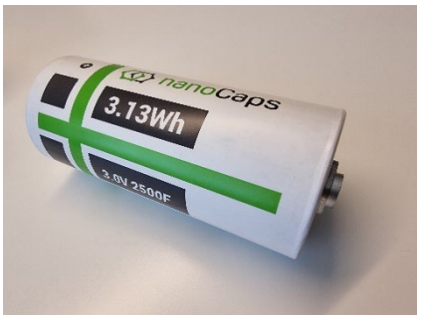
nanoCaps
LEADING EDGE SUPERCAPACITORS

Product Datasheet

ϕ60mm ultracapacitors



- Rated voltage 3V DC
- 650-3000 F capacitance
- High cycle life of 1million cycles
- Very high power density
- Laser weldable terminals
- Green and Environment protection

ELECTRICAL SPECIFICATIONS	
Type	**C60W-3R0-3400**
Rated Voltage V_R	3.00 V
Surge Voltage V_S[1]	3.10 V
Rated Capacitance C[2]	3400 F
Capacitance Tolerance[3]	-0% / +20 %
DC ESR[2]	≤0.28 mΩ
Leakage Current IL[4]	< 12 mA
Self-discharge Rate[5]	<20 %
Constant Current I_{MCC} (ΔT = 15°C)[6]	131 A
Max Current I_{Max}[7]	2.6 kA
Short Current I_S[8]	10.7 kA
Stored Energy E[9]	4.25 Wh
Energy Density E_d[10]	9.3 Wh/kg
Usable Power Density P_d[11]	8.4 kW/kg
Impedance Match Power Density P_{dMax}[12]	17.5 kW/kg

THERMAL CHARACTERISTICS	
Type	**C60W-3R0-3400**
Working Temperature	-40 ~ 65 °C
Storage Temperature[13]	-40 ~ 70 °C
Thermal Resistance R_{Th}[14]	3.14 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

Address: nanoCaps AS, Vestfold Innovation Park, Raveien 205, 3184 Borre, Norway
Tel: +47 91 73 72 06 Web: www.nanocaps.no E-mail: nanocaps@nanocaps.no

SAFETY & ENVIRONMENTAL SPECIFICATIONS

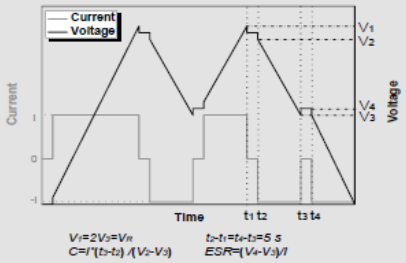
Type	C60W-3R0-3400
Safety	RoHS, REACH and UL810
Vibration	ISO 16750-3 (Table 14)
Shock	SAE J2464

PHYSICAL PARAMETERS

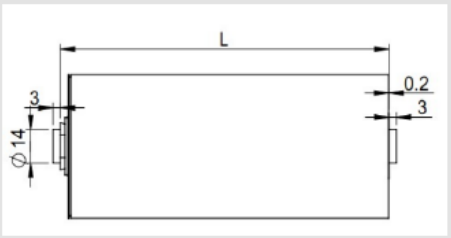
Type		C60W-3R0-3400
Mass, typical M		490 g
Terminals [20]		weldable
Dimensions [21]	Height L	138 mm
	Diameter	60 mm

NOTES

1. Surge voltage V_S: Absolute maximum voltage, non-repetitive. The duration must not exceed 1 second.
2. Capacitance C: The test current is 0.12 A/F, if the calculated current is >100 A, then apply 100 A.。



3. Capacitance tolerance: Typical tolerance is 5%。
4. Leakage current measurement procedure: 1) Charge the capacitor to the V_R with a constant current (0.12 A/F, if the calculated current is >100 A, then apply 100 A). 2) Hold the voltage at V_R for 72 h. 3) The current to maintain V_R after 72 h is the leakage current。
5. Self-discharge rate measurement procedure: 1) Charge the capacitor to V_R with a constant current (0.075 A/F, if the calculated current >100 A, then apply 100 A). 2) Hold the voltage at V_R for 3 h. 3) Floating for 72 h. 4) Measure the voltage after 72 h.
6. Max constant working current:: $I_{MCC} = \sqrt{\Delta T / (ESR * R_{Th})}$
7. Max current: $I_{Max} = 0.5C * V_R/(\Delta t + ESR * C)$, discharge from V_R to V_R /2 in 1 second.
8. Short current: $I_S = V_R/ESR$
9. Stored energy: $E = 0.5C * V^2/3600$
10. Energy density: $E_d = E/M$
11. Usable power density: $P_d = 0.125V_R^2/(ESR * M)$
12. Impedance match power density: $P_{dMax} = 0.25V_R^2/(ESR * m)$
13. Storage temperature: Storage in discharge state
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: Hold the capacitor 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.
17. DC life at RT: Hold the capacitor 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.
18. Cycle life: Charge and discharged the capacitor in the range between V_R and V_R/2. 5 seconds waiting period between charge and discharge. The constant test current is 0.12 A/F (if the calculated current >100 A, then apply 100 A).
19. Shelf life: Discharged and no load applied.
20. Threaded connection: Φ 14 mm*3 mm, and the welding depth should be larger than 1.8 mm.
21. Dimensions:



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

Mounting recommendations:
- Mounting without applying undue mechanical stress on the terminals
- Provide adequate spacing in between cells to secure required insulation strength
- Provide clearance around the safety vent and do not position anything above the safety vent that may be damaged in an event of vent rupture

The contents of this document are subject to change without notice.

Address: nanoCaps AS, Vestfold Innovation Park, Raveien 205, 3184 Borre, Norway
Tel: +47 91 73 72 06 Web: www.nanocaps.no E-mail: nanocaps@nanocaps.no