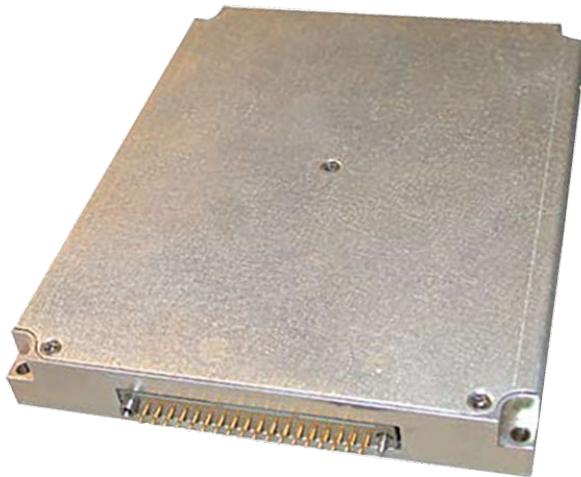


M1802 SERIES

DC/DC POWER SUPPLY



PRODUCT HIGHLIGHTS

- MINIATURE
- HIGH DENSITY
- EIGHT OUTPUT
- DC/DC POWER SUPPLY
- UP TO 150 W



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<p>Applications</p> <p>Military (Airborne, ground-fix, shipboard), Ruggedized, Telecom, Industrial Power Supply</p>					
<p>Special Features</p> <ul style="list-style-type: none"> • Miniature size • High efficiency • High Density • Wide input range • Input / Output isolation • TTL logic enable • Output voltage calibration • Current limit calibration • <u>Fixed</u> switching freq (250 kHz) • External sync capability • <u>EMI</u> filters included • Non-latching protections: <ul style="list-style-type: none"> ○ Overload ○ Short circuit ○ Output Over Voltage ○ Over Temperature 					
<p>Electrical Specifications</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 33%; vertical-align: top;"> <p><u>DC Input</u> Voltage range: 18 to 70 V_{DC}, IAW MIL-STD-704A</p> <p>No damage due to overvoltage transients IAW: MIL-STD-1275A (100 V for 50 ms) MIL-STD-704A (80 V for 0.1 s)</p> <p><u>Line/Load regulation</u> Better than ±1% (no load to full load, -55 °C to +85 °C and over input voltage range).</p> <p><u>Ripple and Noise</u> Less than 50 mV_{p-p}, typical (max. 1%) without external capacitance. When connected to system capacitance ripple drops significantly.</p> </td> <td style="width: 33%; vertical-align: top;"> <p><u>DC Output</u> Please see Outputs Configuration Range below.</p> <p><u>Efficiency</u> Typical 80% - (full load, room temperature)</p> <p><u>Transient Over-and-undershoot</u> Output change at load transient of 30%-100% with T_r & T_f of max 30 μs is 5% of output voltage. Output recover to steady stated within less 0.5 ms.</p> </td> <td style="width: 33%; vertical-align: top;"> <p><u>Isolation</u> Input to Output: 200 V_{DC} Input to Case: 200 V_{DC} Output to Case: 100 V_{DC}</p> <p><u>EMC</u> Designed to meet MIL-STD-461F* CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103</p> <p><u>Turn on Transient</u> Voltage overshoot at during power on is less than 1% nominal voltage.</p> </td> </tr> </table>			<p><u>DC Input</u> Voltage range: 18 to 70 V_{DC}, IAW MIL-STD-704A</p> <p>No damage due to overvoltage transients IAW: MIL-STD-1275A (100 V for 50 ms) MIL-STD-704A (80 V for 0.1 s)</p> <p><u>Line/Load regulation</u> Better than ±1% (no load to full load, -55 °C to +85 °C and over input voltage range).</p> <p><u>Ripple and Noise</u> Less than 50 mV_{p-p}, typical (max. 1%) without external capacitance. When connected to system capacitance ripple drops significantly.</p>	<p><u>DC Output</u> Please see Outputs Configuration Range below.</p> <p><u>Efficiency</u> Typical 80% - (full load, room temperature)</p> <p><u>Transient Over-and-undershoot</u> Output change at load transient of 30%-100% with T_r & T_f of max 30 μs is 5% of output voltage. Output recover to steady stated within less 0.5 ms.</p>	<p><u>Isolation</u> Input to Output: 200 V_{DC} Input to Case: 200 V_{DC} Output to Case: 100 V_{DC}</p> <p><u>EMC</u> Designed to meet MIL-STD-461F* CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103</p> <p><u>Turn on Transient</u> Voltage overshoot at during power on is less than 1% nominal voltage.</p>
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* EMC compliance achieved when tested with 5 μH LISNs, shielded harness and static resistive load.

Protections *		
<p><u>Input</u></p> <ul style="list-style-type: none"> • Under Voltage Lockout Turn off below 16 V_{DC}. Turn on above 17 V_{DC}. • Over Voltage Lockout Turn off above 72 V_{DC}. Turn on below 70 V_{DC}. 	<p><u>Output</u></p> <ul style="list-style-type: none"> • Over Voltage Protection <i>Passive protection:</i> Transorb selected at approx. 20% above nominal voltage. • Current limiting Continuous protection (10-30% above maximum current) for unlimited time. 	<p><u>General</u></p> <ul style="list-style-type: none"> • 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.

Environmental Conditions	
Designed to Meet MIL-STD-810F	
<p><u>Temperature</u> Methods 501.4 & 502.4 Operating: -55 °C to +85 °C (at baseplate) Storage: -55 °C to +125 °C (ambient)</p>	<p><u>Vibration</u> Method 514.5 Procedure I Category 24 - General minimum integrity exposure</p>
<p><u>Altitude</u> Method 500.4 Procedures I – Storage/Air transport: up to 70 kft Procedure II – Operation/Air Carriage: up to 70 kft</p>	<p><u>Shock</u> Method 516.5 30 g, 11 ms terminal peak saw-tooth</p>
<p><u>Humidity</u> Method 507.4 Up to 95% RH</p>	<p><u>Salt Fog</u> Method 509.4</p>

Reliability

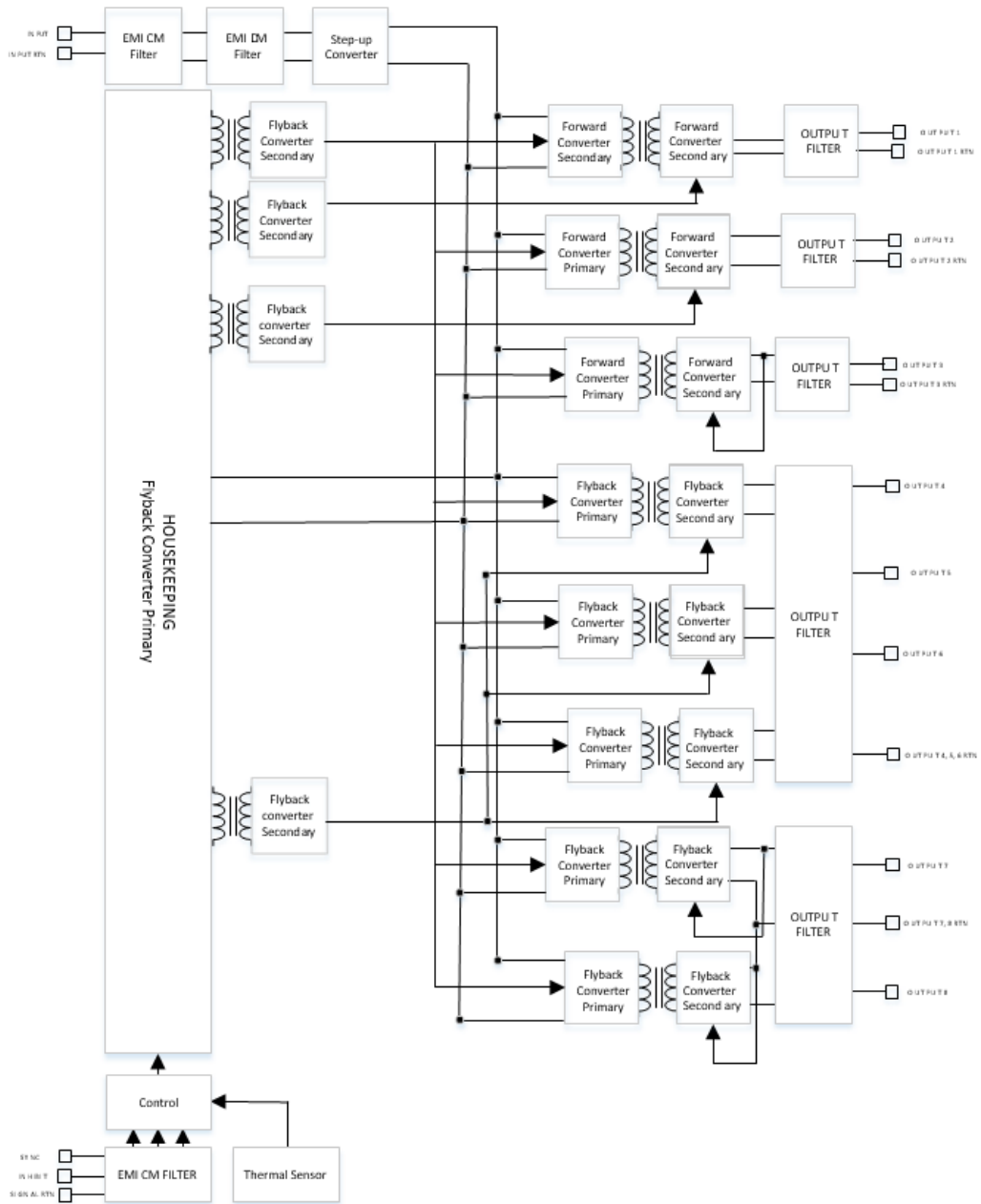
150,000 hours, calculated IAW MIL-HDBK-217F Notice 2 at +85 °C baseplate, Ground Fix conditions.

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.

Operational Block Diagram



Outputs Configuration Range

Output #	Voltage Range	Current Range	Power Range
1	1.5 to 50 V _{DC}	0 to 2.5 A	0 to 40 W
2	1.5 to 50 V _{DC}	0 to 2.5 A	0 to 40 W
3	5 to 18 V _{DC}	0 to 5 A	0 to 25 W
4	1.25 to 100 V _{DC}	0 to 8 A	0 to 30 W
5	1.25 to 100 V _{DC}	0 to 5 A	0 to 10 W
6	1 to 100 V _{DC}	0 to 5 A	0 to 10 W
7	5 to 18 V _{DC}	0 to 2.5 A	0 to 20 W
8	-5 to -18 V _{DC}	0 to 2.5 A	0 to 20 W
Total			0 to 150 W

Outputs Isolation (Ground RTN groups)

- All outputs are isolated form the input.
- Outputs are separated into the following five galvanically isolated groups:
 - Group A: Output #1
 - Group B: Output #2
 - Group C: Output #3
 - Group D: Outputs #4, #5 and #6
 - Group E: Output #7, #8

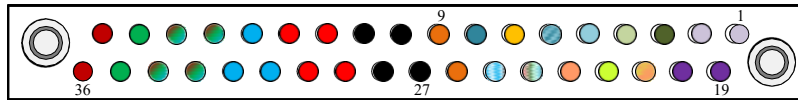
Pin Assignment

Connector type: M55302/61A36 or eq.

Mates with: M55302/62-A36M (solder cup termination) or M55302/66-36M (#22 AWG crimp termination) or eq.

Pin No.	Function	P	
1	OUT 3	+	○
2	OUT 3	+	○
3	OUT 2 RTN	-	●
4	OUT 2	+	○
5	OUT 8	-	○
6	OUTS 7, 8 RTN		○
7	OUT 1 RTN	-	●
8	OUT 7	+	○
9	OUT 1	+	●
10	INPUT RTN	-	●
11	INPUT RTN	-	●
12	INPUT	+	●
13	INPUT	+	●
14	OUT 4	+	○
15	OUTS 4, 5, 6 RTN	-	●
16	OUTS 4, 5, 6 RTN	-	●
17	OUT 5	+	●
18	OUT 6	+	●

Pin No.	Function	P	
19	OUT 3 RTN	-	●
20	OUT 3 RTN	-	●
21	SIGNAL RTN	-	●
22	INHIBIT	+	○
23	SYNC	+	○
24	SENSE 4 RTN	-	○
25	SENSE 4	+	○
26	OUT 1	+	●
27	INPUT RTN	-	●
28	INPUT RTN	-	●
29	INPUT	+	●
30	INPUT	+	●
31	OUT 4	+	○
32	OUT 4	+	○
33	OUTS 4, 5, 6 RTN	-	●
34	OUTS 4, 5, 6 RTN	-	●
35	OUT 5	+	●
36	OUT 6	+	●



Signals Description

SENSE 4 (pin 25)

The **SENSE 4** line is used to achieve accurate voltage regulation at load 4 terminals. To use this feature, connect this pin directly to load 1's positive terminal.

If this function is not required, short **SENSE 4** to **OUT 4** (pins 14, 31 and 32) as close as possible to the connector.

SENSE 4 RTN (pin 24)

The **SENSE 4 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 4 RTN** to **OUT 4 RTN** (pins 15, 16, 33 and 34) as close as possible to the connector.

This signal is referenced to **OUTS 4, 5, 6 RTN**.

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 or 0.5 V – the lesser of the two.

INHIBIT (pin 22)

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.

This signal is referenced to **SIGNAL RTN** (pin 21)

SYNC (pin 23)

The **SYNC** signal is used to synchronize the power supply's switching frequency to system's clock.

Valid external clock frequency is 250 kHz \pm 10 kHz, and duty cycle is 50% \pm 10%.

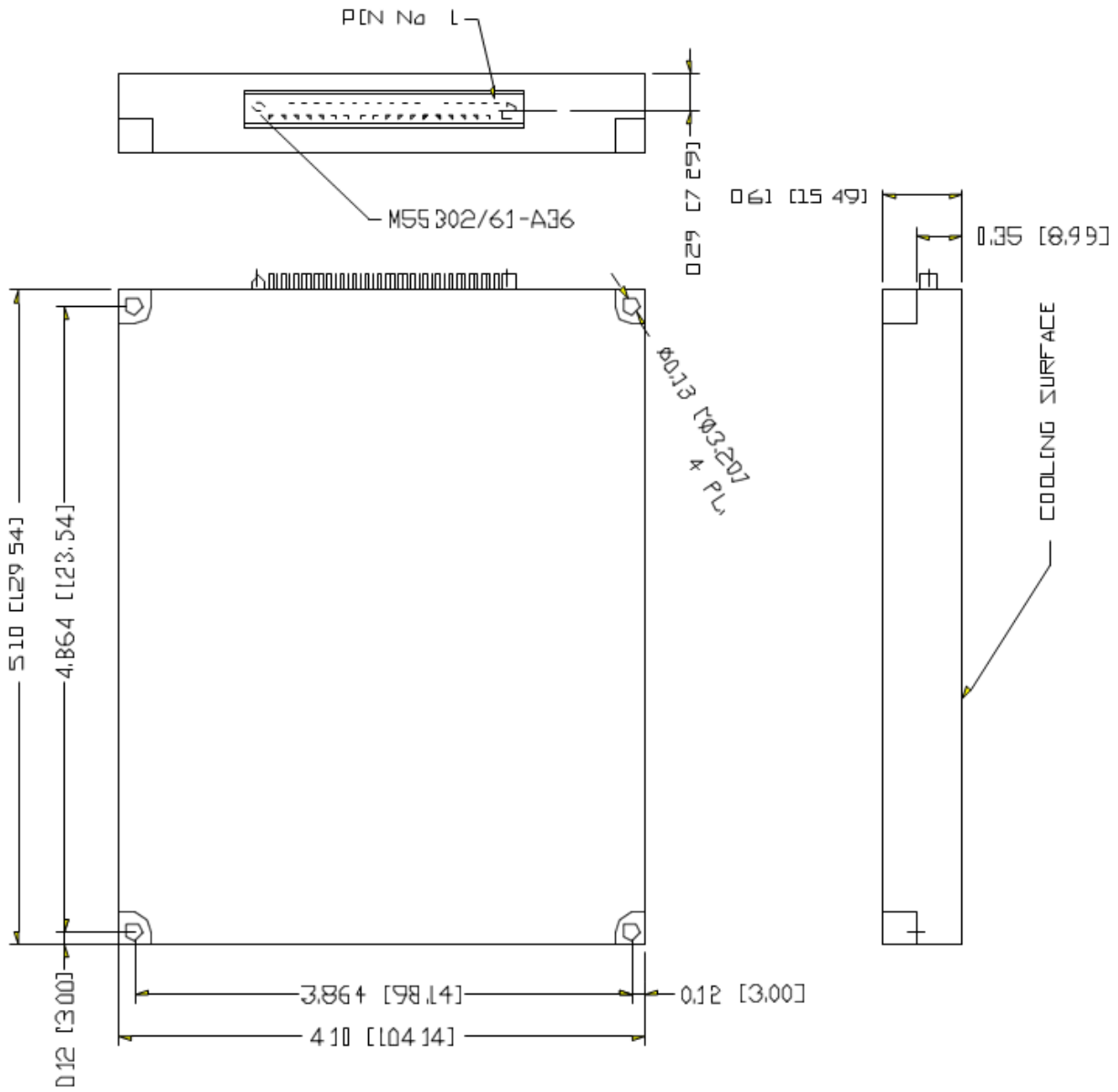
If this function is not required, leave this pin unconnected - the power supply will use its internal clock.

This signal is referenced to **SIGNAL RTN** (pin 21)

SIGNAL RTN (pin 21)

Both **INHIBIT** and **SYNC** signals are referenced to this pin. This pin is referenced to **INPUT RTN** (pins 10, 11, 27 and 28).

Outline Drawing



Notes

1. Dimensions are in inches [mm]
2. Tolerance is:
 .XX ± 0.01 in
 .XXX ± 0.005 in
3. Weight: Approx. 14 oz [400 g]

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