



SILVERSTONE

ATTIS Series

ATTIS 550x / ATTIS 650x / ATTIS 750Rx

80 PLUS Bronze 230V ATX PCIe 5 Fixed Cable Power Supply

- Compliant with ATX 3.1 standards and supports up to 2X power excursion
 - High efficiency with 80 PLUS Bronze 230V certification
- 24/7 continuous power output with 40°C operating temperature
 - Japanese primary capacitor
- Silent running 120mm fan with 18 dBA minimum
 - Multiple protection circuitry
- Black flat embossed cable design
- Active PFC+Double forward+DC to DC Design

SPECIFICATION

SilverStone ATTIS Series

ATTIS 550x / ATTIS 650x / ATTIS 750x

SST-AT550-BF / SST-AT650-BF / SST-AT750-BF

ATX Switching Power Supply
80 PLUS Bronze 230V efficiency certified

550W / 650W / 750W

Summary

This power supply followed the INTEL psu Standard, with a total power of 500W-750W Comply with EU RoHS directive. Supports The INTEL HASWELL platform. Meet the 80PLU Bronze efficiency standard.

1. AC INPUT REQUIREMENTS

1.1 Input AC Voltage : Frequency

Rated Input	Enable Input	Min	Nom	Max
AC200-240V	Vrms	180	200-240	264
	Hz	47	50—60	63

1.2 Input Current Max

Mode	200-240V
500W	5A
550W	5A
650W	5A
750W	5A

1.3 Inrush Current (Cold Start)

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), in the ambient temperature of 25°C, the output is no load, cold start conditions: AC input is 230Vac, less than 130A.

1.4 Power Factor

The AC input voltage is $V_{in} = 220V_{ac}$, and the power factor (PF) is ≥ 0.90 at $\geq 50\%$ load.

2. DC OUTPUT CHARACTERISTICS

2.1 DC Output Voltage Range

DC Output	Vnom	Load Regulation	DC Output Range
+3.3V	+3.3V	$\pm 5\%$	$\pm 5\%$
+5V	+5.00V	$\pm 5\%$	$\pm 5\%$
+12V	+12.00V	+5%/-7%	+5%/-7%
-12V	-12.00V	$\pm 10\%$	$\pm 10\%$
+5VSB	+5.00V	$\pm 5\%$	$\pm 5\%$

2.2 DC Output

Model Name	3.3V	5V	Combine Rated Power	12V	-12V	5VSB	Total Power
500W	20A	20A	100W	41.6A	0.3A	2.5A	500W
550W	20A	20A	100W	45.8A	0.3A	2.5A	550W
650W	20A	20A	100W	54.1A	0.3A	2.5A	650W
750W	20A	20A	100W	62.5A	0.3A	2.5A	750W

2.3 Dynamic Load Test

DC Output	Step Load	Remarks
+5Vdc	1A/us	Simulate PSU at transient response 20% to 50% load situation (Load changing repetition rate: 20msec/1msec)
+3.3Vdc	1A/us	
+12Vdc	5A/us	
-12Vdc	0.1A/us	
+5Vsbdc	0.1A/us	

2.4 Capacitor Load

DC Output	Capacitive load	Remarks
+5Vdc	3300uF	
+3.3Vdc	3300uF	
+12Vdc	6600uF	
-12Vdc	330 uF	
+5Vsbdc	3300 uF	

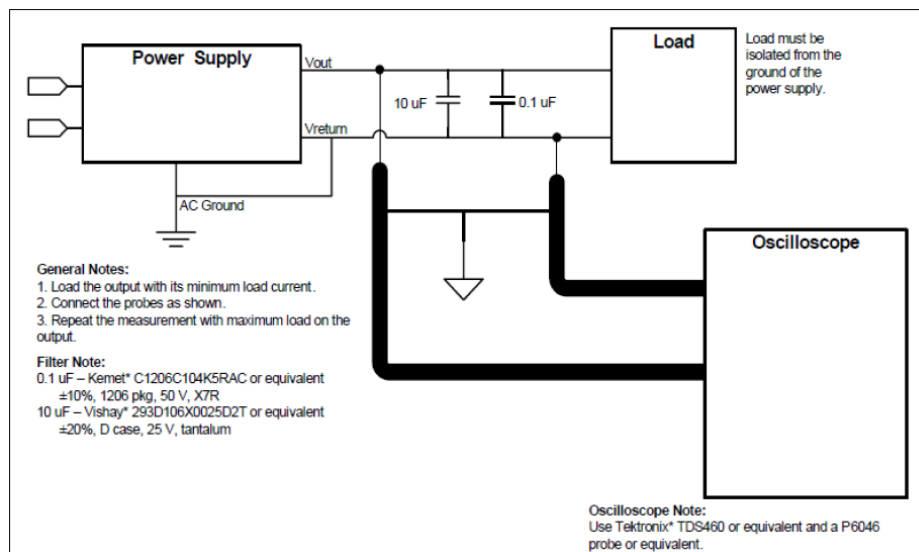
2.5 Ripple & Noise

DC Output	+5V	+12V	+3.3V	-12V	+5VSB
Ripple & Noise(mVp-p)	50mV	120mV	50mV	120mV	50mV

Note: 1. Use oscilloscope with 20MHz bandwidth for test.

2. When measuring, connect a 0.1 μ F porcelain capacitor and a 10 μ F electrolytic capacitor between the output end and the ground.

Schematic Diagram Of Measurement Method



2.6 Efficiency

2.6.1 Standby Power Consumption

Load Condition	Efficiency	Remark
45mA	≥45%	ErP* Lot 6 2013
90mA	≥45%	ErP* Lot 6 2010
0.55A	≥75%	ALPM and ErP* Lot 3 2014
1.0A	≥75%	Recommend
1.5A	≥75%	ALPM and ErP* Lot 3 2014
3.0A	≥75%	Recommend

2.6.2 Power Efficiency Of Whole Machine

Loading	White	Bronze	Silver	Gold	Platinum	Titanium	Low Load 10W/2%
10%							
20%	82%	85%					
50%	85%	88%					
100%	82%	85%					
500W	-	√	-	-	-	-	10W
550W	-	√	-	-	-	-	11W
650W	-	√	-	-	-	-	13W
750W	-	√	-	-	-	-	15W
850W	-	√	-	-	-	-	17W

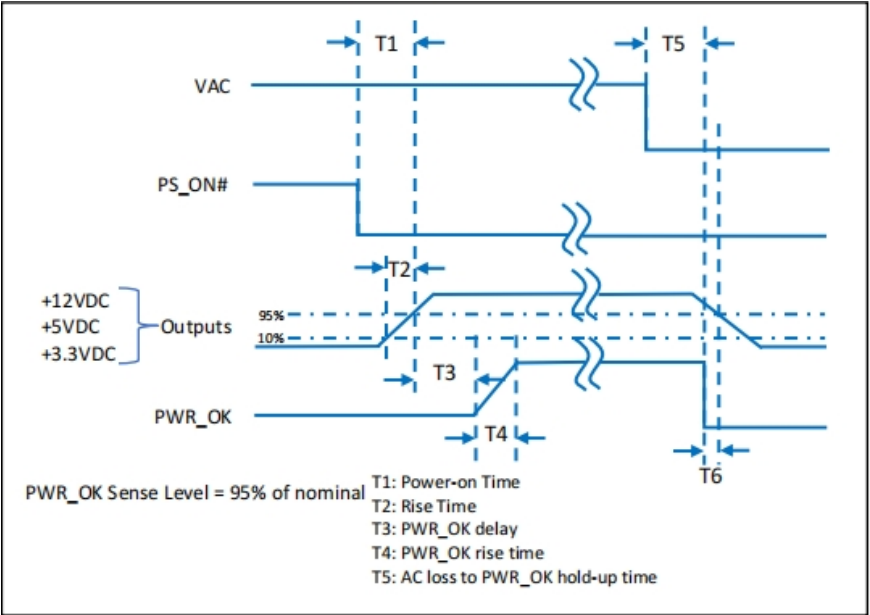
2.7 DC Output Overshoot

The DC output voltage overshoot caused by switching AC power supply or PS_ON# should be less than 10% of the normal output, and no reverse polarity voltage will be generated.



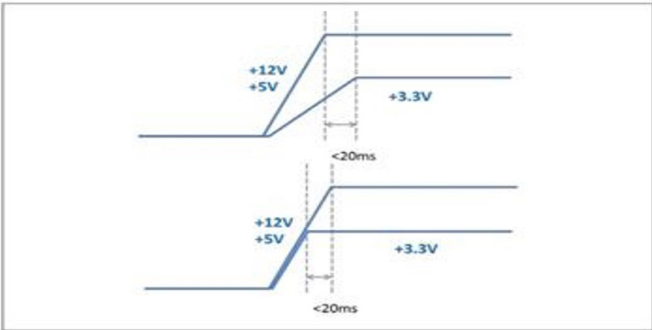
2.8 Logical timing and control signals

2.8.1 : Timing



Parameter	Description	Required
T0	AC Power On Time	$T0 < 2s$
T1	Power Start Time	$T1 \leq 150ms$
T2	Voltage Rise Time	$0.2ms \leq T2 \leq 20ms$
T3	Pwr_Ok Delay Time	$T3 \leq 150ms$
T4	Pwr_Ok Rise Time	$T4 \leq 10ms$
T5	AC Power Off Maintenance Time	$T5 \geq 12ms$ (70% Load)
T6	Power Failure Warning Time	$T6 > 1ms$ (70% Load)

2.8.2 +5V And +3.3V Timing Requirements



Duty Cycle Test Criteria for a 750W PSU – RMS

Duty Cycle	Time Constant (TC)	Time for Power Excursion (TE)	Power @ TC	Power @ TE
5%	1900 μ s	100 μ s	688.2W	1500 W
8%	11.5ms	1ms	673W	1350W
12.5%	70ms	10ms	661.2W	1200W
25%	300 ms	100 ms	692.8W	900W

2.9 PWR_OK/PS_ON#

2.9.1

PWR_OK signal is a 5V TTL signal. PWR_OK signal will be high level after 100-150ms delay when the DC output voltage reaches the minimum detection time after starting. The PWR_OK signal is low when any DC output is below the lowest detection level.

Signal types	+5V TTL
Logical low level	<0.4V, sink current 4mA
Logical high level	2.4V-5V source current 200 μ A
High-pass output impedance	1K Ω $\pm$ 5%

2.9.2

PS_ON# signal is TTL compatible signal, the motherboard through PS_ON# signal to control the switch of the power supply. When the PS_ON# signal is low, the power supply is turned on; when the PS_ON# signal is high, the power supply is turned off.

	Min	Max
VIL Input Low Level Voltage	0.0V	0.8V
IIL (Vin=0.4V) Input Low Level Current (Vin=0.4V)		-1.6mA
VIH (Iin = -200 μ A) Input High Level Voltage (Iin =-200 μ A)	2.0V	

2.10 +5VSB Characteristics

As long as there is an AC voltage input, +5Vsb has an output voltage, and +5VSB provides power output for the computer in standby mode.

3. ENVIRONMENTAL REQUIREMENTS

3.1 Operation

Temperature	0 °C to 40°C
Relative Humidity	10 to 90%, non-condensing

3.2 Shipping And Storage

Temperature	-20 °C TO 70°C
Relative Humidity	5 to 95%, non-condensing

3.3 Altitude

Operating	16404.2FT max
Storage	50032.81FT max

4. HEAT DISSIPATION AND NOISE

Air cooling is adopted for heat dissipation, and the power fan circuit has the function of temperature control and speed regulation, and the noise meets the relevant requirements of GB/T14714.

5. PROTECTION

Power supply due to over voltage, over power, short circuit, over current, over temperature, under voltage, protection function circuit action, electricity from the lock, no output at this time; When these reasons are removed, restart the power supply and the power supply will return to the normal output state. Reset PS_ON# for at least 1 second; Ac power off for at least 10 seconds)

5.1 OPP Test

After power overpower protection, the power supply does not output and is locked. Its output load rises at a rate of at least 5A/ us from full load, and the power of protection action is greater than 110% and less than 170%.

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5.2 Over Voltage Protection

DC Output	Protect Action Output Voltage			Unit
	Min	Nom	Max	
+12V	13.4	15.0	15.6	V
+5V	5.74	6.3	7.0	V
+3.3V	3.76	4.2	4.3	V
+5VSB	5.74	6.3	7.0	V

Note: +3.3V and +5V are DC-DC, and OVP of external irrigation test is cancelled.
+12V is synchronous rectifier output, and OVP of external irrigation test is cancelled.

5.3 Short Circuit Protection

- A. The power supply can be protected and locked when the output of each main power supply except +5VSB shorts to the ground.
- B. If the +5VSB output is short-circuited to the ground, the +5VSB output does not output. If the short-circuit is canceled, the system automatically recovers.

5.4 Over Current Protection

- A. Power protection when the temperature +5VSB output overcurrent. +5VSB will automatically recover after the overcurrent is cancelled.
- B. +12V; +5V; +3.3V output overcurrent, power protection and lock no output. Cancel the overcurrent and restart the PS/ON.
- C. -12V does not perform an overcurrent protection test

Model	+3.3V		+5V		+12V		5VSB	
	Min	Max	Min	Max	Min	Max	Min	Max
500W	22A	40A	22A	40A	50A	70.8A	3.0A	5.0A
550W	22A	40A	22A	40A	55A	77A	3.0A	5.0A
650W	22A	40A	22A	40A	65A	92A	3.0A	5.0A
750W	22A	40A	22A	40A	75A	106A	3.0A	5.0A

5.5 Over Temperature Protection

When the ambient temperature of the power supply exceeds the specification range, the power supply is locked and protected.

OTP	Temperature range
	50°C-65°C

5.6 Under Voltage Protection

Power protection when under voltage occurs at each source output of the power supply

UVP	Vo	Min	Normal	Max	Unit
	+3.3V	2.55	2.69	2.83	V
	+5V	4.1	3.43	4.47	V
	+12V	9.5	10	10.5	V

5.6 Under Voltage Protection

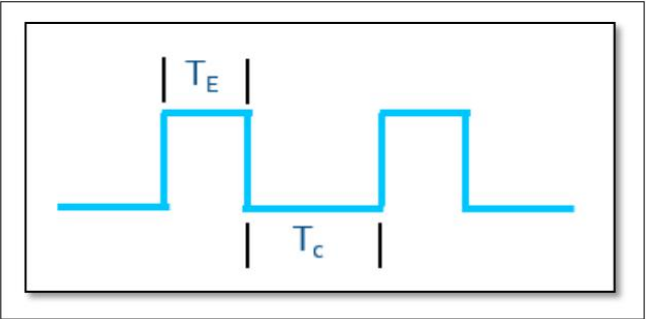
Power protection when under voltage occurs at each source output of the power supply

6. PCIe* AIC PEAK POWER DUTY CYCLE TEST

6.1 Test Condition:

Follow As Below Condition Table.

Duty Cycle Definition :



500W	Duty Cycle	Time Constant (TC)	Time for Power Excursion (TE)	Power @ TC	Power @ TE
	5%	1900 μ s	100 μ s	458.8W	1000W
	8%	11.5ms	1ms	448.7W	900W
	12.5%	70ms	10ms	440.8W	800W
	25%	300 ms	100 ms	461.9W	600W

550W	Duty Cycle	Time Constant (TC)	Time for Power Excursion (TE)	Power @ TC	Power @ TE
	5%	1900 μ s	100 μ s	504.7W	1100W
	8%	11.5ms	1ms	493.5W	990W
	12.5%	70ms	10ms	484.9W	880W
	25%	300 ms	100 ms	508.1W	660W

650W	Duty Cycle	Time Constant (TC)	Time for Power Excursion (TE)	Power @ TC	Power @ TE
	5%	1900 μ s	100 μ s	596.3W	1300W
	8%	11.5ms	1ms	583.3W	1170W
	12.5%	70ms	10ms	573W	1040W
	25%	300 ms	100 ms	600.4W	780W

750W	Duty Cycle	Time Constant (TC)	Time for Power Excursion (TE)	Power @ TC	Power @ TE
	5%	1900 μ s	100 μ s	688.2W	1500W
	8%	11.5ms	1ms	673.0W	1350W
	12.5%	70ms	10ms	661.2W	1200W
	25%	300 ms	100 ms	692.8W	900W

6.2 Test Purpose

Simulate PSU at above table duty cycle 5%, 8%, 12.5%, 25% load situation.
Test input voltage at low line and high line, 10min test time for each Duty Cycle part.

7. ELECTROMAGNETIC COMPATIBILITY

A · Meet Standard Requirements

NO.	Item	Calibration (or test conditions)
7.1	Conducted interference	EN55035 CLASS B
7.2	Radiated interference	EN55035 CLASS B
7.3	Electrostatic immunity	IEC-61000-4-2 CLASS B
7.4	Conduction immunity	IEC61000-4-6 CLASS A
7.5	Radiation immunity	IEC61000-4-3 CLASS A
7.6	Surge	IEC61000-4-5 CLASS B
7.7	Harmonic current	EN61000-3-2 Class D.

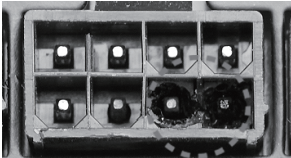
8. INSULATION AND SAFETY SPECIFICATIONS

NO.	Item		Calibration (or test conditions)	Remark
8.1	The electric strength	Input and output	3000Vac (4242dc) /10mA/3s	No arc, no Breakdown
		Input and earth	1800Vac (2546Vdc) /10mA/3s	
		Insulation impedance	500Vdc, 10MΩ Min.	
8.2	Leakage current	< 3.5mA(264Vac,50Hz)		

9. Dimension

150 x 86 x140mm

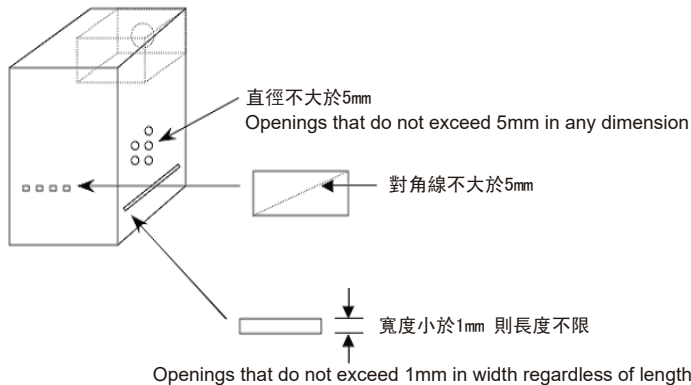
10. Power Supply Connector Overuse Definition



DE	Definition einer Überlastung des Netzeinschlusses	TH	電源供給コネクタの過剰使用定義
FR	Définition de l'utilisation excessive du connecteur d'alimentation électrique	KR	전원 공급 커넥터 과용 정의
ES	Definición de uso excesivo del conector de la Fuente de alimentación	JP	電力供給コネクタの使用限度超過に関する説明
IT	Definizione di uso eccessivo del connettore di alimentazione	CN	电源供应器接头过度使用定义
RU	Определение чрезмерной нагрузки на коннектор блока питания	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。

公司名稱:銀欣科技股份有限公司
公司地址:新北市中和區建康路168號12樓

BSMI ROHS 資訊
<https://www.silverstonetek.com/upload/downloads/PSU/RSD.pdf>

設備名稱:電源供應器 Equipment name		型號 (型式): SST-AX0750FCBR-A; SST-AX0650FCBR-A Type designation (Type)				
單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁺⁶)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
金屬外殼	○	○	○	○	○	○
電路板組成	○	○	○	○	○	○
風扇	○	○	○	○	○	○
線材	○	○	○	○	○	○
輸出接頭	○	○	○	○	○	○
備考1. “超出0.1 wt %” 及 “超出0.01 wt %” 係指限用物質之百分比含量超出百分比含量基準值。 Note 1: “Exceeding 0.1 wt %” and “exceeding 0.01 wt %” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition. 備考2. “○” 係指該項限用物質之百分比含量未超出百分比含量基準值。 Note 2: “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence. 備考3. “—” 係指該項限用物質為排除項目。 Note 3: The “—” indicates that the restricted substance corresponds to the exemption.						

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

检验员: 杨01
生产日期: 见产品条码

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.

Model (safety certification): SST-AX0550FCBR-A / SST-AX0650FCBR-B / SST-AX0750FCBR-B

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.

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