

## EMC TEST REPORT

**Report No.:** 150500230TWN-001R1  
**Model No.:** WiFiHU2s-c  
**Issued Date:** May 23, 2017

**Applicant:** Radicom Research Inc.  
2148 Bering Dr., San Jose, CA. 95131, USA

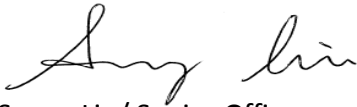
**Test Method/ Standard:** 47 CFR FCC Part 15.247 & ANSI C63.10:2013  
KDB 558074 D01 v04

**Test Site:** 93910

**Test By:** Intertek Testing Services Taiwan Ltd.,  
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**The test report was reviewed by:**

  
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**Title** Group Leader

### Revision History

| Report No.         | Issue Date    | Revision Summary                                                                                                                                           |
|--------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 150500230TWN-001   | Jun. 02, 2015 | Original report                                                                                                                                            |
| 150500230TWN-001R1 | May 23, 2017  | Add greater gain antenna and installed in host for WiFiHU2s-c, after engineer judgment, the tests were considered necessary. See the Summary of Test Data. |

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## 1. Summary of Test Data

| Test Requirement                                                            | Applicable Rule<br>(Section 15.247) | Result                                                                                                                                                                                      |
|-----------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Emissions In Restricted Frequency Bands<br>(Radiated emission measurements) | 15.247(d), 15.205,<br>15.209        | Pass                                                                                                                                                                                        |
| Emission On The Band Edge                                                   | 15.247(d), 15.205                   | Pass                                                                                                                                                                                        |
| Maximum Peak Conducted Output Power                                         | 15.247(b)(3)                        | Add greater gain antenna and installed in host, after confirmation, the difference does not affect the Output Power. Then the test data in this report based on report of 150500230TWN-001. |

## 2. General Information

### 2.1 Identification of the EUT

|                            |                                                                                                    |
|----------------------------|----------------------------------------------------------------------------------------------------|
| Product:                   | USB WiFi Module                                                                                    |
| Model No:                  | WiFiHU2s-c                                                                                         |
| FCC ID:                    | K7T-WIFIHU2S                                                                                       |
| Operating Frequency:       | 2412 MHz ~ 2462 MHz for 802.11b, 802.11g, 802.11n (HT20)<br>2422 MHz ~ 2452 MHz for 802.11n (HT40) |
| Channel Number:            | 11 channels for 2412 MHz ~ 2462 MHz<br>9 channels for 2422 MHz ~ 2452 MHz                          |
| Frequency of Each Channel: | 2407+5 k MHz, k=1~11 for 802.11b, 802.11g, 802.11n HT20<br>2407+5 k MHz, k=3~9 for 802.11n (HT40)  |
| Access scheme:             | DSSS, OFDM                                                                                         |
| Rated Power:               | DC 5V from Notebook                                                                                |
| Power Cord:                | N/A                                                                                                |
| Sample Received:           | May 19, 2017                                                                                       |
| Sample condition:          | Workable                                                                                           |
| Test Date(s):              | May 19, 2017 ~ May 22, 2017                                                                        |

Note 1: The test report only allows to be revised within three years from its original issued date unless further standard or the requirement was noticed.

Note 2: When determining the test conclusion, the Measurement Uncertainty of test has been considered.

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## 2.2 Description of EUT

| Modulation mode | Transmit path  |               |
|-----------------|----------------|---------------|
|                 | Chain 0 / Main | Chain 1 / AUX |
| 802.11b         | V              | X             |
| 802.11g         | V              | X             |
| 802.11 n (HT20) | V              | X             |
| 802.11 n (HT40) | V              | X             |

|                         |                                              |
|-------------------------|----------------------------------------------|
| Product SW/HW version : | SW: V010 / HW: RA6/RA7                       |
| Radio SW/HW version :   | SW: V010 / HW: RA6/RA7                       |
| Test SW Version :       | V010_RTL11n_SingleChip_9xC_USB_v010_20100428 |

## 2.3 Antenna description

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna Gain : 5 dBi  
Antenna Type : Dipole antenna  
Connector Type : SMA-R

## 2.4 Peripherals equipment

| Peripherals | Brand | Model No.     | Serial No. | Data cable        |
|-------------|-------|---------------|------------|-------------------|
| Notebook PC | DELL  | Latitude D610 | 4YWZK1S    | USB 0.5 meter × 1 |

## 2.5 Operation mode

The EUT was supplied with DC 5V from Notebook PC.

TX-MODE was based on a specific test program “MP819xVC.exe program”, and the program could select different frequency and modulation.

With individual verifying, the maximum output power were found out 1 Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n(HT20) mode and 13.5 Mbps data rate for 802.11n(HT40) mode, the final tests were executed under these conditions recorded in this report individually.

The final tests were executed under these conditions recorded in this report individually.

| 802.11b ch6 chain0  |             | 802.11g ch6 chain0  |             | 802.11n HT20 ch6 chain0 |             |
|---------------------|-------------|---------------------|-------------|-------------------------|-------------|
| Data rate<br>(Mbps) | AV<br>(dBm) | Data rate<br>(Mbps) | AV<br>(dBm) | Data rate<br>(Mbps)     | AV<br>(dBm) |
| 1                   | 15.88       | 6                   | 15.36       | MCS0                    | 13.63       |
| 2                   | 15.73       | 9                   | 15.25       | MCS1                    | 13.51       |
| 5.5                 | 15.61       | 12                  | 15.12       | MCS2                    | 13.38       |
| 11                  | 15.48       | 18                  | 14.96       | MCS3                    | 13.27       |
| -                   | -           | 24                  | 14.88       | MCS4                    | 13.14       |
| -                   | -           | 36                  | 14.74       | MCS5                    | 13.00       |
| -                   | -           | 48                  | 14.71       | MCS6                    | 12.87       |
| -                   | -           | 54                  | 14.58       | MCS7                    | 12.73       |

## 2.6 Applied test modes and channels

| Test items                                                | Mode            | Data Rate (Mbps) | Channel  |
|-----------------------------------------------------------|-----------------|------------------|----------|
| Radiated spurious Emission 9kHz~1GHz                      | Worst case      |                  |          |
| Radiated Spurious Emission 1GHz~10 <sup>th</sup> Harmonic | 802.11 b        | 1                | 1, 6, 11 |
|                                                           | 802.11 g        | 6                | 1, 6, 11 |
|                                                           | 802.11 n (HT20) | 6.5              | 1, 6, 11 |
|                                                           | 802.11 n (HT40) | 13.5             | 3, 6, 9  |
| Emission on the Band Edge                                 | 802.11 b        | 1                | 1, 6, 11 |
|                                                           | 802.11 g        | 6                | 1, 6, 11 |
|                                                           | 802.11 n (HT20) | 6.5              | 1, 6, 11 |
|                                                           | 802.11 n (HT40) | 13.5             | 3, 6, 9  |

### 3. Emissions In Restricted Frequency Bands (Radiated emission measurements)

#### 3.1 Operating environment

|                      |                              |     |
|----------------------|------------------------------|-----|
| Temperature:         | 25                           | °C  |
| Relative Humidity:   | 50                           | %   |
| Atmospheric Pressure | 1008                         | hPa |
| Requirement          | 15.247(d), 15.205,<br>15.209 |     |

#### 3.2 Limit for emission in restricted frequency bands (Radiated emission measurement)

| Frequency<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement distance<br>(meters) |
|--------------------|--------------------------------------|----------------------------------|
| 0.009~0.490        | 2400/F(kHz)                          | 300                              |
| 0.490~1.705        | 2400/F(kHz)                          | 30                               |
| 1.705~30           | 30                                   | 30                               |
| 30-88              | 100                                  | 3                                |
| 88-216             | 150                                  | 3                                |
| 216-960            | 200                                  | 3                                |
| Above 960          | 500                                  | 3                                |

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

### 3.3 Measuring instrument setting

#### Below 1GHz measurement

| Receiver settings |                                                                             |
|-------------------|-----------------------------------------------------------------------------|
| Receiver function | Setting                                                                     |
| Detector          | QP                                                                          |
| RBW               | 9-150 kHz ; 200-300 Hz<br>0.15-30 MHz; 9-10 kHz<br>30-1000 MHz; 100-120 kHz |
| VBW               | $\geq 3 \times \text{RBW}$                                                  |
| Sweep             | Auto couple                                                                 |
| Attenuation       | Auto                                                                        |

#### Above 1GHz measurement

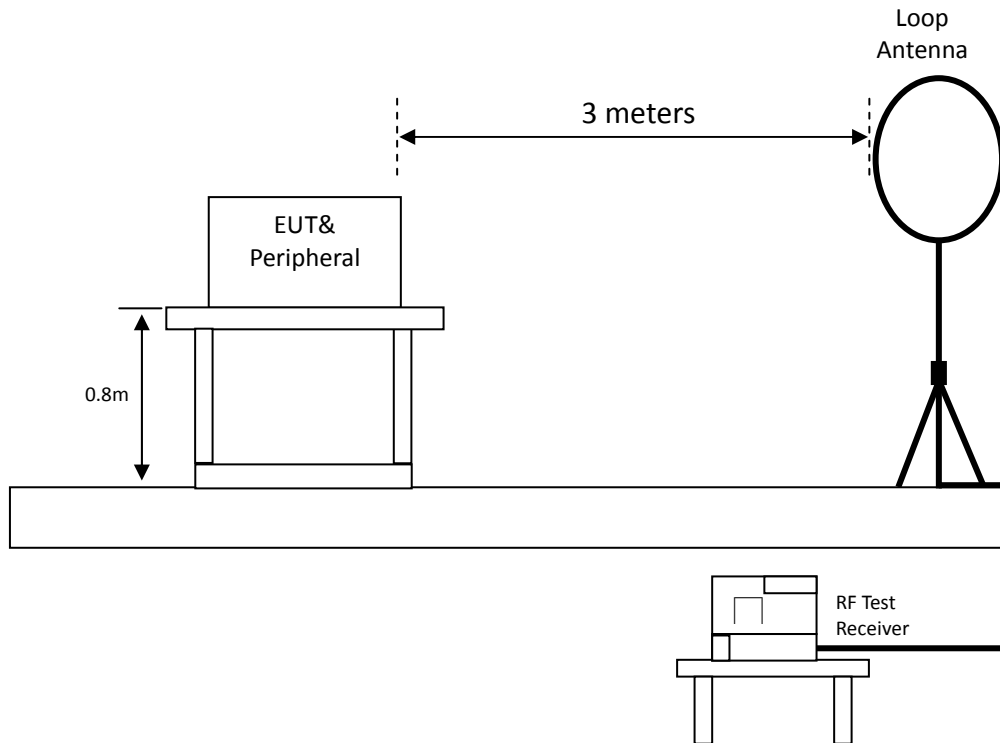
| Spectrum analyzer settings |                           |
|----------------------------|---------------------------|
| Spectrum Analyzer function | Setting                   |
| Detector                   | Peak                      |
| RBW                        | 1MHz                      |
| VBW                        | 3MHz for Peak and Average |
| Sweep                      | Auto couple               |
| Start Frequency            | 1GHz                      |
| Stop Frequency             | Tenth harmonic            |
| Attenuation                | Auto                      |

### 3.4 Test procedure

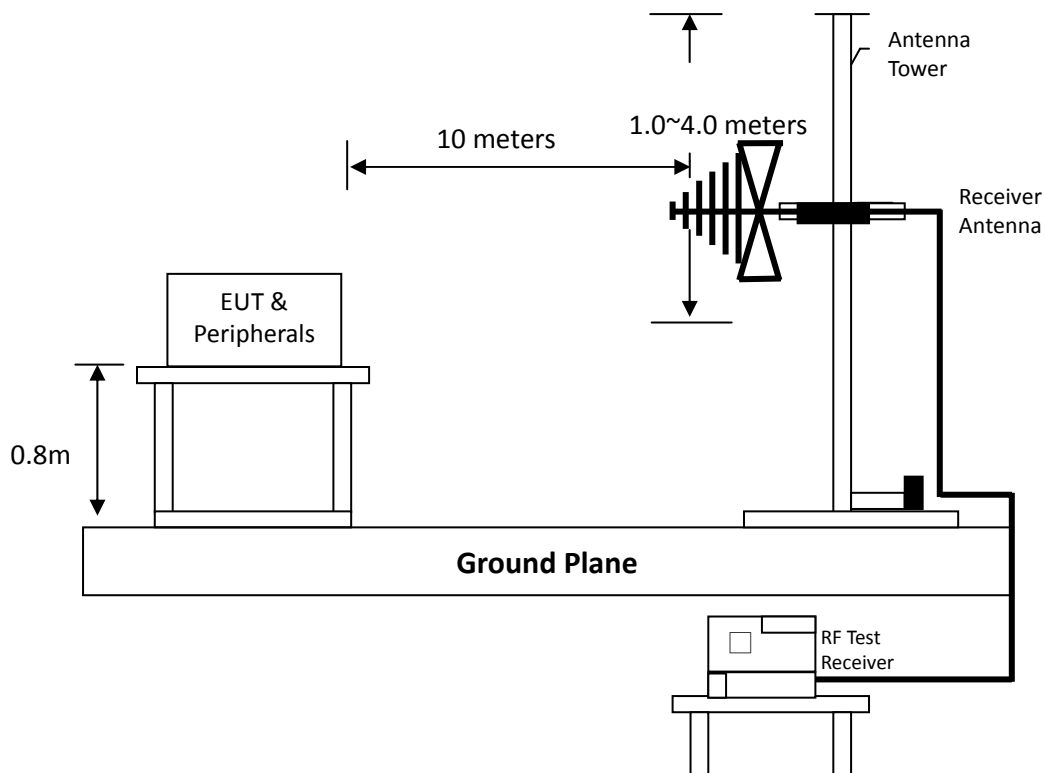
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter or 1.5 meter above ground. The center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the companion devices. The turntable was rotated by 360 degree to find the position of the maximum emission level.
3. The height of the receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of the both horizontal and vertical polarization
4. If find the frequencies above the limit or below within 3dB, the antenna tower was scan (from 1m to 4m) and then the turntable was rotated to find the maximum reading.
5. Set the test-receiver system to peak or CISPR quasi-peak detector with specified bandwidth under maximum hold mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak and average reading  
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
7. If the emissions level of the EUT in peak mode was 3dB lower than the average limit specified then testing will be stopped and peak values of the EUT will be reported. Otherwise, the emissions which do not have 3dB margin will be measured using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, The emissions level of the EUT in peak mode was lower than average limit, then testing will be stopped and peak values of the EUT will be reported, otherwise, the emission will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be quasi-peak measured by receiver.

### 3.5 Test configuration

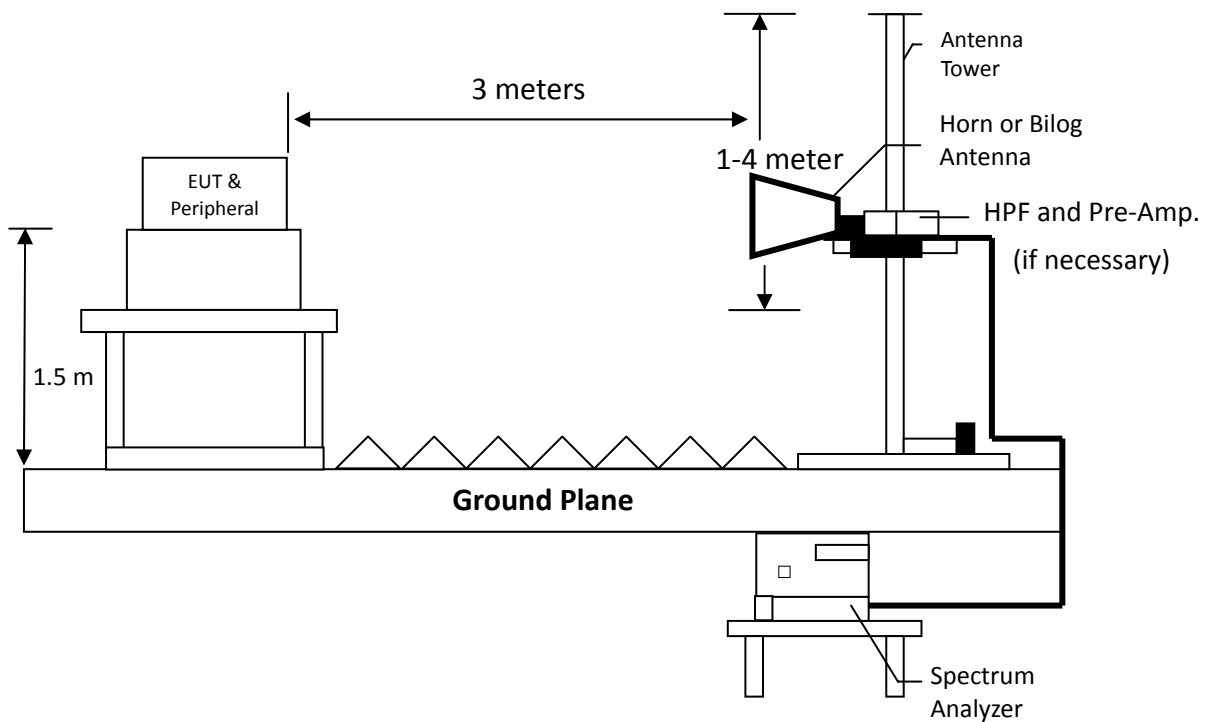
#### 3.5.1 Radiated emission from 9kHz to 30MHz uses Loop Antenna:



### 3.5.2 Radiated emission below 1GHz using Bilog Antenna



### 3.5.3 Radiated emission above 1GHz using Horn Antenna



### 3.6 Test result

#### 3.6.1 Measurement results: frequencies 9kHz to 30MHz

EUT : WiFiHU2s-c

| Frequency<br>(MHz) | Detector | Corr.<br>Factor<br>(dB/m) | Reading<br>(dBμV) | Calculated<br>level<br>(dBμV/m) | Limit<br>@ 3m<br>(dBμV/m) | Margin<br>(dB) |
|--------------------|----------|---------------------------|-------------------|---------------------------------|---------------------------|----------------|
| 0.01               | QP       | 95.30                     | -44.72            | 50.58                           | 127.60                    | -77.02         |
| 0.02               | QP       | 90.60                     | -37.04            | 53.56                           | 121.58                    | -68.02         |
| 0.03               | QP       | 85.90                     | -31.11            | 54.79                           | 118.06                    | -63.27         |
| 0.04               | QP       | 83.20                     | -34.15            | 49.05                           | 115.56                    | -66.51         |
| 0.09               | QP       | 75.46                     | -31.51            | 43.95                           | 108.52                    | -64.57         |
| 0.12               | QP       | 73.23                     | -28.36            | 44.87                           | 106.02                    | -61.15         |
| 0.27               | QP       | 65.96                     | -13.77            | 52.19                           | 98.98                     | -46.79         |
| 0.75               | QP       | 57.50                     | -11.51            | 45.99                           | 70.10                     | -24.11         |
| 0.87               | QP       | 56.16                     | -12.46            | 43.70                           | 68.81                     | -25.11         |
| 1.11               | QP       | 54.18                     | -13.92            | 40.26                           | 66.70                     | -26.44         |
| 1.52               | QP       | 52.26                     | -13.15            | 39.11                           | 63.97                     | -24.86         |
| 1.76               | QP       | 51.13                     | -13.07            | 38.06                           | 69.54                     | -31.48         |

Remark: Corr. Factor = Antenna Factor + Cable Loss - PreAmplifier Gain

### 3.6.2 Measurement results: frequencies below 1 GHz

The test was performed on EUT under 802.11b/g/n continuously transmitting mode. The worst case occurred at 802.11g channel 11.

EUT : WiFiHU2s-c  
Worst Case : 802.11g channel 11

| Antenna<br>Polariz.<br>(V/H) | Freq.<br>(MHz) | Receiver<br>Detector | Corr.<br>Factor<br>(dB/m) | Reading<br>(dBμV) | Corrected<br>Level<br>(dBμV/m) | Limit<br>@ 3 m<br>(dBμV/m) | Margin<br>(dB) |
|------------------------------|----------------|----------------------|---------------------------|-------------------|--------------------------------|----------------------------|----------------|
| Vertical                     | 41.64          | QP                   | 16.50                     | 17.60             | 34.10                          | 40.00                      | -5.90          |
| Vertical                     | 119.24         | QP                   | 13.78                     | 18.01             | 31.79                          | 43.50                      | -11.71         |
| Vertical                     | 173.56         | QP                   | 15.64                     | 20.37             | 36.01                          | 43.50                      | -7.49          |
| Vertical                     | 196.84         | QP                   | 13.86                     | 24.60             | 38.46                          | 43.50                      | -5.04          |
| Vertical                     | 233.70         | QP                   | 15.20                     | 19.68             | 34.88                          | 46.00                      | -11.12         |
| Vertical                     | 346.22         | QP                   | 18.64                     | 15.49             | 34.13                          | 46.00                      | -11.87         |
| Horizontal                   | 130.88         | QP                   | 14.99                     | 14.20             | 29.19                          | 43.50                      | -14.31         |
| Horizontal                   | 173.56         | QP                   | 15.64                     | 17.10             | 32.74                          | 43.50                      | -10.76         |
| Horizontal                   | 196.84         | QP                   | 13.86                     | 20.14             | 34.00                          | 43.50                      | -9.50          |
| Horizontal                   | 220.12         | QP                   | 14.66                     | 19.78             | 34.44                          | 46.00                      | -11.56         |
| Horizontal                   | 233.70         | QP                   | 15.20                     | 20.03             | 35.23                          | 46.00                      | -10.77         |
| Horizontal                   | 256.98         | QP                   | 16.03                     | 17.77             | 33.80                          | 46.00                      | -12.20         |

Remark: Corr. Factor = Antenna Factor + Cable Loss

### 3.6.3 Measurement results: frequency above 1GHz

EUT : WiFiHU2s-c

| Mode                         | Frequency<br>(MHz) | Spectrum<br>Analyzer<br>Detector | Ant.<br>Pol.<br>(H/V) | Preamp.<br>Gain<br>(dB) | Corr.<br>Factor<br>(dB/m) | Reading<br>(dBμV) | Corrected<br>Reading<br>(dBμV/m) | Limit<br>@ 3m<br>(dBμV/m) | Margin<br>(dB) |
|------------------------------|--------------------|----------------------------------|-----------------------|-------------------------|---------------------------|-------------------|----------------------------------|---------------------------|----------------|
| 802.11b , Ch 1<br>2412MHz    | 4824               | PK                               | V                     | 40.10                   | -0.04                     | 43.26             | 43.22                            | 74.00                     | -30.78         |
|                              | 4824               | PK                               | H                     | 40.10                   | -0.04                     | 44.86             | 44.82                            | 74.00                     | -29.18         |
| 802.11b , Ch 6<br>2437MHz    | 4874               | PK                               | V                     | 40.00                   | 0.13                      | 41.52             | 41.65                            | 74.00                     | -32.35         |
|                              | 4874               | PK                               | H                     | 40.00                   | 0.13                      | 44.24             | 44.37                            | 74.00                     | -29.63         |
| 802.11b , Ch 11<br>2462MHz   | 4924               | PK                               | V                     | 39.91                   | 0.30                      | 39.44             | 39.74                            | 74.00                     | -34.26         |
|                              | 4924               | PK                               | H                     | 39.91                   | 0.30                      | 43.83             | 43.79                            | 74.00                     | -30.21         |
| 802.11g , Ch 1<br>2412MHz    | 4824               | PK                               | V                     | 40.10                   | -0.04                     | 41.16             | 41.12                            | 74.00                     | -32.88         |
|                              | 4824               | PK                               | H                     | 40.10                   | -0.04                     | 42.42             | 42.38                            | 74.00                     | -31.62         |
| 802.11g , Ch 6<br>2437MHz    | 4874               | PK                               | V                     | 40.00                   | 0.13                      | 41.01             | 41.14                            | 74.00                     | -32.86         |
|                              | 4874               | AV                               | H                     | 40.00                   | 0.13                      | 43.29             | 43.42                            | 54.00                     | -10.58         |
| 802.11g , Ch 11<br>2462MHz   | 4924               | PK                               | V                     | 39.91                   | 0.30                      | 40.46             | 40.76                            | 74.00                     | -33.24         |
|                              | 4924               | PK                               | H                     | 39.91                   | 0.30                      | 40.87             | 41.17                            | 74.00                     | -32.83         |
| 802.11n20 , Ch 1<br>2412MHz  | 4824               | PK                               | V                     | 40.10                   | -0.04                     | 41.46             | 41.42                            | 74.00                     | -32.58         |
|                              | 4824               | PK                               | H                     | 40.10                   | -0.04                     | 43.95             | 43.91                            | 74.00                     | -30.09         |
| 802.11n20 , Ch 6<br>2437MHz  | 4874               | PK                               | V                     | 40.00                   | 0.13                      | 42.22             | 42.35                            | 74.00                     | -31.65         |
|                              | 4874               | PK                               | H                     | 40.00                   | 0.13                      | 43.76             | 43.89                            | 74.00                     | -30.11         |
| 802.11n20 , Ch 11<br>2462MHz | 4924               | PK                               | V                     | 39.91                   | 0.30                      | 40.68             | 40.98                            | 74.00                     | -33.02         |
|                              | 4924               | PK                               | H                     | 39.91                   | 0.30                      | 43.22             | 43.52                            | 74.00                     | -30.48         |
| 802.11n40 , Ch 3<br>2422MHz  | 4844               | PK                               | V                     | 40.06                   | 0.03                      | 41.51             | 41.54                            | 74.00                     | -32.46         |
|                              | 4844               | PK                               | H                     | 40.06                   | 0.03                      | 43.55             | 43.58                            | 74.00                     | -30.42         |
| 802.11n40 , Ch 6<br>2437MHz  | 4874               | PK                               | V                     | 40.00                   | 0.13                      | 42.58             | 42.71                            | 74.00                     | -31.29         |
|                              | 4874               | PK                               | H                     | 40.00                   | 0.13                      | 43.59             | 43.72                            | 74.00                     | -30.28         |
| 802.11n40 , Ch 9<br>2452MHz  | 4904               | PK                               | V                     | 39.95                   | 0.23                      | 40.69             | 40.92                            | 74.00                     | -33.08         |
|                              | 4904               | PK                               | H                     | 39.95                   | 0.23                      | 42.81             | 43.04                            | 74.00                     | -30.96         |

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre\_Amplifier Gain

#### 4. Emission On Band Edge

##### 4.1 Operating environment

|                      |                    |     |
|----------------------|--------------------|-----|
| Temperature:         | 25                 | °C  |
| Relative Humidity:   | 50                 | %   |
| Atmospheric Pressure | 1008               | hPa |
| Requirement          | 15.247(d), 15.205, |     |

##### 4.2 Measuring instrument setting

| Spectrum analyzer settings |                                 |
|----------------------------|---------------------------------|
| Spectrum Analyzer function | Setting                         |
| Detector                   | Peak                            |
| RBW                        | 1MHz                            |
| VBW                        | 3MHz for Peak; 10Hz for Average |
| Sweep                      | Auto couple                     |
| Restrict bands             | 2310~2390MHz                    |
|                            | 2483.5 ~2500MHz                 |
| Attenuation                | Auto                            |

### 4.3 Test procedure

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter or 1.5 meter above ground. The center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the companion devices. The turntable was rotated by 360 degree to find the position of the maximum emission level.
3. The height of the receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of the both horizontal and vertical polarization
4. If find the frequencies above the limit or below within 3dB, the antenna tower was scan (from 1m to 4m) and then the turntable was rotated to find the maximum reading.
5. Set the test-receiver system to peak or CISPR quasi-peak detector with specified bandwidth under maximum hold mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak and average reading  
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
7. If the emissions level of the EUT in peak mode was 3dB lower than the average limit specified then testing will be stopped and peak values of the EUT will be reported. Otherwise, the emissions which do not have 3dB margin will be measured using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, The emissions level of the EUT in peak mode was lower than average limit, then testing will be stopped and peak values of the EUT will be reported, otherwise, the emission will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be quasi-peak measured by receiver.

#### 4.4 Test results

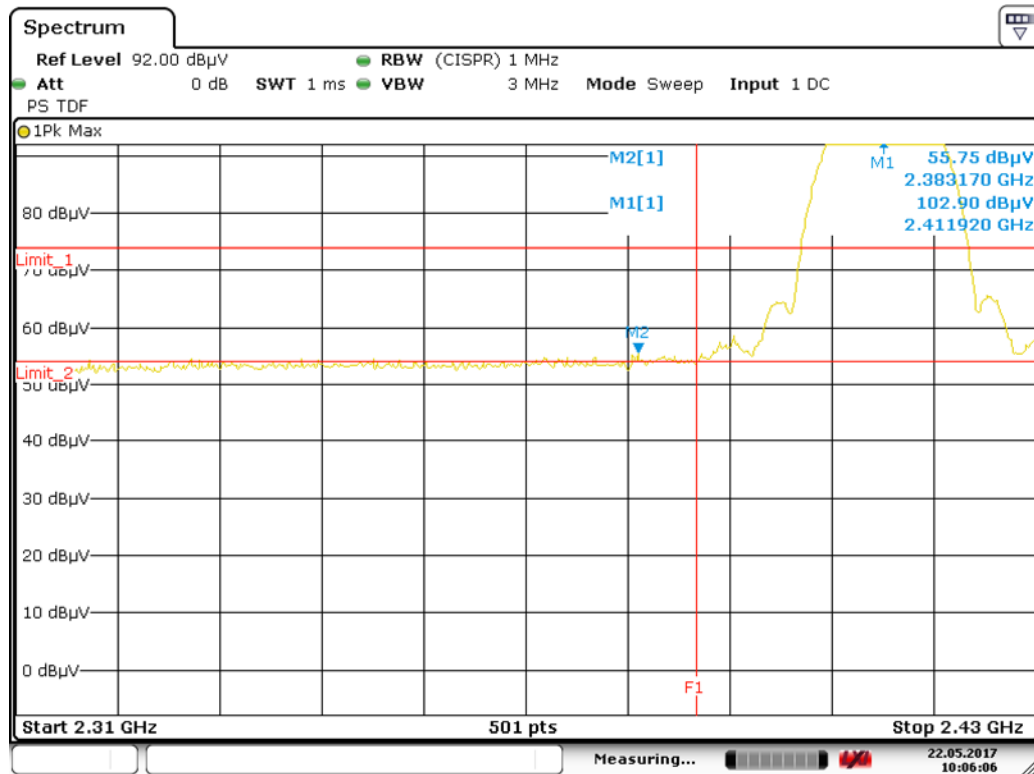
EUT : WiFiHU2s-c

| Mode              | Frequency<br>(MHz) | Spectrum<br>Analyzer<br>Detector | Ant.<br>Pol.<br>(H/V) | Correction<br>Factor<br>(dB/m) | Reading<br>(dBμV) | Corrected<br>Reading<br>(dBμV/m) | Limit<br>@ 3 m<br>(dBμV/m) | Margin<br>(dB) | Restricted<br>band<br>(MHz) |
|-------------------|--------------------|----------------------------------|-----------------------|--------------------------------|-------------------|----------------------------------|----------------------------|----------------|-----------------------------|
| 802.11b           | 2383.17            | PK                               | V                     | 33.82                          | 21.93             | 55.75                            | 74                         | -18.25         | 2310~2390                   |
|                   | 2386.05            | AV                               | V                     | 33.83                          | 8.97              | 42.80                            | 54                         | -11.20         |                             |
|                   | 2490.39            | PK                               | V                     | 34.33                          | 22.73             | 57.06                            | 74                         | -16.94         | 2483.5~2500                 |
|                   | 2484.30            | AV                               | V                     | 34.30                          | 10.87             | 45.17                            | 54                         | -8.83          |                             |
| 802.11g           | 2388.44            | PK                               | V                     | 33.84                          | 24.40             | 58.24                            | 74                         | -15.76         | 2310~2390                   |
|                   | 2390.00            | AV                               | V                     | 33.85                          | 9.40              | 43.25                            | 54                         | -10.75         |                             |
|                   | 2486.90            | PK                               | V                     | 34.32                          | 26.86             | 61.18                            | 74                         | -12.82         | 2483.5~2500                 |
|                   | 2483.50            | AV                               | V                     | 34.30                          | 10.69             | 44.99                            | 54                         | -9.01          |                             |
| 802.11n<br>(HT20) | 2390.00            | PK                               | V                     | 33.85                          | 23.81             | 57.66                            | 74                         | -16.34         | 2310~2390                   |
|                   | 2390.00            | AV                               | V                     | 33.85                          | 9.37              | 43.22                            | 54                         | -10.78         |                             |
|                   | 2485.98            | PK                               | V                     | 34.31                          | 26.41             | 60.72                            | 74                         | -13.28         | 2483.5~2500                 |
|                   | 2483.50            | AV                               | V                     | 34.30                          | 10.59             | 44.89                            | 54                         | -9.11          |                             |
| 802.11n<br>(HT40) | 2385.93            | PK                               | V                     | 33.83                          | 25.19             | 59.02                            | 74                         | -14.98         | 2310~2390                   |
|                   | 2390.00            | AV                               | V                     | 33.85                          | 10.54             | 44.39                            | 54                         | -9.61          |                             |
|                   | 2487.97            | PK                               | V                     | 34.32                          | 26.94             | 61.26                            | 74                         | -12.74         | 2483.5~2500                 |
|                   | 2484.98            | AV                               | V                     | 34.31                          | 12.15             | 46.46                            | 54                         | -7.54          |                             |

Remark: Correction Factor = Antenna Factor + Cable

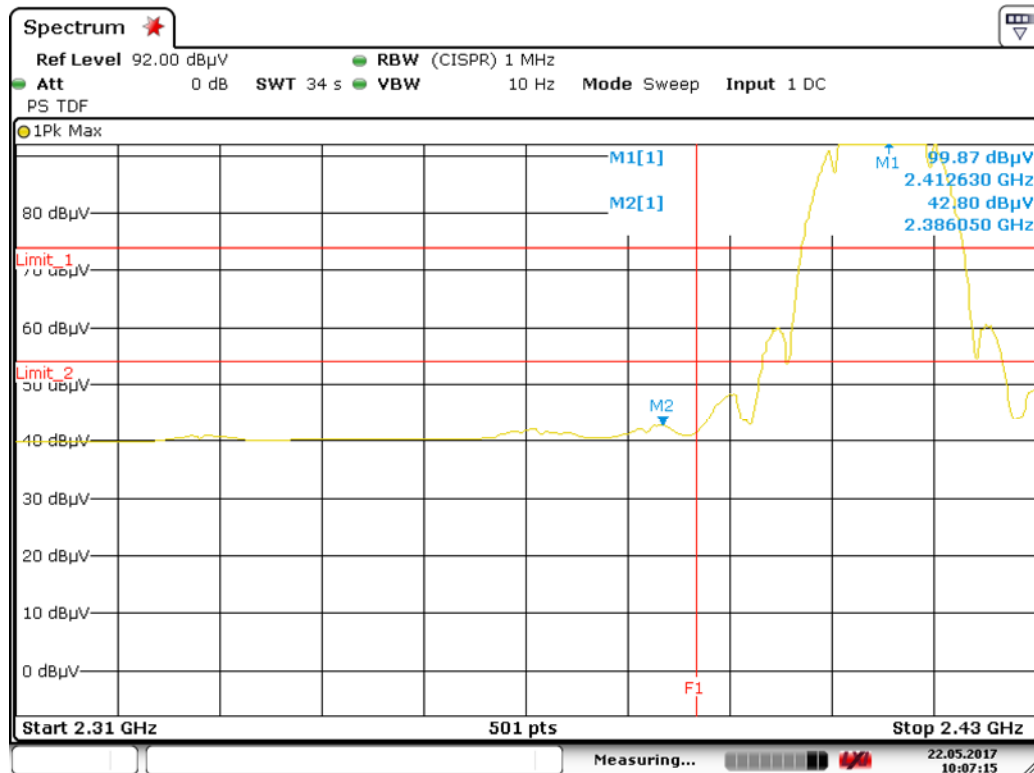
Loss

### Chain0 : Bandedge @ 802.11b mode Ch 1 Peak



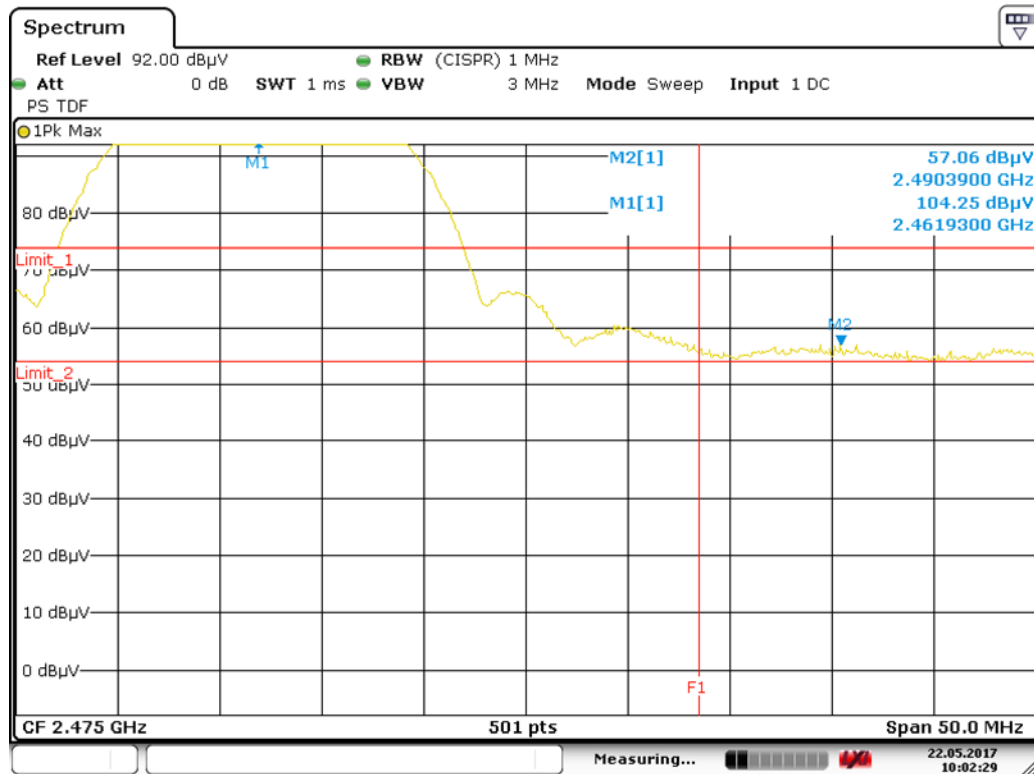
Date: 22.MAY.2017 10:06:06

### Chain0 : Bandedge @ 802.11b mode Ch1 Average



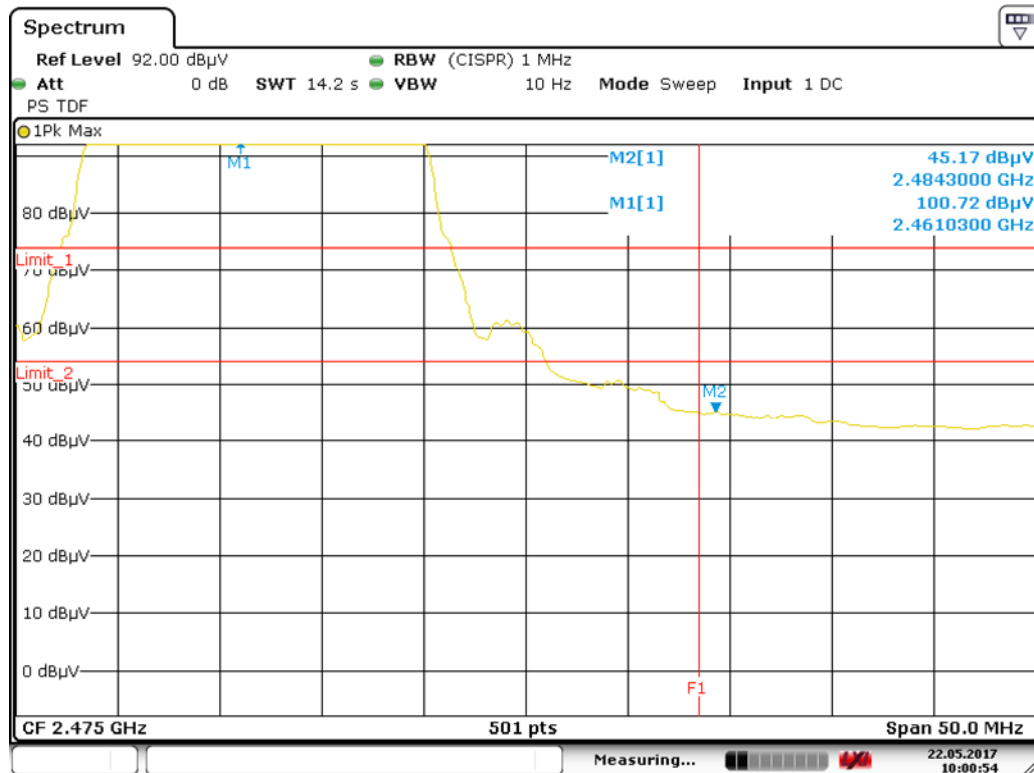
Date: 22.MAY.2017 10:07:16

### Chain0 : Bandedge @ 802.11b mode Ch11 Peak



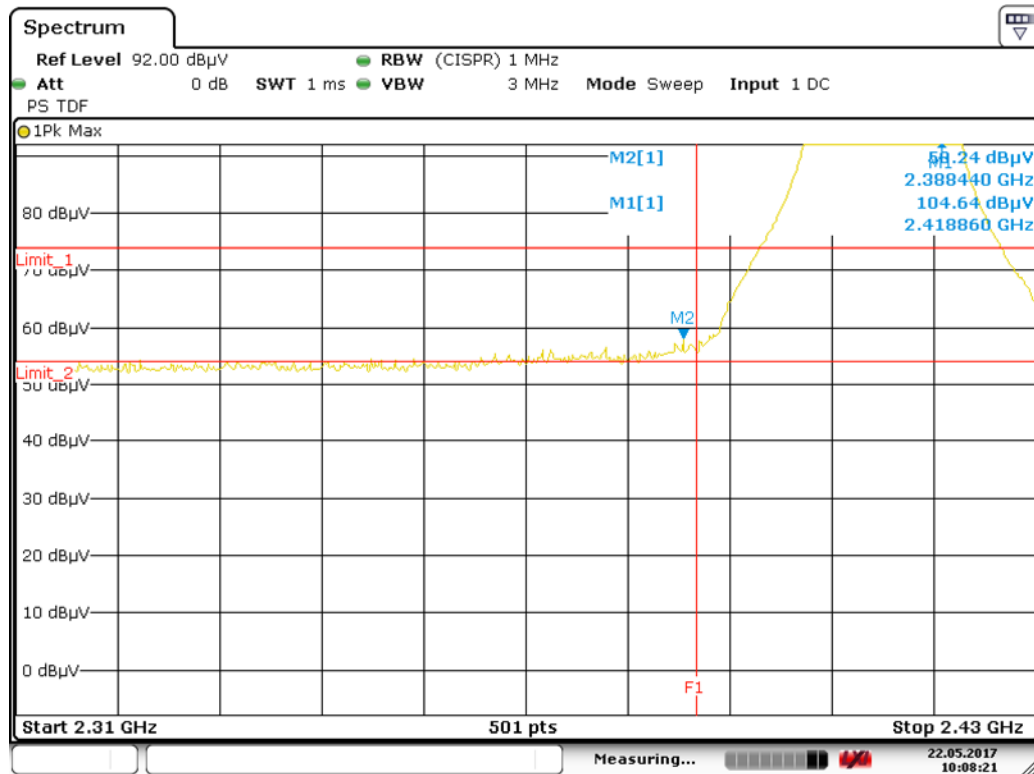
Date: 22.MAY.2017 10:02:30

### Chain0 : Bandedge @ 802.11b mode Ch11 Average



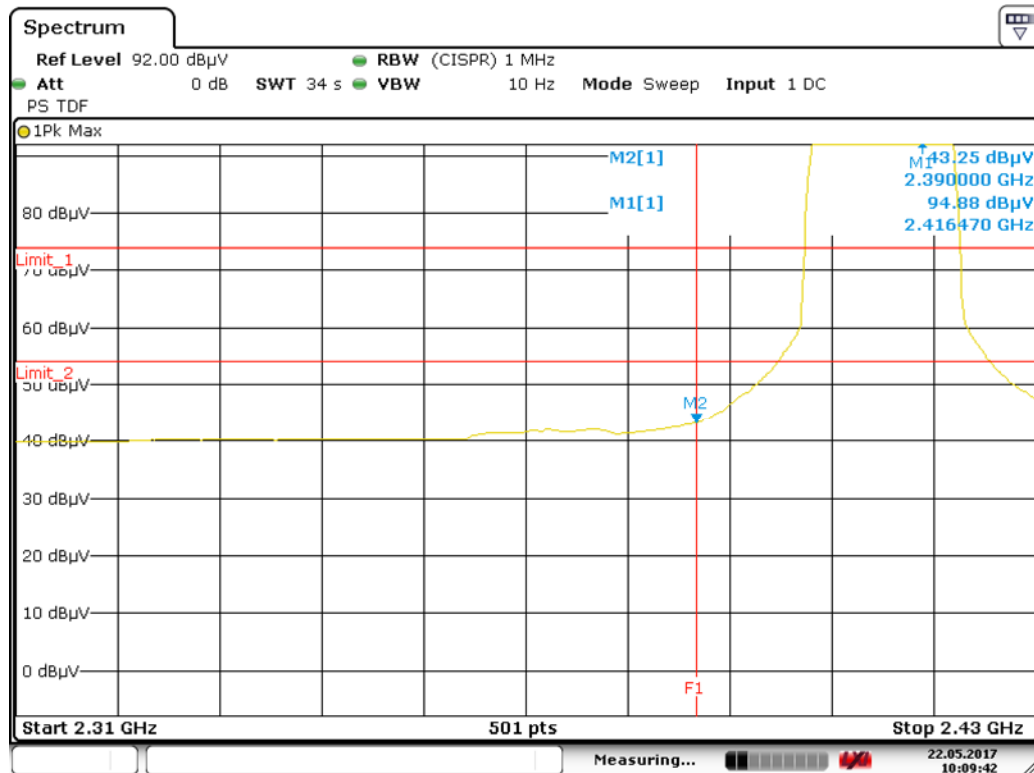
Date: 22.MAY.2017 10:00:54

### Chain0 : Bandedge @ 802.11g mode Ch1 Peak



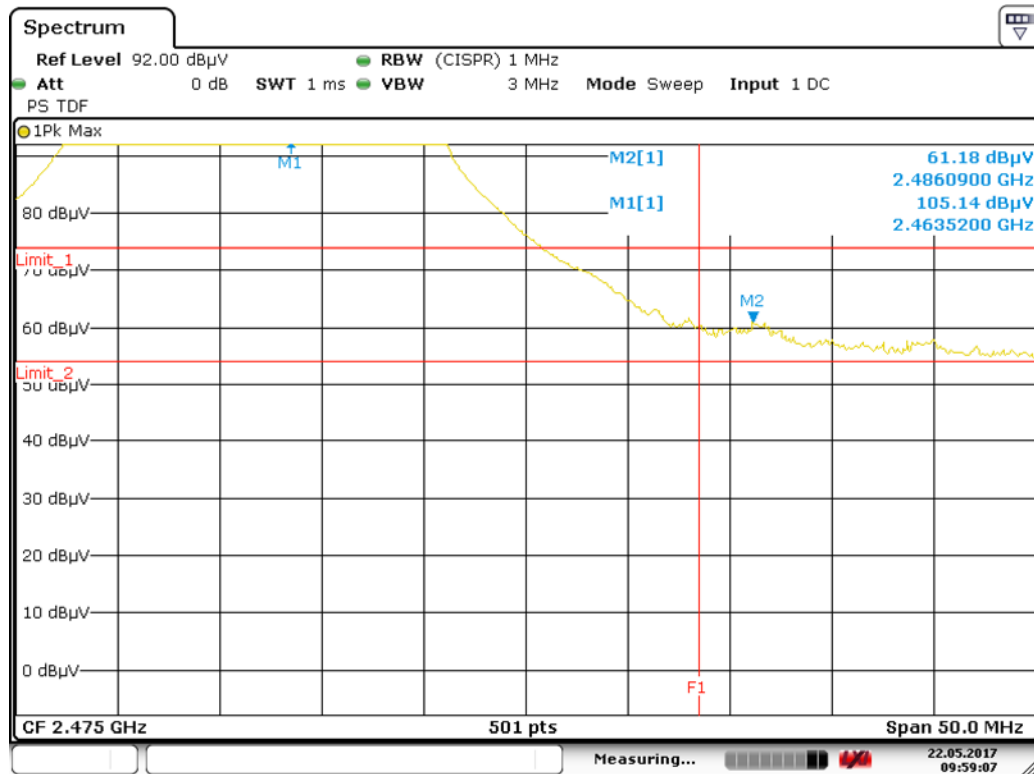
Date: 22.MAY.2017 10:08:21

### Chain0 : Bandedge @ 802.11g mode Ch1 Average



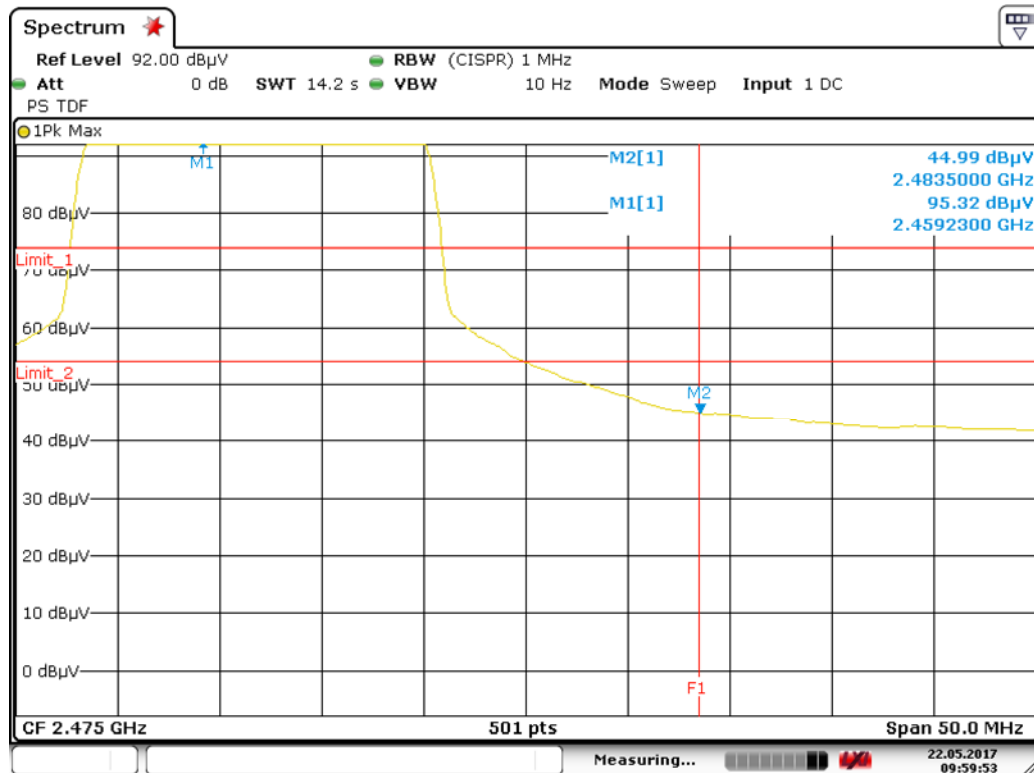
Date: 22.MAY.2017 10:09:42

### Chain0 : Bandedge @ 802.11g mode Ch 11 Peak



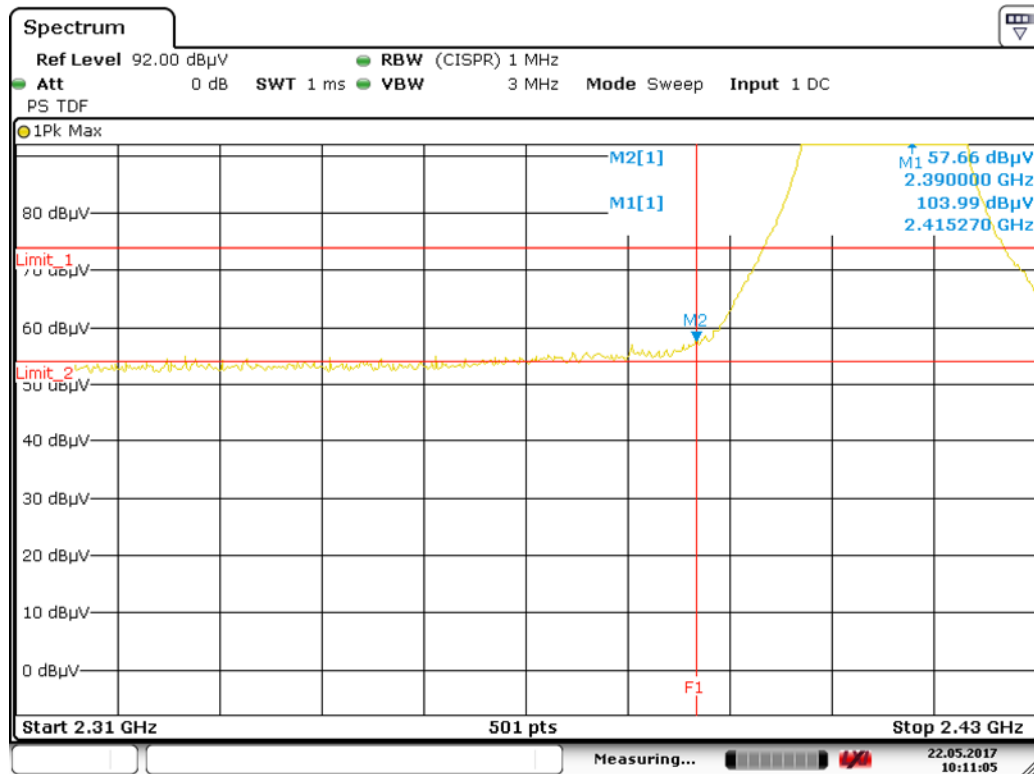
Date: 22.MAY.2017 09:59:07

### Chain0 : Bandedge @ 802.11g mode Ch11 Average



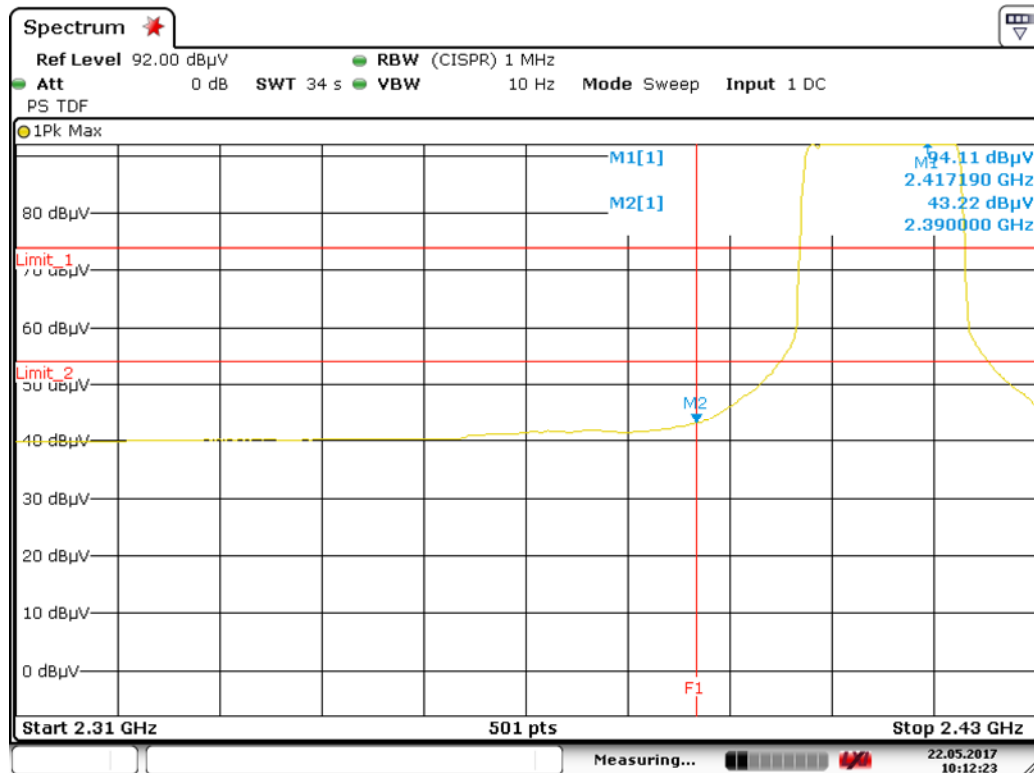
Date: 22.MAY.2017 09:59:53

**Chain0 : Bandedge @ 802.11 n(HT20) mode Ch 1 Peak**



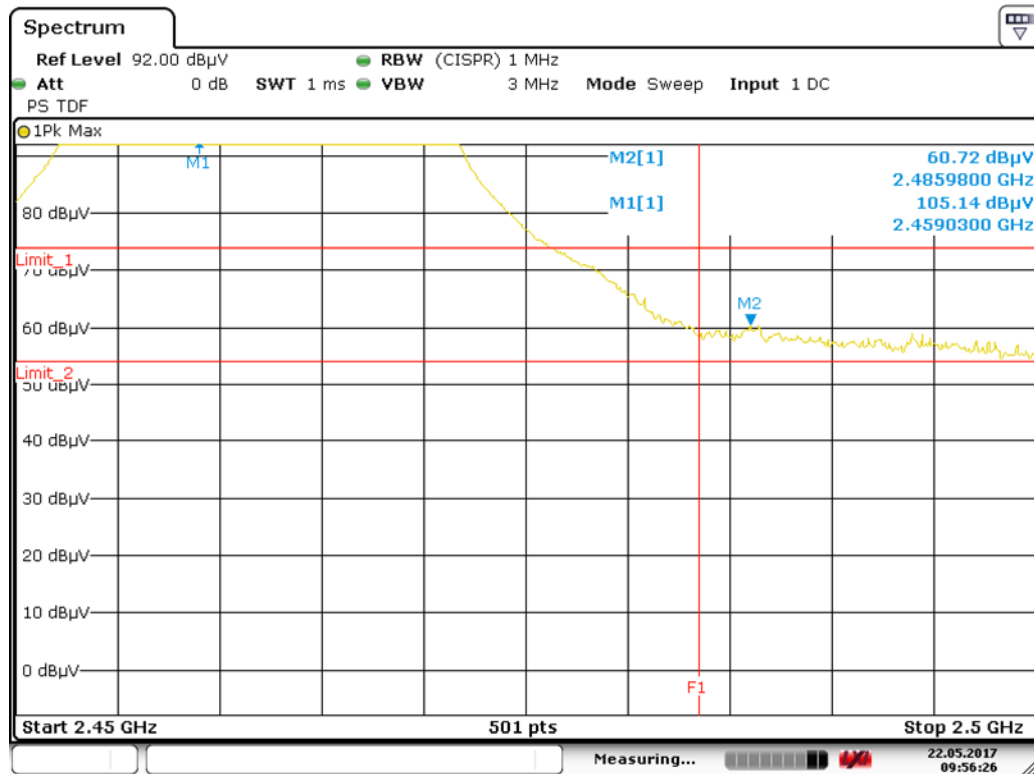
Date: 22.MAY.2017 10:11:05

**Chain0 : Bandedge @ 802.11 n(HT20) mode Ch1 Average**



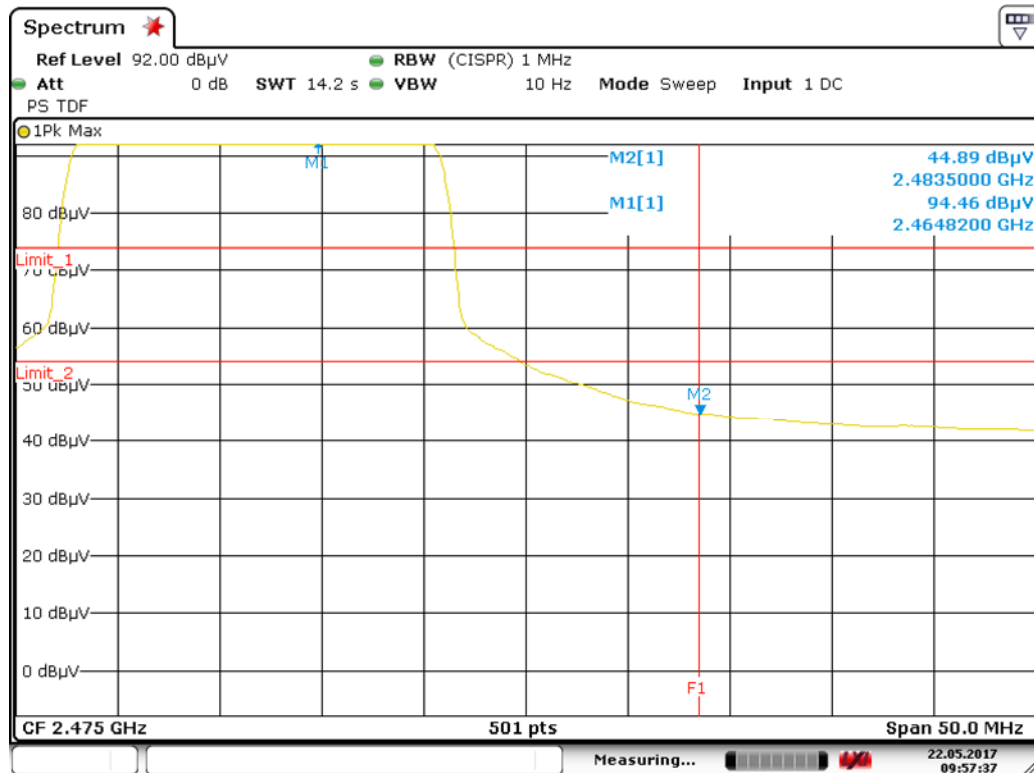
Date: 22.MAY.2017 10:12:23

### Chain0 : Bandedge @ 802.11 n(HT20) mode Ch 11 Peak



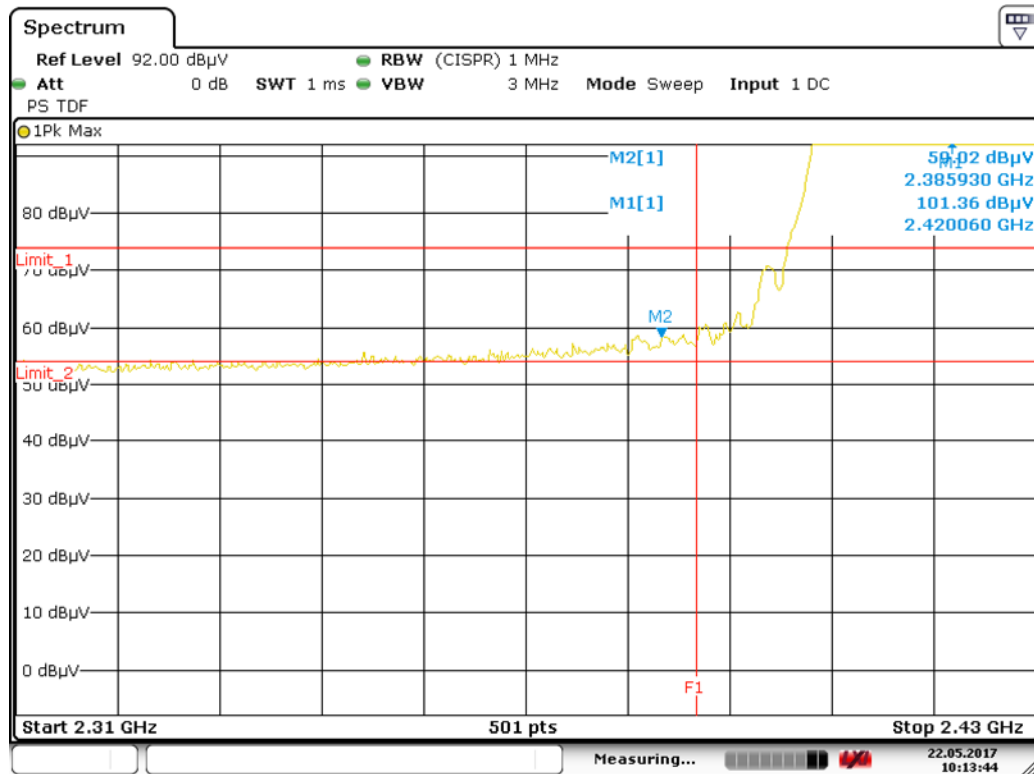
Date: 22.MAY.2017 09:56:26

### Chain0 : Bandedge @ 802.11 n(HT20) mode Ch11 Average



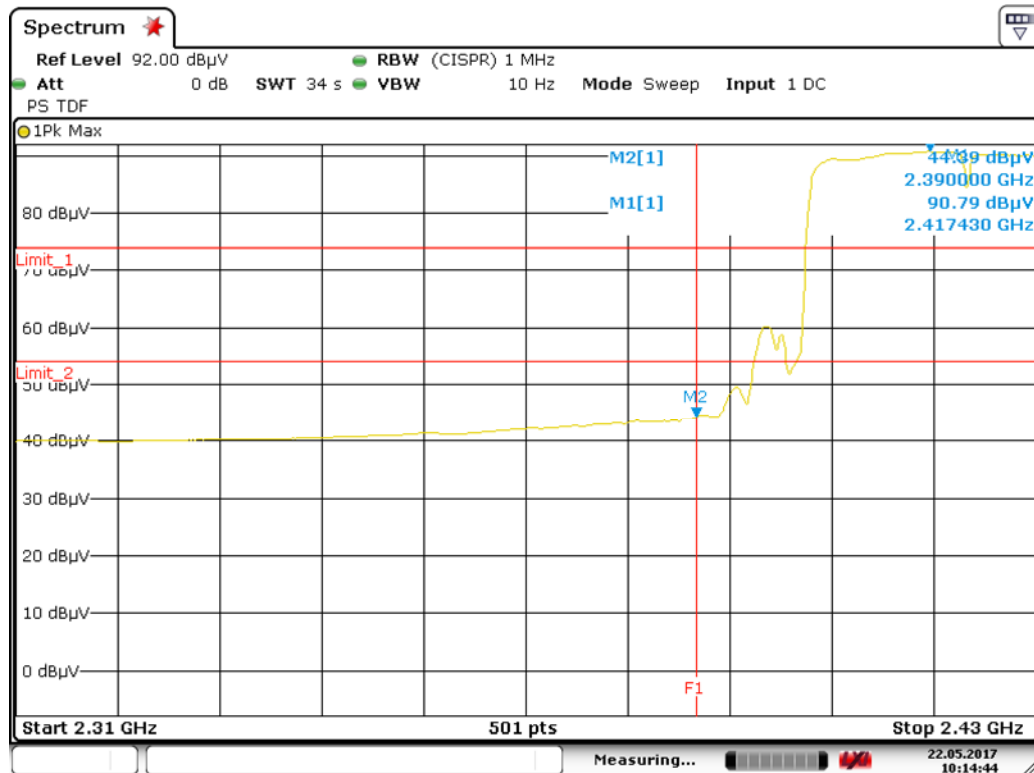
Date: 22.MAY.2017 09:57:38

**Chain0 : Bandedge @ 802.11 n(HT40) mode Ch 3 Peak**



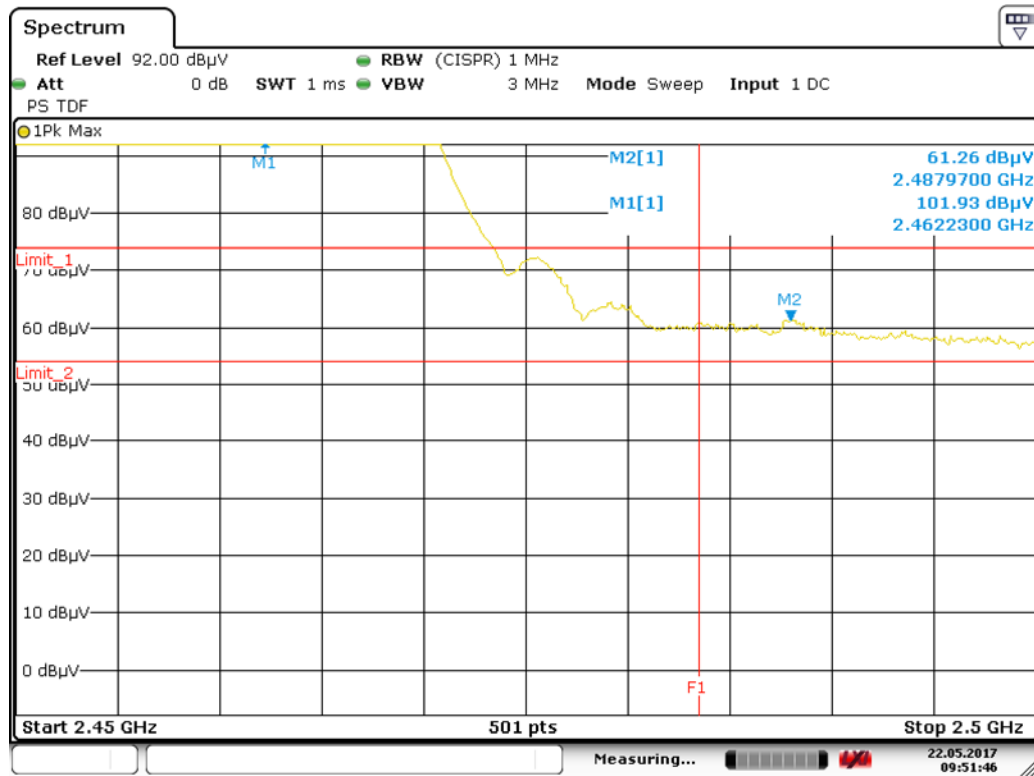
Date: 22.MAY.2017 10:13:44

**Chain0 : Bandedge @ 802.11 n(HT40) mode Ch3 Average**



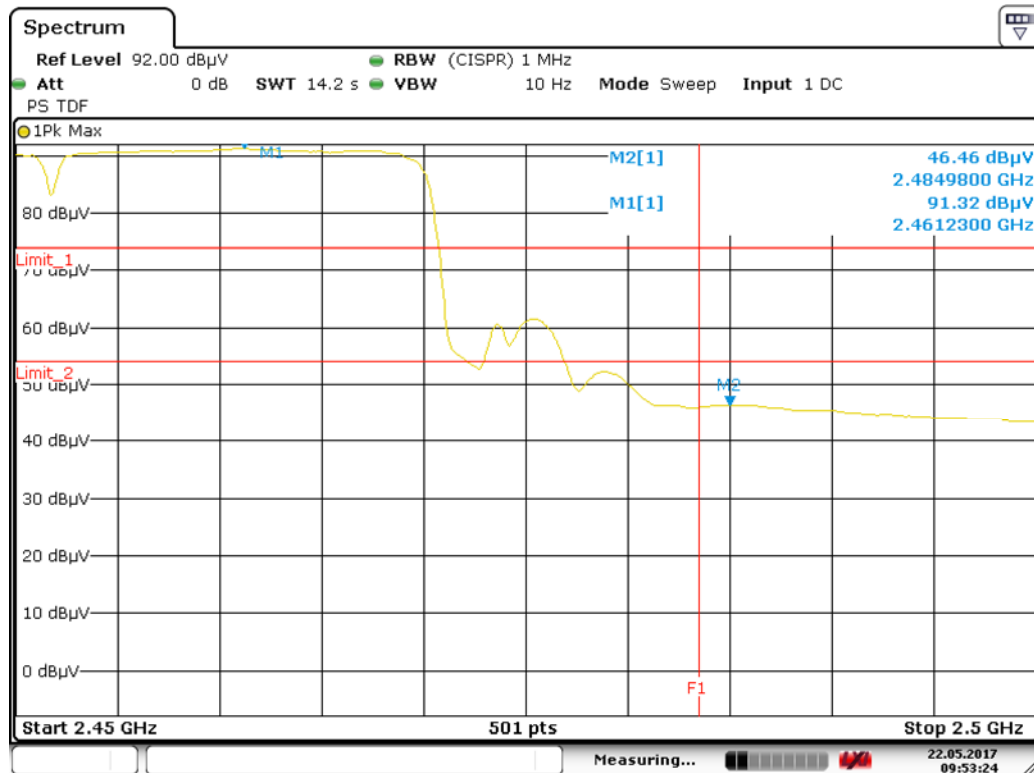
Date: 22.MAY.2017 10:14:44

**Chain0 : Bandedge @ 802.11 n(HT40) mode Ch 9 Peak**



Date: 22.MAY.2017 09:51:46

**Chain0 : Bandedge @ 802.11 n(HT40) mode Ch9 Average**



Date: 22.MAY.2017 09:53:24

## 5. Maximum Peak Conducted Output Power

### 5.1 Operating environment

|                           |                                    |     |
|---------------------------|------------------------------------|-----|
| Temperature:              | 25                                 | °C  |
| Relative Humidity:        | 50                                 | %   |
| Atmospheric Pressure      | 1008                               | hPa |
| Requirement & Test method | 15.247(b)(3)<br>KDB 558074 D01 v04 |     |

### 5.2 Limit for maximum peak conducted output power

For systems using digital modulation in the 2400-2483.5 MHz: 1 Watt (30dBm)

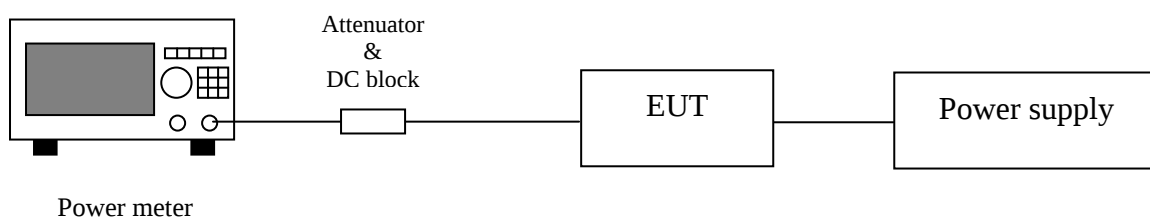
### 5.3 Measuring instrument setting

| Power meter |                                                            |
|-------------|------------------------------------------------------------|
| Power meter | Setting                                                    |
| Bandwidth   | 65MHz bandwidth is greater than the EUT emission bandwidth |
| Detector    | Peak & Average                                             |

### 5.4 Test procedure

Test procedures refer to clause 9.1.3 peak power meter method and clause 9.2.3.2 measurement using a gated RF average power meter of KDB 558074 D01.

### 5.5 Test diagram



## 5.6 Test result

For WiFiHU2s-c:

Single TX

| Mode             | Channel | Frequency (MHz) | Data Rate (Mbps) | Output Power (AV) (dBm) | Total Power (AV) (mW) | Maximun power (PK) (dBm) | Maximun power (PK) (mW) | Limit (dBm) | Margin (dB) |
|------------------|---------|-----------------|------------------|-------------------------|-----------------------|--------------------------|-------------------------|-------------|-------------|
| 802.11b (chain0) | 1       | 2412            | 1                | 15.77                   | 37.76                 | 17.85                    | 60.95368972             | 30          | -12.15      |
|                  | 6       | 2437            |                  | 15.88                   | 38.73                 | 17.92                    | 61.94410751             | 30          | -12.08      |
|                  | 11      | 2462            |                  | 15.54                   | 35.81                 | 17.5                     | 56.23413252             | 30          | -12.50      |
| 802.11g (chain0) | 1       | 2412            | 6                | 15.41                   | 34.75                 | 23.46                    | 221.819642              | 30          | -6.54       |
|                  | 6       | 2437            |                  | 15.36                   | 34.36                 | 22.89                    | 194.5360082             | 30          | -7.11       |
|                  | 11      | 2462            |                  | 15.04                   | 31.92                 | 22.12                    | 162.9296033             | 30          | -7.88       |
| 802.11g (chain1) | 1       | 2412            | 6                | 14.37                   | 27.35                 | 22.77                    | 189.2343619             | 30          | -7.23       |
|                  | 6       | 2437            |                  | 14.18                   | 26.18                 | 22.04                    | 159.9558029             | 30          | -7.96       |
|                  | 11      | 2462            |                  | 13.5                    | 22.39                 | 21.02                    | 126.4736347             | 30          | -8.98       |

2TX

| Mode              | Channel | Frequency<br>(MHz) | Data<br>Rate<br>(Mbps) | Output Power (dBm) |       |         |       | Output Power (mW) |        |         |        | Total Power (dBm) |              |             |              | Limit<br>(dBm) | Margin<br>(dB) |
|-------------------|---------|--------------------|------------------------|--------------------|-------|---------|-------|-------------------|--------|---------|--------|-------------------|--------------|-------------|--------------|----------------|----------------|
|                   |         |                    |                        | Chian 0            |       | Chain 1 |       | Chain 0           |        | Chian 1 |        | AV                |              | PK          |              |                |                |
|                   |         |                    |                        | AV                 | PK    | AV      | PK    | AV                | PK     | AV      | PK     | 0+1<br>(mW)       | 0+1<br>(dBm) | 0+1<br>(mW) | 0+1<br>(dBm) |                |                |
| 802.11n<br>(HT20) | 1       | 2412               | 6.5                    | 13.5               | 21.61 | 12.37   | 20.28 | 22.39             | 144.88 | 17.26   | 106.66 | 39.65             | 15.98        | 251.54      | 24.01        | 30             | -5.99          |
|                   | 6       | 2437               |                        | 13.63              | 21.43 | 12.52   | 20.53 | 23.07             | 139.00 | 17.86   | 112.98 | 40.93             | 16.12        | 251.97      | 24.01        | 30             | -5.99          |
|                   | 11      | 2462               |                        | 13.46              | 20.84 | 12.06   | 19.45 | 22.18             | 121.34 | 16.07   | 88.10  | 38.25             | 15.83        | 209.44      | 23.21        | 30             | -6.79          |
| 802.11n<br>(HT40) | 3       | 2422               | 13                     | 13.19              | 20.73 | 12.24   | 20.04 | 20.84             | 118.30 | 16.75   | 100.93 | 37.59             | 15.75        | 219.23      | 23.41        | 30             | -6.59          |
|                   | 6       | 2437               |                        | 13.29              | 20.55 | 12.01   | 19.71 | 21.33             | 113.50 | 15.89   | 93.54  | 37.22             | 15.71        | 207.04      | 23.16        | 30             | -6.84          |
|                   | 9       | 2452               |                        | 13.19              | 20.17 | 11.97   | 19.63 | 20.84             | 103.99 | 15.74   | 91.83  | 36.58             | 15.63        | 195.83      | 22.92        | 30             | -7.08          |

## Appendix A: Test equipment list

| Equipment                      | Brand                               | Model No.           | Serial No.  | Calibration Date | Next Calibration Date |
|--------------------------------|-------------------------------------|---------------------|-------------|------------------|-----------------------|
| ESCI EMI Test Receiver         | Rohde & Schwarz                     | ESCI                | 100018      | 2016/11/30       | 2017/11/29            |
| Spectrum Analyzer              | Rohde & Schwarz                     | FSP30               | 100137      | 2016/08/16       | 2017/08/15            |
| Horn Antenna (1-18G)           | SHWARZBECK                          | BBHA 9120 D         | 9120D-456   | 2014/08/29       | 2017/08/27            |
| Horn Antenna (14-42G)          | SHWARZBECK                          | BBHA 9170           | BBHA9170159 | 2014/09/16       | 2017/09/14            |
| Broadband Antenna              | SHWARZBECK                          | VULB 9168           | 9168-172    | 2017/04/05       | 2018/04/04            |
| Pre-Amplifier                  | EMC Co.                             | EMC12635SE          | 980205      | 2016/10/08       | 2017/10/07            |
| Pre-Amplifier                  | MITEQ                               | JS4-26004000--27-8A | 828825      | 2016/09/12       | 2017/09/11            |
| Power Meter                    | Anritsu                             | ML2495A             | 0844001     | 2016/11/09       | 2017/11/08            |
| Power Sensor                   | Anritsu                             | MA2411B             | 0738452     | 2016/11/09       | 2017/11/08            |
| Signal Analyzer                | Agilent                             | N9030A              | MY51380492  | 2016/09/13       | 2017/09/12            |
| 966-2(A) Cable 9kHz~26.5GHz    | SUHNER                              | SMA / EX 100        | N/A         | 2016/08/16       | 2017/08/15            |
| 966-2(B) Cable 9kHz~26.5GHz    | SUHNER                              | SUCOFLEX 104P       | CB0005      | 2016/08/16       | 2017/08/15            |
| RF Cable 9kHz~26.5GHz          | SUHNER                              | SUCOFLEX 102        | CB0006      | 2017/05/04       | 2018/05/03            |
| 966-2_3m Semi-Anechoic Chamber | 966_2                               | CEM-966_2           | N/A         | 2017/03/29       | 2018/03/28            |
| High Pass Filter               | Reactel                             | 7HS-3G/18G-S1<br>1  | N/A         | 2016/06/03       | 2017/06/02            |
| Active Loop Antenna            | SCHWARZBECK<br>MESS-ELEKTRONIK<br>C | FMZB1519            | 1519-067    | 2017/03/30       | 2018/03/29            |

Note: No Calibration Required (NCR).

## Appendix B: Measurement Uncertainty

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of  $k=2$ .

| Item                                                                                                         | Uncertainty |
|--------------------------------------------------------------------------------------------------------------|-------------|
| Vertically polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m    | 5.14 dB     |
| Horizontally polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m  | 5.22 dB     |
| Vertically polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m    | 3.64 dB     |
| Horizontally polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m  | 3.64 dB     |
| Vertically polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m   | 2.68 dB     |
| Horizontally polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m | 2.68 dB     |
| Radiated disturbances from 9kHz~30MHz in a semi-anechoic chamber at a distance of 3m                         | 3.54 dB     |
| Emission on the Band Edge Test                                                                               | 3.64 dB     |