TEST REPORT PPP 10059A:2019 TUV SUD Test Report for ErP – External Power Supply Ecodesign requirements for no-load condition electric power consumption and average active efficiency Implementation Measure EC Regulation (EU) 2019/1782	
Report No.: Date of issue: Project handler:	65.182.20.010.01 2020-03-02 Kenny Wu
Testing laboratory: Address: Testing location:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building 12&13, Zhiheng Wisdomland Business Park Nantou Checkpoint Road 2, Nanshan District 518052 Shenzhen CHINA as above
Client: Client number: Address: Contact person:	
Standard:	This TÜV SÜD test program is based on the following standards: (EU) 2019/1782 Test Method: EN 50563:2011+A1:2013 10 CFR 430 Appendix Z: 2015
TRF number and revision:	PPP 10059A:2019 Rev. 01:2019-11
TRF originated by:	TÜV SÜD Product Service GmbH, Mr. Andy Tong
Copyright blank test report:	This test report is based on the content of the standard (see above). The test report considered selected clauses of the a.m. standard(s) and experience gained with product testing. It was prepared by TUV SUD Product Service. TUV SUD Group takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.
General disclaimer:	This test report may only be quoted in full. Any use for advertising purposes must be granted in writing. This report is the result of a single examination of the object in question and is not generally applicable evaluation of the quality of other products in regular production.
Scheme: Non-standard test method: National deviations:	☐ TÜV Mark, ☒ EU-Directive, ☒ without certification ☒ No ☐ Yes, see details under Summary of testing None

Number of pages *(Report)*: Number of pages *(Attachments)*:	18 3
Compiled by:	Kenny Wu *(Printed Name and Signature)*
Approved by:	Kevin Chen *(Printed Name and Signature)*

Test sample:	One (pre-production)
Type of test object:	SWITCHING ADAPTER
Trademark:	N/A
Model and/or type reference:	ZD006C080020EUE, ZD006C080020BSE, ZD006C080020E
Rating(s):	Input: 100-240V~, 50/60Hz, 0.3A; Output: 8.0V⎓, 0.2A, 1.6W
Manufacturer:	Same as client
Manufacturer number:	Same as client
Address:	Same as client
Sub-contractors/ tests (clause):	N/A
Name:	N/A
Order description:	☒ Complete test according to TRF
	☐ Partial test according to manufacturer's specifications
	☐ Preliminary test
	☐ Spot check
	☐ Others:
Date of order:	2019-01-06
Date of receipt of test item:	2020-02-11
Date(s) of performance of test:	From 2020-02-11 to 2020-02-19
Test item particulars:	
Name plate power output (Po):	1.6W
Declared No-load power consumption:	0.09W
Declared Average active efficiency:	71.0%
Declared Efficiency at load 10%:	--
Built-in ON/OFF switch :	N/A
Output :	Fixed
Type of power supply:	☐ Multiple-voltage external power supply ☒ Single-voltage external power supply

Purpose of the product (Description of intended use):

SWITCHING ADAPTER with DC output 8.0VDC, 0.2A, 1.6W for general use purpose.

Characteristic data *(not shown on the marking plate)*:

Weight: approx. 0.075kg.

Attachments:

Attachment 1: Equipment List

Attachment 2: Information in instruction manuals for end-users (where applicable), and free access websites based on manufacturer declaration.

General remarks:

"(see remark #)" refers to a remark appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report ***a comma*** *is used as the decimal separator.*
The test results presented in this report relate only to the object tested.
This report shall not be reproduced except in full without the written approval of the testing laboratory.

Measurement uncertainty budgets have been determined for applicable test methods and are available upon request.

According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.

Summary of testing:

Models ZD006C080020EUE, ZD006C080020BSE, ZD006C080020E are identical except for plug type and model number.

Model ZD006C080020EUE equipped with fixed EU plug.

Model ZD006C080020BSE equipped with fixed BS plug.

Model ZD006C080020E equipped with detachable plug including EU or BS plug.

The model ZD006C080020EUE was selected as representative for all tests unless otherwise specified.

Remark:

	Stage 1
Start Date	01.Apr.2020

☐ deviation(s) found

☒ no deviations found

Additional information on Non-standard test method(s)

Sub clause: N/A

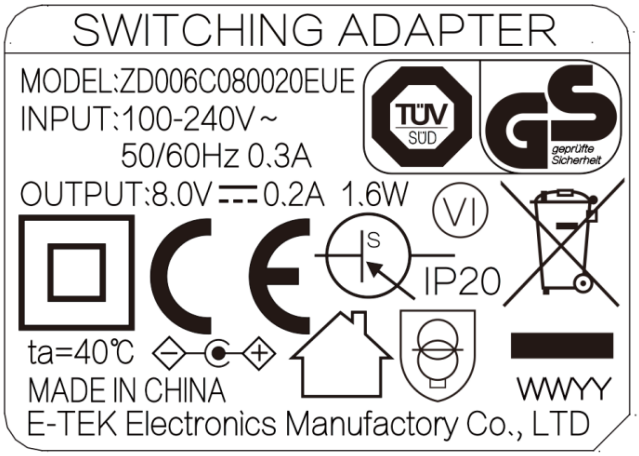
Page: N/A

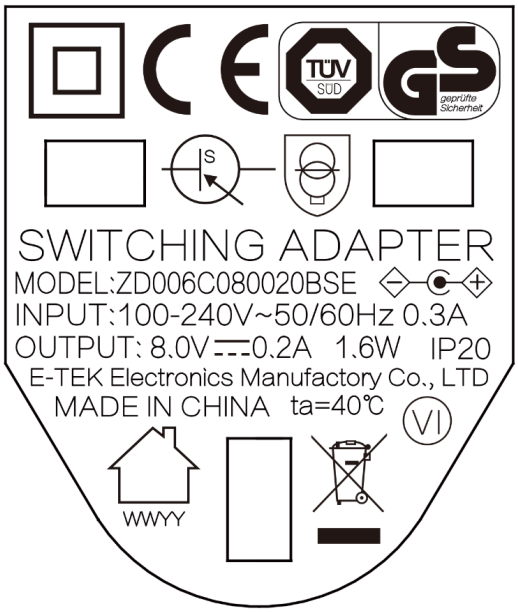
Rational: N/A

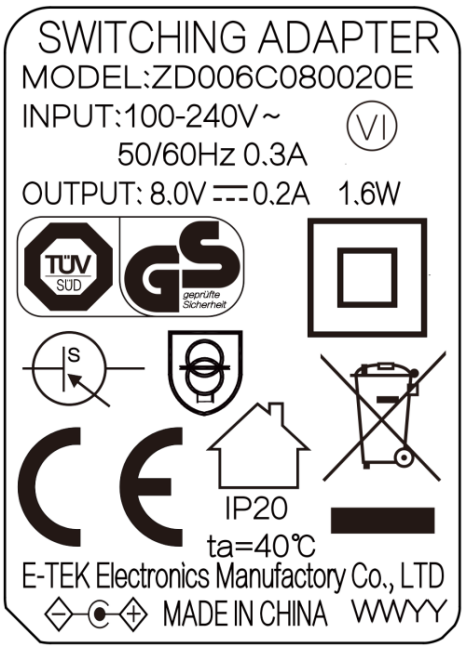
If additional information is necessary, please provide

N/A

Copy of marking plate:







Remark:

1, The height dimension of CE mark should not less than 5mm, the height dimension of WEEE symbol should not less than 7mm.

2. The name and address of importer and manufacturer will be printed on its packaging or in a document accompanying the product.

Picture of the product:

Figure 1 - Overall view for equipment (for model ZD006C080020EUE)

Figure 2 - Overall view for equipment (for model ZD006C080020EUE)

Picture of the product(cont'd):

Figure 3 - Overall view for equipment (for model ZD006C080020BSE)

Figure 4 - Overall view for equipment (for model ZD006C080020BSE)

Picture of the product(cont'd):

Figure 5 - Overall view for equipment (for model ZD006C080020E)

Figure 6 - Internal view (for model ZD006C080020EUE)

Picture of the product(cont'd):

Figure 7 - Internal view (for model ZD006C080020BSE)

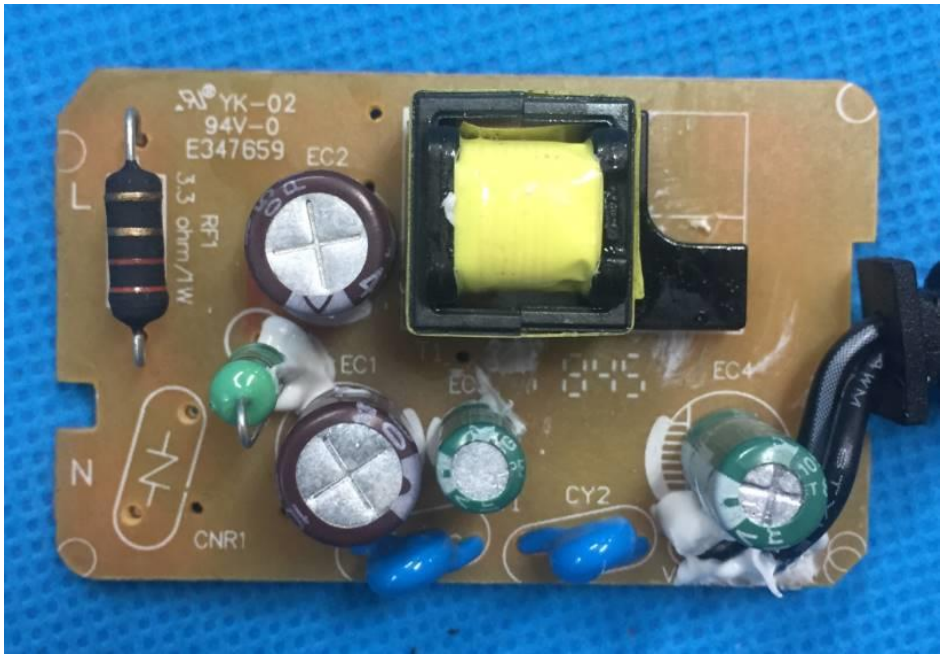


Figure 8 - Top view of PCB

Picture of the product(cont'd):

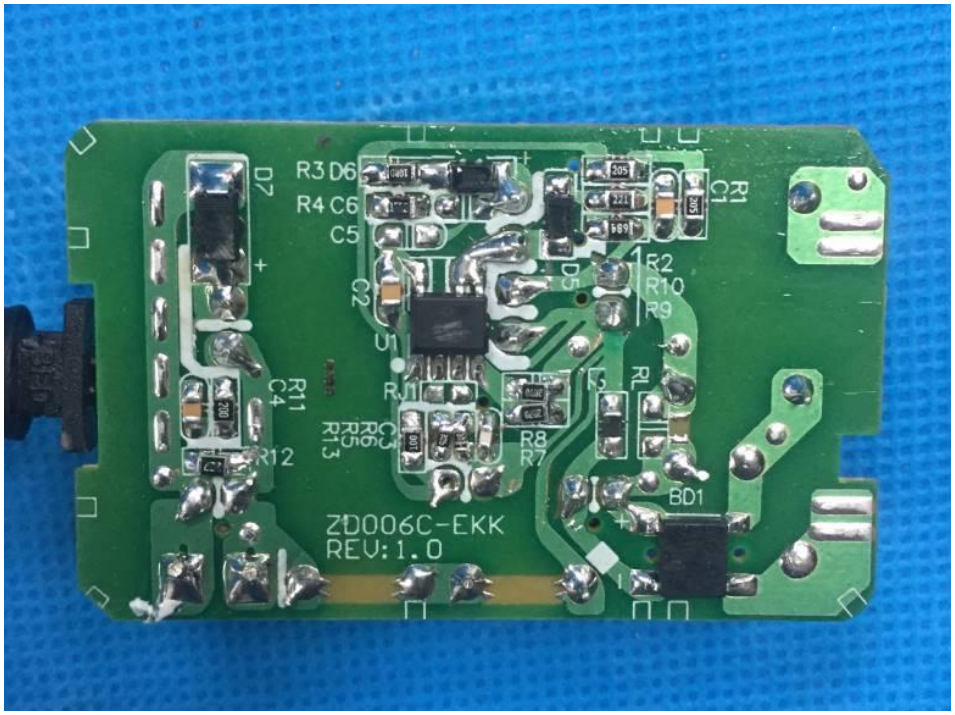


Figure 9 - Bottom view of PCB

Name and address of factory (ies) *(only if certification is provided)*:

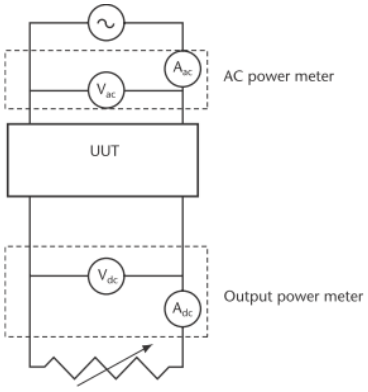
Same as client

Possible test case verdicts:

test case does not apply to the test object:	N/A (not applicable / not included in the order)
test object does meet the requirement:	P (Pass)
test object does not meet the requirement:	F (Fail)

Possible suffixes to the verdicts:

suffix for detailed information for the client:	C (Comment)
suffix for important information for factory inspection:	M (Manufacturing)

Clause	Requirement + Test	result – Remark	Verdict
0.	General	Test method is acccording to EN 50563 and may refer to 10CFR430 Appendix Z for multiple output external power supply in addition as far as needed to supplement the test.	P
0.1	Ambient condition met requirement of: Ambient temperature 20 ±5ºC; Airspeed ≤0.5m/s.	Ambient: 22.4ºC Airspeed: 0.2m/s	P
0.2	Power source meets requirement of: The input voltage source must be capable of delivering at least 10 times the nameplate input power of the UUT; Voltage 230V ±1%; Frequency 50Hz ±1%; THD value <2%; ratio of peak value of test voltage to rms of 1.34 to 1.49.	Volage: 230V Frequency: 50.0Hz THD: Max. 0.07% Ratio: 1.414	P
0.3	Power measurement accuracy		P
	Any power measurements recorded, as well as any power measurement equipment utilized for testing, shall conform to the uncertainty and resolution requirements outlined in Clause 4, “General conditions for measurements,” as well as Annexes B, “Notes on the measurement of low power modes,” and D, “Determination of uncertainty of measurement,” of IEC 62301:2011.		P
0.4	Test circuit		P
	 Fig. 1 Electrical test circuit		P

Clause	Requirement + Test	result – Remark	Verdict

Annex II	Ecodesign requirements for external power supplies		P
1.	Energy efficiency requirements:		P
(a)	From 1 April 2020, the no-load condition power consumption shall not exceed the following values:		P
	<table><tr><th></th><th>AC-AC external power supplies, except low voltage and multiple voltage output external power supplies</th><th>AC-DC external power supplies, except low voltage and multiple voltage output external power supplies</th><th>Low voltage external power supplies</th><th>Multiple voltage output external power supplies</th></tr><tr><td>$P_O \leq 49{,}0$ W</td><td>0,21 W</td><td>0,10 W</td><td>0,10 W</td><td>0,30 W</td></tr><tr><td>$P_O > 49{,}0$ W</td><td>0,21 W</td><td>0,21 W</td><td>0,21 W</td><td>0,30 W</td></tr></table>	See table 1	P
(b)	From 1 April 2020, the average active efficiency shall be not less than the following values:		P
	<table><tr><th></th><th>AC-AC external power supplies, except low voltage and multiple voltage output external power supplies</th><th>AC-DC external power supplies, except low voltage and multiple voltage output external power supplies</th><th>Low voltage external power supplies</th><th>Multiple voltage output external power supplies</th></tr><tr><td>$P_O \leq 1{,}0$ W</td><td>$0{,}5 \times P_O/1W + 0{,}160$</td><td>$0{,}5 \times P_O/1W + 0{,}160$</td><td>$0{,}517 \times P_O/1W + 0{,}087$</td><td>$0{,}497 \times P_O/1W + 0{,}067$</td></tr><tr><td>1 W $< P_O \leq$ 49,0 W</td><td>$0{,}071 \times \ln(P_O/1W) - 0{,}0014 \times P_O/1W + 0{,}67$</td><td>$0{,}071 \times \ln(P_O/1W) - 0{,}0014 \times P_O/1W + 0{,}67$</td><td>$0{,}0834 \times \ln(P_O/1W) - 0{,}0014 \times Po/1W + 0{,}609$</td><td>$0{,}075 \times \ln(P_O/1W) + 0{,}561$</td></tr><tr><td>$P_O > 49{,}0$ W</td><td>0,880</td><td>0,880</td><td>0,870</td><td>0,860</td></tr></table>	See table 1	P
2.	Information requirements:		P
(a)	from 1 April 2020, the nameplate shall include the following information:		P
	<table><tr><th>Nameplate information</th><th>Value and precision</th><th>Unit</th><th>Notes</th></tr><tr><td>Output power</td><td>X,X</td><td>W</td><td>In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage - Output current – Output power shall be given.</td></tr><tr><td>Output voltage</td><td>X,X</td><td>V</td><td>In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage - Output current – Output power shall be given.</td></tr><tr><td>Output current</td><td>X,X</td><td>A</td><td>In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage - Output current – Output power shall be given.</td></tr></table>	See page 5	P

<table>
<tr><th>Clause</th><th>Requirement + Test</th><th>result – Remark</th><th>Verdict</th></tr>
<tr><td>(b)</td><td>from 1 April 2020, instruction manuals for end-users (where applicable), and free access websites of manufacturers, importers or authorised representatives shall include the following information, in the order as set out below:</td><td></td><td>P</td></tr>
<tr><td></td><td>
<table>
<tr><th>Information published</th><th>Value and precision</th><th>Unit</th><th>Notes</th></tr>
<tr><td>Manufacturer's name or trade mark, commercial registration number and address</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Model identifier</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Input voltage</td><td>X</td><td>V</td><td>Specified by the manufacturer. Shall be a value or a range.</td></tr>
<tr><td>Input AC frequency</td><td>X</td><td>Hz</td><td>Specified by the manufacturer. Shall be a value or a range.</td></tr>
<tr><td>Output voltage</td><td>X,X</td><td>V</td><td>Nameplate output voltage. Shall indicate whether is AC or DC.
In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage - Output current – Output power shall be published.</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Output current</td><td>X,X</td><td>A</td><td>Nameplate output current.
In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage - Output current – Output power shall be published.</td></tr>
<tr><td>Output power</td><td>X,X</td><td>W</td><td>Nameplate output power.
In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage - Output current – Output power shall be published.</td></tr>
<tr><td>Average active efficiency</td><td>X,X</td><td>%</td><td>Declared by the manufacturer based on the value calculated as arithmetical mean of efficiency at load conditions 1-4.
In cases where multiple average active efficiencies are declared for multiple output voltages available at load condition 1, the value published shall be the average active efficiency declared for the lowest output voltage.</td></tr>
<tr><td>Efficiency at low load (10 %)</td><td>X,X</td><td>%</td><td>Declared by the manufacturer based on the value calculated at load condition 5.
External power supplies with a nameplate output power of 10 W or less shall be exempted from this requirement.
In cases where multiple average active efficiencies are declared for multiple output voltages available at load condition 1, the value published shall be the value declared for the lowest output voltage.</td></tr>
<tr><td>No-load power consumption</td><td>X,XX</td><td>W</td><td>Declared by the manufacturer based on the value measured for load condition 6.</td></tr>
</table>
</td><td>Draft information layout for web page
See attachment 2</td><td>P</td></tr>
<tr><td></td><td>The relevant load conditions are as follows:</td><td></td><td>P</td></tr>
</table>

Clause	Requirement + Test	result – Remark	Verdict
			P

Percentage of nameplate output current	
Load condition 1	100 % ± 2 %
Load condition 2	75 % ± 2 %

Load condition 3	50 % ± 2 %
Load condition 4	25 % ± 2 %
Load condition 5	10 % ± 1 %
Load condition 6	0 % (no-load condition)

TABLE1	Measurement and calculation					P
Model:	ZD006C080020EUE					
	Load condition 1	Load condition 2	Load condition 3	Load condition 4	Load condition 5*	Load condition 6
	100% ± 2%	75% ± 2%	50% ± 2%	25% ± 2%	10% ± 1%	0%
☒ Output #1:						
Output current (mA)	200.27	150.33	99.78	50.00	--	
Output Voltage (V)	8.36	8.311	8.243	8.181	--	
Active Output Power (W)	1.676	1.250	0.8225	0.409	--	
☐ Output #2:						
Output current (mA)	--	--	--	--	--	
Output Voltage (V)	--	--	--	--	--	
Active Output Power (W)	--	--	--	--	--	
Input Voltage (V)	230.0	230.0	230.0	230.0	--	230.0
Input current (mA)	27.1	21.71	16.05	10.33	--	1.48
Input Power (W)	2.154	1.620	1.095	0.598	--	0.060
THD_I (%)	266.1	281.4	307.6	360.4	--	456.7
True Power Factor	0.345	0.325	0.296	0.252	--	0.174
Power consumed (W)	0.478	0.370	0.2725	0.189	--	--
Active mode Efficiency	77.81%	77.16%	75.11%	68.39 %	--	
Average active Efficiency	74.62%					

Calculation information:
True Power Factor = Input Power / (Input Voltage * Input current)
Power consumed = Input Power - Active Output Power
Efficiency = Active Output Power / Input Power
Average Efficiency = (Efficiency 1 + Efficiency 2 + Efficiency 3 + Efficiency 4)/4
No Load Power consumption = Input Power @ 0% load

Supplementary information:
- Setting: Default.
- Test load: See above.
- Stability achieved: Yes.
- Test with output wire: 185 cm +/- 5 cm, 20 AWG.
- * load contion for external power supply with a name plate output power great than 10 wastts;
- Above tables for output data may be extended if more than 2 outputs for multiple output external power supply.
- Average active mode efficiency ≥ 0.071 * ln(Po/1W) - 0.0014 * Po/1W + 0.67 = 70.12%.
  The no-load condition consumption shall not exceed 0.10W.

Attachment 1: Equipment List

Equipment	ID No.	Model	Brand/Manufacturer	Calibration due date
Power Meter	13217	WT210	Japan Yokogawa	08/20/2020
Power Meter	13218	WT210	Japan Yokogawa	12/04/2020
Temperature and humidity recorder	40773	L92-1	Binyulong	06/18/2020
Electronic Balance	40961	DNC5002	Anheng	05/28/2020
Oscilloscope Probe 100:1	42991	P5122	Tektronix	09/24/2020
Oscilloscope	38797	710105-H-HC/M1S	Yokogawa	11/07/2020
Stop Watch	41160	PC894	TIANFU	06/23/2020
Electronic load	13449	IT8512C	Nanjing ITECH	10/10/2020
5m steel measure tap	13170	30-616	Stanley	06/25/2021
Anemometer	15798	Testo 417	Testo	10/20/2020

Attachment 2: Information in instruction manuals for end-users (where applicable), and free access websites

Information published	Information declared	Value and precision	Unit	Notes
Manufacturer's name or trade mark, commercial registration number and address		-	-	-
	Importer name: XXXXXX Address: XXXXXX Commercial registration number: XXX			
Model identifier	ZD006C080020EUE, ZD006C080020BSE, ZD006C080020E	-	-	-
Input voltage	100-240	X	V	Specified by the manufacturer. Shall be a value or a range.
Input AC frequency	50/60	X	Hz	Specified by the manufacturer. Shall be a value or a range.
Output voltage	8.0 VDC	X,X	V	Nameplate output voltage. Shall indicate whether is AC or DC. In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage - Output current- Output power shall be published.
Output current	0.2	X,X	A	Nameplate output current. In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available Output voltage - Output current – Output power shall be published.
Output power	1.6	X,X	W	Nameplate output power. In cases where more than one physical output or more than one output voltage at load condition 1 are measured, the sets of available

Information published	Information declared	Value and precision	Unit	Notes
				Output voltage - Output current – Output power shall be published.
Average active efficiency	71.0	X,X	%	Declared by the manufacturer based on the value calculated as arithmetical mean of efficiency at load conditions 1-4. In cases where multiple average active efficiencies are declared for multiple output voltages available at load condition 1, the value published shall be the average active efficiency declared for the lowest output voltage.
Efficiency at low load (10 %)	--	X,X	%	Declared by the manufacturer based on the value calculated at load condition 5. External power supplies with a nameplate output power of 10 W or less shall be exempted from this requirement. In cases where multiple average active efficiencies are declared for multiple output voltages available at load condition 1, the value published shall be the value declared for the lowest output voltage.
No-load power consumption	0.09	X,XX	W	Declared by the manufacturer based on the value measured for load condition 6.

END OF TEST REPORT