ASPOWER

深圳欧陆通电子股份有限公司

深圳欧陆通电子股份有限公司 SHENZHEN HONOR ELECTRONIC CO.,LTD ASPOWER Electrical Specification	Model Name	U2A-B20600-S
	Version	S0
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Electrical Specification

(with ATX output for QD-Dist01 (SGCC))

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REV	Description	Date
S0	Release	2020/06/04

Contents

1.0 SCOPE

The specification defines the key characteristics for the power supply. The power supply can be used for Server storage filed, and normal AC input voltage can apply in the power supply.

2.0 INPUT PARAMETER

2.1 Input Voltage/Input Current/Frequency

The power supply should operate in input limited voltage range, and follow the specification defined as below table, includes the limited value of input current, input voltage, working frequency. The power supply should be turned on when 90VAC at min load and max load.

Table1.

	Min	Rated	Max	Units
AC input voltage	90	100~127	264	Vrms
		200~240		Vrms
Frequency	50	50/60	60	Hz
Input current	<10A@100-240VAC			

2.2 Inrush Current

75A max at any phase of 230Vac input when 25degC cold starts. Cold start at normal input voltage at 25℃, when input power is applied to the power supply and any initial inrush current surge or spike of 1ms or less shall not exceed 30A peak per module. Any additional inrush current surges or spikes in the form of AC cycles or multiple AC cycles greater than 5ms shall not exceed 60A peak per module. Inrush current difference between line and neutral is under 0.1A per half cycle of input current and/or the phase difference between line and neutral is less than +/-20 degrees during each AC input voltage half-cycle.

The inrush shall be less than the ratings of the critical components. Any inrush current of the AC line shall not cause damage to the power supply. Surge current does not contain the current spike due to X-CAP.

2.3 Efficiency

Efficiency testing should be in ambient temperature:18degC-27degC, input voltage at 115Vac/60Hz. Efficiency testing delay time should be 15min after running the PSU, and so that the PSU in under steady state. Negligible fan loss and the power of the fan should be supplied by an external DC source.

Table2.

Input	Load	+3.3V	+5V	+12V	-12V	+5VSB	EFF
115Vac/60Hz	20%	2.44A	2.44A	8.09A	0.08A	0.34A	>80%
	50%	6.09A	6.09A	20.22A	0.21A	0.84A	>80%
	100%	12.18A	12.18A	40.45A	0.42A	1.69A	>80%

2.4 Hold up Time (AC & HVDC)

Hold up time is defined length of time from AC(HVDC) input drops to 0V to +12V dropping out of voltage regulation range at any phase of the AC(HVDC), the power supply should meet dynamic voltage range.

1. Hold up time +12Vout>=16ms with 80%load (90V~264VAC)
2. Hold up time PG>=14ms with 80%load (90V~264VAC)
3. Hold up time +5Vsb>=70ms with 80%load (90V~264VAC)

2.5 AC

AC line dropout is the condition when AC input drops to 0VAC at any phase of the AC line for any length of time. During an AC dropout of 10ms or less the power supply shall meet dynamic voltage regulation in the rated load and half load at all AC input voltages.

An AC line dropout of 12ms or less at 80% full load shall not cause malfunction of control signals or protection circuit trip. If the AC dropout lasts longer than 12ms the power supply shall recover and meet all turn on requirements.

An AC line dropout of 16ms or less at half load shall not cause malfunction of control signals or protection circuit trip. If the AC dropout lasts longer than 16ms the power supply shall recover and meet all turn on requirements.

Any dropout of the AC line shall not cause damage to the power supply.

2.6 Power Factor

Power factor is used to measure the power efficiency of the data used in electrical equipment. It is necessary for meeting the energy star's computer server 2 standard requirements. Input voltage condition: 115V/60Hz 230Vac/50Hz, power factor meets the requirement as below table.

Table3.

Load	10% Load	20% Load	50% Load	100% Load
PF	> 0.65	> 0.80	> 0.90	> 0.95

2.7 Surge and Sag

The dynamic conditions of mains input are defined as sag and surge. Sag is mains drop to below normal voltage, surge refers to the input voltage rises above the normal range, the PSU should meet sag and surge requirement.

Table4. Surge and Sag

Duration	Surge/Sag	Input Voltage	Frequency	Performance Criteria
500ms	10%	220/110VAC	50/60Hz	No loss of function or performance
0 to 1/2 AC cycle	30%	220/110VAC	50/60Hz	No loss of function or performance
=1/2 AC cycle	30%	220/110VAC	50/60Hz	No loss of function or performance
>1/2 AC cycle	>30%	220/110VAC	50/60Hz	Loss of function acceptable, Power supply can turn on automatically

3.0 OUTPUT PARAMETER

3.1 Output Current

The following table defines the current ratings. The combined output power of all outputs shall not exceed the rated output power. The power supply shall meet both static, dynamic voltage regulation and timing requirements for the min/ max loading conditions.

Table5.

Output Voltage	Min Current	Max current
+3.3V	0.3A	25A
+5V	0.3A	25A
+12V	1A	48A
-12V	0A	0.5A
+5VSB	0A	3A

Note:

1. The continuous total output power is 600W max.
2. The combined power of +5V and +3.3V is 150W max.

3.2 Voltage Regulation

The power supply output voltage must stay within the following voltage limits shown in below table when operating at steady state, dynamic loading conditions. All outputs are measured with reference to the return remote sense (ReturnS) signal.

Table6.

Output Voltage	Min	Rated	Max	Tolerance
+3.3V	3.135V	3.3V	3.465V	+/-5%
+5V	4.75V	5.0V	5.25V	+/-5%
+12V	11.4V	12.0V	12.6V	+/-5%
-12V	10.8V	12.0V	13.2V	+/-10%
+5VSB	4.75V	5.0V	5.25V	+/-5%

Table7. Load Regulation Test Table

Load/Voltage	+3.3V	+5V	+12V	-12V	+5VSB
Min load	0.3A	0.3A	1A	0.2A	0.2A
20% load	2.44A	2.44A	8.09A	0.08A	0.34A
50% load	6.09A	6.09A	20.22A	0.21A	0.84A
100% load	12.18A	12.18A	40.45A	0.42A	1.69A
3.3V max	25A	13.5A	35.75A	0.5A	3.0A
5V max	7.58A	25A	35.75A	0.5A	3.0A
12V max	1A	2A	48A	0.5A	1.0A

3.3 Ripple & Noise

Table8.

Output voltage	Ripple & noise
+3.3V	<50mV
+5V	<50mV
+12V	<120mV
-12V	<120mV
+5VSB	<50mV

Note:

1. This is measured over a bandwidth of 10Hz to 20MHz at the output connector. A 10μF Electrolytic capacitor in parallel with a 0.1μF ceramic capacitor are placed at the point of measurement.

3.4 Timing

These are the timing requirements for power supply operation including alone module outputs and multi model outputs. All outputs shall rise and fall monotonically. However, PS timing must meet the requirement of mother board. PS supplier must evaluate and verify the timing characteristics when in design stage and system test stage.

Table9. Turn On/Off Timing

Item	Description	Min	Max	Units
Tvout _rise	Output voltage rise from 10% to 90% time for 5Vsb.	1	20	ms
Tvout _rise	Output voltage rise from 10% to 90% time for all output.	1	20	ms
Tsb_on_delay	Delay from AC being applied to 5Vsb being within regulation.		1500	ms
Tac_on_delay	Delay from AC being applied to all output voltages being within regulation.		2500	ms
Tsb_vout	Delay from 5Vsb being in regulation to output voltages being in regulation at AC turn on.	50	1000	ms
Tpson_on_delay	Delay from PSON active to output voltages being within regulation limits.	5	400	ms
Tpwok_on	Delay from output voltages within regulation limits to PWOK asserted at turn on.	100	500	ms

Tvout_holdup	Time all output voltages stay within regulation after loss of AC Tested at 80%full load and over 100-240VAC input.	16		ms
Tpwok_holdup	Delay from loss of AC to de-assertion of PWOK .Tested at 80%full load and over 100-240VAC input.	14		ms
T5Vsb_hold up	Time the 5Vsb output voltage stays within regulation after loss of AC.	70		ms
Tpwok_off	Delay from PWOK de-asserted to output voltages dropping out of regulation limits.	1		ms

Note:

1. Rise Time (Tvout _rise): The all output voltages must rise from 10% to 90% within regulation limits within1 to 20ms.

All outputs must rise monotonically.

2. Tsb-on & Tac-on Delay Time: The Tsb-on delay time for 5Vsb should be ≤ 1.5s at 115Vac/230Vac when full load.

The Tac-on delay time for all output voltages should be ≤ 2.5s at 115Vac/230Vac when full load.

3. Main Output Delay Time (Tsb_vout): The all output voltages being in regulation delay from 5Vsb being in regulation should be 50 to 1000ms when at AC turn on.

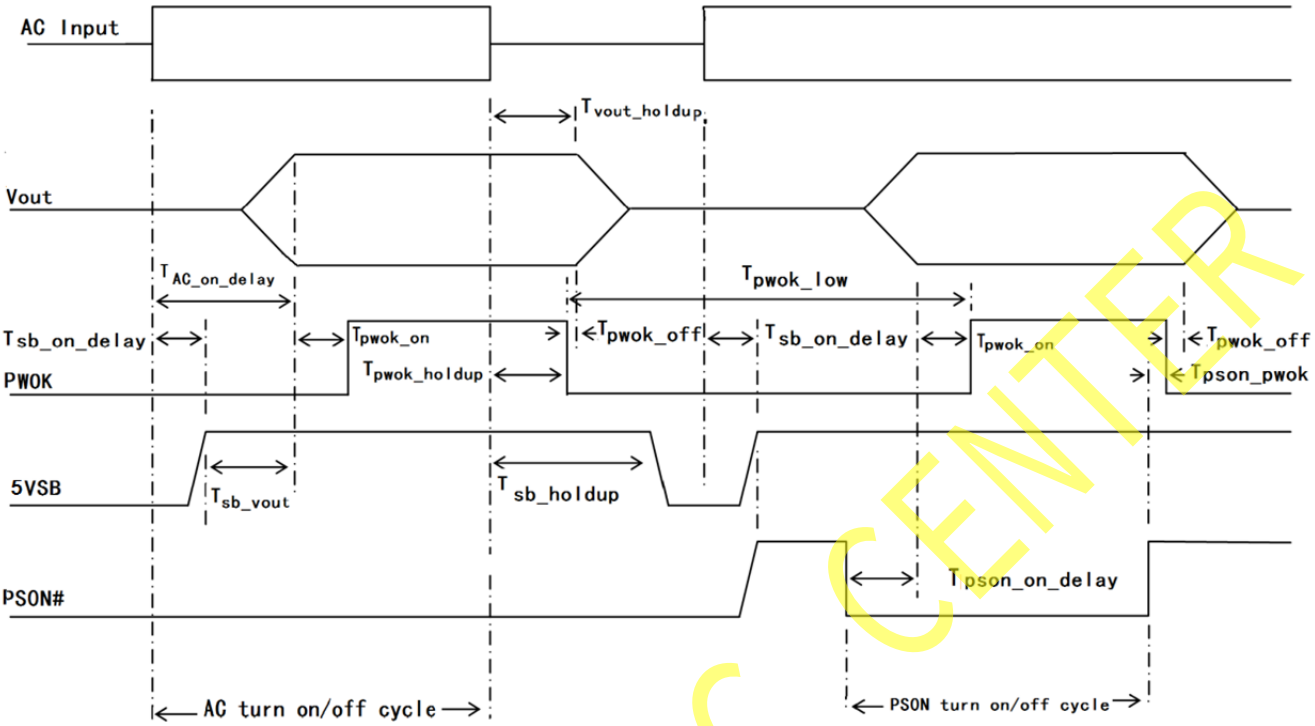
4. Tpson_on_delay: The all output voltages must be within regulation after PSON active for 5 to 400ms.

5. Power Work OK Delay (Tpwok_on): PWOK should delay from all output voltages within regulation for 100 to 500ms.

6. Hold up Time (Tvout_holdup): The hold up time for all output voltages & PWOK should >16 ms at 115Vac/230Vac input when 80% full load.

The hold up time for 5Vsb should >70 ms at 115Vac/230Vac input and 80% full load.

7. Power Fail Delay Time (Tpwok_off): All output voltages dropping out of regulation delay from PG should≥ 1ms when power off.



3.5 Overshoot

Output voltage overshoot is less than 10% at any load and any input voltage, the output rising up waveform should be kept flat and smooth.

Table10.

Output Voltage	Overshoot (Max)
+12V	12.6V
+5V	5.5V
+3.3V	3.7V
+5Vsb	5.5V
-12V	-13.2V

3.6 Dynamic

The overshoot is less than 10% with 30%load change. The load transient repetition rate shall be tested between 50Hz to 5 KHz at duty cycles rang 50%. The test shall be at least in 50 Hz/1KHz/10KHz condition. The load transient repetition rate is only a test specification.

The output voltage shall remain within limits specified for the step loading, slew rate, and capacitive loading in below table.

Table11.

Output Voltage	Transient Step (A) Percent of Rated current	A/us	Frequency (Hz)	Cap (uF)
3.3V	30%	0.5	50Hz-5KHz	10000uF
5V	30%	0.5	50Hz-5KHz	10000uF
12V	30%	0.5	50Hz-5KHz	10000uF
5Vsb	25%	0.5	50Hz-5KHz	1000uF

3.7 Capacitive Loading

The power supply shall be stable and can start up at no load with below capacitive loading. The power supply shall be stable and meet all requirements with the following capacitive loading range. The PSU is not damaged include normal turn on timing, running under light load and full load.

Table12.

Output Voltage	+3.3V	+5V	+12V	-12V	+5VSB
Capacitive loading (uF)	10000	10000	10000	330	1000

3.8 No Load

The power supply turn on in no load condition shall not cause damage to the power supply. The power supply shall be able to turn up in no load condition.

3.9 Remote Sense

Remote sense is necessary at 12V, 5V, 3.3V to ensure that the system can get the normal voltage range.

3.10 Return

All DC Returns (GND) are internally connected to frame ground.

3.11 Control Signal

3.11.1 PSON Signal

PSON signal is required to remotely turn on/off the power supply module/PDB. PSON is an active low signal that turns on +12V output. When this signal is not pulled low by the system, or left open, all the outputs (except for 5VSB) shall be turned off. This signal is pulled to a 5V voltage by a pull-up resistor internal to the system.

Table13. PSON Signal

Signal Level	Status	Logical Level (Min)	Logical Level (Max)
PSON high level	Turn off power	3.6	5.5V
PSON low level	Turn on power	0V	1V
PSON rise and fall time		≦500us	
High-state output impedance		Pull up a resistor between PSON and 5V	

3.11.2 PG Signal

PG signal is the logical signal for PSU under normal status: high level is power normal, low level is power abnormal.

Table14. PG Signal Characteristic

Signal Status	Status	Logical Level (Min)	Logical Level (Max)
PG high level	Power normal	3.6V	5.5V
PG low level	Power abnormal	0V	1V
Source current (PG high level)		≦2mA	
Sink current (PG low level)		≦4mA	
PG rise and fall time		≦500us	
High-state output impedance		Pull up a resistor between PG and 5V	

3.12 Loop Stability

The Power supply should be stable under capacitive loading, min load and max load when input voltage is under full range. To make sure system stable, the PSU must keep phase margin is 45deg, and gain margin is -6dB under full operate temperature range.

4.0 PROTECTION

When the all output voltages OCP / OVP/UVP/Short is triggered, the power supply will shut down and latched off. The latch can be cleared by toggling the PSON signal or by an AC power interruption. 5Vsb output will auto recovery when the fault condition removed.

4.1 Over Voltage Protection (OVP)

When +12V,+5V,+3.3V occurs OVP, the power supply should latch off and must be able to turn on through toggling PS ON/OFF or AC ON/OFF re-cycle after remove the protection.

Table15.

Voltage	Min(V)	Max(V)
3.3V	3.9	4.5
5V	5.7	6.5
12V	13.0	15.6

4.2 Under Voltage Protection (UVP)

When +12V,+5V,+3.3V occurs UVP, the power supply should latch off and must be able to turn on through toggling PS ON/OFF or AC ON/OFF re-cycle after remove the protection.

Table16.

Output	+12V	+3.3V	+5V
UVP Range(V)	8.5-10.5	2.0-2.5	3.0-4.0

4.3 Over Temperature Protection (OTP)

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 and latch-off.

The ambient over temperature point is 55±5℃.

4.4 Short Circuit

All output to GND. The power supply shall shut down and latch off when +12V output is short circuit (impedance less than 0.1ohm), and 5VSB shall be auto restart. The power should be under protection to keep component safe, whatever the outputs is shorten before turn on or shorten after turn on. The +12V can be recovery after removing short by AC on/off or PSON/OFF, but +5VSB can be auto restart after short is removed.

4.5 Over Current Protection (OCP)

The power supply should have over current protection to prevent the outputs from exceeding limits, if the OCP occurred, the power supply should shut down and latch-off and the latch will be cleared by toggling the PSON signal or an AC on/off cycle operation.

Table17. OCP Limited Table

Output	Min(A)	Max(A)
3.3V	28.0	40.0
5V	28.0	40.0
12V	53.0	70.0

Note:

1. After OCP, the +12V output is turned off and locked, and by AC ON/OFF or PSON/OFF unlock, and +5VSB output can automatic restart. When the OCP conditions removed, +5VSB should return to normal.

5.0 OPERATE ENVIRONMENT

5.1 Operate Temperature

Operate temperature: -20℃ to +50℃.

5.2 Storage Temperature

Storage temperature: -40℃ to +70℃.

5.3 Operate Humidity

Operating (non-condensing): 10% to 90% at 40℃.

5.4 Storage Humidity

Storage Humidity (non-condensing): 5% to 95% at 55℃.

5.5 Operate Altitude

Operate Altitude: 0 to 5000m.

5.6 Storage Altitude

Storage Altitude: 0 to 10000m.

5.7 Cold Start

The power supply shall be able to turn on at 0degC.

6.0 SAFETY

6.1 Safety Certification

Meet EN60950-1(Europe).

Meet GB4943.1-2011(CCC-CNCA Certification) (CHINA).

Meet FCC Part 15: Subpart B (Class A)

6.2 Hi-pot

Primary to secondary Hi-pot withstand voltage: 3000Vac or 4242Vdc, 60s, leakage current <10mA.

Primary to grounding Hi-pot withstand voltage: 1500Vac or 2121Vdc, 60s, leakage current <10mA.

6.3 Grounding Impedance Test

Grounding impedance test using grounding current 32A for 180s and the impedance is less than 100mohm.

6.4Insulation Resistance

Primary to Secondary: 500Vdc for 60S, the isolation resistance shall not be less than 100Mohm.

6.5 Leakage Current

264Vac/60Hz conditions to be less than 3.5mA.

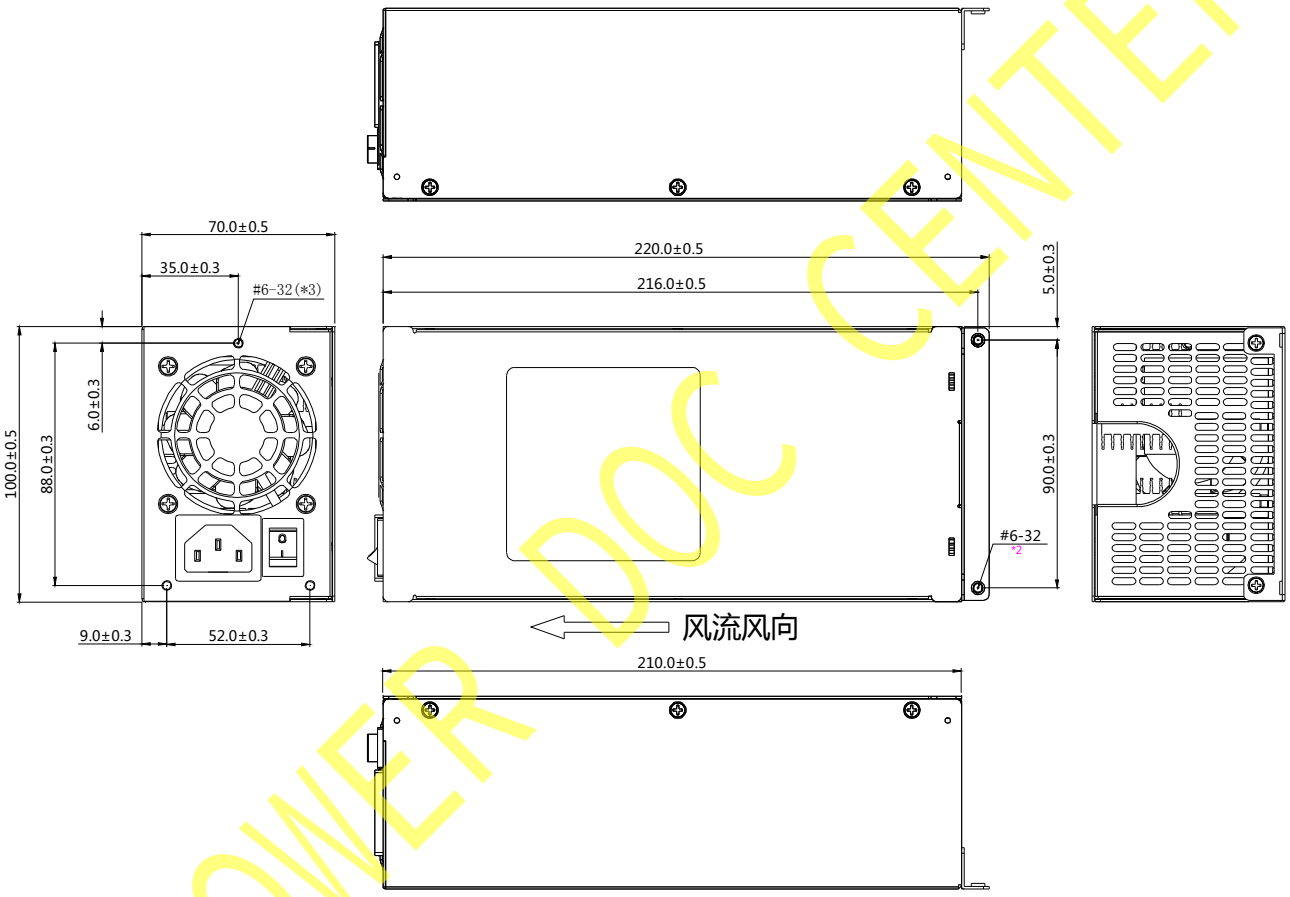
7.0 OUTLINE STRUCTURE

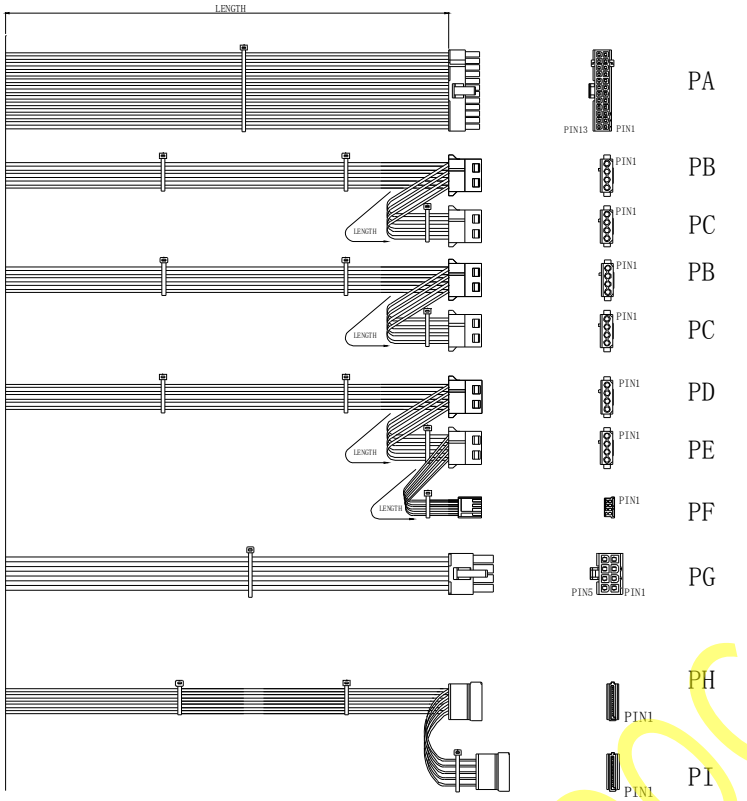
Outline dimension:

Length: 210.0mm

Width: 100.0mm

Thickness: 70.0mm





CONN	PIN	WIRE COLOR	OUTPUT	WIRE SPECIFICATION	LENGTH (mm)	HOUSING(OR EQ)
PA	1	ORANGE	+3.3VDC	UL/CSA 1007 18AWG 80° C 300V	330±30	WST P20+4-I42002K2
	1	ORANGE	+3.3V REMOTE SENSE	UL/CSA 1007 22AWG 80° C 300V		
	2	ORANGE	+3.3VDC	UL/CSA 1007 18AWG 80° C 300V		
	3	BLACK	GND			
	4	RED	+5VDC			
	5	BLACK	GND			
	6	RED	+5VDC			
	7	BLACK	GND			
	8	GRAY	PG	UL/CSA 1007 20AWG 80° C 300V		
	9	PURPLE	+5 VSB	UL/CSA 1007 18AWG 80° C 300V		
	10	YELLOW	+12VDC	UL/CSA 1007 22AWG 80° C 300V		
	10	YELLOW	+12V REMOTE SENSE			
	11	YELLOW	+12VDC	UL/CSA 1007 18AWG 80° C 300V		
	12	ORANGE	+3.3VDC			
	13	ORANGE	+3.3VDC			
	14	BLUE	-12VDC			
	15	BLACK	GND			
	16	GREEN	PS-ON	UL/CSA 1007 20AWG 80° C 300V		
	17	BLACK	GND	UL/CSA 1007 18AWG 80° C 300V		
	18	BLACK	GND			
	19	BLACK	GND			
	20	NC	NC			
	21	RED	+5VDC	UL/CSA 1007 22AWG 80° C 300V		
	21	RED	+5V REMOTE SENSE			
	22	RED	+5VDC	UL/CSA 1007 18AWG 80° C 300V		
	23	RED	+5VDC			
	24	BLACK	GND			
PB PC PD PE	1	YELLOW	+12VDC	UL 1007 18AWG 80° C 300V	PB 330±30mm PC PE 150±10mm	WST P4-A10202
	2	BLACK	GND			
	3	BLACK	GND			
	4	RED	+5VDC			
PF	1	YELLOW	+12VDC	UL 1007 20AWG 80° C 300V	150±10mm	WST P4-I25001
	2	BLACK	GND			
	3	BLACK	GND			
	4	RED	+5VDC			
PG	1	BLACK	GND	UL 1007 18AWG 80° C 300V	330±30mm	WST P8-I42002
	2	BLACK	GND			
	3	BLACK	GND			
	4	BLACK	GND			
	5	YELLOW	+12VDC			
	6	YELLOW	+12VDC			
	7	YELLOW	+12VDC			
	8	YELLOW	+12VDC			
PH PI	1 2 3	ORANGE	+3.3VDC	UL/CSA 1007 18AWG 80° C 300V	PH 330±30mm PI 150±10mm	WST P5-I12707
	4 5 6	BLACK	GND			
	7 8 9	RED	+5VDC			
	10 11 12	BLACK	GND			
	13 14 15	YELLOW	+12VDC			

8.0 ROHS

Power supply must meet be Rohs6 compliant including the component, PCB, soldering material, case, wire, and so on.

9.0 EMC

警告

此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对干扰采取切实可行的措施。

Table18. EMI (Electromagnetic Interference) Requirements Table

Item	Description and Requirement	Criterion	Notes
Radiated Emissions	Frequency:30MHz~1GHz ClassA with 6dB Margin	EN 55032	230V/50Hz input
		FCC part 15	120V/60Hz input
Conducted Emissions	Frequency:150KHz~30MHz ClassA with 6dB Margin	EN 55032	230V/50Hz input
		FCC part 15	120V/60Hz input
Harmonic	IEC 61000-4-13 Class A	IEC 61000-3-2	230V/50Hz input
Voltage Flicker	Pst≦1.0 and Plt≦0.65 Voltage change≦3.3% Relative Voltage change≦4% The voltage changed over 3.3% duration time should≦500ms	EN 61000-3-3	230V/50Hz input

Table19. EMS (Electromagnetic Susceptibility) Requirements Table

Item	Description and Requirement	Level	Criterion
Surge	Different Mode: ±1KV Common Mode: ±2KV	A	EN61000-4-5
Electrical Fast Transient Group(EFT)	±1KV	A	EN61000-4-4 EN 55035
Electrical Static Discharge (ESD)	Touch: ±4KV Air: ±8KV	A	EN61000-4-2 EN 55035
Radiated Susceptibility (RS)	80M Hz~1000MHz 10V/M	A	EN 61000-4-3 EN 55035
Conducted Susceptibility (CS)	150KHz~80MHz 3V/M	A	EN 61000-4-6 EN 55035
Voltage Dips and Interruptions	0% Ut: 10ms 70% Ut: 500ms 0% Ut: 5000ms	B B C	EN 61000-4-11 EN 61000-4-29 EN 55035 / 60601

10.0 PART CONTROL REQUIREMENTS

1. All current limiting devices shall have UL, TUV or VDE certification and shall be identified as applications in which the device complies with IEC60950.

2. All printed circuit board ratings shall meet UL94V - 0 and those from UL certified PCB manufacturers.

3. All joints shall pass UL certification and UL flame retardant rating UL94V-0.

4. All wiring harness shall be from UL certified wiring harness manufacturer. SELV cable is rated at minimum 80V, 130degC.

5. Product safety labels must be printed with UL certified labels and ribbons. In addition labels can be purchased from UL label manufacturers for approval.

6. The product must have the correct regulatory marks to support the certification specified in this document.

11.0 MECHANICAL PERFORMANCE

Mechanical vibration experiment is mainly to simulate the product vibration experiment in the work and transport process, the purpose is to test whether the product can meet certain specifications of vibration intensity, the main test items include:

1. Work random vibration.
2. Work shock.
3. Packaging random vibration.

Table20.

NO	Experiment Item	Sample	Standard	Parameter	Criterion
1	work random vibration	≥3	IPC9592A-2010 IEC60068-2-64	ASD: 20~1000Hz: 0.04g2/Hz; 1000~2000Hz: 6db/oct; 2000Hz: 0.01g2/Hz. About 8Grms. 3 axial, each axial at least 10min. Test process sample power on, normal input voltage, no load. During the test, each power output and signal output should be monitored continuously. The monitoring period should be less than 1ms.	Power supply voltage is Within the specification limits during the test.
2	work shock	≥3	IPC9592A-2010 IEC60068-2-27	Half sine wave, 16ms, at least 30g. 3 axial, each axial 3 times. During the test, each power output and signal output should be monitored continuously. The monitoring period should be less than 1ms.	Power supply voltage is Within the specification limits during the test.
3	packaging random vibration	≥3	IPC9592A-2010 IEC60068-2-64	ASD: 5~1000Hz: 0.05g2/Hz; 1000~2000Hz: 6db/oct; 2000Hz: 0.0125g2/Hz. About 9Grms.	After the test, product should be inspected. Allows minor damage without affecting appearance,

				About 9Grms, 3 axial, each axial at least 10min. Each PSU should have independent packaging follow normal delivery.	installation, or function. Connector pins are not allowed to bend, switch damage, handle damage. Label readability is poor, metal deformation or bending. All equipment through functional testing. Test shipment packaging damage degree does not make judgment requirements.

12.0 MTBF

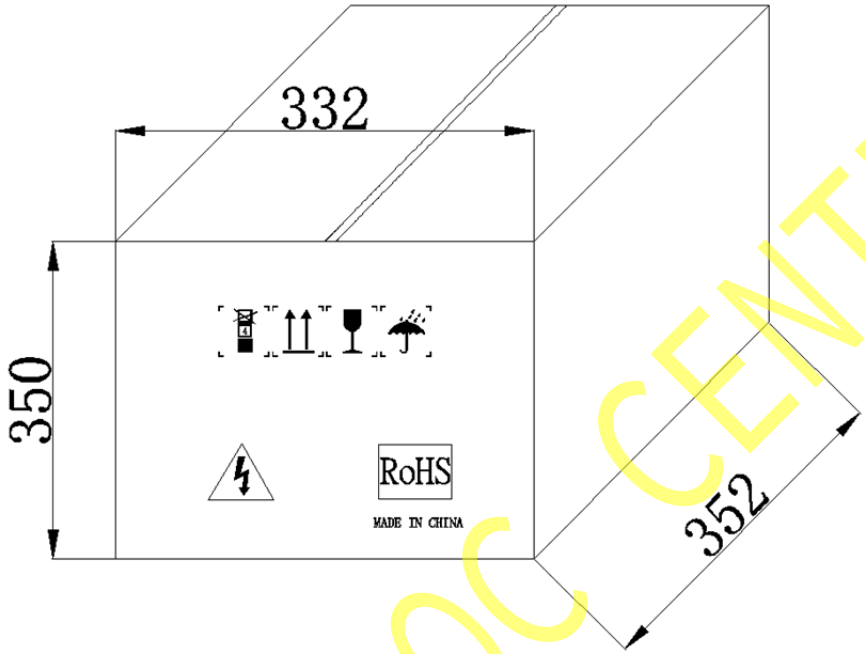
Quantitative reliability (Quantitative) performance requirements: MTBF (MTBF Mean Time Between Critical Failure), according to the Bellcore standard SR-332 Issue3, the PSU operates continuously under 25degC condition, 115VAC/60Hz 230V/50HZ, input voltage under max load, and MTBF is more than 100000 hours, the testing process should not be interrupted.

Table21.

Input Voltage	Load	MTBF
115VAC/60Hz	600W	100000hours
230VAC/50Hz	600W	100000hours

13.0 PACKAGE

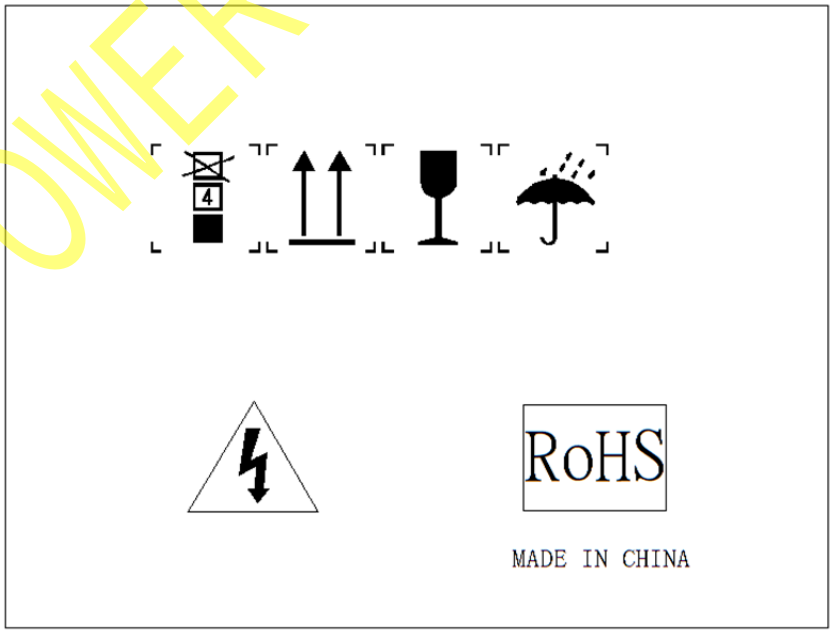
13.1 Outline Diagram of Carton



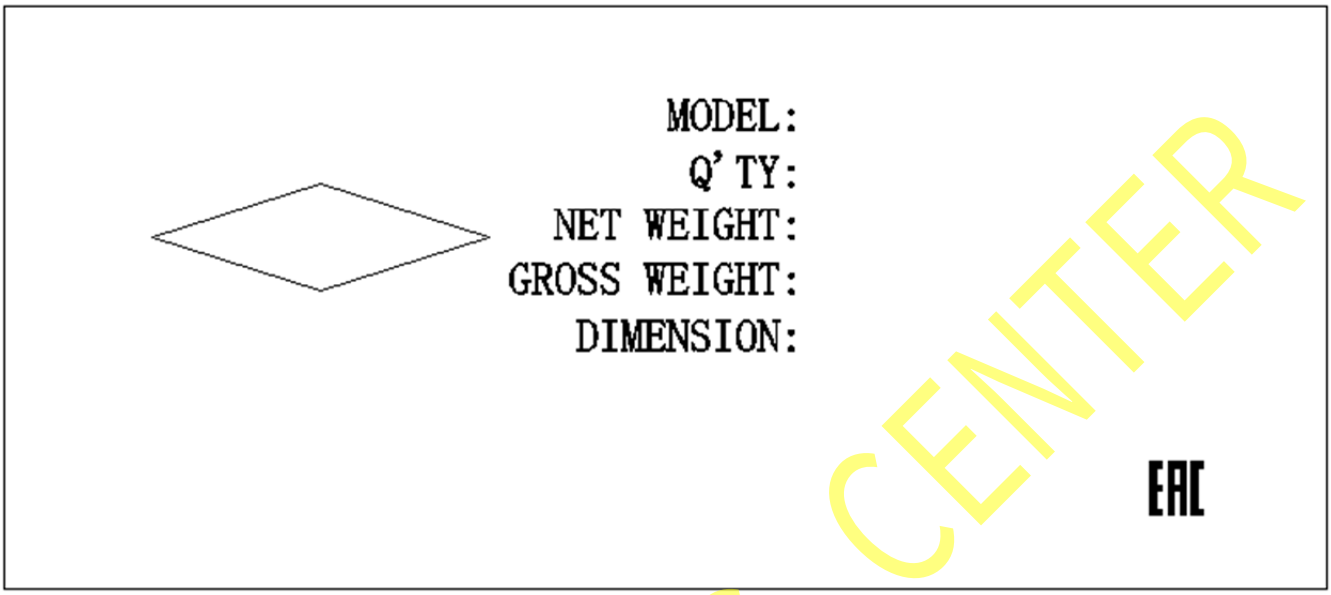
Note:

Material: K=K, five layers of corrugated paper.

13.2 Side Label



13.3 Front Label



14.0 STRESS/COMPONENT DE-RATING

The following component de-rating requirements shall be followed:

1. The semiconductor junction temperature at all loads condition, all input voltage range, and ambient of 50°C shall not exceed 90% rated specification.

2. CAP: Ripple Current: 90% of rated specification at frequency and temperature. Voltage: 90% of the rated specification. Bulk cap voltage de-rating <=90% of the rated specification, if not meet this limited, manufacturers need to provide guarantee letter.

3. Resistor: The power of resistor's de-rating<=65% of the rated specification whatever is ambient or high 50°C condition and all of input voltage range.

Temperature: 80% of rated specification at ambient of 50°C.

4. Static voltage/power/current de-rating of all components: <=90% of the rated specification. The OCP current must be considered the output component de-rating. Vr/Ipeak/If of diode shall meet 90% of spec rating. The voltage and current rating for Dynamic/output short/input on off of all component: <=100% of the rated specification. Main switch MOSFET voltage de-rating <=90% of the rated specification at steady status, <=100% of the rated specification at transient status;

5. Transformer and Inductor:

Transformer and Inductor core and coil temperature shall not exceed 110°C and 80% of rated temperature ambient of 50°C.

The core/junction temperature of all other components at all load condition, all input voltage range, and ambient of 55°C shall not exceed 110°C(130°C max) and 150°C(175°C max) , and the thermal rating must be less than 80% rated specification.

The component thermal shall not reach its max specification rating while the OTP/OCP of the power supply trips due to the excessive heat in the all load/input voltage condition.

6. Component select requirements:

For PFC booster: Vds>=600V

For main switching MOSFET Vds>=600V; (full/half bridge or double forward topology)

For 5Vsb Vds>=800V for single forward or flyback topology), and the MOSFET must separate from switching controller, so the TOP switch or Tiny switch shall be prohibited.

Bulk cap: The max voltage of >=450V. Temperature is 105°C.

Basic life Lo of bulk capacitor must be 3000Hrs or above to meet 5years life time, Less than 3000Hrs cannot be acceptable, Otherwise supplier must provide the evidence to ensure the life time shall be able to meet 5 years by the calculating formula which is acceptable by capacitor manufacture.

7. MOV / Spark gap:

MOV/spark gap voltage must be up to 300Vrms if the MOV or spark gap is used. The voltage of other primary side components must also suffer up to 300Vrms.

8. The board material (PWB) shall be rated 130°C minimum. And the surface temperature shall not exceed 100°C.

9. Gold thickness of gold finger shall be more than 30 u inches.

Thermal derating for all components must be at ambient of 50°C as well as other ambient temperature. Supplier must provide the stress/component de-rating report to customer approval.

15.0 Label

15.1 Specifications label