SPECIFICATION

SilverStone

240W Flex-ATX Switching Power Supply With Active PFC

ENP-2824

This specification describes the requirements of 240 Watts 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.

AC Input Line Requirements

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%	+11.40	+12.0	+12.6	Volts
-12V	±10%	-10.8	-12.0	-13.2	Volts
+5VSb	±5%	+4.75	+5.0	+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%.

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2.2 LOAD RANGE

2.2.1 ENP-2822(220 Watts)

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	0.5	-	17		Amps
+5V	0.3	-	13		Amps
+12V	1.0	-	16	18	Amps
-12V	0.0	-	0.3		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 load on +5V and +3.3V outputs shall not exceed 80W.

(3) The maximum continuous average DC outputs power shall not exceed 240W.

(4) When +5V load over 15A,the Min load of +12V is 2A.
When +12V load is 16A,the Min load of +5V is 1A.

2.3 Output Ripple

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.

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2.3.3 Ripple voltage test circuit

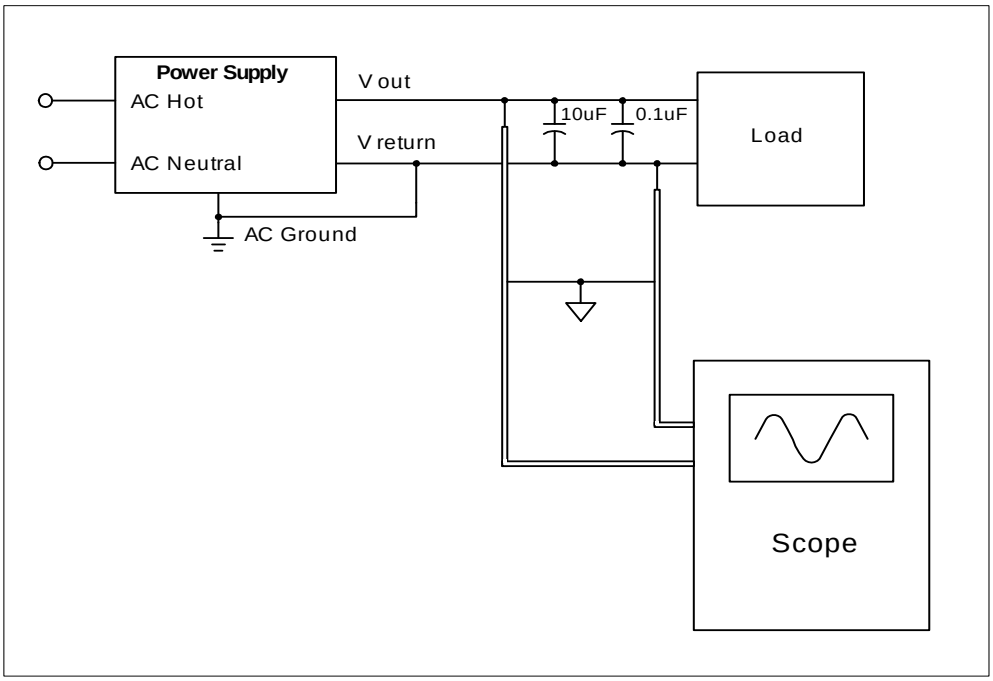

Figure 1. Ripple voltage test circuit

2.4 Overshoot

Any overshoot at turn on or turn off shall be less 10% of the 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 70% at normal AC main voltage and full load on all outputs. 5W "Energy Star" efficiency

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.

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3. PROTECTION

3.1 Over-power protection

The power supply will be shutdown and latch off when output power over 110% ~ 160% 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	15.6	Volts
+5 VDC	5.74	6.3	7.0	Volts
+3.3 VDC	3.76	4.2	5.0	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.

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4. TIMING

4.1 Signal timing drawing

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

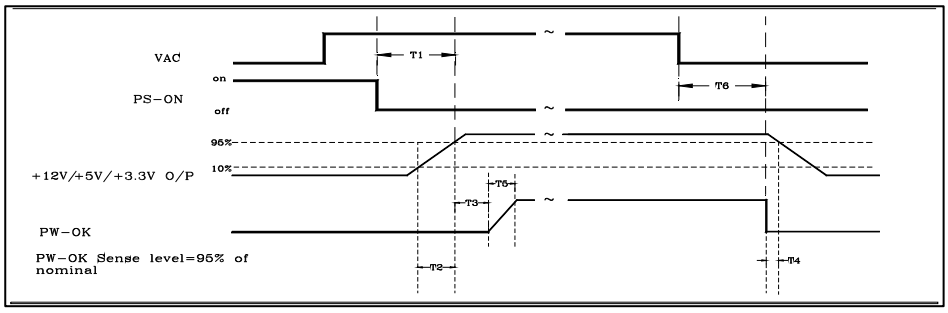

Figure 2. PS-OK Timing Sequence

(1) T2: Rise time (0.2ms~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 16ms in regulation limit at nominal input voltage. (AC:115V/47Hz or 230V/47Hz)

5. ENVIRONMENT

5.1 Operation

Temperature	0 to 40 °C
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.

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6. MTBF

6.1 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.

7. MECHANICAL REQUIREMENTS

7.1 Physical Dimension

53.6 mm (W) × 64mm (H) × 190 mm (D)

7.2 Connectors Define

M/B 24PIN connector (M/B 20PIN in split mode)

18AWG wire	Signal	Pin	Pin	Signal	18AWG 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(18AWG)	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 (18AWG)
Red	+5VDC	21	9	+5Vsb	Purple
Red	+5VDC	22	10	+12V	Yellow
Red (22AWG)	+5Vsense	22			
Red	+5VDC	23	11	+12V	Yellow
Black	COM	24	12	+3.3V	Orange

ATX 12V 4PIN

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

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4PIN peripheral connector (HDD)

18 AWG wire	Signal	Pin
Yellow	+12V	1
Black	COM	2
Black	COM	3
Red	+5VDC	4

4PIN floppy connector (FDD)

Pin	Signal	22AWG wire
1	+5VDC	Red
2	COM	Black
3	COM	Black
4	+12V	Yellow

SATA connector

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

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