

## **M8186 SERIES**

*DC/DC POWER SUPPLY*



### **PRODUCT HIGHLIGHTS**

- **COMPACT**
- **HIGH DENSITY**
- **SINGLE OUTPUT**
- **DC/DC CONVERTER**
- **UP TO 2000W**

## M8186 SERIES DC/DC POWER SUPPLY

### Applications

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

### Special Features

- Miniature size
- High efficiency
- Wide input range
- High density: up to 30.5 W/in<sup>3</sup>
- Input / Output isolation
- Limited Inrush Current
- Remote Inhibit (On/Off)
- Fixed switching freq. (400 kHz)
- EMI filters included
- Cos  $\phi$  > 0.92 from 75% load
- Non-latching protections:
  - Output overload
  - Output short-circuit
  - Output over-voltage
  - Over temperature

### Electrical Specifications

#### Normal Input Voltage

DC voltage range:  
220 to 350 V<sub>DC</sub>

#### DC Output:

Voltage range: 5 to 60 V<sub>DC</sub>  
Current range: 0 to 80 A  
Power range: 0 to 2000 W

#### Isolation

Input to Output: 500 V<sub>DC</sub>  
Input to Case: 500 V<sub>DC</sub>  
Output to Case: 100 V<sub>DC</sub>

#### Line/Load regulation

Up to  $\pm 1\%$  (no load to full load,  $-55^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  and over input voltage range).

#### Efficiency

90% - Typical (nominal line voltage, 28 V<sub>DC</sub> output, full load, standard room temperature)

#### EMC

Designed to meet MIL-STD-461C: CE102, CS101, CS114, CS115, CS116, RE102, RS101, RS103

#### Ripple and Noise

100 to 150 mV<sub>p-p</sub>, typical (max. 1% of nominal voltage) measured across a 1 $\mu$ F ceramic capacitor.

#### Transient Over-and-undershoot

Voltage change less than 10% of nominal value for load step from 50% to 100%. Return to regulation in under 1 ms.

#### Turn on Transient

No Voltage overshoot during turn on.

### Protections \*

#### Input

- **Inrush Current Limiter**  
Up to 6 times the maximum input current for less than 50  $\mu$ s.

#### Output

- **Over-voltage Protection**  
Passive transorb on output, 120%  $\pm$  10% of nominal voltage.
- **Current limiting**  
Continuous protection (10 to 30% above maximum current) for unlimited time.

#### General

- **Over temperature protection**  
Shutdown at baseplate temperature of  $+105^{\circ}\text{C} \pm 5^{\circ}\text{C}$ . Automatic recovery at base plate temperature lower than  $+95^{\circ}\text{C} \pm 5^{\circ}\text{C}$ .

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

## M8186 SERIES DC/DC POWER SUPPLY

### ***Environmental Conditions***

Designed to Meet MIL-STD-810F

#### **Temperature**

Methods 501.4 & 502.4

Operating: -55°C to +85°C (at baseplate)

Storage: -55°C to +125°C (ambient)

#### **Altitude**

Method 500.4

Procedure I – Storage/Air transport:

up to 70,000 ft. (non-operational)

Procedure II – Operation/Air Carriage:

up to 40,000 ft. (operational)

#### **Humidity**

Method 507.4

Up to 95% RH

#### **Vibration**

Method 514.5

Procedure I, Category 24

General minimum integrity exposure

IAW Figure 514.5C-17

1 hour per axis.

#### **Shock**

Method 516.5

Procedure I

20 g / 11 ms terminal peak sawtooth shock pulse

#### **Salt Fog**

Method 509.4

### ***Reliability***

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

### ***Environmental Stress Screening (ESS)***

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

### ***Pin Assignment***

| Pin No. | Function   |
|---------|------------|
| 1       | Signal RTN |
| 2       | - SENSE †  |
| 3       | N/C        |
| 4       | N/C        |
| 5       | N/C        |
| 6       | N/C        |
| 7       | VIN (-)    |
| 8       | VIN (-)    |
| 9       | N/C        |

| Pin No. | Function  |
|---------|-----------|
| 10      | VIN (+)   |
| 11      | VIN (+)   |
| 12      | N/C       |
| 13      | N/C       |
| 14      | Inhibit   |
| 15      | + SENSE † |
| 16      | N/C       |
| 17      | N/C       |
| 18      | N/C       |

| Pin No. | Function |
|---------|----------|
| 19      | N/C      |
| 20      | VIN (-)  |
| 21      | N/C      |
| 22      | N/C      |
| 23      | VIN (+)  |
| 24      | N/C      |
| 25      | Chassis  |
|         |          |
|         |          |

† Please inform factory if sense lines are required to be tied to the output from within, or if the remote sense compensation function will be used.

## M8186 SERIES DC/DC POWER SUPPLY

### Functions and Signals

#### **INHIBIT**

The ***INHIBIT*** signal is used to turn the power supply ON and OFF.

OPEN – will turn on the power supply.

SHORT – between pin 14 and pin 1 will turn off the power supply.

This signal is referenced to the ***SIGNAL RTN*** pin.

#### **SENSE**

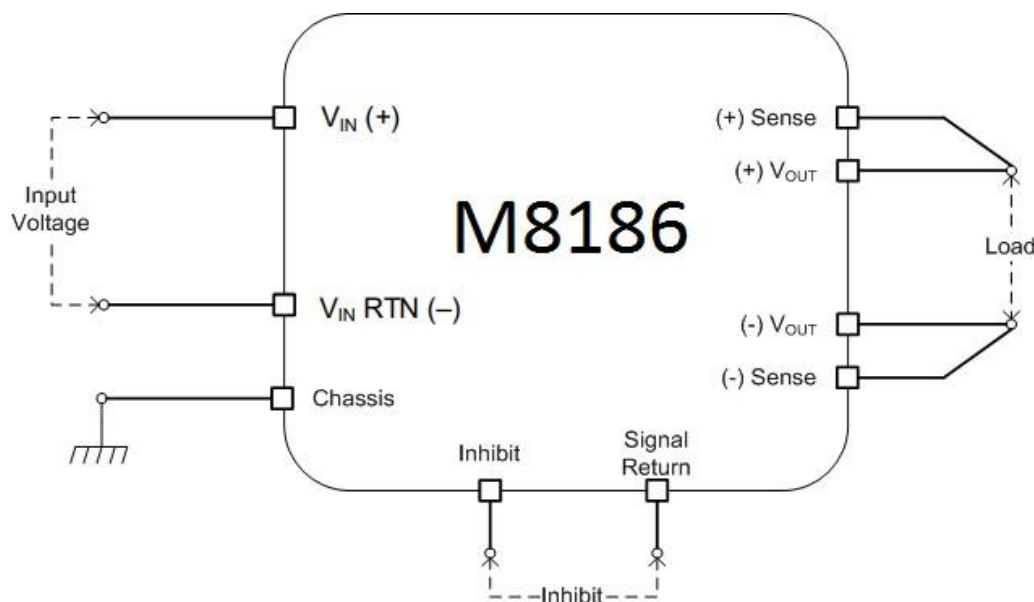
The SENSE is used to achieve accurate load regulations at load terminals (this is done by connecting the pins directly to the load's terminals).

The use of remote sense has a limit of voltage dropout between converter's output and load terminals of 2-10% of voltage output (up to 2V).

Please note that if Sense lines are not used the output may rise as much as 2V above nominal outputs.

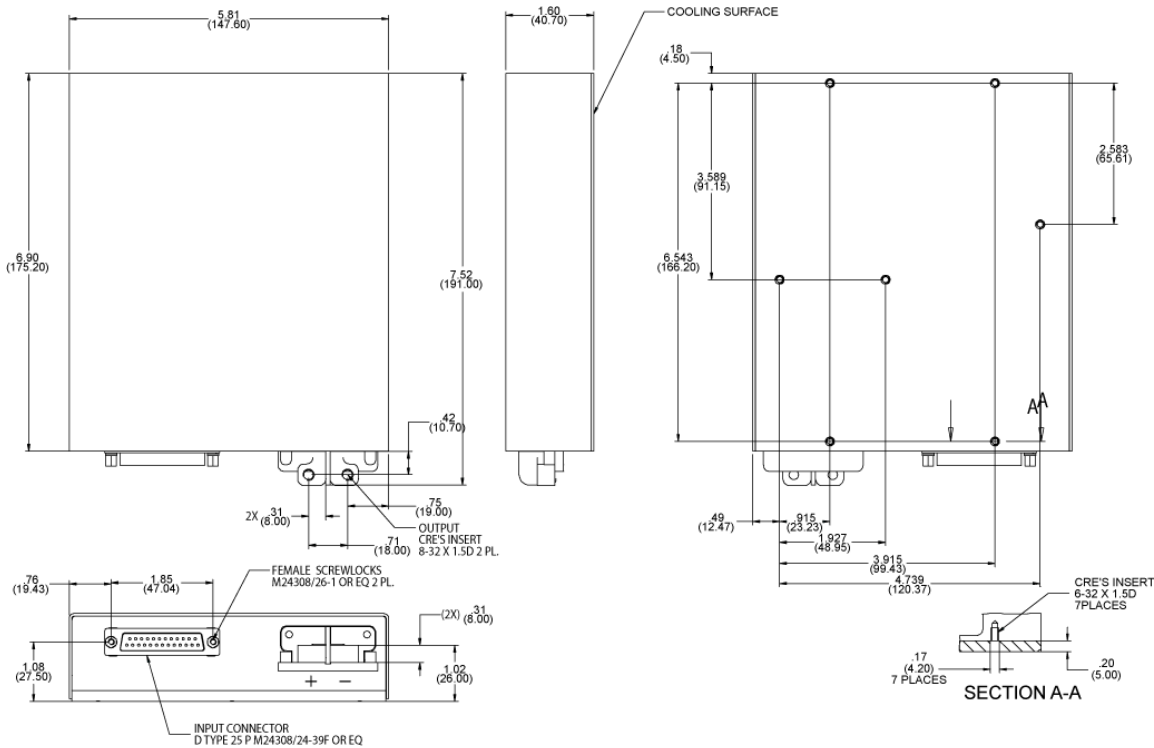
If sense lines are not to be used in the application, please inform factory for internal connection to output pins.

### Typical Connection Diagram



## M8186 SERIES DC/DC POWER SUPPLY

### Outline\* Drawing



### Heat Dissipation Surface



Dissipation Area  
40.08 in<sup>2</sup> (258.6 cm<sup>2</sup>)

### Notes

1. Dimensions are in inches [mm]
2. Tolerance is:  
.XX ± 0.025 in  
.XXX ± 0.010 in
3. Weight: Approx. 4.4 lbs [2 kg]

## M8186 SERIES DC/DC POWER SUPPLY

### Standard Configurations

| Part number | Input          | Output             |         |
|-------------|----------------|--------------------|---------|
|             | Voltage range  | Voltage            | Current |
| M8186-100   | 220 to 350 Vdc | 28 V <sub>DC</sub> | 70 A    |
| M8186-101   | 220 to 350 Vdc | 28 V <sub>DC</sub> | 70 A    |
| M8186-102   | 220 to 350 Vdc | 28 V <sub>DC</sub> | 70 A    |
| M8186-103   | 220 to 350 Vdc | 48 V <sub>DC</sub> | 42 A    |

### Special Features

- **M8186-101:**
  - Parallel operation via output voltage droop. Voltage regulation is  $\pm 2\%$ .
- **M8186-102:**
  - Output voltage sense wires tied internally to the unit.

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