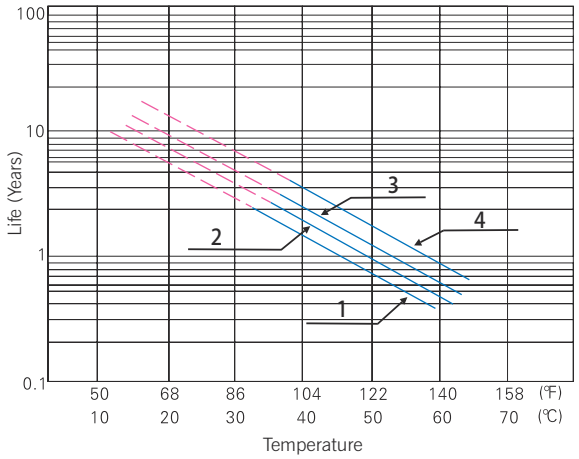
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



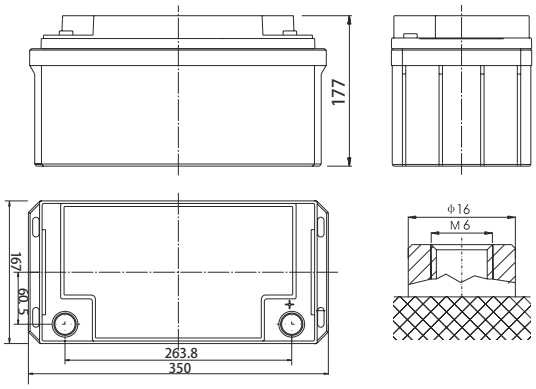
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-65A

FM Series
For General Use



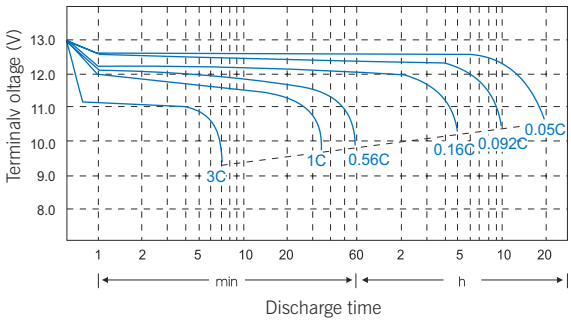
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		65Ah
Dimensions	Total Height (with terminals)	6.97 inches(177mm)
	Height	6.97 inches(177mm)
	length	13.8 inches(350mm)
	width	6.57 inches(167mm)
Weight		Approx.44.0 Pound(20.0kg)

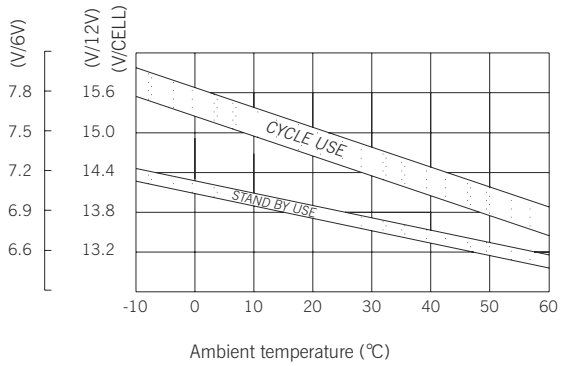
Characteristics

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

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
1.65	197	140	106	68.2	51.7	35.0	24.4	16.6	11.3	6.53	2.85
1.70	184	133	101	64.8	48.8	34.1	23.5	16.3	10.9	6.26	2.78
1.80	146	112	88.4	54	46.1	33.6	22.5	15.3	10.5	5.98	2.72

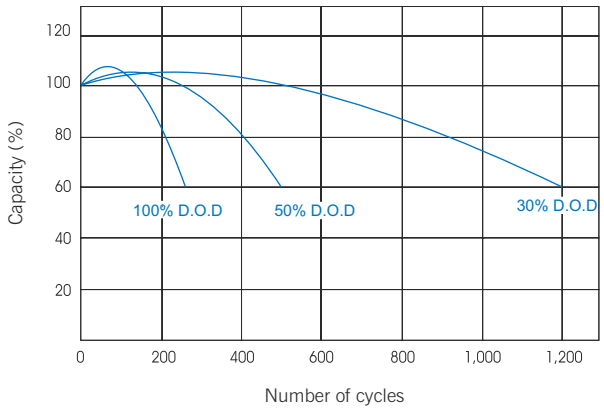
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	359	254	194	127	95.2	77.2	45.3	31.8	20.9	11.8	5.35
1.65	343	251	192	124	94.3	76.4	44.7	31.5	20.7	11.6	5.33
1.67	341	250	190	123	92.9	75.6	44.2	31.4	20.6	11.5	5.31
1.70	328	246	187	121	91.5	75.0	43.6	31.2	20.3	11.3	5.29
1.75	305	230	182	111	90.0	74.8	43.1	30.8	20.1	11.20	5.27
1.80	273	214	170	104	89.0	74.4	42.4	30.1	20.0	11.00	5.25
1.85	219	177	149	96.0	82.1	69.2	41.4	29.7	19.1	10.90	4.95

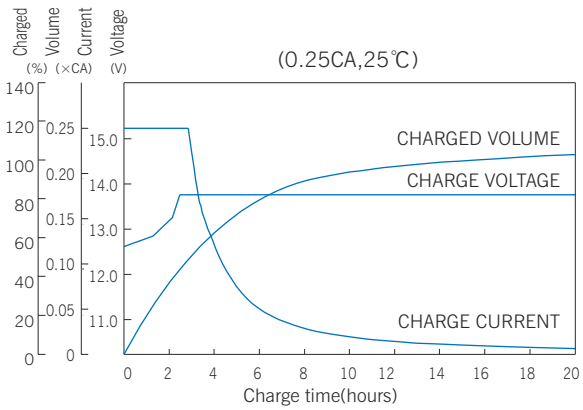
6-FM-65A

The operating environment temperature above 40℃ 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.

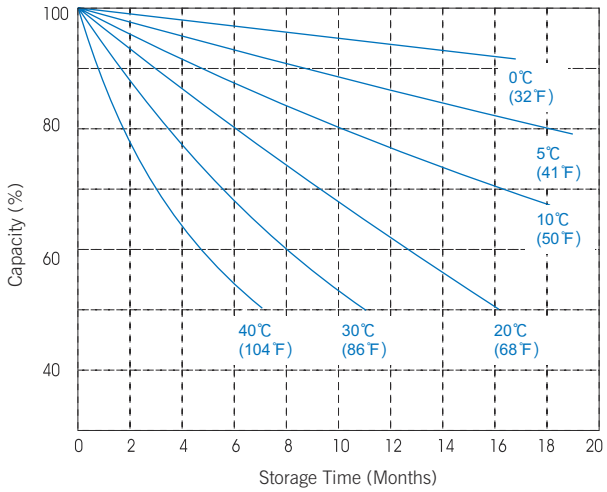
■ Cycle service life in relation to depth of discharge



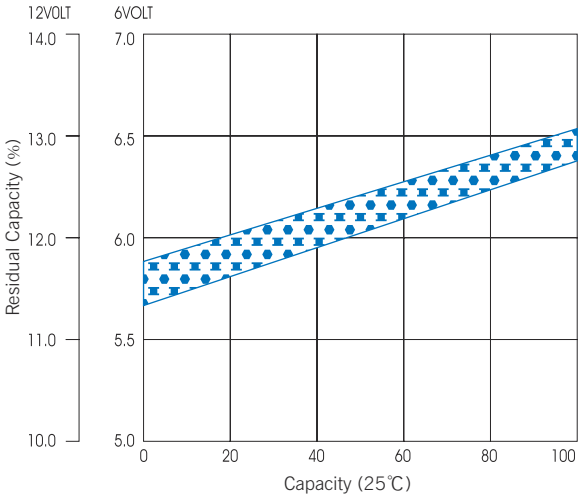
■ Constant voltage charge characteristic



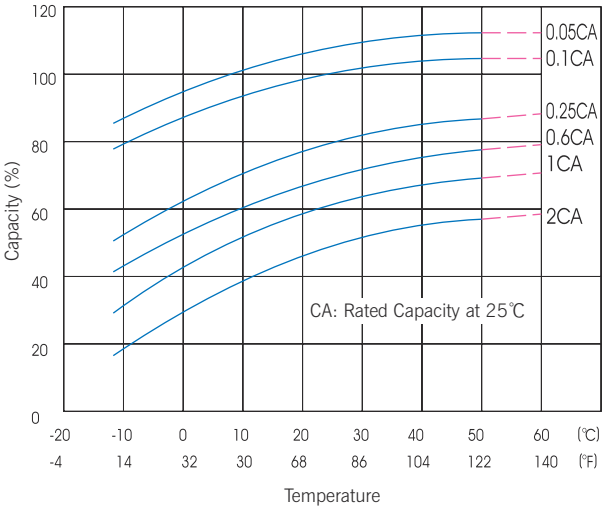
■ Self-Discharge Characteristics



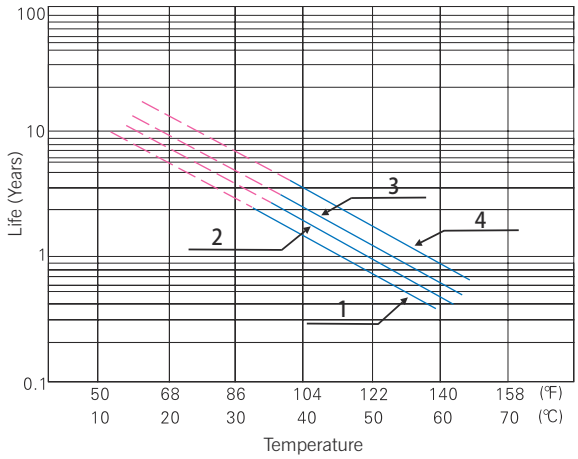
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



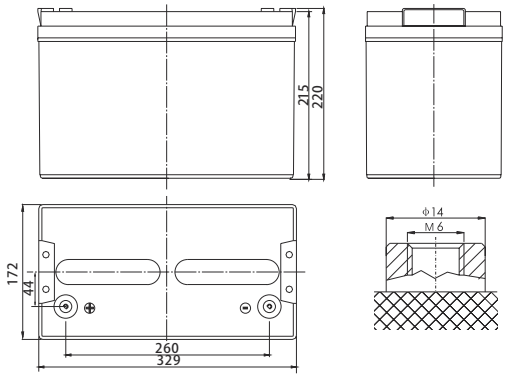
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-100

FM Series
For General Use



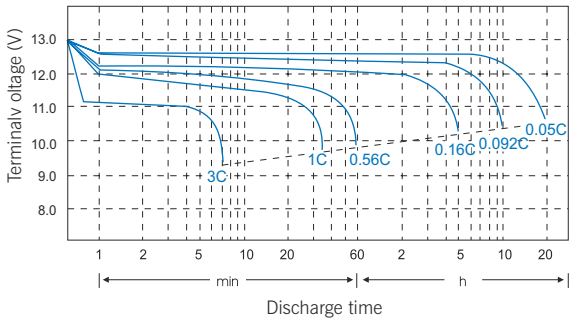
Specifications

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

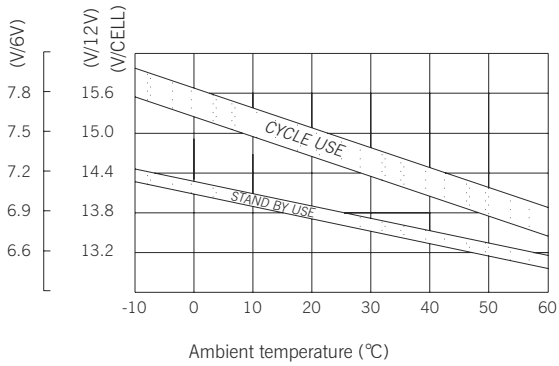
Characteristics

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

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
1.65	311	217	168	102	80.1	54.2	37.8	26.1	17.5	9.80	4.33
1.70	285	205	157	86.8	75.7	51.9	36.9	25.0	16.9	9.59	4.25
1.80	227	173	137	78.4	71.5	49.4	35.3	23.6	16.0	9.20	4.18

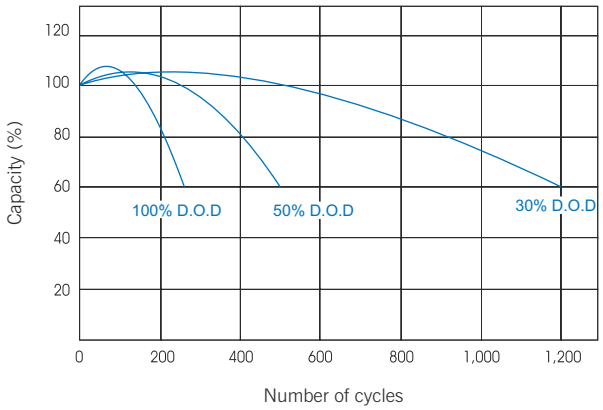
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	571	394	307	191	148	119	70.0	49.1	32.4	18.3	8.11
1.65	542	389	304	185	146	115	69.1	49.0	32.2	18.2	8.10
1.67	540	386	302	173	144	114	68.8	48.6	31.9	18.2	8.09
1.70	506	379	291	162	142	111	68.4	47.7	31.6	18.1	8.07
1.75	461	346	274	156	141	108	67.9	46.4	31.0	18.0	8.06
1.80	423	330	264	151	138	107	66.6	46.1	30.5	17.7	8.04
1.85	339	273	231	141	127	104	64.2	45.0	29.5	16.9	7.62

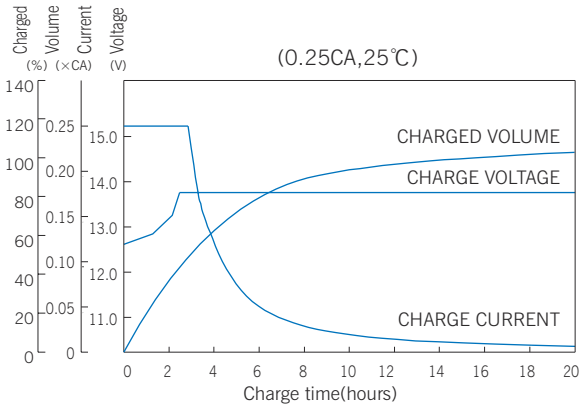
6-FM-100

The operating environment temperature above 40℃ 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.

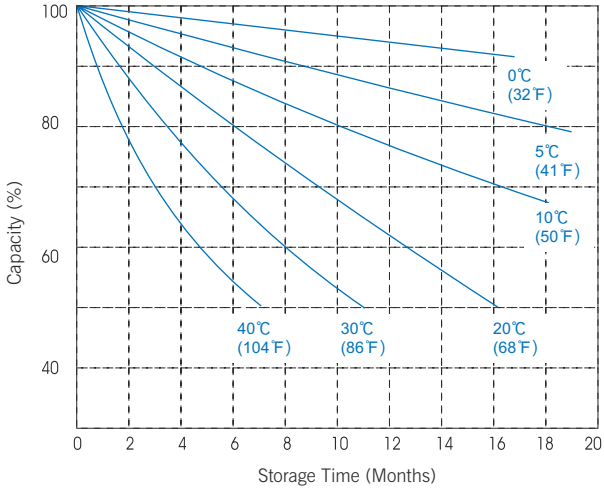
■ Cycle service life in relation to depth of discharge



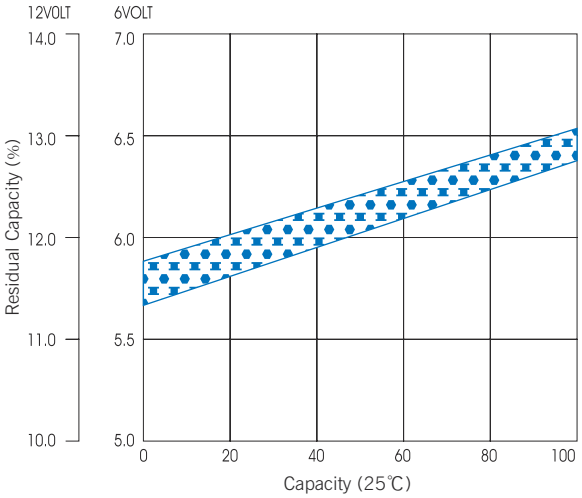
■ Constant voltage charge characteristic



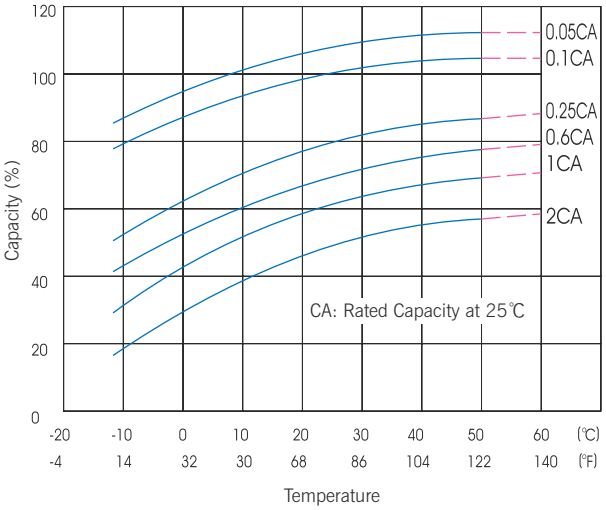
■ Self-Discharge Characteristics



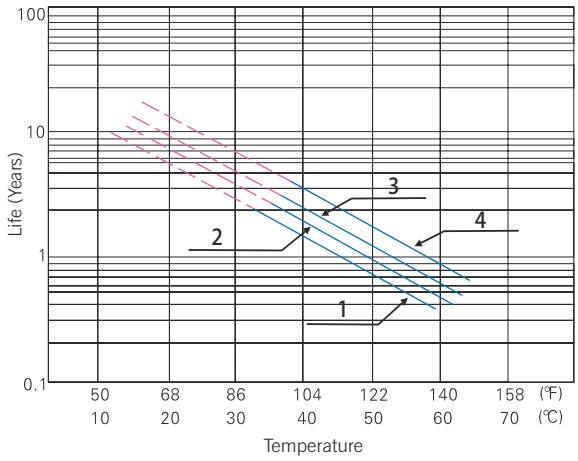
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



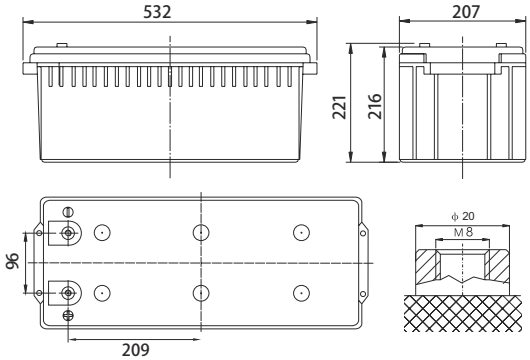
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-150

FM Series
For General Use



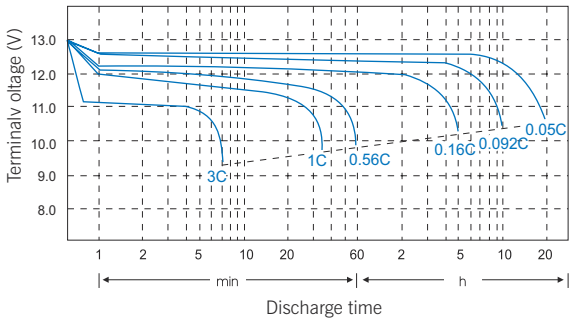
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		150Ah
Dimensions	Total Height (with terminals)	8.70 inches(221mm)
	Height	8.50 inches(216mm)
	length	20.94 inches(532mm)
	width	8.15 inches(207mm)
Weight		Approx.105.2 Pound(47.8kg)

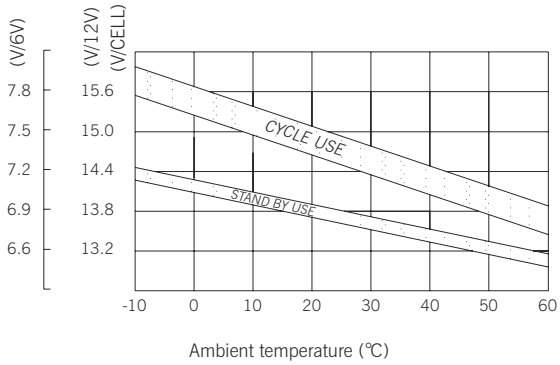
Characteristics

Capacity 77˚F(25℃)	20 hour rate (7.5A)	150 Ah
	10 hour rate (13.8A)	138 Ah
	5 hour rate (24.0A)	120 Ah
	1hour rate (90.0A)	90 Ah
	15Minute Rate (246A)	61.5 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	3 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	1000A(5S)	
Terminal	M5	
Charge (Constant Voltage) — Cycle	Initial Charging Current less than 30A	
	Voltage 14.4~14.7 V / 77˚F(25℃)	
Charge (Constant Voltage) — Float	Voltage 13.5~13.8V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
1.65	461	322	249	155	119	81.7	56.8	38.9	26.1	14.9	6.74
1.70	426	303	239	132	112	77.7	55.0	37.5	25.2	14.5	6.52
1.80	336	255	203	111	106	72.6	53.0	35.8	23.7	13.8	6.28

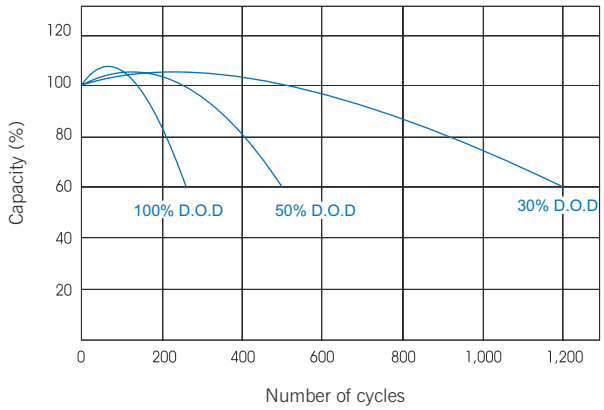
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	821	583	454	286	219	178	106	73.7	48.6	27.8	12.2
1.65	804	576	451	282	217	175	104	72.0	48.1	27.6	12.1
1.67	801	571	450	276	213	172	103	71.3	47.8	27.5	12.0
1.70	757	560	441	247	210	168	102	70.4	47.1	27.2	11.9
1.75	691	519	411	234	208	162	101	69.6	46.5	27.0	11.8
1.80	626	487	391	214	205	159	100	68.7	45.2	26.5	11.6
1.85	501	404	342	208	188	148	95.5	67.8	44.0	25.2	11.4

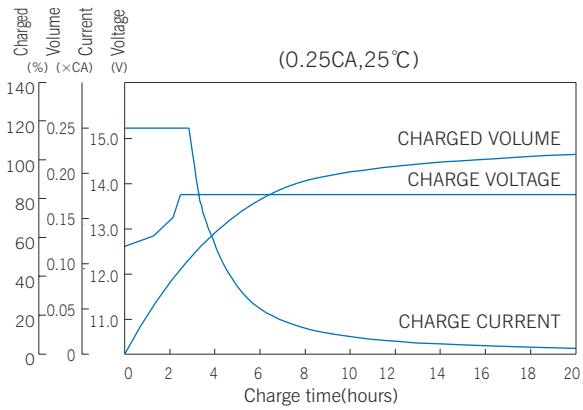
6-FM-150

The operating environment temperature above 40℃ 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.

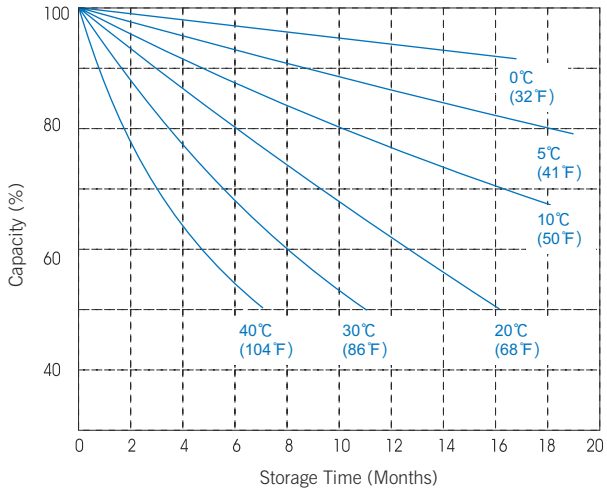
■ Cycle service life in relation to depth of discharge



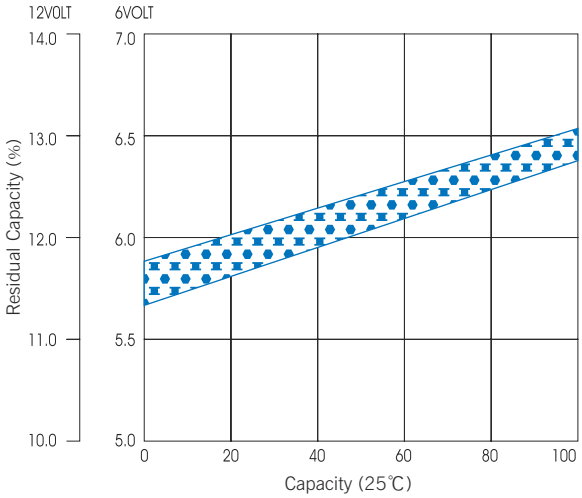
■ Constant voltage charge characteristic



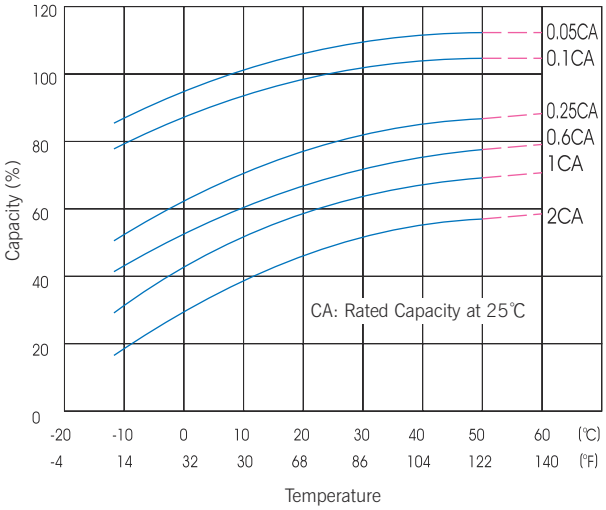
■ Self-Discharge Characteristics



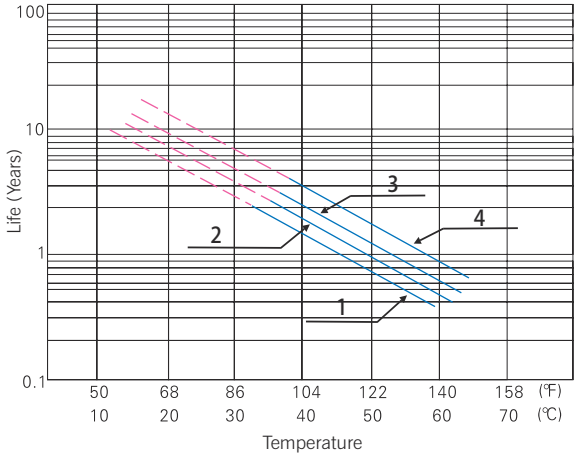
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



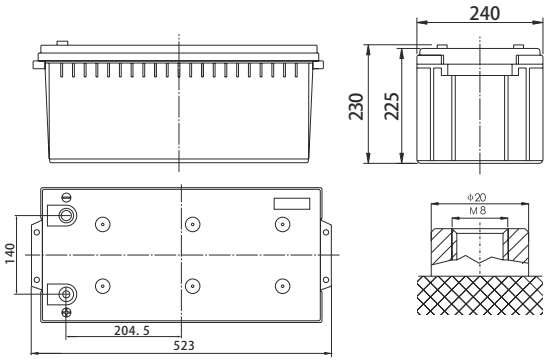
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-200

FM Series
For General Use



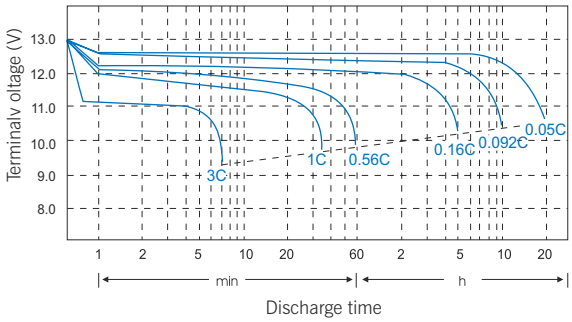
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		200Ah
Dimensions	Total Height (with terminals)	9.06 inches(230mm)
	Height	8.86 inches(225mm)
	length	20.59 inches(523mm)
	width	9.45 inches(240mm)
Weight		Approx.132.66 Pound(60.3kg)

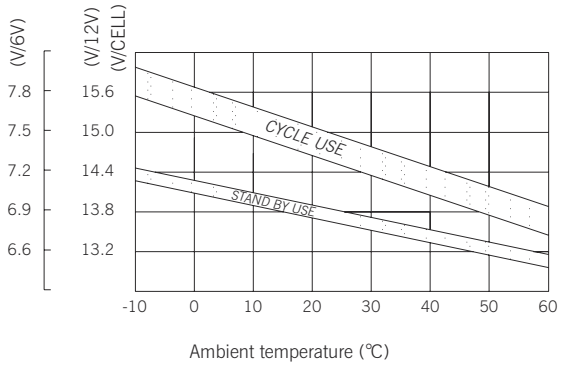
Characteristics

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

Discharge Curves 77˚F (25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
1.65	553	386	299	189	143	109	74.3	51.5	34.2	20.3	8.90
1.70	511	364	286	177	134	103	72.2	50.0	33.5	19.5	8.64
1.80	403	305	244	146	128	98	68.9	48.3	32.1	18.4	8.35

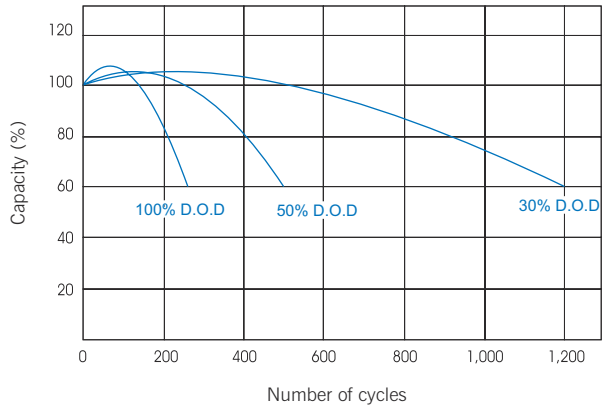
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	985	697	545	349	263	231	138	95.8	63.2	37.3	15.8
1.65	965	691	541	343	260	228	136	94.6	63.0	36.8	15.6
1.67	961	685	540	338	256	223	135	94.0	62.8	36.2	15.5
1.70	908	672	529	331	252	219	134	93.2	62.6	36.0	15.4
1.75	836	629	499	296	250	216	133	92.8	62.0	35.1	15.3
1.80	751	584	469	281	246	211	130	92.1	61.4	34.4	15.1
1.85	601	485	410	257	226	207	124	89.3	57.2	32.8	14.8

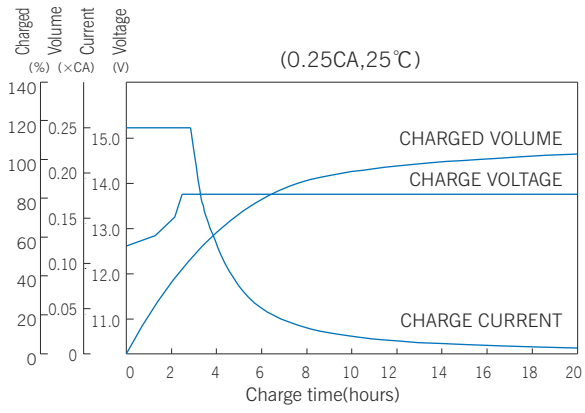
6-FM-200

The operating environment temperature above 40℃ 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.

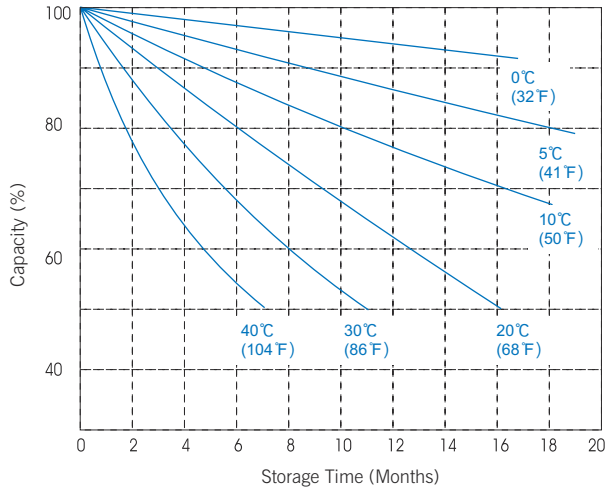
■ Cycle service life in relation to depth of discharge



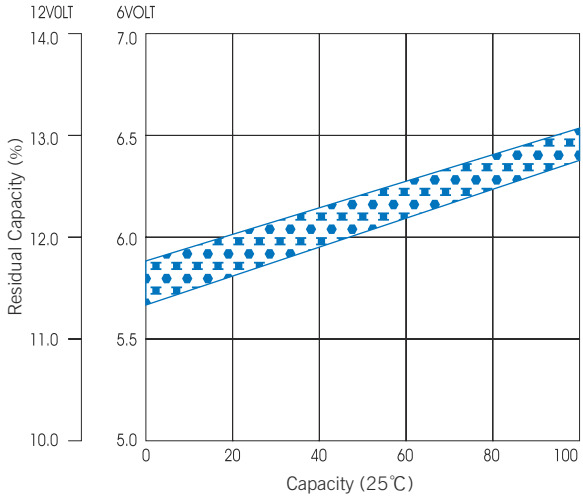
■ Constant voltage charge characteristic



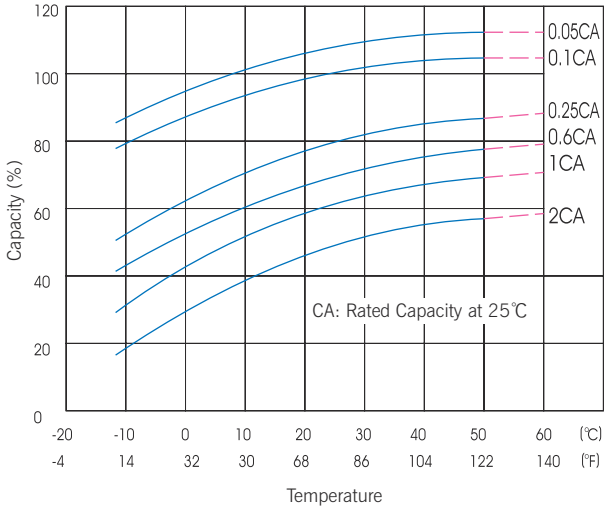
■ Self-Discharge Characteristics



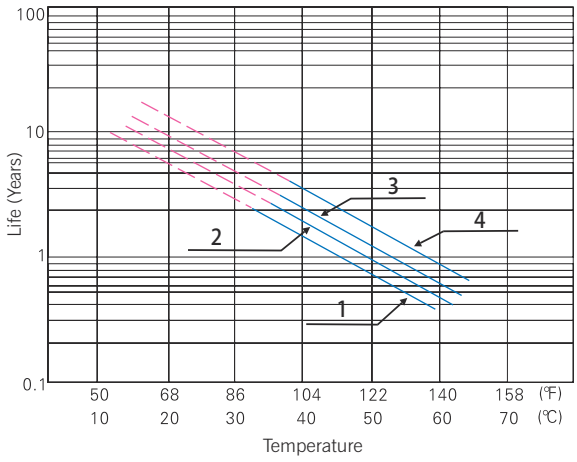
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



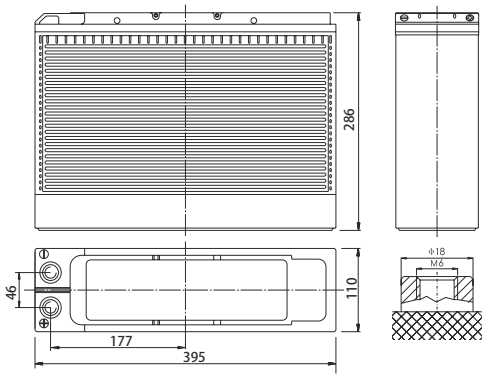
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FMH-100

FMH Series
For Front Terminal



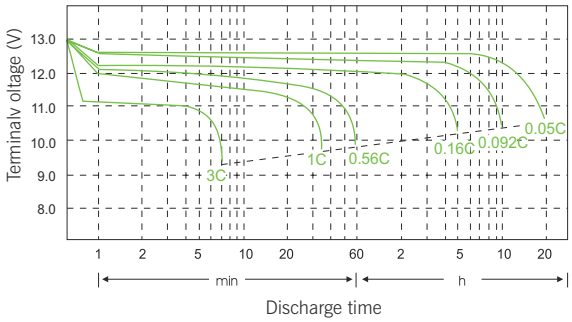
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		100Ah
Dimensions	Total Height (with terminals)	11.26 inches(286mm)
	Height	11.26 inches(286mm)
	length	15.55 inches(395mm)
	width	4.33 inches(110mm)
Weight		Approx.71.06 Pound(32.3kg)

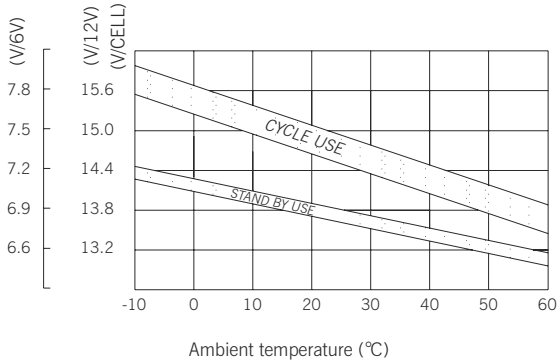
Characteristics

Capacity 77˚F(25℃)	20 hour rate (5.0A)	100 Ah
	10 hour rate (9.2A)	92 Ah
	5 hour rate (16.0A)	80 Ah
	1hour rate (60.0A)	60 Ah
	15Minute Rate (164A)	41 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	4.5 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	800A(5S)	
Terminal	M6	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 30A	
	Voltage 14.4~14.7 V / 77˚F(25℃)	
Float	Voltage 13.5~13.8V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
1.65	311	217	168	102	80.1	54.7	37.8	26.0	17.5	10.6	4.33
1.70	285	205	157	86.8	75.7	52.1	36.9	25.0	16.9	10.4	4.25
1.80	227	173	137	78.4	71.5	49.4	35.3	23.6	16.0	10.0	4.17

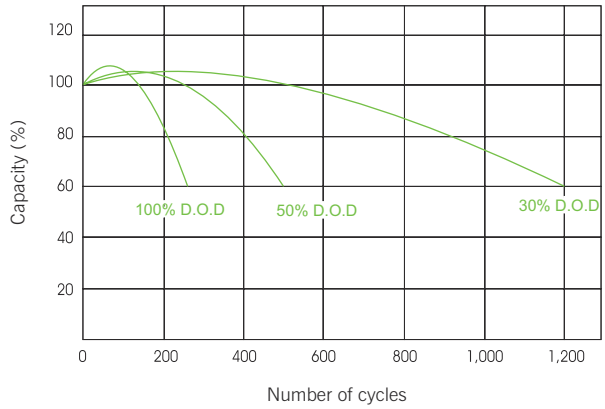
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	571	394	307	191	148	119	70.0	49.1	32.4	18.3	8.11
1.65	542	389	304	185	146	115	69.1	49.0	32.2	18.2	8.10
1.67	540	386	302	173	144	114	68.8	48.6	31.9	18.2	8.09
1.70	506	379	291	162	142	111	68.4	47.7	31.6	18.1	8.07
1.75	461	346	274	156	141	108	67.9	46.4	31.0	18.0	8.06
1.80	423	330	264	151	138	107	66.6	46.1	30.5	17.7	8.04
1.85	339	273	231	141	127	104	64.2	45.0	29.5	16.9	7.62

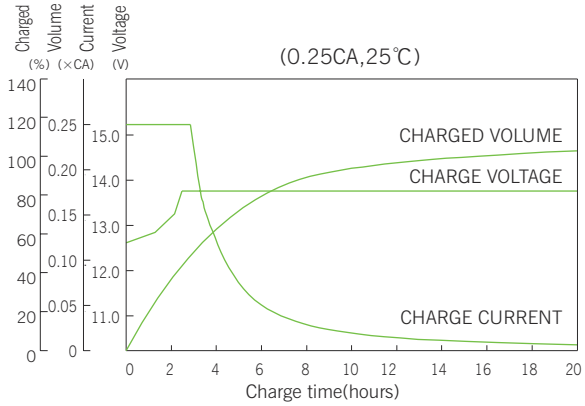
6-FMH-100

The operating environment temperature above 40℃ 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.

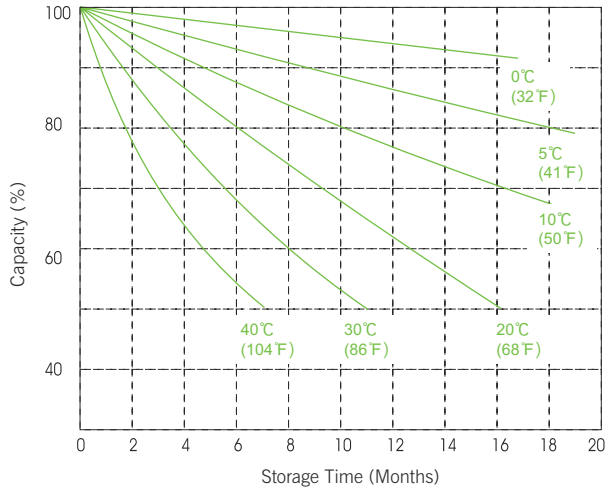
Cycle service life in relation to depth of discharge



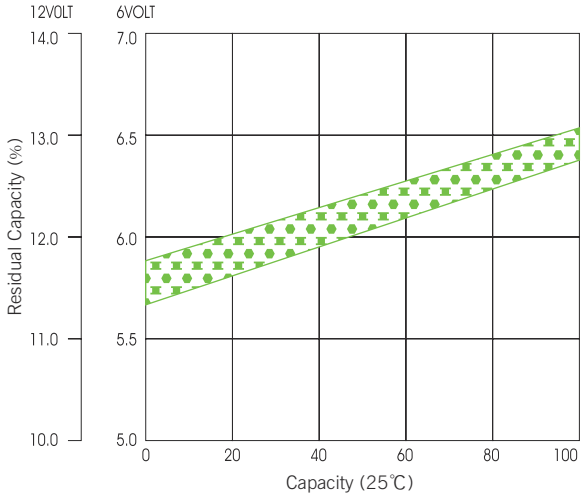
Constant voltage charge characteristic



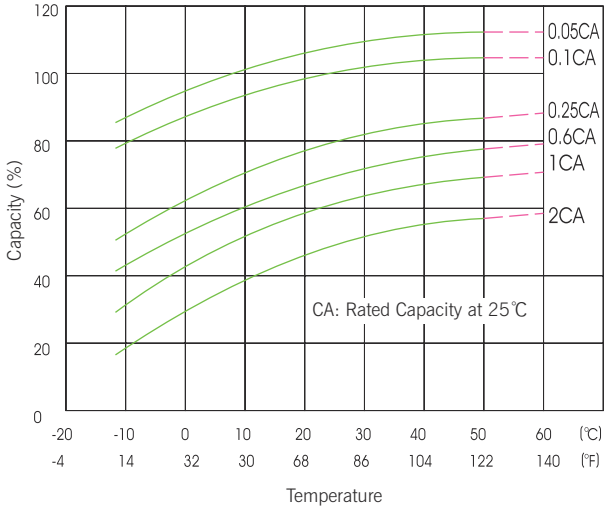
Self-Discharge Characteristics



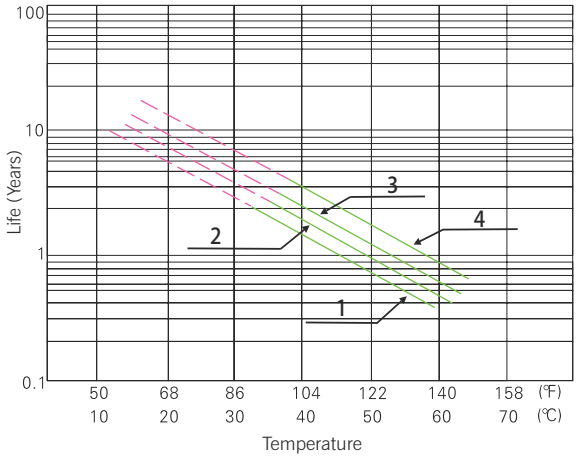
Relationship of OCV and Residual Capacity % (25℃)



Temperature effects on capacity



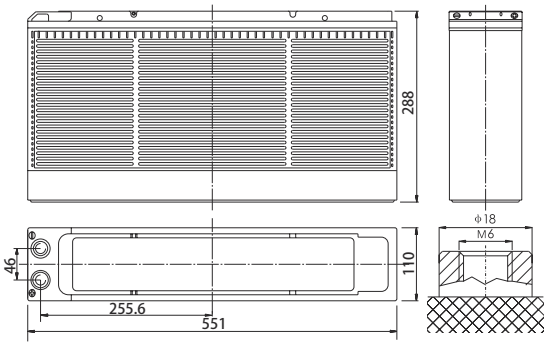
Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FMH-150

FMH Series
For Front Terminal



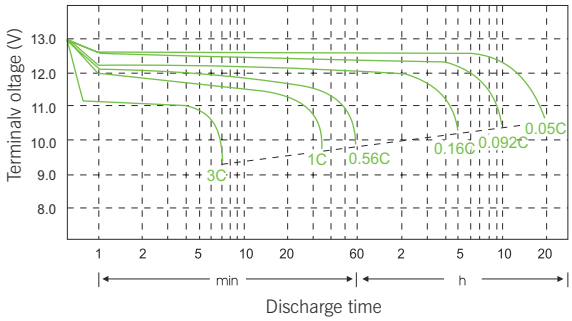
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		150Ah
Dimensions	Total Height (with terminals)	11.34 inches(288mm)
	Height	11.34 inches(288mm)
	length	21.69 inches(551mm)
	width	4.33 inches(110mm)
Weight		Approx.101 Pound(45.9kg)

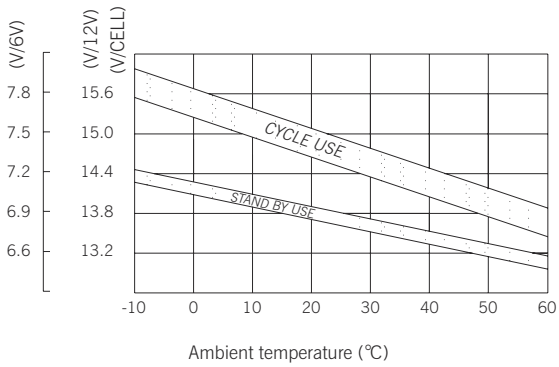
Characteristics

Capacity 77˚F(25℃)	20 hour rate (7.5A)	150 Ah
	10 hour rate (13.8A)	138 Ah
	5 hour rate (24.0A)	120 Ah
	1hour rate (90.0A)	90 Ah
	15Minute Rate (246A)	61.5 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	4.0 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	1000A(5S)	
Terminal	M6	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 45A	
	Voltage 14.4~14.7 V / 77˚F(25℃)	
Float	Voltage 13.5~13.8V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
1.65	461	322	249	157	119	82.2	56.8	38.2	26.3	16.2	6.73
1.70	426	303	239	148	112	80.2	55.0	37.5	25.8	15.7	6.51
1.80	336	255	203	122	106	78.1	53.0	35.9	24.7	15.0	6.25

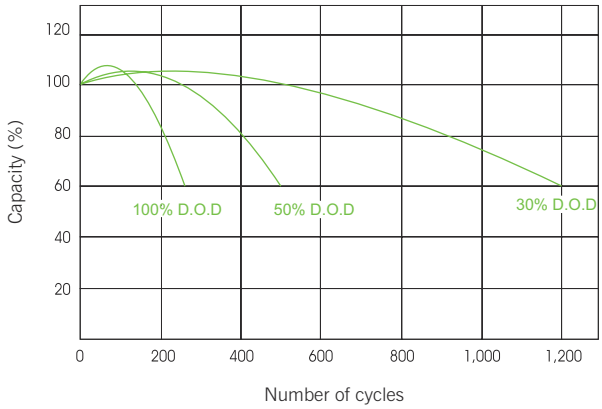
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	821	583	454	291	219	178	106	73.7	48.6	27.8	12.2
1.65	804	576	451	286	217	175	104	73.5	48.4	27.6	12.1
1.67	801	571	450	282	213	174	103	73.4	48.3	27.5	12.0
1.70	757	560	441	276	210	173	102	73.1	48.1	27.2	11.9
1.75	697	524	416	247	208	172	101	72.6	47.9	27.0	11.8
1.80	626	487	391	234	205	171	100	71.6	47.2	26.5	11.6
1.85	501	404	342	214	188	159	95.5	68.7	44.0	25.2	11.4

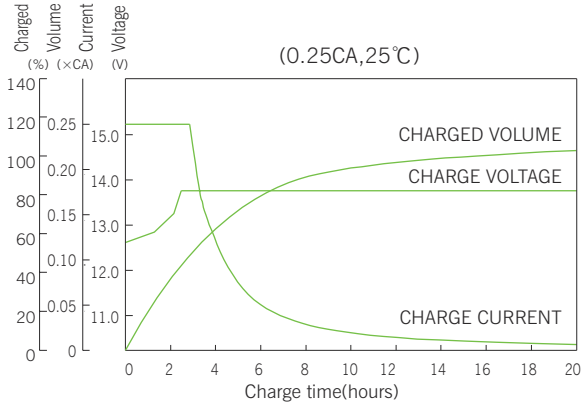
6-FMH-150

The operating environment temperature above 40℃ 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.

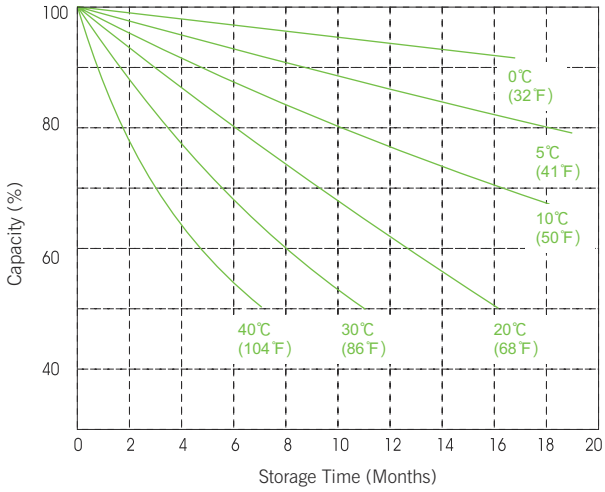
Cycle service life in relation to depth of discharge



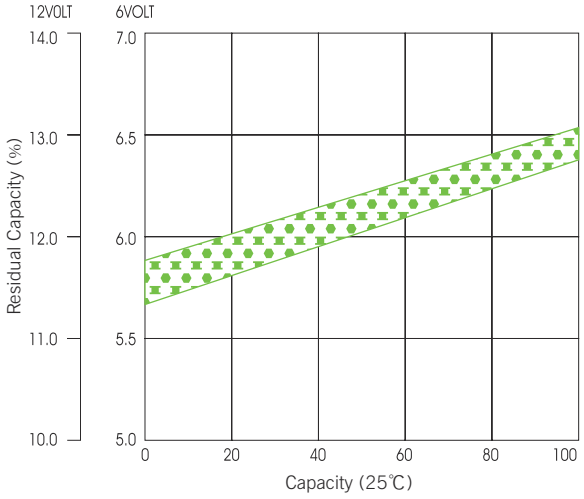
Constant voltage charge characteristic



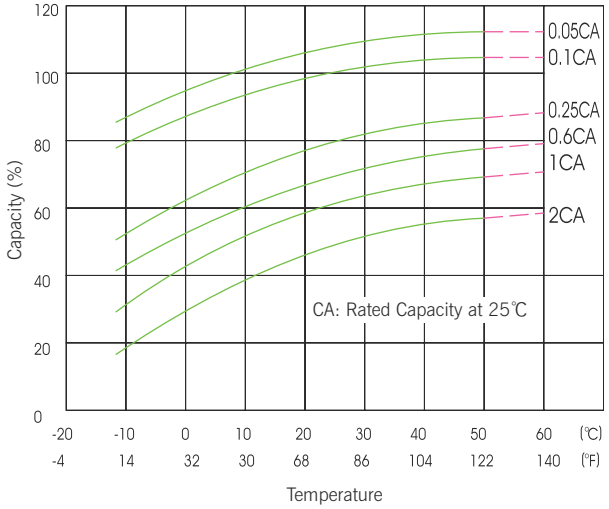
Self-Discharge Characteristics



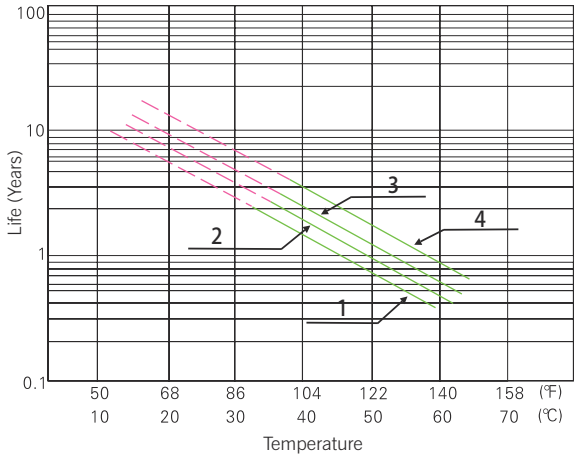
Relationship of OCV and Residual Capacity % (25℃)



Temperature effects on capacity



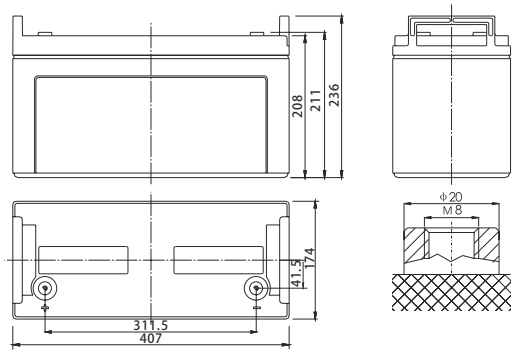
Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FML-100

FML Series
For High Cycle Use



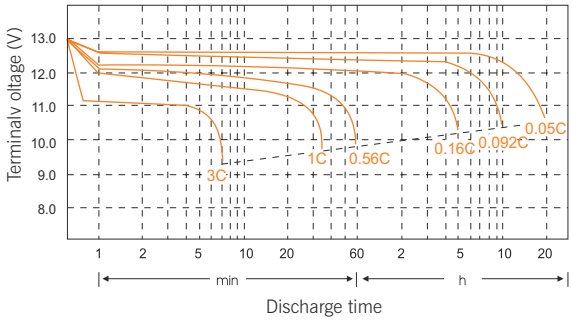
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		100Ah
Dimensions	Total Height (with terminals)	9.29 inches(236mm)
	Height	8.19 inches(208mm)
	length	16.02 inches(407mm)
	width	6.85 inches(174mm)
Weight		Approx.71.7 Pound(32.6kg)

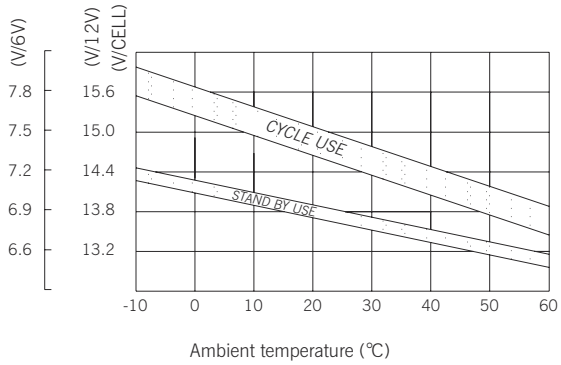
Characteristics

Capacity 77˚F(25℃)	20 hour rate (5.00A)	100 Ah
	10 hour rate (9.20A)	92 Ah
	5 hour rate (16.0A)	80 Ah
	1hour rate (60.0A)	60 Ah
	15Minute Rate (165A)	41.25 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	4.5 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	800A(5S)	
Terminal	M3	
Charge (Constant Voltage) — Cycle	Initial Charging Current less than 30A	
	Voltage 14.4~14.7 V / 77˚F(25℃)	
Charge (Constant Voltage) — Float	Voltage 13.5~13.8V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
1.65	311	217	168	102	80.1	54.5	37.8	26.1	17.5	10.6	4.43
1.70	285	205	157	86.8	75.7	51.9	36.9	25.0	16.9	10.4	4.35
1.80	227	173	137	78.4	71.5	49.2	35.3	23.6	16.0	10.0	4.27

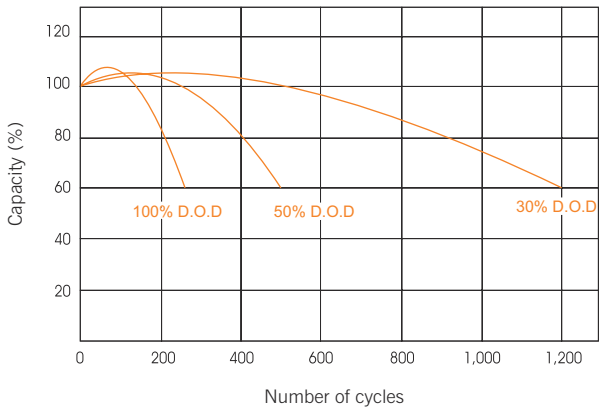
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	571	394	307	191	148	119	70.0	49.1	32.4	18.3	8.11
1.65	542	389	304	185	146	115	69.1	49.0	32.2	18.2	8.10
1.67	540	386	302	173	144	114	68.8	48.6	31.9	18.2	8.09
1.70	506	379	291	162	142	111	68.4	47.7	31.6	18.1	8.07
1.75	461	346	274	156	141	108	67.9	46.4	31.0	18.0	8.06
1.80	423	330	264	151	138	107	66.6	46.1	30.5	17.7	8.04
1.85	339	273	231	141	127	104	64.2	45.0	29.5	16.9	7.62

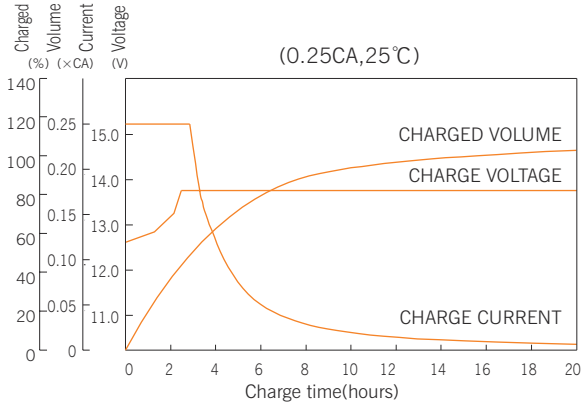
6-FML-100

The operating environment temperature above 40℃ 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.

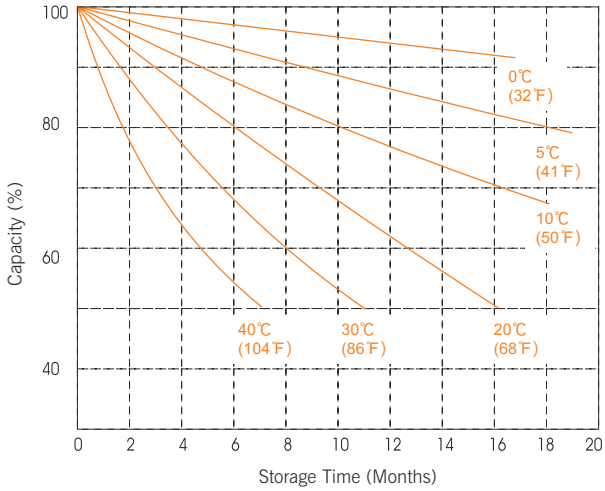
■ Cycle service life in relation to depth of discharge



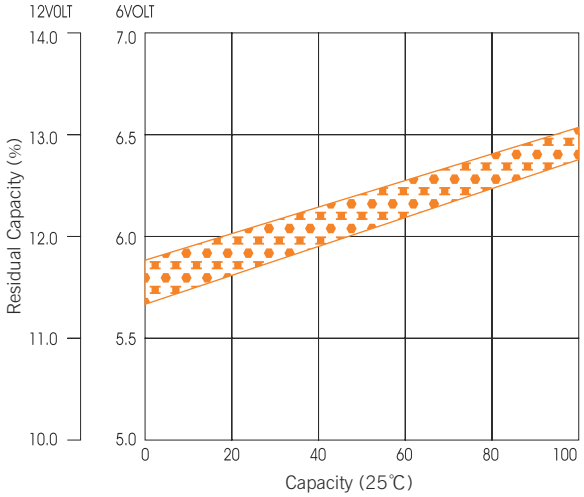
■ Constant voltage charge characteristic



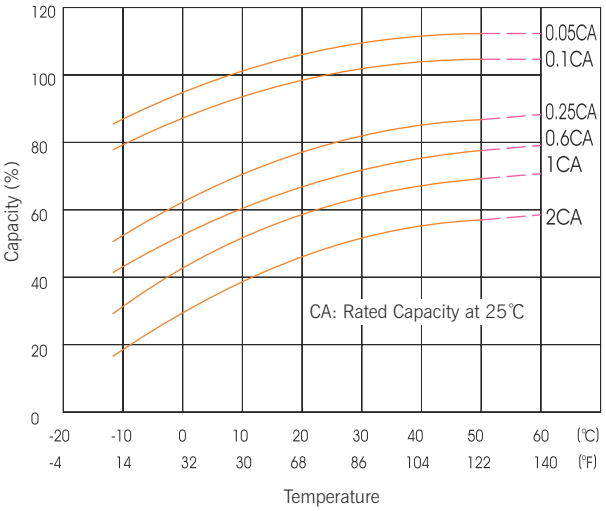
■ Self-Discharge Characteristics



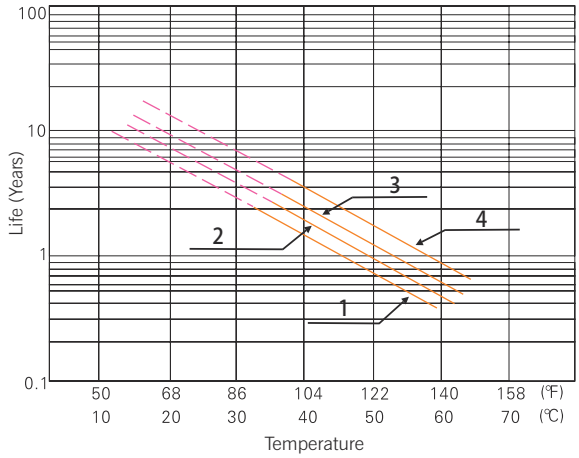
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



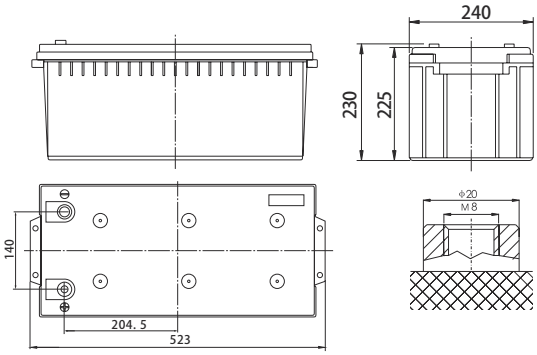
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FML-200

FML Series
For High Cycle Use



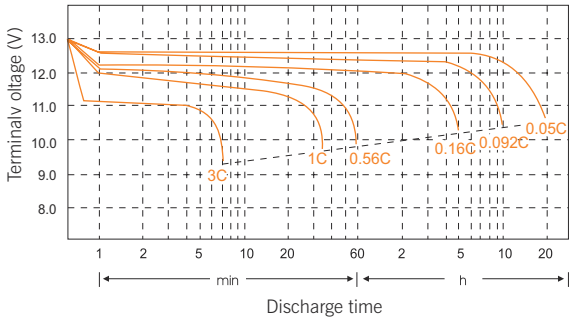
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		200Ah
Dimensions	Total Height (with terminals)	9.06 inches(230mm)
	Height	8.86 inches(225mm)
	length	20.59 inches(523mm)
	width	9.45 inches(240mm)
Weight		Approx.137.5 Pound(62.5kg)

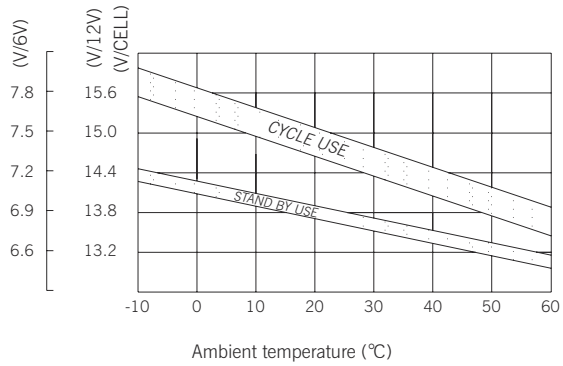
Characteristics

Capacity 77˚F(25℃)	20 hour rate (10.0A)	200 Ah
	10 hour rate (18.40A)	184 Ah
	5 hour rate (32.0A)	160 Ah
	1hour rate (120.0A)	120 Ah
	15Minute Rate (328A)	82.0 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	3.0 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	1333A(5S)	
Terminal	M3	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 30A	
	Voltage 14.4~14.7 V / 77˚F(25℃)	
Float	Voltage 13.5~13.8V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	60Min	2H	3H	4H	5H	10H	20H
1.65	553	386	299	189	143	109	74.3	51.5	34.2	20.3	8.90
1.70	511	364	286	177	134	103	72.2	50.0	33.5	19.5	8.64
1.80	403	305	244	146	128	98	68.9	48.3	32.1	18.4	8.35

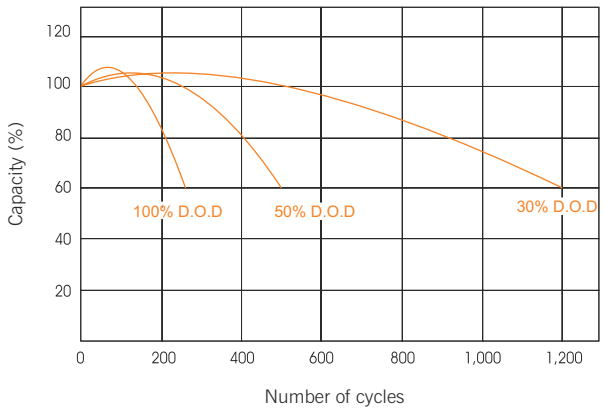
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	985	697	545	349	263	231	138	95.8	63.2	37.3	15.8
1.65	965	691	541	343	260	228	136	94.6	63.0	36.8	15.6
1.67	961	685	540	338	256	223	135	94.0	62.8	36.2	15.5
1.70	908	672	529	331	252	219	134	93.2	62.6	36.0	15.4
1.75	836	629	499	296	250	216	133	92.8	62.0	35.1	15.3
1.80	751	584	469	281	246	211	130	92.1	61.4	34.4	15.1
1.85	601	485	410	257	226	207	124	89.3	57.2	32.8	14.8

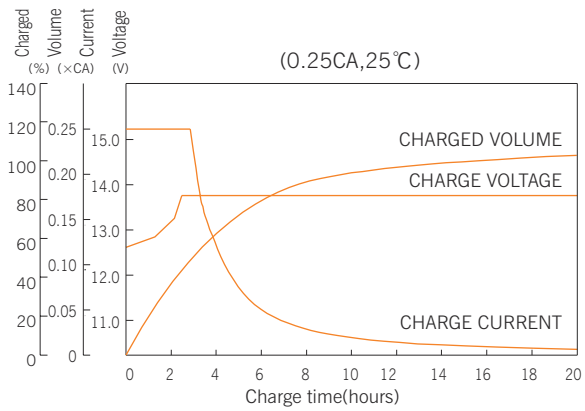
6-FML-200

The operating environment temperature above 40℃ 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.

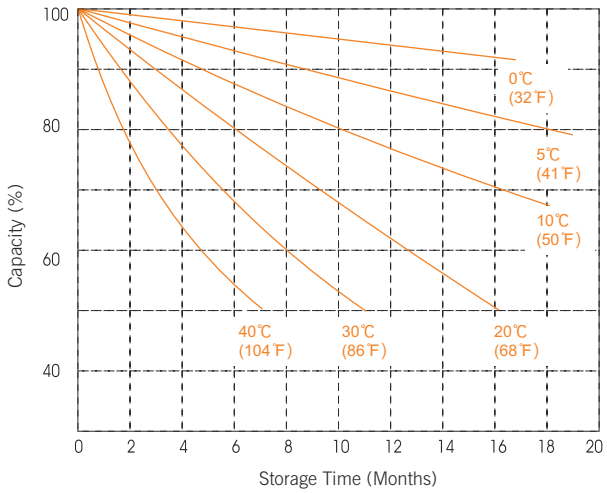
■ Cycle service life in relation to depth of discharge



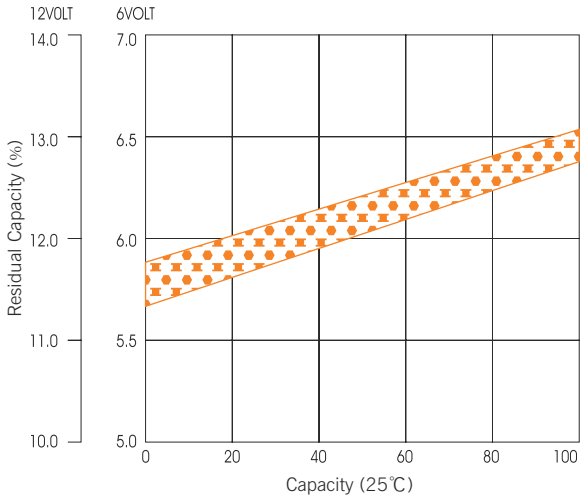
■ Constant voltage charge characteristic



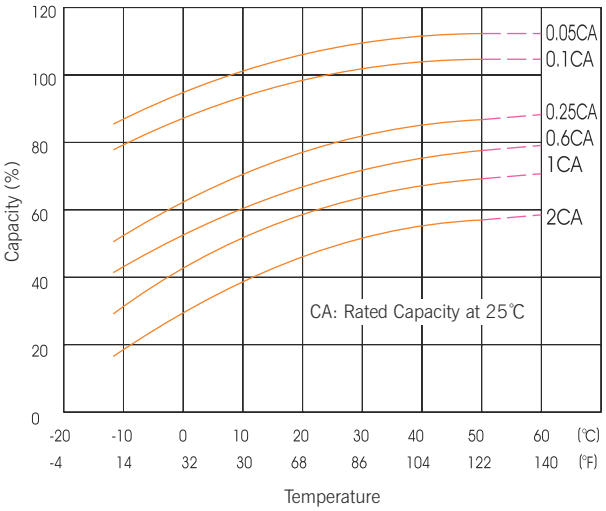
■ Self-Discharge Characteristics



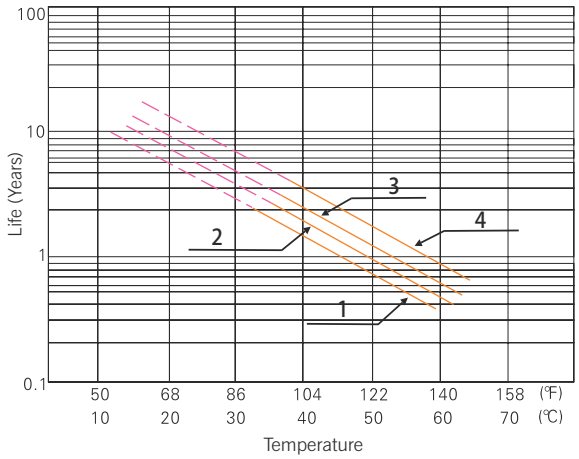
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



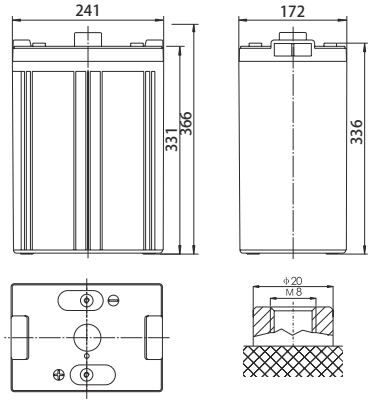
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

GFM500

GFM
For Long Life Standby Use



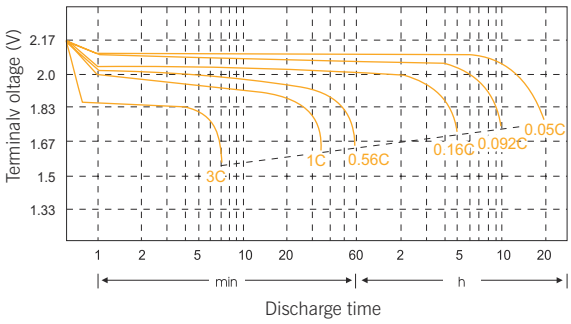
Specifications

Nominal Voltage		2V
Rated Capacity (20 hour rate)		500Ah
Dimensions	Total Height (with terminals)	14.41 inches(366mm)
	Height	13.03 inches(331mm)
	length	9.49 inches(241mm)
	width	6.77 inches(172mm)
Weight		Approx.63.8 Pound(29.0kg)

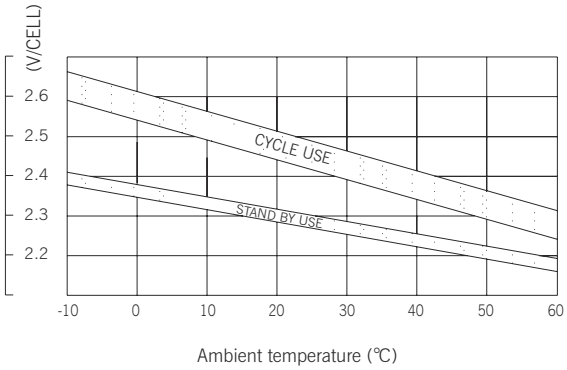
Characteristics

Capacity 77˚F(25℃)	10 hour rate (50.0A)	500 Ah
	5 hour rate (90A)	450 Ah
	1hour rate (300A)	300 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	0.5 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	3500A(5S)	
Terminal	M3	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 100A	
	Voltage 2.40~2.45 V / 77˚F(25℃)	
Float	Voltage 2.23~2.27V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	1082	841	691	467	275	128	97.1	52.9	28.6
1.70	966	769	650	439	255	125	93.7	51.5	27.5
1.80	852	709	605	399	234	121	89.7	50.0	26.6

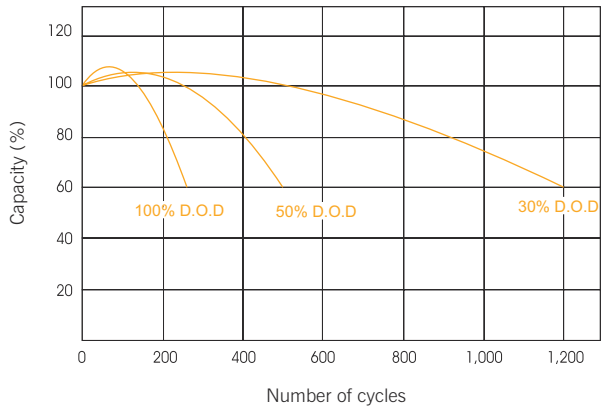
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	1888	1506	1250	850	590	265	179	100	53.0
1.70	1718	1420	1201	820	554	263	175	99.0	52.0
1.80	1589	1355	1163	769	516	260	171	98.0	51.0

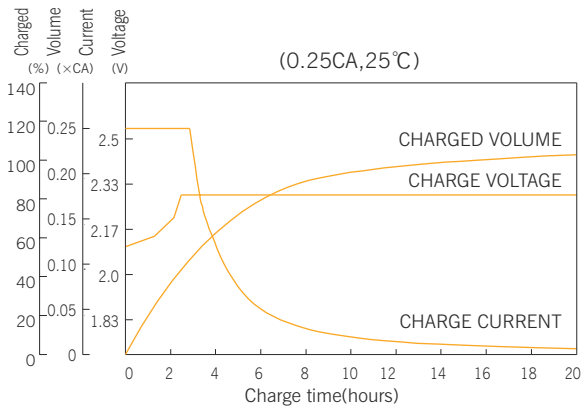
GFM500

The operating environment temperature above 40℃ 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.

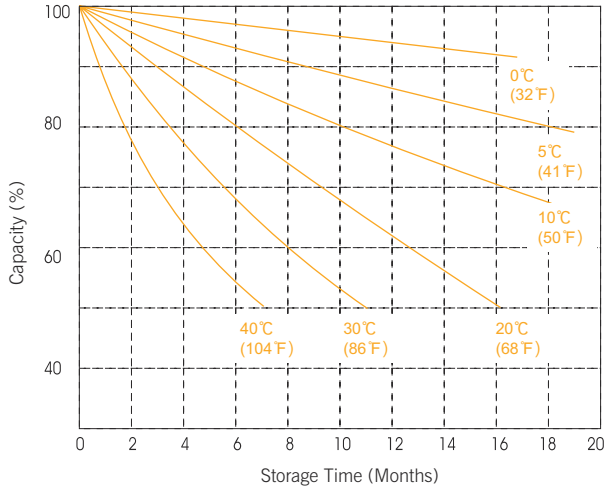
Cycle service life in relation to depth of discharge



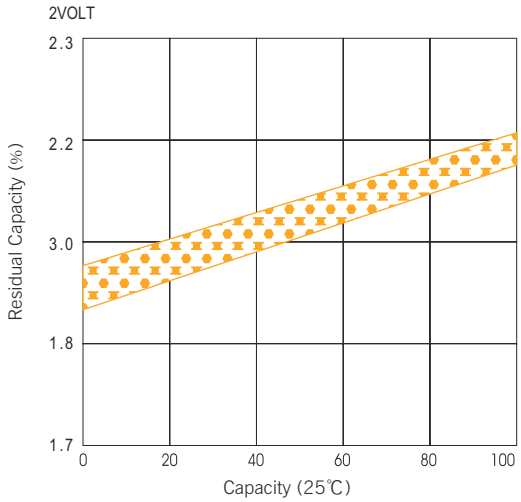
Constant voltage charge characteristic



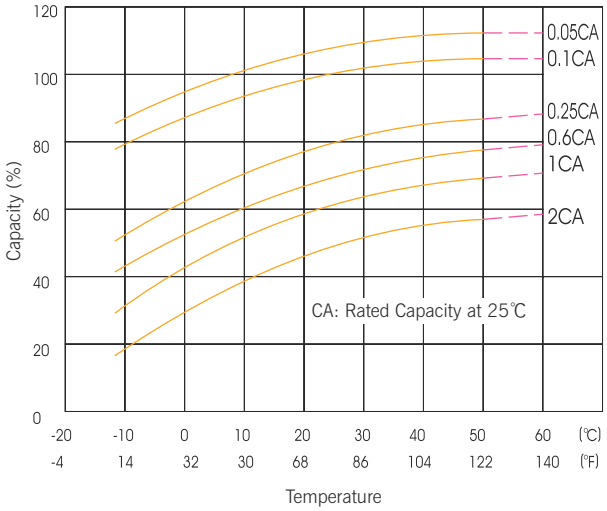
Self-Discharge Characteristics



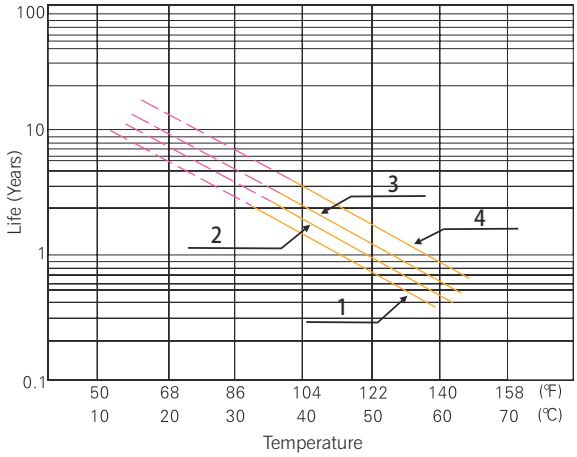
Relationship of OCV and Residual Capacity % (25℃)



Temperature effects on capacity



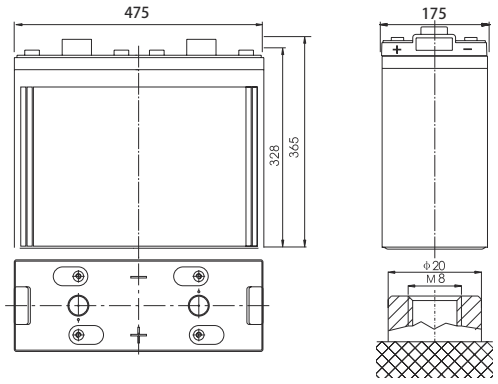
Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

GFM1000

GFM
For Long Life Standby Use



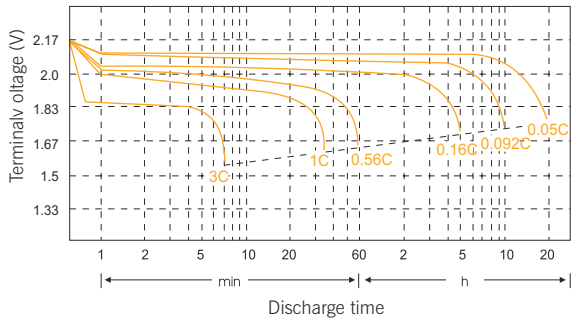
Specifications

Nominal Voltage		2V
Rated Capacity (20 hour rate)		1000Ah
Dimensions	Total Height (with terminals)	14.38 inches(365mm)
	Height	12.92 inches(328mm)
	length	18.71 inches(475mm)
	width	6.89 inches(175mm)
Weight		Approx.123.86 Pound(56.3kg)

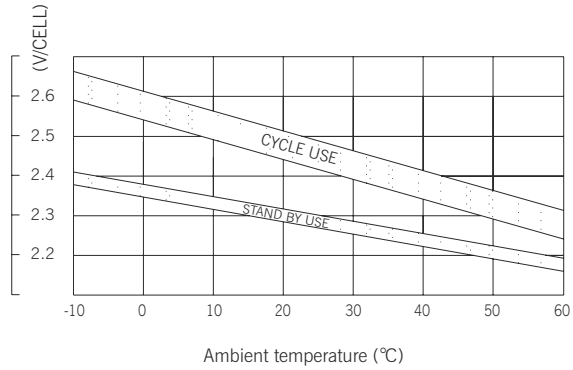
Characteristics

Capacity 77˚F(25℃)	10 hour rate (100A)	1000 Ah
	5 hour rate (180A)	900 Ah
	1hour rate (600A)	600 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	0.2 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	7000A(5S)	
Terminal	M3	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 200A	
	Voltage 2.40~2.45 V / 77˚F(25℃)	
Float	Voltage 2.23~2.27V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	2163	1682	1383	935	550	256	195	106	57.1
1.70	1933	1538	1299	878	510	250	187	103	55.1
1.80	1704	1417	1210	799	468	242	180	100	53.2

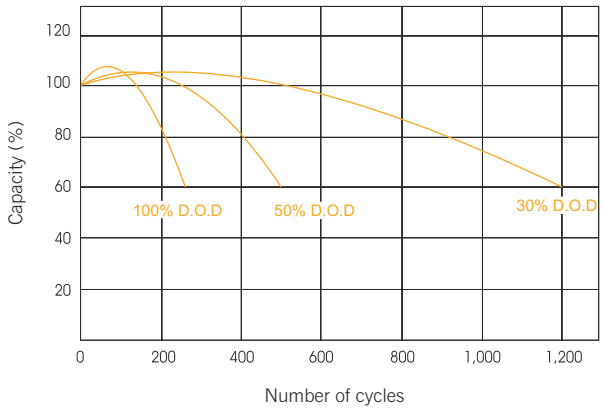
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	3774	3012	2500	1700	1180	530	358	200	106
1.70	3436	2840	2402	1640	1108	524	350	198	104
1.80	3178	2710	2326	1538	1034	519	344	196	102

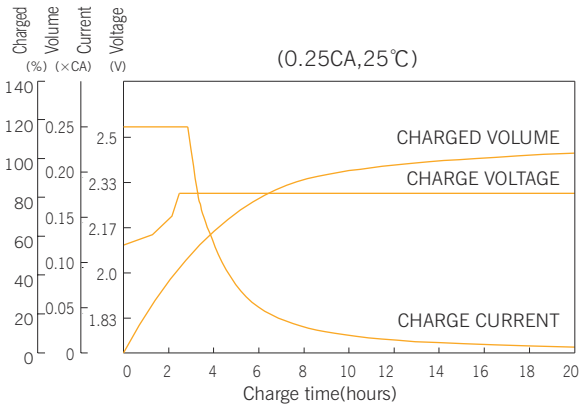
GFM1000

The operating environment temperature above 40℃ 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.

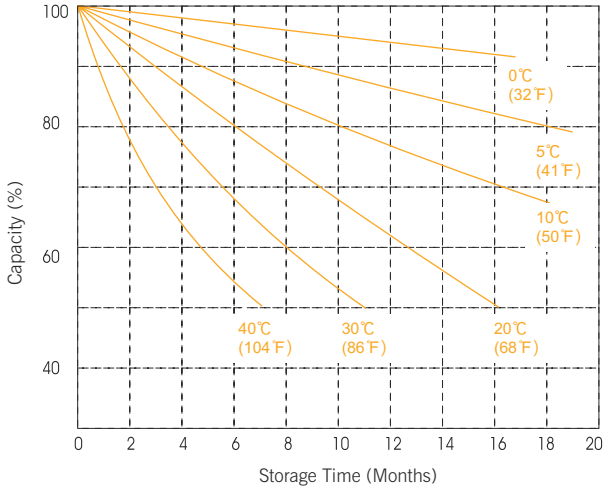
■ Cycle service life in relation to depth of discharge



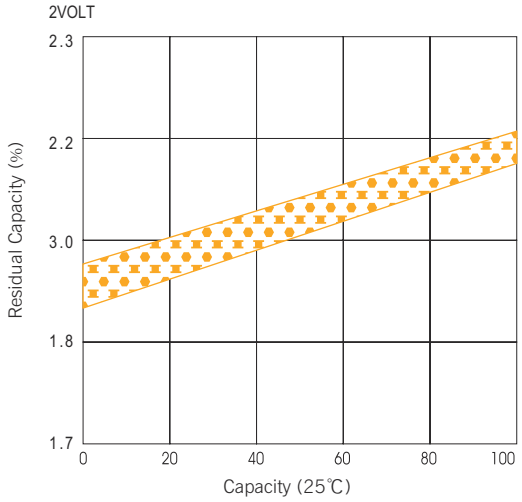
■ Constant voltage charge characteristic



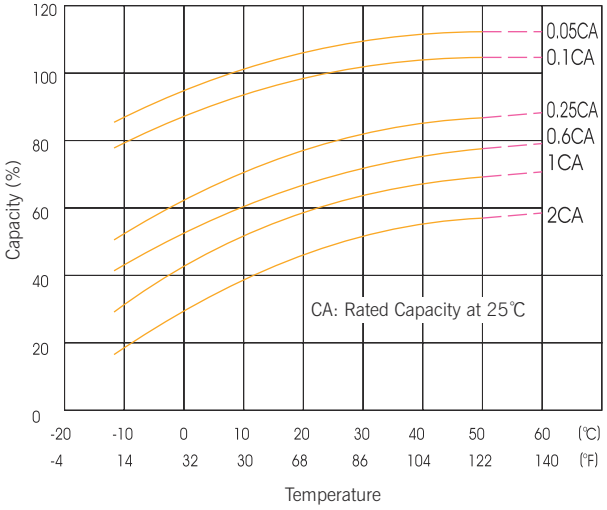
■ Self-Discharge Characteristics



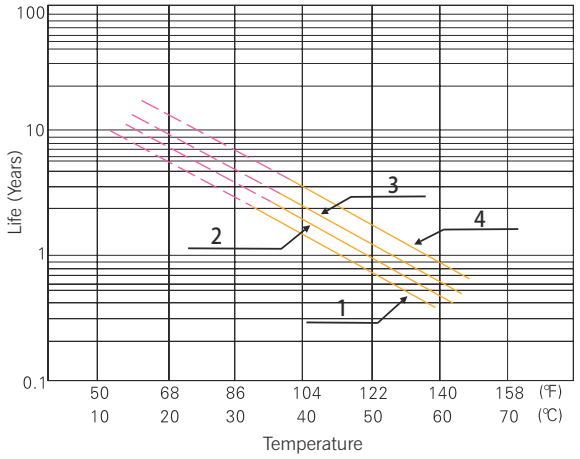
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



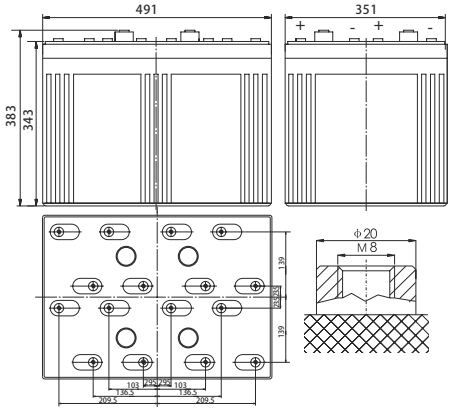
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

GFM2000

GFM
For Long Life Standby Use



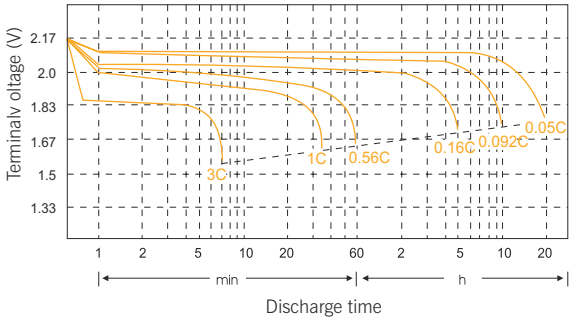
Specifications

Nominal Voltage		2V
Rated Capacity (20 hour rate)		2000Ah
Dimensions	Total Height (with terminals)	15.08inches(383mm)
	Height	13.05 inches(343mm)
	length	19.33 inches(491mm)
	width	13.82 inches(351mm)
Weight		Approx.269.5 Pound(122.5kg)

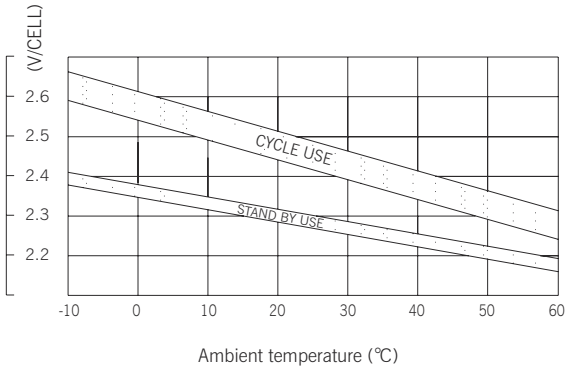
Characteristics

Capacity 77˚F(25℃)	10 hour rate (200A)	2000 Ah
	5 hour rate (360A)	1800 Ah
	1hour rate (1200A)	1200 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	0.12 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	11000A(5S)	
Terminal	M3	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 400A	
	Voltage 2.40~2.45 V / 77˚F(25℃)	
Float	Voltage 2.23~2.27V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	4326	3363	2765	1869	1100	513	389	211	114
1.70	3865	3077	2598	1757	1019	500	375	206	110
1.80	3408	2835	2419	1598	936	484	360	200	107

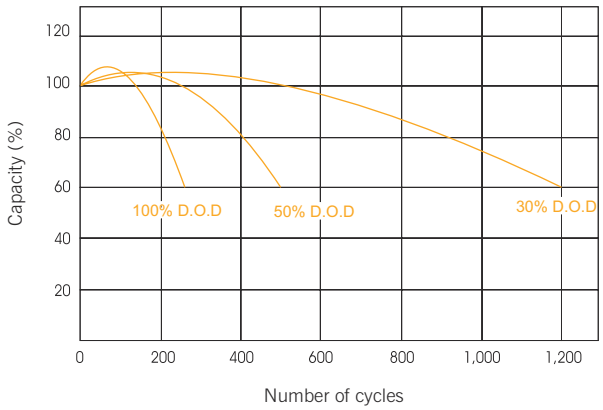
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	7548	6024	5000	3400	2360	1060	716	400	212
1.70	6872	5680	4804	3280	2216	1048	700	396	208
1.80	6356	5420	4652	3076	2068	1038	688	392	205

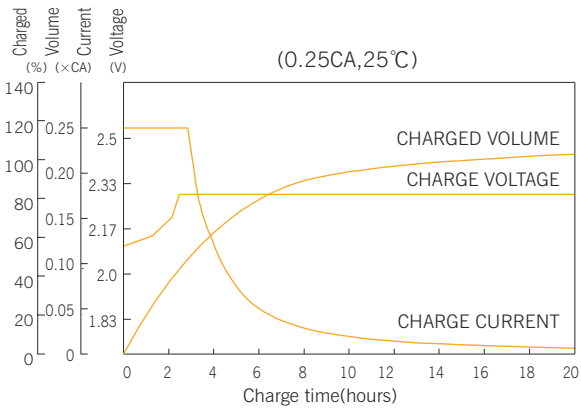
GFM2000

The operating environment temperature above 40℃ 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.

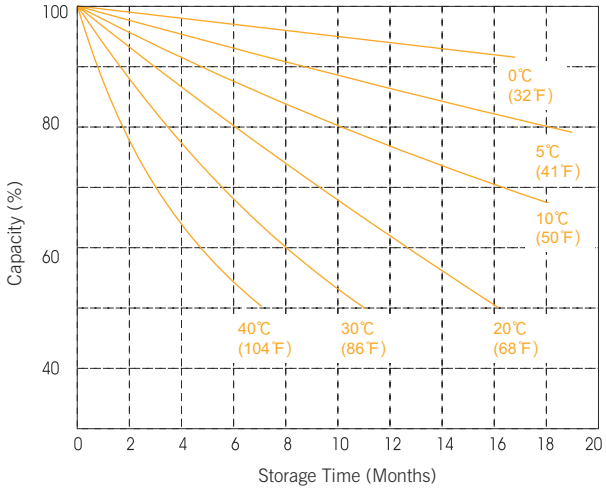
■ Cycle service life in relation to depth of discharge



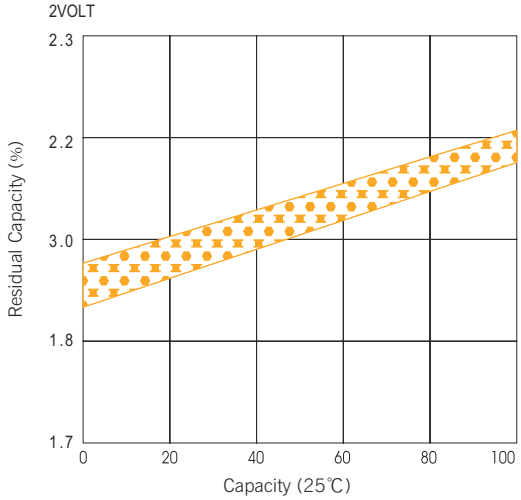
■ Constant voltage charge characteristic



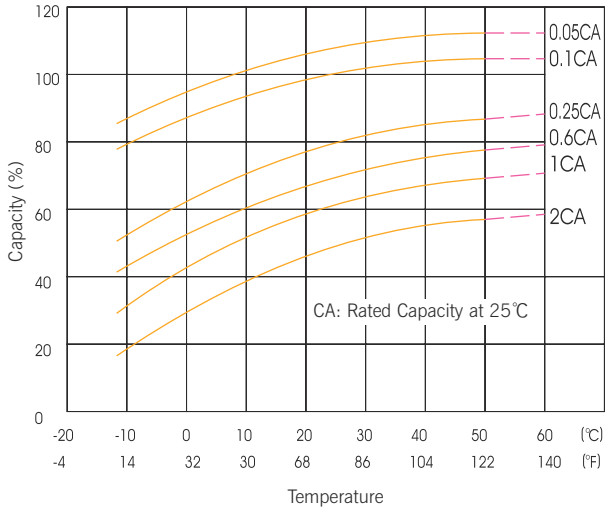
■ Self-Discharge Characteristics



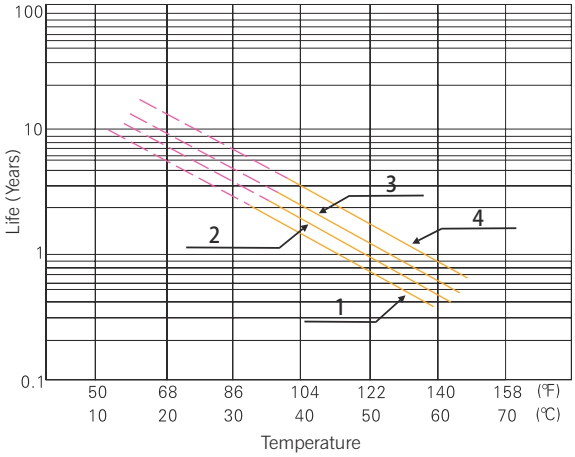
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



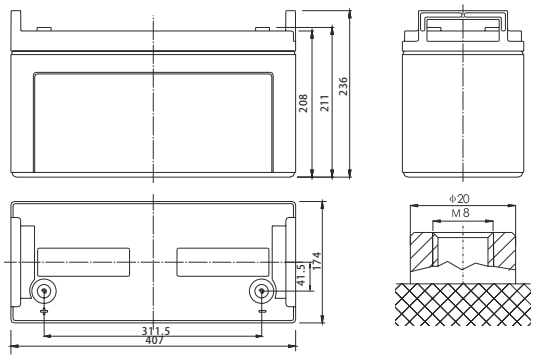
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-100T

Solar Energy
Deep Circulation Series



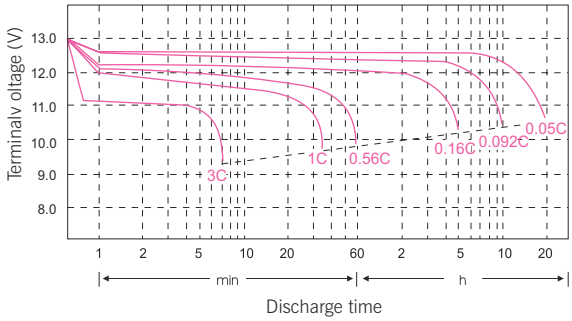
■ Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		100Ah
Dimensions	Total Height (with terminals)	9.29 inches(236mm)
	Height	8.19 inches(208mm)
	length	16.02 inches(407mm)
	width	6.85 inches(174mm)
Weight		Approx.71.5 Pound(32.5kg)

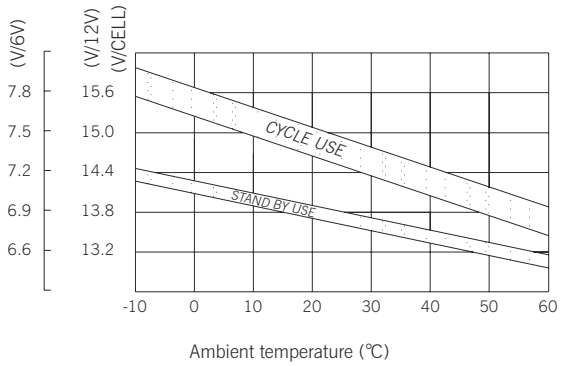
■ Characteristics

Capacity 77˚F(25℃)	20 hour rate (5.0A)	100 Ah
	10 hour rate (9.20A)	92 Ah
	5 hour rate (16.0A)	80 Ah
	1hour rate (60.0A)	60 Ah
	15Minute Rate (164A)	41 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	5.0 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	800A(5S)	
Terminal	M2	
Charge (Constant Voltage) — Cycle	Initial Charging Current less than 30A	
	Voltage 14.4~14.7 V / 77˚F(25℃)	
Charge (Constant Voltage) — Float	Voltage 13.5~13.8V / 77˚F(25℃)	

■ Discharge Curves 77˚F(25℃)



■ Relationship between charge voltage and temperature



■ Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	10Hour	24Hour
1.65	311	217	168	102	80.1	54.5	37.8	26.1	17.5	10.6	4.43
1.70	285	205	157	86.8	75.7	51.9	36.9	25.0	16.9	10.4	4.35
1.80	227	173	137	78.4	71.5	49.2	35.3	23.6	16.0	10.0	4.27

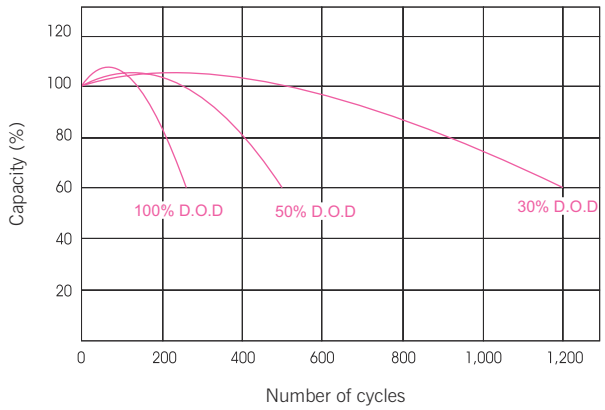
■ Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	571	394	307	191	148	119	70.0	49.1	32.4	18.3	8.11
1.65	542	389	304	185	146	115	69.1	49.0	32.2	18.2	8.10
1.67	540	386	302	173	144	114	68.8	48.6	31.9	18.2	8.09
1.70	506	379	291	162	142	111	68.4	47.7	31.6	18.1	8.07
1.75	461	346	274	156	141	108	67.9	46.4	31.0	18.0	8.06
1.80	423	330	264	151	138	107	66.6	46.1	30.5	17.7	8.04
1.85	339	273	231	141	127	104	64.2	45.0	29.5	16.9	7.62

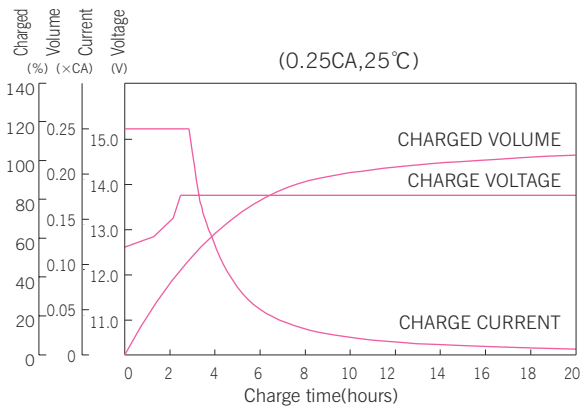
6-FM-100T

The operating environment temperature above 40℃ 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.

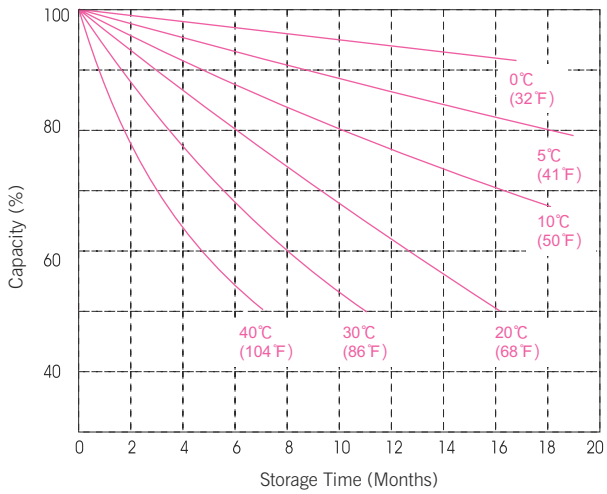
■ Cycle service life in relation to depth of discharge



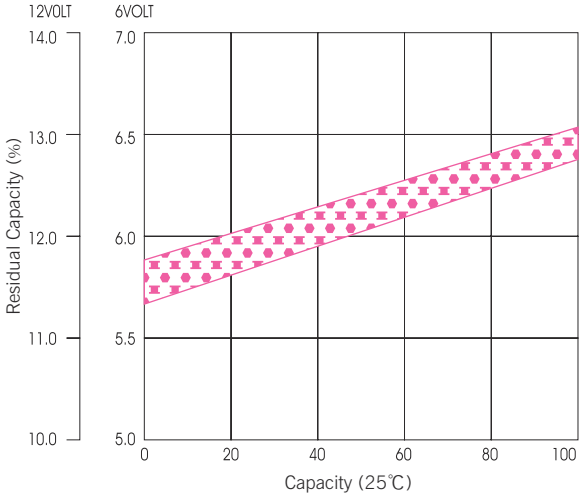
■ Constant voltage charge characteristic



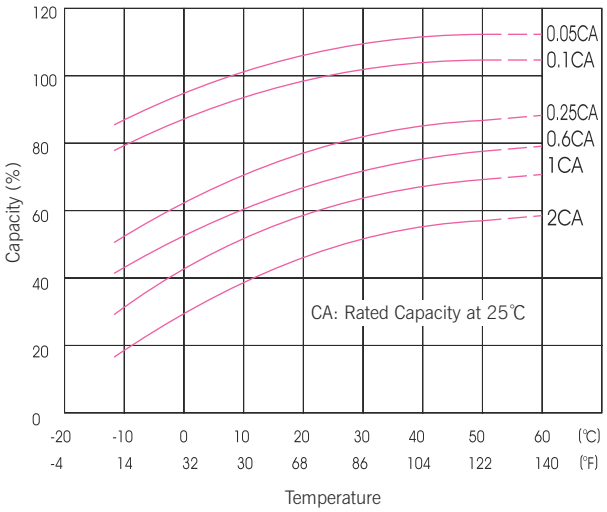
■ Self-Discharge Characteristics



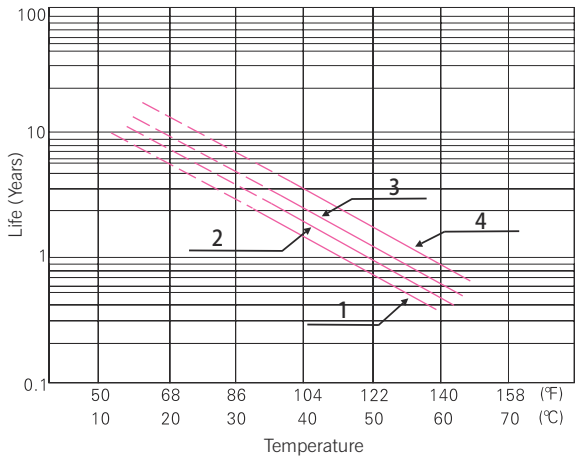
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



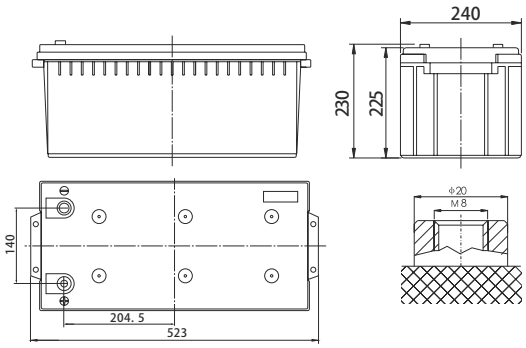
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-200T

Solar Energy
Deep Circulation Series



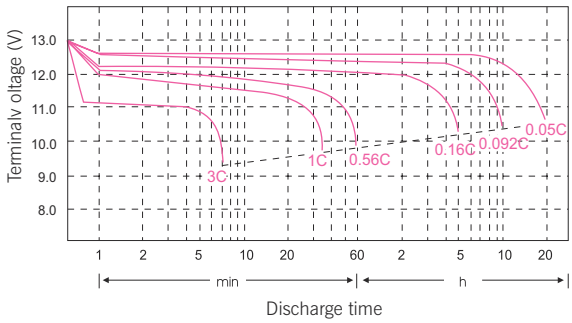
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		200Ah
Dimensions	Total Height (with terminals)	9.06 inches(230mm)
	Height	8.86 inches(225mm)
	length	20.59 inches(523mm)
	width	9.45 inches(240mm)
Weight		Approx.132.66 Pound(60.3kg)

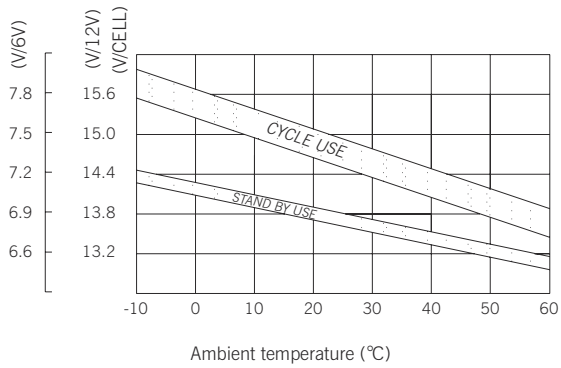
Characteristics

Capacity 77˚F(25℃)	20 hour rate (10.0A)	200 Ah
	10 hour rate (18.4A)	184 Ah
	5 hour rate (32.0A)	160 Ah
	1hour rate (120.0A)	120 Ah
	15Minute Rate (328A)	82.0 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	3.0 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	1333A(5S)	
Terminal	M3	
Charge (Constant Voltage) — Cycle	Initial Charging Current less than 30A	
	Voltage 14.4~14.7 V / 77˚F(25℃)	
Charge (Constant Voltage) — Float	Voltage 13.5~13.8V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	10Hour	24Hour
1.65	553	386	299	189	143	109	74.3	51.5	34.2	22.1	8.90
1.70	511	364	286	177	134	103	72.2	50.0	33.5	21.2	8.64
1.80	403	305	244	146	128	98	68.9	48.3	32.1	20.0	8.35

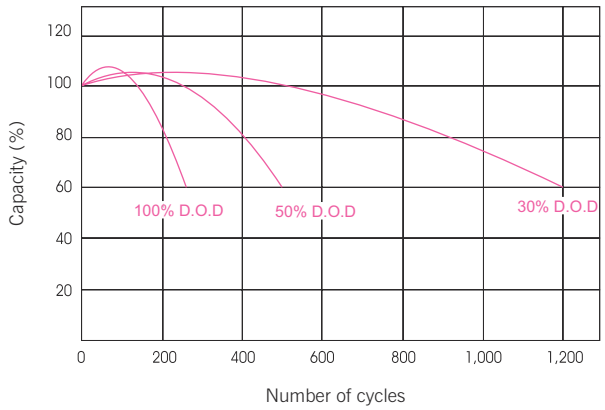
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	985	697	545	349	263	231	138.0	95.8	63.2	37.3	15.8
1.65	965	691	541	343	260	228	136.0	94.6	63.0	36.8	15.6
1.67	961	685	540	338	256	223	135.0	94.0	62.8	36.2	15.5
1.70	908	672	529	331	252	219	134.0	93.2	62.6	36.0	15.4
1.75	836	629	499	296	250	216	133.0	92.8	62.0	35.1	15.3
1.80	751	584	469	281	246	211	130.0	92.1	61.4	34.4	15.1
1.85	601	485	410	257	226	207	124.0	89.3	57.2	32.8	14.8

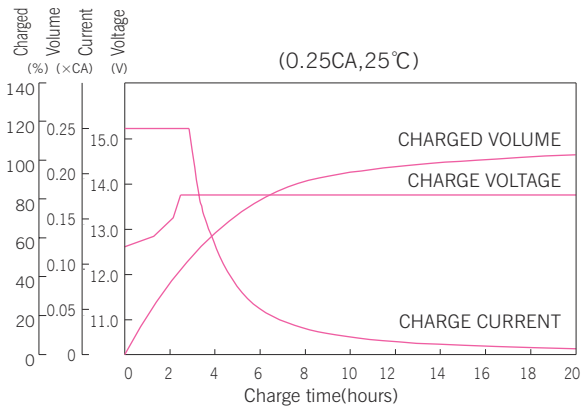
6-FM-200T

The operating environment temperature above 40℃ 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.

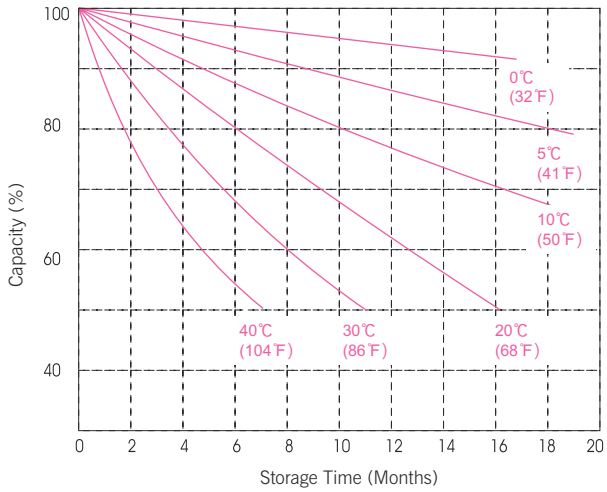
■ Cycle service life in relation to depth of discharge



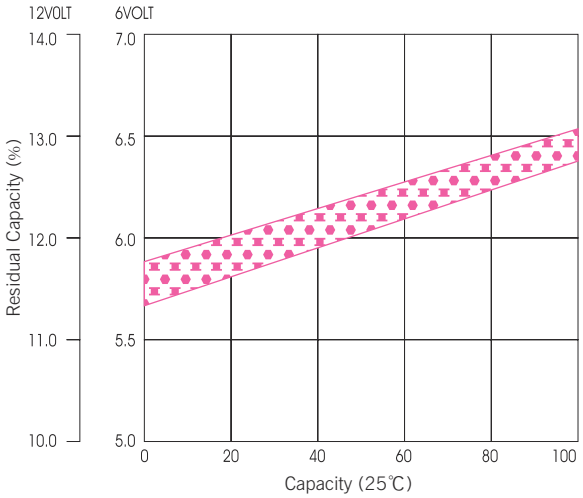
■ Constant voltage charge characteristic



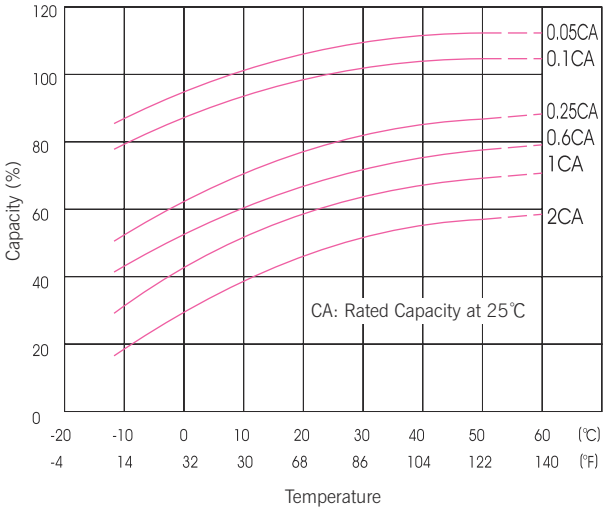
■ Self-Discharge Characteristics



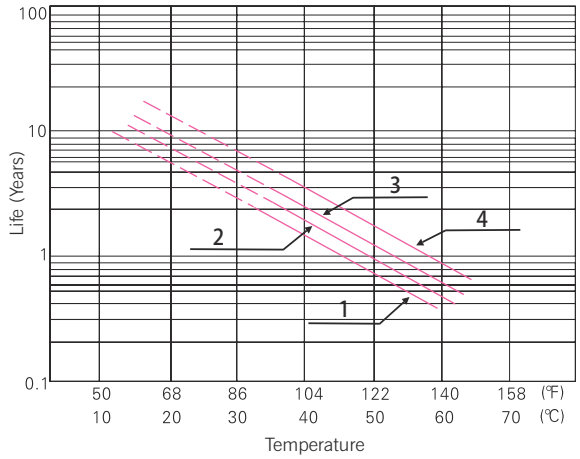
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



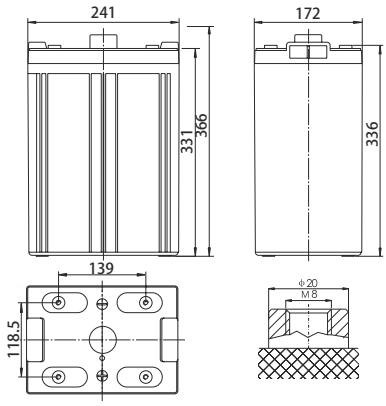
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

GFM500T

Solar Energy
Deep Circulation Series



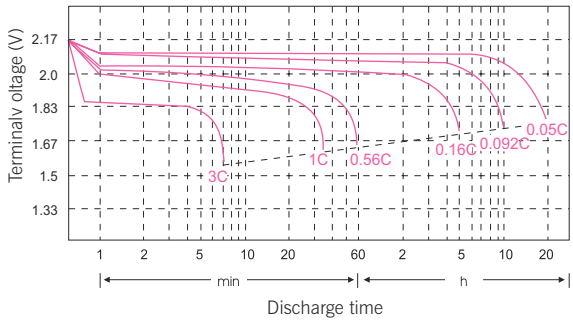
■ Specifications

Nominal Voltage		2V
Rated Capacity (20 hour rate)		500Ah
Dimensions	Total Height (with terminals)	14.41 inches(366mm)
	Height	13.03 inches(331mm)
	length	9.49 inches(241mm)
	width	6.77 inches(172mm)
Weight		Approx.63.8 Pound(29.0kg)

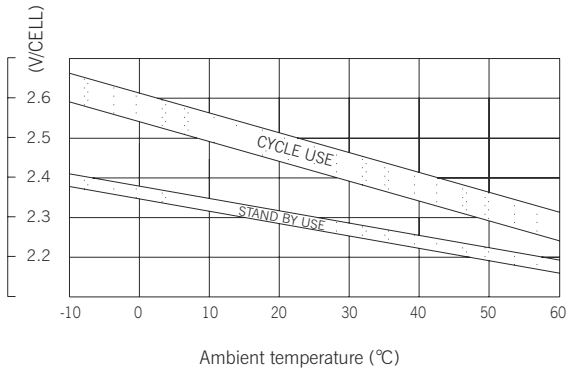
■ Characteristics

Capacity 77˚F(25℃)	10 hour rate (50.0A)	500 Ah
	5 hour rate (90A)	450 Ah
	1hour rate (300A)	300 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	0.5 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	3500A(5S)	
Terminal	M3	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 100A	
	Voltage 2.40~2.45 V / 77˚F(25℃)	
Float	Voltage 2.23~2.27V / 77˚F(25℃)	

■ Discharge Curves 77˚F(25℃)



■ Relationship between charge voltage and temperature



■ Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	1082	841	691	467	275	128	97.1	52.9	28.6
1.70	966	769	650	439	255	125	93.7	51.5	27.5
1.80	852	709	605	399	234	121	89.7	50.0	26.6

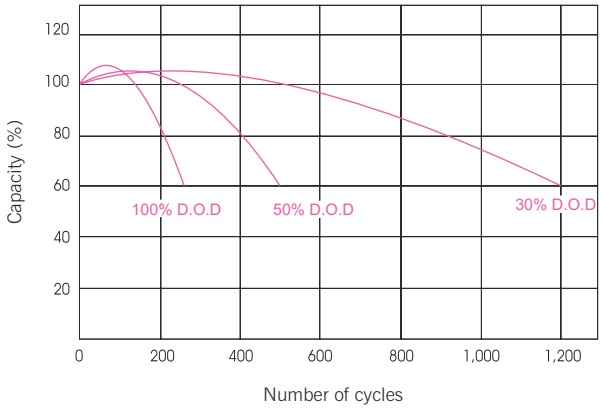
■ Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	1888	1506	1250	850	590	265	179	100	53.0
1.70	1718	1420	1201	820	554	263	175	99.0	52.0
1.80	1589	1355	1163	769	516	260	171	98.0	51.0

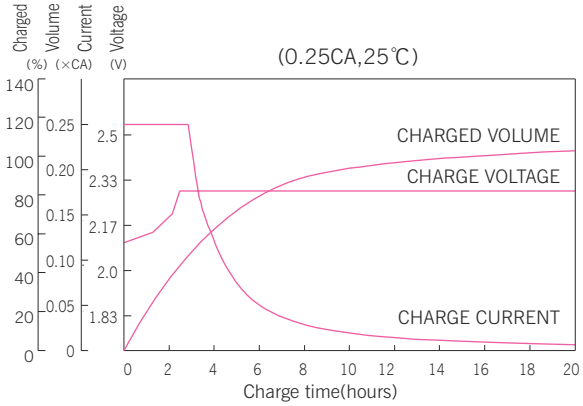
GFM500T

The operating environment temperature above 40℃ 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.

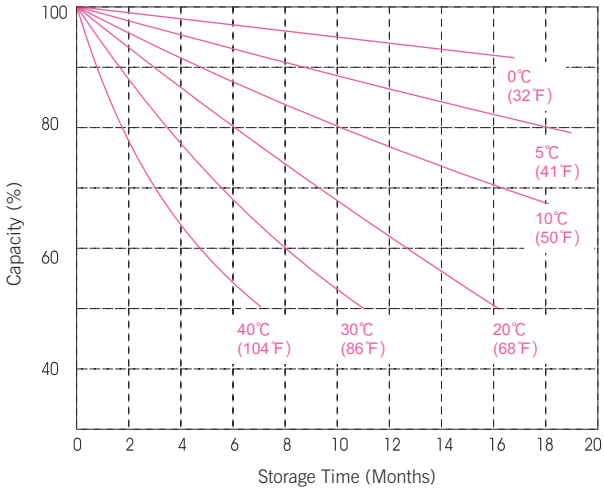
■ Cycle service life in relation to depth of discharge



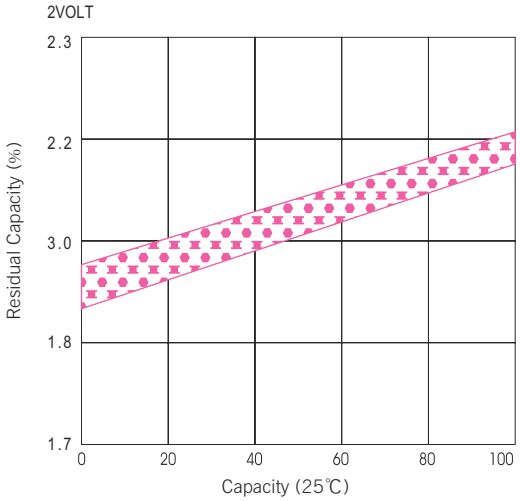
■ Constant voltage charge characteristic



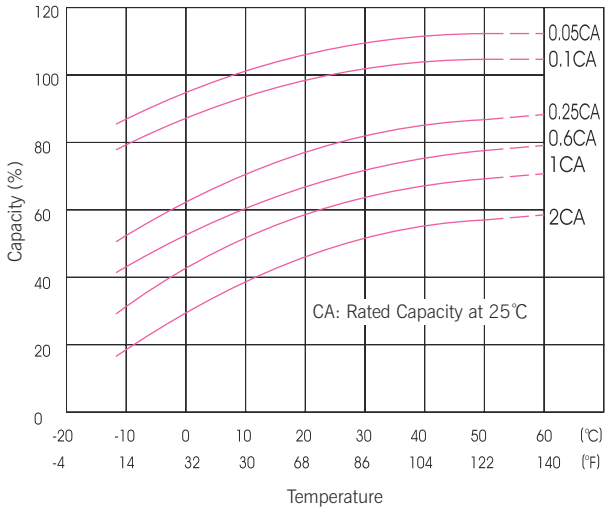
■ Self-Discharge Characteristics



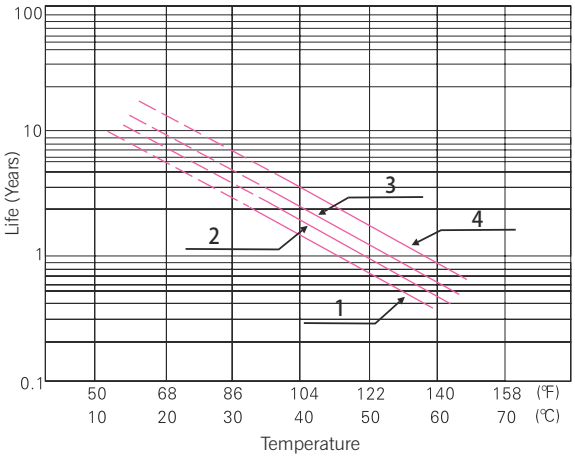
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



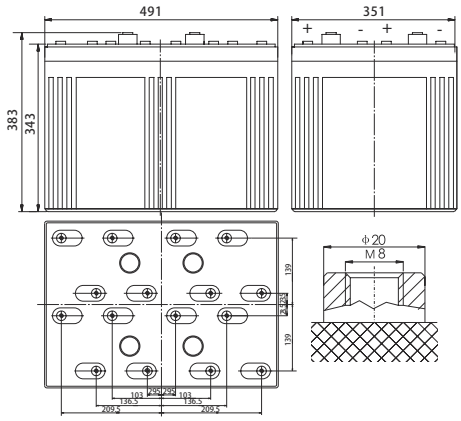
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

GFM2000T

Solar Energy
Deep Circulation Series



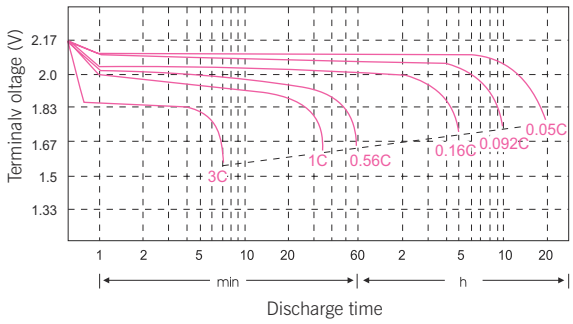
Specifications

Nominal Voltage		2V
Rated Capacity (20 hour rate)		2000Ah
Dimensions	Total Height (with terminals)	15.08 inches(383mm)
	Height	13.05 inches(343mm)
	length	19.33 inches(491mm)
	width	13.82 inches(351mm)
Weight		Approx.270.6 Pound(123kg)

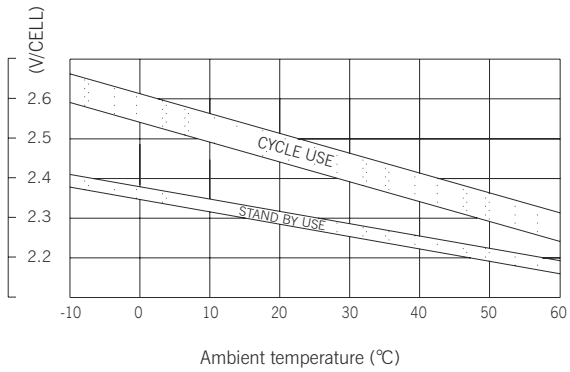
Characteristics

Capacity 77˚F(25℃)	10 hour rate (200A)	2000 Ah
	5 hour rate (360A)	1800 Ah
	1hour rate (1200A)	1200 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	0.12 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	11000A(5S)	
Terminal	M3	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 400A	
	Voltage 2.40~2.45 V / 77˚F(25℃)	
Float	Voltage 2.23~2.27V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	4326	3363	2765	1869	1100	513	389	211	114
1.70	3865	3077	2598	1757	1019	500	375	206	110
1.80	3408	2835	2419	1598	936	484	360	200	107

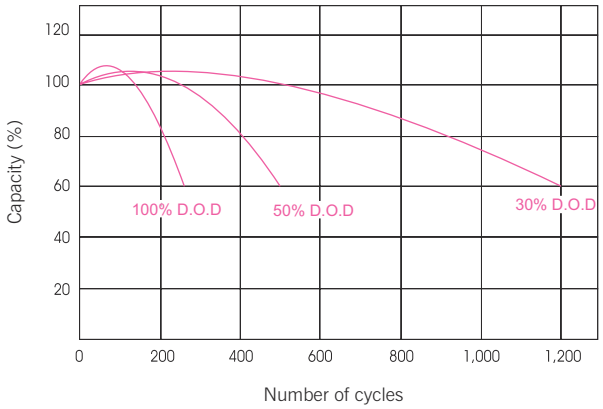
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	7548	6024	5000	3400	2360	1060	716	400	212
1.70	6872	5680	4804	3280	2216	1048	700	396	208
1.80	6356	5420	4652	3076	2068	1038	688	392	205

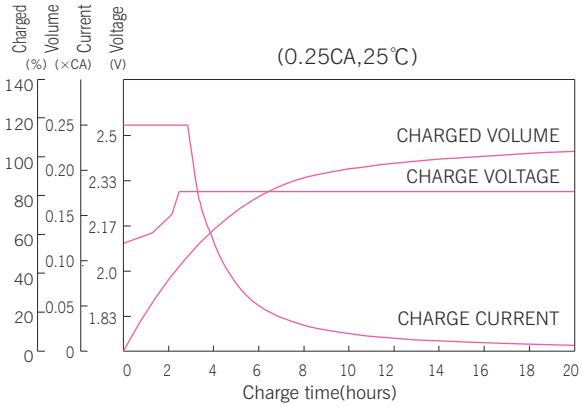
GFM2000T

The operating environment temperature above 40℃ 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.

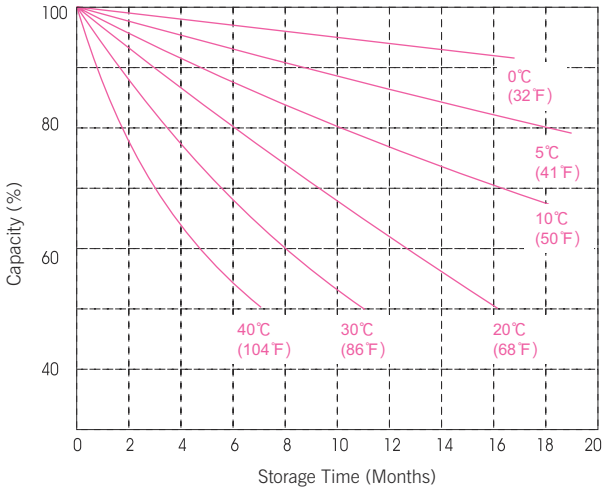
■ Cycle service life in relation to depth of discharge



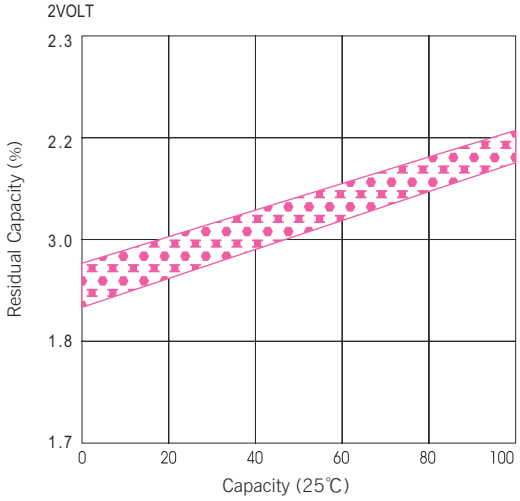
■ Constant voltage charge characteristic



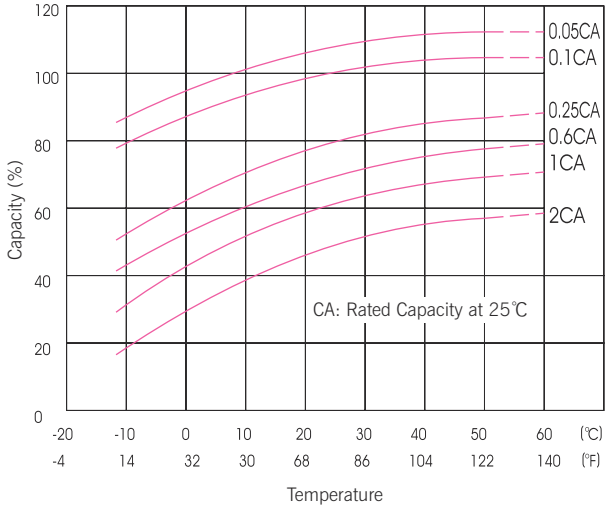
■ Self-Discharge Characteristics



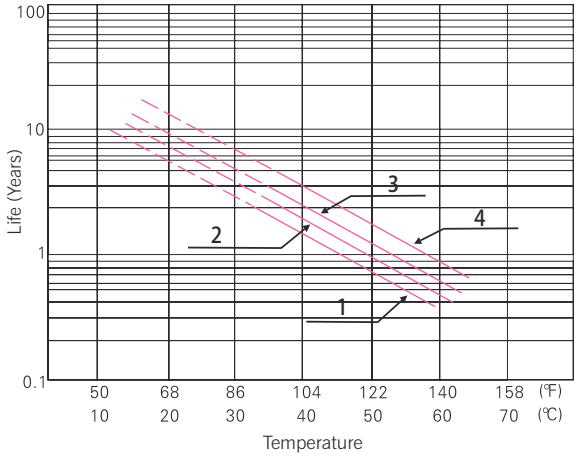
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



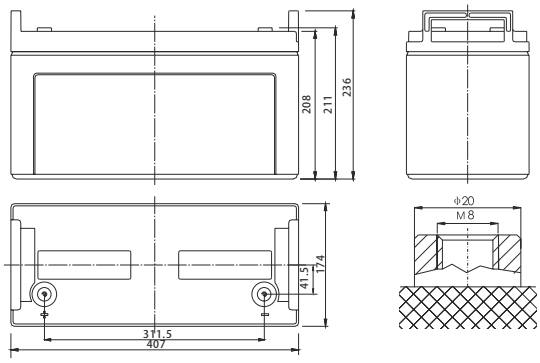
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-100J

Gel Battery Series
(AGM)



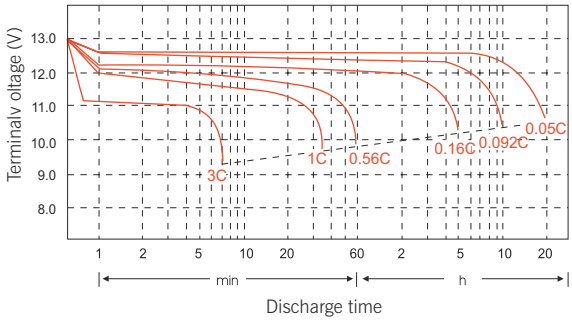
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		100Ah
Dimensions	Total Height (with terminals)	8.62 inches(219mm)
	Height	8.35 inches(212mm)
	length	15.98 inches(406mm)
	width	6.81 inches(173mm)
Weight		Approx.72.6 Pound(33.0kg)

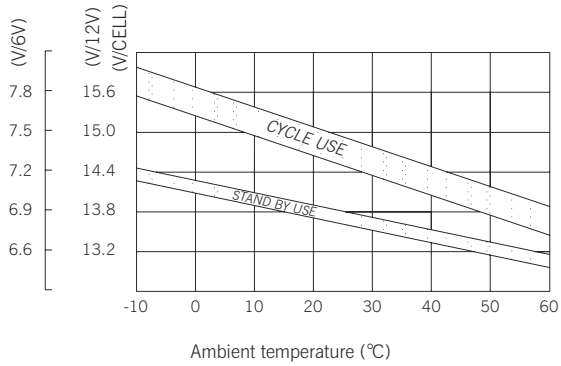
Characteristics

Capacity 77˚F(25℃)	20 hour rate (5.0A)	100 Ah
	10 hour rate (9.20A)	92 Ah
	5 hour rate (16.0A)	80 Ah
	1hour rate (60.0A)	60 Ah
	15Minute Rate (164A)	41 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	4.5 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	800A(5S)	
Terminal	M3	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 30A	
	Voltage 14.4~14.7 V / 77˚F(25℃)	
Float	Voltage 13.5~13.8V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	10Hour	24Hour
1.65	311	217	168	102	80.1	54.2	37.8	26.1	17.5	9.80	4.33
1.70	285	205	157	86.8	75.7	51.9	36.9	25.0	16.9	9.59	4.25
1.80	227	173	137	78.4	71.5	49.4	35.3	23.6	16.0	9.20	4.18

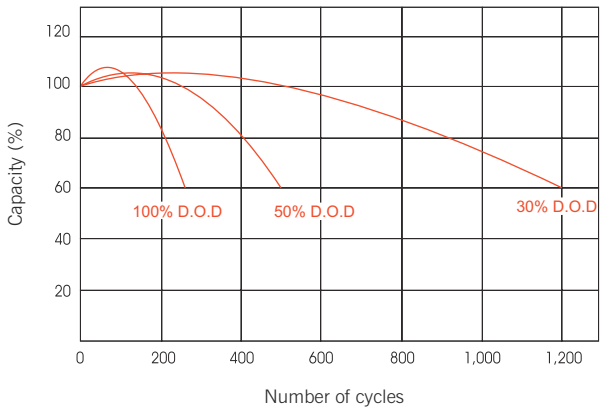
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	571	394	307	191	148	119	70.0	49.1	32.4	18.3	8.11
1.65	542	389	304	185	146	115	69.1	49.0	32.2	18.2	8.10
1.67	540	386	302	173	144	114	68.8	48.6	31.9	18.2	8.09
1.70	506	379	291	162	142	111	68.4	47.7	31.6	18.1	8.07
1.75	461	346	274	156	141	108	67.9	46.4	31.0	18.0	8.06
1.80	423	330	264	151	138	107	66.6	46.1	30.5	17.7	8.04
1.85	339	273	231	141	127	104	64.2	45.0	29.5	16.9	7.62

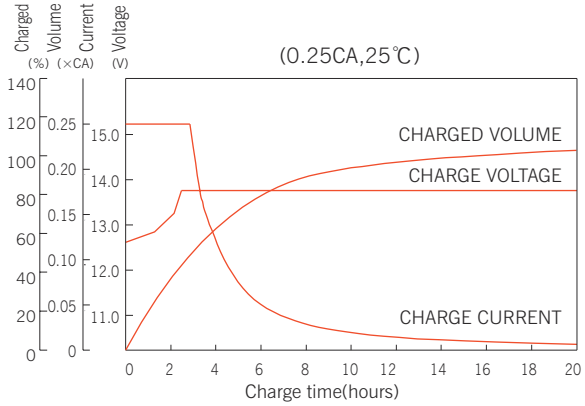
6-FM-100J

The operating environment temperature above 40℃ 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.

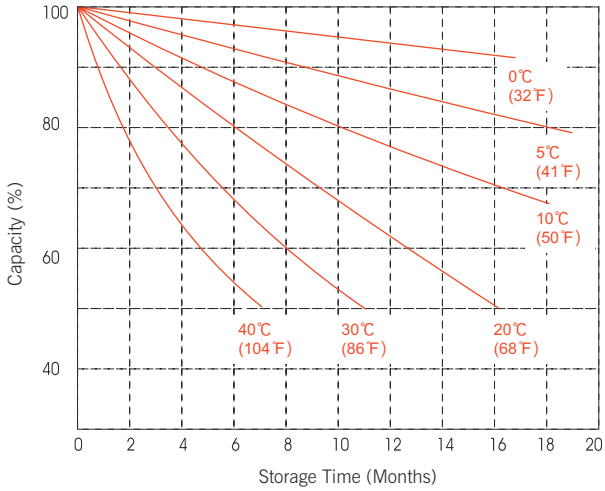
■ Cycle service life in relation to depth of discharge



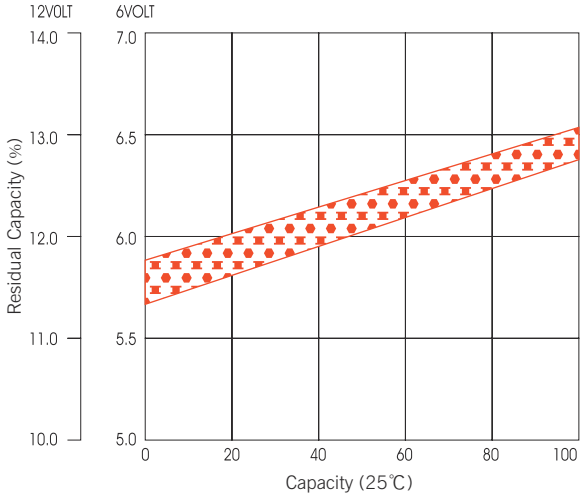
■ Constant voltage charge characteristic



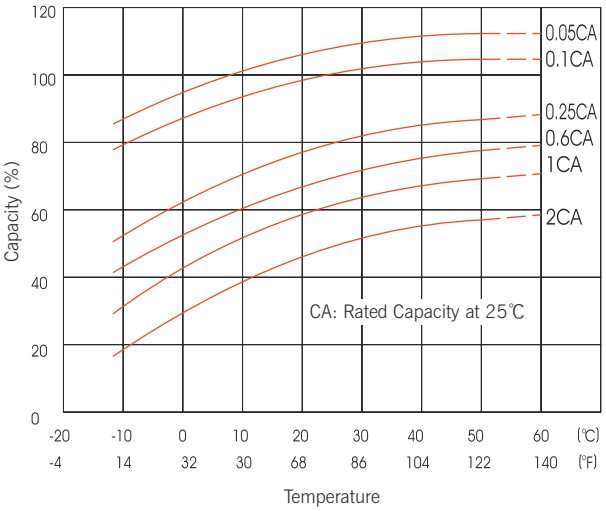
■ Self-Discharge Characteristics



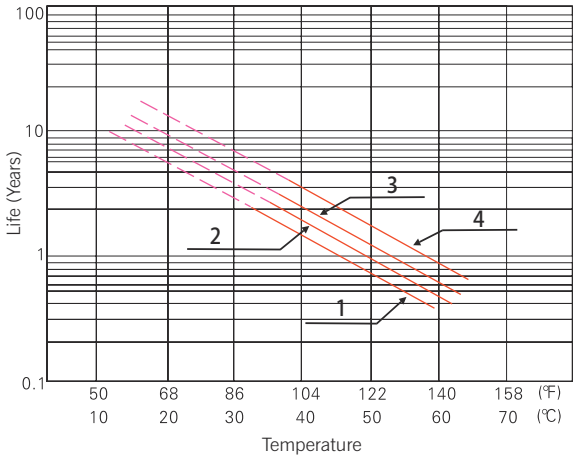
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



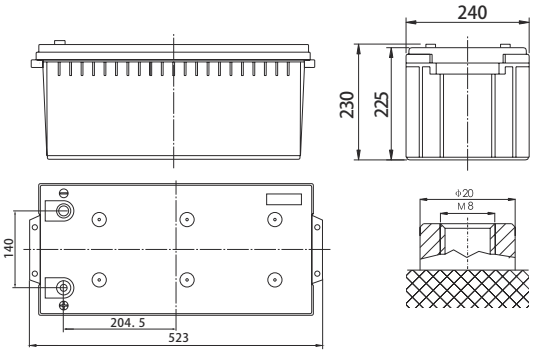
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

6-FM-200J

Gel Battery Series
(AGM)



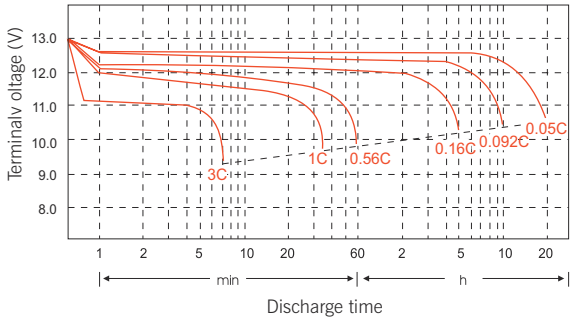
Specifications

Nominal Voltage		12V
Rated Capacity (20 hour rate)		200Ah
Dimensions	Total Height (with terminals)	9.06 inches(230mm)
	Height	8.86 inches(225mm)
	length	20.59 inches(523mm)
	width	9.45 inches(240mm)
Weight		Approx.133.1 Pound(60.5kg)

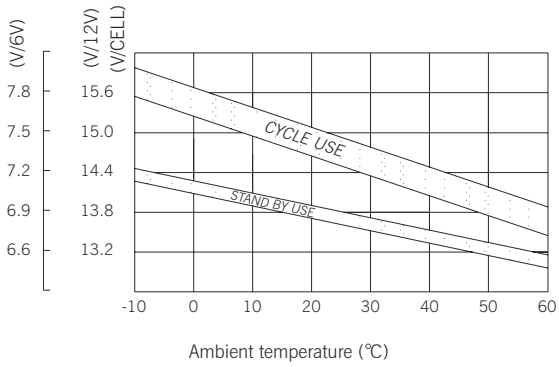
Characteristics

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

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	45Min	1Hour	2Hour	3Hour	5Hour	10Hour	24Hour
1.65	553	386	299	189	143	109	74.3	51.5	34.2	20.3	8.90
1.70	511	364	286	177	134	103	72.2	50.0	33.5	19.5	8.64
1.80	403	305	244	146	128	98	68.9	48.3	32.1	18.4	8.35

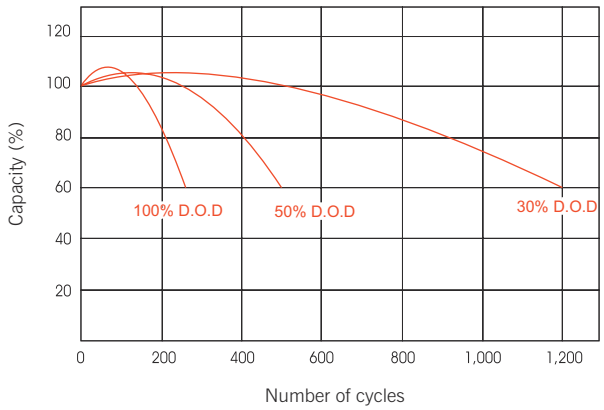
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5min	10min	15min	30min	45min	1h	2h	3h	5h	10h	24h
1.60	985	697	545	349	263	231	138.0	95.8	63.2	37.3	15.8
1.65	965	691	541	343	260	228	136.0	94.6	63.0	36.8	15.6
1.67	961	685	540	338	256	223	135.0	94.0	62.8	36.2	15.5
1.70	908	672	529	331	252	219	134.0	93.2	62.6	36.0	15.4
1.75	836	629	499	296	250	216	133.0	92.8	62.0	35.1	15.3
1.80	751	584	469	281	246	211	130.0	92.1	61.4	34.4	15.1
1.85	601	485	410	257	226	207	124.0	89.3	57.2	32.8	14.8

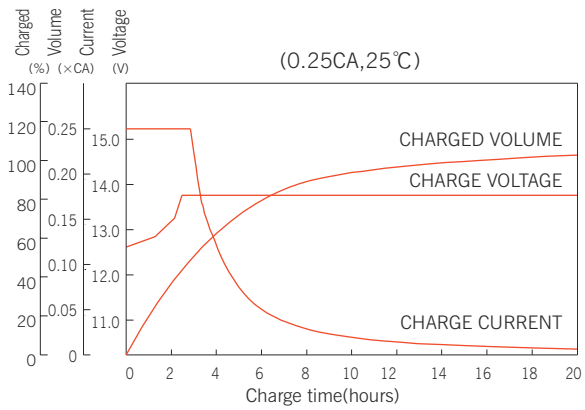
6-FM-200J

The operating environment temperature above 40℃ 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.

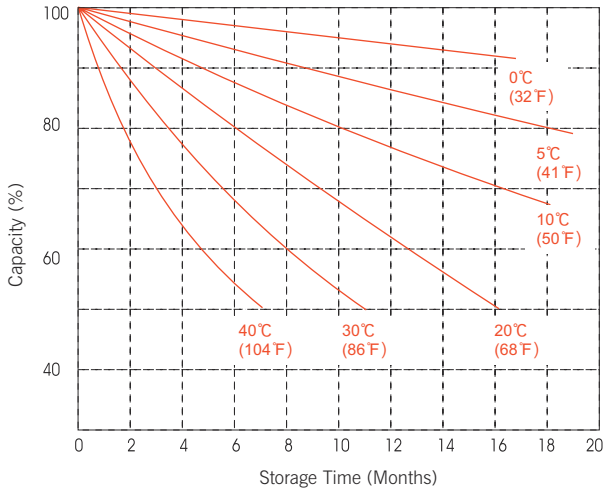
■ Cycle service life in relation to depth of discharge



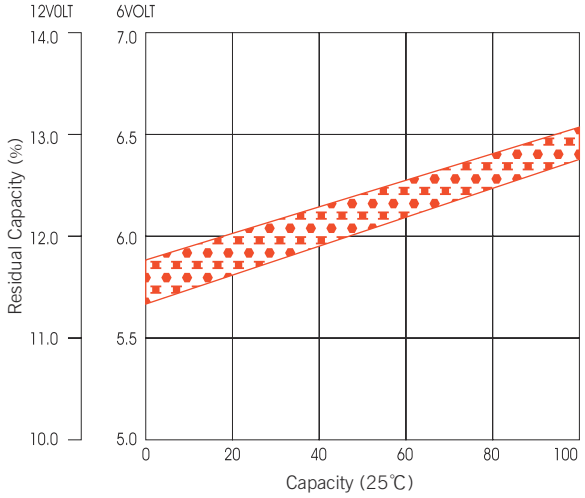
■ Constant voltage charge characteristic



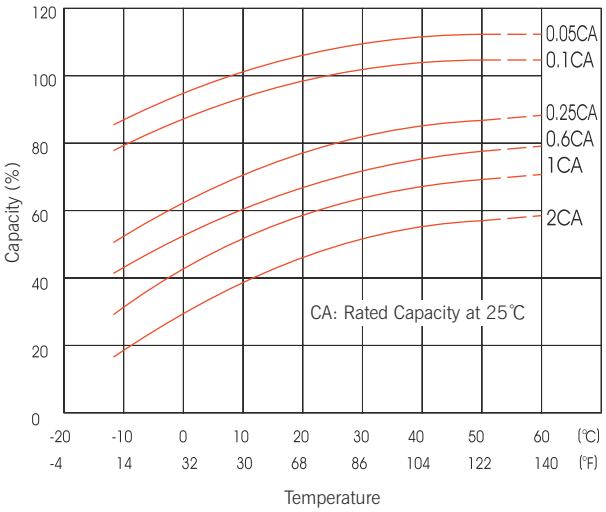
■ Self-Discharge Characteristics



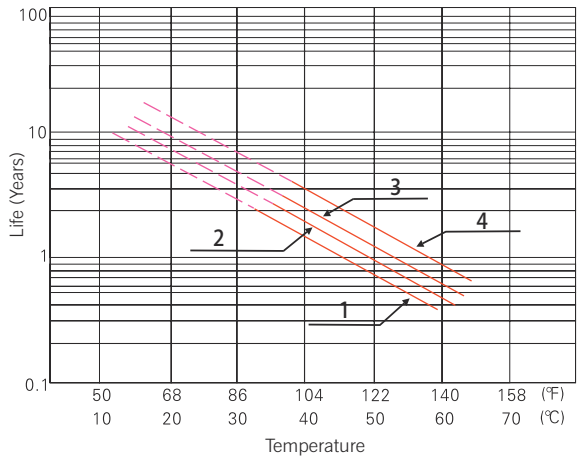
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



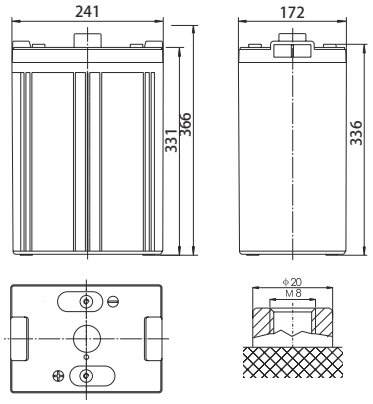
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

GFM500J

Gel Battery Series
(AGM)



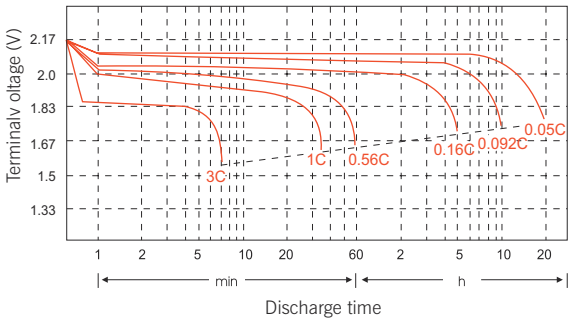
Specifications

Nominal Voltage		2V
Rated Capacity (20 hour rate)		500Ah
Dimensions	Total Height (with terminals)	14.41 inches(366mm)
	Height	13.03 inches(331mm)
	length	9.49 inches(241mm)
	width	6.77 inches(172mm)
Weight		Approx.64.9 Pound(29.5kg)

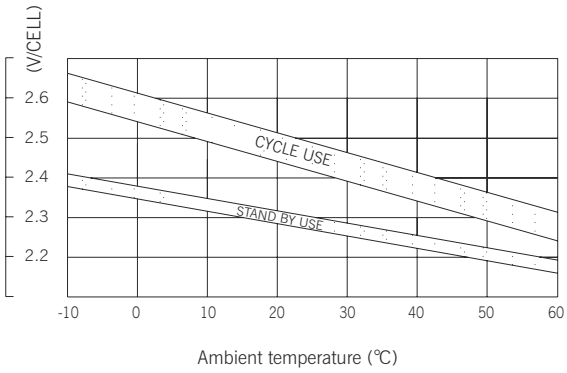
Characteristics

Capacity 77˚F(25℃)	10 hour rate (50.0A)	500 Ah
	5 hour rate (90A)	450 Ah
	1hour rate (300A)	300 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	0.5 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	3500A(5S)	
Terminal	M3	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 100A	
	Voltage 2.40~2.45 V / 77˚F(25℃)	
Float	Voltage 2.23~2.27V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	1082	841	691	467	275	128	97.1	52.9	28.6
1.70	966	769	650	439	255	125	93.7	51.5	27.5
1.80	852	709	605	399	234	121	89.7	50.0	26.6

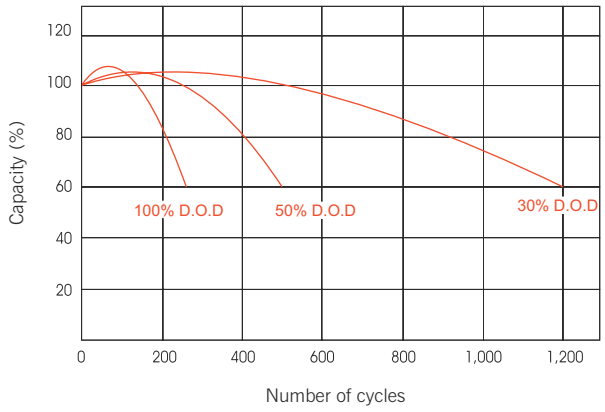
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	1888	1506	1250	850	590	265	179	100	53.0
1.70	1718	1420	1201	820	554	263	175	99.0	52.0
1.80	1589	1355	1163	769	516	260	171	98.0	51.0

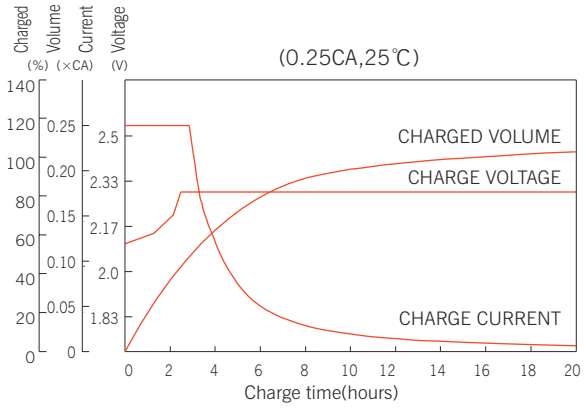
GFM500J

The operating environment temperature above 40℃ 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.

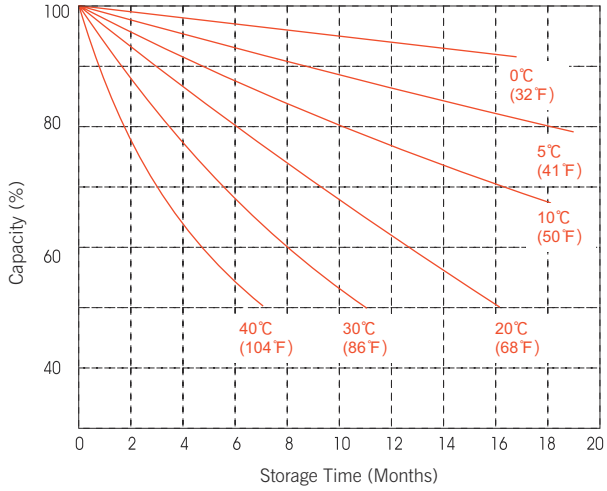
■ Cycle service life in relation to depth of discharge



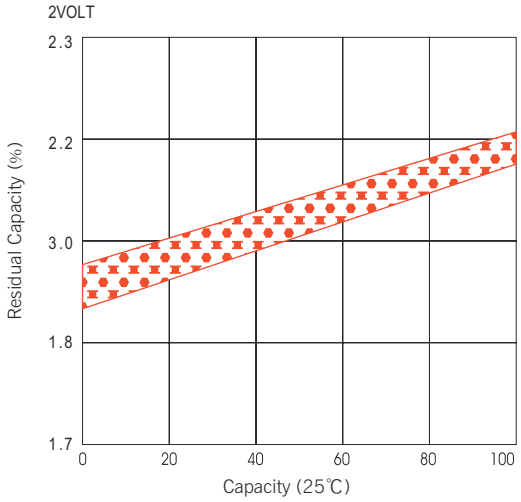
■ Constant voltage charge characteristic



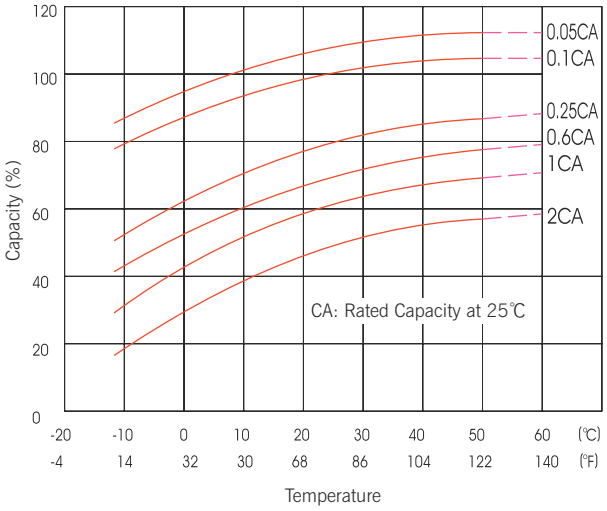
■ Self-Discharge Characteristics



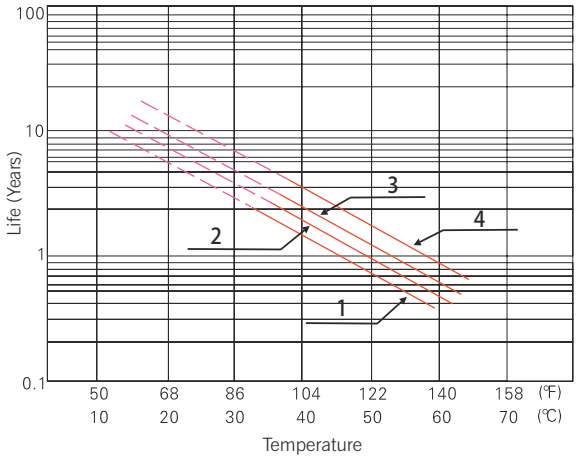
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



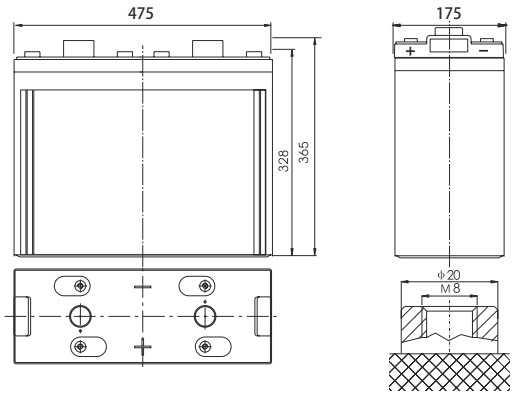
■ Temperature effects float life



1------ For FM series
2------ For FML series
3------ For FMH series
4------ For GFM series

GFM1000J

Gel Battery Series
(AGM)



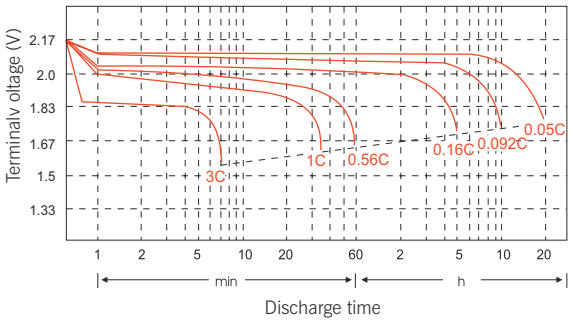
Specifications

Nominal Voltage		2V
Rated Capacity (20 hour rate)		1000Ah
Dimensions	Total Height (with terminals)	14.38 inches(365mm)
	Height	12.92 inches(328mm)
	length	18.71 inches(475mm)
	width	6.89 inches(175mm)
Weight		Approx.129.8 Pound(59.0kg)

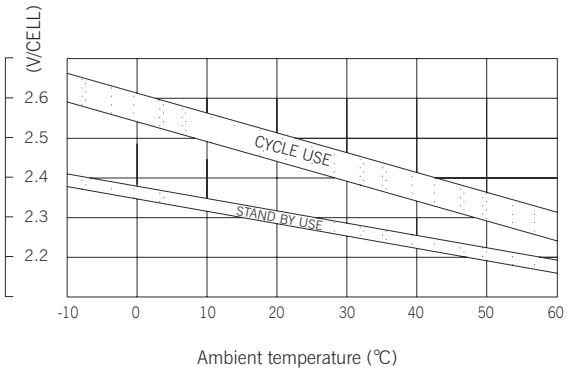
Characteristics

Capacity 77˚F(25℃)	10 hour rate (100A)	1000 Ah
	5 hour rate (180A)	900 Ah
	1hour rate (600A)	600 Ah
Internal Resistance	Full charged Battery 77˚F(25℃)	0.2 MΩ
Capacity affected by Temperature (20hour rate)	104˚F(40℃)	102%
	77˚F(25℃)	100%
	32˚F(0℃)	85%
	5˚F(-15℃)	65%
Self-Discharge 77˚F(25℃)	Capacity after 3 month storage	91%
	Capacity after 6 month storage	81%
	Capacity after 12 month storage	60%
Max. Discharge Current 77˚F(25℃)	7000A(5S)	
Terminal	M3	
Charge (Constant Voltage) Cycle	Initial Charging Current less than 200A	
	Voltage 2.40~2.45 V / 77˚F(25℃)	
Float	Voltage 2.23~2.27V / 77˚F(25℃)	

Discharge Curves 77˚F(25℃)



Relationship between charge voltage and temperature



Constant Current Discharge (AMPERES @25℃)

F.V/Time	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	2163	1682	1383	935	550	256	195	106	57.1
1.70	1933	1538	1299	878	510	250	187	103	55.1
1.80	1704	1417	1210	799	468	242	180	100	53.2

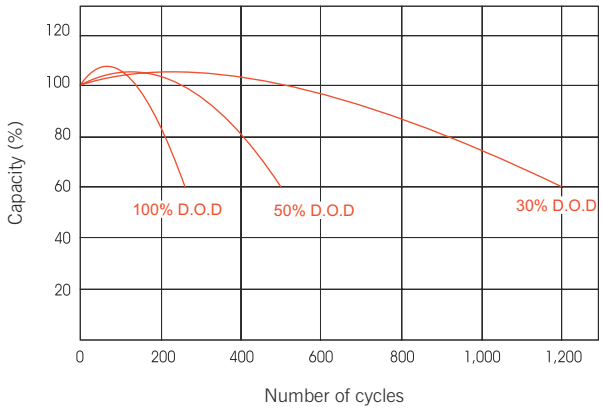
Constant Power Discharge (WATTS PER CELL@25℃)

Cut off voltage V/cell	5Min	10Min	15Min	30Min	1Hour	3Hour	5Hour	10Hour	20Hour
1.60	3774	3012	2500	1700	1180	530	358	200	106
1.70	3436	2840	2402	1640	1108	524	350	198	104
1.80	3178	2710	2326	1538	1034	519	344	196	102

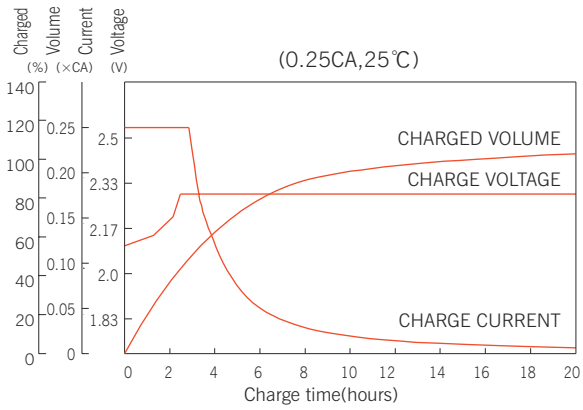
GFM1000J

The operating environment temperature above 40℃ 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.

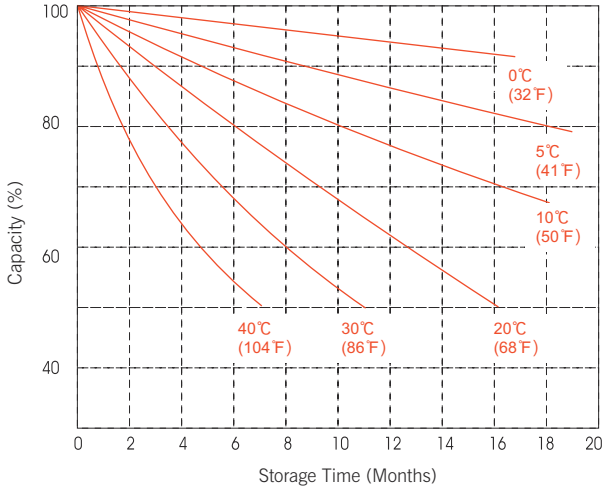
■ Cycle service life in relation to depth of discharge



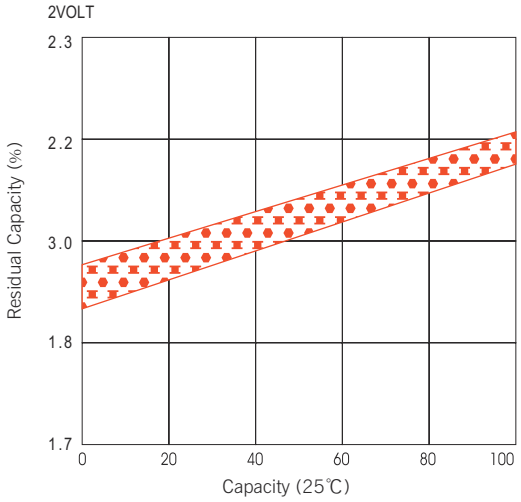
■ Constant voltage charge characteristic



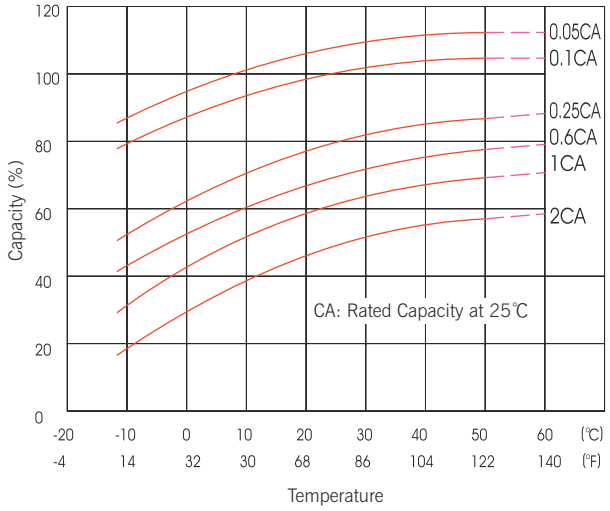
■ Self-Discharge Characteristics



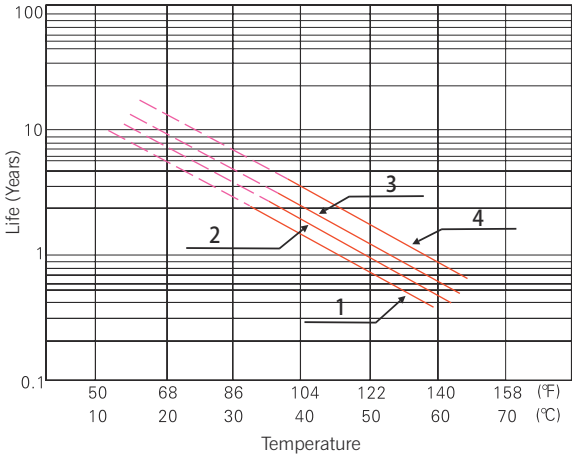
■ Relationship of OCV and Residual Capacity % (25℃)



■ Temperature effects on capacity



■ Temperature effects float life



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