

FCC TEST REPORT
for
ViewSonic Corporation

Wireless Presentation Gateway Dongle
Model No.: WPG-300, VS16124

Prepared for : ViewSonic Corporation
Address : 10 Pointe Dr. Suite 200. Brea, CA 92821, United States

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited
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Report Number : R011503055E
Date of Test : Mar. 06~ Apr. 10, 2015
Date of Report : Apr. 13, 2015

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Appendix I (4 Pages)

Appendix II (3 Pages)

TEST REPORT


Applicant : ViewSonic Corporation
Manufacturer : ViewSonic Corporation
EUT : Wireless Presentation Gateway Dongle
Model No. : WPG-300, VS16124
Serial No. : N.A.
Trade Mark : ViewSonic
Rating : DC 5V, 1A


Measurement Procedure Used:
FCC Part15 Subpart C, Paragraph 15.247

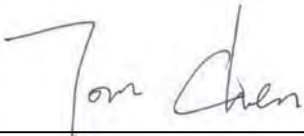
The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Test : Mar. 06~ Apr. 10, 2015

Prepared by : 
(Tested Engineer / Kebo Zhang)

Reviewer : 
(Project Manager / Amy Ding)

Approved & Authorized Signer : 
(Manager / Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : Wireless Presentation Gateway Dongle

Model Number : WPG-300, VS16124
(Note: All samples are the same except the model number and colour, so we prepare "WPG-300" for test only.)

Test Power Supply : DC 5V via USB Port

RF Transmission : 2412MHz~2462MHz (802.11b/802.11g/802.11n(HT20))
Frequency : 2422MHz~2452MHz (802.11n(HT40))

Channels : 11 For (802.11b/802.11g/802.11n(HT20))
7 For (802.11n(HT40))

Modulation : 802.11b: DSSS with DBPSK/DQPSK/CCK
802.11g: OFDM with BPSK/QPSK/16QAM/64QAM
802.11n(HT20): OFDM with BPSK/QPSK/16QAM/64QAM
802.11n(HT40): OFDM with BPSK/QPSK/16QAM/64QAM

Antenna Gain: : 2dBi

Applicant : ViewSonic Corporation
Address : 10 Pointe Dr. Suite 200. Brea, CA 92821, United States

Manufacturer : ViewSonic Corporation
Address : 10 Pointe Dr. Suite 200. Brea, CA 92821, United States

Factory : ViewSonic Corporation
Address : 10 Pointe Dr. Suite 200. Brea, CA 92821, United States

Date of receipt : Mar. 06, 2015

Date of Test : Mar. 06~ Apr. 10, 2015

1.2. Auxiliary Equipment Used during Test

MONITOR : Manufacturer: DELL
M/N: UZ2215Hf
S/N: CN-035VN6-72872-45A-A3AB
Input Rating: AC 100-240V, 50-60Hz, 1.5A
Output Rating: DC 19.5V, 4.62A
TUV-GS FCC CE KCC VCCI

1.3. Description of Test Facility

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

CNAS - LAB Code: L3503

Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021

Shenzhen Anbotek Compliance Laboratory Limited, 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 752021, July 10, 2013.

IC-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited., 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 8058A, February 22, 2013.

Test Location

All Emissions tests were performed at
Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC
Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong,
China

1.4. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.1 dB (Horizontal)
Ur = 4.3 dB (Vertical)
Conduction Uncertainty : Uc = 3.4dB

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC Part 15, Paragraph 15.247.

2.1. 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, Paragraph 15.247(b)(1) | Peak Output Power | PASS | Complies |
| FCC Part 15, Paragraph 15.247(a)(2) | 6dB Bandwidth | PASS | Complies |
| FCC Part 15, Paragraph 15.247(c) | 100kHz Bandwidth of Frequency Band Edges | PASS | Complies |
| FCC Part 15, Paragraph 15.209(a)(f) | Spurious Emission | PASS | Complies |
| FCC Part 15, Paragraph 15.247(a)(1) | Frequency Separation | - | N/A |
| FCC Part 15, Paragraph 15.247(a)(1)(iii) | Number of Hopping Frequency | - | N/A |
| FCC Part 15, Paragraph 15.247(a)(1)(iii) | Time of Occupancy | - | N/A |
| FCC Part 15, Paragraph 15.247(c) | Peak Power Density | PASS | Complies |

2.2. Description of Test Modes

The EUT has been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

IEEE802.11b: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 1 Mbps lowest data rate (worst case) are chosen for the final testing.

IEEE802.11g: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 6 Mbps lowest data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT20): Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with MCS 0 Mbps lowest data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT40): Channel 3(2422MHz), Channel 6(2437MHz) and Channel 9(2452MHz) with MCS 0 Mbps lowest data rate (the worst case) are chosen for the final testing.

2.3. List of channels:

√ - available

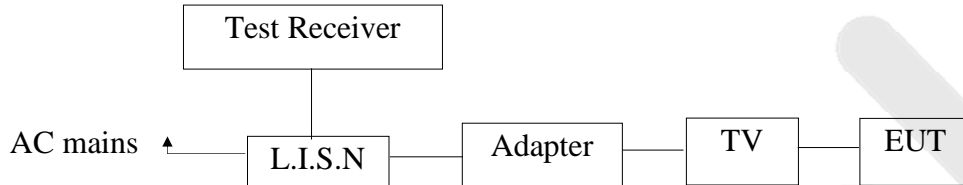
X - tested

| Number | Frequency(MHz) | | 802.11 b/g/n (HT20) | 802.11 b/g/n (HT40) |
|--------|----------------|---|---------------------------|---------------------------|
| 1 | 2412 | √ | X | |
| 2 | 2417 | √ | | |
| 3 | 2422 | √ | | X |
| 4 | 2427 | √ | | |
| 5 | 2432 | √ | | |
| 6 | 2437 | √ | X | X |
| 7 | 2442 | √ | | |
| 8 | 2447 | √ | | |
| 9 | 2452 | √ | | X |
| 10 | 2457 | √ | | |
| 11 | 2462 | √ | X | |

3. Conducted Emission Test

3.1. Block Diagram of Test Setup

3.1.1. Block diagram of connection between the EUT and simulators



3.2. Power Line Conducted Emission Measurement Limits (15.207)

| Frequency MHz | Limits dB(μV) | |
|------------------|------------------|---------------|
| | Quasi-peak Level | Average Level |
| 0.15 ~ 0.50 | 66 ~ 56* | 56 ~ 46* |
| 0.50 ~ 5.00 | 56 | 46 |
| 5.00 ~ 30.00 | 60 | 50 |

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

3.3. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4. Operating Condition of EUT

- 3.4.1. Setup the EUT and simulator as shown as Section 3.1.
- 3.4.2. Turn on the power of all equipment.
- 3.4.3. Let the EUT work in test mode (HDMI, MHL) and measure it.

3.5. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test results are reported on Section 3.6.

3.6. Test equipment

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|--------------------|----------------------|-----------|------------|---------------|---------------|
| 1. | Two-Line V-network | Rohde & Schwarz | ENV216 | 100055 | Apr. 22, 2014 | 1 Year |
| 2. | EMI Test Receiver | Rohde & Schwarz | ESCI | 100627 | Apr. 22, 2014 | 1 Year |
| 3. | RF Switching Unit | Compliance Direction | RSU-M2 | 38303 | Apr. 22, 2014 | 1 Year |

3.7. Power Line Conducted Emission Measurement Results

PASS.

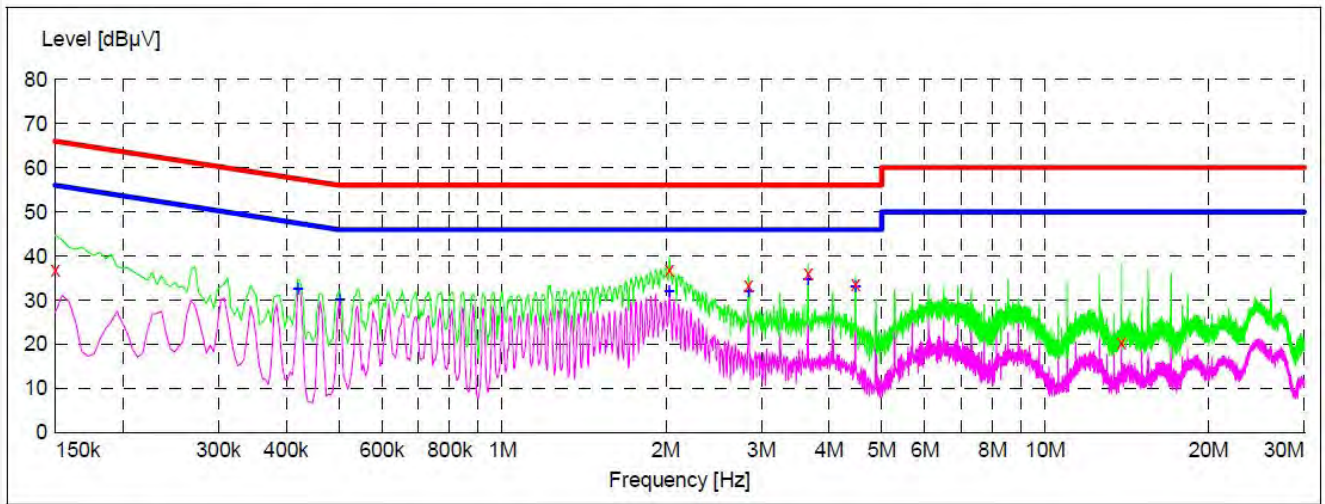
The frequency range from 150KHz to 30 MHz is investigated.

The EUT was tested on (HDMI, MHL) modes, only the worst data of (MHL) is attached in the following pages.

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: MHL
 Test Specification: DC 5V via USB Port
 Comment: Live Line
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage (150K~30M) FIN"
 Short Description: 150K-30M Disturbance Voltages



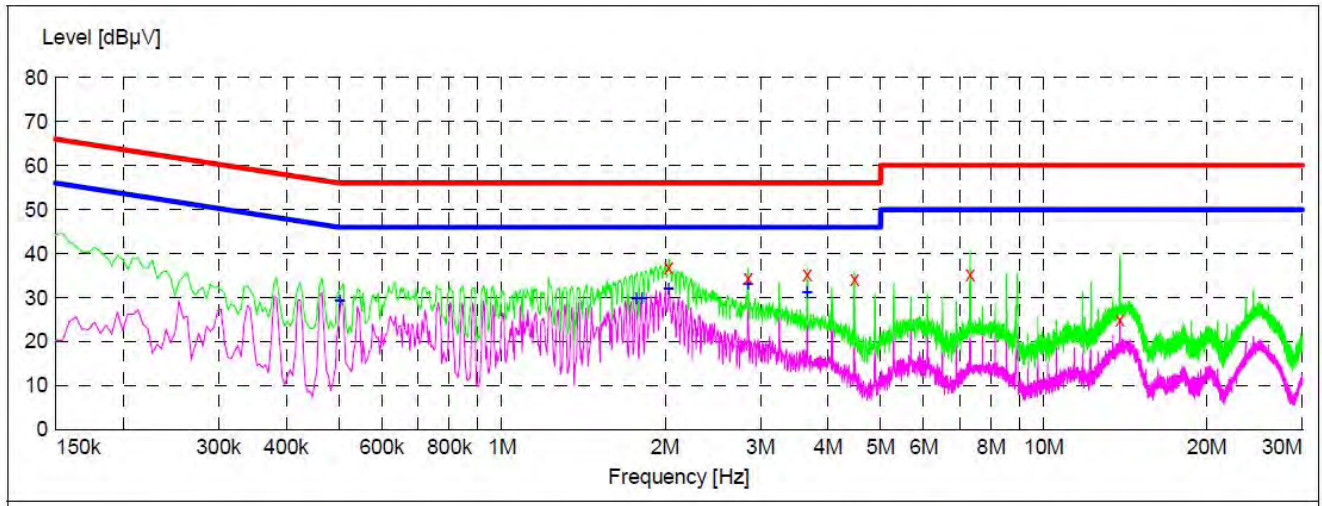
| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.150000 | 37.10 | 20.1 | 66 | 28.9 | QP | L1 | GND |
| 2.030500 | 37.00 | 20.3 | 56 | 19.0 | QP | L1 | GND |
| 2.840500 | 33.50 | 20.4 | 56 | 22.5 | QP | L1 | GND |
| 3.655000 | 36.10 | 20.4 | 56 | 19.9 | QP | L1 | GND |
| 4.469500 | 33.70 | 20.5 | 56 | 22.3 | QP | L1 | GND |
| 13.829500 | 20.50 | 20.7 | 60 | 39.5 | QP | L1 | GND |

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.420000 | 32.60 | 20.1 | 47 | 14.8 | AV | L1 | GND |
| 0.501000 | 30.20 | 20.1 | 46 | 15.8 | AV | L1 | GND |
| 2.030500 | 31.90 | 20.3 | 46 | 14.1 | AV | L1 | GND |
| 2.845000 | 32.20 | 20.4 | 46 | 13.8 | AV | L1 | GND |
| 3.655000 | 34.90 | 20.4 | 46 | 11.1 | AV | L1 | GND |
| 4.469500 | 33.10 | 20.5 | 46 | 12.9 | AV | L1 | GND |

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: MHL
 Test Specification: DC 5V via USB Port
 Comment: Neutral Line
 Tem:25°C Hum:50%

SCAN TABLE: "Voltage (150K~30M) FIN"
 Short Description: 150K-30M Disturbance Voltages

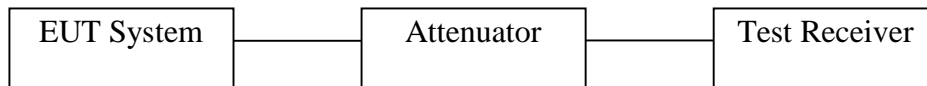


| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 2.030500 | 37.00 | 20.3 | 56 | 19.0 | QP | N | GND |
| 2.845000 | 34.50 | 20.4 | 56 | 21.5 | QP | N | GND |
| 3.655000 | 35.30 | 20.4 | 56 | 20.7 | QP | N | GND |
| 4.469500 | 34.30 | 20.5 | 56 | 21.7 | QP | N | GND |
| 7.313500 | 35.30 | 20.5 | 60 | 24.7 | QP | N | GND |
| 13.834000 | 25.10 | 20.7 | 60 | 34.9 | QP | N | GND |

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---------------|------------|-----------|------------|-----------|----------|------|-----|
| 0.501000 | 29.30 | 20.1 | 46 | 16.7 | AV | N | GND |
| 1.769500 | 29.80 | 20.3 | 46 | 16.2 | AV | N | GND |
| 1.810000 | 30.00 | 20.3 | 46 | 16.0 | AV | N | GND |
| 2.030500 | 32.10 | 20.3 | 46 | 13.9 | AV | N | GND |
| 2.845000 | 33.00 | 20.4 | 46 | 13.0 | AV | N | GND |
| 3.659500 | 31.30 | 20.4 | 46 | 14.7 | AV | N | GND |

4. FCC Part 15.247 Requirements for DSSS & OFDM Modulation

4.1 Test Setup



4.2 6dB Bandwidth

a. Limit

For the direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

b. 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 = 100kHz, VBW \geq 3*RBW = 300kHz,
Detector= Peak
Trace mode= Max hold.
Sweep- auto couple.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

20dB Bandwidth:

C63.10

Occupied Bandwidth (OBW=20dB Bandwidth)

1. Set RBW=1%~5% OBW
2. Set the VBW \geq 3*RBW
3. Set the span range between 2 times and 5 times of the OBW
4. Sweep Time= Auto
Detector= Peak
Trace= Max hold
5. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce the worst case (i.e. the widest) bandwidth. Unless otherwise specified for an unlicensed wireless device, measure the bandwidth at the -20dB levels with respect to the reference level.

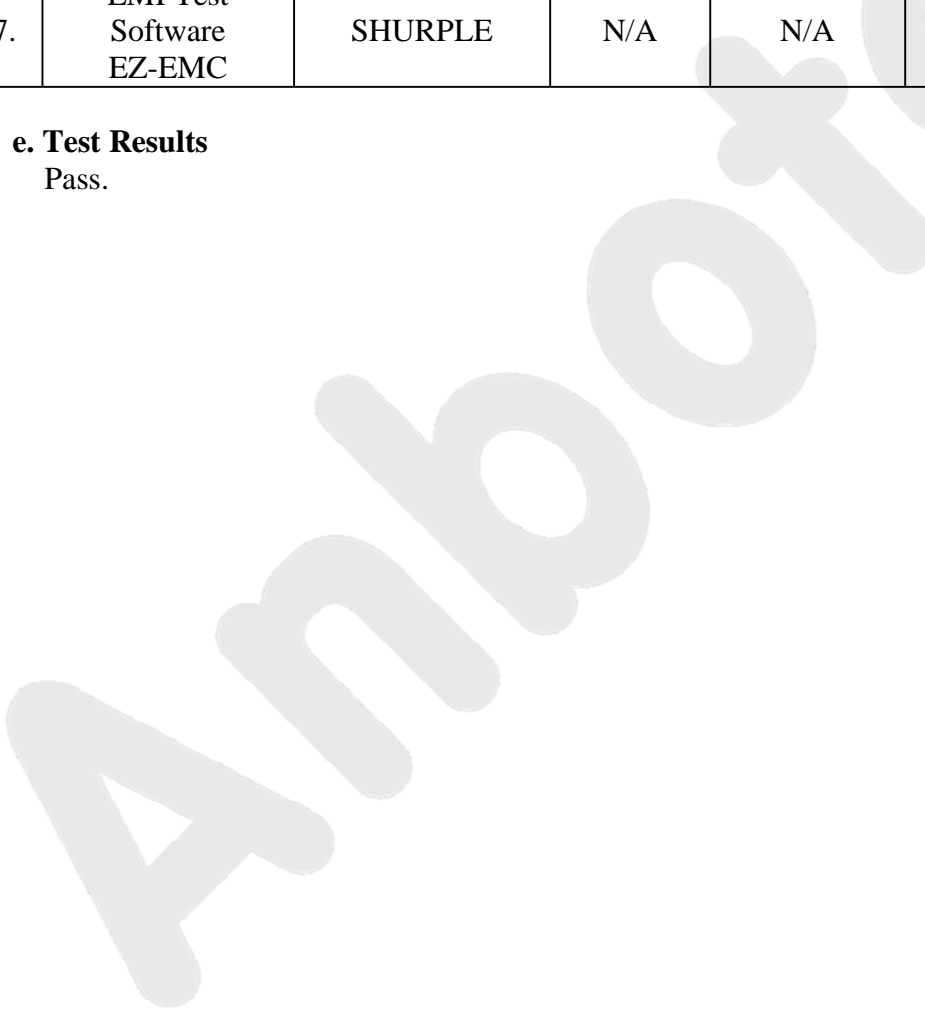
c. Test Setup See 4.1

d. Test Equipment

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|----------------------------|-------------------------|-----------|---------------|---------------|---------------|
| 1. | Spectrum Analysis | Agilent | E4407B | US39390582 | Aug. 08, 2014 | 1 Year |
| 2. | Preamplifier | Instruments corporation | EMC011830 | 980100 | Aug. 08, 2014 | 1 Year |
| 3. | EMI Test Receiver | Rohde & Schwarz | ESPI | 101604 | Apr. 22, 2014 | 1 Year |
| 4. | Double Ridged Horn Antenna | Instruments corporation | GTH-0118 | 351600 | Apr. 04, 2014 | 1 Year |
| 5. | Bilog Broadband Antenna | Schwarzbeck | VULB9163 | VULB 9163-289 | Apr. 24, 2014 | 1 Year |
| 6. | Pre-amplifier | SONOMA | 310N | 186860 | Aug. 08, 2014 | 1 Year |
| 7. | EMI Test Software EZ-EMC | SHURPLE | N/A | N/A | N/A | N/A |

e. Test Results

Pass.



f. Test Data
6dB Bandwidth

ANT A

Test mode: IEEE 802.11b

| Channel | Frequency (MHz) | Bandwidth (MHz) | Limit (kHz) | Results |
|---------|-----------------|-----------------|-------------|---------|
| Low | 2412 | 10.00 | >500 | Pass |
| Mid | 2437 | 10.08 | | Pass |
| High | 2462 | 10.08 | | Pass |

Test mode: IEEE 802.11g

| Channel | Frequency (MHz) | Bandwidth (MHz) | Limit (kHz) | Results |
|---------|-----------------|-----------------|-------------|---------|
| Low | 2412 | 16.60 | >500 | Pass |
| Mid | 2437 | 16.60 | | Pass |
| High | 2462 | 16.60 | | Pass |

Test mode: IEEE 802.11n (HT20)

| Channel | Frequency (MHz) | Bandwidth (MHz) | Limit (kHz) | Results |
|---------|-----------------|-----------------|-------------|---------|
| Low | 2412 | 17.80 | >500 | Pass |
| Mid | 2437 | 17.80 | | Pass |
| High | 2462 | 17.80 | | Pass |

Test mode: IEEE 802.11n (HT40)

| Channel | Frequency (MHz) | Bandwidth (MHz) | Limit (kHz) | Results |
|---------|-----------------|-----------------|-------------|---------|
| Low | 2422 | 36.48 | >500 | Pass |
| Mid | 2437 | 36.48 | | Pass |
| High | 2452 | 36.48 | | Pass |

Test Plots See the following page.

ANT B

Test mode: IEEE 802.11b

| Channel | Frequency (MHz) | Bandwidth (MHz) | Limit (kHz) | Results |
|---------|-----------------|-----------------|-------------|---------|
| Low | 2412 | 10.04 | | Pass |
| Mid | 2437 | 10.04 | >500 | Pass |
| High | 2462 | 10.04 | | Pass |

Test mode: IEEE 802.11g

| Channel | Frequency (MHz) | Bandwidth (MHz) | Limit (kHz) | Results |
|---------|-----------------|-----------------|-------------|---------|
| Low | 2412 | 16.60 | | Pass |
| Mid | 2437 | 16.60 | >500 | Pass |
| High | 2462 | 16.60 | | Pass |

Test mode: IEEE 802.11n (HT20)

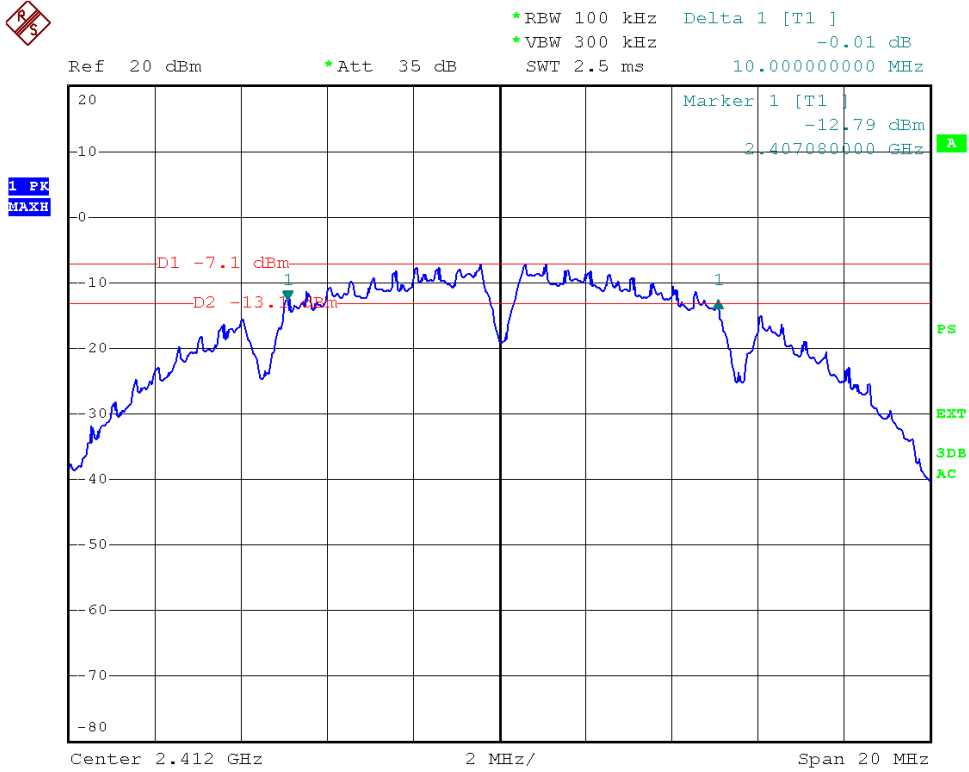
| Channel | Frequency (MHz) | Bandwidth (MHz) | Limit (kHz) | Results |
|---------|-----------------|-----------------|-------------|---------|
| Low | 2412 | 17.84 | | Pass |
| Mid | 2437 | 17.84 | >500 | Pass |
| High | 2462 | 17.84 | | Pass |

Test mode: IEEE 802.11n (HT40)

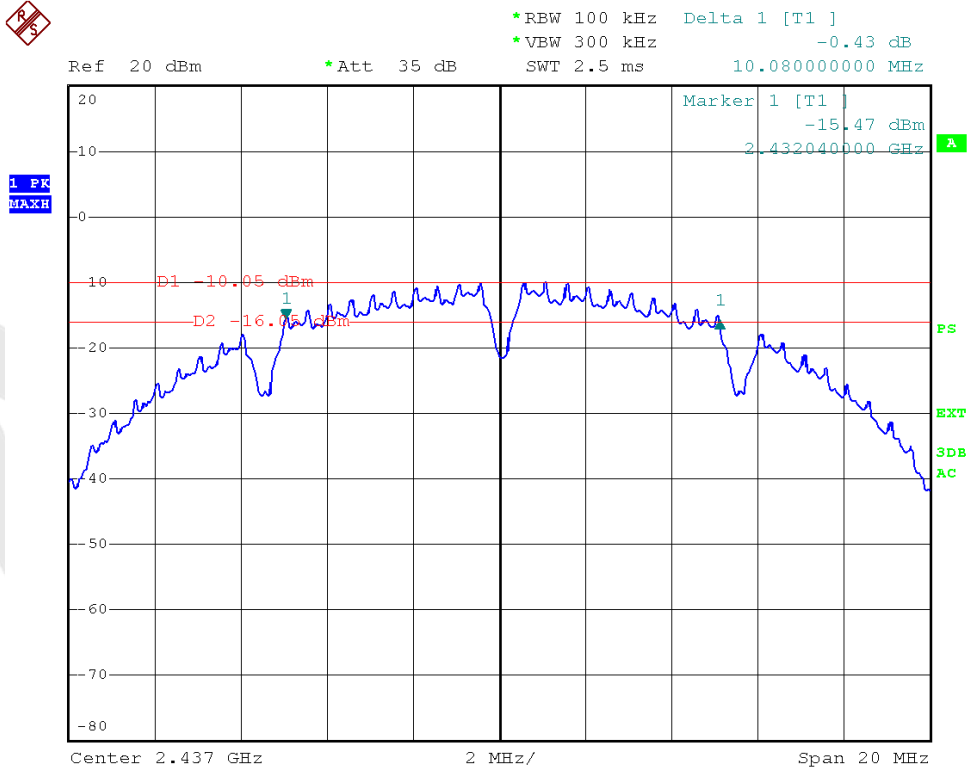
| Channel | Frequency (MHz) | Bandwidth (MHz) | Limit (kHz) | Results |
|---------|-----------------|-----------------|-------------|---------|
| Low | 2422 | 36.48 | | Pass |
| Mid | 2437 | 36.48 | >500 | Pass |
| High | 2452 | 36.48 | | Pass |

Test Plots See the following page.

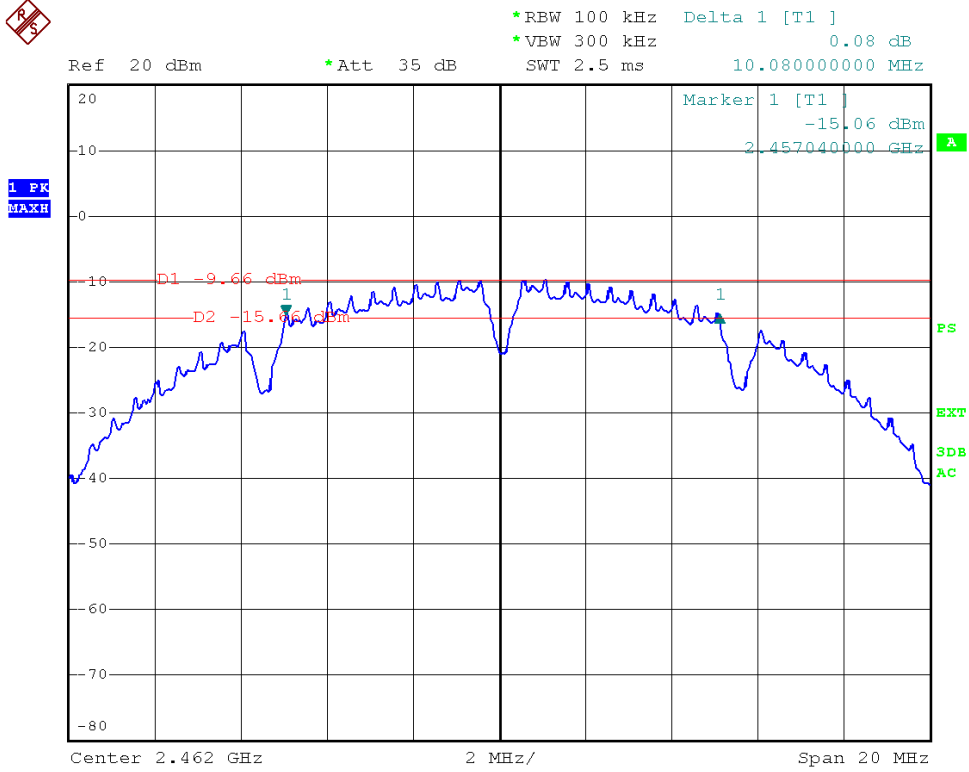
ANT A
Test Mode: 802.11b---Low



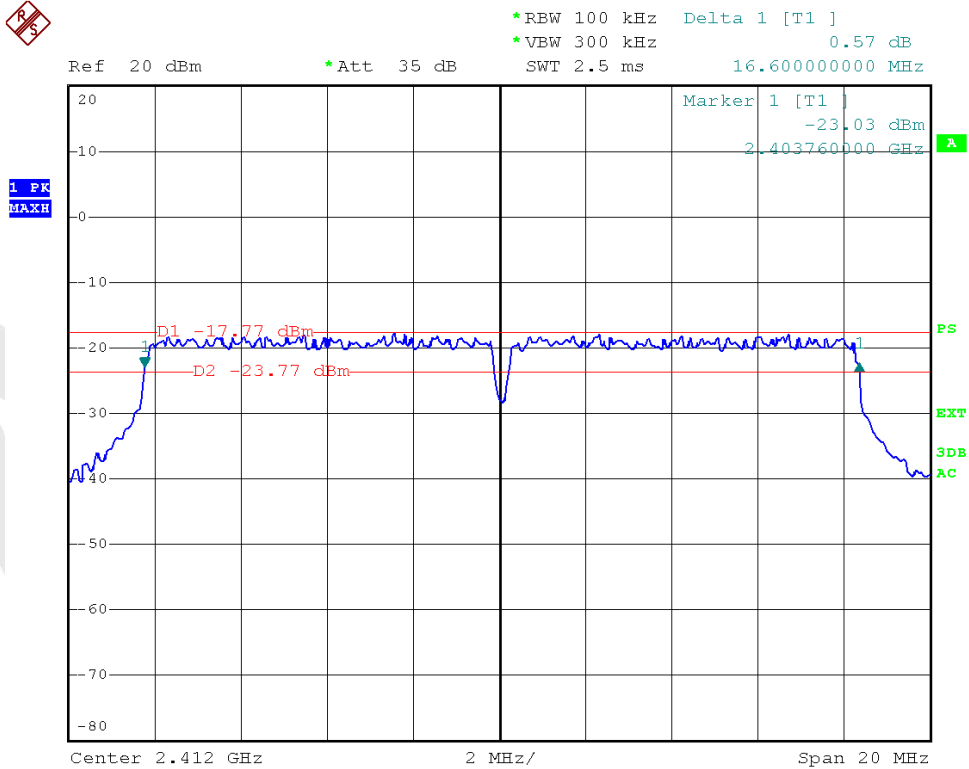
Test Mode: 802.11b---Mid



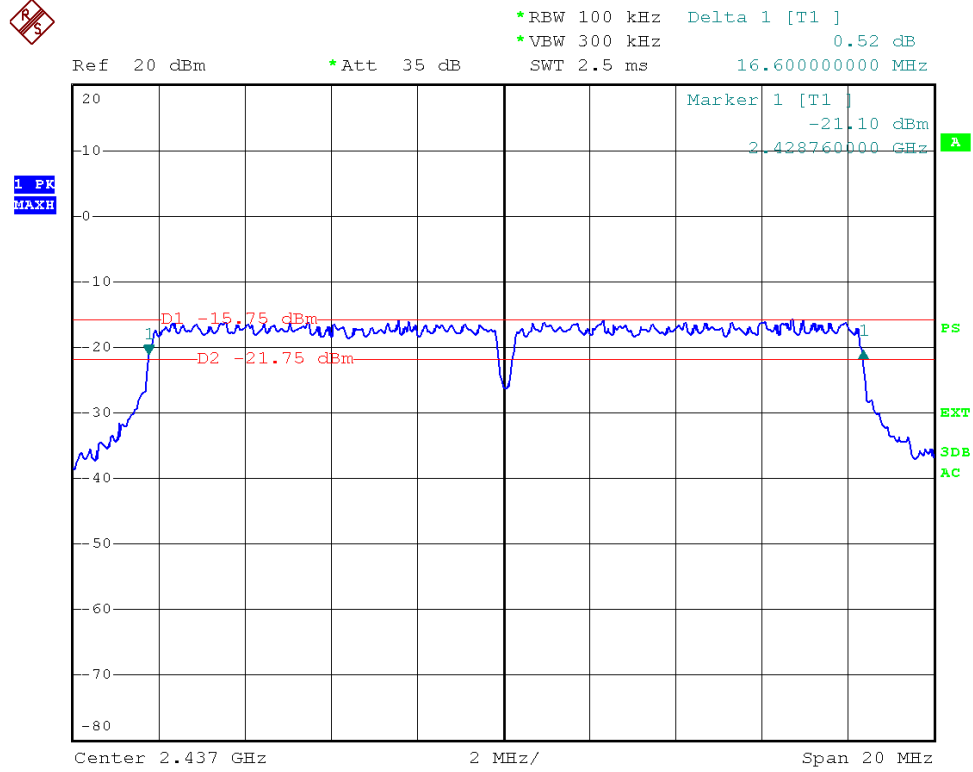
Test Mode: 802.11b---High



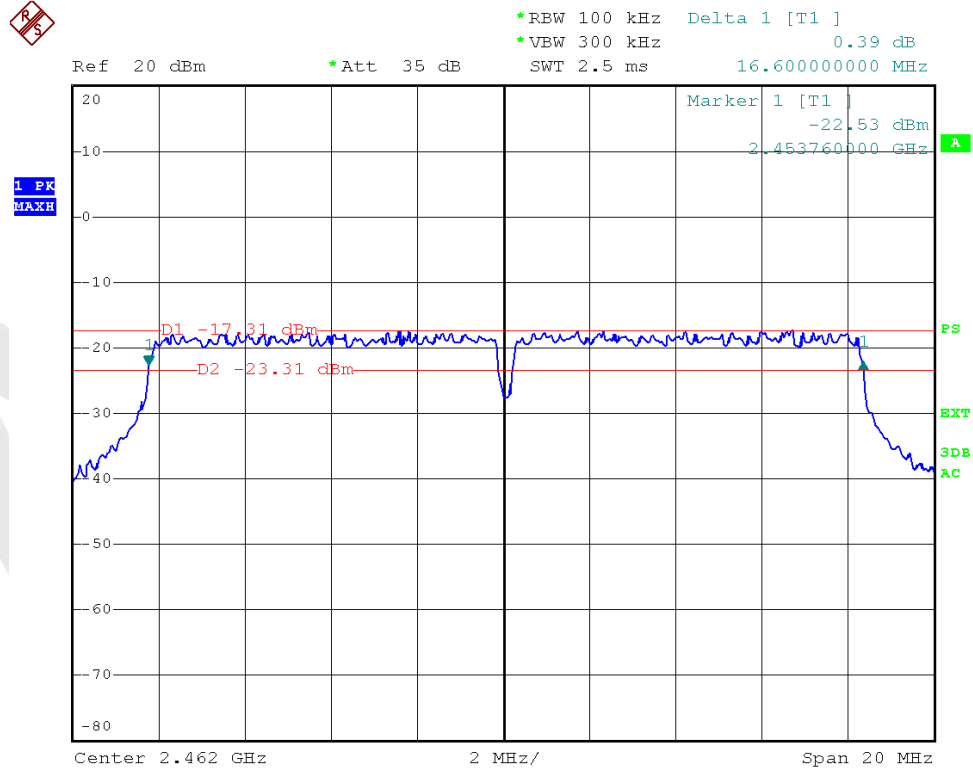
Test Mode: 802.11g---Low



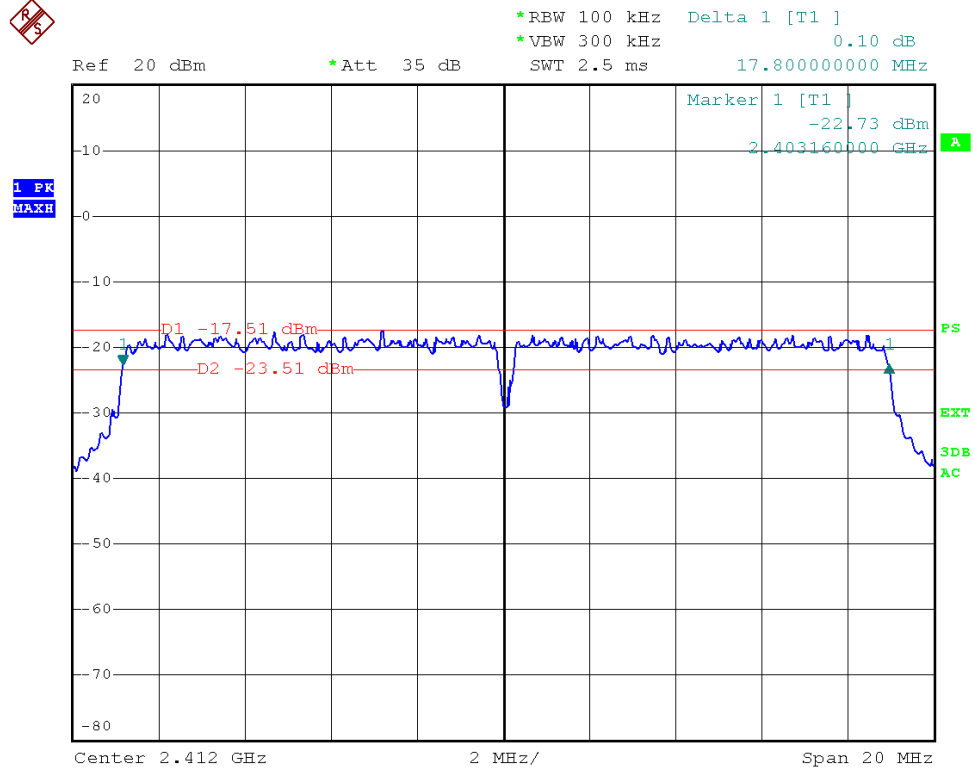
Test Mode: 802.11g---Mid



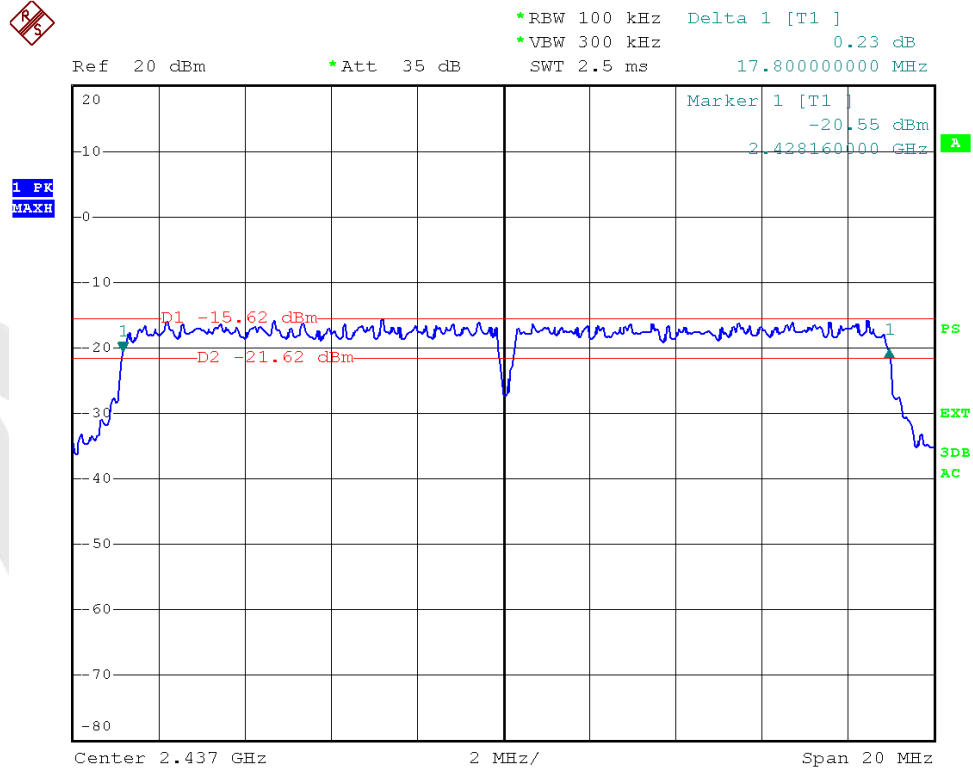
Test Mode: 802.11g---High



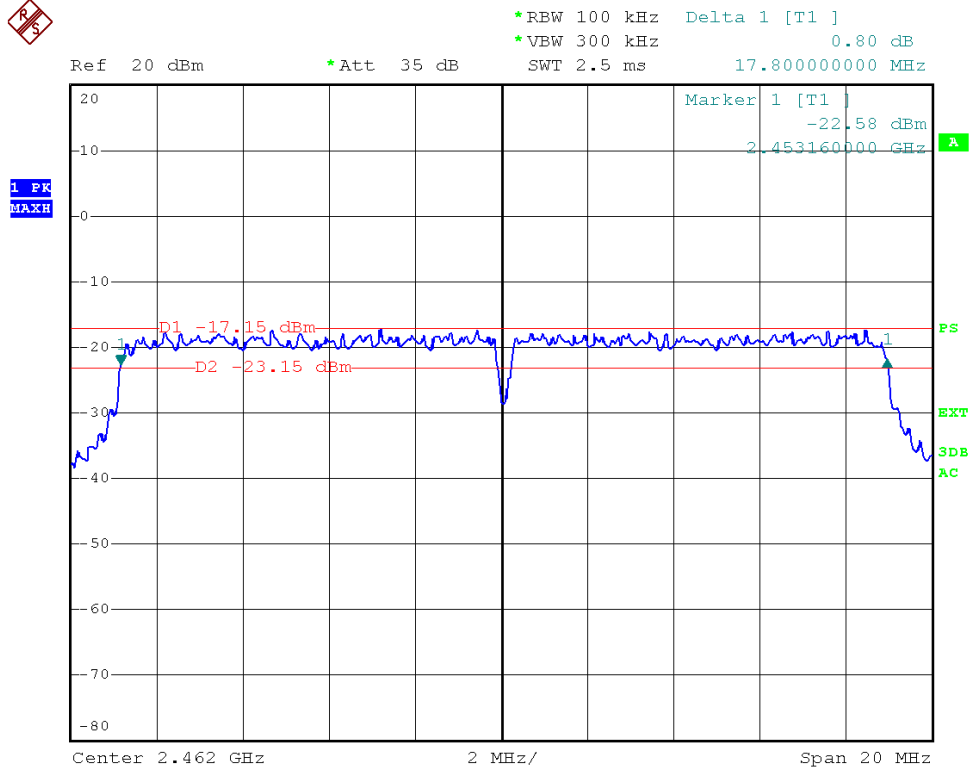
Test Mode: 802.11n (HT20)---Low



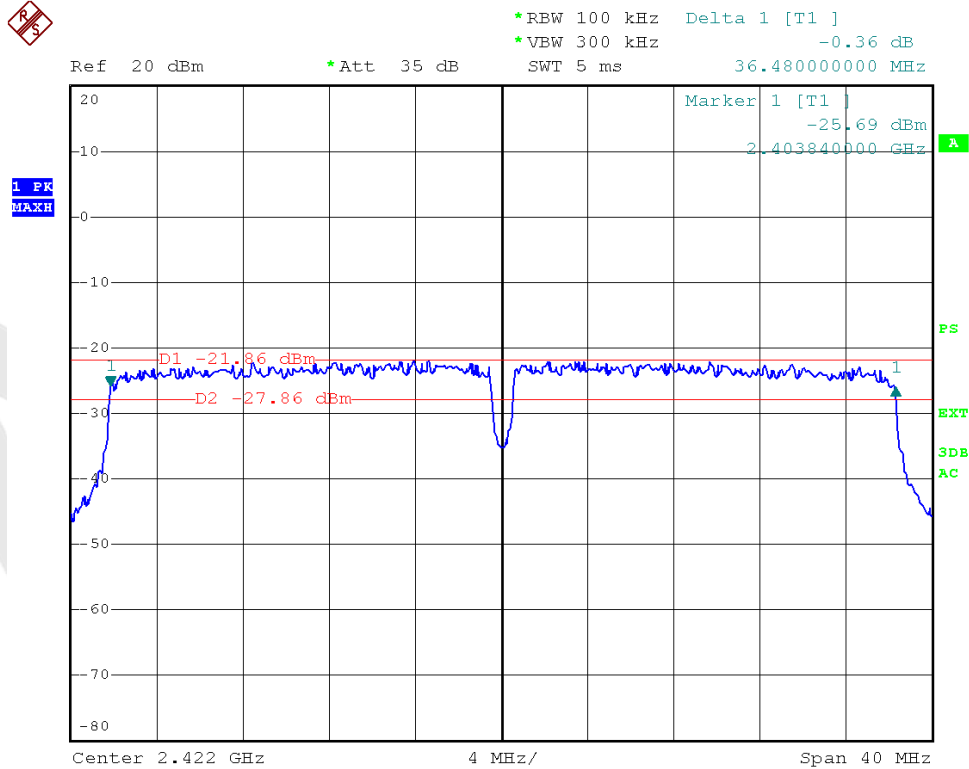
Test Mode: 802.11n (HT20)---Mid



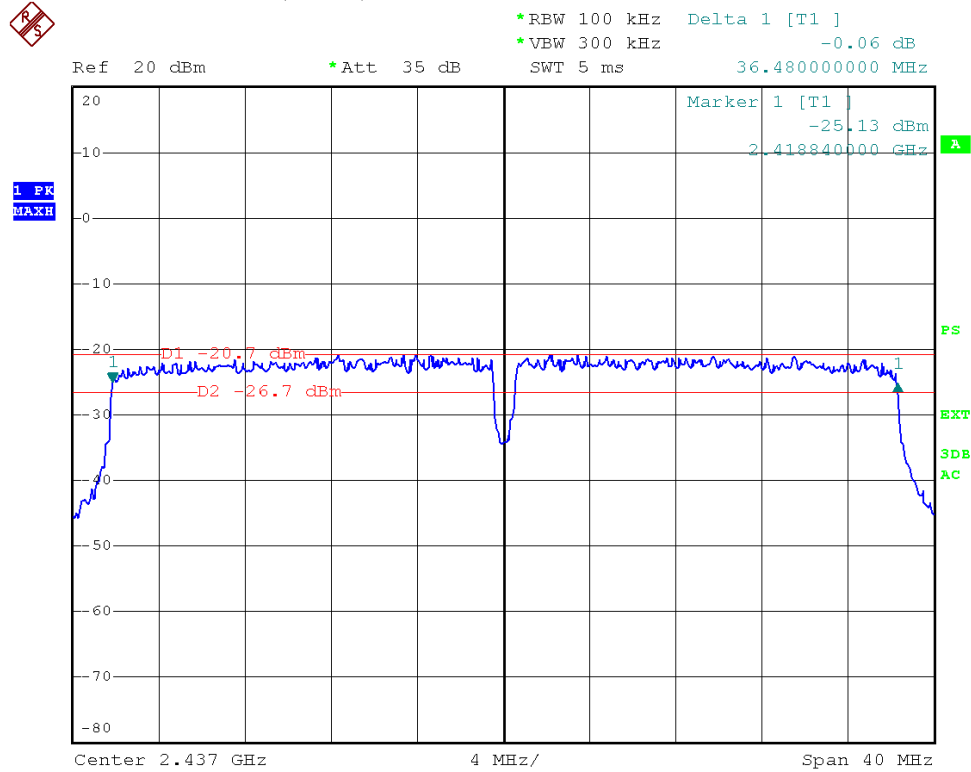
Test Mode: 802.11n (HT20)---High



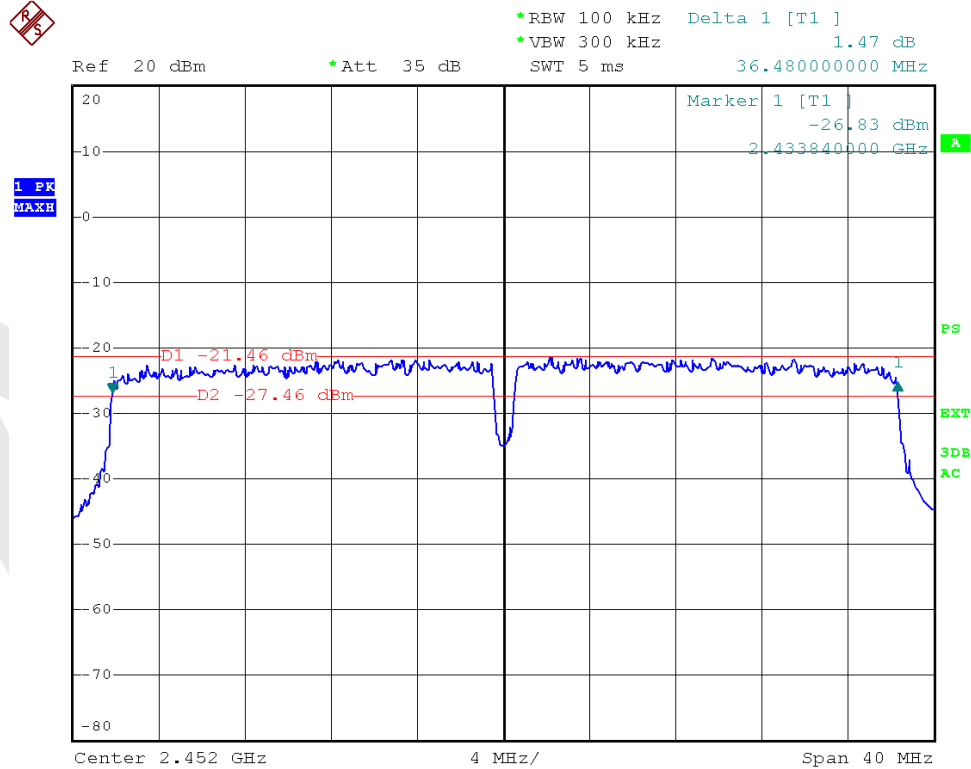
Test Mode: 802.11n (HT40)---Low



Test Mode: 802.11n (HT40)---Mid



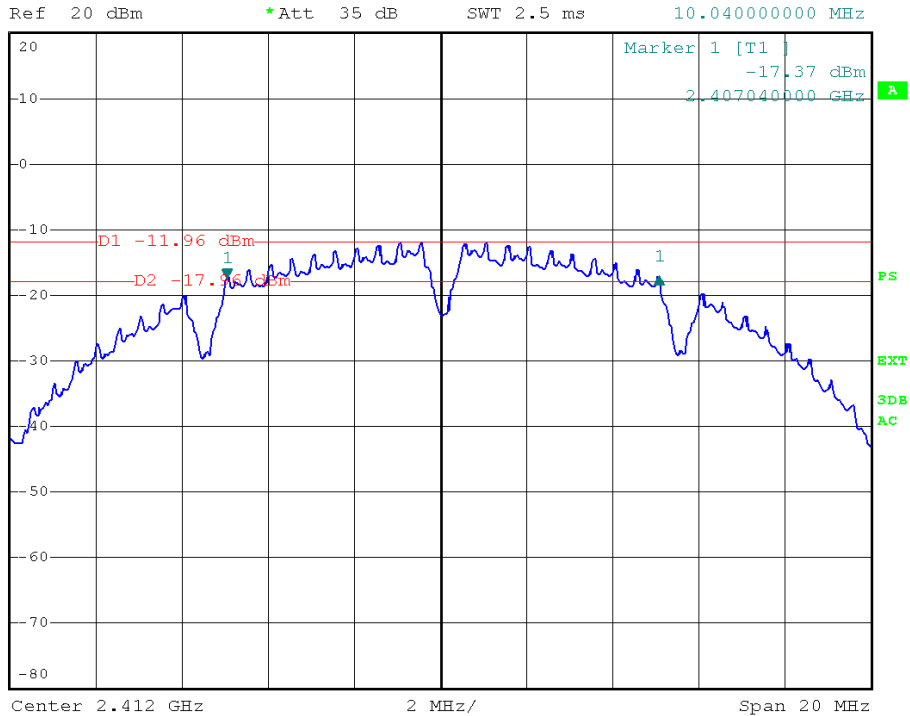
Test Mode: 802.11n (HT40)---High



ANT B
Test Mode: 802.11b---Low



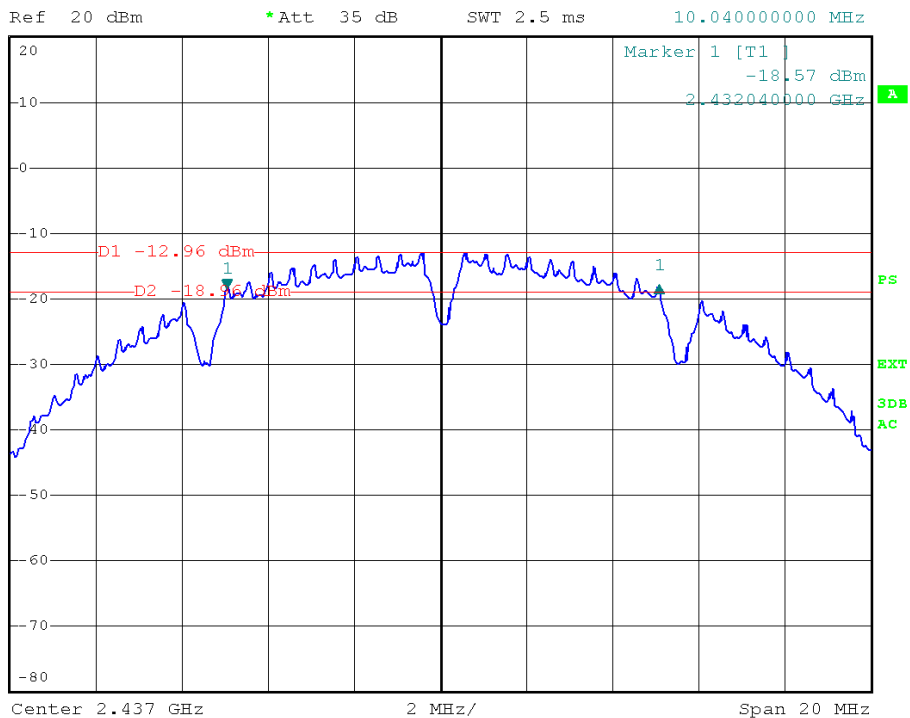
*RBW 100 kHz Delta 1 [T1]
*VBW 300 kHz 0.26 dB
SWT 2.5 ms 10.04000000 MHz



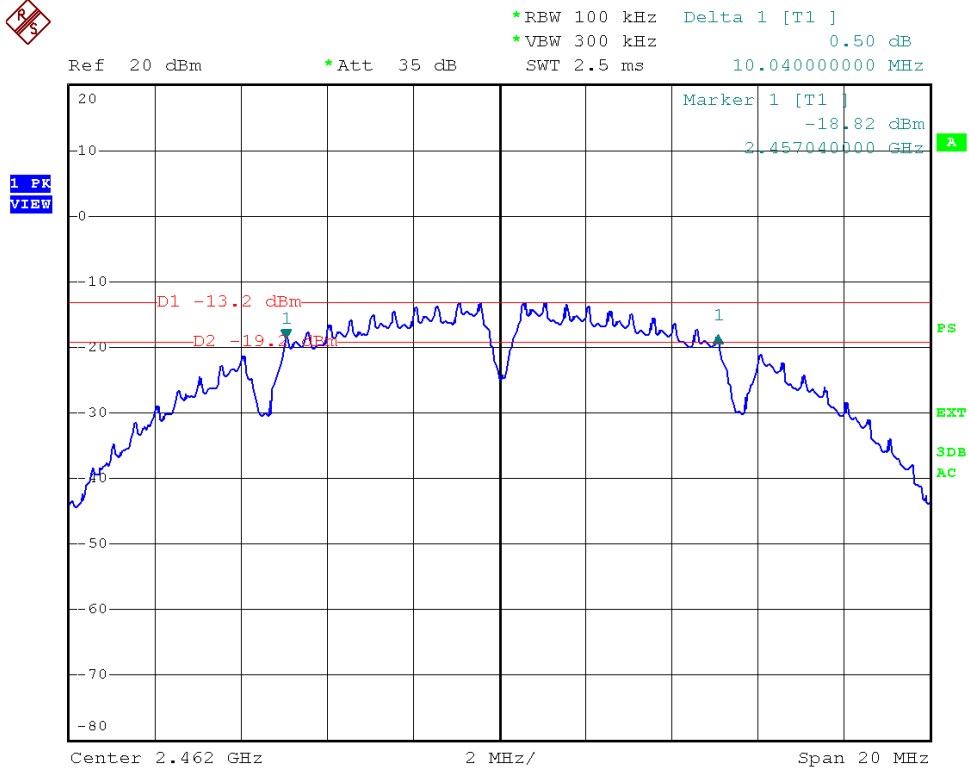
Test Mode: 802.11b---Mid



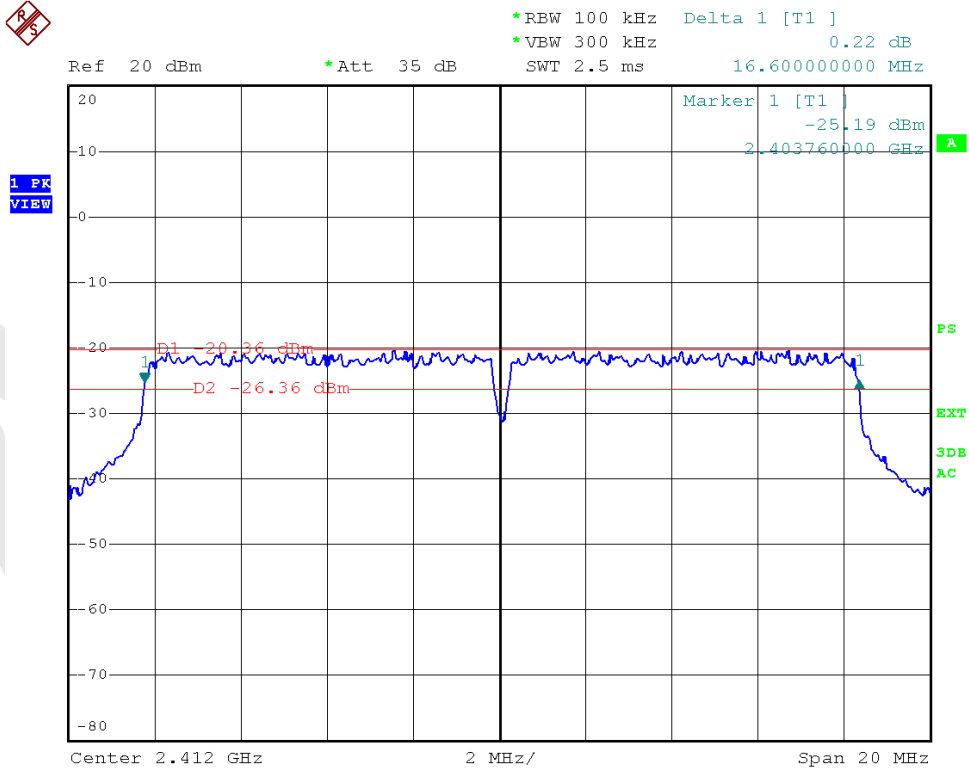
*RBW 100 kHz Delta 1 [T1]
*VBW 300 kHz 0.63 dB
SWT 2.5 ms 10.04000000 MHz



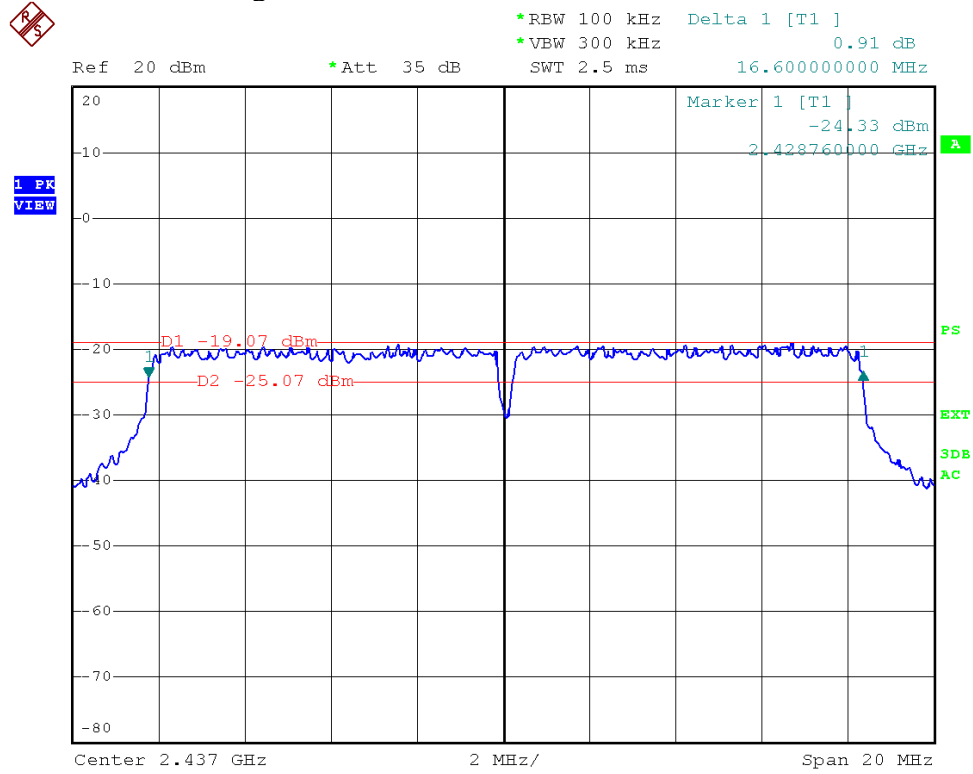
Test Mode: 802.11b---High



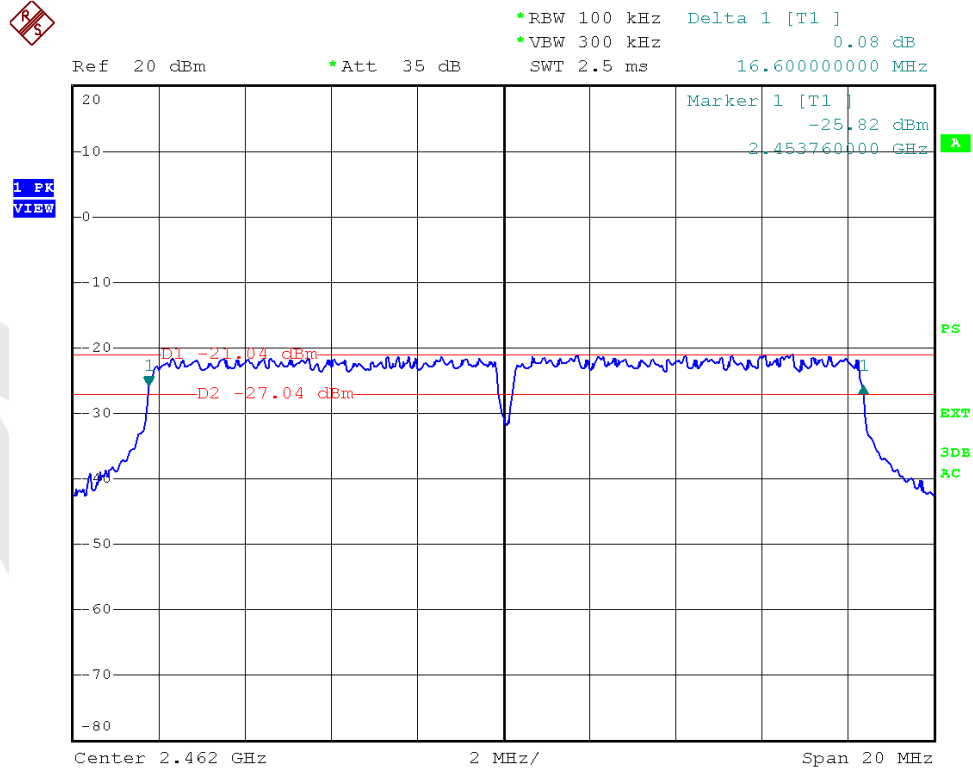
Test Mode: 802.11g---Low



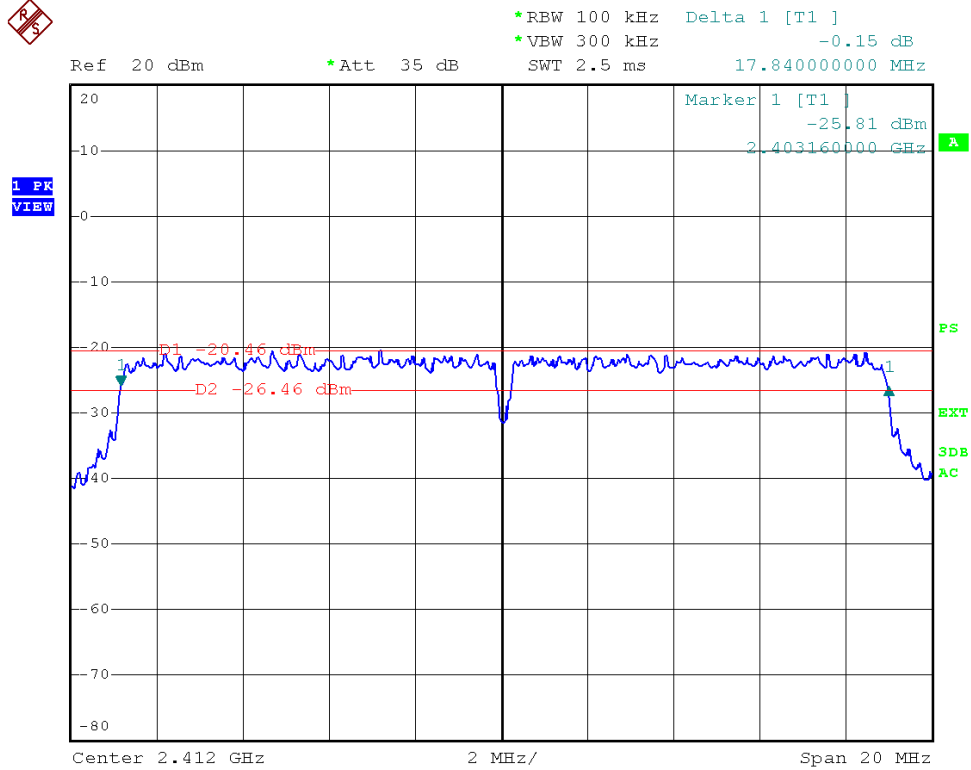
Test Mode: 802.11g---Mid



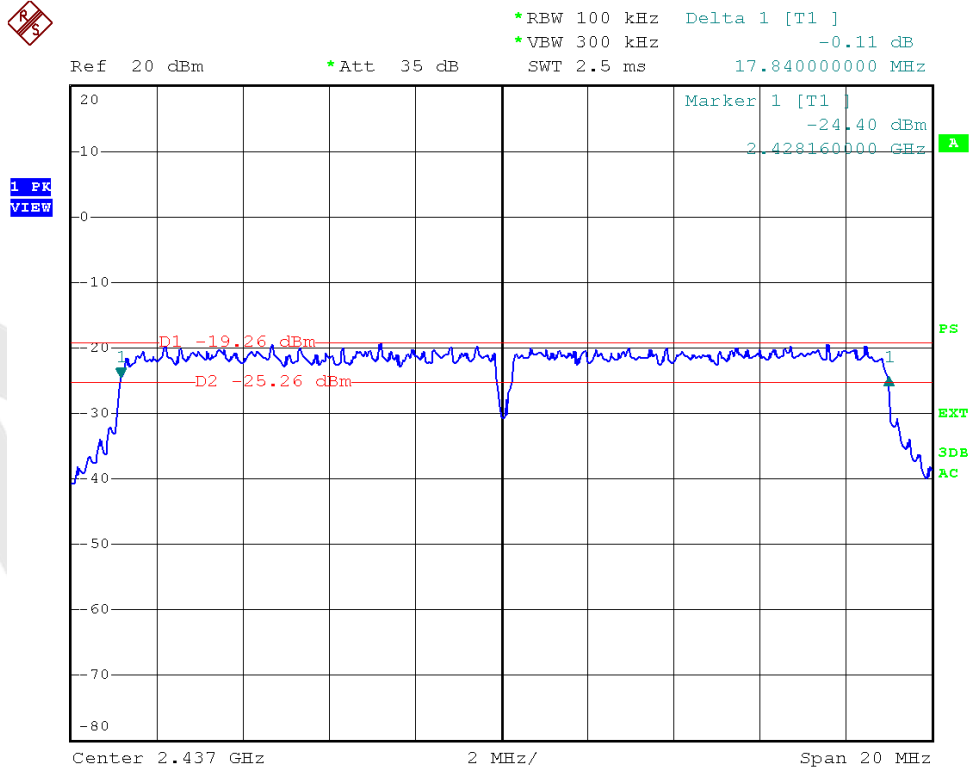
Test Mode: 802.11g---High



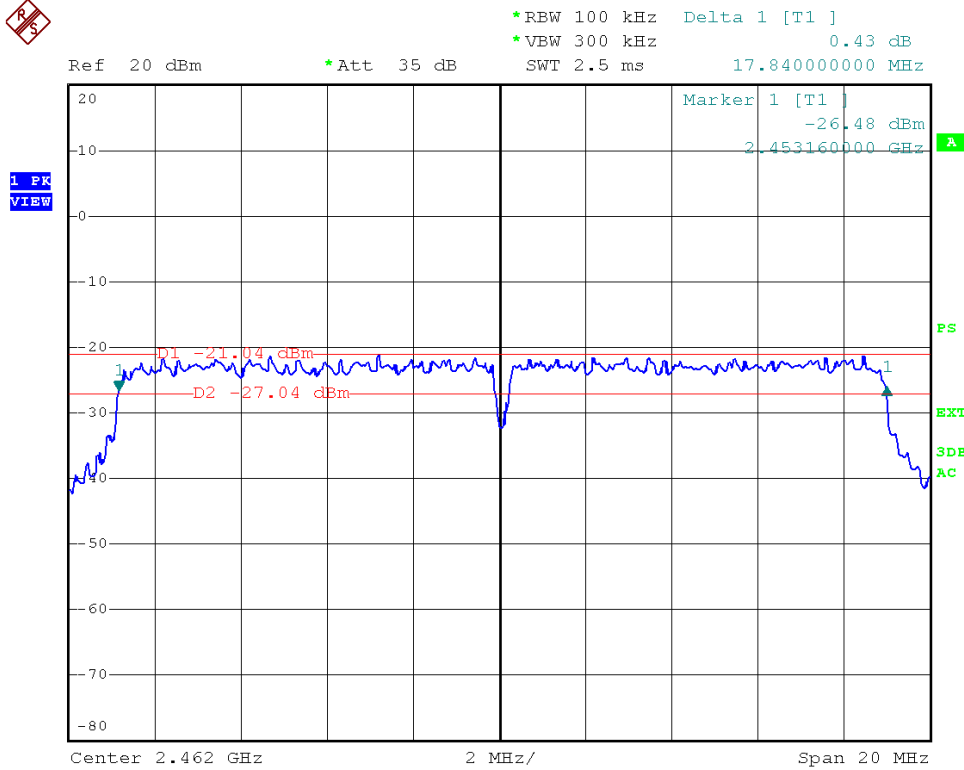
Test Mode: 802.11n (HT20)---Low



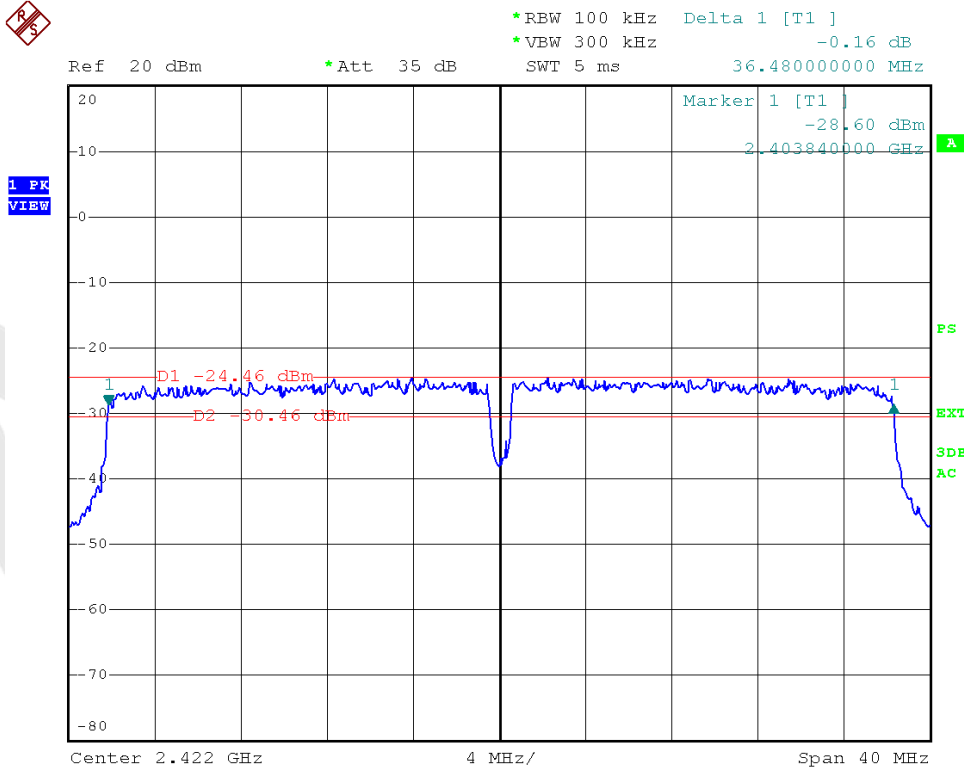
Test Mode: 802.11n (HT20)---Mid



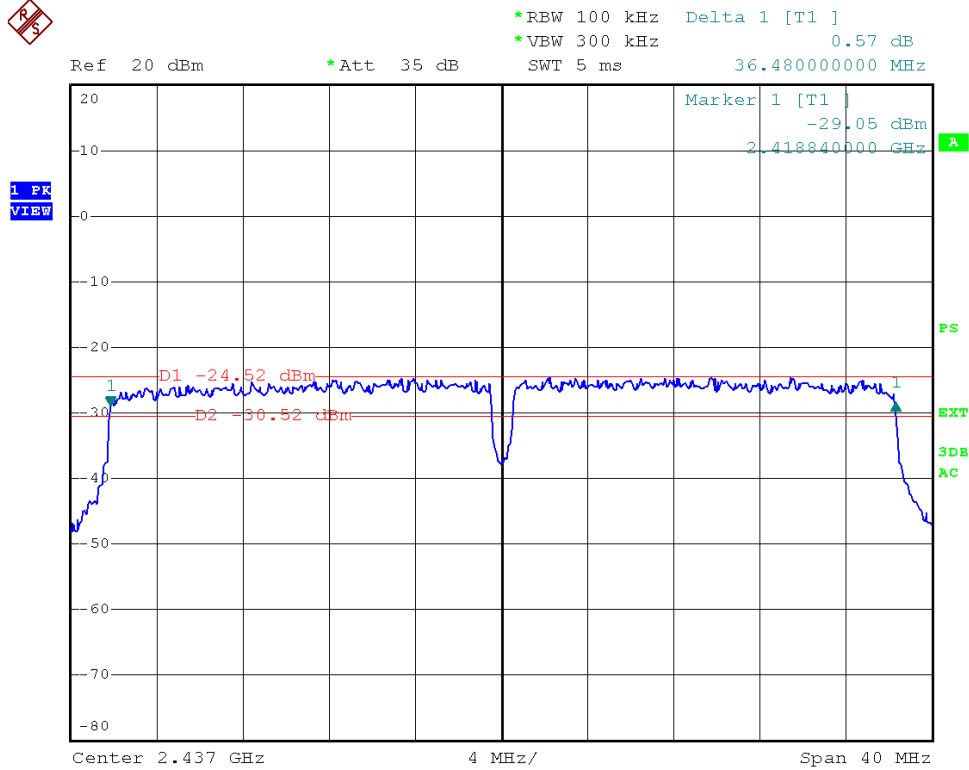
Test Mode: 802.11n (HT20)---High



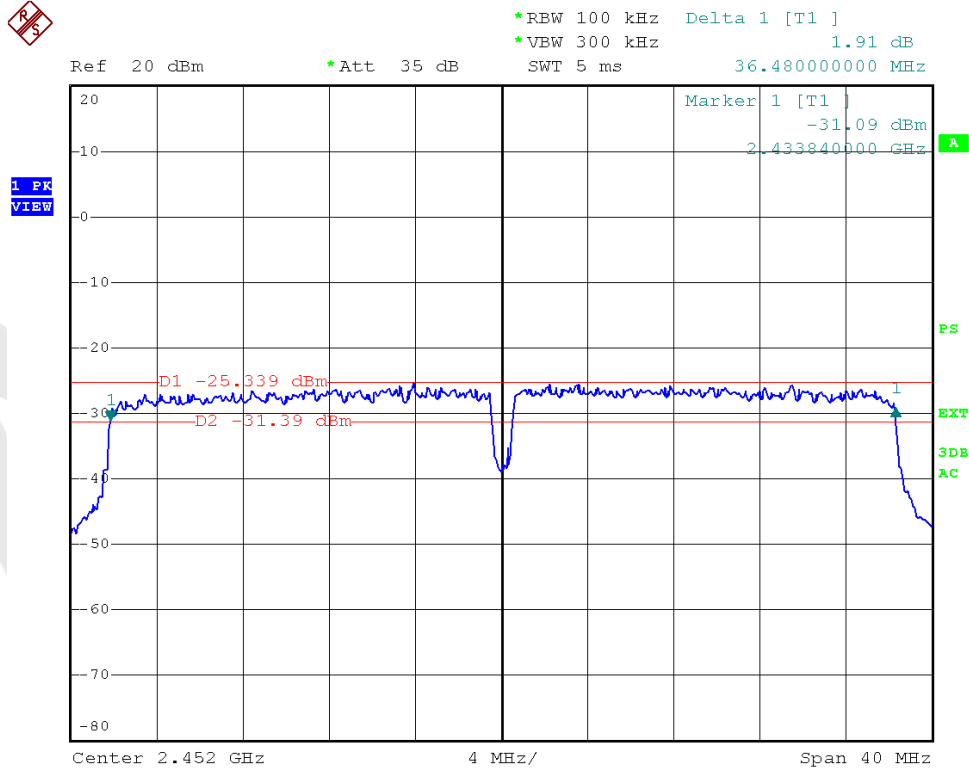
Test Mode: 802.11n (HT40)---Low



Test Mode: 802.11n (HT40)---Mid



Test Mode: 802.11n (HT40)---High



20dB Bandwidth

ANT A

Test mode: IEEE 802.11b

| Channel | Frequency (MHz) | Bandwidth (MHz) | Results |
|---------|-----------------|-----------------|---------|
| Low | 2412 | 18.40 | Pass |
| Mid | 2437 | 18.48 | Pass |
| High | 2462 | 18.32 | Pass |

Test mode: IEEE 802.11g

| Channel | Frequency (MHz) | Bandwidth (MHz) | Results |
|---------|-----------------|-----------------|---------|
| Low | 2412 | 23.68 | Pass |
| Mid | 2437 | 23.76 | Pass |
| High | 2462 | 23.60 | Pass |

Test mode: IEEE 802.11n (HT20)

| Channel | Frequency (MHz) | Bandwidth (MHz) | Results |
|---------|-----------------|-----------------|---------|
| Low | 2412 | 24.32 | Pass |
| Mid | 2437 | 24.32 | Pass |
| High | 2462 | 24.24 | Pass |

Test mode: IEEE 802.11n (HT40)

| Channel | Frequency (MHz) | Bandwidth (MHz) | Results |
|---------|-----------------|-----------------|---------|
| Low | 2422 | 42.88 | Pass |
| Mid | 2437 | 42.88 | Pass |
| High | 2452 | 42.56 | Pass |

Test Plots See the following page.

ANT B

Test mode: IEEE 802.11b

| Channel | Frequency (MHz) | Bandwidth (MHz) | Results |
|---------|-----------------|-----------------|---------|
| Low | 2412 | 18.48 | Pass |
| Mid | 2437 | 18.40 | Pass |
| High | 2462 | 18.40 | Pass |

Test mode: IEEE 802.11g

| Channel | Frequency (MHz) | Bandwidth (MHz) | Results |
|---------|-----------------|-----------------|---------|
| Low | 2412 | 23.68 | Pass |
| Mid | 2437 | 23.68 | Pass |
| High | 2462 | 23.60 | Pass |

Test mode: IEEE 802.11n (HT20)

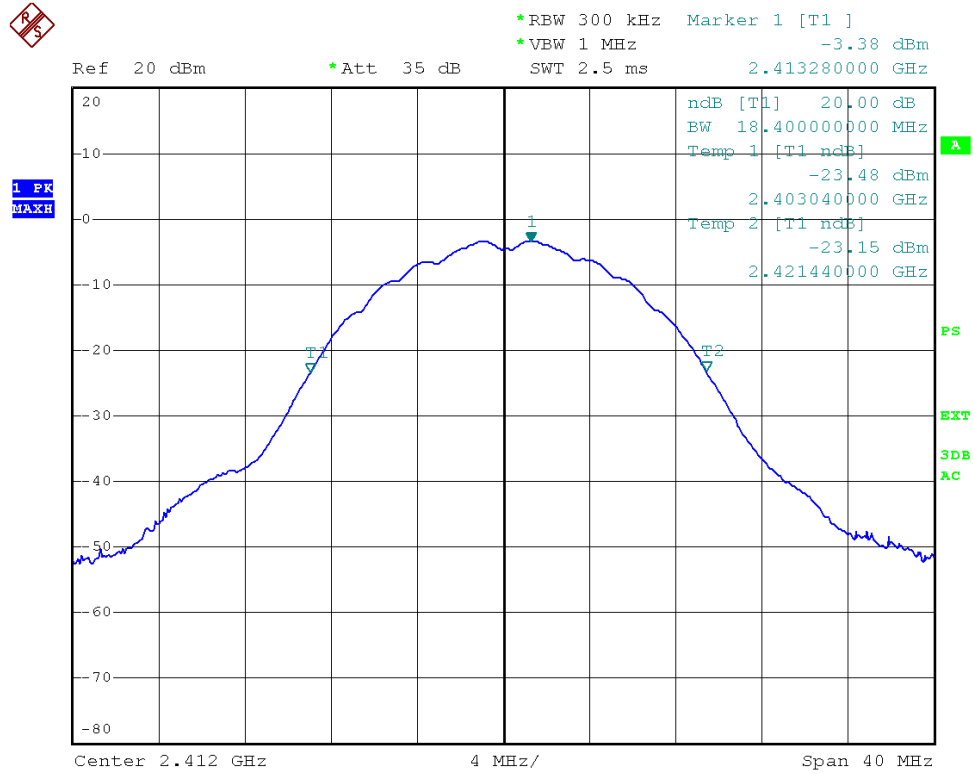
| Channel | Frequency (MHz) | Bandwidth (MHz) | Results |
|---------|-----------------|-----------------|---------|
| Low | 2412 | 24.24 | Pass |
| Mid | 2437 | 24.24 | Pass |
| High | 2462 | 24.32 | Pass |

Test mode: IEEE 802.11n (HT40)

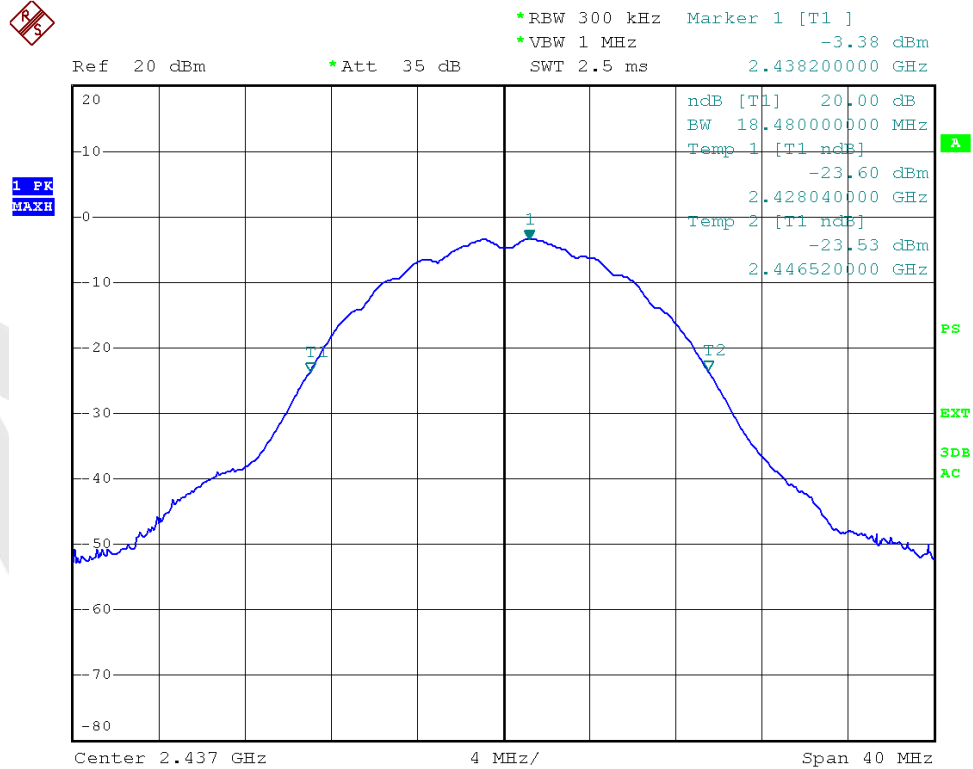
| Channel | Frequency (MHz) | Bandwidth (MHz) | Results |
|---------|-----------------|-----------------|---------|
| Low | 2422 | 42.88 | Pass |
| Mid | 2437 | 42.88 | Pass |
| High | 2452 | 42.88 | Pass |

Test Plots See the following page.

ANT A
Test Mode: 802.11b---Low



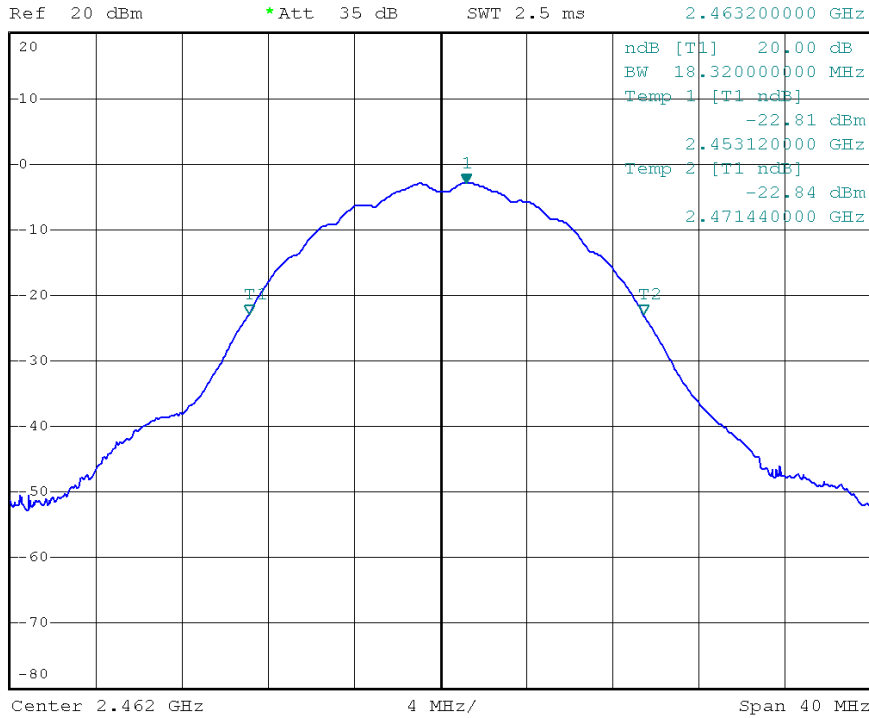
Test Mode: 802.11b---Mid



Test Mode: 802.11b---High



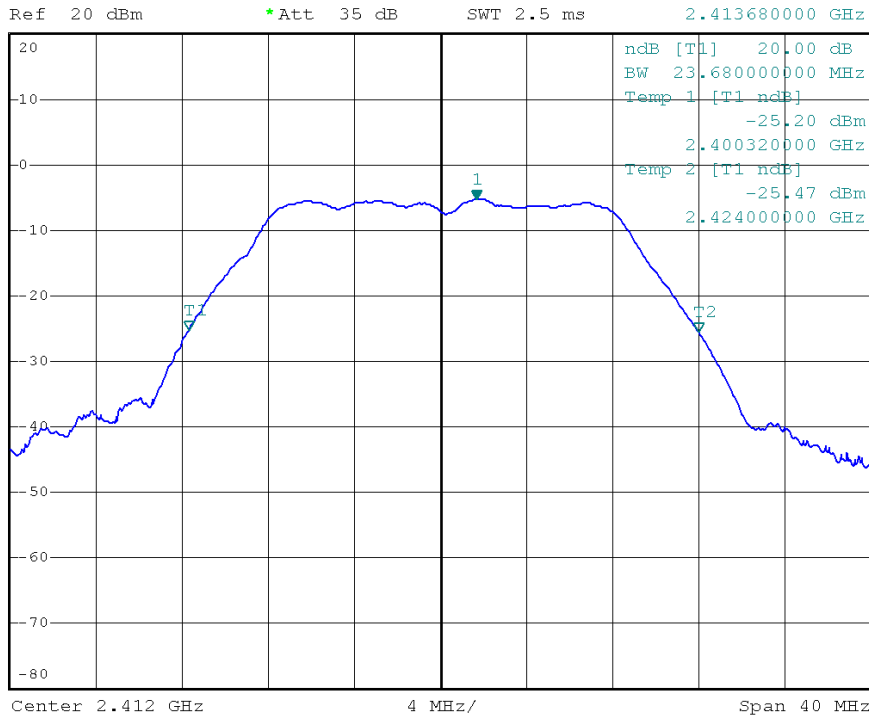
*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -2.89 dBm
SWT 2.5 ms 2.463200000 GHz



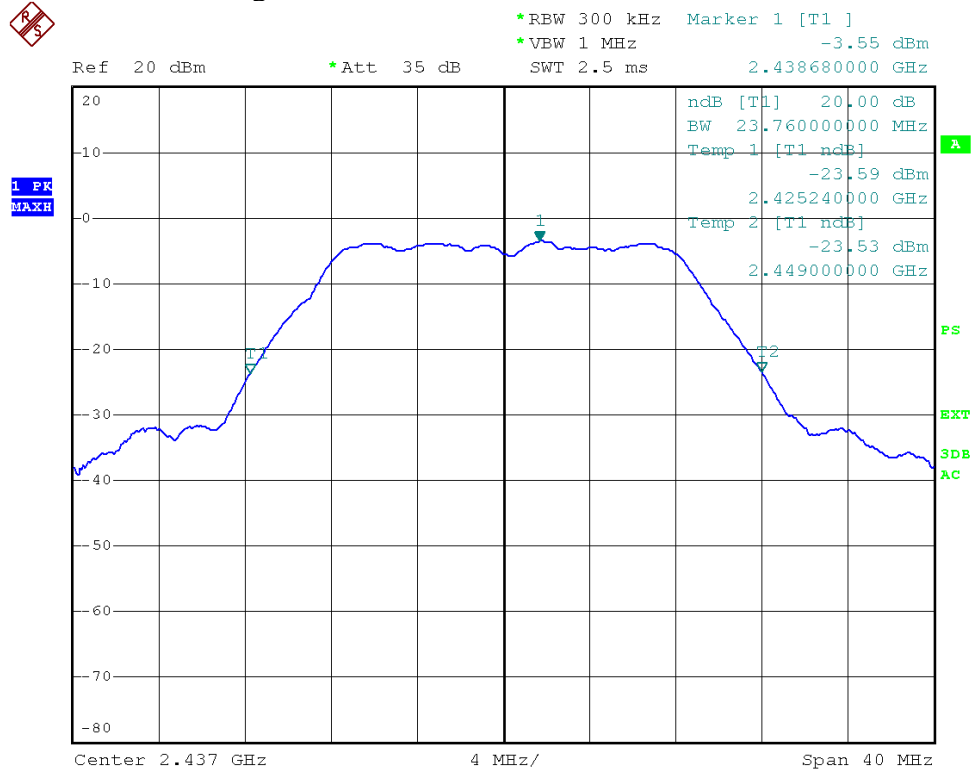
Test Mode: 802.11g---Low



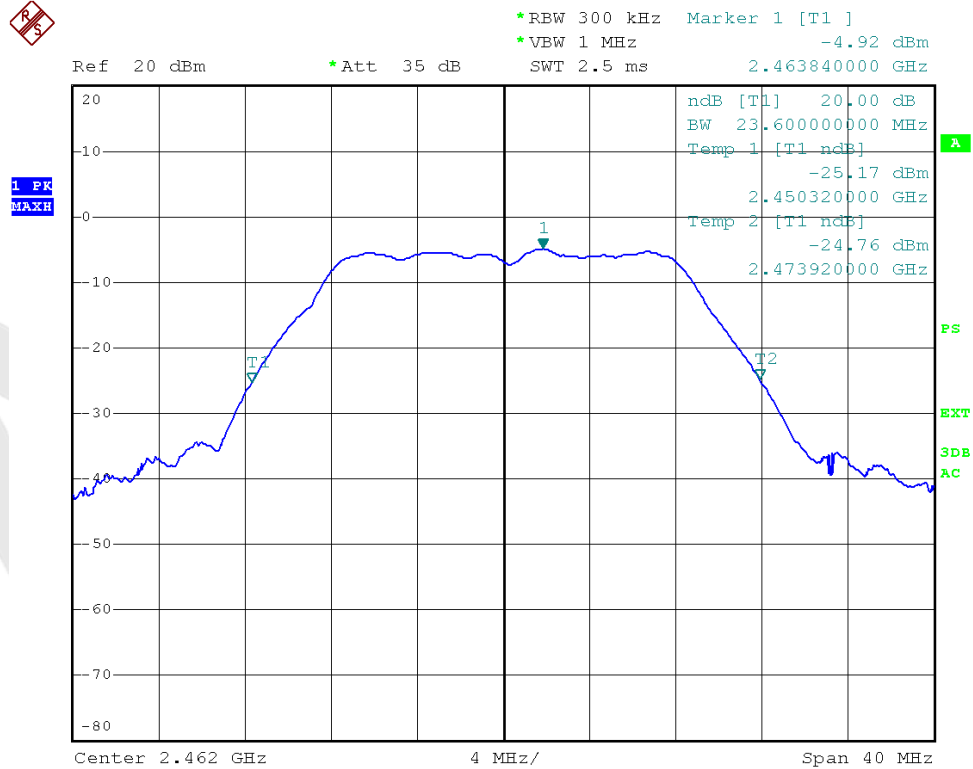
*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -5.27 dBm
SWT 2.5 ms 2.413680000 GHz



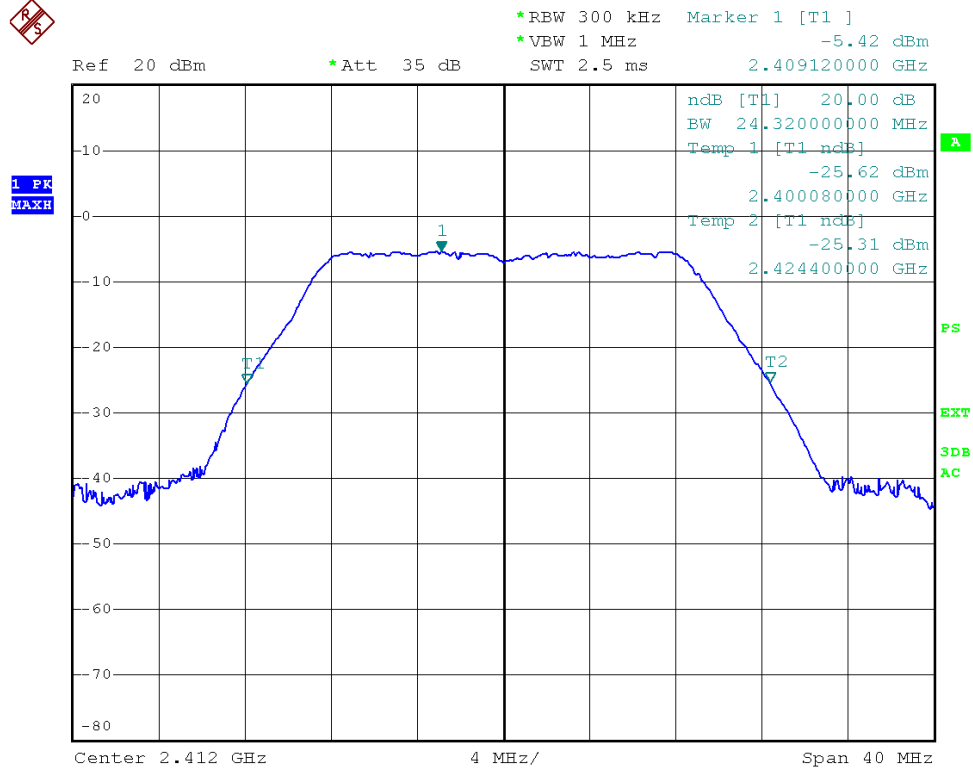
Test Mode: 802.11g---Mid



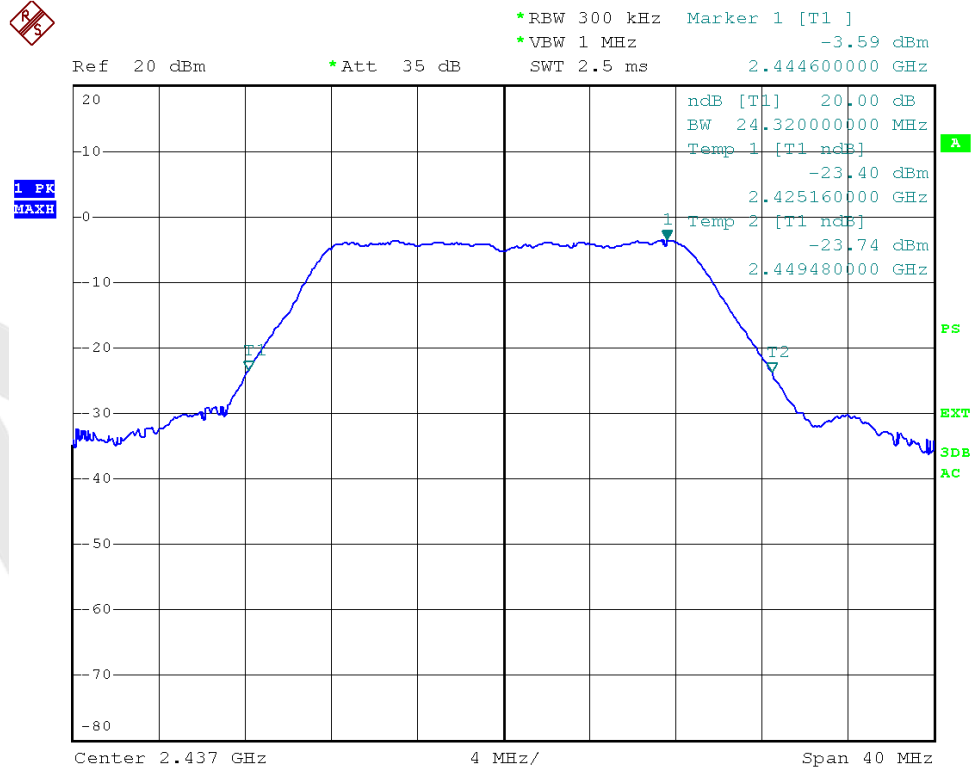
Test Mode: 802.11g---High



Test Mode: 802.11n (HT20)---Low



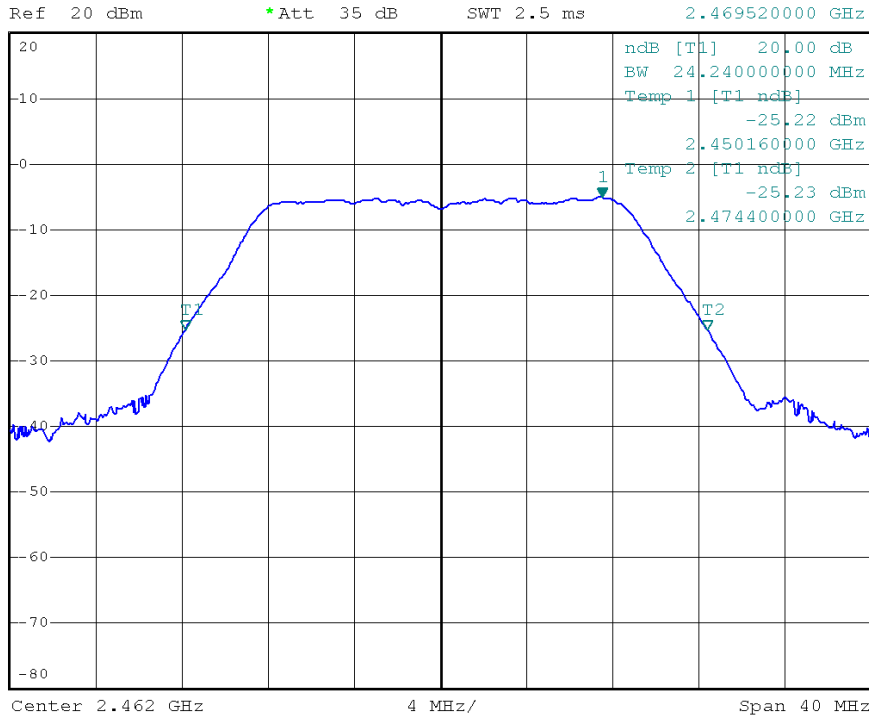
Test Mode: 802.11n (HT20)---Mid



Test Mode: 802.11n (HT20)---High



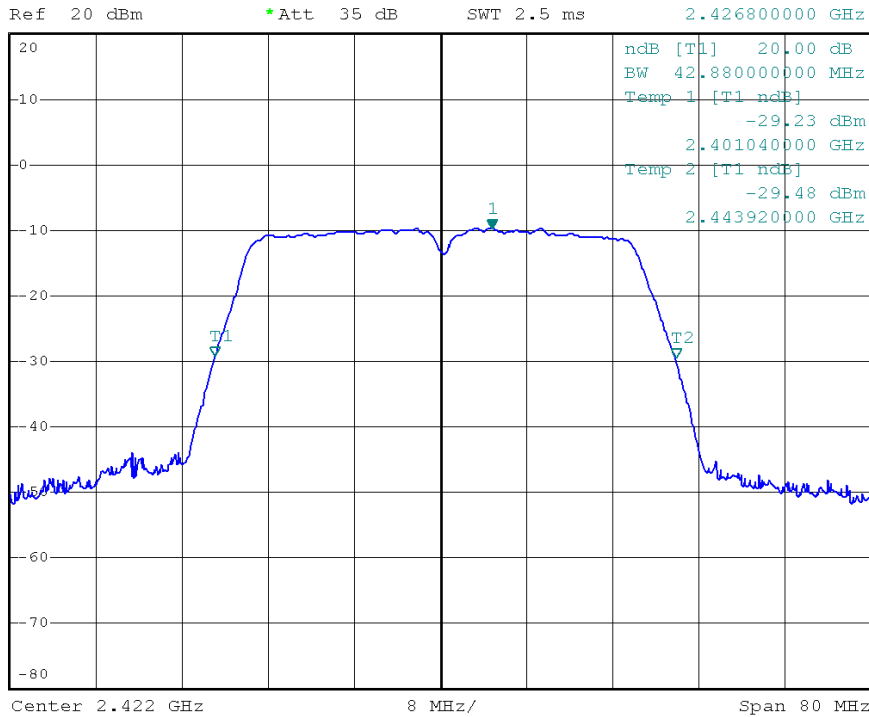
*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -5.17 dBm
SWT 2.5 ms 2.469520000 GHz



Test Mode: 802.11n (HT40)---Low



*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -9.67 dBm
SWT 2.5 ms 2.426800000 GHz

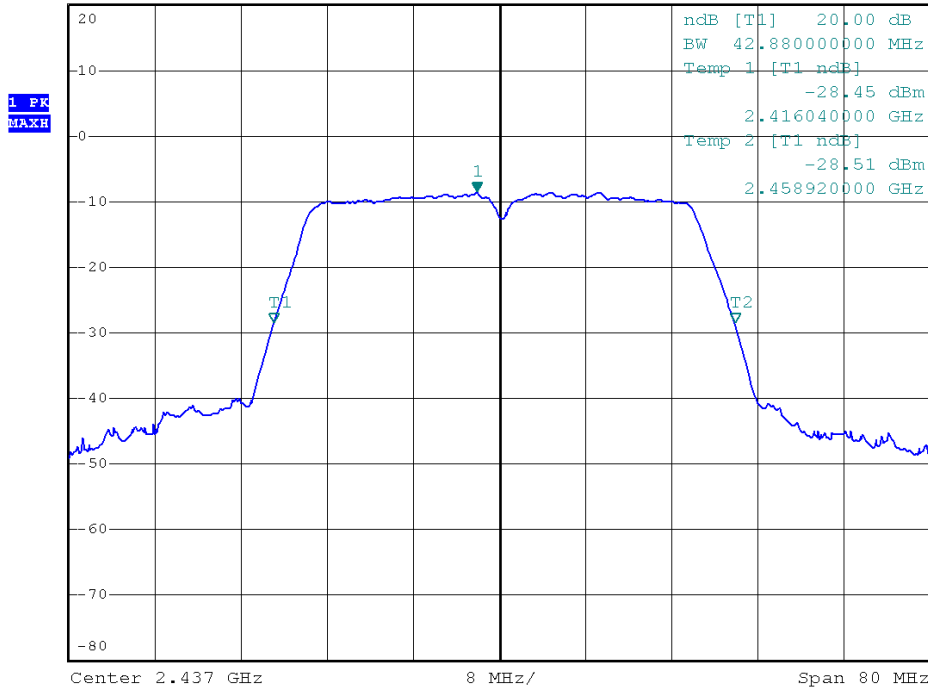


Test Mode: 802.11n (HT40)---Mid



*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -8.57 dBm
SWT 2.5 ms 2.434920000 GHz

Ref 20 dBm *Att 35 dB

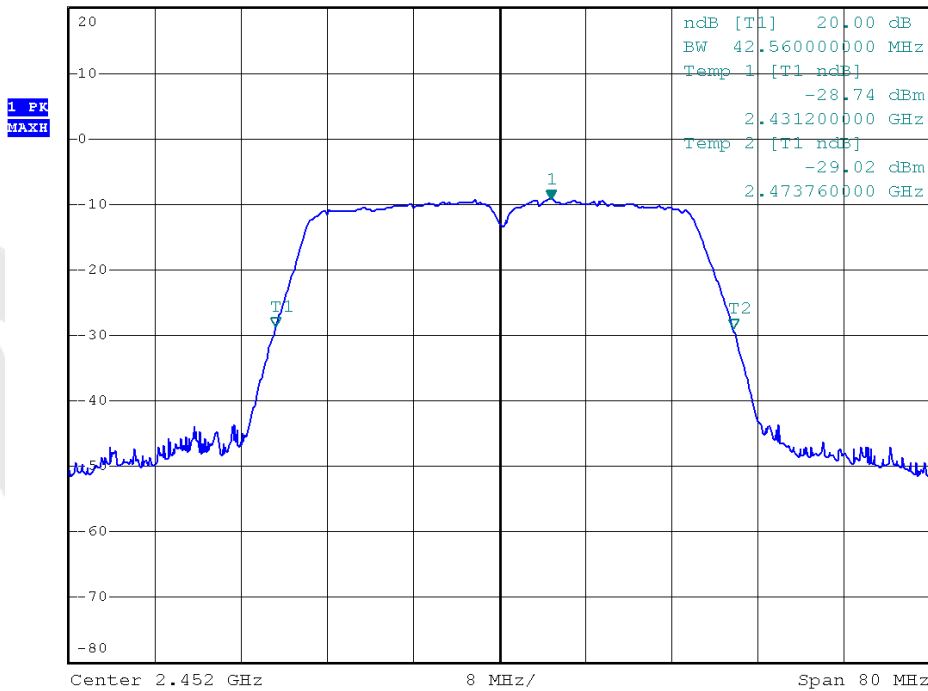


Test Mode: 802.11n (HT40)---High

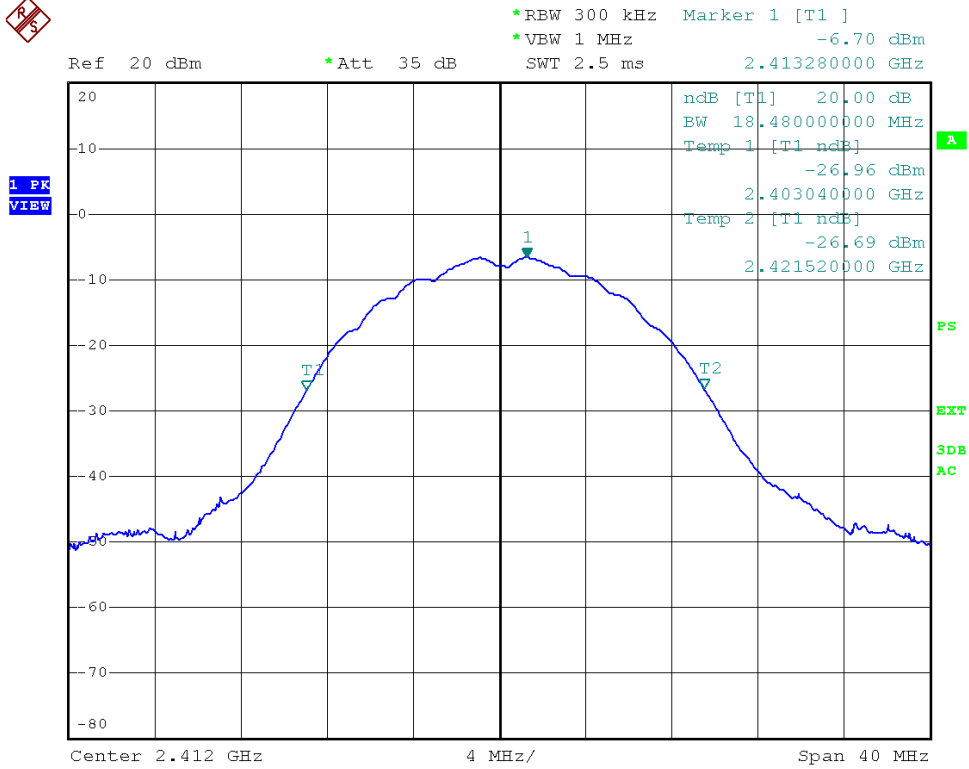


*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -9.31 dBm
SWT 2.5 ms 2.456800000 GHz

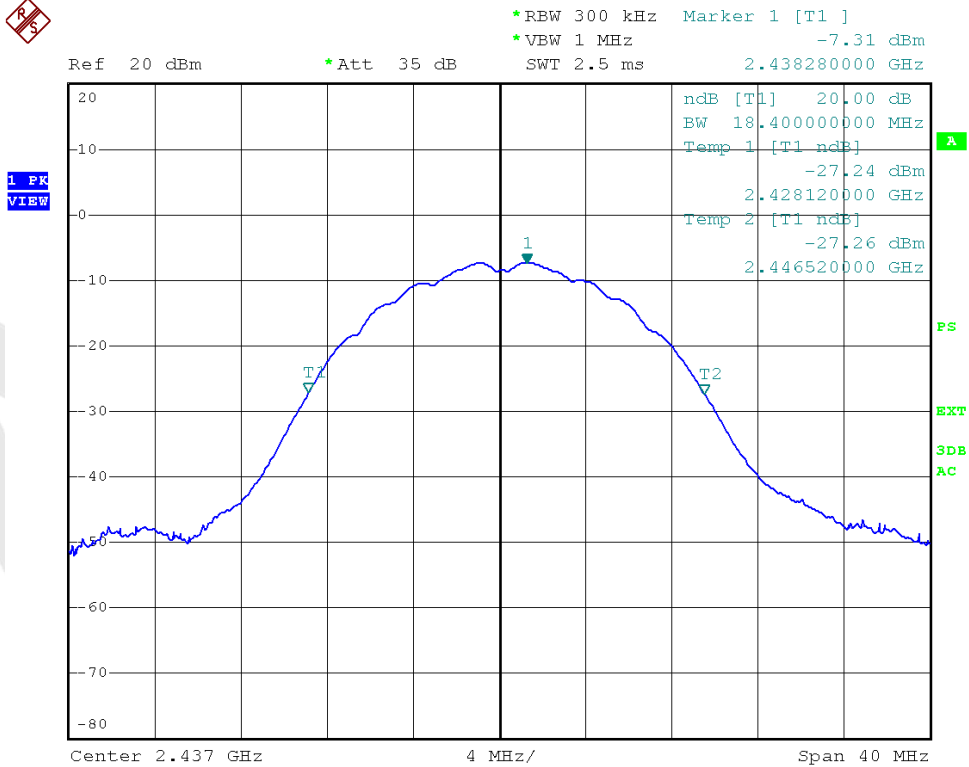
Ref 20 dBm *Att 35 dB



ANT B
Test Mode: 802.11b---Low



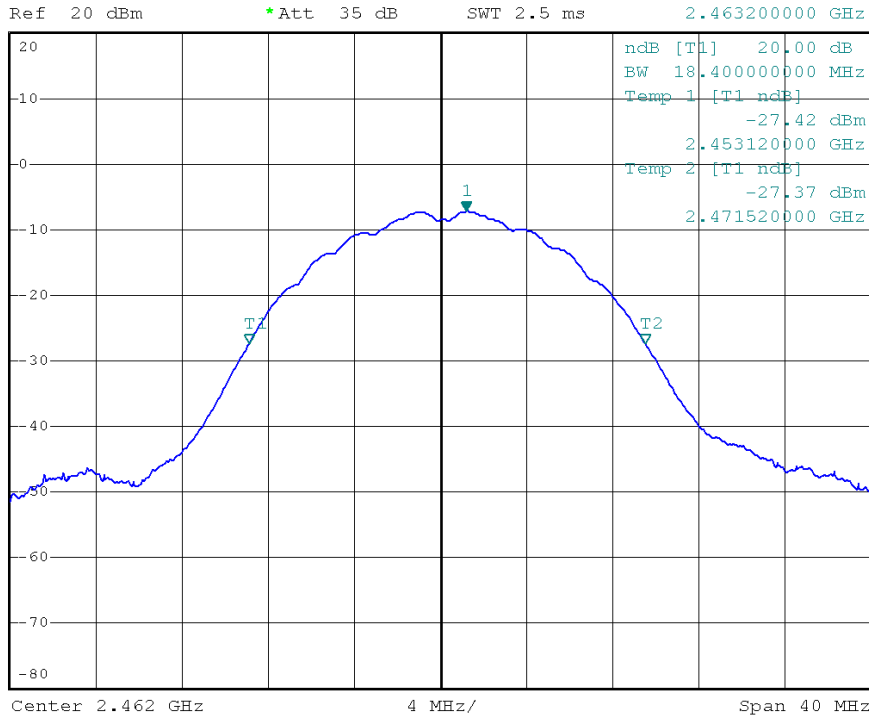
Test Mode: 802.11b---Mid



Test Mode: 802.11b---High



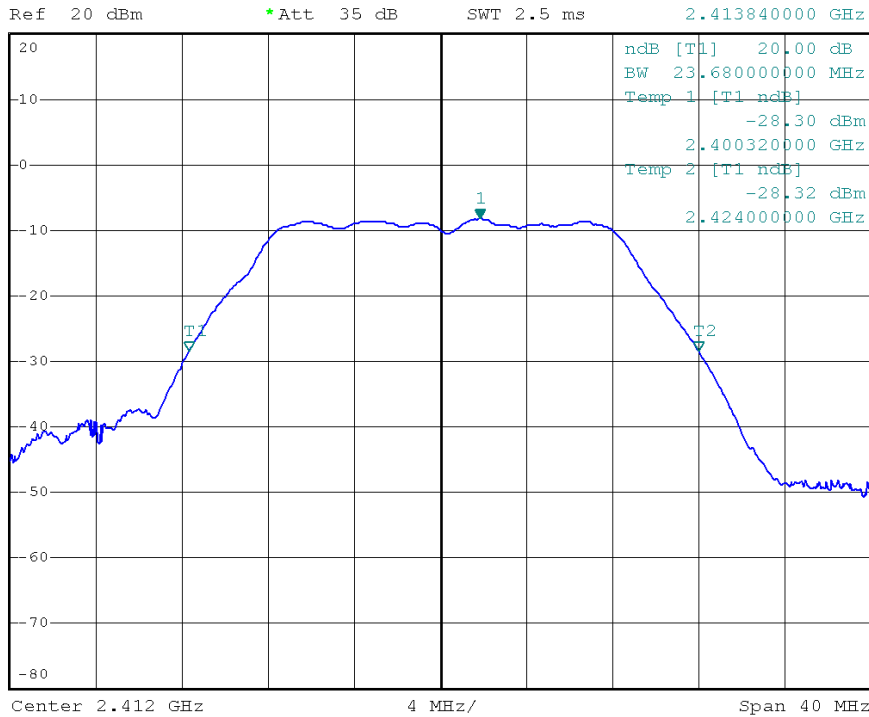
*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -7.27 dBm
SWT 2.5 ms 2.463200000 GHz



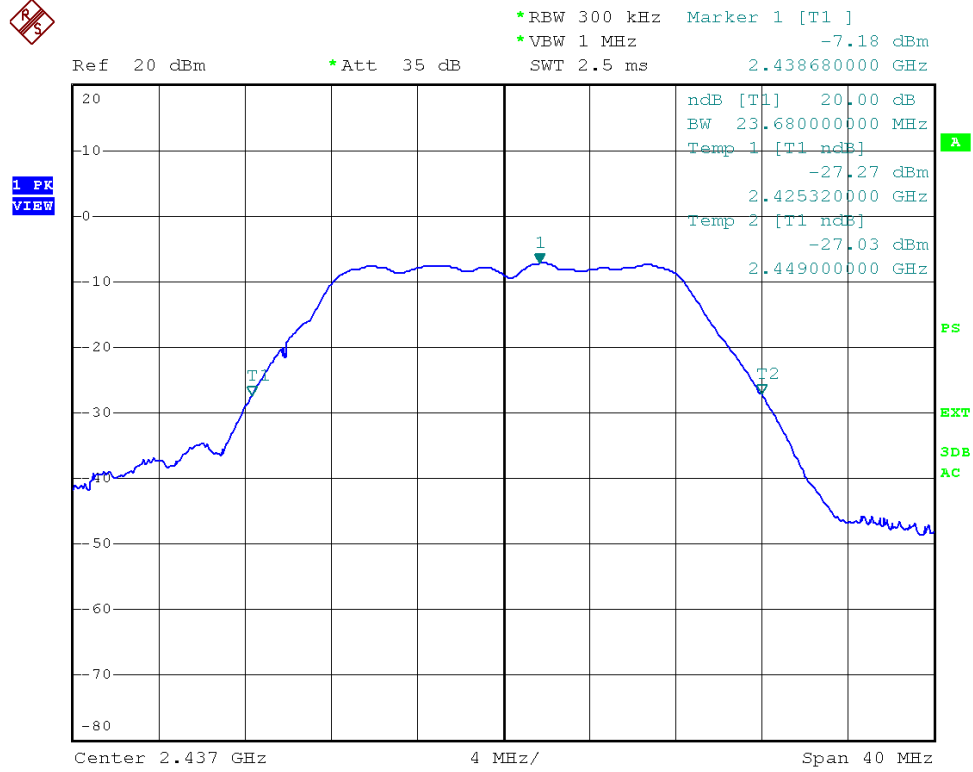
Test Mode: 802.11g---Low



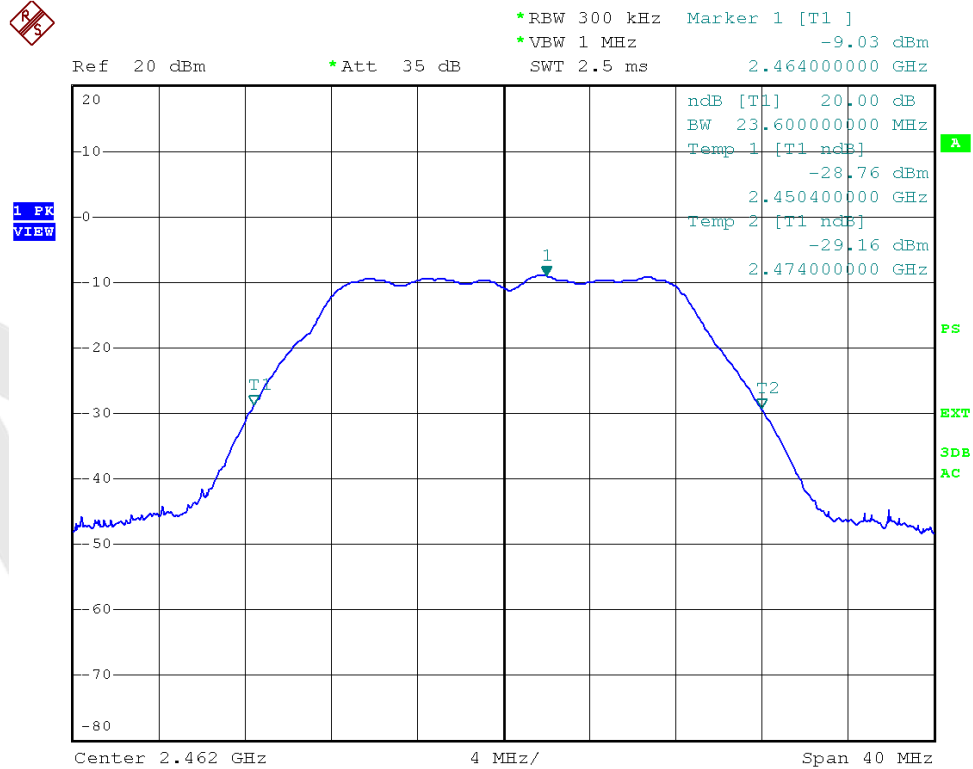
*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -8.29 dBm
SWT 2.5 ms 2.413840000 GHz



Test Mode: 802.11g---Mid



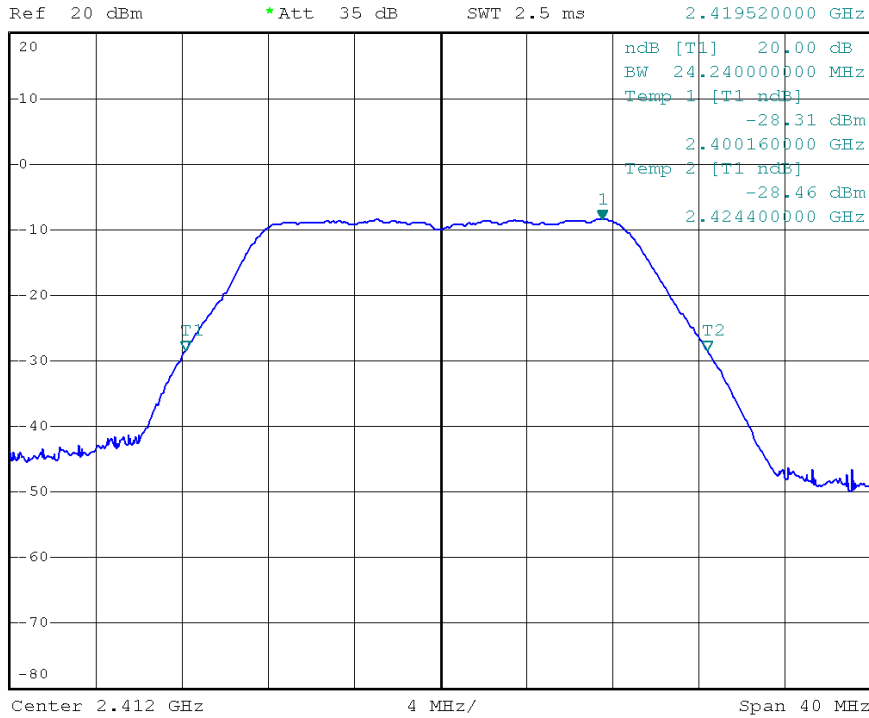
Test Mode: 802.11g---High



Test Mode: 802.11n (HT20)---Low



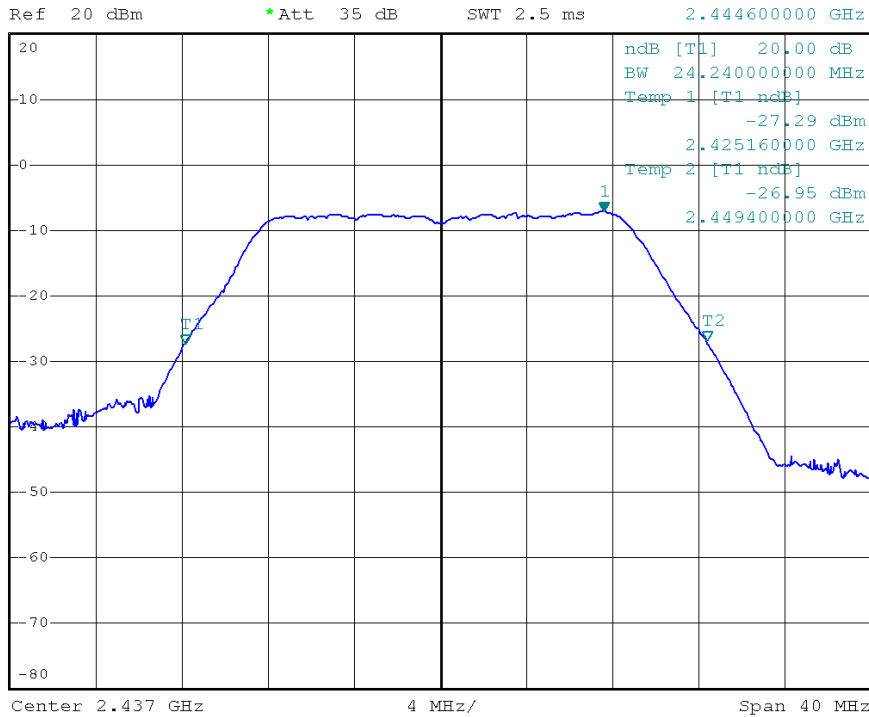
*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -8.47 dBm
SWT 2.5 ms 2.419520000 GHz



Test Mode: 802.11n (HT20)---Mid



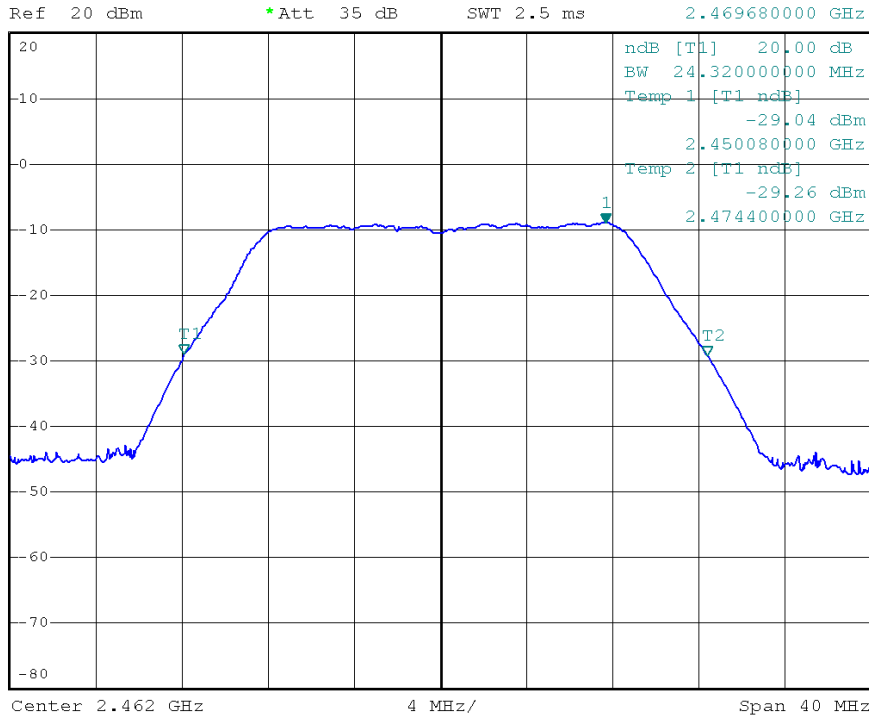
*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -7.21 dBm
SWT 2.5 ms 2.444600000 GHz



Test Mode: 802.11n (HT20)---High



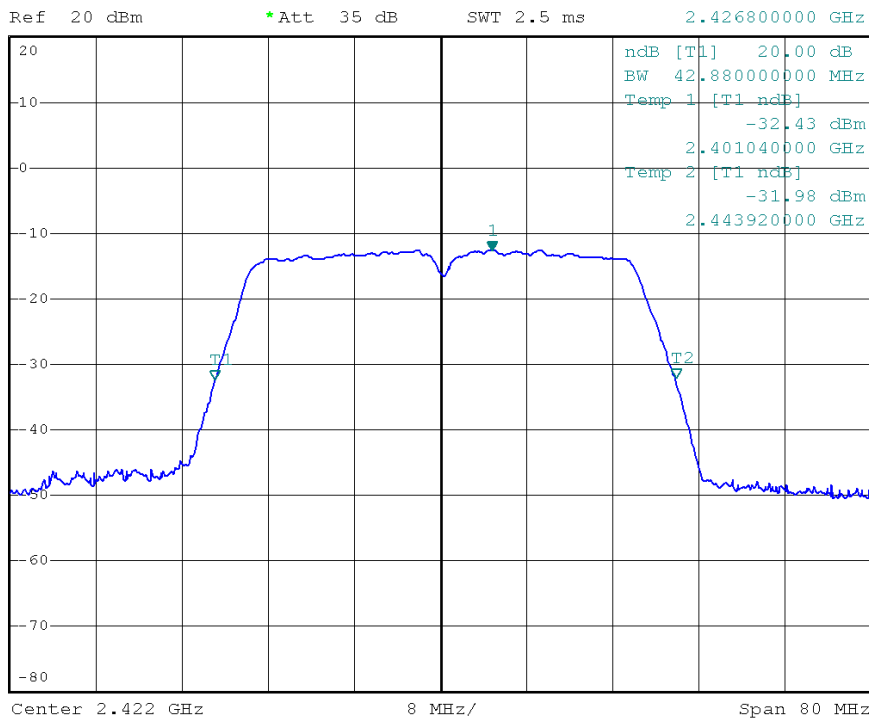
*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -9.00 dBm
SWT 2.5 ms 2.469680000 GHz



Test Mode: 802.11n (HT40)---Low



*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -12.55 dBm
SWT 2.5 ms 2.426800000 GHz

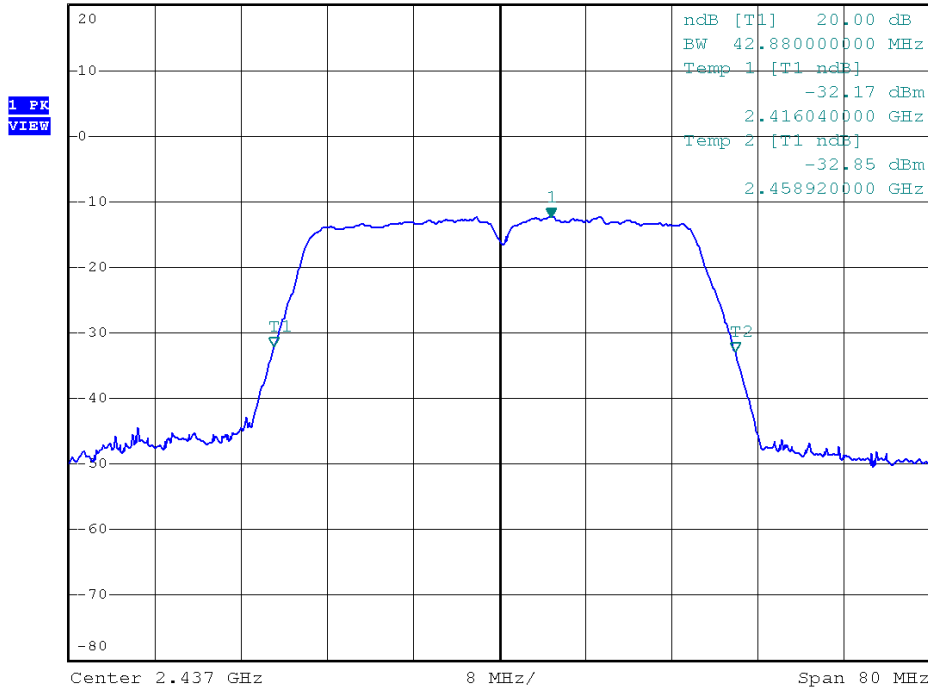


Test Mode: 802.11n (HT40)---Mid



*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -12.39 dBm
SWT 2.5 ms 2.441800000 GHz

Ref 20 dBm *Att 35 dB

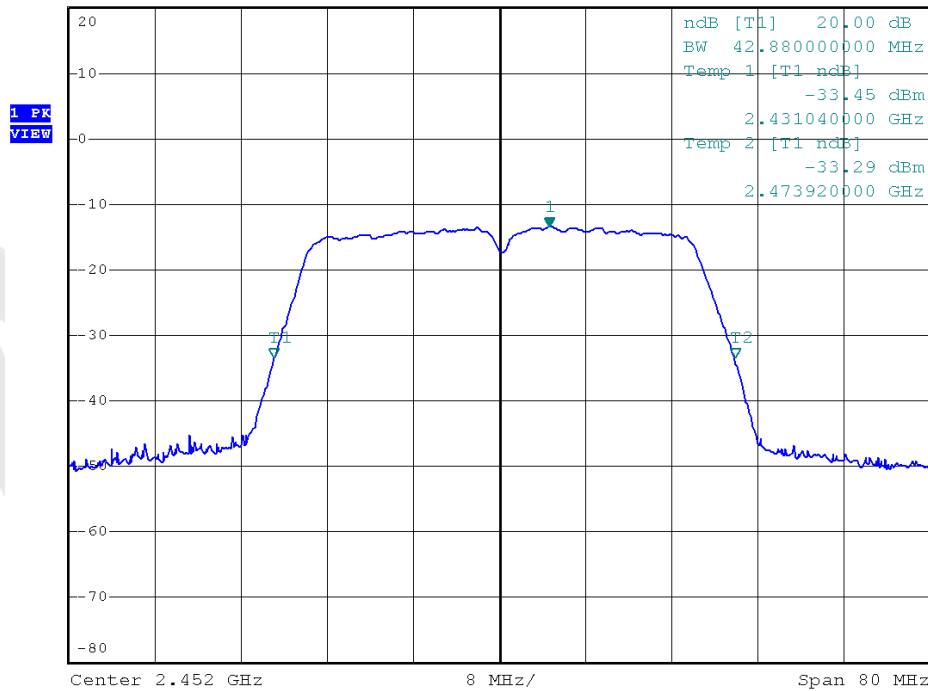


Test Mode: 802.11n (HT40)---High



*RBW 300 kHz Marker 1 [T1]
*VBW 1 MHz -13.47 dBm
SWT 2.5 ms 2.456640000 GHz

Ref 20 dBm *Att 35 dB



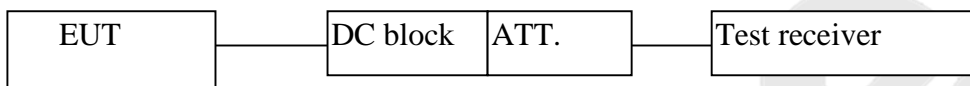
4.3. Maximum Output Power Test

a. Limit

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

1. For systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 watt (30dBm).
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antenna of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

b. Configuration of Measurement



c. Data Rates

IEEE802.11b: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 1 Mbps data rate (worst case) are chosen for the final testing.

IEEE802.11g: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 6 Mbps data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT20: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 6.5Mbps data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT40: Channel 3(2422MHz), Channel 6(2437MHz) and Channel 9(2452MHz) with 13.5Mbps data rate (the worst case) are chosen for the final testing.

d. Test Procedure

This test was according the kDB 558074 9.2.2:

1. Set span to at least 1.5 times the OBW.
2. Set the RBW =1~5% of the OBW, not to exceed 1MHz.
3. Set $VBW \geq 3 * RBW$.
4. Detector = Average.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

e. Test Equipment

Same as the equipment listed in 4.2.

f. Test Results

Pass.

g. Test Data

Antenna A Gain= 2 dBi
 Antenna B Gain= 2 dBi
 Array Gain= 5 dBi= $10 \cdot \log((10^{(2/10)} + (10^{(2/10)})))$

ANT A
 Test mode: IEEE 802.11b

| Channel | Frequency (MHz) | Maximum transmit power (dBm) | Limit | | Result |
|---------|-----------------|------------------------------|-------|---------|--------|
| | | | (dBm) | (watts) | |
| Low | 2412 | 7.84 | 30 | 1 | Pass |
| Mid | 2437 | 7.82 | | | Pass |
| High | 2462 | 8.08 | | | Pass |

Test mode: IEEE 802.11g

| Channel | Frequency (MHz) | Maximum transmit power (dBm) | Limit | | Result |
|---------|-----------------|------------------------------|-------|---------|--------|
| | | | (dBm) | (watts) | |
| Low | 2412 | 4.76 | 30 | 1 | Pass |
| Mid | 2437 | 6.65 | | | Pass |
| High | 2462 | 5.14 | | | Pass |

Test mode: IEEE 802.11n (HT20)

| Channel | Frequency (MHz) | Maximum transmit power (dBm) | Limit | | Result |
|---------|-----------------|------------------------------|-------|---------|--------|
| | | | (dBm) | (watts) | |
| Low | 2412 | 4.92 | 30 | 1 | Pass |
| Mid | 2437 | 6.72 | | | Pass |
| High | 2462 | 5.21 | | | Pass |

Test mode: IEEE 802.11n (HT40)

| Channel | Frequency (MHz) | Maximum transmit power (dBm) | Limit | | Result |
|---------|-----------------|------------------------------|-------|---------|--------|
| | | | (dBm) | (watts) | |
| Low | 2422 | 3.40 | 30 | 1 | Pass |
| Mid | 2437 | 4.35 | | | Pass |
| High | 2452 | 3.73 | | | Pass |

ANT B

Test mode: IEEE 802.11b

| Channel | Frequency (MHz) | Maximum transmit power (dBm) | Limit | | Result |
|---------|-----------------|------------------------------|-------|---------|--------|
| | | | (dBm) | (watts) | |
| Low | 2412 | 12.17 | 30 | 1 | Pass |
| Mid | 2437 | 12.86 | | | Pass |
| High | 2462 | 12.42 | | | Pass |

Test mode: IEEE 802.11g

| Channel | Frequency (MHz) | Maximum transmit power (dBm) | Limit | | Result |
|---------|-----------------|------------------------------|-------|---------|--------|
| | | | (dBm) | (watts) | |
| Low | 2412 | 11.01 | 30 | 1 | Pass |
| Mid | 2437 | 11.16 | | | Pass |
| High | 2462 | 11.55 | | | Pass |

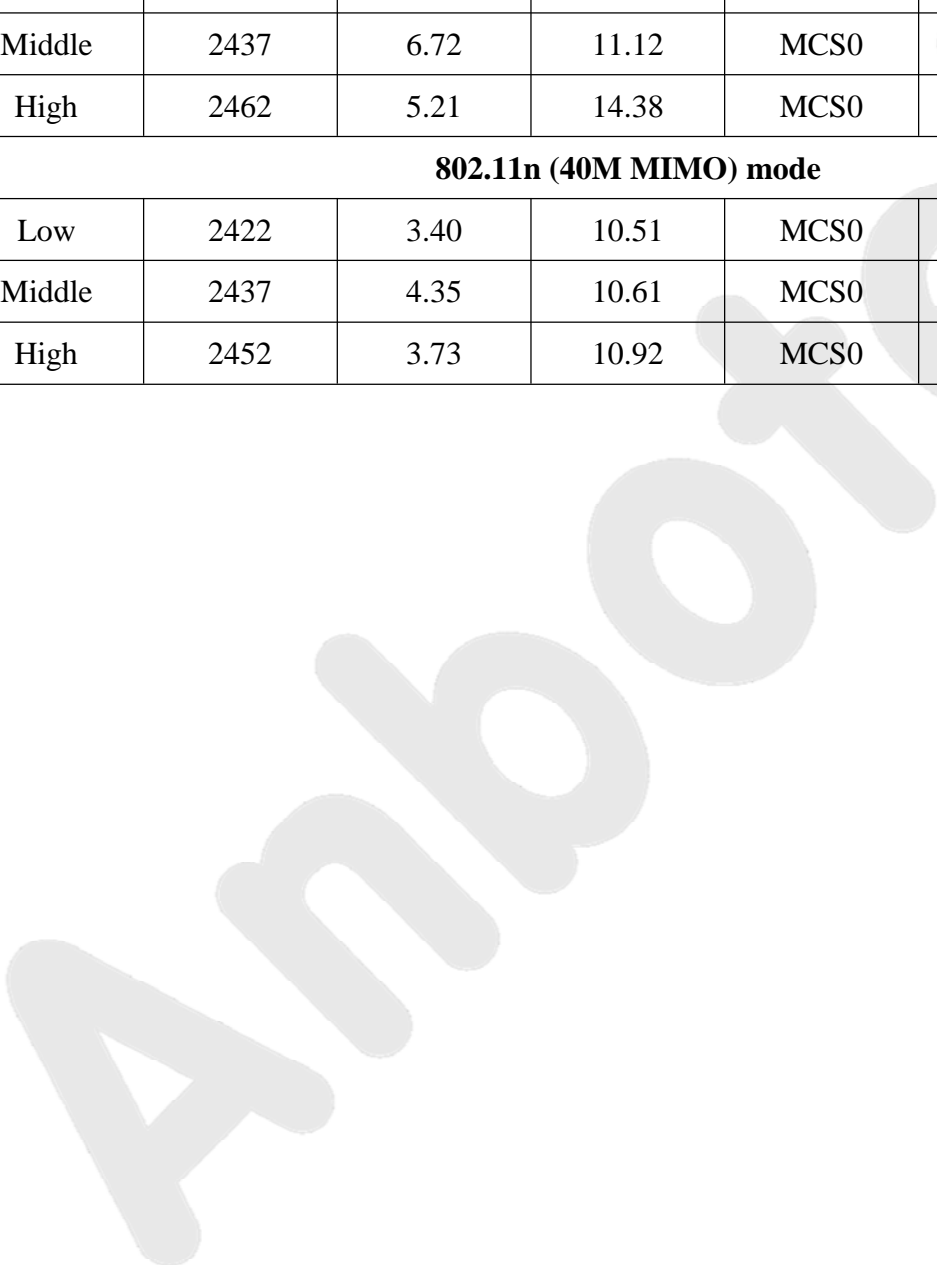
Test mode: IEEE 802.11n (HT20)

| Channel | Frequency (MHz) | Maximum transmit power (dBm) | Limit | | Result |
|---------|-----------------|------------------------------|-------|---------|--------|
| | | | (dBm) | (watts) | |
| Low | 2412 | 11.93 | 30 | 1 | Pass |
| Mid | 2437 | 11.12 | | | Pass |
| High | 2462 | 14.38 | | | Pass |

Test mode: IEEE 802.11n (HT40)

| Channel | Frequency (MHz) | Maximum transmit power (dBm) | Limit | | Result |
|---------|-----------------|------------------------------|-------|---------|--------|
| | | | (dBm) | (watts) | |
| Low | 2422 | 10.51 | 30 | 1 | Pass |
| Mid | 2437 | 10.61 | | | Pass |
| High | 2452 | 10.92 | | | Pass |

| Channel | Channel Frequency (MHz) | ANT A Output Power (dBm) | ANT B Output Power (dBm) | Data Rate (Mbps) | MIMO Output Power (dBm) | Limit (dBm) |
|--------------------------------|-------------------------|--------------------------|--------------------------|------------------|-------------------------|-------------|
| 802.11n (20M MIMO) mode | | | | | | |
| Low | 2412 | 4.92 | 11.93 | MCS0 | 12.72 | 30 |
| Middle | 2437 | 6.72 | 11.12 | MCS0 | 12.47 | 30 |
| High | 2462 | 5.21 | 14.38 | MCS0 | 14.88 | 30 |
| 802.11n (40M MIMO) mode | | | | | | |
| Low | 2422 | 3.40 | 10.51 | MCS0 | 11.28 | 30 |
| Middle | 2437 | 4.35 | 10.61 | MCS0 | 11.53 | 30 |
| High | 2452 | 3.73 | 10.92 | MCS0 | 11.68 | 30 |



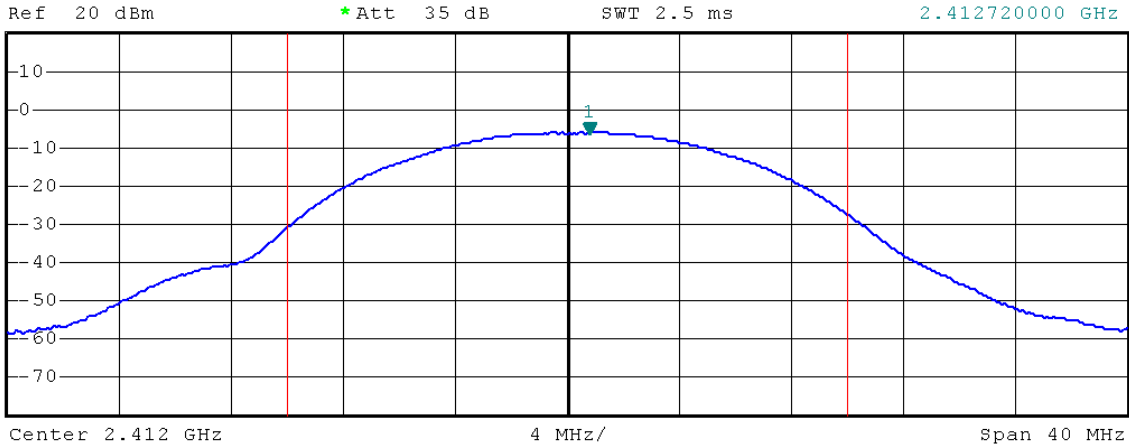
ANT A

Test Mode: 802.11b---Low



*RBW 300 kHz
*VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
-6.05 dBm
2.412720000 GHz



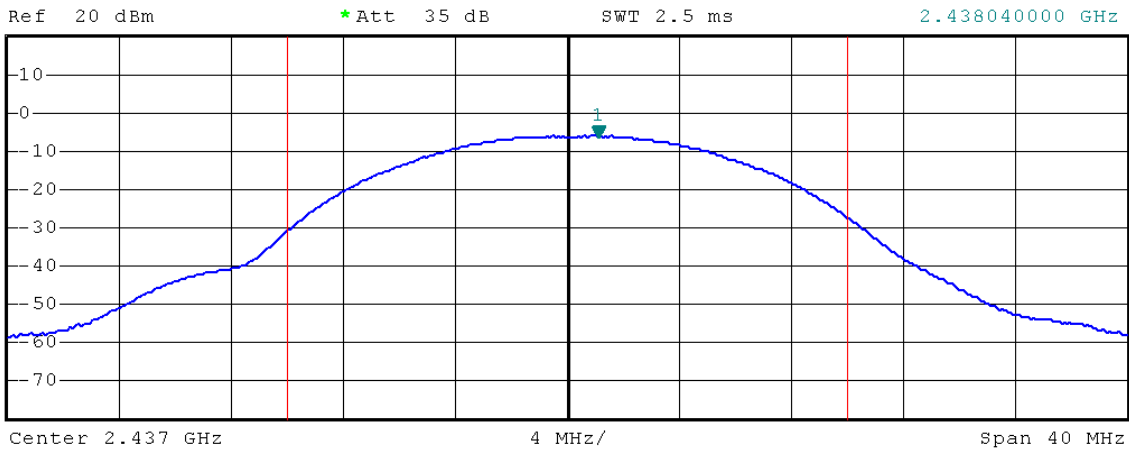
Tx Channel
Bandwidth 20 MHz Power 7.84 dBm

Test Mode: 802.11b---Mid



*RBW 300 kHz
*VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
-6.05 dBm
2.438040000 GHz



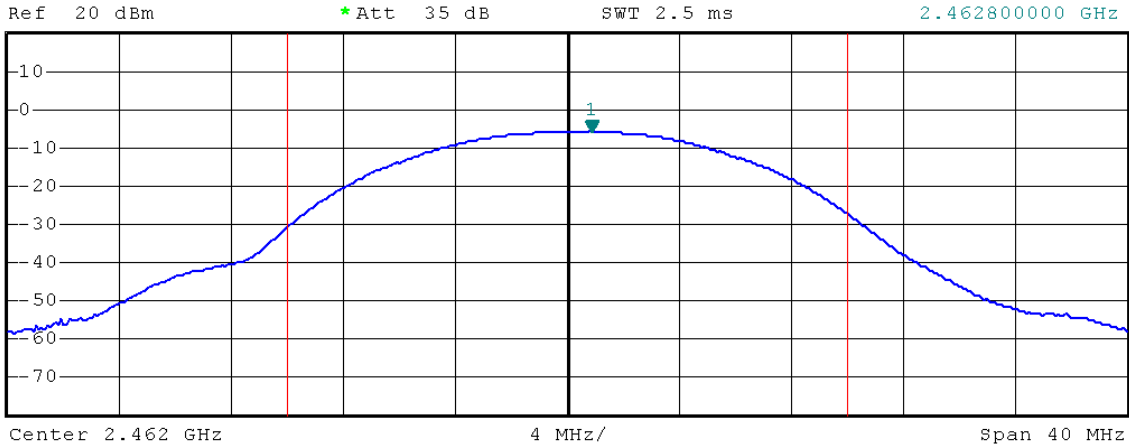
Tx Channel
Bandwidth 20 MHz Power 7.82 dBm

Test Mode: 802.11b---High



*RBW 300 kHz
*VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
-5.72 dBm
2.462800000 GHz



1 RM *
MAXH

A
PS
3DB
AC

Tx Channel
Bandwidth 20 MHz Power 8.08 dBm

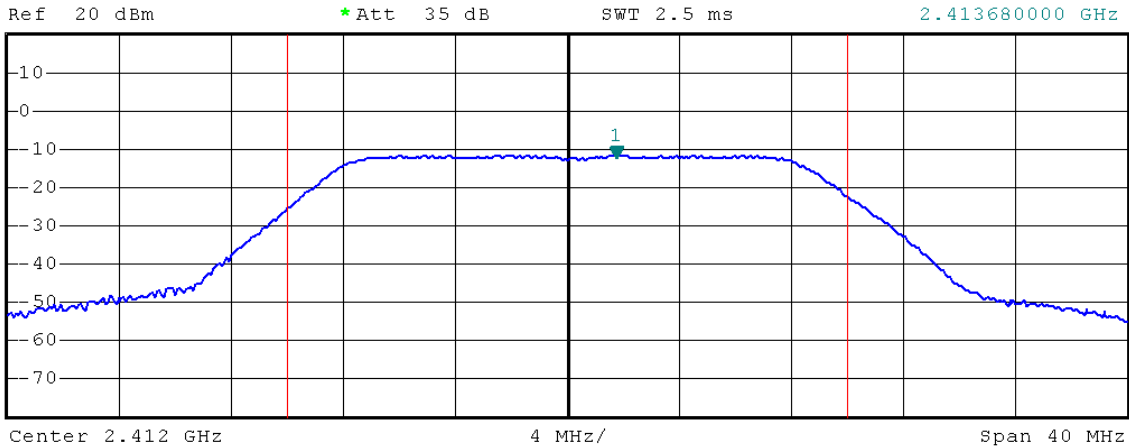
EXT

Test Mode: 802.11g---Low



*RBW 300 kHz
*VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
-11.71 dBm
2.413680000 GHz



1 RM *
MAXH

A
PS
3DB
AC

Tx Channel
Bandwidth 20 MHz Power 4.76 dBm

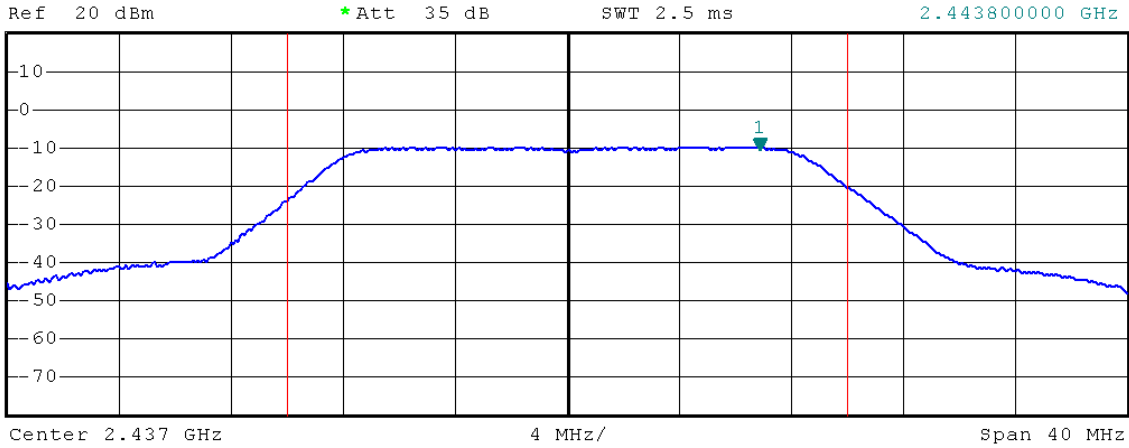
EXT

Test Mode: 802.11g---Mid



*RBW 300 kHz
*VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
-9.83 dBm
2.443800000 GHz



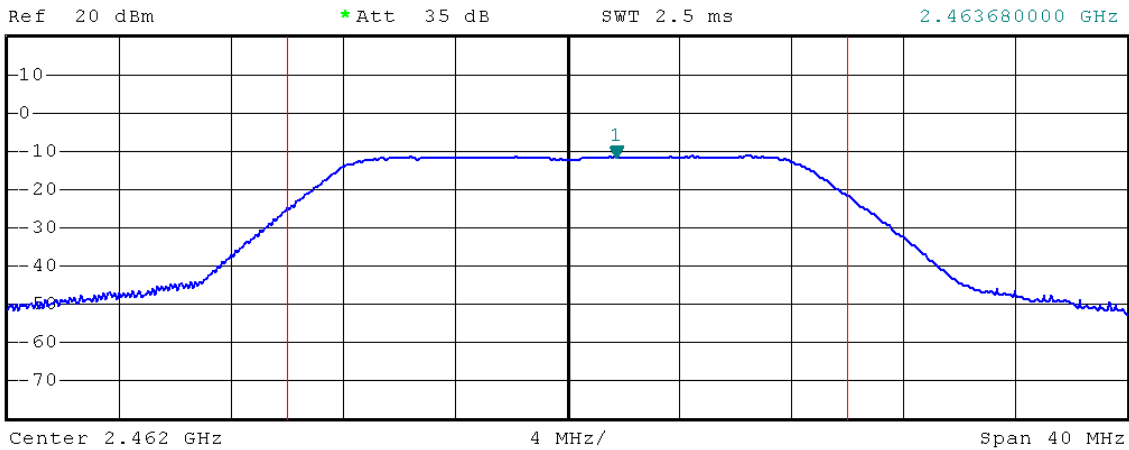
Tx Channel
Bandwidth 20 MHz Power 6.65 dBm

Test Mode: 802.11g---High



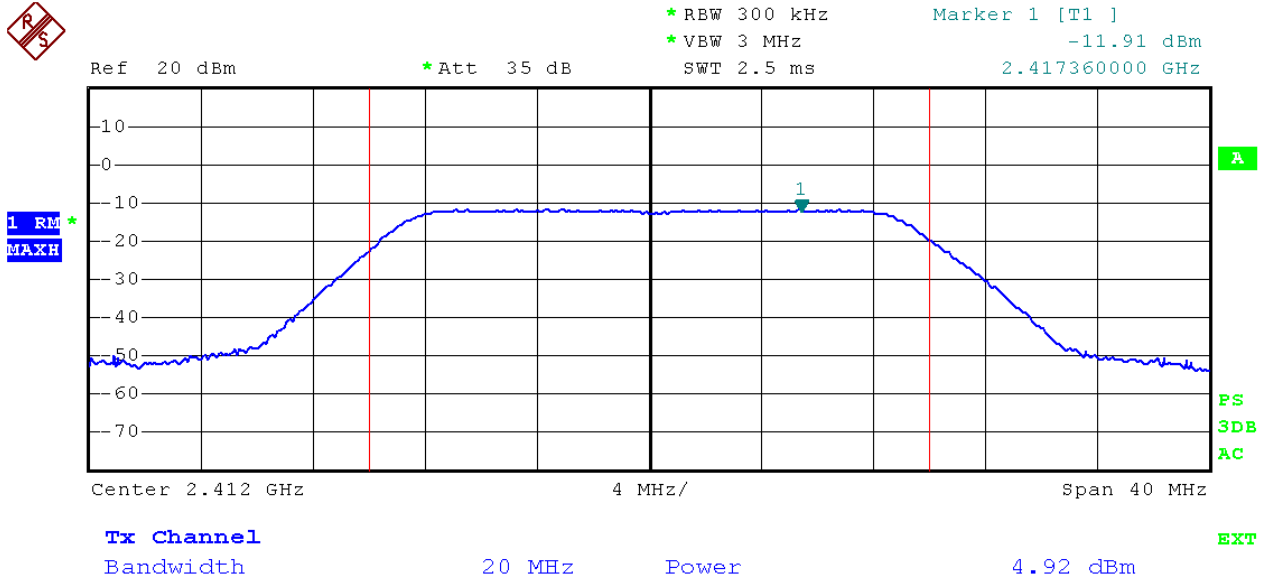
*RBW 300 kHz
*VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
-11.34 dBm
2.463680000 GHz

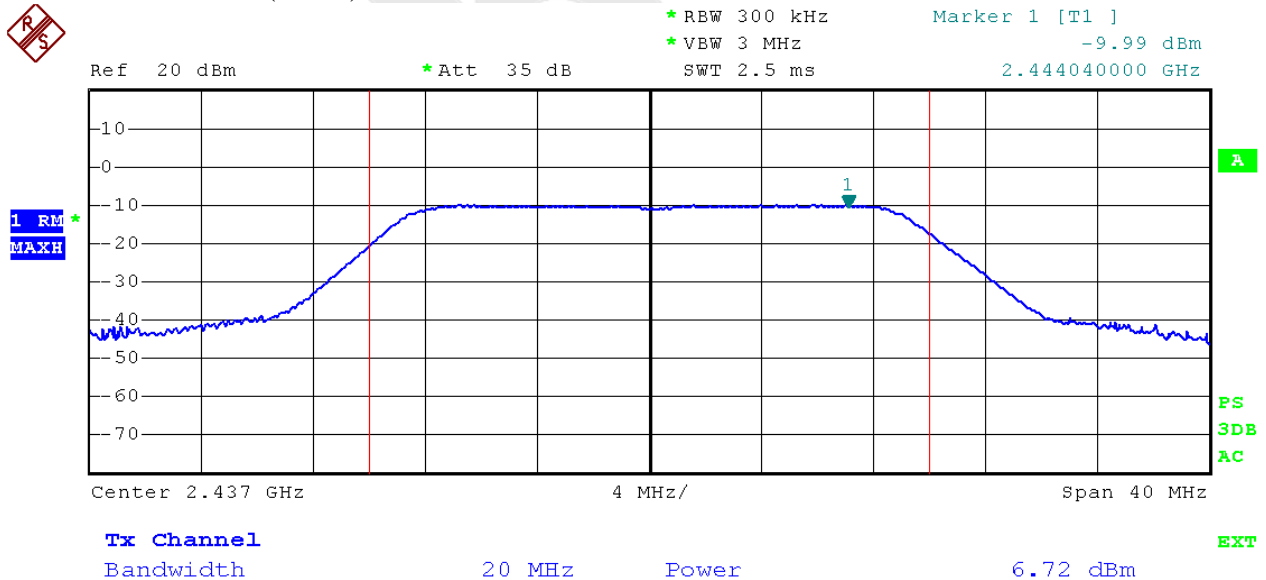


Tx Channel
Bandwidth 20 MHz Power 5.14 dBm

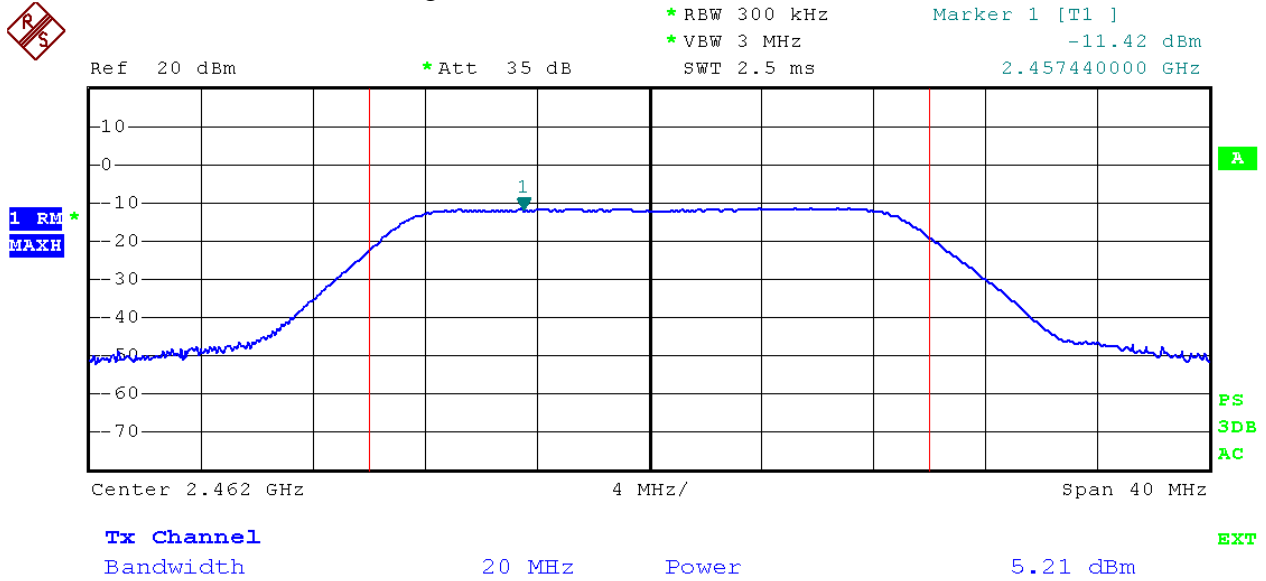
Test Mode: 802.11n(HT20)---Low



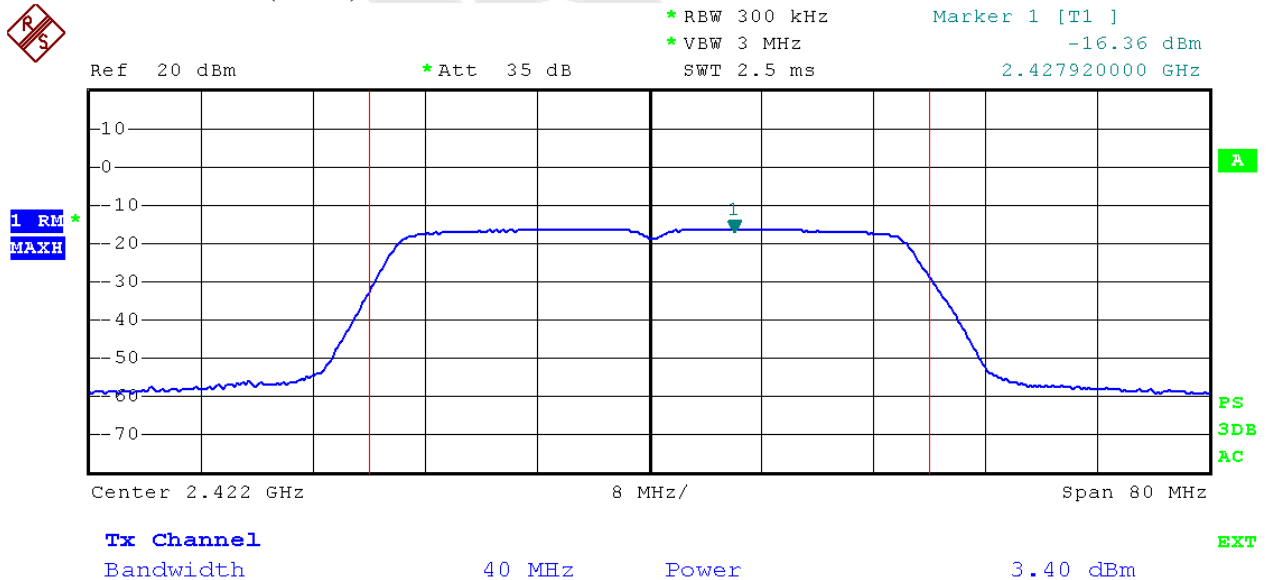
Test Mode: 802.11n(HT20)---Mid



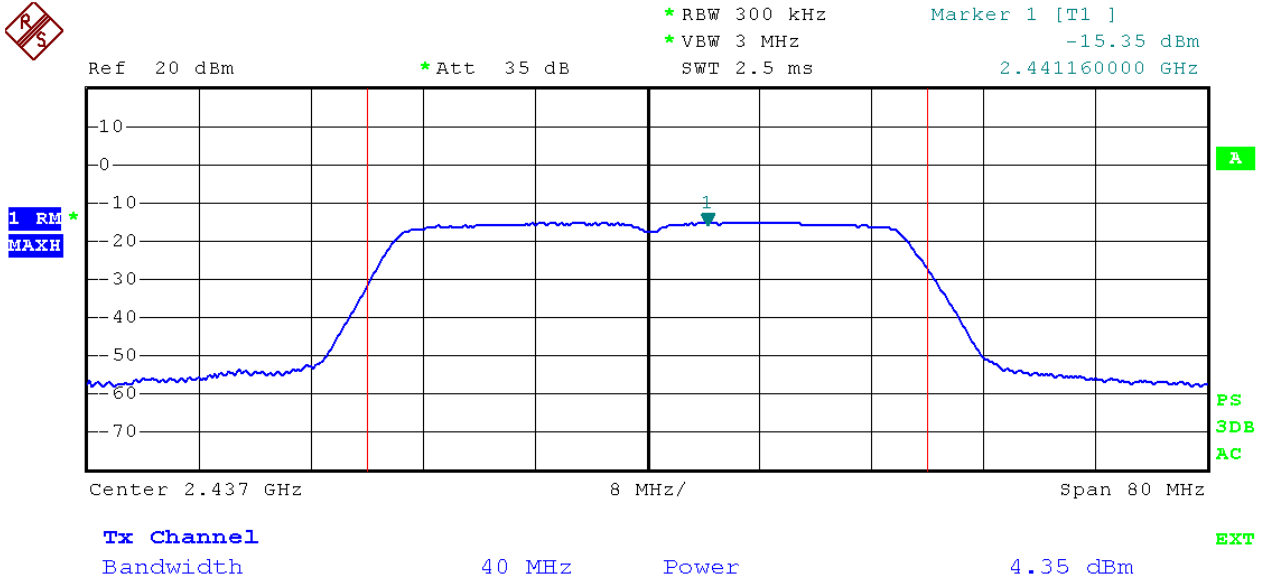
Test Mode: 802.11n(HT20)---High



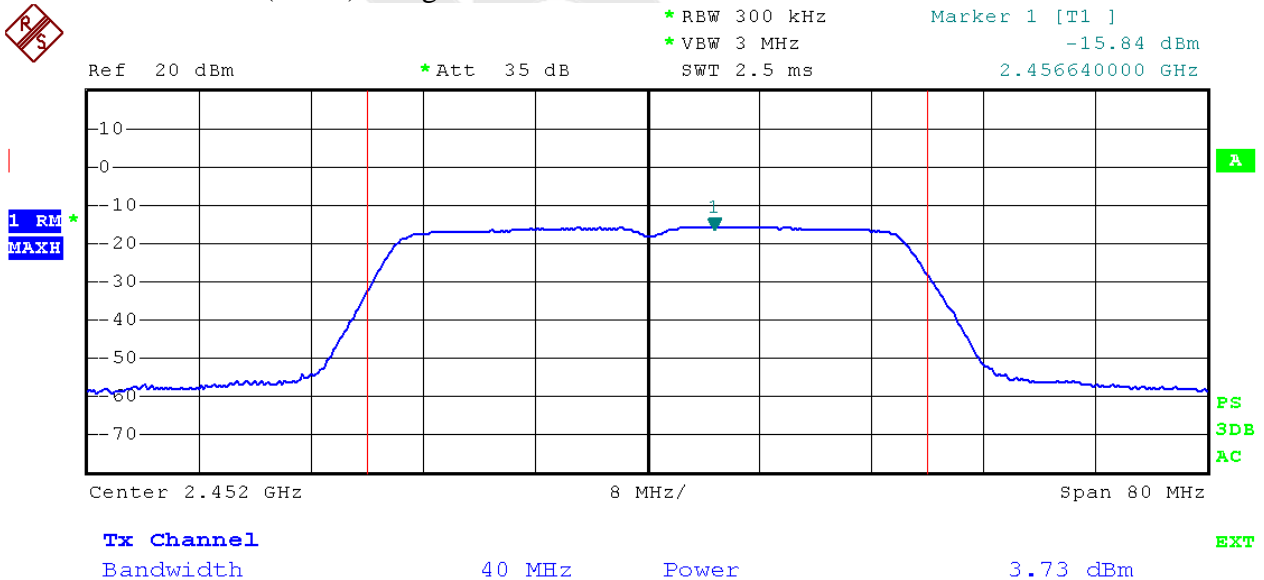
Test Mode: 802.11n(HT40)---Low



Test Mode: 802.11n(HT40)---Mid



Test Mode: 802.11n(HT40)---High



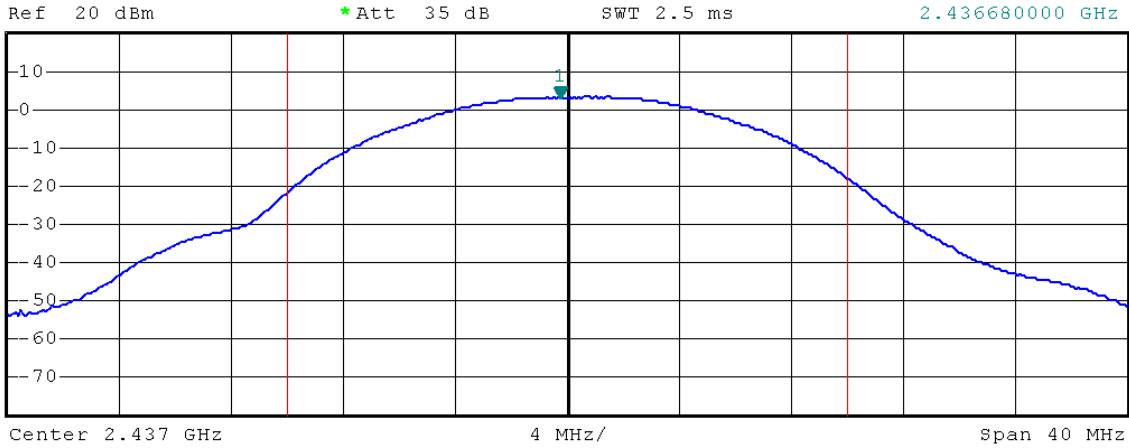
ANT B

Test Mode: 802.11b---Low



*RBW 300 kHz
*VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
3.21 dBm
2.436680000 GHz



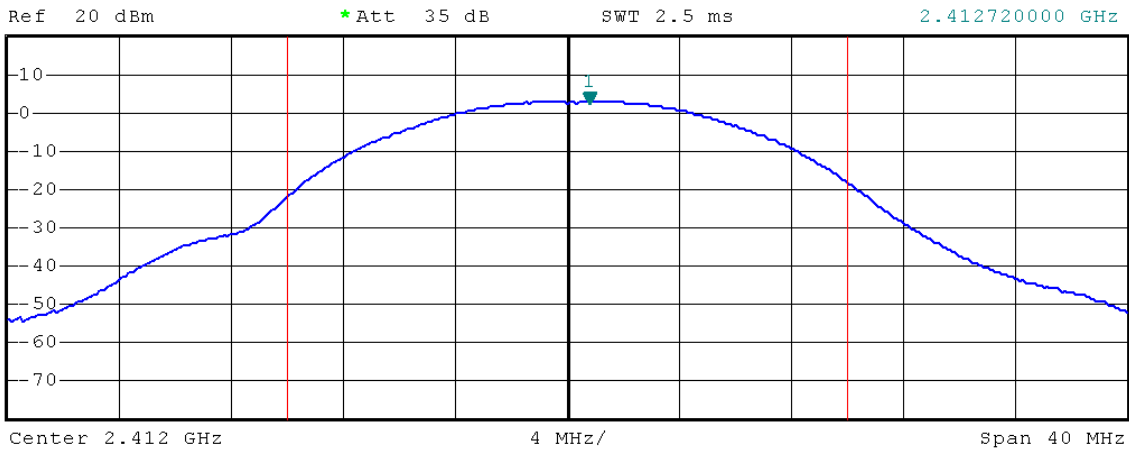
Tx Channel
Bandwidth 20 MHz Power 12.17 dBm

Test Mode: 802.11b---Mid



*RBW 300 kHz
*VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
2.97 dBm
2.412720000 GHz



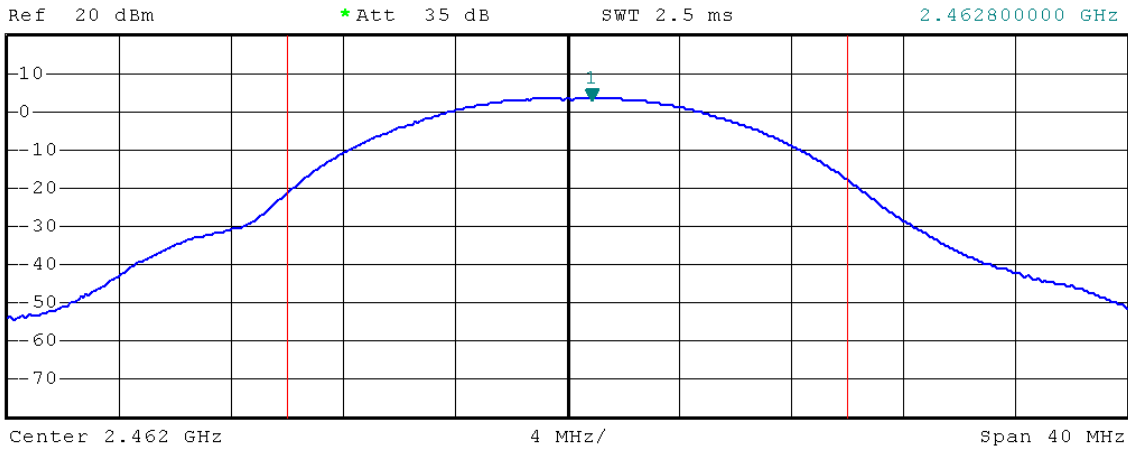
Tx Channel
Bandwidth 20 MHz Power 12.86 dBm

Test Mode: 802.11b---High



*RBW 300 kHz
*VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
3.60 dBm
2.462800000 GHz



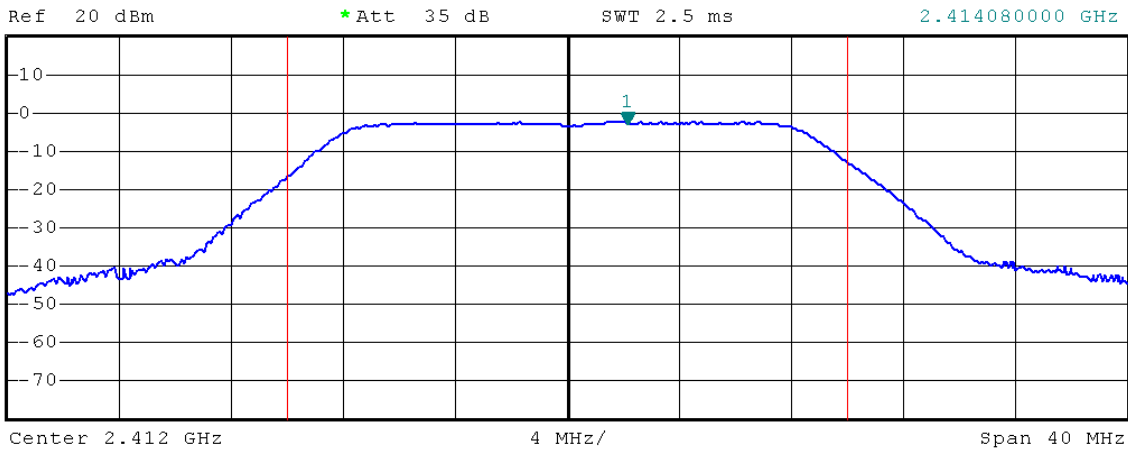
Tx Channel
Bandwidth 20 MHz Power 12.42 dBm

Test Mode: 802.11g---Low



*RBW 300 kHz
*VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
-2.35 dBm
2.414080000 GHz



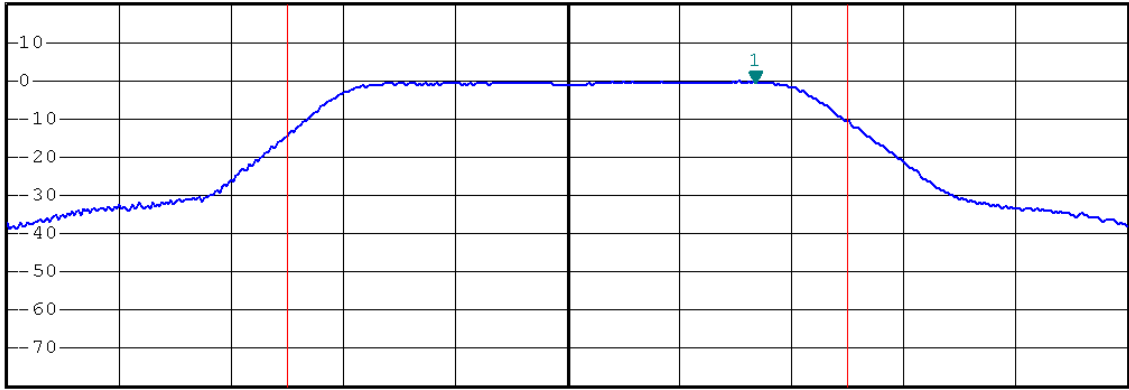
Tx Channel
Bandwidth 20 MHz Power 11.01 dBm

Test Mode: 802.11g---Mid



Ref 20 dBm *Att 35 dB *RBW 300 kHz *VBW 3 MHz SWT 2.5 ms Marker 1 [T1]
-0.24 dBm
2.443640000 GHz

1 RM *
MAXH



Center 2.437 GHz 4 MHz/ Span 40 MHz

Tx Channel Bandwidth 20 MHz Power 11.16 dBm

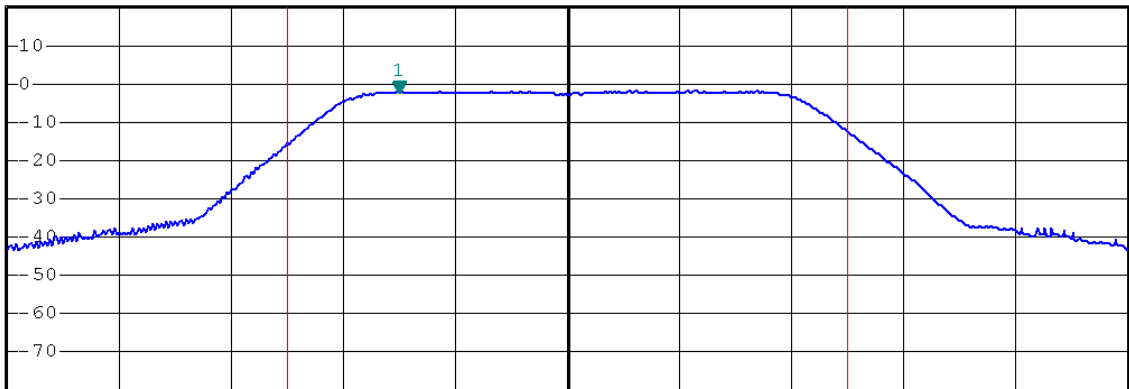
EXT

Test Mode: 802.11g---High



Ref 20 dBm *Att 35 dB *RBW 300 kHz *VBW 3 MHz SWT 2.5 ms Marker 1 [T1]
-1.96 dBm
2.455920000 GHz

1 RM *
MAXH



Center 2.462 GHz 4 MHz/ Span 40 MHz

Tx Channel Bandwidth 20 MHz Power 11.55 dBm

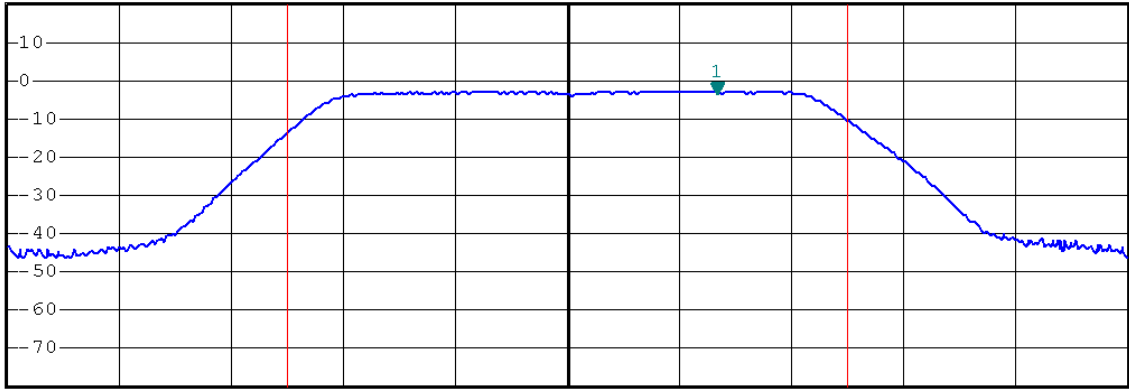
EXT

Test Mode: 802.11n(HT20)---Low



Ref 20 dBm *Att 35 dB *RBW 300 kHz *VBW 3 MHz SWT 2.5 ms Marker 1 [T1]
-2.81 dBm
2.417280000 GHz

1 RM *
MAXH



Center 2.412 GHz 4 MHz/ Span 40 MHz

Tx Channel Bandwidth 20 MHz Power 11.93 dBm

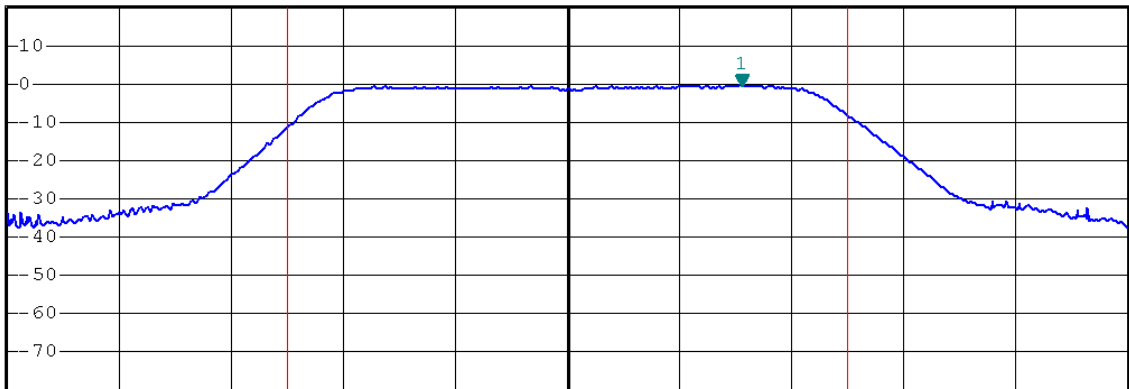
A
EXT

Test Mode: 802.11n(HT20)---Mid



Ref 20 dBm *Att 35 dB *RBW 300 kHz *VBW 3 MHz SWT 2.5 ms Marker 1 [T1]
-0.46 dBm
2.443160000 GHz

1 RM *
MAXH



Center 2.437 GHz 4 MHz/ Span 40 MHz

Tx Channel Bandwidth 20 MHz Power 11.12 dBm

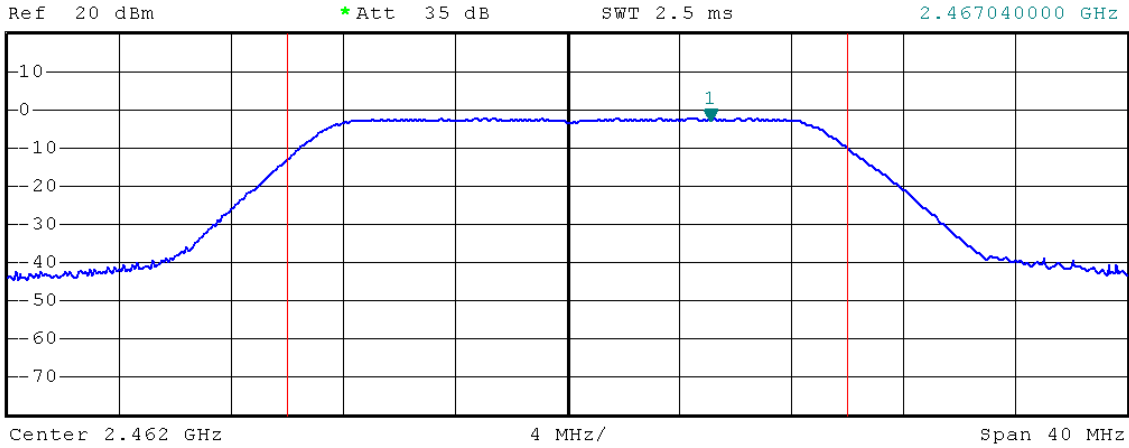
A
EXT

Test Mode: 802.11n(HT20)---High



* RBW 300 kHz
* VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
-2.32 dBm
2.467040000 GHz



1 RM *
MAXH

A
PS
3DB
AC

Tx Channel
Bandwidth 20 MHz Power 14.38 dBm

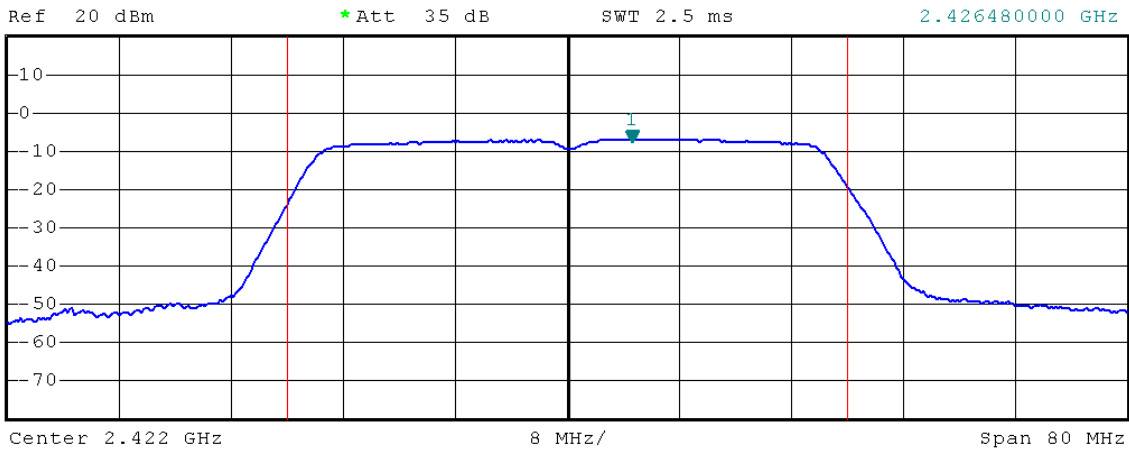
EXT

Test Mode: 802.11n(HT40)---Low



* RBW 300 kHz
* VBW 3 MHz
SWT 2.5 ms

Marker 1 [T1]
-7.05 dBm
2.426480000 GHz



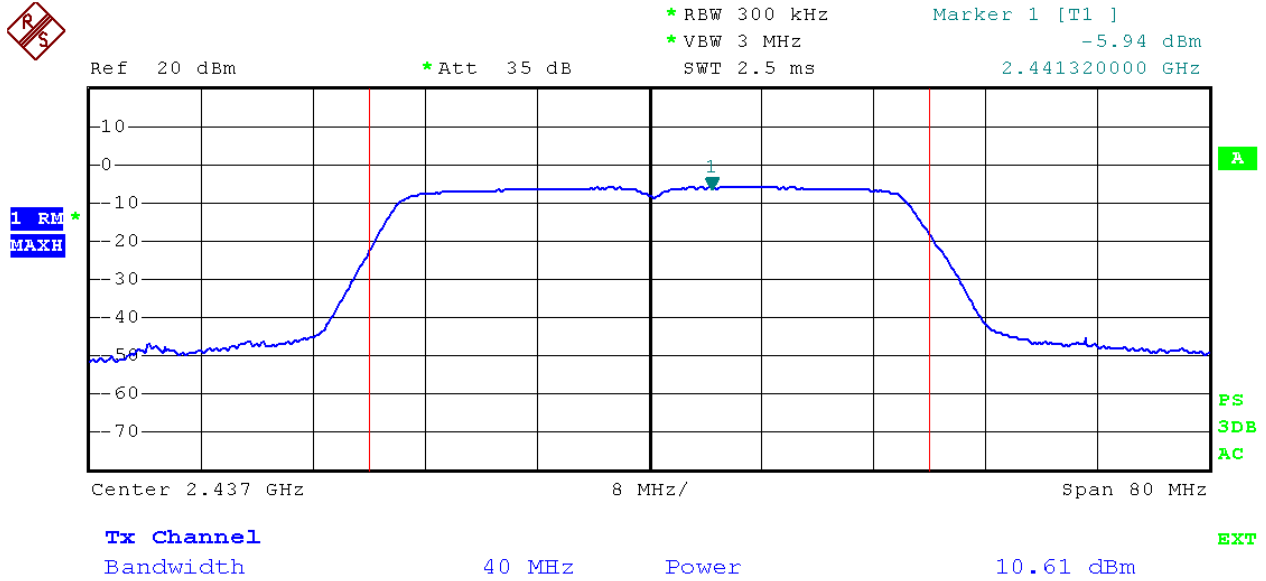
1 RM *
MAXH

A
PS
3DB
AC

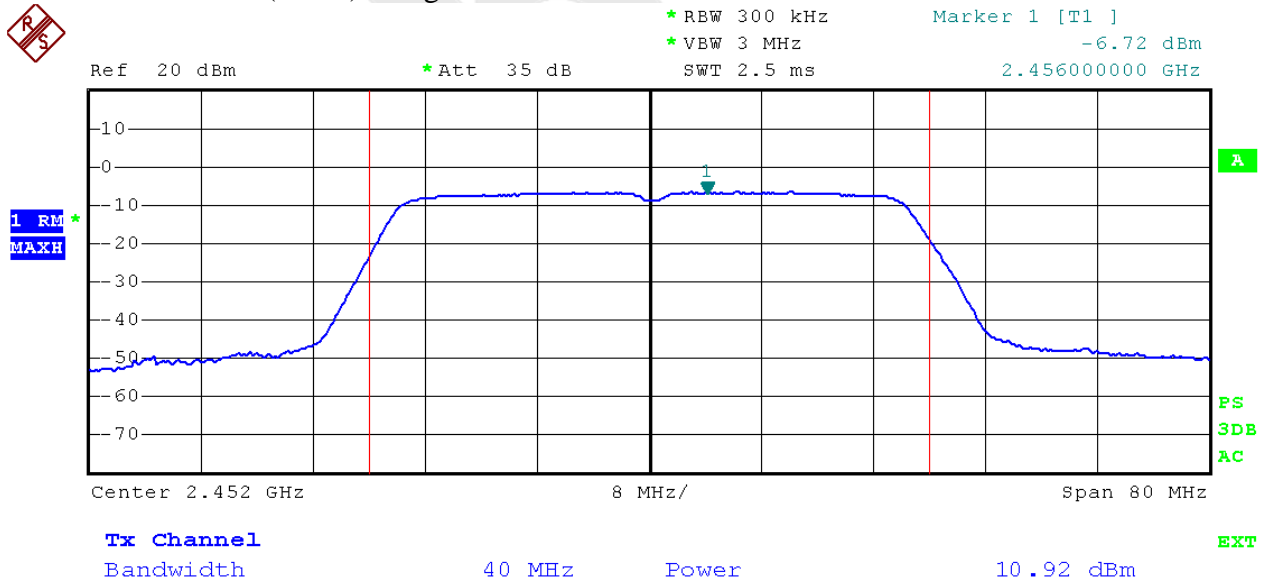
Tx Channel
Bandwidth 40 MHz Power 10.51 dBm

EXT

Test Mode: 802.11n(HT40)---Mid



Test Mode: 802.11n(HT40)---High



4.4. Band Edges Measurement

a. Limit

According to §15.247(c), 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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).

b. Test Procedure

1. Conducted Method:

- 1) Set RBW=100KHz, VBW=300KHz
- 2) Detector=peak
- 3) Sweep time= auto
- 4) Trace mode=max hold.

1) For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane. The EUT is tested in 9*6*6 Chamber.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane. The EUT is tested in 9*6*6 Chamber.

- 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 both RBW and VBW of spectrum analyzer to 100kHz with a convenient frequency span including 100kHz bandwidth from band edge, check the emission of EUT. If pass then set Spectrum Analyzer as below:

For below 1GHz:

The resolution bandwidth and video bandwidth of test receiver/ spectrum analyzer is 120kHz.

Detector: **Quasi-Peak**

For above 1GHz Peak measurement:

The resolution bandwidth of test receiver/ spectrum analyzer is 1MHz and video bandwidth is 3MHz.

Detector: **Peak**

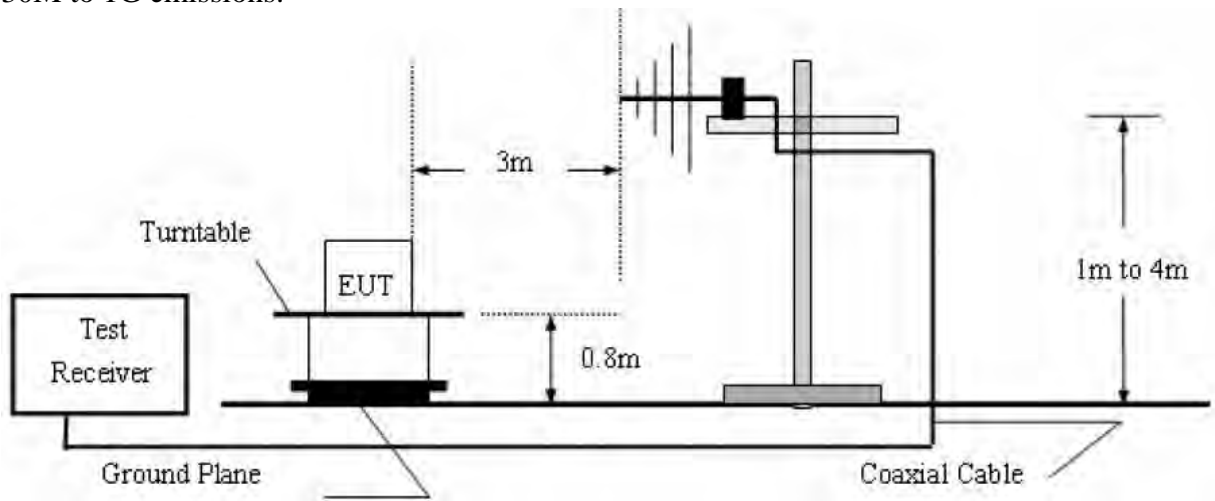
For above 1GHz average measurement:

The resolution bandwidth of test receiver/ spectrum analyzer is 1MHz and the video bandwidth is 10Hz.

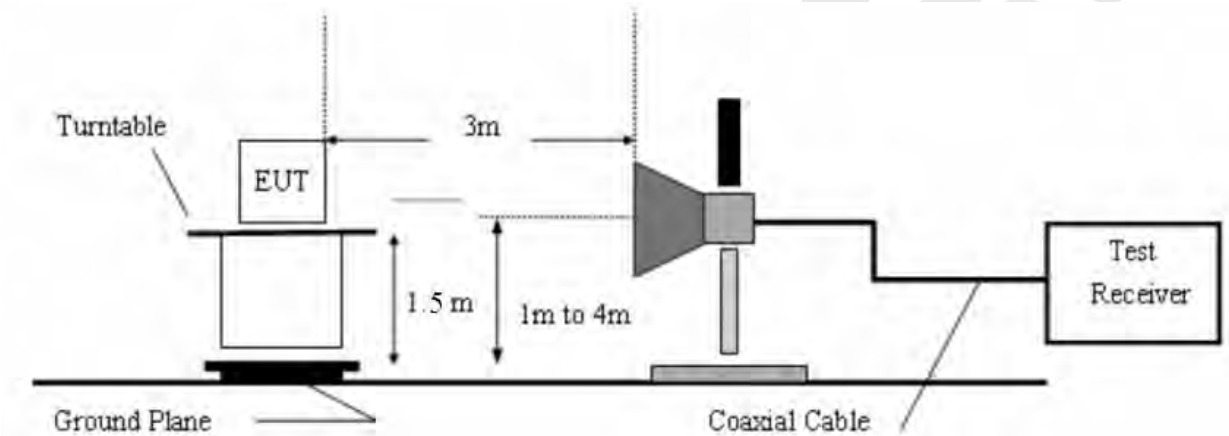
Detector: **Peak**

- 5) Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

30M to 1G emissions:



1G to 40G emissions:



c. Test Equipment

Same as the equipment listed in 4.2.

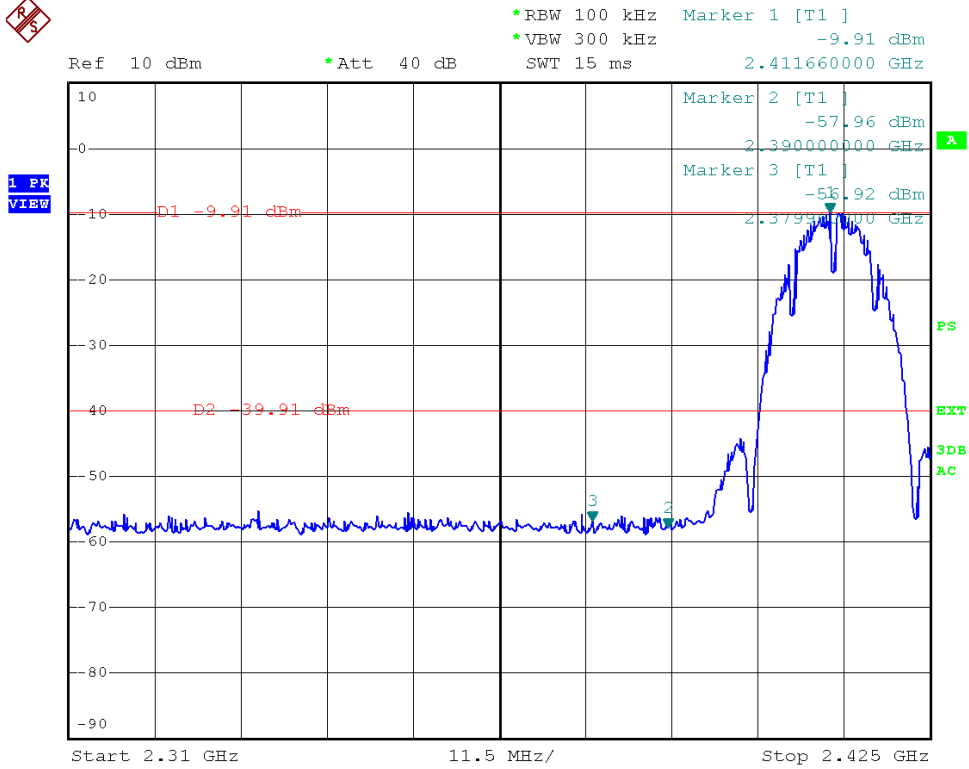
d. Test Results

Pass.

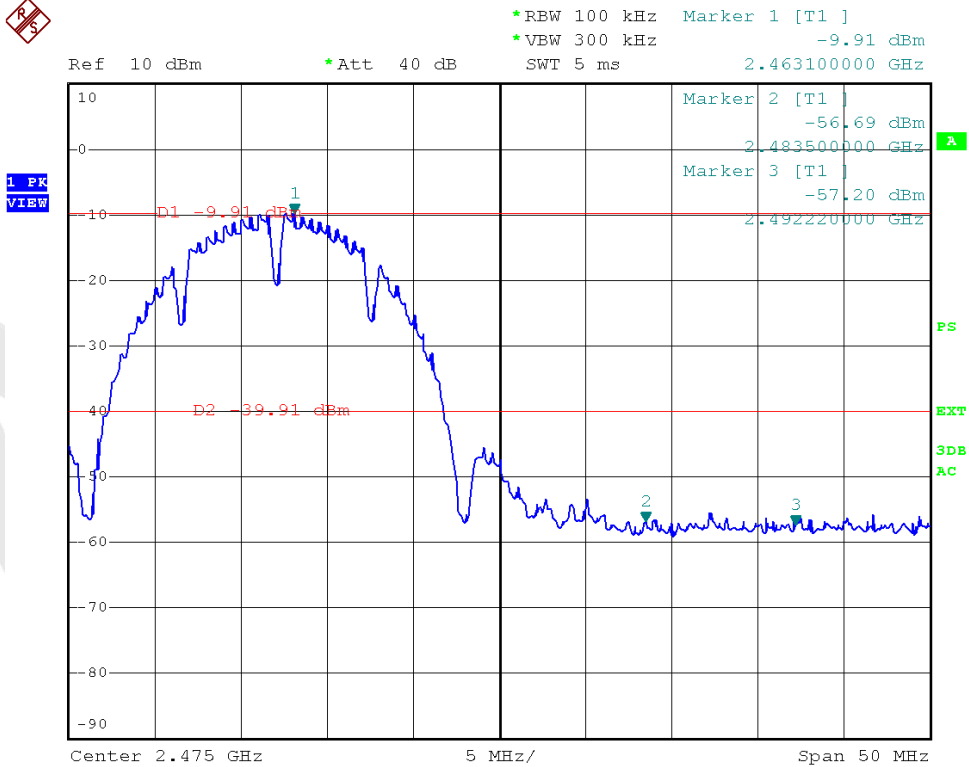
e. Test Plots

See the following page.

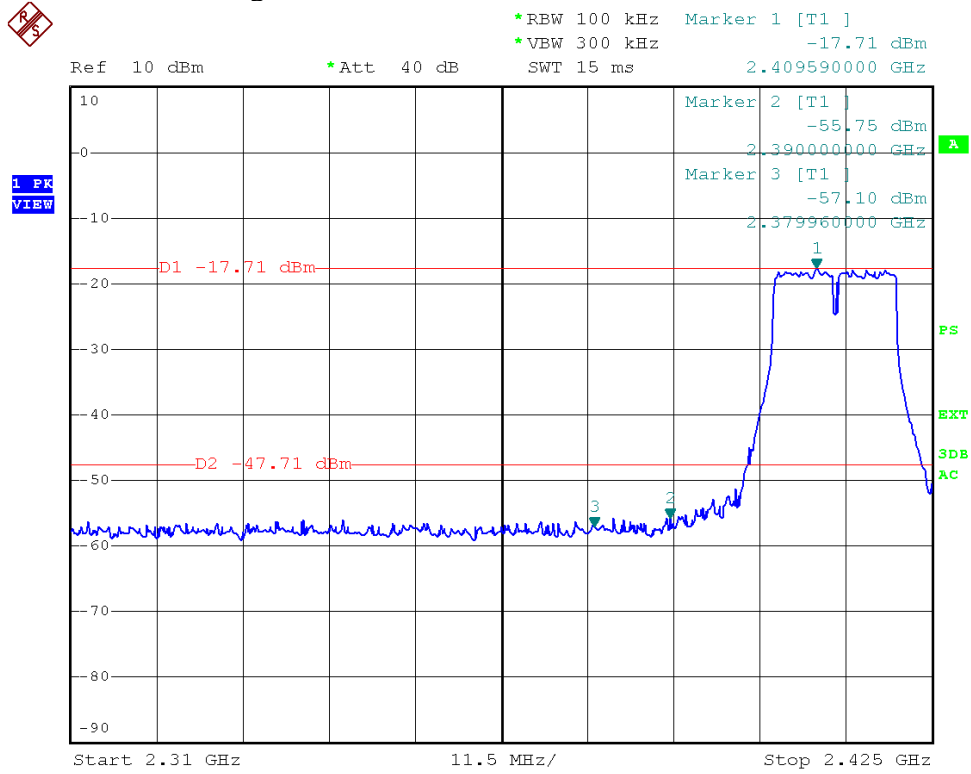
ANTA
Test Mode: 802.11b ---Low



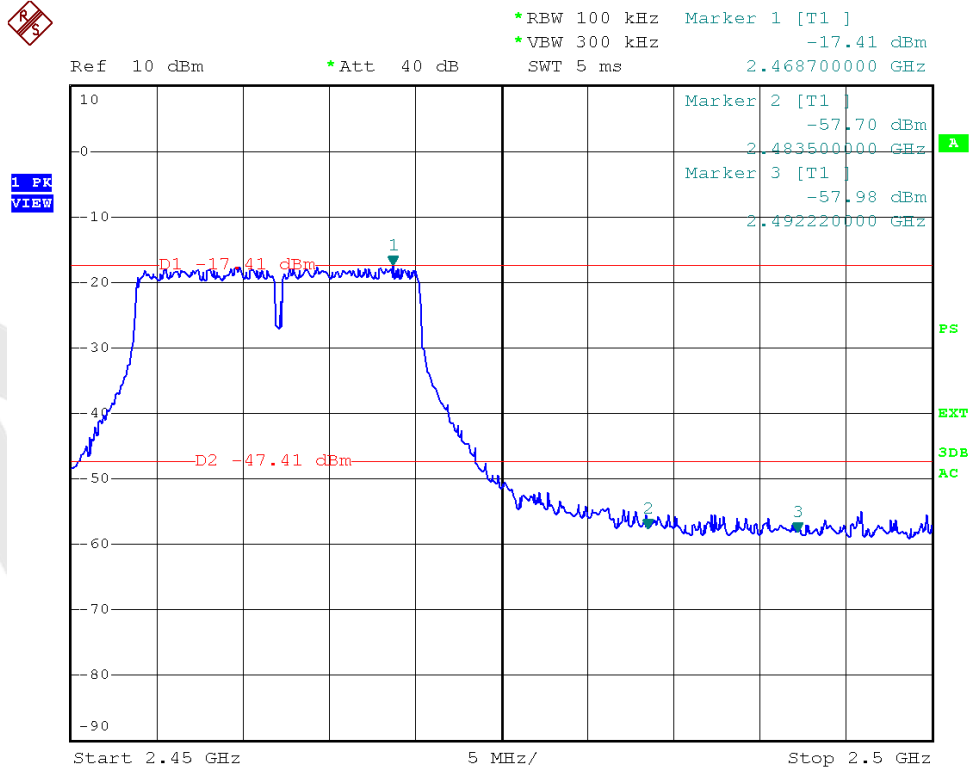
Test Mode: 802.11b ---High



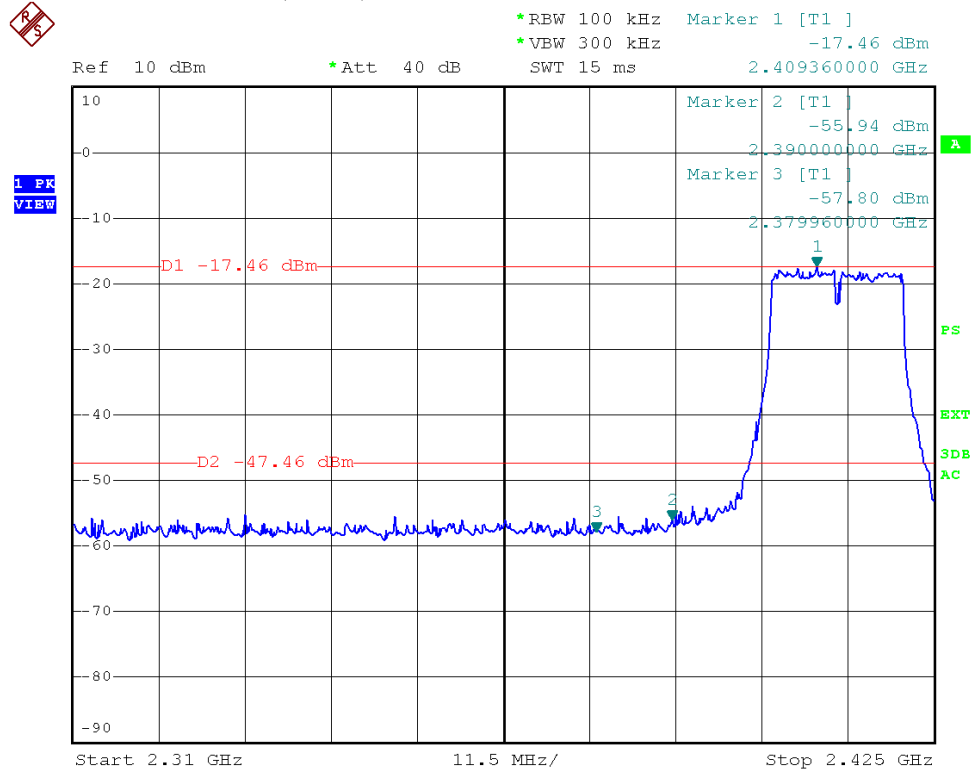
Test Mode: 802.11g ---Low



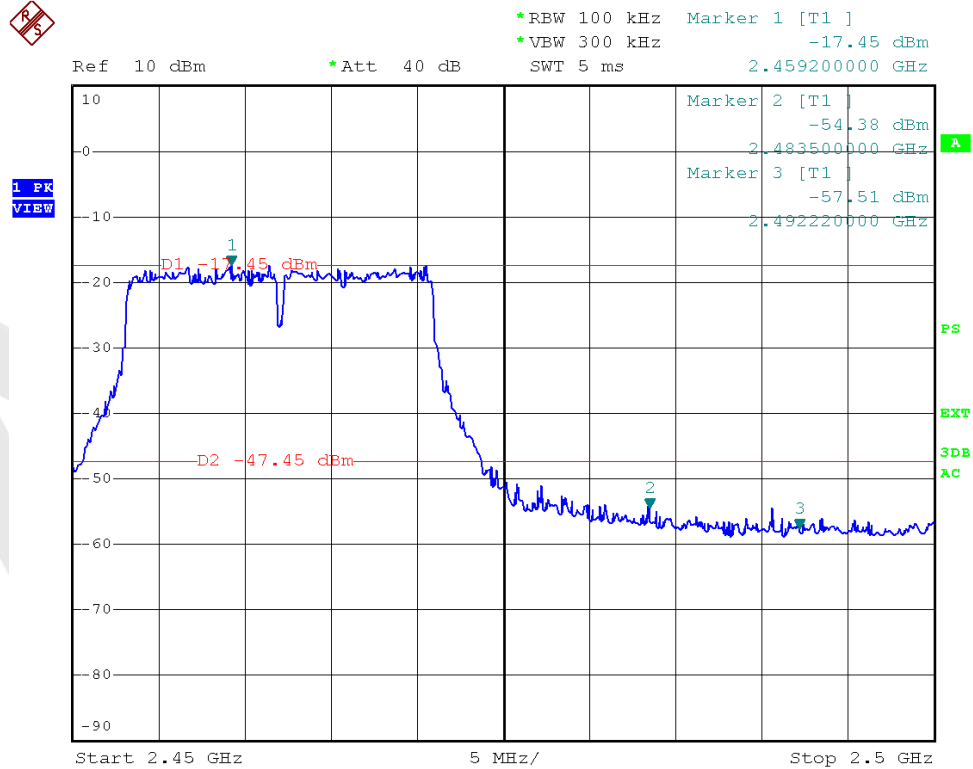
Test Mode: 802.11g ---High



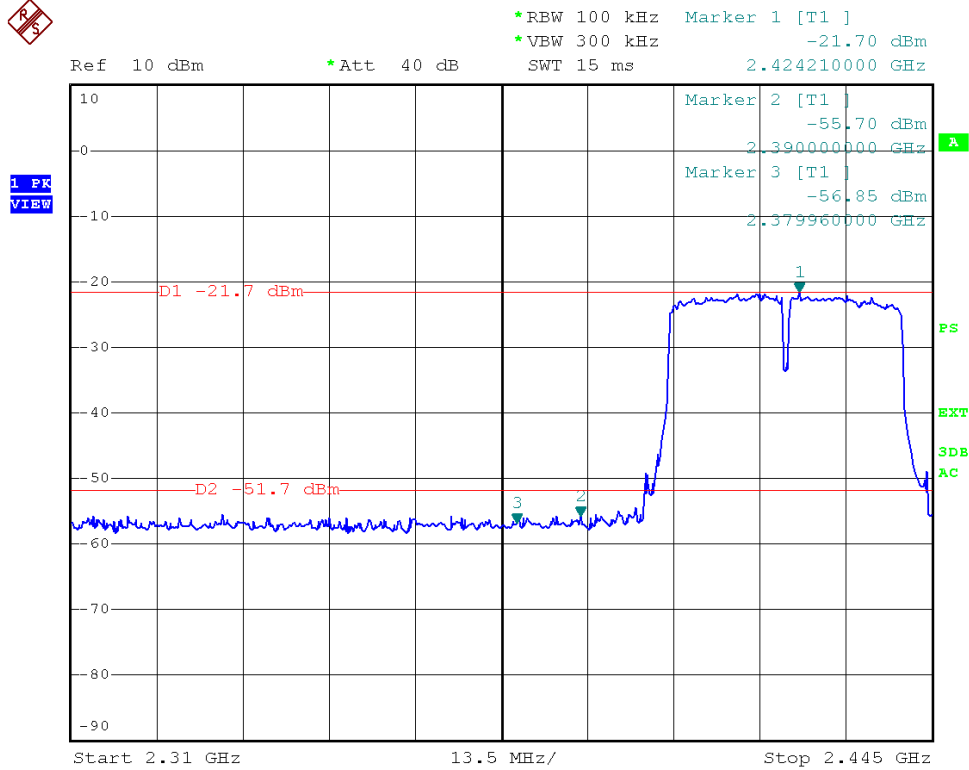
Test Mode: 802.11n (HT20) ---Low



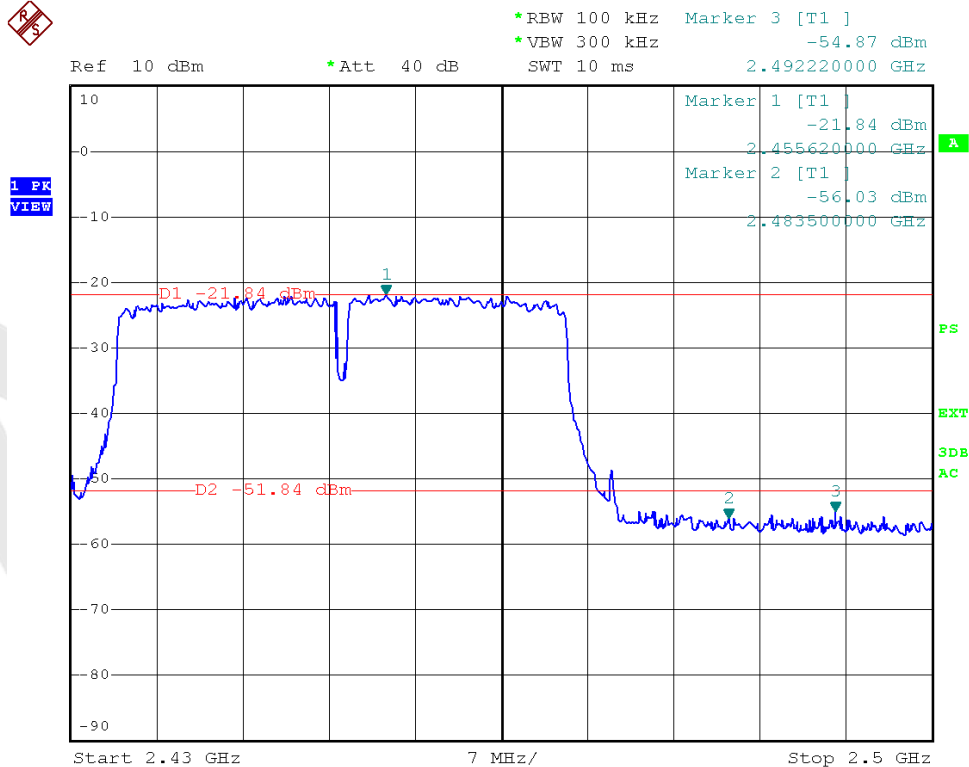
Test Mode: 802.11n (HT20)---High



Test Mode: 802.11n (HT40) ---Low

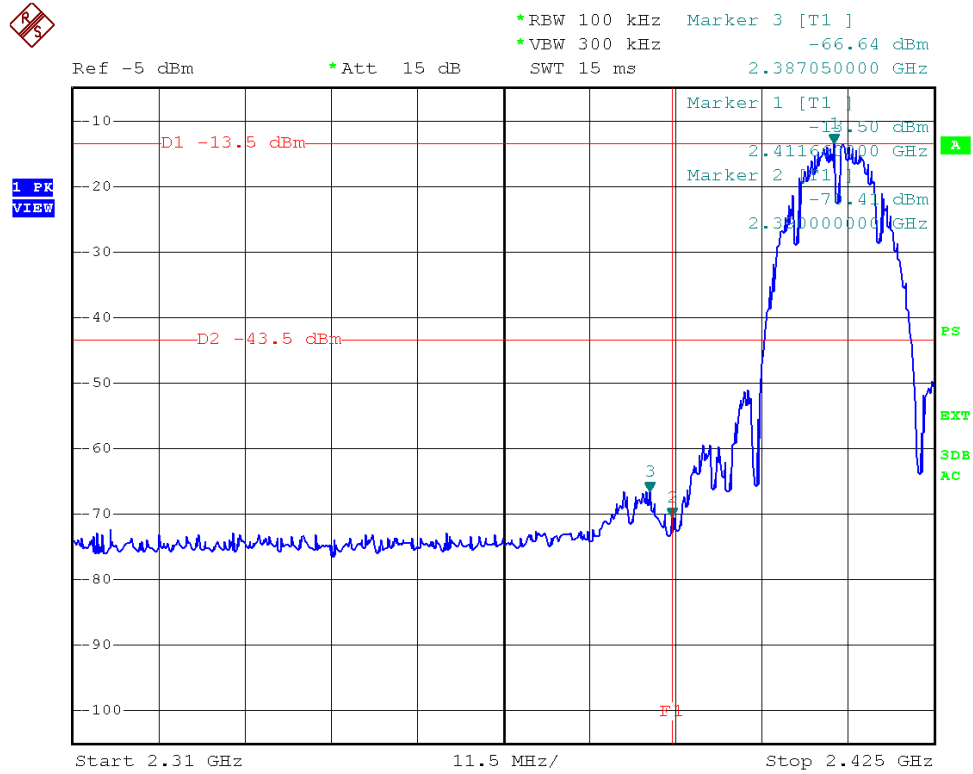


Test Mode: 802.11n (HT40) ---High

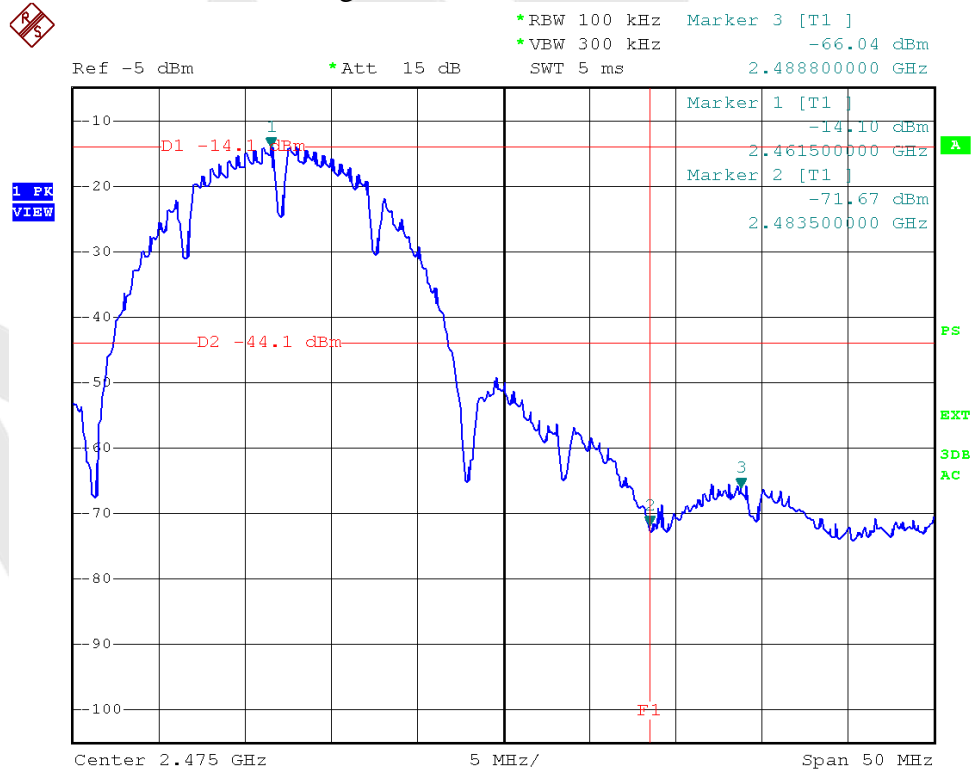


ANTB

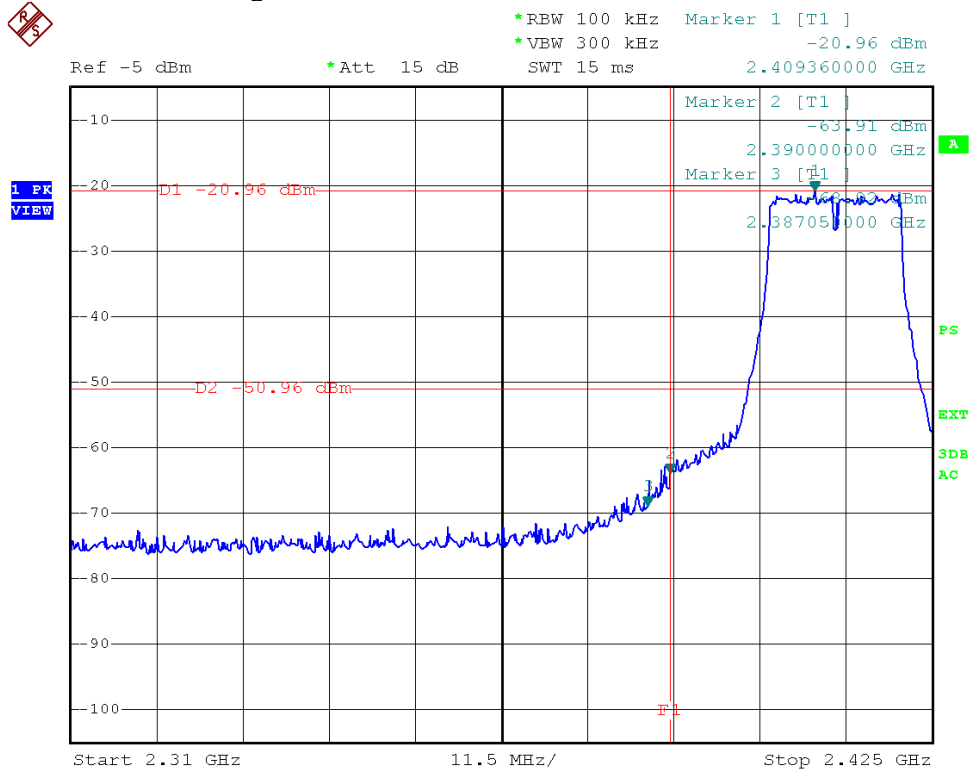
Test Mode: 802.11b ---Low



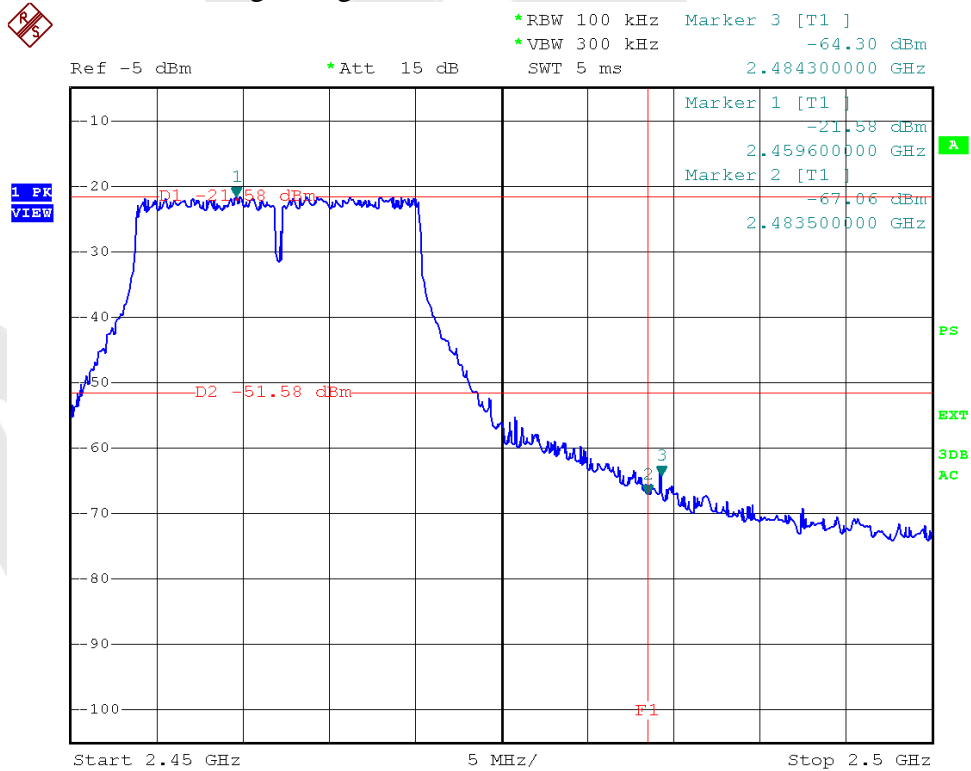
Test Mode: 802.11b ---High



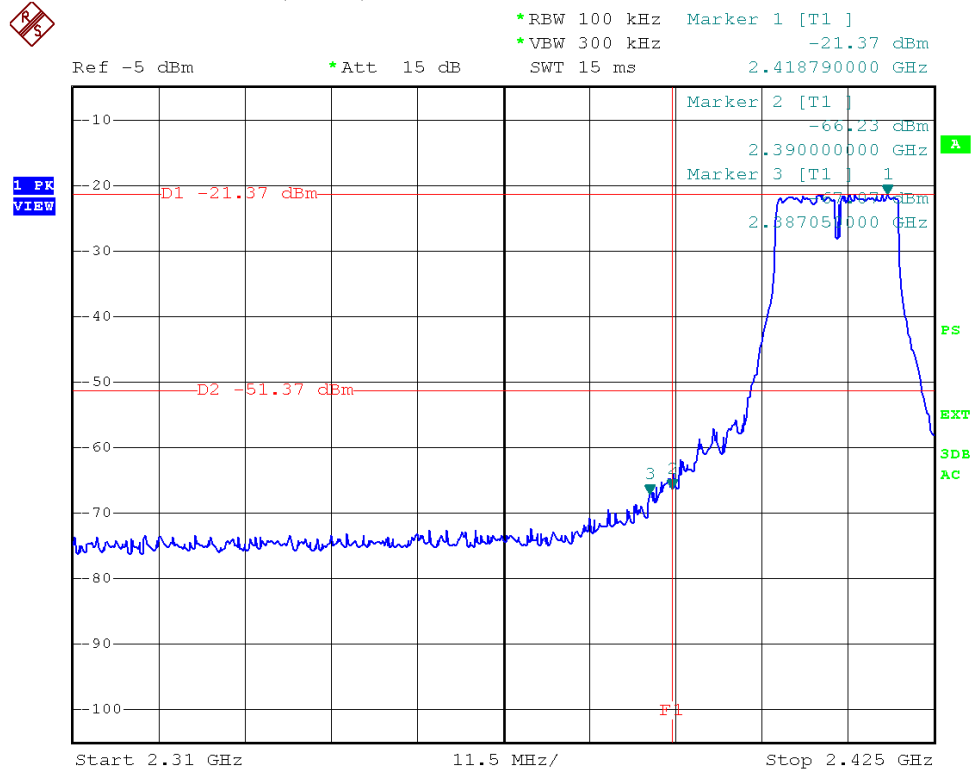
Test Mode: 802.11g ---Low



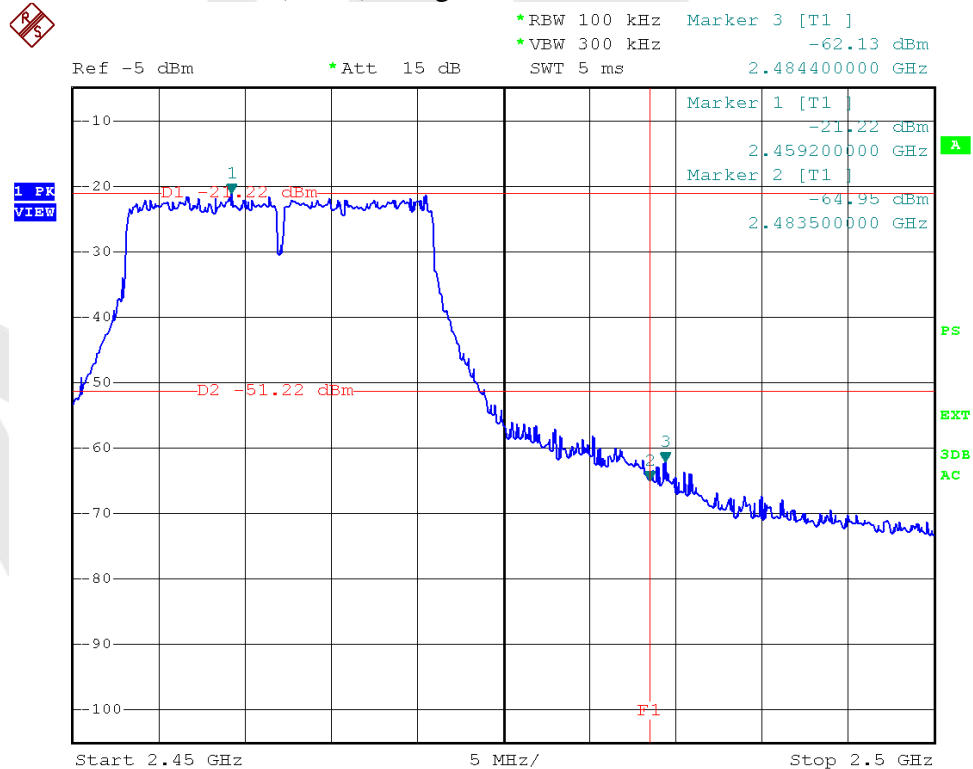
Test Mode: 802.11g ---High



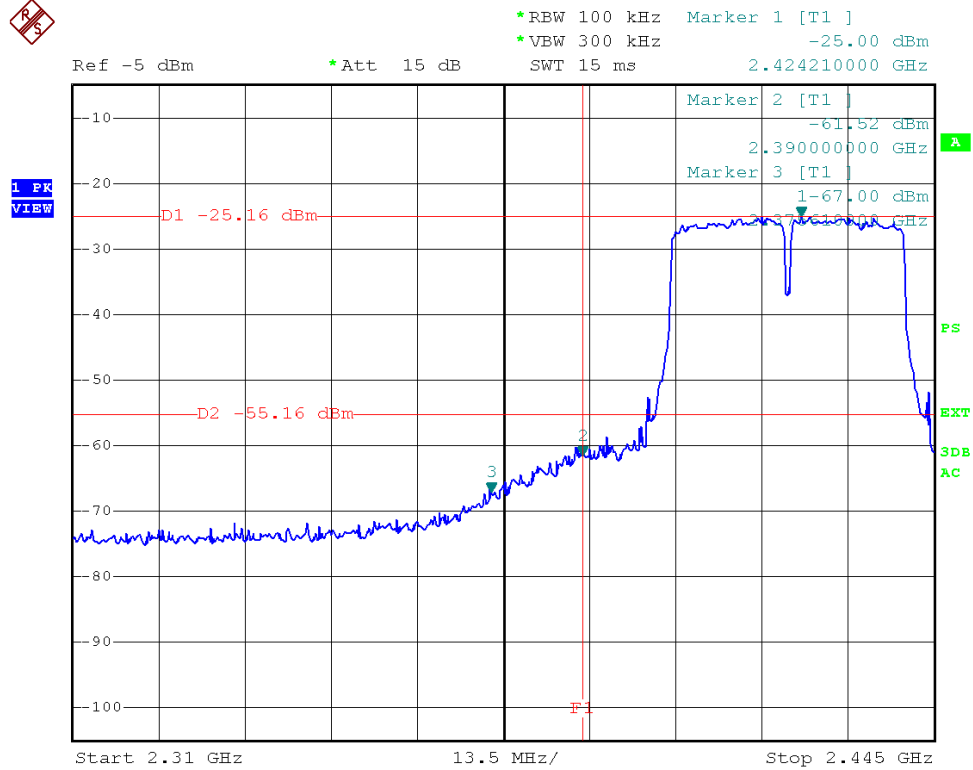
Test Mode: 802.11n (HT20) ---Low



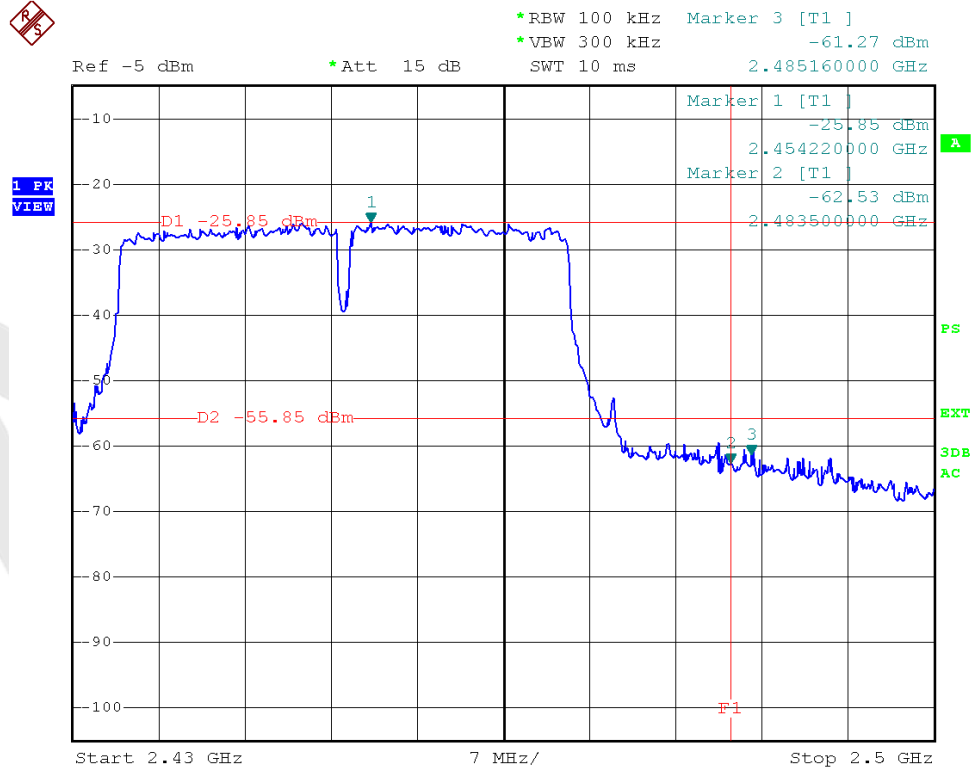
Test Mode: 802.11n (HT20)---High



Test Mode: 802.11n (HT40) ---Low



Test Mode: 802.11n (HT40) ---High



ANT A

Test Mode: 802.11b

2412MHz

Horizontal-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2370.225 | 36.91 | -2.56 | 34.35 | 74.00 | -39.65 | peak | | | |
| 2 | 2390.000 | 40.11 | -2.51 | 37.60 | 74.00 | -36.40 | peak | | | |
| 3 | 2400.000 | 62.51 | -2.49 | 60.02 | 74.00 | -13.98 | peak | | | |

ANT A

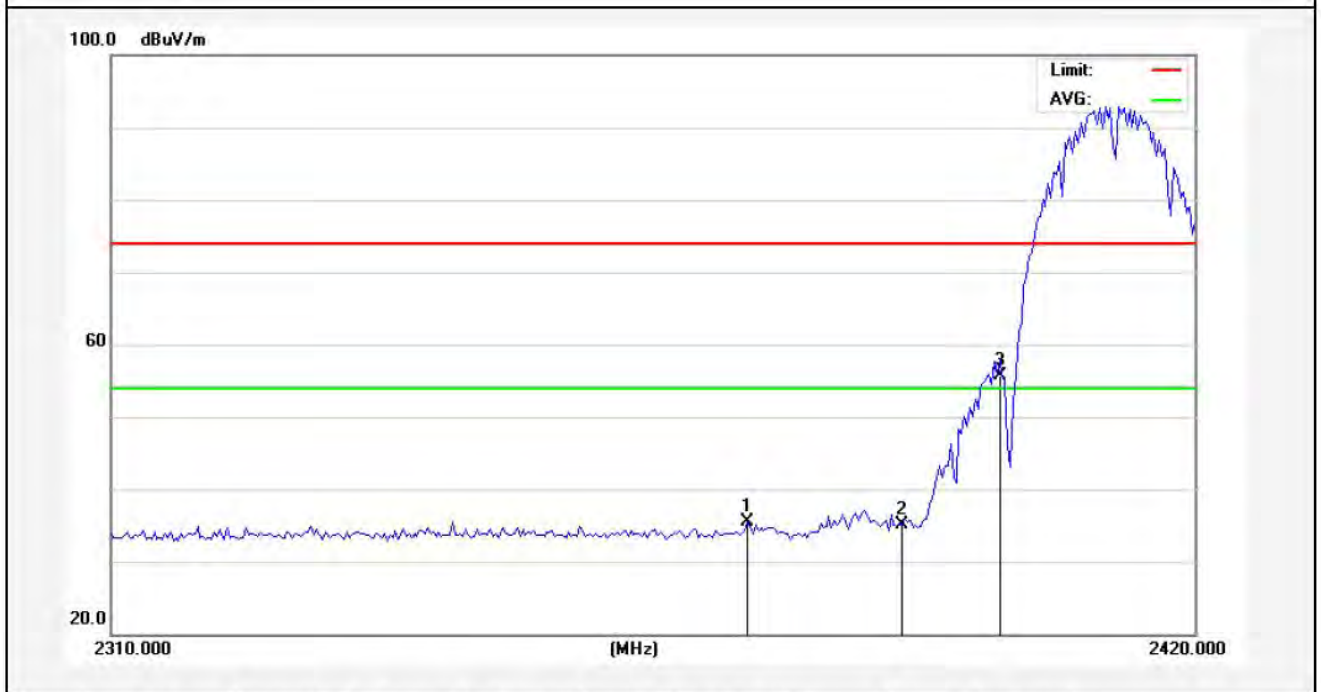
Horizontal-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2374.075 | 28.47 | -2.55 | 25.92 | 54.00 | -28.08 | AVG | | | |
| 2 | 2390.000 | 33.07 | -2.51 | 30.56 | 54.00 | -23.44 | AVG | | | |
| 3 | 2400.000 | 49.36 | -2.49 | 46.87 | 54.00 | -7.13 | AVG | | | |

Anbotek

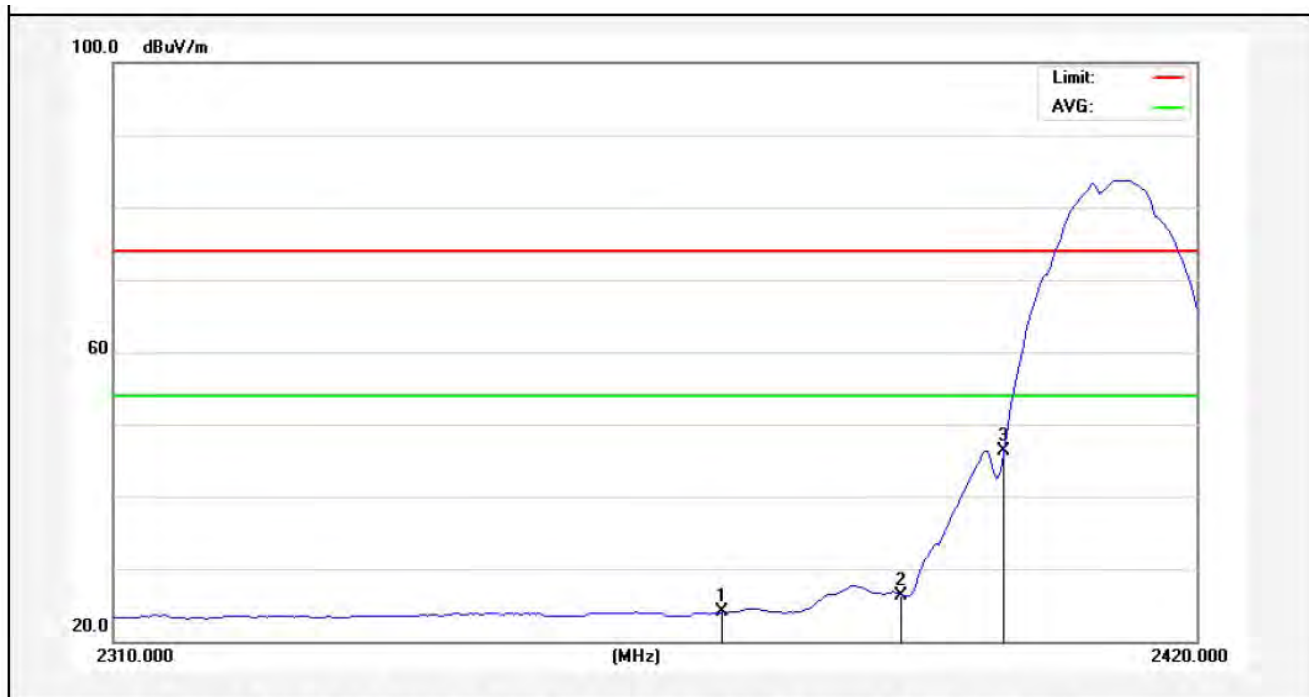
Test Mode: 802.11b
2412MHz
Vertical-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2374.075 | 37.99 | -2.55 | 35.44 | 74.00 | -38.56 | peak | | | |
| 2 | 2390.000 | 37.69 | -2.51 | 35.18 | 74.00 | -38.82 | peak | | | |
| 3 | 2400.000 | 58.19 | -2.49 | 55.70 | 74.00 | -18.30 | peak | | | |

AMB

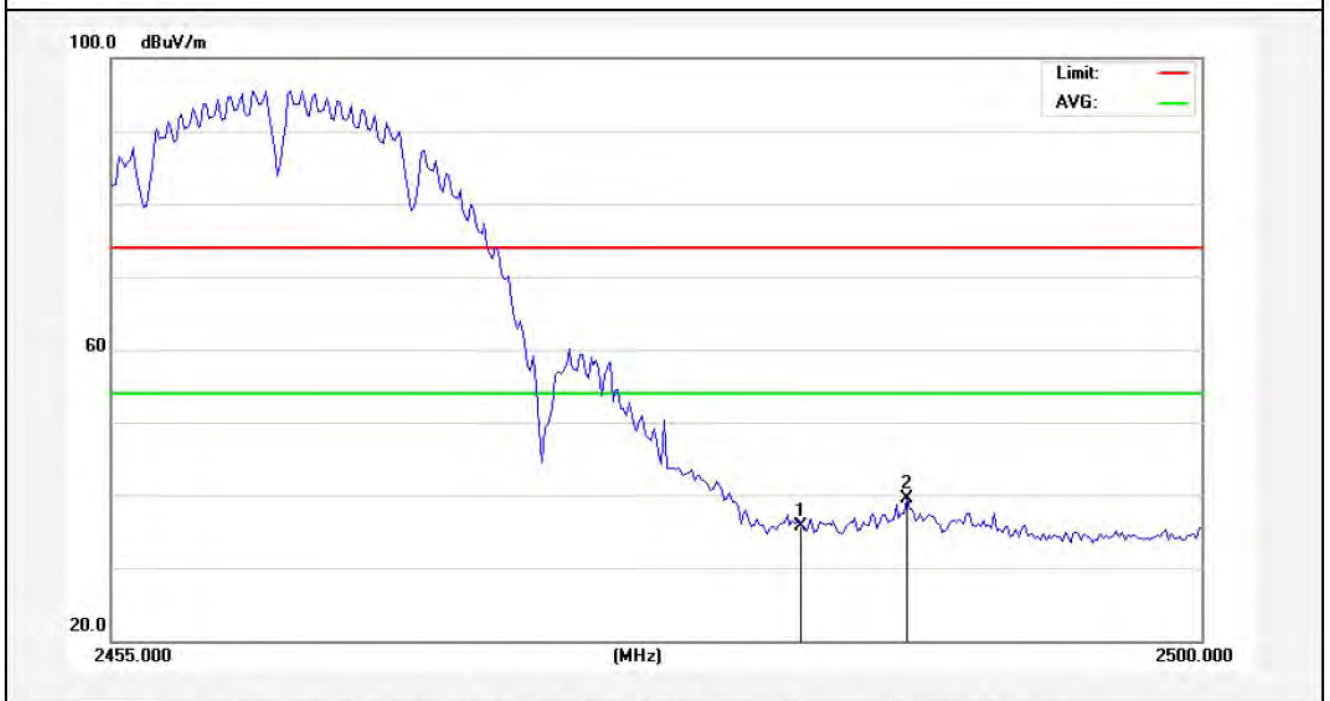
Vertical-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2371.325 | 26.64 | -2.56 | 24.08 | 54.00 | -29.92 | AVG | | | |
| 2 | 2390.000 | 28.84 | -2.51 | 26.33 | 54.00 | -27.67 | AVG | | | |
| 3 | 2400.000 | 48.73 | -2.49 | 46.24 | 54.00 | -7.76 | AVG | | | |

Anbotek

Test Mode: 802.11b
2462MHz
Horizontal-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 38.06 | -2.31 | 35.75 | 74.00 | -38.25 | peak | | | |
| 2 | 2487.850 | 41.78 | -2.30 | 39.48 | 74.00 | -34.52 | peak | | | |

Anbotek

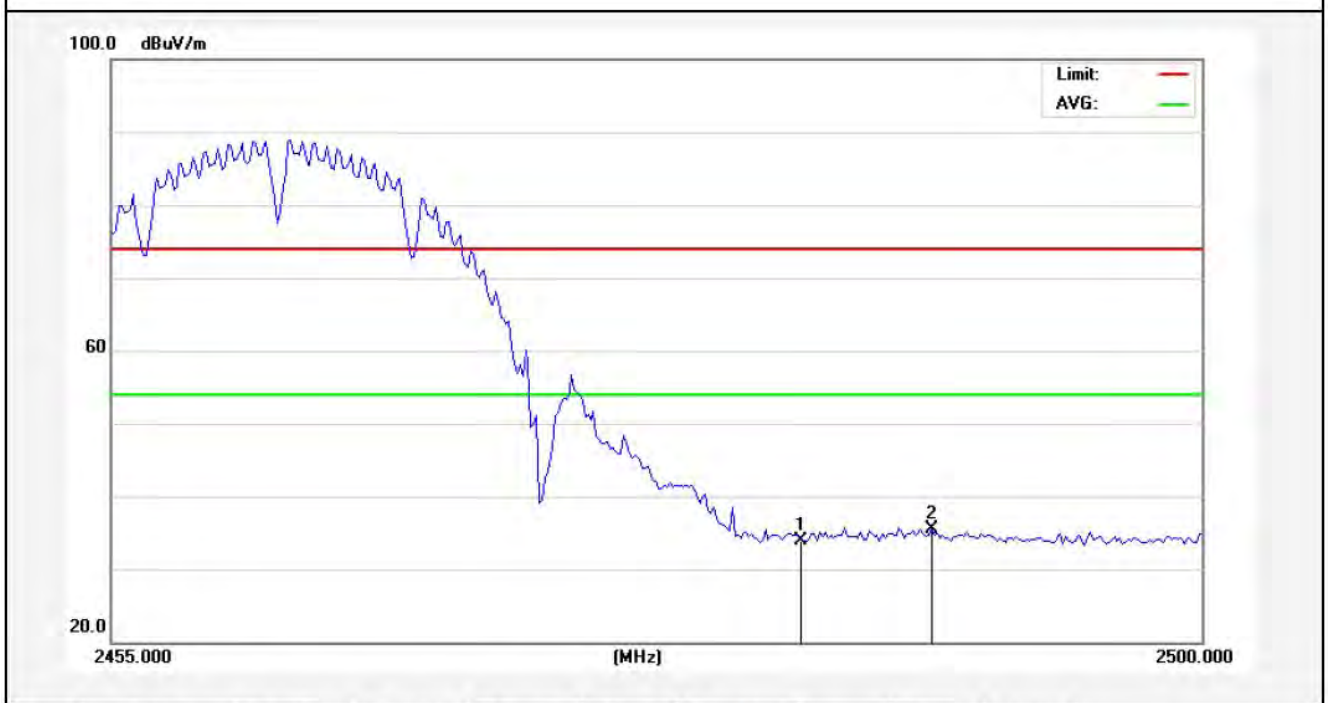
Horizontal-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 27.39 | -2.31 | 25.08 | 54.00 | -28.92 | AVG | | | |
| 2 | 2488.075 | 29.32 | -2.30 | 27.02 | 54.00 | -26.98 | AVG | | | |

Anbotek

Test Mode: 802.11b
2462MHz
Vertical-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 36.29 | -2.31 | 33.98 | 74.00 | -40.02 | peak | | | |
| 2 | 2488.863 | 37.88 | -2.29 | 35.59 | 74.00 | -38.41 | peak | | | |

Anbotek

Vertical-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 27.27 | -2.31 | 24.96 | 54.00 | -29.04 | AVG | | | |
| 2 | 2487.850 | 28.61 | -2.30 | 26.31 | 54.00 | -27.69 | AVG | | | |

Anbotek

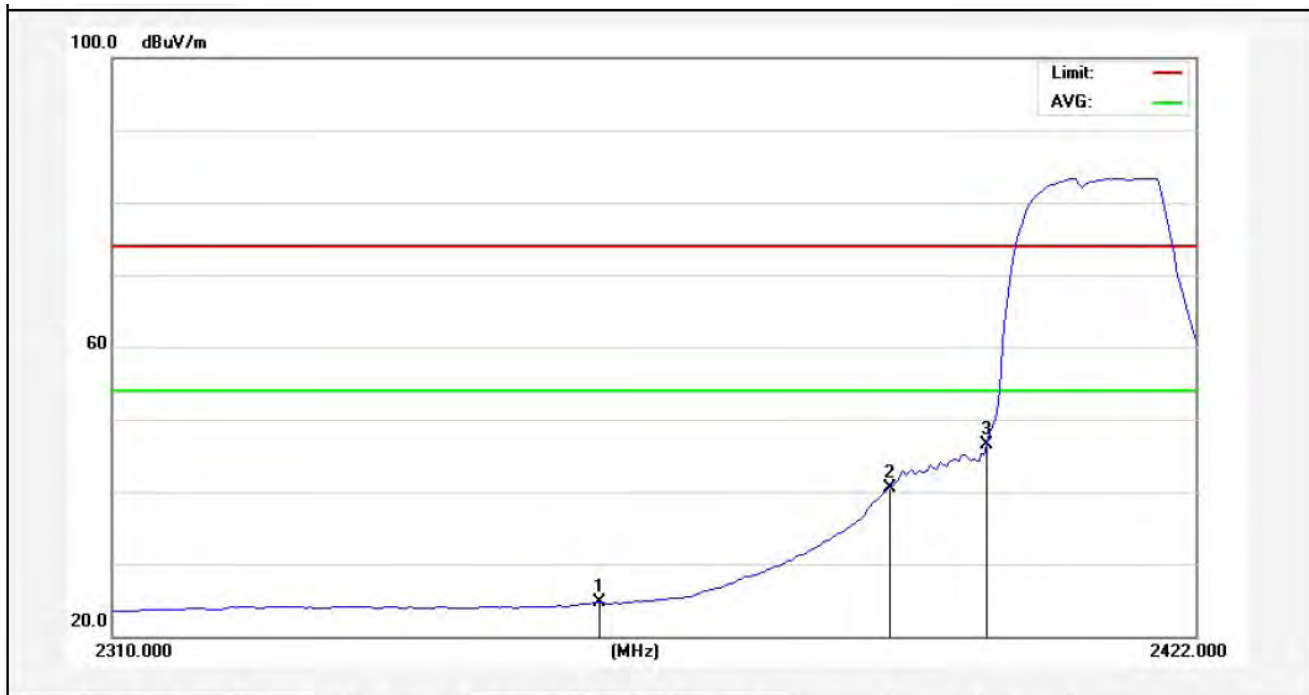
Test Mode: 802.11g
2412MHz
Horizontal-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|--------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2380.560 | 43.98 | -2.54 | 41.44 | 74.00 | -32.56 | peak | | | |
| 2 | 2390.000 | 50.78 | -2.51 | 48.27 | 74.00 | -25.73 | peak | | | |
| 3 | 2400.000 | 63.74 | -2.49 | 61.25 | 74.00 | -12.75 | peak | | | |

AMB

Horizontal-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2359.840 | 27.24 | -2.58 | 24.66 | 54.00 | -29.34 | AVG | | | |
| 2 | 2390.000 | 43.11 | -2.51 | 40.60 | 54.00 | -13.40 | AVG | | | |
| 3 | 2400.000 | 49.03 | -2.49 | 46.54 | 54.00 | -7.46 | AVG | | | |

Anbotek

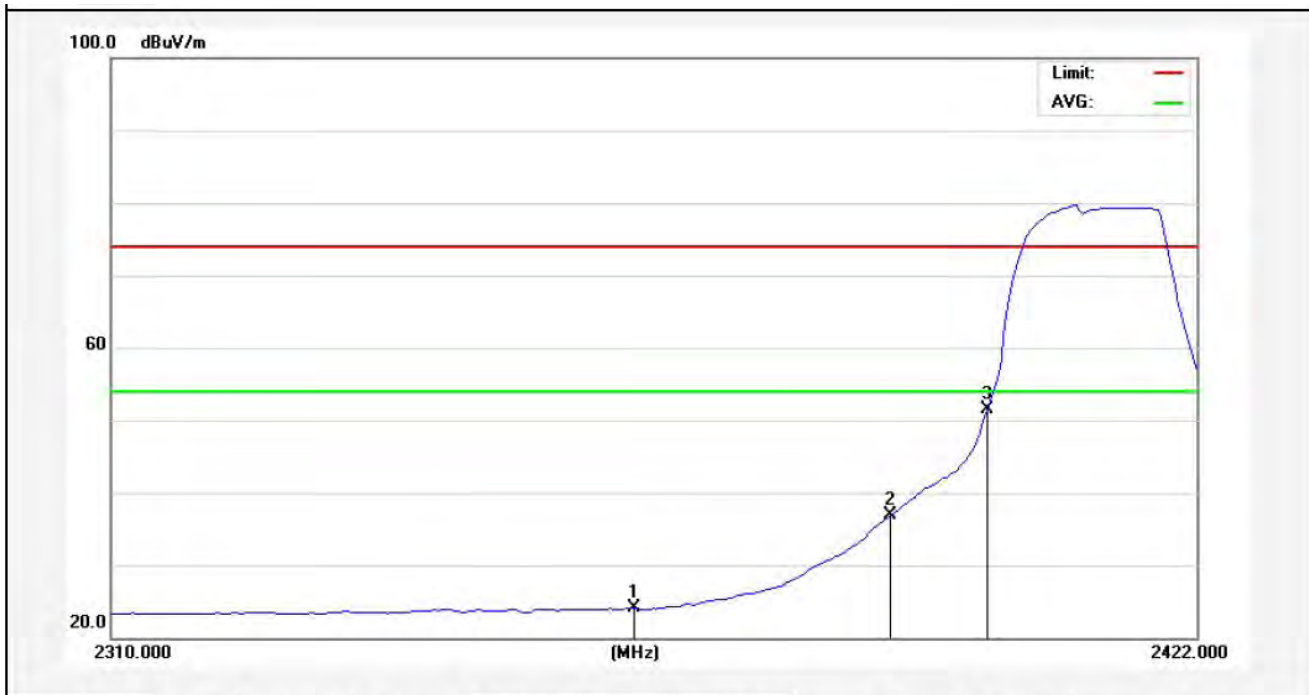
Test Mode: 802.11g
2412MHz
Vertical-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2358.160 | 37.98 | -2.58 | 35.40 | 74.00 | -38.60 | peak | | | |
| 2 | 2390.000 | 46.92 | -2.51 | 44.41 | 74.00 | -29.59 | peak | | | |
| 3 | 2400.000 | 58.14 | -2.49 | 55.65 | 74.00 | -18.35 | peak | | | |

AMB

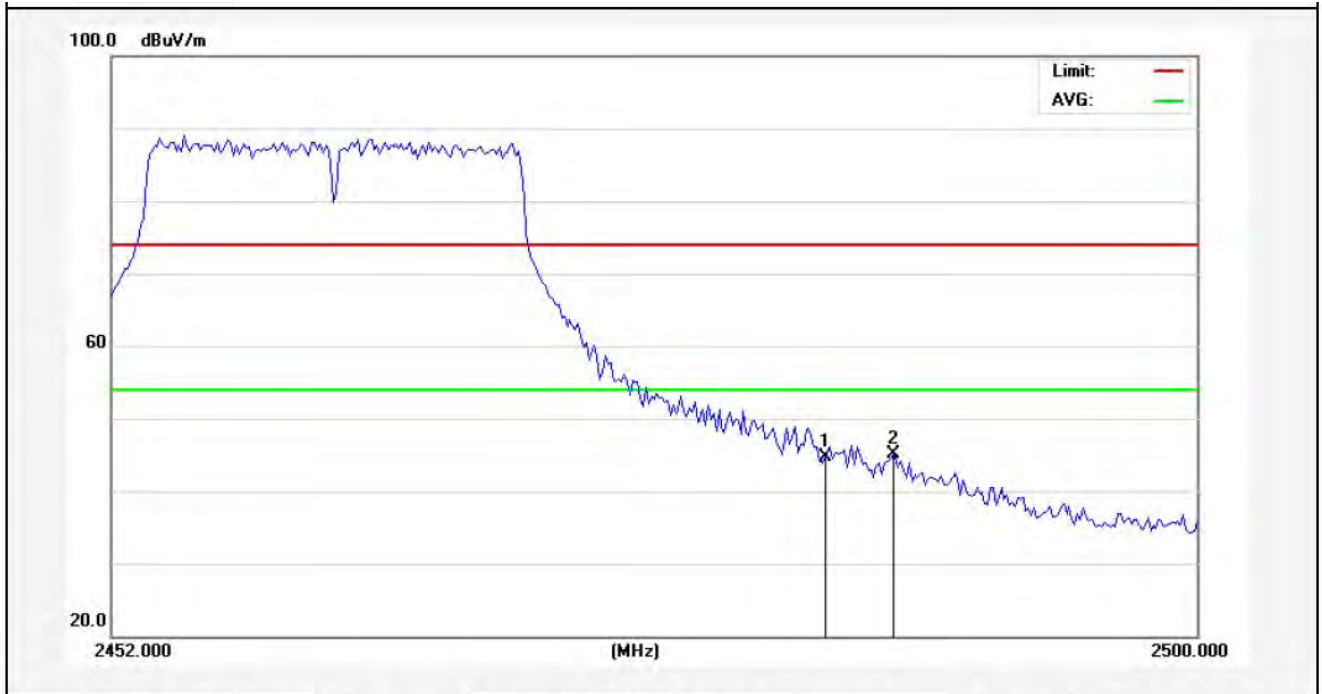
Vertical-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2363.480 | 26.69 | -2.57 | 24.12 | 54.00 | -29.88 | AVG | | | |
| 2 | 2390.000 | 39.39 | -2.51 | 36.88 | 54.00 | -17.12 | AVG | | | |
| 3 | 2400.000 | 53.98 | -2.49 | 51.49 | 54.00 | -2.51 | AVG | | | |

Anbotek

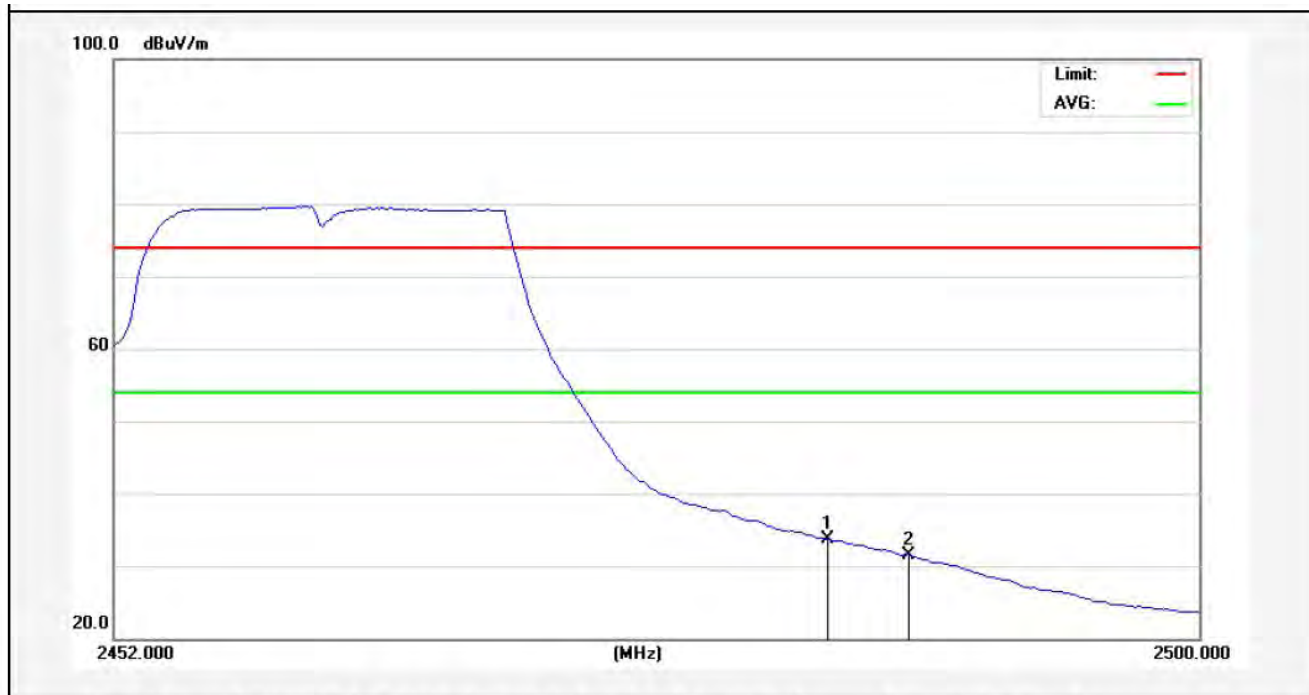
Test Mode: 802.11g
2462MHz
Horizontal-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 46.93 | -2.31 | 44.62 | 74.00 | -29.38 | peak | | | |
| 2 | 2486.560 | 47.48 | -2.30 | 45.18 | 74.00 | -28.82 | peak | | | |

Anbotek

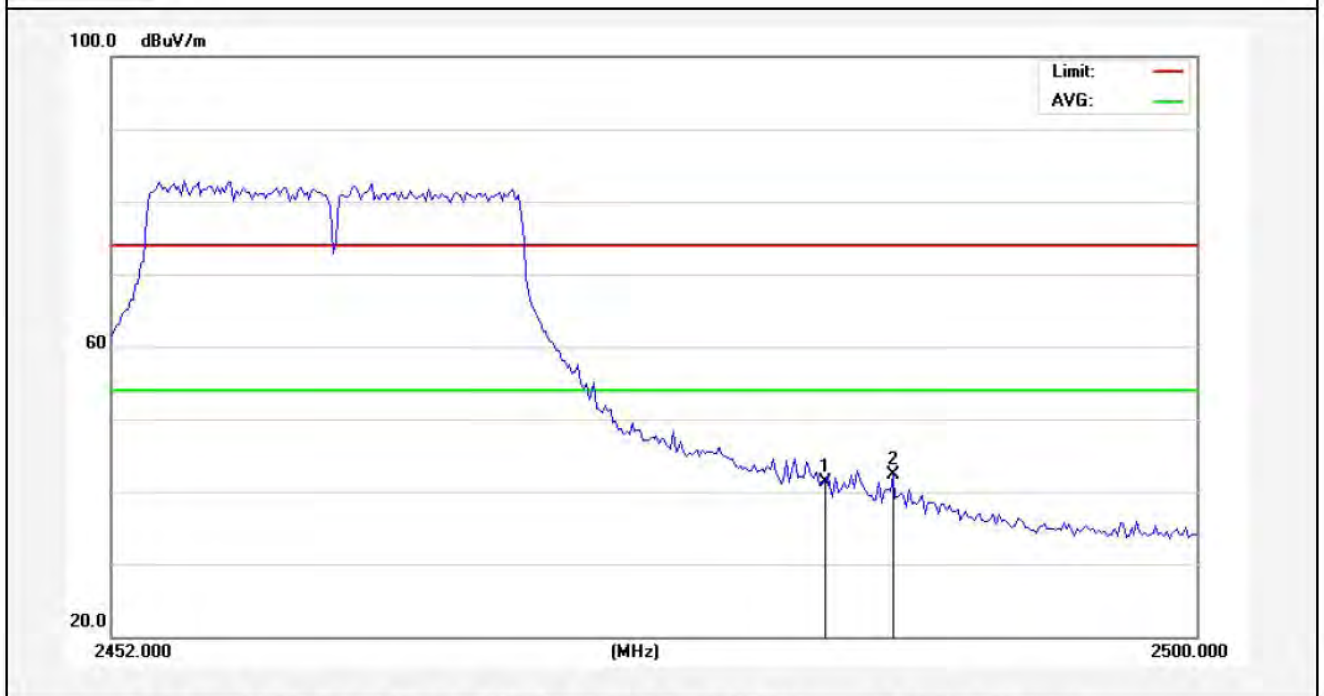
Horizontal-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 36.00 | -2.31 | 33.69 | 54.00 | -20.31 | AVG | | | |
| 2 | 2487.160 | 33.76 | -2.30 | 31.46 | 54.00 | -22.54 | AVG | | | |

Anbotek

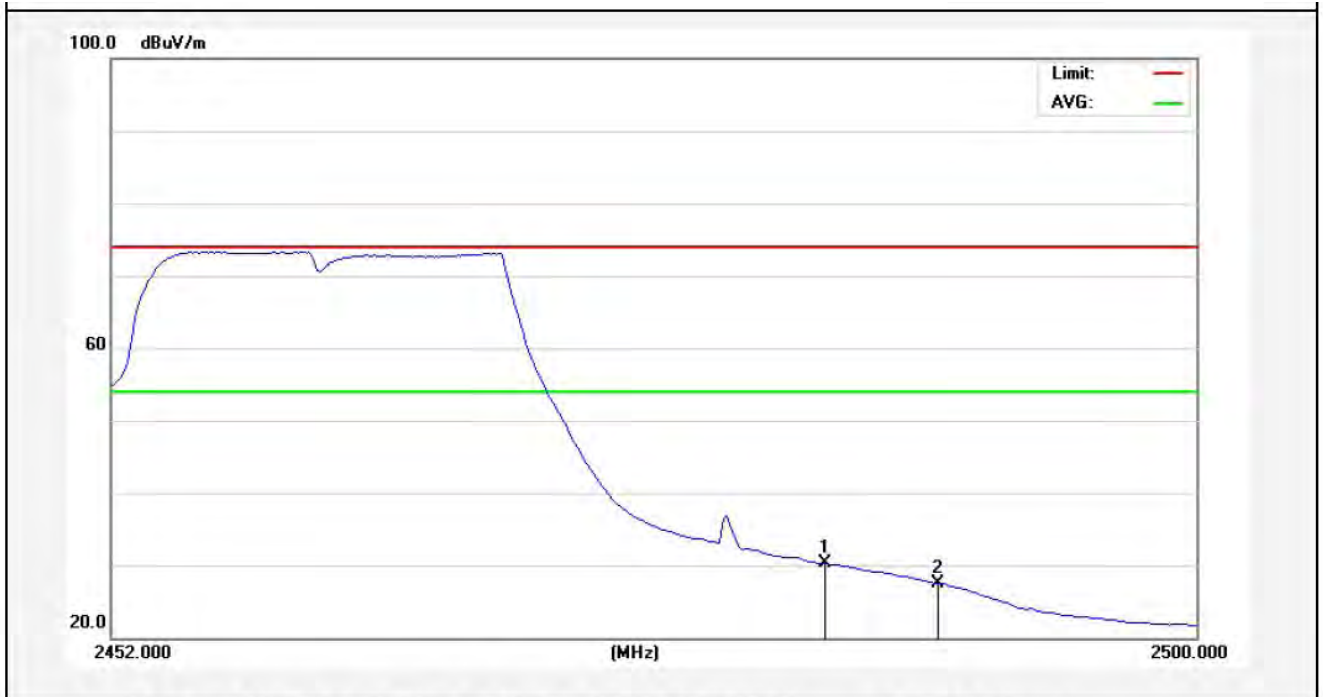
Test Mode: 802.11g
2462MHz
Vertical-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 43.57 | -2.31 | 41.26 | 74.00 | -32.74 | peak | | | |
| 2 | 2486.560 | 44.56 | -2.30 | 42.26 | 74.00 | -31.74 | peak | | | |

Anbotek

Vertical-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 32.54 | -2.31 | 30.23 | 54.00 | -23.77 | AVG | | | |
| 2 | 2488.600 | 29.76 | -2.30 | 27.46 | 54.00 | -26.54 | AVG | | | |

Anbotek

Test Mode: 802.11n (HT20)

2412MHz

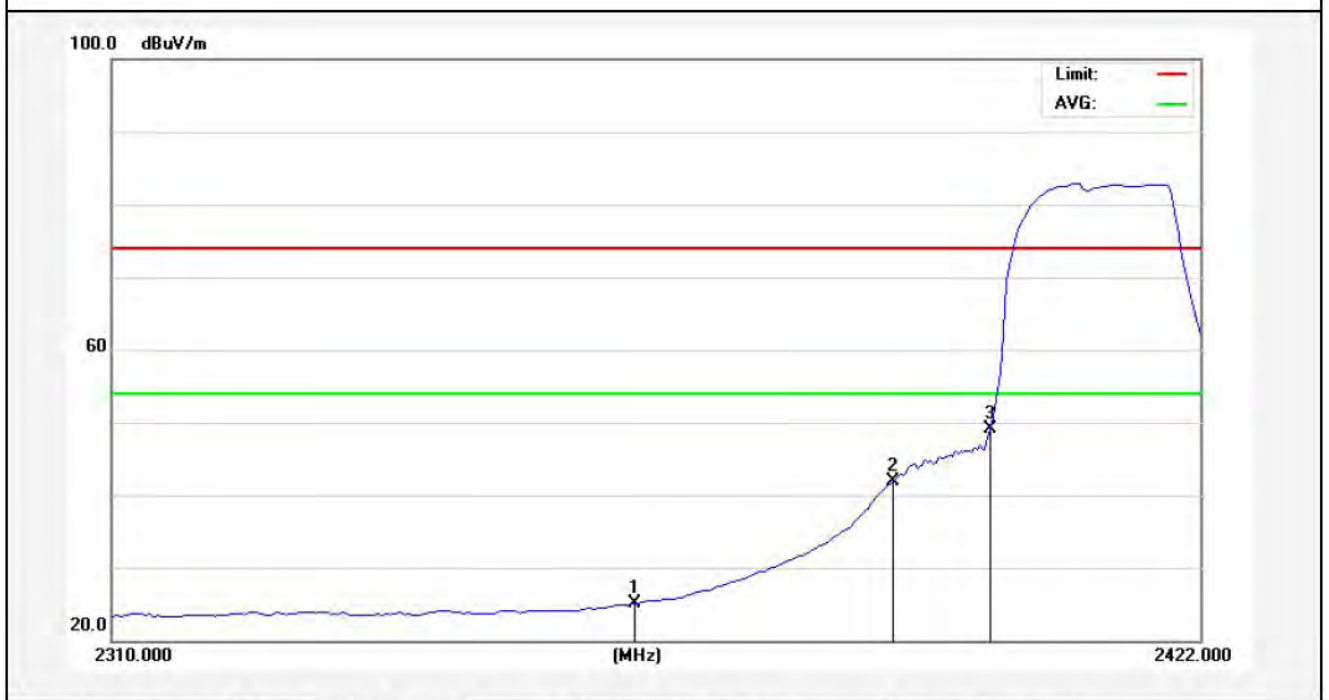
Horizontal-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2375.240 | 42.11 | -2.55 | 39.56 | 74.00 | -34.44 | peak | | | |
| 2 | 2390.000 | 53.18 | -2.51 | 50.67 | 74.00 | -23.33 | peak | | | |
| 3 | 2400.000 | 63.07 | -2.49 | 60.58 | 74.00 | -13.42 | peak | | | |

AMB

Horizontal-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2363.200 | 27.74 | -2.57 | 25.17 | 54.00 | -28.83 | AVG | | | |
| 2 | 2390.000 | 44.34 | -2.51 | 41.83 | 54.00 | -12.17 | AVG | | | |
| 3 | 2400.000 | 51.57 | -2.49 | 49.08 | 54.00 | -4.92 | AVG | | | |

Anbotek

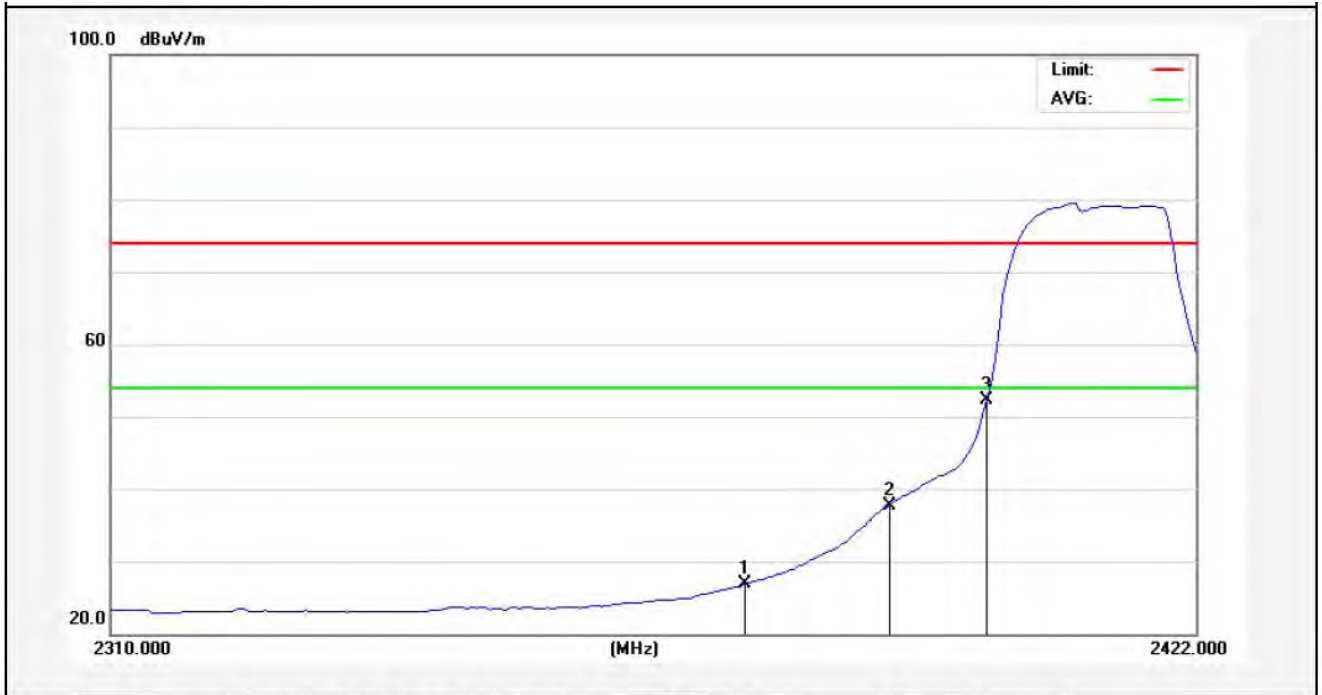
Test Mode: 802.11n (HT20)
2412MHz
Vertical-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2374.960 | 39.71 | -2.55 | 37.16 | 74.00 | -36.84 | peak | | | |
| 2 | 2390.000 | 48.17 | -2.51 | 45.66 | 74.00 | -28.34 | peak | | | |
| 3 | 2400.000 | 58.93 | -2.49 | 56.44 | 74.00 | -17.56 | peak | | | |

AMB

Vertical-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2374.960 | 29.38 | -2.55 | 26.83 | 54.00 | -27.17 | AVG | | | |
| 2 | 2390.000 | 40.25 | -2.51 | 37.74 | 54.00 | -16.26 | AVG | | | |
| 3 | 2400.000 | 54.70 | -2.49 | 52.21 | 54.00 | -1.79 | AVG | | | |

Anbotek

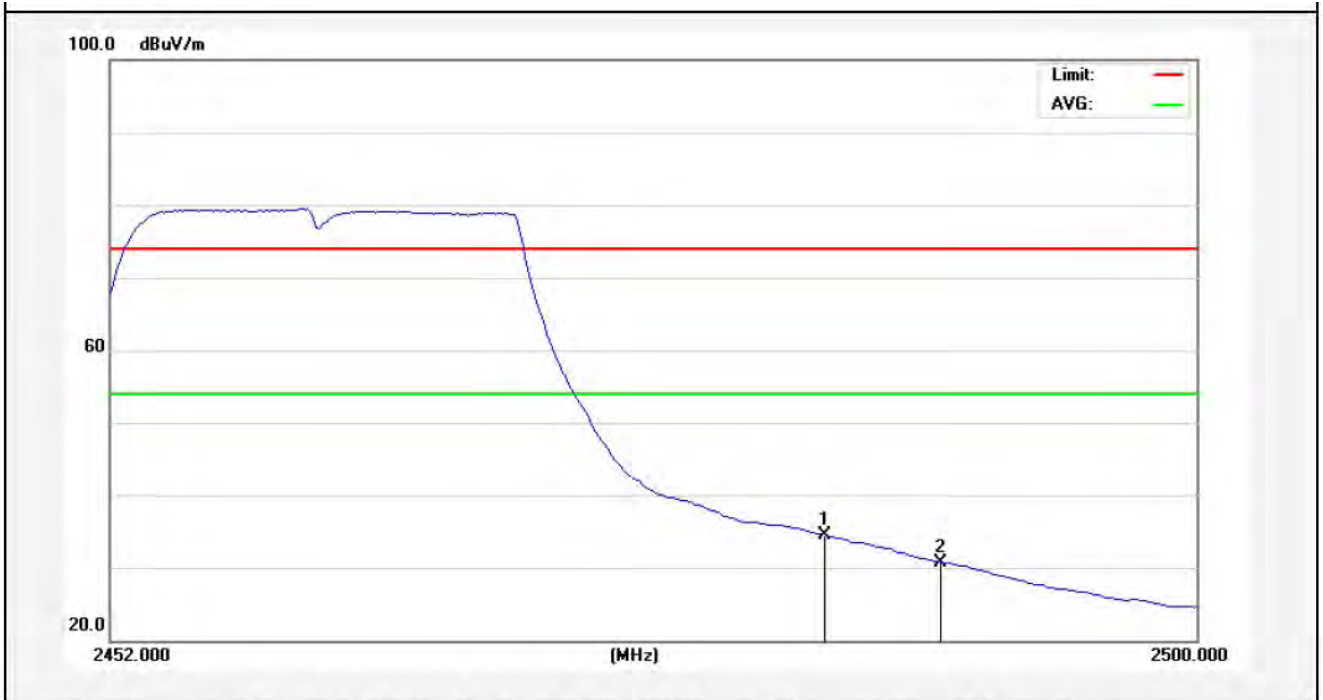
Test Mode: 802.11n (HT20)
2462MHz
Horizontal-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 49.46 | -2.31 | 47.15 | 74.00 | -26.85 | peak | | | |
| 2 | 2489.080 | 46.27 | -2.29 | 43.98 | 74.00 | -30.02 | peak | | | |

Anbotek

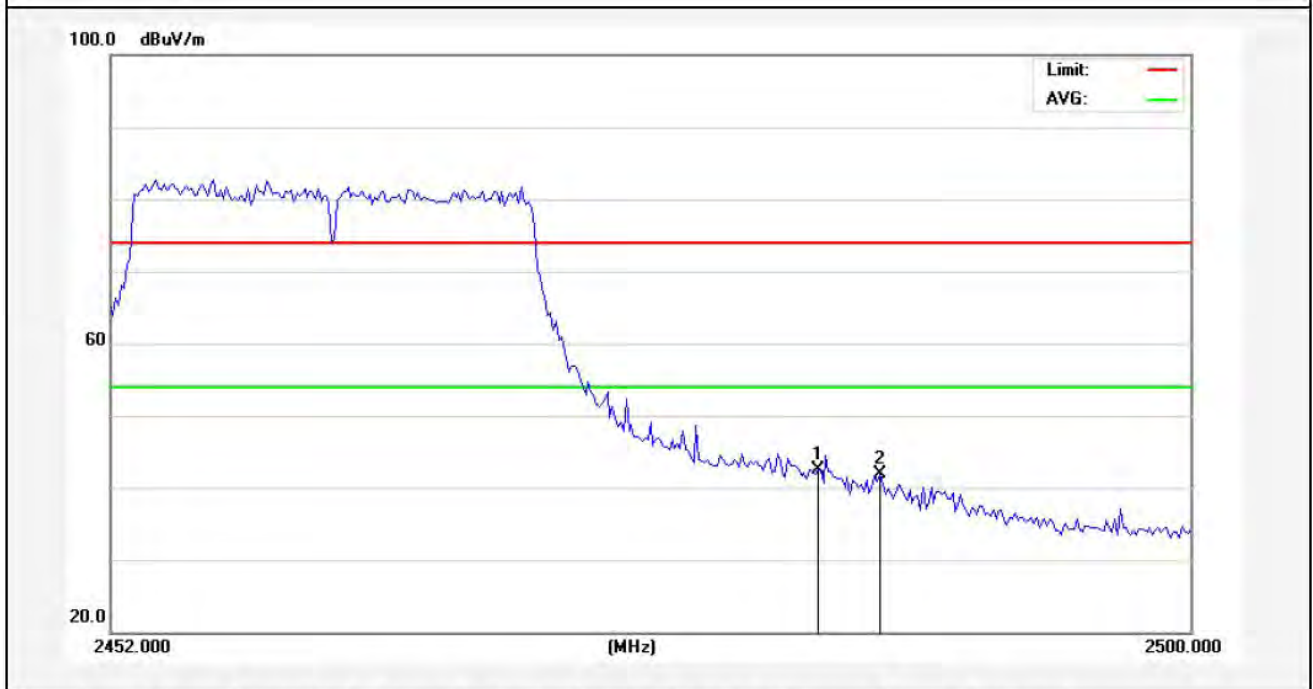
Horizontal-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 36.91 | -2.31 | 34.60 | 54.00 | -19.40 | AVG | | | |
| 2 | 2488.720 | 33.06 | -2.30 | 30.76 | 54.00 | -23.24 | AVG | | | |

Anbotek

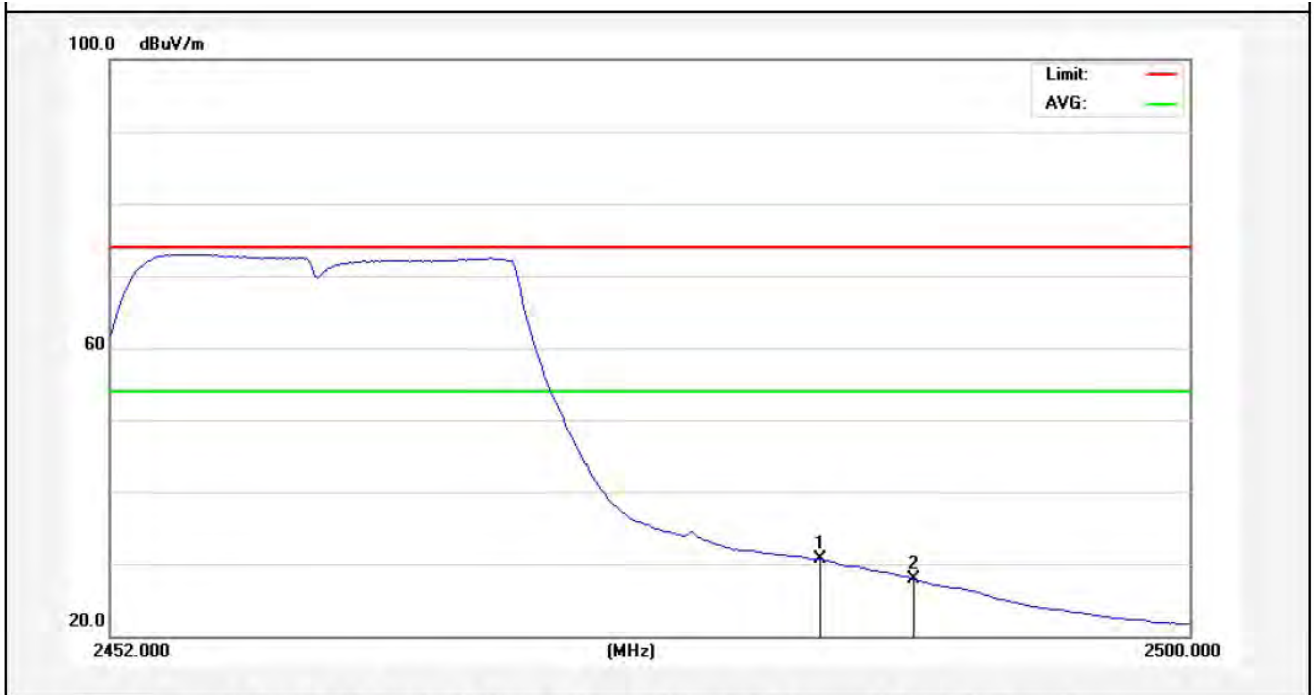
Test Mode: 802.11n (HT20)
2462MHz
Vertical-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 44.79 | -2.31 | 42.48 | 74.00 | -31.52 | peak | | | |
| 2 | 2486.200 | 44.18 | -2.30 | 41.88 | 74.00 | -32.12 | peak | | | |

Anbotek

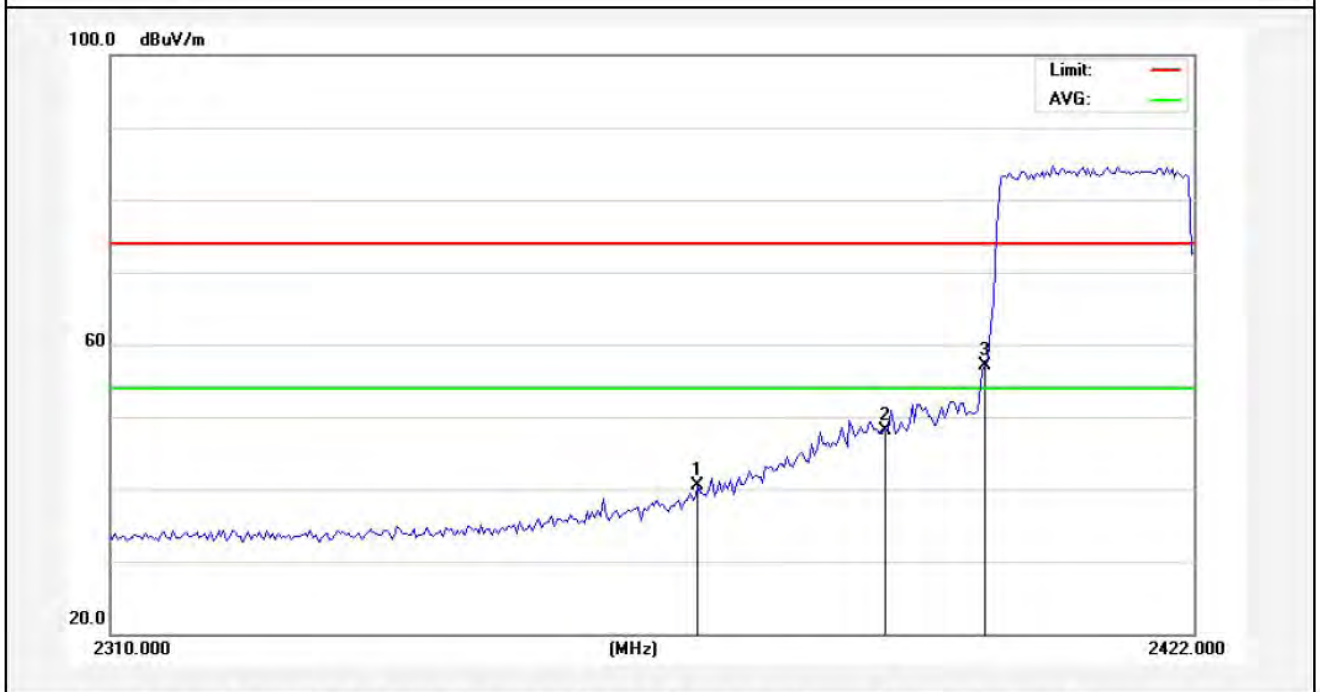
Vertical-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 33.06 | -2.31 | 30.75 | 54.00 | -23.25 | AVG | | | |
| 2 | 2487.760 | 30.15 | -2.30 | 27.85 | 54.00 | -26.15 | AVG | | | |

Anbotek

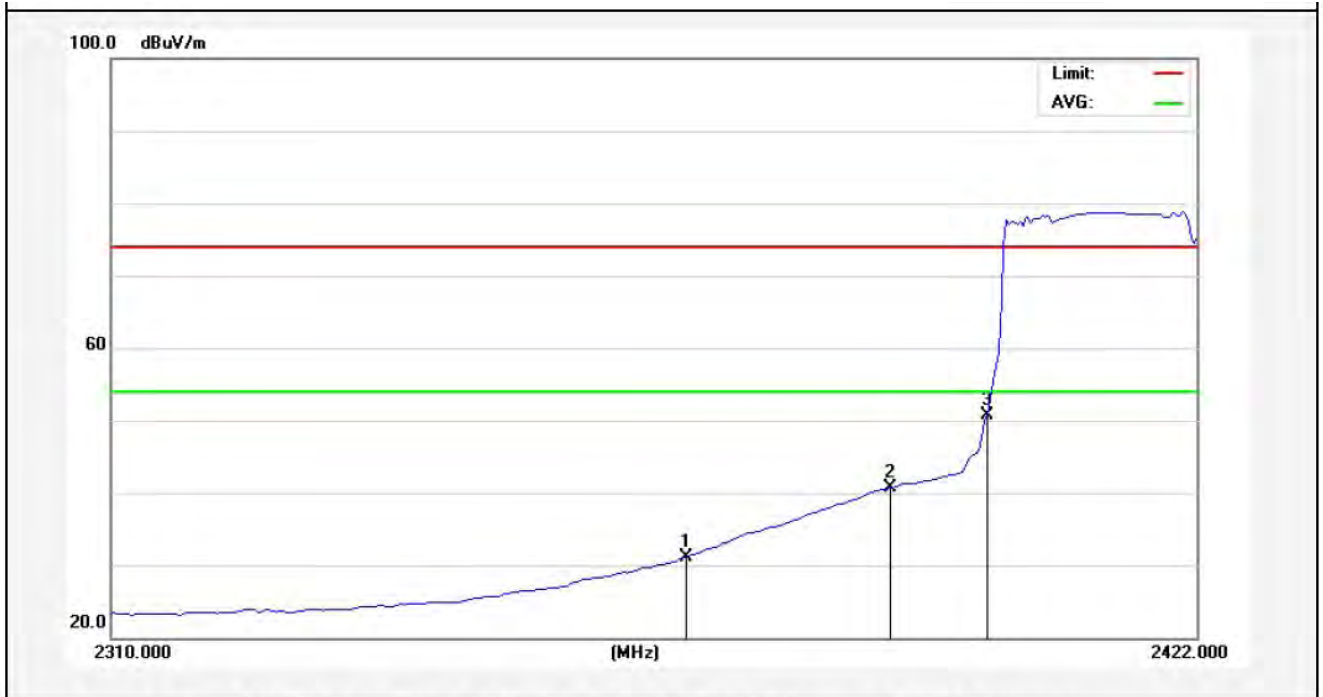
Test Mode: 802.11n (HT40)
2422MHz
Horizontal-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2370.200 | 43.11 | -2.56 | 40.55 | 74.00 | -33.45 | peak | | | |
| 2 | 2390.000 | 50.56 | -2.51 | 48.05 | 74.00 | -25.95 | peak | | | |
| 3 | 2400.000 | 59.69 | -2.49 | 57.20 | 74.00 | -16.80 | peak | | | |

AMB

Horizontal-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2368.520 | 33.64 | -2.56 | 31.08 | 54.00 | -22.92 | AVG | | | |
| 2 | 2390.000 | 43.15 | -2.51 | 40.64 | 54.00 | -13.36 | AVG | | | |
| 3 | 2400.000 | 53.27 | -2.49 | 50.78 | 54.00 | -3.22 | AVG | | | |

Anbotek

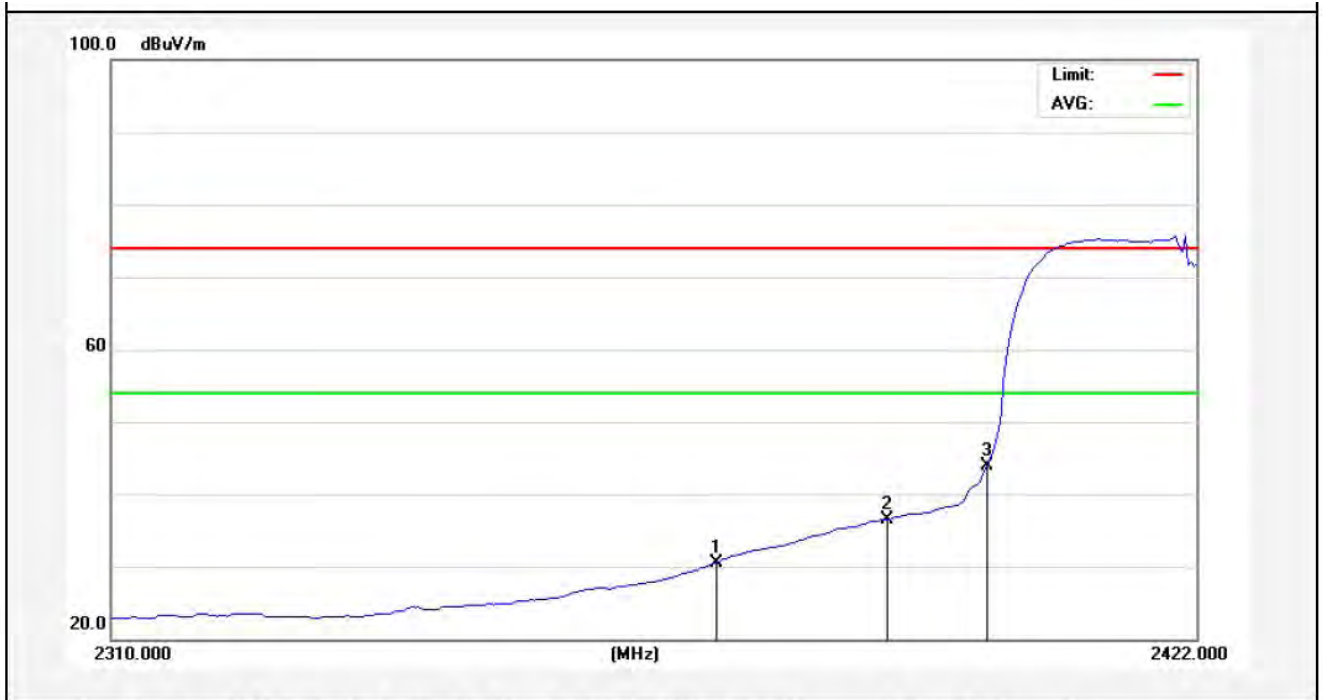
Test Mode: 802.11n (HT40)
2422MHz
Vertical-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2375.240 | 44.82 | -2.55 | 42.27 | 74.00 | -31.73 | peak | | | |
| 2 | 2390.000 | 46.86 | -2.51 | 44.35 | 74.00 | -29.65 | peak | | | |
| 3 | 2400.000 | 54.68 | -2.49 | 52.19 | 74.00 | -21.81 | peak | | | |

AMB

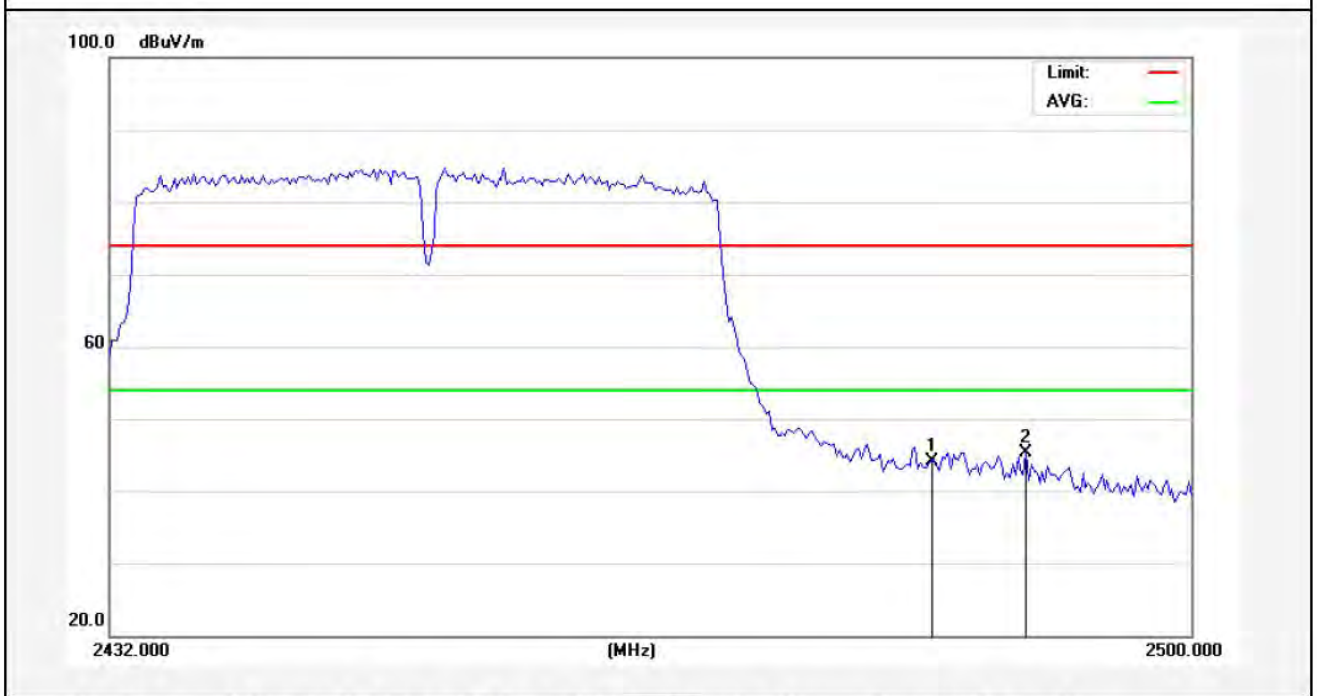
Vertical-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2371.600 | 33.03 | -2.56 | 30.47 | 54.00 | -23.53 | AVG | | | |
| 2 | 2390.000 | 39.04 | -2.51 | 36.53 | 54.00 | -17.47 | AVG | | | |
| 3 | 2400.000 | 46.30 | -2.49 | 43.81 | 54.00 | -10.19 | AVG | | | |

Anbotek

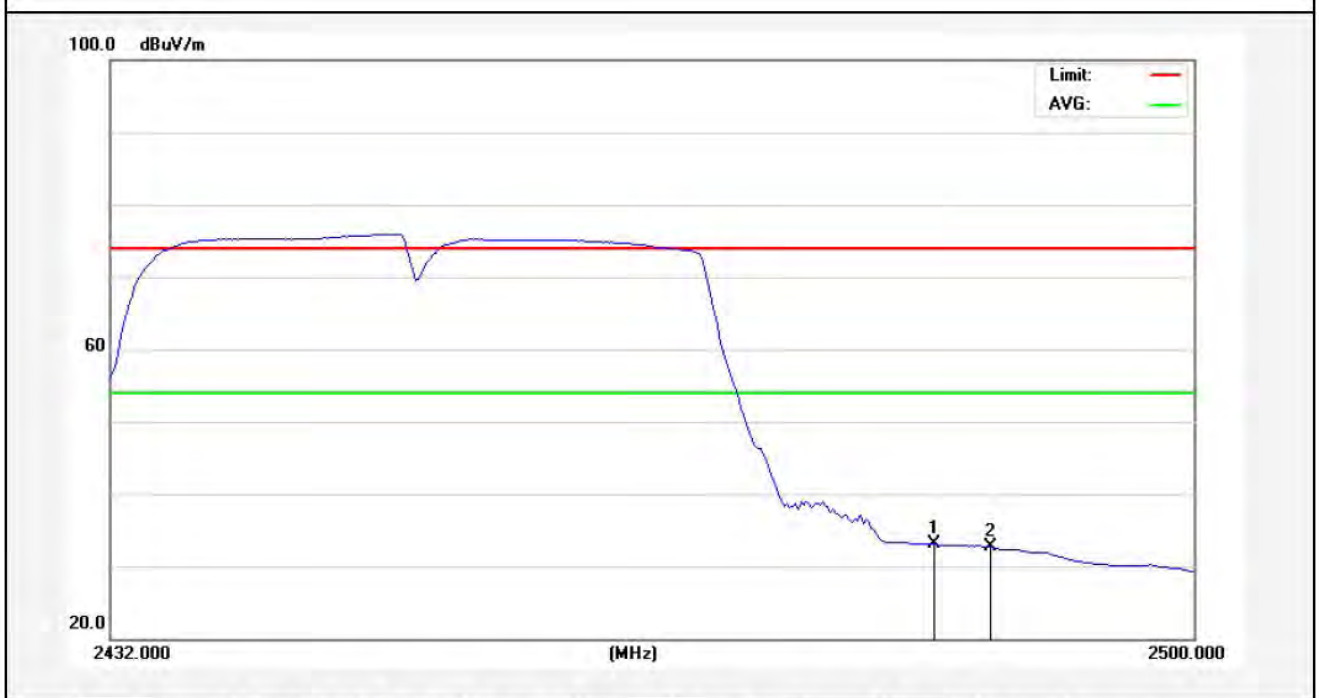
Test Mode: 802.11n (HT40)
2452MHz
Horizontal-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|--------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 46.39 | -2.31 | 44.08 | 74.00 | -29.92 | peak | | | |
| 2 | 2489.630 | 47.57 | -2.29 | 45.28 | 74.00 | -28.72 | peak | | | |

Anbotek

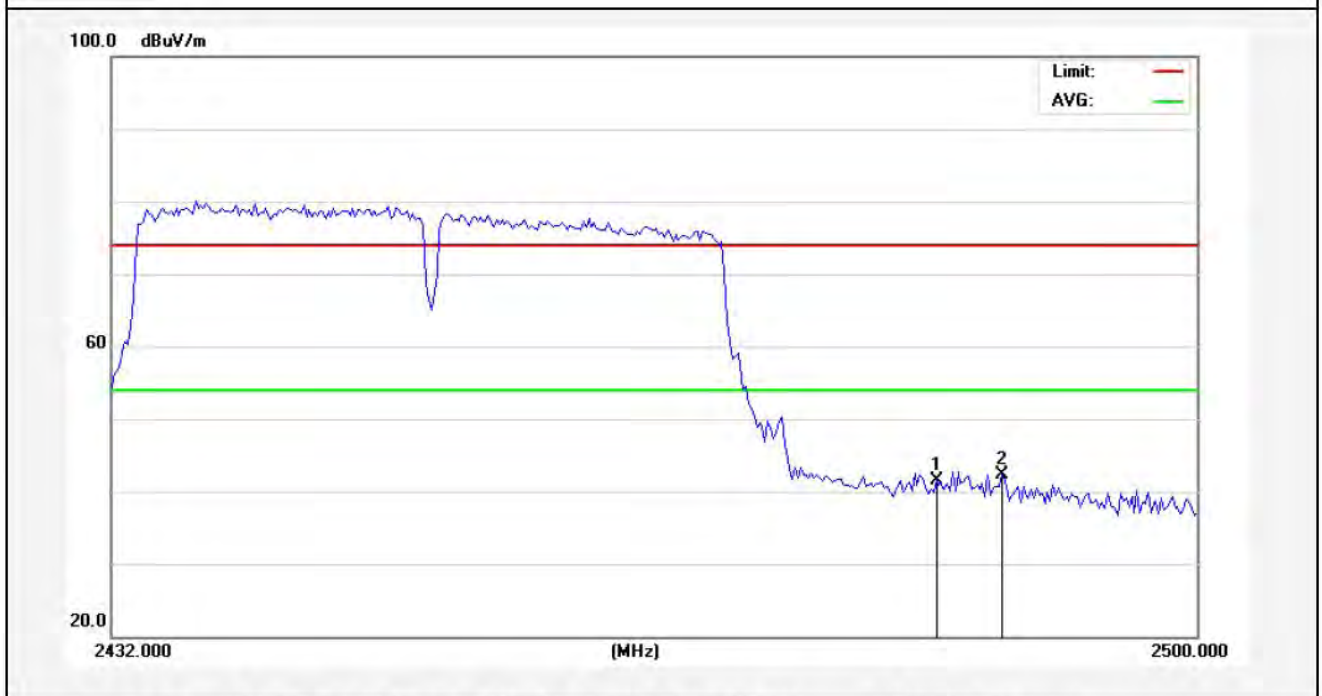
Horizontal-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 35.48 | -2.31 | 33.17 | 54.00 | -20.83 | AVG | | | |
| 2 | 2487.250 | 34.94 | -2.30 | 32.64 | 54.00 | -21.36 | AVG | | | |

Anbotek

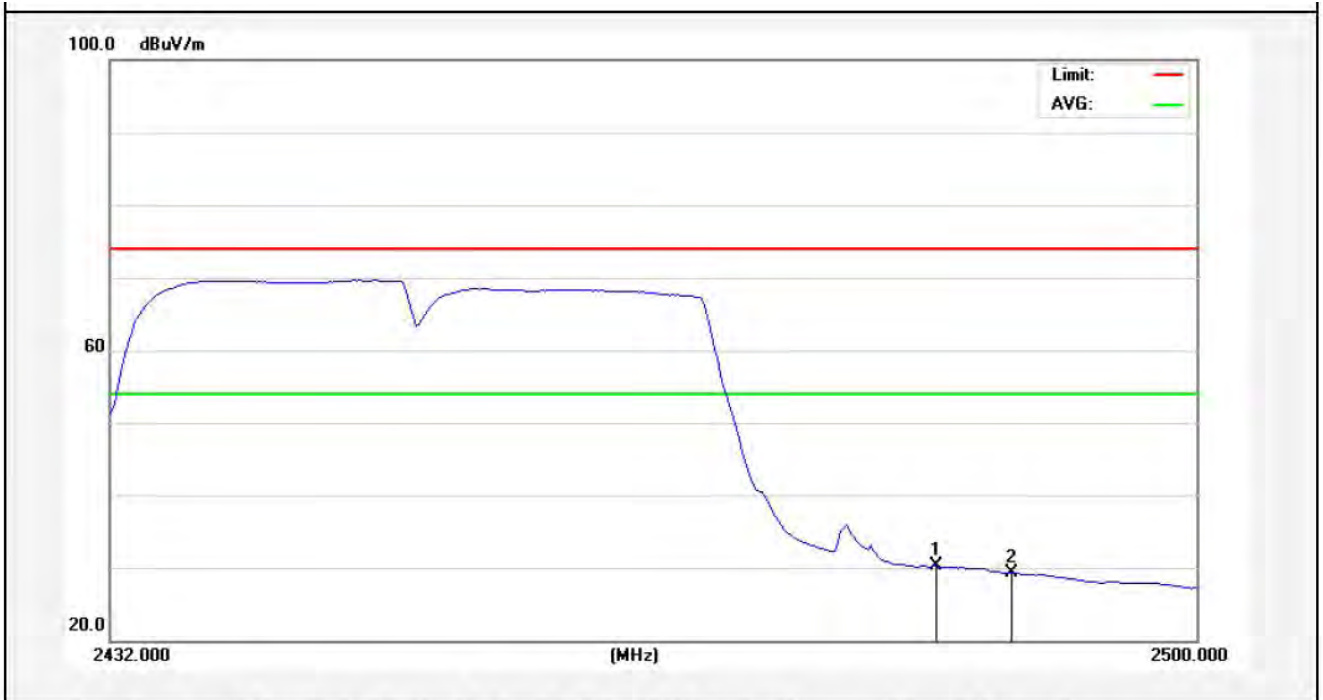
Test Mode: 802.11n (HT40)
2452MHz
Vertical-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 43.80 | -2.31 | 41.49 | 74.00 | -32.51 | peak | | | |
| 2 | 2487.760 | 44.57 | -2.30 | 42.27 | 74.00 | -31.73 | peak | | | |

Anbotek

Vertical-AV:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2483.500 | 32.57 | -2.31 | 30.26 | 54.00 | -23.74 | AVG | | | |
| 2 | 2488.440 | 31.58 | -2.30 | 29.28 | 54.00 | -24.72 | AVG | | | |

Anbotek

ANT B

Test Mode: 802.11b

2412MHz

Horizontal-PEAK:



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|------------------|---------------|-----------------|---------------|-----------------|----------|-------------|--------------|--------|
| 1 | 2386.450 | 46.94 | -2.52 | 44.42 | 74.00 | -29.58 | peak | | | |
| 2 | 2390.000 | 42.73 | -2.51 | 40.22 | 74.00 | -33.78 | peak | | | |
| 3 | 2400.000 | 61.67 | -2.49 | 59.18 | 74.00 | -14.82 | peak | | | |

ANT B