

## SPECIFICATION FOR APPROVAL

<b>CUSTOMER:</b>	PD
<b>CUSTOMER P.N.:</b>	
<b>MODEL NO.:</b>	P40-V3250U200-065N0-US
<b>PRODUCT NO.:</b>	SC371-U0/1110650061
<b>SAMPLE DATE:</b>	2023-09-01

### CUSTOMER AUTHORIZED SIGNATURE

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

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### MANUFACTURER AUTOGRAPH

Reviser	Confirm	Checked	Approval



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## 1. SCOPE

The document detail the electrical, mechanical and environmental specifications of a Fast Charger, the Fast Charger provide 65W continuous output power.

The Fast Charger shall meet the RoHS requirement.

### 1.1. Description

- |   |   |
|---|---|
| <input type="checkbox"/> SMPS Adaptor(Wall mount)           | <input type="checkbox"/> SMPS Adaptor(Desk-top) |
| <input type="checkbox"/> Open Frame                         | <input type="checkbox"/> SMPS Unit (With Case)  |
| <input checked="" type="checkbox"/> PD ADAPTER (Wall mount) | <input type="checkbox"/> Others                 |

### 1.2. Supports fast charge protocol

PD2.0/PD3.0/PPS  
QC2.0/QC3.0/ QC4.0+  
SCP  
FCP  
AFC  
SFCP  
BC1.2  
DCP1.5A  
PE+1.1/ 2.0  
APPLE DEVICE  
SAMSUNG DEVICE

### 1.3. Green Requirements

- RoHS:2011/65/EU & (EU) 2015/863;
- REACH:1907/2006/EC;
- Halogen-free:IEC 61249-2-21;
- CA Prop 65;
- POPs:(EU)2023/1608;
- PAHs: 2005/69/EC;
- Packaging Directive:94/62/EC;
- US EPA Toxic Substances Control Act (TSCA);
- MOSO Environmental standards: WI-QM006-G;
- Others

#### 1.4. Energy Efficiency Requirements

No.	Country	Energy efficiency abbreviation	Whether it meets the requirements/(YES/ <input checked="" type="checkbox"/> , NO/ <input type="checkbox"/> )
1	USA	DoE VI	<input type="checkbox"/>
2		CEC	<input type="checkbox"/>
3	Canada	NRCan	<input type="checkbox"/>
4	Australia/New Zealand	GEMS	<input type="checkbox"/>
5	Europe	Erp VI	<input type="checkbox"/>
6		CoC V5 Tire 2	<input type="checkbox"/>
7	South Korea	KMEPS	<input type="checkbox"/>
8	Mexico	MEPS	<input type="checkbox"/>
9	Byelorussia	MEPS	<input type="checkbox"/>

## 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

2.0A max. @ 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(Erp)

5V3A: 76.41% min. @115V/230Vac input (@25%, 50%, 75% and 100% of max load)  
 9V3A: 80.82% min. @115V/230Vac input (@25%, 50%, 75% and 100% of max load)  
 12V3A: 82.98% min. @115V/230Vac input (@25%, 50%, 75% and 100% of max load)  
 15V3A: 84.65% min. @115V/230Vac input (@25%, 50%, 75% and 100% of max load)  
 20V3.25A: 86.00% min. @115V/230Vac input (@25%, 50%, 75% and 100% of max load)

### 2.5. Energy Consumption

Input Voltage 115Vac 60Hz/230Vac 50Hz, Energy Consumption ≤ 0.3W.

### 2.6. Protection

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

I Brownout: 100 Vac 50 Hz to 0 Vac @ 50 Hz in 1 volt decrements in 30s.

I 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>

##### 3.1.1: Only USB-A1

Output Rate	Rated Load		Output Range	R+N	Remark
	Min. Load	Max. Load			
4.50V	0.0A	5.0A	4.05-4.95V	200mVp-p	
5.00V	0.0A	4.5A	4.50-5.50V	200mVp-p	
5.00V	0.0A	3.0A	4.75-5.25V	200mVp-p	
9.00V	0.0A	2.0A	8.55-9.45V	200mVp-p	
12.00V	0.0A	1.5A	11.40-12.60V	200mVp-p	

##### 3.1.2: Only USB-C1

Output Rate	Rated Load		Output Range	R+N	Remark
	Min. Load	Max. Load			
5.0-21.0V	0.0A	3.0A	4.75-22.0V	200mVp-p	
5.00V	0.0A	3.0A	4.75-5.25V	200mVp-p	
9.00V	0.0A	3.0A	8.55-9.45V	200mVp-p	
12.00V	0.0A	3.0A	11.40-12.60V	200mVp-p	
15.00V	0.0A	3.0A	14.25-15.75V	200mVp-p	
20.00V	0.0A	3.25A	19.00-21.00V	200mVp-p	

##### 3.1.3: Only USB-C2

Output Rate	Rated Load		Output Range	R+N	Remark
	Min. Load	Max. Load			
5.0-21.0V	0.0A	3.0A	4.75-22.0V	200mVp-p	
5.00V	0.0A	3.0A	4.75-5.25V	200mVp-p	
9.00V	0.0A	3.0A	8.55-9.45V	200mVp-p	
12.00V	0.0A	3.0A	11.40-12.60V	200mVp-p	
15.00V	0.0A	3.0A	14.25-15.75V	200mVp-p	
20.00V	0.0A	3.25A	19.00-21.00V	200mVp-p	

##### 3.1.4: USB-C1 + USB-C2(The first port is 45W and the other is 20W)

Output port	Maximum power	Output voltage		Min. Load	Max. Load	Output Range	R+N	Remark
C1+C2	45W+20W	C1	5V	0A	3.0A	4.75-5.25V	200mVp-p	
			9V	0A	3.0A	8.55-9.45V	200mVp-p	
			12V	0A	3.0A	11.40-12.60V	200mVp-p	
			15V	0A	3.0A	14.25-15.75V	200mVp-p	
			20V	0A	2.25A	19.00-21.00V	200mVp-p	
		C2	5V	0A	3.0A	4.75-5.25V	200mVp-p	
			9V	0A	2.22A	8.55-9.45V	200mVp-p	

			12V	0A	1.67A	11.40-12.60V	200mVp-p	
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3.1.5:USB-C1 + USB-A1(The first port is 45W and the other is 18W)

Output port	Maximum power	Output voltage		Min. Load	Max. Load	Output Range	R+N	Remark
C1+A1	45W+18W	C1	5V	0A	3.0A	4.75-5.25V	200mVp-p	
			9V	0A	3.0A	8.55-9.45V	200mVp-p	
			12V	0A	3.0A	11.40-12.60V	200mVp-p	
			15V	0A	3.0A	14.25-15.75V	200mVp-p	
			20V	0A	2.25A	19.00-21.00V	200mVp-p	
		A1	5V	0A	3.0A	4.75-5.25V	200mVp-p	
			9V	0A	2.0A	8.55-9.45V	200mVp-p	
			12V	0A	1.5A	11.40-12.60V	200mVp-p	

3.1.6:USB-C2 + USB-A1(Shared output 5V3A 15W)

Output port	Maximum power	Output voltage	Min. Load	Max. Load	Output Range	R+N	Remark
C2+A1	15W	5V	0A	3.0A	4.75-5.25V	200mVp-p	

3.1.7:USB-C1 + USB-A1(The first port is 45W and the other is 18W)

Output port	Maximum power	Output voltage		Min. Load	Max. Load	Output Range	R+N	Remark
C1+C2+A1	45W+15W	C1	5V	0A	3.0A	4.75-5.25V	200mVp-p	
			9V	0A	3.0A	8.55-9.45V	200mVp-p	
			12V	0A	3.0A	11.40-12.60V	200mVp-p	
			15V	0A	3.0A	14.25-15.75V	200mVp-p	
			20V	0A	2.25A	19.00-21.00V	200mVp-p	
		C2+A1	5V	0A	3.0A	4.75-5.25V	200mVp-p	

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%	
12.00V	0.0A	3.0A	± 3%	± 5%	
15.00V	0.0A	3.0A	± 3%	± 5%	
20.00V	0.0A	3.25A	± 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 +/-10% of the nominal output voltage while the output load is stepped from 20% to 80% of the rated load. The nominal voltage must be recover in 10ms after overshoot.

## 4. Protection Requirements

### 4.1. Over Current Protection (C1/C2)

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	
12.00V	0.0A	3.0A	3.3-3.9A	100-240VAC	
15.00V	0.0A	3.0A	3.3-3.9A	100-240VAC	
20.00V	0.0A	3.25A	3.6-4.2A	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.

## 5. Environment Requirements

### 5.1. Operating Temperature and Relative Humidity

-10°C to +25°C  
35%RH to 85%RH

### 5.2. Storage Temperature and Relative Humidity

-20°C to +80°C  
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 25°C ± 5°C

#### 6.2.MTBF Qualification

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

#### 6.3.E-cap Lifetime

The life estimation of capacitor must be over 5,000hours at 25°C, 80% load and 100-240Vac input.

### 7. EMI/EMS Standards

#### 7.1.EMI Standards

FCC Part15
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#### 7.2.EMS Standards

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

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

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	B
AC-input	1KV	B

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

Surge voltage	Test criteria
Common mode +/-2KV	B
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)	

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 / 10mA Max / 60 second (when safety testing).

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

### 8.2.Leakage Current

0.25mA max. at 264Vac / 60Hz

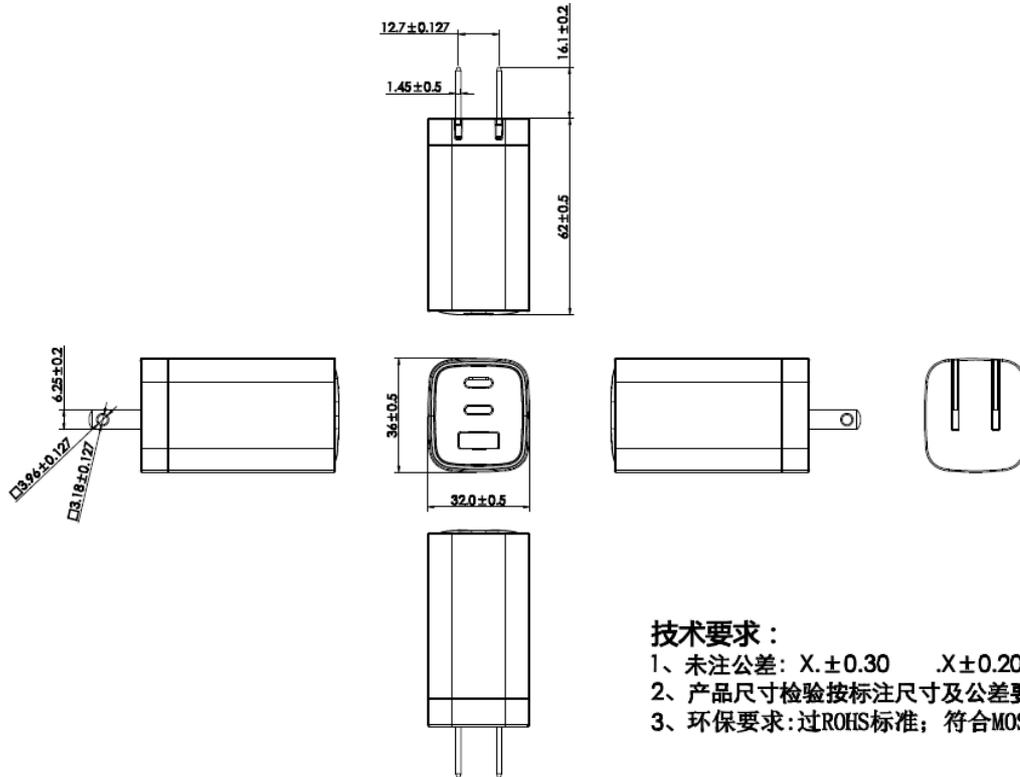
### 8.3.Insulation Resistance

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

### 8.4.Regulatory Standards

Type	Country	Standard	Statue	Mark
UL	USA	UL62368-1	APPROVAL	

## 9. Mechanical Outline Drawing



### 技术要求:

- 1、未注公差: X.  $\pm 0.30$  .X  $\pm 0.20$  .XX  $\pm 0.10$ ;
- 2、产品尺寸检验按标注尺寸及公差要求;
- 3、环保要求:过ROHS标准;符合MOSO环保要求。

Case material: ■ PC temperature resistance: 125°C

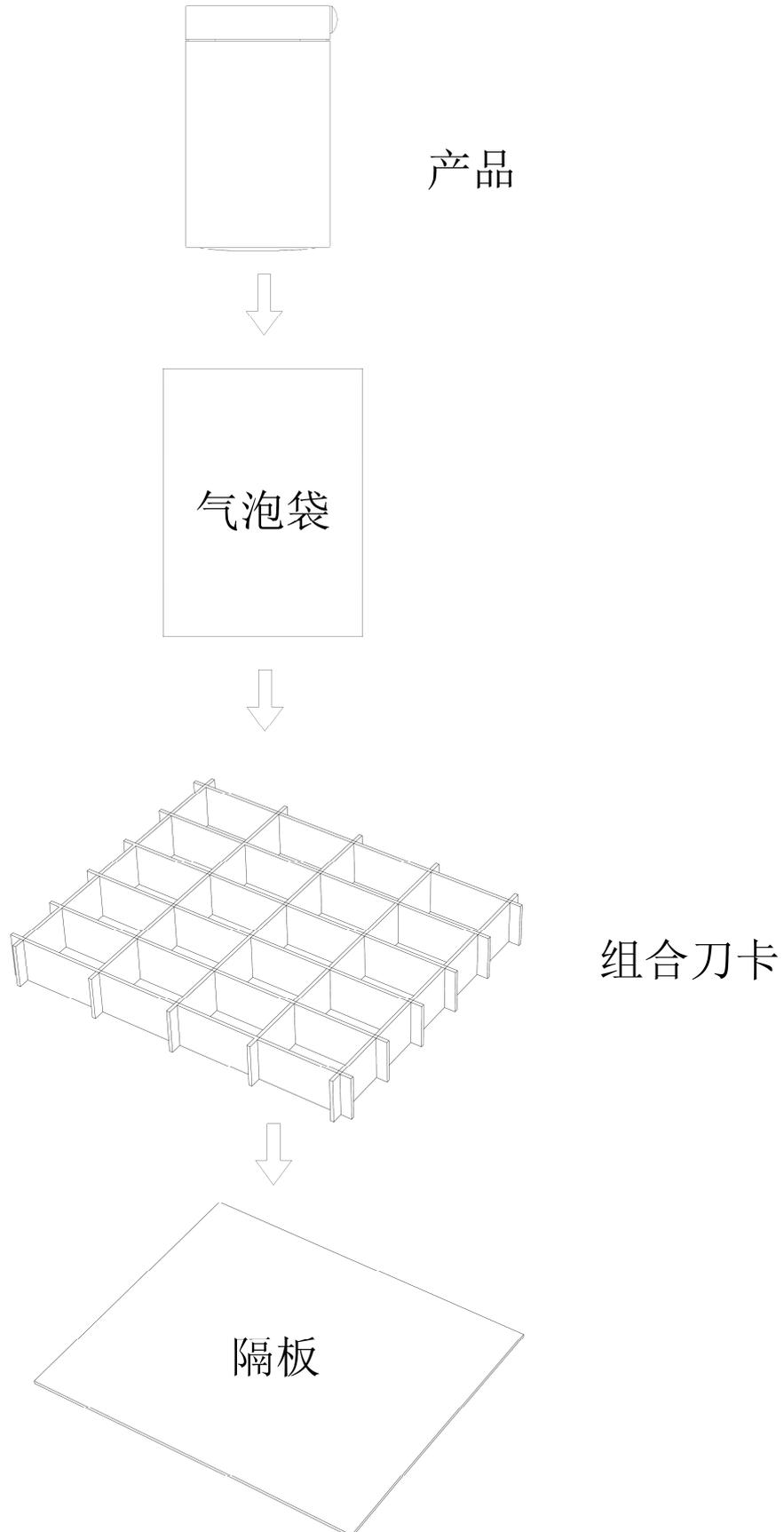
□ PC+ABS temperature resistance: 95°C

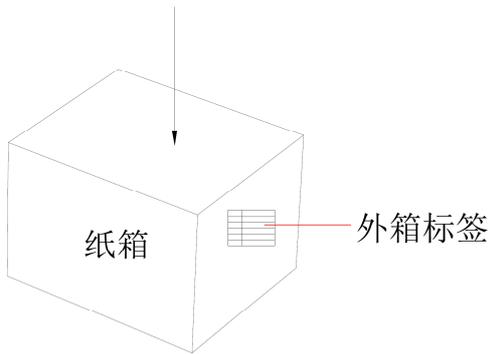
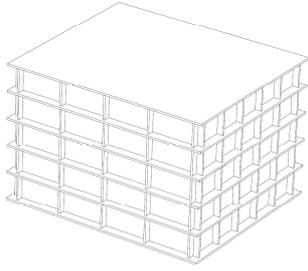
Remark: 1) PC material compliances with ball pressure testing requirement.

2) The color of enclosure are white.

## 10. I/O Marking Drawing

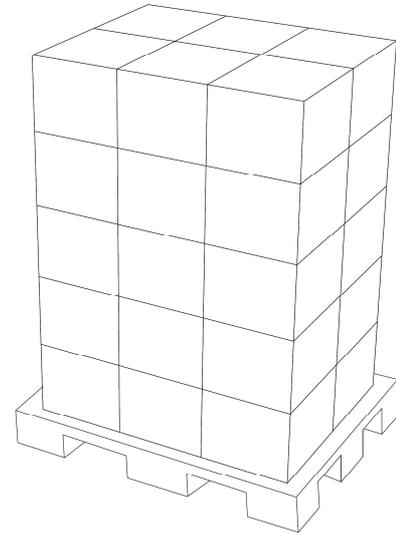
## 11. Package Drawing





技术要求:

- 1、环保要求: 过ROHS标准; 符合茂硕环保要求;
- 2、材质: K=K;
- 3、耐破强度: 18KG;
- 4、尺寸: L351\*W298\*H248mm;
- 5、外观要求: 无破损、无脏污、切口无毛边、印字清晰、内容居中
- 6、颜色: 单黑印刷
- 7、单侧钉装;
- 8、装100PCS产品 (4\*5\*5组合)



包装说明:

- 1、将产品装进气泡袋;
- 2、在纸箱底部放1PCS隔板;
- 3、将组合刀卡放入纸箱;
- 4、把装好的产品放入组合刀卡中;
- 5、每层装20PCS, 装满一层后盖上1PCS隔板;
- 6、重复步骤3至5, 直至装满5层
- 7、将纸箱工字型封箱并填写纸箱任一侧唛的信息, 并在另一侧唛贴1PCS打印好的外箱标签;
- 8、将纸箱放入栈板, 每个栈板放30PCS外箱

栈板 - 321140001  
木质 1000\*800\*100mm

包装方式

清单:



1. 气泡袋



2. 隔板



3. 纸箱



4. 组合刀卡



5. 外箱标签

步骤:



第一步: 将产品装进气泡袋

备注: 产品插脚朝气泡袋开口端



第二步: 将1PCS隔板放入纸箱底部



第三步: 将1PCS组合刀卡放入纸箱



**第四步: 将产品放入组合刀卡中, 装满一层后盖上1PCS隔板**

备注: 每层装20PCS产品, 所有产品朝向保持一致



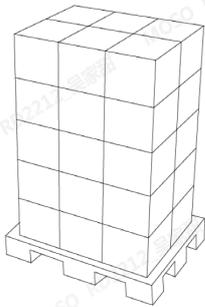
**第五步: 重复步骤3、4, 直至装满5层**

备注: 每箱装100PCS产品, 4\*5\*5组  
△



**第六步: 将纸箱工字型封箱, 并填写任一侧唛上的信息, 在未填写的侧唛上贴1PCS打印好的外箱标签**

备注: 外箱标签覆盖未填写的侧唛信息

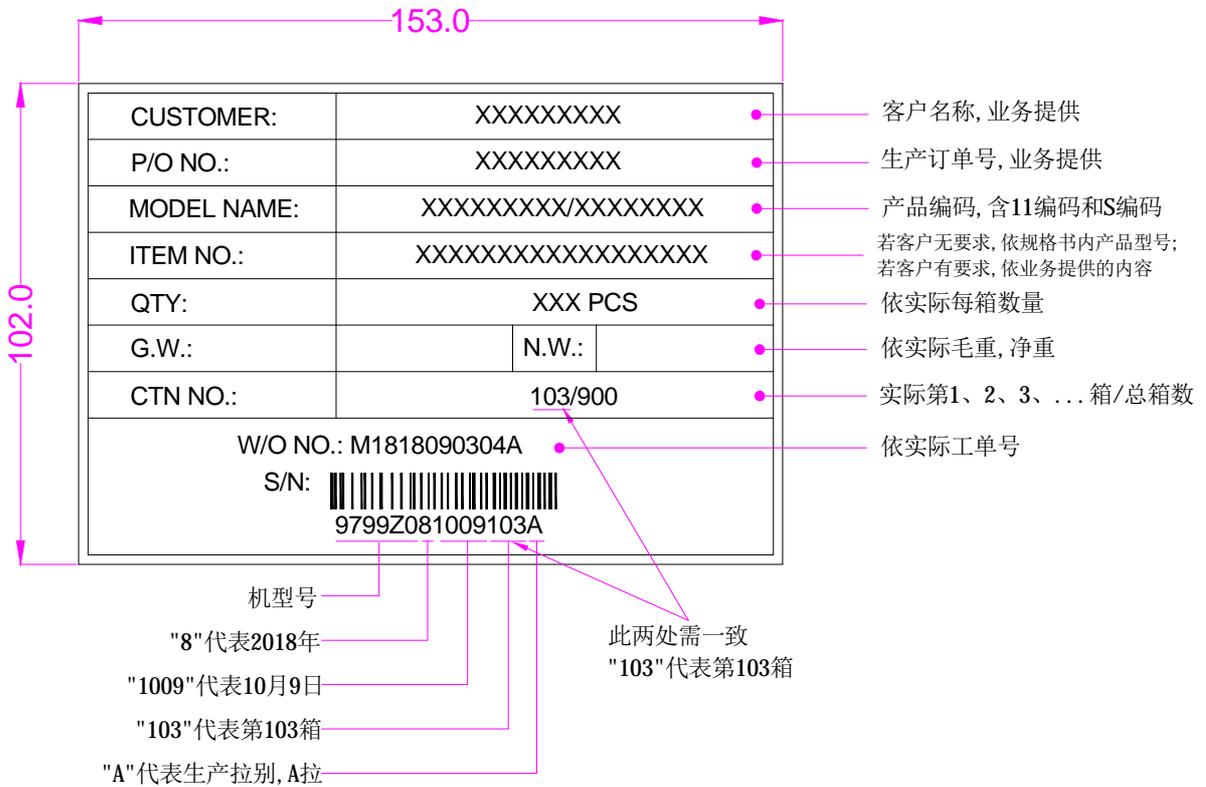


栈板 - 321140001  
木质 1000\*800\*100mm

**第七步: 将纸箱放入栈板, 每个栈板放30PCS纸箱, 共放5层**

备注: 实际订单数量少于30箱时, 按实际出货数量减少堆放层数打栈板

外箱标签



备注:

1. 材质: 80P铜版纸(来料为空白标签)
2. 颜色: 白底黑字, 公司内部打印
3. 背附胶, 粘贴在纸箱上后, 无翘边等不良;
4. 符合ROHS标准及茂硕环保要求
5. 使用空白料号3230200011