



### Features:

- Reliable operation at very low temperatures and low voltages is guaranteed
- The ability to carry out 500,000 loading and unloading cycles
- Operating life of more than 10 years
- Needs no maintenance



## BMOD0117A09

### BOOSTCAP® Ultracapacitor Passive Voltage Module

In the majority of applications, the ultracapacitors are connected in series and parallel in order to reach the required voltage which generally lies in the range of 14 and 700 Vdc.

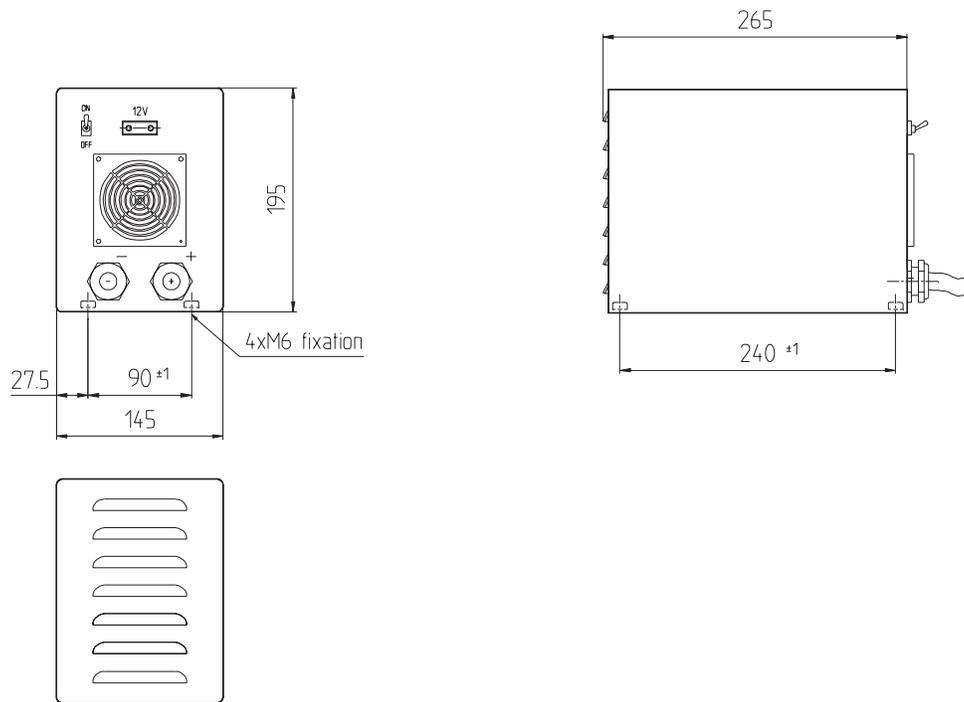
The voltage balancing which is needed to protect the capacitors from over-charging can be done with the following solutions:

- Passive device for equalizing the voltages with resistances
- Passive device for equalizing the voltages with diodes
- Active device for equalizing the voltages

Today Maxwell offers an active sharing device based on a back-boost topology, which ensures no over-voltage and a maximum energy stored with a high efficiency. This voltage balancing device allows individual cells of up to 2.5 V to be combined in modules with an operating voltage of several hundred volts.

#### BATTERY vs. ULTRACAPACITOR vs. CAPACITOR COMPARISON

Available Performance	Lead Acid Battery	Ultracapacitor	Conventional Capacitor
Charge Time	1 to 5 hours	0.3 to 30 seconds	10 <sup>-3</sup> to 10 <sup>-6</sup> seconds
Discharge Time	0.3 to 3 hours	0.3 to 30 seconds	10 <sup>-3</sup> to 10 <sup>-6</sup> seconds
Energy (Wh/kg)	10 to 100	1 to 10	<0.1
Cycle Life	1,000	>500,000	>500,000
Specific Power (W/kg)	<1,000	<10,000	<100,000
Charge/discharge efficiency	0.7 to 0.85	0.85 to 0.98	>0.95



### Specifications

<b>Capacitance</b>	• 435 Farads (DCC, 25°C)				
<b>Capacitance Tolerance</b>	• +20%/-20%				
<b>Voltage</b>	<table border="0"> <tr> <td><b>Rated Surge</b></td> <td>• 14 V</td> </tr> <tr> <td></td> <td>• 17 V</td> </tr> </table>	<b>Rated Surge</b>	• 14 V		• 17 V
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	• 17 V				
<b>Series Resistance</b> (Maximum)	• 4 mΩ (DCC, 25°C)				
<b>Specific Power Density</b>	• 2,000 (W/kg) (14 V)				
<b>Current</b> (Maximum)	• 600 A				
<b>Stored Energy</b> (Maximum)	• 42,500 J				
<b>Specific Energy Density</b>	• 1.9 (Wh/kg) (14 V)				
<b>Leakage Current</b> (Maximum)	• 50 mA (14 V)				
<b>Weight</b>	• 6 kg				
<b>Volume</b>	• 7.5 L				
<b>Temperature<sup>1</sup></b>	<table border="0"> <tr> <td><b>Operating Storage</b></td> <td>• -35° C to 65° C</td> </tr> <tr> <td></td> <td>• -35° C to 65° C</td> </tr> </table>	<b>Operating Storage</b>	• -35° C to 65° C		• -35° C to 65° C
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<b>Life Time</b> (25°C)	• 10 y ΔC >20%, ESR < 200% of initial value				
<b>Cyclability</b> (25°C, I = 20 A)	• 500,000 ΔC >20%, ESR < 200% of initial value				

With a capacitance of 435 farads at 14 volts, and in a 195 x 265 x 145 mm enclosure, Maxwell BMOD0117A09 ultracapacitor module is ideal for automotive subsystems, hybrid electric solutions, medical devices, UPS/backup power, and many other applications requiring a pulse of energy that cannot be efficiently provided by a battery or power supply alone.

The BMOD0117A09 works in tandem with batteries for applications that require both a constant low power discharge for continual function and a pulse power for peak loads. In these applications, the device relieves batteries of peak power functions resulting in an extension of battery life and a reduction of overall battery size and cost.

The BMOD0117A09 is also an ideal source of back-up power and pulse. It can provide extended power availability, allowing critical information and functions to remain available during dips, sags, and outages in a power supply or battery change. And, like all Maxwell ultracapacitor products, the BMOD0117A09 is capable of accepting charges at the identical rate of discharge.

### Physical Characteristics

<b>Dimensions</b> (Reference only)	• 195 x 265 x 145 mm (W x H x L)
<b>General Tolerance</b>	• ISO2768-v

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