FEATURES AND BENEFITS
• High performance product with low ESR
• Exceptional shock and vibration resistance
• Long lifetimes with up to 500,000 duty cycles*
• Compliant with RoHS and REACH requirements

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

PRODUCT SPECIFICATIONS

ELECTRICAL
- Rated Voltage, $V_r$: 5.0 VDC
- Surge Voltage: 5.4 VDC
- Rated Capacitance, $C$: 2.5 F
- Min. / Max. Capacitance, Initial: 2.25 F / 3 F
- Typical Capacitance, Initial: 2.63 F
- Rated (Max.) ESR, Initial: 85 mΩ
- Typical ESR, Initial: 69 mΩ
- Maximum Leakage Current: 8 μA
- Maximum Peak Current, Non-repetitive: 5.1 A

PHYSICAL
- Nominal Mass: 5.0 g

POWER & ENERGY
- Operating Temp. Range: Standard (-40°C to 65°C) at 5.0 V
- Maximum Stored Energy, $E_{max}^6$: 8.6 mWh
- Gravimetric Specific Energy: 1.7 Wh/kg
- Usable Specific Power: 7.0 kW/kg
- Impedance Match Specific Power: 14.7 kW/kg

THERMAL
- Typical Thermal Resistance ($R_{th}$, Housing): 69°C/W
- Typical Thermal Capacitance ($C_{th}$): 4.3 J/°C
- Usable Continuous Current (BOL) ($\Delta T = 15 \, ^\circ C$): 1.6 A
- Usable Continuous Current (BOL) ($\Delta T = 40 \, ^\circ C$): 2.6 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
- Shelf Life: 4 years

SAFETY
- Certifications: RoHS, REACH

*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 \(4 \times C \times V\), 5 min hold at \(V\). constant current discharge \(4 \times C \times V\) to 0.1 V.
     e.g. in case of 5.0V 2.5F module, \(4 \times 2.5 \times 5.0 = 50\) mA.
   - ESR\(_{DC}\): Constant current charge \(4 \times C \times V\) to \(V\), 5 min hold at \(V\).
     e.g. in case of 5.0V 2.5F module, charge with \(4 \times 2.5 \times 5.0 = 50\) mA and discharge with \(40 \times 2.5 \times 5.0 = 500\) mA.

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.

\[ C = \frac{i \times (t_2 - t_1)}{V} \]

where \(C\) is the capacitance (F):
\(i\) is the absolute value of the discharge current (A);
\(V\) is the rated voltage (V);
\(t_1\) is the measurement start voltage, 0.8 \(V\);
\(t_2\) is the time from start of discharge to reach \(V\) (s);
\(t_1\) is the time from start of discharge to reach \(V\) (s);
\(\Delta V\) is the voltage drop during first 10ms of discharge (V).

\[ ESR_{DC} = \frac{\Delta V}{i} \]

**Datasheet: 5.0V 2.5F ULTRACAPACITOR MODULE**

**Part Description: BMOD0002 P005 B02**

When ordering, please reference the Maxwell Model Number below.

**Maxwell Model Number:** BMOD0002 P005 B02

**Maxwell Part Number:** 133731

**Alternate Model Number:** EMHSR-0002C5-005R0

**Dimensions (mm):**

<table>
<thead>
<tr>
<th>Part Description</th>
<th>W (max.)</th>
<th>L (max.)</th>
<th>D (max.)</th>
<th>H1 (min.)</th>
<th>H2 (min.)</th>
<th>A (±0.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMOD0002 P005 B02</td>
<td>21.5</td>
<td>23.0</td>
<td>12.0</td>
<td>0.60</td>
<td>15.0</td>
<td>19.0</td>
</tr>
</tbody>
</table>

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