



Model No.	:	ATS036T-P240 (Level VI)
Description	:	24Volts / 1.5Amps
Part No.	:	
Version	:	01
Date	:	22-Mar.-2016

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1. Feature :

- ◆ Input : Universal 100 ~ 240 Vac / 50 ~ 60 Hz Input, without any slide switch.
- ◆ Output : +24V / 0~1.5 A
- ◆ Case Dimension : 100(L) * 50(W) * 33(H) mm
- ◆ Efficiency : Eff (av) $\geq$ 87.40%
- ◆ Safety : UL
- ◆ EMI : CE / FCC Class B ; Conduction & Radiation Meet
- ◆ 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 VI / ErP (Stage 2) / GEMS / NRCAN / CEC

2. Input :

2.1 Voltage	Universal 100~240Vac, single phase
2.2 Frequency	50 ~ 60 Hz
2.3 Current	1A Max.
2.4 Inrush Current	70A Max. / 230Vac (Cold Start At 25 °C, Full Load)
2.5 Efficiency	Eff (av) $\geq$ 87.40 % (At 115 Vac & 230 Vac)
2.6 Power Consumption	Pi $\leq$ 0.1 W (At 115 Vac & 230 Vac & 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	1.5A Max.
	Regulation	22.80Vmin. ~ 24.00Vtyp. ~ 25.20Vmax.
	Ripple & Noise	240 mVpp Max.
	Total Power	36W 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. (47 μ F) at output connector terminals. (At nominal line voltage, Full Load)



4. Protection :

4.1 Over Voltage Protection (OVP)	V out *180%(Max)
4.2 Short Circuit Protection (SCP)	Automatic recovery after short-circuit fault being removed
4.3 Over Current Protection(OCP)	I out *170%(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 : UL

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

(1)	Primary to Secondary	3000Vac 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 Meet

5.3 Leakage Current : Less than 3.5mA

5.4 Grounding Test : Resistance 0.1ohm Max. @32A

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. : 300,000Hrs.(Calculated Hours at 25°C,By Telcordia SR-332)



8. Mechanical :

8.1 Weight : 170 g Typical

8.2 Cable Type : Black UL2468 20AWG

(Wire + Plug)

Plug : $\varnothing 5.5 \times \varnothing 2.1 \times 9.5 \text{mm}$

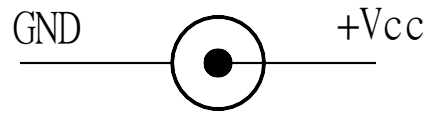
(Tuning Fork & Cannelure)

8.3 Cable Length : 1500mm

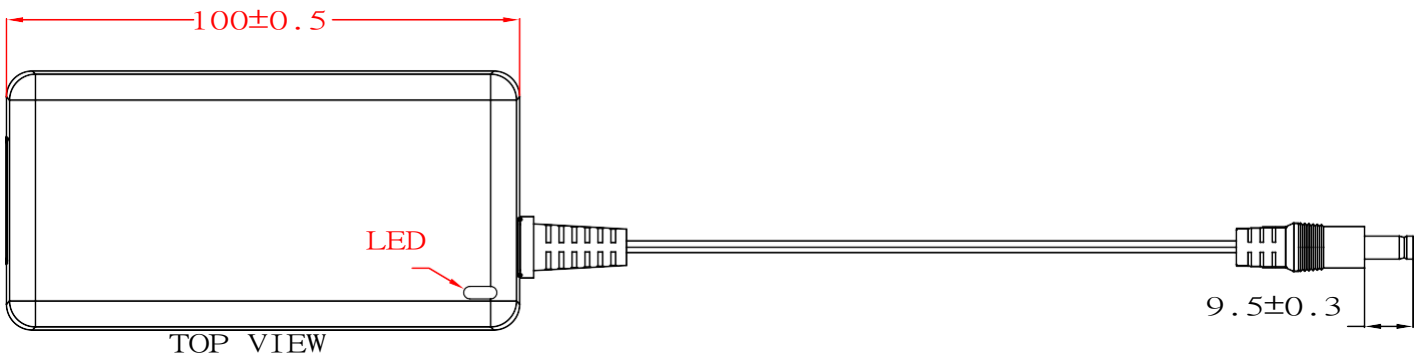
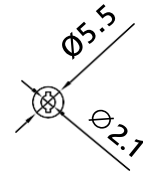
8.4 Case Dimension : 100mm(L)*50mm(W)*33mm(H)

8.5 Material Flammability : UL 94V-0

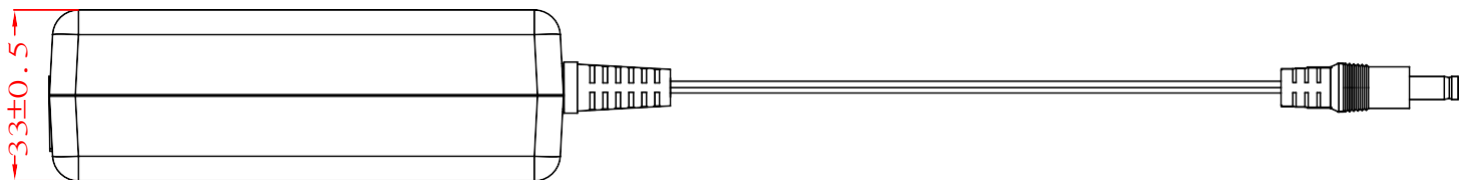
8.6 External Apperance : As drawing below (Scale $\rightarrow$ mm)



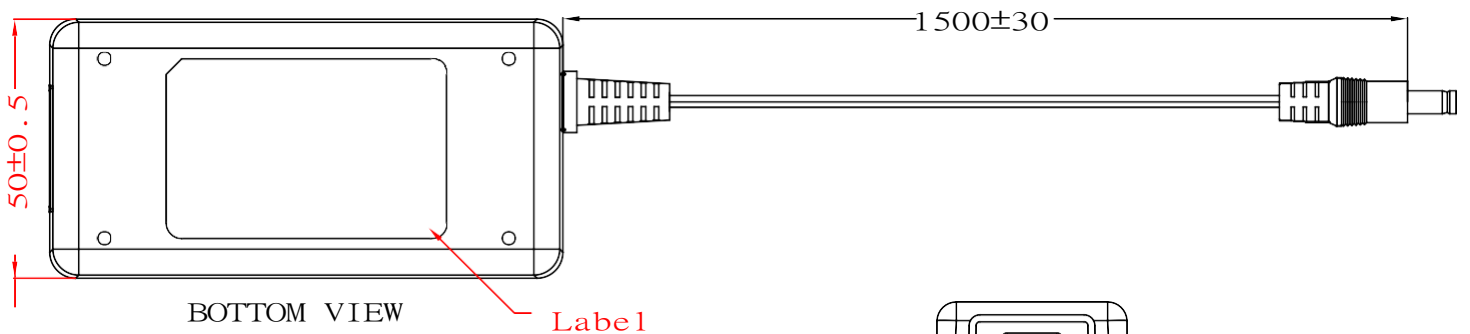
Output Cable Plug Pin Assignment



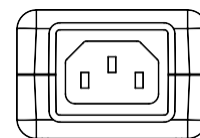
TOP VIEW



SIDE 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 V ~ 25.2 V	24.17 V	24.26 V	24.22 V
115Vac / 50 % Load	22.8 V ~ 25.2 V	24.17 V	24.26 V	24.22 V
132Vac / 50 % Load	22.8 V ~ 25.2 V	24.17 V	24.26 V	24.22 V
180Vac / 50 % Load	22.8 V ~ 25.2 V	24.17 V	24.27 V	24.22 V
230Vac / 50 % Load	22.8 V ~ 25.2 V	24.17 V	24.27 V	24.22 V
264Vac / 50 % Load	22.8 V ~ 25.2 V	24.17 V	24.27 V	24.22 V

B. Efficiency Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 60Hz	87.40 % Min.	89.93 %	89.99 %	89.93 %
230Vac / 50Hz	87.40 % Min.	90.01 %	89.89 %	89.82 %

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

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	24.19 V	24.29 V	24.24 V
115Vac / 50 % Load	22.8 V ~ 25.2 V	24.16 V	24.27 V	24.22 V
115Vac / 100 % Load	22.8 V ~ 25.2 V	24.13 V	24.24 V	24.19 V
230Vac / 0 % Load	22.8 V ~ 25.2 V	24.19 V	24.29 V	24.24 V
230Vac / 50 % Load	22.8 V ~ 25.2 V	24.17 V	24.27 V	24.22 V
230Vac / 100 % Load	22.8 V ~ 25.2 V	24.14 V	24.24 V	24.19 V



D. Ripple & Noise Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	240 mVpp Max.	109 mV	100 mV	110 mV
230Vac / 100 % Load	240 mVpp Max.	104 mV	98 mV	104 mV

E. Inrush Current

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
240Vac / 100 % Load	70A Max	46.4 A	45.2 A	46.8 A

F. Output Current Protection

Test Result Test Result

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac	Iout*170%(Max)	139 %	140 %	150 %
230Vac	Iout*170%(Max)	126 %	130 %	150 %

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

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230Vac / 0 % Load	$\leq 0.1W$	0.09 W	0.09 W	0.08 W

Efficiency Test Report

- A. Model Number : ATS036T-P240 (24V / 1.5A)
- B. DC Power Cord : UL2468 , 20AWG , 1500mm
- C. Average Efficiency :
- Energy Star VI $(0.071 \cdot \ln(P_{out}) - 0.0014 \cdot P_{out} + 0.67) = 87.40 \% \text{ Min.}$
- Erp (Stage 2) $(0.063 \cdot \ln(\text{Nameplate Output}) + 0.622) = 82.22 \% \text{ Min.}$
- MEPS V $(0.0626 \cdot \ln(\text{Nameplate Output}) + 0.622) = 82.09 \% \text{ Min.}$
- D. NO Load Power Consumption :
- Energy Star VI 0.1W Max.
- Erp (Stage 2) 0.3W Max.
- MEPS V 0.3W Max.
- E. Testing Dequipment :
- a. AC Power Source : " Zentech " 2700M-10
- b. Electronic Load : " PRODIGIT " 3311D
- c. Power Meter : " YOKOGAWA " WT210
- d. Digital Meter : " APPA " 99III
- 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)	1500mA	1125mA	750mA	375mA	0mA
Rms Output Voltage(V)	24.16V	24.20V	24.21V	24.22V	24.25V
Active Output Power(W)	36.24W	27.22W	18.16W	9.08W	0.00W
Rms Input Voltage(V)	115V	115V	115V	115V	115V
Rms Input Current(A)	0.671A	0.529A	0.389A	0.231A	0.013A
Rms Input Power(W)	40.26W	30.17W	20.14W	10.19W	0.07W
T.H.D. (Voltage)	0.64	0.54	0.47	0.29	0.09
True Power Factor	0.507	0.475	0.428	0.393	0.040
Power Consumed by UUT(W)	4.02W	2.95W	1.98W	1.10W	0.07W
Efficiency	90.01%	90.23%	90.16%	89.17%	*
Average Efficiency	89.89%				*

- 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)	1500mA	1125mA	750mA	375mA	0mA
Rms Output Voltage(V)	24.16V	24.20V	24.21V	24.23V	24.26V
Active Output Power(W)	36.24W	27.23W	18.16W	9.09W	0.00W
Rms Input Voltage(V)	230V	230V	230V	230V	230V
Rms Input Current(A)	0.438A	0.339A	0.232A	0.128A	0.021A
Rms Input Power(W)	40.23W	30.22W	20.15W	10.24W	0.09W
T.H.D. (Voltage)	0.7	0.57	0.43	0.29	0.09
True Power Factor	0.435	0.425	0.410	0.376	0.015
Power Consumed by UUT(W)	3.99W	3.00W	1.99W	1.15W	0.09W
Efficiency	90.08%	90.09%	90.11%	88.73%	*
Average Efficiency	89.75%				*

Tester : Jarvis