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SPECIFICATION FOR REFERENCE

CUSTOMER: _____

CUSTOMER P.N.: _____

MODEL NO.: P30-H2400R150-036X0-DE

PRODUCT NO.: SCXXX-V0

SAMPLE DATE: 2023-11-27

CUSTOMER AUTHORIZED SIGNATURE		

Please return to us one copy of "SPECIFICATION FOR APPROVAL" with you approved signature.

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Prepared By :	Checked By :	Safetied By:	Approved By :

MOSO® 茂硕电源
股票代码：002660

茂硕电源科技股份有限公司
MOSO POWER SUPPLY TECHNOLOGY CO., LTD

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E. C. LIST

Rev.	Description of Change		Changed Date	ECN No.
	Before	After		
A.1	Original Release		2023-11-27	---

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1. SCOPE

The document detail the electrical, mechanical and environmental specifications of a Fast Charger, the Fast Charger provide 36 W continuous output power.

The Fast Charger shall meet the RoHS requirement.

1.1.Description

☐ SMPS Adaptor(Wall mount) ☐ SMPS Adaptor(Desk-top)
☐ Open Frame ☐ SMPS Unit (With Case)
■ PD ADAPTER (Wall mount) ☐ Others

2. Input Characteristics

2.1.Input Voltage & Frequency

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

	Minimum	Nominal	Maximum
Input Voltage	90Vac	100Vac~240Vac	264Vac
Input Frequency	47Hz	50Hz/60Hz	63Hz

2.2. Input AC Current

1.0Amax. @ 100-240Vac input & Full load

2.3.Inrush Current (cold start)

Peak inrush current shall be limited to 100A for a cold start at 240Vac at 25°C ambient and full load. There is no immediate damage or long-term impact on the reliability of the supply

2.4.Averaged Efficiency

5V3A: 81.39% min. @115V/230Vac input (@25%, 50%, 75% and 100% of max load)

9V3A:86.62% min. @115V/230Vac input (@25%, 50%, 75% and 100% of max load)

15V2.4A:87.4% min. @115V/230Vac input (@25%, 50%, 75% and 100% of max load)

2.5.Energy Consumption

Input Voltage115Vac 60Hz/230Vac 50Hz , Energy Consumption≤0.1W.

2.6.Protection

The supply shall be subjected to the following tests while under maximum rated load. No component damage is permitted.

- Brownout: 100 Vac 50 Hz to 0 Vac @ 50 Hz in 1 volt decrements in 30s.
- Brownout recovery: 0 vac 50 Hz to 100 Vac @ 50 Hz in 1 volt increments in 30s.

After completion of the test, power will be reapplied within the rated line voltage ranges and normal operation is expected.

3. Output Characteristics

3.1. Static Output Characteristics <Vo & R+N>

Output Rate	Rated Load		Output Range	R+N	Remark
	Min. Load	Max. Load			
5.00V	0.0A	3.0A	4.75-5.25V	120mVp-p	
9.00V	0.0A	3.0A	8.55-9.45V	120mVp-p	
15.00V	0.0A	2.4A	14.25-15.75V	120mVp-p	

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Ripple & Noise: Measurement is done by 20MHz bandwidth oscilloscope and the output paralleled a 0.1uF ceramic capacitor and a 10uF electrolysis capacitor. (test under the condition of rated input and rated output)

3.2.Line/ Load Regulation

Output Rate	Load Condition		Line Regulation	Load Regulation	Remark
	Min. Load	Max. Load			
5.00V	0.0A	3.0A	±3%	±5%	
9.00V	0.0A	3.0A	±3%	±5%	
15.00V	0.0A	2.4A	±3%	±5%	

3.3.Turn - on Delay Time

3S max. @ 100Vac to 240Vac input & Full load

3.4. Hold-up Time

10mS min. @ Full load &115Vac/60Hz input turn off at worst case

20mS min. @ Full load &230Vac/50Hz input turn off at worst case

3.5. Rise Time

30mS max. @ Rated load

3.6. Fall Time

30mS max. @ Full load

3.7. Output Overshoot / Undershoot

10% max. When the power on or off, when it is the full input voltage and full load

3.8.Dynamic load change response

The output voltage shall stay within +/-5% of the nominal output voltage 5V(4.75V-5.25V for 5V;8.55V-9.45V for 9V;14.25V-15.75V for 15V) while the output load is stepped from 10% to 100% of the rated load. The nominal voltage must be recover in 10ms after overshoot.

3.9. Dynamic Response

The power supply output voltage shall not undershoot or overshoot beyond the specified limits 5V(4.75V-5.25V);9V(8.55V-9.45V);15V(14.25V-15.75V) after applying load changes from 25% to 75% load and back to 25% load with a 40A/msec ramp rate on the output. The load change will be applied with a 50% duty cycle.

4. Protection Requirements

4.1. Over Current Protection

Output Rate	Rated Load		Over Current	Input Voltage	Remark
	Min. Load	Max. Load			
5.00V	0.0A	3.0A	3.3-3.9A	100-240VAC	
9.00V	0.0A	3.0A	3.3-3.9A	100-240VAC	
15.00V	0.0A	2.4A	2.64-3.12A	100-240VAC	

The output shall hiccup when the over currents applied to the output rail, and shall be self-recovery when the fault condition is removed

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4.2.Short Circuit Protection

The input power shall decrease when the output rail short, the power supply shall no damage, and shall be self-recovery when the fault condition is removed

4.3.Over Voltage Protection

Output Rate	Rated Load		Over Voltage	Input Voltage	Remark
	Min. Load	Max. Load			
5.00V	0.0A	3.0A	6.0-7.0V	100-240VAC	
9.00V	0.0A	3.0A	9.9-11.7V	100-240VAC	
15.00V	0.0A	2.4A	16.5-19.5V	100-240VAC	

5. Environment Requirements

5.1.Operating Temperature and Relative Humidity

-10℃ to +45℃

35%RH to 85%RH

5.2.Storage Temperature and Relative Humidity

-20℃ to +80℃

5%RH to 95%RH

5.3. Vibration

10 to 300Hz sweep at a constant acceleration of 1.0G(Breadth: 3.5mm) for 1Hour for each of the perpendicular axes X, Y, Z

5.4. Drop in

Height: 1m; the product should be fell off on the hardwood with the thickness of 20mm, and the hardwood should be put on the base of the cement or on the ground without flexibility. Apply one times on all surfaces, total 6 times. The electric performance and Hi-Pot test must be OK after the drop tests.

6. Reliability Requirements

6.1. Burn-in

The power supply shall be burn-in for 4 Hours under normal input and 100% rated load at 40℃±5℃

6.2. MTBF Qualification

The MTBF shall be at least 50,000hours at 25℃, Full load and nominal input condition

E-cap Lifetime

The life estimation of capacitor must be over 3 years at 25°, 80% load and 100-240Vac input.

*Standard:

$$\text{Life Time} = Lr * 2^{(To-Tx)/10} * 2^{(\triangle To-\triangle T)/5}$$

$$(\triangle To-\triangle T)/5 = 1-[Ia/(Is*Tf*Ff)]2$$

Note-3 CE Capacitor Life time ΔTo: Self Heat Coefficient (85 ℃ =10, 106℃ = 5)

Lr : Capacitor Life Spec Ia : Measured Ripple Current

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T ○: Capacitor Temp Spec　　Is : Ripple Current spec

Tx : Capacitor case Temp　　Ff : Frequency Factor

ΔT : Capacitor Self Heat　　Tf : Temperature Factor

7. EMI/EMS Standards

7.1.EMI Standards

EN55035, EN55032

7.2.EMS Standards

7-2-1 EN 61000-4-2,electrostatic discharge(ESD) requirement

Discharge characteristic	Test level	Test criteria
Air discharge	+/-8KV	A
Contact discharge	+/-4KV	A

7-2-2 EN 61000-4-3,radiated electromagnetic field susceptibility(rs)

Test level	Test criteria
3V/m (r.m.s)	A
80-1000MHz,80%AM(1KHz) sine-wave	

7-2-3 EN 61000-4-4,electric fast transients(burst) immunity requirement

Coupling	Test level	Test criteria
AC-input	0.5KV	A
AC-input	1KV	A

7-2-4 EN 61000-4-5,surge capability requirement

Surge voltage	Test criteria
Common mode +/-2KV	A
Differential mode +/-1KV	

7-2-5 EN 61000-4-6, Induced radio frequency fields conducted disturbances Immunity requirement

Test level	Test criteria
3V	A
0.15-80 MHz,80%AM(1KHz)	

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7-2-6 Assessment criteria

Acceptance criteria	Performance
A	Agreed operational behavior within the specified limits
B	Time limited functional diminishment or malfunction during the tests is permitted. The function is self-reactivated by the unit following completion of the tests.
C	Malfunction is permitted .The function can be reactivated either by reconnection to the mains or by operator intervention.

8. Safety Standards

8.1.Dielectric Strength(Hi-pot)

Primary to Secondary: 3000Vac / 10mAMax / 60 second

Primary to Secondary: 3300Vac / 5mAMax /3S

8.2.Leakage Current

0.25mAmax. at 264Vac / 60Hz

8.3. Insulation Resistance

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

8.4.Regulatory Standards

Type	Country	Standard	Statue	Mark
CE	Europe	EN62368-1	APPROVED	

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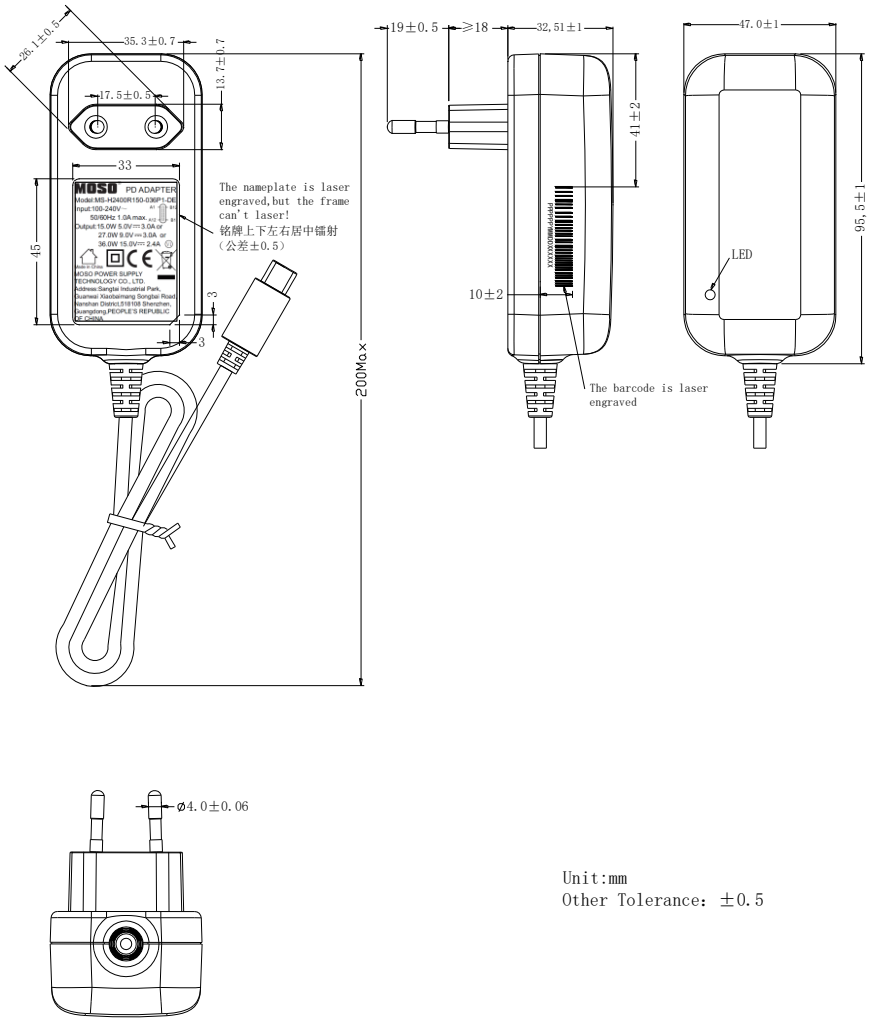
9. Mechanical Outline Drawing



Case material: ☑PC temperature resistance: 125℃
☐PC+ABS temperature resistance: 95℃

Remark: 1)Case cover & chassis material:
2)The White LED visible on the top of the case.