

FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

Tablet PC

Model No.: TM890W515L, TM890W525L, TM890W530L, TM890W535L,
TM890W555L, TM890W545L, TM890W550L, DPA8901, DPW8901,
DPA8908, DPW8908, D8901, M8901, D8906, M8906, NB89, NB8910,
NB8909, NB8905

FCC ID: 2AAP6M8902

Trademark: NOBIS, DOPO, TMAX, DAGE, APEX, NUVISION

REPORT NO.: ES150922017E

ISSUE DATE: October 10, 2015

Prepared for

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Prepared by

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1 TEST RESULT CERTIFICATION

| | |
|----------------------|--|
| Applicant: | SHENZHEN ZOWEE TECHNOLOGY CO., LTD Science&Technology Industrial Park of Privately Owned Enterprises, Pingshan, Xili, Nanshan District, Shenzhen, China518055 |
| Manufacturer: | SHENZHEN ZOWEE TECHNOLOGY CO., LTD Science&Technology Industrial Park of Privately Owned Enterprises, Pingshan, Xili, Nanshan District, Shenzhen, China518055 |
| Product Description: | Tablet PC |
| Model Number: | TM890W515L, TM890W525L, TM890W530L, TM890W535L, TM890W555L, TM890W545L, TM890W550L, DPA8901, DPW8901, DPA8908, DPW8908, D8901, M8901, D8906, M8906, NB89, NB8910, NB8909, NB8905 (Note: These models are identical in circuitry and electrical, mechanical and physical construction; the only differences are the silk-screen, color and model no. for trading purpose. We prepare TM890W515L for test.) |
| File Number: | ES150922017E |
| Date of Test: | September 22, 2015 to October 10, 2015 |


Measurement Procedure Used:


| APPLICABLE STANDARDS | |
|---|-------------|
| STANDARD | TEST RESULT |
| FCC 47 CFR Part 2, Subpart J:2014 FCC 47 CFR Part 15, Subpart C:2014 | PASS |


The above equipment was tested by SHENZHEN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.247

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

Date of Test : September 22, 2015 to October 10, 2015

Prepared by : 
Jack Li/Editor

Reviewer : 
Joe Xia/Supervisor

Approve & Authorized Signer : 
Lisa Wang/Manager

2 EUT TECHNICAL DESCRIPTION

| Characteristics | Description |
|----------------------------------|--|
| Device Type: | Portable device |
| IEEE 802.11 WLAN Mode Supported: | <input checked="" type="checkbox"/> 802.11b(20MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11g(20MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11n(20MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11n(40MHz channel bandwidth) |
| Data Rate: | 802.11 b:1,2,5.5,11Mbps; 802.11 g:6,9,12,18,24,36,48,54Mbps; 802.11n(HT20):MCS0-MCS7; 802.11n(HT40):MCS0-MCS7; |
| Modulation: | DSSS with DBPSK/DQPSK/CCK for 802.11b; OFDM with BPSK/QPSK/16QAM/64QAM for 802.11g/n; |
| Operating Frequency Range: | 2412-2462MHz for 802.11b/g; 2412-2462MHz for 802.11n(HT20); 2422-2452MHz for 802.11n(HT40); |
| Number of Channels: | 11 channels for 802.11b/g; 11 channels for 802.11n(HT20); 7 channels for 802.11n(HT40); |
| Transmit Power Max: | 17.35dBm for 802.11b; 21.10dBm for 802.11g; 20.24dBm for 802.11n(HT20); 19.62dBm for 802.11n(HT40); |
| Antenna Type: | PIFA Antenna |
| Antenna Gain: | 2dBi |
| Power supply: | <input checked="" type="checkbox"/> DC supply: DC 3.7V internal rechargeable lithium battery or DC 5V from AC Adapter |
| | <input checked="" type="checkbox"/> Adapter supply: Model: LPL-C010050200Z Input: AC 100-240V 50/60Hz 300mA Max Output: DC 5V 2000mA |
| Temperature Range: | 0°C ~ +40°C |

Note: for more details, please refer to the User's manual of the EUT.

Modified Information

| Version. | Summary | Date of Rev. | Report No. |
|----------|-----------------|--------------|--------------|
| Ver.1.0 | Original Report | 2015-10-10 | ES150922017E |
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3 SUMMARY OF TEST RESULT

| FCC Part Clause | Test Parameter | Verdict | Remark |
|---|---|---------|--------|
| 15.247(a)(2) | DTS (6dB) Bandwidth | PASS | |
| 15.247(b)(3) | Maximum Peak Conducted Output Power | PASS | |
| 15.247(e) | Maximum Power Spectral Density Level | PASS | |
| 15.247(d) | Unwanted Emission Into Non-Restricted Frequency Bands | PASS | |
| 15.247(d) 15.209 | Unwanted Emission Into Restricted Frequency Bands | PASS | |
| 15.247(d) 15.209 | Radiated Spurious Emission | PASS | |
| 15.207 | Conducted Emission Test | PASS | |
| 15.247(b) | Antenna Application | PASS | |
| NOTE1: N/A (Not Applicable) NOTE2: According to FCC OET KDB 558074, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits. | | | |

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart C

FCC KDB 558074 D01 DTS Meas Guidance v03r02

FCC KDB 662911 D01 Multiple Transmitter Output v01

FCC KDB 662911 D02 MIMO With Cross Polarized Antenna V01

4.2 MEASUREMENT EQUIPMENT USED

4.2.1 Conducted Emission Test Equipment

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. |
|--------------------|-----------------|--------------|---------------|------------|
| Test Receiver | Rohde & Schwarz | ESCS30 | 828985/018 | 05/16/2015 |
| L.I.S.N. | Schwarzbeck | NNLK8129 | 8129203 | 05/16/2015 |
| 50Ω Coaxial Switch | Anritsu | MP59B | M20531 | N/A |
| Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | 100006 | 05/16/2015 |
| Voltage Probe | Rohde & Schwarz | TK9416 | N/A | 05/16/2015 |
| I.S.N | Rohde & Schwarz | ENY22 | 1109.9508.02 | 05/16/2015 |

4.2.2 Radiated Emission Test Equipment

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. |
|-------------------|-----------------|--------------|---------------|------------|
| EMI Test Receiver | Rohde & Schwarz | ESU | 1302.6005.26 | 05/16/2015 |
| Pre-Amplifier | HP | 8447D | 2944A07999 | 05/16/2015 |
| Bilog Antenna | Schwarzbeck | VULB9163 | 142 | 05/16/2015 |
| Loop Antenna | ARA | PLA-1030/B | 1029 | 05/16/2015 |
| Horn Antenna | Schwarzbeck | BBHA 9170 | BBHA9170399 | 05/16/2015 |
| Horn Antenna | Schwarzbeck | BBHA 9120 | D143 | 05/16/2015 |
| Cable | Schwarzbeck | AK9513 | ACRX1 | 05/16/2015 |
| Cable | Rosenberger | N/A | FP2RX2 | 05/16/2015 |
| Cable | Schwarzbeck | AK9513 | CRPX1 | 05/16/2015 |
| Cable | Schwarzbeck | AK9513 | CRRX2 | 05/16/2015 |

4.2.3 Radio Frequency Test Equipment

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. |
|-------------------|-----------------|--------------|---------------|------------|
| Spectrum Analyzer | Agilent | E4407B | 88156318 | 05/16/2015 |
| EMI Test Receiver | Rohde & Schwarz | FSV30 | 103040 | 05/16/2015 |
| Signal Analyzer | Agilent | N9010A | My53470879 | 05/16/2015 |
| Power meter | Anritsu | ML2495A | 0824006 | 05/16/2015 |
| Power sensor | Anritsu | MA2411B | 0738172 | 05/16/2015 |

Remark: Each piece of equipment is scheduled for calibration once a year.

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

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

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (802.11b: 1 Mbps; 802.11g: 6 Mbps; 802.11n (HT20): MCS0; 802.11n (HT40): MCS0) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

All the modulation modes and channels were tested, the data of the worst mode are described in the following pages

The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The Y-plane results were found as the worst case and were shown in this report.

Frequency and Channel list for 802.11b/g/n (HT20):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 1 | 2412 | 5 | 2432 | 9 | 2452 |
| 2 | 2417 | 6 | 2437 | 10 | 2457 |
| 3 | 2422 | 7 | 2442 | 11 | 2462 |
| 4 | 2427 | 8 | 2447 | | |

Frequency and Channel list for 802.11n (HT40):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 3 | 2422 | 5 | 2432 | 8 | 2447 |
| 4 | 2427 | 6 | 2437 | 9 | 2452 |
| | | 7 | 2442 | | |

Test Frequency and Channel for 802.11b/g/n (HT20):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 1 | 2412 | 6 | 2437 | 11 | 2462 |

Test Frequency and channel for 802.11n (HT40):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|------------------|-----------------|------------------|-----------------|-------------------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 3 | 2422 | 6 | 2437 | 9 | 2452 |

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

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

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

- EMC Lab.
- : Accredited by CNAS, 2013.10.29
The certificate is valid until 2016.10.28
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01: 2006(identical to ISO/IEC17025: 2005)
The Certificate Registration Number is L2291
 - : Accredited by TUV Rheinland Shenzhen, 2010.5.25
The Laboratory has been assessed according to the requirements ISO/IEC 17025.
 - : Accredited by FCC, October 28, 2010
The Certificate Registration Number is 406365.
 - : Accredited by FCC, February 28, 2013
The Certificate Registration Number is 709623.
 - : Accredited by Industry Canada, May 24, 2008
The Certificate Registration Number is 4480A-2

6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

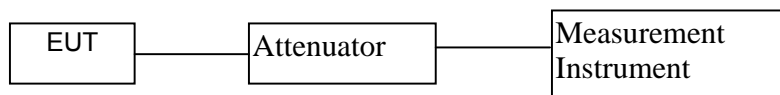
| Parameter | Uncertainty |
|--------------------------------|---------------------------|
| Radio Frequency | $\pm 1 \times 10^{-5}$ |
| Maximum Peak Output Power Test | $\pm 1.0\text{dB}$ |
| Conducted Emissions Test | $\pm 2.0\text{dB}$ |
| Radiated Emission Test | $\pm 2.0\text{dB}$ |
| Power Density | $\pm 2.0\text{dB}$ |
| Occupied Bandwidth Test | $\pm 1.0\text{dB}$ |
| Band Edge Test | $\pm 3\text{dB}$ |
| All emission, radiated | $\pm 3\text{dB}$ |
| Antenna Port Emission | $\pm 3\text{dB}$ |
| Temperature | $\pm 0.5^{\circ}\text{C}$ |
| Humidity | $\pm 3\%$ |

Measurement Uncertainty for a level of Confidence of 95%

7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP 1

The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.

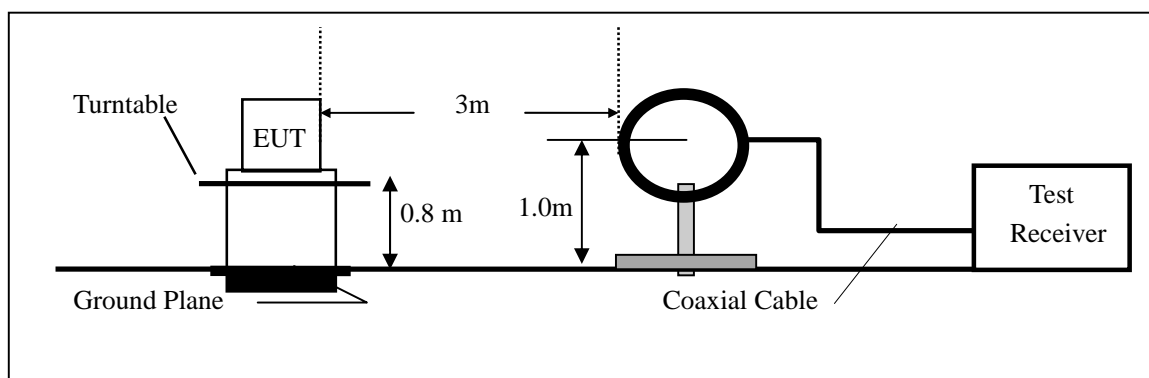


7.2 RADIO FREQUENCY TEST SETUP 2

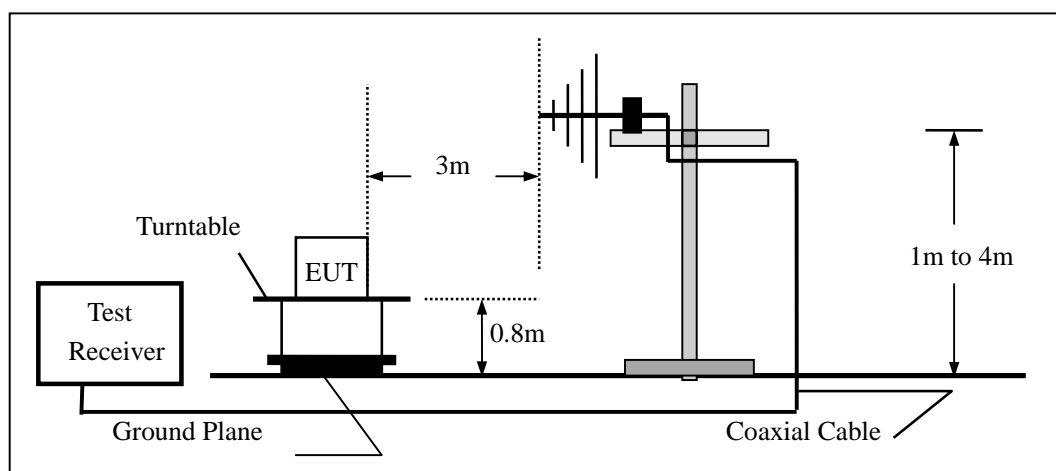
The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

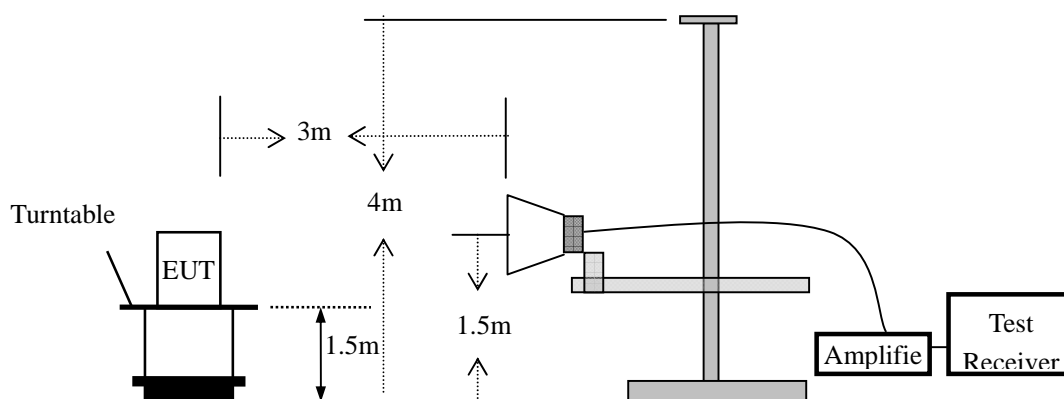
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

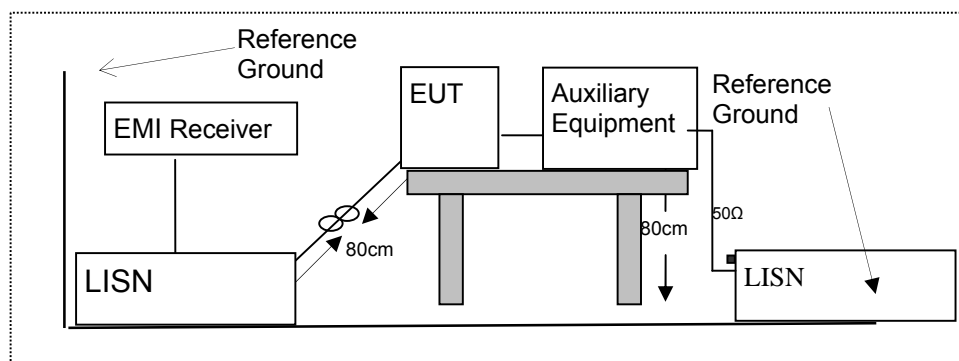


7.3 CONDUCTED EMISSION TEST SETUP

The mains cable of the EUT (Tablet PC) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



7.4 SUPPORT EQUIPMENT

| Item | Equipment | Mfr/Brand | Model/Type No. | Series No. | Note |
|------|-----------|---|----------------|------------|------|
| 1. | Tablet PC | NOBIS, DOPO, TMAX, DAGE, APEX, NUVISION | TM890W515L | 2AAP6M8902 | EUT |

Notes:

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.

8 TEST REQUIREMENTS

8.1 DTS (6DB) BANDWIDTH

8.1.1 Applicable Standard

According to FCC Part 15.247(a)(2) and KDB 558074 DTS 01 Meas. Guidance v03r02

8.1.2 Conformance Limit

The minimum -6 dB bandwidth shall be at least 500 kHz.

8.1.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.1.4 Test Procedure

The EUT was operating in IEEE 802.11b/g/n mode and controlled its channel. Printed out the test result from the spectrum by hard copy function.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW = 100 kHz.

Set the video bandwidth (VBW) =300 kHz.

Set Span=2 times OBW

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

Allow the trace to stabilize.

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Measure and record the results in the test report.

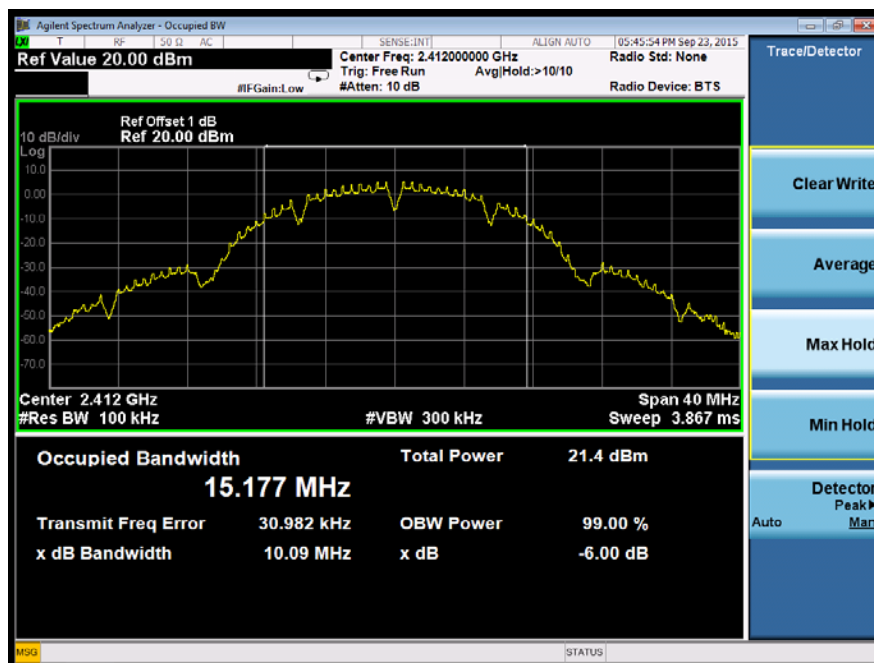
8.1.5 Test Results

Temperature: 24°C
Humidity: 53 %

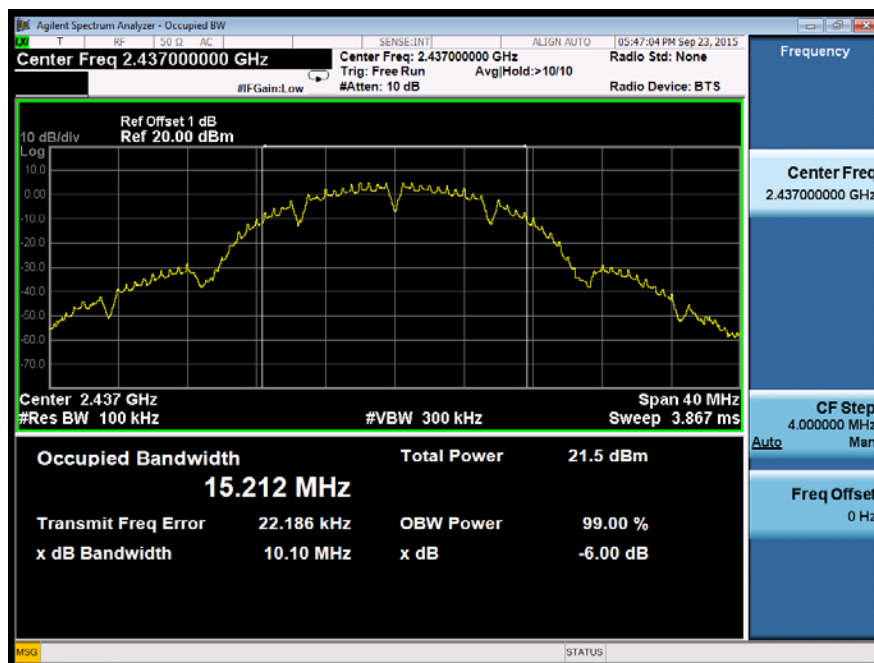
Test Date: September 24, 2015
Test By: KING KONG

| Operation Mode | Channel Number | Channel Frequency (MHz) | Measurement Bandwidth (MHz) | Limit (kHz) | Verdict |
|----------------|----------------|-------------------------|-----------------------------|-------------|---------|
| 802.11b | 1 | 2412 | 10.09 | >500 | PASS |
| | 6 | 2437 | 10.10 | >500 | PASS |
| | 11 | 2462 | 10.12 | >500 | PASS |
| 802.11g | 1 | 2412 | 16.35 | >500 | PASS |
| | 6 | 2437 | 16.37 | >500 | PASS |
| | 11 | 2462 | 16.36 | >500 | PASS |
| 802.11n (HT20) | 1 | 2412 | 17.34 | >500 | PASS |
| | 6 | 2437 | 17.36 | >500 | PASS |
| | 11 | 2462 | 17.37 | >500 | PASS |
| 802.11n (HT40) | 3 | 2422 | 35.29 | >500 | PASS |
| | 6 | 2437 | 35.30 | >500 | PASS |
| | 9 | 2452 | 35.30 | >500 | PASS |

| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11b |
| | Channel 1: 2412MHz |



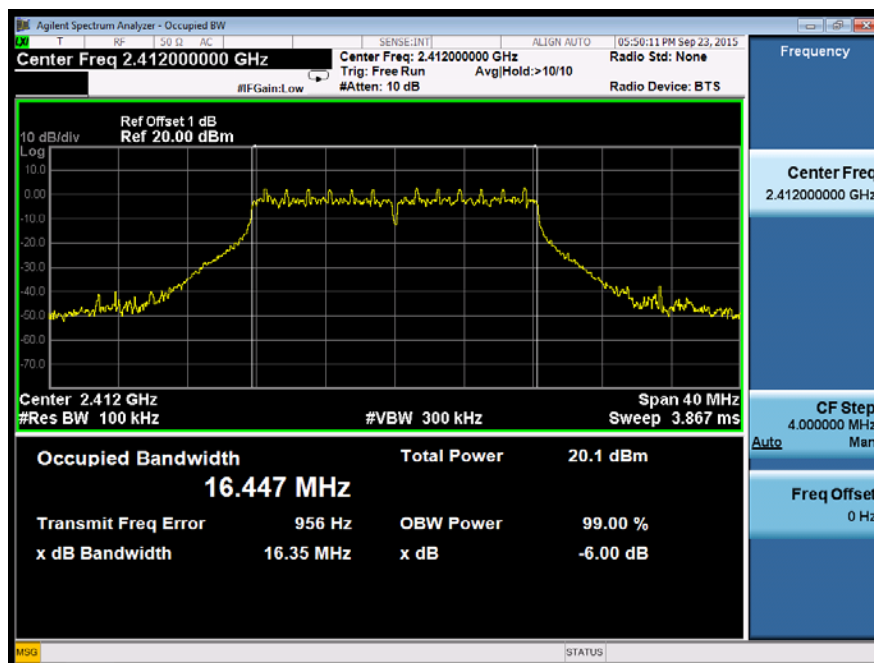
| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11b |
| | Channel 6: 2437MHz |



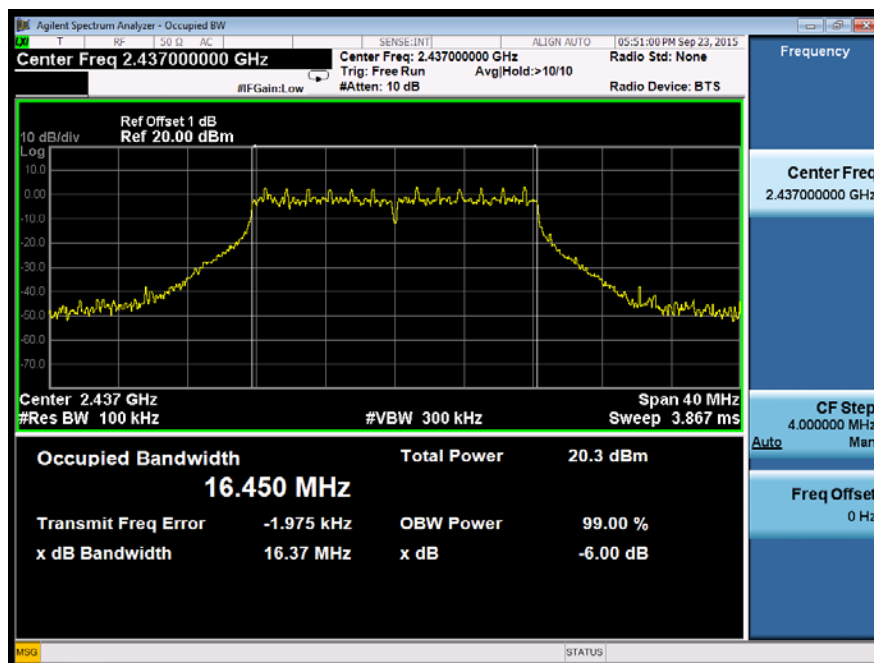
| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11b |
| | Channel 11: 2462MHz |



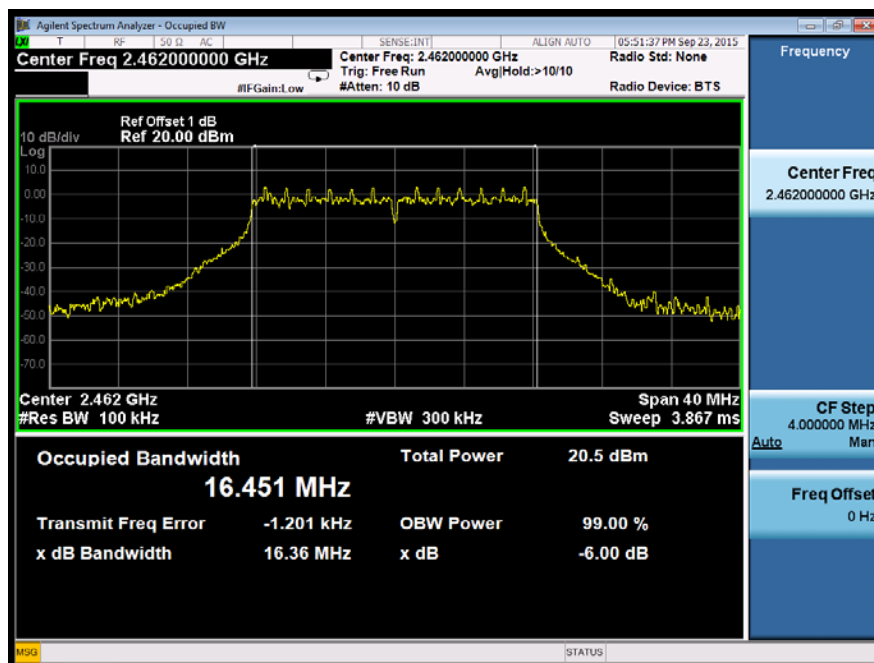
| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11g |
| | Channel 1: 2412MHz |



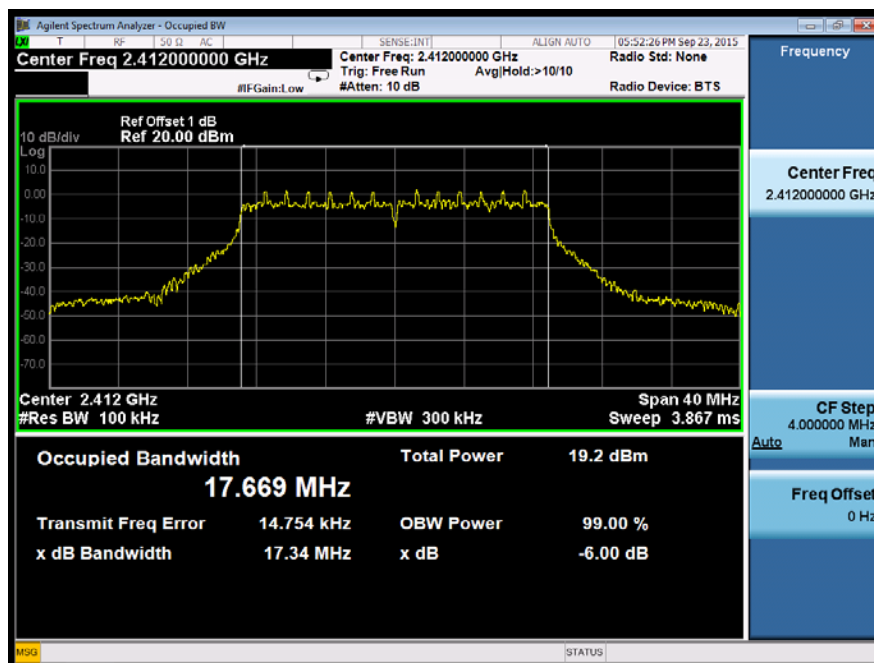
| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11g |
| | Channel 6: 2437MHz |



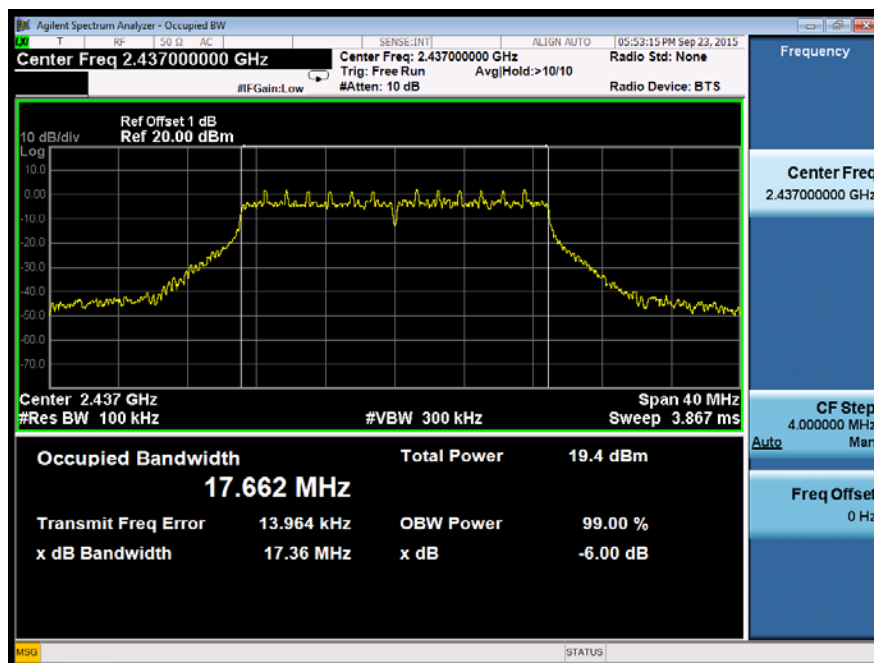
| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11g |
| | Channel 11: 2462MHz |



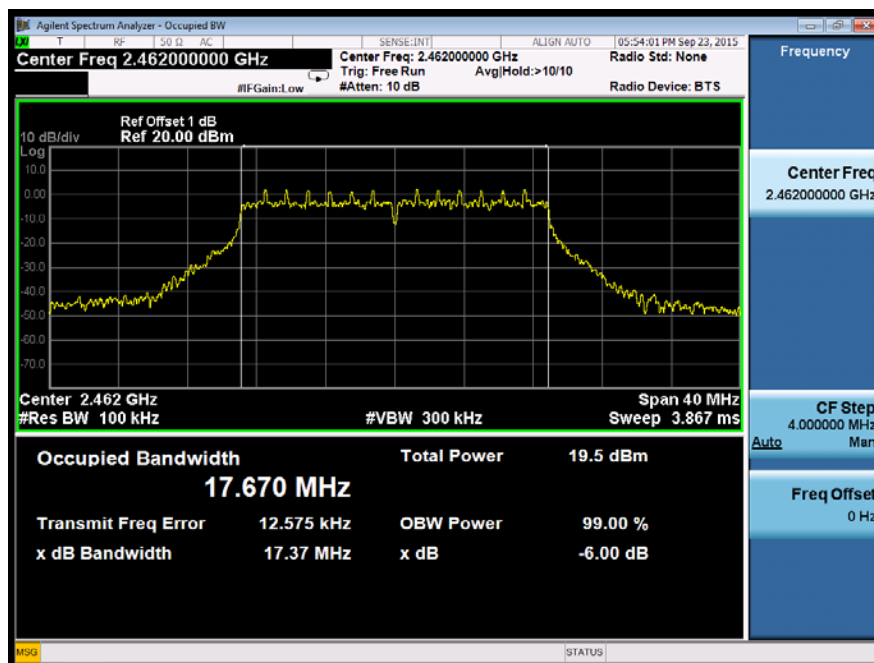
| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11n (HT20) |
| | Channel 1: 2412MHz |



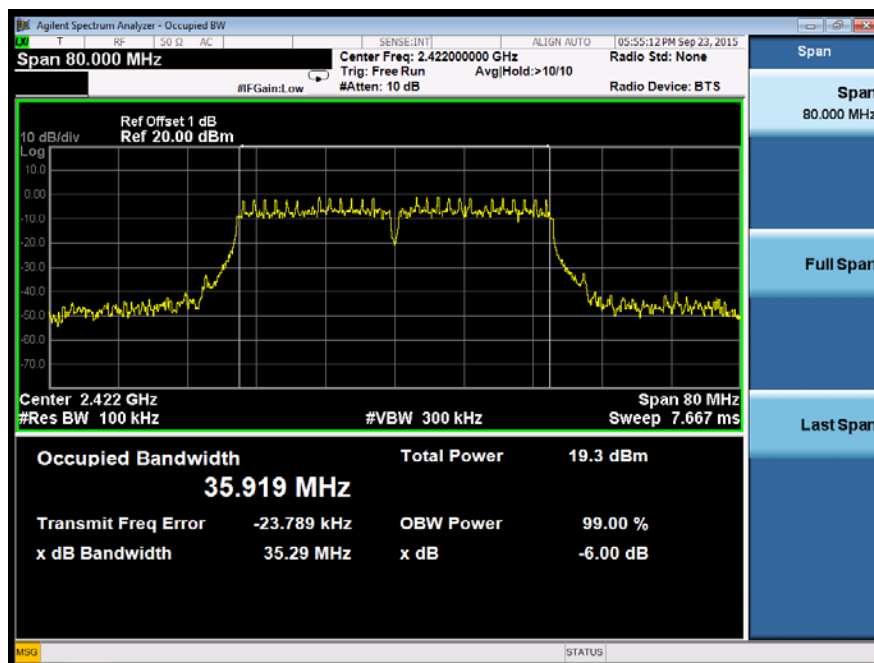
| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11n (HT20) |
| | Channel 6: 2437MHz |



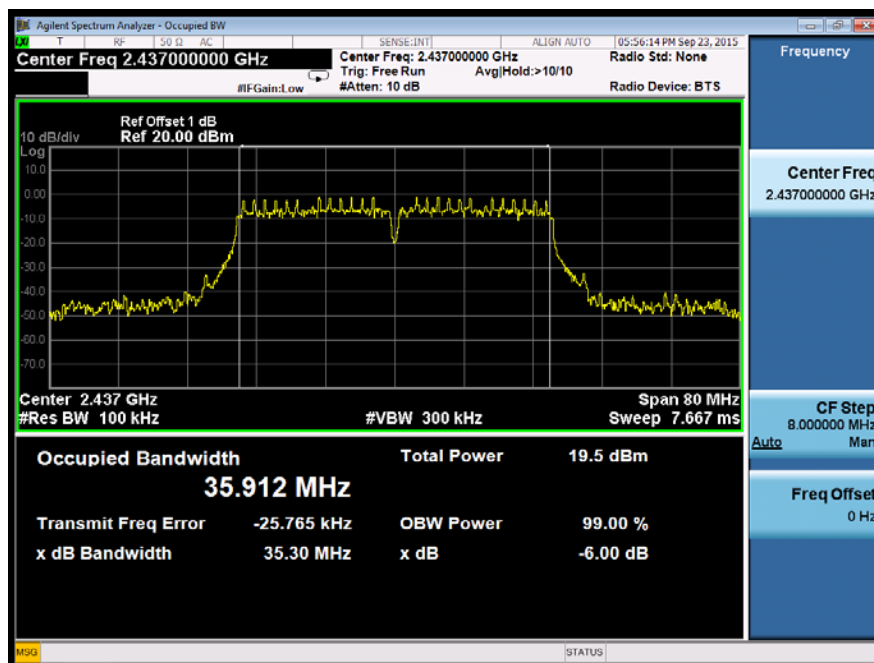
| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11n (HT20) |
| | Channel 11: 2462MHz |



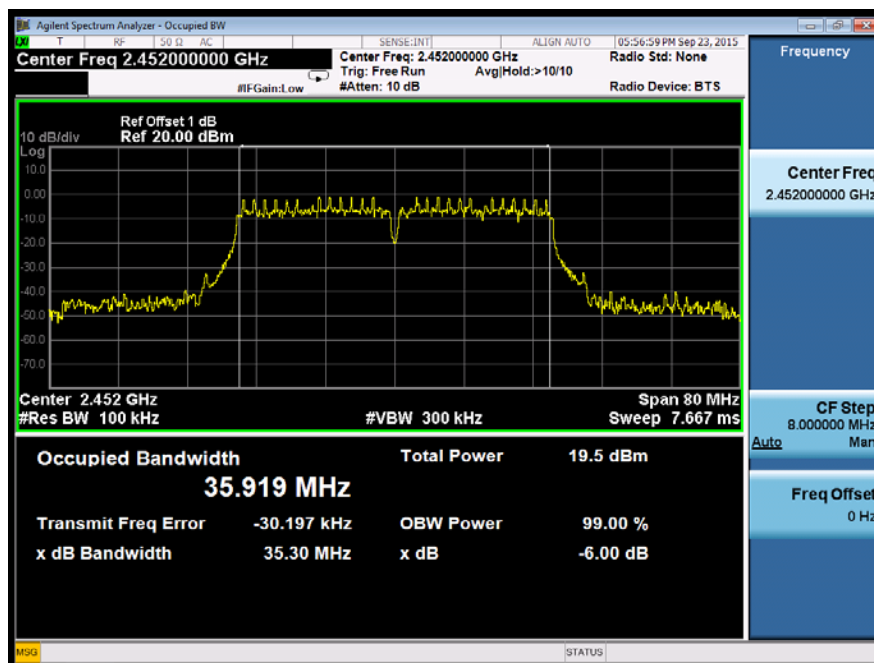
| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11n (HT40) |
| | Channel 3: 2422MHz |



| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11n (HT40) |
| | Channel 6: 2437MHz |



| | |
|------------|---------------------|
| Test Model | DTS (6dB) Bandwidth |
| | 802.11n (HT40) |
| | Channel 9: 2452MHz |



8.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER

8.2.1 Applicable Standard

According to FCC Part 15.247(b)(3) and KDB 558074 DTS 01 Meas. Guidance v03r02

8.2.2 Conformance Limit

The maximum peak conducted output power of the intentional radiator for systems using digital modulation in the 2400 - 2483.5 MHz bands shall not exceed: 1 Watt (30dBm).

8.2.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.2.4 Test Procedure

■ According to FCC Part 15.247(b)(3)

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

The testing follows FCC public Notice DA 00-705 Measurement Guidelines.

The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum output power setting and enable the EUT transmit continuously.

Measure the conducted output power with cable loss and record the results in the test report.

Measure and record the results in the report.

■ According to FCC Part 15.247(b)(4):

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. 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)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

8.2.5 Test Results

Temperature: 24 °C
Humidity: 53 %

Test Date: September 24, 2015
Test By: KING KONG

| Operation Mode | Channel Number | Channel Frequency (MHz) | Power Setting | Measurement Level (dBm) | Limit (dBm) | Verdict |
|----------------|----------------|-------------------------|---------------|-------------------------|-------------|---------|
| 802.11b | 1 | 2412 | 39 | 17.08 | 30 | PASS |
| | 6 | 2437 | 39 | 17.22 | 30 | PASS |
| | 11 | 2462 | 39 | 17.35 | 30 | PASS |
| 802.11g | 1 | 2412 | 47 | 20.89 | 30 | PASS |
| | 6 | 2437 | 47 | 21.00 | 30 | PASS |
| | 11 | 2462 | 47 | 21.10 | 30 | PASS |
| 802.11n (HT20) | 1 | 2412 | 45 | 19.75 | 30 | PASS |
| | 6 | 2437 | 45 | 20.07 | 30 | PASS |
| | 11 | 2462 | 45 | 20.24 | 30 | PASS |
| 802.11n (HT40) | 3 | 2422 | 47 | 19.46 | 30 | PASS |
| | 6 | 2437 | 47 | 19.62 | 30 | PASS |
| | 9 | 2452 | 47 | 19.53 | 30 | PASS |
| Note: N/A | | | | | | |

8.3 MAXIMUM POWER SPECTRAL DENSITY

8.3.1 Applicable Standard

According to FCC Part 15.247(e) and KDB 558074 DTS 01 Meas. Guidance v03r02

8.3.2 Conformance Limit

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.3.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.3.4 Test Procedure

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance

The transmitter output (antenna port) was connected to the spectrum analyzer

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 3 kHz

Set the VBW to: 10 kHz.

Set Detector = peak.

Set Sweep time = auto couple.

Set Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level within the RBW.

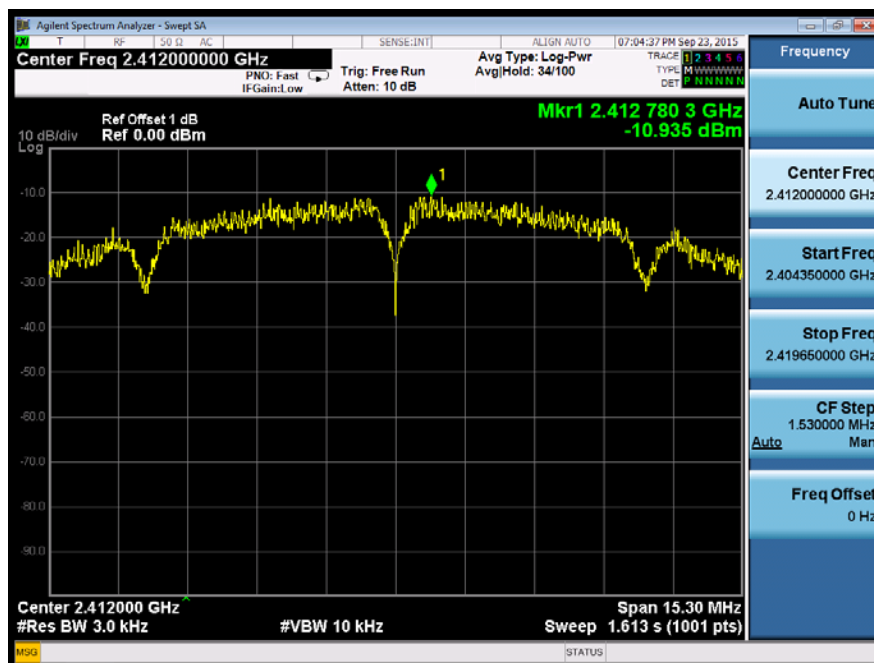
8.3.5 Test Results

Temperature: 24°C
Humidity: 53 %

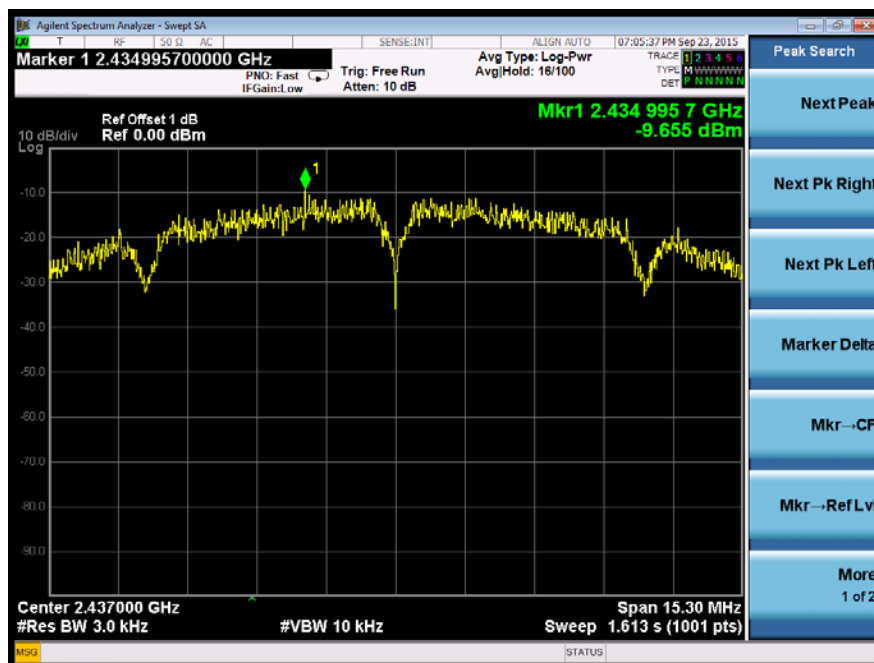
Test Date: September 24, 2015
Test By: KING KONG

| Operation Mode | Channel Number | Channel Frequency (MHz) | Measurement Level (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|----------------|----------------|-------------------------|------------------------------|------------------|---------|
| 802.11b | 1 | 2412 | -10.935 | 8 | PASS |
| | 6 | 2437 | -9.655 | 8 | PASS |
| | 11 | 2462 | -10.299 | 8 | PASS |
| 802.11g | 1 | 2412 | -15.061 | 8 | PASS |
| | 6 | 2437 | -14.442 | 8 | PASS |
| | 11 | 2462 | -14.802 | 8 | PASS |
| 802.11n (HT20) | 1 | 2412 | -16.035 | 8 | PASS |
| | 6 | 2437 | -15.740 | 8 | PASS |
| | 11 | 2462 | -16.051 | 8 | PASS |
| 802.11n (HT40) | 3 | 2422 | -16.414 | 8 | PASS |
| | 6 | 2437 | -20.643 | 8 | PASS |
| | 9 | 2452 | -19.526 | 8 | PASS |
| Note: N/A | | | | | |

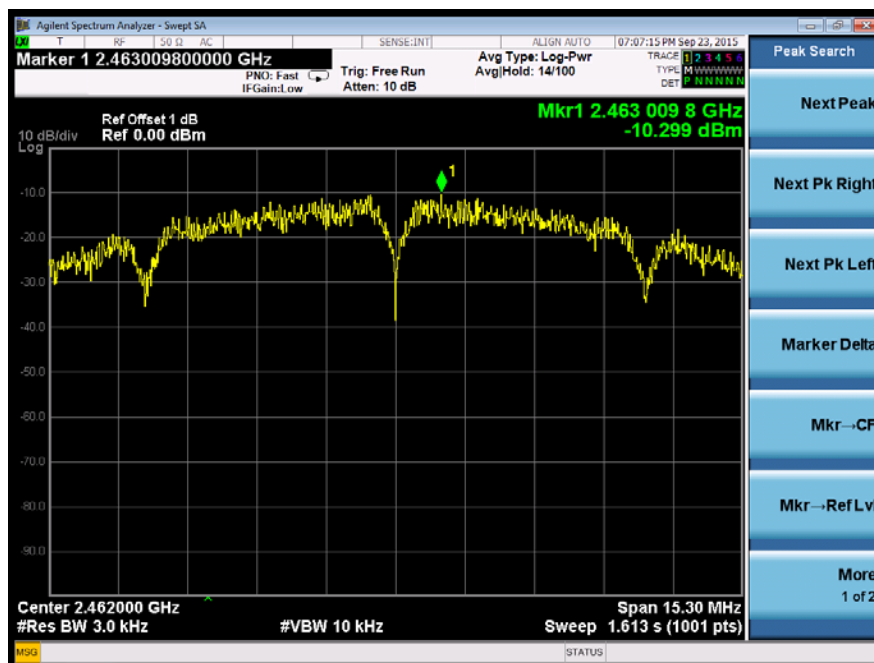
| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11b |
| | Channel 1: 2412MHz |



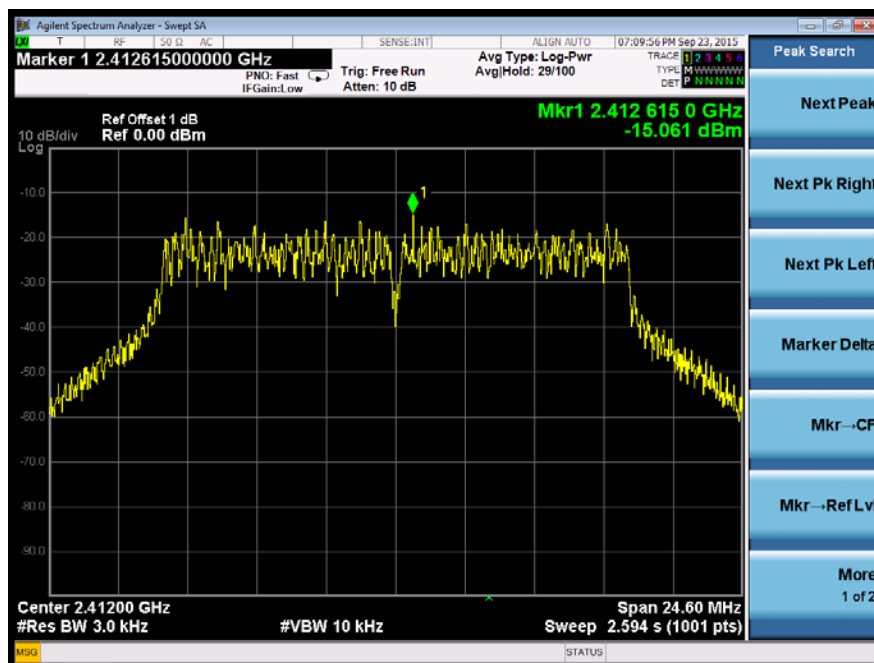
| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11b |
| | Channel 6: 2437MHz |



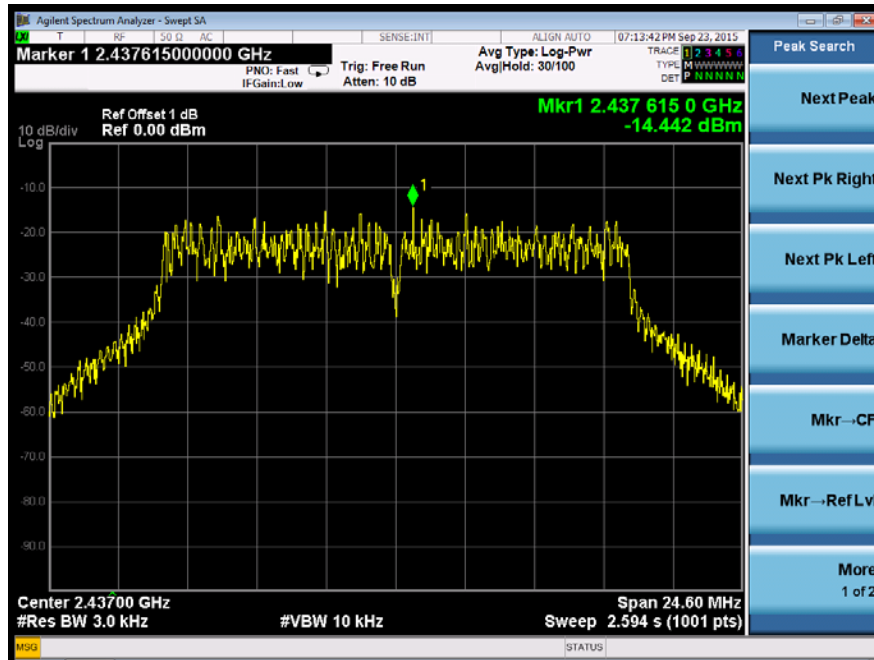
| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11b |
| | Channel 11: 2462MHz |



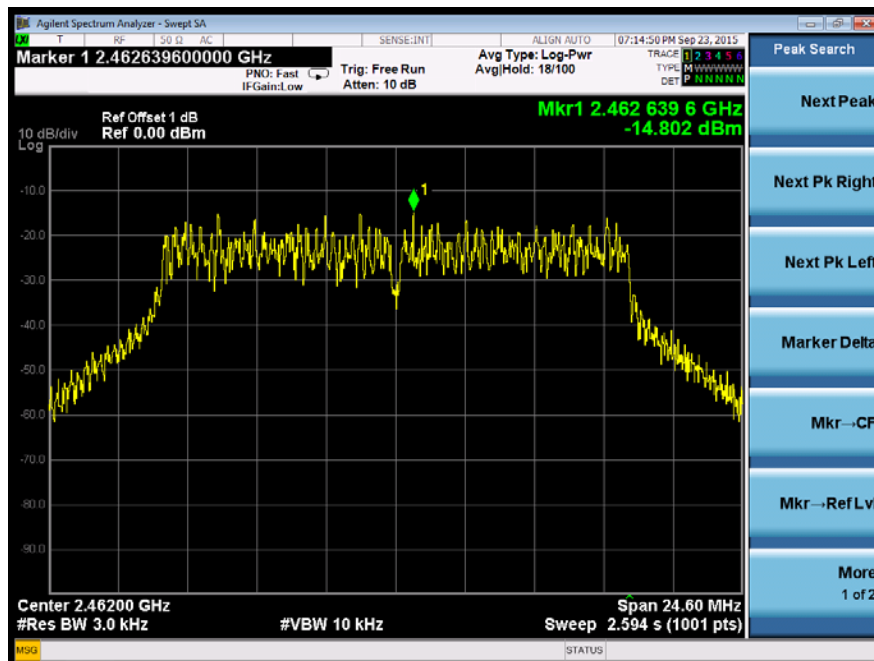
| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11g |
| | Channel 1: 2412MHz |



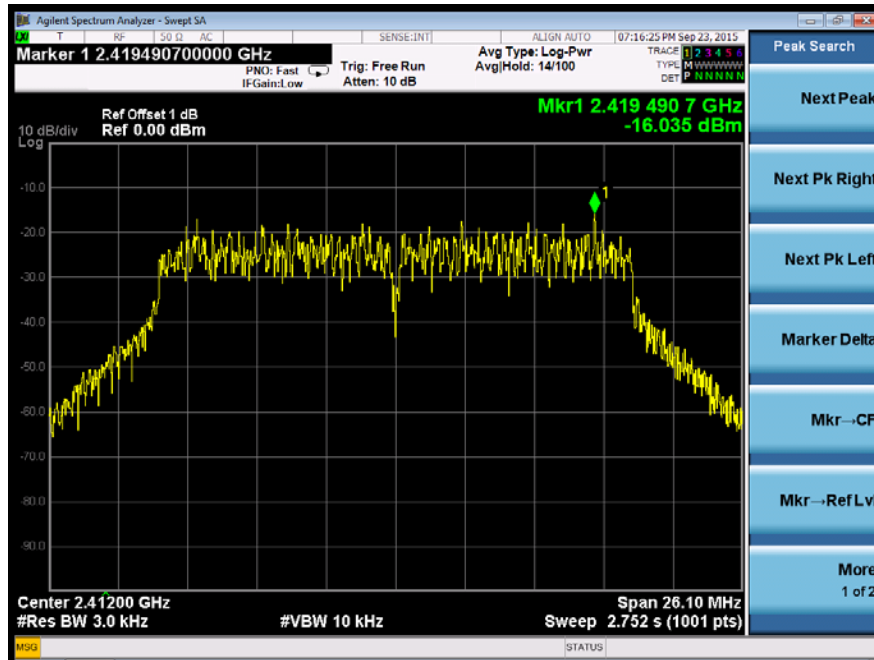
| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11g |
| | Channel 6: 2437MHz |



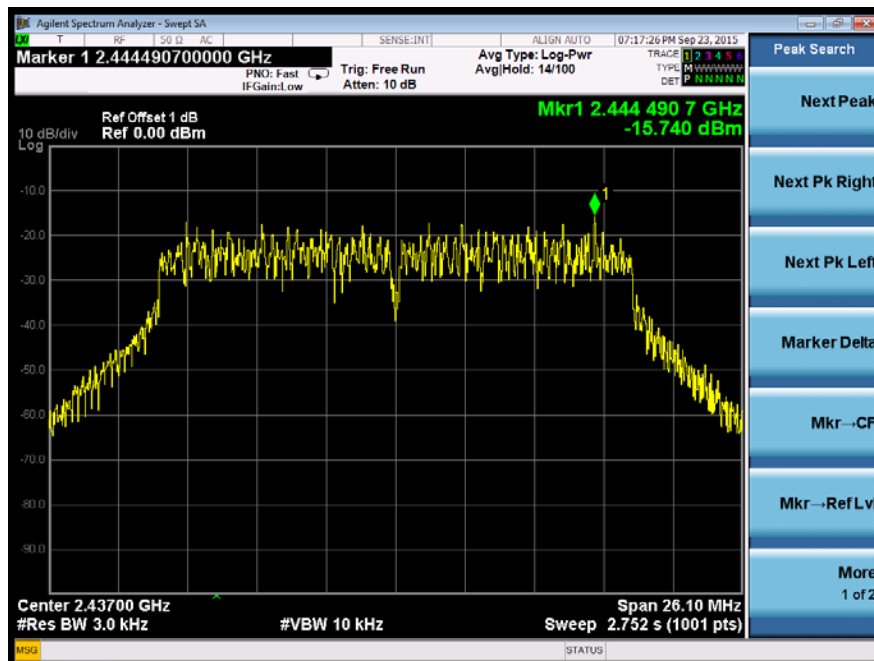
| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11g |
| | Channel 11: 2462MHz |



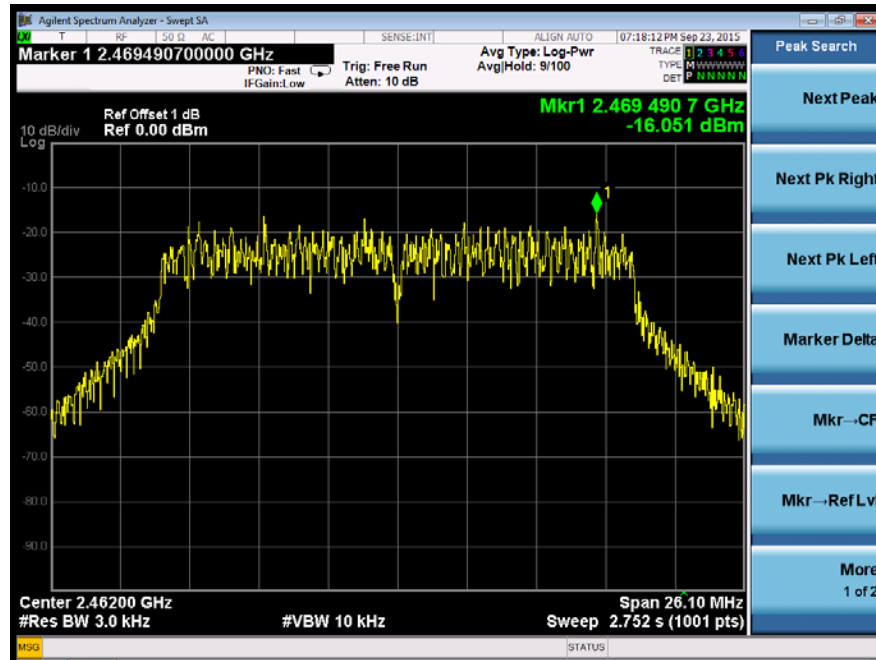
| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11n (HT20) |
| | Channel 1: 2412MHz |



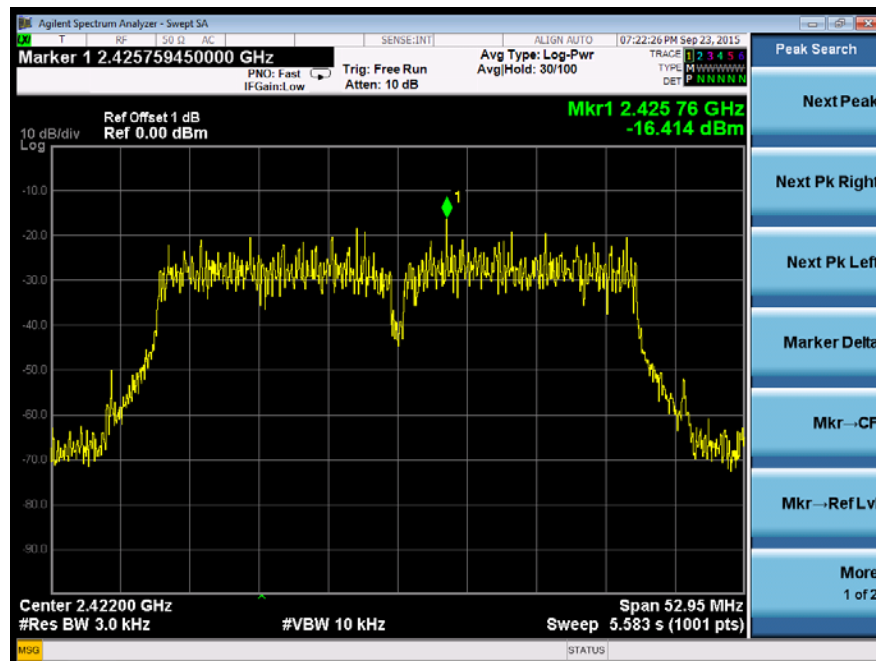
| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11n (HT20) |
| | Channel 6: 2437MHz |



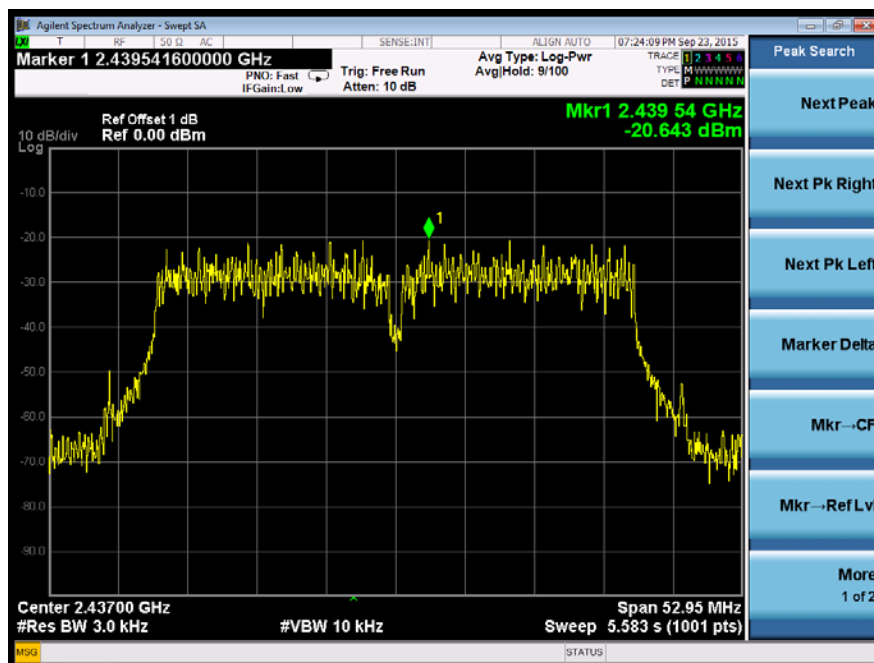
| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11n (HT20) |
| | Channel 11: 2462MHz |



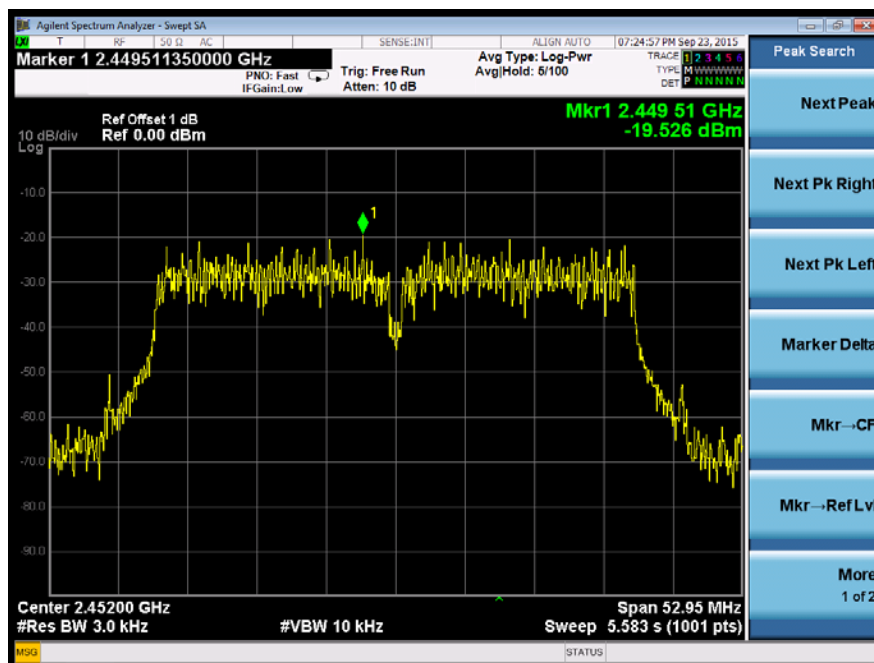
| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11n (HT40) |
| | Channel 3: 2422MHz |



| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11n (HT40) |
| | Channel 6: 2437MHz |



| | |
|------------|------------------------|
| Test Model | Power Spectral Density |
| | 802.11n (HT40) |
| | Channel 9: 2452MHz |



8.4 UNWANTED EMISSIONS INTO NON-RESTRICTED FREQUENCY BANDS

8.4.1 Applicable Standard

According to FCC Part 15.247(d) and KDB 558074 DTS 01 Meas. Guidance v03r02

8.4.2 Conformance Limit

According to FCC Part 15.247(d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

8.4.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.4.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer

■ Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DTS channel center frequency.

Set the span to ≥ 1.5 times the DTS bandwidth.

Set the RBW = 100 kHz.

Set the VBW $\geq 3 \times$ RBW.

Set Detector = peak.

Set Sweep time = auto couple.

Set Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

■ Emission level measurement

Set the center frequency and span to encompass frequency range to be measured.

Set the RBW = 100 kHz.

Set the VBW = 300 kHz.

Set Detector = peak

Sweep time = auto couple.

Trace mode = max hold.

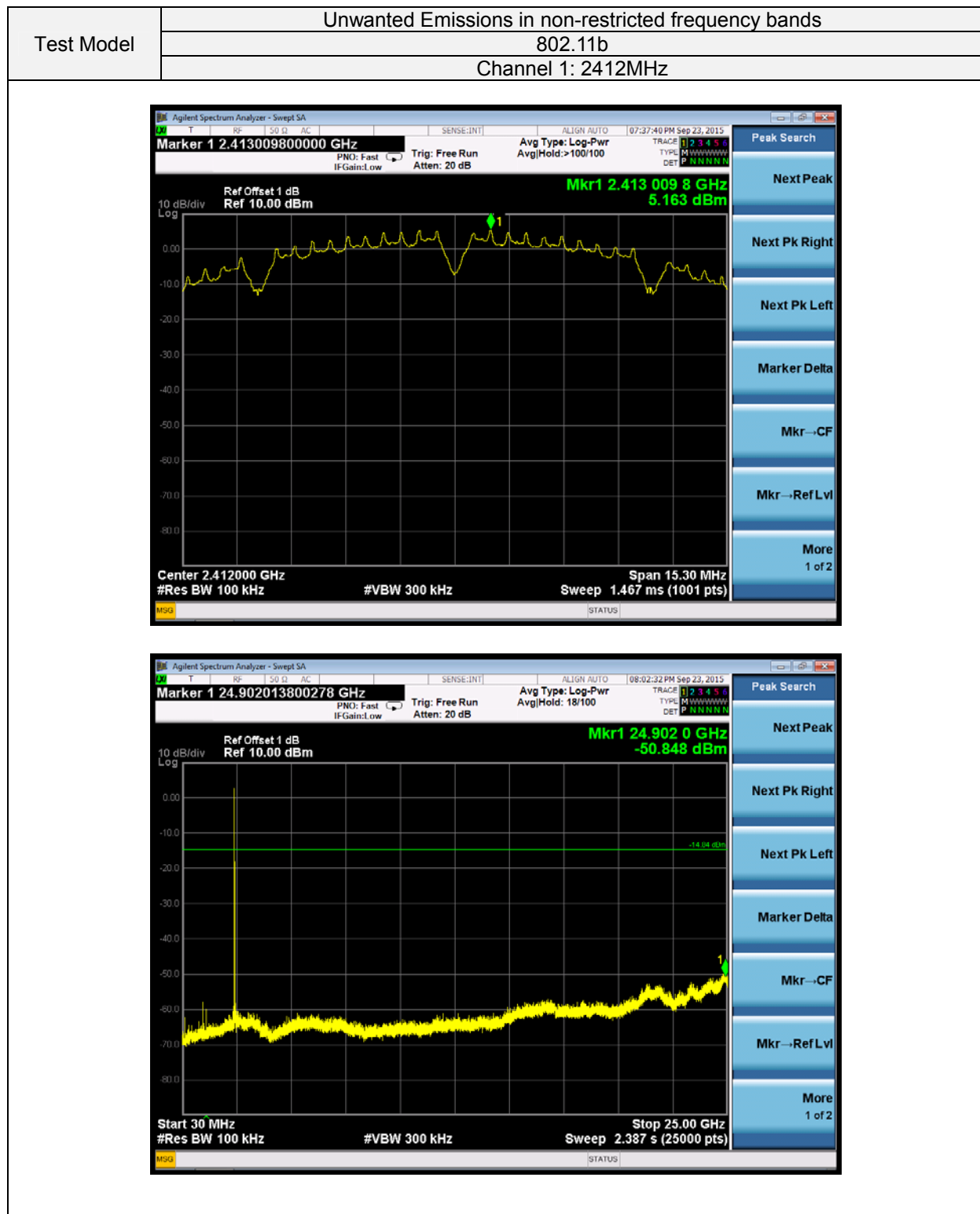
Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

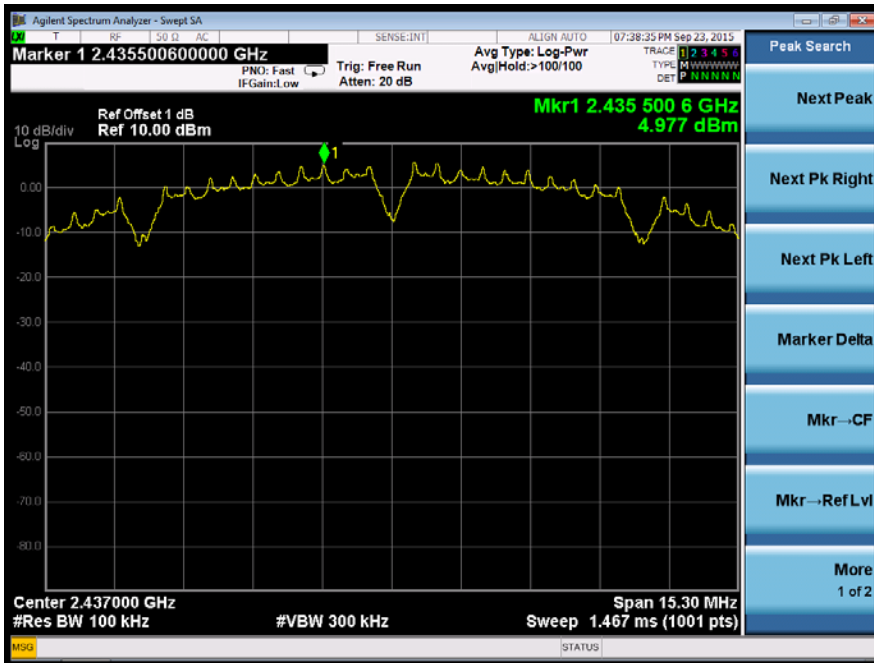

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements. Report the three highest emissions relative to the limit.

8.4.5 Test Results

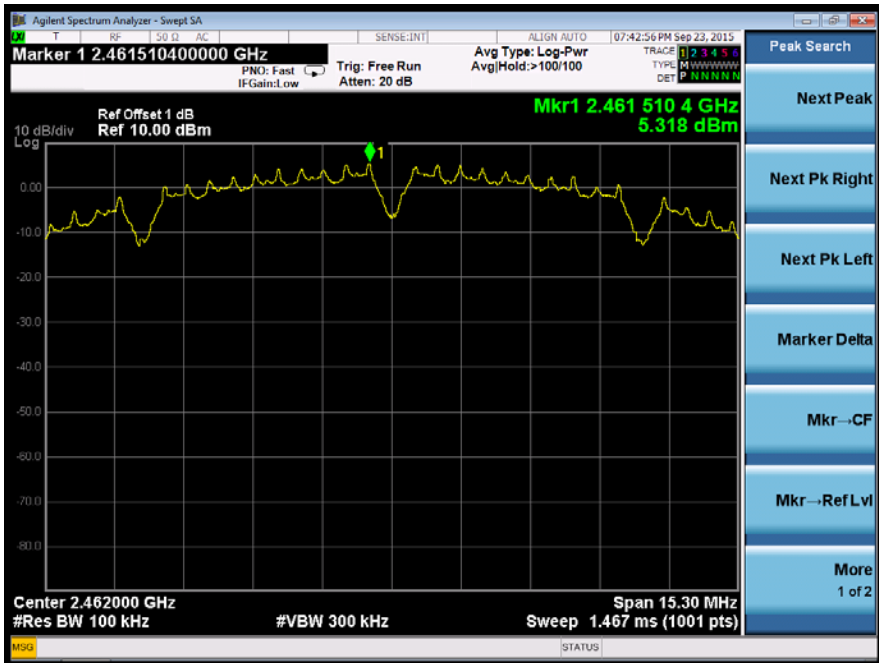

All the modulation modes were tested, the data of the worst mode(802.11b) are described in the following table



| | |
|------------|--|
| Test Model | Unwanted Emissions in non-restricted frequency bands |
| | 802.11b |
| | Channel 6: 2437MHz |

| | |
|------------|--|
| Test Model | Unwanted Emissions in non-restricted frequency bands |
| | 802.11b |
| | Channel 11: 2462MHz |

| | |
|------------|--------------------|
| Test Model | Band edge |
| | 802.11b |
| | Channel 1: 2412MHz |



| | |
|------------|---------------------|
| Test Model | Band edge |
| | 802.11b |
| | Channel 11: 2462MHz |

