

**MODEL NO. ENP7000 延伸版 300W (ACTIVE PFC)**

This specification describes the requirements of 300Watts switching power supply with an FLEX-ATX form-factor and TFX 12V,+5V standby voltage,remote on/off, dual line input capability.

**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	
V <sub>in</sub>	90	<b>100</b>	<b>240</b>	264	VACrms
V <sub>in</sub> Frequency	47	<b>60</b>	<b>50</b>	63	Hz
I <sub>in</sub> (300W)		<b>5</b>	<b>2.5</b>		A

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. 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
+12V	±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

1. When no load, +3.3V output voltage +/-5% regulation limits do not apply.

2. When dynamic load, +12V regulation can to +/-10%.

## 2.2 LOAD RANGE

### 2.2.1 ENP7030( 300Watts) +12V雙組

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	0.2	-	13		Amps
+5V	0.2	-	14		Amps
+12V1	0.6	-	20	22	Amps
+12V2	0.6	-	20	22	Amps
-12V	0.0	-	0.3		Amps
+5VSb	0.0	-	2	2.5	Amps

Notes:

- ( 1 ) The maximum combined load on +5V and +3.3V outputs shall not exceed 80W
- ( 2 ) +12V total DC output power shall not exceed 275W
- ( 3 ) When +12V load is 14A,the Min load of +5V is 3A.
- ( 4 ) The maximum continuous average DC outputs power shall not exceed 300W

### 2.2.2 ENP7030( 300Watts) +12V單組

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	0.2	-	13		Amps
+5V	0.2	-	14		Amps
+12V	0.6	-	23		Amps
-12V	0.0	-	0.3		Amps
+5VSb	0.0	-	2	2.5	Amps

Notes:

- ( 1 ) The maximum combined load on +5V and +3.3V outputs shall not exceed 80W
- ( 2 ) When +12V load is 14A,the Min load of +5V is 3A.
- ( 3 ) The maximum continuous average DC outputs power shall not exceed 300W

## 2.3 Output Ripple and Noise

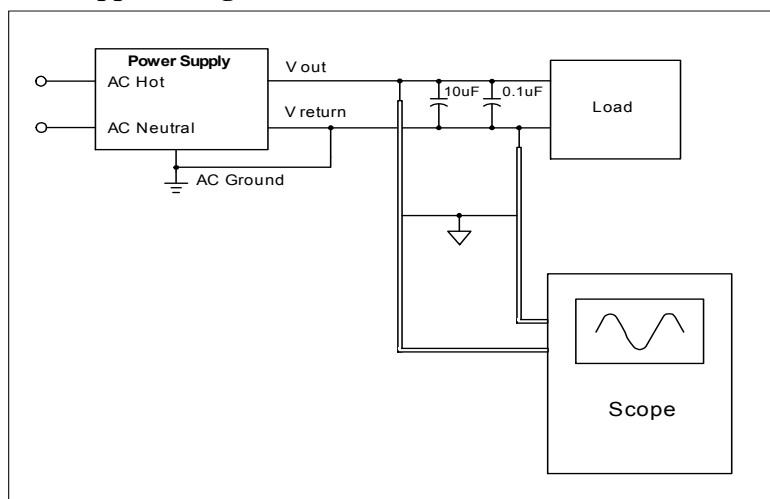
### 2.3.1 Ripple regulation

Parameter	Ripple&Noise	Unit
+3.3V	50	mVp-p
+5V	50	mVp-p
+12V	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.

### 2.5 Efficiency

Power supply efficiency typical 82% 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. 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 circuitry 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	15.6	Volts
+5 VDC	5.74	6.3	7.0	Volts
+3.3 VDC	3.76	4.2	4.3	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.

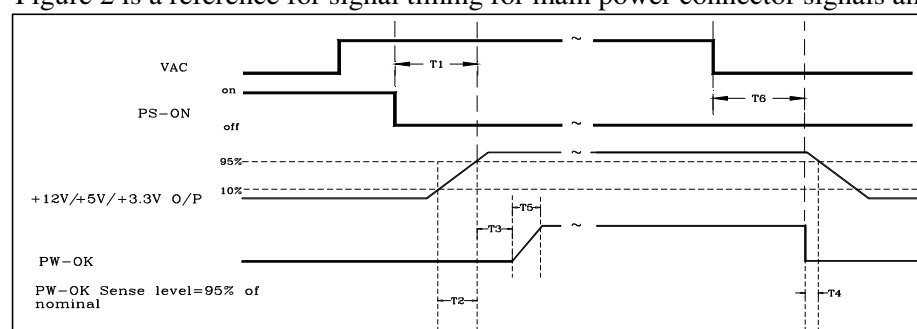
#### 3.4 No load operation

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.

### 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) T2: Rise time (0.1ms~20ms)
- (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)

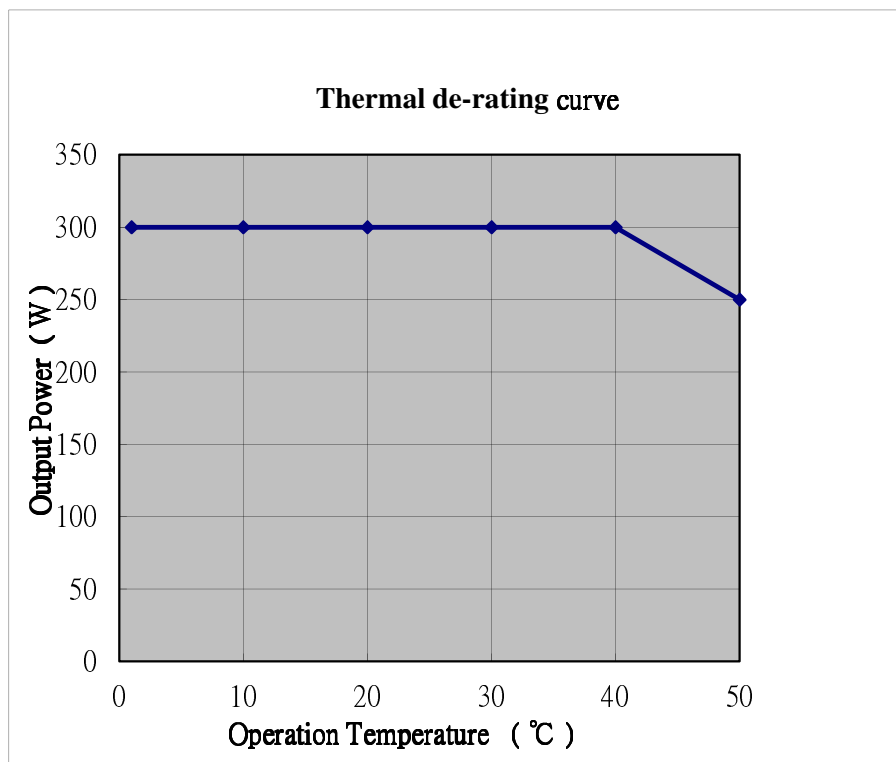
#### 4.2 Hold up time (T6)

When the power loss its input power, it shall maintain **16ms at 75% of full load**.

## 5. ENVIRONMENT

### 5.1 Operation

Temperature	0 to 40 °C at 300W
	0 to 50 °C at 250W
Relative Humidity	to 85%,on-condensing



### 5.2 Shipping and Storage

Temperature	-40 to 70°C
Relative Humidity	to 95%,non-condensing

### 5.3 Altitude

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

## 6. SAFETY

6.1 UL

6.2 cUL

6.3 TUV

6.4 CB

6.5 BSMI

6.6 CCC

## **7. ELECTROMAGNETIC COMPATIBILITY (EMC)**

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

**7.2 ELECTRICAL FAST TRANSIENT / BURST ( EFT/B) – EN 61000 – 4 - 4 : 2010**

**7.3 SURGE – EN 61000 – 4 - 5 : 2005**

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

**7.5 VOLTAGE DIPS – EN 61000 – 4 - 11 : 2004**

**7.6 RADIATED SUSCEPTIBILITY – EN 61000 – 4 – 3 : 2006**

**7.7 CONDUCTED SUSCEPTIBILITY – EN 61000 – 4 - 6 : 2008**

**7.8 VOLTAGE FLUCTUATION - EN 61000 – 3 – 3 : 2008**

**7.9 EN61000-3-2 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 Class B Radio interference (CISPR 22).**

**7.11 FCC Part 15, Subpart J class B 115VAC operation.**

## **8. MTBF**

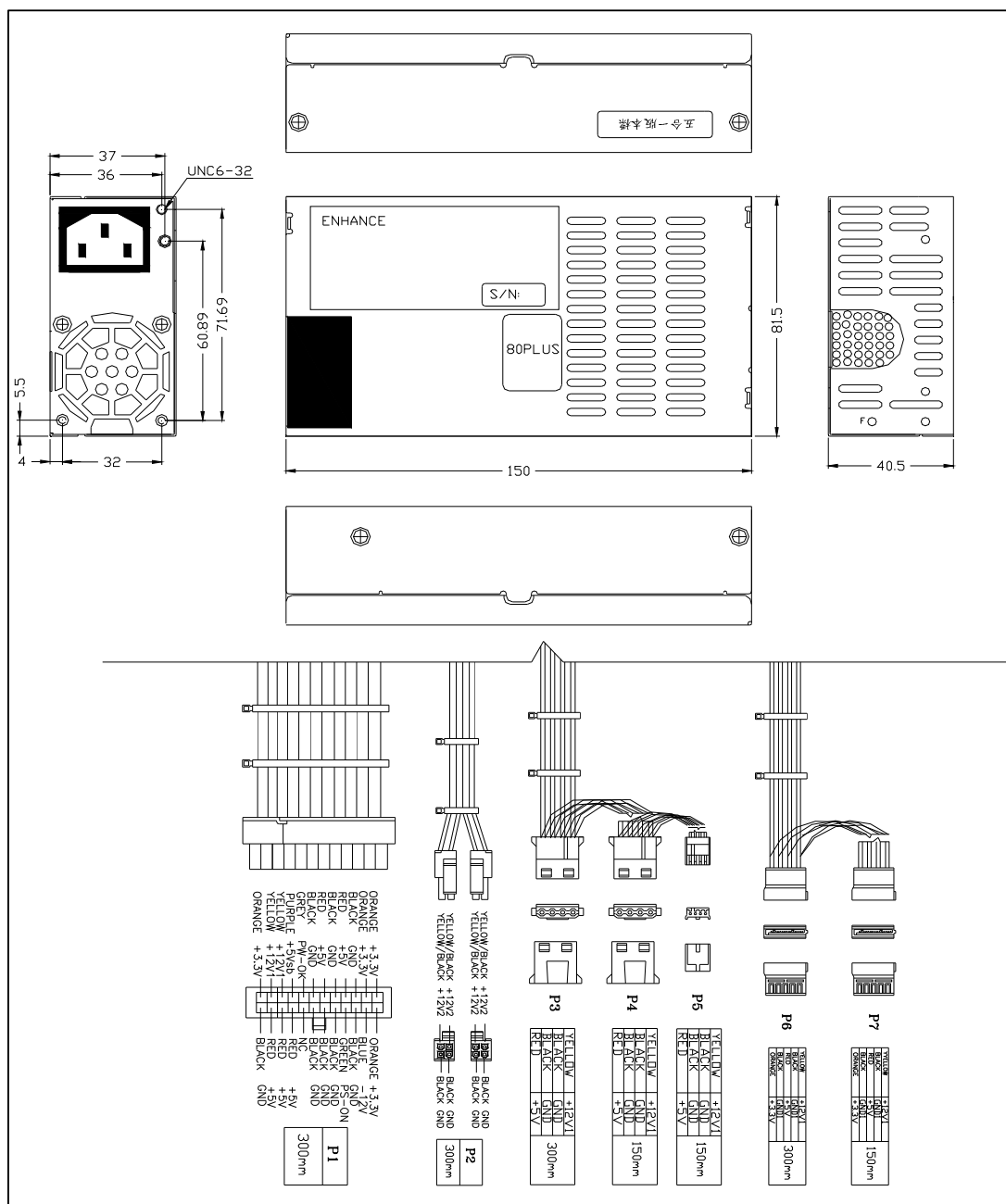
### **8.1 MTBF (mean time between failures) calculation**

The demonstrated MTBF shall be 100,000 hours of continuous operation at 25°C, 75% of 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. MECHANICAL REQUIREMENTS

### 9.1 Physical dimension (B type:L150\*W81.5\*H40.5)

( 線材組合&外露長度僅供參考，可根據客戶要求更改或新增。 )



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

18AWG wire	Signal	Pin	Pin	Signal	18AWG wire
Orange	+3.3V	11	1	+3.3V	Orange
Orange(22AWG)	3.3 sense				
Blue(20AWG)	-12VDC	12	2	+3.3V	Orange
Black	COM	13	3	COM	Black
Green(22AWG)	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	NC	18	8	PG	Grey(22AWG)
Red	+5VDC	19	9	+5VSB	Purple(20AWG)
Red	+5VDC	20	10	+12VDC	Yellow
Red(22AWG)	+5V sense				
Red	+5VDC	B3	B1	+12V1	Yellow
Black	COM	B4	B2	+3.3V	Orange

**P2 Optional Connector (Molex 39-01-2060 or equivalent)**

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

**P3,P4 (Molex 8981-04P or equivalent)****P5 (AMP 171822-4 or equivalent)**

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

**P6,P7 (optional) Serial ATA Power Connector (Molex\* 88751 or equivalent)**

18 AWG wire	Signal	Pin
Orange	+3.3V	5
Black	GND	4
Red	+5V	3
Black	GND	2
Yellow	+12V	1

**10. FAN SPEED CONTROL**

Fan voltage varies with the ambient temperature and/or output power.