

SL POWER MINT1500 Series

500 Watts Single Output
Industrial Grade



Advanced Energy's SL Power MINT1500 series is approved to EN/IEC/UL/CSA 62368-1, with isolation levels which satisfy the 2MOPP requirements. The MINT1500 series operates at universal input range of 90 to 264Vac with 24V, 48V and 56V output voltage. It has wide operating temperature range -10 °C to 70 °C, delivering full rated output power up to +50 °C. In addition, these models feature Power Good, DC OK, Inhibit, PS Off and current sharing signals.

AT A GLANCE

Total Power

500 Watts

Input Voltage

90 to 264 VAC

of Outputs

Single

SPECIAL FEATURES

- 3.3" x 7" x 1.5" Package
- Suitable for 1U Applications
- 500 W with air, 350 W Convection Cooled
- Universal Input 90 to 264 VAC
- Efficiency 93% Typical @ 230Vac
- Active Current Share
- 2 x MOPP Input to Output Isolation
- Class I Input
- 5V Standby Output
- 12V Fan Output
- Power Fail Signal
- DC OK Signal
- Inhibit Signal
- Optional Cover
- Low Inrush Current
- 3 Mounting Orientations
- 3 Year Warranty
- RoHS Compliant

SAFETY

- CSA/IEC/EN/UL60601-1, 3rd Edition
- CSA/IEC/EN/UL62368-1
- CE Mark



ELECTRICAL SPECIFICATIONS

Input	
Input range	90 to 270 VAC, 47 to 63 Hz, 1 ϕ , agency approved from 90 to 264VAC; 120 to 370 VDC (External fuse required for DC input). Power supply is protected against brown out condition
Input current	5 A @ 115 VAC, 2.5 A @ 230 VAC
Inrush current	15 A max, cold start @ 270 VAC input
Input fuses	10 A, 250 VAC fuses provided in both line & neutral
Earth Leakage current	<275 μ A @ 264 VAC, 60 Hz, NC <450 μ A @ 264 VAC, 60 Hz, SFC
Efficiency	93% typical at 230 VAC; 92% typical at 115 VAC
Isolation voltage	Input/Ground: 1800 VAC (1 x MOPP) Input/Output: 4000 VAC (2 x MOPP) Output/Ground: 700 VAC
Output	
Output power	500 W continuous with 200 LFM airflow, 350 W convection cooled
Ripple and noise	See "Ordering Information"
Total regulation	Main output: \pm 2%. 12 V Fan output: \pm 10% (with > 0.1 A load on main output); 5 V standby output: \pm 2%
Output voltage	See "Ordering Information"
Switching Frequency	PFC: Variable, 50 kHz to 500 kHz. Main Converter: Variable 40kHz to 180 kHz, 65 kHz typical
Adjustment range	+/-5% from nominal
Turn on time	< 500 mS @ 115 VAC (inversely proportional to input voltage and thermistor temperature)
Hold-up time	20 mS min @ 100 VAC with full load
Minimum load	Not required
Dynamic load regulation	500 μ S typ. for return to within 0.5% of nominal, 3% of nominal output voltage max @ 50% load change from 5% to 100% load, di/dt = 0.2 A/ μ S
Reliability	
MTBF	Over 500,000 hrs @ 115 VAC Input, 25°C Ambient
Protection	
Input fuses	10 A, 250 VAC fuses provided in both line & neutral
Short circuit protection	Provided - no damage will occur if the output is shorted. Self-recovering
Overload protection	120% to 140% of current rating. Hiccup mode
Overvoltage protection	Hiccup mode, self-recovering. See "Ordering Information" for trip ranges.
Overtemperature protection	Automatic power shutdown at T _C = 135°C/115°C, self-recovering
Auxiliary Signals	
Standby Output	5 V @ 200 mA
Power Good	Signal goes HIGH 100 mS–250 mS after main output is in regulation, and goes LOW with 7mS warning time before loss of main output due to loss of AC input (Output is measured above 90% nominal voltage)
DC OK	During normal operation, this signal is logic HIGH. Signal will go LOW for output less than 90% of nominal
Inhibit	Logic High or Open = On; Logic Low/Ground = Off
Fan Output	12 V @ 0.8 A
Current Share	Active single wire, for up to 3 units connected in parallel
PS Off	Logic Low or Open = On; Logic High = Off

ENVIRONMENTAL SPECIFICATIONS

Weight	680 grams, 750g w/cover
Dimensions	3.3" x 7.0" x 1.5" (W x L x H) With Fan Option: Top Mount 3.3" x 7.0" x 2.09" With IEC: 3.3" x 8.15" x 1.58"
Vibration	Operating 0.003 g ² /Hz, 1.5 grms overall, 3 axes, 10 min/axis Non-operating 0.026 g ² /Hz, 5.0 grms overall, 3 axes, 1 hr/axis
Shock	Operating Half-sine, 40 gpk, 8 ms, 3 axes, 6 shocks total
Operating temperature	-10°C to +70°C. Start up at -40°C, full load
Temperature derating	Derate output power linearly above 50°C to 50% at 70°C
Storage temperature	-40°C to +85°C
Altitude	Operating Up to 3000 m (derate 5°C for natural convection cooling applications) Non-operating -150 to 12,000 m
Relative humidity	5% to 95%, non-condensing

EMI/EMC COMPLIANCE

Conducted emissions	EN55011/22 Class B, FCC Part 15, Subpart B, Class B
Radiated emissions	EN55011/22 Class A, FCC Part 15, Subpart B, Class A
Static discharge immunity	EN61000-4-2, 6 kV contact discharge, 8 kV air discharge, criteria A ¹
Radiated RF immunity	EN61000-4-3, 3 V/m, criteria A ¹
EFT/Burst immunity	EN61000-4-4, 2kV/5kHz, criteria A ¹
Line surge immunity	EN61000-4-5, 1 kV differential, 2 kV common mode, criteria A ¹
Conducted RF immunity	EN61000-4-6, 3 Vrms, criteria A ¹
Power frequency magnetic field immunity	EN61000-4-8, 3 A/m, criteria A ¹
Voltage dip immunity	EN61000-4-11, 0% Vin, 10 mS; 40% Vin, 100 mS (60% load); 70% Vin, 500 mS (80% load); 0% to 5000 mS; criteria A ¹ , B
Line harmonic emissions	EN61000-3-2, Class A, and D meets Class C for 500 W output
Flicker test	EN61000-3-3, Complies

Notes:

- According to the standards, performance criteria are decoded as following:
 - Normal performance during and after the test
 - Temporary degradation, self-recoverable
 - Temporary degradation, operator intervention required to recover the operation
 - Permanent damage

ORDERING INFORMATION

Model Number	Output Voltage	Maximum Load with Convection Cooling	Maximum Load with 200LFM Forced Air	Fan Output	Standby Output	Total Regulation	Ripple & Noise ¹	OVP Threshold
MINT1500A2414E01	24 V	14.6 A	20.8 A	12 V/0.8 A	5 V/0.2 A	± 2%	1%	27.6 ± 1.0 V
MINT1500A4814E01	48 V	7.3 A	10.4 A	12 V/0.8 A	5 V/0.2 A	± 2%	1%	55.5 ± 2.0 V
MINT1500A5614E01	56 V	6.3 A	8.9 A	12 V/0.8 A	5 V/0.2 A	± 2%	1%	64.3 ± 2.0 V

Notes:

1. Measured with noise probe directly across output terminals, and load terminated with 0.1 µF ceramic and 10 µF low ESR capacitors. For main output load of less than 5%, total noise & ripple will increase to 2%.

PIN ASSIGNMENTS

Connector	MINT1500	
J1 (Input connector E version)	PIN 1	Ground
	PIN 3	AC Neutral
	PIN 5	AC Line
DC output connector	PIN 1	+Vo
	PIN 2	RTN
J301 (Fan output connector)	PIN 1	+12V Fan
	PIN 2	+12V Fan RTN
J2 (Signal connector)	PIN 1	Remote Sense +
	PIN 2	Remote Sense -
	PIN 3	+5 V Standby RTN
	PIN 4	RTN
	PIN 5	+5 V Standby
	PIN 6	Power Good
	PIN 7	Current Share
	PIN 8	PS_Off
	PIN 9	Enable
	PIN 10	DC_OK

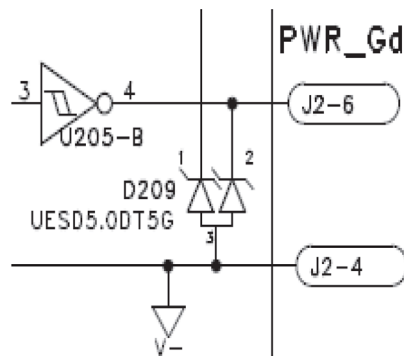
CONNECTORS

	Connector	Mating Connector
J1 (Input connector E version)	/	AMP 770849-5 or 647402-5. Pins = 3-770522-1 or 3-647409-1
DC output connector	Bus bars (M5 x 0.5 screws)	#M3 Spade or Ring Lugs
J301 (Fan Output Connector)	/	AMP 1375820-2, 3-640441-2 or MOLEX 22-01-3027 Pins = AMP 1375819-1 or MOLEX 08-50-0114
J2 (Signal connector)	/	MOLEX 90142-0010. Pins = 90119-2109 or 2120

SIGNAL CONNECTOR - J2

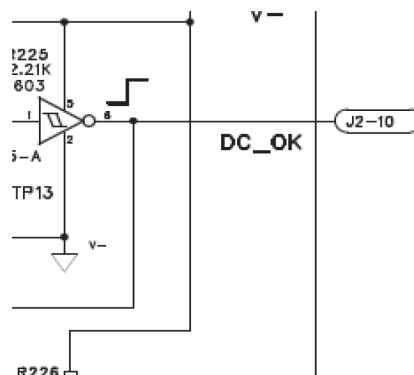
1. Power Good: Output signal - J2 Pin 6

During normal operation is Logic High, goes HIGH 100 mS to 250mS after main output is in regulation, and goes LOW with 7 mS warning time before loss of main output due to loss of AC input. Note: Power Good signal is a combination of AC OK (Internal) and DC OK such that failure of either one will cause the Power Good signal to go low. Logic High: > 4.5V sourcing 16 mA; Logic Low: < 0.5V sinking 16 mA.



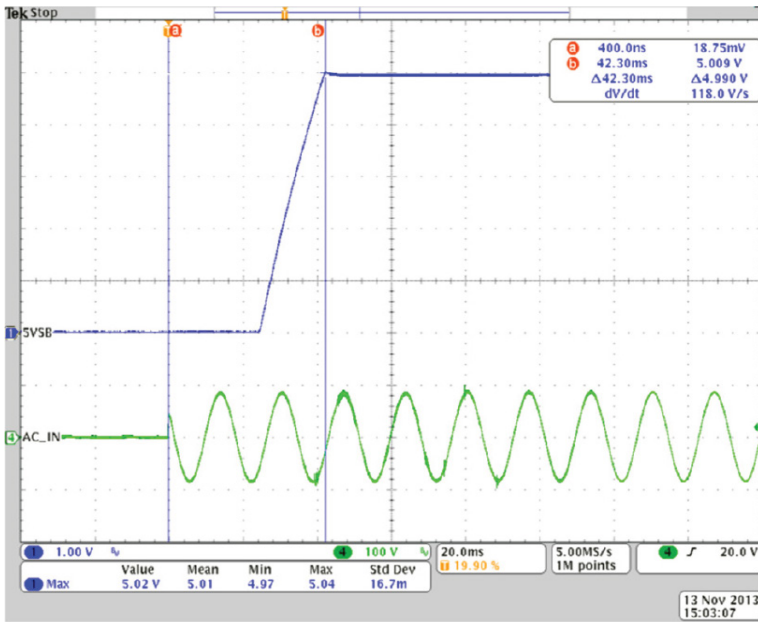
2. DC OK: Output signal - J2 Pin 10

During normal operation, this signal is logic High. It will go logic Low for output less than 90% of its nominal rated voltage. Logic High: > 4.5V sourcing 16 mA; Logic Low: < 0.5V sinking 16 mA.



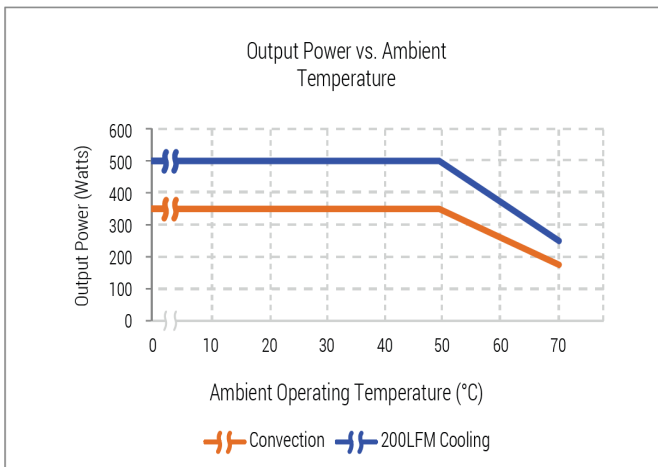
SIGNAL CONNECTOR - J201

- 3. Enable: Input signal - J2 Pin 9
Logic High or Open = On, Low/Ground = Off. Logic High > 3.4V, logic low < 1.2V. Internal pull up resistor: 43kΩ to 5V.
- 4. PS Off: Input signal - J2 Pin 8
Logic Low or Open = On, logic High = Off. Logic High > 3.4V, logic low < 1.2V. Internal pull up resistor: 43kΩ to V-.
- 5. Remote Sense Output Signal - J2 Pin 1 (+Sense), J2 Pin 2 (-Sense)
Less than 250 mV voltage drop compensation due to cable loss on each side of main output.
- 6. Standby Output - J2 Pin 5 (+), J2 Pin 4 (-)
The standby output is always available when AC input is present. It is rated for 5V/0.2A.

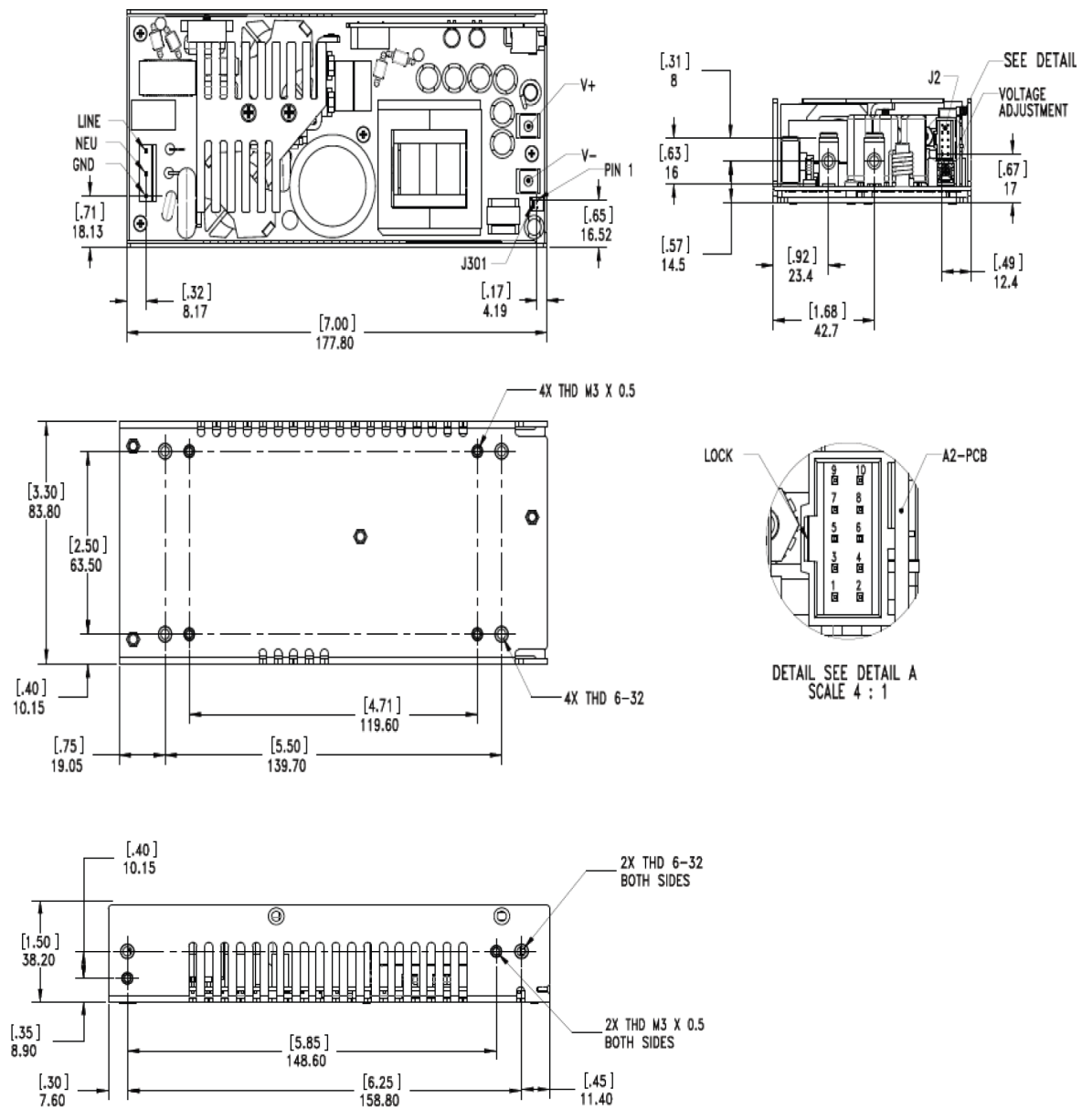


CHARACTERISTIC CURVES

Output vs. Temperature:
350 W convection cooled and 500 W continuous with 200 LFM airflow. Derate output power to 50% at 70°C.



MECHANICAL DRAWING



- Notes:
1. All dimensions in inches (mm), tolerance is $\pm 0.02''$.
 2. Mounting holes should be grounded for EMI purpose.
 3. FG is safety ground connection.
 4. The power supply requires mounting on metal standoffs 0.2" (5 mm) in height, min.



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ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE | TRUST

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