E-Star Power Development Co., Ltd. (E-STAR)
1F., No.40, Juren Ln., Sec. 2, Sanmin Rd., Banciao Dist., New Taipei City 22069, Taiwan (R.O.C.)
Phone : 886-2-2957 5580 Fax : 886-2-2957 7473

SUBJECT: SCOPE OF DOCUMENT

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120W Open Frame type Single output power supply < EP11212400

The purpose of the document is to specify a Single phase AC input, single output switching power supply. This product is AC to DC switching power transfer device, it can provide for a 24V/8.33A & 200Wmax DC output with constant voltage source. This Specification defines the input, output, performance characteristics, environment, noise and safety requirement for a power supply.

2-0. Input Requirements

2-1. Input Voltage

Rated Voltage 100-240 Vac +/- 10% full range.

Normal line input 115Vac/60Hz,220Vac/50Hz.

2-2. Input Frequency

47~63 Hz

2-3. Input Current

a. 3.0A (Max.) @ 115Vac input with full load.

b. 1.5A(Max.) @ 230Vac input with full load.

2-4. Energy saving standards:

2-4-0.Efficiency

Meet CEC level V

The average efficiency >= 87% at normal input & 25% , 50% , 75% , 100% of max output load.

2-5. Configuration

3-wire AC input (Line ,Neutral, FG)

2-6. Input Fuse

The hot line side of the input shall have a fuse, rating (T4A/250V)

2-7. Inrush Current

≦ 60A at 110 Vac

≦ 120A at 220 Vac At cold start, maximum load.

2-8. Line Regulation

This line regulation is less than ± 1%, of rated output voltage @ full load .

2-9. Hold Up Time

≧ 10 mSec., @ Normal line, with full load.

2-10. Rise Time

≦50 mSec., @ 100-240V AC input, with full load.

From 10% to 90% of output voltage.

2-11. No load Power Consumption :

Less than 0.5Watt. at 230Vac/50Hz.

2-12. Turn-ON Time

The output voltage should rise to 90% of rated output voltage in less than 3Sec. from AC apply to 110Vac start up.

2-13. Harmonic Standard and Power Factor

The adapter complied with IEC 61000-3-2 class D harmonic standard while input power over than 75W. The P.F. shall >0.95 @100Vac input and >0.9 @240Vac input whith full load condition.

3-0. Output Requirements

3-1. Output Voltage and Current

Output Voltage (Vdc)	Current Min.(A)	Current Max.(A)
+24V	0	8.33A

3-2. Load Regulation

Voltage (Vdc)	Tolerance (%)
+24V	+5/, -5

3-3. Dynamic Load Regulation

±5% excursion for 50% - 100% or 100% - 50% load change of DC output at any frequency up to 1KHz(duty 50%)

3-4. Ripple & Noise

The power supply shall not exceed the following limits on the indicated voltage for 60Hz or 50Hz ripple, Switching frequency ripple and noise and dynamic load variations measured with a 20MHz

bandwidth

Output	Ripple/Noise
+24V	2.0% max. of rated output voltage

Input condition : for rated voltage , Output condition : for max load
Ripple / Noise: 60Hz ripple + switching ripple and noise
Ripple & Noise are measured at the end of output cable which are added a 0.1uF ceramic capacitor and a 47uF electrolytic capacitor

3-5. Over Voltage Protection

150% Max. of rated voltage.
The output voltage shall be shutdown and latched when OVP occurred and wait ≧3Sec AC reset Power supply normal operating.

3-6. Over Current Protection

The power supply shall not be dammaged by a over current from the output to return line, protection to be invoked if current exceeds Max. rating by about 110% or more, if occur over current the condition will :

Output Voltage	Lower	Upper	State
+24.0Vdc	9.16A	12.45A	shutdown

It will enter into normal condition if the fault condition is removed and wait ≧3Sec AC reset.

3-7. Stability

2% Max. at constant load with constant input (after 30 minutes of operation).

3-8. Drop-out (Power Line Disturbance)

Output voltage shall remain within the specified regulation range, through the absence of a line input during 1/2 cycle, at full load and normal AC line input

3-9. Voltage Isolation

The DC ground will be isolated from the AC neutral and AC line.

4-0.Reliability

4-1. MTBF (MIL-HDBK-217F)

The power supply shall be designed and produced to have a mean time between failure (MTBF) of 100,000 hours at 25 degrees C

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5-0. Environment

5-1 Temperature

a. Operating : 0 to 50 ℃

b. Storage : -20 to 85 ℃

5-2 Humidity

a. Operating : 10 to 90 %

b. Storage: 5 to 90 %

5-3 Altitude

From sea level to 5,000Meter (operation) and 5,0000Meter (nonoperation)

6-0. Safety

6-1. Hi-Pot Test

4000 Vac 10mA 3Sec. between primary and secondary.

1800Vac 10mA 3Sec between Primary and F.G.

6-2. Insulation Test

500Vdc, 2 Sec. between primary and secondary circuit

IR should ≧ 50 MΩ .

6-3. Leakage Current

≦500 uA, at 240Vac/50 Hz

6-4. Safety

UL, CUL, TUV, CB, CE, FCC

6-5. EMS

Items	Specification	Reference
ESD	Contact: ± 6KV	IEC 61000-4-2
	Air: ± 8KV	

RS	Frequency: 1KHz Field Strength: 3V/M	IEC 61000-4-3
EFT	±2KV for power supply lines	IEC 61000-4-4
SURGE	Line to Line: ± 1KV (peak)	IEC 61000-4-5
	Line to F.G : ± 2KV (peak)	

6-6. EMI

Comply with Standards
CISPR22 : EN55022, Class B FCC Part 15, Class B

7-0. Mechanical Characteristics

7-1. Outline Dimension: 127mm (L) * 76.5mm (W) * 37.8mm (H)

7-2. Input Connector: JST/B5P-VH or Equ.
Output Connector: JST/B12P-VH or Equ.

7-3. Vibration Test

The vibration frequencies are set at 20Hz, with total amplitude of 1.5mm Along the 3 directions namely X-Y-Z. The each direction should be vibrated for 60 minutes, after testing no abnormal electrical or mechanical should occur.

7-4. Drop Test (Referencing to CSA C22.2 No.950/UL1950/UL1310/EN60950)

Products shall be dropped from a height of 900 mm onto a horizontal surface consists of hardwood at 13mm thick, mounted on two layers of plywood each 19mm to 20mm thick, all supported on a concrete or equivalent non-resilient floor. Upon conclusion of test, the equipment need not be operational.

7-5. Net Weight (Reference) : 450 g

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