

3V 360F Supercapacitor Cells

- 3V DC output
- 360F Capacitance
- High cycle life of 1 million cycles
- Very high power density
- Radial terminals for PCB mounting
- Ecology



ELECTRICAL SPECIFICATIONS

TYPE	C35S-3R0-0360
Rated Voltage V_R	3.0 V
Surge Voltage V_S^1	3.1 V
Rated Capacitance C^2	360 F
Capacitance Tolerance ³	-0%/+20%
ESR ²	≤ 1.5 m Ω
Leakage Current I_L^4	<1.2 mA
Self-discharge Rate ⁵	<20 %
Constant Current $I_{MCC}(\Delta T = 15^\circ C)^6$	29 A
Max Current I_{Max}^7	351 A
Short Current I_S^8	2.0 kA
Stored Energy E^9	0.45 Wh
Energy Density E_d^{10}	6.3 Wh/kg
Usable Power Density P_d^{11}	10.1 kW/kg
Matched Impedance Power P_{dMax}^{12}	21.1 kW/kg

THERMAL CHARACTERISTICS

Type	C35S-3R0-0360
Working Temperature	-40~65 °C
Storage Temperature ¹³	-40~70 °C
Thermal Resistance R_{Th}^{14}	11.7 K/W
Thermal Capacitance C_{th}^{15}	83 J/K

SAFETY & ENVIRONMENTAL SPECIFICATIONS

TYPE	C35S-3R0-0360
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	C35S-3R0-0360
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	C35S-3R0-0360	
Mass M	71 g	
Terminals(leads) ²⁰	Solderable	
Dimensions ²¹	Height Diameter	62.7 mm 35 mm

NOTES:

TYPE

C35S-3R0-0360

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. 0.1 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 (0.1 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 (0.1 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. 储存温度: 放电状态存储 (单体电压 < 0.2 V).
Storage temperature: discharged state (cell voltage < 0.2 V).
 14. 热阻: $R_{Th} = 1 / (h * A)$, 其中 $h=10 W / (m^2 * K)$, A 为电容器外表面积。
Thermal resistance: $R_{Th} = 1 / (h * A)$, where $h=10 W / (m^2 * K)$, 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 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 0.1 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: Tinned terminal, can weld PCB board.
 21. Dimensions: C35S-3R0-0360
 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. 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. Recommended wave soldering profile for printed circuit assembly with use of lead-free alloy.
 27. Total soldering process time from room temperature to peak temperature 265°C and cool down is 10 minutes max. The time to reach the required temperatures depends on the design of the application and on the power of pre-heating section of the soldering machine. All temperatures are measured on the cell leads on top of the PCB. Recommended thickness for PCB = 2.4 to 3.2 mm. Conformal coating is recommended
Solder: Lead-free (Sn96.5/Ag 3.0/Cu0.5) liquidus point 217°C
Recommended Flux Kester 979T
Ramp Up Rate: 3°-5° C/sec. Max
Preheat: 140° to 155° C 2°-3° C/sec on top of board
Ramp to peak temp: 200°C/sec
Peak Temp: 265°C for 1.5 to 5 sec. Max
Cool Down Rate: 3° C-5° C /sec. Max
Max Conveyor Speed: 40-50 cm/min
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