

M7338 SERIES

DC/DC POWER SUPPLY



PRODUCT HIGHLIGHTS

- MINIATURE
- HIGH DENSITY
- TRIPLE OUTPUT
- DC/DC CONVERTER
- UP TO 600W



Applications

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

Special Features

- Miniature size
- High efficiency
- High density – up to 27.7 W/in³
- Wide input range
- Input / Output isolation
- EMI filters included
- Fixed switching freq. (250 kHz)
- External sync. capability
- Remote Inhibit (On/Off)
- Remote sense compensation
- Non-latching protections:
 - Overload/short-circuit
 - Output overvoltage
 - Input UVLO/OVLO
 - Over temperature

Electrical Specifications**DC Input**

Normal range: 18 to 48 V_{DC}
 Abnormal voltage transient:
 No damage* due to exposure to
 100 V / 50 ms IAW MIL-STD-
 1275A and 80 V / 0.1 s IAW MIL-
 STD-704A

Output Voltage Regulation

Less than ±1%
 (no load to full load; across input
 voltage range; –55 °C to +85 °C
 baseplate temperature).

Ripple & Noise

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

DC Outputs

For each output:
 Voltage range: 1.8 to 50 V_{DC}
 Current range: 0 to 16 A
 Power range: 0 to 200 W
 Total power range: 0 to 600 W

Efficiency

Typical 76% to 85%
 (28V_{DC} output, full load, room
 temperature)

Transient Over-and-undershoot

Output resistance at load change
 of 50% to 100% is typically 50 mΩ
 (for 28 V_{DC} output).
 Output back to steady stated
 within 300 to 500 μs.

Isolation

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

EMC

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

Turn-On Transient

No overshoot.

* The power supply may shut down during the transient once out of the normal operation range, and restart once back within normal operation range.

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

Protections †**Input**

- **Input Reverse Polarity:**
Protection for unlimited time
- **Under-Voltage Lock-Out:**
Unit shuts down below $16V \pm 1.5V$.
- **Over-Voltage Lock-Out:**
Unit shuts down above $52V \pm 2V$.

Output

- **Active Over Voltage Protection**
Internal control shuts down unit $10 \pm 5\%$ above nominal voltage.
- **Passive Over Voltage Protection**
Transorb protects unit and load $20 \pm 10\%$ above nominal voltage.
- **Current limiting**
Output shuts down and attempts to restart periodically, until fault condition removed (hiccup).

General

- **Over temperature protection**
Unit shuts down if baseplate temperature exceeds $+105 \pm 5^\circ C$.
Automatic recovery upon cooldown to below $+95 \pm 5^\circ C$.

Environmental Conditions

Designed to meet MIL-STD-810G

Temperature

Methods 501.5 & 502.5
Operating: $-55^\circ C$ to $+85^\circ C$ (at baseplate)
Storage: $-55^\circ C$ to $+125^\circ C$ (ambient)

Altitude

Method 500.5
Procedures I – Storage/Air transport:
up to 70,000 ft. (non-operational)
Procedure II – Operation/Air Carriage:
up to 70,000 ft. (operational)

Humidity

Method 507.5
Up to 95% RH

Vibration

Method 514.6
Procedure I, Category 24
General minimum integrity exposure
1 hour per axis.

Shock

Method 516.6
Procedure I
20 g / 11 ms terminal peak sawtooth shock pulse

Salt Fog

Method 509.5

Reliability

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

Environmental Stress Screening (ESS)

100% of delivered power supplies are tested at low ambient temperature, high baseplate temperature and at standard room temperature.

Additional tests, such as random vibration and thermal cycling can be added. Consult factory for details.

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

Pin Assignment**J1 - INPUT CONNECTOR****Type:** M24308/24-33F or eq.**Mates with:** M24308/2-3F or eq.

Pin Assignment	Pin Numbers	P
INPUT	9, 10, 11, 12, 13, 22, 23, 24, 25	+
INPUT RTN	5, 6, 7, 8, 17, 18, 19, 20, 21	-
INHIBIT 1	1	+
INHIBIT 2	2	+
INHIBIT 3	15	+
MAIN INHIBIT	16	+
SYNC	4	+
SIGNAL RTN	3	-
CHASSIS	14	0

J2 - OUTPUT CONNECTOR**Type:** M24308/23-34F or eq.**Mates with:** M24308/4-4F or eq.

Pin Assignment	Pin Numbers	P
OUTPUT 1	8, 9, 10, 27, 28	+
OUTPUT 1 RTN	11, 12, 29, 30, 31	-
SENSE 1	26	+
SENSE 1 RTN	13	-
OUTPUT 2	2, 3, 4, 21, 22	+
OUTPUT 2 RTN	5, 6, 23, 24, 25	-
SENSE 2	1	+
SENSE 2 RTN	7	-
OUTPUT 3	14, 15, 16, 33, 34	+
OUTPUT 3 RTN	17, 18, 35, 36, 37	-
SENSE 3	32	+
SENSE 3 RTN	19	-
N.C.	20	

Signals Description

SENSE # (connector J2: pin 26 for output #1, pin 1 for output #2 and pin 32 for output #3)
The **SENSE #** lines are used to achieve accurate voltage regulation at their respective load terminals. To use this feature, connect these pins directly to their respective load's positive terminal.

SENSE # RTN (connector J2: pin 13 for output #1, pin 7 for output #2 and pin 19 for output #3)
The **SENSE # RTN** lines are used to achieve accurate voltage regulation at their respective load terminals. To use this feature, connect these pins directly to their respective load's negative terminal.

If this function is not required, short short **SENSE #** directly to its respective output pins and **SENSE # RTN** to its respective output return pins, as close as possible to the connector.

Note: The use of remote sense has a limit of voltage dropout between the converter's output and the load's terminals of approximately 5% of nominal output voltage or 0.5 V – the lesser of the two.

INHIBIT

The **MAIN INHIBIT** (connector J1, pin 16) signal is used to turn all outputs ON and OFF together. The **INHIBIT #** (connector J1, pins 1 for output #1, pin 2 for output #2 and pin 15 for output #3) signals are used to turn their respective outputs ON and OFF individually.

Leaving these pins open will result in active outputs (according to table truth table).

Shorting these pins to **SIGNAL RTN** will result in inhibited outputs (according to table truth table).

MAIN INHIBIT	INHIBIT 1	INHIBIT 2	INHIBIT 3	Output #1	Output #2	Output #3
OPEN	OPEN	OPEN	OPEN	ON	ON	ON
OPEN	OPEN	OPEN	SHORT	ON	ON	OFF
OPEN	OPEN	SHORT	OPEN	ON	OFF	ON
OPEN	OPEN	SHORT	SHORT	ON	OFF	OFF
OPEN	SHORT	OPEN	OPEN	OFF	ON	ON
OPEN	SHORT	OPEN	SHORT	OFF	ON	OFF
OPEN	SHORT	SHORT	OPEN	OFF	OFF	ON
X	SHORT	SHORT	SHORT	OFF	OFF	OFF
SHORT	X	X	X	OFF	OFF	OFF

If this function is not required, leave these pins unconnected.

This signal is referenced to **SIGNAL RTN** (connector J1 pin 3).

SYNC (connector J1, pin 4)

The ***SYNC*** signal is used for synchronizing the power supply's switching frequency to external clock. Valid external clock frequency is 250 kHz \pm 10 kHz, and duty cycle is 50% \pm 10%. If this function is not required, leave this pin unconnected - the power supply will use its internal clock.

This signal is referenced to ***SIGNAL RTN*** (connector J1, pin 3)

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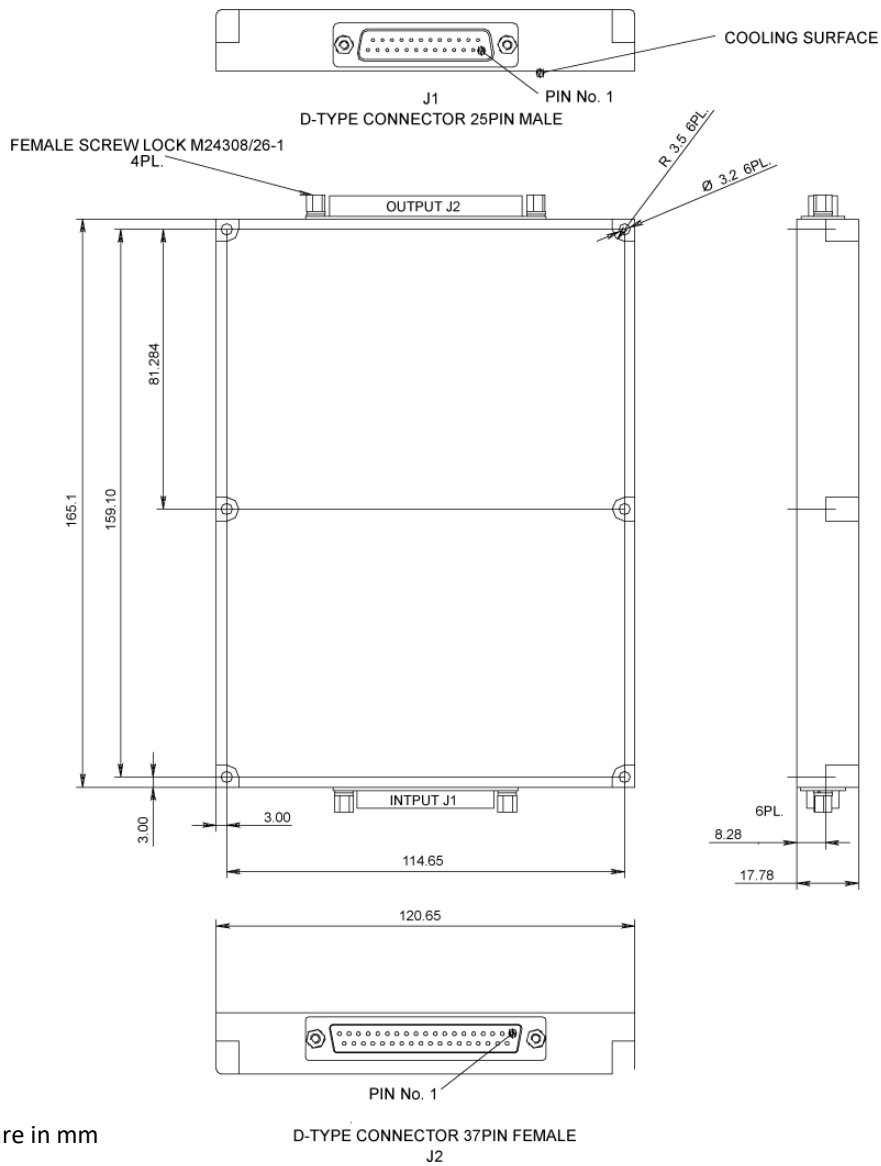
Both ***INHIBIT*** and ***SYNC*** signals are referenced to this pin.

This pin is referenced to ***INPUT RTN*** (connector J1, pins 5, 6, 7, 8, 17, 18, 19, 20 and 21).

CHASSIS (connector J1, pin 14)

This pin is connected to the converter's chassis.

Outline Drawing



Notes

1. Dimensions are in mm
2. Tolerance is:
 .X ± 0.2 mm
 .XXX ± 0.1 mm
3. Weight: Approx. 510 g

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