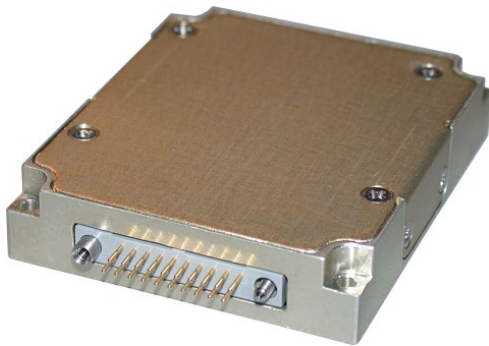


## M7419 SERIES

DC/DC POWER SUPPLY



### PRODUCT HIGHLIGHTS

- MINIATURE
- HIGH DENSITY
- SINGLE OUTPUT
- DC/DC CONVERTER
- UP TO 50W



<p><b>Applications</b>                  Military (Airborne, ground-fix, shipboard), Ruggedized, Telecom, Industrial</p>					
<p><b>Special Features</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 compensation</li> <li>• Remote Inhibit (On/Off)</li> <li>• Fixed switching freq. (250 kHz)</li> <li>• External sync. capability</li> <li>• EMI filters included</li> <li>• Conduction cooled</li> <li>• Non-latching protections:                         <ul style="list-style-type: none"> <li>○ Overload/short-circuit</li> <li>○ Over-voltage</li> <li>○ Over temperature</li> </ul> </li> </ul>					
<p><b>Electrical Specifications</b></p> <table border="0" style="width: 100%;"> <tr> <td style="width: 33%; vertical-align: top;"> <p><b>DC Input</b>                              Normal range: 18 to 48 V<sub>DC</sub></p> <p>Not damaged (may restart) when exposed to surges IAW MIL-STD-1275A (100 V / 50 ms) and IAW MIL-STD-704A (80 V / 0.1 s)</p> <p><b>Output Voltage Regulation</b>                              Better than or equal to ±1% (low to high line voltage, no load to full load, -55 °C to +85 °C at baseplate).</p> <p><b>Ripple and Noise</b>                              Less than 50 mV<sub>p-p</sub>, typical (max. 1%) without external capacitance. When connected to system capacitance ripple drops significantly.</p> </td> <td style="width: 33%; vertical-align: top;"> <p><b>DC Output</b>                              Voltage range: 1.8 to 50 V<sub>DC</sub>                              Current: 0 to 10 A                              Power: 0 to 50 W</p> <p><b>Efficiency</b>                              Typically 70% to 80%, depending on output voltage.</p> <p>Up to 83% @ 28 V<sub>DC</sub> output, 28 V<sub>DC</sub> input, full load and room temperature.</p> <p><b>Load Transient Overshoot and undershoot</b>                              Output resistance at load change of 50%-100% is 30-70 mΩ (depending on output voltage). Output back to steady stated within 300-500 μs</p> </td> <td style="width: 33%; vertical-align: top;"> <p><b>Isolation</b>                              Input to Output: 200 V<sub>DC</sub>                              Input to Case: 200 V<sub>DC</sub>                              Output to Case: 100 V<sub>DC</sub></p> <p><b>EMC</b>                              Complies with MIL-STD-1686 Indirect 4 kV ESD.                              Designed to meet* MIL-STD-461F CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103</p> <p><b>Turn on Transient</b>                              No voltage overshoot during power on.</p> </td> </tr> </table>			<p><b>DC Input</b>                              Normal range: 18 to 48 V<sub>DC</sub></p> <p>Not damaged (may restart) when exposed to surges IAW MIL-STD-1275A (100 V / 50 ms) and IAW MIL-STD-704A (80 V / 0.1 s)</p> <p><b>Output Voltage Regulation</b>                              Better than or equal to ±1% (low to high line voltage, no load to full load, -55 °C to +85 °C at baseplate).</p> <p><b>Ripple and Noise</b>                              Less than 50 mV<sub>p-p</sub>, typical (max. 1%) without external capacitance. When connected to system capacitance ripple drops significantly.</p>	<p><b>DC Output</b>                              Voltage range: 1.8 to 50 V<sub>DC</sub>                              Current: 0 to 10 A                              Power: 0 to 50 W</p> <p><b>Efficiency</b>                              Typically 70% to 80%, depending on output voltage.</p> <p>Up to 83% @ 28 V<sub>DC</sub> output, 28 V<sub>DC</sub> input, full load and room temperature.</p> <p><b>Load Transient Overshoot and undershoot</b>                              Output resistance at load change of 50%-100% is 30-70 mΩ (depending on output voltage). Output back to steady stated within 300-500 μs</p>	<p><b>Isolation</b>                              Input to Output: 200 V<sub>DC</sub>                              Input to Case: 200 V<sub>DC</sub>                              Output to Case: 100 V<sub>DC</sub></p> <p><b>EMC</b>                              Complies with MIL-STD-1686 Indirect 4 kV ESD.                              Designed to meet* MIL-STD-461F CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103</p> <p><b>Turn on Transient</b>                              No voltage overshoot during power on.</p>
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\* Compliance achieved with 5μH LISN, shielded harness and static resistive load.

<b>Protections <sup>†</sup></b>		
<p><b><u>Input</u></b></p> <ul style="list-style-type: none"> <li>• <b>Under-Voltage Lockout</b> Unit may shut down if input voltage drops below <math>16.5 \pm 1</math> V.</li> <li>• <b>Over-Voltage Lockout</b> Unit may shut down if input voltage rises above <math>52 \pm 2</math> V.</li> </ul>	<p><b><u>Output</u></b></p> <ul style="list-style-type: none"> <li>• <b>Over-Voltage Protection</b> Passive transorb, chosen at <math>120\% \pm 10\%</math> of nominal voltage.</li> <li>• <b>Current Limiting</b> Continuous protection (10-30% above maximum current) for unlimited time (Hiccup).</li> </ul>	<p><b><u>General</u></b></p> <ul style="list-style-type: none"> <li>• <b>Over temperature protection:</b> Shutdown if base plate temperature rises above <math>+105\text{ °C} \pm 5\text{ °C}</math>. Auto recovery when baseplate cools down to <math>+95\text{ °C} \pm 5\text{ °C}</math>.</li> </ul>

<b>Environmental Conditions</b>	
Designed to meet MIL-STD-810F	
<p><b><u>Temperature</u></b> Methods 501.4 &amp; 502.4 Operating: <math>-55\text{ °C}</math> to <math>+85\text{ °C}</math> (at baseplate) Storage: <math>-55\text{ °C}</math> to <math>+125\text{ °C}</math> (ambient)</p>	<p><b><u>Vibration</u></b> Method 514.5 Procedure I <math>14.76\text{ g}_{\text{rms}}</math> 20-2000 Hz for 500 seconds at each of 3 perpendicular axes.</p>
<p><b><u>Altitude</u></b> Method 500.4 Procedures I – Storage/Air transport: up to 70,000 ft. (non-operational) Procedure II – Operation/Air Carriage: up to 70,000 ft. (operational)</p>	<p><b><u>Shock</u></b> Method 516.5 Procedure I 50 g / 11 ms terminal peak half-sine shock pulse</p>
<p><b><u>Humidity</u></b> Method 507.4 Up to 95% RH</p>	<p><b><u>Salt Fog</u></b> Method 509.4</p>

**Reliability**

150,000 hours, calculated IAW MIL-HDBK-217F Notice 2 at  $+85\text{ °C}$  baseplate, Ground fixed conditions.

**Environmental Stress Screening (ESS)**

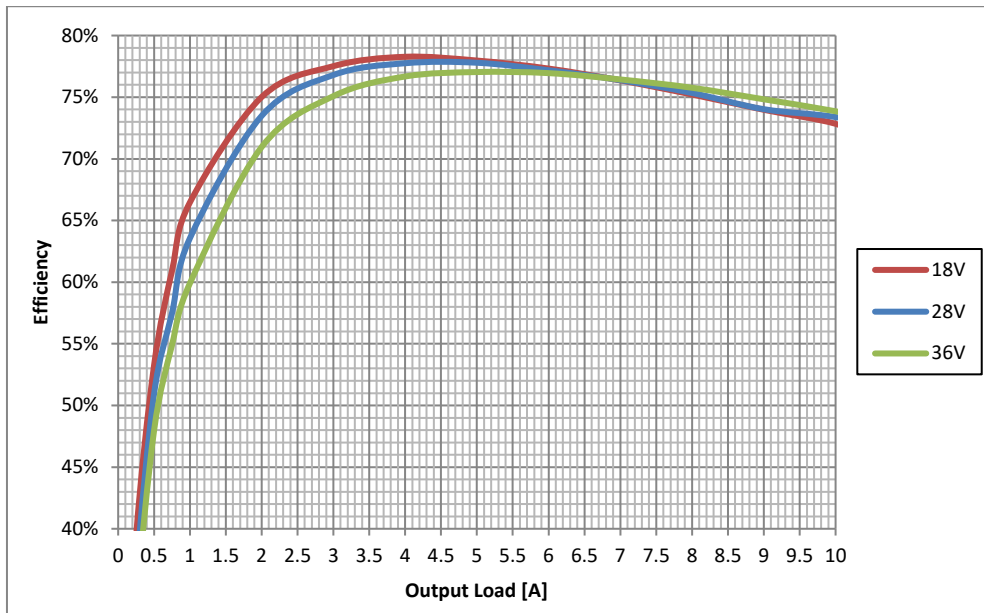
100% of delivered power supplies are tested at low ambient temperature, high baseplate temperature and at standard room temperature. Additional tests, such as random vibration and thermal cycling can be added. **Consult factory for details.**

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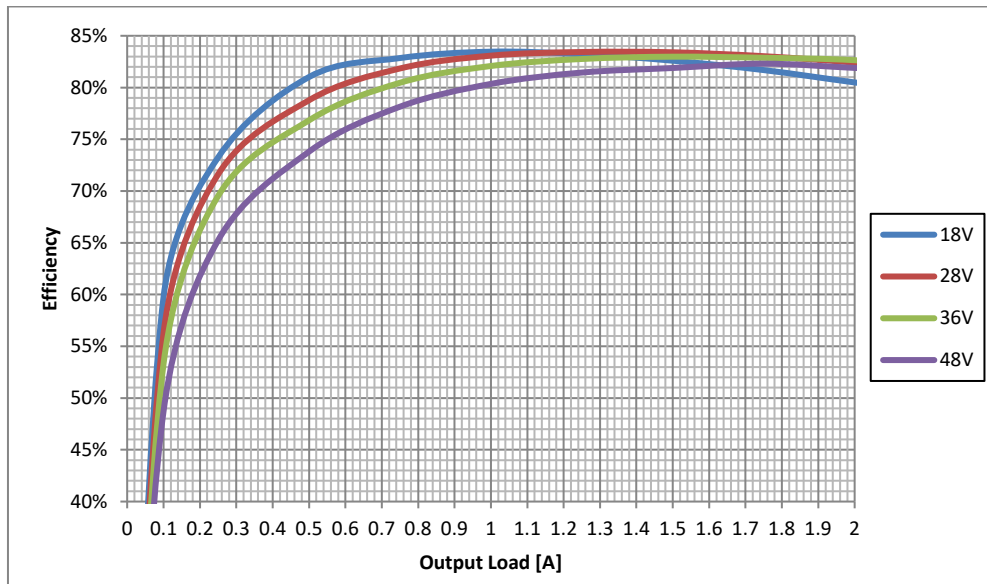
<sup>†</sup> Thresholds and protections can be modified / removed – please consult factory.

**Efficiency vs. Load**

- **5 V<sub>DC</sub> output:**



- **28 V<sub>DC</sub> output:**



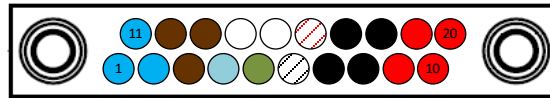
**Pin Assignment**

**Connector type:** RM272-020-322-2900 or eq.

**Mates with:** RM242-020-571-5900 (crimp removable contacts) or RM242-020-241-5900 (solder cup contacts) or eq.

Pin #	Function	Polarity	
1	INPUT	+	●
2	INPUT	+	●
3	INPUT RTN	-	●
4	INHIBIT	+	●
5	SYNC	+	●
6	SENSE RTN	-	⊗
7	OUTPUT RTN	-	●
8	OUTPUT RTN	-	●
9	OUTPUT	+	●
10	OUTPUT	+	●

Pin #	Function	Polarity	
11	INPUT	+	●
12	INPUT RTN	-	●
13	INPUT RTN	-	●
14	N.C.		
15	N.C.		
16	SENSE	+	⊗
17	OUTPUT RTN	-	●
18	OUTPUT RTN	-	●
19	OUTPUT	+	●
20	OUTPUT	+	●



**Note:** All output pins with the same function should be connected together for best performance.

## 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" – will turn off the power supply.

Grounding for signal is VIN RTN pin.

### SYNC signal

The SYNC signal is used to allow the power supply frequency to sync with the system frequency.

SYNC frequency can be  $250 \pm 10$  kHz, TTL level.

When left open, the power supply will work at  $250 \pm 10$  kHz (internal clock).

This signal is referenced to VIN RTN pin.

### SENSE

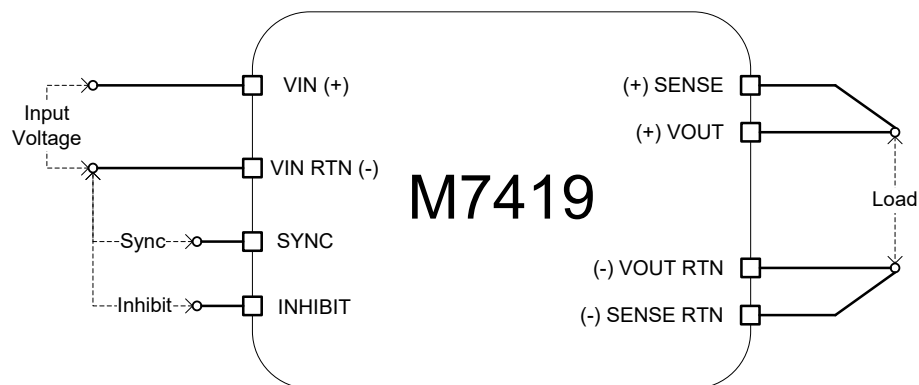
The SENSE is used to achieve accurate load regulations at load terminals (this is done by connecting the pins directly to the load's terminals).

The use of remote sense has a limit of voltage dropout between converter's output and load terminals of

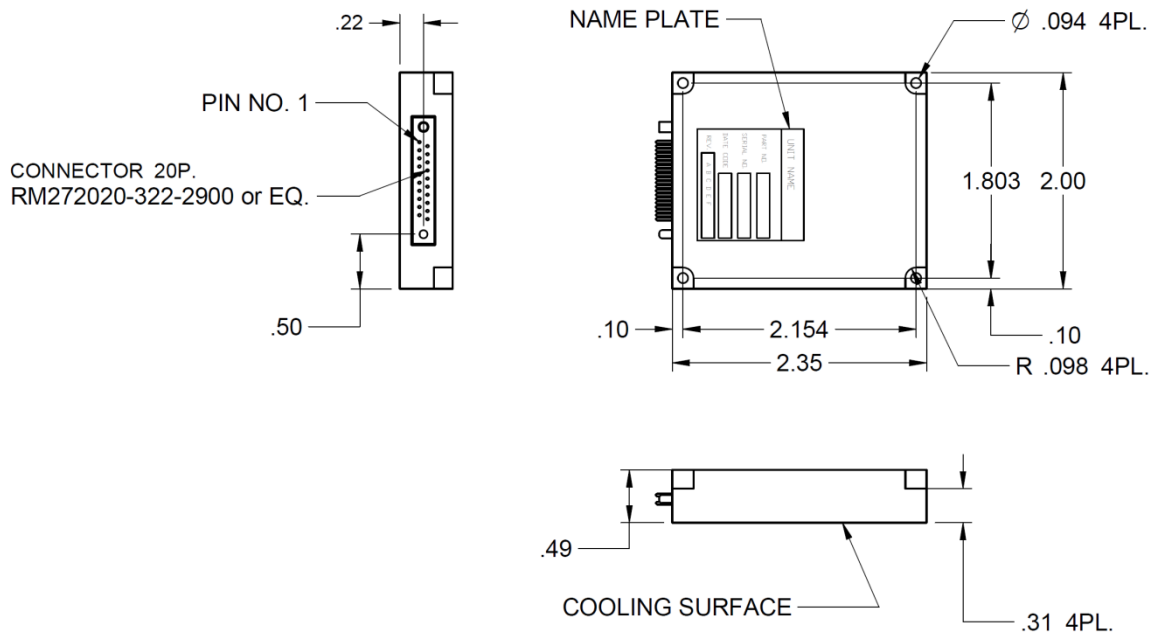
2-10% of voltage output.

**When not used connect SENSE to VOUT and SENSE RTN to VOUT RTN.**

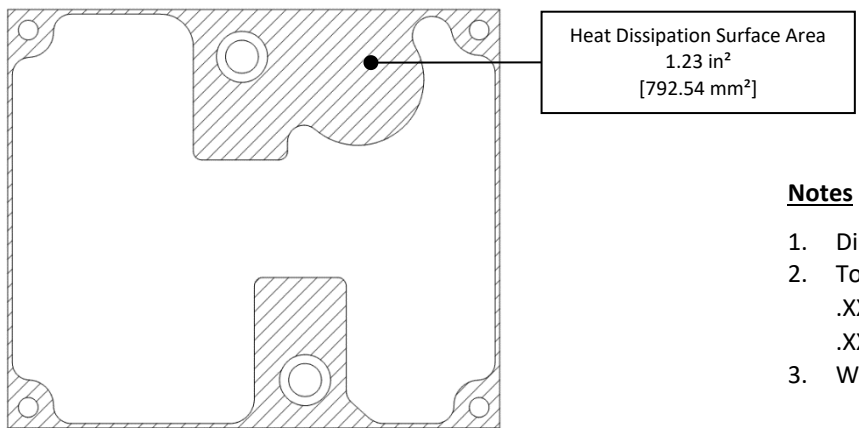
## Typical Connection Diagram



**Outline Drawing**



**Heat Dissipation Surface**



**Notes**

1. Dimensions are in inches [mm]
2. Tolerance is:  
 .XX ± 0.01 in  
 .XXX ± 0.005 in
3. Weight: Approx. 2.5 oz [70 g]

**Standard Variants**

Part number	Output configuration
M7419-100	5 V <sub>DC</sub> / 8 A
M7419-101	12 V <sub>DC</sub> / 3 A
M7419-102	15 V <sub>DC</sub> / 2.5 A
M7419-103	24 V <sub>DC</sub> / 2 A
M7419-104	28 V <sub>DC</sub> / 1.8 A
M7419-105	48 V <sub>DC</sub> / 0.8 A

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