

# M1965 SERIES

## TRIPLE-OUTPUTS OR SINGLE OUTPUTS, 130W

### 1-PHASE AC TO DC POWER SUPPLY

The M1965 is a series of mechanically robust, base plate cooled, high performance, 130W triple or single output AC to DC power supplies, for Navy shipboard, Airborne, and ground applications.

The M1965 converts 85VAC – 265VAC, 50/060/400Hz, to three or one well-regulated, filtered and protected DC Outputs.

The product meet MIL-STD requirements (specified herein).



## M1965 Series– AC/DC Power Supply

**Standard Models List** (for other voltages – consult factory)

Part number	Input	Output 1		Output 2		Output 3	
		Voltage	Voltage	Voltage	Current	Voltage	Current
M1965-100	85-265VAC   Single Phase   50/60/400Hz	12V	3A	12V	3A	5V	8A
M1965-101	85-265VAC   Single Phase   50/60/400Hz	28V	2A	28V	2A	3.3V	5A
M1965-102	85-265VAC   Single Phase   50/60/400Hz	5V	5A	5V	5A	5V	8A

- Additional standard configurations available. **Contact factory for more details.**
- All our products can be configured to comply with EU REACH regulations. **Contact factory for more details.**

## M1965 Series– AC/DC Power Supply

### THE MAIN FEATURES OF THE M1965 ARE:

- AC/DC Triple outputs power supply up to 130W
- 85 to 265VAC Standard Input version
- Miniature size
- High efficiency
- High power factor (up to 96%)
- Input / Output isolation
- Fixed switching freq. (450 kHz for output converters)
- EMI filters included
- Remote inhibit (On/Off)
- Limited inrush current
- Non-latching protections:
- Overload/short-circuit
- Over temperature

## M1965 Series– AC/DC Power Supply

### SPECIFICATIONS:

<b>AC Input</b>	<b>Voltage Range</b>	Option 1: 85 to 265 V <sub>AC</sub> ; 50/60Hz; Single-phase Option 2: 103 to 127 V <sub>AC</sub> ; 400Hz ; Single-phase For 440V <sub>AC</sub> input version - <b>Please contact factory for more details</b>				
	<b>Transient</b>	Work through 80V and 180V IAW MIL-STD-704F figure 3				
	<b>Isolation</b>	Input to Output: 500 VDC Input to Case: 500 VDC				
	<b>Input transient</b>	Voltage overshoot at during power on is less than 3% nominal voltage.				
	<b>Input Current Harmonics</b>	Meets current harmonics requirements of MIL-STD-1399:300B and EN 61000-3-2 Classes A, B and D.				
	<b>Inrush Current Limiter</b>	Peak value of up to 5 times of maximum steady-state input current for inrush currents lasting longer than 50 μs.				
<b>DC Output</b>	<b>OUTPUT RANGE</b>	Out #	Option	Voltage Range	Max current	Max Power
		1	A	0.8-12V	5A	60W
			B	0.8-40V	3.5A	
		2	A	0.8-12V	5A	60W
			B	0.8-40V	3.5A	
		3	A	0.6-5V	8A	40W
	B		0.6-5V	16A	80W	
	<b>Voltage Regulation</b>	Less than ±1% (no load to full load, –40 °C to +85 °C at baseplate).				
	<b>Ripple &amp; Noise</b>	100÷150 mVp-p, typical (max. 1%) without external capacitance.				
	<b>Isolation</b>	Output to Case: 100 VDC Output to Output: 100 VDC				
	<b>Current Limit &amp; Overload</b>	<b>Overload / short-circuit protection</b> Continuous protection (constant current) for unlimited time.				
<b>Efficiency</b>	83% Typical (at nominal input voltage, full load, room temperature)					
<b>Overvoltage Protection</b>	Passive transorbs selected at 120%± 10% of nominal voltage.					
<b>Over Temp. Protection</b>	Shutdown at baseplate temperature of +105 °C ± 5 °C. Automatic recovery when baseplate temperature returns to +95 °C ± 5 °C.					
<b>Line/Load regulation</b>	Less than ±1% (no load to full load, –40 °C to +85 °C at baseplate).					

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	<b>Load Transient Response</b>	<p>For 5V<sub>DC</sub> output, current change from 50% - 100% results in less than 0.15V change.</p> <p>For 12V<sub>DC</sub> output, current change from 50% - 100% results in less than 0.7V change.</p>
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### Specifications (Cont.):

<b>Control &amp; Indication</b>	<b>ON/OFF Input</b>	<p>The INHIBIT signal is used to turn the power supply ON and OFF. The internal 20kΩ pullup, voltage is 3.3V typical and the IPULLDOWN current to RTN needed to turn on the PSUs is 165μA Typical.</p> <p>Table 1 – Inhibit Functionality</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2" style="text-align: center;">Inhibit logic</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">'ON'</td> <td style="text-align: center;">V &gt; 2.4V or Inhibit = 'OPEN'</td> </tr> <tr> <td style="text-align: center;">'OFF'</td> <td style="text-align: center;">Inhibit = 'SHORT' or V &lt; 0.8V</td> </tr> </tbody> </table> <p>The INHIBIT signal is floating from output return.</p> <p>Additional optional ON/OFF inputs: Enable OR 28V between Inhibit pin to signal RTN to active the power supply (output turned on) - Please consult factory.</p>	Inhibit logic		'ON'	V > 2.4V or Inhibit = 'OPEN'	'OFF'	Inhibit = 'SHORT' or V < 0.8V
	Inhibit logic							
	'ON'	V > 2.4V or Inhibit = 'OPEN'						
	'OFF'	Inhibit = 'SHORT' or V < 0.8V						
<b>PS_OK</b>	<p>The PS OK signal indicates the status of the output voltage. When the output voltages rise above 90% ± 5% of its nominal value, " PS OK" will be pulled down to pin 6 through a 100 Ω ± 1% resistor phototransistor.</p> <p>When one of the output voltages falls below 90% ± 5% of its nominal value, "PS OK" will be in high impedance mode.</p> <p>If not used, leave the signal unconnected.</p> <p>Return line: This signal is referenced to PS_OK_RTN and is floating from all other pins.</p>							
<b>SYNC</b>	<p>The SYNC signal is used to allow the power supply frequency to sync with the system frequency. SYNC frequency can be 250 ± 10 kHz, TTL level. When left open, the power supply will work at 250 ± 10 kHz (internal clock).</p>							
<b>SIGNAL RTN</b>	<p>INHIBIT and SYNC signals are referenced to this pin and they are floating from all other pins.</p>							

## M1965 Series– AC/DC Power Supply

<b>Environment Designed to meet MIL-STD-810F</b>	<b>Temperature</b>	Methods 501.4 & 502.4 Operating: –40°C to +85 °C (at baseplate) Storage: –55 °C to +125 °C (ambient)
	<b>Humidity</b>	Method 507.4 Up to 95% RH
	<b>Salt-fog</b>	Method 509.4
	<b>Altitude</b>	Method 500.4 Procedures I – up to 70,000 ft. (non-operational) Procedure II – up to 40,000 ft. (operational)
	<b>Mechanical Shock</b>	Method 516.5 20 g, 11 ms terminal peak saw-tooth
	<b>Vibration</b>	Method 514.5 General minimum integrity exposure IAW Figure 514.5C-17 1 hour per axis.
	<b>Fungus</b>	Does not support fungus growth, in accordance with the guidelines of MIL-STD-454, Requirement 4
<b>EMI</b>	<b>Designed to meet* MIL-STD-461F</b>	CE102-1 (115V limit), CS101, CS114, CS115, CS116, RE102 (44bdµV/m), RS103 (50V/m), CE101-4 curve #1, RE101-1 and RS101.
<b>Reliability</b>	100,000 hours, calculated per MIL-STD-217F Notice 2 at +85 °C baseplate, Ground Fix conditions.	
<b>Cooling Requirements</b>	The M1965 is a baseplate cooled unit. The base of the M1965 should be thermally attached to a suitable heatsink that maintains it below +85 °C.	
<b>Form factor</b>	4" wide, 5.194" high and 0.79" deep. For detailed dimensions and tolerances see Drawing: M1965001	
<b>Weight</b>	470g typical	
<b>Connectors</b>	See page 7	

\* Compliance dependent on specific configuration and is achieved when using shielded interconnection cable.

**M1965 Series– AC/DC Power Supply**

**PIN ASSIGNMENT: J2 - OUTPUT CONNECTOR**

**Connector type:-** M24308/23-27F OR EQ.

Function	Pin No.
ENABLE	13
SYNC	25
SIGNAL RTN	12
PS_OK	24
PS_OK RTN	11
OUT 3	8,9,10,21,22,23
OUT 3 RTN	5,6,7,18,19,20
OUT 2	4,17
OUT 2 RTN	3,16
OUT1	2,15
OUT1 RTN	1,14

**PIN ASSIGNMENT: J1 - INPUT CONNECTOR**

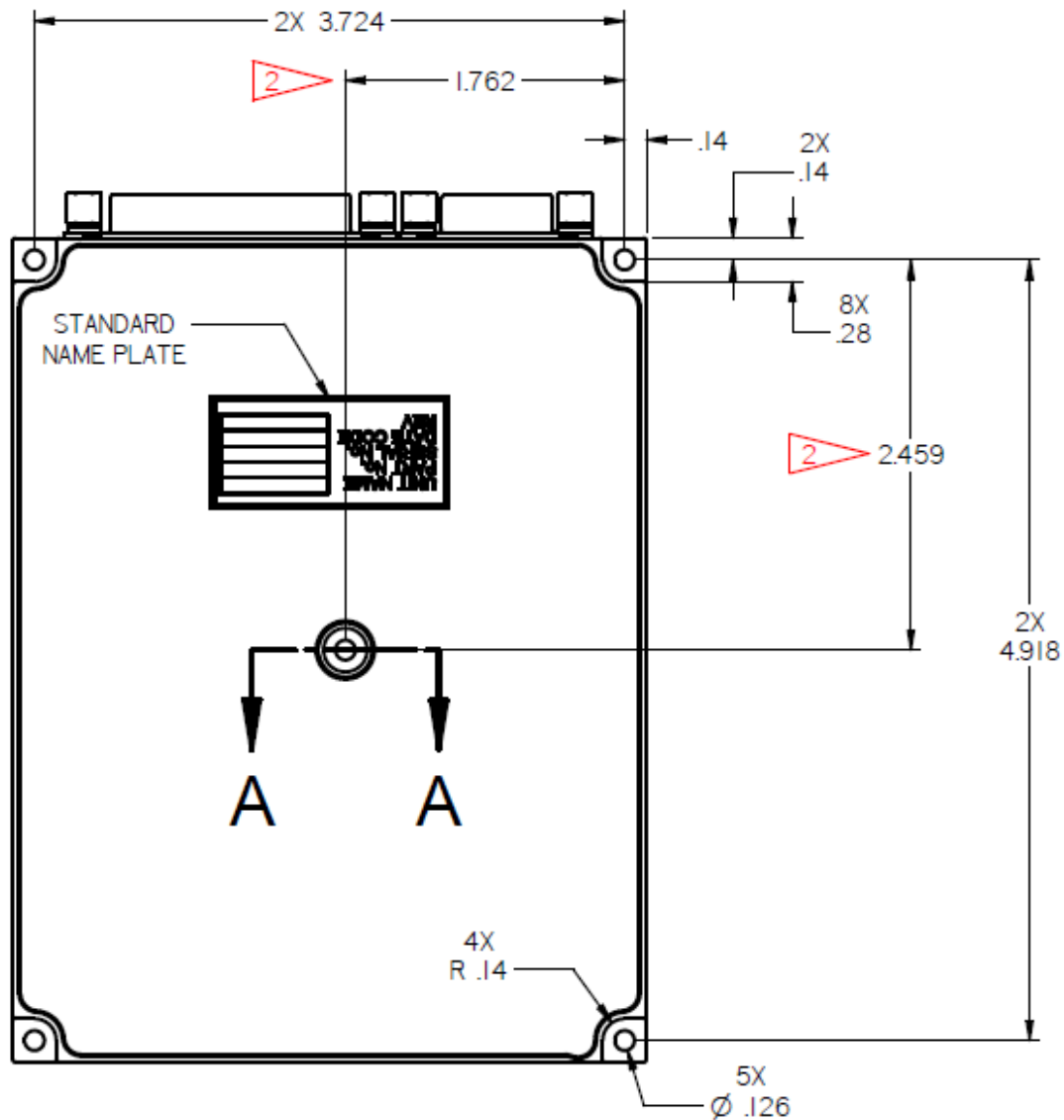
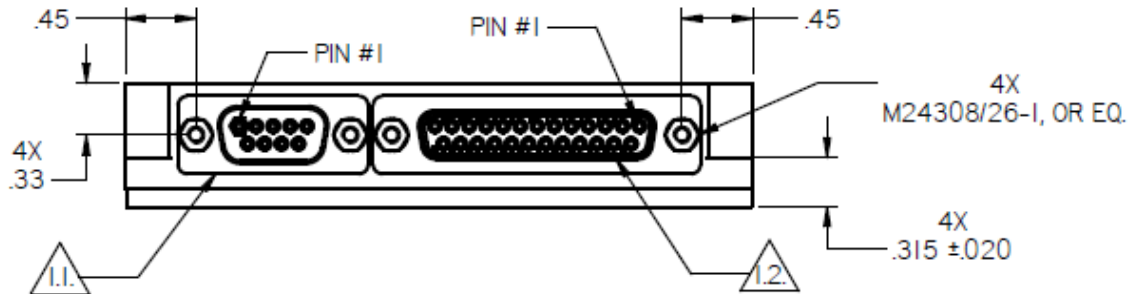
**Connector type -** M24308/24-31F OR EQ.

Function	Pin No.
Line	1
N.C	6,2,7,8,4,9
Neutral	3
Ground	5

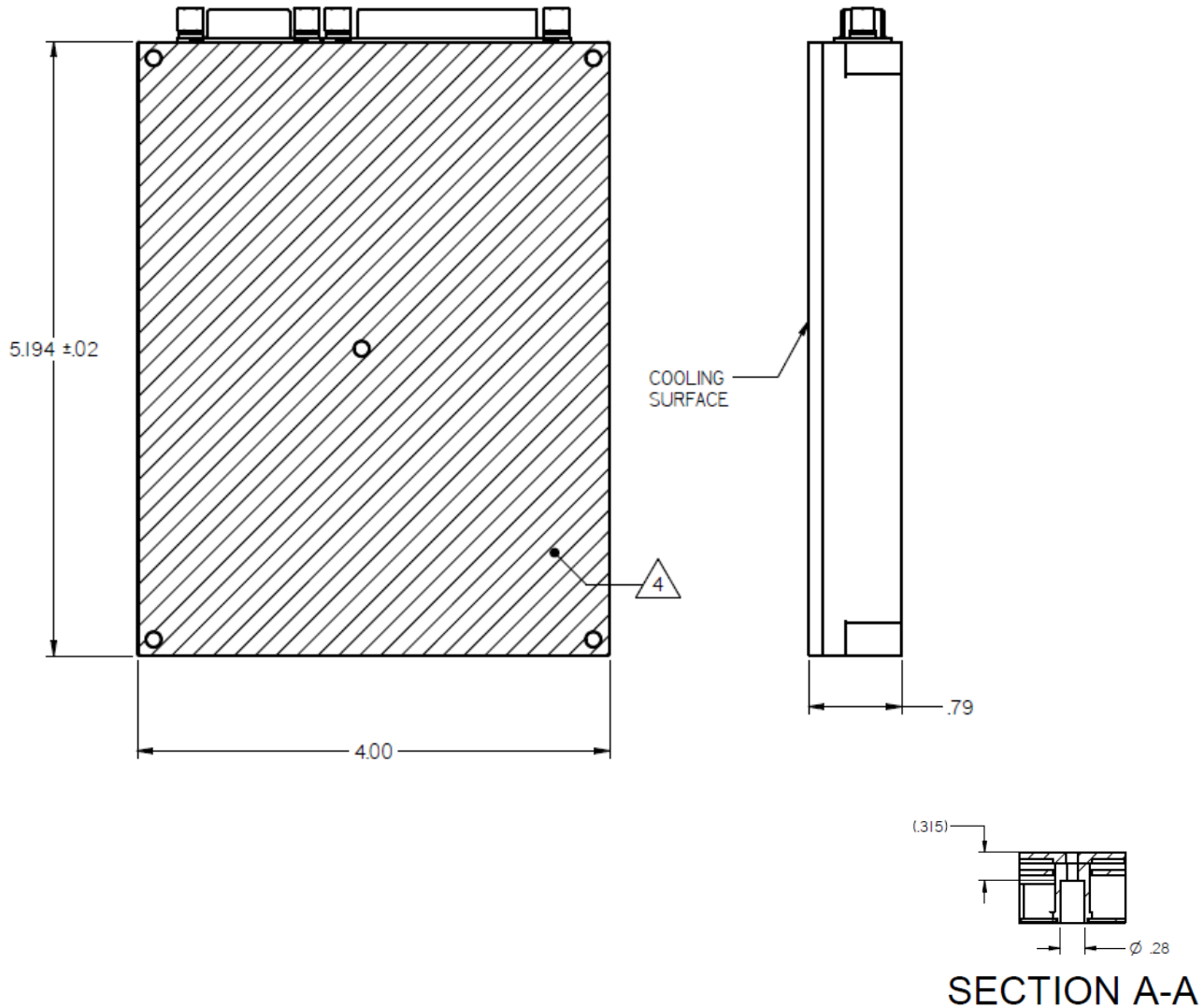
**M1965 Series– AC/DC Power Supply**

**OUTLINE DRAWING**

For detailed dimensions and tolerances see Drawing: M1965001



**M1965 Series– AC/DC Power Supply**



**NOTES :**

**I. CONNECTORS LIST:**

I.1. INPUT CONNECTOR: D-TYPE 9M, M24308/24-31F OR EQ.

**2** I.2. OUTPUT CONNECTOR: D-TYPE 25F, M24308/23-27F OR EQ.

2. MTL. AL 6061-T65I, AL 5052-H32.

3. FINISH: CHROMATE CONVERSION COATING PER MIL -DTL-554I, LAST REVISION, TYPE I, CLASS IA, OR EQ.

4. HEAT DISSIPATION AREA: 20.2 [IN<sup>2</sup>].

5. WORKMANSHIP SHALL BE MIL-STD-454, REQ. 9.

**Please note: Specifications are subject to change without prior notice by the manufacturer.**