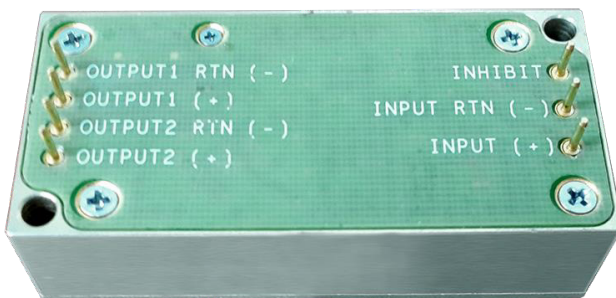


M7115 SERIES

DC/DC POWER SUPPLY



PRODUCT HIGHLIGHTS

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

M7115 SERIES DC/DC POWER SUPPLY

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/in³
- 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)

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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 $18\text{ V} \pm 1\text{ V}$.
Resume above $21\text{ V} \pm 1\text{ V}$.
Protection kicks in $7 \pm 3\text{ ms}$ after onset of under-voltage event.
- **Over-Voltage Lock-Out**
Shutdown above $84\text{ V} \pm 2\text{ V}$.

Output

- **Passive Over-Voltage Protection**
Zener diode installed on output terminals. Zener threshold is $120\% \pm 10\%$ 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 $+105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.
Automatic recovery when baseplate temperature returns to below $+95\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.
Minimum hysteresis $10\text{ }^{\circ}\text{C}$.

Environmental Conditions

Designed to meet MIL-STD-810F

Temperature

Methods 501.4 & 502.4
Operating: $-40\text{ }^{\circ}\text{C}$ to $+100\text{ }^{\circ}\text{C}$ (at baseplate)
Storage: $-55\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$

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 @ $+35\text{ }^{\circ}\text{C}$
Up to 85% RH @ $+40\text{ }^{\circ}\text{C}$

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 $+85\text{ }^{\circ}\text{C}$ 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.**

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Functions and Signals

INHIBIT signal

The **INHIBIT** signal is used to turn the power supply ON and OFF.

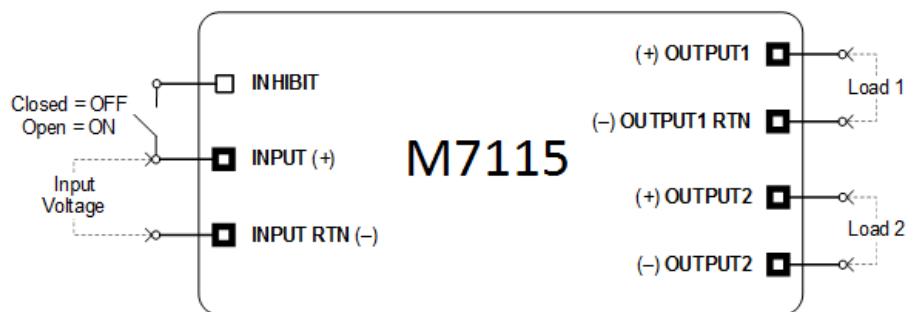
To turn the power supply ON, leave **INH** pin open.

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



The drawing shows the mechanical specifications of the 486200-01 component. The top view (left) is a rectangular package with a width of 57.00 and a length of 56.04. It features four output pins on the left labeled OUTPUT1 RTN (-), OUTPUT1 (+), OUTPUT2 RTN (-), and OUTPUT2 (+), and two input pins on the right labeled INHIBIT and INPUT (+). The side view (right) shows a height of 30.0 and a mounting tab with a width of 4.5 ± 0.5. A heat dissipation surface area is indicated on the right side. Dimensions for pin placement and overall size are provided in millimeters.

7X CAMBION PIN
P/N 460-2976-01-04-00
OR EQ.

OUTPUT1 RTN (-)
OUTPUT1 (+)
OUTPUT2 RTN (-)
OUTPUT2 (+)
INHIBIT
INPUT RTN (-)
INPUT (+)

HEAT DISSIPATION
SURFACE AREA

1. Dimensions are in mm
2. Tolerance is:
 .X $\pm$ 0.25 mm
 .XX $\pm$ 0.2 mm
3. Weight: 50g typical

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