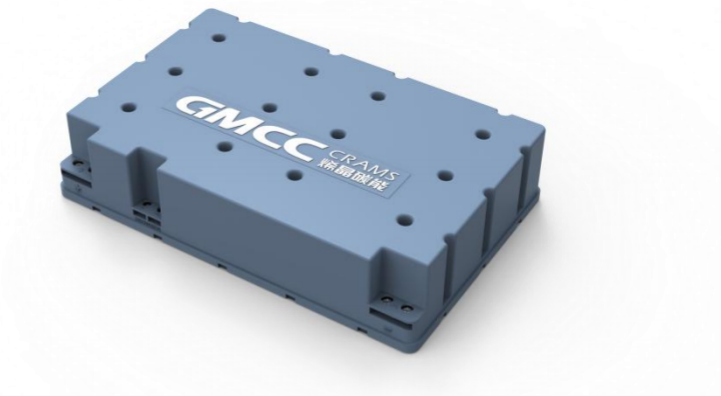
174V 5.3F Supercapacitor Module



- 174V DC output
- 5.3F Capacitance
- A PCB plug-in connection
- High cycle life of 1 million cycles
- Compact in structure and light in weight
- Resistance equalization, temperature output
- Weld the monomer based on a 3V 310F seal

ELECTRICAL SPECIFICATIONS	
TYPE	**M14S-174-0005**
Rated Voltage V_R	174 V
Surge Voltage V_S[1]	179.8 V
Rated Capacitance C[2]	5.3 F
Capacitance Tolerance[3]	-0% / +20 %
ESR[2]	≤130 mΩ
Leakage Current IL[4]	< 14 mA
Self-discharge Rate[5]	<20 %
Cell specification	3V 310F
Maximum storage capacity of a single cell E[9]	0.39 Wh
Module configuration	1P 58 S
Constant Current I_{MCC}(ΔT = 15°C)[6]	17.6 A
Max Current I_{Max}[7]	273 A
Short Current I_S[8]	1.34 kA
Stored Energy E[9]	22.3 Wh
Energy Density E_d[10]	4.6 Wh/kg
Usable Power Density P_d[11]	5.8 kW/kg
Matched Impedance Power P_{dMax}[12]	12 kW/kg
Insulation withstand voltage class	5600V DC/min

THERMAL CHARACTERISTICS	
TYPE	**M14S-174-0005**
Working Temperature	-40 ~ 65°C
Storage Temperature[13]	-40 ~ 70°C
Thermal Resistance R_{Th}[14]	0.37 K/W
Thermal Capacitance C_{th}[15]	5796 J/K

LIFETIME CHARACTERISTICS	
型号	**M14S-174-0005**
DC Life at High Temperature[16]	1500 hours
DC Life at RT[17]	10 years
Cycle Life[18]	1’ 000’ 000 cycles
Shelf Life[19]	4 years

SAFERTY & ENVIRONMENTAL SPECIFICATIONS	
型号 TYPE	**M14S-174-0005**
Safety	RoHS, REACH and UL810A
Vibration	IEC 60068-2-6
Shock	IEC 60068-2-28,29
Degree of protection	IP44

MONITORING / BATTERY VOLTAGE MANAGEMENT	
型号	**M14S-174-0005**
Internal temperature sensor	NTC RTD
Temperature interface	simulation
Battery voltage detection	Voltage splice
Battery voltage management	Resistor equilibrium

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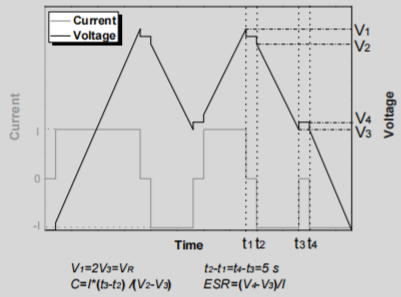
PHYSICAL PARAMETERS	
TYPE	**M14S-174-0005**
Mass M	4.8kg
Terminals(leads)[20]	positive/negative M5
Voltage monitoring terminal	M4
Cooling mode	natural cooling
Dimensions[21] Length×Width×Height	367×235×79 mm
Module mounting hole position	12XM5 mounting screw , L=35-40mm,torque 5-8N.m 12xφ6x24mm

NOTES:

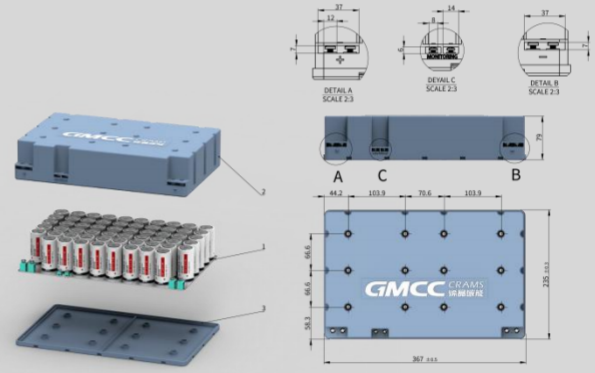
TYPE **M14S-174-0005**

1. Surge voltage VS: Absolute maximum voltage, non-repetitive. The duration must not exceed 1 second.
2. Rated capacity C: the rated capacity test method is as shown in Figure 1. The test current is 100 C multiple current, i.e. 0.075 A / F. if the calculated test current is greater than 100 A, 100 A is used.



$V_1=2V_3=V_R$ $t_2-t_1=t_4-t_3=5$ s
$C=I*(t_3-t_2)/(V_2-V_3)$ $ESR=(V_4-V_3)/I$

3. Capacitance tolerance: Typical capacity is 105% of rated capacity.
4. 4.Leakage current measurement procedure: 1) Charge the capacitor to the VR with a constant current (0.075 A/F, if the calculated current is >100A, then apply 100A). 2) Hold the voltage at VR for 72h. 3) The current to maintain VR after 72 h is the leakage current.
5. Self-discharge rate measurement procedure: 1) Charge the capacitor to VR with a constant current (0.075 A/F, if the calculated current >100A, then apply 100A). 2) Hold the voltage at VR for 3h. 3) Floating for 72h. 4) Measure the voltage after 72 h.
6. Max constant working current: the working current of the supercapacitor in static air depends on the natural convection heat dissipation of the shell and the Joule heat balance.
7. Max current:$IMax = 0.5C * VR\ (\Delta t + ESR * C)$, discharge from VR to VR /2 in 1 second.
8. Short current: Is = VR /ESR Each parameter adopts SI system unit or its conversion unit, This current can't be used as working current.
9. Stored energy: $E = 0.5C*V^2/3600$.
10. Energy density: $E_d = E/M$
11. Usable power density: $P_d = 0.12V_R^2/(ESR*M)$.
12. Impedance match power density: $P_{dMax} = 0.25V_R^2/(ESR*M)$
13. Storage temperature: discharged state(cell voltage < 0.2 V).
14. Thermal resistance: R_{Th} $= 1/(h * A)$„ where h=10 W/(m2*K), A=surface area.
15. Thermal capacitance: For the whole capacitor.
16. Accelerated aging life: at the maximum operating temperature of the supercapacitor (65 C), the rated voltage lasts for 1500h, the capacity remains above 80% of the rated capacity at normal temperature, and the internal resistance is below 200% of the rated internal resistance.
17. Design life: maintain the supercapacitor at its rated voltage. The life criterion is that the capacity is maintained at more than 80% of the rated capacity, and the internal resistance is less than 200% of the rated internal resistance.
18. Cycle life: Conduct constant current charge and discharge in the range of rated voltage VR and 0.5VR, stand between charge and discharge for 5 seconds, test current is 100C rate current, that is, 0.075 A / F, if the calculated test current is greater than 100 A, 100 A is used.
19. Storage life: within the storage temperature range, maintain the discharge state, no load (single voltage <0.2 V).
20. Size and position of the fixed hole: see the figure below



21. Standard marking:
    + Manufacturer, part number, serial number
    + Rated voltage, rated capacity, positive and negative electrode labeling, warning content
    + Storage energy (in Wh)
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