

M7425 SERIES

DC/DC POWER SUPPLY



PRODUCT HIGHLIGHTS

- **MINIATURE**
- **HIGH DENSITY**
- **SINGLE OUTPUT**
- **DC/DC CONVERTER**
- **UP TO 800W**

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<p>Applications</p> <p>Military (Airborne, ground-fix, shipboard), Ruggedized, Telecom, Industrial</p>											
<p>Special Features</p> <ul style="list-style-type: none"> • Miniature size • High efficiency • Wide input range • Input-to-output isolation • Remote sense compensation • Remote inhibit (ON/OFF) • Fixed switching freq. (250 kHz) • External sync. capability • <u>EMI</u> filters included • Indefinite short circuit protection with auto-recovery • Over-voltage shutdown with auto-recovery • Over temperature shutdown with auto-recovery 											
<p>Electrical Specifications</p> <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top; width: 33%;"> <p><u>DC Input</u> Voltage range: 18 to 48V_{DC} Transient protection: No damage due to surges IAW MIL-STD-1275A (100V for 50ms) MIL-STD-704A (80V for 0.1s)</p> </td> <td style="vertical-align: top; width: 33%;"> <p><u>DC Output</u> Voltage range: 3.3V to 50V_{DC} Current range: up to 50A Power range: 800W Peak power (short period): 1kW</p> </td> <td style="vertical-align: top; width: 33%;"> <p><u>Isolation</u> Input to Output: 200V_{DC} Input to Case: 200V_{DC} Output to Case: 100V_{DC}</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p><u>Output Voltage Regulation</u> Up to ±1% (no load to full load, -55°C to +85°C and over input voltage range).</p> </td> <td style="vertical-align: top;"> <p><u>Efficiency</u> Typical 85% (28V_{DC} output, nominal input voltage, full load, room temperature)</p> </td> <td style="vertical-align: top;"> <p><u>EMC</u> Designed to meet MIL-STD-461C CE03, CE07, CS01, CS02, CS06, RE02, RS02, RS03</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p><u>Ripple and Noise</u> Less than 50mV_{p-p}, typical (max. 1%) without external capacitance. When connected to system capacitance ripple drops significantly.</p> </td> <td style="vertical-align: top;"> <p><u>Transient Over- and Undershoot</u> Output resistance at load change of 50%-100% is 30-120mΩ (depending on output voltage). Output back to steady stated within 300-500μs.</p> </td> <td style="vertical-align: top;"> <p><u>Turn on Transient</u> Voltage overshoot at during power on is less than 3% nominal voltage.</p> </td> </tr> </table>			<p><u>DC Input</u> Voltage range: 18 to 48V_{DC} Transient protection: No damage due to surges IAW MIL-STD-1275A (100V for 50ms) MIL-STD-704A (80V for 0.1s)</p>	<p><u>DC Output</u> Voltage range: 3.3V to 50V_{DC} Current range: up to 50A Power range: 800W Peak power (short period): 1kW</p>	<p><u>Isolation</u> Input to Output: 200V_{DC} Input to Case: 200V_{DC} Output to Case: 100V_{DC}</p>	<p><u>Output Voltage Regulation</u> Up to ±1% (no load to full load, -55°C to +85°C and over input voltage range).</p>	<p><u>Efficiency</u> Typical 85% (28V_{DC} output, nominal input voltage, full load, room temperature)</p>	<p><u>EMC</u> Designed to meet MIL-STD-461C CE03, CE07, CS01, CS02, CS06, RE02, RS02, RS03</p>	<p><u>Ripple and Noise</u> Less than 50mV_{p-p}, typical (max. 1%) without external capacitance. When connected to system capacitance ripple drops significantly.</p>	<p><u>Transient Over- and Undershoot</u> Output resistance at load change of 50%-100% is 30-120mΩ (depending on output voltage). Output back to steady stated within 300-500μs.</p>	<p><u>Turn on Transient</u> Voltage overshoot at during power on is less than 3% nominal voltage.</p>
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Protections *

Input

- **Under Voltage Lock Out**
Unit shuts down when input voltage falls below $16.5V_{DC} \pm 1V_{DC}$
- **Over Voltage Lock Out**
Unit shuts down when input voltage rises above $52V_{DC} \pm 2V_{DC}$

Output

- **Active Over-Voltage Protection**
The converter shuts down if it exceeds $110\% \pm 5\%$ of the nominal voltage.
The converter restarts after a preset period of time if output voltage decreases back to normal value.
- **Passive Over-Voltage Protection**
Load protected by a transorb rated $120\% \pm 10\%$ above nominal output voltage.
- **Overload Protection (Hiccup)**
Continuous protection ($20\% \pm 10\%$ above maximum current) for unlimited time.

General

- **Over Temperature Protection**
The converter shuts down if baseplate temperature exceeds $+105^{\circ}\text{C} \pm 5^{\circ}\text{C}$. The converter automatically recovers when its baseplate temperature falls back below $+95^{\circ}\text{C} \pm 5^{\circ}\text{C}$.

Environmental

Design to Meet MIL-STD-810F

Temperature

Operating: -55°C to $+85^{\circ}\text{C}$
(base plate)
Storage: -55°C to $+125^{\circ}\text{C}$

Altitude

Method 500.4
Procedure I & II,
Up to 70,000 ft. operational

Salt Fog

Method 509-4

Humidity

Method 507.4
Procedure I
Up to 95% RH

Vibration (random)

Method 514.5
Category 4 - General minimum integrity exposure
IAW Figure 514.5C-17
1 hour per axis.

Shock

Method 516.5
Procedure I
30g, 11ms terminal peak saw-tooth.

Reliability

150000 hours, calculated per MIL-STD-217F Notice 2 at $+85^{\circ}\text{C}$ baseplate, Ground Fixed environment.

Environmental Stress Screening (ESS)

Including random vibration and thermal cycles is also available. **Please consult factory for details.**

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

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Pin Assignment

Input connector - J1

Connector type: M24308/24-39F or eq.

Mates with: M24308/2-3F or eq.

Pin No.	Function	P
1	INPUT	+
2	INPUT	+
3	INPUT	+
4	INPUT	+
5	INPUT	+
6	N.C.	
7	INPUT RTN	-
8	INPUT RTN	-
9	INPUT RTN	-

Pin No.	Function	P
10	INPUT RTN	-
11	CHASSIS	
12	INHIBIT	+
13	SIGNAL RTN	-
14	INPUT	+
15	INPUT	+
16	INPUT	+
17	INPUT	+
18	N.C.	

Pin No.	Function	P
19	INPUT RTN	-
20	INPUT RTN	-
21	INPUT RTN	-
22	INPUT RTN	-
23	INPUT RTN	-
24	N.C.	
25	SYNC	+

Output connector – J2

Connector type: M24308/23-39F or eq.

Mates with: M24308/4-3F or eq.

Pin No.	Function	P
1	SENSE	+
2	OUTPUT	+
3	OUTPUT	+
4	OUTPUT	+
5	OUTPUT	+
6	OUTPUT	+
7	N.C.	
8	OUTPUT RTN	-
9	OUTPUT RTN	-

Pin No.	Function	P
10	OUTPUT RTN	-
11	OUTPUT RTN	-
12	OUTPUT RTN	-
13	SENSE RTN	-
14	OUTPUT	+
15	OUTPUT	+
16	OUTPUT	+
17	OUTPUT	+
18	OUTPUT	+

Pin No.	Function	P
19	N.C.	
20	N.C.	
21	OUTPUT RTN	-
22	OUTPUT RTN	-
23	OUTPUT RTN	-
24	OUTPUT RTN	-
25	OUTPUT RTN	-

NOTE: All pins with identical function/designation should be connected together for best performance.

Functions and Signals

INHIBIT

Description: Inhibits output.

Use: Apply short circuit or TTL "LOW" to inhibit selected output.

Leave open or apply TTL "HIGH" to enable all outputs.

Referenced to: SIGNAL RTN

SYNC

Description: Synchronizes internal switching frequency to system clock. Use: Apply TTL level, 250 kHz \pm 10 kHz, 50% duty-cycle clock.

Leave open if unused. In this case, the switching frequency will be set by the internal clock.

Referenced to: SIGNAL RTN

SIGNAL RTN

Description: Signals return reference.

Referenced to: Connected by a 100 Ω resistor to INPUT RTN

SENSE

Description: Used to achieve accurate voltage regulation at load terminals, to compensate for voltage drop across the leads connecting the converter to the load, between 2% to 10%.

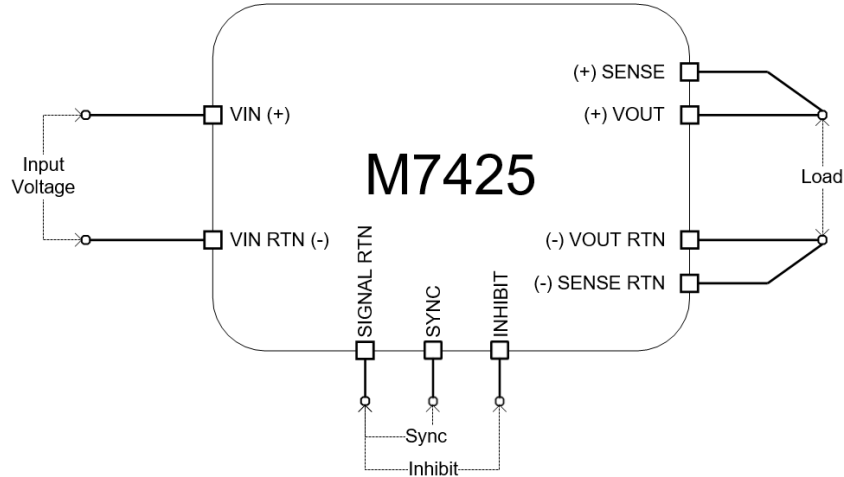
Use: Connect SENSE line directly to the load's positive terminal, and SENSE RTN directly to the load's negative terminal.

If not used, connect SENSE to OUTPUT and SENSE RTN to OUTPUT RTN. Do not leave open!

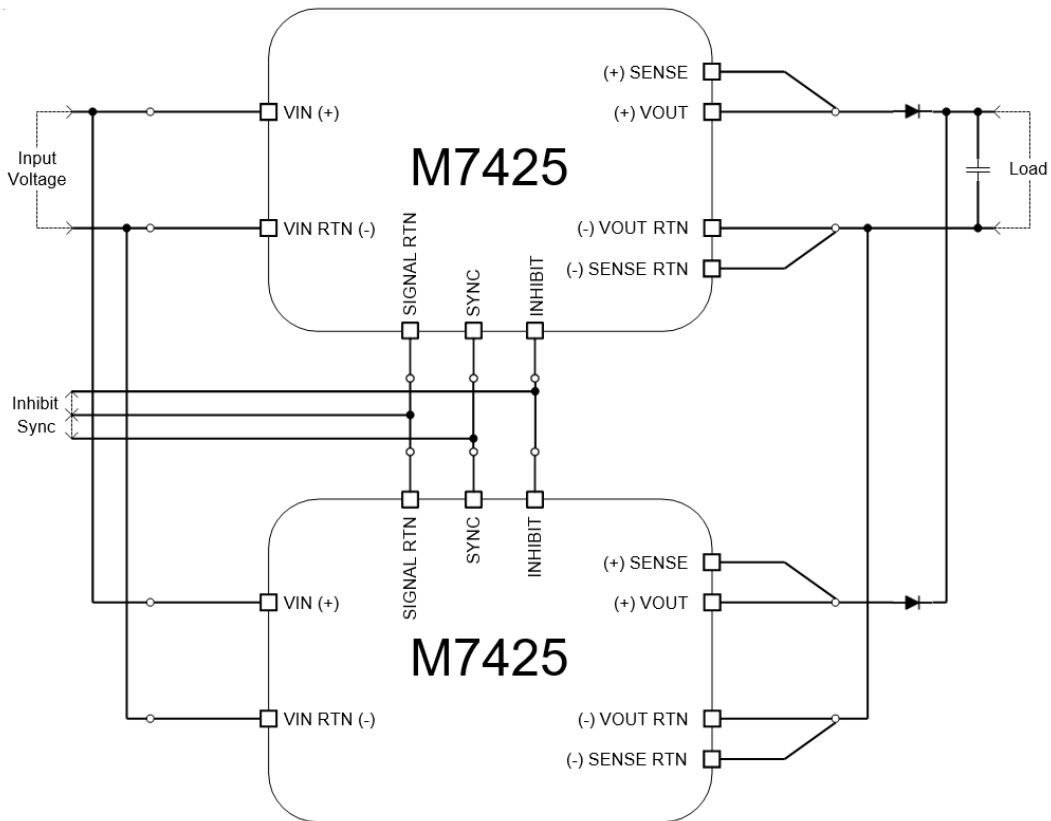
Referenced to: SENSE RTN

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Typical Connection

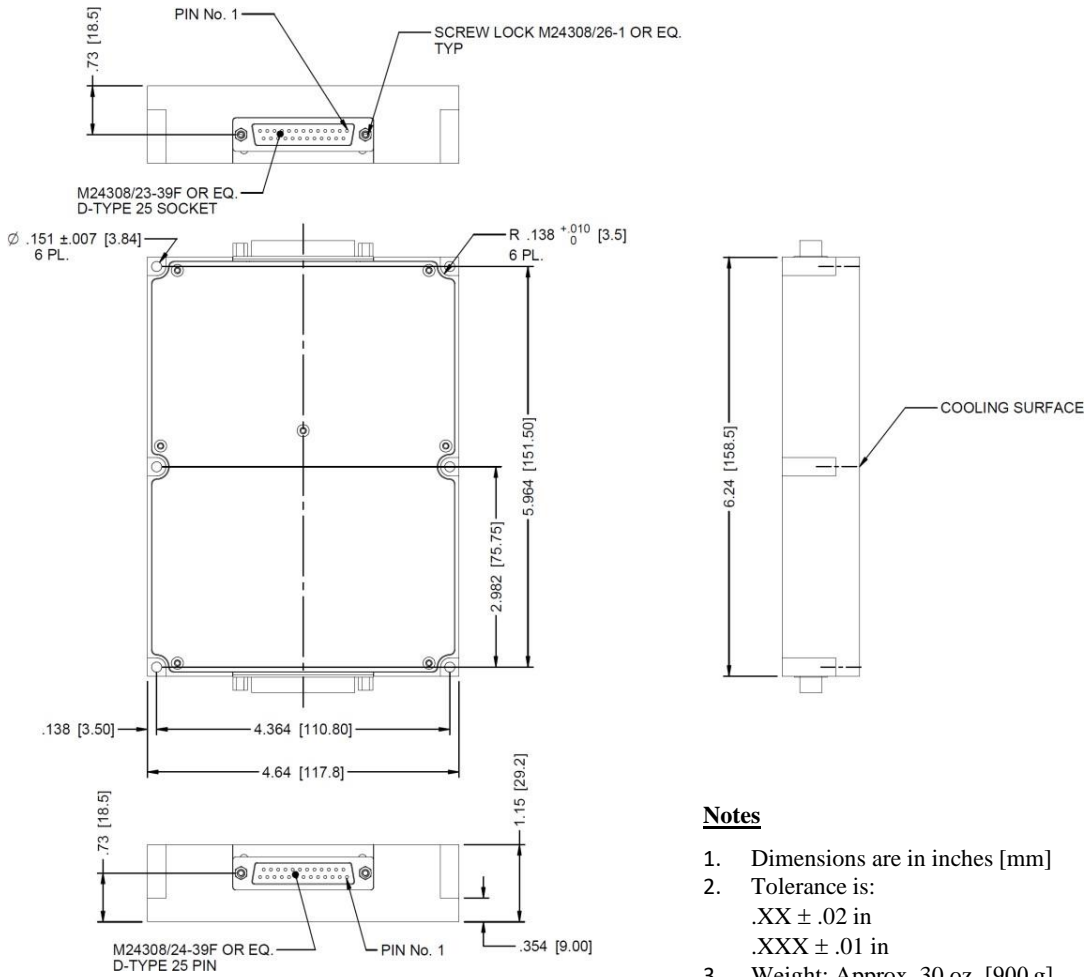


Redundant Connection Diagram



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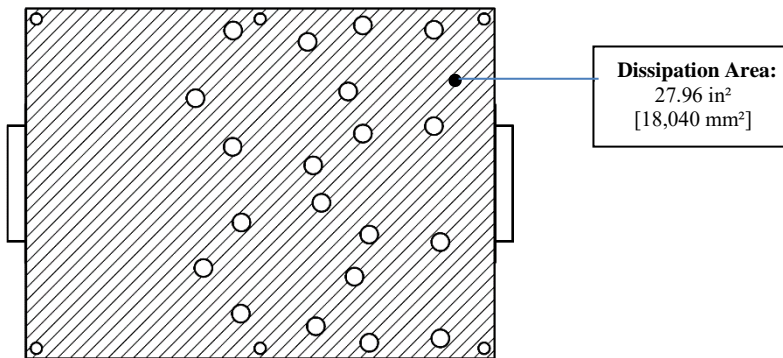
Outline Drawing



Notes

1. Dimensions are in inches [mm]
2. Tolerance is:
.XX ± .02 in
.XXX ± .01 in
3. Weight: Approx. 30 oz. [900 g]

Heat Dissipation Surface



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