

3V 1200F Supercapacitor Cells

- 3V DC output
- 1200F Capacitance
- High cycle life of 1 million cycles
- Very high power density
- Laser-weldable posts



ELECTRICAL SPECIFICATIONS

TYPE	C46W-3R0-1200
Rated Voltage V_R	3.0 V
Surge Voltage V_S^1	3.1 V
Rated Capacitance C^2	1200 F
Capacitance Tolerance ³	-0%/+20%
ESR ²	≤ 0.6 m Ω
Leakage Current I_L^4	<5 mA
Self-discharge Rate ⁵	<20 %
Constant Current $I_{MCC}(\Delta T = 15^\circ C)^6$	65 A
Max Current I_{Max}^7	1.05 kA
Short Current I_S^8	5.0 kA
Stored Energy E^9	1.5 Wh
Energy Density E_d^{10}	7.5 Wh/kg
Usable Power Density P_d^{11}	9.0 kW/kg
Matched Impedance Power P_{dMax}^{12}	18.8 kW/kg

THERMAL CHARACTERISTICS

Type	C46W-3R0-1200
Working Temperature	-40~65 °C
Storage Temperature ¹³	-40~70 °C
Thermal Resistance R_{Th}^{14}	5.9 K/W
Thermal Capacitance C_{th}^{15}	240 J/K

SAFETY & ENVIRONMENTAL SPECIFICATIONS

TYPE	C46W-3R0-1200
Safety	RoHS, REACH and UL810A
Vibration	ISO16750 Table 12
	IEC 60068-2-64 (Table A.5/A.6)
Shock	IEC 60068-2-27

LIFETIME CHARACTERISTICS

TYPE	C46W-3R0-1200
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

PHYSICAL PARAMETERS

TYPE	C46W-3R0-1200	
Mass M	200 g	
Terminals(leads) ²⁰	Weldable	
Dimensions ²¹	Height	98.7 mm
	Diameter	46 mm

NOTES:

TYPE

C46W-3R0-1200

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| <ol style="list-style-type: none"> 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. 3. Capacitance tolerance: Typical capacity is 105% of rated capacity. 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: $I_{MCC} = \sqrt{\Delta T / (ESR * R_{Th})}$ 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: $I_{Max} = 0.5C * VR (\Delta t + ESR * C)$, discharge from VR to VR/2 in 1 second. 8. Short current: $I_s = VR / ESR$ 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. DC Life at High Temperature: Under the maximum working temperature of the supercapacitor (65 ° C), it is constant at its rated voltage for 1500h, the capacity is kept above 80% of the rated capacity under normal temperature, and the internal resistance is below 200% of the rated internal resistance. | <ol style="list-style-type: none"> 17. DC Life at RT: keep the supercapacitor at its rated voltage. The life criterion is that the capacity is kept above 80% of the rated capacity, and the internal resistance is below 200% of the rated internal resistance. 18. Cycle life: Charge and discharged the capacitor in the range between VR and VR /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). 19. Storage life: within the storage temperature range, keep the discharge state, no load (cell voltage < 0.2 V). 20. Leading end: Positive pole Φ10 mm*1.5 mm, negative pole Φ10 mm*2.0 mm 21. Dimensions C46W-3R0-1200 22. Standard marking 23. Name of manufacturer, part number, serial number

Rated voltage and capacitance, negative and positive terminals, warning marking

Stored energy in watt-hours. 24. Mounting recommendations: 25. Recommended welding depth is not less than 1.8 mm.

Provide sufficient distance between cells to meet the insulation strength.

Keep enough space around the explosion-proof tank and keep the top clean and avoid mechanical damage. 26. The contents of this document are subject to change without notice. GMCC accepts no liability for the accuracy or credibility of the values and information contained in this document. |
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