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SPECIFICATION FOR REFERENCE

CUSTOMER: _____

CUSTOMER P.N.: _____

MODEL NO.: MS-V3000R150-038B0-US

PRODUCT NO.: _____

SAMPLE DATE: 2022-07-12

CUSTOMER AUTHORIZED SIGNATURE		

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

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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		2022-07-12	---

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1. SCOPE

The document detail the electrical, mechanical and environmental specifications of a Fast Charger, the Fast Charger provide 45 W continuous output power.

The Fast Charger shall meet the RoHS requirement. without red/yellow phosphorus.

1.1.Description

☐ SMPS Adaptor(Wall mount)　☐ SMPS Adaptor(Desk-top)

☐ Open Frame　☐ SMPS Unit (With Case)

■ PD ADAPTER (Wall mount)　☐ Others

1.2..Supports fast charge protocol

PD3.1

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

1.3Amax. @ 100-240Vac input & Full load

2.3.Inrush Current (cold start)

Peak inrush current shall be limited to 100A for a cold start at 120Vac 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. @115Vac, 230Vac input (@25%, 50%, 75% and 100% of max load)
9V3A:86.62% min. @115Vac, 230Vac input (@25%, 50%, 75% and 100% of max load)
12V3A:87.40% min. @115Vac, 230Vac input (@25%, 50%, 75% and 100% of max load)
15V3A:87.73% min. @115Vac, 230Vac input (@25%, 50%, 75% and 100% of max load)

2.5.Energy Consumption

Input Voltage 115Vac/60Hz , 230Vac/50Hz Energy Consumption≤0.1W.

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	180mVp-p	
9.00V	0.0A	3.0A	8.55-9.45V	180mVp-p	
12.00V	0.0A	3.0A	11.40-12.60V	180mVp-p	
15.00V	0.0A	3.0A	14.25-15.75V	180mVp-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 47uF 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%	
12.00V	0.0A	3.0A	±3%	±5%	
15.00V	0.0A	3.0A	±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

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	5.0A Max	100-240VAC	
9.00V	0.0A	3.0A	5.0A Max	100-240VAC	
12.00V	0.0A	3.0A	5.0A Max	100-240VAC	
15.00V	0.0A	3.0A	5.0A Max	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.

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

The power supply has to be protected against over voltage conditions. No damage allowed.

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5. Environment Requirements

5.1.Operating Temperature and Relative Humidity

-5℃ to +40℃

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 50,000 hours at 25℃, Full load and nominal input condition

6.3.E-cap Lifetime

The life estimation of capacitor must be over 3 years at 25℃, 100% load and 115Vac and 230Vac input.

* Standard: 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, 105℃ = 5)

Lr : Capacitor Life Spec　Ia : Measured Ripple Current

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

FCC Part15

7.2.EMS Standards

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

Discharge characteristic	Test level	Test criteria

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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 +/-2KV	

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)	

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.

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8. Safety Standards

8.1.Dielectric Strength(Hi-pot)

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

Primary to Secondary: 3300Vac / 5mAMax /3S (when production).

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
UL	USA	UL62368-1	APPROVAL	

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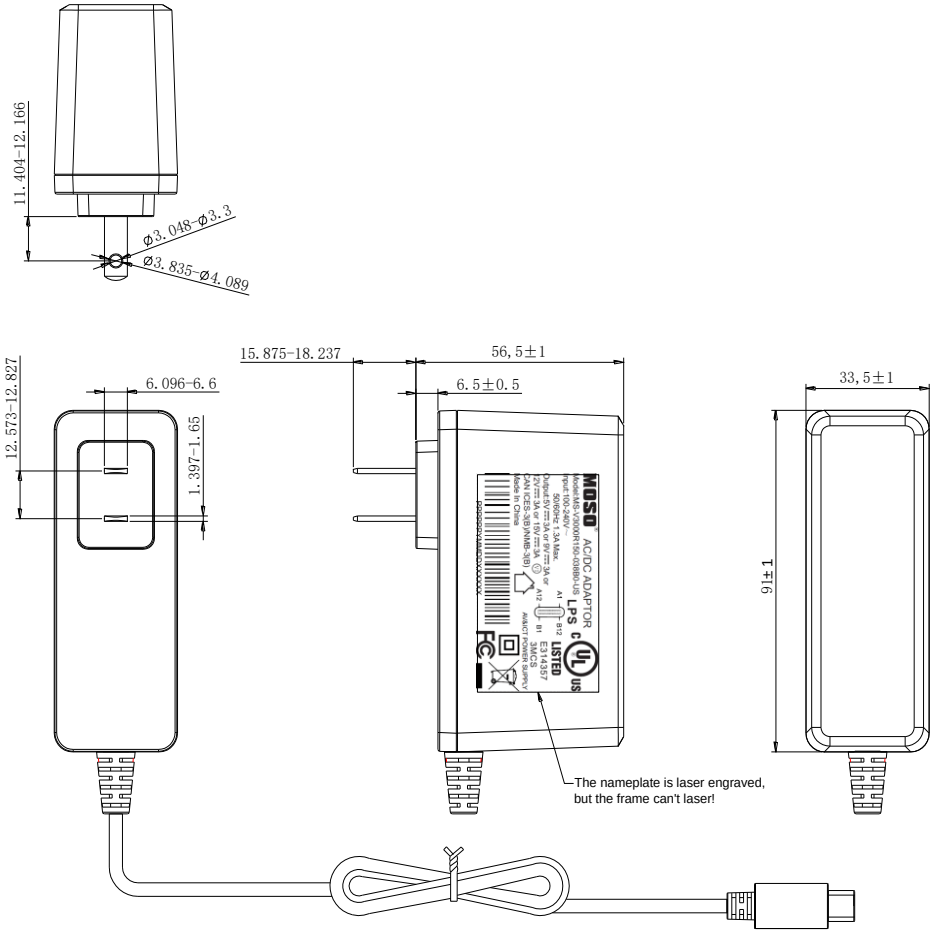
9. Mechanical Outline Drawing



Unit:mm
Other Tolerance：±0.5

Case material: ☑PC temperature resistance: 125℃
☐PC+ABS temperature resistance: 95℃
Remark: 1)PC material compliances with ball pressure testing requirement.
2)The color of enclosure and DC cable are Black.

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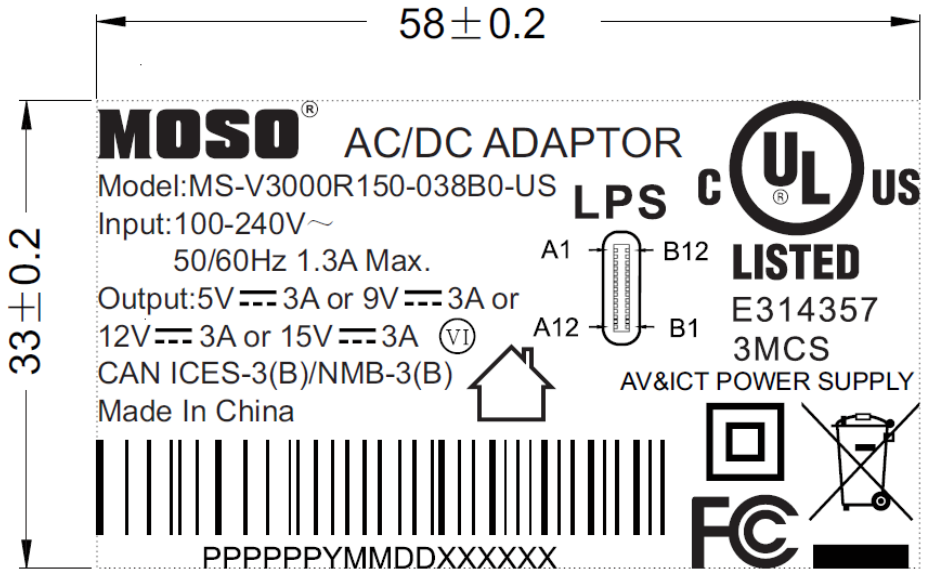
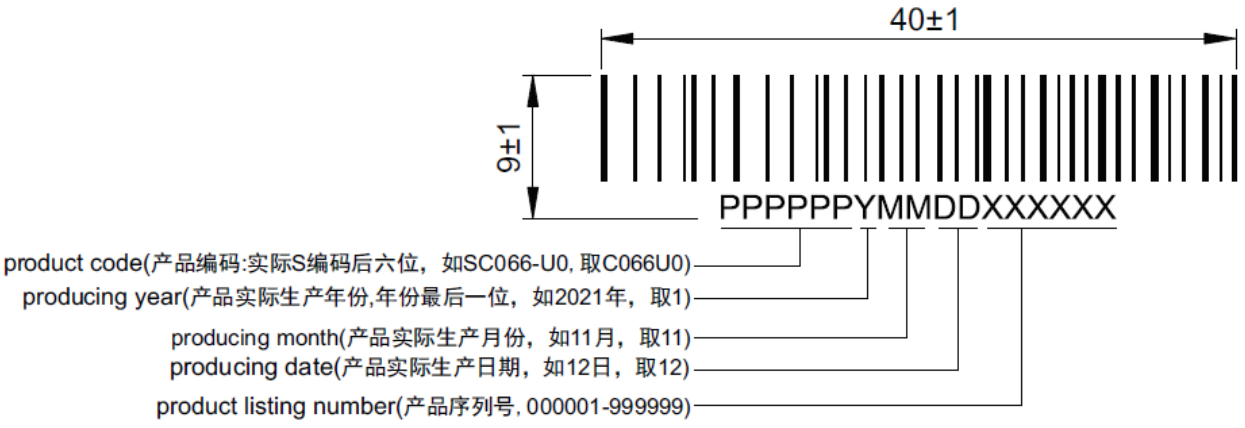
10. DC Cord Drawing

11. I/O Marking Drawing



Remark:
1.Above label is laser engraved.
2.The height dimension of double insulation mark can NOT less than 5mm.



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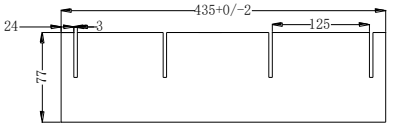
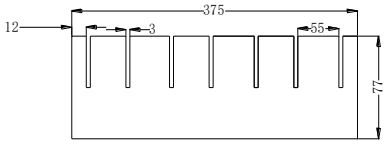
12. Package Drawing



four partitioning card :435*77



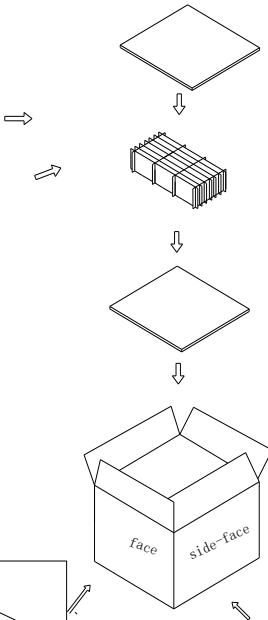
seven partitioning card:375*77

Packing Instruction：

1、the product put in the bag ，
then the packing product put in the
pattitioning card groove，18PCS/floor，
4 floors in all，72PCS/box
such as： 18pcs/floor*4floor=72PCS/box

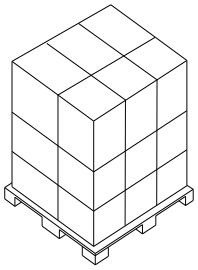
2、the usage of the packing materials：
1）the usage of the four partitioning card 435*77：28PCS
2）the usage of the seven partitioning card 375*77：16PCS
3）the usage of the PE bag 250*120：72PCS
4）the usage of the flat 435*375:5PCS
5）carton box 450*390*335：1PCS

3、Pallet stacke instruction:
1）Pallet size is:L1200*W950*H135mm
2）per floor set 6pcs
3）stacke per 3floor*6pcs carton
total 18 pcs carton

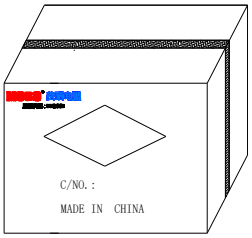


450*390*335MM

the bag of outside size：450L*390W*335H



The pallet stact drawing



The product will be packed in the carton box
and the box will be seled by the sticker

The requirement of PE bag packing: ☐PE bag without sealing by adhesive tape.
☐PE bag with sealing by adhesive tape
☐Other requirement

Remark: If the customer has not chose the PE bag packing way,
We will use the PE bag without sealing by adhesive tape.