

M8139 SERIES

DC/DC POWER SUPPLY



PRODUCT HIGHLIGHTS

- DC/DC CONVERTER
- 18 to 48 VDC INPUT
- TRIPLE DC OUTPUTS
- UP TO 60W
- MINIATURE
- HIGH DENSITY



Applications

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

Special Features

- Miniature size
- High efficiency
- High power density: up to 18 W/in³
- Input / Output isolation
- Wide input Range
- TTL logic enable
- Fixed switching freq. (250 kHz)
- EMI filters included
- Conduction cooled
- Non-latching protections:
 - Overload/short-circuit
 - Over-voltage
 - Over temperature

Electrical Specifications

DC Input

Normal range: 18 to 48 V_{DC}

No damage (may shutdown) due to abnormal transients IAW MIL-STD-1275A (100 V / 50 ms) and MIL-STD-704A (80 V / 0.1 s)

Output Voltage Regulation

Better than or equal to ±1% (low to high line voltage, no load to full load, -55 °C to +85 °C at baseplate).

Ripple and Noise

Less than 50 mV_{p-p}, typical (max. 1%).

DC Output

See table on page 4

Efficiency

Up to 80%, depending on output voltage.

Voltage Regulation

Less than ±1% for output 1, less than ±2% for outputs 2 & 3 (over normal input voltage, load and temperature range)

Isolation

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

Voltage overshoot at during power on is less than 3% nominal voltage.

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

Protections †

Input

- **Under-Voltage Lockout**
Unit may shut down if input voltage drops below 16.5 ± 1 V.
- **Over-Voltage Lockout**
Unit may shut down if input voltage rises above 52 ± 2 V.

Output

- **Over-Voltage Protection**
Passive transorb, chosen at $120\% \pm 10\%$ of nominal voltage.
- **Current Limiting**
Continuous protection for unlimited time

General

- **Over temperature protection:**
Shutdown if base plate temperature rises above $+105 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$.
Auto recovery when baseplate cools down to $+95 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$.

Environmental Conditions

Designed to meet MIL-STD-810F

Temperature

Methods 501.4 & 502.4
Operating: $-55 \text{ }^\circ\text{C}$ to $+85 \text{ }^\circ\text{C}$ (at baseplate)
Storage: $-55 \text{ }^\circ\text{C}$ to $+125 \text{ }^\circ\text{C}$ (ambient)

Vibration

Method 514.5
Procedure I
14.76 g_{rms} 20-2000 Hz for 500 seconds
at each of 3 perpendicular axes.

Altitude

Method 500.4
Procedures I – Storage/Air transport:
up to 70,000 ft. (non-operational)
Procedure II – Operation/Air Carriage:
up to 70,000 ft. (operational)

Shock

Method 516.5
Procedure I
50 g / 11 ms terminal peak half-sine shock pulse

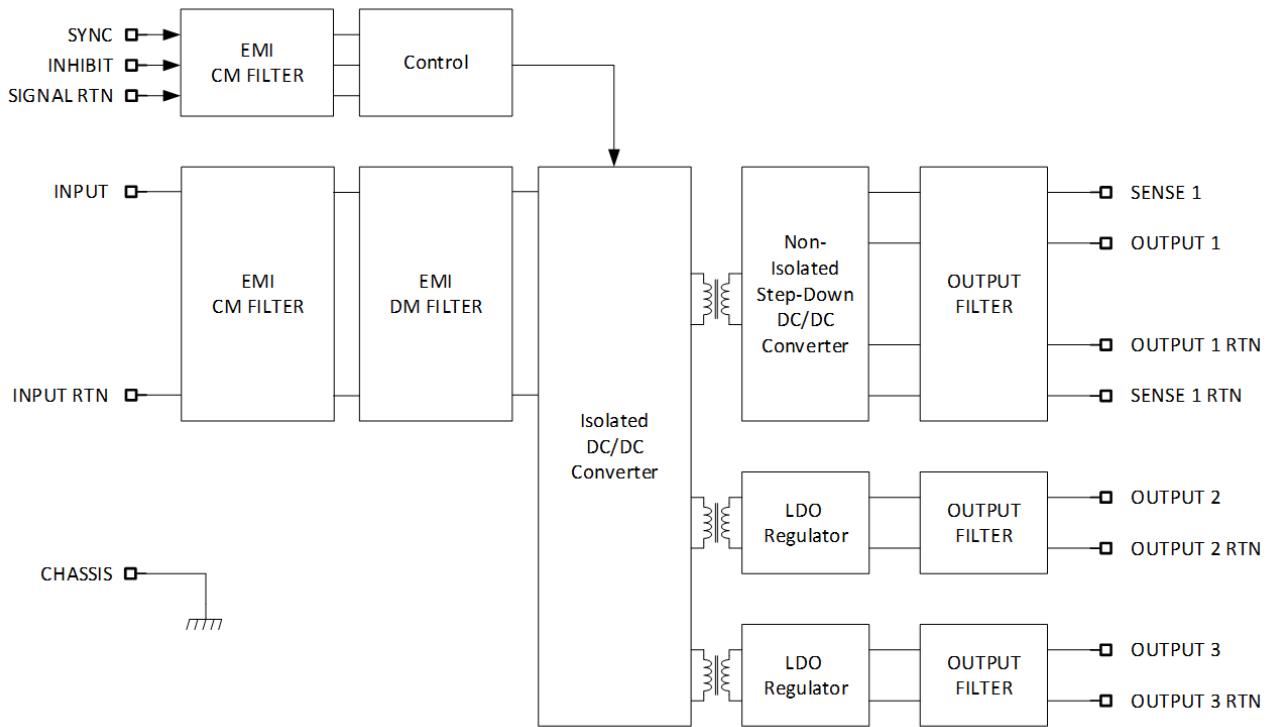
Humidity

Method 507.4
Up to 95% RH

Salt Fog

Method 509.4

Operational Block Diagram



Outputs Range

Output #	Voltage Range	Current Range	Output Regulation	Power Range
1	1 to 15 V _{DC}	0 to 8 A	±1%	0 to 40 W
2	1.8 to 24 V _{DC}	0 to 3 A	±2%	0 to 20 W
3	1.8 to 24 V _{DC}	0 to 1.25 A	±2%	0 to 20 W
Total				0 to 60 W

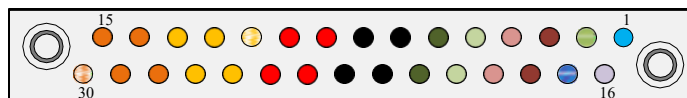
Pin Assignment

Connector type: Airborn RM272-030-312-2900 or eq.

Mates with: Airborn RM242-030-241-5900 (solder cup terminations) or
RM242-030-571-5900 (#20-22 AWG crimp contacts) or eq.

Pin No.	Function	P	
1	INHIBIT	+	○
2	CHASSIS	0	●
3	OUT 2 RTN	-	●
4	OUT 2	+	●
5	OUT 3	+	○
6	OUT 3 RTN	-	●
7	IN RTN	-	●
8	IN RTN	-	●
9	IN	+	●
10	IN	+	●
11	SENSE 1	+	○
12	OUT 1	+	●
13	OUT 1	+	●
14	OUT 1 RTN	-	●
15	OUT 1 RTN	-	●

Pin No.	Function	P	
16	SYNC	+	○
17	SIGNAL RTN	-	●
18	OUT 2 RTN	-	●
19	OUT 2	+	●
20	OUT 3	+	○
21	OUT 3 RTN	-	●
22	IN RTN	-	●
23	IN RTN	-	●
24	IN	+	●
25	IN	+	●
26	OUT 1	+	●
27	OUT 1	+	●
28	OUT 1 RTN	-	●
29	OUT 1 RTN	-	●
30	SENSE 1 RTN	-	○



Signals Description

SENSE 1 (pin 11)

The **SENSE 1** line is used to achieve accurate voltage regulation at load 1 terminals. To use this feature, connect this pin directly to load 1's positive terminal.

If this function is not required, short **SENSE 1** to **OUT 1** (pins 12, 13, 26 and 27) as close as possible to the connector.

SENSE 1 RTN (pin 30)

The **SENSE 1 RTN** line is used to achieve accurate voltage regulation at load terminals. To use this feature, connect this pin directly to load's negative terminal.

If this function is not required, short **SENSE 1 RTN** to **OUT 1 RTN** (pins 14, 15, 28 and 29) 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.

INHIBIT (pin 1)

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

TTL "1" or OPEN – Power supply active (output turned on).

TTL "0" or SHORT to Signal RTN – Power supply inhibited (output turned off). If

this function is not required, leave this pin unconnected.

This signal is referenced to **SIGNAL RTN** (pin 17)

SYNC (pin 16)

The **SYNC** signal is used to synchronize the power supply's switching frequency to system's clock.

Valid external clock frequency is 250 kHz \pm 10 kHz.

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** (pin 17)

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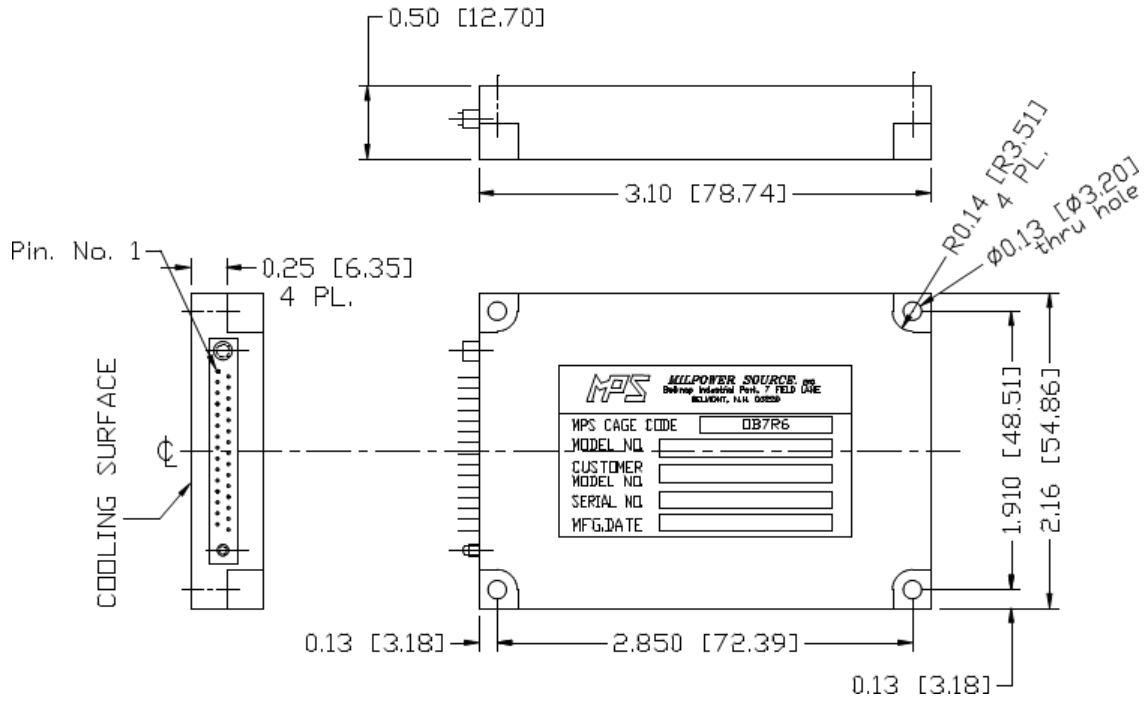
Both **INHIBIT** and **SYNC** signals are referenced to this pin. This

pin is referenced to **IN RTN** (pins 7, 8, 22 and 23) .

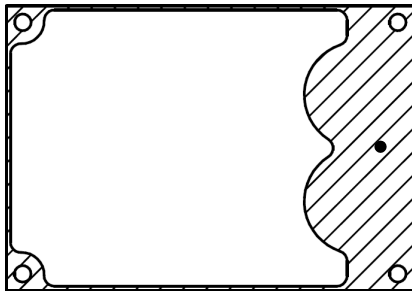
CHASSIS (pin 2)

The **CHASSIS** pin allows additional connection of unit's chassis to system ground.

Outline Drawing



Heat Dissipation Surface Area



Total Surface Area: 1.801 in²
[1162 mm²]

Notes

1. Dimensions are in inches [mm]
2. Tolerance is:
.XX ± 0.01 in
.XXX ± 0.010 in
3. Weight: Approx. TBD oz [TBD g]

Standard Configurations

Part number	Input	Output 1		Output 2		Output 3	
	Voltage range	Voltage	Current	Voltage	Current	Voltage	Current
M8139-100	18 to 48 V _{DC}	5 V _{DC}	6 A	3.3 V _{DC}	2 A	12 V _{DC}	1 A
M8139-101	18 to 48 V _{DC}	12 V _{DC}	3 A	5V _{DC}	2 A	12 V _{DC}	1 A
M8139-102	18 to 48 V _{DC}	5 V _{DC}	5 A	15 V _{DC}	1 A	15 V _{DC}	1 A

Additional standard configurations available. **Consult factory for details.**

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