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承 认 书
SPECIFICATION FOR APPROVAL

CUSTOMER（客户）：国光

Model Number （型号）：AY088P-1HF01

Part Description（元件描述）：switching power supply

Part No. of Customer（客户编号）：

Date of Approval（确认日期）： 2021-9-3

Prepared By: AOYUAN（奥源确认栏）

Reported By	Checked By	Approved By

Please return us one original approved by you with your signatures.
客户承认盖章后敬请寄回正本一份
Customer Signature:（客户签名栏）

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系统文件 ■第一类支持文件 □第二类支持文件 □生效日期:发行一日后生效

主旨 Subject: AY 工程规范	型号: AY088P-1HF01 客户(代码):GG001	文件版本:1.4 Revision 页别数:1 OF 11 Page

版本展演 Revision History

序 号 NO.	修 改 内 容 Modify Item	变更日期 Change date	版本 Revision
1	首次发行	2021-9-3	V1.0
2	增加耐压测试生产条件说明	2021-9-9	V1.1
3	更新产品外观图	2021-10-19	V1.2
4	更新产品外观图	2021-11-15	V1.3
5	更新产品外观图	2021-12-04	V1.4
6	更新产品外观图	2022-05-05	V1.5
7	更新产品外观图	2022-07-07	V1.6
8	更新输出电压与负载，最大负载为 7.3A	2023-09-01	V1.7

收文单位	■ 研发中心	□ 财务部	■ 品管部	■ 工程部	□ 计划部		
	□人力资源部	■ 制造部	□ 采购部	□ 销售部	□变压器事业部		
拟制部门	研发中心	拟制		审核		批准	

Table of Content（目录）

1. Scope (范围)

The AY088P-1HF01 comprises a 88 Watts one-output according to the power supply

（AY088P-1HF01 是一款单路输出总输出功率为 88 瓦的显示电源）

2. Feature(特性)

All products including samples delivered will meet all the requirements as outlined in the document. The basic requirements of the design features are listed below:

（所有提供的产品包括样品将满足本文件所描述的产品规格。其设计基本要求如下）

* Output Voltages:22V

（输出电压：22V）

* Short circuit protection / Over current protection/Over voltage protection

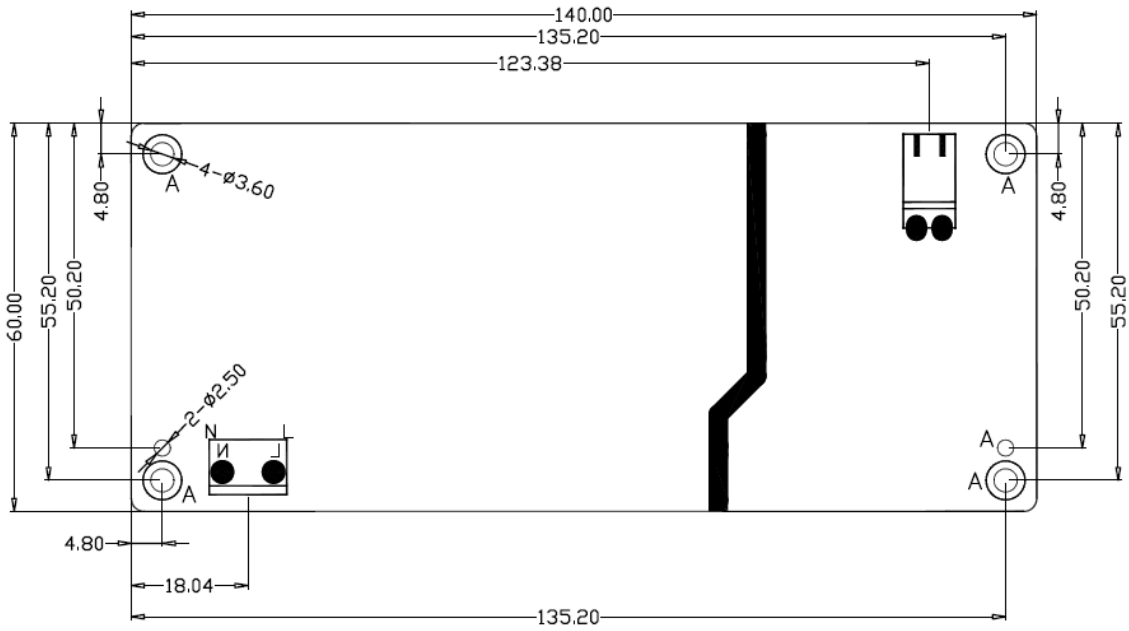
（短路保护/过流保护/过压保护）

* High efficiency ： The efficiency is greater than 85% (230VAC)

（效率：大于 85%, 230VAC）

3. Physical characteristics（物理特性）

3.1 Outline dimensions(unit: mm)(结构图)



140.0(L)*60.0(W)*36(H) mm. (长L *宽W * 高H)

Note: The sample height not include the components pin and PCB

样品的高度不包括元件引脚和 PCB 板

3.2 Weight（重量）

单板样机重量约 170g

3.3 Power supply pin definition (电源连接器脚位定义)

Table.1 Pin-CON1 Connection and Function（插座 CON1 的引脚定义）

NO.	Pin Connection	Function
1	AC-L	AC INPUT LINE
2	NC	NC
3	AC-N	AC INPUT NEUTRAL

Note: CON1 :180º connection, type: pitch 3.96 mm(180º 插座 CON1 的间距是 3.96 毫米)

Table.2 Pin- CON2 Connection and Function（插座 CON2 的引脚定义）

NO.	Pin connection	Function
1	22V	22V OUTPUT
2	GND	GROUND

Note: CON2 : 90 º socket connection, type: pitch 3.96mm (90 º插座 CON2 的针脚间距为 3.96 毫米）

4. Electrical requirements（电气特性）

4.1 Input Electrical Characteristics Overview（输入特性）

Table.3 Input Electrical Characteristics(输入特性)

Input voltage range 输入电压	90Vac to 264Vac
Normal voltage range 标称输入	100Vac to 240Vac
Limited working Range 极限工作范围	88Vac to 280Vac (310Vac at standby)
Frequency range 频率范围	50Hz/60Hz±3%
Max input ac current 满载输入电流	3A max at full load and 100Vac condition
Inrush Current 浪涌电流	70A max at full load ,cold and 220Vac condition

4.2 Output Voltages and Loads(输出电压与负载)

Table.4 Output voltage and load.（输出电压与负载）

Output Voltage 输出电压	Regulation 调整率	Min. Load 最小负载(A)	Rate Load 标称负载(A)	Max. Load 最大负载
22V	20.9V- 23.1V	0A	4A	7.3A/(3 seconds,at Operating temperature 25℃)

Note: 1. The Max current or power should be test at other of dc output at Rated load, and the max current pulse width within 3s 最大电流或功率的测试是在其它各组负载在标称值时测试，且脉宽不小于 3 秒。

2.Typical input voltage (230Vac) is measured to meet the overcurrent point at 7.3A.

典型输入电压（230Vac）测量，满足过流点保持在 7.3A.

4.3 DC Output Ripple & Noise(输出纹波与噪音)

Table.5 Ripple and Noise（输出纹波和噪音）(100-240VAC)

Output Voltage	Ripple & Noise (mV)	
负载类别	输出纹波与噪音	*
22V	≤300mv	配 0.5M 线材

Note: 1. Measurements shall be made with an oscilloscope with 20MHz bandwidth.

示波器须设置在 20 兆赫兹带宽

2. Outputs shall be bypassed at the connector with a 0.1uF ceramic capacitor and a 47uF electrolytic capacitor to simulate system loading.

输出须并联 0.1uF 的陶瓷电容和 47uF 的电解电容来模拟负载

4.4 DC Output Overshoot During Turn-On & Turn-Off（输出超调）

Output Channel	Output(V)	Over shoot voltage(V)超调电压	
		Turn on 开机	Turn off 关机
22V	22V	<24.2V	<24.2V

Note: All of dc output current from Min. to Max. 测试时负载范围：最小到最大

4.5 Dynamic Response（动态响应）

Voltage Regulation 电压变化率	Slew Rate 斜率	Load Change 负载变化
19.8V-24.2V	0.5A/us	20% to80% load

Not:Dynamic response measurements shall be set with a load changing repetition rate of 100Hz

动态测试的负载变化频率范围是 100 赫兹。

4.6 Protection(保护)

Table.6 DC Output Over current Protection(输出过流保护)

Output Voltage	Over Current(A)	Specification
22V	4.4A-11A	Hiccup or Shutdown

Note: The over current protection should be test at other of dc output at Rated load.

过电流保护应在其它 DC 输出工作在标称负载条件下测试。

4.7 Over voltage(过压保护)

Output Voltage 输出电压	Spec(V)	Specification
22V	<33V	Hiccup or Shutdown

4.8 DC Output Short Circuit Protection (输出短路保护)

Table.7 DC Output Short Protection(输出短路保护)

Output Voltage	Specification
22V	Hiccup or Shutdown

Note: Each DC output shall have short circuit protection. A short condition on any of DC outputs shall cause no damage to the power supply. The unit shall recover function automatically or by next AC cycle as soon as the short condition is removed .The Short Circuit protection should be test at other of dc output at Rated load. 每路输出都有输出短路保护功能，且短路时不会对电源造成损害。一旦短路条件解除，电源将尽快自动或通过下一次重新开机恢复正常功能。另外输出短路保护应在其它 DC 输出工作在标称负载条件下测试

4.9 Over Temperature Protection(过温保护)

When the Q1 body temperature over 110-125 度, the power supply will protection Latch off.
（当 Q1 超过约 110-125 度时，电源保护锁定)

4.10 Efficiency(效率)

85% min. It will be measured at the maximum load and typical line (230Vac).
效率在最大负载和典型输入电压下测量（230Vac），效率≥85%。

4.11 Green mode function(环保模式)

Green mode function: input power should be under 0.15W（22V/0mA）at 230Vac.
环保模式：在230V交流输入下，输入功率不超过0.15W（22V/0mA）。

4.12 Turn on delay time(开机延迟时间)

The turn on delay form application of AC input power to the establishment of rated DC power voltage should not exceed 3 seconds during the range from 100 Vac to 240 Vac with rate load.
开机延迟时间是指，在 100~240V 范围交流输入与标称负载情况下，从有交流输入到有额定直流电压输出的时间间隔，并且此时间间隔不能超过 3 秒。

4.13 Hold-up time(关机保持时间)

The power supply shall maintain voltage regulation within the specified limits in table 5 for at least 5 milliseconds (one cycle drop) after losing of input voltage under the following conditions:

关机时间是指，在如下的条件下关断输入电压，电源输出电压在满足表格 7 所示的规格的情况下持续的时间，且这段时间最少保持 5 毫秒。

Input voltage（输入电压）: 100-240Vac

Loading（负载）: Rate load（标称输出负载）

4.14 Output voltage rise time(输出爬升时间)

Output Voltage 输出电压	Rise time(mS)
22V	≤100

The output voltage rise time from 10% to 90% of normal regulation.

输出爬升时间为正常负载时输出电压从 10%上升到 90%的时间。

4.15 Mean time between failures (MTBF) (平均无故障时间)

50,000hrs at 25 degrees centigrade when calculated using MIL-HDBK-217F. The vendor can use agreed upon F.I.T. (failure - in - time) number in place of MTBF.

在 25 摄氏度条件下，使用 MIL-HDBK-217F 估计电源的平均无故障时间大约为 50,000 小时。也可以使用商用 F.I.T.来计算平均无故障时间。

4.16 Hi-pot Test(耐压测试)

100% Hi-pot tested, Primary to second: 3KVAC or 4242VDC 1 minute, the leakage current must be under 10mA, The production execution condition is 3600Vac 3 seconds, the leakage current must be under 5mA

初级到次级，100%耐高压测试，条件是 3000V 交流或 4242V 直流输入，持续时间 1 分钟，泄漏电流必须小于 10mA，生产执行条件为 3600V 交流，持续时间 3 秒，泄漏电流必须小于 5mA

4.17 Insulation Resistance Test (绝缘电阻测试)

100% Insulation Resistance Test, Primary to second or Primary to GND: with 500VDC voltage 3 seconds, the insulation resistance must be over 100Mohm.

初级对次级或初级对地，100%耐高压测试，条件是 500V 直流输入，持续时间 3 秒，绝缘电阻必须大于 100Mohm

5. Environmental requirement（工作环境）

5.1 Temperature（环境温度）

Operating	:	0℃to +40℃ (non-condensing)
Store	:	-20℃ to +70℃

5.2 Humidity（环境湿度）

Operating	:	10% to 90% (non-condensing)
Store	:	5% to 95%

5.3 Altitude（海拔高度）

Operating	:	5000M.(max)
Store	:	5000M.(max)

6. International Standards(国际性认证)

6.1 EMC (电磁兼容性)

6.1.1 EMI standards (EMI 标准)

The power supply shall compliance with the following radio disturbance Criterion

该电源应符合下列无线电干扰标准。

☐ Sound and television broadcast receivers and associated equipment

声音和电视广播接收机及有关设备

EN55013	:	Sound and television broadcast receivers and associated equipment radio disturbance characteristics limits and methods of measurement
GB13837	:	声音和电视广播接收机及有关设备无线电干扰特性限值和测试方法
FCC CFR 47 Part 15 subpart B:美国联邦通信法规第47卷15章内无意式的辐射器材的相关规定		

6.1.2 EMS standards (EMS 标准)

The power supply shall compliance with the following immunity Criterion

该电源应符合下列抗扰度标准

☐ Sound and television broadcast receivers and associated equipment

声音和电视广播接收机及有关设备

EN55020	:	Sound and television broadcast receivers and associated equipment immunity characteristics limits and methods of measurement

GB/T 9383	:	声音和电视广播接收机及有关设备抗扰度限值和测试方法	
EN61000-4-2	:	Electrostatic discharge immunity test	CON:±8KV; AIR:±15KV; 10 charge/point for Con; 10 charge/point for Air
GB/T17626.2	:	静电放电抗扰度试验	
EN61000-4-3	:	Radiated, radio-frequency, electromagnetic field immunity test	900 MHz, 3 V/m, duty cycle 1/8, 217 Hz repetition frequency
GB/T17626.3	:	射频电磁场抗扰度试验	
EN61000-4-4	:	Electrical fast transient/burst immunity test	AC port:±1KV
GB/T17626.4	:	电快速脉冲群抗扰度试验	
EN61000-4-5		Surge immunity test	AC port: 差模±1KV 共模±2KV
GB/T17626.5		浪涌（冲击）抗扰度试验	

6.2 Safety (安全)

The power supply shall compliance with the following safety Criterion

电源应符合以下安全标准

☐ Sound and television broadcast receivers and associated equipment

声音和电视广播接收机及有关设备

EN60065	:	Audio，video and similar electronic apparatus – Safety requirements
IEC60065	:	Audio，video and similar electronic apparatus – Safety requirements
GB 8898	:	音频、视频及类似电子设备安全要求
UL60065	:	UL Standard for Safety for Audio, Video and Similar Electronic Apparatus – Safety Requirements

7. Notice（注意事项）

7. 1 For safety issue, please keep 4.0mm at least from the metal parts of the system. Or put a high-voltage insulator between the power and the metal parts to avoid the situation of Hi-POT failure or arcing---etc.

出于安全问题的考虑,请在组装时确保板和系统金属材料间保持至少 4mm 以上的距离,或者使用具有足够绝缘等级的绝缘材料加以隔离,以避免产生高压放电

7.2 Don’t twist, deform, drop or knock the power supply during assembly

组装时,请确保无扭曲,弯折, 掉落及碰撞等现象的发生

7.3 The power supply is usually designed without the case. Please take care about ESD at anytime

因为本产品为无外壳之设计, 故在任何时候均应注意静电防护

7.4 When assembling, in order to avoid interference, please separate AC cable, DC output cable from each other, and keep some distance.

组装时，为避免干扰，请把 AC 输入线、DC 输出线二线分开并保持一定的距离排放。

8. Function Layout（产品外观图）

Considering the stability of material supply and the competitiveness of cost , we'll use 2-4 brands for each component of this model.this picture is for you reference only. If you have any requests, please contact with us.

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