M7029 SERIES

DC/DC POWER SUPPLY

PRODUCT HIGHLIGHTS

- **MINIATURE**
- **HIGH DENSITY**
- **SINGLE OUTPUT**
- **DC/DC POWER SUPPLY**
- **UP TO 300 W**

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Applications

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

Special Features

- Miniature size
- High efficiency
- Wide input range
- Remote sense
- Remote inhibit
- Input / Output isolation
- High Density – up to 36 W/in³
- Fixed switching freq. (250 kHz)
- External sync. capability
- EMI filters included
- Indefinite short circuit and current limit protection with auto-recovery
- Over-voltage shutdown with auto-recovery
- Over temperature shutdown with auto-recovery

*Electrical Specifications**

DC Input

Input range†: 18 to 48 V_{DC}

No damage for:

100 V for 50 ms (IAW MIL-STD-1275A)

80 V for 0.1 s (IAW MIL-STD-704A)

DC Output

Voltage range: 3.3 V_{DC} to 50 V_{DC}

Current range: 0 to 20 A

Power range: 0 to 300 W

Isolation

Input to Output: 200 V_{DC}

Input to Case: 200 V_{DC}

Output to Case: 100 V_{DC}

Line/Load/Temp regulation

Up to ±1%

(no load to full load, –55 °C to +85 °C and over input voltage range).

Efficiency

88% - 90% typical (full load, room temperature)

83% - 86% for extended input range

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. 100 mV) without external capacitance. When connected to system capacitance ripple drops significantly.

Transient Over-and-undershoot

Load transient at a rate of up to 0.5 A/µs

Range	Excursion	Settling time
50-100%	~ 1%	< 20 µs
10-100%	< 2.5%	< 100 µs

Turn on Transient

Output ramps up without overshooting during power on.

* Unless stated otherwise, all measurements specified here were taken from a 28V/10.7A output variant, at nominal line voltage and room ambient temperature.

† Standard version complies with various standards: MIL-STD-704B-F, MIL-STD-1275A-D, RTCA/DO-160G Section 16.0 Category A and more.
Extended range version (12 to 100V_{DC} operation) available for compliance with even more standards: MIL-STD-704A (exc. 8V sag), MIL-STD-1275E, RTCA/DO-160G Section 16.0, Categories B & Z, DEF STAN 61-5 Part 6 Issue 5, BS EN2282.

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

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*Protections**

Input

- **Input Reverse Polarity** Protection for unlimited time, up to -48 V_{DC}.
- **Under-Voltage Lock-Out** Unit shuts down if input voltage falls below 14 V ± 1 V, and turns back on at 16 V ± 1 V.
- **Over-Voltage Lock-Out** Unit shuts down if input voltage rises above 54 V ± 2 V, and turns back on at 50 V ± 2 V. Extended versions available for compliance with various standards.

Output

- **Active Overvoltage Protection** Secondary independent control, fed directly from the output, is set to override the primary control in case of control loss, and keeps output voltage at 110% ± 5% of nominal.
- **Passive Overvoltage Protection** Transorb placed across the output, selected at 120% ± 10% of nominal voltage.
- **Current limiting** Continuous protection (10-30% above maximum current) for unlimited time (Hiccup).

General

- **Over Temperature Protection:** Unit shuts down if baseplate temperature rises above +105 °C ± 5 °C. Unit recovers automatically when baseplate temperature falls below +95 °C ± 5 °C.

Environmental Conditions

Designed to meet MIL-STD-810G

Temperature

Method 501.5 Procedures I & II
Method 502.5 Procedures I & II
Operating: –55 °C to +85 °C (baseplate)
Storage: –55 °C to +125 °C (ambient)

Altitude

Method 500.5
Procedures I & II
Up to 70000 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.

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

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

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

Pin No.	Function
1	VIN (+)
2	VIN (+)
3	VIN (+)
4	VIN RTN (–)
5	VIN RTN (–)
6	SIGNAL RTN
7	INHIBIT
8	VOUT (+)
9	VOUT (+)

Pin No.	Function
10	VOUT RTN (–)
11	VOUT RTN (–)
12	VOUT RTN (–)
13	SENSE (+)
14	VIN (+)
15	VIN (+)
16	VIN RTN (–)
17	VIN RTN (–)
18	VIN RTN (–)

Pin No.	Function
19	SYNC
20	VOUT (+)
21	VOUT (+)
22	VOUT (+)
23	VOUT RTN (–)
24	VOUT RTN (–)
25	SENSE RTN (–)

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" or short– will turn off the power supply.
(Optional to change the logic of this signal. Please consult with factory.)

SYNC signal

The ***SYNC*** signal is used to allow the power supply frequency to sync with the system frequency.
The system frequency should be 250 kHz ± 10 kHz.
When not connected the power supply will work at 250 kHz ± 10 kHz.

SIGNAL RTN

The ***SIGNAL RTN*** is used as a return path for ***SYNC*** and ***INHIBIT*** signals. This pin is referenced to ***VIN RTN***.

SENSE

The ***SENSE*** is used to achieve accurate load regulation at load terminals. This is done by connecting the pins directly to the load terminals.
The remote sense correction function is limited to voltage drop between converter's output and load terminals of 2% to 5%, or up to 0.5V, the least of the two.
When not used, connect ***SENSE*** to ***VOUT*** and ***SENSE RTN*** to ***VOUT RTN.***
Do not leave ***SENSE*** and ***SENSE RTN*** pins unconnected. These pins can be tied internally to avoid external connection, if function is not required – *consult factory.*

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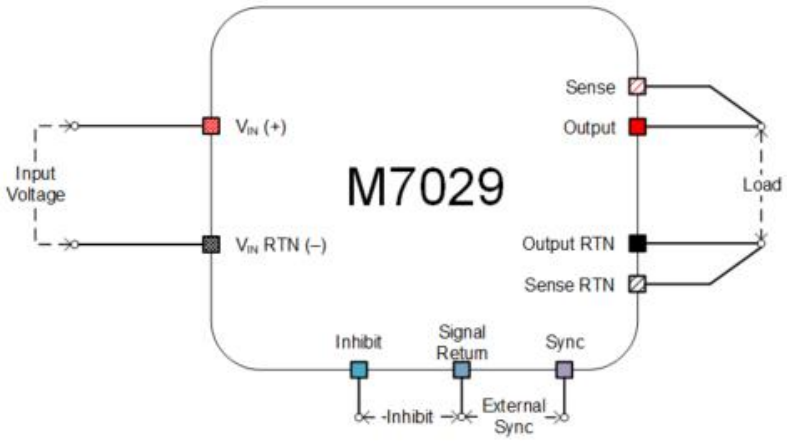
Typical Connection Diagram



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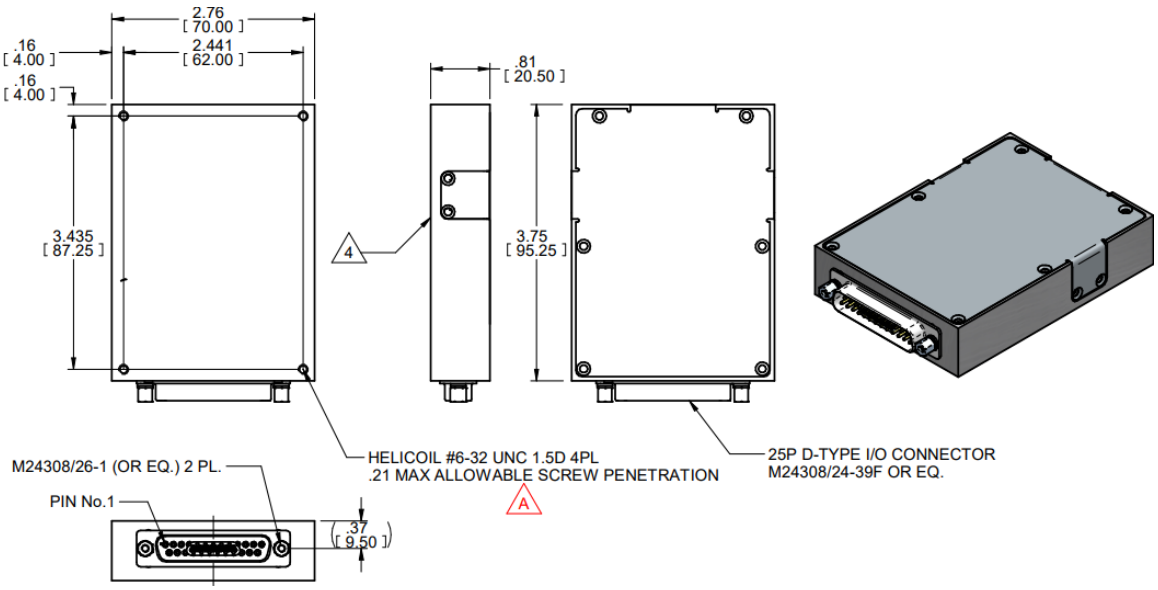
Outline Drawing

For detailed dimensions and tolerances see Drawing: M7029001



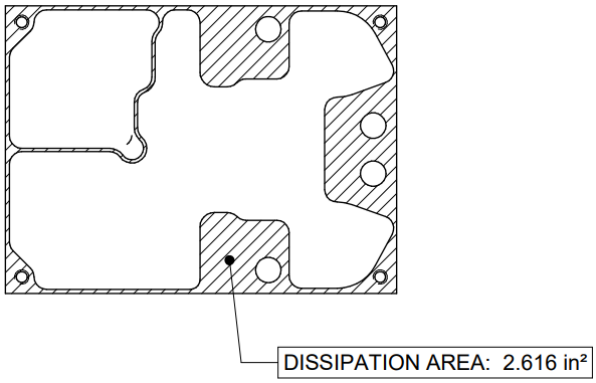
NOTES :

1. WORKMANSHIP SHALL BE MIL-STD-454, REQT. 9
2. DRILL, TAP & COUNTERSINK PER MS 33537
3. CONVERSION COATING PER MIL -C-5541 CL 1A
4. DISSIPATION AREA: 2.616 in² [1690 mm²]
5. MTL: AL 6061 T651 / AL 5052 H32

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCH [MM]
TOLERANCES ARE:

DECIMALS	ANGLES
.XX ± .01	± 1
.XXX± .005	

DO NOT SCALE DRAWING



Heat Dissipation Surface

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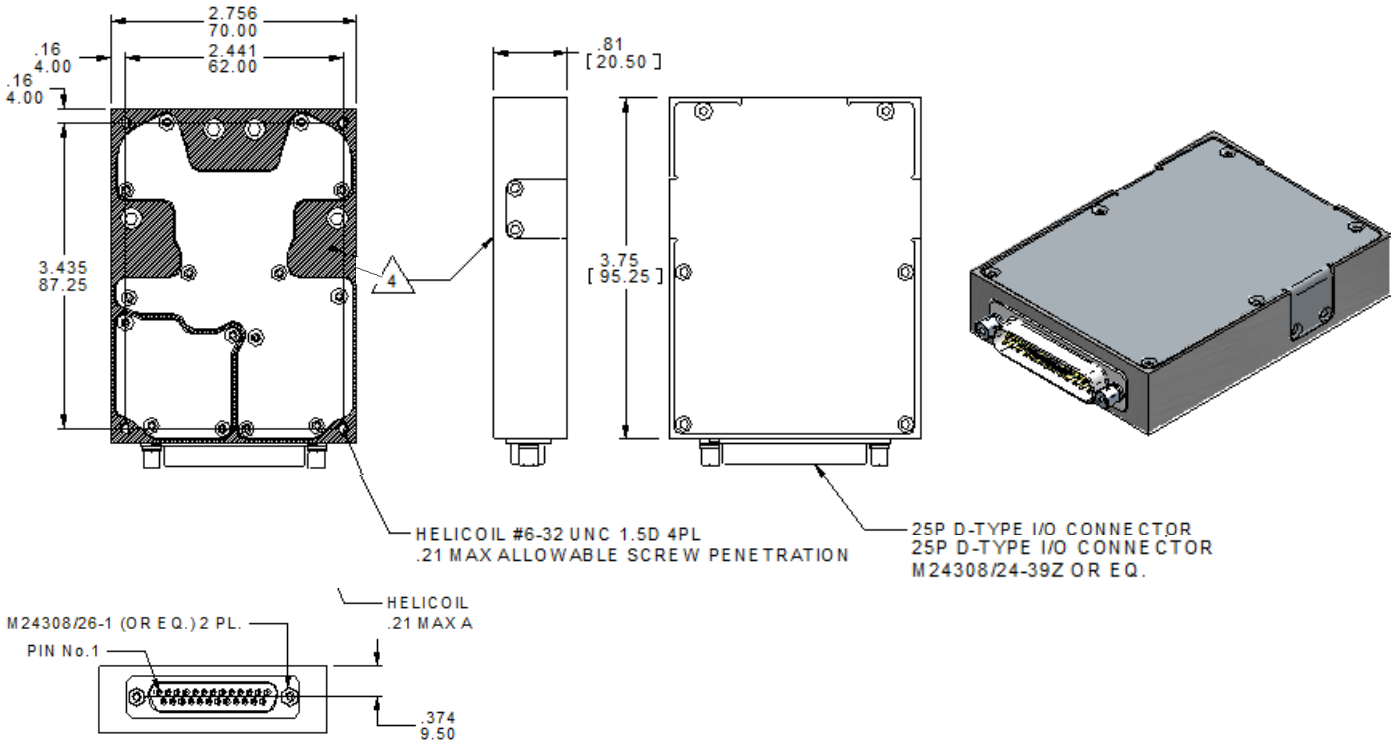
Outline Drawing for REACH complaint units

For detailed dimensions and tolerances see Drawing: M7029801



NOTES:

1. WORKMANSHIP SHALL BE MIL-STD-454, REQT. 9
2. DRILL, TAP & COUNTERSINK PER MS 33537
3. CONVERSION COATING PER MIL-DTL-5541 LAST REV., TYPE II, CLASS IA, CLEAR
4. DISSIPATION AREA: 2.616 in² [1690 mm²]
5. MTL: AL 6061 T651 / AL 5052 H32

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Standard Configurations

Part Number	Input	Output		Special features
	Voltage range	Voltage	Current	
M7029-100	18 to 48 V_{DC}	5 V_{DC}	20 A	
M7029-101	18 to 48 V_{DC}	12 V_{DC}	20 A	
M7029-102	18 to 48 V_{DC}	15 V_{DC}	20 A	
M7029-103	18 to 48 V_{DC}	24 V_{DC}	12.5 A	
M7029-104	18 to 48 V_{DC}	28 V_{DC}	10.7 A	
M7029-105	18 to 48 V_{DC}	48 V_{DC}	6.2 A	
M7029-800	18 to 48 V_{DC}	5 V_{DC}	20 A	*This Product is REACH Compliant *The aluminum parts comprising this converter are chromate conversion coated per MIL-DTL-5541F, Type II CLASS 1A or eq. *Connector type: M24308/24-39Z or eq
M7029-801	18 to 48 V_{DC}	12 V_{DC}	20 A	
M7029-802	18 to 48 V_{DC}	15 V_{DC}	20 A	
M7029-803	18 to 48 V_{DC}	24 V_{DC}	12.5 A	
M7029-804	18 to 48 V_{DC}	28 V_{DC}	10.7 A	
M7029-805	18 to 48 V_{DC}	48 V_{DC}	6.2 A	

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

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