

6. SERVICE LIFE

6.1 CYCLE SERVICE LIFE

The most important factor is the depth of discharge which has a reverse effect on cycle service life.

Fig.13 Effects on DOD on cyclic life.

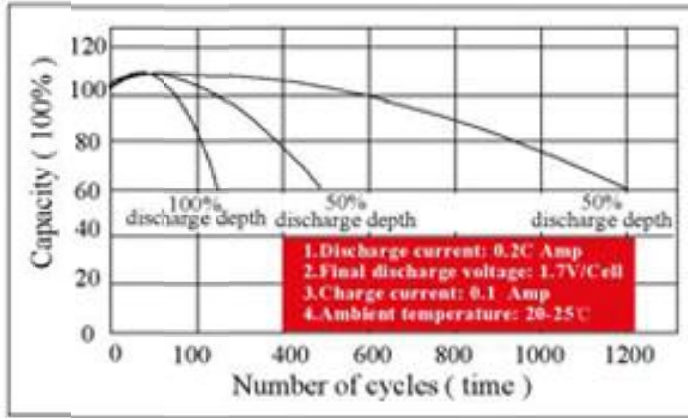


Fig.13 shows the effects of depth of discharge on cyclic life. The discharge capacity has the trend to increase in the initial stage of the cycle and it reaches the maximum at

6.2 TRICKLE/FLOAT SERVICE LIFE

Fig.14 shows temperature effect on float life of Micro series . QIANGJUN battery is designed to operate in float / standby use up to 5 years on the basis of accelerated tests. Fig.15 shows temperature effect on accelerated float service life of Medium Macro, CSM series designed to operate for up to 10 years at 20°C on the basis of accelerated tests.

Fig.14 Float service life of FM series

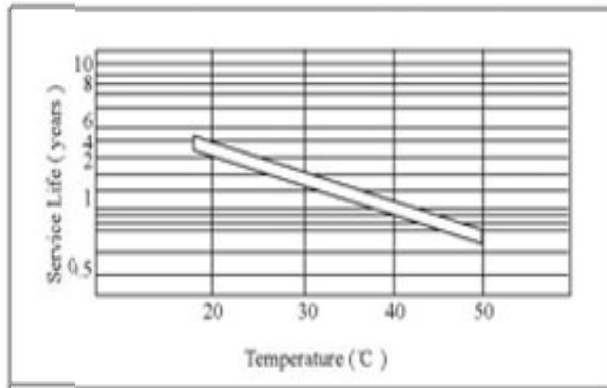
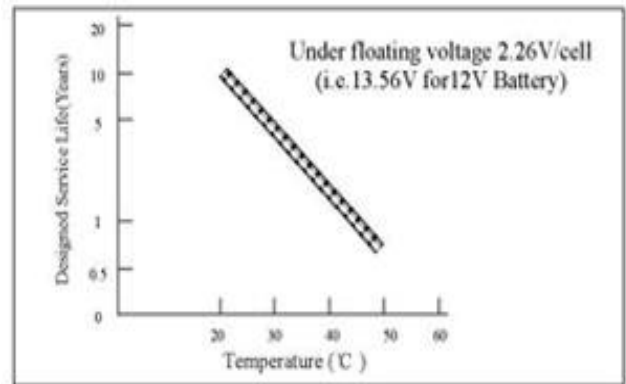
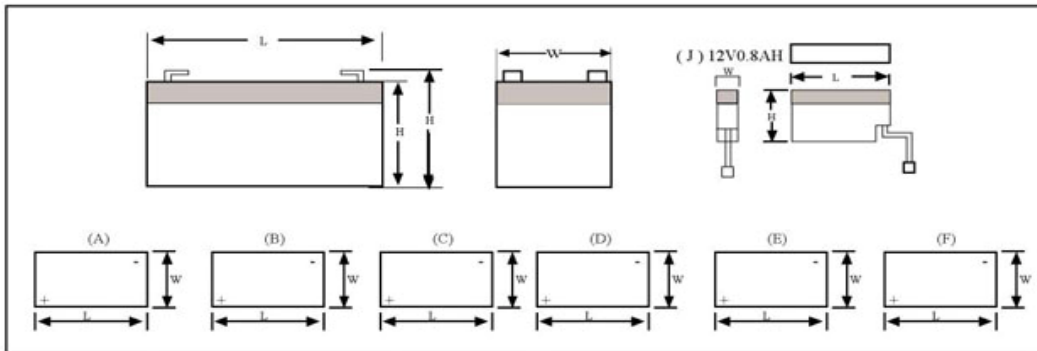


Fig.15 Float service life of CSM and GFM series



7 TERMINAL POSITION



8. HANDLING PRECAUTIONS AND APPLICATION TIPS

8.1 INSTALLATION CAUTIONS

① Initial preparation before installation:

Verify no abnormalities on battery case (like crack or leakage).

② Free air space must be provided between each battery. Minimum space 5-10 mm (0.02-0.04 inch) is necessary.

③ Choose a proper mounting place:

-Away from heat source (such as a transformer). Otherwise, battery temperature will be raised and shorten battery life.

Optimal temperature is 20 /68 F

-Located in the lowest part of the equipment.

-Away from device that may cause sparks (such as switch or fuse) , because battery may genetate inflammable gases during during overcharge.

-Do not place near open flame.

-QIANGJUN battery is designed to be used in any position, but charging in upside-down position should be avoided.

Otherwise,leakage of electrolyte from safety vents may occur during excessive charge.

Do not put batteries into airtight container (s) to release gas generated from excessive charge and avoid explosion.

④ Provide enough insulation in lead wires which connecting battery with the equipment.

⑤ Set the batteries firmly in the equipment. Otherwise, batteries may be damaged, or connection conductivity may be decreased due to shock . when batteries are used in vibration conditions, they shall be mounted in upright position and with proper cushion for protecting vibration.

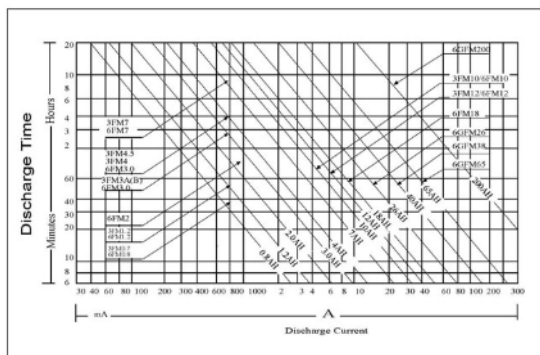
⑥ For applications requiring more than one battery, first make the inter-battery connections properly, then connect the batteries to the charger or the load .Before connection, switch off the circuit of the charger / load. Be careful to connect the positive (+) battery terminal to the (+) pole of the load /charger. Wrong connection will result in explosion, fire and / or damage of the charger / loading equipment and the battery.

⑦ Pay attention to the high voltage when a large number of batteries are connected in series. Be sure to wear rubber gloves before installation or maintenance.

⑧ If 4 or more battery groups are to be used in parallel connection, consult us first.

⑨ Avoid mixed usage of batteries different in capacity, manufacturer, storage or charge / discharge conditions. Batteries may be damaged after cycles due to the difference in electrical characteristics.

9 CAPACITY SELECTION GUIDE



The below chart helps to have a rough idea for an initial selection of the minimum battery capacity .(in 20-hour rate) required for a specific discharge current and the required discharge time. You may find the specified current and time on the chart . The point where the current and time lines intersect in the chart with the diagonal capacity line is the minimum capacity required for your application . Our model number starting with “FM” for general applications are shown .Please note that the chart is shown as a general reference only . It is recommended that cyclic service life / float service life and the individual battery model specification

sheets shall be considered prior to final decision. Also,testing with your product shall shall not be neglected.