MODEL NO. ENH1930 (300W,ACTIVE PFC)

This specification describes the requirements of 300Watt switching power supply with an EPS 1U form-factor and,+5V standby voltage, remote on/off .

☞ 1.0 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	90	**100-240**	264	VACrms
Vin Frequency	47	**60---50**	63	Hz
Iin		**4.5--2.5**		Arms

Power factor correction (PF)>0.9 at full load.

1.2 Inrush current regulation

The power supply must meet inrush requirements for any rated AC voltage, during turn on at any phase of AC voltage, during a single cycle AC dropout condition, during repetitive ON/OFF cycling of AC, and over the specified temperature range (Top). The peak inrush current shall be less than the ratings of its critical components (including input fuse, bulk rectifiers, and surge limiting device).

☞ 2.0 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	+5.0	+5.25	Volts
+12V1	±5%	+11.4	+12.0	+12.6	Volts
+12V2	±5%	+11.4	+12.0	+12.6	Volts
-12V	±10%	-10.8	-12.0	-13.2	Volts
+5VSb	±5%	+4.75	+5.0	+5.25	Volts

2.2 LOAD RANGE

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	0.5	-	**16**		Amps
+5V	0.5	-	**12**		Amps
+12V1	0.2	-	**20**		Amps
+12V2	0.5	-	**20**		Amps
-12V	0.0	-	**0.3**		Amps
+5VSb	0.0	-	**4**		Amps

Notes:

(1) The maximum combined load on +3.3V and +5V outputs shall not exceed 80W.

(2) The maximum continuous average DC outputs power shall not exceed 300W.

(3) +12V total DC output power shall not exceed 245W.

(4) The peak total DC outputs power shall not exceed 330W.

(5) When +5V load is12A,the +12V Min load is 2.5A.

(6) Peak total output power not to exceed 12 seconds in duration .

2.3 Output Ripple

2.3.1 Ripple regulation

Parameter	Ripple&Noise	Unit
+3.3V	**50**	mVp-p
+5V	**50**	mVp-p
+12V1	**120**	mVp-p
+12V2	**120**	mVp-p
-12V	**120**	mVp-p
+5VSb	**50**	mVp-p

2.3.2 Definition

The ripple voltage of the outputs shall be measured at the pins of the output connector when terminated in the load impedance specified in figure1.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

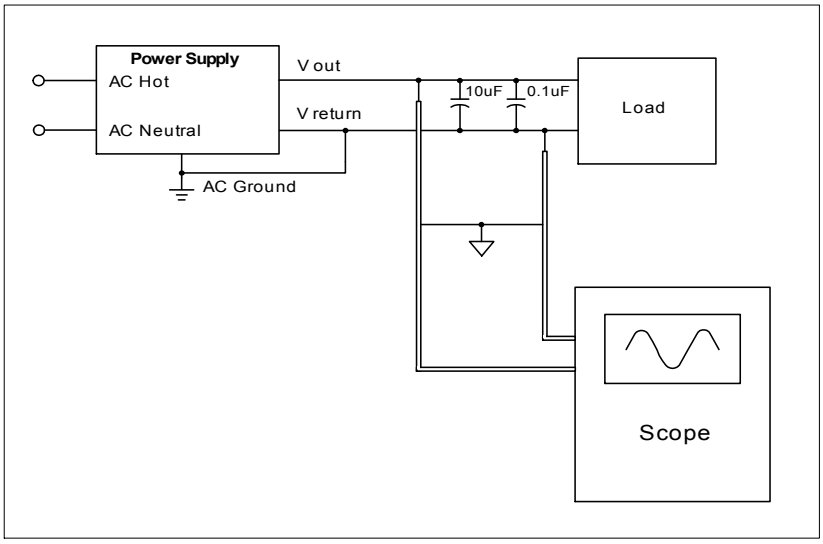


Figure 1. Ripple voltage test circuit

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 **76%** 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 110% ~ 150% of rated DC output.

3.2 Over voltage protection

The over voltage sense circuitry and reference shall reside in packages that are separate and distinct from the regulator control circuity and reference. No single point fault shall be able to cause a sustained over voltage condition on any or all outputs. The supply shall provide latch-mode over voltage protection as defined in Table.

Output	Minimum	Nominal	Maximum	Unit
+12 VDC	13.4	15.0	16.7	Volts
+5 VDC	5.74	6.3	7.0	Volts
+3.3 VDC	3.76	4.2	**4.8**	Volts

3.3 Short circuit

An output short circuit is defined as any output impedance of less than 0.1 ohms. The power supply shall shut down and latch off for shorting the +3.3 VDC,+5 VDC,or+12 VDC rails to return or any other rail. Shorts between main output rails and +5VSB shall not cause any damage to the power supply. The power supply shall either shut down and latch off or fold back for shorting the negative rails.+5VSB must be capable of being shorted indefinitely, but when the short is removed, the power supply shall recover automatically or by cycling PS_ON#.The power supply shall be capable of withstanding a continuous short-circuit to the output without damage or overstress to the unit

3.4 No load operation

No damage or hazardous condition should occur with all the DC output connectors disconnected from the load. The power supply may latch into the shutdown state.

3.5 Output Capcitive Loads

Output	Min	Max
12V	10	11000uF
5V	10	4700uF
3.3V	10	6800uF
-12V	1	350uF
5Vsb	1	350uF

☞ 4.0 TIMING

4.1 Signal timing drawing

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

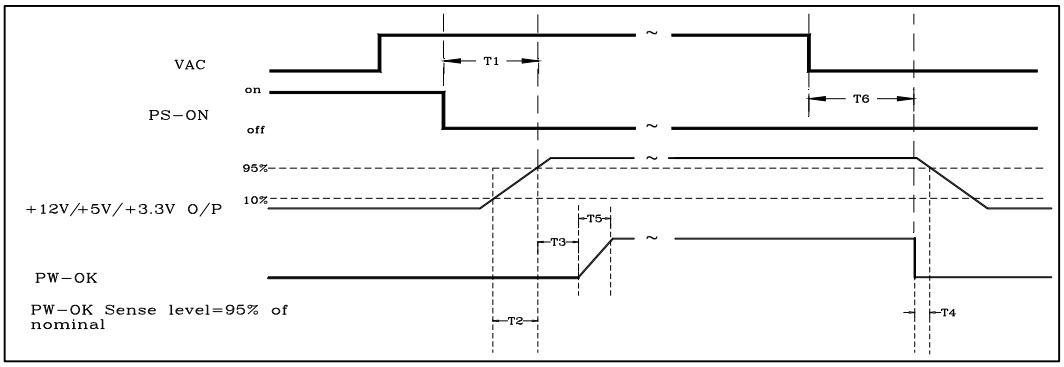


Figure 2. PS-OK Timing Sequence

(1)T2: Rise time (0.1ms~70ms)

(2)T3: Power good signal turn on delay time (100ms~500ms)

(3)T4: Power good signal turn off delay time (1ms min)

(4)T5: Rise time (10ms max)

4.2 .Output Transient Response

Table 13. summarizes the expected output transient step sizes for each output.

The transient load slew rate is =0.5A/us.

Table 13. DC Output Transient Step Sizes

Output	Step Load Size	Load Siew Rate	Capacitive Load
+3.3V	30%of max load	0.5A/uS	1000uF
+5V	30%of max load	0.5A/uS	1000uF
12V1	65%of max load	0.5A/uS	2200uF
12V2	65%of max load	0.5A/uS	2200uF
+5VSB	25%of max load	0.5A/uS	1uF
-12V	25%of max load	0.5A/uS	350uF

'(1) For example, for a rated +5 VDC output of 12A,the transient step would be 30% x 12A=3.6A

Output voltages should remin within the remain within the regulation limits of Section 2.1,and the power supply should stable when subjected to load transients per Table 13. from any steady state load, including any or all of the following conditions:

Simultaneous load steps on the +12 VDC,+5 VDC,and +3.3 VDC outputs (all steps occurring in the same direction)

Load-changing repetition rate of 50 Hz to 10 kHz

AC input range per Section 1.0

4.3 Hold up time

When the power loss its input power,

It shall maintain **16ms** at nominal input voltage.(AC:115V/60Hz or 230V/50Hz)

☞ 5.0 ENVIRONMENT

5.1 Operation

Temperature	**0 to 40** ^{o}C
Relative Humidity	to 85%,on-condensing

5.2 Shipping and Storage

Temperature	-10 to 50^{o}C
Relative Humidity	to 95%,non-condensing

5.3 Altitude

Operating	2000m
Storage	3000m

☞ 6.0 SAFETY

6.1 Underwriters Laboratory (UL) recognition.

The power supply designed to meet UL 60950.

☞ 7.0 ELECTROMAGNETIC COMPATIBILITY (EMC)

7.1 ELECTROSTATIC DISCHARGE (ESD) - IEC 61000 – 4 - 2：2008

7.2 ELECTRICAL FAST TRANSIENT / BURST (EFT/B) – IEC 61000 – 4 - 4：2012

7.3 SURGE – IEC 61000 – 4 - 5：2005

7.4 POWER FREQUENCY MAGNETIC FIELD – IEC 61000 – 4 - 8：2009

7.5 VOLTAGE DIPS – IEC 61000 – 4 - 11：2004

7.6 RADIATED SUSCEPTIBILTY – IEC 61000 – 4 – 3 ：2006+A1 ：2007+A2：2010

7.7 CONDUCTED SUSCEPTIBILTY – IEC 61000 – 4 - 6：2008

7.8 VOLTAGE FLUCTATION - EN 61000 – 3 – 3 ：2008

7.9 EN61000-3-2：2006+A2：2009 harmonic current emissions.

If applicable to sales in 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.

7.10 EN55022：2010/AC：2011 Class B Radio interference (CISPR 22).

7.11 ANSI C63.4-2009 / FCC Part 15, Subpart B / IEC-003 lssue 5 class B 115VAC operation.

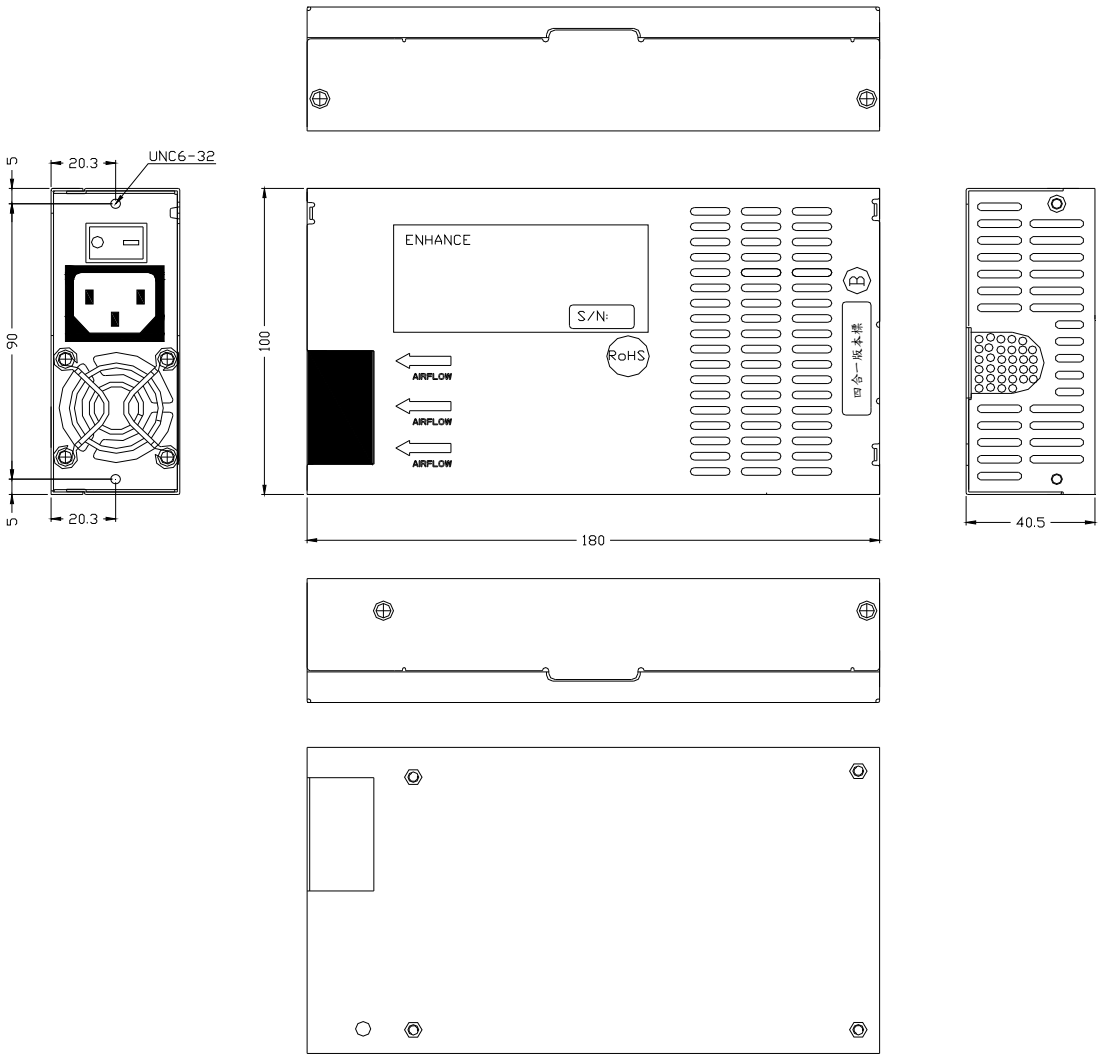
☞ 8.0 MTBF

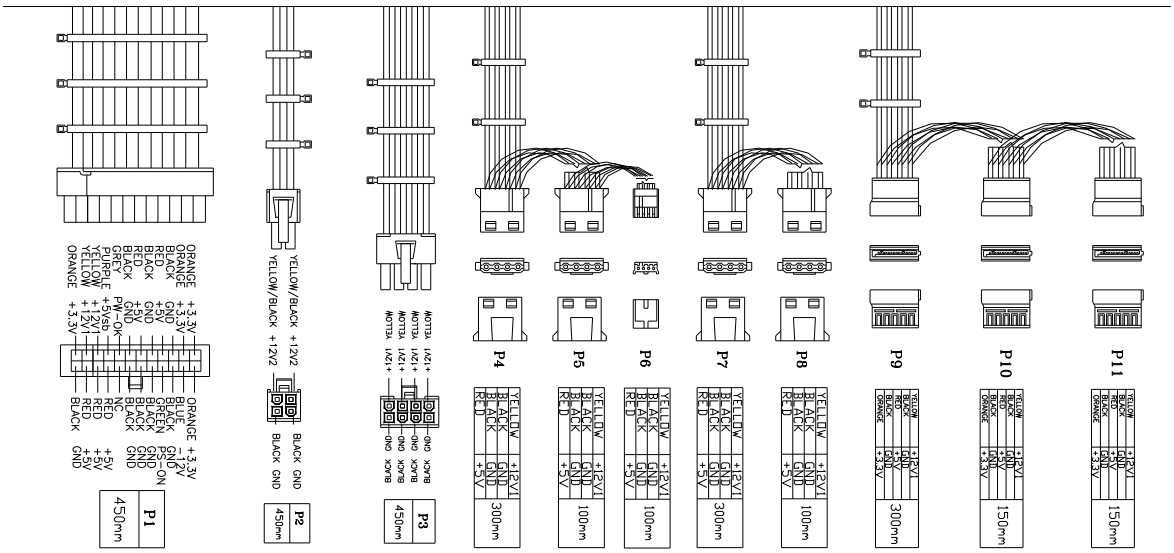
MTBF (mean time between failures) calculation

The demonstrated MTBF shall be 100,000 hours of continuous operation at 25^{o}C, full load and 120V AC input. The MTBF of the power supply shall be calculated in accordance with MIL-HDBK-217F. The DC FAN is not included.

☞ 9.0 MECHANICAL REQUIREMENTS

9.1 Physical dimension : L180mm*W100mm*H40.5mm





☞ 10. FAN SPEED CONTROL

Fan voltage varies with the ambient temperature or output power.