

1.Power Supply Overview

1.1 Input Characteristics				
No.	Item	Technical Requirement	Unit	Remark
1.1.1	Rated Input Voltage	100-240	Vac	
1.1.2	Input Voltage Range	90~264	Vac	
1.1.3	Frequency	47~63	Hz	Typical 50/60Hz
1.1.4	Inrush Current	≤ 80	A	Vin=115Vac,cold start
		≤ 100		Vin=230Vac,cold start
1.1.5	Maximum Input Current	≤2	A	Vin=115Vac
1.1.6	Efficiency	≥90	%	115VAC input, Rated load
		≥91		230VAC input, Rated load
1.1.7	PF Factor	110Vac≥0.95		Rated Input , Rated load
		230Vac≥0.92		

1.2 Output Electrical Characteristics

No.	Item		Technical Requirement	Unit	Remark
1.2.1	Rated Output Voltage		12V	VDC	
1.2.2	Output Voltage Range		11.4~12.6	VDC	
1.2.3	Rated Output Current		8.33	A	Rated load,100W
1.2.4	Minimum Output Current		0.1	A	
1.2.5	Load Regulation		±3	%	Rated output voltage ±3% @115VAC & 220VAC, (min./rated/max. load)
1.2.6	Line Regulation		±3	%	Rated output voltage ±3% @90VAC~264VAC, maximum load
1.2.7	Capacitive Load		2200	μF	
1.2.8	Turn-on Delay Time		≤3	S	Rated Input , Rated load
1.2.9	Rise Time		≤ 100	mS	Rated Input , Rated load
1.2.10	Hold -up Time		≥ 20	mS	Rated Input , Rated load
1.2.11	Output Ripple and Noise		≤120mV	mVp-p	Apply 104 ceramic cap and 10uF E-Cap in parallel with output terminal for ripple and noise measurements, and set the oscilloscope bandwidth of 20MHz.
1.2.12	Temperature Coefficient		±0.02%	V	
1.2.13	Turn-On/Off Overshoot		±10	%	
1.2.14	Dynamic Response	Overshoot Amplitude	±10	%	Load variation from 0%—50%—0%; 50%—100%—50% 0.1A-70%-0.1A 10%-90%-10% T1=T2=5mS,90Vac/60Hz,115 Vac/60Hz, 230Vac/60Hz,264Vac/60Hz. input.have and edge rate of 1.6A/μs
		Recover Time	△ t ≤ 200	μS	

1.3 Output Electrical Characteristics				
No.	Item	Technical Requirement	Unit	Remark
1.3.1	Output current-limiting	14.5-18.3	A	Hiccup restart, automatic recovery with fault removal.
1.3.2	Output over voltage	≤ 16	V	Latch off (test under minimum output load 0.1A)
1.3.3	Output ripple and low limit:	The PSU output ripple should meet 120mV and cannot below 11.4V and shut down when the 12.5A/10s peak load occur.		
1.34	Duration time:	PSU shall be operating properly and no OTP occur with repeated peak load and the time interval which is shown below at 90~264 Vac input and 60°C ambient		
1.3.5	Over Temperature	Have		The power supply shall be protected against over temperature conditions caused by excessive ambient temperature or over current which could cause internal part failures. In an over temperature condition the PSU shall shutdown. When the temperature drops to within safe operating limits for internal parts, the power supply shall restore power automatically. PSU shall not trigger OTP at 120% load, 90Vac with 60°C ambient.
1.3.6	Output Short circuit	Have		Automatic recovery of the module after short circuit troubleshooting

Note:

- Measurements shall be made with an oscilloscope with 20Mhzbandwidth.
- Output shall be bypassed at the connector with a 0.1 μ F ceramic capacitor and a 10uF electrolytic simulate system loading.

3: This test data only in electronic load or resistive and capacitive load test subject.

2.Isolation and Safety Regulation

No.	Item		Technical Requirement	Remark
2.1	Dielectric Strength	Input and output	4242VDc/10mA/1min	no flash-over or breakdown
		Input and ground	2121VDc/10mA/1min	
		Output and ground	750Vdc/5mA/1min	
2.2	Insulation Resistance	Input and output	$\geq 10M\Omega @ 500Vdc$	Normal temperature and humidity
		Input and ground	$\geq 10M\Omega @ 500Vdc$	
		Output and ground	$\geq 10M\Omega @ 500Vdc$	
2.3	Safety standards		Europe EN62368-1:2014/A11:2017 China GB4943.1-2011 North American CSA/UL62368-1:2014 Mexico NOM-001-SCFI-1993 International IEC62368-1	
2.4	Leakage Test	L	3.5mA	standard
		N	3.5mA	standard

3.EMC

Country	Standard	Environmental Phenomenon	Test Specification	Performance criterion
Europe	EN 55032:2015	Radiated Emission	30 MHz-1 GHz	Class B (Under 4 dB) with chassis
		Conducted Emission	150 kHz - 30 MHz	Class B (Under 4 dB) with chassis
	EN 55024:+A1:2015	Electrostatic discharge (IEC 61000-4-2)	8 KV(Contact discharge) 15 KV (Air discharge)	A
		Radio-frequency electromagnetic field Amplitude modulated (IEC 61000-4-3)	80-1000 MHz 3 V/m (unmodulated, r.m.s) 80 % AM (1 kHz)	A
		Electrical fast transients (IEC 61000-4-4)	1KV (peak) 5/50 Tr/Th ns 5 Repetition frequency kHz	A
		Surges (IEC 61000-4-5)	1.2/50 (8/20) Tr/Th μ s 2 (line to line)KV (peak) 4 (line to earth or ground) KV (peak)	A
		Radio-frequency continuous conducted (IEC 61000-4-6)	0.15-80 MHz 3 V (unmodulated, r.m.s) 80 % AM (1 kHz)	A
		Power-frequency magnetic field (IEC 61000-4-8)	50 or 60 Hz 1 A/m (r.m.s.)	A
		Voltage dips (IEC 61000-4-11)	>95 % reduction 0.5 period	A
			30 % reduction 25 periods	C
		Voltage interruptions (IEC 61000-4-11)	>95 % reduction 250 periods	C
	EN 61000-3-2:2014	harmonic currents emissions	Input current up to and 16A per phase)	Class A
	EN 61000-3-3:2013	voltage changes,voltage fluctuations and flicker	Equipment with rated current $\leq$ 16 A per phase	See standard
North American	FCC Part 15 Subpart B	Radiated Emission	30 MHz-1 GHz	class B (Under 4 dB) with chassis
		Conducted Emission	150 kHz - 30 MHz	class B (Under 4 dB) with chassis

Australia	AS/NZS CISPR 32:2015 AS/NZS CISPR 24 Amd 1:2017 AS/NZS 61000.3.2-2013 AS/NZS 61000.3.3-2012	Same as EU	Same as EU	Same as EU
China	GB 9254-2008 GB 17618-2015 GB 17625.1-2012 GB 17625.2-2007	Same as EU	Same as EU	Same as EU
Argentina	N/A	N/A	N/A	N/A
Mexico	N/A	N/A	N/A	N/A
Brazil	N/A	N/A	N/A	N/A

***Remark: Formulation of Test Criterion**

Performance Criterion:

Criterion A: Normal performance in the range of technical requirement;

Criterion B (DIP Test Criterion): In the test, power matching system is allowed to lower the performance. After interference cancellation, the device can be restored to normal, any kind of reset and manual intervention are not allowed.

Criterion B (other test criteria besides DIP Test Criterion): The PSU should pass the retest by matching the device. During the testing process, the output voltage of the power supply should be kept in the normal range; the power-off reset is not allowed, and some functions of the whole system can be temporarily degraded or lost, and self-recovery can be achieved.

Criterion C: Automatic reset with short-time functional interruption can be allowed long-term functional interruption is not allowed or manual reset will be required;

Criterion D: Damage to any device other than the protective device is not allowed, and after replacing the damaged protective device, the performance of the specimen can be restored.

4.Environmental and Reliability Requirement

No	Item	Technical Requirement	Unit	Remark
4.1	Operating temperature	-10~ +60	℃	Typical value 25℃
4.2	Storage temperature	-40 ~ +85	℃	Typical value 25℃
4.3	Operating humidity	5~ 90 (Frost - free)	%	
4.4	Storage humidity	5 ~ 95 (Frost - free)	%	
4.5	Altitude	≤5000	M	Normal operating
4.6	Cooling method	Fanless		
4.7	High temperature operating	+60℃ 8hrs		air output requirement>27CF W
4.8	Normal temperature operating	+25℃ 8hrs		standard
4.9	Low temperature operating	-10℃ 8hrs		standard
4.10	High temperature storage	+85℃ 24hrs		standard
4.11	Low temperature storage	-40℃ 24hrs		standard
4.12	Temperature cycling test	-10 ~+60	℃	standard
4.13	MTBF	200000	Hrs	Typical Value 25℃ @115/230Vac; full load
4.14	Operating life	≥3	Yrs	Typical Value 60 °C @115Vac; full load; PSU construction
4.15	E-Cap Life Time:	≥3	Yrs	The E-Cap life time must greater than 3 years at full load with115Vac and 60℃ ambient.
4.16	Vibration Test	10-55Hz, 49.0m/s2 (5G), 3 minutes period, 60minutes each along X, Y and Z axis.		standard
4.17	Impact Test	196.1m/s2 (20G), 11MS, once each X, Y and Z axis.		standard

5.Other Requirements

No	Item	Technical Requirement	Unit	Remark
5.1	Shape Dimension	(100)*(85)*38.6	mm	(L *W * H)
5.2	Weight	TDB		
5.3	Installation Dimension	See attached photograph 1		
5.4	Output Connector Dimension	See attached sheet1		
5.5	Special process treatment	Put insulator under PCB and bottom		
5.6	Packing	With antistatic bubble		
5.7	Audible noise	≤10	dB	<10db when Fanless condition(base on system),background noise <29dba
5.8	Pollution degree	According toGB4943-2022, 2.10.1.2 require meet pollution Degree II		

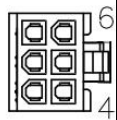
6.Drawing and Dimension

The external dimensions of the Open Frame is(100)*(85)*38.5mm

TBD

Connector and wire function:

Output terminal CN2 :

PIN NO.	Define	
1,2,3	GND	
4,5,6	+12V	