M6500 SERIES

DC/DC POWER SUPPLY



PRODUCT HIGHLIGHTS

- MINIATURE
- HIGH DENSITY
- HIGH EFFICIENCY
- SINGLE OUTPUT
- DC/DC POWER SUPPLY
- UP TO 500 W

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Amphenol
MILITARY HIGH SPEED

M6500 SERIES DC/DC POWER SUPPLY

Applications

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

Special Features

- Miniature size
- High efficiency
- Wide input range
- Input / Output isolation
- Remote sense
- External On/Off Inhibit
- Zero Voltage Switching Technology
- Fixed switching frequency (250 kHz)
- External synchronization capability
- EMI filters included
- Optional parallel connection
- Indefinite short circuit protection with auto-recovery
- Over-voltage shutdown with auto-recovery
- Over temperature shutdown with auto-recovery

Electrical Specifications

DC Input:

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

DC Output:

Output range – 3.3V to 28V
Output current – max 70A
Output power – max 500W

***Isolation*:**

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

Line/Load regulation:

Less than 1% (no load to full load, –55°C to +85°C).

Efficiency:

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

EMC:

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

Ripple and Noise:

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

Load Transient Overshoot and undershoot

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

Turn on Transient

No Voltage over shoot during power on.

‡ EMC compliance achieved when tested with 5 µH LISNs, shielded harness and static resistive load.

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Protections *

Input

- **Inrush Current Limiter** Peak value of 5 x I_{IN} for less than 50µSec.
- **Under voltage protection** Unit shuts down if input voltage falls below 14 V ± 1 V, and turns back on at 16 V ± 1 V
- **Over voltage protection** 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

- **Electronic Over Voltage Protection** Internal control protects unit (no damage) 10% above nominal voltage.
- **Passive transorb on outputs** 20% above nominal voltage.
- **Current limiting** Continuous protection (Hiccup) set at 10-30% above nominal current.

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-810F

Temperature:

Operating: –55°C to +85°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:

Vibration - Figure 514.5C-17. General minimum integrity exposure. (1 hour per axis.)
Shock - Saw-tooth, 20g peak, 11mS.

Salt Fog:

Method 509-4

Reliability

150,000 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.***

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Pin Assignment Standard

Pin No.	Function
1	*+ SENSE*
2	*SIGNAL RTN*
3	*SYNC IN*
4	*INHIBIT*
5	*- SENSE*
6	*N.C*
7	*SYNC OUT*

Pin No.	Function
A1	*+ OUT*
A2	*+ OUT*
A3	*- OUT*
A4	*- OUT*
A5	*- VIN*
A6	*+ VIN*

* All pins with the same name and function should be connected together for best performance.

Pin Assignment for Parallel connection

Pin No.	Function
1	*+ SENSE*
2	*SIGNAL RTN*
3	*SYNC IN*
4	*INHIBIT*
5	*- SENSE*
6	*CURRENT SHARE*
7	*SYNC OUT*

Pin No.	Function
A1	*+ OUT*
A2	*+ OUT*
A3	*- OUT*
A4	*- OUT*
A5	*- VIN*
A6	*+ VIN*

* All pins with the same name and function should be connected together for best performance.

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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.

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 ± 10kHz.
When not connected the power supply will work at 250kHz

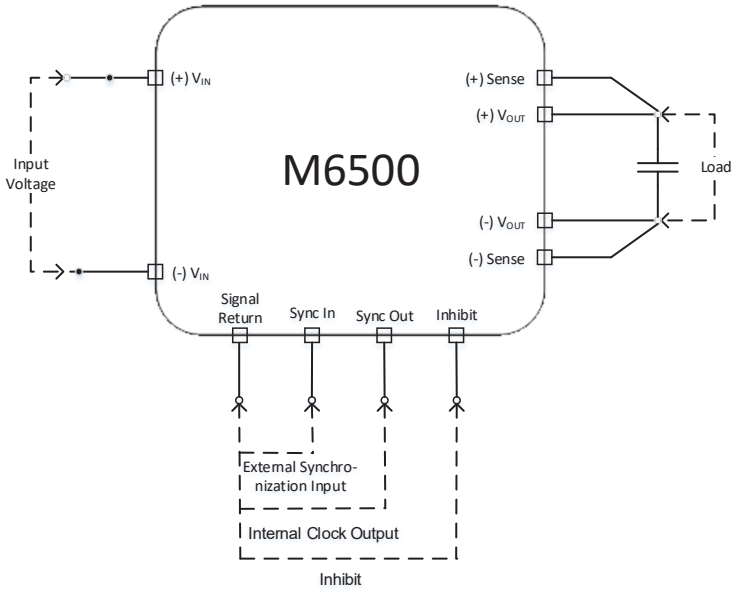
SYNC OUT signal
The SYNC OUT signal is used to sync the system with the power supply frequency.

SIGNAL RTN
The INPUT SIGNAL RTN is referred to the input.
This is used as grounding for SYNC IN, SYNC OUT and INHIBIT signals.

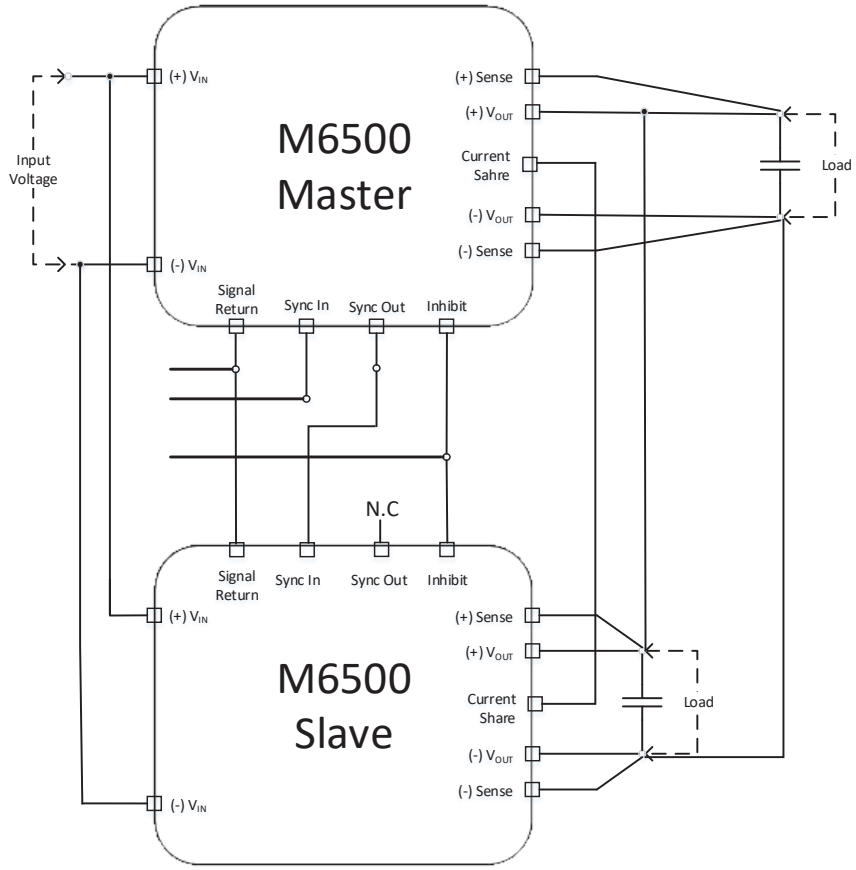
SENSE
The SENSE is used to achieve accurate load regulations at load terminals (this is done by connecting the pins directly to the load's terminals).
The use of remote sense has a limit of voltage dropout between converter's output and load terminals of 2-10% of voltage output.
When not used connect + SENSE to +VOUT and –SENSE to –VOUT

CURRENT SHARE [PARALLEL OPERATION VERSION ONLY]
The **CURRENT SHARE** signal is used to connect the power supply in parallel to other power supplies and have them divide equally the power between one another.
Connect all CURRENT SHARE signals of all paralleled power supplies together.
This signal is referenced to - SENSE.

Typical Connection

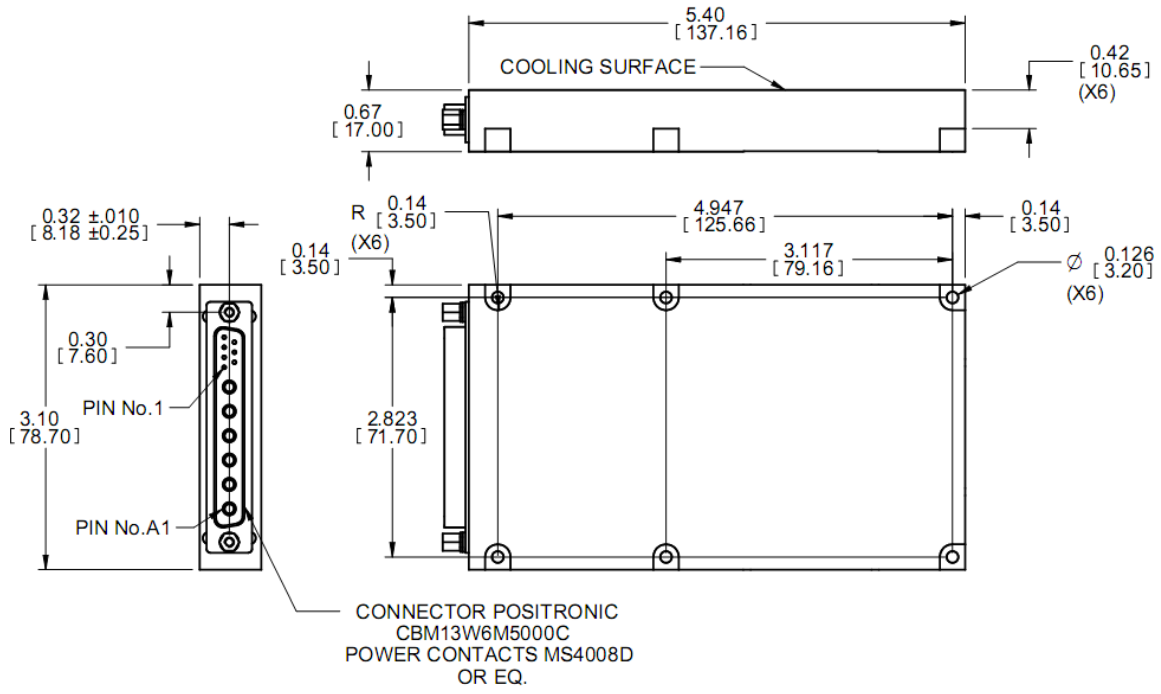


Typical Parallel Connection with Current Share

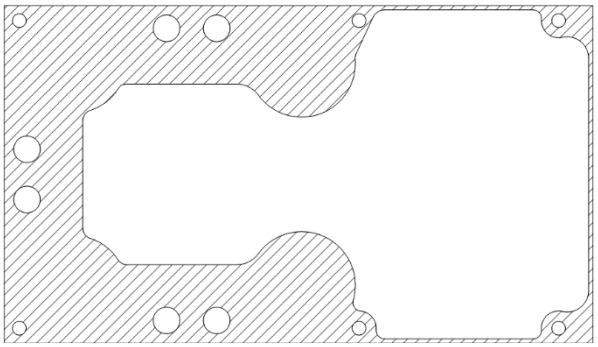


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Outline Drawing



Heat Dissipation Surface



Dissipation Area
6.603 in²
(4260 mm²)

Notes

1. Dimensions are in Inches [mm]
2. Tolerance is:
   .XX ±0.01 IN
   .XXX ±0.005 IN
3. Weight: Approx. 355g (12.52 oz)
4. Mounting holes can be modified – please consult factory.
5. Parasolid 3D module is available for download on site.

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Standard Configurations Table

Part Number	Input	Output		Power
	Voltage range	Voltage	Current	
M6500100	18 to 50 V_{DC}	1.8 VDC	60 A	108W
M6500101	18 to 50 V_{DC}	2.5 VDC	60 A	150W
M6500102	18 to 50 V_{DC}	3.3 VDC	60 A	198W
M6500103	18 to 50 V_{DC}	5 VDC	60A	300W
M6500104	18 to 50 V_{DC}	12 VDC	41 A	492W
M6500105	18 to 50 V_{DC}	15 VDC	33 A	495W
M6500106	18 to 50 V_{DC}	24VDC	21 A	495W
M6500107	18 to 50 V_{DC}	28 VDC	17.5 A	500W
M6500800*	18 to 50 V_{DC}	1.8 VDC	60 A	108W
M6500801*	18 to 50 V_{DC}	2.5 VDC	60 A	150W
M6500802*	18 to 50 V_{DC}	3.3 VDC	60 A	198W
M6500803*	18 to 50 V_{DC}	5 VDC	60A	300W
M6500804*	18 to 50 V_{DC}	12 VDC	41 A	492W
M6500805*	18 to 50 V_{DC}	15 VDC	33 A	495W
M6500806*	18 to 50 V_{DC}	24VDC	21 A	495W
M6500807*	18 to 50 V_{DC}	28 VDC	17.5 A	500W

***For -8XX configurations:**

- These configurations are REACH Compliant
- The aluminum parts are chromate conversion coated per MIL-DTL-5541F, Type II CLASS 1A or eq.

Additional standard configurations available. **Contact factory for more details.**

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

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