



SPECIFICATION

SilverStone **300W SFX Switching Power Supply** **FSP300-60GHS**

Meet 80 Plus Active PFC Circuit
Full Range Input Small Size

1. GENERAL DESCRIPTION AND SCOPE

This is the specification of Model UFSP300-60GHSU; AC-line powered switching power supply with active PFC (Power Factor Correction) circuit, meet EN61000-3-2 and with Full Range Input features.

The specification below is intended to describe as detailedly as possible the functions and performance of the subject power supply. Any comment or additional requirements to this specification from our customers will be highly appreciated and treated as a new target for us to approach.

2. REFERENCE DOCUMENTS

The subject power supply will meet the EMI requirements and obtain main safety approvals as following:

2.1 EMI REGULATORY

- FCC Part 15 Subpart J, Class 'B' 115 Vac operation.
- CISPR 22 Class 'B' 230 Vac operation.

2.2 SAFETY

- NEMKO EN 60950
- TUV EN60950 OR VDE EN60950
- CSA-C22.2 NO. 60950
- IEC 60950
- UL 60950
- CE :

EN 55022:1998+A1: 2000, Class B

EN 61000-3-2: 2000

EN 61000-3-3: 1995+A1: 2001

CISPR22: 1997+A1: 2000, Class B

AS/NZS CISPR 22: 2002, Class B

3. INPUT ELECTRICAL SPECIFICATIONS

3.1. AC INPUT

Parameter	Min.	Nom. ⁽¹⁾	Max.	Unit
V _{in} (115VAC)	90	115	135	VAC _{rms}
V _{in} (230VAC)	180	230	265	VAC _{rms}
V _{in} Frequency	47	--	63	HZ

◆ Nominal voltages for test purposes are considered to be within $\pm 1.0V$ of nominal.

3.2. INRUSH CURRENT

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.



3.3. INPUT LINENT & POWER FACTOR

(At Full load)

AC input	Input line current	P.F.@ Full Load	P.F.@ Pin=75W
115V	< 3.5Amps – rms	> 0.95	>0.8
230V	< 2.0Amps – rms	> 0.9	>0.75

3.4. EFFICIENCY

3.4.1 General

Under the load conditions defined in Table 1 and Table 2. The loading condition for testing efficiency shown in Table 1 represents a fully loaded system. a ~ 50-60% (typical) loaded system.and a ~ 20-30% (light) loaded system.

Table 1. Loading Table for Efficiency Measurement

300W (loading shown in Amps)						
Loading	+12V1	+12V2	+5V	+3.3V	-12V	+5Vsb
Full	7.56	8.64	11.5	10.46	0.37	1.84
Typical	3.78	4.32	5.75	5.23	0.18	0.92
Light	1.51	1.73	2.3	2.09	0.07	0.37

Table 2. Minimum Efficiency Vs Load

Loading	Voltage	Full load	Typical load	Light load
Required Minimum Efficiency	115V	80%	81%	80%
Required Minimum Efficiency	230V	80%	81%	80%

Minimum Efficiency for test purposes are considered to be within $\pm 1.0\%$ of nominal.



4.0. OUTPUT ELECTRICAL REQUIREMENTS

4.1 OUTPUT VOLTAGE AND CURRENT RATING

Output	MINIMUM LOAD	NORMAL LOAD	MAXIMUM LOAD	PEAK LOAD	LOAD REG	LINE REG.	RIPPLE & NOISE
+3.3V	0.5A	10A	20A	-	±5%	±1%	70mV P-P
+5V	0.5A	11A	22A	-	±5%	±1%	70mV P-P
+12V1DC	1.0A	7A	14A	19A	±5%	±1%	140mV P-P
+12V2DC	1.0A	8A	16A	19A	±5%	±1%	140mV P-P
-12V	0.0A	0.25A	0.5A	-	±10%	±1%	140mV P-P
+5VSB	0.0A	1.25A	2.5A	2.5A	±5%	±1%	70mV P-P

(1) +3.3V & 5V total output not exceed 125W.

(2) Total output continuous shall not exceed 300W watts.

(3) +12V Peak current is 19A (less than 10m Sec.), minimum voltage during peak is >10.8Vdc.

(4) 5Vsb Peak current is 3A (less than 500m Sec.), minimum voltage during peak is > 4.5Vdc.

(5) maximum combined current for the 12V outputs shall be 22A.

Voltagess 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.

4.2. LOAD CAPACITY SPECIFICATIONS

The cross regulation defined as follows, the voltage regulation limits DC include DC Output ripple & noise.

LOAD	+3.3V	+5V	+12V1 DC	+12V2 DC	-12V	+5VSB
Condition_1	X	X	X	X	X	2.5A
Condition_2	0.5A	0.5A	1A	1A	0A	0A
Condition_3	0.5A	0.5A	1A	1A	0.5A	0A
Condition_4	0.5A	15A	1A	16A	0.1A	0.1A
Condition_5	1A	2A	14A	1A	0.1A	0.1A
Condition_6	1A	14A	2A	2A	0.1A	0.1A
Condition_7	4.54A	22A	6.72A	6.72A	0.3A	2A
Condition_8	18A	2A	1A	1A	0A	0.1A
Condition_9	20A	11.8A	6.72A	6.72A	0.3A	2A

4.3. HOLD-UP TIME (@FULL LOAD)

115V / 60Hz : 17 mSec. Minimum.

230V / 50Hz : 17mSec. Minimum.

The output voltage will remain within specification, in the event that the input power is removed or interrupted, for the duration of one cycle of the input frequency. The interruption may occur at any point in the AC voltage cycle. The power good signal shall remain high during this test.



4.4. OUTPUT RISE TIME

(10% TO 95% OF FINAL OUTPUT VALUE, @FULL LOAD)

115V-rms or 230V-rms + 3.3Vdc : 20ms Maximum
 + 5Vdc : 20ms Maximum
 + 12Vdc : 20ms Maximum
 + 5Vsb : 25ms Maximum
 - 12Vdc : 20ms Maximum

4.5. OVER VOLTAGE PROTECTION

Voltage Source	Protection Point
+3.3V	3.76V-4.5V
+5V	5.6V-7.0V
+12V	13.0V-16.5V

4.6. OVER-CURRENT PROTECTION

OUTPUT VOLTAGE	Max. overcurrent limit
+3.3V	60A
+5V	48A
+12V1 DC	25A
+12V2 DC	30A

4.7. SHORT CIRCUIT PROTECTION

Output short circuit is defined to be a short circuit load of less than 0.1 ohm.

In the event of an output short circuit condition on +3.3V, +5V or +12V output, the power supply will shutdown and latch off without damage to the power supply. The power supply shall return to normal operation after the short circuit has been removed and the power switch has been turned off for no more than 2 seconds.

4.8. POWER SIGNAL

POWER GOOD @ 115/230V, FULL LOAD	100 –500mSec.
POWER FAIL @115/230V, FULL LOAD	1 mSec. minimum



5.0 FAN NOISE REQUIREMENTS

5.1. The subject power supply is cooled by a self-contained, 80mm×15mm, 12VDC fan

6.0 ENVIRONMENTAL REQUIREMENTS

The power supply will be compliant with each item in this specification for the following Environmental conditions.

6.1. TEMPERATURE RANGE

Operating	+10 to +50 deg. C
Storage	-20 to +80 deg. C

The maximum continuous power rating of supply is 300W at 50?

6.2. HUMIDITY

Operating	5 –95% RH, Non-condensing
Storage	5 –95% RH, Non-condensing

6.3. VIBRATION

The subject power supply will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics.

Vibration Operating – Sine wave excited, 0.25 G 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.

Plane of vibration to be along three mutually perpendicular axes.

6.4. GROUND LEAKAGE CURRENT

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

6.5. 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?.

6.6. DIELECTRIC STRENGTH

Primary to Frame Ground : 1800 Vac for 1 sec.

Primary to Secondary : 1800Vac for 1 sec

6.7. INSULATION RESISTANCE

Primary to Frame Ground : 20 Meg.ohms Minimum

Primary to Secondary : 20 Meg.ohms Minimum



7. LABELLING

Label marking will be permanent, legible and complied with all agency requirements.

7.1. MODEL NUMBER LABEL

Labels will be affixed to the sides of the power supply showing the following:

- Manufacturer's name and logo.
- Model no., serial no., revision level, location of manufacturer.
- The total power output and the maximum load for each output.
- AC input rating.

8.0. MECHANICAL SPECIFICATIONS

8.1 Physical Dimension

125 mm (W) × 63.5 mm (H) × 100 mm (D)

8.2 Connectors Define

	Signal	Pin	Pin	Signal	
Orange	+3.3V	13	1	+3.3V	Orange
Orange	+3.3Vsense	13			
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	+12V1	Yellow
Red	+5Vsense	22			
Red	+5VDC	23	11	+12V1	Yellow
Black	COM	24	12	+3.3V	Orange

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

	Signal	Pin	Pin	Signal	
Black	GND	1	3	+12V1	Yellow
Black	GND	2	4	+12V1	Yellow



8.2 Connectors Define

	Signal	Pin	Pin	Signal	
Yellow	+12V1	1	1	+5VDC	Red
Black	COM	2	2	COM	Black
Black	COM	3	3	COM	Black
Red	+5VDC	4	4	+12V1	Yellow

SATA connector

	Signal	Pin
Orange	+3.3V	5
Black	COM	4
Red	+5V	3
Black	COM	2
Yellow	+12V1	1

6PIN PCI Express connector

	Signal	Pin	Pin	Signal	
Yellow	+12V2	1	4	COM	Black
Yellow	+12V2	2	5	COM	Black
Yellow	+12V2	3	6	COM	Black