

MODEL NO. ENS0575 (ACTIVE PFC)

This specification describes the requirements of 650W/750Watts switching power supply with an stretch form-factor and EPS12V, +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.

750W Table 1 AC Input Line Requirements

Parameter	Min.	Nom.	Max.	Unit
Vin(Full range)	103	115---240	264	VACrms
Vin Frequency	47	60---50	63	Hz
Iin		10----5		Arms

650W Table 1 AC Input Line Requirements

Parameter	Min.	Nom.	Max.	Unit
Vin(Full range)	90	100---240	264	VACrms
Vin Frequency	47	60---50	63	Hz
Iin		10----5		Arms

Power factor correction (PF)>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
+12V1	+/-5%	+11.4	+12	+12.6	Volts
+12V2	+/-5%	+11.4	+12	+12.6	Volts
+12V3	+/-5%	+11.4	+12	+12.6	Volts
+12V4	+/-5%	+11.4	+12	+12.6	Volts
-12V	+/-10%	-10.8	-12	-13.2	Volts
+5VSB	+/-5%	+4.75	+5	+5.25	Volts

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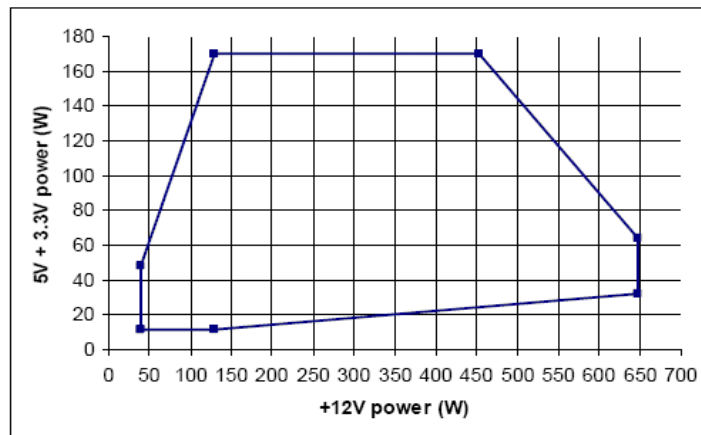
2.2 Load ranges

2.2.2 :ENS-0575 (750 Watts Load Ratings-Dual +12V Rails for processor Power)

Load Range 1

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	1.5	-	24		Amps
+5V	1.0	-	30		Amps
+12V1	0.8	-	18		Amps
+12V2	0.8	-	18		Amps
+12V3	0.5	-	18		Amps
+12V4	1.0	-	18	22	Amps
-12V	0	-	0.5		Amps
+5VSB	0.1	-	3.0	3.5	Amps

Figure 7 750W Cross loading graph

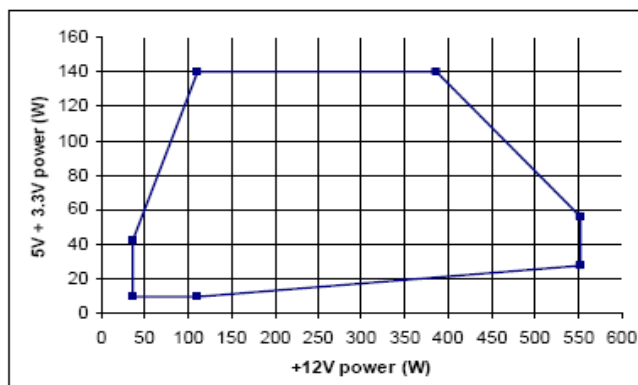


2.2.2 :ENS-0565E (650 Watts Load Ratings-Dual +12V Rails for processor Power)

Load Range 1

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	1.5	-	24		Amps
+5V	1.0	-	24		Amps
+12V1	0.8	-	18		Amps
+12V2	0.8	-	18		Amps
+12V3	0.5	-	18		Amps
+12V4	1.0	-	18	22	Amps
-12V	0	-	0.5		Amps
+5VSB	0.1	-	3.0	3.5	Amps

Figure 5 Cross Loading Graph for 650W Configuration



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Notes:

- (1) The maximum continuous total DC outputs power shall not exceed 650W for ENS0565E.
The maximum continuous total DC outputs power shall not exceed 750W for ENS0575.
- (2) The maximum continuous load on +5V and +3.3V outputs shall not exceed 140W for 650W
The maximum continuous load on +5V and +3.3V outputs shall not exceed 170W for 750W
- (3) The maximum combined current for the +12V outputs shall be 45A, peak load 48A for ENS0565E dual +12V rails for processor power.
The maximum combined current for the +12V outputs shall be 54A, peak load 56A for ENS0575 dual +12V rails for processor power.
- (4) The 5V standby output shall remain on while the AC input power connected, whether DC outputs are disabled (Off) or enabled (On) by the remote on control signal, but when the 5V Standby output remained on with the AC input power turn off, the remote on control will be disabled.
- (5) When the combined current for the +12V outputs is 30A to 38A, the +5V minimum load is 8A.
- (6) When the combined current for the +12V outputs is 38A to 45A, the +5V minimum load is 10A for 650W.
When the combined current for the +12V outputs is 38A to 54A, the +5V minimum load is 15A for 750W.

2.3 Output Ripple**2.3.1 Ripple regulation**

Parameter	Ripple&Noise	Unit
+3.3V	100	mVp-p
+5V	100	mVp-p
+12V1	150	mVp-p
+12V2	150	mVp-p
+12V3	150	mVp-p
+12V4	150	mVp-p
-12V	150	mVp-p
+5VSB	100	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 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.

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2.3.3 Ripple voltage test circuit

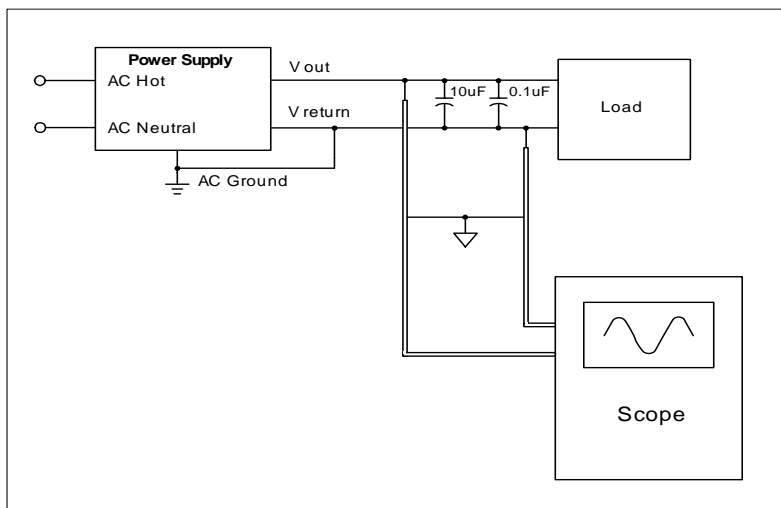


Figure 1. Ripple voltage test circuit

2.4 Overshoot

Any overshoot at turn on or turn off shall be less 10% of the normal 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 68% 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 current protect

The power supply shall have current limit to prevent the +3.3 V, +5 V, and +12 V outputs from exceeding the values shown in Table 27. If the current limits are exceeded the power supply shall shutdown and latch off. The latch will be cleared by toggling the PSON# signal or by an AC power interruption. The power supply shall not be damaged from repeated power cycling in this condition. -12 V and 5 VSB shall be protected under over current or shorted conditions so that no damage can occur to the power supply. All outputs shall be protected so that no damage occurs to the power supply under a shorted output condition.

Table 27: Over Current Protection

Voltage	Over Current Limit (Iout limit)
+3.3 V	110% minimum; 150% maximum
+5 V	110% minimum; 150% maximum
+12V	110% minimum; 150% maximum

3.2 Under voltage protection.

In an under voltage fault occurs, the supply will latch all DC outputs into a shutdown state when +5V & +3.3V outputs under 85% of it's maximum value.

3.3 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

3.4 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

3.5 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.

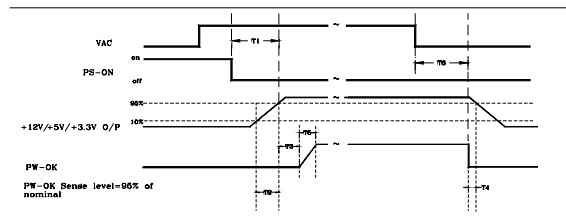


Figure 2. PS-OK Timing Sequence

- (1)T2: Rise time (0.1ms~70ms)
- (2)T3: Power good signal turn on delay time (100ms~1000ms)
- (3)T4: Power good signal turn off delay time (1ms min)
- (4)T5: Rise time (10ms max)
- (5)T6: Hold up time (17ms min)

4.2 Hold up time

When the power loss its input power, it shall maintain 17ms in regulation limit at normal input voltage. (AC:115V/60Hz or 230V/50Hz)

5. ENVIRONMENT

5.1 Operation

Temperature	0 to 50°C
Relative Humidity	10 to 90%, non-condensing

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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.

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

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 EN61000-3-2 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 EN55024 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

The demonstrated MTBF shall be 100,000 hours of continuous operation at 25°C,full load, 80% confidence limit and nominal line. The MTBF of the power supply be calculated in accordance with MIL-HDBK-217F. The DC FAN is not included.

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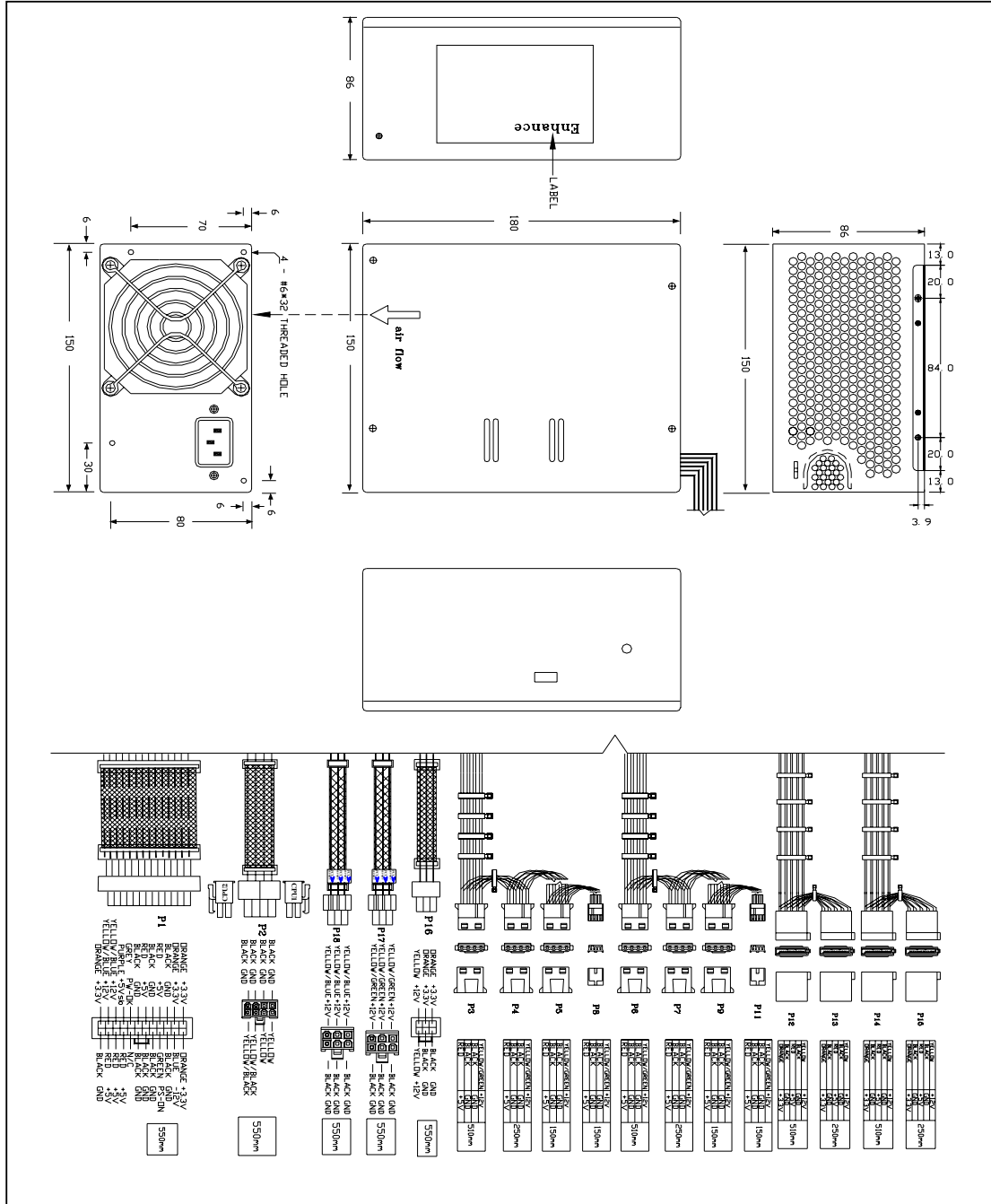
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9. MECHANICAL REQUIREMENTS

9.1 Physical dimension

(線材組合 & 外露長度僅供參考, 可根據客戶要求更改或新增。)



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9.2 Connectors (INTEL approved or equivalent)

P1 Connector (24PIN:Molex 44476-1111 or equivalent)

16AWG wire	Signal	Pin	Pin	Signal	16AWG wire
Orange	+3.3V	13	1	+3.3V	Orange
Orange(22AWG)	+3.3Vsense	13			
Blue (18AWG)	-12VDC	14	2	+3.3V	Orange
Black	COM	15	3	COM	Black
Green(20AWG)	PS-ON	16	4	+5VDC	Red
Black	COM	17	5	COM	Black
Black	COM	18	6	+5VDC	Red
Black	COM	19	7	COM	Black
White	N/C	20	8	PWRGOOD	Grey (20AWG)
Red	+5VDC	21	9	+5Vsb	Purple(18AWG)
Red	+5VDC	22	10	+12V3	Yellow/Blue
Red	+5VDC	23	11	+12V3	Yellow/Blue
Black	COM	24	12	+3.3V	Orange

P3,P4,P5,P6,P7,P9(AMP 1-480424-0 or Molex 8981-04P or equivalent)

18 AWG wire	Signal	Pin	Pin	Signal	22AWG wire
Yellow/Green	+12V4	1	1	+5VDC	Red
Black	COM	2	2	COM	Black
Black	COM	3	3	COM	Black
Red	+5VDC	4	4	+12V4	Yellow/Green

P8,P11(AMP 171822-4 or equivalent)

P2 Connector (8PIN:Molex 44476-1111 or equivalent)

18AWG wire	Signal	Pin	Pin	Signal	18AWG wire
Yellow	+12V2	5	1	COM	Black
Yellow	+12V2	6	2	COM	Black
Yellow/Black	+12V1	7	3	COM	Black
Yellow/Black	+12V1	8	4	COM	Black

P16 (6PIN<AUX>:Molex 39-01-2060 or Equivalent)(optional)

18AWG wire	Signal	Pin	Pin	Signal	18AWG wire
GND	Black	4	1	Orange	+3.3V
GND	Black	5	2	Orange	+3.3V
Yellow	+12V2	6	3	Yellow	+12V2

P17 PCI 6PIN (Molex 90331-0010 or equivalent)

18 AWG wire	Signal	Pin	Pin	Signal	18 AWG wire
COM	Black	4	1	Yellow/Black	+12V1
COM	Black	5	2	Yellow/Black	+12V1
COM	Black	6	3	Yellow/Black	+12V1

P18 PCI 6PIN (Molex 90331-0010 or equivalent)

18 AWG wire	Signal	Pin	Pin	Signal	18 AWG wire
COM	Black	4	1	Yellow/Blue	+12V3
COM	Black	5	2	Yellow/Blue	+12V3
COM	Black	6	3	Yellow/Blue	+12V3

P12,P13,P14,P15 SATA Power Connector (Molex* 88751 or equivalent)(optional)

18AWG wire	Signal	Pin
Orange	+3.3V	5
Black	GND	4
Red	+5V	3
Black	GND	2
Yellow/Green	+12V4	1

10. FAN SPEED CONTROL (optional)

Fan voltage varies with the ambient temperature or output power.

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