# FCC Report (WIFI)

| | |
|---|---|
| **Applicant:** | Shenzhen Profit Peak Limited Company |
| **Address of Applicant:** | 2205 of Dongfang Square, Jianshe Road, Luohu District, Shenzhen, China |
| **Manufacturer:** | Shenzhen 3nod Digital Technology Co., Ltd. |
| **Address of Manufacturer:** | 3nod industrial park, tangxiayong, songgang, baoan, Shenzhen, China |

**Equipment Under Test (EUT)**

| | |
|---|---|
| Product Name: | R360/R720 Camera |
| Model No.: | R360, R720, R360-SLI01, R360-WHE01, R360-BLK01, R360-PGR01, R360-PBL01, R360-PPU01, R360-PPI01, R360-PYE01 |
| **FCC ID:** | 2AKWL-360R |
| **Applicable standards:** | FCC CFR Title 47 Part 15 Subpart C Section 15.247:2016 |
| **Date of sample receipt:** | January 02, 2017 |
| **Date of Test:** | January 02-11, 2017 |
| **Date of report issued:** | January 11, 2017 |
| **Test Result :** | PASS * |

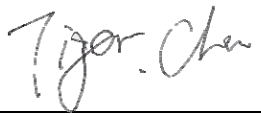
* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

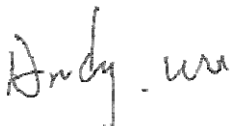
**Robinson Lo**
**Laboratory Manager**

## 2 Version

| Version No. | Date | Description |
|---|---|---|
| *00* | *January 11, 2017* | *Original* |
| | | |
| | | |
| | | |
| | | |

***Prepared By:***  ***Date:*** *January 11, 2017*

***Project Engineer***

***Check By:***  ***Date:*** *January 11, 2017*

***Reviewer***

# 3 Contents

# 4 Test Summary

| Test Item | Section in CFR 47 | Result |
|---|---|---|
| Antenna requirement | 15.203/15.247 (c) | Pass |
| AC Power Line Conducted Emission | 15.207 | Pass |
| Conducted Peak Output Power | 15.247 (b)(3) | Pass |
| Channel Bandwidth | 15.247 (a)(2) | Pass |
| Power Spectral Density | 15.247 (e) | Pass |
| Band Edge | 15.247(d) | Pass |
| Spurious Emission | 15.205/15.209 | Pass |

*Pass: The EUT complies with the essential requirements in the standard.*

*Remark: Test according to ANSI C63.4:2014 and ANSI C63.10:2013.*

**Measurement Uncertainty**

| Test Item | Frequency Range | Measurement Uncertainty | Notes |
|---|---|---|---|
| Radiated Emission | 9kHz ~ 30MHz | ± 4.34dB | (1) |
| Radiated Emission | 30MHz ~ 1000MHz | ± 4.24dB | (1) |
| Radiated Emission | 1GHz ~ 26.5GHz | ± 4.68dB | (1) |
| AC Power Line Conducted Emission | 0.15MHz ~ 30MHz | ± 3.45dB | (1) |
| Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%. | | | |

# 5 General Information

## 5.1 General Description of EUT

| | |
|---|---|
| Product Name: | R360/R720 Camera |
| Model No.: | R360, R720, R360-SLI01, R360-WHE01, R360-BLK01, R360-PGR01, R360-PBL01, R360-PPU01, R360-PPI01, R360-PYE01 |
| Test Model No.: | R360 |
| Remark: | *All above models are identical in the same PCB layout, interior structure and electrical circuits. The only difference is model name for commercial purpose.* |
| Operation Frequency: | 802.11b/802.11g/802.11n(HT20): 2412MHz~2462MHz |
| Channel numbers: | 802.11b/802.11g /802.11n(HT20): 11 |
| Channel separation: | 5MHz |
| Modulation technology: | 802.11b: Direct Sequence Spread Spectrum (DSSS)<br>802.11g/802.11n(H20):<br>Orthogonal Frequency Division Multiplexing (OFDM) |
| Antenna Type: | PCB antenna |
| Antenna gain: | 1.48dBi |
| Power supply: | DC 3.7V 1000mAh Li-ion Battery |

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

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Test channel | Frequency (MHz) |
|---|---|
| | 802.11b/802.11g/802.11n(HT20) |
| Lowest channel | 2412MHz |
| Middle channel | 2437MHz |
| Highest channel | 2462MHz |

## 5.2 Test mode

| | |
|---|---|
| Transmitting mode | Keep the EUT in continuously transmitting mode |
| *Remark: During the test, the dutycycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.* | |

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

| Mode | 802.11b | 802.11g | 802.11n(HT20) |
|---|---|---|---|
| Data rate | 1Mbps | 6Mbps | 6.5Mbps |

## 5.3 Description of Support Units

None.

## 5.4 Test Facility

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

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 22, 2016.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016.

## 5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480
Fax: 0755-27798960

# 6 Test Instruments list

| Radiated Emission: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | 3m Semi- Anechoic Chamber | ZhongYu Electron | 9.0(L)*6.0(W)* 6.0(H) | GTS250 | July. 03 2015 | July 02 2020 |
| 2 | Control Room | ZhongYu Electron | 6.2(L)*2.5(W)* 2.4(H) | GTS251 | N/A | N/A |
| 3 | ESU EMI Test Receiver | R&S | ESU26 | GTS203 | June. 29 2016 | June 28 2017 |
| 4 | Loop Antenna | Zhinan | ZN30900A | GTS534 | June. 29 2016 | June 28 2017 |
| 5 | BiConiLog Antenna | SCHWARZBECK | VULB9163 | GTS214 | June. 29 2016 | June 28 2017 |
| 6 | Double-ridged horn antenna | SCHWARZBECK | 9120D | GTS208 | June. 29 2016 | June 28 2017 |
| 7 | Horn Antenna | ETS-LINDGREN | 3160-09 | GTS218 | June. 29 2016 | June 28 2017 |
| 8 | RF Amplifier | HP | 8347A | GTS204 | June. 29 2016 | June 28 2017 |
| 9 | RF Amplifier | HP | 8349B | GTS206 | June. 29 2016 | June 28 2017 |
| 10 | Broadband Preamplifier | SCHWARZBECK | BBV9718 | GTS535 | June. 29 2016 | June 28 2017 |
| 11 | PSA Series Spectrum Analyzer | Agilent | E4440A | GTS536 | June. 29 2016 | June 28 2017 |
| 12 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 13 | Coaxial Cable | GTS | N/A | GTS210 | June. 29 2016 | June 28 2017 |
| 14 | Coaxial Cable | GTS | N/A | GTS211 | June. 29 2016 | June 28 2017 |
| 15 | Coaxial Cable | GTS | N/A | GTS210 | June. 29 2016 | June 28 2017 |
| 16 | Coaxial Cable | GTS | N/A | GTS212 | June. 29 2016 | June 28 2017 |
| 17 | Thermo meter | N/A | N/A | GTS256 | June. 29 2016 | June 28 2017 |
| 18 | D.C. Power Supply | Instek | PS-3030 | GTS232 | June. 29 2016 | June 28 2017 |

| Conducted Emission | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | Shielding Room | ZhongYu Electron | 7.3(L)x3.1(W)x2.9(H) | GTS252 | May.16 2014 | May 15 2019 |
| 2 | EMI Test Receiver | R&S | ESCI 7 | GTS552 | June. 29 2016 | June 28 2017 |
| 3 | Coaxial Switch | ANRITSU CORP | MP59B | GTS225 | June. 29 2016 | June 28 2017 |
| 4 | Artificial Mains Network | SCHWARZBECK MESS | NSLK8127 | GTS226 | June. 29 2016 | June 28 2017 |
| 5 | High voltage probe | SCHWARZBECK | TK9420 | GTS537 | June. 29 2016 | June 28 2017 |
| 6 | ISN | SCHWARZBECK | NTFM 8158 | GTS565 | June. 29 2016 | June 28 2017 |
| 7 | Coaxial Cable | GTS | N/A | GTS227 | June. 29 2016 | June 28 2017 |
| 8 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 9 | Thermo meter | KTJ | TA328 | GTS233 | June. 29 2016 | June 28 2017 |
| 10 | 10dB Pulse Limiter | Rohde & Schwarz | N/A | GTS224 | June. 29 2016 | June 28 2017 |

| General used equipment: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | Barometer | ChangChun | DYM3 | GTS257 | June. 29 2016 | June 28 2017 |

# 7 Test results and Measurement Data

## 7.1 Antenna requirement

| | |
|---|---|
| **Standard requirement:** | FCC Part15 C Section 15.203 /247(c) |

**15.203 requirement:**

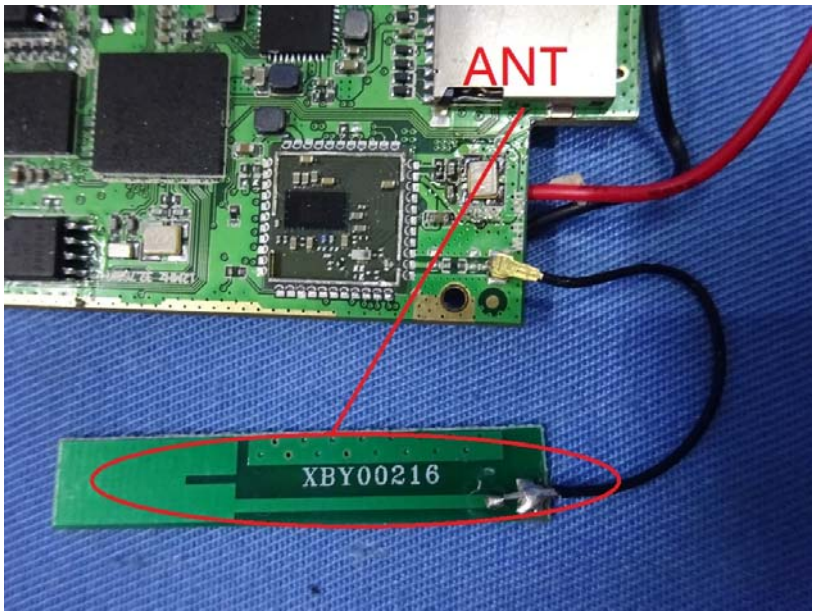
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

**15.247(c) (1)(i) requirement:**

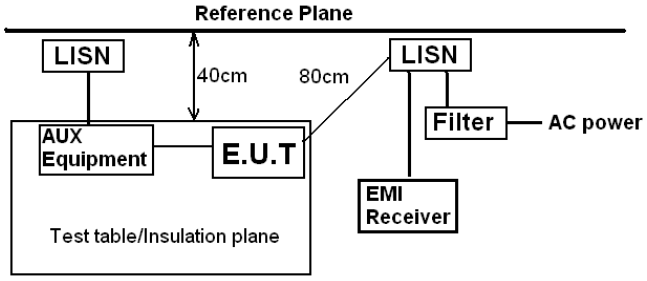
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional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

**E.U.T Antenna:**

*The antenna is PCB antenna, the best case gain of the antenna is 1.48dBi*



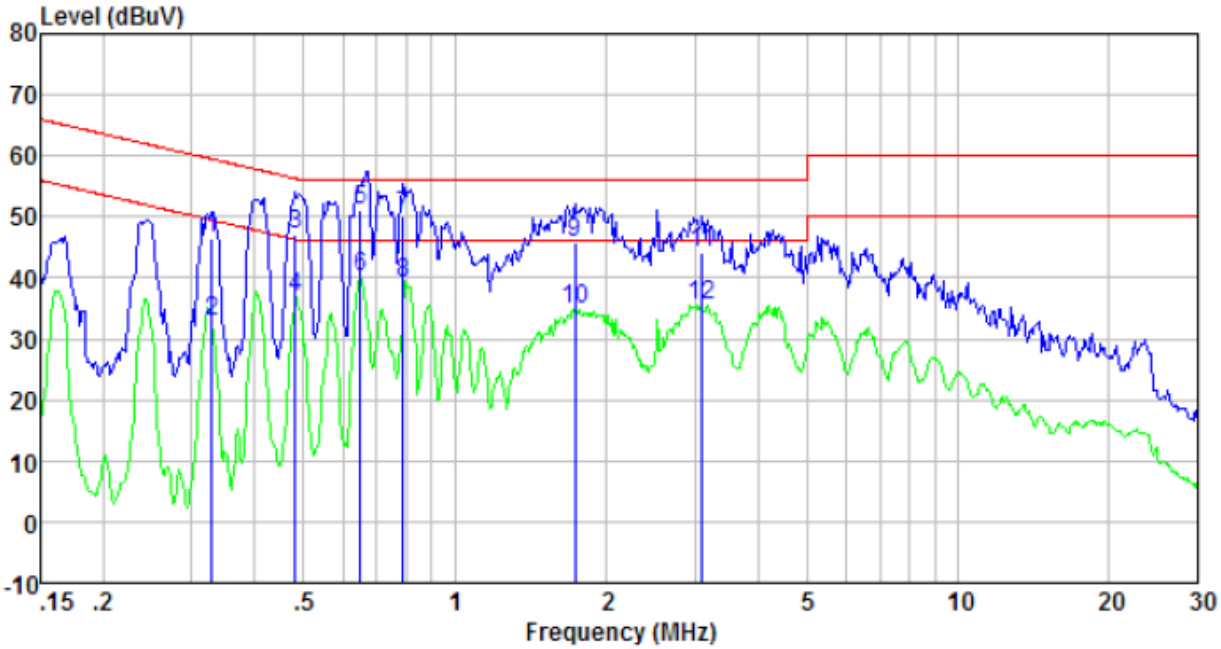
## 7.2 Conducted Emissions

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>150KHz to 30MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9KHz, VBW=30KHz, Sweep time=auto</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test setup:</td><td>


Remark:<br>E.U.T: Equipment Under Test<br>LISN: Line Impedence Stabilization Network<br>Test table height=0.8m
</td></tr>
<tr><td>Test procedure:</td><td>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.<br>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).<br>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 6.0 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 5.2 for details</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

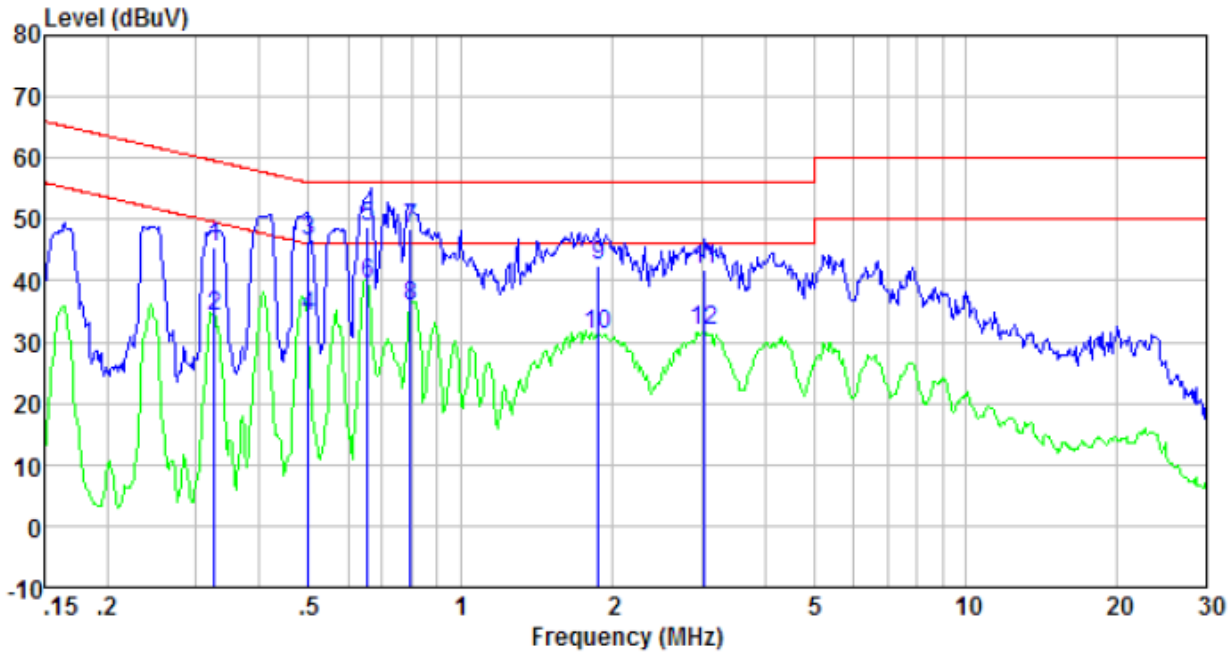
**Measurement data**

Line:




| Freq MHz | Reading level dBuV | lISN/ISN factor dB | Cable loss dB | level dBuV | Limit level dBuV | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|
| 0.329 | 45.97 | 0.43 | 0.10 | 46.50 | 59.49 | -12.99 | QP |
| 0.329 | 32.25 | 0.43 | 0.10 | 32.78 | 49.49 | -16.71 | Average |
| 0.481 | 46.57 | 0.39 | 0.11 | 47.07 | 56.32 | -9.25 | QP |
| 0.481 | 36.45 | 0.39 | 0.11 | 36.95 | 46.32 | -9.37 | Average |
| 0.647 | 50.63 | 0.29 | 0.13 | 51.05 | 56.00 | -4.95 | QP |
| 0.647 | 39.56 | 0.29 | 0.13 | 39.98 | 46.00 | -6.02 | Average |
| 0.788 | 49.63 | 0.27 | 0.13 | 50.03 | 56.00 | -5.97 | QP |
| 0.788 | 38.86 | 0.27 | 0.13 | 39.26 | 46.00 | -6.74 | Average |
| 1.734 | 45.47 | 0.21 | 0.14 | 45.82 | 56.00 | -10.18 | QP |
| 1.734 | 34.53 | 0.21 | 0.14 | 34.88 | 46.00 | -11.12 | Average |
| 3.107 | 43.74 | 0.20 | 0.15 | 44.09 | 56.00 | -11.91 | QP |
| 3.107 | 35.20 | 0.20 | 0.15 | 35.55 | 46.00 | -10.45 | Average |

Neutral:

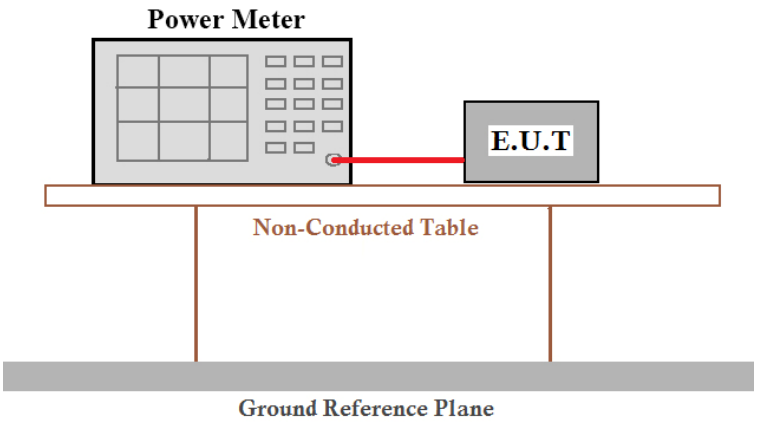



| Freq MHz | Reading level dBuV | lISN/ISN factor dB | Cable loss dB | level dBuV | Limit level dBuV | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|
| 0.325 | 44.82 | 0.41 | 0.10 | 45.33 | 59.57 | -14.24 | QP |
| 0.325 | 33.81 | 0.41 | 0.10 | 34.32 | 49.57 | -15.25 | Average |
| 0.499 | 45.94 | 0.35 | 0.11 | 46.40 | 56.01 | -9.61 | QP |
| 0.499 | 33.77 | 0.35 | 0.11 | 34.23 | 46.01 | -11.78 | Average |
| 0.654 | 48.26 | 0.26 | 0.13 | 48.65 | 56.00 | -7.35 | QP |
| 0.654 | 39.09 | 0.26 | 0.13 | 39.48 | 46.00 | -6.52 | Average |
| 0.796 | 48.08 | 0.23 | 0.13 | 48.44 | 56.00 | -7.56 | QP |
| 0.796 | 35.48 | 0.23 | 0.13 | 35.84 | 46.00 | -10.16 | Average |
| 1.878 | 42.10 | 0.20 | 0.14 | 42.44 | 56.00 | -13.56 | QP |
| 1.878 | 30.97 | 0.20 | 0.14 | 31.31 | 46.00 | -14.69 | Average |
| 3.041 | 41.51 | 0.20 | 0.15 | 41.86 | 56.00 | -14.14 | QP |
| 3.041 | 31.44 | 0.20 | 0.15 | 31.79 | 46.00 | -14.21 | Average |

*Notes:*

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

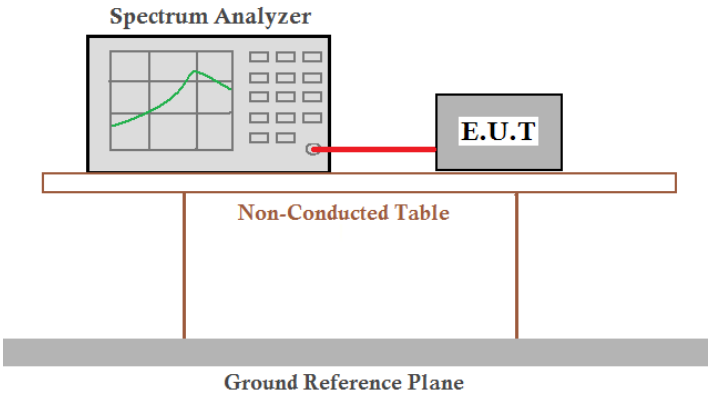
## 7.3 Conducted Peak Output Power

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (b)(3) |
| Test Method: | KDB558074 D01 DTS Meas Guidance V03 |
| Limit: | 30dBm |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Measurement Data**

| Test CH | Peak Output Power (dBm) | | | Limit(dBm) | Result |
|---|---|---|---|---|---|
| | 802.11b | 802.11g | 802.11n(HT20) | | |
| Lowest | 9.16 | 8.40 | 7.83 | 30.00 | Pass |
| Middle | 9.34 | 8.15 | 8.14 | | |
| Highest | 9.33 | 8.44 | 8.14 | | |

## 7.4 Channel Bandwidth

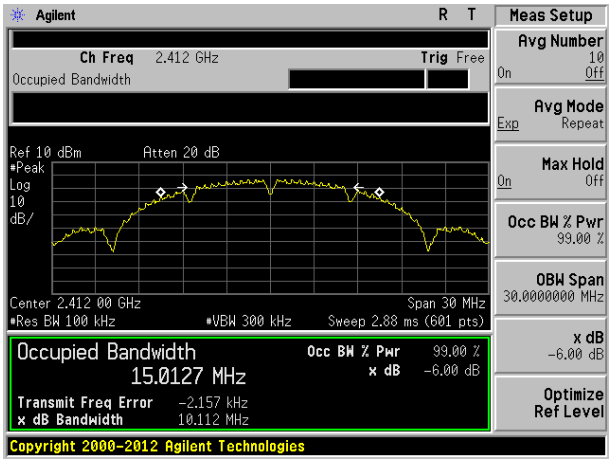
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(2) |
| Test Method: | KDB558074 D01 DTS Meas Guidance V03 |
| Limit: | >500KHz |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Measurement Data**

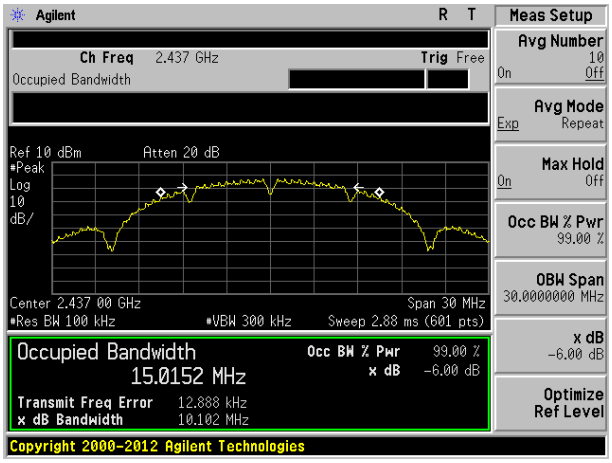
| Test CH | Channel Bandwidth (MHz) | | | Limit(KHz) | Result |
|---|---|---|---|---|---|
| | 802.11b | 802.11g | 802.11n(HT20) | | |
| Lowest | 10.112 | 16.624 | 17.861 | >500 | Pass |
| Middle | 10.102 | 16.613 | 17.853 | | |
| Highest | 10.094 | 16.612 | 17.848 | | |

**Test plot as follows:**

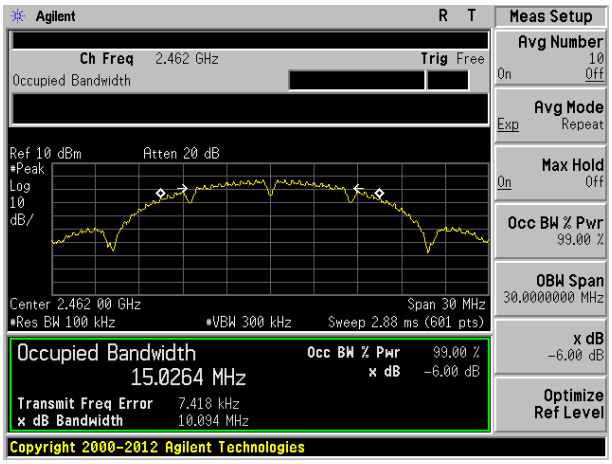
| Test mode: | 802.11b |
|---|---|




Lowest channel

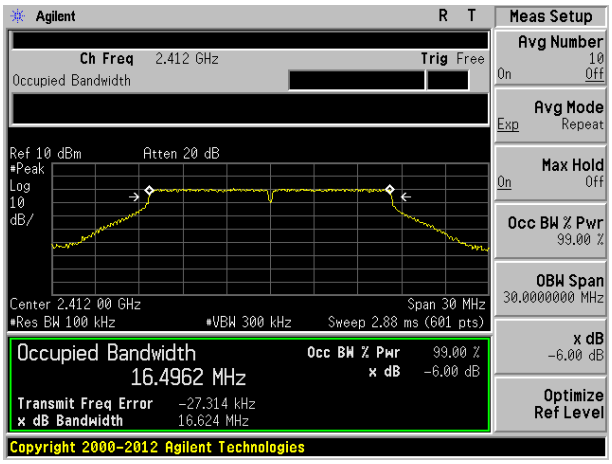



Middle channel

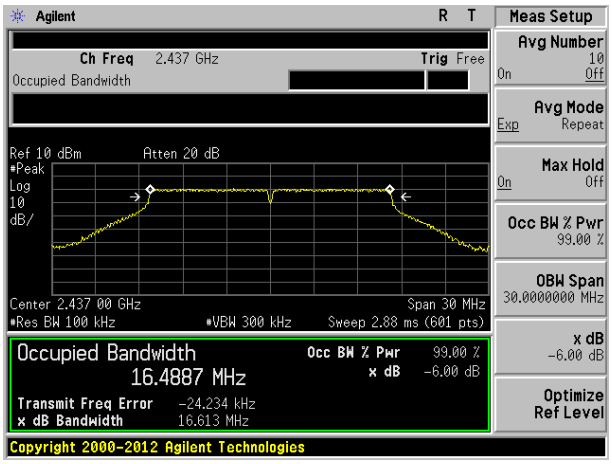



Highest channel

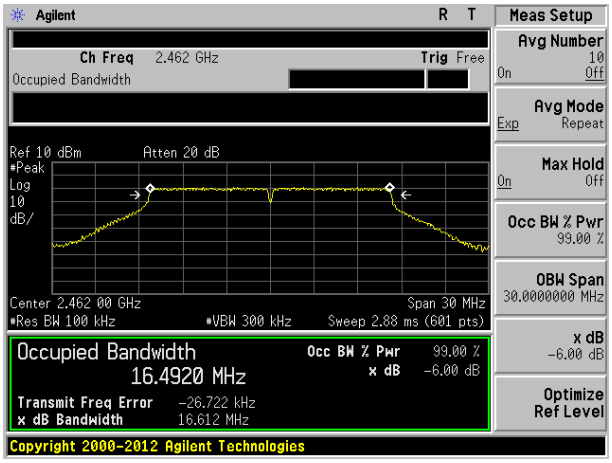
| Test mode: | 802.11g |
|---|---|




Lowest channel

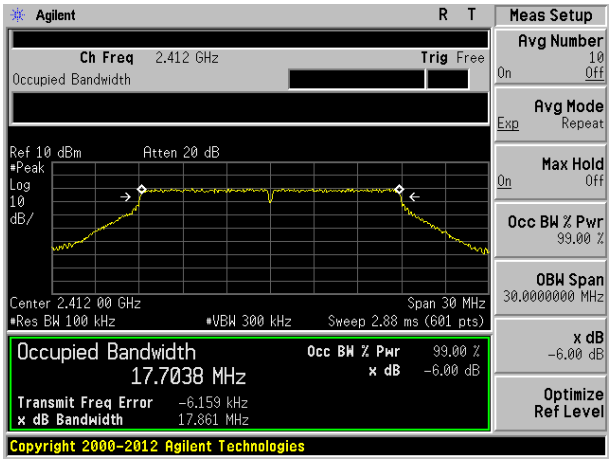



Middle channel

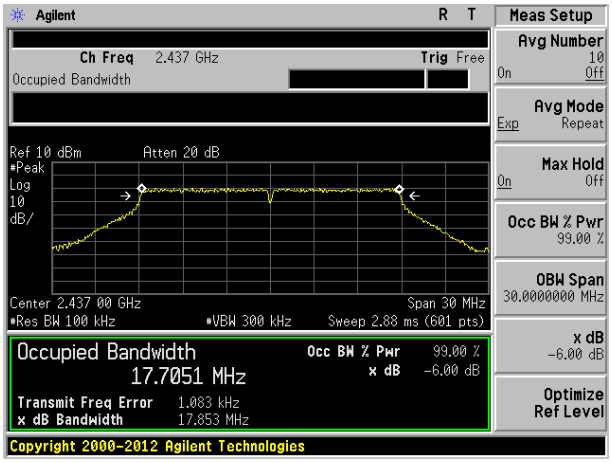



Highest channel

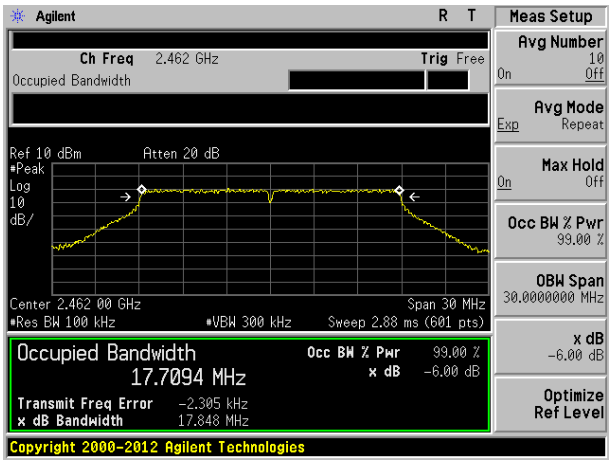
| Test mode: | 802.11n(HT20) |
|---|---|




Lowest channel

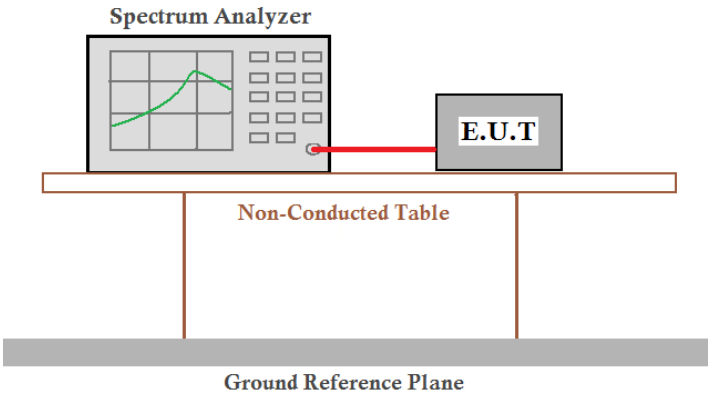



Middle channel




Highest channel

## 7.5 Power Spectral Density

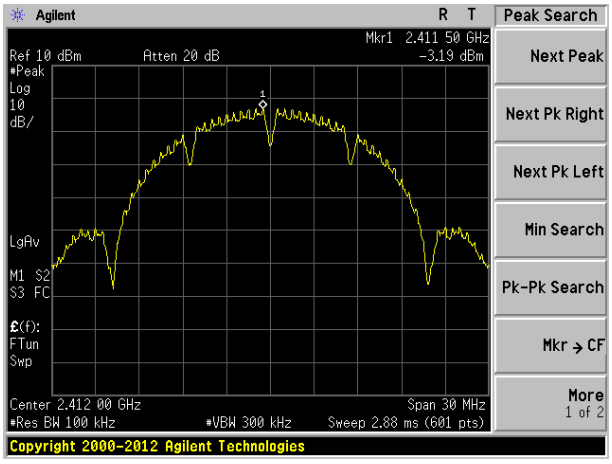
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (e) |
| Test Method: | KDB558074 D01 DTS Meas Guidance V03 |
| Limit: | 8dBm/3kHz |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Measurement Data**

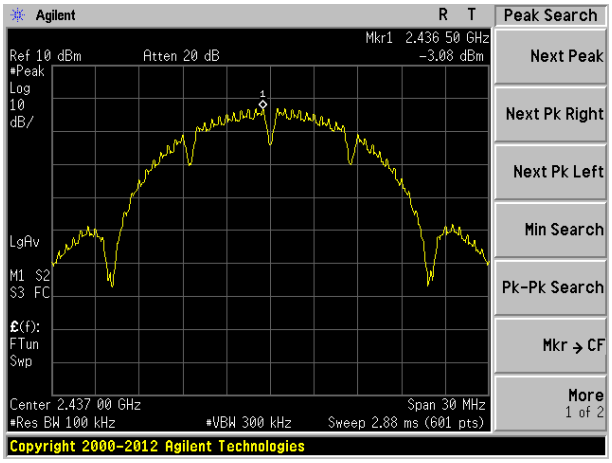
| Test CH | Power Spectral Density (dBm) | | | Limit (dBm/3kHz) | Result |
|---|---|---|---|---|---|
| | 802.11b | 802.11g | 802.11n(HT20) | | |
| Lowest | -3.19 | -9.52 | -9.74 | 8.00 | Pass |
| Middle | -3.08 | -9.66 | -9.91 | | |
| Highest | -3.01 | -9.39 | -9.44 | | |

**Test plot as follows:**

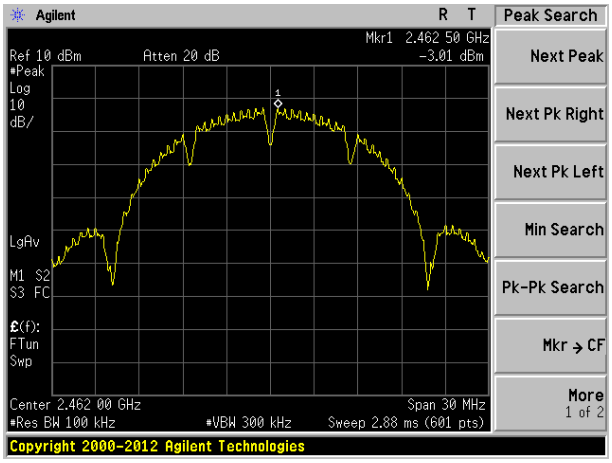
| Test mode: | 802.11b |
|---|---|




Lowest channel

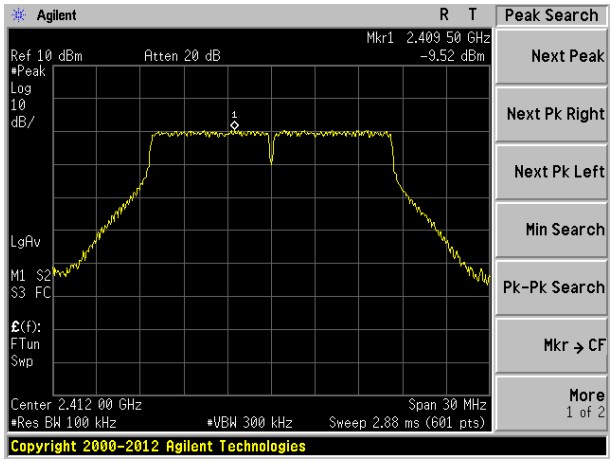



Middle channel

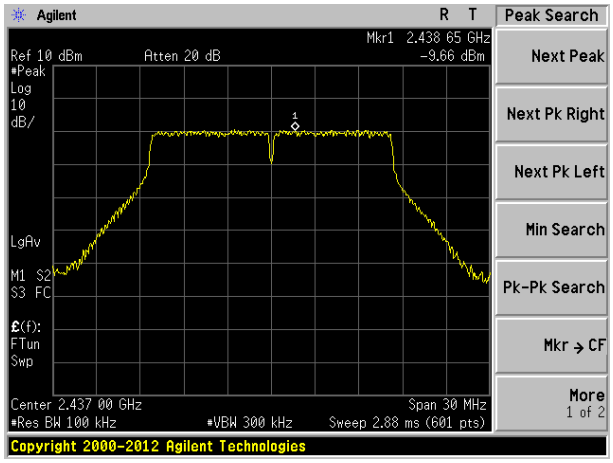



Highest channel

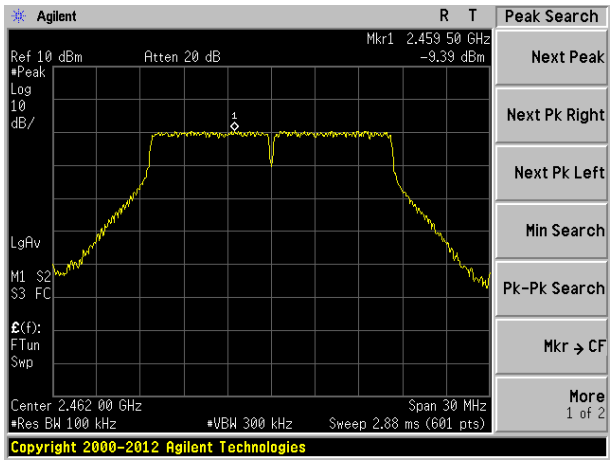
| Test mode: | 802.11g |
|---|---|




Lowest channel

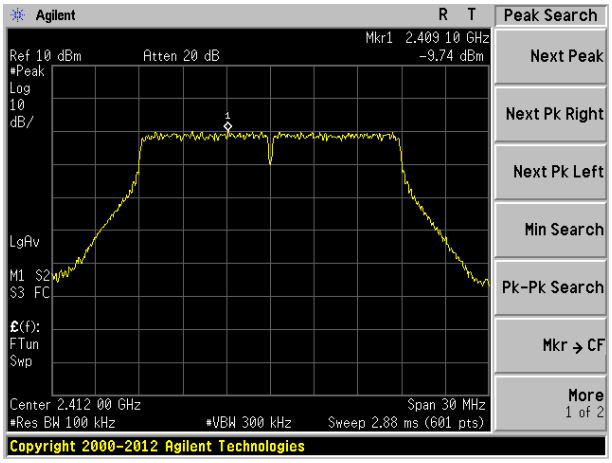



Middle channel

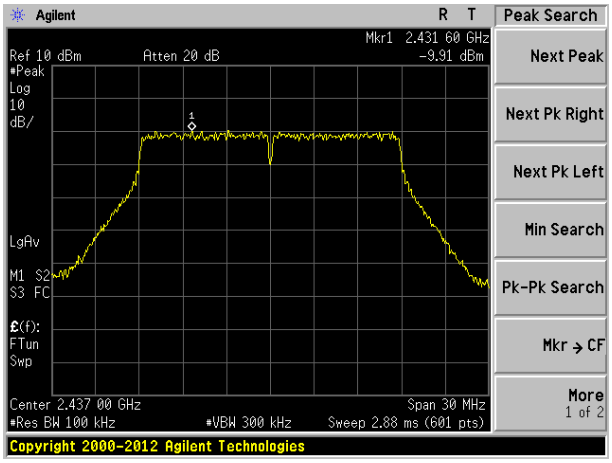



Highest channel

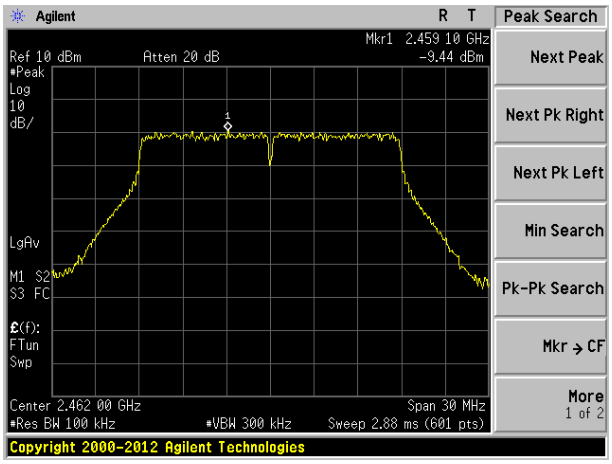
| Test mode: | 802.11n(HT20) |
|---|---|




Lowest channel



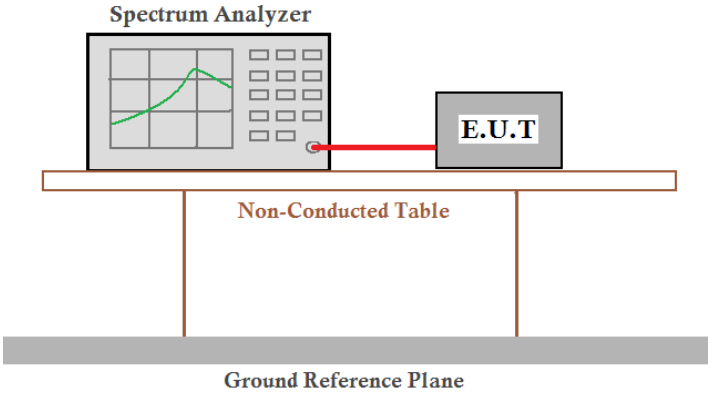

Middle channel




Highest channel

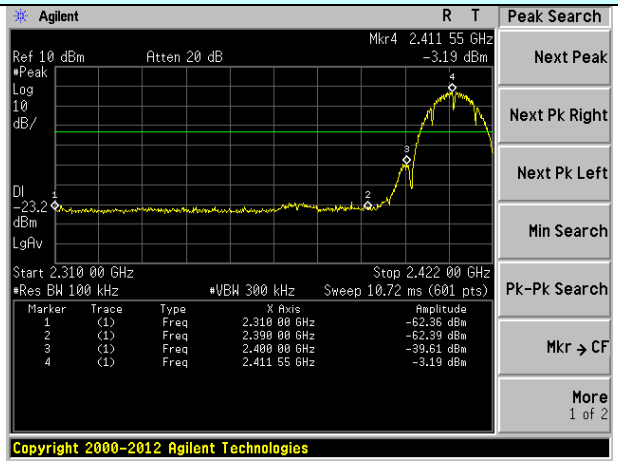
## 7.6 Band edges

### 7.6.1 Conducted Emission Method

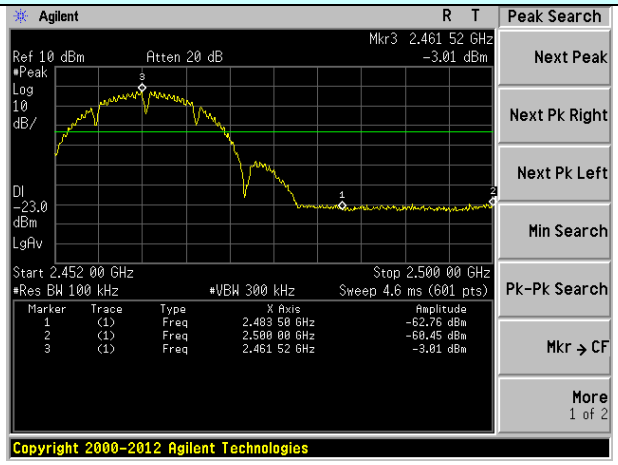
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (d) |
| Test Method: | KDB558074 D01 DTS Meas Guidance V03 |
| Limit: | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the 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 setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Test plot as follows:**

| Test mode: | 802.11b |
|---|---|

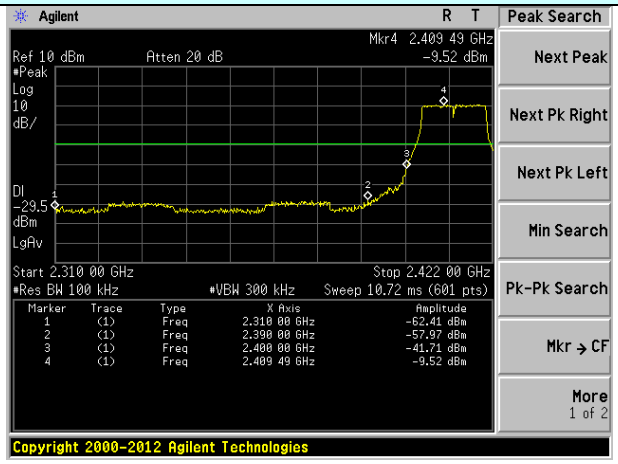



Lowest channel

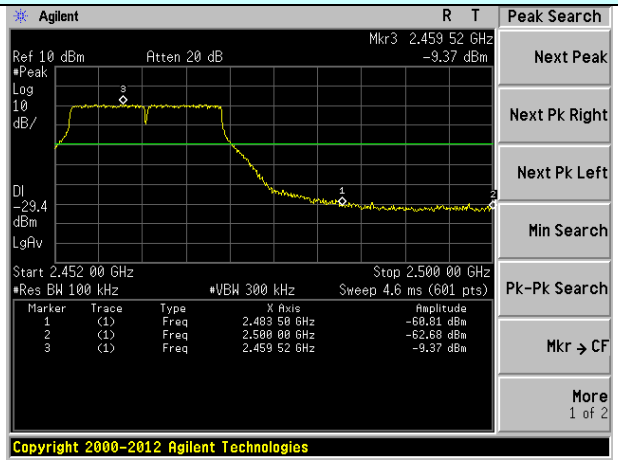



Highest channel

| Test mode: | 802.11g |
|---|---|

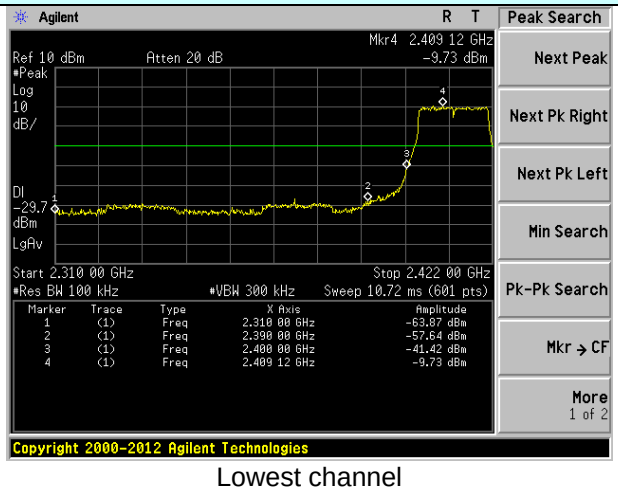



Lowest channel

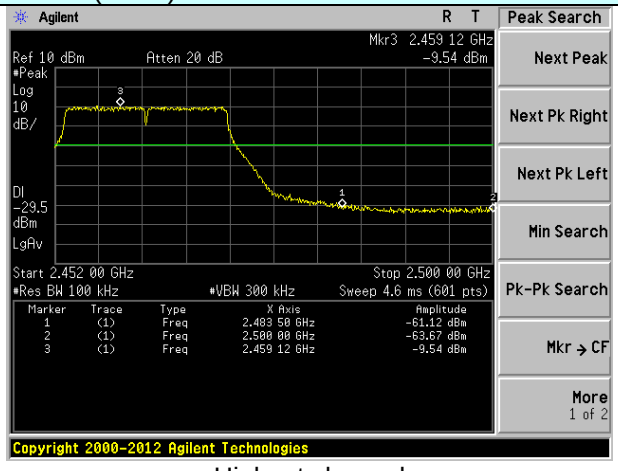



Highest channel

| Test mode: | 802.11n(HT20) |
|---|---|




Lowest channel




Highest channel

### 7.6.2 Radiated Emission Method

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.209 and 15.205 |
| Test Method: | ANSI C63.10:2013 |
| Test Frequency Range: | All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed. |
| Test site: | Measurement Distance: 3m |

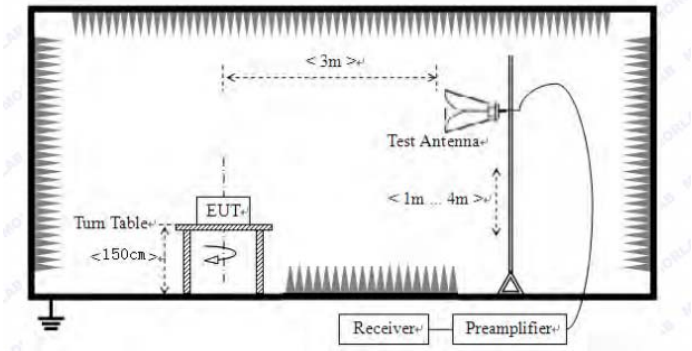
Receiver setup:

| Frequency | Detector | RBW | VBW | Value |
|---|---|---|---|---|
| Above 1GHz | Peak | 1MHz | 3MHz | Peak |
| | RMS | 1MHz | 3MHz | Average |

Limit:

| Frequency | Limit (dBuV/m @3m) | Value |
|---|---|---|
| Above 1GHz | 54.00 | Average |
| | 74.00 | Peak |

Test setup:




Test Procedure:

1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.

| | |
|---|---|
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |

| Test results: | Pass |
|---|---|

Measurement data:

| Test mode: | 802.11b | Test channel: | Lowest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 2390.00 | 51.28 | 27.59 | 5.38 | 34.01 | 50.24 | 74.00 | -23.76 | Horizontal |
| 2400.00 | 65.17 | 27.58 | 5.39 | 34.01 | 59.13 | 74.00 | -9.87 | Horizontal |
| 2390.00 | 52.94 | 27.59 | 5.38 | 34.01 | 51.90 | 74.00 | -22.10 | Vertical |
| 2400.00 | 64.87 | 27.58 | 5.39 | 34.01 | 60.83 | 74.00 | -10.17 | Vertical |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 2390.00 | 38.15 | 27.59 | 5.38 | 34.01 | 37.11 | 54.00 | -16.89 | Horizontal |
| 2400.00 | 46.40 | 27.58 | 5.39 | 34.01 | 45.36 | 54.00 | -8.64 | Horizontal |
| 2390.00 | 39.94 | 27.59 | 5.38 | 34.01 | 38.90 | 54.00 | -15.10 | Vertical |
| 2400.00 | 47.50 | 27.58 | 5.39 | 34.01 | 46.46 | 54.00 | -7.54 | Vertical |

| Test mode: | 802.11b | Test channel: | Highest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 55.78 | 27.53 | 5.47 | 33.92 | 50.86 | 74.00 | -19.14 | Horizontal |
| 2500.00 | 47.72 | 27.55 | 5.49 | 29.93 | 50.83 | 74.00 | -23.17 | Horizontal |
| 2483.50 | 53.96 | 27.53 | 5.47 | 33.92 | 53.04 | 74.00 | -20.96 | Vertical |
| 2500.00 | 50.16 | 27.55 | 5.49 | 29.93 | 53.27 | 74.00 | -20.73 | Vertical |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 38.46 | 27.53 | 5.47 | 33.92 | 37.54 | 54.00 | -16.46 | Horizontal |
| 2500.00 | 34.63 | 27.55 | 5.49 | 29.93 | 37.74 | 54.00 | -16.26 | Horizontal |
| 2483.50 | 40.37 | 27.53 | 5.47 | 33.92 | 39.45 | 54.00 | -14.55 | Vertical |
| 2500.00 | 36.50 | 27.55 | 5.49 | 29.93 | 39.61 | 54.00 | -14.39 | Vertical |

*Remark:*

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.*

| Test mode: | 802.11g | Test channel: | Lowest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 2390.00 | 50.76 | 27.59 | 5.38 | 34.01 | 49.72 | 74.00 | -24.28 | Horizontal |
| 2400.00 | 63.47 | 27.58 | 5.39 | 34.01 | 58.43 | 74.00 | -11.57 | Horizontal |
| 2390.00 | 52.38 | 27.59 | 5.38 | 34.01 | 51.34 | 74.00 | -22.66 | Vertical |
| 2400.00 | 61.03 | 27.58 | 5.39 | 34.01 | 59.99 | 74.00 | -14.01 | Vertical |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 2390.00 | 37.78 | 27.59 | 5.38 | 34.01 | 36.74 | 54.00 | -17.26 | Horizontal |
| 2400.00 | 45.97 | 27.58 | 5.39 | 34.01 | 44.93 | 54.00 | -9.07 | Horizontal |
| 2390.00 | 39.52 | 27.59 | 5.38 | 34.01 | 38.48 | 54.00 | -15.52 | Vertical |
| 2400.00 | 47.03 | 27.58 | 5.39 | 34.01 | 45.99 | 54.00 | -8.01 | Vertical |

| Test mode: | 802.11g | Test channel: | Highest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 51.03 | 27.53 | 5.47 | 33.92 | 50.11 | 74.00 | -23.89 | Horizontal |
| 2500.00 | 47.14 | 27.55 | 5.49 | 29.93 | 50.25 | 74.00 | -23.75 | Horizontal |
| 2483.50 | 53.11 | 27.53 | 5.47 | 33.92 | 52.19 | 74.00 | -21.81 | Vertical |
| 2500.00 | 49.49 | 27.55 | 5.49 | 29.93 | 52.60 | 74.00 | -21.40 | Vertical |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 38.01 | 27.53 | 5.47 | 33.92 | 37.09 | 54.00 | -16.91 | Horizontal |
| 2500.00 | 34.28 | 27.55 | 5.49 | 29.93 | 37.39 | 54.00 | -16.61 | Horizontal |
| 2483.50 | 39.87 | 27.53 | 5.47 | 33.92 | 38.95 | 54.00 | -15.05 | Vertical |
| 2500.00 | 36.12 | 27.55 | 5.49 | 29.93 | 39.23 | 54.00 | -14.77 | Vertical |

*Remark:*

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.*

| Test mode: | 802.11n(HT20) | Test channel: | Lowest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 2390.00 | 50.91 | 27.59 | 5.38 | 34.01 | 49.87 | 74.00 | -24.13 | Horizontal |
| 2400.00 | 63.67 | 27.58 | 5.39 | 34.01 | 58.63 | 74.00 | -11.37 | Horizontal |
| 2390.00 | 52.54 | 27.59 | 5.38 | 34.01 | 51.50 | 74.00 | -22.50 | Vertical |
| 2400.00 | 61.27 | 27.58 | 5.39 | 34.01 | 60.23 | 74.00 | -13.77 | Vertical |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 2390.00 | 37.88 | 27.59 | 5.38 | 34.01 | 36.84 | 54.00 | -17.16 | Horizontal |
| 2400.00 | 46.10 | 27.58 | 5.39 | 34.01 | 45.06 | 54.00 | -8.94 | Horizontal |
| 2390.00 | 39.64 | 27.59 | 5.38 | 34.01 | 38.60 | 54.00 | -15.40 | Vertical |
| 2400.00 | 47.17 | 27.58 | 5.39 | 34.01 | 46.13 | 54.00 | -7.87 | Vertical |

| Test mode: | 802.11n(HT20) | Test channel: | Highest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 51.25 | 27.53 | 5.47 | 33.92 | 50.33 | 74.00 | -23.67 | Horizontal |
| 2500.00 | 47.31 | 27.55 | 5.49 | 29.93 | 50.42 | 74.00 | -23.58 | Horizontal |
| 2483.50 | 53.36 | 27.53 | 5.47 | 33.92 | 52.44 | 74.00 | -21.56 | Vertical |
| 2500.00 | 49.68 | 27.55 | 5.49 | 29.93 | 52.79 | 74.00 | -21.21 | Vertical |

**Average value:**

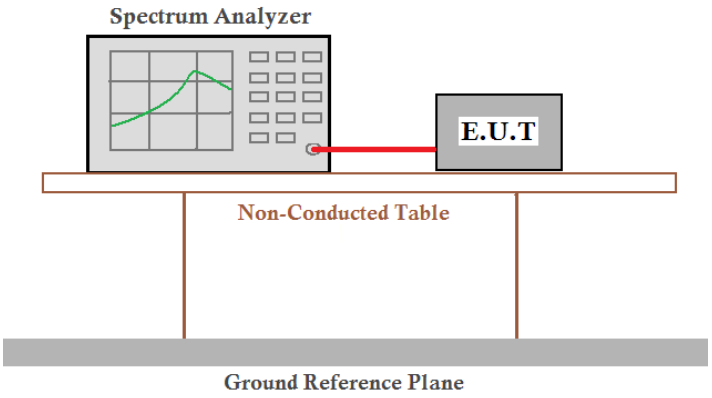
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 38.14 | 27.53 | 5.47 | 33.92 | 37.22 | 54.00 | -16.78 | Horizontal |
| 2500.00 | 34.38 | 27.55 | 5.49 | 29.93 | 37.49 | 54.00 | -16.51 | Horizontal |
| 2483.50 | 40.02 | 27.53 | 5.47 | 33.92 | 39.10 | 54.00 | -14.90 | Vertical |
| 2500.00 | 36.23 | 27.55 | 5.49 | 29.93 | 39.34 | 54.00 | -14.66 | Vertical |

*Remark:*

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.*

## 7.7 Spurious Emission

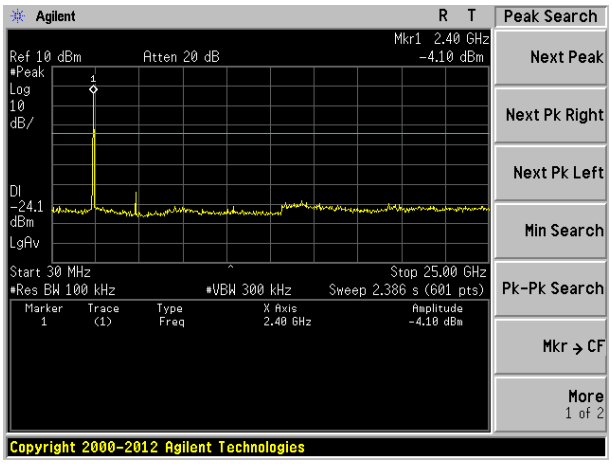
### 7.7.1 Conducted Emission Method

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (d) |
| Test Method: | KDB558074 D01 DTS Meas Guidance V03 |
| Limit: | 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 setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Test plot as follows:**

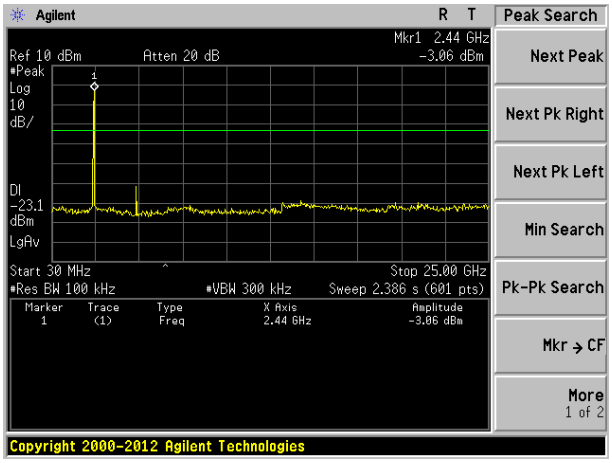
| Test mode: | 802.11b |
|---|---|

Lowest channel



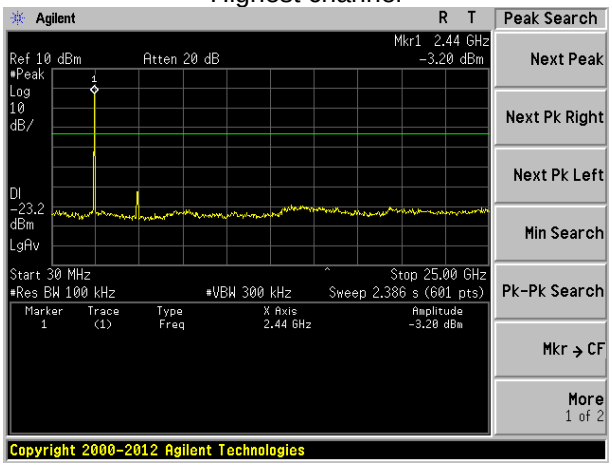

30MHz~25GHz

Middle channel




30MHz~25GHz

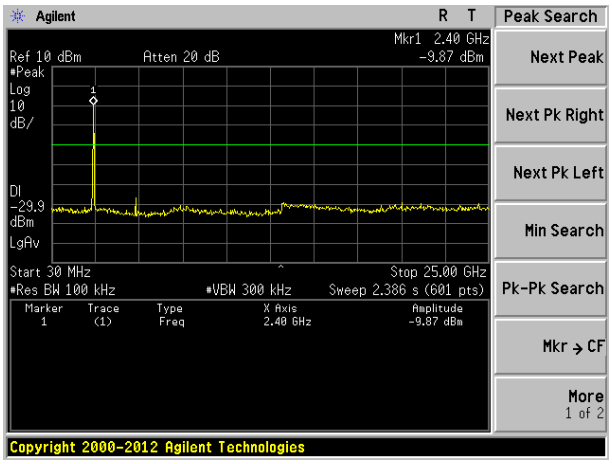
Highest channel




30MHz~25GHz

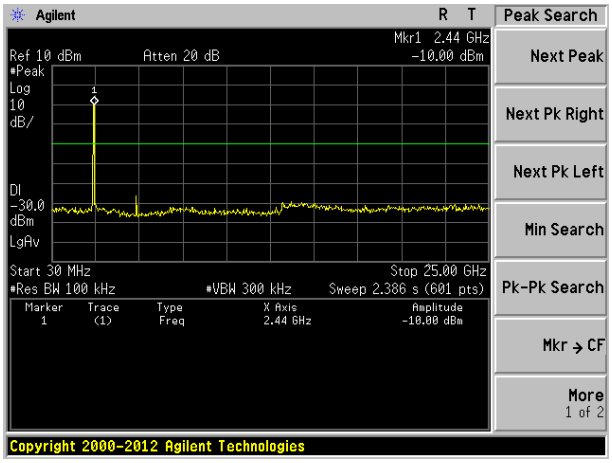
| Test mode: | 802.11g |
|---|---|

Lowest channel



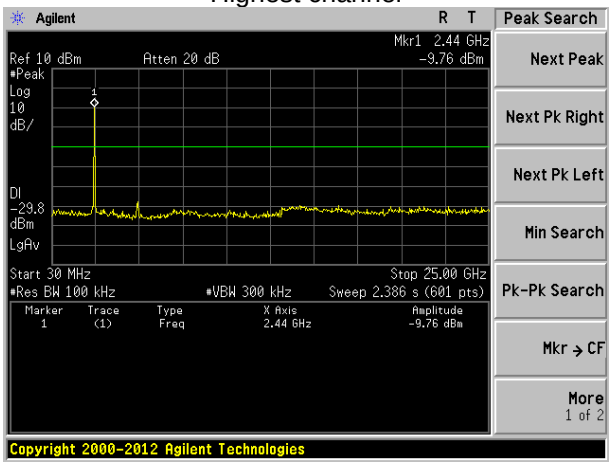

30MHz~25GHz

Middle channel




30MHz~25GHz

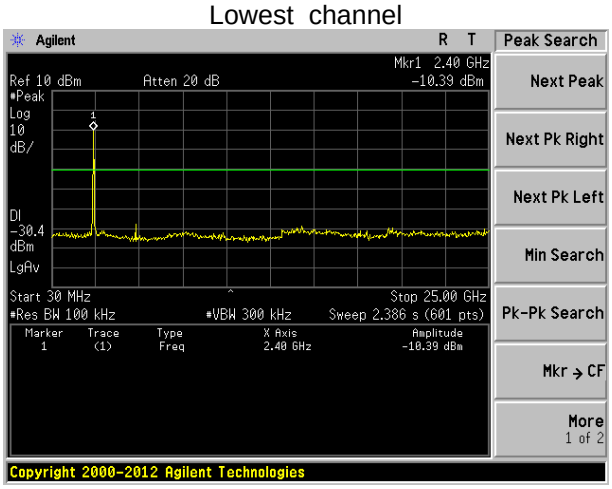
Highest channel




30MHz~25GHz

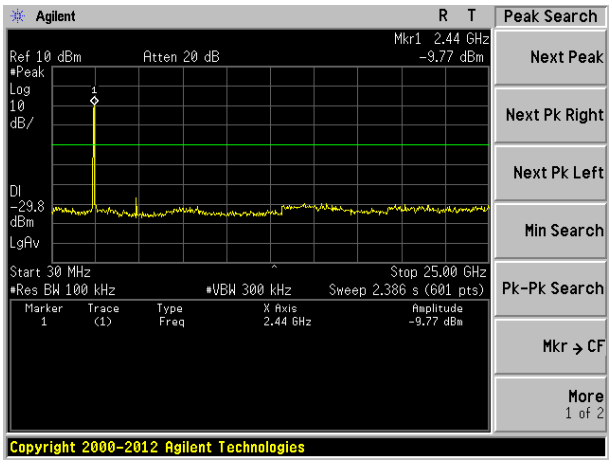
| Test mode: | 802.11n(HT20) |
|---|---|

Lowest channel



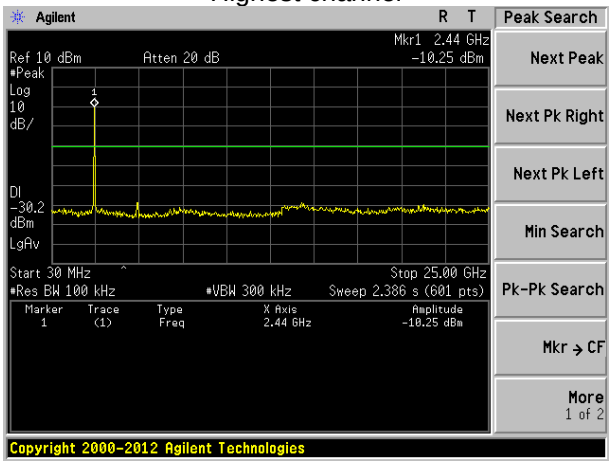

30MHz~25GHz

Middle channel




30MHz~25GHz

Highest channel




30MHz~25GHz

### 7.7.2 Radiated Emission Method

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.209 |
| Test Method: | ANSI C63.10:2013 |
| Test Frequency Range: | 30MHz to 25GHz |
| Test site: | Measurement Distance: 3m |
| Receiver setup: | |

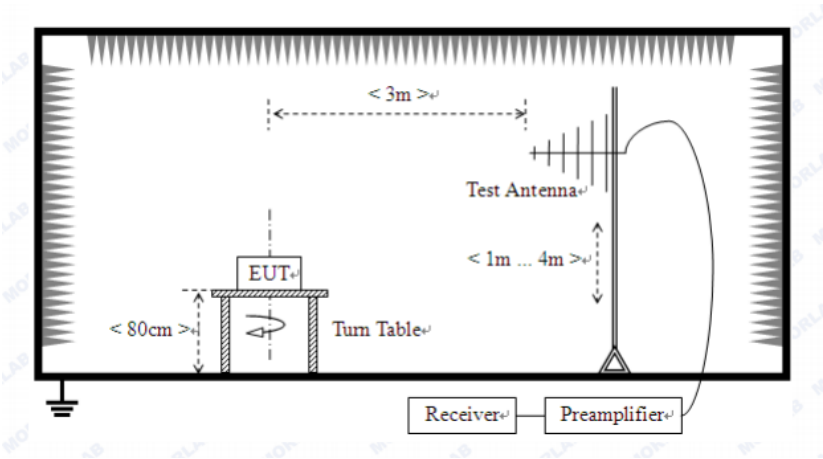
| Frequency | Detector | RBW | VBW | Value |
|---|---|---|---|---|
| 30MHz-1GHz | Quasi-peak | 120KHz | 300KHz | Quasi-peak |
| Above 1GHz | Peak | 1MHz | 3MHz | Peak |
| | RMS | 1MHz | 3MHz | Average |

Limit:

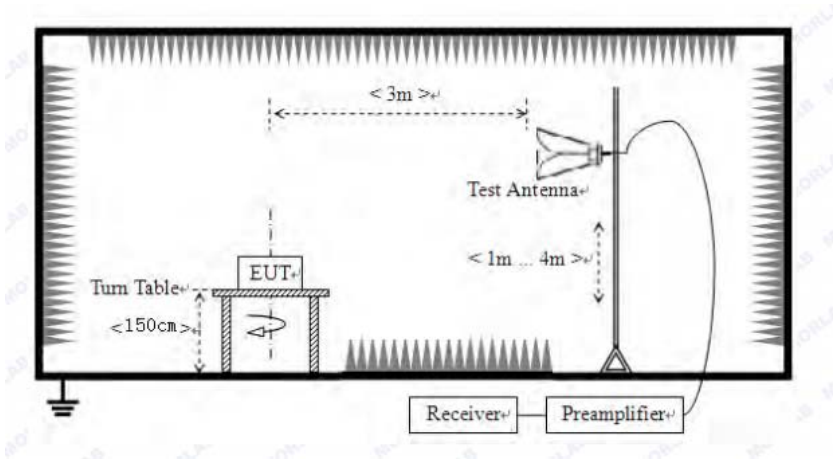
| Frequency | Limit (dBuV/m @3m) | Value |
|---|---|---|
| 30MHz-88MHz | 40.00 | Quasi-peak |
| 88MHz-216MHz | 43.50 | Quasi-peak |
| 216MHz-960MHz | 46.00 | Quasi-peak |
| 960MHz-1GHz | 54.00 | Quasi-peak |
| Above 1GHz | 54.00 | Average |
| | 74.00 | Peak |

Test setup:

Below 1GHz




Above 1GHz

| | |
|---|---|
| |  |
| Test Procedure: | 1. The EUT was placed on the top of a rotating table(0.8 meters below 1G and 1.5 meters above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.<br>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.<br>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.<br>4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.<br>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.<br>6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.<br>7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report. |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

*Remark:*

*Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

**Measurement Data**

■ **Below 1GHz**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 31.40 | 44.92 | 11.30 | 0.57 | 30.10 | 26.69 | 40.00 | -13.31 | Vertical |
| 36.77 | 43.96 | 11.20 | 0.63 | 30.10 | 25.69 | 40.00 | -14.31 | Vertical |
| 197.89 | 55.29 | 10.20 | 1.83 | 29.41 | 37.91 | 43.50 | -5.59 | Vertical |
| 265.68 | 53.20 | 12.34 | 2.20 | 29.93 | 37.81 | 46.00 | -8.19 | Vertical |
| 595.13 | 41.04 | 19.19 | 3.70 | 29.40 | 34.53 | 46.00 | -11.47 | Vertical |
| 793.40 | 37.13 | 21.21 | 4.43 | 29.11 | 33.66 | 46.00 | -12.34 | Vertical |
| 197.89 | 48.19 | 10.20 | 1.83 | 29.41 | 30.81 | 43.50 | -12.69 | Horizontal |
| 258.33 | 52.02 | 12.14 | 2.16 | 29.86 | 36.46 | 46.00 | -9.54 | Horizontal |
| 269.43 | 56.64 | 12.53 | 2.22 | 29.96 | 41.43 | 46.00 | -4.57 | Horizontal |
| 280.02 | 55.26 | 12.82 | 2.27 | 30.03 | 40.32 | 46.00 | -5.68 | Horizontal |
| 595.13 | 37.49 | 19.19 | 3.70 | 29.40 | 30.98 | 46.00 | -15.02 | Horizontal |
| 793.40 | 38.36 | 21.21 | 4.43 | 29.11 | 34.89 | 46.00 | -11.11 | Horizontal |

■ **Above 1GHz**

| Test mode: | 802.11b | Test channel: | Lowest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4824.00 | 45.47 | 31.79 | 8.62 | 32.10 | 48.78 | 74.00 | -20.22 | Vertical |
| 7236.00 | 34.33 | 36.19 | 11.68 | 31.97 | 50.23 | 74.00 | -23.77 | Vertical |
| 9648.00 | 32.79 | 38.07 | 14.16 | 31.56 | 53.46 | 74.00 | -20.54 | Vertical |
| 12060.00 | * | | | | | 74.00 | | Vertical |
| 14472.00 | * | | | | | 74.00 | | Vertical |
| 16884.00 | * | | | | | 74.00 | | Vertical |
| 4824.00 | 39.11 | 31.79 | 8.62 | 32.10 | 47.42 | 74.00 | -26.58 | Horizontal |
| 7236.00 | 34.06 | 36.19 | 11.68 | 31.97 | 49.96 | 74.00 | -24.04 | Horizontal |
| 9648.00 | 32.37 | 38.07 | 14.16 | 31.56 | 53.04 | 74.00 | -20.96 | Horizontal |
| 12060.00 | * | | | | | 74.00 | | Horizontal |
| 14472.00 | * | | | | | 74.00 | | Horizontal |
| 16884.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4824.00 | 32.54 | 31.79 | 8.62 | 32.10 | 37.85 | 54.00 | -13.15 | Vertical |
| 7236.00 | 23.19 | 36.19 | 11.68 | 31.97 | 39.09 | 54.00 | -14.91 | Vertical |
| 9648.00 | 23.14 | 38.07 | 14.16 | 31.56 | 43.81 | 54.00 | -10.19 | Vertical |
| 12060.00 | * | | | | | 54.00 | | Vertical |
| 14472.00 | * | | | | | 54.00 | | Vertical |
| 16884.00 | * | | | | | 54.00 | | Vertical |
| 4824.00 | 28.64 | 31.79 | 8.62 | 32.10 | 36.95 | 54.00 | -17.05 | Horizontal |
| 7236.00 | 22.64 | 36.19 | 11.68 | 31.97 | 38.54 | 54.00 | -15.46 | Horizontal |
| 9648.00 | 22.11 | 38.07 | 14.16 | 31.56 | 42.78 | 54.00 | -11.22 | Horizontal |
| 12060.00 | * | | | | | 54.00 | | Horizontal |
| 14472.00 | * | | | | | 54.00 | | Horizontal |
| 16884.00 | * | | | | | 54.00 | | Horizontal |

*Remark:*

*1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*

*2. "*", means this data is the too weak instrument of signal is unable to test.*

| Test mode: | 802.11b | Test channel: | Middle |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4874.00 | 43.50 | 31.85 | 8.66 | 32.12 | 47.89 | 74.00 | -22.11 | Vertical |
| 7311.00 | 34.38 | 36.37 | 11.71 | 31.91 | 50.55 | 74.00 | -23.45 | Vertical |
| 9748.00 | 33.80 | 38.27 | 14.25 | 31.56 | 54.76 | 74.00 | -19.24 | Vertical |
| 12185.00 | * | | | | | 74.00 | | Vertical |
| 14622.00 | * | | | | | 74.00 | | Vertical |
| 17059.00 | * | | | | | 74.00 | | Vertical |
| 4874.00 | 39.95 | 31.85 | 8.66 | 32.12 | 48.34 | 74.00 | -25.66 | Horizontal |
| 7311.00 | 33.01 | 36.37 | 11.71 | 31.91 | 49.18 | 74.00 | -24.82 | Horizontal |
| 9748.00 | 33.68 | 38.27 | 14.25 | 31.56 | 54.64 | 74.00 | -19.36 | Horizontal |
| 12185.00 | * | | | | | 74.00 | | Horizontal |
| 14622.00 | * | | | | | 74.00 | | Horizontal |
| 17059.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4874.00 | 30.34 | 31.85 | 8.66 | 32.12 | 38.73 | 54.00 | -15.27 | Vertical |
| 7311.00 | 22.69 | 36.37 | 11.71 | 31.91 | 38.86 | 54.00 | -15.14 | Vertical |
| 9748.00 | 23.05 | 38.27 | 14.25 | 31.56 | 44.01 | 54.00 | -9.99 | Vertical |
| 12185.00 | * | | | | | 54.00 | | Vertical |
| 14622.00 | * | | | | | 54.00 | | Vertical |
| 17059.00 | * | | | | | 54.00 | | Vertical |
| 4874.00 | 30.06 | 31.85 | 8.66 | 32.12 | 38.45 | 54.00 | -15.55 | Horizontal |
| 7311.00 | 22.10 | 36.37 | 11.71 | 31.91 | 38.27 | 54.00 | -15.73 | Horizontal |
| 9748.00 | 23.40 | 38.27 | 14.25 | 31.56 | 44.36 | 54.00 | -9.64 | Horizontal |
| 12185.00 | * | | | | | 54.00 | | Horizontal |
| 14622.00 | * | | | | | 54.00 | | Horizontal |
| 17059.00 | * | | | | | 54.00 | | Horizontal |

*Remark:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

| Test mode: | 802.11b | Test channel: | Highest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4924.00 | 45.13 | 31.90 | 8.70 | 32.15 | 53.58 | 74.00 | -20.42 | Vertical |
| 7386.00 | 35.12 | 36.49 | 11.76 | 31.83 | 51.54 | 74.00 | -22.46 | Vertical |
| 9848.00 | 37.14 | 38.62 | 14.31 | 31.77 | 58.30 | 74.00 | -15.70 | Vertical |
| 12310.00 | * | | | | | 74.00 | | Vertical |
| 14772.00 | * | | | | | 74.00 | | Vertical |
| 17234.00 | * | | | | | 74.00 | | Vertical |
| 4924.00 | 44.40 | 31.90 | 8.70 | 32.15 | 52.85 | 74.00 | -21.15 | Horizontal |
| 7386.00 | 34.00 | 36.49 | 11.76 | 31.83 | 50.42 | 74.00 | -23.58 | Horizontal |
| 9848.00 | 33.30 | 38.62 | 14.31 | 31.77 | 54.46 | 74.00 | -19.54 | Horizontal |
| 12310.00 | * | | | | | 74.00 | | Horizontal |
| 14772.00 | * | | | | | 74.00 | | Horizontal |
| 17234.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4924.00 | 36.03 | 31.90 | 8.70 | 32.15 | 44.48 | 54.00 | -9.52 | Vertical |
| 7386.00 | 25.03 | 36.49 | 11.76 | 31.83 | 41.45 | 54.00 | -12.55 | Vertical |
| 9848.00 | 25.64 | 38.62 | 14.31 | 31.77 | 46.80 | 54.00 | -7.20 | Vertical |
| 12310.00 | * | | | | | 54.00 | | Vertical |
| 14772.00 | * | | | | | 54.00 | | Vertical |
| 17234.00 | * | | | | | 54.00 | | Vertical |
| 4924.00 | 34.75 | 31.90 | 8.70 | 32.15 | 43.20 | 54.00 | -10.80 | Horizontal |
| 7386.00 | 23.39 | 36.49 | 11.76 | 31.83 | 39.81 | 54.00 | -14.19 | Horizontal |
| 9848.00 | 22.56 | 38.62 | 14.31 | 31.77 | 43.72 | 54.00 | -10.28 | Horizontal |
| 12310.00 | * | | | | | 54.00 | | Horizontal |
| 14772.00 | * | | | | | 54.00 | | Horizontal |
| 17234.00 | * | | | | | 54.00 | | Horizontal |

*Remark:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

| Test mode: | 802.11g | Test channel: | lowest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4824.00 | 44.47 | 31.79 | 8.62 | 32.10 | 48.78 | 74.00 | -21.22 | Vertical |
| 7236.00 | 34.33 | 36.19 | 11.68 | 31.97 | 50.23 | 74.00 | -23.77 | Vertical |
| 9648.00 | 32.79 | 38.07 | 14.16 | 31.56 | 53.46 | 74.00 | -20.54 | Vertical |
| 12060.00 | * | | | | | 74.00 | | Vertical |
| 14472.00 | * | | | | | 74.00 | | Vertical |
| 16884.00 | * | | | | | 74.00 | | Vertical |
| 4824.00 | 39.11 | 31.79 | 8.62 | 32.10 | 47.42 | 74.00 | -26.58 | Horizontal |
| 7236.00 | 34.06 | 36.19 | 11.68 | 31.97 | 49.96 | 74.00 | -24.04 | Horizontal |
| 9648.00 | 32.37 | 38.07 | 14.16 | 31.56 | 53.04 | 74.00 | -20.96 | Horizontal |
| 12060.00 | * | | | | | 74.00 | | Horizontal |
| 14472.00 | * | | | | | 74.00 | | Horizontal |
| 16884.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4824.00 | 29.54 | 31.79 | 8.62 | 32.10 | 37.85 | 54.00 | -16.15 | Vertical |
| 7236.00 | 23.19 | 36.19 | 11.68 | 31.97 | 39.09 | 54.00 | -14.91 | Vertical |
| 9648.00 | 23.14 | 38.07 | 14.16 | 31.56 | 43.81 | 54.00 | -10.19 | Vertical |
| 12060.00 | * | | | | | 54.00 | | Vertical |
| 14472.00 | * | | | | | 54.00 | | Vertical |
| 16884.00 | * | | | | | 54.00 | | Vertica |
| 4824.00 | 28.64 | 31.79 | 8.62 | 32.10 | 36.95 | 54.00 | -17.05 | Horizontal |
| 7236.00 | 22.64 | 36.19 | 11.68 | 31.97 | 38.54 | 54.00 | -15.46 | Horizontal |
| 9648.00 | 22.11 | 38.07 | 14.16 | 31.56 | 42.78 | 54.00 | -11.22 | Horizontal |
| 12060.00 | * | | | | | 54.00 | | Horizontal |
| 14472.00 | * | | | | | 54.00 | | Horizontal |
| 16884.00 | * | | | | | 54.00 | | Horizontal |

*Remark:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

| Test mode: | 802.11g | Test channel: | Middle |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4874.00 | 44.50 | 31.85 | 8.66 | 32.12 | 47.89 | 74.00 | -21.11 | Vertical |
| 7311.00 | 34.38 | 36.37 | 11.71 | 31.91 | 50.55 | 74.00 | -23.45 | Vertical |
| 9748.00 | 33.80 | 38.27 | 14.25 | 31.56 | 54.76 | 74.00 | -19.24 | Vertical |
| 12185.00 | * | | | | | 74.00 | | Vertical |
| 14622.00 | * | | | | | 74.00 | | Vertical |
| 17059.00 | * | | | | | 74.00 | | Vertical |
| 4874.00 | 39.95 | 31.85 | 8.66 | 32.12 | 48.34 | 74.00 | -25.66 | Horizontal |
| 7311.00 | 33.01 | 36.37 | 11.71 | 31.91 | 49.18 | 74.00 | -24.82 | Horizontal |
| 9748.00 | 33.68 | 38.27 | 14.25 | 31.56 | 54.64 | 74.00 | -19.36 | Horizontal |
| 12185.00 | * | | | | | 74.00 | | Horizontal |
| 14622.00 | * | | | | | 74.00 | | Horizontal |
| 17059.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4874.00 | 30.34 | 31.85 | 8.66 | 32.12 | 38.73 | 54.00 | -15.27 | Vertical |
| 7311.00 | 22.69 | 36.37 | 11.71 | 31.91 | 38.86 | 54.00 | -15.14 | Vertical |
| 9748.00 | 23.05 | 38.27 | 14.25 | 31.56 | 44.01 | 54.00 | -9.99 | Vertical |
| 12185.00 | * | | | | | 54.00 | | Vertical |
| 14622.00 | * | | | | | 54.00 | | Vertical |
| 17059.00 | * | | | | | 54.00 | | Vertical |
| 4874.00 | 30.06 | 31.85 | 8.66 | 32.12 | 38.45 | 54.00 | -15.55 | Horizontal |
| 7311.00 | 22.10 | 36.37 | 11.71 | 31.91 | 38.27 | 54.00 | -15.73 | Horizontal |
| 9748.00 | 23.40 | 38.27 | 14.25 | 31.56 | 44.36 | 54.00 | -9.64 | Horizontal |
| 12185.00 | * | | | | | 54.00 | | Horizontal |
| 14622.00 | * | | | | | 54.00 | | Horizontal |
| 17059.00 | * | | | | | 54.00 | | Horizontal |

*Remark:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

| Test mode: | 802.11g | Test channel: | Highest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4924.00 | 45.13 | 31.90 | 8.70 | 32.15 | 53.58 | 74.00 | -20.42 | Vertical |
| 7386.00 | 35.12 | 36.49 | 11.76 | 31.83 | 51.54 | 74.00 | -22.46 | Vertical |
| 9848.00 | 37.14 | 38.62 | 14.31 | 31.77 | 58.30 | 74.00 | -15.70 | Vertical |
| 12310.00 | * | | | | | 74.00 | | Vertical |
| 14772.00 | * | | | | | 74.00 | | Vertical |
| 17234.00 | * | | | | | 74.00 | | Vertical |
| 4924.00 | 44.40 | 31.90 | 8.70 | 32.15 | 52.85 | 74.00 | -21.15 | Horizontal |
| 7386.00 | 34.00 | 36.49 | 11.76 | 31.83 | 50.42 | 74.00 | -23.58 | Horizontal |
| 9848.00 | 33.30 | 38.62 | 14.31 | 31.77 | 54.46 | 74.00 | -19.54 | Horizontal |
| 12310.00 | * | | | | | 74.00 | | Horizontal |
| 14772.00 | * | | | | | 74.00 | | Horizontal |
| 17234.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4924.00 | 36.03 | 31.90 | 8.70 | 32.15 | 44.48 | 54.00 | -9.52 | Vertical |
| 7386.00 | 25.03 | 36.49 | 11.76 | 31.83 | 41.45 | 54.00 | -12.55 | Vertical |
| 9848.00 | 25.64 | 38.62 | 14.31 | 31.77 | 46.80 | 54.00 | -7.20 | Vertical |
| 12310.00 | * | | | | | 54.00 | | Vertical |
| 14772.00 | * | | | | | 54.00 | | Vertical |
| 17234.00 | * | | | | | 54.00 | | Vertical |
| 4924.00 | 34.75 | 31.90 | 8.70 | 32.15 | 43.20 | 54.00 | -10.80 | Horizontal |
| 7386.00 | 23.39 | 36.49 | 11.76 | 31.83 | 39.81 | 54.00 | -14.19 | Horizontal |
| 9848.00 | 22.56 | 38.62 | 14.31 | 31.77 | 43.72 | 54.00 | -10.28 | Horizontal |
| 12310.00 | * | | | | | 54.00 | | Horizontal |
| 14772.00 | * | | | | | 54.00 | | Horizontal |
| 17234.00 | * | | | | | 54.00 | | Horizontal |

*Remark:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

| Test mode: | 802.11n(HT20) | Test channel: | Lowest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4824.00 | 45.47 | 31.79 | 8.62 | 32.10 | 48.78 | 74.00 | -20.22 | Vertical |
| 7236.00 | 34.33 | 36.19 | 11.68 | 31.97 | 50.23 | 74.00 | -23.77 | Vertical |
| 9648.00 | 32.79 | 38.07 | 14.16 | 31.56 | 53.46 | 74.00 | -20.54 | Vertical |
| 12060.00 | * | | | | | 74.00 | | Vertical |
| 14472.00 | * | | | | | 74.00 | | Vertical |
| 16884.00 | * | | | | | 74.00 | | Vertical |
| 4824.00 | 39.11 | 31.79 | 8.62 | 32.10 | 47.42 | 74.00 | -26.58 | Horizontal |
| 7236.00 | 34.06 | 36.19 | 11.68 | 31.97 | 49.96 | 74.00 | -24.04 | Horizontal |
| 9648.00 | 32.37 | 38.07 | 14.16 | 31.56 | 53.04 | 74.00 | -20.96 | Horizontal |
| 12060.00 | * | | | | | 74.00 | | Horizontal |
| 14472.00 | * | | | | | 74.00 | | Horizontal |
| 16884.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4824.00 | 29.54 | 31.79 | 8.62 | 32.10 | 37.85 | 54.00 | -16.15 | Vertical |
| 7236.00 | 23.19 | 36.19 | 11.68 | 31.97 | 39.09 | 54.00 | -14.91 | Vertical |
| 9648.00 | 23.14 | 38.07 | 14.16 | 31.56 | 43.81 | 54.00 | -10.19 | Vertical |
| 12060.00 | * | | | | | 54.00 | | Vertical |
| 14472.00 | * | | | | | 54.00 | | Vertical |
| 16884.00 | * | | | | | 54.00 | | Vertical |
| 4824.00 | 28.64 | 31.79 | 8.62 | 32.10 | 36.95 | 54.00 | -17.05 | Horizontal |
| 7236.00 | 22.64 | 36.19 | 11.68 | 31.97 | 38.54 | 54.00 | -15.46 | Horizontal |
| 9648.00 | 22.11 | 38.07 | 14.16 | 31.56 | 42.78 | 54.00 | -11.22 | Horizontal |
| 12060.00 | * | | | | | 54.00 | | Horizontal |
| 14472.00 | * | | | | | 54.00 | | Horizontal |
| 16884.00 | * | | | | | 54.00 | | Horizontal |

*Remark:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

| Test mode: | 802.11n(HT20) | Test channel: | Middle |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4874.00 | 44.50 | 31.85 | 8.66 | 32.12 | 47.89 | 74.00 | -21.11 | Vertical |
| 7311.00 | 34.38 | 36.37 | 11.71 | 31.91 | 50.55 | 74.00 | -23.45 | Vertical |
| 9748.00 | 33.80 | 38.27 | 14.25 | 31.56 | 54.76 | 74.00 | -19.24 | Vertical |
| 12185.00 | * | | | | | 74.00 | | Vertical |
| 14622.00 | * | | | | | 74.00 | | Vertical |
| 17059.00 | * | | | | | 74.00 | | Vertical |
| 4874.00 | 39.95 | 31.85 | 8.66 | 32.12 | 48.34 | 74.00 | -25.66 | Horizontal |
| 7311.00 | 33.01 | 36.37 | 11.71 | 31.91 | 49.18 | 74.00 | -24.82 | Horizontal |
| 9748.00 | 33.68 | 38.27 | 14.25 | 31.56 | 54.64 | 74.00 | -19.36 | Horizontal |
| 12185.00 | * | | | | | 74.00 | | Horizontal |
| 14622.00 | * | | | | | 74.00 | | Horizontal |
| 17059.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4874.00 | 30.34 | 31.85 | 8.66 | 32.12 | 38.73 | 54.00 | -15.27 | Vertical |
| 7311.00 | 22.69 | 36.37 | 11.71 | 31.91 | 38.86 | 54.00 | -15.14 | Vertical |
| 9748.00 | 23.05 | 38.27 | 14.25 | 31.56 | 44.01 | 54.00 | -9.99 | Vertical |
| 12185.00 | * | | | | | 54.00 | | Vertical |
| 14622.00 | * | | | | | 54.00 | | Vertical |
| 17059.00 | * | | | | | 54.00 | | Vertical |
| 4874.00 | 30.06 | 31.85 | 8.66 | 32.12 | 38.45 | 54.00 | -15.55 | Horizontal |
| 7311.00 | 22.10 | 36.37 | 11.71 | 31.91 | 38.27 | 54.00 | -15.73 | Horizontal |
| 9748.00 | 23.40 | 38.27 | 14.25 | 31.56 | 44.36 | 54.00 | -9.64 | Horizontal |
| 12185.00 | * | | | | | 54.00 | | Horizontal |
| 14622.00 | * | | | | | 54.00 | | Horizontal |
| 17059.00 | * | | | | | 54.00 | | Horizontal |

*Remark:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

| Test mode: | 802.11n(HT20) | Test channel: | Highest |
|---|---|---|---|

**Peak value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4924.00 | 45.13 | 31.90 | 8.70 | 32.15 | 53.58 | 74.00 | -20.42 | Vertical |
| 7386.00 | 35.12 | 36.49 | 11.76 | 31.83 | 51.54 | 74.00 | -22.46 | Vertical |
| 9848.00 | 37.14 | 38.62 | 14.31 | 31.77 | 58.30 | 74.00 | -15.70 | Vertical |
| 12310.00 | * | | | | | 74.00 | | Vertical |
| 14772.00 | * | | | | | 74.00 | | Vertical |
| 17234.00 | * | | | | | 74.00 | | Vertical |
| 4924.00 | 44.40 | 31.90 | 8.70 | 32.15 | 52.85 | 74.00 | -21.15 | Horizontal |
| 7386.00 | 34.00 | 36.49 | 11.76 | 31.83 | 50.42 | 74.00 | -23.58 | Horizontal |
| 9848.00 | 33.30 | 38.62 | 14.31 | 31.77 | 54.46 | 74.00 | -19.54 | Horizontal |
| 12310.00 | * | | | | | 74.00 | | Horizontal |
| 14772.00 | * | | | | | 74.00 | | Horizontal |
| 17234.00 | * | | | | | 74.00 | | Horizontal |

**Average value:**

| 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 |
|---|---|---|---|---|---|---|---|---|
| 4924.00 | 36.03 | 31.90 | 8.70 | 32.15 | 44.48 | 54.00 | -9.52 | Vertical |
| 7386.00 | 25.03 | 36.49 | 11.76 | 31.83 | 41.45 | 54.00 | -12.55 | Vertical |
| 9848.00 | 25.64 | 38.62 | 14.31 | 31.77 | 46.80 | 54.00 | -7.20 | Vertical |
| 12310.00 | * | | | | | 54.00 | | Vertical |
| 14772.00 | * | | | | | 54.00 | | Vertical |
| 17234.00 | * | | | | | 54.00 | | Vertical |
| 4924.00 | 34.75 | 31.90 | 8.70 | 32.15 | 43.20 | 54.00 | -10.80 | Horizontal |
| 7386.00 | 23.39 | 36.49 | 11.76 | 31.83 | 39.81 | 54.00 | -14.19 | Horizontal |
| 9848.00 | 22.56 | 38.62 | 14.31 | 31.77 | 43.72 | 54.00 | -10.28 | Horizontal |
| 12310.00 | * | | | | | 54.00 | | Horizontal |
| 14772.00 | * | | | | | 54.00 | | Horizontal |
| 17234.00 | * | | | | | 54.00 | | Horizontal |

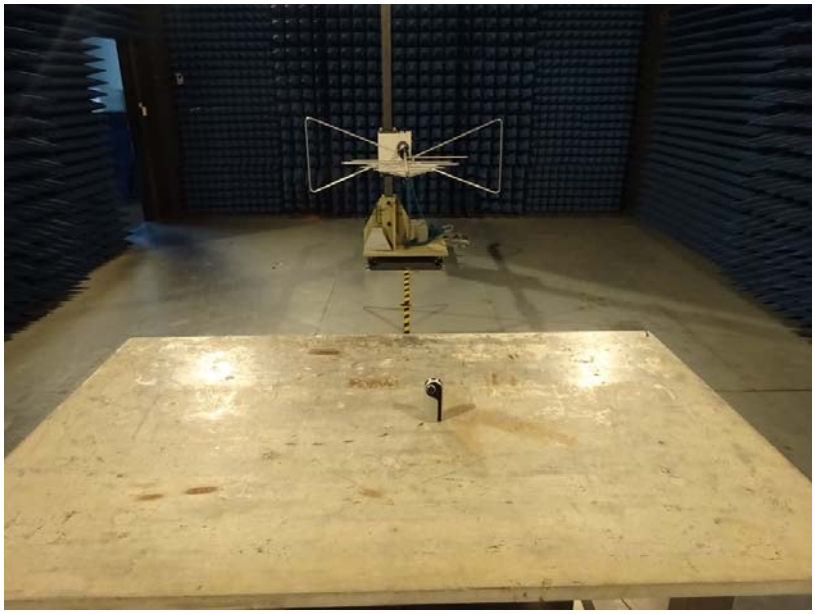
*Remark:*

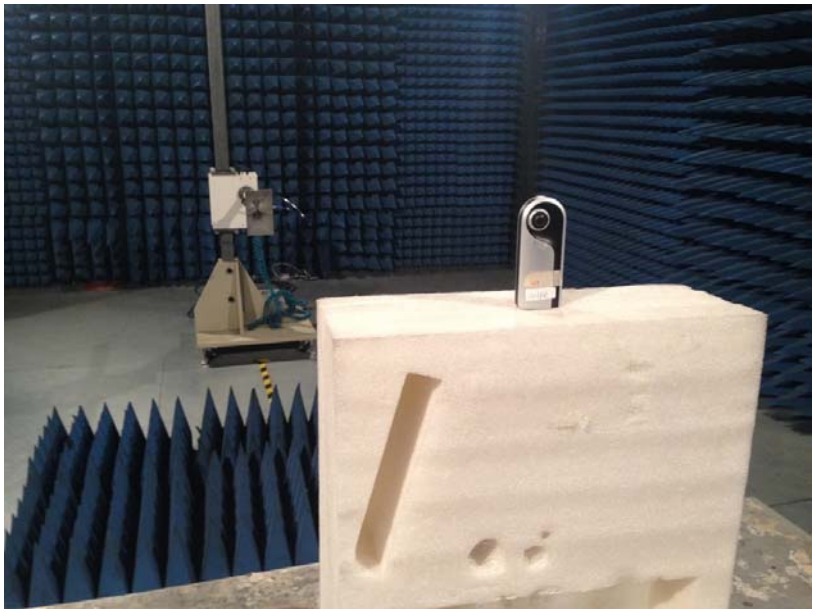
*1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*

*2 "*", means this data is the too weak instrument of signal is unable to test.*

# 8 Test Setup Photo

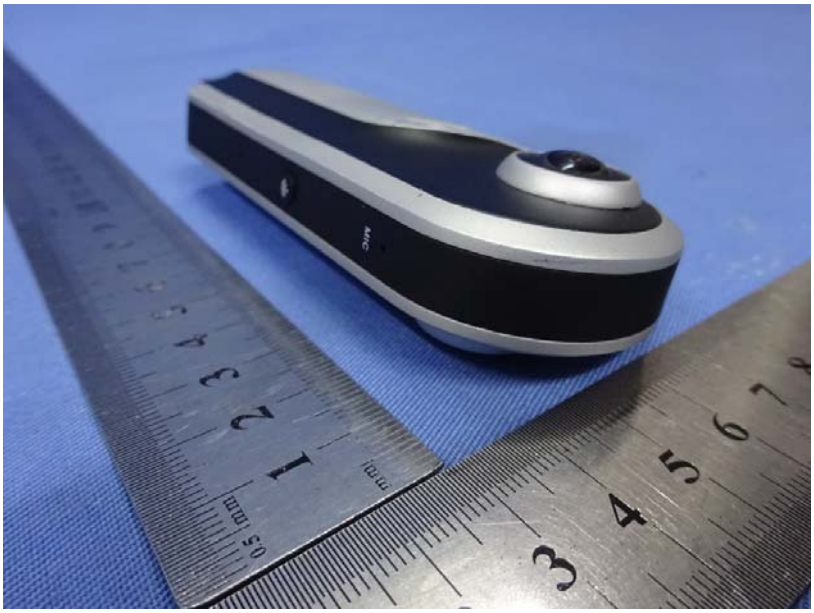
Radiated Emission

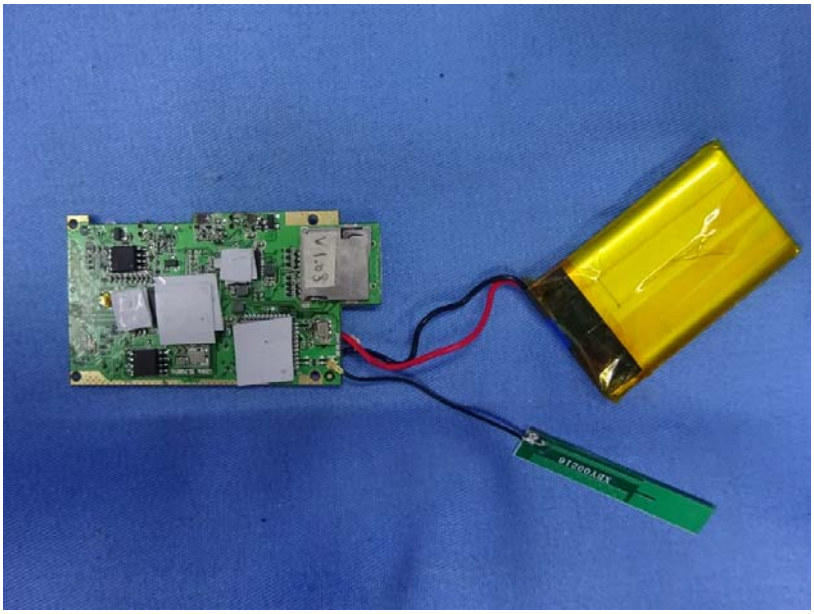


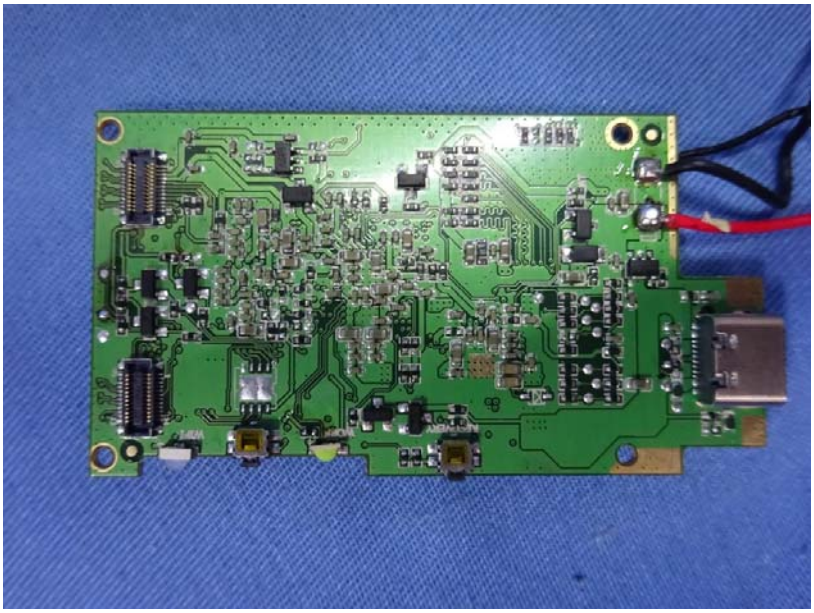


Conducted Emission

# 9 EUT Constructional Details








------End------