



**SILVERSTONE**

## **Flex ATX SERIES**

# **FX600z Platinum**

**Cybenetics Platinum 600W Fully Modular FlexATX Power Supply**

Standard FlexATX form factor  
Built-in 300W 12V-2x6 connector with a 300W 12V-2x6 connector cable included  
Delivers 600W continuous power output at 50°C, rated for 24/7 continuous operation.  
Japanese primary capacitor  
Class-leading +12V single rail  
PCIe 8-pin and 6-pin connector support



# SPECIFICATION

## SilverStone Flax ATX Series FX600z Platinum SST-FX600-PM

**Switching Power Supply**  
**Cybenetics Platinum efficiency certified.**  
**600W**

This specification describes the requirements of 600W with full range voltage, switching power supply with FLEX-ATX 1.43 form-factor and, +5V standby voltage, remote on/off .

### 1.0 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   |
|---------------|-----|--------------------|-----|--------|
| Vin           | 90  | <b>100-240</b>     | 264 | VACrms |
| Vin Frequency | 47  | <b>60----50</b>    | 63  | Hz     |
| lin(600W)     |     | <b>8.0-----4.0</b> |     |        |

Power factor correction (PF)>0.9 at full load.

#### 1.2 Inrush current regulation

The power supply must meet inrush requirements for any rated AC voltage, during turn on at any phase of AC voltage, during a single cycle AC dropout condition, during repetitive ON/OFF cycling of AC, and over the specified temperature range (Top).

The peak inrush current shall be less than the ratings of its critical components (including input fuse, bulk rectifiers, and surge limiting device).

## 2.0 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 | +5.0  | +5.25 | Volts |
| +12V      | ±5%   | +11.4 | +12.0 | +12.6 | Volts |
| -12V      | ±10%  | -10.8 | -12.0 | -13.2 | Volts |
| +5VSb     | ±5%   | +4.75 | +5.0  | +5.25 | Volts |

### 2.2 600W Load range

| Parameter | Min | Nom. | Max        | Peak | Unit |
|-----------|-----|------|------------|------|------|
| +3.3V     | 0.1 | -    | <b>15</b>  |      | Amps |
| +5V       | 0.2 | -    | <b>15</b>  |      | Amps |
| +12V      | 0.5 | -    | <b>50</b>  |      | Amps |
| -12V      | 0A  | -    | <b>0.3</b> |      | Amps |
| +5VSb     | 0A  | -    | <b>2.5</b> |      | Amps |

#### Notes:

- ( 1 ) The maximum combined load on +3.3V and +5V outputs shall not exceed 80W.
- ( 2 ) The +12V maximum load shall not exceed 600W.
- ( 3 ) The maximum continuous average DC outputs power shall not exceed 600W.
- ( 4 ) The 12V-2x6 Max load shall not exceed 25A(300W).

### 2.3 Output Ripple

Summarizes the expected output transient step sizes for each output.

The +3.3V&+5V transient load slew rate is = 1.0 A/μs.

The +12V transient load slew rate is = 5.0 A/μs.

| Parameter         | Maximum Step Size (% of rated output amps) | Maximum Step Size (A) |
|-------------------|--------------------------------------------|-----------------------|
| +3.3V             | 30% load                                   |                       |
| +5V               | 30% load                                   |                       |
| +12V              | 85% load                                   |                       |
| +12V<br>(12V-2x6) | Steps from 100%→300%<br>30%→100%           |                       |
| -12V              |                                            | 0.1A                  |
| +5VSB             |                                            | 0.5A                  |

## 2.4 Output Ripple

### 2.4.1 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 |

### 2.4.2 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 0.1 $\mu$ F ceramic capacitor and a 10 $\mu$ F electrolytic capacitor to simulate system loading. Ripple shall be measured under any condition of line voltage, output load, line frequency, operation temperature.

### 2.4.3 Ripple voltage test circuit

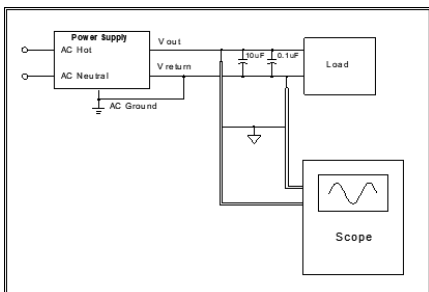


Figure 1. Ripple voltage test circuit

## 2.5 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.

## 2.6 Efficiency

### 2.6.1 At 115Vac

In an under voltage fault occurs, the supply will latch all DC outputs into a shutdown state when +12V, +5V & +3.3V outputs under 85% of it's maximum value.

| Load | Efficiency | Power Factor |
|------|------------|--------------|
| 2%   | 60%        | --           |
| 20%  | 90%        | --           |
| 50%  | 92%        | >0.9         |
| 100% | 89%        | --           |

### 2.6.2 ERP 5VSB Efficiency

| +5VSB LOAD <sup>o</sup> | Efficiency target <sup>o</sup><br>(both 115V and 230V input) <sup>o</sup> |
|-------------------------|---------------------------------------------------------------------------|
| 3A <sup>o</sup>         | 75% <sup>o</sup>                                                          |
| 1.5A <sup>o</sup>       | 75% <sup>o</sup>                                                          |
| 1A <sup>o</sup>         | 75% <sup>o</sup>                                                          |
| 0.55A <sup>o</sup>      | 75% <sup>o</sup>                                                          |
| 90mA <sup>o</sup>       | 55% <sup>o</sup>                                                          |
| 45mA <sup>o</sup>       | 45% <sup>o</sup>                                                          |

## 2.7 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.

## 2.8 Capacitance Loading

The power supply shall be stable and meet all requirements with the following capacitive loading ranges.

| Capacitive Loading Conditions <sup>o</sup> |                                   |
|--------------------------------------------|-----------------------------------|
| Output <sup>o</sup>                        | Capacitive Load (μF) <sup>o</sup> |
| +3.3V <sup>o</sup>                         | 3,300 <sup>o</sup>                |
| +5V <sup>o</sup>                           | 3,300 <sup>o</sup>                |
| +12V <sup>o</sup>                          | 3,300 <sup>o</sup>                |
| -12V <sup>o</sup>                          | 3,30 <sup>o</sup>                 |
| +5VSB <sup>o</sup>                         | 3,300 <sup>o</sup>                |

## 3.0 PROTECTION

### 3.1 Over current protection

The power supply shall have current limit to prevent the +3.3V,+5V, and +12V outputs from exceeding the values shown in the following Table. If the current limits are exceeded the power supply shall shutdown and latch off.

| Voltage | Over Current |
|---------|--------------|
| +12V    | 55A minimum  |
| +5V     | 18A minimum  |
| +3.3V   | 18A minimum  |

### 3.2 Over Temperature Protection

The power supply will be protected against over temperature conditions caused by loss of fan cooling or excessive ambient temperature. In an OTP condition the PSU will shutdown. When the power supply temperature drops to within specified limits, the power supply shall restore power automatically. The OTP must have built in hysteresis such that the power supply will not oscillate on and off due to circuit temperature recovering condition.

### 3.3 Over-power protection

The power supply will be shutdown and latch off when output power within 120~160% of rated DC output.

Note: Assurance machine can work at low voltage, full load won't damage machine.

### 3.4 Under voltage protection.

In an under voltage fault occurs, the supply will latch all DC outputs into a shutdown state when +12V,+5V & +3.3V outputs under 85% of it's maximum value.

### 3.5 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  |
|----------|---------|---------|---------|-------|
| +12V VDC | 13      | 15      | 17      | Volts |
| +5VDC    | 5.5     | 6       | 7       | Volts |
| +3.3VDC  | 3.6     | 4       | 5       | Volts |

### 3.6 Short circuit protection

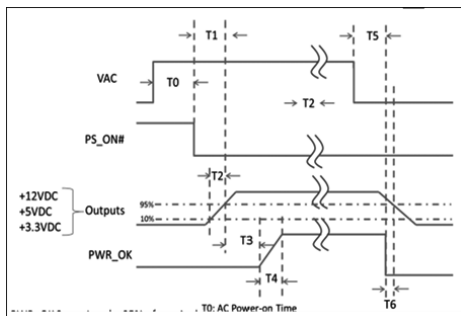
An output short circuit is defined as any output impedance of less than 0.1 ohms. The power supply shall shut down and latch off for shorting the +3.3 VDC, +5 VDC, or +12 VDC rails to return or any other rail. Shorts between main output rails and +5VSB shall not cause any damage to the power supply.

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.

### 3.7 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.

## 4.0 TIMING



| Parameter | Description                      | Required    |
|-----------|----------------------------------|-------------|
| T0        | AC power on time                 | <2s         |
| T1        | Power-on time                    | < 150ms     |
| T2        | Rise time                        | 0.2 – 20 ms |
| T3        | PWR_OK delay                     | 100 – 150ms |
| T4        | PWR_OK rise time                 | < 10 ms     |
| T5        | hold-up time at 75% Load         | > 16 ms     |
| T6        | PWR_OK inactive to DC loss delay | > 1 ms      |

## 5.0 ENVIRONMENT

### 5.1 Operation

|                   |                      |
|-------------------|----------------------|
| Temperature       | 0 to 50 °C           |
| Relative Humidity | to 85%,on-condensing |

### 5.2 Shipping and Storage

|                   |                       |
|-------------------|-----------------------|
| Temperature       | -20 to 70°C           |
| Relative Humidity | to 95%,non-condensing |

### 5.3 Altitude

|           |       |
|-----------|-------|
| Operating | 2000m |
| Storage   | 3000m |

## 6.0 SAFETY

The power supply designed to meet IEC 62368

## 7.0 ELECTROMAGNETIC COMPATIBILITY (EMC)

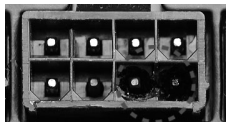
7.1 ELECTROSTATIC DISCHARGE (ESD) – IEC 61000-4-2(EN 61000-4-2).

7.2 RADIATED SUSCEPTIBILITY – IEC 61000-4-3(EN 61000-4-3).

## 8.0 MTBF

The demonstrated MTBF shall be 100,000 hours of continuous operation at 25°C 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.

## 9.0. POWER SUPPLY CONNECTOR OVERUSE DEFINITION



**DE** Definition einer Überlastung des Netzeinschlusses

**FR** Définition de l'utilisation excessive du connecteur d'alimentation électrique

**ES** Definición de uso excesivo del conector de la Fuente de alimentación

**IT** Definizione di uso eccessivo del connettore di alimentazione

**RU** Определение чрезмерной нагрузки на коннектор блока питания

**TH** นิยามการเชื่อมต่อที่มากเกินไปของสายไฟจากตัวจ่ายไฟ

**KR** 전원 공급 커넥터 과용 정의

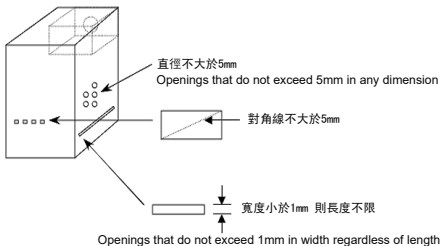
**JP** 電力供給コネクタの使用限度超過に関する説明

**CN** 电源供应器接头过度使用定义

**TW** 電源供應器接頭過度使用定義



- 為了保護使用者及防火的目的，安裝此交換式電源供應器時，必須安裝於符合下列各項要求的外殼中，並且安裝妥當後，才可接上電源。
  - 1-1. 外殼材質須為防火外殼。外殼材質須為防火外殼。
  - 1-2. 外殼的上方及側邊之圓形開孔，最大內徑不可大於5mm。
  - 1-3. 外殼的上方及側邊之長條型開孔，對角線距離不可大於5mm；若寬度小於1mm，則長度不受限制。
  - 1-4. 外殼底部不可有開孔。外殼底部不可有開孔。



2. 本產品輸出含有危險能量，為避免操作時發生危險，須於裝入系統機殼並將所有設備安裝妥當後才可開啟電源。
3. 本產品之電源輸出非屬電力限制型電源，請連接使用具防火外殼之周邊，以避免火災危險發生。

BSMI ROHS 資訊

<http://www.silverstonetek.com/downloads/PSU/RSD.pdf>

| 开关电源供应器 有毒有害物质/元素及其化学含量表 |        |        |        |              |            |              |
|--------------------------|--------|--------|--------|--------------|------------|--------------|
| 零件名称                     | 铅 (Pb) | 汞 (Hg) | 铬 (Cr) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 外壳                       | ○      | ○      | ○      | ○            | ○          | ○            |
| 接头                       | ○      | ○      | ○      | ○            | ○          | ○            |
| 风扇                       | ○      | ○      | ○      | ○            | ○          | ○            |
| 电子卡                      | ○      | ○      | ○      | ○            | ○          | ○            |
| 线材                       | ○      | ○      | ○      | ○            | ○          | ○            |
| 螺丝                       | ○      | ○      | ○      | ○            | ○          | ○            |
| 包材                       | ○      | ○      | ○      | ○            | ○          | ○            |

本表格依据IEC/EN 61324的规定编制

○：表示该有毒有害物质在该部件所有均质材料中的含量均在IEC/EN 61324 规定的限量要求以下。

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出IEC/EN 61324 规定的限量要求。



产品合格证  
SST-FX600-PM

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Product Number : SST-FX600-PM

Model (safety certification) : SST-FX0600MCPT-A

The equipment a Class | Switching Power Supply intended to use for information technology equipment or Audio and Video equipment.

※付属の電源コードは当該製品専用です。他の機器に使用しないでください。

Please refer to SilverStone website for latest specifications updates.



*SilverStone Technology Co., Ltd.*

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