

## PI ELECTRONICS (H.K.) Ltd.

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### AD2061320910-1LF APPROVAL PACKAGE (Rev. 1)

CUSTOMER NAME	: ASUS
CUSTOMER PART NO.	: 0A001-00096100
PI MODEL NO.	: AD2061320910-1LF
REV.	: 1
DATE	: 08-Aug-2017

APPROVED	CHECKED	DRAWN
<b>Winton Lou</b>	<b>HerBert HBXie</b>	<b>RX Shen, Chen MD</b>

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**Customer Part No./Model Name and PI Model List :**

PI Model No.	Customer Part No.	Customer Model Name
AD2061320910-1LF	0A001-00096100	

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# **Section 1 - History of Changes**

PI ELECTRONICS (H.K.) Ltd.  
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**History of Changes :**

Date	Rev	Remarks
08-Aug-2017	1	Document release.

## **Section 2 - Specification**

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**1. DESCRIPTION**

This is a general purpose AC/DC adaptor which converts 100Vac~240Vac to a stabilized DC voltage of 5.2V/1.0A .

**2. ELECTRICAL SPECIFICATION**

**2.1. TYPE**

- Switching regulator type.

**2.2. INPUT**

2.2.1	Rated Input Voltage	: 100~240Vac, @ 50/60Hz.
2.2.2	Operating Input Voltage	: 90~264Vac, 47~ 63Hz.
2.2.3	Input Current	: < 0.13A.
2.2.4	Inrush Current	: The inrush current of the power supply shall be less than the rating of its critical components (include bridge diode, surge limiting device) for all condition of line voltage of 2.2.1. The I <sup>2</sup> t shall less than 22% of the fuse, surge limiting device and bridge diode rating. No component damaged.
2.2.5	Standby power	: <0.075W @ 230Vac. Off Mode: P <sub>out</sub> =0.25W, P <sub>in</sub> <0.45W
2.2.6	Efficiency	: ≥ 73.93% Under the active mode and input voltage 115Vac/60Hz&230Vac/50Hz. The power supply efficiency shall be more than 70% measure at the normal voltage maximum load as specified with the AC input set at the nominal voltage. The 10% efficiency shall be more than 60.7 % measure at 115V/60Hz and 230Vac/50Hz.

Notes :

- The average efficiency shall comply with the DOE VI.
- The UUT shall be operated at 100% of nameplate current output for at least 30 minutes immediately prior to conducting efficiency measurements.
- The ambient temperature shall be maintained at 23°C ± 5°C throughout the test.

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**2.3. OUTPUT**

- 2.3.1 Rated Output Voltage :  $V_o=5.2V_{dc}$
- 2.3.2 Output Voltage Regulation :  $V_o=4.94\sim 5.25V@No\ Load$   
 $V_o=5.0\sim 5.25V@Full\ Load$
- 2.3.3 Output Ripple and noise :  $<200mV_{p-p}$ . The output Ripple & Noise voltage shall be less than 100mV at load 0.5A. The input voltage measure at 100~240Vac.
- Notes :
- Ripple voltage is measured using oscilloscope with bandwidth limited to 20MHz.
  - A 10uF/25V electrolytic capacitor and a 0.1uF/50V ceramic capacitor shall be connected to the connector in parallel.
- 2.3.4 Rated Output Current :  $I_o=1.0A$ . Ripple Current $<100mA$ .
- 2.3.5 Overshoot/Undershoot : 10% of nominal voltage
- 2.3.6 Hold up time :  $>5ms@Full\ load/100Vac$
- 2.3.7 Rise time :  $<40ms$  with 5.2 ohm resistive load.

**2.4. OTHERS**

- 2.4.1 Turn-on Delay :  $< 3$  seconds with resistive load. The input voltage measure at 100/240Vac and at maximum output load.
- 2.4.2 Over Voltage Protection :  $V_o<7.5V$
- 2.4.3 Over Current Protection :  $I_o<1.22A$ . Auto-recovery. Without damage and safety issue.
- 2.4.4 Short Circuit Protection : Shorting of output will not cause power supply to damage, or any safety hazard. Auto-recovery.
- 2.4.5 Power on/off repeat : Repeat power on/off every 1sec test cycle 10K times at  $V_{in} 264Vac$ , no failure.
- 2.4.6 Dynamic Load : Under resistive load conditions, any change in output current at a rate of  $1A/\mu s$ ,  
Condition 1:  $0.5A@5ms, 0A@295ms$   
Condition 2:  $1.0A@5ms, 0.5A@25ms$   
Output voltage range: Max.6V ,Min.4.6V  
If output drop less than 4.6V, the during shall less than 3ms @ condition 1.
- 2.4.7 Case Temperature rise : The case temperature rise shall be less than 35deg C at 25deg C Ambient on bakelite (Not including the bottom surface) without airflow.
- 2.4.8 Acoustic Noise : 1. Microphone at a distance of 10cm from the surface and noise level is less than 20dB@static load (from 0A to Full Load , 0.05A pre step )  
2. Microphone at a distance of 3cm from the surface and noise level is less than 25dB@static



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- 2.4.9 Common Mode Noise : load (from 0A to Full Load , 0.05A pre step )  
: Test Equipment and Environment : Follow  
EN61000-4-6  
Test voltage Condition :3V  
Test Frequency :150K ~ 600K Hz  
Specification :CMN Max.:0.8V@150K~600K

**3. RELIABILITY**

- 3.1 MTBF : > 150K Hours at 90%confidence – level at 25  
degree C.
- 3.2 Life/Power On Hours : The power supply must be designed to operate  
for 13,140 power-on hours.  
AC input voltage: 100 and 240Vrms  
Ambient Temp. : 25°C
- 3.3 Burn-in Test Condition : More than 4 hours at 40°C, normal input  
voltage. AC on/off must be tested.

**4. ENVIRONMENTAL**

**4.1. CLIMATIC SPECIFICATIONS**

- 4.1.1 Operating Temperature : 0degC ~ 40degC
- 4.1.2 Operating Humidity : 5% ~90 % (Non-condensing)
- 4.1.3 Storage Temperature : -30degC ~80degC
- 4.1.4 Storage Humidity : 5% ~90% (Non-condensing)

**4.2. DYNAMIC SPECIFICATIONS**

- 4.2.1 Vibration Test - Non-Operating : 1.5mm, 10-50-10Hz / sine wave.
- 4.2.2 Pass Criterion : Normal functional test should be satisfied after  
the test.

**5. SAFETY AND EMC**

**5.1. DIELECTRIC WITHSTANDING VOLTAGE**

- 5.1.1 Primary to Secondary : 3.0KVac, 1 minute, 5mA for type test, 2 seconds  
for production.
- 5.1.2 Leakage Current : The total combined leakage current shall be  
<20uA when tested at 240Vrms, 50Hz in normal  
operating condition.
- 5.1.3 Insulation Resistance : 30Mohm check at DC 500V.

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**5.2. SAFETY STANDARD**

Type	Country/Region	Standard
CBD PSB	EU	IEC60950-1:2005/EN60950-1:2006
UL	US	UL60950-1 2 <sup>nd</sup> edition
BSMI	TAIWAN	CNS14336-1/CNS13438

**5.3. EMC SPECIFICATION**

5.3.1. Noise-suppressed according to EN55022 Class B and FCC 15 Class B for both Radiated and Conducted Emissions.

5.3.2. Immunity to Electrostatic Discharge (ESD) according to EN 61000-4-2.

Discharge Characteristic	Test Level	Acceptance Criteria *1
Air Discharge	±15KV, 10 times	B
Contact Discharge	±8KV, 10 times	B

Note \*1: For the test result, please refer to (5.3.8) Assessment criteria.

5.3.3. Immunity to Radiated Electromagnetic Field (RS) according to EN 61000-4-3.

- Test characteristic: 80 - 1000MHz, 80% AM (1kHz)

Test Level	Acceptance Criteria
3V/m	A

5.3.4. Immunity to Electrical Fast Transients / Burst (EFT) according to EN 61000-4-4.

Coupling	Test level	Acceptance Criteria
AC-input	1KV	A
AC-input	2KV	B

5.3.5. Lightning Surge capability according to EN 61000-4-5.

Surge voltage	Acceptance Criteria
Common mode ±2KV 12R, 10 times	A
Differential mode ±1KV 2R, 5 times	A

5.3.6. Immunity to Conducted disturbances, induced by radio frequent fields according to EN 61000-4-6.

- Test characteristic 0.15- 80MHz, 80% AM(1kHz)

Test level	Acceptance Criteria
3V	A

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**5.3.7. Immunity to Voltage dips, short interruptions and voltage variations.**

- Test according to EN 61000-4-11.
- Test performed at  $V_{in} = 120V_{ac}/60Hz$ .
- Note : Test with resistive load at rated loading.

Test Level % $V_{in}$	Voltage Dips and Short Interruptions % $V_{in}$	Duration Time of Voltage Dips (in half-sine cycles)	Acceptance Criteria
			120Vac/60Hz
0	100	1	B
		2	B
		5	B
		10	B
		25	B

**5.3.8. 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.

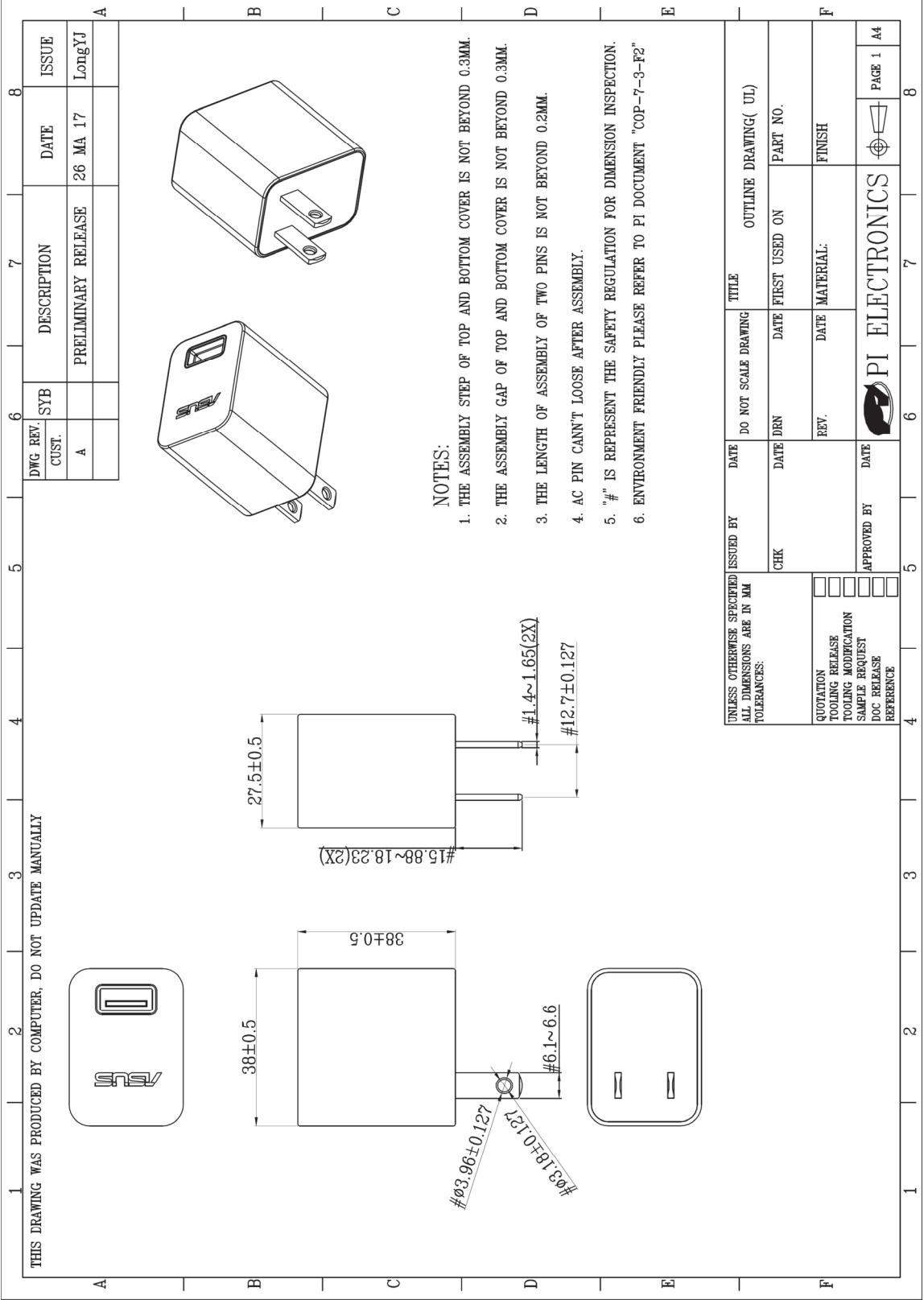
**6. MECHANICAL SPECIFICATIONS**

- |                             |   |
|-----------------------------|---|
| <b>6.1 Weight</b>           | : 31.1g±2.5%  |
| <b>6.2 Input Connector</b>  | : Refer to attached drawing   |
| <b>6.3 Output Cable</b>     | : N/A   |
| <b>6.4 Output Connector</b> | : Refer to attached drawing   |
| <b>6.5 Drop Test</b>        | Drop 6 times(1 times on each face) on each cycles from a height of 36 inches onto a<br>: hardwood surface. There must be no function damage after testing |

## **Section 3 - Outline Drawing**

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Outline Dimension



## **Section 4 - DC Cable Drawing**

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**N/A**

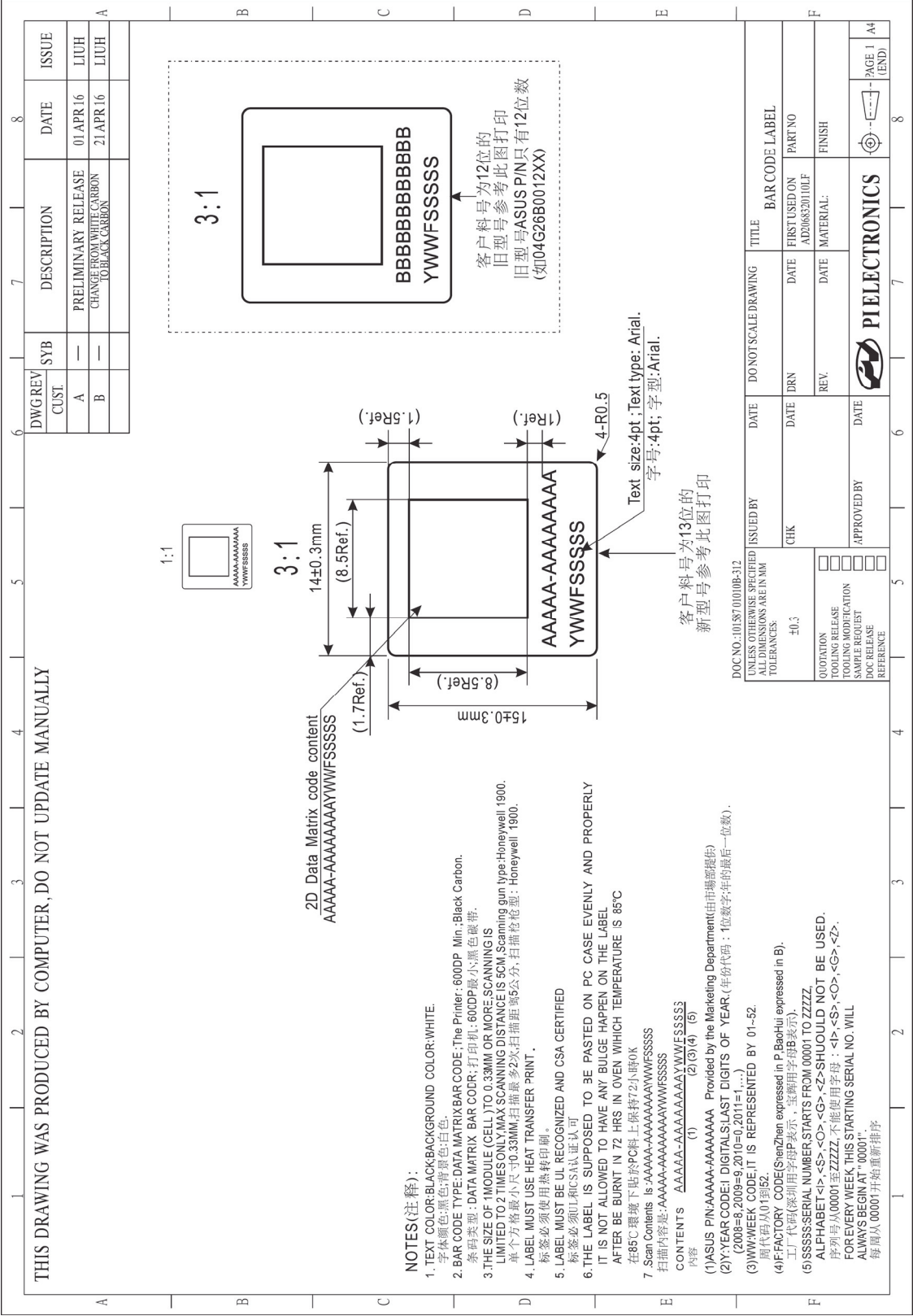
## **Section 5 - Rating and S/N Label Drawing**





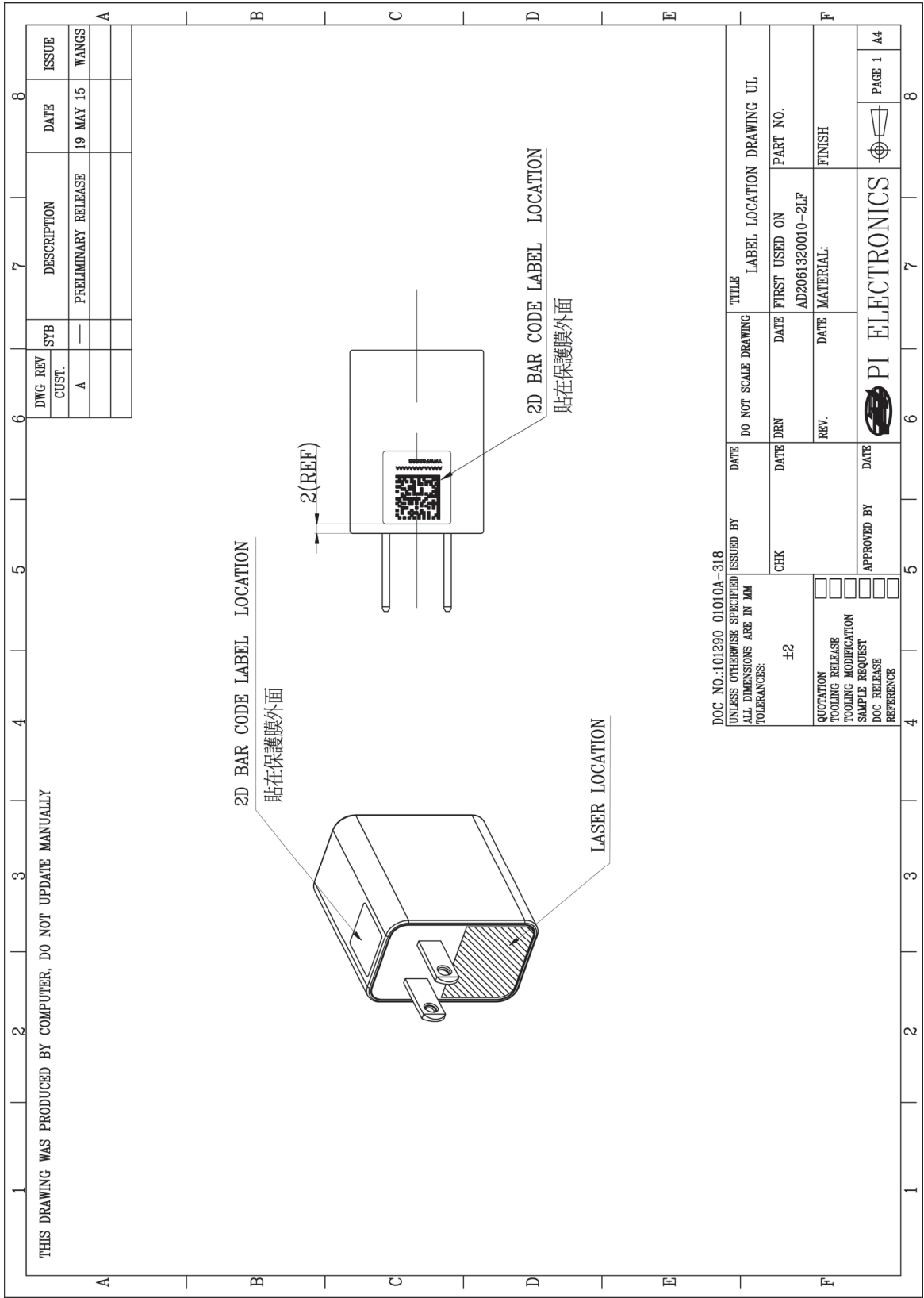
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2D BAR CODE LABEL DRAWING



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LABEL LOCATION DRAWING



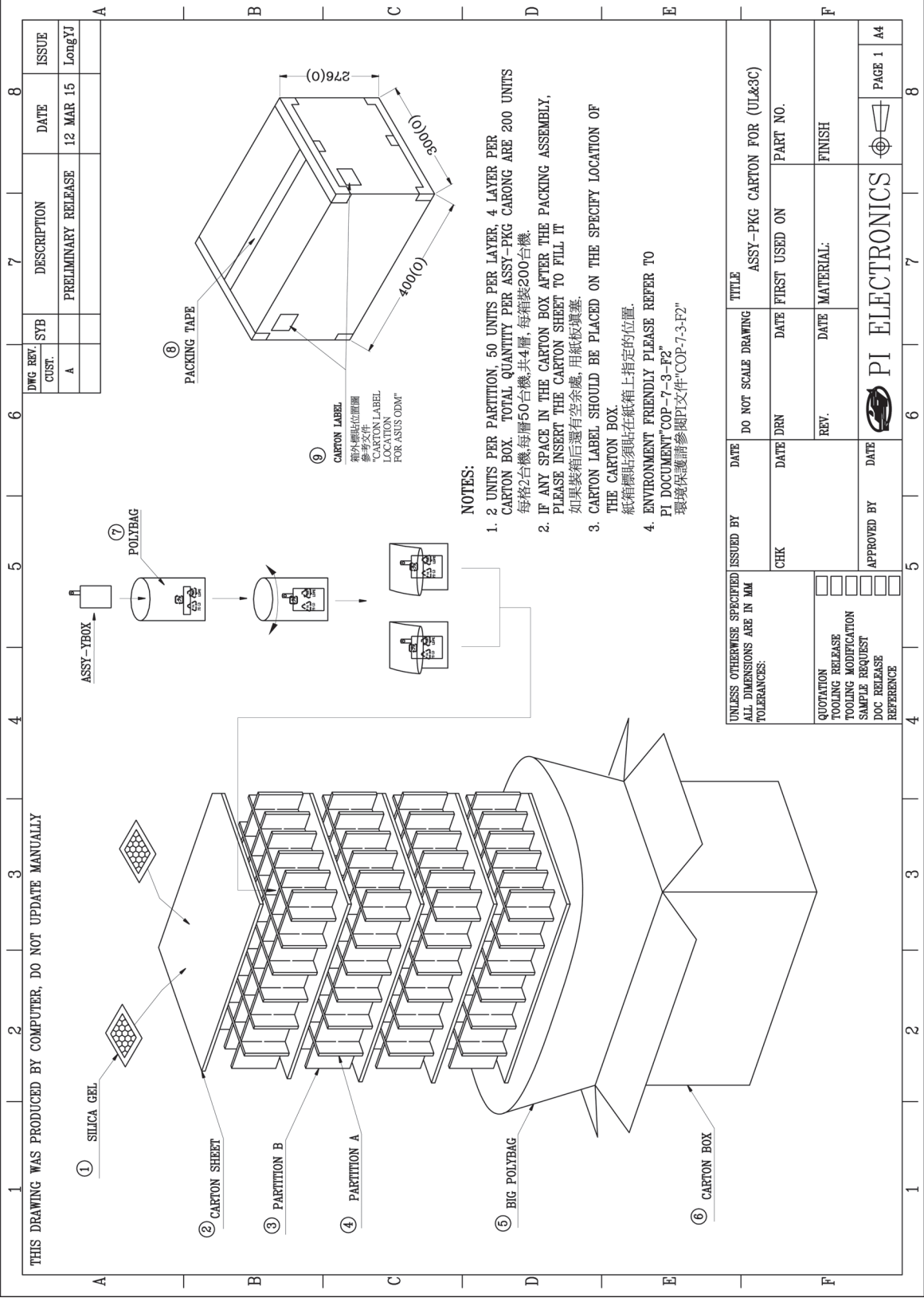
## **Section 6 - Packaging Drawing**

## OPP FILM LOCATION DRAWING

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Carton Drawing





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