

CEC Test Report For External Power Supplies

Report Reference No. : NP2012093H01

Date of issue : 2021-03-04

Testing laboratory : DongGuan PuBiao Testing Technology Co., Ltd

Address: : No. 3, First Floor, Building A, No.30, Minghua Road, Juzhou village, Shijie Town, Dongguan City Guangdong China.

Testing location : As above.

Applicant..... : DONGGUAN RONG HANG ELECTRONIC TECHNOLOGY CO LTD

Address..... : 3F, Building 3, Gekeng Industrial Zone, Hengli Town, DONGGUAN City, 523460 GUANGDONG

Standard : U.S. CEC California Appliance Efficiency Regulations (Section 1601 through 1609 of Title 20 of the California Code of Regulations), item (u) Power Suppliers
U.S. DOE 10 CFR Part 430
Final Rule, Published on Feb. 10, 2014 (Level VI)

Test procedure : CEC: US EPA "Test Method for Calculating the Energy Efficiency of Single-Voltage External AC-DC and AC-AC Power Supplies" dated August 11, 2004.
US DOE: Appendix Z to Subpart B of 10 CFR Part 430

Samples Received Date : 2021-03-01

Tested Date..... : 2021-03-04

Description of Sample(s):

Type of test object..... : CLASS 2 POWER UNIT

Model and/or type reference..... : RH-120-3000U1, RH-120-3000U4

Rating(s)..... : INPUT:for RH-120-3000U1:100-240V~ 50/60Hz 1.5A
for RH-120-3000U4:100-120V~ 50/60Hz 1.5A
OUTPUT: 12V  3000mA

Trademark..... : 

Country of origin : CHINA

Manufacturer(s)..... : Same as applicant

Address:..... : Same as applicant

Integral Input power Switch..... : Not present

Output Cord Length : Min180cm ,min18AWG

Ambient Temp.(°C) : 25

Number of page(s) (Report) : 9

Number of page(s) (Attachment)..... : Photo 2 pages

Compiled by..... : Lisa Yan Approved by..... : Eric Liu

(+ signature)  (+ signature) 

1. Copy of marking plates:



Remark: The models RH-120-3000U1 and RH-120-3000U4 are indicate, only the model name and enclosure shape are difference. Refer to photo for details.

2. Instruments list:

Equi ment Name	Manufacturer	Model No.	Serial No.	Calibration Date	Next Calibration Date
Electronic Load	IVYTECH	8711	1805L110337	2020-04-20	2021-04-19
Humidity Meter	KONGTOP	HTC-1	/	2020-04-20	2021-04-19
Stop Watch	HUIBO	PC396	/	2020-04-20	2021-04-19
Power Parameter Meter	YOKOGAWA	WT31E	C3UD26016E	2020-04-20	2021-04-19
DC Power Supply	MEIRUIKE	PS605D	170417-237	2020-04-20	2021-04-19

3.1. Test Result

Model No.: RH-120-3000U1 (Sample 1#)

Tested at: 115VAC, 60Hz

Sample output rating: 12.0V $\equiv$ 3.0A

	No Load	Active Power Values				Average
Percent of Nameplate Current	0%	25%	50%	75%	100%	--
Output Current (mA)	--	750	1500	2250	3000	
Output Voltage (V)	12.46	12.35	12.24	12.13	12.01	
Output Power (W)	--	9.26	18.36	27.29	36.03	
Ac Input Voltage (V)	115	115	115	115	115	--
Ac Input Power (W)	0.06	10.21	20.48	30.74	41.41	
Total Harmonic Distortion (THDI)	95.31%	86.81%	84.39%	83.14%	81.14%	83.87%
Total Harmonic Distortion (THDV)	0.605%	0.840%	1.095%	1.153%	1.190%	1.070%
True Power Factor (W/VA)	0.221	0.482	0.515	0.526	0.545	0.517
AC Input Frequency (Hz)	60	60	60	60	60	60
Power Consumed by UUT (W)	0.06	0.95	2.12	3.45	5.38	--
Efficiency	--	90.70%	89.65%	88.78%	87.01%	89.03%
Limit for Level VI requirement: Minimum Efficiency Average active mode efficiency limit $\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67=87.41\%$ The no-load condition consumption shall not exceed 0.1W.						

Model No.: RH-120-3000U1 (Sample 1#)
Tested at: 230VAC, 50Hz
Sample output rating: 12.0V=== 3.0A

	No Load	Active Power Values				Average
Percent of Nameplate Current	0%	25%	50%	75%	100%	--
Output Current (mA)	--	750	1500	2250	3000	
Output Voltage (V)	12.46	12.35	12.23	12.10	11.98	
Output Power (W)	--	9.26	18.35	27.23	35.94	
Ac Input Voltage (V)	230	230	230	230	230	--
Ac Input Power (W)	0.08	10.24	20.39	30.56	40.85	
Total Harmonic Distortion (THD)	95.91%	88.75%	85.38%	85.20%	84.96%	86.07%
Total Harmonic Distortion (THDV)	0.597%	0.772%	1.172%	1.329%	1.460%	1.183%
True Power Factor (W/VA)	0.149	0.414	0.483	0.496	0.504	0.474
AC Input Frequency (Hz)	50	50	50	50	50	50
Power Consumed by UUT (W)	0.08	0.98	2.04	3.33	4.91	--
Efficiency	--	90.43%	90.00%	89.10%	87.98%	89.38%
Limit for Level VI requirement: Minimum Efficiency Average active mode efficiency limit $\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67=87.41\%$ The no-load condition consumption shall not exceed 0.1W.						

Model No.: RH-120-3000U1 (Sample 2#)

Tested at: 115VAC, 60Hz

Sample output rating: 12.0V=== 3.0A

	No Load	Active Power Values				Average
Percent of Nameplate Current	0%	25%	50%	75%	100%	--
Output Current (mA)	--	750	1500	2250	3000	
Output Voltage (V)	12.46	12.35	12.20	12.08	11.94	
Output Power (W)	--	9.26	18.30	27.18	35.82	
Ac Input Voltage (V)	115	115	115	115	115	--
Ac Input Power (W)	0.06	10.17	20.40	30.68	41.37	
Total Harmonic Distortion (THD)	94.51%	87.05%	84.56%	83.32%	81.42%	84.09%
Total Harmonic Distortion (THDV)	0.598%	0.835%	1.108%	1.150%	1.181%	1.069%
True Power Factor (W/VA)	0.214	0.476	0.512	0.523	0.541	0.513
AC Input Frequency (Hz)	60	60	60	60	60	60
Power Consumed by UUT (W)	0.06	0.91	2.10	3.50	5.55	--
Efficiency	--	91.05%	89.71%	88.59%	86.58%	88.98%
Limit for Level VI requirement: Minimum Efficiency Average active mode efficiency limit $\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67=87.41\%$ The no-load condition consumption shall not exceed 0.1W.						

Model No.: RH-120-3000U1 (Sample 2#)

Tested at: 230VAC, 50Hz

Sample output rating: 12.0V=== 3.0A

	No Load	Active Power Values				Average
Percent of Nameplate Current	0%	25%	50%	75%	100%	--
Output Current (mA)	--	750	1500	2250	3000	
Output Voltage (V)	12.46	12.22	12.10	11.99	11.93	
Output Power (W)	--	9.17	18.15	26.98	35.79	
Ac Input Voltage (V)	230	230	230	230	230	--
Ac Input Power (W)	0.08	10.18	20.38	30.58	40.83	
Total Harmonic Distortion (THD)	95.31%	88.72%	85.39%	85.26%	85.02%	86.10%
Total Harmonic Distortion (THDV)	0.599%	0.778%	1.168%	1.321%	1.434%	1.175%
True Power Factor (W/VA)	0.154	0.414	0.483	0.495	0.503	0.474
AC Input Frequency (Hz)	50	50	50	50	50	50
Power Consumed by UUT (W)	0.08	1.01	2.23	3.60	5.04	--
Efficiency	--	90.08%	89.06%	88.23%	87.66%	88.76%
Limit for Level VI requirement: Minimum Efficiency Average active mode efficiency limit $\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67=87.41\%$ The no-load condition consumption shall not exceed 0.1W.						

Model No.: RH-120-3000U1 (Sample 3#)

Tested at: 115VAC, 60Hz

Sample output rating: 12.0V=== 3.0A

	No Load	Active Power Values				Average
Percent of Nameplate Current	0%	25%	50%	75%	100%	--
Output Current (mA)	--	750	1500	2250	3000	
Output Voltage (V)	12.46	12.32	12.20	12.05	11.93	
Output Power (W)	--	9.24	18.30	27.11	35.79	
Ac Input Voltage (V)	115	115	115	115	115	--
Ac Input Power (W)	0.06	10.19	20.42	30.69	41.38	
Total Harmonic Distortion (THD)	94.80%	87.01%	84.51%	83.34%	81.39%	84.06%
Total Harmonic Distortion (THDV)	0.603%	0.837%	1.091%	1.139%	1.178%	1.061%
True Power Factor (W/VA)	0.217	0.478	0.512	0.523	0.541	0.514
AC Input Frequency (Hz)	60	60	60	60	60	60
Power Consumed by UUT (W)	0.06	0.95	2.12	3.58	5.59	--
Efficiency	--	90.68%	89.62%	88.33%	86.49%	88.78%
Limit for Level VI requirement: Minimum Efficiency Average active mode efficiency limit $\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67=87.41\%$ The no-load condition consumption shall not exceed 0.1W.						

Model No.: RH-120-3000U1 (Sample 3#)
Tested at: 230VAC, 50Hz
Sample output rating: 12.0V=== 3.0A

	No Load	Active Power Values				Average
Percent of Nameplate Current	0%	25%	50%	75%	100%	--
Output Current (mA)	--	750	1500	2250	3000	
Output Voltage (V)	12.47	12.32	12.17	12.05	11.91	
Output Power (W)	--	9.24	18.26	27.11	35.73	
Ac Input Voltage (V)	230	230	230	230	230	--
Ac Input Power (W)	0.09	10.32	20.51	30.76	40.97	
Total Harmonic Distortion (THD)	93.01%	88.59%	84.84%	85.01%	85.05%	85.87%
Total Harmonic Distortion (THDV)	0.467%	0.459%	0.808%	0.947%	1.039%	0.813%
True Power Factor (W/VA)	0.184	0.435	0.503	0.507	0.531	0.494
AC Input Frequency (Hz)	50	50	50	50	50	50
Power Consumed by UUT (W)	0.09	1.08	2.25	3.65	5.24	--
Efficiency	--	89.53%	89.03%	88.13%	87.21%	88.48%
Limit for Level VI requirement: Minimum Efficiency Average active mode efficiency limit $\cong 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67=87.41\%$ The no-load condition consumption shall not exceed 0.1W.						

3.2. Explanation of DOE sampling plan for class A external power supplies

Model No.: RH-120-3000U1

Tested at: 115VAC, 60Hz

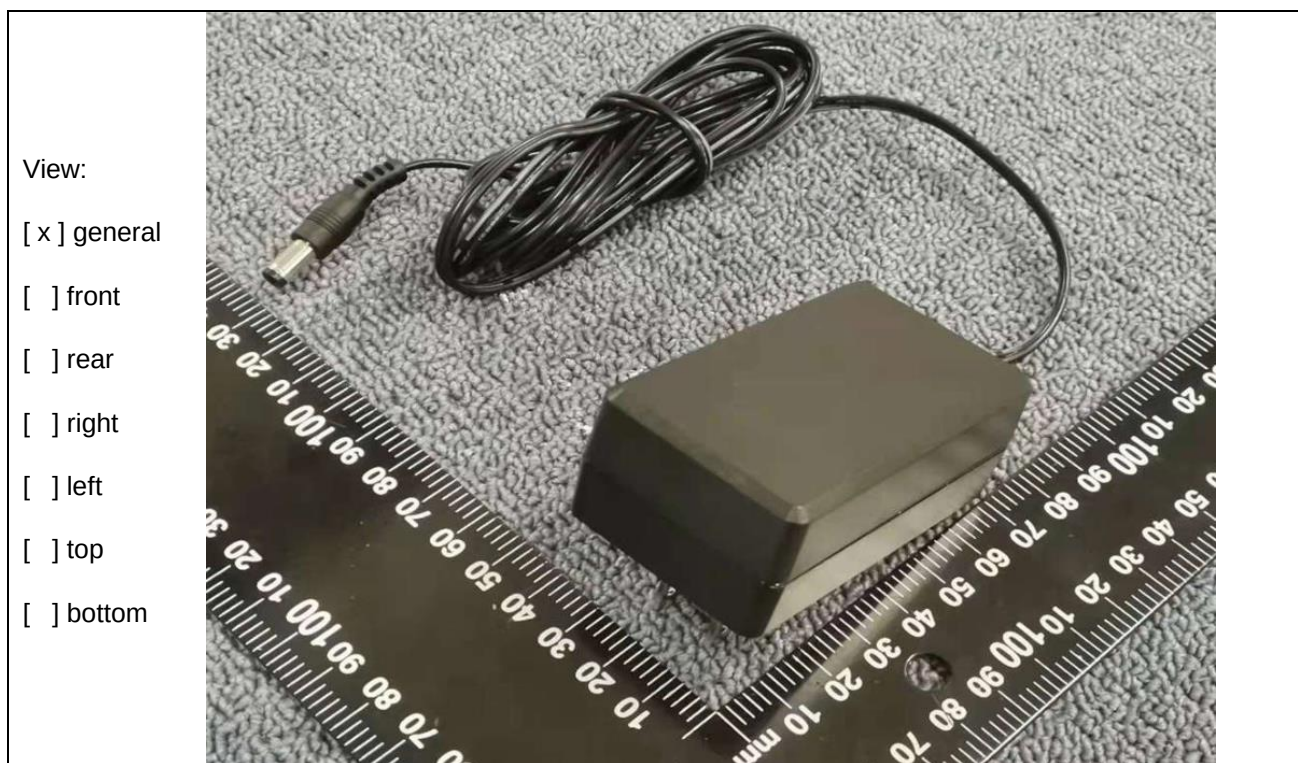
Sample output rating: 12.0V $\overline{=}$ 3.0A

Sample: Sample 1#, Sample 2#, and Sample 3#

Test sample	Measured Active Mode Efficiency (%)	Measured No-Load Mode Power (W)
Sample 1#	89.03%	0.06
Sample 2#	88.98%	0.06
Sample 3#	88.78%	0.06
The report no load power consumption on 97.5% confidence level is the higher of: 1. $UCL/1.05=(X+t*s/\sqrt{n})/1.05=(0.060+4.303*0/\sqrt{3})/1.05=0.057$, or 2. The mean value of measured No-Load Mode Power=0.060W		
The reported Active Mode Efficiency on 97.5% confidence level is the lower of: 1. $LCL/0.95=(X-t*s/\sqrt{n})/0.95=(88.93\%-4.303*0.132\%/\sqrt{3})/0.95=93.27\%$, or 2. The mean value of measured Active Mode Efficiency=88.93%		
Summary: The reported No-Load power is 0.060W, lower than limit of 0.1W. The reported Active Mode Efficiency is 88.93%, greater than limit of 87.41%.		
Verdict: This CLASS 2 POWER UNIT passed Level VI requirement.		

Attachment: Photo documentations

1. For model: RH-120-3000U1



2. For model: RH-120-3000U4