

**CUSTOMER**

**JAMES**

**SPECIFICATION FOR APPROVAL**

**AC/DC ADAPTOR**

**CUSTOMER SPEC:INPUT: 100-240V AC 50/60Hz OUTPUT:24VDC 1000mA**

**CUSTOMER DWG./PART NO.      Wall Mount, UL,5.5\*2.5\*10mm,1.5M**

**PART NO.      S024-1B240100HU**

**SAMPLE NO: M2200760      REV.:             ISSUE      DATE: 2022-9-24**

**PRDUCT NO: SN00760DG**

**Unit Color: Black**



**White**



**APPROVED SIGNATURES/客户确认**

核准/APPROVED BY	审核/ CHECKED BY:	检测/TESTED BY:

**Manufacturer/制造商**

业务/SALES	品管/QE	核准/APPROVED BY	制样/DESIGNED BY
<b>EDDY 袁</b>	<b>周松平</b>	<b>宋军</b>	<b>阳灿</b>

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## Record of Revision

REV.	Description of Change(s)	Changed Date
1.0	Initial Release	09 <sup>th</sup> .September.2022
<p>Mass Power Confidential - Issued</p>		

<b>ISSUE DATE:</b> 09 <sup>th</sup> .September.2022	<b>Sales BY:</b> 周露	<b>DESIGNED BY:</b> 周磊涛	<b>APPROVED BY:</b> 罗赞兴
<b>MSP PN.:</b> SN00760DG	<b>ITEM No.:</b> Specification	<b>MODEL No.</b> S024-1B240100HU	<b>SHEET:</b> Page 2 of 20

## Notice of Deviation

Customer Request	Submitted Sample	Mass Production

Mass Power Confidential - Issued

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## 1.0 SCOPE

This document details the electrical, mechanical and environmental specifications of a switching power supply 24 watts of 24V which will be used, power supply is 2Pin input.

### 1.1 DESCRIPTION

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> WALL MOUNT   | <input type="checkbox"/> OPEN FRAME                         |
| <input type="checkbox"/> DESK-TOP                | <input type="checkbox"/> POWER SUPPLY UNIT(WITH METAL CASE) |
| <input type="checkbox"/> INTERCHANGEABLE AC PLUG | <input type="checkbox"/> OTHERS                             |

## 2.0 INPUT CHARACTERISTIC

### 2.1 INPUT VOLTAGE RANGE

MIN.	NORMAL	MAX.
90Vac	100-240Vac	264Vac

### 2.2 INPUT FREQUENCY RANGE

MIN.	NORMAL	MAX.
47Hz	50/60Hz	63Hz

### 2.3 INPUT CURRENT

The maximum input current is 0.6A RMS at 100Vac input & full-load.

### 2.4 INRUSH CURRENT

Inrush current should not cause I<sup>2</sup>T of fuse and rectifier diode to exceed specification and power supply should not be damaged during 100-240VAC, 25°C cold start.

### 2.5 POWER CONSUMPTION

The input power should be less than 0.1W with output 0A at 115/230Vac input.

### 2.6 EFFICIENCY

86.20% min. @ average of 25%,50%,75%,100% load at 115Vac 60Hz / 230Vac 50Hz input. ( Meet DOE VI )

## 3.0 OUTPUT CHARACTERISTIC

### 3.1 STATIC LOAD

Output Voltage	Total Regulation	Load Range		
		MIN.	MAX.	Peak
24V	22.8-25.2V	0A	1A	/

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### 3.2 RIPPLE & NOISE

The maximum ripple must be less than 150mVp-p when subjected to the following conditions:

- 1). Bandwith: 20MHz
- 2). Add a 47uF/50V(Low ESR) electrolytic capacitor in parallel with a 100nF/50V ceramic capacitor at the point of output load.
- 3). Line Voltage: 90Vac,115Vac,230Vac,264Vac
- 4). Output Load: 0,25%,50%,75%,100%
- 5). Ambient: 25°C

### 3.3 TURN ON DELAY TIME

Measure output delay time at the rated load by 115Vac condition 3sec Max.

### 3.4 HOLD UP TIME

10 msec minimum from loss of 115Vac/60Hz input at maximum load .

### 3.5 RISE TIME

The output voltage shall rise from 10% to 90% of nominal to within the regulation ranges within 30mS at Full load @ 90Vac,115Vac,230Vac,264Vac input.

### 3.6 OVERSHOOT & UNDERSHOOT

The overshoot shall less than 10% of nominal voltage at power on stage, recovery less than 100mS, when turn off the unit, The output voltage undershoot shall not happen.

### 3.7 TRANSIENT RESPONSE

The overshoot and undershoot should be less than ±10% of the nominal output voltage.  
Test condition:

Slew rate: 0.15A/uS, 20%~80%~20% of maximum load

T1=T2=5mS, 115Vac/60Hz, 230Vac/60Hz input.

### 3.8 LINE REGULATION

The line regulation of rated output voltage is less than ±5% while measuring at rated load and +/-10% of input voltage changing.

### 3.9 LOAD REGULATION

The load regulation of rated output voltage is less than ±5% at measured output load from 10% to 100% rated load

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## 4.0 PROTECTION REQUIREMENT

### 4.1 OVER VOLTAGE PROTECTION

The power supply shall be hiccupped when output voltage reaches to its over – voltage protection trigger point [36V Max.](#)

- ☐ The power supply shall fail but safe – the input power shall be less than \_\_\_\_ W.
- ☒ The power supply shall be self – recovering when the fault condition is removed.
- ☐ The power supply will go into latch-off mode, and have to OFF and ON the AC input to restart the power supply.

### 4.2 OVER CURRENT & SHORT CIRCUIT PROTECTION

The power supply shall be hiccupped when operating any output in overload condition ([2A Max.](#)), or when operating any output in a short circuit condition.

- ☐ The power supply short circuit protection – the input power shall be 0-8 W.
- ☒ The power supply shall be self – recovering when the fault condition is removed.
- ☐ The power supply will go into latch-off mode, and have to OFF and ON the AC input to restart the power supply.

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## 5.0 ENVIRONMENTAL CONDITIONS

### 5.1 OPERATING

The power supply shall be capable of operating continuously in any mode without performance deterioration in the following environmental conditions.

**5.1.1** Ambient Temperature: 0°C ~40°C @ full load

**5.1.2** Relative Humidity: 20% ~ 98% Non-Condensing

**5.1.3** Altitude : Sea level to -50m ~ 5000m.

### 5.2 NON - OPERATING

The power supply shall be capable of withstanding the following environmental conditions extended periods of time, without sustaining electrical or mechanical damage and subsequent operational deficiencies:

**5.2.1** Ambient Temperature: -20°C ~ +80°C

**5.2.2** Relative Humidity: 20% ~ 98% Non-Condensing

**5.2.3** Altitude : Sea level to -50m ~ 5000m.

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## 6.0 ELECTRO MAGNETIC COMPATIBILITY

### 6.1 EMI STANDARDS

The power supply shall meet the radiated and conducted emission requirements for [FCC part 15 CLASS B](#)

### 6.2 EMS STANDARDS

The power supply shall meet the following EMS standards [EN55035](#)

#### 6.2.1 EN61000-4-2 Electrostatic Discharge (ESD)

Static – discharge test by contact or air should be conducted with Static – discharge teeter, energy storage capacitance of 150pF, and discharge resistance of 330Ω.

[4KV contact discharge](#), [8KV air discharge](#),

Performance Criterion [A](#).

#### 6.2.2 EN61000-4-3 RADIATED ELECTROMAGNETIC FIELDS(RS)

Radio- frequency Electromagnetic Field Susceptibility Test, RS, 80-1000MHz, [3V/m](#), 80%AM(1KHz), Performance Criterion [A](#).

#### 6.2.3 EN61000-4-4 Electrical Fast Transient / Burst (EFT)

Power Line to Line: [1KV](#)

Line to earth: [1KV](#)

Performance Criterion [A](#).

#### 6.2.4 EN61000-4-5 Lightning Surge (1.2/50uS-8/20uS Combination Wave)

Lightning Surge voltage of differential and common modes shall be applied across AC input lines and across input and frame ground.

Power Line to Line: [1KV](#)

Line to Earth : [1KV](#)

Performance Criterion [A](#).

#### 6.2.5 EN61000-4-6 CONDUCTED RADIO FREQUENCY DISTURBANCES(CS)

Conducted Radio Frequency Disturbances Test, CS, 0.15-80 MHz, [3Vrms](#), 80%AM, 1KHz, Performance Criterion [A](#).

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## 7.0 RELIABILITY AND QUALITY CONTROL

### 7.1 MTBF

The MTBF shall be at least [50,000 hours](#) at 25°C, full load, 115Vac/60Hz and 230Vac/50Hz input, following [SR-332 issue03\(2011\)](#).

### 7.2 BURN-IN

The power supply shall undergo a minimum of [4](#) hours Burn-In test at 40°C ±5°C under full load and nominal input voltage [for QA test](#).

The power supply shall undergo a minimum of [2](#) hours Burn-In test at 40°C ±5°C under full load and nominal input voltage [for mass production](#).

### 7.3 ELECTROLYTIC CAPACITOR LIFE TIME

The life time of Electrolytic Capacitor should be greater than [2](#) years under [120V 60Hz/ 230V 50Hz](#) input @[25°C](#) ambient condition with [full load](#).

The Electrolytic Capacitor life calculated base on actual temperature measurement and shall take into account all factors which affect life base on each capacitor vendor' s Electrolytic Capacitor life formula.(For example capacitor temperature and ripple current).

### 7.4 DROP TEST

All types of wall mount and desktop power supply products are required to have a drop test to be verified.

The testing height must be [100cm +/-1cm](#) from the ground, drop one times for each welding side of the product ([total 6 times](#)), drop on the [30mm hardwood surface](#).

All power supply products must meet the requirement on the specification and do not have any isolation broken.

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## 8.0 MECHANICAL

### 8.1 INPUT AND OUTPUT CONNECTOR ASSIGNMENT

The power supply shall provide input connectors as in table 8.1

PIN#	Polarity
1	Line
2	Neutral

Table 8.1 Top view of AC input Pin assignment

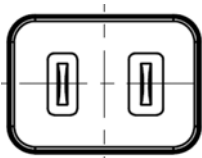


Table 8.2 Top view output Pin assignment



### 8.2 PHYSICAL DIMENSIONS

The detail dimension of the power supply, please see attachment.

### 8.3 LABEL

The label of the power supply, please see attachment.

### 8.4 WEIGHT

The weight of the power supply shall be Approx 117.0g ±5%.

### 8.5 CONNECTOR TYPE

AC INPUT	UL 2PIN
DC OUTPUT	5.5*2.5*10mm Fork & Groove, UL2468, 24AWG, 1500mm

## 9.0 SAFETY

### 9.1 REGULATORY STANDARD

The power supply shall be certified under the following international regulatory standards:

	Country	Certified Status	Standard
UL/cUL	America / Canada	Approved	UL 62368-1 / CSA C22.2

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## 9.2 INSULATION RESISTANCE

Input to output: Min. [10 MΩ](#) at 500VDC.

## 9.3 DIELECTRIC STRENGTH (HI-POT)

Primary to Secondary (Without Ground): [AC 3000V , 10mA Max](#) , 1 minute for type test .

Primary to Secondary (Without Ground): [AC 3600V , 10mA Max](#) ,2S for production

Note: The negative of secondary is connected with Ground.

## 9.4 LEAKAGE CURRENT

The leakage current shall be less than [0.25mA](#) , when power supply is operated maximum input voltage and maximum load.

## 10.0 ENVIRONMENTAL COMPLIANCE

### 10.1 RoHS

Meet 2011/65/EU directive and its amendment (EU) 2015/863

### 10.2 Packaging

Meet EU94/62/EC directive

### 10.3 REACH

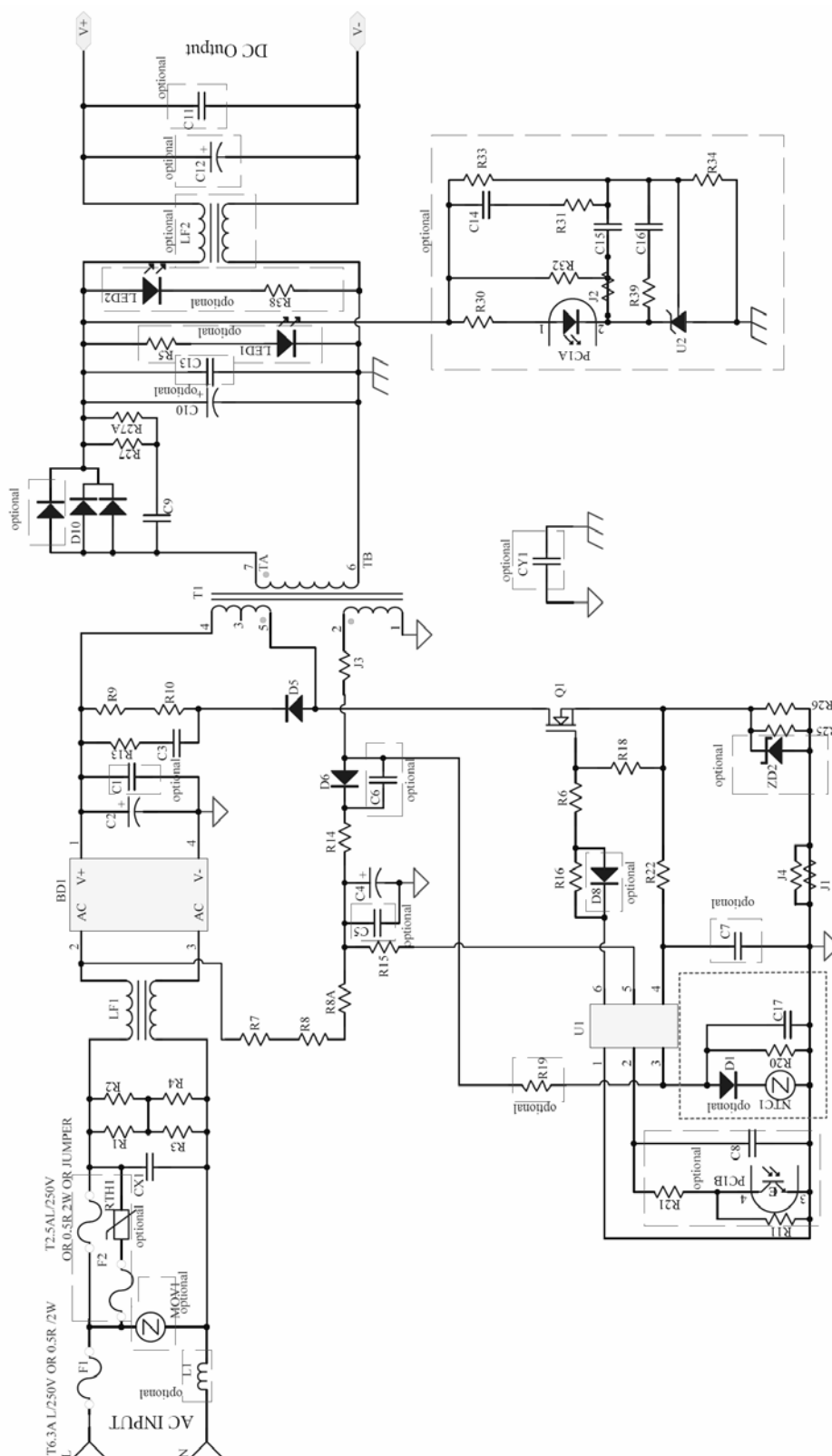
Meet EU 2006/1907/EC directive

### 10.4 WEEE (Waste Electrical and Electronic Equipmeng)

Meet EU 2012/19EC directive

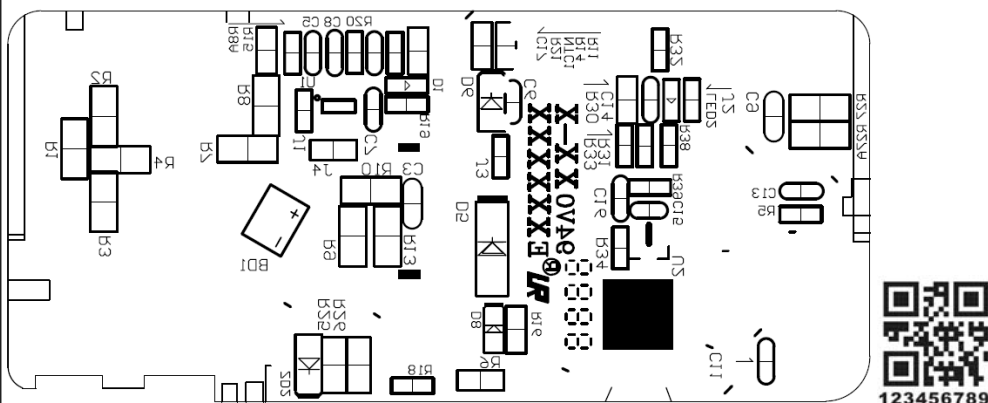
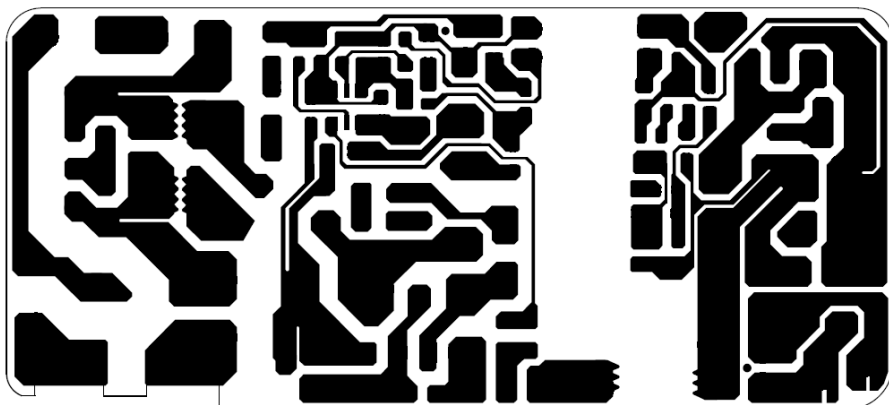
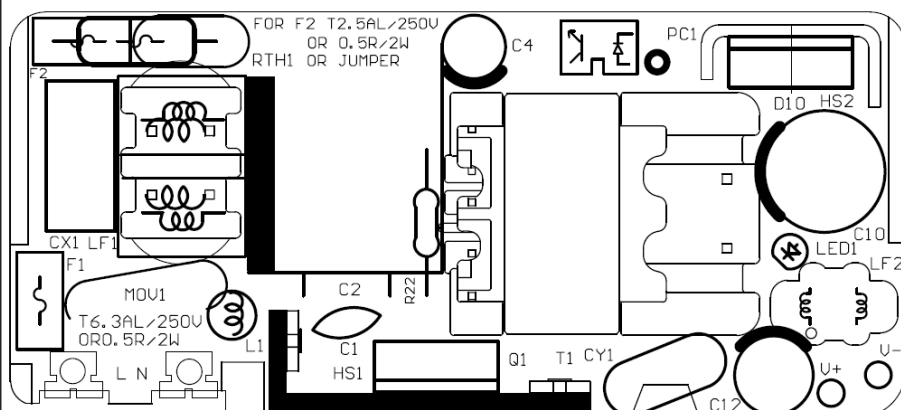
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## 11.0 Circuit Schematic



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## 12.0 PCB Layout



Notes:

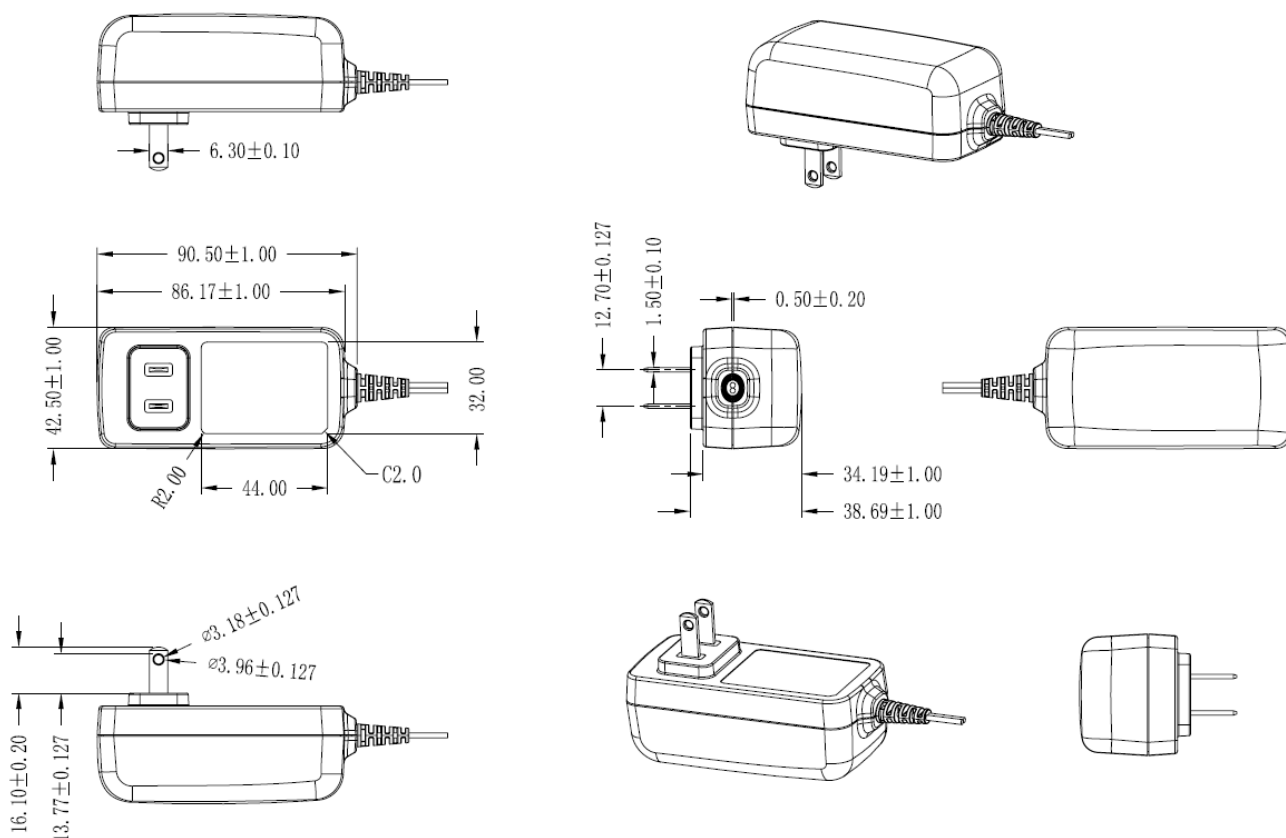
PCB white area laser QR code

The QR code' s number have nine digits , For Example : 123456789

1. Number 1, means laser machine No.: 1~9, A~Z(no include I,O)
2. Number 2, means Year, 1~9,A~Z(no include I,O), for example "9 for 2019" "A" for 2020
3. Number 3, means Month,1~9 for Jan to Sep, "A" for Oct, "B" for Nov, "C" for Dec
4. Number 4, means Date,1~9,A~X(no include I,O),for example "9AA" for 2019/10/10
5. Number 5 to 8, means serial number: 1~9, A~Z(no include I,O), first number:0001
6. Number 9 , means PCB code : 1~9 , A~Z(no include I,O)

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### 13.0 OUTLINE DRAWING

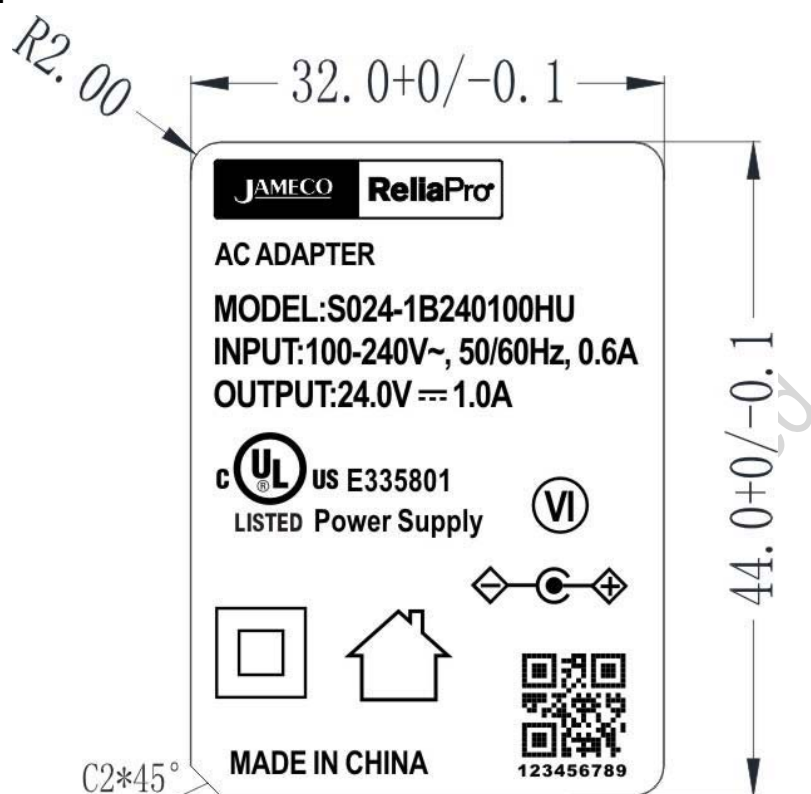


#### Notes:

1. Physical size:  $90.50 \pm 1.0\text{mm(L)} * 42.50 \pm 1.0\text{mm(W)} * 38.69 \pm 1.0\text{mm(H)}$
2. Unit: mm
3. Material: PC945, UL94V-0
4. Color: BLACK
5. AC Input Plug: UL

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## 14.0 NAMEPLATE



Notes:

Unit: mm

1.Laser

The QR code' s number have nine digits , For Example : [123456789](#)

Number 1 to 2, means laser machine No.:per code 1~9, A~Z(no include I,O)

Number 3, means Year, 1~9,A~Z(no include I,O), for example "9" for 2019," A" for 2020

Number 4, means Month,1~9 for Jan to Sep, "A" for Oct, "B" for Nov, "C" for Dec

Number 5, means Date,1~9,A~X(no include I,O),for example "A5G" for 2020/05/16

Number 6 to 9, means serial number: 1~9, A~Z(no include I,O)

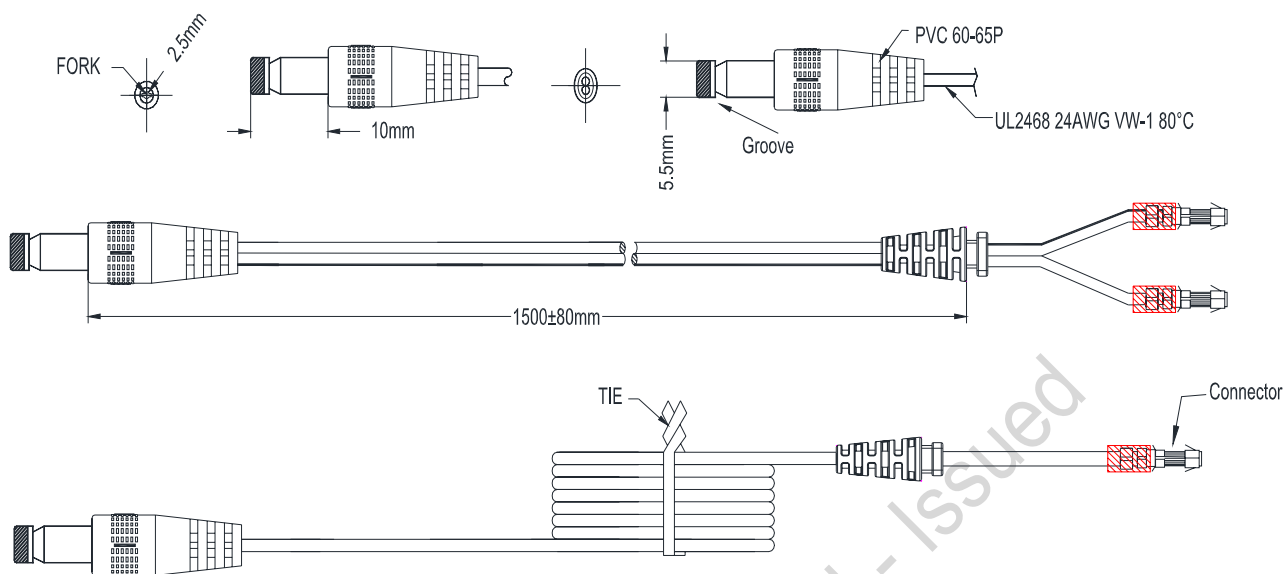
QR code size:7mm\*7mm , type : QR Code

Digit Size:0.9mm(H) ( ±0.5mm)

The distance from QR code size to the digit size:0.5-1mm

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## 15.0 DC CABLE DRAWING

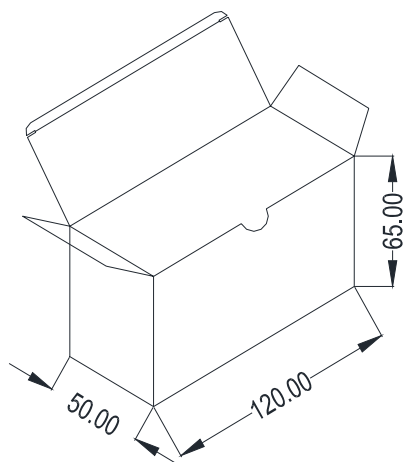


1. DC Plug:  $5.5 \pm 0.05\text{mm} \times 2.5 + 0.1/-0\text{mm} \times 10 \pm 0.5\text{mm}$  , Fork & Groove
2. Wire: UL2468 , 300V , 80°C , 24AWG ,  $1500 \pm 80\text{mm}$
3. Polarity: BLACK and WHITE----Positive, BLACK----Negative
4. DC Jack: PVC

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## 16.0 PACKING DRAWING

### 16.1 White Box

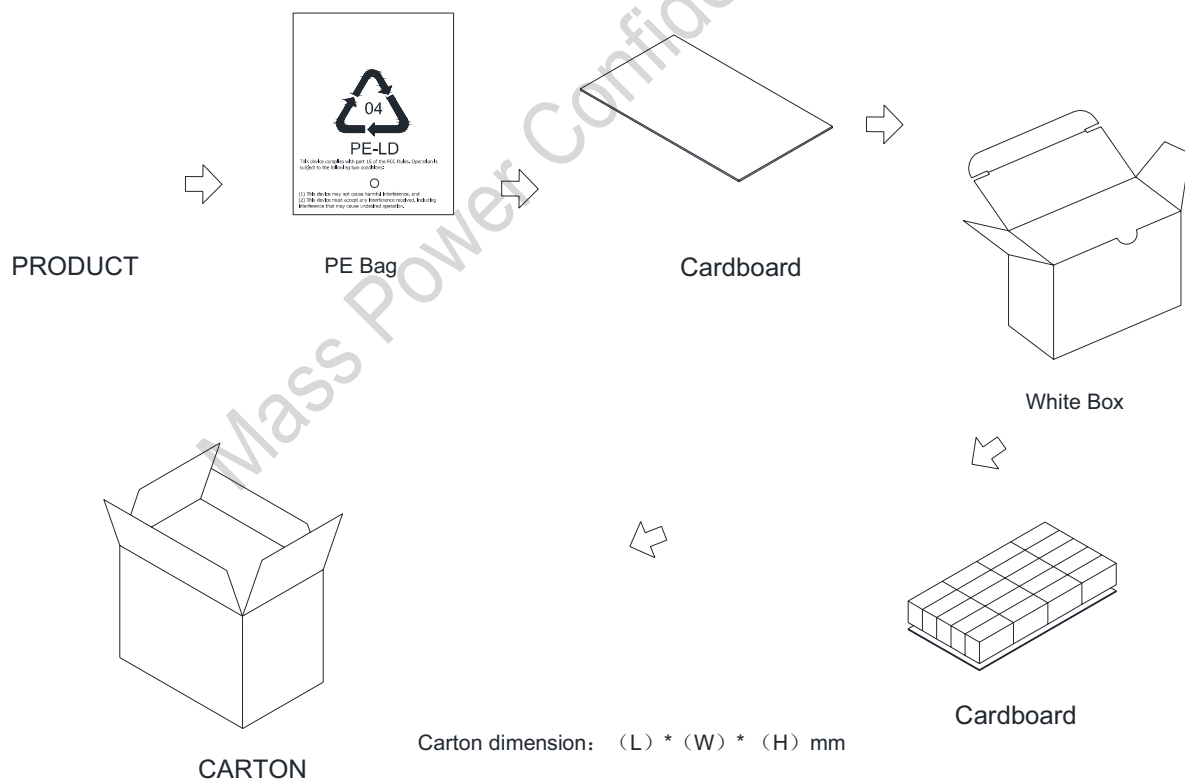


1. Unit: mm

2. Size:  $120 \pm 1 \text{ mm} * 50 \pm 1 \text{ mm} * 65 \pm 1 \text{ mm}$

3. Material: 400g

### 16.2 Croton



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<b>MSP PN.:</b> SN00760DG	<b>ITEM No.:</b> Specification	<b>MODEL No.</b> S024-1B240100HU	<b>SHEET:</b> Page 19 of 20

# CERTIFICATE OF COMPLIANCE

**Certificate Number** 20180911-E335801  
**Report Reference** E335801-A6005-UL  
**Issue Date** 2018-SEPTEMBER-11

**Issued to:** MASS POWER ELECTRONIC LTD  
10TH FL, TOWER A BILLION CENTRE  
1 WANG KWONG RD  
KOWLOON BAY  
KOWLOON HONG KONG  
HONG KONG

**This is to certify that representative samples of** Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment  
AC ADAPTER, Models S024-1BxxxxxyyHU, S024-1BxxxxxyyVU, S024-1BxxxxxyyD5, S024-1BxxxxxyyM2  
(xxx=090-150 or 180-240, indicates rated output voltage range 9.0-15.0 or 18.0-24.0Vd.c., with step 0.1Vd.c.,  
yyy=005-266, indicates rated output current range 0.05-2.66A, with step 0.01A)

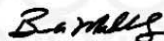
Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

**Standard(s) for Safety:** UL 62368-1, Audio/Video, Information and Communication Technology Equipment Part 1: Safety Requirements  
CSA C22.2 No. 62368-1-14, Audio/Video, Information and Communication Technology Equipment Part 1: Safety Requirements

**Additional Information:** See the UL Online Certifications Directory at [www.ul.com/database](http://www.ul.com/database) for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.



Bruce Mahrenholz, Director North American Certification Program  
UL LLC

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