



Product Service

FCC - TEST REPORT

Report Number : **68.950.13.036.02** Date of Issue: January 3, 2014

Model : **EchoLife HG8245H**

Product Type : GPON Terminal

Applicant : Huawei Technologies Co., Ltd.

Address : Administration Building, Headquarters of Huawei Technologies
Co., Ltd., Bantian, Longgang District, 518129 Shenzhen,
People's Republic of China

Production Facility : Huawei Technologies Co., Ltd.

Address : Administration Building, Headquarters of Huawei Technologies
Co., Ltd., Bantian, Longgang District, 518129 Shenzhen,
People's Republic of China

Test Result : **Positive** **Negative**

Total pages including Appendices : 14

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2 Details about the Test Laboratory

Details about the Test Laboratory

Test site1:

Company name: Jiangsu TÜV Product Service Ltd. Shenzhen Branch
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Test site2:

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Telephone: 86 755 2663 9496

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3 Description of the Equipment Under Test

Description of the Equipment Under Test

Product: GPON Terminal

Model no.: EchoLife HG8245H

Options and accessories: NIL

Rating: DC 12V
Powered by external adaptor:
Adaptor Input: 100-240VAC, 50/60Hz, 0.8A
Adaptor Output: 12.0VDC, 2.0A

Antenna: Unique Antenna, NOT accessible by end user
Max. Gain: 5dBi

RF Transmission Frequency: 2412-2462MHz

Description of the EUT: NIL

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Notebook	Lenovo	T400	----



4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C, Intentional Radiators, 10-1-12 Edition	PART 15 – RADIO FREQUENCY DEVICES Subpart C – Intentional Radiators

**5 Summary of Test Results**

Technical Requirements					
FCC Part 15 Subpart C 10-1-12 Edition					
Test Condition	Pages	Test Result			Test Location
		Pass	Fail	N/A	
15.207 Conducted Emission AC Power Port	--	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test Site2
15.247 (b) (1) Conducted peak output power	8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test Site2
15.247(d) Band edge compliance of RF emissions	--	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test Site2
15.247(d) Spurious RF conducted emissions	--	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test Site2
15.247(d) & 15.209 Spurious radiated emissions	9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Test Site2
15.247(a)(2) 6dB bandwidth	--	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test Site2
15.247(e) Power spectral density	--	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test Site2



6 General Remarks

Remarks

This submittal(s) (test report) is intended for the Class 2 permissive change of FCC ID: QISHG8245H to comply with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules.

SUMMARY:

All tests according to the regulations cited on page 5 were

- Performed

- **Not** Performed

The Equipment Under Test

- **Fulfills** the general approval requirements.

- **Does not** fulfill the general approval requirements.

Sample Received Date: 17 December 2013

Testing Start Date: 19 December 2013

Testing End Date: 31 December 2013

- Jiangsu TÜV Product Service Ltd. Shenzhen Branch -

Tested By	<u>2014-01-03</u>	<u>Sunny Lu</u>	
EMC Project Engineer	Date	Name	Signature

Prepared By	<u>2014-01-03</u>	<u>Peter Kang</u>	
EMC Project Engineer	Date	Name	Signature

Approved by	<u>2014-01-03</u>	<u>Ken Li</u>	
EMC Project Manager	Date	Name	Signature

7 Technical Requirement

7.1 Conducted peak output power

Test Method

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

Limits for conducted peak output power measurements

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤1	≤30

Conducted peak output power

WIFI Mode IEEE 802.11b modulation (1Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	21.42	Pass
CH6 2437MHz	21.35	Pass
CH11 2462MHz	21.53	Pass

WIFI Mode IEEE 802.11g modulation (6Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	23.35	Pass
CH6 2437MHz	23.55	Pass
CH11 2462MHz	23.50	Pass

WIFI Mode IEEE 802.11n HT20 modulation (6.5Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH1 2412MHz	25.31	Pass
CH6 2437MHz	25.44	Pass
CH11 2462MHz	25.81	Pass

WIFI Mode IEEE 802.11n HT40 modulation (6.5Mbps) Test Result

Frequency MHz	Conducted Peak Output Power dBm	Result
CH3 2422MHz	25.20	Pass
CH6 2437MHz	25.21	Pass
CH9 2452MHz	25.28	Pass

7.2 Spurious radiated emissions for transmitter and receiver

Test Method

- 1 The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2 The turntable shall be rotated for 360 degrees to determine the position of maximum emission level
- 3 EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4 Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5 Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Limit

Frequency MHz	Field Strength uV/m	Field Strength dB μ V/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

Transmitter Spurious radiated emissions

WIFI Mode IEEE 802.11b modulation (1 Mbps) CH1 2412MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBμV	Emission Level dBμV/m	Polarization	Limit dBμV/m	Detector	Result
4824.000	32.88	8.58	35.70	46.80	52.56	Horizontal	74	PK	Pass
4824.000	32.88	8.58	35.70	37.93	43.69	Horizontal	54	AV	Pass
4824.000	32.88	8.58	35.70	50.27	57.83	Vertical	74	PK	Pass
4824.000	32.88	8.58	35.70	46.42	52.18	Vertical	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-	-

WIFI Mode IEEE 802.11b modulation (1 Mbps) CH6 2437MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBμV	Emission Level dBμV/m	Polarization	Limit dBμV/m	Detector	Result
55.91	7.32	1.22	0	26.40	34.94	Vertical	40	QP	Pass
4874.000	32.97	8.63	35.70	46.47	52.37	Horizontal	74	PK	Pass
4874.000	32.97	8.63	35.70	38.28	44.18	Horizontal	54	AV	Pass
4874.000	32.97	8.63	35.70	50.53	56.43	Vertical	74	PK	Pass
4874.000	32.97	8.63	35.70	47.25	53.15	Vertical	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-	-

WIFI Mode IEEE 802.11b modulation (1 Mbps) CH11 2462MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dBμV	Emission Level dBμV/m	Polarization	Limit dBμV/m	Detector	Result
55.78	7.36	1.22	0	26.09	34.67	Vertical	40	QP	Pass
4924.000	33.06	8.69	35.70	46.54	52.59	Horizontal	74	PK	Pass
4924.000	33.06	8.69	35.70	39.05	45.10	Horizontal	54	AV	Pass
4924.000	33.06	8.69	35.70	50.58	56.63	Vertical	74	PK	Pass
4924.000	33.06	8.69	35.70	46.25	52.30	Vertical	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Antenna Factor +Cable Loss - Amp. factor + Reading
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

**Transmitter Spurious radiated emissions**

WIFI Mode IEEE 802.11g modulation (6 Mbps) CH1 2412MHz Test Result

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dB μ V	dB μ V/m		dB μ V/m		
4824	32.88	8.58	35.70	44.70	50.46	Horizontal	74	PK	Pass
4824	32.88	8.58	35.70	32.57	38.33	Horizontal	54	AV	Pass
4824	32.88	8.58	35.70	45.70	51.46	Vertical	74	PK	Pass
4824	32.88	8.58	35.70	33.57	39.33	Vertical	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-	-

WIFI Mode IEEE 802.11g modulation (6 Mbps) CH6 2437MHz Test Result

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dB μ V	dB μ V/m		dB μ V/m		
4874.000	32.97	8.63	35.70	46.10	52.00	Vertical	74	PK	Pass
4874.000	32.97	8.63	35.70	34.87	40.77	Vertical	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-	-

WIFI Mode IEEE 802.11g modulation (6 Mbps) CH11 2462MHz Test Result

Frequency	Antenna Factor	Cable Loss	Amp. Factor	Reading	Emission Level	Polarization	Limit	Detector	Result
MHz	dB/m	dB	dB	dB μ V	dB μ V/m		dB μ V/m		
4924.000	33.06	8.69	35.70	46.06	52.11	Vertical I	74	PK	Pass
4924.000	33.06	8.69	35.70	36.02	42.07	Vertical	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Antenna Factor +Cable Loss - Amp. factor + Reading
- (2) Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

**Transmitter Spurious radiated emissions**

WIFI Mode IEEE 802.11n HT20 modulation (6.5 Mbps) CH1 2412MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dB μ V	Emission Level dB μ V/m	Polarization	Limit dB μ V/m	Detector	Result
4824.000	32.88	8.58	35.70	46.87	52.63	Vertical	74	PK	Pass
4824.000	32.88	8.58	35.70	34.96	40.72	Vertical I	54	AV	Pass
7236.000	-	-	-	-	-	-	-	-	-
7236.000	-	-	-	-	-	-	-	-	-

WIFI Mode IEEE 802.11n HT20 modulation (6.5 Mbps) CH6 2437MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dB μ V	Emission Level dB μ V/m	Polarization	Limit dB μ V/m	Detector	Result
4874.000	32.97	8.63	35.70	45.23	51.13	Vertical I	74	PK	Pass
4874.000	32.97	8.63	35.70	34.49	40.39	Vertical	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-	-

WIFI Mode IEEE 802.11n HT20 modulation (6.5 Mbps) CH11 2462MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dB μ V	Emission Level dB μ V/m	Polarization	Limit dB μ V/m	Detector	Result
4924.000	33.06	8.69	35.70	46.75	52.80	Vertical	74	PK	Pass
4924.000	33.06	8.69	35.70	45.06	51.11	Vertical	54	AV	Pass
7386.000	-	-	-	-	-	-	-	-	-
7386.000	-	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Antenna Factor +Cable Loss - Amp. factor + Reading
- (2) Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

Transmitter Spurious radiated emissions

WIFI Mode IEEE 802.11n HT40 modulation (6.5 Mbps) CH3 2422MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dB μ V	Emission Level dB μ V/m	Polarization	Limit dB μ V/m	Detector	Result
4844.000	32.92	8.60	35.70	45.86	51.68	Vertical	74	PK	Pass
4844.000	32.92	8.60	35.70	33.65	39.47	Vertical	54	AV	Pass
7266.000	-	-	-	-	-	-	-	-	-
7266.000	-	-	-	-	-	-	-	-	-

WIFI Mode IEEE 802.11n HT40 modulation (6.5 Mbps) CH6 2437MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dB μ V	Emission Level dB μ V/m	Polarization	Limit dB μ V/m	Detector	Result
4874.000	32.97	8.63	35.70	46.09	51.99	Vertical	74	PK	Pass
4874.000	32.97	8.63	35.70	34.87	40.77	Vertical	54	AV	Pass
7311.000	-	-	-	-	-	-	-	-	-
7311.000	-	-	-	-	-	-	-	-	-

WIFI Mode IEEE 802.11n HT40 modulation (6.5 Mbps) CH9 2452MHz Test Result

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Amp. Factor dB	Reading dB μ V	Emission Level dB μ V/m	Polarization	Limit dB μ V/m	Detector	Result
4904.000	33.03	8.66	35.70	45.84	51.83	Vertical	74	PK	Pass
4904.000	33.03	8.66	35.70	33.54	39.53	Vertical	54	AV	Pass
7356.000	-	-	-	-	-	-	-	-	-
7356.000	-	-	-	-	-	-	-	-	-

Remark:

- (1) Emission Level= Antenna Factor +Cable Loss - Amp. factor + Reading
- (2) Data of measurement within this frequency range shown “-” in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

8 Test Equipment

TEST ITME	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL.DUE.DAT E
CE	Test Receiver	Rohde & Schwarz	ESHS10	838693/001	2014-12-16
	L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	2014-05-07
	L.I.S.N.#3	Kyoritsu	KNW-242C	8-1920-1	2014-05-07
	Terminator	Hubersuhner	50Ω	No. 1	2014-05-07
	Terminator	Hubersuhner	50Ω	No. 2	2014-05-07
	RF Cable	Fujikura	3D-2W	LISN Cable 1#	2014-05-07
	Coaxial Switch	Anritsu	MP59B	M55367	2014-05-07
	Passive Probe	Rohde & Schwarz	ESH2-Z3	299.7810.52	2014-05-07
	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100341	2014-05-07
Peak Power	Spectrum Analyzer	Agilent	E4446A	US44300459	2014-05-07
Band Edge	Spectrum	Agilent	E4446A	US44300459	2014-05-07
	Amp	HP	8449B	3008A02495	2014-05-07
	Antenna	EMCO	3115	9607-4877	2014-05-16
	Bilog Antenna	Schaffner	CBL6111C	2598	2014-12-12
	HF Cable	Hubersuhne	Sucoflex104	---	2014-05-07
Conducted RF Emissions	Spectrum Analyzer	Agilent	E4446A	US44300459	2014-05-07
RSE	Spectrum	Agilent	E4446A	US44300459	2014-05-07
	Amp	HP	8449B	3008A02495	2014-05-07
	Antenna	EMCO	3115	9607-4877	2014-05-17
	Bilog Antenna	Schaffner	CBL6111C	2598	2014-12-13
	HF Cable	Hubersuhne	Sucoflex104	---	2014-05-07
Bandwidth	Spectrum Analyzer	Agilent	E4446A	MY41440292	2014-05-07
PSD	Spectrum Analyzer	Agilent	E4446A	MY41440292	2014-05-07

9 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items		Extended Uncertainty
RE	Field strength (dBμV/m)	U=4.32dB (30MHz-25GHz)
CE	Disturbance Voltage (dBμV)	U=2.40dB(150KHz-30MHz)