



Specification for Approval

Customer : 株式会社アコン

Part Name : AC Adapter

Description : 24.0 Volts / 8.3 Amps

Model No. : ATS200TS-P240 (CoC Tier 2)

Customer P / N :

Product P / N :

Issued Date : 02 - Dec. - 2021

Version : 01

Issued Stamp :

Customer's approval signature

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**199.2W
AC Adapter
SPECIFICATION**

Model No. : **ATS200TS-P240 (CoC Tier 2)**

Description : **24.0 Volts / 8.3 Amps**

Part No. :

Version : **01**

Date : **02 – Dec. – 2021**

Approved	Reviewed	Checked	Prepared	Sales
				



Adapter Technology Co., Ltd.

■ Approval documents / spec. revised records

■ Customer : 株式会社アコン

■ Model no : ATS200TS-P240

■ Original documents content : Spec. 11 pages , Attachment 0 pages

Revised Records : No.	Date	Description (Before / After)	Page(s) Revised	Revised By (Adapter/Customer)	Version
1	Dec./02/2021	Issue	-	Brian	01



1. Feature :

- ◆ **Input** : Universal 100 ~ 240 Vac / 50 ~ 60 Hz Input, without any slide switch.
- ◆ **Output** : +24.0 V / 0 ~ 8.3A
- ◆ **Case Dimension** : 161.0(L) * 54.2(W) * 33.2(H) mm ± 1 mm
- ◆ **Efficiency** : Eff_(av) ≥ 90 % (At 115 Vac & 230 Vac)
Eff ≥ 79 % (At 115 Vac & 230 Vac, 10% load)
- ◆ **Safety** : UL / CUL / GS / PSE / BSMI
- ◆ **EMC** : CE / FCC (conduction & radiation Class B)
- ◆ **Protection** : OVP (Over Voltage Protection) 、SCP (Short Circuit Protection) 、
OCP (Over Current Protection) 、OTP (Over Temperature Protection)
- ◆ **High frequency design** , less power consumption.
- ◆ **Suitable for usage at I.T.E., industrial controller**
- ◆ **Gallium Nitride Based Design.**
- ◆ **NRCan / DoE Level VI / CEC / GEMS VI / ErP (Lot 7) / CoC Tier 2**

2. Input :

2.1 Voltage	Universal 100 ~ 240 Vac , single phase
2.2 Frequency	50 ~ 60 Hz
2.3 Current	2.4 A Max.
2.4 Inrush Current	100 A max. / 240 Vac (Cold start at 25°C , full load) (ac source chroma 6530)
2.5 Efficiency	Eff _(av) ≥ 90 % (At 115 Vac & 230 Vac) Eff ≥ 79 % (At 115 Vac & 230 Vac, 10% load)
2.6 Power Consumption	Pi ≤ 0.15 W (At 115 Vac & 230 Vac & At No load)
2.7 Power Factor (PF)	PF ≥ 0.9 (At 115 Vac & 230 Vac, 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	+24.0 V ± 5%
	Current	8.3 A Max.
	Regulation	22.8 Vmin. ~ 24.0 Vtyp. ~ 25.2 Vmax.
	Ripple & Noise	240 mVp-p max.
	Total Power	199.2 W 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. (47 μF) at output connector terminals. (At nominal line voltage, full load)



4. Protection :

4.1 Over Voltage Protection (OVP)	Vout * 180% max., latch off.
4.2 Over Current Protection (OCP)	Iout * 180% max., autorecovery.
4.3 Short Circuit Protection (SCP)	Autorecovery.
4.4 Over Temperature Protection (OTP)	Latch off.

5. Safety and EMC requirement :

5.1 Safety Requirement

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

b. Dielectric Strength : Cut off current 10mA

(1)	Primary to secondary	3000 Vac for 1 minute
(2)	Primary to Frame Ground	1770 Vac for 1 minute
※ Secondary return isolated to FG		

c. Insulation Resistance :

(1)	Primary to secondary	10 MΩ for 500 Vdc
(2)	Primary to Frame Ground	10 MΩ for 500 Vdc
※ Secondary return isolated to FG		

5.2 EMI Requirement : CE / FCC (conduction & radiation Class B)

5.3 Leakage Current : Less than 3.5 mA

5.4 Grounding Test : < 0.1Ω

6. Operation and environment performance :

6.1 Temperature range

Operating	-20 °C ~ +40 °C
Storage	-20 °C ~ +80 °C

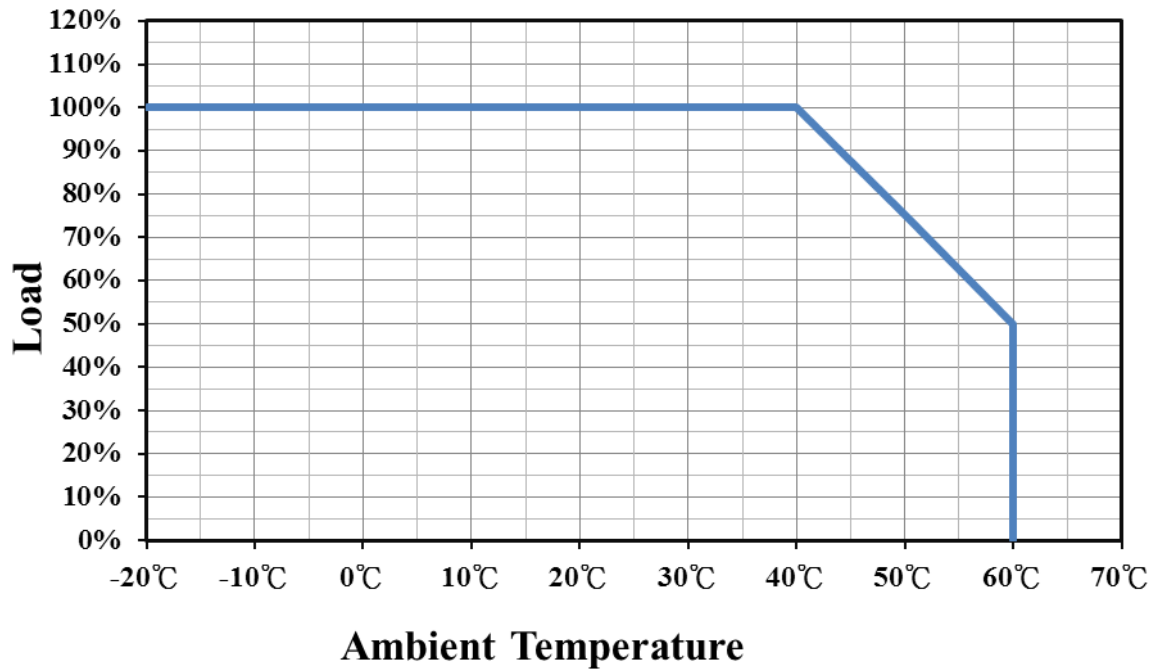
6.2 Humidity range (non-condensing)

Operating	20 % ~ 80 % RH
Storage	10 % ~ 90 % RH

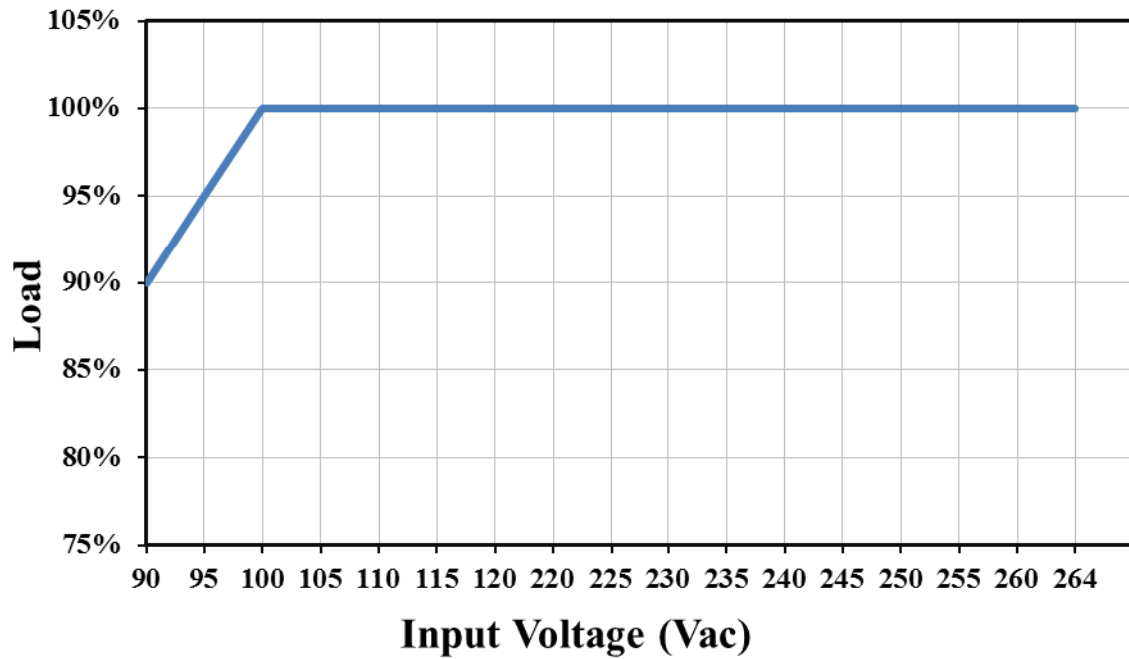
6.3 Cooling : By natural air.

7. M.T.B.F. : 300,000Hrs.(Calculated Hours at 25°C , By Telcordia SR-332)

8. Derating Curve :



9. Static Characteristics :



10. Mechanical :

8.1 Weight : 560 g Ref.

8.2 Cable type : Black UL2464 18AWG * 4C
(wire + plug)

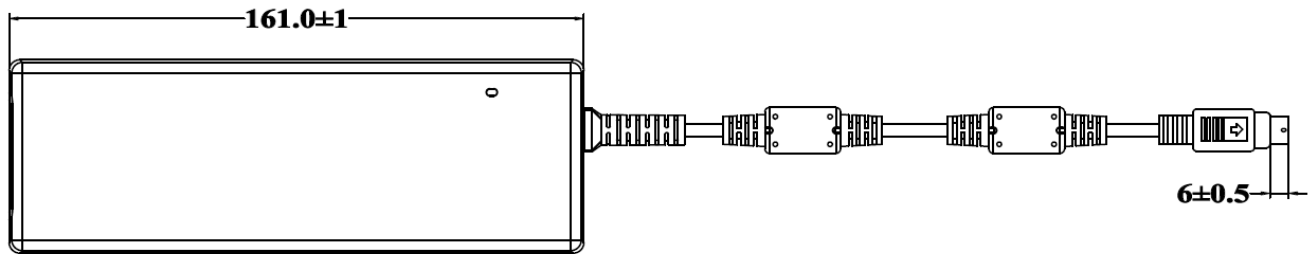
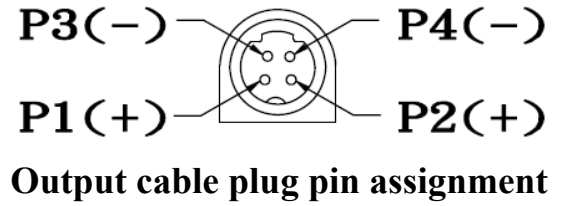
Plug : 4 Pin Din

8.3 Cable length : 1500 mm

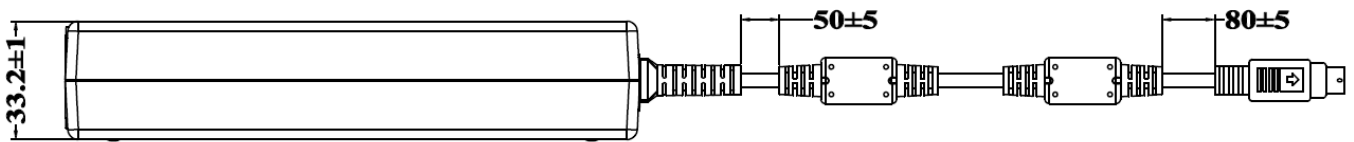
8.4 Case dimension : 161.0 (L) * 54.2 (W) * 33.2 (H) mm \pm 1 mm

8.5 Material flammability : UL 94V-0

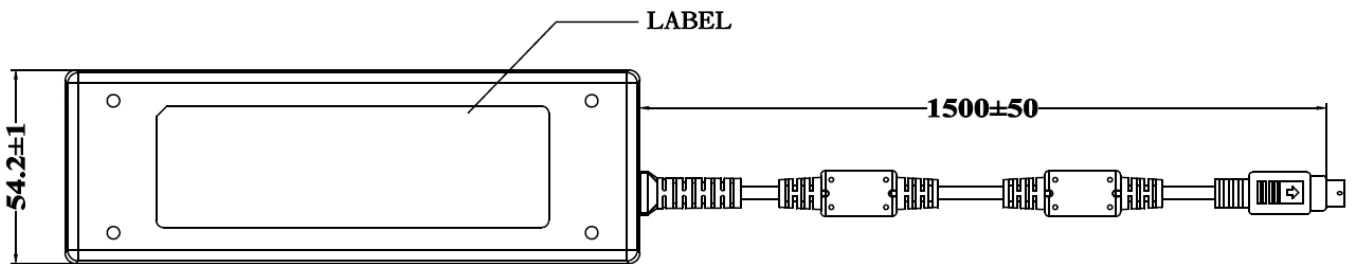
8.6 External appearance : As drawing below (scale \rightarrow mm)



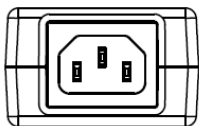
TOP-VIEW



SIDE-VIEW



BOTTOM-VIEW

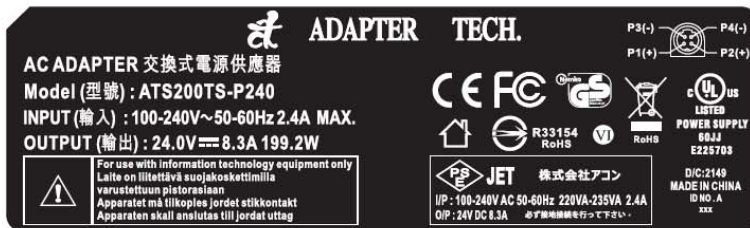


FRONT-VIEW

11. Label :

- 9.1 Label materials : Metalized polyester label (silver gloss)
- 9.2 Color : Black background with silver printing
- 9.3 Label dimension : 108.5 (L)mm * 32.5 (W)mm ± 0.2 mm
- 9.4 Label thickness : 75#

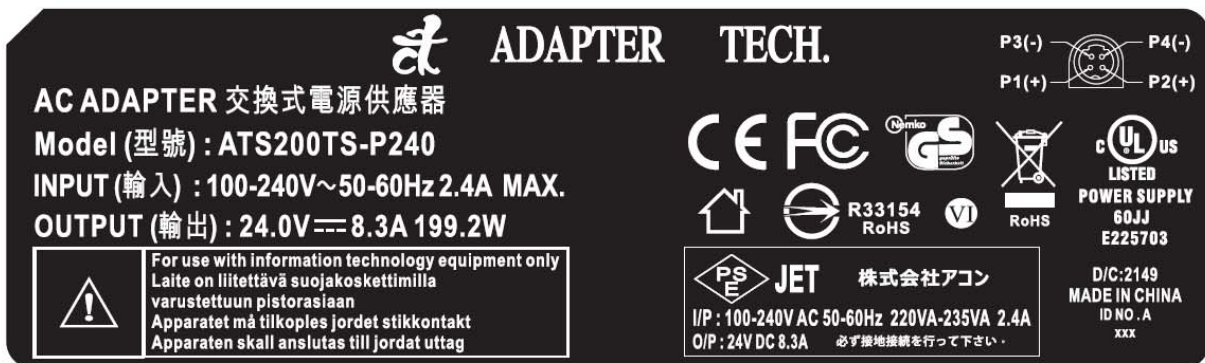
100%



"XXX"

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

160%





A. Line regulation test

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
90 Vac / 50 % Load	22.8 V ~ 25.2 V	24.0 V		
115 Vac / 50 % Load	22.8 V ~ 25.2 V	24.0 V		
132 Vac / 50 % Load	22.8 V ~ 25.2 V	24.0 V		
180 Vac / 50 % Load	22.8 V ~ 25.2 V	24.0 V		
230 Vac / 50 % Load	22.8 V ~ 25.2 V	24.0 V		
264 Vac / 50 % Load	22.8 V ~ 25.2 V	24.0 V		

B. Efficiency test

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac	90 % Min.	92.2 %		
230 Vac	90 % Min.	93.7 %		
230Vac@10% load	79 % Min.	89.5 %		

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

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
115 Vac / 0 % Load	22.8 V ~ 25.2 V	24.1 V		
115 Vac / 50 % Load	22.8 V ~ 25.2 V	24.0 V		
115 Vac / 100 % Load	22.8 V ~ 25.2 V	23.9 V		
230 Vac / 0 % Load	22.8 V ~ 25.2 V	24.1V		
230 Vac / 50 % Load	22.8 V ~ 25.2 V	24.0 V		
230 Vac / 100 % Load	22.8 V ~ 25.2 V	23.9 V		

D. Ripple & Noise test

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100 % Load	240 mV _{p-p} max.	152 mV _{p-p}		
230 Vac / 100 % Load	240 mV _{p-p} max.	153 mV _{p-p}		



E. Inrush current

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230 Vac / 100 % Load	100 A max.	71 A		

F. Over voltage protection

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac	Vout * 180% max.	139%		
230 Vac	Vout * 180% max.	139%		

G. Over current protection

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac	Iout * 180% Max.	145%		
230 Vac	Iout * 180% Max.	145%		

H. Short circuit protection

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac	Shut down	OK		
230 Vac	Shut down	OK		

I. Input power consumption (no load)

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230 Vac / 0 % Load	≤ 0.15 W	0.05 W		

J. Power factor

Test result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100 % Load	≥ 0.9	0.98		
230 Vac / 100 % Load	≥ 0.9	0.94		



Efficiency Test Report

- A. Model Number : AT200TS-X240 (24.0V / 8.3A / 199.2W) (X= A or P)
- B. DC Power Cord : UL2464/UL2095, 18AWG*4C, L=1500mm
- C. Average Efficiency
- ERP (LOT 7) : 88.0 % Min.
 - DoE Level VI : 88.0 % Min.
 - GEMS Level VI : 88.0 % Min.
 - CoC Tier 2 : 89.0 % Min.
 - CoC Tier 2 (10% Load) : 79.0 % Min.
- D. NO Load Power Consumption
- ERP (LOT 7) : 0.21W Max.
 - DoE Level VI : 0.21W Max.
 - GEMS Level VI : 0.21W Max.
 - CoC Tier 2 : 0.15W Max.
- E. Testing Equipment
- a. AC Power Source : " EXTECH " 6600
 - b. Electronic Load : " PRODIGIT " 3356
 - c. Power Meter : " YOKOGAWA " WT-210
 - d. Digital Meter : " FLUKE " 45
- F. AC Input Voltage : 115Vac/60Hz

Reported Quantity	Load Conditions					
	100% * I ₀	75% * I ₀	50% * I ₀	25% * I ₀	10% * I ₀	0% * I ₀
Rms Output Current (mA)	8300mA	6225mA	4150mA	2075mA	830mA	0mA
Rms Output Voltage (V)	23.697V	23.779V	23.858V	23.938V	23.989V	24.022V
Active Output Power (W)	196.68W	148.02W	99.01W	49.67W	19.91W	0.00W
Rms Input Voltage (V)	115V	115V	115V	115V	115V	115V
Rms Input Current (A)	1906.10mA	1432.70mA	959.20mA	496.10mA	248.43mA	29.78mA
Rms Input Power (W)	212.40W	159.00W	106.21W	53.70W	22.47W	0.05W
T.H.D. of the input voltage (%)	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%
T.H.D. of the input current (%)	17.3%	19.7%	14.5%	21.7%	66.7%	1.8%
True Power Factor (PF)	0.98	0.97	0.97	0.94	0.79	0.00
Power Consumed by UUT (W)	15.72W	10.98W	7.20W	4.03W	2.56W	0.05W
Efficiency	92.60%	93.10%	93.22%	92.50%	88.62%	-
Average Efficiency	92.85%				88.62%	-

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

Reported Quantity	Load Conditions					
	100% * I ₀	75% * I ₀	50% * I ₀	25% * I ₀	10% * I ₀	0% * I ₀
Rms Output Current (mA)	8300mA	6225mA	4150mA	2075mA	830mA	0mA
Rms Output Voltage (V)	23.695V	23.779V	23.858V	23.938V	23.989V	24.022V
Active Output Power (W)	196.67W	148.02W	99.01W	49.67W	19.91W	0.00W
Rms Input Voltage (V)	230V	230V	230V	230V	230V	230V
Rms Input Current (A)	971.80mA	742.80mA	515.10mA	287.80mA	181.48mA	58.27mA
Rms Input Power (W)	209.48W	157.13W	104.66W	53.01W	22.24W	0.05W
T.H.D. of the input voltage (%)	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
T.H.D. of the input current (%)	27.7%	21.1%	21.0%	46.4%	88.6%	2.6%
True Power Factor (PF)	0.94	0.92	0.89	0.80	0.53	0.00
Power Consumed by UUT (W)	12.81W	9.11W	5.65W	3.34W	2.33W	0.05W
Efficiency	93.88%	94.20%	94.60%	93.70%	89.53%	-
Average Efficiency	94.10%				89.53%	-