

PI ELECTRONICS (H.K.) Ltd.

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AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

CUSTOMER NAME	: ASUS
CUSTOMER PART NO.	: 0A001-00282200
PI MODEL NO.	: AD2081320110-2LF
REV.	: 1
DATE	: 27-Jul-2018

APPROVED	CHECKED	DRAWN
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AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

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

PI Model No.	Customer Part No.	Customer Model Name
AD2081320110-2LF	0A001-00282200	

PI ELECTRONICS (H.K.) Ltd.
AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

Table of Contents :

Cover Page.....	3
Section 1 - History of Changes.....	3
Section 2 - Specification.....	5
1. DESCRIPTION	6
2. ELECTRICAL SPECIFICATION.....	6
2.1. TYPE	6
2.2. INPUT.....	6
2.3. OUTPUT	7
2.4. OTHERS.....	7
3. RELIABILITY.....	8
4. ENVIRONMENTAL	8
4.1. CLIMATIC SPECIFICATIONS	8
4.2. DYNAMIC SPECIFICATIONS.....	9
5. SAFETY AND EMC.....	9
5.1. DIELECTRIC WITHSTANDING VOLTAGE.....	9
5.2. SAFETY STANDARD.....	9
5.3. EMC SPECIFICATION.....	9
6. MECHANICAL SPECIFICATIONS	11
Section 3 - Outline Drawing.....	12
Section 4 - DC Cable Drawing.....	14
Section 5 - Rating and S/N Label Drawing.....	16
Section 6 - Packaging Drawing.....	20

Section 1 - History of Changes

PI ELECTRONICS (H.K.) Ltd.
AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

History of Changes :

Date	Rev	Remarks
26-Apr-2018	1	Preliminary release.
27-Jul-2018	1	Update the content of Section 3,4,5,6

Section 2 - Specification

PI ELECTRONICS (H.K.) Ltd.
AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

1. DESCRIPTION

This is a general purpose AC/DC adaptor which converts 100Vac~240Vac to a stabilized DC voltage of 5.0V/2.0A .

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 | : < 0.3A. |
| 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 ² 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/50Hz and 115Vac/60Hz.
Off Mode: P _{out} =0.25W, P _{in} <0.45W |
| 2.2.6 | Efficiency | : ≥ 79%
Under the active mode and input voltage 115Vac/60Hz&230Vac/50Hz.
The power supply efficiency shall be more than 77.5% 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 69.8% measure at 115V/60Hz and 230Vac/50Hz |

Notes :

- The average efficiency shall comply with the DOE VI / COC v5 Tier 2 request.
- 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.
- (The measure point is end of DC cable , the cable impedance is 180m ohm)

PI ELECTRONICS (H.K.) Ltd.
AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

2.3. OUTPUT

- 2.3.1 Rated Output Voltage : $V_o=5.0V_{dc}$
- 2.3.2 Output Voltage Regulation : $V_o=4.85\sim 5.25V_{@}(0A-0.49A)$ Load
 $V_o=5.0\sim 5.25V_{@}(0.5A-Full)$ Load
- Notes : The output voltage is measured at USB connect.
- 2.3.3 Output Ripple and noise : $<200mV_{p-p}$. The output Ripple & Noise voltage shall be less than 100mV at load 0.5A.
- Notes :
- Ripple voltage is measured using oscilloscope with bandwidth limited to 20MHz.
 - A 10uF electrolytic capacitor and a 0.1uF ceramic capacitor shall be connected to the connector in parallel.
- 2.3.4 Output Load Current : Rating current: 2.0A
Operating Max current: $\approx 2.0A$
Operating Min current: $\approx 0A$
Ripple current: $<100mA_{(pk-pk)}$
- 2.3.5 Overshoot/Undershoot : 10% of nominal voltage
- 2.3.6 Hold up time : $>5ms_{@Full\ load/100Vac}$
- 2.3.7 Rise time : $<40ms$.
- 2.3.8 ID Function : 1. D+ and D- short to follow BC 1.2
2. Add another ID resistor from short point (D+ & D-) to Ground
3. ID resistor is 750Kohm

2.4. OTHERS

- 2.4.1 Turn-on Delay : < 3 seconds. The input voltage measure at 100/240Vac and at maximum output load.
- 2.4.2 Over Voltage Protection : $V_o < 7.5V$, the recover voltage $< 3.3V$ at auto recovery mode.
- 2.4.3 Over Current Protection : $(2.1-2.45)A$, Auto-recovery.
- 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 : Set the output at maximum load and switch AC ON/OFF at 264Vac/63Hz for 10000 cycles.
AC ON 4 sec and OFF 1 sec for each cycle.
No any component damage or fault condition during the test.
- 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: $2.0A_{@5ms}, 0.5A_{@25ms}$
Output voltage range: Max. 6V , Min. 4.6V

PI ELECTRONICS (H.K.) Ltd.
AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

- If output drop less than 4.6V, the during shall be less than 3ms @ condition 1.
- 2.4.7 Case Temperature rise : The case temperature rise shall be less 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)& dynamic load as item 2.4.6.
2. Microphone at a distance of 3cm from the surface and noise level is less than 25dB@static load (from 0A to Full Load, 0.05A pre step)& dynamic load as item 2.4.6.
- 2.4.9 Common Mode Noise : Test Equipment and Environment : Follow EN61000-4-6
Test voltage Condition : 3V
Test Frequency : 150K ~ 600KHz
Specification : CMN Max.: 0.8V@150K~600K

3. RELIABILITY

- 3.1 MTBF : > 150K Hours 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.
- 3.4 AC Plug Pull/Push Test : >30kg, the AC plug can't separated from the main body and case can't deformation.
- 3.5 DC Connector Salt Spray Test : - Follow EIA Spec.
- Salt Solution : Density 5%, PH value 6.5~7.2
- Chamber Temp. and Corrosion Time : 35 °C for 48hrs
- Without excessive corrosion or crack in appearance.

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)

PI ELECTRONICS (H.K.) Ltd.
AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

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.

5.2. SAFETY STANDARD

Type	Country/Region	Standard
CB	EU	IEC60950/EN60950
UL	US/CA	UL60950

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
	±12KV, 10 times	A
Contact Discharge	±8KV, 10 times	A

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

PI ELECTRONICS (H.K.) Ltd.
AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

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

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.

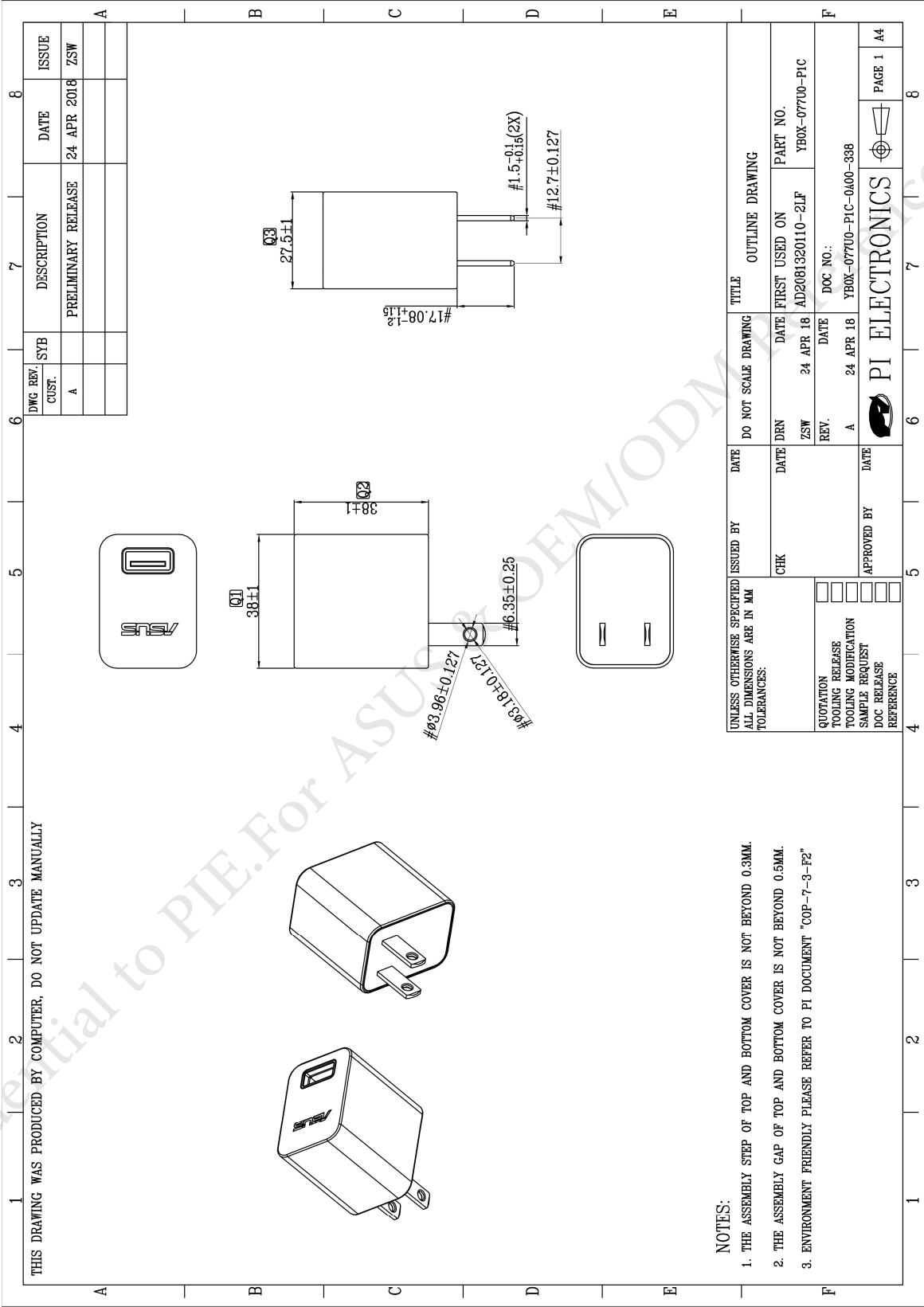
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AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

6. MECHANICAL SPECIFICATIONS

- | | | |
|------------|-------------------------|---|
| 6.1 | Weight | : 39.7g ±5% |
| 6.2 | Input Connector | : Refer to attached drawing |
| 6.3 | Output Cable | : Refer to attached drawing |
| 6.4 | Output Connector | : Refer to attached drawing |
| 6.5 | Drop Test | Drop 30 times(5 times on each face) on each
cycles from a height of 36 inches onto a
: hardwood surface. There must be no function
damage after testing. |

Section 3 - Outline Drawing

PI ELECTRONICS (H.K.) Ltd.
AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)



Section 4 - DC Cable Drawing

PI ELECTRONICS (H.K.) Ltd.
AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

N/A

Section 5 - Rating and S/N Label Drawing

RATING LABEL DRAWING

Page : 17

2D BAR CODE LABEL DRAWING

Page : 18

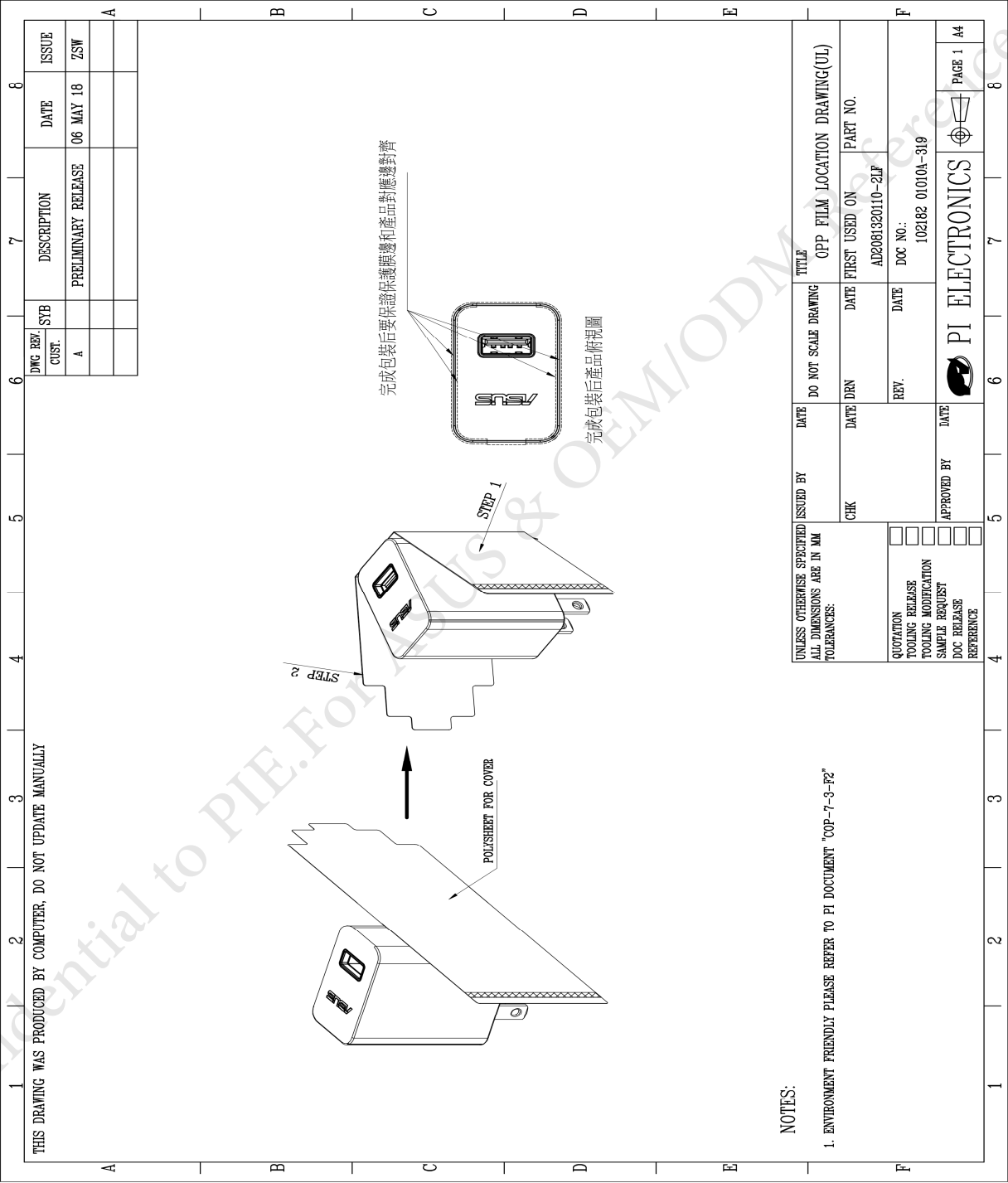
LABEL LOCATION DRAWING

102182 011901-302_20180727

Section 6 - Packaging Drawing

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AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

OPP FILM LOCATION DRAWING



ASSY-CARTON

102182 011901-302_20180727

PI ELECTRONICS (H.K.) Ltd.
AD2081320110-2LF APPROVAL PACKAGE (Rev. 1)

ASSY-PALLET

THIS DRAWING WAS PRODUCED BY COMPUTER, DO NOT UPDATE MANUALLY		6		7		8	
		CUST.	PI	SYB	DESCRIPTION	DATE	ISSUE
		A	B		PRELIMINARY RELEASE	15 MAY 2013	ZSW
		B	1	A2	CHANGE THE HEIGHT OF STACKING	12 JUL 2016	ZSW
							A

NOTES:		4	5	6	7	8
ITEM	DESCRIPTION	PARAMETER				
1	No. of CARTON BOXES PER PALLET(PCS):	8				
2	No. of LAYERS PER PALLET(PCS):	6				
	TOTAL HEIGHT AFTER STACK UP(MM):	1806+50				
3	TOTAL QUANTITY OF CARTON BOXES PER PALLET ASSEMBLY(PCS):	48				
	No. of LAYERS PER PALLET(PCS):	5				
4	TOTAL HEIGHT AFTER STACK UP(MM):	1530+50				
	TOTAL QUANTITY OF CARTON BOXES PER PALLET ASSEMBLY(PCS):	40				
5	No. of LAYERS PER PALLET(PCS):	6				
	TOTAL HEIGHT AFTER STACK UP(MM):	1806+50				
6	TOTAL QUANTITY OF CARTON BOXES PER PALLET ASSEMBLY(PCS):	48				
	No. of LAYERS PER PALLET(PCS):	6				
⑤ THE CARTON BOX ARE STRAPPED BY PACKAGE BELT AT FIRST. THEN PUTTING THE STRETCH WRAP FILM TO HOLD.						
⑥ WRAP THE STACKED CARTONS FIRST BY 1 LAYER OF STRETCH FILM THEN PLACE THE ANGLED CARD BOARD, THEN CONTINUE WRAPPING WITH STRETCH FILM FOR TWO LAYERS.						
⑦ THE PALLET WILL BE SELECTED ACCORDING TO SHIPPING REQUIREMENT THAT MARKETING PROVIDED.						
⑧ ENVIRONMENT FRIENDLY PLEASE REFER TO PI DOCUMENT						

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MM		DATE	DO NOT SCALE DRAWING		TITLE	
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