# FCC 47 CFR PART 15 SUBPART C 15.247

## TEST REPORT

## FOR

UA504 WiFi Module

Model : UA504

Trade Name：Uascent

Issued to
ShenZhen Gather Genius Technology Limited
4F, Building A, Tongfang Information Harbor, No.11, Langshan Road,
Nanshan District, Shenzhen, China
Issued by
WH Technology Corp.

Testing Laboratory
2954

| | | |
|---|---|---|
| **Open Site** | | **No.120, Ln. 5, Hudong St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)** |
| **EMC Test Site** | **Xizhi Office and Lab** | **7F., No.262, Sec. 3, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)** |
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# Contents

# 1. General Information

| | | |
|---|---|---|
| **Applicant** | : | ShenZhen Gather Genius Technology Limited |
| **Address** | : | 4F, Building A, Tongfang Information Harbor, No.11, Langshan Road, Nanshan District, Shenzhen, China |
| **Manufacturer** | : | ShenZhen Gather Genius Technology Limited |
| **Address** | : | 4F, Building A, Tongfang Information Harbor, No.11, Langshan Road, Nanshan District, Shenzhen, China |
| **EUT** | : | UA504 WiFi Module |
| **Model Name** | : | UA504 |
| **Model Differences** | : | |

Is here with confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.10-2013. The said equipment in the configuration described in this report shows the maximum emission levels emanating

**FCC part 15 subpart C**

Receipt Date : 10/12/2017 Final Test Date : 12/04/2017

| **Tested By:** | | **Reviewed by:** | |
|---|---|---|---|
| Dec. 04, 2017 |  | Dec 04, 2017 |  |
| **Date** | Bell Wei/ Engineer | **Date** | Mike Lee / Manager<br>Designation Number: TW1083 |

# 2. Report of Measurements and Examinations

## 2.1 List of Measurements and Examinations

| Test Specification clause | Test case | Test Channel | Recorded In Report | | Pass | Fail | NA | NP | Remark |
|---|---|---|---|---|---|---|---|---|---|
| §15.247(b)(4) | Antenna gain | ☒ Lowest<br>☒ Middle<br>☒ Highest | 802.11b | ☒ Lowest<br>☒ Middle<br>☒ Highest | ☒ | ☐ | ☐ | ☐ | complies |
| §15.247(e) | Power spectral density | ☒ Lowest<br>☒ Middle<br>☒ Highest | 802.11b<br>802.11g<br>802.11n HT20 | ☒ Lowest<br>☒ Middle<br>☒ Highest | ☒ | ☐ | ☐ | ☐ | complies |
| §15.247(a)(2) | Spectrum bandwidth – 6 dB bandwidth | ☒ Lowest<br>☒ Middle<br>☒ Highest | 802.11b<br>802.11g<br>802.11n HT20 | ☒ Lowest<br>☒ Middle<br>☒ Highest | ☒<br>☒ | ☐ | ☐ | ☐ | complies |
| §15.247(b)(1) | Maximum output power | ☒ Lowest<br>☒ Middle<br>☒ Highest | 802.11b<br>802.11g<br>802.11n HT20 | ☒ Lowest<br>☒ Middle<br>☒ Highest | ☒<br>☒<br>☒ | ☐ | ☐ | ☐ | complies |
| §15.247(d) | Band edge compliance conducted | ☒ Lowest<br>☒ Highest | 802.11b<br>802.11g<br>802.11n HT20 | ☒ Lowest<br>☒ Highest | ☒<br>☒ | ☐ | ☐ | ☐ | complies |
| §15.205 | Band edge compliance radiated | ☒ Lowest<br>☒ Highest | 802.11b<br>802.11g<br>802.11n HT20 | ☒ Lowest<br>☒ Highest | ☒ | ☐ | ☐ | ☐ | complies |
| §15.247(d) | TX spurious emissions conducted | ☒ Lowest<br>☒ Middle<br>☒ Highest | 802.11b<br>802.11g<br>802.11n HT20 | ☒ Lowest<br>☒ Middle<br>☒ Highest | ☒<br>☒ | ☐ | ☐ | ☐ | complies |
| §15.247(d) | TX spurious emissions radiated | ☒ Lowest<br>☒ Middle<br>☒ Highest | 802.11b<br>802.11g<br>802.11n HT20 | ☒ Lowest<br>☒ Middle<br>☒ Highest | ☒ | ☐ | ☐ | ☐ | complies |
| §15.109 | RX spurious emissions radiated | -/- | -/- | -/- | ☐ | ☐ | ☒ | ☐ | complies |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| §15.209(a) | TX spurious Emissions radiated < 30 MHz | -/- | 802.11b | -/- | ☒ | ☐ | ☐ | ☐ | complies |
| §15.107(a) §15.207 | Conducted Emissions < 30 MHz | -/- | 802.11b | -/- | ☒ | ☐ | ☐ | ☐ | complies |

Remark:

1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

| Test Items | Mode | Data Rate | Channel |
|---|---|---|---|
| Maximum Peak Conducted Output Power | 11b/DSSS | 1 Mbps | 1/6/11 |
| Power Spectral Density | 11g/OFDM | 6 Mbps | 1/6/11 |
| 6dB Bandwidth<br>Spurious RF conducted emission<br>Radiated Emission 9kHz~1GHz&<br>Radiated Emission 1GHz~10th Harmonic | 11n(20MHz)/OFDM | 6.5Mbps | 1/6/11 |
| Band Edge | 11b/DSSS | 1 Mbps | 1/11 |
| | 11g/OFDM | 6 Mbps | 1/11 |
| | 11n(20MHz)/OFDM | 6.5Mbps | 1/11 |

# 3. Test Configuration of Equipment under Test

## 3.1 Description of the tested samples

| | | |
|---|---|---|
| EUT Name | : | UA504 WiFi Module |
| Model Number | : | UA504 |
| FCCID | : | 2ALLFUA504 |
| Receipt Date | : | 10/12/2017 |
| Input Voltage | : | DC 5V From PC |
| Power From | : | ☐Inside ☑Outside<br>☐Adaptor ☐Battery ☐AC Power Source ☐DC Power Source<br>☑Support Unit PC |
| Operate Frequency | : | Refer to the channel list as described below (2.412 ~2.462 GHz) |
| Modulation Technique | : | 802.11b：1 Mbps<br>802.11g ：6 Mbps<br>802.11n HT20：6.5 Mbps |
| Number of Channels | : | 802.11b, 802.11g, 802.11n, HT20：13 |
| Channel spacing | : | ☐N/A ☑ 5 MHz |
| Operating Mode | : | ☐Simplex ☑ Half Duplex |
| Antenna Type | : | Dipole Antenna |
| Channel bandwidth | : | 5 MHz |
| Antenna gain | | 3.00 dBi |

## 3.2 Carrier Frequency of Channels

802.11b, 802.11g, 802.11n HT 20 (2412MHz~2462MHz)

| Channel | Frequency(MHz) | Channel | Frequency(MHz) |
|---|---|---|---|
| 01 | 2412 | 07 | 2442 |
| 02 | 2417 | 08 | 2447 |
| 03 | 2422 | 09 | 2452 |
| 04 | 2427 | 10 | 2457 |
| 05 | 2432 | 11 | 2462 |
| 06 | 2437 | --- | --- |

### 3.3 Test Mode and Test Software

a. During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
b. The complete test system included Notebook and EUT for RF test.
c. An executive “QATEST” under XP was executed to keep transmitting and receiving data via Wireless.
d. The following test modes were performed for test:
   - 802.11b/g/n HT20: CH01: 2412MHz, CH06: 2437MHz, CH11: 2462MHz
   - 802.11n HT40: CH03: 2422MHz, CH06: 2437MHz, CH09: 2452MHz

## 3.4 TEST Methodology & General Test Procedures

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices
KDB 558074 D01 DTS Meas Guidance v04: GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER SECTION 15.247

## 3.5 Measurement Uncertainty

| Measurement Item | Uncertainty |
|---|---|
| Radiated emission | ±4.11dB |
| Peak Output Power(conducted) | ±1.38dB |
| Peak Output Power(Radiated) | ±1.70dB |
| Power Spectral Density | ±1.39dB |
| Radiated emission(3m) | ±4.11dB |
| Radiated emission(10m) | ±3.89dB |

## 3.6 Description of the Support Equipments

**Setup Diagram**

See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.

**Support Equipment**

Peripherals Devices:

| OUTSIDE SUPPORT EQUIPMENT | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Equipment | Model | Serial No. | FCC ID/ BSMI ID | Trade name | Data Cable | Power Cord |
| 1. | PC | EliteBook 828 G4 | NA | NA | HP | NA | NA |
| 2. | NA | NA | NA | NA | NA | NA | N/A |
| INSIDE SUPPORT EQUIPMENT | | | | | | | |

| No. | Equipment | Model | Serial No. | FCC ID/ BSMI ID | Trade name | Data Cable | Power Cord |
|---|---|---|---|---|---|---|---|
| 1. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

**Note:** All the above equipment /cable were placed in worse case position to maximize emission signals during emission test

**Grounding:** Grounding was in accordance with the manufacturer's requirement and conditions for the intended use.

# 4. Test and measurement equipment

## 4.1 calibration

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

## 4.2 equipment

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

**TABLELIST OF TEST AND MEASUREMENT EQUIPMENT**

| Test Site | Instrument | Manufacturer | Model No. | S/N | Next Cal. Date |
|---|---|---|---|---|---|
| Conduction | Spectrum (9K--3GHz) | R&S | FSP3 | 833387/010 | 2018/09/20 |
| | EMI Receiver | R&S | ESHS10 | 830223/008 | 2018/06/06 |
| | LISN | Rolf Heine Hochfrequenztechnik | NNB-2/16z | 98062 | 2018/06/11 |
| | ISN | Schwarzbeck | 8-Wire ISN CAT5 | CAT5-8158-0094 | 2018/09/21 |
| | RF Cable | N/A | N/A | EMI-3 | 2018/10/18 |
| Radiation | Bilog antenna(30M-1G) | ETC | MCTD2786B | BLB16M04004/JB-5-004 | 2018/05/18 |
| | Double Ridged Guide Horn antenna(1G-18G) | ETC | MCTD 1209 | DRH15N02009 | 2018/11/01 |
| | Horn antenna (18G-26G) | com-power | AH-826 | 81000 | 2018/08/16 |
| | LOOP Antenna (Below 30M) | com-power | AL-130 | 17117 | 2018/10/04 |
| | Pre amplifier (30M-1G) | EMC INSTRUMENT | EMC9135 | 980334 | 2018/05/03 |
| | Microwave Preamplifier (1G-18G) | EMC INSTRUMENT | EMC051845 | 980108&AT-18001 | 2018/10/22 |
| | Pre amplifier (18G~26G) | MITEQ | JS4-18002600-30-5A | 808329 | 2018/08/09 |
| | EMI Test | R&S | ESVS30 | 826006/002 | 2018/11/27 |

| | | | | | |
|---|---|---|---|---|---|
| | Receiver | | (20M-1000MHz) | | |
| | RF Cable (open site) | EMCI | N male on end of both sides (EMI4) | 30m | 2018/10/18 |
| | RF CABLE (1~26G) | HARBOUT INDUSTRIES | LL142MI(4M+4M) | NA | 2018/04/17 |
| | RF CABLE (1~26G) | HARBOUR INDUSTRIES | LL142MI(7M) | NA | 2018/08/09 |
| | Spectrum (9K--7GHz) | R&S | FSP7 | 830180/006 | 2018/04/14 |
| | Spectrum (9K--40GHz) | AGILENT | 8564EC | 4046A0032 | 2018/03/01 |
| Software | e3 | AUDIX | N/A | N/A | N/A |
| SG | SINGAL GENTERATOR (100k-1GHz) | HP | 8648A | 3619U00426 | N/A |

***CALIBRATION INTERVAL OF INSTRUMENTS LISTED ABOVE IS ONE YEAR**

# 5. Antenna Requirements

## 5.1 Standard Applicable

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

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

## 5.2 Antenna Construction and Directional Gain

**802.11b/g/n:**
Antenna Type: Dipole Antenna
Antenna Gain: 3.0 dBi

# 6. Test of Conducted Emission

## 6.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2014 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

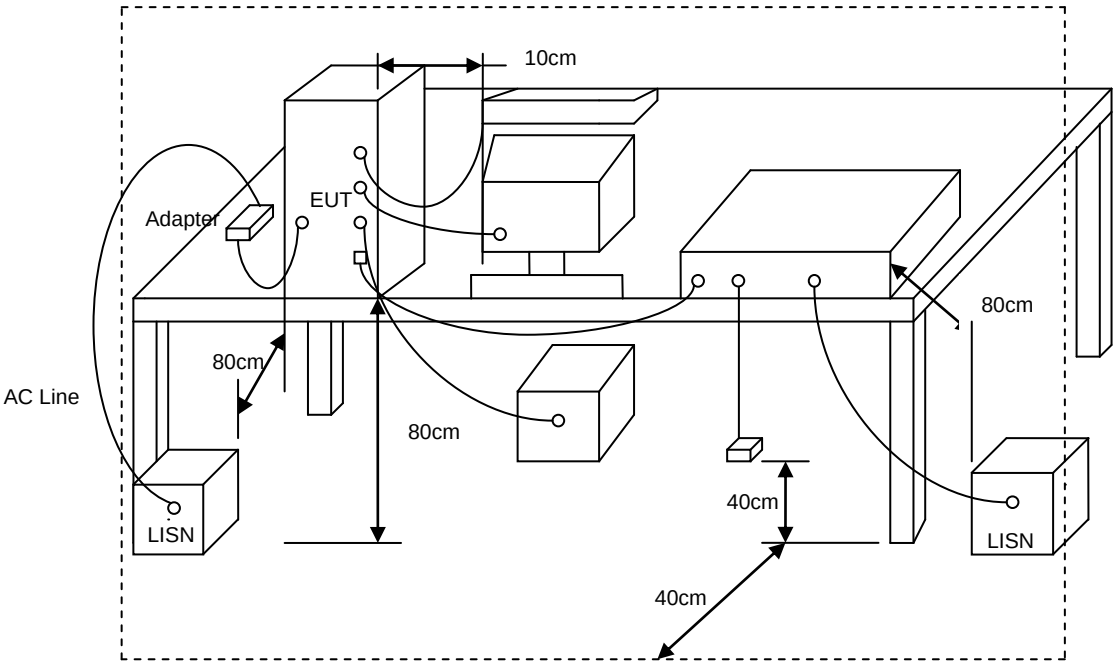
| Frequency (MHz) | Quasi Peak (dB μ V) | Average (dB μ V) |
|---|---|---|
| 0.15 – 0.5 | 66-56* | 56-46* |
| 0.5 – 5.0 | 56 | 46 |
| 5.0 – 30.0 | 60 | 50 |

*Decreases with the logarithm of the frequency.

## 6.2 Test Procedures

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

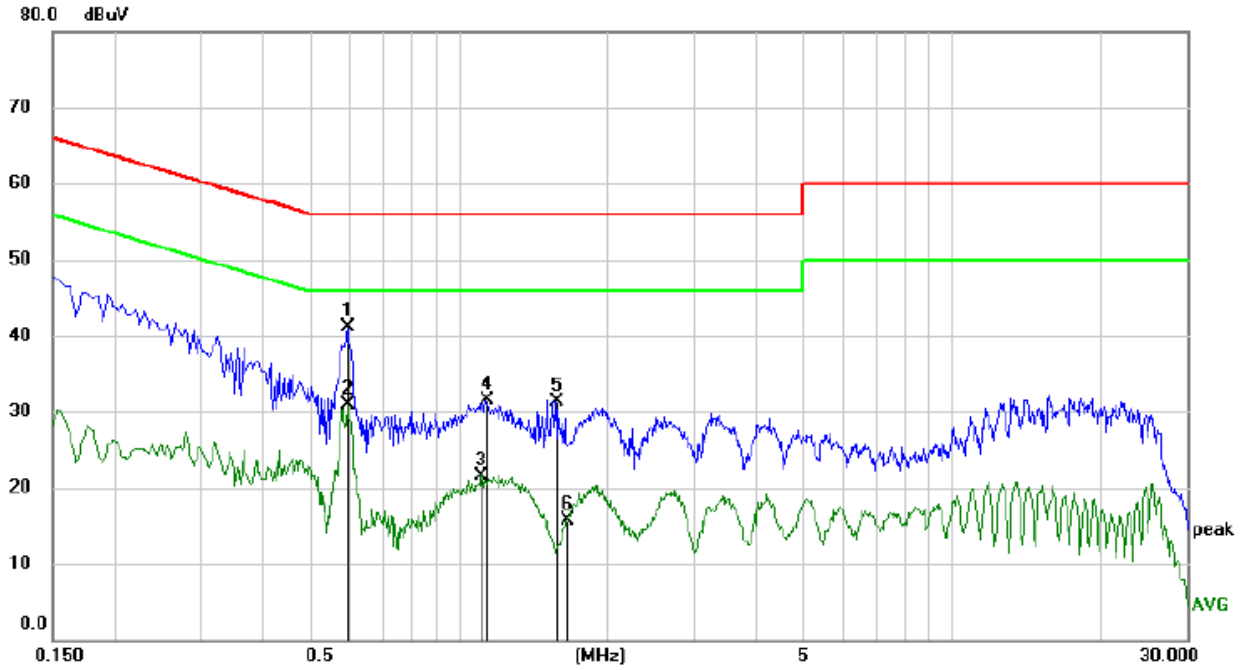
## 6.3 Typical Test Setup



## 6.4 Test Result and Data

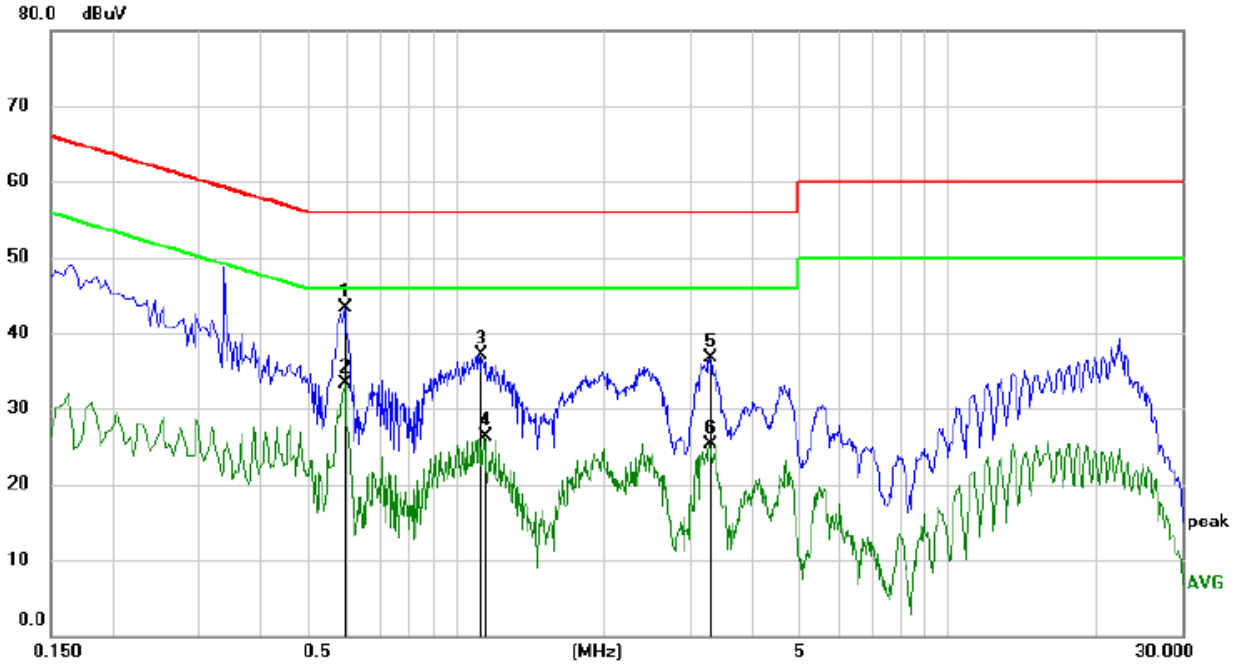
Remark: We measured Conducted Emission at 802.11b/802.11g/802.11n HT20 mode in AC 120V/60Hz the worst case was recorded .

| | | | | | |
|---|---|---|---|---|---|
| Power | : | AC 120V | Pol/Phase | : | LINE |
| Test Mode 1 | : | TX b CH11 2462MHz | Temperature | : | 26 ˚C |
| Memo | : | | Humidity | : | 40 % |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | * | 0.5955 | 41.18 | -0.03 | 41.15 | 56.00 | -14.85 | peak |
| 2 | | 0.5955 | 30.86 | -0.03 | 30.83 | 46.00 | -15.17 | AVG |
| 3 | | 1.1085 | 21.64 | -0.04 | 21.60 | 46.00 | -24.40 | AVG |
| 4 | | 1.1355 | 31.52 | -0.04 | 31.48 | 56.00 | -24.52 | peak |
| 5 | | 1.5765 | 31.35 | -0.04 | 31.31 | 56.00 | -24.69 | peak |
| 6 | | 1.6620 | 15.83 | -0.04 | 15.79 | 46.00 | -30.21 | AVG |

| | | | | | |
|---|---|---|---|---|---|
| Power | : | AC 110V | Pol/Phase | : | NEUTRAL |
| Test Mode 1 | : | TX b CH11 2462MHz | Temperature | : | 26 ˚C |
| Memo | : | | Humidity | : | 40 % |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | * | 0.5955 | 43.40 | -0.03 | 43.37 | 56.00 | -12.63 | peak |
| 2 | | 0.5955 | 33.28 | -0.03 | 33.25 | 46.00 | -12.75 | AVG |
| 3 | | 1.1220 | 37.18 | -0.04 | 37.14 | 56.00 | -18.86 | peak |
| 4 | | 1.1445 | 26.40 | -0.04 | 26.36 | 46.00 | -19.64 | AVG |
| 5 | | 3.2865 | 36.65 | -0.04 | 36.61 | 56.00 | -19.39 | peak |
| 6 | | 3.2865 | 25.40 | -0.04 | 25.36 | 46.00 | -20.64 | AVG |

# 7. Test of Radiated Emission

## 7.1 Test Limit

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

| Frequency (MHz) | Field Strength (microvolt/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 |
| 1.705 ~ 30.0 | 30 | 30 |
| 30 ~ 88 | 100 | 3 |
| 88 ~ 216 | 150 | 3 |
| 216 ~ 960 | 200 | 3 |
| Above 960 | 500 | 3 |

## 7.2 Test Procedures

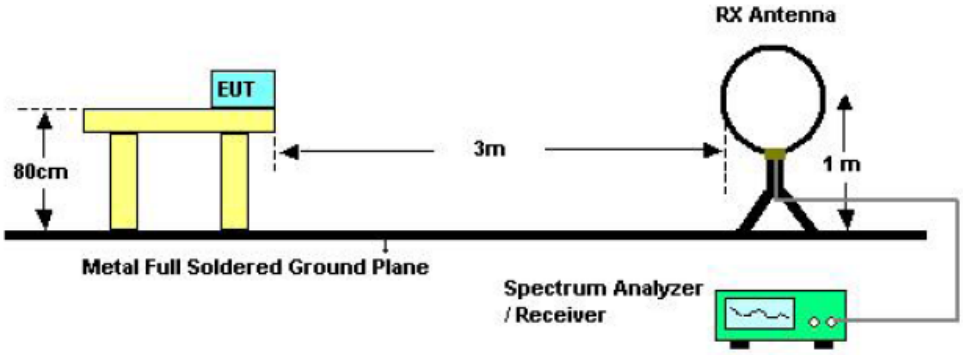
a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in

average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

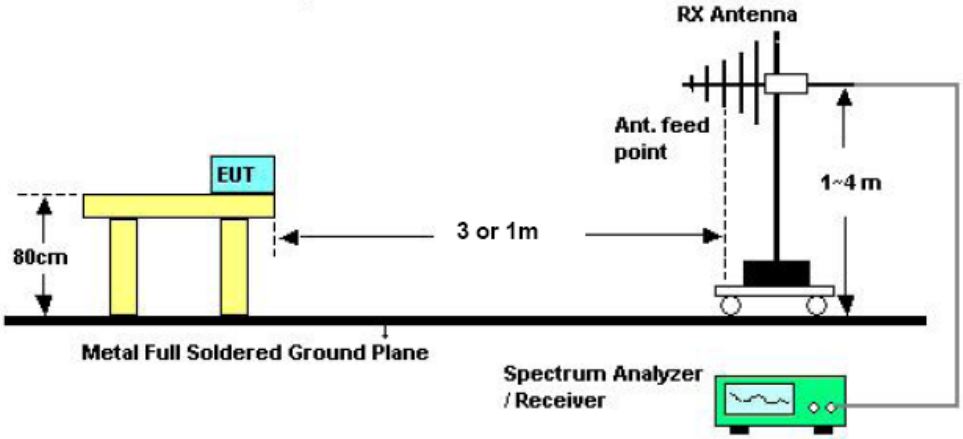
i. "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

## 7.3 Typical Test Setup

**For radiated emissions below 30MHz**




**For radiated emissions above 30MHz**




Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);
Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

### 7.4 Test Result and Data (9kHz ~ 30MHz)

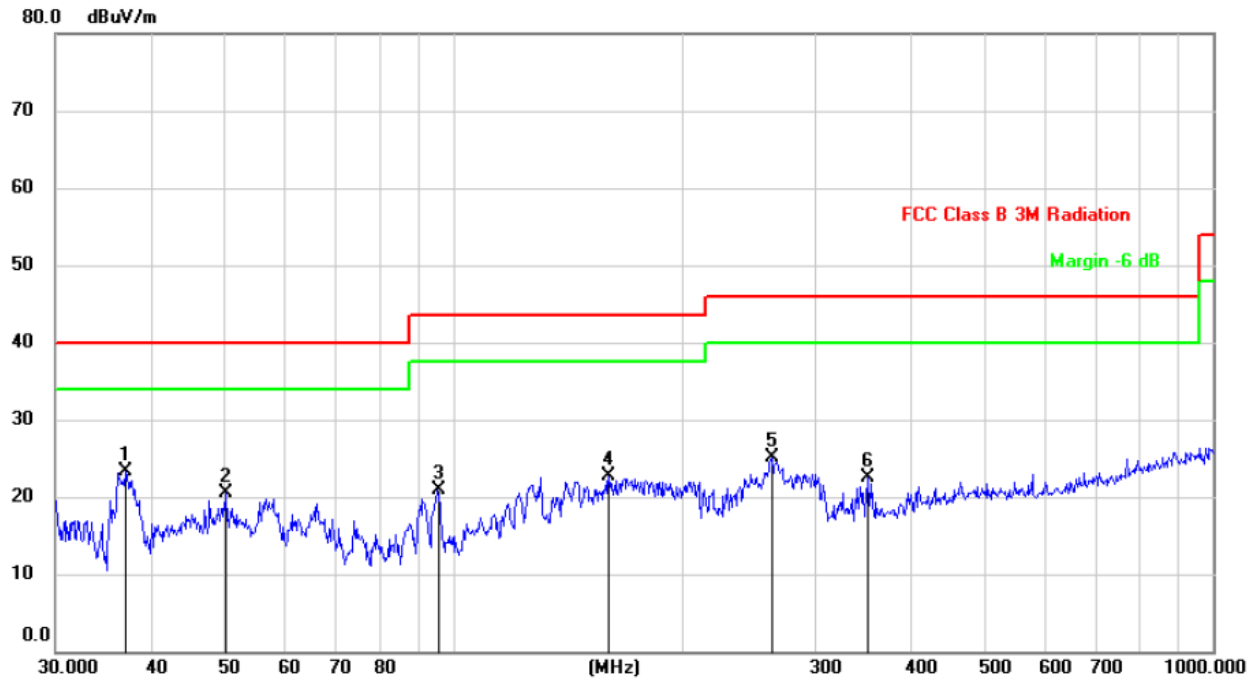
Remark: We measured Radiated Emission at 802.11b/802.11g/802.11n HT20 mode from 9 KHz to 25GHz in AC 120V/60Hz and recorded worst case at 802.11b mode.

| Frequency (MHz) | Corrected Reading (dBuV/m)@3m | FCC Limit (dBuV/m) @3m | Margin (dB) | Detector | Result |
|---|---|---|---|---|---|
| 0.36 | 49.79 | 96.48 | 46.69 | QP | PASS |
| 1.65 | 43.12 | 63.25 | 20.13 | QP | PASS |
| 20.51 | 44.35 | 69.54 | 25.19 | QP | PASS |
| 25.77 | 43.67 | 69.54 | 25.87 | QP | PASS |

### 7.5 Test Result and Data (30MHz ~ 1GHz, worst emissions found)

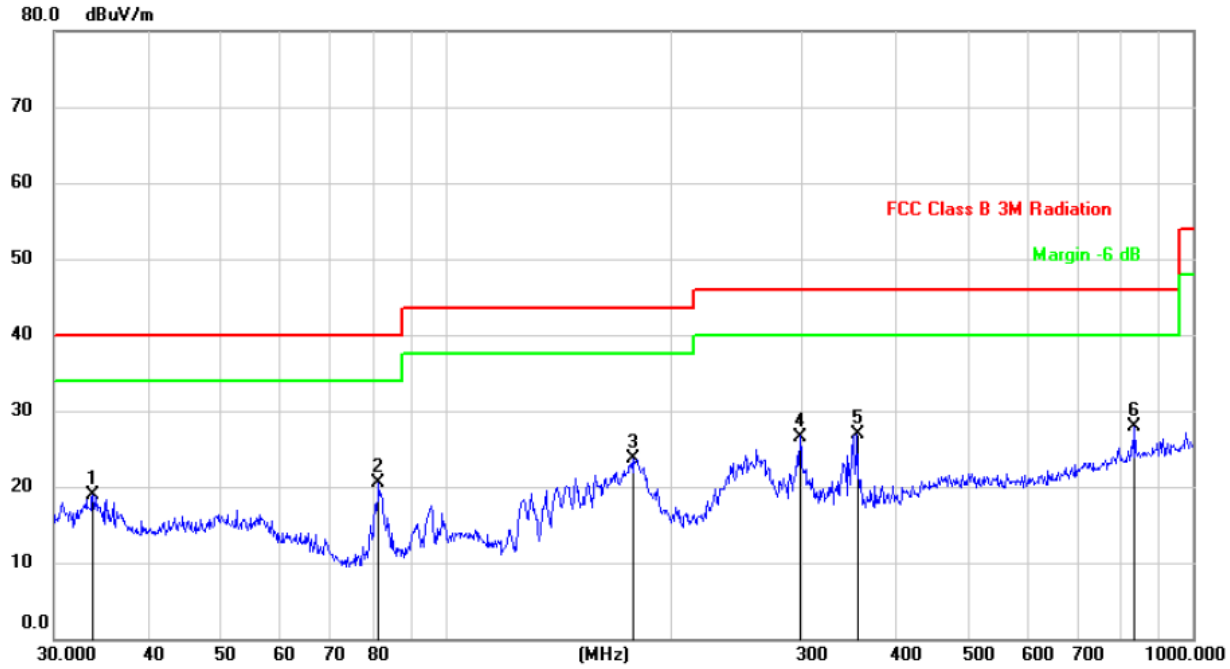
Remark: We measured Radiated Emission at 802.11b/802.11g/802.11n HT20 mode from 9 KHz to 25GHz in AC 120V/60Hz and recorded worst case at 802.11b mode

Horizontal




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dBuV/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | * | 37.0248 | 34.24 | -11.03 | 23.21 | 40.00 | -16.79 | Qp |
| 2 | | 50.2324 | 30.13 | -9.70 | 20.43 | 40.00 | -19.57 | Qp |
| 3 | | 95.4270 | 33.20 | -12.20 | 21.00 | 43.50 | -22.50 | Qp |
| 4 | | 160.3454 | 35.80 | -13.03 | 22.77 | 43.50 | -20.73 | Qp |
| 5 | | 262.8955 | 35.23 | -10.08 | 25.15 | 46.00 | -20.85 | Qp |
| 6 | | 351.7078 | 30.11 | -7.55 | 22.56 | 46.00 | -23.44 | Qp |

Vertical




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dBuV/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 33.7986 | 29.20 | -10.35 | 18.85 | 40.00 | -21.15 | Qp |
| 2 | | 81.4970 | 35.59 | -15.15 | 20.44 | 40.00 | -19.56 | Qp |
| 3 | | 178.7584 | 38.43 | -14.73 | 23.70 | 43.50 | -19.80 | Qp |
| 4 | | 298.2681 | 35.28 | -8.68 | 26.60 | 46.00 | -19.40 | Qp |
| 5 | | 355.4273 | 34.35 | -7.48 | 26.87 | 46.00 | -19.13 | Qp |
| 6 | * | 836.2441 | 30.24 | -2.25 | 27.99 | 46.00 | -18.01 | Qp |

## 7.6 Test Result and Data (Above 1GHz)

***802.11b Mode (above 1GHz)***

| Frequency(MHz): | | | | 2412 | | | Polarity: | | | HORIZONTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4824 | 53.40 | PK | 74 | 20.60 | 1.00 | 115 | 51.30 | 31.6 | 7.00 | 36.5 | 2.10 |
| 1 | 4824 | 39.57 | AV | 54 | 14.43 | 1.00 | 115 | 37.47 | 31.6 | 7.00 | 36.5 | 2.10 |
| 2 | 7236 | 51.36 | PK | 74 | 22.64 | 1.00 | 209 | 40.43 | 37.33 | 8.90 | 35.3 | 10.93 |
| 2 | 7236 | 39.35 | AV | 54 | 14.65 | 1.00 | 209 | 28.42 | 37.33 | 8.90 | 35.3 | 10.93 |

| Frequency(MHz): | | | | 2412 | | | Polarity: | | | VERTICAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4824 | 55.39 | PK | 74 | 18.61 | 1.00 | 112 | 53.29 | 31.60 | 7.00 | 36.50 | 2.10 |
| 1 | 4824 | 41.62 | AV | 54 | 12.38 | 1.00 | 112 | 39.52 | 31.60 | 7.00 | 36.50 | 2.10 |
| 2 | 7236 | 50.89 | PK | 74 | 23.11 | 1.00 | 219 | 39.96 | 37.33 | 8.90 | 35.30 | 10.93 |
| 2 | 7236 | 41.75 | AV | 54 | 12.25 | 1.00 | 219 | 30.82 | 37.33 | 8.90 | 35.30 | 10.93 |

| Frequency(MHz): | | | | 2437 | | | Polarity: | | | HORIZONTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4874.00 | 57.17 | PK | 74.00 | 16.83 | 1.00 | 229 | 55.05 | 31.02 | 7.60 | 36.5 | 2.12 |
| 1 | 4874.00 | 38.93 | AV | 54.00 | 15.07 | 1.00 | 229 | 36.81 | 31.02 | 7.60 | 36.5 | 2.12 |
| 2 | 7311.00 | 54.21 | PK | 74.00 | 19.79 | 1.00 | 142 | 43.13 | 37.28 | 8.60 | 34.8 | 11.08 |
| 2 | 7311.00 | 39.49 | AV | 54.00 | 14.51 | 1.00 | 142 | 28.41 | 37.28 | 8.60 | 34.8 | 11.08 |

| Frequency(MHz): | | 2437 | | | | | Polarity: | | | VERTICAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4874.00 | 57.49 | PK | 74.00 | 16.51 | 1.00 | 129 | 55.37 | 31.02 | 7.60 | 36.5 | 2.12 |
| 1 | 4874.00 | 40.60 | AV | 54.00 | 13.40 | 1.00 | 129 | 38.48 | 31.02 | 7.60 | 36.5 | 2.12 |
| 2 | 7311.00 | 52.63 | PK | 74.00 | 21.37 | 1.00 | 269 | 41.55 | 37.28 | 8.60 | 34.8 | 11.08 |
| 2 | 7311.00 | 40.54 | AV | 54.00 | 13.46 | 1.00 | 269 | 29.46 | 37.28 | 8.60 | 34.8 | 11.08 |

| Frequency(MHz): | | 2462 | | | | | Polarity: | | | HORIZONTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4924.00 | 59.31 | PK | 74.00 | 14.69 | 1.00 | 137 | 56.11 | 31.58 | 7.82 | 36.2 | 3.20 |
| 1 | 4924.00 | 40.64 | AV | 54.00 | 13.36 | 1.00 | 137 | 37.44 | 31.58 | 7.82 | 36.2 | 3.20 |
| 2 | 7386.00 | 55.09 | PK | 74.00 | 18.91 | 1.00 | 285 | 43.15 | 38.51 | 8.73 | 35.3 | 11.94 |
| 2 | 7386.00 | 39.42 | AV | 54.00 | 14.58 | 1.00 | 285 | 27.48 | 38.51 | 8.73 | 35.3 | 11.94 |

| Frequency(MHz): | | 2462 | | | | | Polarity: | | | VERTICAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4924.00 | 57.32 | PK | 74.00 | 16.68 | 1.00 | 138 | 54.12 | 31.58 | 7.82 | 36.2 | 3.20 |
| 1 | 4924.00 | 40.45 | AV | 54.00 | 13.55 | 1.00 | 138 | 37.25 | 31.58 | 7.82 | 36.2 | 3.20 |
| 2 | 7386.00 | 53.06 | PK | 74.00 | 20.94 | 1.00 | 257 | 41.12 | 38.51 | 8.73 | 35.3 | 11.94 |
| 2 | 7386.00 | 41.35 | AV | 54.00 | 12.65 | 1.00 | 257 | 29.41 | 38.51 | 8.73 | 35.3 | 11.94 |

***802.11g Mode (above 1GHz)***

| Frequency(MHz): | | | | 2412 | | | Polarity: | | | HORIZONTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4824 | 59.51 | PK | 74 | 14.49 | 1.00 | 96 | 57.41 | 31.6 | 7.00 | 36.5 | 2.10 |
| 1 | 4824 | 42.77 | AV | 54 | 11.23 | 1.00 | 93 | 40.67 | 31.6 | 7.00 | 36.5 | 2.10 |
| 2 | 7236 | 52.30 | PK | 74 | 21.70 | 1.00 | 132 | 41.37 | 37.33 | 8.90 | 35.3 | 10.93 |
| 2 | 7236 | 39.11 | AV | 54 | 14.89 | 1.00 | 132 | 28.18 | 37.33 | 8.90 | 35.3 | 10.93 |

| Frequency(MHz): | | | | 2412 | | | Polarity: | | | VERTICAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4824 | 59.57 | PK | 74 | 14.43 | 1.00 | 108 | 57.47 | 31.60 | 7.00 | 36.50 | 2.10 |
| 1 | 4824 | 40.72 | AV | 54 | 13.28 | 1.00 | 108 | 38.62 | 31.60 | 7.00 | 36.50 | 2.10 |
| 2 | 7236 | 53.58 | PK | 74 | 20.42 | 1.00 | 187 | 42.65 | 37.33 | 8.90 | 35.30 | 10.93 |
| 2 | 7236 | 40.39 | AV | 54 | 13.61 | 1.00 | 187 | 29.46 | 37.33 | 8.90 | 35.30 | 10.93 |

| Frequency(MHz): | | | | 2437 | | | Polarity: | | | HORIZONTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4874.00 | 58.43 | PK | 74.00 | 15.57 | 1.00 | 109 | 56.33 | 31.02 | 7.60 | 36.5 | 2.12 |
| 1 | 4874.00 | 41.22 | AV | 54.00 | 12.78 | 1.00 | 109 | 39.10 | 31.02 | 7.60 | 36.5 | 2.12 |
| 2 | 7311.00 | 53.43 | PK | 74.00 | 20.57 | 1.00 | 213 | 42.35 | 37.28 | 8.60 | 34.8 | 11.08 |
| 2 | 7311.00 | 41.29 | AV | 54.00 | 12.71 | 1.00 | 213 | 30.21 | 37.28 | 8.60 | 34.8 | 11.08 |

| Frequency(MHz): | | | | 2437 | | | Polarity: | | | VERTICAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4874.00 | 58.65 | PK | 74.00 | 15.35 | 1.00 | 59 | 56.53 | 31.02 | 7.60 | 36.5 | 2.12 |
| 1 | 4874.00 | 41.59 | AV | 54.00 | 12.41 | 1.00 | 59 | 39.47 | 31.02 | 7.60 | 36.5 | 2.12 |
| 2 | 7311.00 | 55.80 | PK | 74.00 | 18.20 | 1.00 | 238 | 44.72 | 37.28 | 8.60 | 34.8 | 11.08 |
| 2 | 7311.00 | 39.88 | AV | 54.00 | 14.12 | 1.00 | 238 | 28.80 | 37.28 | 8.60 | 34.8 | 11.08 |

| Frequency(MHz): | | | | 2462 | | | Polarity: | | | HORIZONTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4924.00 | 59.30 | PK | 74.00 | 14.70 | 1.00 | 107 | 56.10 | 31.58 | 7.82 | 36.2 | 3.20 |
| 1 | 4924.00 | 41.50 | AV | 54.00 | 12.50 | 1.00 | 107 | 38.30 | 31.58 | 7.82 | 36.2 | 3.20 |
| 2 | 7386.00 | 53.65 | PK | 74.00 | 20.35 | 1.00 | 191 | 41.71 | 38.51 | 8.73 | 35.3 | 11.94 |
| 2 | 7386.00 | 39.68 | AV | 54.00 | 14.32 | 1.00 | 191 | 27.74 | 38.51 | 8.73 | 35.3 | 11.94 |

| Frequency(MHz): | | | | 2462 | | | Polarity: | | | VERTICAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4924.00 | 59.84 | PK | 74.00 | 14.16 | 1.00 | 107 | 56.64 | 31.58 | 7.82 | 36.2 | 3.20 |
| 1 | 4924.00 | 41.26 | AV | 54.00 | 12.74 | 1.00 | 107 | 38.06 | 31.58 | 7.82 | 36.2 | 3.20 |
| 2 | 7386.00 | 54.87 | PK | 74.00 | 19.13 | 1.00 | 201 | 42.93 | 38.51 | 8.73 | 35.3 | 11.94 |
| 2 | 7386.00 | 40.83 | AV | 54.00 | 13.17 | 1.00 | 201 | 28.89 | 38.51 | 8.73 | 35.3 | 11.94 |

*802.11n HT20 Mode (above 1GHz)*

| Frequency(MHz): | | 2412 | | | | | Polarity: | | | HORIZONTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4824 | 57.75 | PK | 74 | 16.25 | 1.00 | 115 | 55.65 | 31.6 | 7.00 | 36.5 | 2.10 |
| 1 | 4824 | 40.56 | AV | 54 | 13.44 | 1.00 | 115 | 38.46 | 31.6 | 7.00 | 36.5 | 2.10 |
| 2 | 7236 | 55.40 | PK | 74 | 18.60 | 1.00 | 132 | 44.47 | 37.33 | 8.90 | 35.3 | 10.93 |
| 2 | 7236 | 40.76 | AV | 54 | 13.24 | 1.00 | 132 | 29.83 | 37.33 | 8.90 | 35.3 | 10.93 |

| Frequency(MHz): | | 2412 | | | | | Polarity: | | | VERTICAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4824 | 59.11 | PK | 74 | 14.89 | 1.00 | 123 | 57.01 | 31.60 | 7.00 | 36.50 | 2.10 |
| 1 | 4824 | 41.46 | AV | 54 | 12.54 | 1.00 | 123 | 39.36 | 31.60 | 7.00 | 36.50 | 2.10 |
| 2 | 7236 | 53.62 | PK | 74 | 20.38 | 1.00 | 259 | 42.69 | 37.33 | 8.90 | 35.30 | 10.93 |
| 2 | 7236 | 40.46 | AV | 54 | 13.54 | 1.00 | 259 | 29.53 | 37.33 | 8.90 | 35.30 | 10.93 |

| Frequency(MHz): | | 2437 | | | | | Polarity: | | | HORIZONTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4874.00 | 56.36 | PK | 74.00 | 17.64 | 1.00 | 119 | 54.24 | 31.02 | 7.60 | 36.5 | 2.12 |
| 1 | 4874.00 | 39.99 | AV | 54.00 | 14.01 | 1.00 | 119 | 37.87 | 31.02 | 7.60 | 36.5 | 2.12 |
| 2 | 7311.00 | 53.40 | PK | 74.00 | 20.60 | 1.00 | 261 | 42.32 | 37.28 | 8.60 | 34.8 | 11.08 |
| 2 | 7311.00 | 41.41 | AV | 54.00 | 12.59 | 1.00 | 261 | 30.33 | 37.28 | 8.60 | 34.8 | 11.08 |

| Frequency(MHz): | | 2437 | | | | | Polarity: | | | VERTICAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4874.00 | 59.54 | PK | 74.00 | 14.46 | 1.00 | 79 | 57.42 | 31.02 | 7.60 | 36.5 | 2.12 |
| 1 | 4874.00 | 42.49 | AV | 54.00 | 11.51 | 1.00 | 79 | 40.37 | 31.02 | 7.60 | 36.5 | 2.12 |
| 2 | 7311.00 | 53.73 | PK | 74.00 | 20.27 | 1.00 | 132 | 42.65 | 37.28 | 8.60 | 34.8 | 11.08 |
| 2 | 7311.00 | 39.81 | AV | 54.00 | 14.19 | 1.00 | 132 | 28.73 | 37.28 | 8.60 | 34.8 | 11.08 |

| Frequency(MHz): | | 2462 | | | | | Polarity: | | | HORIZONTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4924.00 | 57.61 | PK | 74.00 | 16.39 | 1.00 | 142 | 54.41 | 31.58 | 7.82 | 36.2 | 3.20 |
| 1 | 4924.00 | 40.88 | AV | 54.00 | 13.12 | 1.00 | 142 | 37.68 | 31.58 | 7.82 | 36.2 | 3.20 |
| 2 | 7386.00 | 54.72 | PK | 74.00 | 19.28 | 1.00 | 227 | 42.78 | 38.51 | 8.73 | 35.3 | 11.94 |
| 2 | 7386.00 | 41.36 | AV | 54.00 | 12.64 | 1.00 | 227 | 29.42 | 38.51 | 8.73 | 35.3 | 11.94 |

| Frequency(MHz): | | 2462 | | | | | Polarity: | | | VERTICAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor | Pre-amplifier(dB) | Correction Factor (dB/m) |
| 1 | 4924.00 | 58.05 | PK | 74.00 | 15.95 | 1.00 | 171 | 54.85 | 31.58 | 7.82 | 36.2 | 3.20 |
| 1 | 4924.00 | 40.68 | AV | 54.00 | 13.32 | 1.00 | 171 | 37.48 | 31.58 | 7.82 | 36.2 | 3.20 |
| 2 | 7386.00 | 54.73 | PK | 74.00 | 19.27 | 1.00 | 235 | 42.79 | 38.51 | 8.73 | 35.3 | 11.94 |
| 2 | 7386.00 | 41.76 | AV | 54.00 | 12.24 | 1.00 | 235 | 29.82 | 38.51 | 8.73 | 35.3 | 11.94 |

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.

# 8. 6dB Bandwidth Measurement Data

## 8.1 Test Limit

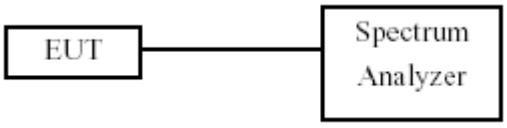
The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

## 8.2 Test Procedures

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW=100 KHz and VBW=300KHz.The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB. According to KDB558074 for one of the following procedures may be used to determine the modulated DTS device signal bandwidth.

a. Set RBW = 100 kHz.
b. Set the video bandwidth (VBW) ≥ 3 RBW.
c. Detector = Peak.
d. Trace mode = max hold.
e. Sweep = auto couple.
f. Allow the trace to stabilize.
g. 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.

## 8.3 Test Setup Layout



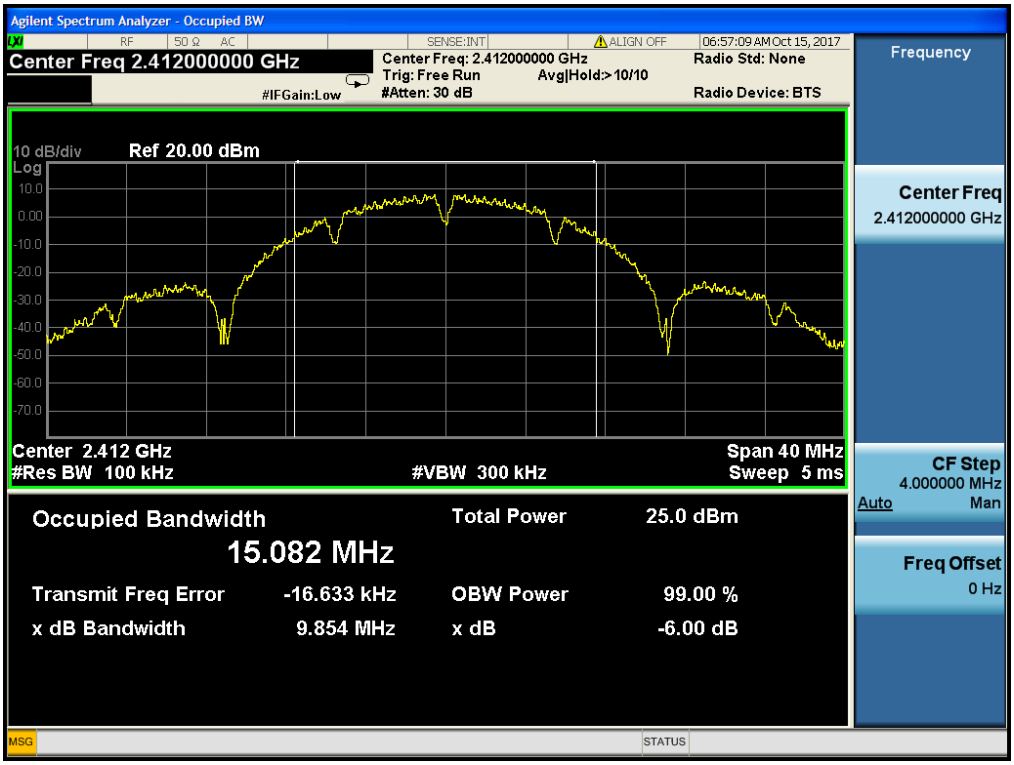
## 8.4 Test Result and Data

Test Date: Oct. 15, 2017 Temperature: 26℃

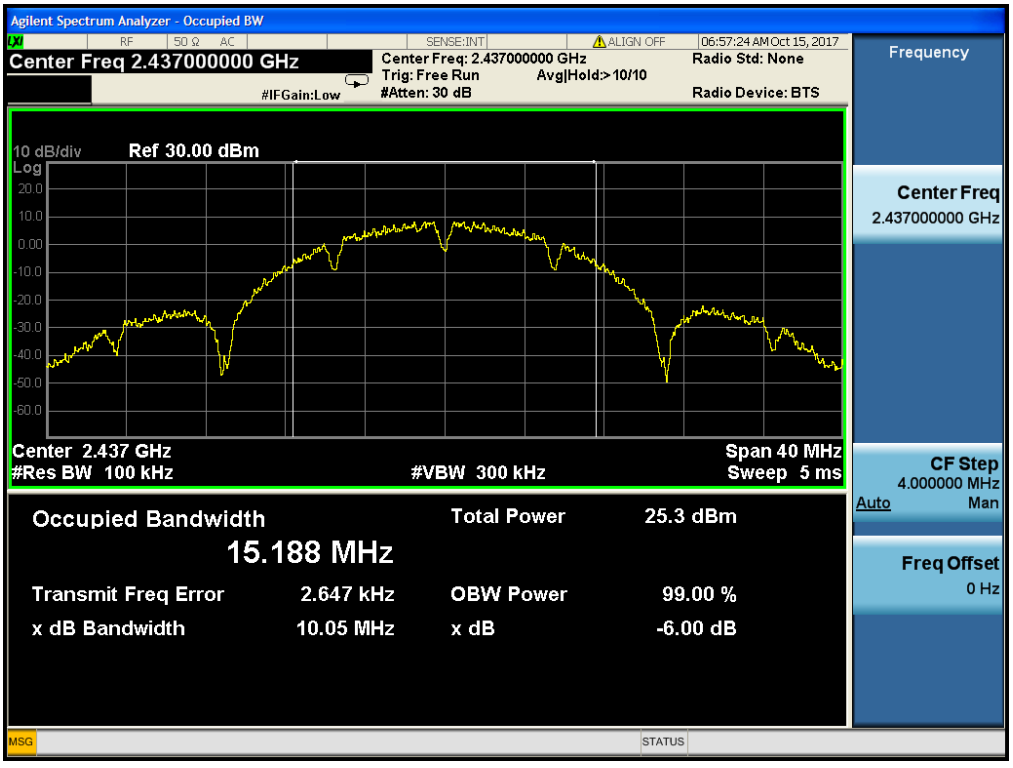
Atmospheric pressure: 996 pha Humidity: 58%

| Modulation Standard | Channel | Frequency (MHz) | 6dB Bandwidth (MHz) |
|---|---|---|---|
| 802.11b (11Mbps) | 01 | 2412 | 9.854 |
| | 06 | 2437 | 10.05 |
| | 11 | 2462 | 10.05 |
| 802.11g (6Mbps) | 01 | 2412 | 16.40 |
| | 06 | 2437 | 16.37 |
| | 11 | 2462 | 16.38 |
| 802.11n HT20 (6.5Mbps) | 01 | 2412 | 17.66 |
| | 06 | 2437 | 17.67 |
| | 11 | 2462 | 17.66 |

Modulation Standard: 802.11b (1Mbps)
Channel: 01

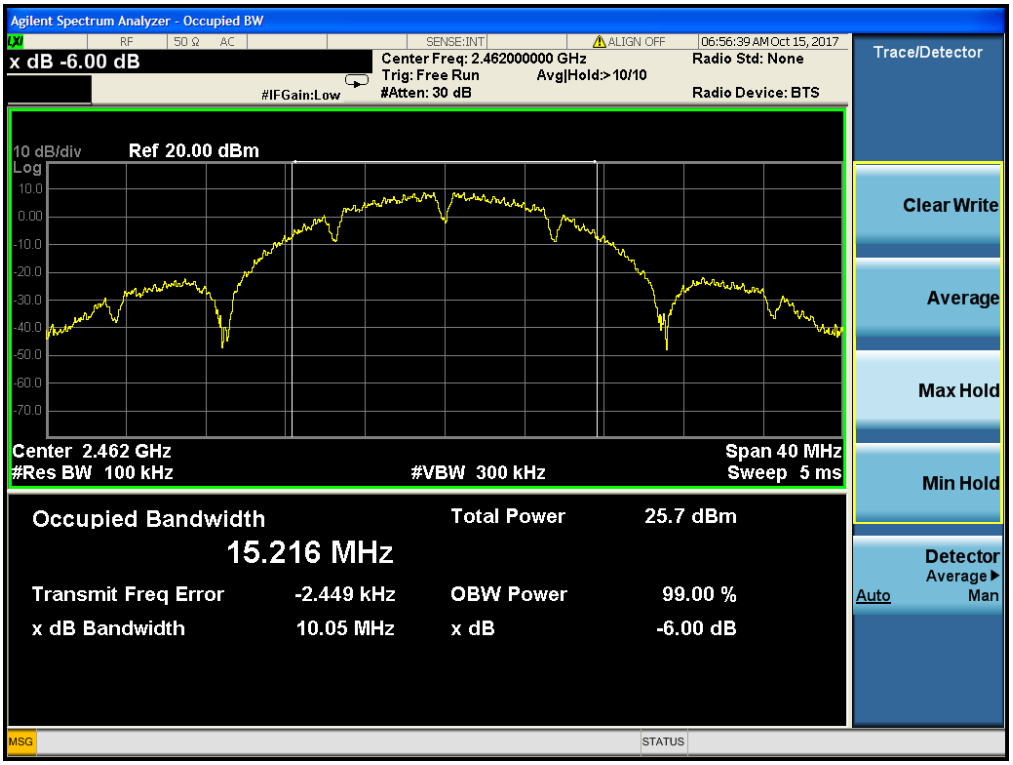



Modulation Standard: 802.11b (1Mbps)
Channel: 06

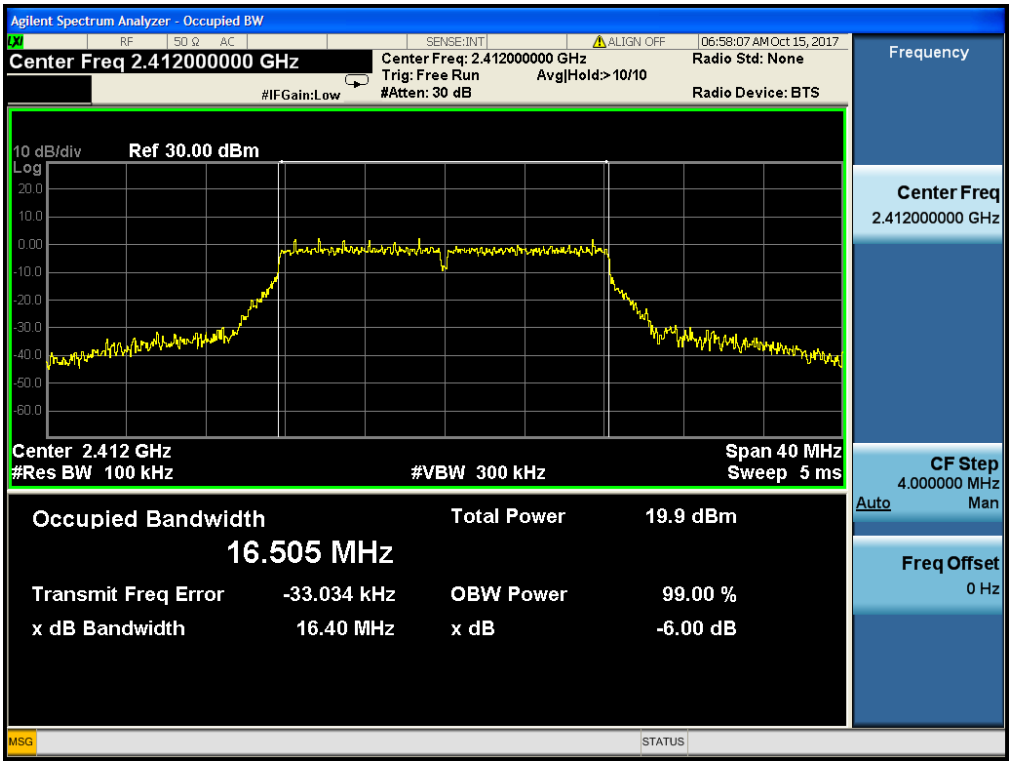



Modulation Standard: 802.11b (1Mbps)

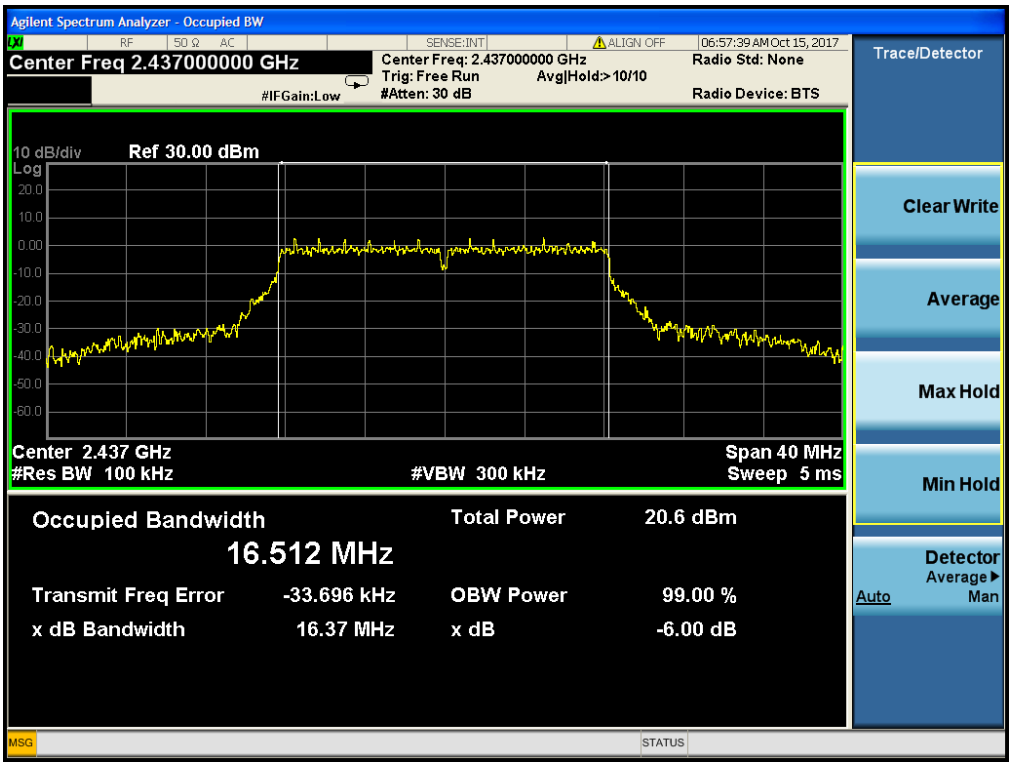
Channel: 11



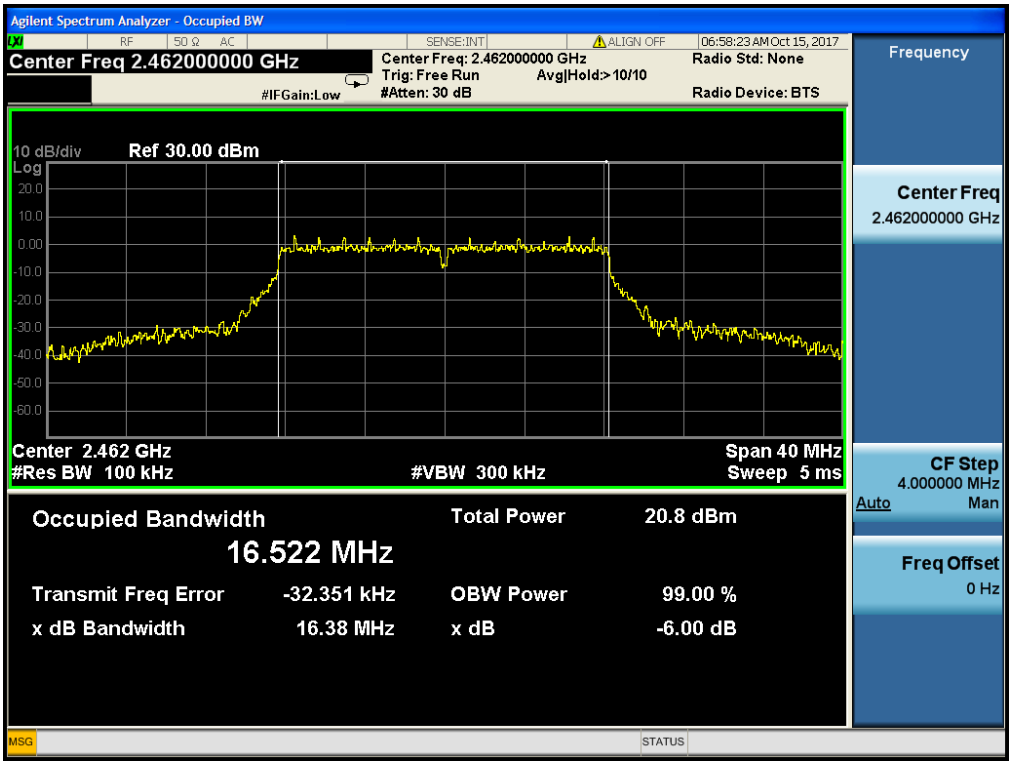

Modulation Standard: 802.11g (6Mbps)
Channel: 01



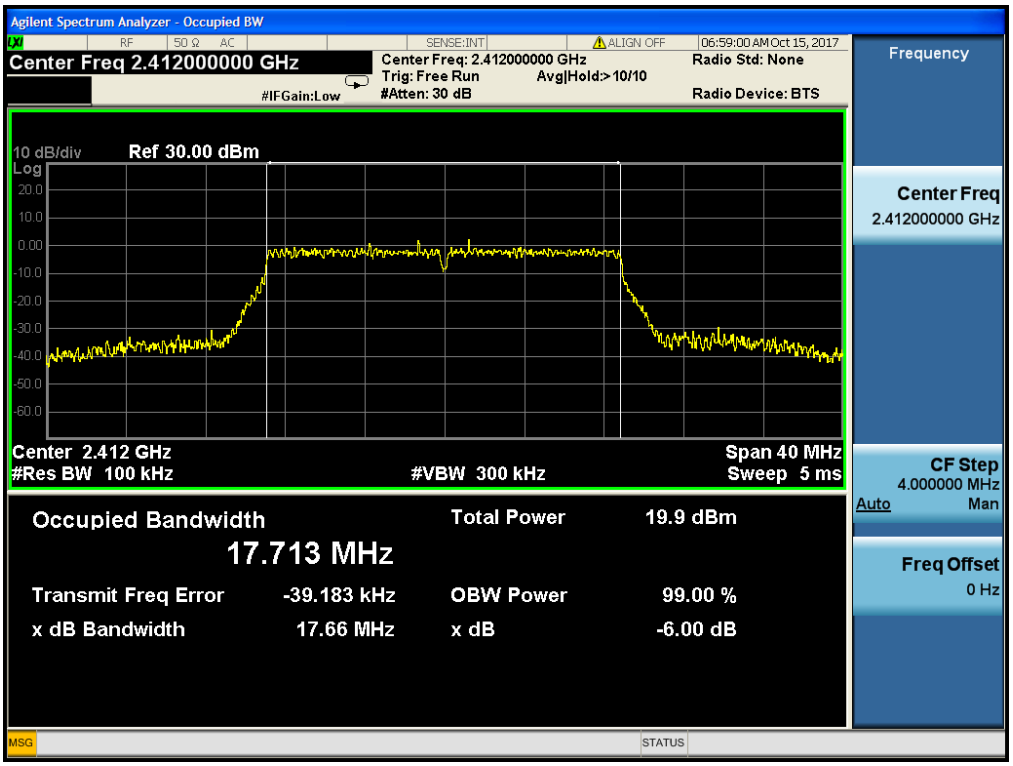

Modulation Standard: 802.11g (6Mbps)
Channel: 06



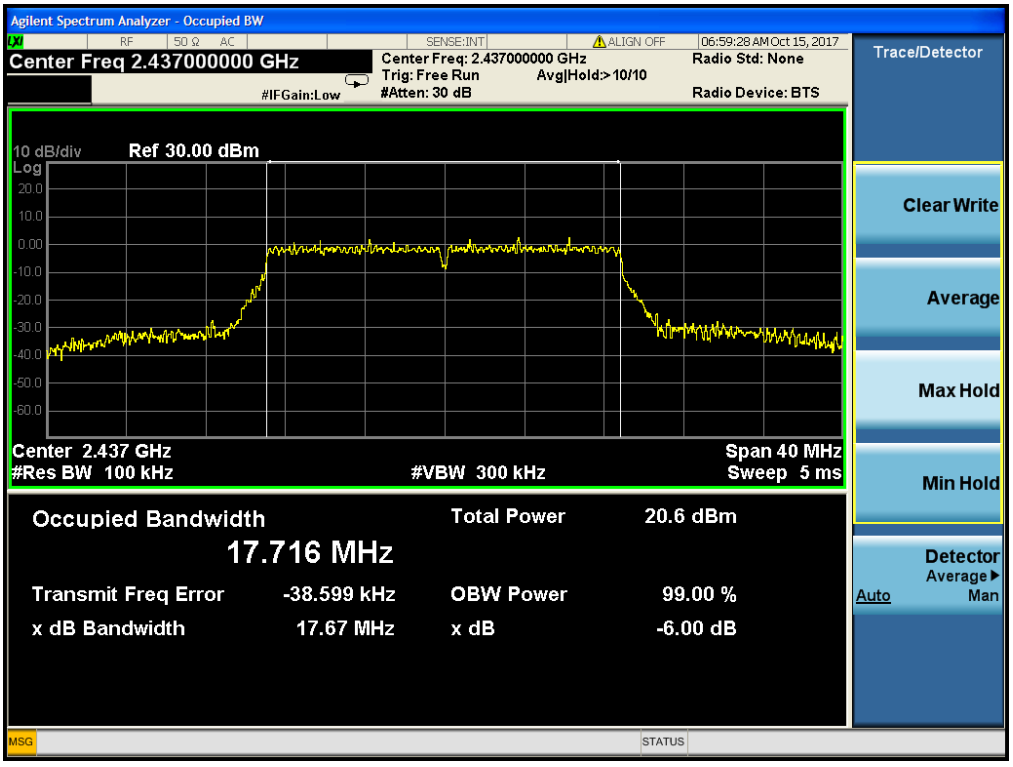

Modulation Standard: 802.11g (6Mbps)
Channel: 11



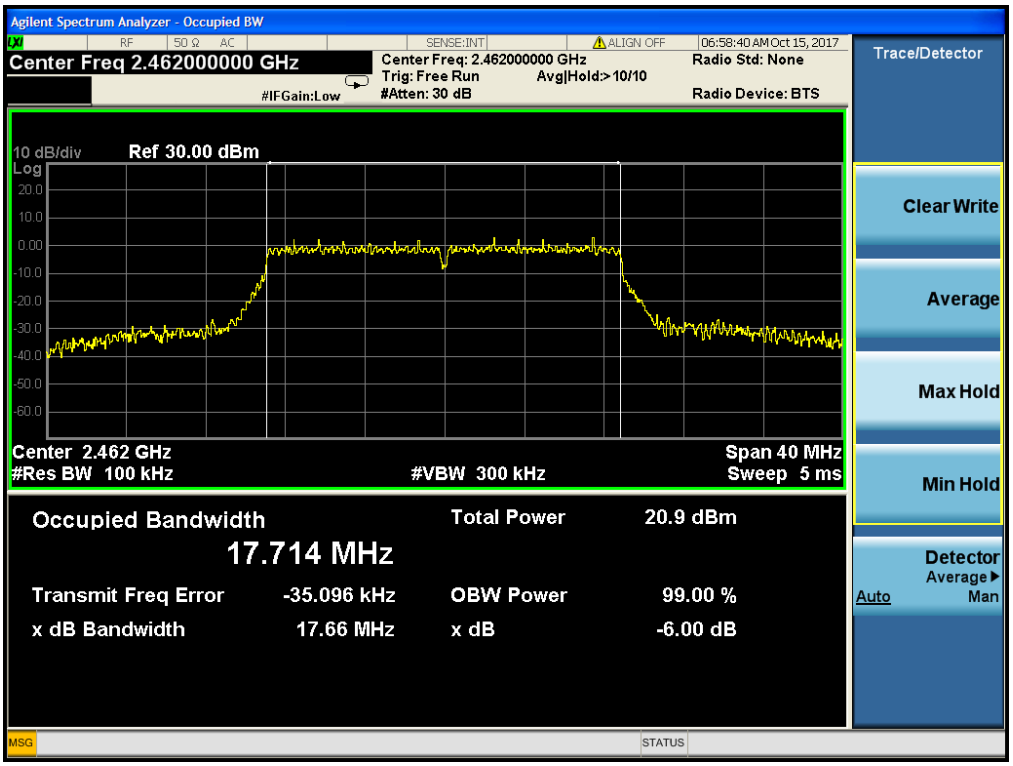

Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 01




Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 06




Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 11


Agilent Spectrum Analyzer - Occupied BW
RF
50 Ω AC
SENSE:INT
ALIGN OFF
06:58:40 AM Oct 15, 2017
Center Freq 2.462000000 GHz
Center Freq: 2.462000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
10 dB/div
Ref 30.00 dBm
Log
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Center 2.462 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 5 ms
Occupied Bandwidth
17.714 MHz
Total Power
20.9 dBm
Transmit Freq Error
-35.096 kHz
OBW Power
99.00 %
x dB Bandwidth
17.66 MHz
x dB
-6.00 dB
Clear Write
Average
Max Hold
Min Hold
Detector
Average
Auto
Man
MSG
STATUS

# 9. Maximum Peak and Average Output Power

## 9.1 Test Limit

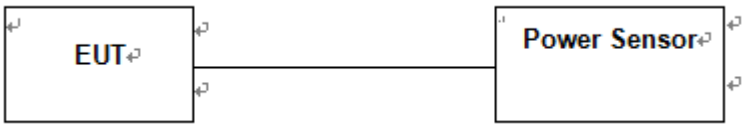
The Maximum Peak Output Power Measurement is 30dBm.

## 9.2 Test Procedures

According to KDB558074 D01 DTS Measurement Guidance Section 9.1 Maximum peak conducted output power,9.1.2. and Average conducted output power, 9.2.3.1.
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 maximum Average conducted output power may be measured using a wideband RF power meter with a thermocouple derector or equivalent. 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.

## 9.3 Test Setup Layout



## 9.4 Test Result and Data

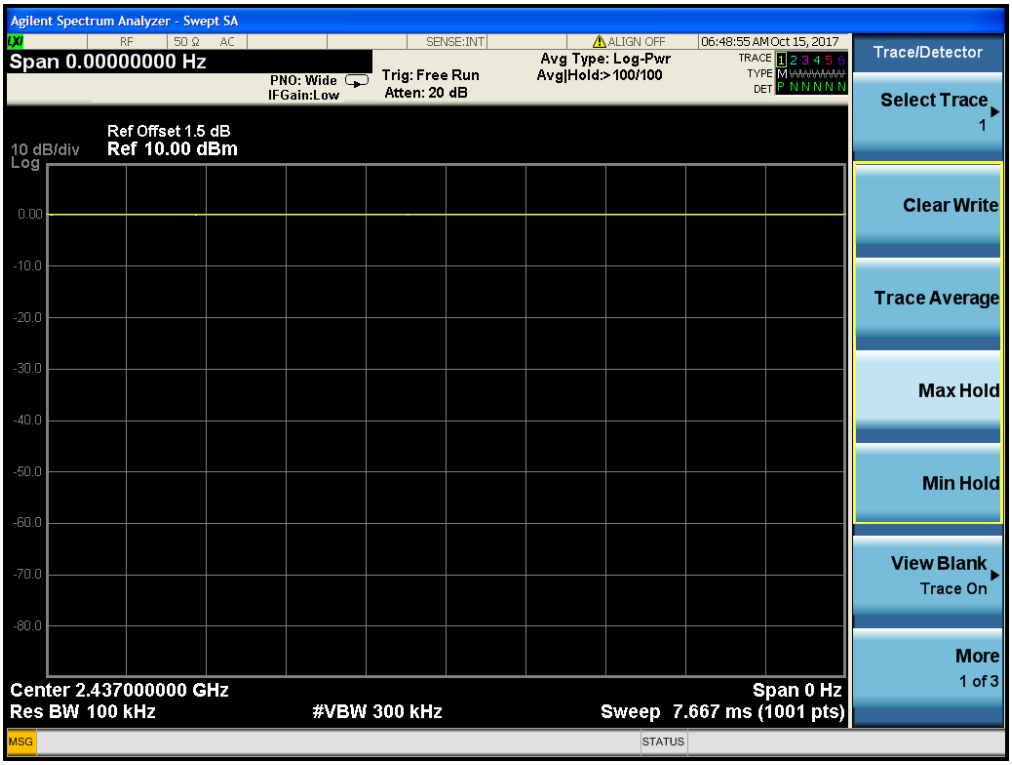
Test Date: Oct. 15, 2017 Temperature: 26℃

Atmospheric pressure: 996 pha Humidity: 58%

| Modulation Standard | Channel | Frequency (MHz) | Peak Power Output (dBm) | Output power AV (dBm) |
|---|---|---|---|---|
| 802.11b (1Mbps) | 01 | 2412 | 16.57 | 14.31 |
| | 06 | 2437 | 16.65 | 14.43 |
| | 11 | 2462 | 16.89 | 14.72 |
| 802.11g (6Mbps) | 01 | 2412 | 14.55 | 11.77 |
| | 06 | 2437 | 14.89 | 11.96 |
| | 11 | 2462 | 15.01 | 12.05 |
| 802.11n HT20 (6.5Mbps) | 01 | 2412 | 14.69 | 11.62 |
| | 06 | 2437 | 14.98 | 11.87 |
| | 11 | 2462 | 15.23 | 12.06 |

Note: 1.The test results including the cable lose.

Duty cycle used in all test items: 100%



# 10. Power Spectral Density

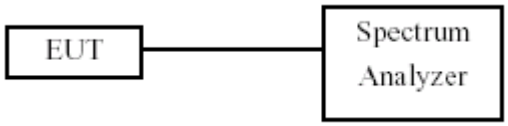
## 10.1 Test Limit

The Maximum of Power Spectral Density Measurement is 8dBm

## 10.2 Test Procedures

a. The transmitter output was connected to spectrum analyzer.
b. The spectrum analyzer's resolution bandwidth were set at 3KHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
c. The power spectral density was measured and recorded.

## 10.3 Test Setup Layout



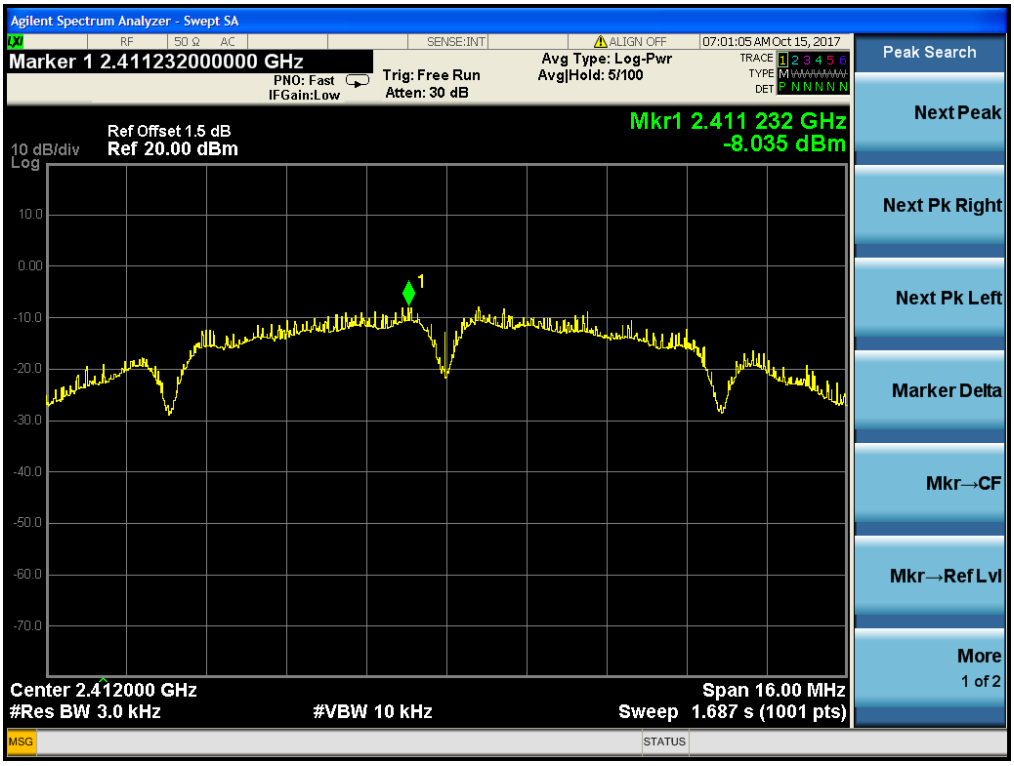
## 10.4 Test Result and Data

Test Date: Oct. 15, 2017 Temperature: 26℃

Atmospheric pressure: 996 pha Humidity: 58%

| Modulation Standard | Channel | Frequency (MHz) | Measured Power Density (dBm) |
|---|---|---|---|
| 802.11b (11Mbps) | 01 | 2412 | -8.035 |
| | 06 | 2437 | -8.424 |
| | 11 | 2462 | -8.958 |
| 802.11g (6Mbps) | 01 | 2412 | -13.065 |
| | 06 | 2437 | -12.315 |
| | 11 | 2462 | -11.793 |
| 802.11n HT20 (6.5Mbps) | 01 | 2412 | -13.452 |
| | 06 | 2437 | -11.840 |
| | 11 | 2462 | -12.446 |

Modulation Standard: 802.11b (1Mbps)
Channel: 01

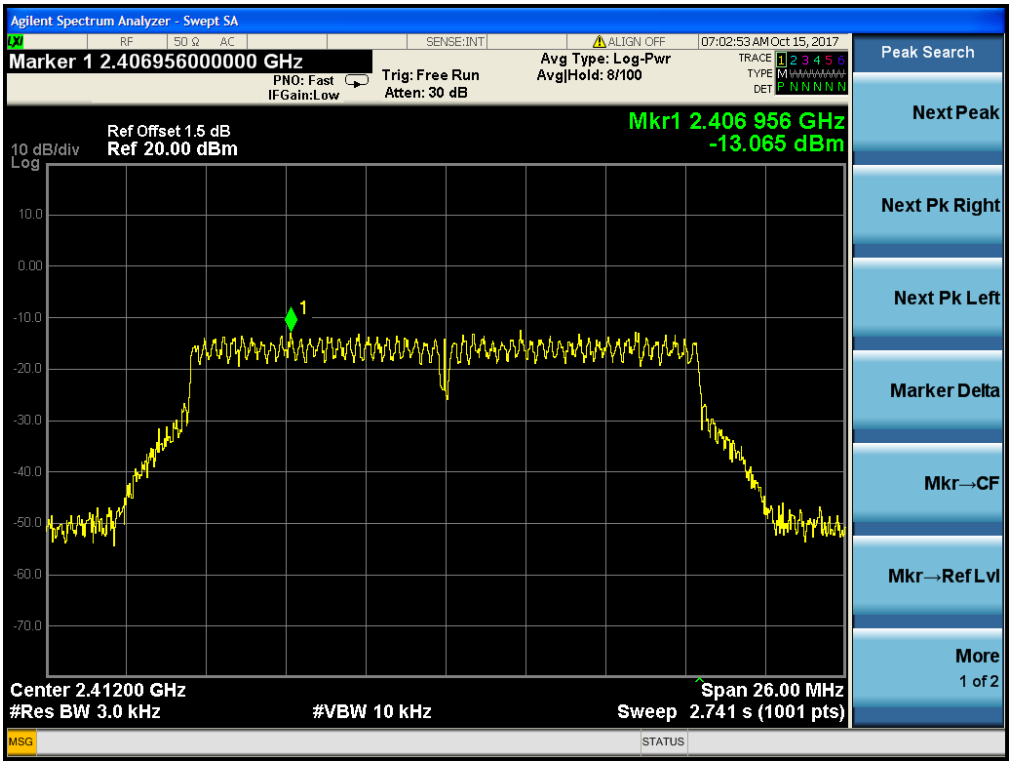



Modulation Standard: 802.11b (1Mbps)
Channel: 06

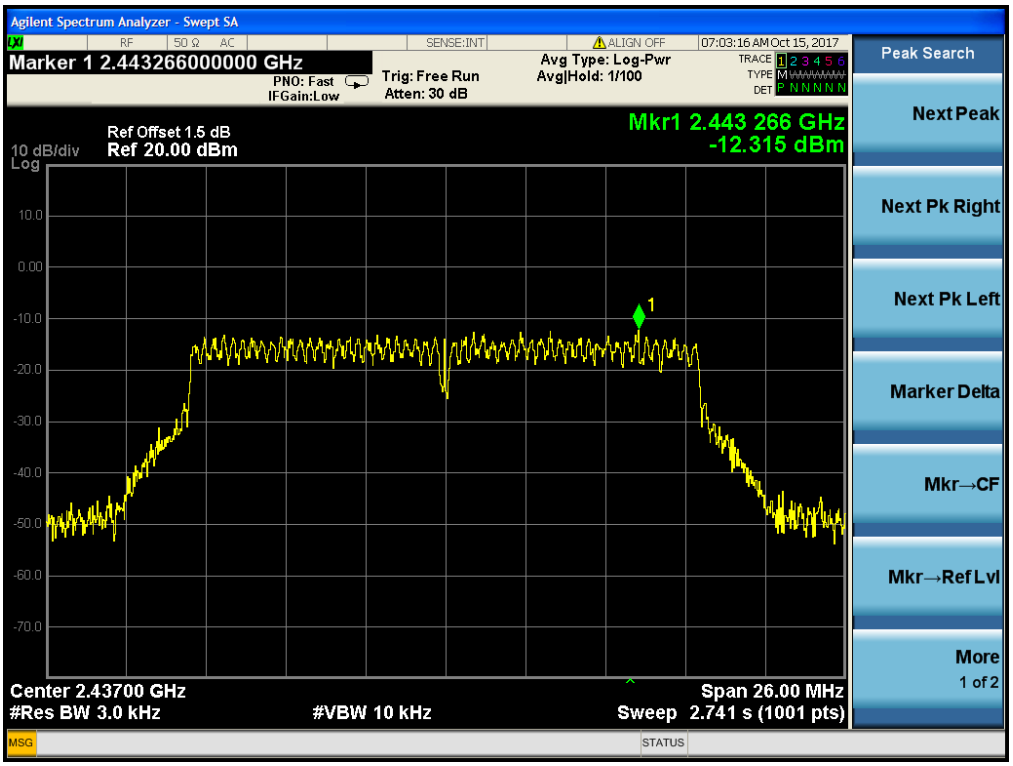

Modulation Standard: 802.11b (1Mbps)

Channel: 11

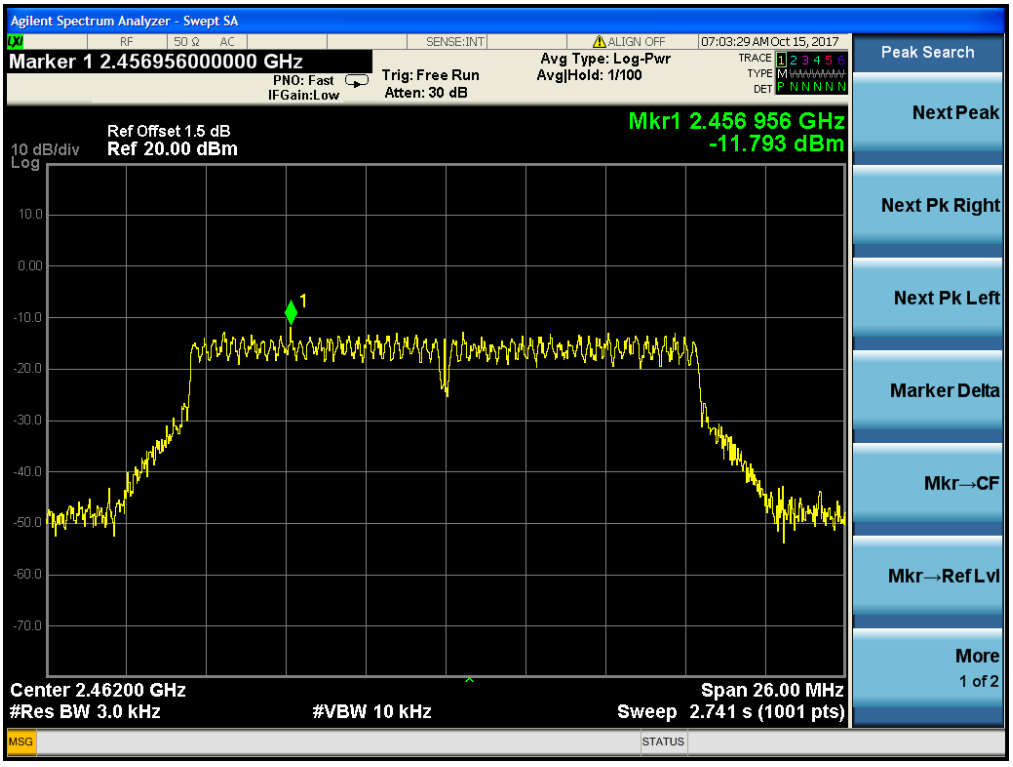

Modulation Standard: 802.11g (6Mbps)
Channel: 01



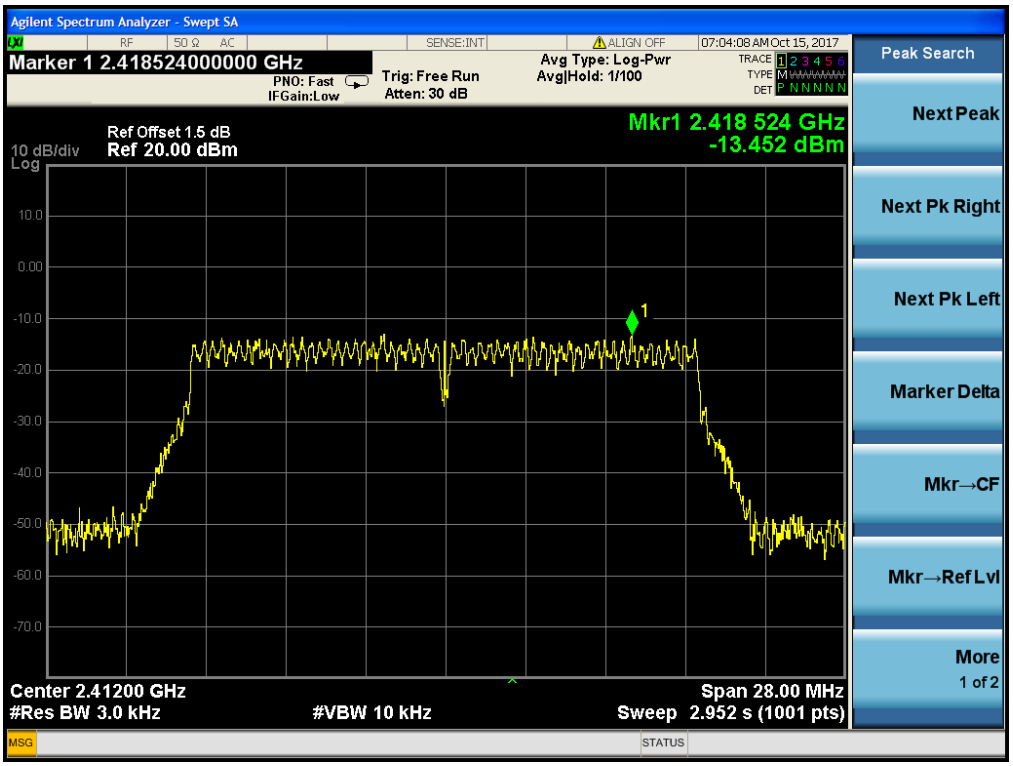

Modulation Standard: 802.11g (6Mbps)
Channel: 06



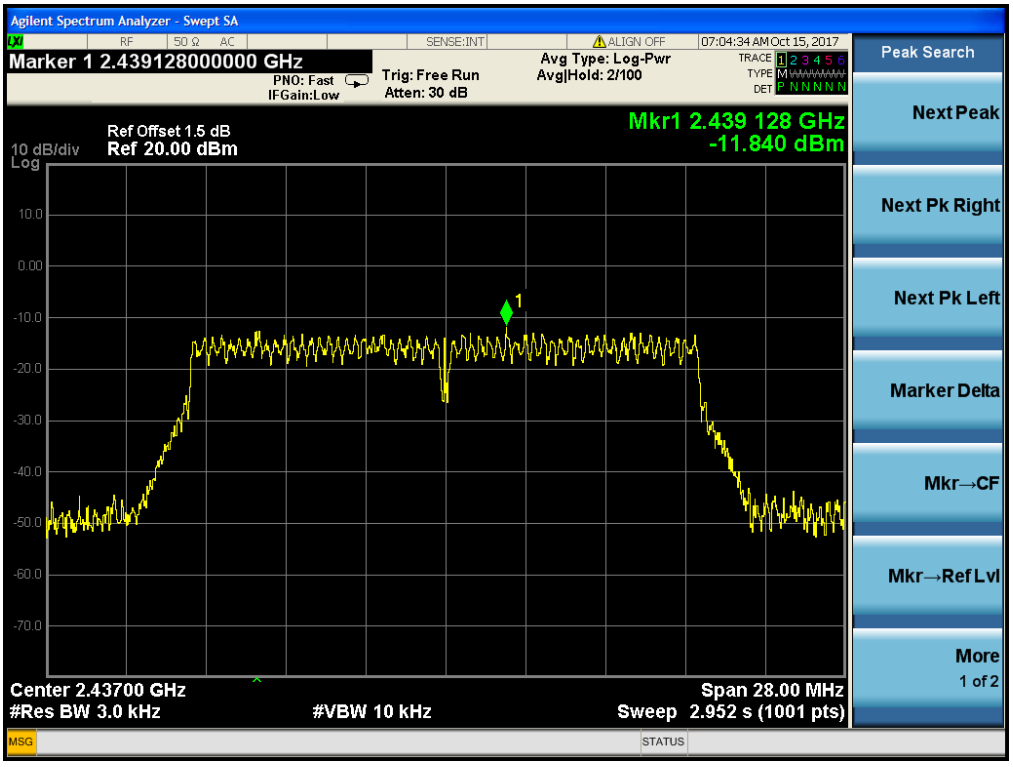

Modulation Standard: 802.11g (6Mbps)
Channel: 11



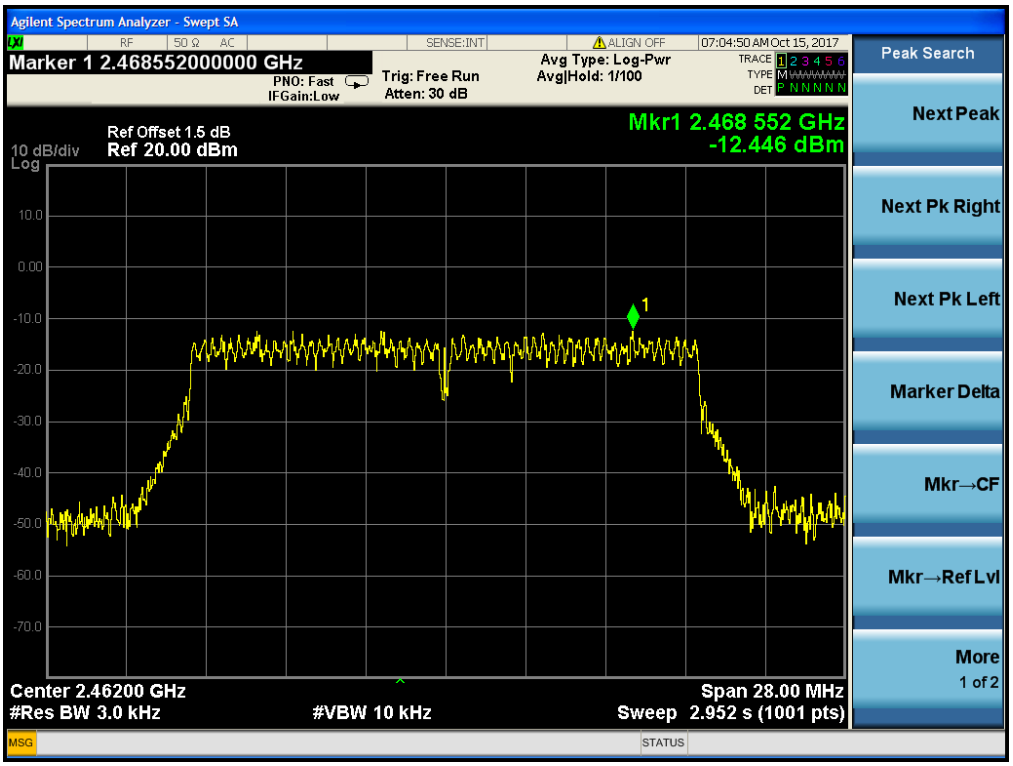

Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 01




Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 06




Modulation Standard: 802.11n HT20 (6.5Mbps)
Channel: 11


Agilent Spectrum Analyzer - Swept SA
RF
50 Ω AC
SENSE:INT
ALIGN OFF
07:04:50 AM Oct 15, 2017
Marker 1 2.468552000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 1.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.468 552 GHz
-12.446 dBm
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
1
Center 2.46200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 28.00 MHz
Sweep 2.952 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

# 11. Band Edges Measurement

## 11.1 Test Limit

Below -20dB of the highest emission level in operating band.
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).

## 11.2 Test Procedure

According to KDB 558074 D01 for Antenna-port conducted measurement. Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz for peak detector and RBW=1MHz, VBW=10Hz for average detector.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.
6. Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency (see 12.2.2, 12.2.3, and 12.2.4 for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
7. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)
8. Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).