

(COMPLIANT MICRO-ATX : SFX 1.0 & SFX 1.1)

This specification describes the requirements of 200W switching power supply with a MICRO-ATX(SFX 1.1) form-factor and SFX 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 _{in} (115VAC)	90	115	132	VACrms
V _{in} (230VAC)	180	230	264	VACrms
V _{in} Frequency	47	--	63	Hz
I _{in} (115VAC)		5A		Arms
I _{in} (230VAC)		3A		Arms

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

1.2 Inrush current regulation

35 A @ 115Vrms
70 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	+12.0	+12.6	Volts
-12V	+/-10%	-10.8	-12.0	-13.2	Volts
-5V	+/-10%	-4.5	-5.0	-5.5	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%.

2.2 LOAD RANGE

ENP-2120 (200W LOAD)

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	1.0	-	17.0	13.0	Amps
+5V	3.0	-	21.0		Amps
+12V	1.0	-	10.0		Amps
-5V(OPTIONAL)	0.0	-	0.5		Amps
-12V	0.0	-	0.8		Amps
+5VSb	0.0	-	2.0		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 0.8 Amp.
- (3) The maximum combined load on +5V and +3.3V outputs shall not exceed 130W.
- (4) The maximum combined load on +5V and +3.3V and +12V output shall not exceed 190W.
- (5) The maximum continuous average DC output power shall not exceed 200W.
- (6) The maximum peak total DC output power shall not exceed 210W.
The power supply shall be capable of supplying peak output power for 15 seconds under all specified conditions.

2.3 Output Ripple

2.3.1 Ripple regulation

Parameter	Ripple	Ripple+ Noise	Unit
+3.3V	50	100	mVp-p
+5V	50	100	mVp-p
+12V	120	200	mVp-p
-12V	120	200	mVp-p
-5V(OPTIONAL)	100	200	mVp-p
+5VSb	100	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 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

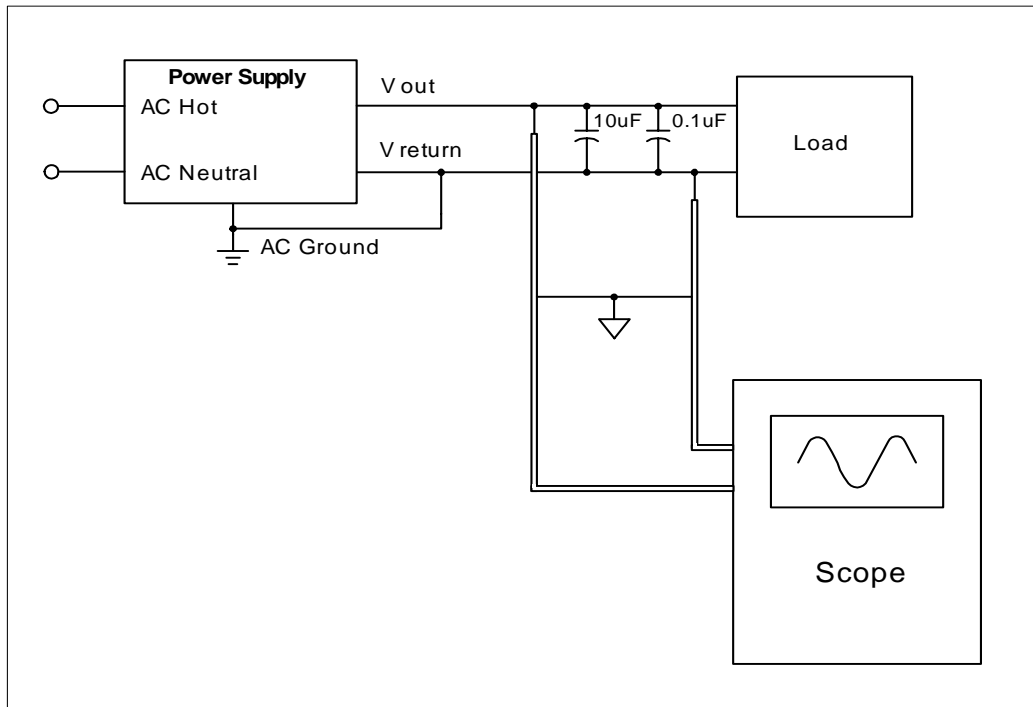


Figure 1. Ripple voltage test circuit

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 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. 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 +3.3V outputs exceed 130% of its maximum value; +12V outputs exceed 140% of its maximum value; +5V outputs exceed 160% of its normal value.

3.3 Short circuit

The power supply shall shutdown and latch off for shorting +3.3V, +5V or +12V, -12V rails. The main output short circuit of any impedance shall less than 0.1ohm. 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.

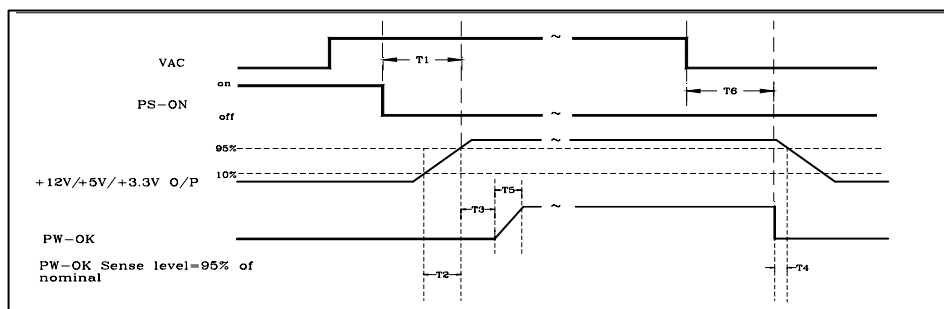


Figure 2. PS-OK Timing Sequence

- (1)T2: Rise time (2ms~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

When the power loss its input power, it shall maintain 14ms in regulation limit at nominal input voltage. (AC:115V/60Hz or 230V/50Hz)

5. ENVIRONMENT

5.1 Operation

Temperature	0 to 40 °C
Relative Humidity	10 to 85%,on-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 NEMKO by any NORDIC CENELEC.

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 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. Full load 80% confidence limit and normal line The MTBF of the power supply be caluted in accordance with MIL-HDBK-217F The DC FAN is not included.

9.2 Connectors (INTEL approved 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)	3.3 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(optional)	-5VDC	18	8	POK	Grey
Red	+5VDC	19	9	+5VSB	Purple
Red	+5VDC	20	10	+12VDC	Yellow

P2,P4,P5,P6 (AMP 1-480424-0 or Molex 8981-04P or equivalent)

20 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

P3 (AMP 171822-4 or equivalent)

P7 optional connector (Molex 39-01-2060 or equivalent)

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

P8 (Molex 90331-0010 or equivalent)

16 AWG wire	Signal	Pin	Pin	Signal	16 AWG wire
Black	COM	1	4	Orange	+3.3VDC
Black	COM	2	5	Orange	+3.3VDC
Black	COM	3	6	Red	+5VDC

☞ **10. FAN SPEED CONTROL (optional)**

Fan voltage varies with the ambient temperature or output power.