



**SILVERSTONE**

# **Extreme Series**

## **Extreme 1000Rz Platinum**

### **Cybenetics Platinum 1000W Fully Modular Power Supply**

Equipped with Gen5 12V-2x6 PCIe connector, meeting Intel SFX12V V4.1 specification standard

Cybenetics Platinum efficiency certification

Ultra-silent 92mm FDB fan with intelligent fan deactivation function

Flexible embossed wire design

All Japanese electrolytic capacitors

# SPECIFICATION

## SilverStone Extreme Series

### Extreme 1000Rz Platinum SST-EX1000R-PM

SFX Switching Power Supply  
Cybenetics Platinum efficiency certified  
1000W

#### 1.General

##### 1.1 Scope

This specification defines the performance characteristics of a single phase 1000 watts, 5output power supply . This specification also defines worldwide safety and electromagnetic compatibility requirements for the power supply which is intended for use in computer products.

#### 2.Input Characteristics

##### 2.1 Input Voltage

Nominal Voltage

100 - 240 Vrms

Voltage Variation Range

90 - 264 Vrms

##### 2.2 Input Frequency

Nominal Frequency

50-60 Hz

Frequency Variation Range

47 Hz to 63 Hz

\* The power supply must operate at above frequency with 90-264VACrms input voltage range.

2.3 Max. Input AC Current

Max. Input Current

12~6A

Measuring Range

100-264 Vrms

2.4 Inrush Current

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

2.5 Efficiency

Efficiency versus Load for ENERGY STAR\*, at 115V/60Hz and 230V/50Hz

| Loading            | Full Load<br>(100%) | Typical Load<br>(50%) | Light Load<br>(20%) | Low Load<br>(2%) | PFC@<br>50%Load |
|--------------------|---------------------|-----------------------|---------------------|------------------|-----------------|
| Minimum Efficiency | 89%                 | 92%                   | 90%                 | 60%              | ≥0.9            |

3. Output characteristics

3.1 Normal Operation Output

| Output Voltage | Load MIN | Range MAX | Total Regulation | Ripple & Noise P-P Max. |
|----------------|----------|-----------|------------------|-------------------------|
| +5V            | 0.0A     | 20A       | ±5%              | 40mV                    |
| +12V           | 0.0A     | 83.3A     | +5% /-7%         | 80mV                    |
| -12V           | 0.0A     | 0.3A      | ±10%             | 80mV                    |
| +5Vs           | 0.0A     | 3.0A      | ±5%              | 40mV                    |
| +3.3V          | 0.0A     | 20A       | ±5%              | 40mV                    |

- Maximum continuous total DC output power should not exceed 1000W
- Maximum continuous combined load on +3.3VDC and +5VDC outputs shall not exceed 100W.
- Maximum combined load on +12V output rails shall not exceed 1000W

NOTE:

Noise test should be measured with 20 MHz bandwidth frequency oscilloscope. The output terminal shall add a tantalum capacitor of 10uF in parallel with a ceramic capacitor of 0.1uF.

### 3.2 Remote On/Off Controlled mode

The PSON# signal is required to remotely turn on/off the power supply, PSON# is an active low signal that turns on the output power rails. When this is not pulled low by the system, or left open, the outputs (except the +5VSB) turn off. This signal is pulled to a standby voltage by a pull-up resistor internal to the power supply.

TTL level      "H" 2.0 V – 5.25 V  
                     "L" 0.0 V – 1.0 V

### 3.3 Regulation

The cross regulation defined as follows, the output regulation should be within the specified range.

| Load         | +5V    | +3.3V  | +12V   | -12V  | +5Vsb |
|--------------|--------|--------|--------|-------|-------|
| Low Load     | 0.22A  | 0.22A  | 1.49A  | 0.01A | 0.05A |
| Light Load   | 2.15A  | 2.15A  | 14.9A  | 0.05A | 0.54A |
| Typical Load | 5.39A  | 5.39A  | 37.25A | 0.13A | 1.34A |
| Full Load    | 10.77A | 10.77A | 74.5A  | 0.27A | 2.68A |

### 3.4 Rise Time

DC output rise time is less than 20 mS at nominal line and full load.

### 3.5 +5V DC / +3.3V DC Power Sequencing

The +12V and +5V output levels must be equal to or greater than the +3.3V output at all times during power-up and normal operation. The time between any output of +12V and +5V reaching its minimum in-regulation level and +3.3V reaching its minimum in-regulation level must be  $\leq 20\text{mS}$ .

### 3.6 Hold-up Time

PG output maintains at least 16mS is 40% 1load after power off which hold within para 3.1 under 115V/60Hz and 230V/50Hz condition.

### 3.7 5VSB

5VSB is required for the implementation of PS-ON described above. 5VSB is a standby voltage that may be used to power circuits that require power input during the powered-down state of all power rails. The 5 VSB pin should deliver  $5\text{V} \pm 5\%$  at a minimum of 3.0 A for PC board circuits to operate. Conversely, PC board should draw no more than 3.0A maximum from this pin. This power may be used to operate circuits such as soft power control.

### 3.8 PG-OK

PG-OK is a power good signal and should be asserted high by power supply to indicate that the +5 VDC and +3.3 VDC outputs are above the under-voltage thresholds of the power supply. When this signal is asserted high, there should be sufficient mains energy stored by the converter to guarantee continuous power operation within specification. Conversely, when either the +5VDC or the +3.3VDC output voltage falls below the under-voltage threshold, or when mains power has been removed for a time sufficiently long so that power supply operation is no longer guaranteed, PG-OK should be deasserted to a low state. See Figure 1 for a representation of the timing characteristics of the PG-OK, PS-ON, and germane power rail signals.

### 3.9 3.3V Sense.

A default 3.3V sense line should be implemented pin 13 of the connector.

### 3.10 Capacitive Load

The power supply should be able to power up and operate normally with the following capacitances simultaneously present on the DC outputs.

| Output | Capacitive load (uF) |
|--------|----------------------|
| +5V    | 3300                 |
| +12V   | 3300                 |
| +3.3V  | 3300                 |
| -12V   | 330                  |
| +5VSB  | 3300                 |

### 3.11 Support PCIE 12V-2x6 Power

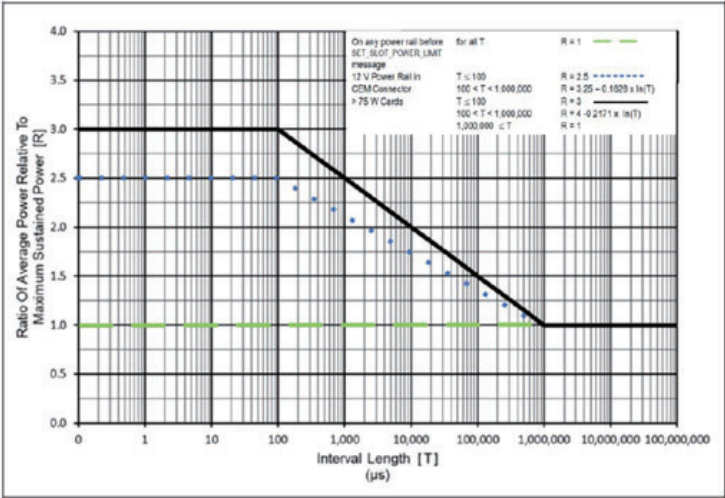
#### 3.11.1 PCI Express\* 12V-2x6 Connector Power Limits

| Initial Permitted Power at System Power Up | Maximum Sustain Power after Software Configuration |
|--------------------------------------------|----------------------------------------------------|
| 375 W                                      | 600 W                                              |
| 225 W                                      | 450 W                                              |
| 150 W                                      | 300 W                                              |
| 100 W                                      | 150 W                                              |
| 0 W <sup>1</sup>                           | 0 W <sup>1</sup>                                   |

### 3.11.2 PCIe\* AIC and PSU Power Budget used for Peak Power Excursion

| % of PSU Rated Size<br>PSU ≤ 450 Watts & PSUs<br>without 12VHPWR<br>Connector | Power Excursion % of<br>PSU Rated Size<br>PSU > 450 Watts &<br>12VHPWR Connector<br>present | Time for Power<br>Excursion (TE) | Testing<br>Duty Cycle |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------|-----------------------|
| 100%                                                                          | 100%                                                                                        | Infinite                         | --                    |
| 110%                                                                          | 120%                                                                                        | 100ms                            | 50%                   |
| 135%                                                                          | 160%                                                                                        | 10ms                             | 25%                   |
| 145%                                                                          | 180%                                                                                        | 1ms                              | 20%                   |
| 150%                                                                          | 200%                                                                                        | 100 us                           | 10%                   |

Figure 3-1: PCI Express\* CEM Add-in Card Power Excursion Limits Chart



## 4. Protection

### 4.1 Input Protection

In primary circuit of the power supply , a protected fuse is inserted. Only internal fault of the power supply will cause the fuse blown. Any overload or short circuit at DC output will keep from fuse brown or fire hazard.

### 4.2 Output Protection

#### 4.2.1 Under voltage protection

The +12V/+5V/+3.3V DC output are protected against the under voltage condition range value can't be exceed 10.3~11.0V at 12V terminal and 3.3~3.7V at 5V, 2.0~2.4V at 3.3V

#### 4.2.2 Over Voltage Protection

The +12V/+5V/+3.3V DC output are protected against the over voltage condition. Maximum value can't be over 15.6V at 12V terminal and 7.0V at 5V, 4.3V at 3.3V.

#### 4.2.3 Over Power Protection

The power supply can be used electronic circuit to limit the output current against exceeding 30-70% of surge output power or protected against excessive power delivery since short circuit of any output or over total power at high line.

#### 4.2.4 Short Circuit Protection

Short circuit placed on +5V,+12V,+3.3V,-12V will latch off. +5VSB will auto-recovery.

#### 4.2.5 Over Current Protection

Current protection should be designed to limit the current to operate within safe operating conditions. Over current protection schemes where only the voltage output that experiences the over current event is shut off may be adequate to maintain safe operation of the power supply and the system; however, damage to the motherboard or other system components may occur. The recommended over current protection scheme is for the power supply to latch into the shutdown state. The setting of over current protection for each output rail is as following.

+5V is less than or equal to 22~30A..

+3.3V is less than or equal to 22~30A.

+12V is less than or equal to 92~120A

#### 4.2.6 Over Temperature Protection

This power supply includes an over-temperature protection sensor, which can trip and shut down the power supply at  $65^{\circ}\text{C} \pm 10^{\circ}\text{C}$

## 5. Start Stability

### 5.1 No Load Start

When power is applied to PSU with no load connected or under minimum load connected, neither damage to power supply nor hazards to users will occur.

### 5.2 Cold Start

The power supply shall operate properly when first applied at normal input voltage and or so maximum load after 4 hours storage in  $0^{\circ}\text{C}$  environment.

6. Environments

6.1 Temperature and Humidity

6.1.1 Operating

|                   |            |
|-------------------|------------|
| Temperature       | 0 to 40 °C |
| Relative Humidity | 20 to 90 % |

6.1.2 Storage

|                   |                          |
|-------------------|--------------------------|
| Temperature       | -40 to 70 °C             |
| Relative Humidity | 20 to 95 % noncondensing |

6.2 Altitude

The power supply can operate normally at any altitude between 0 to 10000 feet.

6.3 Vibration and Shock

6.3.1Sweep and resonance search for each of X,Y,Z, axis at the sweep.  
RATE of 1/OCTAVE/Min.

|             |            |           |
|-------------|------------|-----------|
| Frequency   | Duration   | Amplitude |
| 10-55-10 Hz | 30 minutes | 0.35mm    |

7. Conducted EMI

CE.FCC

8. Product Safety

8.1 Safety Requirement

TUV,CB

8.2 Leakage Current

The AC leakage current is less than 3.5mA when the power supply connect to 264Vac/50Hz .

8.3 Insulation Resistance

The insulation resistance should be not less than 30M ohm after applying of 500VDC for 1 minute.

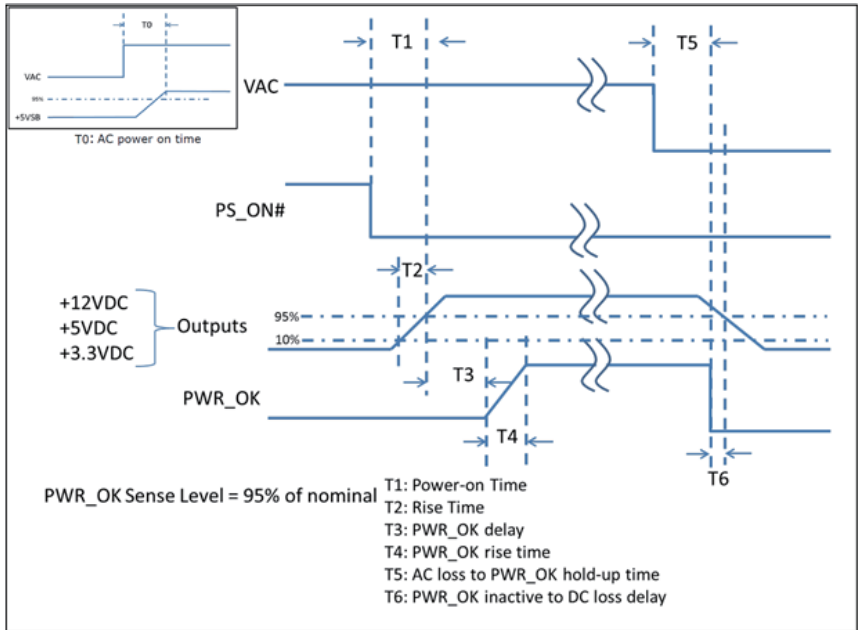
8.4 Dielectric Voltage Withstand

The power supply shall withstand for 1 minute without breakdown the application of a 60Hz 1500V AC voltage applied between both input line and chassis (20mA DC cut-off current). Main transformer shall similarly withstand 3000Vac applied between both primary and secondary windings for a minimum of one minute.

## 9. Power Good Signal

A TTL compatible signal for the purpose of initiating an orderly start-up procedure under normal input operating conditions. During power up, this signal is asserted ( low ) until +5V is under regulation and AC reaches min. line specification range. After all voltage are going appropriate level, the system may have a turn on delay of 100mS, but no greater than 250mS. During power off the signal should go to low level before +5V is out of regulation. The low level is 0 to 0.8V and high level is 4.75 to 5.25V. The " Power Good "signal can drive up to 6 standard TTL loads.

Figure 1 Time Diagram



- \* T0 : AC Turn on time ( 2S. Max.)
- \* T1 : Turn on time ( 200mS. Max.)
- \* T2 : Rise time ( 0.2~20 mS.)
- \* T3 : PWR\_OK delay ( 100~ 250 mS )
- \* T4 : PWR\_OK rise time (10mS. Max.)
- \* T5 : AC loss to PWR\_OK hold-up time (16mS Min 40% Load )
- \* T6 : PWR\_OK inactive to DC loss delay ( 1 mS Min )
- \* Power on-off cycle :

When the power supply is turned off for a minimum of 2.0 sec. and turn on again, the power good signal will be asserted.

## 10. MTBF

The MTBF of the power should be 100,000 hours min.

## 11. Burn-In

11.1 Input Voltage

Applying 230Vac

11.2 Test Condition

Applying 80% loads for the power supply in 40 (+/-5) oC chamber for 4 hours.

## 12. Harmonics

The product shall meet requirement for EN61000-3-2 & EN61000-3-3 :2005 standard of class D, test at 230Vac 50Hz.

## 13. Power Factor

The power supply with active power factor correction, and meet the EN61000-3-2 standards, The power factor is greater than 0.90 at 230V/50Hz, Max. load.

## 14. Fanless Function

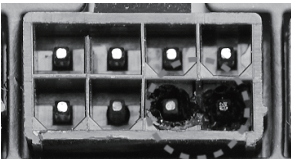
1. The fan does not turn when the load is less than 200W, but the fan will start to cool down when the temperature inside the machine exceeds the safe range.
2. when the load exceeds 300W, the fan starts.
3. Fan Delay Mode PS\_ON# is turned off, the fan stops working 2 minute later.

## 15. Mechanical Specification

15.1 Outline Dimension

125mm (W) X 63.5mm (H) X100mm( D)

## 16. POWER SUPPLY CONNECTOR OVERUSE DEFINITION



**DE** Definition einer Überlastung des Netzanschlusses

**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** นิยามการเชื่อมต่อเกินขีดจำกัดของสายไฟ

**KR** 전원 공급 커넥터 과용 정의

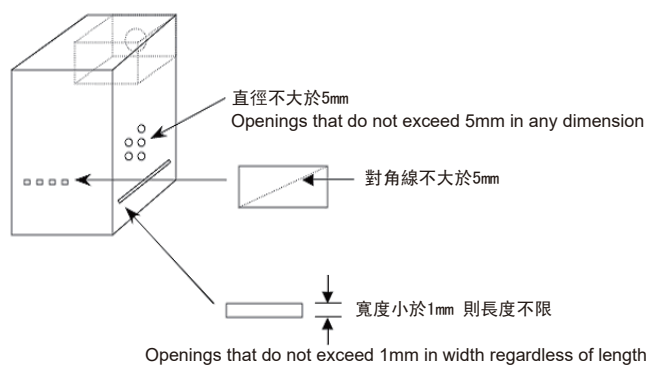
**JP** 電力供給コネクタの使用限度超過に関する説明

**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



1. 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，並且安裝妥善後，才可接上電源。
  - 1-1. 外殼材質須為防火外殼。外壳材质须为防火外壳。
  - 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。外壳底部不可有开孔。



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 |        |              |            |              |
|---------|--------|------------------|--------|--------------|------------|--------------|
| 部件名称    | 铅 (Pb) | 汞 (Hg)           | 镉 (Cd) | 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SJ/T 11364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GB/T 26572 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GB/T 26572 规定的限量要求。

产品合格证

银欣电源 原厂品质 原厂质保

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-EX1000R-PM  
 Model (safety certification) : SST-SX1000MCPT-3TD

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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