GMCC CRAMS

3V 3400F Supercapacitor Cells

- 3V DC output
- 3400F Capacitance
- High cycle life of 1 million cycles
- Very high power density
- Laser-weldable posts

ELECTRICAL SPECIFICATIONS

TYPE	C60W-3R0-3400
Rated Voltage V_R	3.0 V
Surge Voltage V_S[1]	3.1 V
Rated Capacitance C[2]	3400 F
Capacitance Tolerance[3]	-0%/+20%
ESR[2]	≤0.24 mΩ
Leakage Current IL[4]	<12 mA
Self-discharge Rate[5]	<20 %
Constant Current I_{MCC}(ΔT = 15°C)[6]	139 A
Max Current I_{Max}[7]	2.81 kA
Short Current I_S[8]	12.5 kA
Stored Energy E[9]	4.25 Wh
Energy Density E_d[10]	8.3 Wh/kg
Usable Power Density P_d[11]	8.8 kW/kg
Matched Impedance Power P_{dMax}[12]	18.2 kW/kg

THERMAL CHARACTERISTICS

Type	C60W-3R0-3400
Working Temperature	-40~65 °C
Storage Temperature[13]	-40~70 °C
Thermal Resistance R_{Th}[14]	3.2 K/W
Thermal Capacitance C_{th}[15]	565 J/K

LIFETIME CHARACTERISTICS

TYPE	C60W-3R0-3400
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

TYPE	C60W-3R0-3400
Safety	RoHS, REACH and UL810A
Vibration	ISO16750 Table 12 IEC 60068-2-64 (Table A.5/A.6)
Shock	IEC 60068-2-27

PHYSICAL PARAMETERS

TYPE		C60W-3R0-3400
Mass M		514 g
Terminals(leads)[20]		Weldable
Dimensions[21]	Height	138 mm
	Diameter	60 mm

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NOTES:

TYPE	C60W-3R0-3400

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: $IMax = 0.5C * VR\ (\Delta t + ESR * C)$, 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. 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.
17. 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.
18. 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.
19. 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).
20. Storage life: within the storage temperature range, keep the discharge state, no load (cell voltage < 0.2 V).
21. Leading end: Φ14 mm*3 mm.
22. Dimensions C60W-3R0-3400
23. Standard marking
24. Name of manufacturer, part number, serial number

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

    Stored energy in watt-hours.
25. Mounting recommendations:
26. 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.
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