

MDCM0005C8-0160R0TBZ DATASHEET



MODEL	MDCM0005C8-0160R0TBZ
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Version	Revision of historical records
V2019-1 Trial Version	First Edition
V2020-1	Version Update

FEATURES

- Voltage control for each cell
- Over 1,000,000 duty cycles
- High power density
- Midpoint voltage output

APPLICATIONS

- Wind turbine system
- Energy storage systems
- Industrial
- Telecom industry

SPECIFICATIONS

Electrical	Characteristics
Nominal Capacitance	5.8 F
Capacitance Tolerance	0% ~ +20%
Rated Voltage	160 V
Surge Voltage	162 V
ESR,DC	200 mΩ
Maximum Continuous Current ($\Delta T=15^{\circ}\text{C}$)	8 A
Maximum Continuous Current ($\Delta T=40^{\circ}\text{C}$)	13 A
Maximum Peak Current,1sec.	214 A
Leakage Current(25°C , after 72 h)	20 mA
Cell	CDCM0350C0-0002R7SPD
Number of Cells	60
Environment	
Operating Temperature Range	$-40^{\circ}\text{C} \sim +65^{\circ}\text{C}$
Storage Temperature Range	$-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$
Environment Humidity	$\leq 85\%RH$
Physical	
Weight	6 kg
Output terminal	Connection Terminal
Vibration Specification	GB/T 11287-2000
Shock Specification	GB/T 14537-1993
Environment Protection	IP54
Monitoring	
Equilibrium Mode	Resistance Balance Circuit
Other Functions	Detection Of Neutral Point Voltage

SPECIFICATIONS

Power And Energy

Usable Power Density (Pd)	2560 W/kg
Impedance Match Power Density(Pmax)	5333 W/kg
Gravimetric Energy Density(Emax)	3.4 Wh/kg
Stored Energy	20.6 Wh

Life

High Temperature Life (at Rated Voltage & Maximum Operating Temperature)	1500 hours
Capacitance Change (%decrease from initial measured value) ESR Change (%increase from specified value)	≤20% ≤100%
Room Temperature Life (at Rated Voltage at 25°C)	10 years
Capacitance Change (%decrease from initial measured value) ESR Change (%increase from specified value)	≤20% ≤100%
Cycle Life (Number of cycles)	1,000,000
Capacitance Change (%decrease from initial measured value) ESR Change (%increase from specified value)	≤20% ≤100%
Shelf Life (25°C, uncharged)	4 years

Safe

Factory High-Pot Test	2500 VDC
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Thermal Characteristics

Typical Thermal Resistance	1.1 °C/W
Typical Thermal Capacitance	5500 J/°C

NOTES

1. Surge voltage is non-repetitive. The duration must not exceed 1second.
2. Maximum peak current in non-repetitive. The duration must not exceed 1second.
3. Formula of maximum peak current:

$$I_{peak} = \frac{1 / 2CV}{C \times ESR_{DC} + 1}$$

C is rated capacity, V is rated voltage.

4. Formula of power and energy:

Usable Power Density :

$$P_d = \frac{0.12V^2}{ESR_{DC} \times mass}$$

Gravimetric Energy Density:

$$E_{max} = \frac{1 / 2CV^2}{3600 \times mass}$$

Impedance Match Power Density:

$$P_{max} = \frac{V^2}{4ESR_{DC} \times mass}$$

Stored Energy:

$$E = \frac{1 / 2CV^2}{3600}$$

MEASURING METHOD

- 1) Charge and Discharge procedure (Figure 1)
 - a) Charge the capacitor using constant current I to rated voltage V_0 ;
 - b) Keep rated voltage 5 min;
 - c) Discharge the capacitor using constant current I to half rated voltage, record discharge time T_1 during voltage change from V_1 to V_2 ;
 - d) Rest 2-5s, record voltage change ΔV ;
 - e) Discharge it to a very low voltage around 0.01V;
 - f) $V_1=80\% -50\%$.
- 2) Capacitance

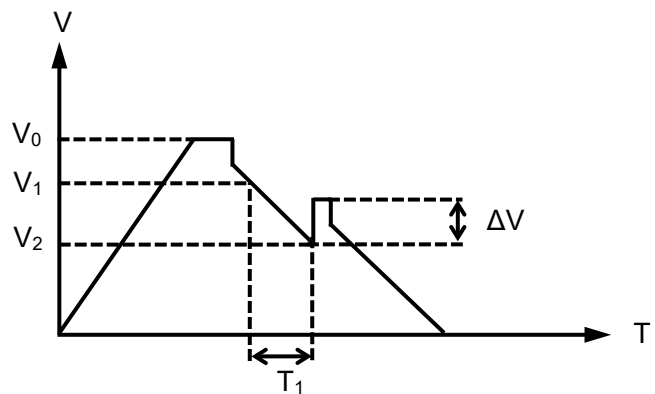
$$C = I \cdot T_1 / (V_1 - V_2)$$

C: Capacitance(F);
 I : Constant Discharge Current(A);
 T_1 : Discharge Time(s);
 $V_1 - V_2$: Voltage Change (V).
- 3) DC ESR

$$DC\ ESR = \Delta V / I$$

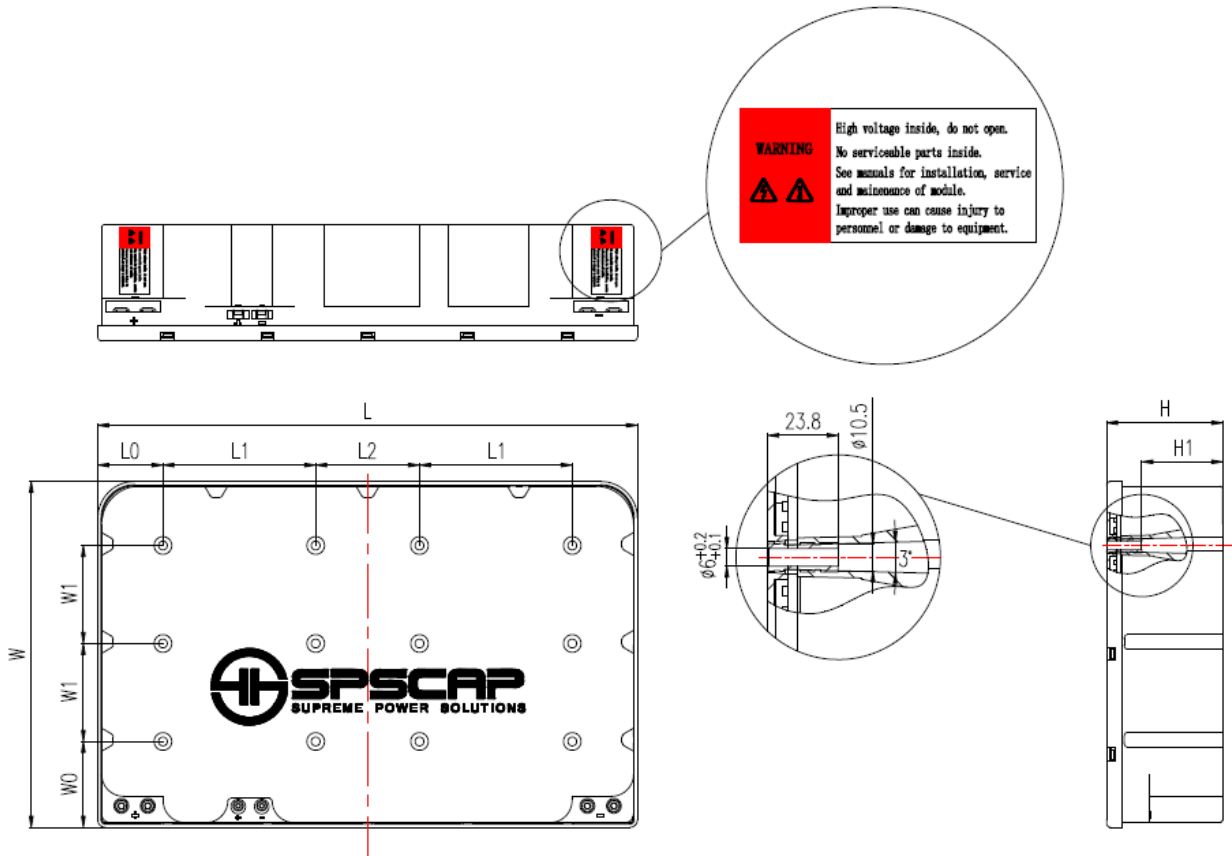
DC ESR: DC Equivalent Series Resistance(Ω)
 ΔV : Voltage Change(V);
 I: Constant Discharge Current (A);
- 4) AC ESR

Measure AC ESR using LCR meter
 Frequency: 1KHz;
 Voltage: fully discharge



Figure

DIMENSIONS



MODEL	Dimension (mm)								
	L (±0.5)	W (±0.5)	H (±0.5)	L1 (±0.2)	L2 (±0.2)	W1 (±0.2)	H1 (±0.5)	L0	W0
MDCM0005C8-016R0TBZ	367	235	79	103.9	70.6	66.6	55	44.3	59

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