



M1912 SERIES

300W Dual Output AC to DC Baseplate Cooled Power Supply



PRODUCT DESCRIPTION

The M1912 is a series of mechanically robust, base plate cooled, high performance, 300W dual output AC to DC power supplies, for Navy shipboard, Airborne, and ground applications. The M1912 converts 115VAC – 230VAC/50-60Hz or 115VAC 400Hz, to a well-regulated, filtered and protected main DC Output 280W and Auxiliary output 20W.

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







STANDARD CONFIGURATIONS

Part	Input		Main Output		Aux Output		
number	Voltage range	Frequency	Voltage	Current	Voltage	Current	ON/OFF Logic
M1912-100	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$12 V_{DC}$	20 A	3.3 V _{DC}	5 A	Enable
M1912-101	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$12 V_{DC}$	20 A	$3.3 V_{\text{DC}}$	5 A	Inhibit
M1912-102	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$12 V_{DC}$	20 A	5 V _{DC}	3.3 A	Enable
M1912-103	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$12 V_{\text{DC}}$	20 A	$5 V_{\text{DC}}$	3.3 A	Inhibit ¹
M1912-104	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$24 V_{DC}$	12A	3.3 V _{DC}	5 A	Inhibit ¹
M1912-106	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$24 V_{DC}$	12A	$5 V_{DC}$	3.3 A	Inhibit ¹
M1912-108	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$24 V_{DC}$	12A	$12 V_{DC}$	1.5 A	Inhibit ¹
M1912-110	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$28 V_{DC}$	10A	3.3 V _{DC}	5 A	Inhibit ¹
M1912-112	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$28 V_{DC}$	10A	5 V _{DC}	3.3 A	Inhibit ¹
M1912-114	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$28 V_{DC}$	10A	$12 V_{DC}$	1.5 A	Inhibit ¹
M1912-116	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$48 V_{DC}$	5.5A	3.3 V _{DC}	5 A	Inhibit ¹
M1912-118	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$48 V_{DC}$	5.5A	5 V _{DC}	3.3 A	Inhibit ¹
M1912-120	Single-phase, 85 to 265 V _{AC}	50/60/400 Hz	$48 V_{DC}$	5.5A	$12 V_{DC}$	1.5 A	Inhibit ¹

• Note: ¹Enbale logic is available - **Contact factory for more details**.

- Additional standard configurations available. Contact factory for more details.
- All of our products can be configured to comply with EU REACH regulations. Contact factory for more details.
- For CE MARKING (IEC 62368-1) configuration Contact factory for more details.







MAIN FEATURES

- > AC/DC Dual output power supply up to 300W
- ➢ Single phase input (50/60/400Hz)
- ▶ Withstands MIL-STD-1399-300B 1,000 V spikes
- > Complies with MIL-STD-461F for shipboard application
- > Complies with MIL-STD-167-1 (Type I) shipboard vibration
- Robust mechanical design, intended for systems that should withstand MIL-DTL-901E high impact shocks
- ▶ High power factor (Full load PF of above 0.9)
- Main output 12V to 48V @ Max 280W
- > Aux. output 3.3V to 12V @ Max 20W
- ➤ High efficiency
- > Full galvanic isolation between Input, Chassis and Outputs.
- Inrush Current Limiter
- External Inhibit (On/Off)
- Fixed switching freq. (250 kHz)
- > EMI filters included
- > Remote sense compensation for Auxiliary output
- > Indefinite short circuit protection with auto-recovery
- Over-voltage shutdown with auto-recovery
- Over temperature shutdown with auto-recovery
- High density
- Conduction cooled via the baseplate
- J-STD-001B and IPC-610A Class-3 workmanship
- Conformal Coating per MIL-I-46058C and IPC-CC-830







SPECIFICATIONS

AC	Voltage and Frequency Under Voltage shutdown	Option 1:85 to 265 VAC ; 50/60HzSingle-phase, 5A maxIAW MIL-STD-1399-300B, Type I (115 Vrms / 60 Hz)Option 2:103 to 127 VAC ; 400HzSingle-phase, 5A maxUnit protects itself (no damage) below 75 VAC @ full load.						
	Inrush Current Limiter	Initial input current surge to charge internal capacitances is limited internally.						
	Isolation	Input to Output: 1000 VDC Input to Case: 1000 VDC <u>Note</u> : Tested during production, at system level the test Voltage limited to 250V since internal TVS installed between Neutral to Chassis for surge protection. If this feature not required, please consult factory .						
	Output Range	Voltage RangeCurrentPowerMain Output12V to 48VUp to 20AUp to 280WAUX Output3.3V to 12VUp to 5AUp to 20WMain output and Auxiliary output are not isolated from each other.Additional configuration available.Consult factory for details.						
	Voltage Regulation	Less than 1% (no load to full load, –40 °C to +85 °C) For voltage output below 5V, Less than 3% (no load to full load, –40 °C to +85 °C)						
DC Output	Remote Sense	 For voltage output below SV, Less than 3% (no load to full load, -40°C to +85°C) AUX SENSE The AUX SENSE line is used to achieve accurate voltage regulation at load terminals. To use this feature, connect this pin directly to load's positive terminal. If this function is not required, short AUX SENSE pin to AUX OUTPUT pins as close as possible to the unit. AUX SENSE RTN The AUX SENSE 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 RTN pin to OUTPUT pins as close as possible to the unit. AUX SENSE RTN The AUX SENSE 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 RTN pin to OUTPUT RTN pins as close as possible to the unit. <u>Note</u>: The use of remote sense has a limit of voltage dropout between the converter's output and the load's terminals of approximately ±0.5V of nominal output unlease 						
	Turn on Overshoot	Output voltage overshoot during power on < 5%						







	Ripple and noise	For Vout>5V typical max 1% For Vout< 5V typical max 2% With 1μF external capacitance.				
	Isolation	Output to case: 200 VDC				
	Current Limit & Overload	10 - 30% above maximum current, indefinitely (Hiccup).				
	Efficiency	$\begin{array}{l} 115 V_{rms} / 400 Hz \geq 80\% \\ 230 V_{rms} / 50 Hz \geq 84\% \\ (Typical @ 250W \ load) \end{array}$				
	Overvoltage Protection	 Active Over Voltage Protection 10% ± 2% above nominal voltage. Passive Over Voltage Protection Transorb/Zener at output selected 20% 				
	Over Temp. ProtectionShutdown at base plate temp. above $+105^{\circ}C \pm 5^{\circ}C$ Automatic reco plate temp. below $+95^{\circ}C \pm 5^{\circ}C$.					
Control & Indication	ON/OFF Input	The ENABLE/ INHIBIT signal is used to turn the power supply ON and OFF.The internal pullup voltage is 3.3V typical and the IPULLDOWN (the minimum current to RTN needed to turn on the PSU) is 3mA Typical.Table 1 – Inhibit and Enable Functionality $\begin{tabular}{ c c c c c }\hline \hline \\ \hline$				
Environment	Temperature	MIL-STD-810F, Methods 501.4 & 502.4 Operating: -40°C to +85°C (at baseplate) Storage: -55°C to +125°C (ambient) Optional: Operating -55°C to +85°C (at baseplate). Consult factory for details.				
	Humidity	MIL-STD-810F, Method 507.4 Up to 95% RH				
	Salt-fog	MIL-STD-810F, Method 509.4				







	Altitude	MIL-STD-810F, Method 500.4 Procedures I – Storage/Air transport: up to 70,000 ft. (non-operational) Procedure II – Operation/Air Carriage: up to 40,000 ft. (operational)					
	Mechanical Shock	MIL-STD-810F, Method 516.5, • Procedure I -Functional shock, 40g, 15 -23 ms, Terminal Peak, Sawtooth shock pulse • Procedure V - Crash Hazard, 40g, 15 -23 ms, Terminal Peak, Sawtooth shock pulse <u>MIL-S-901D</u> : Withstands the high-impact shipboard shock IAW MIL-S-901D, Grade A, Class I and II					
	Vibration	MIL-STD 810F, Method 514.5, Procedure I, Category 24, General minimum integrity exposure, IAW Figure 514.5C-17, 1 hour per axis. Type I vibration IAW MIL-STD-167-1A					
	Fungus	Does not support fungus	growth (MIL	-STD-	810G, Method 508.6)		
	Designed to meet * MIL-STD-461F	Conducted Emission Conducted Susceptibilit Radiated Emission Radiated Susceptibility * All tests are at full load – with shielded Output a	01, CE102 01, CS114, CS115, CS116 01, RE102 01, RS103 e with the provisions of MIL-STD-461F				
EMC	EN/IEC	Radiated Emission Conducted Emission Harmonic current Emission Voltage Fluctuation & Flicker		EN5	N55032 CLASS A C6100-3-2 CLASS A C6100-3-3		
	Immunity Test (EN/IEC)	Test TypeESDRadiated ImmunityEFTSurgeConducted ImmunityMagnetic FieldVoltage dips and shortinterruptions	Test Method EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-8 EN61000-4-11		Test Type/Level/Class Enclosure; Contact; ±4Kv; [B] (80-6000) MHz; 10V/m; [A] ±2kV; [B] L-L: ±1kV; [B] L-E: ±2kV; [B] 150kHz - 80MHz ; 10Vrms; [A] 50Hz; 30A/m; [A] 50Hz; (100/60/30)%; [B & C]		







Cooling Requirements	The M1912 is a baseplate cooled unit. The base of the M1912 should be thermally attached to a suitable heatsink that maintains it below +85 °C.
Form factor	119.4 mm wide, 30 mm high and 177.8 mm deep. The base should be mechanically and thermally attached to a user provided coldplate (see Page 9 and 10). For detailed dimensions and tolerances see Drawing: M1912-100
Weight	1150g (Typical)
Reliability	150,000 hours, calculated IAW MIL-HDBK-217F Notice 2 at +65°C baseplate, Ground fixed conditions.

OPERATIONAL BLOCK DIAGRAM









PIN ASSIGNMENT

J1 – AC Input connector					
Type: Positronic					
CBM3W3M550000 OR EQ.					
Mates with: CBM3W3S00000					
+					
FC4016	FC4016D-15 (X3) – #16 CRIMP CONTACTS				
Pin	Fucntion				
A1	NEUTRAL				
A2	PHASE				
A3	CHASSIS *				

J2 – DC Output connector						
Type: HDC25S50000-15 OR EQ.						
Mates with: M24308/4-3Z OR EQ.						
Pin	Fucntion		Pin	Fucntion		
1	AUX SENSE RTN		14	AUX SENSE		
2	SIGNAL RTN		15	N/A		
3	ENABLE/ INHIBIT		16	AUX OUTPUT		
4	AUX OUTPUT		17	OUTPUT RTN		
5	OUTPUT RTN		18	OUTPUT RTN		
6	OUTPUT RTN		19	OUTPUT RTN		
7	OUTPUT RTN		20	OUTPUT RTN		
8	OUTPUT RTN		21	OUTPUT RTN		
9	OUTPUT RTN		22	OUTPUT		
10	OUTPUT		23	OUTPUT		
11	OUTPUT		24	OUTPUT		
12	OUTPUT		25	OUTPUT		
13	OUTPUT					

* The CHASSIS pin allows additional connection of unit's chassis to system ground.







TYPICAL CONNECTION DIAGRAM









OUTLINE DRAWING









NOTES :

- 1. CONNECTORS:
- 1.1: J1 INPUT CONNECTOR CBM3W3M550000 OR EQ.
- 1.2: J2 OUTPUT CONNECTOR HDC25S50000-15 OR EQ.
- 2. HEAT DISSIPATION SURFACE TOTAL AREA 20,300mm²
- WORKMANSHIP SHALL BE MIL-STD-454, REQT. 9
- MTL. AL 6061-T651& AL 5052-H32
- 5. CHROMATE CONVERSION COATING PER MIL -DTL-5541F, TYPE 1 OR 2 CLASS 1A
- 6. ENGRAVING:
- CHARACTERS HEIGHT: 3 (mm), DEPTH: 0.4 (mm).
- ENGRAVING FILLED WITH BLACK COLOR.
 - These figures are for reference only. For more details, please contact us. •

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

