

## M2786 SERIES

### DC/DC POWER SUPPLY



#### DESCRIPTION

The M2786 military power supply is a rugged dual output DC to DC converter which accepts an 18 - 48VDC input voltage range and provides DC outputs from 2.5 to 28V at up to 30W. Custom outputs available upon request and the unit is Designed to meet military standards, MIL-STD-704, MIL-STD-1275, MIL-STD-810, MIL-STD-461.

#### FEATURES

- Miniature size
- Wide input range
- Input / Output isolation
- Input / Output isolation
- Remote sense compensation
- Remote Inhibit (On/Off)
- Fixed switching freq. (250 kHz)
- External sync. capability
- EMI filters included
- Non-latching protections:
  - oOverload/short-circuit
  - oOver temperature

## HOW TO ORDER

| Part number   | Output #1   | Output #2   |
|---------------|-------------|-------------|
| CF-02EM2786-1 | 3.3V / 4A   | 5V / 3A     |
| CF-02EM2786-2 | 5V / 3A     | 12V / 1.25A |
| CF-02EM2786-3 | 12V / 1.25A | 3.3 V / 3A  |
| CF-02EM2786-4 | 28V / 0.5A  | 5V / 3A     |
| CF-02EM2786-5 | 15V / 1A    | 15V / 1A    |

### ELECTRICAL SPECIFICATIONS:

|   |   |  |
|---|---|--|
| <p><b>Voltage range:</b><br/>18 to 48 VDC,<br/>IAW MIL-STD-704E.<br/>No damage (but may restart)<br/>if exposed to over-voltage<br/>surges IAW MIL-STD-1275A<br/>(100 V / 50 ms) &amp; MIL-STD-<br/>704A (80 V / 0.1 s)</p> | <p><b>Output #1</b><br/>Voltage range: 2.5 to 28 VDC<br/>Current range: 0 to 3 A.<br/>Power range: 0 to 15 W</p> <p><b>Output #2</b><br/>Voltage range: 2.5 to 28 VDC<br/>Current range: 0 to 3 A.<br/>Power range: 0 to 15 W<br/>Total power range: 0 to 30W</p> | <p><b>Isolation:</b><br/>Input to Output: 200 VDC<br/>Input to Case: 200 VDC<br/>Output to Case: 100 VDC<br/>Outputs are isolated</p>  |
| <p><b>Line/Load regulation:</b><br/>Less than <math>\pm 1\%</math> (Low to high line<br/>voltage, no load to full load,<br/>-55°C to +85 °C baseplate<br/>temperature).</p>   | <p><b>Efficiency:</b><br/>90% - Typical (nominal line<br/>voltage, 28VDC output, full<br/>load, standard room tempera-<br/>ture)</p>  | <p><b>EMC:</b><br/>Designed to meet* MIL-<br/>STD461F CE101, CE102,<br/>CS101, CS114, CS115, CS116,<br/>RE101, RE102, RS101, RS103</p> |
| <p><b>Ripple and Noise:</b><br/>Less than 50 mVp-p, typical<br/>(max. 1%) without external<br/>capacitance. When connected<br/>to system capacitance ripple<br/>drops significantly.</p>                                    | <p><b>Step Load Over-and under-<br/>shoot Output resistance:</b><br/>at load change of 50%-100% is<br/>30-120 m<math>\Omega</math> (depending on<br/>output voltage). Output back<br/>to steady stated within 300-<br/>500 <math>\mu</math>s</p>                  | <p><b>Turn-on Transient:</b><br/>No voltage overshoot during<br/>power on.</p>   |

| PROTECTIONS   |   |  |
|---|---|--|
| Input   | Output  | General  |
| <b>Under-Voltage Lockout:</b><br>Unit shuts down when input voltage is below 16.5 V $\pm$ 1 V | <b>Passive Overvoltage Protection:</b><br>Transorbs available on both outputs, rated to 115% $\pm$ 10% of nominal output voltage. | <b>Over temperature protection:</b><br>Shutdown if base plate temperature rises above +105°C $\pm$ 5°C.<br>Automatic recovery at base plate temperature falls below +95°C $\pm$ 5°C. |
| <b>Over-Voltage Lockout:</b><br>Unit shuts down when input voltage is above 52V $\pm$ 2V.     | <b>Current limiting:</b><br>Continuous protection (10- 30% above maximum current) for unlimited time (Hiccup).                    |  |

| Environmental Conditions   |  |  |
|--|--|--|
| <b>Temperature:</b><br>Method 501.5 Procedures I & II<br>Method 502.5 Procedures I & II<br>Operating: -55°C to +85°C (baseplate)<br>Storage: -55°C to +125°C (ambient) | <b>Altitude:</b><br>Method 500.5<br>Procedures I & II<br>Up to 70000 ft. operational       | <b>Salt Fog:</b><br>Method 509.5   |
| <b>Humidity:</b><br>Method 507.5<br>Up to 95% RH.  | <b>Vibration (Random):</b><br>Method 514.6<br>Random Vibration, Category 24, Fig 514.6E-1. | <b>Shock:</b><br>Method 516.6<br>30 g, 11 ms terminal peak sawtooth (all directions) |

## PIN ASSIGNMENT:

Connector type: Airborne RM272-020-312-2900 or eq.

Mating connector: Airborne RM242-020-571-5900 or eq. (other options available)

| Pin Number | Function         | Polarity | Pin Number | Function     | Polarity |
|------------|------------------|----------|------------|--------------|----------|
| 1          | VOUT 1 **        | (+)      | 11         | VOUT 1 **    | (+)      |
| 2          | VOUT 1 SENSE RTN | (-)      | 12         | VOUT 1 SENSE | (+)      |
| 3          | VOUT 1 RTN**     | (-)      | 13         | VOUT 1 RTN** | (-)      |
| 4          | SIGNAL RTN       |          | 14         | SYNC         |          |
| 5          | INHIBIT          |          | 15         | VIN RTN      | (-)      |
| 6          | VIN RTN          | (-)      | 16         | VIN          | (+)      |
| 7          | VIN              | (+)      | 17         | CHASSIS      |          |
| 8          | VOUT 2 SENSE RTN | (-)      | 18         | VOUT 2 RTN * | (-)      |
| 9          | VOUT 2 RTN *     | (-)      | 19         | VOUT 2 *     | (+)      |
| 10         | VOUT 2 *         | (+)      | 20         | VOUT 2 SENSE | (+)      |

## 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.

### SYNC signal

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

The system frequency can be 250 kHz  $\pm$  10 kHz.

When not connected, the power supply will work at internal frequency, close to 250 kHz  $\pm$  10 kHz.

### SIGNAL RTN

The SIGNAL RTN is used as grounding for SYNC and INHIBIT signals.

This is referenced to the VIN RTN pin.

### VOUT SENSE

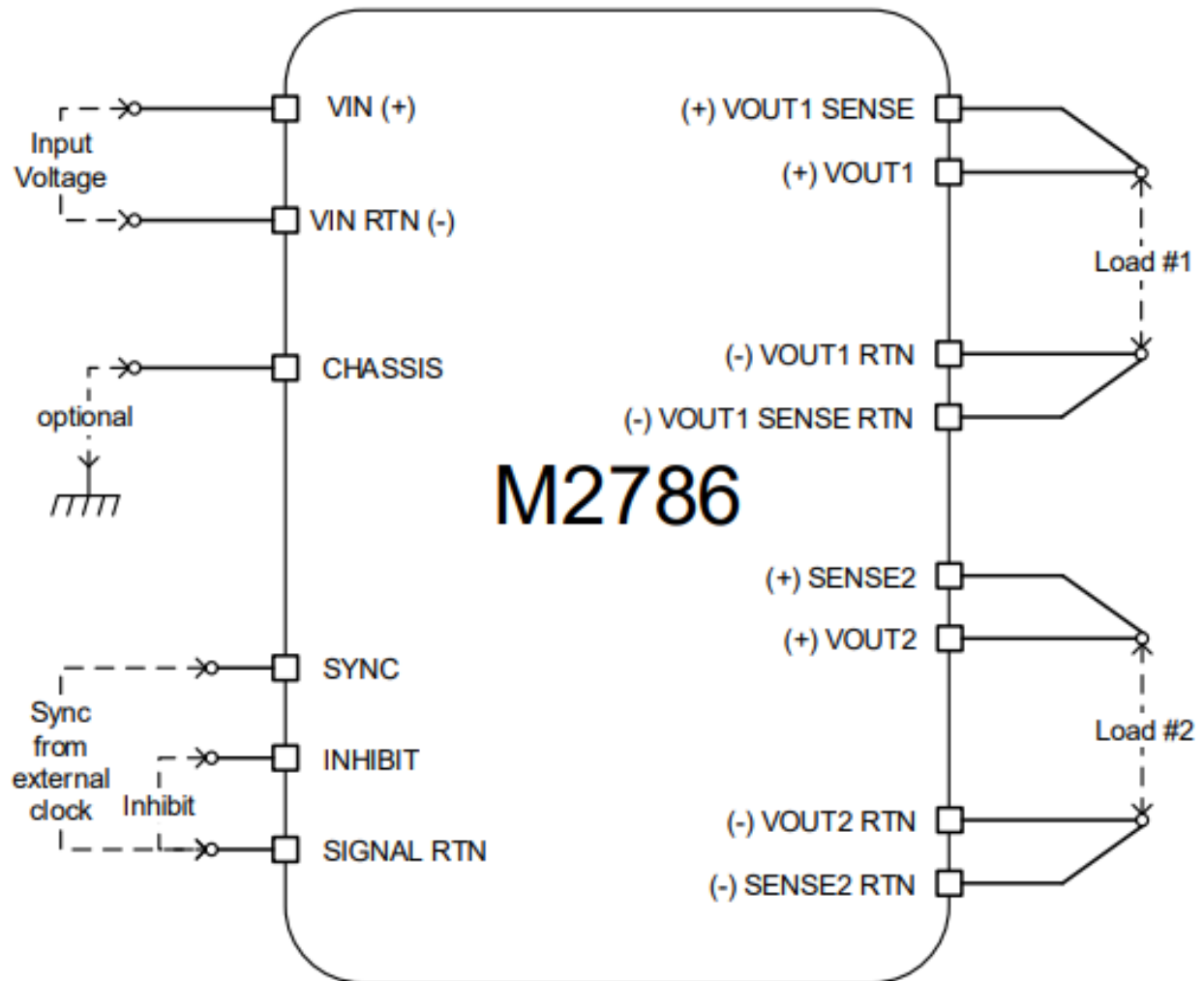
The SENSE is used to achieve accurate load regulation at the load terminals. This is done by connecting these pins directly to their respective load terminals. The use of remote sense has a limit of voltage dropout between converter’s output and load terminals of 2-10% of voltage output.

When not used connect SENSE to VOUT and SENSE RTN to VOUT RTN for each of the outputs.

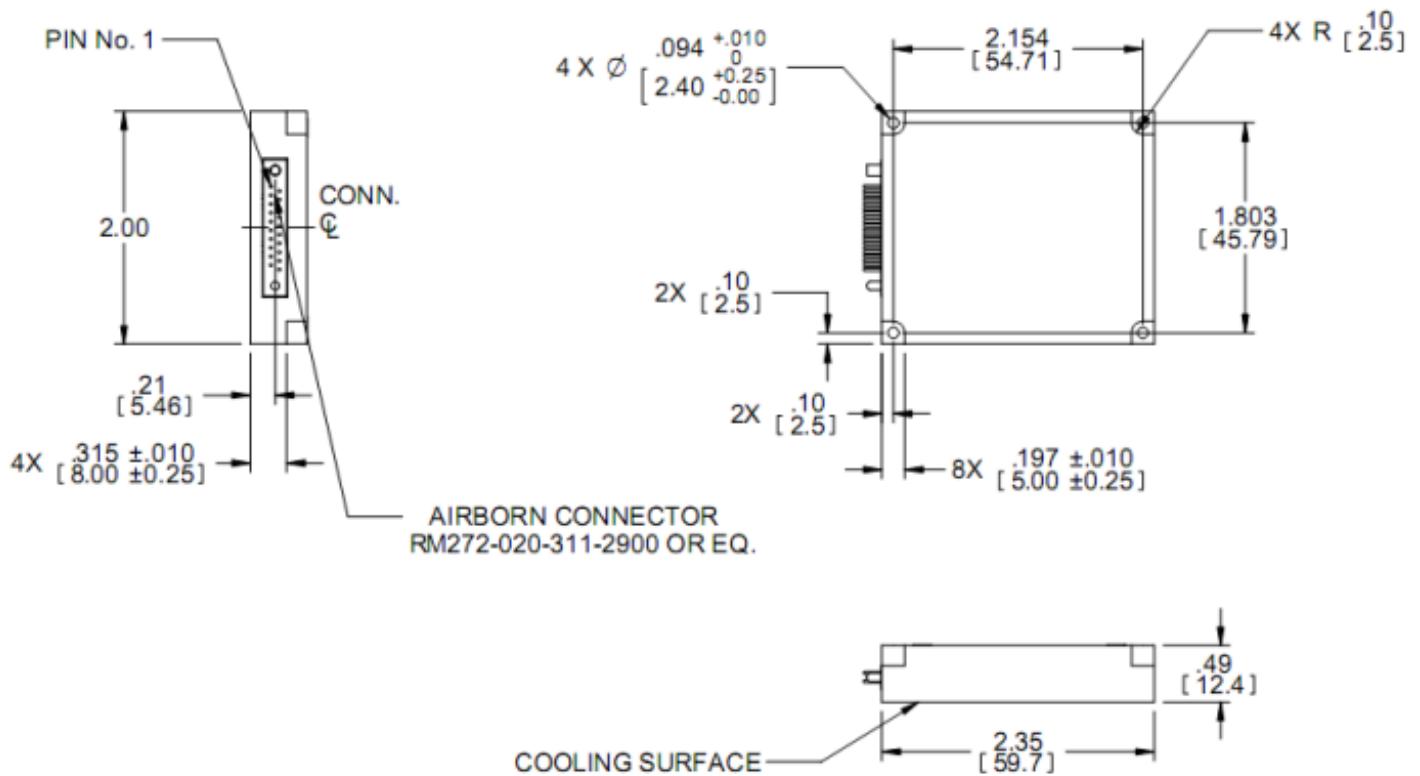
### Chassis PIN

This chassis pin allows connection of the unit chassis to system chassis.V

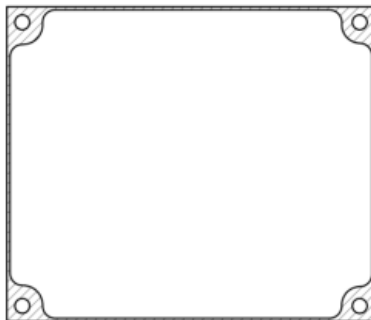
TYPICAL CONNECTION:



## OUTLINE DRAWING:



## HEAT DISSIPATION SURFACE:



Dissipation  
Area  
 $0.31 \text{ in}^2$

### Notes

1. Dimensions are in inches [mm]
2. Tolerance is:  
.XX  $\pm 0.01$  in  
.XXX  $\pm 0.005$  in

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MILITARY HIGH SPEED

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