

10.0 W AC Adapter Specification

Model no. : **ATS012S-W050U (Level VI)**

Description : **5.0 Volts / 2.0 Amps**

Part no. :

Version : **A1**

Date : **28 - Sep. - 2022**

Approved	Reviewed	Checked	Prepared	Sales

1. Feature :

- ◆ **Input** : Universal 100 ~ 240 Vac / 50 ~ 60 Hz input, without any slide switch
- ◆ **Output** : 5.0 V / 0 ~ 2.0 A
- ◆ **Case dimension** : 65.4 (L) * 33.8 (W) * 25.4 (H) ± 1 mm
- ◆ **Efficiency** : Eff (av) ≥ 78.704% (at 115 V / 60 Hz & 230 Vac / 50 Hz input)
Eff (av) ≥ 69.734% (at 230 V / 50 Hz input 10% load)
- ◆ **Safety** : PSE
- ◆ **EMC** : (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**

2. Input :

2.1 Voltage	Universal 100 ~ 240 Vac, single phase
2.2 Frequency	50 ~ 60 Hz
2.3 Current	0.31 A Max.
2.4 Inrush current	Cold start at 25°C, full load 50 A max. / 240 Vac (ac source chroma 6530) 120 A max. / 230 Vac (mains electricity from wall)
2.5 Efficiency	Eff (av) ≥ 78.704% (at 115 V / 60 Hz & 230 Vac / 50 Hz input) Eff (av) ≥ 69.734% (at 230 V / 50 Hz input 10% load)
2.6 Power consumption	Pi ≤ 0.10 W (at 115 Vac & 230 Vac & no Load)

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

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	5.0 V ± 6%
	Current	2.0 A max.
	Regulation	4.7 V min. ~ 5.0 V typ. ~ 5.3 V max.
	Ripple & Noise	200 mV _{p-p} max.
	Total power	10.0 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)	7.5 V max.
4.2 Short circuit protection (SCP)	Automatic recovery after short-circuit fault being removed
4.3 Over current protection (OCP)	4 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 (RMS) for 1 minute
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5.2. Insulation resistance :

(1)	Primary to secondary	10 MΩ for 500 Vdc
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5.3 Leakage current : Less than 0.25 mA

6. Operation and environment performance :

6.1 Temperature range

Operating	-20°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. : 300,000 Hrs. (calculated hours at 25°C, by Telcordia SR-332)

8. Mechanical :

8.1 Weight : 66 g Ref.

8.2 Cable type : Black UL 2468 20 AWG
(wire + plug)

Plug : $\psi 5.5 * \psi 2.1 * 9.5$ mm

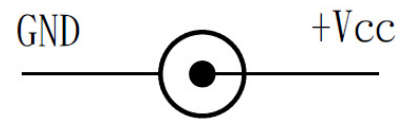
(Tuning fork & cannellure)

8.3 Cable length : 1500 mm

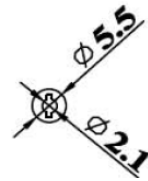
8.4 Case dimension : 65.4 (L) * 33.8 (W) * 25.4 (H) ± 1 mm

8.5 Material flammability : UL 94V-0

8.6 External appearance : As drawing below (scale $\rightarrow$ mm)



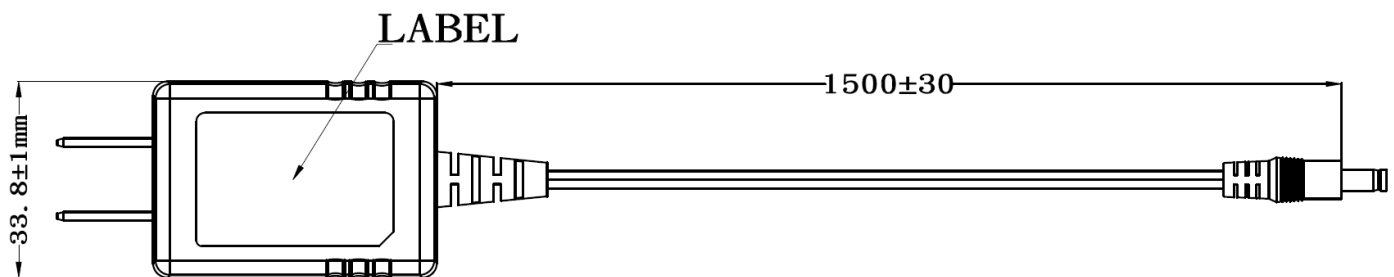
Output cable plug pin assignment



TOP VIEW



SIDE VIEW



BOTTOM VIEW

9. Label :

- 9.1 Label materials : Metalized polyester label (silver gloss)
- 9.2 Color : Black background with silver printing
- 9.3 Label dimension : 33 (L) * 22 (W) $\pm$ 0.1 mm
- 9.4 Label thickness : 75#

100%



300%



Label Part No. :9443126090

A. Line regulation test

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
90 Vac / 50% Load	4.7 V ~ 5.3 V	4.872 V	4.934 V	4.883 V
115 Vac / 50% Load	4.7 V ~ 5.3 V	4.872 V	4.934 V	4.883 V
132 Vac / 50% Load	4.7 V ~ 5.3 V	4.872 V	4.934 V	4.883 V
180 Vac / 50% Load	4.7 V ~ 5.3 V	4.871 V	4.930 V	4.882 V
230 Vac / 50% Load	4.7 V ~ 5.3 V	4.871 V	4.930 V	4.882 V
264 Vac / 50% Load	4.7 V ~ 5.3 V	4.871 V	4.930 V	4.882 V

B. Efficiency test

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac	78.704% min.	80.115%	80.016%	80.077%
230 Vac	78.704% min.	79.692%	79.729%	79.806%
230 Vac 10% load	69.734% min.	74.740%	74.735%	74.737%

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

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	4.7 V ~ 5.3 V	5.011 V	5.081 V	5.049 V
115 Vac / 50% Load	4.7 V ~ 5.3 V	4.872 V	4.934 V	4.883 V
115 Vac / 100% Load	4.7 V ~ 5.3 V	4.862 V	4.909 V	4.889 V
230 Vac / 0% Load	4.7 V ~ 5.3 V	5.000 V	5.073 V	5.047 V
230 Vac / 50% Load	4.7 V ~ 5.3 V	4.871 V	4.930 V	4.882 V
230 Vac / 100% Load	4.7 V ~ 5.3 V	4.860 V	4.919 V	4.874 V

D. Ripple & Noise test

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100% Load	200 mV _{p-p} max.	100.1 mV _{p-p}	101.6 mV _{p-p}	99.3 mV _{p-p}
230 Vac / 100% Load	200 mV _{p-p} max.	94.5 mV _{p-p}	96.3 mV _{p-p}	93.1 mV _{p-p}

E. Inrush current

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230 Vac / 100% Load	50 A max. (chroma 6530)	37.5 A	38.1 A	36.5 A

F. Over voltage protection

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100% Load	7.5 V max.	6.10 V	6.15 V	6.04 V
230 Vac / 100% Load	7.5 V max.	6.20 V	6.23 V	6.18 V

G. Over current protection

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100% Load	4 A max.	2.74 A	2.89 A	2.63 A
230 Vac / 100% Load	4 A max.	2.68 A	2.81 A	2.56 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	≤ 0.10 W	0.059 W	0.063 W	0.060 W
230 Vac / 0% Load	≤ 0.10 W	0.080 W	0.081 W	0.081 W

Efficiency Test Report

A.	Model Number	: ATS012S-W050U	5.0V	2.00A	10.00W
B.	DC Power Cord	: UL2468 20AWG , 1.5M			
C.	Average Efficiency	:			
	Erp (Lot 7)	$0.0834 \cdot \ln(P_{out}) - 0.0014 \cdot P_{out} + 0.609 =$	78.704%	Min.	
	DoE Level VI	$0.0834 \cdot \ln(P_{out}) - 0.0014 \cdot P_{out} + 0.609 =$	78.704%	Min.	
	GEMS Level VI	$0.0834 \cdot \ln(P_{out}) - 0.0014 \cdot P_{out} + 0.609 =$	78.704%	Min.	
	CoC Tier 2	$0.0834 \cdot \ln(P_{no}) - 0.0011 \cdot P_{no} + 0.609 =$	79.004%	Min.	
	CoC Tier 2 (10% Load)	$0.0834 \cdot \ln(P_{no}) - 0.00127 \cdot P_{no} + 0.518 =$	69.734%	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	100%* I ₀	75%* I ₀	50%* I ₀	25%* I ₀	10%* I ₀	0%* I ₀
Reported Quantity						
Rms Output Current(mA)	2000mA	1500mA	1000mA	500mA	200mA	0mA
Rms Output Voltage(V)	4.862V	4.872V	4.872V	4.891V	4.967V	5.011V
Active Output Power(W)	9.72W	7.31W	4.87W	2.45W	0.99W	0.00W
Rms Input Voltage(V)	115V	115V	115V	115V	115V	115V
Rms Input Current(A)	0.191A	0.149A	0.106A	0.060A	0.030A	0.003A
Rms Input Power(W)	12.300W	9.130W	6.045W	3.028W	1.259W	0.059W
True Power Factor (PF)	0.560	0.533	0.496	0.439	0.365	0.171
Total Harmonic Distortion of the input current	132.7A%	145.6A%	166.3A%	203.6A%	242.3A%	305.1A%
Power Consumed by UUT(W)	2.576W	1.822W	1.173W	0.583W	0.266W	0.059W
Active Efficiency	79.057%	80.044%	80.596%	80.763%	78.904%	*
Average Efficiency	80.115%				78.904%	*

G. AC Input Voltage : 230Vac/50Hz

Load Conditions	100%* I ₀	75%* I ₀	50%* I ₀	25%* I ₀	10%* I ₀	0%* I ₀
Reported Quantity						
Rms Output Current(mA)	2000mA	1500mA	1000mA	500mA	200mA	0mA
Rms Output Voltage(V)	4.860V	4.856V	4.871V	4.886V	4.959V	5.000V
Active Output Power(W)	9.72W	7.28W	4.87W	2.44W	0.99W	0.00W
Rms Input Voltage(V)	230V	230V	230V	230V	230V	230V
Rms Input Current(A)	0.121A	0.095A	0.069A	0.040A	0.020A	0.003A
Rms Input Power(W)	12.240W	9.127W	6.081W	3.075W	1.327W	0.080W
True Power Factor (PF)	0.440	0.418	0.383	0.334	0.288	0.116
Total Harmonic Distortion of the input current	201.8A%	219.1A%	239.9A%	277.2A%	310.5A%	242.9A%
Power Consumed by UUT(W)	2.520W	1.843W	1.210W	0.632W	0.335W	0.080W
Active Efficiency	79.412%	79.807%	80.102%	79.447%	74.740%	*
Average Efficiency	79.692%				74.740%	*

Tester : Ian

ATS012S-W 系列 derating curve
(XXX = O/P Voltage , 033,050,060,090,120,150,240)

MODEL	ATS012S-WXXXU
-20℃	100
10℃	100
30℃	100
40℃	100
50℃	90
60℃	70
70℃	40

