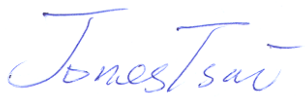
# FCC RF Test Report

| | | |
|---|---|---|
| APPLICANT | : | Ubiquiti Networks, Inc. |
| EQUIPMENT | : | NanoBeam® ac |
| BRAND NAME | : | UBIQUITI |
| MODEL NAME | : | NBE-2AC-13 |
| FCC ID | : | SWX-NBE2AC13 |
| STANDARD | : | FCC Part 15 Subpart C §15.247 |
| CLASSIFICATION | : | (DTS) Digital Transmission System |

**The product was received on Dec. 30, 2015 and testing was completed on Jan. 21, 2016. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in 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: Joseph Lin / Supervisor**



**Approved by: Jones Tsai / Manager**

***SPORTON INTERNATIONAL INC.***

***No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.***

# TABLE OF CONTENTS

# REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| FR5D3042 | Rev. 01 | Initial issue of report | Feb. 01, 2016 |
| FR5D3042 | Rev. 02 | Adding PTP and PTMP description in section 1.4. | Feb. 04, 2016 |
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# SUMMARY OF TEST RESULT

| Report Section | FCC Rule | Description | Limit | Result | Remark |
|---|---|---|---|---|---|
| 3.1 | 15.247(a)(2) | 6dB Bandwidth | ≥ 0.5MHz | Pass | - |
| 3.1 | - | 99% Bandwidth | - | Pass | - |
| 3.2 | 15.247(b)<br>15.247(c )(1)(i ) | Power Output Measurement | ≤ 30dBm | Pass | - |
| 3.3 | 15.247(e) | Power Spectral Density | ≤ 8dBm/3kHz | Pass | - |
| 3.4 | 15.247(d) | Conducted Band Edges | ≤ 20dBc | Pass | - |
| | | Conducted Spurious Emission | | Pass | - |
| 3.5 | 15.247(d) | Radiated Band Edges and Radiated Spurious Emission | 15.209(a) & 15.247(d) | Pass | Under limit 0.07 dB at 2389.200 MHz |
| 3.6 | 15.207 | AC Conducted Emission | 15.207(a) | Pass | Under limit 26.40 dB at 0.526 MHz |
| 3.7 | 15.203 & 15.247(b) | Antenna Requirement | N/A | Pass | - |

# 1 General Description

## 1.1 Applicant

**Ubiquiti Networks, Inc.**
12F, No.105, Song Ren Rd.,SinYi District, Taipei 110,Taiwan

## 1.2 Manufacturer

**Ubiquiti Networks, Inc.**
12F, No.105, Song Ren Rd.,SinYi District, Taipei 110,Taiwan

## 1.3 Product Feature of Equipment Under Test

| Product Feature | |
|---|---|
| **Equipment** | NanoBeam® ac |
| **Brand Name** | UBIQUITI |
| **Model Name** | NBE-2AC-13 |
| **FCC ID** | SWX-NBE2AC13 |
| **EUT supports Radios application** | WLAN 11ac VHT20 (10MHz)<br>WLAN 11ac VHT20<br>WLAN 11ac VHT40 |
| **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

<table>
<tr><th colspan="2">Standards-related Product Specification</th></tr>
<tr><td>Tx/Rx Channel Frequency Range</td><td>802.11ac : 2412 MHz ~ 2462 MHz</td></tr>
<tr><td>Maximum Output Power to antenna</td><td>MIMO<Ant. 1 + 2><br><PTP><br>802.11ac VHT20(10M) : 27.79 dBm (0.6012 W)<br>802.11ac VHT20 : 27.71 dBm (0.5902 W)<br>802.11ac VHT40 : 21.44 dBm (0.1393 W)<br><PTMP><br>802.11ac VHT20(10M) : 22.59 dBm (0.1816 W)<br>802.11ac VHT20 : 22.86 dBm (0.1932 W)<br>802.11ac VHT40 : 21.44 dBm (0.1393 W)</td></tr>
<tr><td>99% Occupied Bandwidth</td><td><PTP><br>802.11ac VHT20(10M) : 10.38MHz<br>802.11ac VHT20 : 18.70MHz<br>802.11ac VHT40 : 37.00MHz<br><PTMP><br>802.11ac VHT20(10M) : 10.35MHz<br>802.11ac VHT20 : 18.70MHz<br>802.11ac VHT40 : 37.00MHz</td></tr>
<tr><td>Antenna Type</td><td><Ant. Port 1><br>802.11ac : Dish Antenna type with gain 13.00 dBi<br><Ant. Port 2><br>802.11ac : Dish Antenna type with gain 13.00 dBi</td></tr>
<tr><td>Type of Modulation</td><td>802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)</td></tr>
<tr><td>Antenna Function for Transmitter</td><td>
<table>
<tr><th></th><th>Ant. Port 1</th><th>Ant. Port 2</th></tr>
<tr><td>802.11 ac MIMO</td><td>V</td><td>V</td></tr>
</table>
</td></tr>
</table>

**Remark:**

1. PTP: fixed point-to-point operation
2. PTMP: fixed point-to-multipoint operation

## 1.5 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

| | | |
|---|---|---|
| **Test Site** | SPORTON INTERNATIONAL INC. | |
| **Test Site Location** | No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,<br>Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 | |
| **Test Site No.** | **Sporton Site No.** | |
| | TH05-HY | CO05-HY |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

| | |
|---|---|
| **Test Site** | SPORTON INTERNATIONAL INC. |
| **Test Site Location** | No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd.,<br>Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.<br>TEL: +886-3-327-0868<br>FAX: +886-3-327-0855 |
| **Test Site No.** | **Sporton Site No.** |
| | 03CH10-HY |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

## 1.7 Applicable 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 v03r03
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- FCC KDB 644545 D03 Guidance for IEEE 802 11ac New Rules v01
- ANSI C63.10-2013

**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.

# 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: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

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 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test shown in the following tables.

**<PTP>**

**MIMO <Ant. 1+2>**

| 2.4GHz 802.11ac VHT20(10M) mode | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Data Rate (MHz) | MCS0 | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 |
| Peak Power (dBm) | 27.79 | 27.72 | 27.63 | 27.12 | 27.10 | 27.17 | 27.34 | 27.38 | 27.28 |

| 2.4GHz 802.11ac VHT20 mode | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Data Rate (MHz) | MCS0 | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 |
| Peak Power (dBm) | 27.71 | 27.60 | 27.60 | 27.12 | 27.19 | 27.01 | 27.44 | 27.14 | 27.24 |

| 2.4GHz 802.11ac VHT40 mode | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Data Rate (MHz) | MCS0 | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 | MCS9 |
| Peak Power (dBm) | 21.44 | 21.40 | 21.36 | 20.77 | 20.73 | 21.19 | 20.93 | 20.59 | 20.34 | 20.39 |

**<PTMP>**

**MIMO <Ant. 1+2>**

| 2.4GHz 802.11ac VHT20(10M) mode | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Data Rate (MHz) | MCS0 | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 |
| Peak Power (dBm) | 22.59 | 22.51 | 22.50 | 21.91 | 22.00 | 22.02 | 22.36 | 22.34 | 21.96 |

| 2.4GHz 802.11ac VHT20 mode | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Data Rate (MHz) | MCS0 | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 |
| Peak Power (dBm) | 22.86 | 22.79 | 22.80 | 22.25 | 22.10 | 21.96 | 22.53 | 22.18 | 22.10 |

| 2.4GHz 802.11ac VHT40 mode | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Data Rate (MHz) | MCS0 | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 | MCS8 | MCS9 |
| Peak Power (dBm) | 21.44 | 21.40 | 21.36 | 20.77 | 20.73 | 21.19 | 20.93 | 20.59 | 20.34 | 20.39 |

**Note:** MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

## 2.3 Test Mode

**Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.**

**MIMO Antenna**

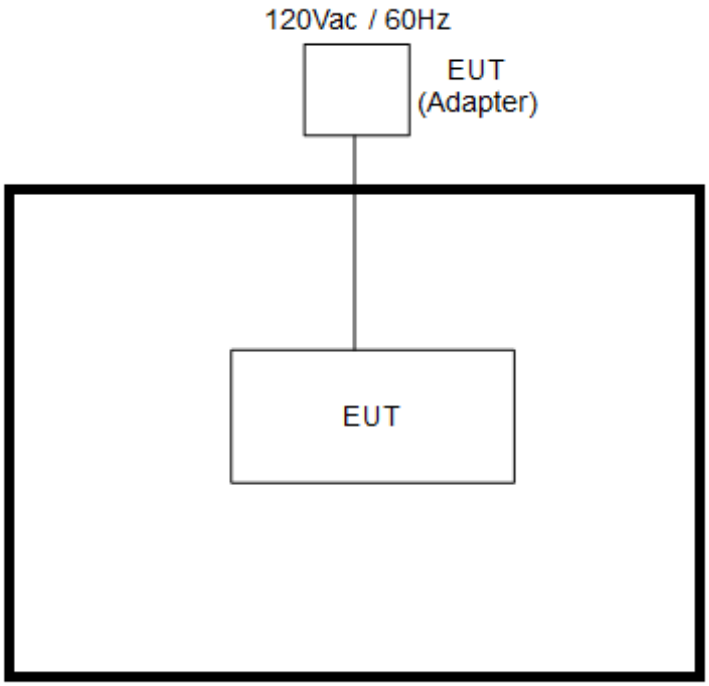
**<2.4GHz>**

| Modulation | Data Rate |
|---|---|
| 802.11ac VHT20(10M) | MCS0 |
| 802.11ac VHT20 | MCS0 |
| 802.11ac VHT40 | MCS0 |

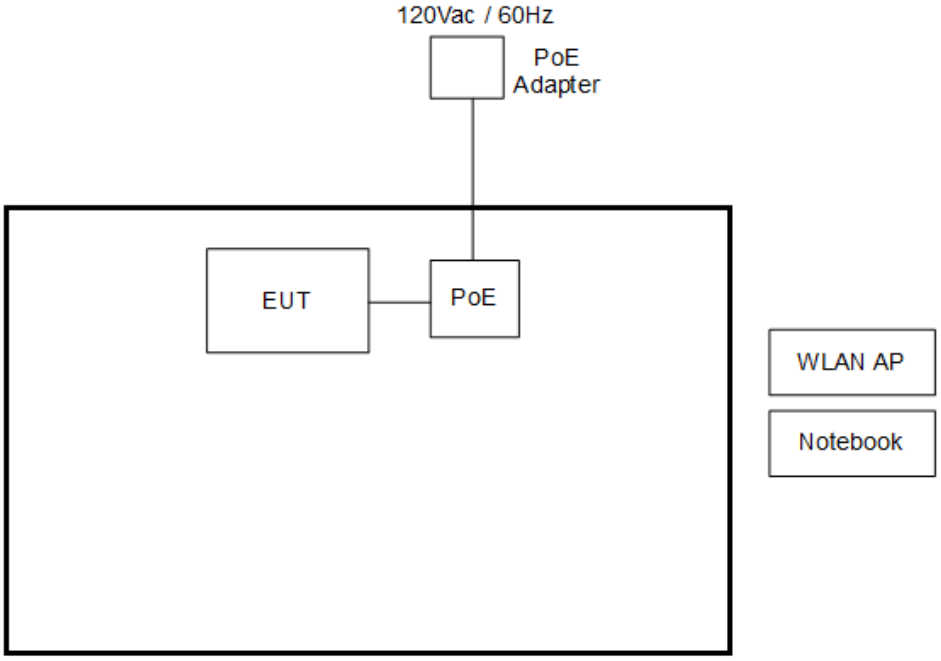
| Test Cases | |
|---|---|
| AC Conducted Emission | Mode 1 ： WLAN Link + PoE + LAN Link |

## 2.4 Connection Diagram of Test System

**<WLAN Tx Mode>**




**<AC Conducted Emission Mode>**



## 2.5 Support Unit used in test configuration and system

| Item | Equipment | Trade Name | Model Name | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|
| 1. | Notebook | DELL | Latitude E6320 | FCC DoC/ Contains FCC ID: QDS-BRCM1054 | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |
| 2. | Notebook | DELL | P20G | FCC DoC/ Contains FCC ID: QDS-BRCM1051 | N/A | AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m |
| 3. | WLAN AP | Ubiquiti | NBE-2AC-13 | N/A | N/A | Unshielded, 0.5 m |

## 2.6 EUT Operation Test Setup

The programmed RF utility “cart.exe tools”, is installed in 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.

## 2.7 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.

Example:
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.

*Offset(dB) = RF cable loss(dB) + attenuator factor(dB).*
= 4.2 + 10 = 14.2 (dB)

# 3 Test Result

## 3.1 6dB and 99% Bandwidth Measurement

### 3.1.1 Limit of 6dB and 99% Bandwidth

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

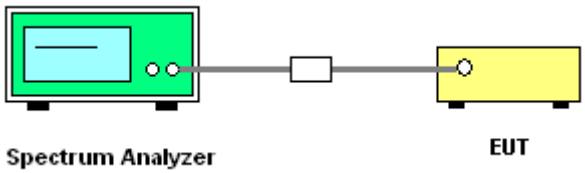
### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r03.
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. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

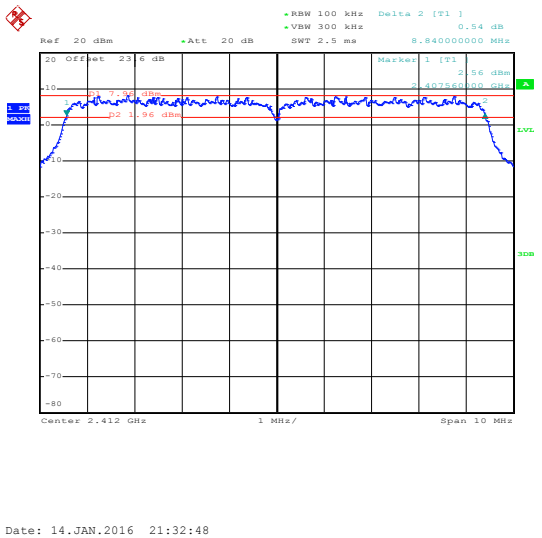
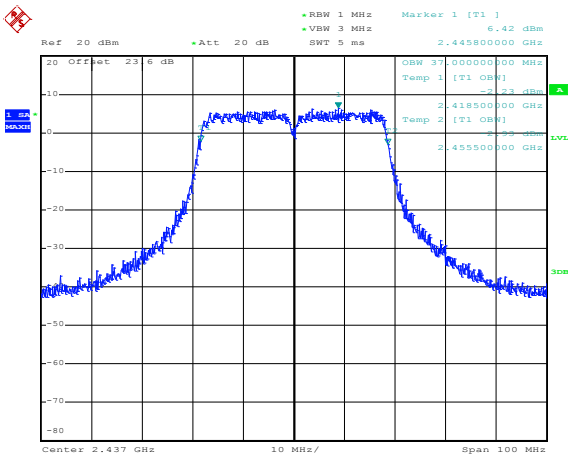
### 3.1.4 Test Setup



### 3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A of this report.

**<PTP>**

| Minimum 6dB Bandwidth | Maximum 99% Occupied Bandwidth |
|---|---|
|  |  |
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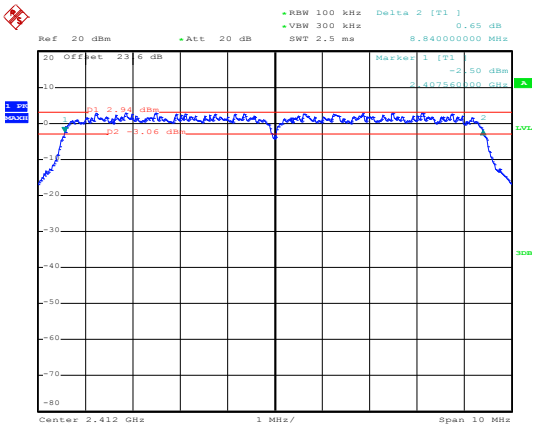
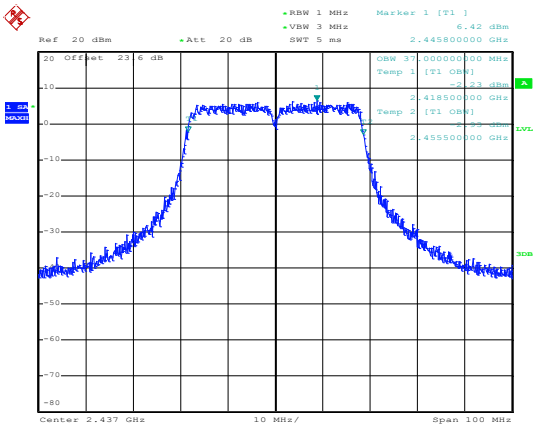
**Note :** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

**<PTMP>**

| Minimum 6dB Bandwidth | Maximum 99% Occupied Bandwidth |
|---|---|
|  |  |
| Date: 13.JAN.2016 23:57:18 | Date: 21.JAN.2016 21:58:25 |

**Note :** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

## 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 and of point-to-multi-point operation, the limit has to be reduced by 1dB for every 1dB that the directional gain of the antenna exceeds 6dBi.

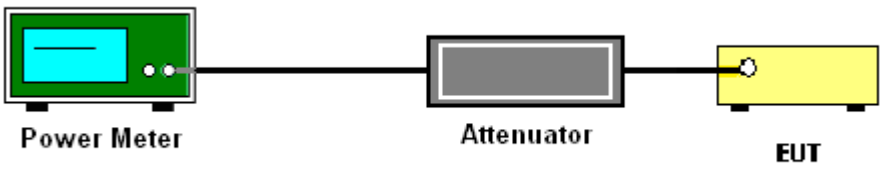
### 3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 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 v03r03 section 9.1.2 PKPM1 Peak power meter method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
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.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

### 3.2.4 Test Setup




### 3.2.5 Test Result of Peak Output Power

Please refer to Appendix A of this report.

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

Please refer to Appendix A of this report.

## 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

The measuring equipment is listed in the section 4 of this test report.

### 3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03
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. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

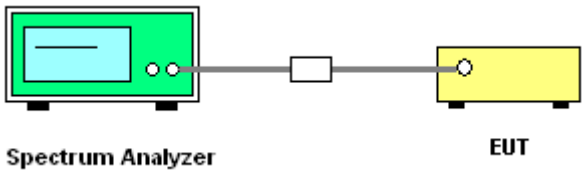
   If measurements performed using method (2) plus 10 log (N) exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

   Method (1): Measure and sum the spectra across the outputs.

   The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

   Method (2): Measure and add 10 log (N) dB, where N is the number of outputs. (N=2)

### 3.3.4 Test Setup

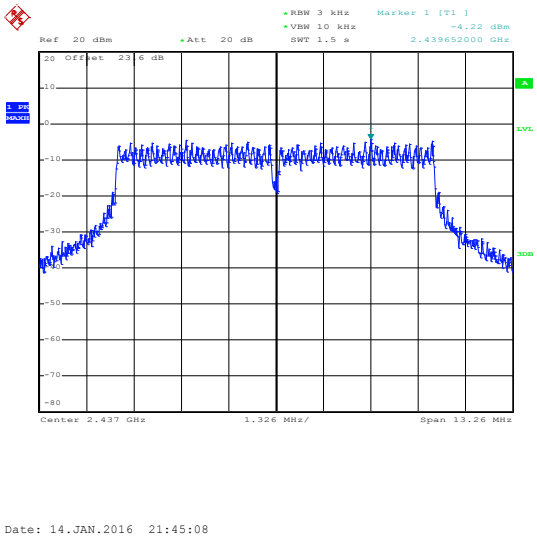



### 3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A of this report.

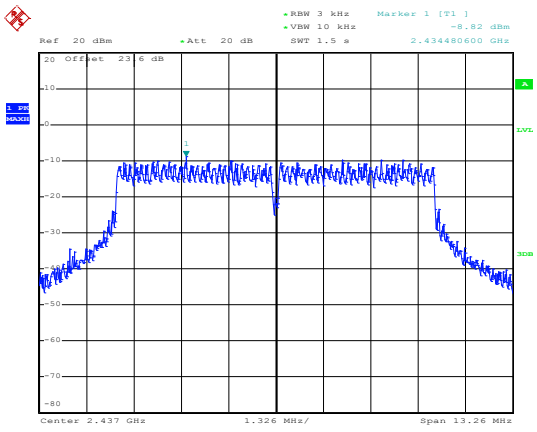
**<PTP>**

**Worst Case Power Density (dBm/3kHz)**



**<PTMP>**

**Worst Case Power Density (dBm/3kHz)**



# 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).

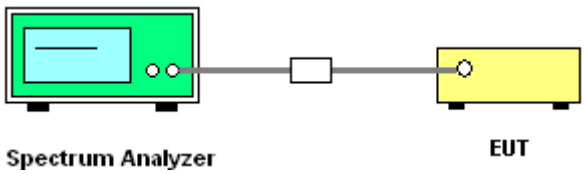
## 3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

## 3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03.
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 Band Edges and Spurious Emission

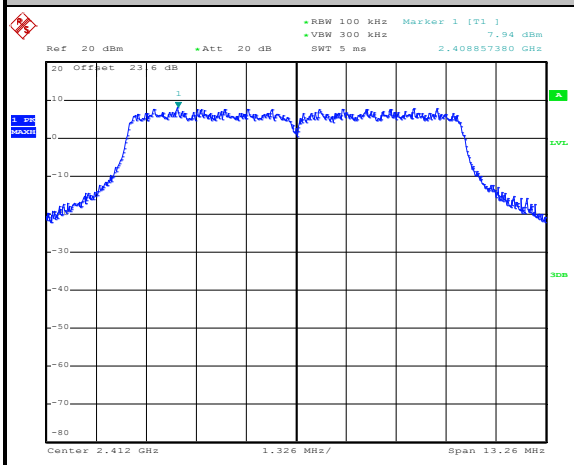
**<PTP>**

**Number of TX = 2, Ant. 1 (Measured)**

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 01 | **Test Engineer :** | Osolemio Chang |

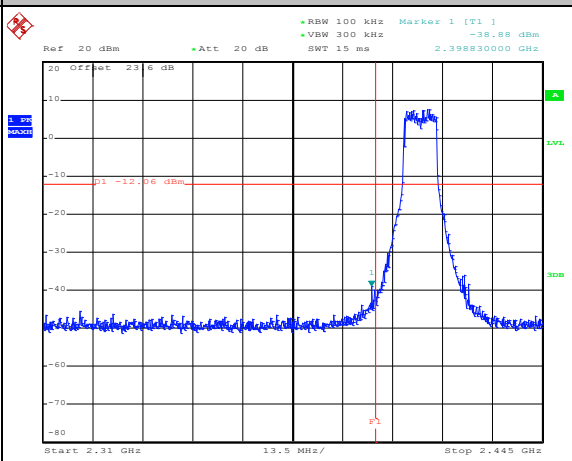
**WLAN 802.11ac VHT20(10M) Channel 01**

**100kHz PSD reference Level**



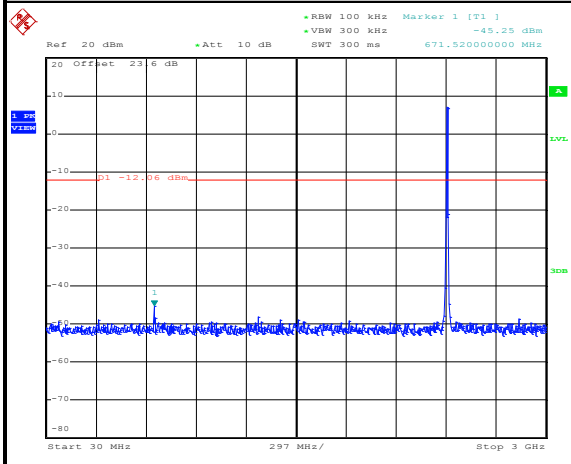

Date: 14.JAN.2016 21:34:00

**Low Channel Plot**



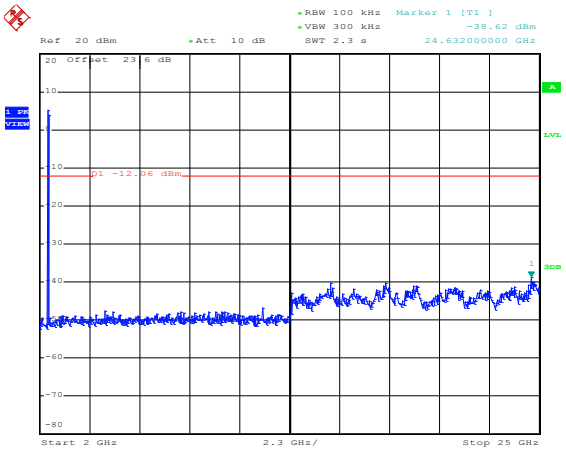

Date: 14.JAN.2016 21:34:11

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 21:34:24

**Spurious Emission 2GHz~25GHz**

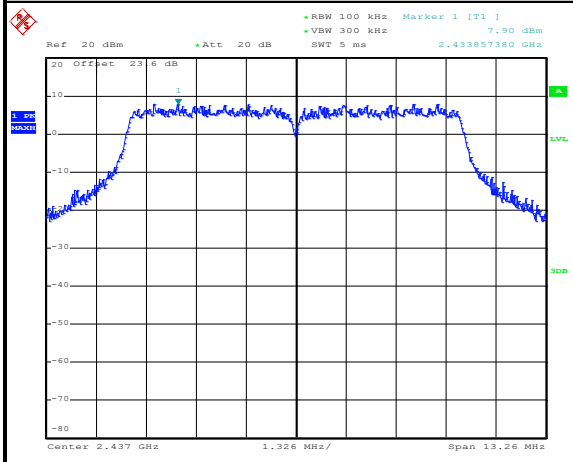



Date: 14.JAN.2016 21:34:32

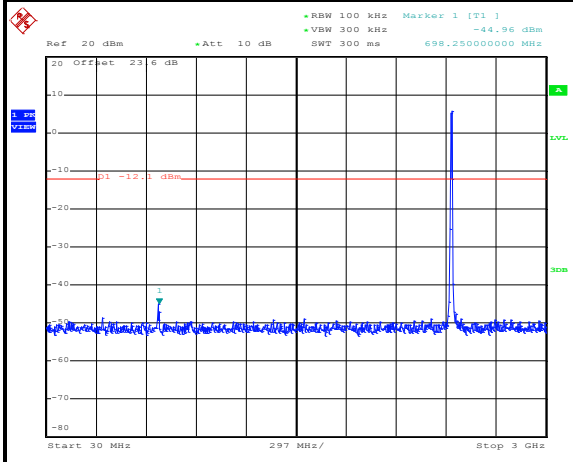
| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

**WLAN 802.11ac VHT20(10M) Channel 06**

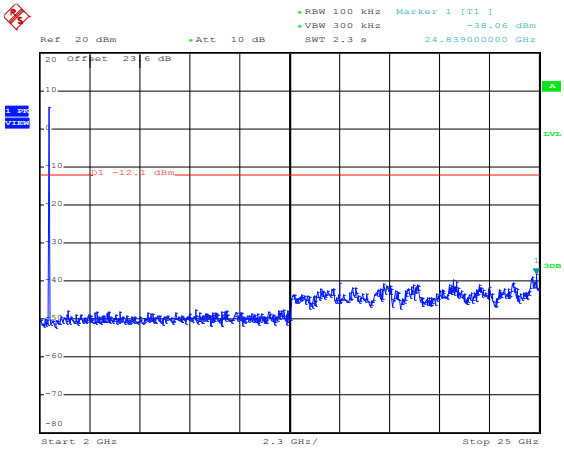
**100kHz PSD reference Level**




**Spurious Emission 30MHz~3GHz**



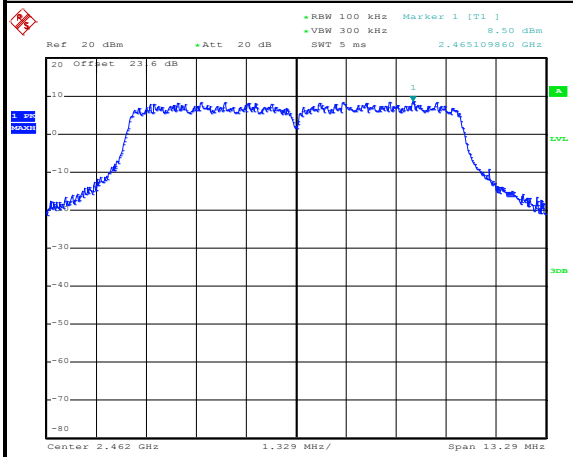

**Spurious Emission 2GHz~25GHz**



| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 11 | **Test Engineer :** | Osolemio Chang |

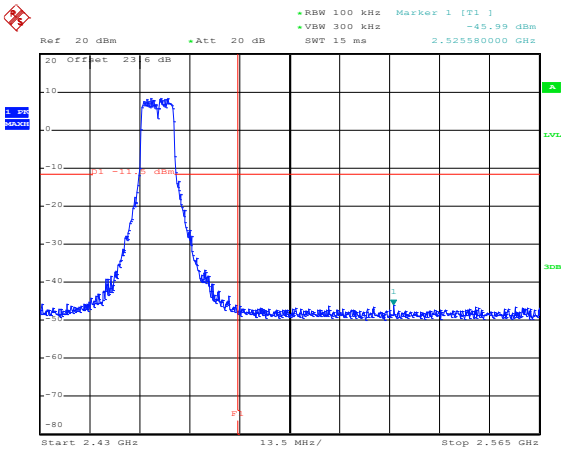
**WLAN 802.11ac VHT20(10M) Channel 11**

**100kHz PSD reference Level**



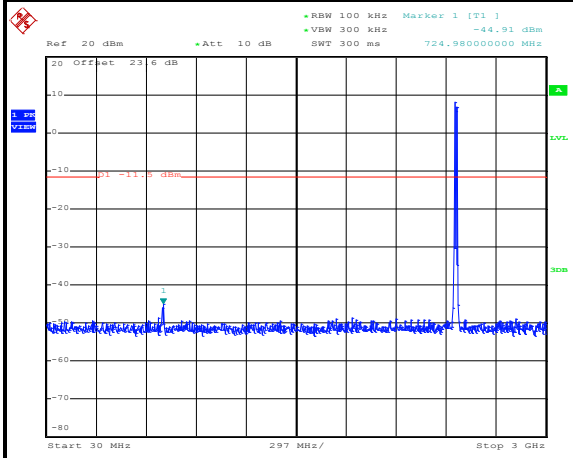

Date: 14.JAN.2016 21:49:43

**High Channel Plot**



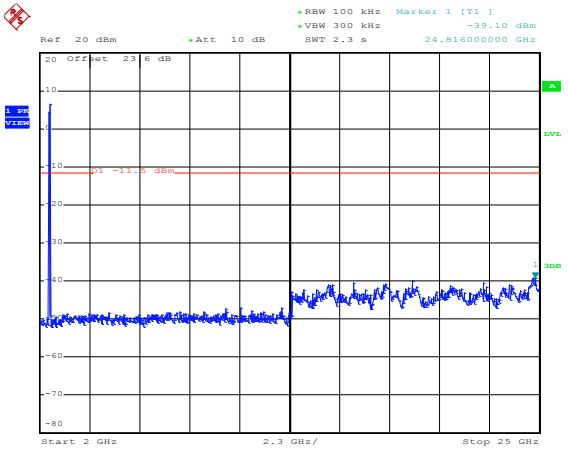

Date: 14.JAN.2016 21:50:09

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 21:50:23

**Spurious Emission 2GHz~25GHz**

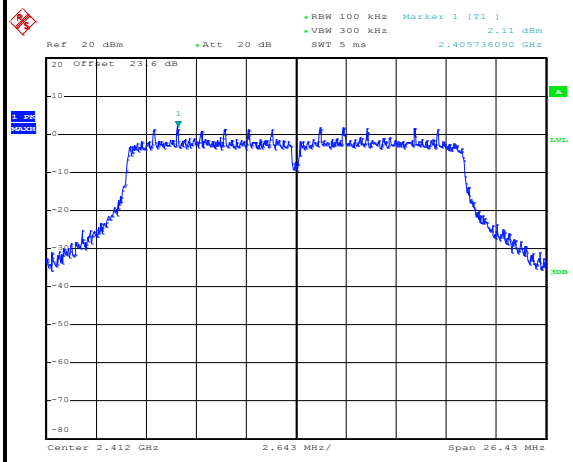



Date: 14.JAN.2016 21:50:31

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 01 | **Test Engineer :** | Osolemio Chang |

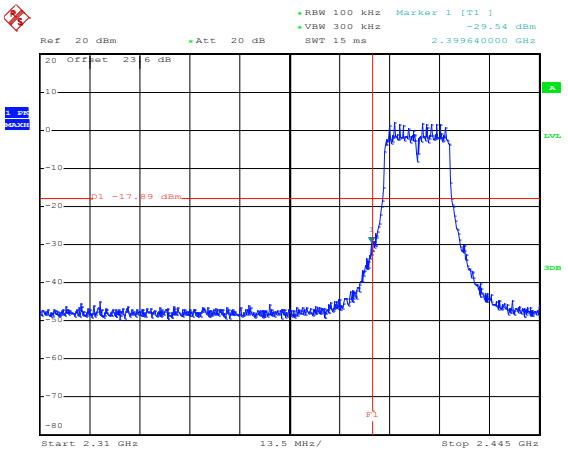
**WLAN 802.11ac VHT20 Channel 01**

**100kHz PSD reference Level**



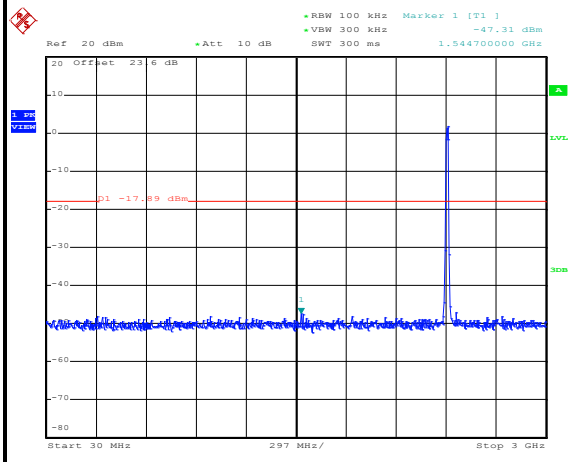

Date: 21.JAN.2016 21:05:47

**Low Channel Plot**



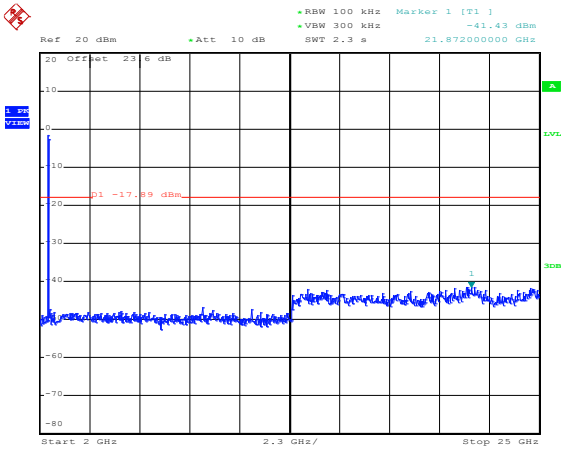

Date: 21.JAN.2016 21:06:13

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:08:52

**Spurious Emission 2GHz~25GHz**

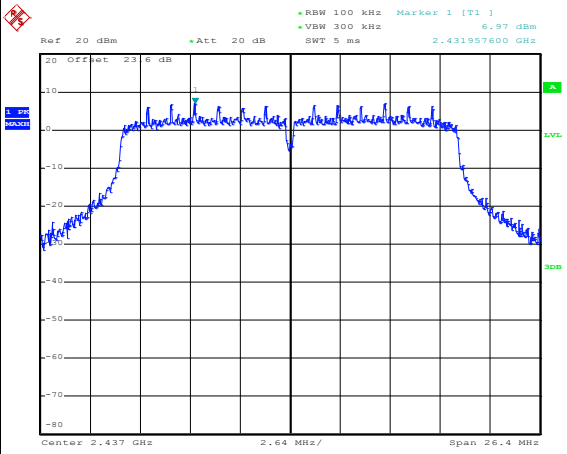



Date: 21.JAN.2016 21:09:12

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

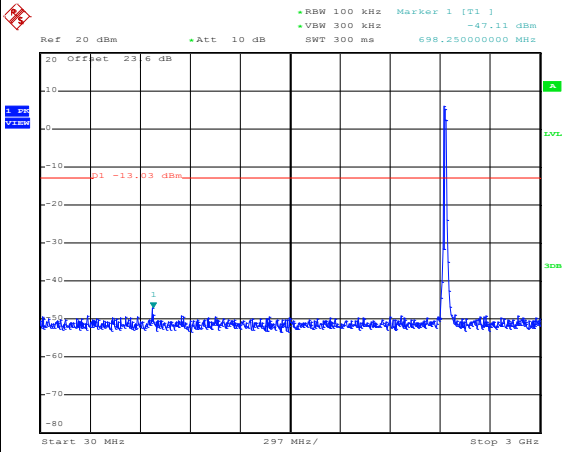
**WLAN 802.11ac VHT20 Channel 06**

**100kHz PSD reference Level**



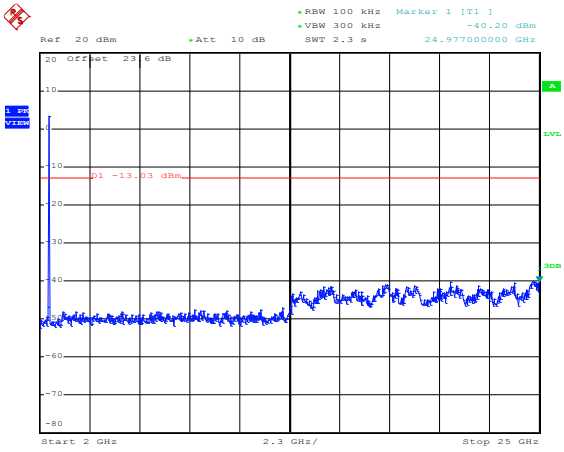

Date: 14.JAN.2016 22:05:48

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 22:06:16

**Spurious Emission 2GHz~25GHz**

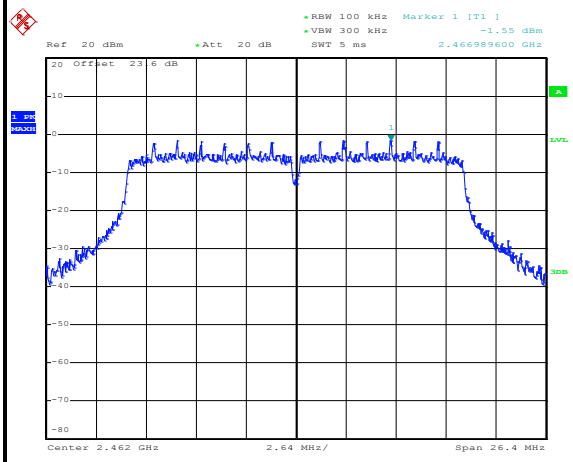



Date: 14.JAN.2016 22:06:25

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 11 | **Test Engineer :** | Osolemio Chang |

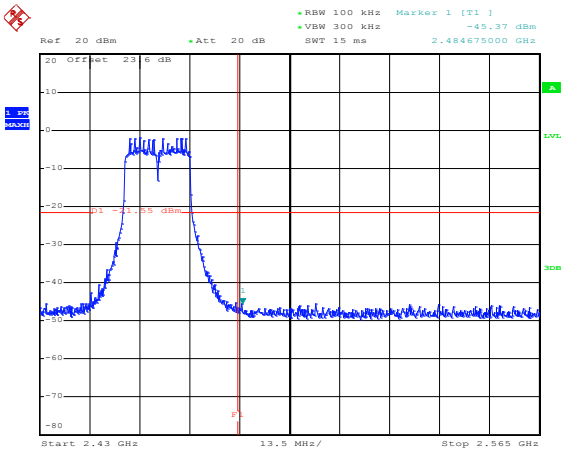
**WLAN 802.11ac VHT20 Channel 11**

**100kHz PSD reference Level**



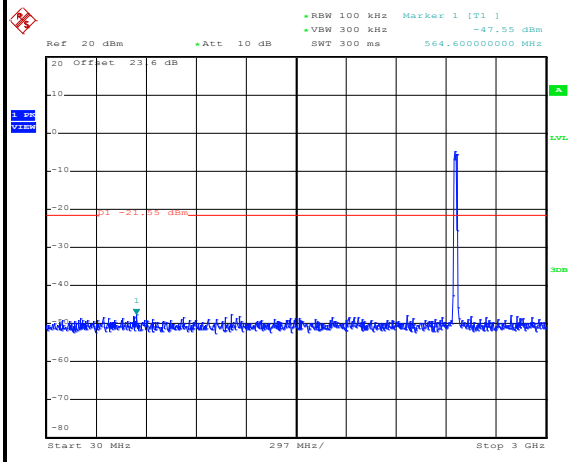

Date: 21.JAN.2016 21:13:31

**High Channel Plot**



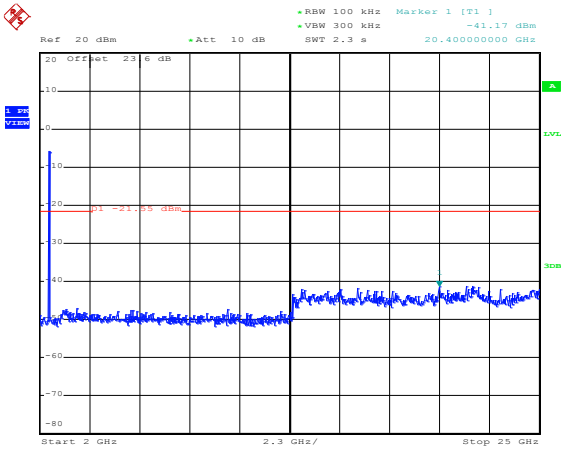

Date: 21.JAN.2016 21:13:53

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:14:07

**Spurious Emission 2GHz~25GHz**

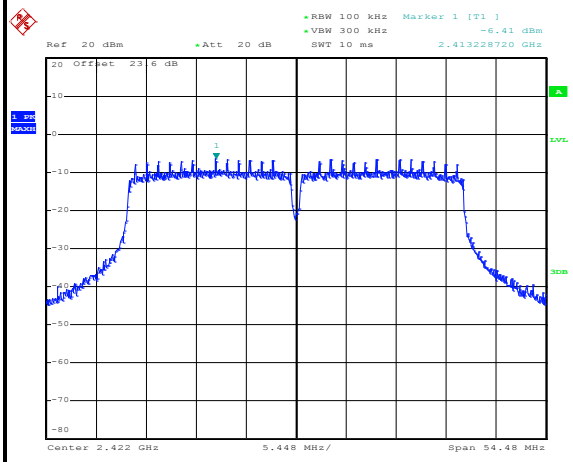



Date: 21.JAN.2016 21:14:16

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 03 | **Test Engineer :** | Osolemio Chang |

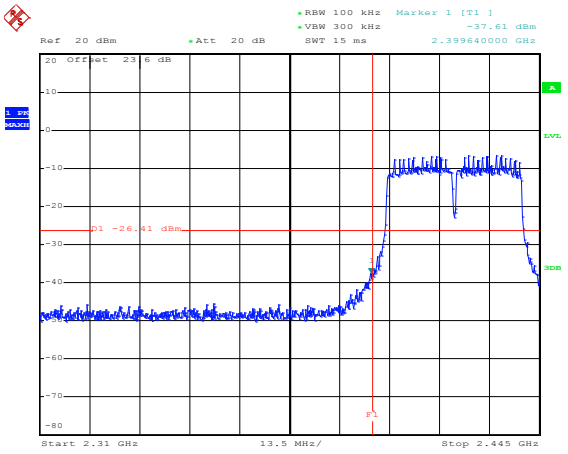
**WLAN 802.11ac VHT40 Channel 03**

**100kHz PSD reference Level**



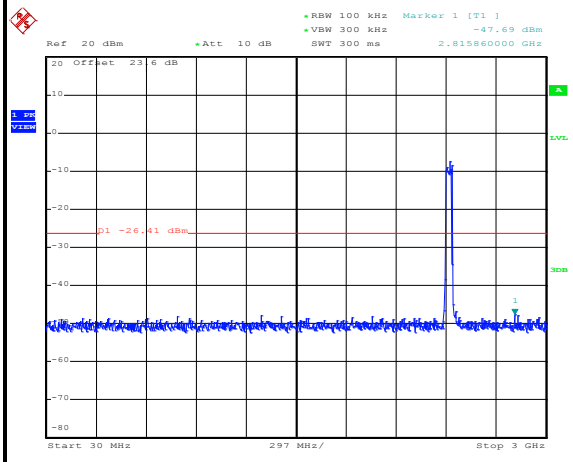

Date: 21.JAN.2016 21:28:33

**Low Channel Plot**



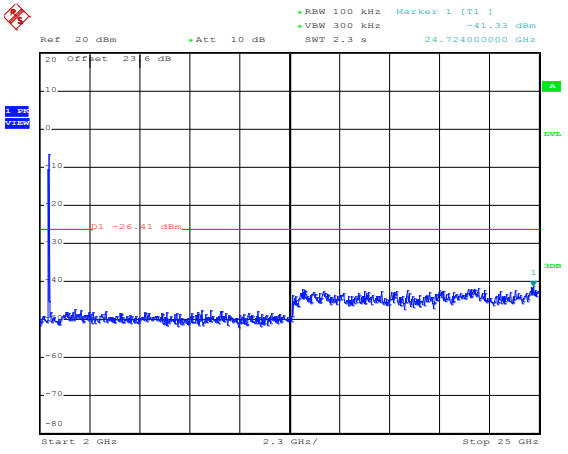

Date: 21.JAN.2016 21:28:48

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:29:02

**Spurious Emission 2GHz~25GHz**

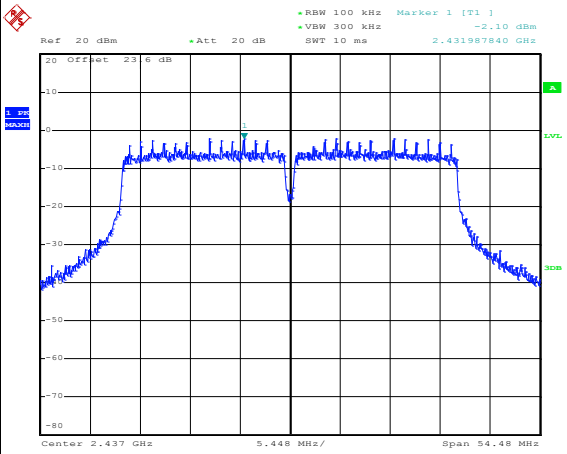



Date: 21.JAN.2016 21:29:11

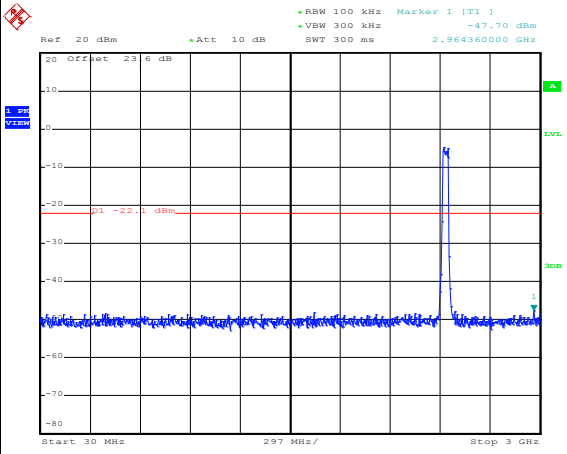
| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

**WLAN 802.11ac VHT40 Channel 06**

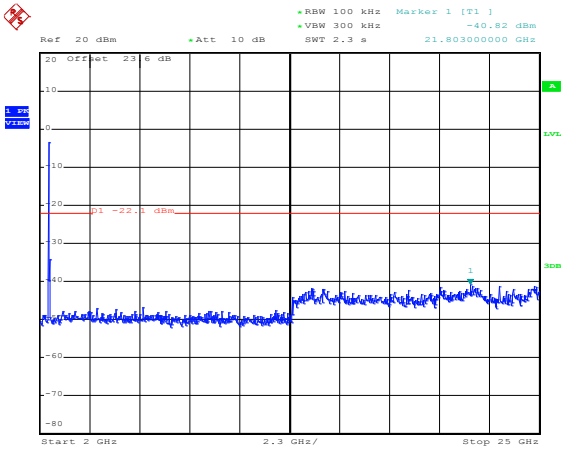
**100kHz PSD reference Level**




**Spurious Emission 30MHz~3GHz**



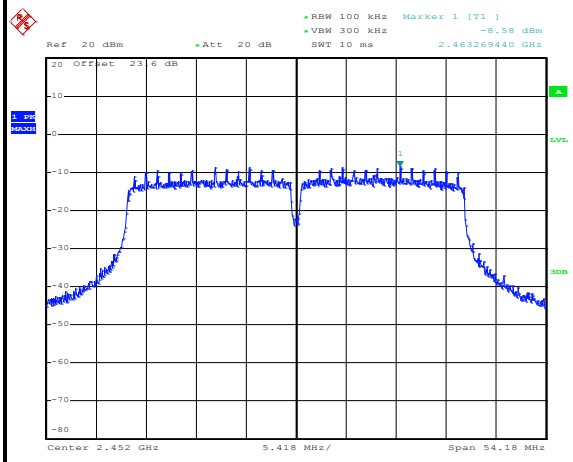

**Spurious Emission 2GHz~25GHz**



| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 09 | **Test Engineer :** | Osolemio Chang |

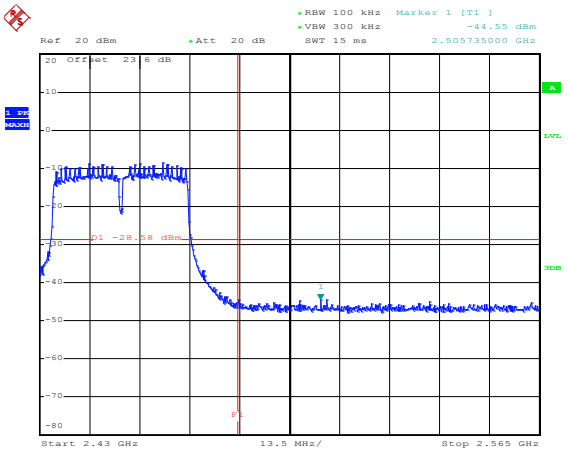
**WLAN 802.11ac VHT40 Channel 09**

**100kHz PSD reference Level**



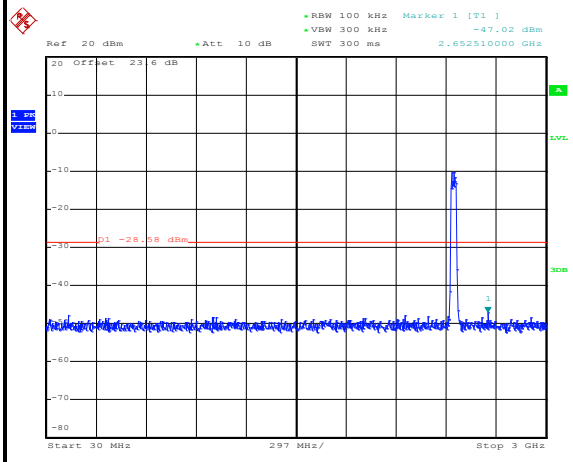

Date: 21.JAN.2016 21:40:43

**High Channel Plot**



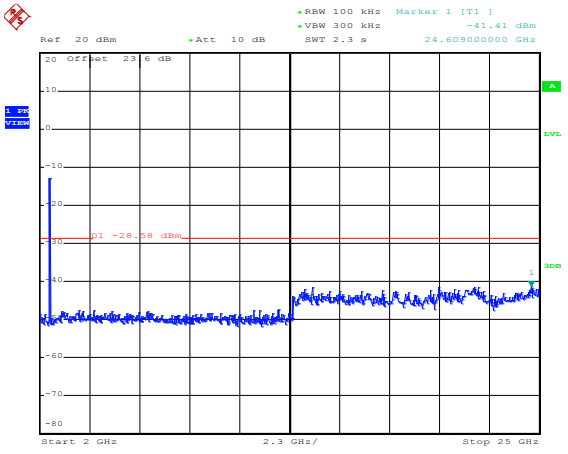

Date: 21.JAN.2016 21:45:18

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:45:30

**Spurious Emission 2GHz~25GHz**



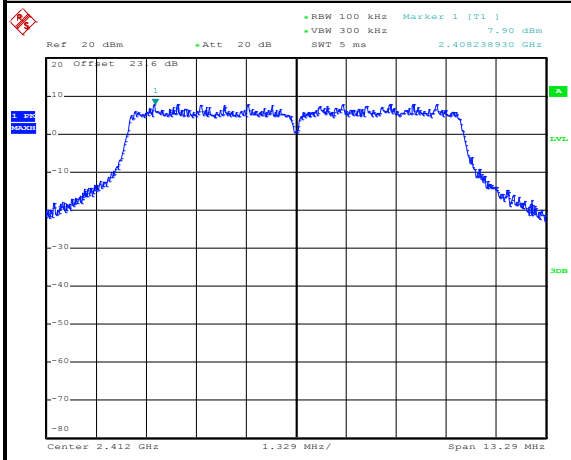

Date: 21.JAN.2016 21:45:39

**Number of TX = 2, Ant. 2 (Measured)**

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 01 | **Test Engineer :** | Osolemio Chang |

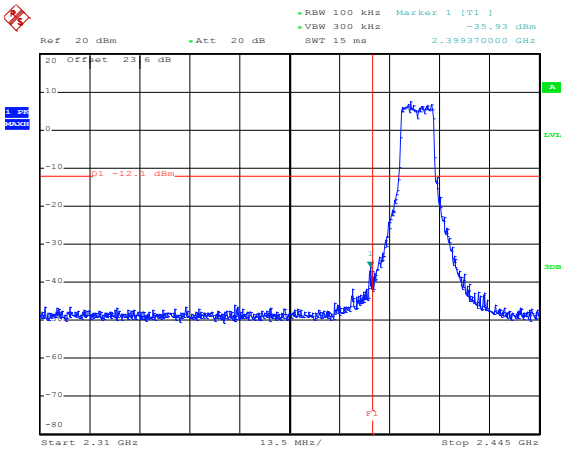
**WLAN 802.11ac VHT20(10M) Channel 01**

**100kHz PSD reference Level**



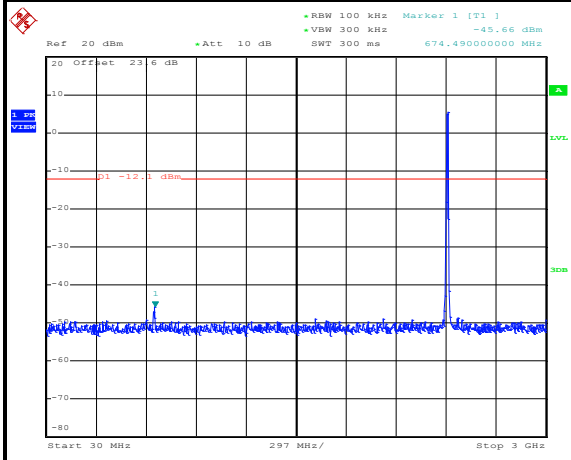

Date: 14.JAN.2016 21:38:20

**Low Channel Plot**



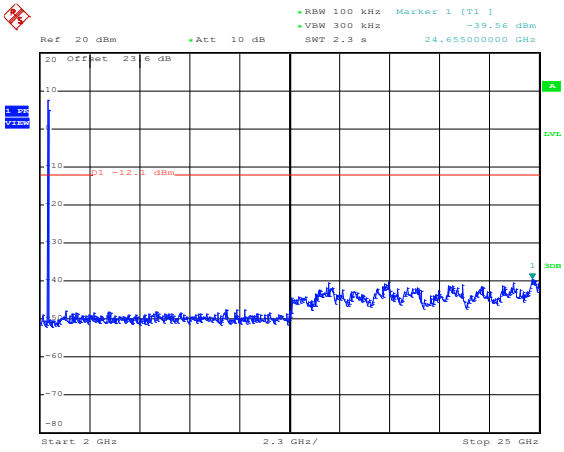

Date: 14.JAN.2016 21:38:49

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 21:39:02

**Spurious Emission 2GHz~25GHz**

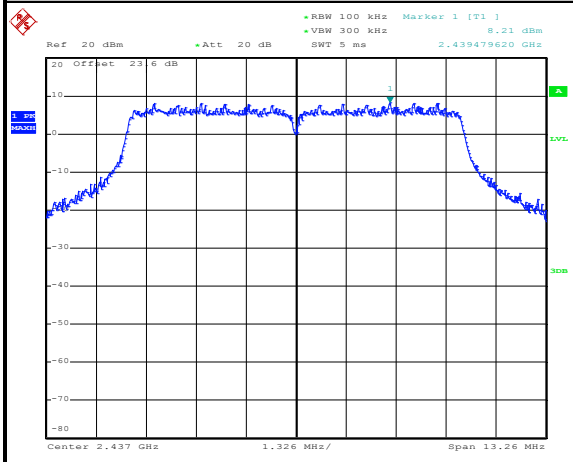



Date: 14.JAN.2016 21:39:11

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

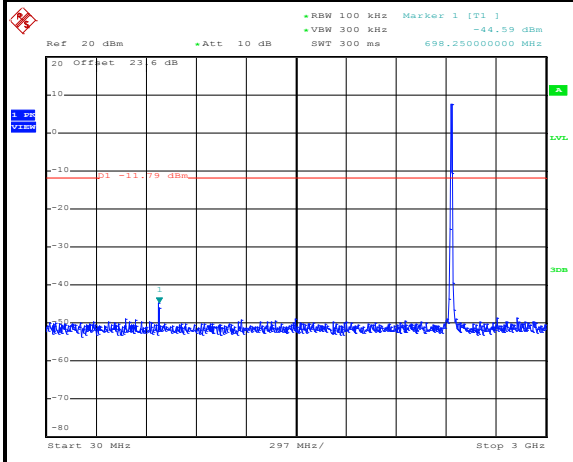
**WLAN 802.11ac VHT20(10M) Channel 06**

**100kHz PSD reference Level**



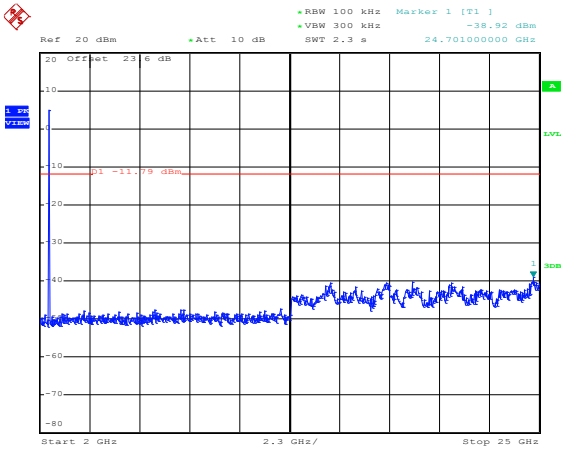

Date: 14.JAN.2016 21:45:29

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 21:45:43

**Spurious Emission 2GHz~25GHz**

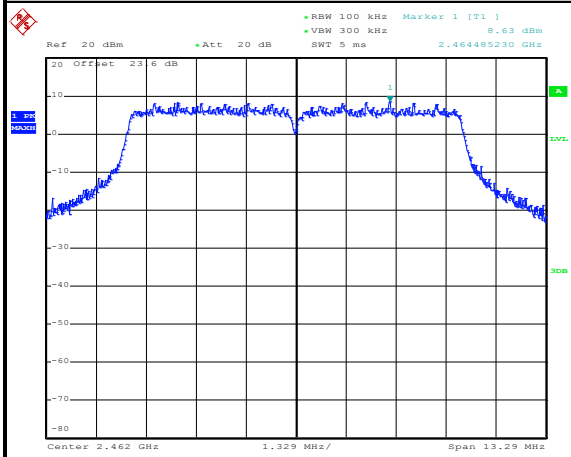



Date: 14.JAN.2016 21:45:51

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 11 | **Test Engineer :** | Osolemio Chang |

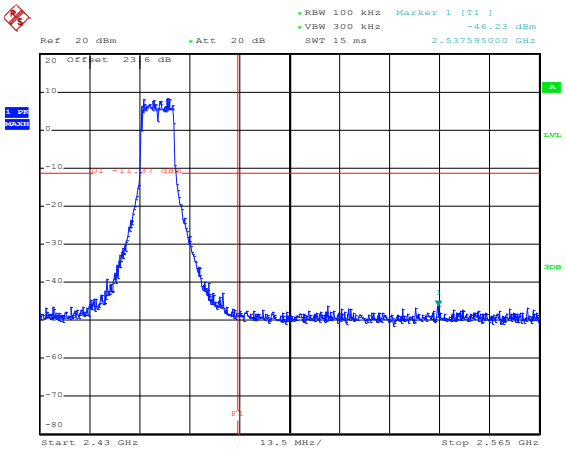
**WLAN 802.11ac VHT20(10M) Channel 11**

**100kHz PSD reference Level**



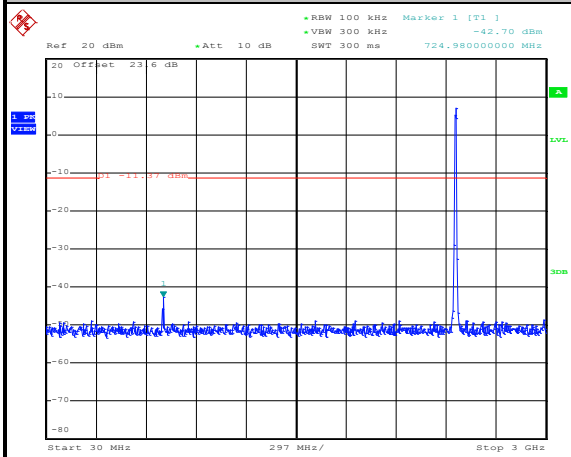

Date: 14.JAN.2016 21:54:40

**High Channel Plot**



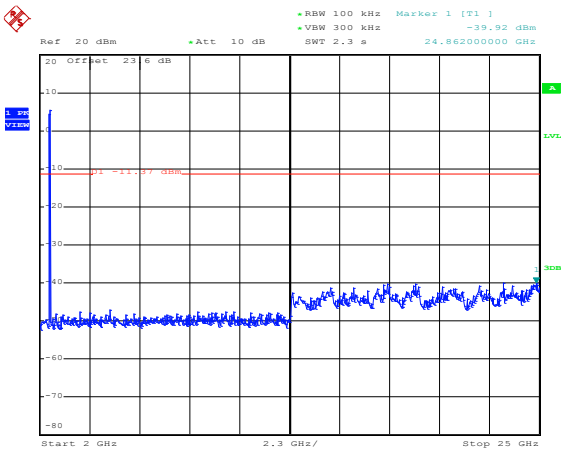

Date: 14.JAN.2016 21:54:54

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 21:55:07

**Spurious Emission 2GHz~25GHz**

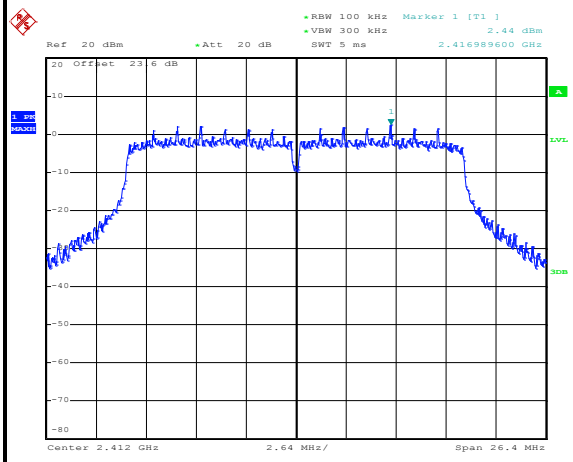



Date: 14.JAN.2016 21:55:15

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 01 | **Test Engineer :** | Osolemio Chang |

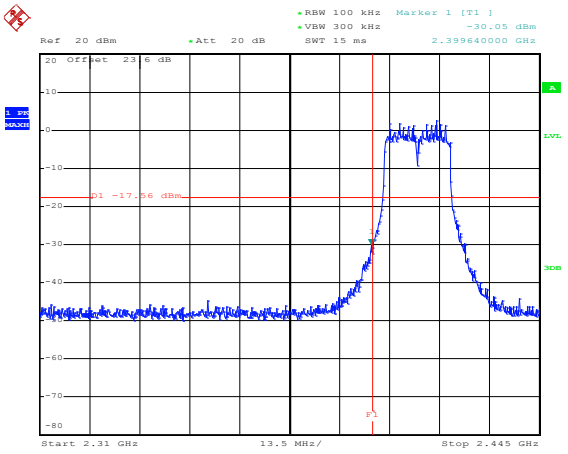
**WLAN 802.11ac VHT20 Channel 01**

**100kHz PSD reference Level**



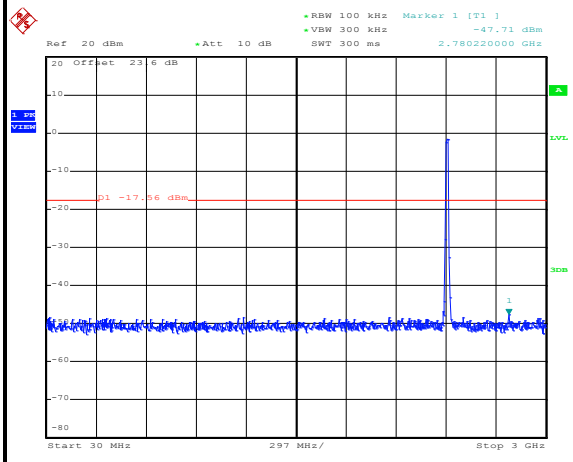

Date: 21.JAN.2016 21:22:48

**Low Channel Plot**



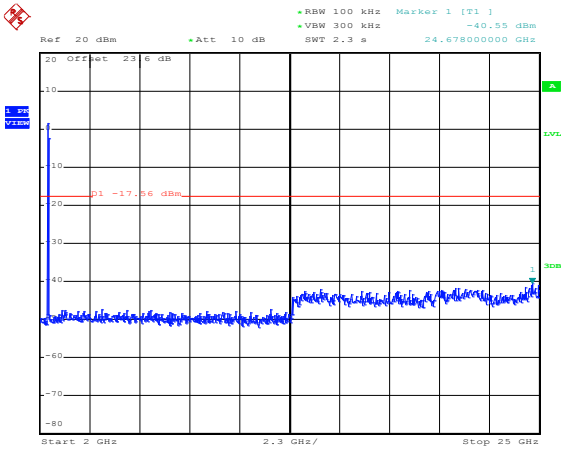

Date: 21.JAN.2016 21:23:10

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:23:29

**Spurious Emission 2GHz~25GHz**

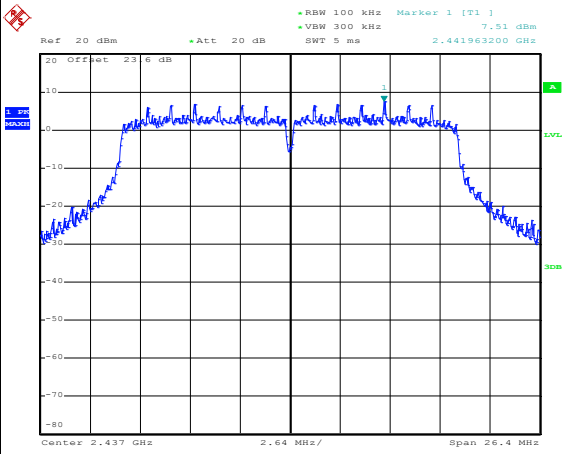



Date: 21.JAN.2016 21:23:37

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

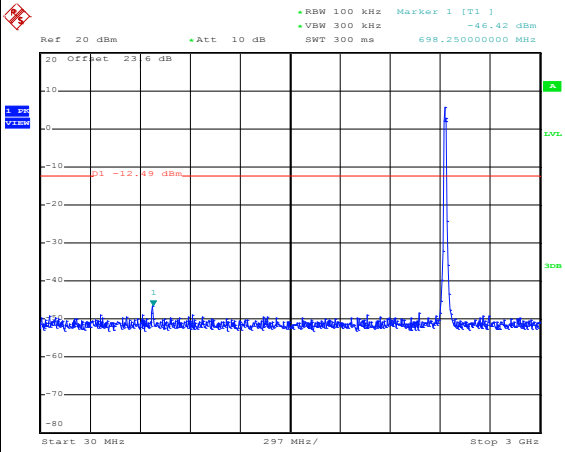
**WLAN 802.11ac VHT20 Channel 06**

**100kHz PSD reference Level**



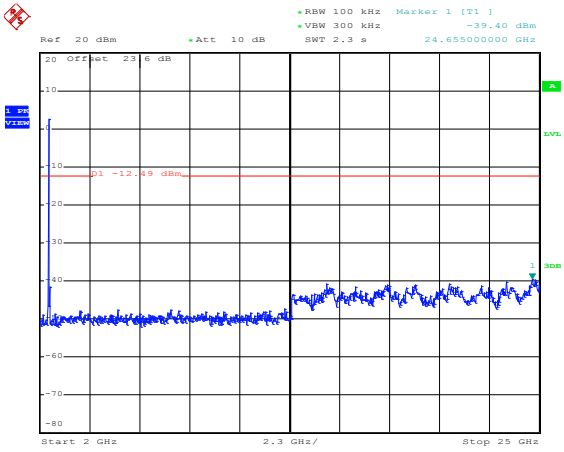

Date: 14.JAN.2016 22:09:21

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 22:09:57

**Spurious Emission 2GHz~25GHz**

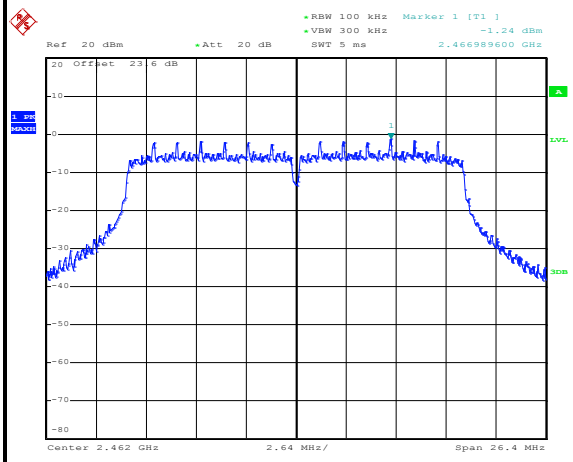



Date: 14.JAN.2016 22:10:05

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 11 | **Test Engineer :** | Osolemio Chang |

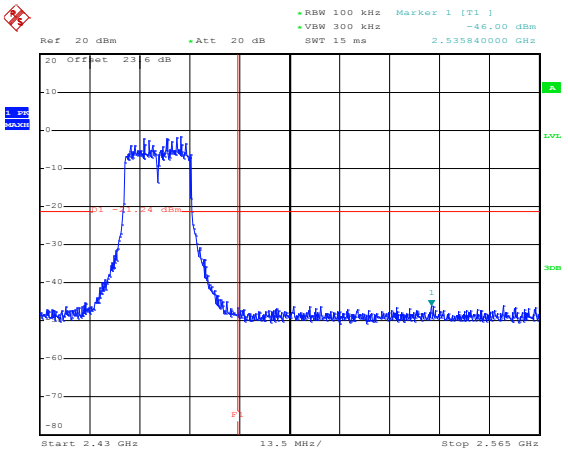
**WLAN 802.11ac VHT20 Channel 11**

**100kHz PSD reference Level**



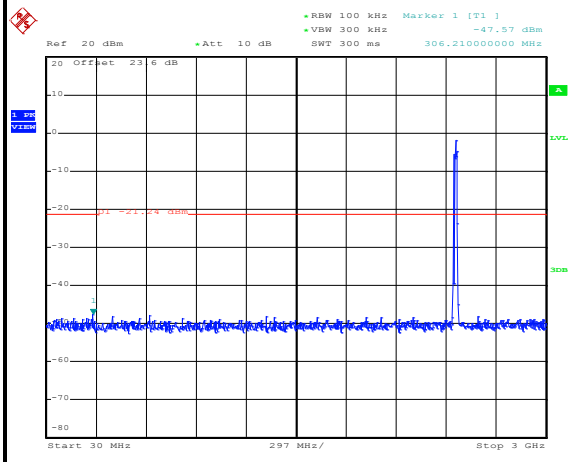

Date: 21.JAN.2016 21:18:52

**High Channel Plot**



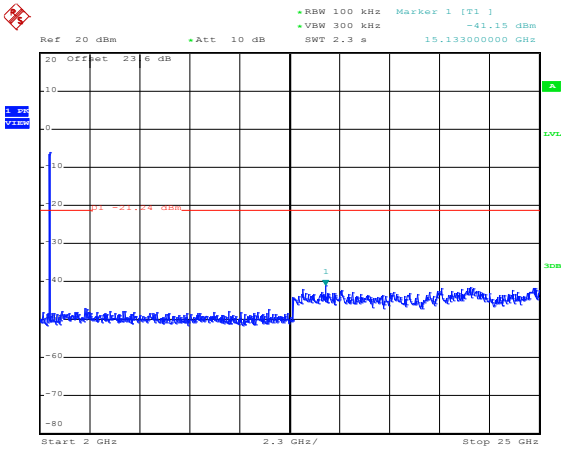

Date: 21.JAN.2016 21:19:04

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:19:31

**Spurious Emission 2GHz~25GHz**

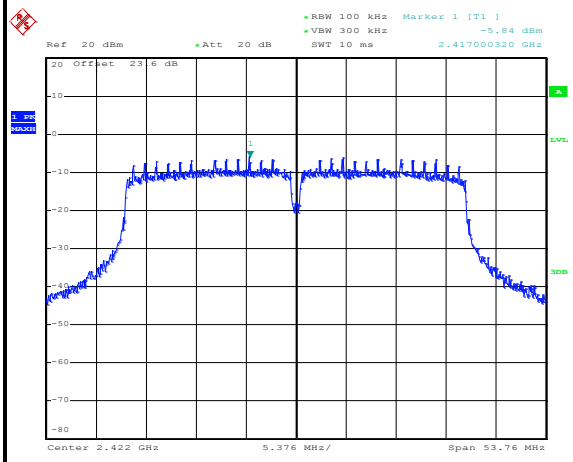



Date: 21.JAN.2016 21:19:39

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 03 | **Test Engineer :** | Osolemio Chang |

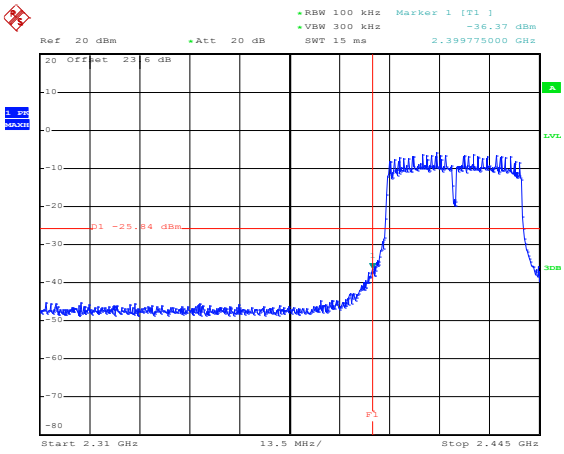
**WLAN 802.11ac VHT40 Channel 03**

**100kHz PSD reference Level**



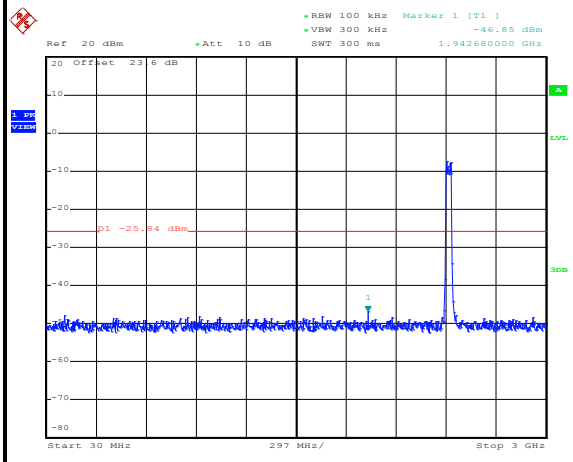

Date: 21.JAN.2016 22:03:07

**Low Channel Plot**



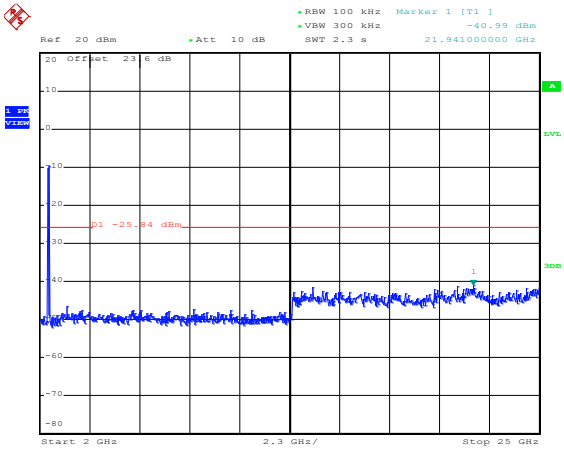

Date: 21.JAN.2016 22:04:37

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 22:07:44

**Spurious Emission 2GHz~25GHz**

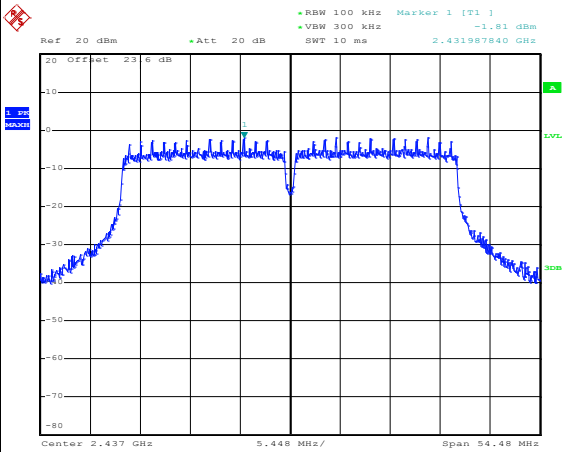



Date: 21.JAN.2016 22:07:52

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

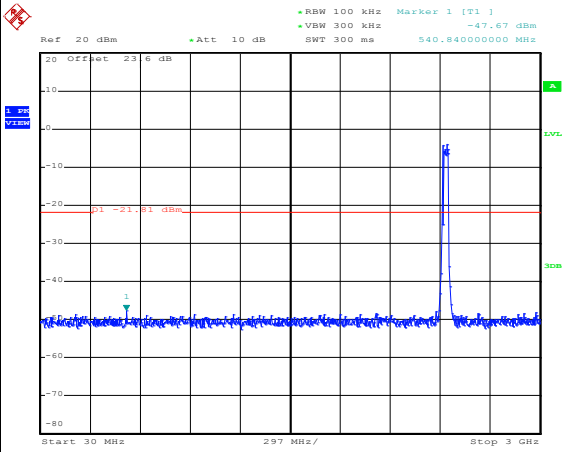
**WLAN 802.11ac VHT40 Channel 06**

**100kHz PSD reference Level**



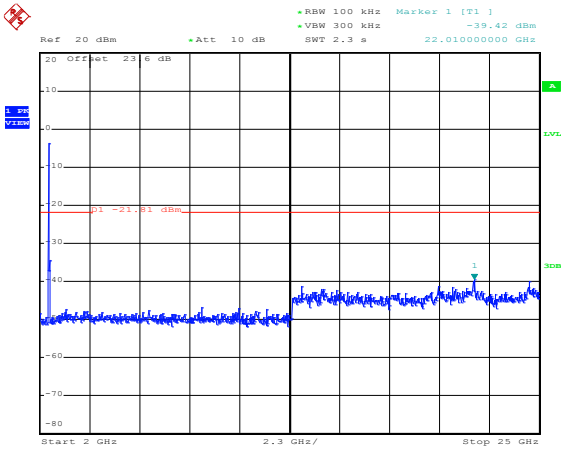

Date: 21.JAN.2016 21:56:12

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:57:13

**Spurious Emission 2GHz~25GHz**

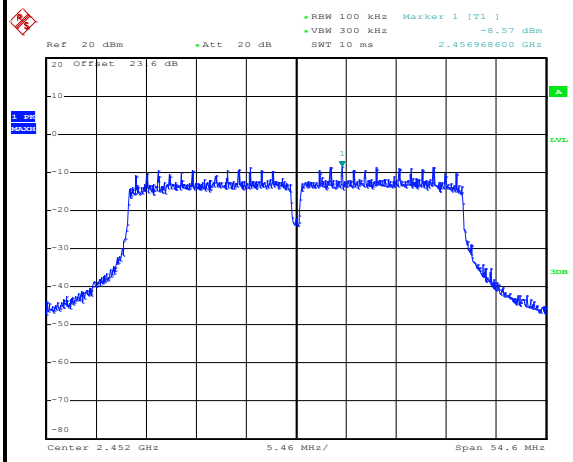



Date: 21.JAN.2016 21:57:21

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 09 | **Test Engineer :** | Osolemio Chang |

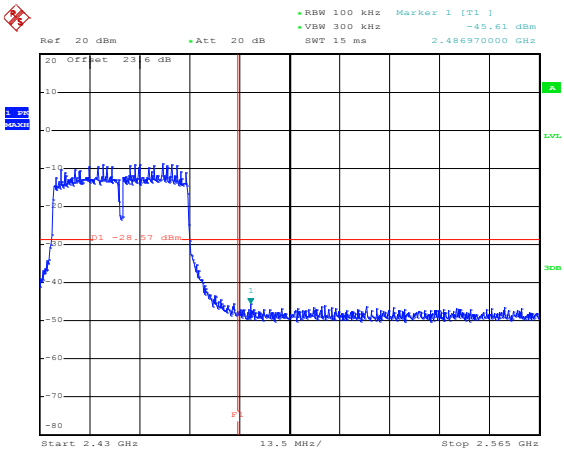
**WLAN 802.11ac VHT40 Channel 09**

**100kHz PSD reference Level**



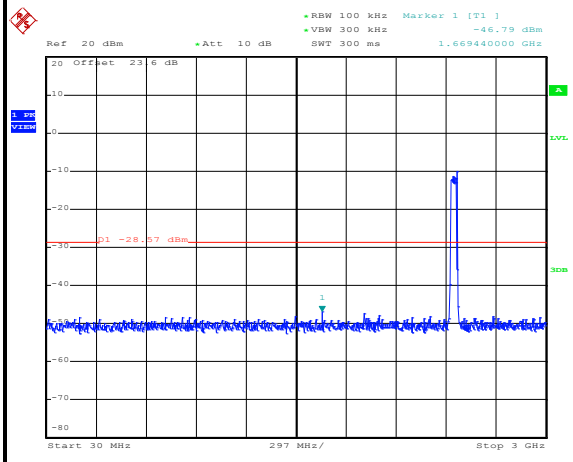

Date: 21.JAN.2016 21:49:13

**High Channel Plot**



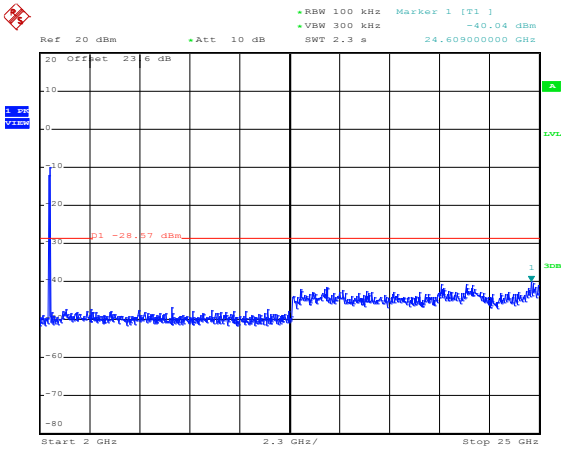

Date: 21.JAN.2016 21:49:28

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:51:12

**Spurious Emission 2GHz~25GHz**




Date: 21.JAN.2016 21:51:21

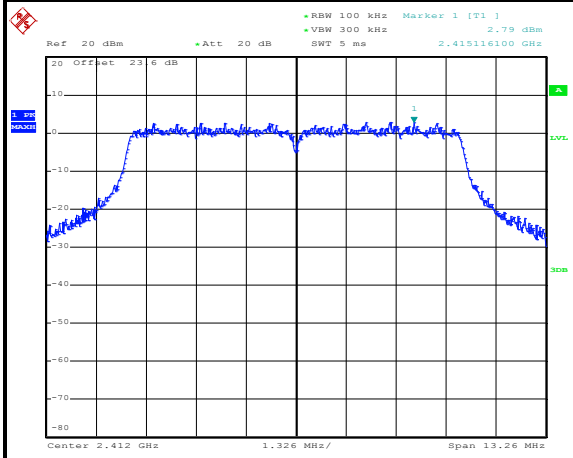
**<PTMP>**

**Number of TX = 2, Ant. 1 (Measured)**

| | | | |
|---|---|---|---|
| **Number of TX** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 01 | **Test Engineer :** | Osolemio Chang |

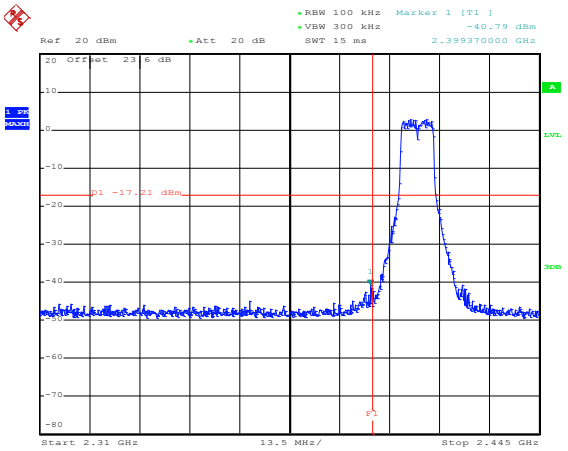
**WLAN 802.11ac VHT20(10M) Channel 01**

**100kHz PSD reference Level**



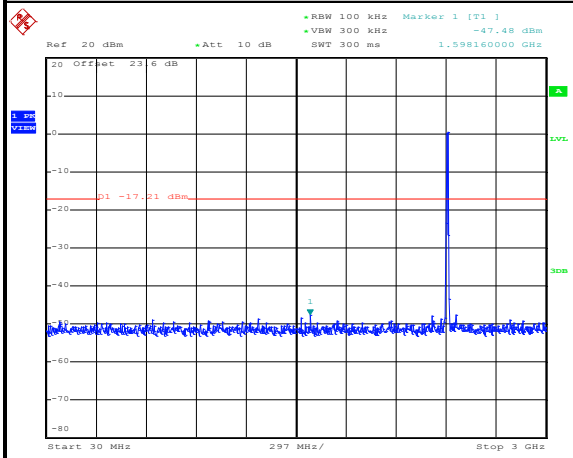

Date: 13.JAN.2016 23:58:01

**Low Channel Plot**



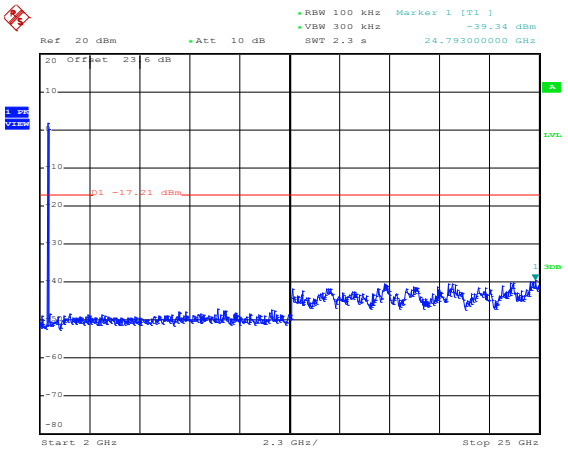

Date: 13.JAN.2016 23:58:29

**Spurious Emission 30MHz~3GHz**




Date: 13.JAN.2016 23:58:42

**Spurious Emission 2GHz~25GHz**

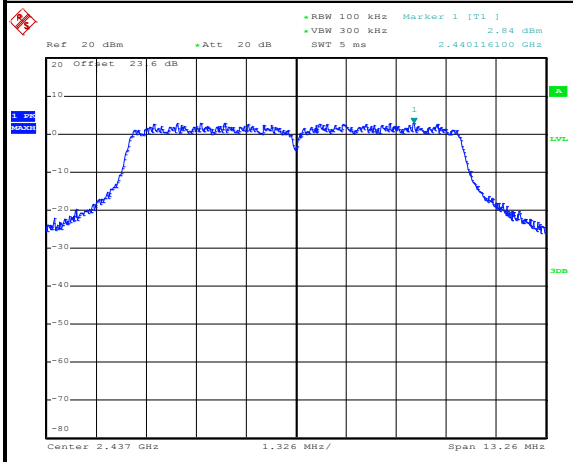



Date: 13.JAN.2016 23:58:50

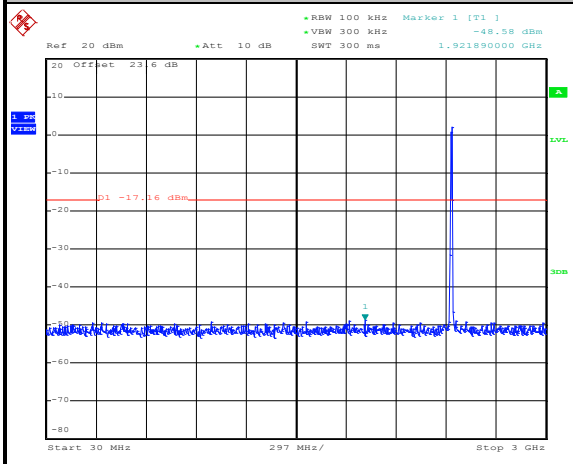
| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

**WLAN 802.11ac VHT20(10M) Channel 06**

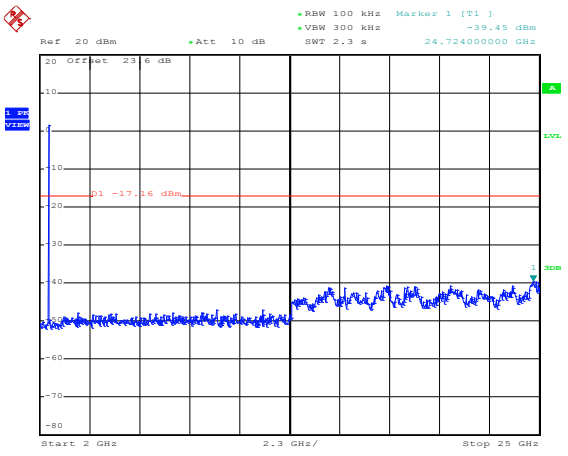
**100kHz PSD reference Level**




**Spurious Emission 30MHz~3GHz**



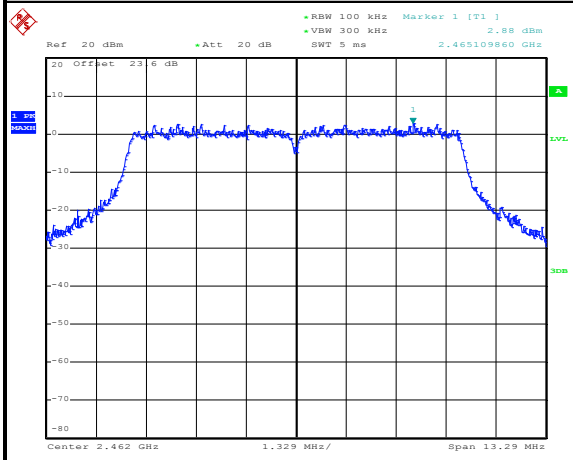

**Spurious Emission 2GHz~25GHz**



| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 11 | **Test Engineer :** | Osolemio Chang |

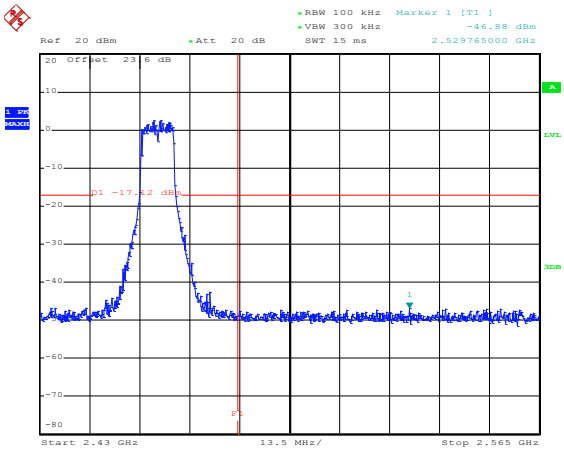
**WLAN 802.11ac VHT20(10M) Channel 11**

**100kHz PSD reference Level**



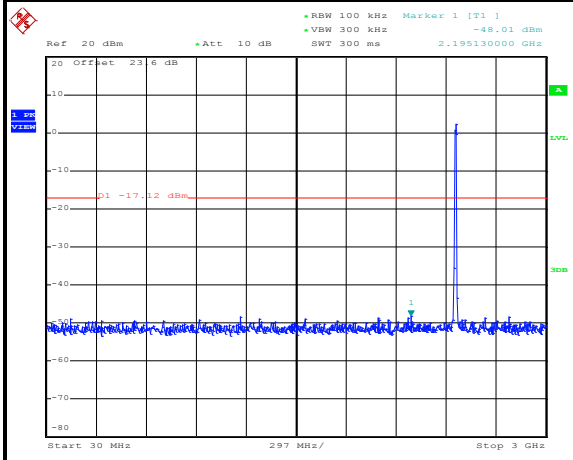

Date: 14.JAN.2016 00:16:56

**High Channel Plot**



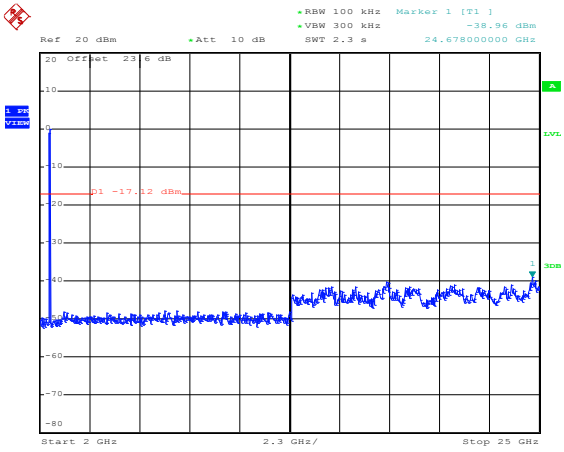

Date: 14.JAN.2016 00:17:10

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 00:18:24

**Spurious Emission 2GHz~25GHz**

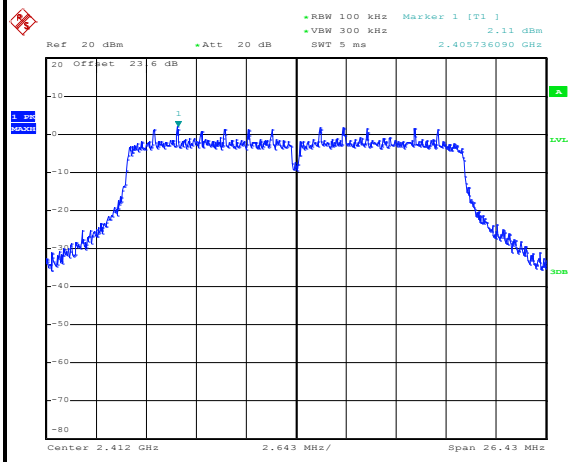



Date: 14.JAN.2016 00:18:33

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 01 | **Test Engineer :** | Osolemio Chang |

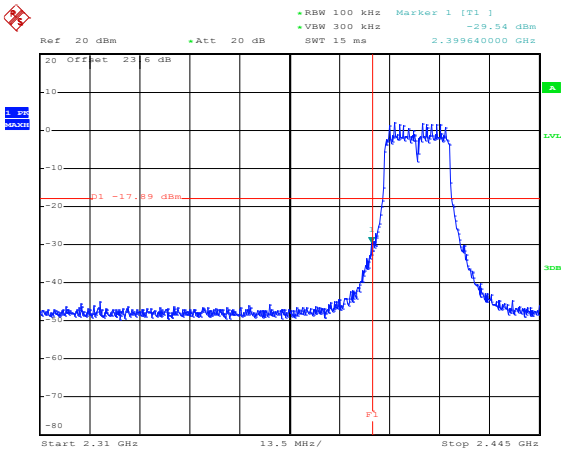
**WLAN 802.11ac VHT20 Channel 01**

**100kHz PSD reference Level**



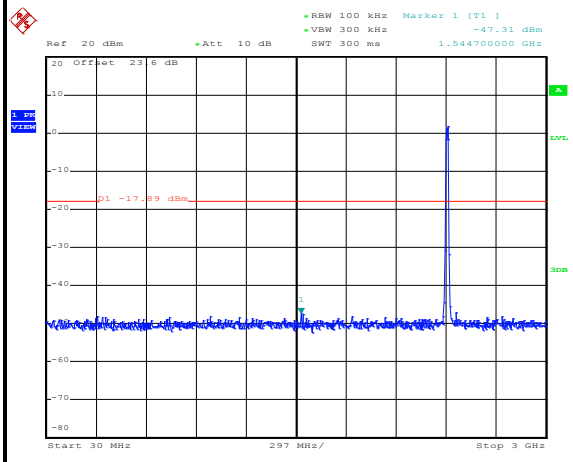

Date: 21.JAN.2016 21:05:47

**Low Channel Plot**



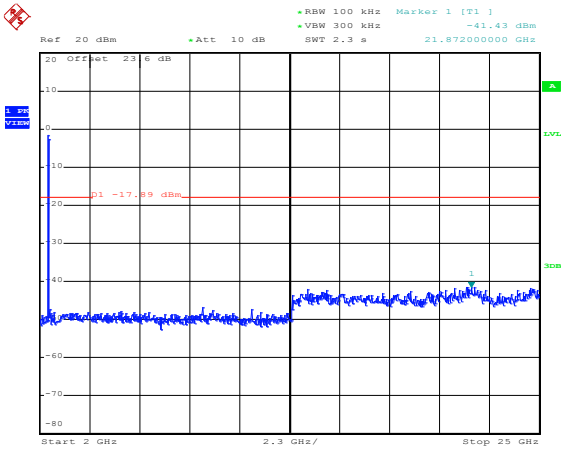

Date: 21.JAN.2016 21:06:13

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:08:52

**Spurious Emission 2GHz~25GHz**

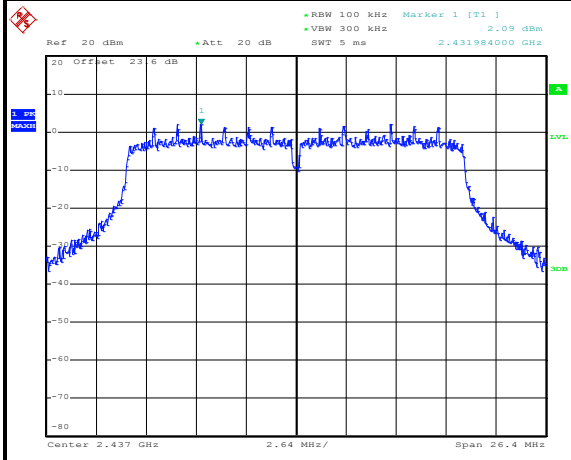



Date: 21.JAN.2016 21:09:12

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

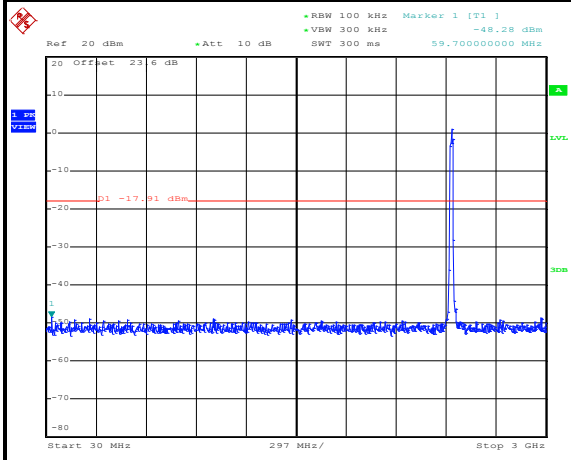
**WLAN 802.11ac VHT20 Channel 06**

**100kHz PSD reference Level**



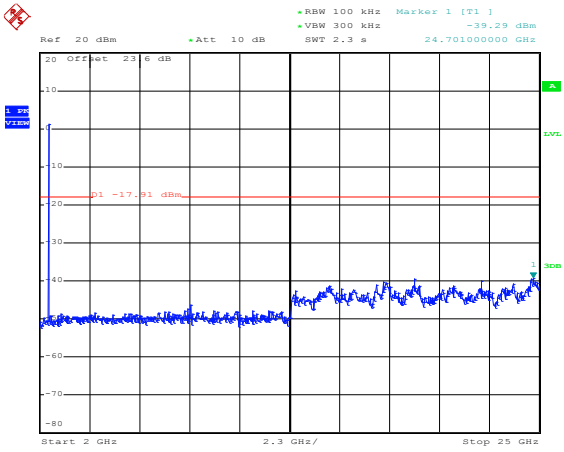

Date: 14.JAN.2016 00:40:10

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 00:40:40

**Spurious Emission 2GHz~25GHz**

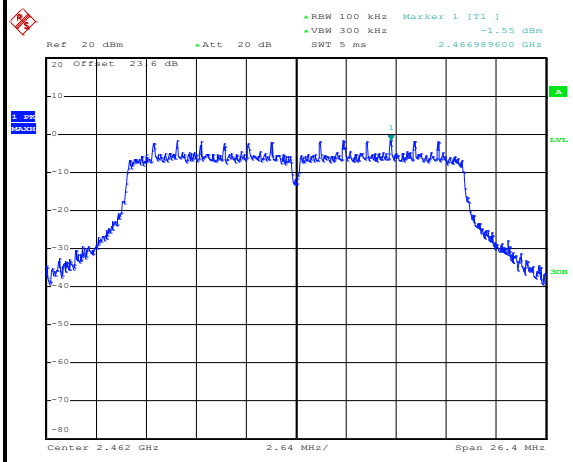



Date: 14.JAN.2016 00:40:49

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 11 | **Test Engineer :** | Osolemio Chang |

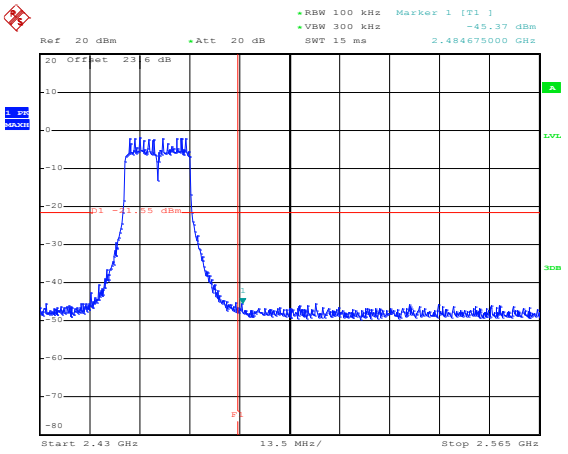
**WLAN 802.11ac VHT20 Channel 11**

**100kHz PSD reference Level**



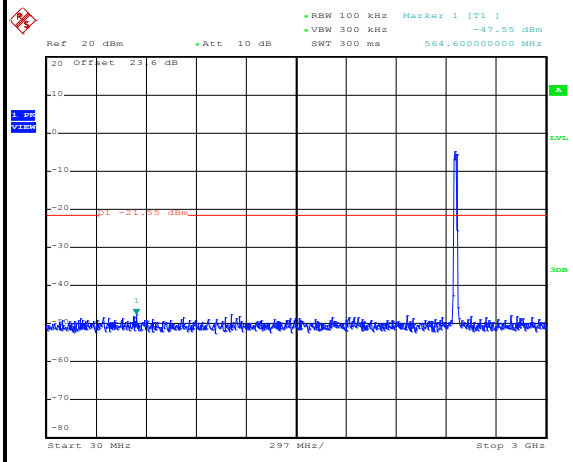

Date: 21.JAN.2016 21:13:31

**High Channel Plot**



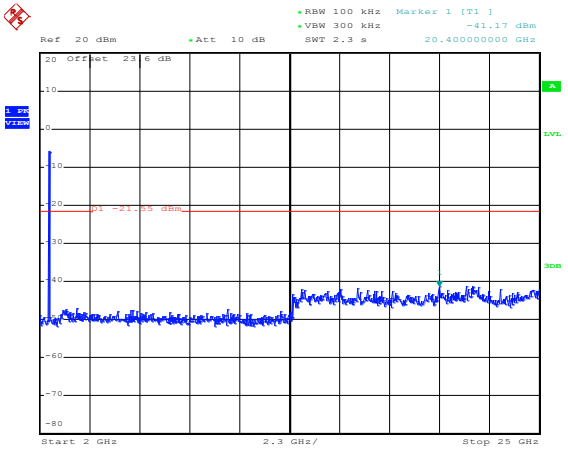

Date: 21.JAN.2016 21:13:53

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:14:07

**Spurious Emission 2GHz~25GHz**

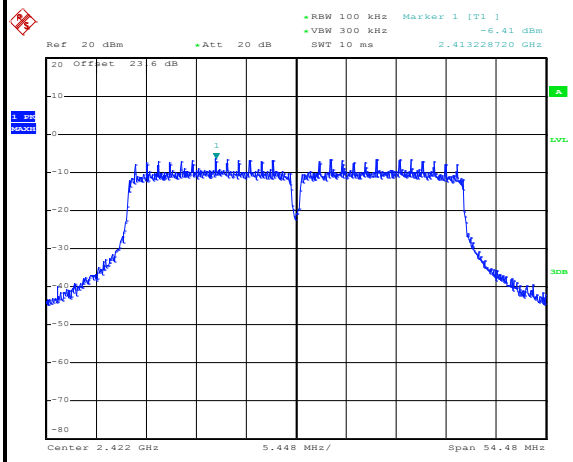



Date: 21.JAN.2016 21:14:16

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 03 | **Test Engineer :** | Osolemio Chang |

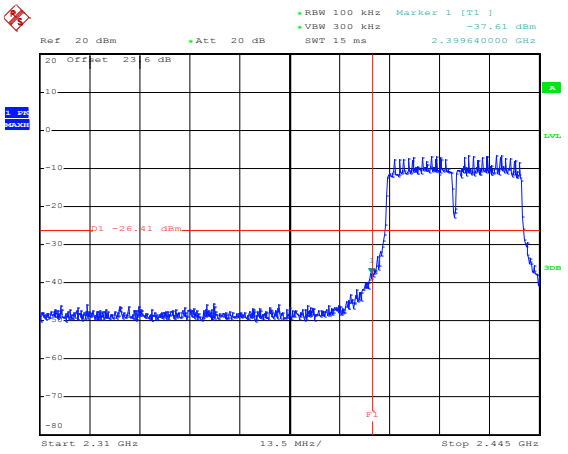
**WLAN 802.11ac VHT40 Channel 03**

**100kHz PSD reference Level**



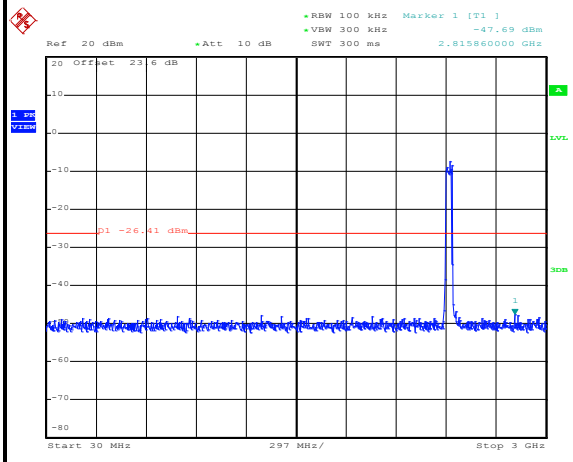

Date: 21.JAN.2016 21:28:33

**Low Channel Plot**



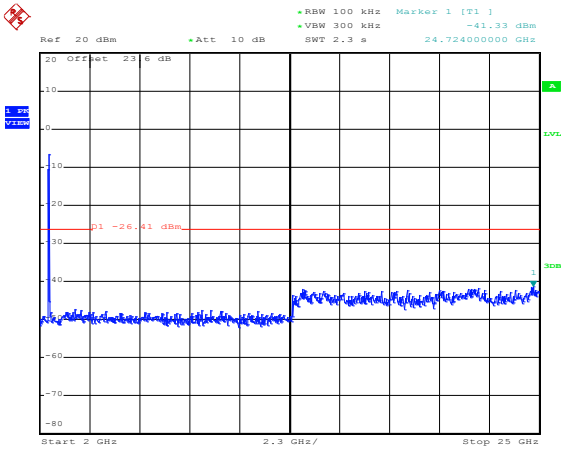

Date: 21.JAN.2016 21:28:48

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:29:02

**Spurious Emission 2GHz~25GHz**

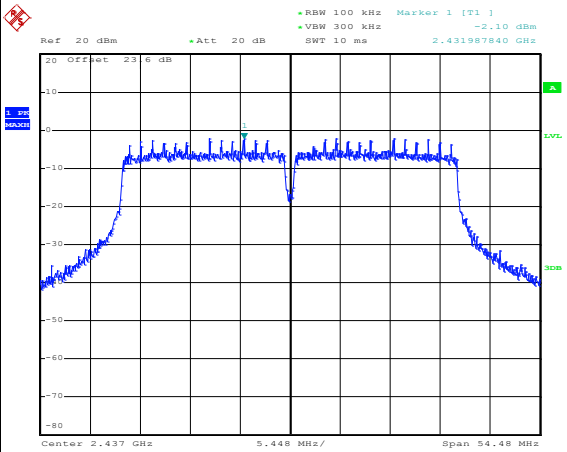



Date: 21.JAN.2016 21:29:11

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

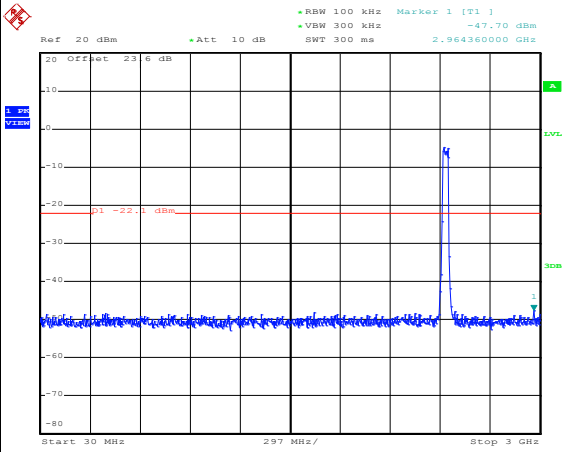
**WLAN 802.11ac VHT40 Channel 06**

**100kHz PSD reference Level**



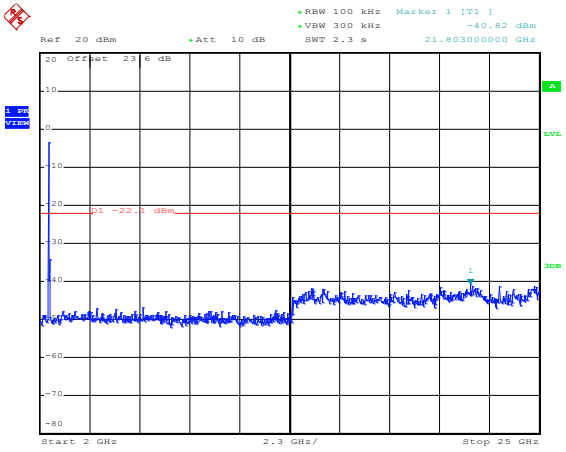

Date: 21.JAN.2016 21:32:55

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:34:04

**Spurious Emission 2GHz~25GHz**

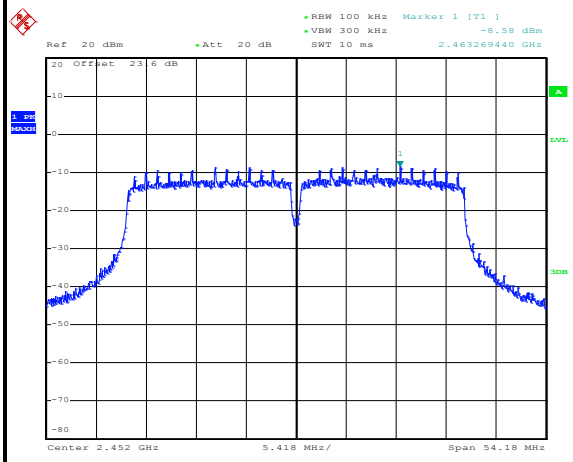



Date: 21.JAN.2016 21:34:12

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 1 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 09 | **Test Engineer :** | Osolemio Chang |

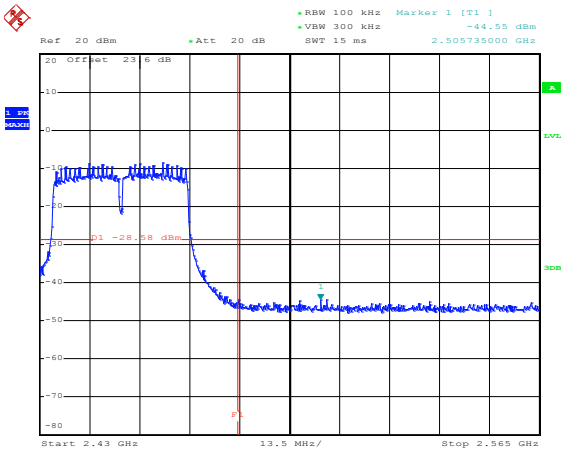
**WLAN 802.11ac VHT40 Channel 09**

**100kHz PSD reference Level**



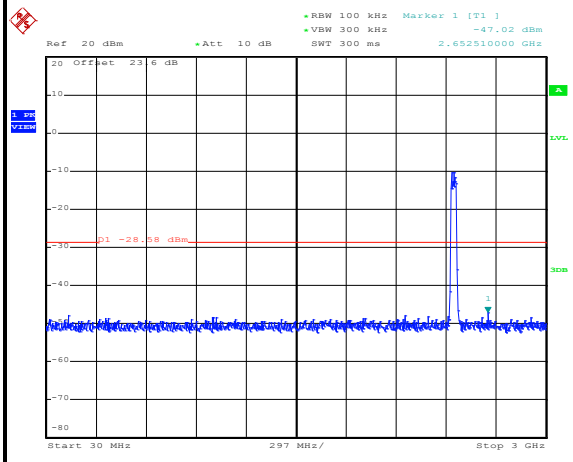

Date: 21.JAN.2016 21:40:43

**High Channel Plot**



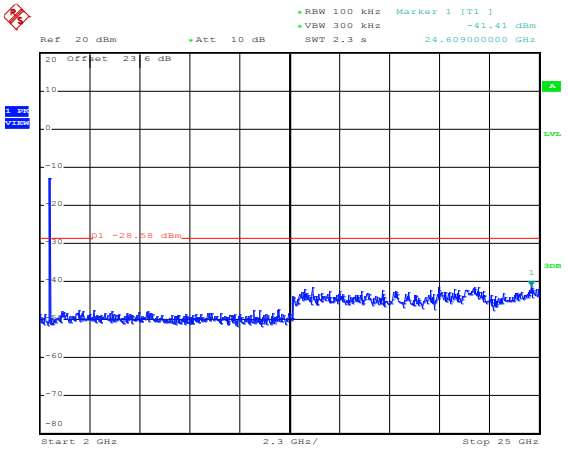

Date: 21.JAN.2016 21:45:18

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:45:30

**Spurious Emission 2GHz~25GHz**



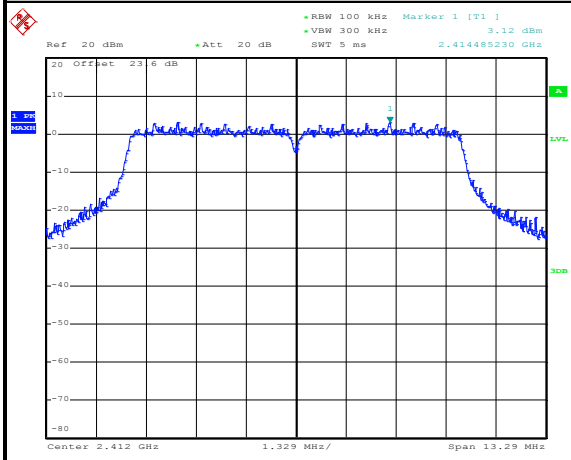

Date: 21.JAN.2016 21:45:39

**Number of TX = 2, Ant. 2 (Measured)**

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 01 | **Test Engineer :** | Osolemio Chang |

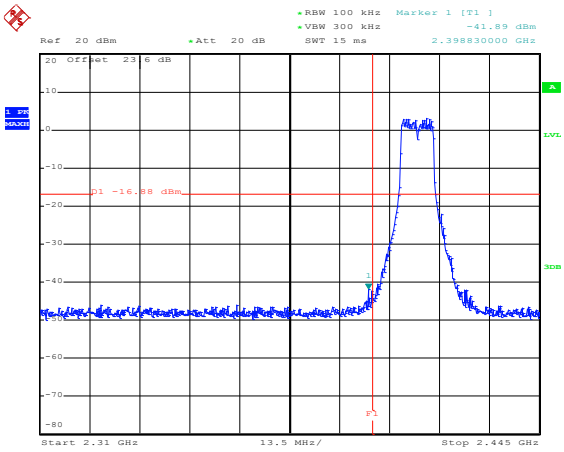
**WLAN 802.11ac VHT20(10M) Channel 01**

**100kHz PSD reference Level**



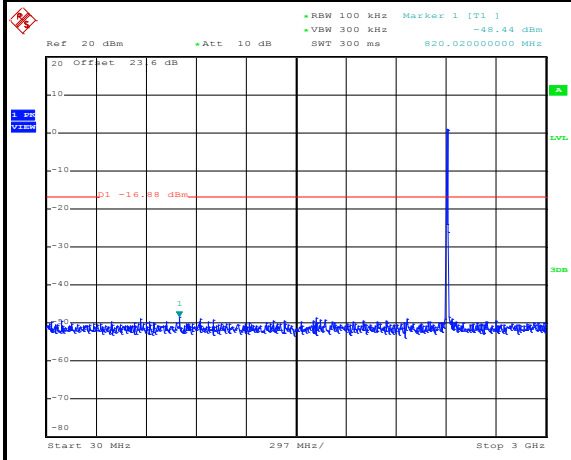

Date: 14.JAN.2016 00:01:16

**Low Channel Plot**



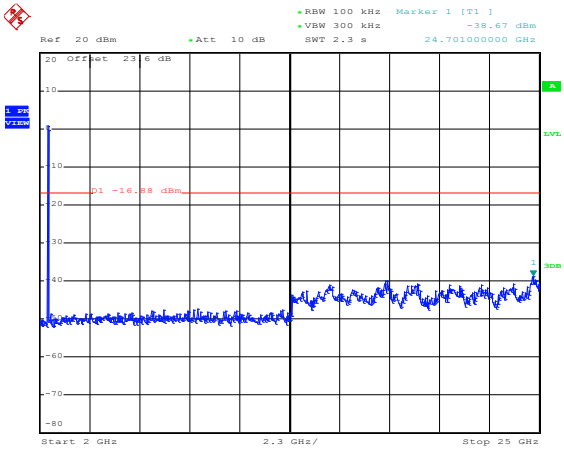

Date: 14.JAN.2016 00:01:43

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 00:01:56

**Spurious Emission 2GHz~25GHz**

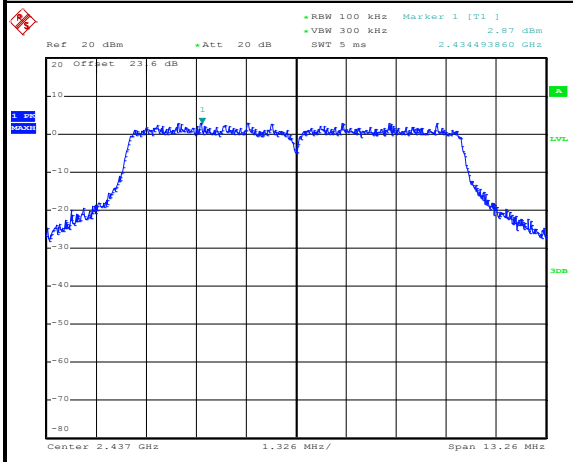



Date: 14.JAN.2016 00:02:04

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

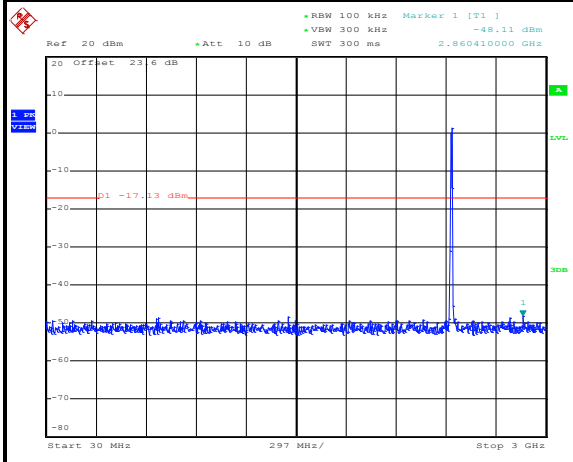
**WLAN 802.11ac VHT20(10M) Channel 06**

**100kHz PSD reference Level**



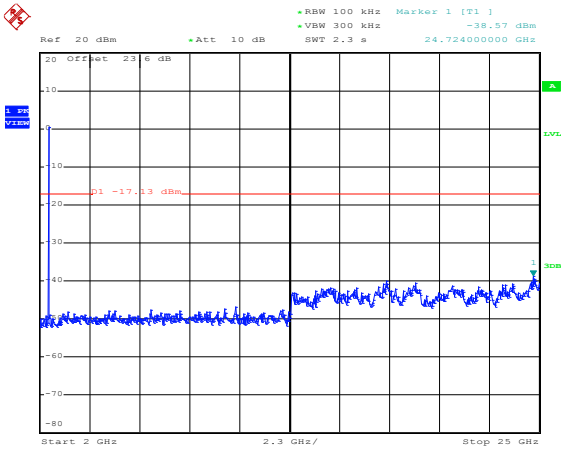

Date: 14.JAN.2016 00:12:22

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 00:12:35

**Spurious Emission 2GHz~25GHz**

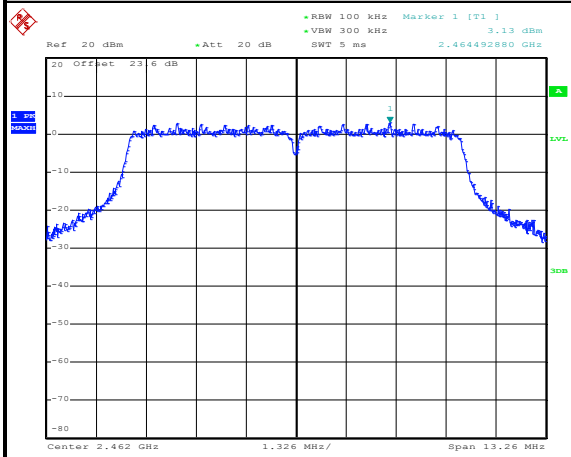



Date: 14.JAN.2016 00:12:44

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20(10M) | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 11 | **Test Engineer :** | Osolemio Chang |

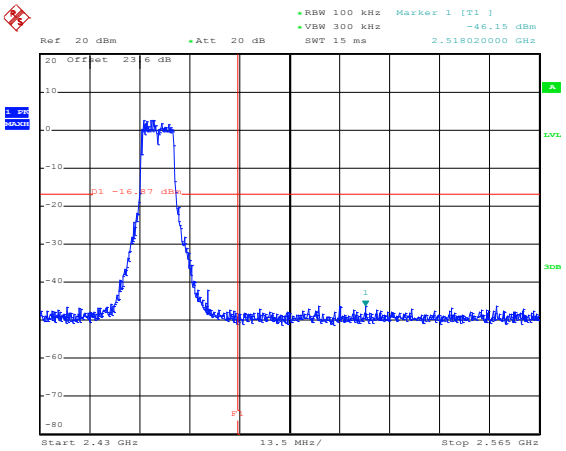
**WLAN 802.11ac VHT20(10M) Channel 11**

**100kHz PSD reference Level**



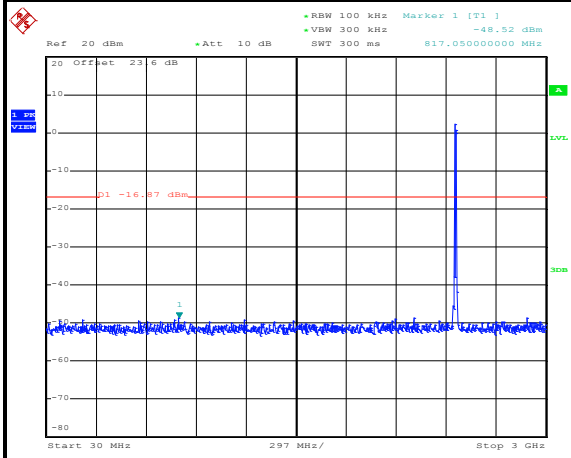

Date: 14.JAN.2016 00:21:39

**High Channel Plot**



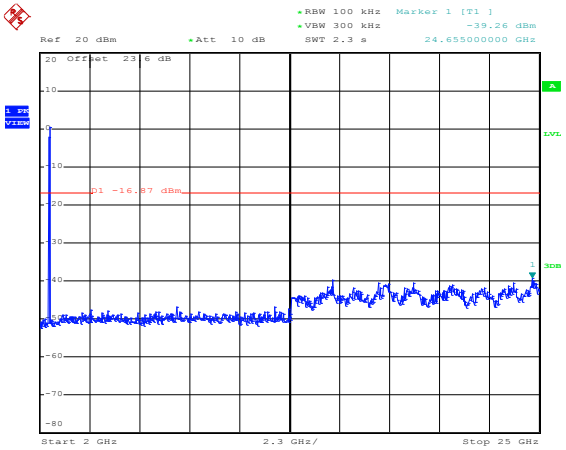

Date: 14.JAN.2016 00:21:53

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 00:22:16

**Spurious Emission 2GHz~25GHz**

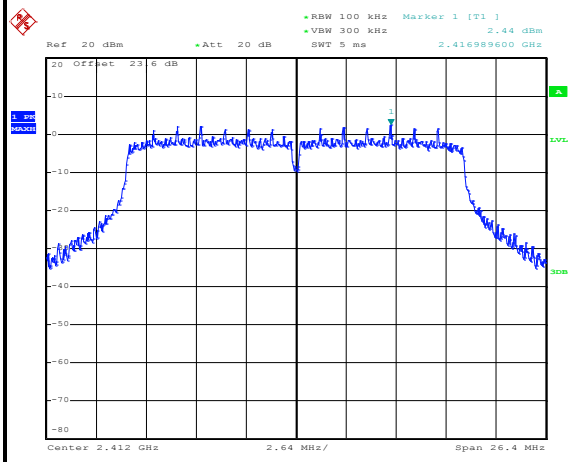



Date: 14.JAN.2016 00:22:24

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 01 | **Test Engineer :** | Osolemio Chang |

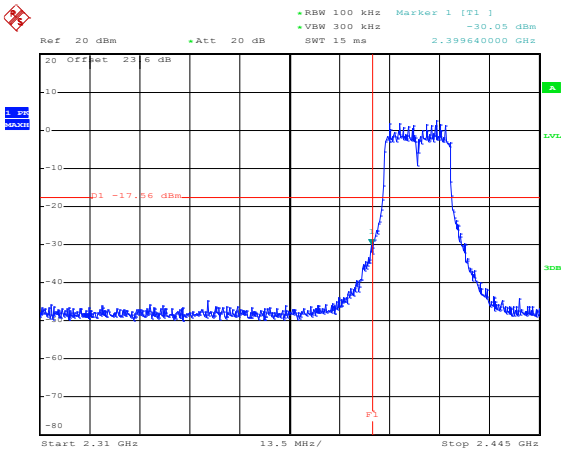
**WLAN 802.11ac VHT20 Channel 01**

**100kHz PSD reference Level**



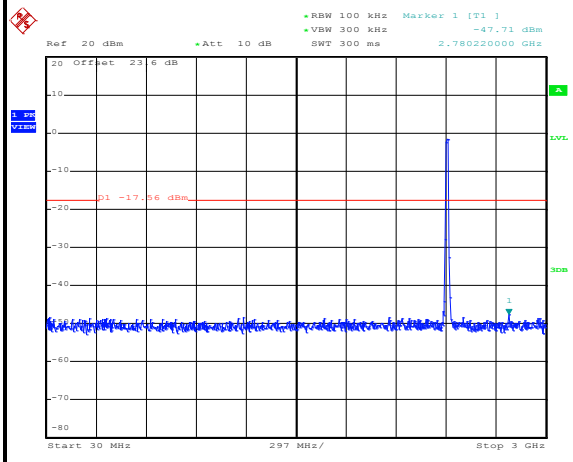

Date: 21.JAN.2016 21:22:48

**Low Channel Plot**



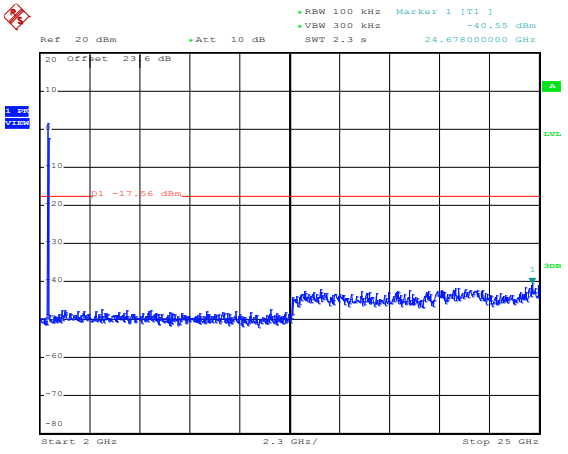

Date: 21.JAN.2016 21:23:10

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:23:29

**Spurious Emission 2GHz~25GHz**

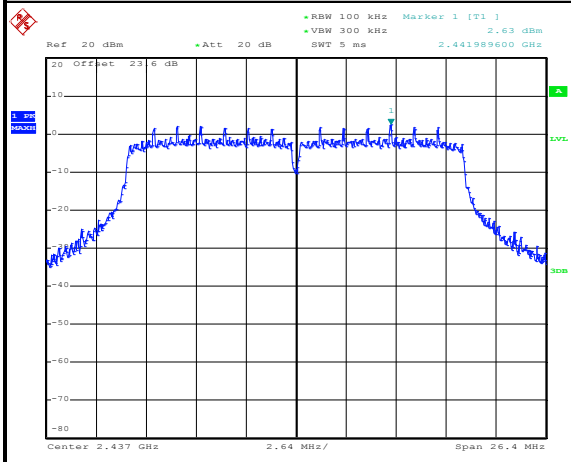



Date: 21.JAN.2016 21:23:37

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

**WLAN 802.11ac VHT20 Channel 06**

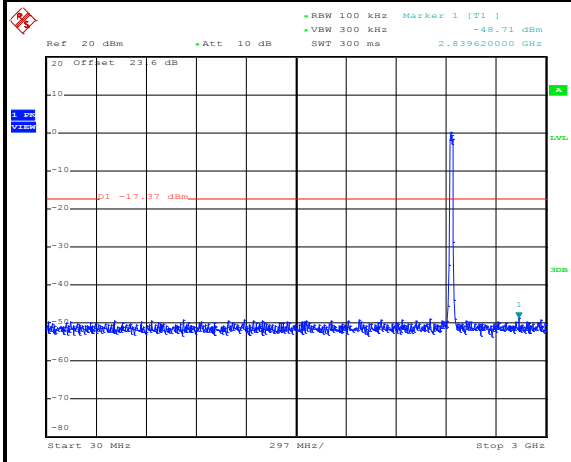
**100kHz PSD reference Level**




Date: 14.JAN.2016 00:44:06

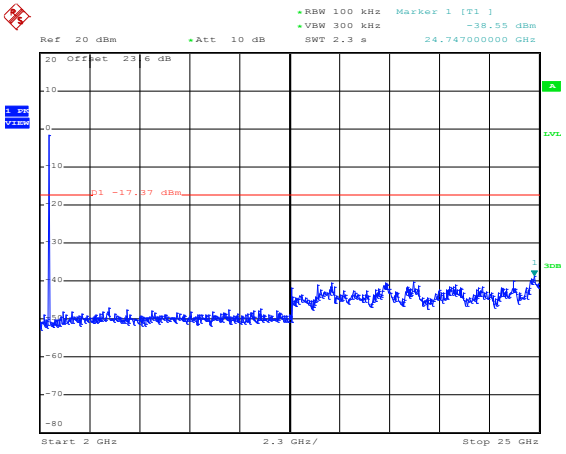
**Mid Channel Plot**

**Spurious Emission 30MHz~3GHz**




Date: 14.JAN.2016 00:45:17

**Spurious Emission 2GHz~25GHz**

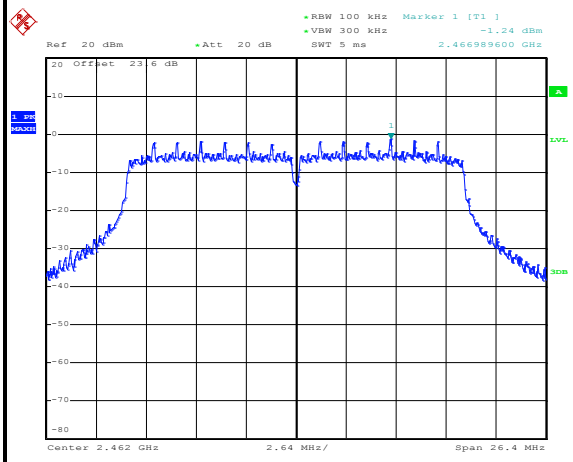



Date: 14.JAN.2016 00:45:27

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT20 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 11 | **Test Engineer :** | Osolemio Chang |

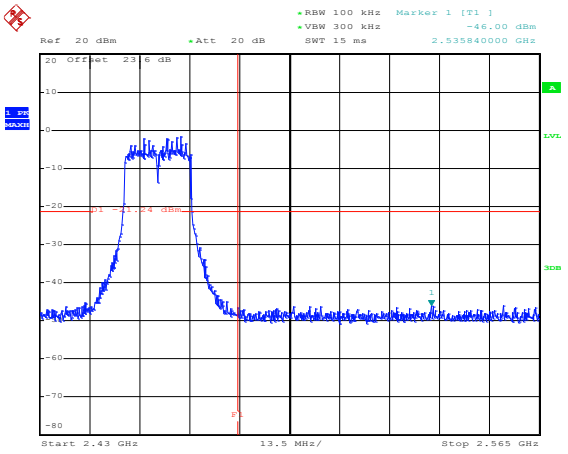
**WLAN 802.11ac VHT20 Channel 11**

**100kHz PSD reference Level**



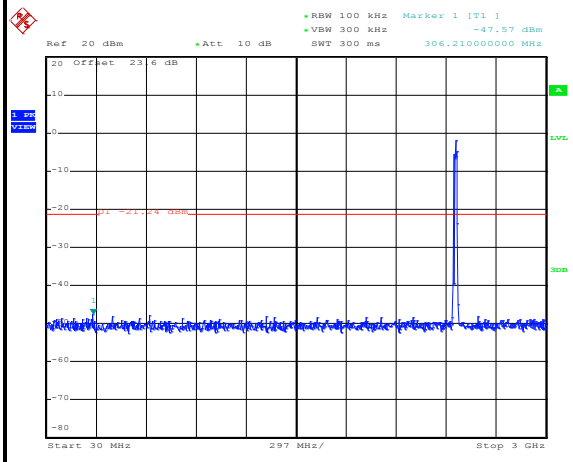

Date: 21.JAN.2016 21:18:52

**High Channel Plot**



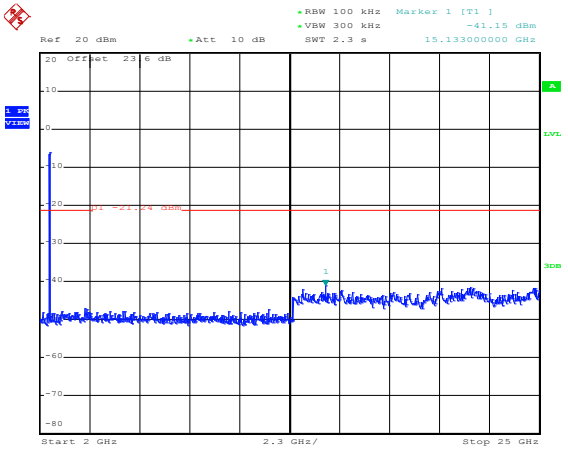

Date: 21.JAN.2016 21:19:04

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:19:31

**Spurious Emission 2GHz~25GHz**

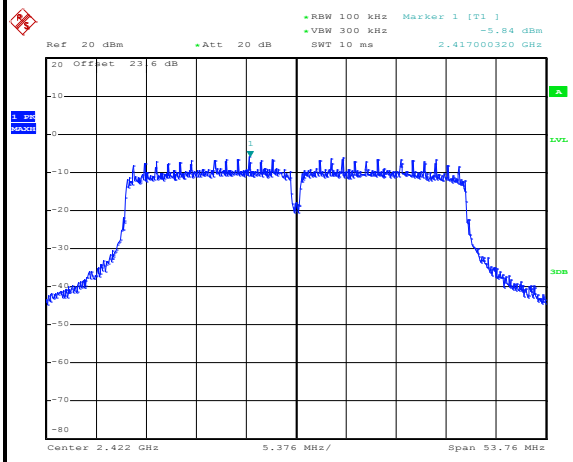



Date: 21.JAN.2016 21:19:39

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 03 | **Test Engineer :** | Osolemio Chang |

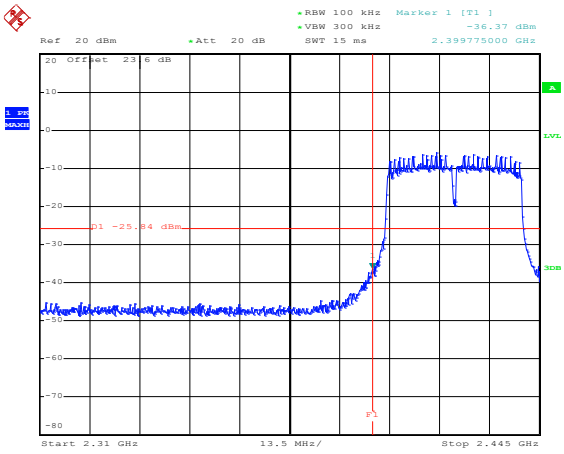
**WLAN 802.11ac VHT40 Channel 03**

**100kHz PSD reference Level**



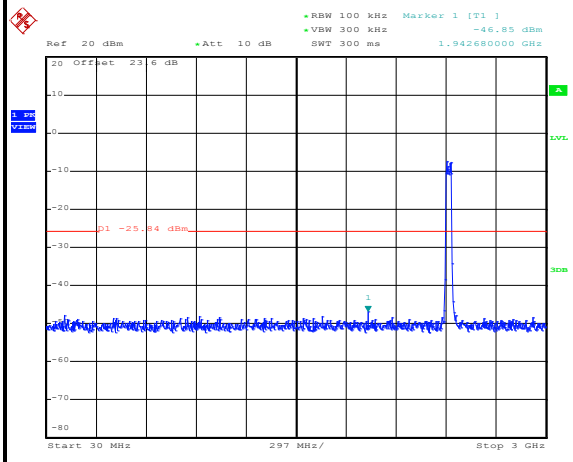

Date: 21.JAN.2016 22:03:07

**Low Channel Plot**



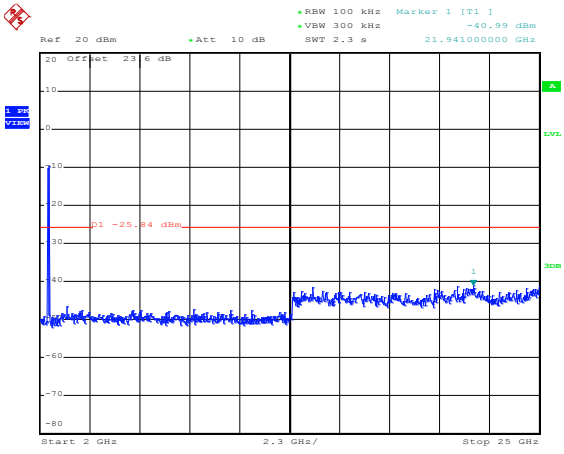

Date: 21.JAN.2016 22:04:37

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 22:07:44

**Spurious Emission 2GHz~25GHz**

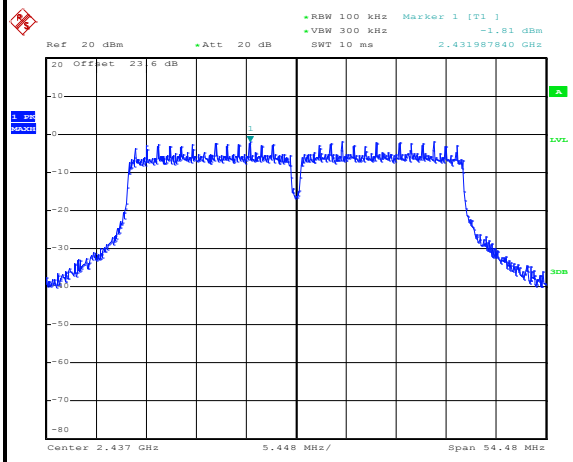



Date: 21.JAN.2016 22:07:52

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Osolemio Chang |

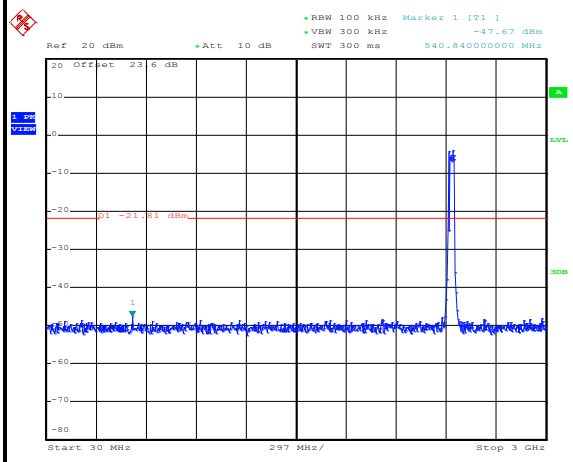
**WLAN 802.11ac VHT40 Channel 06**

**100kHz PSD reference Level**



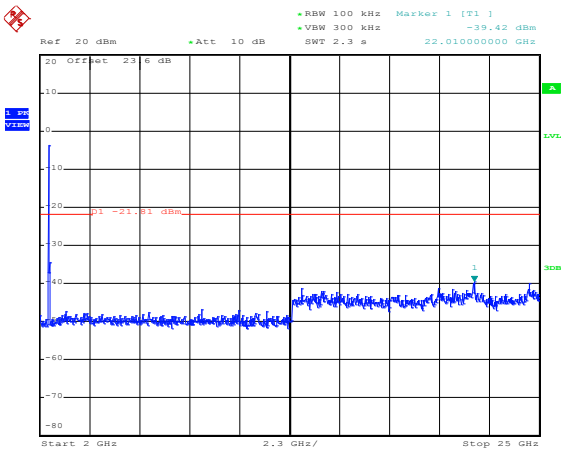

Date: 21.JAN.2016 21:56:12

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:57:13

**Spurious Emission 2GHz~25GHz**

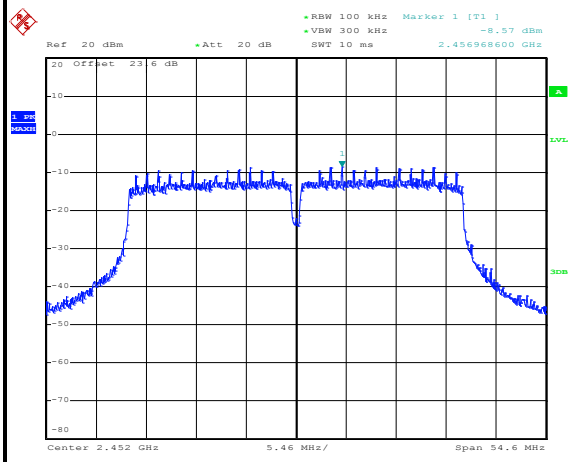



Date: 21.JAN.2016 21:57:21

| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Ant. :** | 2 |
| **Test Mode :** | 802.11ac VHT40 | **Temperature :** | 22~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 45~53% |
| **Test Channel :** | 09 | **Test Engineer :** | Osolemio Chang |

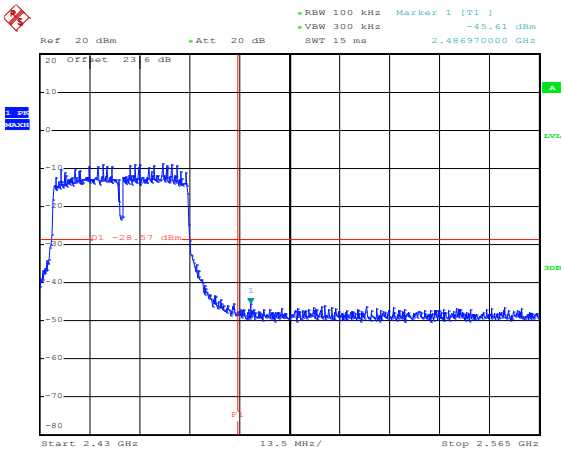
**WLAN 802.11ac VHT40 Channel 09**

**100kHz PSD reference Level**



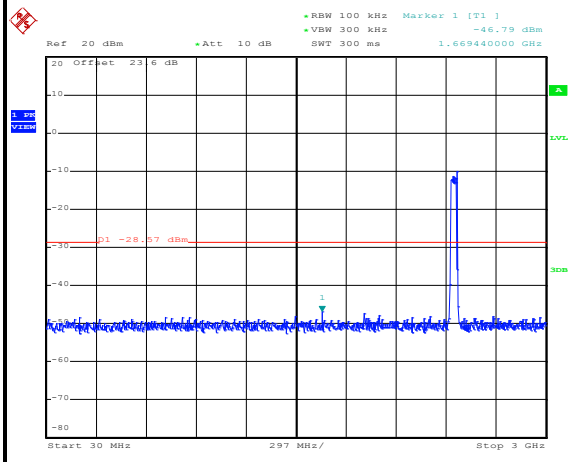

Date: 21.JAN.2016 21:49:13

**High Channel Plot**



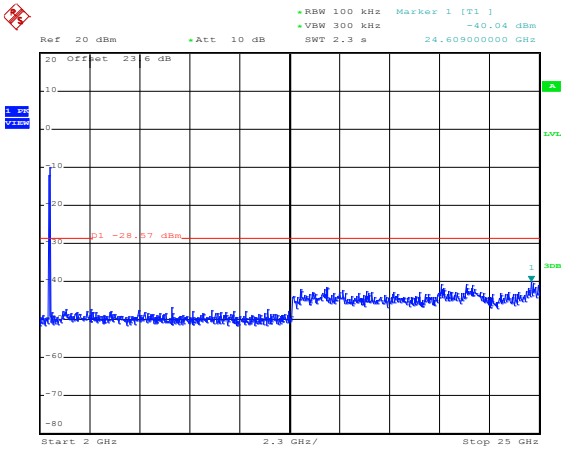

Date: 21.JAN.2016 21:49:28

**Spurious Emission 30MHz~3GHz**




Date: 21.JAN.2016 21:51:12

**Spurious Emission 2GHz~25GHz**




Date: 21.JAN.2016 21:51:21

## 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

The measuring equipment is listed in the section 4 of this test report.

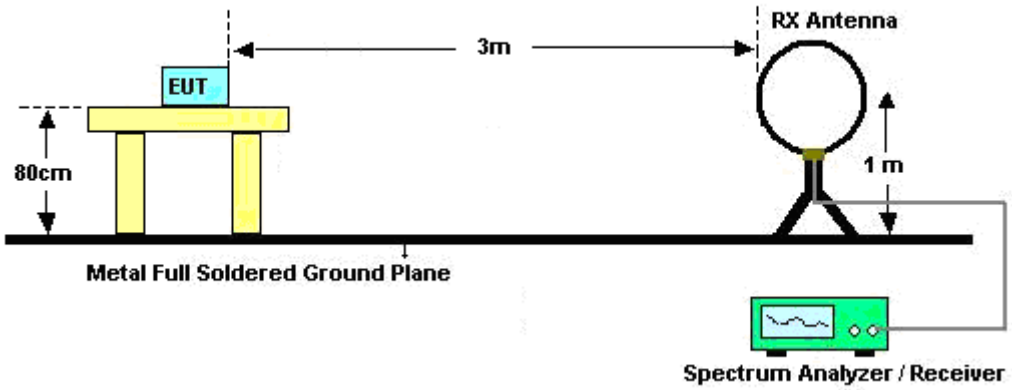
### 3.5.3 Test Procedure

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03.
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 for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively 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.

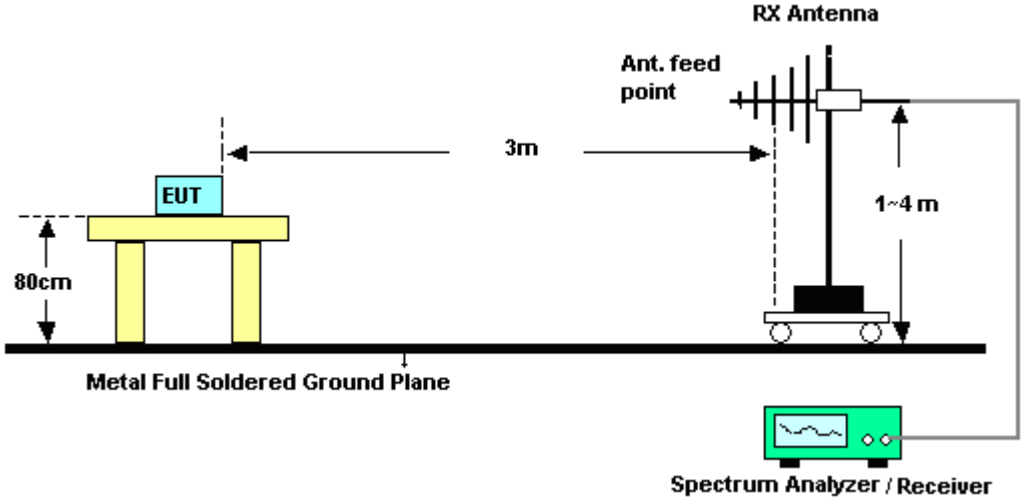
| Antenna | Band | Duty Cycle(%) | T(us) | 1/T(kHz) | VBW Setting |
|---|---|---|---|---|---|
| 0+1 | 2.4GHz 802.11ac20 (10M) for Ant 1 | 96.95 | 2540 | 0.39 | 1kHz |
| 0+1 | 2.4GHz 802.11ac20 (10M) for Ant 2 | 96.21 | 2540 | 0.39 | 1kHz |
| 0+1 | 2.4GHz 802.11ac20 for Ant 1 | 94.07 | 1270 | 0.79 | 1kHz |
| 0+1 | 2.4GHz 802.11ac20 for Ant 2 | 94.78 | 1270 | 0.79 | 1kHz |
| 0+1 | 2.4GHz 802.11ac40 for Ant 1 | 88.73 | 630 | 1.59 | 3kHz |
| 0+1 | 2.4GHz 802.11ac40 for Ant 2 | 88.73 | 630 | 1.59 | 3kHz |

### 3.5.4 Test Setup

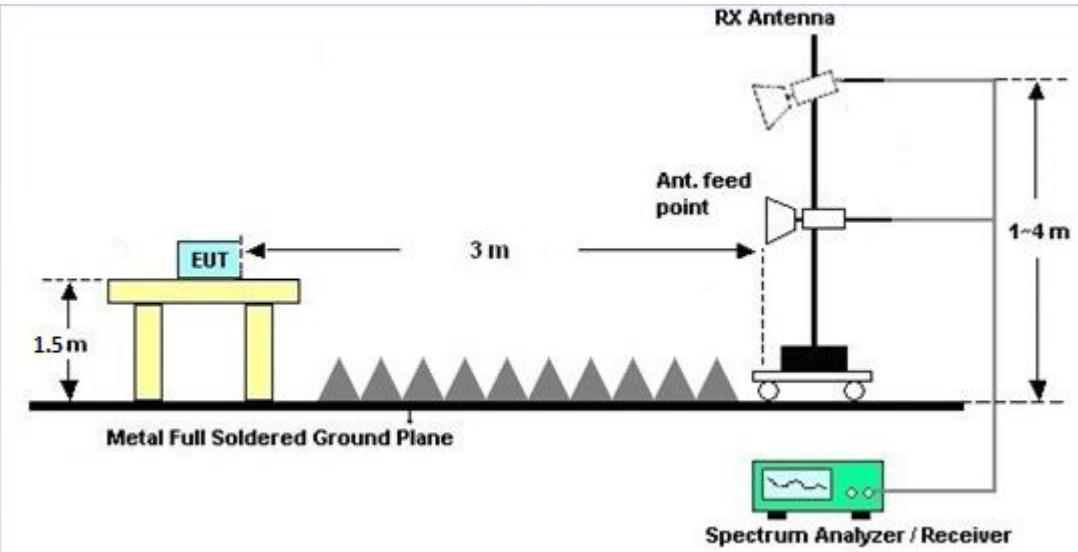
**For radiated emissions below 30MHz**




**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

Please refer to Appendix B and C of this report.

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

Please refer to Appendix B and C of this report.

# 3.6 AC Conducted Emission Measurement

## 3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

| Frequency of emission (MHz) | Conducted limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 79 | 66 |
| 0.5-30 | 73 | 60 |

*Decreases with the logarithm of the frequency.

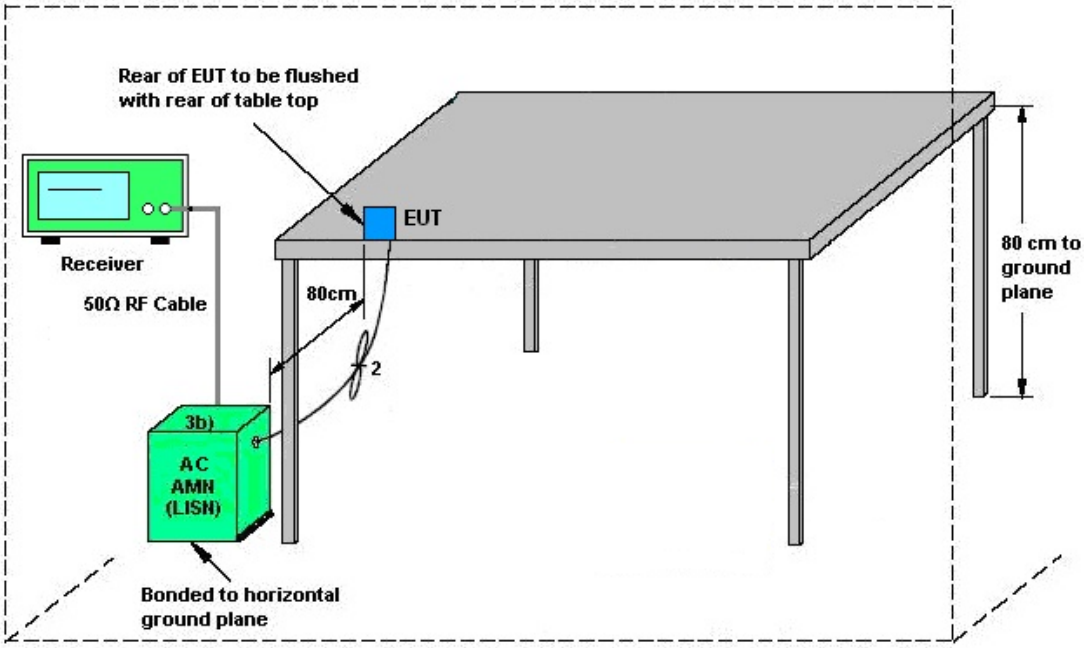
## 3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

## 3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

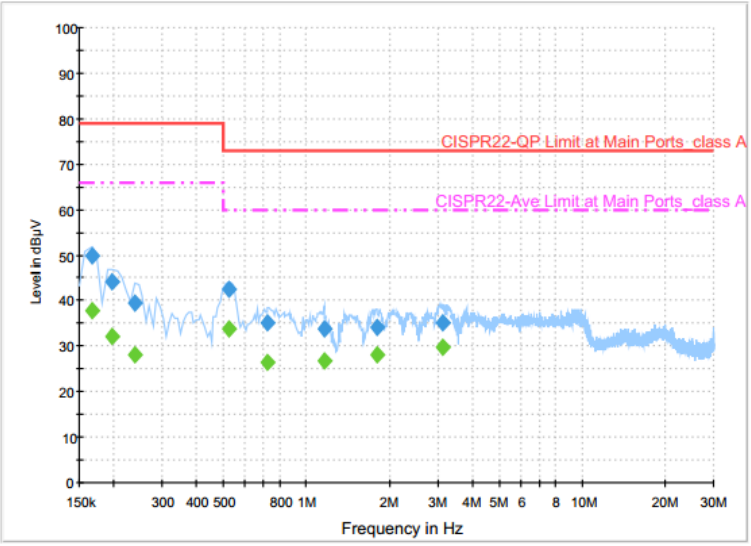
### 3.6.4 Test Setup




AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

## 3.6.5 Test Result of AC Conducted Emission

| Test Mode : | Mode 1 | Temperature : | 23~24℃ |
|---|---|---|---|
| Test Engineer : | Kai-Chun Chu | Relative Humidity : | 60~61% |
| Test Voltage : | 120Vac / 60Hz | Phase : | Line |
| Function Type : | WLAN Link + PoE + LAN Link | | |



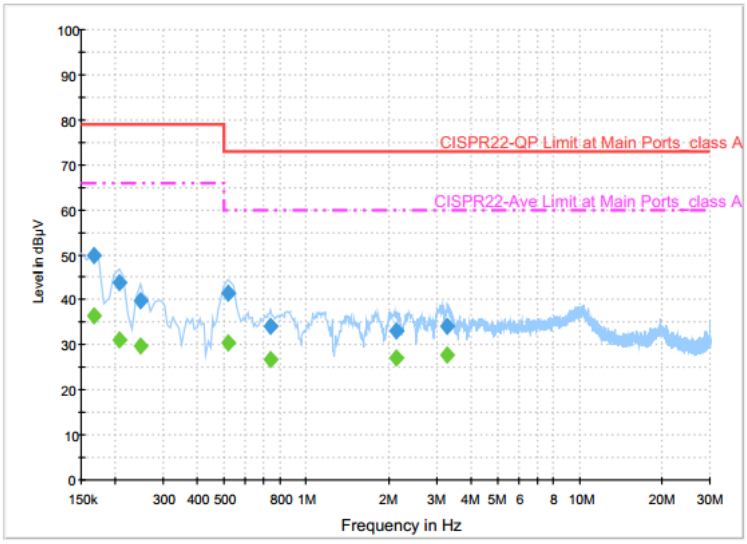

### Final Result : QuasiPeak

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.166000 | 49.9 | Off | L1 | 19.7 | 29.1 | 79.0 |
| 0.198000 | 44.0 | Off | L1 | 19.7 | 35.0 | 79.0 |
| 0.238000 | 39.6 | Off | L1 | 19.7 | 39.4 | 79.0 |
| 0.526000 | 42.6 | Off | L1 | 19.7 | 30.4 | 73.0 |
| 0.726000 | 35.2 | Off | L1 | 19.7 | 37.8 | 73.0 |
| 1.158000 | 33.7 | Off | L1 | 19.7 | 39.3 | 73.0 |
| 1.798000 | 34.0 | Off | L1 | 19.7 | 39.0 | 73.0 |
| 3.110000 | 35.2 | Off | L1 | 19.7 | 37.8 | 73.0 |

### Final Result : Average

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.166000 | 37.9 | Off | L1 | 19.7 | 28.1 | 66.0 |
| 0.198000 | 32.2 | Off | L1 | 19.7 | 33.8 | 66.0 |
| 0.238000 | 28.2 | Off | L1 | 19.7 | 37.8 | 66.0 |
| 0.526000 | 33.6 | Off | L1 | 19.7 | 26.4 | 60.0 |
| 0.726000 | 26.5 | Off | L1 | 19.7 | 33.5 | 60.0 |
| 1.158000 | 26.7 | Off | L1 | 19.7 | 33.3 | 60.0 |
| 1.798000 | 28.1 | Off | L1 | 19.7 | 31.9 | 60.0 |
| 3.110000 | 29.7 | Off | L1 | 19.7 | 30.3 | 60.0 |

| Test Mode : | Mode 1 | Temperature : | 23~24℃ |
|---|---|---|---|
| Test Engineer : | Kai-Chun Chu | Relative Humidity : | 60~61% |
| Test Voltage : | 120Vac / 60Hz | Phase : | Neutral |
| Function Type : | WLAN Link + PoE + LAN Link | | |




**Final Result : QuasiPeak**

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.166000 | 49.8 | Off | N | 19.7 | 29.2 | 79.0 |
| 0.206000 | 43.9 | Off | N | 19.7 | 35.1 | 79.0 |
| 0.246000 | 39.8 | Off | N | 19.7 | 39.2 | 79.0 |
| 0.518000 | 41.4 | Off | N | 19.7 | 31.6 | 73.0 |
| 0.742000 | 34.0 | Off | N | 19.6 | 39.0 | 73.0 |
| 2.134000 | 33.0 | Off | N | 19.6 | 40.0 | 73.0 |
| 3.294000 | 34.1 | Off | N | 19.7 | 38.9 | 73.0 |

**Final Result : Average**

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.166000 | 36.5 | Off | N | 19.7 | 29.5 | 66.0 |
| 0.206000 | 31.0 | Off | N | 19.7 | 35.0 | 66.0 |
| 0.246000 | 29.6 | Off | N | 19.7 | 36.4 | 66.0 |
| 0.518000 | 30.4 | Off | N | 19.7 | 29.6 | 60.0 |
| 0.742000 | 26.9 | Off | N | 19.6 | 33.1 | 60.0 |
| 2.134000 | 26.9 | Off | N | 19.6 | 33.1 | 60.0 |
| 3.294000 | 27.7 | Off | N | 19.7 | 32.3 | 60.0 |

# 3.7 Antenna Requirements

## 3.7.1 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.

## 3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

## 3.7.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

For CDD transmissions, directional gain is calculated as

Directional gain = $G_{ANT}$ + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log($N_{ANT}/N_{SS}$=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

The EUT supports CDD mode.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

| | Ant. 1 (dBi) | Ant. 2 (dBi) | DG for Power (dBi) | DG for PSD (dBi) | Power Limit Reduction (dB) | PSD Limit Reduction (dB) |
|---|---|---|---|---|---|---|
| **2.4 GHz** | 13.00 | 13.00 | 13.00 | 16.01 | 7.00 | 10.01 |

*Power Limit Reduction = DG(Power) – 6dBi, ( min = 0 )*

*PSD Limit Reduction = DG(PSD) – 6dBi, ( min = 0 )*

# 4 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Power Meter | Anritsu | ML2495A | 1132003 | 300MHz~40GHz | Aug. 12, 2015 | Jan. 13, 2016~ Jan. 21, 2016 | Aug. 11, 2016 | Conducted (TH05-HY) |
| Power Sensor | Anritsu | MA2411B | 1126017 | 300MHz~40GHz | Aug. 12, 2015 | Jan. 13, 2016~ Jan. 21, 2016 | Aug. 11, 2016 | Conducted (TH05-HY) |
| Spectrum Analyzer | Rohde & Schwarz | FSP40 | 100057 | 9kHz-40GHz | Nov. 23, 2015 | Jan. 13, 2016~ Jan. 21, 2016 | Nov. 22, 2016 | Conducted (TH05-HY) |
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100315 | 9 kHz~30 MHz | Sep. 02, 2015 | Jan. 18, 2016~ Jan. 19, 2016 | Sep. 01, 2016 | Radiation (03CH10-HY) |
| Amplifier | SONOMA | 310N | 187311 | 9kHz~1GHz | Nov. 16, 2015 | Jan. 18, 2016~ Jan. 19, 2016 | Nov. 15, 2016 | Radiation (03CH10-HY) |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | 9120D-1325 | 1GHz ~ 18GHz | Sep. 30, 2015 | Jan. 18, 2016~ Jan. 19, 2016 | Sep. 29, 2016 | Radiation (03CH10-HY) |
| Preamplifier | Keysight | 83017A | MY53270078 | 1GHz~26.5GHz | Nov. 13, 2015 | Jan. 18, 2016~ Jan. 19, 2016 | Nov. 12, 2016 | Radiation (03CH10-HY) |
| Preamplifier | MITEQ | AMF-7D-00101800-30-10P | 1902246 | 1GHz~18GHz | Nov. 16, 2015 | Jan. 18, 2016~ Jan. 19, 2016 | Nov. 15, 2016 | Radiation (03CH10-HY) |
| Spectrum Analyzer | Keysight | N9010A | MY54200485 | 10Hz ~ 44GHZ | Oct. 15, 2015 | Jan. 18, 2016~ Jan. 19, 2016 | Oct. 14, 2016 | Radiation (03CH10-HY) |
| Antenna Mast | EMEC | AM-BS-4500-B | N/A | 1~4m | N/A | Jan. 18, 2016~ Jan. 19, 2016 | N/A | Radiation (03CH10-HY) |
| Turn Table | EMEC | TT 2200 | N/A | 0-360 degree | N/A | Jan. 18, 2016~ Jan. 19, 2016 | N/A | Radiation (03CH10-HY) |
| Bilog Antenna | TESEQ | CBL 6111D | 37059 | 30MHz~1GHz | Dec. 29, 2015 | Jan. 18, 2016~ Jan. 19, 2016 | Dec. 28, 2016 | Radiation (03CH10-HY) |
| EMI Test Receiver | Rohde & Schwarz | ESU26 | 100390 | 20Hz~26.5GHz | Dec. 21, 2015 | Jan. 18, 2016~ Jan. 19, 2016 | Dec. 20, 2016 | Radiation (03CH10-HY) |
| Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170584 | 18GHz- 40GHz | Nov. 02, 2015 | Jan. 18, 2016~ Jan. 19, 2016 | Nov. 01, 2016 | Radiation (03CH10-HY) |
| Preamplifier | MITEQ | JS44-18004000-33-8P | 1840917 | 18GHz ~ 40GHz | Jun. 02, 2015 | Jan. 18, 2016~ Jan. 19, 2016 | Jun. 01, 2016 | Radiation (03CH10-HY) |
| AC Power Source | ChainTek | APC-1000W | N/A | N/A | N/A | Jan. 05, 2016 | N/A | Conduction (CO05-HY) |
| EMI Test Receiver | Rohde & Schwarz | ESCI 7 | 100724 | 9kHz~7GHz | Aug. 26, 2015 | Jan. 05, 2016 | Aug. 25, 2016 | Conduction (CO05-HY) |
| LISN | Rohde & Schwarz | ENV216 | 100080 | 9kHz~30MHz | Dec. 02, 2015 | Jan. 05, 2016 | Dec. 01, 2016 | Conduction (CO05-HY) |

# 5 Uncertainty of Evaluation

**Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **2.26** |

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

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **4.90** |

# Appendix A. Conducted Test Results

**<PTP>**

Report Number : FR5D3042

| | | | | |
|---|---|---|---|---|
| Test Engineer: | osolemio Chang | Temperature: | 23.4 ~ 24.5 | °C |
| Test Date: | 2016/1/13 ~ 2016/1/21 | Relative Humidity: | 52.9 ~ 54.1 | % |

## ***TEST RESULTS DATA***
## ***6dB and 99% Occupied Bandwidth***

| 2.4GHz Band | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | 99% Occupied BW (MHz) | | 6dB BW (MHz) | | 6dB BW Limit (MHz) | Pass/Fail |
| | | | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | | |
| VHT20(10M) | MCS0 | 2 | 1 | 2412 | 10.23 | 10.23 | 8.84 | 8.86 | 0.50 | Pass |
| VHT20(10M) | MCS0 | 2 | 6 | 2437 | 10.33 | 10.30 | 8.84 | 8.84 | 0.50 | Pass |
| VHT20(10M) | MCS0 | 2 | 11 | 2462 | 10.38 | 10.18 | 8.86 | 8.86 | 0.50 | Pass |
| VHT20 | MCS0 | 2 | 1 | 2412 | 18.55 | 18.70 | 17.62 | 17.60 | 0.50 | Pass |
| VHT20 | MCS0 | 2 | 6 | 2437 | 18.50 | 18.55 | 17.60 | 17.60 | 0.50 | Pass |
| VHT20 | MCS0 | 2 | 11 | 2462 | 18.65 | 18.45 | 17.60 | 17.60 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 3 | 2422 | 36.60 | 36.60 | 36.32 | 35.84 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 6 | 2437 | 36.70 | 37.00 | 36.32 | 36.32 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 9 | 2452 | 36.70 | 36.80 | 36.12 | 36.40 | 0.50 | Pass |

Report Number : FR5D3042

## ***TEST RESULTS DATA***
## ***Peak Output Power***

| 2.4GHz Band | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Peak Conducted Power (dBm) | | | Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power (dBm) | | | | Pass /Fail |
| | | | | | Ant 1 | Ant 2 | SUM | Ant 1 | Ant 2 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | | | |
| VHT20(10M) | MCS0 | 2 | 1 | 2412 | 24.40 | 24.43 | 27.43 | 28.00 | | 13.00 | | 40.43 | | | | Pass |
| VHT20(10M) | MCS0 | 2 | 6 | 2437 | 24.70 | 24.61 | 27.67 | 28.00 | | 13.00 | | 40.67 | | | | Pass |
| VHT20(10M) | MCS0 | 2 | 11 | 2462 | 24.73 | 24.83 | 27.79 | 28.00 | | 13.00 | | 40.79 | | | | Pass |
| VHT20 | MCS0 | 2 | 1 | 2412 | 19.64 | 19.63 | 22.65 | 28.00 | | 13.00 | | 35.65 | | | | Pass |
| VHT20 | MCS0 | 2 | 6 | 2437 | 24.61 | 24.78 | 27.71 | 28.00 | | 13.00 | | 40.71 | | | | Pass |
| VHT20 | MCS0 | 2 | 11 | 2462 | 15.77 | 15.81 | 18.80 | 28.00 | | 13.00 | | 31.80 | | | | Pass |
| VHT40 | MCS0 | 2 | 3 | 2422 | 14.04 | 14.44 | 17.25 | 28.00 | | 13.00 | | 30.25 | | | | Pass |
| VHT40 | MCS0 | 2 | 6 | 2437 | 18.36 | 18.49 | 21.44 | 28.00 | | 13.00 | | 34.44 | | | | Pass |
| VHT40 | MCS0 | 2 | 9 | 2452 | 18.36 | 11.55 | 14.48 | 28.00 | | 13.00 | | 27.48 | | | | Pass |

Note: Measured power (dBm) has offset with cable loss.

## ***TEST RESULTS DATA***
## ***Average Output Power***

| 2.4GHz Band | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Duty Factor (dB) | | Average Conducted Power (dBm) | | |
| | | | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | SUM |
| VHT20(10M) | MCS0 | 2 | 1 | 2412 | 0.13 | 0.17 | 18.60 | 18.49 | 21.56 |
| VHT20(10M) | MCS0 | 2 | 6 | 2437 | 0.13 | 0.17 | 18.66 | 18.49 | 21.70 |
| VHT20(10M) | MCS0 | 2 | 11 | 2462 | 0.13 | 0.17 | 18.68 | 18.49 | 21.80 |
| VHT20 | MCS0 | 2 | 1 | 2412 | 0.27 | 0.23 | 13.45 | 13.36 | 16.41 |
| VHT20 | MCS0 | 2 | 6 | 2437 | 0.27 | 0.23 | 18.50 | 13.36 | 21.77 |
| VHT20 | MCS0 | 2 | 11 | 2462 | 0.27 | 0.23 | 9.51 | 13.36 | 12.56 |
| VHT40 | MCS0 | 2 | 3 | 2422 | 0.52 | 0.52 | 7.97 | 7.99 | 10.99 |
| VHT40 | MCS0 | 2 | 6 | 2437 | 0.52 | 0.52 | 12.19 | 12.07 | 15.19 |
| VHT40 | MCS0 | 2 | 9 | 2452 | 0.52 | 0.52 | 5.28 | 5.31 | 8.30 |

Note: Measured power (dBm) has offset with cable loss.

## ***TEST RESULTS DATA***
## ***Peak Power Spectral Density***

| 2.4GHz Band | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Peak PSD (dBm/3kHz) | | | DG (dBi) | | Peak PSD Limit (dBm/3kHz) | | Pass/Fail |
| | | | | | Ant 1 | Ant 2 | Worse + 3.01 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | |
| VHT20(10M) | MCS0 | 2 | 1 | 2412 | -3.97 | -4.61 | -0.96 | 16.01 | | 5.00 | | Pass |
| VHT20(10M) | MCS0 | 2 | 6 | 2437 | -4.41 | -4.22 | -1.21 | 16.01 | | 5.00 | | Pass |
| VHT20(10M) | MCS0 | 2 | 11 | 2462 | -4.55 | -3.74 | -0.73 | 16.01 | | 5.00 | | Pass |
| VHT20 | MCS0 | 2 | 1 | 2412 | -12.06 | -12.59 | -9.05 | 16.01 | | 5.00 | | Pass |
| VHT20 | MCS0 | 2 | 6 | 2437 | -7.12 | -8.16 | -4.11 | 16.01 | | 5.00 | | Pass |
| VHT20 | MCS0 | 2 | 11 | 2462 | -16.02 | -15.43 | -12.42 | 16.01 | | 5.00 | | Pass |
| VHT40 | MCS0 | 2 | 3 | 2422 | -20.45 | -21.00 | -17.44 | 16.01 | | 5.00 | | Pass |
| VHT40 | MCS0 | 2 | 6 | 2437 | -16.10 | -15.77 | -12.76 | 16.01 | | 5.00 | | Pass |
| VHT40 | MCS0 | 2 | 9 | 2452 | -22.41 | -22.41 | -19.40 | 16.01 | | 5.00 | | Pass |

Measured power density (dBm) has offset with cable loss.

**<PTMP>**

Report Number : FR5D3042

| | | | | |
|---|---|---|---|---|
| Test Engineer: | osolemio Chang | Temperature: | 22.7 ~ 23.5 | °C |
| Test Date: | 2016/1/13 ~ 2016/1/21 | Relative Humidity: | 52.4 ~ 53.8 | % |

## ***TEST RESULTS DATA***
## ***6dB and 99% Occupied Bandwidth***

| 2.4GHz Band | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | 99% Occupied BW (MHz) | | 6dB BW (MHz) | | 6dB BW Limit (MHz) | Pass/Fail |
| | | | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | | |
| VHT20(10M) | MCS0 | 2 | 1 | 2412 | 10.18 | 10.33 | 8.84 | 8.86 | 0.50 | Pass |
| VHT20(10M) | MCS0 | 2 | 6 | 2437 | 10.35 | 10.28 | 8.84 | 8.84 | 0.50 | Pass |
| VHT20(10M) | MCS0 | 2 | 11 | 2462 | 10.25 | 10.20 | 8.86 | 8.84 | 0.50 | Pass |
| VHT20 | MCS0 | 2 | 1 | 2412 | 18.55 | 18.70 | 17.62 | 17.60 | 0.50 | Pass |
| VHT20 | MCS0 | 2 | 6 | 2437 | 18.65 | 18.65 | 17.60 | 17.60 | 0.50 | Pass |
| VHT20 | MCS0 | 2 | 11 | 2462 | 18.65 | 18.45 | 17.60 | 17.60 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 3 | 2422 | 36.60 | 36.60 | 36.32 | 35.84 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 6 | 2437 | 36.70 | 37.00 | 36.32 | 36.32 | 0.50 | Pass |
| VHT40 | MCS0 | 2 | 9 | 2452 | 36.70 | 36.80 | 36.12 | 36.40 | 0.50 | Pass |

Report Number : FR5D3042

## ***TEST RESULTS DATA***
## ***Peak Output Power***

| 2.4GHz Band | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Peak Conducted Power (dBm) | | | Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power (dBm) | | EIRP Power Limit (dBm) | | Pass /Fail |
| | | | | | Ant 1 | Ant 2 | SUM | Ant 1 | Ant 2 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | |
| VHT20(10M) | MCS0 | 2 | 1 | 2412 | 19.41 | 19.62 | 22.53 | 23.00 | | 13.00 | | 35.53 | | 36.00 | | Pass |
| VHT20(10M) | MCS0 | 2 | 6 | 2437 | 19.45 | 19.71 | 22.59 | 23.00 | | 13.00 | | 35.59 | | 36.00 | | Pass |
| VHT20(10M) | MCS0 | 2 | 11 | 2462 | 19.42 | 19.24 | 22.34 | 23.00 | | 13.00 | | 35.34 | | 36.00 | | Pass |
| VHT20 | MCS0 | 2 | 1 | 2412 | 19.64 | 19.88 | 22.77 | 23.00 | | 13.00 | | 35.77 | | 36.00 | | Pass |
| VHT20 | MCS0 | 2 | 6 | 2437 | 19.72 | 19.97 | 22.86 | 23.00 | | 13.00 | | 35.86 | | 36.00 | | Pass |
| VHT20 | MCS0 | 2 | 11 | 2462 | 15.77 | 15.81 | 18.80 | 23.00 | | 13.00 | | 31.80 | | 36.00 | | Pass |
| VHT40 | MCS0 | 2 | 3 | 2422 | 14.04 | 14.44 | 17.25 | 23.00 | | 13.00 | | 30.25 | | 36.00 | | Pass |
| VHT40 | MCS0 | 2 | 6 | 2437 | 18.36 | 18.49 | 21.44 | 23.00 | | 13.00 | | 34.44 | | 36.00 | | Pass |
| VHT40 | MCS0 | 2 | 9 | 2452 | 18.36 | 11.55 | 14.48 | 23.00 | | 13.00 | | 27.48 | | 36.00 | | Pass |

Note: Measured power (dBm) has offset with cable loss.

## ***TEST RESULTS DATA***
## ***Average Output Power***

| 2.4GHz Band | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Duty Factor (dB) | | Average Conducted Power (dBm) | | |
| | | | | | Ant 1 | Ant 2 | Ant 1 | Ant 2 | SUM |
| VHT20(10M) | MCS0 | 2 | 1 | 2412 | 0.13 | 0.17 | 13.22 | 13.64 | 16.45 |
| VHT20(10M) | MCS0 | 2 | 6 | 2437 | 0.13 | 0.17 | 13.57 | 13.84 | 16.72 |
| VHT20(10M) | MCS0 | 2 | 11 | 2462 | 0.13 | 0.17 | 13.27 | 13.14 | 16.22 |
| VHT20 | MCS0 | 2 | 1 | 2412 | 0.27 | 0.23 | 13.45 | 13.53 | 16.50 |
| VHT20 | MCS0 | 2 | 6 | 2437 | 0.27 | 0.23 | 13.59 | 13.53 | 16.65 |
| VHT20 | MCS0 | 2 | 11 | 2462 | 0.27 | 0.23 | 9.51 | 13.53 | 12.56 |
| VHT40 | MCS0 | 2 | 3 | 2422 | 0.52 | 0.52 | 7.97 | 7.99 | 10.99 |
| VHT40 | MCS0 | 2 | 6 | 2437 | 0.52 | 0.52 | 12.19 | 12.07 | 15.19 |
| VHT40 | MCS0 | 2 | 9 | 2452 | 0.52 | 0.52 | 5.28 | 5.31 | 8.30 |

Note: Measured power (dBm) has offset with cable loss.

## ***TEST RESULTS DATA***
## ***Peak Power Spectral Density***

| 2.4GHz Band | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Peak PSD (dBm/3kHz) | | | DG (dBi) | | Peak PSD Limit (dBm/3kHz) | | Pass/Fail |
| | | | | | Ant 1 | Ant 2 | Worse + 3.01 | Ant 1 | Ant 2 | Ant 1 | Ant 2 | |
| VHT20(10M) | MCS0 | 2 | 1 | 2412 | -9.71 | -9.39 | -6.38 | 16.01 | | -2.01 | | Pass |
| VHT20(10M) | MCS0 | 2 | 6 | 2437 | -9.28 | -8.82 | -5.81 | 16.01 | | -2.01 | | Pass |
| VHT20(10M) | MCS0 | 2 | 11 | 2462 | -9.34 | -10.26 | -6.33 | 16.01 | | -2.01 | | Pass |
| VHT20 | MCS0 | 2 | 1 | 2412 | -12.06 | -12.59 | -9.05 | 16.01 | | -2.01 | | Pass |
| VHT20 | MCS0 | 2 | 6 | 2437 | -12.06 | -12.42 | -9.05 | 16.01 | | -2.01 | | Pass |
| VHT20 | MCS0 | 2 | 11 | 2462 | -16.02 | -15.43 | -12.42 | 16.01 | | -2.01 | | Pass |
| VHT40 | MCS0 | 2 | 3 | 2422 | -20.45 | -21.00 | -17.44 | 16.01 | | -2.01 | | Pass |
| VHT40 | MCS0 | 2 | 6 | 2437 | -16.10 | -15.77 | -12.76 | 16.01 | | -2.01 | | Pass |
| VHT40 | MCS0 | 2 | 9 | 2452 | -22.41 | -22.41 | -19.40 | 16.01 | | -2.01 | | Pass |

Measured power density (dBm) has offset with cable loss.

# Appendix B. Radiated Spurious Emission

| | | | |
|---|---|---|---|
| **Test Engineer :** | Stan Hsieh, Ray Lee, and Tsung Lee | **Temperature :** | 22~24°C |
| | | **Relative Humidity :** | 45~48% |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11ac VHT20 (10MHz) (Band Edge @ 3m)**

| WIFI | Note | Frequency | Level | Over | Limit | Read | Antenna | Cable | Preamp | Ant | Table | Peak | Pol. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ant. | | | | Limit | Line | Level | Factor | Loss | Factor | Pos | Pos | Avg. | |
| 1+2 | | ( MHz ) | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11ac VHT20 (10MHz) CH 01 2412MHz | | 2389.92 | 68.46 | -5.54 | 74 | 69.06 | 27.23 | 5.39 | 33.22 | 213 | 184 | P | H |
| | | 2390 | 51.94 | -2.06 | 54 | 52.54 | 27.23 | 5.39 | 33.22 | 213 | 184 | A | H |
| | * | 2410.438 | 124.3 | - | - | 124.82 | 27.28 | 5.42 | 33.22 | 213 | 184 | P | H |
| | * | 2410.771 | 115.65 | - | - | 116.17 | 27.28 | 5.42 | 33.22 | 213 | 184 | A | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 2389.47 | 69.28 | -4.72 | 74 | 69.9 | 27.23 | 5.39 | 33.24 | 251 | 182 | P | V |
| | | 2389.92 | 51.23 | -2.77 | 54 | 51.83 | 27.23 | 5.39 | 33.22 | 251 | 182 | A | V |
| | * | 2414 | 123.6 | - | - | 124.12 | 27.28 | 5.42 | 33.22 | 251 | 182 | P | V |
| | * | 2414 | 115.18 | - | - | 115.7 | 27.28 | 5.42 | 33.22 | 251 | 182 | A | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| 802.11ac VHT20 (10MHz) CH 06 2437MHz | | 2389.83 | 58.39 | -15.61 | 74 | 58.99 | 27.23 | 5.39 | 33.22 | 231 | 183 | P | H |
| | | 2389.38 | 47.45 | -6.55 | 54 | 48.07 | 27.23 | 5.39 | 33.24 | 231 | 183 | A | H |
| | * | 2435.905 | 125.05 | - | - | 125.52 | 27.32 | 5.42 | 33.21 | 231 | 183 | P | H |
| | * | 2435.905 | 116.33 | - | - | 116.8 | 27.32 | 5.42 | 33.21 | 231 | 183 | A | H |
| | | 2483.88 | 57.56 | -16.44 | 74 | 57.82 | 27.46 | 5.46 | 33.18 | 231 | 183 | P | H |
| | | 2483.6 | 48.1 | -5.9 | 54 | 48.36 | 27.46 | 5.46 | 33.18 | 231 | 183 | A | H |
| | | 2388.93 | 55.04 | -18.96 | 74 | 55.66 | 27.23 | 5.39 | 33.24 | 249 | 179 | P | V |
| | | 2390 | 46.19 | -7.81 | 54 | 46.79 | 27.23 | 5.39 | 33.22 | 249 | 179 | A | V |
| | * | 2439 | 124.42 | - | - | 124.84 | 27.37 | 5.42 | 33.21 | 249 | 179 | P | V |
| | * | 2439 | 115.72 | - | - | 116.14 | 27.37 | 5.42 | 33.21 | 249 | 179 | A | V |
| | | 2483.6 | 57.71 | -16.29 | 74 | 57.97 | 27.46 | 5.46 | 33.18 | 249 | 179 | P | V |
| | | 2483.52 | 46.04 | -7.96 | 54 | 46.3 | 27.46 | 5.46 | 33.18 | 249 | 179 | A | V |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **802.11ac VHT20 (10MHz) CH 11 2462MHz** | * | 2464 | 124.88 | - | - | 125.23 | 27.41 | 5.44 | 33.2 | 231 | 186 | P | H |
| | * | 2464 | 117.04 | - | - | 117.39 | 27.41 | 5.44 | 33.2 | 231 | 186 | A | H |
| | | 2483.84 | 67.35 | -6.65 | 74 | 67.61 | 27.46 | 5.46 | 33.18 | 231 | 186 | P | H |
| | | 2484.48 | 53.51 | -0.49 | 54 | 53.77 | 27.46 | 5.46 | 33.18 | 231 | 186 | A | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | * | 2460 | 124.78 | - | - | 125.13 | 27.41 | 5.44 | 33.2 | 242 | 183 | P | V |
| | * | 2460.287 | 115.94 | - | - | 116.29 | 27.41 | 5.44 | 33.2 | 242 | 183 | A | V |
| | | 2484 | 67.17 | -6.83 | 74 | 67.43 | 27.46 | 5.46 | 33.18 | 242 | 183 | P | V |
| | | 2483.52 | 51.85 | -2.15 | 54 | 52.11 | 27.46 | 5.46 | 33.18 | 242 | 183 | A | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11ac VHT20 (10MHz) (Harmonic @ 3m)**

| WIFI Ant. 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11ac VHT20 (10MHz) CH 01 2412MHz | | 4824 | 48.1 | -25.9 | 74 | 69.67 | 31.46 | 7.58 | 60.61 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 4824 | 43.83 | -30.17 | 74 | 65.4 | 31.46 | 7.58 | 60.61 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| 802.11ac VHT20 (10MHz) CH 06 2437MHz | | 4874 | 47.44 | -26.56 | 74 | 68.7 | 31.56 | 7.7 | 60.52 | 100 | 0 | P | H |
| | | 7311 | 59.22 | -14.78 | 74 | 74.48 | 36.18 | 9.49 | 60.93 | 203 | 346 | P | H |
| | | 7311 | 52.9 | -1.1 | 54 | 68.16 | 36.18 | 9.49 | 60.93 | 203 | 346 | A | H |
| | | | | | | | | | | | | | H |
| | | 4874 | 48.4 | -25.6 | 74 | 69.66 | 31.56 | 7.7 | 60.52 | 100 | 0 | P | V |
| | | 7311 | 54.17 | -19.83 | 74 | 69.43 | 36.18 | 9.49 | 60.93 | 309 | 11 | P | V |
| | | 7311 | 48.91 | -5.09 | 54 | 64.17 | 36.18 | 9.49 | 60.93 | 309 | 11 | A | V |
| | | | | | | | | | | | | | V |
| 802.11ac VHT20 (10MHz) CH 11 2462MHz | | 4924 | 51.3 | -22.7 | 74 | 72.13 | 31.66 | 7.93 | 60.42 | 100 | 0 | P | H |
| | | 7386 | 60.53 | -13.47 | 74 | 75.82 | 36.37 | 9.53 | 61.19 | 235 | 348 | P | H |
| | | 7386 | 50.79 | -3.21 | 54 | 66.08 | 36.37 | 9.53 | 61.19 | 235 | 348 | A | H |
| | | | | | | | | | | | | | H |
| | | 4924 | 52.24 | -21.76 | 74 | 73.07 | 31.66 | 7.93 | 60.42 | 100 | 0 | P | V |
| | | 7386 | 54.78 | -19.22 | 74 | 70.07 | 36.37 | 9.53 | 61.19 | 281 | 6 | P | V |
| | | 7386 | 47.57 | -6.43 | 54 | 62.86 | 36.37 | 9.53 | 61.19 | 281 | 6 | A | V |
| | | | | | | | | | | | | | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11ac VHT20 (Band Edge @ 3m)**

| WIFI Ant. 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2389.47 | 65.05 | -8.95 | 74 | 65.67 | 27.23 | 5.39 | 33.24 | 234 | 181 | P | H |
| | | 2390 | 53.67 | -0.33 | 54 | 54.27 | 27.23 | 5.39 | 33.22 | 234 | 181 | A | H |
| | * | 2414 | 115.59 | - | - | 116.11 | 27.28 | 5.42 | 33.22 | 234 | 181 | P | H |
| | * | 2414 | 108.08 | - | - | 108.6 | 27.28 | 5.42 | 33.22 | 234 | 181 | A | H |
| 802.11ac | | | | | | | | | | | | | H |
| VHT20 | | | | | | | | | | | | | H |
| CH 01 | | 2389.38 | 64.18 | -9.82 | 74 | 64.8 | 27.23 | 5.39 | 33.24 | 251 | 182 | P | V |
| 2412MHz | | 2390 | 53.54 | -0.46 | 54 | 54.14 | 27.23 | 5.39 | 33.22 | 251 | 182 | A | V |
| | * | 2414 | 114.89 | - | - | 115.41 | 27.28 | 5.42 | 33.22 | 251 | 182 | P | V |
| | * | 2414 | 107.4 | - | - | 107.92 | 27.28 | 5.42 | 33.22 | 251 | 182 | A | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | 2389.47 | 58.05 | -15.95 | 74 | 58.67 | 27.23 | 5.39 | 33.24 | 233 | 184 | P | H |
| | | 2389.47 | 48.23 | -5.77 | 54 | 48.85 | 27.23 | 5.39 | 33.24 | 233 | 184 | A | H |
| | * | 2439 | 121.22 | - | - | 121.64 | 27.37 | 5.42 | 33.21 | 233 | 184 | P | H |
| | * | 2439 | 113.57 | - | - | 113.99 | 27.37 | 5.42 | 33.21 | 233 | 184 | A | H |
| 802.11ac | | 2484.08 | 60.49 | -13.51 | 74 | 60.75 | 27.46 | 5.46 | 33.18 | 233 | 184 | P | H |
| VHT20 | | 2483.96 | 50.23 | -3.77 | 54 | 50.49 | 27.46 | 5.46 | 33.18 | 233 | 184 | A | H |
| CH 06 | | 2387.94 | 55.86 | -18.14 | 74 | 56.48 | 27.23 | 5.39 | 33.24 | 248 | 183 | P | V |
| 2437MHz | | 2389.92 | 47.18 | -6.82 | 54 | 47.78 | 27.23 | 5.39 | 33.22 | 248 | 183 | A | V |
| | * | 2435 | 121.39 | - | - | 121.86 | 27.32 | 5.42 | 33.21 | 248 | 183 | P | V |
| | * | 2435 | 112.76 | - | - | 113.23 | 27.32 | 5.42 | 33.21 | 248 | 183 | A | V |
| | | 2485.64 | 56.87 | -17.13 | 74 | 57.13 | 27.46 | 5.46 | 33.18 | 248 | 183 | P | V |
| | | 2483.6 | 46.83 | -7.17 | 54 | 47.09 | 27.46 | 5.46 | 33.18 | 248 | 183 | A | V |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | * | 2464 | 112.62 | - | - | 112.97 | 27.41 | 5.44 | 33.2 | 230 | 184 | P | H |
| | * | 2464 | 105.24 | - | - | 105.59 | 27.41 | 5.44 | 33.2 | 230 | 184 | A | H |
| | | 2484.52 | 62.99 | -11.01 | 74 | 63.25 | 27.46 | 5.46 | 33.18 | 230 | 184 | P | H |
| | | 2483.56 | 52.32 | -1.68 | 54 | 52.58 | 27.46 | 5.46 | 33.18 | 230 | 184 | A | H |
| **802.11ac** | | | | | | | | | | | | | H |
| **VHT20** | | | | | | | | | | | | | H |
| **CH 11** | * | 2460 | 112.52 | - | - | 112.87 | 27.41 | 5.44 | 33.2 | 246 | 180 | P | V |
| **2462MHz** | * | 2460 | 104.24 | - | - | 104.59 | 27.41 | 5.44 | 33.2 | 246 | 180 | A | V |
| | | 2483.76 | 62.3 | -11.7 | 74 | 62.56 | 27.46 | 5.46 | 33.18 | 246 | 180 | P | V |
| | | 2483.6 | 50.67 | -3.33 | 54 | 50.93 | 27.46 | 5.46 | 33.18 | 246 | 180 | A | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |

**Remark**

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11ac VHT20 (Harmonic @ 3m)**

| WIFI Ant. 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4824 | 42.38 | -31.62 | 74 | 63.95 | 31.46 | 7.58 | 60.61 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| 802.11ac | | | | | | | | | | | | | H |
| VHT20 | | | | | | | | | | | | | H |
| CH 01 | | 4824 | 36.81 | -37.19 | 74 | 58.38 | 31.46 | 7.58 | 60.61 | 100 | 0 | P | V |
| 2412MHz | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | 4874 | 46.27 | -27.73 | 74 | 67.53 | 31.56 | 7.7 | 60.52 | 100 | 0 | P | H |
| | | 7311 | 56.19 | -17.81 | 74 | 71.45 | 36.18 | 9.49 | 60.93 | 207 | 345 | P | H |
| 802.11ac | | 7311 | 48 | -6 | 54 | 63.26 | 36.18 | 9.49 | 60.93 | 207 | 345 | A | H |
| VHT20 | | | | | | | | | | | | | H |
| CH 06 | | 4874 | 44.43 | -29.57 | 74 | 65.69 | 31.56 | 7.7 | 60.52 | 100 | 0 | P | V |
| 2437MHz | | 7311 | 56.07 | -17.93 | 74 | 71.33 | 36.18 | 9.49 | 60.93 | 290 | 6 | P | V |
| | | 7311 | 45.49 | -8.51 | 54 | 60.75 | 36.18 | 9.49 | 60.93 | 290 | 6 | A | V |
| | | | | | | | | | | | | | V |
| | | 4924 | 36.78 | -37.22 | 74 | 57.61 | 31.66 | 7.93 | 60.42 | 100 | 0 | P | H |
| | | 7386 | 41.15 | -32.85 | 74 | 56.44 | 36.37 | 9.53 | 61.19 | 100 | 0 | P | H |
| 802.11ac | | | | | | | | | | | | | H |
| VHT20 | | | | | | | | | | | | | H |
| CH 11 | | 4924 | 36.49 | -37.51 | 74 | 57.32 | 31.66 | 7.93 | 60.42 | 100 | 0 | P | V |
| 2462MHz | | 7386 | 41.18 | -32.82 | 74 | 56.47 | 36.37 | 9.53 | 61.19 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |

**Remark**

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11ac VHT40 (Band Edge @ 3m)**

| WIFI Ant. 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2390 | 61.93 | -12.07 | 74 | 62.53 | 27.23 | 5.39 | 33.22 | 218 | 180 | P | H |
| | | 2390 | 52.94 | -1.06 | 54 | 53.54 | 27.23 | 5.39 | 33.22 | 218 | 180 | A | H |
| | * | 2420.541 | 108.33 | - | - | 108.8 | 27.32 | 5.42 | 33.21 | 218 | 180 | P | H |
| | * | 2420 | 100.04 | - | - | 100.51 | 27.32 | 5.42 | 33.21 | 218 | 180 | A | H |
| 802.11ac | | 2483.8 | 56.38 | -17.62 | 74 | 56.64 | 27.46 | 5.46 | 33.18 | 218 | 180 | P | H |
| VHT40 | | 2486.48 | 47.22 | -6.78 | 54 | 47.48 | 27.46 | 5.46 | 33.18 | 218 | 180 | A | H |
| CH 03 | | 2390 | 63.16 | -10.84 | 74 | 63.76 | 27.23 | 5.39 | 33.22 | 250 | 182 | P | V |
| 2422MHz | | 2389.2 | 53.93 | -0.07 | 54 | 54.55 | 27.23 | 5.39 | 33.24 | 250 | 182 | A | V |
| | * | 2424 | 107.46 | - | - | 107.93 | 27.32 | 5.42 | 33.21 | 250 | 182 | P | V |
| | * | 2424 | 99.87 | - | - | 100.34 | 27.32 | 5.42 | 33.21 | 250 | 182 | A | V |
| | | 2496.92 | 52.98 | -21.02 | 74 | 53.19 | 27.5 | 5.46 | 33.17 | 250 | 182 | P | V |
| | | 2486.2 | 44.39 | -9.61 | 54 | 44.65 | 27.46 | 5.46 | 33.18 | 250 | 182 | A | V |
| | | 2389.56 | 58.98 | -15.02 | 74 | 59.6 | 27.23 | 5.39 | 33.24 | 230 | 183 | P | H |
| | | 2389.92 | 50.67 | -3.33 | 54 | 51.27 | 27.23 | 5.39 | 33.22 | 230 | 183 | A | H |
| | * | 2435 | 111.52 | - | - | 111.99 | 27.32 | 5.42 | 33.21 | 230 | 183 | P | H |
| | * | 2435 | 104.32 | - | - | 104.79 | 27.32 | 5.42 | 33.21 | 230 | 183 | A | H |
| 802.11ac | | 2485.24 | 61.44 | -12.56 | 74 | 61.7 | 27.46 | 5.46 | 33.18 | 230 | 183 | P | H |
| VHT40 | | 2483.6 | 52.38 | -1.62 | 54 | 52.64 | 27.46 | 5.46 | 33.18 | 230 | 183 | A | H |
| CH 06 | | 2388.03 | 58.48 | -15.52 | 74 | 59.1 | 27.23 | 5.39 | 33.24 | 241 | 183 | P | V |
| 2437MHz | | 2389.83 | 49.78 | -4.22 | 54 | 50.38 | 27.23 | 5.39 | 33.22 | 241 | 183 | A | V |
| | * | 2439 | 111.93 | - | - | 112.35 | 27.37 | 5.42 | 33.21 | 241 | 183 | P | V |
| | * | 2439 | 104.06 | - | - | 104.48 | 27.37 | 5.42 | 33.21 | 241 | 183 | A | V |
| | | 2483.72 | 62.73 | -11.27 | 74 | 62.99 | 27.46 | 5.46 | 33.18 | 241 | 183 | P | V |
| | | 2483.72 | 52.64 | -1.36 | 54 | 52.9 | 27.46 | 5.46 | 33.18 | 241 | 183 | A | V |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2389.56 | 53.6 | -20.4 | 74 | 54.22 | 27.23 | 5.39 | 33.24 | 226 | 182 | P | H |
| | | 2389.83 | 44.32 | -9.68 | 54 | 44.92 | 27.23 | 5.39 | 33.22 | 226 | 182 | A | H |
| | * | 2454 | 105.75 | - | - | 106.1 | 27.41 | 5.44 | 33.2 | 226 | 182 | P | H |
| | * | 2454 | 98.43 | - | - | 98.78 | 27.41 | 5.44 | 33.2 | 226 | 182 | A | H |
| **802.11ac** | | 2483.92 | 64.28 | -9.72 | 74 | 64.54 | 27.46 | 5.46 | 33.18 | 226 | 182 | P | H |
| **VHT40** | | 2483.68 | 53.17 | -0.83 | 54 | 53.43 | 27.46 | 5.46 | 33.18 | 226 | 182 | A | H |
| **CH 09** | | 2388.84 | 52.6 | -21.4 | 74 | 53.22 | 27.23 | 5.39 | 33.24 | 242 | 181 | P | V |
| **2452MHz** | | 2389.83 | 44.07 | -9.93 | 54 | 44.67 | 27.23 | 5.39 | 33.22 | 242 | 181 | A | V |
| | * | 2454 | 106.12 | - | - | 106.47 | 27.41 | 5.44 | 33.2 | 242 | 181 | P | V |
| | * | 2454 | 97.93 | - | - | 98.28 | 27.41 | 5.44 | 33.2 | 242 | 181 | A | V |
| | | 2483.52 | 62.94 | -11.06 | 74 | 63.2 | 27.46 | 5.46 | 33.18 | 242 | 181 | P | V |
| | | 2483.56 | 52.31 | -1.69 | 54 | 52.57 | 27.46 | 5.46 | 33.18 | 242 | 181 | A | V |

**Remark**

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11ac VHT40 (Harmonic @ 3m)**

| WIFI Ant. 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4844 | 35.83 | -38.17 | 74 | 57.22 | 31.49 | 7.7 | 60.58 | 100 | 0 | P | H |
| | | 7266 | 40.42 | -33.58 | 74 | 55.68 | 36.11 | 9.46 | 60.83 | 100 | 0 | P | H |
| 802.11ac | | | | | | | | | | | | | H |
| VHT40 | | | | | | | | | | | | | H |
| CH 03 | | 4844 | 35.48 | -38.52 | 74 | 56.87 | 31.49 | 7.7 | 60.58 | 100 | 0 | P | V |
| 2422MHz | | 7266 | 40.95 | -33.05 | 74 | 56.21 | 36.11 | 9.46 | 60.83 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | 4874 | 39.3 | -34.7 | 74 | 60.56 | 31.56 | 7.7 | 60.52 | 100 | 0 | P | H |
| | | 7311 | 46.2 | -27.8 | 74 | 61.46 | 36.18 | 9.49 | 60.93 | 100 | 0 | P | H |
| 802.11ac | | | | | | | | | | | | | H |
| VHT40 | | | | | | | | | | | | | H |
| CH 06 | | 4874 | 35.72 | -38.28 | 74 | 56.98 | 31.56 | 7.7 | 60.52 | 100 | 0 | P | V |
| 2437MHz | | 7311 | 43.56 | -30.44 | 74 | 58.82 | 36.18 | 9.49 | 60.93 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | 4902 | 36.1 | -37.9 | 74 | 57.11 | 31.63 | 7.82 | 60.46 | 100 | 0 | P | H |
| | | 7356 | 41.11 | -32.89 | 74 | 56.39 | 36.3 | 9.51 | 61.09 | 100 | 0 | P | H |
| 802.11ac | | | | | | | | | | | | | H |
| VHT40 | | | | | | | | | | | | | H |
| CH 09 | | 4902 | 36.15 | -37.85 | 74 | 57.16 | 31.63 | 7.82 | 60.46 | 100 | 0 | P | V |
| 2452MHz | | 7356 | 41.97 | -32.03 | 74 | 57.25 | 36.3 | 9.51 | 61.09 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**Emission below 1GHz**

**2.4GHz WIFI 802.11ac VHT40 (LF)**

| WIFI | Note | Frequency | Level | Over | Limit | Read | Antenna | Cable | Preamp | Ant | Table | Peak | Pol. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ant. | | | | Limit | Line | Level | Factor | Loss | Factor | Pos | Pos | Avg. | |
| 1+2 | | ( MHz ) | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | (dBμV) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 2.4GHz 802.11ac VHT40 LF | | 125.04 | 37.56 | -5.94 | 43.5 | 51.09 | 17.8 | 1.33 | 32.66 | | | P | H |
| | | 129.9 | 36.96 | -6.54 | 43.5 | 50.29 | 18 | 1.33 | 32.66 | | | P | H |
| | | 214.95 | 38.58 | -4.92 | 43.5 | 53.64 | 16.05 | 1.62 | 32.73 | 100 | 133 | P | H |
| | | 325.2 | 35.7 | -10.3 | 46 | 46.27 | 20.25 | 1.94 | 32.76 | | | P | H |
| | | 400.1 | 38.83 | -7.17 | 46 | 47.32 | 22.22 | 2.13 | 32.84 | | | P | H |
| | | 724.9 | 33.15 | -12.85 | 46 | 36.21 | 26.99 | 2.91 | 32.96 | | | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 125.04 | 34.89 | -8.61 | 43.5 | 48.42 | 17.8 | 1.33 | 32.66 | | | P | V |
| | | 200.1 | 33.87 | -9.63 | 43.5 | 49.32 | 15.8 | 1.48 | 32.73 | | | P | V |
| | | 214.95 | 37.1 | -6.4 | 43.5 | 52.16 | 16.05 | 1.62 | 32.73 | 100 | 162 | P | V |
| | | 328 | 32.92 | -13.08 | 46 | 43.4 | 20.34 | 1.94 | 32.76 | | | P | V |
| | | 400.1 | 36.31 | -9.69 | 46 | 44.8 | 22.22 | 2.13 | 32.84 | | | P | V |
| | | 957.3 | 32.04 | -13.96 | 46 | 30.22 | 30.21 | 3.29 | 31.68 | | | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found.<br>2. All results are PASS against limit line. | | | | | | | | | | | | |

**Note symbol**

| | |
|---|---|
| * | **Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency. |
| ! | Test result is **over limit** line. |
| P/A | **P**eak or **A**verage |
| H/V | **H**orizontal or **V**ertical |

**A calculation example for radiated spurious emission is shown as below:**

| WIFI | Note | Frequency | Level | Over | Limit | Read | Antenna | Cable | Preamp | Ant | Table | Peak | Pol. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ant. | | | | Limit | Line | Level | Factor | Loss | Factor | Pos | Pos | Avg. | |
| 1+2 | | ( MHz ) | ( dBµV/m ) | ( dB ) | ( dBµV/m ) | ( dBµV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11b CH 01 2412MHz | | 2390 | 55.45 | -18.55 | 74 | 54.51 | 32.22 | 4.58 | 35.86 | 103 | 308 | P | H |
| | | 2390 | 43.54 | -10.46 | 54 | 42.6 | 32.22 | 4.58 | 35.86 | 103 | 308 | A | H |

1. Level(dBµV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBµV/m) – Limit Line(dBµV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBµV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBµV) – 35.86 (dB)

= 55.45 (dBµV/m)

2. Over Limit(dB)

= Level(dBµV/m) – Limit Line(dBµV/m)

= 55.45(dBµV/m) – 74(dBµV/m)

= -18.55(dB)

**For Average Limit @ 2390MHz:**

1. Level(dBµV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBµV) – 35.86 (dB)

= 43.54 (dBµV/m)

2. Over Limit(dB)

= Level(dBµV/m) – Limit Line(dBµV/m)

= 43.54(dBµV/m) – 54(dBµV/m)

= -10.46(dB)

**Both peak and average measured complies with the limit line, so test result is "PASS".**

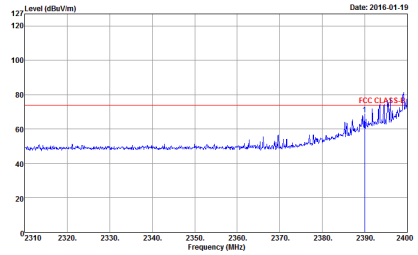
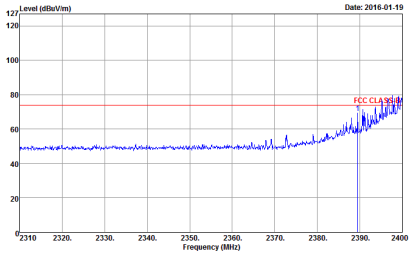
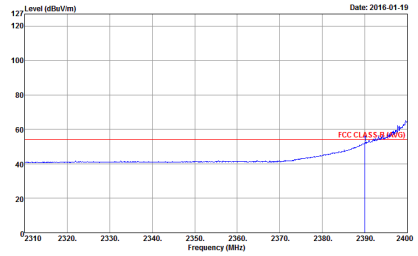
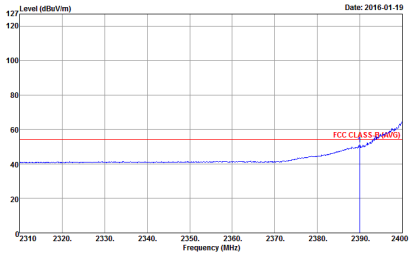
# Appendix C. Radiated Spurious Emission Plots

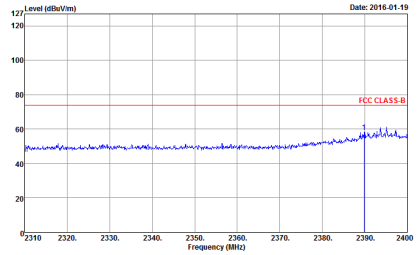
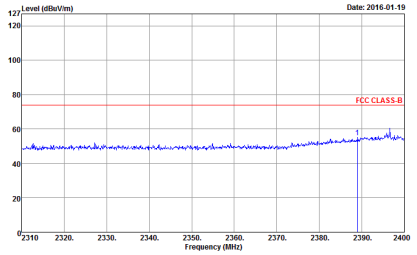
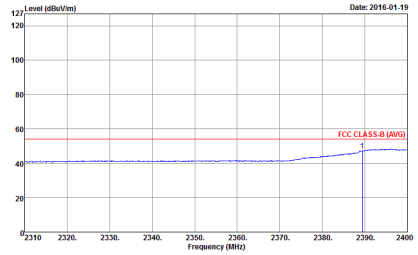
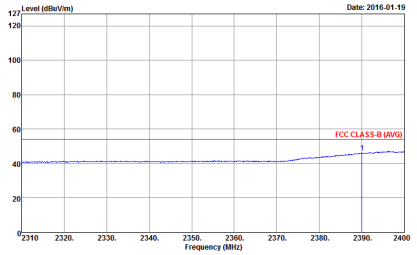
## Note symbol

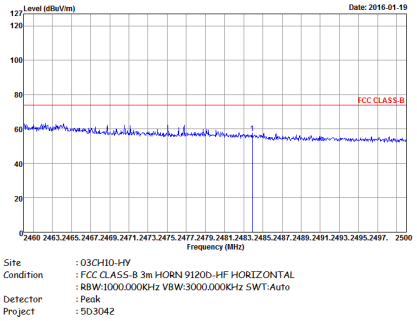
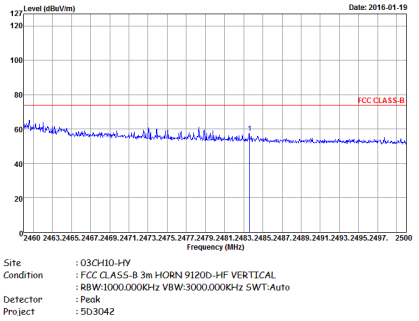
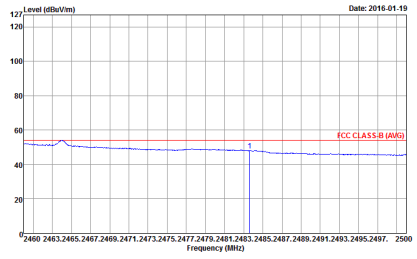
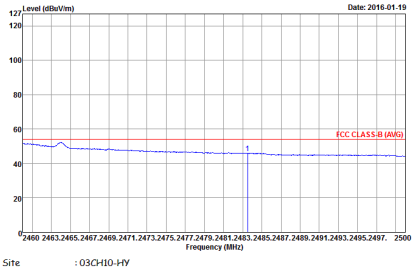
| | |
|---|---|
| -L | **Low channel location** |
| -R | **High channel location** |

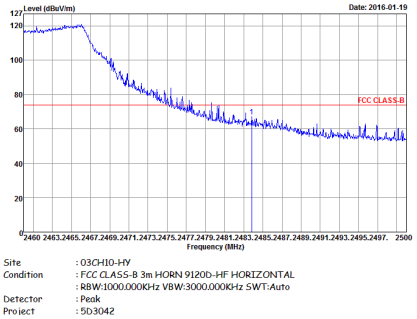
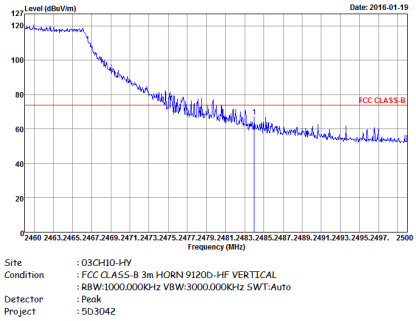
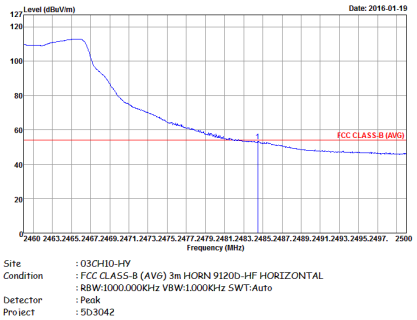
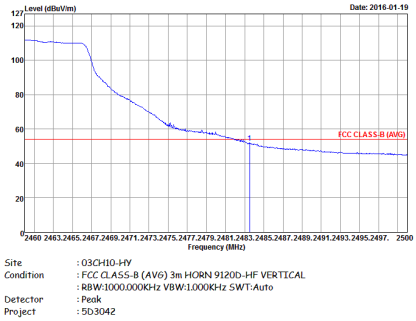
**2.4GHz 2400~2483.5MHz**

**WIFI 802.11b (Band Edge @ 3m)**

| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 (10MHz) CH01 2412MHz | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042<br>Mode : 1 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042<br>Mode : 1 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

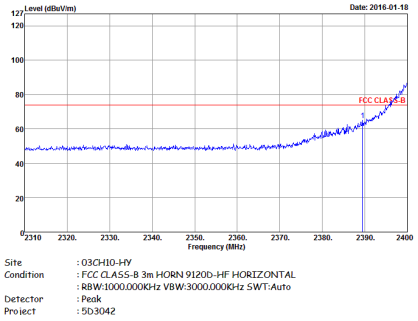
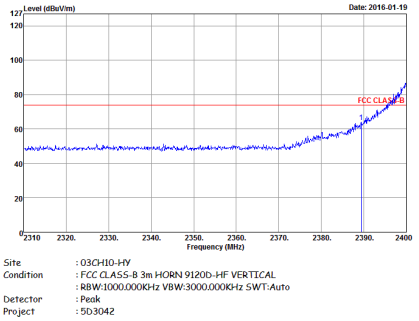
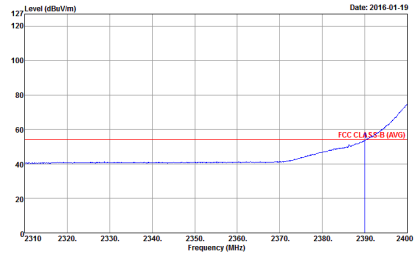
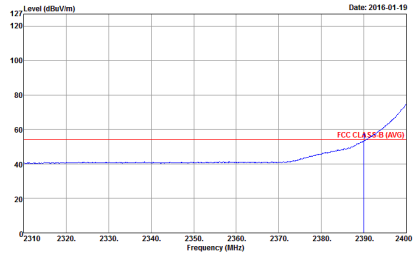
| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 (10MHz) CH06 2437MHz - L | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AV6) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AV6) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

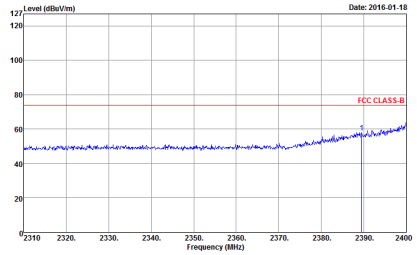
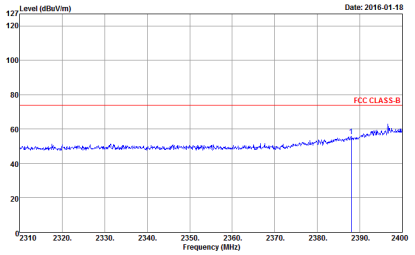
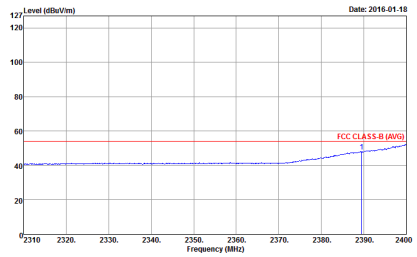
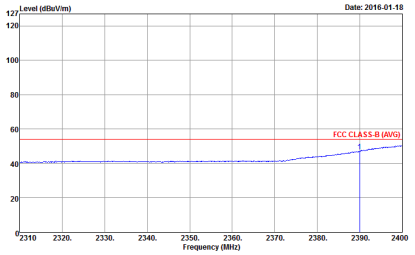
| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 (10MHz) CH06 2437MHz - R | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

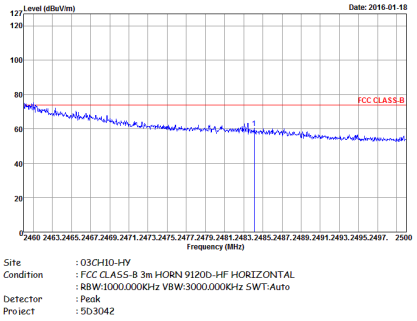
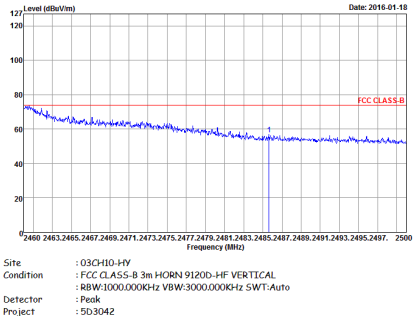
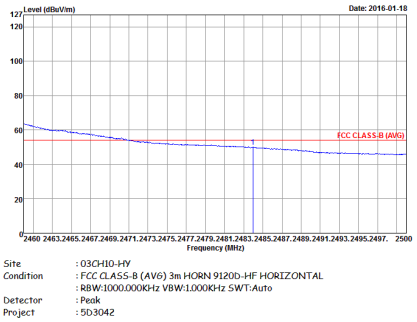
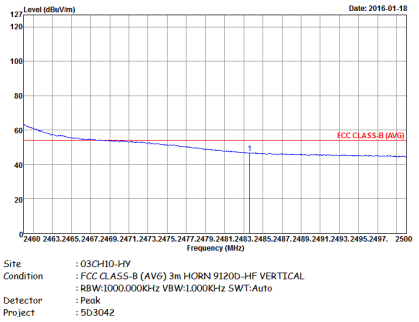
| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 (10MHz) CH11 2462MHz | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

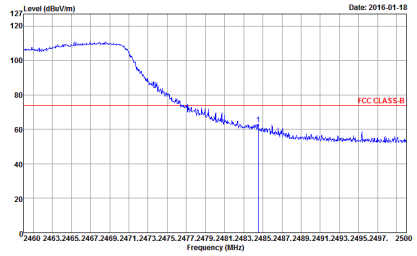
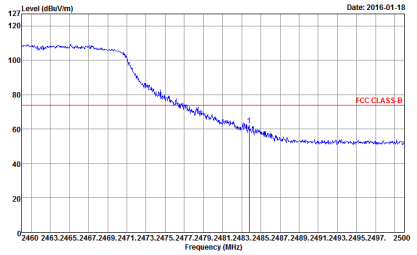
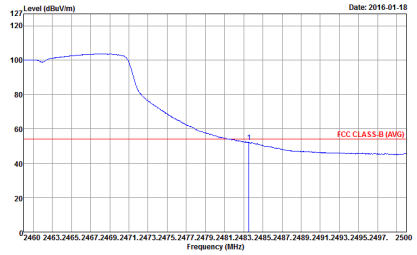
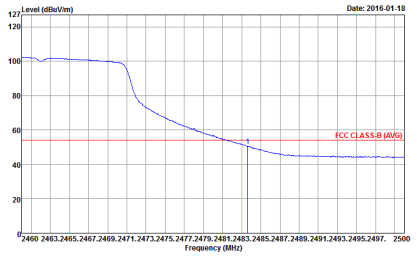
**2.4GHz 2400~2483.5MHz**

**WIFI 802.11ac VHT20 (Band Edge @ 3m)**

| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 CH01 2412MHz | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

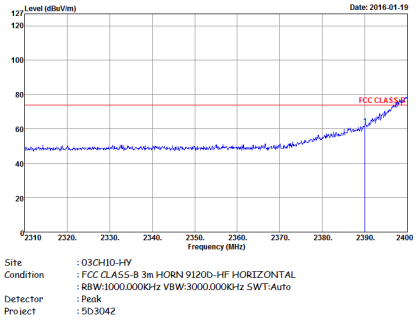
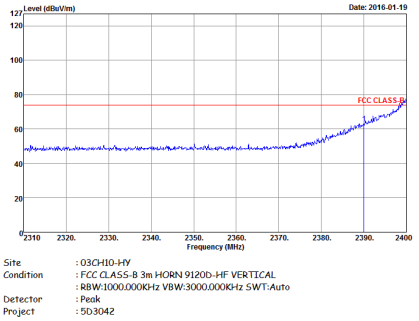
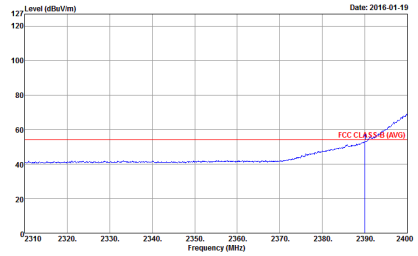
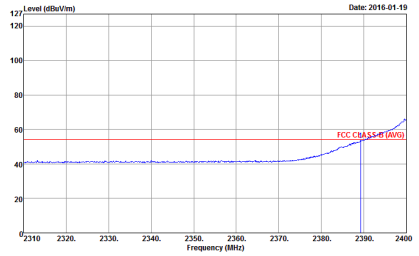
| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 CH06 2437MHz - L | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AV6) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AV6) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

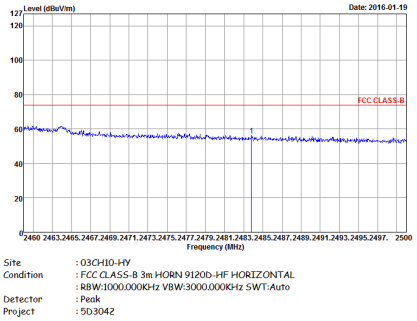
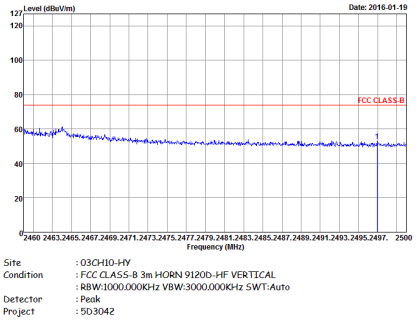
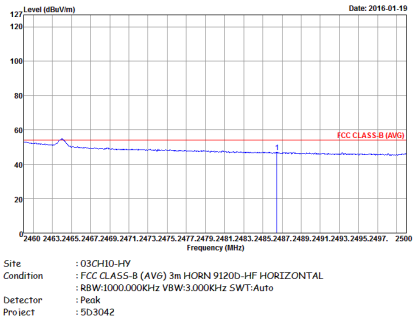
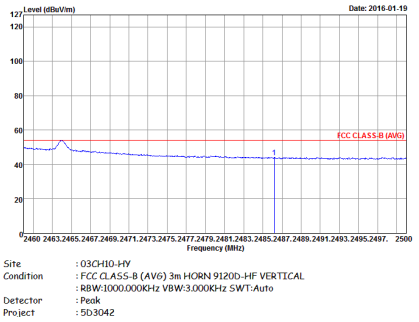
| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VH20 CH06 2437MHz - R | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

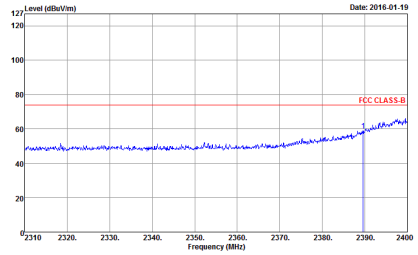
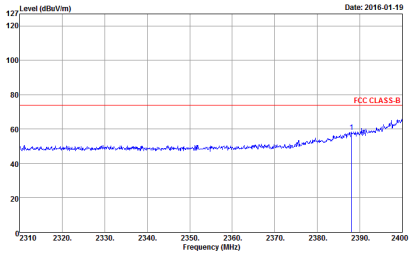
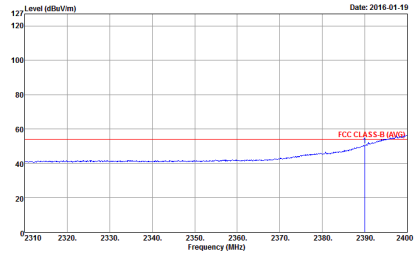
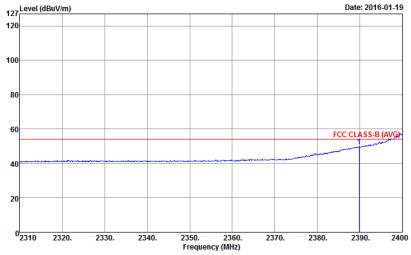
| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VH20 CH11 2462MHz | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

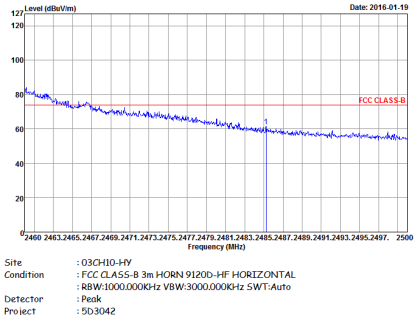
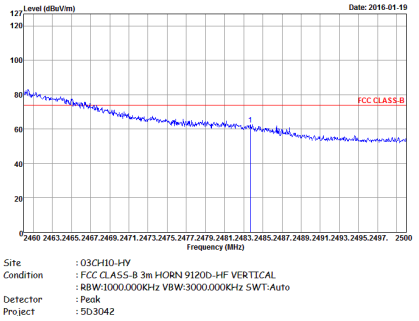
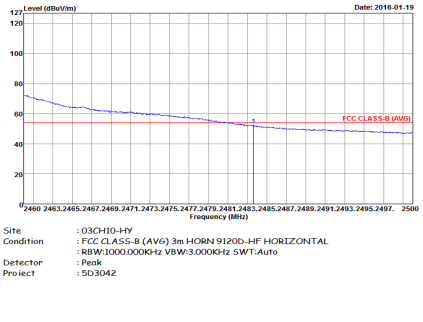
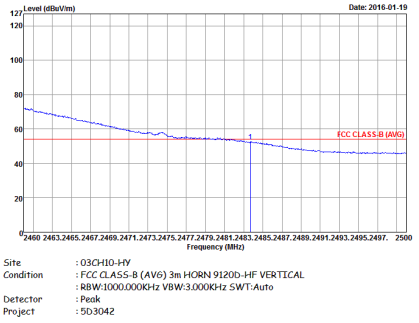
**2.4GHz 2400~2483.5MHz**

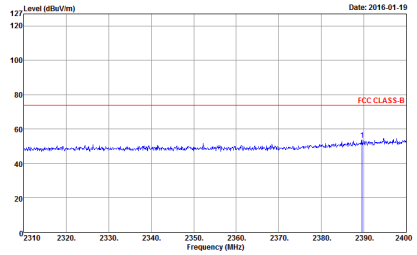
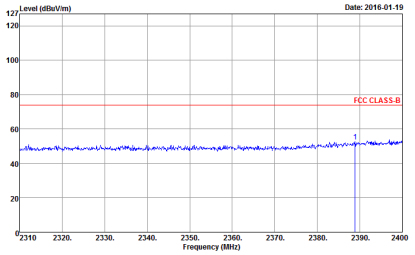
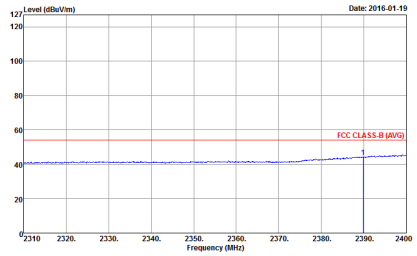
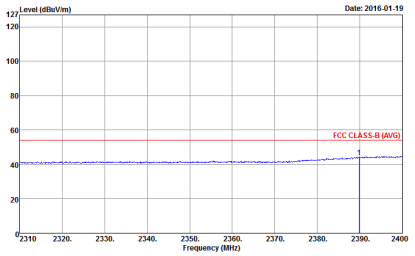
**WIFI 802.11ac VHT40 (Band Edge @ 3m)**

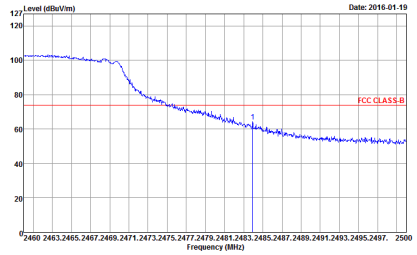
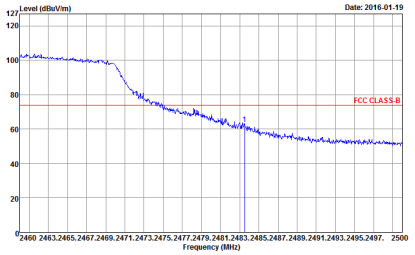
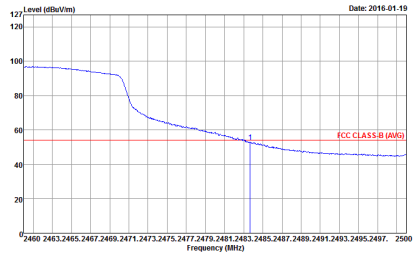
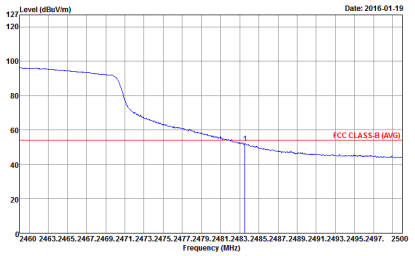
| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VH40 CH03 2422MHz - L | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VH40 CH03 2422MHz - R | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VH40 CH06 2437MHz - L | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

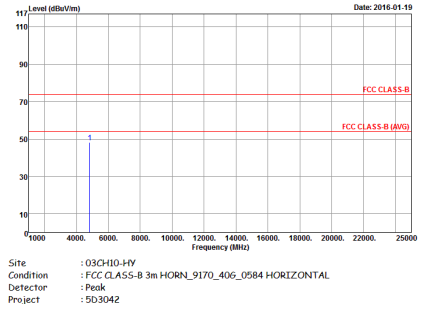
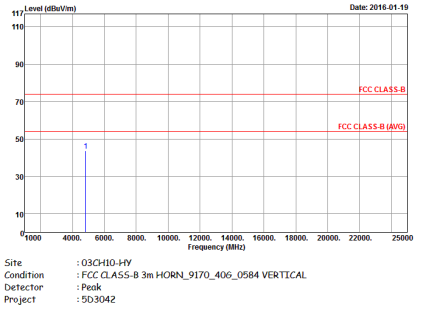
| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VH40 CH06 2437MHz - R | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

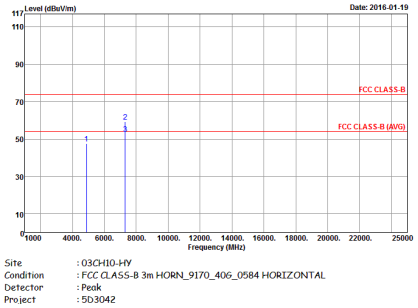
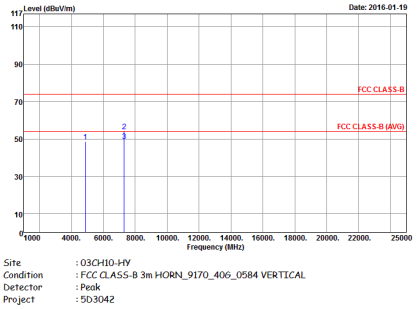
| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VH40 CH09 2452MHz - L | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

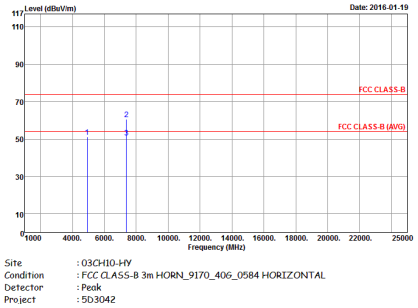
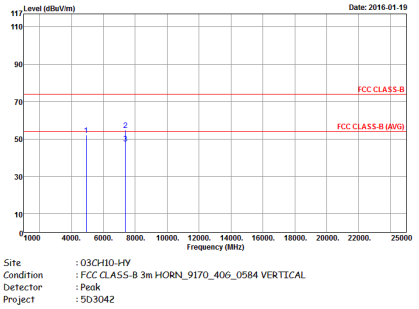
| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11ac VH40 CH09 2452MHz - R | |
| 1+2 | Horizontal | Vertical |
| Peak |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |
| Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br>Detector : Peak<br>Project : 5D3042 |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11b (Harmonic @ 3m)**

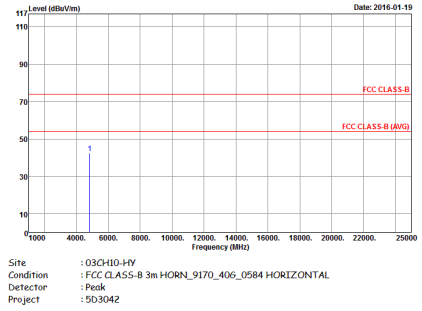
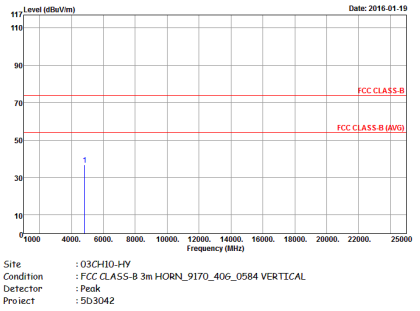
| WIFI | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 (10MHz) CH01 2412MHz | |
| 1+2 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

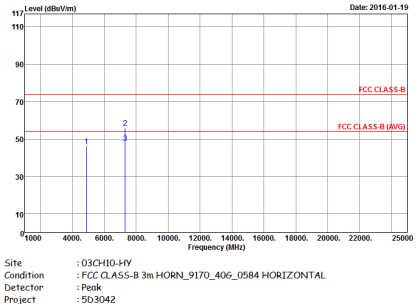
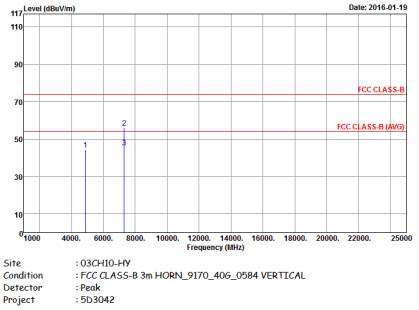
| WIFI | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 (10MHz) CH06 2437MHz | |
| 1+2 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

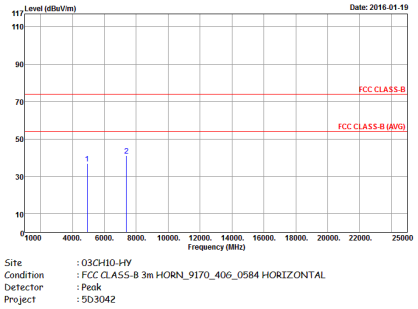
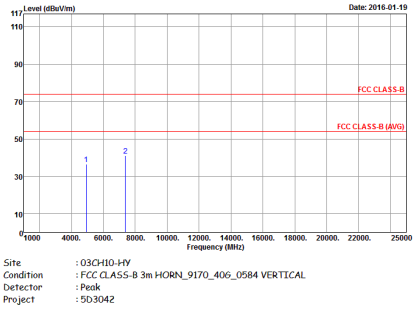
| WIFI | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 (10MHz) CH11 2462MHz | |
| 1+2 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11ac VHT20 (Harmonic @ 3m)**

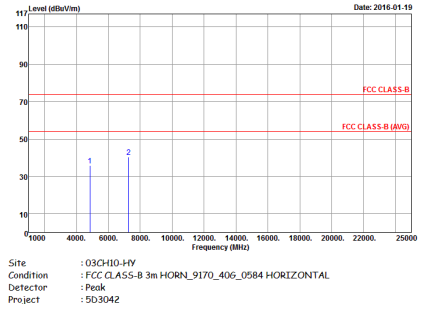
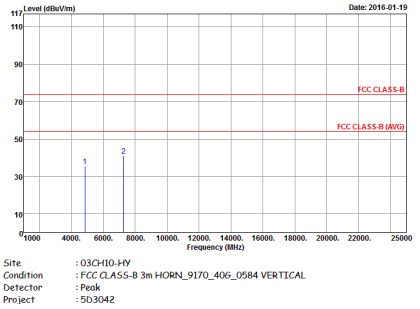
| WIFI | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 CH01 2412MHz | |
| 1+2 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

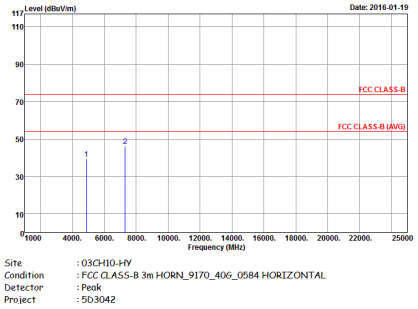
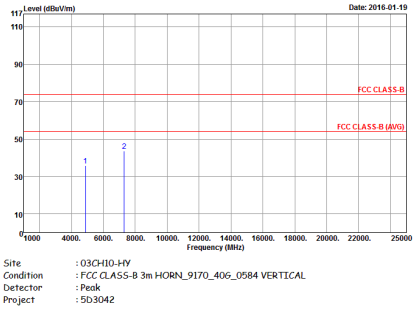
| WIFI | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 CH06 2437MHz | |
| 1+2 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

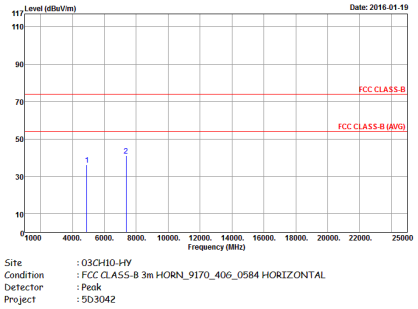
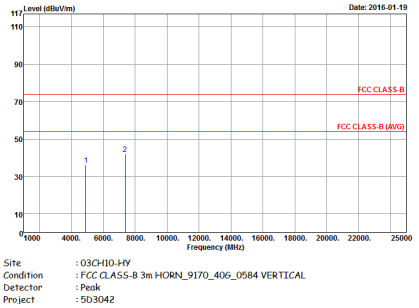
| WIFI | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT20 CH11 2462MHz | |
| 1+2 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11ac VHT40 (Harmonic @ 3m)**

| WIFI | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT40 CH03 2422MHz | |
| 1+2 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

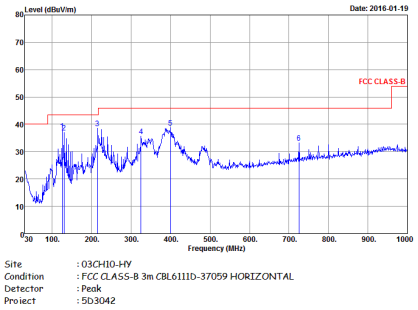
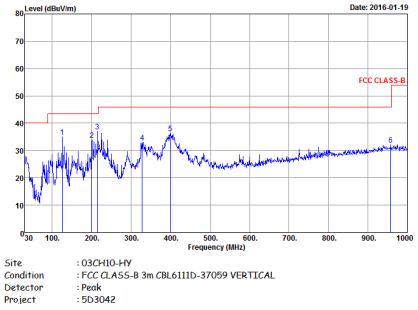
| WIFI | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT40 CH06 2437MHz | |
| 1+2 | Horizontal | Vertical |
| Peak<br>Avg. |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN_9170_406_0584 HORIZONTAL<br>Detector : Peak<br>Project : 5D3042 |  <br>Site : 03CH10-HY<br>Condition : FCC CLASS-B 3m HORN_9170_406_0584 VERTICAL<br>Detector : Peak<br>Project : 5D3042 |

| WIFI | 2.4GHz 2400~2483.5MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11ac VHT40 CH09 2452MHz | |
| 1+2 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

**2.4GHz 2400~2483.5MHz**

**Emission below 1GHz**

**2.4GHz WIFI 802.11ac VHT40 (LF)**

| WIFI | 2.4GHz 2400~2483.5MHz | |
|---|---|---|
| ANT | 802.11ac VHT40 LF | |
| 1+2 | Horizontal | Vertical |
| QP / Peak |  |  |