

## **M7127 SERIES**

*DC/DC POWER SUPPLY*



### **PRODUCT HIGHLIGHTS**

- **MINIATURE**
- **VERY HIGH DENSITY**
- **DC/DC CONVERTER**
- **UP TO 500W (750W peak)**

## M7127 SERIES DC/DC POWER SUPPLY

### Applications

Military (Airborne, ground-fix, shipboard), Ruggedized, Telecom, Industrial

### Special Features

- Miniature size
- High efficiency
- Wide input range
- Input / Output isolation
- Remote sense
- Remote Inhibit (On/Off)
- Optional parallel connection
- High Density – up to 47 W/in<sup>3</sup>
- Fixed switching freq. (250 kHz)
- External sync capability
- EMI filters included
- Floating Connector
- Indefinite short circuit protection with auto-recovery
- Over-voltage shutdown with auto-recovery
- Over temperature shutdown with auto-recovery

### Electrical Specifications

#### DC Input:

Voltage range: 18 to 48 V<sub>DC</sub>  
 Transient protection (no damage) IAW MIL-STD-1275A (100 V for 50 ms) and IAW MIL-STD-704A (80 V for 0.1 s)  
 Extended input range option: 18 to 100 V<sub>DC</sub>, IAW MIL-STD-1275E.

#### Line/Load regulation:

Less than ±1%  
 (No load to full load, -55 °C to +85 °C, and over input voltage range).

#### Ripple and Noise:

Less than 50 mV<sub>p-p</sub>, typical (max. 100 mV) without external capacitance. When connected to system capacitance ripple drops significantly.

#### DC Output:

Voltage: 5 to 50 V<sub>DC</sub>  
 Current: 0 to 40 A  
 Power Range: 0 to 500 W  
 Peak power: Up to 750 W for up to 4 seconds.  
 After 4 seconds, the output falls to 70% from it is nominal value.

#### Efficiency:

88% - 90% typical (full load, room temperature)  
 83% - 86% for extended input range

#### Load Transient Overshoot and undershoot

Output change at load transient of 30%-100% with T<sub>r</sub> & T<sub>f</sub> of max 30 μs is 5% of output voltage. Output recover to steady stated within less 0.5 ms.

#### Isolation:

Input to Output: 200 V<sub>DC</sub>  
 Input to Case: 200 V<sub>DC</sub>  
 Output to Case: 100 V<sub>DC</sub>

#### EMC:

Meets\* MIL-STD-461F  
 CE101, CE102, CS101, CS114, CS115, CS116, RE102, RS101, RS103

#### Turn on Transient

No overshoot.

\* EMC Compliance achieved with 5μH LISN, shielded harness and static resistive load.

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### Protections \*

#### Input

- **Input Reverse Polarity:**  
Protection for unlimited time
- **Under-Voltage Lock-Out:**  
Unit shuts down below  $15\text{ V} \pm 1\text{ V}$ .  
Resumes operation at  $17\text{ V} \pm 1\text{ V}$ .  
Min. hysteresis 2 V.
- **Over-Voltage Lock-Out:**  
Unit shuts down above  $54\text{ V} \pm 2\text{ V}$ .

#### Output

- **Active Over-Voltage Protection:**  
Secondary control circuit takes over if output voltage exceeds  $110\% \pm 5\%$  of nominal voltage.
- **Passive Over-Voltage Protection:**  
Zener diode installed on output terminals, selected at  $120\% \pm 10\%$  of nominal voltage.
- **Current limiting:**  
Continuous protection (10-30% above maximum current) for unlimited time (Hiccup).

#### General

- **Over Temperature Protection:**  
Output shuts down if base plate temperature exceeds  $+105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ .  
Automatic recovery when baseplate temperature returns to below  $+95\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ .
- **POR:**  
Protection Override signal (BATTLE SHORT function) overrides over temperature protection and input over/under-voltage lock-out.

### Environmental Conditions

Meets MIL-STD-810F

#### Temperature

Operating:  $-55\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$  (at baseplate)  
Storage:  $-55\text{ }^{\circ}\text{C}$  to  $+125\text{ }^{\circ}\text{C}$

#### Altitude

Method 500.4  
Procedures I & II, up to 70,000 ft.

#### Salt Fog

Method 509.4

#### Humidity

Method 507.4  
Procedure I  
Up to 95%.

#### Vibration

Method 514.5  
Category 4  
General minimum integrity exposure  
IAW Figure 514.5C-17,  
1 hour per axis.

#### Shock

Method 516.5  
Procedure I  
Saw-tooth, 30 g peak, 11 ms

### Reliability

150,000 hours, calculated per MIL-STD-217F Notice 2 at  $+85\text{ }^{\circ}\text{C}$  baseplate, Ground fixed.

### Environmental Stress Screening (ESS)

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

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

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

The system frequency should be  $250 \text{ kHz} \pm 10 \text{ kHz}$ .

When not connected the power supply will work at 250 kHz

#### POR (Protection Override)

The POR signal disables the input under voltage lockout, over voltage lockout and over temperature protection.

TTL "0" or short circuit – Protections are disabled.

TTL "1" or open circuit – Protections are enabled.

#### SIGNAL RTN

The INPUT SIGNAL RTN is referred to the input.

This is used as grounding for SYNC IN, INHIBIT and POR signals.

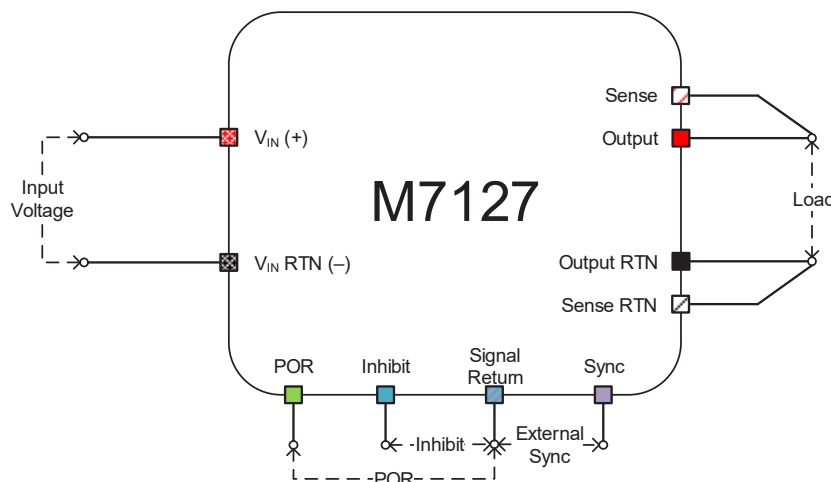
#### SENSE

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).

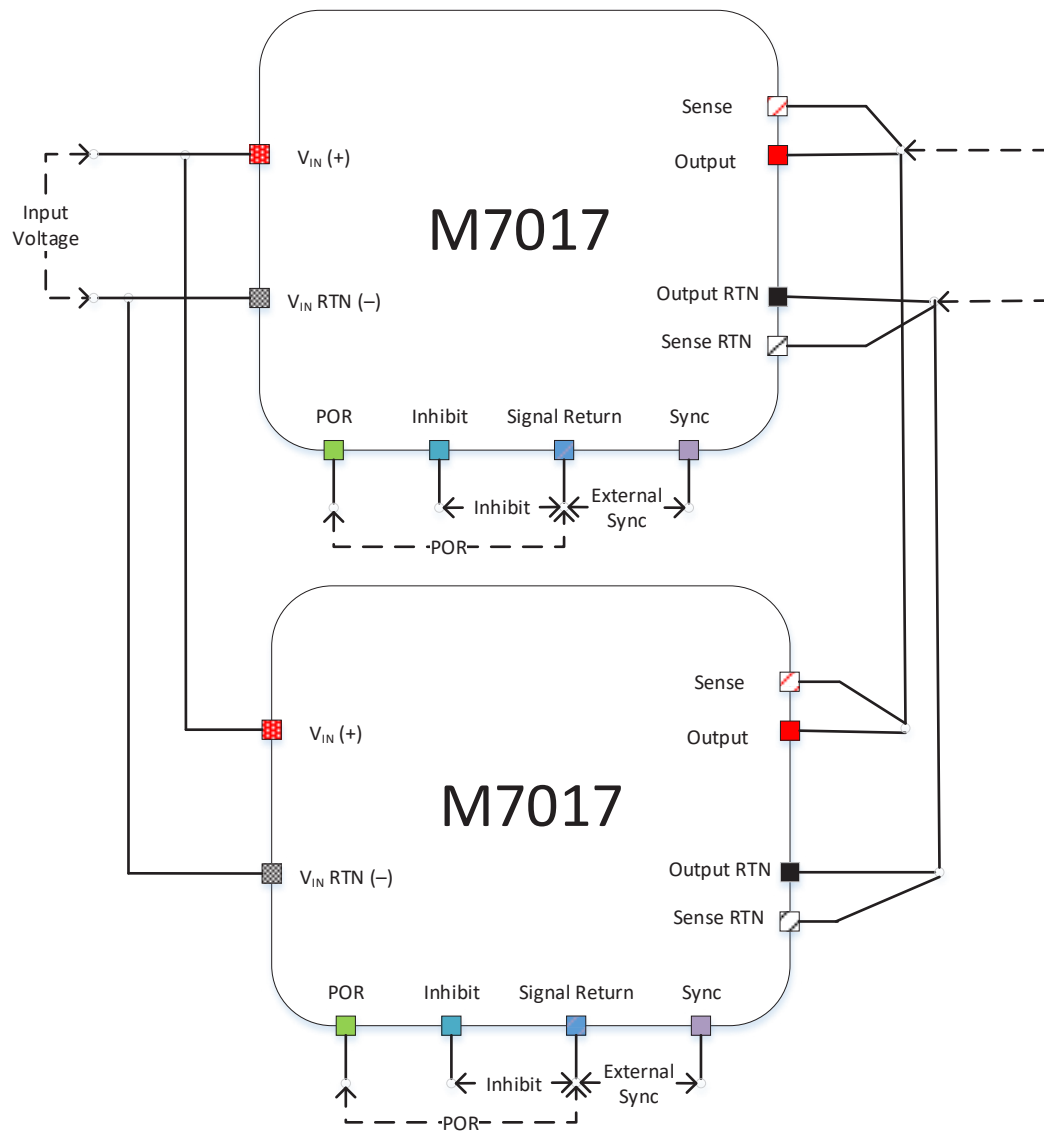
The use of remote sense has a limit of voltage dropout between converter's output and load terminals up to 0.5V.

When not used connect + SENSE to +VOUT and –SENSE to –VOUT.

### Typical Connection Diagram



### Parallel operation - Typical Connection Diagram



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### Pin Assignment

**Connector type:** Positronic DD44M3000S-759.1 or eq.

**Mates with:** Positronic DD44S###0S-759.0 or eq.

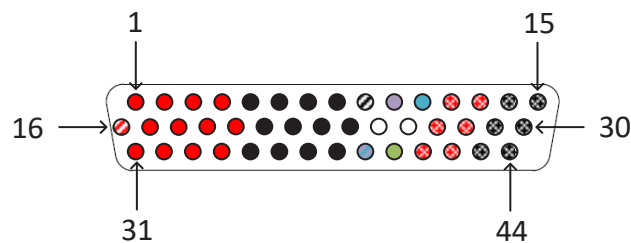
Pin #	Function
1	OUT (+)
2	OUT (+)
3	OUT (+)
4	OUT (+)
5	OUT RTN (-)
6	OUT RTN (-)
7	OUT RTN (-)
8	OUT RTN (-)
9	SENSE RTN (-)
10	SYNC IN
11	INHIBIT

Pin #	Function
12	VIN (+)
13	VIN (+)
14	VIN RTN (-)
15	VIN RTN (-)
16	SENSE (+)
17	OUT (+)
18	OUT (+)
19	OUT (+)
20	OUT (+)
21	OUT RTN (-)
22	OUT RTN (-)

Pin #	Function
23	OUT RTN (-)
24	OUT RTN (-)
25	N/C
26	N/C
27	VIN (+)
28	VIN (+)
29	VIN RTN (-)
30	VIN RTN (-)
31	OUT (+)
32	OUT (+)
33	OUT (+)

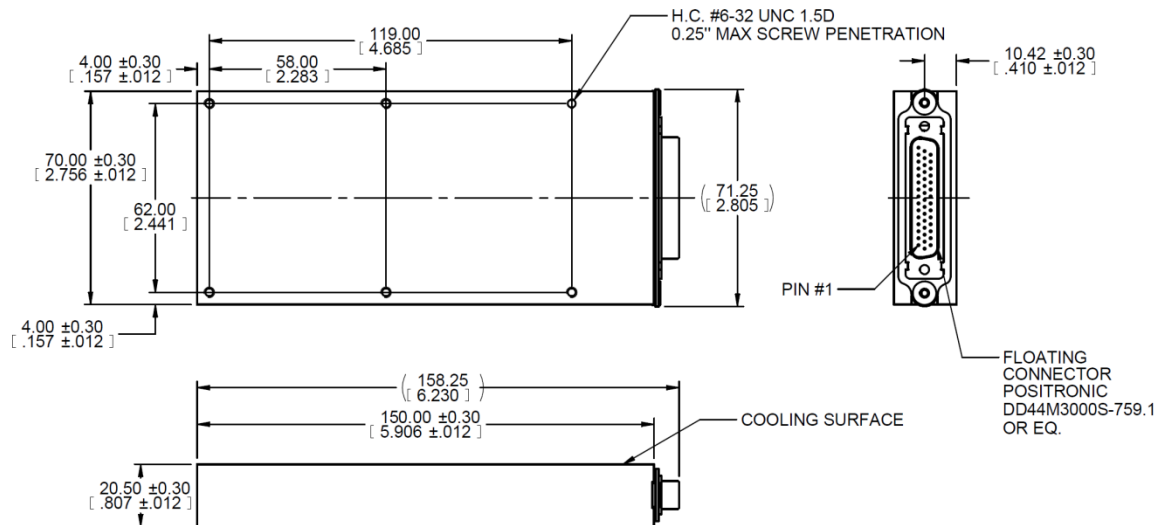
Pin #	Function
34	OUT (+)
35	OUT RTN (-)
36	OUT RTN (-)
37	OUT RTN (-)
38	OUT RTN (-)
39	SIGNAL RTN
40	POR
41	VIN (+)
42	VIN (+)
43	VIN RTN (-)
44	VIN RTN (-)

Note: All identically designated pins should be connected together for best performance.



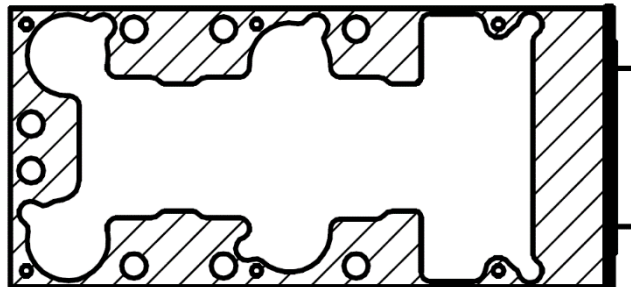
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### Outline Drawing



### Heat Dissipation Surface

Dissipation Area  
6.5 in<sup>2</sup>  
(4 200 mm<sup>2</sup>)



### Notes

1. Dimensions are in inches [mm]
2. Tolerance is:  
.XX ± 0.02 in  
.XXX ± 0.008 in
3. Weight: TBD

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