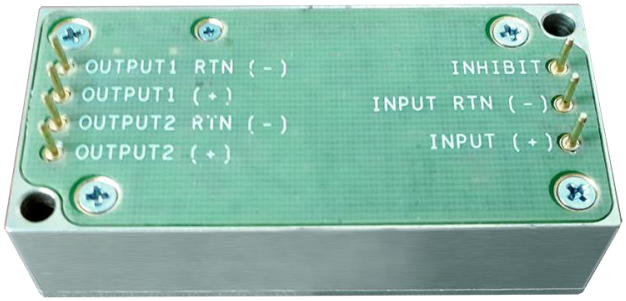
M7115 SERIES

DC/DC POWER SUPPLY



PRODUCT HIGHLIGHTS

- **MINIATURE**
- **HIGH DENSITY**
- **DUAL OUTPUT**
- **DC/DC POWER SUPPLY**
- **UP TO 20 W**

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Applications

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

Special Features

- Miniature size
- High efficiency
- Wide input range
- High Density – up to 11.5 W/in^3
- Remote Inhibit (On/Off)
- Fixed switching freq. (~250 kHz)
- EMI filters included
- Input / Output isolation
- Non-latching protections:
  - Overload/Short-circuit
  - Over-voltage
  - Over temperature

Electrical Specifications

DC Input

Normal steady-state range:

- 18 to 70 V_{DC}

Normal over-voltage transients (operational) IAW:

- MIL-STD-1275A (100 V / 50 ms)
- MIL-STD-704A (80 V / 0.1 s)

Abnormal under-voltage transients (no damage, no operation): 14V / 0.6 s

Output Voltage Regulation

Up to ±1%
(no load to full load, –40 °C to +100 °C, and over input voltage range).

Internal Clock Frequency

Internal clock frequency is set to 250 kHz ± 10 kHz

DC Output

Output #1:
Voltage range: 1.5 to 48 V_{DC}
Current range: 0 to 3 A
Power range: 0 to 12 W

Output #2:
Voltage range: 1.5 to 48 V_{DC}
Current range: 0 to 1.5 A
Power range: 0 to 12 W

Ripple and Noise

Less than 100 mV_{p-p}, typical (max. 1%), measured across an external 0.1 µF capacitor with 20 MHz bandwidth.

Transient Over-and-undershoot

Output voltage change due to load transient of 30 to 90% with t_r & t_f of max 30 µs is up to 5% of nominal output voltage.
Output recovers to steady state voltage within less 2 ms.

Isolation

Input to Output: 200 V_{DC}
Input to Case: 200 V_{DC}
Output to Case: 100V_{DC}
(Standard room temperature, 35 to 60% RH, 0 to 300 ft AMSL).

Efficiency

85% typical (28 V_{DC} input, 5 V_{DC} and 15 V_{DC} outputs, full loads, room temperature)

83% typical (full loads, –55°C to +85°C and over normal input voltage range)

Electrical Specifications – continued

Turn-On Time
Output voltage reaches 90% of its nominal value within 50 ms from when input voltage rises above 20 V.

Turn-On Rise Time
Output voltage rise time from 10% to 90% of its nominal value during turn-on is up to 15 ms.

Turn-On Transient
Voltage overshoot during power on is less than 5% of nominal voltage.

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

ESD
Complies with IEC-61000-4-2 level 4, 8 kV contact and 15 kV air discharge (Including pin injection when non-operational).

Protections **

Input
- **Under-Voltage Lock-Out**
  Shutdown below 18 V ± 1 V.
  Resume above 21 V ± 1 V.
  Protection kicks in 7 ± 3 ms after onset of under-voltage event.
- **Over-Voltage Lock-Out**
  Shutdown above 84 V ± 2 V.

Output
- **Passive Over-Voltage Protection**
  Zener diode installed on output terminals. Zener threshold is 120% ± 10% of nominal voltage.
- **Overload Protection**
  Output voltage turns off and on periodically with low duty-cycle (hiccup) when detecting overload or short circuit.

General
- **Over Temperature Protection**
  Output shuts down if base plate temperature exceeds +105 °C ± 5 °C.
  Automatic recovery when baseplate temperature returns to below +95 °C ± 5 °C.
  Minimum hysteresis 10 °C.

Environmental Conditions

Designed to meet MIL-STD-810F

Temperature
Methods 501.4 & 502.4
Operating: –40 °C to +100 °C (at baseplate)
Storage: –55 °C to +125 °C

Altitude
Method 500.4
Procedures I & II
Up to 70 000 ft. operational

Salt Fog
Method 509.4

Humidity
Method 507.4
Procedure I
Up to 90% RH @ +35 °C
Up to 85% RH @ +40 °C

Vibration (random)
Method 514.5
Category 4 - General minimum integrity exposure
IAW Figure 514.5C-17
1 hour per axis.

Shock
Method 516.5
Procedure I
20 g, 5 ms half-sine
10 g, 50 ms half-sine

Reliability

150,000 hours, calculated IAW MIL-HDBK-217F Notice 2 at +85 °C baseplate, Ground Fix environment.

Environmental Stress Screening (ESS)

Including random vibration and thermal cycles is also available. ***Please consult factory for details.***

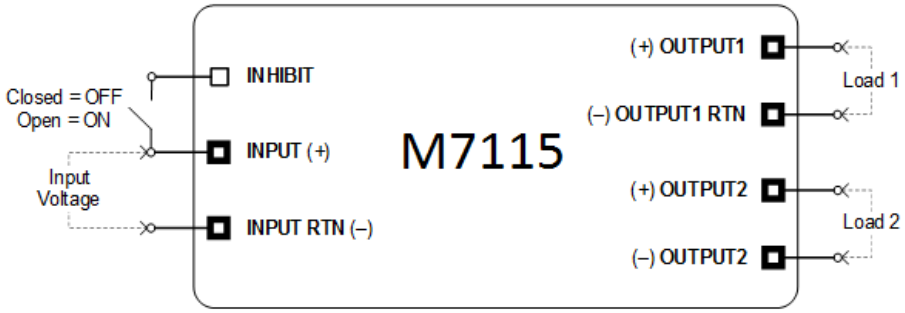
* EMC Compliance achieved with 5µH LISN, shielded harness and static resistive load. Depending on the actual configuration, an external filter may be required for full compliance.
** Thresholds and protections can be modified / removed – **please consult factory.**

Functions and Signals

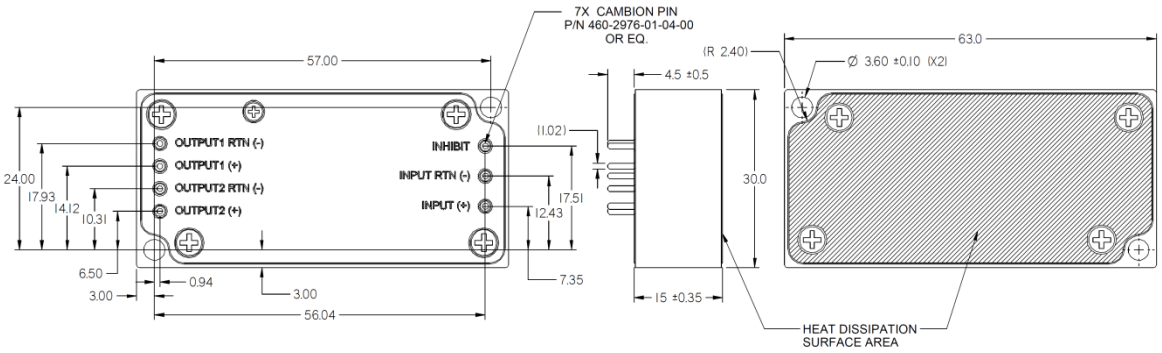
INHIBIT signal

The **INHIBIT** signal is used to turn the power supply ON and OFF.
To turn the power supply ON, leave **INH** pin open.
To turn the power supply OFF, connect 28 V_{DC} IAW MIL-STD-704E (18 to 50 V) to **INH** pin.
If not used (always ON), leave this pin unconnected.
This signal is referenced to input voltage return (**VINRTN** pin)

Typical Connection Diagram



Outline Drawing



Notes

1. Dimensions are in mm
2. Tolerance is:
   .X ± 0.25 mm
   .XX ± 0.2 mm
3. Weight: Less than 365 g

Note: Specifications are subject to change without prior notice by the manufacturer