



ISO/IEC17025 Accredited Lab.

Report No:

FCC 1312050

File reference No:

2014-01-15

Applicant:

Shenzhen HAC Telecom Technology Co., Ltd

Product:

Zigbee Module

Model No:

HAC-LBee

Trademark:

N/A

Test Standards:

FCC Part 15 Subpart C, Paragraph 15.247

Test result:

It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4, FCC Part 15 Subpart C, Paragraph 15.247 regulations for the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Jack Chung

Manager

Dated:

Jan 15, 2014

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO., LTD

5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

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Special Statement:

The testing quality ability of our laboratory meet with “Quality Law of People’s Republic of China” Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAL. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAL-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC- Registration No.: IC5205A-02

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-02.

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Test Report Conclusion

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1.0 General Details

1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO., LTD
Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.
Telephone: (755) 83448688
Fax: (755) 83442996
Site on File with the Federal Communications Commission – United States
Registration Number: 899988
For 3m & 10 m OATS
Site Listed with Industry Canada of Ottawa, Canada
Registration Number: IC: 5205A-02
For 3m & 10 m OATS

1.2 Applicant Details

Applicant: Shenzhen HAC Telecom Technology Co., Ltd
Address: Fl.6, Building 2, Jiuxiangling New Industry Park, No.4227, Xilihu Road, Nanshan, Shenzhen, China.
Telephone: +86 755 23981076 ext 923
Fax: +86 755 23981007

1.3 Description of EUT

Product: Zigbee Module
Manufacturer: Shenzhen HAC Telecom Technology Co., Ltd
Address: Fl.6, Building 2, Jiuxiangling New Industry Park, No.4227, Xilihu Road, Nanshan, Shenzhen, China.
Brand Name: N/A
Additional Brand Name: N/A
Model Number: HAC-LBee
Additional Model Number: N/A
Type of Modulation IEEE 802.15.4 : DSSS (O-QPSK)
Frequency range 2405-2480MHz
Antenna Designation: Dipole Antenna and the maximum Gain of this antenna is 2.15dBi;

1.4 Submitted Sample: 2 Samples

1.5 Test Duration

2013-12-12 to 2014-01-15

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1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

Terry Tang

The sample tested by _____

Print Name: Terry Tang

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2.0	Test Equipments				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2013-08-25	2014-08-24
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2013-08-25	2014-08-24
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2013-08-25	2014-08-24
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2013-08-25	2014-08-24
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2013-08-25	2014-08-24
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2013-08-25	2014-08-24
System Controller	CT	SC100	-	--	--
Printer	EPSON	PHOTO EX3	CFNH234850	--	--
Computer	IBM	8434	1S8434KCE99BLXL O*	-	-
Loop Antenna	EMCO	6502	00042960	2013-08-25	2014-08-24
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2013-08-25	2014-08-24
3m OATS	--	--	N/A	2013-08-25	2014-08-24
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2013-08-25	2014-08-24
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2013-08-25	2014-08-24
Power meter	Anritsu	ML2487A	6K00003613	2013-08-25	2014-08-24
Power sensor	Anritsu	MA2491A	32263	2013-08-25	2014-08-24
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2013-08-25	2014-08-24
LISN	AFJ	LS16C	10010947251	2013-08-25	2014-08-24
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2013-08-25	2014-08-24
9*6*6 Anechoic	--	--	N/A	2013-08-25	2014-08-24
EMI Test Receiver	RS	ESCS30	100139	2013-08-25	2014-08-24
LISN	AFJ	LS16C	10010947251	2013-08-25	2014-08-24
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2013-08-25	2014-08-24

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3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:			
Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107 & 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.247(a)(2) Limit	Spectrum bandwidth of a Orthogonal Frequency Division Multiplex System Limit: 6dB bandwidth>500kHz	PASS	Complies
FCC Part 15, Paragraph 15.247(b)	Maximum peak output power Limit: max. 30dBm	PASS	Complies
FCC Part 15, Paragraph 15.109,15.205 & 15.209	Transmitter Radiated Emission Limit: Table 15.209	PASS	Complies
FCC Part 15, Paragraph 15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Complies
FCC Part 15, Paragraph 15.247(d)	Out of Band Emission and Restricted Band Radiation Limit: 20dB less than peak value of fundamental frequency Restricted band limit: Table 15.209	PASS	Complies

3.2 Test Standards

FCC Part 15 Subpart & Subpart C, Paragraph 15.247

4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co., Ltd

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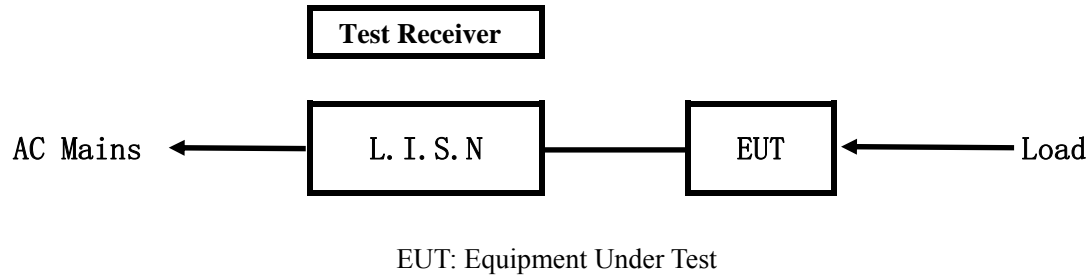
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5.0 Power Line Conducted Emission Test

5.1 Schematics of the test

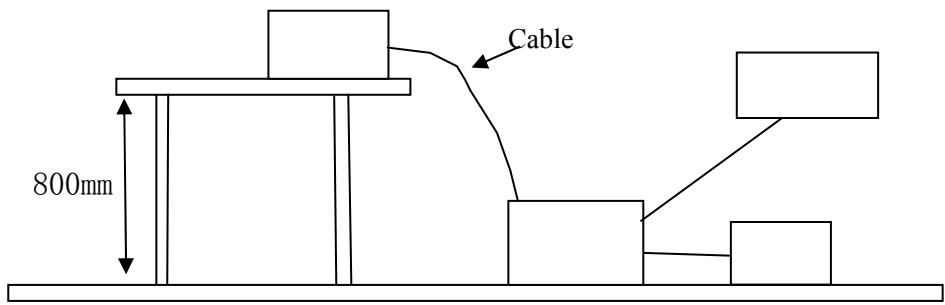


5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A.	EUT		
Device	Manufacturer	Model	FCC ID
Zigbee Module	Shenzhen HAC Telecom Technology Co., Ltd	HAC-LBee	WMUHAC-LBEE

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B. Internal Device

Device	Manufacturer	Model	Rating

C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply (FCC VOC)	THX	THX-050200KE	Input: 10-240V~, 50/60Hz, 0.65A; Output: DC5V, 2A

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207 and 15.107 and RSS-210

Frequency (MHz)	Class A Limits (dB μ V)		Class B Limits (dB μ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

- Notes:
1. *Decreasing linearly with logarithm of frequency.
 2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

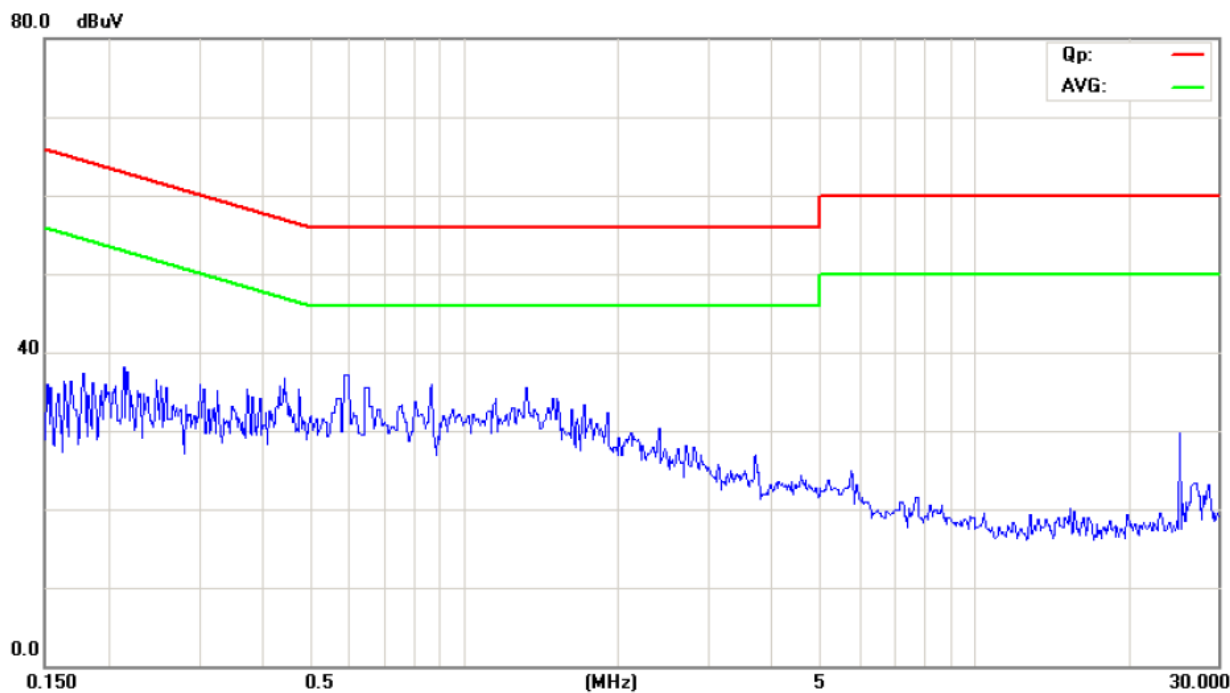
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A: Conducted Emission on Live Terminal (150kHz to 30MHz)
EUT Operating Environment
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa
EUT set Condition: Keep Transmitting
Equipment Level: Class B
Results: PASS
Please refer to following diagram for individual



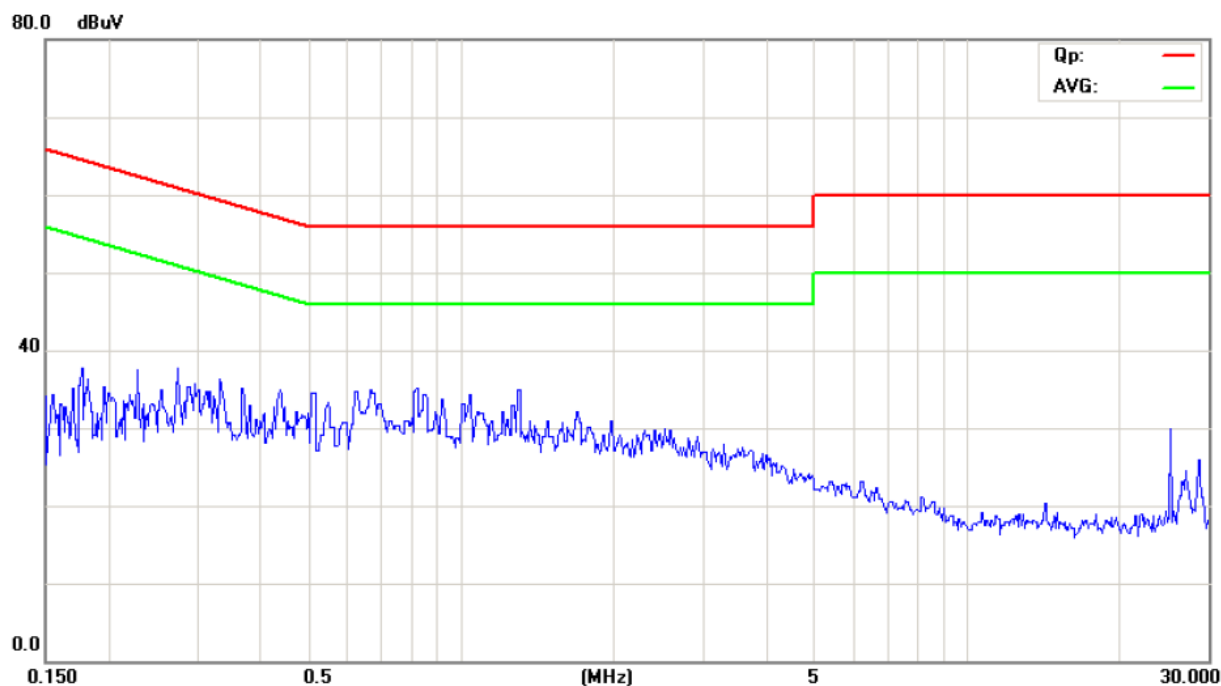
Frequency (MHz)	Line	Reading(dBμV)		Limit(dBμV)	
		Quasi-peak	Average	Quasi-peak	Average
--	Live	--	--	--	--

-The test data shows much less than the limit, no necessary take down the results.

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B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)
EUT Operating Environment
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa
EUT set Condition: Keep Transmitting
Equipment Level: Class B
Results: Pass
Please refer to following diagram for individual



Frequency (MHz)	Line	Reading(dBμV)		Limit(dBμV)	
		Quasi-peak	Average	Quasi-peak	Average
	Neutral				

-The test data shows much less than the limit, no necessary take down the results.

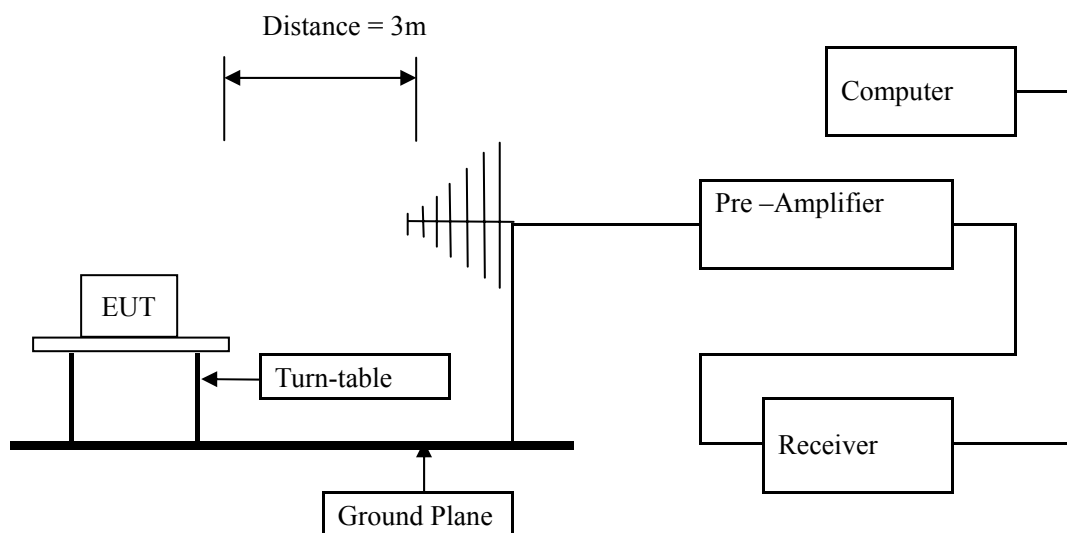
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6 Radiated Emission Test

6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a “QP” in the data table.
- (6) The antenna polarization : Vertical polarization and Horizontal polarization.

Block diagram of Test setup



6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition

Same as section 5.4 of this report.

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6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.209 and 15.109

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

- Note:
1. RF Voltage (dBuV) = 20 log RF Voltage (μ V)
 2. In the Above Table, the higher limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

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Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

Radiated Emission In Horizontal (30MHz---1000MHz)

EUT set Condition: Keep Transmitting

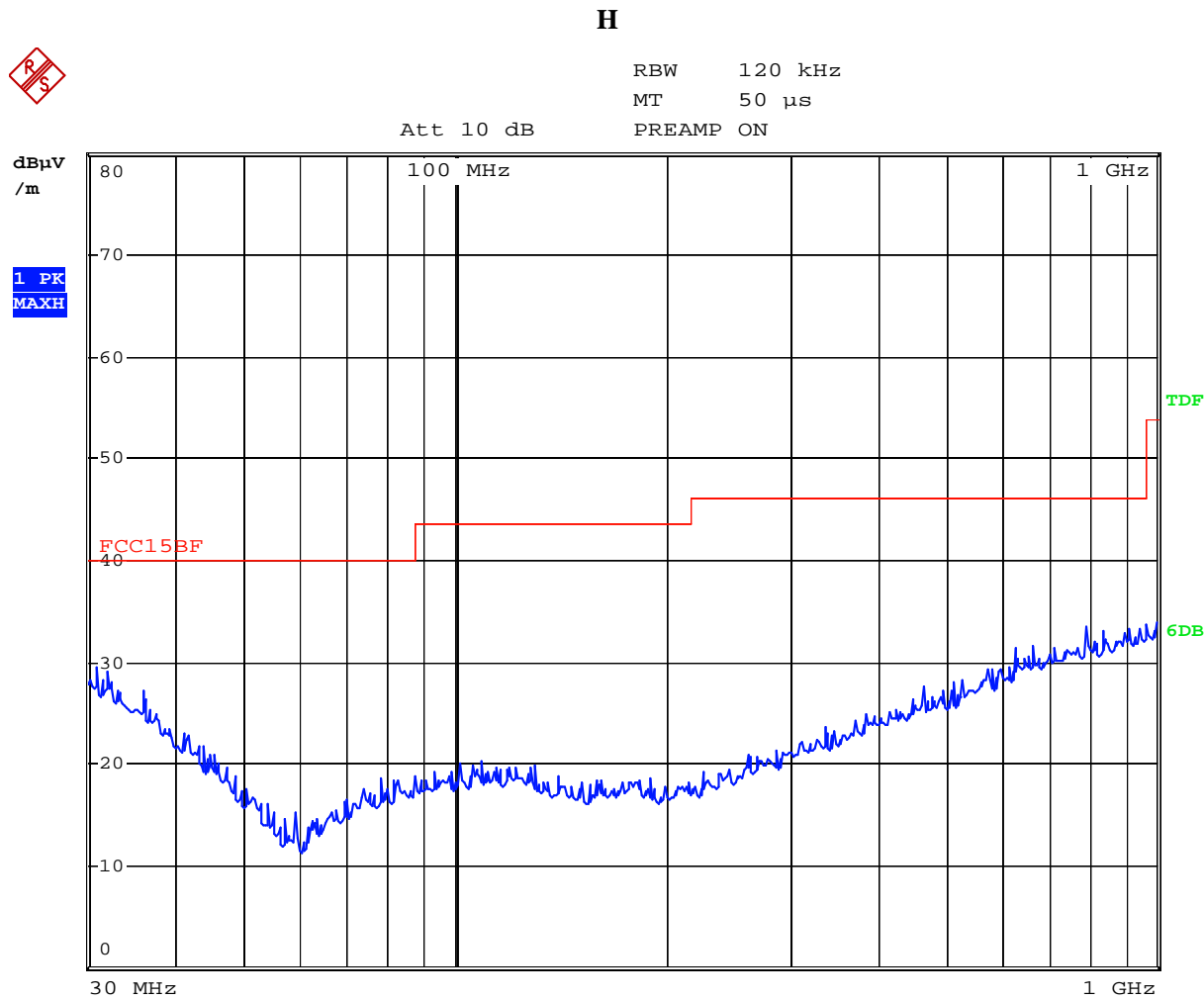
Results: Pass

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
--	--	H	--
--	--	V	--

-The test data shows much less than the limit, no necessary take down the results.



Test Figure:

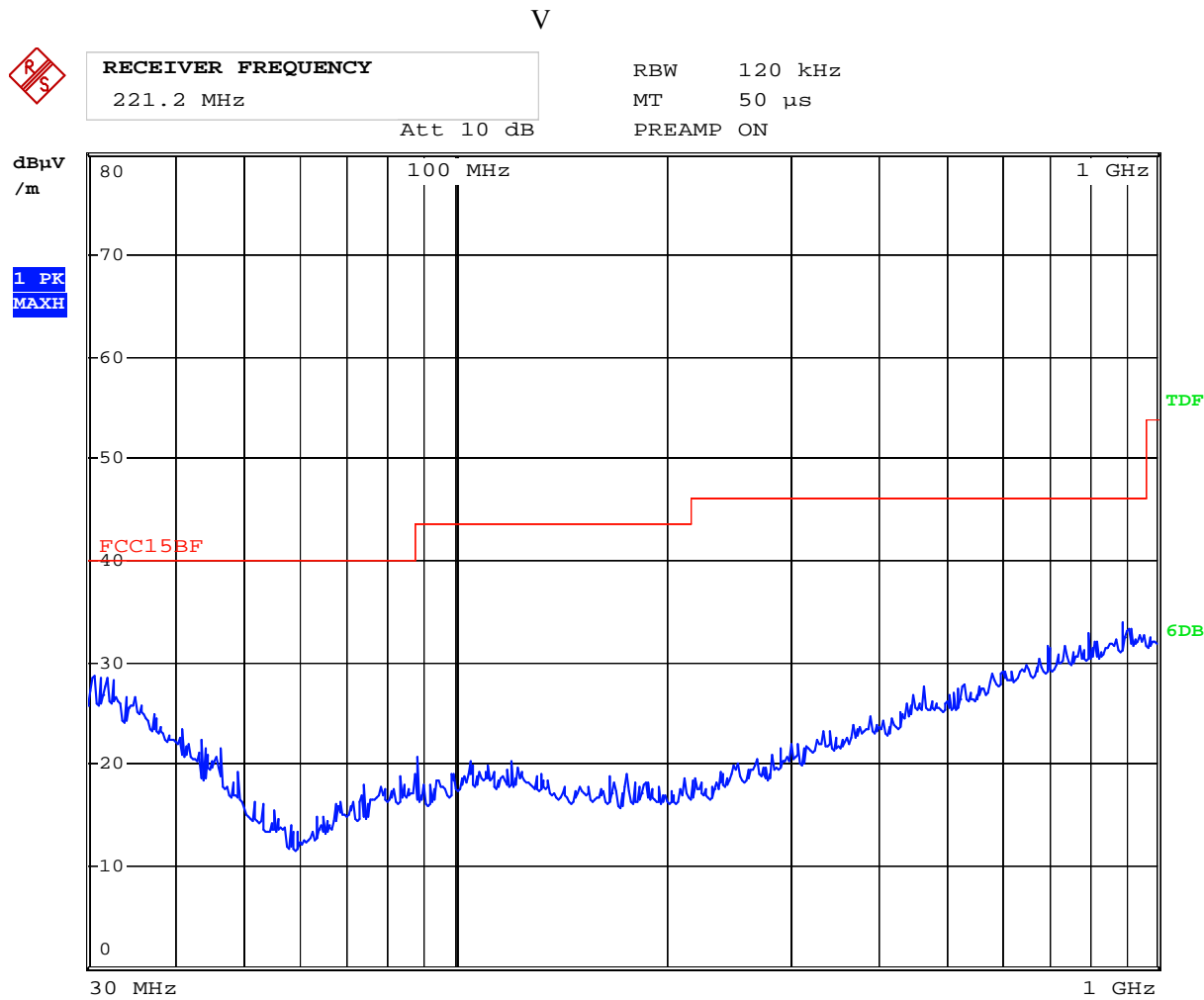


Date: 15.JAN.2014 10:09:51

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Test Figure:



Date: 15.JAN.2014 10:12:06

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Operation Mode: Keeping Transmitting under Low Channel 2405MHz

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2405.00	111.61 (PK)	H	Fundamental Frequency
2405.00	111.90 (PK)	V	
4810.00	46.32 (PK)	H	74(Peak)/ 54(AV)
4810.00	46.97 (PK)	V	74(Peak)/ 54(AV)
7215.00	--	H/V	74(Peak)/ 54(AV)
9620.00	--	H/V	74(Peak)/ 54(AV)
12025	--	H/V	74(Peak)/ 54(AV)
14430	--	H/V	74(Peak)/ 54(AV)
16835	--	H/V	74(Peak)/ 54(AV)
19240	--	H/V	74(Peak)/ 54(AV)
21645	--	H/V	74(Peak)/ 54(AV)
24050	--	H/V	74(Peak)/ 54(AV)

- Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured



Operation Mode: Keeping Transmitting under Middle Channel 2440MHz

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2440.00	111.92 (PK)	H	Fundamental Frequency
2440.00	111.41 (PK)	V	
4880.00	46.68 (PK)	H	74(Peak)/ 54(AV)
4880.00	46.18 (PK)	V	74(Peak)/ 54(AV)
7320.00	--	H/V	74(Peak)/ 54(AV)
9760.00	--	H/V	74(Peak)/ 54(AV)
12200	--	H/V	74(Peak)/ 54(AV)
14640	--	H/V	74(Peak)/ 54(AV)
17080	--	H/V	74(Peak)/ 54(AV)
19520	--	H/V	74(Peak)/ 54(AV)
21960	--	H/V	74(Peak)/ 54(AV)
24400	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured

Operation Mode: Transmitting under High Channel 2480MHz

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2480.00	111.92 (PK)	H	Fundamental Frequency
2480.00	111.40 (PK)	V	
4960	45.98 (PK)	H	74(Peak)/ 54(AV)
4960	45.48 (PK)	V	74(Peak)/ 54(AV)
7440	--	H/V	74(Peak)/ 54(AV)
9920	--	H/V	74(Peak)/ 54(AV)
12400	--	H/V	74(Peak)/ 54(AV)
14880	--	H/V	74(Peak)/ 54(AV)
17360	--	H/V	74(Peak)/ 54(AV)
19840	--	H/V	74(Peak)/ 54(AV)
22320	--	H/V	74(Peak)/ 54(AV)
24800	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit
2. Remark "---" means that the emissions level is too low to be measured

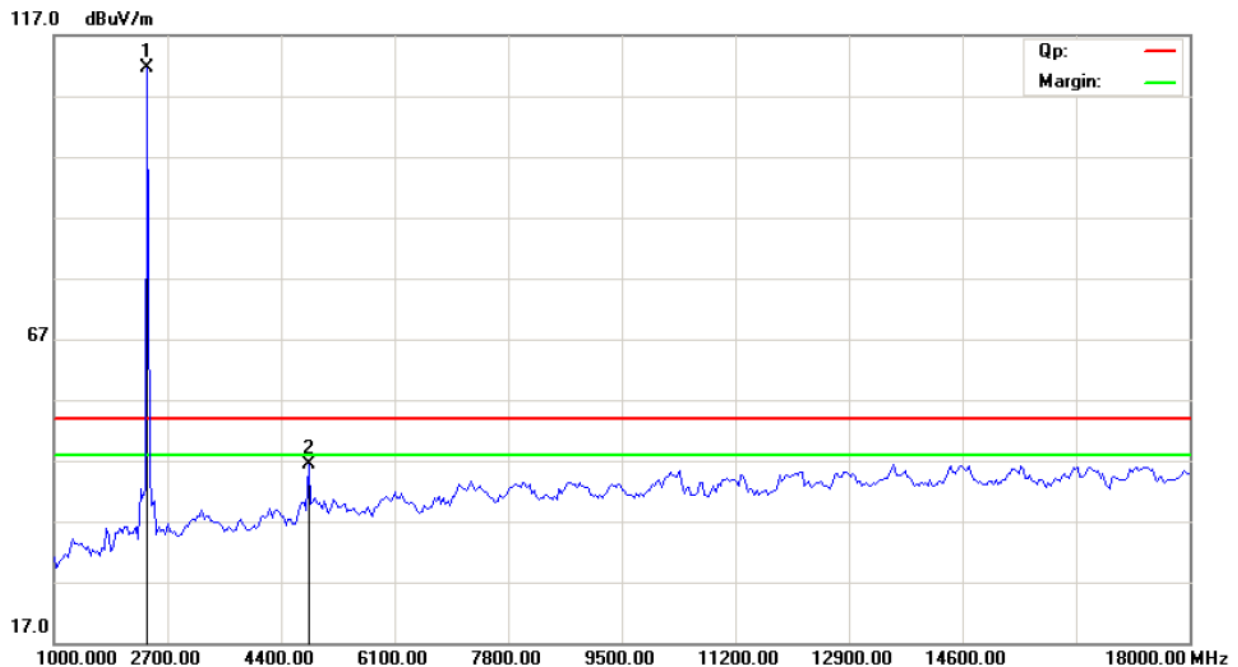
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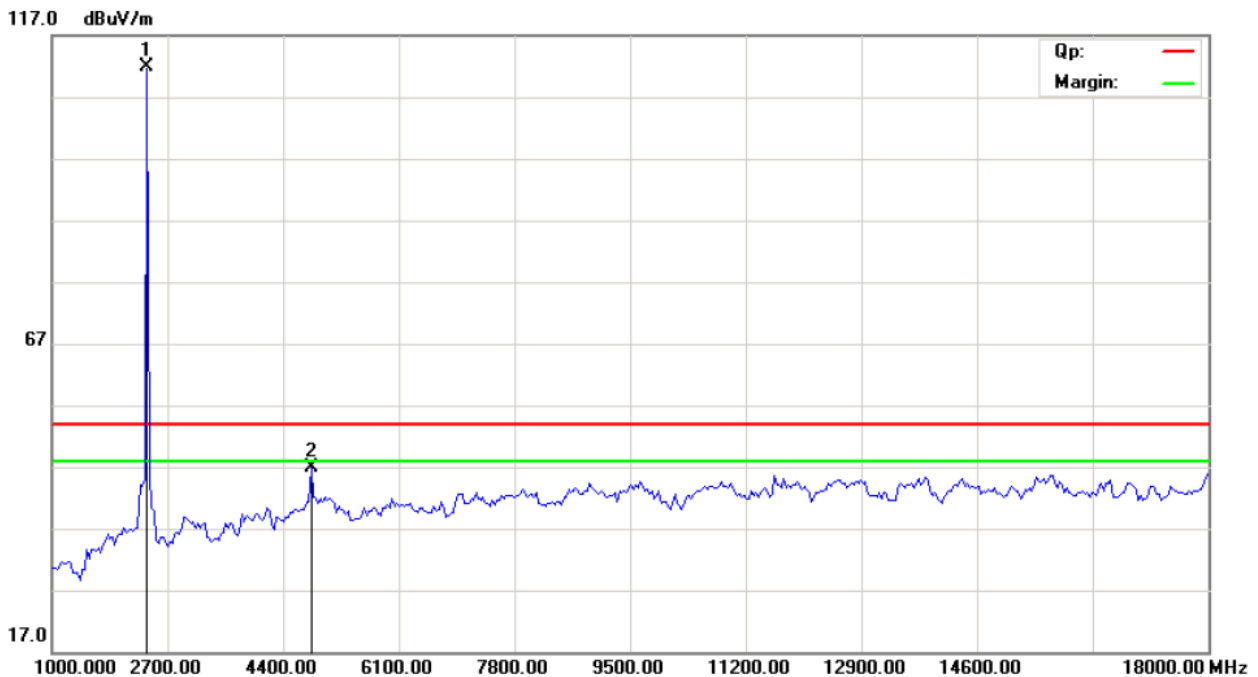
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Please refer to the following test plots for details:

Low Channel 2405MHz: Horizontal



Low Channel 2405MHz: Vertical

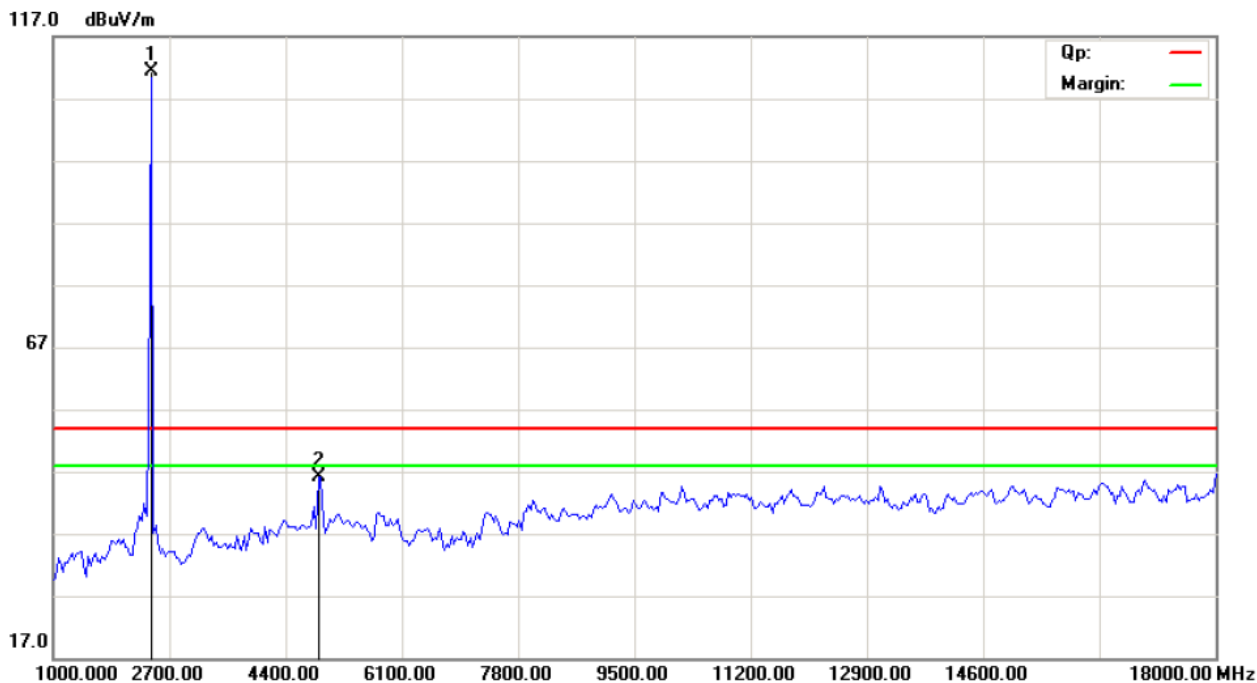


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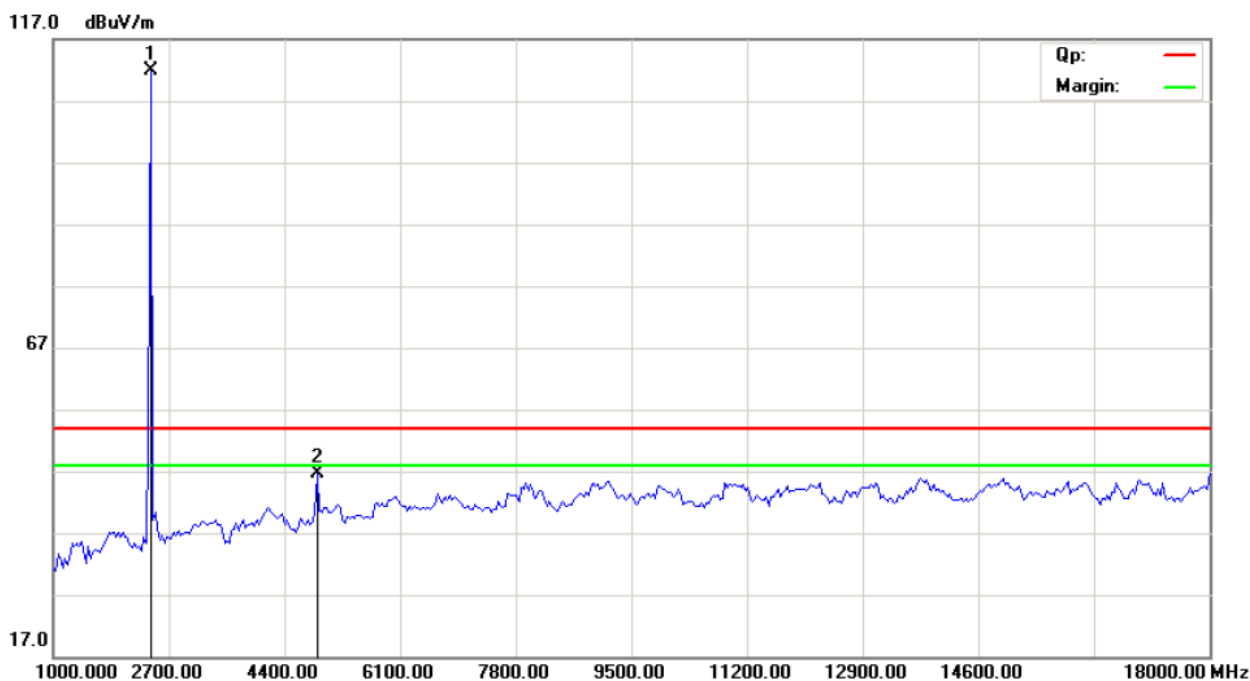
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Middle Channel 2440MHz: Vertical



Middle Channel 2440MHz: Horizontal

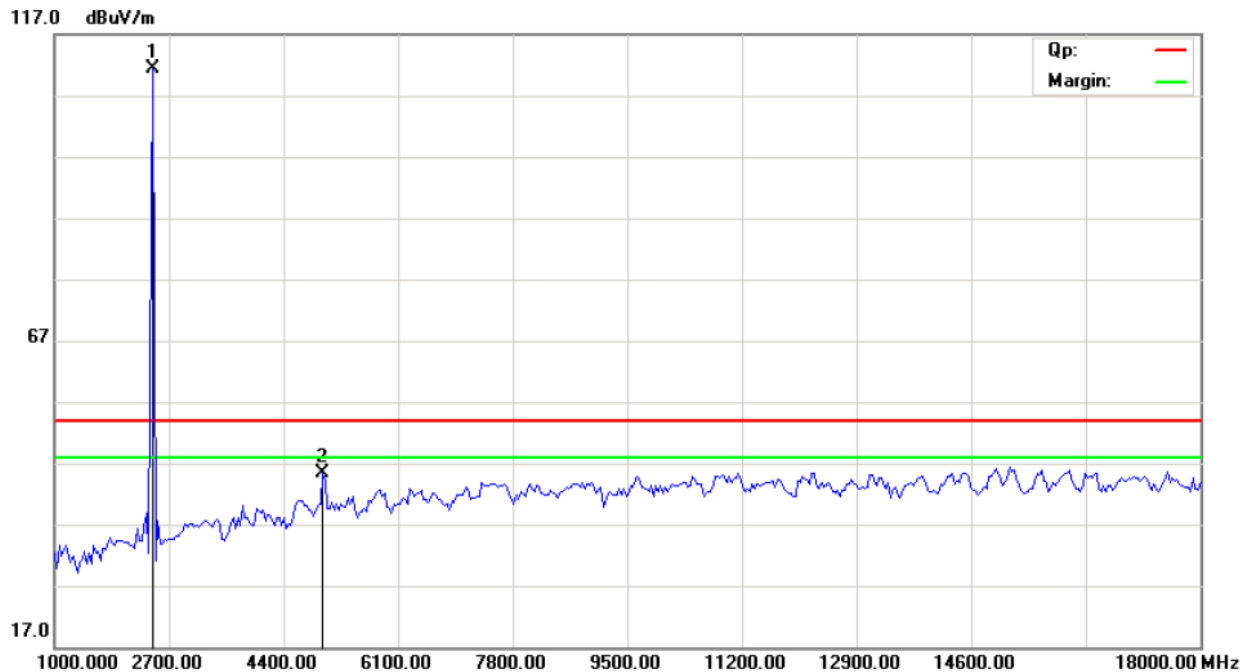


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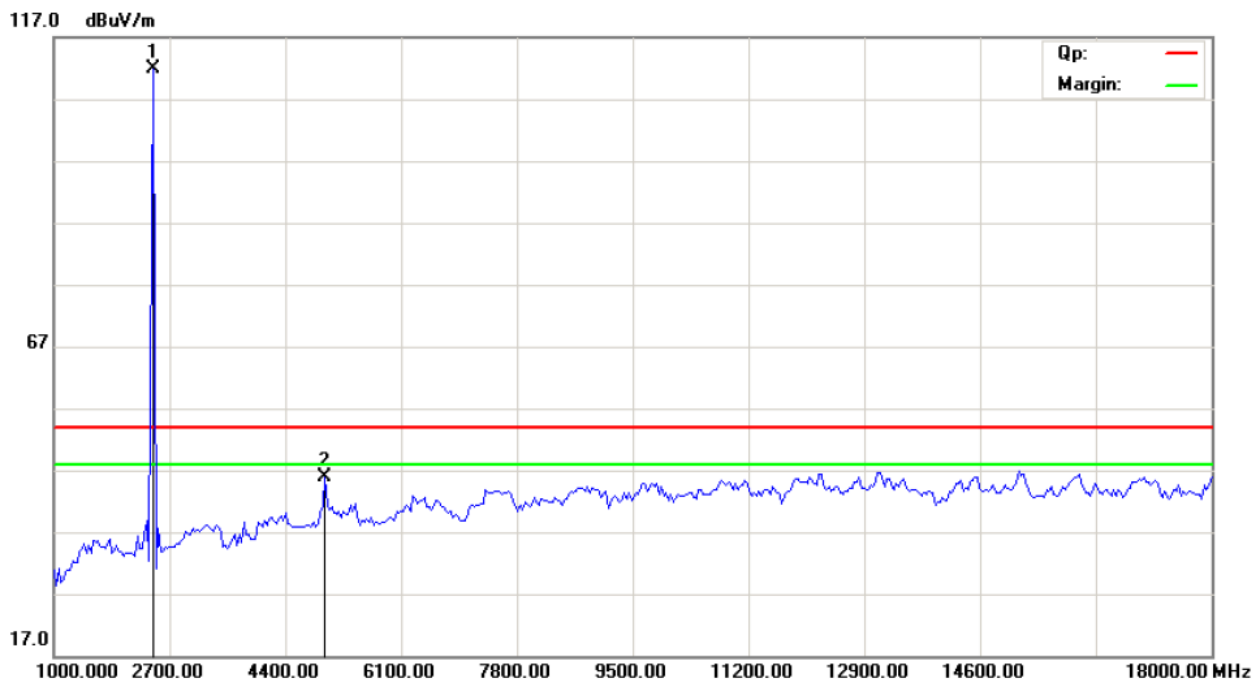
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High Channel 2480MHz: Vertical



High Channel 2480MHz: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

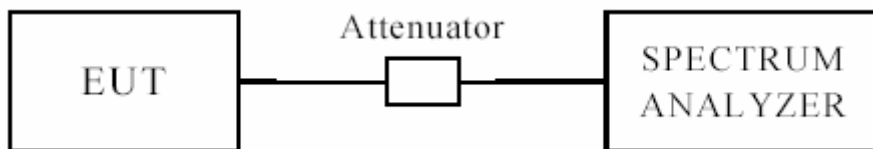
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7.0 6dB Bandwidth Measurement

7.1 Test Setup



7.2 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is >500 kHz

7.3 Test Procedure

1. Set resolution bandwidth (RBW) = 100 kHz
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.4 Test Result

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6dB Occupied Bandwidth

EUT	Zigbee Module		Model	HAC-LBee	
Mode	Keeping Transmitting		Input Voltage	AC120V	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
Low	2405	1	1.62	0.5	Pass
Middle	2440	1	1.62	0.5	Pass
High	2480	1	1.62	0.5	Pass

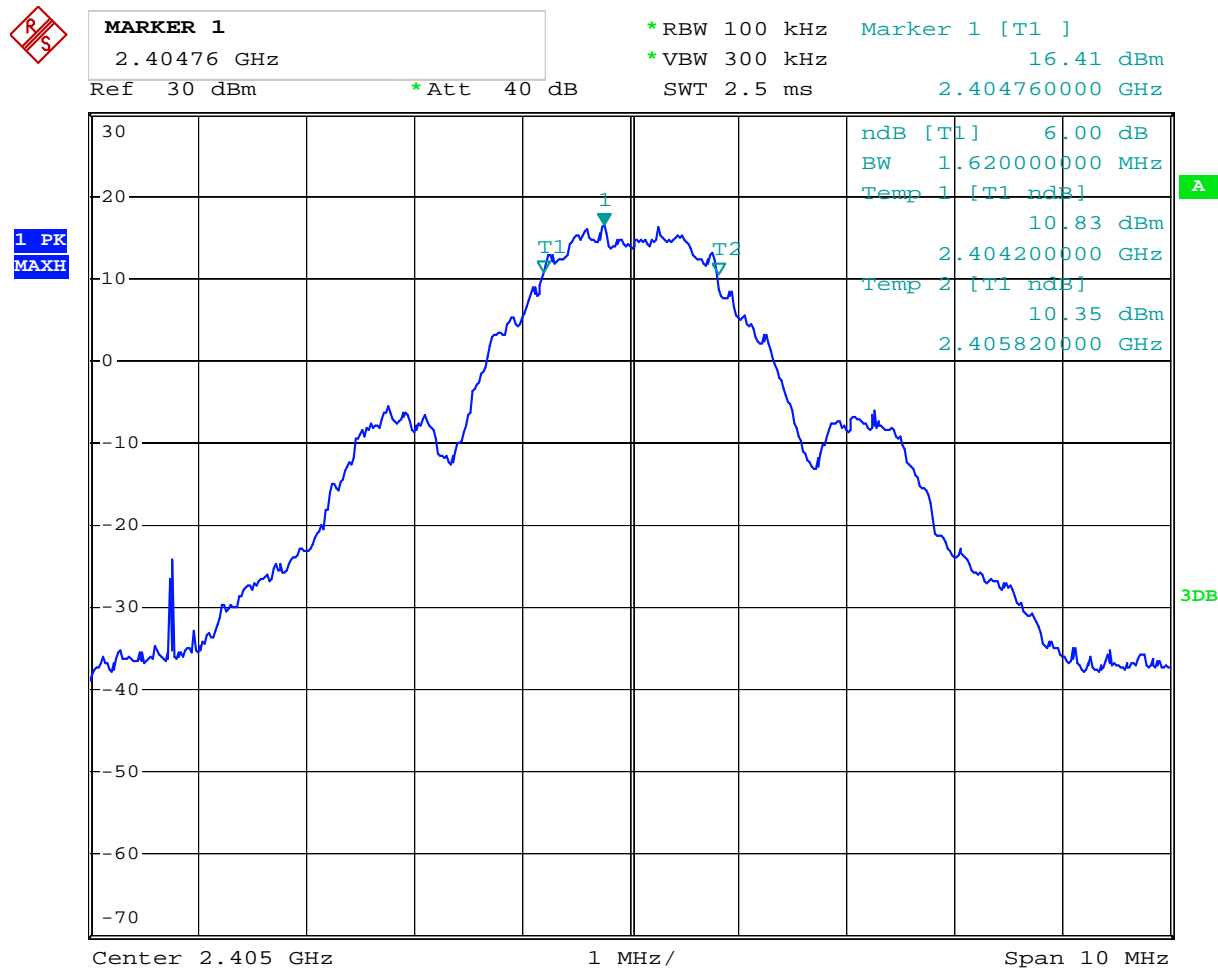
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1. Low Channel 2405 MHz

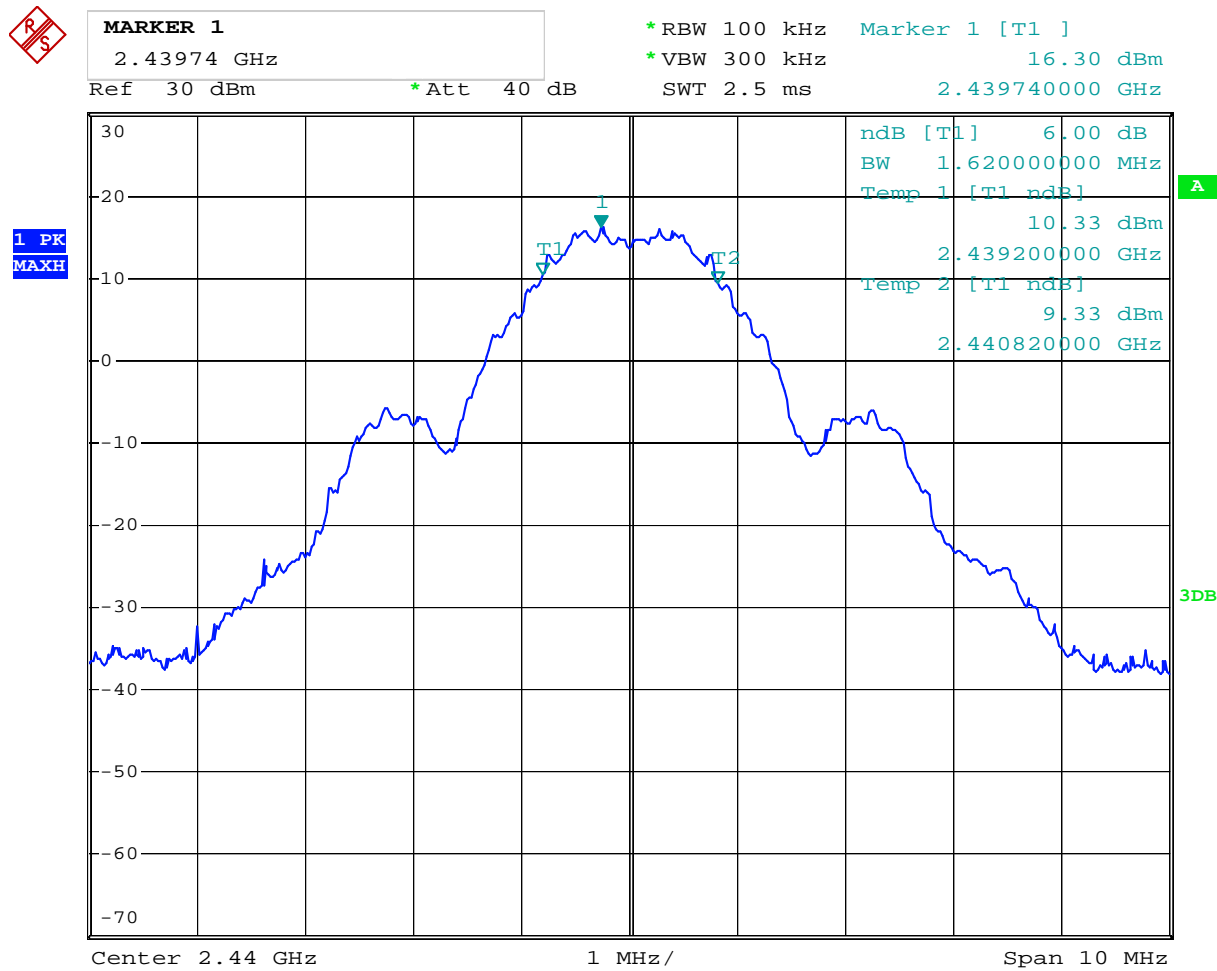


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2. Middle Channel 2440 MHz

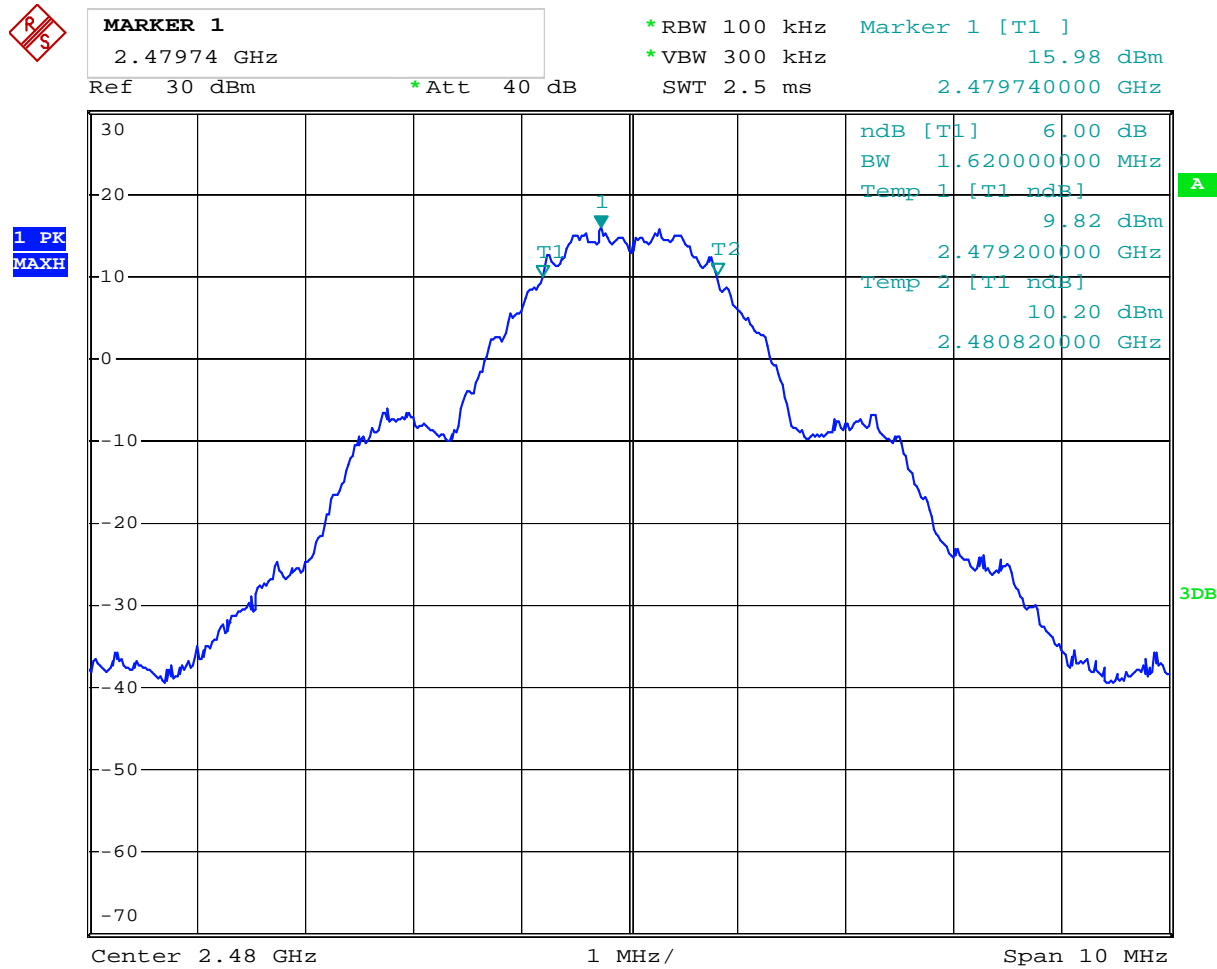


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3. High Channel 2480 MHz

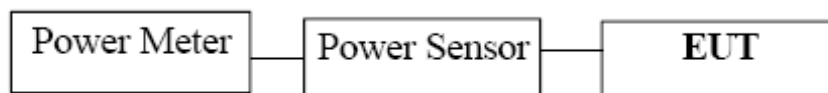


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8. Maximum Peak Output Power

8.1 Test Setup



8.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

8.3 Test Procedure

The RF power output was measured with a Power meter connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate centre frequency.

Note: the peak power was measured

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8.4 Test Results

EUT	Zigbee Module	Model	HAC-LBee	
Mode	Keeping Transmitting	Input Voltage	AC120V	
Temperature	24 deg. C,	Humidity	56% RH	
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
Low	2405	19.68	30	Pass
Middle	2440	19.65	30	Pass
High	2480	19.50	30	Pass

Note: 1. The result basic equation calculation as follow:

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss} + \text{Attenuator}$$

2. The worse case was recorded

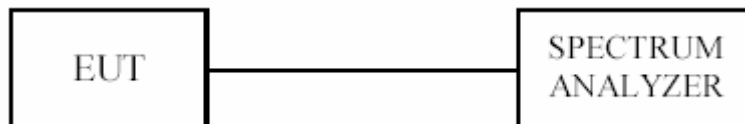
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9. Power Spectral Density Measurement

9.1 Test Setup



9.2 Limits of Power Spectral Density Measurement

The Maximum Power Spectral Density Measurement is 8dBm.

9.3 Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 10 kHz.
3. Set the VBW \geq 30 kHz.
4. Set the span to 1.5 times the DTS channel bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level must be \leq 8 dBm.

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9.4 Test Result

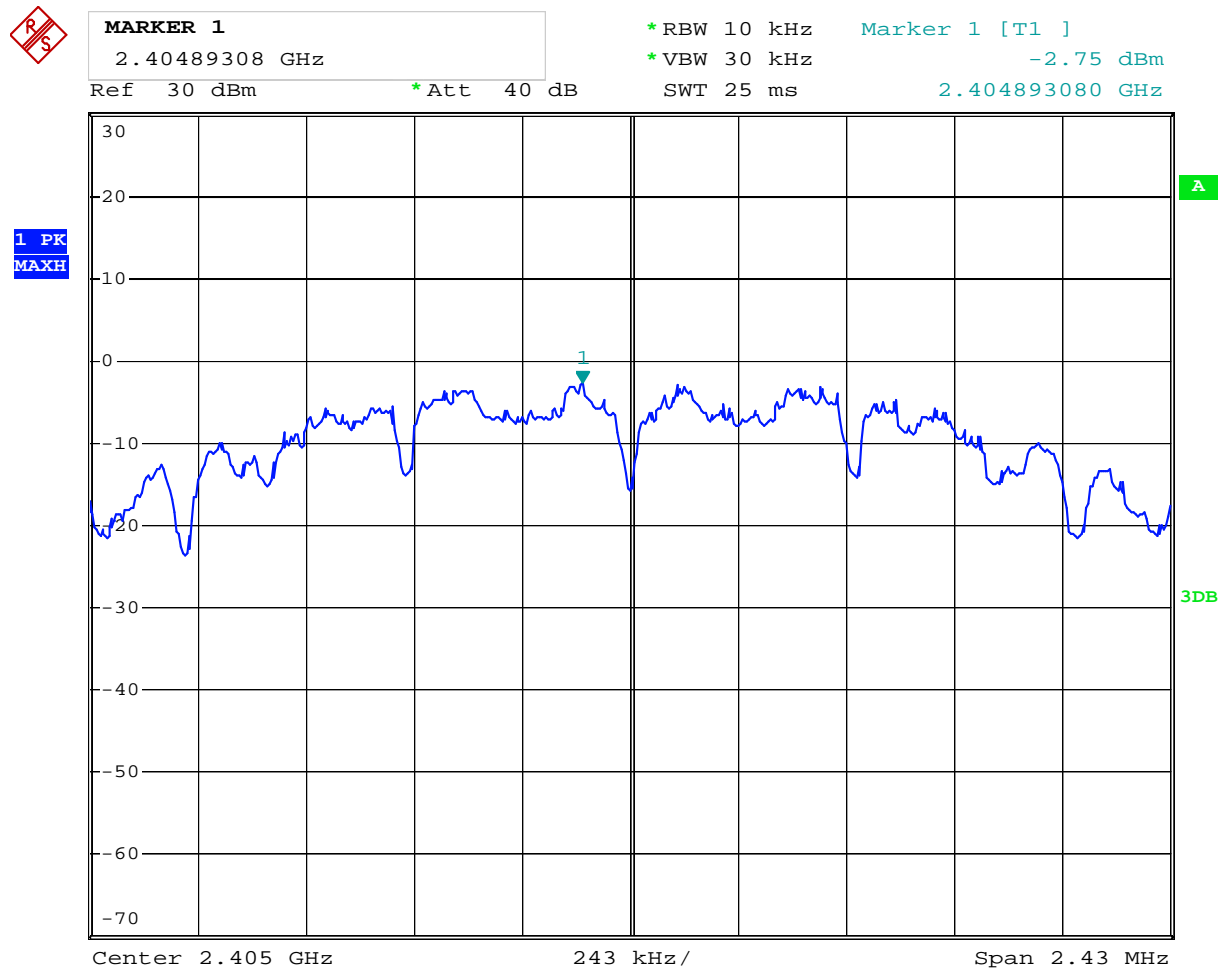
EUT		Zigbee Module		Model	HAC-LBee	
Mode		Keeping Transmitting		Input Voltage		AC120V
Temperature		24 deg. C,		Humidity		56% RH
Channel	Channel Frequency (MHz)		Final Power Spectral Density (dBm)		Maximum Limit (dBm)	Pass/ Fail
Low	2405		-2.75		8	Pass
Middle	2440		-1.90		8	Pass
High	2480		-2.01		8	Pass

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9.5 Photo of Power Spectral Density Measurement

1. Low Channel 2405 MHz

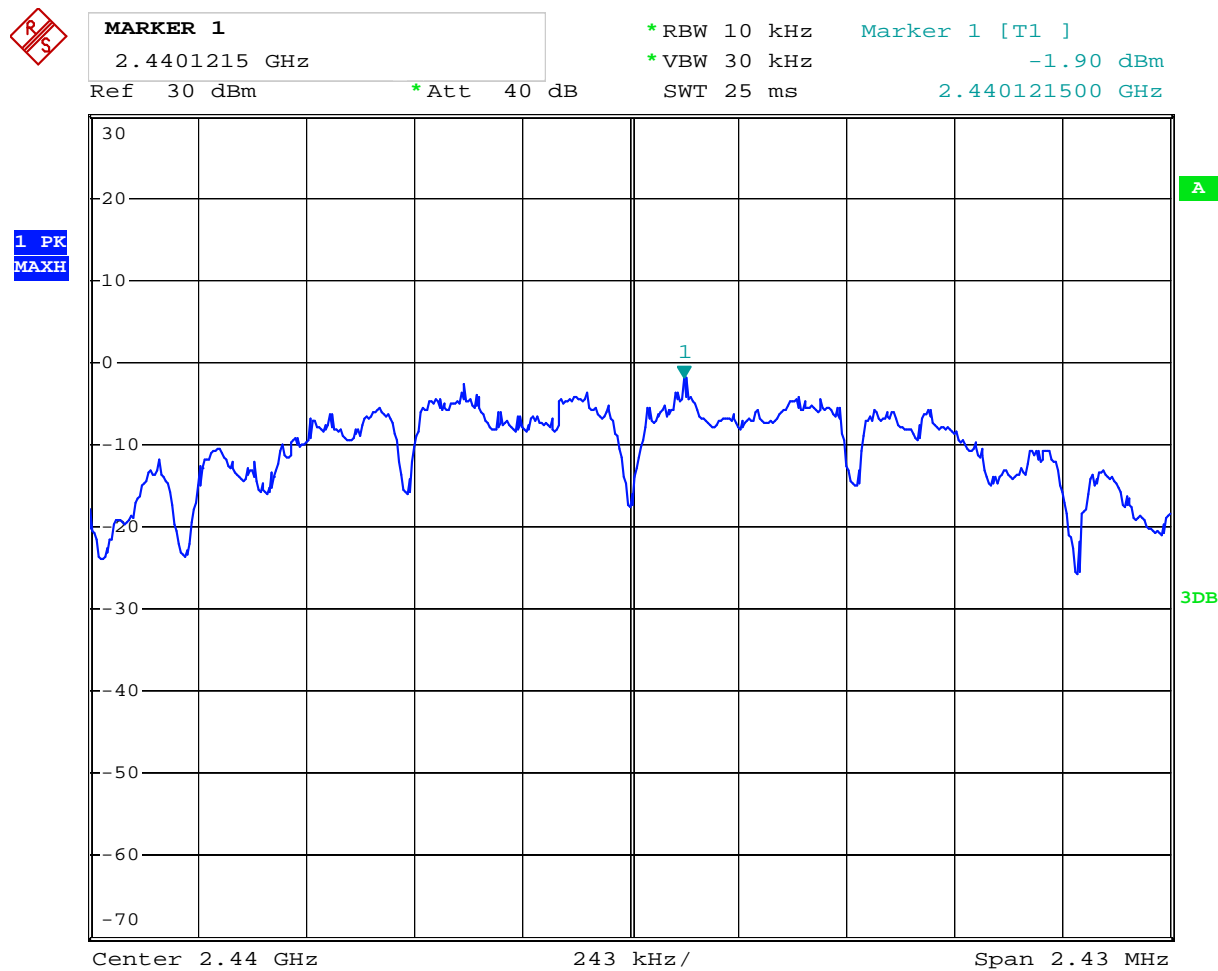


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2. Middle Channel 2440 MHz

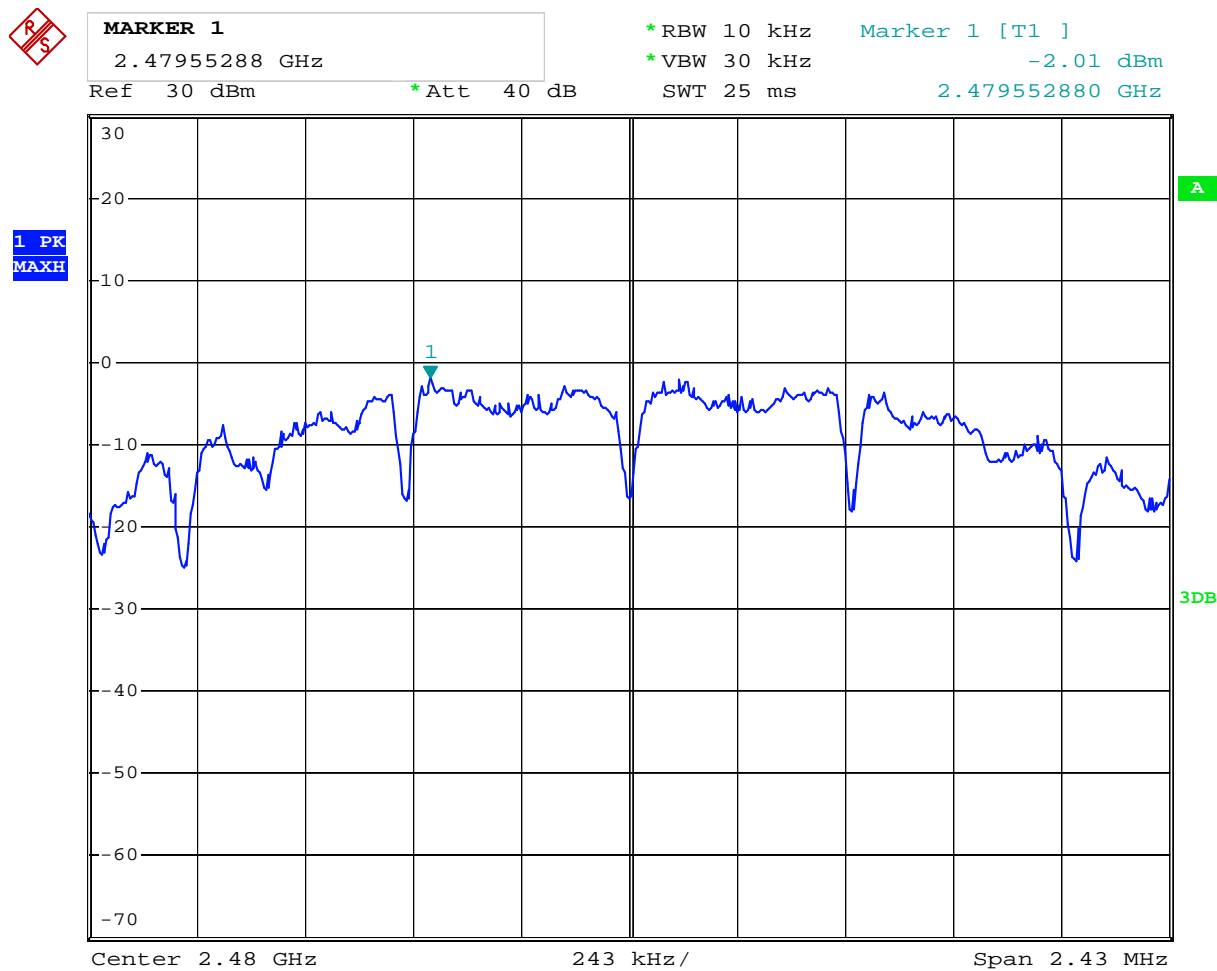


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3. High Channel 2480 MHz

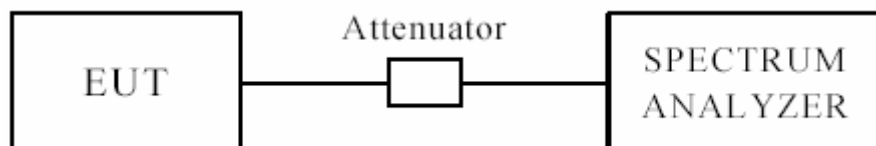


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10 Out of Band Measurement

10.1 Test Setup for band edge



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

10.2 Limits of Out of Band Emissions Measurement

1. Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

10.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test.(Peak values with $\text{RBW}=\text{VBW}=1\text{MHz}$ and PK detector. AV value with $\text{RBW}=1\text{MHz}$, $\text{VBW}=10\text{Hz}$ and PK detector)

For bandage test, the spectrum set as follows: $\text{RBW}=\text{VBW}=100\text{ kHz}$. A conducted measurement used

10.4 Test Result

Please see next pages

Note: For band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule.

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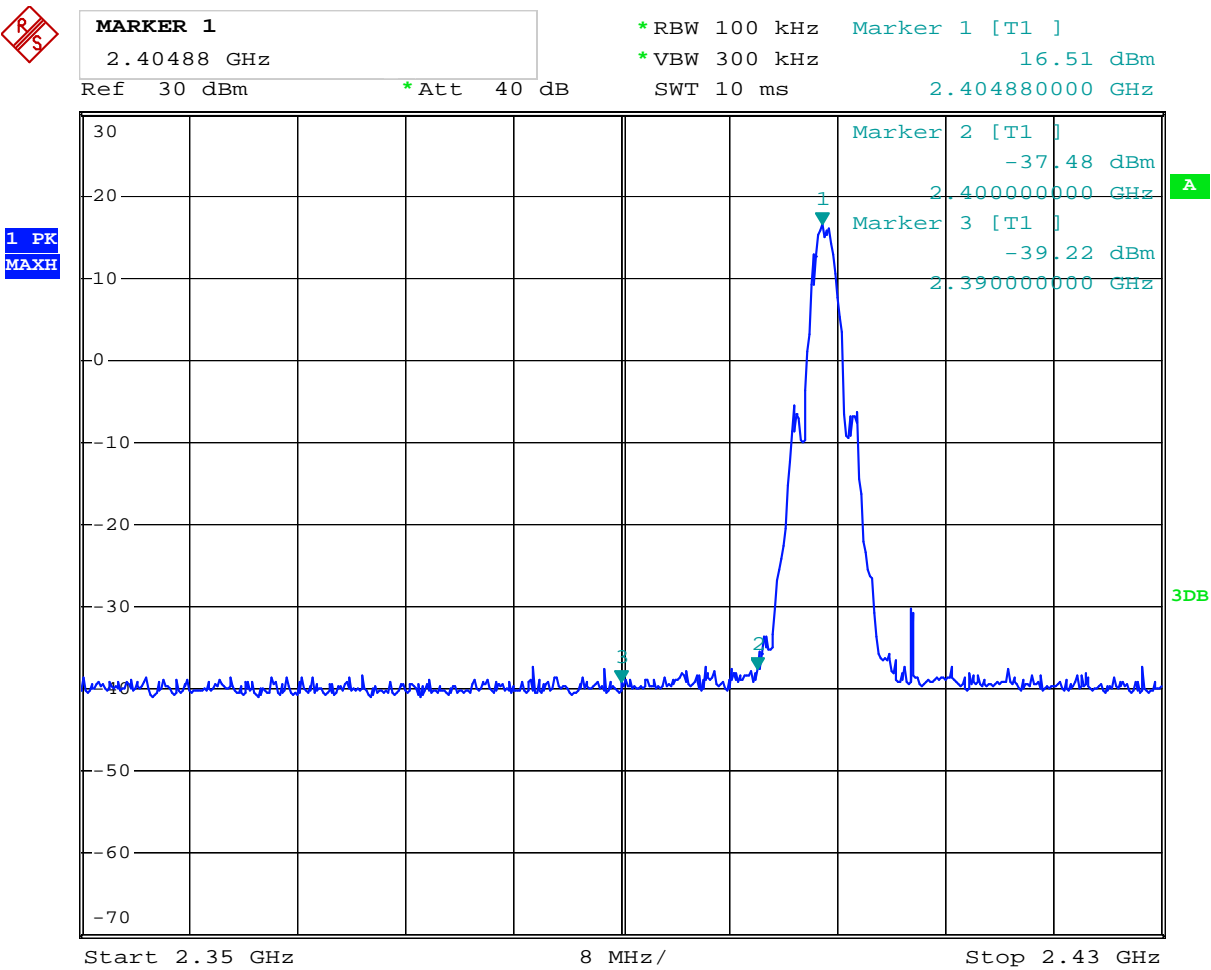


Low channel 2405MHz

10.4 Band-edge Test Result

EUT	Zigbee Module	Model	HAC-LBee
Mode	Keeping Transmitting	Input Voltage	AC120V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 10.DEC.2013 17:46:58

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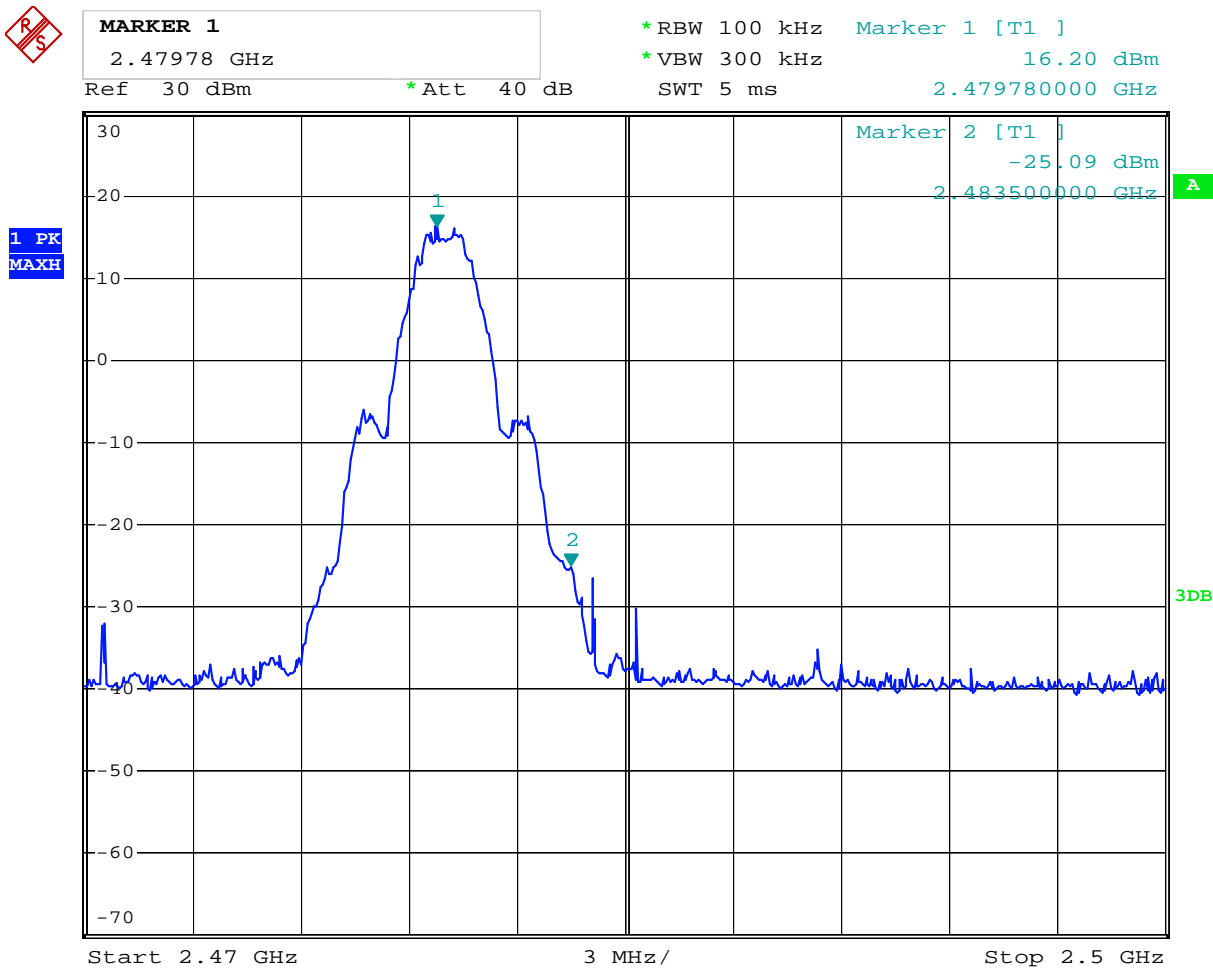


High channel 2480MHz

10.4 Band-edge Test Result

EUT	Zigbee Module	Model	HAC-LBee
Mode	Keeping Transmitting	Input Voltage	AC120V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



Date: 10.DEC.2013 17:48:33

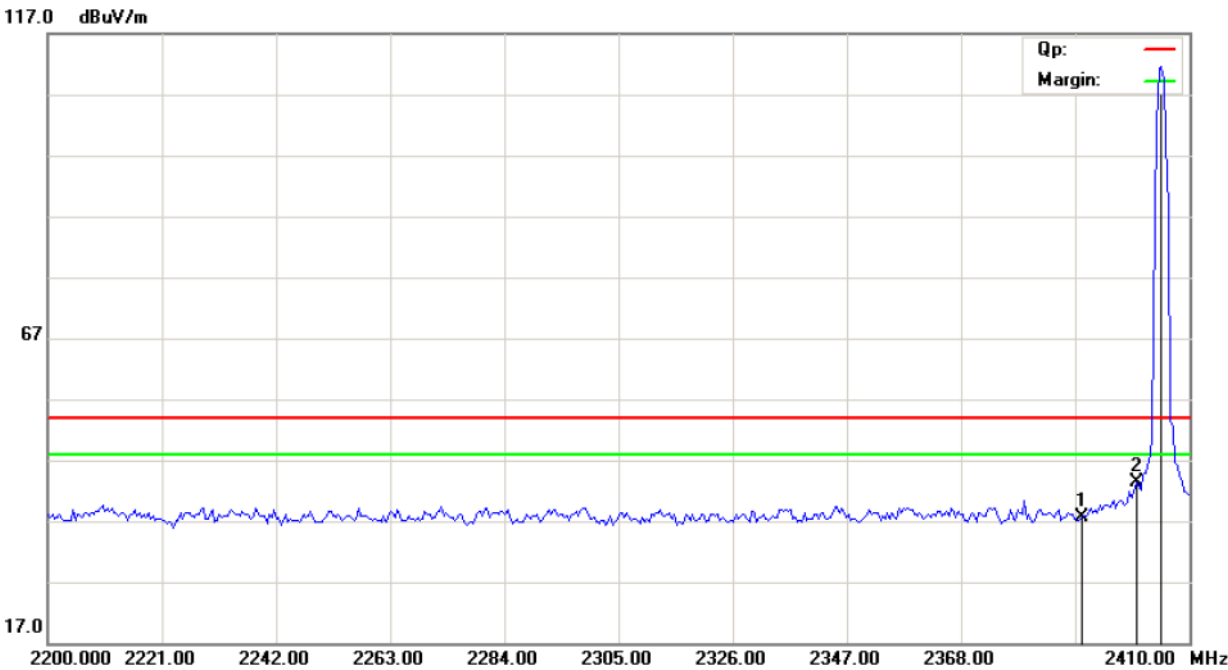
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10.4 Restricted band Measurement

Product:	Zigbee Module		Test Mode:	Low Channel
Mode	Keeping Transmitting		Input Voltage	120V~
Temperature	24 deg. C		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2390MHz	PK (dBμV/m)	37.53	Limit	74(dBμV/m)
	AV(dBμV/m)	--		54(dBμV/m)

Test Figure: Horizontal

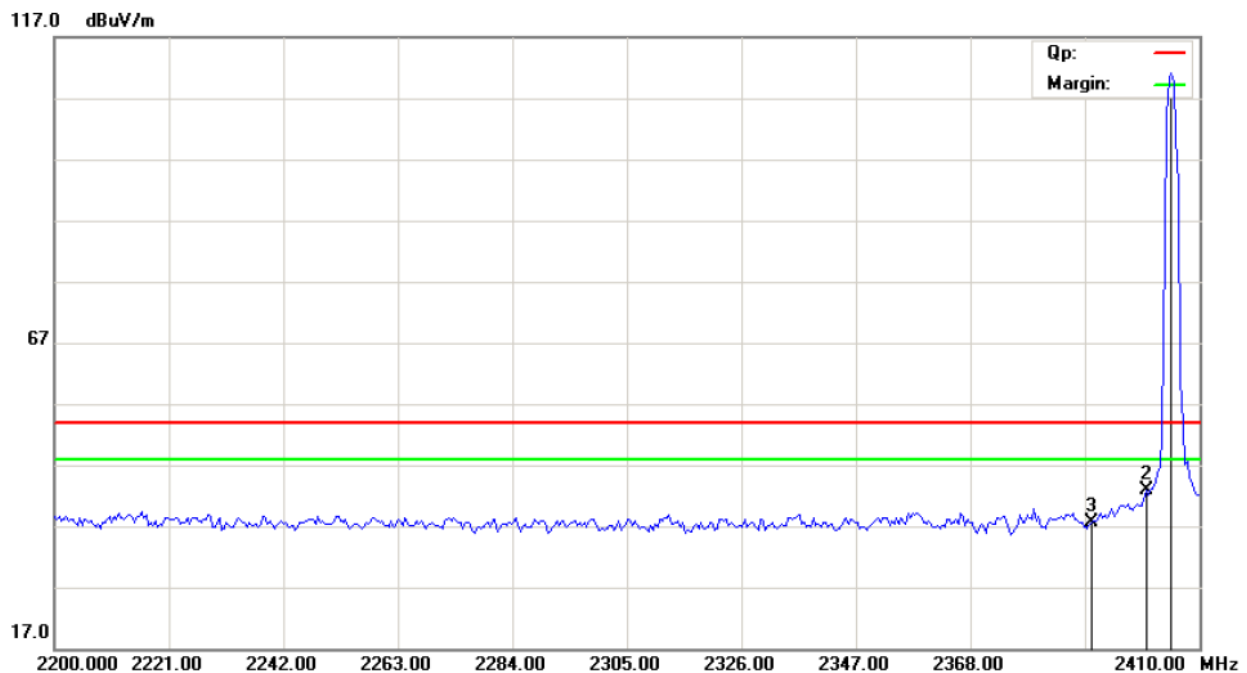


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10.4 Restricted band Measurement

Product:	Zigbee Module		Test Mode:	Low Channel
Mode	Keeping Transmitting		Input Voltage	120V~
Temperature	24 deg. C		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2390MHz	PK (dBμV/m)	37.58	Limit	74(dBμV/m)
	AV(dBμV/m)	--		54(dBμV/m)

Test Figure: Vertical



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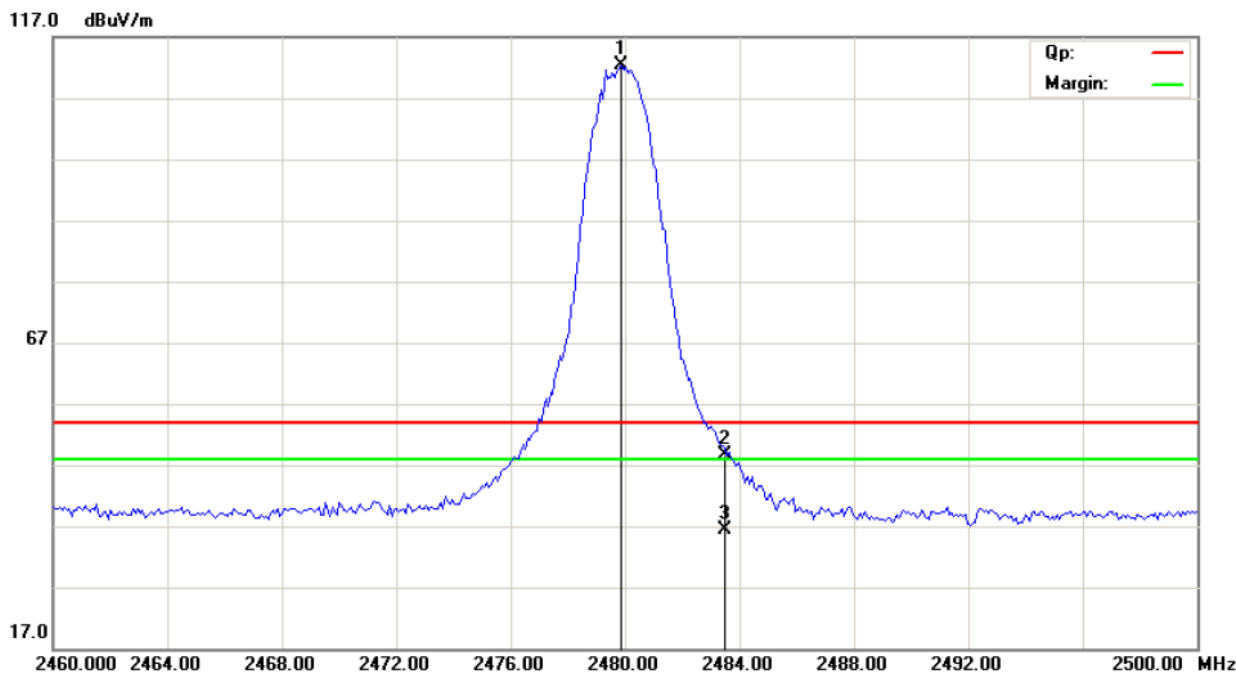
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10.4 Restricted band Measurement

Product:	Zigbee Module		Test Mode:	High Channel
Mode	Keeping Transmitting		Input Voltage	120V~
Temperature	24 deg. C		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2483.5MHz	PK (dBμV/m)	48.55	Limit	74(dBμV/m)
	AV(dBμV/m)	36.30		54(dBμV/m)

Test Figure: Horizontal

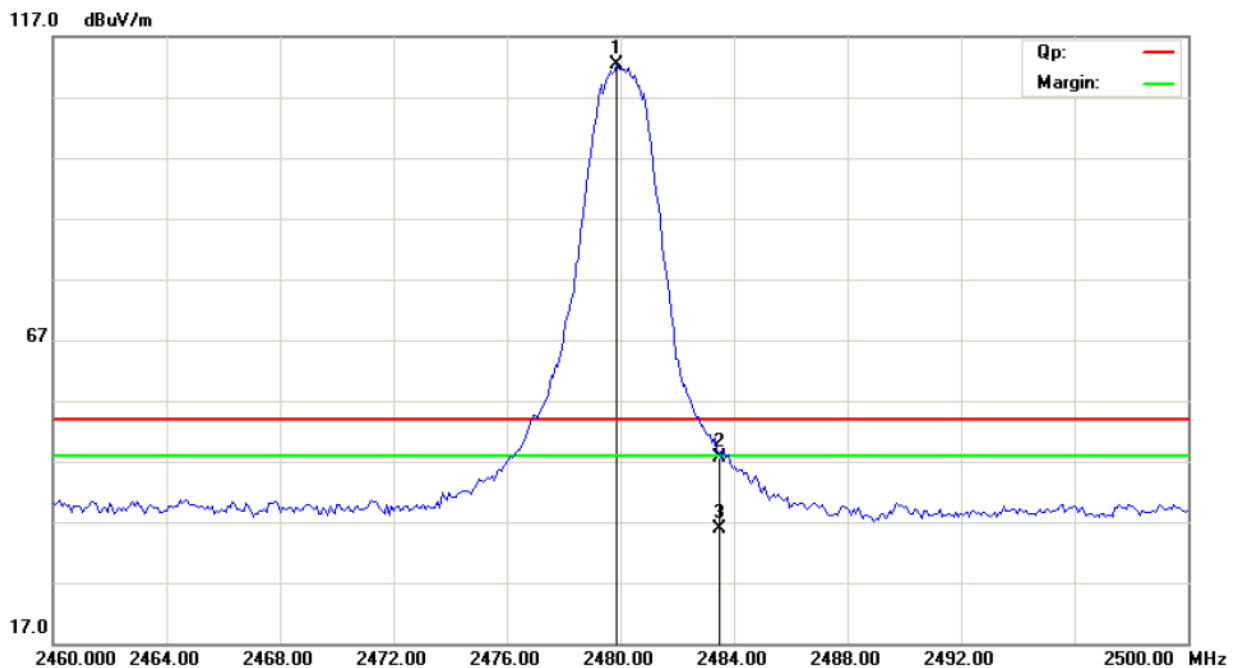


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10.4 Restricted band Measurement

Product:	Zigbee Module		Test Mode:	High Channel
Mode	Keeping Transmitting		Input Voltage	120V~
Temperature	24 deg. C		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2483.5MHz	PK (dBμV/m)	47.55	Limit	74(dBμV/m)
	AV(dBμV/m)	35.98		54(dBμV/m)

Test Figure: Vertical



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11.0 Antenna Requirement

11.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected construction

Dipole antenna used. The maximum Gain of the antennas is 2.15 dBi.

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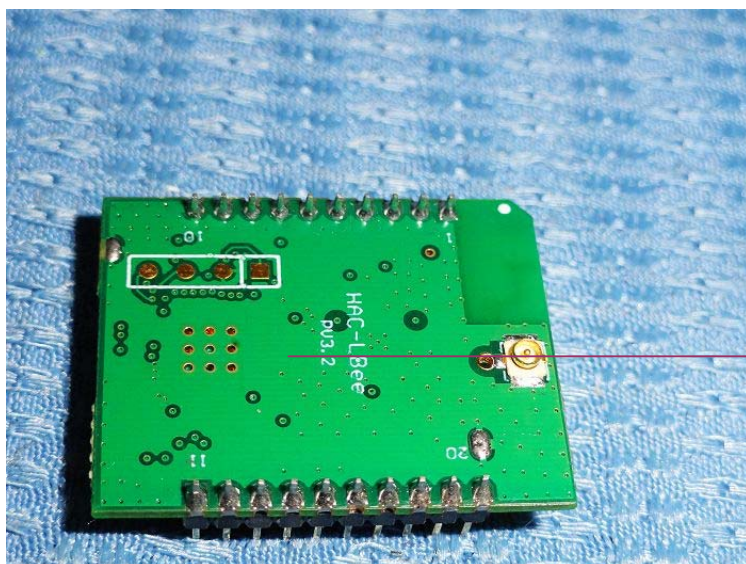
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12.0 FCC Label

FCC ID: WMUHAC-LBEE

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



FCC Label Location

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13.0 Photo of testing

Conducted Emission Test Setup:



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Radiated Emission Test Setup:

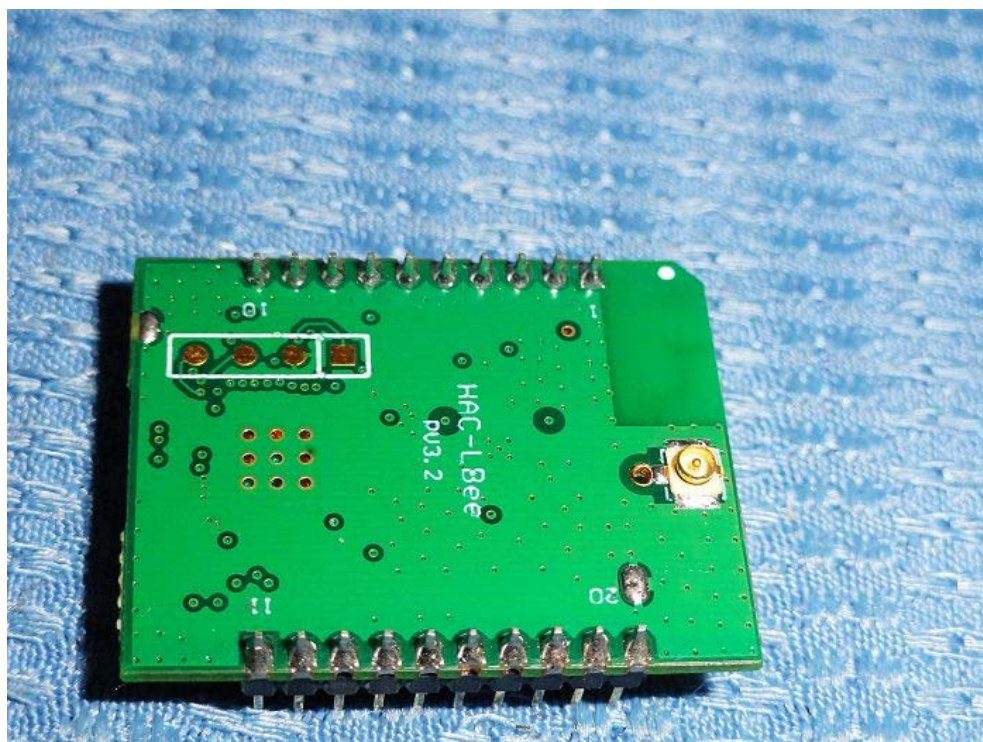
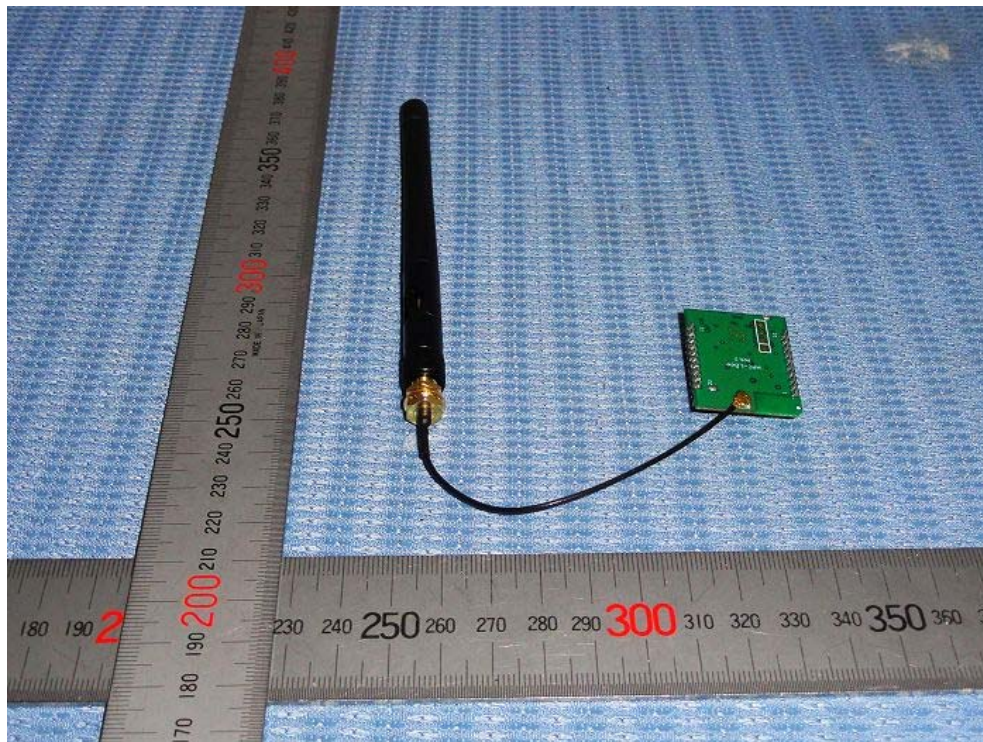


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Photo for the EUT

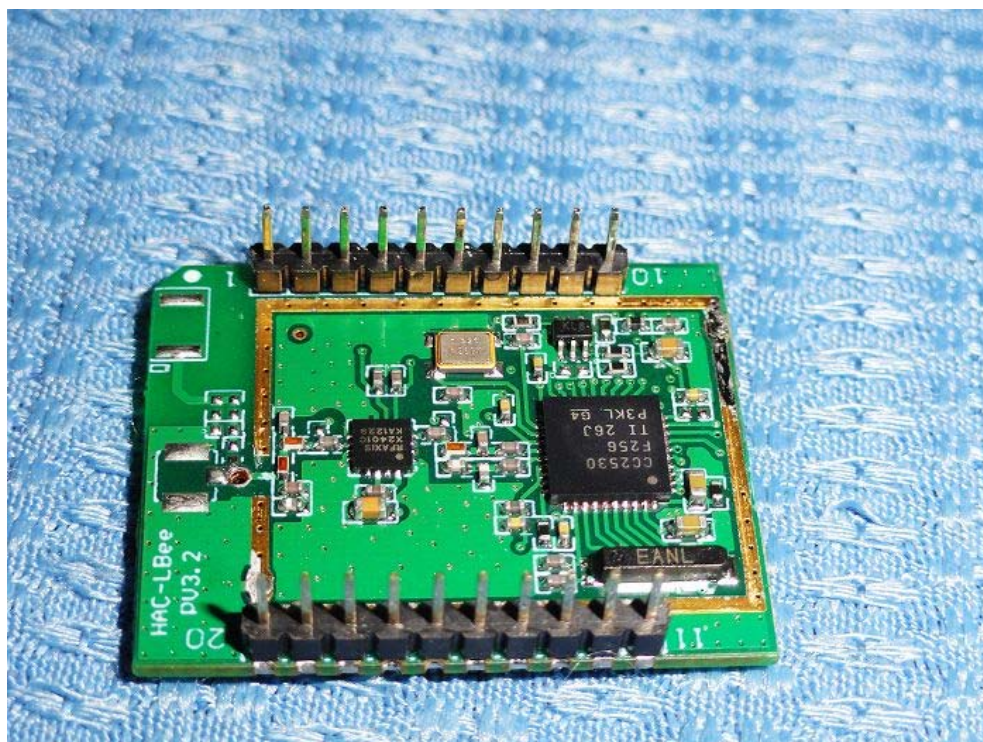


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Photo for the EUT

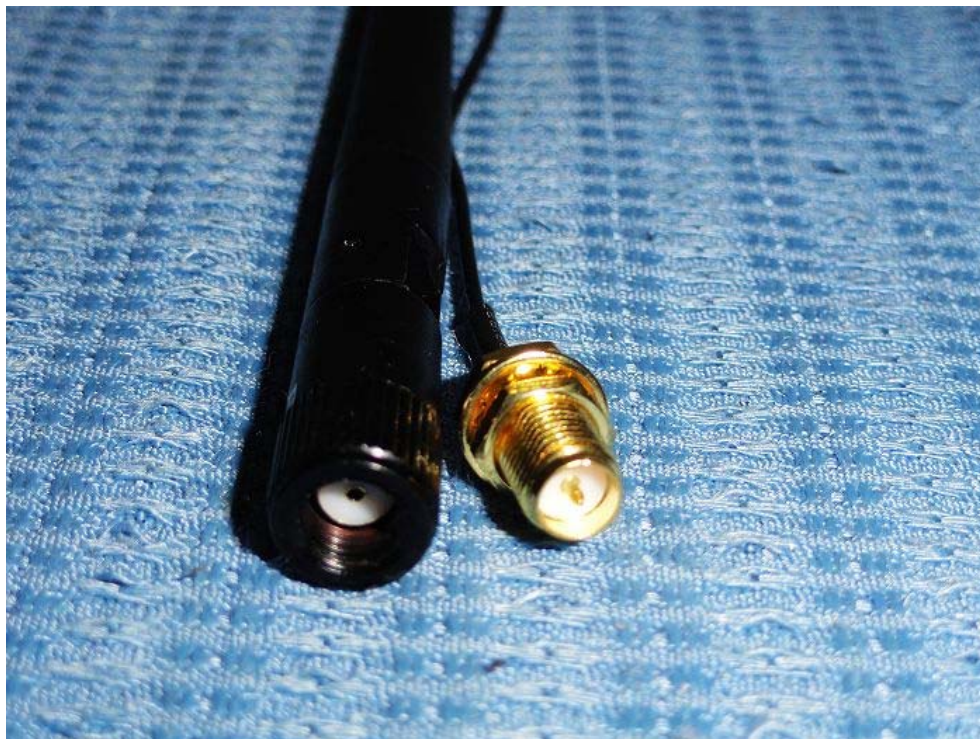


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Photo for the EUT



End of the report

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