

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)

Line/Load regulation

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

Ripple and Noise

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

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

Efficiency

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

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

Isolation

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

EMC

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

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 $16.5\text{ V} \pm 1\text{ V}$.
- **Over-Voltage Lockout**
Unit shuts down when input voltage is above $52\text{ V} \pm 2\text{ V}$.

Output

- **Passive Overvoltage Protection**
Transorbs available on both outputs, rated to $115\% \pm 10\%$ 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 $+105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.
Automatic recovery at base plate temperature falls below $+95\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

Environmental Conditions

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

Temperature

Method 501.5 Procedures I & II
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Operating: $-55\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$
(baseplate)
Storage: $-55\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$
(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 $+85\text{ }^{\circ}\text{C}$ base plate, Ground fixed.

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

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

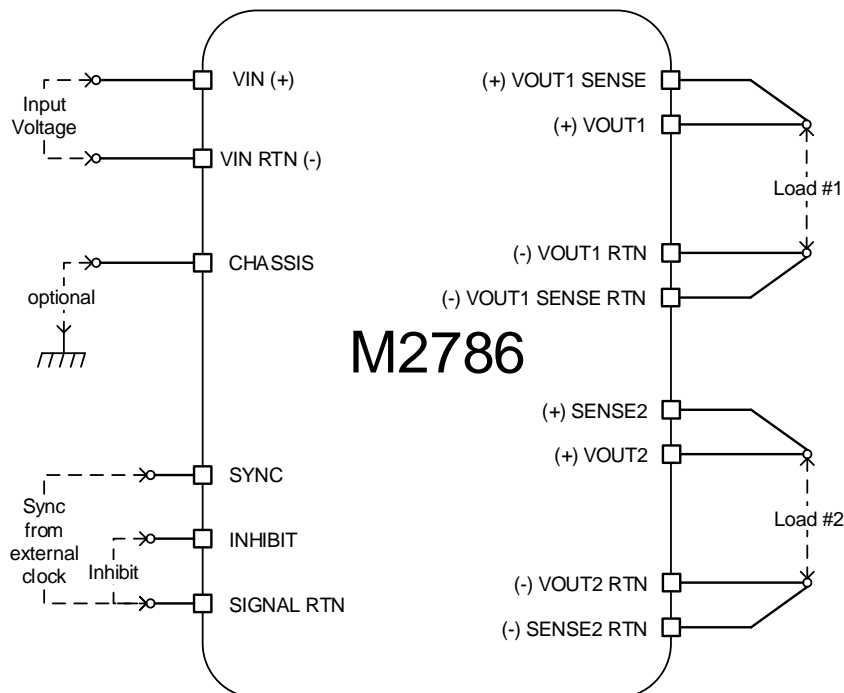
The **SENSE** is used to achieve accurate load regulation at the load terminals. This is done by connecting these pins directly to their respective load terminals. The use of remote sense has a limit of voltage dropout between converter’s output and load terminals of 2-10% of voltage output.

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

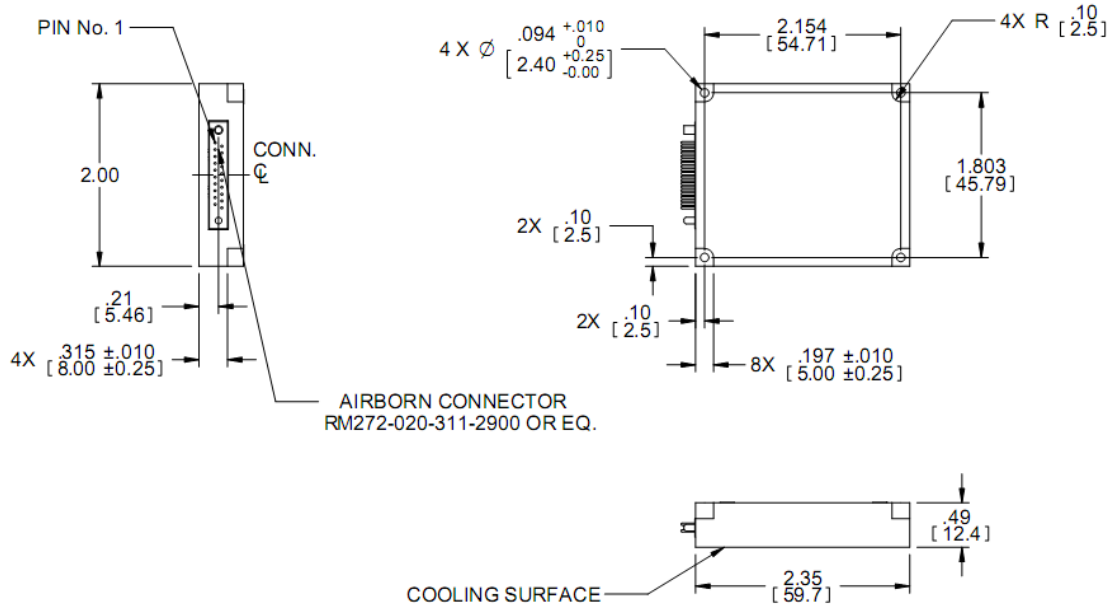
Chassis PIN

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

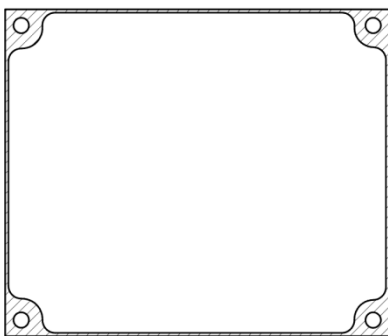
Typical Connection Diagram



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