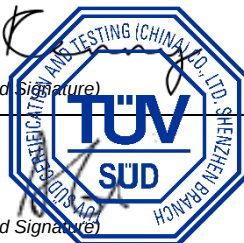




TEST REPORT PPP 11046C:2019 Rev. 00 TUV SUD Test Report for Canada's Energy Efficiency Regulations – External Power Supplies	
Report No.:	65.182.22.083.01
Date of issue:	2022-10-08
Project handler:	Kenny Wu
Testing laboratory:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Address:	Building 12 & 13, Zhiheng Wisdomland Business Park, Guankou Erlu, Nantou, Nanshan District, Shenzhen, Guangdong 518052, China
Testing location:	as above
Client:	DONGGUAN GAOYI ELECTRONIC CO., LTD.
Client number:	085743
Address:	WEST SHAYAO RD, SHIJIE TOWN, 523292 DONGGUAN, GUANGDONG, PEOPLE'S REPUBLIC OF CHINA
Contact person:	Mr. Kuo Xiaoqing
Standard:	This TÜV SÜD test program is based on the following standards: Canada's Energy Efficiency Regulations – External Power Supplies (incl. Amendment 1 to 14): 31. Oct. 2018 Test Method: ☐ CSA C381.1-08 ☒ 10 C.F.R. Appendix Z ☒ CSA C381.1-17
TRF number and revision:	PPP 11046C:2019 Rev. 00/2019-03
TRF originated by:	TÜV SÜD Product Service GmbH, Mr. Alex Kong
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:	☒ Canada's Energy Efficiency Certification ☐ without certification
Non-standard test method:	☒ No ☐ Yes, see details under Summary of testing
National deviations:	N/A



Number of pages (Report):	17
Number of pages (Attachments):	3
Compiled by:	Kenny Wu (Printed Name and Signature)
Approved by:	Alex Wu (Printed Name and Signature)





Test sample:	Two (Pre-production)
Type of test object:	Class 2 Power Supply
Trademark:	
Model and/or type reference:	RSS1002-144120-W2
Rating(s):	Input: 100-240VAC, 50/60Hz, 0.6A Output: 12.0VDC, 1.2A, 14.4W
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:	2022-08-29
Date of receipt of test item:	2022-09-01
Date(s) of performance of test:	2022-09-01 to 2022-09-05
Test item particulars:	
Output characteristic:	DC
Nominal output voltage at the highest settings (V):	12.0
Nominal output voltage at the lowest settings (V):	12.0
Nominal output power at the highest power settings (W):	$12.0 \times 1.2 = 14.4$
Nominal output power at the lowest power settings (W):	$12.0 \times 1.2 = 14.4$
Average efficiency at the highest power settings:	84.30%
Average efficiency at the lowest power settings:	84.30%
Power in no-load mode (W):	0.074

Type of power supply: Replacement / Security EPS related end-use equipment and the brand and model number of that equipment: Efficiency protocol Roman numeral: Name of the organization or province that carried out the verification and authorized the verification mark that will appear on the product:	☐ External power supplies, other than replacement external power supplies, ☒ Direct operation external power supplies other than replacement external power supplies ☐ Indirect operation external power supplies other than replacement external power supplies ☐ Replacement external power supplies ☐ Adaptive external power supply ☒ Direct operation external power supply ☐ Indirect operation external power supply ☐ Multiple-voltage external power supply ☒ Single-voltage external power supply N/A VI TÜV SÜD America Inc.
Purpose of the product (Description of intended use): Class 2 Power Supply with DC Output 12.0VDC, 1.2A, 14.4W for general use purpose.	
Characteristic data (not shown on the marking plate): Weight (kg): Approx. 0.198kg	
Attachments: 1 page of Equipment list - CDF	
General remarks: <i>"(see remark #)" refers to a remark appended to the report.</i> <i>"(see appended table)" refers to a table appended to the report.</i> <i>Throughout this report a comma is used as the decimal separator.</i> <i>The test results presented in this report relate only to the object tested.</i> <i>This report shall not be reproduced except in full without the written approval of the testing laboratory.</i>	



Summary of testing:

The energy efficiency regulations by provinces (Ontario, Quebec) were also considered as below:

- ONTARIO REGULATION 509/18 ENERGY AND WATER EFFICIENCY - APPLIANCES AND PRODUCTS: External Power Supply;
- Quebec's Energy Efficiency Regulation as published in the Quebec Gazette Part 2 No. 50, 12 December 2018 (amended, O.C. 1394-2018) - Act respecting energy efficiency and energy conservation standards for certain electrical or hydrocarbon-fuelled appliances (Schedule 2, External Power Supply).

☐ deviation(s) found

☒ no deviations found

Additional information on Non-standard test method(s)

Sub clause: N/A

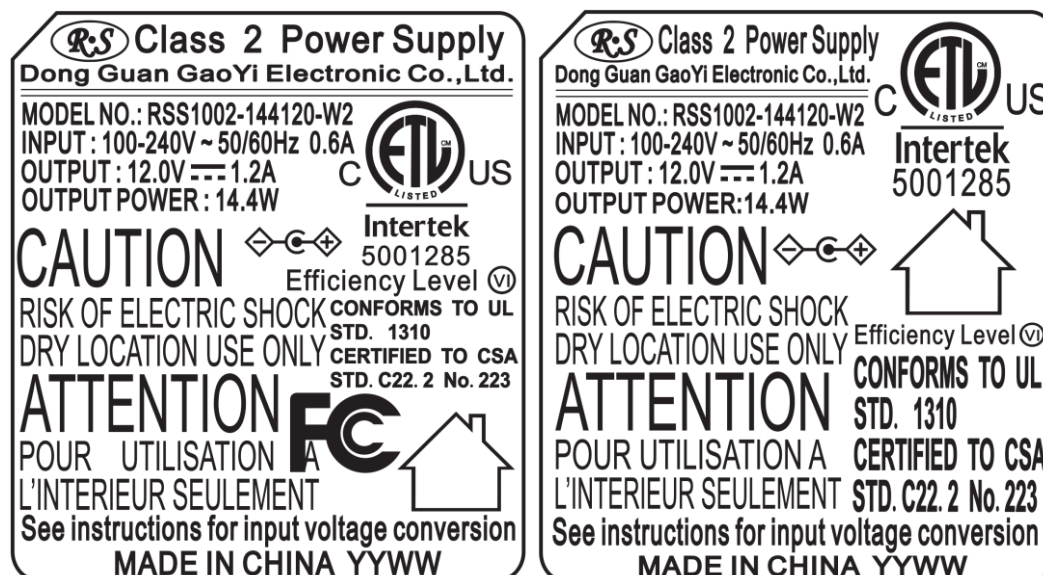
Page: N/A

Rational: N/A

If additional information is necessary, please provide

N/A

Copy of marking plate:



Remark: Date code YYWW, YY means years, WW means weeks.

Picture of the product:



Fig. 1 – Outside view

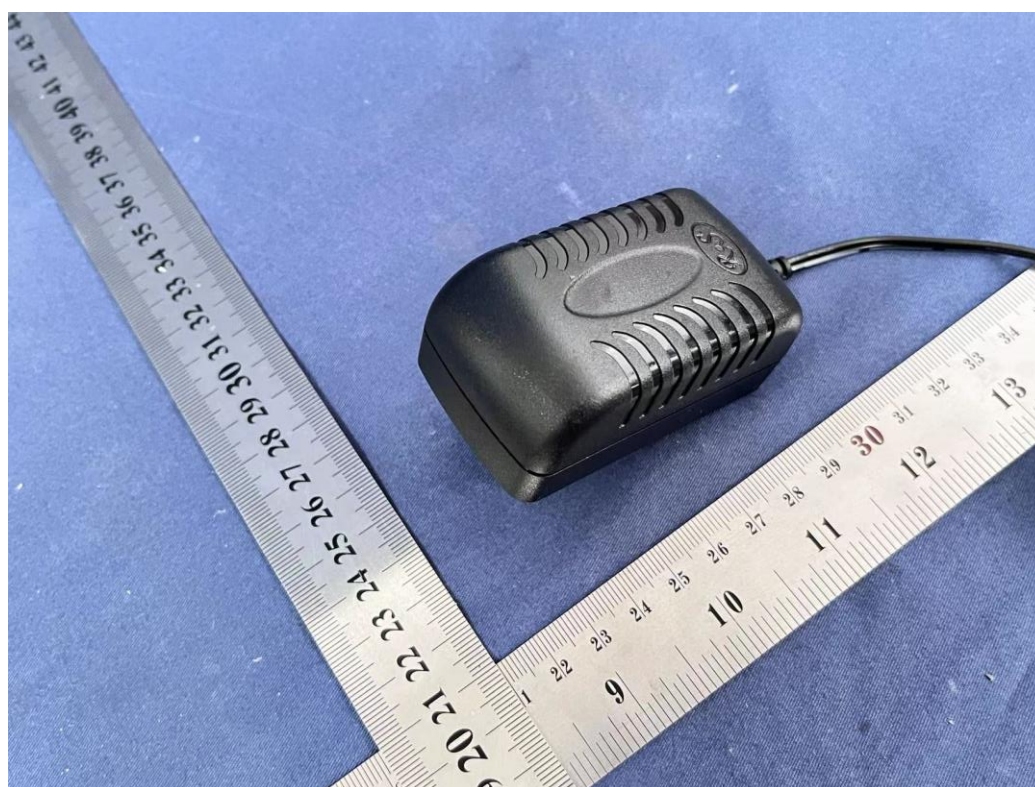
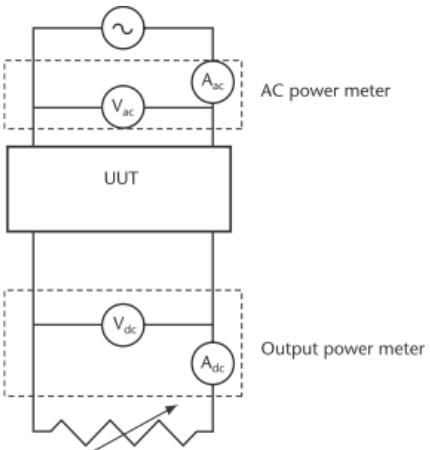


Fig. 2 – Outside view

Clause	Requirement – Test	Measuring result – Remark	Verdict
0.	General		P
0.1	Ambient condition met requirement of: Ambient temperature $23 \pm 5^{\circ}\text{C}$; Airspeed $\leq 0.5\text{m/s}$. (CSA C381.1-08)		N/A
	Ambient condition met requirement of: Ambient temperature $20 \pm 5^{\circ}\text{C}$; Airspeed $\leq 0.5\text{m/s}$. (CSA C381.1-17 and 10 C.F.R. Appendix Z)	See table 1 to 3	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 $115\text{V} \pm 1\%$; Frequency $60\text{Hz} \pm 1\%$; THD value $< 2\%$; ratio of peak value of test voltage to rms of 1.34 to 1.49. (CSA C381.1-08, CSA C381.1-17, and 10 C.F.R. Appendix Z)	See table 1 and 2, ratio of peak value of test voltage to rms: 1.41	P
0.3	Power measurement accuracy		P
	Measurements of active power of 0.5 W or greater shall be made with an uncertainty of $\leq 2\%$. Measurements of active power of less than 0.5 W shall be made with an uncertainty of $\leq 0.01\text{ W}$. Instruments measuring active power shall have a resolution of 0.01 W or better. Measurements of voltage and current shall be made with an uncertainty of $\leq 2\%$. (CSA C381.1-08)		N/A
	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 CAN/CSA-C62301. (CSA C381.1-17)		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		P

	low power modes,” and D, “Determination of uncertainty of measurement,” of IEC 62301. (10 C.F.R. Appendix Z)		
0.4	Test circuit		P
	 Fig. 1 Electrical test circuit (CSA C381.1-08, CSA C381.1-17, and 10 C.F.R. Appendix Z)		P

Clause	Requirement – Test	Measuring result – Remark			Verdict
1.	Energy Performance Standard				P
1.1	Minimum average efficiency in active mode (E_{A_Limit}) and Maximum Power in no-load mode ($P_{No-load_Limit}$)				P
E_{A_Limit} and $P_{No-load_Limit}$ table:					P
Item	Energy-using Product	Standard	Energy Efficiency Standard	Period of Manufacture	
☐ 1	External power supplies, other than replacement external power supplies	CSA C381.1-08 or 10 C.F.R. Appendix Z	10 C.F.R. §430.32(w)(1)(i) for efficiency in active mode and, if product is not a security external power supply, power in no-load mode ≤ 0.5 W	On or after July 1, 2010 and before July 1, 2017	
☒ 2	Direct operation external power supplies other than replacement external power supplies	CSA C381.1-17 or 10 C.F.R. Appendix Z	CSA C381.1-17, Table D.1, for efficiency in active mode and power in no-load mode	On or after July 1, 2017	
☐ 3	Indirect operation external power supplies other than replacement external power supplies	CSA C381.1-08 or 10 C.F.R. Appendix Z	10 C.F.R. §430.32(w)(1)(i) for efficiency in active mode and, if product is not a security external power supply, power in no-load mode ≤ 0.5 W	On or after July 1, 2017	
☐ 4	Replacement external power supplies	CSA C381.1-08 or 10 C.F.R. Appendix Z	10 C.F.R. §430.32(w)(1)(i) for efficiency in active mode and, if product is not a security external power supply, power in no-load mode ≤ 0.5 W	On or after July 1, 2013 and before February 10, 2020	
☐ 5	Replacement external power supplies	CSA C381.1-17 or 10 C.F.R. Appendix Z	CSA C381.1-17, Table D.1, for efficiency in active mode and power in no-load mode	On or after February 10, 2020	

10 C.F.R. §430.32(w)(1)(i):

Active mode	
Nameplate output	Required efficiency (decimal equivalent of percentage)
Less than 1 watt	0.5 times the Nameplate output
From 1 watt to not more than 51 watt	The sum of 0.09 times the Natural Logarithm of the Nameplate output and 0.5.
Great than 51 watt	0.85

CSA C381.1-17, Table D.1:

Single-voltage external ac-dc power supply, basic-voltage		
Nameplate output power (P_{out})	Minimum average efficiency in active mode (expressed as a decimal)	Maximum power in no-load mode, W
$P_{out} \leq 1$ W	$\geq 0.5 \times P_{out} + 0.16$	≤ 0.100
1 W $< P_{out} \leq 49$ W	$\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67$	≤ 0.100
49 W $< P_{out} \leq 250$ W	≥ 0.880	≤ 0.210
$P_{out} > 250$ W	≥ 0.875	≤ 0.500
Single-voltage external ac-dc power supply, low-voltage		
Nameplate output power (P_{out})	Minimum average efficiency in active mode (expressed as a decimal)	Maximum power in no-load mode, W
$P_{out} \leq 1$ W	$\geq 0.517 \times P_{out} + 0.087$	≤ 0.100
1 W $< P_{out} \leq 49$ W	$\geq 0.0834 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.609$	≤ 0.100
49 W $< P_{out} \leq 250$ W	≥ 0.870	≤ 0.210
$P_{out} > 250$ W	≥ 0.875	≤ 0.500
Single-voltage external ac-ac power supply, basic-voltage		
Nameplate output power (P_{out})	Minimum average efficiency in active mode (expressed as a decimal)	Maximum power in no-load mode, W
$P_{out} \leq 1$ W	$\geq 0.5 \times P_{out} + 0.16$	≤ 0.210
1 W $< P_{out} \leq 49$ W	$\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67$	≤ 0.210
49 W $< P_{out} \leq 250$ W	≥ 0.880	≤ 0.210
$P_{out} > 250$ W	≥ 0.875	≤ 0.500
Single-voltage external ac-ac power supply, low-voltage		
Nameplate output power (P_{out})	Minimum average efficiency in active mode (expressed as a decimal)	Maximum power in no-load mode, W
$P_{out} \leq 1$ W	$\geq 0.517 \times P_{out} + 0.087$	≤ 0.210
1 W $< P_{out} \leq 49$ W	$\geq 0.0834 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.609$	≤ 0.210
49 W $< P_{out} \leq 250$ W	≥ 0.870	≤ 0.210
$P_{out} > 250$ W	≥ 0.875	≤ 0.500
Multiple-voltage external power supply		
Nameplate output power (P_{out})	Minimum average efficiency in active mode (expressed as a decimal)	Maximum power in no-load mode, W
$P_{out} \leq 1$ W	$\geq 0.497 \times P_{out} + 0.067$	≤ 0.300
1 W $< P_{out} \leq 49$ W	$\geq 0.075 \times \ln(P_{out}) + 0.561$	≤ 0.300
$P_{out} > 49$ W	≥ 0.860	≤ 0.300

1.1.1	E_{A_Limit} :	$\geq 83.93\%$	P
	Evaluation: $E_{A_Limit} \leq E_A$ at highest setting	$E_A = 84.30\%$ (fixed output)	P
	Evaluation: $E_{A_Limit} \leq E_A$ at lowest setting	$E_A = 84.30\%$ (fixed output)	P
1.1.2	$P_{No-load_Limit}$:	≤ 0.100 W	P
	Evaluation: $P_{No-load} \leq P_{No-load_Limit}$	$P_{No-load} = 0.074$ W	P
2	Labelling requirements		P

Clause	Requirement – Test	Measuring result – Remark	Verdict
	EnerGuide labelling requirements are not part of this amendment to the Energy Efficiency Regulations.		N/A
	To be marked with: the roman numeral mark or	VI marked on the label	P
	To be marked with: the verification mark		N/A

TABLE 1		Measurement and calculation				P
T _{amb} (23 ±5)		(°C):	23.8	Rh (10-80%)		(%): 58.6
THD (<2%)		(%):	Max. 0.069%	Airspeed (<0.5)		(m/s): 0.3
Setting		None				
	Load condition 1	Load condition 2	Load condition 3	Load condition 4	Load condition 5	
	100% ± 2%	75% ± 2%	50% ± 2%	25% ± 2%	0%	
Output current (mA)	1200.3	899.90	600.30	299.69		
Output Voltage (V)	11.857	11.941	11.789	11.776		
Active Output Power (P _{Out}) (W)	14.235	10.743	7.0720	3.5258		
Input Voltage (V)	115.33	115.33	115.33	115.33	115.33	
Frequency (Hz)	60.0	60.0	60.0	60.0	60.0	
Input current (mA)	260.88	204.83	143.11	82.330	2.9390	
Active Input Power (P _i) (W)	17.105	12.791	8.3117	4.1220	0.070	
Efficiency (E _x)	83.22%	83.99%	85.08%	85.54%		
Average Efficiency (E _A)	84.46%					
Calculation information: E _x = P _O / P _i E _A = (E ₁ + E ₂ + E ₃ + E ₄)/4 No Load Power consumption (P _{No-load}) = P _i @ 0% load						
Supplementary information: Sample No.: 1# Tested at: 115VAC, 60Hz. Test with output wire: 180cm, 22AWG.						
CSA C381.1-17, Table D.1 for direct operation external power supplies other than replacement external power supplies and efficiency mark level VI limit: Average active mode efficiency limit ≥ 0.071 * ln(P _o) – 0.0014 * P _o + 0.67 = 83.93%, No load power limit: ≤ 0.100W.						

TABLE 2		Measurement and calculation				P
T _{amb} (23 ±5)		(°C):	23.8	Rh (10-80%)		(%): 58.6
THD (<2%)		(%):	Max. 0.071%	Airspeed (<0.5)		(m/s): 0.3
Setting		None				
	Load condition 1	Load condition 2	Load condition 3	Load condition 4	Load condition 5	
	100% ± 2%	75% ± 2%	50% ± 2%	25% ± 2%	0%	
Output current (mA)	1199.4	899.90	598.70	299.67		
Output Voltage (V)	12.020	12.059	11.957	11.956		
Active Output Power (P _{Out}) (W)	14.436	10.840	7.1359	3.5777		
Input Voltage (V)	115.28	115.28	115.28	115.28	115.28	
Frequency (Hz)	60.0	60.0	60.0	60.0	60.0	
Input current (mA)	260.89	205.89	142.87	82.520	3.0060	
Active Input Power (P _i) (W)	17.292	13.005	8.4430	4.2012	0.071	
Efficiency (E _x)	83.48%	83.35%	84.52%	85.16%		
Average Efficiency (E _A)	84.13%					
Calculation information: E _x = P _O / P _i E _A = (E ₁ + E ₂ + E ₃ + E ₄)/4 No Load Power consumption (P _{No-load}) = P _i @ 0% load						
Supplementary information: Sample No.: 2# Tested at: 115VAC, 60Hz. Test with output wire: 180cm, 22AWG.						
CSA C381.1-17, Table D.1 for direct operation external power supplies other than replacement external power supplies and efficiency mark level VI limit: Average active mode efficiency limit ≥ 0.071 * ln(Po) – 0.0014 * Po + 0.67 = 83.93%, No load power limit: ≤ 0.100W.						

TABLE 3		Measurement and calculation				P
T _{amb} (23 ±5)		(°C):	23.8	Rh (10-80%)		(%): 58.6
THD (<2%)		(%):	Max. 0.105%	Airspeed (<0.5)		(m/s): 0.3
Setting		None				
	Load condition 1	Load condition 2	Load condition 3	Load condition 4	Load condition 5	
	100% ± 2%	75% ± 2%	50% ± 2%	25% ± 2%	0%	
Output current (mA)	1200.3	899.90	598.90	299.66		
Output Voltage (V)	11.967	12.061	11.910	11.934		
Active Output Power (P _{Out}) (W)	14.365	10.848	7.1272	3.5643		
Input Voltage (V)	230.41	230.41	230.41	230.41	230.41	
Frequency (Hz)	50.0	50.0	50.0	50.0	50.0	
Input current (mA)	168.88	134.19	93.920	54.820	1.9160	
Active Input Power (P _i) (W)	17.126	12.821	8.3845	4.2256	0.084	
Efficiency (E _x)	83.88%	84.61%	85.00%	84.35%		
Average Efficiency (E _A)	84.46%					
Calculation information: E _x = P _O / P _i E _A = (E ₁ + E ₂ + E ₃ + E ₄)/4 No Load Power consumption (P _{No-load}) = P _i @ 0% load						
Supplementary information: Sample No.: 2# Tested at: 230VAC, 50Hz. Test with output wire: 180cm, 22AWG.						
CSA C381.1-17, Table D.1 for direct operation external power supplies other than replacement external power supplies and efficiency mark level VI limit: Average active mode efficiency limit ≥ 0.071 * ln(Po) – 0.0014 * Po + 0.67 = 83.93%, No load power limit: ≤ 0.100W.						

Table 4 Explanation of sampling plan external power supplies		
Test sample	Measured Active Mode Efficiency (%)	Measured No-Load Mode Power (W)
1#	84.46% (see table 1)	0.070 (see table 1)
2#	84.13% (see table 2)	0.071 (see table 2)
The reported no load power consumption on 97.5% confidence level is the higher of: 1. $UCL/1.05 = (X + t * s/\sqrt{n})/1.05 = 0.074W$, or 2. The mean value of measured No-Load Mode Power= 0.071W		
The reported Active Mode Efficiency on 97.5% confidence level is the lower of: 1. $LCL/0.95 = (X - t * s/\sqrt{n})/0.95 = 86.51\%$, or 2. The mean value of measured Active Mode Efficiency= 84.30%		
Summary: The reported No-Load Power is 0.074W, lower than limit of 0.100W. The reported Active Mode Efficiency is 84.30%, greater than limit of 83.93%.		

Attachment 1: Equipment List

Equipment	ID No.	Model	Brand/Manufacturer	Calibration due date
Power Meter	40591	WT310-H-C2	Japan Yokogawa	02/18/2023
Power Meter	46449	WT310E-C2-H/G5	Yokogawa Meters & Instruments Corporation	11/02/2022
Electronic Load	16953	IT8512C+	ITECH	10/18/2022
Temperature and humidity recorder	20991	L92-1	HangZhou LuLuGe	04/20/2023
Electronic Balance	40961	DNC5002	Anheng	05/11/2023
Oscilloscope	33098	710105-H-HC/M1S	Yokogawa	08/29/2023
Oscilloscope Probe 100:1	51734	P5122	Tektronix(China) Co. Ltd.	10/24/2022
Stop Watch	38618	PC894	TIANFU	10/25/2022
Anemometer	15798	Testo 417	Testo	10/20/2022
Metal measuring ruler	46945	5m	Deli	11/19/2025

Attachment 2: CDF

Object / Part No.	Manufacturer/ trademark	Type / model	Technical data	Mark(s) of conformity
Transformer	Shenzhen Xsd-T Technology Co Ltd	X105B0091 T3-C	--	--
Outpur wire	interchangerable	interchangerable	Min. 22AWG, Max. 180cm	--

--END OF TEST REPORT--