

**电源承认书**  
**POWER SUPPLY FOR APPROVAL**

产品名称 : 电源适配器

(PART NAME) (ADAPTER)

供方型号 : MD60-29

(SUPPLIER PARTN NO.)

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## 一、电气性能 (ELECTRICAL):

### 1.1、输入要求 INPUT REQUIREMENTS:

#### 电压 (Voltage):

输入电压范围是: 100VAC 到 240VAC

The range of input voltage is from 100V AC to 240VAC.

#### 频率 (FREQUENCY):

输入频率范围是: 47 Hz 到 63 Hz

The range of input frequency is from 47 Hz to 63 Hz

#### 电流 (Current):

在 100VAC 输入时, 额定负载 2.0A, 最大输入电流是 1.6A

#### 浪涌电流 (INRUSH CURRENT):

在环境温度 25℃, 输入电压 240VAC 冷态启动时, 浪涌电流不会超过: 80A

The inrush current will not exceed 80A at 240Vac input, cold start, 25℃.

#### 待机输入功率 (Standby Input power):

测试条件: 输入电压: AC115V,+/-10% or AC230, +/-10% @50/60Hz, 空载。

Testing Condition: AC115V,+/-10% or AC230V,+/-10% @50/60Hz, no load.

Loading (负载)	Input	Input Power
No load	AC115V,+/-10%	Max. <u>0.21 W</u>
	AC230V,+/-10%	Max. <u>0.21 W</u>

(空载)

#### 待机输入电流(Standby Input Current):

测试条件: 输入电压: AC100V,+/-10% or AC240, +/-10% @50/60Hz, 空载。

Testing Condition: AC100V,+/-10% or AC240V, +/-10% @50/60Hz, no load

Loading (负载)	Input Current
No load (空载)	Max. <u>45mA</u> (最大:45mA)

#### 平均效率 (Average efficiency):

##### 测试方法 (Testing method):

在测试之前, 先满载老化 45 分钟。

before testing must aging test 45 minutes in full load status

测试电压 (testing voltage): 115VAC/50Hz and 240VAC/50Hz

电源在满载, 额定负载 75%, 额定负载 50%, 额定负载 25%, 电源转换的平均效率 88%, 符合 VI 能效标准要求。

test efficiency in full load, 75% load, 50% load, 25% load, and get the average value

Determination standard: ≥88%, meet level VI efficiency requirement

## 1.2、输出要求 (OUTPUT REQUIREMENTS):

静态负载 (Static load):

Input Voltage	Output Voltage	Min load (电小负载)	Rated load (额定负载)	Cut Off Current (关断电流)
100V-240VAC	DC29.0V	0A	2.0A	6-10A

输出电压 (Output voltage):

在所有组合的状态下, 包括在负载时, 带线材输出线以及在不同环境温度, 包括电压变化率, 均符合以下参数要求:

The output voltage shall be statically regulated for all combinations of load, line and environment including cross regulation as shown.

Output# (输出)	Voltage/Current (电压 电流)	Range (范围)
1	+29.0V/0A	28.0V-30.0V
2	+29.0V/2.0A	28.0V-30.0V

输出电流 (Output Current):

ItemS (项次)	Particulary (特别)	Value (数值)			
1	Input voltage	110VAC	120VAC	220VAC	240VAC
2	Rated current	2.0A	2.0A	2.0A	2.0A
3	Current out	5A	5A	5A	5A
		During Ton=2min, Toff=9min (开通2分钟, 关断9分钟)			
4	Cut Off Current	6A-10A	6A-10A	6A-10A	6A-10A

纹波和噪音 (Ripple and Noise):

Output # (输出)	Voltage/ Current (电压/电流)	Maximum ripple & Noise (最大纹波和噪音)
1	+29.0V/2.0A	250mVp-p (Ripple) 纹波

用 20MHZ 的带宽示波器, 并在测试输出最终端, 并接 47uF 的电解电容和 0.1uF 的电容器

条件: 输入: 100-240VAC, 在负载电流 2.0A 时测试。

Measurement is done by 20MHz bandwidth oscilloscope and terminated each output with a 47uF capacitor and a 0.1uF capacitor.

Condition: Input100-240VAC, at load current2.0A

温度系数 (Temperature coefficient):

在环境温度 0°C-40°C 满负载状态时, 电压的变化率是小于或等于输出电压变换的 5%。

The changing rate of output voltage ≤5% at 0°C-40°C underfull loading condition.

## LED 显示状态 (LED display status):

当开关电源接通, LED 会被点亮。

LED light green, when SMPS power.

## 二、保护要求 (PROTECTION REQUIREMENT) :

### 过电流保护 (Over-current protection):

当电源工作时, 在任何一段时间, 输出线路达到过负载状态时, 电源将关断, 停止工作, 当故障移除时, 电源应当自动回复。

When operating any output under any line condition, into an over load condition for an indefinite period of time, the power supply shall be shutdown . The power supply shall be self recovering when fault condition remove.

### 过温保护 (Over temperature protection):

当内部功率器件达到温度触发点时, 电源将关断, 停止工作。

The power supply shall be shutdown , when the interior power device temperature reaches to temperature protection trigger point.

## 三、环境条件 (ENVIRONMENTAL) :

### 工作状态 (Operating):

电源在以下环境条件下能在各种模式持续工作, 不会损坏。

The power supply shall be capable of operating continuously in any mode, without sustaining electrical or mechanical damage and subsequent operational deficiencies.

Ambient Temperature: -20℃~40℃

环境温度: -20℃~40℃

Relative Humidity: 0%~90%

环境湿度: 0%~90%

### 非工作状态 (Non – operating):

电源在以下环境条件下放置一段时间, 电性能及机械性能不受损坏。

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

Ambient Temperature: -20℃~70℃

环境温度: -20℃~70℃

Relative Humidity: 0%~95%

环境湿度: 0%~95%

## 四、可靠性 (Reliability):

### 高温存储 (High temperature storage):

电源应能存储在环境温度: 70±2℃, 湿度: 95%, 24 小时

The power supply shall stored at temperature of 70±2℃ for 24 hours.

Relative Humidity: 95%

### 低温存储 (Low temperature storage):

电源应能存储在环境温度: -20±2℃, 湿度: 0%, 24 小时

The power supply shall stored at temperature of -20±2℃ for 24 hours.

Relative Humidity: 0%

### 老化 (Burn-In):

在环境温度 25±5℃ 时, 电源在额定负载至少老化 2 小时。

The power supply will be performed a minimum for 2 hours Burn-In at 25±5℃ under rated load

### 平均故障时间 (MTBF):

在环境温度 25℃ 使用, 平均故障时间大于 50000 小时

The power supply will have a calculated MTBF of greater than 50000 hours at ambient temperature 25℃

### 静电标准 (ESD Standard):

静电阻抗能力满足 EN6100-4-2 标准, 接触放电大于 8.0KV。

ESD meets standard of EN61000-4-2, resistance ability by contact discharging is more than 8.0KV

### 跌落 (Drop):

在高度为 100cm 自由跌落在混凝土地板上, 跌 6 次, 每次一个面

标准 (1): 塑料外壳完好无损, 对使用不会带来触电的危险。

标准 (2): 在跌落测试后, 电性能各项参数测试均符合要求。

Falling height: 100cm natural falling to concrete floor.

Falling direction: 6 sides Drops: 1 drop for each side

Criteria: (1) Plastic case remains intact to protect user from electrical shock

(2) Normal Functional Test Shall Be Satisfied After The Test

### 振动测试 (Vibration test):

振动频率 10-25Hz 振幅 1.0mm, 沿 X 轴、Y 轴和 Z 轴方向各 15 分钟。

Frequency: 10-25Hz Amplitude: 1.0mm, Time: 15 times per directions (X, Y and Z)

### 电线摇摆测试 (Cord bending test)

DC 线, 吊重 200g, 左右摇摆角度 120 度, 每分钟摇摆 40 次, 至少大于 1000 次。

The DC cord shall withstand weight of 200g, it swing from left to right at angle of 120 degree, 40 times per minute, more than 1000 times

### 拉力测试 (Strain relief test):

电源主体的没一个部位、插头、电线在静态时, 能承受 5KG 的重力 15 秒。

Fix the main part of the power supply, Plug and cord at their normal position applied a weight of 5 Kg to output for 15 seconds

## 五、机械部分 (MECHANICAL):

### 重量 (Weight):

电源的重量大约是: 221g

The weight of the power supply: Approx.: 221g

### 物理尺寸 (Physical Dimensions):

电源的外形尺寸是: 118mm (长) x 58mm (宽) x 39mm (高)

The dimension of the power supply is 118 mm(L) X 58 mm (W) X 39mm (H)



连接头 (Connector) :

AC INPUT AC	2 PIN AC SOCKET
DC OUTPUT 输出)	NISPT-1 18AWG 0.18M+S01 Pin Connector

铭牌-激光打印 (Label-Laser printing) :

**AC/DC ADAPTER**

Model NO. : MD60-29

Input: AC100V~240V 50/60HZ 1.6A

Output: DC29.0V = 2.0A

Power: 58.0W Efficiency Level: (VI)

**CAUTION**

Risk of electric shock

Dry location use only

Changzhou Wujin Hong Guang Radio Co., Ltd

Class 2 Power Unit

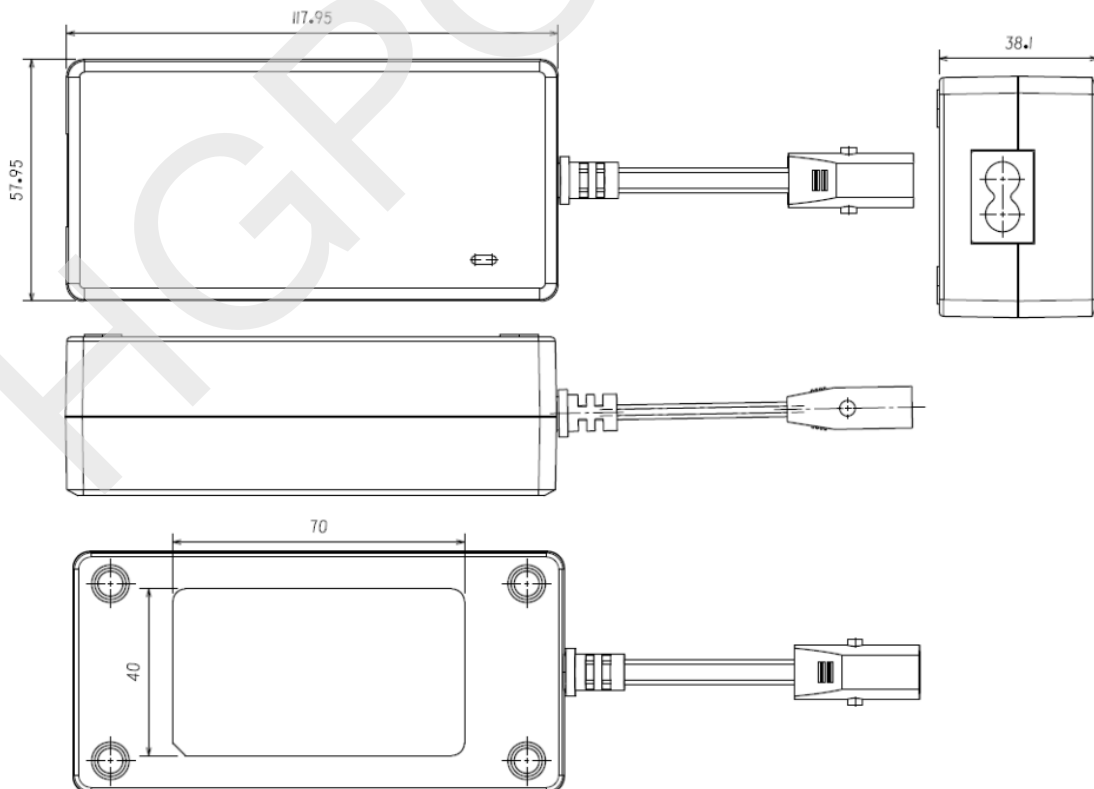
FC c UL US LISTED E219352 43FE 9HA4 TUV-025065-EA

www.tuv.com ID 1111238853

S/N

MADE IN CHINA

图纸或包装 (Drawing or Packing) :





## 六、认证清单 (Certification List) :

No.	Approval / Certificate / Report	Standards	C	App r	Note
1	UL Approval (CUL-LISTED)	UL62368-1 CAN/CSA-C22.2 No. 62368-1			
2	FCC (USA):certificate and report	FCC Part 15, Class B			
3	TW-ICES	ICES-003			加拿大EMC
4	TUV-RH NRCAN	CSA-C381.1-08			加拿大能效
5	CB-Certificate	IEC61558-1 IEC61558-2-16			
6	CE/EMC+LVD Note: The report should show all the standards. But please define the WORST CASE (e.g. WORST CASE limits) to reduce the tests.	EN55014-1 (European Standard) and CISPR 14-1 (International Standard) EN55014-2 (European Standard) and CISPR 14-2 (International Standard)			
		EN61000-3-2 (European Standard) and IEC61000-3-2 (International Standard)			
		EN61000-3-3 (European Standard) and IEC61000-3-3 (International Standard)			
		EN62233			
7	TUV/GS	EN61558-1 EN61558-2-16			
8	PSE	J61558-1 J61558-2-17			
9	SAA	AU61558-1 AU61558-2-16			base on CB
10	RCM				含5年注册
11	EAC	IEC 61558-1 IEC 61558-2-16			base on CB + EMC report(CNA S)

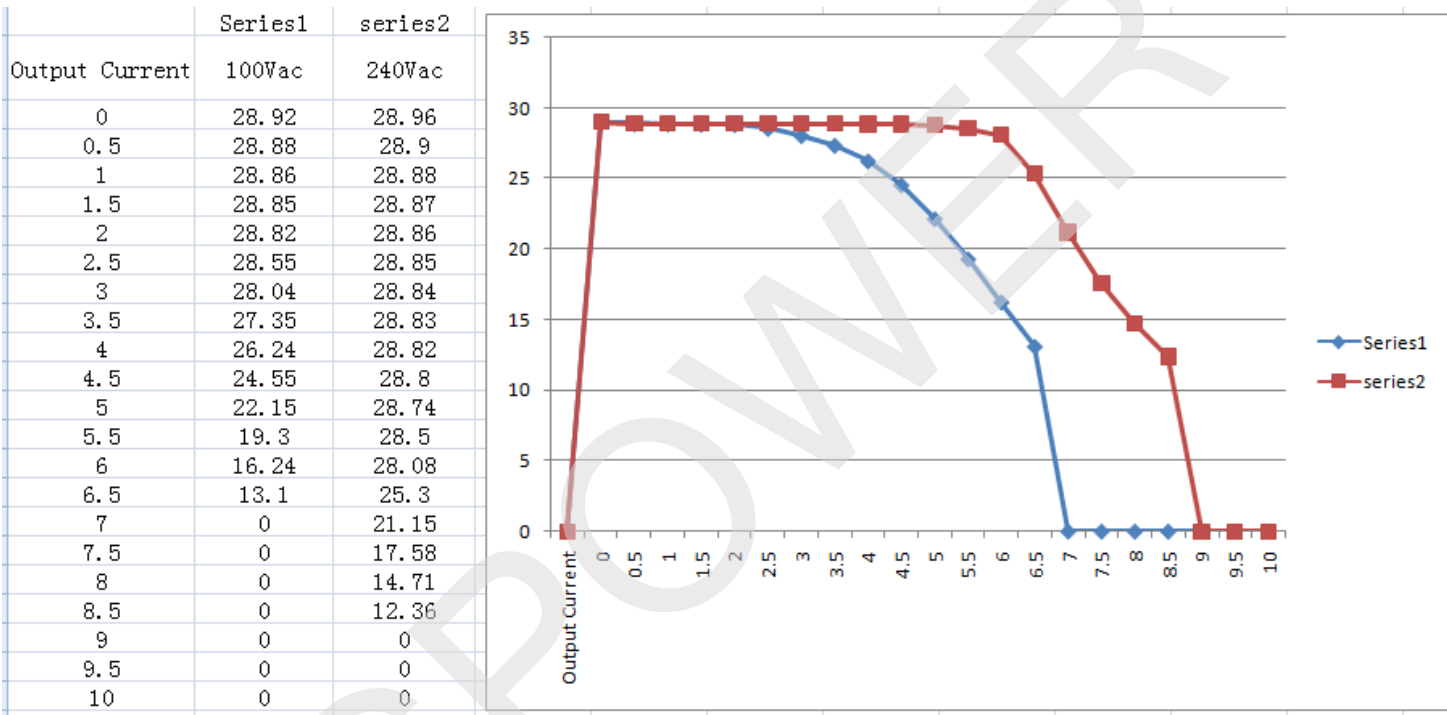
12	CCC	GB4943.1.2011 GB17625.1-2012 GB9254-2008			含变压器、外壳随机测试费
13	BSMI	CNS14336	CNS13438		台湾认证
14	KC+KCC+K-MEPS	K60950-1			含5年注册
15	GEMS				TUV 四合一能效报告
16	Europe:ERP Testreport (Ecodesign)	(EC) No 278/2009(Requirements Ecodesign)			
17	USA (California):Test report	CEC-400-2010-012 Single voltage external AC-DC and AC-AC power supplies (Part 1: General requirements)			
18	USA (DOE):Test report	U.S. DOE 10CFR Part 430			
19	RoHs				SGS报告
20	Reach				SGS报告

## 七、测试报告 (Test Report) :

性能测试报告 (Performance test report) :

电压/电流曲线 (U/I curve) :

MD60-29 电压/电流曲线表



**能效报告 (Efficiency Report) :**

测试条件 TEST CONDITIONS

测试温度 TEST TEMPERATURE: 25°C

输入电压 INPUT VOLTAGE:115V-240V/AC 47HZ-63HZ

NO:	输入电压 Input Voltage	空载功耗 No-Load Input power (W)	空载电压 NO-Load voltage(V)	带载电压 Load voltage( V)	带载电流 Load Current(A)	输入电流 Load input current (A)	输入功率 Input power at load (W)	纹波 Ripple (mV)	关断电流 Cut current (A)
1	115V	0.01	29.12	29.03	2	0.949	65.41	184	6.5
	240V	0.08	29.15	29.05	2	0.491	64.54	200	9.0
2	115V								
	240V								
3	115V								
	240V								
4	115V								
	240V								
5	115V								
	240V								
6	115V								
	240V								

拟制 DWGBY	徐江海	 <b>常州市红光无线电有限公司</b> <b>CHANGZHOU HONGGUANG RADIO</b> <b>CO.,LTD</b> 地址: 江苏 常州市 礼嘉镇青洋路桂阳路一号 ADD: Banshang, lijia Town, Changzhou, Jiangsu, China 电话 TEL: 86-159-86732495 86735639 86735139 传真 TAX: 86-519-86731270 <a href="http://www.hgpower.com">Http://www.hgpower.com</a> 邮编 P.C.: 213165 E-mail:lglxdh@public.cz.js.cn company@hgpower.com
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