M1981 SERIES

HIGH DENSITY, HIGH POWER FACTOR,

SINGLE PHASE, SINGLE OUTPUT,

AC / DC CONVERTERS

Up to 200W

Applications

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

Special Features

- Miniature size
- High efficiency
- Wide input range
- High power factor (0.98)
- Input / Output isolation
- Inrush Current Limiter
- External On/Off Inhibit
- Fixed switching freq. (250 kHz)
- Ext. synchronization capability
- EMI filters included
- 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 265 V_{AC}, 50/60/400 Hz, single-phase
per MIL-STD-704A &
per MIL-STD-1399:300A (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.

DC Output

Output range – 3.3V to 48V
Output power – 200W (peak 250W)
Output current – max 20A

Efficiency

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

Load Transient Overshoot and undershoot

Current change from 50%-100% output voltage change less than 0.5V within 200-300µSec

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, 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 inrush currents lasting more than 50µSec.
- **Under Voltage Lock-Out** Unit shuts down below 75V_{AC} ± 5V_{AC}.

Output

- **Active Overvoltage Protection** Internal control protects unit 5-15% above nominal voltage.
- **Passive Overvoltage Protection** 10-30% above nominal voltage.
- **Current limiting** Continuous protection (10-30% above maximum current) for unlimited time (Hiccup).

General

- **Over temperature protection:** Shuts down if base plate temp exceeds +105°C ± 5°C. Automatic recovery when base plate temperature drops below +95°C ± 5°C.

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

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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

~143,000 hours, calculated per MIL-STD-217F Change Notice 2 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

Option A: with external synchronization, without sense lines.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	OUT RTN (–)	10	PHASE	19	N/C
2	OUT RTN (–)	11	N/C	20	SYNC RTN
3	N/C	12	NEUTRAL	21	INHIBIT RTN
4	OUT (+)	13	NEUTRAL	22	N/C
5	OUT (+)	14	OUT RTN (–)	23	PHASE
6	N/C	15	OUT RTN (–)	24	N/C
7	SYNC	16	N/C	25	CHASSIS
8	INHIBIT	17	OUT (+)		
9	N/C	18	OUT (+)		

Option B: with sense lines, without external synchronization.

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	OUT RTN (–)	10	PHASE	19	N/C
2	OUT RTN (–)	11	N/C	20	SENSE RTN (–)
3	N/C	12	NEUTRAL	21	INHIBIT RTN
4	OUT (+)	13	NEUTRAL	22	N/C
5	OUT (+)	14	OUT RTN (–)	23	PHASE
6	N/C	15	OUT RTN (–)	24	N/C
7	SENSE (+)	16	N/C	25	CHASSIS
8	INHIBIT	17	OUT (+)		
9	N/C	18	OUT (+)		

Note: All pins with the identical function or designation should be connected together for best performance.

Functions and Signals

SENSE
The SENSE line is used to achieve accurate voltage regulation at load terminals.
To use this feature, connect this pin directly to load's positive terminal.
If this function is not required, short SENSE pin to OUTPUT pins as close as possible to the unit.

SENSE RTN
The SENSE RTN line is used to achieve accurate voltage regulation at load terminals.
To use this feature, connect this pin directly to load's negative terminal.
If this function is not required, short SENSE RTN pin to OUTPUT RTN pins as close as possible to the unit.

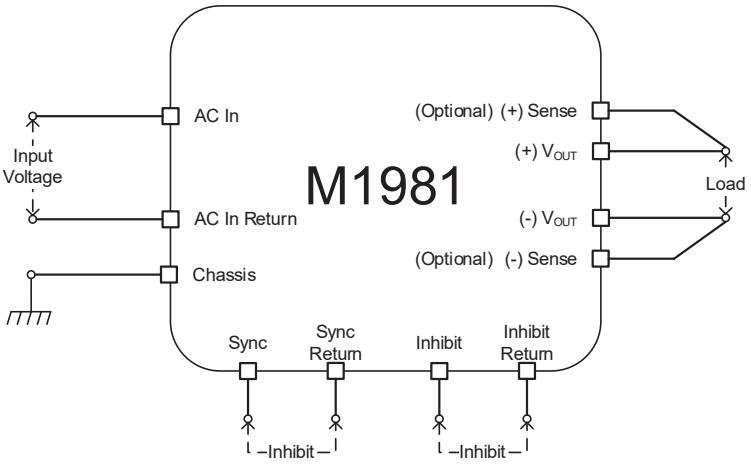
Note: The use of remote sense has a limit of voltage dropout between the converter's output and the load's terminals of approximately 5% of nominal output voltage.

INHIBIT
The INHIBIT signal is used to turn the power supply ON and OFF.
TTL "1" or OPEN – Power supply active (output turned on).
TTL "0" or SHORT to Signal RTN – Power supply inhibited (output turned off).
If this function is not required, leave this pin unconnected.

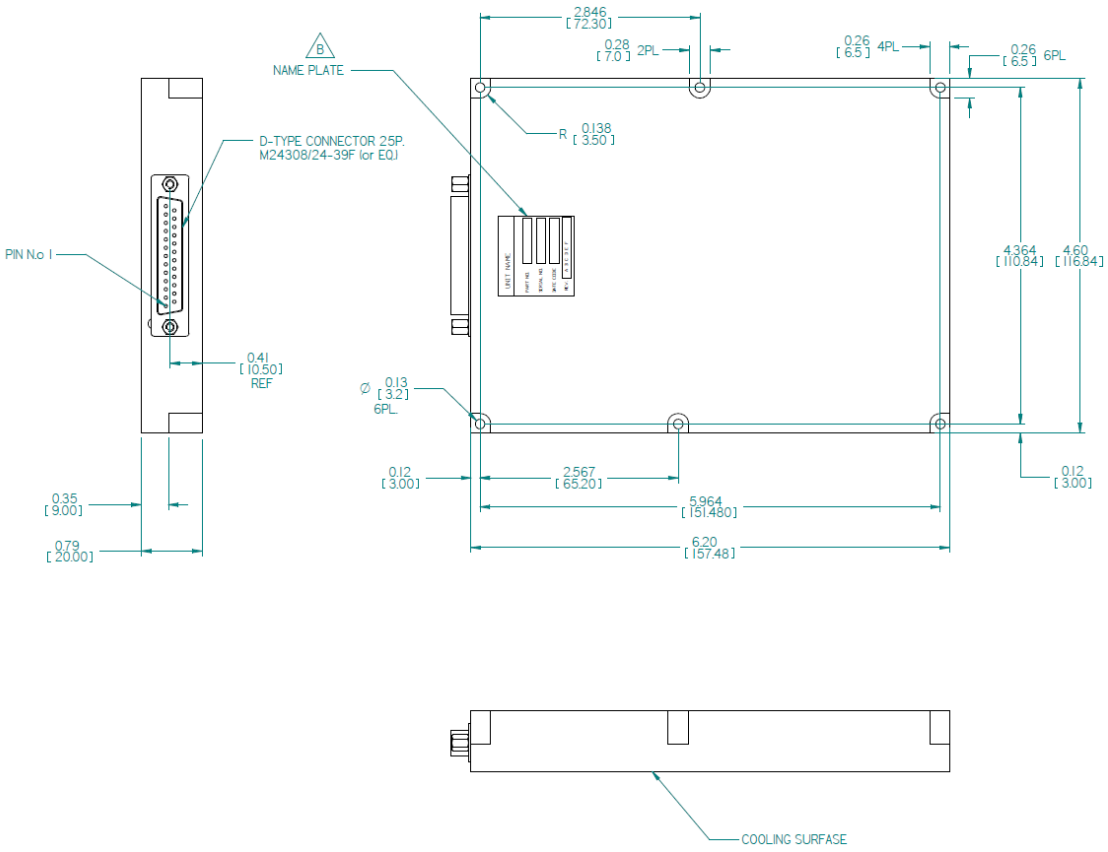
SYNC
The SYNC signal is used to synchronize the power supply's switching frequency to system's clock. Valid external clock frequency is 250kHz ± 10kHz.
If this function is not required, leave this pin unconnected - the power supply will use its internal clock.

CHASSIS
The CHASSIS pin allows additional connection of unit's chassis to system ground.

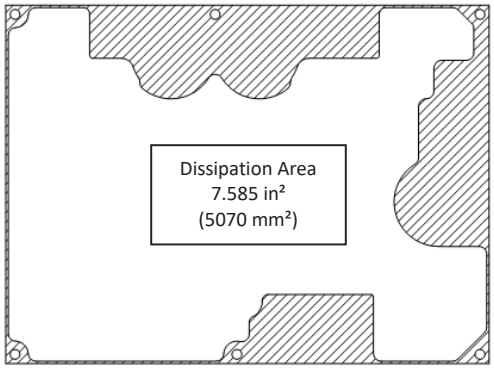
Typical Connection



Outline Drawing



Heat Dissipation Surface



Notes

1. Dimensions are in Inches [mm]
2. Tolerance is:
   .XX ±0.01 IN
   .XXX ±0.005 IN
3. Weight: Approx. 23 Oz (650 gr)
4. Parasolid 3D module is available for download on site.

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