M1132 SERIES

DC/DC POWER SUPPLY

PRODUCT HIGHLIGHTS

- **COMPACT**
- **6 OUTPUTS**
- **UP TO 320W**

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Applications

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

Special Features

- High density
- Wide input voltage range
- Input / Output isolation
- Remote sense
- External On/Off
- Fixed switching freq. (250 kHz)
- External sync. capability
- EMI filters included (5 µH LISNs)
- I^2C communication
- Non-latching protections:
  - Overload / short-circuit
  - Over-voltage
  - Over-temperature

Electrical Specifications*

DC Input

- Steady-State: 18 to 48 V_{DC}
- Comply with MIL-STD-704F normal transients

DC Outputs**

#	Voltage range	Current range	Power range
1	3.3-12 V	0-10A	0-100 W
2	3.3V-6V	0-30A	0-120W
3	3.3V-6V	0-15A	0-60W
4	-20V- -3.3V	0-4A	0-22W
5	2V-2.5V	0-2A	0-4.5W
6	10V-28V	0-0.65A	0-18W
Total output power: up to 320 W			

Isolation

Input to Output: 200 V_{DC}
Input to Case: 200 V_{DC}
Output to Case: 100 V_{DC}

Output Voltage Regulation

Less than ±1.5% (no load to full load, –55 °C to +85 °C and over normal input voltage range).

Efficiency

86% - Typical
(nominal input voltage, full load, room temperature)

EMC

Complies with MIL-STD-461F (with 5 µH LISNs): CE101, CE102, CS101, RE102 (tested with shielded cables).
Design to meet CS114, CS115, and CS116.

Ripple and Noise

Typically less than 50 mV_{p-p} (max. 1%), measured across a 0.1 µF capacitor, with 10 µF capacitor across load at Input Voltage of 18V-36V, all Temperature Range.

Transient Over-and-undershoot

Output dynamic response of less than 5% at load step of 50%-100%. Output returns to regulation in under 1 ms.

Communication

I^2C protocol available for input voltages, temperature for all output voltages (GAx, SCL, SDA)

*Unless stated otherwise, all measurements specified here were taken under full load conditions, at steady-state input voltage over full temperature range.

Protections *

Input

- **Under-Voltage Lockout**
  Unit shuts down if input voltage drops below 16.5 ± 1 V.
  Automatic restart when input voltage rises above 20 ± 1 V.
  Minimum hysteresis: 2 V.
- **Over-Voltage Lockout**
  Unit shuts down if input voltage rises above 55 ± 2 V.
  Automatic restart when input voltage falls below 38 ± 2 V.
  Lockout is delayed by at least 100 ms from the onset of the over-voltage state, to allow operation through normal transients, per MIL-STD-704 and MIL-STD-1275.

Output

- **Over-Voltage Protection**
- **Overload / Short-Circuit Protection**
  Continuous protection (10-30% above maximum current) for unlimited time (Hiccup).
  Automatic recovery when overload/short-circuit removed.

General

- **Over Temperature Protection**
  Automatic shutdown in case internal temperature rises above 105 ± 5 °C.

Environmental Conditions

Designed to meet MIL-STD-810G

Temperature – High
Method 501.5
Procedure I – Storage: up to +125 °C
Procedure II – Operation: up to +85 °C cooling surface

Temperature – Low
Method 502.5
Procedure I – Storage: down to –55 °C
Procedure II – Operation: down to –55 °C

Altitude
Method 500.5
Procedures I - Storage/Air Transport: up to 40 kft
Procedures II - Operation/Air carriage: up to 70 kft

Humidity
Method 507.5
Up to 95% RH

Fungus
Method 509.5
Does not support fungus growth, in accordance with the guidelines of MIL-STD-454, Requirement 4.

Salt Fog
Method 509.5

Vibration (random)
Method 514.6
Procedure I – General Vibration
Category 24 – General minimum integrity exposure

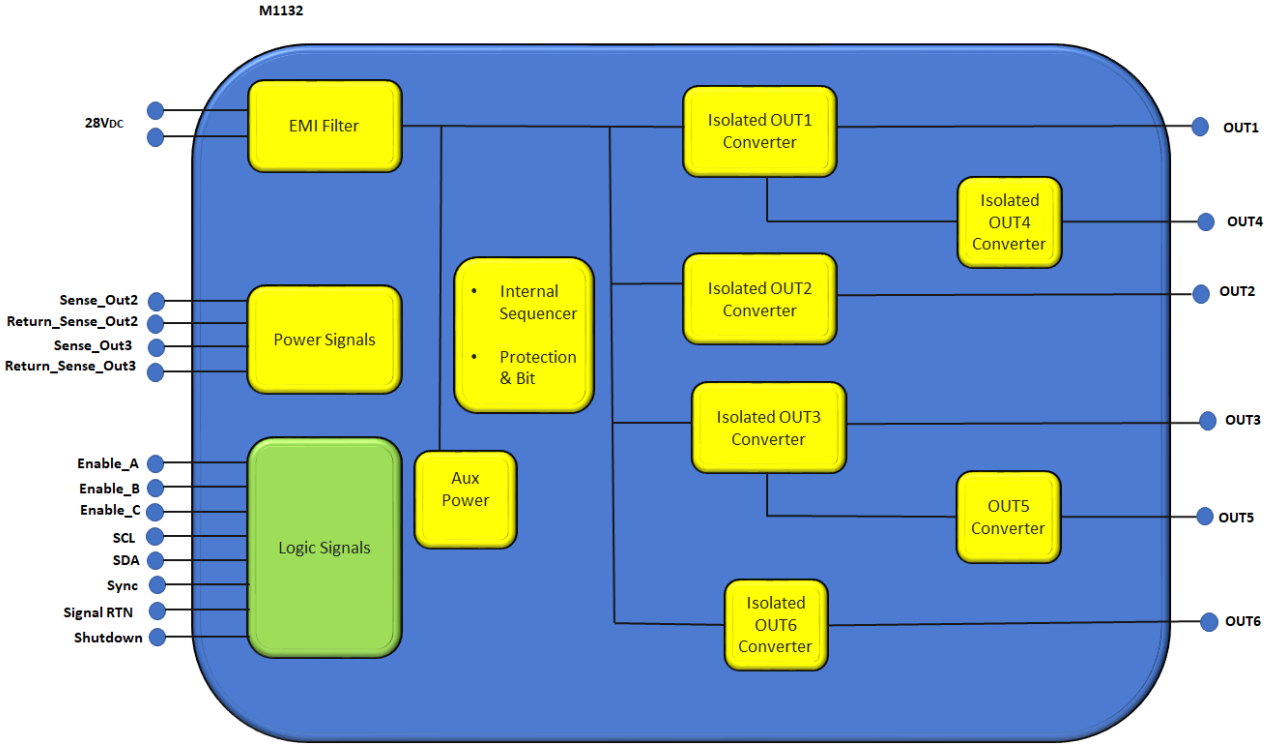
Shock
Method 516.6
Procedure I – Functional Shock
40 g, 11 ms Terminal peak sawtooth shock pulse (all directions)

Environmental Stress Screening (ESS)

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

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

Block Diagram



Pin Assignment

Connector type: Positronic DD78M4000C-15 or eq.
Mating connector: M24308/2-15F or eq.

Pin Number	Pin Name
1	-DC_IN
2	+DC_IN
3	+DC_IN
4	+DC_IN
5	-
6	Out6
7	POWER_RETURN_B
8	Out3
9	Out3
10	Out5
11	POWER_RETURN_A
12	Out1
13	-
14	Out2
15	POWER_RETURN_B
16	Out2
17	POWER_RETURN_B
18	POWER_RETURN_B
19	Return_Sense_Out2
20	Sense_Out2
21	-DC_IN
22	+DC_IN
23	-DC_IN
24	-
25	POWER_RETURN_C
26	Enable_C
27	POWER_RETURN_B
28	POWER_RETURN_B
29	Out3
30	POWER_RETURN_B
31	POWER_RETURN_A
32	Out1
33	Out2
34	POWER_RETURN_B
35	Out2
36	POWER_RETURN_B
37	Out2
38	POWER_RETURN_B
39	POWER_RETURN_B

Pin Number	Pin Name
40	-DC_IN
41	+DC_IN
42	+DC_IN
43	-DC_IN
44	-
45	Sense_Out3
46	Enable_B
47	SDA
48	POWER_RETURN_B
49	Out3
50	Sync
51	POWER_RETURN_A
52	Out1
53	Out2
54	POWER_RETURN_B
55	Out2
56	POWER_RETURN_B
57	Out2
58	POWER_RETURN_B
59	Out4
60	-DC_IN
61	+DC_IN
62	-DC_IN
63	Shoutdown
64	Return_Sense_Out3
65	Enable_A
66	SCL
67	POWER_RETURN_B
68	POWER_RETURN_B
69	Out3
70	Out3
71	Signal_RTN
72	Out2
73	POWER_RETURN_B
74	Out2
75	POWER_RETURN_B
76	Out2
77	POWER_RETURN_B
78	Out4

Pinout information:

Out1: out1_rtn: POWER_RETURN_A,

Out2: out2_rtn: POWER_RETURN_B, on/off [1] by Enable_A [2].

Out3: out3_rtn: POWER_RETURN_B, on/off [1] by Enable_B [2].

Out4: out4_rtn: POWER_RETURN_B, on/off [1] by Enable_B [2].

Out5: out5_rtn: POWER_RETURN_B, on/off [1] by Enable_B [2].

Out6: out6_rtn: POWER_RETURN_C, on/off [1] by Enable_C [2].

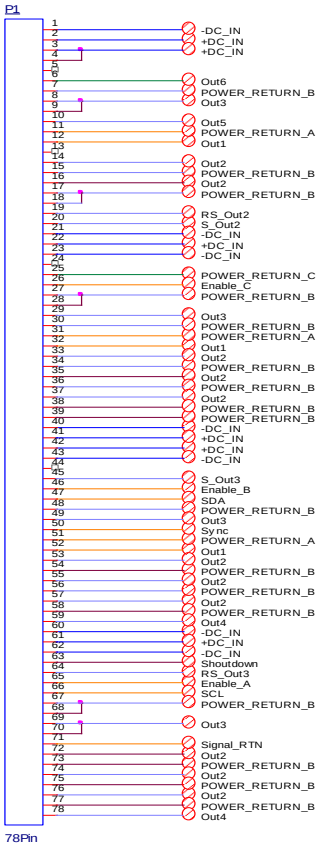
Shutdown: on/off [3] all outputs by signal shutdown [4].

SCL, SDA: SCL[2], SDA[2] signals used for I2C bus Clock and Data respectively.

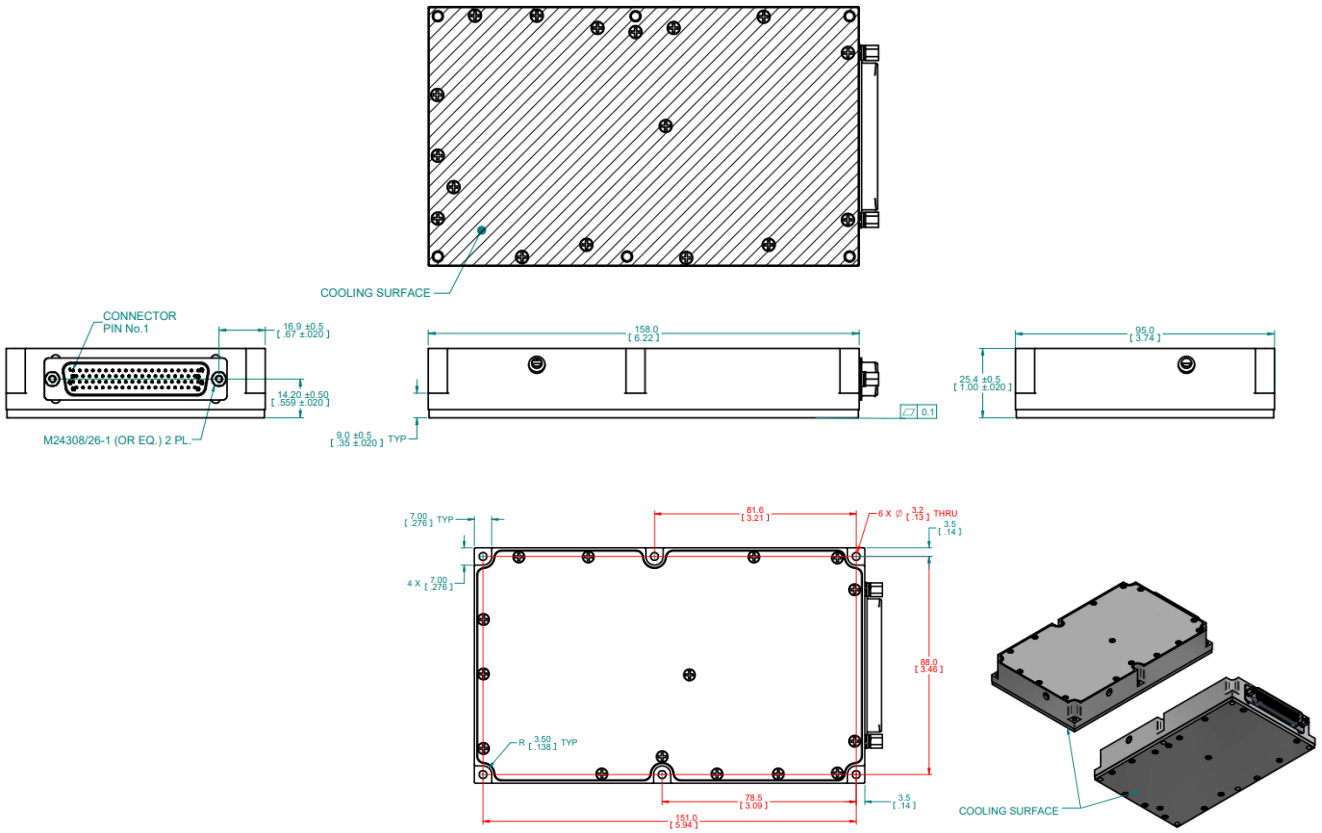
Sync: Sync[2] signal is used to allow the power supply frequency to sync with the system frequency.

Notes :

1. On – short enable , off – open enable.
2. Signal referenced to SIGNAL RTN(which referenced to POWER_RETURN_A).
3. On – open Shutdown , off – short Shutdown.
4. Signal referenced to -DC_IN



Outline Drawing



NOTES:

1. CONNECTOR: DD78M4000C-15 OR EQ. (GOLD OVER NICKEL CONTACTS)
2. HEAT DISSIPATION AREA – 14, 488.01 mm^2
3. WORKMANSHIP SHALL BE MIL-STD-454, REQT. 9
4. MTL. AL 6061 – T651& AL 5052-H32
5. CONVERSION COATING PER MIL-C-5541, TYPE, CLASS 1A
6. COOLING SURFACE FINISH, MEDIUM PHOSPHOROUS ELECTROLESS NICKEL, 8-15um THK, MIL-DTL-26074 – BOTTOM SURFACE AND THE 4 SIDES.

Notes

1. Dimensions are in mm [inch] do not scale drawing
2. Tolerance is:
   X.X ± 0. 3
   X.XX ± 0.20 ANGLES ± 1
   X.XXX ± 0.100
3. Weight: Approx. 730 g

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