TEST REPORT

Reference No.	:	WTD22F07152091N
Applicant	:	Jiangsu Chenyang Electron Co., Ltd.
Address	:	No. 58 Chenyang Road, Hexi Industrial Park, Huangtang Town, Danyang City, 212364 Jiangsu, P. R. China
Manufacturer	:	Jiangsu Chenyang Electron Co., Ltd.
Address	:	No. 58 Chenyang Road, Hexi Industrial Park, Huangtang Town, Danyang City, 212364 Jiangsu, P. R. China
Product Name	:	AC POWER SUPPLY
Model No.	:	MC-682N, MC-683N
Test specification	:	EU Energy-related Products (ErP) directive 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 EN 50563:2011/A1:2013, EN 50564:2011
Date of Receipt sample	:	2022-07-26
Date of Test	:	2022-08-03 to 2022-08-04
Date of Issue	:	2022-08-26
Test Report Form No.	:	WPA-ERP-03A
Test Result	:	Pass

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

Prepared By:
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Tested by: Lillian Chen

Lillian Chen

Approved by: Jerry Mu

Jerry Mu

Conclusion:
The submitted samples comply with the above procedure.

Energy Test Instruction for no-load condition electric power consumption and average active efficiency of external power supplies

Definitions:

EUT – equipment under test;

No-load condition – the condition in which the input of an external power supply is connected to the mains power source, but the output is not connected to any primary load;

Active mode – a condition in which the input of an external power supply is connected to the mains power source and the output is connected to a load;

Active mode efficiency – the ratio of the power produced by an external power supply in active mode, to the input power required to produce it;

Average active efficiency – the average of the active mode efficiencies at 25%, 50%, 75% and 100% of the nameplate output power.

General conditions for measurements:

Test condition parameter:	
Air speed close to the EUT	≤0.5m/s
Ambient temperature	23°C±5°C
Humidity:	59.9%RH
Test voltage and frequency	230V±1%/50Hz±1%
Total harmonic content of the test voltage at the EUT	≤2%(up to and including the 13th harmonic)
Crest factor of test voltage	1.34 – 1.49
Power measurement accuracy	≤2%(power≥0.5W) ≤0.01W(power<0.5W)
Resolution of power meter	0.01W

Remark:

1. When determining for test conclusion, measurement uncertainty of tests has been considered.

2. Measurements of power of 0.50 W or greater was made with an uncertainty of less than or equal to 2 % at the 95 % confidence level.

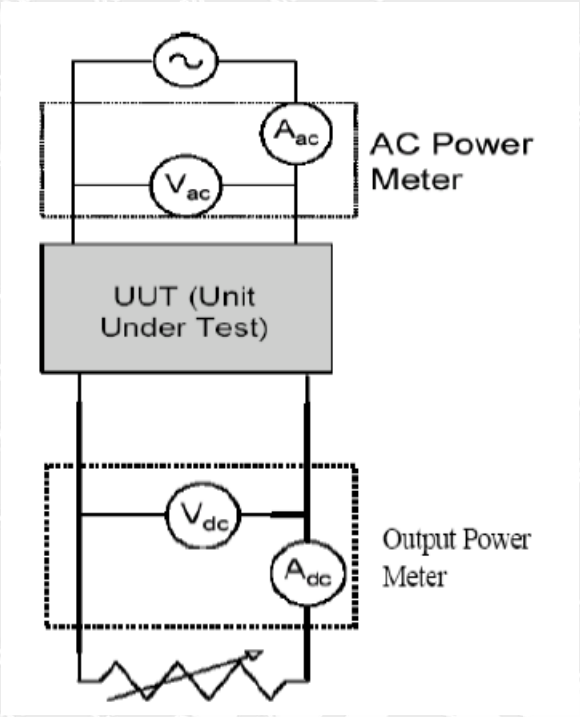
3. Measurements of power of less than 0.50 W was made with an uncertainty of less than or equal to 0.01 W at the 95 % confidence level.

Preparation of EUT & Measuring equipment

EUT preparation:

The EUT shall be operated at 100% of nameplate current output for at least 30 minutes immediately prior to conducting efficiency measurements.

Measuring equipment preparation:



Procedure:

Monitor ac input power for a period of 5 minutes to assess the stability of the EUT. If the power level does not drift by more than 5% from the maximum value observed, the EUT can be considered stable and the measurements can be recorded at the end of the 5 minute period. Subsequent load conditions (see below) can then be measured under the same 5 minute stability guidelines.

If ac input power is not stable over a 5 minute period, connect the EUT to the metering equipment and select the mode to be measured. Monitor the power. Average power is determined using either the average power or accumulated energy approaches outlined below.

a) Average power approach: where the power meter can record a true average power over a user selected period, the period selected shall not be less than 5 min (except if there is an operating cycle – see below).

b) Accumulated energy approach: where the power meter can accumulate energy over a user selected period, the period selected shall not be less than 5 min (except if there is an operating cycle – see below). The integrating period shall be such that the total recorded value for energy and time is more than 200 times the resolution of the meter for energy and time. Determine the average power by dividing the accumulated energy by the time for the monitoring period.

If the power varies over a cycle (i.e. a regular sequence of power states that occur over several minutes or hours), the period selected to average power or accumulate energy shall be one or more complete cycles in order to get a representative average value.

Efficiency measurements shall be conducted in sequence from Load Condition 1 to Load Condition 5 as indicated in follow table.

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)

Product Information:

Model:	MC-682N, MC-683N
Product Powered (if known):	Unknown
Integral Input Power Switch:	Not present
Input Cord Length (cm) :	Not present
Output Cord Length (cm):	Not present
Brand:	Lenovo
Ratings:	INPUT: 100-240V~, 50/60Hz, 2.0A OUTPUT: 5.0V⎓ 3.0A, 15.0W or 9.0V⎓ 3.0A, 27.0W or 15.0V⎓ 3.0A, 45.0W or 20.0V⎓ 3.4A, 68.0W or 11.0V⎓ 6.2A, 68.2W MAX

Nameplate Specifications	Input (AC)	Output (DC)
Voltage (V)	100-240	5.0/9.0/15.0/20.0/11.0
Current (A)	2.0	3.0/3.0/3.0/3.4/6.2
Power (W)	Not Stated	15.0/27.0/45.0/68.0/68.2
Frequency (Hz)	50/60	DC

Nameplate output power (Po) : ☐ Less than or equal to 10W ☒ Greater than 10W

Sample 1#:

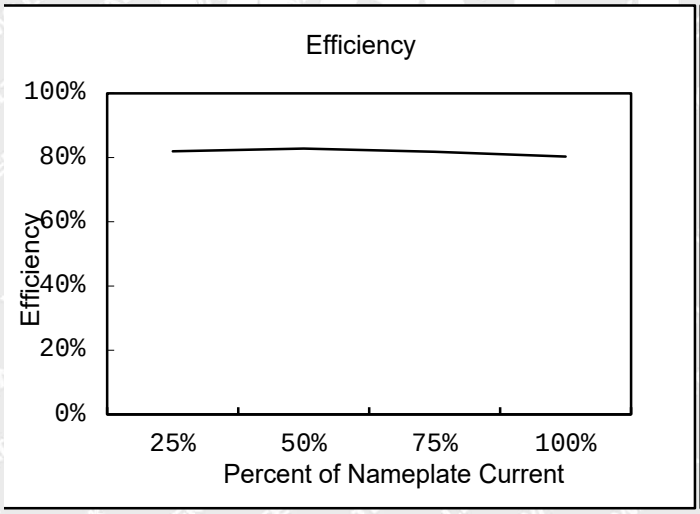
Measured and Calculated Data at 230V 50Hz (For 5.0VDC 3.0A)

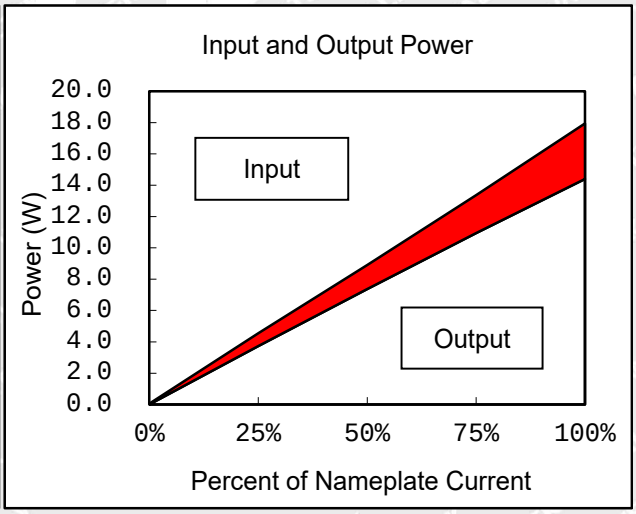
	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	750	1500	2250	3000	
Output Voltage (V)	5.020	4.970	4.910	4.860	4.800	
Output Power (W)	0	3.728	7.365	10.935	14.400	

Input Voltage (V)	**230**	**230**	**230**	**230**	**230**	
Input Power (W)	0.053	4.550	8.900	13.370	17.940	
Total Harmonic Distortion (THD)A%	34.27%	240.34%	236.53%	224.11%	211.41%	189.33%
True Power Factor (W/VA)	0.025	0.266	0.327	0.364	0.394	0.275
Input Frequency	**50**	**50**	**50**	**50**	**50**	**50**

Power Consumed by EUT (W)	0.053	0.823	1.535	2.435	3.540	
Efficiency		81.92%	82.75%	81.79%	80.27%	81.68%

Efficiency and Power Curve Chart (230V, 50Hz)



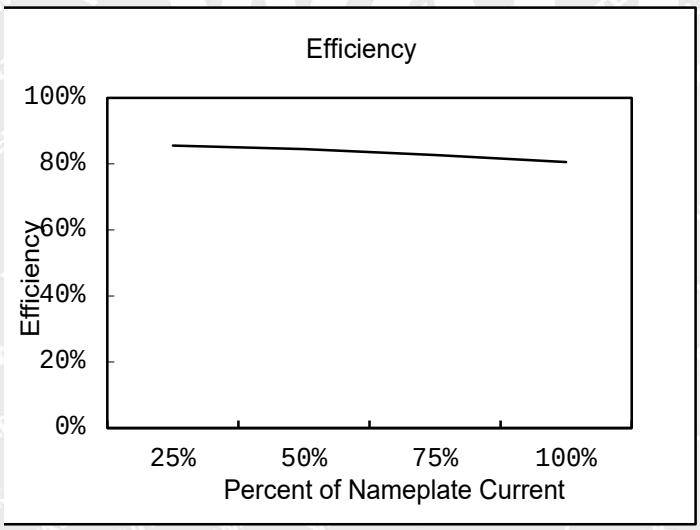


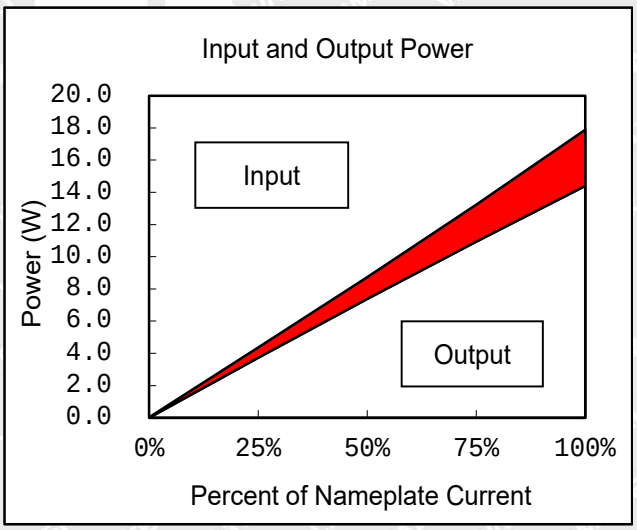
Sample 1#:

Measured and Calculated Data at 115V 60Hz (For 5.0VDC 3.0A)

	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	750	1500	2250	3000	
Output Voltage (V)	5.030	4.970	4.920	4.860	4.800	
Output Power (W)	0	3.728	7.380	10.935	14.400	
Input Voltage (V)	**115**	**115**	**115**	**115**	**115**	
Input Power (W)	0.025	4.360	8.740	13.230	17.880	
Total Harmonic Distortion (THD)A%	49.61%	201.31%	180.13%	165.41%	155.12%	150.32%
True Power Factor (W/VA)	0.040	0.430	0.480	0.511	0.533	0.399
Input Frequency	**60**	**60**	**60**	**60**	**60**	**60**
Power Consumed by EUT (W)	0.025	0.633	1.360	2.295	3.480	
Efficiency		85.49%	84.44%	82.65%	80.54%	83.28%

Efficiency and Power Curve Chart (115V, 60Hz)



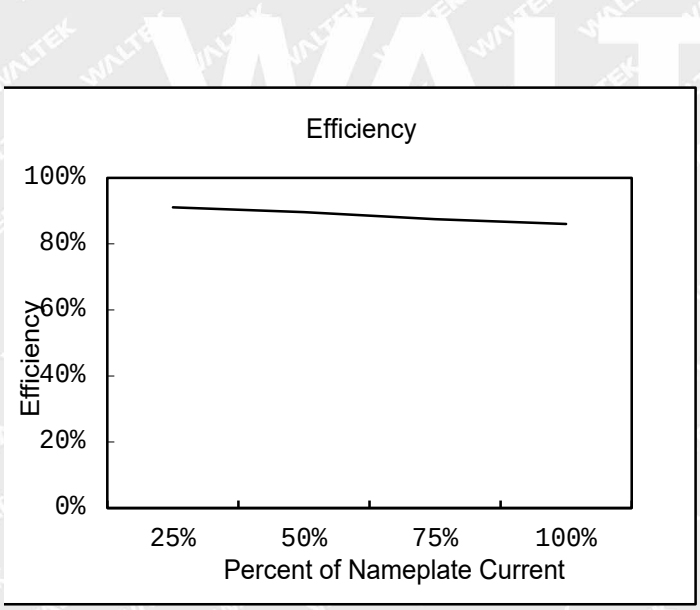


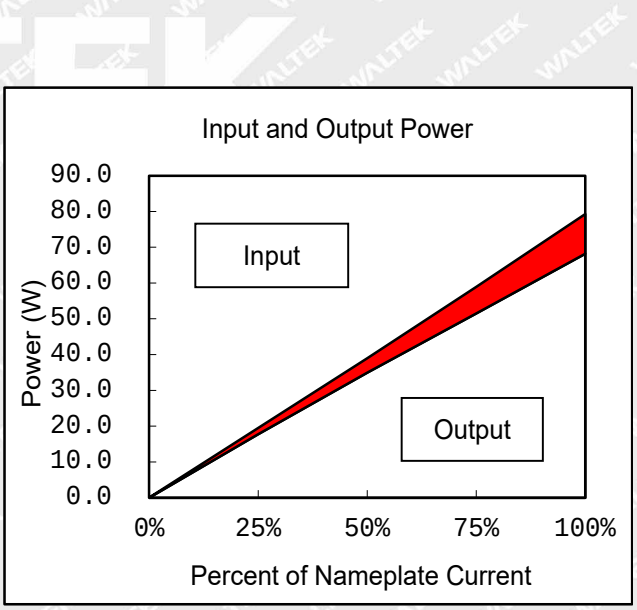
Sample 1#:

Measured and Calculated Data at 230V 50Hz (For 11.0VDC 6.2A)

	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	1550	3100	4650	6200	
Output Voltage (V)	11.580	11.460	11.270	11.080	11.000	
Output Power (W)	0	17.763	34.937	51.522	68.200	
Input Voltage (V)	**230**	**230**	**230**	**230**	**230**	
Input Power (W)	0.051	19.510	39.010	58.930	79.290	
Total Harmonic Distortion (THD)A%	58.74%	212.78%	182.03%	165.41%	157.03%	155.20%
True Power Factor (W/VA)	0.043	0.393	0.456	0.493	0.513	0.380
Input Frequency	**50**	**50**	**50**	**50**	**50**	**50**
Power Consumed by EUT (W)	0.051	1.747	4.073	7.408	11.090	
Efficiency		91.05%	89.56%	87.43%	86.01%	88.51%

Efficiency and Power Curve Chart (230V, 50Hz)



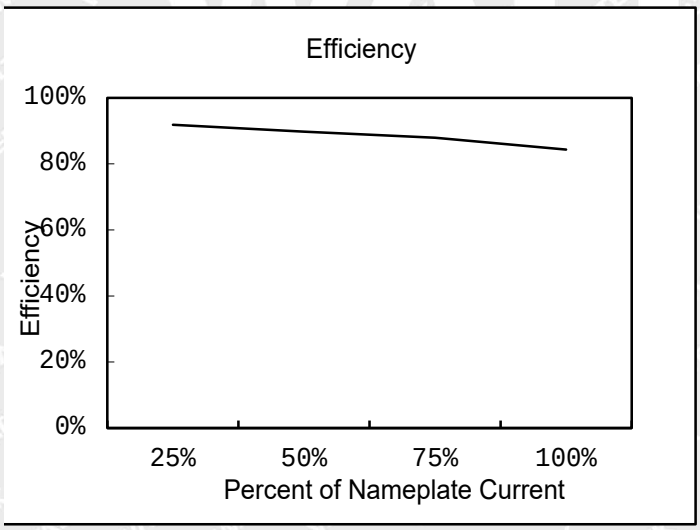


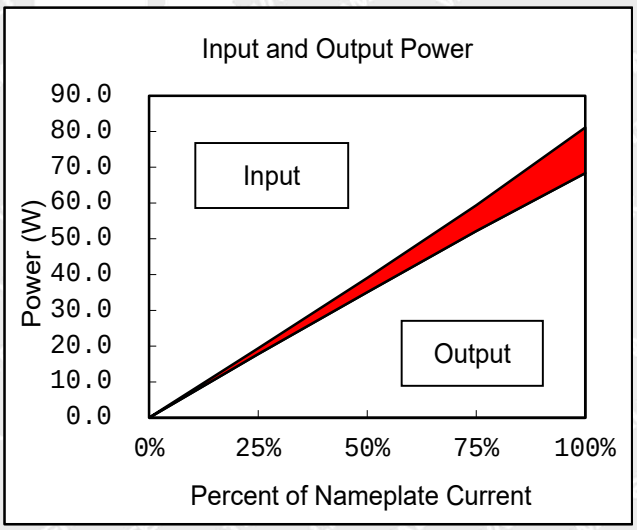
Sample 1#:

Measured and Calculated Data at 115V 60Hz (For 11.0VDC 6.2A)

	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	1550	3100	4650	6200	
Output Voltage (V)	11.580	11.490	11.310	11.220	11.030	
Output Power (W)	0	17.810	35.061	52.173	68.386	
Input Voltage (V)	**115**	**115**	**115**	**115**	**115**	
Input Power (W)	0.025	19.400	39.080	59.370	81.100	
Total Harmonic Distortion (THD)A%	98.13%	157.12%	141.03%	132.32%	126.73%	131.07%
True Power Factor (W/VA)	0.087	0.527	0.554	0.558	0.564	0.458
Input Frequency	**60**	**60**	**60**	**60**	**60**	**60**
Power Consumed by EUT (W)	0.025	1.591	4.019	7.197	12.714	
Efficiency		91.80%	89.72%	87.88%	84.32%	88.43%

Efficiency and Power Curve Chart (115V, 60Hz)



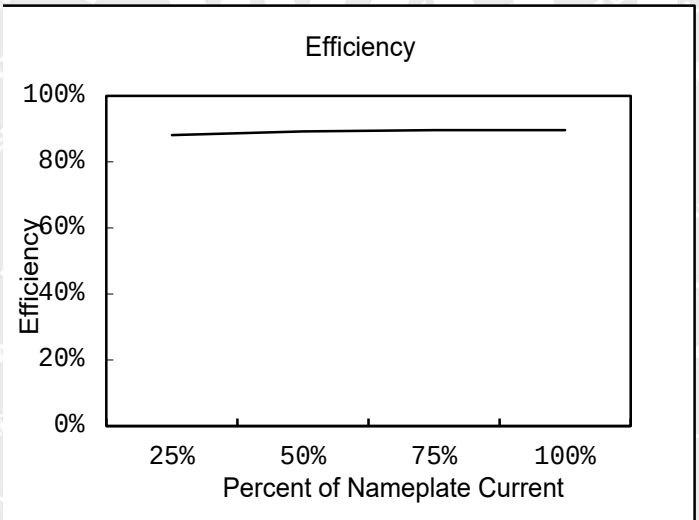


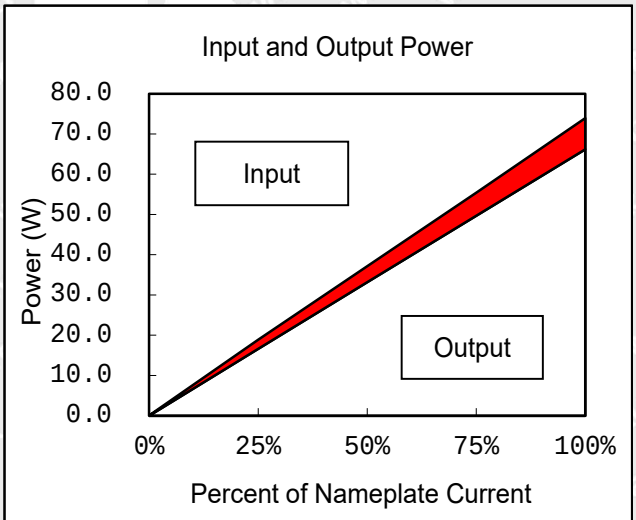
Sample 1#:

Measured and Calculated Data at 230V 50Hz (For 20.0VDC 3.4A)

	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	850	1700	2550	3400	
Output Voltage (V)	19.560	19.540	19.510	19.480	19.470	
Output Power (W)	0	16.609	33.167	49.674	66.198	
Input Voltage (V)	**230**	**230**	**230**	**230**	**230**	
Input Power (W)	0.053	18.860	37.180	55.440	73.920	
Total Harmonic Distortion (THD)A%	89.27%	211.03%	182.11%	165.21%	156.03%	160.73%
True Power Factor (W/VA)	0.075	0.393	0.459	0.493	0.515	0.387
Input Frequency	**50**	**50**	**50**	**50**	**50**	**50**
Power Consumed by EUT (W)	0.053	2.251	4.013	5.766	7.722	
Efficiency		88.06%	89.21%	89.60%	89.55%	89.11%

Efficiency and Power Curve Chart (230V, 50Hz)





Sample 1#:

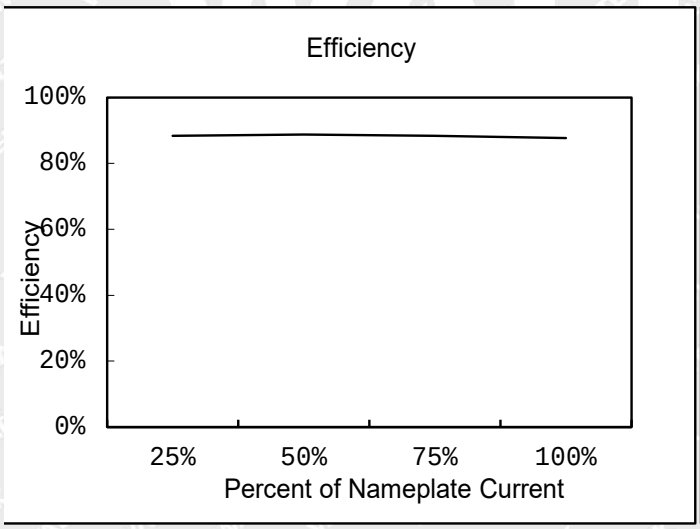
Measured and Calculated Data at 115V 60Hz (For 20.0VDC 3.4A)

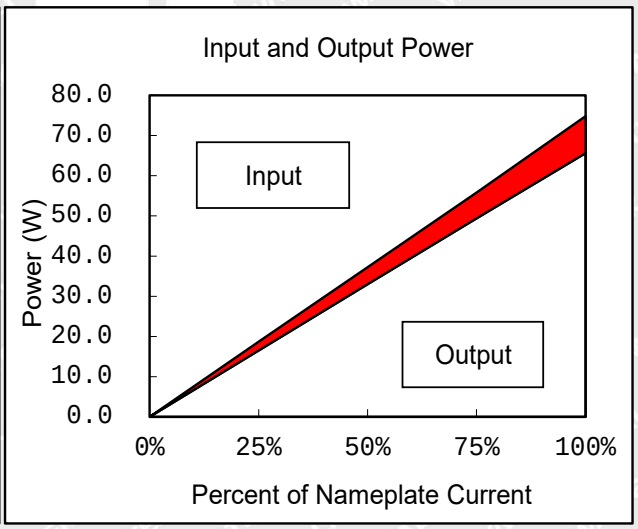
	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	850	1700	2550	3400	
Output Voltage (V)	19.570	19.470	19.420	19.350	19.300	
Output Power (W)	0	16.550	33.014	49.343	65.620	

Input Voltage (V)	**115**	**115**	**115**	**115**	**115**	
Input Power (W)	0.025	18.740	37.220	55.830	74.850	
Total Harmonic Distortion (THD)A%	170.23%	157.71%	138.70%	132.60%	126.80%	145.21%
True Power Factor (W/VA)	0.158	0.527	0.557	0.565	0.566	0.475
Input Frequency	**60**	**60**	**60**	**60**	**60**	**60**

Power Consumed by EUT (W)	0.025	2.191	4.206	6.488	9.230	
Efficiency		88.31%	88.70%	88.38%	87.67%	88.26%

Efficiency and Power Curve Chart (115V, 60Hz)





Sample 2#:

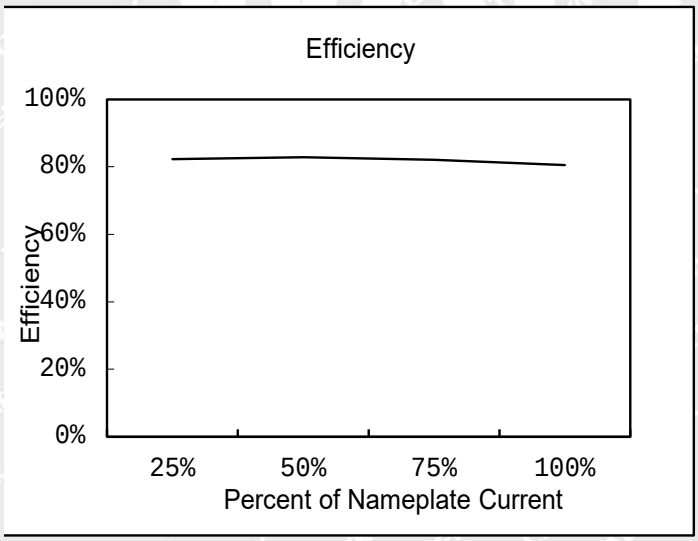
Measured and Calculated Data at 230V 50Hz (For 5.0VDC 3.0A)

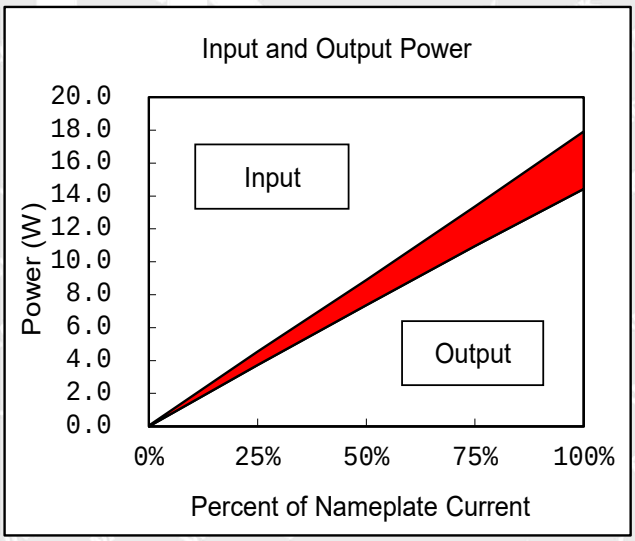
	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	750	1500	2250	3000	
Output Voltage (V)	5.020	4.980	4.910	4.870	4.810	
Output Power (W)	0	3.735	7.365	10.958	14.430	

Input Voltage (V)	**230**	**230**	**230**	**230**	**230**	
Input Power (W)	0.051	4.540	8.890	13.360	17.920	
Total Harmonic Distortion (THD)A%	36.13%	242.16%	237.61%	222.14%	209.43%	189.49%
True Power Factor (W/VA)	0.023	0.262	0.323	0.368	0.399	0.275
Input Frequency	**50**	**50**	**50**	**50**	**50**	**50**

Power Consumed by EUT (W)	0.051	0.805	1.525	2.403	3.490	
Efficiency		82.27%	82.85%	82.02%	80.52%	81.91%

Efficiency and Power Curve Chart (230V, 50Hz)



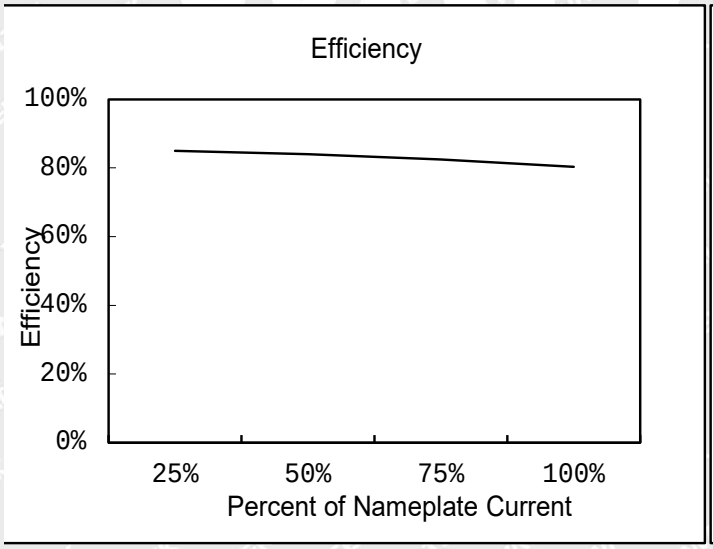


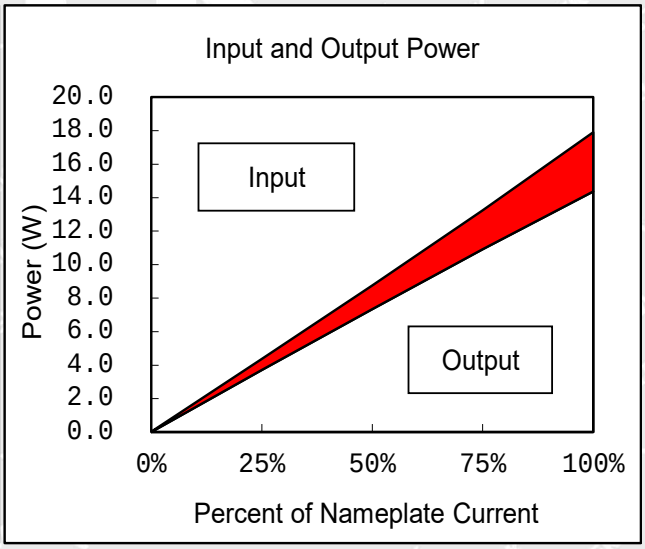
Sample 2#:

Measured and Calculated Data at 115V 60Hz (For 5.0VDC 3.0A)

	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	750	1500	2250	3000	
Output Voltage (V)	5.030	4.950	4.900	4.850	4.790	
Output Power (W)	0	3.713	7.350	10.913	14.370	
Input Voltage (V)	**115**	**115**	**115**	**115**	**115**	
Input Power (W)	0.027	4.370	8.750	13.240	17.900	
Total Harmonic Distortion (THD)A%	53.16%	203.13%	182.01%	163.43%	153.71%	151.09%
True Power Factor (W/VA)	0.047	0.438	0.486	0.518	0.538	0.405
Input Frequency	**60**	**60**	**60**	**60**	**60**	**60**
Power Consumed by EUT (W)	0.027	0.658	1.400	2.328	3.530	
Efficiency		84.95%	84.00%	82.42%	80.28%	82.91%

Efficiency and Power Curve Chart (115V, 60Hz)



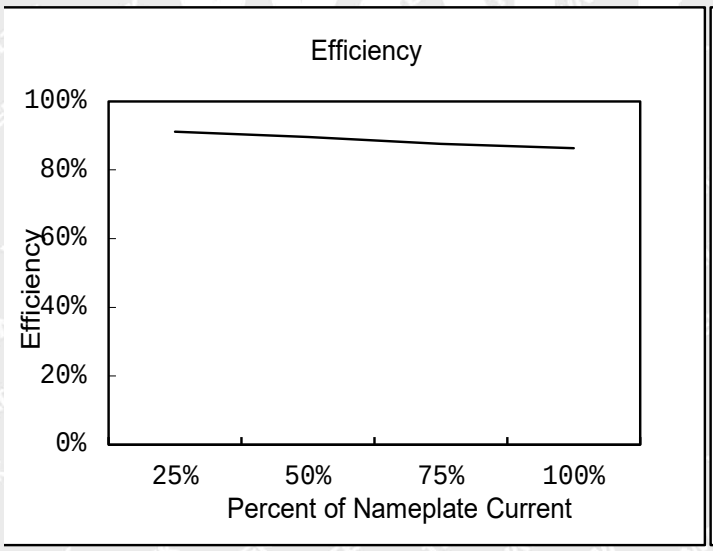


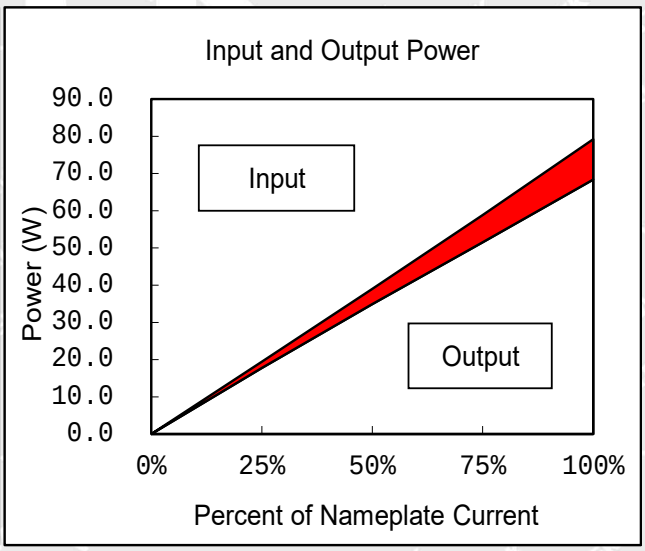
Sample 2#:

Measured and Calculated Data at 230V 50Hz (For 11.0VDC 6.2A)

	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	1550	3100	4650	6200	
Output Voltage (V)	11.580	11.470	11.270	11.090	11.030	
Output Power (W)	0	17.779	34.937	51.569	68.386	
Input Voltage (V)	**230**	**230**	**230**	**230**	**230**	
Input Power (W)	0.049	19.500	39.000	58.890	79.230	
Total Harmonic Distortion (THD)A%	60.13%	214.03%	185.13%	162.43%	159.23%	156.19%
True Power Factor (W/VA)	0.048	0.397	0.452	0.498	0.518	0.383
Input Frequency	**50**	**50**	**50**	**50**	**50**	**50**
Power Consumed by EUT (W)	0.049	1.722	4.063	7.322	10.844	
Efficiency		91.17%	89.58%	87.57%	86.31%	88.66%

Efficiency and Power Curve Chart (230V, 50Hz)



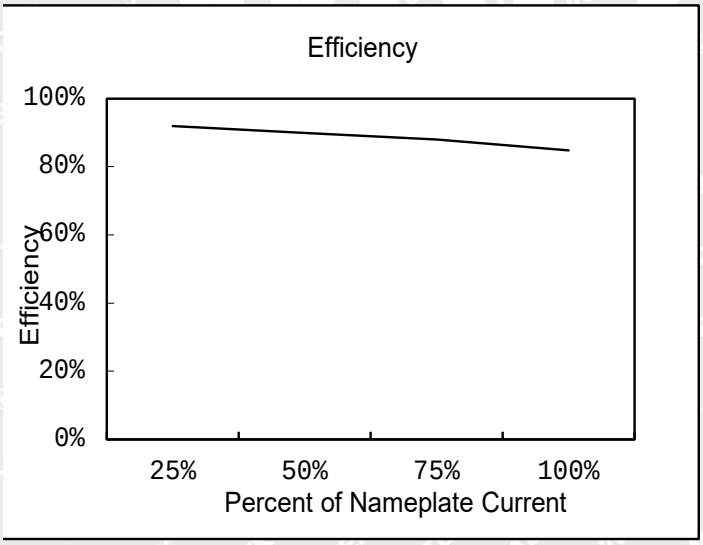


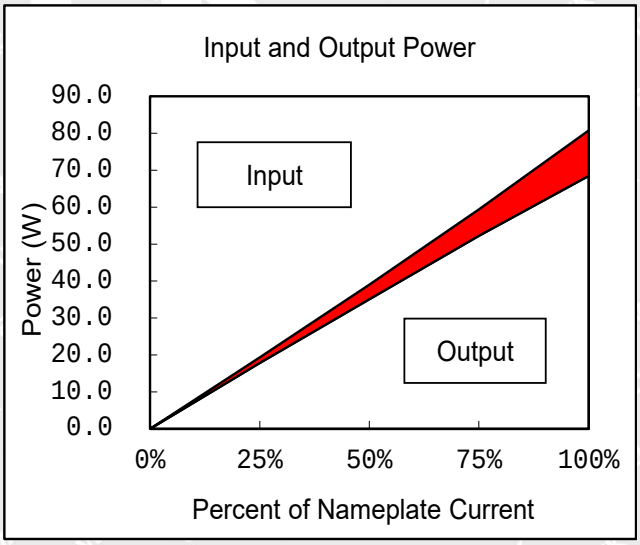
Sample 2#:

Measured and Calculated Data at 115V 60Hz (For 11.0VDC 6.2A)

	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	1550	3100	4650	6200	
Output Voltage (V)	11.590	11.500	11.330	11.230	11.050	
Output Power (W)	0	17.825	35.123	52.220	68.510	
Input Voltage (V)	**115**	**115**	**115**	**115**	**115**	
Input Power (W)	0.024	19.400	39.070	59.340	80.820	
Total Harmonic Distortion (THD)A%	99.03%	155.13%	143.76%	130.13%	123.04%	130.22%
True Power Factor (W/VA)	0.083	0.523	0.557	0.554	0.568	0.457
Input Frequency	**60**	**60**	**60**	**60**	**60**	**60**
Power Consumed by EUT (W)	0.024	1.575	3.947	7.121	12.310	
Efficiency		91.88%	89.90%	88.00%	84.77%	88.64%

Efficiency and Power Curve Chart (115V, 60Hz)





Sample 2#:

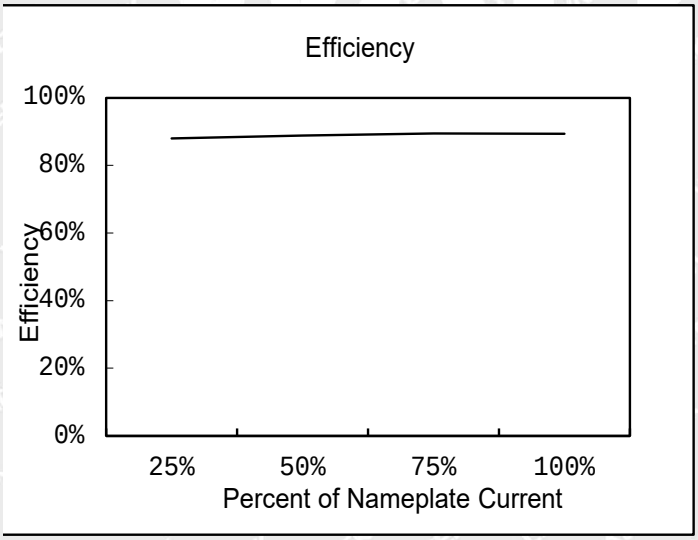
Measured and Calculated Data at 230V 50Hz (For 20.0VDC 3.4A)

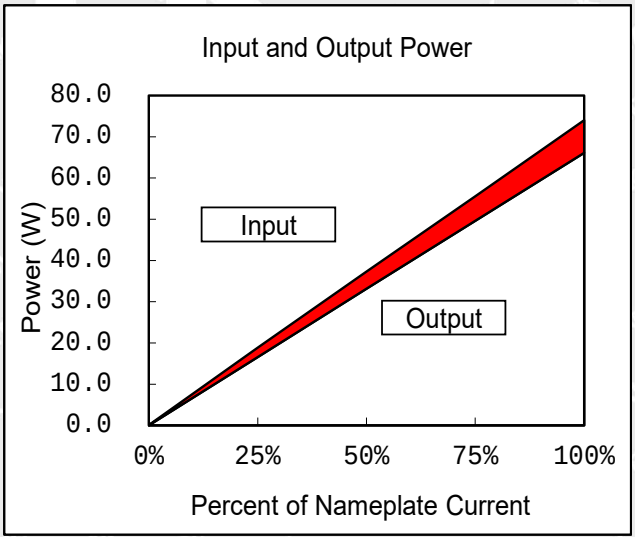
	No Load	Active Power Values				
Percent of Nameplate Current	0%	25%	50%	75%	100%	Average
Output Current (mA)	0	850	1700	2550	3400	
Output Voltage (V)	19.550	19.530	19.500	19.460	19.450	
Output Power (W)	0	16.601	33.150	49.623	66.130	

Input Voltage (V)	230	230	230	230	230	
Input Power (W)	0.055	18.880	37.320	55.530	74.020	
Total Harmonic Distortion (THD)A%	92.03%	214.03%	185.13%	162.03%	154.46%	161.54%
True Power Factor (W/VA)	0.078	0.393	0.457	0.498	0.512	0.388
Input Frequency	50	50	50	50	50	50

Power Consumed by EUT (W)	0.055	2.280	4.170	5.907	7.890	
Efficiency		87.93%	88.83%	89.36%	89.34%	88.86%

Efficiency and Power Curve Chart (230V, 50Hz)





Sample 2#:

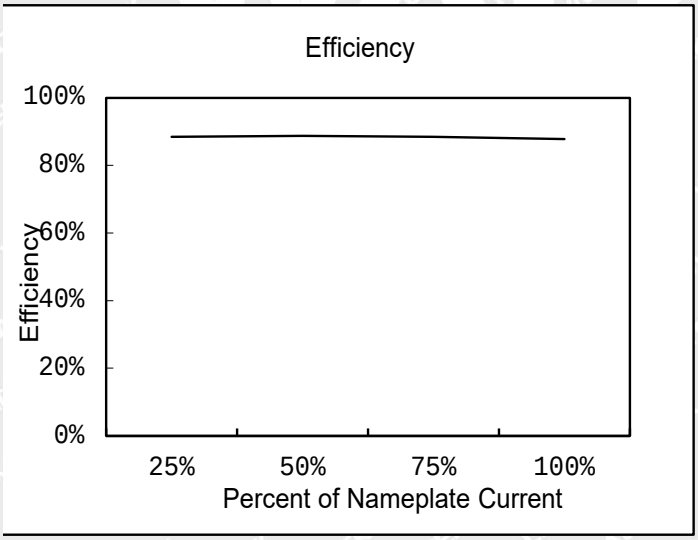
Measured and Calculated Data at 115V 60Hz (For 20.0VDC 3.4A)

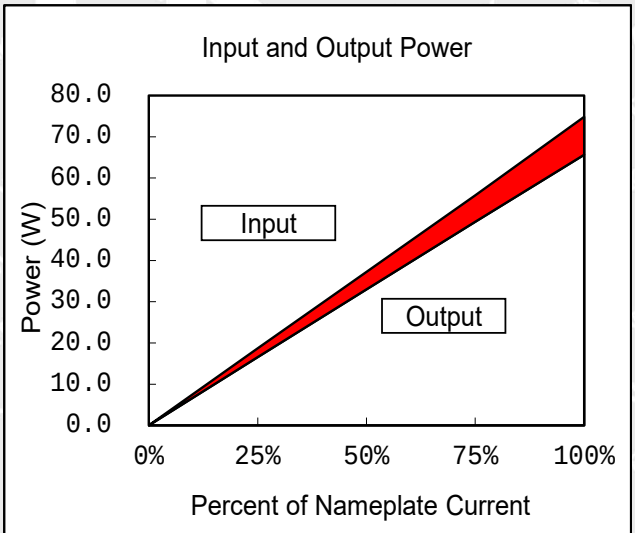
	No Load	Active Power Values				
Percent of Nameplate Current	0%	25%	50%	75%	100%	Average
Output Current (mA)	0	850	1700	2550	3400	
Output Voltage (V)	19.570	19.480	19.420	19.360	19.310	
Output Power (W)	0	16.558	33.014	49.368	65.654	

Input Voltage (V)	115	115	115	115	115	
Input Power (W)	0.024	18.720	37.210	55.800	74.810	
Total Harmonic Distortion (THD)A%	173.13%	153.46%	135.47%	130.43%	125.13%	143.52%
True Power Factor (W/VA)	0.156	0.524	0.553	0.568	0.569	0.474
Input Frequency	60	60	60	60	60	60

Power Consumed by EUT (W)	0.024	2.162	4.196	6.432	9.156	
Efficiency		88.45%	88.72%	88.47%	87.76%	88.35%

Efficiency and Power Curve Chart (115V, 60Hz)





Sample 3#:

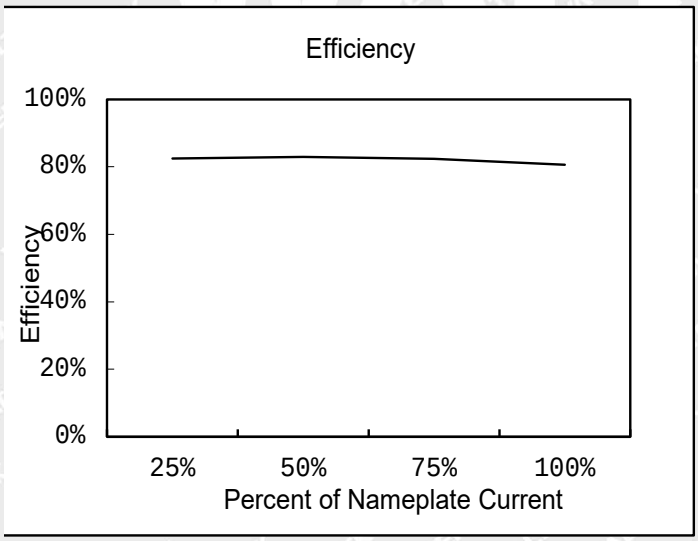
Measured and Calculated Data at 230V 50Hz (For 5.0VDC 3.0A)

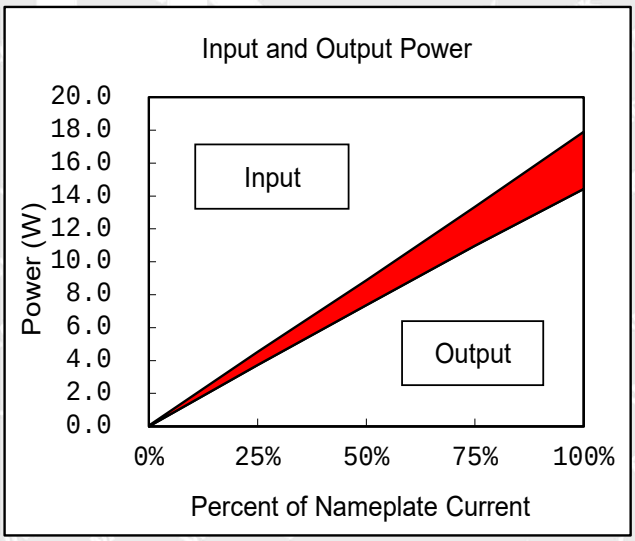
	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	750	1500	2250	3000	
Output Voltage (V)	5.020	4.980	4.910	4.880	4.810	
Output Power (W)	0	3.735	7.365	10.980	14.430	

Input Voltage (V)	**230**	**230**	**230**	**230**	**230**	
Input Power (W)	0.048	4.530	8.880	13.340	17.900	
Total Harmonic Distortion (THD)A%	39.11%	245.01%	239.13%	224.51%	207.12%	190.98%
True Power Factor (W/VA)	0.025	0.266	0.326	0.365	0.397	0.276
Input Frequency	**50**	**50**	**50**	**50**	**50**	**50**

Power Consumed by EUT (W)	0.048	0.795	1.515	2.360	3.470	
Efficiency		82.45%	82.94%	82.31%	80.61%	82.08%

Efficiency and Power Curve Chart (230V, 50Hz)



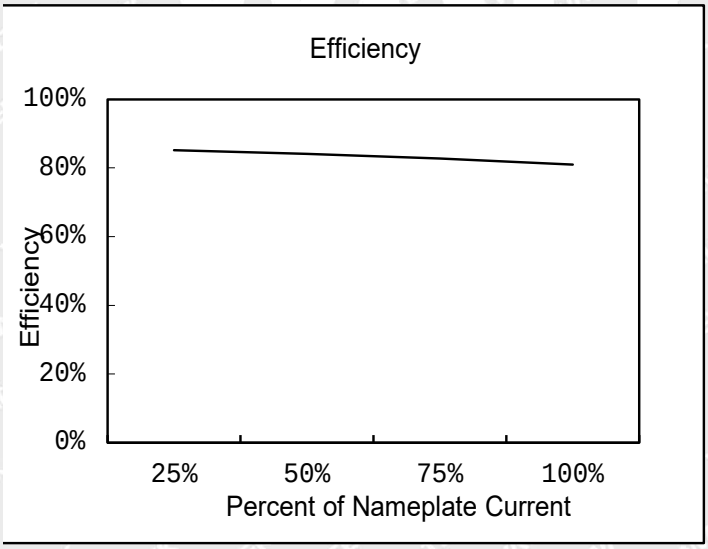


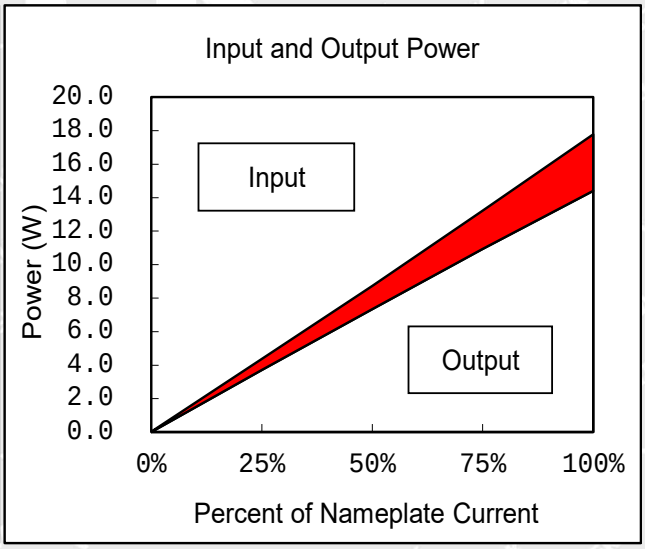
Sample 3#:

Measured and Calculated Data at 115V 60Hz (For 5.0VDC 3.0A)

	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	750	1500	2250	3000	
Output Voltage (V)	5.030	4.950	4.900	4.860	4.800	
Output Power (W)	0	3.713	7.350	10.935	14.400	
Input Voltage (V)	**115**	**115**	**115**	**115**	**115**	
Input Power (W)	0.026	4.360	8.740	13.220	17.780	
Total Harmonic Distortion (THD)A%	58.15%	206.12%	185.81%	160.43%	155.71%	153.24%
True Power Factor (W/VA)	0.049	0.435	0.483	0.515	0.537	0.404
Input Frequency	**60**	**60**	**60**	**60**	**60**	**60**
Power Consumed by EUT (W)	0.026	0.648	1.390	2.285	3.380	
Efficiency		85.15%	84.10%	82.72%	80.99%	83.24%

Efficiency and Power Curve Chart (115V, 60Hz)



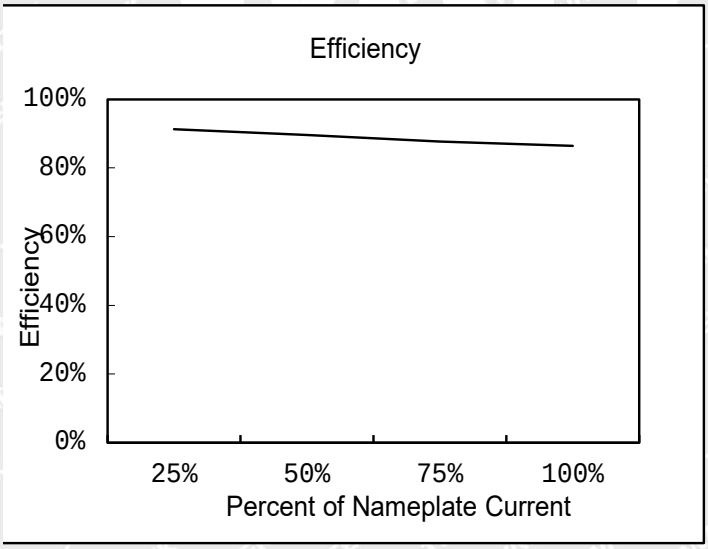


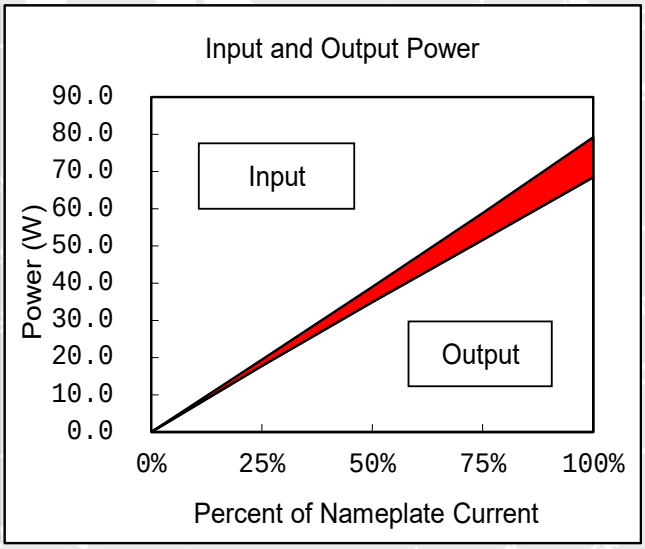
Sample 3#:

Measured and Calculated Data at 230V 50Hz (For 11.0VDC 6.2A)

	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	1550	3100	4650	6200	
Output Voltage (V)	11.580	11.470	11.270	11.100	11.040	
Output Power (W)	0	17.779	34.937	51.615	68.448	
Input Voltage (V)	**230**	**230**	**230**	**230**	**230**	
Input Power (W)	0.048	19.490	38.990	58.870	79.210	
Total Harmonic Distortion (THD)A%	63.21%	217.12%	183.51%	164.23%	157.12%	157.04%
True Power Factor (W/VA)	0.051	0.395	0.455	0.496	0.515	0.382
Input Frequency	**50**	**50**	**50**	**50**	**50**	**50**
Power Consumed by EUT (W)	0.048	1.712	4.053	7.255	10.762	
Efficiency		91.22%	89.61%	87.68%	86.41%	88.73%

Efficiency and Power Curve Chart (230V, 50Hz)



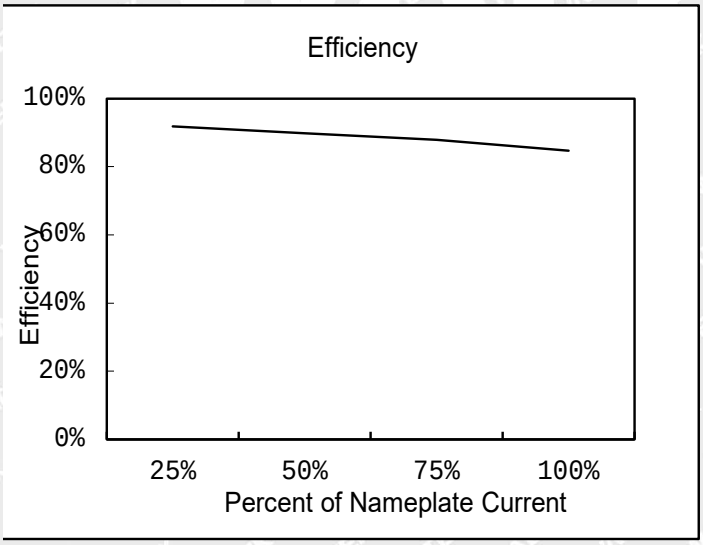


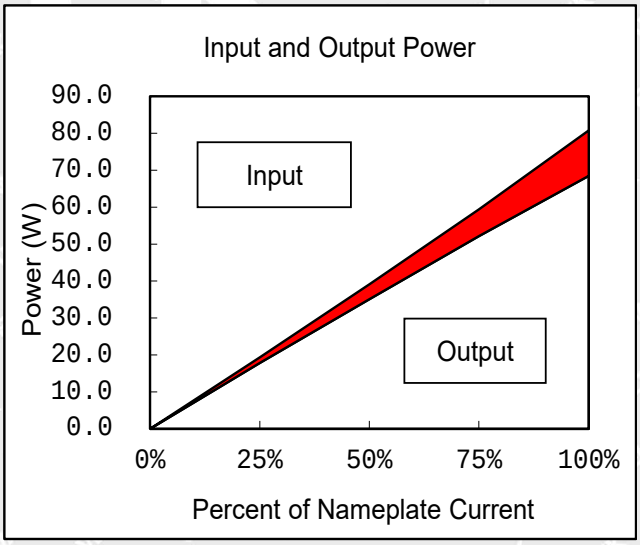
Sample 3#:

Measured and Calculated Data at 115V 60Hz (For 11.0VDC 6.2A)

	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	1550	3100	4650	6200	
Output Voltage (V)	11.590	11.500	11.320	11.220	11.040	
Output Power (W)	0	17.825	35.092	52.173	68.448	
Input Voltage (V)	**115**	**115**	**115**	**115**	**115**	
Input Power (W)	0.023	19.420	39.090	59.350	80.830	
Total Harmonic Distortion (THD)A%	97.21%	152.31%	140.13%	132.34%	125.77%	129.55%
True Power Factor (W/VA)	0.086	0.525	0.554	0.556	0.565	0.457
Input Frequency	**60**	**60**	**60**	**60**	**60**	**60**
Power Consumed by EUT (W)	0.023	1.595	3.998	7.177	12.382	
Efficiency		91.79%	89.77%	87.91%	84.68%	88.54%

Efficiency and Power Curve Chart (115V, 60Hz)



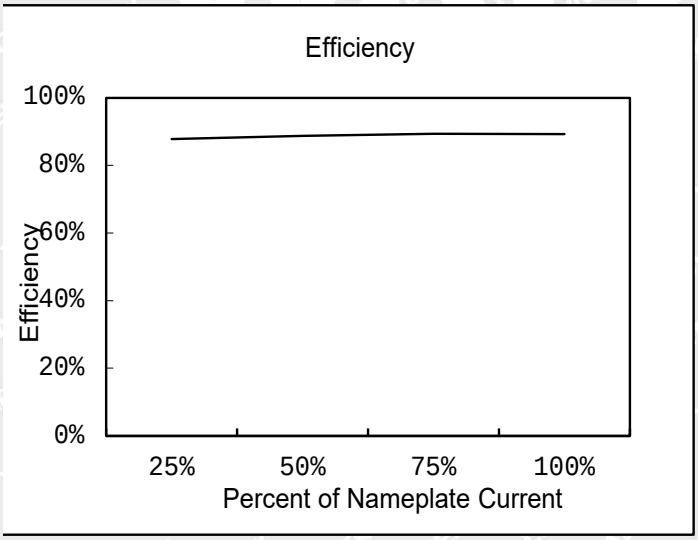


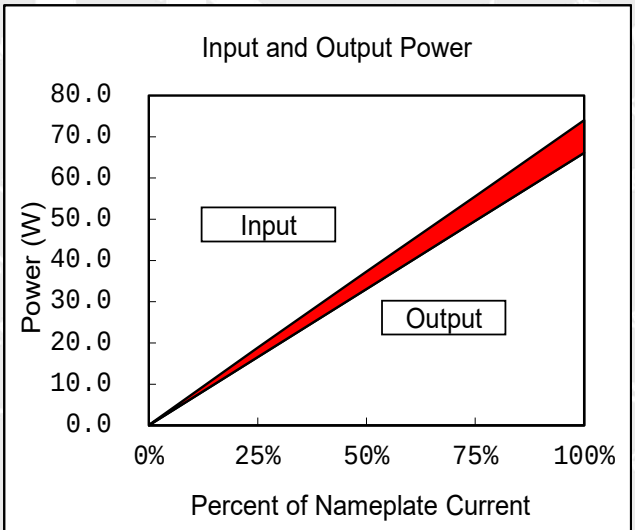
Sample 3#:

Measured and Calculated Data at 230V 50Hz (For 20.0VDC 3.4A)

	No Load	Active Power Values				
Percent of Nameplate Current	0%	25%	50%	75%	100%	Average
Output Current (mA)	0	850	1700	2550	3400	
Output Voltage (V)	19.550	19.530	19.490	19.460	19.440	
Output Power (W)	0	16.601	33.133	49.623	66.096	
Input Voltage (V)	230	230	230	230	230	
Input Power (W)	0.057	18.910	37.350	55.570	74.060	
Total Harmonic Distortion (THD)A%	96.05%	212.43%	188.12%	165.13%	151.23%	162.59%
True Power Factor (W/VA)	0.076	0.396	0.452	0.493	0.515	0.386
Input Frequency	50	50	50	50	50	50
Power Consumed by EUT (W)	0.057	2.310	4.217	5.947	7.964	
Efficiency		87.79%	88.71%	89.30%	89.25%	88.76%

Efficiency and Power Curve Chart (230V, 50Hz)





Sample 3#:

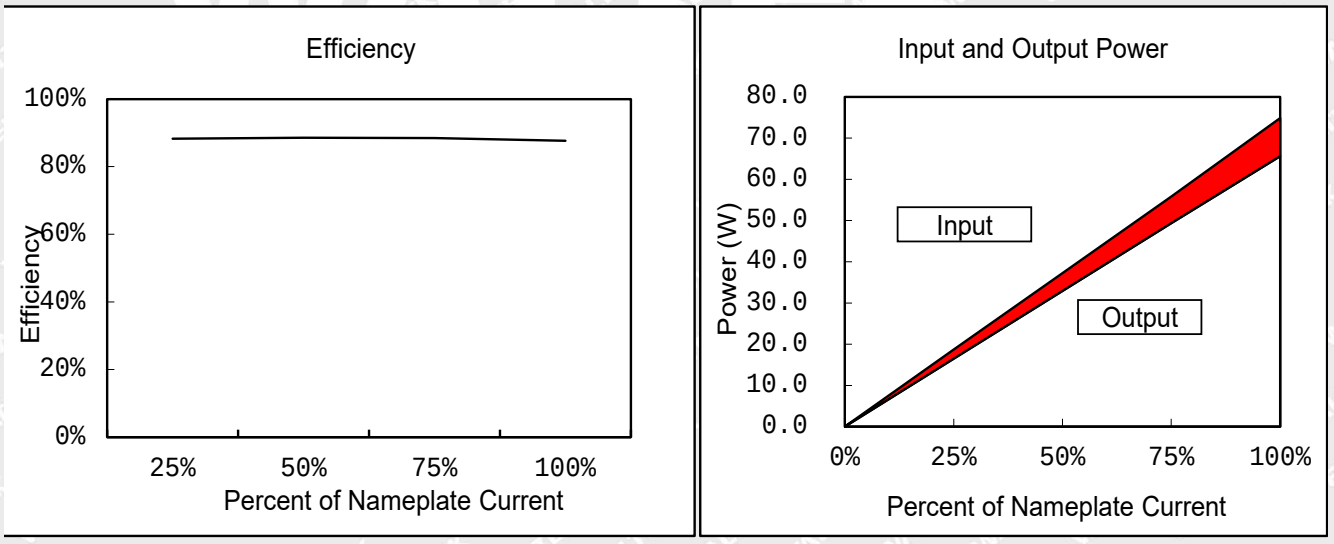
Measured and Calculated Data at 115V 60Hz (For 20.0VDC 3.4A)

	No Load	Active Power Values				
Percent of Nameplate Current	**0%**	**25%**	**50%**	**75%**	**100%**	**Average**
Output Current (mA)	0	850	1700	2550	3400	
Output Voltage (V)	19.570	19.460	19.400	19.350	19.300	
Output Power (W)	0	16.541	32.980	49.343	65.620	

Input Voltage (V)	**115**	**115**	**115**	**115**	**115**	
Input Power (W)	0.026	18.740	37.230	55.820	74.820	
Total Harmonic Distortion (THD)A%	177.12%	158.12%	131.72%	129.40%	126.15%	144.50%
True Power Factor (W/VA)	0.153	0.526	0.558	0.565	0.569	0.474
Input Frequency	**60**	**60**	**60**	**60**	**60**	**60**

Power Consumed by EUT (W)	0.026	2.199	4.250	6.478	9.200	
Efficiency		88.27%	88.58%	88.40%	87.70%	88.24%

Efficiency and Power Curve Chart (115V, 60Hz)



Tested model:	MC-682N			**at 230V/50Hz**
Nameplate Output:	**5.0Vdc,3.0 A, 15.0W**			
Test specimen	**1**	**2**	**3**	
Percent of Nameplate Current	**10%**	**10%**	**10%**	**Remark**
RMS Input Voltage (V)	**230.0**	**230.0**	**230.0**	
Input Frequency (Hz)	**50**	**50**	**50**	
RMS Input Power (W)	1.890	1.900	1.880	Input Power (Pin)
Total Harmonic Distortion (THD A, %)	211.34	214.03	209.13	
True Power Factor	0.195	0.191	0.193	
Output Voltage (Vdc)	5.00	5.00	5.00	
Output Current (mA)	300	300	300	
Active Output Power (W)	1.500	1.500	1.500	Output Power (Pout)
Power Consumed by UUT (W)	0.390	0.400	0.380	
Efficiency (%)	**79.37**	**78.95**	**79.79**	(Pout/Pin)*100% at 10% active mode *)
Note: *) No energy efficiency requirement at 10% load active condition; only test for nameplate output power (Po) greater than 10W.				

Tested model:	MC-682N			**at 230V/50Hz**
Nameplate Output:	**11.0Vdc,6.2 A, 68.2 W**			
Test specimen	**1**	**2**	**3**	
Percent of Nameplate Current	**10%**	**10%**	**10%**	**Remark**
RMS Input Voltage (V)	**230.0**	**230.0**	**230.0**	
Input Frequency (Hz)	**50**	**50**	**50**	
RMS Input Power (W)	8.500	8.530	8.520	Input Power (Pin)
Total Harmonic Distortion (THD A, %)	236.23	238.46	240.13	
True Power Factor	0.311	0.313	0.309	
Output Voltage (Vdc)	11.51	11.50	11.49	
Output Current (mA)	620	620	620	
Active Output Power (W)	7.136	7.130	7.124	Output Power (Pout)
Power Consumed by UUT (W)	1.364	1.400	1.396	
Efficiency (%)	**83.95**	**83.59**	**83.62**	(Pout/Pin)*100% at 10% active mode *)
Note: *) No energy efficiency requirement at 10% load active condition; only test for nameplate output power (Po) greater than 10W.				

Tested model:	MC-682N			**at 230V/50Hz**
Nameplate Output:	**20.0Vdc,3.4 A, 68 W**			
Test specimen	**1**	**2**	**3**	
Percent of Nameplate Current	**10%**	**10%**	**10%**	**Remark**
RMS Input Voltage (V)	**230.0**	**230.0**	**230.0**	
Input Frequency (Hz)	**50**	**50**	**50**	
RMS Input Power (W)	8.100	8.130	8.120	Input Power (Pin)
Total Harmonic Distortion (THD A, %)	234.34	237.12	235.06	
True Power Factor	0.316	0.319	0.317	
Output Voltage (Vdc)	19.54	19.55	19.53	
Output Current (mA)	340	340	340	
Active Output Power (W)	6.645	6.647	6.640	Output Power (Pout)
Power Consumed by UUT (W)	1.455	1.483	1.480	
Efficiency (%)	**82.04**	**81.76**	**81.77**	(Pout/Pin)*100% at 10% active mode *)
Note: *) No energy efficiency requirement at 10% load active condition; only test for nameplate output power (Po) greater than 10W.				

Result:

The samples submitted were tested and comply with the efficiency in the active mode and the energy consumption in the no-load mode at the corresponding national AC mains supply voltage according to following regulations:

☒	EU Energy-related Products (ErP) directive COMMISSION REGULATION (EU) 2019/1782 of 1 October 2019

And the use of an efficiency mark, according to the international efficiency marking protocol, qualified with efficiency marking: ☒ VI

Details of Minimum Efficiency Performance Standard (MEPS) refer to following table

EU Energy-related Products (ErP) directive

Ecodesign requirements

set out in Annex II, 1 a) & b) of COMMISSION REGULATION (EU) 2019/1782

for no-load electric power consumption and average active efficiency of external power supplies

Single-Voltage External AC-DC or AC-AC Power Supply, Basic-Voltage			
Nameplate Output Power (Pno)	**Minimum Average Efficiency in Active Mode**		**Verdict**
≤ 1W	≥ 0.5 ×Pno + 0.16		N/A
1 W < to ≤ 49 W	≥ 0.071 × ln(Pno) − 0.0014 ×Pno +0.67		N/A
49W < to ≤ 250W	≥ 0.880		N/A
Nameplate Output Power (Pno)	**Maximum Power in No-Load Mode**		**Verdict**
	☐ **Ac-Ac EPS**	☐ **Ac-Dc EPS**	
≤ 49 W	≤ 0.21W	≤ 0.10W	N/A
49W < to ≤ 250W	≤ 0.21W		N/A

Single-Voltage External AC-DC or AC-AC Power Supply, Low-Voltage (For 5VDC 3.0A)			
Nameplate Output Power (Pno)	**Minimum Average Efficiency in Active Mode**		**Verdict**
≤ 1W	≥ 0.517 × Pno + 0.087		N/A
1 W < to ≤ 49 W	≥0.0834 × ln(Pno) −0.0014 × Pno + 0.609		P
49W < to ≤ 250W	≥ 0.870		N/A
Nameplate Output Power (Pno)	**Maximum Power in No-Load Mode**		**Verdict**
	☐ **Ac-Ac EPS**	☒ **Ac-Dc EPS**	
≤ 49 W	≤ 0.10W	≤ 0.10W	P
49W < to ≤ 250W	≤ 0.21W		N/A

Multiple-Voltage		
Nameplate Output Power (Pno)	**Minimum Average Efficiency in Active Mode**	**Verdict**
0 to ≤ 1 W	≥ 0.497 * Pno+ 0.067	N/A
1 to ≤ 49 W	≥ 0.075 * ln(Pno) + 0.561	N/A
49 W	≥ 0.860	N/A
Nameplate Output Power (Pno)	**Maximum Power in No-Load Mode**	**Verdict**
Any	≤ 0.30	N/A

Notes:

For model MC-682N with output rating of DC 5.0V, 3.0A, 15.0W, required minimum average active efficiency limit is 81.39%, the minimum average active efficiency from the tested sample is 81.68%; Limit for no load power is 0.100W, the maximum no load power tested sample is 0.053W.

The minimum active efficiency at 10 % load of full rated output current from the tested sample is 78.95%.

Single-Voltage External AC-DC or AC-AC Power Supply, Basic-Voltage (For 11VDC 6.2A)			
Nameplate Output Power (Pno)	**Minimum Average Efficiency in Active Mode**		**Verdict**
≤ 1W	≥ 0.5 ×Pno + 0.16		N/A
1 W < to ≤ 49 W	≥ 0.071 × ln(Pno) − 0.0014 ×Pno +0.67		N/A
49W < to ≤ 250W	≥ 0.880		P
Nameplate Output Power (Pno)	**Maximum Power in No-Load Mode**		**Verdict**
	☐ **Ac-Ac EPS**	☐ **Ac-Dc EPS**	
≤ 49 W	≤ 0.21W	≤ 0.10W	N/A
49W < to ≤ 250W	≤ 0.21W		P

Single-Voltage External AC-DC or AC-AC Power Supply, Low-Voltage		
Nameplate Output Power (Pno)	**Minimum Average Efficiency in Active Mode**	**Verdict**

≤ 1W	≥ 0.517 × Pno + 0.087		N/A
1 W < to ≤ 49 W	≥0.0834 × ln(Pno) −0.0014 × Pno + 0.609		N/A
49W < to ≤ 250W	≥ 0.870		N/A
Nameplate Output Power (Pno)	**Maximum Power in No-Load Mode**		**Verdict**
	☐ **Ac-Ac EPS**	☐ **Ac-Dc EPS**	
≤ 49 W	≤ 0.10W	≤ 0.10W	N/A
49W < to ≤ 250W	≤ 0.21W		N/A

Multiple-Voltage		
Nameplate Output Power (Pno)	**Minimum Average Efficiency in Active Mode**	**Verdict**
0 to ≤ 1 W	≥ 0.497 * Pno+ 0.067	N/A
1 to ≤ 49 W	≥ 0.075 * ln(Pno) + 0.561	N/A
49 W	≥ 0.860	N/A
Nameplate Output Power (Pno)	**Maximum Power in No-Load Mode**	**Verdict**
Any	≤ 0.30	N/A

Notes:

For model MC-682N with output rating of DC 11.0V, 6.2A, 68.2W, required minimum average active efficiency limit is 88.00%, the minimum average active efficiency from the tested sample is 88.43%; Limit for no load power is 0.210W, the maximum no load power tested sample is 0.051W.

The minimum active efficiency at 10 % load of full rated output current from the tested sample is 83.59%.

Single-Voltage External AC-DC or AC-AC Power Supply, Basic-Voltage (For 20VDC 3.4A)		
Nameplate Output Power (Pno)	**Minimum Average Efficiency in Active Mode**	**Verdict**
≤ 1W	≥ 0.5 ×Pno + 0.16	N/A
1 W < to ≤ 49 W	≥ 0.071 × ln(Pno) − 0.0014 ×Pno +0.67	N/A
49W < to ≤ 250W	≥ 0.880	P

Nameplate Output Power (Pno)	Maximum Power in No-Load Mode		Verdict
	☐ Ac-Ac EPS	☐ Ac-Dc EPS	
≤ 49 W	≤ 0.21W	≤ 0.10W	N/A
49W < to ≤ 250W	≤ 0.21W		P

Single-Voltage External AC-DC or AC-AC Power Supply, Low-Voltage			
Nameplate Output Power (Pno)	**Minimum Average Efficiency in Active Mode**		**Verdict**
≤ 1W	≥ 0.517 × Pno + 0.087		N/A
1 W < to ≤ 49 W	≥0.0834 × ln(Pno) −0.0014 × Pno + 0.609		N/A
49W < to ≤ 250W	≥ 0.870		N/A
Nameplate Output Power (Pno)	**Maximum Power in No-Load Mode**		**Verdict**
	☐ Ac-Ac EPS	☐ Ac-Dc EPS	
≤ 49 W	≤ 0.10W	≤ 0.10W	N/A
49W < to ≤ 250W	≤ 0.21W		N/A

Multiple-Voltage		
Nameplate Output Power (Pno)	**Minimum Average Efficiency in Active Mode**	**Verdict**
0 to ≤ 1 W	≥ 0.497 * Pno+ 0.067	N/A
1 to ≤ 49 W	≥ 0.075 * ln(Pno) + 0.561	N/A
49 W	≥ 0.860	N/A
Nameplate Output Power (Pno)	**Maximum Power in No-Load Mode**	**Verdict**
Any	≤ 0.30	N/A

Notes:

For model MC-682N with output rating of DC 20.0V, 3.4A, 68.0W, required minimum average active efficiency limit is 88.00%, the minimum average active efficiency from the tested sample is 88.24%; Limit for no load power is 0.210W, the maximum no load power tested sample is 0.057W.

The minimum active efficiency at 10 % load of full rated output current from the tested sample is 81.76%.

Supplementary information to test procedure for multiple-voltage:

According to Annex II, 3 Measurements and calculations of COMMISSION REGULATION (EU) 2019/1782

For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the Official Journal of the European Union, or other reliable, accurate and reproducible methods, which take into account the generally recognised state of the art.

Photo and Label of Product

Model: MC-682N

Model: MC-682N

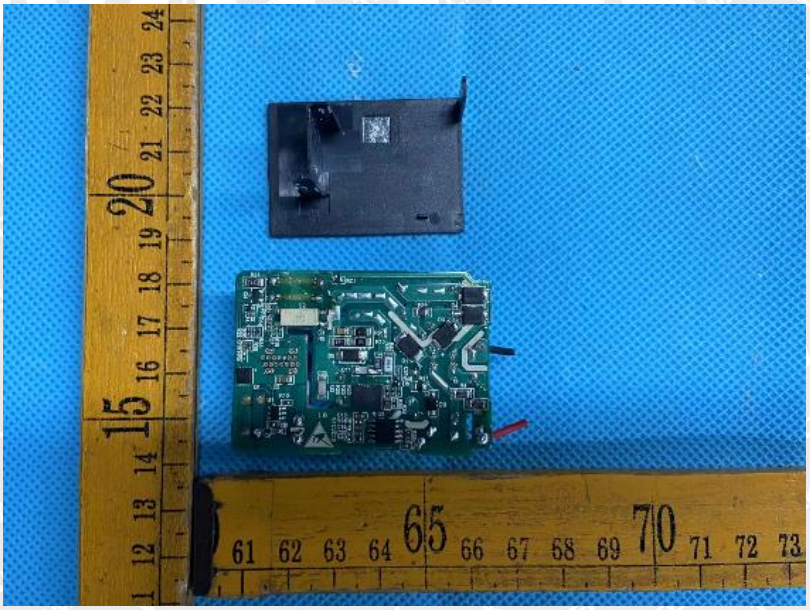
Photo and Label of Product

Model: MC-683N

Model: MC-683N

Photo and Label of Product

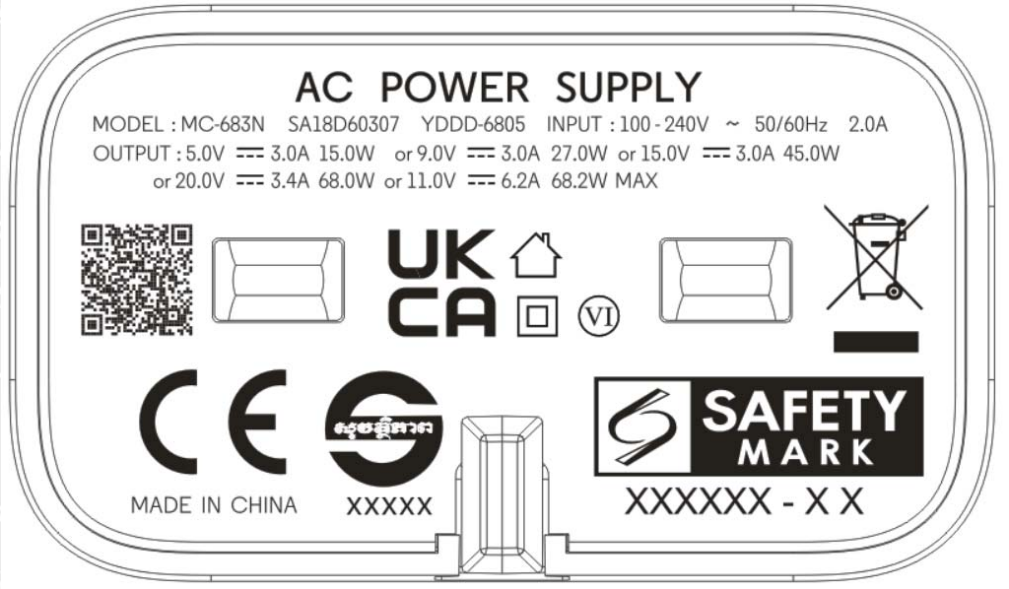
PCB view



PCB view

Photo and Rating Label of Product

Model: MC-682N



Model: MC-683N

Trademark: " " or "Lenovo" marked on the enclosure.

Test Equipment List

Equipment	Model/Type	Measurement	Cal. Date	Valid Date
Digital Power Meter	WT210	No load and active output	Apr. 01, 2022	Mar. 31, 2023
DC electronic load	3311F	No load and active output	Oct. 11, 2022	Oct. 10, 2023
Clock	PC397	No load and active output	Feb. 18, 2022	Feb. 17, 2023
Hygrothermograph	AW5147W	No load and active output	Oct. 23, 2021	Oct. 22, 2022

Ambient Temperature and Humidity

Temperature: 24.2°C Humidity: 61.4%RH

====== End of Report ======