



**FCC 47 CFR PART 15 SUBPART C &
INDUSTRY CANADA RSS-210**

TEST REPORT

For

802.11n, 2.4G 1T1R Wireless LAN USB Module

Model: WN4638R

Trade Name: LITE-ON

Issued to

Lite-On Technology Corp.

4F, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C.

Issued by

Compliance Certification Services Inc.

**No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)**

<http://www.ccsrf.com>

service@ccsrf.com

Issued Date: October 17, 2014



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Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		October 17, 2014		Initial Issue	ALL	Kelly Cheng



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1. TEST RESULT CERTIFICATION

Applicant: Lite-On Technology Corp.
4F, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan,
R.O.C.

Manufacturer: LITE-ON TECHNOLOGY (Changzhou) CO., LTD
A9 Building, No. 88 Yanghu Road, Wujin Hi-Tech Industrial
Development Zone, Changzhou City,
Jiangsu Province 213100 China

Equipment Under Test: 802.11n, 2.4G 1T1R Wireless LAN USB Module

Trade Name: LITE-ON

Model: WN4638R

Date of Test: October 9, 2014

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C & Industry Canada RSS-210 Issue 8 December, 2010	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247 and Industry Canada RSS-210.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Reviewed by:

Miller Lee
Section Manager
Compliance Certification Services Inc.

Angel Cheng
Section Manager
Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	802.11n, 2.4G 1T1R Wireless LAN USB Module			
Trade Name	LITE-ON			
Model Number	WN4638R			
Model Discrepancy	N/A			
Received Date	October 7, 2014			
EUT Power Rating	Powered from host device			
Frequency Range	2412 ~ 2462 MHz			
Transmit Power	Mode	Frequency Range	Output Power (dBm)	Output Power (W)
	802.11b	2412 - 2462	24.98	0.3148
	802.11g	2412 - 2462	24.98	0.3148
	802.11n Standard-20 MHz	2412 - 2462	24.37	0.2735
	802.11n Standard-40 MHz	2422 - 2452	24.16	0.2606
Modulation Technique	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mbps) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps) IEEE 802.11n HT 20 MHz mode Channel mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps) IEEE 802.11n HT 40 MHz mode: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps)			
Number of Channels	IEEE 802.11b/g mode: 11 Channels IEEE 802.11n HT 20 MHz mode Channel mode: 11 Channels IEEE 802.11n HT 40 MHz mode: 7 Channels			
Antenna Specification	Walsin Technology Corporation. 1. RFMTA400536IMA301 / 3.79dBi 2. RFMTA400565IMAB701 / 3.4dBi 3. RFMTA400580IMAB701 / 3.2dBi 4. RFMTA400540IMAB701 / 3.4dBi			
Antenna Designation	PIFA Antenna			

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC & IC ID: **PPQ-WN4638R** & **4491A-WN4638R** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4: 2009 and FCC CFR 47 Part 15.207, 15.209, 15.247 and DA00-705.

The tests documented in this report were performed in accordance with IC RSS-210, IC RSS-Gen, IC RSS-102, IC RSS-212, and ANSI C63.4.

This submittal(s) (test report) is intended for IC Certification with Industry Canada RSS-210.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

The tests documented in this report were performed in accordance with IC RSS-210, IC RSS-Gen, IC RSS-102, and ANSI C63.4.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.



3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

- (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

- (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



3.5 DESCRIPTION OF TEST MODES

The EUT (model: WN4638R) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

IEEE 802.11b mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE 802.11g mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n HT 40 MHz mode:

Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with 13.5Mbps data rate were chosen for full testing.



4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: Each piece of equipment is scheduled for calibration once a year and Loop Antenna is scheduled for calibration once three years.

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	03/19/2015
Power Meter	Anritsu	ML2495A	1012009	04/24/2015
Power Sensor	Anritsu	MA2411B	0917072	04/24/2015

Wugu 966 Chamber A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	10/31/2014
EMI Test Receiver	R&S	ESCI	100064	02/14/2015
Pre-Amplifier	Mini-Circuits	ZFL-1000LN	SF350700823	01/10/2015
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/16/2015
Bilog Antenna	Sunol Sciences	JB3	A030105	09/30/2015
Horn Antenna	EMCO	3117	00055165	01/08/2015
Horn Antenna	EMCO	3116	00026370	10/09/2015
Loop Antenna	EMCO	6502	8905/2356	06/08/2015
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Site NSA	CCS	N/A	N/A	12/23/2014
Test S/W	EZ-EMC (CCS-3A1RE)			

Conducted Emission room # A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCI	101203	09/11/2015
LISN	R&S	ESH3-Z5	848773/014	12/09/2014
ISN	FCC	FCC-TLISN-T8-02-09	101131	09/03/2015
Coaxial Cable	Commate	CFD300-NL	NA	12/05/2014
Test S/W	CCS-3A1-CE			



4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	N/A
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☐ No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.




All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 0824-01 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC 2324G-1 for 3M Semi Anechoic Chamber A, 2324G-2 for 3M Semi Anechoic Chamber B.



5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

** No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook PC	ASUS	M5200AE	5BN0AG019631	PD9WM3B2100	N/A	AC I/P: Unshielded, 1.8m with a core DC O/P: Unshielded, 1.8m

Remark:

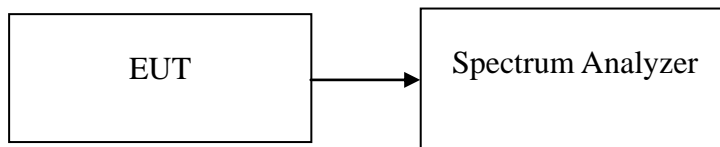
1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



7. FCC PART 15.247 REQUIREMENTS & RSS-210 REQUIREMENTS

7.1 99% BANDWIDTH

Test Configuration



TEST PROCEDURE

The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold.

**Test Data****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	12.5709
Mid	2437	12.8490
High	2462	12.1510

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.0788
Mid	2437	17.1318
High	2462	17.1331

Test mode: IEEE 802.11n HT 20 MHz mode Channel mode

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	17.8011
Mid	2437	17.7964
High	2462	17.8231

Test mode: IEEE 802.11n HT 40 MHz mode Channel mode

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2422	36.2532
Mid	2437	36.2580
High	2452	36.2498



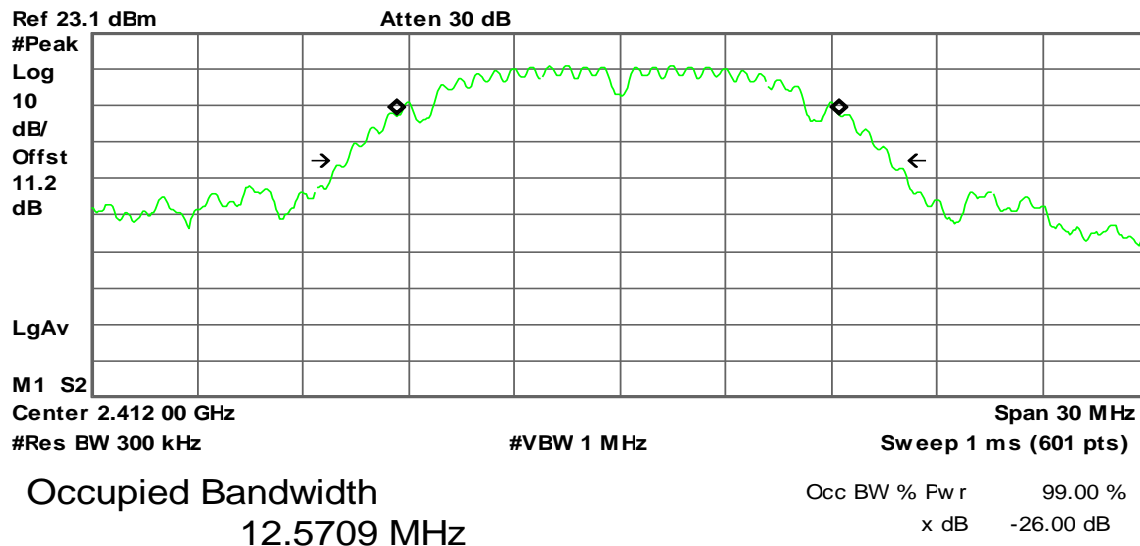
Test Plot

IEEE 802.11b mode

99% Bandwidth (CH Low)

Agilent 21:10:09 Apr 7, 1970

R L

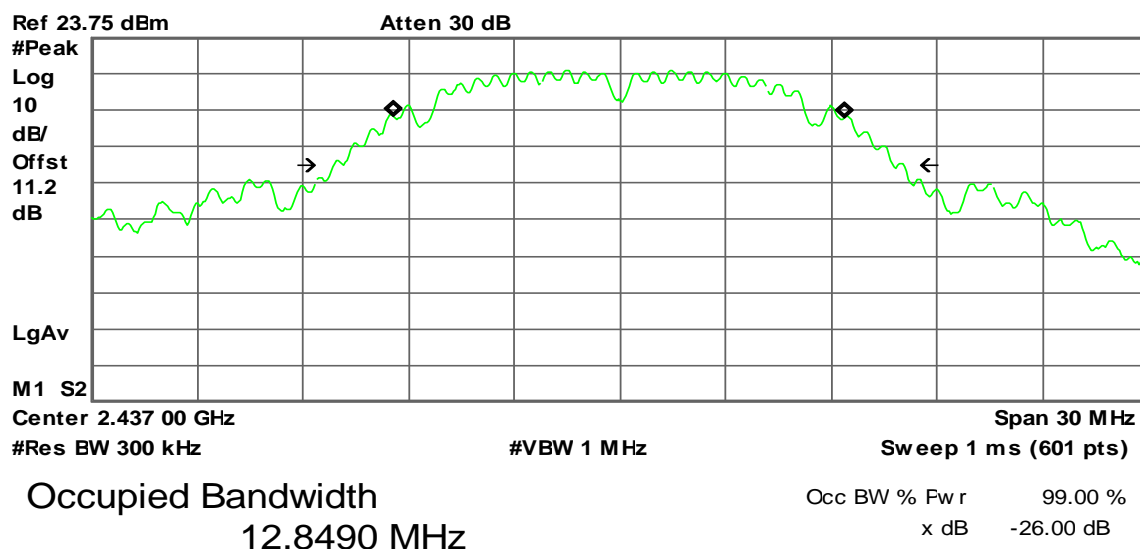


Transmit Freq Error -43.334 kHz
x dB Bandw idth 15.429 MHz

99% Bandwidth (CH Mid)

Agilent 21:22:09 Apr 7, 1970

R L



Transmit Freq Error -43.036 kHz
x dB Bandw idth 16.198 MHz



99% Bandwidth (CH High)

Agilent 21:28:17 Apr 7, 1970

R L



Occupied Bandwidth
12.1510 MHz

Occ BW % Fw r 99.00 %
x dB -26.00 dB

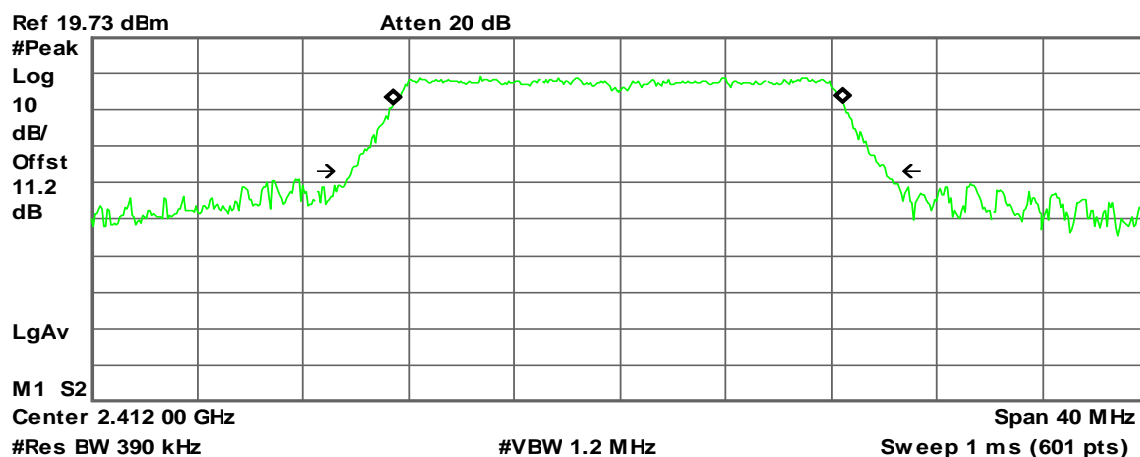
Transmit Freq Error -26.339 kHz
x dB Bandw idth 14.922 MHz

IEEE 802.11g mode

99% Bandwidth (CH Low)

Agilent 21:38:33 Apr 7, 1970

R L



Occupied Bandwidth
17.0788 MHz

Occ BW % Fw r 99.00 %
x dB -26.00 dB

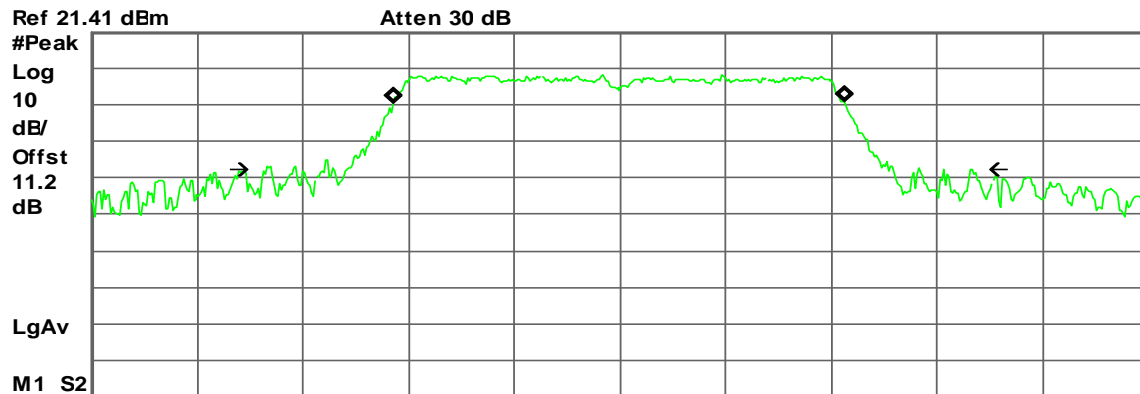
Transmit Freq Error -68.257 kHz
x dB Bandw idth 20.255 MHz



99% Bandwidth (CH Mid)

Agilent 21:46:01 Apr 7, 1970

R L



Center 2.437 00 GHz Span 40 MHz
#Res BW 390 kHz #VBW 1.2 MHz Sweep 1 ms (601 pts)

Occupied Bandwidth
17.1318 MHz

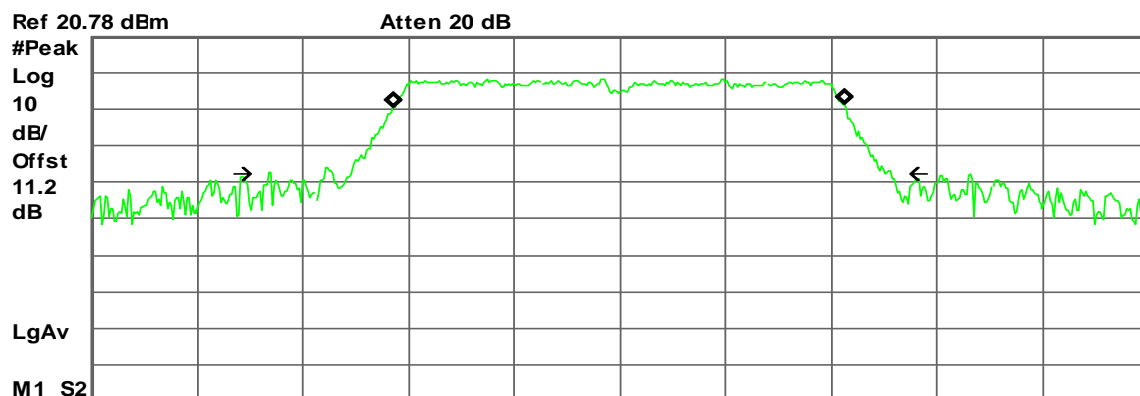
Occ BW % Fw r 99.00 %
x dB -26.00 dB

Transmit Freq Error -35.351 kHz
x dB Bandw idth 26.722 MHz

99% Bandwidth (CH High)

Agilent 21:52:21 Apr 7, 1970

R L



Center 2.462 00 GHz Span 40 MHz
#Res BW 390 kHz #VBW 1.2 MHz Sweep 1 ms (601 pts)

Occupied Bandwidth
17.1331 MHz

Occ BW % Fw r 99.00 %
x dB -26.00 dB

Transmit Freq Error -51.633 kHz
x dB Bandw idth 23.582 MHz

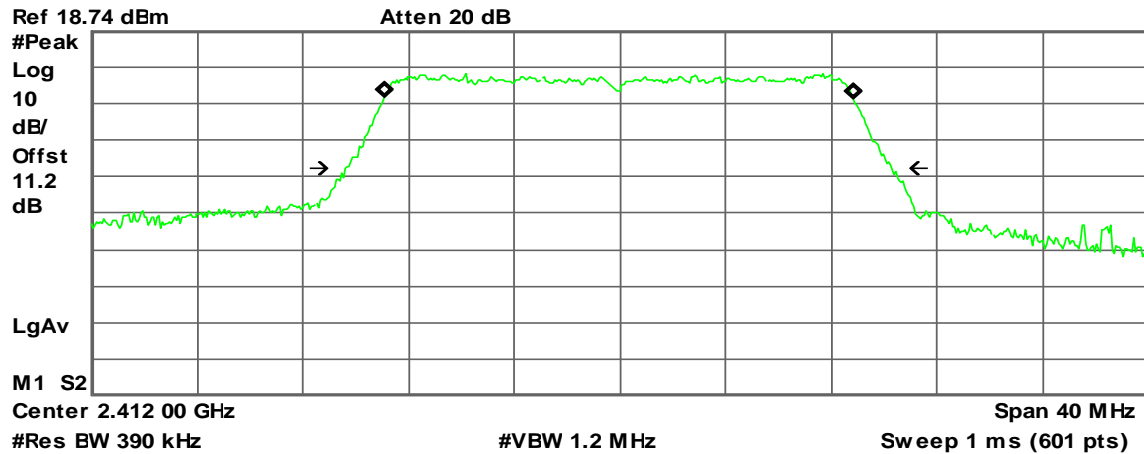


IEEE 802.11n HT 20 MHz mode Channel mode

99% Bandwidth (CH Low)

Agilent 22:03:41 Apr 7, 1970

R L



Occupied Bandwidth
17.8011 MHz

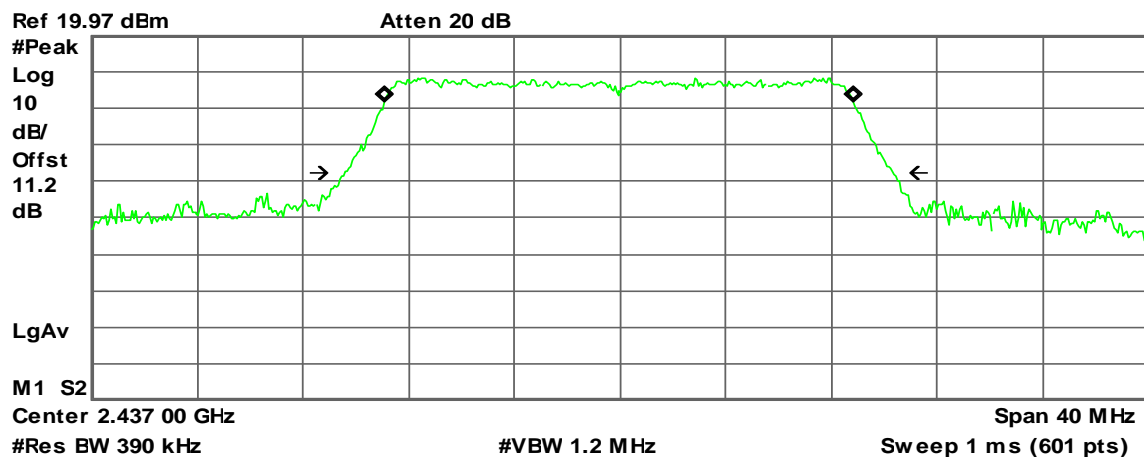
Occ BW % Fw r 99.00 %
x dB -26.00 dB

Transmit Freq Error -35.063 kHz
x dB Bandw idth 20.735 MHz

99% Bandwidth (CH Mid)

Agilent 22:10:32 Apr 7, 1970

R L



Occupied Bandwidth
17.7964 MHz

Occ BW % Fw r 99.00 %
x dB -26.00 dB

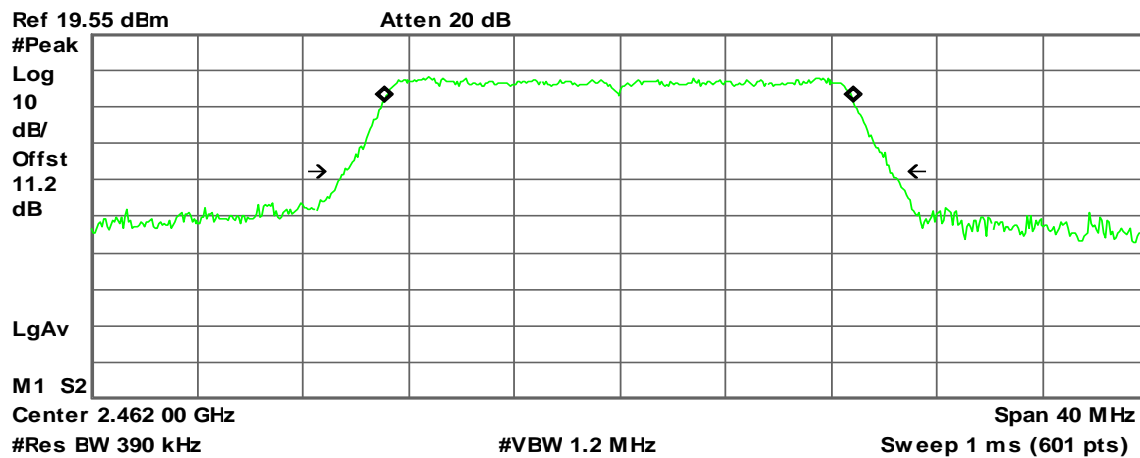
Transmit Freq Error -22.273 kHz
x dB Bandw idth 20.787 MHz



99% Bandwidth (CH High)

Agilent 22:16:34 Apr 7, 1970

R L



Occupied Bandwidth
17.8231 MHz

Occ BW % Fw r 99.00 %
x dB -26.00 dB

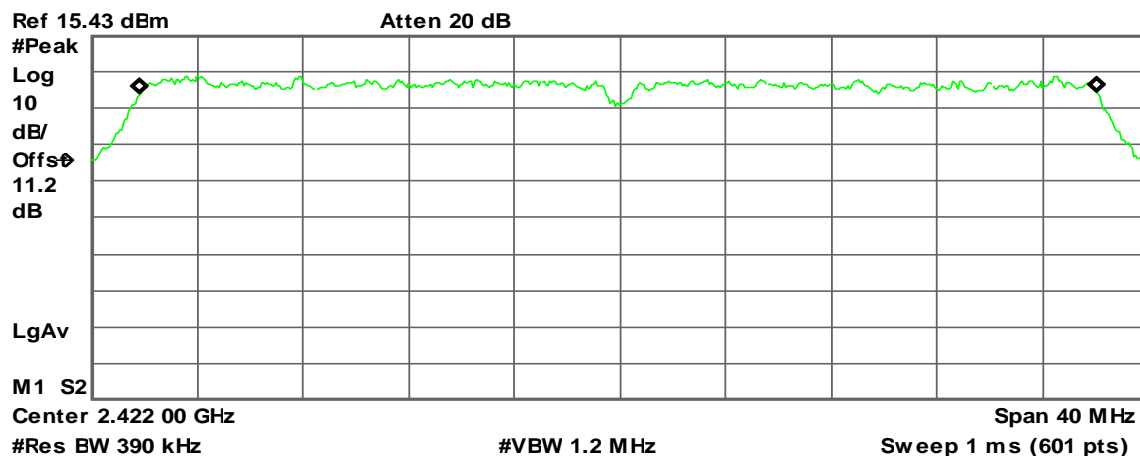
Transmit Freq Error -38.827 kHz
x dB Bandw idth 20.699 MHz

IEEE 802.11n HT 40 MHz mode Channel mode

99% Bandwidth (CH Low)

Agilent 22:24:46 Apr 7, 1970

R L



Occupied Bandwidth
36.2532 MHz

Occ BW % Fw r 99.00 %
x dB -26.00 dB

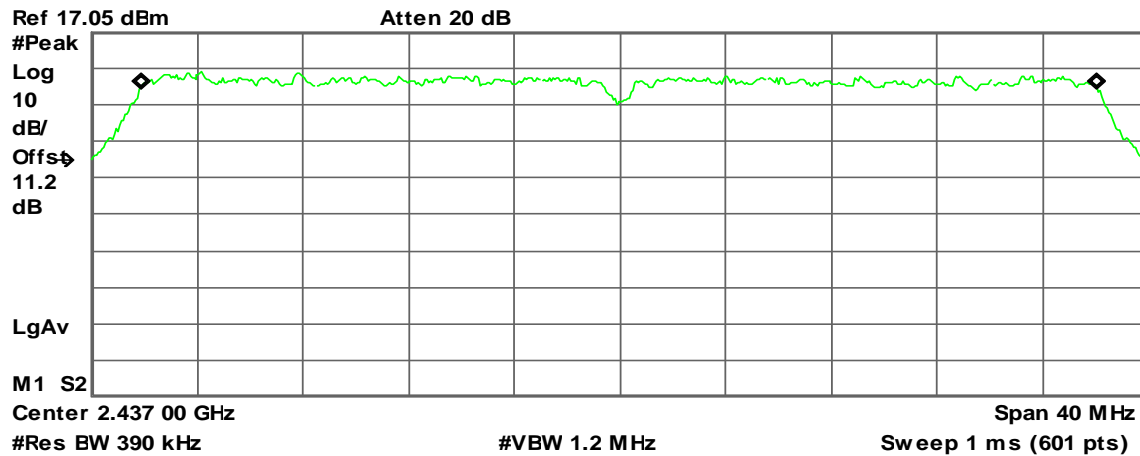
Transmit Freq Error -50.546 kHz
x dB Bandw idth 40.000 MHz



99% Bandwidth (CH Mid)

Agilent 22:31:23 Apr 7, 1970

R L



Occupied Bandwidth
36.2580 MHz

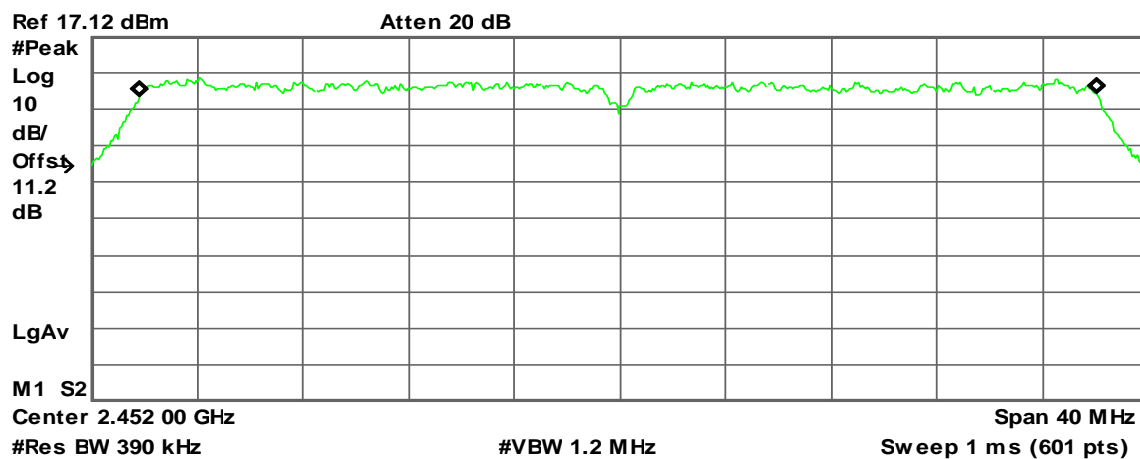
Occ BW % Fw r 99.00 %
x dB -26.00 dB

Transmit Freq Error -32.670 kHz
x dB Bandwidth 40.000 MHz

99% Bandwidth (CH High)

Agilent 22:37:48 Apr 7, 1970

R L



Occupied Bandwidth
36.2498 MHz

Occ BW % Fw r 99.00 %
x dB -26.00 dB

Transmit Freq Error -56.713 kHz
x dB Bandwidth 40.000 MHz

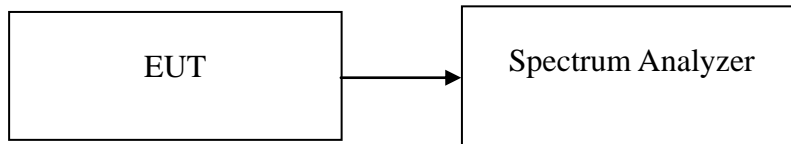


7.2 6DB BANDWIDTH

LIMIT

According to §15.247(a)(2) & RSS-210 §A8.2(a), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100 kHz, VBW = RBW, Span = 50 MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

No non-compliance noted

**Test Data****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.3334	>500	PASS
Mid	2437	10.3334		PASS
High	2462	10.3334		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.9167	>500	PASS
Mid	2437	16.8333		PASS
High	2462	16.8333		PASS

Test mode: IEEE 802.11n HT 20 MHz mode Channel mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.75	>500	PASS
Mid	2437	17.75		PASS
High	2462	17.75		PASS

Test mode: IEEE 802.11n HT 40 MHz mode Channel mode

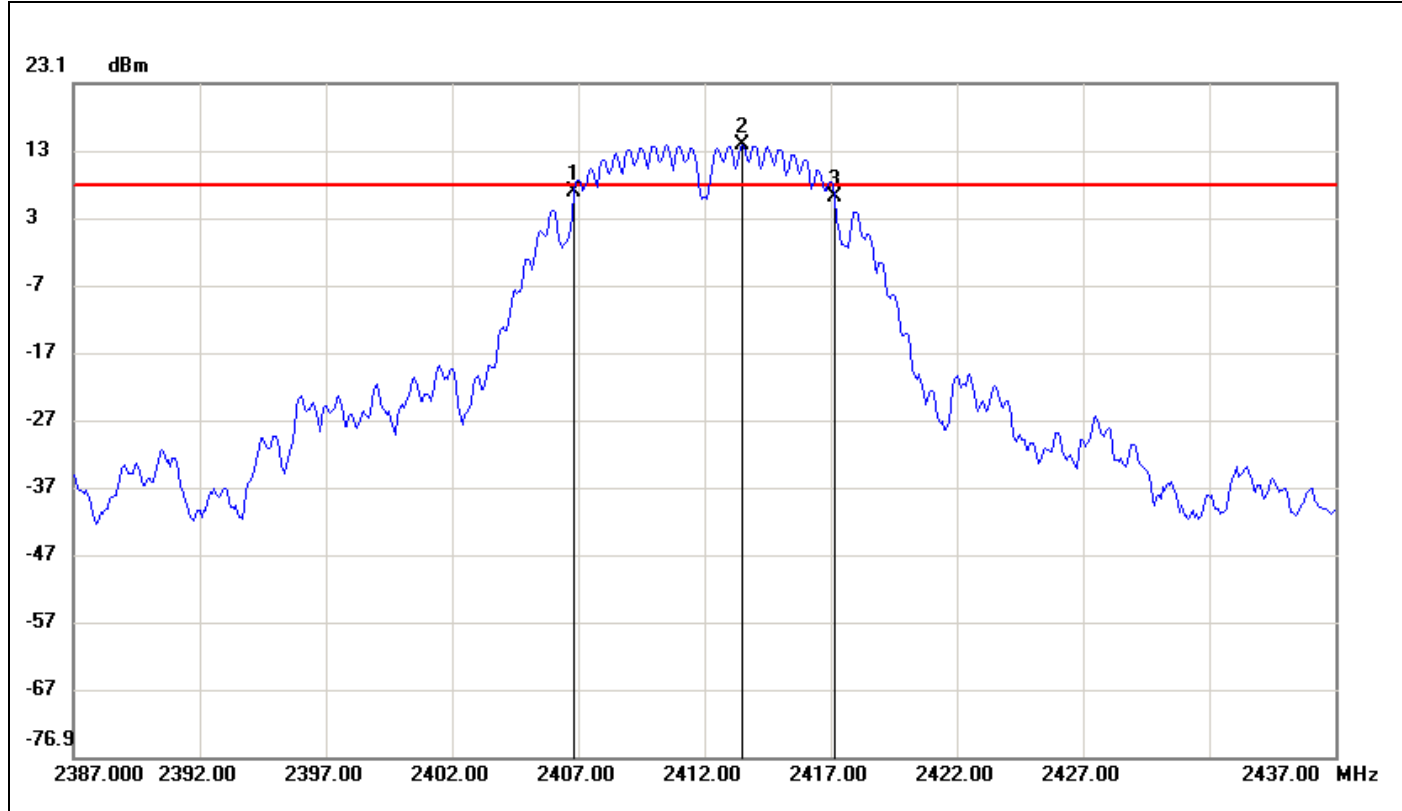
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.75	>500	PASS
Mid	2437	36.6666		PASS
High	2452	36.6666		PASS



Test Plot

IEEE 802.11b mode

6dB Bandwidth (CH Low)

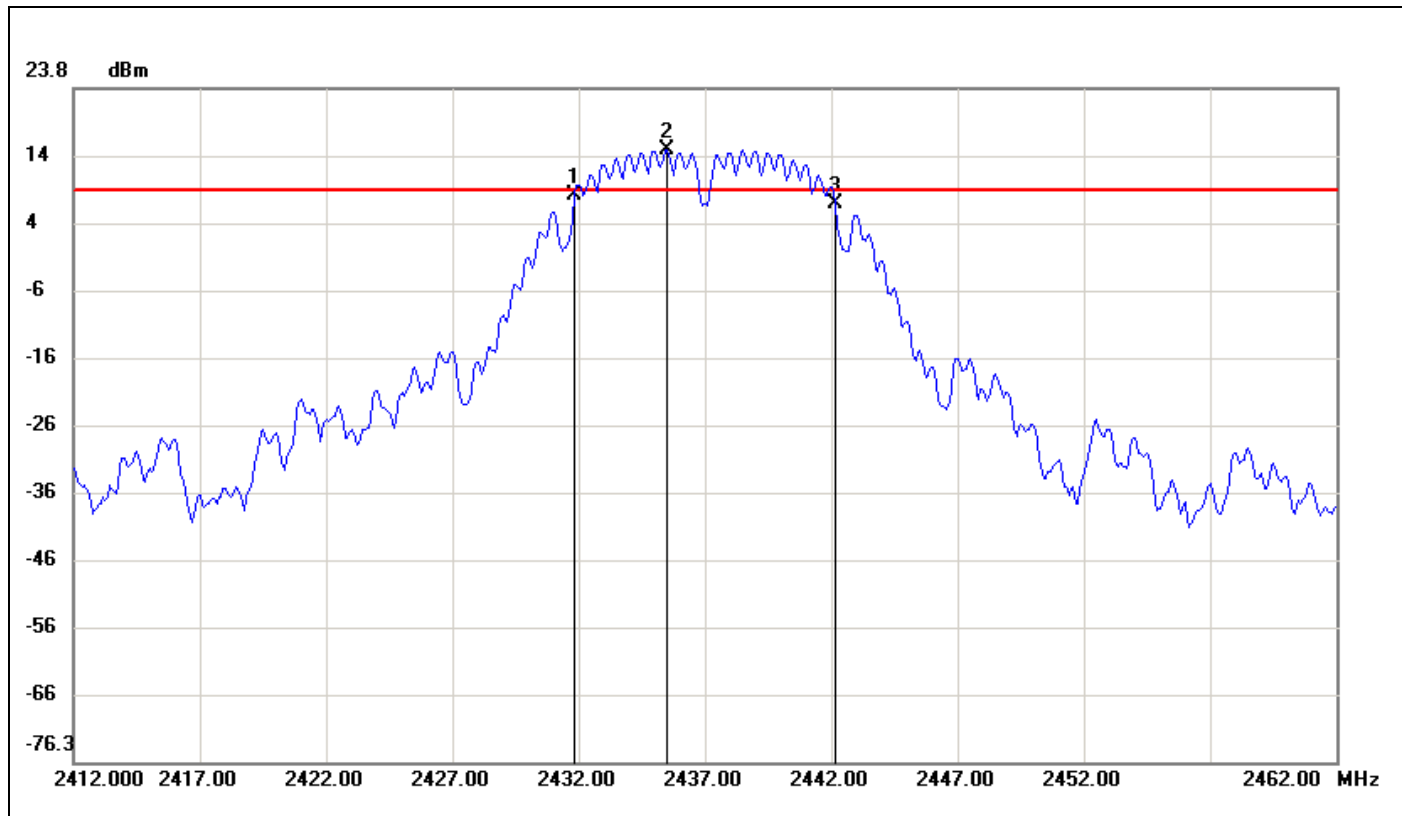


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2406.8333	6.91	8.03	-1.12
2	2413.5000	14.03	8.03	6.00
3	2417.1667	6.14	8.03	-1.89

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	10.3334	-0.77



6dB Bandwidth (CH Mid)

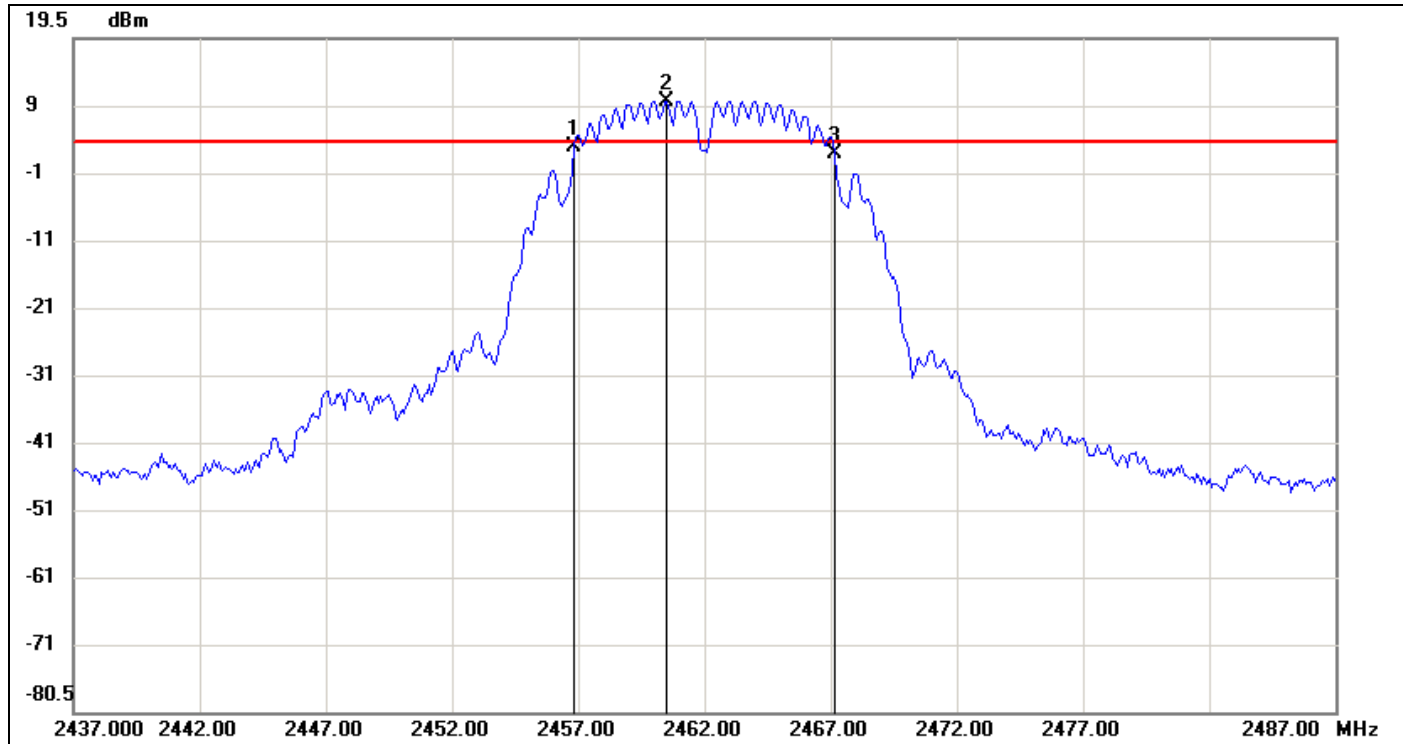


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2431.8333	7.81	8.66	-0.85
2	2435.5000	14.66	8.66	6.00
3	2442.1667	6.61	8.66	-2.05

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	10.3334	-1.2



6dB Bandwidth (CH High)



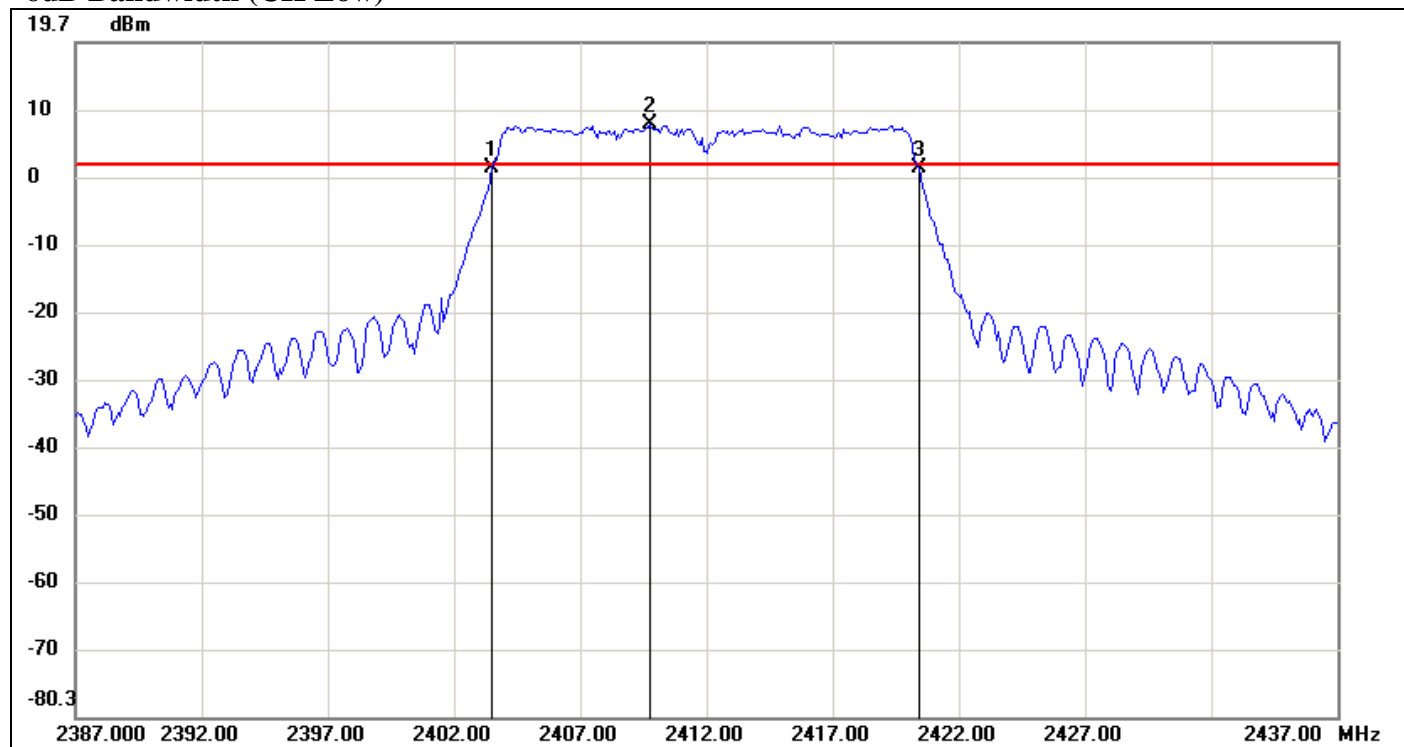
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2456.8333	3.33	4.12	-0.79
2	2460.5000	10.12	4.12	6.00
3	2467.1667	2.22	4.12	-1.90

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	10.3334	-1.11



IEEE 802.11g mode

6dB Bandwidth (CH Low)

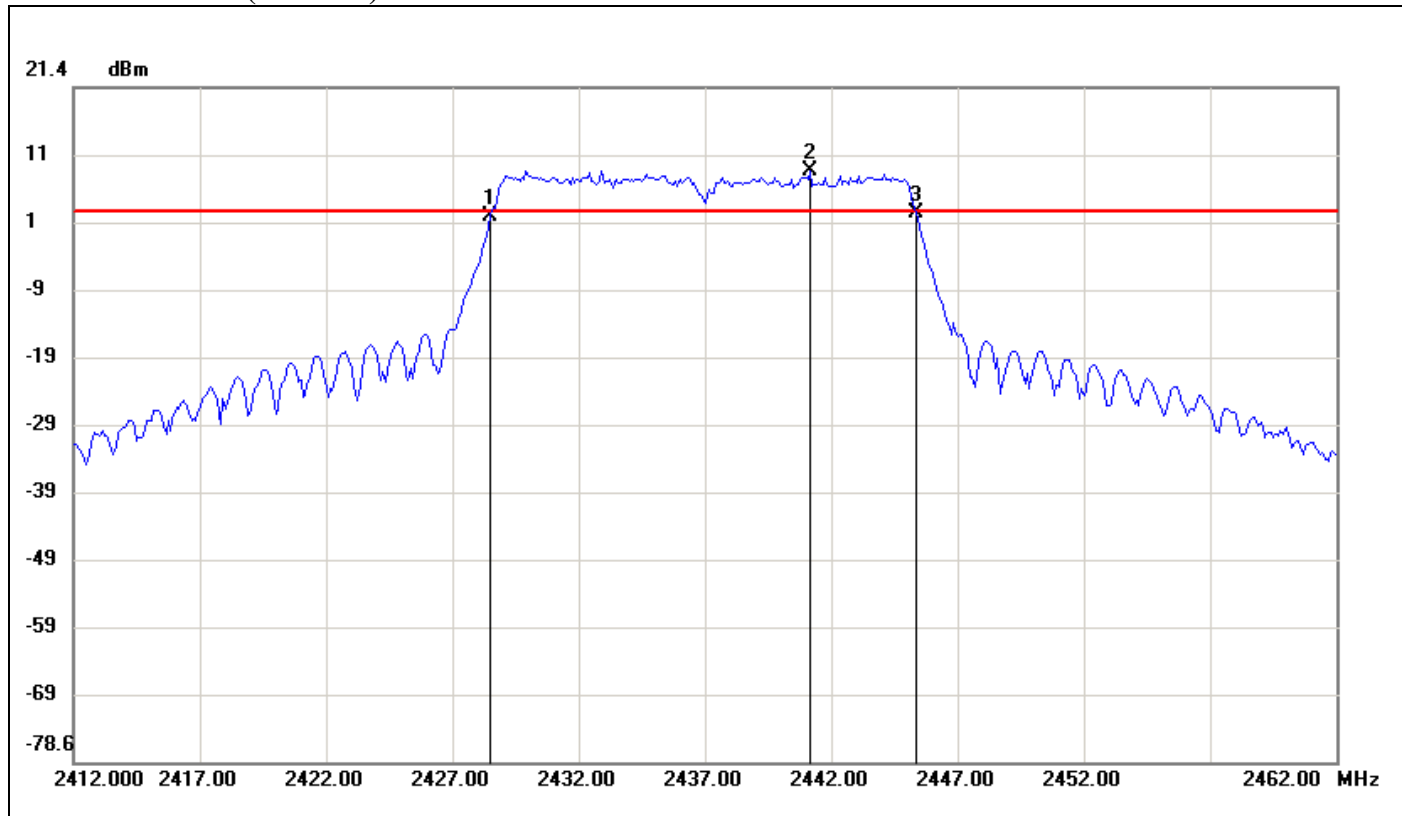


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2403.5000	1.20	1.53	-0.33
2	2409.7500	7.53	1.53	6.00
3	2420.4167	1.15	1.53	-0.38

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	16.9167	-0.05



6dB Bandwidth (CH Mid)

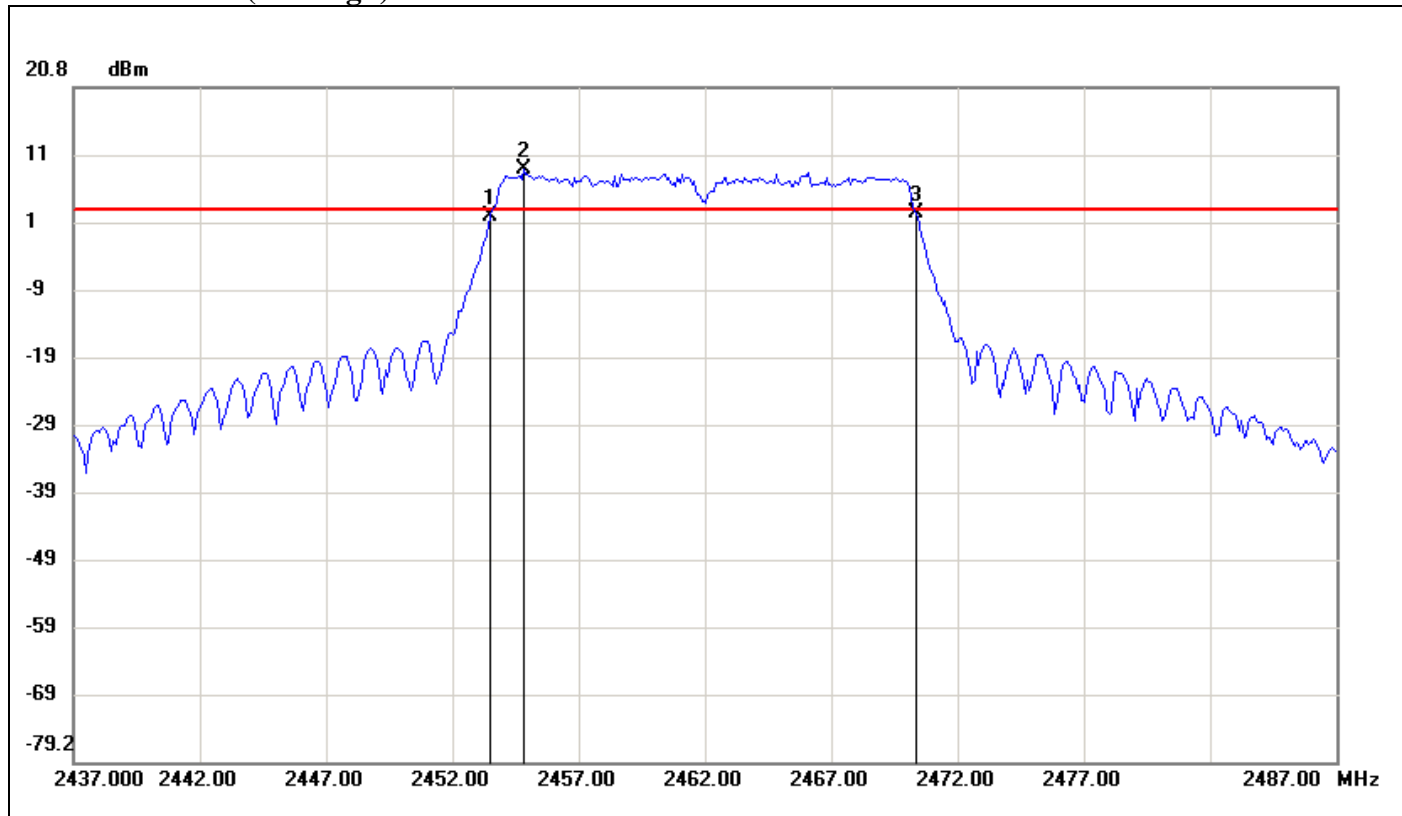


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2428.5000	2.17	3.15	-0.98
2	2441.1667	9.15	3.15	6.00
3	2445.3333	2.78	3.15	-0.37

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	16.8333	0.61



6dB Bandwidth (CH High)



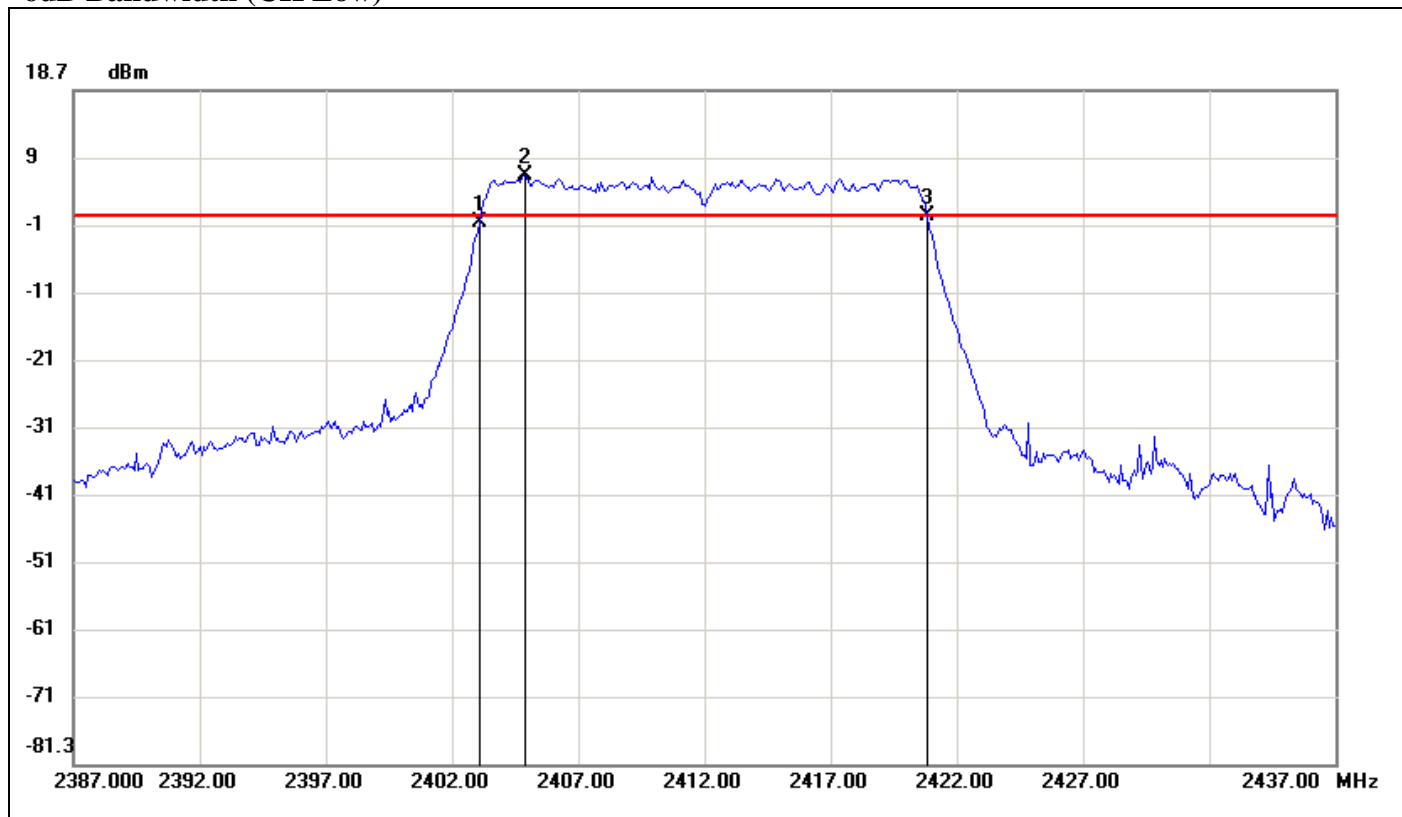
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2453.5000	1.61	2.66	-1.05
2	2454.8333	8.66	2.66	6.00
3	2470.3333	2.13	2.66	-0.53

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	16.8333	0.52



IEEE 802.11n HT 20 MHz mode Channel mode

6dB Bandwidth (CH Low)

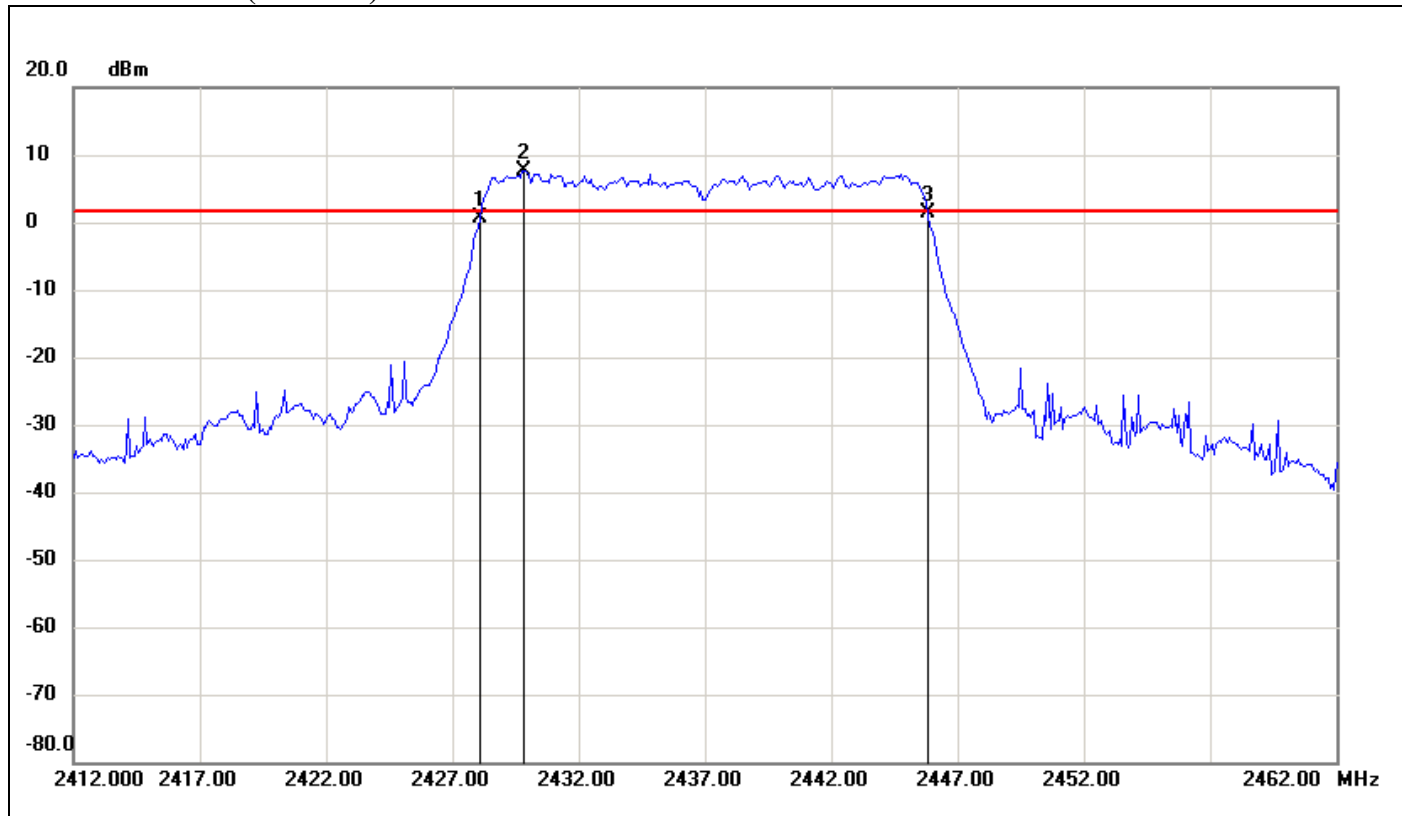


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2403.0833	-0.83	0.17	-1.00
2	2404.9167	6.17	0.17	6.00
3	2420.8333	0.16	0.17	-0.01

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.75	0.99



6dB Bandwidth (CH Mid)

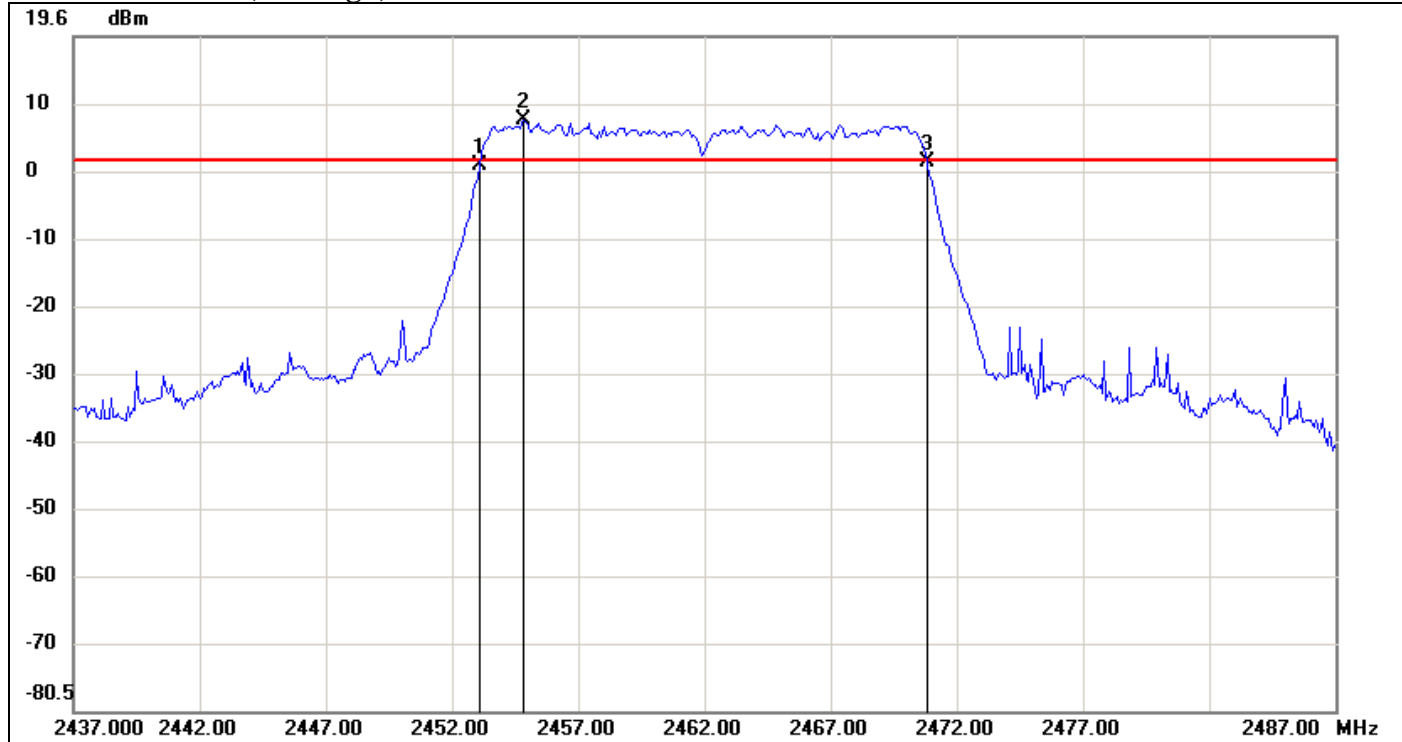


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2428.0833	0.67	1.65	-0.98
2	2429.8333	7.65	1.65	6.00
3	2445.8333	1.44	1.65	-0.21

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.75	0.77



6dB Bandwidth (CH High)



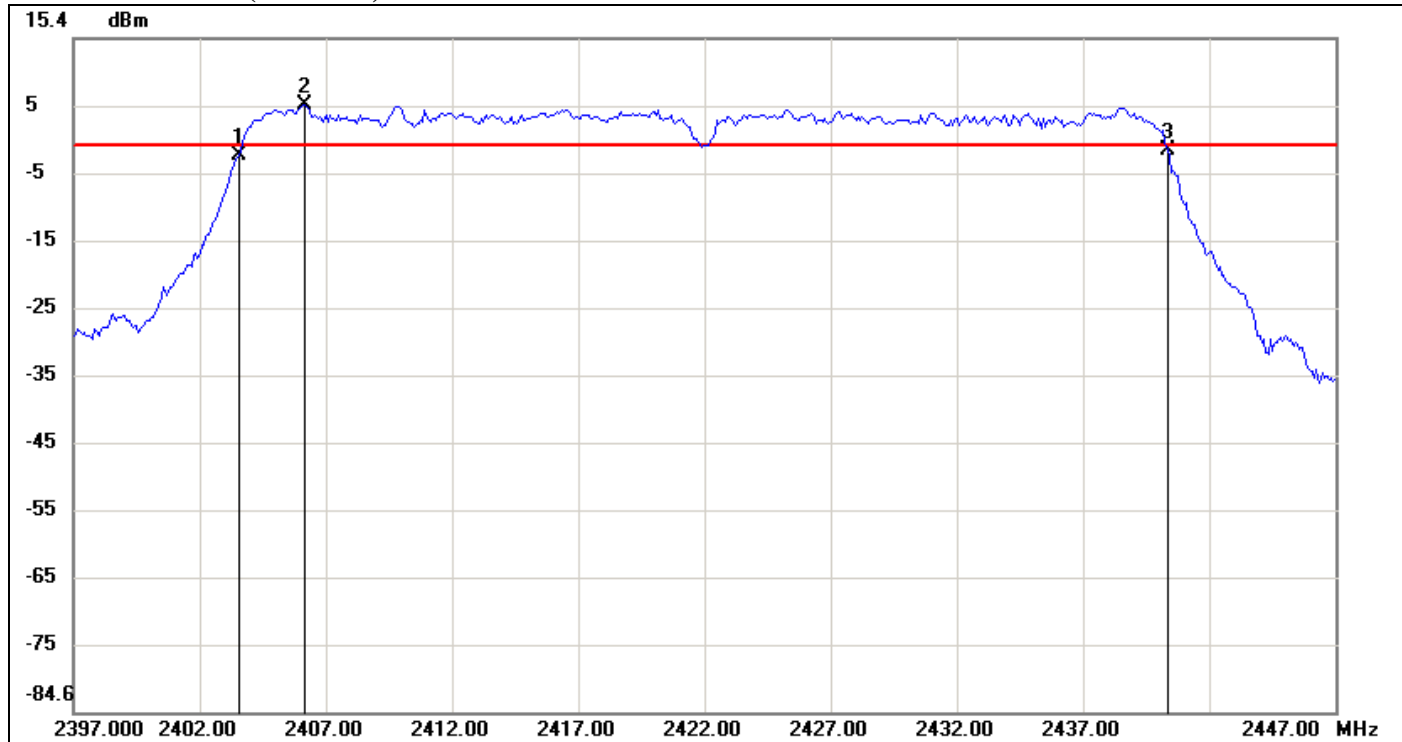
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2453.0833	0.31	1.09	-0.78
2	2454.8333	7.09	1.09	6.00
3	2470.8333	0.94	1.09	-0.15

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.75	0.63



IEEE 802.11n HT 40 MHz mode Channel mode

6dB Bandwidth (CH Low)

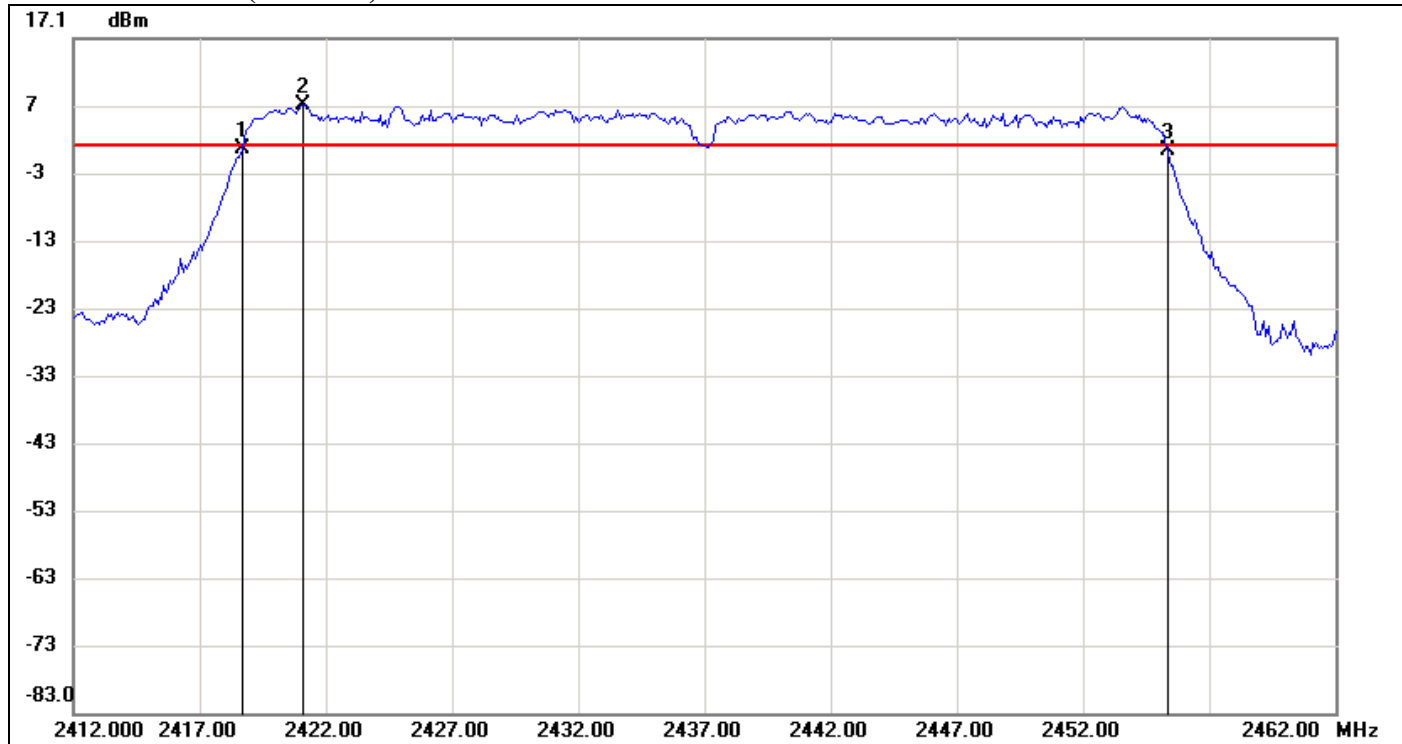


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2403.5833	-2.04	-0.51	-1.53
2	2406.1667	5.49	-0.51	6.00
3	2440.3333	-1.31	-0.51	-0.80

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	36.75	0.73



6dB Bandwidth (CH Mid)

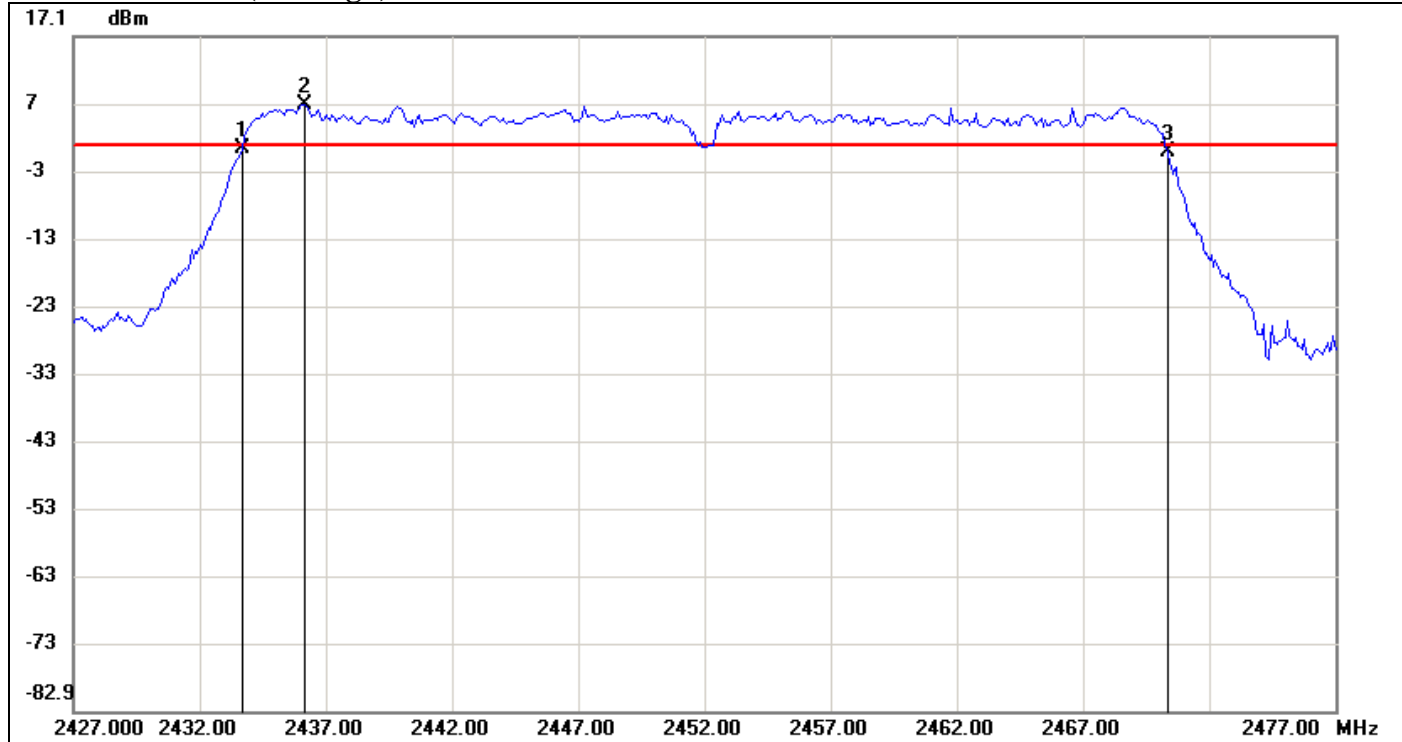


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2418.6667	0.69	1.24	-0.55
2	2421.0833	7.24	1.24	6.00
3	2455.3333	0.41	1.24	-0.83

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	36.6666	-0.28



6dB Bandwidth (CH High)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2433.6667	0.53	0.98	-0.45
2	2436.1667	6.98	0.98	6.00
3	2470.3333	0.10	0.98	-0.88

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	36.6666	-0.43



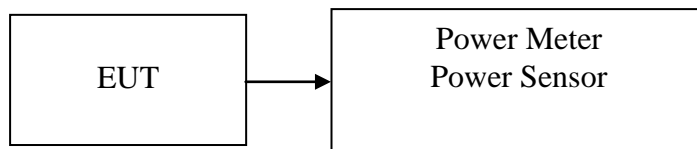
7.3 PEAK POWER

LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.
2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. According to RSS-210 §A8.4(4), for systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the peak power detection.

TEST RESULTS

No non-compliance noted

**Test Data****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	24.40	0.2754	1.00	PASS
Mid	2437	*24.98	0.3148		PASS
High	2462	21.33	0.1358		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	24.12	0.2582	1.00	PASS
Mid	2437	*24.98	0.3148		PASS
High	2462	24.27	0.2673		PASS

Test mode: IEEE 802.11n HT 20 MHz mode Channel mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	*24.37	0.2735	1.00	PASS
Mid	2437	24.08	0.2559		PASS
High	2462	23.95	0.2483		PASS

Test mode: IEEE 802.11n HT 40 MHz mode Channel mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	23.31	0.2143	1.00	PASS
Mid	2437	*24.16	0.2606		PASS
High	2452	23.59	0.2286		PASS

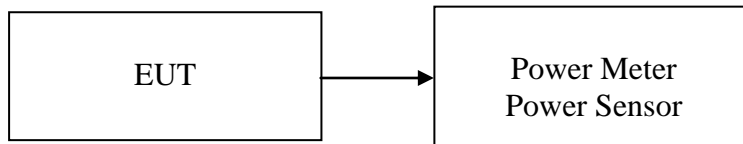


7.4 AVERAGE POWER

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the peak power detection.

TEST RESULTS

No non-compliance noted

**Test Data****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	21.10	0.1288
Mid	2437	21.92	0.1556
High	2462	17.95	0.0624

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	15.33	0.0341
Mid	2437	15.68	0.0370
High	2462	14.75	0.0299

Test mode: IEEE 802.11n HT 20 MHz mode Channel mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	15.18	0.0330
Mid	2437	16.12	0.0409
High	2462	15.28	0.0337

Test mode: IEEE 802.11n HT 40 MHz mode Channel mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2422	14.21	0.0264
Mid	2437	15.27	0.0337
High	2452	14.48	0.0281



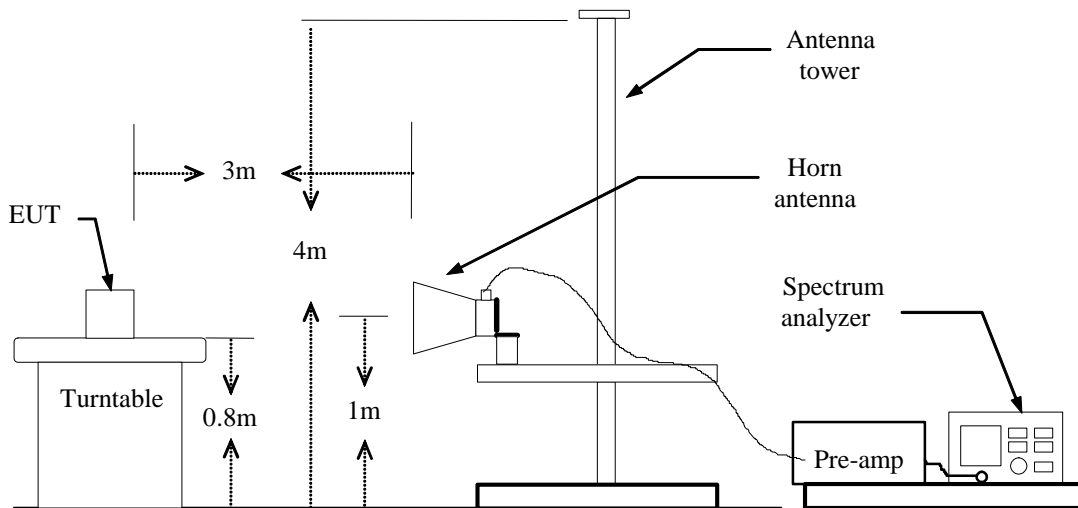
7.5 BAND EDGES MEASUREMENT

LIMIT

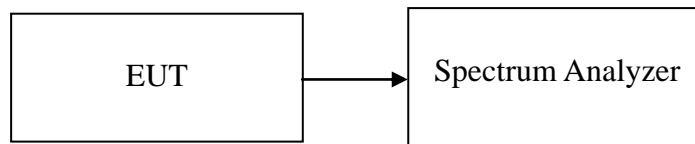
According to §15.247(d) & RSS-210 §A8.5, in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Test Configuration

For Radiated



For Conducted





TEST PROCEDURE

For Radiated

1. The EUT is placed on a turntable, which is 0.8m above the 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 emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
 - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

For Conducted

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

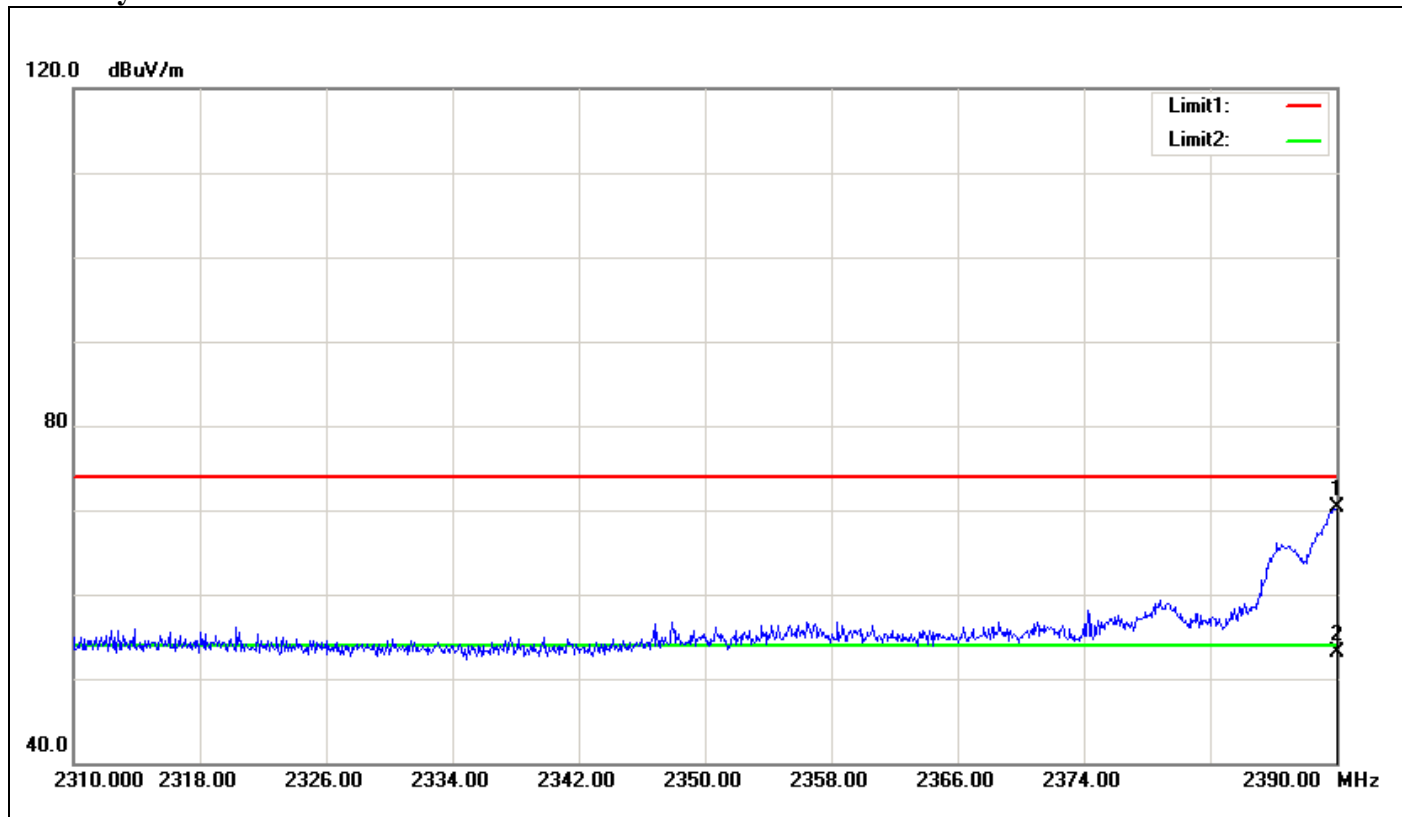
TEST RESULTS

Refer to attach spectrum analyzer data chart.



Band Edges (IEEE 802.11b mode / CH Low)

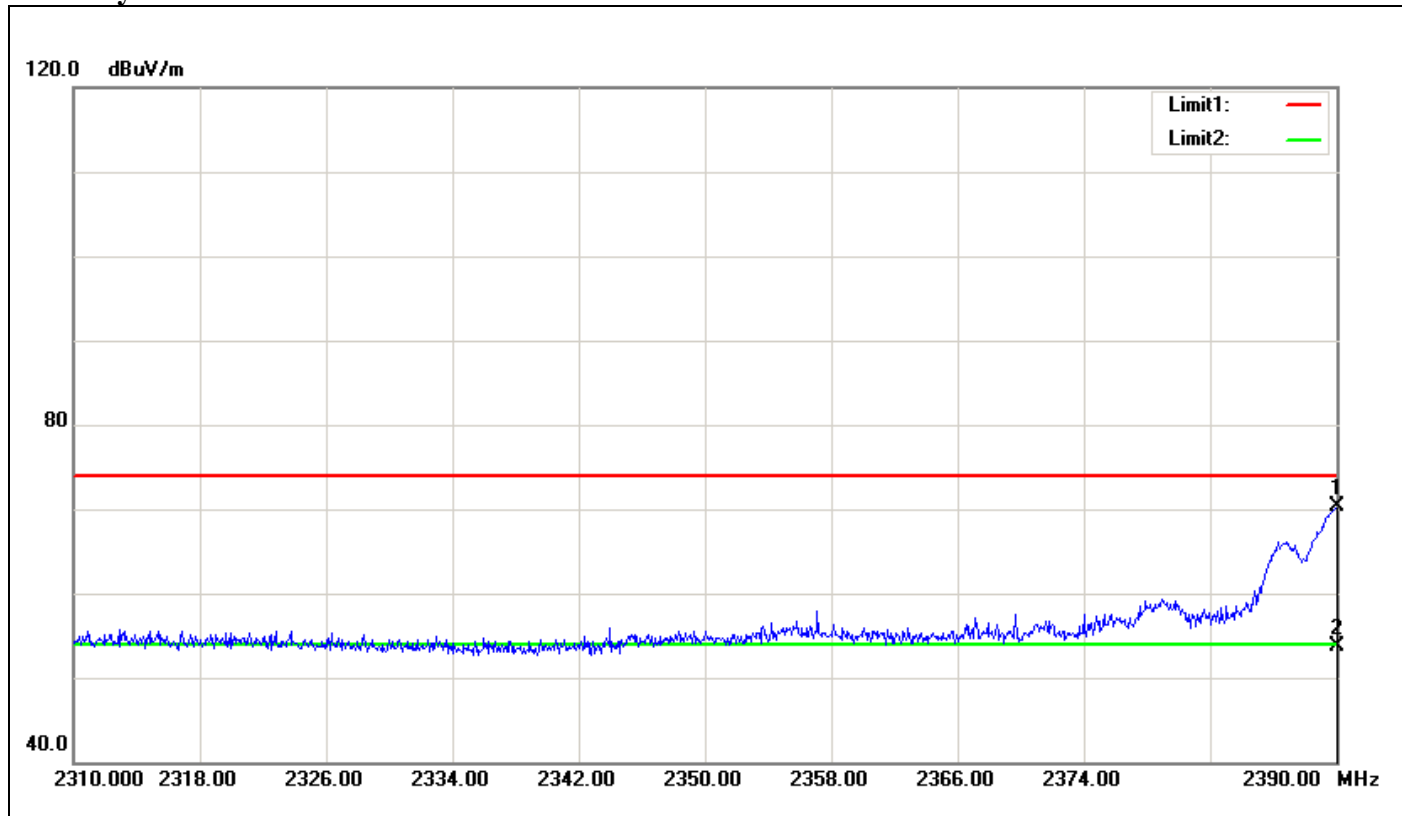
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2390.000	71.34	-1.05	70.29	74.00	-3.71	100	66	peak
2	2390.000	54.22	-1.05	53.17	54.00	-0.83	100	66	AVG



Polarity: Horizontal

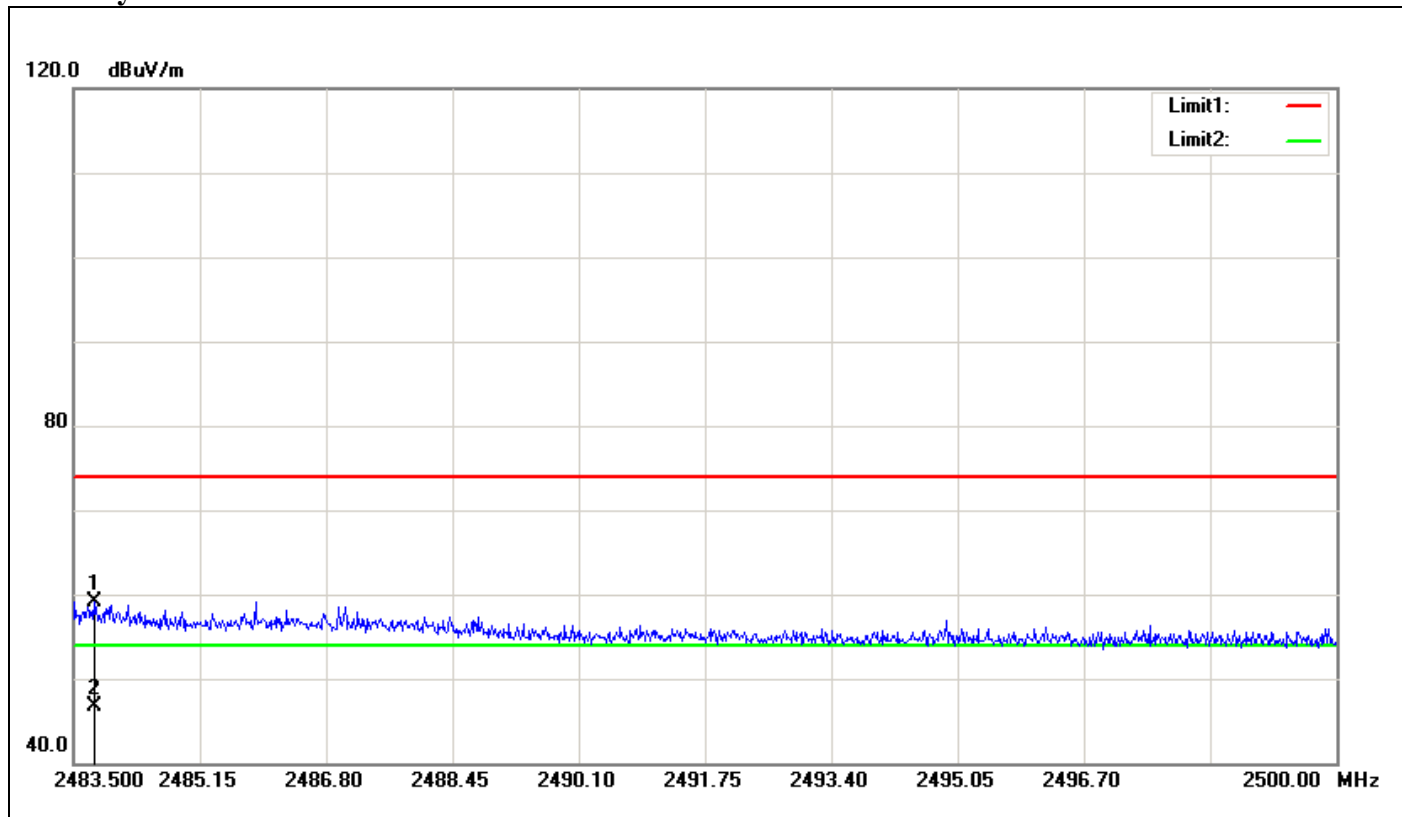


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2390.000	71.31	-1.05	70.26	74.00	-3.74	100	273	peak
2	2390.000	54.66	-1.05	53.61	54.00	-0.39	100	273	AVG



Band Edges (IEEE 802.11b mode / CH High)

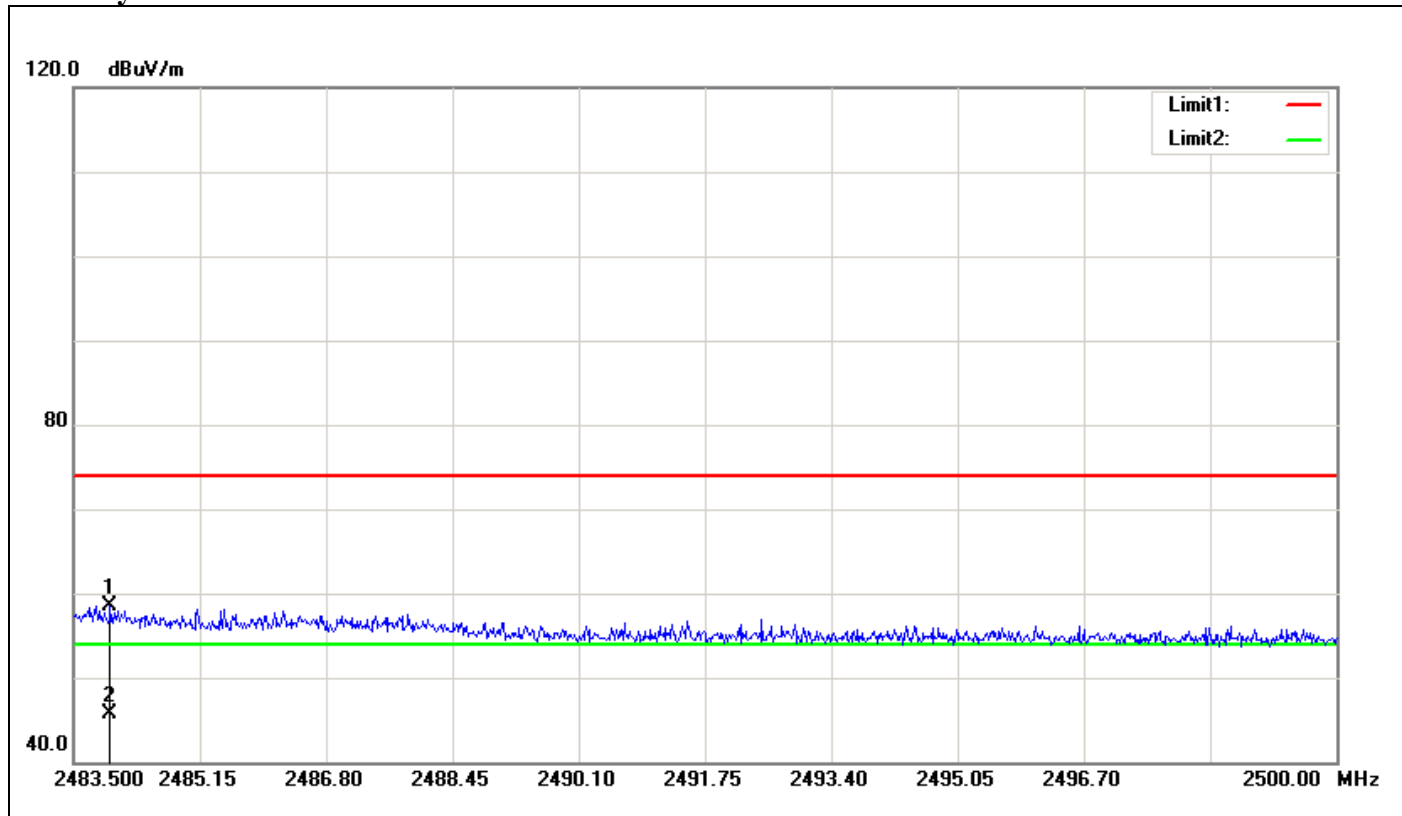
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2483.764	59.65	-0.47	59.18	74.00	-14.82	100	245	peak
2	2483.764	47.19	-0.47	46.72	54.00	-7.28	100	245	AVG



Polarity: Horizontal

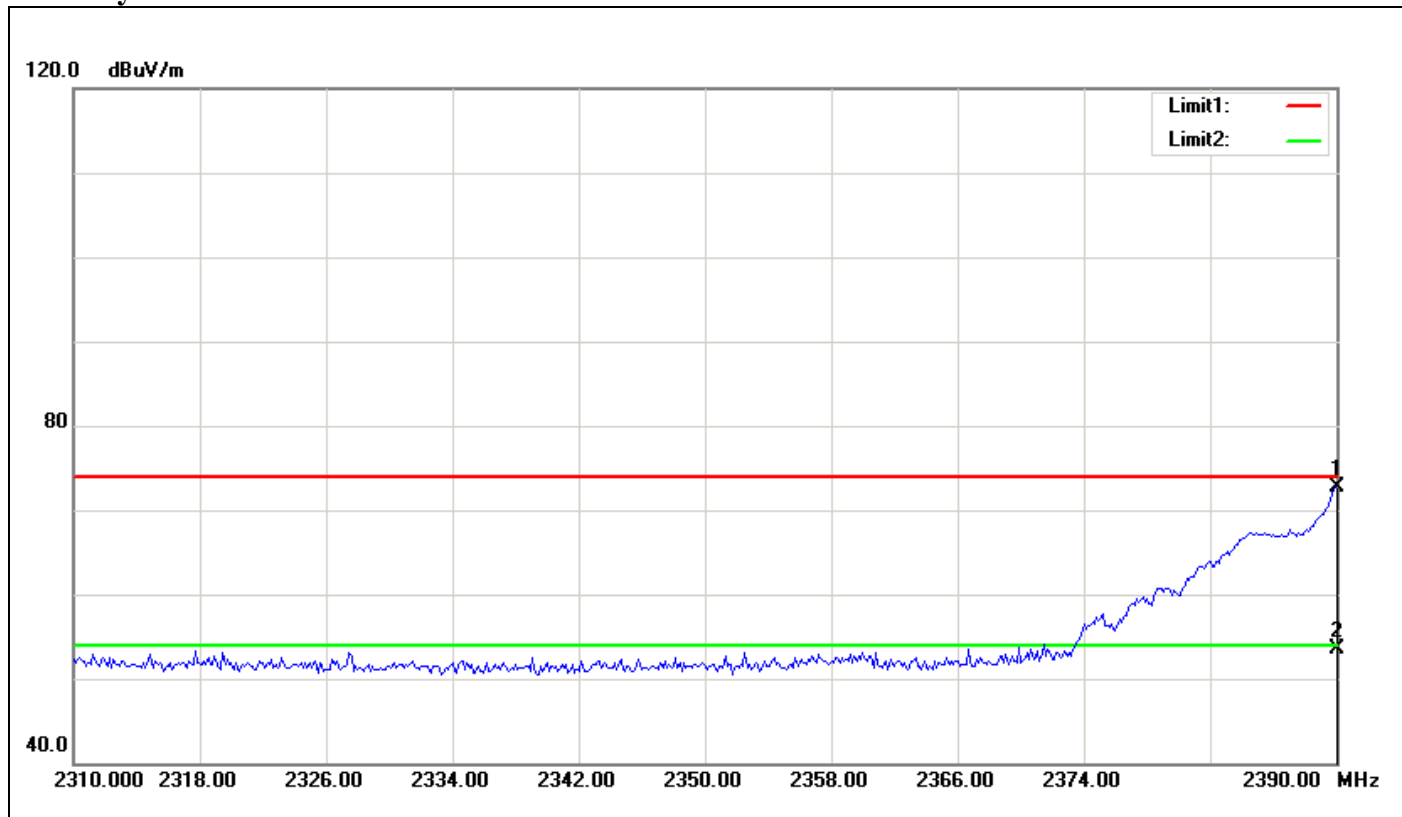


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2483.979	59.02	-0.47	58.55	74.00	-15.45	100	3	peak
2	2483.979	46.23	-0.47	45.76	54.00	-8.24	100	3	AVG



Band Edges (IEEE 802.11g mode / CH Low)

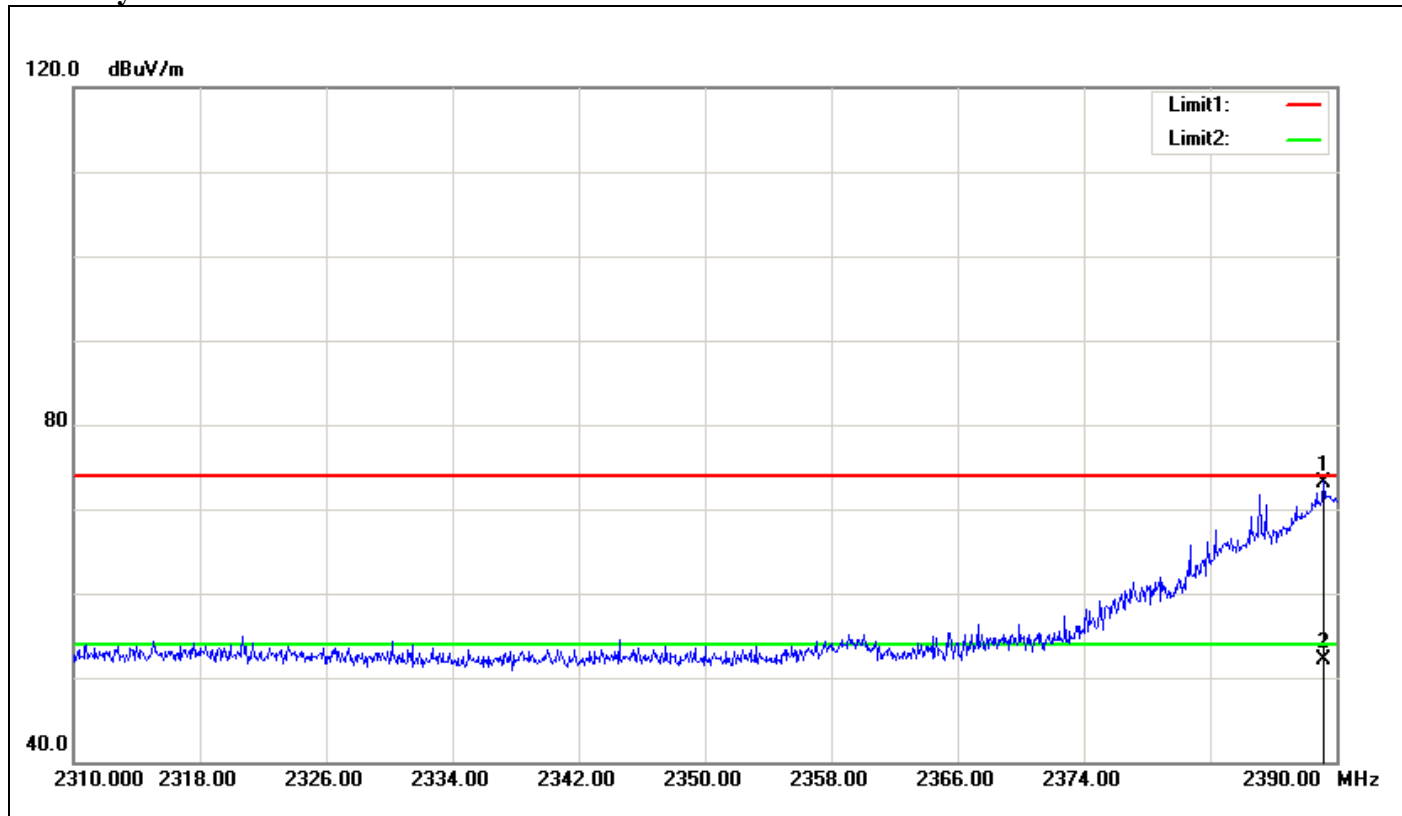
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2390.000	73.72	-1.05	72.67	74.00	-1.33	100	229	peak
2	2390.000	54.65	-1.05	53.60	54.00	-0.40	100	229	AVG



Polarity: Horizontal

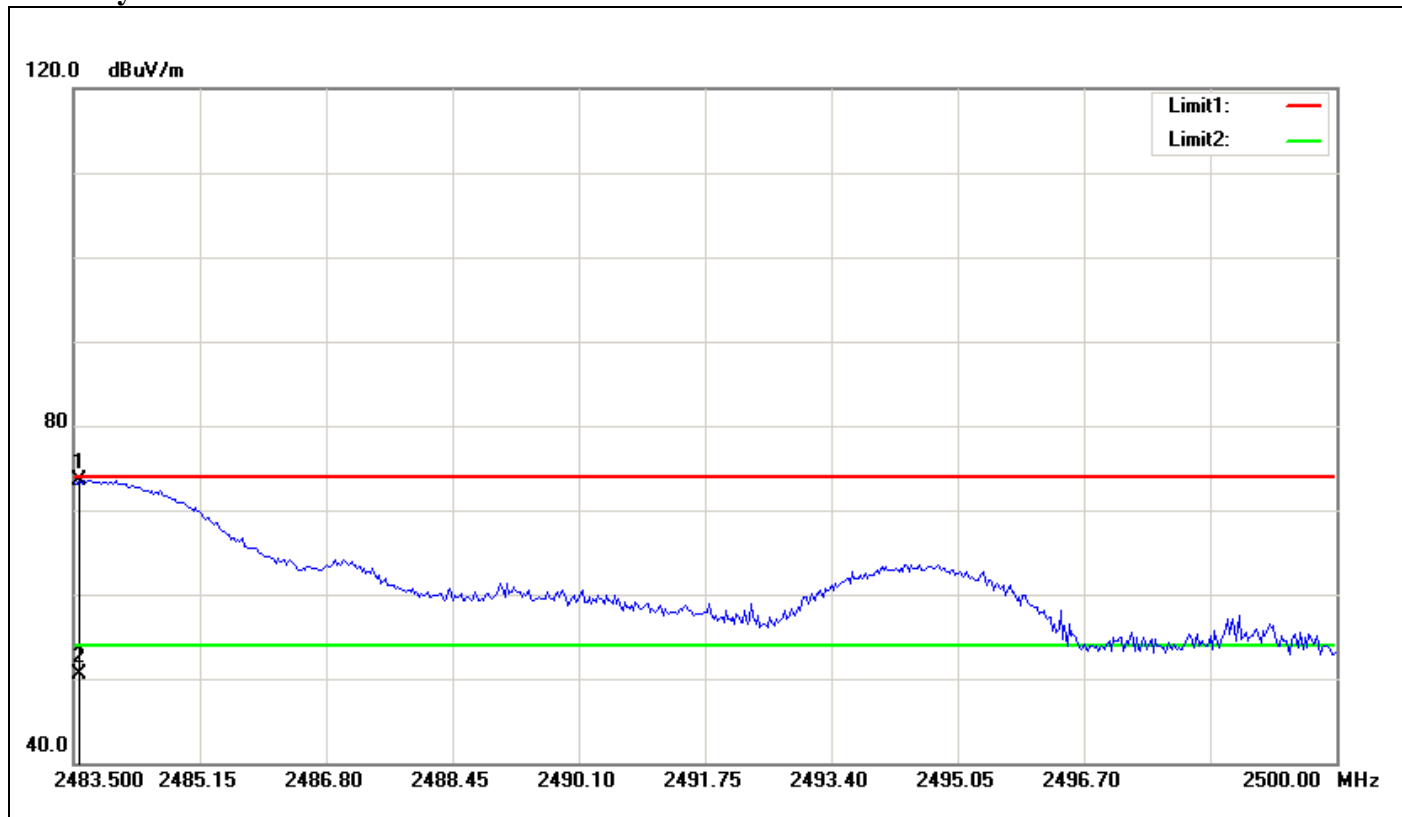


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2389.200	74.26	-1.06	73.20	74.00	-0.80	100	356	peak
2	2389.200	53.16	-1.06	52.10	54.00	-1.90	100	356	AVG



Band Edges (IEEE 802.11g mode / CH High)

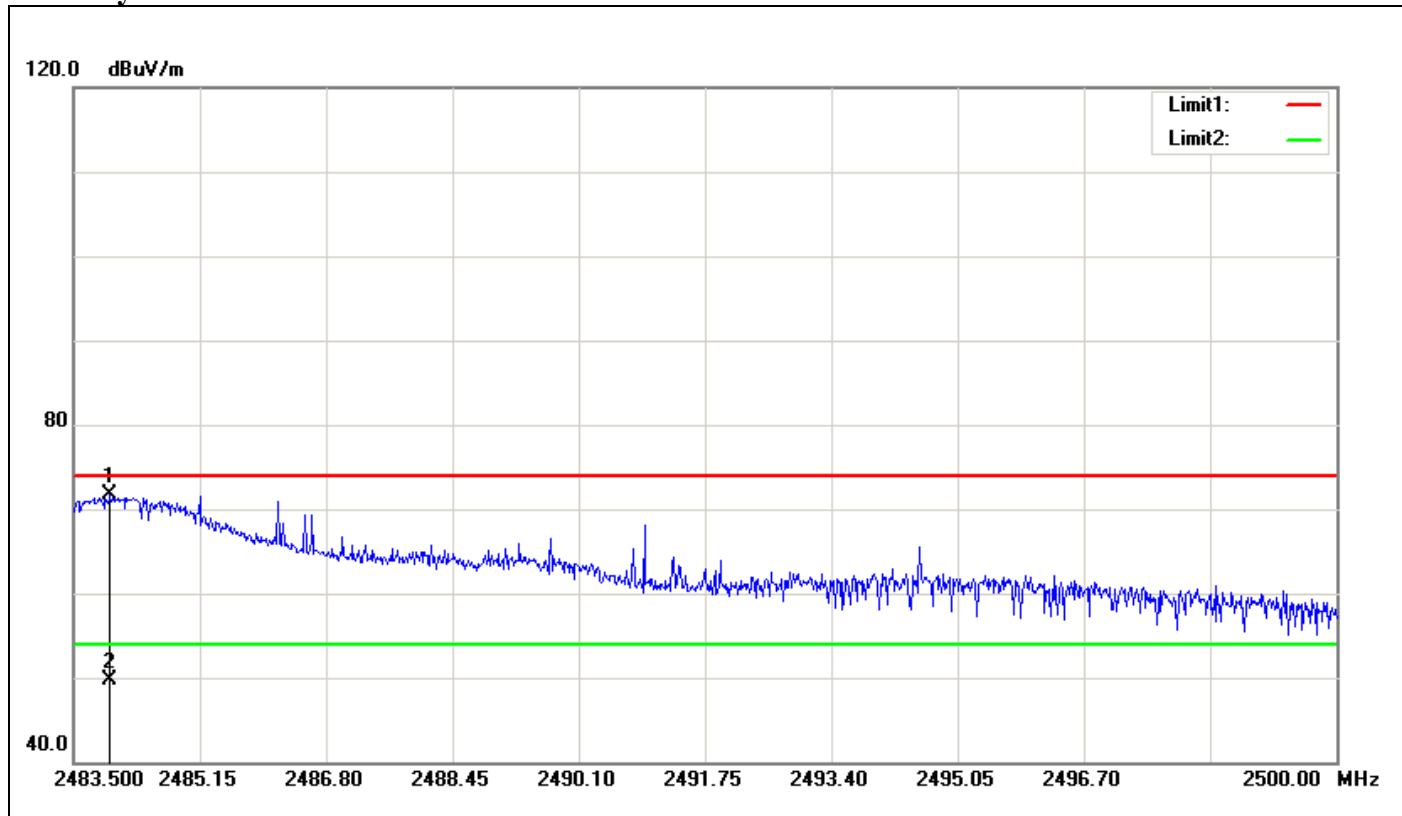
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2483.582	74.06	-0.47	73.59	74.00	-0.41	100	284	peak
2	2483.582	50.99	-0.47	50.52	54.00	-3.48	100	284	AVG



Polarity: Horizontal

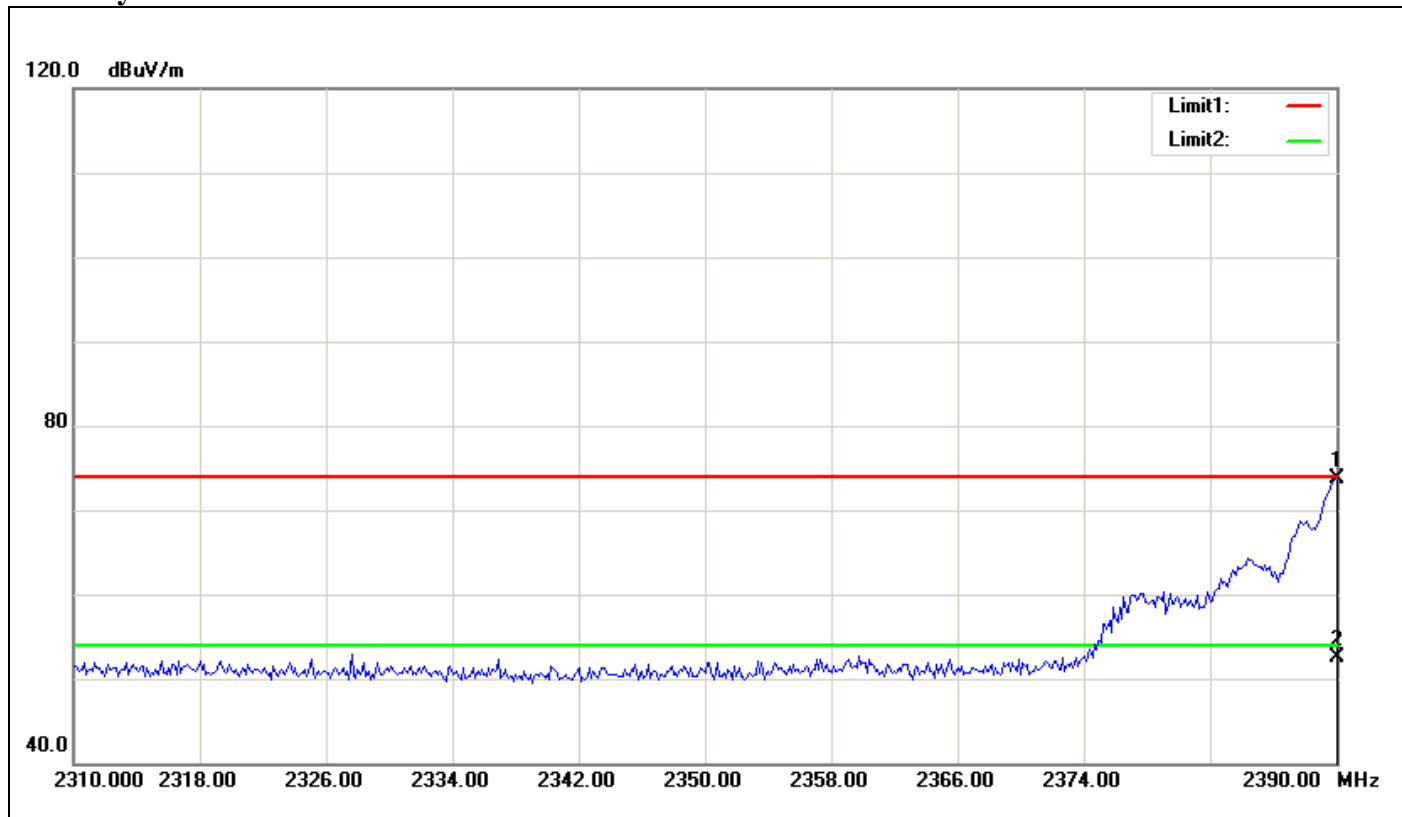


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2483.979	72.17	-0.47	71.70	74.00	-2.30	100	77	peak
2	2483.979	50.26	-0.47	49.79	54.00	-4.21	100	77	AVG



Band Edges (IEEE 802.11n HT 20 MHz mode / CH Low)

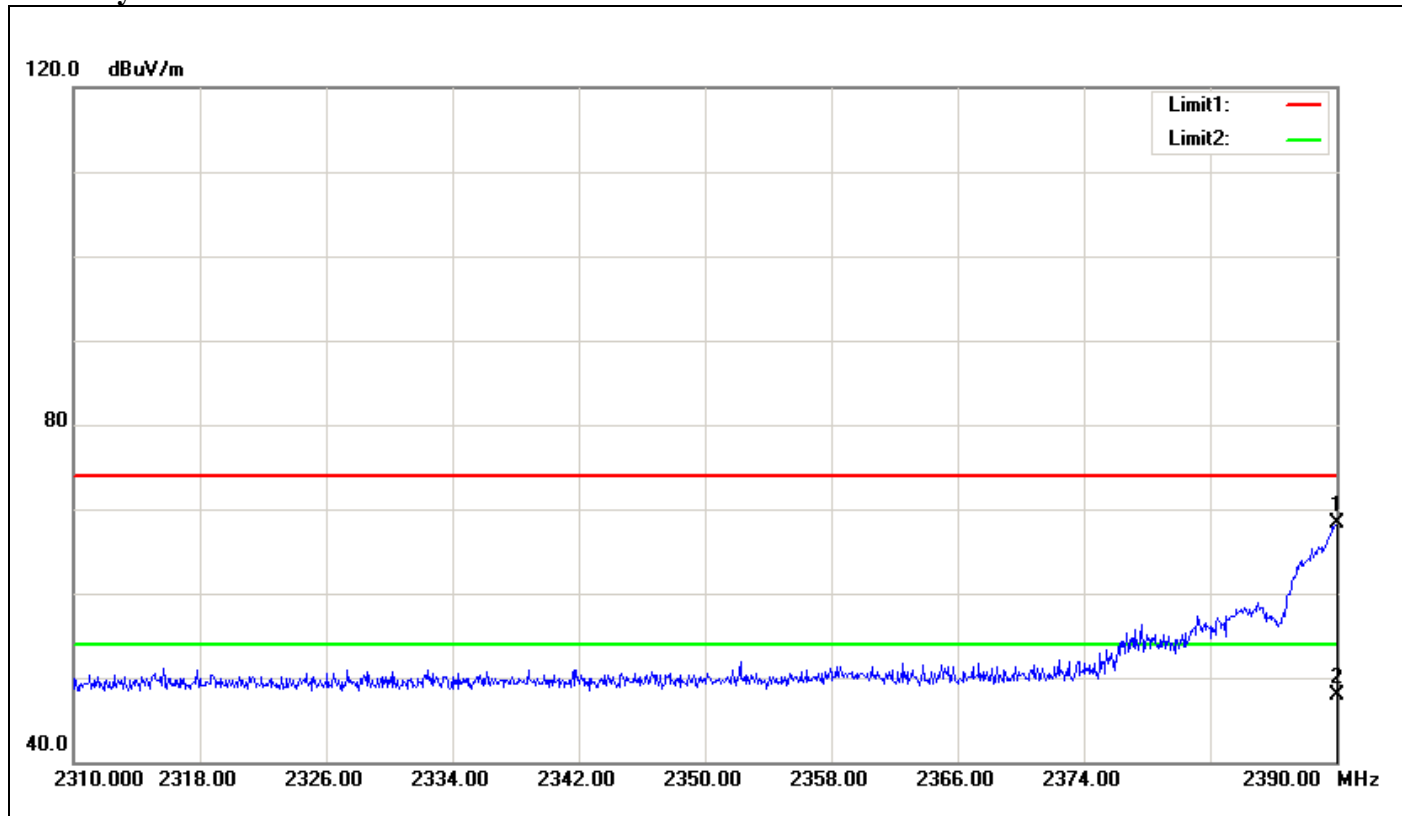
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2390.000	74.66	-1.05	73.61	74.00	-0.39	100	295	peak
2	2390.000	53.55	-1.05	52.50	54.00	-1.50	100	295	AVG



Polarity: Horizontal

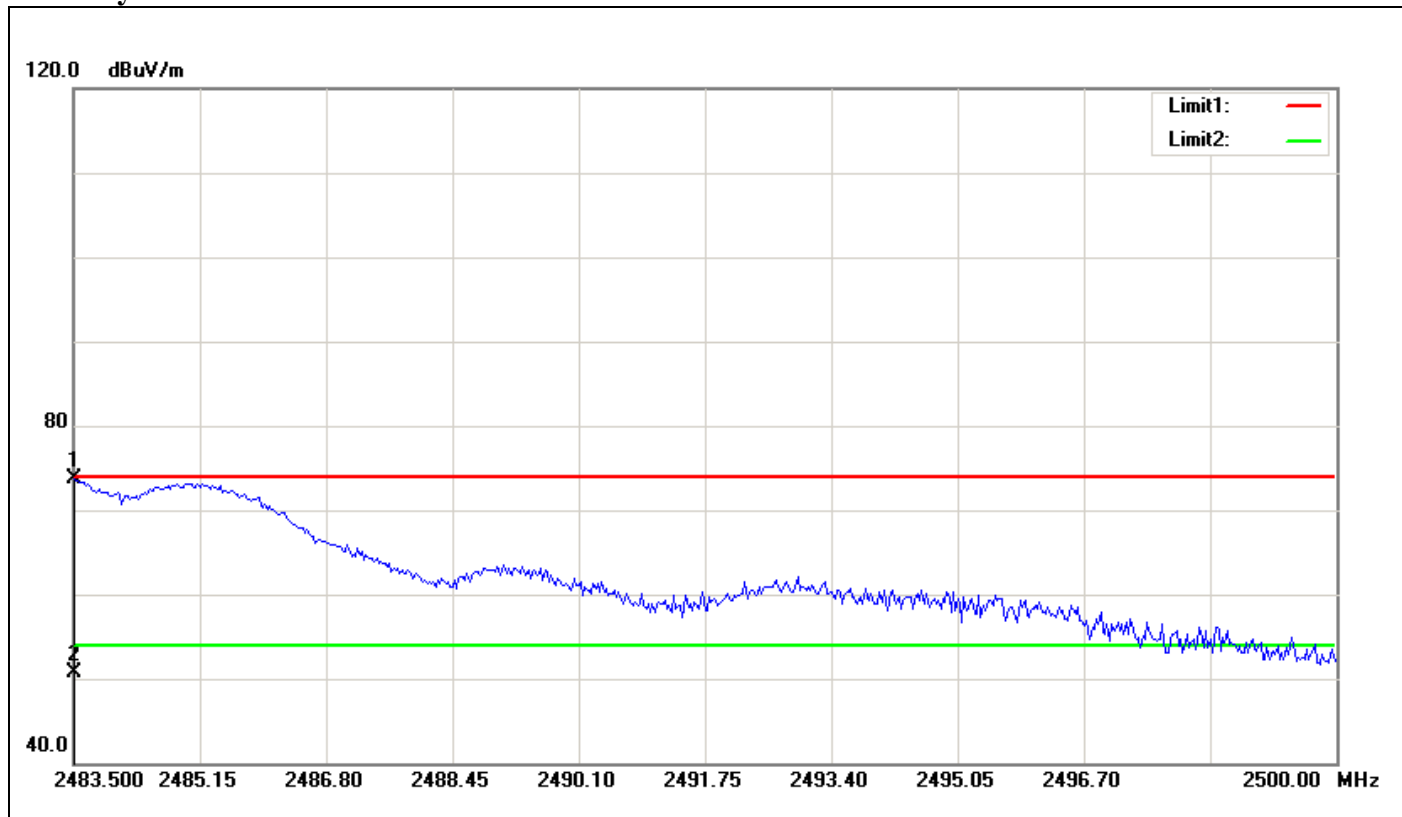


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2390.000	69.44	-1.05	68.39	74.00	-5.61	100	349	peak
2	2390.000	48.90	-1.05	47.85	54.00	-6.15	100	349	AVG



Band Edges (IEEE 802.11n HT 20 MHz mode / CH High)

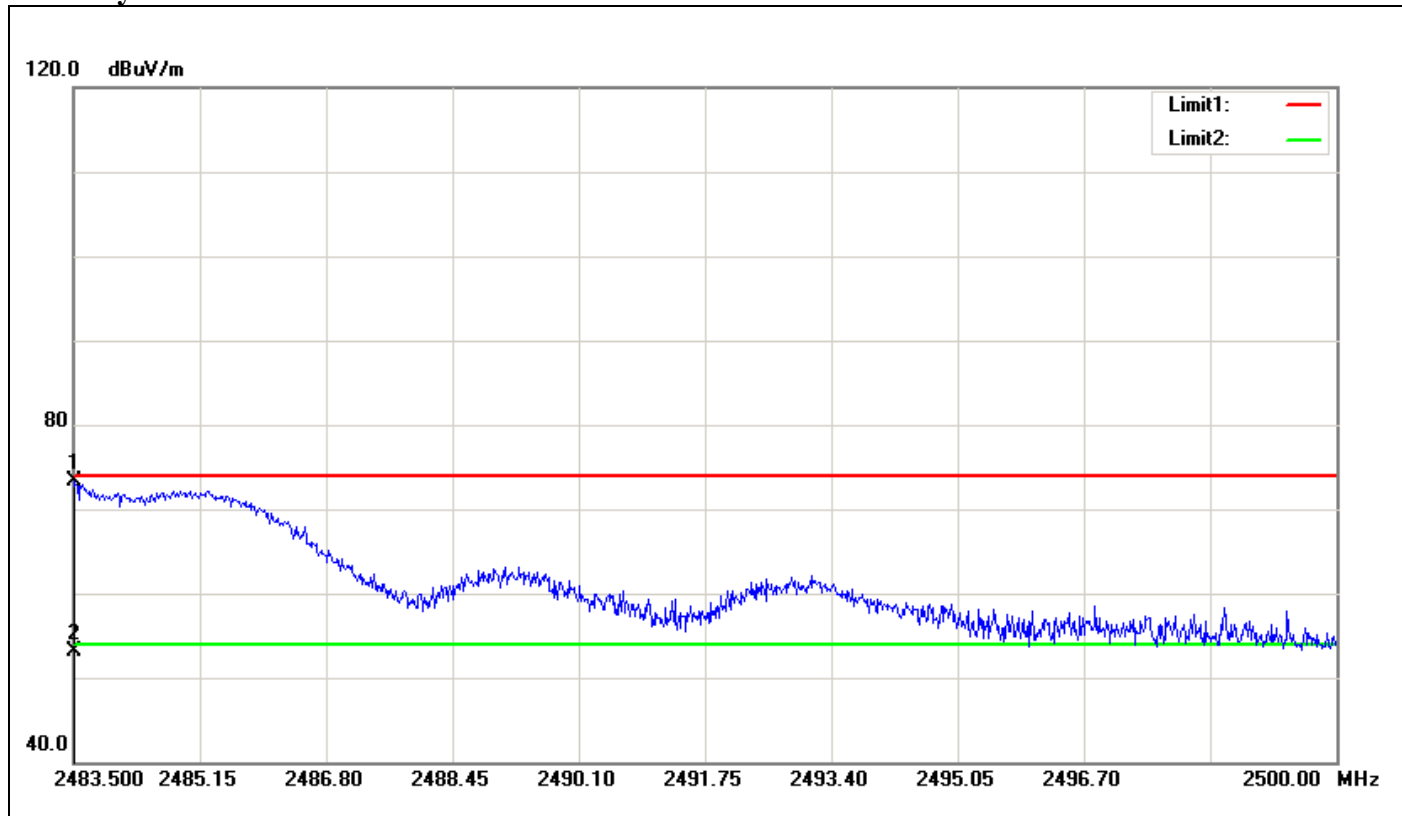
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2483.500	74.11	-0.47	73.64	74.00	-0.36	100	294	peak
2	2483.500	51.10	-0.47	50.63	54.00	-3.37	100	294	AVG



Polarity: Horizontal

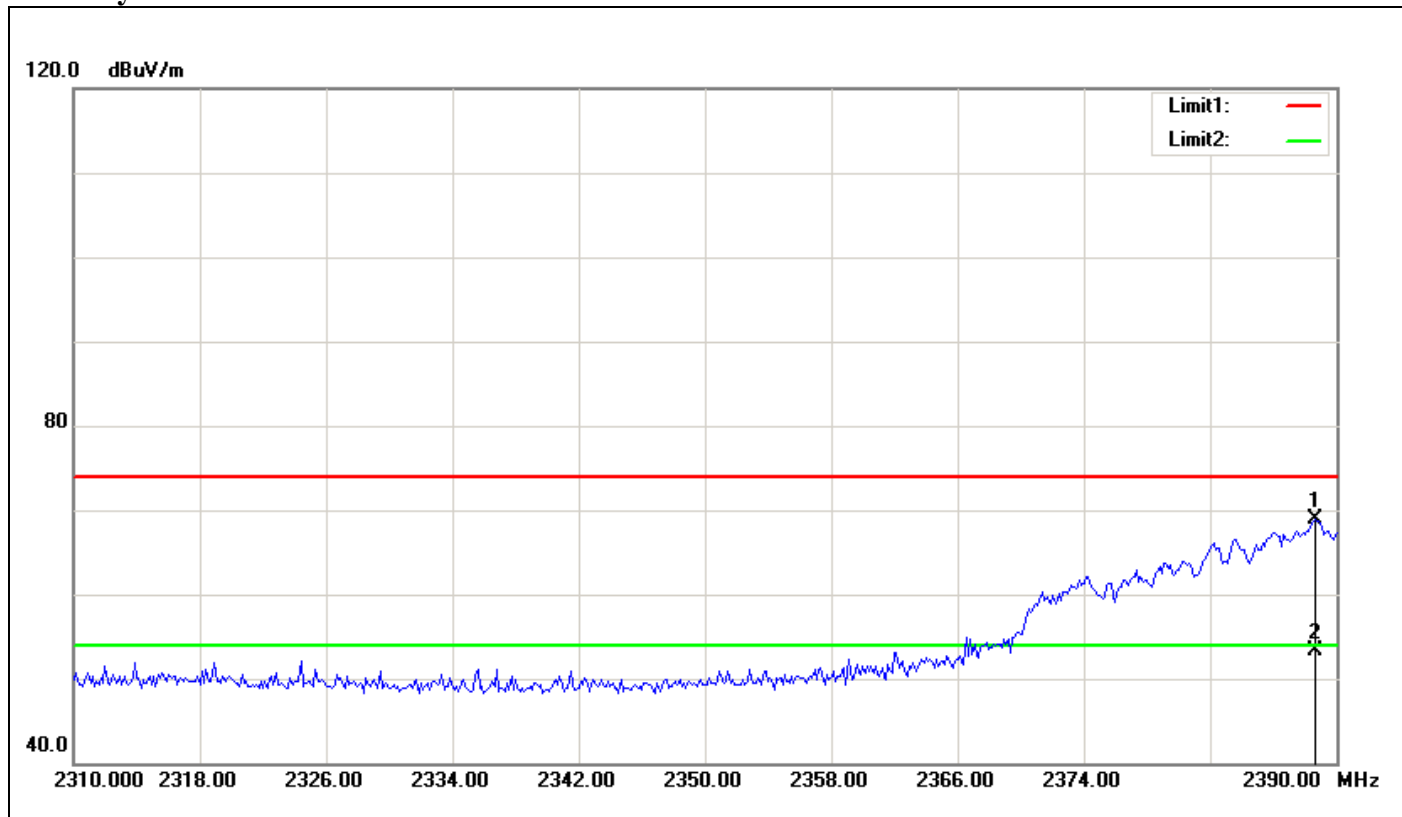


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2483.500	73.78	-0.47	73.31	74.00	-0.69	100	302	peak
2	2483.500	53.57	-0.47	53.10	54.00	-0.90	100	302	AVG



Band Edges (IEEE 802.11n HT 40 MHz mode / CH Low)

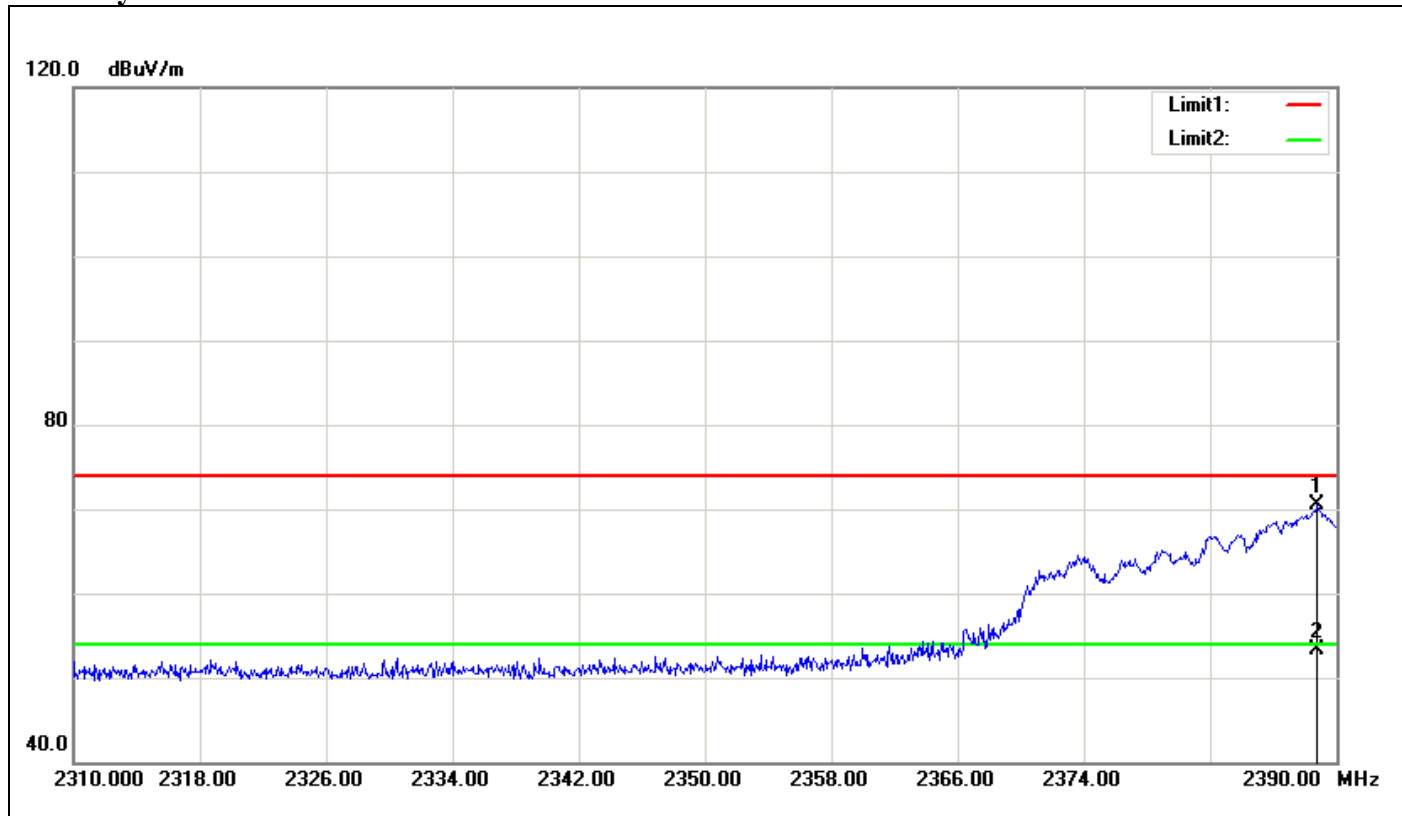
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2388.667	69.95	-1.06	68.89	74.00	-5.11	100	163	peak
2	2388.667	54.27	-1.06	53.21	54.00	-0.79	100	163	AVG



Polarity: Horizontal

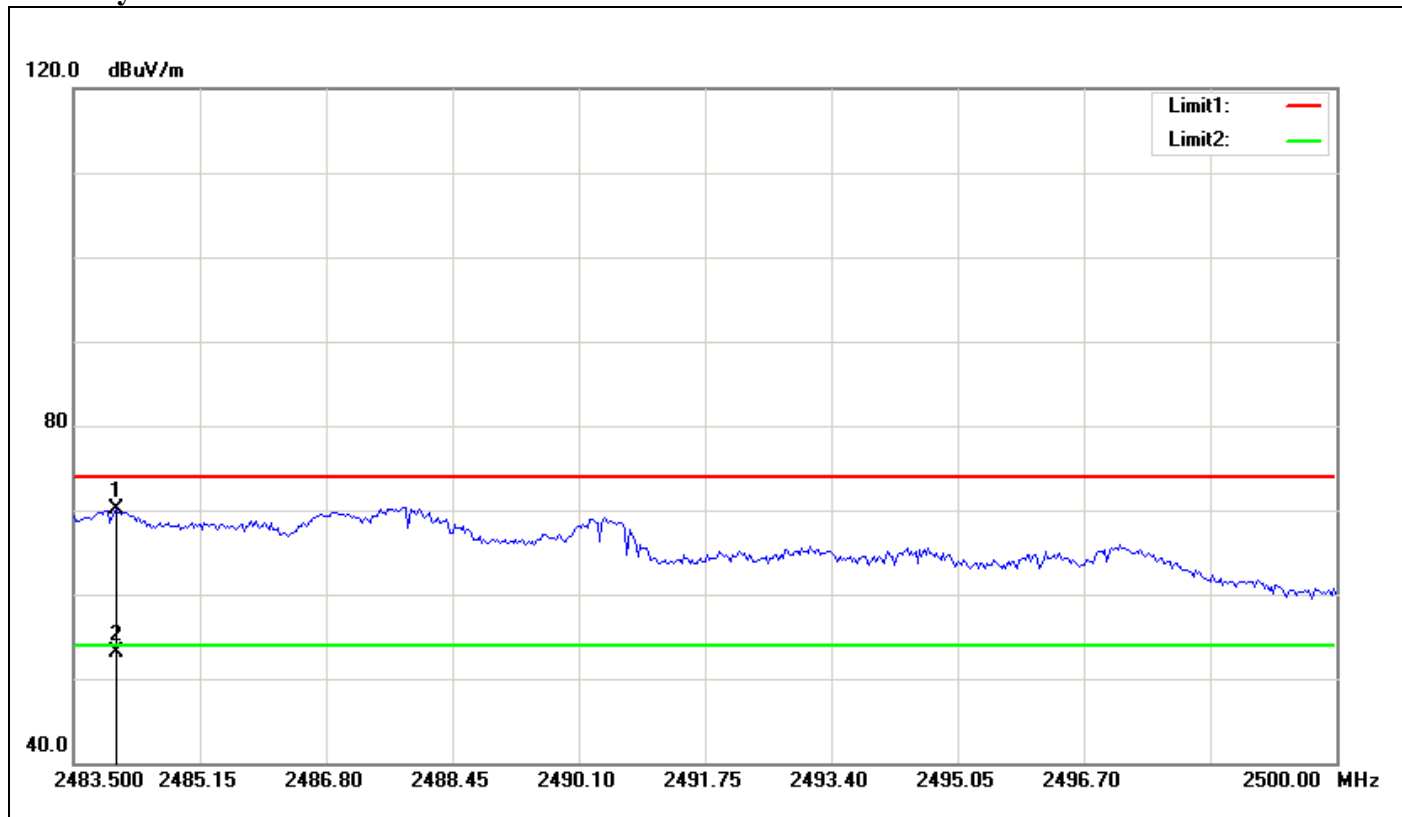


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2388.800	71.47	-1.06	70.41	74.00	-3.59	100	186	peak
2	2388.800	54.28	-1.06	53.22	54.00	-0.78	100	186	AVG



Band Edges (IEEE 802.11n HT 40 MHz mode / CH High)

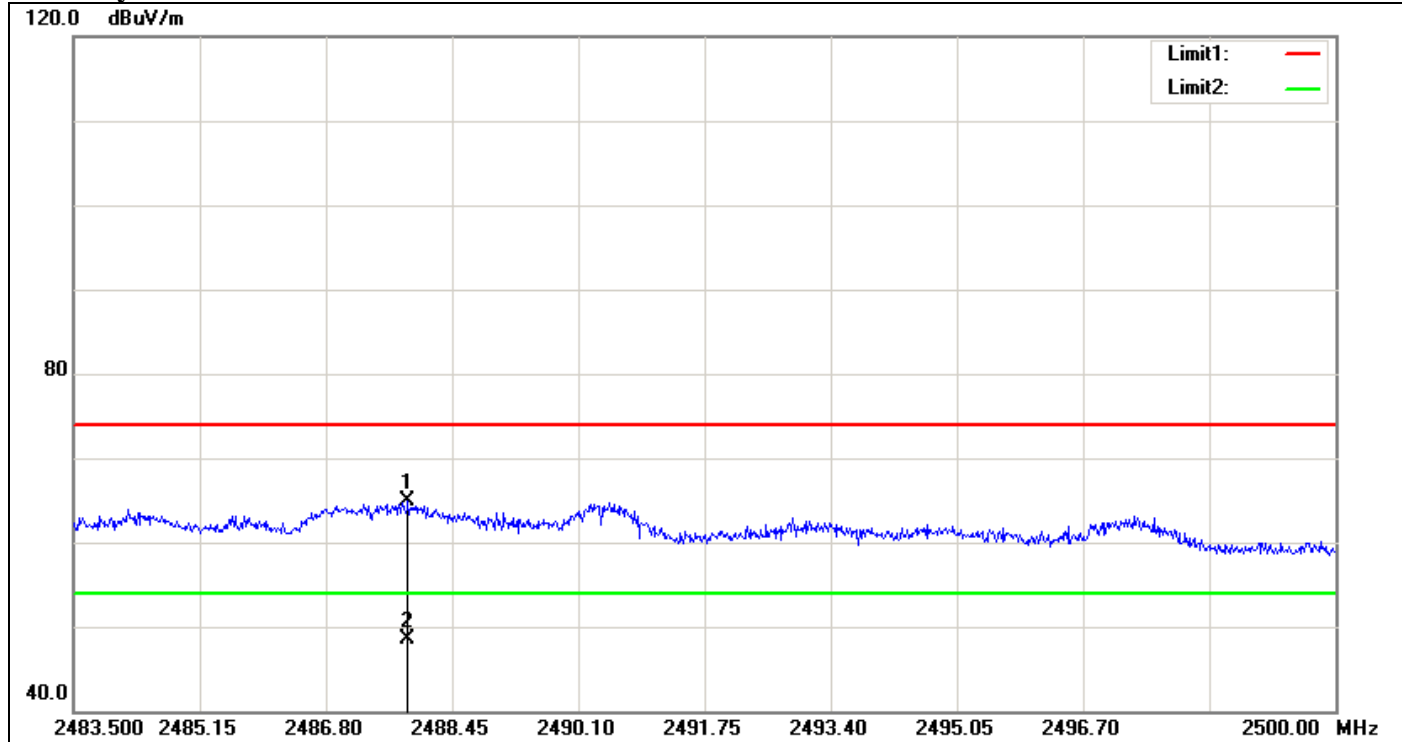
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2484.050	70.51	-0.47	70.04	74.00	-3.96	100	77	peak
2	2484.050	53.61	-0.47	53.14	54.00	-0.86	100	77	AVG



Polarity: Horizontal

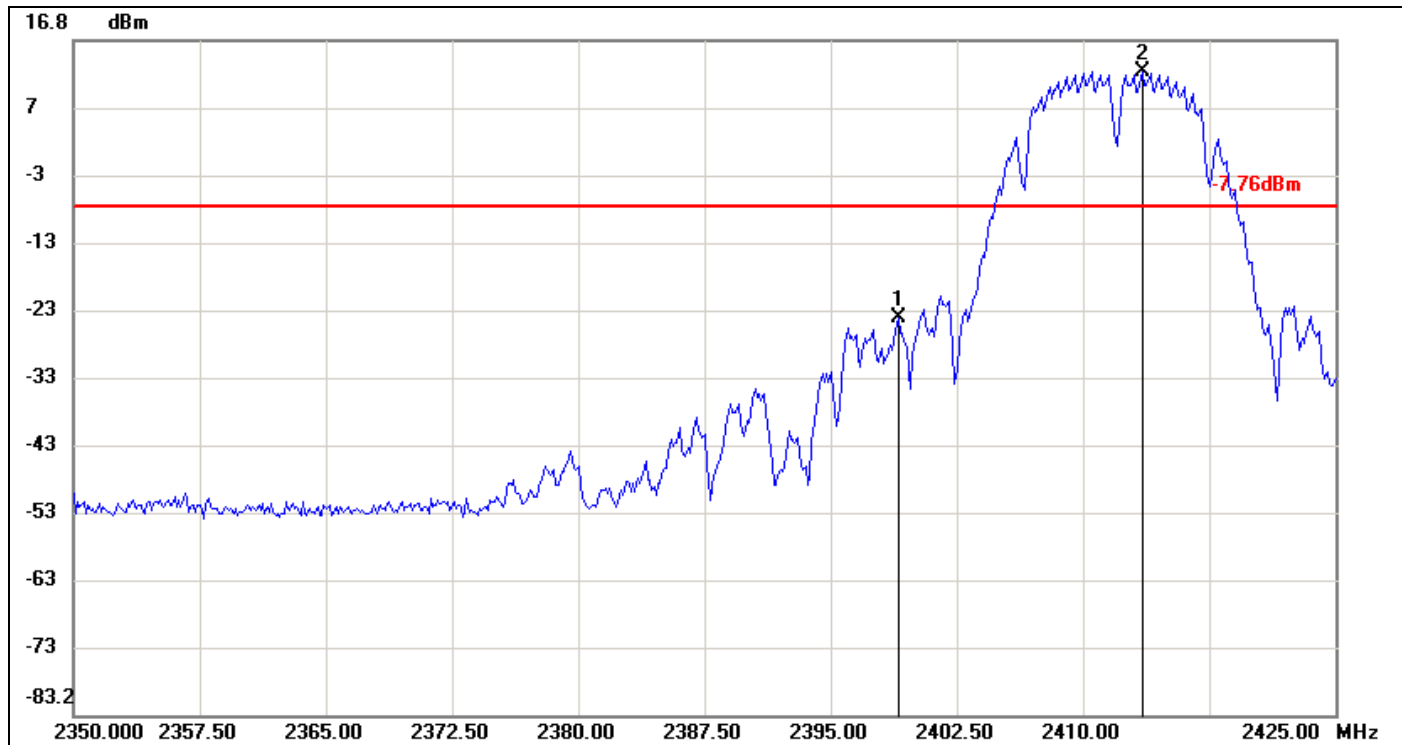


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2487.872	65.27	-0.42	64.85	74.00	-9.15	100	67	peak
2	2487.872	48.96	-0.42	48.54	54.00	-5.46	100	67	AVG



Test Plot

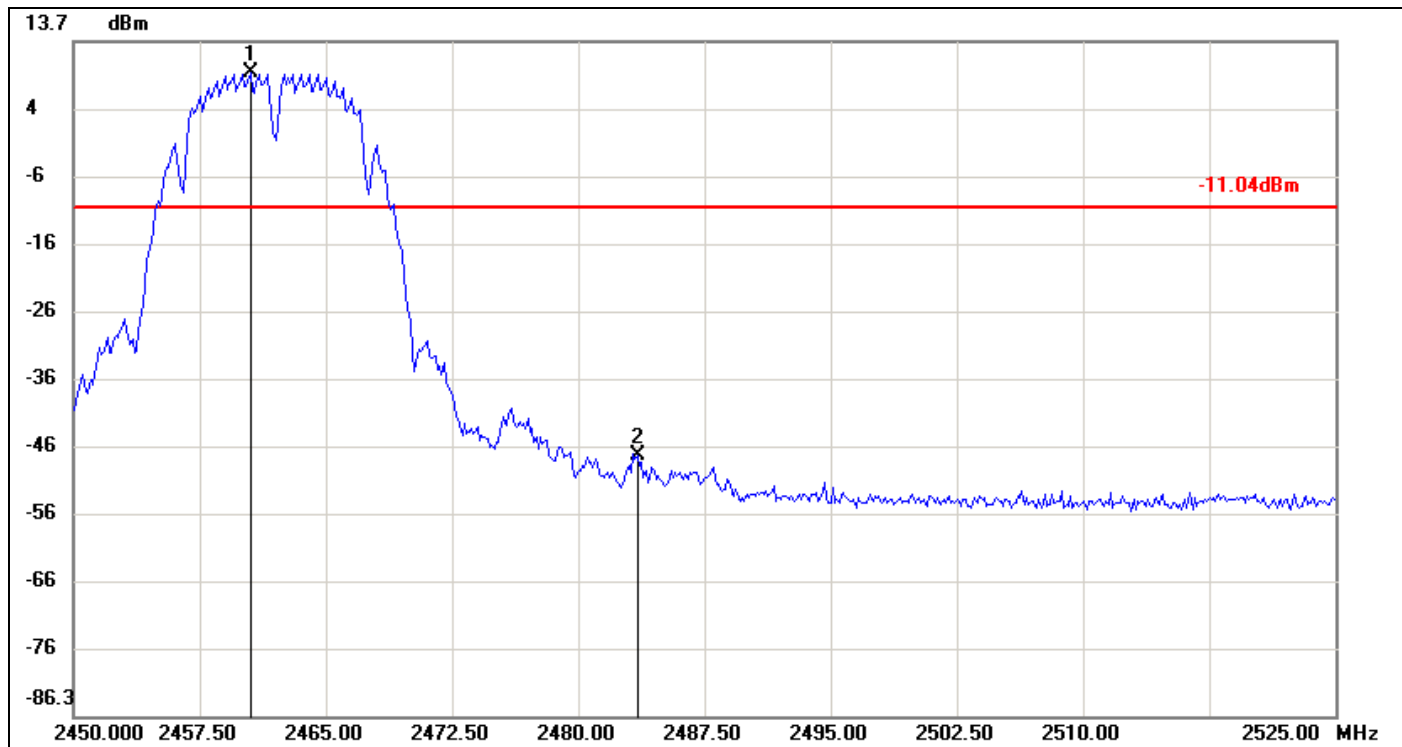
Conducted Band Edges (IEEE 802.11b mode / CH Low)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2399.0000	-24.37	-7.76	-16.61
2	2413.5000	12.24	-7.76	20.00



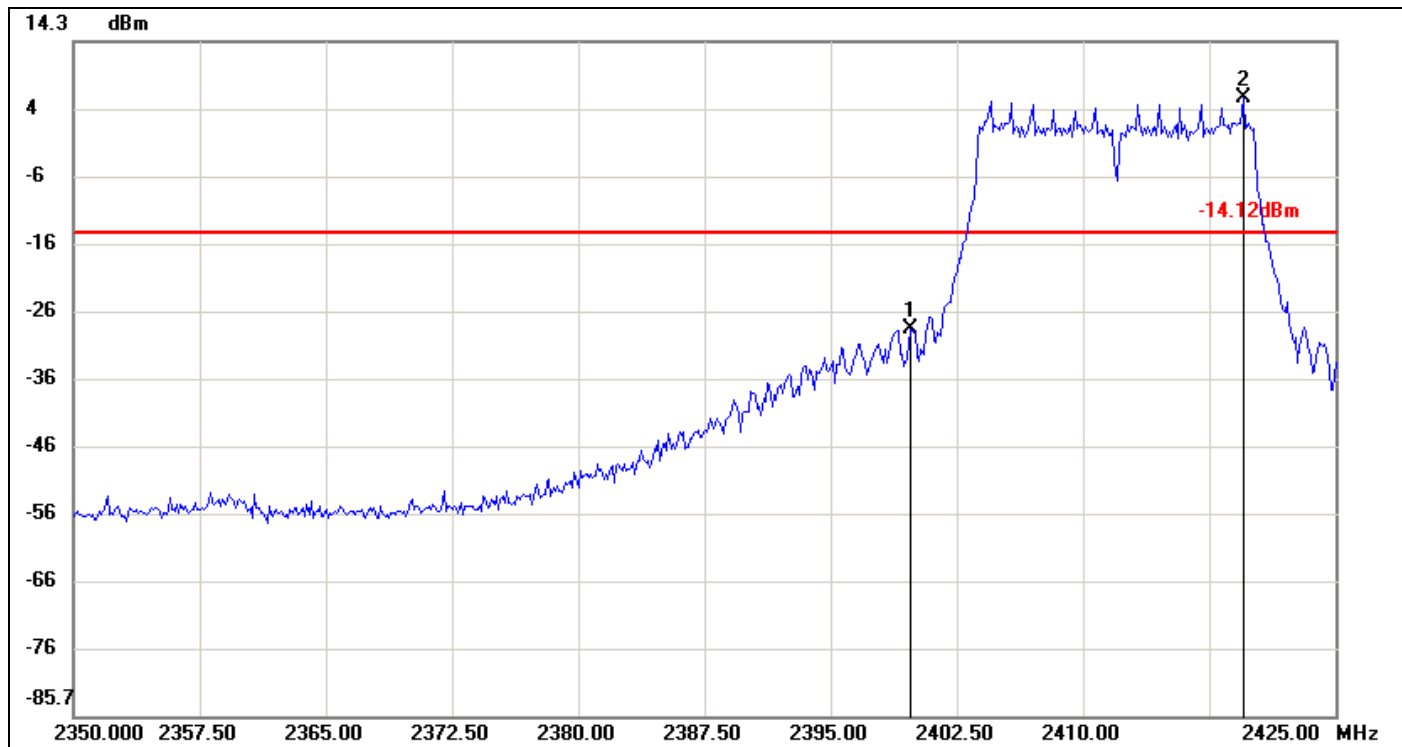
Conducted Band Edges (IEEE 802.11b mode / CH High)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2460.5000	8.96	-11.04	20.00
2	2483.5000	-47.68	-11.04	-36.64



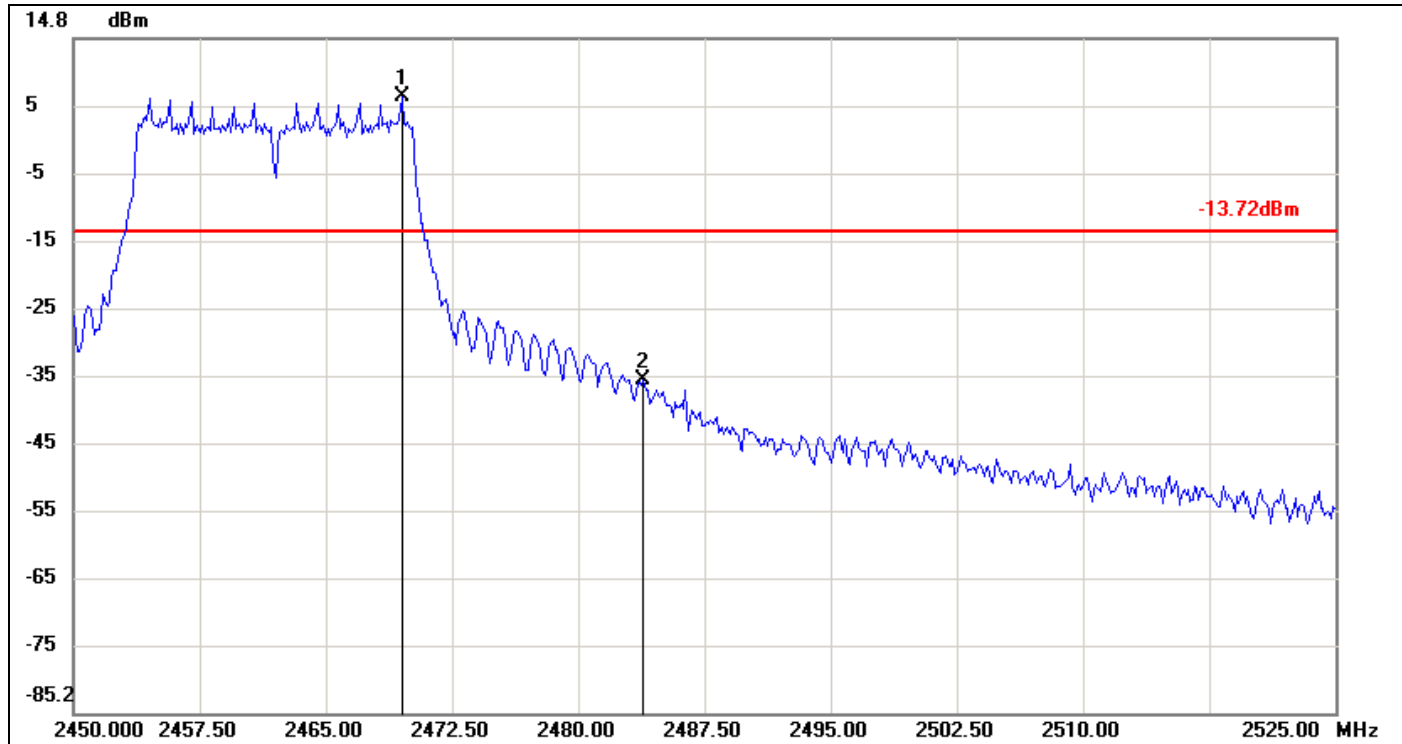
Conducted Band Edges (IEEE 802.11g mode / CH Low)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2399.7500	-28.34	-14.12	-14.22
2	2419.5000	5.88	-14.12	20.00



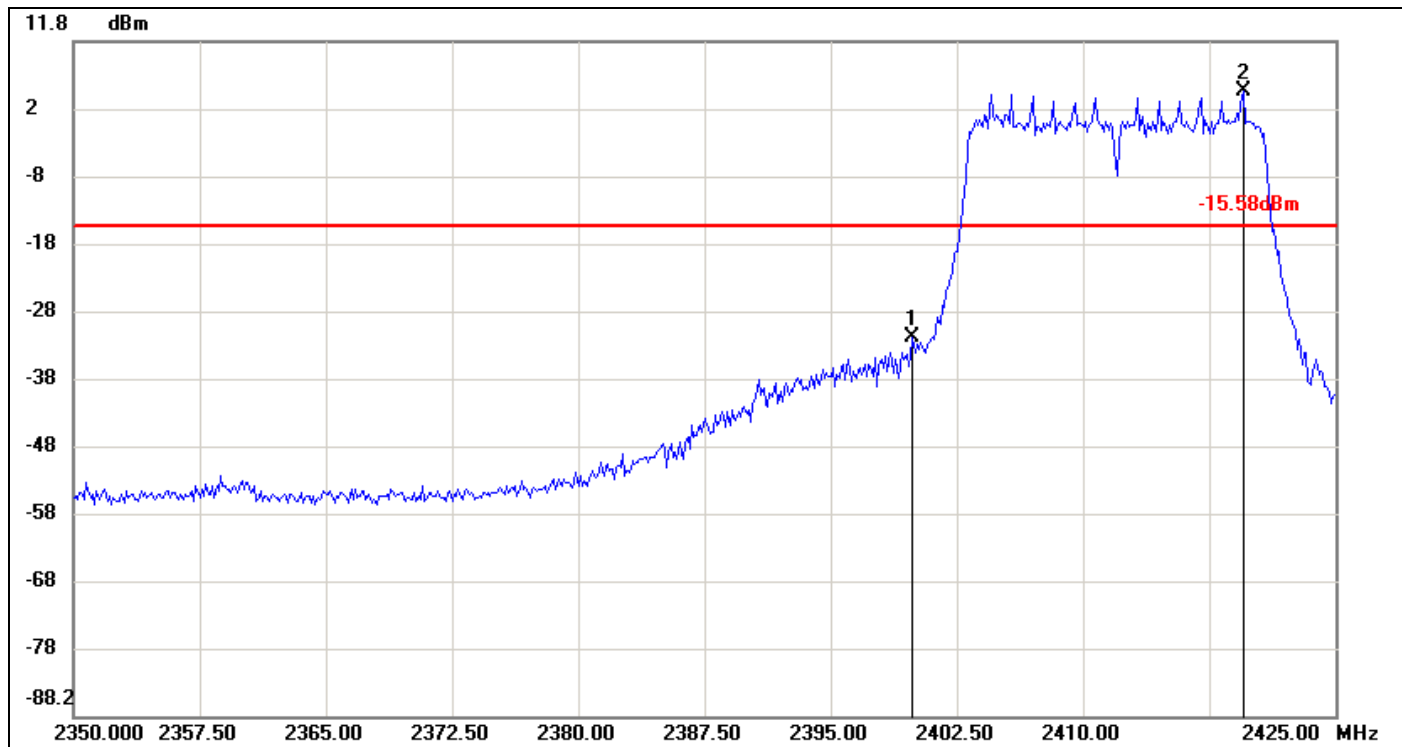
Conducted Band Edges (IEEE 802.11g mode / CH High)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2469.5000	6.28	-13.72	20.00
2	2483.8750	-35.79	-13.72	-22.07



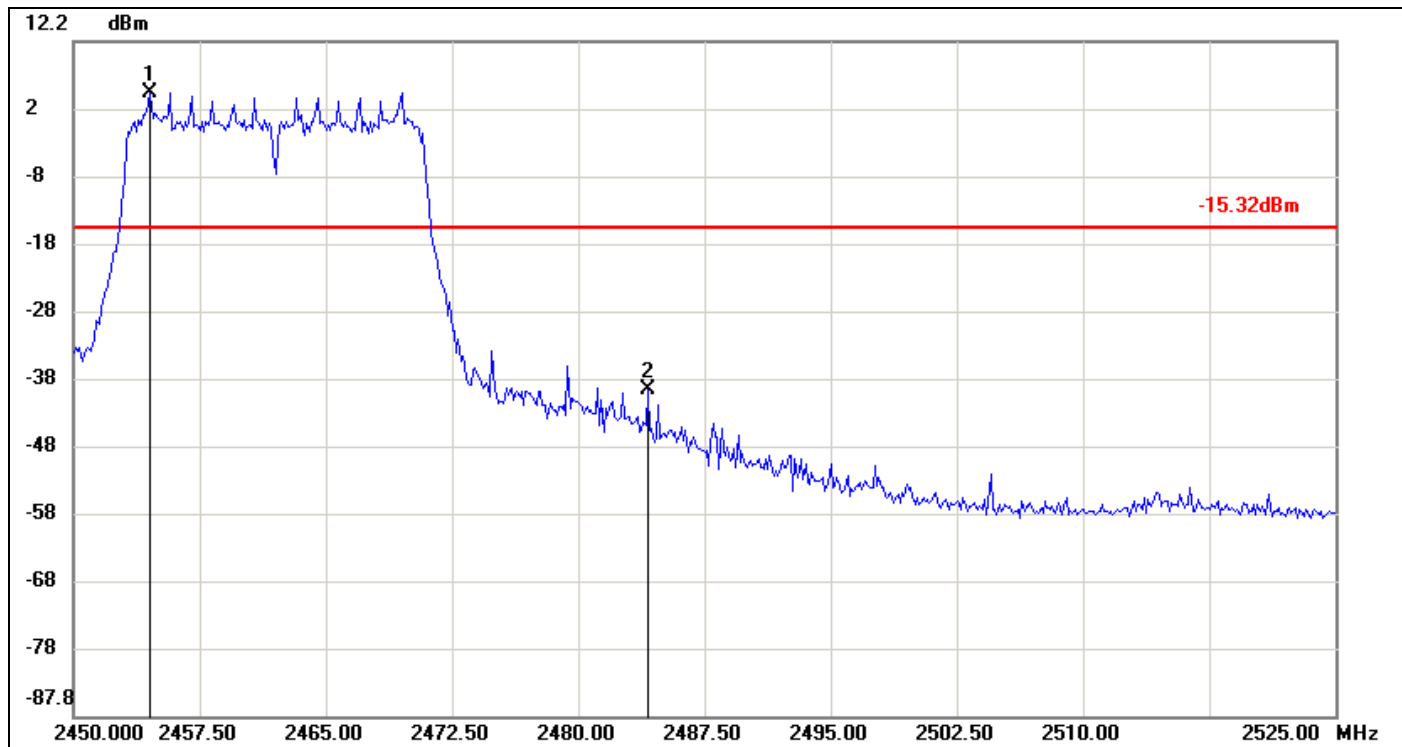
Conducted Band Edges (IEEE 802.11n HT 20 MHz mode / CH Low)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2399.8750	-32.19	-15.58	-16.61
2	2419.5000	4.42	-15.58	20.00



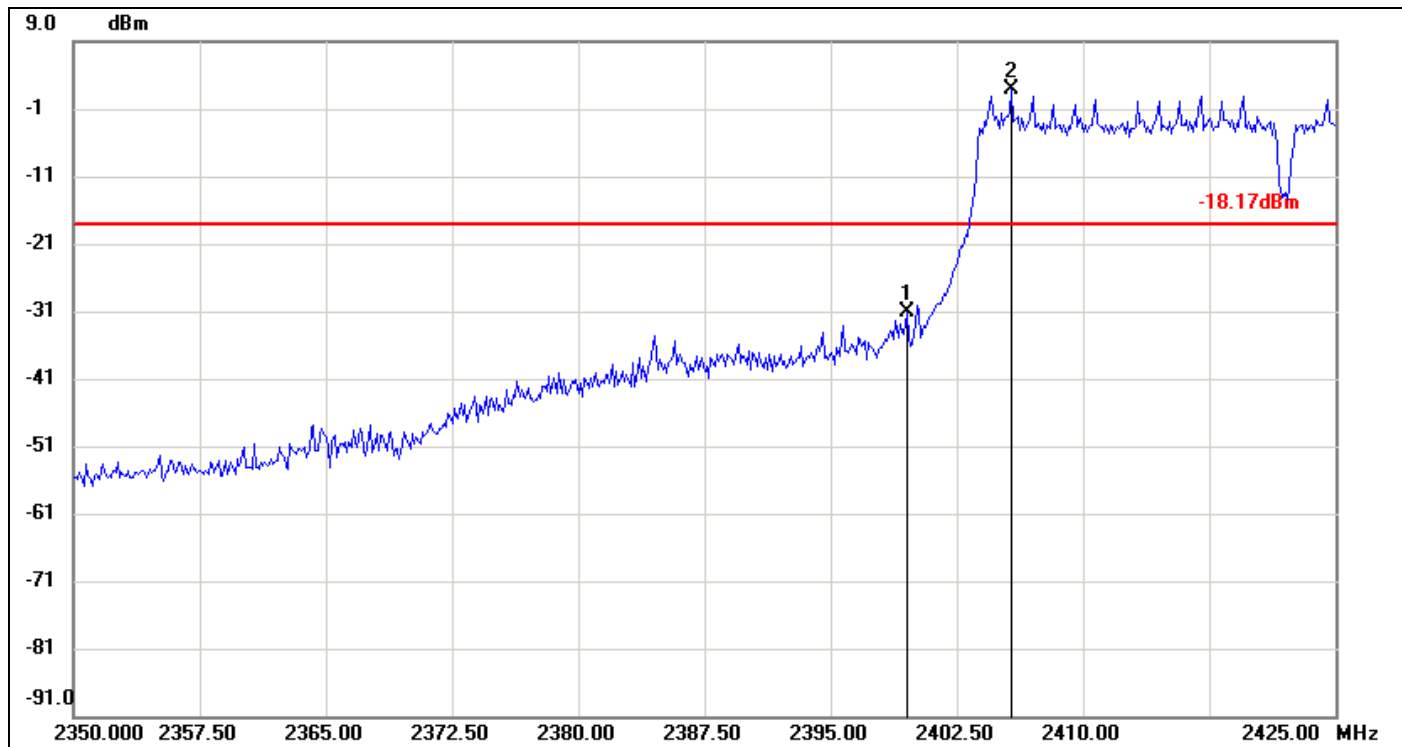
Conducted Band Edges (IEEE 802.11n HT 20 MHz mode / CH High)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2454.5000	4.68	-15.32	20.00
2	2484.1250	-39.48	-15.32	-24.16



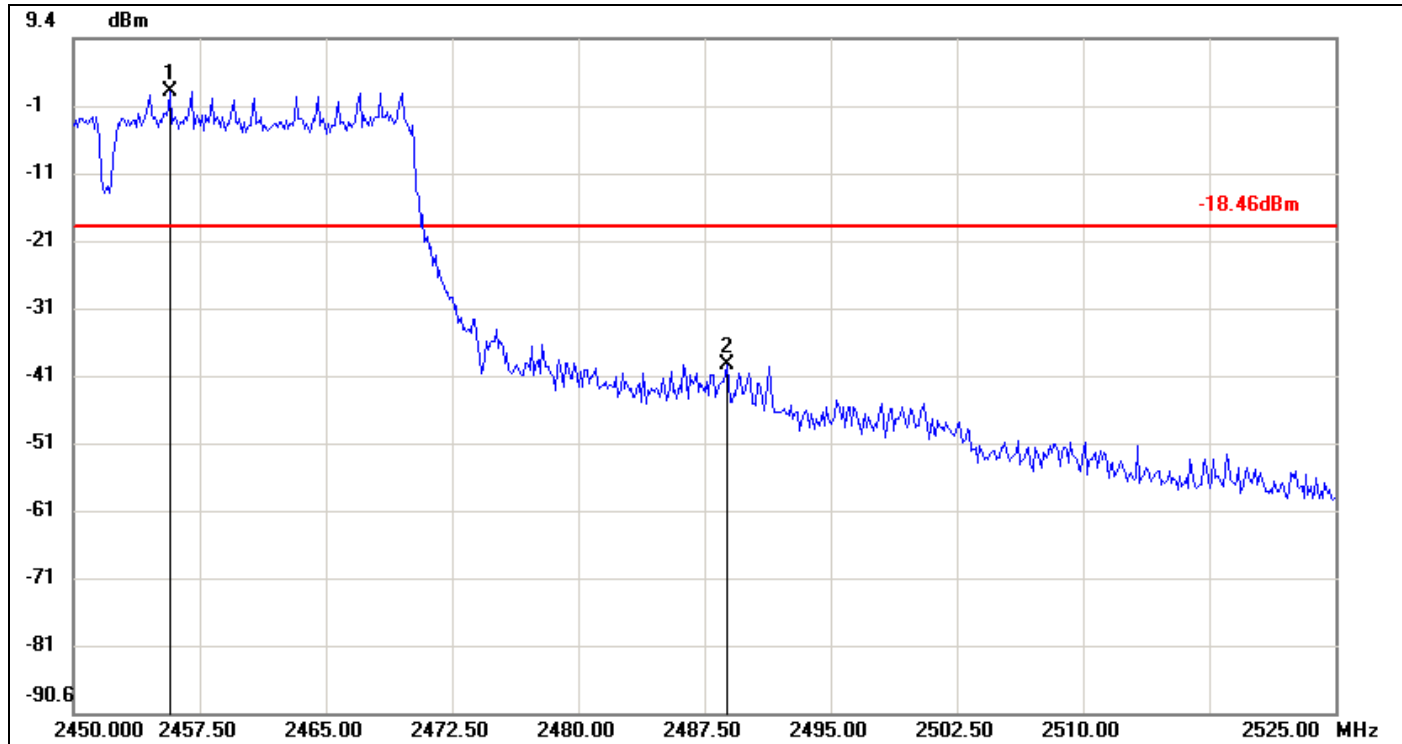
Conducted Band Edges (IEEE 802.11n HT 40 MHz mode / CH Low)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2399.5000	-31.24	-18.17	-13.07
2	2405.7500	1.83	-18.17	20.00



Conducted Band Edges (IEEE 802.11n HT 40 MHz mode / CH High)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2455.7500	1.54	-18.46	20.00
2	2488.8750	-38.98	-18.46	-20.52

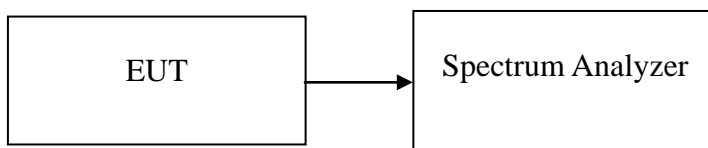


7.6 PEAK POWER SPECTRAL DENSITY

LIMIT

1. According to §15.247(e) & RSS-210 §A8.2, for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
2. According to §15.247(f) & RSS-210 §A8.3, the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3 kHz, VBW = 10 kHz, Span = 300 kHz, Sweep time = 100 s
3. Record the max reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

TEST RESULTS

No non-compliance noted

**Test Data****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	2.01	8.00	PASS
Mid	2437	2.52		PASS
High	2462	-1.18		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-3.71	8.00	PASS
Mid	2437	-3.19		PASS
High	2462	-2.66		PASS

Test mode: IEEE 802.11n HT 20 MHz mode Channel mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-4.34	8.00	PASS
Mid	2437	-3.66		PASS
High	2462	-4.00		PASS

Test mode: IEEE 802.11n HT 40 MHz mode Channel mode

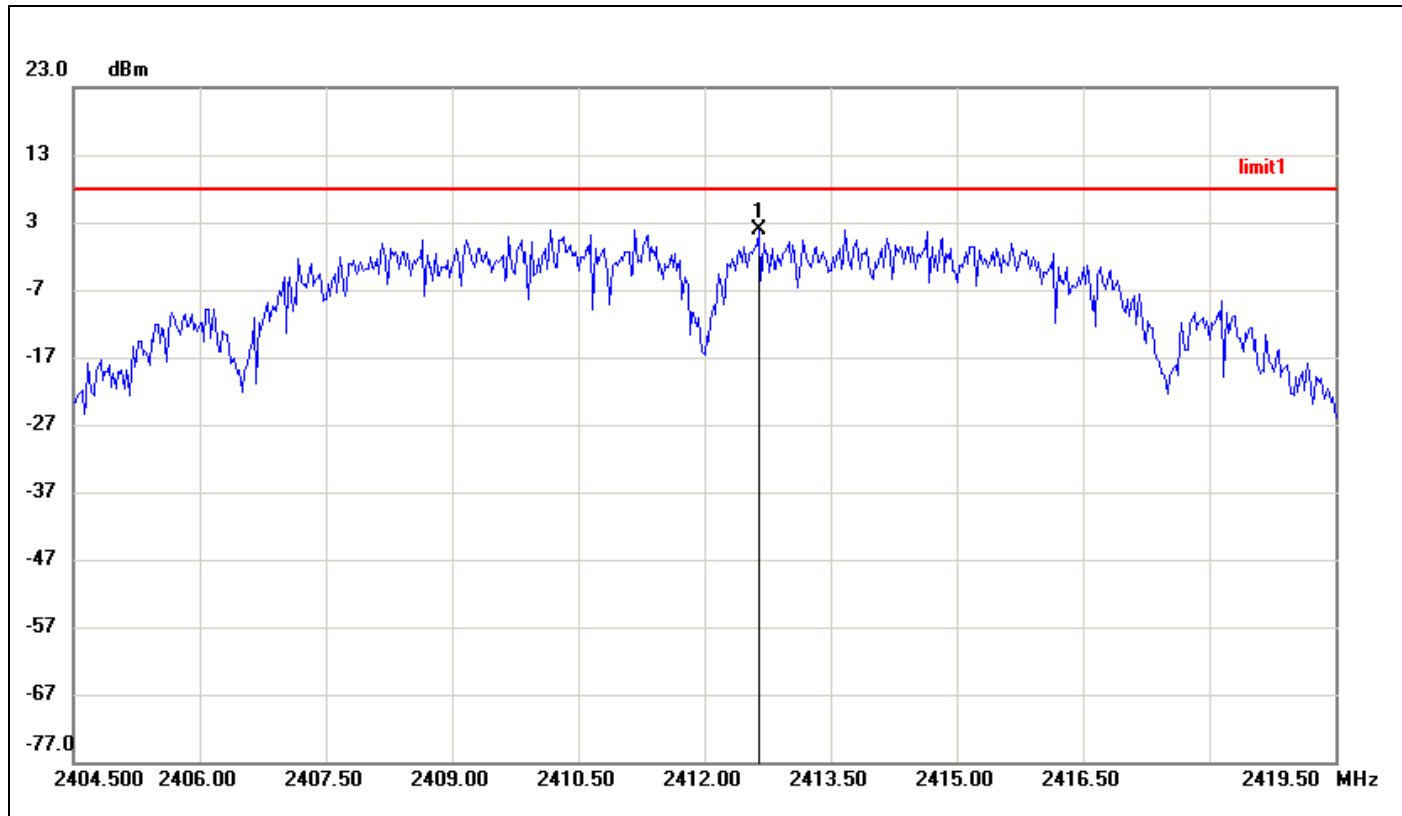
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-7.15	8.00	PASS
Mid	2437	-5.01		PASS
High	2452	-6.41		PASS



Test Plot

IEEE 802.11b mode

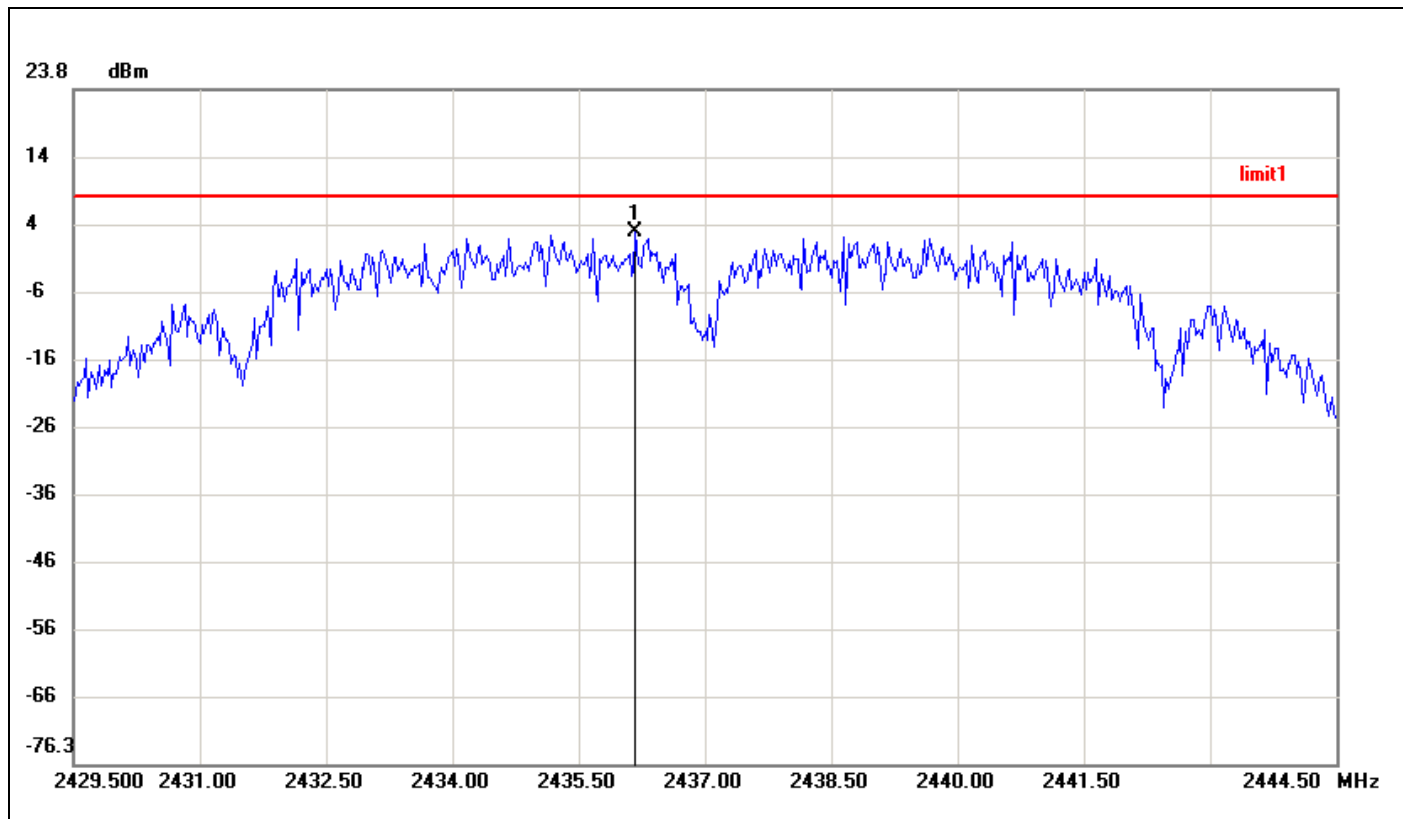
PPSD (CH Low)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2412.6500	2.01	8.00	-5.99



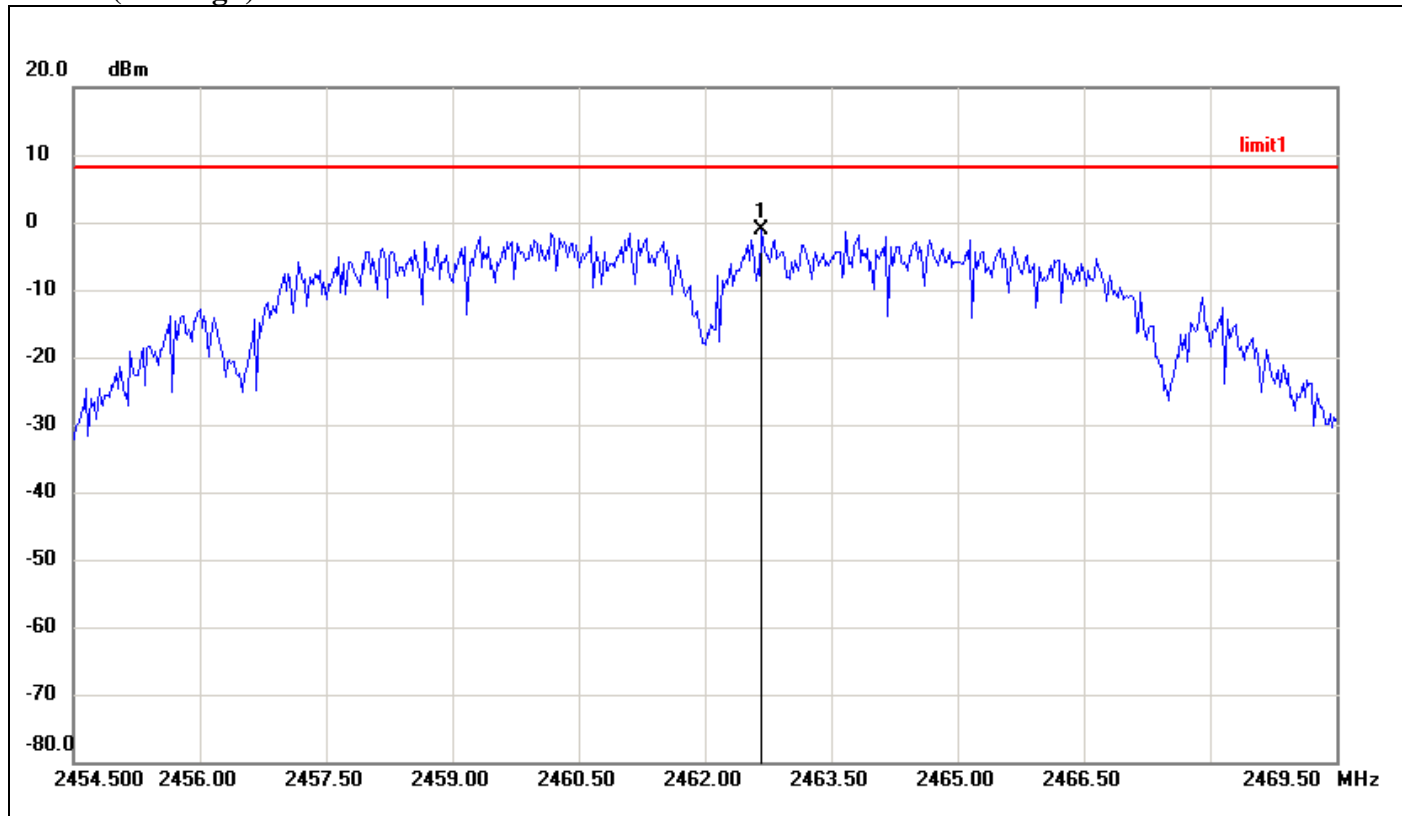
PPSD (CH Mid)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2436.1750	2.52	8.00	-5.48



PPSD (CH High)

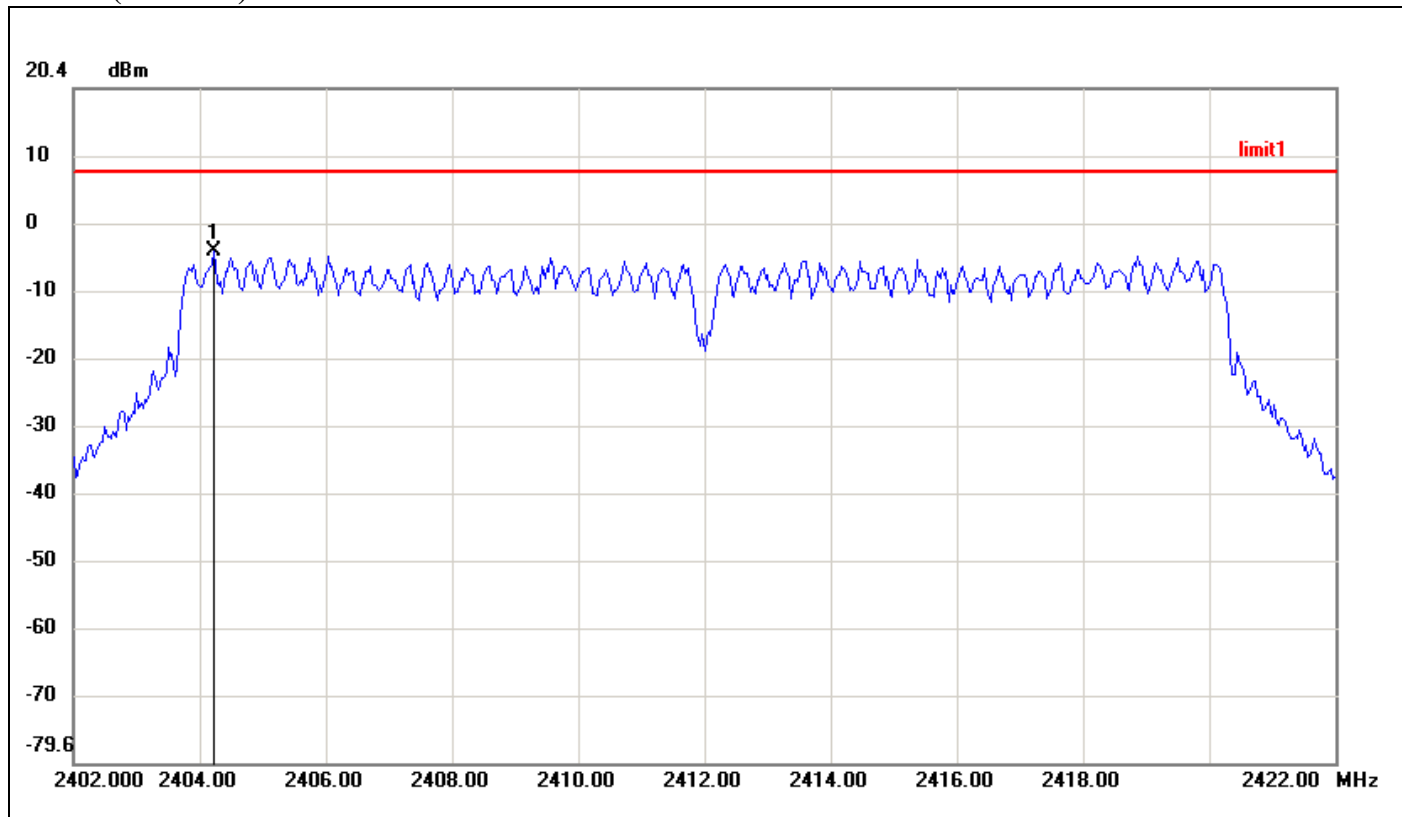


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2462.6750	-1.18	8.00	-9.18



IEEE 802.11g mode

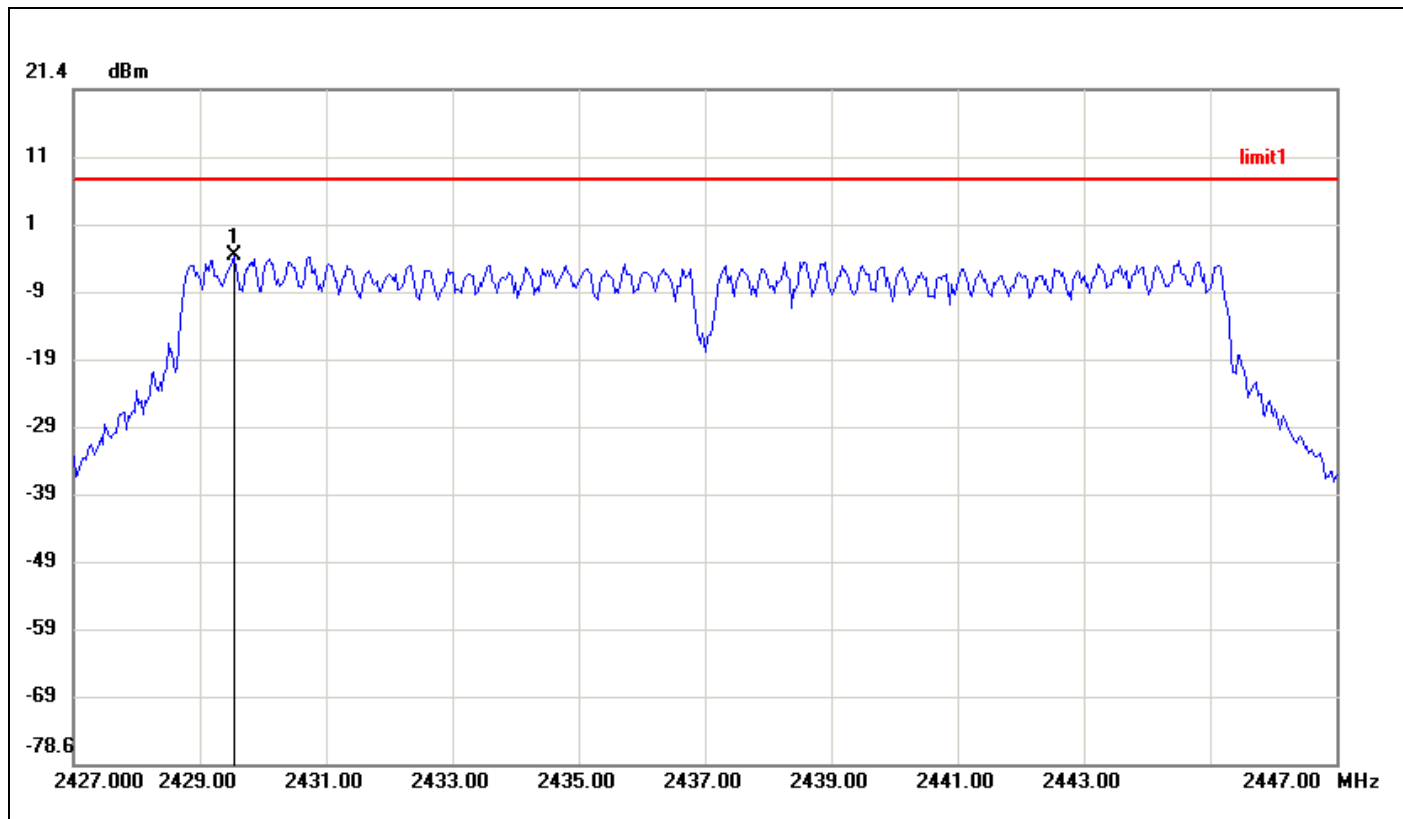
PPSD (CH Low)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2404.2333	-3.71	8.00	-11.71



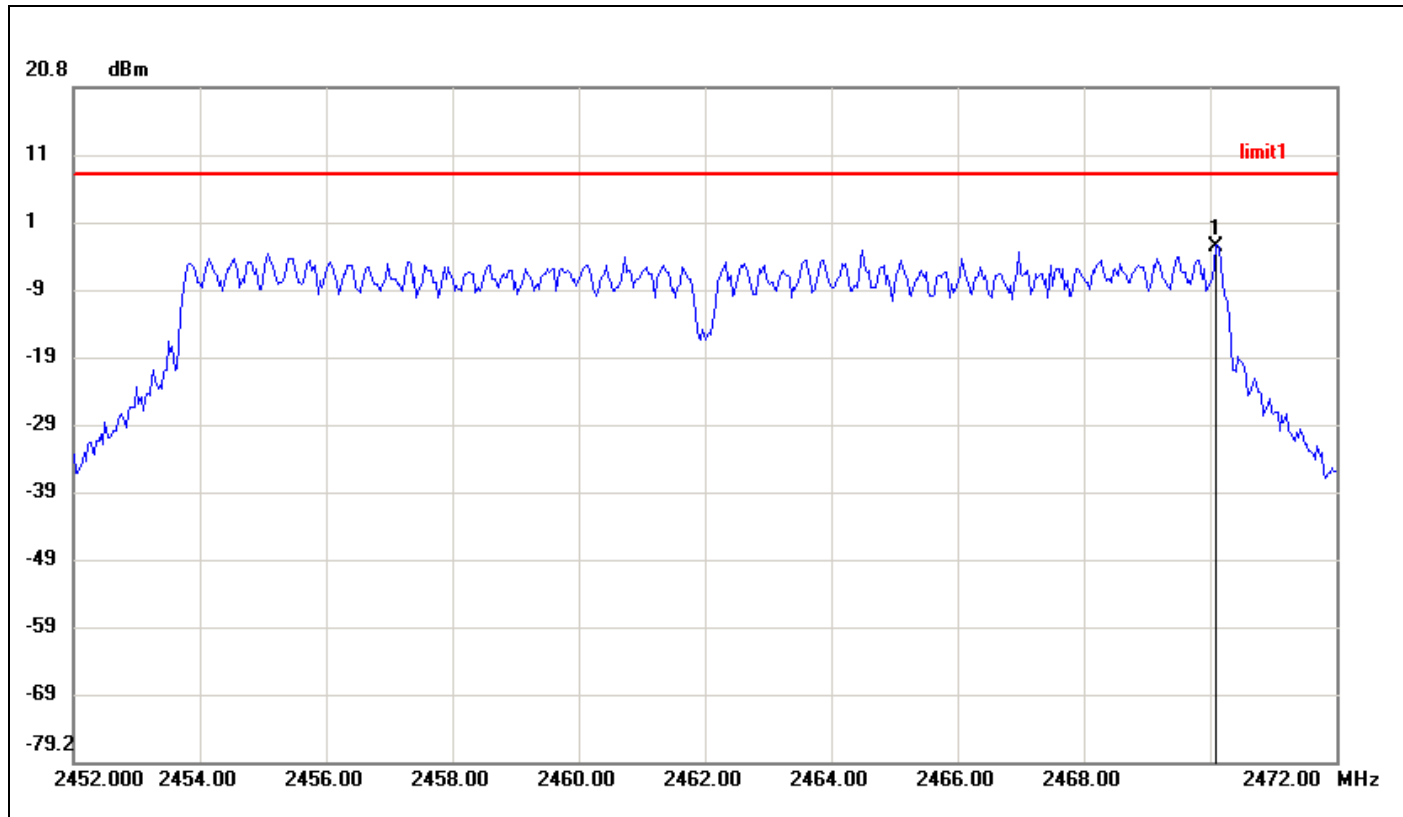
PPSD (CH Mid)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2429.5333	-3.19	8.00	-11.19



PPSD (CH High)

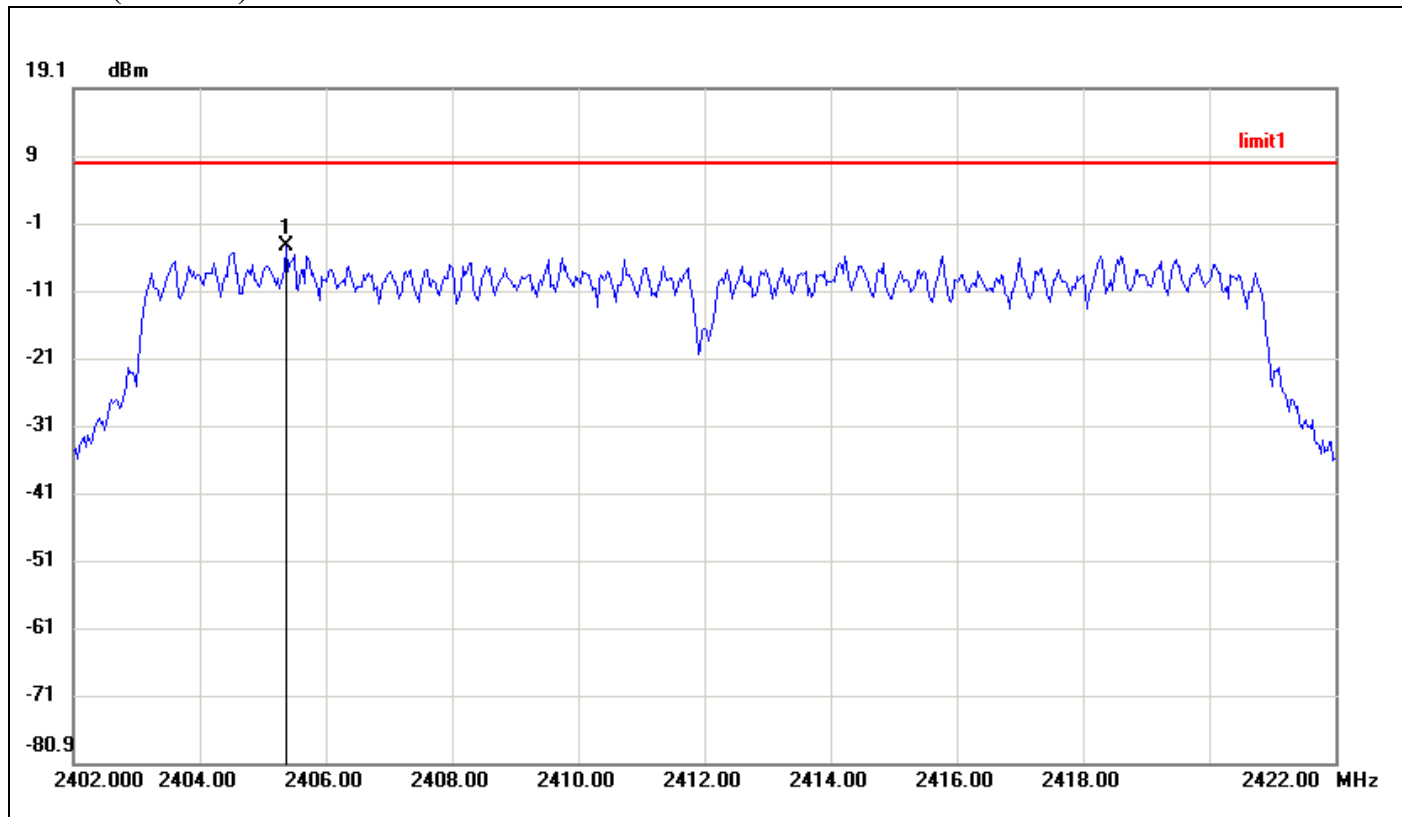


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2470.1000	-2.66	8.00	-10.66



IEEE 802.11n HT 20 MHz mode Channel mode

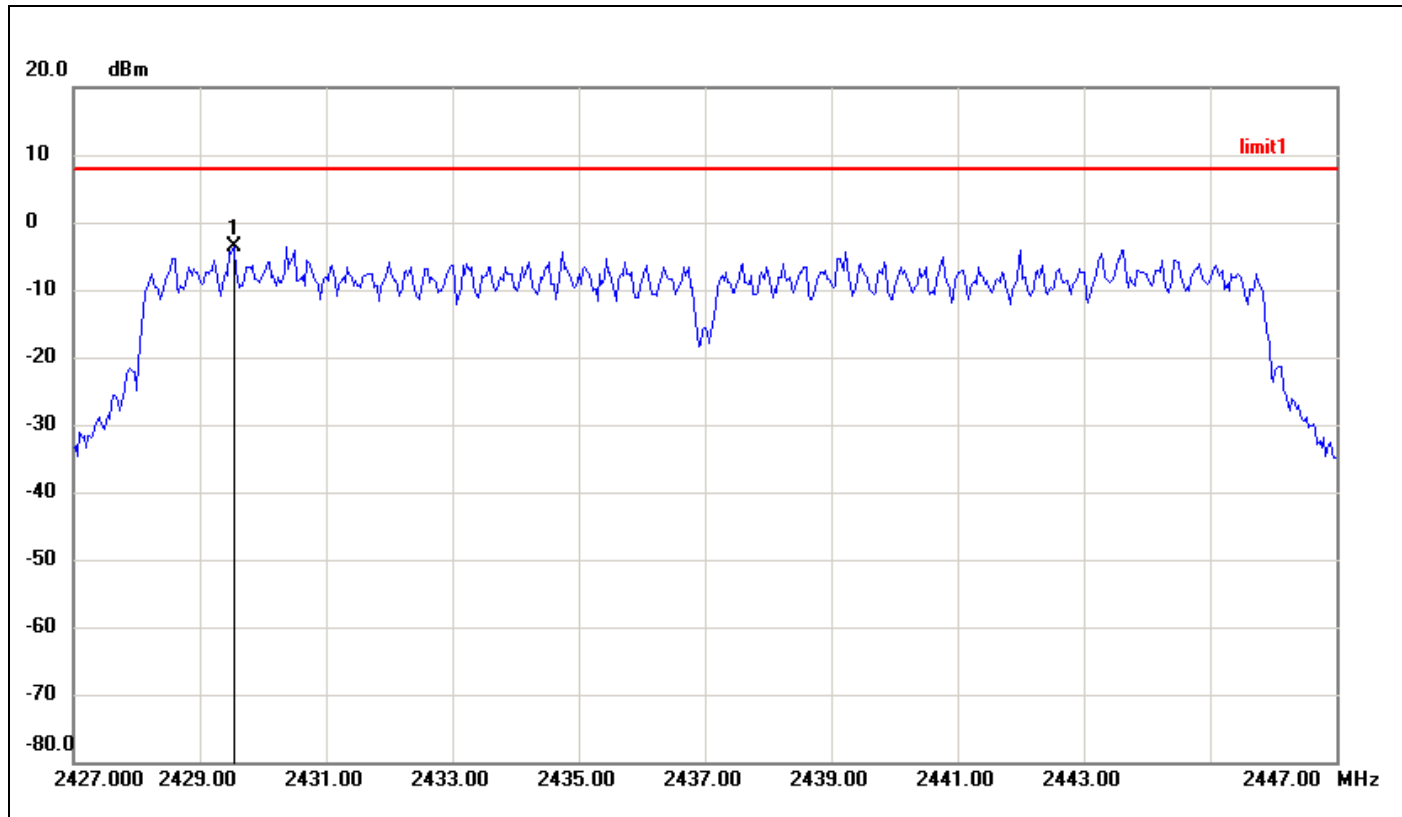
PPSD (CH Low)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2405.3667	-4.34	8.00	-12.34



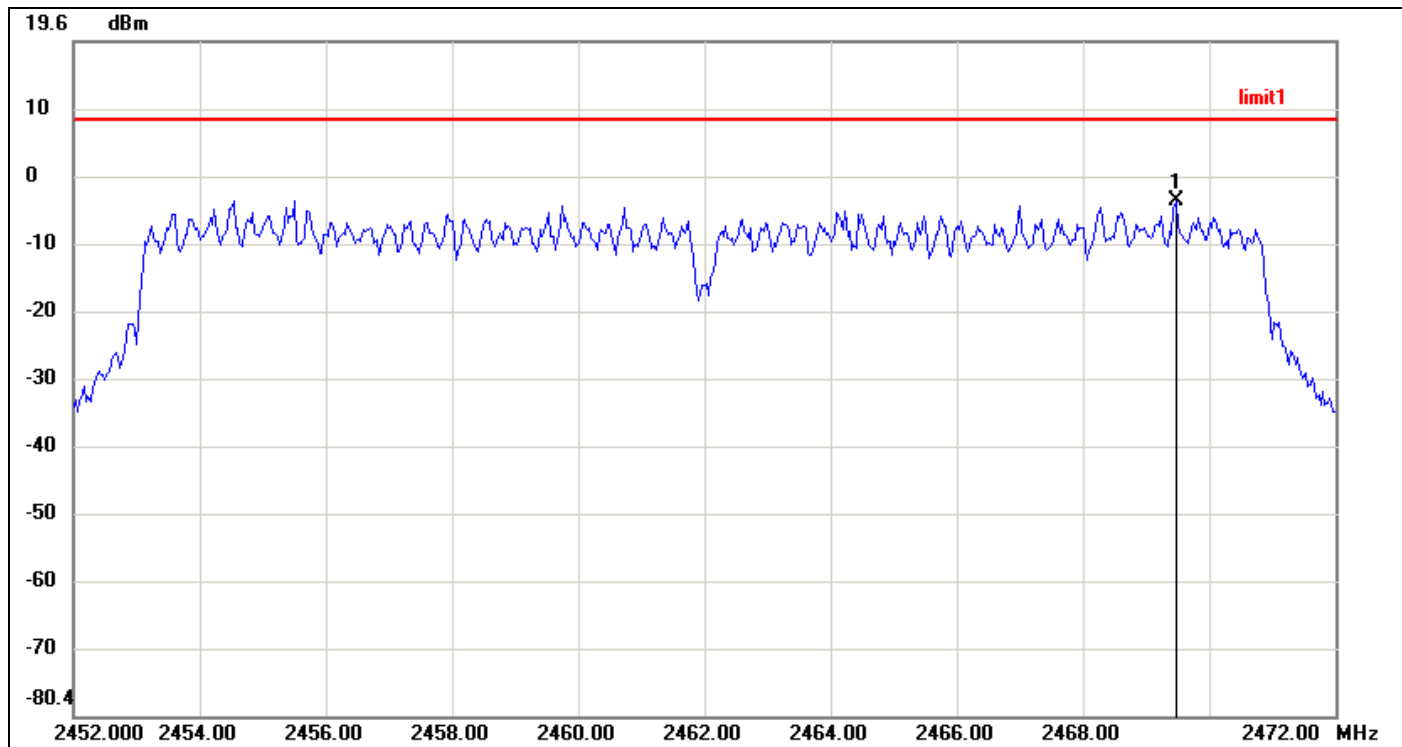
PPSD (CH Mid)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2429.5333	-3.66	8.00	-11.66



PPSD (CH High)

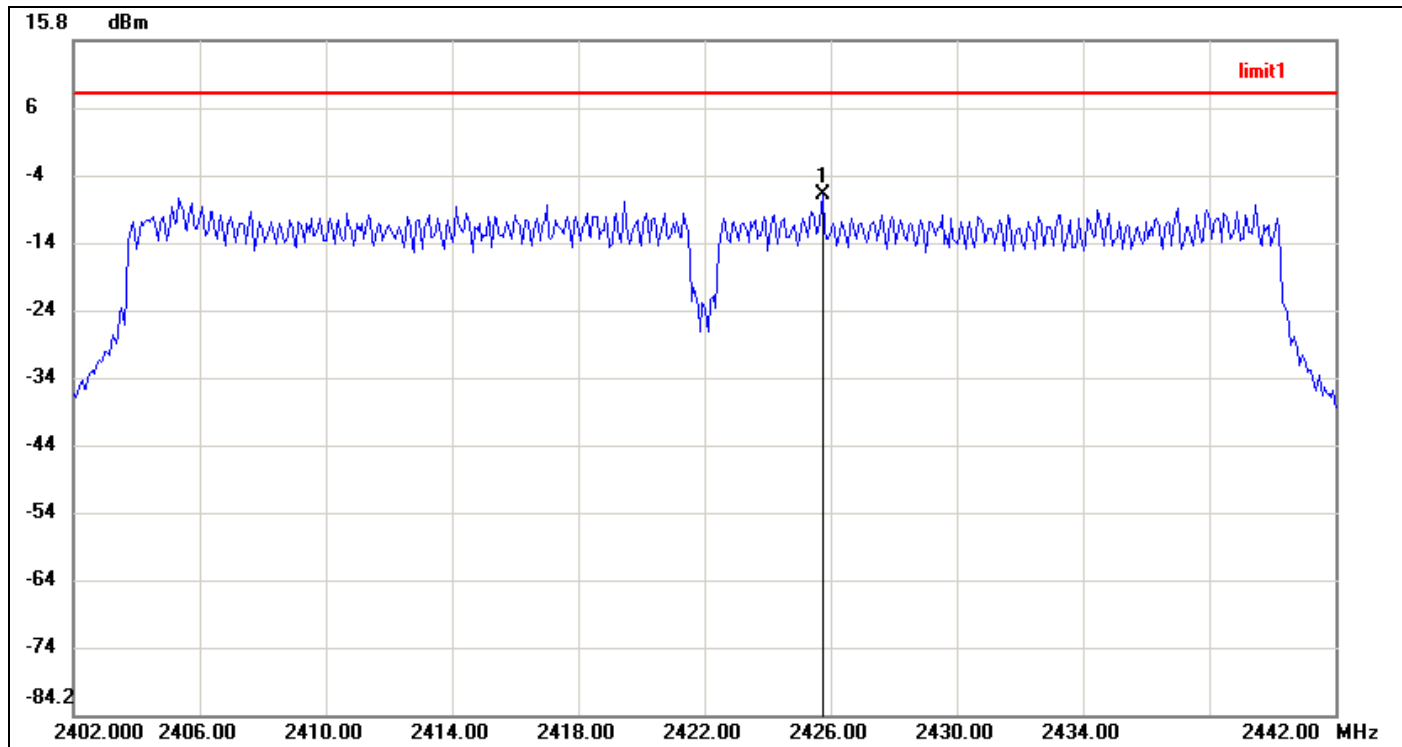


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2469.4667	-4.00	8.00	-12.00



IEEE 802.11n HT 40 MHz mode Channel mode

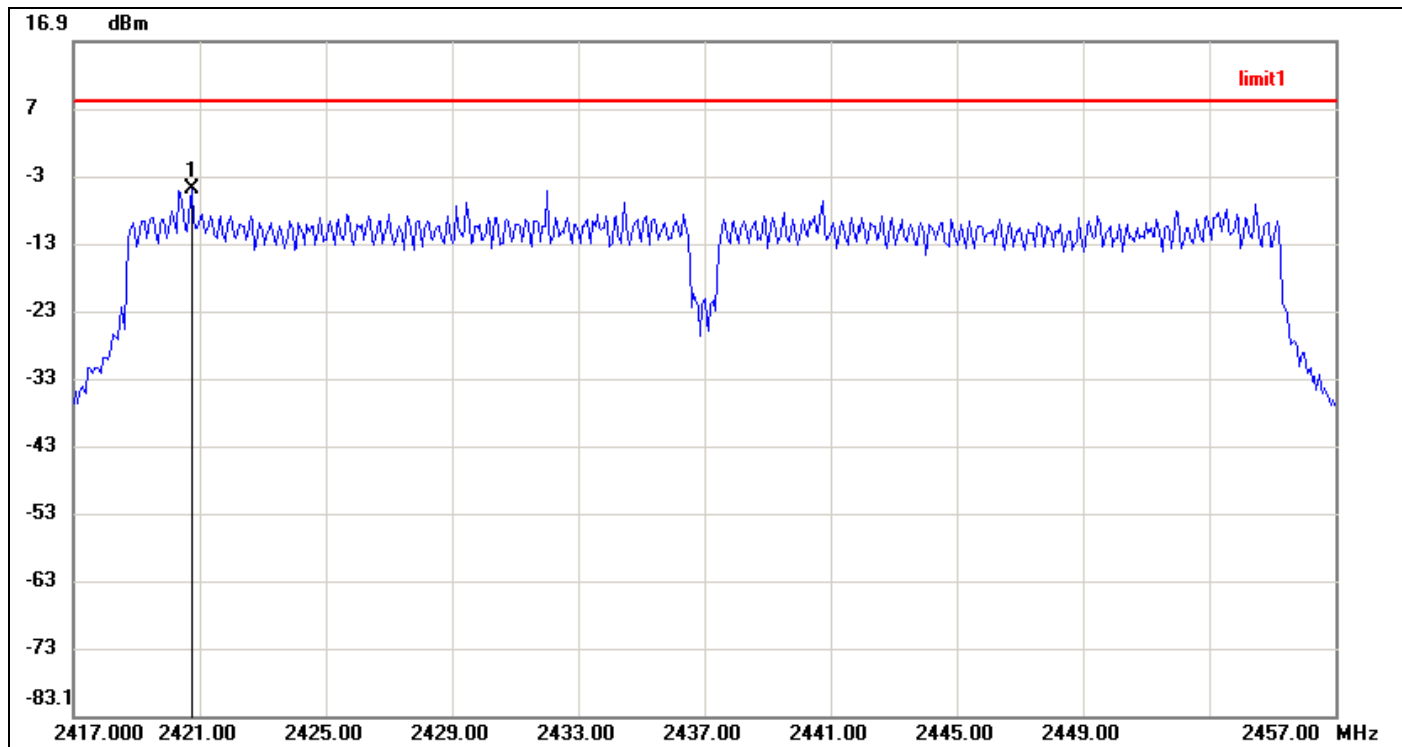
PPSD (CH Low)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2425.7333	-7.15	8.00	-15.15



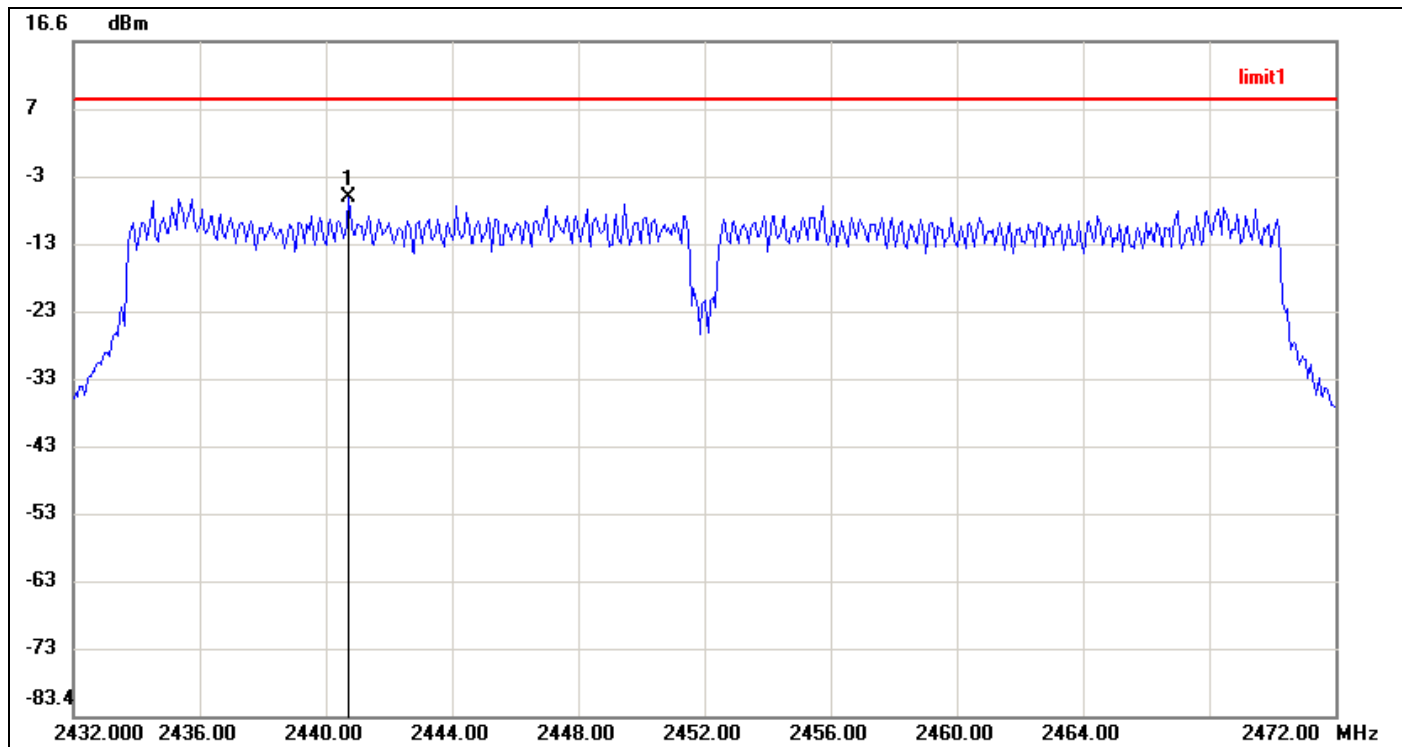
PPSD (CH Mid)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2420.7333	-5.01	8.00	-13.01



PPSD (CH High)



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2440.7333	-6.41	8.00	-14.41



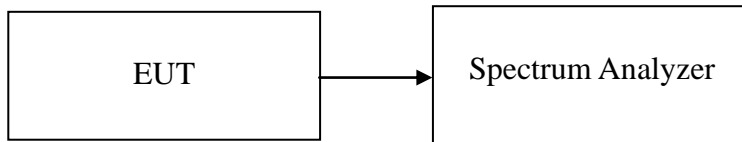
7.7 SPURIOUS EMISSIONS

7.7.1 Conducted Measurement

LIMIT

According to §15.247(d) & RSS-210 §A8.5, in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Test Configuration



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

TEST RESULTS

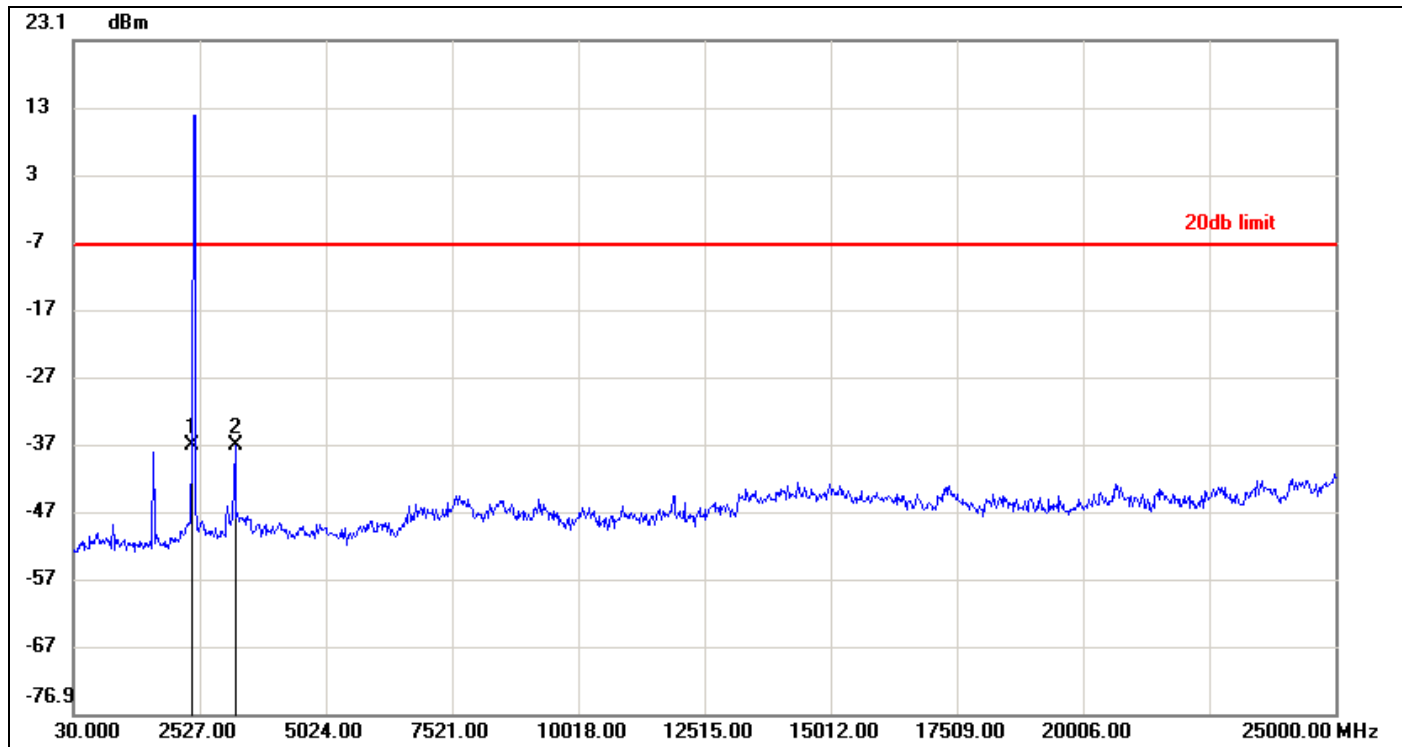
No non-compliance noted



Test Plot

IEEE 802.11b mode

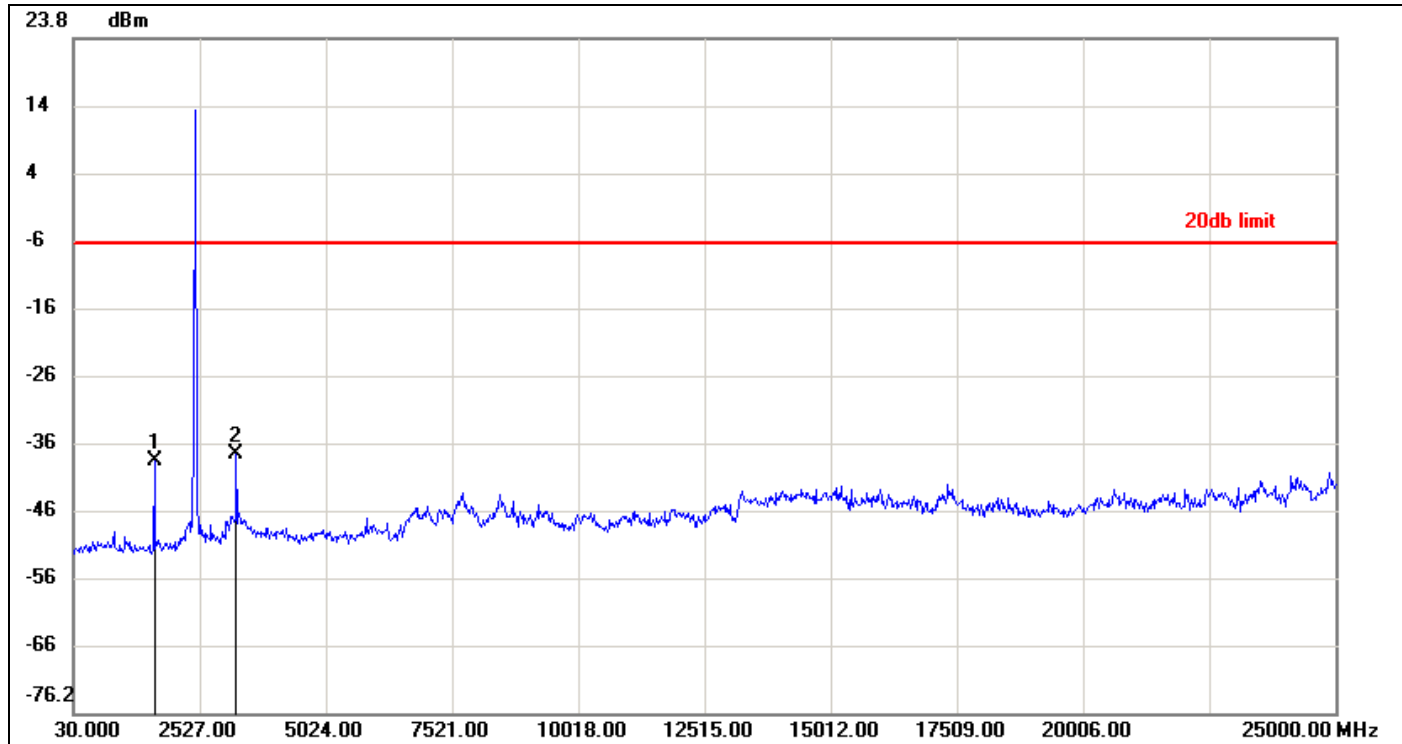
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2377.1800	-36.94	-7.24	-29.70
2	3226.1600	-36.99	-7.24	-29.75



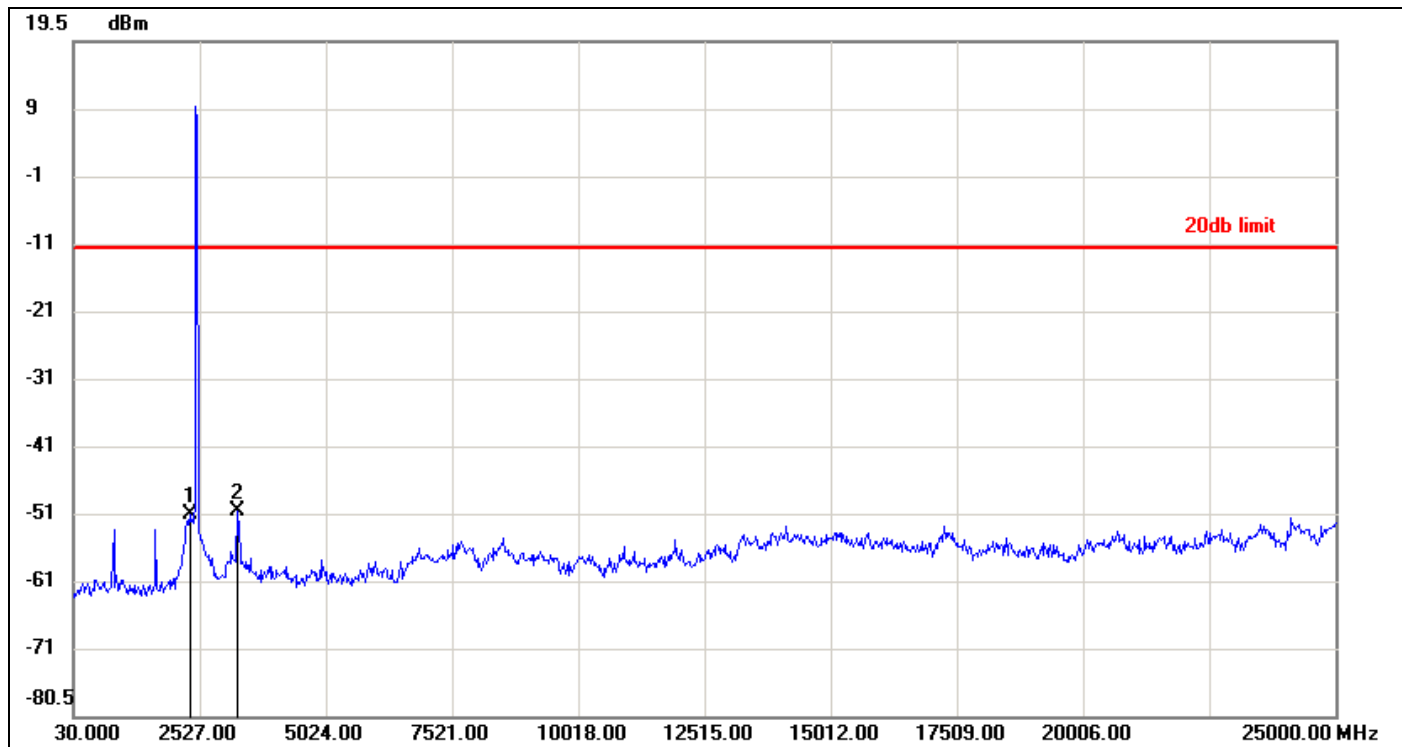
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	1628.0800	-38.88	-6.59	-32.29
2	3251.1300	-37.92	-6.59	-31.33



CH High

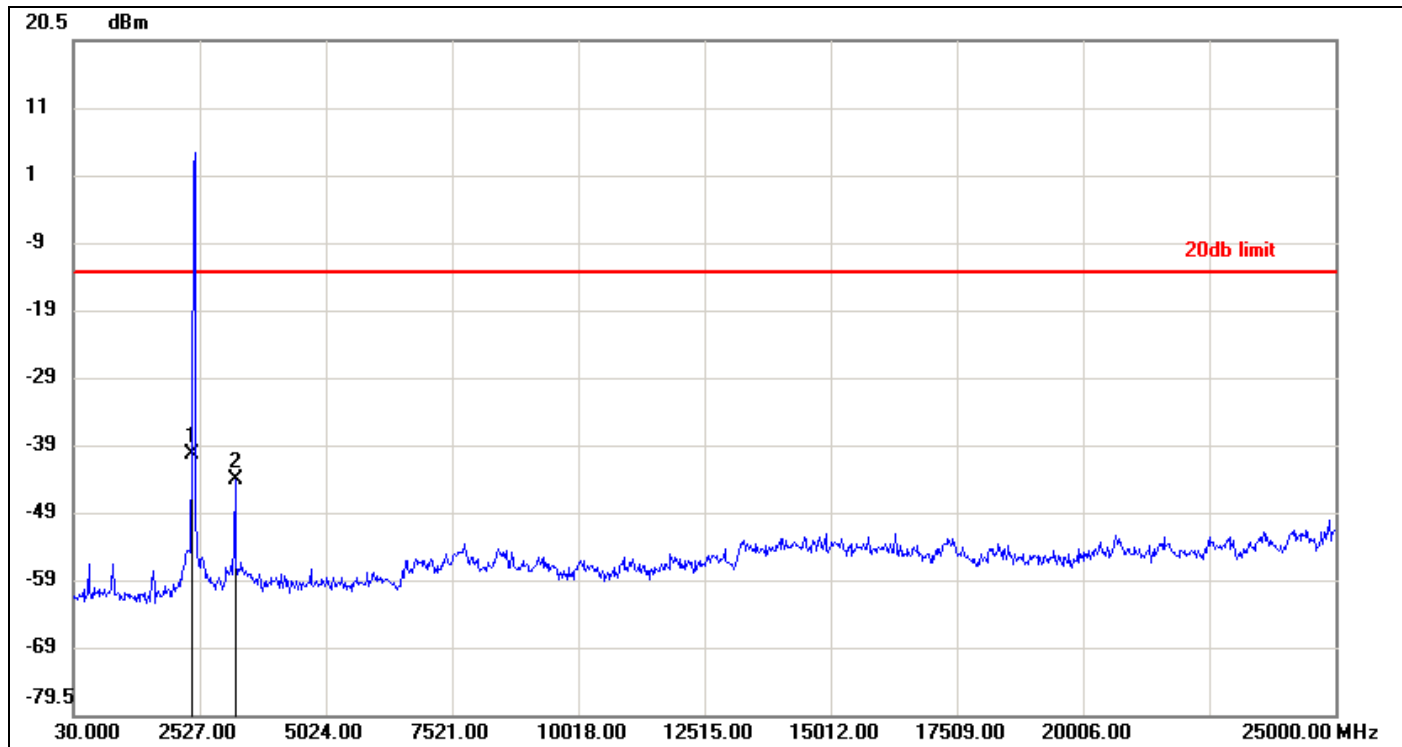


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2327.2400	-50.58	-11.10	-39.48
2	3276.1000	-50.25	-11.10	-39.15



IEEE 802.11g mode

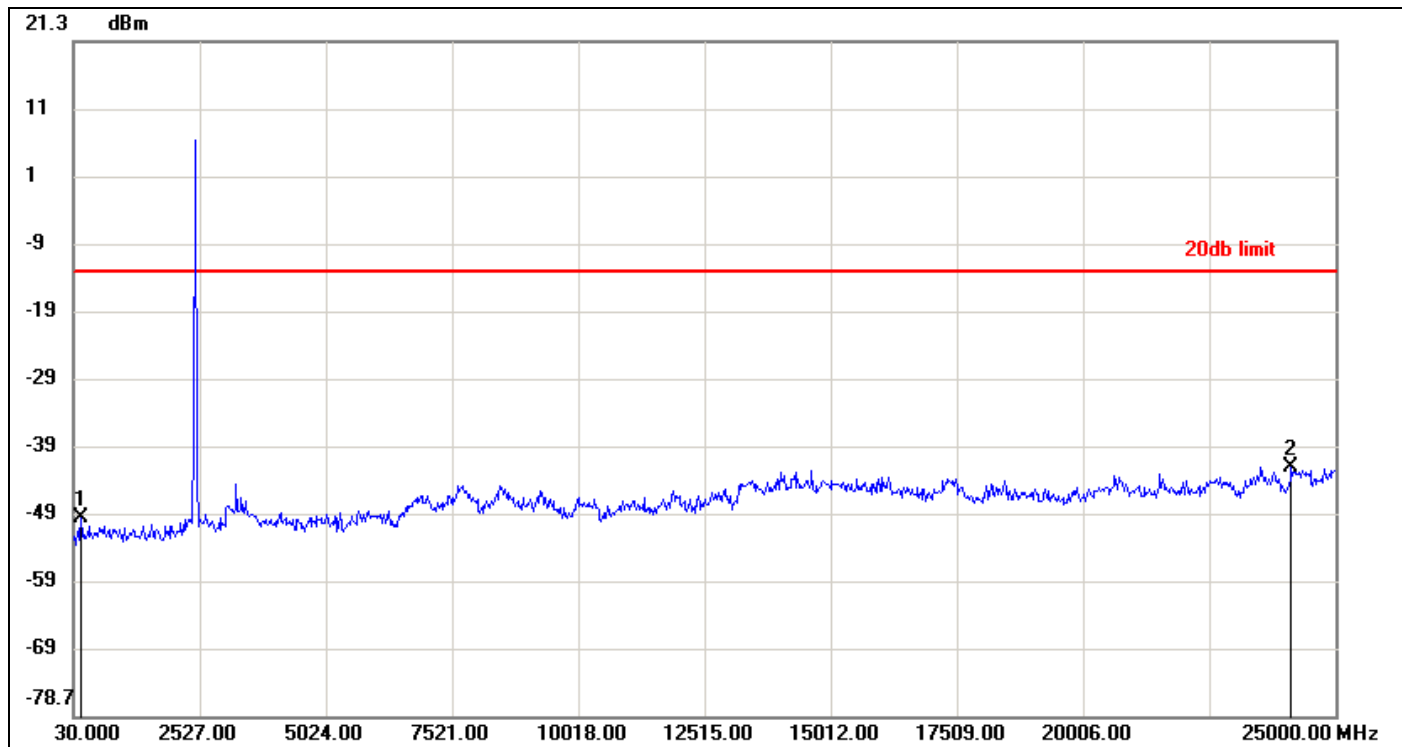
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2377.1800	-40.90	-13.94	-26.96
2	3226.1600	-44.62	-13.94	-30.68



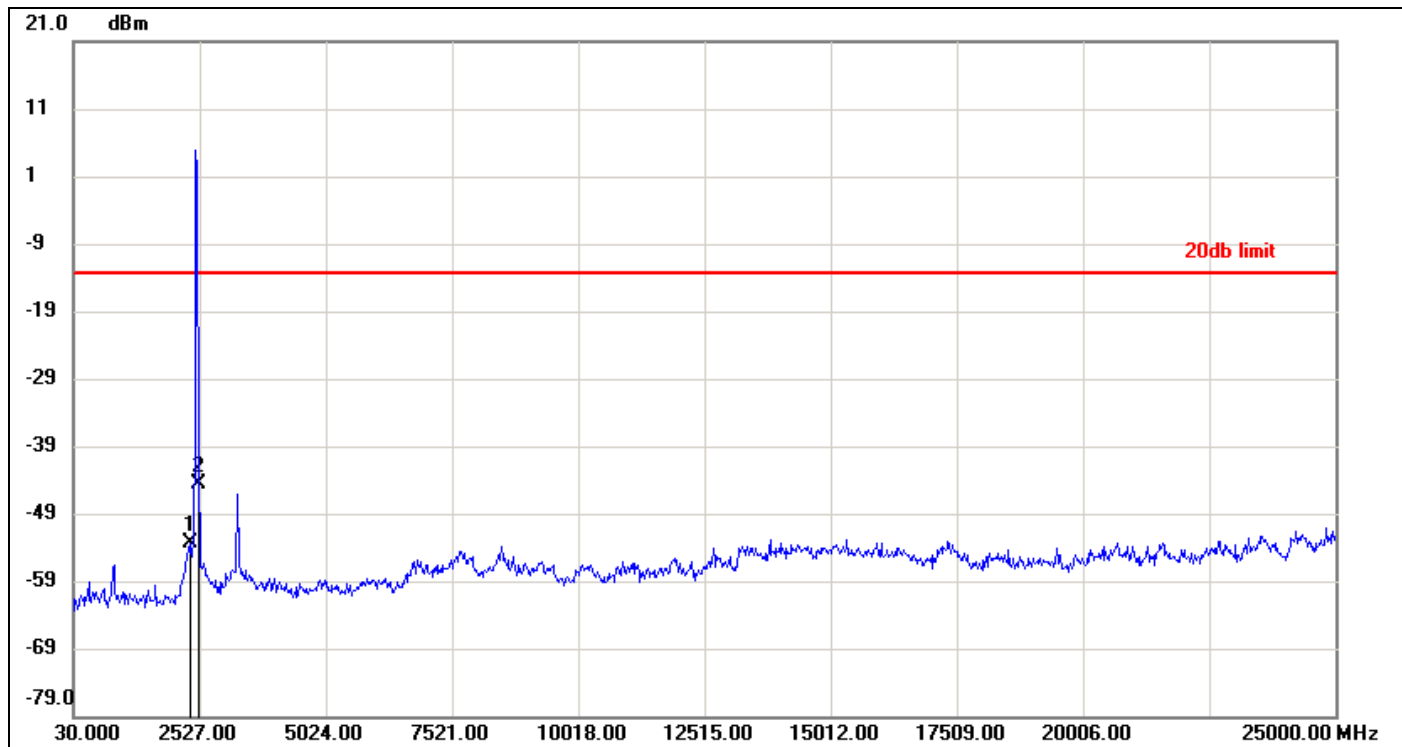
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	179.8200	-49.22	-12.80	-36.42
2	24126.0500	-41.85	-12.80	-29.05



CH High

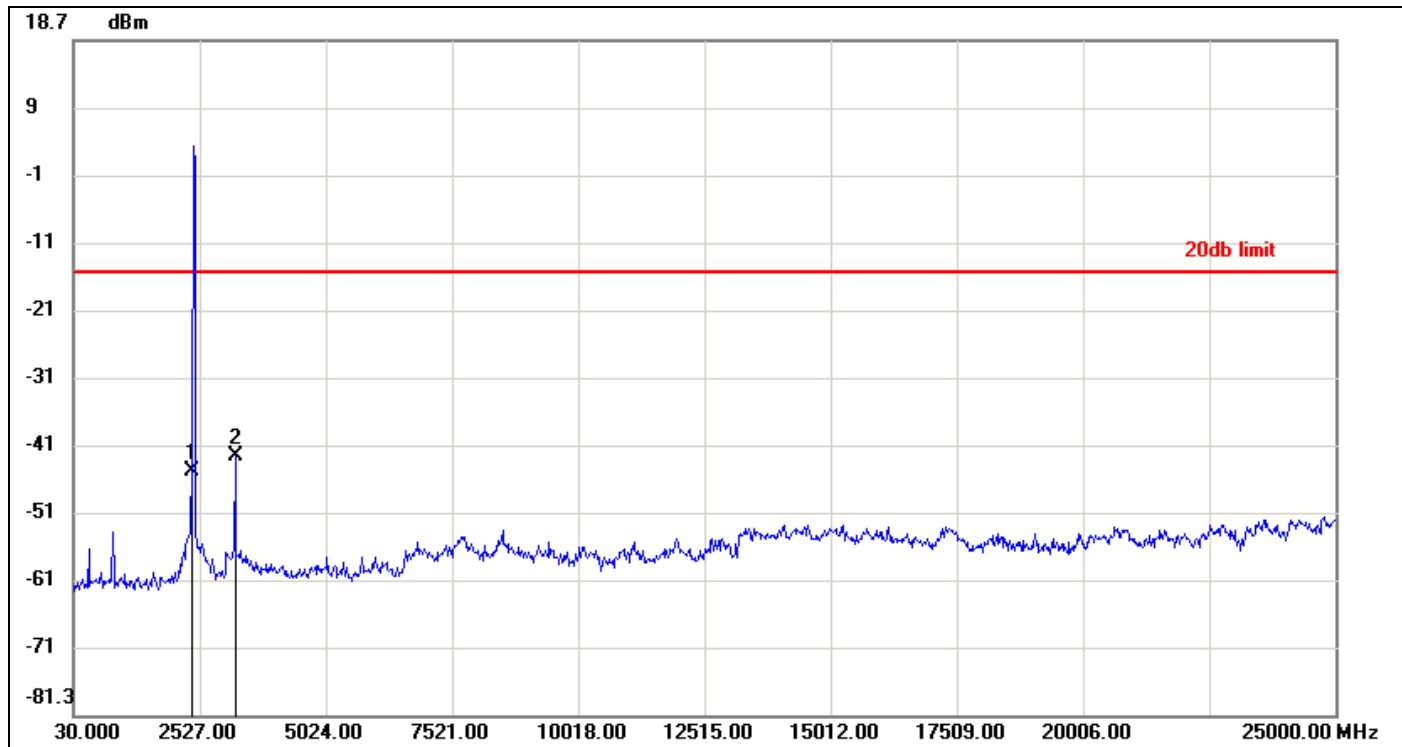


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2352.2100	-53.40	-13.37	-40.03
2	2502.0300	-44.59	-13.37	-31.22



IEEE 802.11n HT 20 MHz mode Channel mode

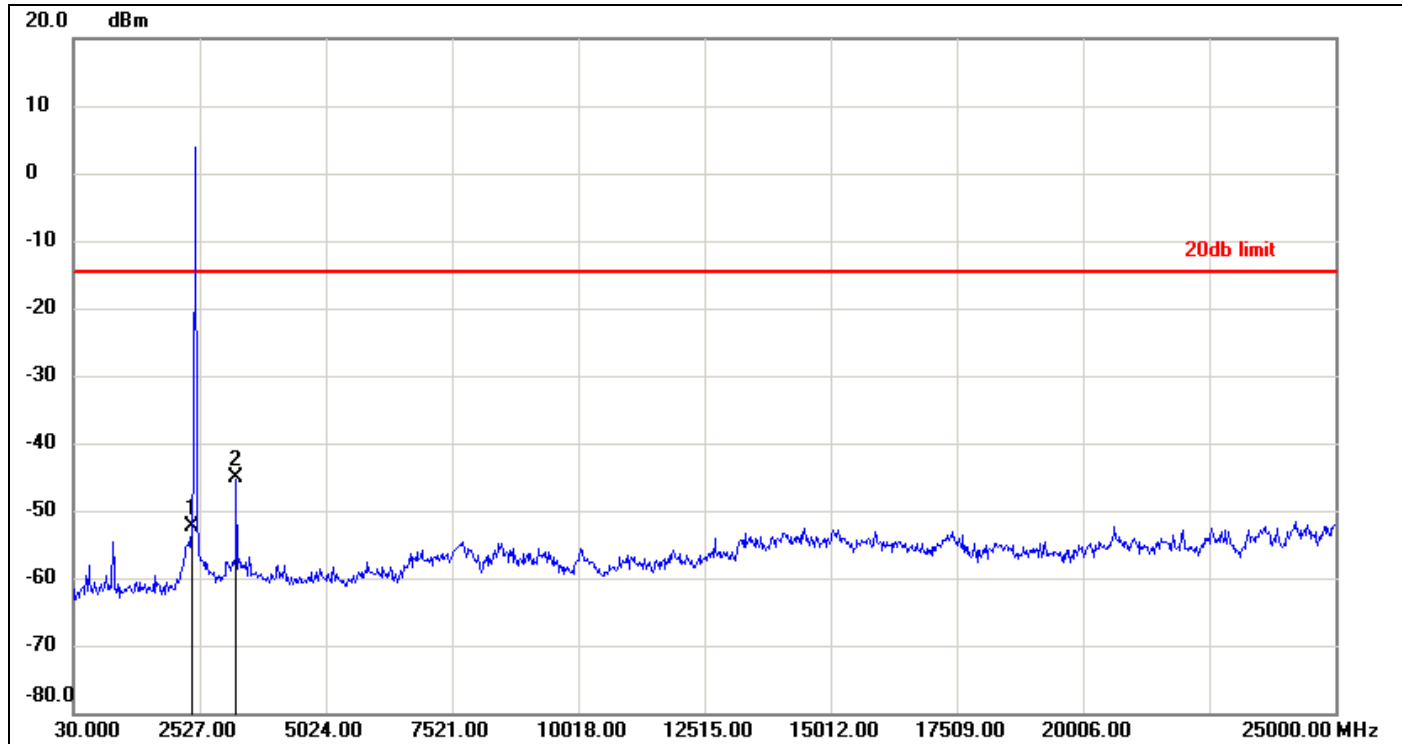
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2377.1800	-45.15	-15.71	-29.44
2	3226.1600	-42.94	-15.71	-27.23



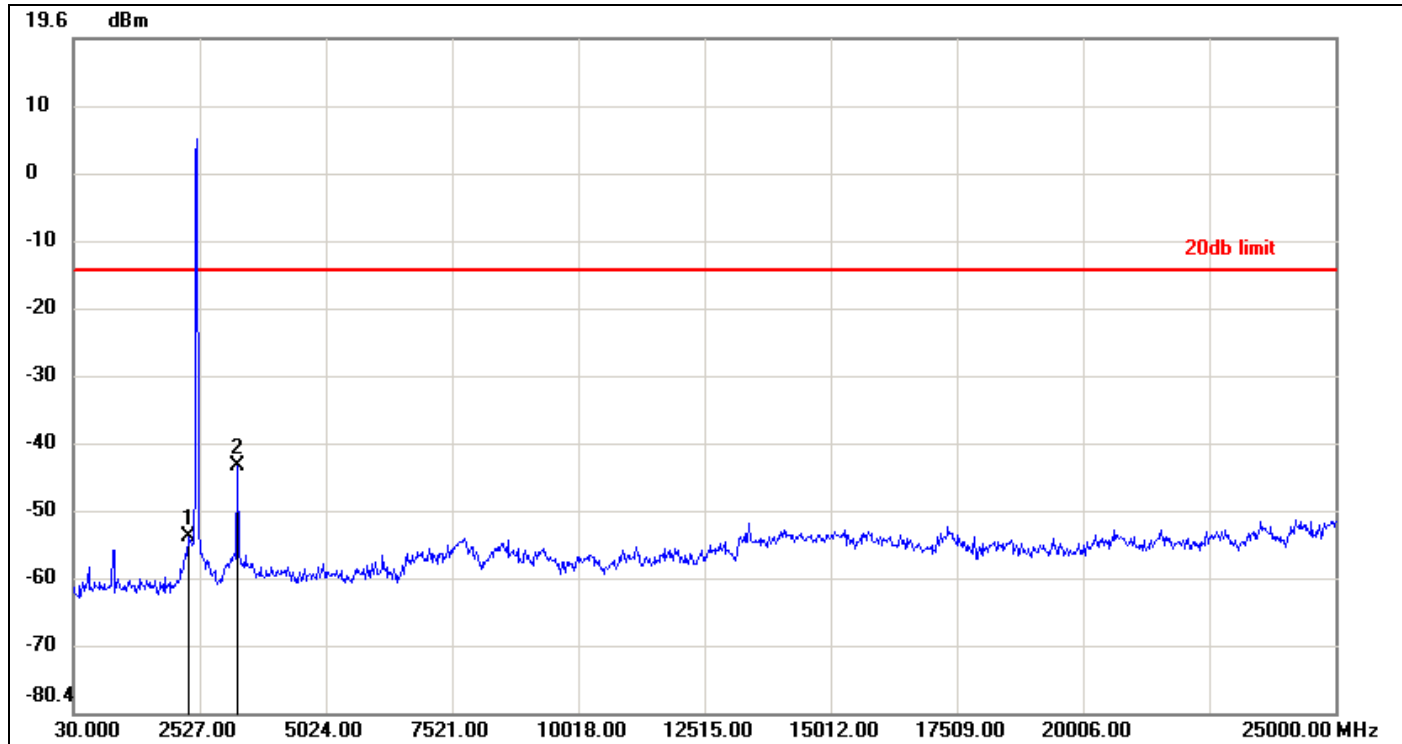
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2377.1800	-52.40	-14.53	-37.87
2	3251.1300	-45.26	-14.53	-30.73



CH High

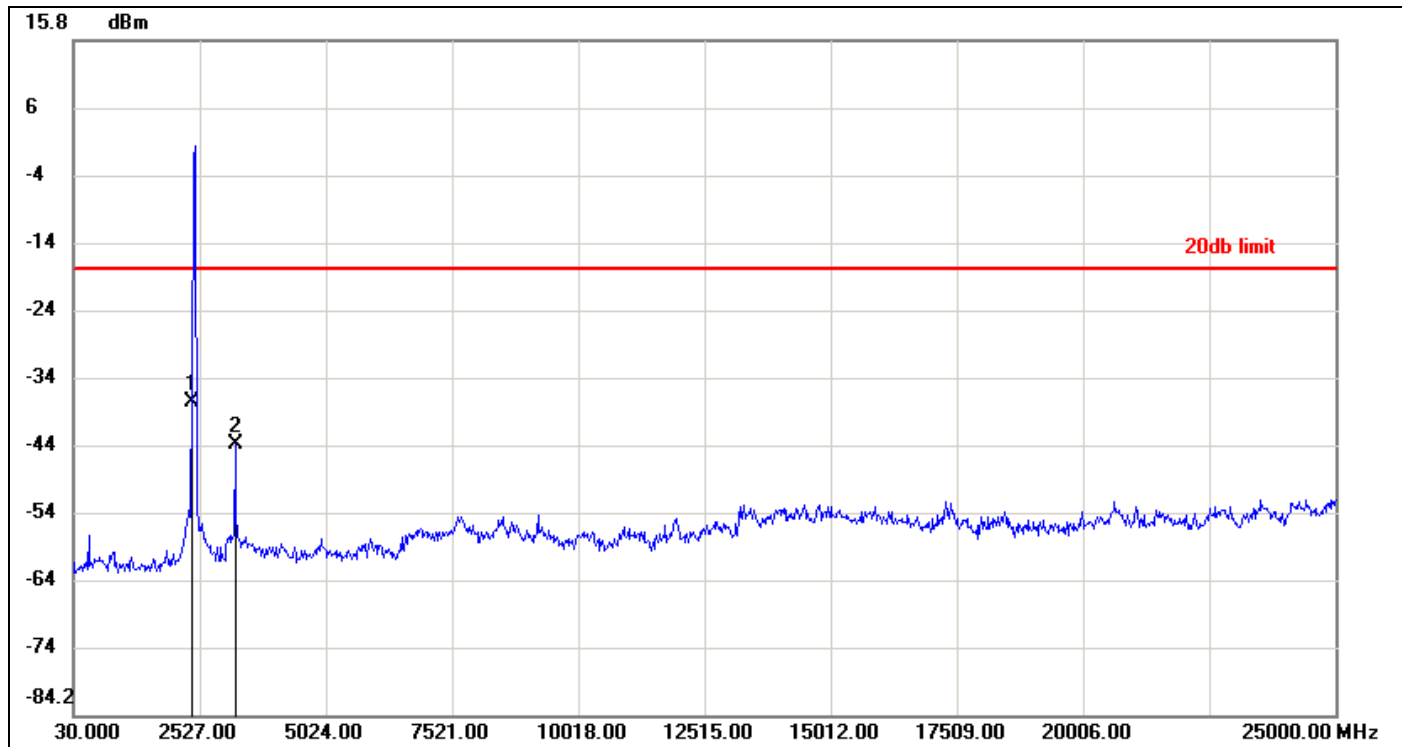


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2302.2700	-54.39	-14.73	-39.66
2	3276.1000	-43.70	-14.73	-28.97



IEEE 802.11n HT 40 MHz mode Channel mode

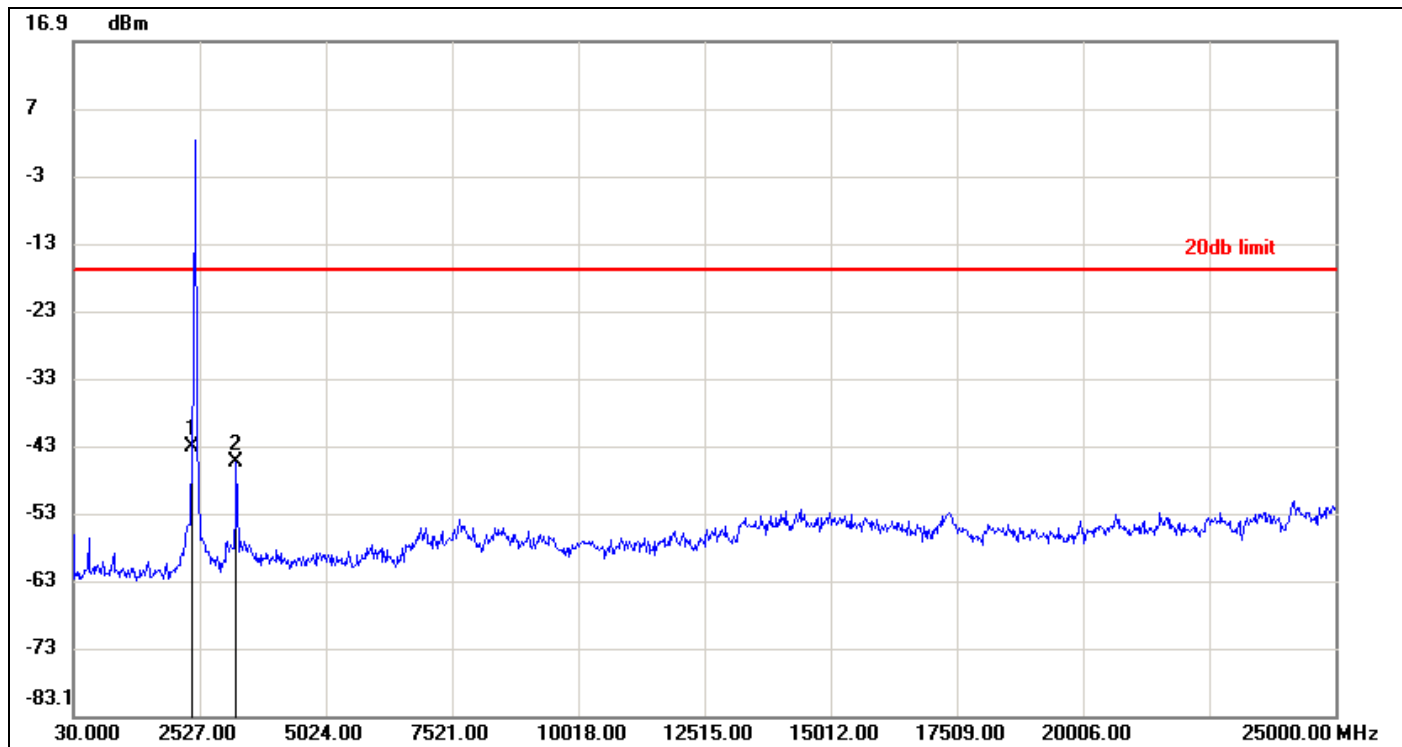
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2377.1800	-37.85	-18.14	-19.71
2	3226.1600	-44.06	-18.14	-25.92



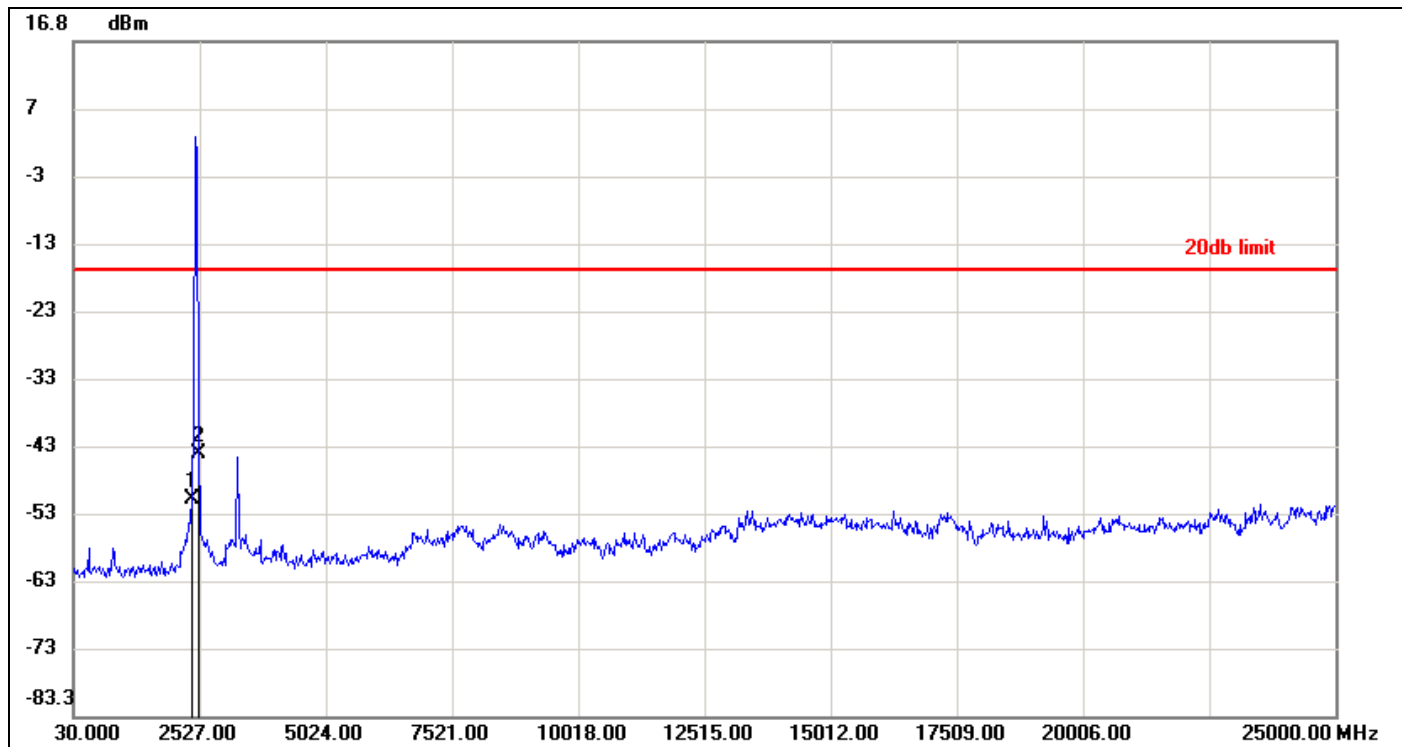
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2377.1800	-43.16	-16.93	-26.23
2	3251.1300	-45.59	-16.93	-28.66



CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2377.1800	-51.14	-17.19	-33.95
2	2502.0300	-44.44	-17.19	-27.25



7.8 RADIATED EMISSIONS

LIMIT

All spurious emissions shall comply with the limits of §15.209(a) and RSS-Gen Table 2 & Table 5.

RSS-Gen Table 2 & Table 5: General Field Strength Limits for Transmitters and Receivers at Frequencies Above 30 MHz ^(Note)

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Note: *Measurements for compliance with limits in the above table may be performed at distances other than 3 metres, in accordance with Section 7.2.7.

Transmitting devices are not permitted in Table 1 bands or, unless stated otherwise, in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz).

RSS-Gen Table 6: General Field Strength Limits for Transmitters at Frequencies Below 30 MHz (Transmit)

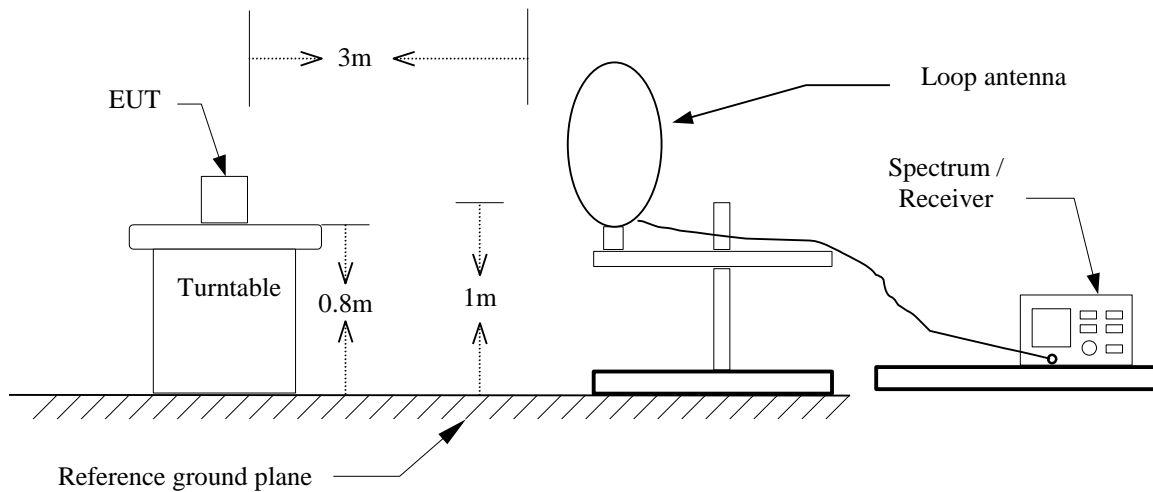
Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/377F (F in kHz)	3000
490-1,705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Note: The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average detector.

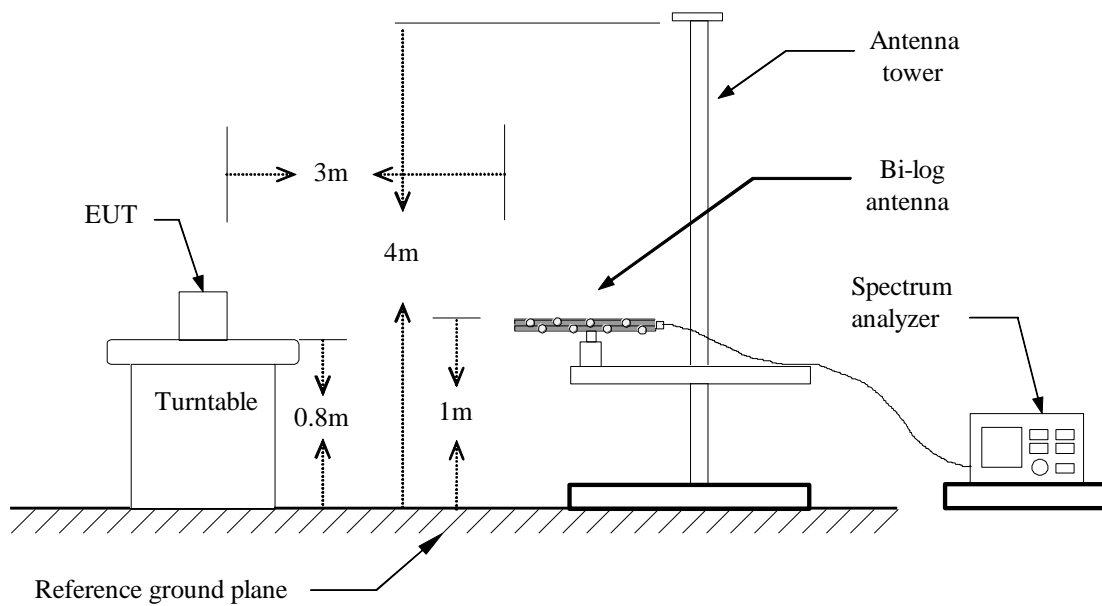


Test Configuration

9kHz ~ 30MHz

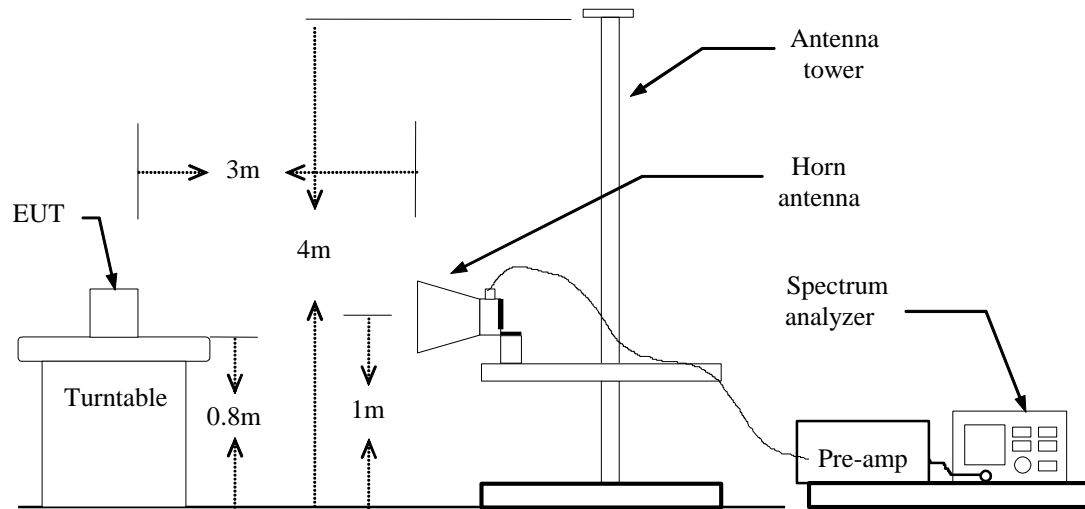


30MHz ~ 1GHz





Above 1 GHz





TEST PROCEDURE

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. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:
Below 1GHz:
RBW=100kHz / VBW=300kHz / Sweep=AUTO
Above 1GHz:
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz / VBW=300Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

**Below 1GHz****Operation Mode:** Normal Link**Test Date:** October 9, 2014**Temperature:** 27°C**Tested by:** David Shu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
32.9100	41.14	-12.00	29.14	40.00	-10.86	peak	V
74.6200	51.00	-22.79	28.21	40.00	-11.79	peak	V
161.9200	35.82	-18.37	17.45	43.50	-26.05	peak	V
235.6400	40.81	-18.69	22.12	46.00	-23.88	peak	V
320.0300	37.82	-15.92	21.90	46.00	-24.10	peak	V
448.0700	36.16	-12.71	23.45	46.00	-22.55	peak	V
68.8000	51.20	-22.72	28.48	40.00	-11.52	peak	H
256.0100	43.52	-17.97	25.55	46.00	-20.45	peak	H
320.0300	47.20	-15.92	31.28	46.00	-14.72	peak	H
448.0700	38.70	-12.71	25.99	46.00	-20.01	peak	H
625.5800	28.85	-9.90	18.95	46.00	-27.05	peak	H
807.9400	29.58	-7.28	22.30	46.00	-23.70	peak	H

Remark:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. $\text{Margin (dB)} = \text{Result (dBuV/m)} - \text{Limit (dBuV/m)}$.

**Above 1 GHz****Operation Mode:** TX / IEEE 802.11b / CH Low**Test Date:** October 9, 2014**Temperature:** 26°C**Tested by:** David Shu**Humidity:** 60 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1608.000	51.14	-4.85	46.29	74.00	-27.71	peak	V
4420.000	40.44	6.90	47.34	74.00	-26.66	peak	V
5735.000	39.15	10.98	50.13	74.00	-23.87	peak	V
N/A							
1700.000	50.47	-4.29	46.18	74.00	-27.82	peak	H
4270.000	39.95	6.25	46.20	74.00	-27.80	peak	H
5430.000	39.39	10.06	49.45	74.00	-24.55	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser; with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** TX / IEEE 802.11b / CH Mid**Test Date:** August 9, 2014**Temperature:** 26°C**Tested by:** David Shu**Humidity:** 60 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
2034.000	51.83	-2.48	49.35	74.00	-24.65	peak	V
4110.000	38.84	5.56	44.40	74.00	-29.60	peak	V
5340.000	39.00	9.68	48.68	74.00	-25.32	peak	V
N/A							
1624.000	50.34	-4.76	45.58	74.00	-28.42	peak	H
3825.000	41.12	4.35	45.47	74.00	-28.53	peak	H
5375.000	39.66	9.98	49.64	74.00	-24.36	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** TX / IEEE 802.11b / CH High**Test Date:** October 9, 2014**Temperature:** 26°C**Tested by:** David Shu**Humidity:** 60 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1738.000	49.98	-4.06	45.92	74.00	-28.08	peak	V
4200.000	39.88	5.95	45.83	74.00	-28.17	peak	V
5935.000	38.92	12.05	50.97	74.00	-23.03	peak	V
N/A							
1946.000	51.60	-2.80	48.80	74.00	-25.20	peak	H
4185.000	40.58	5.88	46.46	74.00	-27.54	peak	H
5920.000	38.93	11.97	50.90	74.00	-23.10	peak	
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** TX / IEEE 802.11g / CH Low**Test Date:** October 9, 2014**Temperature:** 26°C**Tested by:** David Shu**Humidity:** 60 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
2026.000	50.09	-2.48	47.61	74.00	-26.39	peak	V
4460.000	40.66	7.08	47.74	74.00	-26.26	peak	V
5850.000	39.35	11.60	50.95	74.00	-23.05	peak	V
N/A							
1506.000	50.86	-5.47	45.39	74.00	-28.61	peak	H
3825.000	41.02	4.35	45.37	74.00	-28.63	peak	H
6080.000	39.98	12.68	52.66	74.00	-21.34	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** TX / IEEE 802.11g / CH Mid**Test Date:** August 9, 2014**Temperature:** 26°C**Tested by:** David Shu**Humidity:** 60 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1732.000	50.97	-4.10	46.87	74.00	-27.13	peak	V
4280.000	40.04	6.30	46.34	74.00	-27.66	peak	V
6575.000	38.19	14.37	52.56	74.00	-21.44	peak	
N/A							
1338.000	51.37	-6.36	45.01	74.00	-28.99	peak	H
3850.000	40.30	4.46	44.76	74.00	-29.24	peak	H
5965.000	37.91	12.21	50.12	74.00	-23.88	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** TX / IEEE 802.11g / CH High**Test Date:** October 9, 2014**Temperature:** 26°C**Tested by:** David Shu**Humidity:** 60 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1948.000	51.04	-2.79	48.25	74.00	-25.75	peak	V
4405.000	40.00	6.84	46.84	74.00	-27.16	peak	V
5910.000	39.29	11.92	51.21	74.00	-22.79	peak	V
N/A							
1962.000	50.32	-2.70	47.62	74.00	-26.38	peak	H
4545.000	40.21	7.37	47.58	74.00	-26.42	peak	H
6135.000	39.15	12.88	52.03	74.00	-21.97	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode Channel
mode / CH Low

Test Date: October 9, 2014

Temperature: 26°C

Tested by: David Shu

Humidity: 60 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1764.000	50.80	-3.90	46.90	74.00	-27.10	peak	V
3880.000	41.62	4.58	46.20	74.00	-27.80	peak	V
5340.000	39.82	9.68	49.50	74.00	-24.50	peak	V
N/A							
1406.000	51.10	-6.00	45.10	74.00	-28.90	peak	H
4150.000	41.47	5.73	47.20	74.00	-26.80	peak	H
5740.000	39.49	11.01	50.50	74.00	-23.50	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode Channel mode / CH Mid

Test Date: August 9, 2014

Temperature: 26°C

Tested by: David Shu

Humidity: 60 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1702.000	48.48	-4.28	44.20	74.00	-29.80	peak	V
3735.000	41.95	3.98	45.93	74.00	-28.07	peak	V
5755.000	40.17	11.09	51.26	74.00	-22.74	peak	V
N/A							
1584.000	51.93	-5.00	46.93	74.00	-27.07	peak	H
4085.000	40.16	5.45	45.61	74.00	-28.39	peak	H
5430.000	39.45	10.06	49.51	74.00	-24.49	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode Channel mode / CH High

Test Date: October 9, 2014

Temperature: 26°C

Tested by: David Shu

Humidity: 60 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1594.000	52.63	-4.94	47.69	74.00	-26.31	peak	V
4615.000	40.60	7.56	48.16	74.00	-25.84	peak	V
6110.000	38.24	12.79	51.03	74.00	-22.97	peak	V
N/A							
1780.000	49.96	-3.81	46.15	74.00	-27.85	peak	H
4130.000	40.67	5.64	46.31	74.00	-27.69	peak	H
5375.000	39.34	9.98	49.32	74.00	-24.68	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 40 MHz mode
/ CH Low

Test Date: October 9, 2014

Temperature: 26°C

Tested by: David Shu

Humidity: 60 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1740.000	51.29	-4.05	47.24	74.00	-26.76	peak	V
4845.000	40.05	8.17	48.22	74.00	-25.78	peak	V
6850.000	38.78	15.15	53.93	74.00	-20.07	peak	V
N/A							
1714.000	50.23	-4.21	46.02	74.00	-27.98	peak	H
4775.000	40.84	7.98	48.82	74.00	-25.18	peak	H
6305.000	39.41	13.47	52.88	74.00	-21.12	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 40 MHz mode
/ CH Mid

Test Date: August 9, 2014

Temperature: 26°C

Tested by: David Shu

Humidity: 60 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1806.000	50.88	-3.65	47.23	74.00	-26.77	peak	V
4350.000	41.18	6.60	47.78	74.00	-26.22	peak	V
5335.000	40.96	9.64	50.60	74.00	-23.40	peak	V
N/A							
1948.000	51.69	-2.79	48.90	74.00	-25.10	peak	H
3880.000	40.95	4.58	45.53	74.00	-28.47	peak	H
5445.000	39.83	9.99	49.82	74.00	-24.18	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 40 MHz mode
/ CH High

Test Date: October 9, 2014

Temperature: 26°C

Tested by: David Shu

Humidity: 60 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
1398.000	51.09	-6.05	45.04	74.00	-28.96	peak	V
4400.000	40.84	6.82	47.66	74.00	-26.34	peak	V
6005.000	39.98	12.42	52.40	74.00	-21.60	peak	V
N/A							
1690.000	51.36	-4.35	47.01	74.00	-26.99	peak	H
4320.000	41.68	6.47	48.15	74.00	-25.85	peak	H
6155.000	39.16	12.95	52.11	74.00	-21.89	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. 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.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



7.9 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a) & RSS-Gen §7.2.4, except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

* Decreases with the logarithm of the frequency.

Test Configuration

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.



TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Test Data

Operation Mode: Normal Link **Test Date:** October 29, 2014
Temperature: 25°C **Tested by:** Dennis Li
Humidity: 55% RH

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB/m)	QP Result (dBuV/m)	AV Result (dBuV/m)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.2340	27.92	14.34	0.19	28.11	14.53	62.31	52.31	-34.20	-37.78	L1
0.3820	29.18	16.70	0.20	29.38	16.90	58.24	48.24	-28.86	-31.34	L1
0.6980	27.24	16.49	0.20	27.44	16.69	56.00	46.00	-28.56	-29.31	L1
1.0140	29.70	19.04	0.21	29.91	19.25	56.00	46.00	-26.09	-26.75	L1
1.6580	33.04	21.49	0.16	33.20	21.65	56.00	46.00	-22.80	-24.35	L1
3.0900	15.40	4.95	0.17	15.57	5.12	56.00	46.00	-40.43	-40.88	L1
0.2620	34.99	22.13	0.10	35.09	22.23	61.37	51.37	-26.28	-29.14	L2
0.3900	34.06	20.44	0.10	34.16	20.54	58.06	48.06	-23.90	-27.52	L2
0.5980	27.76	14.58	0.10	27.86	14.68	56.00	46.00	-28.14	-31.32	L2
0.9700	33.70	20.07	0.10	33.80	20.17	56.00	46.00	-22.20	-25.83	L2
1.5620	36.02	22.29	0.04	36.06	22.33	56.00	46.00	-19.94	-23.67	L2
2.1980	26.08	9.97	0.00	26.08	9.97	56.00	46.00	-29.92	-36.03	L2

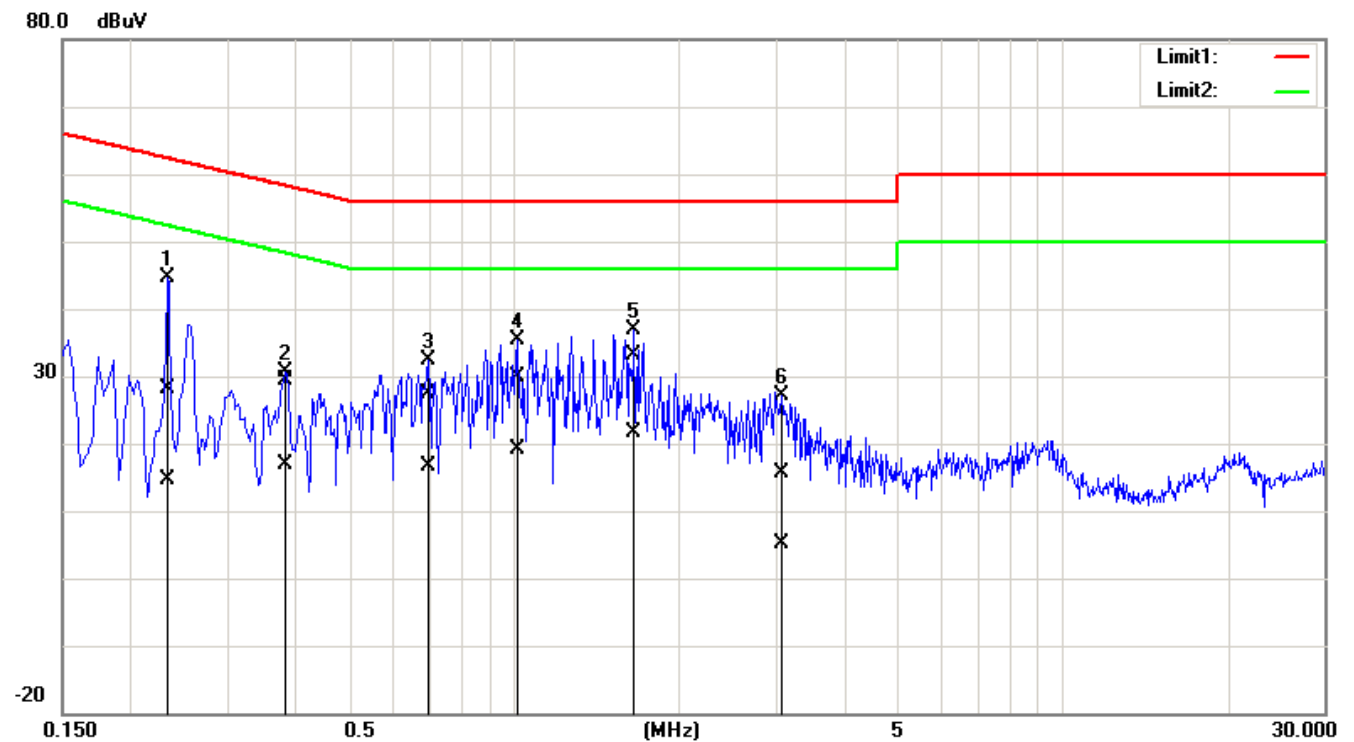
Remark:

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10 kHz; the IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9 kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)



Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)

