Amphenol
MILITARY HIGH SPEED

M7228 SERIES
DC/DC POWER SUPPLY

DESCRIPTION

The M7228 military power supply is a rugged DC to DC converter which accepts an 18 - 48VDC input voltage range and provides a single DC output from 2 to 15V at up to 200W. Custom outputs available upon request and the unit is Designed to meet military standards, MIL-STD-704, MIL-STD-1275, MIL-STD-810, MIL-STD-461.

FEATURES

- Miniature size
- High efficiency
- Wide input range
- Input / Output isolation
- Remote sense
- External On/Off Inhibit
- Parallel connection with current share
- Redundancy connection
- Fixed switching frequency (250 kHz)
- External synchronization capability
- EMI/RFI filters included
- External output modification
- Indefinite short circuit protection with auto-recovery
- Over-voltage shutdown with auto-recovery

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HOW TO ORDER

PART NUMBER	CF-	DC/DC POWER SUPPLY

ELECTRICAL SPECIFICATIONS

DC Input range: 18 to 48 VDC, per MIL-STD-704E.	**DC Output:** Output range – 2V to 15V Output current – max 50A
No damage for: MIL-STD-1275A (100V for 50mSec) MIL-STD-704A (80V for 0.1 Sec)	**Efficiency:** Typical 80-88% - (full load, room temperature)
Line/Load regulation: Less than 1% (no load to full load, –55°C to +85°C).	**Load Transient Overshoot and undershoot:** Output resistance at load change of 50%-100% is 30-70 mΩ (depending on output voltage). Output back to steady stated within 300-500µSec
Ripple and Noise: Less than 50mVp-p, typical (max. 1%) without external capacitance. When connected to system capacitance ripple drops significantly.	**Isolation:** 200V between Input and Output 200V between Input and Case 100V between Output and Case
EMI/RFI: Design to meet* MIL-STD-461F CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102,	**Turn on Transient:** No voltage over shoot during power on.

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PROTECTIONS

INPUT	OUTPUT	GENERAL
Inrush Current Limiter: peak value of 5 x Iin for less than 50µSec.	**Electronic over voltage protection:** Internal control protects unit (no damage) 10% above nominal voltage.	**Over temperature protection:** Shutdown at base plate temperature of +105C (±5°C) Automatic recovery at base plate temperature lower than +95°C (±5°C)
Under voltage protection: unit protects itself (no damage) below 16.5Vdc.	**Passive transorb on ouputs:** 20% above nominal voltage.	
Over voltage protection: unit protects itself (no damage) above 52Vdc	**Current limiting:** Continuous protection (10-30% above maximum current) for unlimited time (Hiccup).	

ENVIRONMENTAL (Meets or exceeds MIL-STD-810D)

Temperature: Operating –55°C to +85°C (baseplate) Storage –55°C to +125°C	**Reliability:** 150,000 hours, calculated per MIL-STD-217F at +85°C baseplate, ground fixed.
Humidity: Method 507.4 - Up to 95%.	**Altitude:** Method 500.4, Procedure I & II, 40,000 ft. and 70,000 ft. Operational
Salt Fog: Method 509-4	**Vibration and Shock:** Shock - Saw-tooth, 20g peak, 11mS. Vibration - Figure 514.5C-17. General minimum integrity exposure. (1 hour per axis)

PIN ASSIGNMENTS

Pin No.	Pin Function
1	PAR OUT
2	-SIGNAL OUT RTN
3	-SENSE
4	- OUT
5	- OUT
6	-OUT
7	- OUT
8	-OUT
9	+OUT
10	+OUT

Pin No.	Pin Function
11	+OUT
12	+OUT
13	+OUT
14	SYN IN
15	SYN OUT
16	-SIGNAL IN RTN
17	+VIN
18	- VIN
19	- VIN
20	VCAL OUT

Pin No.	Pin Function
21	PAR IN
22	- OUT
23	-OUT
24	- OUT
25	- OUT
26	- OUT
27	+OUT
28	+OUT
29	+OUT
30	+OUT

Pin No.	Pin Function
31	+OUT
32	NC.
33	+SENSE
34	INHIBIT
35	+VIN
36	+VIN
37	- VIN

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.

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.

SYN IN signal

The SYN IN signal is used to allow the power supply frequency to sync with the system frequency. The system frequency should be 250Khz ±10Khz TTL level.
When not connected the power supply will work at 250kHZ.

SYN OUT signal

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

PAR IN signal

The PAR IN signal is used to connect the power supply in parallel to other power supplies and have them divide
equally the power between one another. All the power supplies should connect PAR IN signals together except the
master unit where the PAR OUT signal connects to all the PAR IN signals.

PAR OUT signal

The PAR OUT signal is used to connect the power supply in parallel to other power supplies and have them divide equally the power between one another. The master unit connects the PAR OUT signals to all PAR IN pins of the slave units.

SIGNAL IN RTN

The –SIGNAL IN is referred to the input ground.
This Pin is used as grounding for INHIBIT, SYN IN, SYN OUT signals.

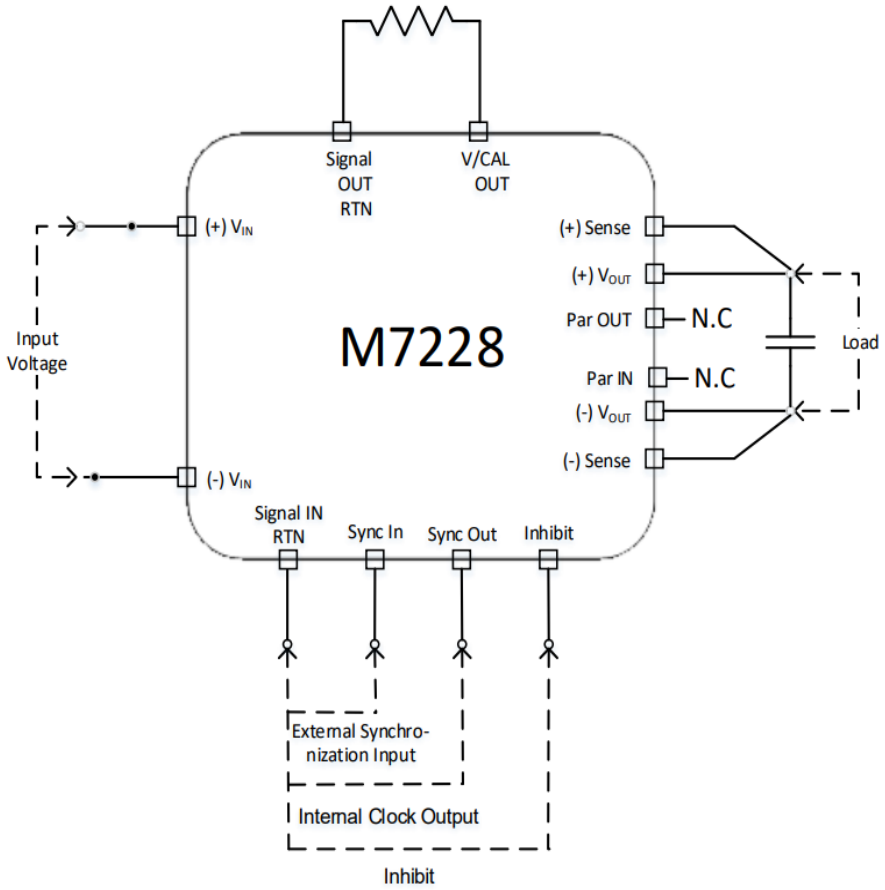
SIGNAL OUT RTN

The –OUT SIGNAL is referred to the output ground.
This Pin is used as grounding for PAR IN, PAR OUT and V/CAL OUT signal.

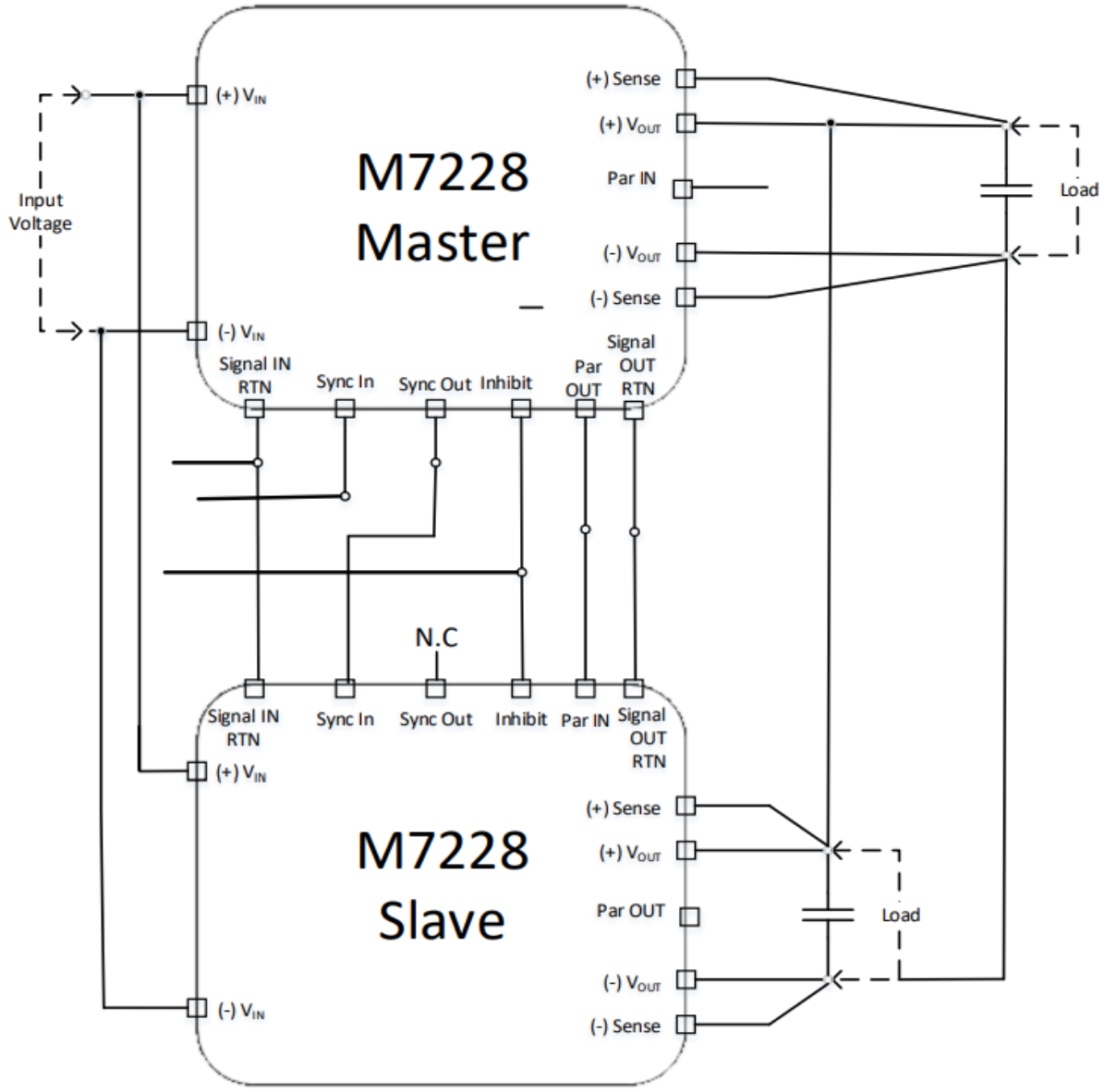
V/CAL OUT

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

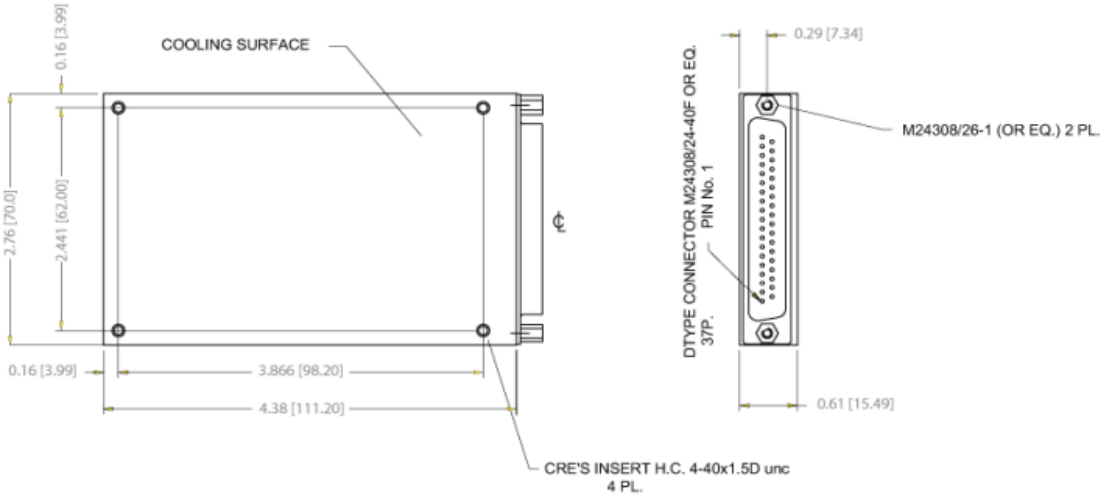
TYPICAL CONNECTION



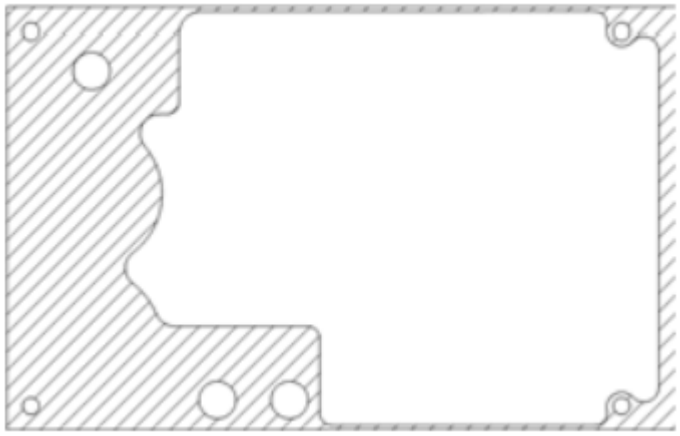
PARALLEL CONNECTION WITH CURRENT



OUTLINE DRAWING



HEAT DISSIPATION SURFACE



Dissipation Area
3.876 in²
(2501mm²)

Notes
1. Dimensions are in Inches [mm]
2. Tolerance is:
.XX ±.02 IN
.XXX ±.01 IN
3. Weight: Approx. 265g (9.2 oz)
4. Mounting holes can be modified – please consult factory.
5. Parasolid 3D module is available for download on site.

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