

M7221 SERIES

MINIATURE, HIGH DENSITY, HIGH
EFFICIENCY, SINGLE OUTPUT,
DC/DC CONVERTERS
(UP TO 300W)



Applications

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

Special Features

- Miniature size
- High efficiency
- Wide input range
- Input / Output isolation
- Remote sense
- Parallel connection of modules
- Redundancy connection
- Fixed switching frequency (250 KHz)
- External synchronization capability
- TTL logic enable
- EMI/RFI filters included
- Output voltage adjustment with external resistor
- Indefinite short circuit protection with auto-recovery
- Over-voltage shutdown with auto-recovery
- Over temperature shutdown with auto-recovery

Electrical Specifications

DC Input:

DC Input range: 18 to 48 V_{DC}, per MIL-STD-704E.
No damage for:
MIL-STD-1275A (100V for 50mSec)
MIL-STD-704A (80V for 0.1 Sec)

Line/Load regulation:

Less than 1% (no load to full load, -55°C to +90°C).

Ripple and Noise:

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

DC Output:

Output range – 3.3V to 15V
Output current – max 60A.

Efficiency:

Typical 75-85% - (full load, room temperature)

Load Transient Overshoot and undershoot

Output resistance at load change of 50%-100% is 30-120 mΩ (depending on output voltage). Output back to steady stated within 300-500μSec

Isolation:

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

EMI/RFI:

Design to meet or exceed MIL-STD-461C CE03, CE07, CS01, CS02, CS06, RE02, RS02, RS03

Turn on Transient

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

Protections *

Input

- **Inrush Current Limiter** – peak value of 5 x I_{in} for less than 50μSec.
- **Under voltage protection** – unit protects itself (no damage) below 16.5V_{dc}.
- **Over voltage protection** – unit protects itself (no damage) above 52V_{dc}

Output

- **Electronic over voltage protection** – Internal control protects unit (no damage) 10% above nominal voltage.
- **Passive tranzorb on outputs** – 20% above nominal voltage.
- **Current limiting** – Continuous protection (10-30% above maximum current) for unlimited time (Hiccup).

General

- **Over temperature protection:** Shutdown at base plate temperature of +105°C (±5°C) Automatic recovery at base plate temperature lower than +95°C (±5°C)

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

Environmental

Design to Meet MIL-STD-810D

Temperature:

Operating: -55°C to +90°C
(base plate)

Storage: -55°C to +125°C

Humidity:

Method 507.4 - Up to 95%.

Altitude:

Method 500.4, Procedure I & II, 40,000
ft. and 70,000 ft. Operational

Vibration and Shock:

Shock - Saw-tooth, 20g peak, 11mS.

Vibration - Figure 514.5C-17. General
minimum integrity exposure. (1 hour per
axis.)

Salt Fog:

Method 509-4

Reliability

100,000 hours, calculated per
MIL-STD-217F 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.**

Pin Assignment

Pin No.	Pin Function	Pin No.	Pin Function	Pin No.	Pin Function	Pin No.	Pin Function
1	SIG OUT RTN**	14	-VIN	27	-VOUT	40	+VOUT
2	PAR IN	15	+VIN	28	-VOUT	41	-VOUT
3	PAR OUT	16	+VIN	29	-VIN	42	-VOUT
4	OUT VCAL	17	SYN OUT	30	-VIN	43	-VOUT
5	+VOUT	18	+VOUT	31	+VIN	44	-VOUT
6	+VOUT	19	+VOUT	32	+VIN	45	-VIN
7	-VOUT	20	+VOUT	33	SYN IN	46	-VIN
8	-VOUT	21	+VOUT	34	-SENSE	47	+VIN
9	-VOUT	22	+VOUT	35	+VOUT	48	+VIN
10	-VOUT	23	+VOUT	36	+VOUT	49	INHIBIT
11	-VOUT	24	-VOUT	37	+VOUT	50	SIG IN RTN**
12	+SENSE	25	-VOUT	38	+VOUT		
13	-VIN	26	-VOUT	39	+VOUT		

* Reference ground for INHIBIT, SYN IN and SYN OUT

** Reference ground for PAR IN, PAR OUT and OUT VCAL.

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" – will turn off the power supply.

Ground reference for the INHIBIT signal is SIGNAL IN RTN (pin #50).

SENSE

The SENSE is used to achieve accurate load regulations at load terminals (this is done by connecting the pins directly to the load's terminals).

The use of remote sense has a limit of voltage dropout between converter's output and load terminals of 2-10% of voltage output.

When not used connect +SENSE to +OUT and -SENSE to -OUT.

SYNC IN signal

The SYNC IN signal is used to allow the power supply frequency to sync with the system frequency. The system frequency should be 250KHz \pm 10KHz.

When not connected the power supply will work at 250KHz.

SYNC OUT signal

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

SIGNAL IN RTN

The SIGNAL IN RTN is addressed as INPUT ground.

This Pin is used as grounding for SYNC OUT, SYNC IN and INHIBIT signals.

PAR IN signal

The PAR IN signal is used to connect the power supply in parallel to another power supply and have them working together.

The PAR OUT signal from another power supply is connected to this pin.

PAR OUT signal

The PAR OUT signal is used to connect the power supply in parallel to another power supply and have them working together.

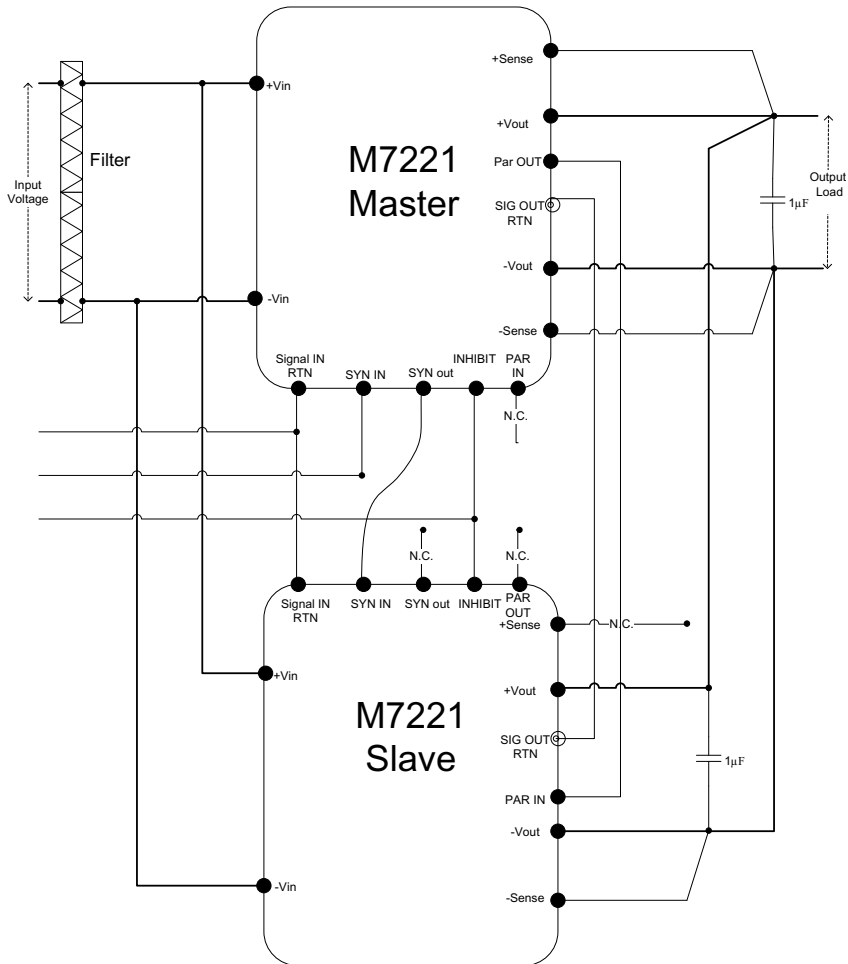
OUT V/CAL signal

The OUT V/CAL signal is used to control and adjust the output power of the power supply within the given tolerances.

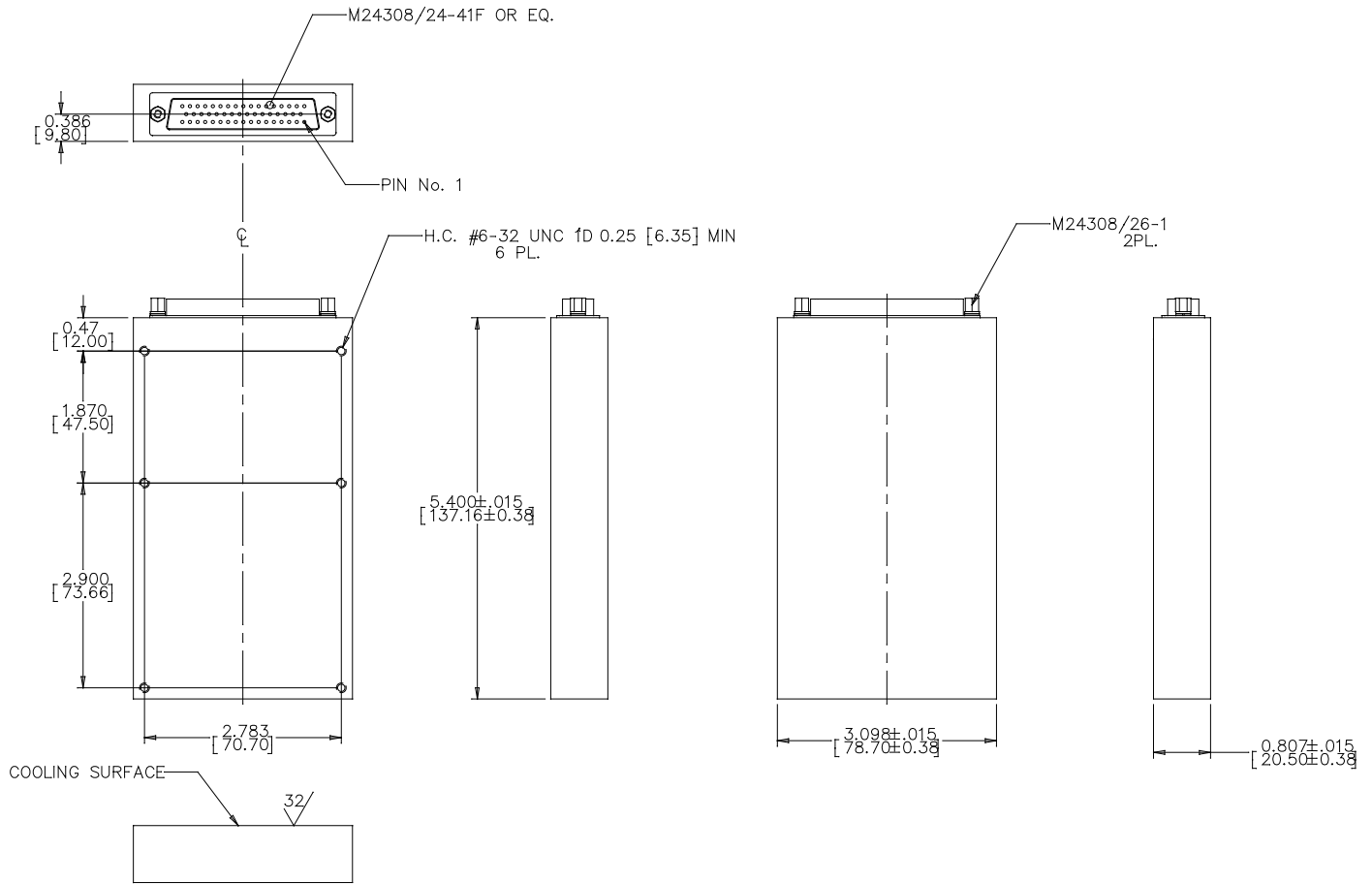
SIGNAL OUT RTN

This pin is used as grounding for PAR IN, PAR OUT and OUT V/CAL signals.

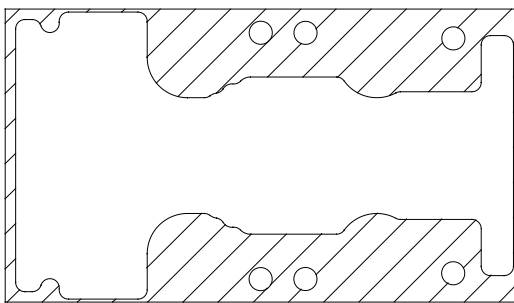
Parallel connection



Outline Drawing



Heat Dissipation Surface



4136 ± 0.25 mm

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

Notes

1. Dimensions are in Inches [mm]
2. Tolerance is:
.XX ± 0.02 IN
.XXX ± 0.01 IN
3. Weight: Approx. 355gr (12.35 Oz)