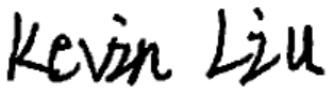


CEC TEST REPORT

Applicant	Huizhou Zhongbang Electronics Co., Ltd.		
Address	Floor 1-4, No. 90 Songbai Ling Road, Sanhe Village, Tonghu Town, Zhongkai High-Tech Zone, Huizhou City, Guangdong Province, 516121, P.R. China		
Manufacturer	Huizhou Zhongbang Electronics Co., Ltd.		
Address	Floor 1-4, No. 90 Songbai Ling Road, Sanhe Village, Tonghu Town, Zhongkai High-Tech Zone, Huizhou City, Guangdong Province, 516121, P.R. China		
Test Laboratory	Dongguan ITL Co., Ltd No. 8, Jinqianling Street 5, Huangjiang Town, Dongguan, Guangdong, China		
Type of appliance	Power Supply		
Intended use	General use		
Brand name			
Type	ZB-H290020_A+, ZB-H290020_B+, ZB-H290020_T+, MC120-29V2A, MC140-29V2A		
Serial number	N/A (Engineering sample)		
Receipt condition	Intact		
Sample receipt date	2023-06-27		
Test date	2023-06-28		
Issued date	2023-07-01		
Test specification:	US CEC: California Code of Regulations, Title 20, Division 2, Chapter 4, Article 4. Appliance Efficiency Regulations, Sections 1601 through 1609 US EPA " Test Method for Calculating the Energy Efficiency of Single-Voltage External AC-DC Power Supplies US EPA "International Efficiency Marking Protocol for External Power Suppliers Appliance Efficiency Regulations		
Test Result:	Passed.		
Tested by:		Approved by:	
Kevin Liu		Carlen Liu	

1. Test Sites

Test sites: Dongguan ITL Co., Ltd

No. 8, Jinqianling Street 5, Huangjiang Town, Dongguan, Guangdong, China

2. List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Model	S/N	Calibrated until
Digital Power Meter	YAKOGAWA	WT310E-C2/G5	DGITL-001j	Dec. 27, 2023
DC electric load	ITECH	IT8511+	DGITL-002i	Aug. 12, 2023
AC power source	SOPHPOWER	AFC-110	DGITL-030a	Non-calibrated Equipment
Measuring tape	Easv Purable Unique	E-J012	DGITL-020a	Aug. 19, 2024
Humidity and temperature recorder	TEMPERATURE	HTC-8A	DGITL-016d	Aug. 18, 2023

3. Standard and environmental condition

Standard applied	US CEC: California Code of Regulations, Title 20, Division 2, Chapter 4, Article 4. Appliance Efficiency Regulations, Sections 1601 through 1609
Tested at	115VAC / 60Hz, 230VAC / 50Hz
Ambient temperature	24.8°C
Relative humidity	51% RH
THD V%	0.09-0.50%
Set-up and circuits used for electrical testing	See page 7 testing circuit

4. General Product Information

Model name	Input	Output	Output Wattage	Output cord length
ZB-H290020_A+, ZB-H290020_B+, ZB-H290020_T+, MC120-29V2A, MC140-29V2A	100-240V~, 50-60Hz, 1.6A	29.0Vd.c., 2.0A	58.0W	40cm, 18AWG (for test)

Note:

1. "+" can be A-Z, a-z, 0-9 or blank, for marketing purpose.
2. All models are identical to each other except model name, enclosure shape, see photos for details.
The model ZB-H290020_B+ same as MC140-29V2A, except model name; the model ZB-H290020_T+ same as MC120-29V2A, except model name.
3. If no other specified, the model ZB-H290020_A+ was selected for testing.

Product Function and Intended Use

General use.

4.1 Product Function and Intended Use

The EUT is external power supply.

Summary of test results

Calculated energy performance requirement (Standards for State-Regulated):

Model name	25%, 50%, 75% and 100%					No load
	average active efficiency (Min.)		No-load condition electric power consumption (Max.)		energy performance requirement 115V/60Hz	
	230V/50Hz	115V/60Hz	230V/50Hz	115V/60Hz		
ZB-H290020_A+, ZB-H290020_B+, ZB-H290020_T+, MC120-29V2A, MC140-29V2A	89.357%	89.173%	0.140W	0.072W	≥88.00%	≤ 0.210W
Level VI	PASS					

Test Summary

(1) Class A External Power Supplies. Except as provided in subsections 1605.1(u)(4) and 1605.1(u)(7) of this Article, all Class A external power supplies manufactured on or after July 1, 2008, shall meet the standards shown in Table U-1:

Table U-1
Standards for Class A External Power Supplies

<i>Active Mode</i>	
<i>Nameplate Output</i>	<i>Required efficiency (decimal equivalent of a percentage)</i>
Less than 1 watt	0.5 times the Nameplate output
From 1 watt to not more than 51 watts	The sum of 0.09 times the Natural Logarithm of the Nameplate Output and 0.5
Greater than 51 watts	0.85
Not more than 250 watts	0.5

(2) Direct Operation External Power Supplies. Except as provided in subsections 1605.1(u)(7) and 1605.1(u)(8) of this Article, all direct operation external power supplies manufactured on or after February 10, 2016, shall meet the standards shown in Table U-2:

Table U-2
Standards for Direct Operation External Power Supplies

<i>Power Supply Type</i>	<i>Nameplate Output Power (P_{out})</i>	<i>Minimum Average Efficiency in Active Mode*</i>	<i>Maximum Power in No Load Mode [W]</i>
Single Voltage External AC-DC Power Supply, Basic Voltage	$P_{out} \leq 1 \text{ W}$	$\geq 0.5 \times P_{out} + 0.16$	≤ 0.100
	$1 \text{ W} \leq P_{out} \leq 49 \text{ W}$	$\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67$	≤ 0.100
	$49 \text{ W} \leq P_{out} \leq 250 \text{ W}$	≥ 0.880	≤ 0.210
	$P_{out} > 250 \text{ W}$	≥ 0.875	≤ 0.500
Single Voltage External AC-DC Power Supply, Low Voltage	$P_{out} \leq 1 \text{ W}$	$\geq 0.517 \times P_{out} + 0.087$	≤ 0.100
	$1 \text{ W} \leq P_{out} \leq 49 \text{ W}$	$\geq 0.0834 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.609$	≤ 0.100
	$49 \text{ W} \leq P_{out} \leq 250 \text{ W}$	≥ 0.870	≤ 0.210
	$P_{out} > 250 \text{ W}$	≥ 0.875	≤ 0.500
Single Voltage External AC-AC Power Supply, Basic Voltage	$P_{out} \leq 1 \text{ W}$	$\geq 0.5 \times P_{out} + 0.16$	≤ 0.210
	$1 \text{ W} \leq P_{out} \leq 49 \text{ W}$	$\geq 0.071 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.67$	≤ 0.210
	$49 \text{ W} \leq P_{out} \leq 250 \text{ W}$	≥ 0.880	≤ 0.210
	$P_{out} > 250 \text{ W}$	≥ 0.875	≤ 0.500
Single Voltage External AC-AC Power Supply, Low Voltage	$P_{out} \leq 1 \text{ W}$	$\geq 0.517 \times P_{out} + 0.087$	≤ 0.210
	$1 \text{ W} \leq P_{out} \leq 49 \text{ W}$	$\geq 0.0834 \times \ln(P_{out}) - 0.0014 \times P_{out} + 0.609$	≤ 0.210
	$49 \text{ W} \leq P_{out} \leq 250 \text{ W}$	≥ 0.870	≤ 0.210
	$P_{out} > 250 \text{ W}$	≥ 0.875	≤ 0.500
Multiple Voltage External Power Supply	$P_{out} \leq 1 \text{ W}$	$\geq 0.497 \times P_{out} + 0.067$	≤ 0.300
	$1 \text{ W} \leq P_{out} \leq 49 \text{ W}$	$\geq 0.075 \times \ln(P_{out}) + 0.561$	≤ 0.300
	$P_{out} > 49 \text{ W}$	≥ 0.860	≤ 0.300

* Expressed as a decimal.

(3) All External Power Supplies Manufactured On or After February 10, 2016. Except as provided in subsections 1605.1(u)(7) and 1605.1(u)(8) of this Article, all direct operation external power supplies manufactured on or after February 10, 2016, shall meet the standards shown in Table U-3:

Table U-3
Standards for All External Power Supplies
Manufactured On or After February 10, 2016

Operation EPS Type	Class A EPS	Non-Class A EPS
Direct Operation EPS	Level VI: 10 C.F.R. 430.32 (w)(1)(ii)	Level VI 10 C.F.R. 430.32(w)(1)(ii)
Indirect Operation EPS	Level VI: 10 C.F.R. 430.32 (w)(1)(i)	No standards

MEASUREMENT CONDITIONS

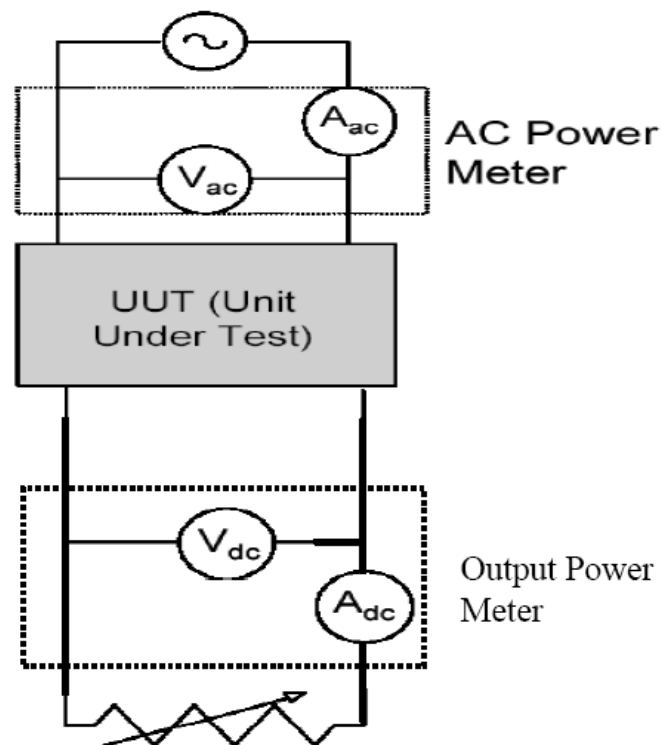
The UUT is operated at 100% of nameplate current output for 30 minutes immediately prior to conducting efficiency measurements.

After this warm-up period, the ac input power is monitored for a period of 5 minutes to assess the stability of the UUT.

The power level has not drifted by more than 5% from the maximum value observed. The UUT is considered stable and the measurements have been recorded at the end of the 5 minute period.

Measurements of power of 0.50 W or greater are made with an uncertainty of less than or equal to 2% at the 95% confidence level. Measurements of power of less than 0.50 W are made with an uncertainty of less than or equal to 0.01 W at the 95% confidence level.

Testing circuits



Test Results

Model No.: ZB-H290020_A+		Sample #1			
	No Load	Load condition			
Percentage of nameplate current	0%	25%	50%	75%	100%
Output current (mA)		500	1000	1500	2000
Output voltage (V)	29.64	29.59	29.54	29.51	29.49
Output power (W)		14.795	29.540	44.265	58.980
AC input current (mA)		197.23	360.20	517.30	666.50
AC input voltage (V)	230.00	230.00	230.00	230.00	230.00
AC supply frequency (Hz)	50.00	50.00	50.00	50.00	50.00
AC input power (W)	0.140	16.732	33.102	49.541	65.232
Total Harmonic distortion (THD)V%	0.10	0.21	0.31	0.40	0.49
Total Harmonic distortion (THD)A%	6.62	237.61	224.28	214.08	208.74
True power factor (W/VA)	0.026	0.369	0.399	0.417	0.425
Power consumed by EUT (W)	0.140	1.937	3.562	5.276	6.252
Efficiency		88.423%	89.239%	89.350%	90.416%
Average active efficiency *	89.357%				
	No Load	Load condition			
Percentage of nameplate current	0%	25%	50%	75%	100%
Output current (mA)		500	1000	1500	2000
Output voltage (V)	29.64	29.60	29.57	29.52	29.48
Output power (W)		14.800	29.570	44.280	58.960
AC input current (mA)		358.60	636.70	865.30	1096.60
AC input voltage (V)	115.00	115.00	115.00	115.00	115.00
AC supply frequency (Hz)	60.00	60.00	60.00	60.00	60.00
AC input power (W)	0.072	16.540	33.068	49.967	66.120
Total Harmonic distortion (THD)V%	0.09	0.18	0.28	0.35	0.39
Total Harmonic distortion (THD)A%	17.59	221.56	188.79	163.13	147.80
True power factor (W/VA)	0.044	0.401	0.451	0.498	0.526
Power consumed by EUT (W)	0.072	1.740	3.498	5.687	7.160
Efficiency		89.480%	89.422%	88.618%	89.171%
Average active efficiency *	89.173%				

*) Arithmetic average of efficiency at load conditions 25%, 50%, 75% and 100%.

Test Results

Model No.: ZB-H290020_A+		Sample #2			
	No Load	Load condition			
Percentage of nameplate current	0%	25%	50%	75%	100%
Output current (mA)		500	1000	1500	2000
Output voltage (V)	29.76	29.71	29.68	29.64	29.60
Output power (W)		14.855	29.680	44.460	59.200
AC input current (mA)		197.09	358.70	516.30	674.50
AC input voltage (V)	230.00	230.00	230.00	230.00	230.00
AC supply frequency (Hz)	50.00	50.00	50.00	50.00	50.00
AC input power (W)	0.140	16.774	33.064	49.351	65.826
Total Harmonic distortion (THD)V%	0.10	0.22	0.31	0.40	0.50
Total Harmonic distortion (THD)A%	6.47	236.47	223.03	214.75	209.29
True power factor (W/VA)	0.026	0.370	0.401	0.416	0.424
Power consumed by EUT (W)	0.140	1.919	3.384	4.891	6.626
Efficiency		88.560%	89.765%	90.089%	89.934%
Average active efficiency *	89.587%				
	No Load	Load condition			
Percentage of nameplate current	0%	25%	50%	75%	100%
Output current (mA)		500	1000	1500	2000
Output voltage (V)	29.75	29.72	29.68	29.65	29.60
Output power (W)		14.860	29.680	44.475	59.200
AC input current (mA)		358.70	636.30	869.60	1100.01
AC input voltage (V)	115.00	115.00	115.00	115.00	115.00
AC supply frequency (Hz)	60.00	60.00	60.00	60.00	60.00
AC input power (W)	0.070	16.615	33.192	49.844	66.684
Total Harmonic distortion (THD)V%	0.09	0.19	0.29	0.25	0.38
Total Harmonic distortion (THD)A%	16.45	220.34	187.75	162.74	147.34
True power factor (W/VA)	0.043	0.402	0.454	0.498	0.527
Power consumed by EUT (W)	0.070	1.755	3.512	5.369	7.484
Efficiency		89.437%	89.419%	89.228%	88.777%
Average active efficiency *	89.215%				

*) Arithmetic average of efficiency at load conditions 25%, 50%, 75% and 100%.

Label

Power Supply
Model No.:ZB-H290020_A
Input:100-240V~,50-60Hz,1.6A
Output:29V --- 2A
Date Code:MM,DD,YYYY
Efficiency Level:(VI)


CE **UL** US LISTED
E365620


Type Approved
Safety
Regular Production
Surveillance
www.tuv.com
ID 2000000000




+  -
IP20 ta:30°C
Made in China

CAUTION
Risk of electric shock
Dry location use only
See the instruction manual for
proper selection of the power
supply cord

Power Supply
Model No.:ZB-H290020_B
Input:100-240V~,50-60Hz,1.6A
Output:29V --- 2A
Date Code:MM,DD,YYYY
Efficiency Level:(VI)


CE **UL** US LISTED
E365620


Type Approved
Safety
Regular Production
Surveillance
www.tuv.com
ID 2000000000




+  -
IP20 ta:30°C
Made in China

CAUTION
Risk of electric shock
Dry location use only
See the instruction manual for
proper selection of the power
supply cord

Power Supply
Model No.:MC140-29V2A
Input:100-240V~,50-60Hz,1.6A
Output:29V --- 2A
Date Code:MM,DD,YYYY
Efficiency Level:(VI)


CE **UL** US LISTED
E365620


Type Approved
Safety
Regular Production
Surveillance
www.tuv.com
ID 2000000000




+  -
IP20 ta:30°C
Made in China

CAUTION
Risk of electric shock
Dry location use only
See the instruction manual for
proper selection of the power
supply cord

Power Supply
Model No.:ZB-H290020_T
Input:100-240V~,50-60Hz,1.6A
Output:29V --- 2A
Date Code:MM,DD,YYYY
Efficiency Level:(VI)


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E365620


Type Approved
Safety
Regular Production
Surveillance
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ID 2000000000




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IP20 ta:30°C
Made in China

CAUTION
Risk of electric shock
Dry location use only
See the instruction manual for
proper selection of the power
supply cord

Power Supply
Model No.:MC120-29V2A
Input:100-240V~,50-60Hz,1.6A
Output:29V --- 2A
Date Code:MM,DD,YYYY
Efficiency Level:(VI)


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Type Approved
Safety
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Surveillance
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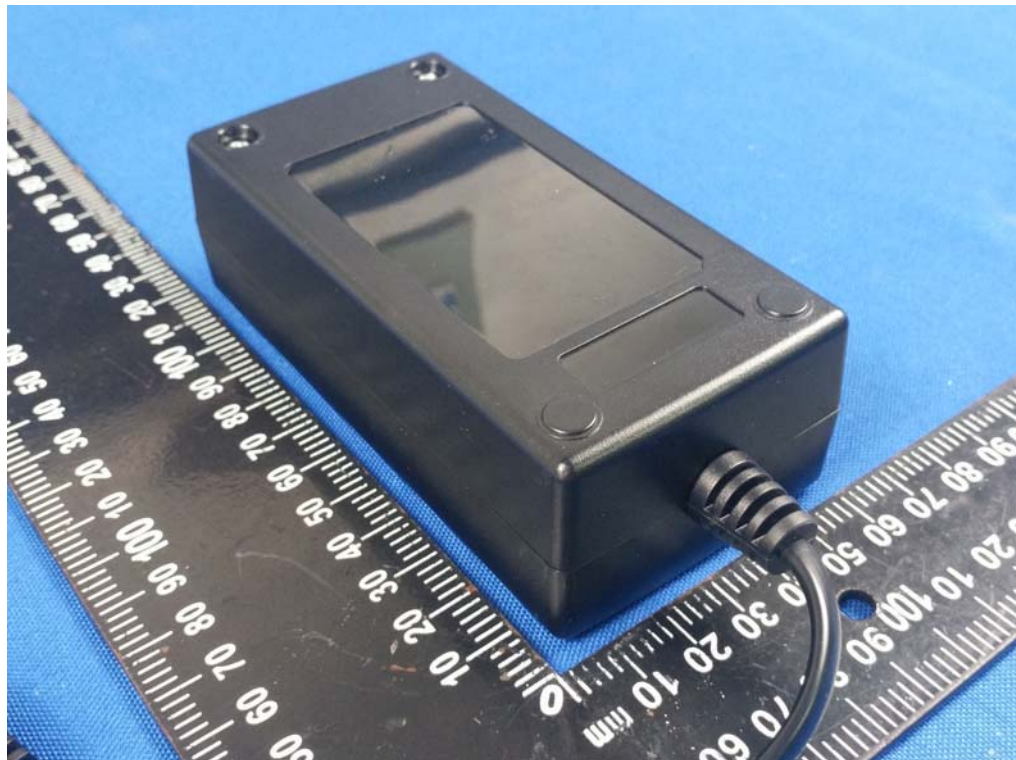



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IP20 ta:30°C
Made in China

CAUTION
Risk of electric shock
Dry location use only
See the instruction manual for
proper selection of the power
supply cord

Photo(s) of the appliance:

For model: ZB-H290020_A+



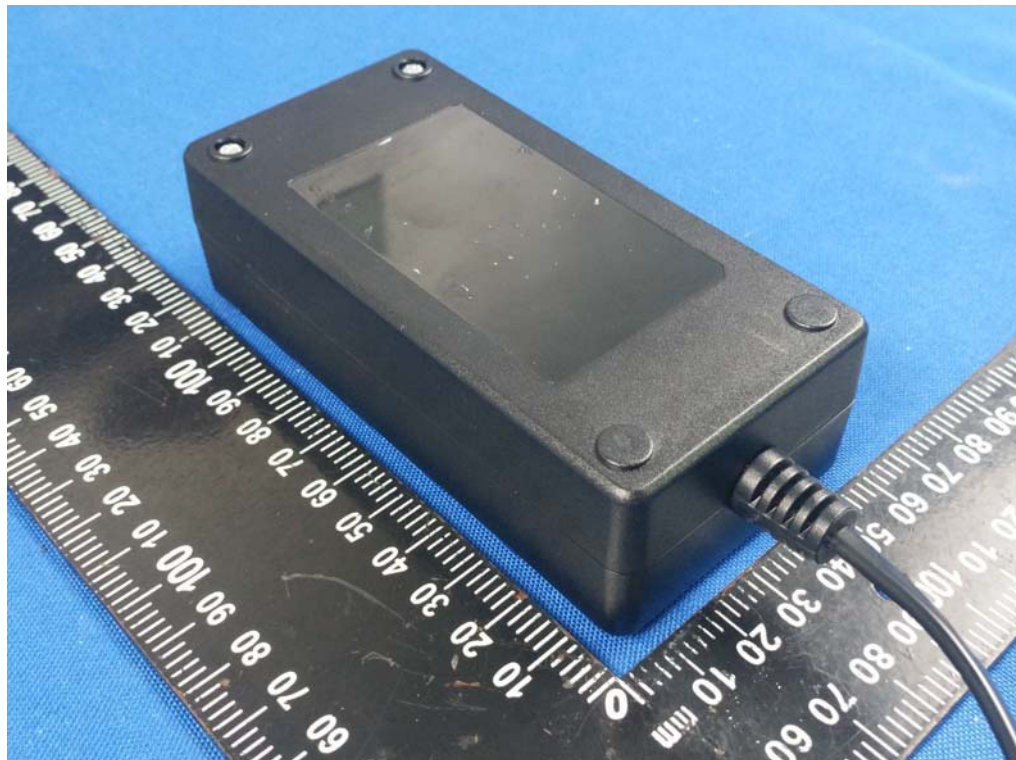
Photo(s) of the appliance:

For model: ZB-H290020_B+, MC140-29V2A



Photo(s) of the appliance:

For model: ZB-H290020_T+, MC120-29V2A



--End of report--