ENGINEERING SPECIFICATION

90W AC Adaptor

Part Number: PA-1900-32I2

EFFECTIVE DATE: Jan. 03, 2018

Revision History

REV. NO.	ITEM	DESCRIPTIONS OF CHANGE		CHANGED DATE :	REF. DOC. NO.
		BEFORE	AFTER		
A		Release IPOWER		2018/01/03	

Table Contents

1. General

1.1. Scope

This specification defines the performance characteristics of a grounded, single phase, 90W, 1 outputs power supply. This specification also defines worldwide safety and electromagnetic compatibility requirements for the power supply which is intended for use in notebook products.

1.2. Type of Power

Without power line harmonics and input 3pin model.

2. INPUT REQUIREMENTS

2.1. INPUT VOLTAGE

	MINIMUM	MAXIMUM	NOMINAL
LOW RANGE	90VAC	132VAC	100-120VAC
HIGH RANGE	180VAC	264VAC	200-240VAC

2.2. FREQUENCY

	MINIMUM	MAXIMUM	NOMINAL
SINGLE PHASE	47Hz	63Hz	50-60Hz

2.3. Voltage Section

A full range will be provided to select the appropriate range.

2.4. EPA Requirement

The Adaptor shall be designed to meet EPS requirement, No Load Power Loss shall be less than 0.15W at 115VAC/60Hz and 230VAC/50Hz. And Average Efficiency value of 25%, 50%, 75% and 100% load condition shall be more than 89.0% with both 115VAC/230VAC. Efficiency at 10% load shall be more than 79.0% for COC Tier 2.

2.5. Input Current

Input Current will be 1.7 Amps maximum at input voltage 90Vac/60Hz and at maximum load conditions.

2.6. Inrush Current

The adapter inrush current shall be no damage and less than the ratings of its critical components for all conditions of line voltage.

Test Condition			Design Requirement
AC input	DC Output		
220V / 50Hz	+19V	4.74A	Shall be meet 22% fuse and 100% bridge diode I^2t.

2.7. TINY LOAD EFFICIENCY

Test condition	Design Requirement
115VAC/60Hz,230VAC/50Hz, load=0.25W	AC input power<0.5W
115VAC/60Hz,230VAC/50Hz, load=0.5W	AC input power<1.0W
115VAC/60Hz,230VAC/50Hz, load=1.0W	AC input power<1.7W
115VAC/60Hz,230VAC/50Hz, load=1.5 W	AC input power<2.4W
115VAC/60Hz,230VAC/50Hz, load=11.6W	AC input power<14 W
115VAC/60Hz,230VAC/50Hz, load=18.7W	AC input power<22 W

3. OUTPUT REQUIREMENTS

3.1. STATIC DC LOAD

NOMINAL VOLTAGE (V)	LOAD CURRENT(A)		REGULATION
	MIN.	MAX.	
19	0	4.74	18.55V-19.95 V

3.2. PEAK LOAD

NOMINAL VOLTAGE (V)	LOAD CURRENT(A)	REGULATION
19	6.16 (2 msec. duration)	> 17V

*Duty: Ton=2ms (130%), Toff=98ms (100%)
*Load Condition: 100% - 130%
*AC input: 100Vac/50Hz & 240Vac/50Hz

3.3. DYNAMIC LOAD

NOMINAL VOLTAGE (V)	LOAD CURRENT(A)		REGULATION
	MIN.	MAX.	
19	0.1	4.74	18.05V~19.95V

*Freq: 10Hz to 1KHz
*Slew Rate: 1A/us
*Duty: 50%
*Load Condition: 0.1A – 2.37A, 2.37A – 4.74A
*AC input: 90Vac/60Hz & 240Vac/50Hz

3.4. RIPPLE AND NOISE

The ripple and noise of the outputs shall be measured at the load end if the output cables when terminated to load impedance as specified in paragraph 3.3.

OUTPUT VOLTAGE		RIPPLE & NOISE (P-P)	
19	V	380	mV

Note1: Use 20MHz Bandwidth frequency scope.
Note2: Filter capacitors are connected to each pins of the mating output connector. Capacitance values and material type are listed below.

VOLTAGE NOM.(V)	CAPACITANCE NOM. (uF)	MATERIAL TYPE
19	0.47uF/47uF	CERAMIC/ELE

3.5. CAPACITIVE LOAD

Plugging a 220uF capacitor to a live adapter, and adapter can't shut down (Vo >17V within 1ms).

3.6. RISE TIME

The output rise time (measured from the 10% point to the 90% point on the waveform) shall be less than 100ms.

3.7. HOLD UP TIME

The power supply shall maintain voltage regulation within the specified limits in item 3.1 for at least 5 milliseconds after loss input voltage at 115VAC/60Hz and 230VAC/50Hz at maximum output load.

3.8. OVERSHOOT

During power-on or power-off, the output voltage shall be monotonically increasing or decreasing with respect to the overshoot which shall neither exceed 20.5 volts (8%).

4. NO LOAD OPERATION

The power supply shall be able to operate under no load condition. No damage to the power supply is allowed and internal component cannot be stressed beyond its rating.

5. FREQUENCY OF OPERATION

To keep audible noise to a minimum, power supply shall be switched at frequencies higher than 20kHz (except no load operation)

6. TEMPERATURE COEFFICIENT

The temperature coefficient of the all outputs is 0.05% per degree centigrade maximum.

7. PROTECTION

7.1. Over voltage protection

The power supply should shut down for any cause of over voltage conditions before any output exceeds its limits below.

NOMINAL OUTPUT VOLTAGE (V)	OVER VOLTAGE (V)
19V	20~27

The power supply is latched and power on reset is required.

7.2. Short circuit Protection

A short circuit placed on DC output shall cause no damage to the power supply. The power supply will be latch-off.

7.3. Over Current Protection

The power supply shall provide over current protection on output. Maximum current inception point of output shall be limited to the following values:

OUTPUT VOLTAGE (V)	CURRENT LIMIT (A)
19	5.21~7.11

The power supply shall cause no damage and will be latch-off.

7.4. Over Temperature Protection

The Adaptor shall provide Over Temperature Protection and the case temperature shall be under 105℃ under input 100VAC~240VAC , the PSU shall be latch-off.

8. TURN ON TIME

The turn on time shall be less than 3 sec. for input AC115V/60Hz and Full load conditions. (Be measured from AC on point to the 90% point of the output voltage)

9. SAFETY REQUIREMENTS

9.1. DIELECTRIC STRENGTH

Primary to Secondary: 4242 VDC for 1 minute.
Primary to PE: 2150 VDC for 1 minute.
Leakage current must be less than 10mA.

9.2. INSULATION RESISTANCE

Primary to secondary: 30 Meg. ohms Min., 500VDC for 1 minute.

9.3. GROUND LEAKAGE CURRENT

The power supply ground leakage current shall be less than 75uA at 240Vac/50Hz for L to FG and N to FG.

10. ELECTROMAGNETIC COMPATIBILITY

Power supply for use with the host system will be tested to conform with the following emission standards.

10.1. LIGHTNING SURGE

Test condition	
Differential mode	±1kV
Common mode	±2kV

10.2. ESD

The power supply shall meet Contact discharge ±8KV and Air discharge ±15KV requirement, when power supply is operating at maximum load condition.

11. Environment

11.1. Operating

Temperature: 0 to 40 degrees centigrade.
Relative Humidity: 5 to 90 percent, non-condensing.

11.2. Shipping AND Storage

Temperature: -20 to +85 degrees centigrade.
Relative Humidity: 5 to 90 percent, non-condensing.

12. Temperature Rise of Case Surface

The case temperature of AC adaptor with 25℃ Amb/no air flow/ 100VAC/ 50Hz/ full load condition shall not exceed (△T) 50℃ on Bottom side and (△T) 45℃on other sides.

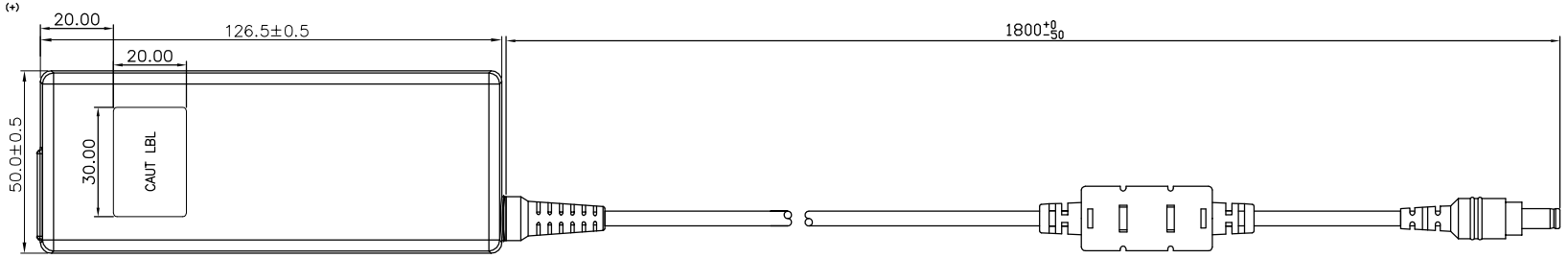
13. Acoustic noise

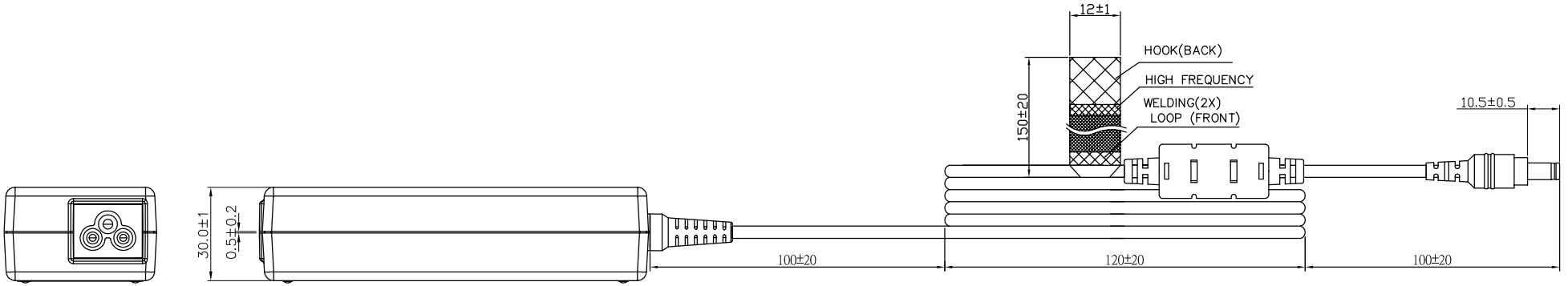
The PSU set up measured should be made at 5cm distance between adapter and microphone. Test load is 0.1A, 0.2A, 0.3A…to full load. Input voltage is 100Vac and 240Vac. Any sound or noise ≦25 dB (A) for 120~15 KHz, ≦31 dB (A) for 16 KHz~20 KHz.

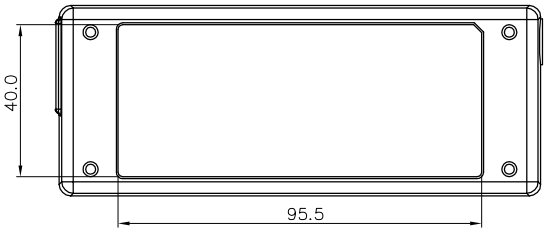
NOTES: UNLESS OTHERWISE SPECIFIED.

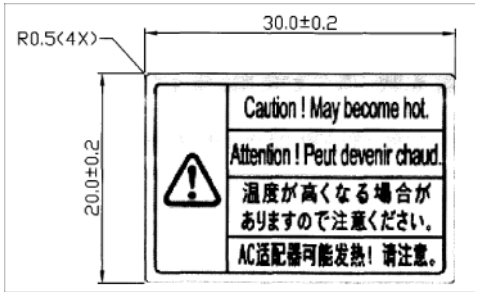
1. ALL DIMENSIONS ARE IN mm.
   TOLERANCES TO BE ±0.25 mm.
2. PARTS SPECIFIED AS FOLLOWS:
2-1. ENCLOSURE:
   MATERIAL: SABIC Innovative Plastics Japan LLC 945(GG)
   Bayer AG 6485+ (f1) CHEIL INDUSTRIES INC CHEMICALS DIV EN-1052 (+)
   V-0 RATED FLAMMABILITY.
   * COLOR: GE #701 (BLACK).
   * TEXTURE: MT-11020 (MAT).
2-2. AC RECEPTACLE:
   * IEC 320, C6 CERTIFIED, 3 WAY.

2-3. DC OUTPUT:
   * REFERENCE DC CORD DRAWING
     DIELECTRIC: BLACK PBT RESIN.
   * CORE: RH 14.2*28.5*6.35
   * CABLE: UL AWM 1571,
     WIRE #18 & SPIRAL #18.
   * JACKET COLOR: BLACK.









REVISION	DESCRIPTION	DATE	ZONE	UNIT: mm	SCALE: 1.000
A	RELEASED	2017-07-05	1A~8F	FINAL DATE	

2D FILE	OUTLINE_PA-1900-32I2	DESIGNER	Felix			LITEON	TITLE: OUTLINE / PROJECT: PA-1900-32I2	PART NO.: / DRAWING NO.:	REV.: A
3D FILE		CHECKER		APPROVED					

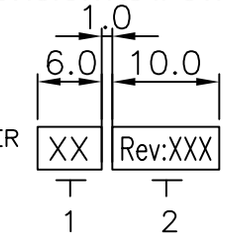
NOTES: UNLESS OTHERWISE SPECIFIED.

1. TOLERANCES TO BE ±0.2 mm.
2. THE ARRANGEMENT OF LAMINATE WITH MATERIAL THICKNESS AS FOLLOWS:

①	MYLAR FILM(MAT)	0.05±10%
②	ACRYLIC ADHESIVE	0.018±10%
③	SYNTHESIS(#75)	0.075±10%
④	ACRYLIC ADHESIVE	0.028±10%
	GRAND TOTAL THK.	0.171±10%

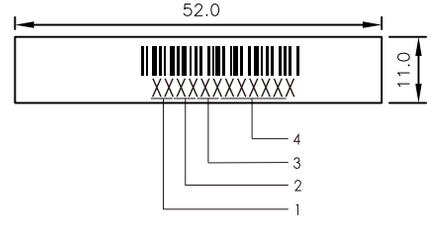
3. THE LINES ARE 0.5 mm WIDE.
4. COLOR: CHARACTERS, LOGOS AND LINES SHALL BE WHITE, BASE TO BE BLACK.
5. APPROVED VENDOR MUST BE UL RECOGNIZED & CSA CERTIFIED.
6. THIS LABEL SHALL BE MARKED WITH THE CSA VENDOR IDENTIFI-CATION MARK AS SPECIFIED IN THE CSA LIST. LOCATE APPROX. AS SHOWN.
7. SAFETY STANDARD ORGANIZATION SYMBOLS ARE 7.62 TO 5.0 HIGH.
8. LETTERING SHOULD BE CLEAR-CUT. SURFACE TO BE FREE OF DEFECT.

9. S/N SPECIFIED AS FOLLOWS: (PRINTED BY LITE-ON)
   1--SERIAL MODEL: I2
   2--REVISION: Rev: CUSTOMER REVISION AS IPOWER (SALES OFFER)

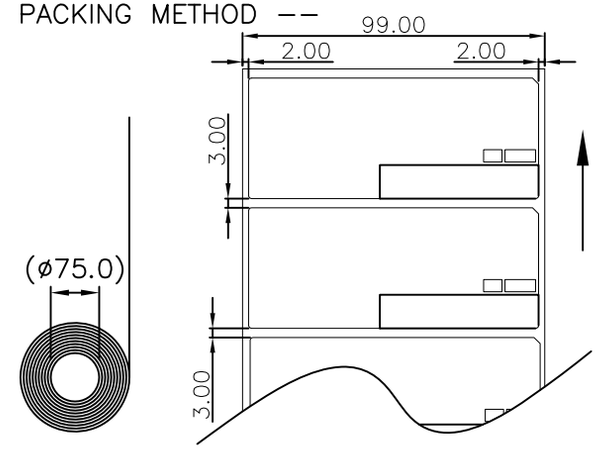


* COLOR:
WHITE BASE, BLACK LETTER

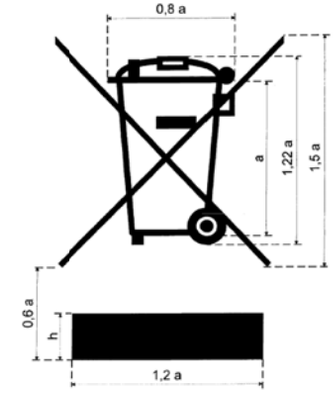
10. BAR CODE(CODE128) SPECIFIED AS FOLLOWS: (PRINTED BY LITE-ON)
    1 – FACTORY CODE, CHINA SU ZHOU (FORDGOOD) – A2
    CHINA SU ZHOU (LI SHIN) – A3
    DONGGUAN (LITEON FABRICATION 2) – L2
    DONGGUAN (LITEON FABRICATION 3) – L3
    CHANGZHOU (LITEON) --> C1
    2 – A.D. THE END NUMBER OF PRODUCT YEAR,
    1995--95, 1996--96, 1997--97..... ; 2000--2K, 3000--3K.....
    3 – WEEK, PRODUCT WEEK 01,02,03,...
    4 – PRODUCT NO.: SERIAL NO. (MONTH RESET FROM 000001~999999)

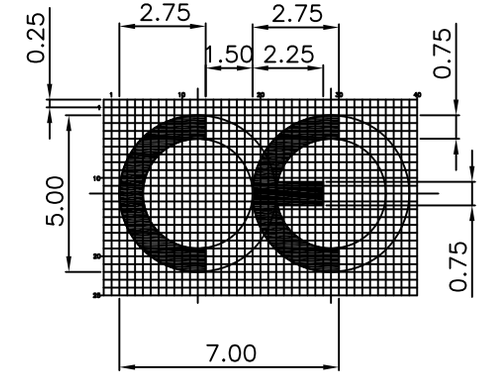


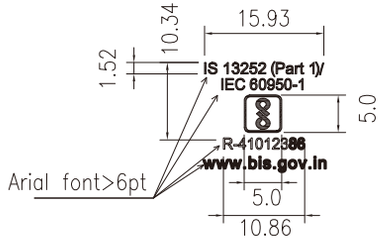
* NOTES FOR INCOMING PACKAGE:
PACKING METHOD --

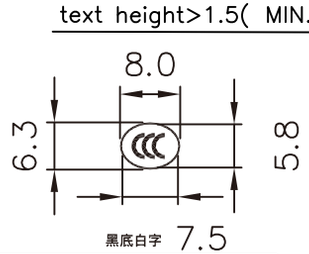


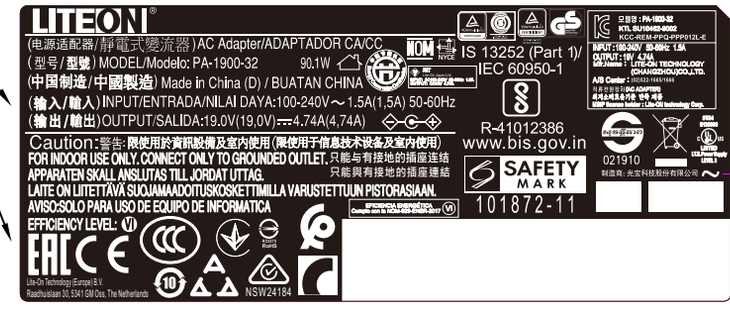
Trash can symbol and black bar >7mm height









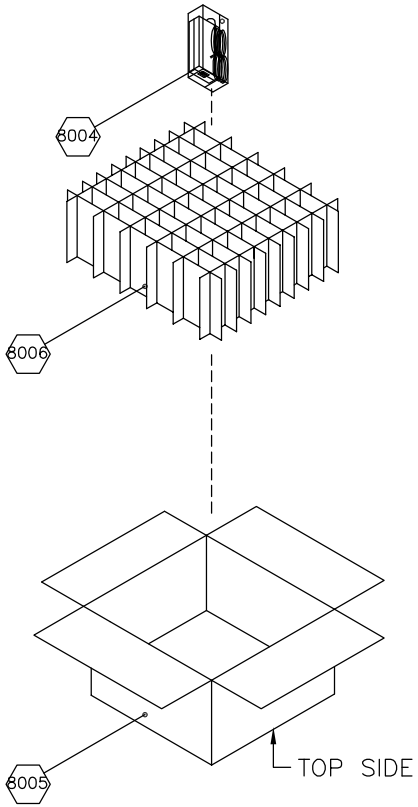


SEE NOTES 6.

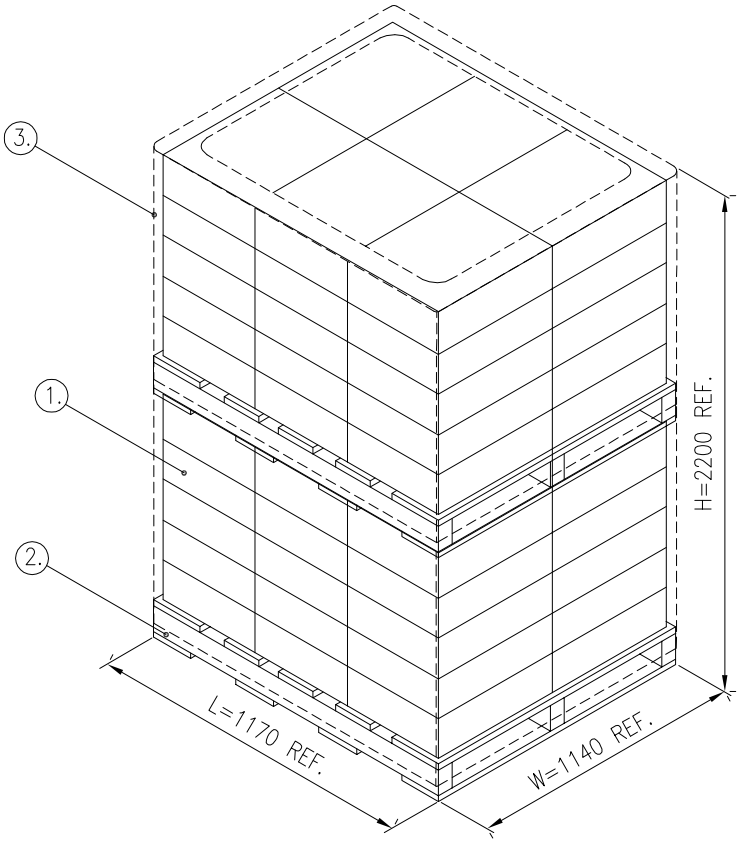
LABEL SIZE:
39.5(L) x 95(W),
R1(3X), C2
TOLERANCE TO BE
+0/-0.2

REVISION	DESCRIPTION	DATE	CHECKER
E	Update PSE	2024/12/20	
D	Update PSE	2024/11/21	
C	Update PSB, NOM, CCC, BIS, CE ErP Lot 7, TUV, EU Address, PSE, KC, RCM, add Morocco	2021/02/17	
B	Update KVALITET	2017/12/28	

PRINTING DATE	2020/01/31		2D FILE	6A004F_PA-1900-32I2	DESIGNER	Mika		TITLE: SPEC LABEL	PART NO.: 6A004F
FINAL DATE	2020/01/31		SAFETY		APPROVER	Randy		PROJECT: PA-1900-32I2	DRAWING NO.: 493-6A004F Rev. E
UNIT : mm	SCALE:								



CUSTOMER P/N	
DESCRIPTION (V)	ADP SPS LUXSHARE
LITE-ON P/N	
REV. NO.	VENDOR BUYER
QUANTITY (PC'S)	
MFG DATE (yyww)	
MADE IN	CHINA
WEIGHT (kg)	NET: GROSS:
CARTON NO.	



* PALLET ASS'Y DRAWING:
1. ALL DIMENSIONS ARE IN mm.
2. PARTS SPECIFIED AS FOLLOWS:

ITEM	PART NAME	QUANTITY
1.	CARTON	1 CARTON=40 UNITS
2.	PALLET	1 PALLET=5 LAYERS =30 CARTONS =1200 UNITS
3.	POLYESTER FILM	2 LAYERS MIN. =1200 UNITS
4.	40 FT CONTAINER	1 CONTAINER=40 PALLETS
	20 FT CONTAINER	1 CONTAINER=20 PALLETS

REVISION	DESCRIPTION	DATE	ZONE
A	RELEASED	2017-07-05	

PRINTING DATE 2017-07-05 | FINAL DATE 2017-07-05 | UNIT: mm | SCALE:

2D FILE PACKING_PA-1900-3212 | 3D FILE | DESIGNER Felix | CHECKER | APPROVED

LITEON LITE-ON ELECTRONICS, INC.

TITLE: PACKING DRAWING | PART NO.: ---- | PROJECT: PA-1900-3212 | DRAWING NO.: | REV.: A