

 <b>深圳市汇科源电子科技有限公司</b> Shenzhenshi Huikeyuan Electronic Tech.co., LTD		<b>REVISION</b> (版本)	A0
		<b>DATE</b> (日期)	2021.11.29
<b>PART NUMBER</b> (产品编号)	A160	<b>CUSTOMER NAME AND MODEL</b> (客户名称和型号)	

## SPECIFICATION FOR APPROVAL

### 产 品 承 认 书

CUSTOMER / 客 户: \_\_\_\_\_

CUSTOMER MODEL NO. / 客户型号: \_\_\_\_\_

SAMPLE NO. / 样品单号: \_\_\_\_\_

SERIES PRODUCTS / 产品系列:   A 系列  

PRODUCT NAME / 产品名称:   电源适配器  

OUR MODEL NO. / 机种型号:   A160  

Color / 颜色:   Black/黑色  

DATE / 日期:   2021.11.29  

<b>CUSTOMER APPROVED SIGNATURE</b> 客户确认		

<b>Designed by</b> 制 作	<b>Checked by</b> 审 核	<b>Approved by</b> 批 准
吴 骄	汪海波	

**Please to sign back after you confirm!**

承认书确认后请回签一份!

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Rev. List/版本目录			
Rev./版本	Date/日期	Description/描述	Design/制订
A0	2021.11.29	New Rev./新版本	

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## 1. Scope (适用范围)

The specification shall be applied to the field of IT and AV equipment  
 本规范应适用于 IT 和 AV 设备领域。

## 2. Quote Criterion (引用标准)

2.1 Safety:accord with

①IEC 62368-1:2014;

②EN 62368-1:2014/A11:2017, EK1 557-13, AfPS GS 2019:01 PAK,;

③EN 62368-1:2014/A11:2017, BS EN 62368-1:2014/A11:2017;

④UL 62368-1,2nd Ed, 2014-12-01(Audio/ideo, information and communication technology equipment Part 1: Safety requirements) , CAN/CSA C22.2 No. 62368-1-14, 2nd Ed, Issued: 2014-12-01(Audio/ideo, information and communication technology equipment Part 1: Safety requirements)

⑤GB 4943.1-2011,

⑥AS/NZS62368-1-2018,

⑦JP 62368-1(2020),

⑧KC62368-1

安规:符合标准

①IEC 62368-1:2014;

②EN 62368-1:2014/A11:2017, EK1 557-13, AfPS GS 2019:01 PAK,;

③EN 62368-1:2014/A11:2017, BS EN 62368-1:2014/A11:2017;

④UL 62368-1,2nd Ed, 2014-12-01(Audio/ideo, information and communication technology equipment Part 1: Safety requirements) , CAN/CSA C22.2 No. 62368-1-14, 2nd Ed, Issued: 2014-12-01(Audio/ideo, information and communication technology equipment Part 1: Safety requirements)

⑤GB 4943.1-2011,

⑥AS/NZS62368-1-2018,

⑦JP 62368-1(2020),

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## 2.2 EMI STANDARD EMI 标准

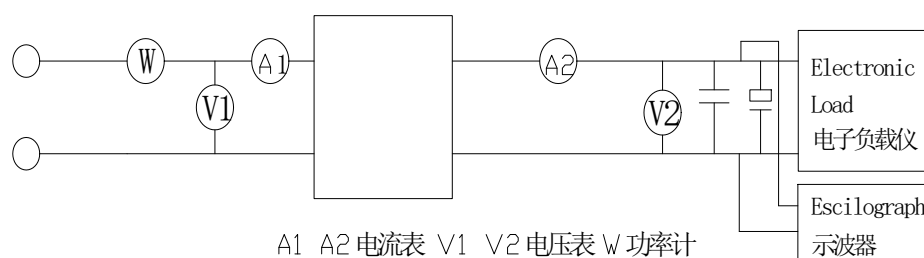
- ①EN 55032:2015/A11:2020, EN IEC 61000-3-2:2019/A1:2021, EN 61000-3-3:2013/A1:2019, EN 55035:2017/A11:2020, BS EN 55032:2015/A11:2020, BS EN IEC 61000-3-2:2019/A1:2021, BS EN 61000-3-3:2013/A1:2019, BS EN 55035:2017/A11:2020
- ②EN 55032:2015/A11:2020, EN IEC 61000-3-2:2019, EN 61000-3-3:2013/A1:2019, EN 55035:2017/A11:2020
- ③GB/T9254:2008, GB17625.1:2012
- ④47 CFR FCC Part 15, Subpart B, ANSI C63.4-2014
- ⑤EN 55032, EN IEC 61000-3-2, EN 61000-3-3, EN 55035, BS EN 55032, BS EN IEC 61000-3-2, BS EN 61000-3-3 and BS EN 55035
- ⑥EN 55032, EN 55035, EN IEC 61000-3-2, EN 61000-3-3
- ⑦AS/NZS CISPR 32:2015+A1:2020
- ⑧KN 32, KN 35
- ⑨J55032(H29)

## 3. Electrical Characteristic (电气特性)

Test Circuit (测试电路)

If the test is to be made on a specified circuit, be sure to use the following circuit.

(无特殊规定的情况下依照下面的电路进行测试, 11、12 为电流表.)



## 4. Input Characteristics (输入特性)

### 4.1. Rated Input Voltage (额定输入电压)

It is normal for 100Vac to 240Vac input AC voltage.

( 额定输入交流 100V~240V)

### 4.2. Input Voltage Range (输入电压范围)

The adapter shall operate from 90to 264Vac and the range switching is unnecessary.

(输入电压范围交流 90V~264V)

### 4.3. Rated Frequency (输入频率)

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It is normal for 50Hz or 60Hz and single phase.  
(输入频率 50Hz/60Hz)

#### 4.4. Empty loaded wasting(空载功耗)

The Input power is 150mW(0.15W) or less in empty loaded.  
输入空载功耗小于 150mW(0.15W)

#### 4.5. Frequency Range (输入频率范围)

The adapter shall operate with an input frequency from 47Hz to 63Hz.  
(输入频率范围 47Hz~63Hz)

#### 4.6. Steady AC Current (AC 输入电流)

Maximum steady state input current is 2.6A (Max) Measured at 100Vac input and maximum load.  
(100V 满载时输入电流 2.6A 最大)

#### 4.7. Input Inrush Current (输入浪涌电流)

With cold starting, the Input Inrush current should less than 100A.  
(电源启动时输入涌浪电流小于 100A)

#### 4.8. PFC Value (功率因素校正)

$PF \geq 0.9$  230VAC FULL LAOD  
(230VAC 输入, 输出满载,  $PF \geq 0.9$ )

### 5. Output Characteristics (输出特性)

#### 5.1. Rated Output Voltage Current (输出额定电压电流)

Model 型号	5.1 Output Voltage 输出电压	5.1 Min Load 最小负载	5.1 Output Current 输出电流	5.1 Load Regulatio 负载调整	5.1 Line Regulation 线性调整	5.1 Output Voltage Range 输出电压范围	5.2 Rated Power 额定功率	5.3 Ripple/Noise (p-p) 纹波噪声	5.4 average efficiency 平均效率	5.5.1 Over Current Protection 过流保护
A160-120010000	12V	0A	10A	±5%	±1%	11.40V-12.60V	120W	200mV Max	89% Min	14A Max
A160-120012500	12V	0A	12.5A	±5%	±1%	11.40V-12.60V	150W	200mV Max	89% Min	17A Max
A160-150010000	15V	0A	10A	±5%	±1%	14.25V-15.75V	150W	200mV Max	89% Min	14A Max

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## 5.2. Rated Power (额定功率)

This adapter is capable to support Rated MaxPower continuously at all specified conditions. Note: the test shall be made under the following conditions, unless otherwise specified: Ambient Temperature 25°C, Relative Humidity 35~85%RH Air Pressure 86~106kPa

(不同状态下输出额定最大功率, 在无特别指定条件下,测试温度为 25°C、湿度为 35~85%RH、气压为 86~106kPa)

## 5.3. Output Ripple and Noise (输出纹波、噪音)

5.3.1 AC Input 115V/60Hz,230V/50Hz. Output ripple voltage is less Measured methods:Performed by 20MHz bandwidth in oscilloscope. Applied 0.1uF ceramic capacitor and 10uF electrolytic capacitor across output connector terminals Measured at the end of DC cable.( AC 输入 115V/60Hz,230V/50Hz. 输出端并 0.1uF 与 10uF 电容, 限制示波器带宽 20MHz 时)

### 5.3.2 Turn on delay time/启动延迟时间:

3Second Max.at 115Vac input and output Max.load.

当输入 115Vac 和输出最大负载时,最大启动时间为 3S.

### 5.3.3 Rise time/上升时间:

40 mS Max.at 115Vac input and output Max load.

当输入 115Vac 和输出最大负载时最大时间为 40 mS.

### 5.3.4 Hold up time/保持时间:

5 mS Min.at 115Vac input and output Max.Load.

当输入 115Vac 和输出最大负载时,最小保持时间为 5 mS .

## 5.4. Average Efficiency (平均效率)

measured at 115Vac and 230Vac input voltage, maximum load . Meet CEC,Energy Star 3.0 (CoC V5-level VI), All data was measurement at pcb end.

(在输入电压 115Vac -230Vac, 输出最大负荷下, 适配器工作效率满足能源之星 3.0 (CoC V5-6 级), 所有数据在 pcb 板端结束处测量。

## 5.5. Protection (保护)

### 5.5.1. Over Current Protection (过流保护)

Output overcurrent protection current is limited and less than the maximum value  
输出过流保护电流被限制且小于最大值

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### 5.5.2. Short Circuit Protection (短路保护)

When the output short circuit, the product input power is reduced, will not damage, the product into the self-locking state, when the short-circuit situation is lifted, the product needs to restart, resume normal work  
 当输出短路时, 产品的输入功率降低, 不会损坏, 产品进入自锁状态, 当短路情况解除时, 产品需要重新启动才能恢复正常工作

### 5.5.3. Over voltage protection (过压保护)

When the output voltage exceeds the rated voltage of 120% to 170%, the product will enter the self-locking state, after troubleshooting, the product needs to restart to restore normal work.

当输出电压超过额定电压 120%~170%时, 产品进入自锁状态, 故障排除后, 产品需要重新启动才能恢复正常工作。

## 6. Reliability Items (信赖性项目)

### 6.1. Electrostatic Discharge (静电)

At 150pF: 330Ω, for each point, 10 shots of direct discharge or air discharge. (1 MΩ/SHOT), have no malfunction. Direct discharge: ±4kV, Air discharge: ±8kV

(在接触放电±4kV 和空气中放电±8kV 模式下,各处分别放电 10 次无误动作)

### 6.2. Hi-Pot Test (高压测试)

After AC 3000V1min between input plug-DC plug. cutoff current 5mA, the adapter have no failures like damages, arch, insulation damage etc. (at 25° C)

在 25° C 环境下, AC 输入插头与 DC 插头之间加 AC3000V 1 分钟, 电流 5mA 最大, 适配器无损伤、电弧放电、绝缘破坏等异常。)

### 6.3. Insulation Resistance (绝缘电阻)

At 25° C after DC 500V 1min between input plug- DC plug, insulation resistance 7MΩ/min)

(在 25° C 环境下, AC 输入插头与 DC 插头之间输入 DC500V1 分钟后绝缘阻抗在 7MΩ以上)

### 6.4. Leakage Current (泄漏电流)

3.5mA maximum, at nominal AC input voltage and frequency

(额定交流输入时泄漏电流不得超过 3.5mA)

### 6.5. Temperature Rise (温升)

At 25°C with the rated input 100-240Vac charged to the primary a rated load on the secondary ,every parts of the case surface rise 77°C or less,

(在常温 25°C 下输入端施加 100-240Vac 电压, 输出额定负载的状态下, 机壳温度小于 77°C。)



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## 7. Environmental Requirement (环境要求)

### 7.1. Operating Temperature (工作温度)

-10°C TO 40°C Full load, Normal operation. 满载, 正常工作.

### 7.2. Storage Temperature (储藏温度 8H)

-25°C TO +70°C With package/带外壳

### 7.3. Operating Humidity (工作湿度)

5%(0°C)~90%(40°C),RH,72Hrs,Full load, Normal operating.

5%(0°C)~90%(40°C), 湿度 72 小时, 满载, 正常工作

### 7.4. Storage Humidity (储藏湿度)

5% ~ 95% RH. Non-condensing

## 8. Mechanical Requirement (机械要求)

### 8.1. Input plug type (输入插头类型)

**IEC-320-C14**

### 8.2. Drop Test (跌落试验)

from 100cm height to the most likely to cause adverse results to the horizontal position of the surface drop test bed three times, the adapter in addition to surface scratches, it should be no dysfunction can cause the adapter and other potentially the harm. (Horizontal surface of the test rig shall be composed of at least 13mm thick hardwood installed in two layers of plywood, each layer of plywood thickness 19-20mm, and then placed on a cement base or equivalent on the ground inelastic)

(从 100cm 高处、以可能对其造成最不利结果的位置跌落至水平表面试验台 3 次, 适配器除表面有擦伤外, 应该没有任何功能障碍和其他方面能导致适配器产生潜在的危害。(水平表面试验台应是由至少 13mm 厚的硬木安装在两层胶合板上组成, 每一层胶合板的厚度为 19-20mm, 然后放在一水泥基座上或等效的无弹性的地面上)

### 8.3. Salty Fog Test for Metal Part (五金件盐雾实验)

Experiment condition, Salty water thickness: 5%, Equipment Temperature: 35 ~ 40 °C ,put the adapter(unpacking)in the test equipment for 24h, after 24h recovery at 25 °C checking the appearance, the metal parts have no erode and rust.

(盐雾试验要求: 调制(工业盐)盐水的浓度为 5%, 设备温度设置为 35~40°C, 适配器不包装, 放入盐雾试验设备中持续喷雾 24 小时, 试验结束后取出, 在常温下搁置 24 小时, 再检查适配器外观: 要求外露金属及电镀件不生锈。)

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## 9. Mechanical Characteristics (机械性能)

### 9.1. Appearance (外观)

Visual inspection the case have no visual abnormality, no obvious nick, burr and other mechanical damage, outer metal have no rust. Use limit sample to check for any failures.

(目视检查, 无外观异常, 表面无明显划痕、毛刺及其它机械损伤, 外露金属部分无锈, 其他限度根据样品确认。)

### 9.2. Case/Resin Materials (外壳材质)

Flame resistance applies to UL94-V1  
(耐燃性遵循 UL94-V1)

## 10. Environmental Performances (环境性能)

### 10.1. Operating at the Lower temperature (低温工作实验)

At  $-10\pm 2^{\circ}\text{C}$ , with the rated voltage 100-240Vac charged to the primary and unloaded and full load on the secondary, no abnormality in electric and mechanical characteristic, after 2 hours recovery at the room temperature.

(环境温度  $-10\pm 2^{\circ}\text{C}$ , 在输入端施加额定电压 100-240Vac 输出端无负荷与满载状态下, 试验 2 小时, 无特性异常)

### 10.2. Operating at the High Temperature (高温工作实验)

At  $40\pm 2^{\circ}\text{C}$ , with the rated voltage 100-240Vac charged to the primary and unloaded and full load on the secondary. No abnormality in electric and mechanical characteristic after 2 hours recovery at the room temperature.

(环境温度  $40\pm 2^{\circ}\text{C}$ , 在输入端施加额定电压 100-240Vac 输出端无负荷与满载状态下, 试验 2 小时, 无特性异常)

### 10.3. Storage at the Lower Temperature( 低温放置)

At  $-25\pm 2^{\circ}\text{C}$ , test of non-operated, No abnormality in electric and mechanical characteristic after 2hours recovery at the room temperature.

(在  $-25\pm 2^{\circ}\text{C}$  非工作状态下进行试验, 试验后常温放置 2 小时后测试无异常)

### 10.4. Storage at the Higher Temperature (高温放置)

At  $70\pm 2^{\circ}\text{C}$ , test of non-operated, No abnormality in electric and mechanical characteristic after 2hours recovery at the room temperature.

(在  $70\pm 2^{\circ}\text{C}$  非工作状态下进行试验, 试验后常温放置 2 小时后测试无异常)

 <b>深圳市汇科源电子科技有限公司</b> Shenzhenshi Huikeyuan Electronic Tech.co., LTD		<b>REVISION</b> (版本)	A0
		<b>DATE</b> (日期)	2021.11.29
<b>PART NUMBER</b> (产品编号)	A160	<b>CUSTOMER NAME AND MODEL</b> (客户名称和型号)	

### 10.5. Storage at High Temperature and High Humidity with the Adaptor Turned on(高温高湿度放置)

At  $40 \pm 2^\circ\text{C}$ , 90~95%RH, test of operating 48hours, no abnormality in electric and mechanical characteristic, after 4hours recovery at the room temperature.

(在  $40^\circ\text{C} \pm 2^\circ\text{C}$ , 90~95%RH, 非工作状态试验持续 48H, 试验后常温放置 4 小时测试特性无异常)

### 10.6. Storage at low Temperature and Low Humidity with the Adaptor Turned on(低温低湿度放置)

At  $-10^\circ\text{C} \pm 2^\circ\text{C}$ , 10%~40%RH, test of operating 48hours, no abnormality in electric and mechanical characteristic, after 4hours recovery at the room temperature.

(在  $-10^\circ\text{C} \pm 2^\circ\text{C}$ , 10%~40%RH, 非工作状态试验持续 48H, 试验后常温放置 4 小时测试特性无异常)

## 11. Photograph of the Product (产品外观图)

### 11.1 Enclosure/外壳:

The power supply size: L160 x W76.5 x H29.8mm; 外壳尺寸: L160 x W76.5 x H29.8mm;

