

## Active PFC MODEL NO. ENP-2300

This specification describes the requirements of 200W switching power supply with FLEX-ATX form-factor, +5V standby voltage, remote on/off control, dual line input capability and forced air cooling characteristics.

### ☞ 1. AC INPUT

#### 1.1 AC input requirements

The input voltage, current, and frequency requirements for continuous operation are stated below.

Table 1 AC Input Line Requirements

Parameter	Min	Nom.	Max	Unit
Vin(Full range)	90	100 - 240	264	VACrms
Vin Frequency	47		63	Hz
Iin(Current)		4 2		Arms

Power Factor Correction (PFC) > 0.95 at full load.

#### 1.2 Inrush current regulation

50 A @ 115Vrms

100 A @ 230Vrms (at 25°C ambient cold start).

### ☞ 2. DC OUTPUT

#### 2.1 DC voltage regulation

Parameter	Range	Min	Nom.	Max	Unit
+3.3V	+/-5%	+3.14	+3.3	+3.47	Volts
+5V	+/-5%	+4.75	+5	+5.25	Volts
+12V	+/-5%	+11.4	+12	+12.6	Volts
-5V	+/-10%	-4.5	-5	-5.5	Volts
-12V	+/-10%	-10.8	-12	-13.2	Volts
+5VSB	+/-5%	+4.75	+5	+5.25	Volts

## 2.2 Load ranges

### ENP-2300 (200 Watts)

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	1.0	-	17.0		Amps
+5V	3.0	-	12.0		Amps
+12V	1.0	-	10.0	13.0	Amps
-5V	0.0	-	0.3		Amps
-12V	0.0	-	0.5		Amps
+5VSB	0.0	-	1.5		Amps

#### Notes:

- (1) The maximum continuous average DC output power shall not exceed 200W for ENP-2320 .
- (2) The maximum continuous average load on +5V and +3.3V outputs shall not exceed 61W for ENP-2320 .
- (3) The maximum total combined current on -12V and -5V is 0.8A.
- (4) The +5V standby outputs shall remain on with the AC input power connected, whether the powersupply DC outputs are disabled (Off) or enabled (On) by the remote on control signal.
- (5) Peak +12 VDC outputs power not to exceed 13 seconds in duration .

## 2.3 Output Ripple

### 2.3.1 Ripple regulation

Parameter	Ripple+Noise	Unit
+3.3V	100	mVp-p
+5V	100	mVp-p
+12V	200	mVp-p
-5V	200	mVp-p
-12V	200	mVp-p
+5VSB	200	mVp-p

### 2.3.2 Definition

The ripple voltage of the output shall be measured at the pins of the output connector when terminated in the load impedance specified in Figure 1. Ripple and noise are measured at the connectors with a 0.1uF ceramic capacitor and a 10uF electrolytic capacitor to simulate system loading. Ripple shall be measured under any condition of line voltage, output load, line frequency, operation temperature.

### 2.3.3 Ripple voltage test circuit

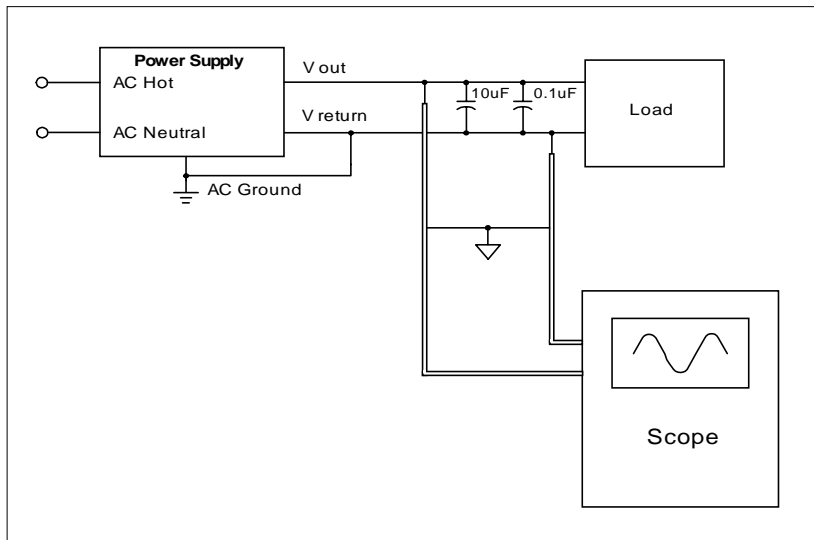


Figure 1. Ripple voltage test circuit

### 2.4 Overshoot

Any overshoot at turn on or turn off shall be less 10% of the nominal voltage value, all outputs shall be within the regulation limit of section 2.0 before issuing the power good signal of section 5.0.

### 2.5 Efficiency

Power supply efficiency typical 65% at normal AC main voltage and full load on all outputs.

### 2.6 Remote on/off control

When the logic level "PS-ON" is low, the DC outputs are to be enabled.

When the logic level is high or open collector, the DC outputs are to be disabled.

## ☞ 3.0 PROTECTION

### 3.1 Over-power protection

The power supply will be shutdown and latch off when output power over 150% of rated DC output.

**NOTES:** 5Vsb will be auto-recovery when the fault removed.

### 3.2 Over voltage protection

In an over voltage fault occurs, the supply will latch all DC output into a shutdown state when +5V & +3.3V outputs exceed 130% of its maximum value; +12V outputs exceed 140% of its maximum value.

### 3.3 Short circuit

The power supply shall shutdown and latch off for shorting +3.3V, +5V, -5V, or +12V, -12V rails. The main output short circuit of any impedance shall less than 0.1 ohms. The maximum short circuit current in any output shall not exceed 240VA.

### 3.4 No load operation

No damage or hazardous will occur with any output disconnected from load.

4. TIMING

4.1 Signal timing drawing

Figure 2. is a reference for signal timing for main power connector signals and rails.

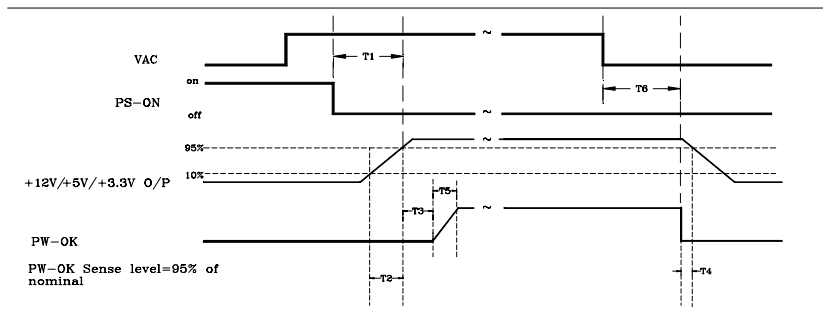


Figure 2. PS-OK Timing Sequence

- (1) Rise time ( $0.1ms \leq T2 \leq 20ms$ )
- (2) Power good signal turn on delay time ( $100ms < T3 < 500ms$ )
- (3) Power good signal turn off delay time ( $T4 \geq 1ms$ )
- (4) Rise time ( $T5 \leq 10ms$ )

4.2 Hold up time (T6 of Figure 2.)

When the power loss its input power, it shall maintain 16ms in regulation limit at nominal input voltage. (AC:115/60Hz or 230V/50Hz)

5. ENVIRONMENT

5.1 Operation

Temperature	0 to 40°C
Relative Humidity	10 to 85%, non-condensing

5.2 Shipping and Storage

Temperature	-20 TO 60°C
Relative Humidity	5 to 95%, non-condensing

5.3 Altitude

Operating	10,000FT max
Storage	50,000FT max

## ☞ 6. SAFETY

### 6.1 Underwriters Laboratory (UL) recognition.

The power supply designed to meet UL 1950.

### 6.2 Canadian Standards Association(CSA) approval.

The power supply designed to meet CSA C22.2 NO. 950.

### 6.3 The power supply must be certified to EN60 950, A1 and A2.

### 6.4 CB test report to meet the IEC 950 2ND.

### 6.5 SEMKO,NEMKO,DEMKO,or SETI certified by any NORDIC CENELEC.

### 6.6 The power supply must bear the German Bauart Mark from TUV or VDE.

## ☞ 7. ELECTROMAGNETIC COMPATIBILITY (EMC)

### 7.1 IEC 1000-4-2 ESD LEVEL X20KV4.

### 7.2 IEC 1000-4-3 radiated electrical field requirement.

### 7.3 IEC 1000-4-4 BURST.

### 7.4 IEC 1000-4-5 surge Voltages.

### 7.5 EN 61000-3-2 harmonic current emissions.

If applicable to sales in Japan or Europe, the power supply shall meet the requirements of EN 61000-3-2 class D and the guidelines for the suppression of harmonics in appliances and general use equipment class D for harmonic line current content at full-rated power.

### 7.6 EN55022 Class B Radio interference (CISPR 22)

### 7.7 FCC Part 15, Subpart J class B 115VAC operation.

## ☞ 8. MTBF

### 8.1 MTBF (mean time between failures)calculation

> 100,000 Hours at 75% of maximum continuous output loading at 25°C ambient conditions.  
The DC FAN is not included.

9. MECHANICAL REQUIREMENTS

9.1 Physical dimension

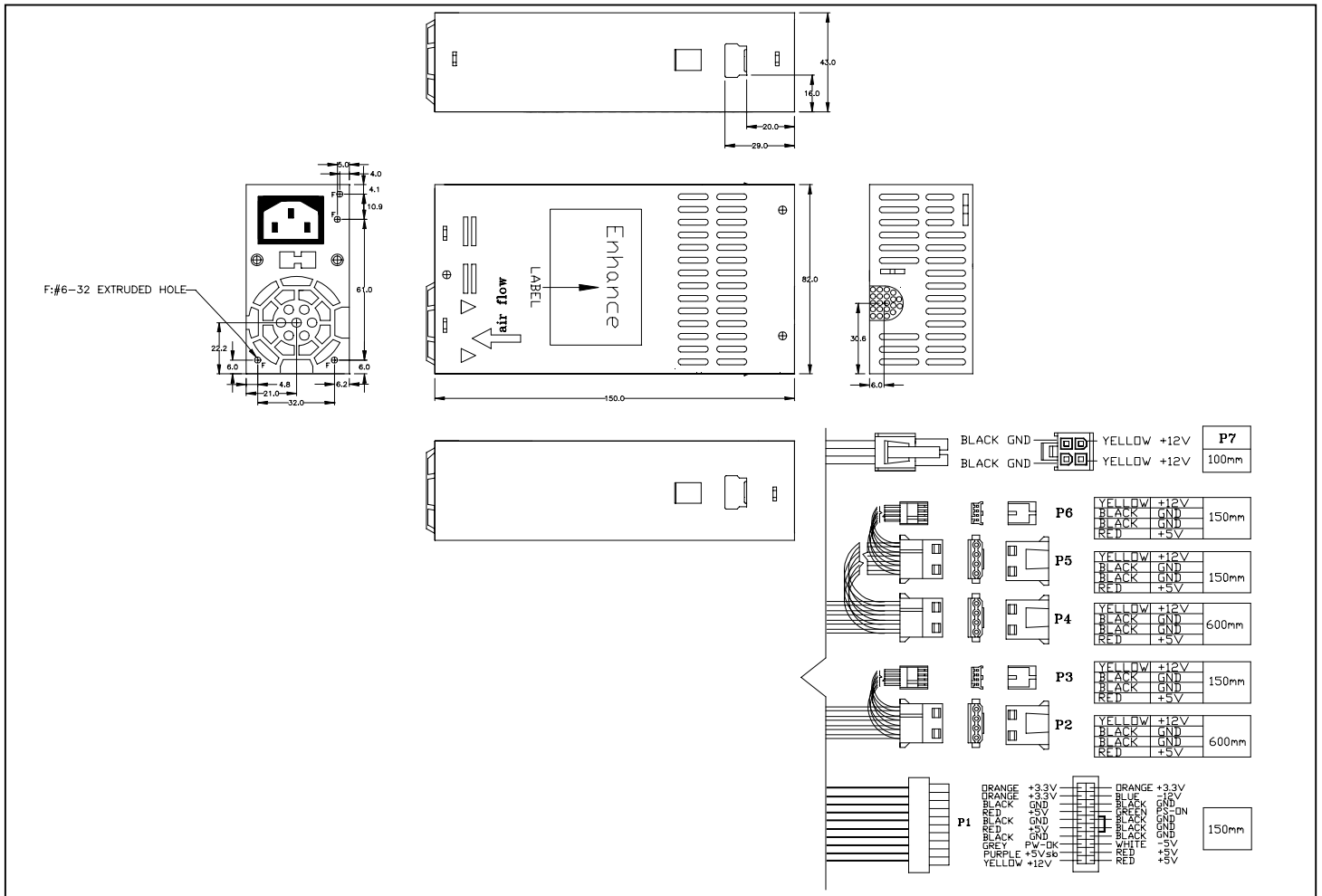


FIGURE 3.MECHANICAL DIAGRAM

**9.2 Connectors (INTEL approved equivalent)****P1 connector (Molex 39-01-2200 or equivalent)**

18AWG wire	Signal	Pin	Pin	Signal	18AWG wire
Orange(20AWG)	+3.3V	11	1	+3.3V	Orange
Orange(22AWG)	3.3 sense	11			
Blue	-12VDC	12	2	+3.3V	Orange
Black	COM	13	3	COM	Black
Green	PS-ON	14	4	+5VDC	Red
Black	COM	15	5	COM	Black
Black	COM	16	6	+5VDC	Red
Black	COM	17	7	COM	Black
White	-5VDC	18	8	POK	Grey (20AWG)
Red	+5VDC	19	9	+5VSB	Purple (20AWG)
Red	+5VDC	20	10	+12VDC	Yellow

**P2,P4,P5 (AMP 1-480424-04 or Molex 8981-04P or equivalent)****P3,P6 (AMP 171822-4 or Equivalent)**

18 AWG wire	Signal	Pin	Pin	Signal	22AWG wire
Yellow	+12VDC	1	1	+5VDC	Red
Black	COM	2	2	COM	Black
Black	COM	3	3	COM	Black
Red	+5VDC	4	4	+12VDC	Yellow

**ATX12V Power Connector****P7 (Molex 39-01-2040 or equivalent)**

Pin	Signal	8AWG wire	Pin	Signal	18AWG wire
1	GND	Black	3	+12V1	Yellow
2	GND	Black	4	+12V1	Yellow