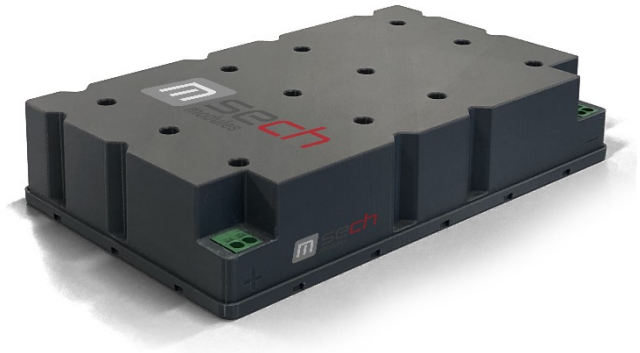


Product Datasheet

174V 6.2F module

- Rated voltage 174VDC
- 6.2F capacitance
- Resistive cell balancing
- Compact and light weight package
- Based on 360F hermetically sealed cells
- PCB push-in connections



ELECTRICAL SPECIFICATIONS

Type	M14S-174-0006
Rated Voltage V_R	174.00 V
Surge Voltage V_S^1	179.80 V
Rated Capacitance C^2	6.2 F
Capacitance Tolerance 3	0% / +20%
DC ESR 2	<120 m Ω
Leakage Current I_L^4	<25 mA
Constant Current ($\Delta T = 15^\circ C$) 6	11 A
Max Current I_{Max}^7	309 A
Short Current I_S^8	1.5 kA
Stored Energy E^9	26 Wh
Energy Density E_d^{10}	4.9 Wh/kg
Usable Power Density P_d^{11}	6 kW/kg
Impedance Match Power Density P_{dMax}^{12}	11.9 kW/kg

THERMAL CHARACTERISTICS

Type	M14S-174-0006
Working Temperature	-40 ~ 65°C
Storage Temperature 13	-40 ~ 70°C
Thermal Resistance R_{Th}^{14}	1°C/W
Thermal Capacitance C_{Th}^{15}	5'000 J/°C

LIFETIME CHARACTERISTICS

Type	M14S-174-0006
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

SAFETY & ENVIRONMENTAL SPECIFICATIONS

Type	M14S-174-0006
Safety	RoHS, REACH
Vibration	IEC60068-2-6
Shock	IEC60068-2-28, 29
Environmental Protection	IP44

MONITORING AND CELL VOLTAGE MANAGEMENT

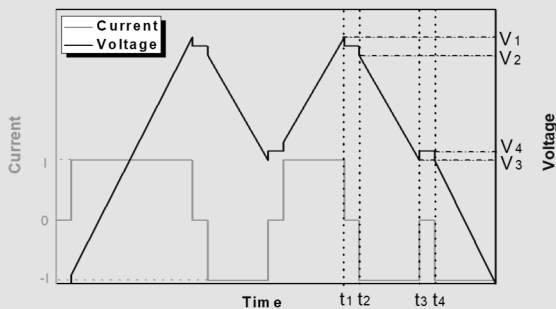
Type	M14S-174-0006
Cell Voltage Management	Passive balancing

PHYSICAL PARAMETERS

Type	M14S-174-0006
Mass M	5.3 kg
Terminals ²⁰	PCB push-in connections, 0.75 – 16mm ²
Dimensions ²¹ Length	391 mm
Width	234 mm
Height	77 mm
Module Fixation Holes ²¹	12 x Ø6mm x 24mm

NOTES:

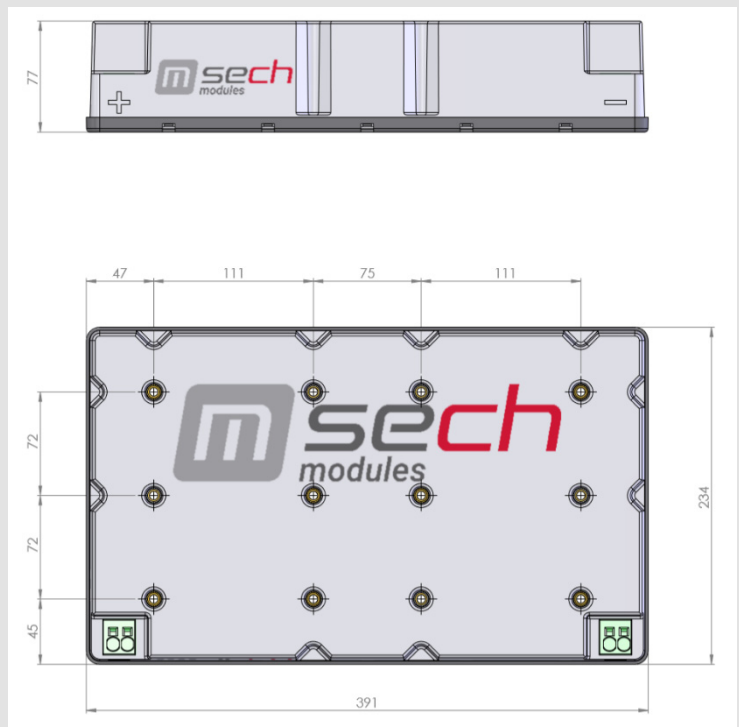
- Surge voltage V_S : Absolute maximum voltage, non-repetitive. The duration must not exceed 1 second.
- Capacitance C: The test current is 0.075 A/F, if the calculated current is >100A, then apply 100A.
- Cycle life: Charge and discharged the module in the range between V_R and $V_R/2$. 5 seconds waiting period between charge and discharge. The constant test current is 0.075 A/F (if the calculated current >100A, then apply 100A).
- Shelf life: Discharged and no load applied at RT.
- Phoenix Contact PCB terminal block – SPT 16/2-V-10.0-ZB - 1735875
- Dimensions and position of fixation holes: See below drawing



$$V_1 = 2V_3 = V_R \quad t_2 - t_1 = t_4 - t_3 = 0.1 \text{ s}$$

$$C = I * (t_3 - t_2) / (V_2 - V_3) \quad ESR = (V_4 - V_3) / I$$

- Capacitance tolerance: Typical tolerance is +5%~+10%.
- Leakage current measurement procedure: 1) Charge the capacitor to the V_R with a constant current (0.075 A/F, if the calculated current is >100A, then apply 100A). 2) Hold the voltage at V_R for 72h. 3) The current to maintain V_R after 72 h is the leakage current.
- Self-discharge rate measurement procedure: 1) Charge the capacitor to V_R with a constant current (0.075 A/F, if the calculated current >100A, then apply 100A). 2) Hold the voltage at V_R for 3h. 3) Floating for 72h. 4) Measure the voltage after 72 h.
- Max constant working current: $I_{MCC} = \sqrt{\Delta T / (ESR * R_{Th})}$
- Max current: $I_{Max} = 0.5C * V_R / (\Delta t + ESR * C)$, discharge from V_R to $V_R/2$ in 1 second.
- Short current: $I_S = V_R / ESR$
- Stored energy: $E = 0.5C * V^2 / 3600$
- Energy density: $E_d = E / M$
- Usable power density: $P_d = 0.125V_R^2 / (ESR * M)$
- Impedance match power density: $P_{dMax} = 0.25V_R^2 / (ESR * m)$
- Storage temperature: Storage in discharge state.
- Thermal resistance: $R_{Th} = \Delta T / P$, where $P = ESR * I^2$
- Thermal capacitance is indicated for the whole module.
- DC life at high temperature: Hold the module charged at rated voltage at 65°C for 1500h. The capacitance shall be >80% of the rated value, the ESR shall be <200% of the rated value.
- DC life at RT: Hold the module charged at rated voltage at room temperature RT, the capacitance shall be >80% of the rated value, the ESR shall be <200% of the rated value.



Notes:

- Standard markings:
- + Name of manufacturer, part number, serial number
 - + Rated voltage and capacitance, negative and positive terminals, warning marking
 - + Stored energy in watt-hours

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