# Variant FCC/IC RF Test Report

| | | |
|---|---|---|
| APPLICANT | : | Qualcomm Atheros, Inc. |
| EQUIPMENT | : | 1X1 802.11b/g/n - BT4.0 Combo PCIe minicard |
| BRAND NAME | : | Qualcomm Atheros |
| MODEL NAME | : | QCWB335 |
| FCC ID | : | PPD-QCWB335 |
| IC | : | 4104A-QCWB335 |
| STANDARD | : | FCC Part 15 Subpart C §15.247<br>IC RSS-210 issue 8 |
| CLASSIFICATION | : | (DTS) Digital Transmission System |

**This is a variant report which is only valid together with the original test report. The WiFi + Bluetooth module was tested on extended card inserted to a host laptop PC. The product was received on Oct. 17, 2012 and completely tested on Jan. 29, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.**

**The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.**

**Reviewed by:**

Jones Tsai

**Jones Tsai / Manager**

Testing Laboratory 1190

***SPORTON INTERNATIONAL INC.***
***No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.***

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# REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| FR240322-08C | Rev. 01 | This is a variant report. All the test cases were performed on original report which can be referred to Sporton Report No. FR240322B.<br>Detail changes list as below :<br>1. Shielding change<br>2. Minor layout change.<br>3. BOM change (Rx path)<br>Based on the changes, only the 6dB Bandwidth, Peak Output Power, Power Spectral Density, Conducted Band Edges, Conducted Spurious Emission, Radiated Band Edges, and Radiated Spurious Emission test cases were verified. | Feb. 07, 2013 |
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# SUMMARY OF TEST RESULT

| Report Section | FCC Rule | IC Rule | Description | Limit | Result | Remark |
|---|---|---|---|---|---|---|
| 3.1 | 15.247(a)(2) | RSS-210 A8.2(a) | 6dB Bandwidth | ≥ 0.5MHz | Pass | - |
| 3.2 | 15.247(b) | RSS-210 A8.4 | Power Output Measurement | ≤ 30dBm | Pass | - |
| 3.3 | 15.247(e) | RSS-210 A8.2(b) | Power Spectral Density | ≤ 8dBm/3kHz | Pass | - |
| 3.4 | 15.247(d) | RSS-210 A8.5 | Conducted Band Edges | ≤ 20dBc | Pass | - |
| | | | Conducted Spurious Emission | | Pass | - |
| 3.5 | 15.247(d) | RSS-210 A8.5 | Radiated Band Edges and Radiated Spurious Emission | 15.209(a) & 15.247(d) | Pass | Under limit 0.34 dB at 2389.740 MHz |
| 3.6 | 15.203 & 15.247(b) | RSS-210 A8.4 | Antenna Requirement | N/A | Pass | - |

# 1 General Description

## 1.1 Applicant

**Qualcomm Atheros, Inc.**
1700 Technology Drive, San Jose, CA95110

## 1.2 Manufacturer

**Qualcomm Atheros, Inc.**
1700 Technology Drive, San Jose, CA95110

## 1.3 Feature of Equipment Under Test

| Product Feature | |
|---|---|
| **Equipment** | 1X1 802.11b/g/n - BT4.0 Combo PCIe minicard |
| **Brand Name** | Qualcomm Atheros |
| **Model Name** | QCWB335 |
| **FCC ID** | PPD-QCWB335 |
| **IC** | 4104A-QCWB335 |
| **EUT supports Radios application** | WLAN 11bgn / Bluetooth 2.1/3.0 /4.0 |
| **EUT Stage** | Identical Prototype |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Product Specification of Equipment Under Test

| Product Specification subjective to this standard | |
|---|---|
| **Tx/Rx Channel Frequency Range** | 2400 MHz ~ 2483.5 MHz |
| **Transfer Rate** | **802.11b:** 11 / 5.5 / 2 / 1Mbps<br>**802.11g:** 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps<br>**802.11n HT20 (Guard Interval: 800ns):** 65 / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5Mbps<br>**802.11n HT40 (Guard Interval: 800ns):** 135 / 121.5 / 108 / 81 / 54 / 40.5 / 27 / 13.5 Mbps<br>**802.11n HT20 (Guard Interval: 400ns):** 72.2 / 65 / 57.8 / 43.3 / 28.9 / 21.7 / 14.4 / 7.2Mbps<br>**802.11n HT40 (Guard Interval: 400ns):** 150 / 135 / 120 / 90 / 60 / 45 / 30 / 15Mbps |
| **Maximum Output Power to Antenna** | 802.11b : 19.93 dBm (0.0984 W)<br>802.11g : 24.54 dBm (0.2844 W)<br>802.11n HT20 : 23.97 dBm (0.2495 W)<br>802.11n HT40 : 23.15 dBm (0.2065 W) |
| **Duty Cycle** | 802.11b : 100.00%<br>802.11g : 98.02%<br>802.11n HT20 : 98.92%<br>802.11n HT40 : 99.08% |
| **Antenna Type** | Antenna 1 : PIFA Antenna with gain 3.62 dBi<br>Antenna 2 : Dipole Antenna with gain 3.20 dBi |
| **Type of Modulation** | 802.11b : DSSS (DBPSK / DQPSK / CCK)<br>802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) |

## 1.5 Testing Site

| Test Site | SPORTON INTERNATIONAL INC. | | |
|---|---|---|---|
| Test Site Location | No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,<br>Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL: +886-3-3273456 / FAX: +886-3-3284978 | | |
| Test Site No. | Sporton Site No. | | FCC/IC Registration No. |
| | TH02-HY | 03CH06-HY | 722060/4086B-1 |

The test site complies with ANSI C63.4 2003 requirement.

## 1.6 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
- ANSI C63.10-2009
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3
- NOTICE 2012-DRS0126

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
3. Per the section 2.2.3 of Notice of 2012-DRS0126, " Receivers Excluded from Industry Canada Requirements", only radiocommunication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to Industry Canada requirements.

# 2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiated emission (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

## 2.1 Carrier Frequency and Channel

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| 2400-2483.5 MHz | 1 | 2412 | 7 | 2442 |
| | 2 | 2417 | 8 | 2447 |
| | 3 | 2422 | 9 | 2452 |
| | 4 | 2427 | 10 | 2457 |
| | 5 | 2432 | 11 | 2462 |
| | 6 | 2437 | | |

## 2.2 Maximum Peak Conducted Output Power

**<Ant. 1>**

| Band | 2.4GHz 802.11b RF Power (dBm) | | | 2.4GHz 802.11g RF Power (dBm) | | |
|---|---|---|---|---|---|---|
| Channel | 1 | 6 | 11 | 1 | 6 | 11 |
| Frequency (MHz) | 2412 | 2437 | 2462 | 2412 | 2437 | 2462 |
| Peak Power | 19.61 | **19.93** | 19.84 | 23.36 | **24.54** | 23.29 |

| Band | 2.4GHz 802.11n HT20 RF Power (dBm) (Guard Interval: 800 ns) | | |
|---|---|---|---|
| Channel | 1 | 6 | 11 |
| Frequency (MHz) | 2412 | 2437 | 2462 |
| Peak Power | 22.68 | **23.97** | 22.76 |

| Band | 2.4GHz 802.11n HT40 RF Power (dBm) (Guard Interval: 800 ns) | | |
|---|---|---|---|
| Channel | 3 | 6 | 9 |
| Frequency (MHz) | 2422 | 2437 | 2452 |
| Peak Power | 21.40 | **23.15** | 21.68 |

**<Ant. 2>**

| Band | 2.4GHz 802.11b RF Power (dBm) | | | 2.4GHz 802.11g RF Power (dBm) | | |
|---|---|---|---|---|---|---|
| Channel | 1 | 6 | 11 | 1 | 6 | 11 |
| Frequency (MHz) | 2412 | 2437 | 2462 | 2412 | 2437 | 2462 |
| Peak Power | 19.61 | **19.93** | 19.84 | 21.69 | **24.54** | 23.29 |

| Band | 2.4GHz 802.11n HT20 RF Power (dBm) (Guard Interval: 800 ns) | | |
|---|---|---|---|
| Channel | 1 | 6 | 11 |
| Frequency (MHz) | 2412 | 2437 | 2462 |
| Peak Power | 20.91 | **23.97** | 22.76 |

| Band | 2.4GHz 802.11n HT40 RF Power (dBm) (Guard Interval: 800 ns) | | |
|---|---|---|---|
| Channel | 3 | 6 | 9 |
| Frequency (MHz) | 2422 | 2437 | 2452 |
| Peak Power | 21.40 | **23.15** | 22.08 |

**Remark:**

The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n HT20 with Guard Interval setting = 800 ns, 13.5Mbps for 802.11n HT40 with Guard Interval setting = 800 ns for all the test cases due to the highest RF output power.

## 2.3 Maximum Average Conducted Output Power:

**<Ant. 1>**

| Band | 2.4GHz 802.11b RF Power (dBm) | | | 2.4GHz 802.11g RF Power (dBm) | | |
|---|---|---|---|---|---|---|
| Channel | 1 | 6 | 11 | 1 | 6 | 11 |
| Frequency (MHz) | 2412 | 2437 | 2462 | 2412 | 2437 | 2462 |
| Average Power | 17.28 | **17.98** | 17.73 | 14.67 | **17.89** | 14.93 |

| Band | 2.4GHz 802.11n HT20 RF Power (dBm) (Guard Interval: 800 ns) | | |
|---|---|---|---|
| Channel | 1 | 6 | 11 |
| Frequency (MHz) | 2412 | 2437 | 2462 |
| Average Power | 13.24 | **16.31** | 13.64 |

| Band | 2.4GHz 802.11n HT40 RF Power (dBm) (Guard Interval: 800 ns) | | |
|---|---|---|---|
| Channel | 3 | 6 | 9 |
| Frequency (MHz) | 2422 | 2437 | 2452 |
| Average Power | 11.06 | **14.28** | 11.93 |

**<Ant. 2>**

| Band | 2.4GHz 802.11b RF Power (dBm) | | | 2.4GHz 802.11g RF Power (dBm) | | |
|---|---|---|---|---|---|---|
| Channel | 1 | 6 | 11 | 1 | 6 | 11 |
| Frequency (MHz) | 2412 | 2437 | 2462 | 2412 | 2437 | 2462 |
| Average Power | 17.28 | **17.98** | 17.73 | 11.78 | **17.89** | 14.93 |

| Band | 2.4GHz 802.11n HT20 RF Power (dBm) (Guard Interval: 800 ns) | | |
|---|---|---|---|
| Channel | 1 | 6 | 11 |
| Frequency (MHz) | 2412 | 2437 | 2462 |
| Average Power | 10.87 | **16.31** | 13.64 |

| Band | 2.4GHz 802.11n HT40 RF Power (dBm) (Guard Interval: 800 ns) | | |
|---|---|---|---|
| Channel | 3 | 6 | 9 |
| Frequency (MHz) | 2422 | 2437 | 2452 |
| Average Power | 11.06 | **14.28** | 13.12 |

**Remark:**

1. The average power, which is used by the test method, Option 3 (average power meter method), in DTS Meas. Guidance v02, is reporting only.
2. The EUT is programmed to transmit signals continuously.

## 2.4 Antenna Information

| Brand / Model Name | Type | Frequency Range (MHz) | Antenna Gain (dBi) |
|---|---|---|---|
| Wistron Neweb Corporation / EBJ Aux | PIFA | 2400 ~ 2483.5 | 3.62 |
| INPAQ / DAMA1BM30000402 | Dipole | 2400 ~ 2483.5 | 3.20 |

| | Antenna port 0 | Antenna port 1 |
|---|---|---|
| Single antenna | WLAN/BT timely coexistence | RX diversity or terminated |
| Dual antenna | WLAN TX/RX | Bluetooth TX/RX |

## 2.5 Test Mode

For radiated: The EUT's antenna was pre-tested under the following modes:

| Test Mode | Description |
|---|---|
| **Mode A** | **X-Y axis** |
| Mode B | Y-Z axis |
| Mode C | X-Z axis |

From the above modes, the worst case was found in Mode A. Therefore only the test data of the mode was recorded in this report.

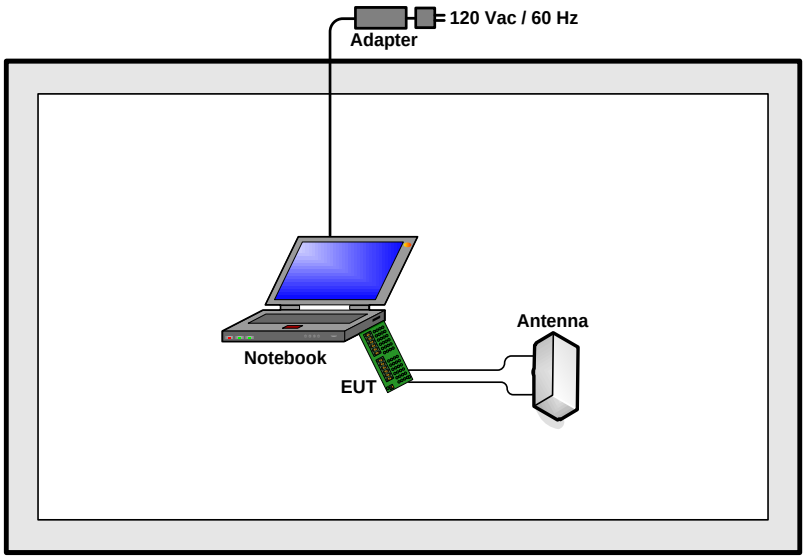
The details of test channels and bandwidth were for RF conductive measurement.

| Mode | Tested Channel | 6dB Bandwidth | Output Power | Band Edges | Spurious Emission | Power Spectral Density | Radiated Emission |
|---|---|---|---|---|---|---|---|
| 802.11b | 1, 6, 11 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 802.11g | 1, 6, 11 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 802.11n HT20 | 1, 6, 11 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 802.11n HT40 | 3, 6, 9 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

**Final results of test modes, data rates and test channels are shown as following table.**

| Test Cases | | | | |
|---|---|---|---|---|
| | **Test Items** | **Mode** | **Data Rate** | **Test Channel** |
| **Conducted TCs** | **6dB BW Power Spectral Density** | **802.11b** | **1 Mbps** | **1/6/11** |
| | | **802.11g** | **6 Mbps** | **1/6/11** |
| | | **802.11n HT20** | **6.5 Mbps** | **1/6/11** |
| | | **802.11n HT40** | **13.5 Mbps** | **3/6/9** |
| | **Output Power** | **802.11b** | **1 Mbps** | **1/6/11** |
| | | **802.11g** | **6 Mbps** | **1/6/11** |
| | | **802.11n HT20** | **6.5 Mbps** | **1/6/11** |
| | | **802.11n HT40** | **13.5 Mbps** | **3/6/9** |
| | **Conducted Band Edge** | **802.11b** | **1 Mbps** | **1/11** |
| | | **802.11g** | **6 Mbps** | **1/11** |
| | | **802.11n HT20** | **6.5 Mbps** | **1/11** |
| | | **802.11n HT40** | **13.5 Mbps** | **3/9** |
| | **Conducted Spurious Emission** | **802.11b** | **1 Mbps** | **1/6/11** |
| | | **802.11g** | **6 Mbps** | **1/6/11** |
| | | **802.11n HT20** | **6.5 Mbps** | **1/6/11** |
| | | **802.11n HT40** | **13.5 Mbps** | **3/6/9** |
| **Radiated TCs** | **Radiated Band Edge** | **802.11b** | **1 Mbps** | **1/11** |
| | | **802.11g** | **6 Mbps** | **1/11** |
| | | **802.11n HT20** | **6.5 Mbps** | **1/11** |
| | | **802.11n HT40** | **13.5 Mbps** | **3/9** |
| | **Radiated Spurious Emission** | **802.11b** | **1 Mbps** | **1/6/11** |
| | | **802.11g** | **6 Mbps** | **1/6/11** |
| | | **802.11n HT20** | **6.5 Mbps** | **1/6/11** |
| | | **802.11n HT40** | **13.5 Mbps** | **3/6/9** |
| **Remark:** For Radiated TCs, all the tests were performance with Antenna 1 and Antenna 2 | | | | |

## 2.6 Connection Diagram of Test System




## 2.7 Support Unit used in test configuration and system

| Item | Equipment | Trade Name | Model Name | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|
| 1. | Notebook | Lenovo | 0769 | FCC DoC | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |

## 2.8 Description of RF Function Operation Test Setup

The programmed RF utility “artgui.exe” is installed in notebook make the EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

## 2.9 Measurement Results Explanation Example

**For all conducted test items:**

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example :

*Offset(dB) = RF cable loss(dB) + attenuator factor(dB).*

= 4.2 + 10 = 14.2 (dB)

# 3 Test Result

## 3.1 6dB Bandwidth Measurement

### 3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 KHz.

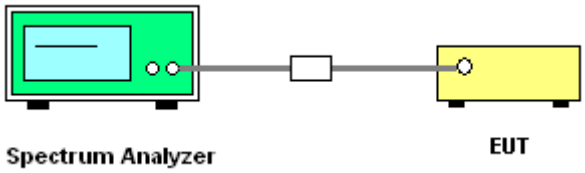
### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.
5. Measure and record the results in the test report.

### 3.1.4 Test Setup



### 3.1.5 Test Result of 6dB Bandwidth

| Test Mode : | 802.11b | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 802.11b 6dB Bandwidth (MHz) | 6dB Bandwidth Min. Limit (MHz) | Pass/Fail |
|---|---|---|---|---|
| 01 | 2412 | 10.09 | 0.5 | Pass |
| 06 | 2437 | 10.04 | 0.5 | Pass |
| 11 | 2462 | 10.06 | 0.5 | Pass |

| Test Mode : | 802.11g | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 802.11g 6dB Bandwidth (MHz) | 6dB Bandwidth Min. Limit (MHz) | Pass/Fail |
|---|---|---|---|---|
| 01 | 2412 | 16.35 | 0.5 | Pass |
| 06 | 2437 | 16.33 | 0.5 | Pass |
| 11 | 2462 | 16.37 | 0.5 | Pass |

| Test Mode : | 802.11n HT20 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

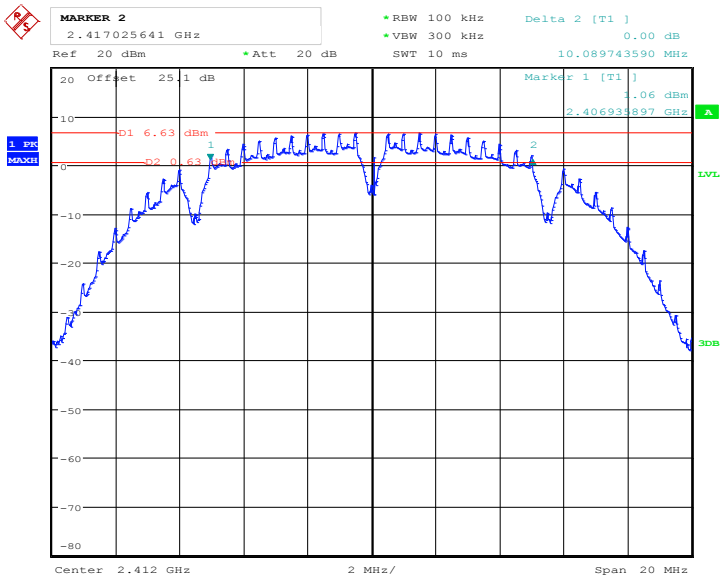
| Channel | Frequency (MHz) | 2.4GHz 802.11n HT20 6dB Bandwidth (MHz) | 6dB Bandwidth Min. Limit (MHz) | Pass/Fail |
|---|---|---|---|---|
| 01 | 2412 | 17.56 | 0.5 | Pass |
| 06 | 2437 | 17.56 | 0.5 | Pass |
| 11 | 2462 | 17.56 | 0.5 | Pass |

| Test Mode : | 802.11n HT40 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 2.4GHz 802.11n HT40 6dB Bandwidth (MHz) | 6dB Bandwidth Min. Limit (MHz) | Pass/Fail |
|---|---|---|---|---|
| 03 | 2422 | 36.28 | 0.5 | Pass |
| 06 | 2437 | 36.38 | 0.5 | Pass |
| 09 | 2452 | 36.38 | 0.5 | Pass |

## 3.1.6 Test Result of 6dB Bandwidth Plots

### 802.11b 6 dB Bandwidth Plot on Channel 01

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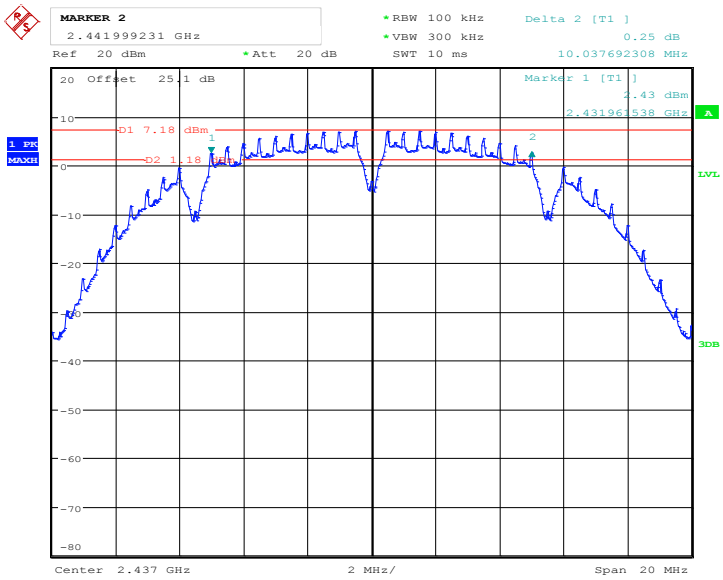
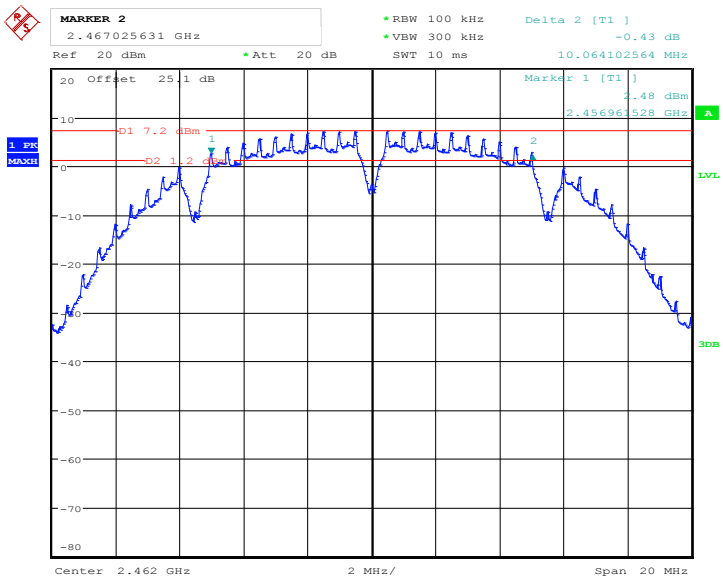
### 802.11b 6 dB Bandwidth Plot on Channel 06



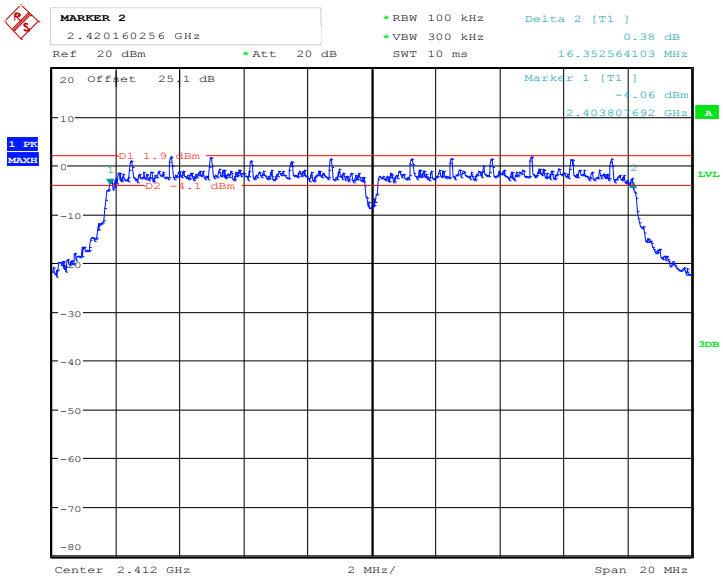

Date: 28.JAN.2013 16:29:23

## 802.11b 6 dB Bandwidth Plot on Channel 11



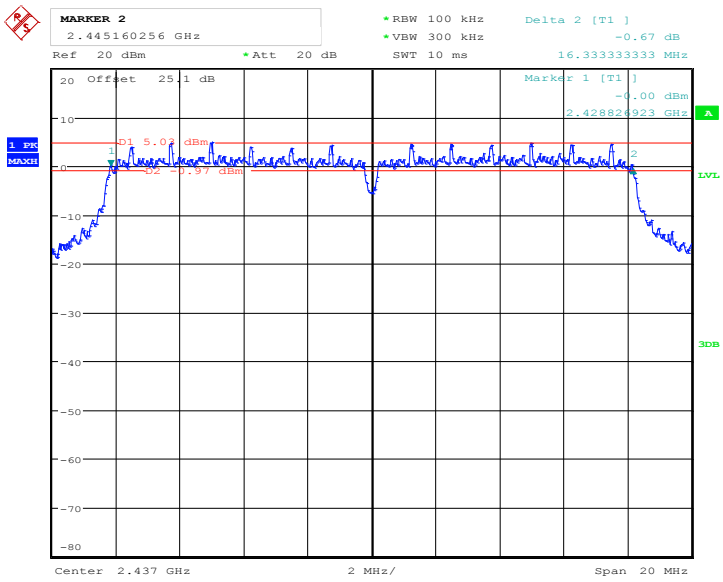

Date: 28.JAN.2013 16:34:58

## 802.11g 6 dB Bandwidth Plot on Channel 01



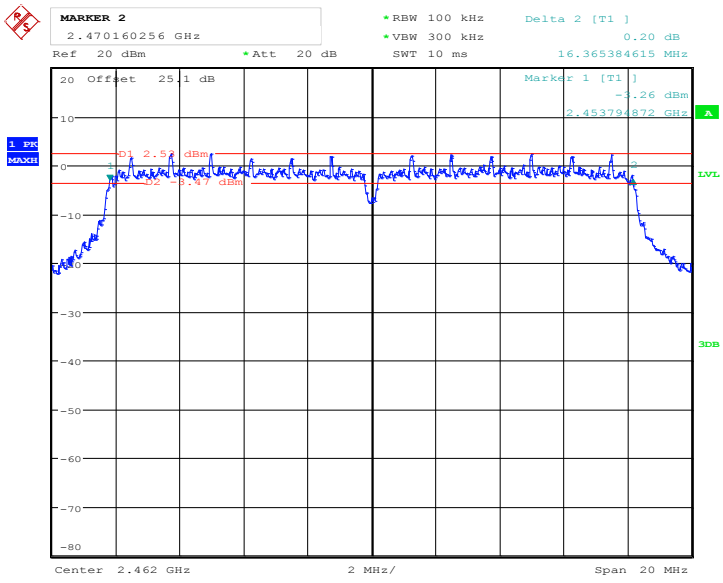

Date: 28.JAN.2013 16:41:35

## 802.11g 6 dB Bandwidth Plot on Channel 06



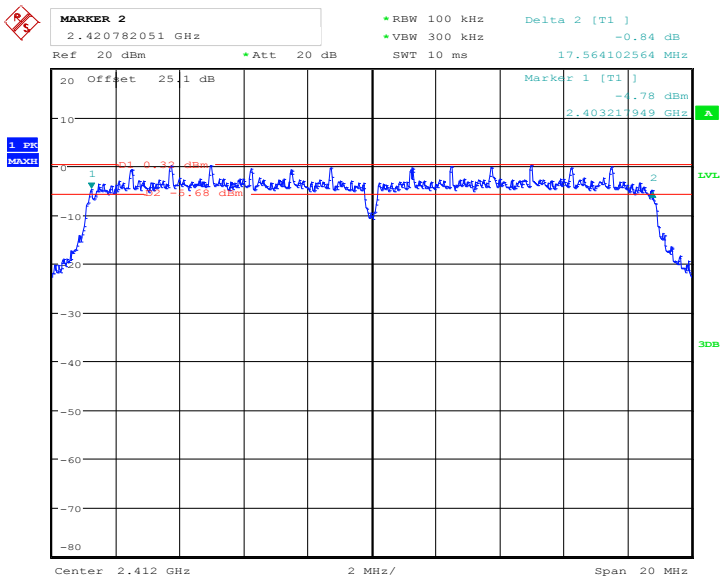

Date: 28.JAN.2013 16:51:31

## 802.11g 6 dB Bandwidth Plot Channel 11



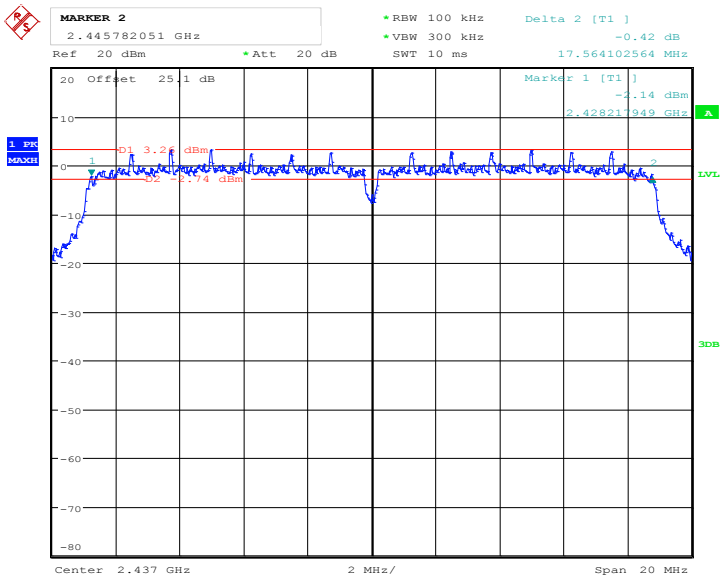

Date: 28.JAN.2013 16:55:20

## 802.11n HT20 6 dB Bandwidth Plot on Channel 01



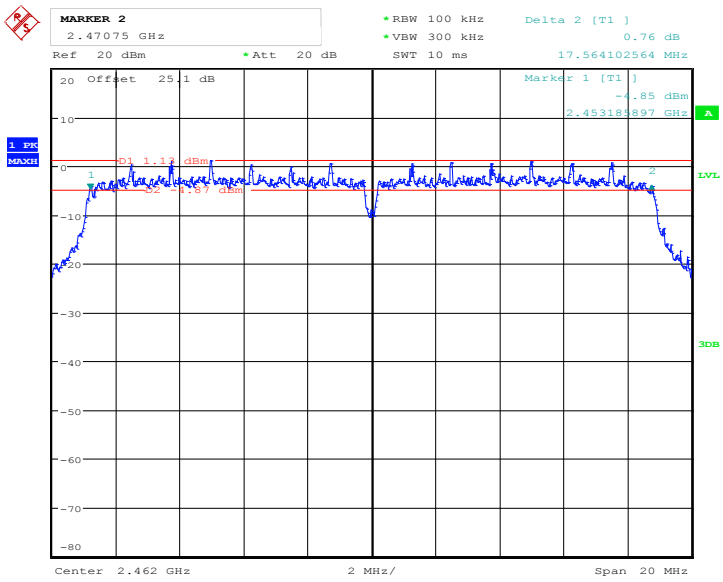

Date: 28.JAN.2013 17:01:25

## 802.11n HT20 6 dB Bandwidth Plot on Channel 06



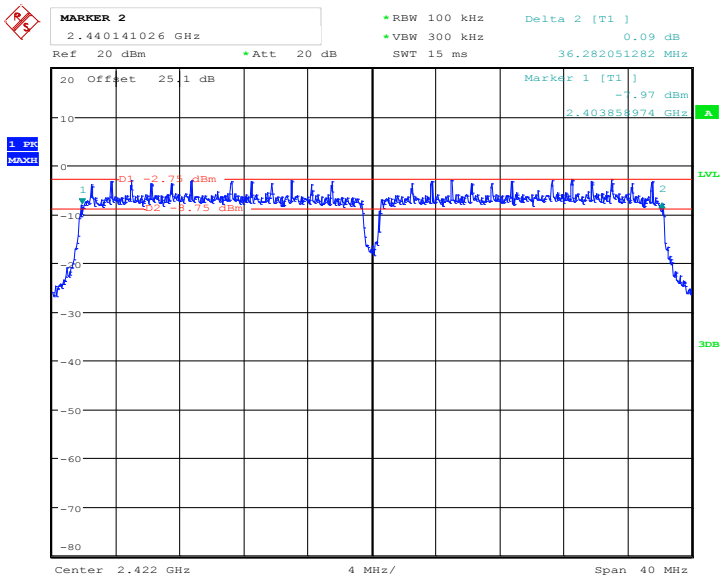

Date: 28.JAN.2013 17:06:06

## 802.11n HT20 6 dB Bandwidth Plot on Channel 11



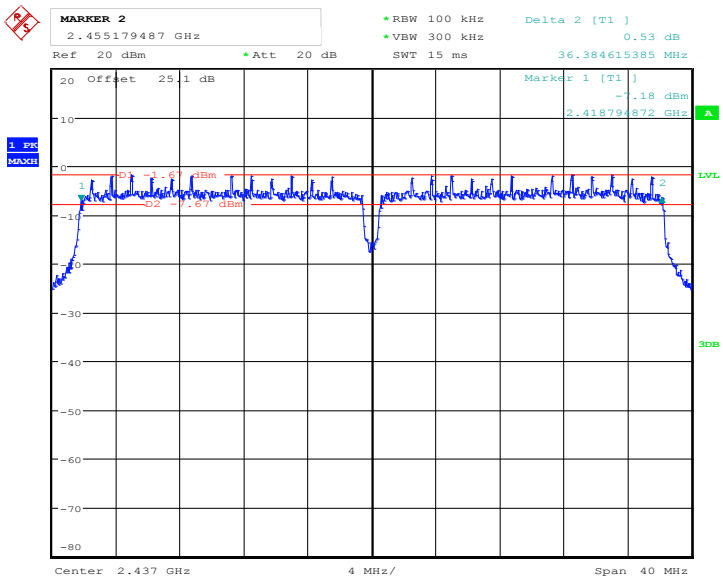

Date: 28.JAN.2013 17:10:54

## 802.11n HT40 6 dB Bandwidth Plot on Channel 03



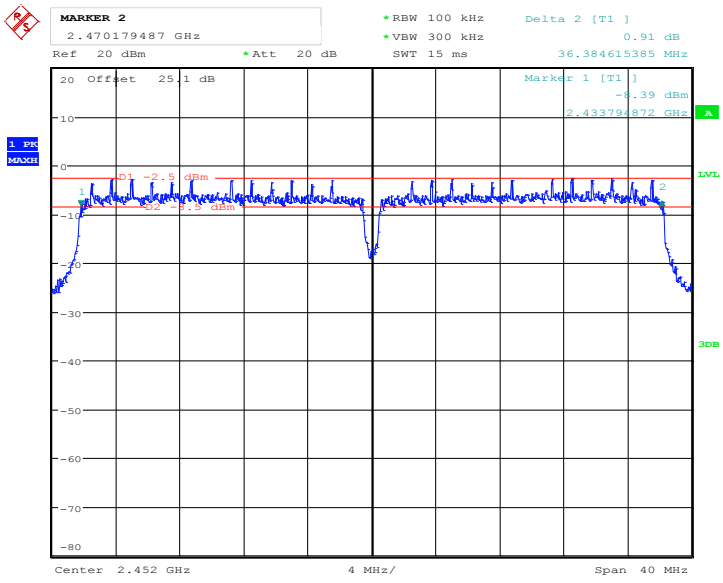

Date: 28.JAN.2013 17:15:38

## 802.11n HT40 6 dB Bandwidth Plot on Channel 06




Date: 28.JAN.2013 17:28:25

## 802.11n HT40 6 dB Bandwidth Plot on Channel 09




Date: 28.JAN.2013 17:55:57

## 3.2 Peak Output Power Measurement

### 3.2.1 Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

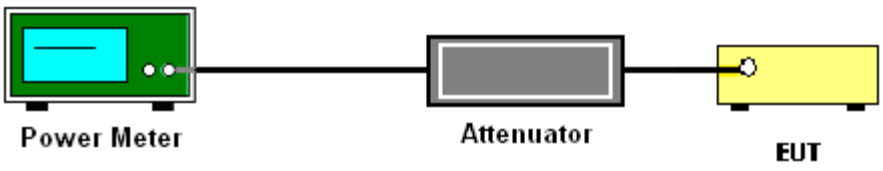
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

### 3.2.4 Test Setup



### 3.2.5 Test Result of Peak Output Power

| Test Mode : | 802.11b | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 802.11b Peak Output Power (dBm) | | Max. Limits (dBm) | Pass/Fail |
|---|---|---|---|---|---|
| | | Ant. 1 | Ant. 2 | | |
| 01 | 2412 | 19.61 | 19.61 | 30 | Pass |
| 06 | 2437 | 19.93 | 19.93 | 30 | Pass |
| 11 | 2462 | 19.84 | 19.84 | 30 | Pass |

| Test Mode : | 802.11g | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 802.11g Peak Output Power (dBm) | | Max. Limits (dBm) | Pass/Fail |
|---|---|---|---|---|---|
| | | Ant. 1 | Ant. 2 | | |
| 01 | 2412 | 23.36 | 21.69 | 30 | Pass |
| 06 | 2437 | 24.54 | 24.54 | 30 | Pass |
| 11 | 2462 | 23.29 | 23.29 | 30 | Pass |

| Test Mode : | 802.11n HT20 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 802.11n HT20 Peak Output Power (dBm) | | Max. Limits (dBm) | Pass/Fail |
|---|---|---|---|---|---|
| | | Ant. 1 | Ant. 2 | | |
| 01 | 2412 | 22.68 | 20.91 | 30 | Pass |
| 06 | 2437 | 23.97 | 23.97 | 30 | Pass |
| 11 | 2462 | 22.76 | 22.76 | 30 | Pass |

| Test Mode : | 802.11n HT40 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 802.11n HT40 Peak Output Power (dBm) | | Max. Limits (dBm) | Pass/Fail |
|---|---|---|---|---|---|
| | | Ant. 1 | Ant. 1 | | |
| 03 | 2422 | 21.40 | 21.40 | 30 | Pass |
| 06 | 2437 | 23.15 | 23.15 | 30 | Pass |
| 09 | 2452 | 21.68 | 22.08 | 30 | Pass |

### 3.2.6 Test Result of Average output Power (Reporting Only)

| Test Mode : | 802.11b | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |
| Duty Cycle: | 100.00% | Duty Factor: | 0.00dB |

| Channel | Frequency (MHz) | 802.11b Average Output Power (dBm) | |
|---|---|---|---|
| | | Ant. 1 | Ant. 2 |
| 01 | 2412 | 17.28 | 17.28 |
| 06 | 2437 | 17.98 | 17.98 |
| 11 | 2462 | 17.73 | 17.73 |

| Test Mode : | 802.11g | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |
| Duty Cycle: | 98.02% | Duty Factor: | 0.09dB |

| Channel | Frequency (MHz) | 802.11g Average Output Power (dBm) | |
|---|---|---|---|
| | | Ant. 1 | Ant. 2 |
| 01 | 2412 | 14.67 | 11.78 |
| 06 | 2437 | 17.89 | 17.89 |
| 11 | 2462 | 14.93 | 14.93 |

| Test Mode : | 802.11n HT20 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |
| Duty Cycle: | 98.92% | Duty Factor: | 0.05dB |

| Channel | Frequency (MHz) | 802.11n HT20 Average Output Power (dBm) | |
|---|---|---|---|
| | | Ant. 1 | Ant. 2 |
| 01 | 2412 | 13.24 | 10.87 |
| 06 | 2437 | 16.31 | 16.31 |
| 11 | 2462 | 13.64 | 13.64 |

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11n HT40 | **Temperature :** | 24~26℃ |
| **Test Engineer :** | Rover Lee | **Relative Humidity :** | 50~53% |
| **Duty Cycle:** | 99.08% | **Duty Factor:** | 0.04dB |

| Channel | Frequency (MHz) | 802.11n HT40 Average Output Power (dBm) | |
|---|---|---|---|
| | | Ant. 1 | Ant. 2 |
| 03 | 2422 | 11.06 | 11.06 |
| 06 | 2437 | 14.28 | 14.28 |
| 09 | 2452 | 11.93 | 13.12 |

## 3.3 Power Spectral Density Measurement

### 3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3KHz band at any time interval of continuous transmission.

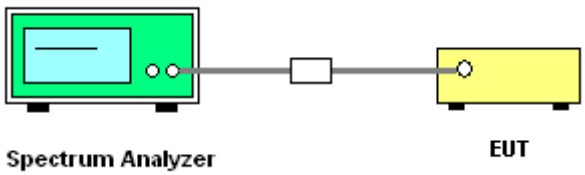
### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.3.3 Test Procedures

1. The testing follows Measurement Procedure 9.1 Option 1 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. The Measured power density (dBm)/ 100KHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

### 3.3.4 Test Setup



### 3.3.5 Test Result of Power Spectral Density

| Test Mode : | 802.11b | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 802.11b Power Density | | Max. Limits (dBm/3KHz) | Pass /Fail |
|---|---|---|---|---|---|
| | | PSD/100KHz (dBm) | PSD/3KHz (dBm) | | |
| 01 | 2412 | 6.15 | -8.08 | 8 | Pass |
| 06 | 2437 | 6.92 | -6.78 | 8 | Pass |
| 11 | 2462 | 6.97 | -7.14 | 8 | Pass |

| Test Mode : | 802.11g | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 802.11g Power Density | | Max. Limits (dBm/3KHz) | Pass /Fail |
|---|---|---|---|---|---|
| | | PSD/100KHz (dBm) | PSD/3KHz (dBm) | | |
| 01 | 2412 | 1.16 | -11.36 | 8 | Pass |
| 06 | 2437 | 4.77 | -8.81 | 8 | Pass |
| 11 | 2462 | 2.36 | -11.04 | 8 | Pass |

| Test Mode : | 802.11n HT20 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

| Channel | Frequency (MHz) | 802.11n HT20 Power Density | | Max. Limits (dBm/3KHz) | Pass /Fail |
|---|---|---|---|---|---|
| | | PSD/100KHz (dBm) | PSD/3KHz (dBm) | | |
| 01 | 2412 | -0.40 | -13.66 | 8 | Pass |
| 06 | 2437 | 3.12 | -11.21 | 8 | Pass |
| 11 | 2462 | 0.94 | -12.97 | 8 | Pass |

| Test Mode : | 802.11n HT40 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Engineer : | Rover Lee | Relative Humidity : | 50~53% |

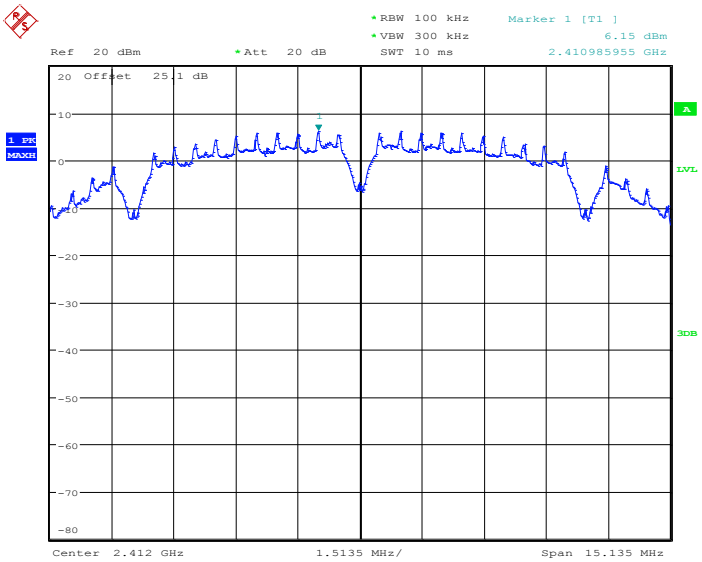
| Channel | Frequency (MHz) | 802.11n HT40 Power Density | | Max. Limits (dBm/3KHz) | Pass /Fail |
|---|---|---|---|---|---|
| | | PSD/100KHz (dBm) | PSD/3KHz (dBm) | | |
| 03 | 2422 | -5.47 | -19.85 | 8 | Pass |
| 06 | 2437 | -1.81 | -15.76 | 8 | Pass |
| 09 | 2452 | -2.48 | -16.34 | 8 | Pass |

***Note:***

1. *Measured power density (dBm) has offset with cable loss.*
2. *The Measured power density (dBm)/ 100KHz is reference level and used as 20dBc down for Conducted Band Edges and Conducted Spurious Emission limit line.*

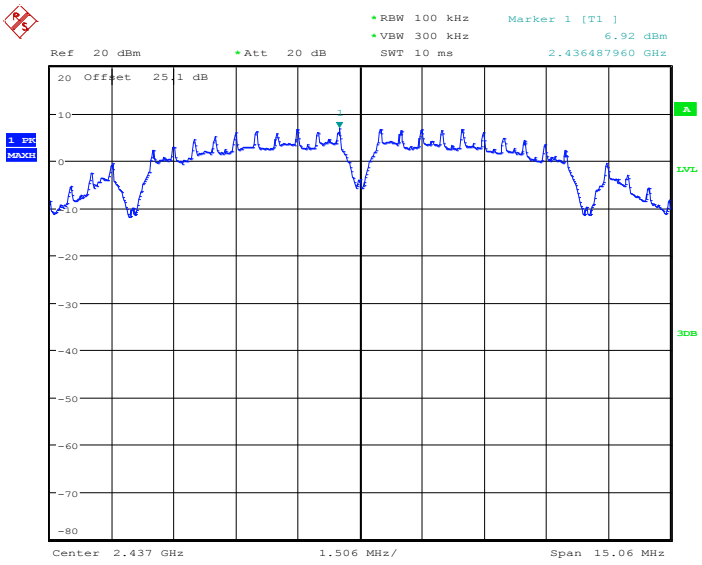
## 3.3.6 Test Result of Power Spectral Density Plots (100kHz)

### 802.11b PSD 100kHz Plot on Channel 01



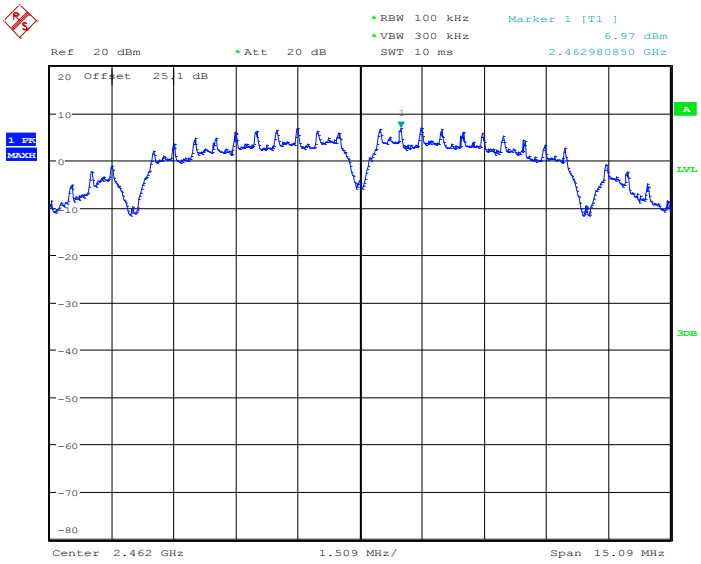

Date: 28.JAN.2013 16:25:30

### 802.11b PSD 100kHz Plot on Channel 06



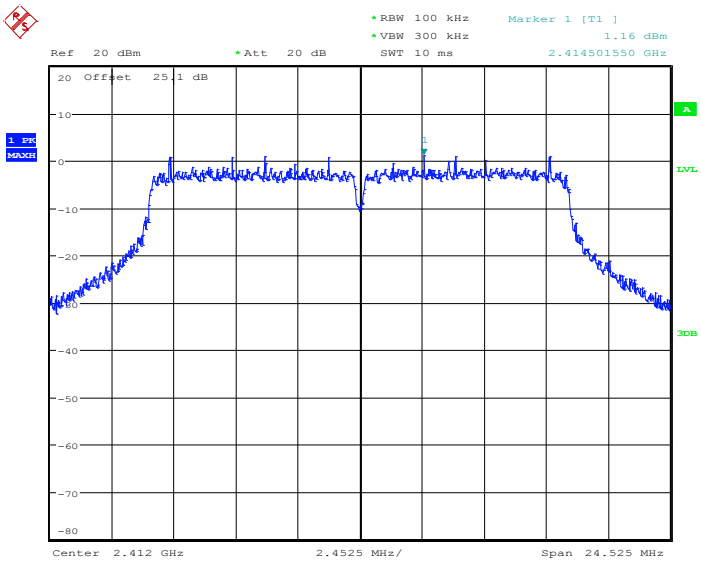

Date: 28.JAN.2013 16:30:37

## 802.11b PSD 100kHz Plot on Channel 11



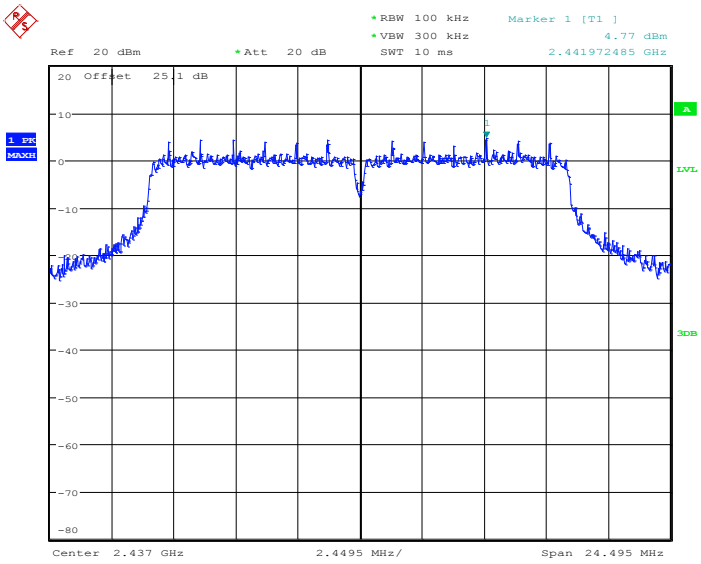

Date: 28.JAN.2013 16:35:58

## 802.11g PSD 100kHz Plot on Channel 01



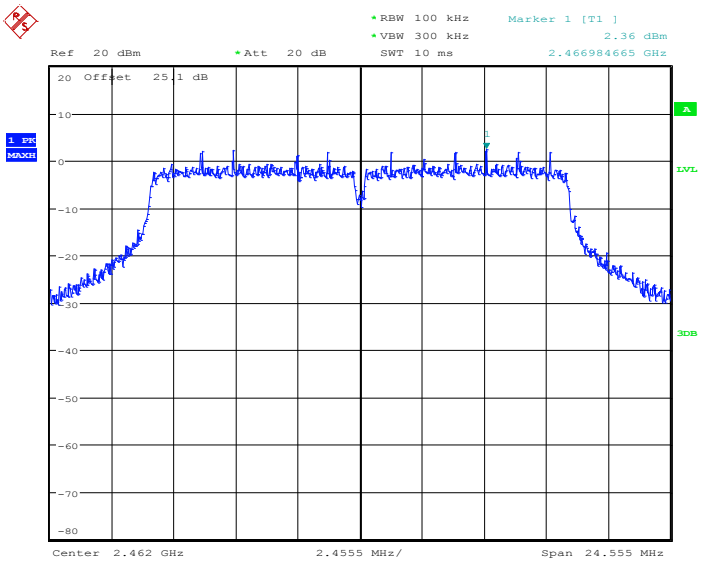

Date: 28.JAN.2013 16:42:59

## 802.11g PSD 100kHz Plot on Channel 06



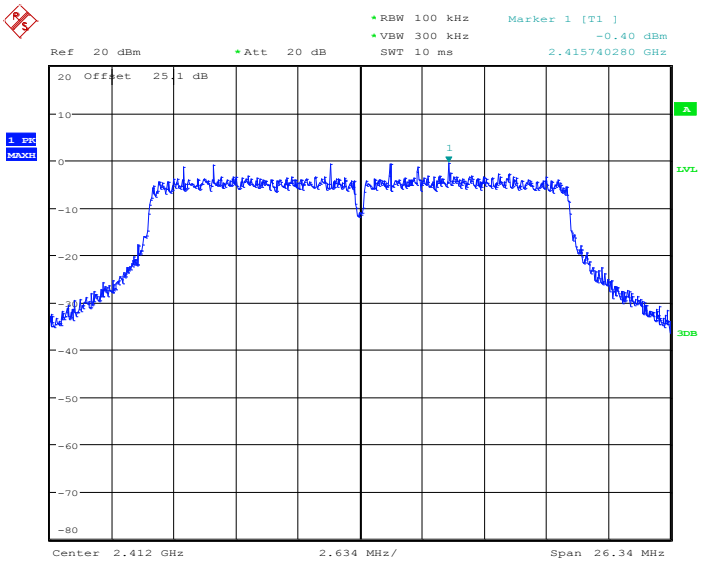

Date: 28.JAN.2013 16:52:34

## 802.11g PSD 100kHz Plot on Channel 11



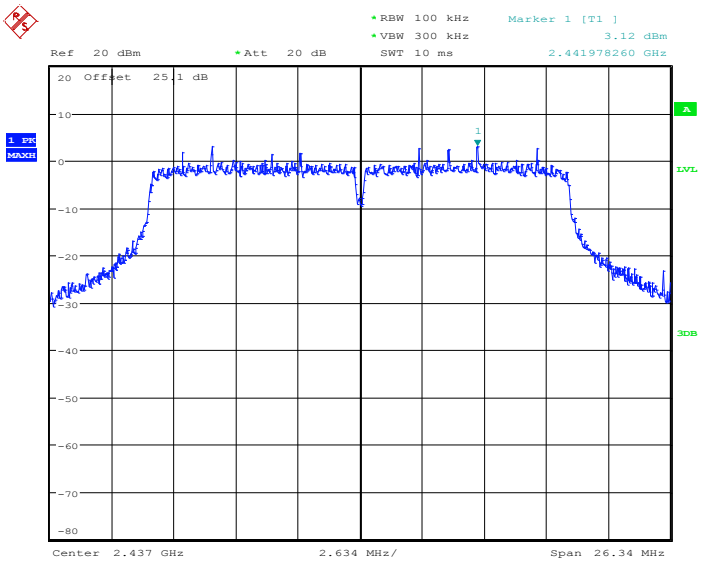

Date: 28.JAN.2013 16:56:15

## 802.11n HT20 PSD 100kHz Plot on Channel 01



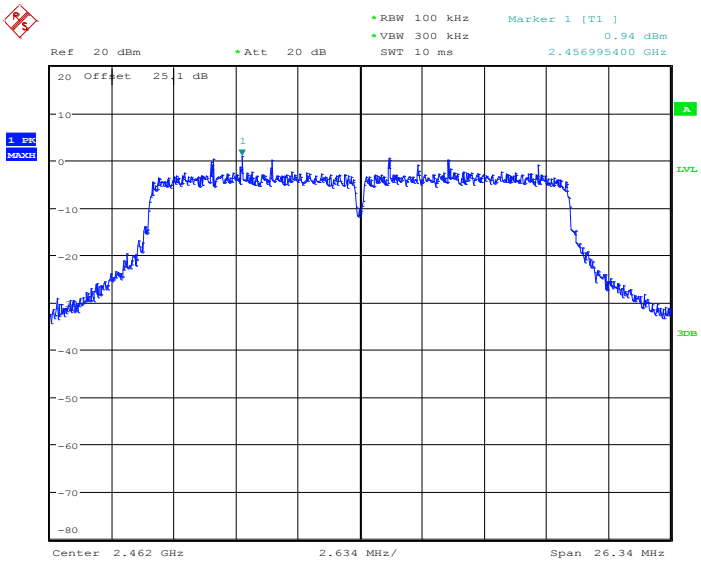

Date: 28.JAN.2013 17:02:24

## 802.11n HT20 PSD 100kHz Plot on Channel 06



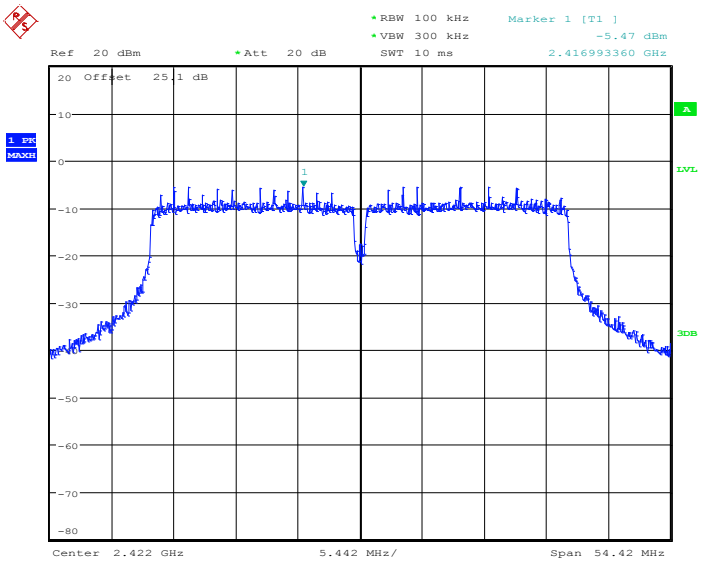

Date: 28.JAN.2013 17:07:08

## 802.11n HT20 PSD 100kHz Plot on Channel 11



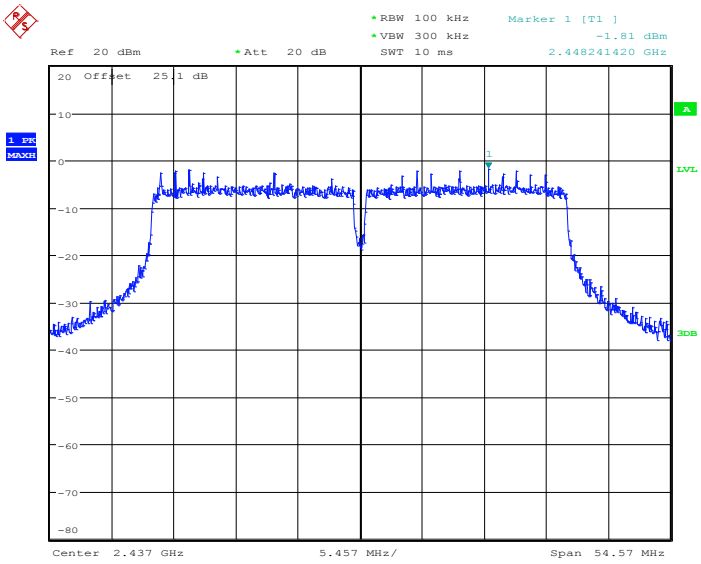

Date: 28.JAN.2013 17:11:55

## 802.11n HT40 PSD 100kHz Plot on Channel 03

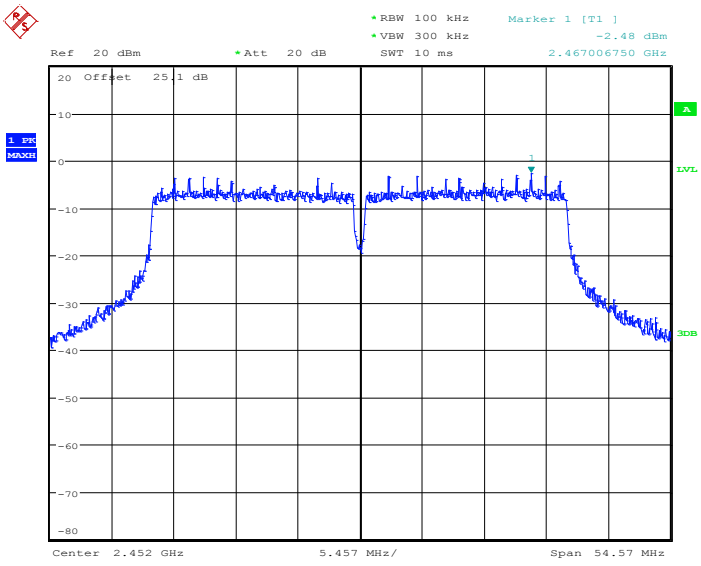



Date: 28.JAN.2013 17:22:14

## 802.11n HT40 PSD 100kHz Plot on Channel 06

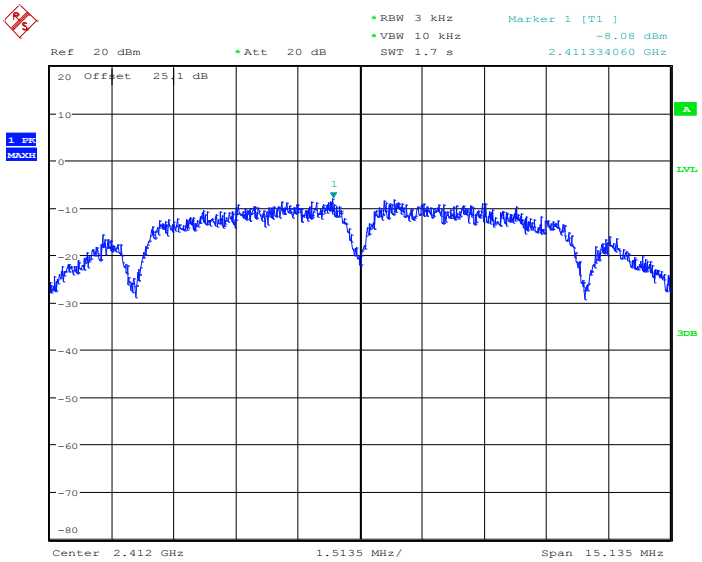



## 802.11n HT40 PSD 100kHz Plot on Channel 09



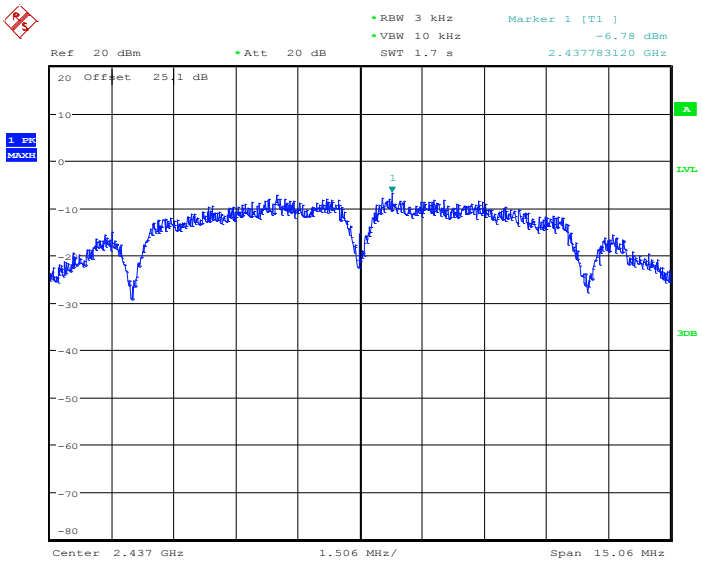
## 3.3.7 Test Result of Power Spectral Density Plots (3kHz)

### 802.11b PSD 3kHz Plot on Channel 01



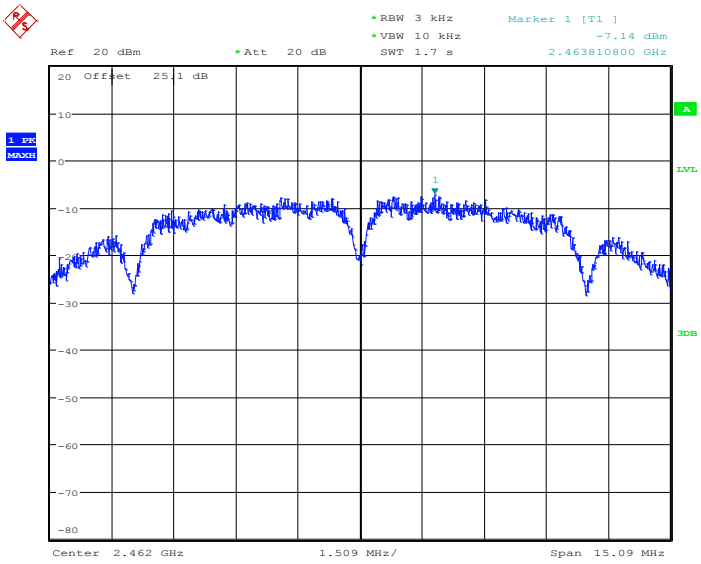

Date: 28.JAN.2013 16:25:22

### 802.11b PSD 3kHz Plot on Channel 06



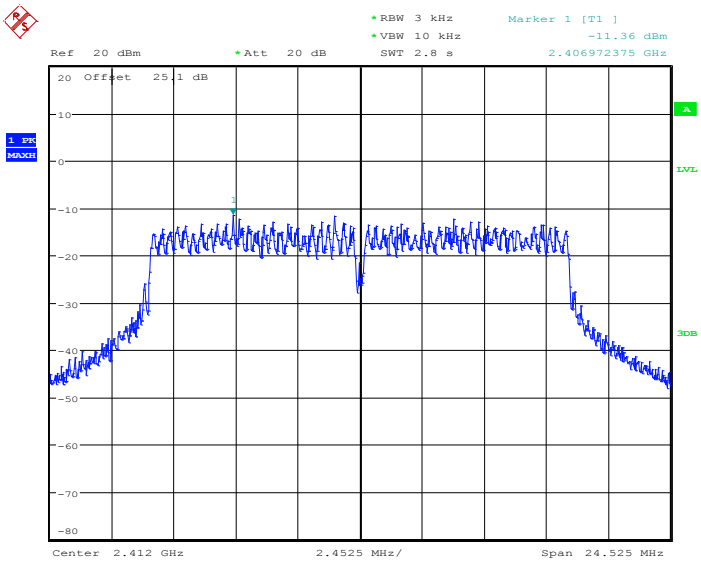

Date: 28.JAN.2013 16:30:29

## 802.11b PSD 3kHz Plot on Channel 11



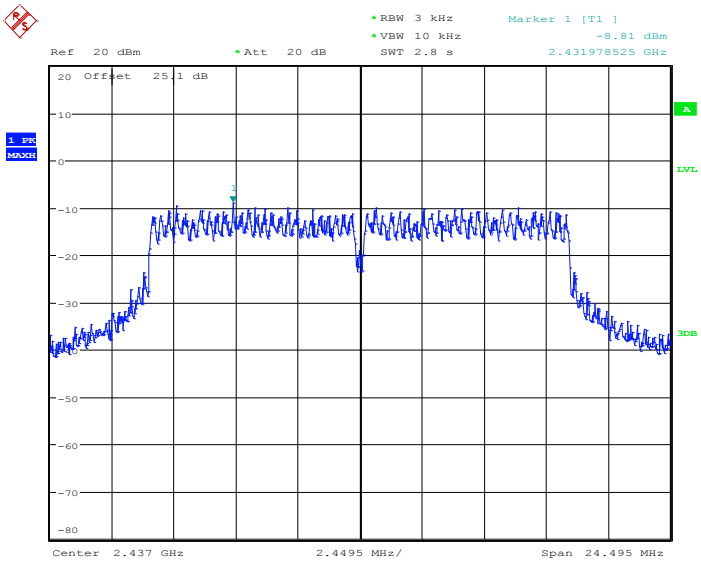

Date: 28.JAN.2013 16:35:50

## 802.11g PSD 3kHz Plot on Channel 01



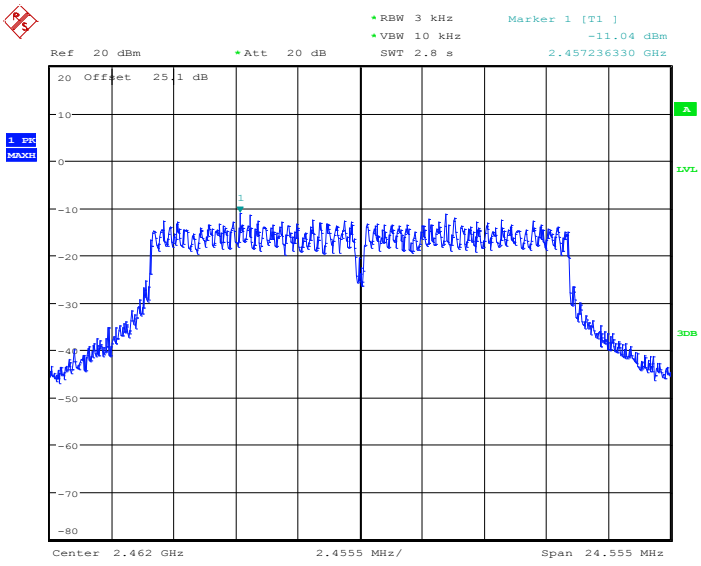

Date: 28.JAN.2013 16:42:52

## 802.11g PSD 3kHz Plot on Channel 06



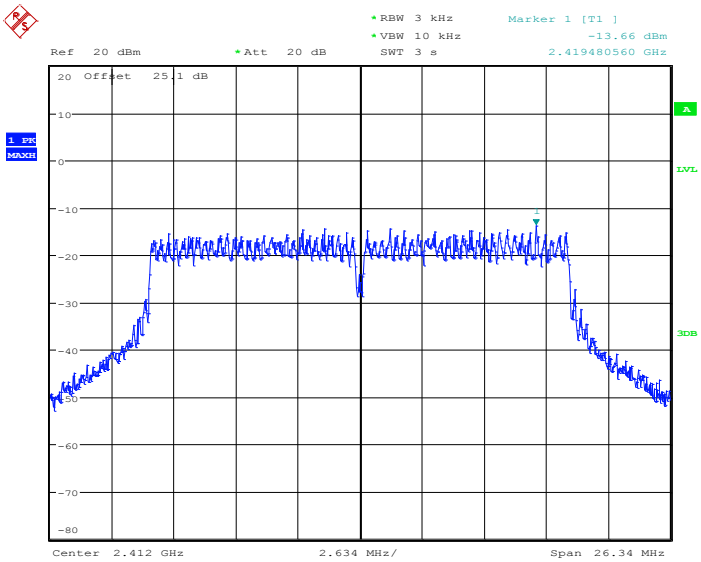

Date: 28.JAN.2013 16:52:26

## 802.11g PSD 3kHz Plot on Channel 11

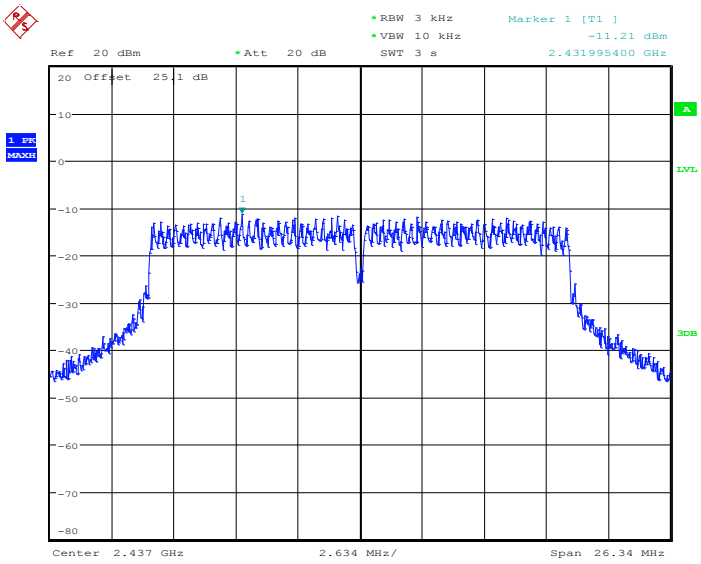



Date: 28.JAN.2013 16:56:07

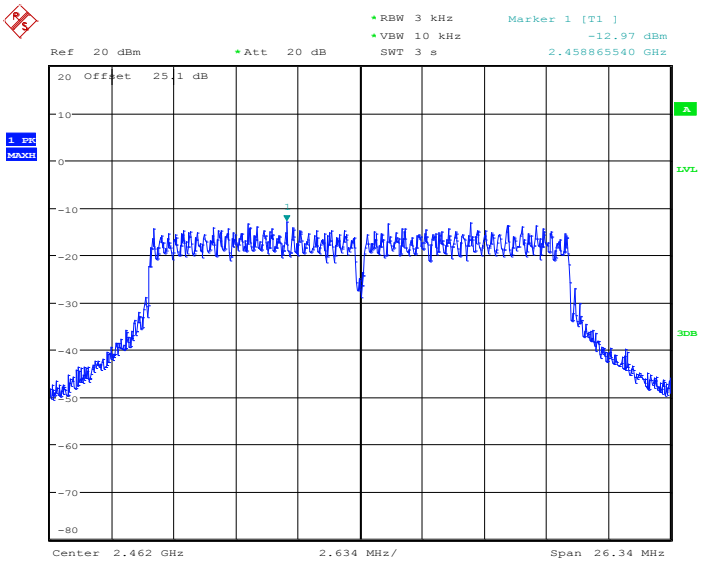
## 802.11n HT20 PSD 3kHz Plot on Channel 01




## 802.11n HT20 PSD 3kHz Plot on Channel 06

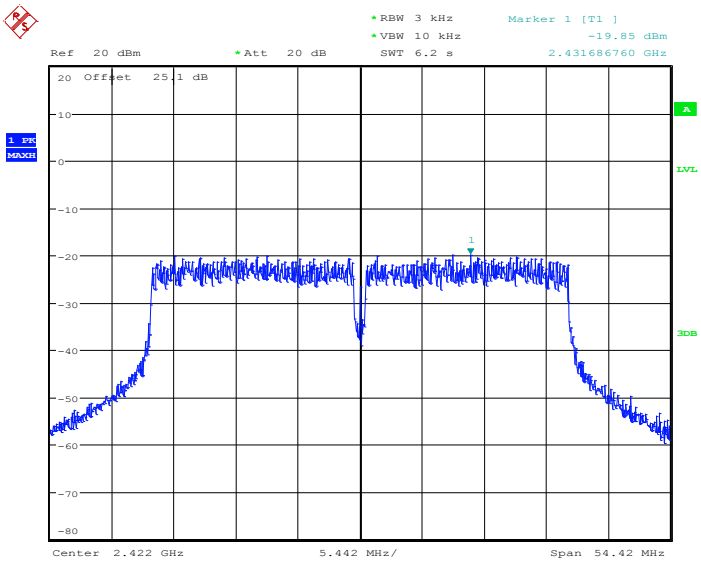


## 802.11n HT20 PSD 3kHz Plot on Channel 11



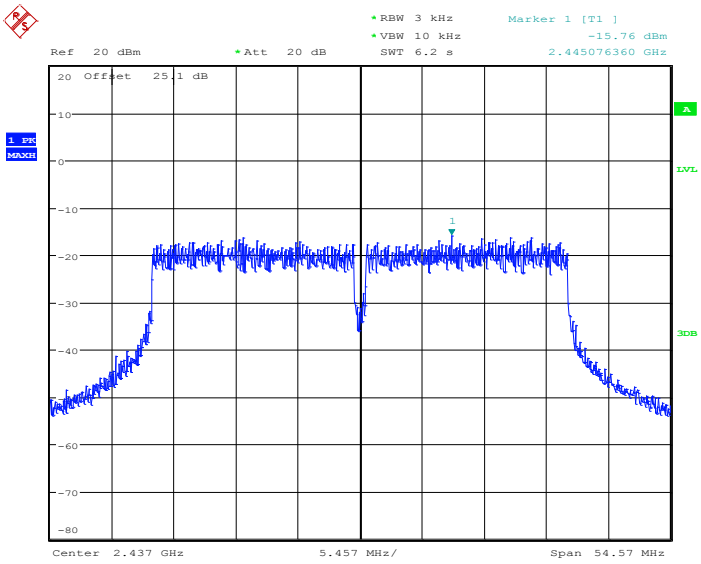

Date: 28.JAN.2013 17:11:47

## 802.11n HT40 PSD 3kHz Plot on Channel 03



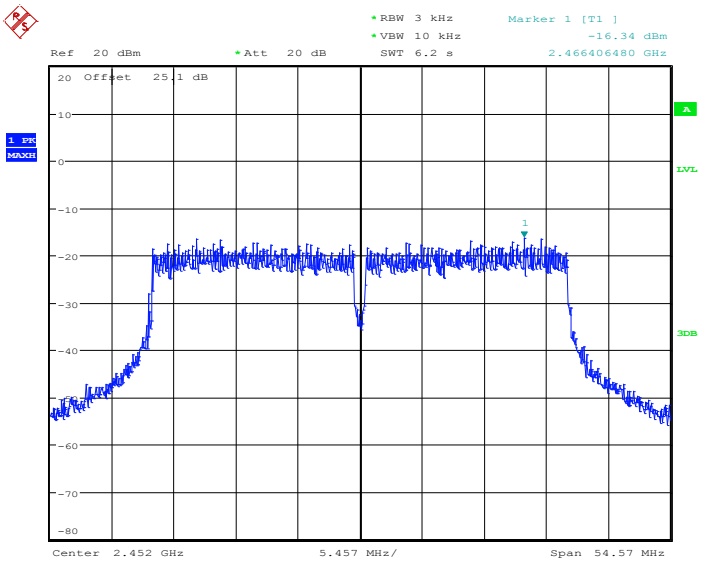

Date: 28.JAN.2013 17:22:06

## 802.11n HT40 PSD 3kHz Plot on Channel 06




Date: 28.JAN.2013 17:29:16

## 802.11n HT40 PSD 3kHz Plot on Channel 09




Date: 28.JAN.2013 17:56:58

# 3.4 Conducted Band Edges and Spurious Emission Measurement

## 3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

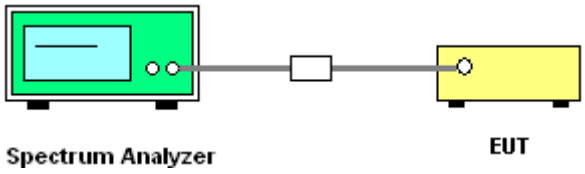
## 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

## 3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 KHz, VBW=300 KHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

## 3.4.4 Test Setup

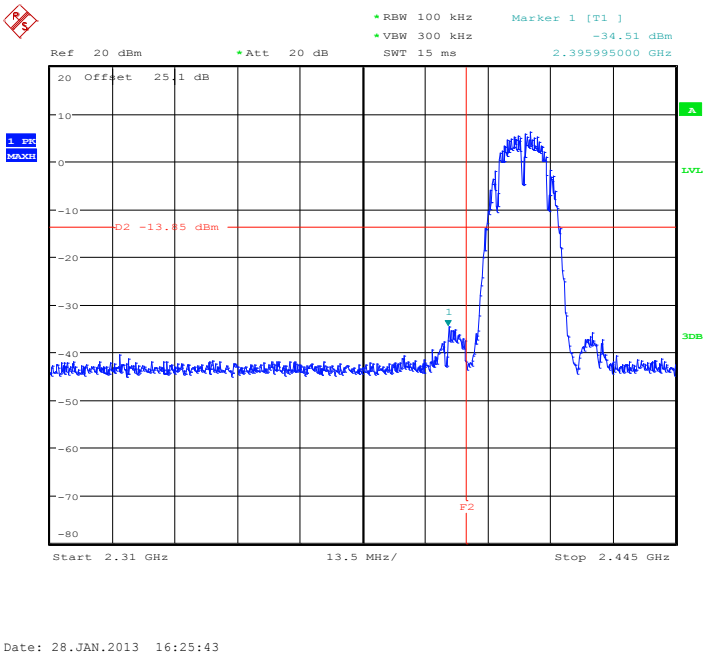


## 3.4.5 Test Result of Conducted Spurious at Band Edges

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11b | **Temperature :** | 24~26℃ |
| **Test Band :** | Low and High | **Relative Humidity :** | 50~53% |
| **Test Channel :** | 01 and 11 | **Test Engineer :** | Rover Lee |

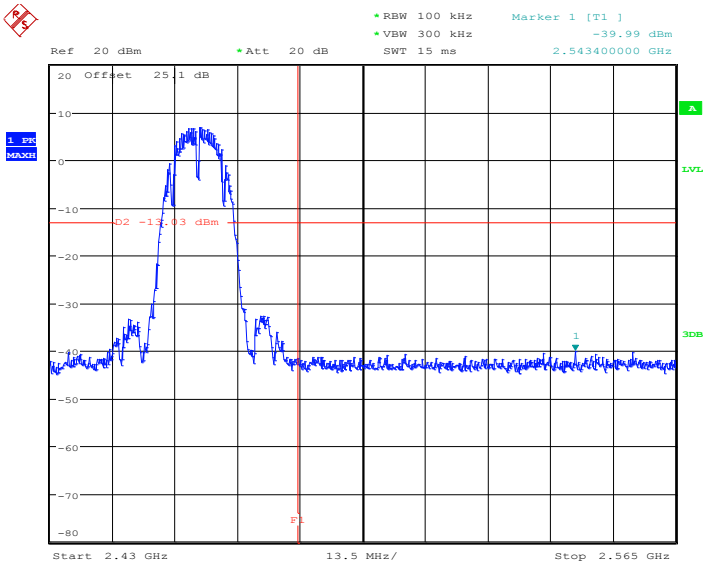
**802.11b**

**Low Band Edge Plot on Channel 01**



**802.11b**

**High Band Edge Plot on Channel 11**

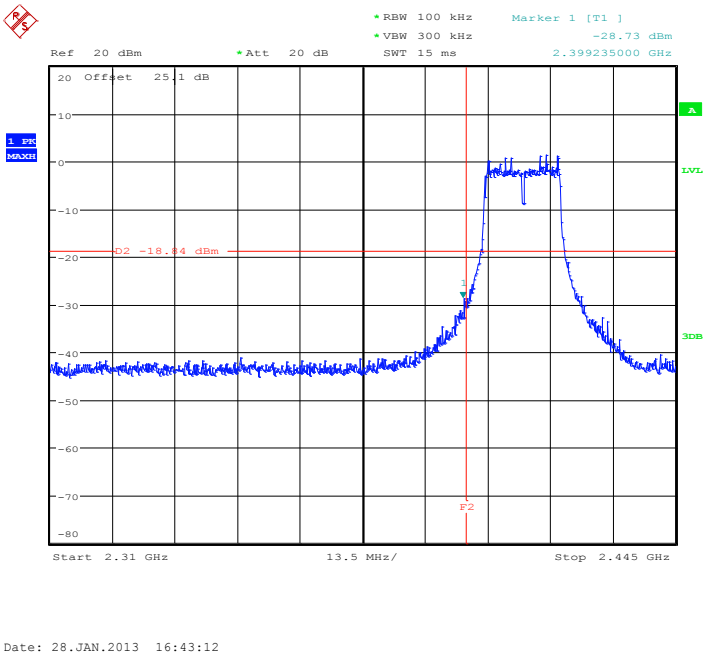



Date: 28.JAN.2013 16:36:11

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11g | **Temperature :** | 24~26℃ |
| **Test Band :** | Low and High | **Relative Humidity :** | 50~53% |
| **Test Channel :** | 01 and 11 | **Test Engineer :** | Rover Lee |

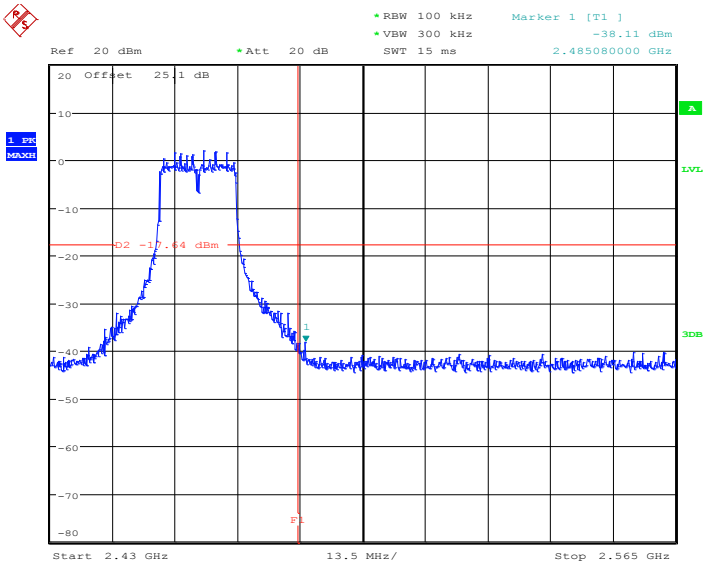
**802.11g**

**Low Band Edge Plot on Channel 01**



**802.11g**

**High Band Edge Plot on Channel 11**

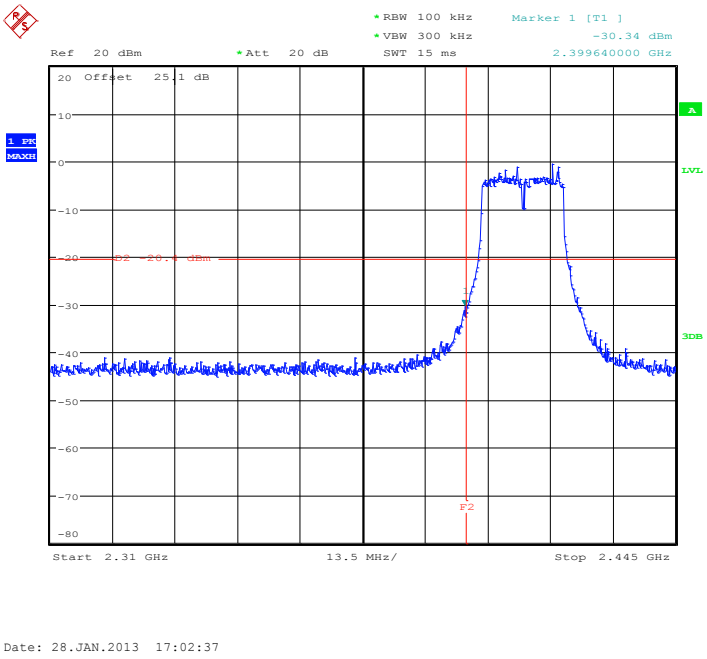



Date: 28.JAN.2013 16:56:28

| Test Mode : | 802.11n HT20 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Band : | Low and High | Relative Humidity : | 50~53% |
| Test Channel : | 01 and 11 | Test Engineer : | Rover Lee |

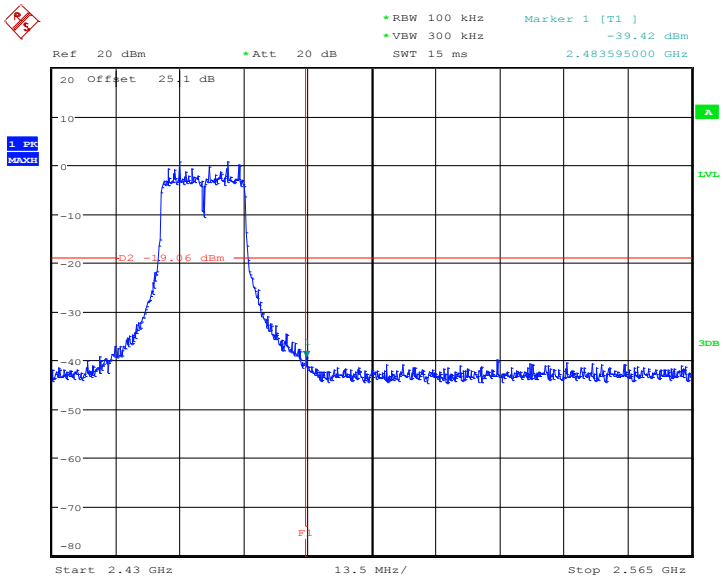
**802.11n HT20**

**Low Band Edge Plot on Channel 01**



**802.11n HT20**

**High Band Edge Plot on Channel 11**

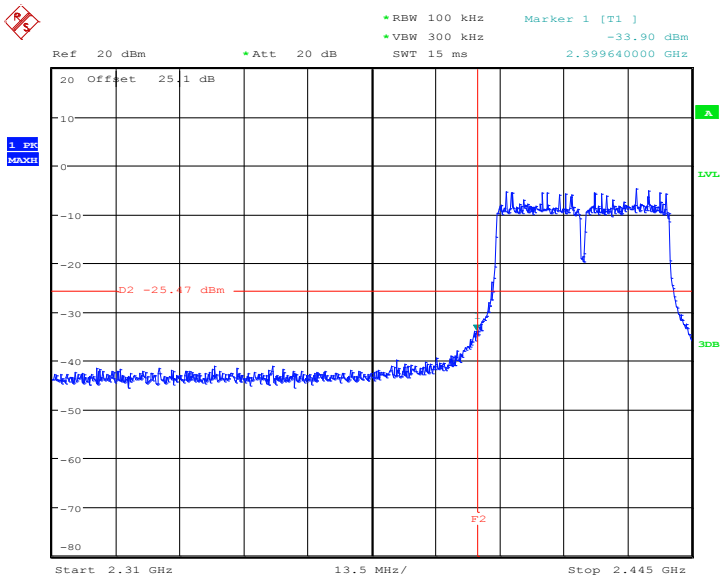



Date: 28.JAN.2013 17:12:08

| Test Mode : | 802.11n HT40 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Band : | Low and High | Relative Humidity : | 50~53% |
| Test Channel : | 03 and 09 | Test Engineer : | Rover Lee |

**802.11n HT40**

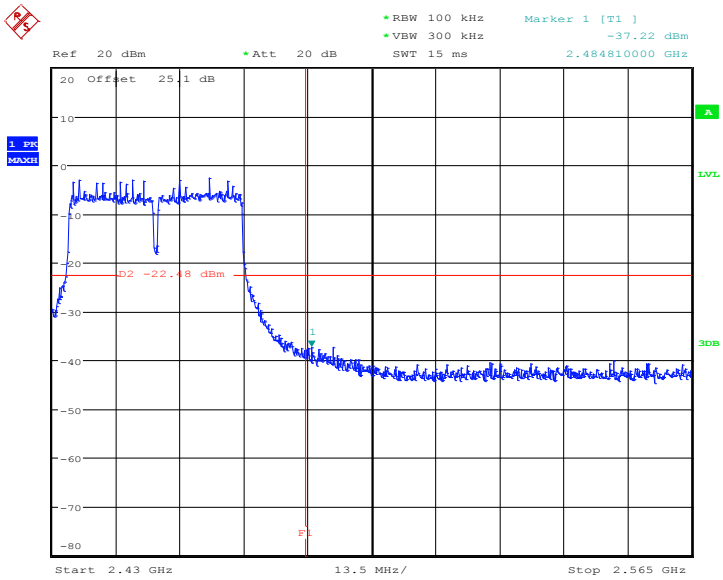
**Low Band Edge Plot on Channel 03**




Date: 28.JAN.2013 17:22:27

**802.11n HT40**

**High Band Edge Plot on Channel 09**



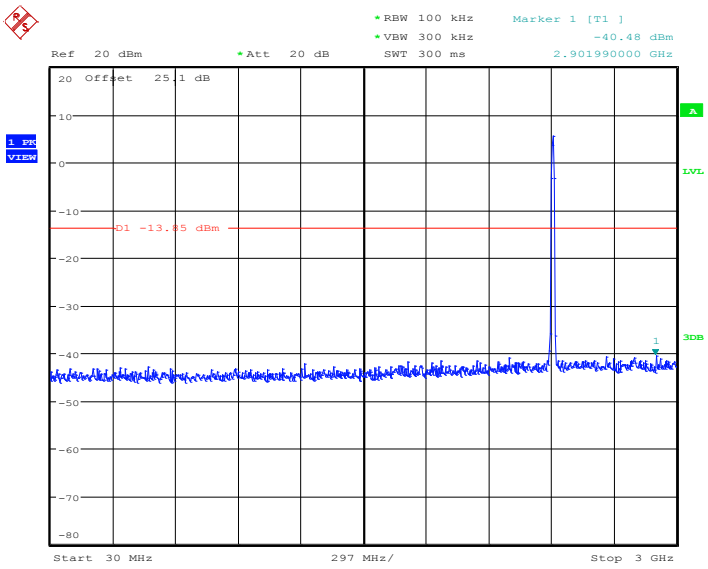

Date: 28.JAN.2013 17:57:19

## 3.4.5 Test Result of Conducted Spurious Emission

| Test Mode : | 802.11b | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Band : | 30MHz-3GHz and 2G-25GHz | Relative Humidity : | 50~53% |
| Test Channel : | 01, 06, 11 | Test Engineer : | Rover Lee |

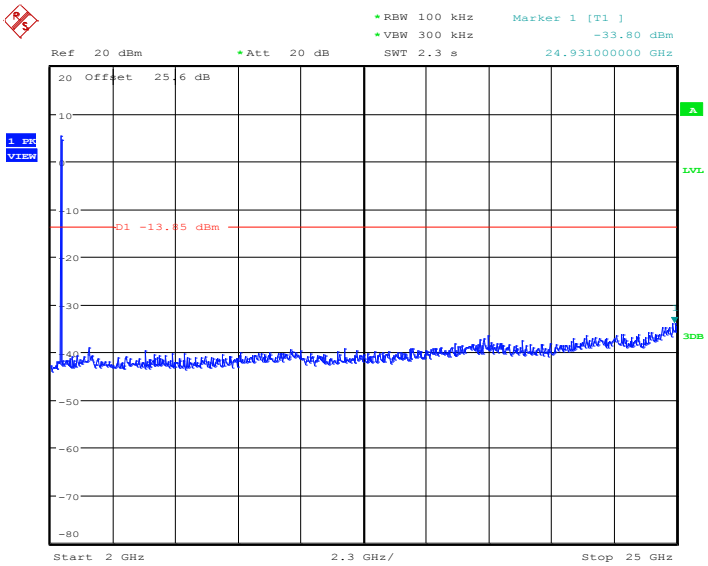
**802.11b 30 MHz~3 GHz**

**Conducted Spurious Emission Plot on Channel 01**



### 802.11b 2 GHz~25 GHz

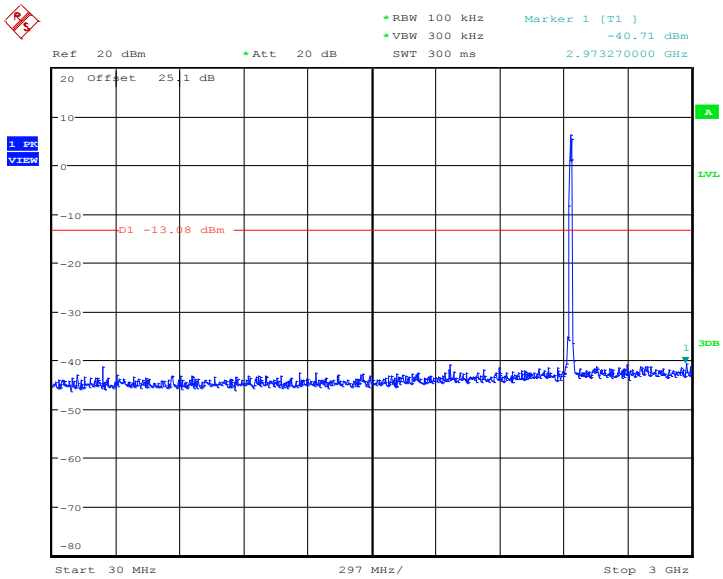
### Conducted Spurious Emission Plot on Channel 01




Date: 28.JAN.2013 16:26:19

### 802.11b 30 MHz~3 GHz

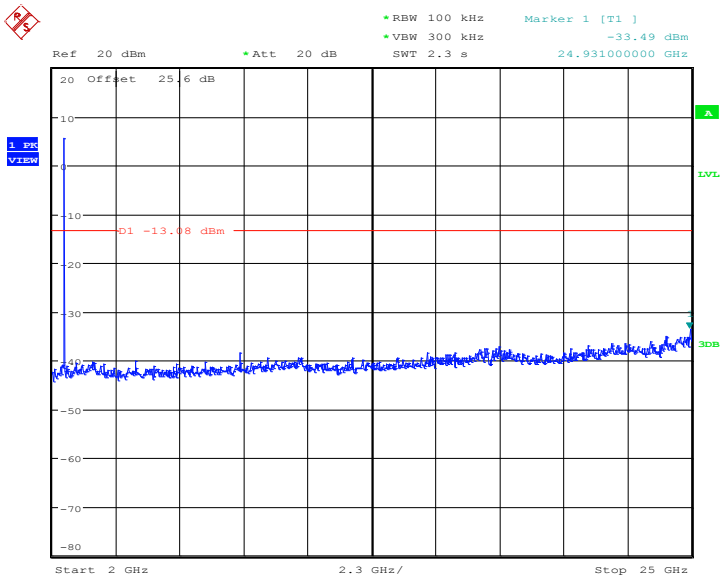
### Conducted Spurious Emission Plot on Channel 06




Date: 28.JAN.2013 16:30:55

### 802.11b 2 GHz~25 GHz

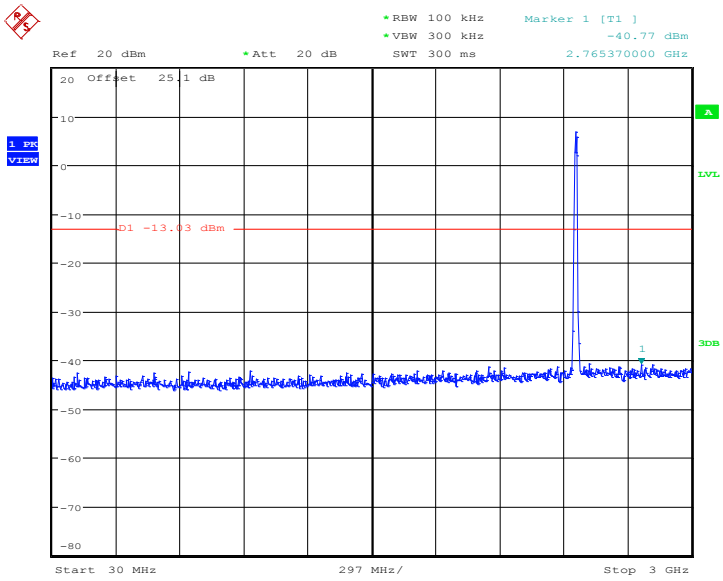
### Conducted Spurious Emission Plot on Channel 06




Date: 28.JAN.2013 16:31:13

### 802.11b 30 MHz~3 GHz

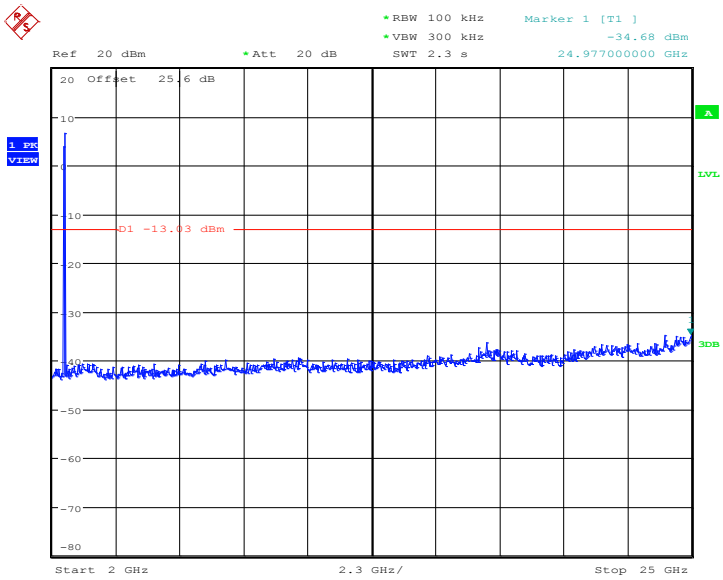
### Conducted Spurious Emission Plot on Channel 11




Date: 28.JAN.2013 16:36:29

### 802.11b 2 GHz~25 GHz

### Conducted Spurious Emission Plot on Channel 11

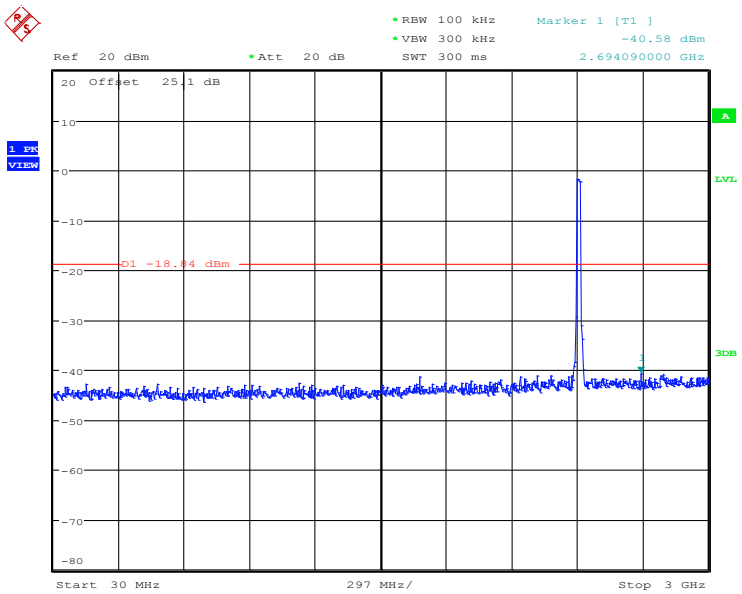



Date: 28.JAN.2013 16:36:47

| Test Mode : | 802.11g | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Band : | 30MHz-3GHz and 2G-25GHz | Relative Humidity : | 50~53% |
| Test Channel : | 01, 06, 11 | Test Engineer : | Rover Lee |

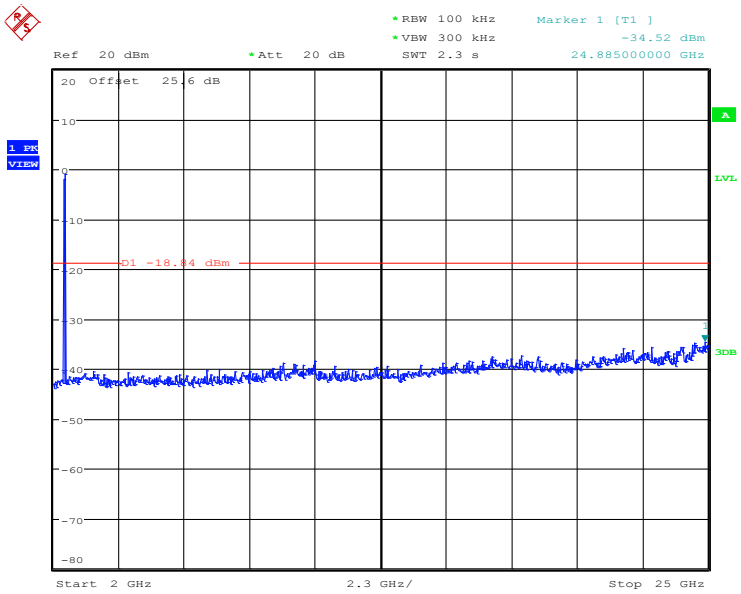
**802.11g 30 MHz~3 GHz**

**Conducted Spurious Emission Plot on Channel 01**



### 802.11g 2 GHz~25 GHz

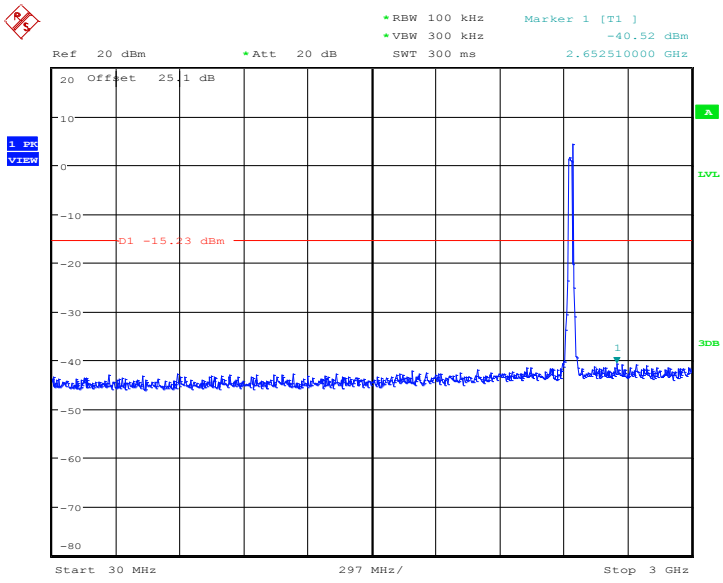
### Conducted Spurious Emission Plot on Channel 01




Date: 28.JAN.2013 16:43:49

### 802.11g 30 MHz~3 GHz

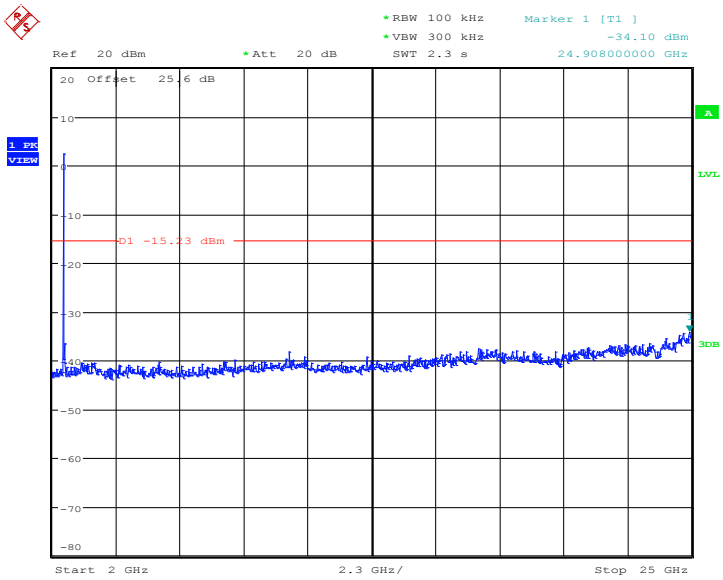
### Conducted Spurious Emission Plot on Channel 06




Date: 28.JAN.2013 16:52:52

### 802.11g 2 GHz~25 GHz

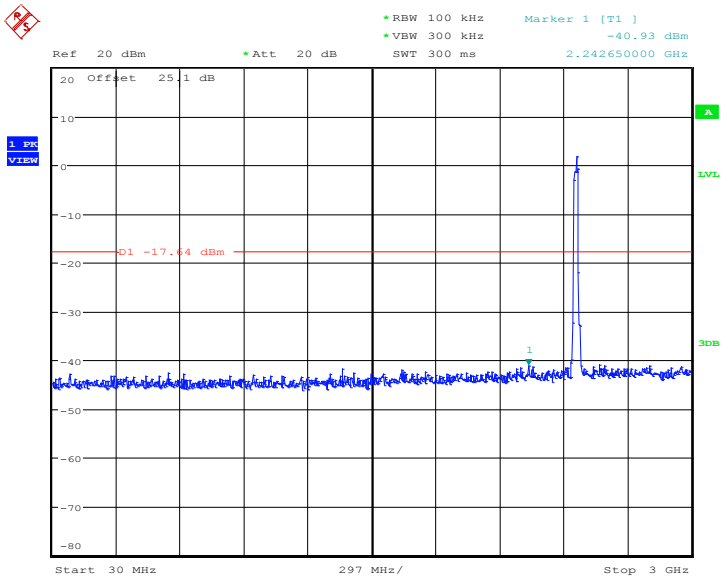
### Conducted Spurious Emission Plot on Channel 06




Date: 28.JAN.2013 16:53:10

### 802.11g 30 MHz~3 GHz

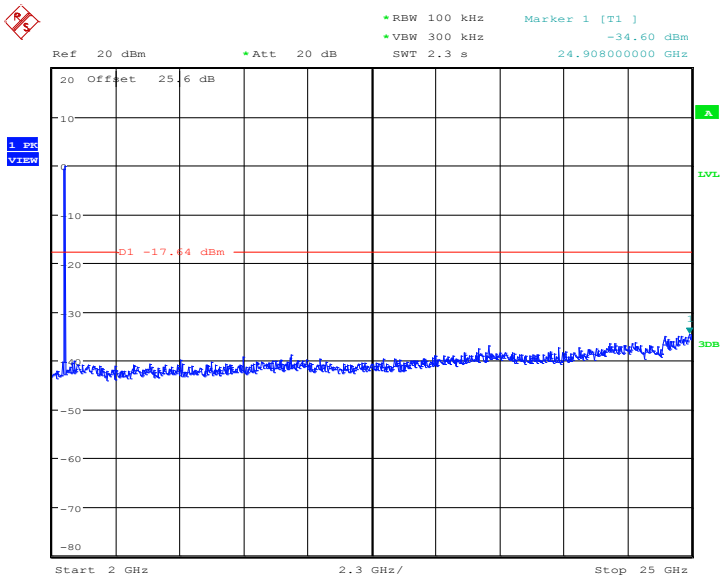
### Conducted Spurious Emission Plot on Channel 11




Date: 28.JAN.2013 16:56:46

### 802.11g 2 GHz~25 GHz

### Conducted Spurious Emission Plot on Channel 11

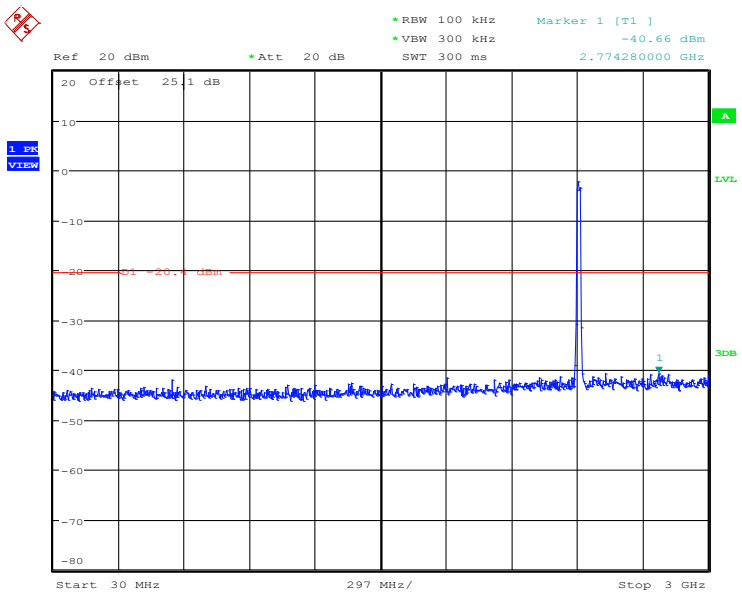



Date: 28.JAN.2013 16:57:04

| Test Mode : | 802.11n HT20 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Band : | 30MHz-3GHz and 2G-25GHz | Relative Humidity : | 50~53% |
| Test Channel : | 01, 06, 11 | Test Engineer : | Rover Lee |

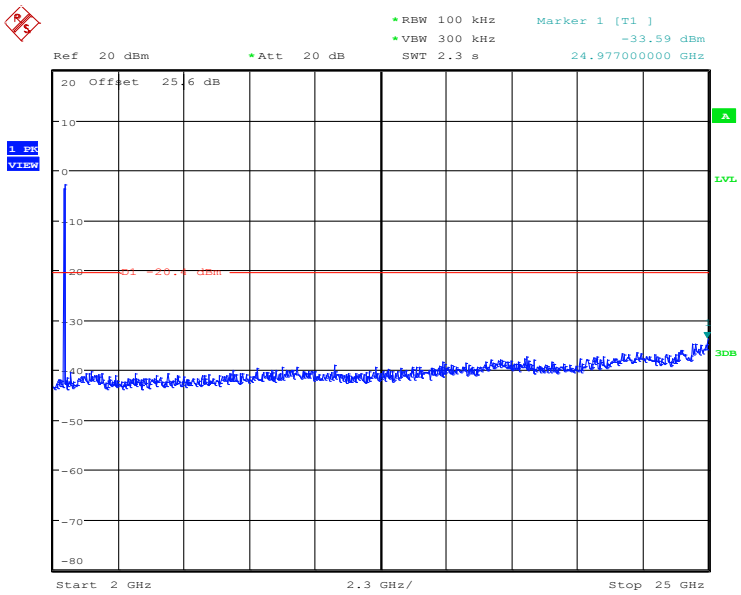
**802.11n HT20 30 MHz~3 GHz**

**Conducted Spurious Emission Plot on Channel 01**



### 802.11n HT20 2 GHz~25 GHz

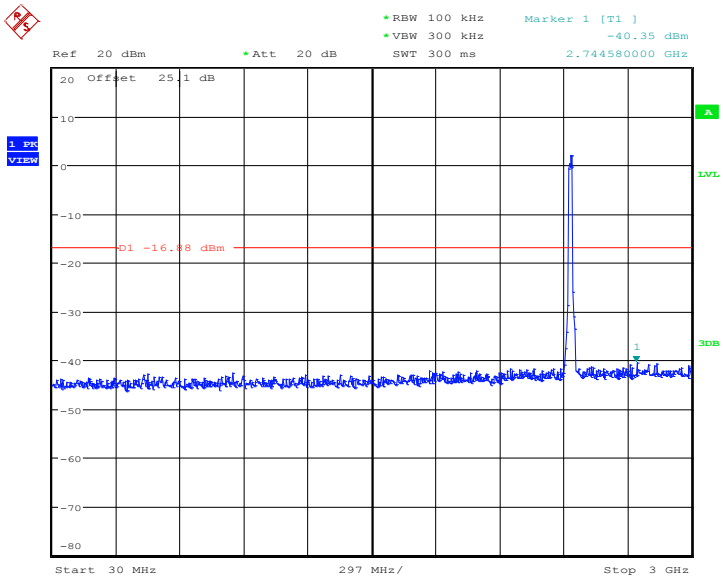
### Conducted Spurious Emission Plot on Channel 01




Date: 28.JAN.2013 17:03:13

### 802.11n HT20 30 MHz~3 GHz

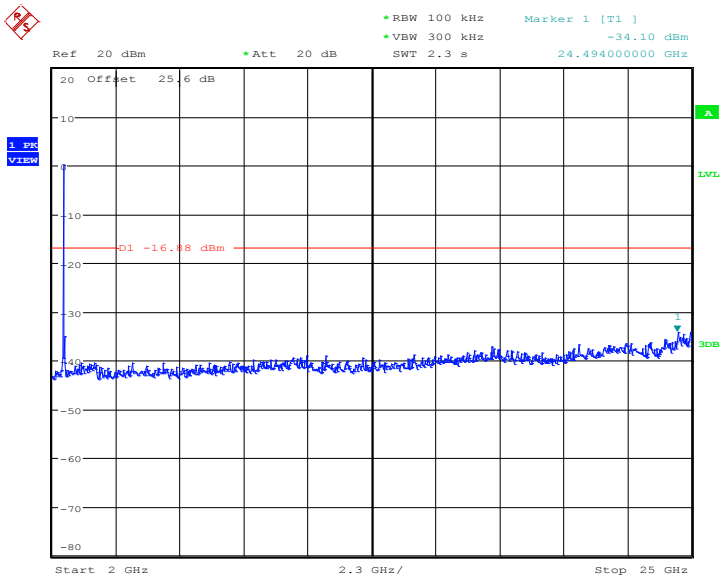
### Conducted Spurious Emission Plot on Channel 06




Date: 28.JAN.2013 17:07:27

### 802.11n HT20 2 GHz~25 GHz

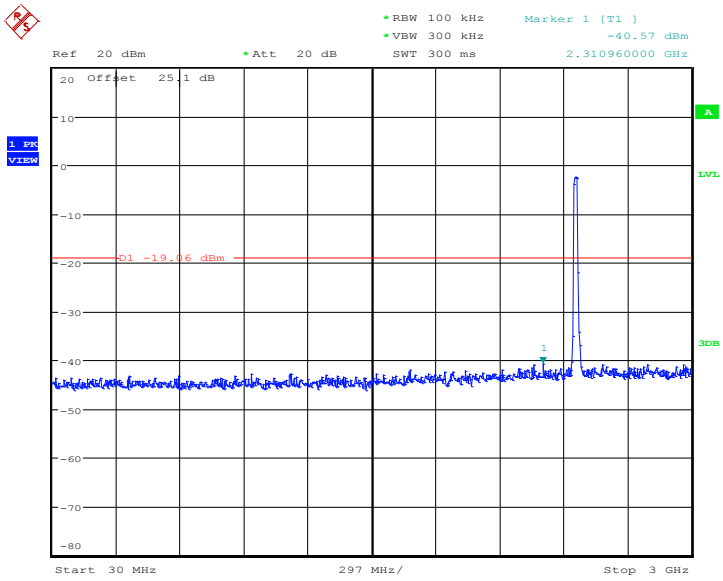
### Conducted Spurious Emission Plot on Channel 06




Date: 28.JAN.2013 17:07:45

### 802.11n HT20 30 MHz~3 GHz

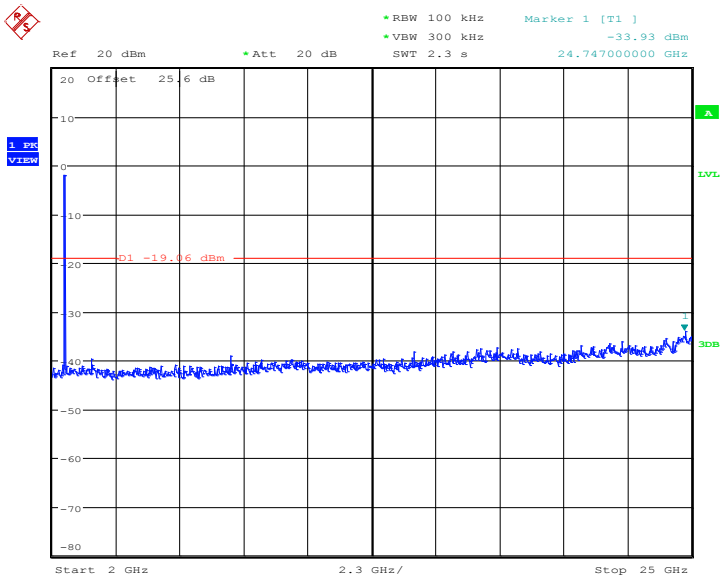
### Conducted Spurious Emission Plot on Channel 11




Date: 28.JAN.2013 17:12:26

## 802.11n HT20 2 GHz~25 GHz

## Conducted Spurious Emission Plot on Channel 11

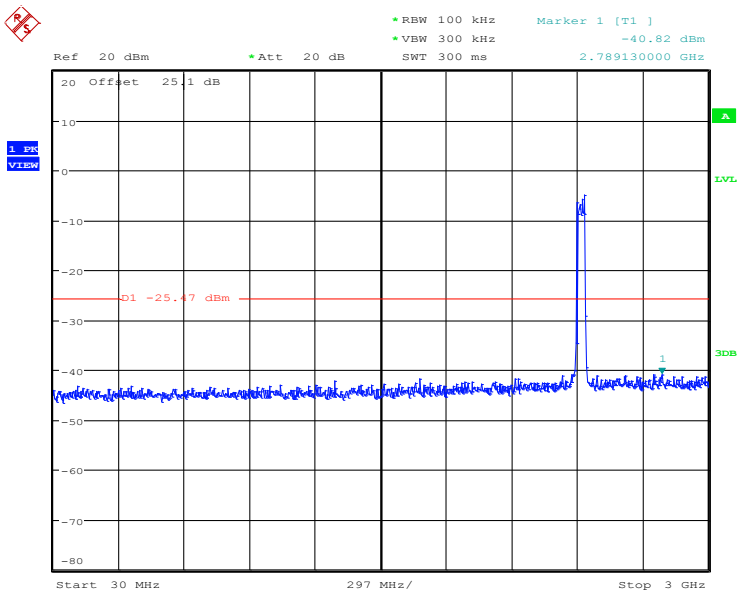



Date: 28.JAN.2013 17:12:44

| Test Mode : | 802.11n HT40 | Temperature : | 24~26℃ |
|---|---|---|---|
| Test Band : | 30MHz-3GHz and 2G-25GHz | Relative Humidity : | 50~53% |
| Test Channel : | 03, 06, 09 | Test Engineer : | Rover Lee |

**802.11n HT40 30 MHz~3 GHz**

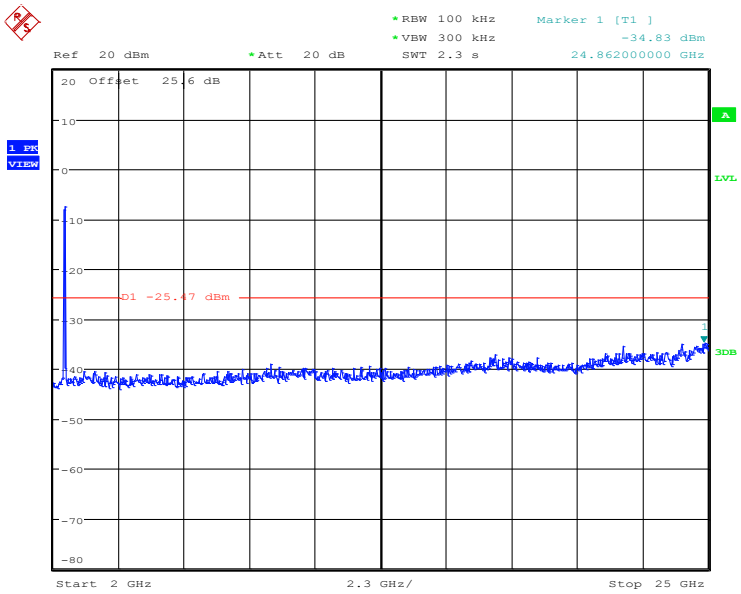
**Conducted Spurious Emission Plot on Channel 03**




Date: 29.JAN.2013 07:57:40

### 802.11n HT40 2 GHz~25 GHz

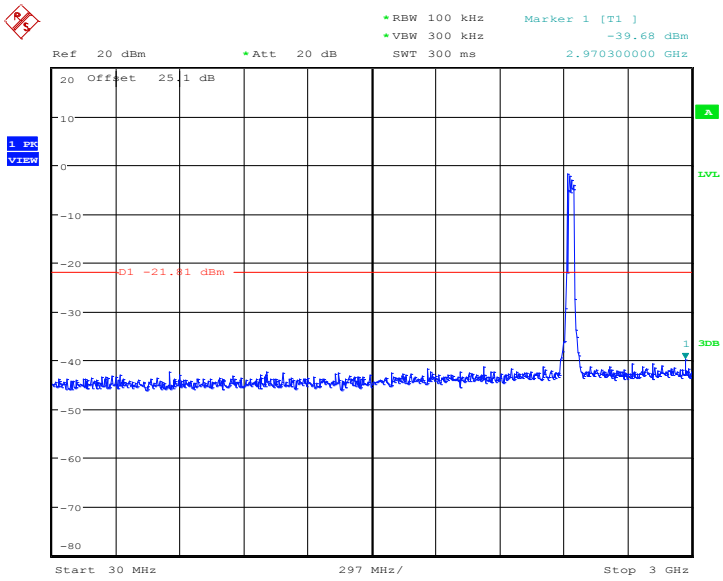
### Conducted Spurious Emission Plot on Channel 03




Date: 29.JAN.2013 07:57:57

### 802.11n HT40 30 MHz~3 GHz

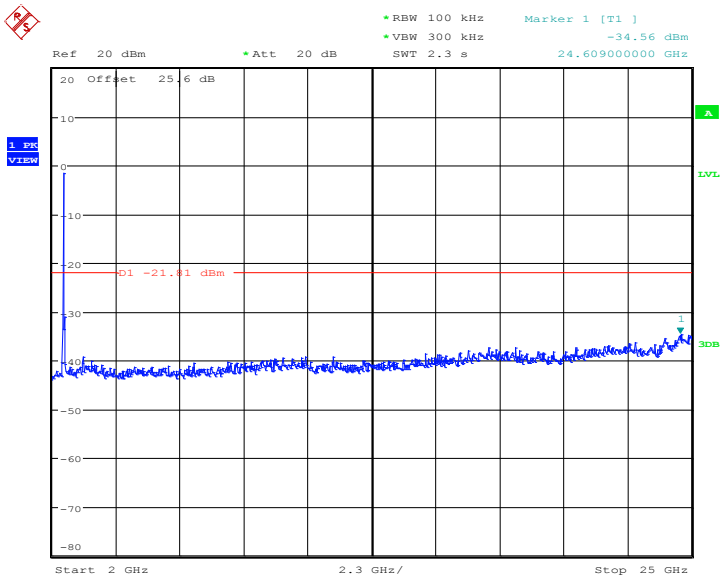
### Conducted Spurious Emission Plot on Channel 06




Date: 29.JAN.2013 07:59:09

### 802.11n HT40 2 GHz~25 GHz

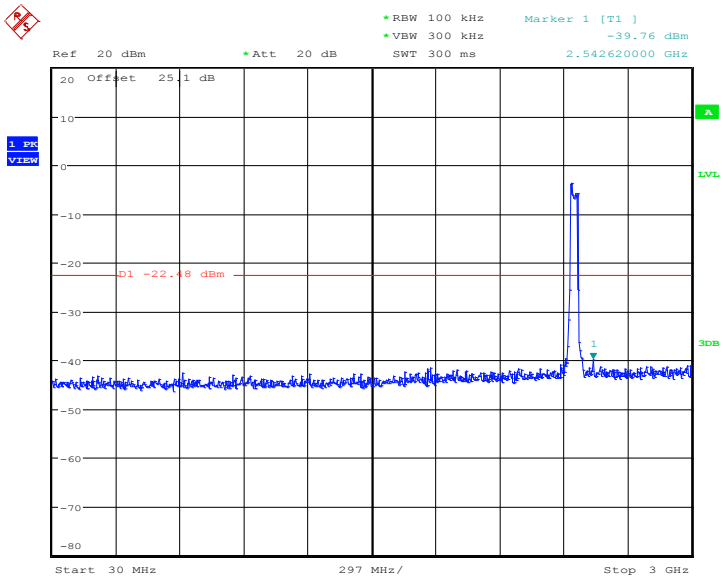
### Conducted Spurious Emission Plot on Channel 06




Date: 29.JAN.2013 07:59:27

### 802.11n HT40 30 MHz~3 GHz

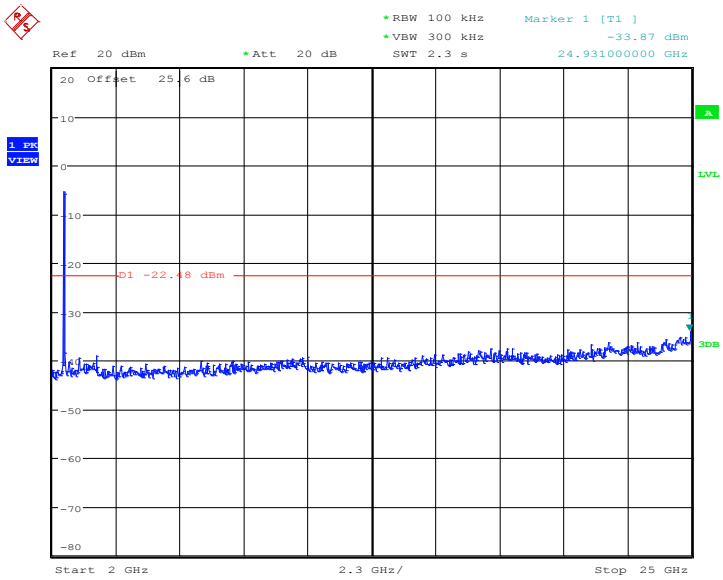
### Conducted Spurious Emission Plot on Channel 09




Date: 28.JAN.2013 17:57:37

### 802.11n HT40 2 GHz~25 GHz

### Conducted Spurious Emission Plot on Channel 09



## 3.5 Radiated Band Edges and Spurious Emission Measurement

### 3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 KHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

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

### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.5.3 Test Procedure

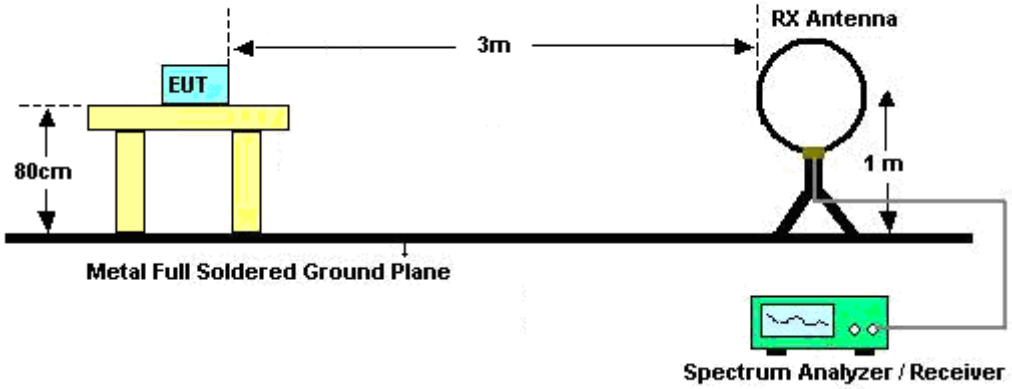
1. The testing follows the guidelines in ANSI C63.10-2009.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, 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.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 KHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

| Band | Duty Cycle(%) | T(μs) | 1/T(KHz) | VBW Setting |
|---|---|---|---|---|
| 802.11b | 100 | - | - | 10Hz |
| 802.11g | 98.02 | - | - | |
| 2.4G 802.11n HT20 | 98.92 | - | - | |
| 2.4G 802.11n HT40 | 99.08 | - | - | |

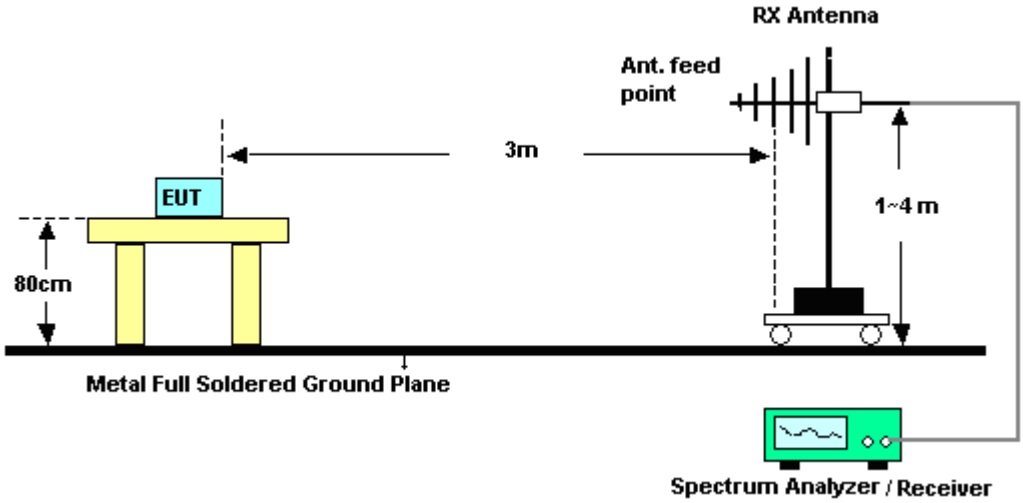
**Note:** For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

### 3.5.4 Test Setup

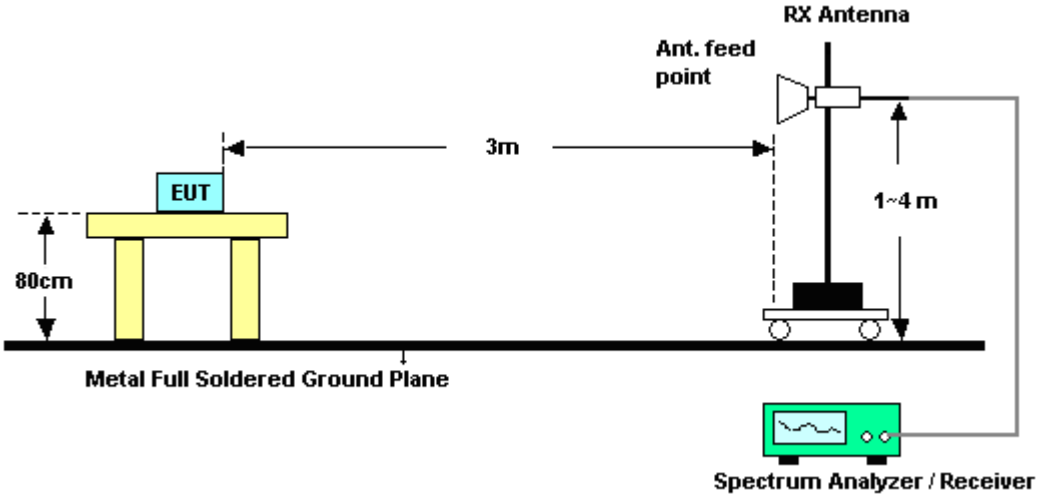
**For radiated emissions below 30MHz**




**For radiated emissions from 30MHz to 1GHz**



**For radiated emissions above 1GHz**




## 3.5.5 Test Results of Radiated Emissions (9KHz ~ 30MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

### 3.5.6 Test Result of Radiated Spurious at Band Edges

**<Ant. 1>**

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11b | **Temperature :** | 21~23°C |
| **Test Band :** | Low | **Relative Humidity :** | 53~55% |
| **Test Channel :** | 01 | **Test Engineer :** | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2386.32 | 55.3 | -18.7 | 74 | 51.05 | 32.36 | 6.45 | 34.56 | 100 | 85 | Peak |
| 2386.23 | 49.17 | -4.83 | 54 | 44.92 | 32.36 | 6.45 | 34.56 | 100 | 85 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2386.77 | 54.28 | -19.72 | 74 | 50.03 | 32.36 | 6.45 | 34.56 | 106 | 314 | Peak |
| 2387.13 | 47.59 | -6.41 | 54 | 43.34 | 32.36 | 6.45 | 34.56 | 106 | 314 | Average |

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11b | **Temperature :** | 21~23°C |
| **Test Band :** | High | **Relative Humidity :** | 53~55% |
| **Test Channel :** | 11 | **Test Engineer :** | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2488.06 | 56.15 | -17.85 | 74 | 51.61 | 32.5 | 6.59 | 34.55 | 100 | 50 | Peak |
| 2487.73 | 49.09 | -4.91 | 54 | 44.55 | 32.5 | 6.59 | 34.55 | 100 | 50 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Frequency ( MHz )** | **Level ( dBµV/m )** | **Over Limit ( dB )** | **Limit Line ( dBµV/m )** | **Read Level (dBµV)** | **Antenna Factor ( dB )** | **Cable Loss ( dB )** | **Preamp Factor ( dB )** | **Ant Pos ( cm )** | **Table Pos ( deg )** | **Remark** |
| 2488.27 | 54.7 | -19.3 | 74 | 50.16 | 32.5 | 6.59 | 34.55 | 185 | 312 | Peak |
| 2487.73 | 47.38 | -6.62 | 54 | 42.84 | 32.5 | 6.59 | 34.55 | 185 | 312 | Average |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | Low | Relative Humidity : | 53~55% |
| Test Channel : | 01 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2388.84 | 70.23 | -3.77 | 74 | 65.98 | 32.36 | 6.45 | 34.56 | 100 | 81 | Peak |
| 2390 | 52.07 | -1.93 | 54 | 47.82 | 32.36 | 6.45 | 34.56 | 100 | 81 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2385.87 | 66.81 | -7.19 | 74 | 62.56 | 32.36 | 6.45 | 34.56 | 135 | 276 | Peak |
| 2390 | 48.53 | -5.47 | 54 | 44.28 | 32.36 | 6.45 | 34.56 | 135 | 276 | Average |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | High | Relative Humidity : | 53~55% |
| Test Channel : | 11 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2483.5 | 69.21 | -4.79 | 74 | 64.69 | 32.48 | 6.59 | 34.55 | 100 | 47 | Peak |
| 2483.5 | 51.1 | -2.9 | 54 | 46.58 | 32.48 | 6.59 | 34.55 | 100 | 47 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2483.68 | 69.83 | -4.17 | 74 | 65.31 | 32.48 | 6.59 | 34.55 | 108 | 321 | Peak |
| 2483.5 | 50.61 | -3.39 | 54 | 46.09 | 32.48 | 6.59 | 34.55 | 108 | 321 | Average |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | Low | Relative Humidity : | 53~55% |
| Test Channel : | 01 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2389.83 | 71.18 | -2.82 | 74 | 66.93 | 32.36 | 6.45 | 34.56 | 100 | 49 | Peak |
| 2390 | 51.55 | -2.45 | 54 | 47.3 | 32.36 | 6.45 | 34.56 | 100 | 49 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2386.14 | 63.43 | -10.57 | 74 | 59.18 | 32.36 | 6.45 | 34.56 | 100 | 287 | Peak |
| 2390 | 44.45 | -9.55 | 54 | 40.2 | 32.36 | 6.45 | 34.56 | 100 | 287 | Average |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | High | Relative Humidity : | 53~55% |
| Test Channel : | 11 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2483.89 | 72.84 | -1.16 | 74 | 68.32 | 32.48 | 6.59 | 34.55 | 100 | 34 | Peak |
| 2483.5 | 49.78 | -4.22 | 54 | 45.26 | 32.48 | 6.59 | 34.55 | 100 | 34 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2484.13 | 72.59 | -1.41 | 74 | 68.07 | 32.48 | 6.59 | 34.55 | 100 | 320 | Peak |
| 2483.5 | 49.37 | -4.63 | 54 | 44.85 | 32.48 | 6.59 | 34.55 | 100 | 320 | Average |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | Low | Relative Humidity : | 53~55% |
| Test Channel : | 03 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2389.92 | 65.15 | -8.85 | 74 | 60.9 | 32.36 | 6.45 | 34.56 | 100 | 30 | Peak |
| 2390 | 49.03 | -4.97 | 54 | 44.78 | 32.36 | 6.45 | 34.56 | 100 | 30 | Average |
| 2485.18 | 51.97 | -22.03 | 74 | 47.45 | 32.48 | 6.59 | 34.55 | 100 | 30 | Peak |
| 2495.83 | 38.48 | -15.52 | 54 | 33.94 | 32.5 | 6.59 | 34.55 | 100 | 30 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2390 | 64.66 | -9.34 | 74 | 60.41 | 32.36 | 6.45 | 34.56 | 100 | 222 | Peak |
| 2390 | 47.52 | -6.48 | 54 | 43.27 | 32.36 | 6.45 | 34.56 | 100 | 222 | Average |
| 2490.16 | 48.27 | -25.73 | 74 | 43.73 | 32.5 | 6.59 | 34.55 | 100 | 222 | Peak |
| 2489.83 | 33.97 | -20.03 | 54 | 29.43 | 32.5 | 6.59 | 34.55 | 100 | 222 | Average |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | High | Relative Humidity : | 53~55% |
| Test Channel : | 09 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2387.4 | 53.61 | -20.39 | 74 | 49.36 | 32.36 | 6.45 | 34.56 | 100 | 32 | Peak |
| 2381.19 | 38.18 | -15.82 | 54 | 33.96 | 32.33 | 6.45 | 34.56 | 100 | 32 | Average |
| 2483.56 | 69.9 | -4.1 | 74 | 65.38 | 32.48 | 6.59 | 34.55 | 100 | 32 | Peak |
| 2483.5 | 51.11 | -2.89 | 54 | 46.59 | 32.48 | 6.59 | 34.55 | 100 | 32 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2384.88 | 51.86 | -22.14 | 74 | 47.64 | 32.33 | 6.45 | 34.56 | 100 | 236 | Peak |
| 2389.83 | 36.4 | -17.6 | 54 | 32.15 | 32.36 | 6.45 | 34.56 | 100 | 236 | Average |
| 2487.07 | 65.98 | -8.02 | 74 | 61.46 | 32.48 | 6.59 | 34.55 | 100 | 236 | Peak |
| 2483.5 | 45.86 | -8.14 | 54 | 41.34 | 32.48 | 6.59 | 34.55 | 100 | 236 | Average |

**<Ant. 2>**

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11b | **Temperature :** | 21~23°C |
| **Test Band :** | Low | **Relative Humidity :** | 53~55% |
| **Test Channel :** | 01 | **Test Engineer :** | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2386.32 | 52.78 | -21.22 | 74 | 48.53 | 32.36 | 6.45 | 34.56 | 100 | 329 | Peak |
| 2385.78 | 45.14 | -8.86 | 54 | 40.89 | 32.36 | 6.45 | 34.56 | 100 | 329 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2390 | 62.85 | -11.15 | 74 | 58.6 | 32.36 | 6.45 | 34.56 | 100 | 197 | Peak |
| 2385.78 | 50.28 | -3.72 | 54 | 46.03 | 32.36 | 6.45 | 34.56 | 100 | 197 | Average |

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11b | **Temperature :** | 21~23°C |
| **Test Band :** | High | **Relative Humidity :** | 53~55% |
| **Test Channel :** | 11 | **Test Engineer :** | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2487.01 | 56.35 | -17.65 | 74 | 51.83 | 32.48 | 6.59 | 34.55 | 137 | 236 | Peak |
| 2487.73 | 50.16 | -3.84 | 54 | 45.62 | 32.5 | 6.59 | 34.55 | 137 | 236 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2488.12 | 56.81 | -17.19 | 74 | 52.27 | 32.5 | 6.59 | 34.55 | 100 | 187 | Peak |
| 2487.73 | 50.81 | -3.19 | 54 | 46.27 | 32.5 | 6.59 | 34.55 | 100 | 187 | Average |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | Low | Relative Humidity : | 53~55% |
| Test Channel : | 01 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2390 | 60.04 | -13.96 | 74 | 55.79 | 32.36 | 6.45 | 34.56 | 142 | 233 | Peak |
| 2390 | 44.78 | -9.22 | 54 | 40.53 | 32.36 | 6.45 | 34.56 | 142 | 233 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2387.22 | 73.24 | -0.76 | 74 | 68.99 | 32.36 | 6.45 | 34.56 | 100 | 188 | Peak |
| 2390 | 46.47 | -7.53 | 54 | 42.22 | 32.36 | 6.45 | 34.56 | 100 | 188 | Average |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | High | Relative Humidity : | 53~55% |
| Test Channel : | 11 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2483.65 | 66.81 | -7.19 | 74 | 62.29 | 32.48 | 6.59 | 34.55 | 135 | 237 | Peak |
| 2483.5 | 49.99 | -4.01 | 54 | 45.47 | 32.48 | 6.59 | 34.55 | 135 | 237 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2483.5 | 67.63 | -6.37 | 74 | 63.11 | 32.48 | 6.59 | 34.55 | 100 | 190 | Peak |
| 2483.5 | 49.65 | -4.35 | 54 | 45.13 | 32.48 | 6.59 | 34.55 | 100 | 190 | Average |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | Low | Relative Humidity : | 53~55% |
| Test Channel : | 01 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2389.47 | 63.47 | -10.53 | 74 | 59.22 | 32.36 | 6.45 | 34.56 | 140 | 232 | Peak |
| 2390 | 44.41 | -9.59 | 54 | 40.16 | 32.36 | 6.45 | 34.56 | 140 | 232 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2389.74 | 73.66 | -0.34 | 74 | 69.41 | 32.36 | 6.45 | 34.56 | 100 | 186 | Peak |
| 2390 | 46.81 | -7.19 | 54 | 42.56 | 32.36 | 6.45 | 34.56 | 100 | 186 | Average |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | High | Relative Humidity : | 53~55% |
| Test Channel : | 11 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2487.07 | 65.36 | -8.64 | 74 | 60.84 | 32.48 | 6.59 | 34.55 | 100 | 55 | Peak |
| 2483.5 | 43.31 | -10.69 | 54 | 38.79 | 32.48 | 6.59 | 34.55 | 100 | 55 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2483.86 | 68.78 | -5.22 | 74 | 64.26 | 32.48 | 6.59 | 34.55 | 100 | 195 | Peak |
| 2483.5 | 46.59 | -7.41 | 54 | 42.07 | 32.48 | 6.59 | 34.55 | 100 | 195 | Average |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | Low | Relative Humidity : | 53~55% |
| Test Channel : | 03 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2387.49 | 60.66 | -13.34 | 74 | 56.41 | 32.36 | 6.45 | 34.56 | 100 | 312 | Peak |
| 2390 | 48.39 | -5.61 | 54 | 44.14 | 32.36 | 6.45 | 34.56 | 100 | 312 | Average |
| 2497.63 | 47.89 | -26.11 | 74 | 43.35 | 32.5 | 6.59 | 34.55 | 100 | 312 | Peak |
| 2497.51 | 35.66 | -18.34 | 54 | 31.12 | 32.5 | 6.59 | 34.55 | 100 | 312 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2387.22 | 68.54 | -5.46 | 74 | 64.29 | 32.36 | 6.45 | 34.56 | 100 | 192 | Peak |
| 2390 | 53.16 | -0.84 | 54 | 48.91 | 32.36 | 6.45 | 34.56 | 100 | 192 | Average |
| 2485.63 | 51.61 | -22.39 | 74 | 47.09 | 32.48 | 6.59 | 34.55 | 100 | 192 | Peak |
| 2497.21 | 39.46 | -14.54 | 54 | 34.92 | 32.5 | 6.59 | 34.55 | 100 | 192 | Average |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Band : | High | Relative Humidity : | 53~55% |
| Test Channel : | 09 | Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2390 | 56.48 | -17.52 | 74 | 52.23 | 32.36 | 6.45 | 34.56 | 108 | 240 | Peak |
| 2379.03 | 41.52 | -12.48 | 54 | 37.33 | 32.33 | 6.42 | 34.56 | 108 | 240 | Average |
| 2483.92 | 64.54 | -9.46 | 74 | 60.02 | 32.48 | 6.59 | 34.55 | 108 | 240 | Peak |
| 2483.5 | 49.45 | -4.55 | 54 | 44.93 | 32.48 | 6.59 | 34.55 | 108 | 240 | Average |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
| 2385.87 | 58.25 | -15.75 | 74 | 54 | 32.36 | 6.45 | 34.56 | 126 | 189 | Peak |
| 2381.37 | 42.6 | -11.4 | 54 | 38.38 | 32.33 | 6.45 | 34.56 | 126 | 189 | Average |
| 2484.79 | 64.17 | -9.83 | 74 | 59.65 | 32.48 | 6.59 | 34.55 | 126 | 189 | Peak |
| 2483.71 | 48.99 | -5.01 | 54 | 44.47 | 32.48 | 6.59 | 34.55 | 126 | 189 | Average |

## 3.5.7 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

**<Ant. 1>**

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11b | **Temperature :** | 21~23°C |
| **Test Channel :** | 01 | **Relative Humidity :** | 53~55% |
| **Test Engineer :** | Hayden Wu, Timberland Lin, and Kai Wang | **Polarization :** | Horizontal |
| **Remark :** | 1. 2412 MHz is fundamental signal which can be ignored.<br>2. 2397.12 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 108.22dBμV/m - 20dB = 88.22 dBμV/m.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2397.12 | 66.16 | -22.06 | 88.22 | 61.91 | 32.36 | 6.45 | 34.56 | 100 | 85 | Peak |
| 2412 | 104.36 | - | - | 100.05 | 32.38 | 6.49 | 34.56 | 100 | 85 | Average |
| 2412 | 108.22 | - | - | 103.91 | 32.38 | 6.49 | 34.56 | 100 | 85 | Peak |

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11b | **Temperature :** | 21~23°C |
| **Test Channel :** | 01 | **Relative Humidity :** | 53~55% |
| **Test Engineer :** | Hayden Wu, Timberland Lin, and Kai Wang | **Polarization :** | Vertical |
| **Remark :** | 1. 2412 MHz is Fundamental signal which can be ignored.<br>2. 2396.94 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2396.94 | 70.08 | -17.13 | 87.21 | 65.83 | 32.36 | 6.45 | 34.56 | 106 | 314 | Peak |
| 2412 | 103.35 | - | - | 99.04 | 32.38 | 6.49 | 34.56 | 106 | 314 | Average |
| 2412 | 107.21 | - | - | 102.9 | 32.38 | 6.49 | 34.56 | 106 | 314 | Peak |

| Test Mode : | 802.11b | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2439 MHz and 2440 MHz are Fundamental signals which can be ignored.<br>2. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 143.94 | 37.14 | -6.36 | 43.5 | 56.42 | 10.63 | 1.36 | 31.27 | - | - | Peak |
| 179.85 | 41.94 | -1.56 | 43.5 | 62.3 | 9.35 | 1.51 | 31.22 | 135 | 296 | Peak |
| 179.85 | 41.89 | -1.61 | 43.5 | 62.25 | 9.35 | 1.51 | 31.22 | 135 | 296 | QP |
| 215.76 | 37.98 | -5.52 | 43.5 | 58.37 | 9.1 | 1.63 | 31.12 | - | - | Peak |
| 323.1 | 38 | -8 | 46 | 53.42 | 13.53 | 1.98 | 30.93 | - | - | Peak |
| 798.4 | 39.63 | -6.37 | 46 | 48.66 | 19.8 | 3.09 | 31.92 | - | - | Peak |
| 896.4 | 42.87 | -3.13 | 46 | 50.54 | 20.56 | 3.24 | 31.47 | - | - | Peak |
| 2439 | 104.49 | - | - | 100.1 | 32.43 | 6.52 | 34.56 | 100 | 92 | Average |
| 2440 | 108.52 | - | - | 104.13 | 32.43 | 6.52 | 34.56 | 100 | 92 | Peak |
| 4875 | 48.23 | -25.77 | 74 | 58.88 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 48.72 | -5.28 | 54 | 57.92 | 36.14 | 10.94 | 56.28 | 103 | 54 | Average |
| 7311 | 54.66 | -19.34 | 74 | 63.86 | 36.14 | 10.94 | 56.28 | 103 | 54 | Peak |

| Test Mode : | 802.11b | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2438 MHz is Fundamental signal which can be ignored.<br>2. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 38.64 | 23.47 | -16.53 | 40 | 40.64 | 13.66 | 0.67 | 31.5 | - | - | Peak |
| 179.85 | 34.43 | -9.07 | 43.5 | 54.79 | 9.35 | 1.51 | 31.22 | - | - | Peak |
| 214.95 | 32.56 | -10.94 | 43.5 | 52.96 | 9.1 | 1.63 | 31.13 | - | - | Peak |
| 499.5 | 32.89 | -13.11 | 46 | 44.74 | 17.69 | 2.46 | 32 | - | - | Peak |
| 798.4 | 30.69 | -15.31 | 46 | 39.72 | 19.8 | 3.09 | 31.92 | - | - | Peak |
| 900.6 | 39.61 | -6.39 | 46 | 47.26 | 20.6 | 3.24 | 31.49 | 100 | 286 | Peak |
| 2438 | 102.95 | - | - | 98.56 | 32.43 | 6.52 | 34.56 | 192 | 312 | Average |
| 2438 | 106.84 | - | - | 102.45 | 32.43 | 6.52 | 34.56 | 192 | 312 | Peak |
| 4875 | 49.01 | -24.99 | 74 | 59.66 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 49.15 | -4.85 | 54 | 58.35 | 36.14 | 10.94 | 56.28 | 100 | 39 | Average |
| 7311 | 55.11 | -18.89 | 74 | 64.31 | 36.14 | 10.94 | 56.28 | 100 | 39 | Peak |

| Test Mode : | 802.11b | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2460 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2460 | 104.96 | - | - | 100.51 | 32.45 | 6.56 | 34.56 | 100 | 50 | Average |
| 2460 | 109.07 | - | - | 104.62 | 32.45 | 6.56 | 34.56 | 100 | 50 | Peak |

| Test Mode : | 802.11b | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2462 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2462 | 103.07 | - | - | 98.62 | 32.45 | 6.56 | 34.56 | 185 | 312 | Average |
| 2462 | 106.96 | - | - | 102.51 | 32.45 | 6.56 | 34.56 | 185 | 312 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 01 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2414 MHz is fundamental signal which can be ignored.<br>2. 2399.19 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399.19 | 82.19 | -6.05 | 88.24 | 77.94 | 32.36 | 6.45 | 34.56 | 100 | 81 | Peak |
| 2414 | 97.08 | - | - | 92.77 | 32.38 | 6.49 | 34.56 | 100 | 81 | Average |
| 2414 | 108.24 | - | - | 103.93 | 32.38 | 6.49 | 34.56 | 100 | 81 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 01 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2414 MHz is fundamental signal which can be ignored.<br>2. 2399.91 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399.91 | 76.85 | -8.51 | 85.36 | 72.6 | 32.36 | 6.45 | 34.56 | 135 | 276 | Peak |
| 2414 | 94.05 | - | - | 89.74 | 32.38 | 6.49 | 34.56 | 135 | 276 | Average |
| 2414 | 105.36 | - | - | 101.05 | 32.38 | 6.49 | 34.56 | 135 | 276 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2440 MHz is fundamental signal which can be ignored.<br>2. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2352 | 39.63 | -14.37 | 54 | 35.5 | 32.31 | 6.38 | 34.56 | 100 | 88 | Average |
| 2352 | 54.42 | -19.58 | 74 | 50.29 | 32.31 | 6.38 | 34.56 | 100 | 88 | Peak |
| 2440 | 99.64 | - | - | 95.25 | 32.43 | 6.52 | 34.56 | 100 | 88 | Average |
| 2440 | 111.29 | - | - | 106.9 | 32.43 | 6.52 | 34.56 | 100 | 88 | Peak |
| 4875 | 47.63 | -26.37 | 74 | 58.28 | 34.85 | 10.18 | 55.68 | 200 | 0 | Peak |
| 7311 | 45.74 | -8.26 | 54 | 54.94 | 36.14 | 10.94 | 56.28 | 103 | 55 | Average |
| 7311 | 57.73 | -16.27 | 74 | 66.93 | 36.14 | 10.94 | 56.28 | 103 | 55 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2439 MHz is fundamental signal which can be ignored.<br>2. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2439 | 99.01 | - | - | 94.62 | 32.43 | 6.52 | 34.56 | 130 | 314 | Average |
| 2439 | 110.79 | - | - | 106.4 | 32.43 | 6.52 | 34.56 | 130 | 314 | Peak |
| 4875 | 47.95 | -26.05 | 74 | 58.6 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 45.56 | -8.44 | 54 | 54.76 | 36.14 | 10.94 | 56.28 | 147 | 61 | Average |
| 7311 | 58.69 | -15.31 | 74 | 67.89 | 36.14 | 10.94 | 56.28 | 147 | 61 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2460 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2380 | 38.5 | -15.5 | 54 | 34.28 | 32.33 | 6.45 | 34.56 | 100 | 47 | Average |
| 2380 | 53.56 | -20.44 | 74 | 49.34 | 32.33 | 6.45 | 34.56 | 100 | 47 | Peak |
| 2460 | 97.81 | - | - | 93.36 | 32.45 | 6.56 | 34.56 | 100 | 47 | Average |
| 2460 | 108.63 | - | - | 104.18 | 32.45 | 6.56 | 34.56 | 100 | 47 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2464 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2380 | 37.81 | -16.19 | 54 | 33.59 | 32.33 | 6.45 | 34.56 | 108 | 321 | Average |
| 2380 | 53.46 | -20.54 | 74 | 49.24 | 32.33 | 6.45 | 34.56 | 108 | 321 | Peak |
| 2464 | 99.07 | - | - | 94.62 | 32.45 | 6.56 | 34.56 | 108 | 321 | Average |
| 2464 | 107.91 | - | - | 103.46 | 32.45 | 6.56 | 34.56 | 108 | 321 | Peak |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 01 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2408 MHz and 2410 MHz are fundamental signals which can be ignored.<br>2. 2399.82 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399.82 | 87.59 | -0.93 | 88.52 | 83.34 | 32.36 | 6.45 | 34.56 | 100 | 49 | Peak |
| 2408 | 108.52 | - | - | 104.21 | 32.38 | 6.49 | 34.56 | 100 | 49 | Peak |
| 2410 | 97.22 | - | - | 92.91 | 32.38 | 6.49 | 34.56 | 100 | 49 | Average |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 01 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2410 MHz is fundamental signal which can be ignored.<br>2. 2399.55 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399.55 | 81.88 | -1.59 | 83.47 | 77.63 | 32.36 | 6.45 | 34.56 | 100 | 287 | Peak |
| 2410 | 92.16 | - | - | 87.85 | 32.38 | 6.49 | 34.56 | 100 | 287 | Average |
| 2410 | 103.47 | - | - | 99.16 | 32.38 | 6.49 | 34.56 | 100 | 287 | Peak |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2439 MHz is fundamental signal which can be ignored.<br>2. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2439 | 99.33 | - | - | 94.94 | 32.43 | 6.52 | 34.56 | 100 | 92 | Average |
| 2439 | 110.5 | - | - | 106.11 | 32.43 | 6.52 | 34.56 | 100 | 92 | Peak |
| 4875 | 48.22 | -25.78 | 74 | 58.87 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 43.25 | -10.75 | 54 | 52.45 | 36.14 | 10.94 | 56.28 | 103 | 56 | Average |
| 7311 | 57.04 | -16.96 | 74 | 66.24 | 36.14 | 10.94 | 56.28 | 103 | 56 | Peak |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2439 MHz is fundamental signal which can be ignored.<br>2. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2439 | 95.52 | - | - | 91.13 | 32.43 | 6.52 | 34.56 | 100 | 280 | Average |
| 2439 | 106.56 | - | - | 102.17 | 32.43 | 6.52 | 34.56 | 100 | 280 | Peak |
| 4875 | 48.08 | -25.92 | 74 | 58.73 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 43.59 | -10.41 | 54 | 52.79 | 36.14 | 10.94 | 56.28 | 143 | 62 | Average |
| 7311 | 57.72 | -16.28 | 74 | 66.92 | 36.14 | 10.94 | 56.28 | 143 | 62 | Peak |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2462 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2462 | 96.53 | - | - | 92.08 | 32.45 | 6.56 | 34.56 | 100 | 34 | Average |
| 2462 | 107.81 | - | - | 103.36 | 32.45 | 6.56 | 34.56 | 100 | 34 | Peak |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2464 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2464 | 95.28 | - | - | 90.83 | 32.45 | 6.56 | 34.56 | 100 | 320 | Average |
| 2464 | 106.56 | - | - | 102.11 | 32.45 | 6.56 | 34.56 | 100 | 320 | Peak |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 03 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2426 MHz is fundamental signal which can be ignored.<br>2. 2399.28 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399.28 | 78.13 | -3.92 | 82.05 | 73.88 | 32.36 | 6.45 | 34.56 | 100 | 30 | Peak |
| 2426 | 90.62 | - | - | 86.29 | 32.4 | 6.49 | 34.56 | 100 | 30 | Average |
| 2426 | 102.05 | - | - | 97.72 | 32.4 | 6.49 | 34.56 | 100 | 30 | Peak |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 03 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2424 MHz is fundamental signal which can be ignored.<br>2. 2399.64 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399.64 | 78.1 | -0.59 | 78.69 | 73.85 | 32.36 | 6.45 | 34.56 | 100 | 222 | Peak |
| 2424 | 86.91 | - | - | 82.58 | 32.4 | 6.49 | 34.56 | 100 | 222 | Average |
| 2424 | 98.69 | - | - | 94.36 | 32.4 | 6.49 | 34.56 | 100 | 222 | Peak |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2435 MHz is fundamental signal which can be ignored.<br>2. 2396.31 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2396.31 | 75.15 | -11.64 | 86.79 | 70.9 | 32.36 | 6.45 | 34.56 | 100 | 46 | Peak |
| 2435 | 96.27 | - | - | 91.91 | 32.4 | 6.52 | 34.56 | 100 | 46 | Average |
| 2435 | 106.79 | - | - | 102.43 | 32.4 | 6.52 | 34.56 | 100 | 46 | Peak |
| 4875 | 47.64 | -26.36 | 74 | 58.29 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 49.54 | -24.46 | 74 | 58.74 | 36.14 | 10.94 | 56.28 | 100 | 0 | Peak |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2439 MHz is fundamental signal which can be ignored.<br>2. 2396.76 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2396.76 | 69.57 | -11.84 | 81.41 | 65.32 | 32.36 | 6.45 | 34.56 | 100 | 239 | Peak |
| 2439 | 90.53 | - | - | 86.14 | 32.43 | 6.52 | 34.56 | 100 | 239 | Average |
| 2439 | 101.41 | - | - | 97.02 | 32.43 | 6.52 | 34.56 | 100 | 239 | Peak |
| 4875 | 47.63 | -26.37 | 74 | 58.28 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 50.01 | -23.99 | 74 | 59.21 | 36.14 | 10.94 | 56.28 | 100 | 0 | Peak |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 09 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2454 MHz is fundamental signal which can be ignored.<br>2. 2391.21 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2391.21 | 54.84 | -29.25 | 84.09 | 50.59 | 32.36 | 6.45 | 34.56 | 100 | 32 | Peak |
| 2454 | 92.69 | - | - | 88.24 | 32.45 | 6.56 | 34.56 | 100 | 32 | Average |
| 2454 | 104.09 | - | - | 99.64 | 32.45 | 6.56 | 34.56 | 100 | 32 | Peak |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 09 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2454 MHz is fundamental signal which can be ignored.<br>2. 2396.94 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2396.94 | 53.73 | -25.8 | 79.53 | 49.48 | 32.36 | 6.45 | 34.56 | 100 | 236 | Peak |
| 2454 | 88.49 | - | - | 84.04 | 32.45 | 6.56 | 34.56 | 100 | 236 | Average |
| 2454 | 99.53 | - | - | 95.08 | 32.45 | 6.56 | 34.56 | 100 | 236 | Peak |

**<Ant. 2>**

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11b | **Temperature :** | 21~23°C |
| **Test Channel :** | 01 | **Relative Humidity :** | 53~55% |
| **Test Engineer :** | Hayden Wu, Timberland Lin, and Kai Wang | **Polarization :** | Horizontal |
| **Remark :** | 1. 2412 MHz is fundamental signal which can be ignored.<br>2. 2397.57 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2397.57 | 71.63 | -17.66 | 89.29 | 67.38 | 32.36 | 6.45 | 34.56 | 100 | 197 | Peak |
| 2412 | 105.24 | - | - | 100.93 | 32.38 | 6.49 | 34.56 | 100 | 197 | Average |
| 2412 | 109.29 | - | - | 104.98 | 32.38 | 6.49 | 34.56 | 100 | 197 | Peak |

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11b | **Temperature :** | 21~23°C |
| **Test Channel :** | 01 | **Relative Humidity :** | 53~55% |
| **Test Engineer :** | Hayden Wu, Timberland Lin, and Kai Wang | **Polarization :** | Vertical |
| **Remark :** | 1. 2410 MHz is Fundamental signal which can be ignored.<br>2. 2397.12 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2397.12 | 63.9 | -19.44 | 83.34 | 59.65 | 32.36 | 6.45 | 34.56 | 100 | 329 | Peak |
| 2410 | 99.18 | - | - | 94.87 | 32.38 | 6.49 | 34.56 | 100 | 329 | Average |
| 2410 | 103.34 | - | - | 99.03 | 32.38 | 6.49 | 34.56 | 100 | 329 | Peak |

| Test Mode : | 802.11b | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2439 MHz is Fundamental signal which can be ignored.<br>2. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 143.94 | 29.84 | -13.66 | 43.5 | 49.33 | 10.83 | 1.38 | 31.7 | - | - | Peak |
| 179.04 | 32.9 | -10.6 | 43.5 | 53.9 | 9.15 | 1.54 | 31.69 | - | - | Peak |
| 216.3 | 33.01 | -12.99 | 46 | 54.05 | 9.02 | 1.6 | 31.66 | - | - | Peak |
| 324.5 | 29.05 | -16.95 | 46 | 45.02 | 13.65 | 1.98 | 31.6 | - | - | Peak |
| 499.5 | 29.4 | -16.6 | 46 | 41.15 | 17.6 | 2.43 | 31.78 | - | - | Peak |
| 898.5 | 36.55 | -9.45 | 46 | 44.17 | 20.7 | 3.29 | 31.61 | 100 | 248 | Peak |
| 2439 | 104.87 | - | - | 100.48 | 32.43 | 6.52 | 34.56 | 100 | 187 | Average |
| 2439 | 109.17 | - | - | 104.78 | 32.43 | 6.52 | 34.56 | 100 | 187 | Peak |
| 4875 | 50.56 | -23.44 | 74 | 61.21 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 53.4 | -0.6 | 54 | 62.6 | 36.14 | 10.94 | 56.28 | 148 | 129 | Average |
| 7311 | 59.56 | -14.44 | 74 | 68.76 | 36.14 | 10.94 | 56.28 | 148 | 129 | Peak |

| Test Mode : | 802.11b | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2436 MHz is Fundamental signal which can be ignored.<br>2. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 143.4 | 40.23 | -3.27 | 43.5 | 59.72 | 10.83 | 1.38 | 31.7 | 126 | 279 | Peak |
| 166.35 | 39.83 | -3.67 | 43.5 | 60.09 | 9.88 | 1.52 | 31.66 | - | - | Peak |
| 179.85 | 40.01 | -3.49 | 43.5 | 61.01 | 9.15 | 1.54 | 31.69 | - | - | Peak |
| 399.4 | 35.18 | -10.82 | 46 | 48.88 | 15.9 | 2.19 | 31.79 | - | - | Peak |
| 798.4 | 34.17 | -11.83 | 46 | 43.06 | 19.98 | 3.11 | 31.98 | - | - | Peak |
| 896.4 | 42.19 | -3.81 | 46 | 49.82 | 20.7 | 3.29 | 31.62 | - | - | Peak |
| 2436 | 99.91 | - | - | 95.55 | 32.4 | 6.52 | 34.56 | 106 | 117 | Average |
| 2436 | 104.13 | - | - | 99.77 | 32.4 | 6.52 | 34.56 | 106 | 117 | Peak |
| 4875 | 48.45 | -25.55 | 74 | 59.1 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 51.76 | -2.24 | 54 | 60.96 | 36.14 | 10.94 | 56.28 | 100 | 98 | Average |
| 7311 | 58 | -16 | 74 | 67.2 | 36.14 | 10.94 | 56.28 | 100 | 98 | Peak |

| Test Mode : | 802.11b | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2460 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2460 | 103.96 | - | - | 99.51 | 32.45 | 6.56 | 34.56 | 137 | 236 | Average |
| 2460 | 108.18 | - | - | 103.73 | 32.45 | 6.56 | 34.56 | 137 | 236 | Peak |

| Test Mode : | 802.11b | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2460 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2460 | 104.73 | - | - | 100.28 | 32.45 | 6.56 | 34.56 | 100 | 187 | Average |
| 2460 | 109.31 | - | - | 104.86 | 32.45 | 6.56 | 34.56 | 100 | 187 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 01 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2410 MHz is fundamental signal which can be ignored.<br>2. 2399 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399 | 79.01 | -7.02 | 86.03 | 74.76 | 32.36 | 6.45 | 34.56 | 100 | 0 | Peak |
| 2410 | 94.9 | - | - | 90.59 | 32.38 | 6.49 | 34.56 | 142 | 233 | Average |
| 2410 | 106.03 | - | - | 101.72 | 32.38 | 6.49 | 34.56 | 142 | 233 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 01 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2410 MHz is fundamental signal which can be ignored.<br>2. 2399 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399 | 85.07 | -3.01 | 88.08 | 80.82 | 32.36 | 6.45 | 34.56 | 100 | 0 | Peak |
| 2410 | 97.11 | - | - | 92.8 | 32.38 | 6.49 | 34.56 | 100 | 188 | Average |
| 2410 | 108.08 | - | - | 103.77 | 32.38 | 6.49 | 34.56 | 100 | 188 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 2439 MHz is fundamental signal which can be ignored. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2356 | 49.65 | -4.35 | 54 | 45.52 | 32.31 | 6.38 | 34.56 | 100 | 350 | Average |
| 2356 | 61.48 | -12.52 | 74 | 57.35 | 32.31 | 6.38 | 34.56 | 100 | 350 | Peak |
| 2439 | 101.14 | - | - | 96.75 | 32.43 | 6.52 | 34.56 | 100 | 193 | Average |
| 2439 | 112.26 | - | - | 107.87 | 32.43 | 6.52 | 34.56 | 100 | 193 | Peak |
| 4875 | 38.65 | -15.35 | 54 | 49.3 | 34.85 | 10.18 | 55.68 | 141 | 294 | Average |
| 4875 | 51.41 | -22.59 | 74 | 62.06 | 34.85 | 10.18 | 55.68 | 141 | 294 | Peak |
| 7311 | 48.39 | -5.61 | 54 | 57.59 | 36.14 | 10.94 | 56.28 | 147 | 127 | Average |
| 7311 | 64.34 | -9.66 | 74 | 73.54 | 36.14 | 10.94 | 56.28 | 147 | 127 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2439 MHz is fundamental signal which can be ignored.<br>2. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2356 | 48.17 | -5.83 | 54 | 44.04 | 32.31 | 6.38 | 34.56 | 145 | 230 | Average |
| 2356 | 57.06 | -16.94 | 74 | 52.93 | 32.31 | 6.38 | 34.56 | 145 | 230 | Peak |
| 2439 | 100.28 | - | - | 95.92 | 32.4 | 6.52 | 34.56 | 138 | 235 | Average |
| 2439 | 111.89 | - | - | 107.53 | 32.4 | 6.52 | 34.56 | 138 | 235 | Peak |
| 4875 | 49.69 | -24.31 | 74 | 60.34 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 47.41 | -6.59 | 54 | 56.61 | 36.14 | 10.94 | 56.28 | 100 | 97 | Average |
| 7311 | 62.58 | -11.42 | 74 | 71.78 | 36.14 | 10.94 | 56.28 | 100 | 97 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2460 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2378 | 42.65 | -11.35 | 54 | 38.46 | 32.33 | 6.42 | 34.56 | 135 | 237 | Average |
| 2378 | 53.12 | -20.88 | 74 | 48.93 | 32.33 | 6.42 | 34.56 | 135 | 237 | Peak |
| 2460 | 96.84 | - | - | 92.39 | 32.45 | 6.56 | 34.56 | 135 | 237 | Average |
| 2460 | 108.07 | - | - | 103.62 | 32.45 | 6.56 | 34.56 | 135 | 237 | Peak |

| Test Mode : | 802.11g | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2460 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2382 | 47.37 | -6.63 | 54 | 43.15 | 32.33 | 6.45 | 34.56 | 100 | 190 | Average |
| 2382 | 59.03 | -14.97 | 74 | 54.81 | 32.33 | 6.45 | 34.56 | 100 | 190 | Peak |
| 2460 | 97.97 | - | - | 93.52 | 32.45 | 6.56 | 34.56 | 100 | 190 | Average |
| 2460 | 109.33 | - | - | 104.88 | 32.45 | 6.56 | 34.56 | 100 | 190 | Peak |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 01 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2410 MHz is fundamental signal which can be ignored.<br>2. 2399 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399 | 80.96 | -2.3 | 83.26 | 76.71 | 32.36 | 6.45 | 34.56 | 100 | 0 | Peak |
| 2410 | 92.75 | - | - | 88.44 | 32.38 | 6.49 | 34.56 | 140 | 232 | Average |
| 2410 | 103.26 | - | - | 98.95 | 32.38 | 6.49 | 34.56 | 140 | 232 | Peak |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 01 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2414 MHz is fundamental signal which can be ignored.<br>2. 2399 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399 | 86.42 | -1.44 | 87.86 | 82.17 | 32.36 | 6.45 | 34.56 | 100 | 0 | Peak |
| 2414 | 97 | - | - | 92.69 | 32.38 | 6.49 | 34.56 | 100 | 186 | Average |
| 2414 | 107.86 | - | - | 103.55 | 32.38 | 6.49 | 34.56 | 100 | 186 | Peak |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2436 MHz is fundamental signal which can be ignored.<br>2. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2358 | 46.21 | -7.79 | 54 | 42.04 | 32.31 | 6.42 | 34.56 | 138 | 238 | Average |
| 2358 | 58.17 | -15.83 | 74 | 54 | 32.31 | 6.42 | 34.56 | 138 | 238 | Peak |
| 2436 | 99.48 | - | - | 95.12 | 32.4 | 6.52 | 34.56 | 140 | 234 | Average |
| 2436 | 110.44 | - | - | 106.08 | 32.4 | 6.52 | 34.56 | 140 | 234 | Peak |
| 4875 | 48.04 | -25.96 | 74 | 58.69 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 44.98 | -9.02 | 54 | 54.18 | 36.14 | 10.94 | 56.28 | 105 | 277 | Average |
| 7311 | 61.7 | -12.3 | 74 | 70.9 | 36.14 | 10.94 | 56.28 | 105 | 277 | Peak |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2439 MHz is fundamental signal which can be ignored.<br>2. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2354 | 49.36 | -4.64 | 54 | 45.23 | 32.31 | 6.38 | 34.56 | 100 | 342 | Average |
| 2354 | 60.31 | -13.69 | 74 | 56.18 | 32.31 | 6.38 | 34.56 | 100 | 342 | Peak |
| 2439 | 100.75 | - | - | 96.36 | 32.43 | 6.52 | 34.56 | 100 | 191 | Average |
| 2439 | 111.55 | - | - | 107.16 | 32.43 | 6.52 | 34.56 | 100 | 191 | Peak |
| 4875 | 50.05 | -23.95 | 74 | 60.7 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 45.41 | -8.59 | 54 | 54.61 | 36.14 | 10.94 | 56.28 | 148 | 127 | Average |
| 7311 | 62.39 | -11.61 | 74 | 71.56 | 36.13 | 10.94 | 56.24 | 148 | 127 | Peak |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2464 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2464 | 92.42 | - | - | 87.97 | 32.45 | 6.56 | 34.56 | 100 | 55 | Average |
| 2464 | 103.29 | - | - | 98.84 | 32.45 | 6.56 | 34.56 | 100 | 55 | Peak |

| Test Mode : | 802.11n HT20 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 11 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2464 MHz is fundamental signal which can be ignored.<br>2. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2370 | 44.49 | -9.51 | 54 | 40.3 | 32.33 | 6.42 | 34.56 | 100 | 323 | Average |
| 2370 | 57.16 | -16.84 | 74 | 52.97 | 32.33 | 6.42 | 34.56 | 100 | 323 | Peak |
| 2464 | 95.4 | - | - | 90.95 | 32.45 | 6.56 | 34.56 | 100 | 195 | Average |
| 2464 | 106.57 | - | - | 102.12 | 32.45 | 6.56 | 34.56 | 100 | 195 | Peak |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 03 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2420 MHz is fundamental signal which can be ignored.<br>2. 2399.91 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399.91 | 75.36 | -2.31 | 77.67 | 71.11 | 32.36 | 6.45 | 34.56 | 100 | 312 | Peak |
| 2420 | 86.78 | - | - | 82.45 | 32.4 | 6.49 | 34.56 | 100 | 312 | Average |
| 2420 | 97.67 | - | - | 93.34 | 32.4 | 6.49 | 34.56 | 100 | 312 | Peak |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 03 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2420 MHz is fundamental signal which can be ignored.<br>2. 2399.91 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399.91 | 83.4 | -2.45 | 85.85 | 79.15 | 32.36 | 6.45 | 34.56 | 100 | 192 | Peak |
| 2420 | 93.58 | - | - | 89.25 | 32.4 | 6.49 | 34.56 | 100 | 192 | Average |
| 2420 | 105.85 | - | - | 101.52 | 32.4 | 6.49 | 34.56 | 100 | 192 | Peak |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 06 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2436 MHz is fundamental signal which can be ignored.<br>2. 2399.91 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399.91 | 73.04 | -13.03 | 86.07 | 68.79 | 32.36 | 6.45 | 34.56 | 140 | 238 | Peak |
| 2436 | 94.11 | - | - | 89.75 | 32.4 | 6.52 | 34.56 | 140 | 238 | Average |
| 2436 | 106.07 | - | - | 101.71 | 32.4 | 6.52 | 34.56 | 140 | 238 | Peak |
| 4875 | 47.32 | -26.68 | 74 | 57.97 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 38.91 | -15.09 | 54 | 48.11 | 36.14 | 10.94 | 56.28 | 100 | 97 | Average |
| 7311 | 54.01 | -19.99 | 74 | 63.18 | 36.13 | 10.94 | 56.24 | 100 | 97 | Peak |

| | | | |
|---|---|---|---|
| **Test Mode :** | 802.11n HT40 | **Temperature :** | 21~23°C |
| **Test Channel :** | 06 | **Relative Humidity :** | 53~55% |
| **Test Engineer :** | Hayden Wu, Timberland Lin, and Kai Wang | **Polarization :** | Vertical |
| **Remark :** | 1. 2435 MHz is fundamental signal which can be ignored.<br>2. 2397.84 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Average measurement was not performed if peak level went lower than the average limit. | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2397.84 | 76.91 | -9.99 | 86.9 | 72.66 | 32.36 | 6.45 | 34.56 | 100 | 186 | Peak |
| 2435 | 94.69 | - | - | 90.33 | 32.4 | 6.52 | 34.56 | 100 | 186 | Average |
| 2435 | 106.9 | - | - | 102.54 | 32.4 | 6.52 | 34.56 | 100 | 186 | Peak |
| 4875 | 47.06 | -26.94 | 74 | 57.71 | 34.85 | 10.18 | 55.68 | 100 | 0 | Peak |
| 7311 | 40.26 | -13.74 | 54 | 49.46 | 36.14 | 10.94 | 56.28 | 138 | 128 | Average |
| 7311 | 54.12 | -19.88 | 74 | 63.32 | 36.14 | 10.94 | 56.28 | 138 | 128 | Peak |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 09 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Horizontal |
| Remark : | 1. 2450 MHz is fundamental signal which can be ignored.<br>2. 2399.54 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2399.54 | 61.24 | -21.55 | 82.79 | 56.99 | 32.36 | 6.45 | 34.56 | 108 | 240 | Peak |
| 2450 | 91.59 | - | - | 87.2 | 32.43 | 6.52 | 34.56 | 108 | 240 | Average |
| 2450 | 102.79 | - | - | 98.4 | 32.43 | 6.52 | 34.56 | 108 | 240 | Peak |

| Test Mode : | 802.11n HT40 | Temperature : | 21~23°C |
|---|---|---|---|
| Test Channel : | 09 | Relative Humidity : | 53~55% |
| Test Engineer : | Hayden Wu, Timberland Lin, and Kai Wang | Polarization : | Vertical |
| Remark : | 1. 2450 MHz is fundamental signal which can be ignored.<br>2. 2398.47 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.<br>3. Test result of emissions which are 20 dB lower than the limit is not reported per15.31 | | |

| Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| 2398.47 | 59.56 | -26.01 | 85.57 | 55.31 | 32.36 | 6.45 | 34.56 | 126 | 189 | Peak |
| 2450 | 94.2 | - | - | 89.81 | 32.43 | 6.52 | 34.56 | 126 | 189 | Average |
| 2450 | 105.57 | - | - | 101.18 | 32.43 | 6.52 | 34.56 | 126 | 189 | Peak |

## 3.6 Antenna Requirements

### 3.6.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the Antenna exceeds 6 dBi. The use of a permanently attached Antenna or of an Antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

### 3.6.2 Antenna Connected Construction

The antennas type used in this product are Antenna 1 : PIFA Antenna with IPEX connector and Antenna 2 : Dipole Antenna with Reverse-SMA type RF connector. And it is considered to meet antenna requirement.

### 3.6.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

# 4 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Spectrum Analyzer | R&S | FSP40 | 100055 | 9kHz~40GHz | Jun. 06, 2012 | Jan. 21, 2013 ~ Jan. 29, 2013 | Jun. 05, 2013 | Conducted (TH02-HY) |
| Power Meter | Anritsu | ML2495A | 1036004 | 300MHz~40GHz | Sep. 08, 2012 | Jan. 21, 2013 ~ Jan. 29, 2013 | Sep. 07, 2013 | Conducted (TH02-HY) |
| Power Sensor | Anritsu | MA2411B | 1027253 | 300MHz~40GHz | Sep. 08, 2012 | Jan. 21, 2013 ~ Jan. 29, 2013 | Sep. 07, 2013 | Conducted (TH02-HY) |
| Spectrum Analyzer | R&S | FSP30 | 101352 | 9KHz~30GHz | Nov. 07, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | Nov. 06, 2013 | Radiation (03CH06-HY) |
| Spectrum Analyzer | Agilent | E4408B | MY44211030 | 9KHz ~ 26.5GHz | Nov. 26, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | Nov. 25, 2013 | Radiation (03CH06-HY) |
| EMI Test Receiver | R&S | ESVS10 | 834468/0003 | 20MHz ~ 1000MHz | May 04, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | May 03, 2013 | Radiation (03CH06-HY) |
| Bilog Antenna | SCHAFFNER | CBL6112B | 2885 | 30MHz ~ 2GHz | Oct. 06, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | Oct. 05, 2013 | Radiation (03CH06-HY) |
| Double Ridge Horn Antenna | EMCO | 3117 | 00066583 | 1GHz ~ 18GHz | Aug. 01, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | Jul. 31, 2013 | Radiation (03CH06-HY) |
| Double Ridge Horn Antenna | COM-POWER | AH-118 | 071025 | 1GHz~18GHz | Aug. 09, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | Aug. 08, 2013 | Radiation (03CH06-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170251 | 15GHz ~ 40GHz | Sep. 28, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | Sep. 27, 2013 | Radiation (03CH06-HY) |
| Preamplifier | Agilent | 8449B | 3008A01917 | 1GHz ~ 26.5GHz | Apr. 13, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | Apr. 12, 2013 | Radiation (03CH06-HY) |
| Amplifier | Agilent | 310N | 186713 | 9KHz ~ 1GHz | Apr. 11, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | Apr. 10, 2013 | Radiation (03CH06-HY) |
| Pre Amplifier | EMCI | EMC051845 | SN980048 | 1GHz ~ 18GHz | Jul. 21, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | Jul. 20, 2013 | Radiation (03CH06-HY) |
| Pre Amplifier | MITEQ | AMF-7D-00101800-30-10P | 159087 | 1GHz~18GHz | Feb. 27, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | Feb. 26, 2013 | Radiation (03CH06-HY) |
| Loop Antenna | R&S | HFH2-Z2 | 860004/001 | 9KHz ~ 30MHz | Jul. 03, 2012 | Jan. 21, 2013 ~ Jan. 25, 2013 | Jul. 02, 2013 | Radiation (03CH06-HY) |

# 5 Uncertainty of Evaluation

**Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **2.54** |

**Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **4.72** |

# Appendix A. Photographs of EUT

Please refer to Sporton report number EP240322-08 as below.