

## 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 <sup>1</sup>	5.8 F
Minimum Capacitance, initial <sup>1</sup>	5.8 F
Maximum Capacitance, initial <sup>1</sup>	7 F
Maximum ESR <sub>DC</sub> , initial <sup>1</sup>	240 mΩ
Test Current for Capacitance and ESR <sub>DC</sub> <sup>1</sup>	35 A
Rated Voltage	160 V
Absolute Maximum Voltage <sup>2</sup>	170 V
Absolute Maximum Current	170 A
Leakage Current at 25°C, maximum <sup>3</sup>	25 mA
Maximum Series Voltage	750 V
Capacitance of Individual Cells <sup>9</sup>	350 F
Maximum Stored Energy, Individual Cell <sup>9</sup>	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 for applicable operating and use requirements.

## PRODUCT SPECIFICATIONS (Cont'd)

### MONITORING / CELL VOLTAGE MANAGEMENT

BMOD0006 E160 B02

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, $P_d$ <sup>4</sup>	2,500 W/kg
Impedance Match Specific Power, $P_{max}$ <sup>5</sup>	5,100 W/kg
Specific Energy, $E_{max}$ <sup>6</sup>	4 Wh/kg
Stored Energy, $E_{stored}$ <sup>7</sup>	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 <sup>10</sup>	5,600 VDC

## TYPICAL CHARACTERISTICS

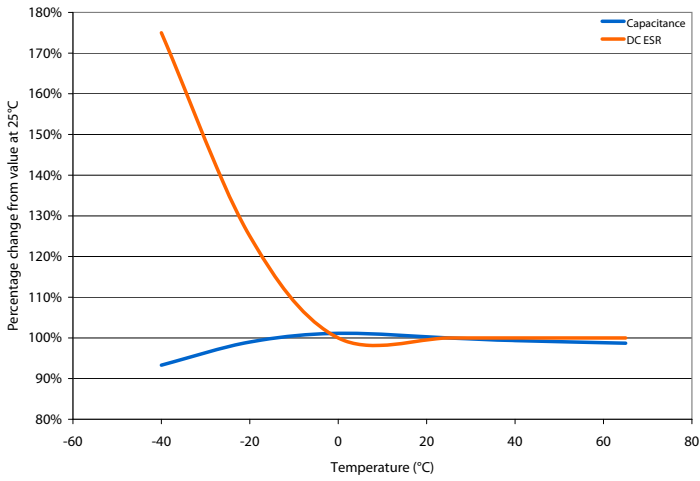
### THERMAL CHARACTERISTICS

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

### LIFE

DC Life at High Temperature <sup>1</sup> (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 <sup>1</sup> (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<sub>DC</sub> 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.  $P_{max} = \frac{V^2}{4 \times ESR_{DC} \times \text{mass}}$

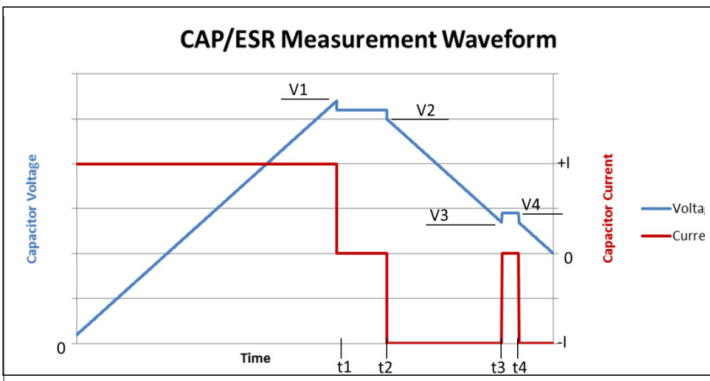
6.  $E_{max} = \frac{1/2 CV^2}{3,600 \times \text{mass}}$

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

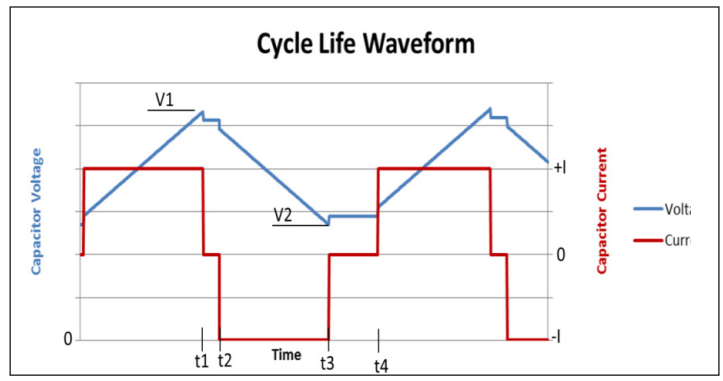
8.  $\Delta T = I_{RMS}^2 \times ESR \times R_{ca}$

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.



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



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

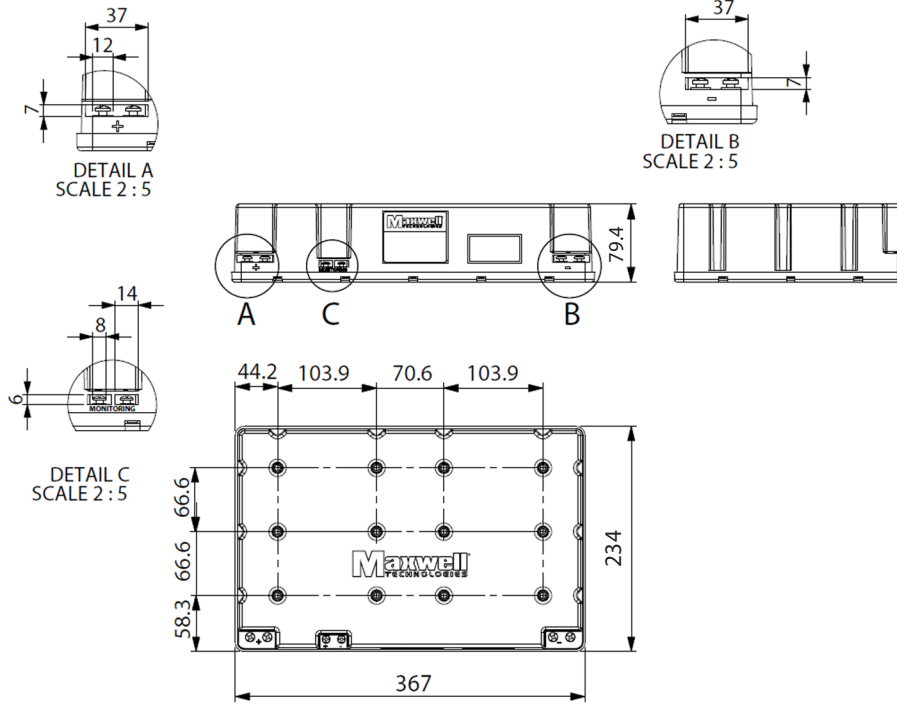
**MOUNTING RECOMMENDATIONS**

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	Dimensions (mm)			Package Quantity
	L (±0.7mm)	W (±0.7mm)	H (±0.7mm)	
BMOD0006 E160 B02	367.0	234.0	79.4	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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