SPECIFICATION

SWITCHING POWER SUPPLY

V Platinum V2 1100W/1300W/1600W
Full Modular Version

PM	EE	ME	Package
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APPROVED BY

REV.	Description	Date	Approved
1.0	Initial release	8/21 23’	Ivan Pan Hank Chan

1.0 SCOPE

This document provides design suggestions and reference specifications for a family of power supplies that comply with the **ATX12V Rev. 3.0 & EPS12V Ver. 2.92** Specification for motherboards and chassis. It includes supplementary information not expressly detailed in the ATX & EPS Specification, such as information about the physical form factor of the power supply, cooling requirements, connector configuration, and pertinent electrical and signal timing specifications.

2.0 Electrical

The Following electrical requirements must be met over the environmental ranges as defined in **Section 6**。

2.1 AC Input

Table 1 lists AC input voltage and frequency requirements for continuous operation.
The power supply shall be capable of delivering full rated output power over input voltage ranges required by the table below.

Table 1. AC Input Line Requirements

Parameter	Minimum	Nominal	Maximum	Units
Input Voltage Range (For 1100W / 1300W)	90	100-240	264	Vac
Input Voltage Range (For 1600W)	104	115-240	264	Vac
Input Voltage Range (For 1600W derating 1300W)	90	100-114	125	Vac
Input Frequency Range	47	50-60	63	Hz
Input Current Range (For 1100W)	/	13 – 7	/	A
Input Current Range (For 1300W)	/	15 – 7	/	A
Input Current Range (For 1600W)	/	16– 8	/	A

2.2.1 Input Over Current Protection

The power supply has internal surge current and overcurrent protectors. When external AC voltage surges or internal components are abnormal, the protection device will cause necessary actions.

2.2.2 Wave Forms

Harmonic Content shall meet EN61000-3-2 Class D.

2.2.3 Inrush Current

65A maximum at 115Vac, 130A maximum at 230Vac, 25°Celsius, Cold start.

2.2.4 Active Power Factor Correction

The power supply must maintain a true power factor, must meet the following **Table 2** conditions and requirements at Normal input Range.

Table 2: Power Factor Correction Requirement

Rated of Load		50%	100%
Power Factor	115Vac/60Hz	≥ 0.95	≥ 0.99
	230Vac/50Hz	≥ 0.95	≥ 0.98

2.1.5 AC Line Transient Requirement

AC line transient conditions are characterized as “sag” and “surge” conditions. Sag conditions (also referred to as “brownout” conditions) will be defined as the AC line voltage dropping below nominal voltage. Surge conditions will be defined as the AC line voltage rising above nominal voltage. The power supply shall meet the regulation requirements under the following AC line sag and surge conditions.

Table 3: AC Line Sag Transient Performance

Duration	Sag	Operating AC Voltage	Line Frequency	Load	Performance Criteria
Continuous	10%	115/230VAC	50/60 Hz	100%	No loss of function or performance
16mS	95%	115/230VAC	50/60 HZ	100%	No loss of function or performance
>1 AC cycle	> 10%	115/230VAC	50/60 Hz	100%	Loss of function Acceptable, Self-recoverable

Table 4: AC Line Surge Transient Performance

Duration	Surge	Operating AC Voltage	Line Frequency	Load	Performance Criteria
Continuous	10%	115/230VAC	50/60 Hz	100%	No loss of function or performance
0 - 1 AC cycle	10%	115/230VAC	50/60 Hz	100%	No loss of function or performance

2.2 DC Output

2.2.1 DC Voltage Regulation

Table 5. DC Voltage Regulation Requirement

Output	DC Dynamic Voltage Regulation	Minimum	Nominal	Maximum	Unit
+12VDC	+5% / -7%	+11.4	+12.00	+12.6	Volts
+5VDC	±5%	+4.75	+5.00	+5.25	Volts
+3.3VDC	±5%	+3.201	+3.15	+3.46	Volts
-12VDC	±10%	-11.04	-12.00	-12.96	Volts
+5Vsb	±5%	+4.75	+5.00	+5.25	Volts

2.2.2 DC Output Load Current Ranges

Combined Line and Cross-Load Regulations Over any combination of line voltage specified in **Section 2.2.1** and the Cross-Load condition shown **Table 6** below. The output voltage must be as shown in the following

Table 6. DC Output Load / Current Ranges & Cross Load Defined

1100W DC Output Load /Current Ranges

Output	Output	I min	I max.	I peak
1	+12 V	0A	91.6A	
2	+5 V	0A	20A	
3	+3.3 V	0A	20A	
4	-12 V	0A	0.3A	
5	+5 VSB	0A	3A	3.5A
+5V & +3.3V combined load			120W	
Total power rating			1100W	

1300W DC Output Load /Current Ranges

Output	Output	I min	I max.	I peak
1	+12 V	0A	108.3A	
2	+5 V	0A	20A	
3	+3.3 V	0A	20A	
4	-12 V	0A	0.3A	
5	+5 VSB	0A	3A	3.5A
+5V & +3.3V combined load			120W	
Total power rating			1300W	

1600W DC Output Load /Current Ranges

Output	Output	I min	I max.	I peak
1	+12 V	0A	133.3A	
2	+5 V	0A	20A	
3	+3.3 V	0A	20A	
4	-12 V	0A	0.3A	
5	+5 VSB	0A	3A	3.5A
+5V & +3.3V combined load			120W	
Total power rating			1600W	

Note: When the input voltage is operating at 100-114V, please follow the 1300W specification for Output Current & Power rated parameters.

1100W CROSS LOAD REGULATION CHARACTERISTICS

NO	LOAD	+3.3V	+5V	+12V	-12V	+5Vsb	NOTE
1	COND.1	-	-	-	-	0A	+5Vsb Remote off
2	COND.2	-	-	-	-	3A	+5Vsb Max Remote off
3	COND.3	-	-	-	-	3.5A	+5Vsb Peak Remote off
4	COND.4	0A	0A	0A	0A	0A	No Load
5	COND.5	0A	0A	0A	0A	3A	+5Vsb Max
6	COND.6	6.1A	20.0A	0A	0A	0A	5V&3.3V Combined only (5V)
7	COND.7	20.0A	10.8A	0A	0A	0A	5V&3.3V Combined only (3.3V)
8	COND.8	6.1A	20.0A	81.3A	0.3A	0.1A	5V&3.3V Comb. Max Power(5V)
9	COND.9	20.0A	10.8A	81.3A	0.3A	0.1A	5V&3.3V Comb. Max Power(3.3V)
10	COND.10	20.0A	0A	0A	0A	0A	+3.3V Max
11	COND.11	0A	20.0A	0A	0A	0A	+5V Max
12	COND.12	0A	0A	0A	0.3A	0A	-12V Max
13	COND.13	0A	0A	91.6A	0A	0A	+12V Max
14	COND.14	2.57A	2.57A	16.28A	0.05A	0.53A	20% Load for 80Plus
15	COND.15	6.42A	6.42A	40.71A	0.13A	1.33A	50% Load for 80Plus
16	COND.16	12.84A	12.84A	81.41A	0.27A	2.66A	100% Load for 80Plus

1300W CROSS LOAD REGULATION CHARACTERISTICS

NO	LOAD	+3.3V	+5V	+12V	-12V	+5Vsb	NOTE
1	COND.1	-	-	-	-	0A	+5Vsb Remote off
2	COND.2	-	-	-	-	3A	+5Vsb Max Remote off
3	COND.3	-	-	-	-	3.5A	+5Vsb Peak Remote off
4	COND.4	0A	0A	0A	0A	0A	No Load
5	COND.5	0A	0A	0A	0A	3A	+5Vsb Max
6	COND.6	6.1A	20.0A	0A	0A	0A	5V&3.3V Combined only (5V)
7	COND.7	20.0A	10.8A	0A	0A	0A	5V&3.3V Combined only (3.3V)
8	COND.8	6.1A	20.0A	98.0A	0.3A	0.1A	5V&3.3V Comb. Max Power(5V)
9	COND.9	20.0A	10.8A	98.0A	0.3A	0.1A	5V&3.3V Comb. Max Power(3.3V)
10	COND.10	20.0A	0A	0A	0A	0A	+3.3V Max
11	COND.11	0A	20.0A	0A	0A	0A	+5V Max
12	COND.12	0A	0A	0A	0.3A	0A	-12V Max
13	COND.13	0A	0A	108.3A	0A	0A	+12V Max
14	COND.14	2.61A	2.61A	19.58A	0.05A	0.54A	20% Load for 80Plus
15	COND.15	6.53A	6.53A	48.95A	0.14A	1.36A	50% Load for 80Plus
16	COND.16	13.07A	13.07A	97.89A	0.27A	2.71A	100% Load for 80Plus

1600W CROSS LOAD REGULATION CHARACTERISTICS

NO	LOAD	+3.3V	+5V	+12V	-12V	+5Vsb	NOTE
1	COND.1	-	-	-	-	0A	+5Vsb Remote off
2	COND.2	-	-	-	-	3A	+5Vsb Max Remote off
3	COND.3	-	-	-	-	3.5A	+5Vsb Peak Remote off
4	COND.4	0A	0A	0A	0A	0A	No Load
5	COND.5	0A	0A	0A	0A	3A	+5Vsb Max
6	COND.6	6.1A	20.0A	0A	0A	0A	5V&3.3V Combined only (5V)
7	COND.7	20.0A	10.8A	0A	0A	0A	5V&3.3V Combined only (3.3V)
8	COND.8	6.1A	20.0A	123.0A	0.3A	0.1A	5V&3.3V Comb. Max Power(5V)
9	COND.9	20.0A	10.8A	123.0A	0.3A	0.1A	5V&3.3V Comb. Max Power(3.3V)
10	COND.10	20.0A	0A	0A	0A	0A	+3.3V Max
11	COND.11	0A	20.0A	0A	0A	0A	+5V Max
12	COND.12	0A	0A	0A	0.3A	0A	-12V Max
13	COND.13	0A	0A	133.3A	0A	0A	+12V Max
14	COND.14	2.66A	2.66A	24.54A	0.06A	0.55A	20% Load for 80Plus
15	COND.15	6.65A	6.65A	61.35A	0.14A	1.38A	50% Load for 80Plus
16	COND.16	13.31A	13.31A	122.70A	0.28A	2.76A	100% Load for 80Plus

2.2.3 Output Ripple & Noise Requirement

Ripple and noise are defined as periodic or random signals over a frequency band of 10 Hz to 20 MHz. Measurements shall be made with an oscilloscope with 20 MHz bandwidth. Outputs should be bypassed at the connector with a 0.1uF ceramic disk capacitor and a 10uF electrolytic capacitor to simulate system loading.

Table 7. DC Output Ripple/Noise

Output	Maximum Ripple and Noise	Unit
+12VDC	120	mVp-p
+5VDC	50	mVp-p
+3.3VDC	50	mVp-p
-12VDC	120	mVp-p
+5Vsb	50	mVp-p
PWR-OK	400	mVp-p
PSON#	400	mVp-p

Ripple and noise shall be measured using the following methods:

a) Measurements made differentially to eliminate common-mode noise

b) Ground lead length of oscilloscope probe shall be ≤ 0.25 inch.

c) Measurements made where the cable connectors attach to the load.

d) Measurements measured at locations where remote sense wires are connected.

e) When performing this test, the probe clips and capacitors should be located close to the load.

The test set-up shall be as shown below.

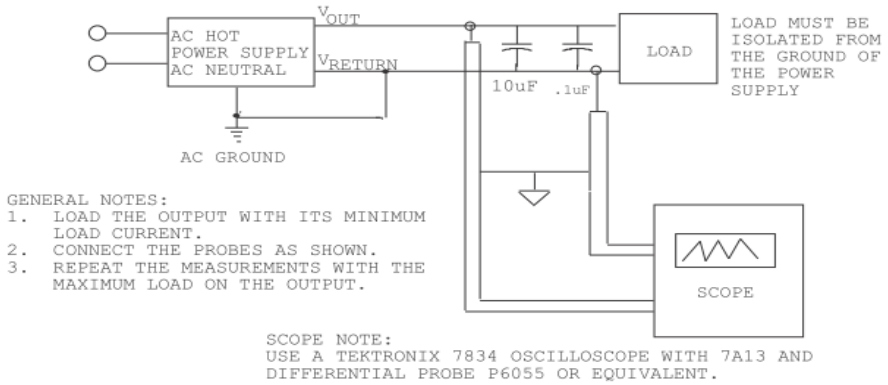


Figure 1. Differential Noise Test Setup

2.2.4 ERP Requirements

5VSB efficiency should meet EUP(2013)、ErP Lot 3 2014 as below:

Table 8. ERP efficiency requirements

5VSB Load Target	5VSB Actual Load	Efficiency Target (Both 115V and 230V Input)	Remark
Max / Label	3.0A / Label	≧75%	
1.5A		≧75%	ALPM and ErP Lot 3 2014
1.00A		≧75%	
0.55A		≧75%	ALPM and ErP* Lot 3 2014
90mA		≧55%	
45mA		≧45%	ErP* Lot 6 2013

2.2.5 Efficiency Load and Requirement

The power efficiency shall meet 80PLUS Gold Standard (115V Internal Non-Redundant) specified in below table

The efficiency should be measured at 115VAC/60Hz Input at 25℃ Ambient Condition.,

1100W Efficiency Load Condition.

Loading	+3.3V	+5V	+12V	-12V	+5Vsb	Required minimum Efficiency
20%	**2.57A**	**2.57A**	**16.28A**	**0.05A**	**0.53A**	≧90%
50%	**6.42A**	**6.42A**	**40.71A**	**0.13A**	**1.33A**	≧92%
100%	**12.84A**	**12.84A**	**81.41A**	**0.27A**	**2.66A**	≧89%

1300W Efficiency Load Condition.

Loading	+3.3V	+5V	+12V	-12V	+5Vsb	Required minimum Efficiency
20%	**2.61A**	**2.61A**	**19.58A**	**0.05A**	**0.54A**	≧90%
50%	**6.53A**	**6.53A**	**48.95A**	**0.14A**	**1.36A**	≧92%
100%	**13.07A**	**13.07A**	**97.89A**	**0.27A**	**2.71A**	≧89%

1600W Efficiency Load Condition.

Loading	+3.3V	+5V	+12V	-12V	+5Vsb	Required minimum Efficiency
20%	**2.66A**	**2.66A**	**24.54A**	**0.06A**	**0.55A**	≧90%
50%	**6.65A**	**6.65A**	**61.35A**	**0.14A**	**1.38A**	≧92%
100%	**13.31A**	**13.31A**	**122.70A**	**0.28A**	**2.76A**	≧89%

The test set-up shall be as shown below.

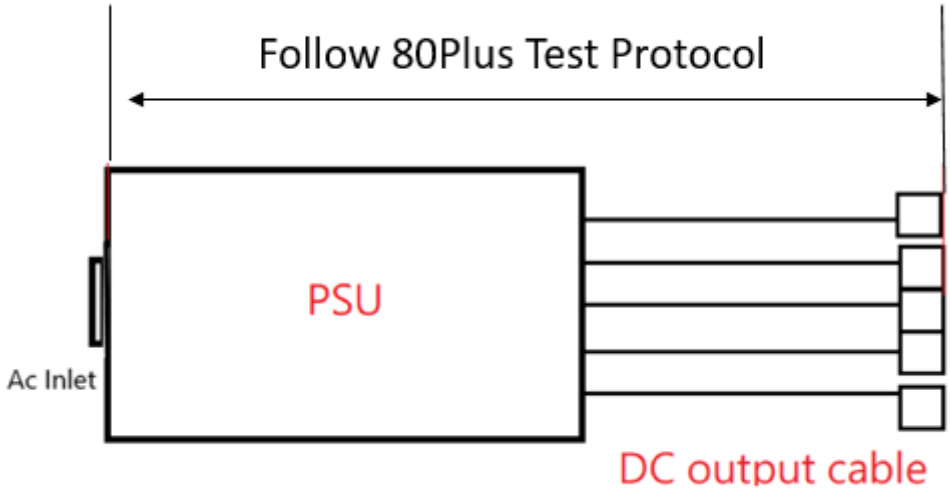


Figure 2. Efficiency Test Setup

2.2.6 TRANSIENT RESPONSE (STEP LOAD)

The power supply shall be stable and output voltage over / undershoot shall be within the regulation band specified in **Table 9** under Load transient conditions as:

- +5V or +3.3V transients to **40%** rated o/p current.
- +12V transients to **60%** rated output current.
- Transients frequency: 50Hz to 10KHz, 50% duty cycle.
- Capacitive loading per Paragraph 2.2.7

Table 9. DC Dynamic Regulation Requirements

Output	Range	Transients slew rate (A/µS)
+12V	±5%	5.0
+5V	±5%	1.0
+3.3V	±5%	1.0
-12V	±10%	0.1
+5Vsb	±5%	0.5
+12VHPWR	+5% / -8%	5.0

2.2.7 Capacitive Load

The power supply should be able to power up and operate with the regulation limits defined in **Table 6** with the following capacitances simultaneously present on the DC outputs.

Table 10. Output Capacitive Load

Output	Capacitive load (uF)
+12V	6,600
+5V	3,300
+3.3V	3,300
-12V	330
+5Vsb	3,300

2.2.8 +12V Rail ATX 3.0 Peak Power Requirement

In ATX V3.0, the +12V Rail must meet the following Peak power requirements, including Duty cycle 5%, 8%, 12.5%, 25% in **+12V Rail** rated maximum output 120%，160%，180%，200% Load condition requirements.

These test conditions must use and the output voltage must be within **Table 11** regulation rate of +12V Output.

Test Condition:

- Input Voltage : 104VAC / 264VAC (For 1600W), 90VAC / 125VAC (For derating 1300W)
- 90VAC / 264VAC (For 1100W / 1300W)
- Capacitive Load : +12V rail 6,600uF
- Slow rate: **5A/us**
- Each test time must be at the maximum operating ambient temperature of the product and exceed 40 minutes. Continue until thermal equilibration, during which Components must not exceed Thermal stress specifications.

Table 11. + 12V ATX 3.0 Peak Power Regulation Requirement

Output	Minimum	Nominal	Maximum	Unit
+12VDC	+11.2	+12.00	+12.6	Volts

Table 14. + 12V Rail ATX 3.0 Peak Power Setting Requirement

Power Excursion % of PSU Rated Size PSU > 450 Watts & 12VHPWR Connector present	Time for Power Excursion (T_E)	Testing Duty Cycle
200%	100 µs	5%
180%	1 ms	8%
160%	10 ms	12.5%
120%	100 ms	25%
100%	Infinite	--

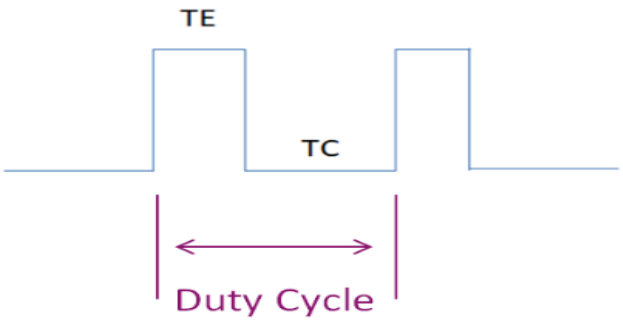


Figure 3. Peak power duty cycle definition

For 1100W Rating ATX 3.0 Peak power Test Conditions Requirements

	100us		1ms		10ms		100ms	
PSU Output Rails	**TE (A)**	**TC (A)**	**TE (A)**	**TC(A)**	**TE (A)**	**TC (A)**	**TE (A)**	**TC (A)**
5 V	10.27	10.27	10.27	10.27	10.27	10.27	10.27	10.27
3.3 V	10.27	10.27	10.27	10.27	10.27	10.27	10.27	10.27
-12V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5 VSB	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53
12V	176.01	76.79	157.67	74.93	139.34	73.48	102.67	77.35
PSU Power	2200.0	1009.4	1980.0	987.1	1760.0	969.7	1320.0	1016.1

For 1300W Rating ATX 3.0 Peak power Test Conditions Requirements

	100us		1ms		10ms		100ms	
PSU Output Rails	**TE (A)**	**TC (A)**	**TE (A)**	**TC(A)**	**TE (A)**	**TC (A)**	**TE (A)**	**TC (A)**
5 V	10.45	10.45	10.45	10.45	10.45	10.45	10.45	10.45
3.3 V	10.45	10.45	10.45	10.45	10.45	10.45	10.45	10.45
-12V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5 VSB	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
12V	209.21	91.96	187.54	89.76	165.88	88.05	122.54	92.62
PSU Power	2600.0	1193.0	2340.0	1166.5	2080.0	1146.0	1560.0	1200.9

For 1600W Rating ATX 3.0 Peak power Test Conditions Requirements

	100us		1ms		10ms		100ms	
PSU Output Rails	**TE (A)**	**TC (A)**	**TE (A)**	**TC(A)**	**TE (A)**	**TC (A)**	**TE (A)**	**TC (A)**
5 V	10.64	10.64	10.64	10.64	10.64	10.64	10.64	10.64
3.3 V	10.64	10.64	10.64	10.64	10.64	10.64	10.64	10.64
-12V	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5 VSB	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55
12V	259.07	114.76	232.41	112.05	205.74	109.95	152.41	115.58
PSU Power	3200.0	1468.3	2880.0	1435.7	2560.0	1410.5	1920.0	1478.0

2.2.9 +5VDC / +3.3VDC Power / Sequencing

The +5VDC output level is equal to or greater than the +3.3VDC output at all times during power-up and normal operation. The time between the +5VDC output reaching its minimum in-regulation level and 3.3VDC reaching its minimum in-regulation level shall be less than or equal to 20mS.

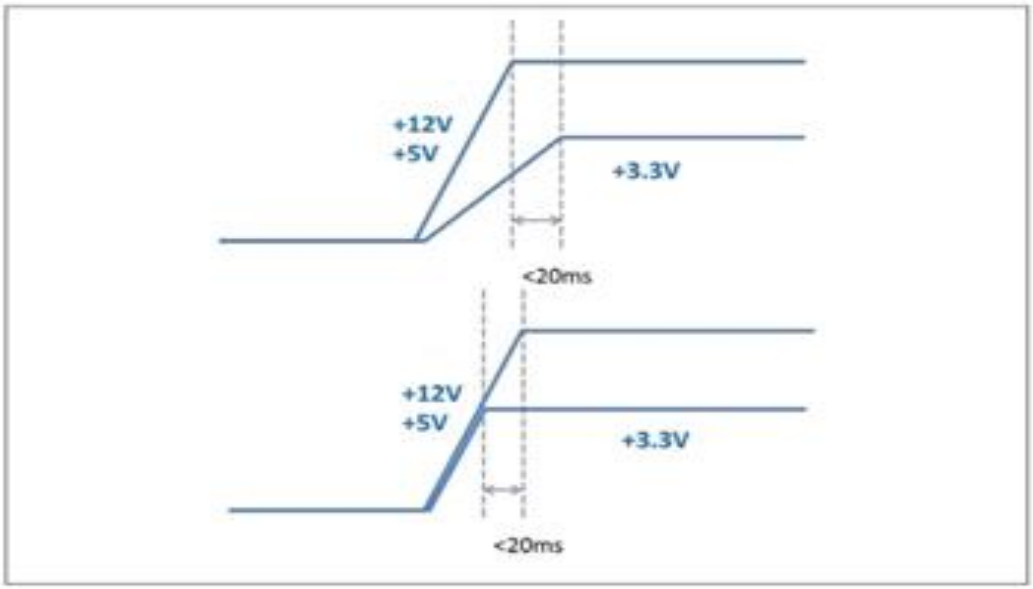


Figure 4. Power Supply Timing

3.0 Timing / Housekeeping / Control

Table 12. Timing Requirement

Timing	Required
T0 - AC Power on Time	< 2s
T1 - Power-on Time	< 150ms
T2 - Rise Time	0.2ms ~ 20ms
T3 - PWR_OK delay	100ms ~ 150ms
T4 - PWR_OK rise time	≤ 10ms
T5 - AC loss to PWR_OK Hold-up time	≥ 16ms
T6 - Power-down warning	≥ 1ms

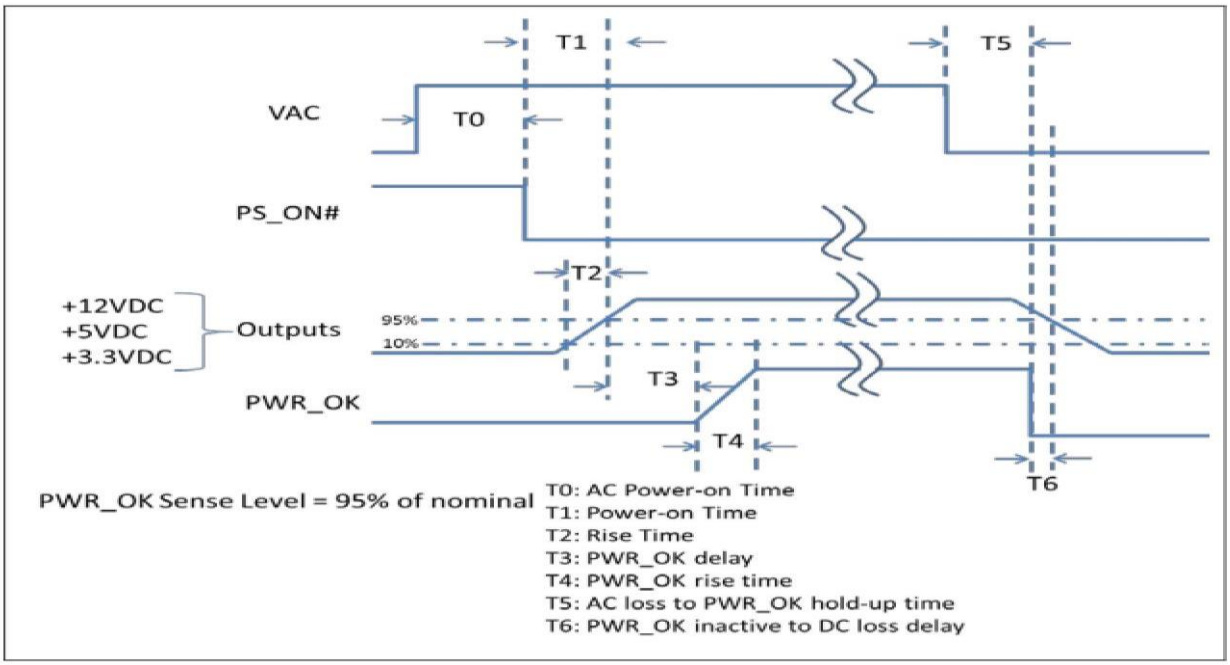


Figure 5. Power Supply Timing

3.1 Power Good signal (PWR-OK)

The power good signal (TTL compatible) shall be provided to indicate normal operating conditions of the power supply. The power good signal will be asserted (low state) during power up until the +5VDC outputs are within the regulation range defined in **Section 2.2.1** The electrical and timing characteristics of the power good signal are given in **Table 16**.

Table 13. PWR_OK Signal Characteristics

Signal Type	+5 V TTL compatible
Logic level low	< 0.4 V while sinking 4 mA
Logic level high	Between 2.4 V and 5.25 V output while sourcing 200 µA
High-state output impedance	1 kΩ from output to common
Max Ripple / Noise	400 mV p-p

3.2 PS_ON#

PS_ON# is an active-low, TTL-compatible signal that allows a motherboard to remotely control the power supply in conjunction with features such as soft on/off, Wake on LAN, or wake-on-modem. When PS_ON# is pulled to TTL low, the power supply should turn on the five main DC output rails: +12VDC, +5VDC, +3.3VDC, and -12VDC. When PS_ON# is pulled to TTL high or open-circuited, the DC output rails should not deliver current and should be held at zero potential with respect to ground. PS_ON# has no effect on the +5VSB output, which is always enabled whenever the AC power is present. To support systems with ALPM this is required for all power supplies. The power supply may be asked to turn back on before all voltage rails have turned off. The power supply must be able to turn back on via a change in the PS_ON# signal after 100 ms of the PS_ON# signal being de-asserted. **Table 17** lists PS_ON# signal characteristics. The power supply shall provide an internal pull-up to TTL high. The power supply shall also provide de-bounce circuitry on PS_ON# to prevent it from oscillating on/off at startup when activated by a mechanical switch. The DC output enable circuitry must be SELV-compliant. The power supply shall not latch into a shutdown state when PS_ON# is driven active by pulses between 10 ms to 100 ms during the decay of the power rails.

Table 17. PS_ON# Signal Characteristics

Signal type	Min.	Max.
V_{IL}, Input Low Voltage	0.0 V	0.8 V
I_{IL}, Input Low Current (Vin = 0.4 V)		-1.6 mA
V_{IH}, Input High Voltage (Iin = -200 µA)	2.0 V	
V_{IH} open circuit, Iin = 0		5.25 V
Max Ripple /Noise		400mV p-p

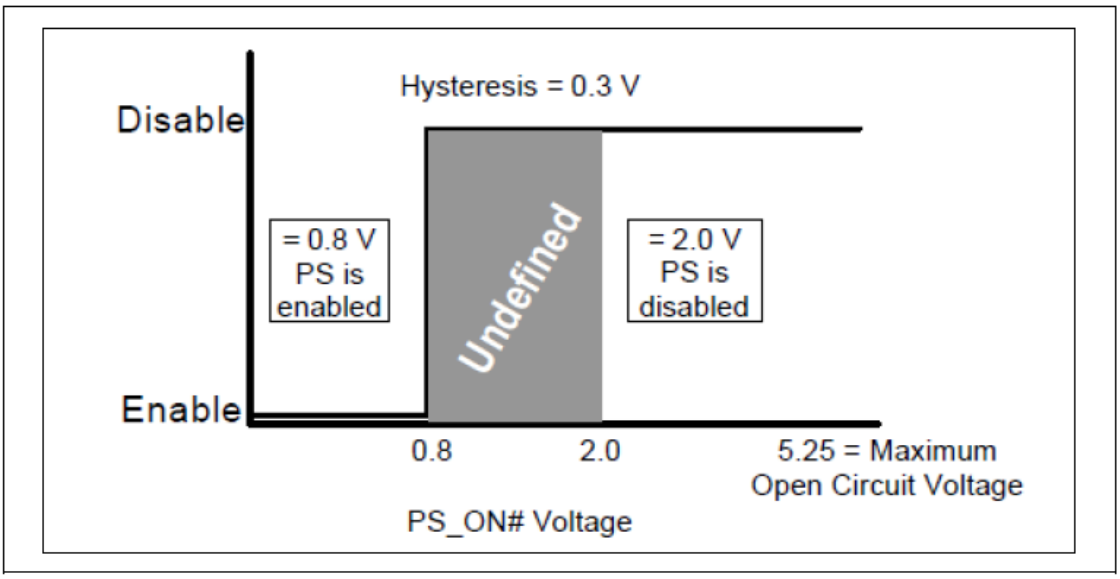


Figure 6. PS_ON# Signal Voltage level

3.3 +5VSB

+5VSB is a standby supply output that is active whenever the AC power is present. This output provides a power source for circuits that must remain operational when the five main DC output rails are in a disabled state. Example uses include soft power control, Wake on LAN, wake-on-modem, intrusion detection, Alternative Low Power Modes (ALPM) or suspend state activities.

The power supply must be able to provide the required power during a “wake up” event. If an external USB device generates the event, there may be peak currents as high as **3.5A**., lasting no more than **500ms**.

Over current protection is required on the +5VSB output regardless of the output current rating. This ensures the power supply will not be damaged if external circuits draw more current than the supply can provide.

3.4 Power-on Time

The power-on time is defined as the time from when PS_ON# is pulled low to when the +12 VDC, +5 VDC, and +3.3 VDC outputs are within the regulation ranges specified in **Section 2.2.1** The power-on time shall be less than **150mS** (T1 < **150ms**). +5VSB shall have a power-on time of 2S maximum after application of valid AC voltages.

3.5 Rise Time

The output voltages shall rise from≦10% of nominal to within the regulation ranges specified in **Section 2.2.1** within **0.2ms** to **20ms** (**0.2ms**≦T2≦**20ms**).

3.6 HOLD-UP TIME

Upon the loss of AC input power, the output shall remain within regulation under maximum **100%** load as specified in **paragraph 2.2.2** and at nominal input voltage for minimum of **16ms** after the last current pulse drawn from the line.

3.7 Overshoot at Turn-on / Turn-off

Any output overshoot at turn on shall be less than **110%** of the nominal output voltage. The output voltage overshoot upon the application or removal of the input voltage, or the assertion/de-assertion of PS_ON#, No voltage of opposite polarity shall be present on any output during turn-on or turn-off.

4.0 Output Protection

4.1 Short-Circuit Protection

A short circuit placed between DC return and Cross output (Impedance less than 0.1 ohm) shall cause no damage and the main output shall shutdown and latch off, but only the +5VSB shall recover automatically.

***Note: 5Vsb no need to test SCP with other's rail.**

4.2 Over Voltage Protection

When the DC output (+5V, +12V, +3.3V & +5Vsb) have over voltage condition, the power supply shall provide latch mode over voltage protection.

Table 18. Over Voltage Protection

Output	Minimum	Nominal	Maximum	Unit
+12V	13.4	15	15.6	Volts
+5V	5.74	6.3	7.0	Volts
+3.3V	3.76	4.2	4.3	Volts
+5Vsb	5.74	6.3	7.0	Volts

4.3 Under Voltage Protection

The under-voltage protection points of all output voltages must use the Power good drop signal as the protection trigger judgment of each output rail.

Table 19. Under Voltage Protection

Output	Min.	Typ.	Max.	Unit
+3.3V For P.G	2.55	2.69	2.83	Volts
+5V For P.G	4.1	4.3	4.47	Volts
+12V For P.G	9.5	10.0	10.5	Volts

4.4 Over Current Protection:

Overload current applied to each tested output rail will cause the output to trip between **110% ~ 150%** of max current for all +12V rails and **110% ~ 150%** for +5V and +3.3V rails.

starting from Max current to PSU Latch off.- After the over-current condition is removed, the PSU must be started normally again through Remote ON/OFF, and there must be no damage.

4.5 Over Power Protection

The power supply shall be shut down and latch off, if the wattage of the power supply is between **110% ~ 160%** of maximum load.

starting from Max power or Maximum combined power to PSU Latch off. the cut-off current shall not exceed the lower limit of each Output Rail OCP protection.

4.6 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 shut down. **(Allow Latch-off or soft-recovery)**. When the power supply temperature drops to within specified limits, the power supply Remote on / off **(or AC ON/OFF)** shall restore power.

4.7 Reset after Shutdown

If the power supply latches into a shutdown state because of a fault condition on its outputs, the power supply shall return to normal operation only after the fault has been removed and the PS_ON# has been cycled OFF/ON with a minimum OFF time of 0.5 second.

4.8 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.

When the power supply is in the PSON# signal = Low state, the power supply must maintain normal operation without any trigger protection or shutdown behavior.

5.0 Mechanical Specifications

5.1 Mechanical Housing

5.1.1 Housing Size

Dimension	Maximum Dimension
Length	160mm
Width	150mm
Height	86mm

5.1.2 Housing Finish

Black powder coat, textured finish

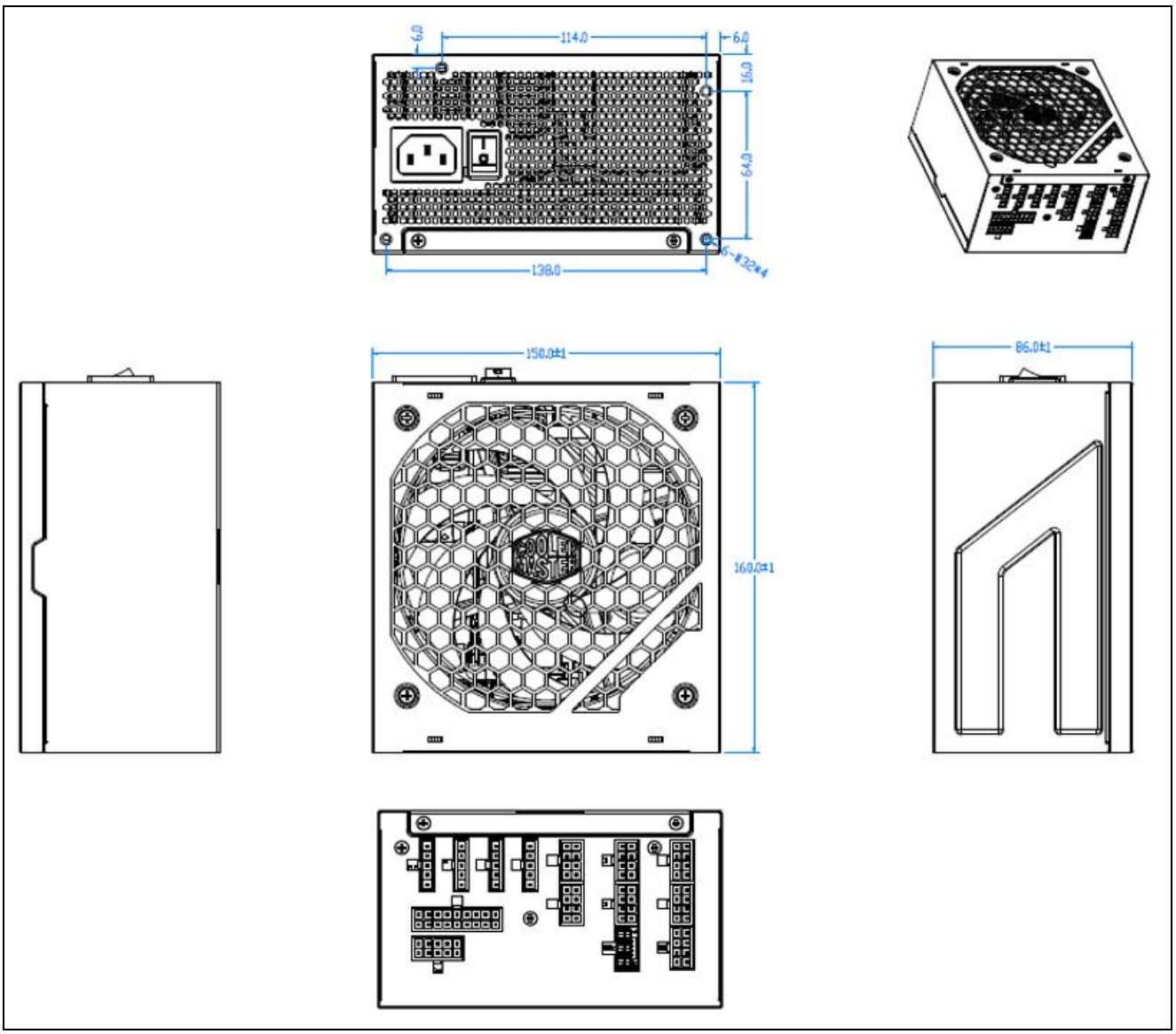
5.1.3 Weight

<5.0 Kg

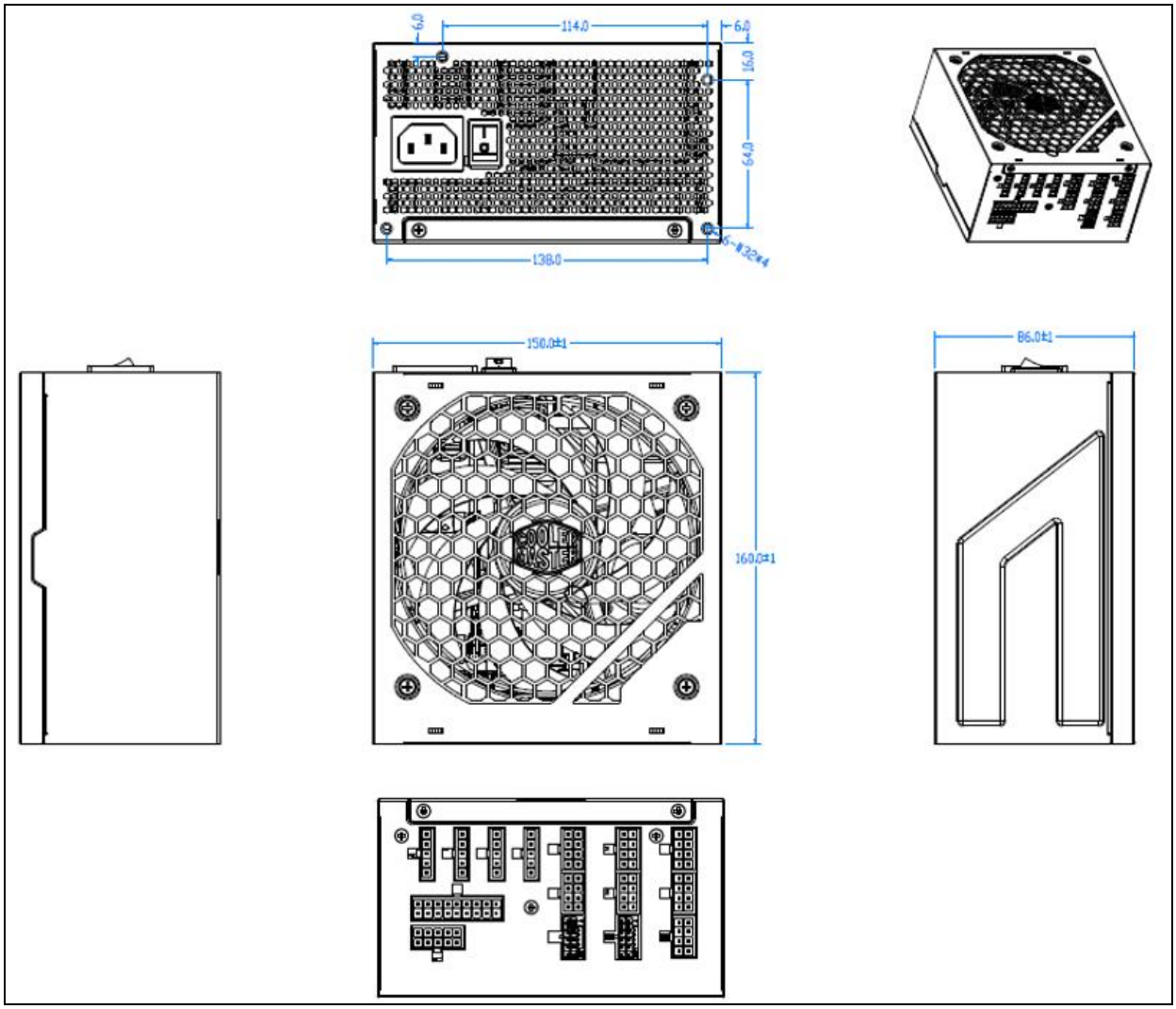
5.1.4 Product Outline

(Images are for reference only)

For 1100W / 1300W

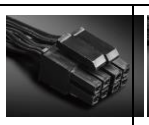
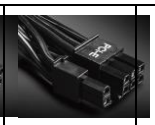
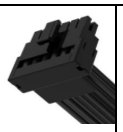


For 1600W

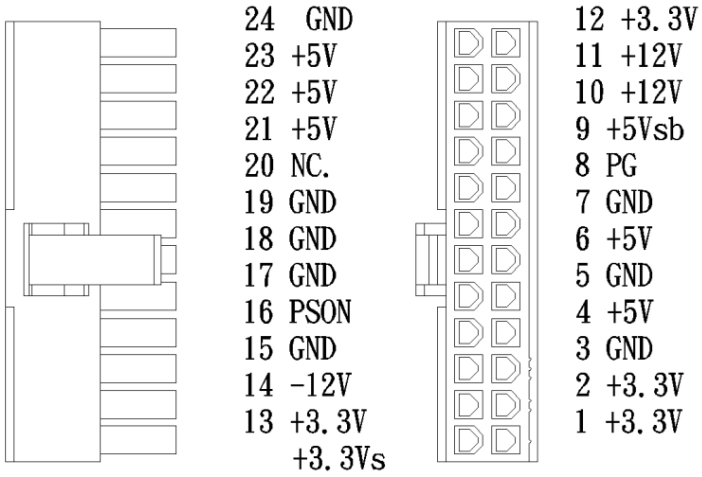


5.2 Connectors and Cables

5.2.1 DC Power Connectors and DC Cable Harness
Please refer the attached file for all models

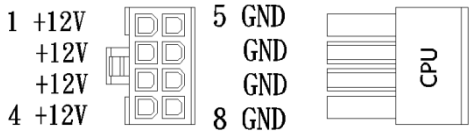
							
	ATX24 Pin	**CPU 4+4 Pin**	**CPU 8 Pin**	**PCI-e 6+2 Pin**	**PCI-e 12+4 pin**	**SATA**	**Peripheral**
Gauge	16 AWG	16 AWG	16AWG	16 AWG / 18 AWG	16 AWG / 28 AWG 90 degree connector VGA side UL1430 or 1569 +70P	18 AWG	18 AWG
Wire Color	BLACK						
Connector Color	BLACK						
Cable Type	Flat cable	Flat cable	Flat cable	Flat cable	Cable + Nylon woven mash	Flat cable	Flat cable
1100W	1 × 650mm	1 × 650mm	1 × 650mm	5 × 550mm	1 x 650mm	4 × 500(s)+120(s)+120(s)+120(s)mm	1 × 500(p)+120(p)+120(p)+120(p)mm
1300W	1 × 650mm	1 × 650mm	1 × 650mm	5 × 550mm	1 x 650mm	4 × 500(s)+120(s)+120(s)+120(s)mm	1 × 500(p)+120(p)+120(p)+120(p)mm
1600W	1 × 650mm	1 × 650mm	1 × 650mm	5 × 550mm	2 x 650mm	4 × 500(s)+120(s)+120(s)+120(s)mm	1 × 500(p)+120(p)+120(p)+120(p)mm

5.2.2 ATX Main Mother Board Power Connector 24 pin(Flat Cable)

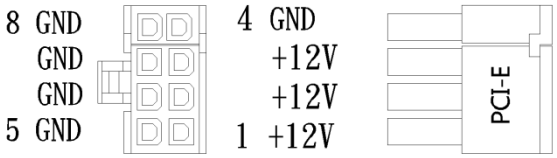


5.2.3 EPS/ATX 12V Power Processor Connector 8 Pin (4+4 Split)

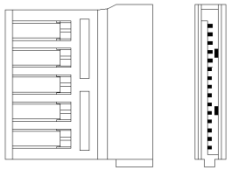
5.2.4 EPS/ATX 12V Power Processor Connector 8 Pin



5.2.5 PCI-Express Connector 8 pin(6+2 split)



5.2.6 Serial ATA, SATA, Power Connector

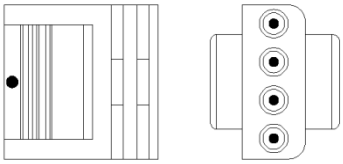


1 +3.3V
2 GND
3 +5V
4 GND
5 +12V

s1、SATA TYPE

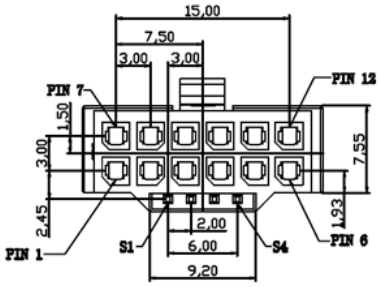
s2 SATA TYPE

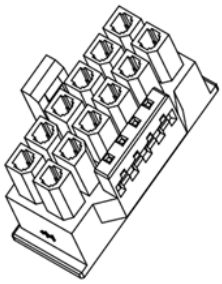
5.2.7 Peripheral Flat Power Connectors (4 pin)



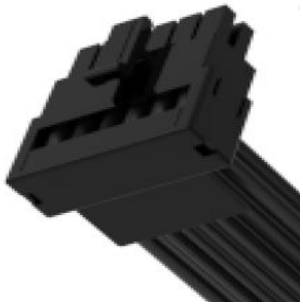
1 +12V
2 GND
3 GND
4 +5V

5.2.8 12VHPWR Connector (12pin+4pin) For PCI 5.0





For PSU Side



For GPU Side

Pin	Signal	Pin	Signal
1	+12V	7	GND
2	+12V	8	GND
3	+12V	9	GND
4	+12V	10	GND
5	+12V	11	GND
6	+12V	12	GND
S1	CARD_PWR_STABLE	S3	SENSE 0
S2	CARD_CBL_PRES#	S4	SENSE 1

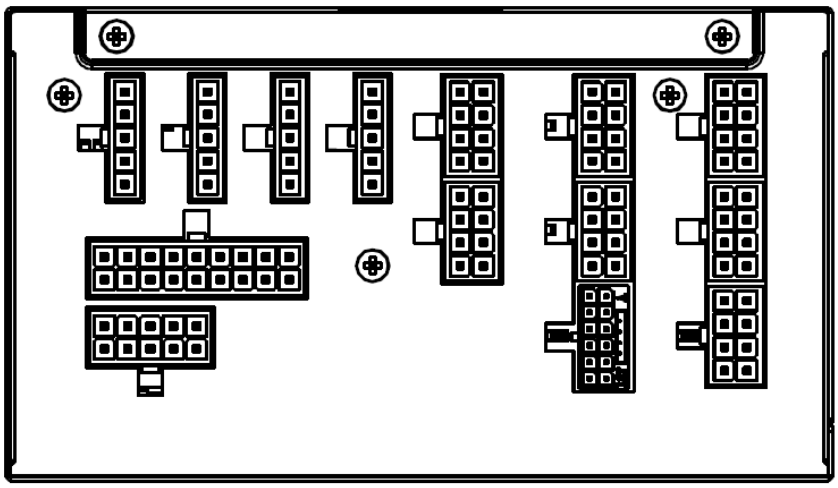
Each power Rating 12VHPWR S1 ~ S4 signal Pin setting

Model	S1	S2	S3(Sense 0)	S4 (Sense 1)	Remark
1100W	4.7kΩ pull-up resistor to +3.3V	100kΩ pull-up resistor to +3.3V	GND	GND	Support 600W
1300W			GND	GND	Support 600W
1600W			GND	GND	Support 600W

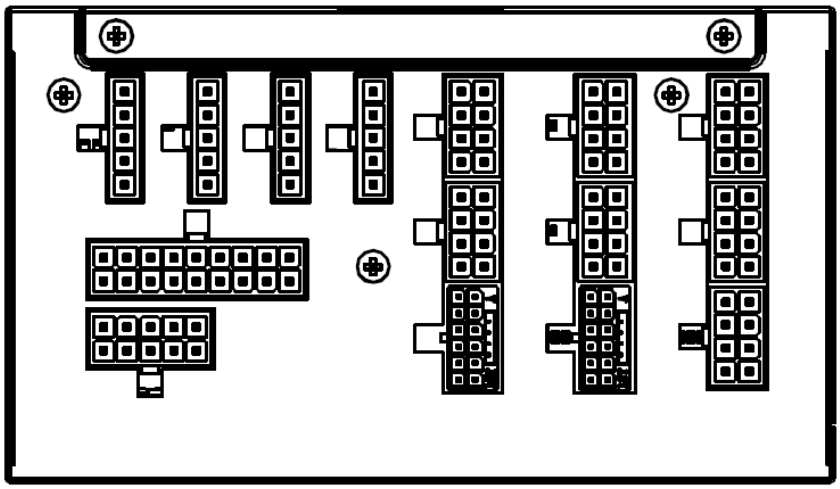
5.2.9 Output Connector Pin Definition (for reference) 1100W ~ 1600W

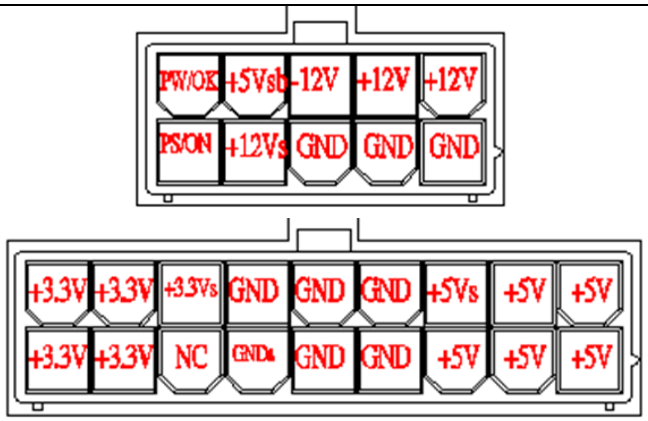
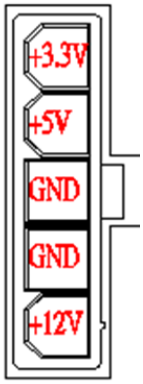
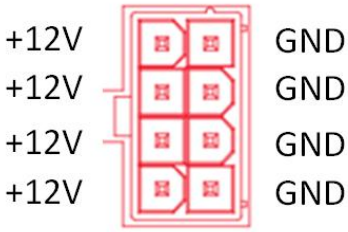
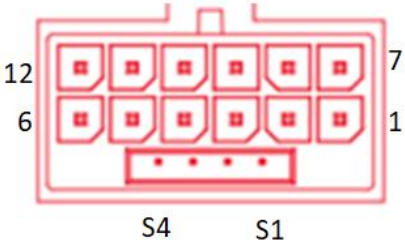
- 1100/1300W 12VHPWR connectors 1pcs.
- 1600W 12VHPWR connectors 2pcs.
-

For 1100W / 1300W



For 1600W



Modular Con. Name	Pin Definition
10P / 18 MB	
SATA / HDD	
8P PCIE & CPU	
12VHPWR	

Pin	Signal
p1 ~ 6	+12V
p7~ 12	GND
S1	CARD_PWR_STABLE (4.7kΩ pull-up resistor to +3.3V)
S2	CARD_CBL_PRES# (100kΩ pull-up resistor to +3.3V)
S3	SENSE 0
S4	SENSE 1

5.3 FAN

5.3.1 Fan Type

LDB, life specification 50,000 hours at 40 degrees Celsius minimum
15~65% relative humidity

5.3.2 Airflow

98.8CFM maximum

5.3.3 Fan Speed

2400 ±10% RPM

5.3.4 Acoustic Noise

In the semi-anechoic room, the microphone is measured at a distance of 1M from the air outlet of the PSU and measured with reference to the ISO7779 standard. The background noise of the semi-anechoic room must be <10db.

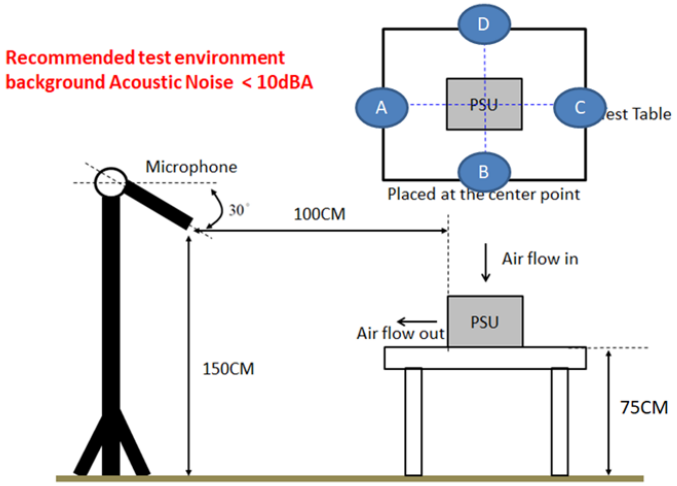
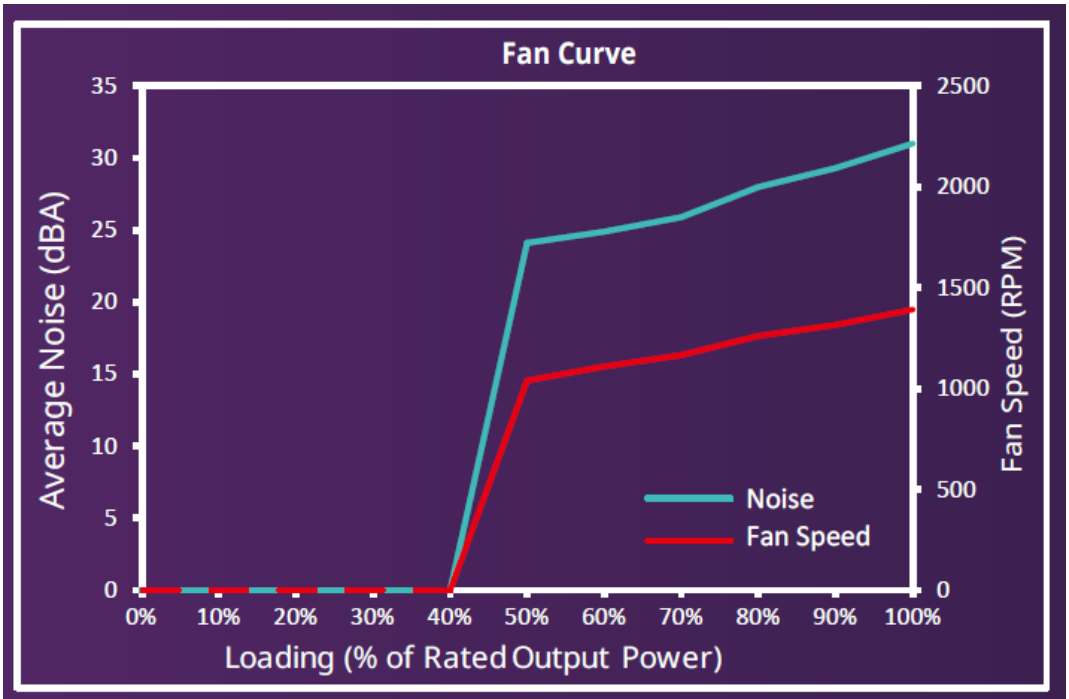


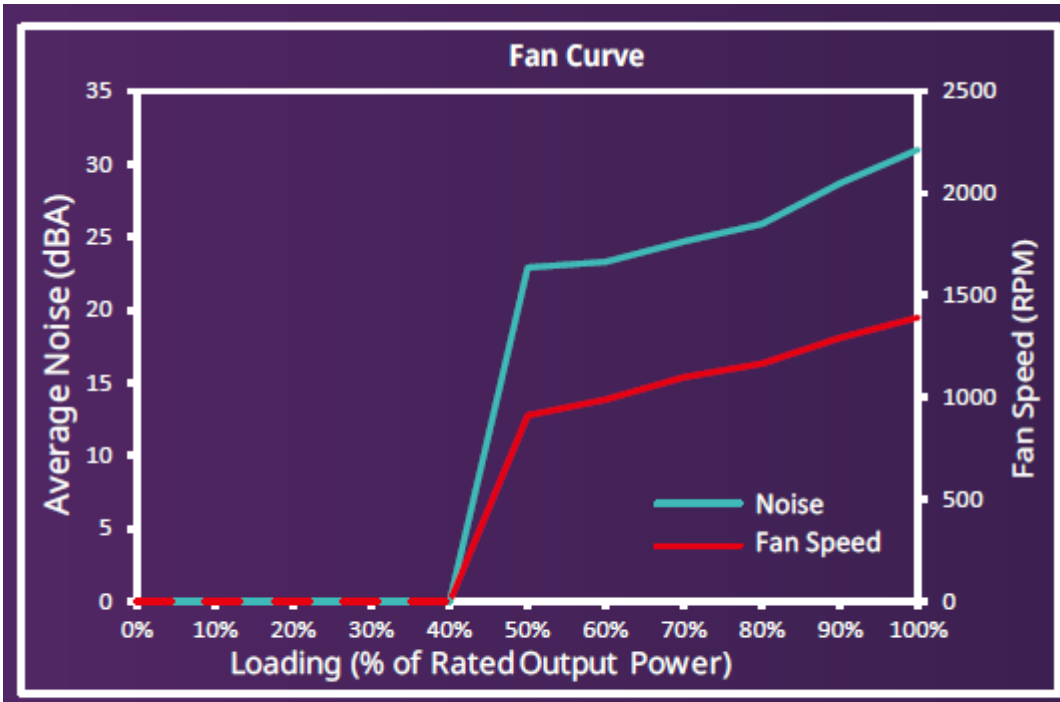
Figure 7. Acoustic Noise test environment settings

For 1100W



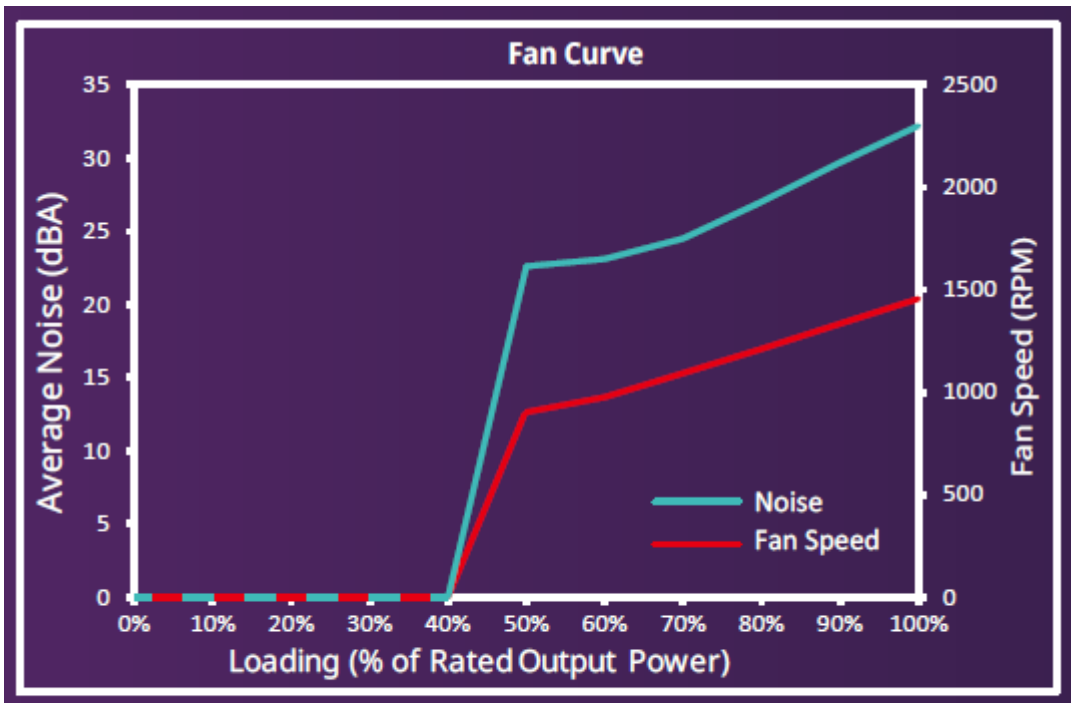
The above fan curve is tested under ambient temperature of 25 degrees C and core temperature is related to load.

FOR 1300W



The above fan curve is tested under ambient temperature of 25 degrees C and core temperature is related to load.

FOR 1600W



The above fan curve is tested under ambient temperature of 25 degrees C and core temperature is related to load.

6.0 Environment

6.1 Temperature

Operating ambient : 0℃ ~ 50℃

Non-operating ambient: -20℃ ~ +70℃

6.2 Humidity

Operating: 5% to 85% relative humidity (non-condensing)

Non-operating: 5% to 95% relative humidity (non-condensing)

6.3 Altitude

Operate properly at any altitude between 0 and 5,000 meter.

6.4 Mechanical shock

Non-operating:50g,trapezoidal input; velocity change≧170 in/s three drops on each of six faces are applied to each sample.

6.5 Vibration

Non-operating:0.01 g^2/Hz at 5 Hz, sloping to 0.02 g^2/Hz at 20 Hz, and maintaining 0.02 g^2/Hz from 20 Hz to 500 Hz. The area under the PSD curve is 3.13 gRMS. The duration shall be 10 minutes per axis for all three axes on all samples.

7.0 Electromagnetic Compatibility (EMC)

Parameter	Standard	Conditions / Criteria	
Electromagnetic Interference	CISPR 32 EN 55032 : 2020	Conducted B Class Radiated B Class	
Harmonics	EN 61000-3-2 : 2019 Class D		
Flicker	EN 61000-3-3 : 2013/A1:2019 Class B		
ESD Susceptibility	IEC 61000-4-2 : 2008	±8KV by Air, ±4KV by Contact Performance Criteria A	
Radiated Susceptibility	IEC 61000-4-3 : 2006+A1 : 2007+A2 : 2010	80MHz~6000MHz ; 3V/m(rms) ; Amplitude 80% AM(1KHz) Performance Criteria A	
EFT/Burst	IEC 61000-4-4 : 2012	Repetition Rate 5KHz, AC port: 1KV, DC: 0.5 KV, Performance Performance Criteria A	
Lightning Surge Immunity	IEC 61000-4-5 : 20147	Line-to-Line: 1.0KV Line-to-Ground: 2.0KV Rise time : 8uS , Decay time : 20uS Phase:0/90/180/270deg Performance Criteria A	
Conducted Susceptibility	IEC 61000-4-6 : 2013	0.15MHz~80MHz 3V/m Amplitude 80% AM 1KHz Performance Criteria A	
Power frequency magnetic field	IEC 61000-4-8 : 2009	50 Hz, 1A/m Performance Criteria A	
Voltage Dips and Interruptions	IEC 61000-4-11 : 2017	>95%(Voltage Dips) / 0.5(periods) 30%(Voltage Dips) / 25(periods) >95%(Voltage Dips) / 250(periods)	Criteria A Criteria A Criteria C

8.0 Ground Leakage Current

The ground leakage current shall be less than 2.5mA at 264Vac.

9.0 Dielectric Withstand Voltage:

9.1 Primary To Secondary: 3000Vac or 4242Vdc 60sec.
Primary To F.G: 1800Vac or 2500Vdc 60sec.

9.2 Insulation Resistance: Primary To Safety Ground: 500Vdc, 10MΩ Min.

9.3 Leakage Current: Measured At 264Vac/50Hz and 1mA Max

10.0 Mean Time Between Failures (MTBF)

The MTBF of the power supply shall be calculated utilizing the Part-Stress Analysis method of MIL217F. The calculated MTBF of the power supply shall be greater than 100,000 hours under the following conditions: Full rated load; 115V AC input; Ground Benign; 25°C

11.0 Product Certifications and safety regulations

Apply Mark	Standard
CB	IEC 62368-1, 2rd&3nd Edition
UL(cTUVus)	UL 62368-1, 3nd Edition, 2019-12-31 CSA C22.2 No. 62368-1-14, 2nd Edition, 2007-12
TUV	EN 62368-1:2020+ALL
Rohs2.0	2011/65/EU&2015/863/EU
CE	EN 55032:2015 +A11:2020 Class B EN 61000-3-2:2019 .EN 61000-3-3:2013+A1:2019 EN55035:2017+A11:2020 IEC 61000-4-2Edition 2.0 2009 IEC 61000-4-3Edition 3.2 2010 IEC 61000-4-4Edition 3.0 2012 IEC 61000-4-5Edition 3.1 2017 IEC 61000-4-6Edition 4.0 2015 IEC 61000-4-8Edition 2.0 2010 IEC 61000-4-11Edition2.1 2017
FCC	47 CFR FCC Rules and regulations part 15 subpart B,IECS-003 Issue 7,Class B
BSMI	CNS15936, CNS15598-1
CCC	GB 17625.1-2022 ;GB 4943.1-2022;GB/T 9254.1-2021
RCM	Safety of Information Technology Equipment
EAC	Safety of Information Technology Equipment
UKCA	Safety of Information Technology Equipment
KC+KCC	By Regional
BIS	By Regional