Amphenol
MILITARY HIGH SPEED

M6500 SERIES
DC/DC POWER SUPPLY

DESCRIPTION

The M6500 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 3.3 to 28V at up to 500W. 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
- 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

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HOW TO ORDER

PART NUMBER	INPUT VOLTAGE RANGE	OUTPUT VOLTAGE | CURRENT	POWER
CF-	18 TO 50 VDC	1.8 VDC / 60 A	108W
CF-	18 TO 50 VDC	2.5 VDC / 60 A	150W
CF-	18 TO 50 VDC	3.3 VDC / 60 A	198W
CF-	18 TO 50 VDC	5 VDC / 60 A	300W
CF-	18 TO 50 VDC	12 VDC / 41 A	492W
CF-	18 TO 50 VDC	15 VDC / 33 A	495W
CF-	18 TO 50 VDC	24 VDC / 21A	495W
CF-	18 TO 50 VDC	28 VDC / 17.5 A	500W
CF-	18 TO 50 VDC	1.8 VDC / 60 A	108W
CF-	18 TO 50 VDC	2.5 VDC / 60 A	150W
CF-	18 TO 50 VDC	3.3 VDC / 60 A	198W
CF-	18 TO 50 VDC	5 VDC / 60 A	300W
CF-	18 TO 50 VDC	12 VDC / 41 A	492W
CF-	18 TO 50 VDC	15 VDC / 33 A	495W
CF-	18 TO 50 VDC	24 VDC / 21 A	495W
CF-	18 TO 50 VDC	28 VDC / 17.5 A	500W

ELECTRICAL SPECIFICATIONS

DC Input: 18 to 48VDC 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 50mVp-p, typical (max. 1%) without external capacitance. When connected to system capacitance ripple drops significantly.	**Load Transient Overshoot and undershoot:** Output resistance at loadchange 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.

PROTECTIONS

Input	Output	General
Isolation: Inrush Current Limiter Peak value of 5 x IIN for less than 50µSecase	**Electronic Over Voltage Protection:** Internal control protects unit (no damage) 10% above nominal voltage.	**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)
Under voltage protection: Unit shuts down if input volage falls below 14 V ± 1 V, and turns back on at 16 V ± 1 V	**Passive transorb on outputs:** 20% above nominal voltage	
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.	**Current limiting:** Continuous protection (Hiccup) set at 10-30% above nominal current.	

ENVIRONMENTAL CONDITIONS

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

PIN ASSIGNEMENT 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

PIN ASSIGNEMENT 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

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.

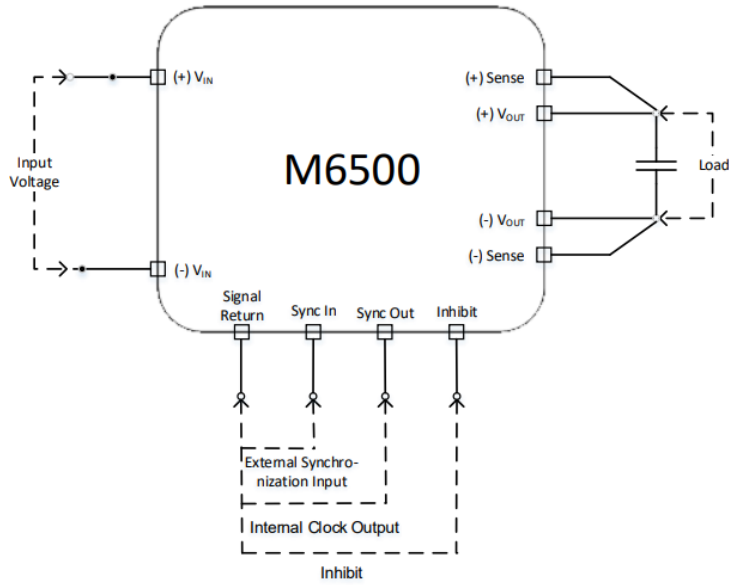
SENSE

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

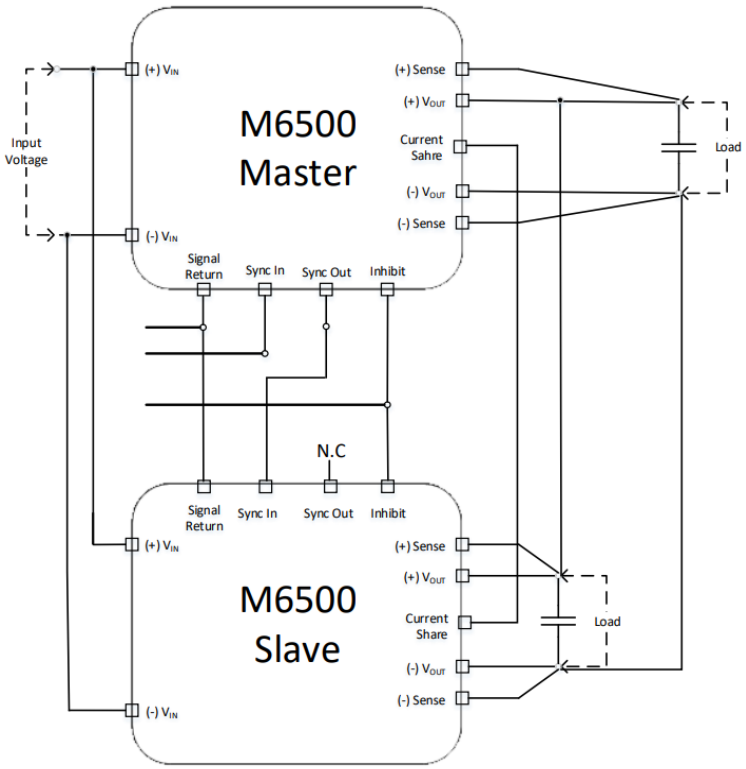
CURRENT SHARE [PARALLEL OPERATION VERSION ONLY]

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.

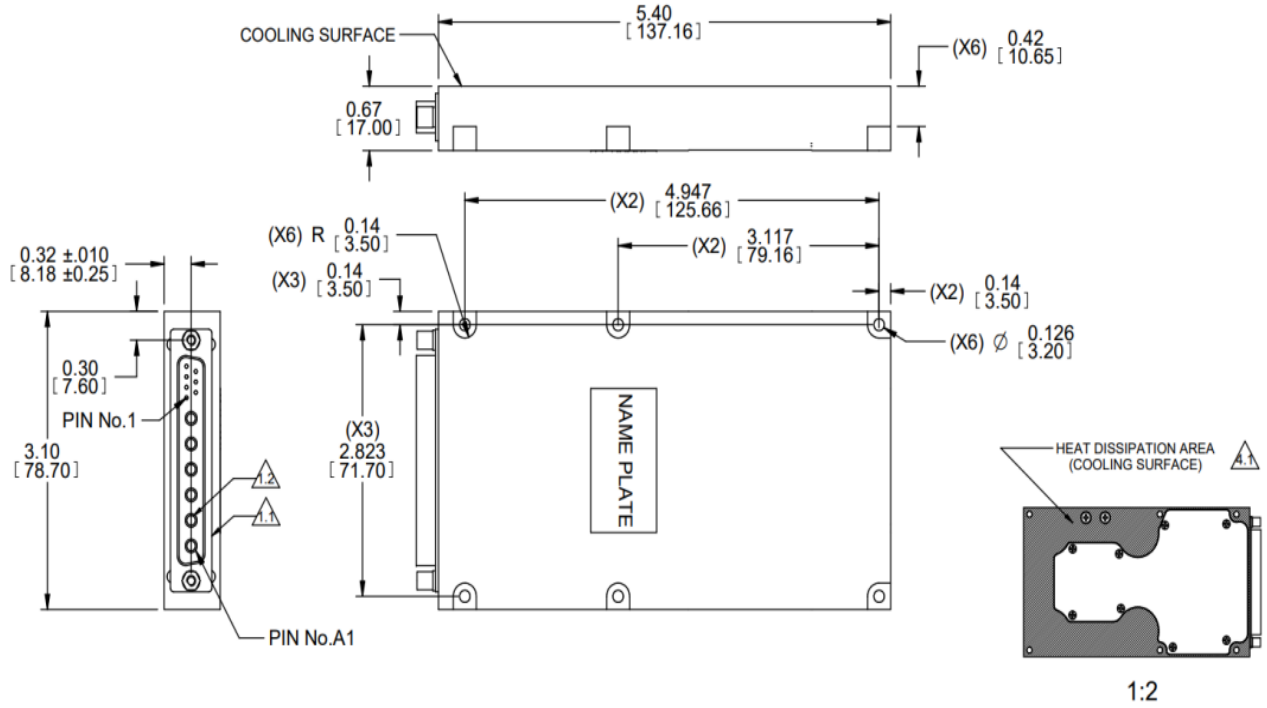
TYPICAL CONNECTION DIAGRAM



TYPICAL PARALLEL CONNECTION WITH CURRENT SHARE



OUTLINE DRAWING



NOTES:
1. CONNECTOR:
   1.1 POSITRONIC. P/N CBM13W6M5000C OR EQ.
   1.2 POWER CONTACTS MS4008D OR EQ.

2. MTL. AL6061-T651/ AL 5052-H32

3 FINISH:
   3.1 CHROMATE CONVERSION COATING PER MIL-DT5541, LAST REVISION, TYPE 1, CLASS 1A

4. COOLING:
   4.1 HEAT DISSIPATION AREA- 6.8 IN^2

5. WORKMANSHIP SHALL BE MIL-STD-454, REQT. 9.

Amphenol
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