GlobTek, INC.

GlobTek®, Inc.

AC-DC External Power Supplies Test Report

Product Name: Power Supply

Manufacturer GlobTek, Inc.

Importer Address: 186 Veterans Dr. Northvale, NJ 07647 USA

Model Number: GT-81081-6024-T3

Declare that the product conforms to the following specifications

This document hereby certifies the above listed products are in compliance with the "Australian and New Zealand Energy Performance and Marking Requirements for External Power Supplies Minimum Energy Performance Standards (MEPS) Level V and meet AS/NZS4665 – 2005.

The test method was according to AS/NZS4665 – 2005, which is technically identical to the US EPA "Test Method for Calculating the Energy Efficiency of Single-Voltage External AC-DC and AC-AC Power Supplies" dated August 11, 2004.

Manufacturer/ Importer

Company Name GlobTek, Inc.

Position R&D Dept.

Name (Type name) _____ **Authorized Signature** _____

GlobTek CEC 2008

GlobTek, INC.

TEST REPORT California Energy Commission's Appliance Regulations (Section 1601 – 1608 of Title 20 of the California Code of Regulations)
Report Reference No. …….. : GlobTek-RD-2015123001 Tested by (name +signature)……. : Engineer by (name +signature)…. : Approved by (name +signature)… :
Testing Laboratory ……... : **GlobTek, Inc.** Address ……...……... : **186 Veterans Dr. Northvale, NJ 07647 USA**
Manufacturer's name …….…. : (1) GlobTek, Inc. (2) GlobTek (Suzhou) Co., Ltd Address ……...…….. : (1) 186 Veterans Dr. Northvale, NJ 07647 USA (2) Building 4, No. 76, Jin Ling East Rd., Suzhou Industrial Park, Suzhou,JiangSu 215021, China
Test specification : Standard …….. : AS/NZS 4665.1:2005 Test procedure …… : US EPA-Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies, August 11, 2004
Test item description ……..… : ■ **AC-DC power supply** □ **AC-AC power supply** Trade Mark ……. : **GlobTek** Model/Type reference …….. : **GT-81081-6024-T3** Ratings ……... : Input: 100-240Vac, 50/60 Hz, 1.5A Output: 24Vdc, 2.5A

Copy of marking plate/Label


GlobTek, Inc.
ITE POWER SUPPLY
N4292
EMC

Test item particulars : …….…... :

EUT output cord length …….… :1800 mm + / - 10 (18 AWG)

Possible test case verdicts:

-test case does not apply to the test object …… : N/A

-test object does meet the requirement …….. : P(Pass)

-test object does not meet the requirement …... : F(Fail)

Testing :

Date of receipt of test item ……... : 2015/12/27

Date (s) of performance of tests ……..….. : 2015/12/27

General remarks:

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 Issuing testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a comma (point) is used as the decimal separator.

The Report contains the following Enclosures:

Enclosure 1 : Photographs

Enclosure 2 : Test Equipment List

General product information:

- The EUT (Equipment under Test) is an Ac-Dc switching supply for Information Technology Equipment used.

US EPA – Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies			
Clause	Requirement + Test	Result – Remark	Verdict
4	General Conditions for Measurement		P
a.	Test Voltage		
	An ac reference source shall be used to Provide input voltage to the EUT.	See Enclosure 2	P
	Input to the EUT shall be the specified Voltage ± 1% and the specified frequency ± 1%	See appended table	P
	The EUT shall be tested at two voltage and Frequency combinations:	See below	P
	115V at 60Hz	See appended table	P
	230v at 50Hz	See appended table	P
b.	Load Condition		
	The EUT shall be tested at the following load Conditions:		
	Load condition 1 : 100% ± 2%	2500mA	P
	Load condition 2 : 75% ± 2%	1875mA	P
	Load condition 3 : 50% ± 2%	1250mA	P
	Load condition 4 : 25% ± 2%	625mA	P
	Load condition 5 : 0%	0A	P
c.	Testing Sequence		
	The EUT shall be operated at 100% of nameplate current output for at least 30 minutes immediately prior to conducting efficiency measurements.	The EUT is operated at 100% of nameplate current output for 30 minutes	P
	After this warm-up period, the technician shall monitor ac input power for a period of 5 minutes to assess the stability of the EUT.		P
	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.		P
	If ac input power is not stable over a 5 minute period, the technician shall follow the guidelines established by IEC 62301 for measuring average power or accumulated energy over time for both ac input and dc output		N
	Efficiency measurements shall be conducted In sequence from Load Condition 1 to Load Condition 5 as indicated in Table		P

US EPA – Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies			
Clause	Requirement + Test	Result – Remark	Verdict

	Test results		
	Temperature immediately surrounding the EUT(℃) …… :	25 (℃) Sample 1	
	Test voltage (V) …….. :	115 (V)	
	Frequency (Hz) …….. :	60 (Hz)	

Test Item	Measure at load condition					
	1	2	3	4	5	
Rms Output Current (mA)	2500	1875	1250	625	0	
Rms Output Voltage (V)	23.8	23.94	24.04	24.15	24.24	
Active Output Power (W)	59.5	44.8	30	15.00	0	
Rms input voltage (V)	115					
Rms input Power (W)	70.2	52.31	34.780	17.460	0.38	
Total Harmonic Distortion(THD)	0.5050	0.4460	0.3660	0.2560	0.0870	
True Power Factor	0.5400	0.5130	0.4930	0.4560	0.1000	
Power Consumed by EUT(W)	10.7	7.51	4.78	2.460	Mea.	Req.
					0.38	**0.75**
Efficiency	84.760%	85.640%	86.260%	85.910%	N/A	
Average Efficiency	85.643 % (Requirement: 84%)				P	

Supplementary information:

Australian and New Zealand Energy Performance and Marking Requirements for External Power Supplies Minimum Energy Performance Standards (MEPS) states：

In accord with the international marking protocol, Levels III and IV are defined in AS/NZS4665.1 2005. In May 2008, the US EPA announced more stringent criteria to establish level V.

Level V will be proposed as an amendment to AS/NZS4665 and exceeds Australian and New Zealand MEPS criteria.

In the interim, Regulators have approved the use of performance mark Vas an accepted performance mark.

External power supplies with nominal 230 Va.c. mains supply input and a single output at extra low voltage (ELV) either a.c. or d.c., and a maximum output of 250W or 250 VA, manufactured or imported for sale in Australia or New Zealand will be required to meet or exceed the requirements of performance mark III. I.e. meet or exceed the average energy efficiency level in Table 1, AND meet or be less than the no-load requirements in Table 2 when tested at 230 Va.c. 50 Hz.

US EPA – Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies			
Clause	Requirement + Test	Result – Remark	Verdict

	Test results		
	Temperature immediately surrounding the EUT(℃) …… :	25 (℃) Sample 1	
	Test voltage (V) …….. :	230 (V)	
	Frequency (Hz) …….. :	50 (Hz)	

Test Item	Measure at load condition					
	1	2	3	4	5	
Rms Output Current (mA)	2500	1875	1250	625	0	
Rms Output Voltage (V)	23.79	23.92	24.2	24.1	24.24	
Active Output Power (W)	59.400	44.800	30	15	0	
Rms input voltage (V)	230					
Rms input Power (W)	69.22	51.910	34.7	17.960	0.46	
Total Harmonic Distortion(THD)	0.1820	0.1670	0.1400	0.1010	0.05	
True Power Factor	0.4530	0.4300	0.4090	0.3710	0.0370	
Power Consumed by EUT(W)	9.820	7.11	4.7	2.96	Mea.	Req.
					0.46	**0.75**
Efficiency	85.810	86.300	86.460	83.520	N/A	
Average Efficiency	85.523% (Requirement: 84%)				P	

Supplementary information:

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Level V will be proposed as an amendment to AS/NZS4665 and exceeds Australian and New Zealand MEPS criteria.

In the interim, Regulators have approved the use of performance mark Vas an accepted performance mark.

External power supplies with nominal 230 Va.c. mains supply input and a single output at extra low voltage (ELV) either a.c. or d.c., and a maximum output of 250W or 250 VA, manufactured or imported for sale in Australia or New Zealand will be required to meet or exceed the requirements of performance mark III. I.e. meet or exceed the average energy efficiency level in Table 1, AND meet or be less than the no-load requirements in Table 2 when tested at 230 Va.c. 50 Hz.

US EPA – Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies			
Clause	Requirement + Test	Result – Remark	Verdict

	Test results		
	Temperature immediately surrounding the EUT(℃) …… :	25 (℃) Sample 2	
	Test voltage (V) …….. :	115 (V)	
	Frequency (Hz) …….. :	60 (Hz)	

Test Item	Measure at load condition					
	1	2	3	4	5	
Rms Output Current (mA)	2500	1875	1250	625	0	
Rms Output Voltage (V)	23.89	24	24.09	24.19	24.29	
Active Output Power (W)	59.7	44.9	30.1	15.1	0	
Rms input voltage (V)	115					
Rms input Power (W)	70.6	52.6	35	17.6	0.45	
Total Harmonic Distortion(THD)	0.5030	0.4330	0.342	0.2450	0.08	
True Power Factor	0.5460	0.5190	0.5010	0.4600	0.1	
Power Consumed by EUT(W)	10.9	7.7	4.9	2.5	Mea. **0.45**	Req. **0.75**
Efficiency	84.560%	85.360%	86%	85.8%	N/A	
Average Efficiency	85.430 % (Requirement: 84%)					

Supplementary information:

Australian and New Zealand Energy Performance and Marking Requirements for External Power Supplies Minimum Energy Performance Standards (MEPS) states：

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Level V will be proposed as an amendment to AS/NZS4665 and exceeds Australian and New Zealand MEPS criteria.

In the interim, Regulators have approved the use of performance mark Vas an accepted performance mark.

External power supplies with nominal 230 Va.c. mains supply input and a single output at extra low voltage (ELV) either a.c. or d.c., and a maximum output of 250W or 250 VA, manufactured or imported for sale in Australia or New Zealand will be required to meet or exceed the requirements of performance mark III. I.e. meet or exceed the average energy efficiency level in Table 1, AND meet or be less than the no-load requirements in Table 2 when tested at 230 Va.c. 50 Hz.

US EPA – Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies			
Clause	Requirement + Test	Result – Remark	Verdict

	Test results		
	Temperature immediately surrounding the EUT(℃) …… :	25 (℃) Sample 2	
	Test voltage (V) …….. :	230 (V)	
	Frequency (Hz) …….. :	50 (Hz)	

Test Item	Measure at load condition					
	1	2	3	4	5	
Rms Output Current (mA)	2500	1875	1250	625	0	
Rms Output Voltage (V)	23.88	23.96	24.07	24.16	24.28	
Active Output Power (W)	59.7	44.9	30	15.1	0	
Rms input voltage (V)	230					
Rms input Power (W)	69.55	52.1	34.8	18.14	0.68	
Total Harmonic Distortion(THD)	0.181	0.165	0.137	0.1	0.05	
True Power Factor	0.456	0.434	0.413	0.374	0.06	
Power Consumed by EUT(W)	9.85	7.2	4.8	3.04	Mea.	Req.
					0.68	**0.75**
Efficiency	85.840%	86.180%	86.2%	83.240%	N/A	
Average Efficiency	85.365% (Requirement: 84%)					

Supplementary information:

Australian and New Zealand Energy Performance and Marking Requirements for External Power Supplies Minimum Energy Performance Standards (MEPS) states：

In accord with the international marking protocol, Levels III and IV are defined in AS/NZS4665.1 2005. In May 2008, the US EPA announced more stringent criteria to establish level V.

Level V will be proposed as an amendment to AS/NZS4665 and exceeds Australian and New Zealand MEPS criteria.

In the interim, Regulators have approved the use of performance mark Vas an accepted performance mark.

External power supplies with nominal 230 Va.c. mains supply input and a single output at extra low voltage (ELV) either a.c. or d.c., and a maximum output of 250W or 250 VA, manufactured or imported for sale in Australia or New Zealand will be required to meet or exceed the requirements of performance mark III. I.e. meet or exceed the average energy efficiency level in Table 1, AND meet or be less than the no-load requirements in Table 2 when tested at 230 Va.c. 50 Hz.

US EPA – Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies			
Clause	Requirement + Test	Result – Remark	Verdict

Test results			
	Temperature immediately surrounding the EUT(℃) …… :	25 (℃) Sample 3	
	Test voltage (V) …….. :	115 (V)	
	Frequency (Hz) …….. :	60 (Hz)	

Test Item	Measure at load condition					
	1	2	3	4	5	
Rms Output Current (mA)	2500	1875	1250	625	0	
Rms Output Voltage (V)	23.91	24.02	24.11	24.19	24.3	
Active Output Power (W)	59.7	45	30.1	15.1	0	
Rms input voltage (V)	115					
Rms input Power (W)	70.5	52.5	34.9	17.6	0.42	
Total Harmonic Distortion(THD)	0.514	0.445	0.364	0.254	0.087	
True Power Factor	0.544	0.515	0.495	0.456	0.1	
Power Consumed by EUT(W)	10.8	7.5	4.8	2.5	Mea.	Req.
					0.42	**0.75**
Efficiency	84.680%	85.710%	86.250%	85.8%	N/A	
Average Efficiency	85.610% (Requirement: 84%)					

Supplementary information:

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Level V will be proposed as an amendment to AS/NZS4665 and exceeds Australian and New Zealand MEPS criteria.

In the interim, Regulators have approved the use of performance mark Vas an accepted performance mark.

External power supplies with nominal 230 Va.c. mains supply input and a single output at extra low voltage (ELV) either a.c. or d.c., and a maximum output of 250W or 250 VA, manufactured or imported for sale in Australia or New Zealand will be required to meet or exceed the requirements of performance mark III. I.e. meet or exceed the average energy efficiency level in Table 1, AND meet or be less than the no-load requirements in Table 2 when tested at 230 Va.c. 50 Hz.

US EPA – Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies			
Clause	Requirement + Test	Result – Remark	Verdict

Test results			
	Temperature immediately surrounding the EUT(℃) …… :	25 (℃) Sample 3	
	Test voltage (V) …….. :	230 (V)	
	Frequency (Hz) …….. :	50 (Hz)	

Test Item	Measure at load condition					
	1	2	3	4	5	
Rms Output Current (mA)	2500	1875	1250	625	0	
Rms Output Voltage (V)	23.89	24.01	24.09	24.2	24.28	
Active Output Power (W)	59.7	44.9	30.1	15.1	0	
Rms input voltage (V)	230					
Rms input Power (W)	69.62	52.06	34.82	18.21	0.67	
Total Harmonic Distortion(THD)	0.18	0.16	0.14	0.1	0.05	
True Power Factor	0.457	0.433	0.411	0.376	0.06	
Power Consumed by EUT(W)	9.92	7.16	4.72	3.11	Mea.	Req.
					0.67	**0.75**
Efficiency	85.750%	86.250%	86.440%	82.920%	N/A	
Average Efficiency	85.340% (Requirement: 84%)					

Supplementary information:

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Level V will be proposed as an amendment to AS/NZS4665 and exceeds Australian and New Zealand MEPS criteria.

In the interim, Regulators have approved the use of performance mark Vas an accepted performance mark.

External power supplies with nominal 230 Va.c. mains supply input and a single output at extra low voltage (ELV) either a.c. or d.c., and a maximum output of 250W or 250 VA, manufactured or imported for sale in Australia or New Zealand will be required to meet or exceed the requirements of performance mark III. I.e. meet or exceed the average energy efficiency level in Table 1, AND meet or be less than the no-load requirements in Table 2 when tested at 230 Va.c. 50 Hz.

Table 1: MEPS required minimum efficiency level- Performance mark III

Nameplate Power Output (Pno) Watts	Average Efficiency
0 to 1	≥ 0.49 x Pno
>1 to 49	≥0.09Ln(Pno)+0.49
>49 to 250	≥ 0.84

Where: P_{no} is the nameplate output power of the Unit Under Test.

"Ln" refers to the natural logarithm (base e). The algebraic order of operations requires that the natural logarithm calculation be performed first.

Table 2: MEPS required maximum no-load power – Performance mark III

Nameplate Power Output (Pno)Watts	AC – DC Watts	AC-AC
0 to <10	≤ 0.5	N/A
10 to 250	≤ 0.75	N/A

Table 3: Requirements for 'high efficiency' external power supplies （Performance mark IV）

Nameplate Power Output (Pno) Watts		Average Efficiency
0 to 1		≥ 0.5 x Pno
>1 to 51		≥ 0.09Ln(Pno)+0.5
>51 to 250		≥ 0.85
Type and Nameplate Power Output (Pno) Watts		No Load Power Watts
AC – DC	0 to 250	≤ 0.5
AC – AC	0 to 250	N/A

Table 4: Efficiency requirements for "High efficiency" performance mark V

	Output specifications	Active mode efficiency requirements	
		Nameplate output power (Pno) Watts	Average active mode efficiency
V	Output voltage < 6 Volts And Output current ≥ 0.550 Amps	0 to 1	≥0.497 × Pno+ 0.067
		>1 to 49	≥0.075 Ln (Pno) +0.561
		>49 to 250	≥0.86
	All other models	0 to 1	≥0.480 × Pno+ 0.140
		>1 to 49	≥0.0626 x Ln (Pno) + 0.622
		>49 to 250	≥0.87

Table 5: No-load requirements for "High efficiency" performance mark V

Nameplate output power (Pno) Watts	No-load power consumption requirements Watts	
	AC – AC	AC - DC
0 to < 50	N/A	≤ 0.3
≥ 50 to 250	N/A	≤ 0.5

GlobTek, INC.
Enclosure 1
Photos of EUT

GlobTek, INC.
Enclosure 2

Test Equipment List

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Ac Power Source	Chroma	6110	A6G0790001	----
Ac Power Source	Chroma	6408	6408-2000553	----
Current Meter	Yokogawa	2013	B610210007	2008-12-25
Multimeter	FLUKE	187	TA0000572	2008-12-25
Variably Resister	----	----	A6G0160001	2008-12-25
Digital Power Meter	Yokogawa	WT210	B6G1080007 91F138523	2008-12-25
Digital Power Meter	Voltech	PM100	B6G0380001	2008-12-25
Electronic Load DC Load	Chroma	6304-63010	A6G0450009	2009-03-05
Electronic Load DC Load	Prodigit	3300C+3311D	A6G14500025 A6G14500023 A6G14500024	2009-03-05

Test Equipment Set-up