24W
Switching Power Adapter
SPECIFICATION

Description: 24Volts / 1.0Amps

Part No.: AD-AT24010T

Version: 02

Date: 31-Aug-2010

1. Feature：

- ♦ **Input** ： **Universal 100 ~ 240 Vac / 47 ~ 63 Hz Input, without any slide switch.**
- ♦ **Output** ： **+24V / 0~1 A**
- ♦ **Case Dimension** ： **88mm(L)*50mm(W)*34mm(H) (±0.5mm)**
- ♦ **Efficiency** ： **Eff (av) ≧ 82.22 % Min.**
- ♦ **Safety** ： **UL / CUL / PSE / BSMI / GS / RCM**
- ♦ **EMI** ： **FCC / 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 Energy Star V / Erp (Stage 2) / MEPS V .**

2. Input：

2.1 Voltage	**Universal 100~240Vac, single phase**
2.2 Frequency	**47 ~ 63 Hz**
2.3 Current	**0.58A Max.**
2.4 Inrush Current	**30A Max. / 100Vac ； 45A Max. / 230Vac (Cold Start At 25 ºC，Full Load)**
2.5 Efficiency	**Eff (av) ≧ 82.22 % Min. (At 115 Vac & 230 Vac)**
2.6 Power Consumption	**Pi ≦ 0.3 W (At 230Vac & No Load)**

※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 ± 5%**
	Current	**1.0A Max.**
	Regulation	**22.8Vmin. ~ 24.0Vtyp. ~ 25.2Vmax.**
	Ripple & Noise	**100 mV Max.**
	Total Power	**24W Max.**

Remark : For ripple & noise measurement, use a 20MHz bandwidth frequency oscilloscope, and add a 0.1μF 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)	27V (Max.)
4.2 Short Circuit Protection (SCP)	Automatic recovery after short-circuit fault being removed
4.3 Over Current Protection(OCP)	2.5A (MAX)

Remark : When Short Circuit 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 ： UL / CUL / PSE / BSMI / GS / RCM

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

5.3 Leakage Current ： Less than 0.25mA

6. Operation and Environment Performance：

6.1 Temperature Range

Operating	+ 0ºC ~ + 40ºC
Storage	- 20 ºC ~ + 80 ºC

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 25ºC，By MIL-HDBK-217F)

8.Mechanical :

Output Cable Plug Pin Assignment

8.1 Weight : 165 g Typical

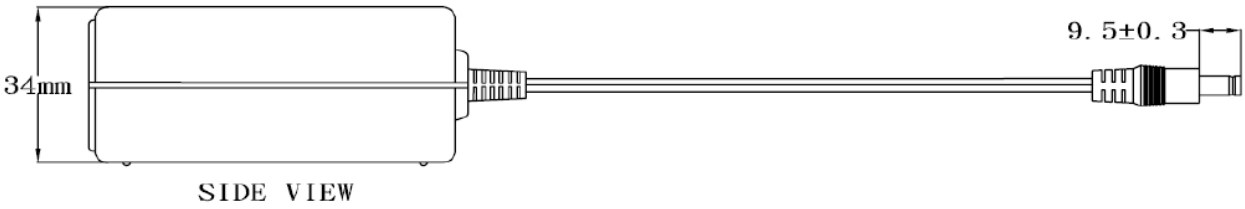
8.2 Cable Type : Black UL2468 AWG22
(Wire + Plug)
Plug : ø5.5*ø2.1*9.5mm (Tuning Fork & Cannelure)

8.3 Cable Length : 1500mm

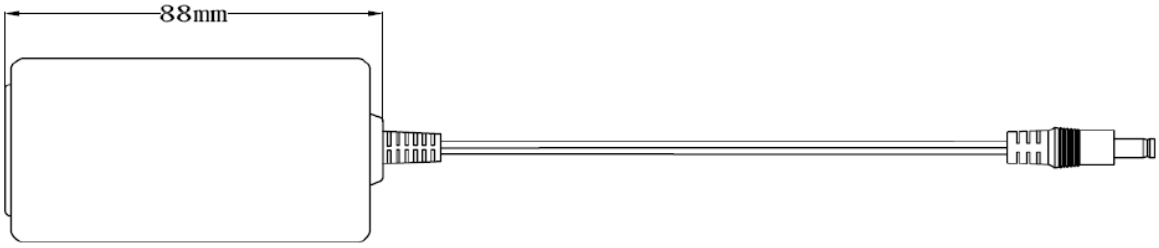
8.4 Case Dimension : 88mm(L)*50mm(W)*34mm(H) (±0.5mm)

8.5 Material Flammability : UL 94V-0

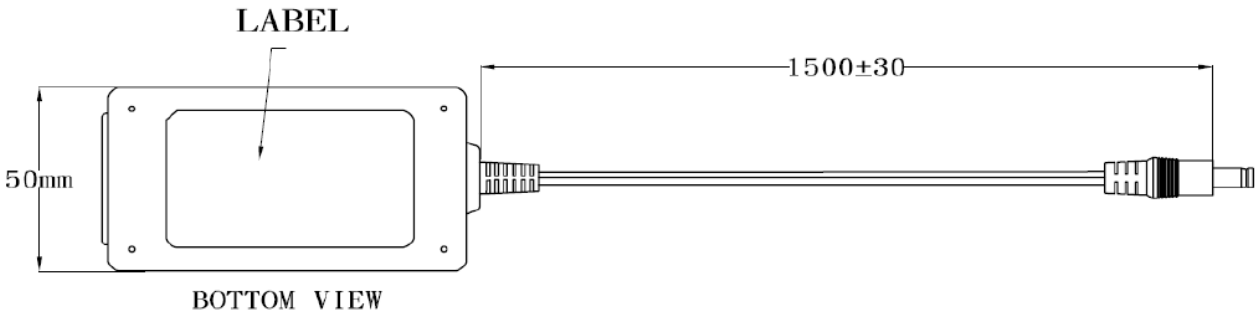
8.6 External Appearance : As drawing below (Scale - mm)



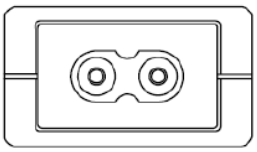
SIDE VIEW



TOP VIEW



BOTTOM VIEW



FRONT-VIEW

A. Line Regulation Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
90Vac / 50 % Load	22.8~25.2 V	23.99 V	24.37 V	24.31 V
115Vac / 50 % Load	22.8~25.2 V	23.98 V	24.38 V	24.30 V
132Vac / 50 % Load	22.8~25.2 V	23.99 V	24.37 V	24.30 V
180Vac / 50 % Load	22.8~25.2 V	23.99 V	24.37 V	24.31 V
230Vac / 50 % Load	22.8~25.2 V	23.99 V	24.38 V	24.30 V
264Vac / 50 % Load	22.8~25.2 V	23.98 V	24.38 V	24.30 V

B. Efficiency Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % load	82.22 % Min.	85.69 %	84.88 %	84.98 %
230Vac / 100 % load	82.22 % Min.	84.77 %	84.47 %	84.33 %

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

E1=efficiency with 25% rated load ; E2= efficiency with 50% rated load

E3=efficiency with 75% rated load ; E4= efficiency with 100% rated load

C. Load Regulation Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 0 % Load	22.8~25.2 V	24.10 V	24.09 V	24.15 V
115Vac / 50 % Load	22.8~25.2 V	23.98 V	24.03 V	24.10 V
115Vac / 100 % Load	22.8~25.2 V	23.90 V	23.97 V	24.07 V
230Vac / 0 % Load	22.8~25.2 V	24.10 V	24.09 V	24.15 V
230Vac / 50 % Load	22.8~25.2 V	23.99 V	24.03 V	24.11 V
230Vac / 100 % Load	22.8~25.2 V	23.91 V	23.96 V	24.07 V

D. Ripple & Noise Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	100mVpp Max	60.4mVpp	58.8mVpp	57.9mVpp
230Vac / 100 % Load	100mVpp Max	52.4mVpp	52.7mVpp	54.5mVpp

E. Inrush Current

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	30A Max.	27.8 A	27.9A	27.5A
230Vac / 100 % Load	45A Max	42.6 A	43.2A	43.3A

F. Over Current Protection

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	2.5A Max.	1.463A	1.476A	1.473A
230Vac / 100 % Load	2.5A Max.	1.556 A	1.576A	1.520A

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	0.28 W	0.28 W	0.29 W

Efficiency Test Report

A.	Model Number	AD-AT24010T(Z=A,B,C,E,K,T,U,V)(24V/1A/24W)	
B.	DC Power Cord	UL2468,22AWG,1.8M	
C.	Average Efficiency		
	Energy Star V	(0.0626*Ln(Nameplate Output)+0.622) = 82.09% Min.	
	Erp (Stage 2)	(0.063*Ln(Nameplate Output)+0.622)=82.22% Min.	
	MEPS V	(0.0626*Ln(Nameplate Output)+0.622) = 82.09% Min.	
D.	NO Load Power Consumption		
	Energy Star V	0.3W Max.	
	Erp (Stage 2)	0.3W Max.	
	MEPS V	0.3WMax.	
E.	Testing Equipment		
	a. AC Power Source	"Zentech "	2700M-10
	b. Electronic Load	" PRODIGIT "	331tC
	c. Power Meter	" Zentech"	2100
	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	0%* I_0
Rms Output Current (mA)	1000mA	750mA	500mA	250mA	0mA
Rms Output Voltage(V)	23.750V	23.810V	23.870V	23.920V	23.990V
Active Output Power(W)	23.75W	17.86W	11.94W	5.98W	0.00W
Rms Input Voltage(V)	115V	115V	115V	115V	115V
Rms Input Current (A)	0.447A	0.349A	0.254A	0.150A	0.011A
Rms Input Power(W)	27.80W	20.80W	13.80W	7.00W	0.19W
T.H.D. (Voltage)	0.16	0.15	0.15	0.12	0.1
True Power Factor	0.540	0.517	0470	0.404	0.153
Power Consumed by UUT(W)	4.05W	2.94W	1.87W	1.02W	0.19W
Efficiency	85.43%	85.85%	86.49%	85..43%	*
Average Efficiency	85.80%				*

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)	11000mA	750mA	500mA	250lnA	0mA
Rms Output Voltage(V)	23.750V	23.810V	23.870V	23.920V	23.980V
Active Output Power(W)	23.75W	17.86W	11.94W	5.98W	0.00W
Rms Input Voltage(V)	230V	230V	230V	230V	230V
Rms Input Current (A)	0.302A	0.238A	0.168A	0.095A	0.016A
Rms Input Power(W)	27.40W	20.60W	13.90W	7.10W	0.25W
T.H.D. (Voltage)	0.23	0.19	0.15	0.12	0.1
True Power Factor	0.394	0.376	0.360	0.325	0.067
Power Consumed by UUT(W)	3.65W	2.74W	1.97W	1.12W	0.25W
Efficiency	86.68%	86.69%	85.86%	84.23%	*
Average Efficiency	85.86%				*