



**深圳市火牛科技有限公司**  
**SHENZHEN HUONIU TECHNOLOGY CO., LTD.**



**REACH**

## SPECIFICATION FOR APPROVAL

CUSTOMER: \_\_\_\_\_ MODEL NO.: HNC050200U

CUSTOMER P/N: \_\_\_\_\_ HUONIU P/N: S001318-UF

REV. A DATE: 2010-12-6

DESCRIPTION: Input:100-240Vac ;Outpu5.0Vdc2.0A, SMPS Adapter

### CUSTOMER APPROVED SIGNATURE

APPROVED BY:	CHECKED BY:	TESTED BY:
DATE:	DATE:	DATE:
Please send one copy of this specification back after you sign and approve for production		

ISSUED BY	游金晶	CHECKED BY		APPROVED BY	
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**SHENZHEN HUONIU TECHNOLOGY CO., LTD.**

ADD: 6A,NO 1 of ChuangchengBuilding,Taiwan industrial Zone,Shiyan Town Baoan,Shenzhen, GuangDong,P.R.China.

TEL : (+86) 755-29827666 (+86) 755-29828699

FAX : (+ 86) 755-28079166

E-mail: [sales@szhuoniu.com](mailto:sales@szhuoniu.com)

Website: <http://www.szhuoniu.com>

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## Design Revision History

Mark	Description of Change		Changed	Reason of	Revised	Approved
	Before	After	Date	Change	By	By
	New	—				

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## 1. SCOPE

This document details the electrical, mechanical and environmental specifications of a switching power supply.

### 1.1 Description

- Wall Mount  Desk-Top  
 Open Frame  Others

## 2. INPUT REQUIREMENTS

### 2.1 Input Voltage & Frequency

The range of input voltage is from 90Vac to 264Vac

	Min.	Normal	Max.
Input Voltage	90Vac	100-240Vac	264Vac
Input Frequency	47Hz	50/60Hz	63Hz

### 2.2 Current

The maximum input current is 0.35A max. at 100-240Vac.

### 2.3 Inrush Current

The inrush current will not exceed 80A at 100-240Vac input and Max load for a cold start at 25°C.

### 2.4 Stand-By Power

The input power should be less than 0.5W with No-Load.

## 3. OUTPUT FEATURES

### 3.1 Output Parameters

	Output Data	Spec. Limit			Test Condition
		Min Value	Typical	Max Value	
3.1.1	5.0Vdc				
3.1.2	Output Voltage	4.75	5.00	5.25	0 ~ 2A Loading
3.1.3	Output Load	0.0A	—		
3.1.4	Ripple and Noise	—	—	120mVp-p	20MHz Bandwidth 10uF Ele. Cap.0.1uF Cer. Cap.
3.1.5	Output power	—	—	10 MAX	MAX. load(2A) & 100- 240Vac

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### 3.2 Turn On Delay

During turn on and turn off, no output voltage shall exceed its nominal voltage by more than 10% and no output shall change its polarity with respect to its return line. All outputs shall reach their steady state values within 3 seconds of turn on.

### 3.3 Hold Up Time

5 ms minimum at 115Vac/60Hz input at maximum load, and 10 ms minimum at 230Vac/50Hz input at maximum load.

### 3.4 Typical Efficiency

The efficiency (watts out / watts in) shall be higher than 70.72% typical while measuring at nominal line and maximum load condition, test in 1 minute after power on.

### 3.5 Output Transient Response

The power supply shall maintain output transient response time within 10ms with a loading current change from 20% to 80% of maximum current and 0.5A/ $\mu$ s rise up /drow down test at end of output terminal.

## 4. PROTECTION REQUIREMENT

### 4.1 Over-Voltage Protection

Over-voltage protection shall be included in the adaptor circuit. A single component failure must not cause an over voltage.

### 4.2 Over-Current Protection

The adaptor must have a current limiting function on the output voltage. in overload mode, the output must drop to a low voltage.

### 4.3 Short-Circuit Protection

The adaptor must withstand a continuous short circuit on the output without damage.

## 5. ENVIRONMENTAL CONDITIONS

### 5.1 Operating

The power supply shall be capable of operating normally in any mode without malfunction happens in the following environmental conditions.

#### 5.1.1 Operating Temperature: 0°C ~40°C

Relative Humidity: 10% ~ 90%

Altitude: Sea level to 2,000 m.

#### 5.1.2 Vibration: 1.0mm, 10 –55Hz, 15 minutes per cycle for each axis (X, Y, Z).

#### 5.1.3 Cooling: Natural convection cooling

### 5.2 Non - Operating

The power supply shall be capable of withstanding the following environmental conditions extended periods of time, without sustaining electrical or mechanical damage and subsequent operational deficiencies.

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5.2.1 Storage Temperature: -30°C ~ 70°C

5.2.2 Relative Humidity: 10% ~ 90%

5.2.3 Altitude: Sea level to 2,000 m.

5.2.4 Vibration and Shock:

The power supply shall be designed to withstand normal transportation vibration per MIL-STD-810D, method 514 and procedures X, as it is mounted in the chassis assembly and packed for shipping.

## 6. RELIABILITY AND QUALITY CONTROL

6.1 MTBF

When the power supply is operating within the limits of this specification the MTBF shall be at least 50,000 hours at 25°C (MIL-HDBK-217F).

6.2 Burn-In

The power supply shall withstand a minimum of 2-4 hours Burn-In test under full load at 35°C ~40°C room temperatures, after test, product shall operate normally.

6.3 Component Derating

Semiconductor junction temperatures shall not exceed the manufacturer's maximum thermal rating.

## 7. MECHANICAL CHARACTERISTICS

7.1 Physical Dimensions

The detail dimension of the power supply is drawn on APPENDIX A.

7.2 Nameplate

The label of the power supply, please see APPENDIX B.

7.3 Drop test

Dropped freely from 1 m (for wall mount product) height onto the surface is consisted of hardwood 13 mm thick, mounted on two layers of plywood each 19-20 mm thick, all supported on concrete floor 1 time from 3 different surface, after test, it's no safety damage for product.

## 8. SAFETY

8.1 Safety Standard

The power supply shall be certified under the following international regulatory standards

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Item	County	Certified	Standard
UL	American	—	UL 60065

8.2 Insulation Resistance

Input to output: **10 MΩ** min. at **500 VDC**.

8.3 Dielectric Strength (Hi-Pot)

Primary to Secondary **DC4242V,5mA** 1 minute for type test, 3 seconds for product.

8.4 Leakage Current

The leakage current shall be less than **0.25mA** for **Class II** when the power supply is operated maximum input voltage and maximum frequency.

**9. EMC STANDARDS**

9.1 EMI Standards

The power supply shall meet the radiated and conducted emission requirements for **UL 60065**

9.2 EMS Standards

The power supply shall meet the following EMS standards

9.2.1 IEC61000-4-2 Electrostatic Discharge (ESD)

Static – discharge test by contact or air should be conducted with Static – discharge teeter, energy storage capacitance of 150pF, and discharge resistance of 330Ω.

**8KV** air discharge, **4KV** contact discharge, Performance Criterion B.

9.2.2 IEC61000-4-3 Radiated Electromagnetic Fields(RS)

Radio- frequency Electromagnetic Field Susceptibility Test, RS, 80-1000MHz,3V/m, 80%AM(1KHz), Performance Criterion A.

9.2.3 IEC61000-4-4 Electrical Fast Transient / Burst (EFT)

Power Line to Line: **1KV**

Performance Criterion B.

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9.2.4 IEC61000-4-5 Lightning Surge Attachment

Lightning Surge voltage of differential and common modes shall be applied across AC input lines and across input and frame ground.

Power Line to Line: **1KV**

Line to Earth : **2KV**

Performance Criterion B.

9.2.5 IEC61000-4-6 Conducted Radio Frequency Disturbances (CS)

Conducted Radio Frequency Disturbances Test, CS, 0.15-80 MHz, 3V/m, 80%AM, 1KHz, Performance Criterion A.

9.2.6 IEC61000-4-11 Voltage Dips/Short Interruption/Variations

Voltage Dips, 30% reduction- 10ms, Performance Criterion B, 60%

Reduction – 100ms, Performance Criterion C, Voltage Interruptions>95%

Reduction- 5000ms, Performance Criterion C.

**10. OTHER REQUIREMENTS**

10.1 Hazardous Substances

The components and used materials shall be in compliance with

EU Directive 2002/95/EC "RoHS"

EU Directive 2002/96/EC "WEEE"

10.2 Energy Efficiency

10.2.1 The No-Load power consumption shall be less than **0.5W** at input **115/230Vac,60/50Hz**

10.2.2 The average active mode efficiency shall be higher than **70.72 %** at input

**115/230Vac,60/50Hz**

10.2.3  International Efficiency Level IV

Korea Energy Efficiency Label

10.2.4 This power supply is therefore in compliance with the requirements of

California Energy Commission for external power supplies (CEC)

Energy Star requirements for external power supplies(EPS Version 2.0)

EU Code of Conduct on Energy Efficiency of External Power Supplies (Version 4)

Australian and New Zealand Energy Performance Requirements for external power supplies (MEPS)

China Energy Efficiency requirements for external power supplies ([GB20943-2007](#))

Korea regulation on Energy Efficiency Labeling and Standards for external power supplies (MKE's Notification 2008-99)

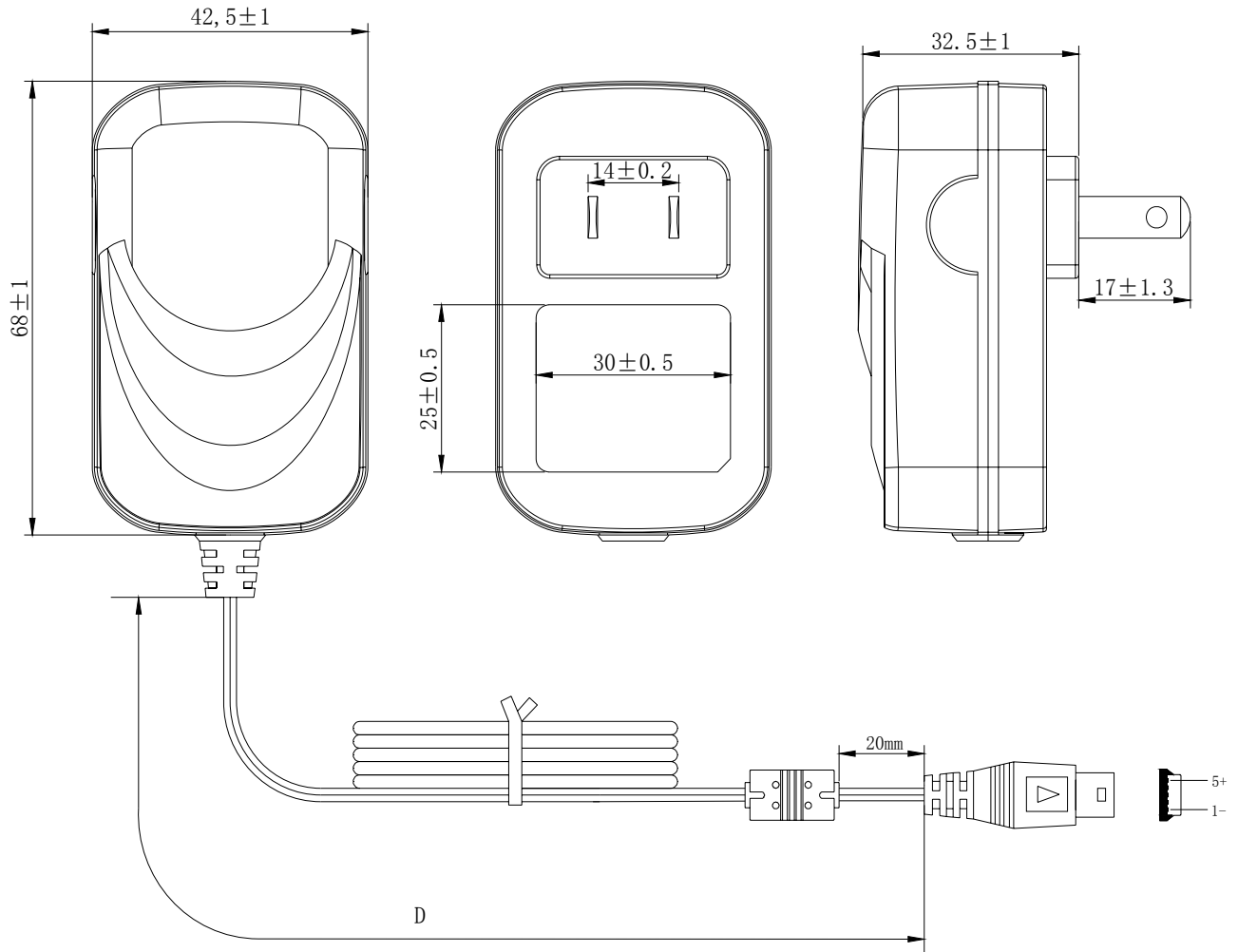
Implementing Directive [2009/125/EC](#) of the European Parliament and of the Council with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies ([No 278/2009 ,Stage 1](#))

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# APPENDIX A

Mechanical Dimensions(Unit: mm) Tolerance Of unspecified Parts:±1.5mm

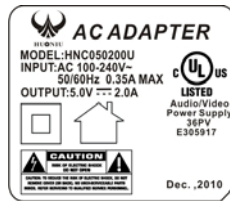


	$\Phi A$	$\Phi B$	C	D
DIMENSION				1200
TOLERANCE				±50
REMARK	AWG20# / 2C UL2468 MINI5PIN (1-,5+) black			

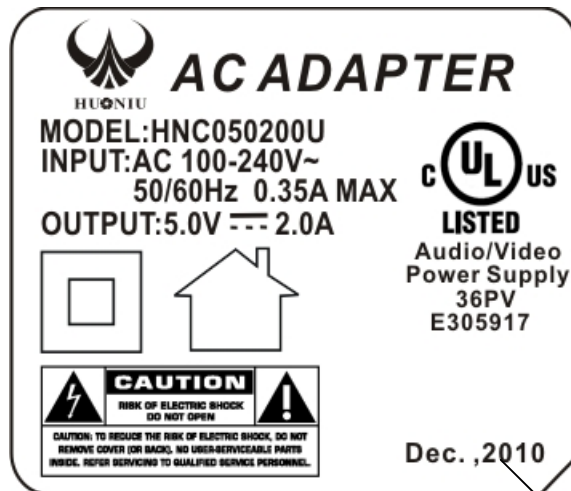
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# APPENDIX B

Name Plate:



1: 1



1: 2.5

Size: **29.5\*24.5**

月份和年份按实际做货时间

Unit: mm

Tolerance: +0/-0.2

Back Color : **Black**

Word Color: **White**

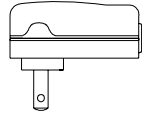
\* Please Advise If Any Comments About The Name Plate Information.

Otherwise, This Information Is Defaulted As Customer Approval,  
And Will Be Applied To Production .

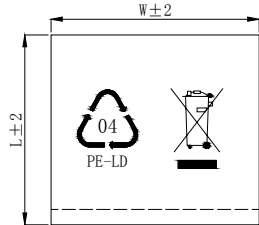
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# APPENDIX C

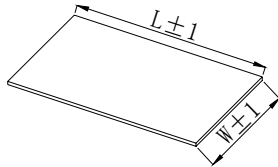
PRODUCT:



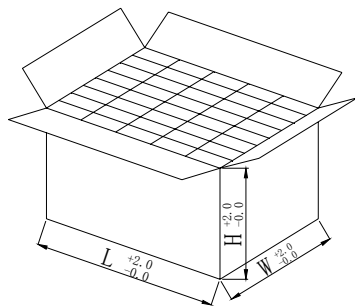
PLASTIC BAG:



PAPERBOARD:



CARTON:



DIMENSION(UNIT IN cm):

	L	W	H
PLASTIC BAG	15.0	16.0	
WHITE BOX (0/-0.1)			
PAPERBOARD	43.0	30.0	
CARTON	45.0	32.0	26.0

PACKING METHOD:

PAPERBOARD PLACEMENT METHOD	PUT A PAPERBOARD AT THE TOP AND BOTTOM, TOTAL OF 5PCS
PACKING METHOD	35PCS/LAYER X 4 LAYERS
QTY	140PCS

REMARK:

1. STORAGE CONDITION

TEMPERATURE: -10°C ~ +60°C

RELATIVE HUMIDITY: 30% ~ 80%

2. STORAGE PERIOD: 6 MONTHES

3. ANLISTATIG: NO REQUIREMENT

4. PLEASE ADVISE IF ANY COMMENTS ABOUT THE PACKING INFORMATION.

OTHERWISE, THIS INFORMATION IS DEFAULTED AS CUSTOMER APPROVAL, AND WILL BE APPLIED TO PRODUCTION.

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# APPENDIX D

## SAMPLE PRIMARY TEST REPORT

MODEL NO.	HNC050200U							
Test Items.	Test Condition	Unit	Sample Number and Test Result					Pass/ Fail
			1#	2#	3#	4#	5#	
Unload output voltage  4.75 V $\pm$ 5.25 V	90Vac	V	5.19	5.18	5.21	5.20	5.19	PASS
	115Vac	V	5.19	5.18	5.21	5.20	5.19	PASS
	230Vac	V	5.19	5.18	5.21	5.20	5.19	PASS
	264Vac	V	5.19	5.18	5.21	5.20	5.19	PASS
Rated load output voltage  2 A 4.75 V $\pm$ 5.25 V	90Vac	V	4.84	4.83	4.85	4.85	4.84	PASS
	115Vac	V	4.84	4.83	4.85	4.85	4.84	PASS
	230Vac	V	4.84	4.83	4.85	4.85	4.84	PASS
	264Vac	V	4.84	4.83	4.85	4.85	4.84	PASS
Rated load input power	115Vac	W	13.60	13.50	13.60	13.60	13.50	PASS
		PF	0.64	0.63	0.64	0.65	0.63	PASS
	230Vac	W	13.30	13.30	13.30	13.30	13.30	PASS
		PF	0.71	0.70	0.71	0.71	0.71	PASS
Output ripple & noise voltage $\leq$ 120 mV (test at full loading)	90Vac	mV	45.00	44.00	37.00	43.00	44.00	PASS
	115Vac	mV	42.00	40.00	38.00	36.00	52.00	PASS
	230Vac	mV	39.00	41.00	35.00	40.00	37	PASS
	264Vac	mV	38.00	37.00	32.00	41.00	41	PASS
Short-circuit protection test (Short at end of DC plug)	90Vac		OK	OK	OK	OK	OK	PASS
	264Vac		OK	OK	OK	OK	OK	PASS
Efficiency	115Vac	%	71.18	71.56	71.32	71.32	71.70	PASS
	230Vac	%	72.78	72.63	72.93	72.93	72.78	PASS
Hi-pot test	4242Vdc/3.5mA 1Minute		OK	OK	OK	OK	OK	PASS
DC cord and DC connector			OK	OK	OK	OK	OK	PASS
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