

FEATURES AND BENEFITS*

- Up to 10 year DC life
- 160V DC working voltage
- Resistive cell balancing
- Compact and light weight package
- Screw terminals

TYPICAL APPLICATIONS

- Wind turbine pitch control
- Small UPS systems
- Small industrial systems



PRODUCT SPECIFICATIONS

ELECTRICAL

BMOD0006 E160 B02

| | |
|---|---------|
| Rated Capacitance ¹ | 5.8 F |
| Minimum Capacitance, initial ¹ | 5.8 F |
| Maximum Capacitance, initial ¹ | 7 F |
| Maximum ESR _{DC} , initial ¹ | 240 mΩ |
| Test Current for Capacitance and ESR _{DC} ¹ | 35 A |
| Rated Voltage | 160 V |
| Absolute Maximum Voltage ² | 170 V |
| Absolute Maximum Current | 170 A |
| Leakage Current at 25°C, maximum ³ | 25 mA |
| Maximum Series Voltage | 750 V |
| Capacitance of Individual Cells ⁹ | 350 F |
| Maximum Stored Energy, Individual Cell ⁹ | 0.35 Wh |
| Number of Cells | 60 |

TEMPERATURE

| | |
|---|-------|
| Operating Temperature (Cell Case Temperature) | |
| Minimum | -40°C |
| Maximum | 65°C |
| Storage Temperature (Stored Uncharged) | |
| Minimum | -40°C |
| Maximum | 70°C |

PHYSICAL

| | |
|-------------------------------|--------------------|
| Mass, typical | 5.2 kg |
| Power Terminals | M5 Thread |
| Recommended Torque - Terminal | 4 Nm |
| Vibration Specification | IEC60068-2-6 |
| Shock Specification | IEC60068-2-27,-29 |
| Environmental Protection | IP54 |
| Cooling | Natural Convection |

*Results may vary. Additional terms and conditions, including the limited warranty, apply at the time of purchase. See the warranty details and enclosed information for applicable operating and use requirements.

PRODUCT SPECIFICATIONS (Cont'd)

MONITORING / CELL VOLTAGE MANAGEMENT

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| | |
|-----------------------------|--------------------|
| Internal Temperature Sensor | N/A |
| Temperature Interface | N/A |
| Cell Voltage Monitoring | Voltage Center Tap |
| Connector | M4 |
| Cell Voltage Management | Passive |

POWER AND ENERGY

| | |
|--|------------|
| Usable Specific Power, P_d ⁴ | 2,500 W/kg |
| Impedance Match Specific Power, P_{max} ⁵ | 5,100 W/kg |
| Specific Energy, E_{max} ⁶ | 4 Wh/kg |
| Stored Energy, E_{stored} ⁷ | 21 Wh |

SAFETY

| | |
|--|-----------|
| Short Circuit Current, typical (Current possible with short circuit from rated voltage. Do not use as an operating current.) | 670 A |
| Certifications | RoHS |
| High-Pot Capability ¹⁰ | 5,600 VDC |

TYPICAL CHARACTERISTICS

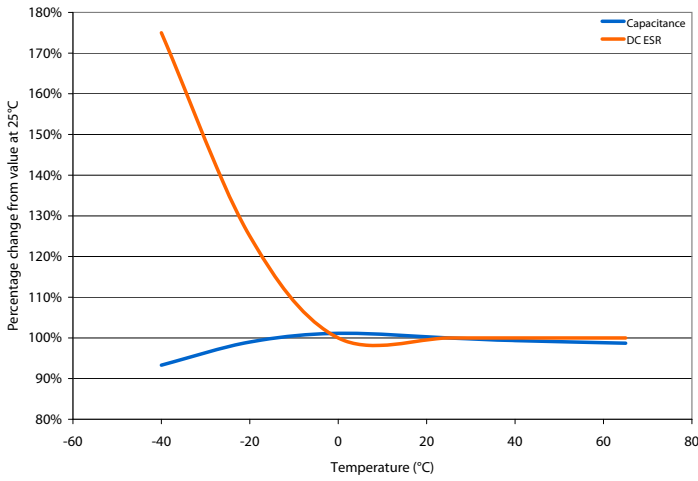
THERMAL CHARACTERISTICS

| | |
|--|---------------------|
| Thermal Resistance (R_{ca} , All Cell Cases to Ambient), typical ⁸ | 1.1°C/W |
| Thermal Capacitance (C_{th}), typical | 4,800 J/°C |
| Maximum Continuous Current ($\Delta T = 15$ °C) ⁸ | 7 A _{RMS} |
| Maximum Continuous Current ($\Delta T = 40$ °C) ⁸ | 12 A _{RMS} |

LIFE

| | |
|--|-------------|
| DC Life at High Temperature ¹ (held continuously at Rated Voltage and Maximum Operating Temperature) | 1,500 hours |
| Capacitance Change (% decrease from minimum initial value) | 20% |
| ESR Change (% increase from maximum initial value) | 100% |
| Projected DC Life at 25°C ¹ (held continuously at Rated Voltage) | 10 years |
| Capacitance Change (% decrease from minimum initial value) | 20% |
| ESR Change (% increase from maximum initial value) | 100% |
| Shelf Life (Stored uncharged at 25°C) | 4 years |

ESR AND CAPACITANCE VS TEMPERATURE



NOTES

1. Capacitance and ESR_{DC} measured at 25°C using specified test current per waveform below.
2. Absolute maximum voltage, non-repeated. Not to exceed 1 second.
3. After 72 hours at rated voltage. Initial leakage current can be higher.

4. Per IEC 62391-2, $P_d = \frac{0.12V^2}{ESR_{DC} \times \text{mass}}$

5. $P_{max} = \frac{V^2}{4 \times ESR_{DC} \times \text{mass}}$

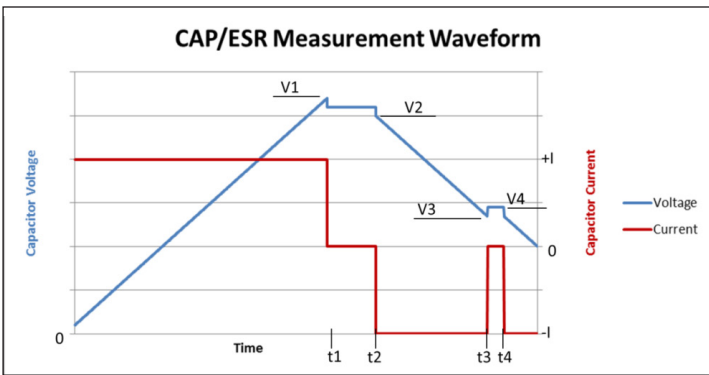
6. $E_{max} = \frac{1/2 CV^2}{3,600 \times \text{mass}}$

7. $E_{stored} = \frac{1/2 CV^2}{3,600}$

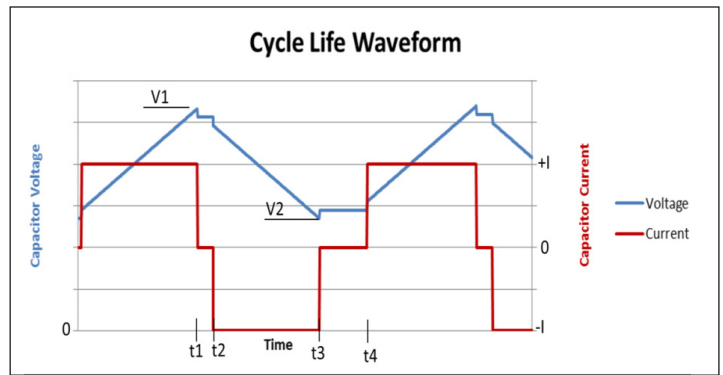
8. $\Delta T = I_{RMS}^2 \times ESR \times R_{ca}$

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. Duration = 60 seconds. Not intended as an operating parameter.



$V1 = V_{rated}$ $t2 - t1 = 15 \text{ seconds}$ $\text{Capacitance} = I \times (t3 - t2) / (V2 - V3)$
 $V3 = 0.5 \times V_{rated}$ $t4 - t3 = 5 \text{ seconds}$ $\text{ESR} = (V4 - V3) / I$



$V1 = V_{rated}$ $t2 - t1 = 5 \text{ seconds (I=0)}$
 $V2 = 0.5 \times V_{rated}$ $t4 - t3 = 15 \text{ seconds (I=0)}$

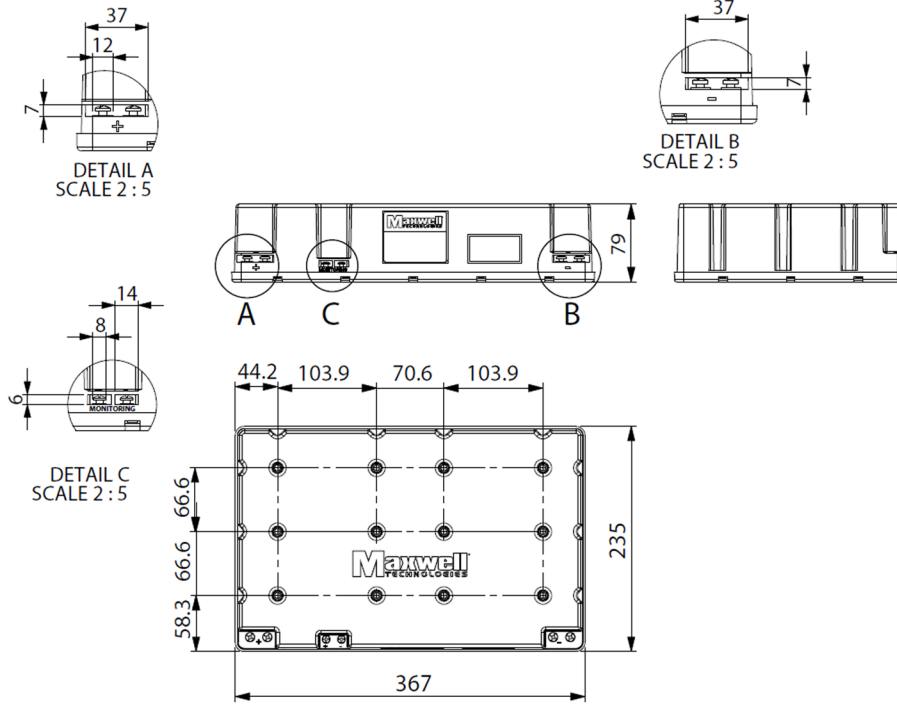
MOUNTING RECOMMENDATIONS

Please refer to the user manual for installation recommendations.

MARKINGS

Products are marked with the following information: Rated capacitance, rated voltage, product number, name of manufacturer, positive and negative terminal, warning marking, serial number.

BMOD0006 E160 B02



| Part Description | L (±0.5mm) | Dimensions (mm) W (±0.2mm) | H (±0.7mm) | Package Quantity |
|-------------------|------------|-------------------------------|------------|------------------|
| BMOD0006 E160 B02 | 367 | 235 | 79 | 3 |

Product dimensions are for reference only unless otherwise identified. Product dimensions and specifications may change without notice.

Please contact Maxwell Technologies directly for any technical specifications critical to application. All products featured on this datasheet are covered by the following U.S. patents and their respective foreign counterparts: 6643119, 7295423, 7307830, 7342770, 7352558, 7384433, 7440258, 7492571, 7508651, 7791860, 7791861, 7859826, 7883553, 7935155, 8072734, 8279580, and patents pending.



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