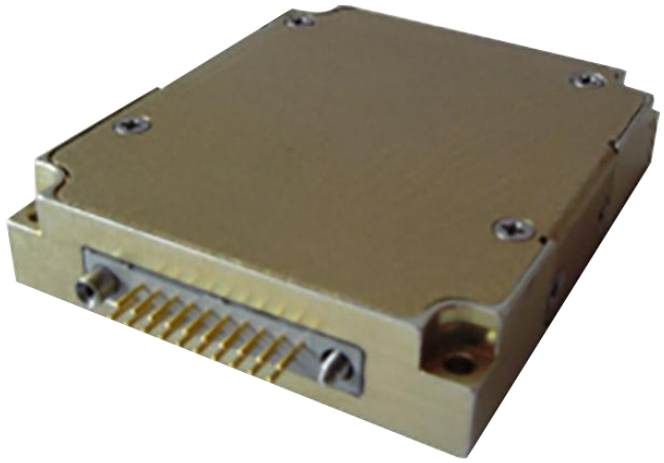
# M2786 SERIES

*DC/DC POWER SUPPLY*



## PRODUCT HIGHLIGHTS

- **MINIATURE, HIGH DENSITY**
- **DUAL OUTPUT**
- **DC/DC POWER SUPPLY**
- **UP TO 30 W**

## 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.

## Applications

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

## Special Features

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

## Electrical Specifications

***DC Input***

Voltage range: 18 to 48 $V_{DC}$, IAW MIL-STD-704E.

**No damage** (but may restart) if exposed to **over-voltage surges** IAW MIL-STD-1275A (100 V / 50 ms) & MIL-STD-704A (80 V / 0.1 s)

***DC Output***

**Output #1**
Voltage range: 2.5 to 28 $V_{DC}$
Current range: 0 to 3 A.
Power range: 0 to 15 W

**Output #2**
Voltage range: 2.5 to 28 $V_{DC}$
Current range: 0 to 3 A.
Power range: 0 to 15 W

**Total power range:** 0 to 30 W

***Isolation***

Input to Output: 200 $V_{DC}$
Input to Case: 200 $V_{DC}$
Output to Case: 100 $V_{DC}$
Outputs are isolated

***Line/Load regulation***

Less than ±1% (Low to high line voltage, no load to full load, –55 °C to +85 °C baseplate temperature).

***Efficiency***

75% Typical (full load, nominal line voltage, room temperature)

***EMC***

Designed to meet* MIL-STD-461F
CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103

***Ripple and Noise***

Less than 50 $mV_{p-p}$, typical (max. 1%) without external capacitance. When connected to system capacitance ripple drops significantly.

***Step Load Over-and-undershoot*** Output resistance at load change of 50%-100% is 30-120 mΩ (depending on output voltage). Output back to steady stated within 300-500 µs

***Turn-on Transient***

No voltage overshoot during power on.

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

## Protections *

***Input***

- **Under-Voltage Lockout**
  Unit shuts down when input voltage is below 16.5 V ± 1 V.
- **Over-Voltage Lockout**
  Unit shuts down when input voltage is above 52 V ± 2 V.

***Output***

- **Passive Overvoltage Protection**
  Transorbs available on both outputs, rated to 115% ± 10% of nominal output voltage.
- **Current limiting****
  Continuous protection (10-30% above maximum current) for unlimited time (Hiccup).

**General**

- **Over temperature protection**
  Shutdown if base plate temperature rises above +105 °C ± 5 °C.
  Automatic recovery at base plate temperature falls below +95 °C ± 5 °C.

## Environmental Conditions

Designed to meet environmental conditions IAW MIL-STD-810G:

***Temperature***
Method 501.5 Procedures I & II
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Operating: –55 °C to +85 °C (baseplate)
Storage: –55 °C to +125 °C (ambient)

***Altitude***
Method 500.5
Procedures I & II
Up to 70 000 ft. operational

***Salt Fog***
Method 509.5

***Humidity***
Method 507.5
Up to 95% RH.

***Vibration (Random)***
Method 514.6
Random Vibration, Category 24, Fig 514.6E-1.

***Shock***
Method 516.6
30 g, 11 ms terminal peak saw-tooth (all directions)

## Reliability

150,000 hours, calculated per MIL-STD-217F Notice 2 at +85°C base plate, Ground fixed.

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

**If short circuit occur in master output , current limiting will be activated for both outputs.

If short circuit occur in slave output , master output will not be affected.

## 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 |
|---|---|---|
| 1 | VOUT 1 ** | (+) |
| 2 | VOUT 1 SENSE RTN | (–) |
| 3 | VOUT 1 RTN** | (–) |
| 4 | SIGNAL RTN | |
| 5 | INHIBIT | |
| 6 | VIN RTN | (–) |
| 7 | VIN | (+) |
| 8 | VOUT 2 SENSE RTN | (–) |
| 9 | VOUT 2 RTN * | (–) |
| 10 | VOUT 2 * | (+) |

| Pin Number | Function | Polarity |
|---|---|---|
| 11 | VOUT 1 ** | (+) |
| 12 | VOUT 1 SENSE | (+) |
| 13 | VOUT 1 RTN** | (–) |
| 14 | SYNC | |
| 15 | VIN RTN | (–) |
| 16 | VIN | (+) |
| 17 | CHASSIS | |
| 18 | VOUT 2 RTN * | (–) |
| 19 | VOUT 2 * | (+) |
| 20 | VOUT 2 SENSE | (+) |

* Master output

** Slave output

**Notes:**

1. Slave output is sequenced after master output. **Please consult factory for details.**
2. All pins with identical function/designation should be connected together for proper operation.

## 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 ± 10 kHz.
When not connected, the power supply will work at internal frequency, close to 250 kHz ± 10 kHz.

### SIGNAL RTN

The SIGNAL RTN is used as grounding for ***SYNC*** and ***INHIBIT*** signals.
This is referenced to the ***VIN RTN*** pin.

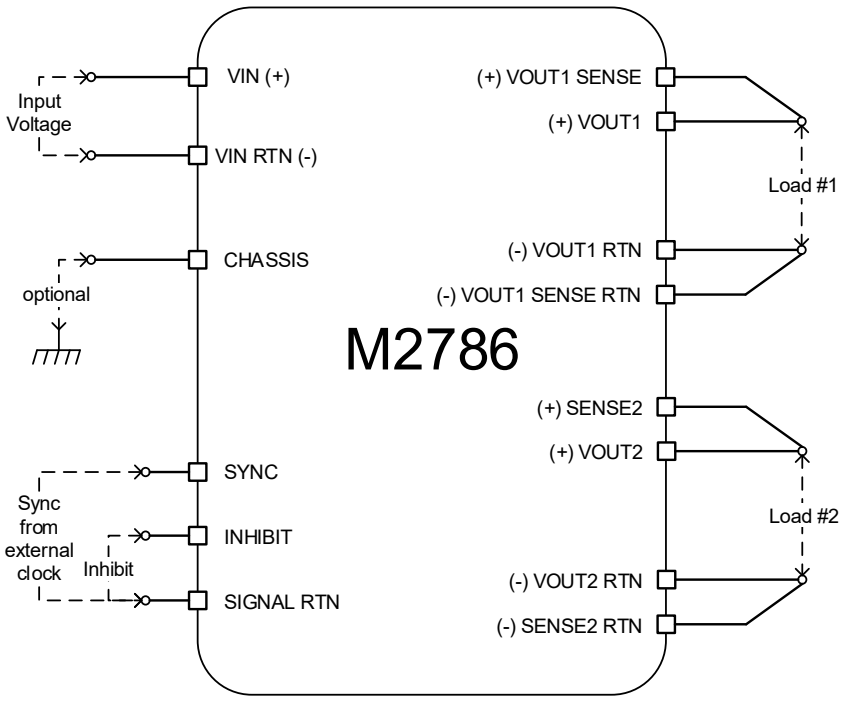
### VOUT SENSE

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.

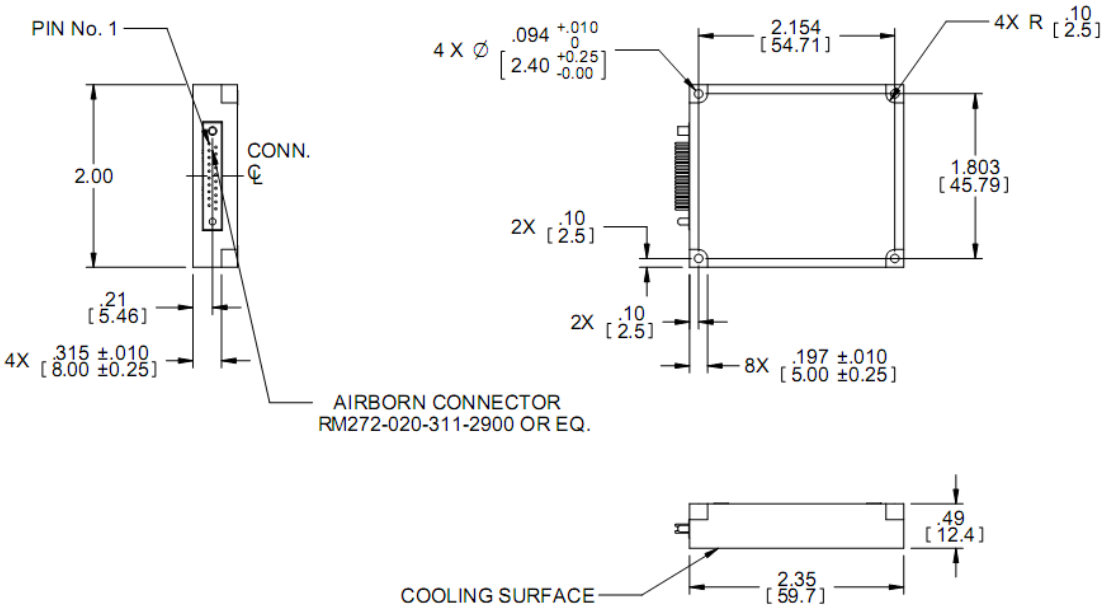
### Chassis PIN

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

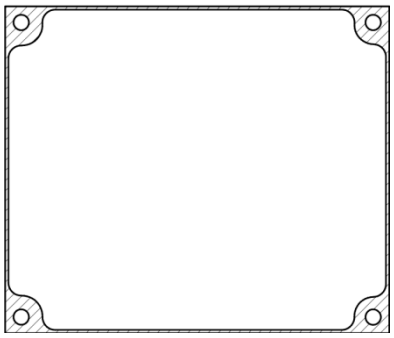
## Typical Connection Diagram



## Outline Drawing




## Heat Dissipation Surface



Dissipation Area
0.31 in²

***Notes***

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

## Standard Configurations

| Model | Output #1 | Output #2 |
|---|---|---|
| M2786-100 | 3.3V / 4A | 5V / 3A |
| M2786-101 | 5V / 3A | 12V / 1.25A |
| M2786-102 | 12V / 1.25A | 3.3V / 3A |
| M2786-103 | 28V / 0.5A | 5V / 3A |
| M2786-104 | 15V / 1A | 15V / 1A |

- Additional standard configurations available, please consult factory for details

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