

M7029 SERIES

MINIATURE, HIGH DENSITY,
SINGLE OUTPUT
DC / DC CONVERTER
UP TO 300W



PRELIMINARY

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 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:
100V for 50ms (IAW MIL-STD-1275A)
80V for 0.1 Sec (IAW MIL-STD-704A)

DC Output

Output range: 3.3V to 50V
Output current: max 20A
Output power: 300W

Isolation

200V between Input and Output
200V between Input and Case
100V between Output and Case

Line/Load/Temp regulation

Better than ±1%
(Low line to high line, no load to full load, -55°C to +85°C).

Efficiency

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

83% - 86% for extended input range

EMC

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

Ripple and Noise

Less than 50mV_{p-p}, typical (max. 100mV) without external capacitance. When connected to system capacitance ripple drops significantly.

Load Transient Overshoot and undershoot

Output change at load transient of 30%-100% with T_r & T_f of max 30μs is 5% of output voltage. Output recover to steady stated within less 0.5ms.

Turn on Transient

Output ramps up without overshooting during power on.

* Standard version complies with various standards: MIL-STD-704B-F, MIL-STD-1275A-D, RTCA/DO-160G category A and more.
Extended range version (12 to 100V_{DC} operation) available for compliance with even more standards: MIL-STD-704A, MIL-STD-1275E, RTCA/DO-160G all categories, DEF STAN 61-5 Part 6 Issue 5, BS EN2282.

Protections*

Input

- **Input Reverse Polarity**
Protection for unlimited time, up to $-48V_{DC}$.
- **Under-Voltage Lock-Out**
Unit shuts down if input voltage falls below $15V \pm 1V$. Unit turns back on at $17V \pm 1V$. Min. hysteresis is 3V.
- **Over-Voltage Lock-Out**
Unit shuts down if input voltage rises above $54V_{DC} \pm 2V$. Extended versions available for compliance with various standards.

Output

- **Active Over-Voltage 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 $110\% \pm 5\%$ of nominal.
- **Passive Over-Voltage Protection**
Transorb placed across the output, selected at $120\% \pm 10\%$ 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 $+105^{\circ}C \pm 5^{\circ}C$. Unit recovers automatically when baseplate temperature falls below $+95^{\circ}C \pm 5^{\circ}C$.

Environmental

Designed to meet MIL-STD-810G

Temperature

Method 501.5 Procedures I & II, and Method 502.5 Procedures I & II.
Operating: $-55^{\circ}C$ to $+85^{\circ}C$ (baseplate)
Storage: $-55^{\circ}C$ to $+125^{\circ}C$ (ambient)

Altitude

Method 500.5, Procedures I & II, 70,000 ft. Operational

Salt Fog:

Method 509.5

Humidity

Method 507.5 - Up to 95%.

Vibration and Shock

Shock: Saw-tooth, 30g peak, 11mS.
Vibration: Method 514.6, General minimum integrity exposure, 1 hour per axis (Figure 514.6E-1).

Reliability

150,000 hours, calculated per MIL-STD-217F Notice 2, at $+85^{\circ}C$ 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

Pin Assignment

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

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

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	VIN (+)	10	VOUT RTN (-)	19	SYNC
2	VIN (+)	11	VOUT RTN (-)	20	VOUT (+)
3	VIN (+)	12	VOUT RTN (-)	21	VOUT (+)
4	VIN RTN (-)	13	SENSE (+)	22	VOUT (+)
5	VIN RTN (-)	14	VIN (+)	23	VOUT RTN (-)
6	SIGNAL RTN	15	VIN (+)	24	VOUT RTN (-)
7	INHIBIT	16	VIN RTN (-)	25	SENSE RTN (-)
8	VOUT (+)	17	VIN RTN (-)		
9	VOUT (+)	18	VIN 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.

SYNC signal

The SYNC IN signal is used to allow the power supply frequency to sync with the system frequency.

The system frequency should be 250 kHz \pm 10 kHz.

When not connected the power supply will work at 250 kHz

SIGNAL RTN

The INPUT SIGNAL RTN is referred to the input.

This pin is used as a return path for SYNC and INHIBIT signals.

SENSE

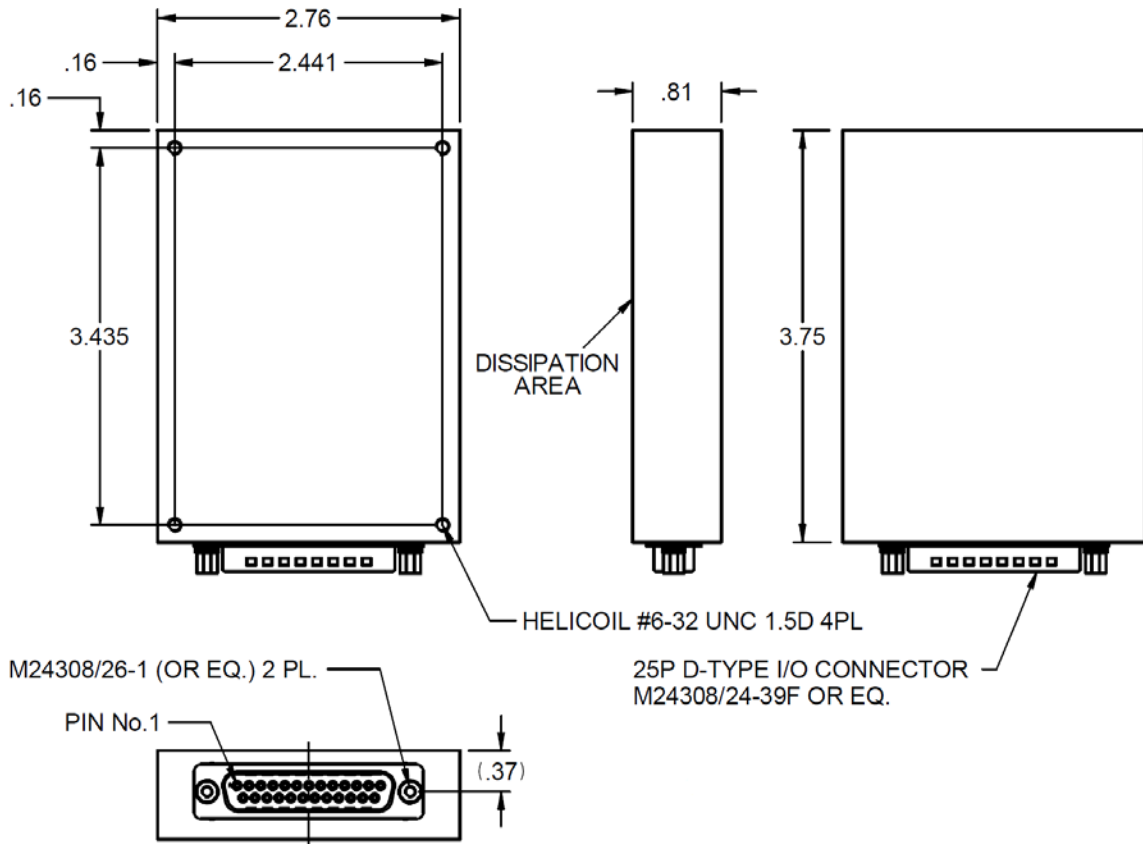
The SENSE is used to achieve accurate load regulation at load terminals. This is done by connecting the pins directly to the load terminals.

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.

These pins can be tied internally if not required, to avoid adding this external connection.

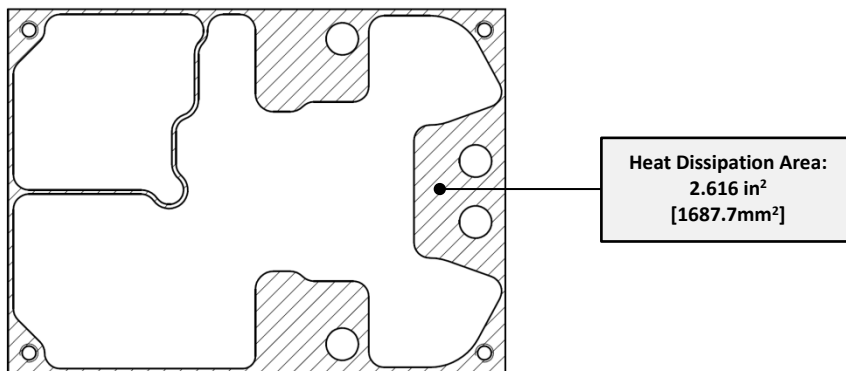
Outline Drawing



Notes

1. Dimensions are in Inches [mm]
2. Tolerance is:
.XX ±0.01 IN
.XXX ±0.005 IN
3. Expected weight: 10.6 oz (300g)
4. 3D model available

Heat Dissipation Surface



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