

MODEL NO. ENP-2222D SERIES WITH OPTIONAL PFC FUNCTION

This specification describes the requirements of 220watts switching power supply with a TFX 12V form-factor ,+5V standby voltage ,remote on/off ,dual line input capability.

F 1.0 INPUT REQUIREMENTS

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 _{in} (115VAC)	90	115	132	VACrms
V _{in} (230VAC)	180	230	264	VACrms
V _{in} Frequency	47	--	63	Hz
I _{in} (115VAC)			5	Arms
I _{in} (230VAC)			3	Arms

A manual switch shall be provided to select the appropriate voltage range.

1.2 Inrush current

45 A @ 115Vrms

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

F 2.0 OUTPUT REQUIREMENTS

2.1 Voltage

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	+12.0	+12.6	Volts
-5V(optional)	+/-10%	-4.5	-5.0	-5.5	Volts
-12V	+/-10%	-10.8	-12.0	-13.2	Volts
+5VSB	+/-5%	+4.75	+5	+5.25	Volts

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

2.At +12V surge, regulation can go to +/-10%.

AUDIT: _____ CHECK: _____ DESIGN: _____

2.2 DC output current load ranges

ENP-2222D (220Watts)

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	0.5	-	17.0		Amps
+5V	0.3	-	13.0		Amps
+12V	1.0	-	16.0	17.0	Amps
-5V(OPTIONAL)	0.0	-	0.3	0.5	Amps
-12V	0.0	-	0.3		Amps
+5Vsb	0.0	-	2.0	2.5	Amps

Notes:

- (1) +5Vsb is a SELV standby voltage that is always present when AC mains voltage is present.
- (2) The maximum combined current on -5V and -12V shall not exceed 0.8A .
- (3) The maximum continuous average DC output power shall not exceed 220Watts.
- (4) The maximum combined load on +5V and +3.3V outputs shall not exceed 80Watts.
- (5) The maximum peak total DC output power shall not exceed 225 Watts.
- (6) Peak +12 VDC output power not to exceed 12 seconds in duration .

2.3 Output Ripple

2.3.1 Output Ripple

Parameter	Ripple Max	Ripple & Noise Max	Unit
+3.3V		150	mVp-p
+5V		150	mVp-p
+12V		200	mVp-p
-5V(optional)		200	mVp-p
-12V		200	mVp-p
+5Vsb		150	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

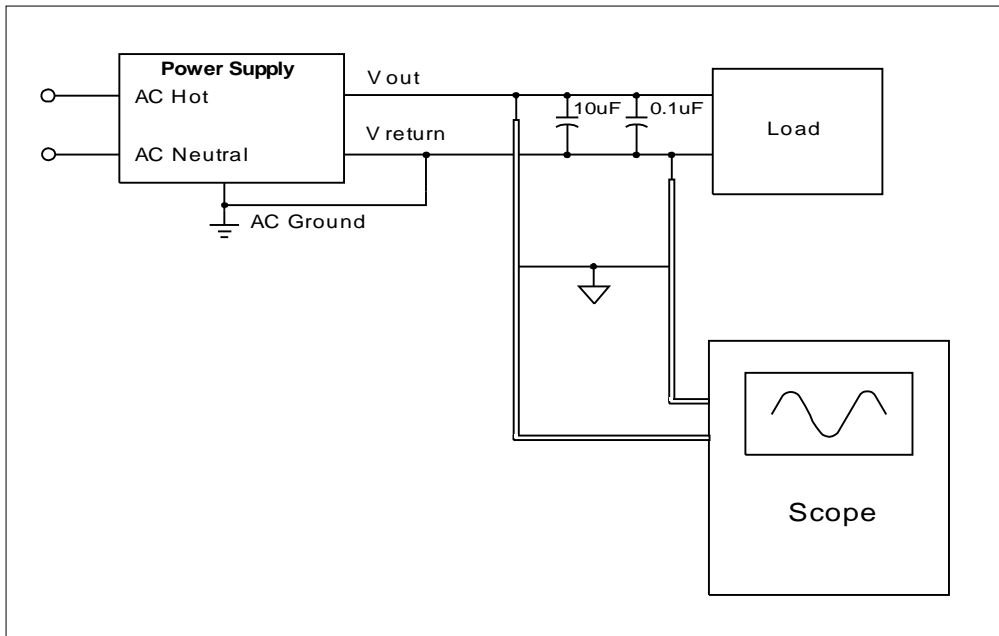


Figure 1. Ripple voltage test circuit

2.4 Overshoot

Any overshoot at turn on or turn off shall be less 10% of the nominal voltage value, all output 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 70% at normal AC main voltage and full load on all outputs.

2.6 PFC

Power Factor Correction typical 75% at normal AC main voltage and full load on all outputs.

2.7 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.

2.7 Rise Time

The outputs shall rise in 0.1ms to 20ms from less 10% to within regulation ranges.

F 3.0 PROTECTION

3.1 Over-power protection

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

3.2 Over voltage protection

In an over voltage fault occurs, the supply will latch all DC output into a shutdown state when +3.3V outputs exceed 130% of its maximum value . +5V outputs exceed 160% 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 0.1ohms.The Max short circuit current in any output shall not exceed 240VA.

Note: +5Vsb will be auto-recovery when the fault removed.

3.4 No load operation

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

F 4.0 POWER SUPPLY SEQUENCING

4.1 Power on

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

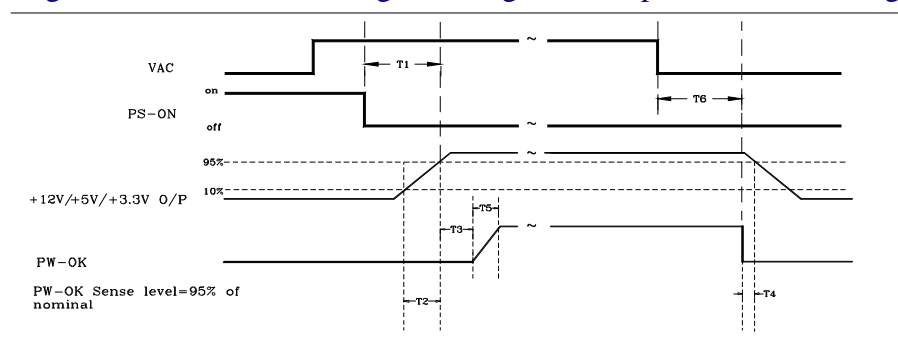


Figure 2. PS-OK Timing Sequence

- (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 of figure 2.)

When the power loss its input power, it shall maintain 16ms in regulation limit at nominal input voltage.

F 5.0 ENVIRONMENT

5.1 Operation

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

5.2 Shipping and storage

Temperature	-20 to 70°C
Relative Humidity	5 to 95%,non-condensing

5.3 Altitude

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

F 6.0 SAFETY

6.1 Underwriters Laboratory (UL) recognition.

The power supply designed to meet UL 1950.

6.2 CB test report to meet the IEC 950 2ND.

6.3 NEMKO certified by any NORDIC CENELEC.

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

F 7.0 ELECTROMAGNETIC COMPATIBILITY (EMC)

7.1 IEC 801-2 ESD (IEC 1004-4-2)

7.2 IEC 801-3 radiated electrical field requirement (IEC 1004-4-3)

7.3 IEC 801-4 BURST (IEC 1004-4-4)

7.4 IEC 801-5 surge Voltages

7.5 EN60555-2 harmonic current emissions

7.6 EN55022 class B radio interference (CISPR 22)

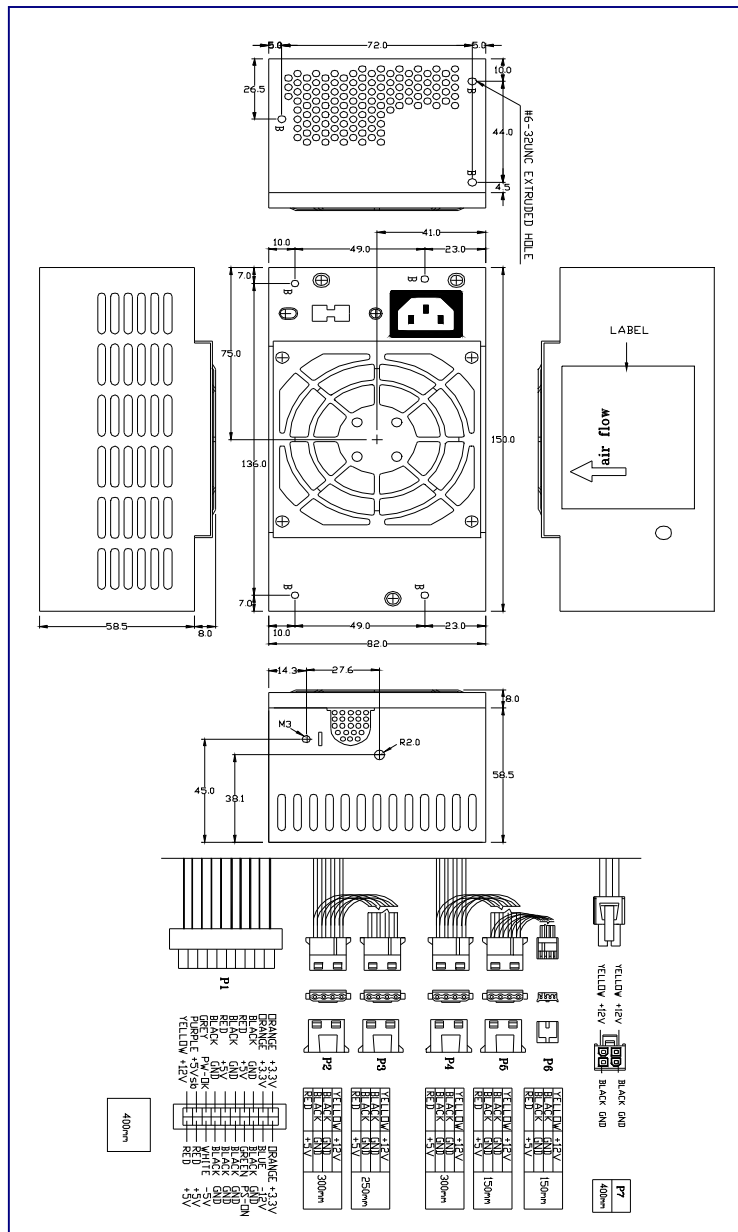
7.7 FCC part 15, subpart J class B 115VAC operation.

F 8.0 MTBF

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 shall be calculated in accordance with MIL-STD-217D/E. The DC FAN is not included.

F 9.0 MECHANICAL REQUIREMENTS

9.1 Physical dimension .



9.2 Connectors (INTEL approved or equivalent)

P1 connector (Molex 39-01-2200 or equivalent)

20AWG wire	Signal	Pin	Pin	Signal	20AWG wire
Orange	+3.3V	11	1	+3.3V	Orange
Orange(22AWG)	+ 3.3V 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(optional)	-5VDC	18	8	POK	Grey
Red	+5VDC	19	9	+5VSB	Purple
Red	+5VDC	20	10	+12VDC	Yellow

P2,P3,P4 (AMP 1-480424-04 or Molex 8981-04P or equivalent)

P5 (AMP 171822-4 or equivalent)

20AWG 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

P6 optional connector (Molex 39-01-2060 or equivalent)

20AWG wire	Signal	Pin	Pin	Signal	20AWG wire
Black	GND	1	3	Yellow	+12V
Black	GND	2	4	Yellow	+12V