

GSC5250 Super Capacitors Battery

GSC5250 is a 48V 7500F (5250WH) super capacitor module designed for UPS batteries. GSC5250 consists of 70pcs 4.2V21000F cell capacitors.



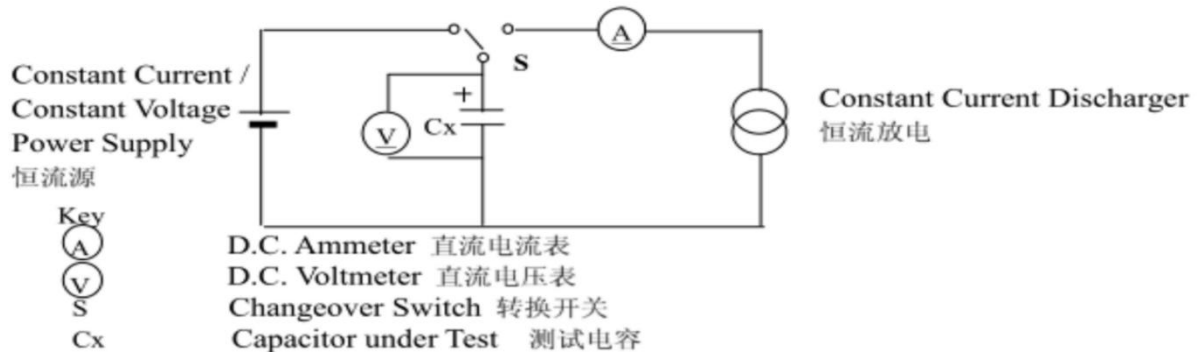
Specification

Item	Parameters
Rated Capacitance	7500F (-20% ~ +20%) see Note below
Energy storage	5250Wh
Rated Voltage (U _R)	48V
Maximum Charge Voltage	58.8V
Minimum Discharge Voltage	42V
Internal Resistance(AC)	<4mΩ (tested at 1KHz, 20±2 °C)
Rated Charge Current	100A
Maximum Continuous discharge Current	200A (-25~45°C 3 minutes)
Max. Peak Current	300A (30mS)
Safety Test Standard	DC1500V
Safety standards	QC/T 741 GB/T 34870
Operating Temperature Range	-20~60 °C
Storage Temperature Range	-20~55 °C
Cycle life	>20000Times (50A)
Nominal Weight	<45Kg
Dimension	633*485*152mm
Protection Class	IP30
Over charge voltage protection	>58.8V.DC (Off charge)
Over Discharge voltage protection	<42V (Stop discharge)
Over temperature protection	>60°C (Stop Work)
Low temperature protection	<-20°C (Stop Work)
Over current protection	Stop work

NOTE

Constant current discharge method

Measuring circuit



- 1) Set the D.C. voltage at the rated voltage (U_R).
- 2) Set the constant current value of the constant current discharger to the discharge current specified in Table 1.
- 3) Turn the switch S to the D.C. power supply, apply voltage and charge for 1 min after the constant current/constant voltage power supply has achieved the rated voltage.
- 4) After charging for 1 min, change over the switch S to the constant current discharger, and discharge with a constant current.
- 5) Charge with 30A current to 58.8V, and then charge with 58.8V constant voltage until the current replaces 5A to terminate. Then discharge at a constant current of 50A until the termination of 42V. Record the discharge time t (hours). The average discharge voltage U_r (volts). Calculate the energy storage capacity (watt hours) by the following formula

$$C=ItU_r$$

- 6) The computer always calculates the energy storage: discharge through a constant current of 40A to cause the lowest voltage point of 12V. Calculation by computer time integral formula

$$W=\int_0^{\infty} UI \Delta t /3600 \quad (W_WH, U_Voltage, I_current, t_second)$$

Product General Performance

Unless otherwise stated, tests should be done within one month of delivery under the following conditions:

Ambient Temperature T_a : $25 \pm 3^\circ\text{C}$

Relative Humidity: $55 \pm 20\%RH$

Notes: standard Charge/Discharge condition

Charge method: voltage limit 58.8V, 5A cut-off current.

Charge current: 50A, recommended

Discharge method: 50A, Cut-off voltage: 42V

Item	Criteria	Test Method
Internal impedance(Ri)	$\leq 4\text{m}\Omega$	Upon fully charge(1kHz)
Leakage current (mA/72hrs)	$\leq 5\text{mA}$	Charging current of Charge 72 hours later test current
Cycle Life (20°C)	$\geq 20,000$ Cycles	Standard Charge/Discharge condition, Cycles test until Two successive discharge capacity less than 75% of original, the cycles less than 80% of original, the cycles life cut up
High temperature characteristics	$C/C \Delta \leq 5\%$ $ESR \leq 1.5 * R$ 25°C	Using standard Charge/Discharge condition to measure capacitor's original capacity, after Standard Charge, placed 2hours upon $60 \pm 2^\circ\text{C}$, at this temperature, discharge to 42V in 50A
Low temperature characteristics	$C/C \Delta \leq 20\%$ $ESR \leq 1.5 * R$ 25 °C	Using standard Charge/Discharge condition to measure capacitor's original capacity, after Standard Charge, placed 16-24hours upon $-20 \pm 2^\circ\text{C}$, at this temperature, discharge to 42V in 50A
The ratio of Charged retention	$\geq 12\%$	Using standard Charge/Discharge condition to measure capacitor's original capacity, after Standard Charge, placed 28 days upon $25 \pm 2^\circ\text{C}$, at this temperature, discharge to 42V in 50A to test the residual capacity

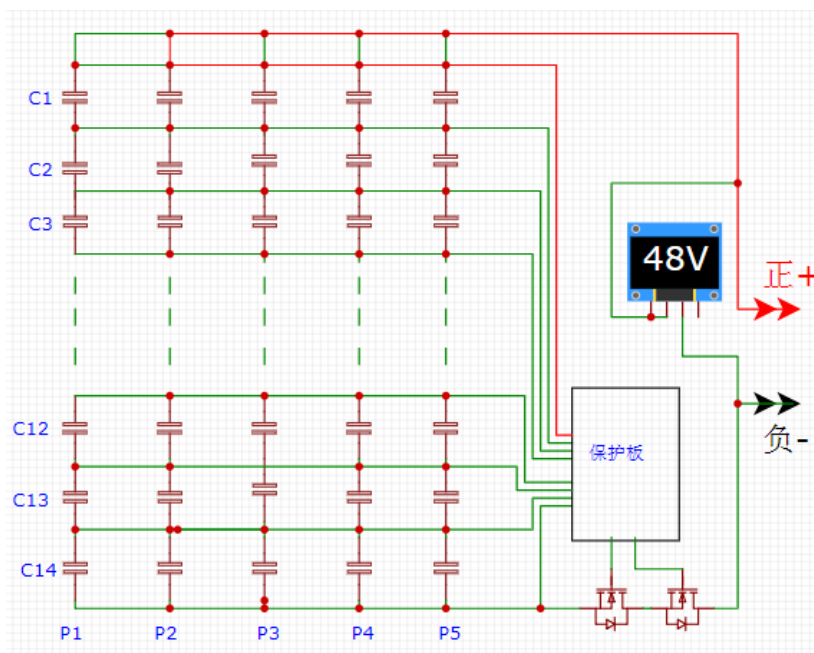
Product Reliability

Item	Criteria	Test Method
Temperature and Humidity Test	$\Delta C/C \leq 5\%$ $ESR \leq 1.5 * R$ 25°C	The capacitor shall be exposed for 240 ± 48 hours in an atmosphere of 90~95%RH at $60 \pm 2^\circ\text{C}$, the characteristic change shall meet the following requirement. The result should meet the specifications without visible damage and no leakage of electrolyte.
Overcharge test	No fire, No Explosion.	The standard charged, then recharged with 50A for 1 hour or the voltage is 1.5UR.
Over discharge test	No Explosion, No Fire	The standard charged, Discharge test cell at standard discharging method discharge for 90 minutes
Short circuit test	No fire, No Explosion The maximum Temperature: $\leq 150^\circ\text{C}$	Rest cells for 30min at $25 \pm 2^\circ\text{C}$ after standard charged. Connect cell terminals with copper lead (electric resistance: $5\text{m}\Omega$ or less) and leave for 10 minutes.
Thermal Test	No fire, no leakage. The maximum Temperature: $\leq 200^\circ\text{C}$	The standard charged cell is to be heated in a gravity convection or circulating air oven. The temperature of the oven is to be raised at a rate of $5 \pm 2^\circ\text{C} / \text{min}$. The oven is to remain for 30 minutes at $130 \pm 2^\circ\text{C}$ before the test is discontinued.

Vibration Test	No Explosion, No Fire	After standard charging, fixed the cell to vibration table and subjected to vibration cycling that the frequency is to be varied at the rate of 1Hz per minute between 10Hz an 55Hz,the excursion of the vibration is 1.6mm.The cell shall be vibrated for 30 minutes per axis of XYZ axes.
Drop Test	No Explosion, No Fire	The cell is to be dropped from a height of meter twice onto concrete ground. And Observe for an hour
Nail penetration Test	No Explosion, No Fire	After standard charging, put the cells with thermocouple into the fume hood, then penetrate completely the center of the largest side at the speed of 10-40mm per second by a $\Phi 3.0\text{-}\Phi 8.0\text{mm}$ stainless steel nail.
Crush Test	No Explosion, No Fire	After standard charging, crush the cell vertically until the shell rupture or the voltage tapered to 42V, the area of the extrusion head should be larger than 30% or . The extrusion force reaches 200KN

Product Electrical properties

Circuit Diagram



Charge/Discharge Characteristics

Charge: 50A(Constant Current) charge to 58.8V, then cut off after CV (Constant Voltage) charging for Current under 5 A.

Discharge: 50A (Constant Current) discharge to 42V.

Discharge current	About Discharge time	Discharge voltage
50A	120minutes	42V to 58.8V

Charge current	About Charge time	Charge voltage
50A	140minutes	42V to 58.8V

Current	Discharging Time	Charging Time
10A	600 minutes	620 minutes
20A	300 minutes	320 minutes
30A	200 minutes	210 minutes
40A	150 minutes	170 minutes

