

M169 SERIES

**HIGH DENSITY,
HIGH POWER FACTOR,
SINGLE OUTPUT
AC / DC CONVERTERS
UP TO 1,000W**



Applications

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

Special Features

- Miniature size
- High efficiency
- Wide input range
- High power factor (0.99)
- Input / Output isolation
- Remote sense
- Inrush Current Limiter
- External On/Off Inhibit
- Fixed switching frequency (250kHz)
- External synchronization capability
- EMI filters included
- Parallel connection
- Indefinite short circuit protection with auto-recovery
- Over-voltage shutdown with auto-recovery
- Over temperature shutdown with auto-recovery

Electrical Specifications

AC Input:

85 to 265V_{AC}, 50/60/400Hz, single-phase per MIL-STD-704A & per MIL-STD-1399 (60Hz).

Line/Load regulation:

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

Ripple and Noise:

100÷150mV_{p-p}, typical (max. 1%) without external capacitance. When connected to system capacitance ripple drops significantly.

DC Output:

Output range – 3.3V to 270V
Output power – 1000W (peak 1200W)
Output current – max 105A.

Efficiency :

Up to 80% - Typical (full load, room temperature)

Isolation:

1000V between Input and Output
1000V between Input and Case
200V between Output and Case

EMC:

Designed to meet** MIL-STD-461D:
CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103

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 75Vac.

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.

** When mated with M1169 filter.

Environmental

Design to Meet MIL-STD-810F

Temperature:

Operating: -40°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:

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

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.**

Pin Assignment (Input)

Pin No.	Pin Function	Pin No.	Pin Function
1	PHASE	9	PHASE
2	PHASE	10	PHASE
3	PHASE	11	N.C.
4	N.C.	12	NEUTRAL
5	NEUTRAL	13	NEUTRAL
6	NEUTRAL	14	NEUTRAL
7	N.C.	15	N.C.
8	CHASSIS		

Pin Assignment (Output)

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

* All output parallel pins should be connected together for best performance.

Functions and Signals

INH IN 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 RTN (pin #1).

INH OUT signal

Used when connecting two units or more in parallel.

The signal is to be connected to the INH IN signal of the slave unit (see diagram below). The signal synchronizes the shutdown and startup of the units.

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 $250\text{kHz} \pm 10\text{kHz}$.

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

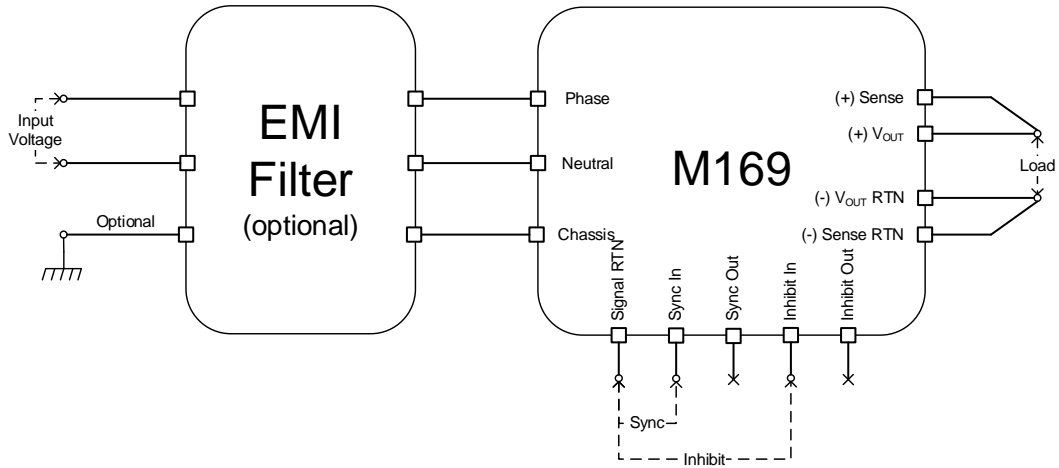
The SIGNAL RTN is a floated ground.

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

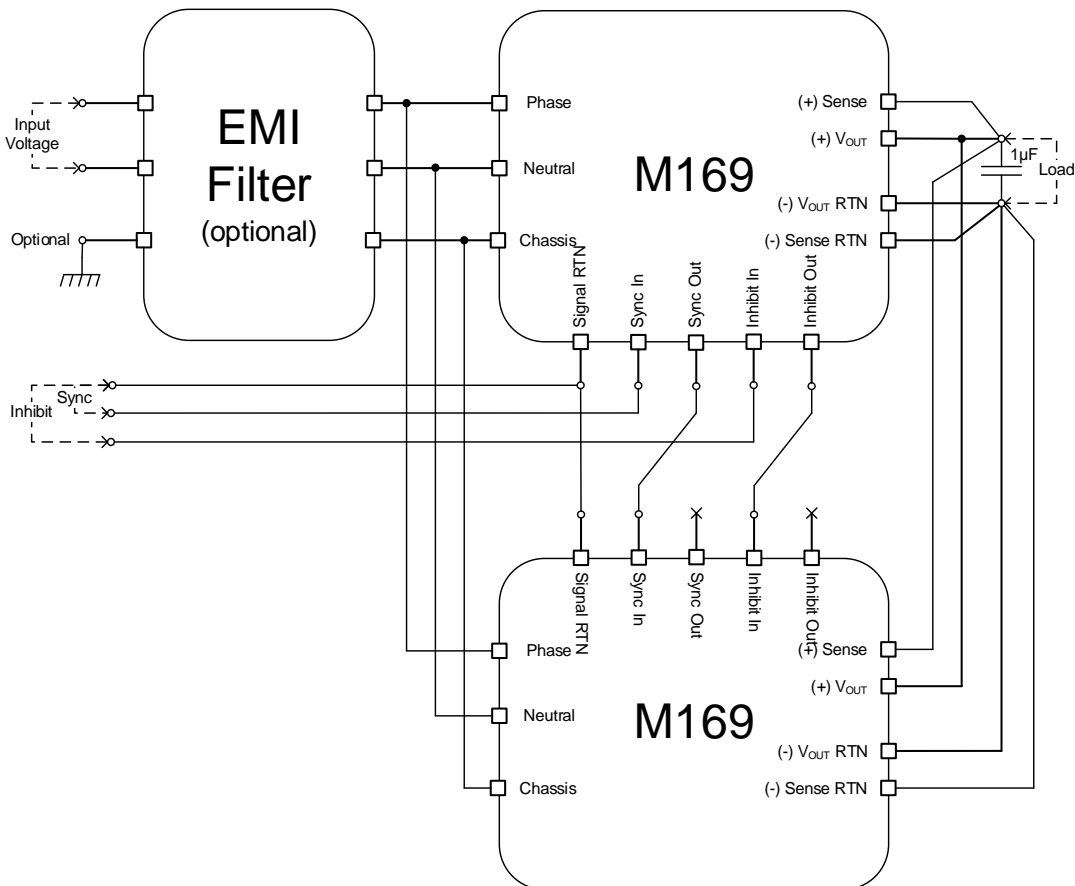
Chassis PIN

This pin is an option to connect the unit chassis to system chassis.

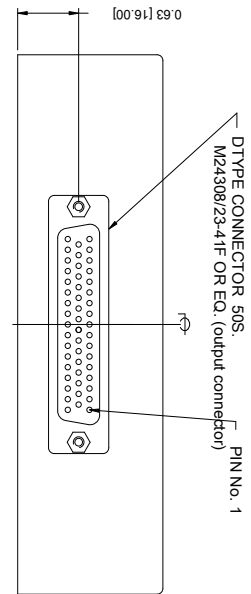
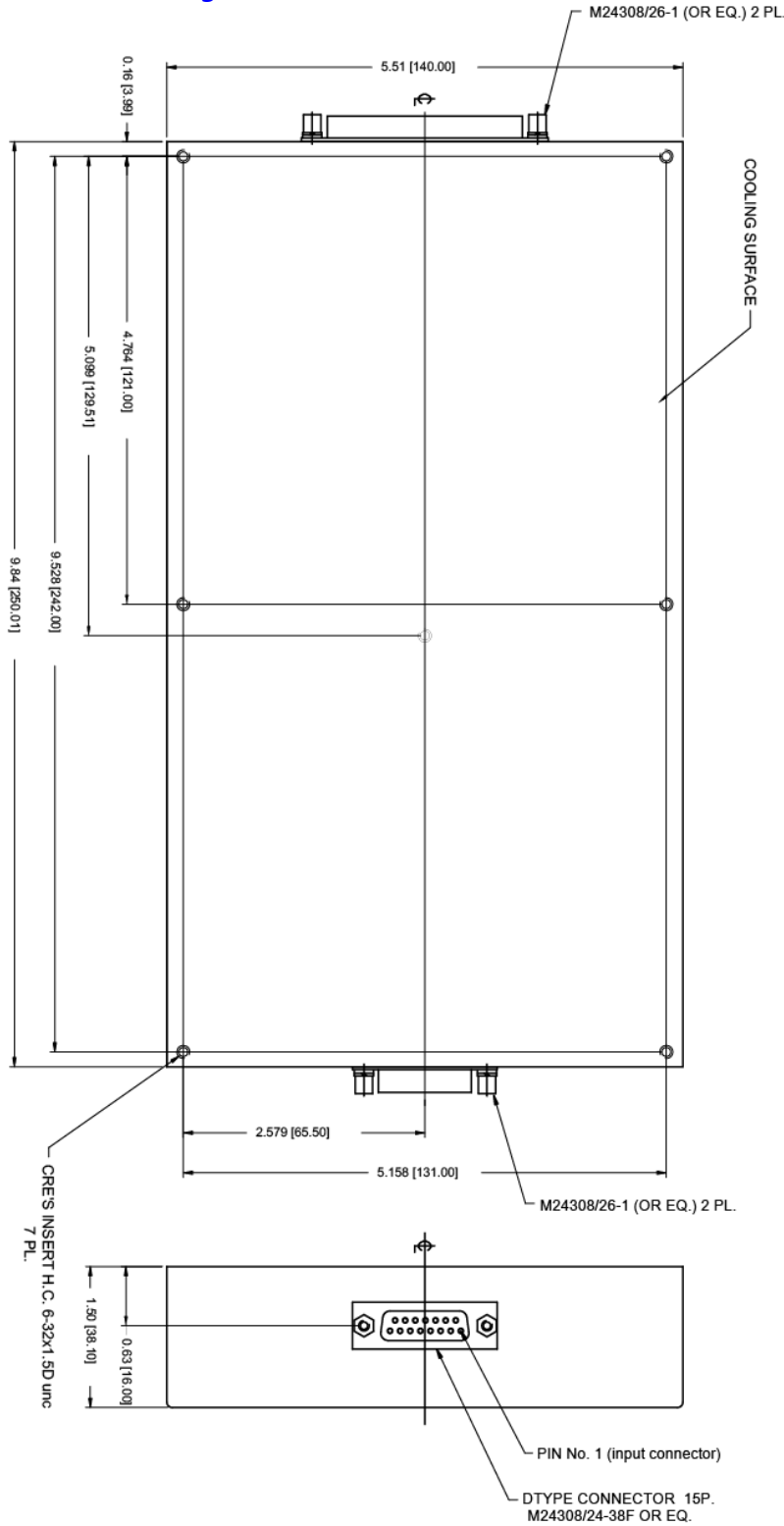
Typical Connection



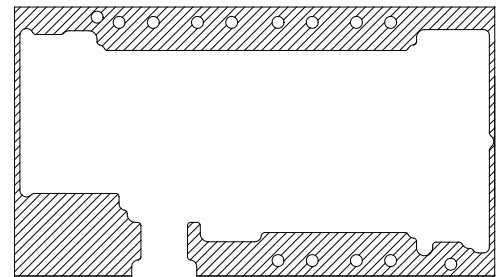
Parallel Connection



Outline Drawing



Heat Dissipation Surface



Dissipation Area
16.54 in²
(10670 mm²)

Notes

1. Dimensions are in Inches [mm]
2. Tolerance is:
.XX ±.02 IN
.XXX ±.01 IN
3. Weight: 4.25 Lb (1922 gr)
4. Parasolid 3D module is available for download on site.

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