

1. Scope of Application 适用范围

Power supplies for Information Technology Equipment including electrical business equipment, networking equipment, safety security camera, monitoring and other fields. Operating conditions of this power supply are as follows:

信息技术设备的电源， 包括电子商务设备， 网络设备， 安全监控摄像头， 监视和其他领域。

2. Electrical Specifications 电气规格

2.1 Input Characteristics

Item	Parameter	Technical Requirement	Unit	Remark
2.1.1	Normal input voltage 输入电压	100~240	Vac	
	DC Input	190~290Vdc	Vdc	
2.1.2	Input Voltage range 输入电压范围	90~264	Vac	
2.1.3	Input Frequency 输入频率	45 ~ 65	Hz	50/60Hz
2.1.4	Inrush current 启动冲击电流	≤ 60	A	Vin=220Vac,满载, 冷启动, 25℃
2.1.5	Input Current 输入电流	≤ 0.6	A	Vin100Vac Full load 满载
2.1.6	Efficiency 效率	$\geq 80\%$		115VAC 输入, 满载
		$\geq 81\%$		230VAC 输入, 满载

2.2 Output Characteristics 输出特性

Item	Parameter		Technical Requirement			Unit	Remark
2.2.1	Rated Output Voltage 额定输出电压		12.0			Vdc	
2.2.2	Output Voltage Range 输出电压范围		11.64~12.36			Vdc	
2.2.3	Output rated current 输出额定电流		2.2			A	
2.2.4	Load regulation 负载调整率		≤±3%			/	
2.2.5	Line regulation rate 电压调整率		≤±2%			/	
2.2.6	Capacitive load 容性负载		2200			uF	全电压，全负载范围内
2.2.7	Turn on delay time 开启延迟时间		≤3.0			S	100-240Vac full load
2.2.8	Rise time 上升时间		≤ 20			ms	100-240Vac full load
2.2.9	Output maintenance time 输出维持时间		≥20			ms	220Vac full load
2.2.10	Output Ripple &Noise 输出纹波和噪声		≤ 120mV			Vp-p	带宽 20MHz 负载端并 104 陶瓷电容和 10 μ F 电解电容， 25℃
			≤ 120mV				
2.2.11	Temperature coefficient 温度系数		≤ ±0.02%			V	
2.2.12	Turn-On/Off overshoot 开启/关闭/过冲		≤ ±5%			/	
2.2.13	Dynamic Response 动态响应	过冲幅度	≤ ±5%	≤ ±5%	μS	25%-50%-25%或者 50%-75%-50% 25%-75%-25%或者 50%-100%-50% 电流变化率为0.25A/us周期4ms	
		恢复时间	200				

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2.3 Protections 保护

Item	Parameter	Technical Requirement	Unit	Remark
2.3.1	Output over current protection 输出过电流保护	2.6~4.4	A	打嗝重启，去除故障可自动恢复
2.3.2	Output over voltage protection 输出过压保护	13.6~16.8	V	(输出最小载 0.1A 条件下测试) 打嗝重启，去除故障可自动恢复
2.3.3	Output Short Circuit Protection 输出短路保护	The PSU automatically recovery after short circuit is moving 故障移除，产品自动恢复		
2.3.4	Input under-pressure protection 输入欠压保护	$\leq 65\text{Vac}$	V	
	Input overpressure protection 输入过压保护	$\geq 285\text{Vac}$	V	

3. EMC Requirements EMC 要求

3.1 EMI Requirements 电磁干扰要求

Item	Regulations	Class level	Note
Conduction 传导	EN55032	CLASS A(6dB余量)	电源+系统测试
Radiation 辐射	EN55032	CLASS A(6dB余量)	

3.2 EMS Requirements EMS 要求

Item	Regulations	Spec	Criterion level
ESD 静电	IEC-61000-4-2	接触放电 6KV ; 空气放电 8KV	B
Surge 雷击	IEC-61000-4-5	DM $\pm 6\text{KV}$, CM $\pm 6\text{KV}$	判据B不掉电
EFT 快速脉冲群	IEC61000-4-4	Level 3 , $\pm 2\text{KV}$	B

4.Safety Requirements 安全要求

Item	Parameter		Technical Requirement	Remark
4.1	Electric Strength Test 电气强度测试	L,N to DC output	3000Vac/10mA/1min	The PSU no flash over and insulation break down occurs during electric strength test.
		L,N to Earth	1500Vac/10mA/1min	
		DC output to Earth	/	
4.2	Insulation Resistance 绝缘电阻	L,N to DC Output	$\geq 100M\Omega @ 500Vdc$	Typical value (normal temperature and humidity)
		L,N to Earth	$\geq 100M\Omega @ 500Vdc$	
		DC Output to Earth	$\geq 100M\Omega @ 500Vdc$	
4.3	Leakage current 漏电流	$\leq 0.25mA @ 264Vac/60HZ$		Input to Output
		$\leq 3.5mA @ 264Vac/60HZ$		Input to Earth
4.4	Safety 安全	Meet IEC62368-1(2014/2018) and GB4943.1-2022		

5.Environmental Requirements 环境要求

Item	Parameter	Technical Requirement	Unit	Remark
5.1	Operating temperature 工作温度	-10°C ~ +55 °C	°C	Typ :35°C
5.2	Storage Temperature 存储温度	-40°C- +70°C	°C	Typ :25°C
5.3	Operating Humidity 操作湿度	5%-95%	RH	Non-condensing (非冷凝)
5.4	Storage Humidity 存储湿度	5%-95%	RH	Non-condensing (非冷凝)
5.5	Altitude 海拔高度	≤ 5000	M	0-3KM 海拔, 电源长期工作温度是 55 度, 海拔超过 3000m 时, 每升高 200m 电源工作环境温度降低 1°C
5.6	Vibration Test 振动测试	5Grms,10Hz to 500Hz,10 minutes/cycle,60 minutes along X,Y,Z axis		
5.7	MTBF 平均无故障时间	250,000	hours	MIL-HDBK-217F (25°C)
5.8	散热方式	自然冷却		
5.9	E- Cap Lifetime 电解电容寿命	10 Years Min 不小于 10 年	/	110Vac & Full load & 35°C