USER GUIDE

CHARGE AND DISCHARGE

VOLTAGE

Do not operate the supercapacitor beyond the rated voltage range. The lifetime of the product will be reduced ifoperated at higher voltages.

REVERSE VOLTAGE

The polarity of supercapacitors is marked on the package of the cell, please connect it correctly when using. Incorrect connection of the supercapacitor will affect the lifetime of supercapacitors and can cause serious damageto the cells such as swelling and electrolyte leakage.

INTERNAL RESISTANCE

Supercapacitors have an inherent internal resistance. When used as backup power, the instantaneous current and internal resistance will lead to a small voltage drop. To ensure optimal operation, please select the appropriate product model according to the DC ESR and current offered in the specification.

LIFETIME AND TEMPERATURE

Working temperature will affect the lifetime of supercapacitors. In general, the lifetime can be predicted based onthe equation below:

$$L = L_0 \times 2^{\frac{T_0 - T}{10}}$$

T: Actual working temperature

T_0: Rated maximal working temperature

L: Lifetime of product under actual working temperature T

L_0: Lifetime of product under rated maximal working temperature T_0

High ambient temperatures will shorten the shelf life of supercapacitors, therefore it is suggested to use and store the cells in a cool, well-ventilated environment. Apart from ambient temperature, supercapacitors themselves will generate heat when working. The rising temperature can be calculated using a thermal resistance (℃/W) offeredin the product datasheet

$$\Delta T = I^2 \times R_{th} \times ESR_{DC}$$

ΔT：Internal temperature rising as a result of internal resistance；

R_{th}：Thermal resistance I：

Actual working current

ESR_{DC}：Internal resistance under DC charge and discharge

Both the ambient temperature and generated operational heat will need to be considered when choosing the propersupercapacitor for the desired applications.

SERIES CONNECTION

When connecting supercapacitors in series, please make sure that the voltage applied to individual cell does not exceed the rated voltage, otherwise it will shorten the shelf life of supercapacitors and potentially cause serious failure to the product, such as swelling and electrolyte leakage.

SOLDERING THE CELLS

The temperature generated by soldering can affect the life of the supercapacitors. For manual soldering, it is recommended to use a tip temperature below 350°C and a soldering duration of less than 4 s. For wave soldering, the recommended temperature should be less than 260 ° C with a soldering time less than 5 s. The preheating temperature should be lower than 100 ° C, and the time should be less than 60 s for PCB boards no thinner than
0.8 mm.

Also pay attention to circuit safety when soldering. Do not touch the plastic casing of supercapacitor to the PCB board or other components, as excessive soldering temperatures can cause the plastic casing to rupture. To preventshort circuits, avoid soldering supercapacitors on exposed PCBs.

STORAGE AND TRANSPORT

For safety, discharge the supercapacitor to a voltage below 0.1V before storing and transporting. Avoid storingthe supercapacitor in the following environments:

- High temperature, high humidity environment;
- Direct contact with solvents such as water, brine, and oil
- Direct contact with corrosive gases and liquids such as acids and bases
- Direct contact with flammable and explosive chemicals
- High dust environment
- Shock or vibration environment

The international transportation description of supercapacitors is "electronics - capacitors". Avoid violent compression during transportation. If you encounter a product that is deformed or damaged, please stop using it and contact the manufacturer for replacement.

SAFETY INFORMATION

Do not disassemble, squeeze, or pin the supercapacitor, otherwise it will cause leakages or

short circuit.It is forbidden to put the supercapacitor into the fire, as it is an explosive risk.

Do not use damaged supercapacitors.

EMERGENCY PROCEDURES：

In the event of an emergency such as a short circuit or overheating, please disconnect the power supply and load connected to the supercapacitor. Do not touch the supercapacitor before it has cooled down.

If you encounter leakage of electrolyte, avoid inhalation or skin contact with leaked electrolyte. If the electrolytecontacts with the skin, please clean the skin with water or soapy water. If contact with eyes, rinse with water or saline and seek medical advice. If inhaled, please move to a ventilated area with fresh air and seek medical advice. Please bring the chemical safety data sheet provided by our company when you seek medical treatment.