

9.0 EMC

Table20.EMI(Electromagnetic Interference)Requirements Table

Item	Description and Requirement	Criterion	Notes
Radiated Emissions	Frequency: 30MHz~1GHz	EN 55022	230V/50Hz input 115V/60Hz input
	Class A with 3dB Margin		
Conducted Emissions	Frequency: 150KHz~30MHz	EN 55022	230V/50Hz input 115V/60Hz input
	Class A with 3dB Margin		

Table21. EMS(Electromagnetic Susceptibility)Requirements Table

Item	Description and Requirement	Level	Criterion	Notes
EFT	±2KV	A	IEC61000-4-4	
Surge	Different Mode: ±1KV 2ohm Common Mode: ±2KV 12ohm	A	IEC61000-4-5	Basic Requirement



ESD	Touch: $\pm 6KV$ Air: $\pm 8KV$	A	IEC61000-4-2
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Performance criterion:

- A. Equipment can work in the specified conditions.
- B. Test equipment temporary performance decline, loss of function or reset phenomenon, but it can be recovery itself.
- C. Equipment has temporary performance decline or loss of function and it is restored by operator intervention or system.
- D. Equipment has non recoverable performance degradation or loss of function due to component damage, software affected or data loss.

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.

Table22. Mechanical Requirement

NO	Experiment Item	Sample	Standard	Parameter	Criterion
1	work random vibration	≥3	IPC9592A-2010 IEC60068-2-64	<p>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.</p>	Power supply voltage is Within the specification limits during the test.
2	work shock	≥3	IPC9592A-2010 IEC60068-2-27	<p>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.</p>	Power supply voltage is Within the specification limits during the test.

3	packaging random vibration	≥3	IPC9592A-2010 IEC60068-2-64	<p>ASD: 5~1000Hz: 0.05g²/Hz; 1000~2000Hz: 6db/oct, 2000Hz: 0.0125g²/Hz. About 9Grms. About 9Grms, 3 axial, each axial at least 10min. Each PSU should have independent packaging follow normal delivery.</p>	<p>After the test, product should be inspected. Allows minor damage without affecting appearance, 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.</p>
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12.0 MTBF

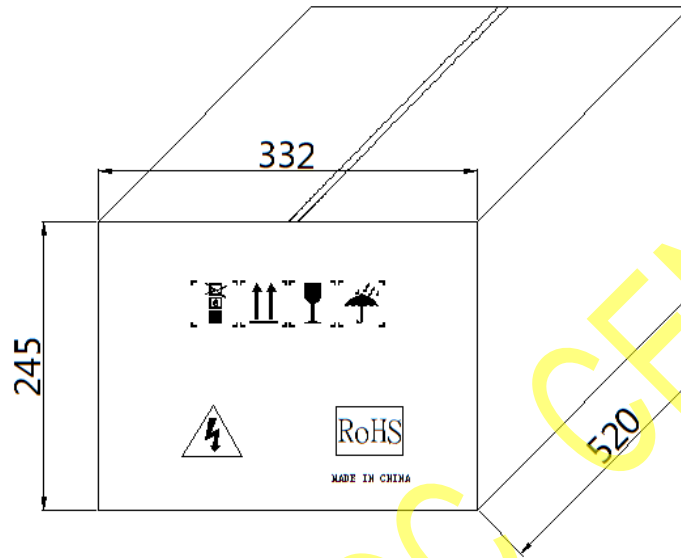
100K hours minimum. Quantitative reliability (Quantitative) performance requirements: MTBF (MTBF Mean Time Between Critical Failure), according to the Bellcore standard SR-332 Issue3, the PSU operates continuously under 25degC condition, 230V/50Hz input voltage under max load, and MTBF is more than 100000 hours, the testing process should not be interrupted.

Table23.

Input Voltage	Load	MTBF
230VAC/50Hz	12V/33A	100000hours

13.0 PACKAGE

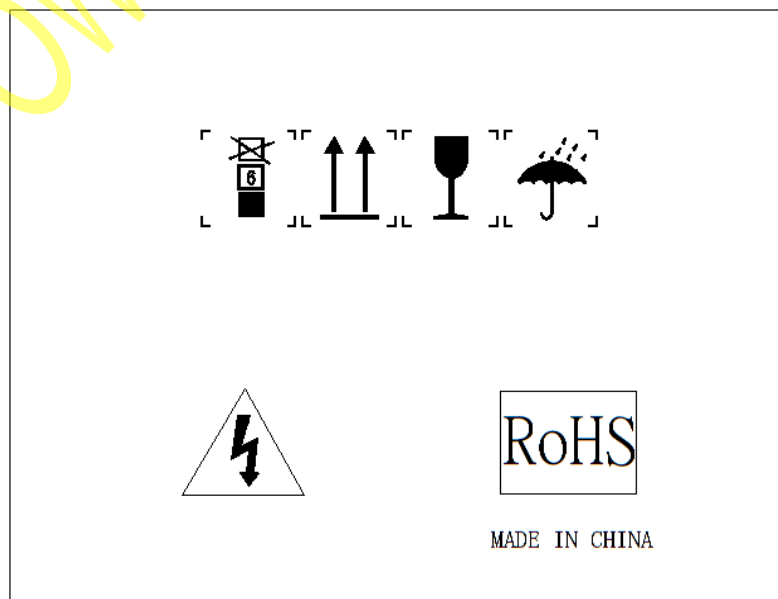
13.1 Outline Diagram of Carton



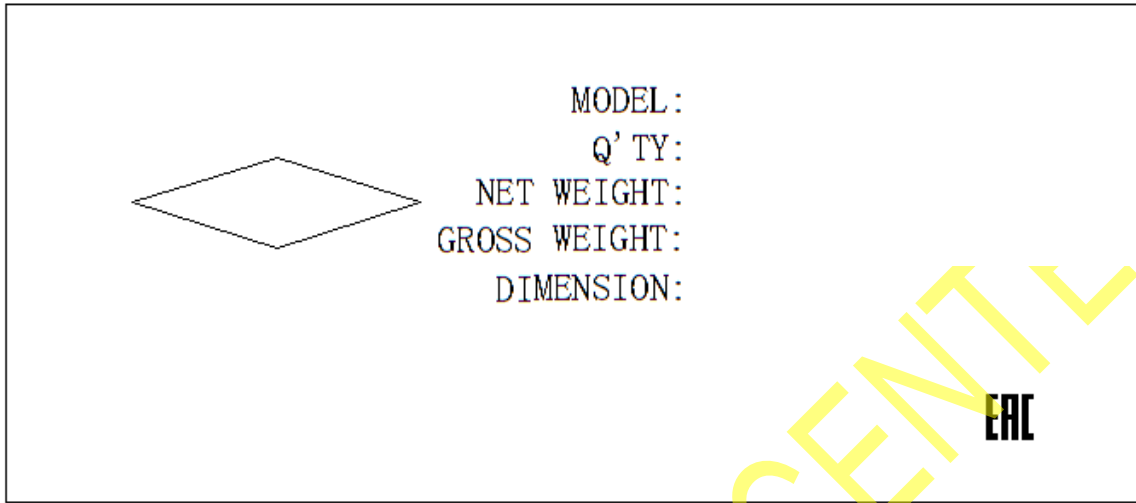
Note:

1. Material: outside the box: K=K, five layers of corrugated paper, the thickness: 5.0mm min, Bursting strength: 11KG min.
2. Outline: bright and clean, no stain, yellow white and no color difference, no gap junction.
3. Dimension: above dimensions for carton size, tolerance +/-3mm.

13.2 Side Label



13.3 Front Label



14.0 SOFTWARE

14.1 PMBus Communication

There is 4.5V voltage to supply the MCU's Vcc in power supply. The MCU in power supply can communication with system via PMBus1.2 protocol. The power supply output terminal has two signals, one is SCL (clock bus), the other is SDA (data bus), and they are bidirectional communication and can get a continuous signal bus. The supply voltage of bus is 3.3 ~ 4.5V, so SDA (data bus) and SCL (clock bus) needs to be pulled up a 3.6K resistor from system board's 3.3V or 4.5V voltage.

We can set address of MCU via power module's A0 signal. SCL- Serial Data Clock Input, 100KHz max, SDA- Serial Data I/O.

Table24. IIC Address

Equipment	Address	Address Bit							
MCU	0xBx	1	0	1	1	0	0	A0	R/W

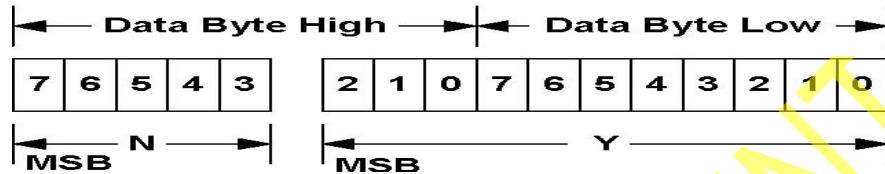
Table25. MCU Address Diagram

Address bit A0	I2C Address for Read Operation
Low (<0.5V)	B0H
High (>3.6V)	B2H

14.2 PMBus Specification

Linear Data Formats:

The Linear Data Format is a two byte value with: An 11 bit, two’s complement mantissa and A 5 bit, two’s complement exponent (scaling factor). The format of the two data bytes is illustrated in below Figure.



The relation between Y, N and the “real world” value is: $X = Y \cdot 2^N$.

Where, as described below:

X is the “real world” value being communicated.

Y is an 11 bit, two’s complement integer.

N is a 5 bit, two’s complement integer.

Devices that use the linear format must accept and be able to process any value of N.

14.3 PMBus Command Supported

Table26. STATUS_WORD Command

Byte	Bit	Status Bit Name	Meaning	Support
Low	7	BUSY	A fault was declared because the device was busy and unable to respond.	No
	6	OFF	This bit is asserted if the unit is not providing power to the output, regardless of the reason, including simply not being enabled.	Yes
	5	VOUT_OV	An output over voltage fault has occurred.	Yes
	4	IOUT_OC	An output over current fault has occurred.	Yes
	3	VIN_UV	An input under voltage fault has occurred.	Yes
	2	TEMPERATURE	A temperature fault or warning has occurred.	Yes
	1	CML	A communications, memory or logic fault has occurred.	No
	0	NONE OF THE ABOVE	A fault or warning not listed in bits [7:1] of this byte has occurred.	No

High	7	VOUT	An output voltage fault or warning has occurred.	Yes
	6	IOUT/POUT	An output current or output power fault or warning has occurred.	Yes
	5	INPUT	An input voltage, input current, or input power fault or warning has occurred.	Yes
	4	MFR	A manufacturer specific fault or warning has occurred.	No
	3	POWER_GOOD#	The POWER_GOOD signal, if present, is negated.	Yes
	2	FANS	A fan or airflow fault or warning has occurred.	Yes
	1	OTHER	A bit in STATUS_OTHER is set.	No
	0	UNKNOWN	A fault type not given in bits [15:1] of the STATUS_WORD has been detected.	No

Table27. STATUS_VOUT Command

Bit	Meaning	Support
7	VOUT Over voltage Fault	Yes
6	VOUT Over voltage Warning	No
5	VOUT Under voltage Warning	No
4	VOUT Under voltage Fault	Yes
3	VOUT_MAX Warning (An attempt has been made to set the output voltage to value higher than allowed by the VOUT_MAX command)	No
2	TON_MAX_FAULT	No
1	TOFF_MAX Warning	No
0	VOUT Tracking Error	No

Table28. STATUS_IOUT Command

Bit	Meaning	Support
7	IOUT Over current Fault	Yes
6	IOUT Over current And Low Voltage Shutdown Fault	No
5	IOUT Over current Warning	Yes
4	IOUT Undercurrent Fault	No
3	Current Share Fault	No
2	Power Limiting	No

1	POUT Overpower Fault	No
0	POUT Overpower Warning	No

Table29. STATUS_INPUT Command

Bit	Meaning	Support
7	VIN Over voltage Fault	No
6	VIN Over voltage Warning	No
5	VIN Under voltage Warning	No
4	VIN Under voltage Fault	Yes
3	Unit Off For Insufficient Input Voltage	No
2	IIN Over current Fault	No
1	IIN Over current Warning	No
0	PIN Overpower Warning	No

Table30. STATUS_TEMPERATURE Command

Bit	Meaning	Support
7	Over temperature Fault	Yes
6	Over temperature Warning	Yes
5	Under temperature Warning	No
4	Under temperature Fault	No
3	Reserved	No
2	Reserved	No
1	Reserved	No
0	Reserved	No

Table31. STATUS_FAN_1_2 Command

Bit	Meaning	Support
7	Fan 1 Fault	Yes
6	Fan 2 Fault	No
5	Fan 1 Warning	Yes
4	Fan 2 Warning	No
3	Fan 1 Speed Overridden	No
2	Fan 2 Speed Overridden	No



1	Airflow Fault	No
0	Airflow Warning	No

Table32.

CMD Code	Name	Type	Bytes	Comment
03h	CLEAR_FAULTS	Send Byte	0	
79h	STATUS_WORD	Read Word	2	
7Ah	STATUS_VOUT	Read Byte	1	
7Bh	STATUS_IOUT	Read Byte	1	
7Ch	STATUS_INPUT	Read Byte	1	
7Dh	STATUS_MPERATURE	Read Byte	1	
81h	STATUS_FANS_1_2	Read Byte	1	
88h	READ_VIN	Read Word	2	
89h	READ_IIN	Read Word	2	
8Bh	READ_VOUT	Read Word	2	
8Ch	READ_IOUT	Read Word	2	
90h	READ_FAN_SPEED_1	Read Word	2	Rpm value
96h	READ_POUT	Read Word	2	
97h	READ_PIN	Read Word	2	
98h	PMBUS_REVISION	Read Byte	1	V1.2(0x22)
99h	MFR_ID	Read Block	14	See MFR Data table
9Ah	MFR_MODEL	Read Block	14	See MFR Data table
9Bh	MFR_REVISION	Read Block	6	See MFR Data table
A0h	MFR_VIN_MIN	Read Word	2	See MFR Data table
A1h	MFR_VIN_MAX	Read Word	2	See MFR Data table
A4h	MFR_VOUT_MIN	Read Word	2	See MFR Data table
A5h	MFR_VOUT_MAX	Read Word	2	See MFR Data table
A6h	MFR_IOUT_MAX	Read Word	2	See MFR Data table
A8h	MFR_TAMBIENT_MAX	Read Word	2	See MFR Data table
A9h	MFR_TAMBIENT_MIN	Read Word	2	See MFR Data table



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Table33. MFR Data Table

CMD Code	Name	Comment
99h	MFR_ID	ASPOWER
9Ah	MFR_MODEL	R1A-KH0400
9Bh	MFR_REVISION	1.1SA1
A0h	MFR_VIN_MIN	90V
A1h	MFR_VIN_MAX	264V
A4h	MFR_VOUT_MIN	11.4V
A5h	MFR_VOUT_MAX	12.6V
A6h	MFR_IOUT_MAX	33A
A8h	MFR_TAMBIENT_MAX	50°C
A9h	MFR_TAMBIENT_MIN	0°C

15.0 Label

SWITCHING POWER SUPPLY

交换式电源供应器

MODEL NO. (型号) : R1A-KH0400
Produced by ASPOWER

AC INPUT (交流输入) ~	电压 (VOLTAGE)	电流 (CURRENT)	频率 (FREQUENCY)
	100V-240V	6.3A Max.	50/60Hz
DC INPUT (直流输入) ==	145V-350V	6.3A Max.	/
DC OUTPUT (直流输出) ==	+5V	+3.3V	+12V
	-12V	+5Vsb	
	18A	18A	33A
		0.5A	3A
最大功率400W			

Attention:
 Combined 5V&3.3V power not exceed 110W
 5V及3.3V综合输出功率不超过110W
 Maximum continuous output is 400W
 最大连续输出400W

Attention:
 Indoor use only and chassis-assembly!
 注意: 仅供室内和搭配机箱使用!
 Don't remove this cover. Hazardous voltage in power supply!
 请勿拆开外壳, 电源内有危险电压!
 Multiple power sources. Please cut off all power before servicing.
 此产品为多个电源供电, 维修时请将所有电源断开。
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 SHENZHEN HONOR ELECTRONIC CO.,LTD.

EAC89+

线材颜色定义

+5V	红色
+3.3V	橙色
+12V	黄色
-12V	蓝色
+5Vsb	紫色
GND	黑色
P.G	灰色
PS/ON	绿色

中国制造
Made In China


Qdion 交换式电源供应器

MODEL (型号) : U1A-K10400-DRB

Produced by ASPOWER

AC INPUT (交流输入) ~	电压 (VOLTAGE)	电流 (CURRENT)	频率 (FREQUENCY)
	100V-240V	6.3A Max.	50/60Hz
DC INPUT (直流输入) ==	145V-350V	6.3A Max.	/
DC OUTPUT (直流输出) ==	+12V	+5Vsb	最大功率400W
	33A	3A	

Attention:
Maximum continuous output is 400W
最大连续输出400W



EAC 92+



Attention :
Indoor use only and chassis-assembly!
注意:仅供室内和搭配机箱使用!



Don't remove this cover, Hazardous voltage in power supply!
请勿拆开外壳, 电源内有危险电压!

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Qdion

**SWITCHING POWER SUPPLY
交换式电源供应器**

MODEL NO. (型号) : R1A-KH0400

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AC INPUT (交流输入) ~	电压 (VOLTAGE)		电流 (CURRENT)			频率 (FREQUENCY)
		100V-240V		6.3A Max.		
DC INPUT (直流输入) ==	145V-350V		6.3A Max.			
DC OUTPUT (直流输出) ==	+5V	+3.3V	+12V	-12V	+5Vsb	最大功率400W
	18A	18A	33A	0.5A	3A	

Attention:

Combined 5V&3.3V power not exceed 110W
5V及3.3V综合输出功率不超过110W
Maximum continuous output is 400W
最大连续输出400W



Attention :

Indoor use only and chassis-assembly!

注意: 仅供室内和搭配机箱使用!

Don't remove this cover. Hazardous voltage in power supply!

请勿拆开外壳, 电源内有危险电压!

Multiple power sources. Please cut off all power before servicing.

此产品为多个电源供电, 维修时请将所有电源断开。

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SHENZHEN HONOR ELECTRONIC CO.,LTD.

EAC 89+

线材颜色定义	
+5V	红色
+3.3V	橙色
+12V	黄色
-12V	蓝色
+5Vsb	紫色
GND	黑色
P.G	灰色
PS/ON	绿色

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