Adapter Technology Co., Ltd.

Specification for Approval

Customer	：	**Energy Access (PG)**
Part name	：	**AC Adapter (open frame)**
Description	：	**12 Volts / 1 Amps**
Model no.	：	**ATM012T-F120 (CoC Tier 2)**
Customer P / N	：	
Product P / N	：	**ATM012TF120000006**
Issued date	：	**16 - Mar. - 2022**
Version	：	**A2**
Issued stamp	：	

Customer's approval signature

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Factory (China)：BOAYANG ELECTRONICS CO., LTD.
(Philippines)：ADAPTER TECHNOLOGY CO.,LTD.

12 W
Open Frame Power Supply
Specification

Model no.	:	**ATM012T-F120 (CoC Tier 2)**
Description	:	**12 Volts / 1 Amps**
Part no.	:	**ATM012TF120000006**
Version	:	**A2**
Date	:	**16 - Mar. - 2022**

Approved	Reviewed	Checked	Prepared	Sales
		阿達特 2022.03.16 陳信宇	阿達特 2022.03.16 陳信宇	

■ Approval documents / spec. revised records

■ Customer ： **Energy Access (PG)**

■ Model no ： **ATM012T-F120**

■ Original documents content ： Spec. 10 pages， Attachment 1 pages

Revised records No.	Date	Description (Before / After)	Page(s) revised	Revised by (Adapter/Customer)	Version
1	Nov./17/2021	Issue	--	Ian	A1
2	Mar./16 /2022	Label Material Corrected	P7	owen	A2

1. Feature：

- ♦ Input ： Universal 100 ~ 240 Vac / 50 ~ 60 Hz input，without any slide switch
- ♦ Output ： 12.0 V / 0 ~ 1.0 A
- ♦ Case dimension ： 65.0 (L) * 44.7 (W) * 24.0 (H) ± 1 mm
- ♦ Efficiency ： $Eff_{(av)}$ ≧ 82.963% (at 115 V / 60 Hz input)
  $Eff_{(av)}$ ≧ 83.263% (at 230 V / 50 Hz input for CoC Tier 2)
  Eff ≧ 73.263% (at 230 V / 50 Hz input 10 % load for CoC Tier 2)
- ♦ Safety ： I.T.E.：UL / cUL
- ♦ EMC ： CE / FCC (conduction & radiation Class B)
- ♦ Protection ： OVP (Over voltage protection)、SCP (Short circuit protection)、OCP (Over current protection)
- ♦ Suitable for usage at I.T.E., industrial controller
- ♦ Meet NRCan / DoE Level VI / CEC / GEMS VI / ErP (Lot 7) / CoC Tier 2

2. Input：

2.1 Voltage	Universal 100 ~ 240 Vac，single phase
2.2 Frequency	50 ~ 60 Hz
2.3 Current	0.29 ~ 0.17 A
2.4 Inrush current	Cold start at 25ºC，full load 60 A max. / 240 Vac (ac source chroma 6530) 120 A max. / 230 Vac (mains electricity from wall)
2.5 Efficiency	$Eff_{(av)}$ ≧ 82.963% (at 115 V / 60 Hz input) $Eff_{(av)}$ ≧ 83.263% (at 230 V / 50 Hz input for CoC Tier 2) Eff ≧ 73.263% (at 230 V / 50 Hz input 10% load for CoC Tier 2)
2.6 Power consumption	Pi ≦ 0.075 W (at 115 Vac & 230 Vac & no Load)

※$Eff_{(av)} = \frac{E_1 + E_2 + E_3 + E_4}{4}$

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

3. Output：

3.1 DC output	Voltage	12.0 V ± 5%
	Current	1.0 A max.
	Regulation	11.4 V min. ~ 12.0 V typ. ~ 12.6 V max.
	Ripple & Noise	120 mV_{p-p} max.
	Total power	12.0 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. (47 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)	3 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 requirement：

5.1. Dielectric strength ： Cut off current 10 mA

(1)	Primary to secondary	3000 Vac for 1 minute

5.2. Insulation resistance ：

(1)	Primary to secondary	10 MΩ for 500 Vdc

5.3 Leakage current ： Less than 0.25 mA

6. Operation and environment performance：

6.1 Temperature range

Operating	0ºC ~ +50ºC
Storage	-20ºC ~ +80ºC

6.2 Humidity range (non-condensing)

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

6.3 Cooling：By natural air

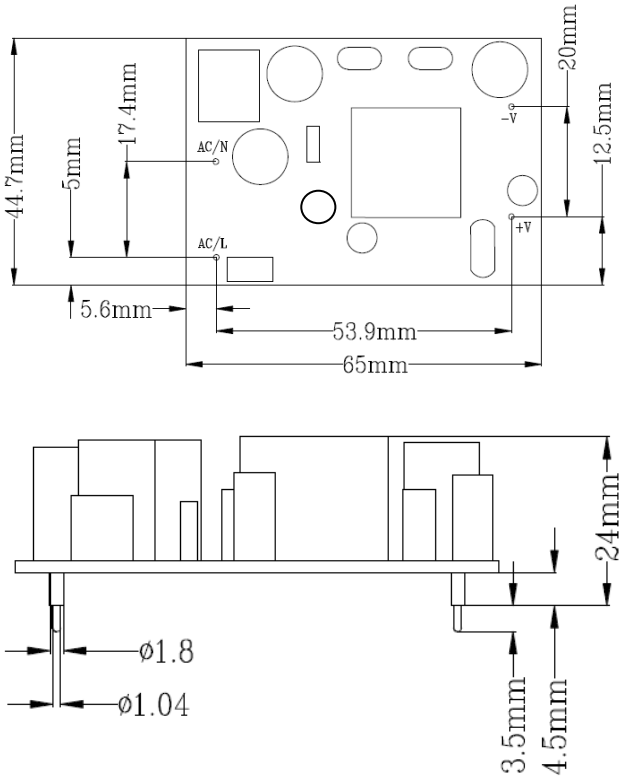
7. M.T.B.F.：300,000 Hrs. (calculated hours at 25ºC，by Telcordia SR-332)

8. Mechanical :

8.1 Weight : 40 g Ref.

8.2 Case dimension : 65.0 (L) * 44.7 (W) * 24 (H) ± 1 mm

8.3 External appearance : As drawing below (scale → mm)



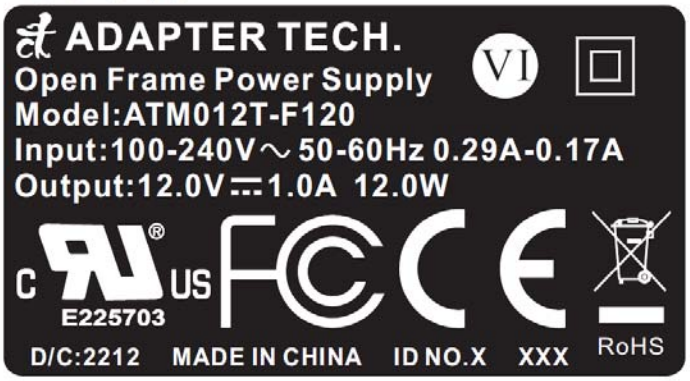
RANGE	TOLRENCE
0-10mm	±0.5mm
10-100mm	±1mm

9. Label :

9.1	Label materials	:	Synthetic Paper + PO1T
9.2	Color	:	Black background with silver printing
9.3	Label dimension	:	23.0 (L) * 12.5 (W) ± 0.1 mm
9.4	Label thickness	:	75#

100%

400%



"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. :9443122230

A. Line regulation test

Test result ：

Test condition	Spec.	Reading 1	Reading 2	Reading 3
90 Vac / 50% Load	11.4 V ~ 12.6 V	12.114 V	12.114 V	12.114 V
115 Vac / 50% Load	11.4 V ~ 12.6 V	12.114 V	12.114 V	12.114 V
132 Vac / 50% Load	11.4 V ~ 12.6 V	12.114 V	12.114 V	12.114 V
180 Vac / 50% Load	11.4 V ~ 12.6 V	12.114 V	12.114 V	12.114 V
230 Vac / 50% Load	11.4 V ~ 12.6 V	12.114 V	12.114 V	12.114 V
264 Vac / 50% Load	11.4 V ~ 12.6 V	12.114 V	12.114 V	12.114 V

B. Efficiency test

Test result ：

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac DOE Level VI	82.963% min.	85.782%	85.782%	85.782%
230 Vac COC Tier 2	83.263% min.	85.317%	85.317%	85.317%
230 Vac COC Tier 2 (10% Load)	73.263% min.	76.800%	76.800%	76.800%

$$Eff_{(av)} = \frac{E_1 + E_2 + E_3 + E_4}{4}$$

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 V ~ 12.6 V	12.140 V	12.140 V	12.140 V
115 Vac / 50% Load	11.4 V ~ 12.6 V	12.114 V	12.114 V	12.114 V
115 Vac / 100% Load	11.4 V ~ 12.6 V	12.087 V	12.087 V	12.087 V
230 Vac / 0% Load	11.4 V ~ 12.6 V	12.140 V	12.140 V	12.140 V
230 Vac / 50% Load	11.4 V ~ 12.6 V	12.114 V	12.114 V	12.114 V
230 Vac / 100% Load	11.4 V ~ 12.6 V	12.087 V	12.087 V	12.087 V

D. Ripple & Noise test

Test result ：

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100% Load	120 mV_{p-p} max.	52.2 mV_{p-p}	52.2 mV_{p-p}	52.2 mV_{p-p}
230 Vac / 100% Load	120 mV_{p-p} max.	52.8 mV_{p-p}	52.8 mV_{p-p}	52.8 mV_{p-p}

E. Inrush current

Test result ：

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230 Vac / 100% Load	60 A max. (chroma 6530)	48.2 A	48.2 A	48.2 A

F. Over voltage protection

Test result ：

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100% Load	22 V max.	18.9 V	18.9 V	18.9 V
230 Vac / 100% Load	22 V max.	18.9 V	18.9 V	18.9 V

G. Over current protection

Test result ：

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100% Load	3 A max.	1.60 A	1.60 A	1.60 A
230 Vac / 100% Load	3 A max.	1.58 A	1.58 A	1.58 A

H. Short circuit protection

Test result ：

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100% Load	Auto recovery	Ok	Ok	Ok
230 Vac / 100% Load	Auto recovery	Ok	Ok	Ok

I. Input power consumption (no load)

Test result ：

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 0% Load	≦ 0.075 W	0.052 W	0.052 W	0.052 W
230 Vac / 0% Load	≦ 0.075 W	0.064 W	0.064 W	0.064 W

Efficiency Test Report

A.	Model Number	: ATM012T-F120	12.0V	1.00A	12.00W
B.	DC Power Cord	:			
C.	Average Efficiency	:			
	Erp (Lot 7)	0.0834*ln(Pout)-0.0014*Pout+0.609 =	82.963%	Min.	
	DoE Level VI	0.0834*ln(Pout)-0.0014*Pout+0.609 =	82.963%	Min.	
	GEMS Level VI	0.0834*ln(Pout)-0.0014*Pout+0.609 =	82.963%	Min.	
	CoC Tier 2	0.0834*ln(Pno)-0.0011*Pno+0.609 =	83.263%	Min.	
	CoC Tier 2 (10% Load)	0.0834*ln(Pno)-0.00127*Pno+0.518 =	73.263%	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			

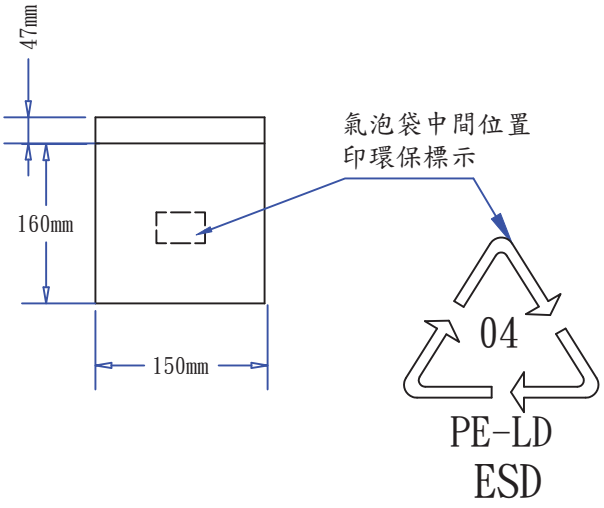
Load Conditions / Reported Quantity	100%* I_0	75%* I_0	50%* I_0	25%* I_0	10%* I_0	0%* I_0
Rms Output Current(mA)	1000mA	750mA	500mA	250mA	100mA	0mA
Rms Output Voltage(V)	12.087V	12.100V	12.114V	12.127V	12.119V	12.140V
Active Output Power(W)	12.09W	9.08W	6.06W	3.03W	1.21W	0.00W
Rms Input Voltage(V)	115V	115V	115V	115V	115V	115V
Rms Input Current(A)	0.218A	0.171A	0.125A	0.072A	0.035A	0.001A
Rms Input Power(W)	14.109W	10.513W	7.014W	3.576W	1.516W	0.052W
True Power Factor (PF)	0.563	0.535	0.488	0.432	0.377	0.452
Total Harmonic Distortion of the input current	140.0A%	153.9A%	175.2A%	222.3A%	274.6A%	292.1A%
Power Consumed by UUT(W)	2.022W	1.438W	0.957W	0.544W	0.304W	0.052W
Active Efficiency	85.669%	86.322%	86.356%	84.780%	79.941%	*
Average Efficiency	85.782%				79.941%	*

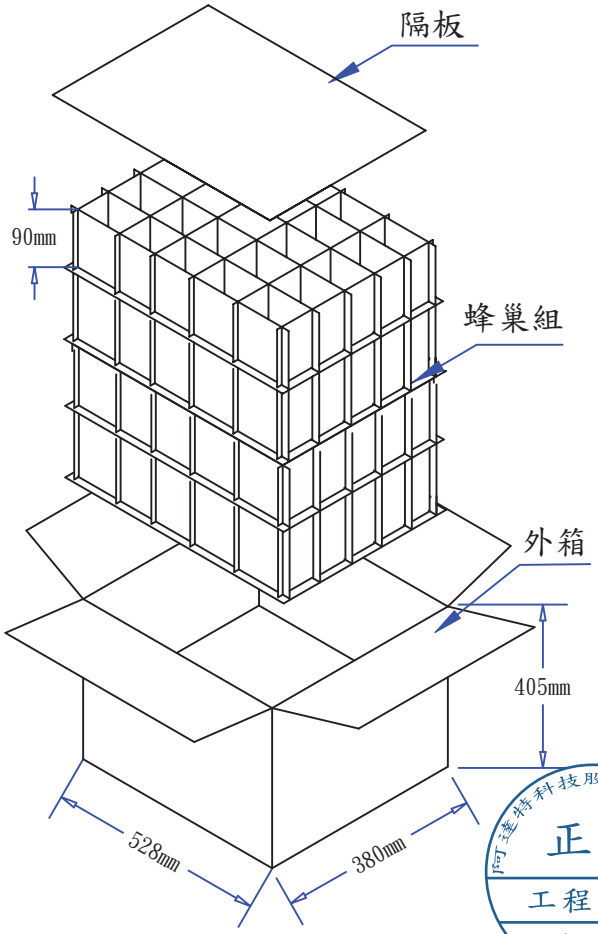
G. AC Input Voltage : 230Vac/50Hz

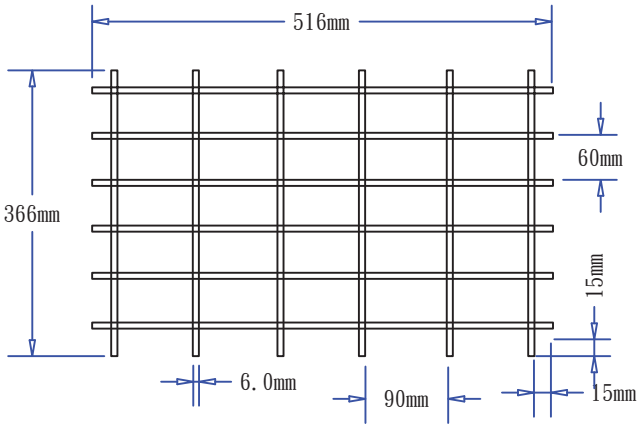
Load Conditions / Reported Quantity	100%* I_0	75%* I_0	50%* I_0	25%* I_0	10%* I_0	0%* I_0
Rms Output Current(mA)	1000mA	750mA	500mA	250mA	100mA	0mA
Rms Output Voltage(V)	12.087V	12.100V	12.114V	12.127V	12.119V	12.140V
Active Output Power(W)	12.09W	9.08W	6.06W	3.03W	1.21W	0.00W
Rms Input Voltage(V)	230V	230V	230V	230V	230V	230V
Rms Input Current(A)	0.145A	0.119A	0.088A	0.048A	0.023A	0.001A
Rms Input Power(W)	14.035W	10.568W	7.086W	3.618W	1.578W	0.064W
True Power Factor (PF)	0.421	0.386	0.350	0.328	0.298	0.278
Total Harmonic Distortion of the input current	231.0A%	255.7A%	281.7A%	325.1A%	346.1A%	180.2A%
Power Consumed by UUT(W)	1.948W	1.493W	1.029W	0.586W	0.366W	0.064W
Active Efficiency	86.120%	85.872%	85.478%	83.796%	76.800%	*
Average Efficiency	85.317%				76.800%	*

Tester : Ian

	REVISIONS				
	SHOW	REV	DESCRIPTION	DATE	APPROVED
☑ 用膠帶封口	1	A	初版制作	13/10/29	SUN
☐ 無需膠帶封口	2	B	更新格式	21/11/16	SUN







阿達特科技股份有限公司 正式 工程二部 發行章

PIS15W00001 包裝(FOR CDS015-F076)(K=K) 環保防靜電氣泡袋-刀卡-100

9550017801	1.隔板:510(L)*360(W)*6mm	K=K	5/100
	2.數量:5*5*4=100PCS		
9520022901	3.外箱:528(L)*380(W)*405(H)mm	K=K	1/100
9560019501	4.6刀卡:516(L)*90(W)*6mm(邊分)	K=K	24/100
9560019601	5.6刀卡:366(L)*90(W)*6mm(邊分)	K=K	24/100
9540006801	6.環保防靜電氣泡袋：160(L)*150(W)*47mm 9KG 紅色透明,單端開口,中間位置印環保標示的ESD標示. 1/1		

7.機器裝入環保防靜電氣泡袋內，然後對折袋口再裝入蜂巢內,方向須統一.

8.外箱標注為外徑尺寸.

9.上述所有材料須完全符合環保ROHS標準.

阿達特科技股份有限公司
Adapter Technology Co., Ltd.

DRAWING NO. PIS15W00001		APPROVAL 1 BY		
UNIT mm	MODEL NO CDS015-F076	APPROVAL 2 BY		
	FILE NO. ADT-0234	CHECKED BY(ENGINEER)	Sun	2021/11/16
SCALE	REV. B SHEET 1/1	DRAWN BY	Moon	2021/11/16

Apply for sales	Apply for engineer	Use the sales	Use the engineer
	阿達特 2021.11.17 張裕瑋		