



## Specification for Approval

**Customer** : Lomex Ltd.

**Part name** : AC ADAPTER

**Description** : 12.0 Volts / 2.0 Amps

**Model no.** : ATS024T-W120E(Europe/ CoC Tier 2)

**Customer P / N** : 24-02-25

**Product P / N** : ATS024TW120E415218

**Issued date** : 08 – Apr. – 2020

**Version** : A1

**Issued stamp** :

**Customer's approval signature**

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## 24.0 W AC Adapter SPECIFICATION

**Model no.** : **ATS024T-W120E (Europe/CoC Tier 2)**

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**Description** : **12.0 Volts / 2.0 Amps**

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**Part no.** : **ATS024TW120E415218**

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**Version** : **A1**

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**Date** : **08 - Apr. - 2020**

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| Approved | Reviewed | Checked | Prepared | Sales |
|----------|----------|---------|----------|-------|
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## ■ Approval documents / spec. revised records

■ Customer : Lomex Ltd.

■ Model no : ATS024T-W120E

■ Original documents content : Spec. 10 pages , Attachment 2 pages

| Revised records No. | Date         | Description ( Before / After ) | Page(s) revised | Revised by (Adapter/Customer) | Version |
|---------------------|--------------|--------------------------------|-----------------|-------------------------------|---------|
| 1                   | Apr./08/2020 | Issue                          | --              | Billy                         | A1      |
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## 1. Feature :

- ◆ **Input** : Universal 100 ~ 240 Vac / 50 ~ 60 Hz Input , without any slide switch.
- ◆ **Output** : +12.0 V / 0 ~ 2.0 A
- ◆ **Case Dimension** : 72 (L) \* 34 (W) \* 90 (H) mm (±1mm)
- ◆ **Efficiency** : Eff (av) ≥ 86.204% (115V/60Hz input for Level VI)  
Eff (av) ≥ 86.204% (230V/50Hz input for GEMS VI)  
Eff (av) ≥ 86.804% (230V/50Hz input for CoC Tier2)  
Eff ≥ 76.804%(At 230V/50Hz input@10% load for CoC Tier2)
- ◆ **Safety** : CB(60950-1) / CB(62368-1) / GS(60950-1) / GS(62368-1)
- ◆ **EMI** : CE Class B ; Conduction & Radiation Met.
- ◆ **Protection** : OVP (Over Voltage Protection) 、SCP (Short Circuit Protection) 、OCP (Over Current Protection)
- ◆ **High frequency design** , less power consumption.
- ◆ Suitable for usage at Telecommunication, Computer, Industrial Controller, & OA System.
- ◆ Meet DoE Level VI/ CoC Tier 2 / ErP ( Lot 7 ) / GEMS / NRCan.

## 2. Input :

|                       |                                                                                                                                                                                                                         |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1 Voltage           | Universal 100 ~ 240 Vac , single phase                                                                                                                                                                                  |
| 2.2 Frequency         | 50 - 60 Hz                                                                                                                                                                                                              |
| 2.3 Current           | 0.58 A Max.                                                                                                                                                                                                             |
| 2.4 Inrush Current    | 50 A Max. / 100 Vac ; 60 A Max. / 230 Vac<br>(Cold Start At 25 °C , Full Load)                                                                                                                                          |
| 2.5 Efficiency        | Eff (av) ≥ 86.204% (115V/60Hz input for Level VI)<br>Eff (av) ≥ 86.204% (230V/50Hz input for GEMS VI)<br>Eff (av) ≥ 86.804% (230V/50Hz input for CoC Tier2)<br>Eff ≥ 76.804%(At 230V/50Hz input@10% load for CoC Tier2) |
| 2.6 Power Consumption | Pi ≤ 0.10 W ( At 115V & 230Vac & No Load for Level VI)<br>Pi ≤ 0.075 W ( At 230Vac & No Load for CoC Tier2)                                                                                                             |

$$\text{※Eff}_{(av)} = \frac{E1 + E2 + E3 + E4}{4}$$

E1=efficiency with 25% rated load ; E2= efficiency with 50% rated load  
E3=efficiency with 75% rated load ; E4= efficiency with 100% rated load

## 3. Output :

|               |                |                                       |
|---------------|----------------|---------------------------------------|
| 3.1 DC Output | Voltage        | +12.0 V ± 5%                          |
|               | Current        | 2.0 A Max.                            |
|               | Regulation     | 11.4 Vmin. ~ 12.0 V typ. ~ 12.6 Vmax. |
|               | Ripple & Noise | 120 mV <sub>p-p</sub> Max.            |
|               | Total Power    | 24.0 W Max.                           |

Remark : For ripple & noise measurement , use a 20 MHz bandwidth frequency oscilloscope , and add a 0.1 μF multilayer cap.  
and a low ESR electrolytic cap. (10 μF ) at output connector terminals. (at nominal line voltage , full load)



## 4. Protection :

|                                    |                                                            |
|------------------------------------|------------------------------------------------------------|
| 4.1 Over Voltage Protection (OVP)  | 22 V max.                                                  |
| 4.2 Short Circuit Protection (SCP) | Automatic recovery after short-circuit fault being removed |
| 4.3 Over Current Protection(OCP)   | 5 A max.                                                   |

Remark : When short circuit protection or over current protection is activated , the power supply will shutdown automatically.

Once the abnormal condition resulting in the failure being removed , the power supply will restart accordingly.

When over voltage protection is activated , the power supply will shutdown.

## 5. Safety 、EMI and EMC Requirement :

### 5.1 Safety Requirement

a. Safety : CB(60950-1) / CB(62368-1) / GS(60950-1) / GS(62368-1)

b. Dielectric Strength : 10mA Max. Cut off current

|     |                      |                      |
|-----|----------------------|----------------------|
| (1) | Primary to Secondary | 3000Vac for 1 Minute |
|-----|----------------------|----------------------|

c. Insulation Resistance :

|     |                      |                     |
|-----|----------------------|---------------------|
| (1) | Primary to Secondary | 10 M Ohm for 500Vdc |
|-----|----------------------|---------------------|

5.2 EMI Requirement : CE Class B ; Conduction & Radiation Met.

5.3 Leakage Current : Less than 0.25 mA

## 6. Operation and Environment Performance :

### 6.1 Temperature Range

|           |                 |
|-----------|-----------------|
| Operating | 0 °C - +40 °C   |
| Storage   | -20 °C - +80 °C |

### 6.2 Humidity Range(Non-condensing)

|           |               |
|-----------|---------------|
| Operating | 20% - 80 % RH |
| Storage   | 10% - 90 % RH |

6.3 Cooling : By natural air

7. M.T.B.F. : 300,000 Hrs. (calculated hours at 25 °C , by Telcordia SR-332)

## 8. Mechanical :

8.1 Weight : 170 g Typical

8.2 Cable type : Black UL 2468 22 AWG  
(wire + plug)

Plug :  $\phi 5.5 * \phi 2.1 * 9.5$  mm

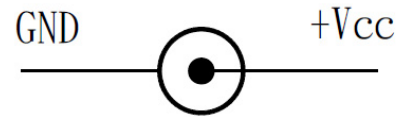
(Tuning Fork & cannellure)

8.3 Cable length : 1500 mm

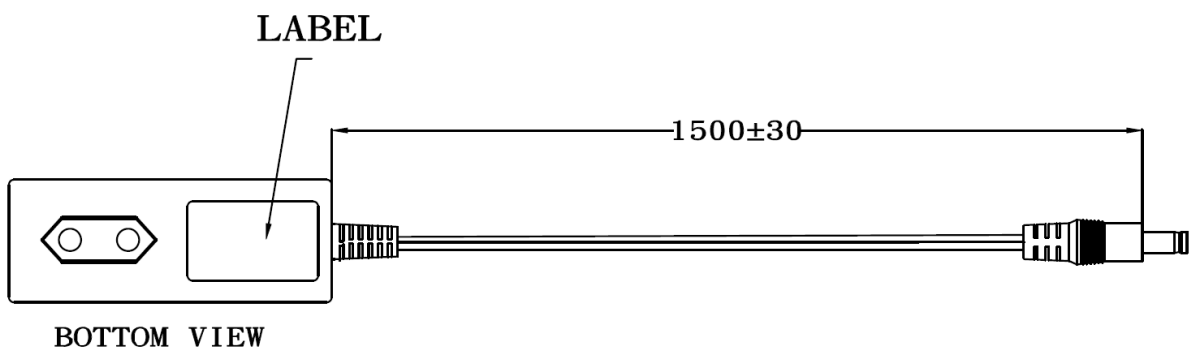
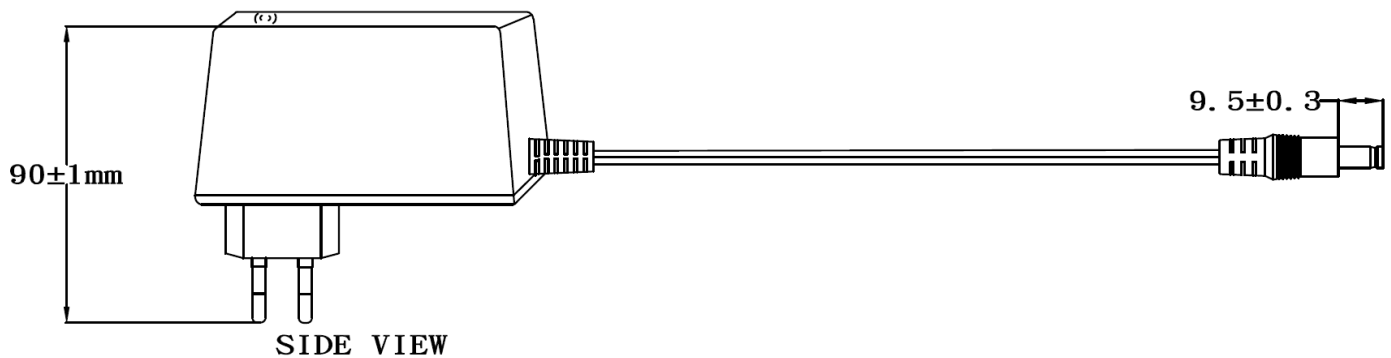
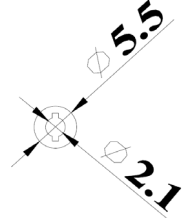
8.4 Case dimension : 72 (L) \* 34 (W) \* 90 (H) mm ( $\pm 1$ mm)

8.5 Material flammability : UL 94V-0

8.6 External appearance : As drawing below (scale  $\rightarrow$  mm)



Output cable plug pin assignment



## 9. Label :

- 9.1 Label materials : Metalized polyester label (silver gloss)
- 9.2 Color : Black background with silver printing
- 9.3 Label dimension : 27.5 (L)\* 24.5 (W) (±0.1mm)
- 9.4 Label thickness : 75#

100%



300%



"XXX"

Label supplier's code.

It is accurate that the number of words depends on the real finished product.

ID NO."X"

Manufacturer's code.

It is accurate that the number of words depends on the real finished product.

## Label Part No. :9443110300

## A. Line Regulation Test

Test Result :

| Test condition      | Spec.         | Reading 1 | Reading 2 | Reading 3 |
|---------------------|---------------|-----------|-----------|-----------|
| 90 Vac / 50 % Load  | 11.4 ~ 12.6 V | 11.966 V  | 11.952 V  | 11.984 V  |
| 115 Vac / 50 % Load | 11.4 ~ 12.6 V | 11.966 V  | 11.952 V  | 11.984 V  |
| 132 Vac / 50 % Load | 11.4 ~ 12.6 V | 11.966 V  | 11.952 V  | 11.984 V  |
| 180 Vac / 50 % Load | 11.4 ~ 12.6 V | 11.966 V  | 11.952 V  | 11.984 V  |
| 230 Vac / 50 % Load | 11.4 ~ 12.6 V | 11.966 V  | 11.952 V  | 11.984 V  |
| 264 Vac / 50 % Load | 11.4 ~ 12.6 V | 11.966 V  | 11.952 V  | 11.984 V  |

## B. Efficiency Test

Test Result :

| Test condition   | Spec.        | Reading 1 | Reading 2 | Reading 3 |
|------------------|--------------|-----------|-----------|-----------|
| 115 Vac          | 86.204% Min. | 86.783%   | 86.523%   | 86.582%   |
| 230 Vac          | 86.804% Min. | 87.179%   | 86.988%   | 87.004%   |
| 230Vac @10% load | 76.804% Min. | 81.923%   | 82.038%   | 82.002%   |

$$\text{Eff}_{(av)} = \frac{E_1 + E_2 + E_3 + E_4}{4}$$

$E_1$ =efficiency with 25% rated load ,  $E_2$ = efficiency with 50% rated load

$E_3$ =efficiency with 75% rated load ,  $E_4$ = efficiency with 100% rated load

## C. Load Regulation Test

Test Result :

| Test condition       | Spec.         | Reading 1 | Reading 2 | Reading 3 |
|----------------------|---------------|-----------|-----------|-----------|
| 115 Vac / 0 % Load   | 11.4 ~ 12.6 V | 12.123 V  | 12.114 V  | 12.141 V  |
| 115 Vac / 50 % Load  | 11.4 ~ 12.6 V | 11.966 V  | 11.952 V  | 11.984 V  |
| 115 Vac / 100 % Load | 11.4 ~ 12.6 V | 11.811 V  | 11.801 V  | 11.833 V  |
| 230 Vac / 0 % Load   | 11.4 ~ 12.6 V | 12.123 V  | 12.114 V  | 12.141 V  |
| 230 Vac / 50 % Load  | 11.4 ~ 12.6 V | 11.966 V  | 11.952 V  | 11.984 V  |
| 230 Vac / 100 % Load | 11.4 ~ 12.6 V | 11.811 V  | 11.801 V  | 11.833 V  |

## D. Ripple & Noise Test

Test Result :

| Test condition       | Spec.                      | Reading 1              | Reading 2              | Reading 3              |
|----------------------|----------------------------|------------------------|------------------------|------------------------|
| 115 Vac / 100 % Load | 120 mV <sub>p-p</sub> max. | 36.4 mV <sub>p-p</sub> | 38.4 mV <sub>p-p</sub> | 32.6 mV <sub>p-p</sub> |
| 230 Vac / 100 % Load | 120 mV <sub>p-p</sub> max. | 43.2 mV <sub>p-p</sub> | 46.4 mV <sub>p-p</sub> | 40.2 mV <sub>p-p</sub> |

## E. Inrush Current

Test Result :

| Test condition       | Spec.     | Reading 1 | Reading 2 | Reading 3 |
|----------------------|-----------|-----------|-----------|-----------|
| 100 Vac / 100 % Load | 50 A Max. | 34.2 A    | 35.2 A    | 33.2 A    |
| 230 Vac / 100 % Load | 60 A Max. | 54.3 A    | 52.4 A    | 52.4 A    |

## F. Over Current Protection

Test Result :

| Test condition | Spec.   | Reading 1 | Reading 2 | Reading 3 |
|----------------|---------|-----------|-----------|-----------|
| 115Vac         | 5 A Max | 3.05 A    | 3.00 A    | 3.10 A    |
| 230Vac         | 5 A Max | 3.01 A    | 2.98 A    | 3.04 A    |

## G. Short Circuit Protection

Test Result :

| Test condition | Spec.         | Reading 1 | Reading 2 | Reading 3 |
|----------------|---------------|-----------|-----------|-----------|
| 115 Vac        | Auto Recovery | OK        | OK        | OK        |
| 230 Vac        | Auto Recovery | OK        | OK        | OK        |

## H. Input Power Consumption(No Load)

Test Result :

| Test condition     | Spec.          | Reading 1 | Reading 2 | Reading 3 |
|--------------------|----------------|-----------|-----------|-----------|
| 115 Vac / 0 % Load | $\leq 0.10$ W  | 0.043 W   | 0.046 W   | 0.045 W   |
| 230 Vac / 0 % Load | $\leq 0.075$ W | 0.067 W   | 0.070 W   | 0.071 W   |



## Efficiency Test Report

|    |                           |                                                            |         |      |       |
|----|---------------------------|------------------------------------------------------------|---------|------|-------|
| A. | Model Number              | : ATS024T-A/P/W120Z                                        | 12.0V   | 2.0A | 24.0W |
| B. | DC Power Cord             | : UL2468 22AWG, 1.5M                                       |         |      |       |
| C. | Average Efficiency        | :                                                          |         |      |       |
|    | Erp (Lot 7)               | $0.071 \cdot \ln(P_{out}) - 0.0014 \cdot P_{out} + 0.67 =$ | 86.204% | Min. |       |
|    | DoE Level VI              | $0.071 \cdot \ln(P_{out}) - 0.0014 \cdot P_{out} + 0.67 =$ | 86.204% | Min. |       |
|    | GEMS Level VI             | $0.071 \cdot \ln(P_{out}) - 0.0014 \cdot P_{out} + 0.67 =$ | 86.204% | Min. |       |
|    | CoC Tier 2                | $0.071 \cdot \ln(P_{no}) - 0.00115 \cdot P_{no} + 0.67 =$  | 86.804% | Min. |       |
|    | CoC Tier 2 (10% Load)     | $0.071 \cdot \ln(P_{no}) - 0.00115 \cdot P_{no} + 0.57 =$  | 76.804% | Min. |       |
| D. | NO Load Power Consumption | :                                                          |         |      |       |
|    | Erp (Lot 7)               | 0.10W Max.                                                 |         |      |       |
|    | DoE Level VI              | 0.10W Max.                                                 |         |      |       |
|    | GEMS Level VI             | 0.10W Max.                                                 |         |      |       |
|    | CoC Tier 2                | 0.075W Max.                                                |         |      |       |
| E. | Testing Equipment         | :                                                          |         |      |       |
|    | a. AC Power Source        | : " Zentech " 2700M-10                                     |         |      |       |
|    | b. Electronic Load        | : " PRODIGIT " 3311C                                       |         |      |       |
|    | c. Power Meter            | : " YOKOGAWA " WT-210A                                     |         |      |       |
|    | d. Digital Meter          | : " FLUKE " 45                                             |         |      |       |
| F. | AC Input Voltage          | : 115Vac/60Hz                                              |         |      |       |

| Load Conditions                                | 100%* I <sub>0</sub> | 75%* I <sub>0</sub> | 50%* I <sub>0</sub> | 25%* I <sub>0</sub> | 10%* I <sub>0</sub> | 0%* I <sub>0</sub> |
|------------------------------------------------|----------------------|---------------------|---------------------|---------------------|---------------------|--------------------|
| Reported Quantity                              |                      |                     |                     |                     |                     |                    |
| Rms Output Current(mA)                         | 2000mA               | 1500mA              | 1000mA              | 500mA               | 200mA               | 0mA                |
| Rms Output Voltage(V)                          | 11.746V              | 11.848V             | 11.951V             | 12.053V             | 12.114V             | 12.154V            |
| Active Output Power(W)                         | 23.49W               | 17.77W              | 11.95W              | 6.03W               | 2.42W               | 0.00W              |
| Rms Input Voltage(V)                           | 115V                 | 115V                | 115V                | 115V                | 115V                | 115V               |
| Rms Input Current(A)                           | 0.451A               | 0.352A              | 0.258A              | 0.152A              | 0.070A              | 0.010A             |
| Rms Input Power(W)                             | 27.524W              | 20.457W             | 13.650W             | 6.853W              | 2.813W              | 0.043W             |
| True Power Factor (PF)                         | 0.530                | 0.504               | 0.459               | 0.391               | 0.350               | 0.039              |
| Total Harmonic Distortion of the input current | 145.0A%              | 158.7A%             | 182.1A%             | 223.1A%             | 252.6A%             | 31.6A%             |
| Power Consumed by UUT(W)                       | 4.032W               | 2.685W              | 1.699W              | 0.826W              | 0.390W              | 0.043W             |
| Active Efficiency                              | 85.351%              | 86.875%             | 87.553%             | 87.940%             | 86.129%             | *                  |
| Average Efficiency                             | 86.930%              |                     |                     |                     | 86.129%             | *                  |

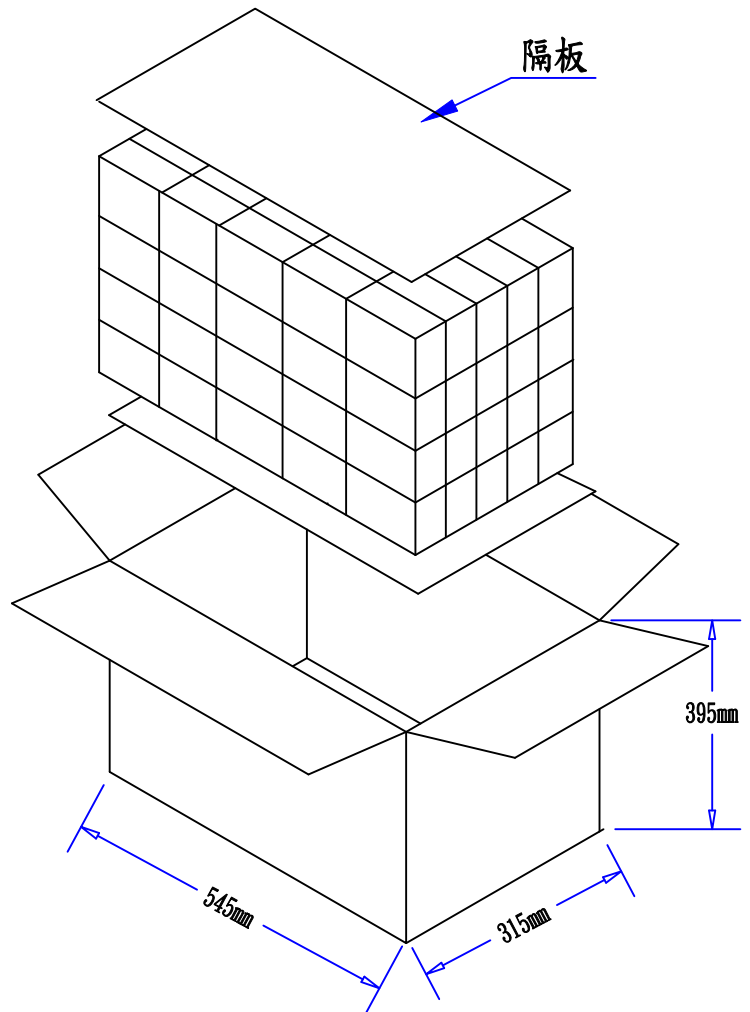
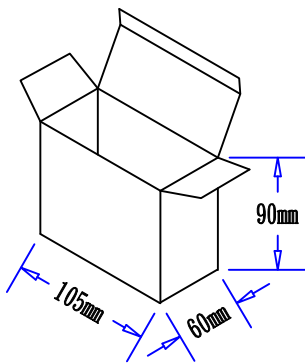
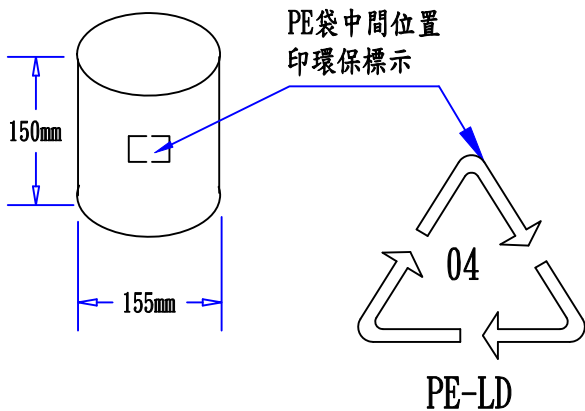
### G. AC Input Voltage : 230Vac/50Hz

| Load Conditions                                | 100%* I <sub>0</sub> | 75%* I <sub>0</sub> | 50%* I <sub>0</sub> | 25%* I <sub>0</sub> | 10%* I <sub>0</sub> | 0%* I <sub>0</sub> |
|------------------------------------------------|----------------------|---------------------|---------------------|---------------------|---------------------|--------------------|
| Reported Quantity                              |                      |                     |                     |                     |                     |                    |
| Rms Output Current(mA)                         | 2000mA               | 1500mA              | 1000mA              | 500mA               | 200mA               | 0mA                |
| Rms Output Voltage(V)                          | 11.750V              | 11.850V             | 11.953V             | 12.054V             | 12.115V             | 12.154V            |
| Active Output Power(W)                         | 23.50W               | 17.78W              | 11.95W              | 6.03W               | 2.42W               | 0.00W              |
| Rms Input Voltage(V)                           | 230V                 | 230V                | 230V                | 230V                | 230V                | 230V               |
| Rms Input Current(A)                           | 0.326A               | 0.265A              | 0.180A              | 0.100A              | 0.046A              | 0.015A             |
| Rms Input Power(W)                             | 27.200W              | 20.380W             | 13.620W             | 6.887W              | 2.885W              | 0.067W             |
| True Power Factor (PF)                         | 0.362                | 0.335               | 0.328               | 0.299               | 0.274               | 0.019              |
| Total Harmonic Distortion of the input current | 244.5A%              | 268.4A%             | 272.1A%             | 274.4A%             | 212.1A%             | 9.8A%              |
| Power Consumed by UUT(W)                       | 3.700W               | 2.605W              | 1.667W              | 0.860W              | 0.462W              | 0.067W             |
| Active Efficiency                              | 86.397%              | 87.218%             | 87.761%             | 87.513%             | 83.986%             | *                  |
| Average Efficiency                             | 87.222%              |                     |                     |                     | 83.986%             | *                  |

Tester : Wei

|          |              |    |            |
|----------|--------------|----|------------|
| 料號       | R44M1C150170 |    |            |
| 客戶       | 阿達特          | 制圖 | 潘胜         |
| 頁數       | 01           | 審核 |            |
|          |              | 批準 |            |
| 泰岳電子有限公司 |              |    |            |
| 圖號       | ADT-3433     | 日期 | 2015/08/29 |

| SHOW | REV | DESCRIPTION | DATE     | APPROVED |
|------|-----|-------------|----------|----------|
|      | A   | 初版制作        | 13/08/12 |          |
|      |     |             |          |          |
|      |     |             |          |          |



# **PIS18W00048 包裝(FOR 18W, 24W插牆式) 短環保PE泡袋厚0.09-白盒-100**

**9550006001** 1. 隔板:530(L)\*300(W)\*6mm

B=B 2/100

2. 數量:25\*4=100PCS

**9520006502** 3. 外箱:545(L)\*315(W)\*395(H)mm

K=K 1/100

**9510003502** 4. 白盒:105(L)\*60(W)\*90(H)mm 350P+CE(即C9紙加裱350磅白板紙) 1/1

**9540008801** 5. 環保PE袋:150(L)\*155(W)\*0.09mm 無色透明,單端開口,中間位置印環保標示. 1/1

6. 成品裝入PE袋后封好,再放入外箱,方向必須統一.

7. 外箱,白盒標注為外徑尺寸

8. 上述所有材料須符合環保ROHS標準.

阿達特科技股份有限公司

|                                |                         |           |                      |     |                  |
|--------------------------------|-------------------------|-----------|----------------------|-----|------------------|
| DRAWING NO. <b>PIS18W00048</b> |                         |           | APPROVAL 1 BY        |     |                  |
| UNIT                           | MODEL NO. 18W, 24W(插牆式) |           | APPROVAL 2 BY        |     |                  |
| mm                             | FILE NO. ADT-0211       |           | CHECKED BY(ENGINEER) |     |                  |
| SCALE                          | REV. A                  | SHEET 1/1 | DRAWN BY             | 李金朝 | DATE: 2013/08/12 |