



**Specification for Approval**

**Customer : Energy Access**

**Part name : Open Frame Power Supply**

**Description : 48 Volts / 9.4 Amps & 12 Volts / 0.6 Amps & 5 Volts / 1 Amps**

**Model no. : ATM450S-F480**

**Customer P / N :**

**Product P / N : ATM450SF480000004**

**Issued date : 27 - Aug. - 2021**

**Version : A1**

**Issued stamp :**

**Customer's approval signature**

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**(Philippines) : ADAPTER TECHNOLOGY CO.,LTD.**



**450 W  
Open Frame Power Supply  
Specification**

**Model no.** : **ATM450S-F480**

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Approved	Reviewed	Checked	Prepared	Sales





## 1. Feature :

- ◆ **Input** : Universal 100 ~ 240 Vac / 50 ~ 60 Hz input , without any slide switch
- ◆ **Output** : 48 V / 0 ~ 9.4 A & 12 V / 0 ~ 0.6 A & 5 V / 0 ~ 1 A
- ◆ **Case dimension** : See to the Mechanical
- ◆ **Efficiency** : 92% Typical (48 V max. load, 12 V and 5 V no load at 115 Vac)  
94% Typical (48 V max. load, 12 V and 5 V no load at 230 Vac)
- ◆ **Safety** : I.T.E. : UL / cUL  
Medical : UL / cUL / TUV-SUD
- ◆ **EMC** : CE / FCC (conduction & radiation Class B)
- ◆ **Protection** : OVP (Over voltage protection) 、 SCP (Short circuit protection) 、  
OCP (Over current protection) 、 OTP (Over Temperature Protection)
- ◆ Suitable for usage at I.T.E., industrial controller, medical
- ◆ Maximum 450 W with 13.8 CFM forced air cooling and 250 W air convection at 50 ambient temperature.

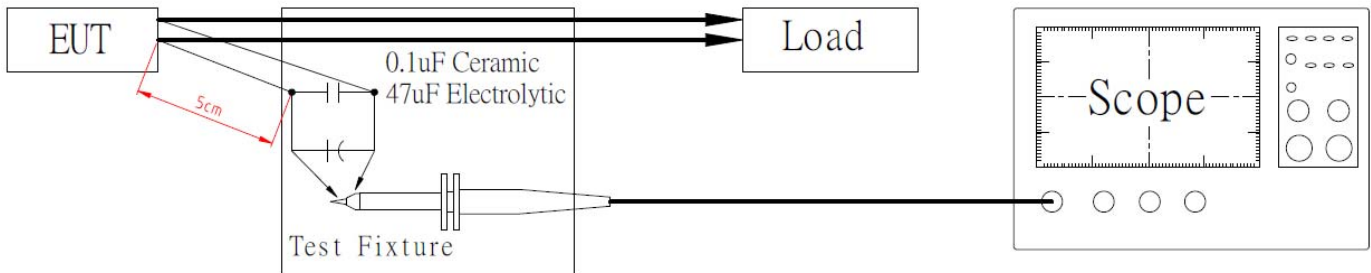
## 2. Input :

2.1 Voltage	Universal 100 ~ 240 Vac , single phase
2.2 Frequency	50 ~ 60 Hz
2.3 Current	5.3 ~ 2.2 A
2.4 Inrush current	100 A max. / 230 Vac (cold start at 25°C , Max. load) ( ac source chroma 6530 )
2.5 Efficiency	92% Typical (48 V max. load, 12 V and 5 V no load at 115 Vac) 94% Typical (48 V max. load, 12 V and 5 V no load at 230 Vac)
2.6 Power factor (PF)	Pi ≥ 0.9 (at full load)

## 3. Output :

3.1 DC output 1	Voltage	48.0 V ± 5%
	Current	Rated Load 5.2 A (air convection) Max. Load 9.4 A (13.8 CFM forced air-cooling)
	Regulation	45.6 V min. ~ 48.0 V typ. ~ 50.4 V max.
	Ripple & Noise	480 mV <sub>p-p</sub> max.
3.2 DC output 2	Voltage	12.0 V ± 5% (for fan)
	Current	0.6 A max.
	Regulation	11.4 V min. ~ 12.0 V typ. ~ 12.6 V max.
3.3 DC output 3	Voltage	5.0 V ± 5%
	Current	1 A max.
	Regulation	4.75 V min. ~ 5.0 V typ. ~ 5.25 V max.
	Ripple & Noise	100 mV <sub>p-p</sub> max.

Remark : For ripple & noise measurement , use a 20 MHz bandwidth frequency oscilloscope , and add a 0.1  $\mu$ F multilayer cap. and a Low ESR electrolytic cap. (47 $\mu$ F ) at output connector terminals. (at nominal line voltage , full load)



**Ripple & Noise measurement circuit**

#### 4. Remote on / off :

4.1 Remote on	Open or > 3.5 V
4.2 Remote off	Short to DC RTN or < 0.8V

#### 5. Protection :

5.1 Over voltage protection (OVP)	Vout * 130% max at 48 V output (Shout down) Vout * 180% max at 5 V output (Shout down)
5.2 Short circuit protection (SCP)	Automatic recovery after short-circuit fault being removed
5.3 Over current protection (OCP)	Iout * 130% max at 48 V output (auto recovery) Iout * 200% max at 5 V output (auto recovery)
5.4 Over Temperature Protection (OTP)	Shut down for 48 V and 12V

#### 6. Safety requirement :

6.1 Dielectric strength : Cut off current 10 mA

(1)	Primary to secondary	4000 Vac for 1 minute
(2)	Primary to ground	1500 Vac for 1 minute

6.2 Insulation resistance :

(1)	Primary to secondary	10 M $\Omega$ for 500 Vdc
(2)	Primary to ground	10 M $\Omega$ for 500 Vdc

6.3 Grounding test : < 0.1  $\Omega$

6.4 Leakage current : Less than 100 uA



## 7. Operation and environment performance :

### 7.1 Temperature range

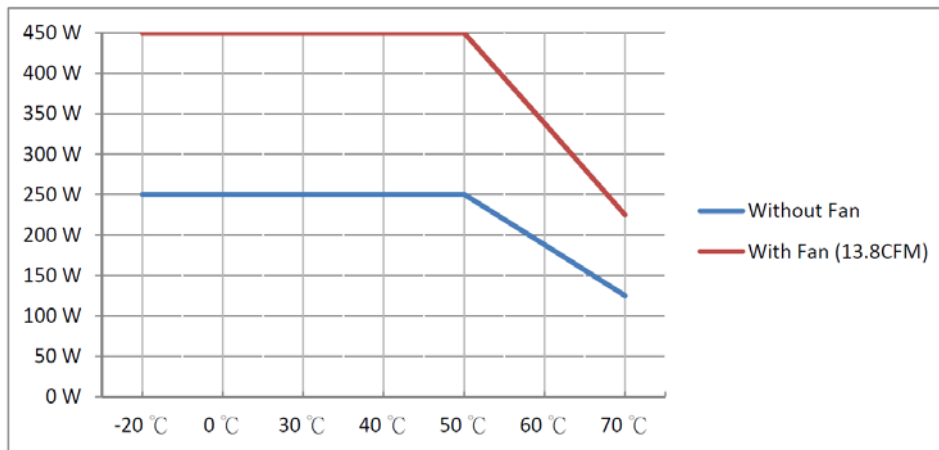
Operating	-20°C ~ +50°C
Storage	-20°C ~ +80°C

### 7.2 Humidity range (non-condensing)

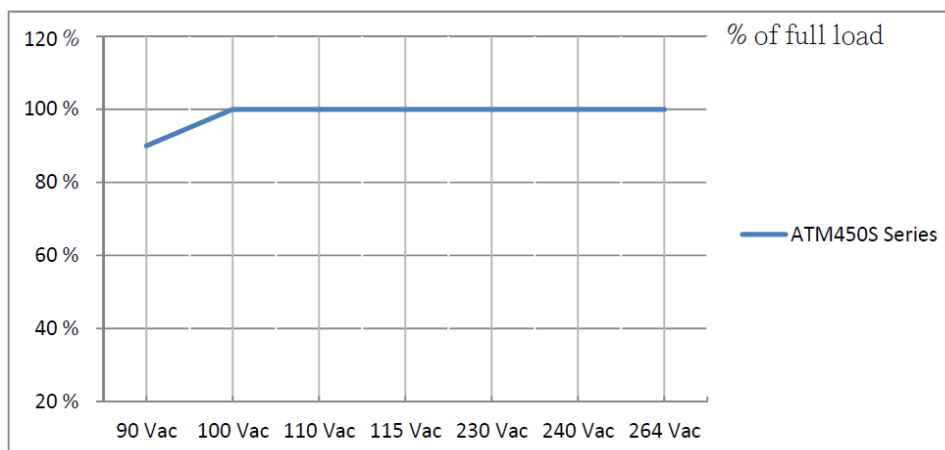
Operating	20% ~ 80% RH
Storage	10% ~ 90% RH

### 7.3 Cooling : By natural air

## 8. M.T.B.F. : 300,000 Hrs. at 250 W (calculated hours at 25°C , by Telcordia SR-332)



**Power De-rating curve**



**Derating Curve VS. Input Voltage**



## 9. Connector and pin assignment

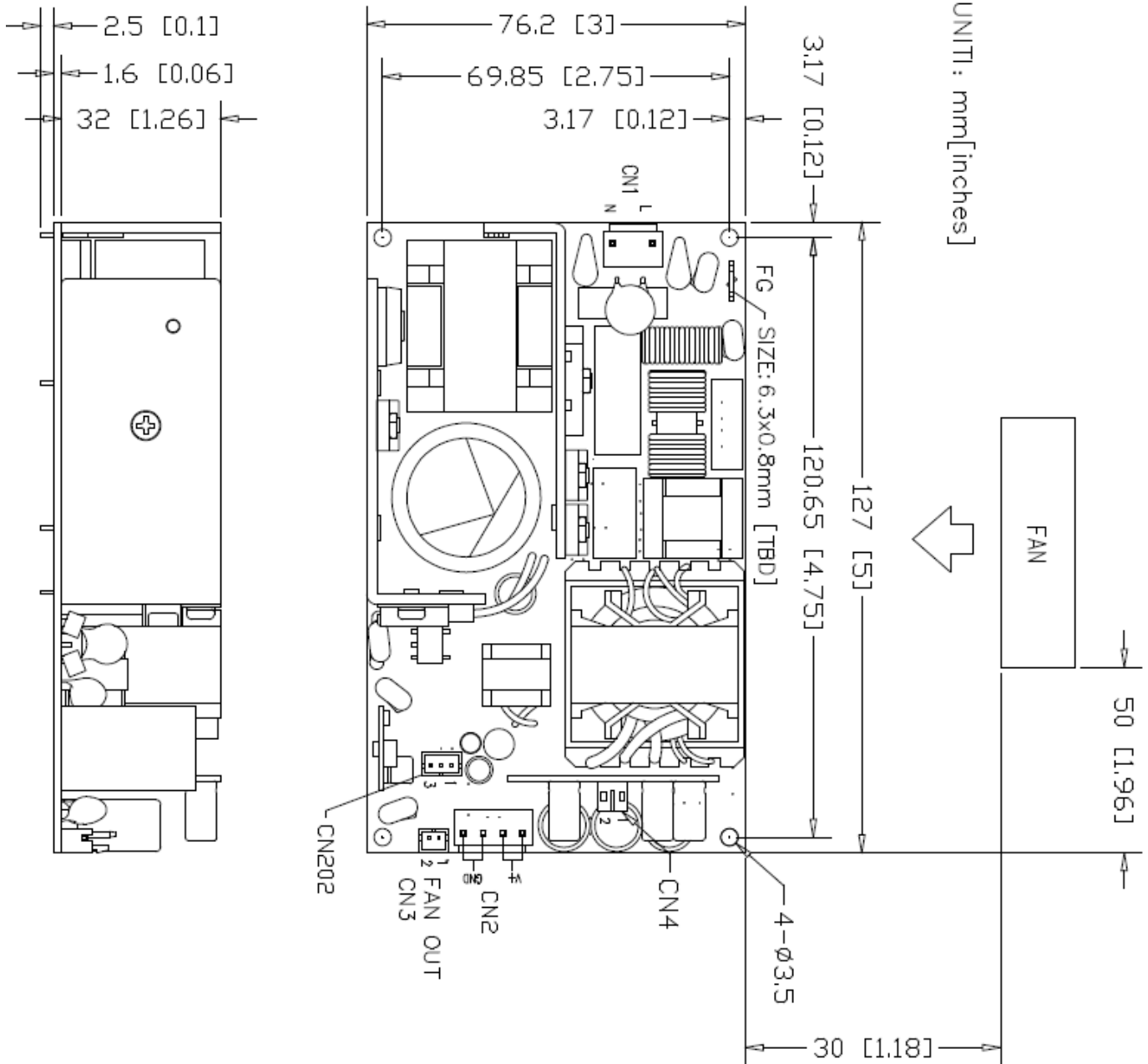
Input connector CN1 (wafer : JST: B2P3-VH) ,or equivalent	
Pin 1	Neutral
Pin 2	Line
GND	Ground
Output connector CN2 (wafer : 承消:CV-W3961-04) ,or equivalent	
Pin 1	VO+
Pin 2	VO+
Pin 3	DC RTN
Pin 4	DC RTN
Output connector CN3 (wafer : CP-W20-02) ,or equivalent	
Pin 1	12 V for Fan
Pin 2	DC RTN
Output connector CN202 (wafer : CP-W20-03) ,or equivalent	
Pin 1	5 V for standby
Pin 2	DC RTN
Pin 3	Remote on /off
Output connector CN4 (wafer : CP-W20-02) ,or equivalent	
Pin 1	VO+ (sense+)
Pin 2	DC RTN (sense-)

## 10. Mechanical :

10.1 Weight : 390 g Ref.

10.2 Dimension : 127 mm(L) \* 76.2 mm(W) \* 38.1(H) mm ± 1 mm

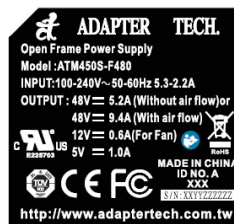
10.3 External Look :



## 11. Label :

- 11.1 Label materials : Metalized polyester label (silver gloss)
- 11.2 Color : Black background with silver printing
- 11.3 Label dimension : 32 (L) \* 30 (W) ± 0.2 mm
- 11.4 Label thickness : 75#

### 100%

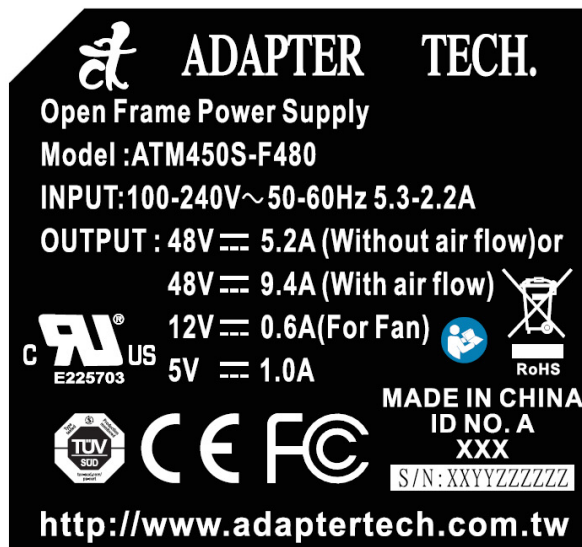


"XXX"

Label supplier's code  
It is accurate that the number  
of words depends on the real  
finished product

S/N:XXYYZZZZZZ  
XX=Year=2021=21  
YY=Week=01  
ZZZZZZ=Serial number  
=000001~999999

### 250%



## Label Part No:9443120940

## A. Line Regulation Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
90 Vac / 50% Load	48 V : 45.6 ~ 50.4 V	48.02 V	48.00 V	48.00 V
	12 V (fan) : 11.4 ~ 12.6 V	11.96 V	11.96 V	11.96 V
	5 V : 4.75 ~ 5.25 V	5.00 V	5.00 V	5.00 V
115 Vac / 50% Load	48 V : 45.6 ~ 50.4 V	48.02 V	48.00 V	48.00 V
	12 V (fan) : 11.4 ~ 12.6 V	11.96 V	11.96 V	11.96 V
	5 V : 4.75 ~ 5.25 V	5.00 V	5.00 V	5.00 V
132 Vac / 50% Load	48 V : 45.6 ~ 50.4 V	48.02 V	48.00 V	48.00 V
	12 V (fan) : 11.4 ~ 12.6 V	11.96 V	11.96 V	11.96 V
	5 V : 4.75 ~ 5.25 V	5.00 V	5.00 V	5.00 V
180 Vac / 50% Load	48 V : 45.6 ~ 50.4 V	48.02 V	48.00 V	48.00 V
	12 V (fan) : 11.4 ~ 12.6 V	11.96 V	11.96 V	11.96 V
	5 V : 4.75 ~ 5.25 V	5.00 V	5.00 V	5.00 V
230 Vac / 50% Load	48 V : 45.6 ~ 50.4 V	48.02 V	48.00 V	48.00 V
	12 V (fan) : 11.4 ~ 12.6 V	11.96 V	11.96 V	11.96 V
	5 V : 4.75 ~ 5.25 V	5.00 V	5.00 V	5.00 V
264 Vac / 50% Load	48 V : 45.6 ~ 50.4 V	48.02 V	48.00 V	48.00 V
	12 V (fan) : 11.4 ~ 12.6 V	11.96 V	11.96 V	11.96 V
	5 V : 4.75 ~ 5.25 V	5.00 V	5.00 V	5.00 V

## B. Efficiency Test

Test Result : (When 5 V & 12 V (fan) no load)

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100% Load	92% typ.	92.33%	92.21%	92.30%
230 Vac / 100% Load	94% typ.	94.69%	94.53%	94.62%

## C. Load Regulation Test

Test Result : (At 5 V output when 48 V 50% load & 12 V 50% load(fan))

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 0% Load	5 V : 4.75 ~ 5.25 V	5.04 V	5.04 V	5.04 V
115 Vac / 50% Load	5 V : 4.75 ~ 5.25 V	5.00 V	5.00 V	5.00 V
115 Vac / 100% Load	5 V : 4.75 ~ 5.25 V	4.95 V	4.95 V	4.95 V
230 Vac / 0% Load	5 V : 4.75 ~ 5.25 V	5.04 V	5.04 V	5.04 V
230 Vac / 50% Load	5 V : 4.75 ~ 5.25 V	5.00 V	5.00 V	5.00 V
230 Vac / 100% Load	5 V : 4.75 ~ 5.25 V	4.95 V	4.95 V	4.95 V



## Test Result : (At 12 V(fan) output when 5 V 50% load & 48 V 50% load)

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 0% Load	12 V : 11.4 ~ 12.6 V	11.95 V	11.95 V	11.95 V
115 Vac / 50% Load	12 V : 11.4 ~ 12.6 V	11.95 V	11.95 V	11.95 V
115 Vac / 100% Load	12 V : 11.4 ~ 12.6 V	11.95 V	11.95 V	11.95 V
230 Vac / 0% Load	12 V : 11.4 ~ 12.6 V	11.95 V	11.95 V	11.95 V
230 Vac / 50% Load	12 V : 11.4 ~ 12.6 V	11.95 V	11.95 V	11.95 V
230 Vac / 100% Load	12 V : 11.4 ~ 12.6 V	11.95 V	11.95 V	11.95 V

## Test Result : (At 48 V output when 5 V 50% load & 12 V(fan) 50% load)

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 0% Load	48 V : 45.6 ~ 50.4 V	48.20 V	48.20 V	48.20 V
115 Vac / 50% Load	48 V : 45.6 ~ 50.4 V	48.02 V	48.00 V	48.02 V
115 Vac / 100% Load	48 V : 45.6 ~ 50.4 V	47.90 V	47.89 V	47.90 V
230 Vac / 0% Load	48 V : 45.6 ~ 50.4 V	48.20 V	48.20 V	48.20 V
230 Vac / 50% Load	48 V : 45.6 ~ 50.4 V	48.02 V	48.00 V	48.02 V
230 Vac / 100% Load	48 V : 45.6 ~ 50.4 V	47.90 V	47.89 V	47.90 V

## D. Ripple & Noise Test

### Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100% Load	48 V : 480 mV <sub>pp</sub> Max.	205 mV	225 mV	225 mV
	5 V : 100 mV <sub>pp</sub> Max.	75 mV	75 mV	80 mV
230 Vac / 100% Load	48 V : 480 mV <sub>pp</sub> Max.	205 mV	225 mV	225 mV
	5 V : 100 mV <sub>pp</sub> Max.	75 mV	75 mV	80 mV

## E. Inrush Current

### Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230 Vac / 100% Load	100 A Max.	85 A	85 A	88 A



## F. Short Circuit Protection

**Test Result : (At 5 V output when 12 V (fan) & 48 V output 50% load)**

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

**Test Result : (At 12 V (fan) output when 5 V & 48 V output 50% load)**

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

**Test Result : (At 48 V output when 5 V & 12 V (fan) output 50% load)**

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

## G. Over Current Protection

**Test Result : (At 5 V output when 12 V (fan) & 48 V output 50% load)**

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac	Iout * 200% Max.	158%	160%	158%
230 Vac	Iout * 200% Max.	158%	160%	158%

**Test Result : (At 48 V output when 5 V & 12 V (fan) output 50% load)**

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac	Iout * 130% Max.	122%	120%	125%
230 Vac	Iout * 130% Max.	122%	120%	125%



## H. Over Voltage Protection

Test Result : (At 5 V output)

Test condition	Spec.	Reading 1	Reading 2	Reading 3
		5 V	5 V	5 V
115 Vac / 50% Load	Auto Recovery	160%	160%	160%
230 Vac / 50% Load	Auto Recovery	160%	160%	160%

Test Result : (At 48 V output)

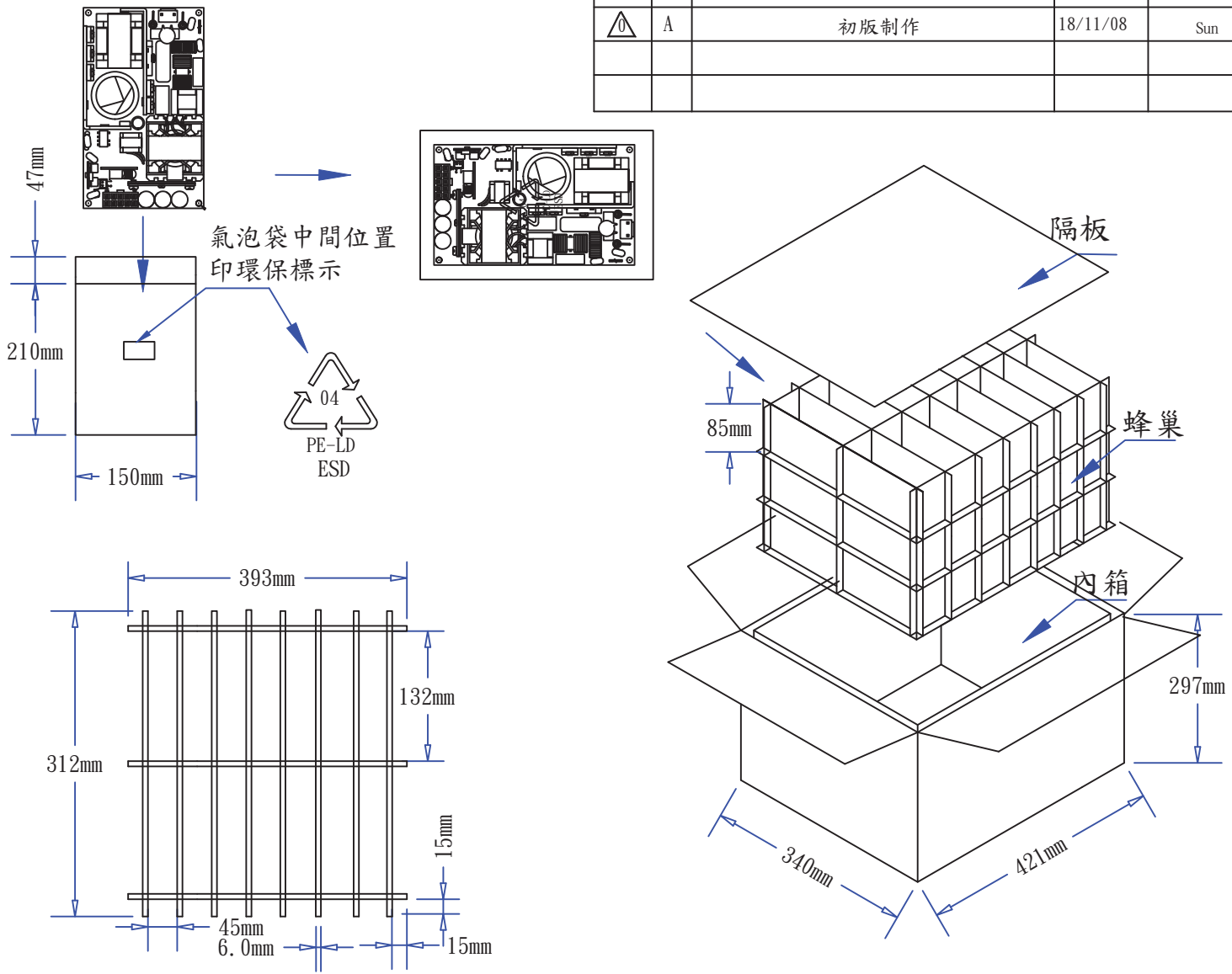
Test condition	Spec.	Reading 1	Reading 2	Reading 3
		48 V	48 V	48 V
115 Vac / 50% Load	Shutdown	130%	130%	130%
230 Vac / 50% Load	Shutdown	130%	130%	130%

## I. Power Factor

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100% Load	$\geq 0.9$	0.99	0.99	0.99
230 Vac / 100% Load	$\geq 0.9$	0.98	0.98	0.98

REVISIONS				
SHOW	REV	DESCRIPTION	DATE	APPROVED
△	A	初版制作	18/11/08	Sun



**PIS450W0001 包裝(ATM450S-F)(K=K)環保防靜電氣泡袋-內箱-邊刀-42**

- 9550040601** 1. 隔板:393(L)\*312(W)\*6mm K=K 4/42
- 2. 數量:7\*2\*3=42PCS
- 9520063101** 3. 外箱:421(L)\*340(W)\*297(H)mm K=K 1/42
- 9520063001** 4. 內箱:407(L)\*326(W)\*279(H)mm K=K 無上下蓋 1/42
- 9560038201** 4. 3刀卡:312(L)\*85(W)\*6mm (邊分) K=K 24/42
- 9560038301** 5. 8刀卡:393(L)\*85(W)\*6mm (邊分) K=K 9/42
- 9540005501** 6. 環保防靜電氣泡袋:210\*150\*47mm 紅色透明,單端開口, 中間位置印環保和ESD標志 1/1

- 7. 外箱標注為外徑尺寸.
- 8. 成品裝入氣泡袋需對折再用小膠紙封口. 側立裝入蜂巢內, 方向須統一.
- 9. 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  
Adapter Technology Co., Ltd.

DRAWING NO. <b>PIS450W0001</b>		APPROVAL2	
UNIT mm	MODEL NO. ATM450S-F190	APPROVAL1	
SCALE	REV. A	ENGINEER	Sun
	SHEET 1/1	DRAWN BY	Moon
Apply for sales	Apply for engineer	Use the sales	Use the engineer

2018/11/08

2018/11/08