XP™ 2.7V 10F ULTRACAPACITOR CELL

FEATURES AND BENEFITS
- Enhanced performance under adverse environmental conditions
- Patented improvements both in structure and in sealing
- Long lifetimes with up to 500,000 duty cycles
- Compliant with UL, RoHS and REACH requirements

TYPICAL APPLICATIONS
- Actuators
- Emergency Lighting
- Telematics
- Automotive
- Security Equipment
- Backup System
- Smoke Detectors
- Advanced Metering

PRODUCT SPECIFICATIONS

ELECTRICAL
- Rated Voltage, $V_r$: 2.7 VDC
- Surge Voltage: 2.85 VDC
- Rated Capacitance, $C$: 10 F
- Min. / Max. Capacitance, Initial: 9 F / 12 F
- Typical Capacitance, Initial: 10.6 F
- Rated (Max.) ESR$_{DC}$, Initial: 30 mΩ
- Typical ESR$_{DC}$, Initial: 25 mΩ
- Typical ESR$_{DC}$, Initial, 5 sec: 46 mΩ
- Maximum Leakage Current: 23 μA
- Maximum Peak Current, Non-repetitive: 10 A

PHYSICAL
- Nominal Mass: 3.2 g

POWER & ENERGY
- Operating Temp. Range: Standard (-40°C to 65°C) at 2.7 V
- Extended (-40°C to 85°C) at 2.3 V
- Maximum Stored Energy: 10.1 mWh
- Gravimetric Specific Energy: 3.1 Wh/kg
- Usable Specific Power: 9.1 kW/kg
- Impedance Match Specific Power: 18.9 kW/kg

SAFETY
- Certifications: RoHS, REACH, UL 810A

TYPICAL CHARACTERISTICS

THERMAL
- Typical Thermal Resistance ($R_{in, Housing}$): 42°C/W
- Typical Thermal Capacitance ($C_{in}$): 2.7 J°C
- Usable Continuous Current (BOL), ($\Delta T = 15^\circ C$): 3.4 A
- Usable Continuous Current (BOL), ($\Delta T = 40^\circ C$): 5.6 A

LIFE*
- Projected DC Life at Room Temperature: 10 years
- DC Life at High Temperature: 1,500 hours
- DC Life at De-rated Voltage & Higher Temperature: 1,500 hours
- Projected Cycle Life at Room Temperature: 500,000 cycles
- Biased Humidity Life: 2,500 hours
- Shelf Life: 4 years

*Results may vary. Additional terms and conditions, including the limited warranty, apply at the time of purchase. See the warranty details for applicable operating and use requirements.
Datasheet: XP™ 2.7V 10F ULTRACAPACITOR CELL

1. Surge Voltage
   Absolute maximum voltage, non-repetitive. Duration not to exceed 1 second.

2. "Typical" values represent mean values of production sample.

3. Rated Capacitance & ESR_{dc} (measure method)
   • Capacitance: Constant current charge (10 mA/F) to V_{dc}, 5 min hold at V_{dc},
     constant current discharge 10 mA/F to 0.1V.
     e.g. in case of 2.7V 10F cell, 10 * 10 = 100 mA
   • ESR_{dc}: Constant current charge (10 mA/F) to V_{dc}, 5 min hold at V_{dc},
     constant current discharge (40 * C * V_{dc}[mA]) to 0.1 V.
     e.g. in case of 2.7V 10F cell, charge with 10 * 10 = 100 mA and discharge with
     40 * 10 * 2.7 = 1,080 mA

   ![Image](image.png)

   

   1.08A

   0.6V

   1.08A

   0.6V

   C = \frac{1}{2}\left(\frac{I}{V}\right)

   where C is the capacitance (F);
   I is the absolute value of the discharge current (A);
   V is the absolute voltage (V);

   ESR_{dc} = \frac{\Delta V}{I}

   where ΔV is the voltage drop during first 10ms of discharge (V).

   Typical ESR_{dc} Initial, 5 sec tested per Maxwell Application Note. "Test Procedures
   for Capacitance, ESR, Leakage Current and Self-Discharge Characterizations of

4. Maximum Leakage Current
   • Current measured after 72 hrs at rated voltage and 25°C. Initial leakage current
     can be higher.
   • If applicable, module leakage current is the sum of cell and balancing circuit
     leakage currents.

5. Maximum Peak Current
   • Current needed to discharge cell/module from rated voltage to half-rated
     voltage in 1 second.

BCAP0010 P270 X01

When ordering, please reference the Maxwell Model Number below.

Maxwell Model Number: BCAP0010 P270 X01
Maxwell Part Number: 133517
Alternate Model Number: ESHSR-0010CP0-002R7UC

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