1、 Electrical Specification/电气特性

1.1、SCOPE/概述

The document details the electrical, mechanical and environmental specifications of a SMPS, the power supply provides 24 W continuous output power.

资料详细描述了一款 24W(连续输出功率)开关电源的电气性,结构性及环境等要求.

The power supply shall meet the **RoHS** requirements.

此款电源符合 RoHS 要求.

Description/描述：

- ■ SMPS Adaptor(Wall mount)/插墙式适配器
- □ SMPS Adaptor(Desk-top)/桌面型适配器
- □ Open Frame/开放式结构
- □ SMPS Unit (With Case)/带铁壳型
- □ Others/其他

1.2、Input Characteristics/输入特性

1.2.1 Input Voltage & Frequency/输入电压与频率

The range of input voltage is from 90Vac to 264Vac with a single phase.

输入电压范围：从 90Vac 到 264Vac，单相输入.

	Minimum/最小	Rating/额定值	Maximum/最大
Input Voltage/输入电压	90Vac	100Vac~240Vac	264Vac
Input Frequency/输入频率	47Hz	60Hz/50Hz	63Hz

1.2.2 Input AC Current/输入交流电流

0.7Amax. @ 90Vac input & Full load/在 90Vac 输入和满载条件下最大 0.7A

1.2.3 Inrush Current (cold start)/浪涌电流(冷启动)

@ 230Vac/50Hz&264Vac/50Hz input，full load and cold start ,it do not cause device damage

在 230Vac/50Hz&264Vac/50Hz 输入条件下满载冷启动，不能造成任何器件损坏。

1.2.4 Average Efficiency /平均效率

While input 115Vac and 230Vac, the average efficiency is more than 84.70%.The test point is at 25%,50%,75% and 100% of max load respectively.(warm up after 30 minutes)

在输入 115Vac 和 230Vac 条件下，平均效率不小于 84.70%。测试点分别是最大载的 25%,50%,75%和 100%。（热机半小时后测试）

1.2.5 No-Load Input Power Dissipation/输入空载功率损耗

While input 115Vac or 230Vac and the output is no load, the input power loss must be less than 75mW. 在输入 115Vac/230Vac，空载功耗小于 75mW.

1.3、Output Characteristics/输出特性

1.3.1 Static Output Characteristics <Vo & R+N>/静态输出特性<输出&纹波+噪音>

Output	Rated Load/额定负载		Peak	Output Range	R+N	Remark
Rating	Min. Load	Max. Load	Peak Load	输出电压范围	纹波与噪声	备 注
+12.0V	0A		/	11.4V ~ 12.6V	150mVp-p	

+12.0V		2.0A	/	11.0V ~ 12.6V	150mVp-p	

Ripple & Noise: Tested by a oscilloscope using 20MHz bandwidth and the output is paralleled a 0.1uF ceramic capacitor and a 10uF electrolysis capacitor. (Under the input Voltage 100~240Vac)，-30℃ start.

纹波与噪声: 量测时示波器选用 20MHz 带宽限制,输出端要并联一颗 0.1uF 的陶瓷电容和一颗 10uF 的电解电容(输入电压 100~240Vac), -30℃启机。

1.3.2 Line/ Load Regulation/线性/负载调整率

Output	Load Condition/负载条件		Line Regulation	Load Regulation	Remark
Rating	Min. Load	Max. Load	线性调整率	负载调整率	备注
+12.0V	0A	2.0A	±2%	±5%	满载电压范围 11.0V ~ 12.6V

1.3.2 Turn - on Delay Time/开机延迟时间

3S max. @110Vac/60Hz input & Full load& the output capacitive load is the largest /在 110Vac/60Hz 输入和满载并且输出端容性负载为最大时，开机延时最大 3S

1.3.4 Hold-up Time/关机维持时间

5mS min. @ Full load &110Vac/60Hz input turn off./在 110Vac/60Hz 输入,满载情况下关机，最小 5mS。

1.3.5 Rise Time/上升时间

20mS max. @ Full load/在满载条件下最大 20mS

1.3.6 Output Overshoot / Undershoot/输出过冲/欠冲

10% max. When the power on or off/当电源开或者关时，输出过冲或者欠冲最大为 10%

1.3.7 Capacitance Load/容性负载

While input 90V/264Vac & full load, and the output is paralleled a 1000uF electrolysis capacitor, the output voltage shall be single assurgent

在输入 90Vac/264Vac、满载并在输出端并联一个 1000uF 的电解电容负载条件下，适配器的输出为单调上升。

1.3.8 Output Load Transient Response/输出负载瞬态响应

Output voltage is within 10.8-13.2V while the load step is from 20% to 80% of max load, R/S: 0.5A/uS, frequency: 100Hz and 8mS duration at 80% of max load.

输出电压在 10.8-13.2V 之间,负载变化: 从最大载的 20%到 80%,斜率: 0.5A/uS,频率: 100Hz, 80%负载持续时间为 8mS.

1.4、Protection Requirements/保护要求

1.4.1 Over Current Protection/过流保护

OCP Point Limited: 2.5A~3.5A /保护点限制:2.5A~3.5A

The output shall hiccup when the over current applied to the output, and shall be Self-recovery when the fault condition is removed

当过电流时,输出将进入打嗝模式,当过流情况解除后,产品将会自动恢复正常

1.4.2 Short Circuit Protection/短路保护

The input power shall decrease when the output is short to GND; the power supply shall not damage, and shall be self-recovery when the fault condition is removed

当输出对地短路时,产品输入功率降低且不会损伤,当短路情况解除后,产品将会自动恢复正常

1.4.3 Over Voltage Protection/过压保护

OVP Point limited: 16V of Max. /保护点限制：最大 16V

The power supply shall be protected when the output is over voltage, and the power supply shall not be damaged

当输出过压时,产品保护且不会损伤

2、Environment Requirements/环境要求

2.1、 Operating Temperature and Relative Humidity/操作温度和湿度要求

0℃ to +40℃ 5%RH to95%RH

2.2、 Storage Temperature and Relative Humidity/存储温度和湿度要求

-40℃ to +70℃

5%RH to 95%RH （non-condensing）

Sea level shall below or no more than5000m

在海拔低于 5,000 米的条件下，低温存储下限为-40℃（无结冰环境）；高温存储上限为 +70℃,相对湿度为 5%RH to 95%RH。

3、Reliability Requirements/可靠性要求

3.1、Vibration/振动

5 to 500Hz sweep at a shift gears for 20 minute for each of the perpendicular axes X, Y, Z there into : acceleration frequency for 10 m2/s3 at 5~10HZ; acceleration frequency for 3 m2/s3 at 10~200HZ; acceleration frequency for 1 m2/s3 at 200~500HZ

扫描频率: 5 to 500Hz 随机振动, X, Y, Z 三垂直坐标轴向各振动 20 分钟,其中: 5~10HZ 频率范围的加速度频率为 10 m2/s3 ，10~200HZ 频率范围的加速度频率为 3 m2/s3，200~500HZ 频率范围的加速度频率为 1 m2/s3

3.2、 Drop in/跌落

1 Corner, 3 Edges, 6 Surfaces each once, Height: 100cm, on the cement plane

1 角, 3 棱, 6 面各一次, 跌落高度: 100 厘米, 跌落到水泥地板上

3.3、MTBF Qualification/平均间隔故障时间估算

The MTBF shall be at least 50,000hours at 25℃, 100% load and normal input condition

平均间隔故障时间: 至少 50,000 小时,25℃环境及额定输入与 100%负载条件下

3.4、The lifetime electrolyte capacitor/电解电容寿命

The lifetime of electrolyte capacitor shall be at least26,280hours at25℃, 100% load and input voltage condition 110Vac and 230Vac

电解电容寿命至少 26,280 小时,25℃环境及 100%负载条件下，输入电压条件 110Vac 和 230Vac

4、EMI/EMS Standards/EMI/EMS 标准

4.1、 EMI Standards/EMI 标准

EN 55032: 2015 EN 61000-3-2:2014 EN 61000-3-3:2013 满足最新标准

4.2、 EMS Standards/EMS 标准

EN 61000-3-2	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & flicker
EN 61000-4-2	Electrostatic Discharge(ESD) Level3: 8kV air discharge, 6kV contact discharge
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS
EN 61000-4-4	Electrical Fast Transient/Burst-EFT Level3
EN 61000-4-5	Surge Immunity Test: Differential mode ±2kV, Common mode ±4kV
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
EN 61000-4-8	Power Frequency Magnetic Field Test
EN 61000-4-11	Voltage Dips

5、Safety Standards/安规标准

5.1、 Dielectric Strength(Hi-pot)/介电耐压强度(高压)

Primary to Secondary: 3000Vac / 3.5mA / 60 seconds

Or 4242Vdc / 3.5mA / 60 seconds

初级对次级: 3000Vac / 3.5mA / 60 秒

或 4242Vdc / 3.5mA / 60 秒

5.2、 Leakage Current/漏电流

0.25mAmax. at 264Vac / 50Hz input/在输入 264Vac/50Hz 的条件下最大 0.25mA

5.3、 Insulation Resistance/绝缘阻抗

100MΩ min. @ primary to secondary add a 500Vdc test voltage

在初级与次级间加 500Vdc 进行测试,最小 100MΩ

5.4、 Regulatory Standards/安规标准

Type	Country	Standard	Type	Country	Standard
☐ UL/CUL	USA	UL60950-1	☐PSB/CB	Singapore	IEC60950-1
☐ TUV_GS	Europe	EN60950-1	☐ BIS	India	IS13252
■ CCC	China	GB4943	☐ LVD	Europe	EN60950-1
☐ CE	Europe	EN60950-1	☐ BSMI	Taiwan	IEC60950-1
☐ RCM	Australia	AS/NAS/4417 /AS/NZS CISPR22	☐ KC	KOREA	K60950-1

6、Mach. Outline Drawing/外观图