2.7V 325F ULTRACAPACITOR CELL

FEATURES AND BENEFITS
• High specific power density of 14.6 kW/kg
• Extremely low ESR < 1.9 mΩ
• Exceptional shock and vibration resistance
• Long lifetimes with up to 500,000 duty cycles*
• Compliant with UL, RoHS and REACH

TYPICAL APPLICATIONS
• Automotive peak power assist subsystems: electric active-roll control, electric power steering, electric-turbocharging or regenerative breaking
• Automotive backup power applications: autonomous driving or Advanced Driver-Assistance Systems, board-net stabilization

PRODUCT SPECIFICATIONS

ELECTRICAL
Rated Voltage, $V_R$ 2.7 VDC
Surge Voltage$^1$ 2.85 VDC
Rated Capacitance, $C^3$ 325 F
Min. / Max. Capacitance, Initial 325 F / 390 F
Typical Capacitance, Initial$^2,3$ 340 F
Rated (Max.) ESR$_{DC}$, Initial$^3$ 1.9 mΩ
Typical ESR$_{DC}$, Initial$^2,3$ 1.6 mΩ
Typical ESR$_{DC}$, Initial, 5 sec$^2,3$ 2.1 mΩ
Maximum Leakage Current$^4$ 0.45 mA
Maximum Peak Current, Non-repetitive$^6$ 270 A

PHYSICAL
Nominal Mass 65.3 g

POWER & ENERGY
Operating Temp. Range -40°C to 65°C
Maximum Stored Energy, $E_{max}^6$ 0.33 Wh
Gravimetric Specific Energy$^6$ 5.0 Wh/kg
Usable Specific Power$^6$ 7.0 kW/kg
Impedance Match Specific Power$^6$ 14.6 kW/kg

SAFETY
Certifications RoHS, REACH
UL 810A

TYPICAL CHARACTERISTICS

THERMAL CHARACTERISTICS
Typical Thermal Resistance ($R_{th}$, Housing)$^8$ 8.8°C/W
Typical Thermal Capacitance ($C_{th}$) 75.6 J/°C
Usable Continuous Current (BOL) ($\Delta T = 15 \, ^\circ C)^{8,10}$ 30 A
Usable Continuous Current (BOL) ($\Delta T = 40 \, ^\circ C)^{8,10}$ 49 A

LIFE*
Projected DC Life at Room Temperature (At rated voltage and 25°C, EOL$^{10}$) 10 years
DC Life at High Temperature (At rated voltage and 65°C, EOL$^{10}$) 1,500 hours
Projected Cycle Life at Room Temperature$^7$ (Constant current charge-discharge from $V_R$ to 1/2$V_R$ at 25°C, EOL$^{10}$) 500,000 cycles
Shelf Life (Stored uncharged at 25°C, ≤ 50% RH) 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.
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 \( V_{cr} \), 5 min hold at \( V_{cr} \),
     constant current discharge 10 mA/F to 0.1V.
   - ESR_{DC}: Constant current charge (10 mA/F) to \( V_{cr} \), 5 min hold at \( V_{cr} \),
     constant current discharge (40 * C * \( V_{cr} \) [mA]) to 0.1 V.

   e.g. in case of 2.7V 325F cell, charge with 10 * 325 = 3,250 mA and discharge
   with 40 * 325 * 2.7 = 35,100 mA

4. Maximum Leakage Current
   - Maximum leakage current can be higher.

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

6. Energy & Power (Based on IEC 62391-2)
   - Maximum Stored Energy, \( E_{max} (Wh) = \frac{1}{2}CV_{max}^{2} \)
   - Gravimetric Specific Energy (Wh/kg) = \( \frac{E_{max}}{mass} \)
   - Usable Specific Power (W/kg) = \( \frac{C}{ESR_{DC} \times mass} \)
   - Impedance Match Specific Power (W/kg) = \( \frac{0.25V_{max}^{2}}{ESR_{DC} \times mass} \)

   • Presented Power and Energy values are calculated based on Rated
     Capacitance & Rated (Max.) ESR_{DC} Initial values.

7. Cycle Life Test Profile
   Cycle life varies depending upon application-specific characteristics. Actual
   results will vary.

8. Temperature Rise at Constant Current
   - \( \Delta T = \frac{I^{2}R_{th}^{2}}{R_{DC}} \)

   Typical ESR_{DC}: initial, 5 sec tested per Maxwell Application Note, "Test Procedures
   for Capacitance, ESR, Leakage Current and Self-Discharge Characteristics of

9. Per United Nations material classification UN3499, all Maxwell ultracapacitors
   have less than 10 Wh capacity to meet the requirements of Special Provisions
   361. Both individual ultracapacitors and modules composed of those
   ultracapacitors shipped by Maxwell can be transported without being treated as
   dangerous goods (hazardous materials) under transportation regulations.

10. EOL: Beginning of Life, rated initial product performance
    EOL: End of Life criteria
    • Capacitance: 80% of min. BOL rating
    • ESR_{LC}: 2x max. BOL rating

BCAP0325 P270 S17

Part Description | L (±0.1) | D (max) | d (±0.1) | H (±0.3) | A (±0.1) | B (±0.1) | E (±0.1) | F (±0.1)
--- | --- | --- | --- | --- | --- | --- | --- | ---
BCAP0325 P270 S17 | 62.5 | 33.8 | 2.0 | 3.0 | 11.9 | 10.0 | 5.0 | 5.9

When ordering, please reference the Maxwell Model Number below.

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