



Specification for Approval

Customer : Ituner Networks

Part Name : AC ADAPTER

Description : 19 Volts / 8.4 Amps (Peak 200W)

Model No. : STD-19084 (LEVEL V)

Customer P / N :

Product P / N :

Issued Date : 30 - June – 2011

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@adaptech.com.tw ; service@adaptech.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



160W
Switching Power Adapter
SPECIFICATION

Model No. : **STD-19084 (LEVEL V)**

Description : **19 Volts / 8.4 Amps (Peak 200W)**

Part No. :

Version : **01**

Date : **30 - June – 2011**

Approved	Checked	Prepared



■ Approval Documents/Spec. Revised Records

■ Customer : Ituner Networks

■ Model No. : STD-19084

■ 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)	Version
1	June/30/2011	ISSUE		<i>Satoshi</i>	01



1. Feature :

- ◆ **Input** : Universal 100 ~ 240 Vac / 47 ~ 63 Hz Input, without any slide switch.
- ◆ **Output** : +19 V / 0 ~ 8.4 A (Peak 200W)
- ◆ **Case Dimension** : 175.2 (L) * 74 (W) * 42 (H) mm
- ◆ **Efficiency** : Eff (av) $\geq$ 87%
- ◆ **Safety** : CUL / UL / GS / PSE / BSMI
- ◆ **EMI** : CE / FCC Class B, Conduction & Radiation Met.
- ◆ **Protection** : OVP (Over Voltage Protection), SCP (Short Circuit Protection), OTP (Over Temperature 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 ~ 240 Vac, single phase
2.2 Frequency	47 ~ 63 Hz
2.3 Current	2.2 A Max.
2.4 Inrush Current	100 A Max. / 230 Vac (Cold start at 25°C, full load)
2.5 Efficiency	Eff (av) $\geq$ 87% (At 115 Vac & 230 Vac)
2.6 Power Consumption	Pi $\leq$ 0.5 W (At 230Vac & No load)
2.7 Power Factor (PF)	Pi $\geq$ 0.9 (At Full 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	+19.00 V $\pm$ 5%
	Current	8.4 A Max.(Peak 200 W at Io= 10.5 A)
	Regulation	(1)18.0 Vmin. ~ 19.0 Vtyp. ~ 20.0 Vmax.(At Io= 0~8.4A) (2)18.0 Vmin. ~ 19.0 max.(At Io= 10.5 A)
	Ripple & Noise	380 mV Max.
	Total Power	160 W Max. (Peak 200W)

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)	Vout * (110% ~ 150%)
4.2 Short Circuit Protection (SCP)	Automatic recovery after short-circuit fault being removed
4.3 Over Temperature Protection (OTP)	OTP 110 degree. Latch protection.

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 latch.

5. Safety 、EMI and EMC Requirement :

5.1 Safety Requirement

a. Safety : CUL / UL / GS / PSE / BSMI

b. Dielectric Strength : Cut off current 10 mA.

(1)	Primary to Secondary	1800 Vac for 1 Minute
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c. Insulation Resistance :

(1)	Primary to Secondary	10 M ohm for 500 Vdc
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5.2 EMI Requirement : CE / FCC Class B ; Conduction & Radiation Met.

5.3 Leakage Current : Less than 3.5 mA

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 hours min. at 25°C, by MIL-HDBK-217F

8. Mechanical :

8.1 Weight : 700 g Typical

8.2 Cable Type : Black UL2464 AWG16
(Wire + Plug)

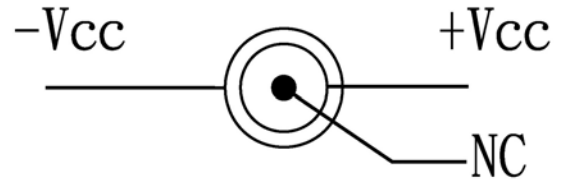
Plug : $\phi 7.4 * \phi 5.1 * \phi 0.6 \text{ mm} * 12 \text{ mm}$.

8.3 Cable Length : 1500 mm

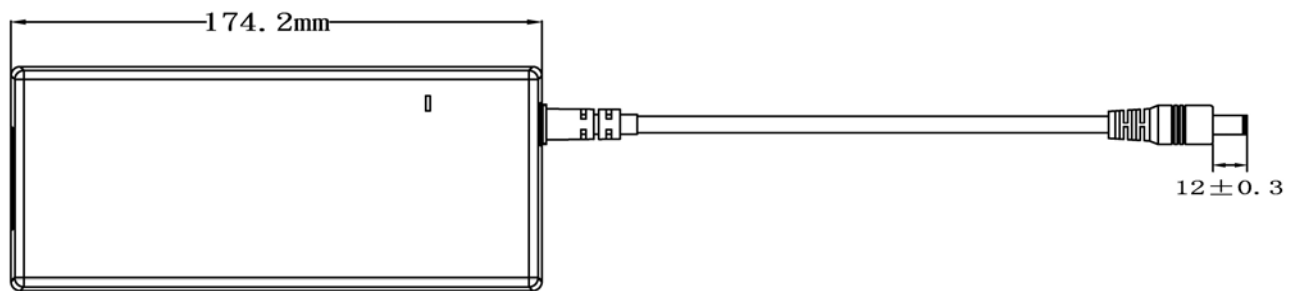
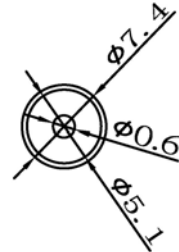
8.4 Case Dimension : 175.2mm(L) * 74 mm(W) * 42 mm(H)

8.5 Material Flammability : UL 94V-0

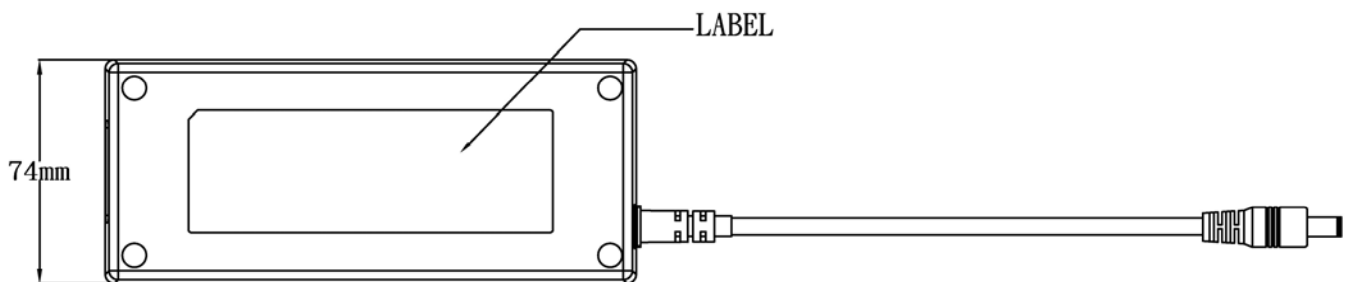
8.6 External Apperance : As drawing below (Scale $\rightarrow$ mm)



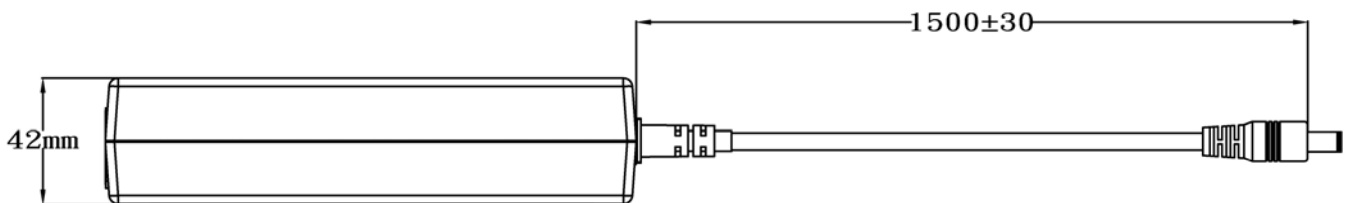
Output Cable Plug Pin Assignment



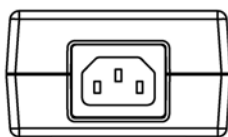
TOP-VIEW



BOTTOM-VIEW



SIDE-VIEW



FRONT-VIEW

8.7 Spec. Label Materials : Metalized Polyester Label (Silver Gloss)
 Color : Black Background with Silver Printing
 Label Dimension : 39mm(H)*119mm(W)

100%



"XXX"

Label supplier's code.
 It is accurate that the number of words depends on the real finished product.

160%



Label Part No. :

A. Line Regulation Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
90Vac / 50 % Load	18.0 V ~ 20.0 V	18.94 V		
115Vac / 50 % Load	18.0 V ~ 20.0 V	18.94 V		
132Vac / 50 % Load	18.0 V ~ 20.0 V	18.94 V		
180Vac / 50 % Load	18.0 V ~ 20.0 V	18.94 V		
230Vac / 50 % Load	18.0 V ~ 20.0 V	18.94 V		
264Vac / 50 % Load	18.0 V ~ 20.0 V	18.94 V		

B. Efficiency Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac	87 % Min.	88.14 %		
230Vac	87 % Min.	89.50 %		

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

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

C. Load Regulation Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 0 % Load	18.0 V ~ 20.0 V	19.08 V		
115Vac / 50 % Load	18.0 V ~ 20.0 V	18.94 V		
115Vac / 100 % Load	18.0 V ~ 20.0 V	18.80 V		
230Vac / 0 % Load	18.0 V ~ 20.0 V	19.08 V		
230Vac / 50 % Load	18.0 V ~ 20.0 V	18.94 V		
230Vac / 100 % Load	18.0 V ~ 20.0 V	18.80 V		

D. Ripple & Noise Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	380 mV Max.	103 mV		
230Vac / 100 % Load	380 mV Max.	118 mV		



E. Inrush Current

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230Vac / 100 % Load	100A Max.	78 A		

F. Over Voltage Protection

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	Vout*(110%~150%)	115%		
230Vac / 100 % Load	Vout*(110%~150%)	112%		

G. Short Circuit Protection

Test Result :

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

H. Input Power Consumption(No Load)

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230Vac / 0 % Load	$\leq 0.5 \text{ W}$	0.41 W	0.	

I. Power Factor

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115Vac / 100 % Load	≥ 0.9	0.99		
230Vac / 100 % Load	≥ 0.9	0.95		



Adapter Technology Co., Ltd.

Efficiency Test Report

- A. Model Number : STD-19084(19V /8.4A /160 W)
- B. DC Power Cord : 1500 mm
- C. Average Efficiency :
- Energy Star V 87 % Min.
- Erp (Stage 2) 87 % Min.
- MEPS V 87 % Min.
- D. NO Load Power Consumption :
- Energy Star V 0.5W max.
- Erp (Stage 2) 0.5W max.
- MEPS V 0.5W max.
- E. Testing Dequiptment :
1. AC Power Source : " APE " 2700M-10
2. Electronic Load : " PRODIGIT " 3302
3. Power Meter : " IDRC" CP-290
4. Digital Meter : " FLUKE " 179
- 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)	8400mA	6300mA	4200mA	2100mA	0mA
Rms Output Voltage(V)	18.800V	18.870V	18.940V	19.010V	19.080V
Active Output Power(W)	157.92W	118.88W	79.55W	39.92W	0.00W
Rms Input Voltage(V)	115V	115V	115V	115V	115V
Rms Input Current(A)	1.540A	1.159A	0.797A	0.425A	0.028A
Rms Input Power(W)	176.50W	132.50W	89.40W	47.30W	0.34W
Voltage T.H.D.(%)	0.19	0.17	0.15	0.10	0.09
True Power Factor	0.993	0.991	89.500	0.942	0.104
Power Consumed by UUT(W)	18.58W	13.62W	9.85W	7.38W	0.39W
Efficiency	89.47%	89.72%	88.98%	84.40%	*
Average Efficiency	88.14%				*

- 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)	8400mA	6300mA	4200mA	2100mA	0mA
Rms Output Voltage(V)	18.800V	18.870V	18.940V	19.010V	19.080V
Active Output Power(W)	157.92W	118.88W	79.55W	39.92W	0.00W
Rms Input Voltage(V)	230V	230V	230V	230V	230V
Rms Input Current(A)	0.785A	0.603A	0.423A	0.237A	0.033A
Rms Input Power(W)	172.90W	130.40W	88.20W	46.80W	0.41W
Voltage T.H.D.(%)	0.17	0.15	0.12	0.11	0.09
True Power Factor	0.957	0.940	90.600	0.858	0.050
Power Consumed by UUT(W)	14.98W	0.43W	8.65W	6.88W	0.41W
Efficiency	91.34%	91.17%	90.19%	85.30%	*
Average Efficiency	89.50%				*

Tester : Satoshi