

## M7017 SERIES

DC/DC POWER SUPPLY



### PRODUCT HIGHLIGHTS

- **MINIATURE**
- **HIGH DENSITY**
- **SINGLE OUTPUT**
- **DC/DC POWER SUPPLY**
- **UP TO 200 W CONTINUOUS,  
330 W PEAK**

|   |   |   |  |   |   |   |  |   |  |   |   |
|---|---|---|--|---|---|---|--|---|--|---|---|
| <p><b><i>Applications</i></b><br/>Military (Airborne, ground-fix, shipboard), Ruggedized, Telecom, Industrial</p>   |   |   |  |   |   |   |  |   |  |   |   |
| <p><b><i>Special Features</i></b></p> <ul style="list-style-type: none"> <li>• Miniature size</li> <li>• High efficiency</li> <li>• Wide input range</li> <li>• Input / Output isolation</li> <li>• Remote sense</li> <li>• External On/Off Inhibit</li> <li>• High Density – up to 25.3 W/in<sup>3</sup></li> <li>• <u>Fixed</u> switching frequency (250 kHz)</li> <li>• External synchronization capability</li> <li>• <u>EMI</u> filters included</li> <li>• Indefinite short circuit and current limit protection with auto-recovery</li> <li>• Over-voltage shutdown with auto-recovery</li> <li>• Over temperature shutdown with auto-recovery</li> </ul>  |   |   |  |   |   |   |  |   |  |   |   |
| <p><b><i>Electrical Specifications</i></b></p> <table border="0" style="width: 100%;"> <tr> <td style="width: 33%; vertical-align: top;"> <p><b><u>DC Input:</u></b><br/>18 to 48V<sub>DC</sub> per MIL-STD-704F.<br/>Works thorough surges as defined by:<br/>MIL-STD-704A (80V for 0.1 Sec)<br/>No damage for:<br/>MIL-STD-1275A (100V for 50mSec)</p> </td> <td style="width: 33%; vertical-align: top;"> <p><b><u>DC Output:</u></b><br/>Output range – 1.5V to 60V<br/><br/>Output current – up to 15A<br/>Output power – steady state 200W<br/>Peak power – 330W up to 5 Sec (after that overload protection turns output to 70% from output).</p> </td> <td style="width: 33%; vertical-align: top;"> <p><b><u>Isolation:</u></b><br/>200V between Input and Output<br/><br/>200V between Input and Case<br/>100V between Output and Case</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p><b><u>Line/Load regulation:</u></b><br/>Less than 1% (no load to full load, –55°C to +85°C, and over input voltage range).</p> </td> <td style="vertical-align: top;"> <p><b><u>Efficiency:</u></b><br/>Typical 88-90% - (full load, room temperature) at worst case.</p> </td> <td style="vertical-align: top;"> <p><b><u>EMC:</u></b><br/>Designed to meet* MIL-STD-461F CE101, CE102, CS101, CS114<br/>CS115, CS116, RE101, RE102<br/>RS101, RS103</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p><b><u>Ripple and Noise:</u></b><br/>Less than 50mV<sub>p-p</sub>, typical (max. 100mV) without external capacitance. When connected to system capacitance ripple drops significantly.</p> </td> <td style="vertical-align: top;"> <p><b><u>Load Transient Overshoot and undershoot</u></b><br/>Output change at load transient of 30%-100% with t<sub>r</sub> &amp; t<sub>f</sub> of max 30μsec is 5% of output voltage. Output recover to steady stated within less 0.5ms.</p> </td> <td style="vertical-align: top;"> <p><b><u>Turn on Transient</u></b><br/>No voltage overshoot during startup.</p> </td> </tr> </table> |   |   | <p><b><u>DC Input:</u></b><br/>18 to 48V<sub>DC</sub> per MIL-STD-704F.<br/>Works thorough surges as defined by:<br/>MIL-STD-704A (80V for 0.1 Sec)<br/>No damage for:<br/>MIL-STD-1275A (100V for 50mSec)</p> | <p><b><u>DC Output:</u></b><br/>Output range – 1.5V to 60V<br/><br/>Output current – up to 15A<br/>Output power – steady state 200W<br/>Peak power – 330W up to 5 Sec (after that overload protection turns output to 70% from output).</p> | <p><b><u>Isolation:</u></b><br/>200V between Input and Output<br/><br/>200V between Input and Case<br/>100V between Output and Case</p> | <p><b><u>Line/Load regulation:</u></b><br/>Less than 1% (no load to full load, –55°C to +85°C, and over input voltage range).</p> | <p><b><u>Efficiency:</u></b><br/>Typical 88-90% - (full load, room temperature) at worst case.</p> | <p><b><u>EMC:</u></b><br/>Designed to meet* MIL-STD-461F CE101, CE102, CS101, CS114<br/>CS115, CS116, RE101, RE102<br/>RS101, RS103</p> | <p><b><u>Ripple and Noise:</u></b><br/>Less than 50mV<sub>p-p</sub>, typical (max. 100mV) without external capacitance. When connected to system capacitance ripple drops significantly.</p> | <p><b><u>Load Transient Overshoot and undershoot</u></b><br/>Output change at load transient of 30%-100% with t<sub>r</sub> &amp; t<sub>f</sub> of max 30μsec is 5% of output voltage. Output recover to steady stated within less 0.5ms.</p> | <p><b><u>Turn on Transient</u></b><br/>No voltage overshoot during startup.</p> |
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\*Compliance achieved with 5μH LISN, shielded harness and static resistive load.

**Protections \***

**Input**

- **Input reverse polarity:**  
Protection for unlimited time
- **Under voltage protection:**  
Unit protects itself (shutdown) below 15V<sub>DC</sub>. Turn on at 16V-18V with min. 3V hysteresis to shut down.
- **Over voltage protection**  
– unit protects itself (shut down) above 86V<sub>DC</sub>.

**Output**

- **Electronic over voltage protection:** Internal control protects unit (no damage) 10% above nominal voltage.
- **Passive zener on output:** 20% above nominal voltage.
- **Current limiting:** Continuous protection (10-30% above maximum current) for unlimited time (Hick up).

**General**

- **Over temperature protection:**  
Shutdown at base plate temperature of +105°C (±5°C) Automatic recovery at base plate temperature lower than +95°C (±5°C)
- **POR:** Protection override signal for BATTLE SHORT function

\* Thresholds and protections can be modified / removed – please consult factory.

**Environmental**

Design to Meet MIL-STD-810F

**Temperature:**

Operating: –55°C to +85°C (base plate)  
Storage: –55°C to +125°C

**Humidity:**

Method 507.4 - Up to 95%.

**Altitude:**

Method 500.4, Procedure I & II, 40,000 ft. and 70,000 ft. Operational

**Vibration and Shock:**

Shock - Saw-tooth, 30g peak, 11mS.  
Vibration - Figure 514.5C-17. General minimum integrity exposure. (1 hour per axis.)

**Salt Fog:**

Method 509-4

**Reliability**

150,000 hours, calculated per MIL-STD-217F at +85°C base plate, Ground fixed.

**Environmental Stress Screening (ESS)**

Including random vibration and thermal cycles is also available. **Please consult factory for details.**

## Pin Assignment

| P1 – Input |              |         |              | J2 – Output |              |         |              |
|------------|--------------|---------|--------------|-------------|--------------|---------|--------------|
| Pin No.    | Pin Function | Pin No. | Pin Function | Pin No.     | Pin Function | Pin No. | Pin Function |
| 1          | N/C          | 9       | VIN RTN      | 1           | VOUT RTN     | 9       | N/C          |
| 2          | SYNC         | 10      | VIN RTN      | 2           | VOUT RTN     | 10      | SENSE        |
| 3          | INHIBIT      | 11      | VIN          | 3           | VOUT RTN     | 11      | VOUT         |
| 4          | POR          | 12      | VIN          | 4           | VOUT RTN     | 12      | VOUT         |
| 5          | SIGNAL RTN   | 13      | VIN RTN      | 5           | VOUT RTN     | 13      | VOUT         |
| 6          | VIN          | 14      | VIN RTN      | 6           | SENSE RTN    | 14      | VOUT         |
| 7          | VIN          | 15      | VIN RTN      | 7           | N/C          | 15      | VOUT         |
| 8          | VIN          |         |              | 8           | N/C          |         |              |

## Functions and Signals

### **INHIBIT signal**

The INHIBIT signal is used to turn the power supply ON and OFF.  
 TTL “1” or OPEN – will turn on the power supply. (For normal operation leave the signal not connected.) TTL “0” or short– will turn off the power supply.

### **SYNC signal**

The SYNC IN signal is used to allow the power supply frequency to sync with the system frequency. The system frequency should be 250kHz ± 10kHz.  
 When not connected the power supply will work at 250kHz

### **SIGNAL RTN**

The INPUT SIGNAL RTN is referred to the input.  
 This is used as grounding for SYNC IN, INHIBIT and POR signals.

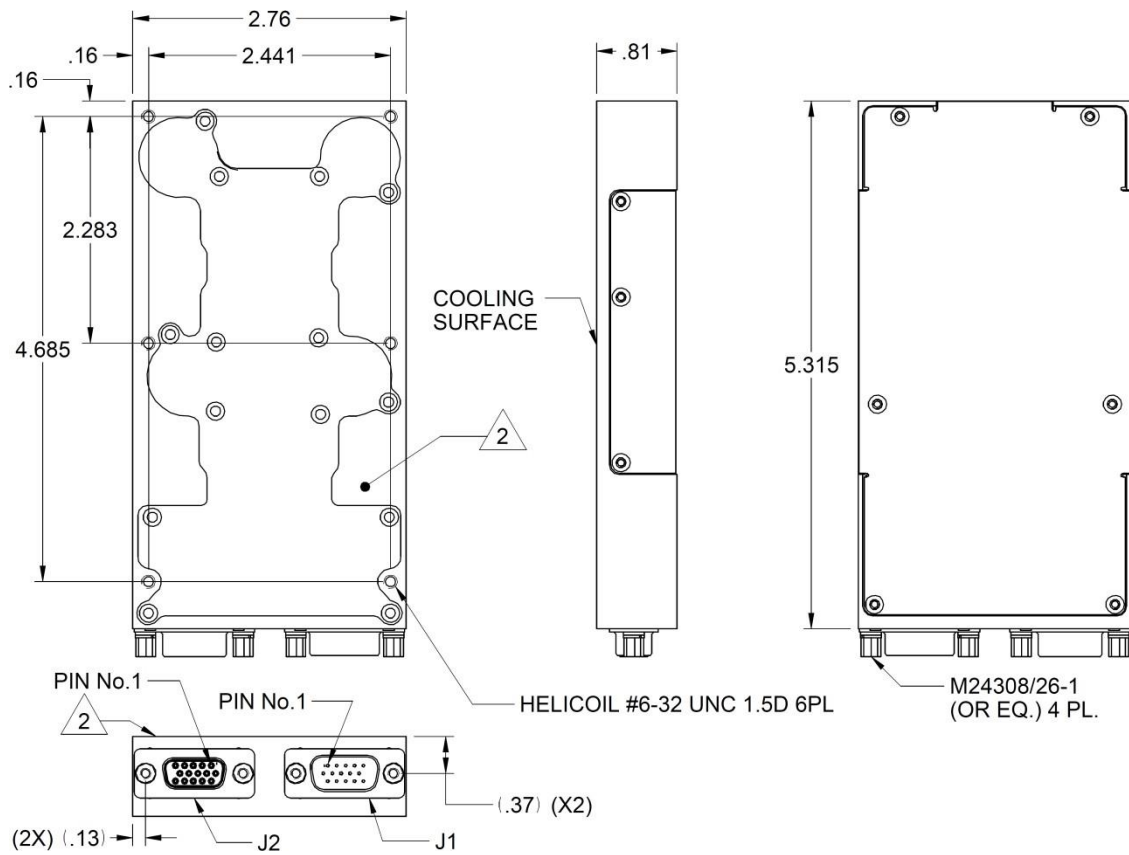
### **SENSE**

The SENSE is used to achieve accurate load regulations at load terminals (this is done by connecting the pins directly to the load’s terminals).  
 The use of remote sense has a limit of voltage dropout between converter’s output and load terminals up to 0.5V.  
 When not used connect + SENSE to +VOUT and –SENSE to –VOUT

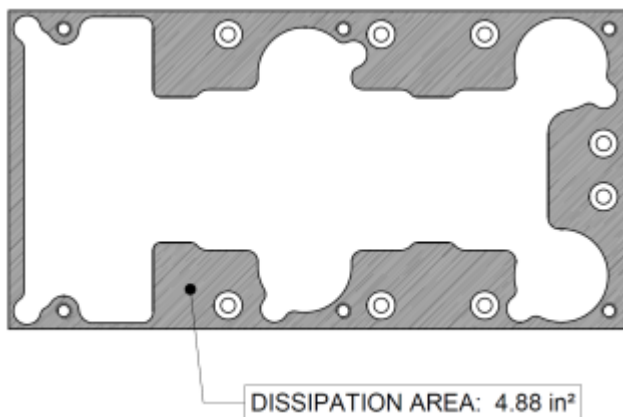
### **POR (Protection Override)**

The POR signal disables the Input Under Voltage protection, Input Over Voltage Protection, Over Temperature protection and Hiccup function (overcurrent and short circuit).  
 TTL “0” or short – All protections are disabled (override mode).  
 TTL “1” or OPEN – All protections are enabled (protected mode).

**Outline Drawing**



**Heat Dissipation Surface**



**Notes**

1. Dimensions are in Inches [mm]
2. Tolerance is:  
.XX ± 0.02 IN  
.XXX ± 0.008 IN
3. Weight: Approx. 400g (14.1 oz)
4. Mounting holes can be modified – please consult factory.
5. Parasolid 3D module is available for download on site.

\* Specifications are subject to change without prior notice by the manufacturer.