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SilverStone Technology Co., Ltd.

www.silverstonetek.com

support@silverstonetek.com
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STRIDER PLUS SERIES

ST60F-P

Unparalleled combination of power, efficiency, and flexibility

600W 24hour continuous power output with 40°C operating temperature

100% modular cables

Efficiency 85%~88% at 20%~100% loading

Class-leading single +12V rail with 42A

Strict $\pm 3\%$ voltage regulation

Japanese main capacitors

Silent running 135mm fan with 19dBA minimum

Dual EPS 8pin connectors support

Single PCI-E 8pin and four PCI-E 6pin connectors support

Support ATX 12V 2.3 & EPS 12V

Active PFC

SPECIFICATION

SilverStone Strider Plus ST60F-P

ATX12V / EPS 12V Switching Power Supply With Active PFC PS/2

This specification describes the requirements of ST60F-P with active P.F.C Switching Power Supply with an ATX form-factor, +5V standby voltage, fan control, ATX 12V Power supply version 2.3, remote on/off control, dual line input capability and forced air cooling characteristics.

1. Table 1. AC INPUT requirements

The input voltage, current, and frequency requirements for continuous operation are stated below.

Parameter	Min.	Nom.		Max.	Unit
Vin	103	115	240	264	VACrms
Vin Frequency	47	60	50	63	Hz
Iin		10	5		A

1.1 Inrush current limiting

50 A @ 115Vrms

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

2. DC OUTPUT

2.1 Table 2. DC voltage regulation

Parameter	Range	Min	Nom	Max	Unit
+3.3V	+/-3%	+3.20	+3.3	+3.39	Volts
+5V	+/-3%	+4.85	+5.0	+5.15	Volts
+12V	+/-3%	+11.64	+12.0	+12.36	Volts
-12V	+/-10%	-10.80	-12.0	-13.2	Volts
+5VSB	+/-5%	+4.75	+5.0	+5.25	Volts

2.2 Load Ranges

2.2.1 Table 3 Typical Power Distribution for a 600W ATX12V Configuration

Cross Loading graph for 600w Configuraton

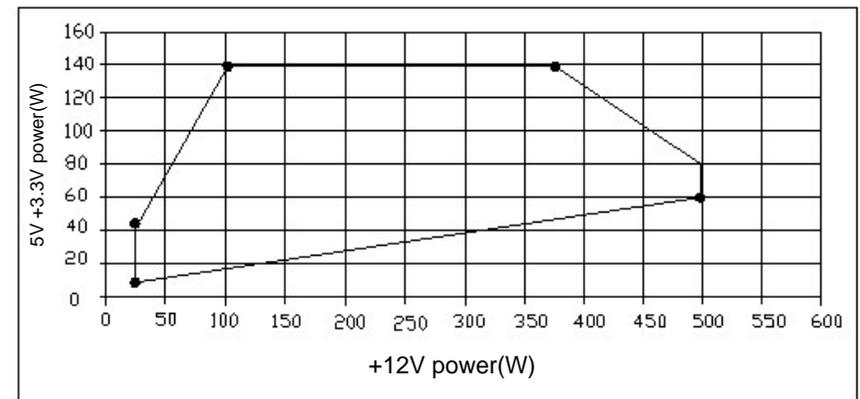


Table 4 Typical Power Distribution for a 600W ATX12V Configuration

Parameter	Min	Nom	Max	Peak	Unit
+12VDC	0.6	-	42.0	-	Amps
+5VDC	0.2	-	24.0	-	Amps
+3.3VDC	0.1	-	24.0	-	Amps
-12VDC	0.0	-	0.3	-	Amps
+5VSB	0.0	-	2.5	3.5	Amps

Note:

1. Total combined output of 3.3V and 5V is $\leq 140W$.
2. +12V outputs power shall not exceed 504W.
3. When +5V load is 24A, +12V min load is 38A.
4. When +12V load is 42A, +5V min load is 5A.
5. Peak currents may last up to 17 seconds with not more than one occurrence per minute requirements.

2.3 DC Output Ripple/Noise.

2.3.1 Table5 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 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 Figure1. Ripple/Noise voltage test circuit

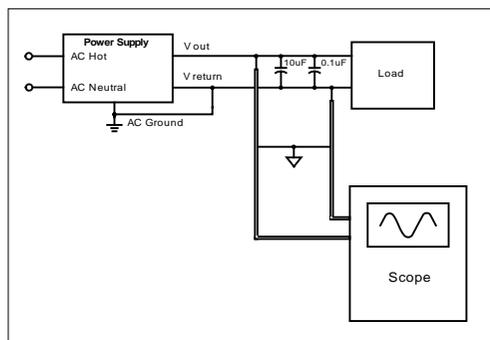


Figure 1. Ripple/Noise voltage test circuit

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 typical efficiency is 82% under full Load at nominal input voltage of 115VAC or 230VAC.

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 is 110%~160%.

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	17	Volts
+5 VDC	5.74	6.3	7.5	Volts
+3.3 VDC	3.76	4.2	4.8	Volts

3.3 Over Current Protection

+5VDC' and '+3.3VDC' have separate over current protection circuits to meet 240VA safety requirement.

Parameter	Min.	Max.	Unit
+12V	50	65	A

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.

3.4 Over Current Protection

In the event of a fan failure or the vents being blocked, the power supply shall have protection such that any over temperature condition caused by these events shall protect the power supply from damage or abnormal and/or dangerous operation.

A shutdown of the power supply is acceptable.

A temperature derating factor less than 110% for the critical components is recommended before the power supply is shut down.

Temperature derating factors higher than 110% can be evaluated on a case by case basis.

4. TIMING

4.1 Signal timing drawing

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

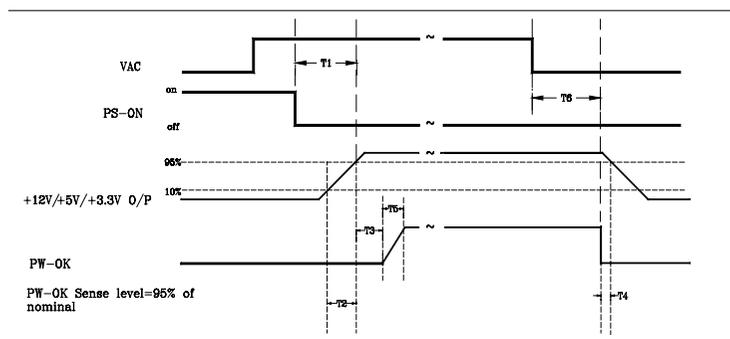


Figure 2. PS-OK Timing Sequence

- (1) T2: Rise time (0.1ms~20ms)
- (2) T3: Power good turn on delay time (100ms~500ms)
- (3) T4: Power good turn off delay time (1ms min)
- (4) T5: Rise time (10ms max)

4.2. Output Transient Response

Table 13. summarizes the expected output transient step sizes for each output. The transient load slew rate is =1.0A/us.

Table 13. DC Output Transient Step Sizes

Output	Max. step size (% of rated output amps per Sec 3.2.3) ⁽¹⁾	Max. step size (amps)
+12VDC	60%	
+5 VDC	30%	
+3.3 VDC	30%	
-12 VDC		0.1A
+5 VSB		0.5A

⁽¹⁾ For example, for a rated +5 VDC output of 18A, the transient step would be 30% x 18A=5.4A

Output voltages should remain within the regulation limits of Section 2.1, and the power supply should be stable when subjected to load transients per Table 13. from any steady state load, including any or all of the following conditions:

- * Simultaneous load steps on the +12 VDC, +5 VDC, and +3.3 VDC outputs (all steps occurring in the same direction)
- * Load-changing repetition rate of 50 Hz to 10 kHz
- * AC input range per Section 1.0
- * +5vsb Loading min 0.1A

4.3 Hold up time (T6 of figure 2.)

When the power loses its input power, the output shall maintain 10ms in regulation ranges at nominal input voltage. (AC:115V/60Hz or 230V/50Hz/90% load).

4.4 Capacitive Load-REQUIRED

The power supply should be able to power up and operate with the regulation limits defined in Table 13, with the following capacitances simultaneously present on the DC outputs.

Output Capacitive Loads

Output	Capacitive Load(uF)
+12VDC	10000
+5 VDC	10000
+3.3 VDC	10000
-12 VDC	330
+5 VSB	6000

5. ENVIRONMENT

5.1 Operation

Temperature	0 to 40°C
Relative Humidity	20 to 85%, non-condensing

5.2 Shipping and Storage

Temperature	-40 to 70°C
Relative Humidity	5 to 90%, non-condensing

5.3 Altitude

Operating	3,000FT max.
Storage	15,000FT max.

5.4 Operating AC Input Voltage

600W	AC 103 ~ 264V auto ranging
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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, 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.

7. MECHANICAL REQUIREMENTS

7.1 Physical Dimension

150 mm (W) × 86 mm (H) × 160mm (D)

7.2 Connectors

M/B 24PIN connector

	Signal	Pin	Pin	Signal	
Orange	+3.3V	13	1	+3.3V	Orange
Orange	+3.3Vsense	13		+3.3V	Orange
Blue	-12VDC	14	2	+3.3V	Orange
Black	COM	15	3	COM	Black
Green	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
Red	+5VDC	21	9	+5Vsb	Purple
Red	+5VDC	22	10	+12V	Yellow
Red	+5Vsense	22		+12V	Yellow
Red	+5VDC	23	11	+12V	Yellow
Black	COM	24	12	+3.3V	Orange

EPS 12V 8PIN Connector

	Signal	Pin	Pin	Signal	
Yellow	+12V	5	1	COM	Black
Yellow	+12V	6	2	COM	Black
Yellow	+12V	7	3	COM	Black
Yellow	+12V	8	4	COM	Black

ATX 12V 4PIN (4+4PIN EPS 12V in split mode)

	Signal	Pin	Pin	Signal	
Black	GND	1	3	12V	Yellow
Black	GND	2	4	12V	Yellow

4PIN peripheral connector (HDD)

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

4PIN floppy connector (FDD)

SATA connector

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

8PIN PCI Express connector

	Signal	Pin	Pin	Signal	
Yellow	+12V	1	5	COM	Black
Yellow	+12V	2	6	COM	Black
Yellow	+12V	3	7	COM	Black
Black sense1	COM	4	8	COM	Black

6PIN PCI Express connector

	Signal	Pin	Pin	Signal	
Yellow	+12V	1	4	COM	Black
Yellow	+12V	2	5	COM	Black
Yellow	+12V	3	6	COM	Black



To be valid, this sheet must be filled out by
your salesperson at the time of purchase.

Store :

Purchaser :

Purchase date :

Model No. :

Serial No. :

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