



Industrial

### FEATURES AND BENEFITS

3.3" X 7" X 1.5" Package, Ideal for 1U Applications

Up to 500W W/Air, 350W Convection Cooled

Universal Input 90VAC~270VAC

Active Current Share

Class I Input

Standby and Fan Output Voltages

Inhibit, Power Fail, Output Ok Signals

Approved to IEC60601-1 3<sup>rd</sup> Edition &  
EN60950 2<sup>nd</sup> Edition

2 X MOPP Isolation

93% Efficiency @ 230V Input, 92% @ 115V Input

Optional Cover

3 Mounting Orientations

3 Year Warranty

Low Inrush Current



### MODEL SELECTION

Model Number	Volts	Output Current		Fan Output	5V Standby Output	Ripple & Noise <sup>1</sup>	Total Regulation	OVP Threshold
		w/200LFM air	Convection					
MINT1500A2414E01	24V	20.8A	14.6A	12Vdc/0.8A	5V@200mA	1%	±2%	27.6V ± 1.0V
MINT1500A4814E01	48V	10.4A	7.3A	12Vdc/0.8A	5V@200mA	1%	±2%	55.5V ± 2.0V
MINT1500A5614E01	56V	8.9A	6.3A	12Vdc/0.8A	5V@200mA	1%	±2%	64.3V ± 2.0V

#### Notes:

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



### INPUT

Input Voltage and Frequency	90VAC–270VAC, 47Hz–63Hz agency approved from 90VAC–264VAC. 120VDC–300VDC (External fuse required for DC input). Power supply is protected against brown out condition
Input Current	115VAC: 5A, 230VAC: 2.5A
Inrush Current	270VAC, cold start: will not exceed 15A
Input Fuses	F1, F2: T10A, 250VAC, provided on all models
Earth Leakage Current	<275 $\mu$ A@264VAC, 60Hz, NC; <450 $\mu$ A SFC
Efficiency	92% typical at 115VAC, 93% typical at 230VAC

### SAFETY

Safety Standards	EN/CSA/UL/IEC 60601-1 3 <sup>rd</sup> Edition
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### PROTECTION

Overvoltage Protection	Hiccup Mode, Self-recovering see models chart for trip ranges
Short Circuit Protection	Self-recovering
Overtemperature Protection	Provided, self-recovering automatic power shutdown at TC 135°C/115°C
Overload Protection	120% to 140% of current rating, Hiccup Mode

### ENVIRONMENT

Operating Temperature	-10°C to +70°C (Derate output power linearly by 2.5% /°C above 50°C to 50% at 70°C)
Storage Temperature	-40°C to +85°C
Relative Humidity	5% to 95%, non-condensing
Weight	680 grams. 750g w/cover
Dimensions	W: 3.3" x L: 7.0" x H: 1.5" W: 84mm x L: 178mm x H: 38mm With Fan Option: Top Mount: 3.3" x 7.0" x 2.09" With IEC: 3.3" x 8.15" x 1.58"
Altitude	Operating: Up to 3000m (derate 5°C for natural Convection Cooling Applications) Non-operating: -150m–12,000m
Vibration	Operating: 0.003g <sup>2</sup> /Hz, 1.5 grams overall, 3 axes, 1 hour/axis Operating: 0.026g <sup>2</sup> /Hz, 5.0 grams overall, 3 axes, 10 min/axis
Shock	Operating: Half-sine, 40gpk, 8mS, 3 axes, 6 shocks total

### RELIABILITY

MTBF	Over 500,000 hours, 25°C Ambient, 115VAC input
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### OUTPUT

Output Voltage	See models chart
Output Power	500W continuous with 200 lfm airflow, up to 350W convection cooled @ 100VAC, 50°C ambient
Turn On Time	<500mS @115VAC
Hold-up Time	20mS minimum at full load & 100VAC input
Output Voltage Adjustment	±5% from nominal
Transient Response	500 $\mu$ S typical for return to within 0.5% of nominal, 50% load step from 5% to 100%. $\Delta i/\Delta t$ : <0.2A/ $\mu$ S. Maximum Voltage Deviation = 3%
Ripple and Noise	See models chart
Total Regulation	Main Output: ±2%. 12V Fan Output: ±10% (with >0.1A load on main o/p) 5VSB Output: ±2%
Switching Frequency	PFC: Variable, 50kHz–500kHz Main Converter: Variable 40kHz–180kHz, 65Khz typical
Minimum Load	Not required

### ISOLATION

Isolation	Input-Output: 4000VAC, 2 x MOPP Input-Ground: 1800VAC, 1 x MOPP Output-Ground: 700VDC
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### 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 A, Class A
Static Discharge Immunity	EN61000-4-2, Criteria A, 6kV Contact Discharge, 8kV air discharge
Radiated RF Immunity	EN61000-4-3, 3V/m;10V/M Criteria A, B
EFT/Burst Immunity	EN61000-4-4, 2kV/5kHz
Line Surge Immunity	EN61000-4-5, 1kV differential, 2kV common-mode
Conducted RF Immunity	EN61000-4-6, 3Vrms
Power Frequency Magnetic Field Immunity	EN61000-4-8, 3A/m
Voltage Dip Immunity	EN61000-4-11, 0% Vin, 10mS; 40% Vin, 100mS (60% load); 70% Vin, 500mS (80% load); 0% 5000mS; Criteria A, B
Line Harmonic Emissions	EN61000-3-2, Class A, and D Meets Class C for 500watt output
Flicker Test	EN61000-3-3, Complies



## AUXILIARY SIGNALS

Power Good	Inhibit	PS Off	DC OK	Current Sharing
Signal goes HIGH 100mS–250mS 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)	Logic High or Open = On Low/ground = Off	Low or Open = ON Logic High = OFF	During normal operation, this signal is logic HIGH. Signal will go LOW for output less than 90% of nominal	Active single wire, for up to 3 units in parallel

## ISOLATION SPECIFICATIONS

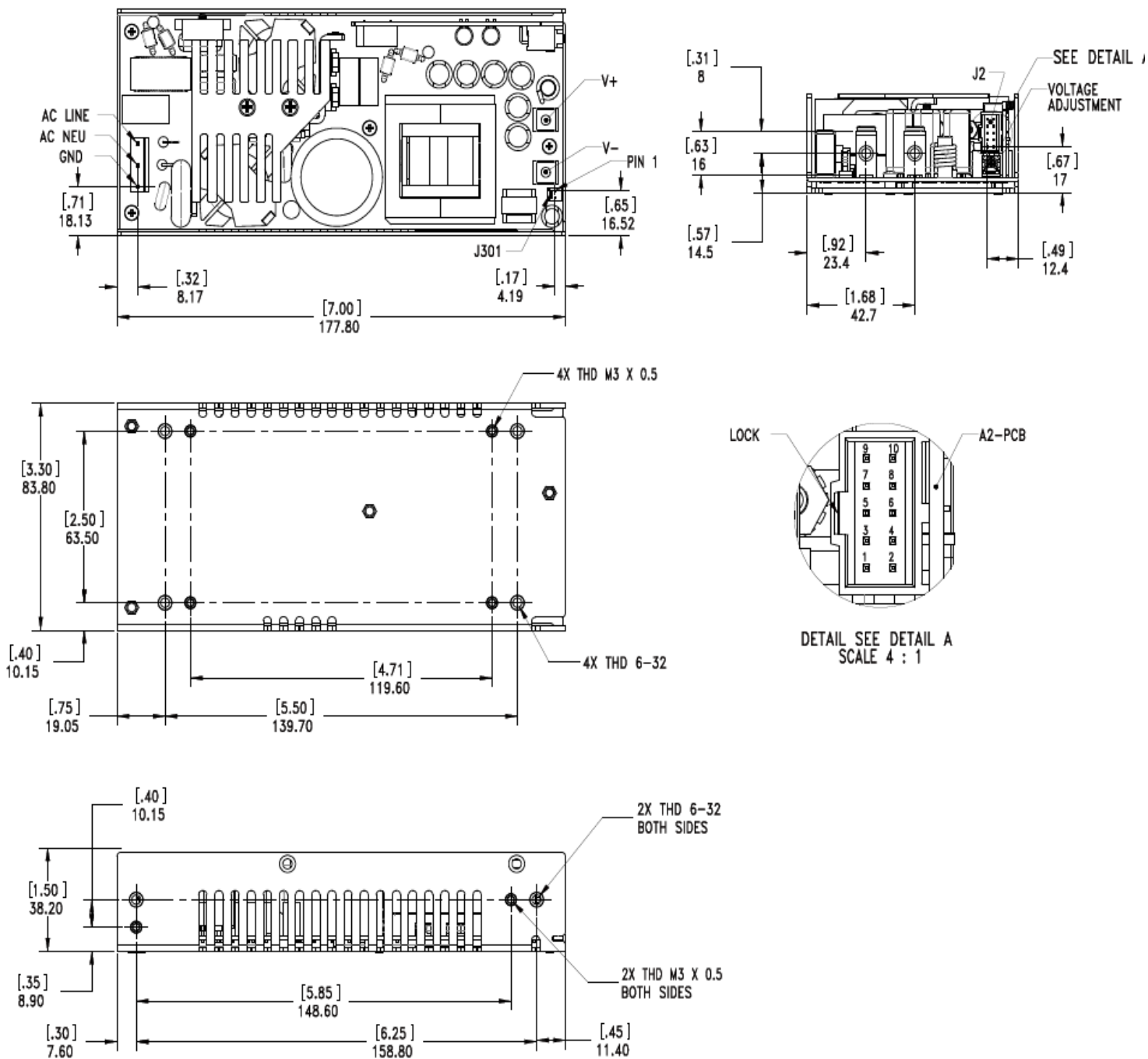
Parameter	Conditions/Description	Min	Nom	Max	Units
Insulation Safety Rating	Input/Ground Input/Output Output/Ground		1 MOPP 2 MOPP Operational		
Electric Strength Test Voltage	Input/Ground Input/Output Output/Ground	1800 4000 700	-	-	VAC VAC VAC

## CONNECTOR INFORMATION

Input Connector J1 (E Version)	DC Output Connector	Fan Output Connector J301	Signal Connector J2 (see Detail B on prior page)	
PIN 1) GROUND PIN 3) AC NEUTRAL PIN 5) AC LINE	(2) Buss Bars (M5 x 0.5 Screws): 1) +Vout 2) RTN	PIN 1) +12Vfan PIN 2) RTN	PIN 1) Remote Sense + PIN 2) Remote Sense - PIN 3) +5Vsb RTN PIN 4) RTN PIN 5) +5Vsb	PIN 6) Power_Good PIN 7) Current Share PIN 8) PS_Off PIN 9) Enable PIN 10) DC_OK
Mating Connector: AMP 770849-5 or 647402-5 Pins= 3-770522-1 or 3-647409-1	Mating Connector: #M3 Spade or Ring Lugs	Mating Connector: AMP 1375820-2, 3-640441- 2, or Molex 22-01-3027 Pins = AMP 1375819-1 or Molex 08- 50-0114	Mating Connector: Molex 90142-0010 Pins = 90119-2109 or 2120	



## MECHANICAL DRAWING



## FAN OPTIONS

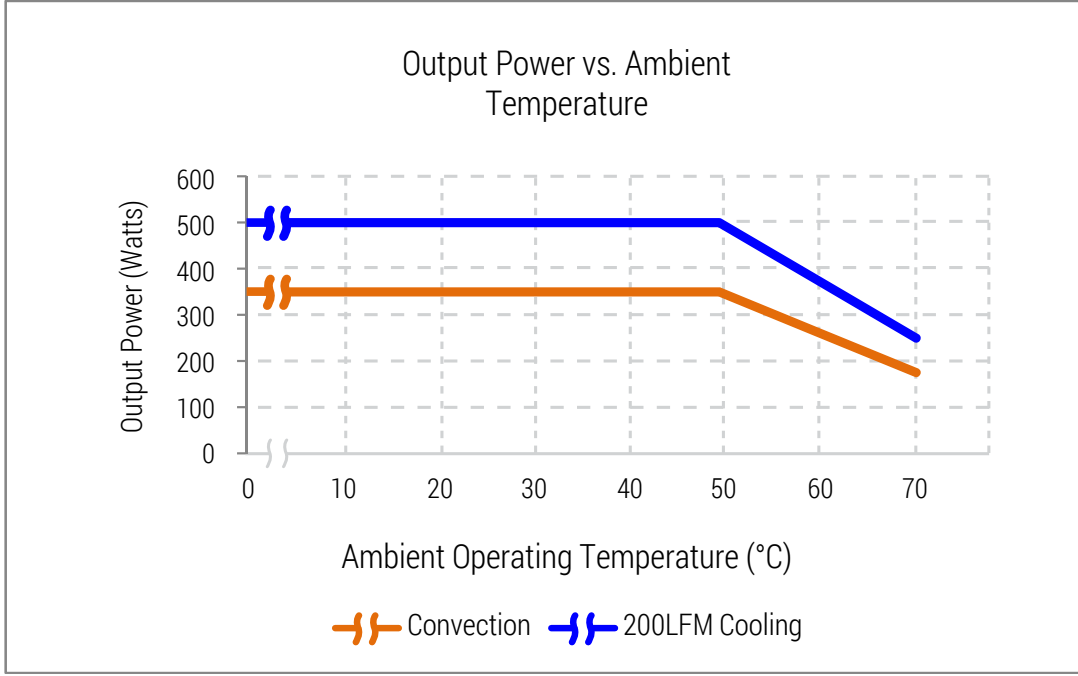
CONSULT FACTORY



## CHARACTERISTIC CURVES

### OUTPUT VS. TEMPERATURE

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



## POWER\_GOOD, DC\_OK, INHIBIT SIGNALS AND CURRENT SHARING – J2

### 1. Power\_Good: - Output Signal – J2 Pin 6

During normal operation is Logic High, goes HIGH 100mS–250mS after main output is in regulation, and goes LOW with 7mS 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 16mA

Logic Low: <0.5V sinking 16mA

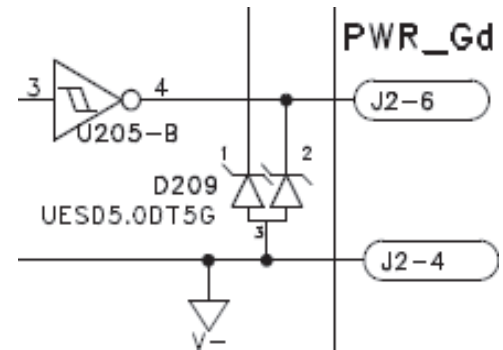


Figure 1



## 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 16mA  
Logic Low: <0.5V sinking 16mA

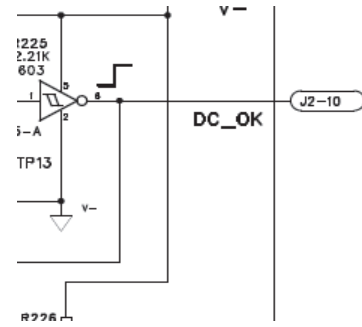


Figure 2

## 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: 43KW 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 down resistor: 43KW to V-

## 5. Remote Sense Output Signal – J2 Pin 1 (+Sense), J2 Pin 2 (-Sense)

Less than 250mV voltage drop compensation due to cable loss on each side of main output. See Figure 3 for wiring connection



## 6. Stand-By Output – J2 Pin5 (+), J2 Pin 4 (-)

The standby output is always available when AC input is present. It is rated for 5V/0.2A

### 5VSB Always present when AC is On

