# M7427 SERIES

## SINGLE-OUTPUT, 500W DC TO DC BASEPLATE COOLED SEALED POWER SUPPLY

The M7427 is a series of mechanically robust, base-plate cooled, high performance, power supplies, designed for applications where 28VDC has to be converted to a tightly regulated, filtered and protected DC output.



**Milpower Source, Inc.** • Belmont, NH, **USA** • P: (603) 267-8865
Email: sales@milpower.com • Website: www.milpower.com • CAGE: 5YWX2

**Standard Models List** (for other voltages – consult factory)

| Part Number | Input | Output | | Power | Special features |
|---|---|---|---|---|---|
| | Voltage range | Voltage | Current | | |
| M7427-100 | 18 to 50 $V_{DC}$ | 12 $V_{DC}$ | 40 A | 480W | Peak Power 540W for 2 sec |
| M7427-101 | 18 to 50 $V_{DC}$ | 15 $V_{DC}$ | 33 A | 495W | Peak Power 600W for 2 sec |
| M7427-103 | 18 to 50 $V_{DC}$ | 28 $V_{DC}$ | 18 A | 504W | Peak Power 750W for 4 sec |
| M7427-104 | 18 to 50 $V_{DC}$ | 48 $V_{DC}$ | 10.5A | 504W | Peak Power 750W for 4 sec |
| M7427-105 | 18 to 50 $V_{DC}$ | 24 $V_{DC}$ | 21 A | 504W | Peak Power 750W for 4 sec |
| M7427-106 | 18 to 50 $V_{DC}$ | 28 $V_{DC}$ | 18A | 504W | Peak Power 750W for 4 sec Parallel operation via output voltage droop. Voltage regulation is ±2%. |

- Additional standard configurations available. **Contact factory for more details.**
- All of our products can be configured to comply with EU REACH regulations. **Contact factory for more details.**

## THE MAIN FEATURES OF THE M7427 ARE:

- DC/DC Single outputs power supply up to 500W
- 750W Power peak for 4 sec for output voltage above 24Vdc
- 600W peak power for 2 sec for output voltage below 24Vdc
- Sealed enclosure
- 18 to 50VDC Standard Input version
- For standard Input version No damage due to abnormal transients IAW MIL-STD-1275E (100 V / 50 ms) and MIL-STD-704A (80 V / 0.1 s)
- For extended input version 12 to 100VDC operation - **Please contact factory for more details**
- High efficiency – up to 90% (depending on output voltage).
- Full galvanic isolation between Input, Chassis and Outputs
- Fixed switching freq. (250 kHz)
- EMI filters included
- Indefinite short circuit protection with auto-recovery
- Over-voltage protection
- Over temperature shutdown with auto-recovery
- High density
- Conduction cooled via the baseplate

## SPECIFICATIONS:

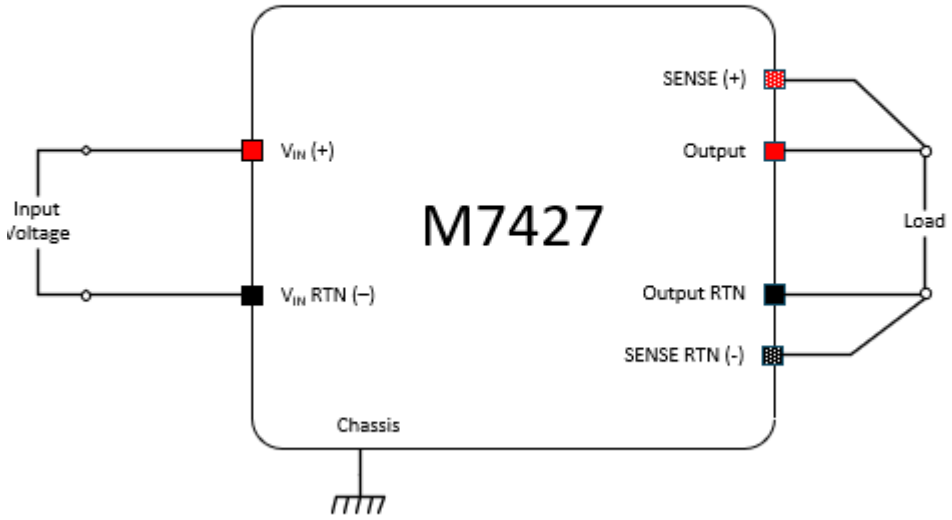
| | | |
|---|---|---|
| **DC Input** | ***Voltage Range*** | 18 to 50 $V_{DC}$<br><br>**Extended input range option:**<br>12 to 100 $V_{DC}$<br>IAW MIL-STD-1275E |
| | ***Isolation*** | Input to Output: 200 VDC<br>Input to Case: 200 VDC |
| | **Input Reverse Polarity** | Protection for unlimited time |
| | **Under-Voltage Lock-Out** | The unit shuts down below 15V ± 1V*. Resumes operation at 17V ± 1V*. Min. hysteresis 2V*.<br>*Estimated values. |
| | **Over-Voltage Lock-Out** | The unit shuts down above 55V ± 4V.<br>Optional:<br>At 12-100V input unit shuts down 105 ±2V |
| **DC Output** | ***Rating*** | See table on page 9 |
| | ***Voltage Regulation*** | Better than or equal to ±1%<br>(low to high line voltage, no load to full load, –55 °C to +80 °C at baseplate). |
| | ***Remote 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).<br>For output voltage above 8V, the use of remote sense has a max limit of 0.25V voltage dropout between converter's output and load terminals.<br>For output voltage below 8V, the use of remote sense has a max limit of 0.5V voltage dropout between converter's output and load terminals.<br>When not used connect SENSE 1 to OUT 1 and SENSE 1 RTN to OUT 1 RTN. |
| | ***Ripple*** | Less than 50 mVp-p, typical (max. 1% of output voltage) |
| | ***Isolation*** | Output to Case: 100 VDC |

| | | |
|---|---|---|
| | ***Overvoltage Protection*** | • **Active Over-Voltage Protection:** The secondary control circuit takes the over if output voltage exceeds 110% ± 5% of nominal voltage. Beyond this, output voltage clamps.<br>• **Passive Over-Voltage Protection:** Zener diode installed on output terminals, selected at 120% ± 10% of nominal voltage. |
| | **Peak Load Duration Limiter** | Peak load is enabled for 2- 4 seconds. Beyond this, output voltage folds to limit the output power to the nominal value. |
| | ***Efficiency*** | Typical: 88% - 90%<br>Extended input range: 83% - 86%<br>(28$V_{DC}$ output, nominal input, full load, room temperature) |
| | ***Current Limit & Overload*** | Output voltage turns off and on periodically with low duty cycle (hiccup) to protect system conductors and converter from short circuit<br><br>**Optional:**<br>Continuous protection for unlimited time.<br>**If this feature is required please consult factory.** |
| | ***Over Temp. Protection*** | Output shuts down if base plate temperature exceeds +100°C ± 5°C. Automatic recovery when baseplate temperature returns to below +95°C ± 5°C. |

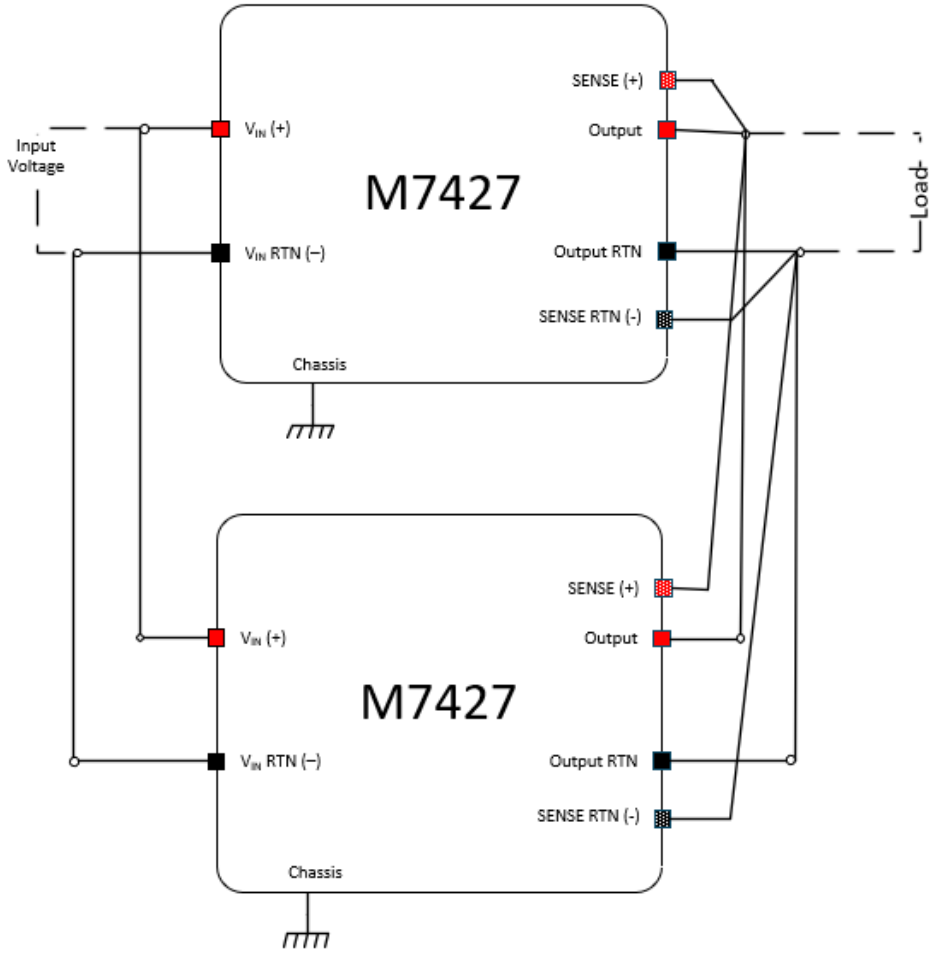
## Specifications (Cont.):

| | | |
|---|---|---|
| **Environment Designed to meet MIL-STD-810F** | ***Temperature*** | Methods 501.4 & 502.4<br>Operating: –55 °C to +80 °C (at baseplate)<br>Storage: –55 °C to +125 °C (ambient) |
| | ***Humidity*** | Method 507.4<br>Up to 95% RH |
| | ***Salt-fog*** | Method 509.4 |
| | ***Altitude*** | Method 500.4<br>Procedures I – Storage/Air transport:<br>up to 70,000 ft. (non-operational)<br>Procedure II – Operation/Air Carriage:<br>up to 70,000 ft. (operational) |
| | ***Mechanical Shock*** | Method 516.5<br>Procedure I<br>50 g / 11 ms terminal peak half-sine shock pulse |
| | ***Vibration*** | Method 514.5<br>Procedure I<br>14.76 $g_{rms}$ 20-2000 Hz for 500 seconds<br>at each of 3 perpendicular axes. |
| | ***Rain*** | Method 506.4<br>Procedures I - Rain and Blowing Rain<br>Procedure III - Drip |
| | ***Fungus*** | Does not support fungus growth, in accordance with the guidelines of MIL-STD-454, Requirement 4. |
| **IP Rating** | Designed to meet IP67 | |
| **EMI** | ***MIL-STD-461F*** | Meets* MIL-STD-461F CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103<br>*EMI Compliance achieved with 5µH LISN, shielded harness and static resistive load.<br>(Optional: 50 µH – Please consult factory) |
| **Reliability** | 150,000 hours, calculated per MIL-HDBK-217F Notice 2 at +85 °C baseplate, Ground Fix conditions. | |
| **Cooling Requirements** | The M7427 is a baseplate cooled unit. The base of the M7427 should be thermally attached to a suitable heatsink that maintains it below +80 °C. | |
| **Weight** | Typical 2.1 kg | |

## TYPICAL CONNECTION DIAGRAM



## PARALLEL OPERATION - TYPICAL CONNECTION DIAGRAM




**Note:** Parallel operation via output voltage droop. Voltage regulation is ±2%.

## Outputs Range

| Output # | Voltage Range | Current Range | Output Regulation | Power Range |
|---|---|---|---|---|
| 1 | 12 to 50 $V_{DC}$ | 40A max | ±1% | 500W max |

## PIN ASSIGNMENT: J1 - INPUT CONNECTOR

**Connector type J1:** D38999/24TG16PN OR EQ.
**Mates with:** TBD

| Function | Pin # |
|---|---|
| Vin | S,R,P,N,M,C |
| Vin_RTN | L,K,J,H,A,B |

## PIN ASSIGNMENT: J2 - OUTPUT CONNECTOR

**Connector type J2:** D38999/24TG29SN OR EQ

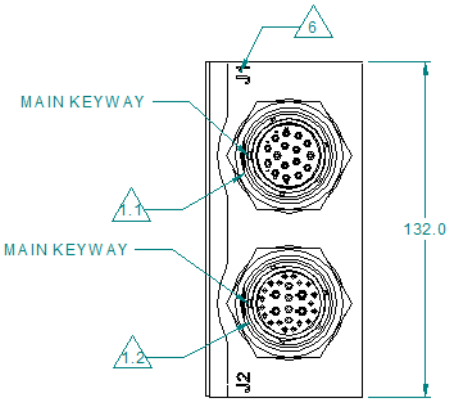
**Mates with:** TBD

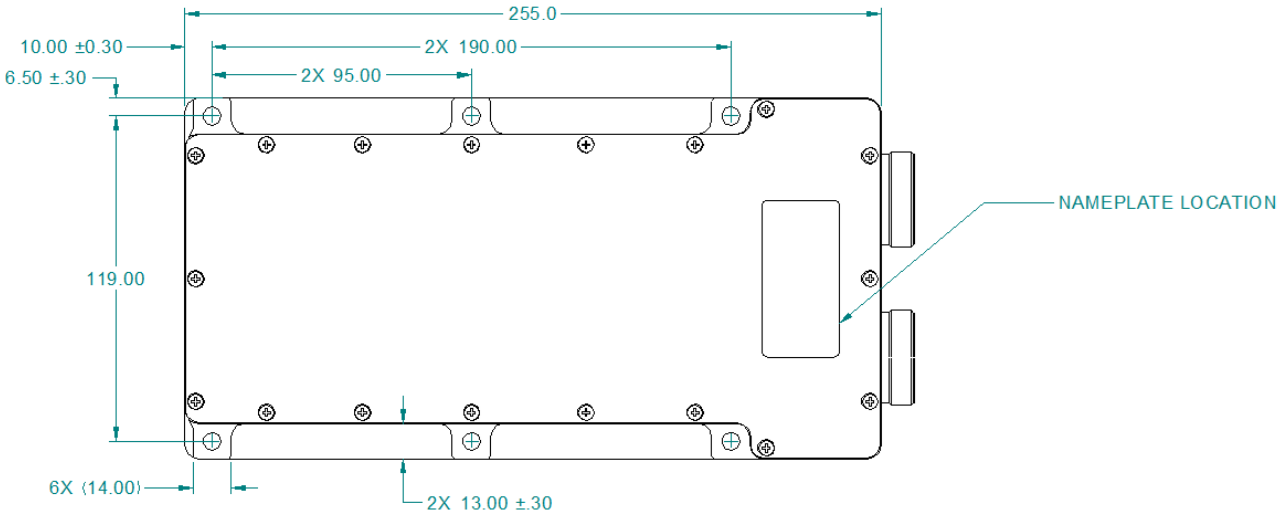
| Function | Pin # |
|---|---|
| Output | 11,14,15,16,17,18,19,25 |
| Output RTN | 1,2,3,4,5,6,9,20 |
| SENSE | 8 |
| SENSE RTN | 12 |

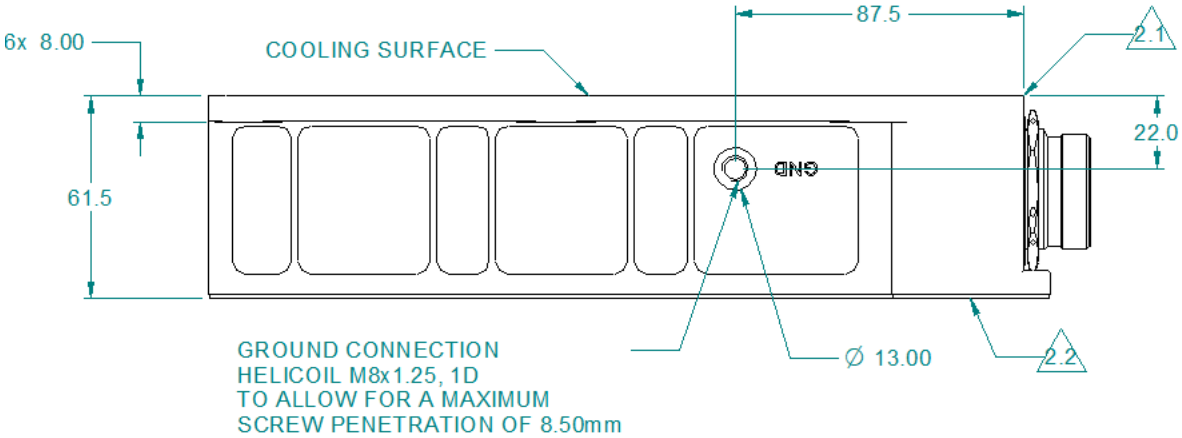
Note: All pins with identical function/designation should be connected together for optimal performance.

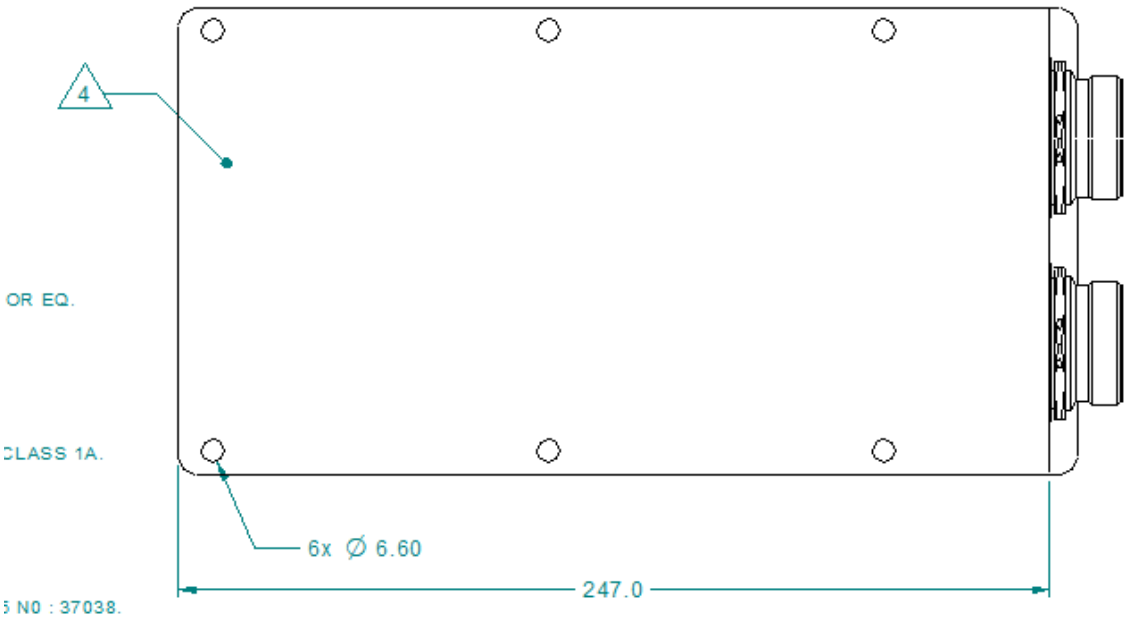
## OUTLINE DRAWING:

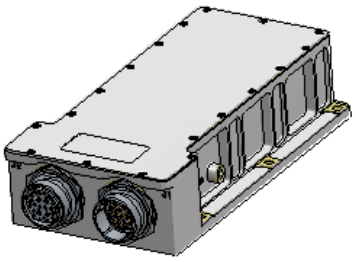
***For detailed dimensions and tolerances see Drawing: M7427-105***





NOTES :
1. CONNECTORS LIST:
1.1. J1 INPUT - JAM NUT RECEPTACLE 16 MALE CONTACTS (#16) P/N: D38999/24TG16PN OR EQ.
1.2. J2 OUTPUT - JAM NUT RECEPTACLE 27 FEMALE CONTACTS (19#20, 4X#16, 4#12)
P/N: D38999/24TG29SN OR EQ.
2. MTL.
2.1. AL 6061-T6/T651/T6511, OR EQ.
2.2. AL 5052-H32, OR EQ.
3. FINISH:
3.1 CHROMATE CONVERSION COATING PER MIL -DTL-5541, LAST REVISION, TYPE I, CLASS 1A.
4. COOLING: HEAT DISSIPATION AREA- 31,000 [mm²] .
5. WORKMANSHIP SHALL BE MIL-STD-454, REQT. 9
6. ENGRAVING
6.1. CHARACTER HEIGHT : 5.0 MM.
6.2. CHARACTER DEPTH : 0.5 MM.
6.4. CHARACTER ARE CENTRALLY LOCATED,
6.5. FILL ENGRAVING WITH BLACK LUSTERLESS EPOXY PAINT COLOR PER FED-STD 595 N0 : 37038.

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