



SILVERSTONE[®]
Designing Inspiration

STRIDER

ST400

Effortless power on demand

Dual +12V rails for newest systems

6 pin PCI express connector

Silent running 120mm fan

Four serial ATA connectors

Components designed for reliability

Support ATX 12V 2.2

SPECIFICATION

SilverStone STRIDER ST400 ATX12V 2.2 Switching Power Supply PS/2 400W

1. GENERAL REQUIREMENTS

This specification describes a 400 watts power supply. With +5V stand-by, remote ON/OFF control for ATX system and passive PFC(Power Factor Correction) (option) circuit at 230 Vac.

2. INPUT REQUIREMENTS

The power supply shall operate in 115Vrms \pm 10% or 230Vrms \pm 10%. The power supply shall operate from an AC mains frequency of 47 through 63 Hz. Maximum inrush current from power-on (with power on at any point on the AC sine) and including, but not limited to, three line cycles, shall be limited to a level below the surge rating of the input line cord, AC switch if present, bridge rectifier, fuse, and EMI filter components. Repetitive ON/OFF cycling of the AC input voltage should not damage the power supply or cause the input fuse to blow.

The AC mains steady-state RMS input current shall be:

8.5 amps maximum / 115 Vrms, 60 Hz.

5 amps maximum / 230 Vrms, 50 Hz.

3. OUTPUT REQUIREMENTS

3.1 OUTPUT VOLTAGE AND CURRENT

	MINIMUM LOAD	NORMAL LOAD	MAXIMUM LOAD	LOAD REG.	LINE REG.	RIPPLE	NOISE
+3.3V	0.5A	10.0A	28A	±5%	±1%	50mV P-P	50mV P-P
+5V	0.3A	7.0A	30A	±5%	±1%	50mV P-P	50mV P-P
+12V1DC	1.0A	7.0A	18A	±5%	±1%	120mV P-P	120mV P-P
+12V2DC	1.0A	8.5A	18A	±5%	±1%	120mV P-P	120mV P-P
-12V	0.0A	0.4A	0.5A	±10%	±2%	120mV P-P	120mV P-P
+5Vsb	0.0A	1.25A	2.5A	±5%	±1%	50mV P-P	50mV P-P

(1) +3.3V & +5V total output not exceed 180W.

When +3.3V is load to 28A, the +5V maximum load is 17.52A.

When +3.3V is load to 9.0A, the +5V maximum load is 30A.

(2) +12V1DC & +12V2DC total output not exceed 348W.

(3) +3.3V & +5V & +12V1DC & +12V2DC total output not exceed 385W.

(4) All outputs shall be safety-isolated from the AC mains and share a common return.

This common return must be connected to supply chassis.

(5) Voltages and ripple are measured at the load side of mating connectors with a 0.1 uF monolithic ceramic capacitor paralleled by a 10 uF electrolytic capacitor across the measuring terminals.

LOAD REGULATION CHARACTERISTICS

NO.	LOAD	OUTPUT LOAD					
		+3.3V	+5V	+12V1DC	+12V2DC	-12V	+5Vsb
1	COND.1	0.5A	0.3A	1.0A	1.0A	0A	0A
2	COND.2	3.0A	3.0A	2.0A	2.0A	0A	0A
3	COND.3	11A	12A	2.0A	1.5A	0.15A	1.0A
4	COND.4	20A	14A	5.0A	4.0A	0.15A	1.5A
5	COND.5	28A	14A	8.0A	6.0A	0.3A	2.0A
6	COND.6	10A	10A	13.0A	12.0A	0.3A	2.5A
7	COND.7	7.2A	10A	10.0A	15.0A	0.5A	2.5A
8	COND.8	16A	11.2A	11.2A	12.0A	0.3A	1.0A
9	COND.9	1.0A	2.0A	5.0A	4.0A	0.5A	0A

3.2 REMOTE ON/OFF CONTROL

The power supply shall accept a logic open collector level which will disable / enable all the output voltage (exclude + 5V standby).

As logic level is low, outputs voltage were enable.

As logic level is high, outputs voltage were disable.

Note: 1. Logic high level :3.50-5.25V while sourcing 0.4mA maximum.

2. Logic low level : 0-0.5V while sinking 1.5mA maximum.

3. Rise Time : 2ms maximum (10%-90%).

3.3 OUTPUT VOLTAGE HOLD-UP TIME

17.0 mS minimum : at 115V / 60 Hz. (COND.6)

17.0 mS minimum : at 230V / 50 Hz. (COND.6)

3.4 OPERATION AT NO LOAD

The power supply shall be capable of being operated with no load on any or all outputs without damage. For no load on +3.3V&+5V, the output shall not exceed +4.5 & +6.5Vdc and the power supply may shutdown and require by remote-control or remove AC power restart.

3.5 PROTECTION

3.5.1 Over-voltage protection

In the event of an over-voltage condition on +3.3 & +5Vdc & +12V the power supply shall

shutdown and require remote control or remove the AC mains input to reset the system.

+5V : 6.5V (maximum)

+3.3V : 4.6V (maximum)

+12V1DC : 15.5V (maximum)

+12V2DC : 15.5V (maximum)

3.5.2 Over-LOAD protection

There shall be protection from an output over-current event. The supply may shutdown from such an event and require power-on restart. Testing consists of application of the listed over-current value with maximum load on all other outputs.

Over-current test values: (maximum load)

+3.3V : 90A maximum

+5V : 68A maximum

+12V1DC : 32A maximum

+12V2DC : 32A maximum

3.5.3 Short-Current Protection

A short circuit at any output shall cause no damage to the power supply nor blow the primary fuse. The supply may shut down in the event of a short circuit and require power-on restart. A short circuit consists of application of a test resistance of less than 0.05 ohms at each output with maximum load on all outputs.

3.6 OUTPUT RISETIME

The cold-start enable output voltage risetime of all outputs shall be measured with maximum load on all outputs.

risetime : +3.3V 20mS (maximum)

(10-95%) +5V 20mS (maximum)

+12 V1DC 20mS (maximum)

+12 V2DC 20mS (maximum)

-12 V 20mS (maximum)

+5Vsb 20mS (maximum)

3.7 OUTPUT OVERSHOOT

No output voltage shall overshoot or generate spikes at turn-on or turn-off, during momentary power loss, output short, or realistic input voltage or output load changes, Overshoot is defined as any output that exceeds the voltage tolerance plus or minus an additional 5%.

3.8 EFFICIENCY

Overall efficiency must be 70% minimum measured at normal AC mains voltage and frequency with maximum loads on all outputs.

3.9 POWER GOOD SIGNAL

115/230V (FULL LOAD) : 100-500mS

3.10 POWER ON TIME

115/230V (FULL LOAD) : 500mS minimum.

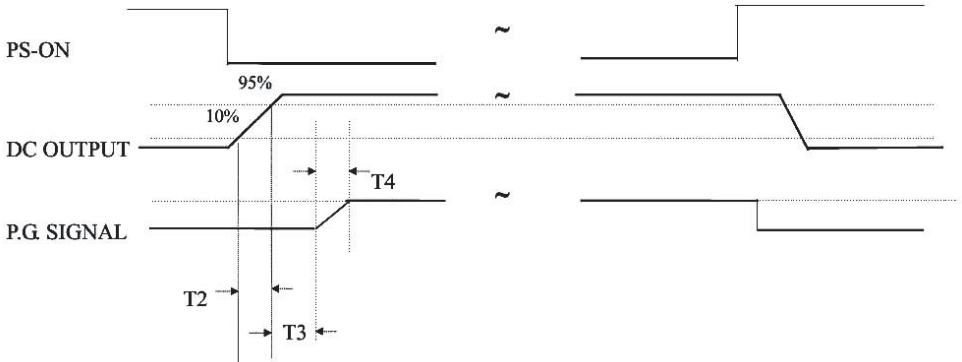


Figure 1

T2 : RISETIME < 20mS

T3 : POWER GOOD DELAY TIME 100mS-500mS

T4 : POWER GOOD RISETIME \leq 10mS

4. PHYSICAL ENVIRONMENT

4.1 OPERATING CONDITIONS

The power supply shall be capable of continuous operation and meet all electrical specification without need for adjustment when subjected to the following environmental conditions:

4.1.1 AMBIENT TEMPERATURE : 0 TO 50°C

The maximum continuous power rating of supply is 400W at 25°C. De-rate 2W / °C from 25°C to 50°C.

4.1.2 RELATIVE HUMIDITY : 90%

4.2 STORAGE AND SHIPPING CONDITIONS

No degradation of the power supply shall occur during shipping or storage at the specified conditions.

4.2.1 AMBIENT TEMPERATURE : -20 TO +65°C

4.2.2 RELATIVE HUMIDITY : 95%

4.3 SHOCK AND VIBRATION

The power supply will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics. Storage -40G, 11mSec. half-sine wave pulse in both directions on three mutually perpendicular axes. Operating -10G, 11mSec. half-sine wave pulse in both directions on three mutually perpendicular axes. Vibration Operation-Sine wave excited, 0.25G maximum acceleration. 10-250 Hz, swept at one octave/min. Fifteen minute dwell at all resonant points, where resonance is defined as those exciting frequencies at which the device under test experiences excursions two times large than non-resonant excursions.

5. REGULATORY COMPLIANCE

5.1 SAFETY REQUIREMENTS

-TUV EN60950

-UL 60950

5.2 DIELECTRIC STRENGTH

Primary to Frame Ground : 1800 Vac for 1 sec.

Primary to Secondary : 1800 Vac for 1 sec.

5.3 INSULATION RESISTANCE

Primary to Secondary : 20 Meg. ohms Minimum.

Primary to FRAME GROUND : 20 Meg. ohms Minimum.

5.4 GROUND LEAKAGE CURRENT

The power supply ground leakage current shall be less than 3.5mA.

5.5 EMISSION REQUIREMENTS

When testing the power supply must operate within the listed requirements.

6 OTHER REQUIREMENTS

6.1 COOLING

With the fan voltage set to around 12 volts, the fan will deliver greater than 38.2 CFM with the power supply in open air.

6.2 INPUT CONNECTIONS

Refer to Mechanical Specifications for placement. The AC mains input are through a three-circuit IEC type connector mounted on the rear of the power supply chassis.

6.3 RELIABILITY

The power supply reliability, when calculated by MIL-HDBK-217; latest revision, are exceed 100,000 hours with all output at maximum load and an ambient temperature of 25°C.

6.4 PIN DEFINITION***M/B 24PIN connector***

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

ATX 12V 4PIN connector

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

6PIN PCI Express Connector

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

4PIN peripheral connector (HDD) 4PIN floppy connector (FDD)

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

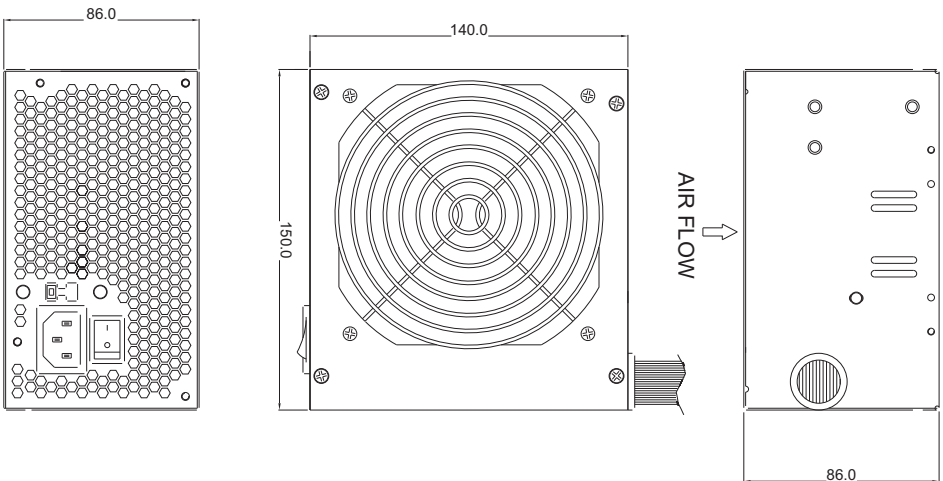
SATA connector

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

7. FAN SPEED CONTROL

Fan voltage varies with the ambient temperature or output power.

8. Power Supply Dimension : 150mm(W) × 86mm(H) × 140mm(D)



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