**Shenzhen CTA Testing Technology Co., Ltd.**

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

# TEST REPORT

**FCC Part 15C**

| | |
|---|---|
| **Report Reference No.....:** | **CTA240709105** |
| **FCC ID. .....:** | **2BHLL-V22** |
| Compiled by ( position+printed name+signature).....: | File administrators Zoey Cao |
| Supervised by ( position+printed name+signature).....: | Project Engineer Amy Wen |
| Approved by ( position+printed name+signature).....: | RF Manager Eric Wang |
| Date of issue .....: | 2024-07-15 |

| | |
|---|---|
| **Testing Laboratory Name**.....: | **Shenzhen CTA Testing Technology Co., Ltd.** |
| Address .....: | Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China |

| | |
|---|---|
| **Applicant's name**.....: | **Shenzhen Chuanghongyu Technology Co., Ltd** |
| Address .....: | 301 Jinjin Building, No. 242 Jihua Road, Jihua Street, Longgang District, Shenzhen,Guangdong,China |

| | |
|---|---|
| **Test specification** .....: | |
| Standard.....: | **FCC Part 15C** |

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| | |
|---|---|
| **Test item description .....:** | Dash camera,Car Dvr |
| Trade Mark.....: | / |
| **Manufacturer**.....: | **Shenzhen Chuanghongyu Technology Co., Ltd** |
| Model/Type reference.....: | V22 |
| Listed Models .....: | V21，V26A，V26B，K04，S5 |
| Ratings .....: | DC5V, 2A from Car charging |
| Result .....: | **PASS** |

# TEST REPORT

| | | |
|---|---|---|
| Equipment under Test | : | Dash camera,Car Dvr |
| Model /Type | : | V22 |
| Listed Models | : | V21，V26A，V26B，K04，S5 |
| **Applicant** | : | **Shenzhen Chuanghongyu Technology Co., Ltd** |
| Address | : | 301 Jinjin Building, No. 242 Jihua Road, Jihua Street, Longgang District, Shenzhen,Guangdong,China |
| **Manufacturer** | : | **Shenzhen Chuanghongyu Technology Co., Ltd** |
| Address | : | 301 Jinjin Building, No. 242 Jihua Road, Jihua Street, Longgang District, Shenzhen,Guangdong,China |

| **Test result** | **Pass *** |
|---|---|

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# 1. TEST STANDARDS AND REPORT VERSION

## 1.1. Test Standards

The tests were performed according to following standards:

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 forTesting Unlicensed Wireless Devices

KDB 558074 D01 DTS Meas Guidance v05: Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating under Section 15.247 of The FCC Rules

## 1.2. Test Description

| Test Item | FCC Rule | Result |
|---|---|---|
| Antenna requirement | 15.203/15.247(c) | PASS |
| Line Conducted Emissions (AC Main) | 15.207 | PASS |
| Conducted Peak Output Power | 15.247(b)(3) | PASS |
| Power Spectral Density | 15.247(e) | PASS |
| 6dB Bandwidth | 15.247(a)(2) | PASS |
| Restricted band | 15.247(d)/15.205 | PASS |
| Spurious Emissions | 15.247(d)/15.209 | PASS |

## 1.3. Address of the test laboratory

**Shenzhen CTA Testing Technology Co., Ltd.**
Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community,Fuhai Street, Bao'an District, Shenzhen, China

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

## 1.4. Test Facility

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

**FCC-Registration No.: 517856 Designation Number: CN1318**
Shenzhen CTA Testing Technology Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

**A2LA-Lab Cert. No.: 6534.01**
Shenzhen CTA Testing Technology Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

**ISED#: 27890 CAB identifier: CN0127**
Shenzhen CTA Testing Technology Co., Ltd. has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

## 1.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01"Electromagnetic

compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 1"and TR-100028-02 "Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen Global Test Service Co.,Ltd.quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Global Test Service Co.,Ltd.is reported:

| Test | Range | Measurement Uncertainty | Notes |
|---|---|---|---|
| Radiated Emission | 30~1000MHz | 4.10 dB | (1) |
| Radiated Emission | 1~18GHz | 4.32 dB | (1) |
| Radiated Emission | 18-40GHz | 5.54 dB | (1) |
| Conducted Disturbance | 0.15~30MHz | 3.12 dB | (1) |
| Conducted Power | 9KHz~18GHz | 0.61 dB | (1) |
| Spurious RF Conducted Emission | 9KHz~40GHz | 1.22 dB | (1) |
| Band Edge Compliance of RF Emission | 9KHz~40GHz | 1.22 dB | (1) |
| Occupied Bandwidth | 9KHz~40GHz | - | (1) |

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

# 2. GENERAL INFORMATION

## 2.1. General Remarks

| | | |
|---|---|---|
| Date of receipt of test sample | : | 2024.07.09 |
| | | |
| Testing commenced on | : | 2024.07.10 |
| | | |
| Testing concluded on | : | 2024.07.15 |

## 2.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|---|---|
| Normal Temperature: | 25°C |
| Relative Humidity: | 55 % |
| Air Pressure: | 101 kPa |

## 2.3. General Description of EUT

| | |
|---|---|
| Name of EUT | Dash camera,Car Dvr |
| Model Number | V22, V21，V26A，V26B，K04，S5 |
| Power Supply | DC5V, 2A from Car charging |
| Frequency Range | 2412MHz~2462MHz for 802.11b/802.11g/802.11n(HT20)<br>2422MHz~2452MHz for 802.11n(HT40) |
| Channel number: | 11 for 802.11b/802.11g/802.11n(HT20)<br>7 for 802.11n(HT40) |
| Modulation Type | DSSS for 802.11b<br>OFDM for 802.11g/802.11n(HT20)/802.11n(HT40) |
| Channel separation: | 5MHz |
| Antenna Type | Pcb antenna |
| Antenna Gain | -1.0dBi |
| Sample ID: | CTA240709105-1 |

Note: For more details, refer to the user's manual of the EUT.

## 2.4. Operation state

➢ **Test frequency list**

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

| 802.11b/g/n(HT20) | | 802.11n(HT40) | |
|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 01 | 2412 | 01 | - |
| 02 | 2417 | 02 | - |
| 03 | 2422 | 03 | 2422 |
| 04 | 2427 | 04 | 2427 |
| 05 | 2432 | 05 | 2432 |
| 06 | 2437 | 06 | 2437 |
| 07 | 2442 | 07 | 2442 |
| 08 | 2447 | 08 | 2447 |
| 09 | 2452 | 09 | 2452 |

| | | | |
|---|---|---|---|
| 10 | 2457 | 10 | - |
| 11 | 2462 | 11 | - |

➢ **Test mode**

| For RF test items |
|---|
| The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%). |
| For AC power line conducted emissions: |
| The EUT was set to connect with the WLAN AP under large package sizes transmission. |
| For Radiated suprious emissions test item: |
| The engineering test program was provided and enabled to make EUT continuous transmit(duty cycle>98%). The EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data Recorded in the report. |

## 2.5. Equipments Used during the Test

| Test Equipment | Manufacturer | Model No. | Serial No. | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|
| LISN | R&S | ENV216 | 3560.6550.08 | 2023/09/19 | 2024/09/18 |
| LISN | R&S | ESH2-Z5 | 893606/008 | 2023/09/19 | 2024/09/18 |
| EMI Test Receiver | R&S | ESPI3 | 101841-cd | 2023/09/19 | 2024/09/18 |
| EMI Test Receiver | R&S | ESCI7 | 101102 | 2023/09/19 | 2024/09/18 |
| Spectrum Analyzer | Agilent | N9020A | MY48010425 | 2023/09/19 | 2024/09/18 |
| Spectrum Analyzer | R&S | FSV40 | 100019 | 2023/09/19 | 2024/09/18 |
| Vector Signal generator | Agilent | N5181A | MY49060502 | 2023/09/19 | 2024/09/18 |
| Signal generator | Agilent | E4421B | 3610AO1069 | 2023/09/19 | 2024/09/18 |
| Climate Chamber | ESPEC | EL-10KA | A20120523 | 2023/09/19 | 2024/09/18 |
| Controller | EM Electronics | Controller EM 1000 | N/A | N/A | N/A |
| Horn Antenna | Schwarzbeck | BBHA 9120D | 01622 | 2023/09/19 | 2024/09/18 |
| Active Loop Antenna | Beijing Da Ze Technology Co.,Ltd. | ZN30900C | 15006 | 2023/09/19 | 2024/09/18 |
| Bilog Antenna | Schwarzbeck | VULB9163 | 000976 | 2023/09/19 | 2024/09/18 |
| Broadband Horn Antenna | SCHWARZBECK | BBHA 9170 | 791 | 2023/09/19 | 2024/09/18 |
| Amplifier | Schwarzbeck | BBV 9743 | #202 | 2023/09/19 | 2024/09/18 |
| Amplifier | Schwarzbeck | BBV9179 | 9719-025 | 2023/09/19 | 2024/09/18 |
| Amplifier | EMCI | EMC051845B | 980355 | 2023/09/19 | 2024/09/18 |
| Temperature/Humidity Meter | Gangxing | CTH-608 | 02 | 2023/09/19 | 2024/09/18 |
| High-Pass Filter | K&L | 9SH10-2700/X12750-O/O | KL142031 | 2023/09/19 | 2024/09/18 |
| High-Pass Filter | K&L | 41H10-1375/U12750-O/O | KL142032 | 2023/09/19 | 2024/09/18 |
| RF Cable(below 1GHz) | HUBER+SUHNER | RG214 | RE01 | 2023/09/19 | 2024/09/18 |
| RF Cable(above 1GHz) | HUBER+SUHNER | RG214 | RE02 | 2023/09/19 | 2024/09/18 |
| Data acquisition card | Agilent | U2531A | TW53323507 | 2023/09/19 | 2024/09/18 |
| Power Sensor | Agilent | U2021XA | MY5365004 | 2023/09/19 | 2024/09/18 |
| Test Control Unit | Tonscend | JS0806-1 | 178060067 | 2023/09/19 | 2024/09/18 |
| Automated filter bank | Tonscend | JS0806-F | 19F8060177 | 2023/09/19 | 2024/09/18 |
| Radio Communication | HP | 8920A | 116250 | 2023/09/19 | 2024/09/18 |

| | | | | | |
|---|---|---|---|---|---|
| Tester | | | | | |
| EMI Test Software | Tonscend | JS1120-1 | Ver 2.6.8.0518 | / | / |
| EMI Test Software | Tonscend | JS1120-3 | Ver 2.5.77.0418 | / | / |
| EMI Test Software | Tonscend | JS32-CE | Ver 2.5 | / | / |
| EMI Test Software | Tonscend | JS32-RE | Ver 2.5.1.8 | / | / |

Note: The Cal.Interval was one year.

## 2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for filing to comply with Section 15.247 of the FCC Part 15, Subpart C rules.

## 2.7. Modifications

No modifications were implemented to meet testing criteria.

## 2.8. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|---|---|
| Temperature: | 15~35°C |
| Relative Humidity: | 30~60 % |
| Air Pressure: | 950~1050mba |

# 3. TEST CONDITIONS AND RESULTS

## 3.1. Antenna requirement

**REQUIREMENT:**

**FCC CFR Title 47 Part 15 Subpart C 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. The use of a permanently attached antenna or of anantenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

**FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):**

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

**TEST RESULTS**

☒ **Passed** ☐ **Not Applicable**

The directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.

## 3.2. Conducted Emissions (AC Main)

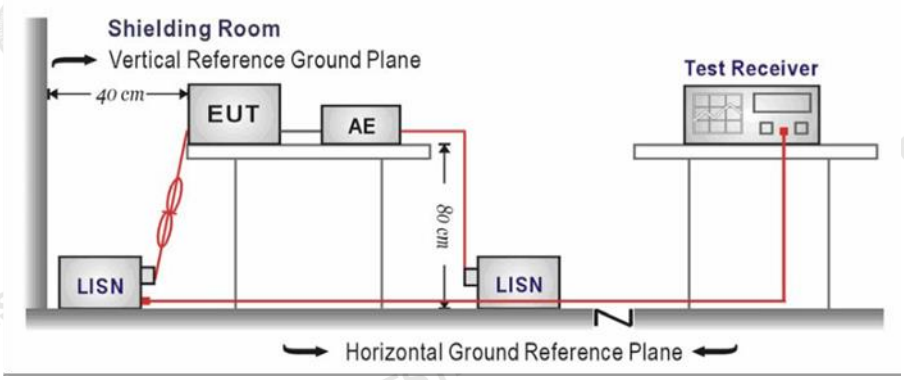
**LIMIT**

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

| Frequency range (MHz) | Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

* Decreases with the logarithm of the frequency.

**TEST CONFIGURATION**




**TEST PROCEDURE**

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor,was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

**TEST MODE:**

Please refer to the clause 3.3

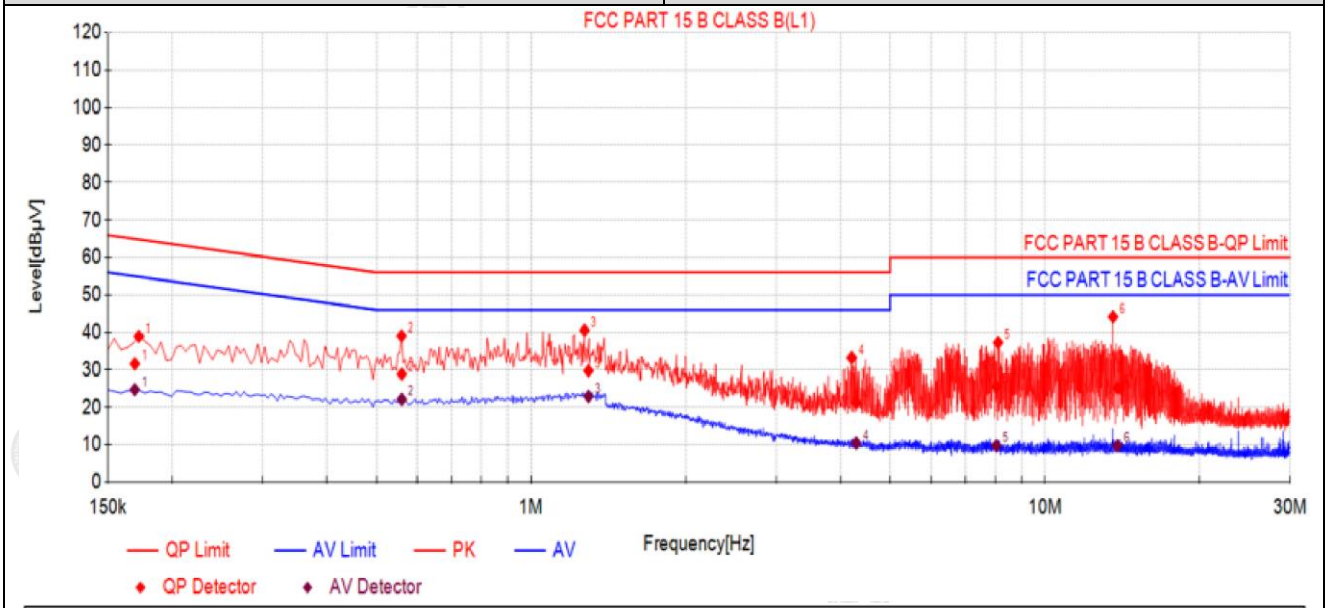
**TEST RESULTS**

☒ **Passed** ☐ **Not Applicable**

Note:

1) Transd=Cable lose+ Pulse Limiter Factor + Artificial Mains Factor
2) Margin= Limit -Level

| Test Line: | L |
|---|---|

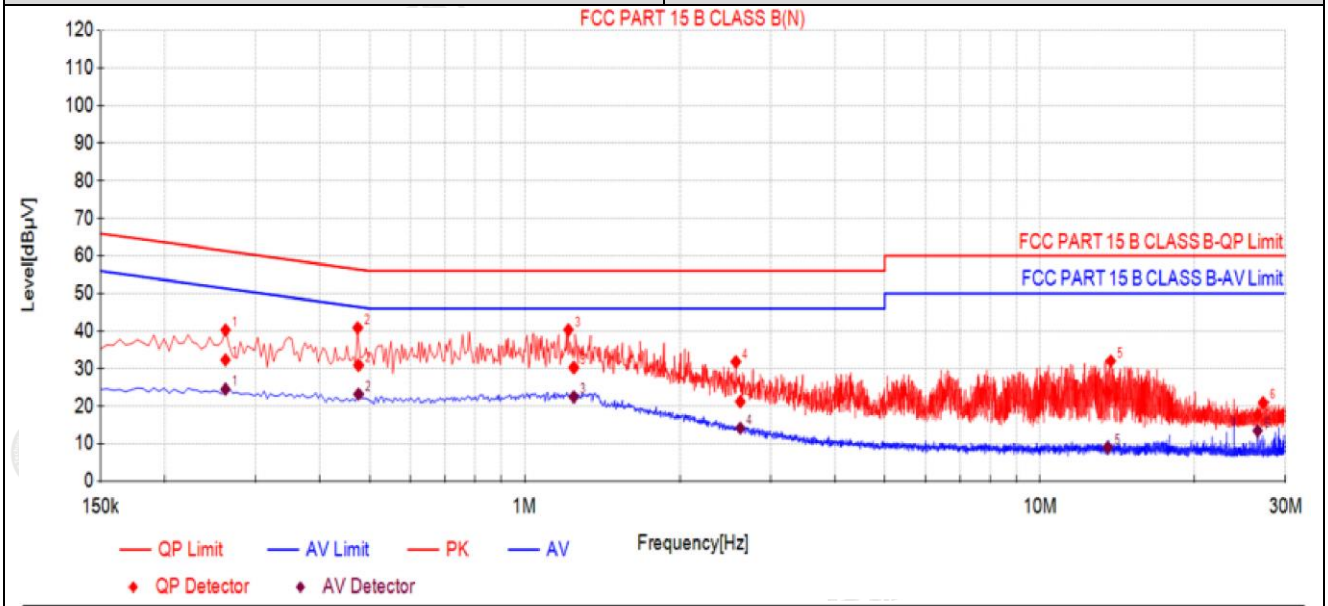



## Final Data List

| NO. | Freq. [MHz] | Factor [dB] | QP Reading[dBµV] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Reading [dBµV] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.1694 | 10.50 | 21.13 | 31.63 | 64.99 | 33.36 | 14.20 | 24.70 | 54.99 | 30.29 | PASS |
| 2 | 0.5601 | 10.50 | 18.38 | 28.88 | 56.00 | 27.12 | 11.63 | 22.13 | 46.00 | 23.87 | PASS |
| 3 | 1.2935 | 10.50 | 19.25 | 29.75 | 56.00 | 26.25 | 12.40 | 22.90 | 46.00 | 23.10 | PASS |
| 4 | 4.2944 | 10.50 | 10.74 | 21.24 | 56.00 | 34.76 | -0.03 | 10.47 | 46.00 | 35.53 | PASS |
| 5 | 8.0456 | 10.50 | 14.98 | 25.48 | 60.00 | 34.52 | -0.75 | 9.75 | 50.00 | 40.25 | PASS |
| 6 | 13.8477 | 10.50 | 14.64 | 25.14 | 60.00 | 34.86 | -0.76 | 9.74 | 50.00 | 40.26 | PASS |

Note:1).QP Value (dBµV)= QP Reading (dBµV)+ Factor (dB)
2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)
3). QPMargin(dB) = QP Limit (dBµV) - QP Value (dBµV)
4). AVMargin(dB) = AV Limit (dBµV) - AV Value (dBµV)

| Test Line: | N |
|---|---|




## Final Data List

| NO. | Freq. [MHz] | Factor [dB] | QP Reading[dBµV] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Reading [dBµV] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.2624 | 10.50 | 21.84 | 32.34 | 61.35 | 29.01 | 14.04 | 24.54 | 51.35 | 26.81 | PASS |
| 2 | 0.4758 | 10.50 | 20.43 | 30.93 | 56.41 | 25.48 | 12.70 | 23.20 | 46.41 | 23.21 | PASS |
| 3 | 1.2455 | 10.50 | 19.79 | 30.29 | 56.00 | 25.71 | 11.98 | 22.48 | 46.00 | 23.52 | PASS |
| 4 | 2.6209 | 10.50 | 10.73 | 21.23 | 56.00 | 34.77 | 3.68 | 14.18 | 46.00 | 31.82 | PASS |
| 5 | 13.5525 | 10.50 | 13.27 | 23.77 | 60.00 | 36.23 | -1.49 | 9.01 | 50.00 | 40.99 | PASS |
| 6 | 26.4882 | 10.50 | 7.22 | 17.72 | 60.00 | 42.28 | 2.97 | 13.47 | 50.00 | 36.53 | PASS |

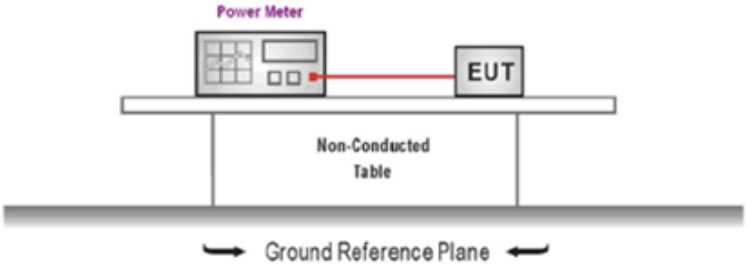
Note:1).QP Value (dBµV)= QP Reading (dBµV)+ Factor (dB)
2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)
3). QPMargin(dB) = QP Limit (dBµV) - QP Value (dBµV)
4). AVMargin(dB) = AV Limit (dBµV) - AV Value (dBµV)

## 3.3. Conducted Peak Output Power

**LIMIT**

**FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3):** 30dBm

**TEST CONFIGURATION**




**TEST PROCEDURE**

1. The EUT was tested according to ANSI C63.10: 2013 and KDB 558074 D01 for compliance to FCC 47 CFR 15.247 requirements.
2. The maximum peak conducted output power may be measured using a broadband peak RF power meter.
3. 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
4. Record the measurement data.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS**

☒ **Passed** ☐ **Not Applicable**

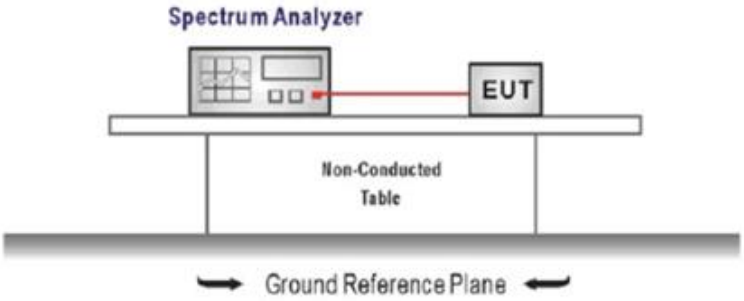
| Type | Channel | Peak Output power (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| 802.11b | 01 | 17.65 | ≤30.00 | Pass |
| | 06 | 17.74 | | |
| | 11 | 18.48 | | |
| 802.11g | 01 | 17.19 | ≤30.00 | Pass |
| | 06 | 17.24 | | |
| | 11 | 17.47 | | |
| 802.11n(HT20) | 01 | 16.28 | ≤30.00 | Pass |
| | 06 | 16.60 | | |
| | 11 | 16.91 | | |
| 802.11n(HT40) | 03 | 15.71 | ≤30.00 | Pass |
| | 06 | 15.55 | | |
| | 09 | 15.79 | | |

## 3.4. Power Spectral Density

**LIMIT**

**FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e):**For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

**TEST CONFIGURATION**




**TEST PROCEDURE**

1. Connect the antenna port(s) to the spectrum analyzer input,
2. Configure the spectrum analyzer as shown below:
   Center frequency=DTS channel center frequency
   Span =1.5 times the DTS bandwidth
   RBW = 3 kHz ≤ RBW ≤ 100 kHz, VBW ≥ 3 × RBW
   Sweep time = auto couple
   Detector = peak
   Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. Use the peak marker function to determine the maximum amplitude level within the RBW.
5. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

**TEST MODE:**

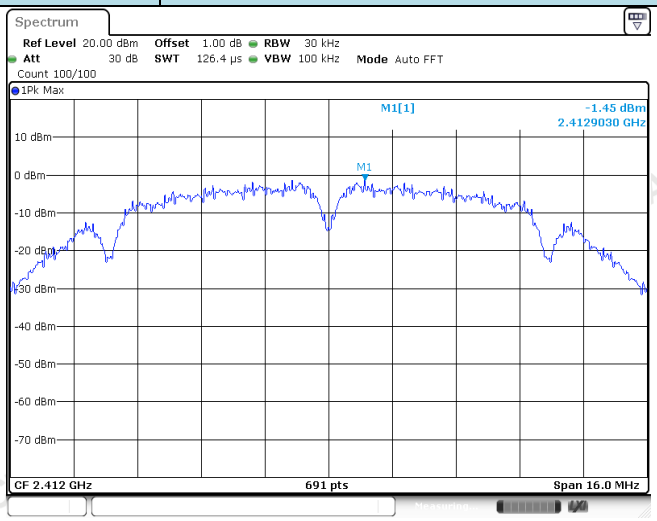
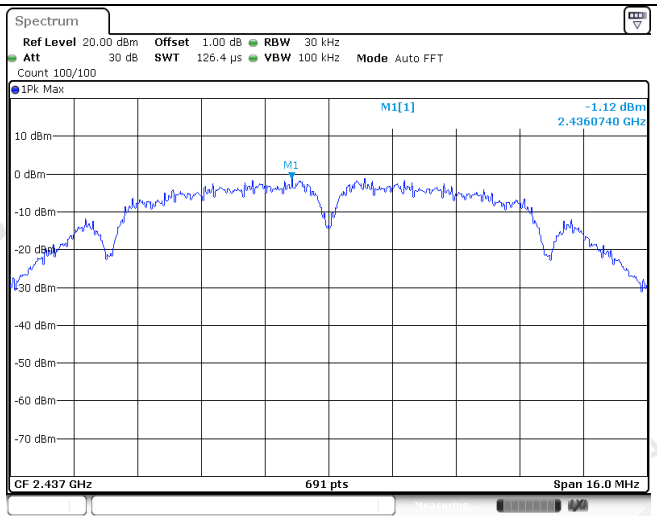
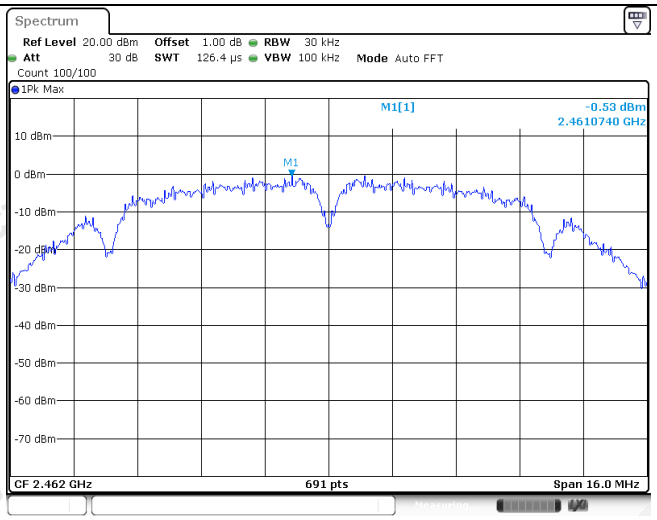
Please refer to the clause 3.3

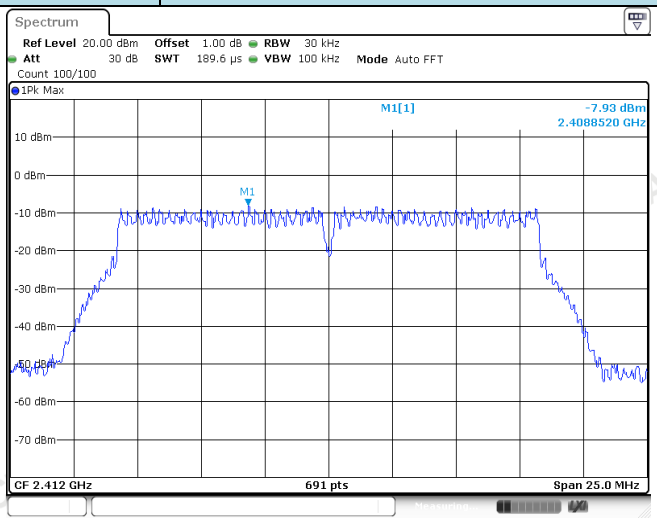
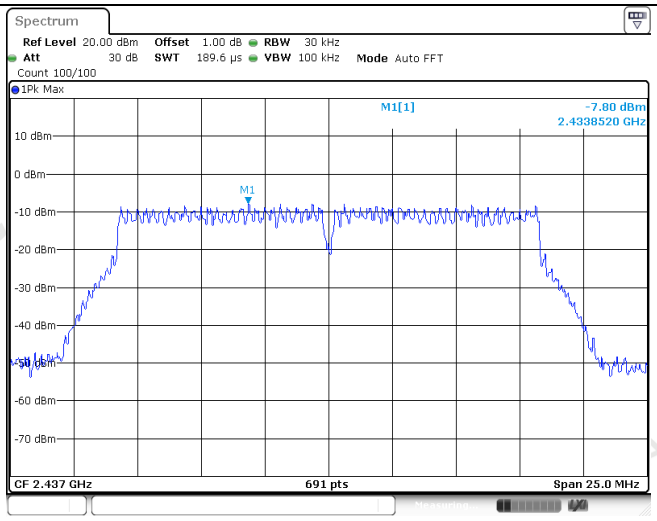
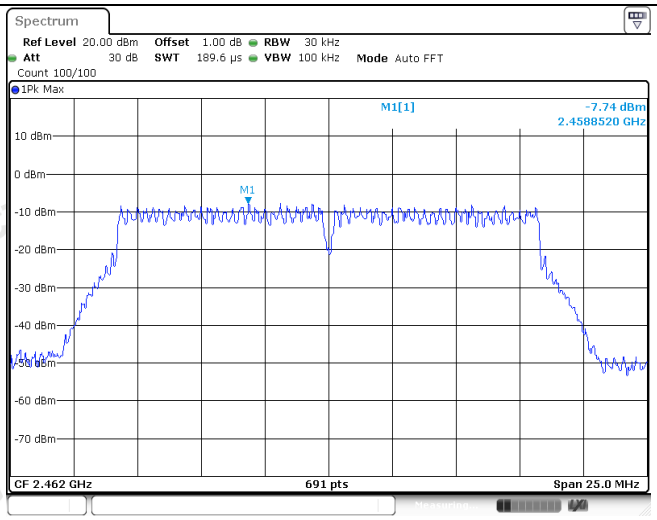
**TEST RESULTS**

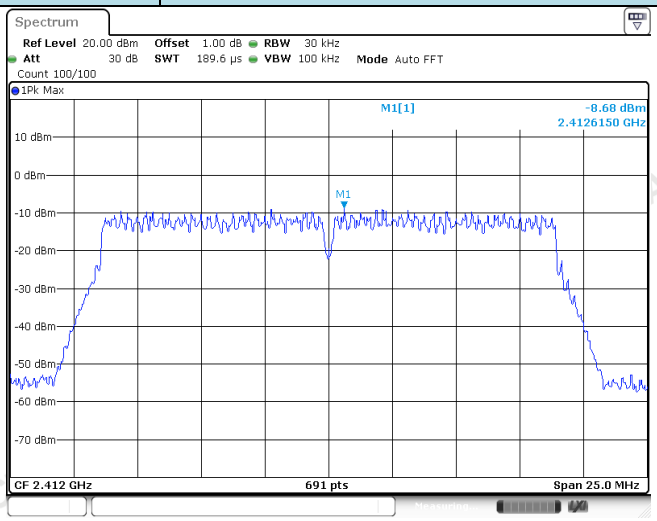
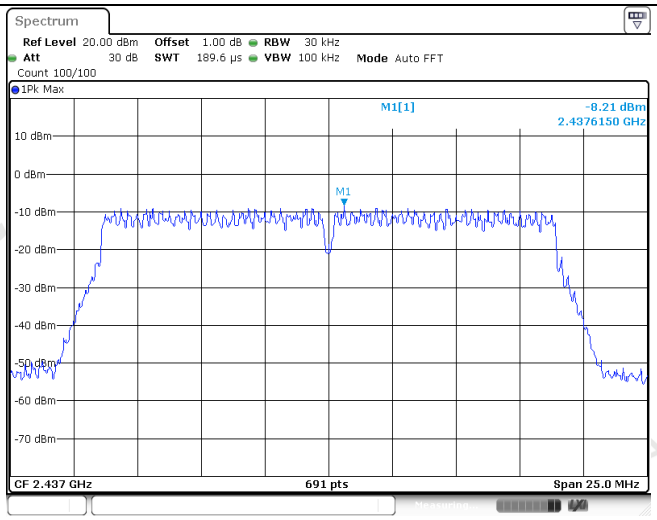
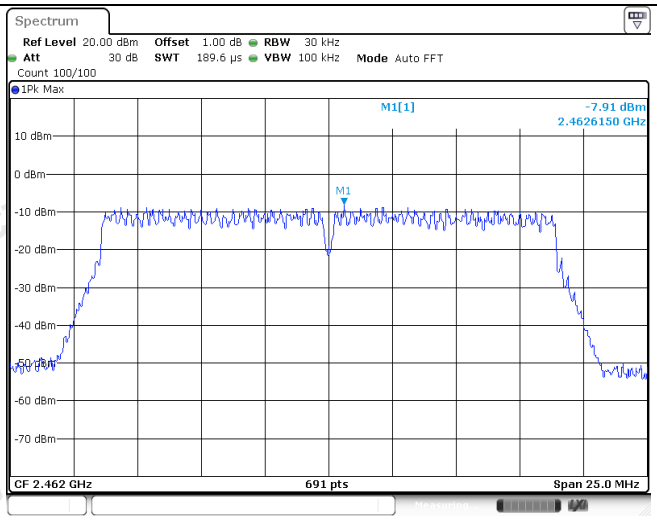
☒ **Passed** ☐ **Not Applicable**

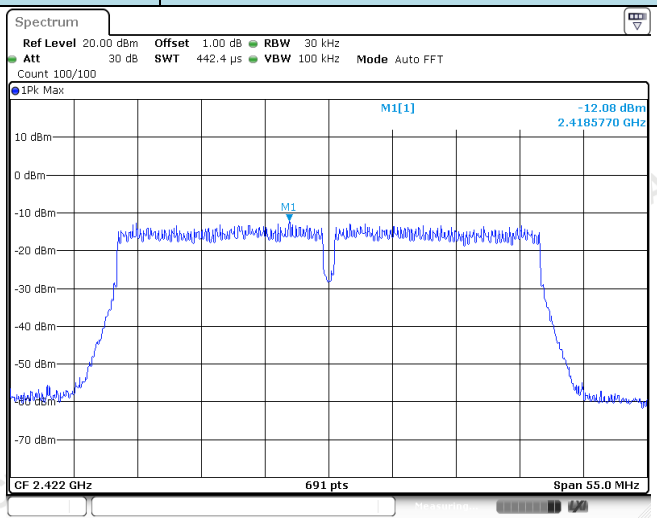
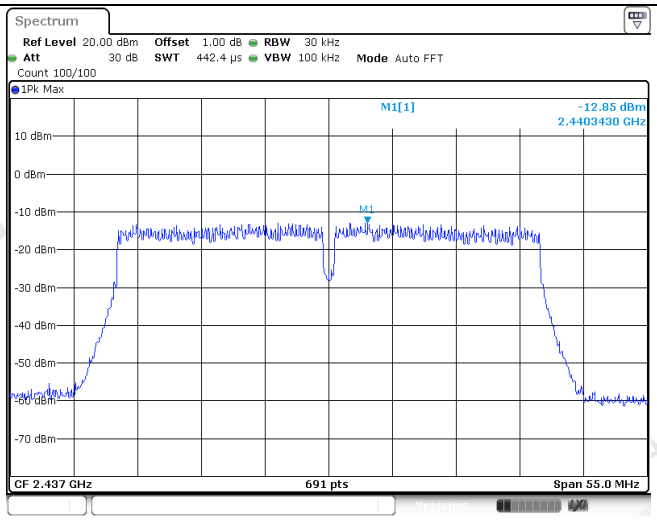
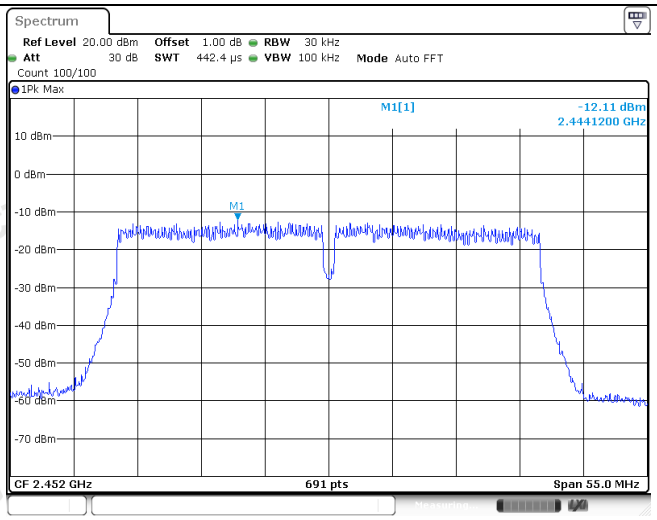
| Type | Channel | Power Spectral Density (dBm/30KHz) | Limit (dBm/3KHz) | Result |
|---|---|---|---|---|
| 802.11b | 01 | -1.45 | ≤8.00 | Pass |
| | 06 | -1.12 | | |
| | 11 | -0.53 | | |
| 802.11g | 01 | -7.93 | ≤8.00 | Pass |
| | 06 | -7.80 | | |
| | 11 | -7.74 | | |
| 802.11n(HT20) | 01 | -8.68 | ≤8.00 | Pass |
| | 06 | -8.21 | | |
| | 11 | -7.91 | | |
| 802.11n(HT40) | 03 | -12.08 | ≤8.00 | Pass |
| | 06 | -12.85 | | |
| | 09 | -12.11 | | |

Test plot as follows:

| Type: | 802.11b |
|---|---|
| CH01 |  |
| CH06 |  |
| CH11 |  |

| Type: | 802.11g |
|---|---|
| CH01 |  |
| CH06 |  |
| CH11 |  |

| Type: | 802.11n(HT20) |
|---|---|
| CH01 |  |
| CH06 |  |
| CH11 |  |

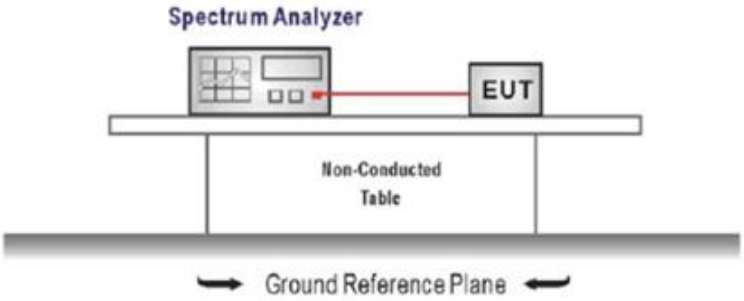
| Type: | 802.11n(HT40) |
|---|---|
| CH03 |  |
| CH06 |  |
| CH09 |  |

## 3.5. 6dB bandwidth

**LIMIT**

**FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2):**
For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

**TEST CONFIGURATION**




**TEST PROCEDURE**

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).
   Center Frequency =DTS channel center frequency
   Span=2 x DTS bandwidth
   RBW = 100 kHz, VBW ≥ 3 × RBW
   Sweep time= auto couple
   Detector = Peak
   Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. 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, and record the pertinent measurements.

**TEST MODE:**

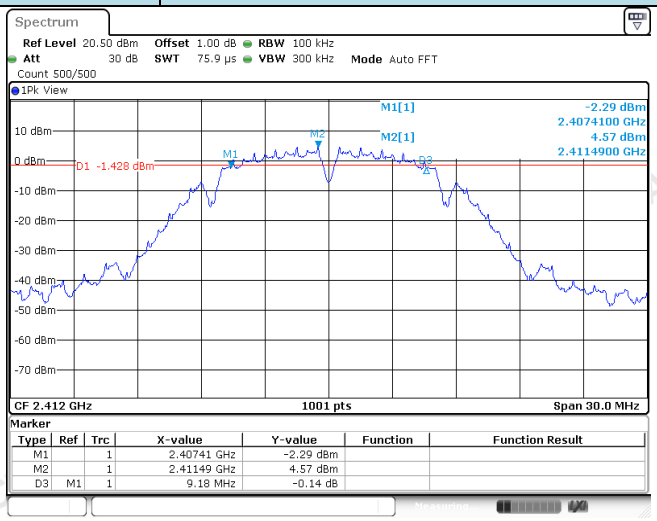
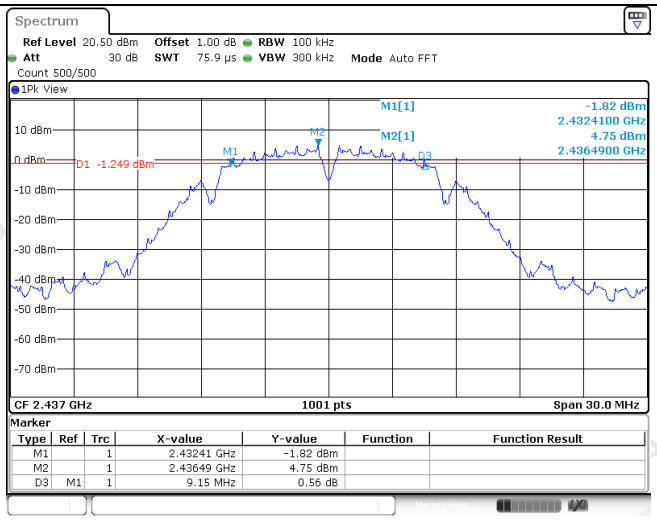
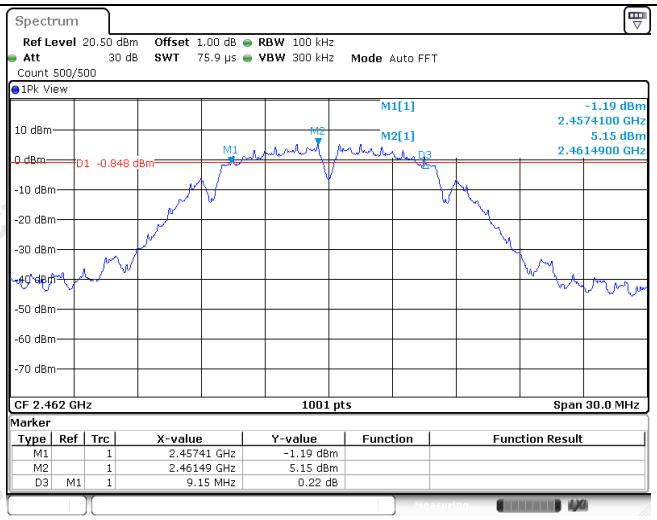
Please refer to the clause 3.3

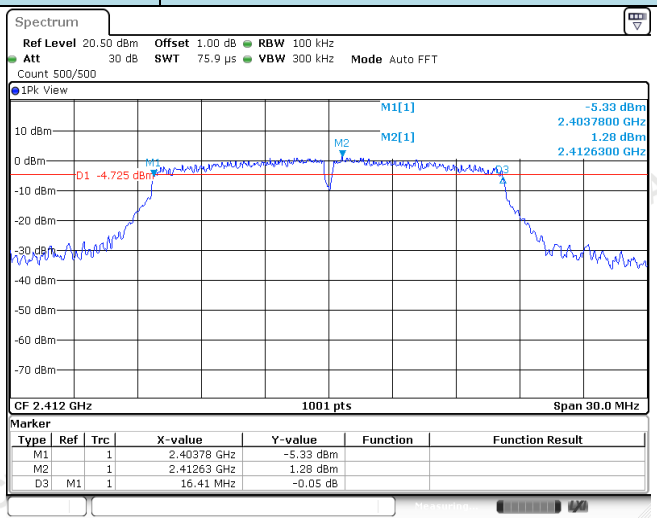
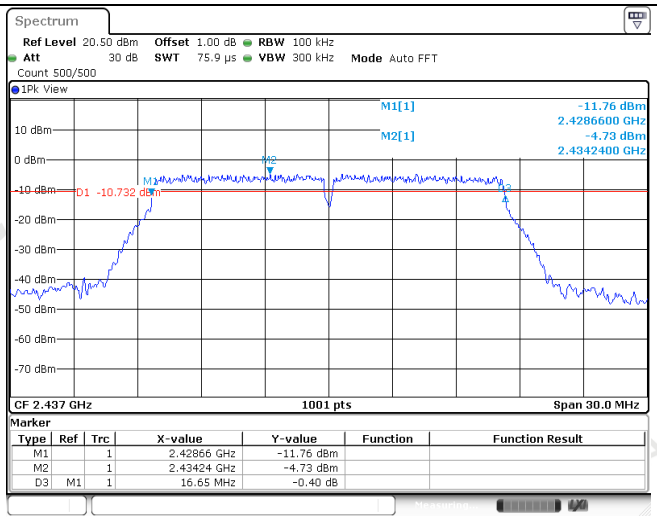
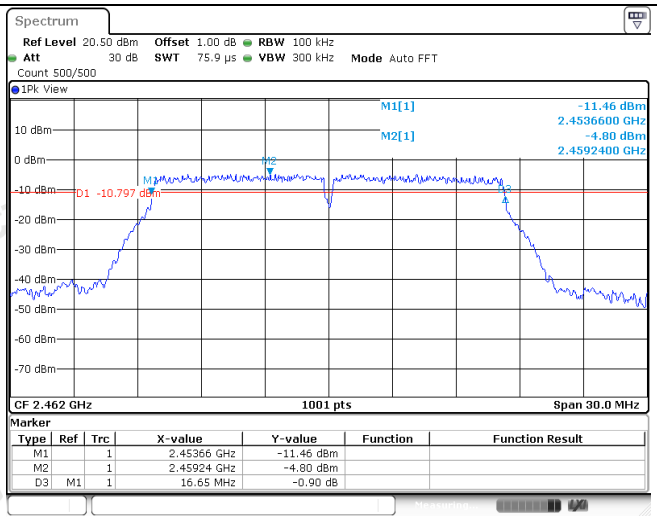
**TEST RESULTS**

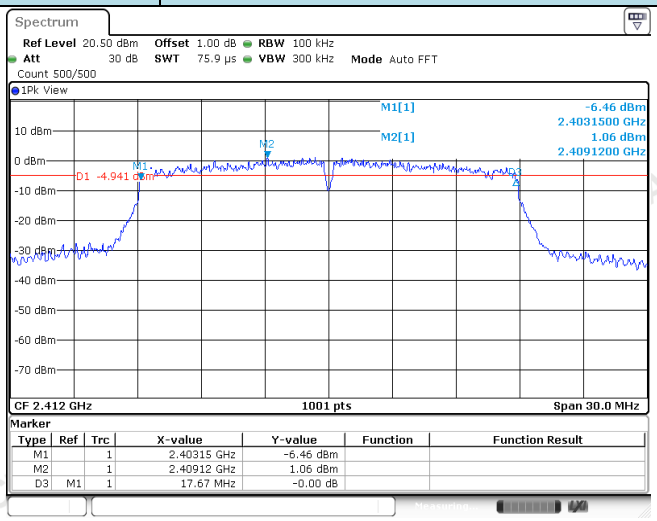
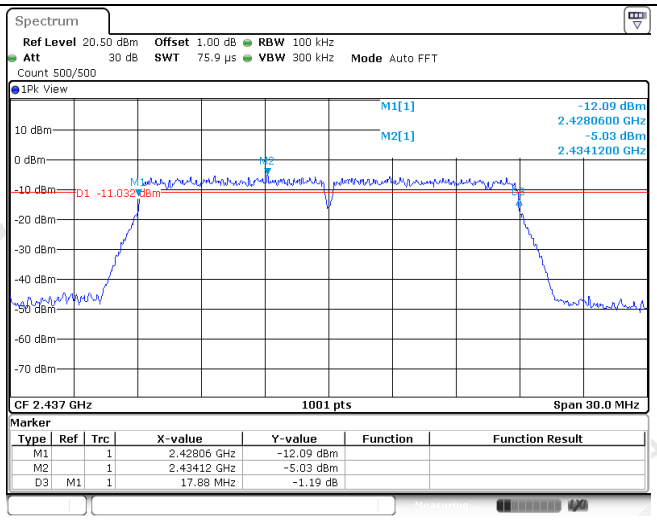
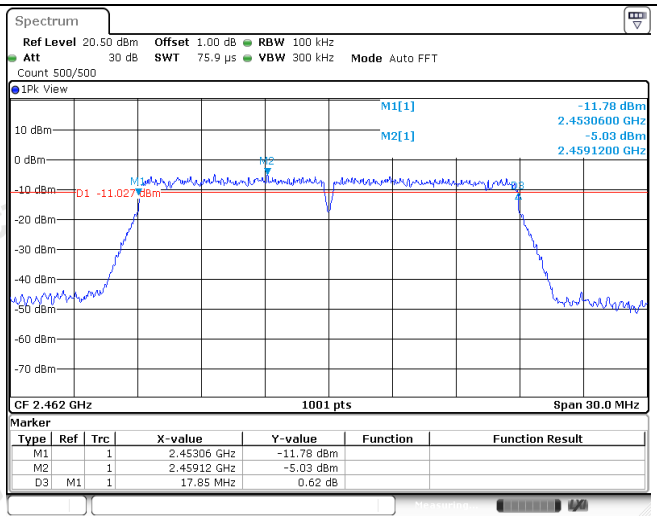
☒ **Passed** ☐ **Not Applicable**

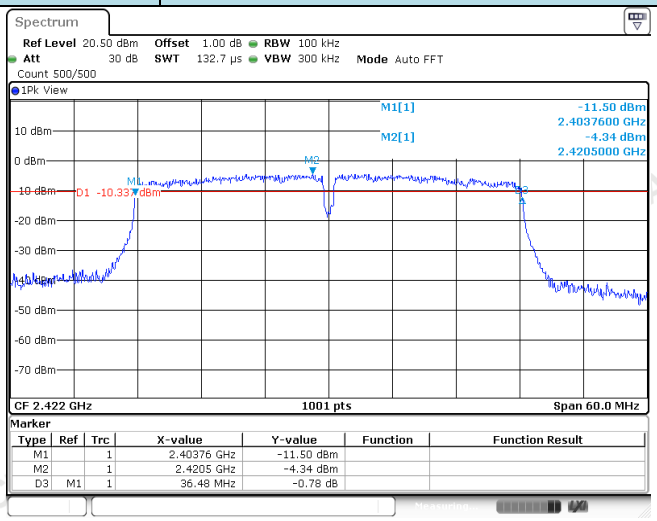
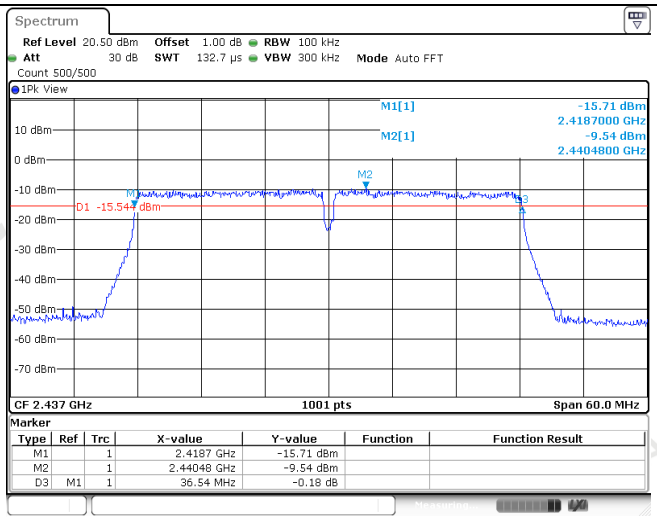
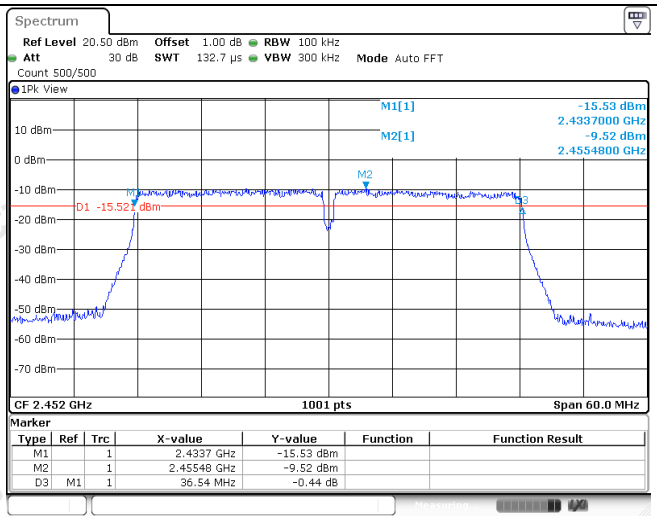
| Type | Channel | 6dB Bandwidth (MHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| 802.11b | 01 | 9.18 | ≥500 | Pass |
| | 06 | 9.15 | | |
| | 11 | 9.15 | | |
| 802.11g | 01 | 16.41 | ≥500 | Pass |
| | 06 | 16.65 | | |
| | 11 | 16.65 | | |
| 802.11n(HT20) | 01 | 17.67 | ≥500 | Pass |
| | 06 | 17.88 | | |
| | 11 | 17.85 | | |
| 802.11n(HT40) | 03 | 36.48 | ≥500 | Pass |
| | 06 | 36.54 | | |
| | 09 | 36.54 | | |

Test plot as follows:

| Type: | 802.11b |
|---|---|
| CH01 |  |
| CH06 |  |
| CH11 |  |

| Type: | 802.11g |
|---|---|
| CH01 |  |
| CH06 |  |
| CH11 |  |

| Type: | 802.11n(HT20) |
|---|---|
| CH01 |  |
| CH06 |  |
| CH11 |  |

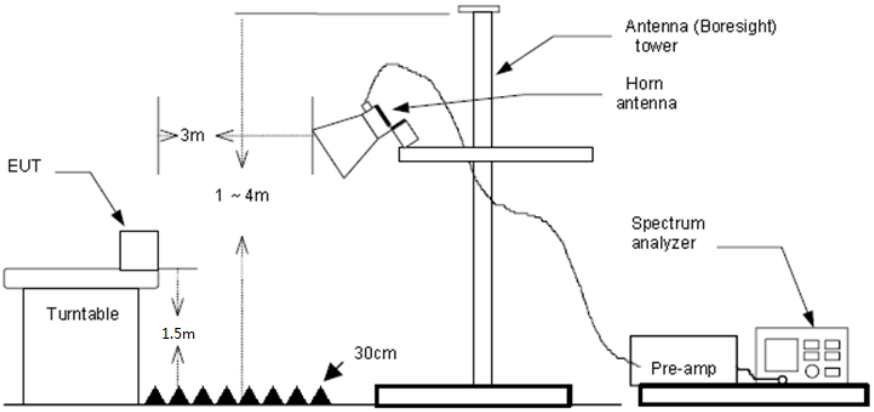
| Type: | 802.11n(HT40) |
|---|---|
| CH03 |  |
| CH06 |  |
| CH09 |  |

## 3.6. Restricted band

**LIMIT**

**FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):**
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, Radiated Emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the Radiated Emissions limits specified in §15.209(a) (see §15.205(c)).

**TEST CONFIGURATION**




**TEST PROCEDURE**

1) The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2) The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3) The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
4) The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. Thisis repeated for both horizontal and vertical polarization of the antenna. In order to find themaximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5) The receiver set as follow:
   RBW=1MHz, VBW=3MHz PEAK detector for Peak value.
   RBW=1MHz, VBW=3MHz RMS detector for Average value.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS**

☒ **Passed** ☐ **Not Applicable**

Note:
1) Final level= Read level + Antenna Factor+ Cable Loss- Preamp Factor

| 802.11b | | | | | CH01 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 2310.00 | 27.15 | 28.05 | 6.62 | 0.00 | 61.82 | 74.00 | -12.18 | Vertical | Peak |
| 2390.01 | 27.92 | 27.65 | 6.75 | 0.00 | 62.32 | 74.00 | -11.68 | Vertical | Peak |
| 2310.00 | 28.13 | 28.05 | 6.62 | 0.00 | 62.80 | 74.00 | -11.20 | Horizontal | Peak |
| 2390.01 | 26.63 | 27.65 | 6.75 | 0.00 | 61.03 | 74.00 | -12.97 | Horizontal | Peak |
| 2310.00 | 12.53 | 28.05 | 6.62 | 0.00 | 47.20 | 54.00 | -6.80 | Vertical | Average |
| 2390.01 | 12.25 | 27.65 | 6.75 | 0.00 | 46.65 | 54.00 | -7.35 | Vertical | Average |
| 2310.00 | 12.52 | 28.05 | 6.62 | 0.00 | 47.19 | 54.00 | -6.81 | Horizontal | Average |
| 2390.01 | 12.23 | 27.65 | 6.75 | 0.00 | 46.63 | 54.00 | -7.37 | Horizontal | Average |

| 802.11b | | | | | CH11 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 2483.49 | 27.29 | 27.26 | 6.83 | 0.00 | 61.38 | 74.00 | -12.62 | Vertical | Peak |
| 2500.00 | 26.73 | 27.20 | 6.84 | 0.00 | 60.77 | 74.00 | -13.23 | Vertical | Peak |
| 2483.49 | 27.50 | 27.26 | 6.83 | 0.00 | 61.59 | 74.00 | -12.41 | Horizontal | Peak |
| 2500.00 | 27.11 | 27.20 | 6.84 | 0.00 | 61.15 | 74.00 | -12.85 | Horizontal | Peak |
| 2483.49 | 12.19 | 27.26 | 6.83 | 0.00 | 46.28 | 54.00 | -7.72 | Vertical | Average |
| 2500.00 | 12.19 | 27.20 | 6.84 | 0.00 | 46.23 | 54.00 | -7.77 | Vertical | Average |
| 2483.49 | 12.18 | 27.26 | 6.83 | 0.00 | 46.27 | 54.00 | -7.73 | Horizontal | Average |
| 2500.00 | 12.19 | 27.20 | 6.84 | 0.00 | 46.23 | 54.00 | -7.77 | Horizontal | Average |

| 802.11g | | | | | CH01 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 2310.00 | 26.73 | 28.05 | 6.62 | 0.00 | 61.40 | 74.00 | -12.60 | Vertical | Peak |
| 2390.01 | 27.30 | 27.65 | 6.75 | 0.00 | 61.70 | 74.00 | -12.30 | Vertical | Peak |
| 2310.00 | 26.71 | 28.05 | 6.62 | 0.00 | 61.38 | 74.00 | -12.62 | Horizontal | Peak |
| 2390.01 | 26.15 | 27.65 | 6.75 | 0.00 | 60.55 | 74.00 | -13.45 | Horizontal | Peak |
| 2310.00 | 12.51 | 28.05 | 6.62 | 0.00 | 47.18 | 54.00 | -6.82 | Vertical | Average |
| 2390.01 | 13.17 | 27.65 | 6.75 | 0.00 | 47.57 | 54.00 | -6.43 | Vertical | Average |
| 2310.00 | 12.52 | 28.05 | 6.62 | 0.00 | 47.19 | 54.00 | -6.81 | Horizontal | Average |
| 2390.01 | 12.57 | 27.65 | 6.75 | 0.00 | 46.97 | 54.00 | -7.03 | Horizontal | Average |

| 802.11g | | | | | CH11 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 2483.49 | 25.79 | 27.26 | 6.83 | 0.00 | 59.88 | 74.00 | -14.12 | Vertical | Peak |
| 2500.00 | 26.33 | 27.20 | 6.84 | 0.00 | 60.37 | 74.00 | -13.63 | Vertical | Peak |
| 2483.49 | 26.72 | 27.26 | 6.83 | 0.00 | 60.81 | 74.00 | -13.19 | Horizontal | Peak |
| 2500.00 | 26.21 | 27.20 | 6.84 | 0.00 | 60.25 | 74.00 | -13.75 | Horizontal | Peak |
| 2483.49 | 12.36 | 27.26 | 6.83 | 0.00 | 46.45 | 54.00 | -7.55 | Vertical | Average |
| 2500.00 | 12.20 | 27.20 | 6.84 | 0.00 | 46.24 | 54.00 | -7.76 | Vertical | Average |
| 2483.49 | 12.31 | 27.26 | 6.83 | 0.00 | 46.40 | 54.00 | -7.60 | Horizontal | Average |
| 2500.00 | 12.19 | 27.20 | 6.84 | 0.00 | 46.23 | 54.00 | -7.77 | Horizontal | Average |

| 802.11n(HT20) | | | | | CH01 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 2310.00 | 25.29 | 28.05 | 6.62 | 0.00 | 59.96 | 74.00 | -14.04 | Vertical | Peak |
| 2390.01 | 26.25 | 27.65 | 6.75 | 0.00 | 60.65 | 74.00 | -13.35 | Vertical | Peak |
| 2310.00 | 27.28 | 28.05 | 6.62 | 0.00 | 61.95 | 74.00 | -12.05 | Horizontal | Peak |
| 2390.01 | 26.29 | 27.65 | 6.75 | 0.00 | 60.69 | 74.00 | -13.31 | Horizontal | Peak |
| 2310.00 | 12.51 | 28.05 | 6.62 | 0.00 | 47.18 | 54.00 | -6.82 | Vertical | Average |
| 2390.01 | 13.91 | 27.65 | 6.75 | 0.00 | 48.31 | 54.00 | -5.69 | Vertical | Average |
| 2310.00 | 12.53 | 28.05 | 6.62 | 0.00 | 47.20 | 54.00 | -6.80 | Horizontal | Average |
| 2390.01 | 12.75 | 27.65 | 6.75 | 0.00 | 47.15 | 54.00 | -6.85 | Horizontal | Average |

| 802.11n(HT20) | | | | | CH11 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 2483.49 | 25.71 | 27.26 | 6.83 | 0.00 | 59.80 | 74.00 | -14.20 | Vertical | Peak |
| 2500.00 | 26.48 | 27.20 | 6.84 | 0.00 | 60.52 | 74.00 | -13.48 | Vertical | Peak |
| 2483.49 | 25.96 | 27.26 | 6.83 | 0.00 | 60.05 | 74.00 | -13.95 | Horizontal | Peak |
| 2500.00 | 24.98 | 27.20 | 6.84 | 0.00 | 59.02 | 74.00 | -14.98 | Horizontal | Peak |
| 2483.49 | 12.40 | 27.26 | 6.83 | 0.00 | 46.49 | 54.00 | -7.51 | Vertical | Average |
| 2500.00 | 12.22 | 27.20 | 6.84 | 0.00 | 46.26 | 54.00 | -7.74 | Vertical | Average |
| 2483.49 | 12.56 | 27.26 | 6.83 | 0.00 | 46.65 | 54.00 | -7.35 | Horizontal | Average |
| 2500.00 | 12.18 | 27.20 | 6.84 | 0.00 | 46.22 | 54.00 | -7.78 | Horizontal | Average |

| 802.11n(HT40) | | | | | CH03 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 2310.00 | 27.34 | 28.05 | 6.62 | 0.00 | 62.01 | 74.00 | -11.99 | Vertical | Peak |
| 2389.99 | 26.76 | 27.65 | 6.75 | 0.00 | 61.16 | 74.00 | -12.84 | Vertical | Peak |
| 2310.00 | 25.53 | 28.05 | 6.62 | 0.00 | 60.20 | 74.00 | -13.80 | Horizontal | Peak |
| 2389.99 | 27.11 | 27.65 | 6.75 | 0.00 | 61.51 | 74.00 | -12.49 | Horizontal | Peak |
| 2310.00 | 12.52 | 28.05 | 6.62 | 0.00 | 47.19 | 54.00 | -6.81 | Vertical | Average |
| 2389.99 | 16.00 | 27.65 | 6.75 | 0.00 | 50.40 | 54.00 | -3.60 | Vertical | Average |
| 2310.00 | 12.52 | 28.05 | 6.62 | 0.00 | 47.19 | 54.00 | -6.81 | Horizontal | Average |
| 2389.99 | 14.01 | 27.65 | 6.75 | 0.00 | 48.41 | 54.00 | -5.59 | Horizontal | Average |

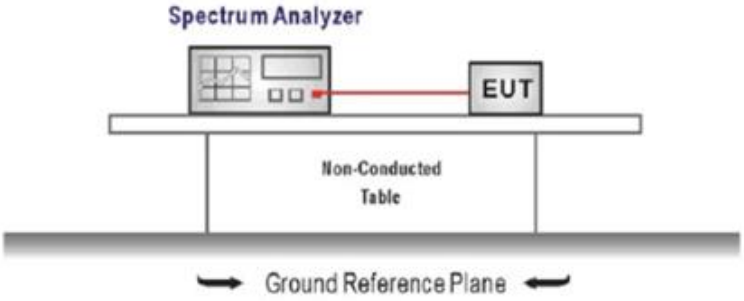
| 802.11n(HT40) | | | | | CH09 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 2483.50 | 26.50 | 27.26 | 6.83 | 0.00 | 60.59 | 74.00 | -13.41 | Vertical | Peak |
| 2500.00 | 27.31 | 27.20 | 6.84 | 0.00 | 61.35 | 74.00 | -12.65 | Vertical | Peak |
| 2483.50 | 26.29 | 27.26 | 6.83 | 0.00 | 60.38 | 74.00 | -13.62 | Horizontal | Peak |
| 2500.00 | 26.86 | 27.20 | 6.84 | 0.00 | 60.90 | 74.00 | -13.10 | Horizontal | Peak |
| 2483.50 | 13.66 | 27.26 | 6.83 | 0.00 | 47.75 | 54.00 | -6.25 | Vertical | Average |
| 2500.00 | 12.35 | 27.20 | 6.84 | 0.00 | 46.39 | 54.00 | -7.61 | Vertical | Average |
| 2483.50 | 13.47 | 27.26 | 6.83 | 0.00 | 47.56 | 54.00 | -6.44 | Horizontal | Average |
| 2500.00 | 12.41 | 27.20 | 6.84 | 0.00 | 46.45 | 54.00 | -7.55 | Horizontal | Average |

## 3.7. Band edge and Spurious Emissions (conducted)

**LIMIT**

**FCC CFR Title 47 Part 15 Subpart C Section15.247 (d):**
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

**TEST CONFIGURATION**




**TEST PROCEDURE**

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Establish a reference level by using the following procedure
   Center frequency=DTS channel center frequency
   The span = 1.5 times the DTS bandwidth.
   RBW = 100 kHz, VBW ≥ 3 x RBW
   Detector = peak, Sweep time = auto couple, Trace mode = max hold
   Allow trace to fully stabilize
   Use the peak marker function to determine the maximum PSD level

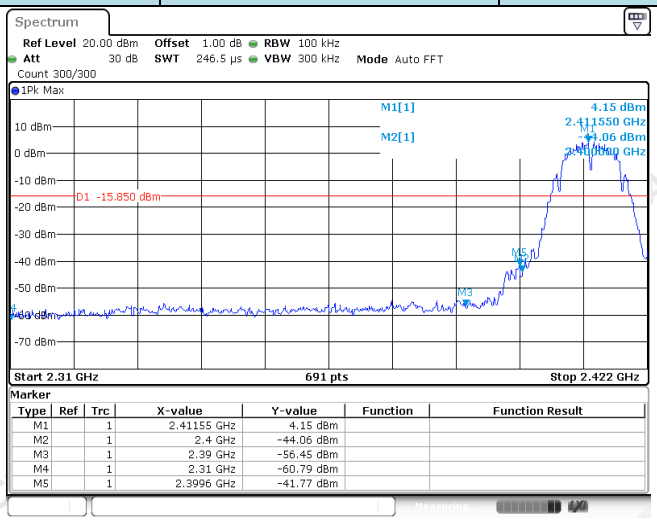
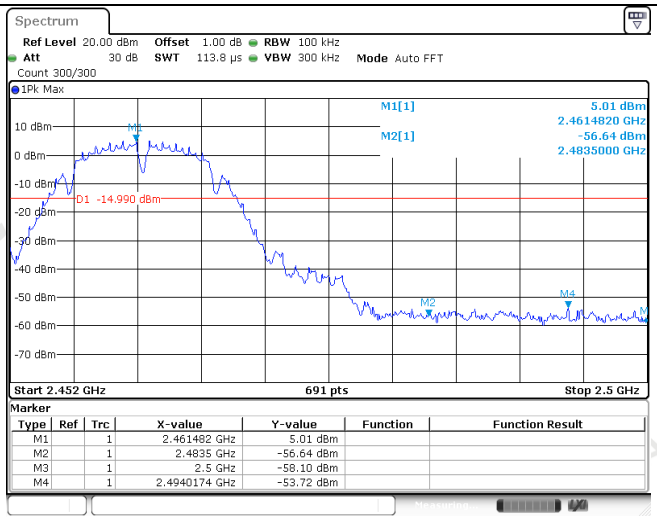
   Note: the channel found to contain the maximum PSD level can be used to establish the reference level.
3. Emission level measurement
   Set the center frequency and span to encompass frequency range to be measured
   RBW = 100 kHz, VBW ≥ 3 x RBW
   Detector = peak, Sweep time = auto couple, Trace mode = max hold
   Allow trace to fully stabilize
   Use the peak marker function to determine the maximum amplitude level.
4. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
5. Ensure that the amplitude of all unwanted emission outside of the authorized frequency band excluding restricted frequency bands) are attenuated by at least the minimum requirements specified (at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz). Report the three highest emission relative to the limit.

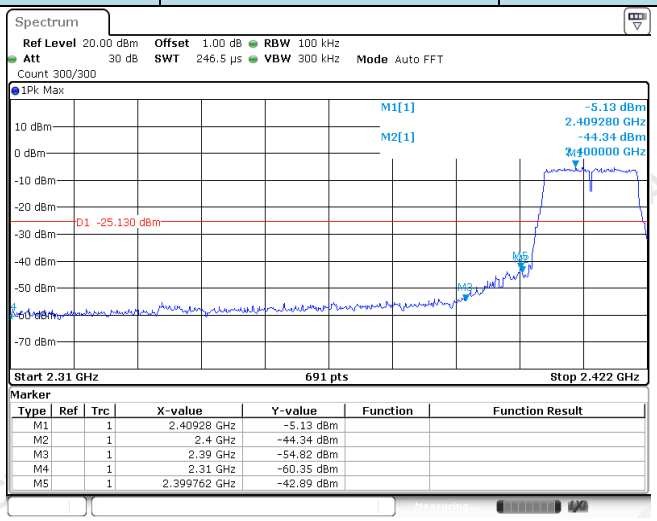
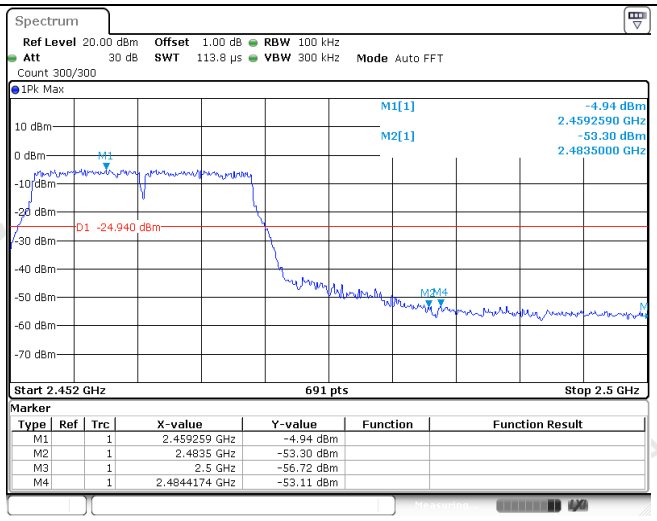
**TEST MODE:**

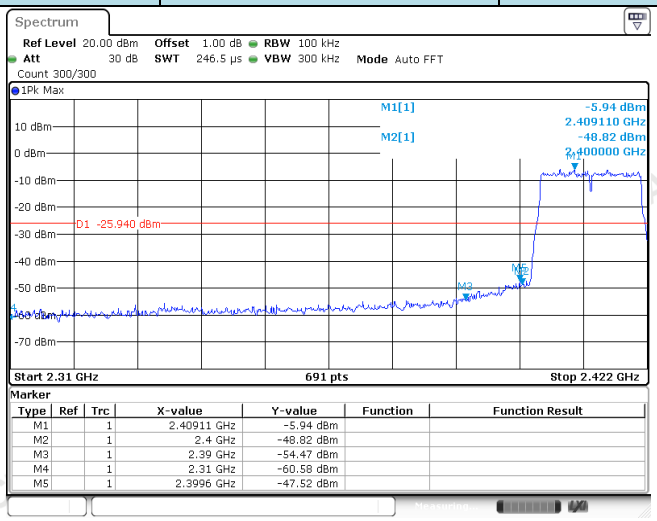
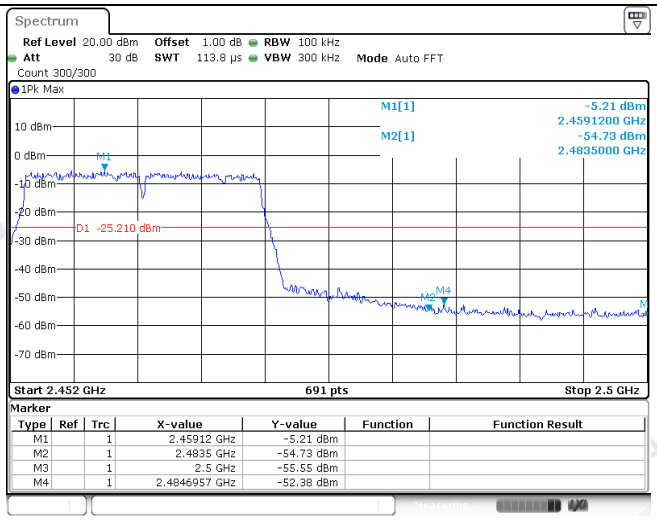
Please refer to the clause 3.3

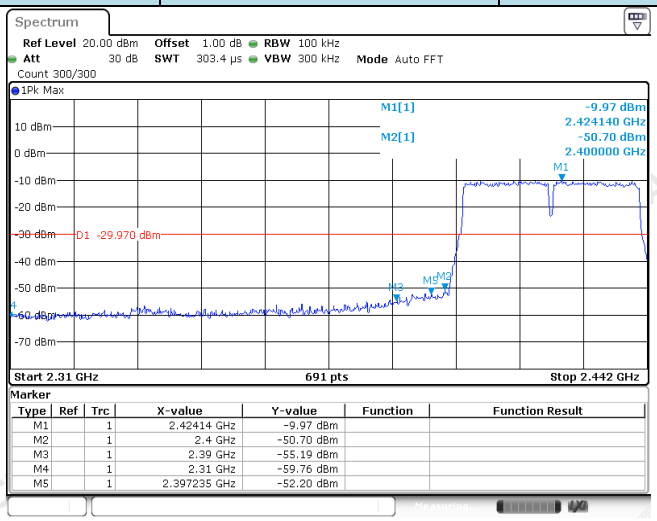
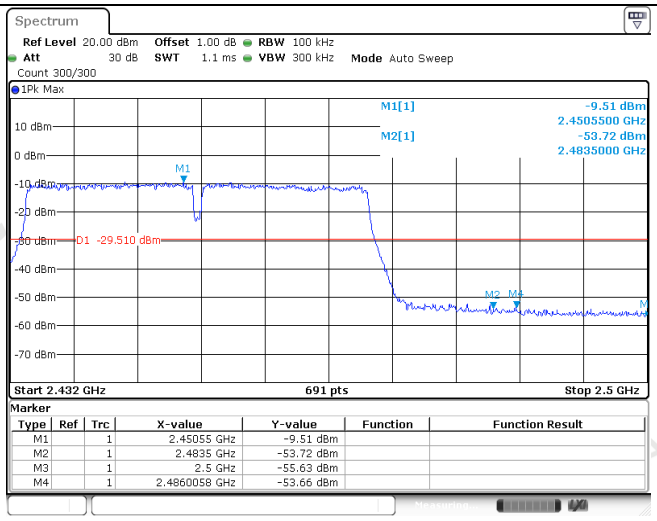
**TEST RESULTS**

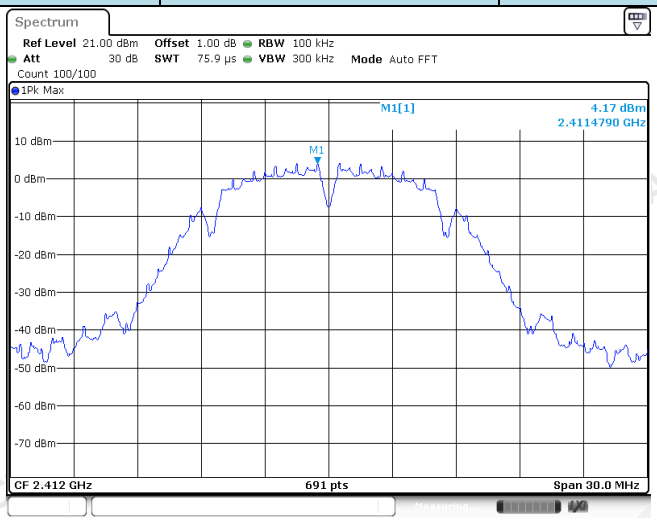
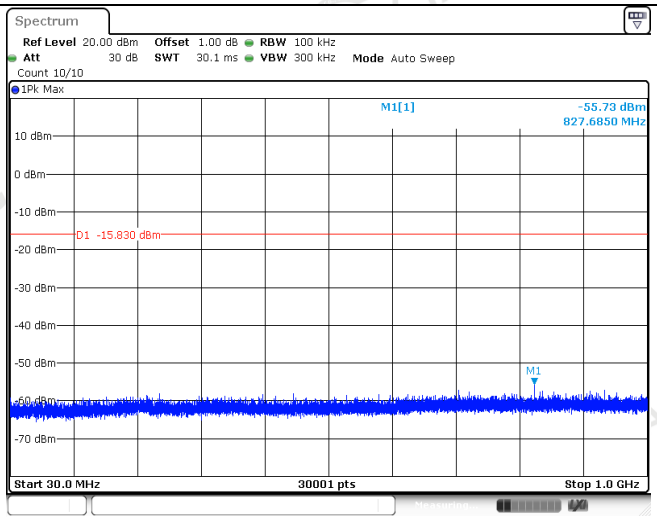
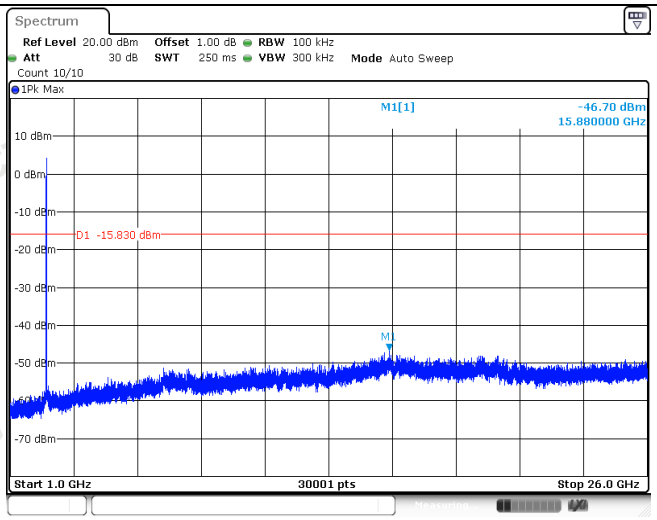
☒ **Passed** ☐ **Not Applicable**

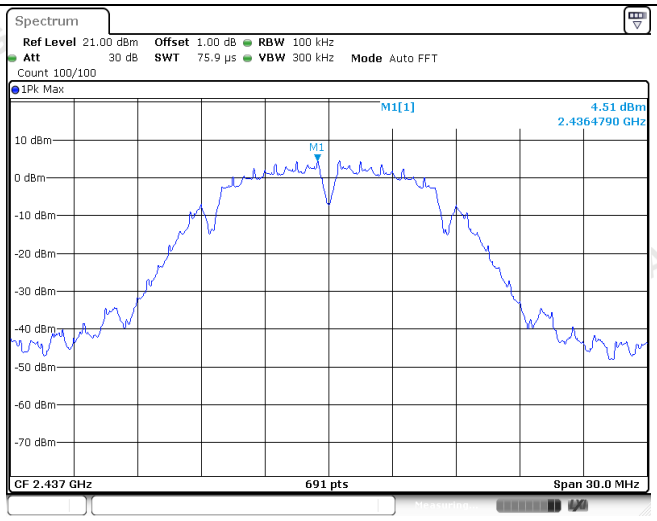
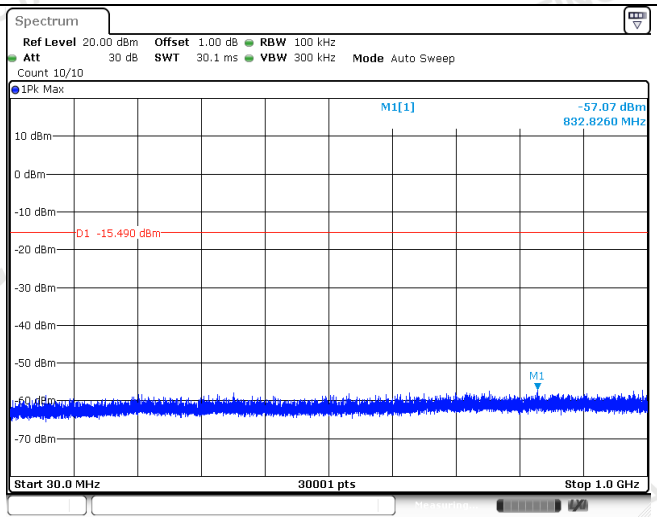
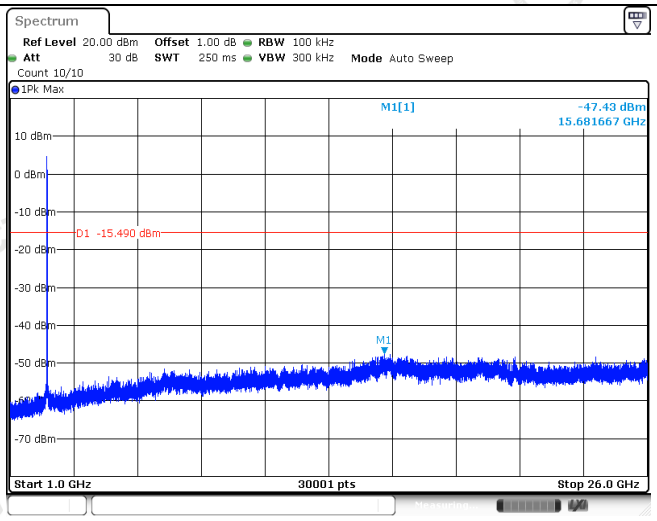
| Test Item: | Bandedge | Type: | 802.11b |
|---|---|---|---|
| CH01 |  | | |
| CH11 |  | | |

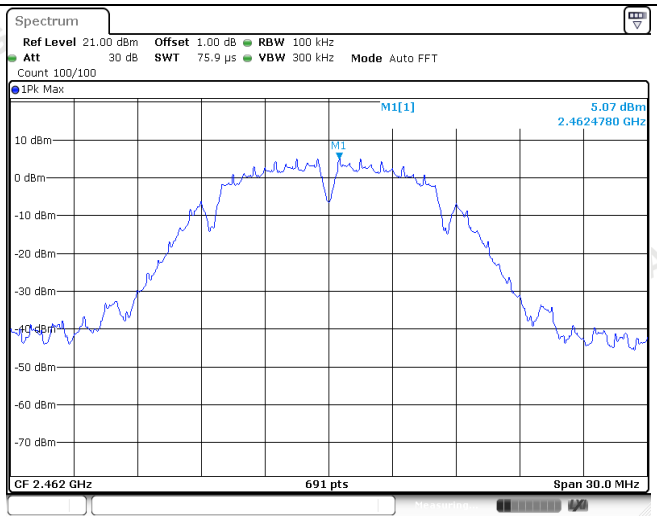
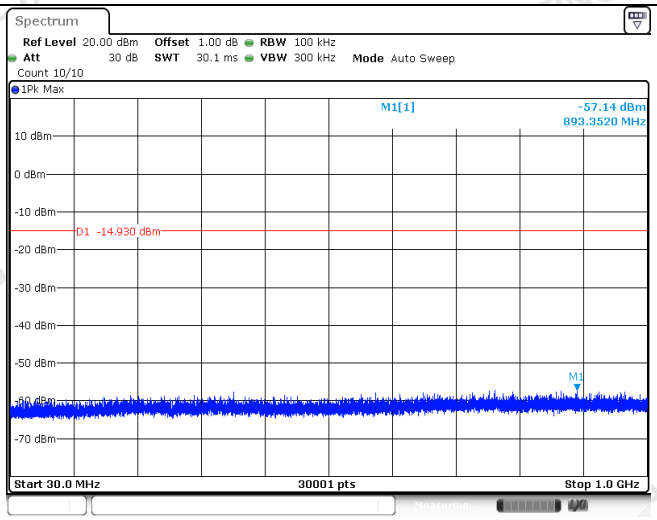
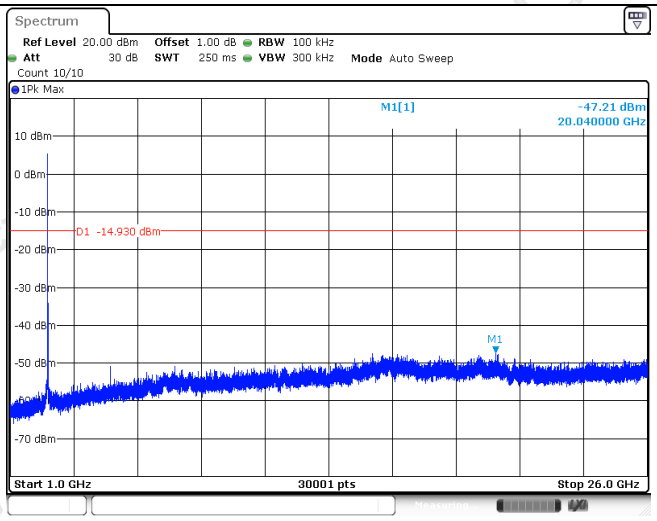
| Test Item: | Bandedge | Type: | 802.11g |
|---|---|---|---|
| CH01 |  | | |
| CH11 |  | | |

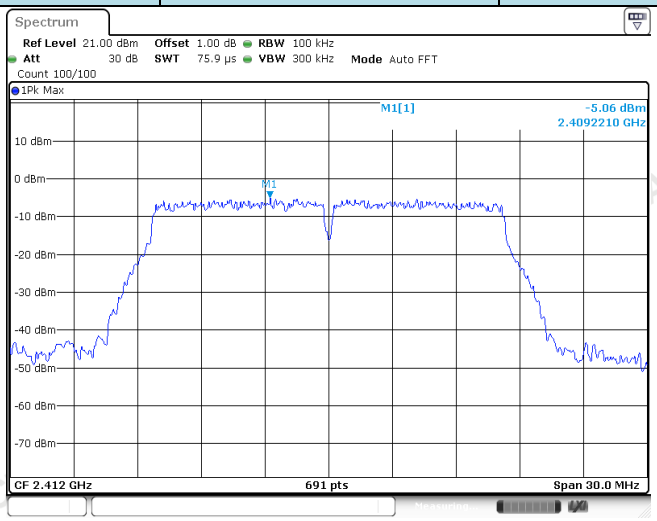
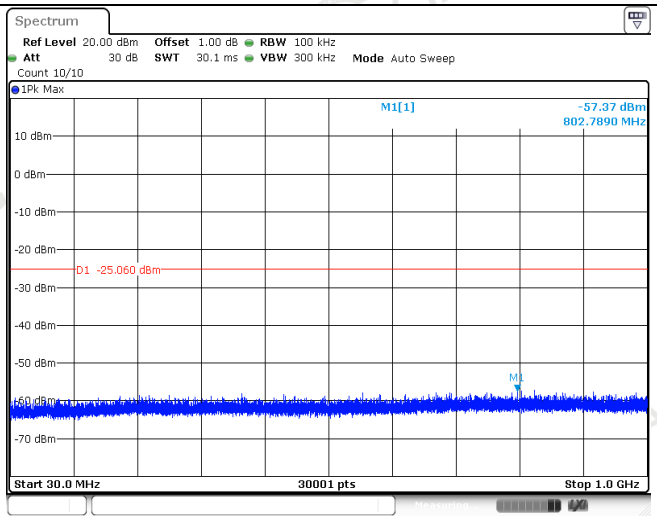
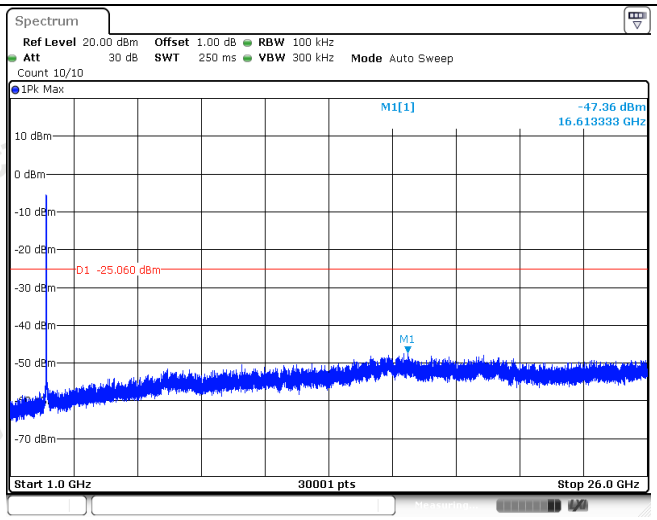
| Test Item: | Bandedge | Type: | 802.11n(HT20) |
|---|---|---|---|
| CH01 |  | | |
| CH11 |  | | |

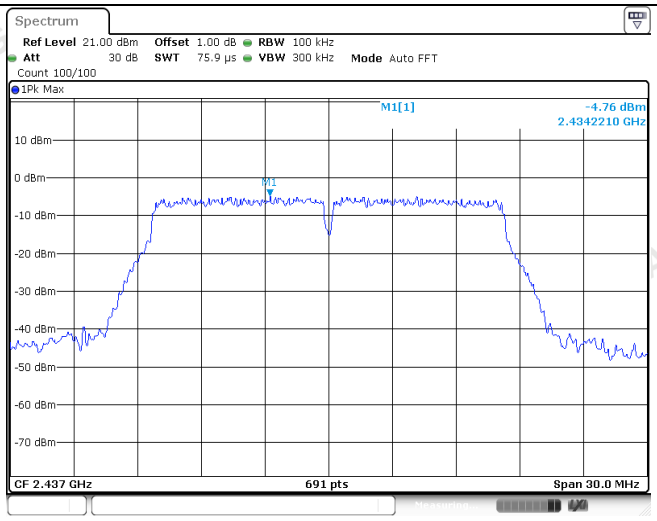
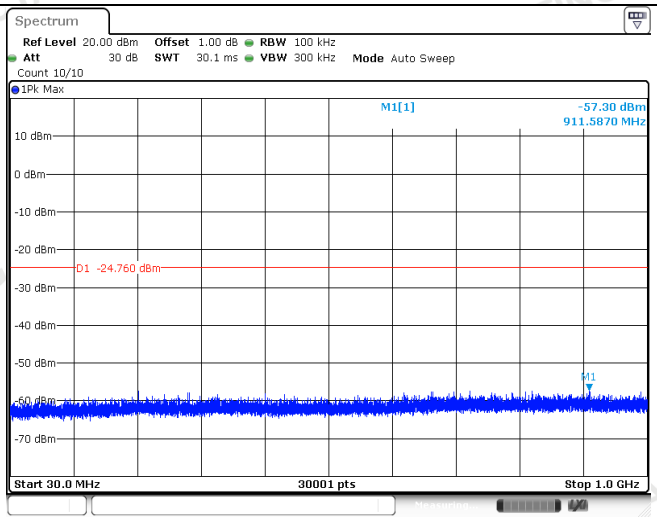
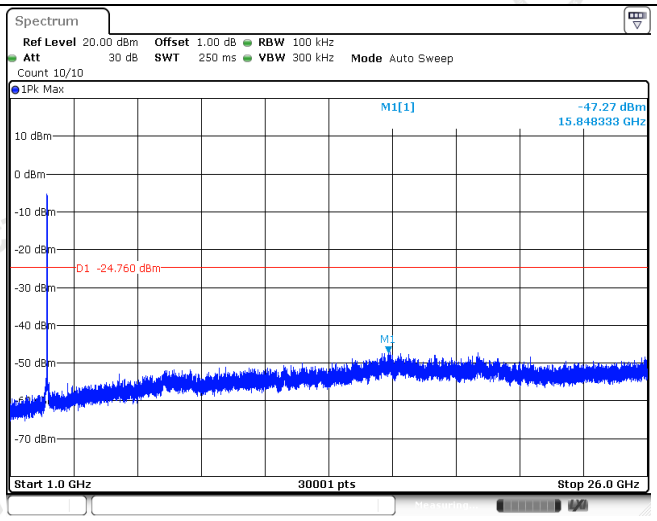
| Test Item: | Bandedge | Type: | 802.11n(HT40) |
|---|---|---|---|
| CH03 |  | | |
| CH09 |  | | |

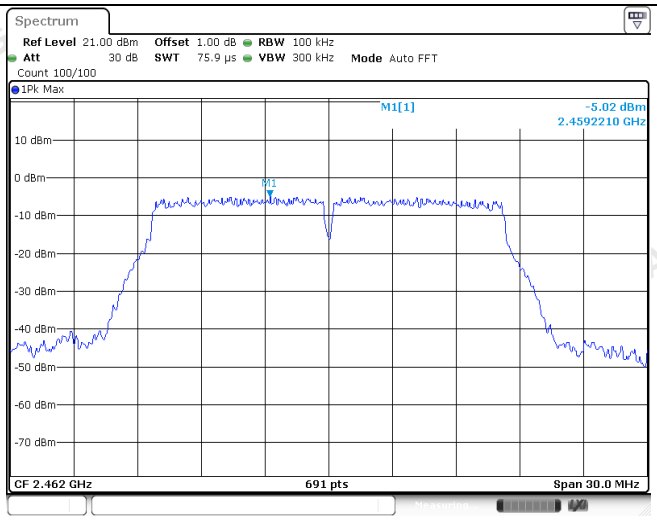
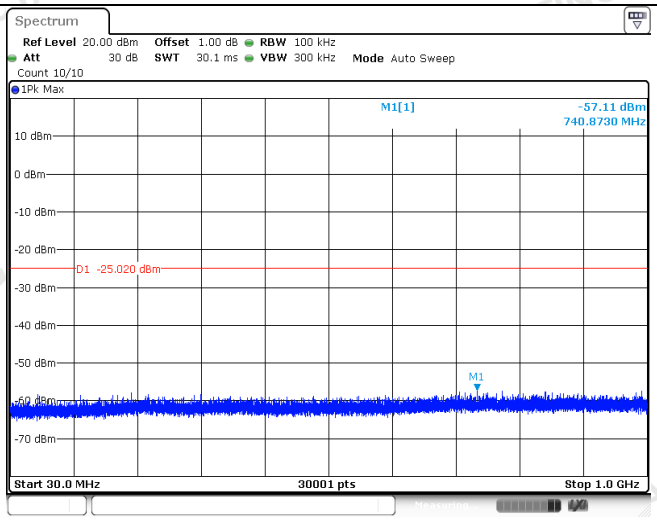
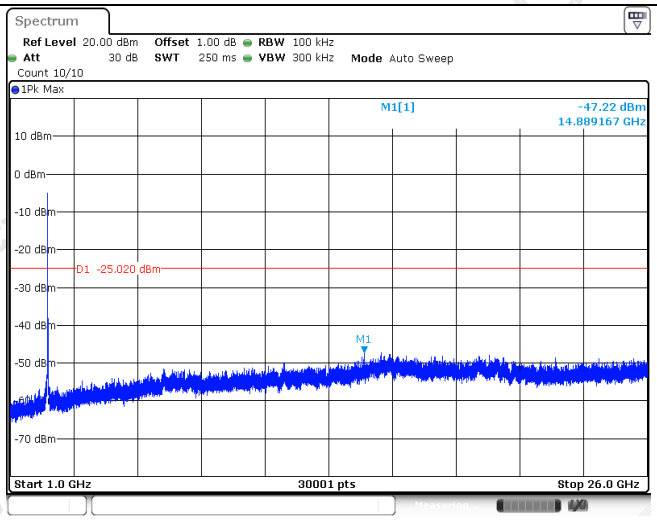
| Test Item: | SE | Type: | 802.11b |
|---|---|---|---|
| CH01<br>Reference level |  | | |
| CH01<br>30MHz~1000MHz |  | | |
| CH01<br>1GHz~26GHz |  | | |

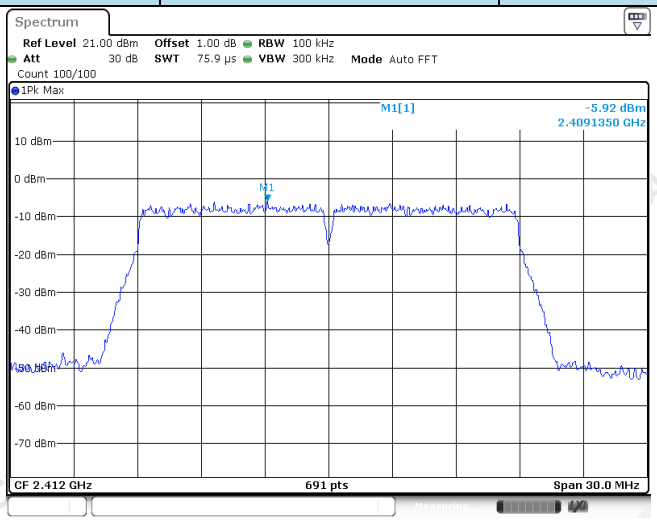
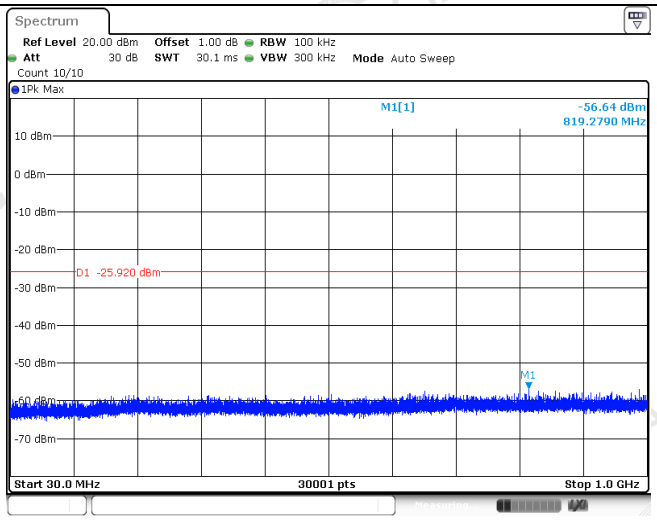
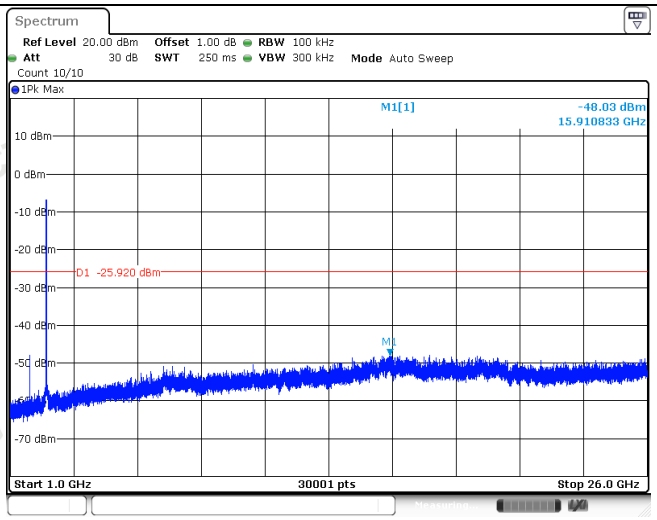
| | |
|---|---|
| CH06<br>Reference level |  |
| CH06<br>30MHz~1000MHz |  |
| CH06<br>1GHz~26GHz |  |

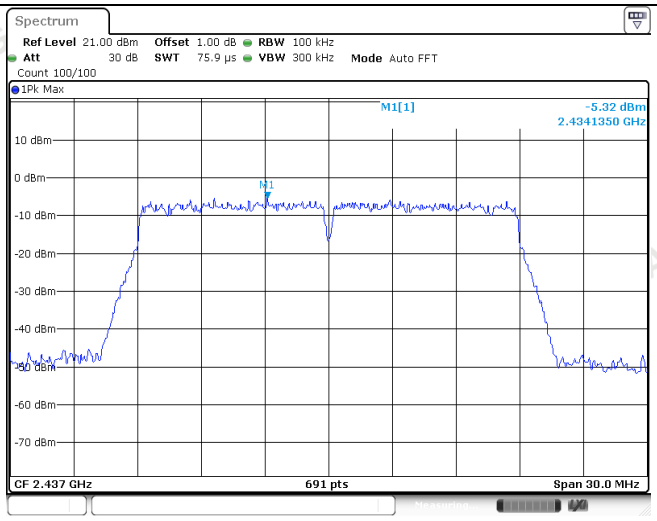
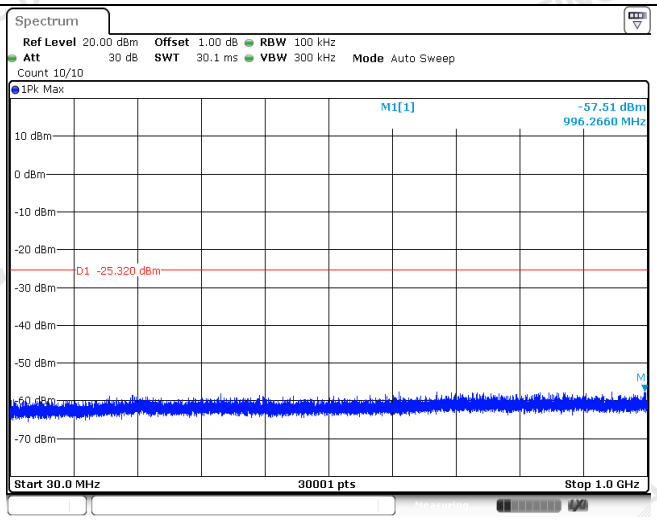
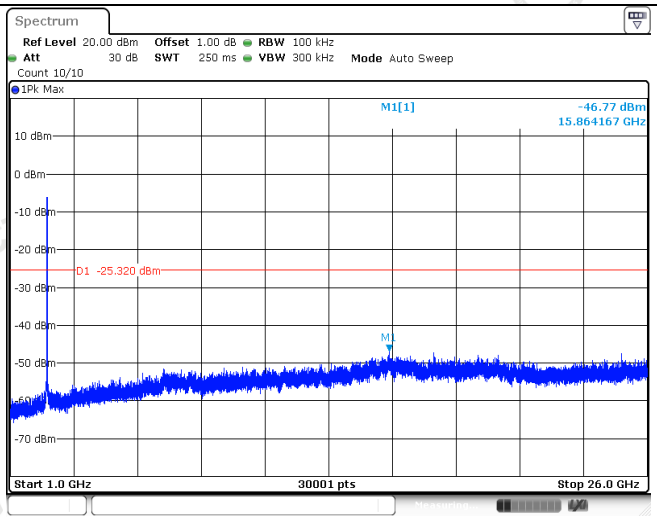
| | |
|---|---|
| CH11<br>Reference level |  |
| CH11<br>30MHz~1000MHz |  |
| CH11<br>1GHz~26GHz |  |

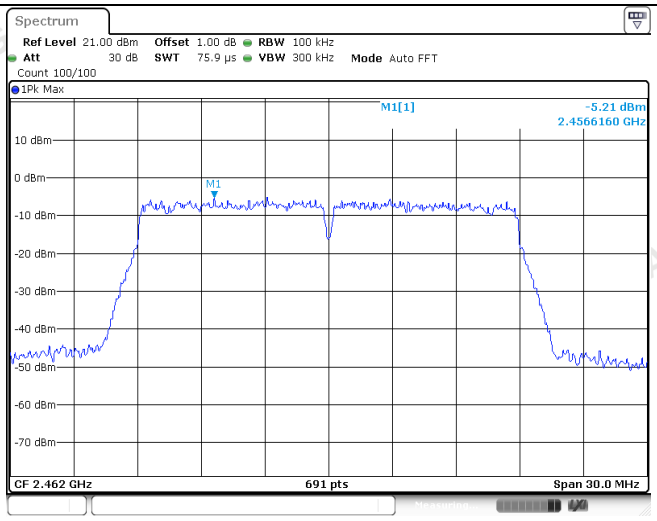
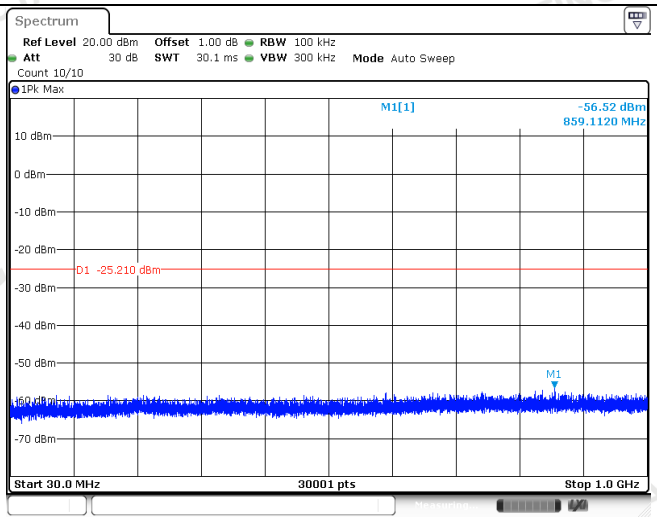
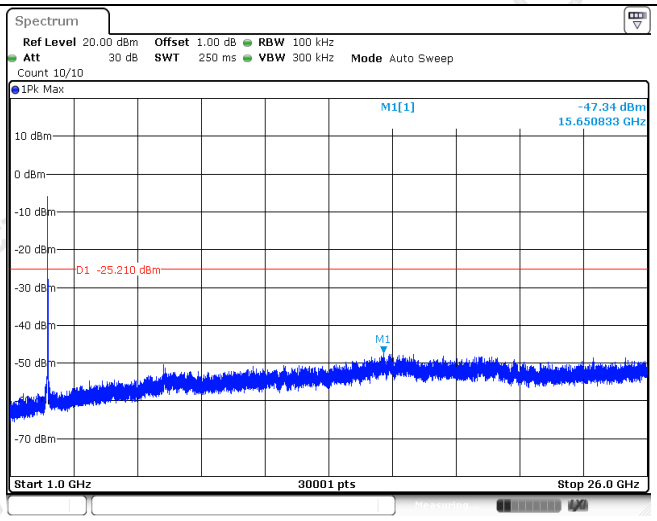
| Test Item: | SE | Type: | 802.11g |
|---|---|---|---|
| CH01<br>Reference level |  | | |
| CH01<br>30MHz~1000MHz |  | | |
| CH01<br>1GHz~26GHz |  | | |

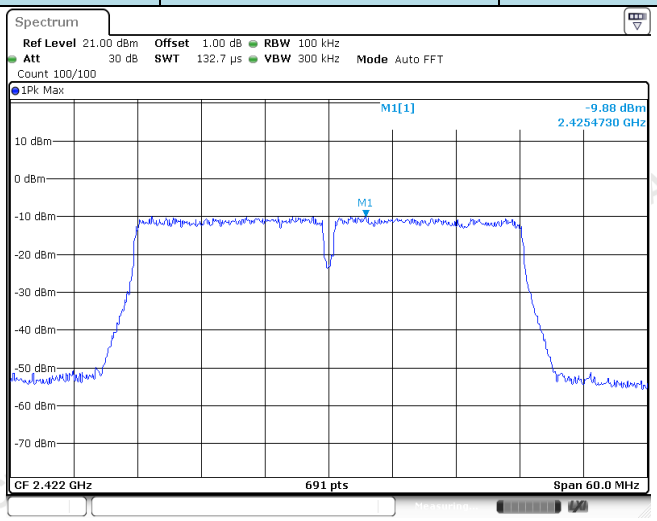
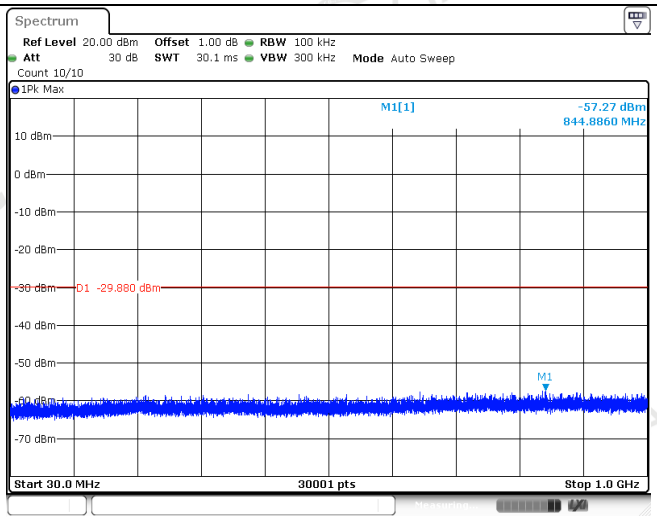
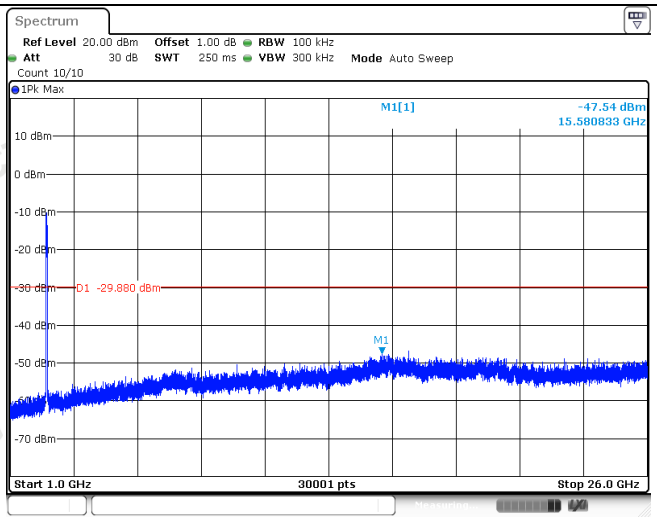
| | |
|---|---|
| CH06<br>Reference level |  |
| CH06<br>30MHz~1000MHz |  |
| CH06<br>1GHz~26GHz |  |

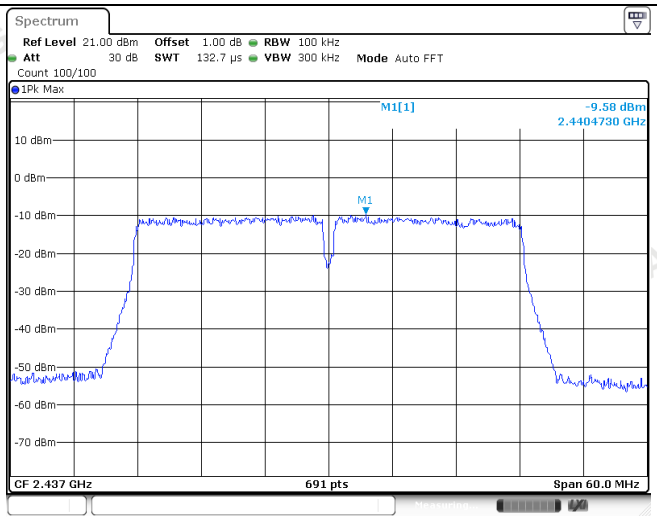
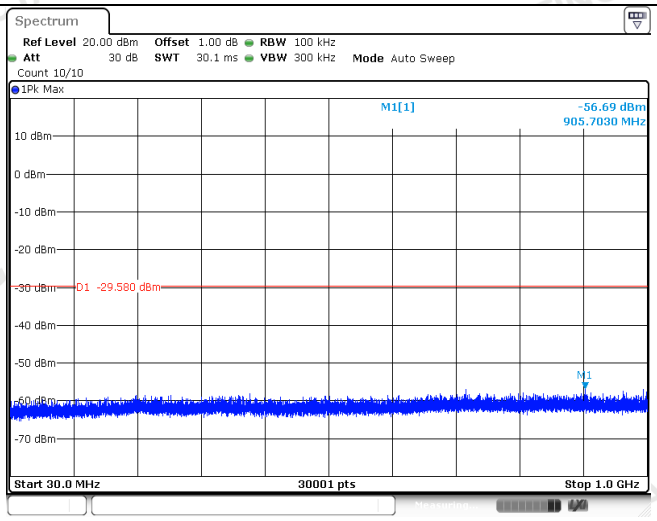
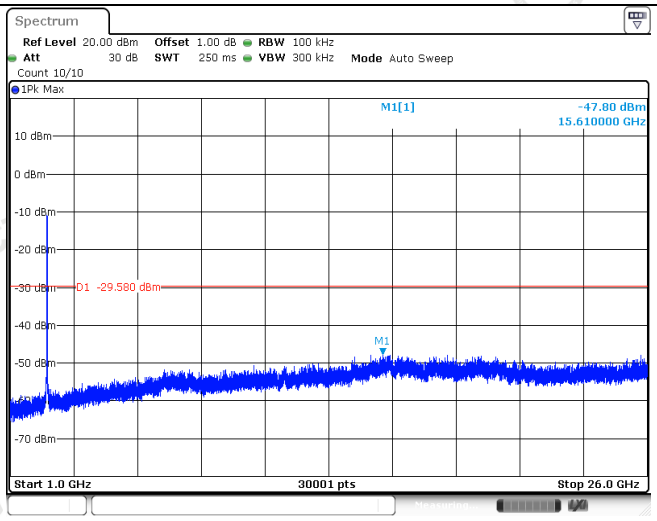
| | |
|---|---|
| CH11<br>Reference level |  |
| CH11<br>30MHz~1000MHz |  |
| CH11<br>1GHz~26GHz |  |

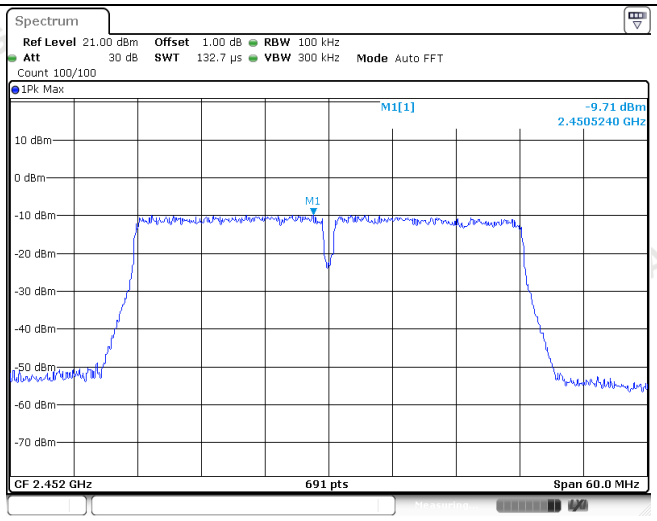
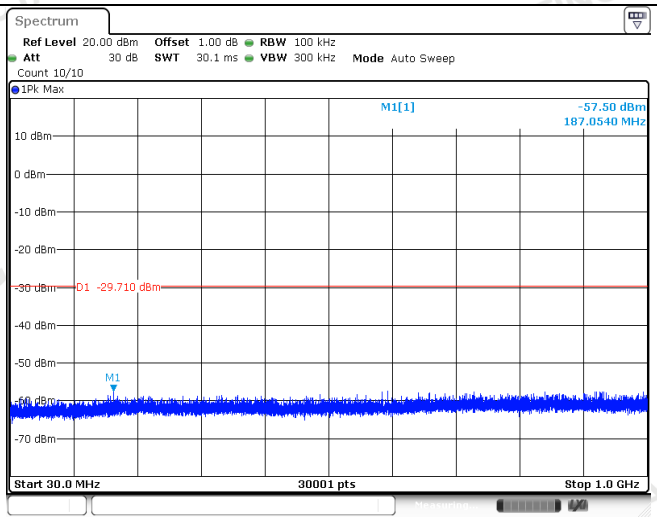
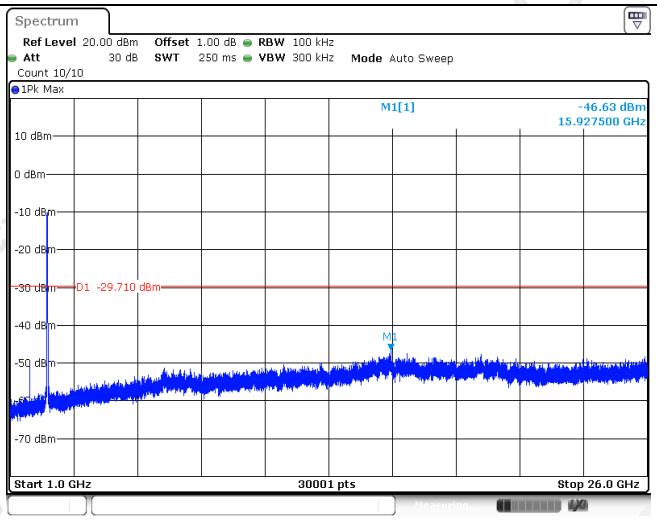
| Test Item: | SE | Type: | 802.11n(HT20) |
|---|---|---|---|
| CH01<br>Reference level |  | | |
| CH01<br>30MHz~1000MHz |  | | |
| CH01<br>1GHz~26GHz |  | | |

| | |
|---|---|
| CH06<br>Reference level |  |
| CH06<br>30MHz~1000MHz |  |
| CH06<br>1GHz~26GHz |  |

| | |
|---|---|
| CH11<br>Reference level |  |
| CH11<br>30MHz~1000MHz |  |
| CH11<br>1GHz~26GHz |  |

| Test Item: | SE | Type: | 802.11n(HT40) |
|---|---|---|---|
| CH03<br>Reference level |  | | |
| CH03<br>30MHz~1000MHz |  | | |
| CH03<br>1GHz~26GHz |  | | |

| | |
|---|---|
| CH06<br>Reference level |  |
| CH06<br>30MHz~1000MHz |  |
| CH06<br>1GHz~26GHz |  |

| | |
|---|---|
| CH09<br>Reference level |  |
| CH09<br>30MHz~1000MHz |  |
| CH09<br>1GHz~26GHz |  |

## 3.8. Spurious Emissions (radiated)

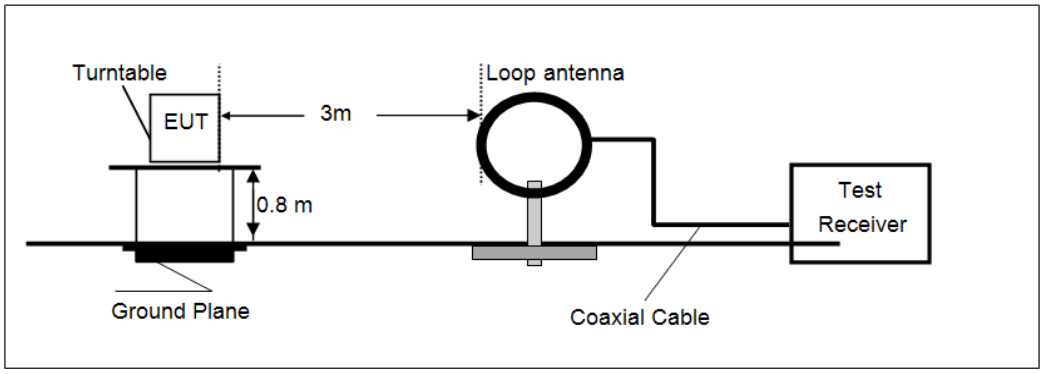
**LIMIT**

**FCC CFR Title 47 Part 15 Subpart C Section 15.209**

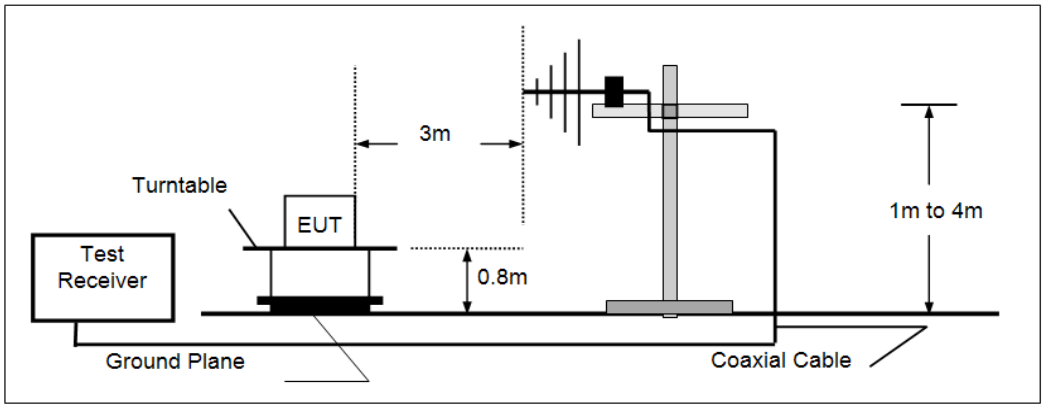
| Frequency | Limit (dBuV/m @3m) | Value |
|---|---|---|
| 30MHz-88MHz | 40.00 | Quasi-peak |
| 88MHz-216MHz | 43.50 | Quasi-peak |
| 216MHz-960MHz | 46.00 | Quasi-peak |
| 960MHz-1GHz | 54.00 | Quasi-peak |
| Above 1GHz | 54.00 | Average |
| | 74.00 | Peak |

**TEST CONFIGURATION**

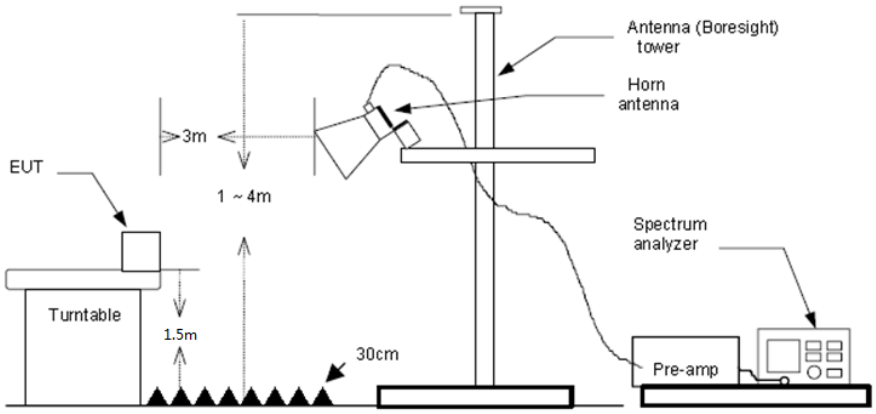
➢ 9kHz ~30MHz




➢ 30MHz ~ 1GHz




➢ Above 1GHz



**TEST PROCEDURE**

1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. 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 turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings

(1) Span shall wide enough to fully capture the emission being measured;
(2) Below 1 GHz:
RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
(3) From 1 GHz to $10^{th}$ harmonic:
RBW=1MHz, VBW=3MHz Peak detector for Peak value.
RBW=1MHz, VBW=3MHz RMS detector for Average value.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS**

☒ **Passed** ☐ **Not Applicable**

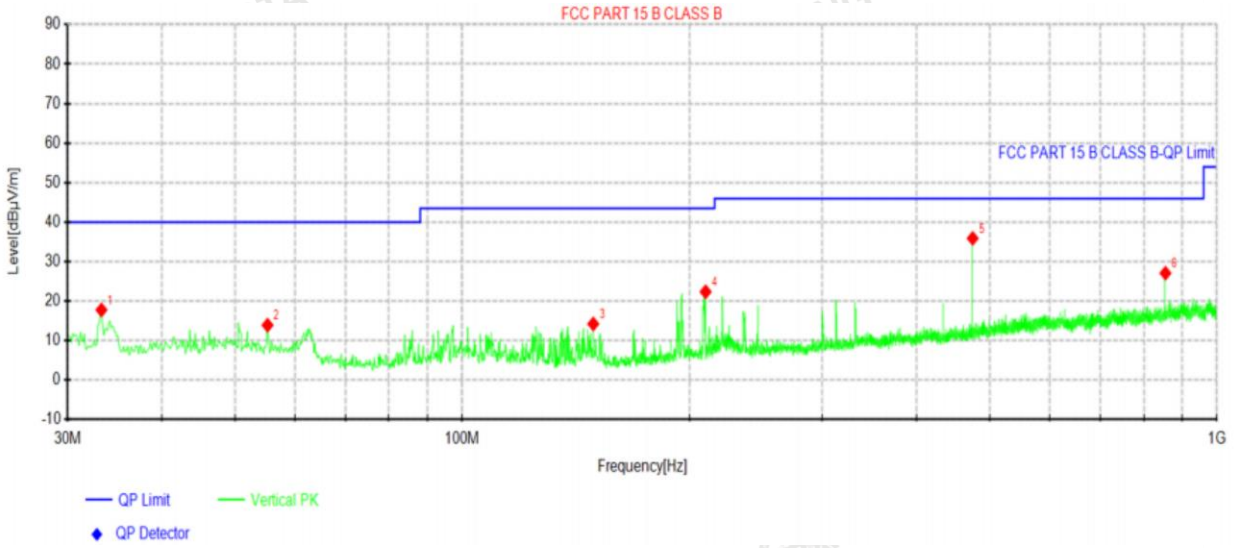
Note:
1) Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2) The emission levels of other frequencies are very lower than the limit and not show in test report.

- **9kHz ~ 30MHz**
  The EUT was pre-scanned the frequency band (9kHz~30MHz), found the radiated level lower than the limit, so don't show on the report.

- **30MHz ~1000MHz**
  Have pre-scan all modulation mode, found the 802.11b mode CH01 which it was worst case, so only the worst case's data on the test report.

➢ **30MHz ~ 1GHz**

| Polarization: | Vertical |
|---|---|

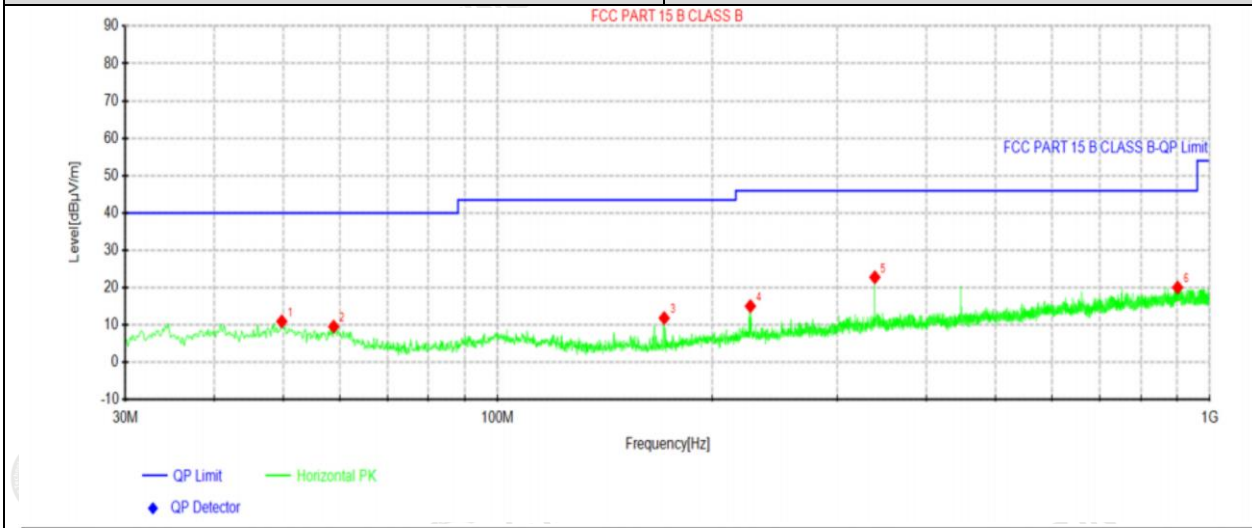



**Suspected Data List**

| NO. | Freq. [MHz] | Reading [dBµV] | Level [dBµV/m] | Factor [dB/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 33.2738 | 35.94 | 17.78 | -18.16 | 40.00 | 22.22 | 100 | 220 | Vertical |
| 2 | 55.22 | 31.10 | 13.92 | -17.18 | 40.00 | 26.08 | 100 | 164 | Vertical |
| 3 | 149.188 | 36.00 | 14.24 | -21.76 | 43.50 | 29.26 | 100 | 334 | Vertical |
| 4 | 210.177 | 41.46 | 22.37 | -19.09 | 43.50 | 21.13 | 100 | 347 | Vertical |
| 5 | 474.745 | 50.59 | 35.91 | -14.68 | 46.00 | 10.09 | 100 | 115 | Vertical |
| 6 | 854.742 | 36.85 | 27.09 | -9.76 | 46.00 | 18.91 | 100 | 172 | Vertical |

Note:1).Level (dBµV/m)= Reading (dBµV)+ Factor (dB/m)
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
3). Margin(dB) = Limit (dBµV/m) - Level (dBµV/m)

| Polarization: | Horizontal |
|---|---|




**Suspected Data List**

| NO. | Freq. [MHz] | Reading [dBµV] | Level [dBµV/m] | Factor [dB/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 49.7638 | 27.07 | 10.99 | -16.08 | 40.00 | 29.01 | 100 | 107 | Horizontal |
| 2 | 58.8575 | 27.57 | 9.61 | -17.96 | 40.00 | 30.39 | 100 | 33 | Horizontal |
| 3 | 171.377 | 32.85 | 11.88 | -20.97 | 43.50 | 31.62 | 100 | 293 | Horizontal |
| 4 | 226.425 | 33.67 | 15.08 | -18.59 | 46.00 | 30.92 | 100 | 285 | Horizontal |
| 5 | 338.581 | 39.15 | 22.80 | -16.35 | 46.00 | 23.20 | 100 | 163 | Horizontal |
| 6 | 901.181 | 29.25 | 20.07 | -9.18 | 46.00 | 25.93 | 100 | 350 | Horizontal |

Note:1).Level (dBµV/m)= Reading (dBµV)+ Factor (dB/m)
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
3). Margin(dB) = Limit (dBµV/m) - Level (dBµV/m)

➢ **1 GHz ~ 25 GHz**

| 802.11b | | | | | CH01 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 1213.44 | 34.54 | 26.29 | 4.68 | 37.22 | 28.29 | 74.00 | -45.71 | Vertical | Peak |
| 3088.45 | 34.41 | 28.78 | 7.59 | 37.50 | 33.28 | 74.00 | -40.72 | Vertical | Peak |
| 5689.36 | 32.08 | 31.62 | 10.41 | 34.31 | 39.80 | 74.00 | -34.20 | Vertical | Peak |
| 7880.77 | 31.18 | 36.59 | 12.87 | 33.06 | 47.58 | 74.00 | -26.42 | Vertical | Peak |
| 1468.70 | 32.81 | 25.83 | 5.20 | 37.08 | 26.76 | 74.00 | -47.24 | Horizontal | Peak |
| 3143.98 | 34.00 | 28.80 | 7.65 | 37.45 | 33.00 | 74.00 | -41.00 | Horizontal | Peak |
| 5476.22 | 30.96 | 31.81 | 10.18 | 34.46 | 38.49 | 74.00 | -35.51 | Horizontal | Peak |
| 7566.25 | 30.35 | 36.17 | 12.61 | 33.03 | 46.10 | 74.00 | -27.90 | Horizontal | Peak |

| 802.11b | | | | | CH06 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 1207.28 | 34.79 | 26.29 | 4.67 | 37.22 | 28.53 | 74.00 | -45.47 | Vertical | Peak |
| 4045.06 | 33.62 | 29.79 | 8.82 | 36.72 | 35.51 | 74.00 | -38.49 | Vertical | Peak |
| 6594.52 | 31.38 | 34.19 | 11.35 | 33.67 | 43.25 | 74.00 | -30.75 | Vertical | Peak |
| 8770.01 | 31.12 | 37.76 | 13.07 | 32.98 | 48.97 | 74.00 | -25.03 | Vertical | Peak |
| 1303.09 | 33.69 | 26.19 | 4.84 | 37.17 | 27.55 | 74.00 | -46.45 | Horizontal | Peak |
| 3160.03 | 34.16 | 28.80 | 7.67 | 37.43 | 33.20 | 74.00 | -40.80 | Horizontal | Peak |
| 6219.51 | 30.83 | 32.94 | 11.01 | 33.91 | 40.87 | 74.00 | -33.13 | Horizontal | Peak |
| 9251.58 | 31.05 | 38.91 | 13.55 | 33.44 | 50.07 | 74.00 | -23.93 | Horizontal | Peak |

| 802.11b | | | | | CH11 | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 1182.94 | 34.56 | 26.17 | 4.62 | 37.23 | 28.12 | 74.00 | -45.88 | Vertical | Peak |
| 3184.25 | 33.08 | 28.80 | 7.70 | 37.41 | 32.17 | 74.00 | -41.83 | Vertical | Peak |
| 5125.52 | 32.40 | 31.80 | 9.77 | 35.13 | 38.84 | 74.00 | -35.16 | Vertical | Peak |
| 7508.69 | 30.90 | 36.11 | 12.42 | 33.02 | 46.41 | 74.00 | -27.59 | Vertical | Peak |
| 1273.57 | 34.63 | 26.23 | 4.79 | 37.18 | 28.47 | 74.00 | -45.53 | Horizontal | Peak |
| 3096.33 | 35.00 | 28.79 | 7.60 | 37.49 | 33.90 | 74.00 | -40.10 | Horizontal | Peak |
| 5086.52 | 32.57 | 31.85 | 9.74 | 35.21 | 38.95 | 74.00 | -35.05 | Horizontal | Peak |
| 7376.08 | 31.86 | 36.30 | 12.04 | 33.23 | 46.97 | 74.00 | -27.03 | Horizontal | Peak |

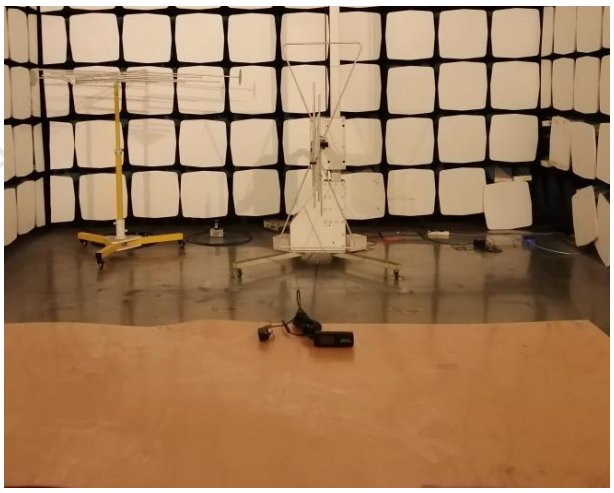
Remark:

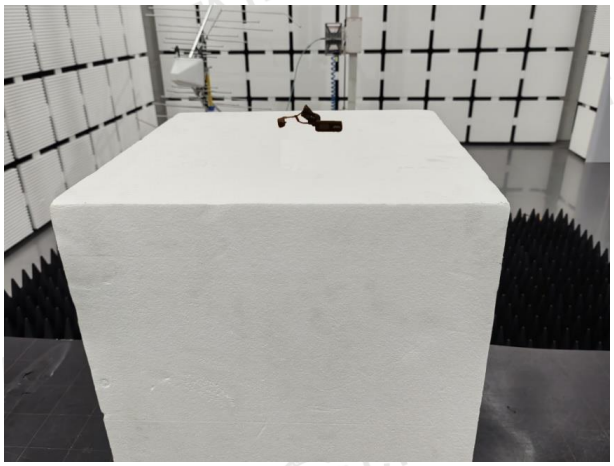
1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies(test frequency band is 1GHz to 25GHz) are very lower than the limit and not show in test report.
4. Pre-scan all modes, found the 802.11b was the worst case and recoeded it.

# 4. TEST SETUP PHOTOS

Conducted Emissions

Radiated Emissions





# 5. EXTERANAL AND INTERNAL PHOTOS

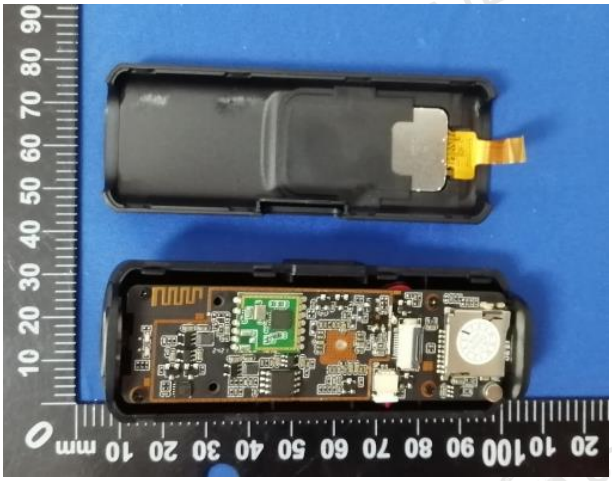
External Photos

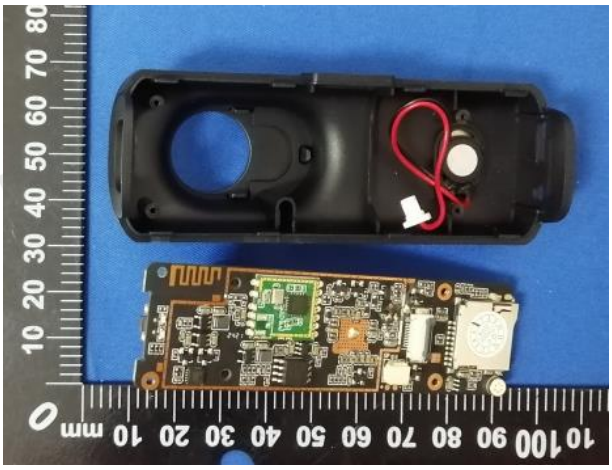
4K Ultra HD
DASH CAMERA

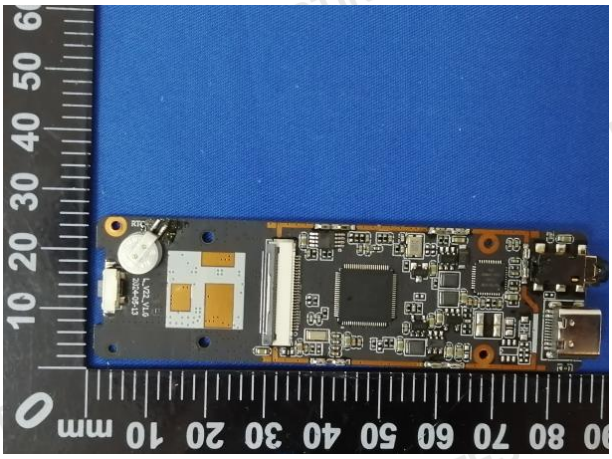
4K Ultra HD
DASH CAMERA

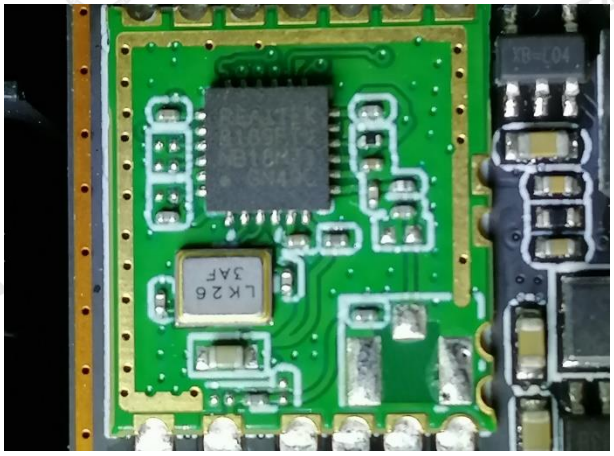
4K Ultra HD
DASH CAMERA

Internal Photos









--------End of Report--------