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Ref. Report No.

ESTS-G16031801

TEST REPORT

Energy Efficiency Regulations

Energy Efficiency of External Power Supplies

Applicant: Aquil Star Precision Industrial(Shenzhen) Co., Ltd
 Address: Building A And B, The No.4 Of Tengfeng Third Road, Fenghuang Third
 Industry, Fuyong Town, Baoan Zone, Shenzhen City, P. R. China
 Manufacturer: Same as applicant
 Address: Same as applicant
 Factory: Same as applicant
 Address: Same as applicant
 Product name: SWITCHING ADAPTER
 Output Cord Length (cm): USB Output or Output cord 150cm
 Trade mark: --
 Model No: ASSA75a2-050480, ASSA75a3-050480, ASSA75a4-050480,
 ASSA75A3-050480, ASSA75a3c-050480, ASSA75A3c-050480,
 ASSA75w2-050480, ASSA75w3-050480, ASSA75w4-050480,
 ASSA75W3-050480, ASSA75w3c-050480, ASSA75W3c-050480,
 PC205-050480, PC208-050480, PC401-050480, PC402-050480
 Ratings: Input: 100-240VAC, 50/60Hz, 1.2A;
 Output: 5.0Vdc, 4.8A
 Standard: U.S.DOE 10 CFR Part 429 and 430, Final Rule, published on
 Feb.10,2014(Level VI)
 Date of Receiver: March 18, 2016
 Date of Test: April 29, 2016
 Date of Issue: May 7, 2016
 Testing Laboratory: Dongguan EST Electromagnet Technology Co., Ltd.
 Address: Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong,
 China
 Test Report Form No.....: ESTS-G16031801
 Test Result: PASS

This Test Report is Issued Under the Authority of:

Tested By

Rose Weng
 Rose Weng/Engineer

Approved By

Techie Chen
 Techie Chen/Reviewer

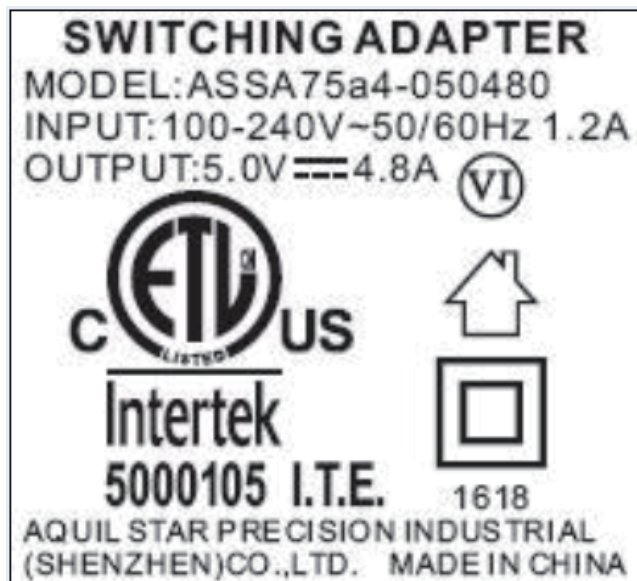


Test Report issued under the responsibility of:

Dongguan EST Electromagnet Technology Co., Ltd.

Copy of marking plate(Representative):

The artwork below may be only a draft.



General product information:

1. The submitted samples were found to comply with the above standard.
2. This test results relate only to the submit samples.
3. The equipment models ASSA75a2-050480, ASSA75a3-050480, ASSA75a4-050480, ASSA75A3-050480, ASSA75a3c-050480, ASSA75A3c-050480, ASSA75w2-050480, ASSA75w3-050480, ASSA75w4-050480, ASSA75W3-050480, ASSA75w3c-050480, ASSA75W3c-050480, PC205-050480, PC208-050480, PC401-050480, PC402-050480 are identical with each other except for model name, plug portions and output type. And ASSA75a2-050480 represents America plug with two USB output, ASSA75a3-050480 represents America plug with three USB output, ASSA75a4-050480 represents America plug with four USB output, ASSA75A3-050480 represents America plug with two USB output add output wire, ASSA75a3c-050480 represents America plug with two



USB output add type C, ASSA75A3c-050480 represents America plug with one USB add one type C add output wire, ASSA75w2-050480 represents Replaceable plug with two USB output, ASSA75w3-050480 represents Replaceable plug with three USB output, ASSA75w4-050480 represents Replaceable plug with four USB output, ASSA75W3-050480 represents Replaceable plug with two USB output add output wire, ASSA75w3c-050480 represents Replaceable plug with two USB output add type C, ASSA75W3c-050480 represents Replaceable plug with one USB add one type C add output wire, PC205-050480 represents American plug with two USB outputs, PC208-050480 represents detachable plug and with two USB outputs, PC401-050480 represents American plug with four USB outputs, PC402-050480 represents detachable plug with four USB outputs.

4. Model ASSA75a2-050480 was selected for testing.

Note: This report shall not be reproduced except for authorized by testing laboratory.

General condition

1. Test Room

The test was carried out in a room that has an air speed close to the UUT of ≤ 0.5 m/s. The ambient temperature was maintained at $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ throughout the test.

2. Test Voltage

The input voltage is within the specified voltage $\pm 1\%$ and the specified frequency $\pm 1\%$. The UUT was tested at rated supply as mentioned in Summary of testing. The input power source is capable of delivering at least 10 times the nameplate input power of the UUT. The THD of the supply voltage when supplying the UUT in the specified mode was not exceeding 2%, up to and including the 13th harmonic.

3. Test Setup

The UUT was operated at 100% of rated current output for at least 30 minutes immediately prior to conducting efficiency measurements.

4. THD

The THD of the input voltage shall be ≤ 2 percent, up to and including the 13th harmonic. The crest factor of the input voltage shall be between 1.34 and 1.49.

5. Load Conditions

The UUT was tested at four active mode load conditions and the no-load condition according to table below by using electronic load.

Percentage of Nameplate Output Current	
Load Condition 1	100% \pm 2%
Load Condition 2	75% \pm 2%
Load Condition 3	50% \pm 2%
Load Condition 4	25% \pm 2%
Load Condition 5	0%

The 2% allowance is of nameplate output current, not of the calculated current value. For example, a UUT at Load Condition 3 may be tested in a range from 48% to 52% of rated output current.



**International Efficiency Marking Protocol for External Power Supplies
Version 3.0, September 2013**

Mark	Performance Requirements					
	Nameplate Output Power (P _{no})	No-Load Mode Power	Nameplate Output Power (P _{no})	Average Efficiency in Active Mode	Power Factor	
I	Used if none of the other criteria are met.					
II	0 to ≤ 10 watts	≤ 0.75	0 to < 1 watt	≥ 0.39 * P _{no}	Not applicable	
	> 10 to 250 watts	≤ 1.0	1 to < 49 watts	≥ 0.107 * Ln(P _{no}) + 0.39		
			> 49 watts	≥ 0.82		
III	0 to < 10 watts	≤ 0.5	0 to 1 watt	≥ 0.49 * P _{no}	Not applicable	
	10 to 250 watts	≤ 0.75	> 1 to < 49 watts	≥ 0.09 * Ln(P _{no}) + 0.49		
			>49 to 250 watts	≥ 0.84		
IV	0 to 250 watts	≤ 0.5	0 to 1 watt	≥ 0.5 * P _{no}	Not applicable	
			1 to 51 watts	≥ 0.09 * Ln(P _{no}) + 0.5		
			>51 to 250 watts	≥ 0.85		
V	0 to < 50 watts	≤ 0.5 for ac-ac; ≤ 0.3 for ac-dc	0 to ≤ 1 watt	Standard: ≥ 0.480 * P _{no} + 0.140 Low Voltage: ≥ 0.497 * P _{no} + 0.067	EPSs with ≥ 100 watts input power must have a true power factor ≥ 0.9 at 100% of rated load when tested at 115 volts/60Hz.	
	≥ 50 to ≤ 250 watts	≤ 0.5	> 1 to 49 watts	Standard: ≥ [0.0626 * Ln(P _{no})] + 0.622 Low Voltage: ≥ [0.0750 * Ln(P _{no})] + 0.561		
			> 49 to 250 watts	Standard: ≥ 0.870 Low Voltage: ≥ 0.860		
VI	Single-Voltage					
	0 to ≤ 49 W	AC-DC: ≤ 0.100 AC-AC: ≤ 0.210	0 to ≤ 1 W	Basic Voltage: ≥ 0.5 * P _{no} + 0.16 Low Voltage: ≥ 0.517 * P _{no} + 0.087	Not Applicable	
			1 to ≤ 49 W	Basic Voltage: ≥ 0.071 * Ln(P _{no}) - 0.0014 * P _{no} + 0.67 Low Voltage: ≥ 0.0834 * Ln(P _{no}) - 0.0014 * P _{no} + 0.609		
	>49 to ≤ 250 W	≤ 0.210	>49 to ≤ 250 W	Basic Voltage: ≥ 0.880 Low Voltage: ≥ 0.870		
	> 250 W	≤ 0.500	>250 W	≥ 0.875		
	Multiple-Voltage					
	Any	≤ 0.300	0 to ≤ 1 W	≥ 0.497 * P _{no} + 0.067		
1 to ≤ 49 W			≥ 0.075 * Ln(P _{no}) + 0.561			
49 W			≥ 0.860			
VII	Reserved for future use					



Test data

Sample Model: ASSA75a2-050480		115Vac/ 60Hz			
Load condition	No Load	Active load of the nameplate (5.0Vdc, 4.8A)			
(Sample 1)	0%	25%	50%	75%	100%
Output voltage(Vdc)	5.15	5.13	5.09	5.05	5.02
Output Current(mA)	--	1200	2400	3600	4800
Active Output Power(W)	--	6.16	12.22	18.18	24.10
Input Power(W)	0.067	7.22	14.41	21.71	29.13
Total Harmonic Distortion(THD,V%)	0.43	0.51	0.57	0.74	0.85
True Power Factor(W/VA)	0.057	0.444	0.498	0.532	0.557
Power Consumed(W)	0.067	1.06	2.19	3.53	5.03
Efficiency(%)	--	85.32	84.80	83.74	82.73
Average Efficiency(%)	--	84.15			
Load condition	No Load	Active load of the nameplate (5.0Vdc, 4.8A)			
(Sample 2)	0%	25%	50%	75%	100%
Output voltage(Vdc)	5.15	5.12	5.10	5.05	5.02
Output Current(mA)	--	1200	2400	3600	4800
Active Output Power(W)	--	6.14	12.24	18.18	24.10
Input Power(W)	0.063	7.18	14.37	21.67	29.10
Total Harmonic Distortion(THD,V%)	0.45	0.48	0.57	0.68	0.84
True Power Factor(W/VA)	0.057	0.442	0.495	0.528	0.554
Power Consumed(W)	0.063	1.04	2.13	3.49	5.00
Efficiency(%)	--	85.56	85.18	83.89	82.82
Average Efficiency(%)	--	84.36			
Load condition	No Load	Active load of the nameplate (5.0Vdc, 4.8A)			
(Sample 3)	0%	25%	50%	75%	100%
Output voltage(Vdc)	5.17	5.13	5.09	5.05	5.02
Output Current(mA)	--	1200	2400	3600	4800
Active Output Power(W)	--	6.16	12.22	18.18	24.10
Input Power(W)	0.060	7.18	14.34	21.63	29.09
Total Harmonic Distortion(THD,V%)	0.42	0.51	0.57	0.74	0.85
True Power Factor(W/VA)	0.036	0.441	0.495	0.529	0.554
Power Consumed(W)	0.060	1.02	2.12	3.45	4.99
Efficiency(%)	--	85.79	85.22	84.05	82.85
Average Efficiency(%)	--	84.48			



Sample Model: ASSA75a2-050480		230Vac / 50Hz			
Load condition	No Load	Active load of the nameplate (5.0Vdc, 4.8A)			
(Sample 1)	0%	25%	50%	75%	100%
Output voltage(Vdc)	5.16	5.11	5.08	5.03	5.00
Output Current(mA)	--	1200	2400	3600	4800
Active Output Power(W)	--	6.13	12.19	18.11	24.00
Input Power(W)	0.084	7.27	14.37	21.49	28.79
Total Harmonic Distortion(THD,V%)	0.44	0.41	0.44	0.47	0.57
True Power Factor(W/VA)	0.017	0.391	0.442	0.467	0.488
Power Consumed(W)	0.084	1.14	2.18	3.38	4.79
Efficiency(%)	--	84.32	84.83	84.27	83.36
Average Efficiency(%)	--	84.20			
Load condition	No Load	Active load of the nameplate (5.0Vdc, 4.8A)			
(Sample 2)	0%	25%	50%	75%	100%
Output voltage(Vdc)	5.15	5.12	5.08	5.05	5.02
Output Current(mA)	--	1200	2400	3600	4800
Active Output Power(W)	--	6.14	12.19	18.18	24.10
Input Power(W)	0.085	7.25	14.35	21.47	28.78
Total Harmonic Distortion(THD,V%)	0.45	0.41	0.46	0.48	0.56
True Power Factor(W/VA)	0.022	0.385	0.436	0.465	0.489
Power Consumed(W)	0.085	1.11	2.16	3.29	4.68
Efficiency(%)	--	84.69	84.95	84.68	83.74
Average Efficiency(%)	--	84.52			
Load condition	No Load	Active load of the nameplate (5.0Vdc, 4.8A)			
(Sample 3)	0%	25%	50%	75%	100%
Output voltage(Vdc)	5.17	5.14	5.10	5.08	5.05
Output Current(mA)	--	1200	2400	3600	4800
Active Output Power(W)	--	6.17	12.24	18.29	24.24
Input Power(W)	0.089	7.29	14.42	21.56	28.84
Total Harmonic Distortion(THD,V%)	0.46	0.43	0.46	0.49	0.57
True Power Factor(W/VA)	0.024	0.387	0.438	0.469	0.491
Power Consumed(W)	0.089	1.12	2.18	3.27	4.60
Efficiency(%)	--	84.64	84.88	84.83	84.05
Average Efficiency(%)	--	84.60			



TEST RESULTS AND REQUIREMENT:

Test Results:

	Model No.	Test at 115V, 60Hz	Test at 230V, 50Hz	Efficiency requirements
No load power (W)	ASSA75a2-050480 (#1)	0.067	0.084	≤0.30
	ASSA75a2-050480 (#2)	0.063	0.085	≤0.30
	ASSA75a2-050480 (#3)	0.060	0.089	≤0.30
Average Efficiency (%)	ASSA75a2-050480 (#1)	84.15	84.20	≥79.94
	ASSA75a2-050480 (#2)	84.36	84.52	≥79.94
	ASSA75a2-050480 (#3)	84.48	84.60	≥79.94
Verdict	---	PASS	PASS	---

Limit for efficiency mark level VI:

Minimum Efficiency Average active mode efficiency limit greater than or equal to $0.075 * \ln(P_{no}) + 0.561 = 79.94\%$

The no-load condition consumption shall not exceed $\leq 0.30W$.

Photo documentation:



Photo 1



Photo 2



Equipments used for measurement

Test Equipments List					
Equipment Name	Manufacturer	Model #	Reg. No.	Cal. Date	Next Cal.
Power Meter	YOKOGAWA	WT210	EST015-008Y	2015-06-13	2016-06-12
Digital Multimeter	FLUKE	Fluke17B	EST001-001	2015-06-13	2016-06-12
Measuring Tape	Henan Yu Cheng Xinxin Measuring Factory	5m	JH1077	2015-06-22	2016-06-21
Temperature-Humidity Recorder	KTJ	TA218	EST019-001	2015-06-17	2016-06-16

-----End of Report-----