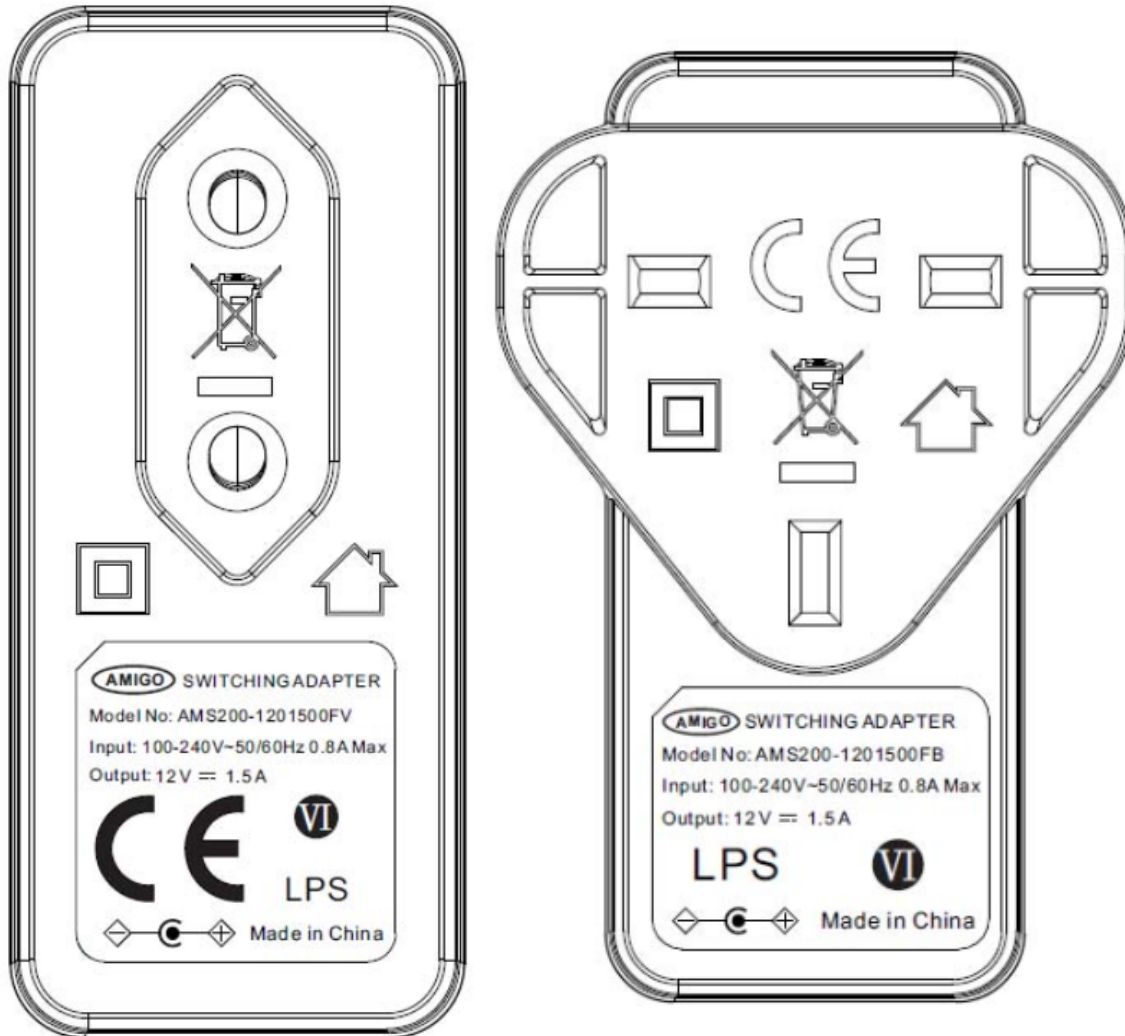


External Power Supplies Energy Efficiency Test Report

Report reference No.	TR19120169-S-000
Tested by (printed name and signature)	Bill Xie <i>Bill Xie</i>
Reviewed by (printed name and signature)	Lynn Chen <i>ly Chen</i>
Approved by (printed name and signature)	Linc Yuan <i>Linc Yuan</i>
Date of issue	2019-12-12
Total number of page(s)	13
Testing laboratory	Guangdong Keyway Testing Technology Co., Ltd.
Address	No.7 of Zhangmutou Section, Guanzhang Road, Zhangmutou town, Dongguan Guangdong China.
Applicant	Global Yeou Diann Electric Industrial Co., Ltd.
Address	No. 378, Kaisyuan 4th Rd., Cianjhen District, Kaohsiung City, 806 Taiwan
Manufacturer	Global Yeou Diann Electric Industrial Co., Ltd.
Address	No. 378, Kaisyuan 4th Rd., Cianjhen District, Kaohsiung City, 806 Taiwan
Standards	<input checked="" type="checkbox"/> COMMISSION REGULATION (EU) 2019/1782 of 1 October 2019 laying down ecodesign requirements for external power supplies pursuant to Directive 2009/125/EC of the European Parliament and of the Council and repealing Commission Regulation (EC) No 278/2009. <input checked="" type="checkbox"/> EN 50563:2011+A1:2013: External a.c. – d.c. – a.c. power supplies – Determination of no-load power and average efficiency of active modes. <input checked="" type="checkbox"/> EN 50564:2011: Electrical and electronic household and office equipment- Measurement of low power consumption.
Energy performance mark	VI
Test item description	SWITCHING ADAPTER
Trade mark	
Model/Type reference	AMS200-1201500FV, AMS200-1201500FB, AMS200-1201500F, AMS200-1201500FF, AMS200-1201500F3V, AMS200-1201500F3B
Ratings	I/P: 100-240VAC, 50/60Hz, 0.8A Max O/P: 12Vdc, 1.5A
Samples Received Date	2019-12-11
Tested Date	2019-12-12

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



General product information:

The equipment under test is a:

- Single-voltage external AC-DC power supply; and:
- Single-voltage external AC-AC power supply; and:
- Switch-selectable external power supply;
- Low-voltage external power supply;

The equipment under test with without a manual on-off switch.

Model difference:

The models AMS200-1201500FV provided with fixed European plug, AMS200-1201500FB provided with fixed UK plug. The model AMS200-1201500F is provided with interchangeable plug, European plug and UK plug, models AMS200-1201500FF are desk top type with AC inlet, the model AMS200-1201500F3B is desk top type with non-detachable power supply cord with UK plug, AMS200-1201500F3V is desk top type with non-detachable power supply cord with EU plug.

All test was carried out on model AMS200-1201500F3V.

Test program and conditions:

1. All tests was carried out in a room with an air speed immediately surrounding the UUT of ≤ 0.5 m/s.
2. The ambient temperature was maintained at 25 °C throughout the test.
3. Measurements were mode for supply voltage of 115V/60Hz and 230V/50Hz.
4. The load conditions specified in Table 1 shall be achieved by using a resistive load. The resistive load may be a variable resistor, an electronic test load, or a combination thereof, having a power factor of 0.95 to 1. When an electronic load is used, the constant current mode is used.
5. Test set-up according following figure 1.

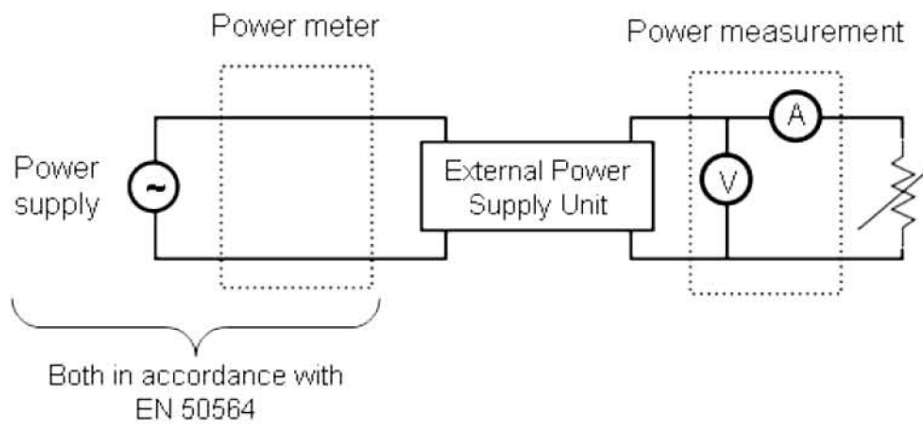


Figure 1

6. Testing sequence:
The tests shall be conducted as follows:
 - a) Using the set-up in figure 1 apply load condition as specified in Table 1.
 - b) The output of the EPS shall be maintained at load condition 1 for at least 30 minutes, this is the warm-up period. After this warm-up period the AC input power is monitored for a period of 5 minutes to assess stability. If the input power level does not change by more than 5% during these 5 min the measurement is considered to be stable and the measurements are recorded at the end of the 5 minute period. If the AC input power is not stable over a 5 minute period, stability shall be determined in accordance with EN 50564:2011, 5.3. If load condition 1 cannot be maintained for either warm-up period or the stability period then compliance with this standard cannot be determined.
 - c) Immediately subsequent to b) load conditions 2 through 5 are measured in sequence each with a 5 minute period for determining stability. If is not necessary to repeat the warm-up period unless the EPS is not stable within each of the 5 minute periods. If AC input is not stable over a 5 minute period, stability shall be determined in accordance with EN 50564:2011, 5.3. When it is not possible to immediately follow the preceding test condition a warm-up period of at least 30 min shall be introduced using the relevant load condition.
 - d) If the external power supply has a user-selectable output voltage, the above sequence is conducted first with the highest output voltage setting and then the sequence is repeated with the lowest voltage setting.
7. Power consumption of the UUT at each Load Condition 1-5 is the difference between the DC output power (W) at that Load Condition and the AC input power (W) at that Load Condition. The power consumption of Load Condition 6 (no load) is equal to the AC input power (W) at that Load Condition.

TABLE 1—LOADING CONDITIONS FOR UNIT UNDER TEST

Loading Condition 1	100% of Derated Nameplate Output Current $\pm 2\%$.
Loading Condition 2	75% of Derated Nameplate Output Current $\pm 2\%$.
Loading Condition 3	50% of Derated Nameplate Output Current $\pm 2\%$.
Loading Condition 4	25% of Derated Nameplate Output Current $\pm 2\%$.
Loading Condition 5	10% of Derated Nameplate Output Current $\pm 2\%$.
Loading Condition 6	0%.

8. When test power supplies packaged for consumer use to power a product with the DC output cord supplied by the manufacturer. Cut the cord immediately adjacent to the DC output connector, and report the output cord length is 150cm, 22 AWG under test.
9. The connection between the mains and the external power supply input shall be as supplied by the organization taking responsibility for the product. Where more than one connection means are provided, testing shall only be carried out in one configuration. When test power supplies packaged for consumer use to power a product with the AC power supply cord supplied by the manufacturer. Report the power supply cord length is 180cm, 18 AWG under test.
10. Any switch controlling power to the input of the external power supply shall be in the 'on' position.

THE LIMITS FOR EXTERNAL POWER SUPPLY:

Single-Voltage External Power Supply, Basic-Voltage			
Nameplate Output Power (P_{out})	Minimum Average Efficiency in Active Mode	Maximum Power in No-Load Mode [W]	
		AC-AC	AC-DC
$P_{out} \leq 1W$	$\geq 0.5 \times P_{out} + 0.16$	≤ 0.210	≤ 0.100
$1W < P_{out} \leq 49W$	$\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67$	≤ 0.210	≤ 0.100
$49W < P_{out}$	≥ 0.880	≤ 0.210	≤ 0.210
Single-Voltage External Power Supply, Low-Voltage			
Nameplate Output Power (P_{out})	Minimum Average Efficiency in Active Mode	Maximum Power in No-Load Mode [W]	
$P_{out} \leq 1W$	$\geq 0.517 \times P_{out} + 0.087$	≤ 0.100	
$1W < P_{out} \leq 49W$	$\geq 0.0834 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.609$	≤ 0.100	
$49W < P_{out}$	≥ 0.870	≤ 0.210	
Multiple-Voltage External Power Supply			
Nameplate Output Power (P_{out})	Minimum Average Efficiency in Active Mode	Maximum Power in No-Load Mode [W]	
$P_{out} \leq 1W$	$\geq 0.497 \times P_{out} + 0.067$	≤ 0.300	
$1W < P_{out} \leq 49W$	$\geq 0.075 \times \ln(P_{out}) + 0.561$	≤ 0.300	
$P_{out} > 49W$	≥ 0.860	≤ 0.300	

Note:

Single-voltage external AC-DC power supply means an external power supply that is designed to convert line voltage AC into lower-voltage DC output and is able to convert to only one DC output voltage at a time.

Single-voltage external AC-AC power supply means an external power supply that is designed to convert line voltage AC into lower-voltage AC output and is able to convert to only one AC output voltage at a time.

Low-voltage external power supply means an external power supply with a nameplate output voltage less than 6 volts and nameplate output current greater than or equal to 550 milliamps. Basic-voltage external power supply means an external power supply that is not a low-voltage power supply.

TEST RESULTS:

Test item	Test at 115V, 60Hz	Test at 230V, 50Hz	Efficiency requirements
No load power (W)	0.042 (max.)	0.060 (max.)	≤0.100
Efficiency of 10% full load (%)	--	82.68 (min.)	--
Average efficiency (%) ¹⁾	86.80 (min.)	86.32 (min.)	≥85.01
Complies with performance mark	VI		

Note: ¹⁾ the average efficiency of 25%, 50%, 75% and 100% full load.

Test Data:

Measured and Calculated Data at 115V, 60Hz							
	No load	Active Power Values					Average
Percent of nameplate current	0%	10%	25%	50%	75%	100%	--
Output Current (mA)	--	--	375	750	1125	1500	
Output Voltage (V, r.m.s)	--	--	11.93	12.15	12.35	12.39	
Output Power (W, r.m.s)	--	--	4.473	9.112	13.893	18.585	
AC Input Voltage (V, r.m.s)	115	--	115	115	115	115	--
AC Input Power (W, r.m.s)	0.042	--	5.126	10.082	16.226	22.130	
THD (%)	0.18	--	0.24	0.28	0.35	0.42	
True Power Factor (W/VA)	0.04	--	0.50	0.54	0.57	0.59	
AC Input Frequency (Hz)	60	--	60	60	60	60	
Power Consumed (W)	0.042	--	0.653	0.970	2.333	3.545	--
Efficiency (%)	--	--	87.26	90.37	85.62	83.98	86.80

Measured and Calculated Data at 230V, 50Hz							
	No load	Active Power Values					Average
Percent of nameplate current	0%	10%	25%	50%	75%	100%	--
Output Current (mA)	--	150	375	750	1125	1500	
Output Voltage (V, r.m.s)	--	11.85	11.89	12.04	12.22	12.40	
Output Power (W, r.m.s)	--	1.777	4.458	9.030	13.747	18.600	
AC Input Voltage (V, r.m.s)	230	230	230	230	230	230	--
AC Input Power (W, r.m.s)	0.060	2.149	5.157	10.407	15.966	21.628	
THD (%)	0.54	0.55	0.56	0.56	0.58	0.61	
True Power Factor (W/VA)	0.04	0.35	0.41	0.45	0.47	0.49	
AC Input Frequency (Hz)	50	50	50	50	50	50	
Power Consumed (W)	0.060	0.372	0.699	1.377	2.219	3.028	--
Efficiency (%)	--	82.68	86.44	86.76	86.10	85.99	86.32

Supplementary information:

1. Average active mode efficiency of 25%-100% full load limit $\geq 85.01\%$
2. The no-load condition consumption shall not exceed 0.100W.

Photograph Document



Picture 1, Overall view of AMS200-1201500FB



Picture 2, Overall view of AMS200-1201500FB

Photograph Document



Picture 3, Overall view of AMS200-1201500FV



Picture 4, Overall view of AMS200-1201500FV

Photograph Document



Picture 5, Overall view of AMS200-1201500F



Picture 6, Overall view of AMS200-1201500F

Photograph Document



Picture 7, Overall view of AMS200-1201500F3V

Test equipment list

Equipment	Manufacturer	Type	Series No	Cal.	Due.
Electronic Load	M9711	Maynuo	091000960150 829363	2019-09-26	2020-09-25
Measuring tape	THD	5m	--	2019-10-11	2020-10-10
Temp. & Humi. Recorder	ISUZU	TH-27R	ABG400443-2	2019-10-07	2020-10-06
Power Meter	YOKOKAWA	WT210	91N405508	2019-03-28	2020-03-27
Anemometer	TES	TES1340	120708172	2019-04-10	2020-04-09