



Specification for Approval

Customer :

Part Name : AC ADAPTER

Description : 24 Volts / 2.1 Amps

Model No. : ATS050-P240

Customer P / N :

Product P / N :

Issued Date : 2-Jan.-2013

Version : 01

Issued Stamp :

Customer's Approval Signature

ADAPTER TECHNOLOGY CO.,LTD.

Office (Taiwan) : 6F-9,No.258, Liancheng Rd.,Zhonghe District,New Taipei City 235,Taiwan (R.O.C.)

TEL : +886-2-8226-2279

FAX : +886-2-8226-2238

E-mail : service_tw@ adaptertech.com.tw ; service@ adaptertech.com.tw

Factory (China) : BOAYANG ELECTRONICS CO., LTD.

**Di Feng Gong Ye Qu 2 Hao,Xiasha Liuwu Village, Shipai Town, Dong Guan City,
Guang Dong Province,China**

TEL : 86-0769-8136-9899 ; 86-0769-8136-0909 ; 86-0769-8136-9008

86-0769-8186-8338 ; 86-0769-8186-8900

FAX : 86-0769-8136-9009



50W
Switching Power Adapter
SPECIFICATION

Model No. : **ATS050-P240**

Description : **24Volts / 2.1Amps**

Part No. :

Version : **01**

Date : **2-Jan.-2013**

Approved	Checked	Prepared	Sales



■ Approval Documents/Spec. Revised Records

- Customer :
- Model No. : ATS050-P240
- Original Documents Content : Spec. 10 Pages, Attachment 0 Pages

Revised Records : No.	Date (mm/dd/yyyy)	Description (Before / After)	Page(s) Revised	Revised By (Adapter/Customer)	Remark
1	Jan./2/2013	ISSUE	-	王月才	01



1. Feature :

- ◆ **Input** : Universal 100 ~ 240 Vac / 50 ~ 60 Hz Input, without any slide switch.
- ◆ **Output** : +24V / 0~2.1A
- ◆ **Case Dimension** : 115 (L) *53 (W) * 38 (H) mm
- ◆ **Efficiency** : Eff (av) $\geq$ 87%
- ◆ **Safety** : UL / cUL / GS / PSE / BSMI / CB / RCM
- ◆ **EMI** : CE / FCC 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 CEC/DoE/ErP(Stage 2)/MEPS V./NRCan**

2. Input :

2.1 Voltage	Universal 100~240Vac, single phase
2.2 Frequency	50 ~ 60 Hz
2.3 Current	1.2A Max.
2.4 Inrush Current	60A Max. / 230Vac (Cold start at 25 °C , full load)
2.5 Efficiency	Eff (av) $\geq$ 87% (At 115 Vac & 230 Vac)
2.6 Power Consumption	Pi $\leq$ 0.3 W (At 230Vac & No load)

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

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	+24V $\pm$ 5%
	Current	2.1A Max.
	Regulation	22.80Vmin. ~ 24.00Vtyp. ~ 25.20Vmax.
	Ripple & Noise	240mV Max.
	Total Power	50W Max.

Remark : For ripple & noise measurement, use a 20MHz bandwidth frequency oscilloscope, and add a 0.1 μ F multilayer Cap. and a Low ESR Electrolytic Cap. (10 μ F) at output connector terminals. (At nominal line voltage, full load)



4. Protection :

4.1 Over Voltage Protection (OVP)	V out *150% Max
4.2 Short Circuit Protection (SCP)	Automatic recovery after short-circuit fault being removed
4.3 Over Current Protection(OCP)	I out *180% 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 latch .

5. Safety 、EMI and EMC Requirement :

5.1 Safety Requirement

a. Safety : UL / cUL / GS / PSE / BSMI / CB / RCM

b. Dielectric Strength : Cut off current 10mA

(1)	Primary to Secondary	1800Vac for 1 Minute
(2)	Primary to Frame Ground	1500Vac for 1 Minute

c. Insulation Resistance :

(1)	Primary to Secondary	10 M ohm for 500Vdc
(2)	Primary to Frame Ground	10 M ohm for 500Vdc

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

5.3 Leakage Current : Less than 3.5mA

5.4 Grounding Test : Resistance 0.1ohm Max. @ 25A

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. : 50,000 Hrs.(At 25°C , By MIL-HDBK-217F)

8. Mechanical :

8.1 Weight : 310 g Typical

8.2 Cable Type : Black UL2468 AWG18

(Wire + Plug)

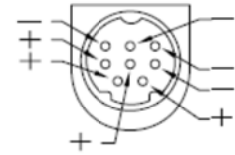
Plug : Mini 8Pin

8.3 Cable Length : 1500mm

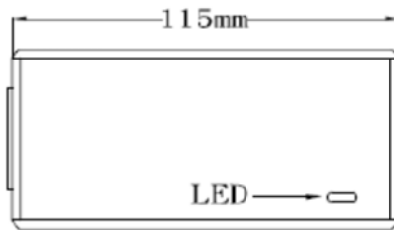
8.4 Case Dimension : 115mm(L)*53mm(W)*38mm(H)

8.5 Material Flammability : UL 94V-0

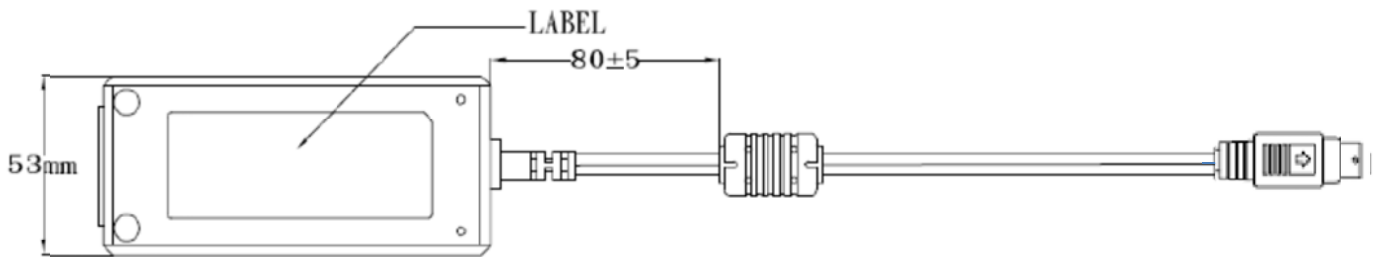
8.6 External Apperance : As drawing below (Scale → mm)



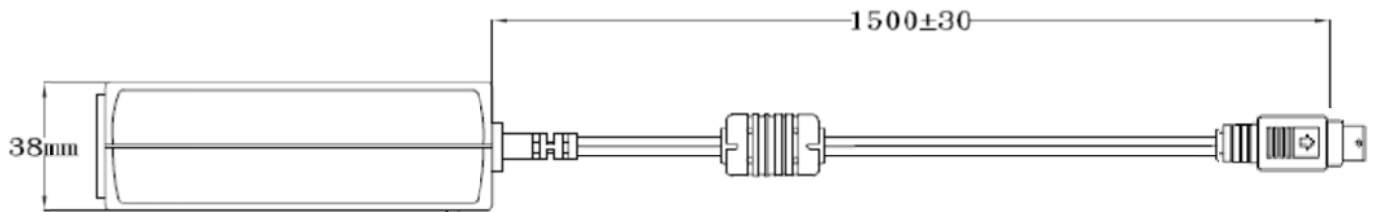
Output Cable Plug Pin Assignment



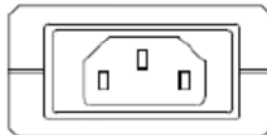
TOP-VIEW



BOTTOM-VIEW



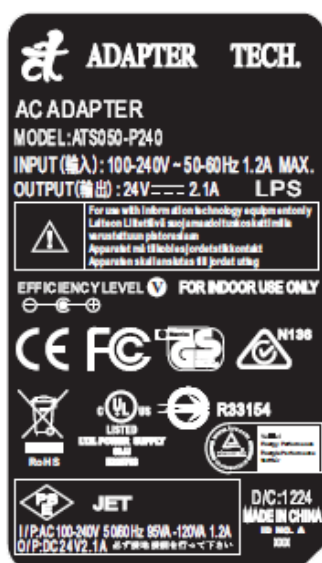
SIDE-VIEW



FRONT-VIEW

8.7 Spec. Label Materials : Metalized Polyester Label (Silver Gloss-Coated)
 Color : Black Background with Silver Printing
 Label Dimension : 70.8mm(H)*40.4mm(W)+/-0.1mm
 Label Thickness : 0.1mm

100%



"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.

200%



Label Part NO.:

REV:

A. Line Regulation Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
90Vac / 50 % Load	22.8 V ~ 25.2 V	23.78 V	23.76 V	23.88 V
115Vac / 50 % Load	22.8 V ~ 25.2 V	23.78 V	23.77 V	23.86 V
132Vac / 50 % Load	22.8 V ~ 25.2 V	23.79 V	23.77 V	23.87 V
180Vac / 50 % Load	22.8 V ~ 25.2 V	23.80 V	23.76 V	23.87 V
230Vac / 50 % Load	22.8 V ~ 25.2 V	23.80 V	23.78 V	23.88 V
264Vac / 50 % Load	22.8 V ~ 25.2 V	23.79 V	23.76 V	23.87 V

B. Efficiency Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac	87 % Min.	87.48%	87.45%	87.42%
230Vac	87 % Min.	87.25%	87.23%	87.21%

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

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

C. Load Regulation Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 0 % Load	22.8 V ~ 25.2 V	23.98 V	23.97 V	24.05 V
115Vac / 50 % Load	22.8 V ~ 25.2 V	23.78 V	23.77 V	23.86 V
115Vac / 100 % Load	22.8 V ~ 25.2 V	23.62 V	23.64 V	23.71 V
230Vac / 0 % Load	22.8 V ~ 25.2 V	23.98 V	23.98 V	24.05 V
230Vac / 50 % Load	22.8 V ~ 25.2 V	23.80 V	23.77 V	23.88 V
230Vac / 100 % Load	22.8 V ~ 25.2 V	23.66 V	23.65 V	23.70 V

D. Ripple & Noise Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	240mV Max.	48mV	56mV	53mV
230Vac / 100 % Load	240mV Max.	49mV	57mV	56mV

E. Inrush Current

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230Vac / 100 % Load	60A Max	46	48	46

F. Over Current Protection

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	I _{out} *180% Max	147.71%	149.75%	146.61%
230Vac / 100 % Load	I _{out} *180% Max	136.42%	137.46%	135.32%

G. Short Circuit Protection

Test Result :

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

H. Input Power Consumption(No Load)

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230Vac / 0 % Load	≤ 0.3 W	0.25	0.26	0.24

Efficiency Test Report

- A. Model Number : ATS050-P240 (24V /2.1A)
- B. DC Power Cord : UL2468, 18AWG , 1.5M ,
- C. Average Efficiency :
 Energy Star V 87.00 % min.
 Eup (Stage 2) $(0.063 \times \ln(\text{Nameplate Output}) + 0.622) = 86.89 \% \text{ Min.}$
 MEPS V 87.00 % min.
- D. NO Load Power Consumption :
 Energy Star V 0.3W max.
 Eup (Stage 2) 0.3W max.
 MEPS V 0.3W max.
- E. Testing Dequpment :
 1. AC Power Source : " Zentech " 2700M-10
 2. Electronic Load : " PRODIGIT " 3311C
 3. Power Meter : " IDRC " CP-290
 4. 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	0%* I ₀
Rms Output Current(mA)	2100mA	1575mA	1050mA	525mA	0mA
Rms Output Voltage(V)	23.794V	23.881V	23.960V	24.048V	24.126V
Active Output Power(W)	49.97W	37.61W	25.16W	12.63W	0.00W
Rms Input Voltage(V)	115V	115V	115V	115V	115V
Rms Input Current(A)	0.805A	0.721A	0.518A	0.291A	0.023A
Rms Input Power(W)	57.30W	42.86W	28.30W	14.67W	0.19W
Voltage T.H.D.(%)	---	---	---	---	---
True Power Factor	0.541	0.515	0.475	0.433	0.070
Power Consumed by UUT(W)	7.33W	5.25W	3.14W	2.04W	0.19W
Efficiency	87.20%	87.76%	88.90%	86.06%	*
Average Efficiency	87.48%				*

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

Load Conditions Reported Quantity	100%* I ₀	75%* I ₀	50%* I ₀	25%* I ₀	0%* I ₀
Rms Output Current(mA)	2100mA	1575mA	1050mA	525mA	0mA
Rms Output Voltage(V)	23.785V	23.872V	23.952V	24.034V	24.128V
Active Output Power(W)	49.95W	37.60W	25.15W	12.62W	0.00W
Rms Input Voltage(V)	230V	230V	230V	230V	230V
Rms Input Current(A)	0.608A	0.464A	0.326A	0.178A	0.016A
Rms Input Power(W)	56.75W	42.63W	28.64W	14.85W	0.25W
Voltage T.H.D.(%)	%	---	---	---	---
True Power Factor	0.402	0.399	0.377	0.352	0.054
Power Consumed by UUT(W)	6.80W	5.03W	3.49W	2.23W	0.25W
Efficiency	88.01%	88.20%	87.81%	84.97%	*
Average Efficiency	87.25%				*

Tester : 王月才