

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

## INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E AND INDUSTRY CANADA RSS 247 REQUIREMENT

OF

**Product Name:** miCoach Elite Base Station  
**Brand Name:** adidas  
**Model No.:** BKC75  
**Model Difference:** N/A  
**Article Number:** AP4326, AP7447, AP7448  
**FCC ID:** ZLGETSYS  
**IC:** 9722A-ETSYS  
**Report No.:** E2/2015/20032  
**Issue Date:** Jan. 14, 2016  
**FCC Rule Part:** §15.407  
**IC Rule Part** RSS-247 issue 1 May 2015

**adidas AG**  
**Prepared for:** World of Sports, Adi-Dassler-Strasse 1,  
91074 Herzogenaurach, Germany

**SGS Taiwan Ltd.**  
**Prepared by:** Electronics & Communication Laboratory  
No.2, Keji 1st Rd., Guishan District,  
Taoyuan City, Taiwan 333



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## VERIFICATION OF COMPLIANCE

**Applicant:** adidas AG  
World of Sports, Adi-Dassler-Strasse 1, 91074 Herzogenaurach,  
Germany

**Product Name:** miCoach Elite Base Station

**Brand Name:** adidas

**Model No.:** BKC75

**Model Difference:** N/A

**Article Number:** AP4326, AP7447, AP7448

**FCC ID:** ZLGETSYS

**IC:** 9722A-ETSYS

**File Number:** E2/2015/20032

**Date of test:** Mar. 03, 2015 ~ Jan. 14, 2016

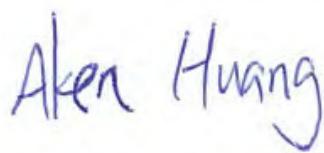
**Date of EUT Received:** Mar. 03, 2015

**We hereby certify that:**

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory  
The test data, data evaluation, test procedures, and equipment configurations shown in  
this report were made in accordance with the procedures given in ANSI C63.10: 2013  
and the energy emitted by the sample EUT tested as described in this report is in com-  
pliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

**Test By:**

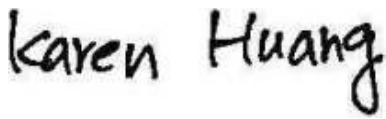


**Date:**

Jan. 14, 2016

*Aken Huang / Engineer*

**Prepared By:**



**Date:**

Jan. 14, 2016

*Karen Huang / Clerk*

**Approved By:**



**Date:**

Jan. 14, 2016

*Jim Chang / Asst. Manager*

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## Revision History

| Report Number | Revision | Description                  | Issue Date    |
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| E2/2015/20032 | Rev.00   | Initial creation of document | Jan. 14, 2016 |
|               |          |                              |               |
|               |          |                              |               |
|               |          |                              |               |

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## 1. GENERAL INFORMATION

### 1.1 Product Description

General:

|                                 |   |  |
|---------------------------------|---|--|
| Product Name:                   | miCoach Elite Base Station                                    |  |
| Brand Name:                     | adidas  |  |
| Model No.:                      | BKC75   |  |
| Model Difference:               | N/A   |  |
| Article Number:                 | AP4326, AP7447, AP7448  |  |
| Product SW/HW version:          | N/A / B3.0  |  |
| Radio SW/HW version:            | N/A / N/A   |  |
| Test SW Version:                | N/A   |  |
| RF power setting in TEST SW:    | N/A   |  |
| Charger:                        | Model No.: BKC83, Supplier: adidas                            |  |
| pCone:                          | Model No.: N/A, Supplier: adidas                              |  |
| Power Core:                     | Model No.: N/A, Supplier: N/A                                 |  |
| USB-Micro Cable:                | Model No.: N/A, Supplier: N/A                                 |  |
| USB Cable:                      | Model No.: N/A, Supplier: N/A                                 |  |
| Charger Cable:                  | Model No.: N/A, Supplier: N/A                                 |  |
| LAN Cable Cat 5e non-shielding: | Model No.: N/A, Supplier: N/A                                 |  |
| Clothes:                        | Model No.: N/A, Supplier: adidas                              |  |
| POD:                            | Model No.: N/A, Supplier: adidas                              |  |
| Power Supply:                   | 7.2Vdc form rechargeable battery or 19Vdc from AC/DC adapter. |  |
|                                 | Battery:  | Model No.: BT-70651BE;<br>Supplier: Bren-Tronics Inc |
|                                 | Adapter:  | Model No.: ADP-90RD AA;<br>Supplier: Innergie        |

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## WLAN 5GHz:

| Wi-Fi   | Frequency Range   | Channels | Rated Power (Avg.) / (EIRP)                         | Modulation Technology |
|---------|-------------------|----------|---|-----------------------|
| 11a     | 5150~5250         | 4        | 14.06 dBm /<br>19.66 dBm (EIRP)                     | OFDM                  |
|         | 5250~5350         | 4        | 13.91 dBm /<br>19.81dBm (EIRP)                      |                       |
|         | 5470~5725         | 8        | 15.53 dBm /<br>20.23dBm (EIRP)                      |                       |
| 11n_20M | HT20<br>5150~5250 | 4        | (MIMO Chain 0+1)<br>13.87 dBm /<br>22.48 dBm (EIRP) | OFDM                  |
|         | HT20<br>5250~5350 | 4        | (MIMO Chain 0+1)<br>13.97 dBm /<br>22.88dBm (EIRP)  |                       |
|         | HT20<br>5470~5725 | 8        | (MIMO Chain 0+1)<br>15.16 dBm /<br>22.87dBm (EIRP)  |                       |
| 11n_40M | HT40<br>5150~5250 | 2        | (MIMO Chain 0+1)<br>14.08 dBm /<br>22.69 dBm (EIRP) | OFDM                  |
|         | HT40<br>5250~5350 | 2        | (MIMO Chain 0+1)<br>13.97dBm /<br>22.88dBm (EIRP)   |                       |
|         | HT40<br>5470~5725 | 2        | (MIMO Chain 0+1)<br>14.84 dBm /<br>22.55dBm (EIRP)  |                       |

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|                     |   |
|---------------------|---|
| Antenna Designation | PIFA Antenna<br>Main:<br>Part No.: N/A, Supplier: N/A<br>5GHz Gain: 3.5dBi (5150MHz-5250MHz)<br>5GHz Gain: 3.9dBi (5250MHz-5350MHz)<br>5GHz Gain: 4.7dBi (5470MHz-5725MHz)<br><br>Aux:<br>Part No.: N/A, Supplier: N/A<br>5GHz Gain: 5.6dBi (5150MHz-5250MHz)<br>5GHz Gain: 5.9dBi (5250MHz-5350MHz)<br>5GHz Gain: 4.4dBi (5470MHz-5725MHz) |
| Modulation type     | 64QAM, 16QAM, QPSK, BPSK for OFDM   |
| Transition Rate:    | 802.11 a: 6/9/12/18/24/36/48/54 Mbps<br>802.11 n_20MHz: 6.5 – 144.4Mbps<br>802.11 n_40MHz: 13.5 – 300Mbps   |

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## 1.2 Product Feature of Equipment Under Test

The equipment under Test (Hereafter Called: EUT) is supporting Wi-Fi 802.11a/b/g/n and Zigbee features, and below is details of information.

| Product Feature     |                            |
|---------------------|----------------------------|
| Product Name:       | miCoach Elite Base Station |
| Brand Name:         | adidas                     |
| Model No.:          | BKC75                      |
| Model Difference:   | N/A                        |
| Article Number:     | AP4326, AP7447, AP7448     |
| FCC ID:             | ZLGETSYS                   |
| IC:                 | 9722A-ETSYS                |
| Wi-Fi Specification | 802.11a/b/g/n              |
| 2.4GHz:             | Zigbee                     |

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

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### 1.3 Test Methodology of Applied Standards

FCC Part 15, Subpart E §15.407

FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r01

FCC KDB 662911 D01 Multiple Transmitter Output

RSS-247 issue 1 May 2015

RSS-Gen issue4 Nov. 2014

ANSI C63.10:2013

Note:

1. All test items have been performed and record as per the above standards.
2. The composite system is compliance with FCC Subpart B is authorized under the certification procedure.

### 1.4 Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333

(TAF code 0513)

FCC Registration Numbers are: 628985

Canada Registration Number: 4620A-5

### 1.5 Special Accessories

There are no special accessories used while test was conducted.

### 1.6 Equipment Modifications

There was no modification incorporated into the EUT.

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## 2. SYSTEM TEST CONFIGURATION

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed according to §15.207. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

#### 2.3.2 Radiated Emissions

The EUT is placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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## 2.4 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 attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

#### Note:

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

SISO mode offset

= RF cable loss (dB)+ attenuation factor(dB)=12.3(dB)

MIMO mode offset

= RF cable loss (dB)+ attenuation factor(dB)+  $10 \log(N_{ANT})$  dB =15.3(dB)

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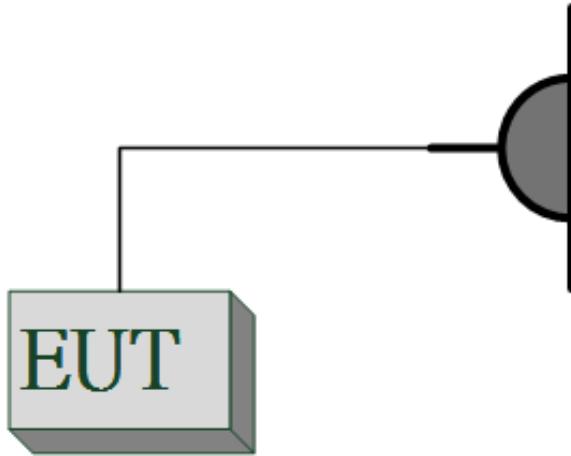
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## 2.5 Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**



**Table 2-1 Equipment Used in Tested System**

| Item | Equipment          | Mfr/Brand | Model/Type No. | Series No. | Data Cable | Power Cord |
|------|--------------------|-----------|----------------|------------|------------|------------|
| 1.   | WLAN Test Software | DRTU      | N/A            | N/A        | N/A        | N/A        |

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### 3. SUMMARY OF TEST RESULT

| FCC Rules                | IC Rules                              | Description Of Test                            | Result    |
|--------------------------|---------------------------------------|--|-----------|
| §15.207                  | RSS-Gen §8.8                          | AC Power Line Conducted Emission               | Compliant |
| §15.403(i)<br>§15.407(e) | RSS-247 §6.2.1~ 4 (1)<br>RSS-Gen §6.6 | 26 dB & 6dB & 99% Emission Bandwidth           | Compliant |
| §15.407(a)               | RSS-247 §6.2.1~ 4 (1)                 | Maximum Conducted Output Power                 | Compliant |
| §15.407(a)               | RSS-247 §6.2.1~ 4 (1)                 | Power Spectral Density                         | Compliant |
| §15.407(b)               | RSS-247 §6.2.1~ 4 (2)                 | Undesirable Radiated Emissions                 | Compliant |
| §15.407(c)               | RSS-247 §6.4                          | Transmission in case of Absence of Information | Compliant |
| §15.407(g)               | RSS-Gen §6.11                         | Frequency Stability                            | Compliant |
| §15.203<br>§15.407(a)    | RSS- Gen §6.7<br>RSS- Gen §8.3        | Antenna Requirement                            | Compliant |

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## 4. DESCRIPTION OF TEST MODES

### 4.1 Operated in U-NII Bands

Operated band in 5150 MHz ~5250 MHz:

4 channels are provided for 802.11a, 802.11n\_HT20

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 36      | 5180 MHz  | 44      | 5220 MHz  |
| 40      | 5200 MHz  | 48      | 5240 MHz  |

2 channels are provided for 802.11n\_HT40

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 38      | 5190 MHz  | 46      | 5230 MHz  |

Operated band in 5250 MHz ~5350 MHz:

4 channels are provided for 802.11a, 802.11n\_HT20

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 52      | 5260 MHz  | 60      | 5300 MHz  |
| 56      | 5280 MHz  | 64      | 5320 MHz  |

2 channels are provided for 802.11n\_HT40

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 54      | 5270 MHz  | 62      | 5310 MHz  |

Operated band in 5470 MHz ~5725 MHz:

8 channels are provided for 802.11a, 802.11n\_HT20

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 100     | 5500 MHz  | 132     | 5660 MHz  |
| 104     | 5520 MHz  | 136     | 5680 MHz  |
| 108     | 5540 MHz  | 140     | 5700 MHz  |
| 112     | 5560 MHz  |         |           |
| 116     | 5580 MHz  |         |           |

2 channels are provided for 802.11n\_HT40

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 110     | 5550 MHz  | 134     | 5670 MHz  |

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## 4.2 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Test program used to control the EUT for staying in continuous transmitting mode is programmed.
3. Investigation has been done on all the possible configurations for searching the worst case.
4. The given UE is pre-scanned among 802.11n and ac modes, and 802.11ac yields the highest reading that generates the highest emission. Therefore, 802.11ac as the mode of test configuration is chosen to carry out the relevantly mandatory test items.

### RADIATED EMISSION TEST:

#### RADIATED EMISSION TEST (BELOW 1 GHz)

| MODE         | FREQUENCY BAND (MHz) | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION | DATA RATE (Mbps) | ANTENNA PORT |
|--------------|----------------------|-------------------|----------------|------------|------------------|--------------|
| 802.11a      | 5180~5240            | 36 to 48          | 36             | OFDM       | 6                | MAIN         |
| 802.11n_HT40 | 5190~5230            | 38 to 46          | 38             | OFDM       | MCS8             | MIMO         |
| 802.11a      | 5260~5320            | 52 to 64          | 60             | OFDM       | 6                | MAIN         |
| 802.11n_HT40 | 5270~5310            | 54 to 62          | 54             | OFDM       | MCS8             | MIMO         |
| 802.11a      | 5500~5700            | 100 to 140        | 116            | OFDM       | 6                | MAIN         |
| 802.11n_HT40 | 5550~5670            | 110 to 134        | 134            | OFDM       | MCS8             | MIMO         |

#### RADIATED EMISSION TEST (ABOVE 1 GHz)

| MODE         | FREQUENCY BAND (MHz) | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION | DATA RATE (Mbps) | ANTENNA PORT |
|--------------|----------------------|-------------------|----------------|------------|------------------|--------------|
| 802.11a      | 5180~5240            | 36 to 48          | 36,44,48       | OFDM       | 6                | MAIN         |
| 802.11n_HT20 |                      |                   |                | OFDM       | MCS8             | MIMO         |
| 802.11n_HT40 | 5190~5230            | 38 to 46          | 38,46          | OFDM       | MCS8             | MIMO         |
| 802.11a      | 5260~5320            | 52 to 64          | 52,60,64       | OFDM       | 6                | MAIN         |
| 802.11n_HT20 |                      |                   |                | OFDM       | MCS8             | MIMO         |
| 802.11n_HT40 | 5270~5310            | 54 to 62          | 54,62          | OFDM       | MCS8             | MIMO         |
| 802.11a      | 5500~5700            | 100 to 140        | 100,116,140    | OFDM       | 6                | MAIN         |
| 802.11n_HT20 |                      |                   |                | OFDM       | MCS8             | MIMO         |
| 802.11n_HT40 | 5550~5670            | 110 to 134        | 110,134        | OFDM       | MCS8             | MIMO         |

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**Note:**

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/n WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.

**ANTENNA PORT CONDUCTED MEASUREMENT:**

| CONDUCTED TEST |                      |                   |                |            |                  |              |
|----------------|----------------------|-------------------|----------------|------------|------------------|--------------|
| MODE           | FREQUENCY BAND (MHz) | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION | DATA RATE (Mbps) | ANTENNA PORT |
| 802.11a        | 5180~5240            | 36 to 48          | 36,44,48       | OFDM       | 6                | MAIN         |
| 802.11n_HT20   |                      |                   |                | OFDM       | MCS8             | MIMO         |
| 802.11n_HT40   | 5190~5230            | 38 to 46          | 38,46          | OFDM       | MCS8             | MIMO         |
| 802.11a        | 5260~5320            | 52 to 64          | 52,60,64       | OFDM       | 6                | MAIN         |
| 802.11n_HT20   |                      |                   |                | OFDM       | MCS8             | MIMO         |
| 802.11n_HT40   | 5270~5310            | 54 to 62          | 54,62          | OFDM       | MCS8             | MIMO         |
| 802.11a        | 5500~5700            | 100 to 140        | 100,116,140    | OFDM       | 6                | MAIN         |
| 802.11n_HT20   |                      |                   |                | OFDM       | MCS8             | MIMO         |
| 802.11n_HT40   | 5550~5670            | 110 to 134        | 110,134        | OFDM       | MCS8             | MIMO         |

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## 5. MEASUREMENT UNCERTAINTY

| Test Items                              | Uncertainty                |
|---|----------------------------|
| AC Power Line Conducted Emission        | +/- 2.586 dB               |
| 26dB & 6dB Emission Bandwidth           | +/- 123.36 Hz              |
| The Maximum Output Power Measurement    | +/- 0.96 dB                |
| Peak Power Spectral Density Measurement | +/- 1.67 dB                |
| Frequency Stability                     | +/- 123.36 Hz              |
| Temperature                             | +/- 0.65 °C                |
| Humidity                                | +/- 4.6 %                  |
| DC / AC Power Source                    | DC= +/- 0.13%, AC=+/- 0.2% |

### Radiated Spurious Emission:

|  |                            |
|--|----------------------------|
| Measurement uncertainty<br>(Polarization : <b>Vertical</b> ) | 9kHz-30MHz: +/- 2.87dB     |
|  | 30MHz - 180MHz: +/- 3.37dB |
|  | 180MHz -417MHz: +/- 3.19dB |
|  | 0.417GHz-1GHz: +/- 3.19dB  |
|  | 1GHz - 18GHz: +/- 4.04dB   |
|  | 18GHz - 40GHz: +/- 4.04dB  |

|  |                            |
|--|----------------------------|
| Measurement uncertainty<br>(Polarization : <b>Horizontal</b> ) | 9kHz-30MHz: +/- 2.87dB     |
|  | 30MHz - 167MHz: +/- 4.22dB |
|  | 167MHz -500MHz: +/- 3.44dB |
|  | 0.5GHz-1GHz: +/- 3.39dB    |
|  | 1GHz - 18GHz: +/- 4.08dB   |
|  | 18GHz - 40GHz: +/- 4.08dB  |

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

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## 6. CONDUCTED EMISSION TEST

### 6.1. Standard Applicable

Frequency range within 150 kHz to 30 MHz shall not exceed the Limit table as below.

| Frequency range<br>MHz | Limits<br>dB(uV) |          |
|------------------------|------------------|----------|
|                        | Quasi-peak       | Average  |
| 0.15 to 0.50           | 66 to 56         | 56 to 46 |
| 0.50 to 5              | 56               | 46       |
| 5 to 30                | 60               | 50       |

**Note**

1. The lower limit shall apply at the transition frequencies

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### 6.2. Measurement Equipment Used

| Conducted Emission Test Site |             |                       |                  |              |            |
|------------------------------|-------------|-----------------------|------------------|--------------|------------|
| EQUIPMENT<br>TYPE            | MFR         | MODEL<br>NUMBER       | SERIAL<br>NUMBER | LAST<br>CAL. | CAL DUE.   |
| EMI Test Receiver            | R&S         | ESCI 7                | 100950           | 12/12/2015   | 12/11/2016 |
| Coaxial Cables               | N/A         | N30N30-1042-150<br>cm | N/A              | 01/06/2015   | 01/07/2016 |
| LISN                         | Schwarzbeck | NSLK 8127             | 8127-648         | 06/09/2015   | 06/08/2016 |
| LISN                         | Rolf-Heine  | NNB-2/16Z             | 99012            | 03/04/2015   | 03/03/2016 |
| Test Software                | Farad       | EZ-EMC                | Ver.<br>SGS-03A2 | N.C.R.       | N.C.R.     |

### 6.3. EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The LISN was connected with 120Vac/60Hz power source.

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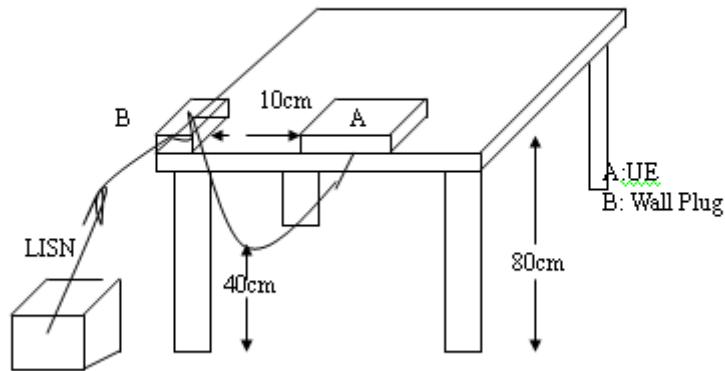
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## 6.4. Test SET-UP



## 6.5. Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed.

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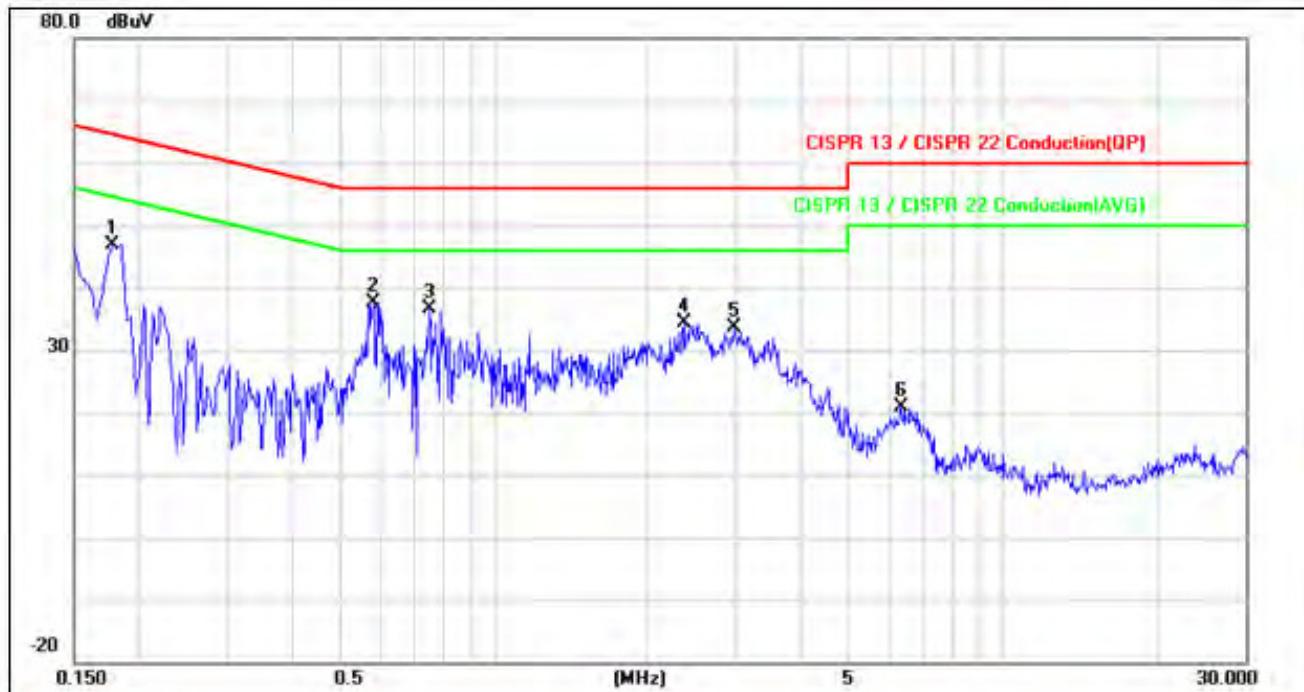
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## 6.6. Measurement Result

### AC POWER LINE CONDUCTED EMISSION TEST DATA

|                 |                      |           |            |               |
|-----------------|----------------------|-----------|------------|---------------|
| Operation Mode: | Operation mode       |           | Test Date: | Jan. 04, 2016 |
| Temperature:    | 22 °C                | Humidity: | 73 %       | Test By: Aken |
| Model No.:      | Adapter: ADP-90RD AA |           | Probe:     | L1            |



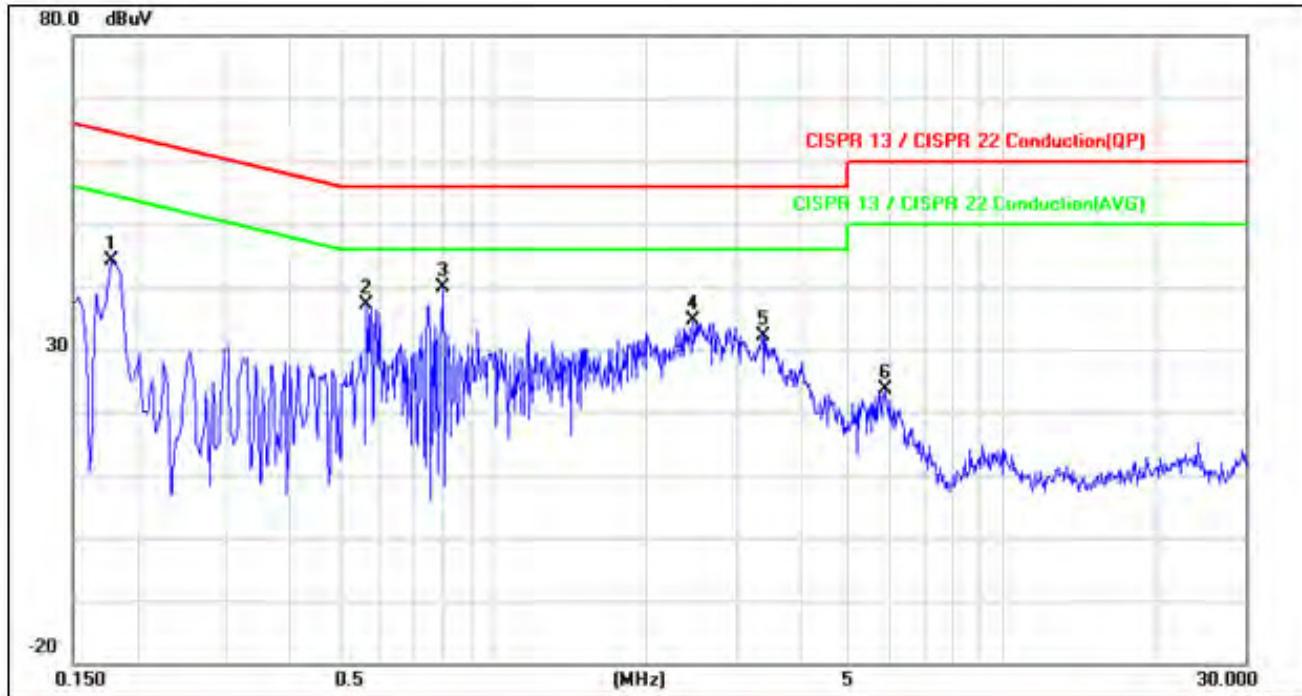
| No. | Mr. | Freq.<br>(MHz) | Reading<br>dBuV | Factor<br>(dB) | Measurement<br>(dBuV) | Limit<br>(dBuV) | Over<br>(dB) | Detector | Comment |
|-----|-----|----------------|-----------------|----------------|-----------------------|-----------------|--------------|----------|---------|
| 1   | *   | 0.1780         | 46.88           | 0.08           | 46.96                 | 64.58           | -17.62       | peak     |         |
| 2   |     | 0.5820         | 37.45           | 0.24           | 37.69                 | 56.00           | -18.31       | peak     |         |
| 3   |     | 0.7500         | 36.28           | 0.33           | 36.61                 | 56.00           | -19.39       | peak     |         |
| 4   |     | 2.3620         | 33.71           | 0.59           | 34.30                 | 56.00           | -21.70       | peak     |         |
| 5   |     | 2.9620         | 33.02           | 0.59           | 33.61                 | 56.00           | -22.39       | peak     |         |
| 6   |     | 6.3500         | 20.17           | 0.64           | 20.81                 | 60.00           | -39.19       | peak     |         |

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|                 |                      |           |      |            |               |
|-----------------|----------------------|-----------|------|------------|---------------|
| Operation Mode: | Operation mode       |           |      | Test Date: | Jan. 04, 2016 |
| Temperature:    | 22 °C                | Humidity: | 73 % | Test By:   | Aken          |
| Model No.:      | Adapter: ADP-90RD AA |           |      | Probe:     | N             |



| No. | Alc. | Freq.<br>(MHz) | Reading<br>dBuV | Factor<br>(dB) | Measurement<br>dBuV | Limit<br>dBuV | Over.<br>(dB) | Detector | Comment |
|-----|------|----------------|-----------------|----------------|---------------------|---------------|---------------|----------|---------|
| 1   |      | 0.1780         | 43.91           | 0.14           | 44.05               | 64.58         | -20.53        | peak     |         |
| 2   |      | 0.5660         | 36.94           | 0.30           | 37.24               | 56.00         | -18.76        | peak     |         |
| 3   | *    | 0.7980         | 39.46           | 0.39           | 39.85               | 56.00         | -16.15        | peak     |         |
| 4   |      | 2.4820         | 34.00           | 0.64           | 34.64               | 56.00         | -21.36        | peak     |         |
| 5   |      | 3.3980         | 31.43           | 0.65           | 32.08               | 56.00         | -23.92        | peak     |         |
| 6   |      | 5.9180         | 22.94           | 0.68           | 23.62               | 60.00         | -36.38        | peak     |         |

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## 7. DUTY CYCLE TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

### Formula:

$$\text{Duty Cycle} = \text{Ton} / (\text{Ton} + \text{Toff})$$

### Measurement Procedure:

1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

### Duty Cycle:

|              | Duty Cycle | Duty Factor (dB) |
|--------------|------------|------------------|
| 802.11a      | 0.97       | 0.15             |
| 802.11n_HT20 | 0.97       | 0.15             |
| 802.11n_HT40 | 0.95       | 0.22             |

$$\text{Duty Cycle Factor: } 10 * \log (1/0.97) = 0.15$$

$$\text{Duty Cycle Factor: } 10 * \log (1/0.97) = 0.15$$

$$\text{Duty Cycle Factor: } 10 * \log (1/0.95) = 0.22$$

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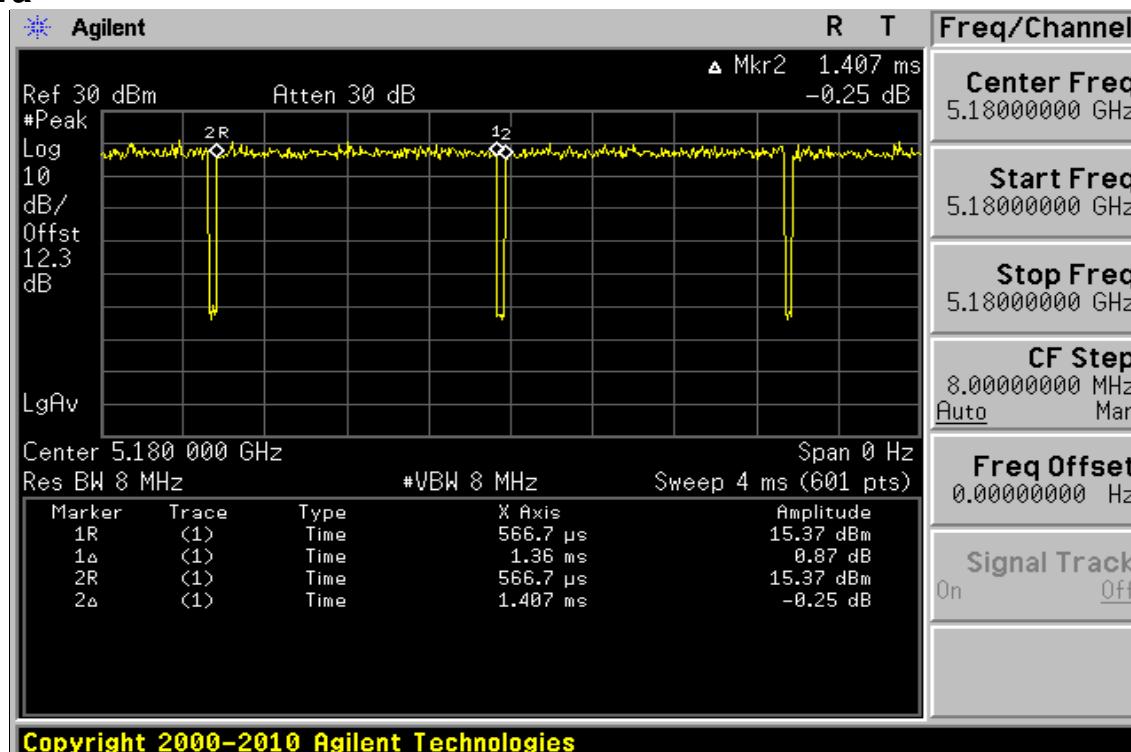
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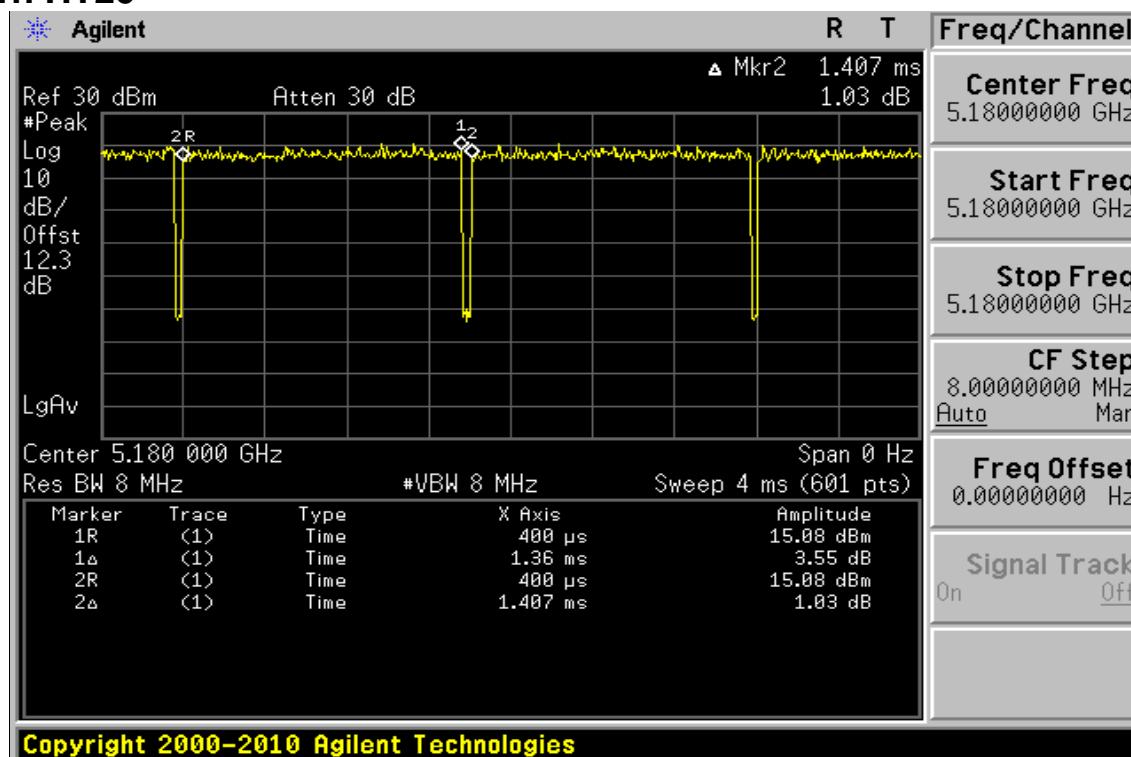
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## DUTY CYCLE TEST SIGNAL Measurement Result

### 802.11a



### 802.11n HT20

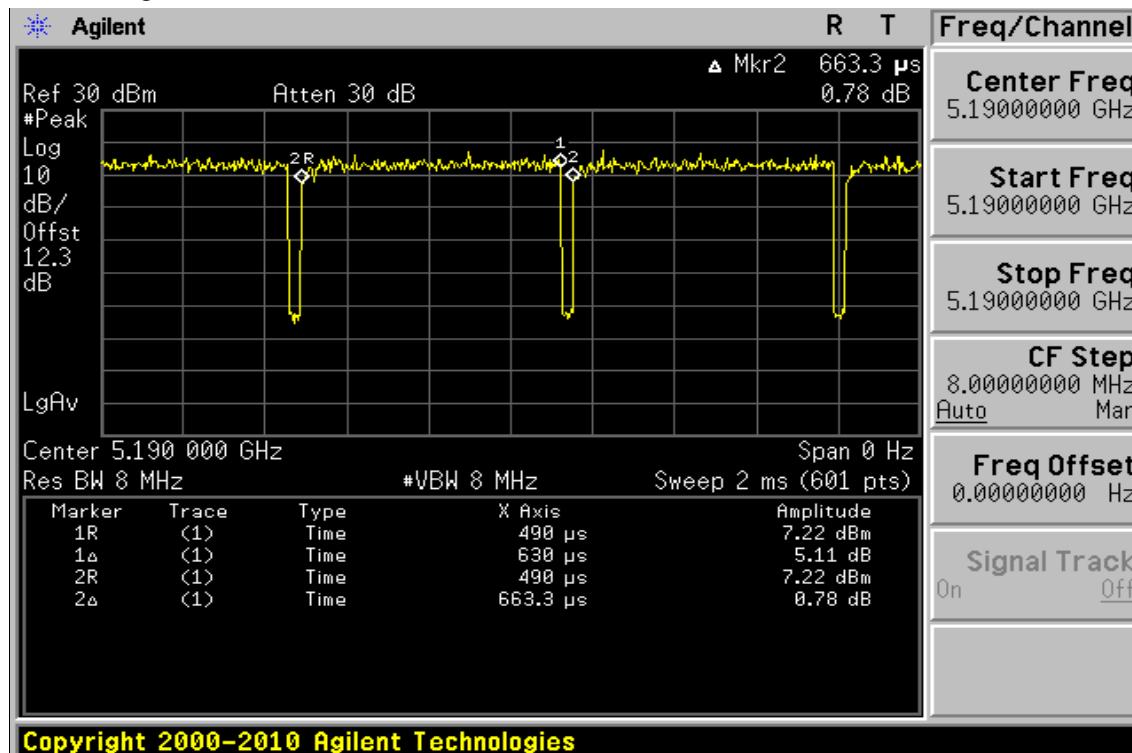


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**802.11 n HT 40**

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## 8. 26dB & 6dB EMISSION BANDWIDTH MEASUREMENT

### 8.1 Standard Applicable

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

### 8.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r01.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
  - a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold, Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
  - b. Mark the peak frequency and -26dB (upper and lower) frequency.
4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
5. Minimum Emission Bandwidth for the band 5.725-5.850GHz.
  - a. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3\*RBW, Span = 30M/50MHz, Detector=Peak,  
Sweep=auto
  - b. Mark the peak frequency and -6dB (upper and lower) frequency.
6. Repeat above procedures until all test default channel measured were complete.

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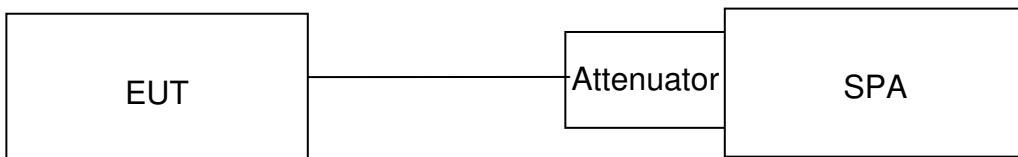
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### 8.3 Measurement Equipment Used

| Conducted Emission Test Site |           |              |               |            |            |
|------------------------------|-----------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE               | MFR       | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Spectrum Analyzer            | KEYSIGHT  | N9010A       | MY54510568    | 04/14/2015 | 04/13/2016 |
| Splitter                     | RF-LAMBAD | RFLT2W1G18G  | RF35          | 12/12/2015 | 12/11/2016 |
| DC Block                     | PASTERNAK | PE8210       | RF29          | 12/12/2015 | 12/11/2016 |
| Attenuator                   | WOKEN     | 218FS-10     | RF23          | 12/12/2015 | 12/11/2016 |

### 8.4 Test Set-up



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## 8.5 Measurement Result

### 26dB Bandwidth

802.11a

| Frequency (MHz) | 26dB Bandwidth (MHz) | 10 Log (B) (dB) |
|-----------------|----------------------|-----------------|
| 5180            | 22.39                | 13.50           |
| 5220            | 22.06                | 13.44           |
| 5240            | 22.09                | 13.44           |
| 5260            | 22.03                | 13.43           |
| 5300            | 22.88                | 13.59           |
| 5320            | 22.28                | 13.48           |
| 5500            | 22.28                | 13.48           |
| 5580            | 22.10                | 13.44           |
| 5700            | 22.35                | 13.49           |

802.11a\_HT20 (Main)

| Frequency (MHz) | 26dB Bandwidth (MHz) | 10 Log (B) (dB) |
|-----------------|----------------------|-----------------|
| 5180            | 22.05                | 13.43           |
| 5220            | 22.41                | 13.50           |
| 5240            | 22.03                | 13.43           |
| 5260            | 22.78                | 13.58           |
| 5300            | 22.30                | 13.48           |
| 5320            | 22.83                | 13.59           |
| 5500            | 22.37                | 13.50           |
| 5580            | 22.05                | 13.43           |
| 5700            | 22.77                | 13.57           |

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## 802.11a\_HT20 (Aux)

| Frequency (MHz) | 26dB Bandwidth (MHz) | 10 Log (B) (dB) |
|-----------------|----------------------|-----------------|
| 5180            | 22.04                | 13.43           |
| 5220            | 22.09                | 13.44           |
| 5240            | 22.27                | 13.48           |
| 5260            | 22.11                | 13.45           |
| 5300            | 22.85                | 13.59           |
| 5320            | 22.14                | 13.45           |
| 5500            | 22.94                | 13.60           |
| 5580            | 22.57                | 13.53           |
| 5700            | 22.10                | 13.44           |

## 802.11a \_HT40 (Main)

| Frequency (MHz) | 26dB Bandwidth (B) (MHz) | 10 Log (B) (dB) |
|-----------------|--------------------------|-----------------|
| 5190            | 43.48                    | 16.38           |
| 5230            | 43.18                    | 16.35           |
| 5270            | 43.85                    | 16.42           |
| 5310            | 43.10                    | 16.34           |
| 5550            | 43.70                    | 16.40           |
| 5670            | 43.38                    | 16.37           |

## 802.11a \_HT40 (Aux)

| Frequency (MHz) | 26dB Bandwidth (B) (MHz) | 10 Log (B) (dB) |
|-----------------|--------------------------|-----------------|
| 5190            | 43.37                    | 16.37           |
| 5230            | 43.08                    | 16.34           |
| 5270            | 43.20                    | 16.36           |
| 5310            | 43.56                    | 16.39           |
| 5550            | 43.42                    | 16.38           |
| 5670            | 43.21                    | 16.36           |

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## 99% Bandwidth

802.11a

| Frequency (MHz) | 99% Bandwidth (MHz) | 10 Log (B) (dB) |
|-----------------|---------------------|-----------------|
| 5180            | <b>16.676</b>       | 12.22           |
| 5220            | 16.569              | 12.19           |
| 5240            | 16.664              | 12.22           |
| 5260            | 16.591              | 12.20           |
| 5300            | <b>16.686</b>       | 12.22           |
| 5320            | 16.660              | 12.22           |
| 5500            | <b>16.704</b>       | 12.23           |
| 5580            | 16.657              | 12.22           |
| 5700            | 16.621              | 12.21           |

802.11a\_HT20 (Main)

| Frequency (MHz) | 99% Bandwidth (MHz) | 10 Log (B) (dB) |
|-----------------|---------------------|-----------------|
| 5180            | 17.701              | 12.48           |
| 5220            | <b>17.769</b>       | 12.50           |
| 5240            | 17.721              | 12.48           |
| 5260            | 17.714              | 12.48           |
| 5300            | <b>17.733</b>       | 12.49           |
| 5320            | 17.728              | 12.49           |
| 5500            | <b>17.719</b>       | 12.48           |
| 5580            | 17.707              | 12.48           |
| 5700            | 17.692              | 12.48           |

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## 802.11a\_HT20 (Aux)

| Frequency (MHz) | 99% Bandwidth (MHz) | 10 Log (B) (dB) |
|-----------------|---------------------|-----------------|
| 5180            | 17.714              | 12.48           |
| 5220            | <b>17.755</b>       | 12.49           |
| 5240            | 17.695              | 12.48           |
| 5260            | <b>17.757</b>       | 12.49           |
| 5300            | 17.683              | 12.48           |
| 5320            | 17.709              | 12.48           |
| 5500            | <b>17.836</b>       | 12.51           |
| 5580            | 17.707              | 12.48           |
| 5700            | 17.712              | 12.48           |

## 802.11a\_HT40 (Main)

| Frequency (MHz) | 99% Bandwidth (MHz) | 10 Log (B) (dB) |
|-----------------|---------------------|-----------------|
| 5190            | <b>36.324</b>       | 15.60           |
| 5230            | 36.284              | 15.60           |
| 5270            | <b>36.263</b>       | 15.59           |
| 5310            | 36.181              | 15.58           |
| 5550            | <b>36.278</b>       | 15.60           |
| 5670            | 36.273              | 15.60           |

## 802.11a\_HT40 (Aux)

| Frequency (MHz) | 99% Bandwidth (MHz) | 10 Log (B) (dB) |
|-----------------|---------------------|-----------------|
| 5190            | <b>36.344</b>       | 15.60           |
| 5230            | 36.181              | 15.58           |
| 5270            | <b>36.235</b>       | 15.59           |
| 5310            | 36.223              | 15.59           |
| 5550            | 36.308              | 15.60           |
| 5670            | <b>36.321</b>       | 15.60           |

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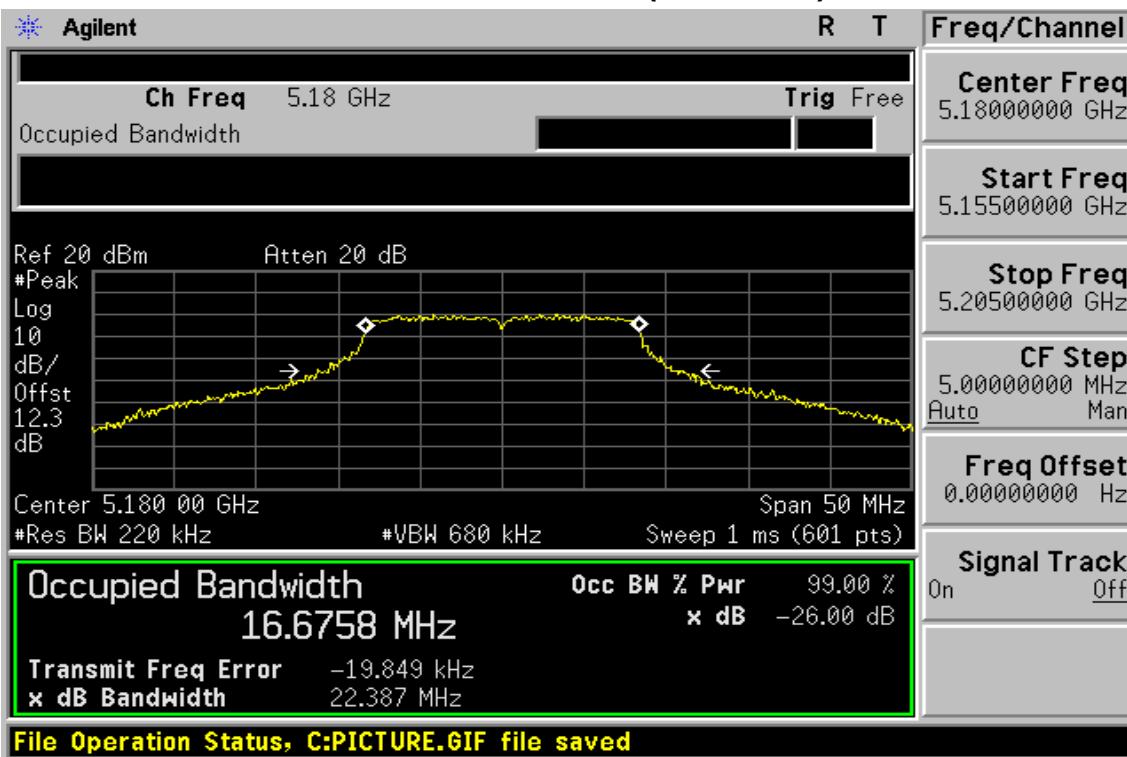
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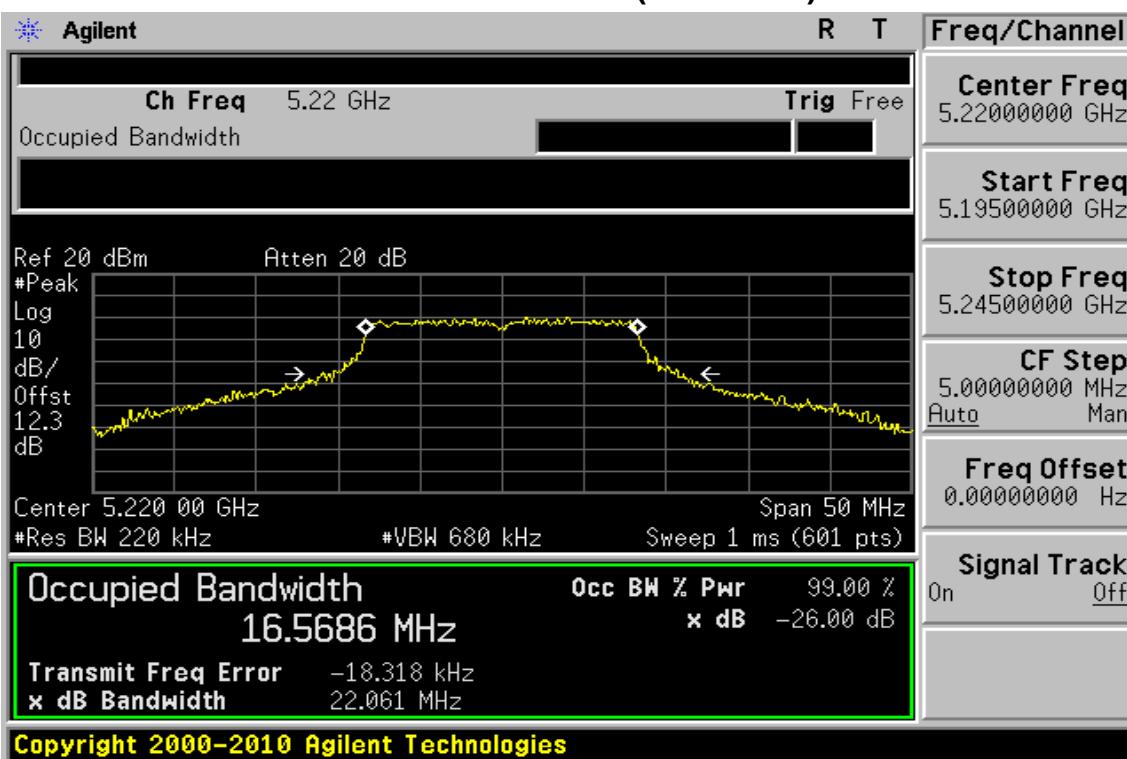
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## 802.11a, 5150~5250 MHz

## 26dB &amp; 99% Band Width Test Data CH-Low (5180MHz)



## 26dB &amp; 99% Band Width Test Data CH-Mid (5220MHz)

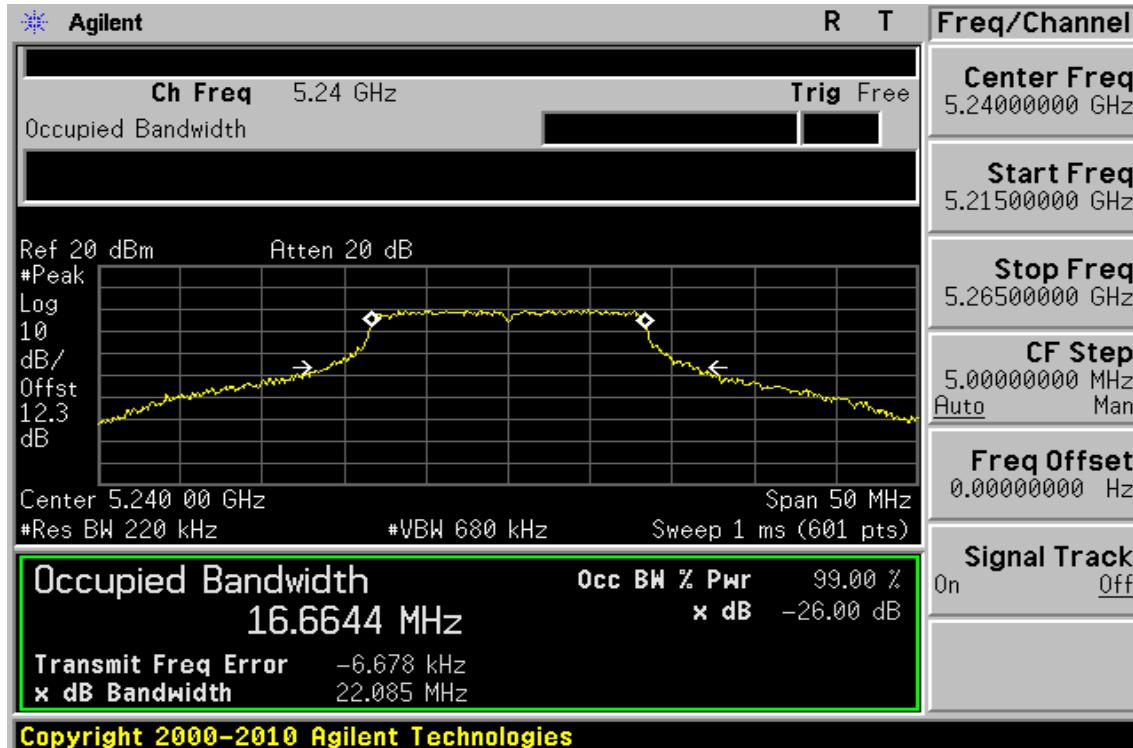


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**26dB & 99% Band Width Test Data CH-High (5240MHz)**

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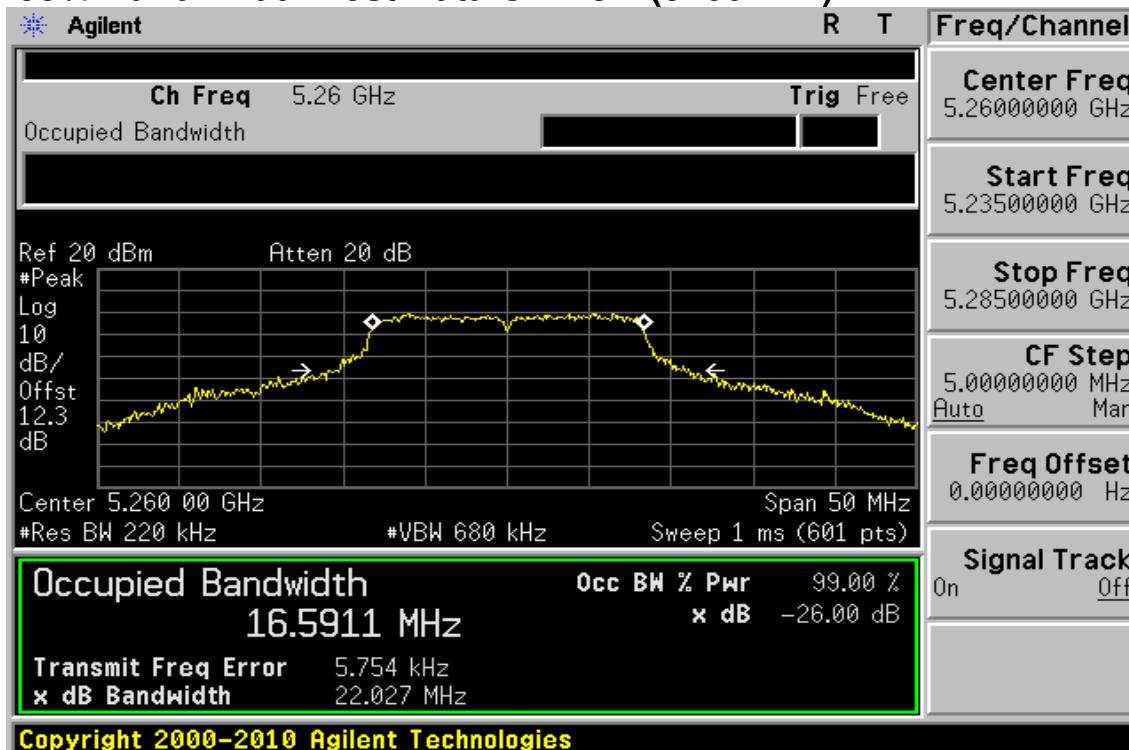
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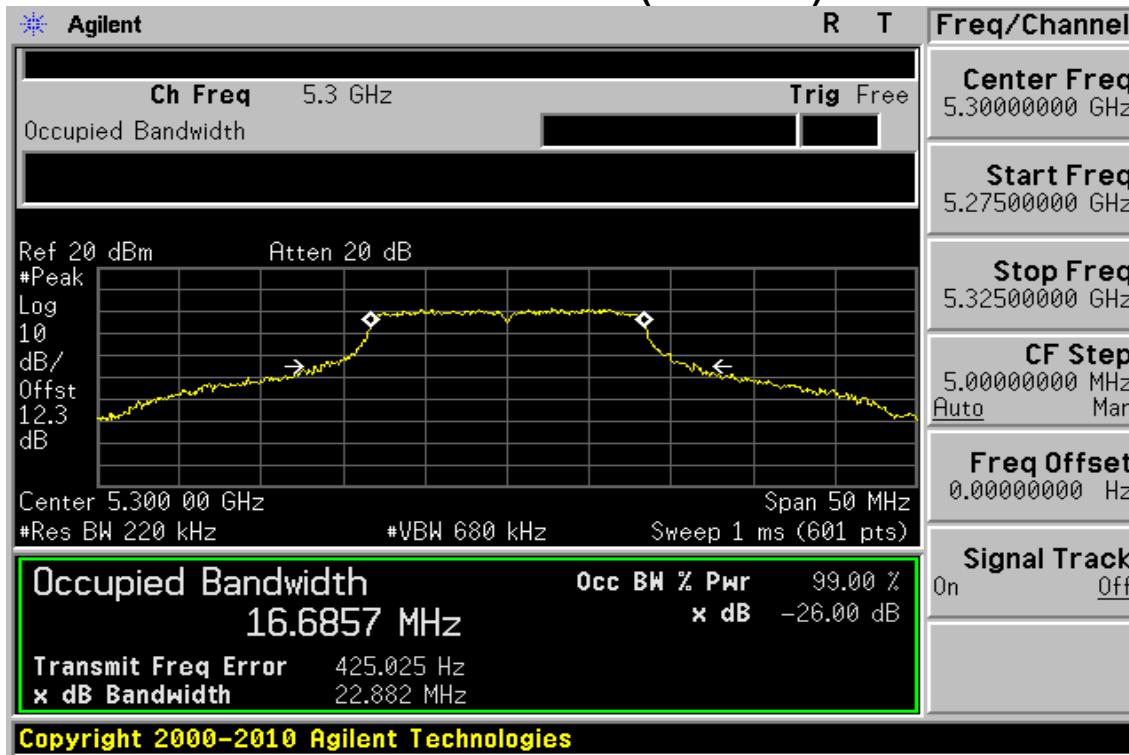
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## 802.11a, 5250~5350 MHz

## 26dB &amp; 99% Band Width Test Data CH-Low (5260MHz)



## 26dB &amp; 99% Band Width Test Data CH-Mid (5300MHz)



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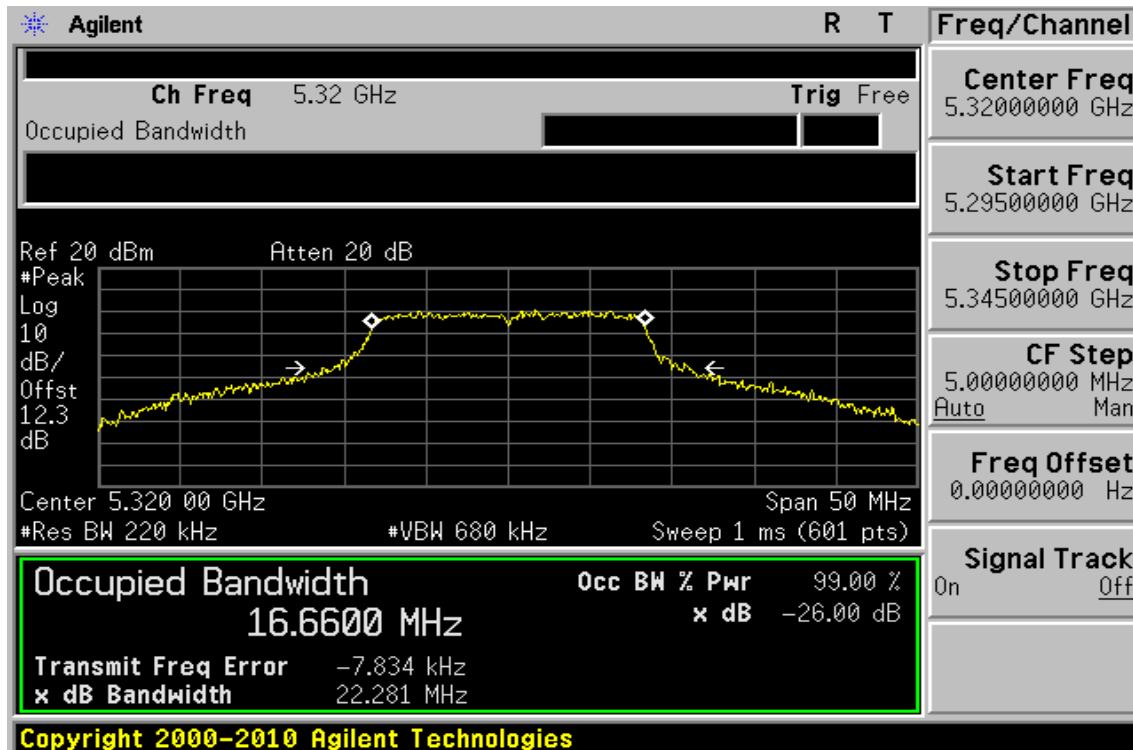
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**26dB & 99% Band Width Test Data CH-High (5320MHz)**

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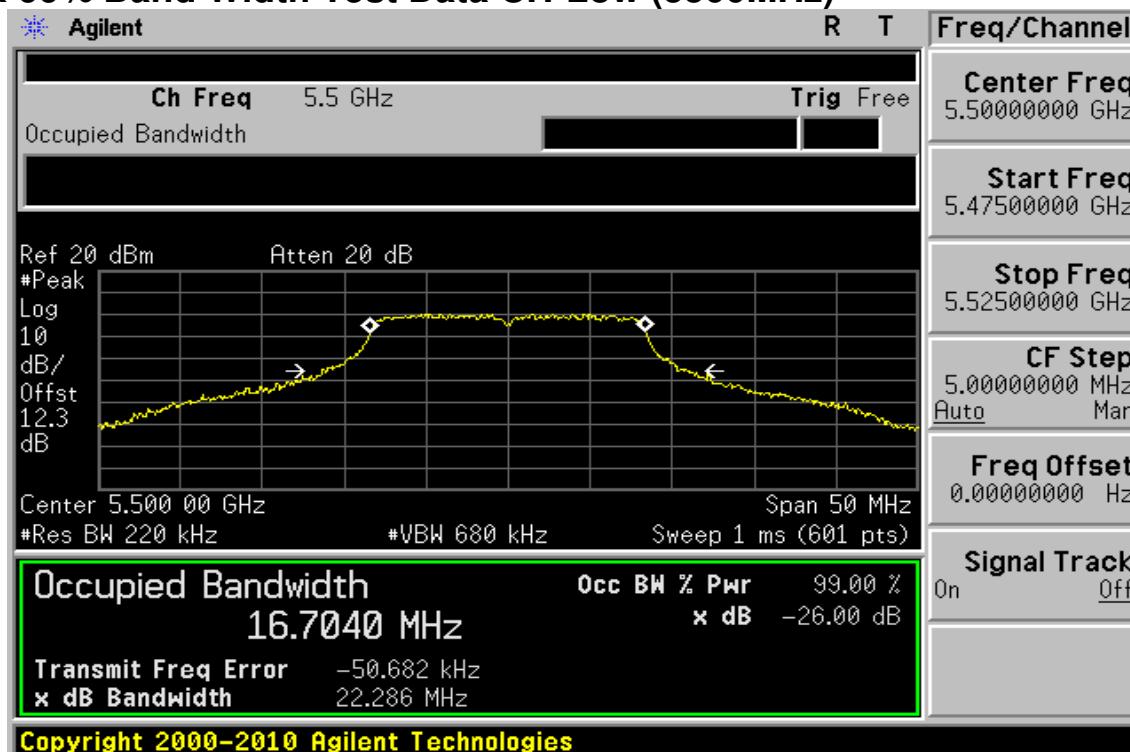
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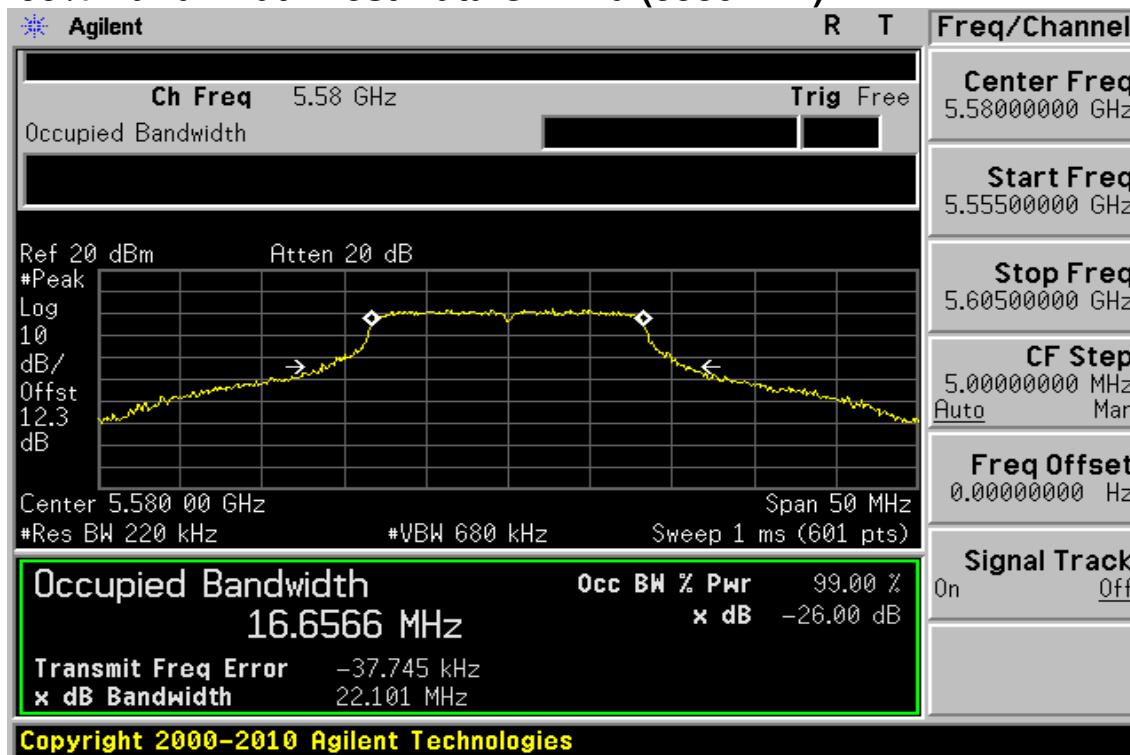
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## 802.11a, 5470~5725 MHz

## 26dB &amp; 99% Band Width Test Data CH-Low (5500MHz)



## 26dB &amp; 99% Band Width Test Data CH-Mid (5580MHz)

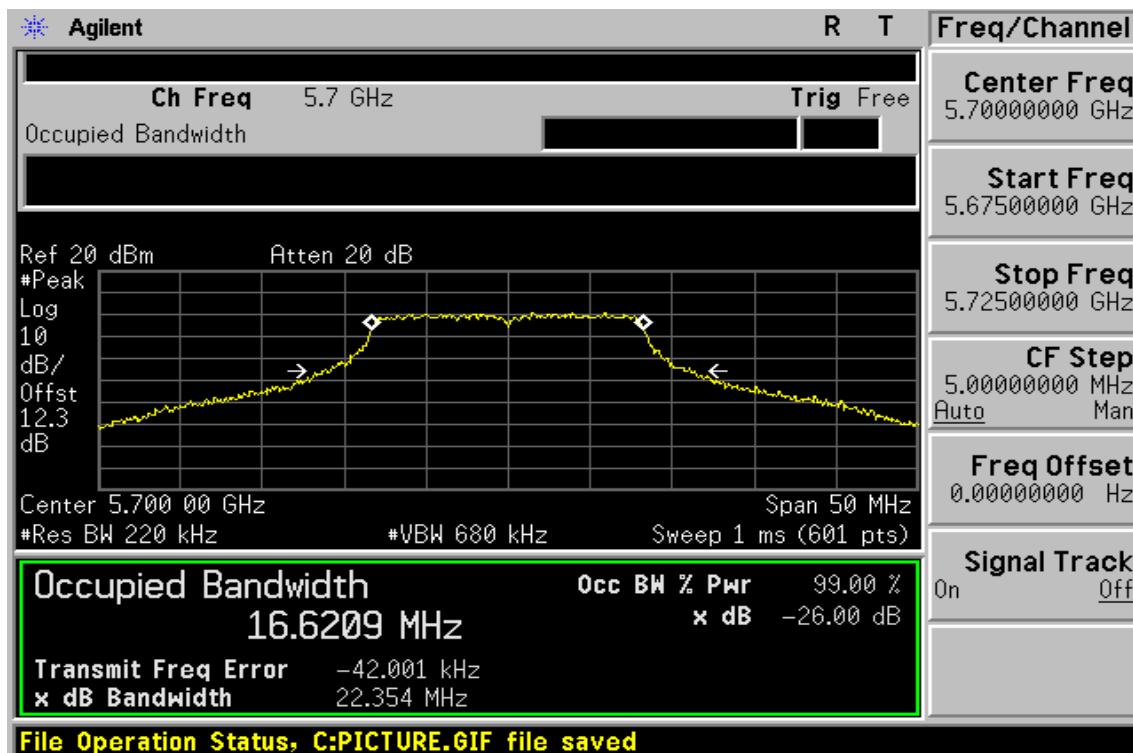


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**26dB & 99% Band Width Test Data CH-High (5700MHz)**

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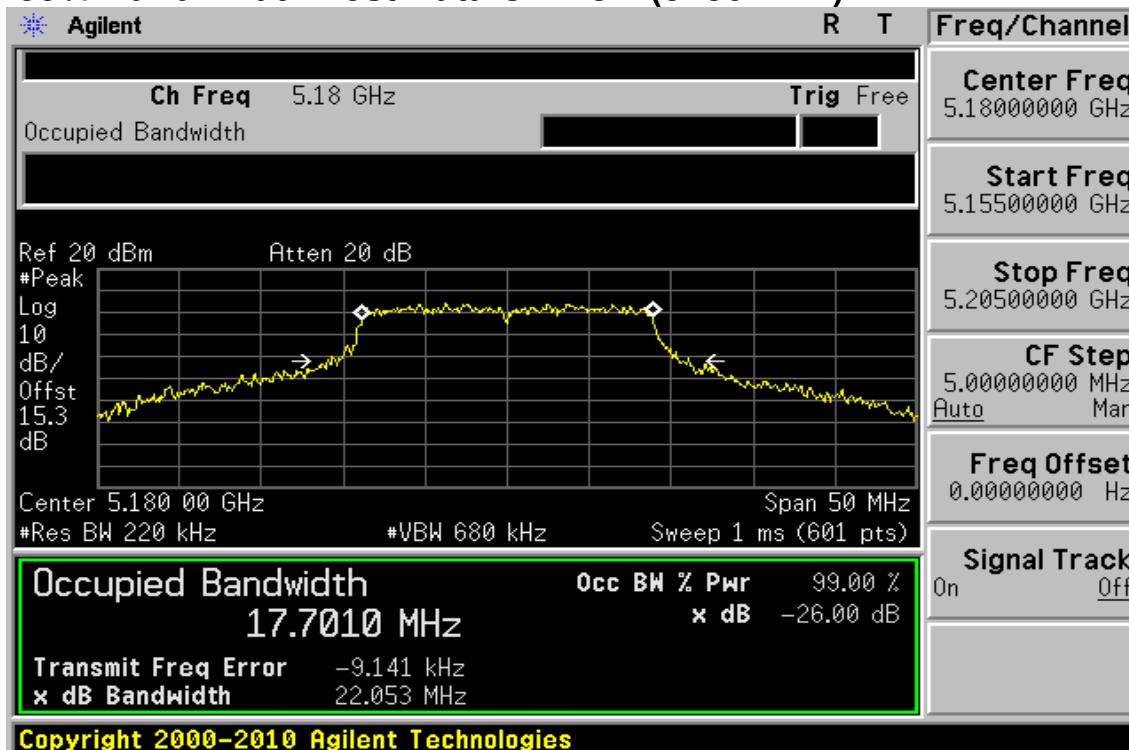
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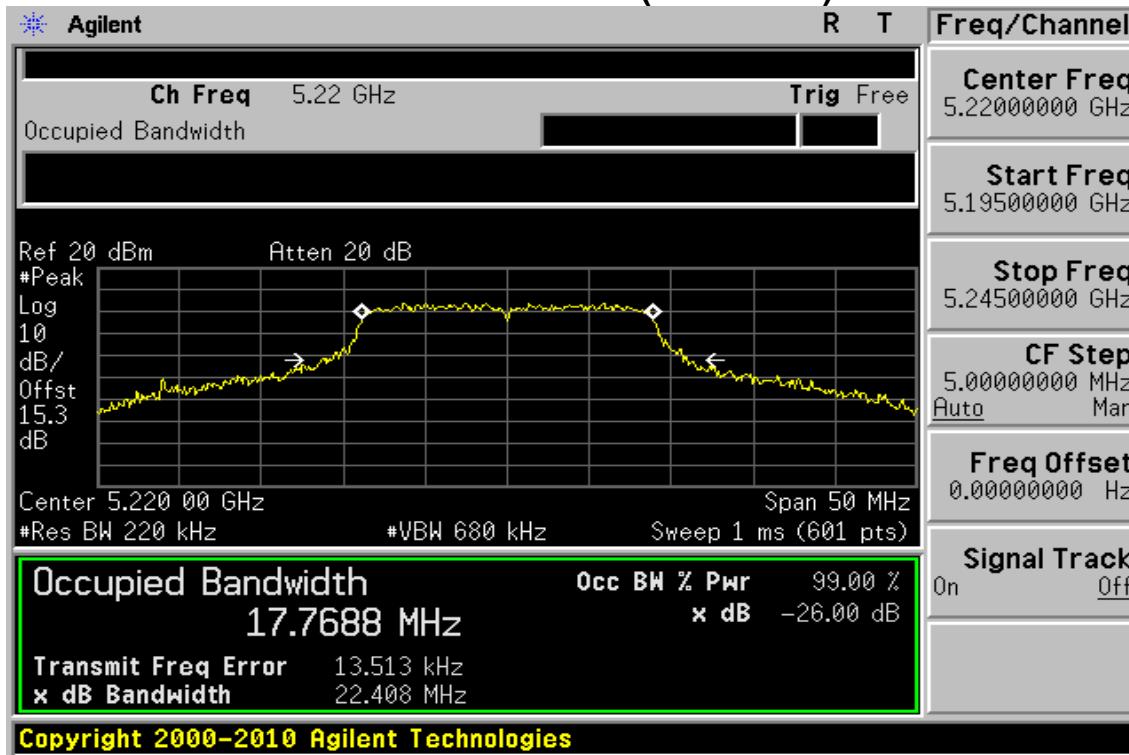
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## 802.11n HT20, 5150~5250 MHz (Main) 26dB & 99% Band Width Test Data CH-Low (5180 MHz)



## 26dB & 99% Band Width Test Data CH-Mid (5220 MHz)

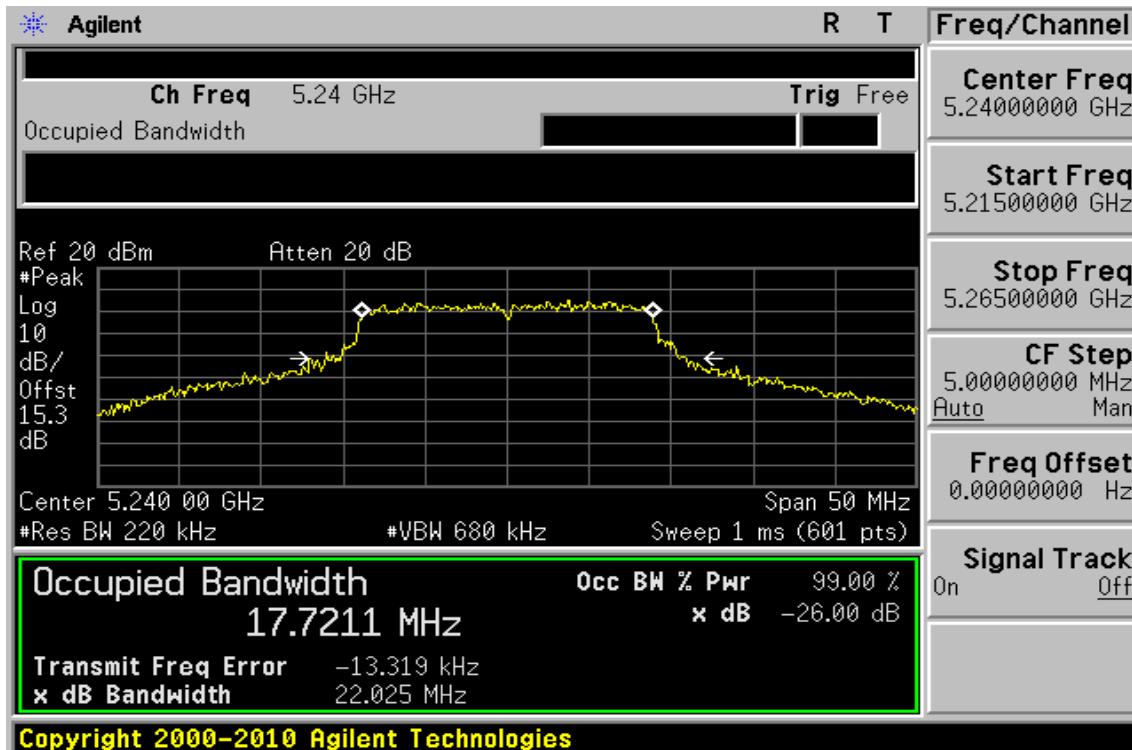


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**26dB & 99% Band Width Test Data CH-High (5240 MHz)**

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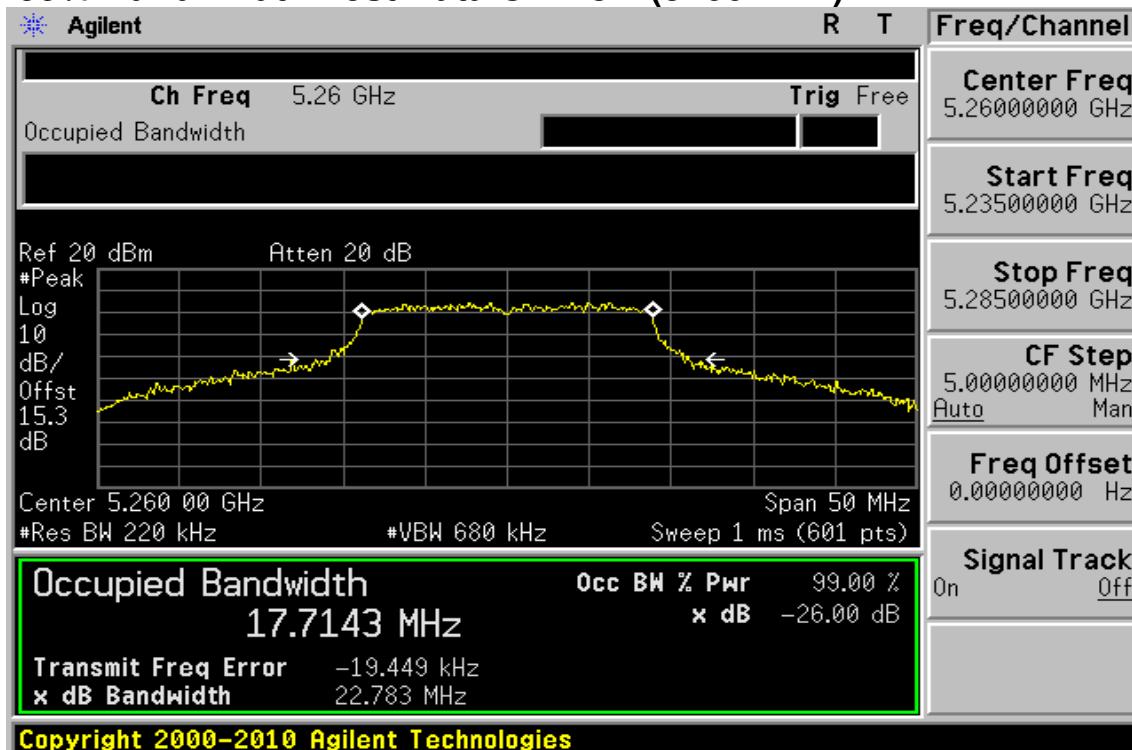
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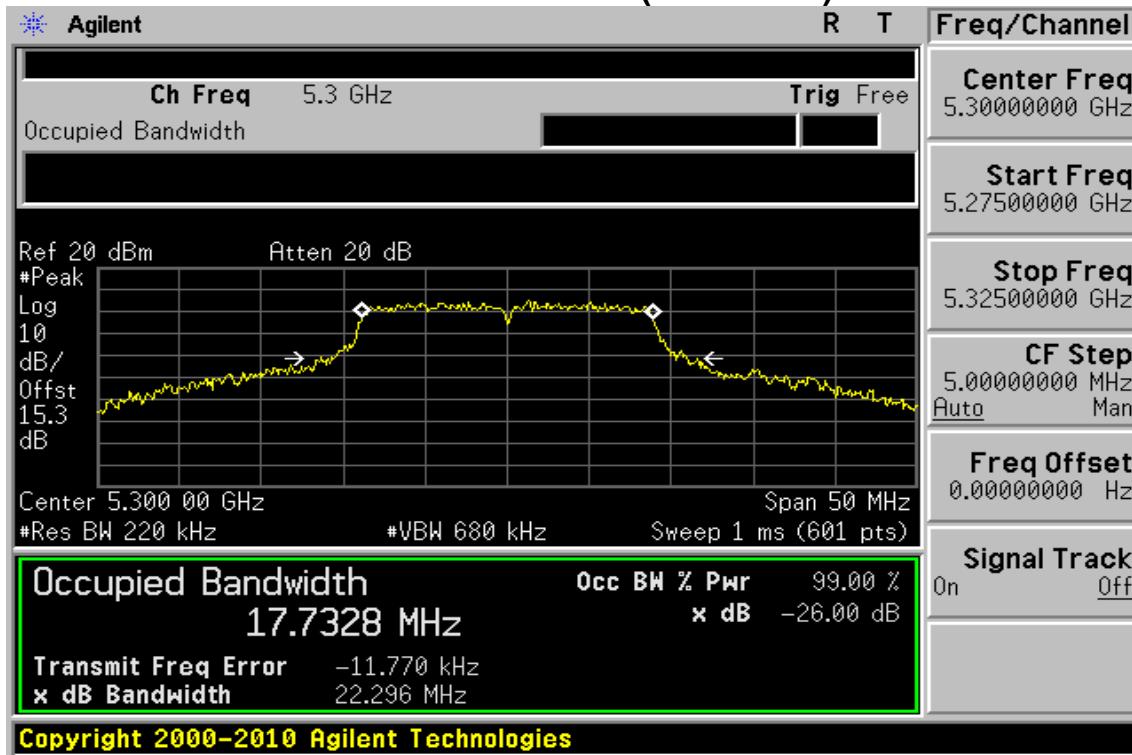
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## 802.11n HT20, 5250~5350 MHz (Main) 26dB & 99% Band Width Test Data CH-Low (5260 MHz)



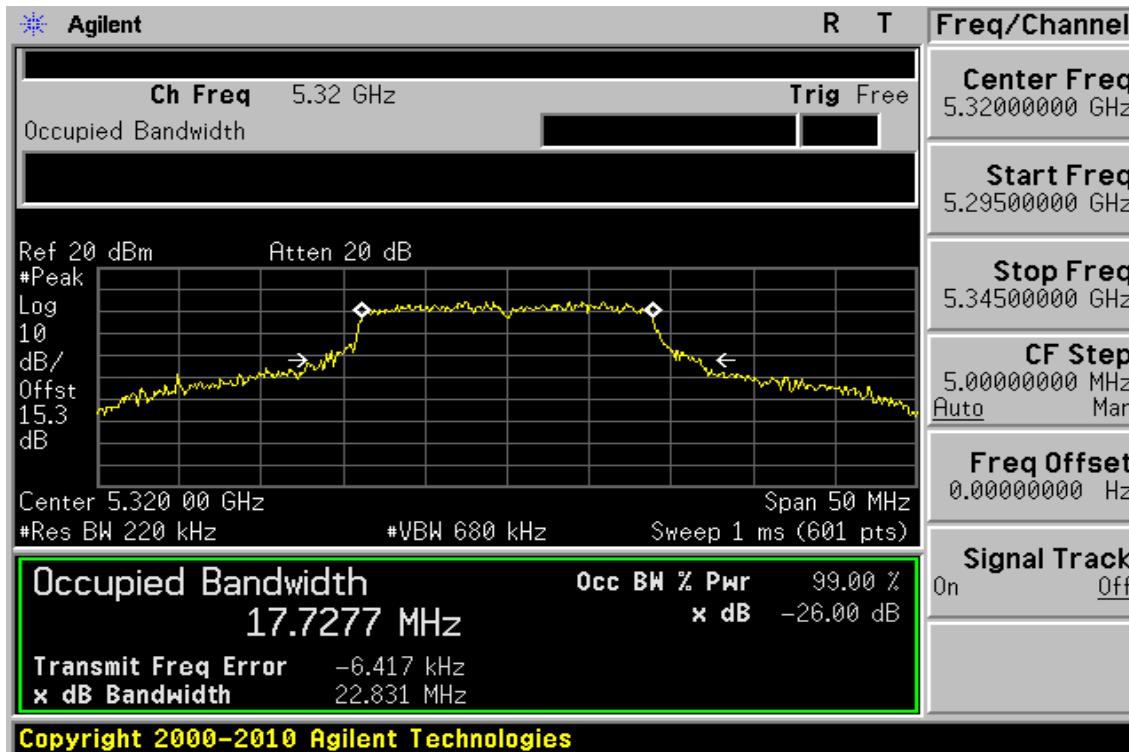
## 26dB & 99% Band Width Test Data CH-Mid (5300 MHz)



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**26dB & 99% Band Width Test Data CH-High (5320 MHz)**

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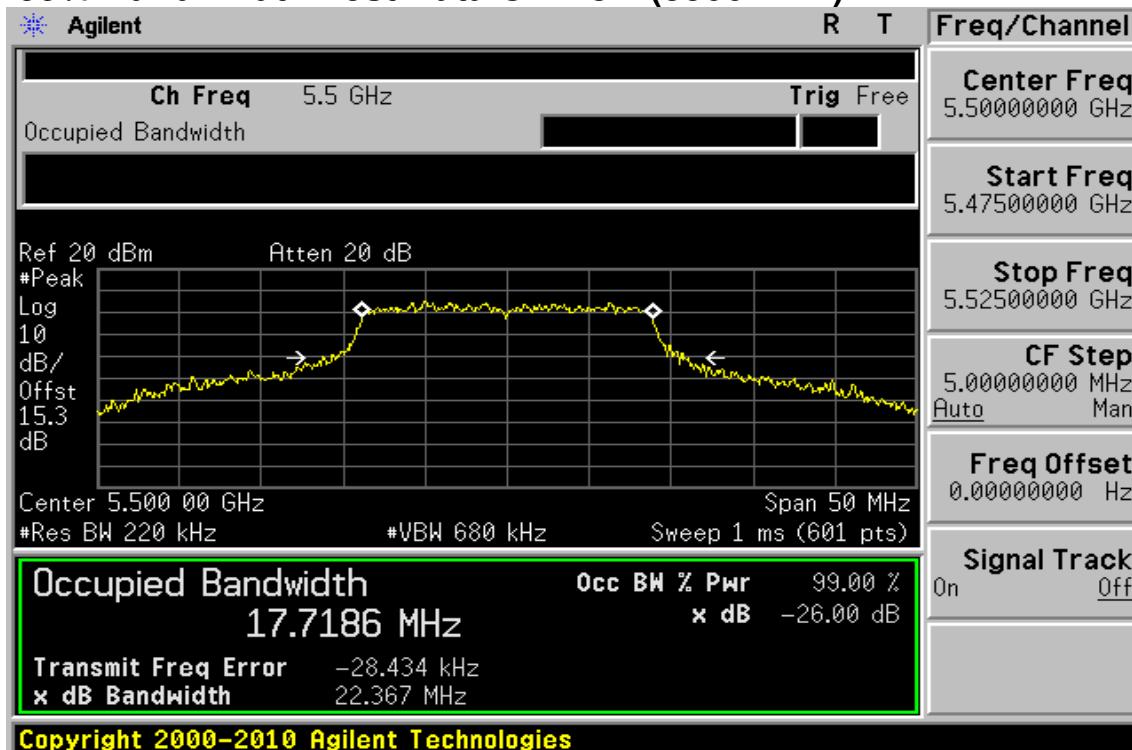
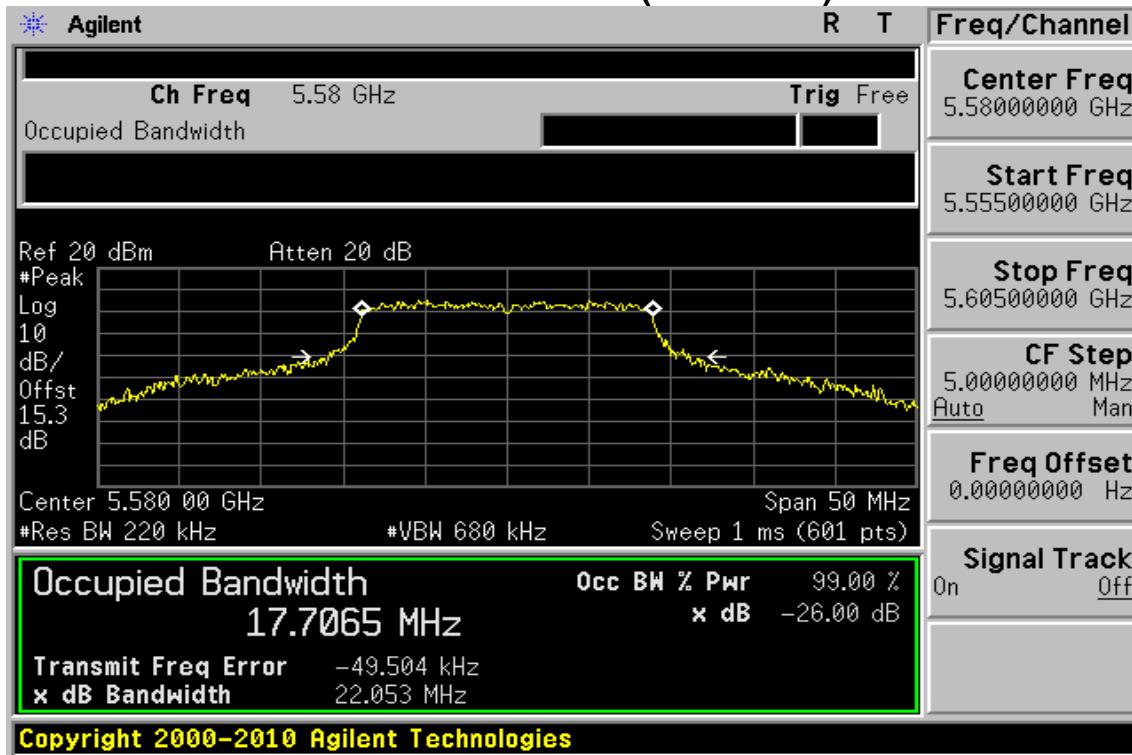
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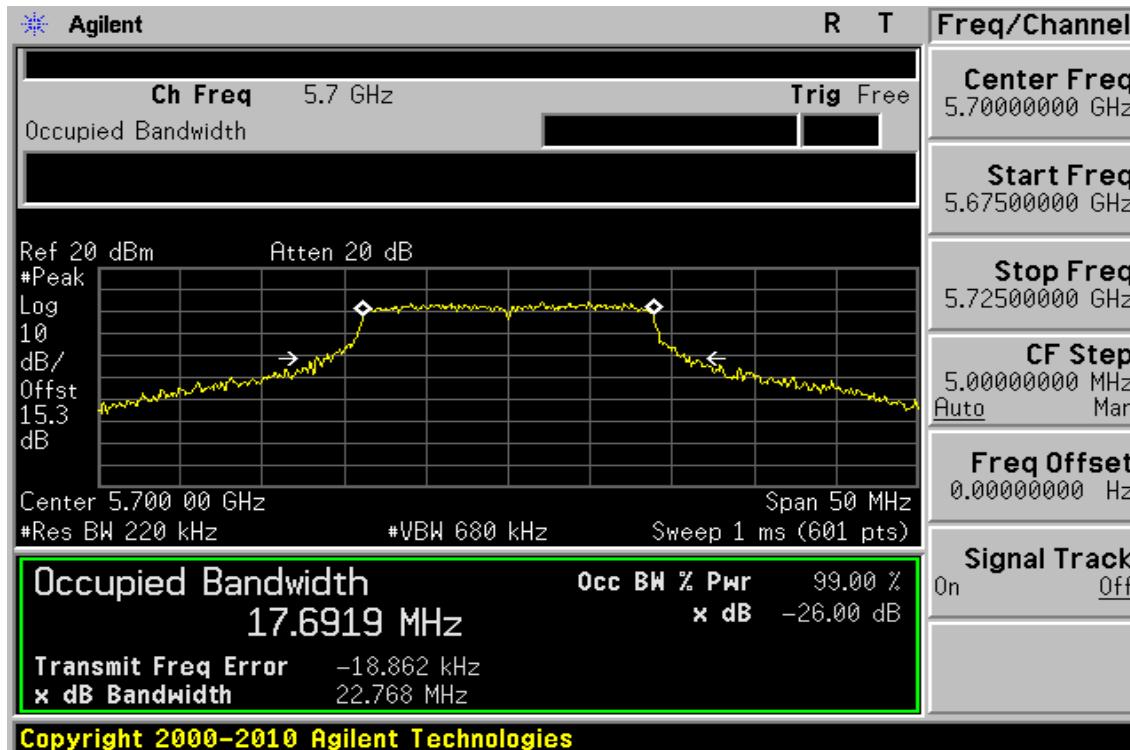
**802.11n HT20, 5470~5725 MHz (Main)  
26dB & 99% Band Width Test Data CH-Low (5500 MHz)****26dB & 99% Band Width Test Data CH-Mid (5580 MHz)**

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**26dB & 99% Band Width Test Data CH-High (5700 MHz)**

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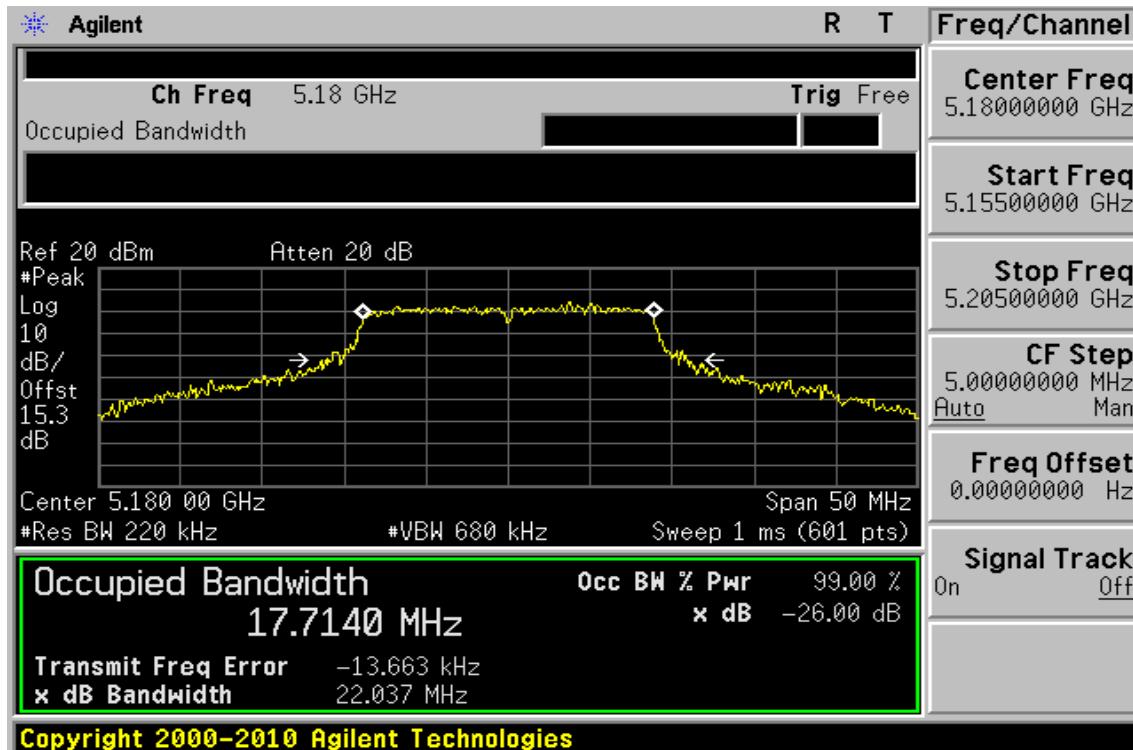
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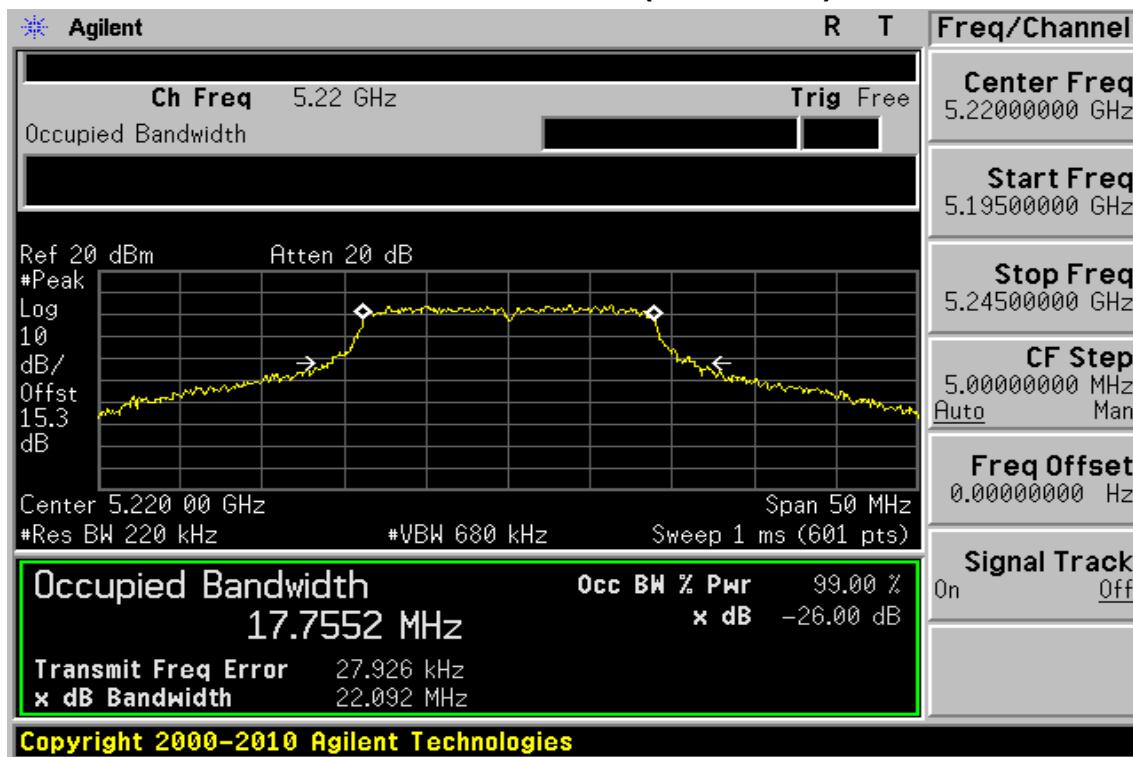
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## 802.11n HT20, 5150~5250 MHz (Aux)

### 26dB & 99% Band Width Test Data CH-Low (5180 MHz)



### 26dB & 99% Band Width Test Data CH-Mid (5220 MHz)



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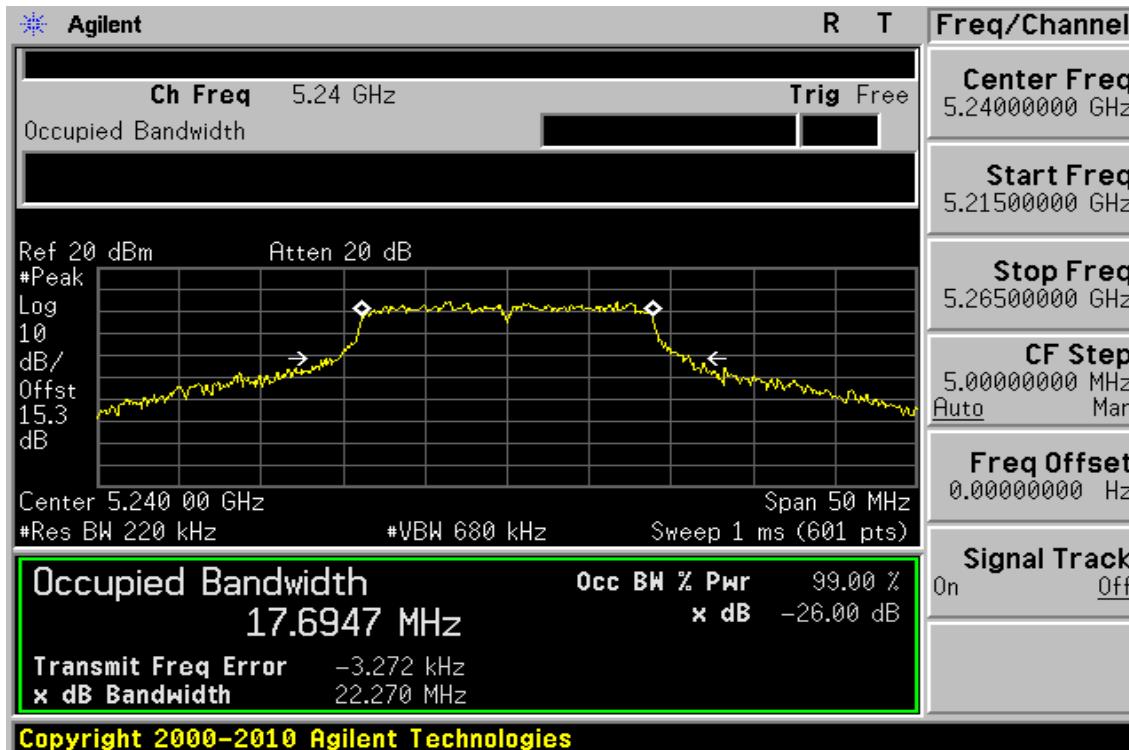
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**26dB & 99% Band Width Test Data CH-High (5240 MHz)**

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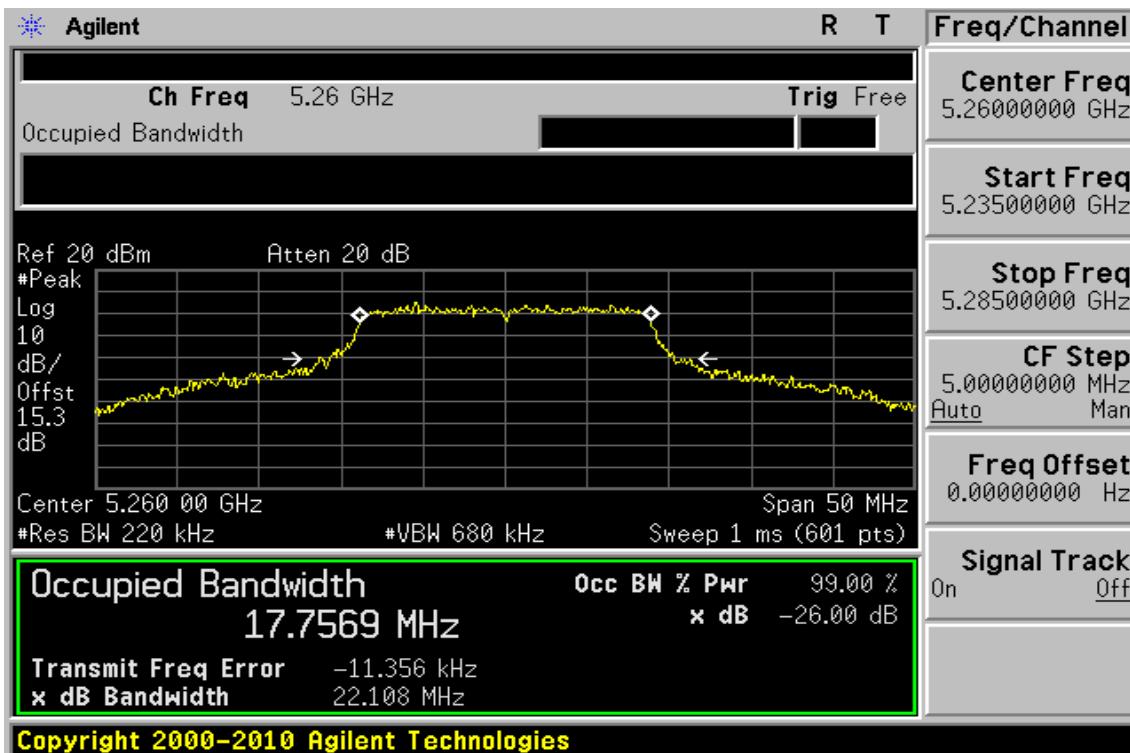
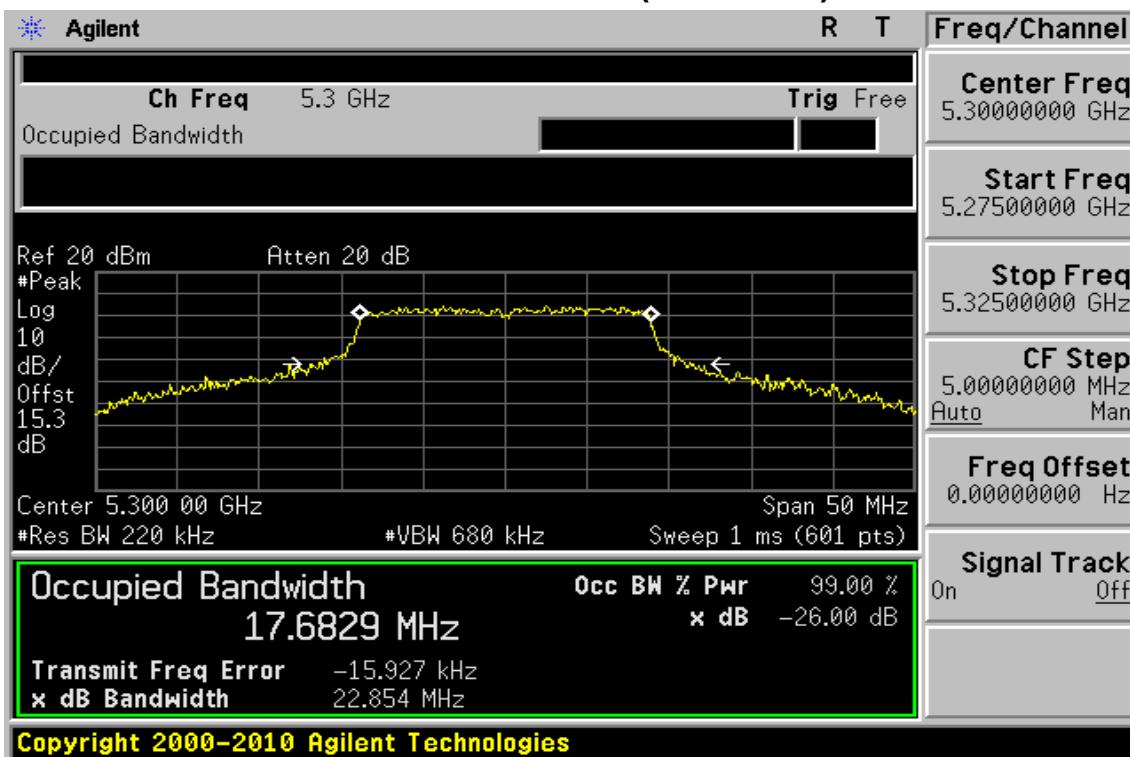
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**802.11n HT20, 5250~5350 MHz (Aux)  
26dB & 99% Band Width Test Data CH-Low (5260 MHz)****26dB & 99% Band Width Test Data CH-Mid (5300 MHz)**

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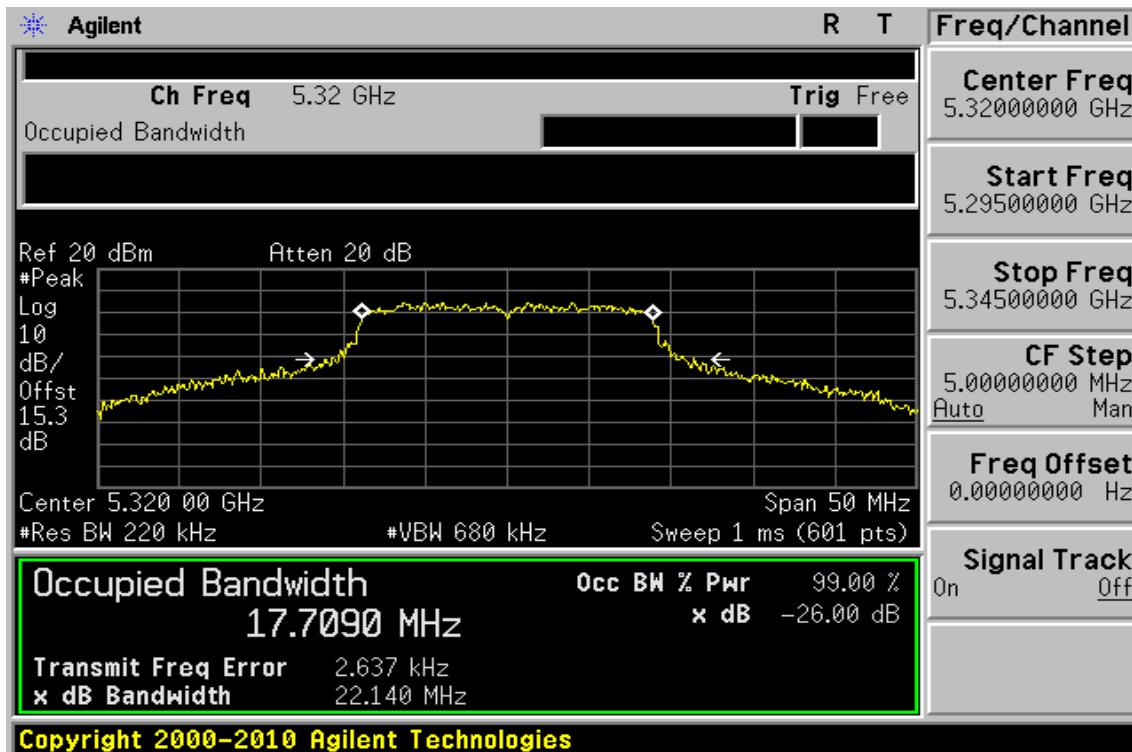
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**26dB & 99% Band Width Test Data CH-High (5320 MHz)**

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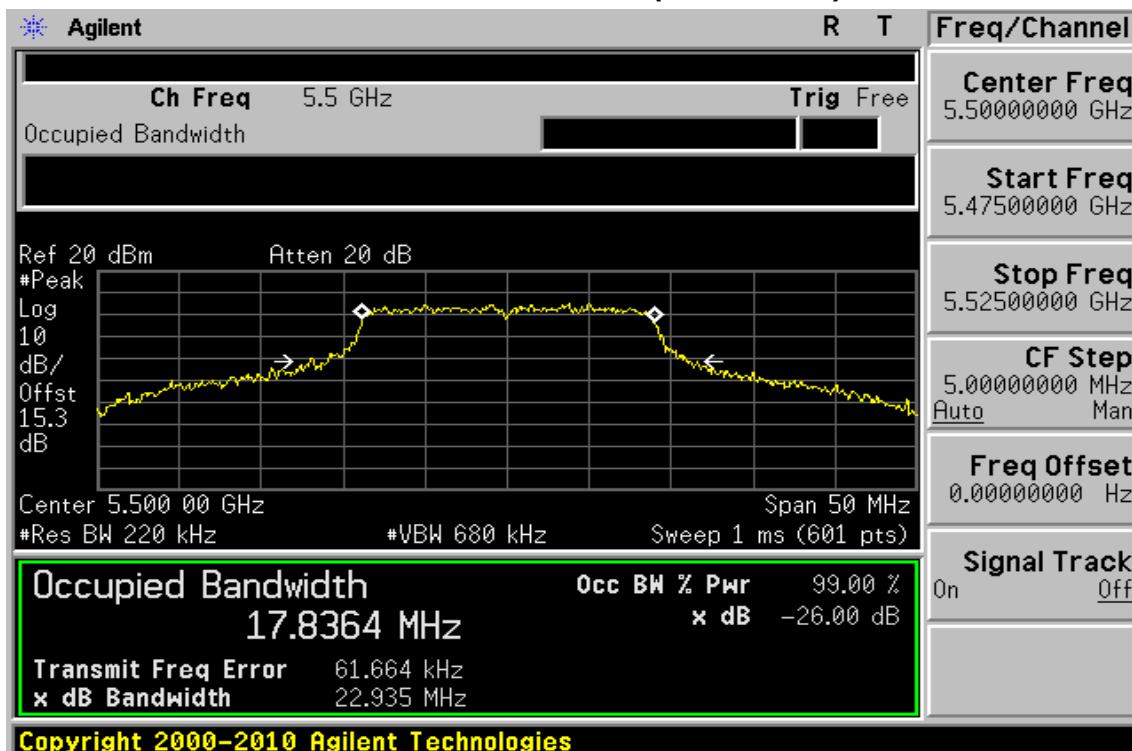
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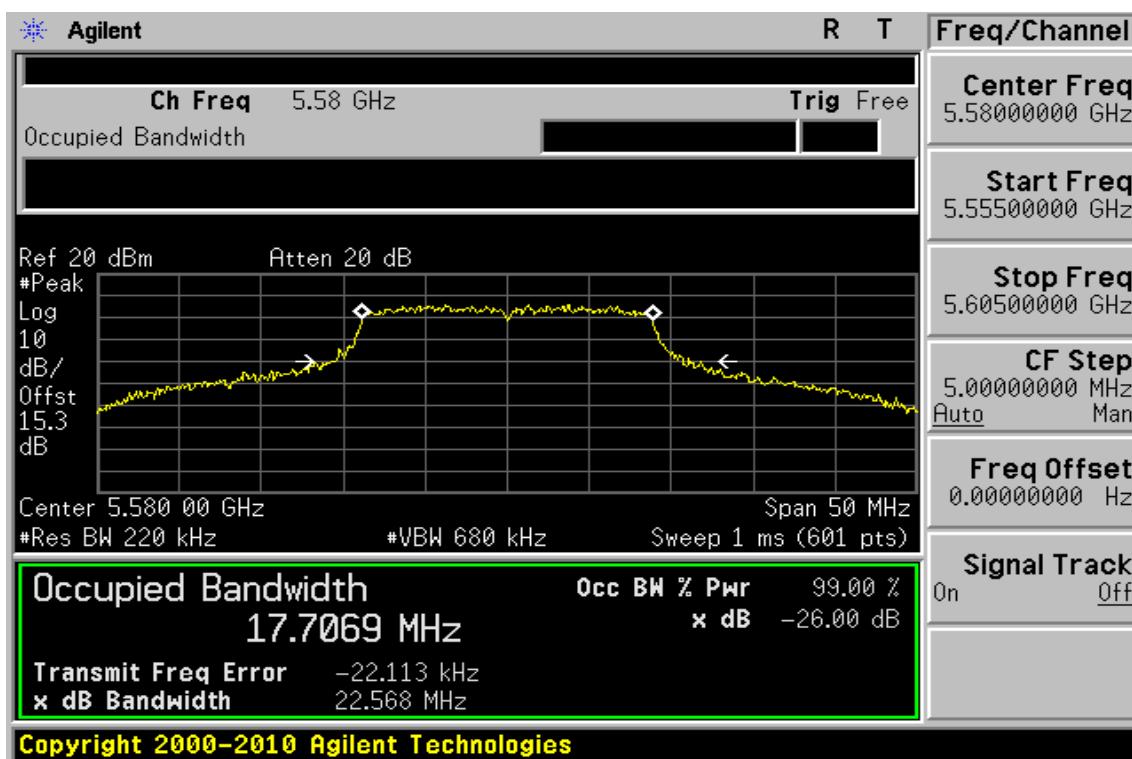
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## 802.11n HT20, 5470~5725 MHz (Aux) 26dB & 99% Band Width Test Data CH-Low (5500 MHz)



## 26dB & 99% Band Width Test Data CH-Mid (5580 MHz)

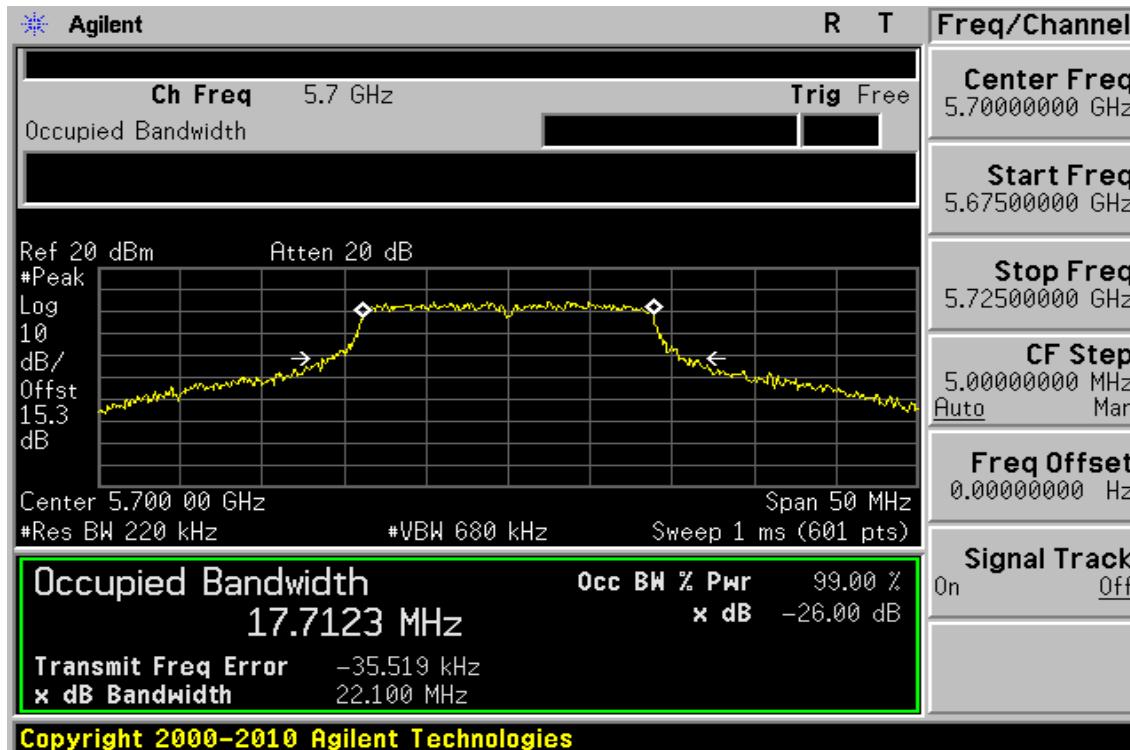


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## 26dB &amp; 99% Band Width Test Data CH-High (5700 MHz)



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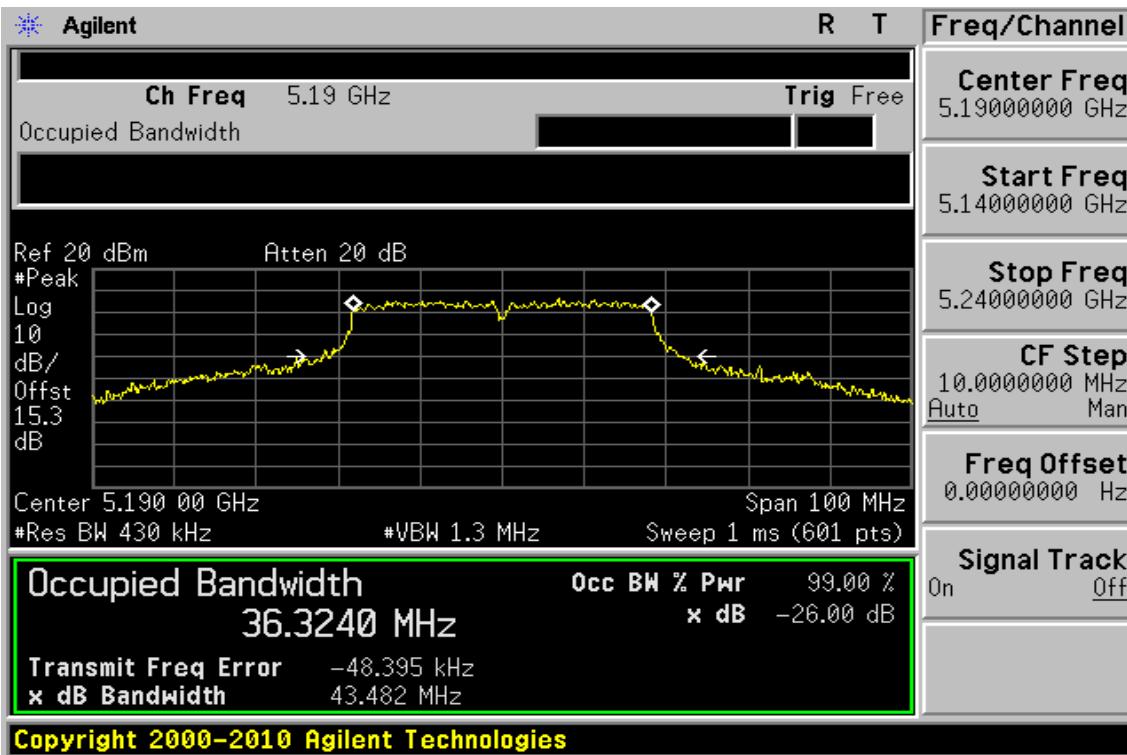
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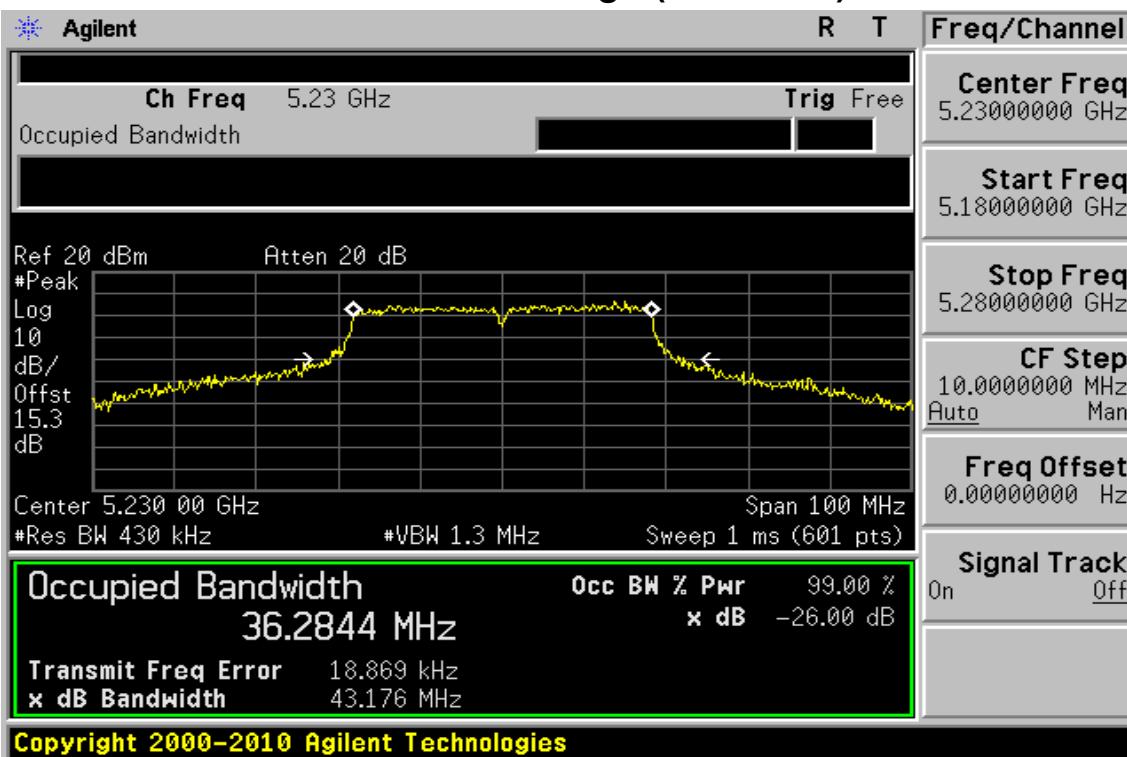
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## 802.11n HT40, 5150~5250 MHz (Main)

### 26dB & 99% Band Width Test Data CH-Low (5190 MHz)



### 26dB & 99% Band Width Test Data CH-High (5230 MHz)



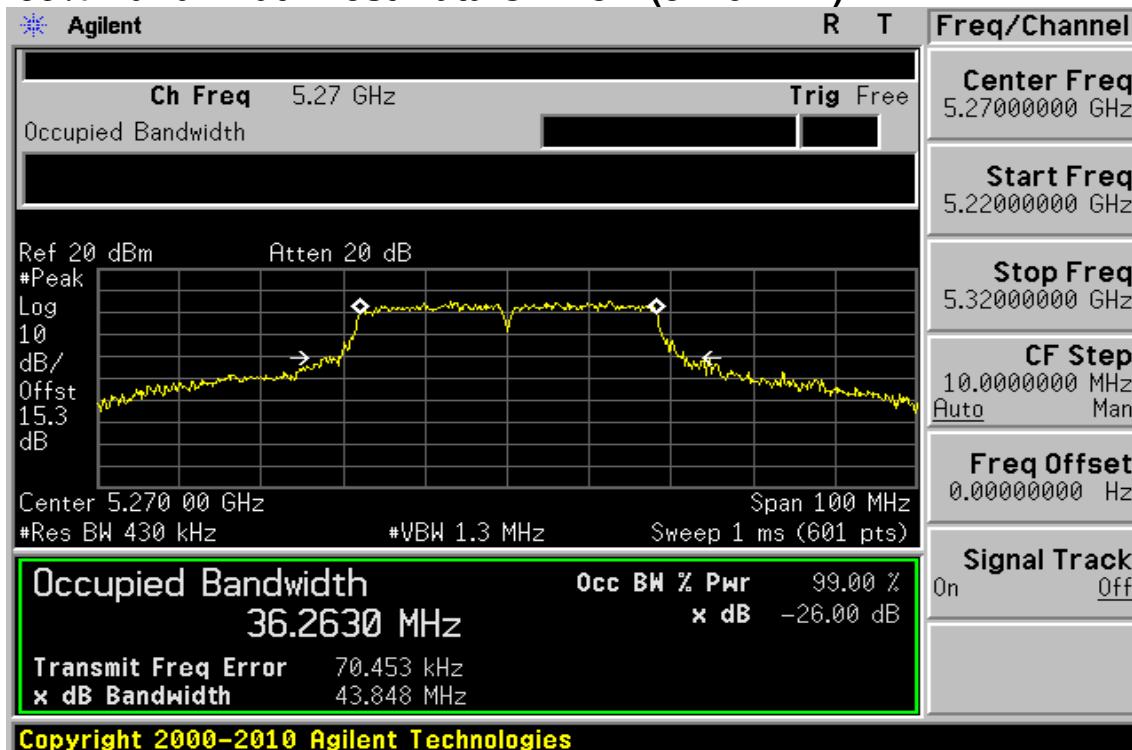
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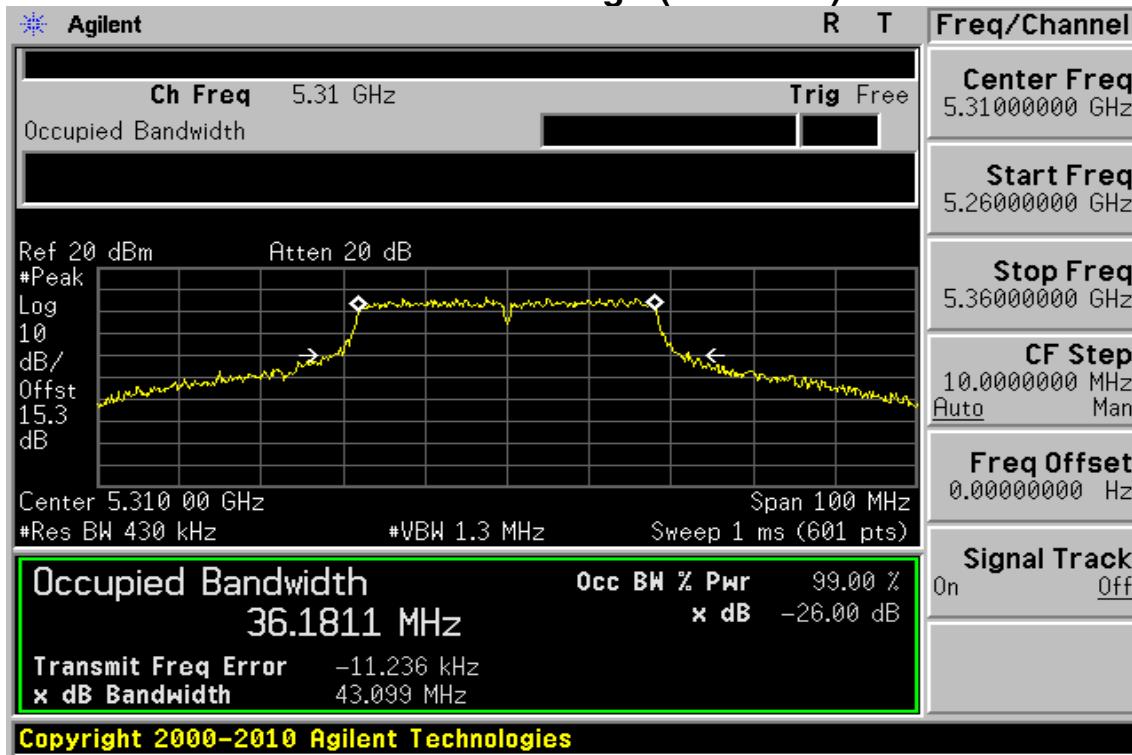
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## 802.11n HT40, 5250~5350 MHz (Main) 26dB & 99% Band Width Test Data CH-Low (5270 MHz)



## 26dB & 99% Band Width Test Data CH-High (5310MHz)



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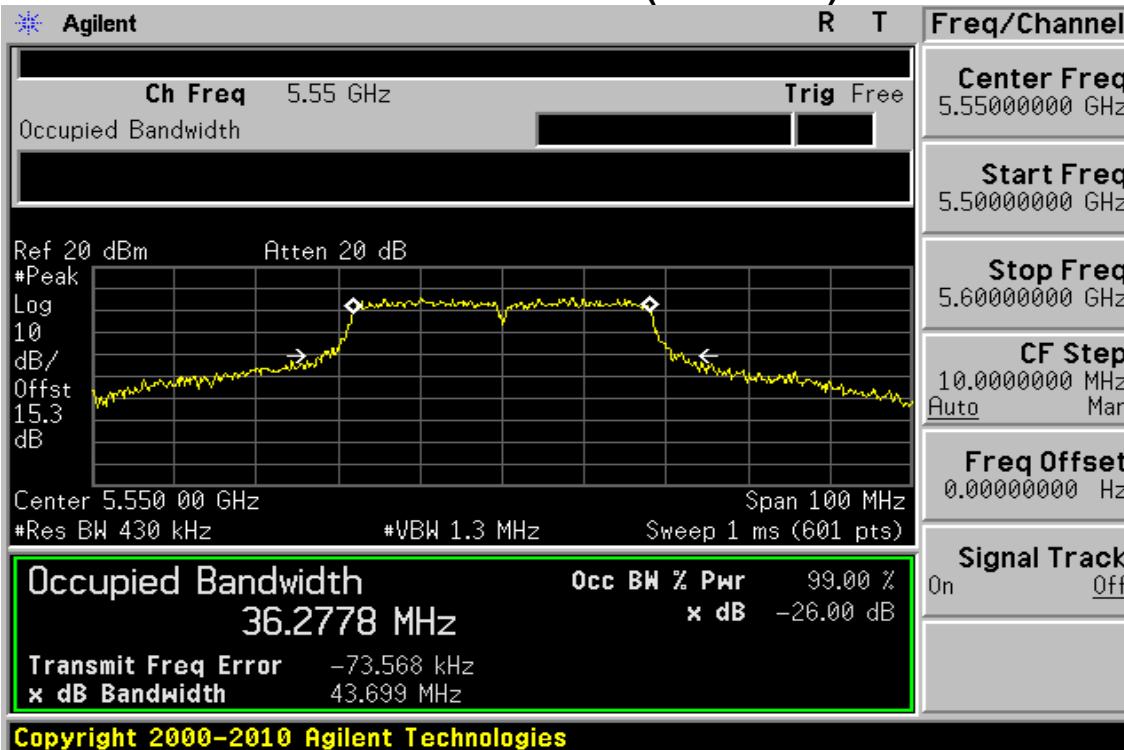
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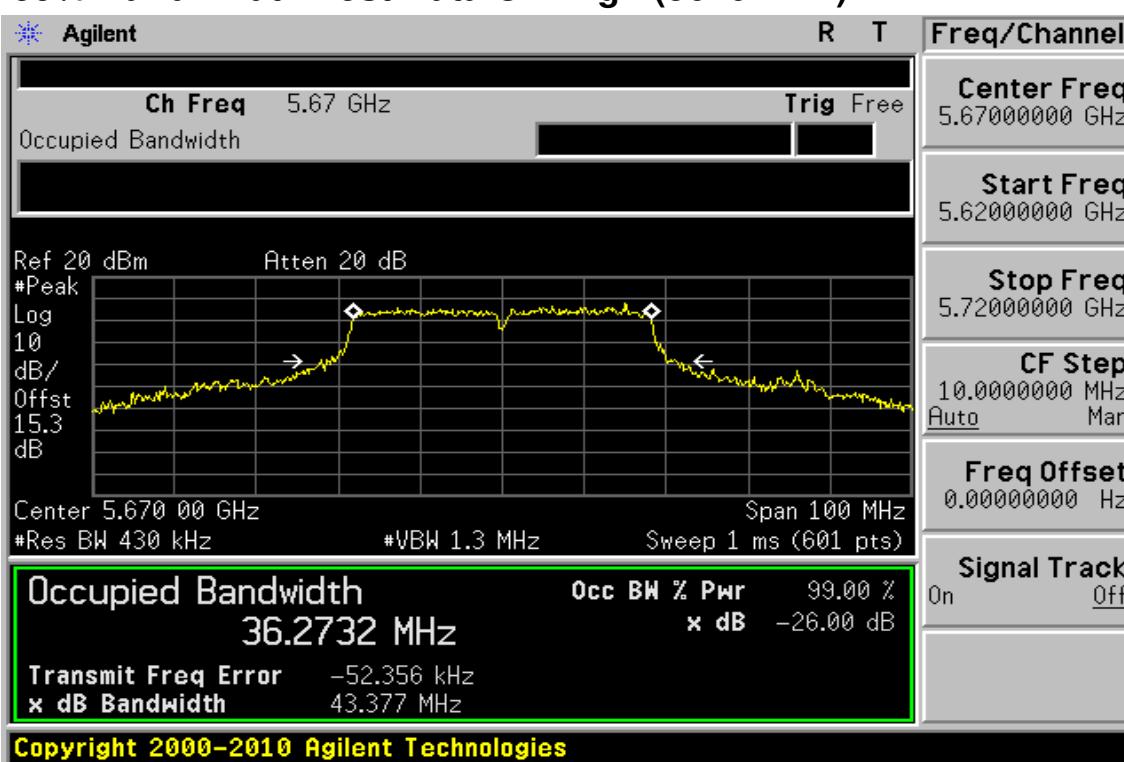
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## 802.11n HT40, 5470~5725 MHz (Main)

## 26dB &amp; 99% Band Width Test Data CH-Low (5550 MHz)



## 26dB &amp; 99% Band Width Test Data CH-High (5670 MHz)



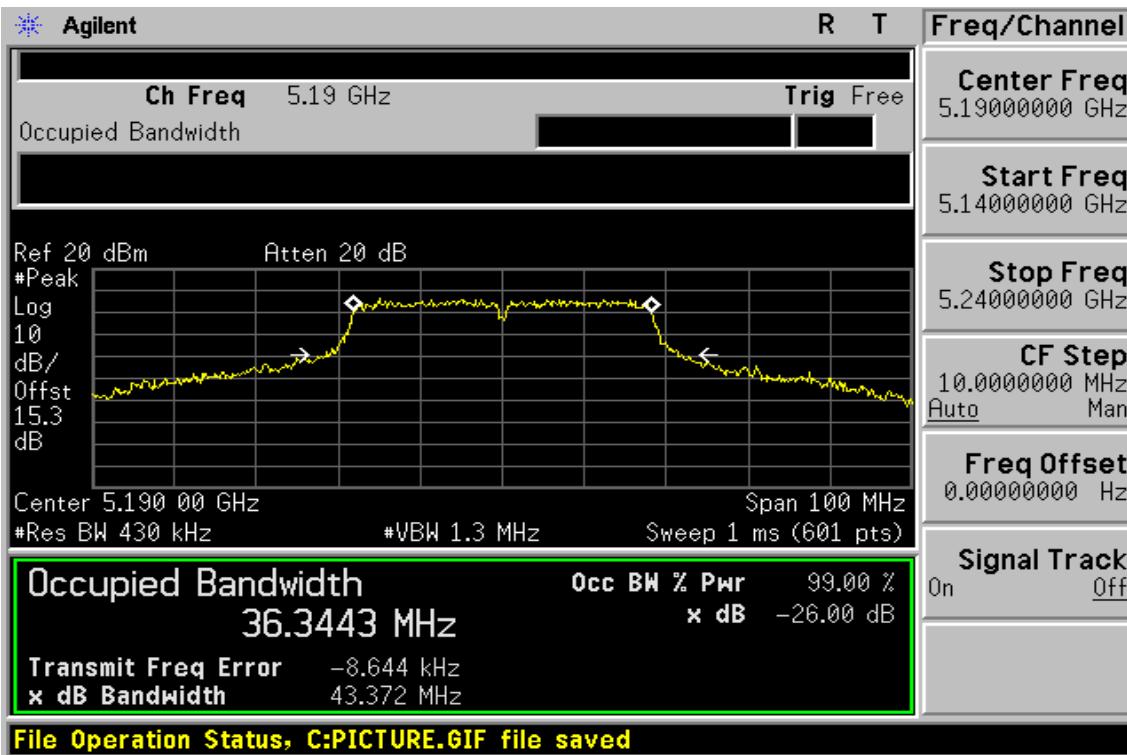
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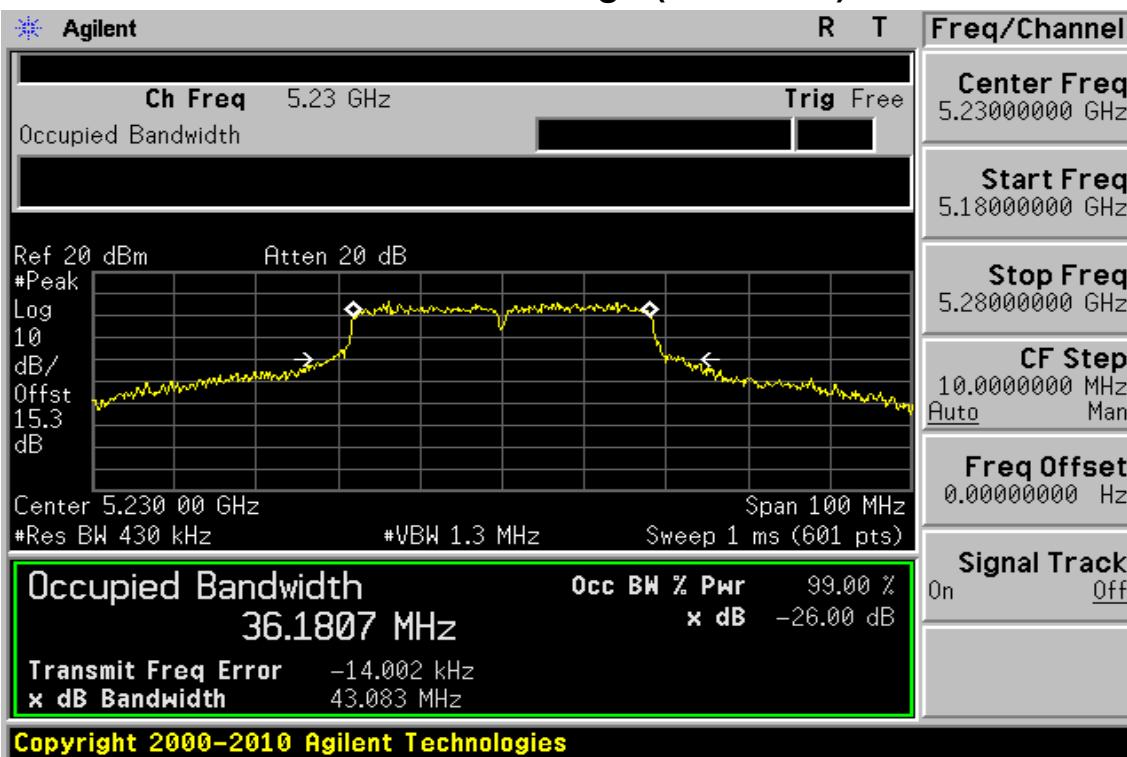
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## 802.11n HT40, 5150~5250 MHz (Aux)

### 26dB & 99% Band Width Test Data CH-Low (5190 MHz)



### 26dB & 99% Band Width Test Data CH-High (5230 MHz)



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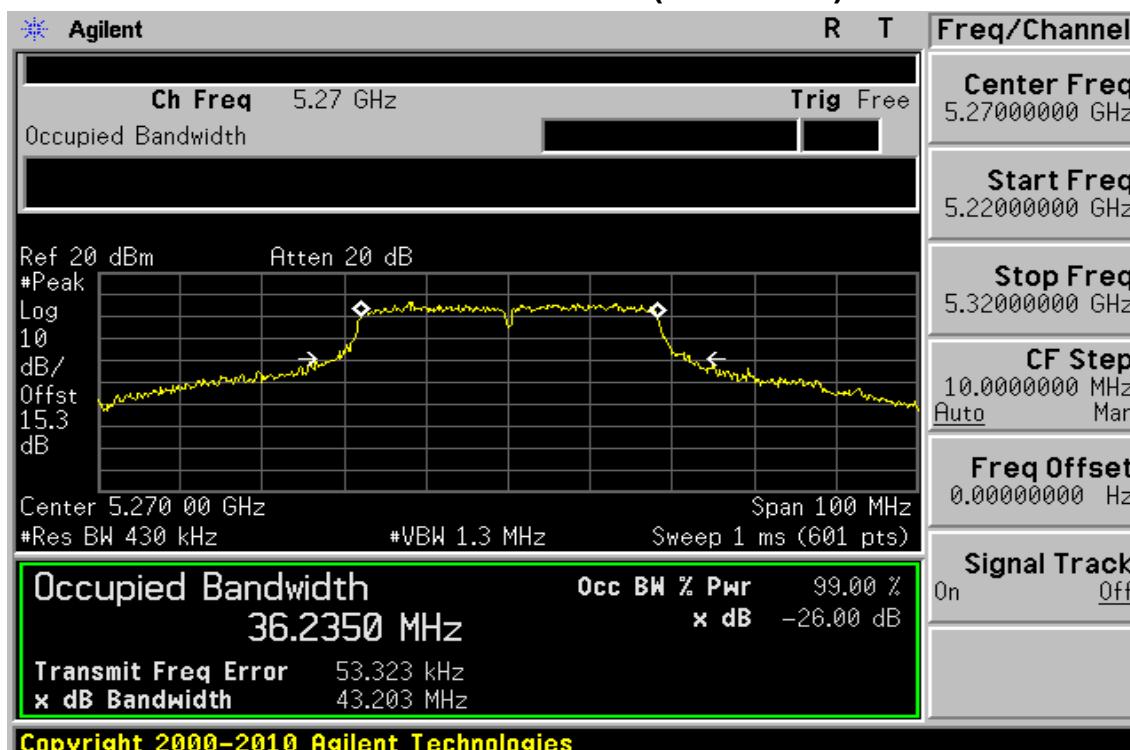
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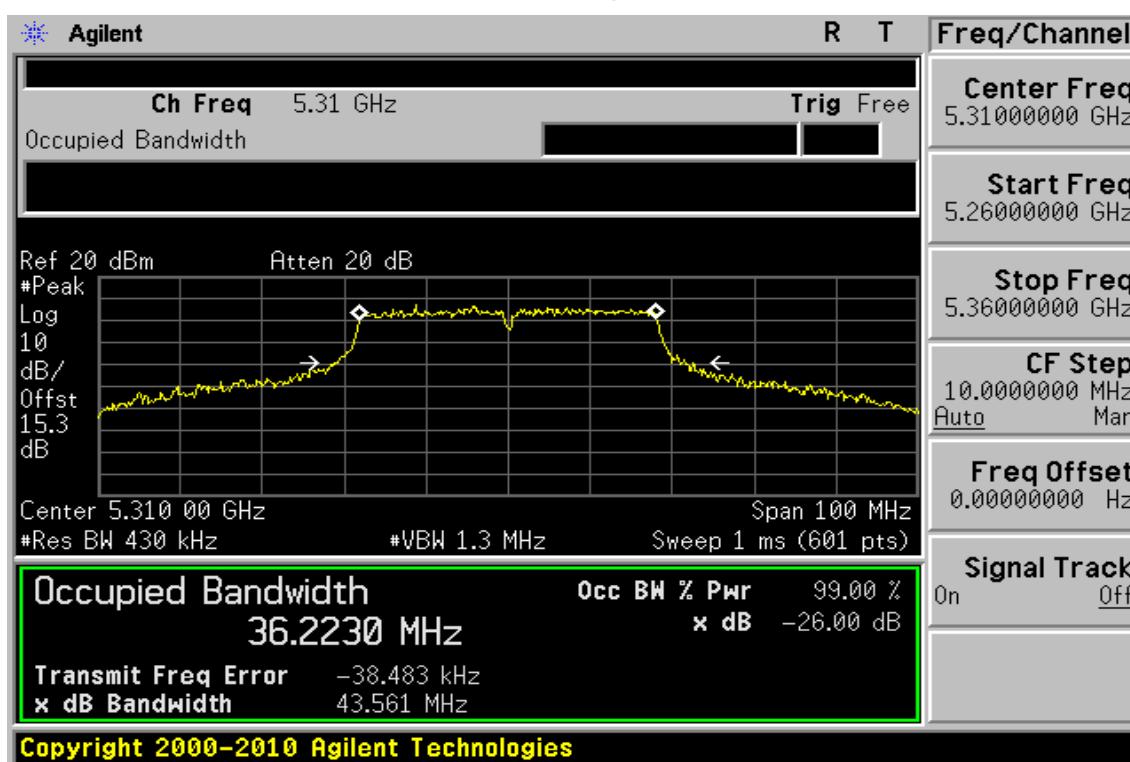
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## 802.11n HT40, 5250~5350 MHz (Aux) 26dB & 99% Band Width Test Data CH-Low (5270 MHz)



## 26dB & 99% Band Width Test Data CH-High (5310MHz)



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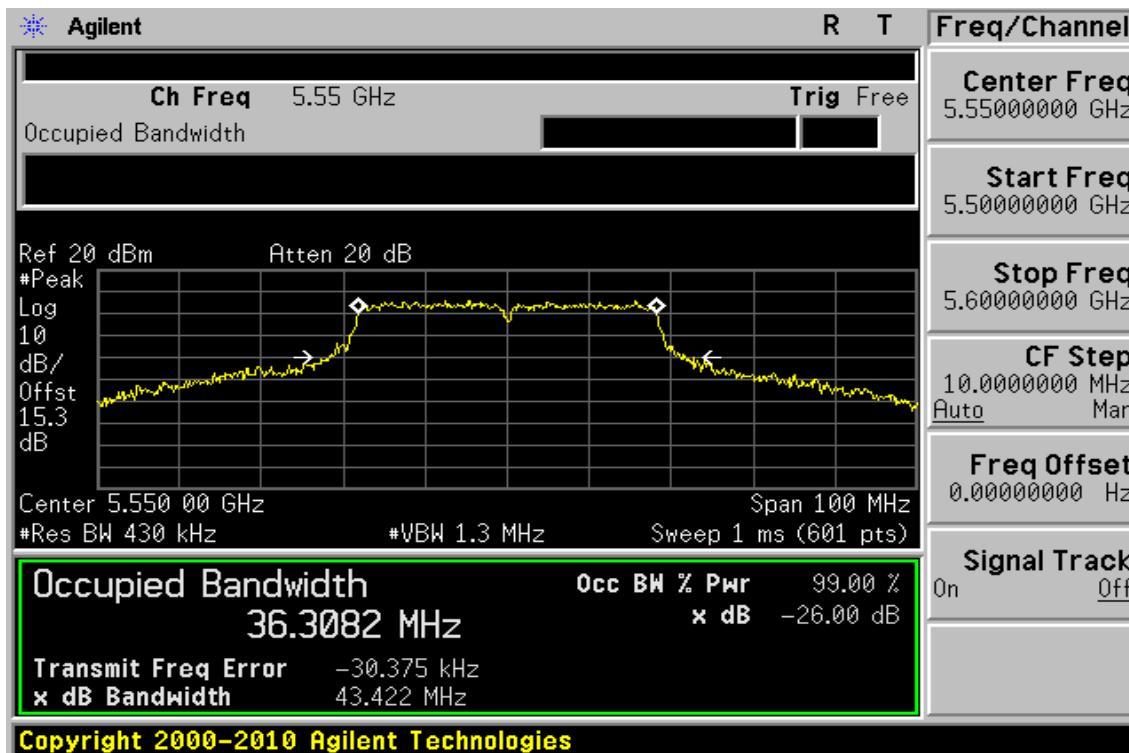
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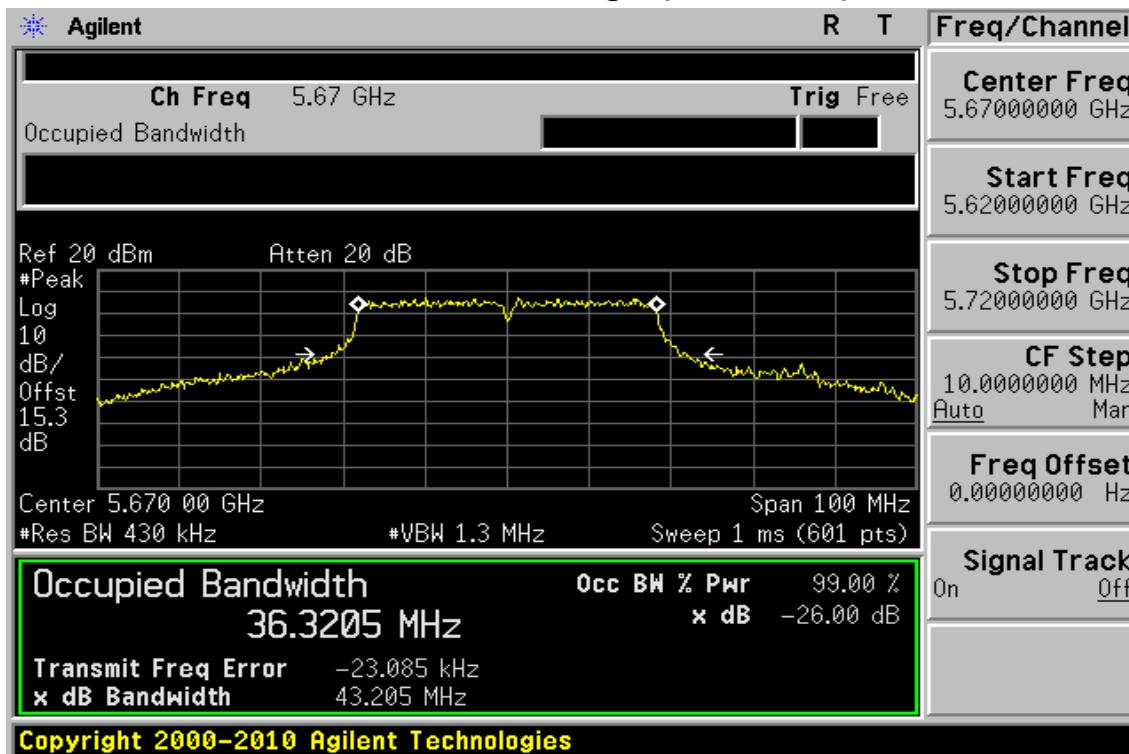
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## 802.11n HT40, 5470~5725 MHz (Aux)

### 26dB & 99% Band Width Test Data CH-Low (5550 MHz)



### 26dB & 99% Band Width Test Data CH-High (5670 MHz)



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## 9. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

### 9.1 Standard Applicable

FCC

| OPERATION Band | EUT CATEGORY                        | LIMIT                             |
|----------------|-------------------------------------|-----------------------------------|
| U-NII-1        | Access Point (Master device)        | 1 Watt(30dBm)                     |
|                | Fixed point-to-point Access Point   | 1 Watt(30dBm)                     |
|                | ✓ Mobile and portable client device | 250mW(23.98dBm)                   |
| U-NII-2A       | ✓                                   | 250mW(23.98dBm) or 11dBm+10 log B |
| U-NII-2C       | ✓                                   | 250mW(23.98dBm) or 11dBm+10 log B |

IC

| OPERATION FREQUENCY BAND        | LIMIT   |
|---------------------------------|---|
| 5150~5250 MHz                   | EIRP shall not exceed 200 mW or $10 + 10 \log_{10} B$ , dBm   |
| 5250~5350 MHz                   | Conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$<br>EIRP shall not exceed 1.0 W or $17 + 10 \log_{10} B$ , dBm |
| 5470-5600 MHz and 5650-5725 MHz | Conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$<br>EIRP shall not exceed 1.0 W or $17 + 10 \log_{10} B$ , dBm |

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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The antenna gain is greater than 6 dBi in MIMO mode the limit reduce as below:

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

### FCC

|                 | <b>Effective Legacy Gain (dBi)</b> | <b>Limit</b>   |
|-----------------|------------------------------------|--|
| <b>UNII-1</b>   | $5.6+3.01=8.61\text{dBi}$          | $23.98\text{dBm} - (8.61 - 6 \text{ dBi}) = 21.37\text{dBm}$ |
| <b>UNII-2A</b>  | $5.9+3.01=8.91\text{dBi}$          | $23.98\text{dBm} - (8.91 - 6 \text{ dBi}) = 21.07\text{dBm}$ |
| <b>U-NII-2C</b> | $4.7+3.01=7.71\text{dBi}$          | $23.98\text{dBm} - (7.71 - 6 \text{ dBi}) = 22.27\text{dBm}$ |

### IC

|                 | <b>Effective Legacy Gain (dBi)</b> | <b>Limit</b>   |
|-----------------|------------------------------------|--|
| <b>UNII-2A</b>  | $5.9+3.01=8.91\text{dBi}$          | $23.98\text{dBm} - (8.91 - 6 \text{ dBi}) = 21.07\text{dBm}$ |
| <b>U-NII-2C</b> | $4.7+3.01=7.71\text{dBi}$          | $23.98\text{dBm} - (7.71 - 6 \text{ dBi}) = 22.27\text{dBm}$ |

Therefore the limit needs to reduce for the U-NII-2A and U-NII-2C band.

## 9.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r01.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
4. Power Meter is used as the auxiliary test equipment to conduct the output power measurement.
5. Record the max. reading and add  $10 \log(1/\text{duty cycle})$ .
6. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

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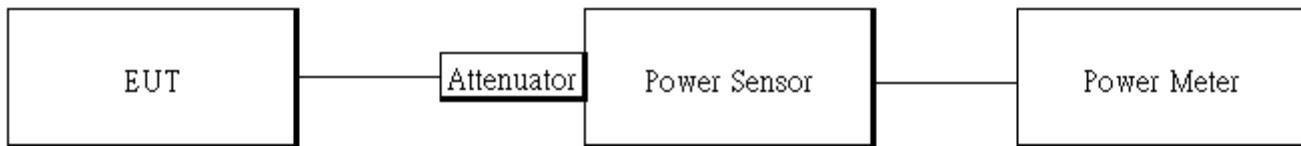
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### 9.3 Measurement Equipment Used

Refer to section 8.3 for details.

| Conducted Emission Test Site |           |              |               |            |            |
|------------------------------|-----------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE               | MFR       | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Power Meter                  | Anritsu   | ML2496A      | 1326001       | 06/23/2015 | 06/22/2016 |
| Power Sensor                 | Anritsu   | MA2411B      | 1315048       | 06/23/2015 | 06/22/2016 |
| Spectrum Analyzer            | KEYSIGHT  | N9010A       | MY54510568    | 04/14/2015 | 04/13/2016 |
| Splitter                     | RF-LAMBAD | RFLT2W1G18G  | RF35          | 12/12/2015 | 12/11/2016 |
| DC Block                     | PASTERNAK | PE8210       | RF29          | 12/12/2015 | 12/11/2016 |
| Attenuator                   | WOKEN     | 218FS-10     | RF23          | 12/12/2015 | 12/11/2016 |

### 9.4 Test Set-up



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## 9.5 Measurement Result

802.11a

| CH  | Frequency (MHz) | TOTAL POWER (dBm) | TOTAL POWER (mW) | REQUIRED LIMIT (dBm)            | RESULT |
|-----|-----------------|-------------------|------------------|---------------------------------|--------|
| 36  | 5180            | 13.52             | 22.491           | 23.98                           | PASS   |
| 44  | 5220            | <b>14.06</b>      | <b>25.468</b>    | 23.98                           | PASS   |
| 48  | 5240            | 14.02             | 25.235           | 23.98                           | PASS   |
| 52  | 5260            | <b>13.91</b>      | <b>24.604</b>    | 23.98 or $11+10\log(B) = 23.20$ | PASS   |
| 60  | 5300            | 13.57             | 22.751           | 23.98 or $11+10\log(B) = 23.22$ | PASS   |
| 64  | 5320            | 13.87             | 24.378           | 23.98 or $11+10\log(B) = 23.22$ | PASS   |
| 100 | 5500            | <b>15.53</b>      | <b>35.727</b>    | 23.98 or $11+10\log(B) = 23.23$ | PASS   |
| 116 | 5580            | 15.23             | 33.343           | 23.98 or $11+10\log(B) = 23.22$ | PASS   |
| 140 | 5700            | 14.14             | 25.942           | 23.98 or $11+10\log(B) = 23.21$ | PASS   |

802.11n HT20 (MIMO)

| CH  | Frequency (MHz) | AVERAGE POWER (dBm) |         | TOTAL POWER (dBm) | TOTAL POWER (mW) | REQUIRED LIMIT (dBm)            | RESULT |
|-----|-----------------|---------------------|---------|-------------------|------------------|---------------------------------|--------|
|     |                 | CHAIN 0             | CHAIN 1 |                   |                  |                                 |        |
| 36  | 5180            | 9.78                | 11.7    | 13.86             | 24.297           | 21.37                           | PASS   |
| 44  | 5220            | 10.04               | 11.55   | <b>13.87</b>      | <b>24.381</b>    | 21.37                           | PASS   |
| 48  | 5240            | 10.07               | 11.5    | 13.85             | 24.288           | 21.37                           | PASS   |
| 52  | 5260            | 10.49               | 11.38   | <b>13.97</b>      | <b>24.935</b>    | 21.07 or $11+10\log(B) = 23.49$ | PASS   |
| 60  | 5300            | 9.64                | 10.9    | 13.33             | 21.507           | 21.07 or $11+10\log(B) = 23.48$ | PASS   |
| 64  | 5320            | 9.75                | 11.45   | 13.69             | 23.404           | 21.07 or $11+10\log(B) = 23.48$ | PASS   |
| 100 | 5500            | 10.54               | 12.03   | 14.36             | 27.283           | 22.27 or $11+10\log(B) = 23.51$ | PASS   |
| 116 | 5580            | 10.21               | 13.49   | <b>15.16</b>      | <b>32.831</b>    | 22.27 or $11+10\log(B) = 23.48$ | PASS   |
| 140 | 5700            | 8.9                 | 13.08   | 14.48             | 28.086           | 22.27 or $11+10\log(B) = 23.48$ | PASS   |

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## 802.11n HT40 (MIMO)

| CH  | Frequency (MHz) | AVERAGE POWER (dBm) |         | TOTAL POWER (dBm) | TOTAL POWER (mW) | REQUIRED LIMIT (dBm)           | RESULT |
|-----|-----------------|---------------------|---------|-------------------|------------------|--------------------------------|--------|
|     |                 | CHAIN 0             | CHAIN 1 |                   |                  |                                |        |
| 38  | 5190            | 9.14                | 12.27   | 13.99             | 25.069           | 21.37                          | PASS   |
| 46  | 5230            | 9.6                 | 12.16   | 14.08             | 25.564           | 21.37                          | PASS   |
| 54  | 5270            | 9.94                | 11.79   | 13.97             | 24.964           | 21.07 or<br>11+10log(B) =26.59 | PASS   |
| 62  | 5310            | 9.11                | 11.34   | 13.38             | 21.761           | 21.07 or<br>11+10log(B) =26.59 | PASS   |
| 110 | 5550            | 10.04               | 13.00   | 14.78             | 30.045           | 22.27 or<br>11+10log(B) =26.60 | PASS   |
| 134 | 5670            | 8.93                | 13.55   | 14.84             | 30.463           | 22.27 or<br>11+10log(B) =26.60 | PASS   |

\* Note: The duty cycle factor is compensated to obtain the maximum value of measurement in average.

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**EIRP Measurement:**

802.11a

| CH  | Frequency (MHz) | TOTAL POWER (dBm) | TOTAL POWER (mW) | GAIN (dBi) | EIRP (dBm) | REQUIRED LIMIT (dBm)            | RESULT |
|-----|-----------------|-------------------|------------------|------------|------------|---------------------------------|--------|
| 36  | 5180            | 13.52             | 22.491           | 5.60       | 19.12      | 23.01 or $10+10\log(B) = 22.22$ | PASS   |
| 44  | 5220            | <b>14.06</b>      | <b>25.468</b>    |            | 19.66      | 23.01 or $10+10\log(B) = 22.19$ | PASS   |
| 48  | 5240            | 14.02             | 25.235           |            | 19.62      | 23.01 or $10+10\log(B) = 22.22$ | PASS   |
| 52  | 5260            | <b>13.91</b>      | <b>24.604</b>    | 5.90       | 19.81      | 30 or $17+10\log(B) = 29.20$    | PASS   |
| 60  | 5300            | 13.57             | 22.751           |            | 19.47      | 30 or $17+10\log(B) = 29.22$    | PASS   |
| 64  | 5320            | 13.87             | 24.378           |            | 19.77      | 30 or $17+10\log(B) = 29.22$    | PASS   |
| 100 | 5500            | <b>15.53</b>      | <b>35.727</b>    | 4.70       | 20.23      | 30 or $17+10\log(B) = 29.23$    | PASS   |
| 116 | 5580            | 15.23             | 33.343           |            | 19.93      | 30 or $17+10\log(B) = 29.22$    | PASS   |
| 140 | 5700            | 14.14             | 25.942           |            | 18.84      | 30 or $17+10\log(B) = 29.21$    | PASS   |

802.11n HT20 (MIMO)

| CH  | Frequency (MHz) | TOTAL POWER (dBm) | TOTAL POWER (mW) | GAIN (dBi) | EIRP (dBm)   | REQUIRED LIMIT (dBm)            | RESULT |
|-----|-----------------|-------------------|------------------|------------|--------------|---------------------------------|--------|
| 36  | 5180            | 13.86             | 24.322           | 8.61       | 22.47        | 23.01 or $10+10\log(B) = 22.48$ | PASS   |
| 44  | 5220            | <b>13.87</b>      | <b>24.378</b>    |            | <b>22.48</b> | 23.01 or $10+10\log(B) = 22.49$ | PASS   |
| 48  | 5240            | 13.85             | 24.266           |            | 22.46        | 23.01 or $10+10\log(B) = 22.48$ | PASS   |
| 52  | 5260            | <b>13.97</b>      | <b>24.935</b>    | 8.91       | <b>22.88</b> | 30 or $17+10\log(B) = 29.48$    | PASS   |
| 60  | 5300            | 13.33             | 21.507           |            | 22.24        | 30 or $17+10\log(B) = 29.48$    | PASS   |
| 64  | 5320            | 13.69             | 23.404           |            | 22.60        | 30 or $17+10\log(B) = 29.48$    | PASS   |
| 100 | 5500            | 14.36             | 27.283           | 7.71       | 22.07        | 30 or $17+10\log(B) = 29.48$    | PASS   |
| 116 | 5580            | <b>15.16</b>      | <b>32.831</b>    |            | <b>22.87</b> | 30 or $17+10\log(B) = 29.48$    | PASS   |
| 140 | 5700            | 14.48             | 28.086           |            | 22.19        | 30 or $17+10\log(B) = 29.48$    | PASS   |

\* **Note:** EIRP = Average Power + Gain

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## 802.11n HT40 (MIMO)

| CH  | Frequency (MHz) | TOTAL POWER (dBm) | TOTAL POWER (mW) | GAIN (dBi) | EIRP (dBm)   | REQUIRED LIMIT (dBm)            | RESULT |
|-----|-----------------|-------------------|------------------|------------|--------------|---------------------------------|--------|
| 38  | 5190            | 13.99             | 25.061           | 8.61       | 22.60        | 23.01 or $10+10\log(B) = 25.60$ | PASS   |
| 46  | 5230            | <b>14.08</b>      | <b>25.586</b>    |            | 22.69        | 23.01 or $10+10\log(B) = 25.58$ | PASS   |
| 54  | 5270            | <b>13.97</b>      | <b>24.946</b>    | 8.91       | <b>22.88</b> | 30 or $17+10\log(B) = 32.59$    | PASS   |
| 62  | 5310            | 13.38             | 21.777           |            | 22.29        | 30 or $17+10\log(B) = 32.58$    | PASS   |
| 110 | 5550            | 14.78             | 30.061           | 7.71       | 22.49        | 30 or $17+10\log(B) = 32.60$    | PASS   |
| 134 | 5670            | <b>14.84</b>      | <b>30.479</b>    |            | <b>22.55</b> | 30 or $17+10\log(B) = 32.60$    | PASS   |

\* **Note:** EIRP = Average Power + Gain

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## 10. PEAK POWER SPECTRAL DENSITY

### 10.1 Standard Applicable

FCC

| OPERATION Band | EUT CATEGORY |                                   | LIMIT      |
|----------------|--------------|-----------------------------------|------------|
| U-NII-1        |              | Access Point (Master device)      | 17dBm/ MHz |
|                |              | Fixed point-to-point Access Point |            |
|                | ✓            | Mobile and portable client device | 11dBm/ MHz |
| U-NII-2A       | ✓            |                                   | 11dBm/ MHz |
| U-NII-2C       | ✓            |                                   | 11dBm/ MHz |

IC

| OPERATION FREQUENCY BAND        | LIMIT                              |
|---------------------------------|------------------------------------|
| 5150~5250 MHz                   | EIRP spectral density 10 dBm / MHz |
| 5250~5350 MHz                   | 11dBm / MHz                        |
| 5470-5600 MHz and 5650-5725 MHz | 11dBm / MHz                        |

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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The antenna gain is greater than 6 dBi in MIMO mode the limit reduce as below:

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

### FCC

|                 | Effective Legacy Gain (dBi) | Limit  |
|-----------------|-----------------------------|--|
| <b>UNII-1</b>   | $5.6+3.01=8.61\text{dBi}$   | $11\text{dBm} - (8.61 - 6 \text{ dBi}) = 8.39\text{dBm}$ |
| <b>UNII-2A</b>  | $5.9+3.01=8.91\text{dBi}$   | $11\text{dBm} - (8.91 - 6 \text{ dBi}) = 8.09\text{dBm}$ |
| <b>U-NII-2C</b> | $4.7+3.01=7.71\text{dBi}$   | $11\text{dBm} - (7.71 - 6 \text{ dBi}) = 9.29\text{dBm}$ |

### IC

|                 | Effective Legacy Gain (dBi) | Limit  |
|-----------------|-----------------------------|--|
| <b>UNII-2A</b>  | $5.9+3.01=8.91\text{dBi}$   | $11\text{dBm} - (8.91 - 6 \text{ dBi}) = 8.09\text{dBm}$ |
| <b>U-NII-2C</b> | $4.7+3.01=7.71\text{dBi}$   | $11\text{dBm} - (7.71 - 6 \text{ dBi}) = 9.29\text{dBm}$ |

Therefore the limit needs to reduce for the UNII-1, U-NII-2A, U-NII-2C and U-NII-3 band.

## 10.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r01.
3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
4. **For U-NII1, U-NII-2A, U-NII-2C Band:**

Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

#### For U-NII-3 Band:

Set RBW=500 kHz, VBW $\geq$  3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)

5. Use the cursor on spectrum to peak search the highest level of trace
6. Record the max. reading and add 10 log(1/duty cycle).
7. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Note: For the test of PSD at MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main An-

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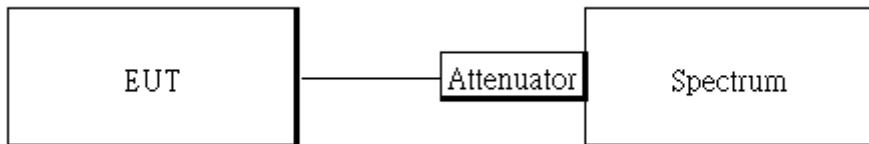
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tenna at single transmitting mode and Aux that yields the higher value. The MIMO transmitting mode produces higher value of outcome

### 10.3 Measurement Equipment Used

| Conducted Emission Test Site |               |              |               |            |            |
|------------------------------|---------------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE               | MFR           | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Spectrum Analyzer            | Agilent       | E4446A       | MY51100003    | 01/29/2015 | 01/28/2016 |
| DC Block                     | Mini-Circuits | BLK-18-S+    | 1             | 01/02/2015 | 01/01/2016 |
| Attenuator                   | Mini-Circuit  | BW-S10W2+    | 002           | 01/02/2015 | 01/01/2016 |

### 10.4 Test Set-up



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## 10.5 Measurement Result

802.11a

| Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|------------|-------------|-------------|
| 5180            | -1.145     | 11.00       | -12.15      |
| 5220            | -0.561     | 11.00       | -11.56      |
| 5240            | -1.009     | 11.00       | -12.01      |
| 5260            | -1.818     | 11.00       | -12.82      |
| 5300            | -2.133     | 11.00       | -13.13      |
| 5320            | -1.549     | 11.00       | -12.55      |
| 5500            | -1.542     | 11.00       | -12.54      |
| 5580            | -0.441     | 11.00       | -11.44      |
| 5700            | -1.783     | 11.00       | -12.78      |

EIRP spectral density

| Frequency (MHz) | PPSD (dBm / MHz) | Antenna Gain (dBi) | EIRP spectral density (dBm / | Limit (dBm / MHz) | Margin (dB) |
|-----------------|------------------|--------------------|------------------------------|-------------------|-------------|
| 5180            | -1.145           | 5.60               | 4.46                         | 10.00             | -5.55       |
| 5220            | -0.561           | 5.60               | 5.04                         | 10.00             | -4.96       |
| 5240            | -1.009           | 5.60               | 4.59                         | 10.00             | -5.41       |

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## 802.11n HT20 (MIMO)

| Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|------------|-------------|-------------|
| 5180            | -1.013     | 8.39        | -9.40       |
| 5220            | -1.566     | 8.39        | -9.96       |
| 5240            | 0.255      | 8.39        | -8.14       |
| 5260            | -0.124     | 8.09        | -8.21       |
| 5300            | -1.024     | 8.09        | -9.11       |
| 5320            | -0.393     | 8.09        | -8.48       |
| 5500            | 0.901      | 9.29        | -8.39       |
| 5580            | 1.322      | 9.29        | -7.97       |
| 5700            | 1.878      | 9.29        | -7.41       |

## EIRP spectral density

| Frequency (MHz) | PPSD (dBm / MHz) | Antenna Gain (dBi) | EIRP spectral density (dBm / MHz) | Limit (dBm / MHz) | Margin (dB) |
|-----------------|------------------|--------------------|-----------------------------------|-------------------|-------------|
| 5180            | -1.013           | 8.61               | 7.60                              | 10.00             | -2.40       |
| 5220            | -1.566           | 8.61               | 7.04                              | 10.00             | -2.96       |
| 5240            | 0.255            | 8.61               | 8.87                              | 10.00             | -1.14       |

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## 802.11n HT40 (MIMO)

| Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|------------|-------------|-------------|
| 5190            | -4.677     | 8.39        | -13.07      |
| 5230            | -4.320     | 8.39        | -12.71      |
| 5270            | -5.447     | 8.09        | -13.54      |
| 5310            | -4.120     | 8.09        | -12.21      |
| 5550            | -2.734     | 9.29        | -12.02      |
| 5670            | -1.909     | 9.29        | -11.20      |

## EIRP spectral density

| Frequency (MHz) | PPSD (dBm / MHz) | Antenna Gain (dBi) | EIRP spectral density (dBm / | Limit (dBm / MHz) | Margin (dB) |
|-----------------|------------------|--------------------|------------------------------|-------------------|-------------|
| 5190            | -4.677           | 8.61               | 3.93                         | 10.00             | -6.07       |
| 5230            | -4.320           | 8.61               | 4.29                         | 10.00             | -5.71       |

**Note: As cable loss+ Duty cycle factor that offsets on the Spectrum.**

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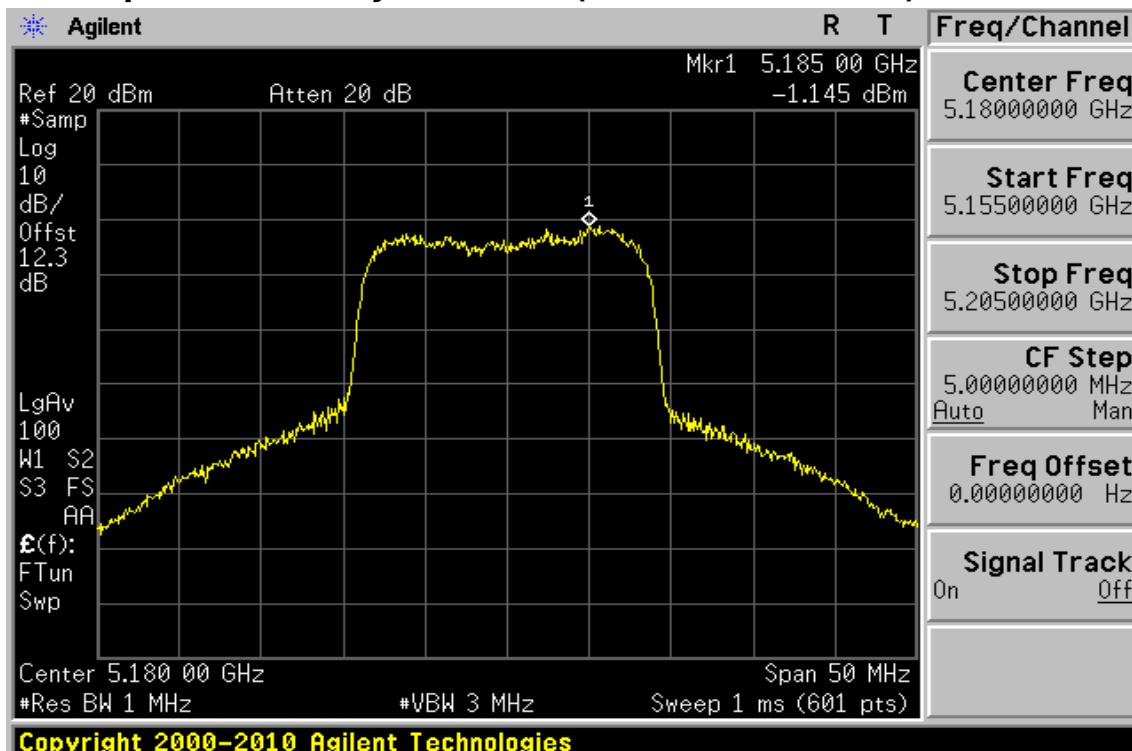
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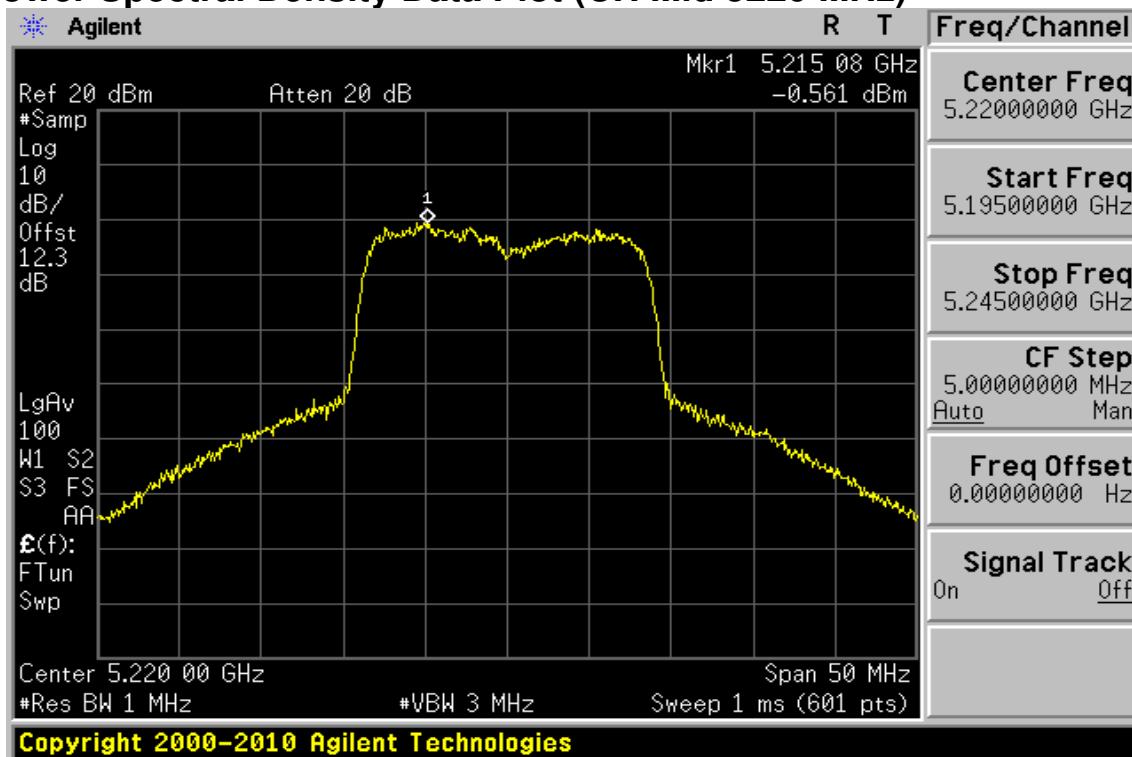
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## 802.11a 5150~5250 MHz

### Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)

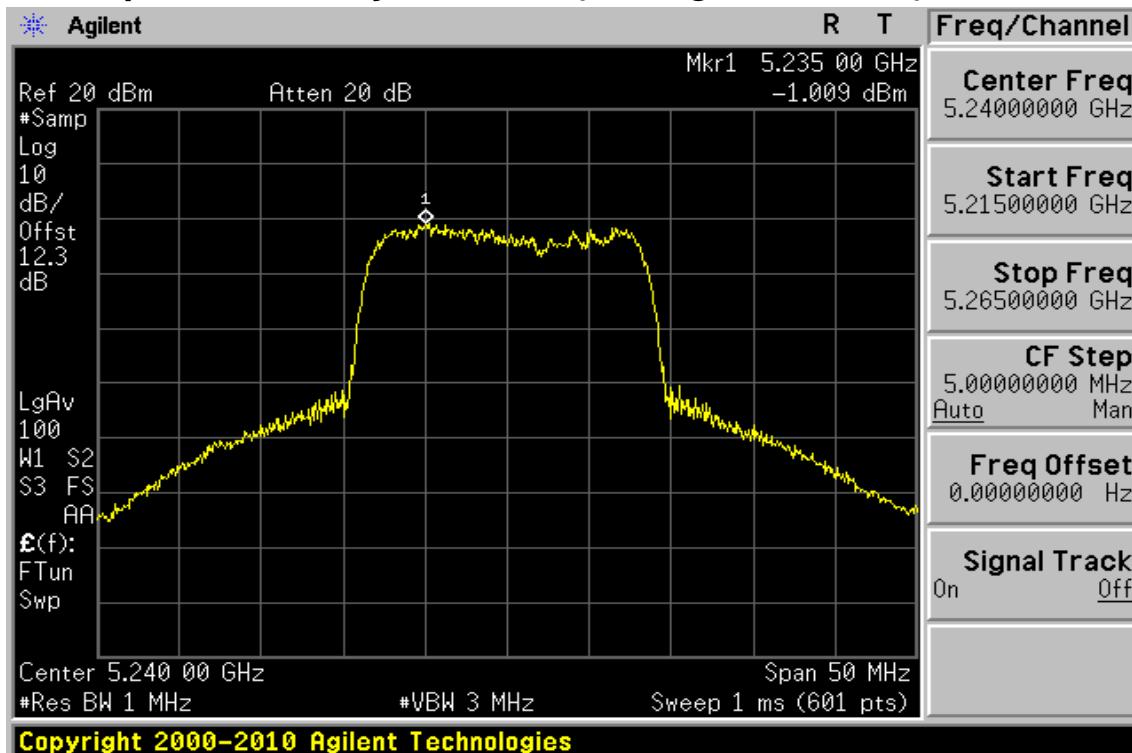


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**Peak Power Spectral Density Data Plot (CH High 5240 MHz)**

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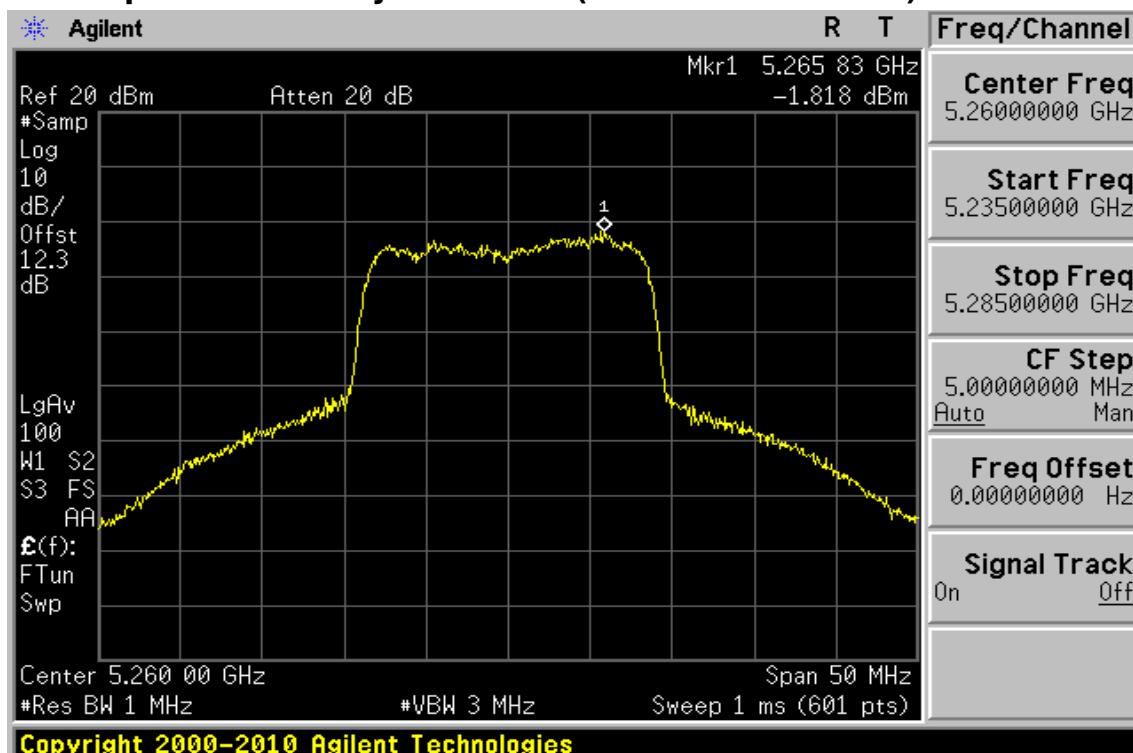
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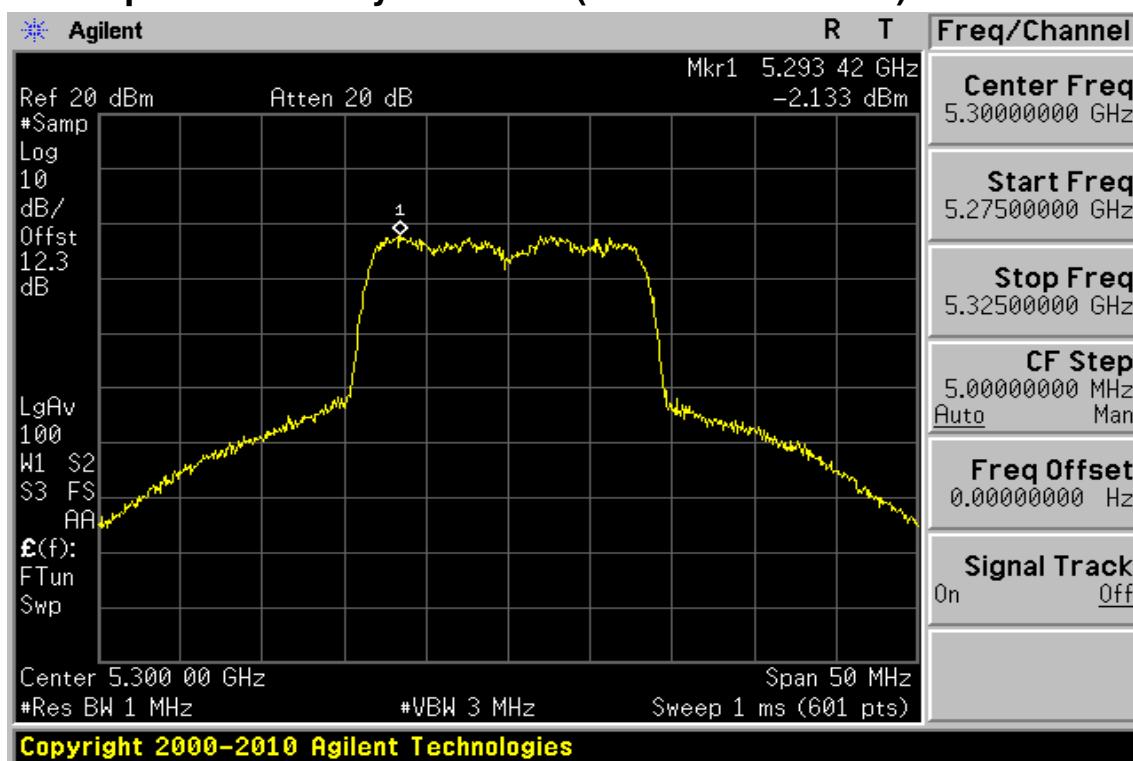
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## 802.11a 5250~5350 MHz

### Peak Power Spectral Density Data Plot (CH Low 5260 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)

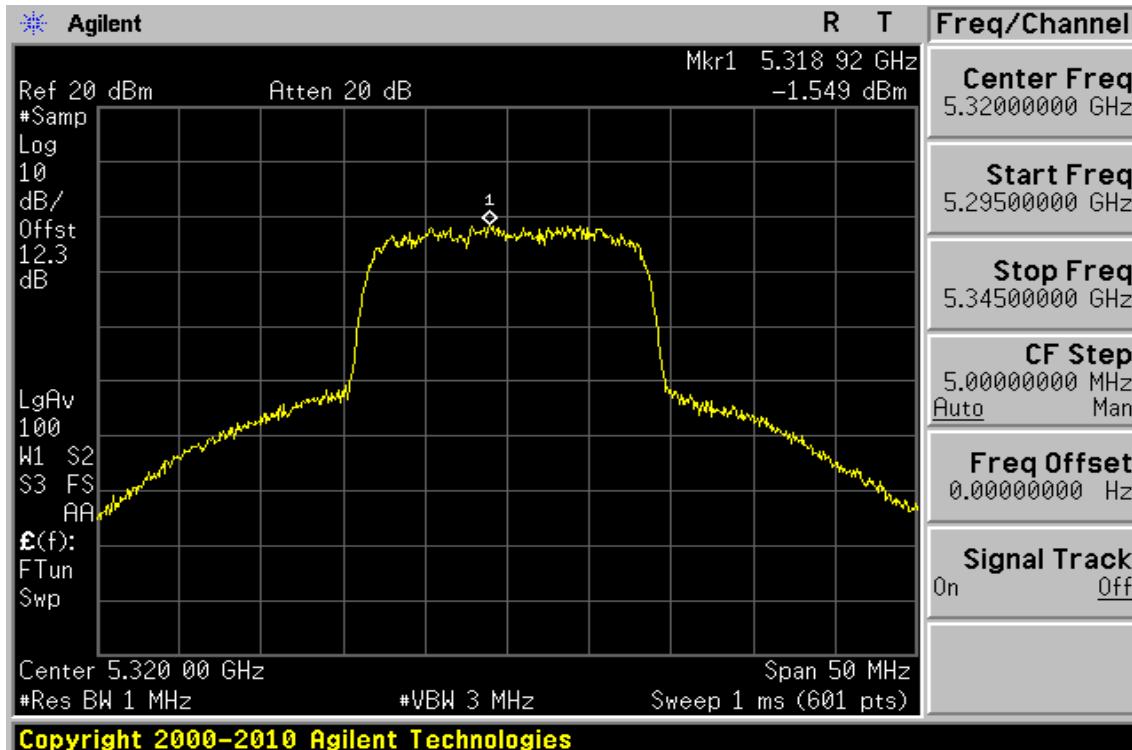


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**Peak Power Spectral Density Data Plot (CH High 5320 MHz)**

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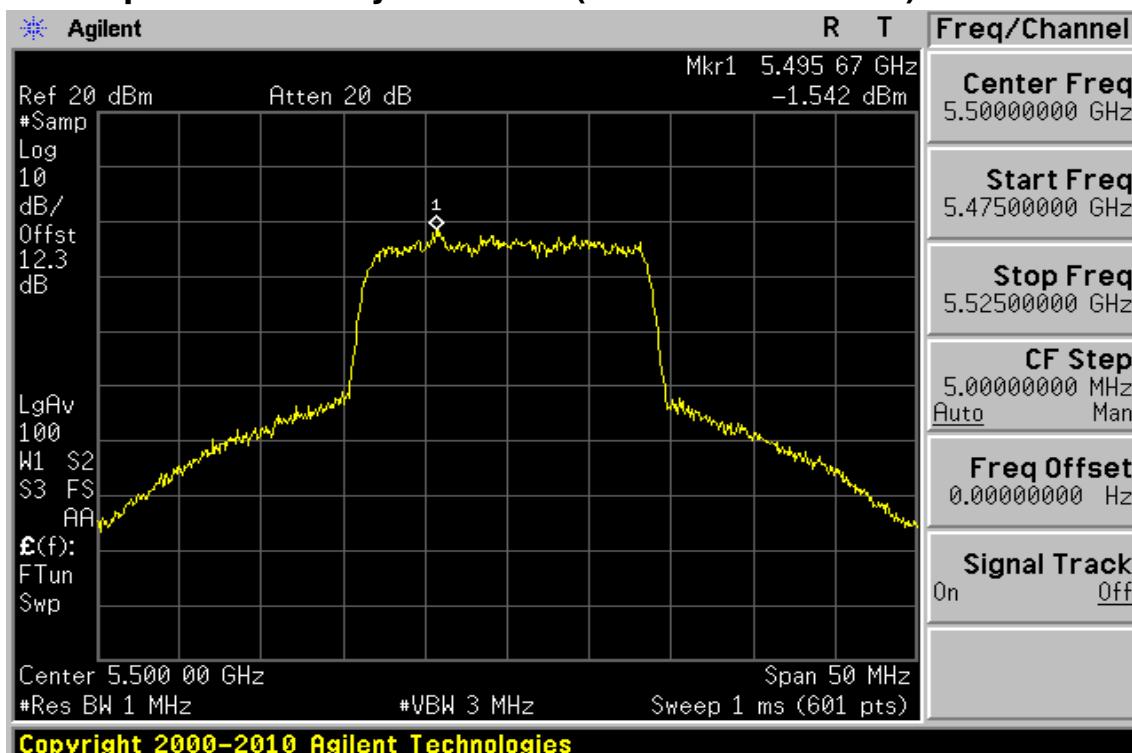
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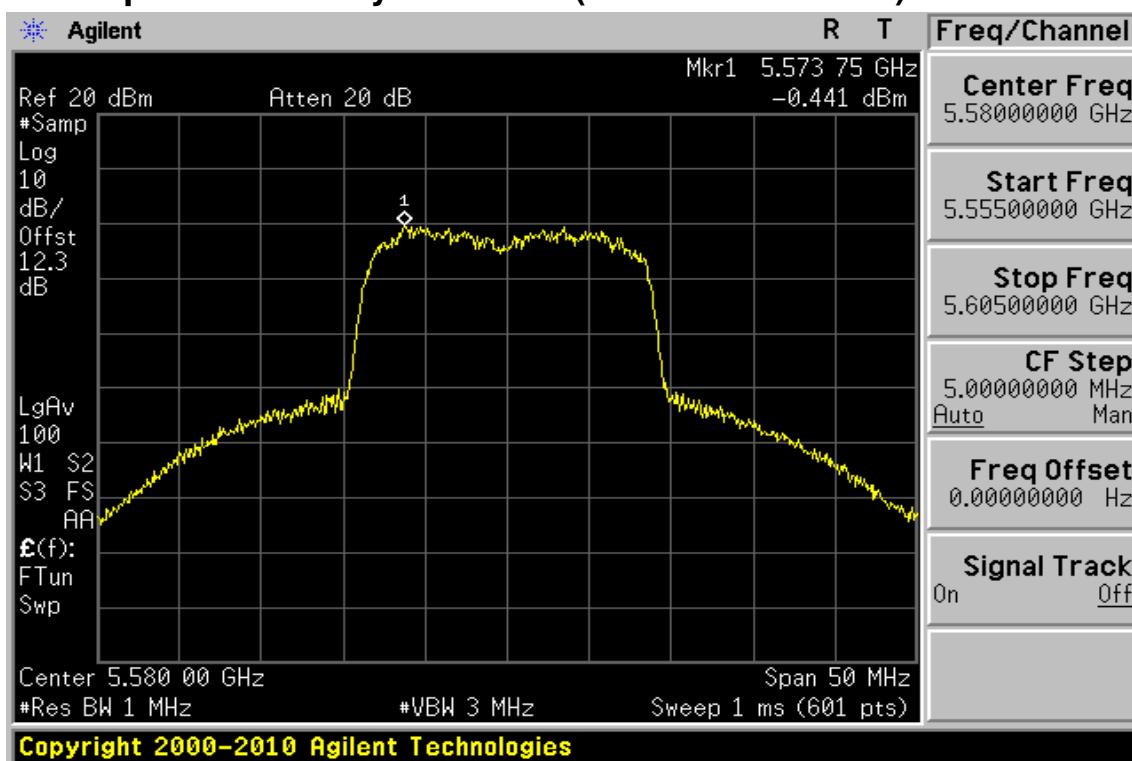
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## 802.11a 5470~5725 MHz

### Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5580 MHz)



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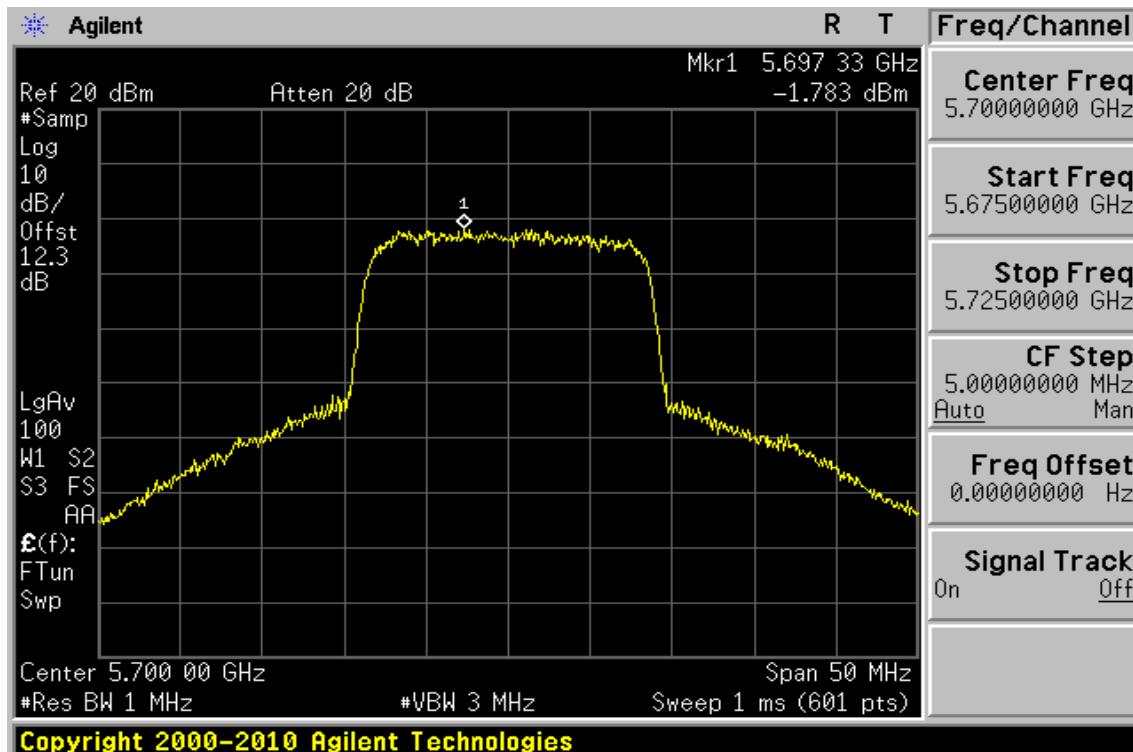
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**Peak Power Spectral Density Data Plot (CH High 5700 MHz)**

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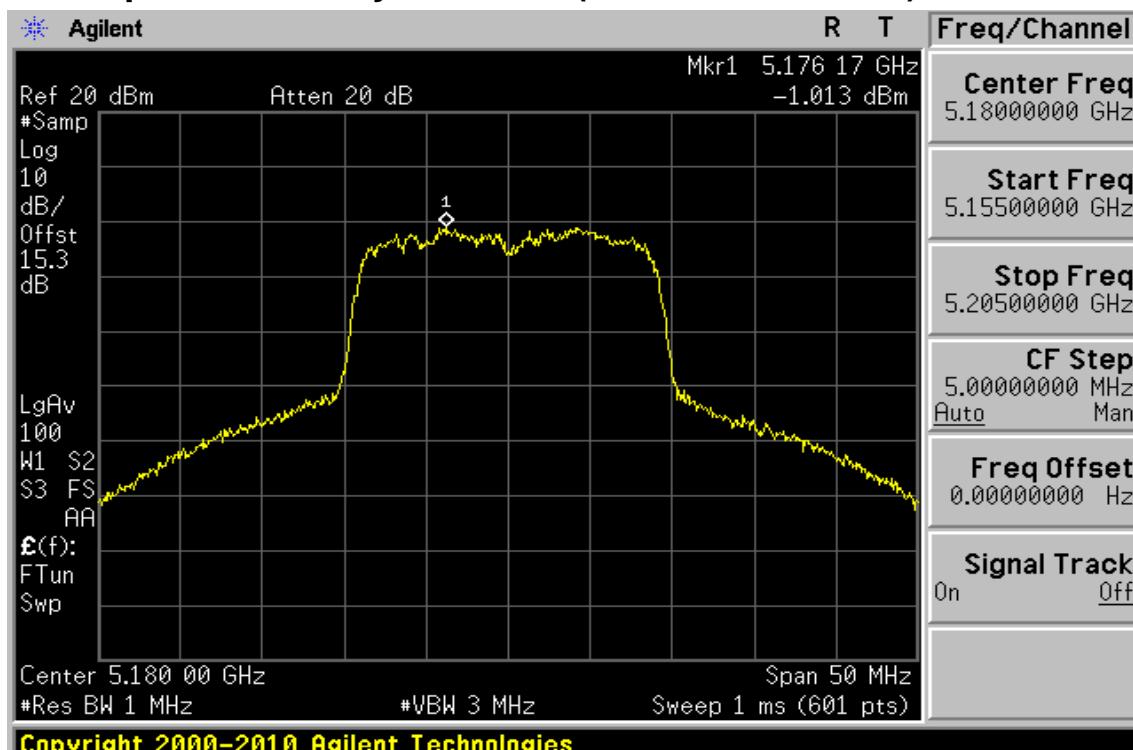
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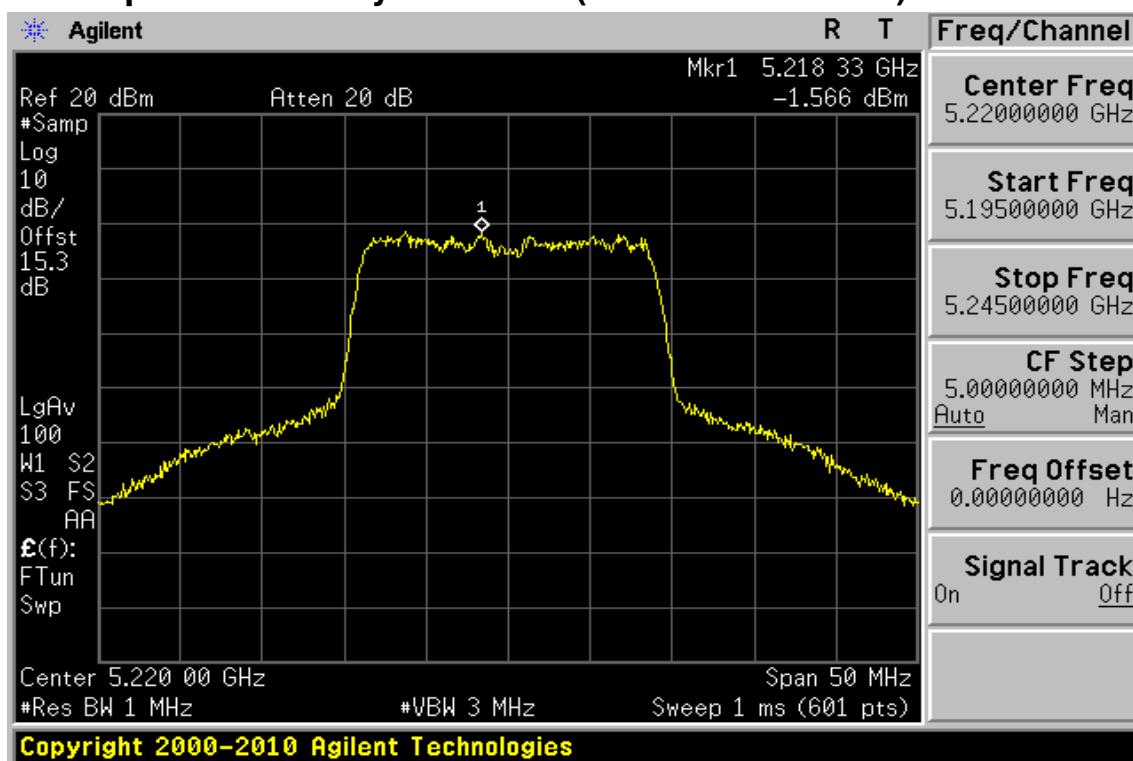
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## 802.11n HT20, 5150~5250 MHz

### Peak Power Spectral Density Data Plot (CH Low 5180 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5220 MHz)

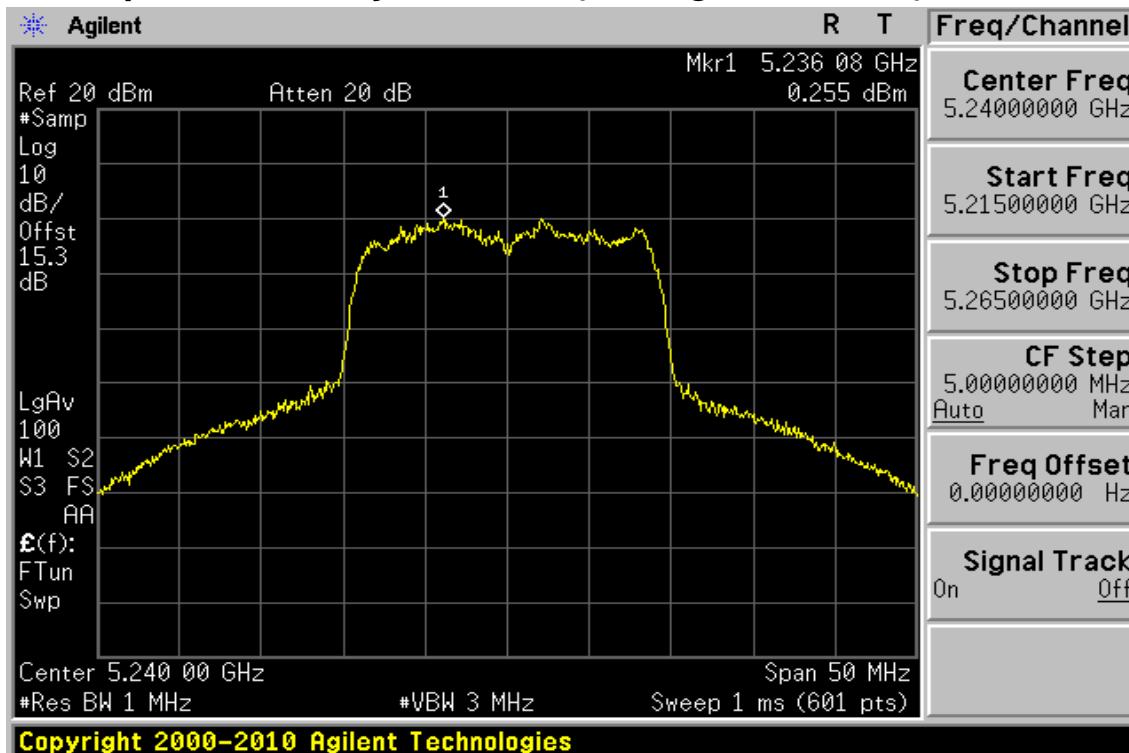


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**Peak Power Spectral Density Data Plot (CH High 5240 MHz)**

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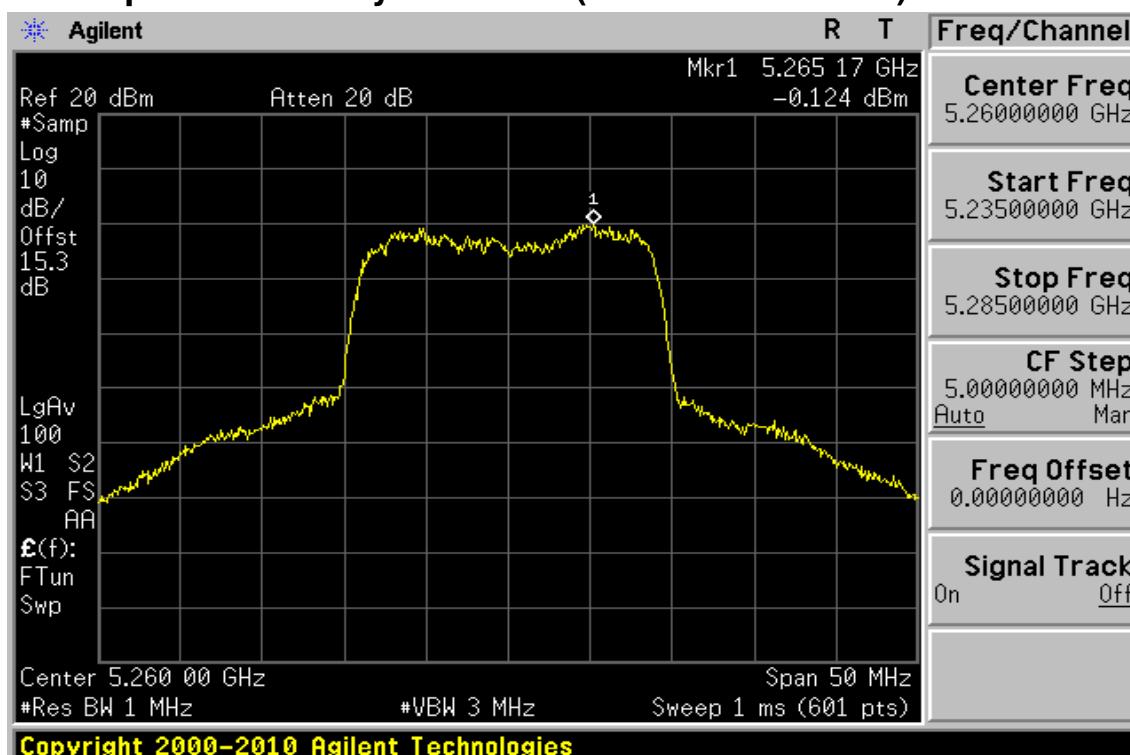
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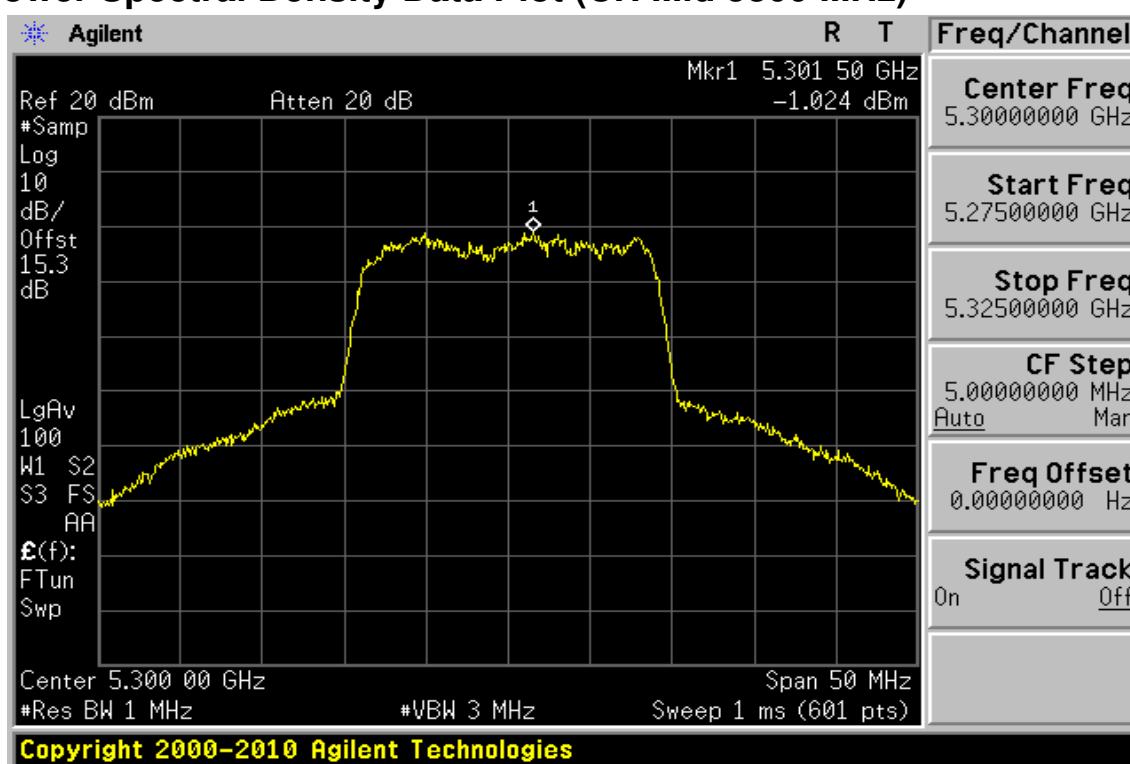
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## 802.11n HT20, 5250~5350 MHz

### Peak Power Spectral Density Data Plot (CH Low 5260MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5300 MHz)

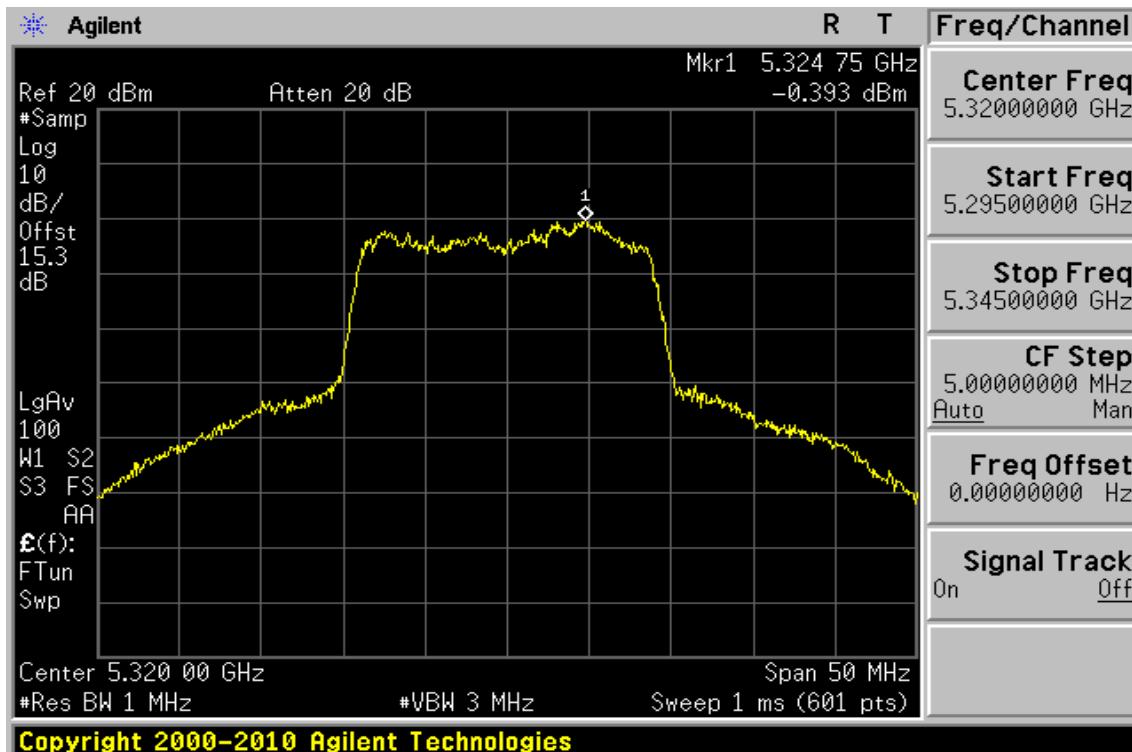


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**Peak Power Spectral Density Data Plot (CH High 5320 MHz)**

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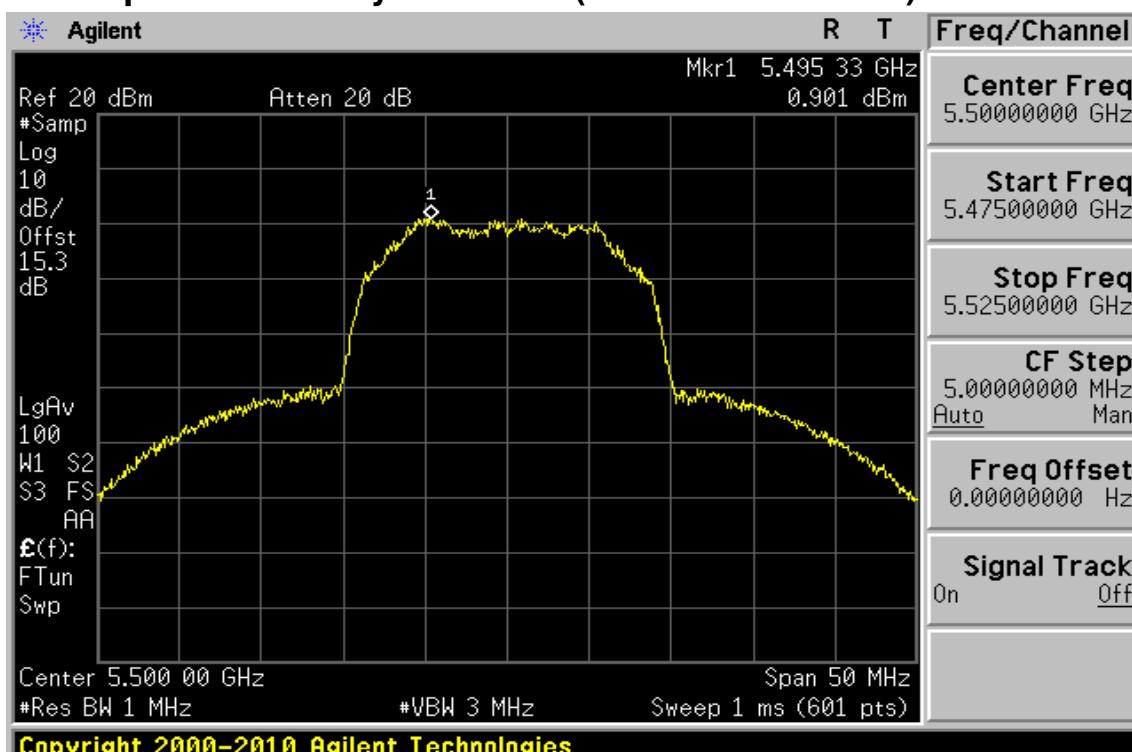
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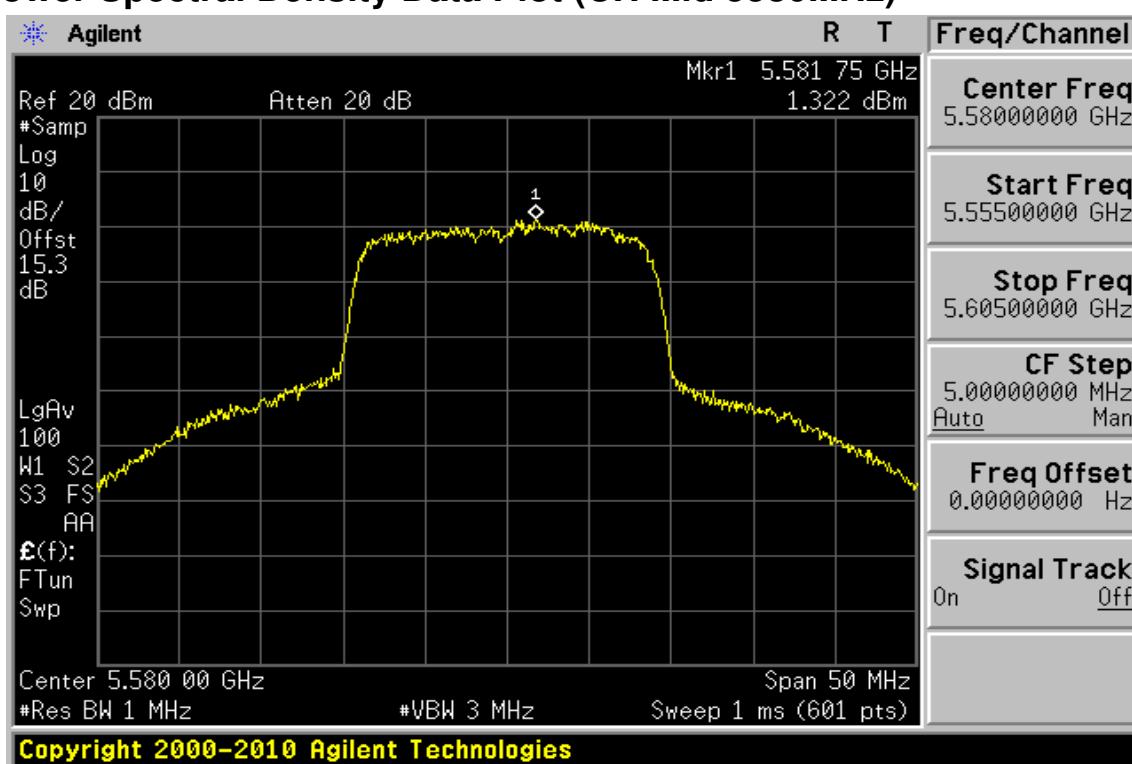
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## 802.11n HT20, 5470~5725 MHz

### Peak Power Spectral Density Data Plot (CH Low 5500 MHz)



### Peak Power Spectral Density Data Plot (CH Mid 5580MHz)

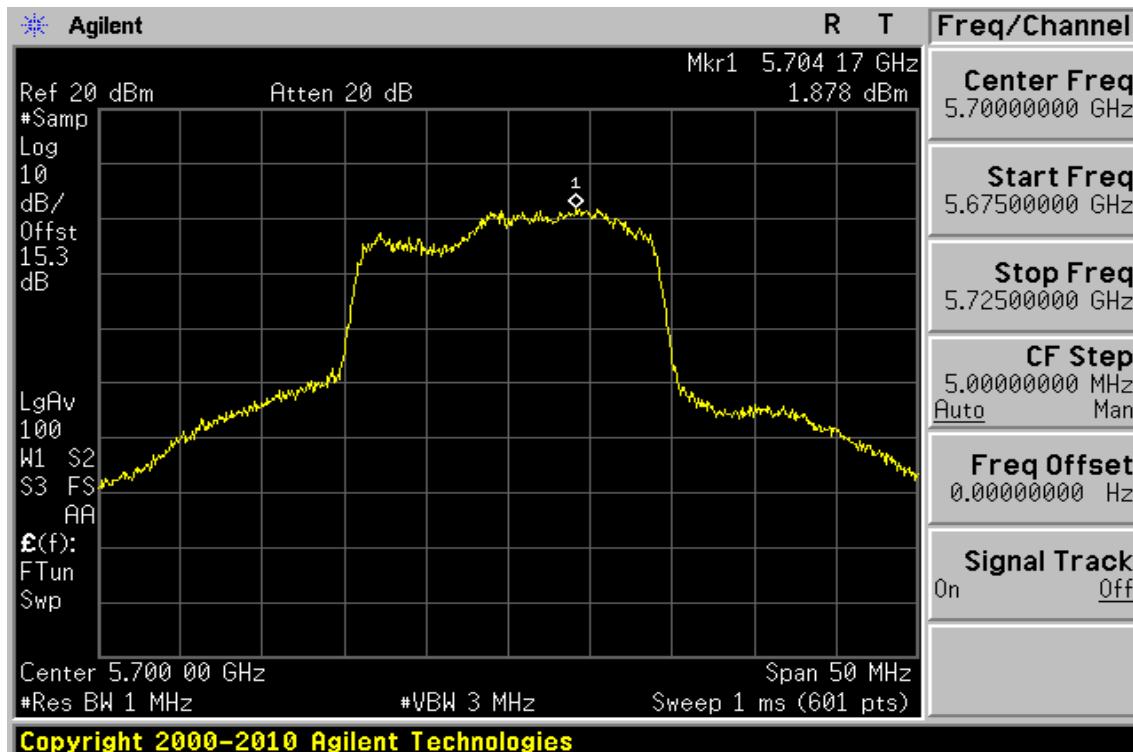


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**Peak Power Spectral Density Data Plot (CH High 5700 MHz)**

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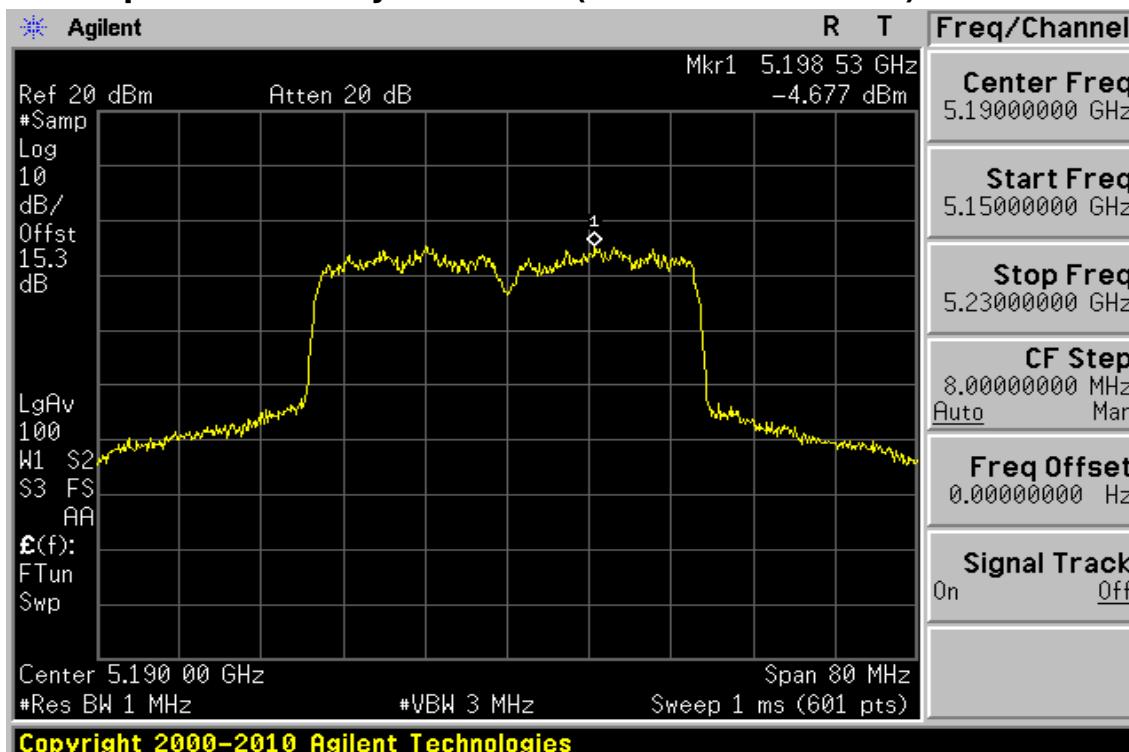
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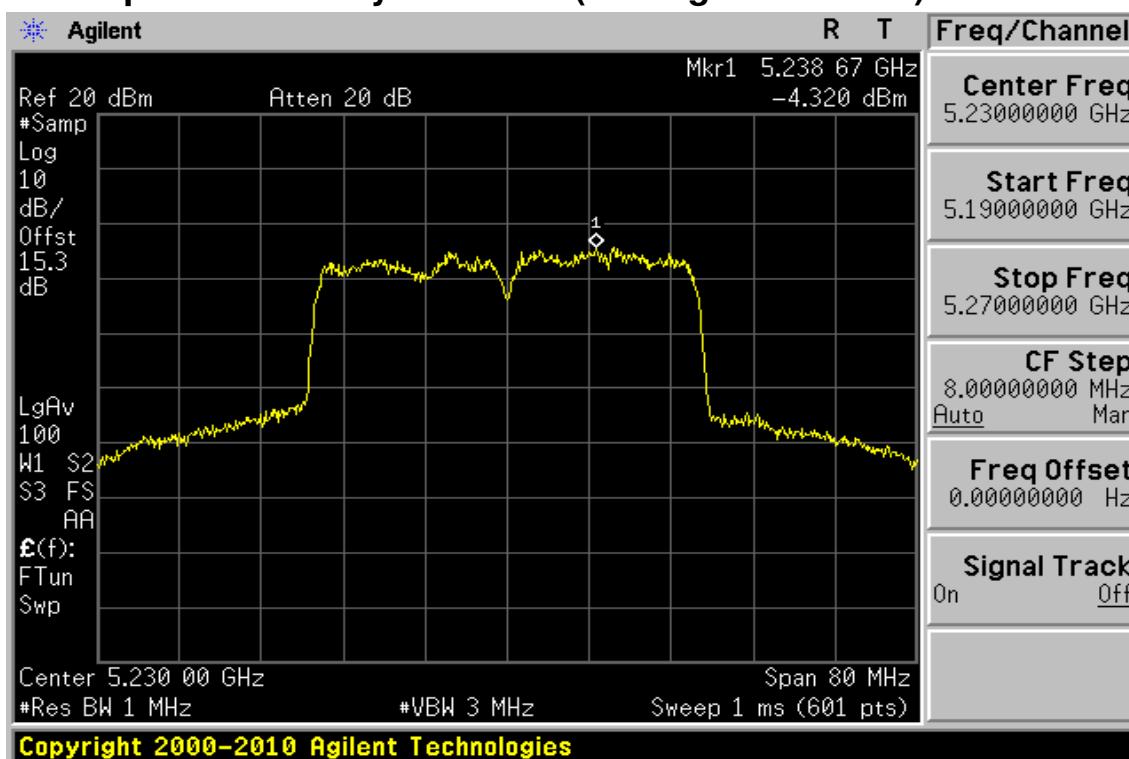
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## 802.11n HT40, 5150~5250 MHz

## Peak Power Spectral Density Data Plot (CH Low 5190 MHz)



## Peak Power Spectral Density Data Plot (CH High 5230 MHz)



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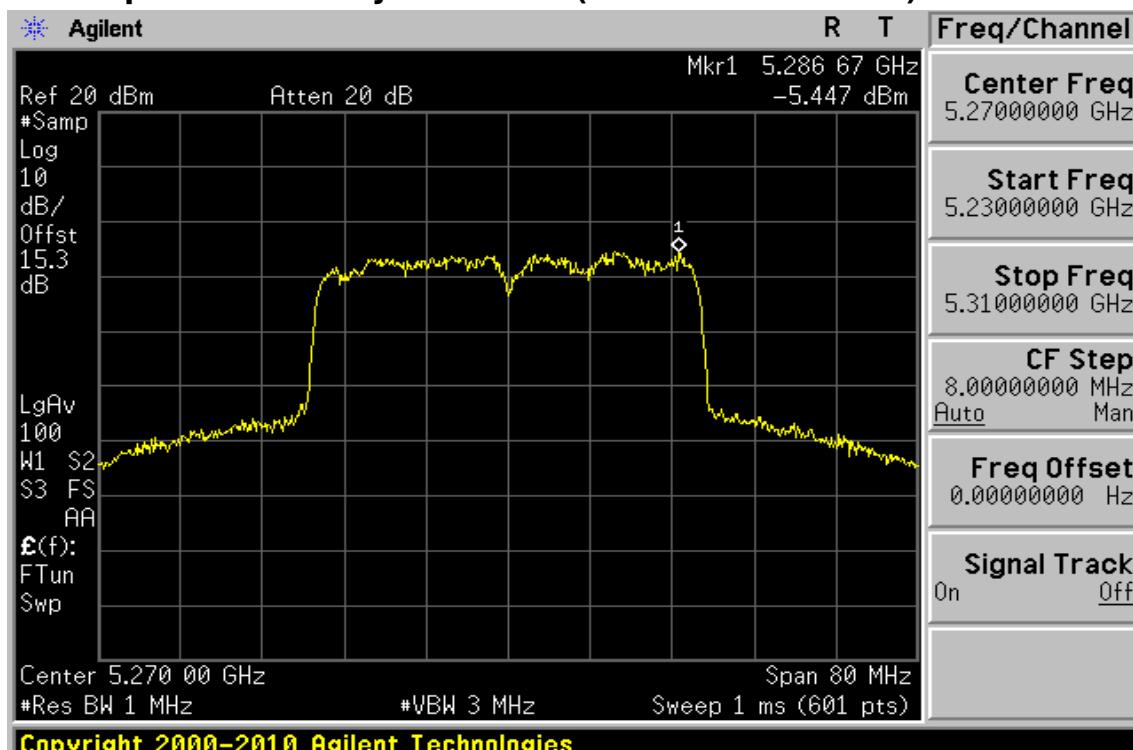
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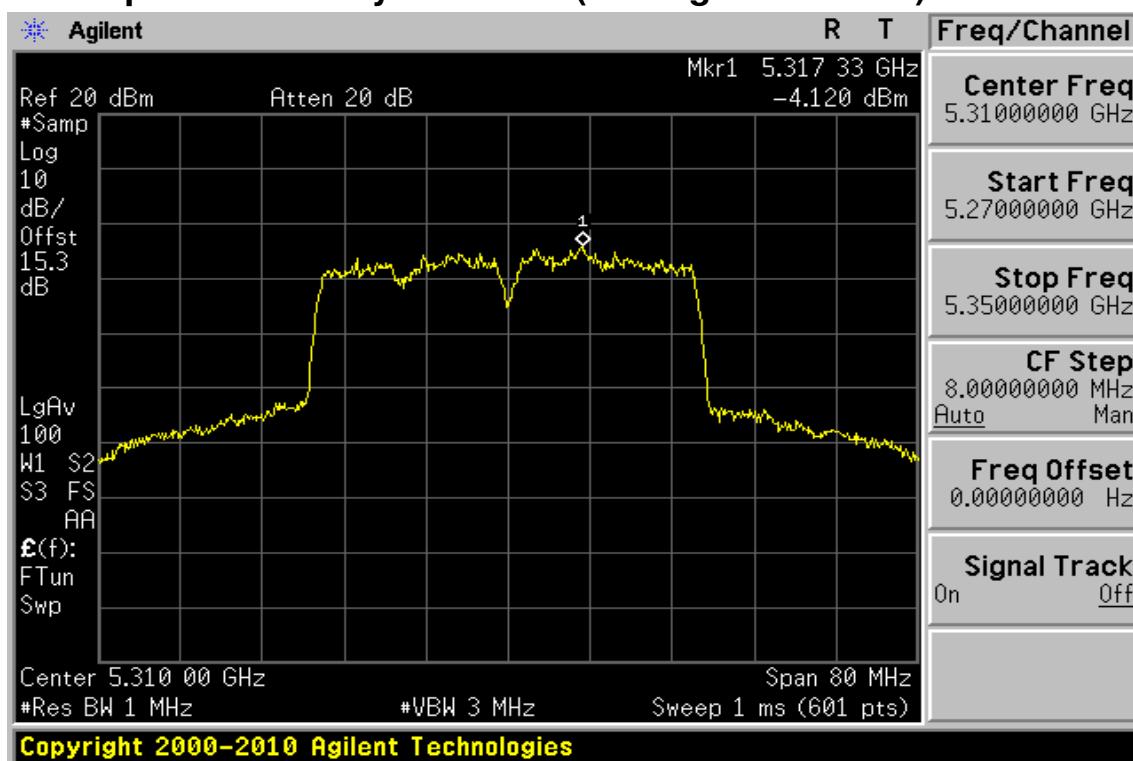
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## 802.11n HT40, 5250~5350 MHz

### Peak Power Spectral Density Data Plot (CH Low 5270 MHz)



### Peak Power Spectral Density Data Plot (CH High 5310 MHz)

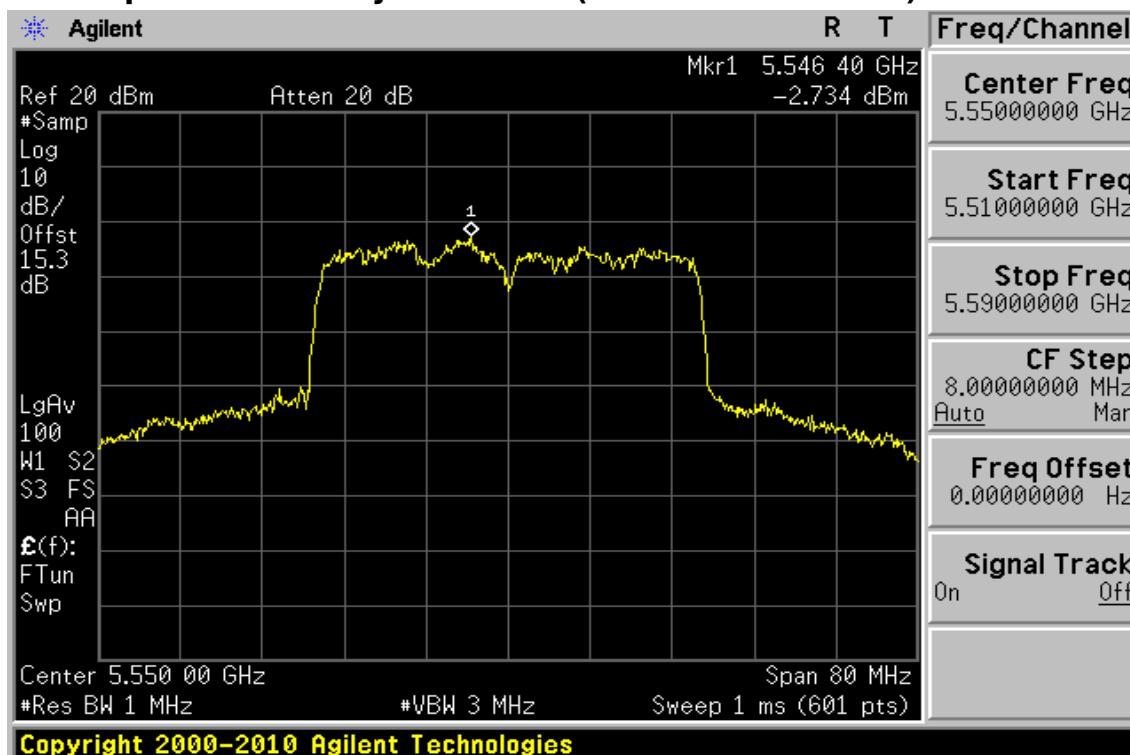
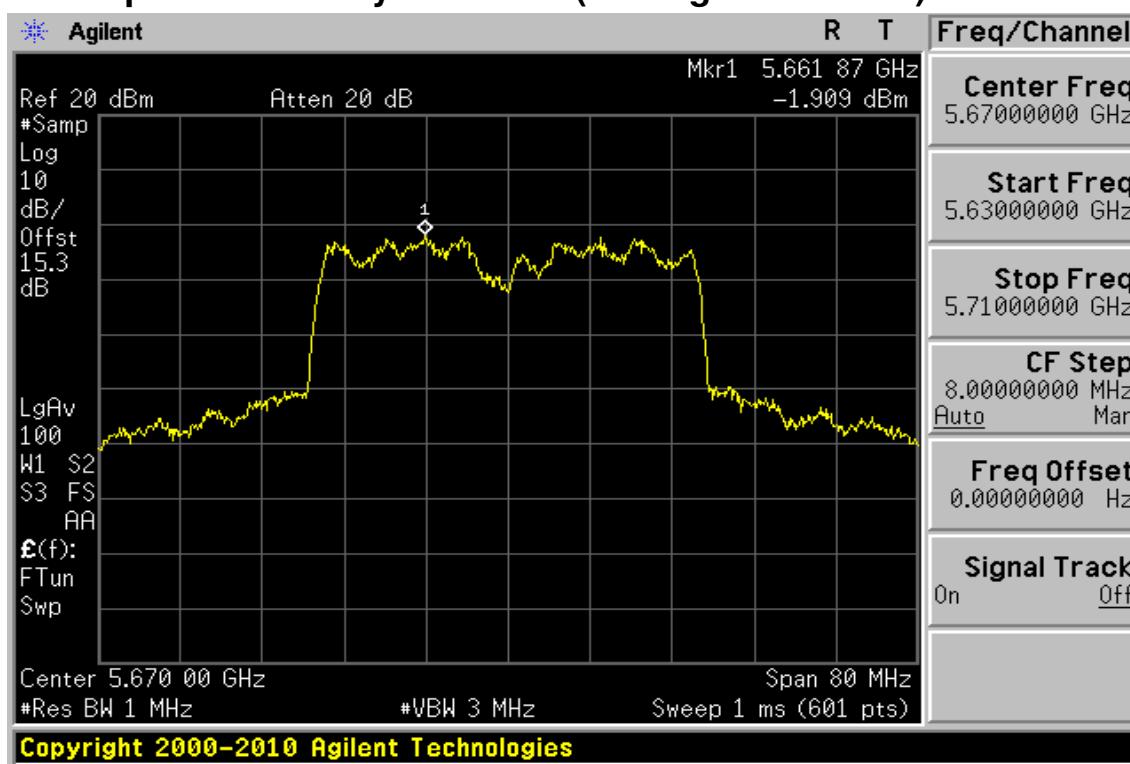


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**802.11n HT40, 5470~5725 MHz****Peak Power Spectral Density Data Plot (CH Low 5550 MHz)****Peak Power Spectral Density Data Plot (CH High 5670 MHz)**

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## 11. UNDESIRABLE RADIATED EMISSION MEASUREMENT1

### 11.1 Standard Applicable

The maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
2. For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
3. For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
4. For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

| APPLICABLE TO  | LIMIT                 |  |
|--|-----------------------|--|
| FCC KDB 789033 D02 General<br>UNII Test Procedures New Rules<br>v01r01 | FIELD STRENGTH AT 3m  |  |
|  | PK: 74 (dB $\mu$ V/m) | AV 54 (dB $\mu$ V/m)                               |
| APPLICABLE TO  | EIRP LIMIT            | FIELD STRENGTH AT 3m                               |
| 15.407(b)(1)   | RSS-247 §6.2.1 (2)    | PK: -27 (dBm/MHz)                                  |
| 15.407(b)(2)   | RSS-247 §6.2.2 (2)    | PK: 68.3 (dB $\mu$ V/m)                            |
| 15.407(b)(3)   | RSS-247 §6.2.3 (2)    |  |
| 15.407(b)(4)   | RSS-247 §6.2.4 (4)    | PK: -27 (dBm/MHz)<br>PK: -17 (dBm/MHz)             |
|  |                       | PK: 68.3 (dB $\mu$ V/m)<br>PK: 78.2 (dB $\mu$ V/m) |

EIRP =  $(E^*d)^2 / 30$ , where E is the field in V/m, d is the measurement distance (3m), EIRP is the equivalent isotropically radiated power in Watts.

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Unwanted spurious emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

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

**Note:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB $\mu$ V/m) = 20 log Emission level (dB $\mu$ V/m)

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## 11.2 Measurement Equipment Used

| SGS 966 Chamber No.C |                 |                             |               |            |            |
|----------------------|-----------------|-----------------------------|---------------|------------|------------|
| EQUIPMENT TYPE       | MFR             | MODEL NUMBER                | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| EMI Test Receiver    | R&S             | ESU 40                      | 100363        | 04/09/2015 | 04/08/2016 |
| Loop Antenna         | ETS-Lindgren    | 6502                        | 00143303      | 12/09/2015 | 12/08/2016 |
| Broadband Antenna    | TESEQ           | CBL 6112D                   | 35240         | 10/28/2015 | 10/27/2016 |
| Horn Antenna         | ETS-Lindgren    | 3117                        | 00143272      | 12/08/2015 | 12/07/2016 |
| Horn Antenna         | Schwarzbeck     | BBHA9170                    | 185           | 07/25/2015 | 07/24/2016 |
| Pre Amplifier        | EMC Instruments | EMC330                      | 980096        | 12/12/2015 | 12/11/2016 |
| Pre Amplifier        | EMC Instruments | EMC0011830                  | 980199        | 12/12/2015 | 12/11/2016 |
| Pre Amplifier        | R&S             | SCU-18                      | 10204         | 12/12/2015 | 12/11/2016 |
| Pre Amplifier        | R&S             | SCU-26                      | 100780        | 12/12/2015 | 12/11/2016 |
| Pre Amplifier        | R&S             | SCU-40                      | 100356        | 12/12/2015 | 12/11/2016 |
| Pre Amplifier        | EMC Instruments | EMC184045B                  | 980135        | 12/12/2015 | 12/11/2016 |
| Coaxial Cable        | Huber+Suhner    | RG 214/U                    | 966Rx 9K-30M  | 12/12/2015 | 12/11/2016 |
| Coaxial Cable        | Huber+Suhner    | RG 214/U<br>SUCOFLEX 104    | 966Rx 30M-3G  | 12/12/2015 | 12/11/2016 |
| Coaxial Cable        | Huber+Suhner    | SUCOFLEX 104                | 966Rx 1G-18G  | 12/12/2015 | 12/11/2016 |
| Coaxial Cable        | Huber+Suhner    | mini 141-12<br>SUCOFLEX 104 | 966Rx 18G-40G | 12/12/2015 | 12/11/2016 |
| Coaxial Cable        | Huber+Suhner    | SUCOFLEX 104                | 966Tx 30M-18G | 12/12/2015 | 12/11/2016 |
| Coaxial Cable        | Huber+Suhner    | SUCOFLEX 102                | 966Tx 18G-40G | 12/12/2015 | 12/11/2016 |
| Attenuator           | WOKEN           | 218FS-10                    | RF27          | 12/12/2015 | 12/11/2016 |
| Site NSA             | SGS             | 966 Chamber C               | SAC-C         | 03/04/2015 | 03/03/2016 |
| Site VSWR            | SGS             | 966 Chamber C               | SAC-C         | 03/04/2015 | 03/03/2016 |
| DC Power Supply      | HOLA            | DP-3003                     | D7070035      | 05/04/2015 | 05/03/2016 |
| Controller           | MF              | MF-7802                     | N/A           | N.C.R.     | N.C.R.     |
| Antenna Master       | MF              | N/A                         | N/A           | N.C.R.     | N.C.R.     |
| Turn Table           | MF              | N/A                         | N/A           | N.C.R.     | N.C.R.     |
| Test Software        | World-Pallas    | Dr. E                       | V 3.0 Lite    | N.C.R.     | N.C.R.     |

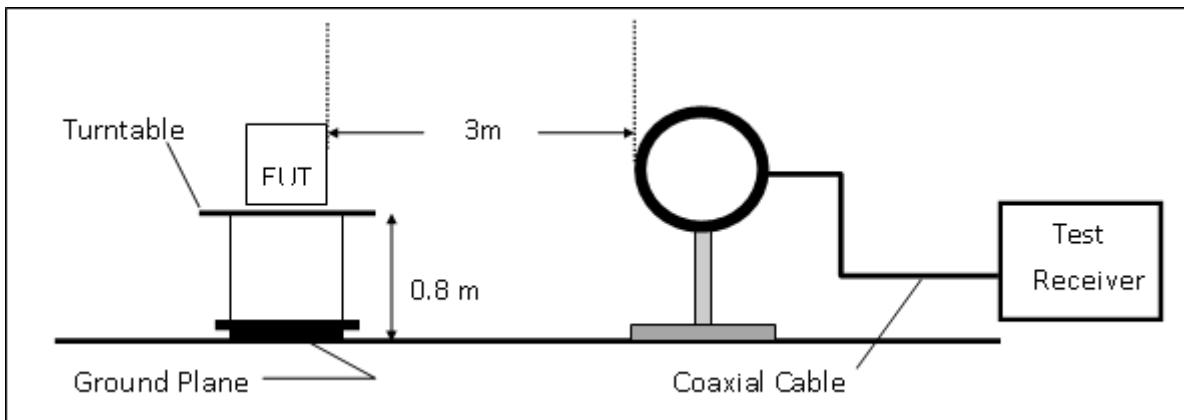
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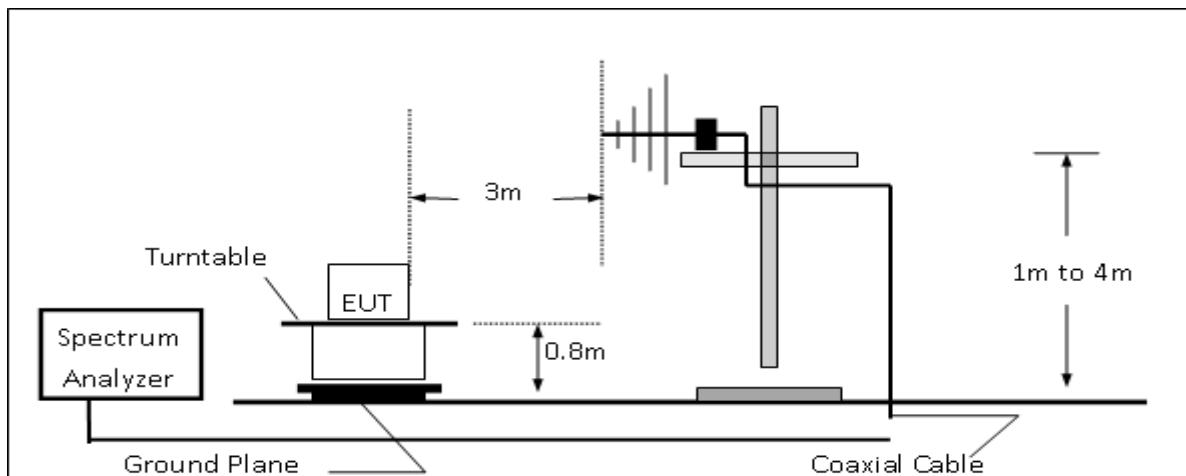
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### 11.3 Test SET-UP

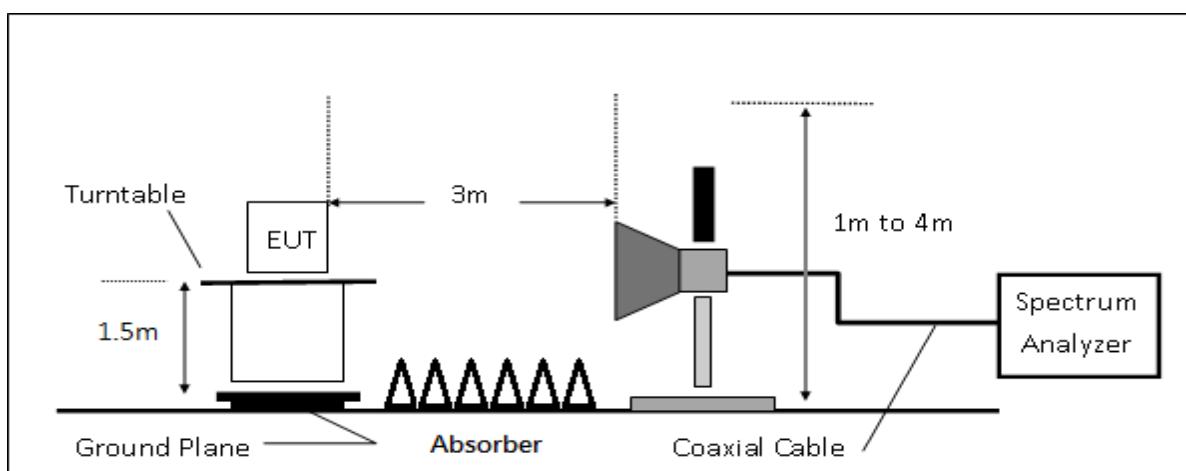
#### (A) Radiated Emission Test Set-UP Frequency Below 30MHz.



#### (B) Radiated Emission Test Set-Up, Frequency form 30MHz to 1000MHz



#### (C) Radiated Emission Test Set-UP Frequency Over 1 GHz



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## 11.4 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r01.
3. The EUT was placed on a turn table with 0.8m for frequency < 1GHz and 1.5m for frequency > 1GHz above ground plane.
4. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
5. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
6. Set the spectrum analyzer as RBW=120 kHz and VBW=300 kHz for Peak Detector (PK) and Quasi-peak (QP) at frequency below 1 GHz.
7. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz for Peak Detector at frequency above 1 GHz.
8. Set the spectrum analyzer as RBW=1 MHz, VBW=10 Hz (Duty cycle > 98%) or VBW  $\geq$  1/T (Duty cycle < 98%) for Average Detector at frequency above 1 GHz.
9. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
10. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
11. Repeat above procedures until all frequency measured were complete.

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## 11.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

|       |                        |  |
|-------|------------------------|--|
| Where | FS = Field Strength    | CL = Cable Attenuation Factor (Cable Loss) |
|       | RA = Reading Amplitude | AG = Amplifier Gain                        |
|       | AF = Antenna Factor    |  |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

**Note :**

“F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

## 11.6 Test Results of Radiated Spurious Emissions form 9 KHz to 30 MHz

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

## 11.7 Measurement Result

Refer to attach tabular data sheets.

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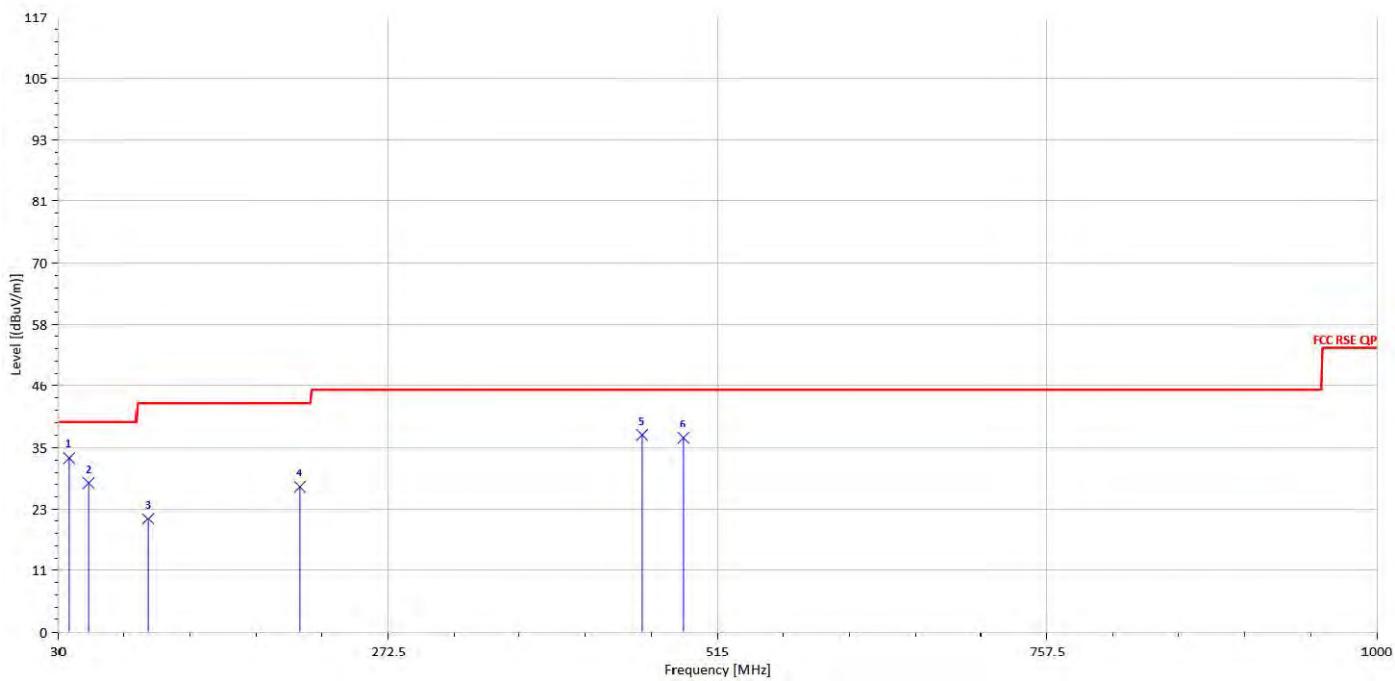
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**Radiated Spurious Emission Measurement Result****Below 1GHz Worst-Case Data:****802.11a 5150~5250 MHz**

|                       |           |                          |                     |
|-----------------------|-----------|--------------------------|---------------------|
| Operation Band        | :802.11 a | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5220 MHz | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX MID   | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan   | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Margin<br>dB |
|--------------|-----------------|------------------|---------------------------|-------|--------------|------------------------|------------------------|--------------|
|              |                 |                  | PK/QP/AV                  | dBμV  |              |                        |                        |              |
| 37.76        | S               | Peak             | 50.66                     | 50.66 | -17.57       | 33.09                  | 40                     | -6.91        |
| 52.31        | S               | Peak             | 54.52                     | 54.52 | -26.23       | 28.29                  | 40                     | -11.71       |
| 95.96        | S               | Peak             | 46.08                     | 46.08 | -24.54       | 21.54                  | 43.5                   | -21.96       |
| 207.51       | S               | Peak             | 50.55                     | 50.55 | -22.98       | 27.57                  | 43.5                   | -15.93       |
| 459.71       | S               | Peak             | 52.04                     | 52.04 | -14.62       | 37.42                  | 46                     | -8.58        |
| 489.78       | S               | Peak             | 50.99                     | 50.99 | -14.10       | 36.89                  | 46                     | -9.11        |

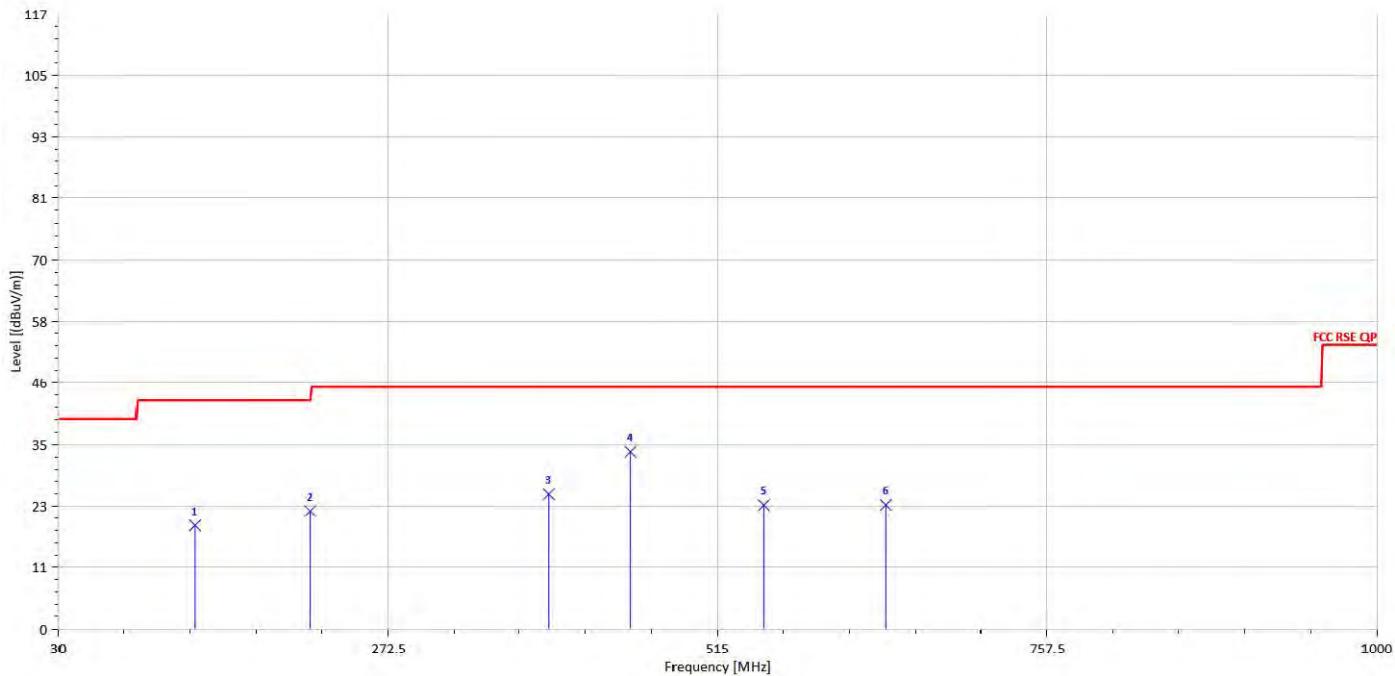
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Operation Band :802.11 a  
 Fundamental Frequency :5220 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |  | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--|--------------|------------------------------|------------------------------|--------------|
|              |                 |                              |                           |  |              |                              |                              |              |
| 130.88       | S               | Peak                         | 41.04                     |  | -21.37       | 19.68                        | 43.5                         | -23.82       |
| 215.27       | S               | Peak                         | 45.41                     |  | -22.95       | 22.46                        | 43.5                         | -21.04       |
| 390.84       | S               | Peak                         | 41.85                     |  | -16.20       | 25.65                        | 46                           | -20.35       |
| 450.98       | S               | Peak                         | 48.64                     |  | -14.92       | 33.72                        | 46                           | -12.28       |
| 548.95       | S               | Peak                         | 36.89                     |  | -13.29       | 23.59                        | 46                           | -22.41       |
| 639.16       | S               | Peak                         | 34.99                     |  | -11.37       | 23.62                        | 46                           | -22.38       |

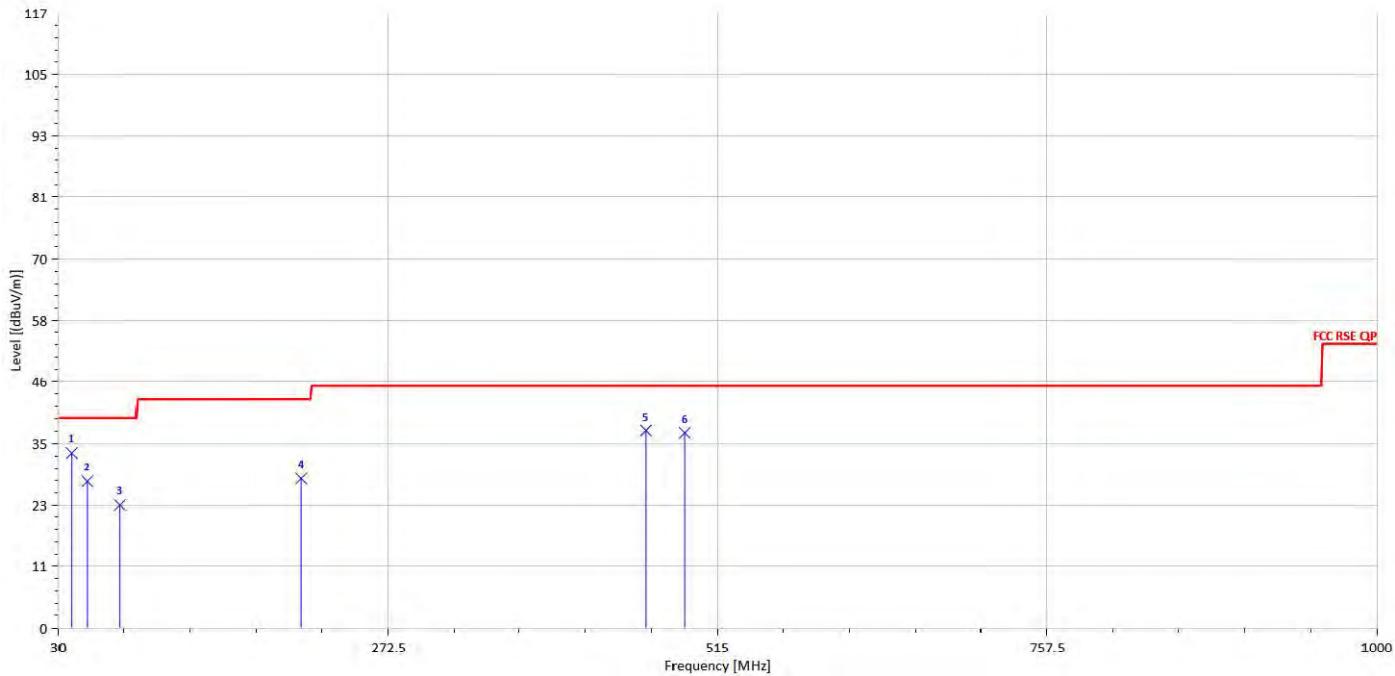
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## 802.11a 5250~5350 MHz

|                       |           |                          |                     |
|-----------------------|-----------|--------------------------|---------------------|
| Operation Band        | :802.11 a | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5300 MHz | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX MID   | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan   | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |               | Factor<br>dB | Actual<br>FS<br>dBµV | Limit<br>@3m<br>dBµV/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|---------------|--------------|----------------------|------------------------|--------------|
|              |                 |                              | Mode                      | Level<br>dBµV |              |                      |                        |              |
| 39.70        | S               | Peak                         | 52.08                     | -18.79        | 33.29        | 40                   | -6.71                  |              |
| 51.34        | S               | Peak                         | 53.81                     | -25.94        | 27.87        | 40                   | -12.13                 |              |
| 75.59        | S               | Peak                         | 50.73                     | -27.28        | 23.45        | 40                   | -16.55                 |              |
| 208.48       | S               | Peak                         | 51.36                     | -22.96        | 28.40        | 43.5                 | -15.10                 |              |
| 462.62       | S               | Peak                         | 52.05                     | -14.54        | 37.51        | 46                   | -8.49                  |              |
| 490.75       | S               | Peak                         | 51.16                     | -14.09        | 37.06        | 46                   | -8.94                  |              |

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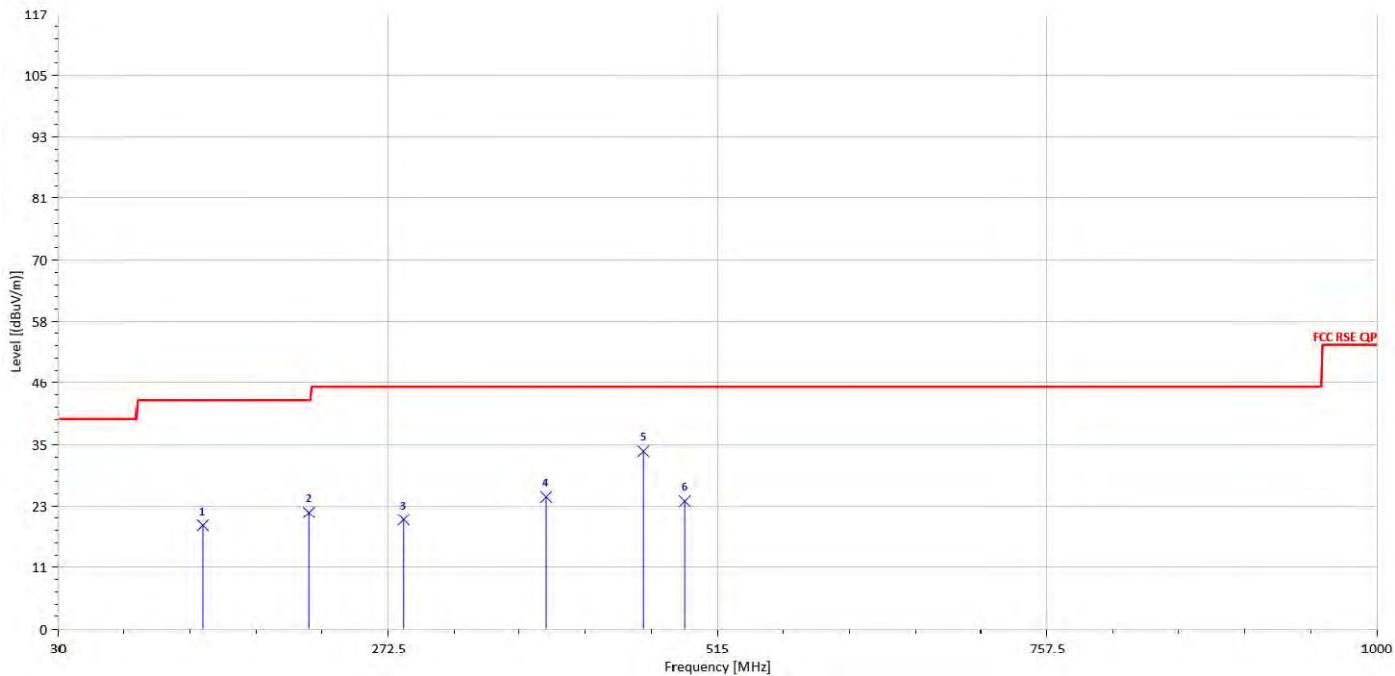
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Operation Band :802.11 a  
 Fundamental Frequency :5300 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------------|------------------------------|------------------------------|--------------|
|              |                 |                              | Reading                   | Level |              |                              |                              |              |
| 136.70       | S               | Peak                         | 41.23                     |       | -21.55       | 19.68                        | 43.5                         | -23.82       |
| 214.30       | S               | Peak                         | 45.10                     |       | -22.94       | 22.16                        | 43.5                         | -21.34       |
| 284.14       | S               | Peak                         | 40.34                     |       | -19.56       | 20.78                        | 46                           | -25.22       |
| 388.90       | S               | Peak                         | 41.35                     |       | -16.23       | 25.12                        | 46                           | -20.88       |
| 460.68       | S               | Peak                         | 48.40                     |       | -14.59       | 33.81                        | 46                           | -12.19       |
| 490.75       | S               | Peak                         | 38.44                     |       | -14.09       | 24.35                        | 46                           | -21.65       |

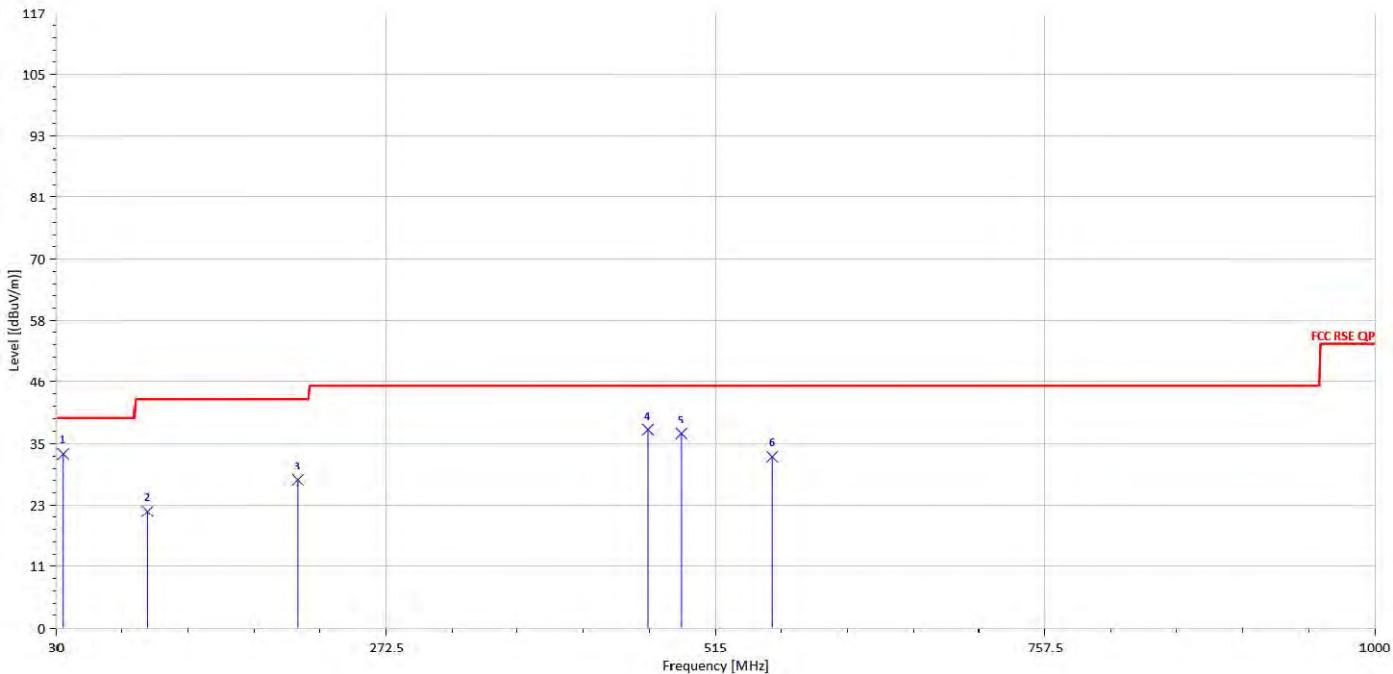
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## 802.11a, 5470~5725 MHz

|                       |           |                          |                     |
|-----------------------|-----------|--------------------------|---------------------|
| Operation Band        | :802.11 a | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5580 MHz | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX MID   | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan   | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |               | Factor<br>dB | Actual<br>FS<br>dBµV/m | Limit<br>@3m<br>dBµV/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|---------------|--------------|------------------------|------------------------|--------------|
|              |                 |                              | Mode                      | Level<br>dBµV |              |                        |                        |              |
| 34.85        | S               | Peak                         | 48.87                     | -15.75        | 33.12        | 40                     | -6.88                  |              |
| 96.93        | S               | Peak                         | 46.56                     | -24.36        | 22.19        | 43.5                   | -21.31                 |              |
| 207.51       | S               | Peak                         | 51.13                     | -22.98        | 28.15        | 43.5                   | -15.35                 |              |
| 465.53       | S               | Peak                         | 52.10                     | -14.43        | 37.67        | 46                     | -8.33                  |              |
| 489.78       | S               | Peak                         | 51.04                     | -14.10        | 36.94        | 46                     | -9.06                  |              |
| 556.71       | S               | Peak                         | 45.51                     | -12.89        | 32.62        | 46                     | -13.38                 |              |

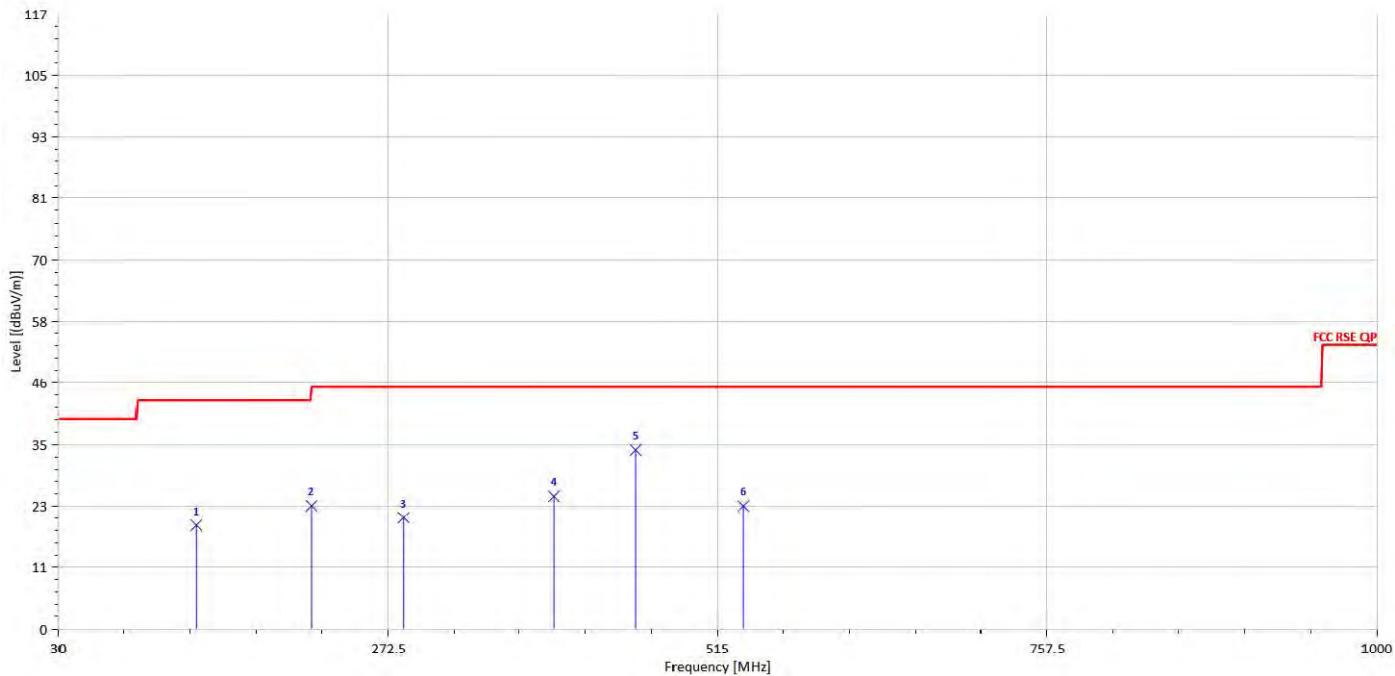
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Operation Band :802.11 a  
Fundamental Frequency :5580 MHz  
Operation Mode :TX MID  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V |  | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---|--|--------------|------------------------------|------------------------------|--------------|
|              |                 |                              |   |  |              |                              |                              |              |
| 131.85       | S               | Peak                         | 41.10                                   |  | -21.38       | 19.72                        | 43.5                         | -23.78       |
| 216.24       | S               | Peak                         | 46.41                                   |  | -22.96       | 23.45                        | 46                           | -22.55       |
| 284.14       | S               | Peak                         | 40.74                                   |  | -19.56       | 21.18                        | 46                           | -24.82       |
| 394.72       | S               | Peak                         | 41.27                                   |  | -16.04       | 25.23                        | 46                           | -20.77       |
| 454.86       | S               | Peak                         | 48.84                                   |  | -14.77       | 34.06                        | 46                           | -11.94       |
| 534.40       | S               | Peak                         | 36.59                                   |  | -13.16       | 23.43                        | 46                           | -22.57       |

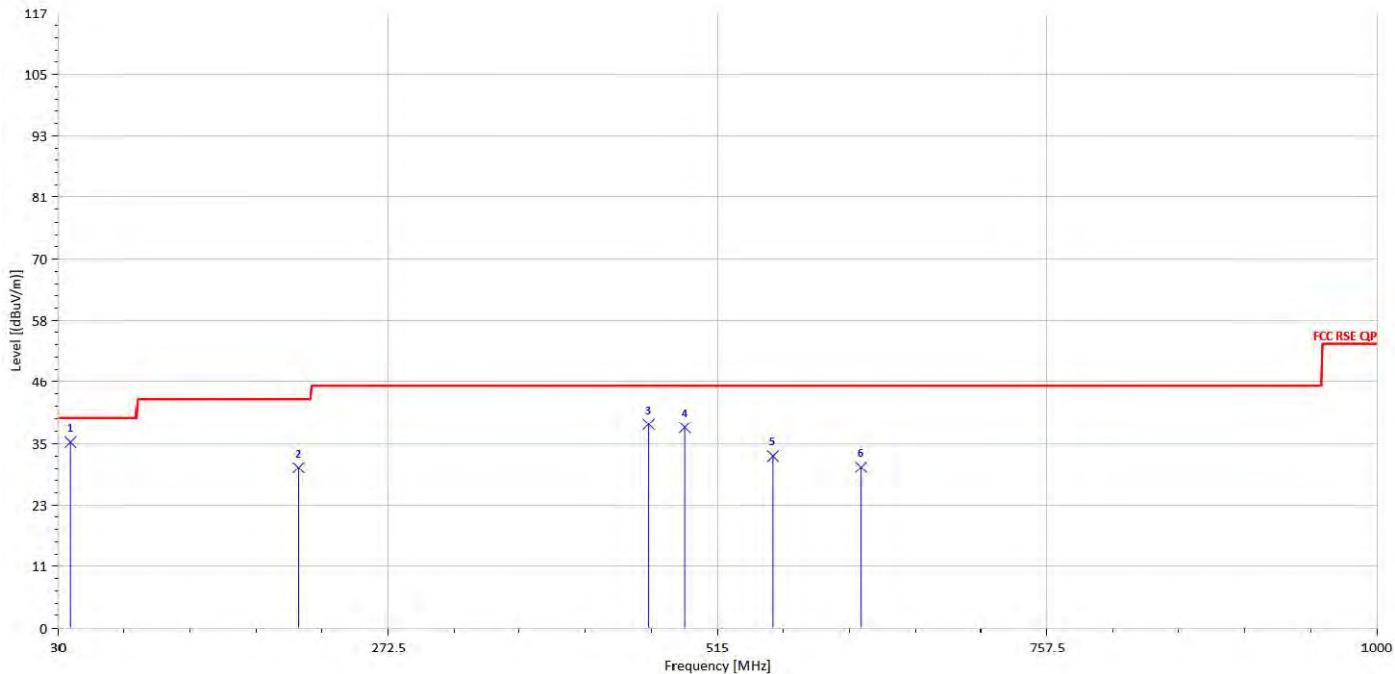
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**802.11n\_HT40 5150~5250 MHz**

|                       |                |                          |                     |
|-----------------------|----------------|--------------------------|---------------------|
| Operation Band        | :802.11 n_HT40 | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5190 MHz      | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX LOW        | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan        | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |               | Factor<br>dB | Actual<br>FS<br>dBµV/m | Limit<br>@3m<br>dBµV/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|---------------|--------------|------------------------|------------------------|--------------|
|              |                 |                              | Mode                      | Level<br>dBµV |              |                        |                        |              |
| 38.73        | S               | Peak                         | 53.51                     | -18.19        | 35.32        | 40                     | -4.68                  |              |
| 206.54       | S               | Peak                         | 53.50                     | -23.01        | 30.49        | 43.5                   | -13.01                 |              |
| 464.56       | S               | Peak                         | 53.24                     | -14.47        | 38.77        | 46                     | -7.23                  |              |
| 490.75       | S               | Peak                         | 52.20                     | -14.09        | 38.11        | 46                     | -7.89                  |              |
| 555.74       | S               | Peak                         | 45.58                     | -12.85        | 32.73        | 46                     | -13.27                 |              |
| 620.73       | S               | Peak                         | 42.75                     | -12.17        | 30.58        | 46                     | -15.42                 |              |

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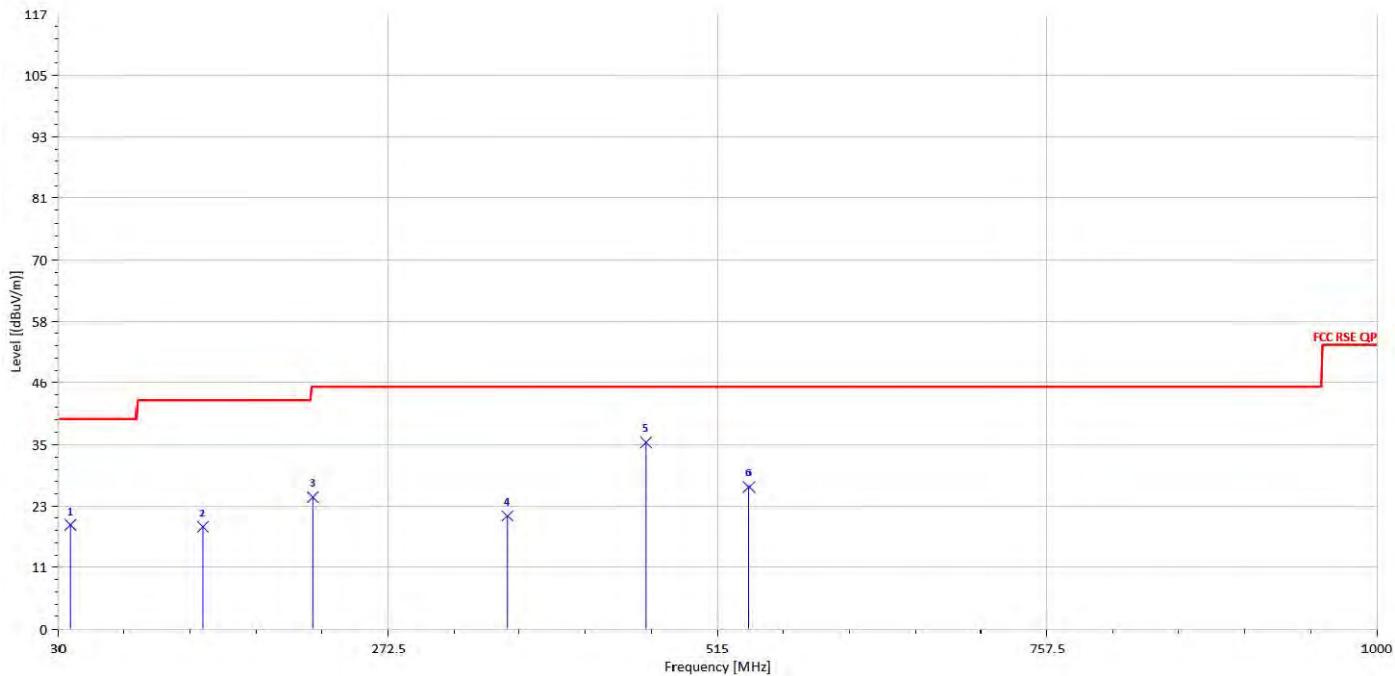
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Operation Band :802.11 n\_HT40  
 Fundamental Frequency :5190 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |  | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--|--------------|------------------------------|------------------------------|--------------|
|              |                 |                              |                           |  |              |                              |                              |              |
| 38.73        | S               | Peak                         | 37.96                     |  | -18.19       | 19.77                        | 40                           | -20.23       |
| 136.70       | S               | Peak                         | 40.94                     |  | -21.55       | 19.39                        | 43.5                         | -24.11       |
| 217.21       | S               | Peak                         | 48.05                     |  | -22.97       | 25.09                        | 46                           | -20.91       |
| 360.77       | S               | Peak                         | 38.66                     |  | -17.14       | 21.52                        | 46                           | -24.49       |
| 462.62       | S               | Peak                         | 50.02                     |  | -14.54       | 35.48                        | 46                           | -10.52       |
| 538.28       | S               | Peak                         | 40.32                     |  | -13.34       | 26.98                        | 46                           | -19.02       |

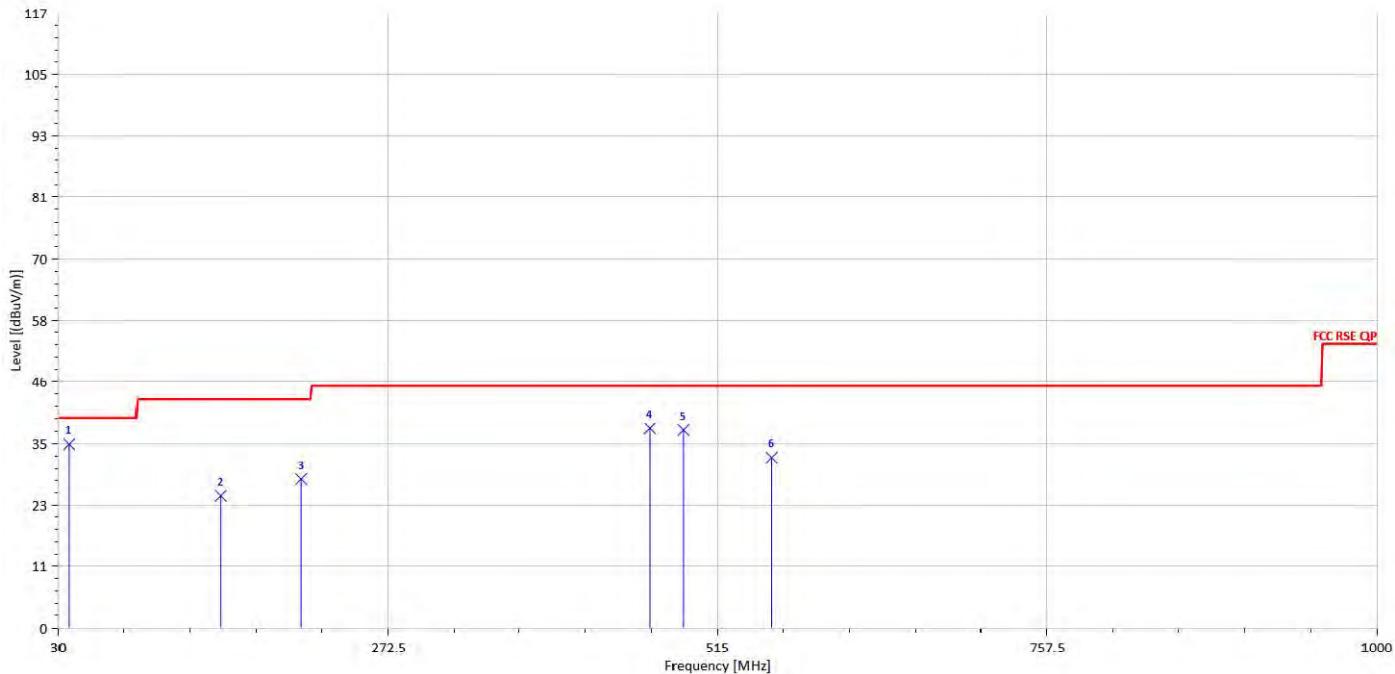
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## 802.11n\_HT40 5250~5350 MHz

|                       |                |                          |                     |
|-----------------------|----------------|--------------------------|---------------------|
| Operation Band        | :802.11 n_HT40 | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5270 MHz      | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX LOW        | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan        | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |                             | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-----------------------------|--------------|------------------------------|------------------------------|--------------|
|              |                 |                              | Mode                      | Reading Level<br>dB $\mu$ V |              |                              |                              |              |
| 37.76        | S               | Peak                         | 52.49                     | -17.57                      | 34.92        | 40                           | -5.08                        |              |
| 149.31       | S               | Peak                         | 47.76                     | -22.61                      | 25.15        | 43.5                         | -18.35                       |              |
| 208.48       | S               | Peak                         | 51.23                     | -22.96                      | 28.28        | 43.5                         | -15.22                       |              |
| 465.53       | S               | Peak                         | 52.37                     | -14.43                      | 37.94        | 46                           | -8.06                        |              |
| 489.78       | S               | Peak                         | 51.69                     | -14.10                      | 37.60        | 46                           | -8.40                        |              |
| 554.77       | S               | Peak                         | 45.40                     | -12.96                      | 32.44        | 46                           | -13.56                       |              |

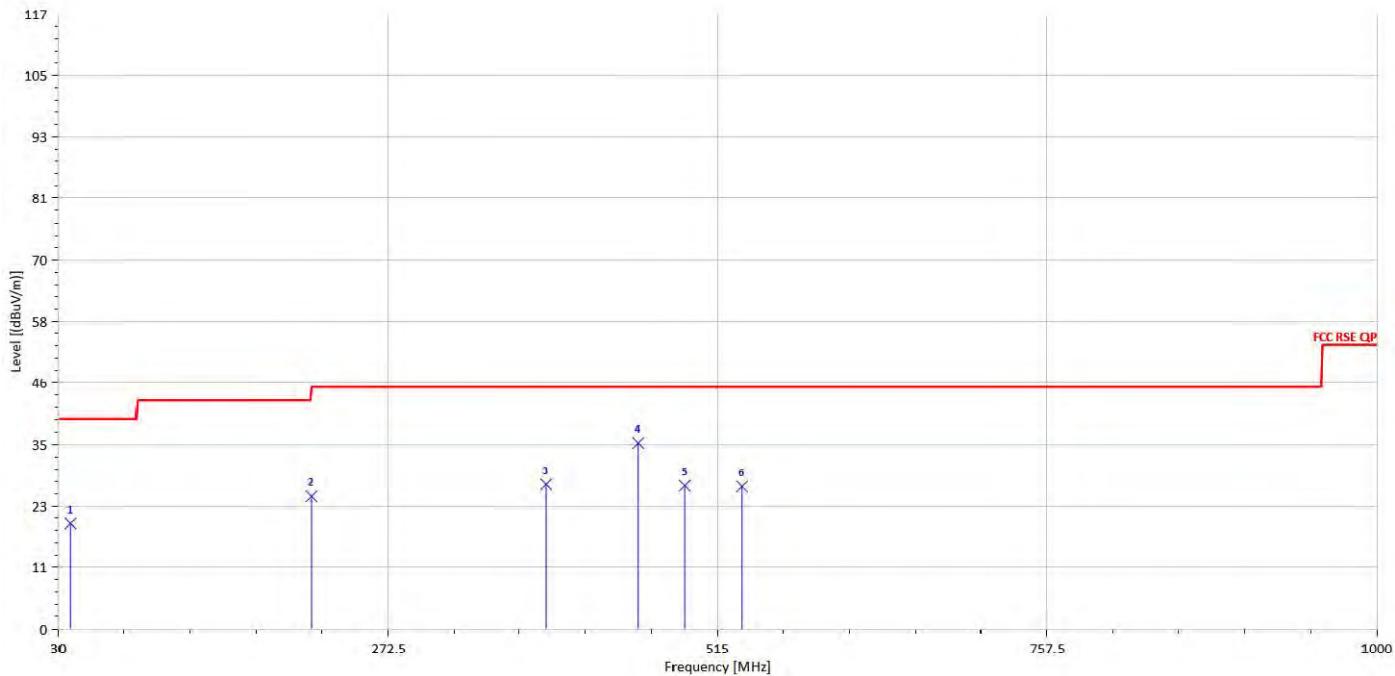
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Operation Band :802.11 n\_HT40  
 Fundamental Frequency :5270 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |  | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--|--------------|------------------------------|------------------------------|--------------|
|              |                 |                              |                           |  |              |                              |                              |              |
| 38.73        | S               | Peak                         | 38.22                     |  | -18.19       | 20.03                        | 40                           | -19.97       |
| 216.24       | S               | Peak                         | 48.21                     |  | -22.96       | 25.25                        | 46                           | -20.75       |
| 388.90       | S               | Peak                         | 43.74                     |  | -16.23       | 27.50                        | 46                           | -18.50       |
| 456.80       | S               | Peak                         | 50.05                     |  | -14.72       | 35.34                        | 46                           | -10.66       |
| 490.75       | S               | Peak                         | 41.35                     |  | -14.09       | 27.26                        | 46                           | -18.74       |
| 533.43       | S               | Peak                         | 40.33                     |  | -13.22       | 27.11                        | 46                           | -18.89       |

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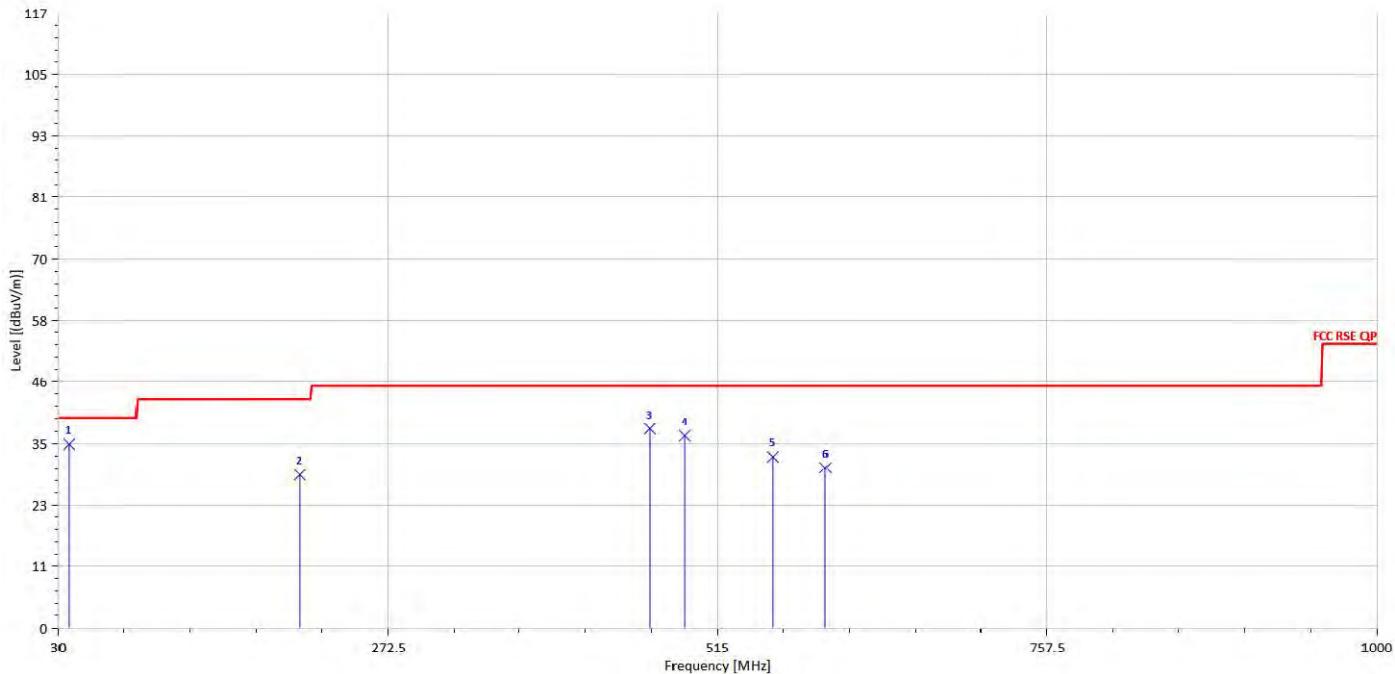
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## 802.11n\_HT40, 5470~5725 MHz

|                       |                |                          |                     |
|-----------------------|----------------|--------------------------|---------------------|
| Operation Band        | :802.11 n_HT40 | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5550 MHz      | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX LOW        | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan        | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level |        | Factor<br>dB | Actual<br>FS<br>dBµV/m | Limit<br>@3m<br>dBµV/m | Margin<br>dB |
|--------------|-----------------|------------------|---------------------------|--------|--------------|------------------------|------------------------|--------------|
|              |                 |                  | PK/QP/AV                  | dBµV   |              |                        |                        |              |
| 37.76        | S               | Peak             | 52.50                     | -17.57 | 34.93        | 40                     | -5.07                  |              |
| 207.51       | S               | Peak             | 52.11                     | -22.98 | 29.12        | 43.5                   | -14.38                 |              |
| 465.53       | S               | Peak             | 52.31                     | -14.43 | 37.88        | 46                     | -8.12                  |              |
| 490.75       | S               | Peak             | 50.65                     | -14.09 | 36.56        | 46                     | -9.44                  |              |
| 555.74       | S               | Peak             | 45.40                     | -12.85 | 32.56        | 46                     | -13.44                 |              |
| 594.54       | S               | Peak             | 42.60                     | -12.13 | 30.47        | 46                     | -15.53                 |              |

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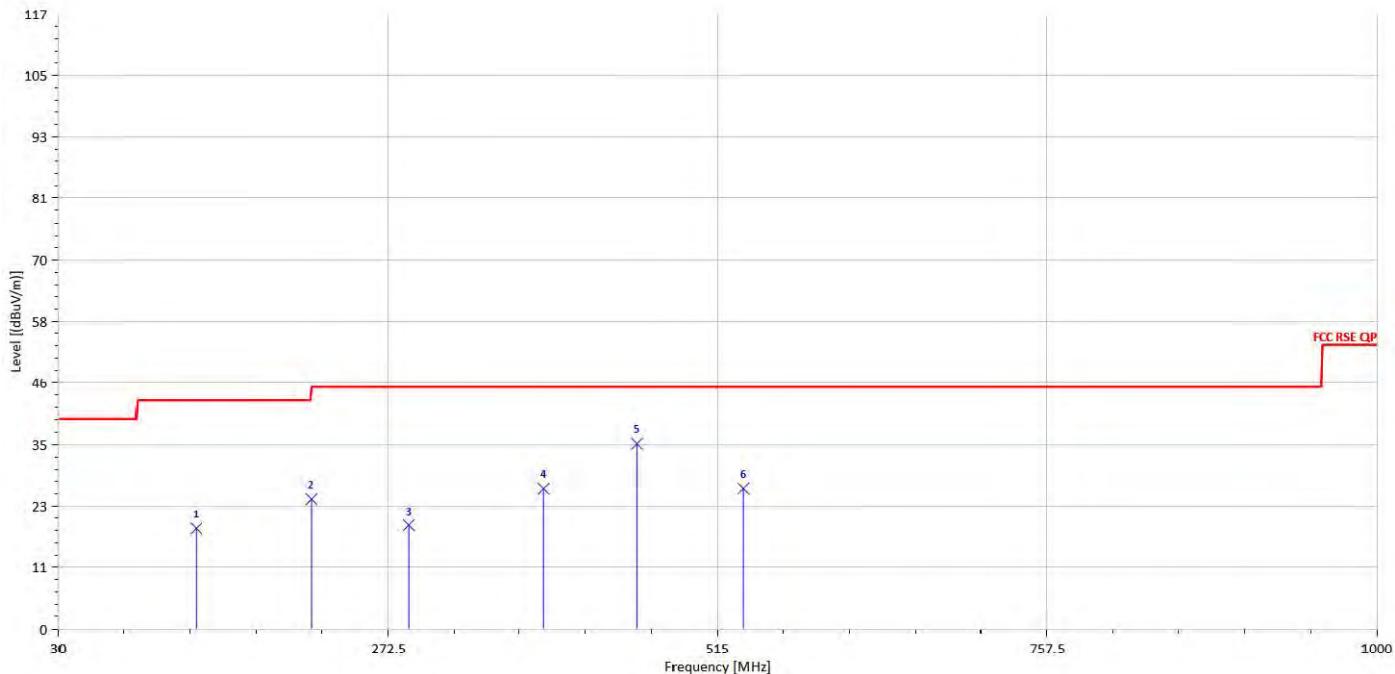
f (886-2) 2298-0488

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Operation Band :802.11 n\_HT40  
 Fundamental Frequency :5550 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |  | Factor<br>dB | Actual<br>FS<br>dBµV/m | Limit<br>@3m<br>dBµV/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--|--------------|------------------------|------------------------|--------------|
|              |                 |                              |                           |  |              |                        |                        |              |
| 131.85       | S               | Peak                         | 40.48                     |  | -21.38       | 19.10                  | 43.5                   | -24.40       |
| 216.24       | S               | Peak                         | 47.67                     |  | -22.96       | 24.71                  | 46                     | -21.29       |
| 288.02       | S               | Peak                         | 39.17                     |  | -19.45       | 19.72                  | 46                     | -26.28       |
| 386.96       | S               | Peak                         | 42.98                     |  | -16.32       | 26.67                  | 46                     | -19.33       |
| 455.83       | S               | Peak                         | 49.96                     |  | -14.75       | 35.21                  | 46                     | -10.79       |
| 534.40       | S               | Peak                         | 39.86                     |  | -13.16       | 26.70                  | 46                     | -19.30       |

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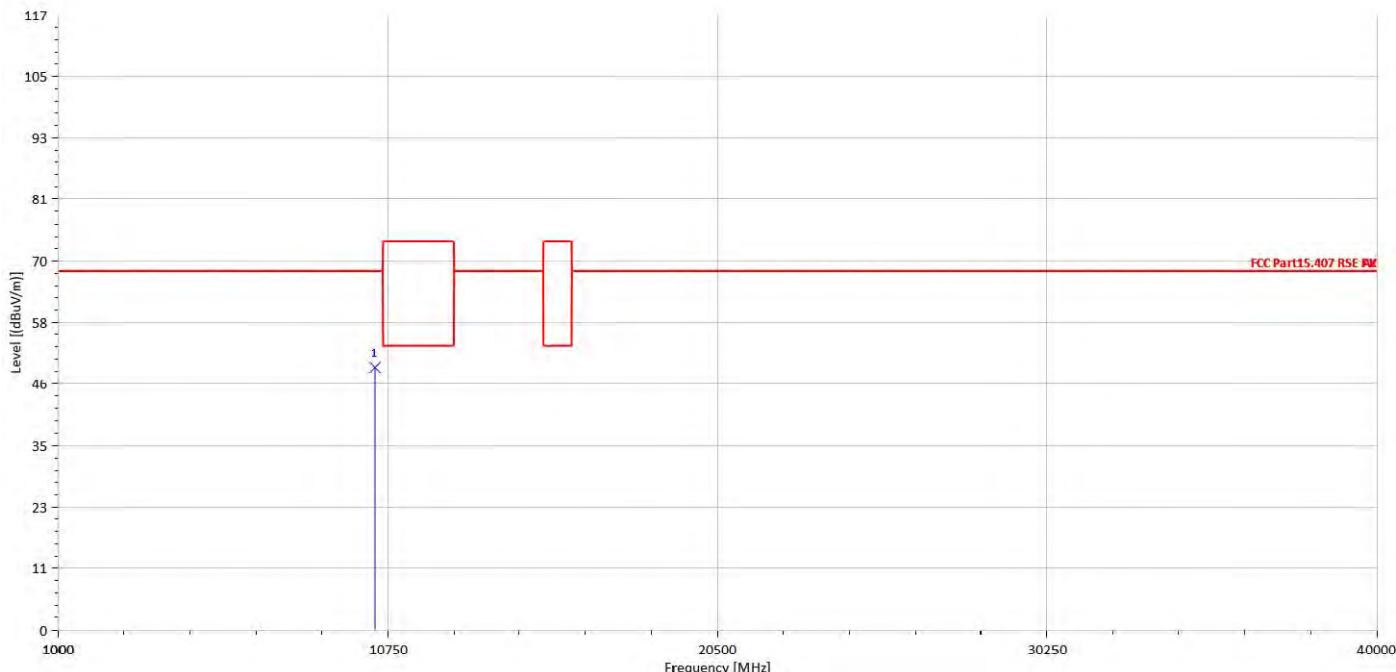
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**Above 1GHz Worst-Case Data:**
**802.11a, 5150~5250 MHz**

Operation Band :802.11 a  
 Fundamental Frequency :5180 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note    | Detector<br>Mode | Spectrum<br>Reading Level<br>dBµV | Factor<br>dB | Actual<br>FS<br>dBµV/m | Limit<br>@3m<br>dBµV/m | Safe<br>Margin<br>dB |
|--------------|---------|------------------|-----------------------------------|--------------|------------------------|------------------------|----------------------|
|              | F/H/E/S | PK/QP/AV         |                                   |              |                        |                        |                      |
| 10360.00     | H       | Peak             | 31.02                             | 18.94        | 49.96                  | 68.3                   | -18.34               |

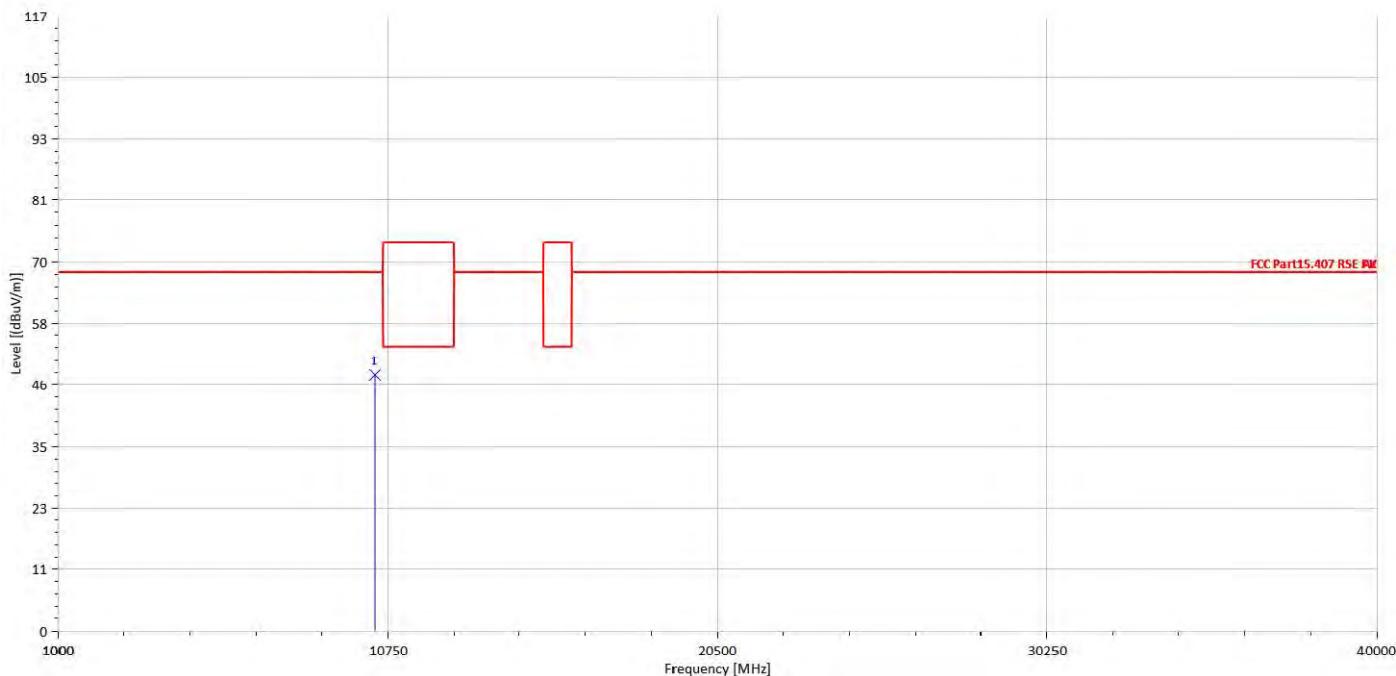
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Operation Band :802.11 a  
Fundamental Frequency :5180 MHz  
Operation Mode :TX LOW  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |              | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--------------|--------------|------------------------------|------------------------------|----------------------|
|              |                 |                              | Spectrum<br>Reading Level | Factor<br>dB |              |                              |                              |                      |
| 10360.00     | H               | Peak                         | 29.83                     | 18.94        | 48.77        | 68.3                         | 68.3                         | -19.53               |

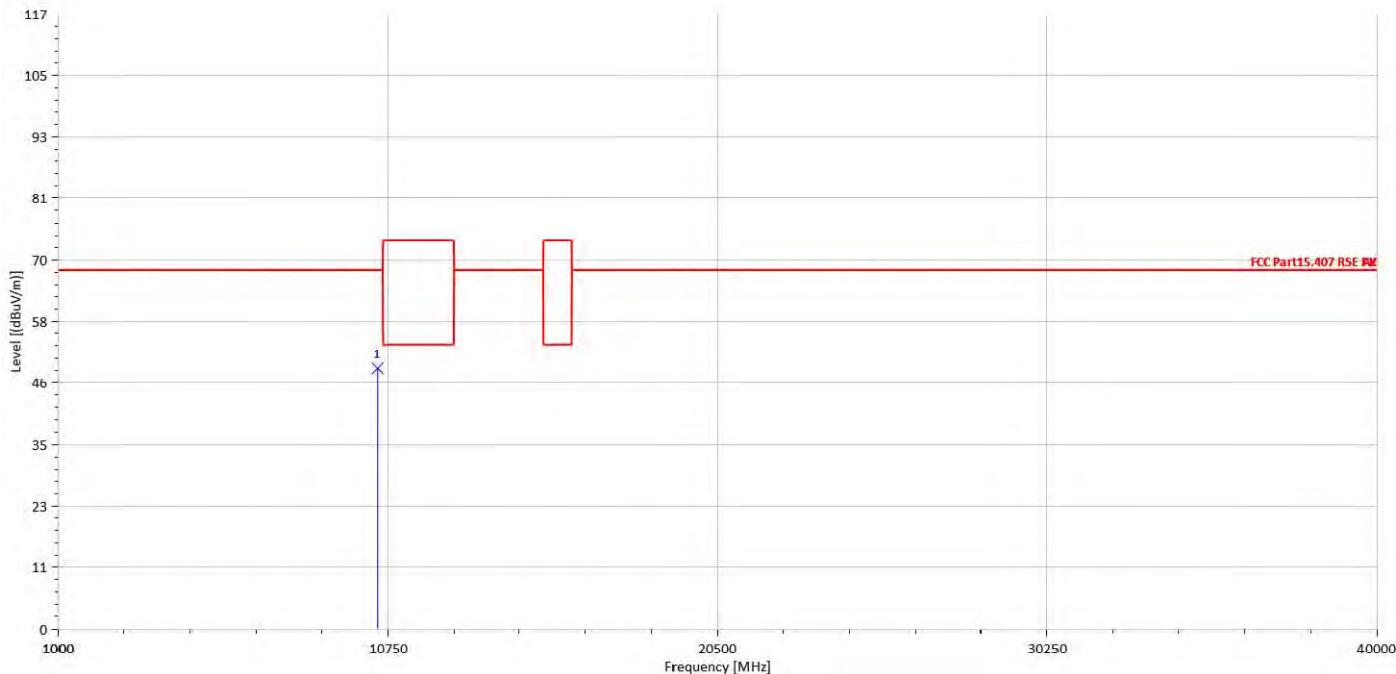
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Operation Band :802.11 a  
Fundamental Frequency :5220 MHz  
Operation Mode :TX MID  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|-----------------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                              | 30.58 |              |                        |                        |                      |
| 10440.00     | H               |                              |                                   | 30.58 | 19.03        | 49.61                  | 68.3                   | -18.69               |

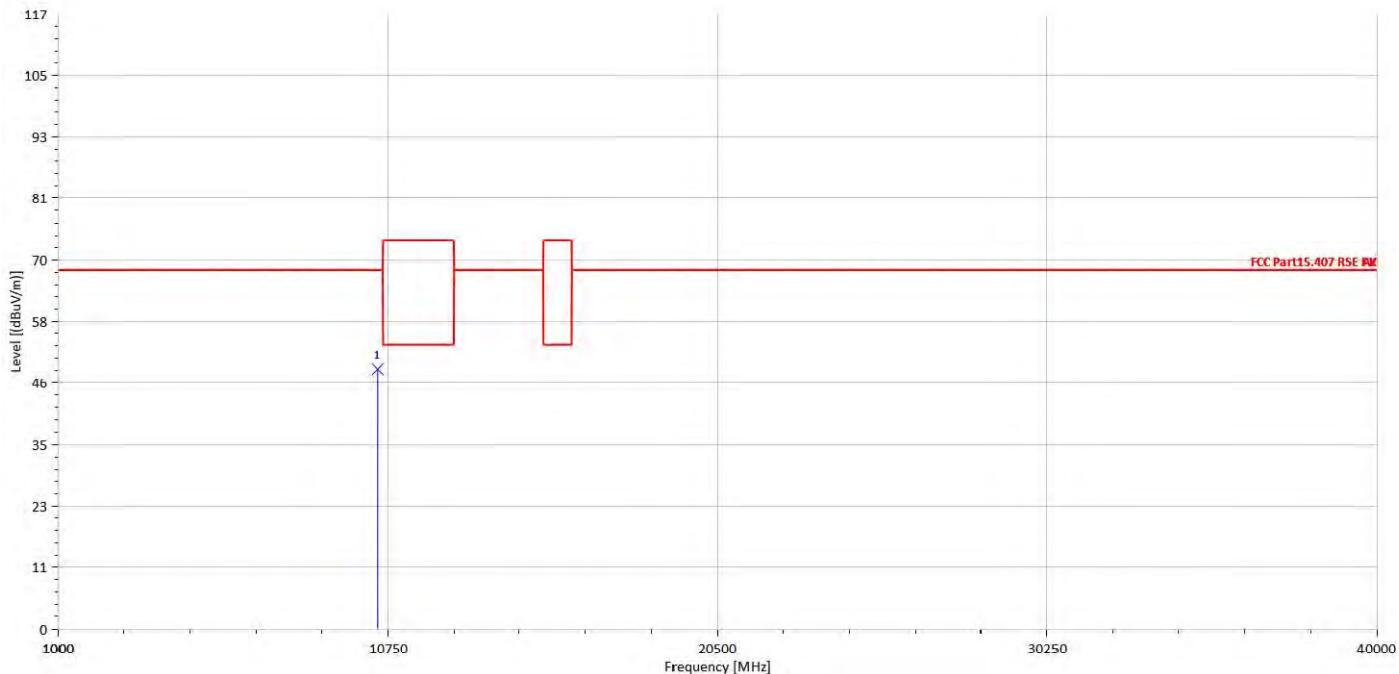
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Operation Band :802.11 a  
Fundamental Frequency :5220 MHz  
Operation Mode :TX MID  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------------|------------------------------|------------------------------|----------------------|
|              |                 |                              | Peak                      | 30.41 |              |                              |                              |                      |
| 10440.00     | H               |                              |                           | 30.41 | 19.03        | 49.44                        | 68.3                         | -18.86               |

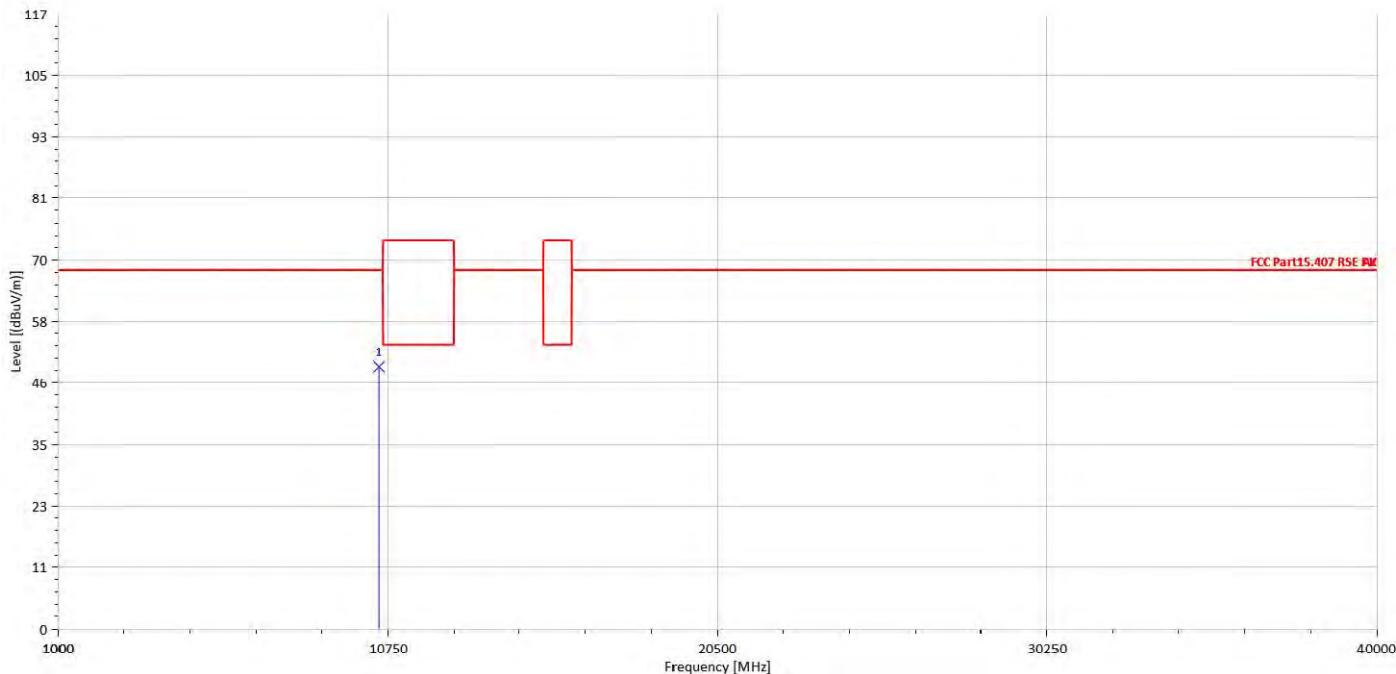
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Operation Band :802.11 a  
 Fundamental Frequency :5240 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dBµV/m | Limit<br>@3m<br>dBµV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | 30.78 |              |                        |                        |                      |
| 10480.00     | H               |                              |                           | 30.78 | 19.13        | 49.91                  | 68.3                   | -18.39               |

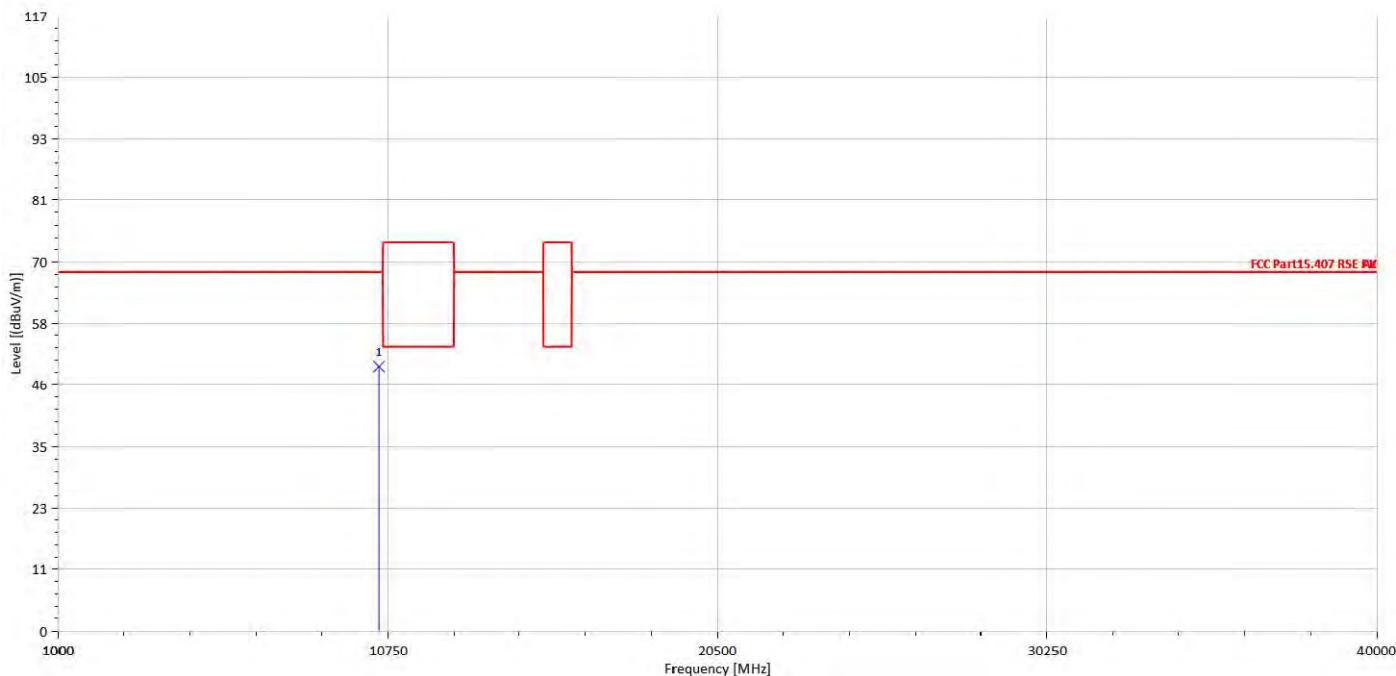
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Operation Band :802.11 a  
 Fundamental Frequency :5240 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|-----------------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                              | 31.19 |              |                        |                        |                      |
| 10480.00     | H               | Peak                         |                                   | 31.19 | 19.13        | 50.32                  | 68.3                   | -17.98               |

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### Band edge falling to restricted band

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a      | Test Date                | :2015-12-17       |
| Fundamental Frequency | :5180 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Burly            |
| EUT Pol.              | :H Plan        | Measurement Antenna Pol. | :VERTICAL         |

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5150.00      | E               | Peak                         | 43.00                                   | 11.14        | 54.14              | 74                  | -19.86 |
| 5150.00      | E               | Average                      | 31.86                                   | 11.14        | 43.00              | 54                  | -11.00 |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a      | Test Date                | :2015-12-17       |
| Fundamental Frequency | :5180 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Burly            |
| EUT Pol.              | :H Plan        | Measurement Antenna Pol. | :HORIZONTAL       |

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5150.00      | E               | Peak                         | 42.16                                   | 11.14        | 53.30              | 74                  | -20.70 |
| 5150.00      | E               | Average                      | 31.63                                   | 11.14        | 42.77              | 54                  | -11.23 |

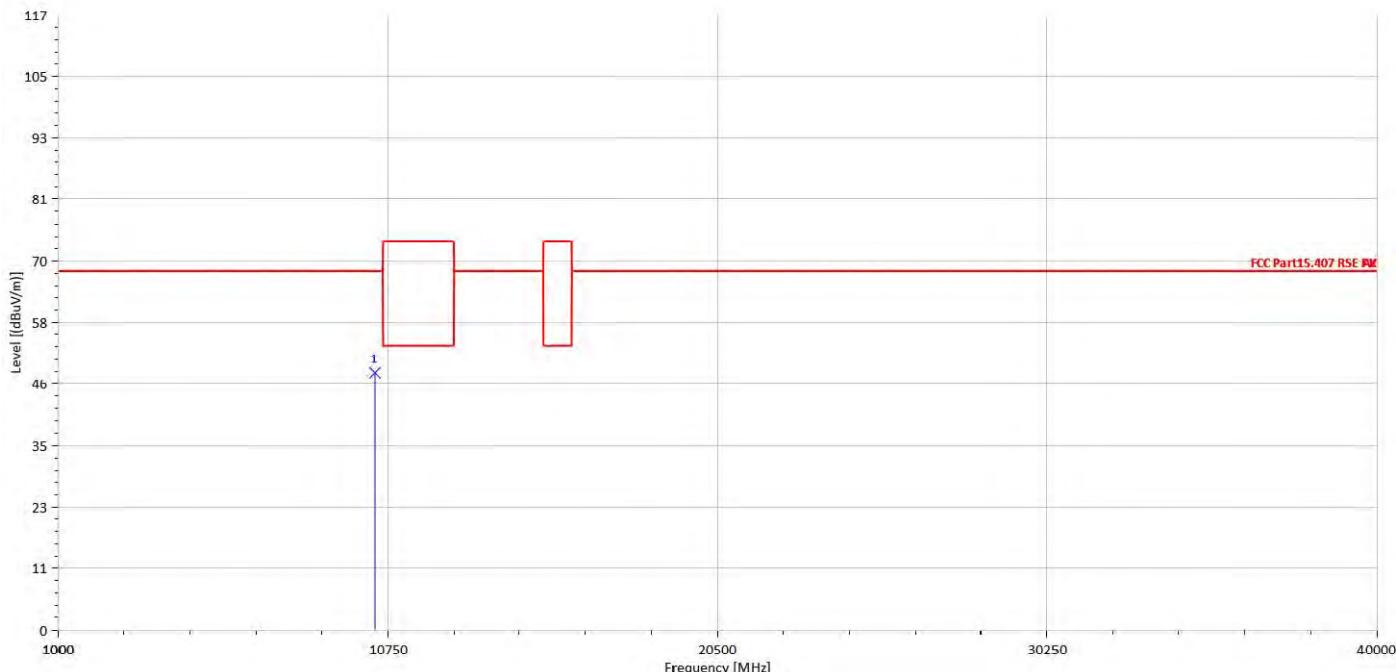
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**Radiated Spurious Emission Measurement Result 802.11n HT20, 5150~5250 MHz**

|                       |              |                          |                     |
|-----------------------|--------------|--------------------------|---------------------|
| Operation Band        | :802.11 n20M | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5180 MHz    | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX LOW      | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan      | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | Note     | Detector<br>Mode | Spectrum<br>Reading Level<br>dBμV | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|----------|------------------|-----------------------------------|--------------|------------------------|------------------------|----------------------|
| F/H/E/S      | PK/QP/AV |                  |                                   |              |                        |                        |                      |
| 10360.00     | H        | Peak             | 30.04                             | 18.94        | 48.98                  | 68.3                   | -19.32               |

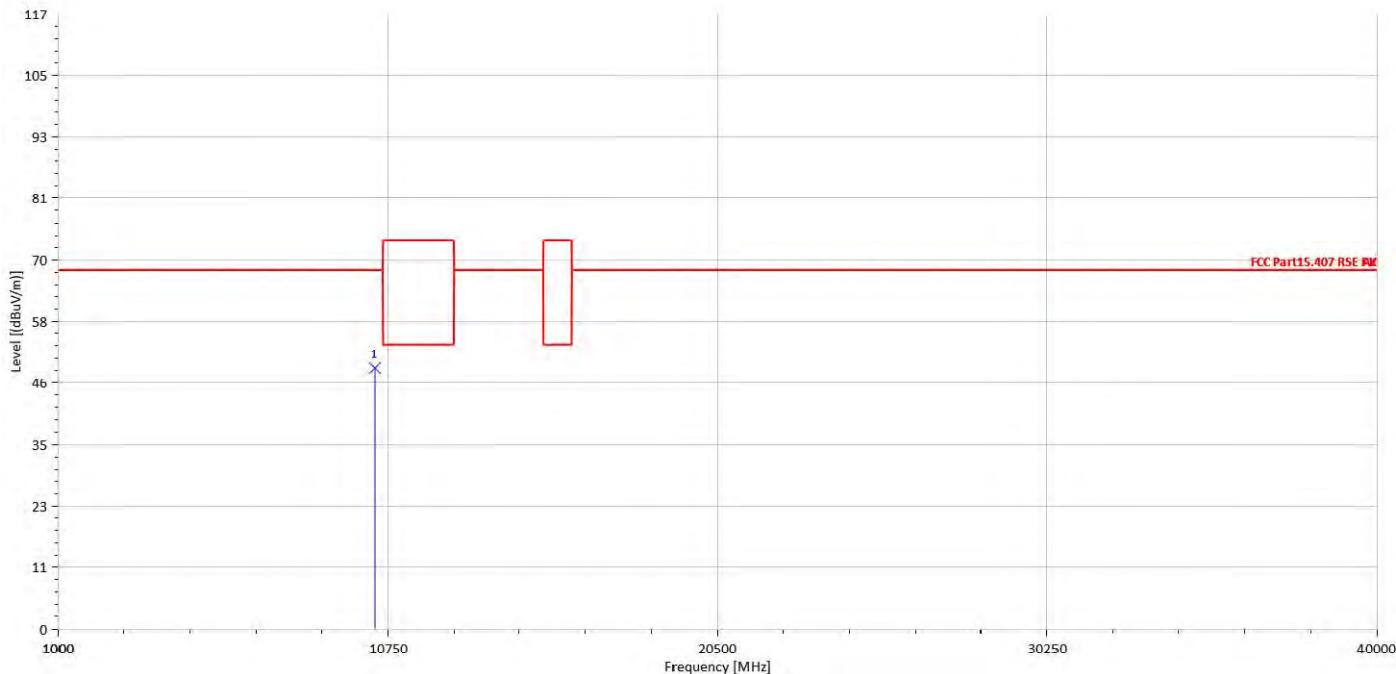
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Operation Band :802.11 n20M  
Fundamental Frequency :5180 MHz  
Operation Mode :TX LOW  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------------|------------------------------|------------------------------|----------------------|
|              |                 |                              | Reading                   | Level |              |                              |                              |                      |
| 10360.00     | H               | Peak                         | 30.74                     |       | 18.94        | 49.68                        | 68.3                         | -18.62               |

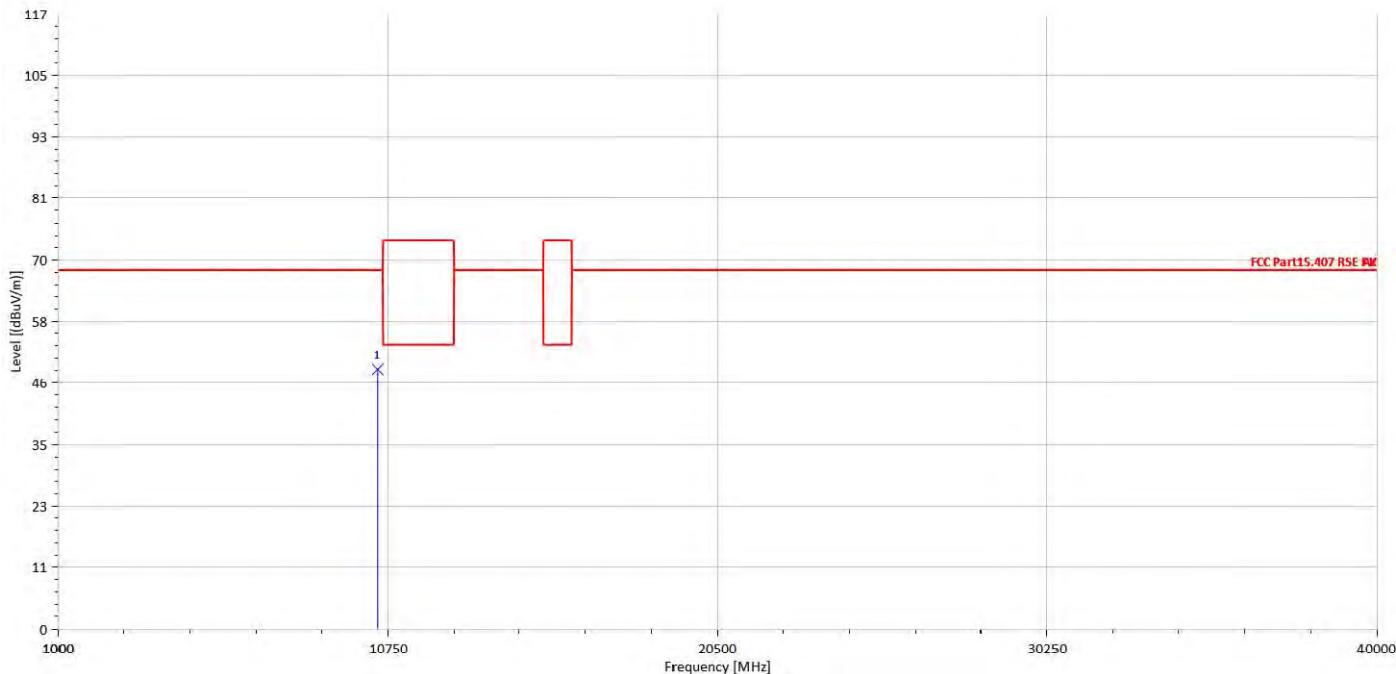
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Operation Band :802.11 n20M  
 Fundamental Frequency :5220 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |              | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Spectrum<br>Reading Level | Factor<br>dB |              |                        |                        |                      |
| 10440.00     | H               | Peak                         | 30.39                     | 19.03        | 49.42        | 68.3                   | -18.88                 |                      |

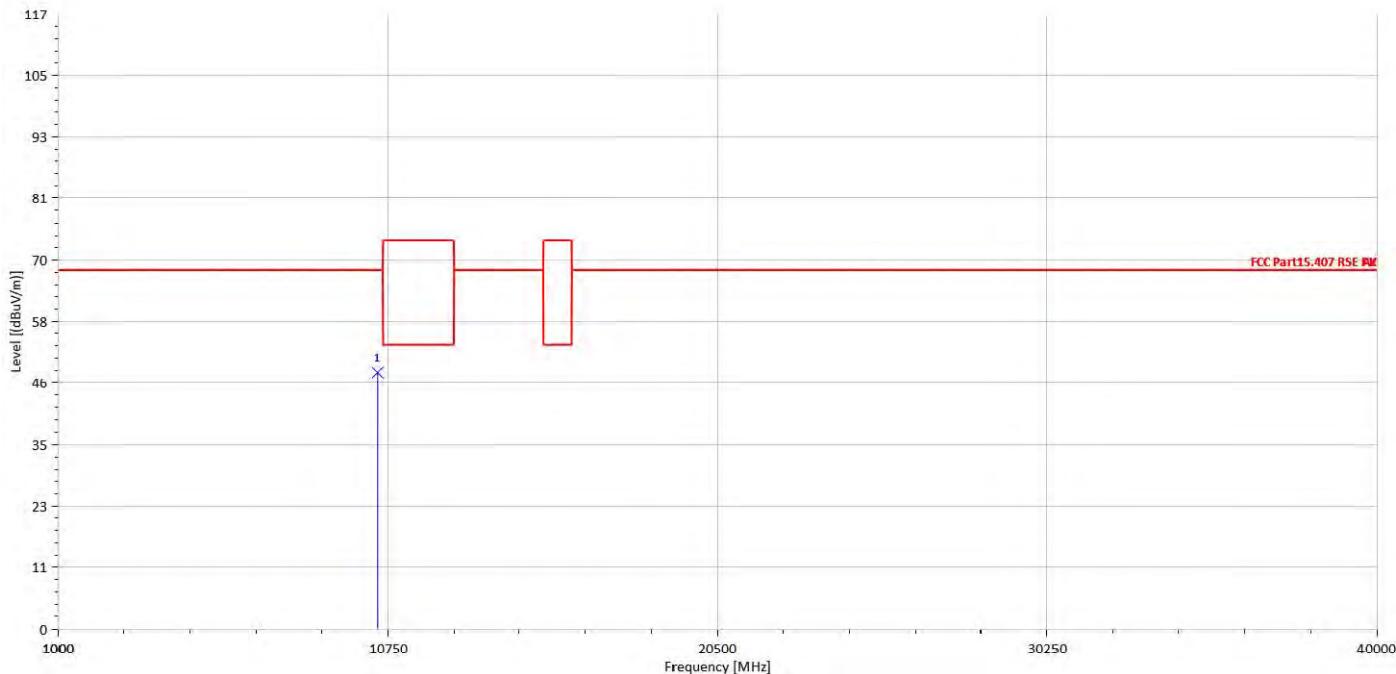
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Operation Band :802.11 n20M  
 Fundamental Frequency :5220 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|-----------------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                              | 29.82 |              |                        |                        |                      |
| 10440.00     | H               |                              |                                   | 29.82 | 19.03        | 48.84                  | 68.3                   | -19.46               |

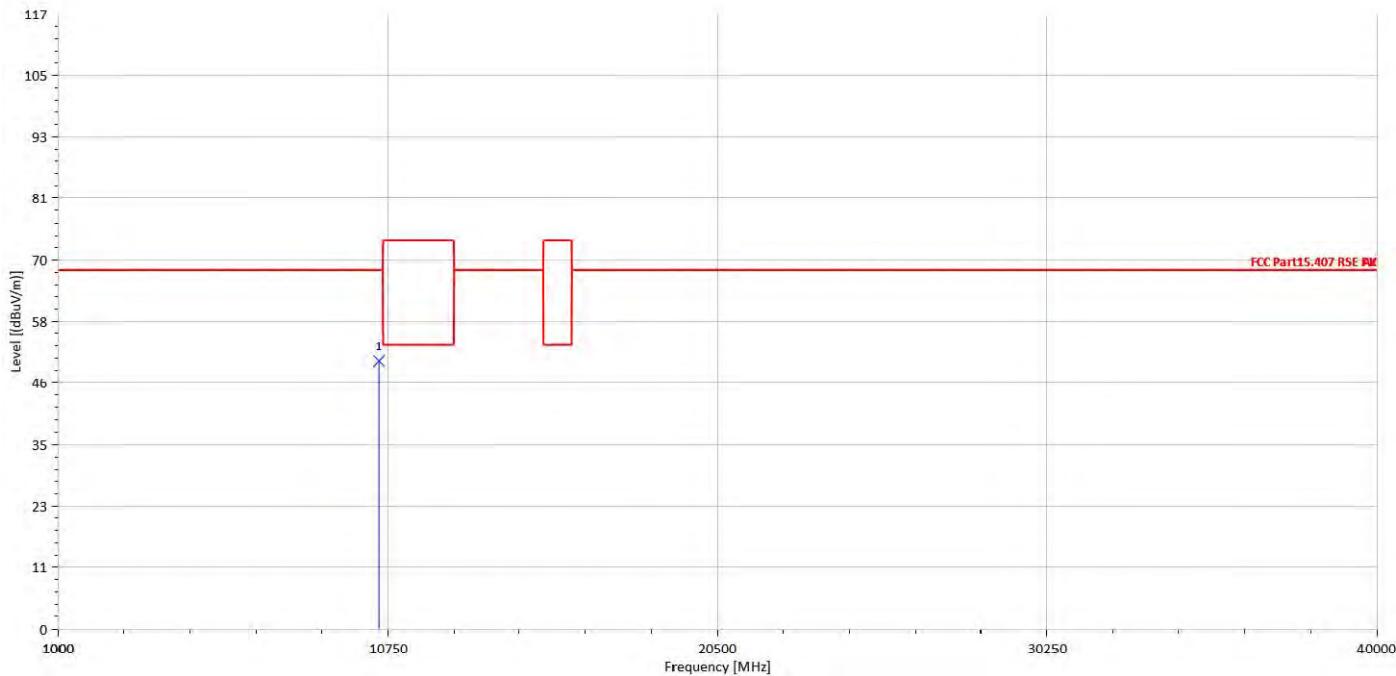
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Operation Band :802.11 n20M  
 Fundamental Frequency :5240 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |              | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Spectrum<br>Reading Level | Factor<br>dB |              |                        |                        |                      |
| 10480.00     | H               | Peak                         | 31.88                     | 19.13        | 51.00        | 68.3                   | 51.00                  | -17.30               |

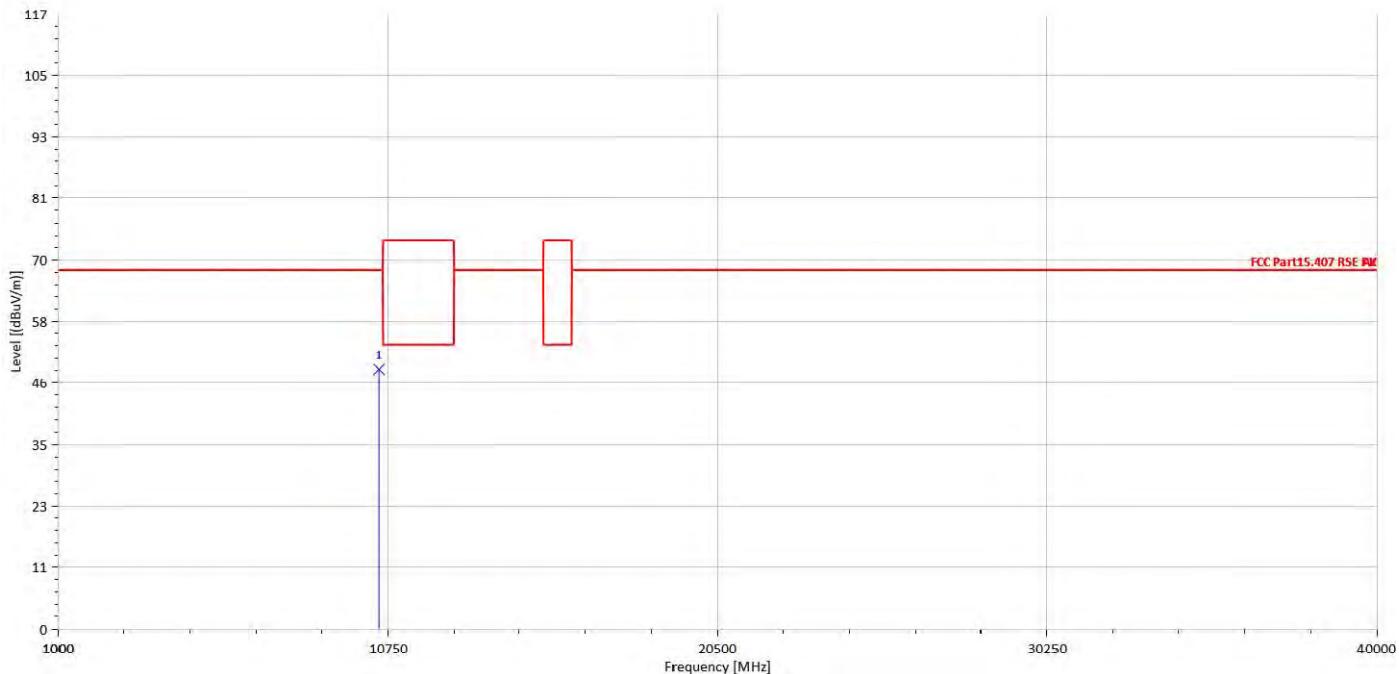
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Operation Band :802.11 n20M  
 Fundamental Frequency :5240 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V |                              | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---|------------------------------|--------------|------------------------------|------------------------------|----------------------|
|              |                 |                              | Factor<br>dB                            | Actual<br>FS<br>dB $\mu$ V/m |              |                              |                              |                      |
| 10480.00     | H               | Peak                         | 30.29                                   | 19.13                        | 49.42        | 68.3                         | -18.88                       |                      |

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### Band edge falling to restricted band

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 n20    | Test Date                | :2015-12-17       |
| Fundamental Frequency | :5180 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Burly            |
| EUT Pol.              | :H Plan        | Measurement Antenna Pol. | :VERTICAL         |

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor | Actual | Limit | Margin |
|--------------|-----------------|------------------|---------------------------|--------|--------|-------|--------|
|              |                 |                  |                           |        | FS     | @3m   | dB     |
| 5149.36      | S               | Peak             | 44.77                     | 11.14  | 55.92  | 74    | -18.08 |
| 5149.36      | S               | Average          | 32.24                     | 11.14  | 43.38  | 54    | -10.62 |
| 5150.00      | E               | Peak             | 43.51                     | 11.14  | 54.65  | 74    | -19.35 |
| 5150.00      | E               | Average          | 32.26                     | 11.14  | 43.40  | 54    | -10.60 |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 n20    | Test Date                | :2015-12-17       |
| Fundamental Frequency | :5180 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Burly            |
| EUT Pol.              | :H Plan        | Measurement Antenna Pol. | :HORIZONTAL       |

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor | Actual | Limit | Margin |
|--------------|-----------------|------------------|---------------------------|--------|--------|-------|--------|
|              |                 |                  |                           |        | FS     | @3m   | dB     |
| 5150.00      | E               | Peak             | 43.86                     | 11.14  | 55.00  | 74    | -19.00 |
| 5150.00      | E               | Average          | 32.12                     | 11.14  | 43.26  | 54    | -10.74 |

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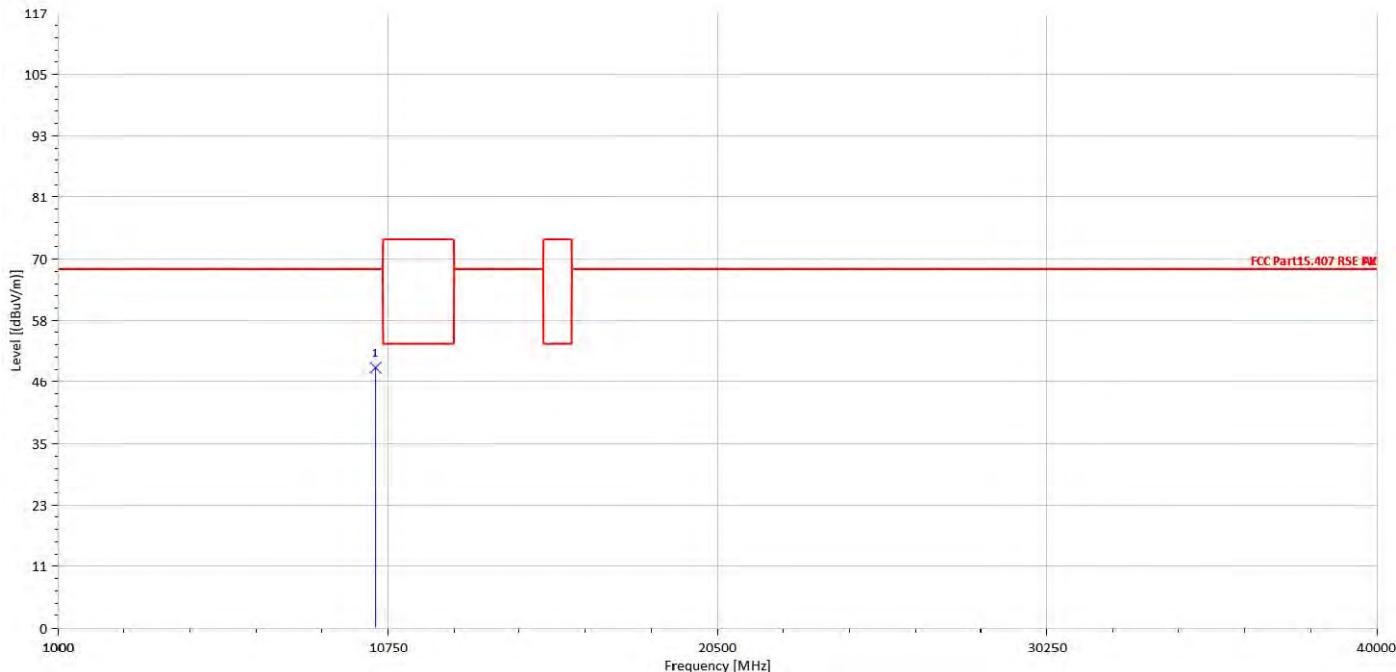
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**Radiated Spurious Emission Measurement Result 802.11n HT40, 5150~5250 MHz**

|                       |              |                          |                     |
|-----------------------|--------------|--------------------------|---------------------|
| Operation Band        | :802.11 n40M | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5190 MHz    | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX LOW      | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan      | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---|--------------|------------------------------|------------------------------|----------------------|
| 10380.00     | H               | Peak                         | 30.55                                   | 19.01        | 49.56                        | 68.3                         | -18.74               |

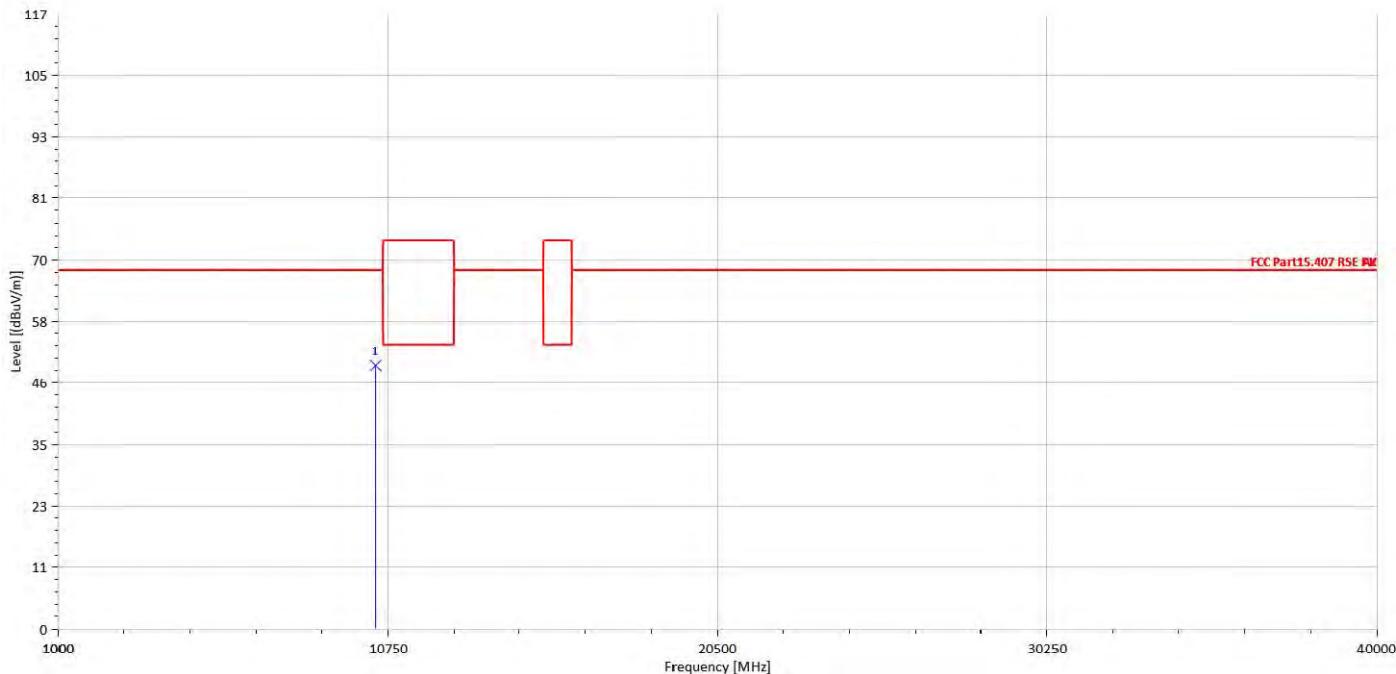
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Operation Band :802.11 n40M  
 Fundamental Frequency :5190 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |              | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--------------|--------------|------------------------------|------------------------------|----------------------|
|              |                 |                              | Spectrum<br>Reading Level | Factor<br>dB |              |                              |                              |                      |
| 10380.00     | H               | Peak                         | 31.13                     | 19.01        | 50.15        | 68.3                         | -18.15                       |                      |

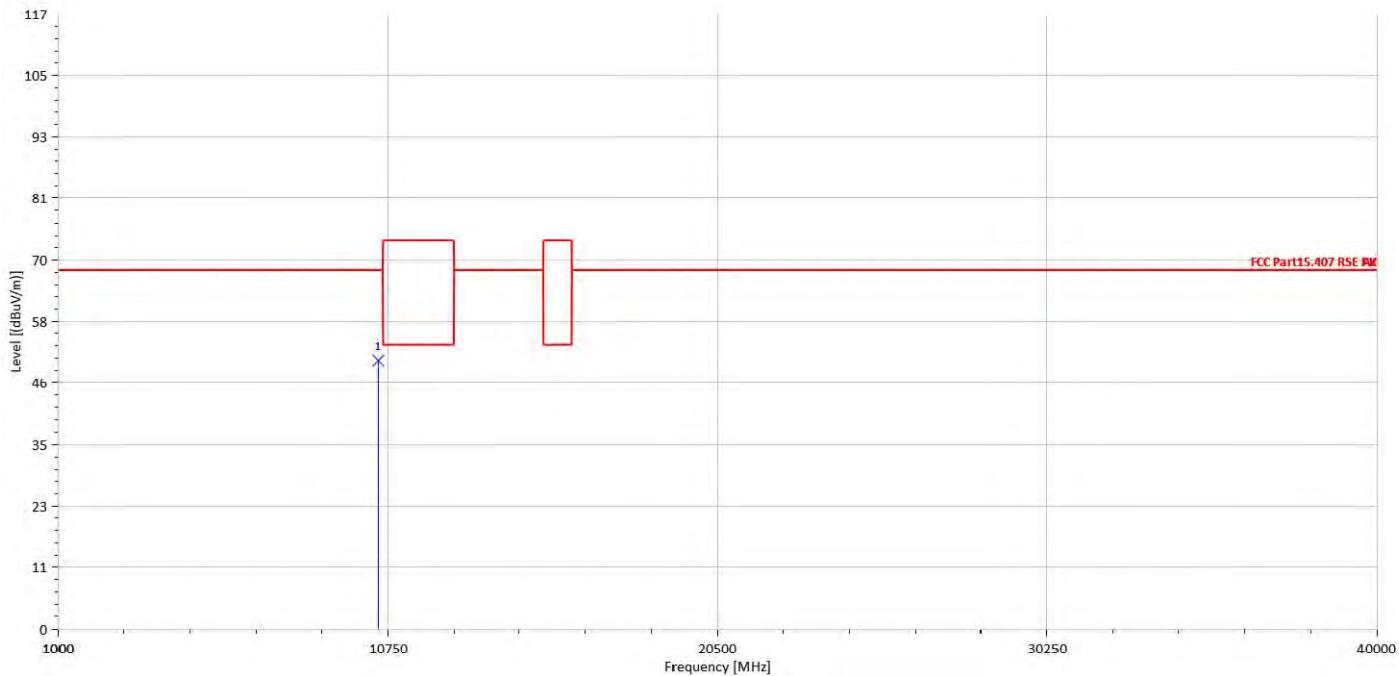
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Operation Band :802.11 n40M  
 Fundamental Frequency :5230 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |              | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Spectrum<br>Reading Level | Factor<br>dB |              |                        |                        |                      |
| 10460.00     | H               | Peak                         | 31.94                     | 19.11        | 51.06        | 68.3                   | -                      | -17.24               |

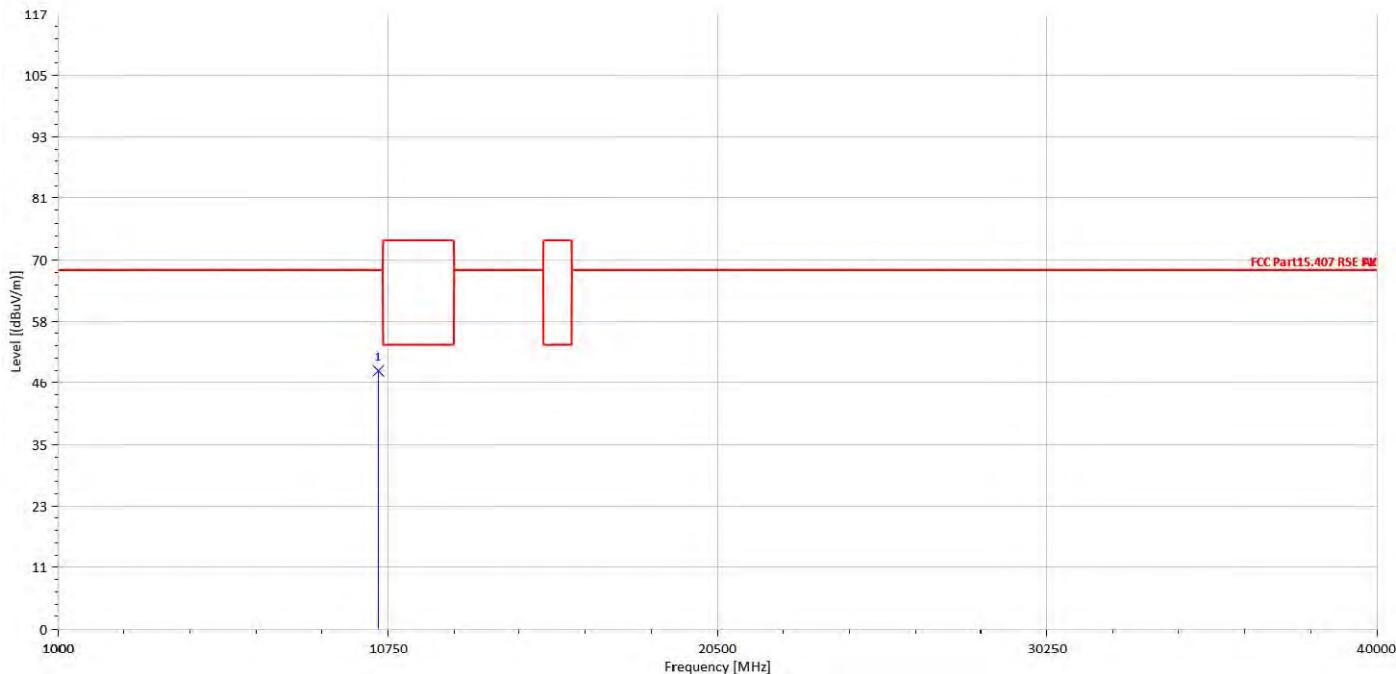
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Operation Band :802.11 n40M  
Fundamental Frequency :5230 MHz  
Operation Mode :TX HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|-----------------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                              | 30.05 |              |                        |                        |                      |
| 10460.00     | H               |                              |                                   | 30.05 | 19.11        | 49.16                  | 68.3                   | -19.14               |

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**Band edge falling to restricted band**

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 n40    | Test Date                | :2015-12-17       |
| Fundamental Frequency | :5190 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Burly            |
| EUT Pol.              | :H Plan        | Measurement Antenna Pol. | :VERTICAL         |

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5150.00      | E               | Peak                         | 56.46                                   | 11.14        | 67.60              | 74                  | -6.40  |
| 5150.00      | E               | Average                      | 37.47                                   | 11.14        | 48.61              | 54                  | -5.39  |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 n40    | Test Date                | :2015-12-17       |
| Fundamental Frequency | :5190 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Burly            |
| EUT Pol.              | :H Plan        | Measurement Antenna Pol. | :HORIZONTAL       |

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5148.76      | S               | Peak                         | 55.89                                   | 11.15        | 67.04              | 74                  | -6.96  |
| 5148.76      | S               | Average                      | 36.13                                   | 11.15        | 47.28              | 54                  | -6.72  |
| 5150.00      | E               | Peak                         | 54.37                                   | 11.14        | 65.51              | 74                  | -8.49  |
| 5150.00      | E               | Average                      | 36.67                                   | 11.14        | 47.81              | 54                  | -6.19  |

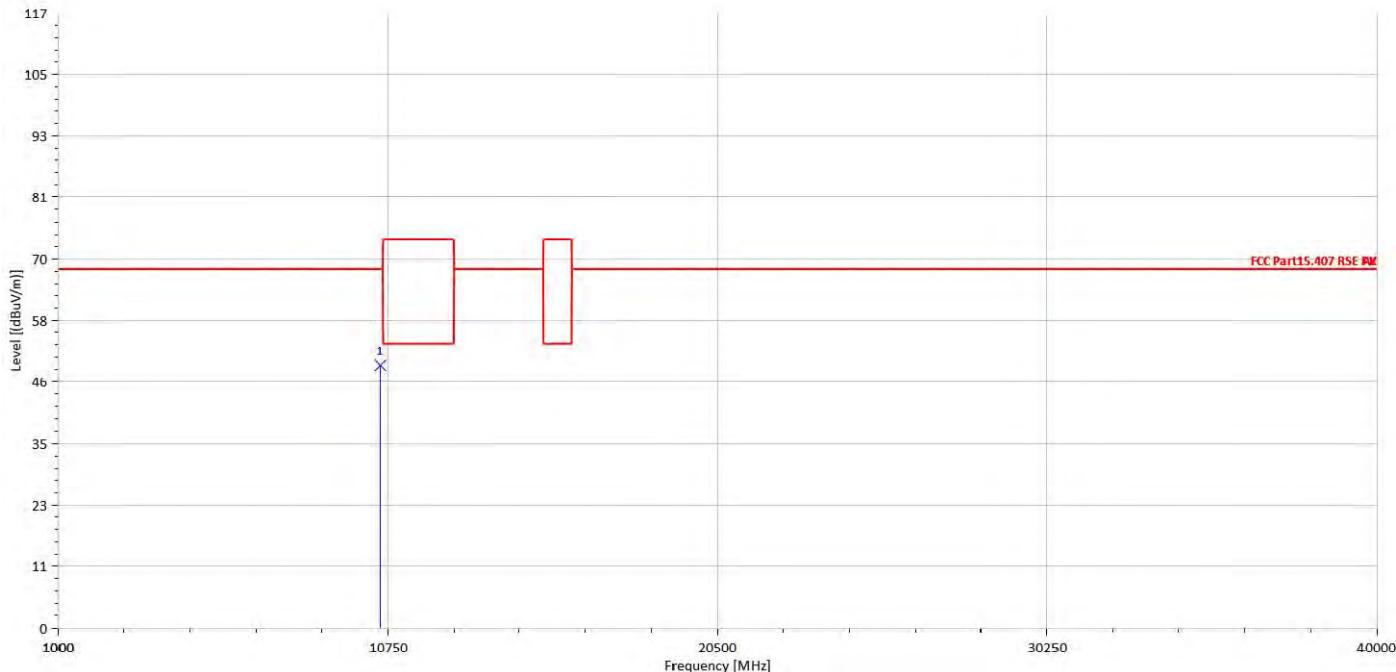
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**Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz**

|                       |           |                          |                     |
|-----------------------|-----------|--------------------------|---------------------|
| Operation Band        | :802.11 a | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5260 MHz | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX LOW   | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan   | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---|--------------|------------------------------|------------------------------|----------------------|
| 10520.00     | H               | Peak                         | 30.73                                   | 19.25        | 49.98                        | 68.3                         | -18.32               |

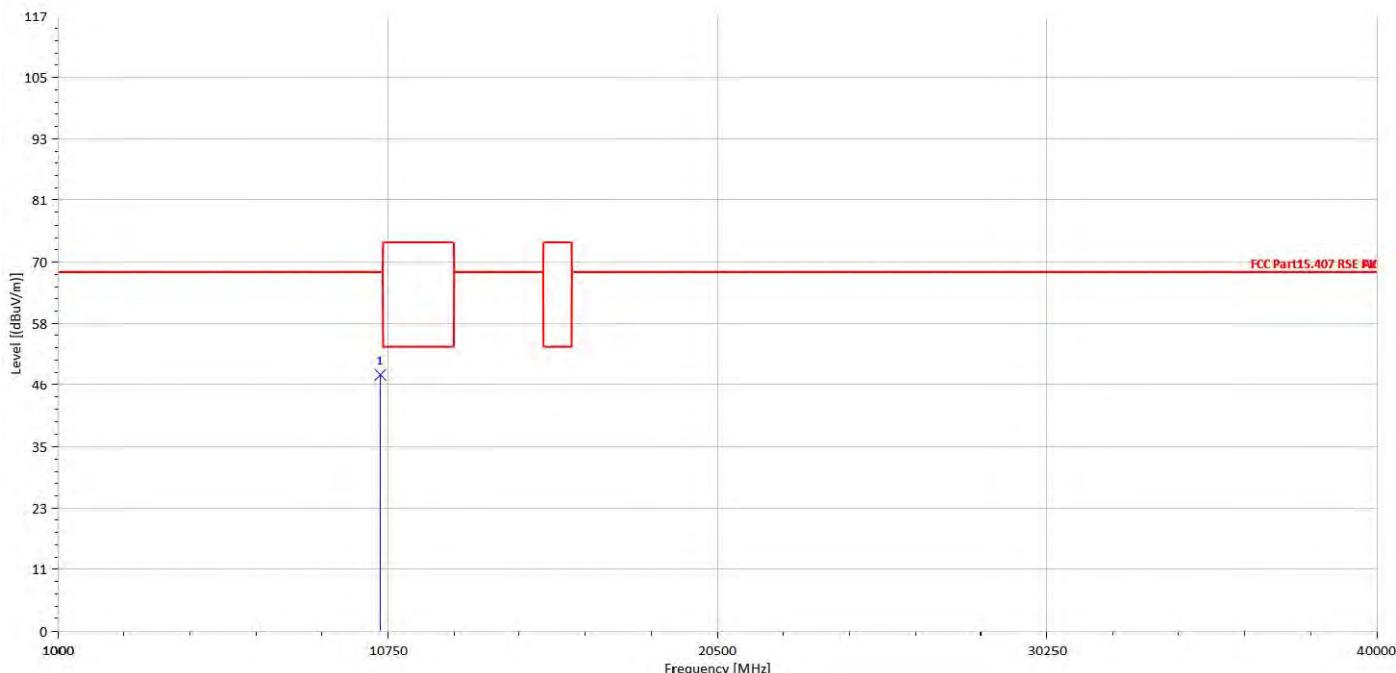
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Operation Band :802.11 a  
 Fundamental Frequency :5260 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |              | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Spectrum<br>Reading Level | Factor<br>dB |              |                        |                        |                      |
| 10520.00     | H               | Peak                         | 29.55                     | 19.25        | 48.80        | 68.3                   | 68.3                   | -19.50               |

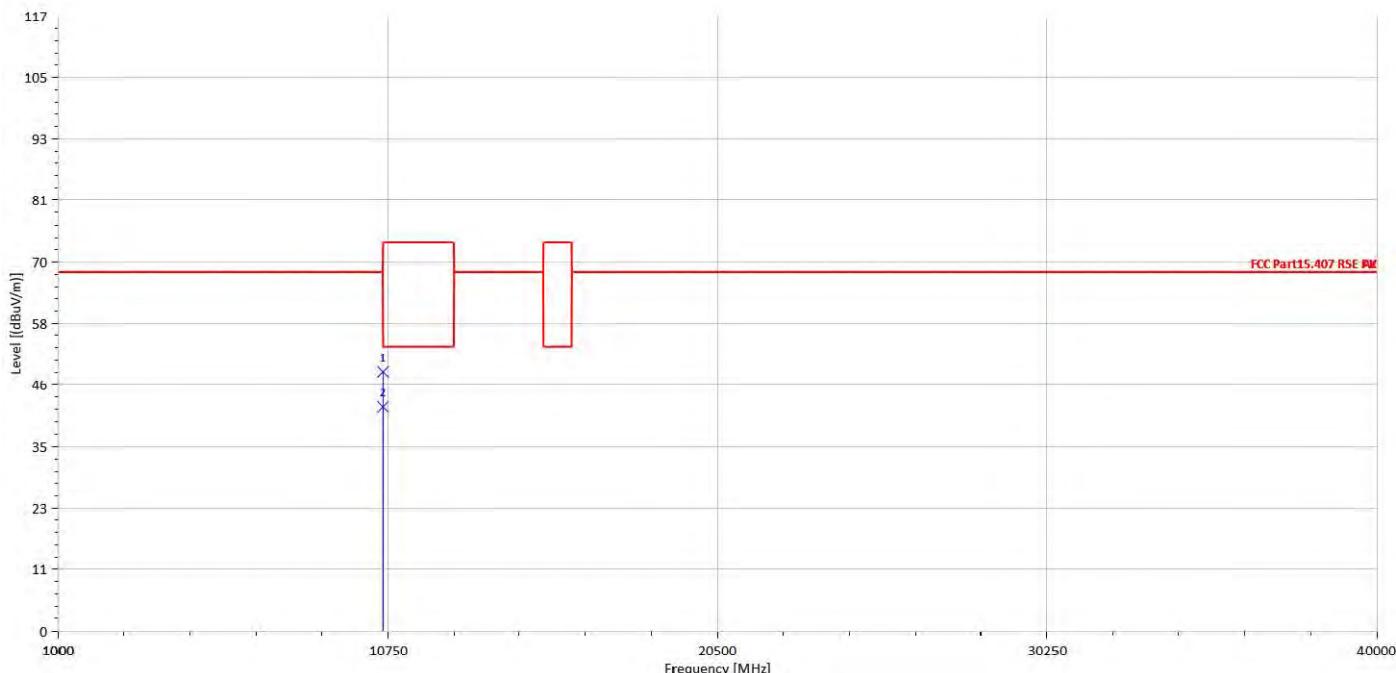
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Operation Band :802.11 a  
 Fundamental Frequency :5300 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |  | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--|--------------|------------------------|------------------------|----------------------|
|              |                 |                              |                           |  |              |                        |                        |                      |
| 10600.00     | H               | Peak                         | 29.96                     |  | 19.38        | 49.33                  | 74                     | -24.67               |
| 10600.00     | H               | Average                      | 23.26                     |  | 19.38        | 42.64                  | 54                     | -11.36               |

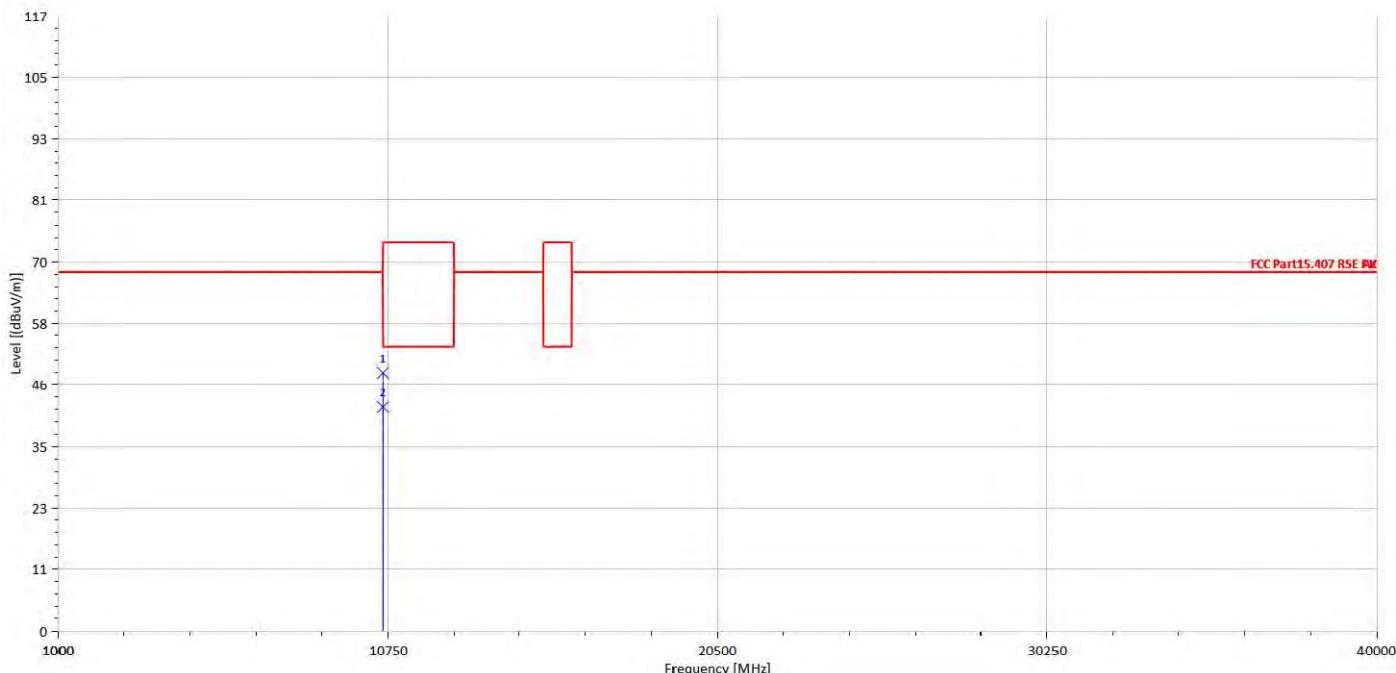
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Operation Band :802.11 a  
 Fundamental Frequency :5300 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | 29.76 |              |                        |                        |                      |
| 10600.00     | H               | Average                      | 23.25                     | 19.38 | 49.14        | 74                     | -24.86                 |                      |
| 10600.00     | H               | Average                      | 23.25                     | 19.38 | 42.63        | 54                     | -11.37                 |                      |

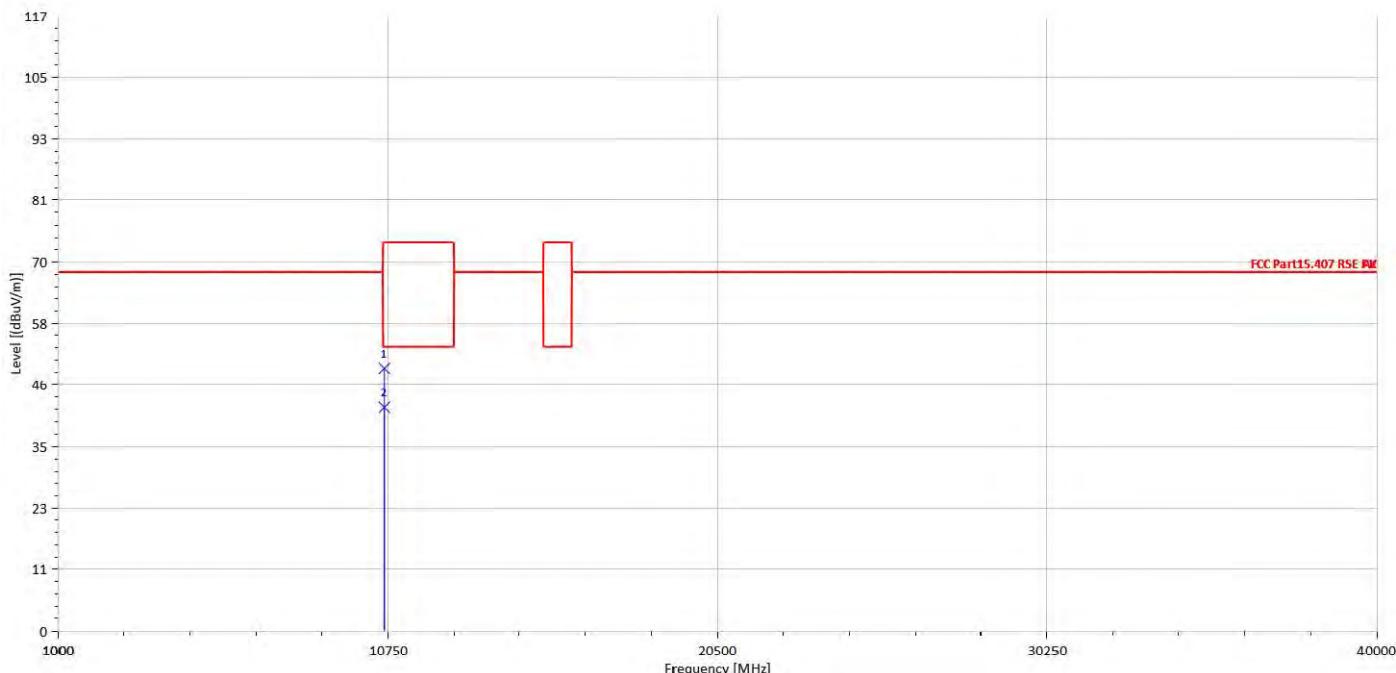
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Operation Band :802.11 a  
Fundamental Frequency :5320 MHz  
Operation Mode :TX HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |         | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|---------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | Average |              |                        |                        |                      |
| 10640.00     | H               | Peak                         | 30.70                     |         | 19.28        | 49.98                  | 74                     | -24.02               |
| 10640.00     | H               | Average                      |                           | 23.29   | 19.28        | 42.57                  | 54                     | -11.43               |

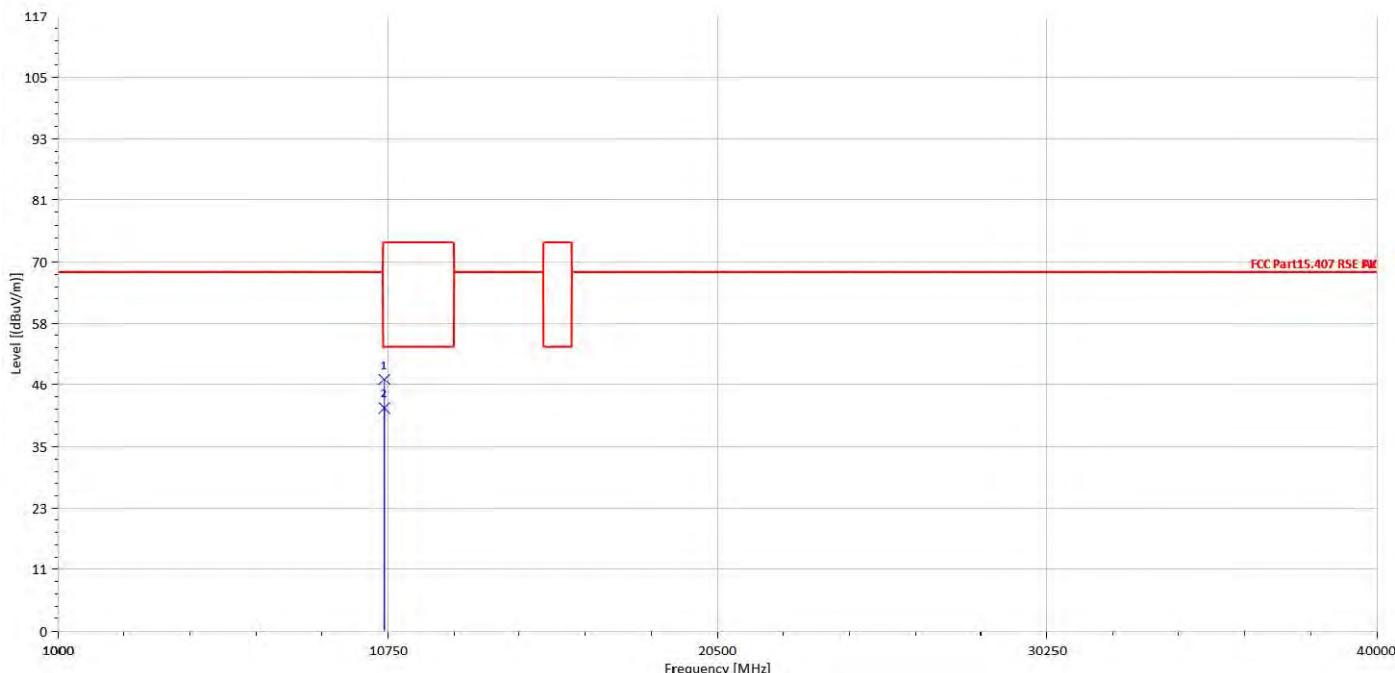
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Operation Band :802.11 a  
Fundamental Frequency :5320 MHz  
Operation Mode :TX HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor | Actual<br>FS<br>dB | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------|--------------------|------------------------|----------------------|
|              |                 |                              | dBμV                      | dB    |        |                    |                        |                      |
| 10640.00     | H               | Peak                         | 28.59                     | 19.28 | 47.87  | 74                 | -26.13                 |                      |
| 10640.00     | H               | Average                      | 23.17                     | 19.28 | 42.45  | 54                 | -11.55                 |                      |

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**Band edge falling to restricted band**

Operation Band :802.11 a  
 Fundamental Frequency :5320 MHz  
 Operation Mode :Band Edge HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5350.00      | E               | Peak                         | 42.82                                   | 11.30        | 54.12              | 74                  | -19.88 |
| 5350.00      | E               | Average                      | 31.98                                   | 11.30        | 43.28              | 54                  | -10.72 |

Operation Band :802.11 a  
 Fundamental Frequency :5320 MHz  
 Operation Mode :Band Edge HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5350.00      | E               | Peak                         | 43.27                                   | 11.30        | 54.57              | 74                  | -19.43 |
| 5350.00      | E               | Average                      | 31.97                                   | 11.30        | 43.27              | 54                  | -10.73 |

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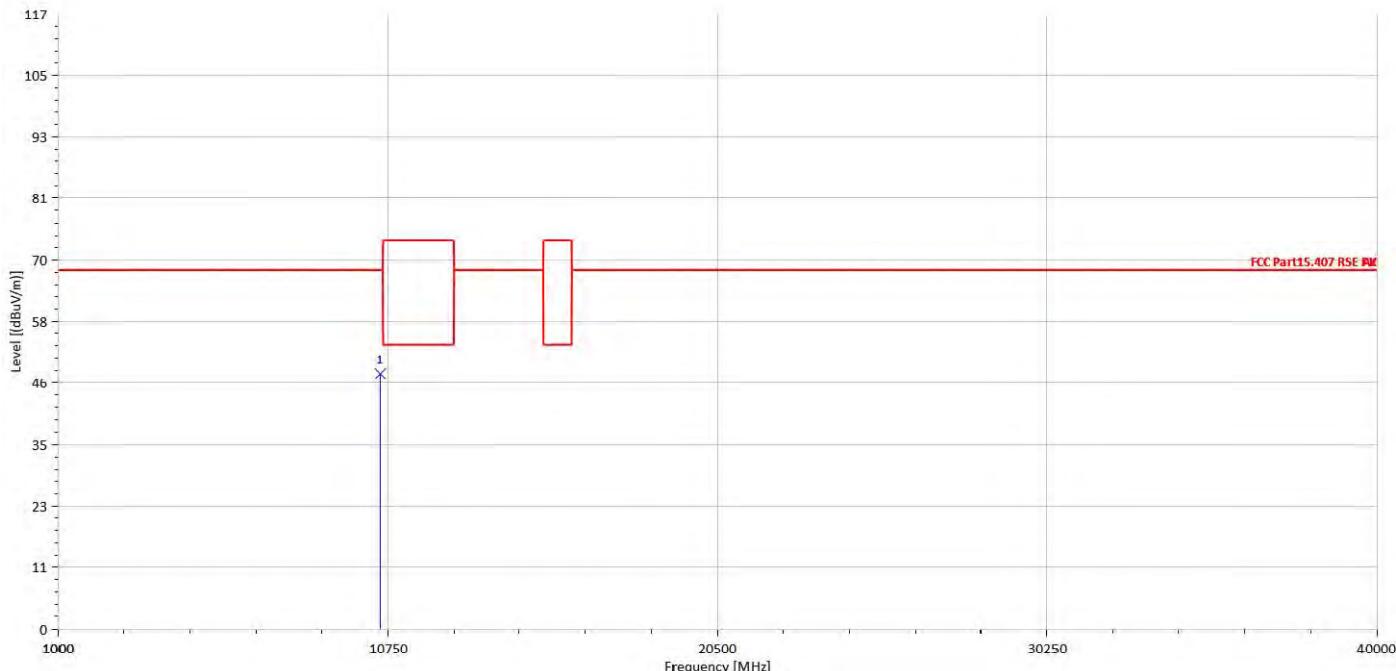
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**Radiated Spurious Emission Measurement Result 802.11n HT20, 5250~5350 MHz**

Operation Band :802.11 n20M Test Date :2015-12-17  
Fundamental Frequency :5260 MHz Temp./Humi. :26.5 deg\_C / 50 RH  
Operation Mode :TX LOW Engineer :Vito  
EUT Pol. :H Plan Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---|--------------|------------------------------|------------------------------|----------------------|
| 10520.00     | H               | Peak                         | 29.32                                   | 19.25        | 48.57                        | 68.3                         | -19.73               |

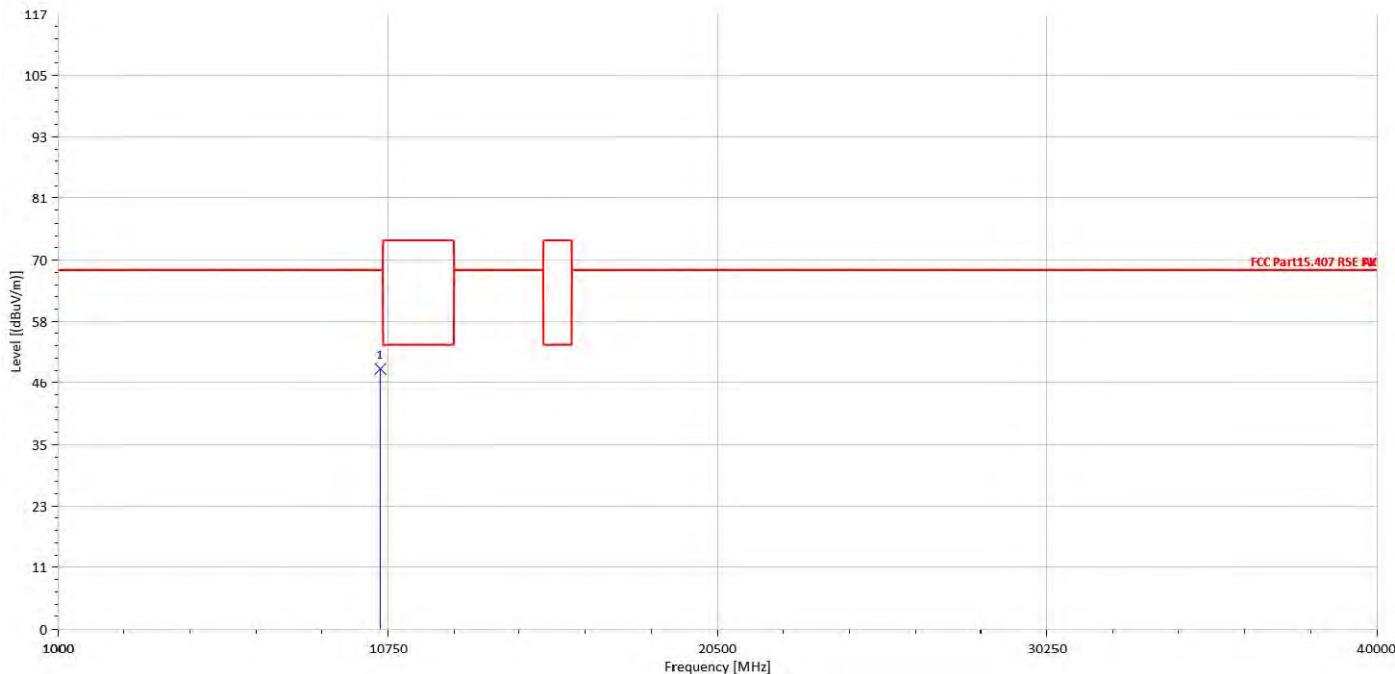
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Operation Band :802.11 n20M  
Fundamental Frequency :5260 MHz  
Operation Mode :TX LOW  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |              | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--------------|--------------|------------------------------|------------------------------|----------------------|
|              |                 |                              | Spectrum<br>Reading Level | Factor<br>dB |              |                              |                              |                      |
| 10520.00     | H               | Peak                         | 30.27                     | 19.25        | 49.52        | 68.3                         | -18.78                       |                      |

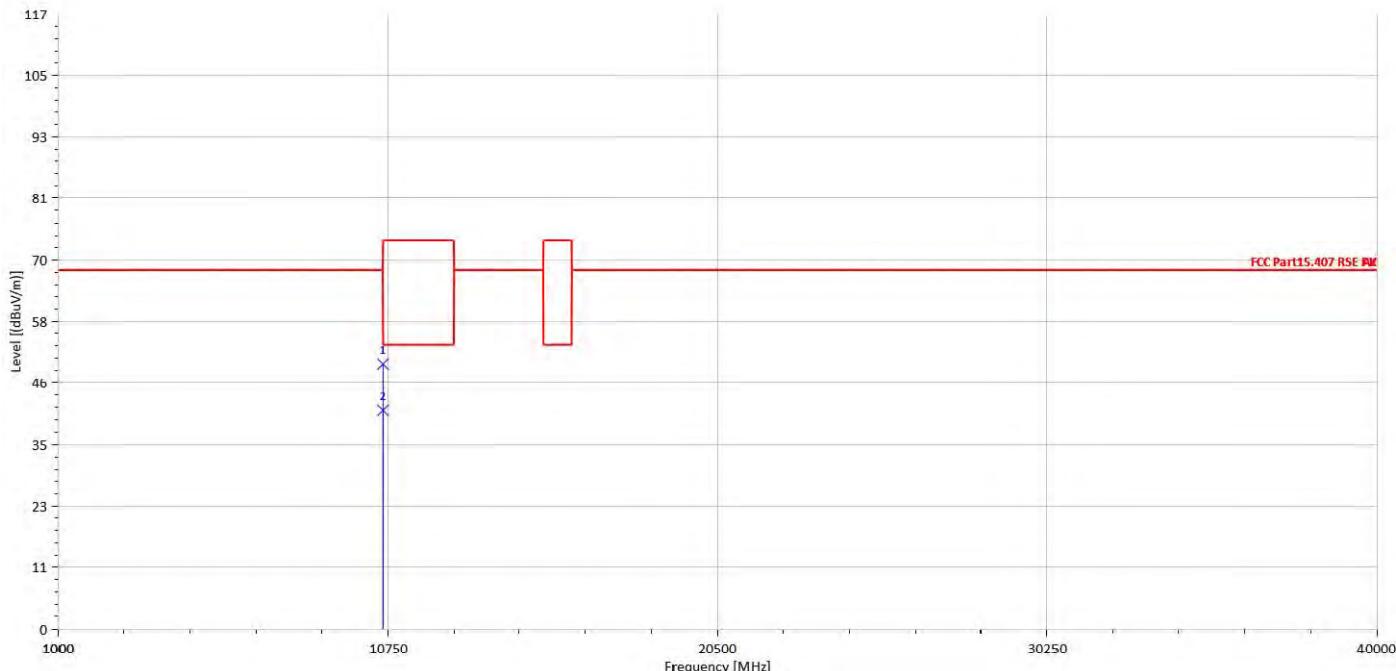
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Operation Band :802.11 n20M  
 Fundamental Frequency :5300 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | 22.26 |              |                        |                        |                      |
| 10600.00     | H               | Peak                         | 31.03                     | 19.38 | 50.41        | 74                     | -23.59                 |                      |
| 10600.00     | H               | Average                      | 22.26                     | 19.38 | 41.64        | 54                     | -12.36                 |                      |

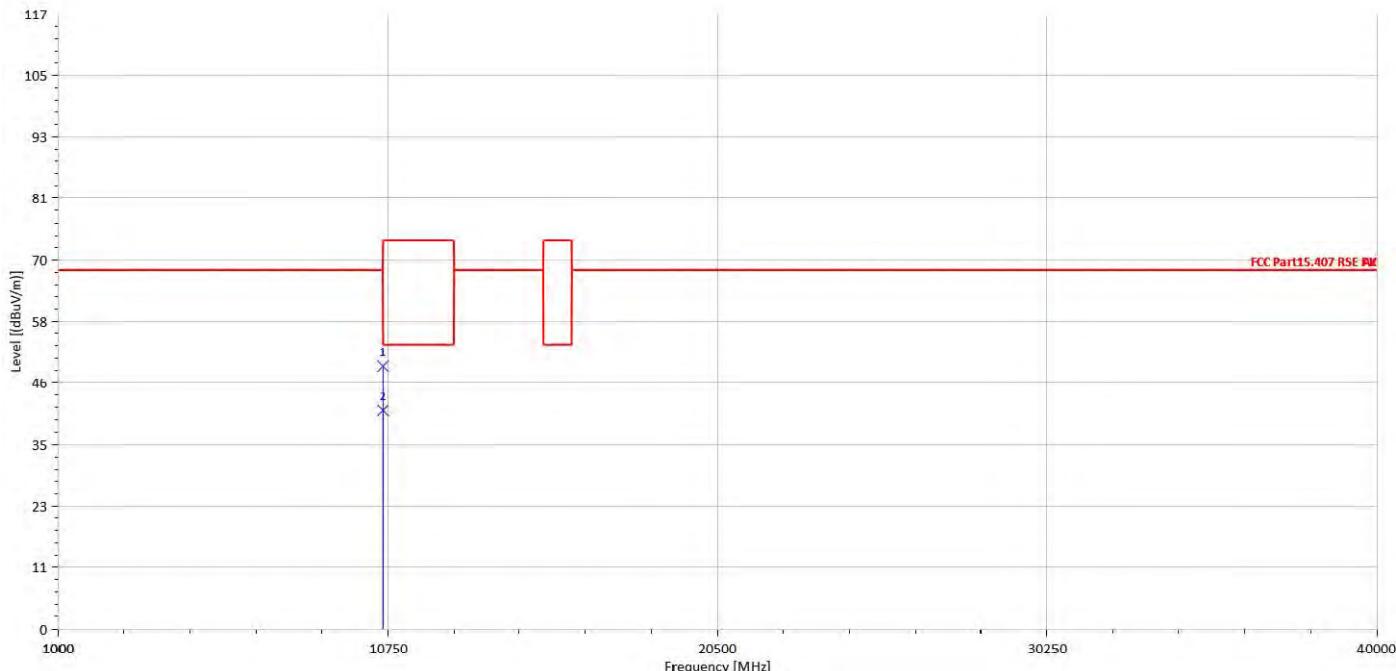
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Operation Band :802.11 n20M  
 Fundamental Frequency :5300 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | 22.25 |              |                        |                        |                      |
| 10600.00     | H               | Peak                         | 30.63                     | 19.38 | 50.01        | 74                     | -23.99                 |                      |
| 10600.00     | H               | Average                      | 22.25                     | 19.38 | 41.63        | 54                     | -12.37                 |                      |

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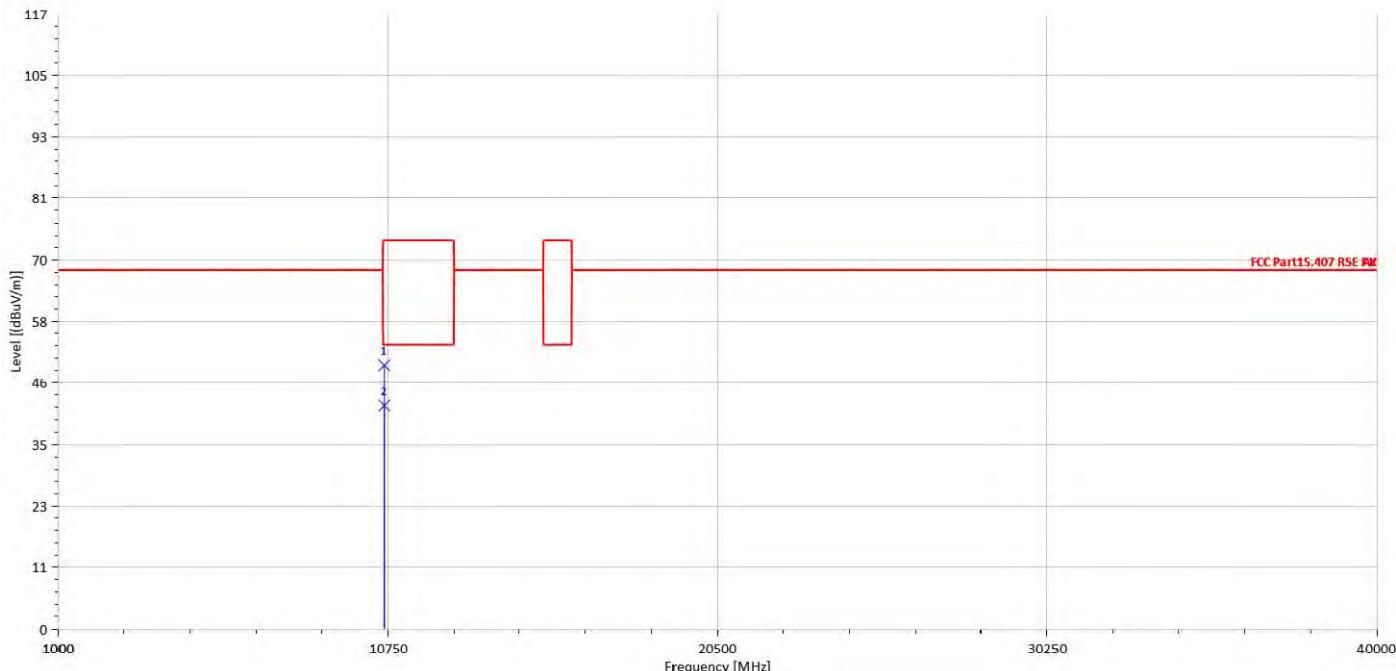
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Operation Band :802.11 n20M  
 Fundamental Frequency :5320 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | 30.90 |              |                        |                        |                      |
| 10640.00     | H               | Average                      | 23.25                     | 19.28 | 50.18        | 74                     | -23.82                 |                      |
| 10640.00     | H               | Average                      | 23.25                     | 19.28 | 42.53        | 54                     | -11.47                 |                      |

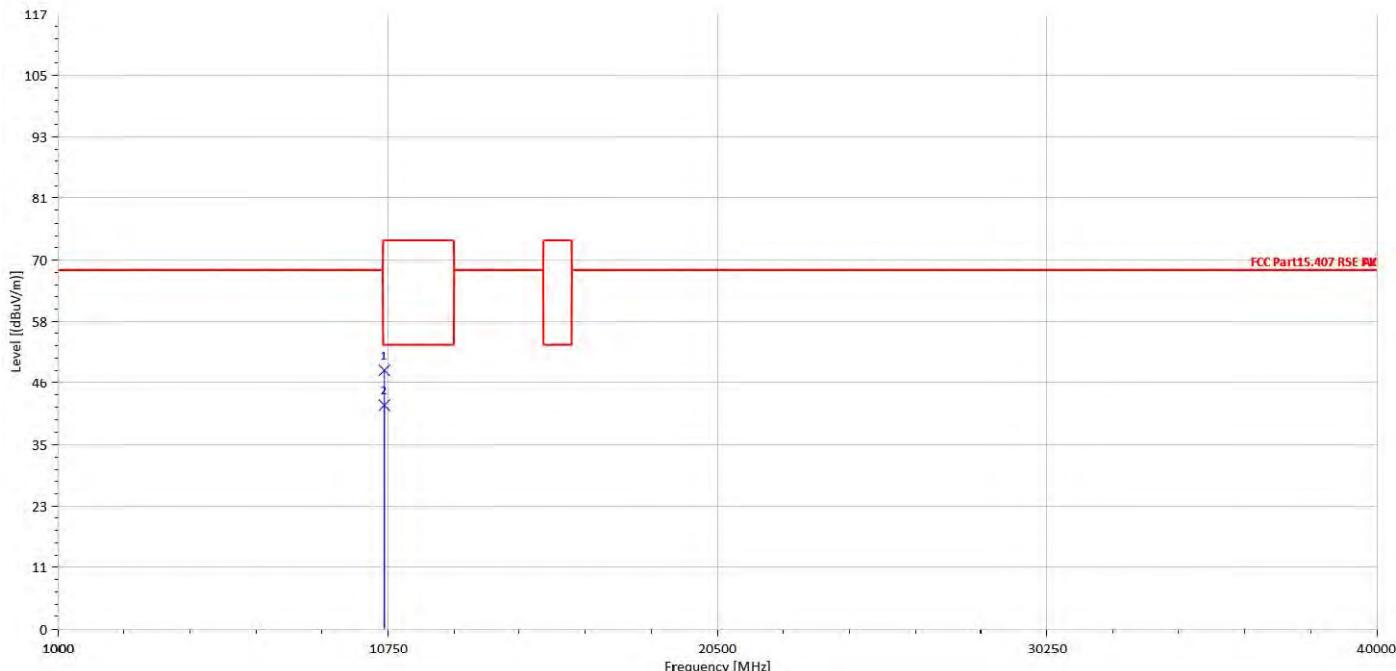
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Operation Band :802.11 n20M  
 Fundamental Frequency :5320 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |  | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--|--------------|------------------------|------------------------|----------------------|
|              |                 |                              |                           |  |              |                        |                        |                      |
| 10640.00     | H               | Peak                         | 29.96                     |  | 19.28        | 49.24                  | 74                     | -24.76               |
| 10640.00     | H               | Average                      | 23.30                     |  | 19.28        | 42.58                  | 54                     | -11.42               |

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**Band edge falling to restricted band**

Operation Band :802.11 n20  
 Fundamental Frequency :5320 MHz  
 Operation Mode :Band Edge HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5350.00      | E               | Peak                         | 47.56                                   | 11.30        | 58.86              | 74                  | -15.14 |
| 5350.00      | E               | Average                      | 33.11                                   | 11.30        | 44.41              | 54                  | -9.59  |

Operation Band :802.11 n20  
 Fundamental Frequency :5320 MHz  
 Operation Mode :Band Edge HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5350.00      | E               | Peak                         | 44.84                                   | 11.30        | 56.14              | 74                  | -17.86 |
| 5350.00      | E               | Average                      | 32.82                                   | 11.30        | 44.12              | 54                  | -9.88  |
| 5352.96      | S               | Peak                         | 46.56                                   | 11.32        | 57.88              | 74                  | -16.12 |
| 5352.96      | S               | Average                      | 32.48                                   | 11.32        | 43.80              | 54                  | -10.20 |

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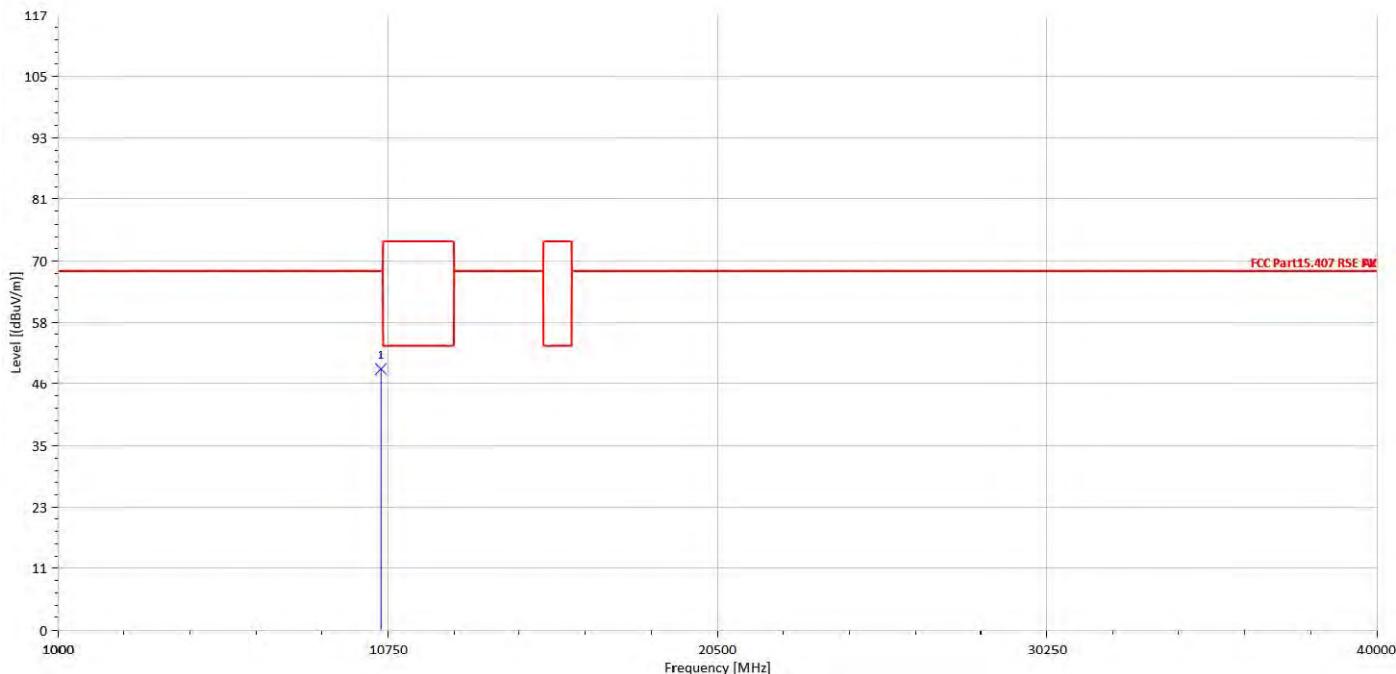
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**Radiated Spurious Emission Measurement Result 802.11n HT40, 5250~5350 MHz**

|                       |              |                          |                     |
|-----------------------|--------------|--------------------------|---------------------|
| Operation Band        | :802.11 n40M | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5270 MHz    | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX LOW      | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan      | Measurement Antenna Pol. | :VERTICAL           |



| Freq.    | Note    | Detector | Spectrum | Factor | Actual | Limit | Safe   |
|----------|---------|----------|----------|--------|--------|-------|--------|
| MHz      | F/H/E/S | Mode     | Reading  | Level  | FS     | @3m   | Margin |
| 10540.00 | H       | Peak     | 30.55    | 19.13  | 49.68  | 68.3  | -18.62 |

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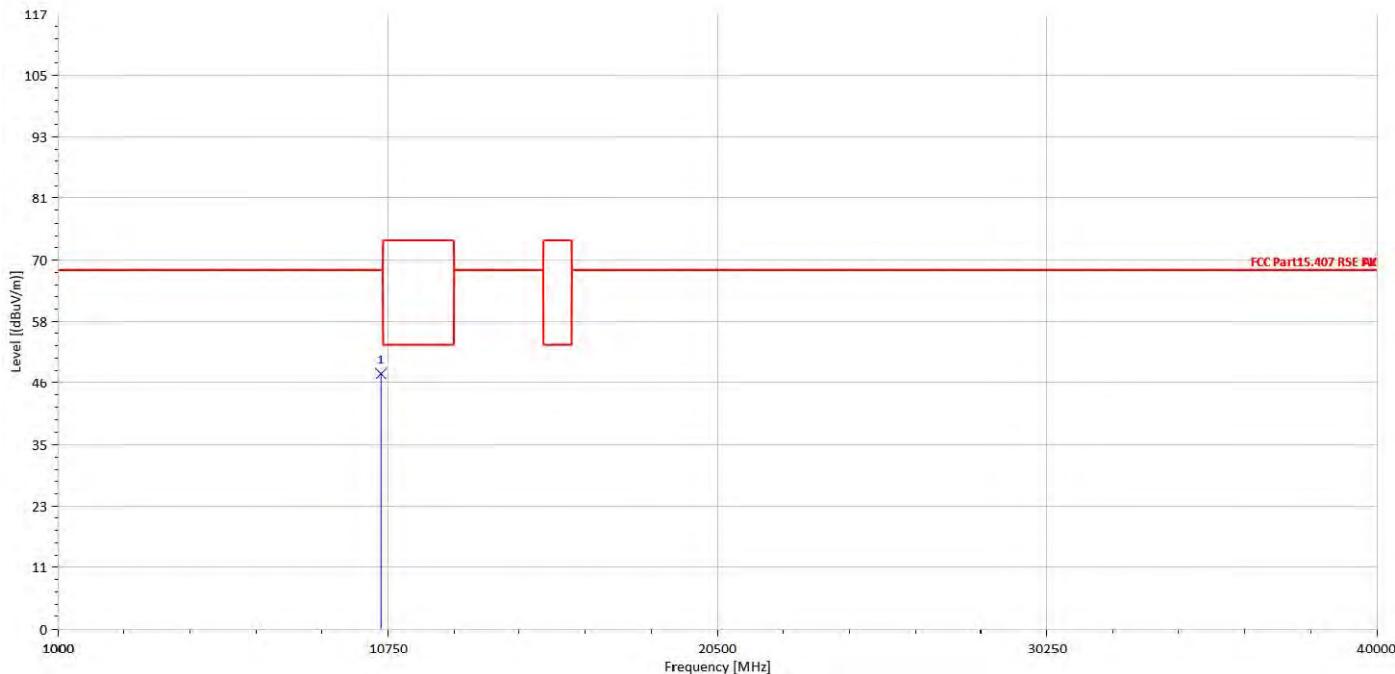
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Operation Band :802.11 n40M  
Fundamental Frequency :5270 MHz  
Operation Mode :TX LOW  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |              | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--------------|--------------|------------------------------|------------------------------|----------------------|
|              |                 |                              | Spectrum<br>Reading Level | Factor<br>dB |              |                              |                              |                      |
| 10540.00     | H               | Peak                         | 29.48                     | 19.13        | 48.61        | 68.3                         | -19.69                       |                      |

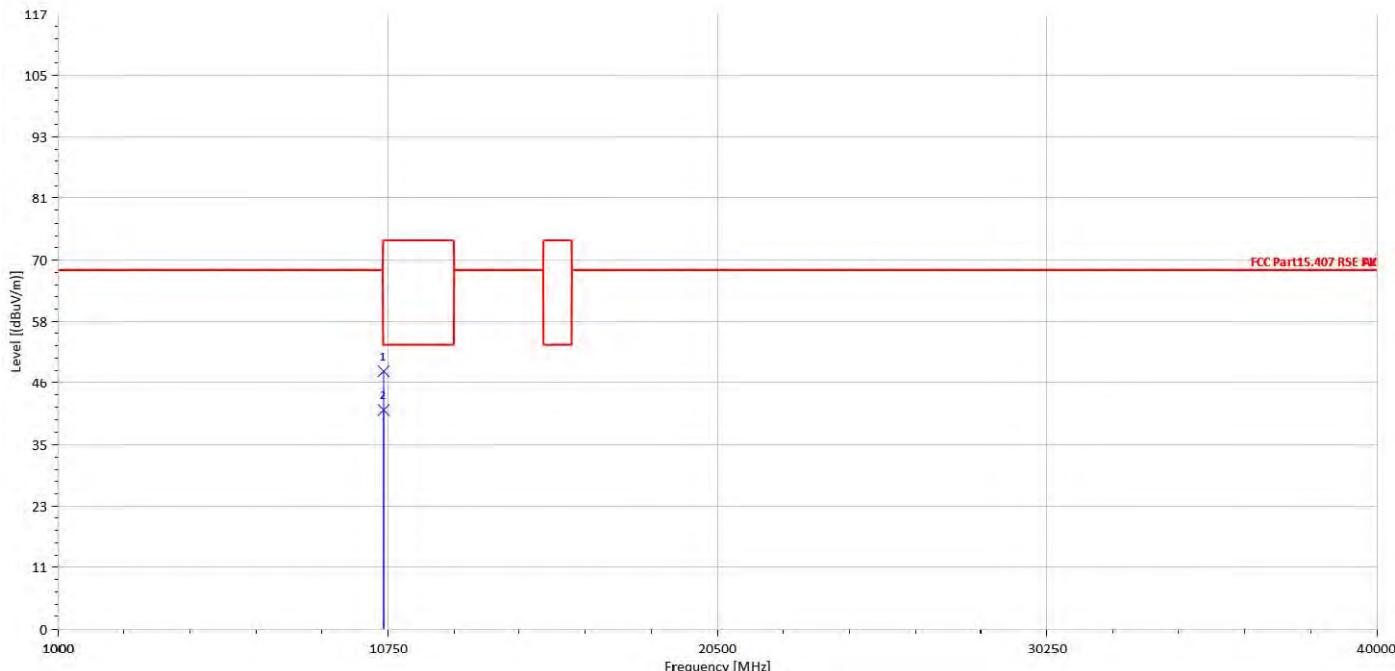
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Operation Band :802.11 n40M  
Fundamental Frequency :5310 MHz  
Operation Mode :TX HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor | Actual<br>FS<br>dB | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------|--------------------|------------------------|----------------------|
|              |                 |                              | dBμV                      | dB    |        |                    |                        |                      |
| 10620.00     | H               | Peak                         | 29.70                     | 19.38 | 49.08  | 74                 | -24.92                 |                      |
| 10620.00     | H               | Average                      | 22.31                     | 19.38 | 41.69  | 54                 | -12.31                 |                      |

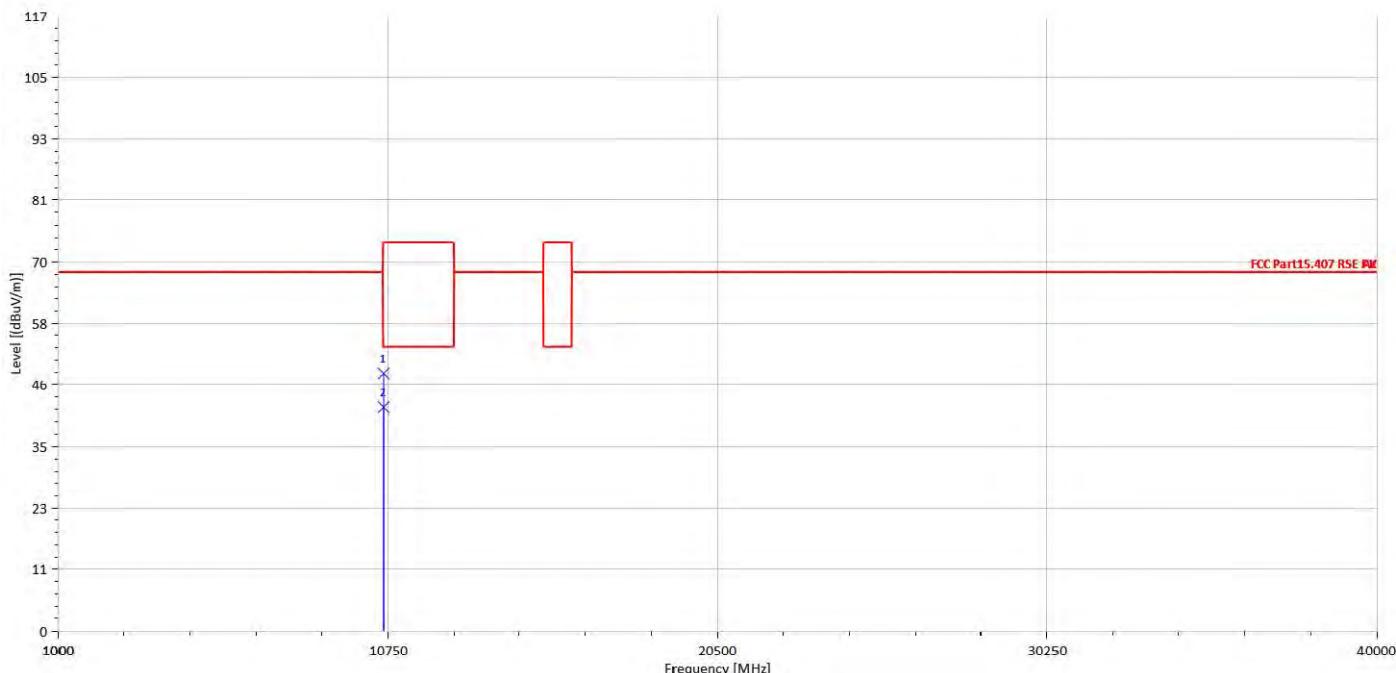
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Operation Band :802.11 n40M  
Fundamental Frequency :5310 MHz  
Operation Mode :TX HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |               | Factor | Actual<br>FS<br>dB | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|---------------|--------|--------------------|------------------------|----------------------|
|              |                 |                              | Reading                   | Level<br>dBμV |        |                    |                        |                      |
| 10620.00     | H               | Peak                         | 29.66                     |               | 19.38  | 49.04              | 74                     | -24.96               |
| 10620.00     | H               | Average                      | 23.21                     |               | 19.38  | 42.59              | 54                     | -11.41               |

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**Band edge falling to restricted band**

Operation Band :802.11 n40  
 Fundamental Frequency :5310 MHz  
 Operation Mode :Band Edge HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5350.00      | E               | Peak                         | 57.59                                   | 11.30        | 68.89              | 74                  | -5.11  |
| 5350.00      | E               | Average                      | 39.99                                   | 11.30        | 51.29              | 54                  | -2.71  |
| 5351.36      | S               | Peak                         | 60.08                                   | 11.32        | 71.40              | 74                  | -2.60  |
| 5351.36      | S               | Average                      | 39.06                                   | 11.32        | 50.38              | 54                  | -3.62  |

Operation Band :802.11 n40  
 Fundamental Frequency :5310 MHz  
 Operation Mode :Band Edge HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5350.00      | E               | Peak                         | 55.30                                   | 11.30        | 66.60              | 74                  | -7.40  |
| 5350.00      | E               | Average                      | 39.20                                   | 11.30        | 50.50              | 54                  | -3.50  |
| 5351.84      | S               | Peak                         | 58.24                                   | 11.32        | 69.56              | 74                  | -4.44  |
| 5351.84      | S               | Average                      | 38.27                                   | 11.32        | 49.59              | 54                  | -4.41  |

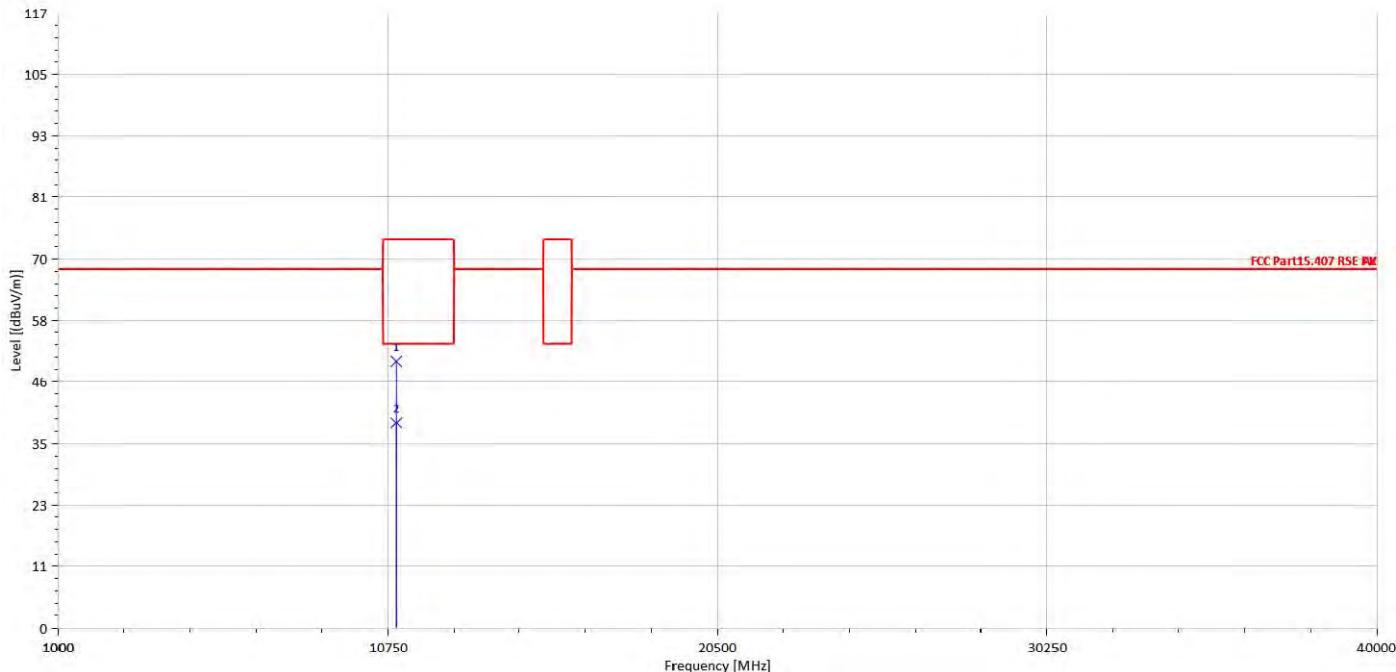
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**Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz**

|                       |           |                          |                     |
|-----------------------|-----------|--------------------------|---------------------|
| Operation Band        | :802.11 a | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5500 MHz | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX LOW   | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan   | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|-----------------------------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              |                                   |              |                        | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
| 11000.00     | H               | Peak                         | 30.72                             | 20.02        | 50.74                  | 74                     | -23.26               |
| 11000.00     | H               | Average                      | 18.99                             | 20.02        | 39.01                  | 54                     | -14.99               |

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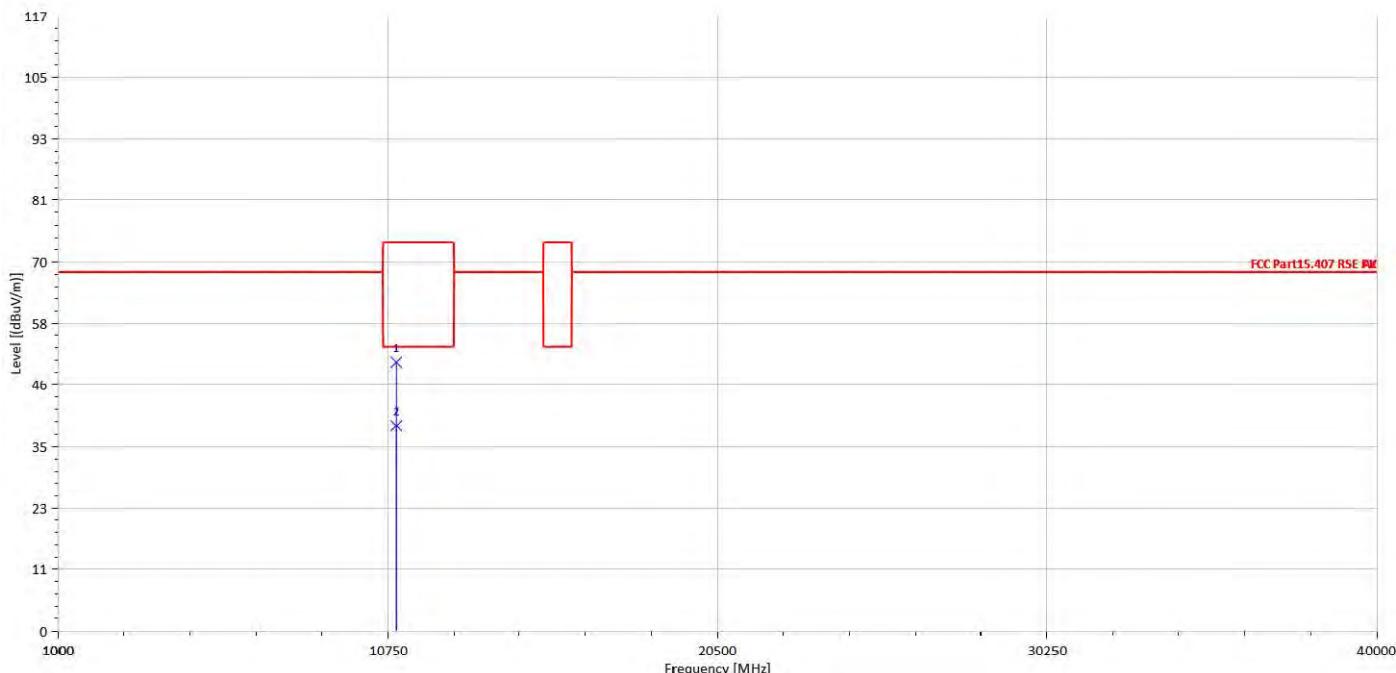
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Member of SGS Group

Operation Band :802.11 a  
 Fundamental Frequency :5500 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |      | Factor<br>dB | Actual<br>FS<br>dBµV/m | Limit<br>@3m<br>dBµV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | dBµV |              |                        |                        |                      |
| 11000.00     | H               | Peak                         | 31.11                     |      | 20.02        | 51.13                  | 74                     | -22.87               |
| 11000.00     | H               | Average                      | 19.01                     |      | 20.02        | 39.03                  | 54                     | -14.97               |

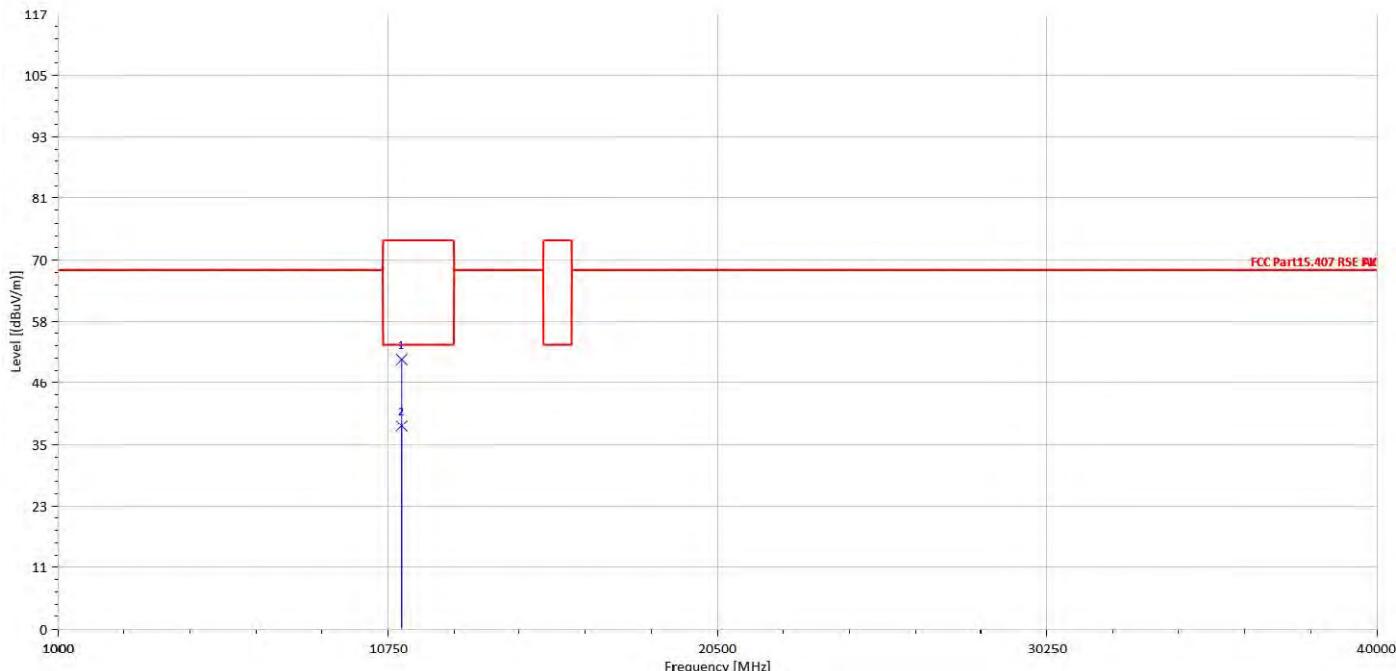
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Operation Band :802.11 a  
 Fundamental Frequency :5580 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |                 | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-----------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak<br>dBμV              | Average<br>dBμV |              |                        |                        |                      |
| 11160.00     | H               | Peak                         | 30.91                     |                 | 20.38        | 51.29                  | 74                     | -22.71               |
| 11160.00     | H               | Average                      |                           | 18.24           | 20.38        | 38.62                  | 54                     | -15.38               |

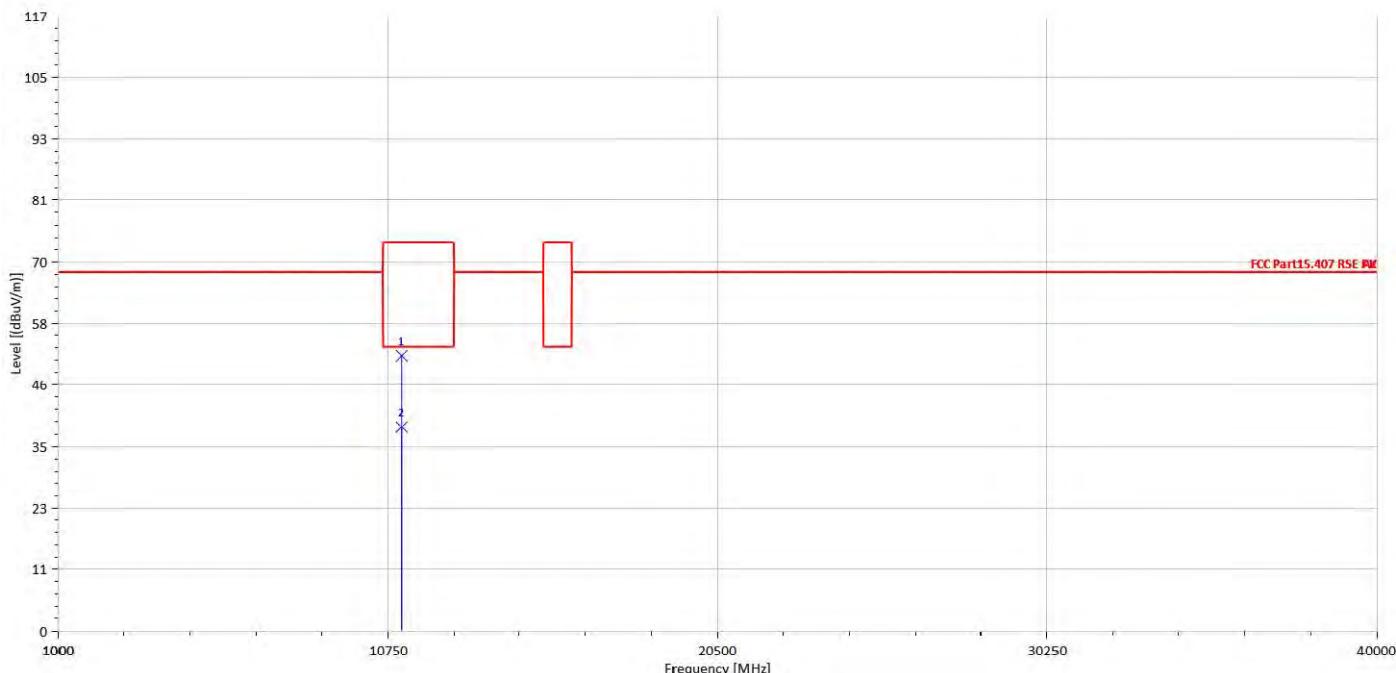
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Operation Band :802.11 a  
 Fundamental Frequency :5580 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |              | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Spectrum<br>Reading Level | Factor<br>dB |              |                        |                        |                      |
| 11160.00     | H               | Peak                         | 31.97                     | 20.38        | 52.35        | 74                     | -21.65                 |                      |
| 11160.00     | H               | Average                      | 18.42                     | 20.38        | 38.80        | 54                     | -15.20                 |                      |

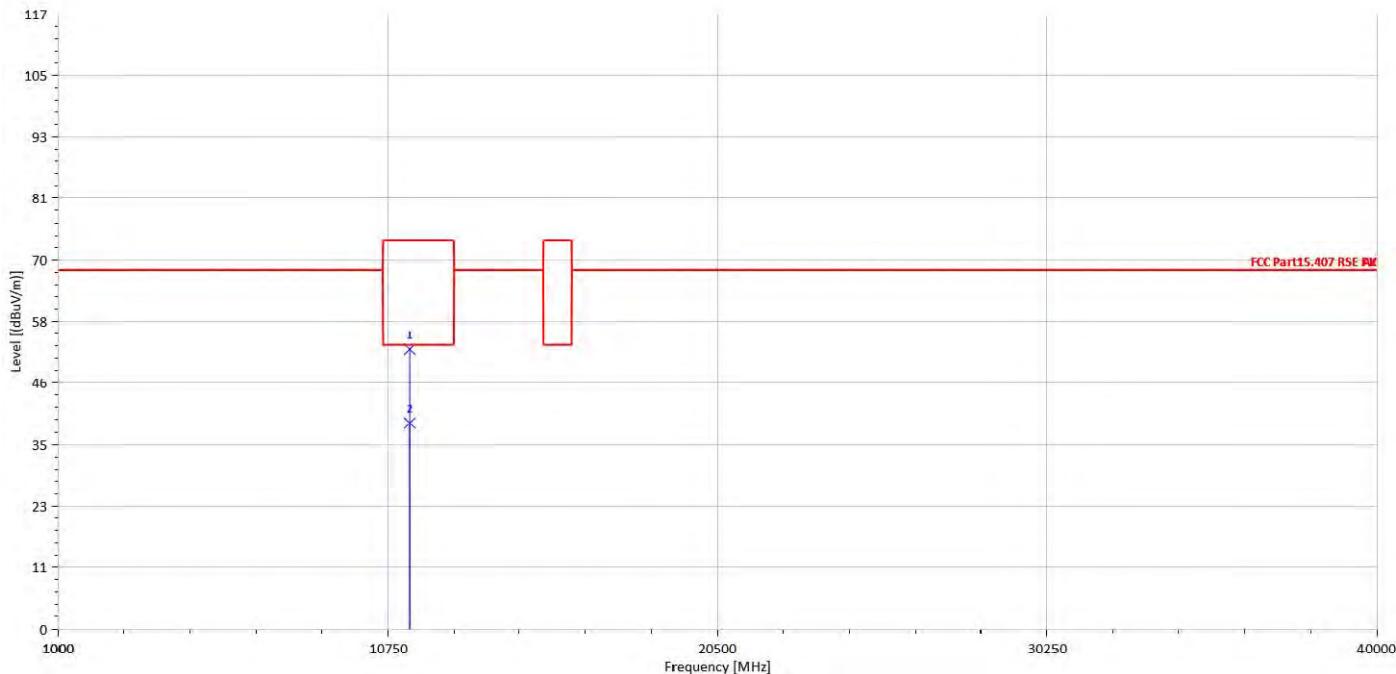
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Operation Band :802.11 a  
 Fundamental Frequency :5700 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |      | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | dBμV |              |                        |                        |                      |
| 11400.00     | H               | Peak                         | 32.38                     |      | 20.81        | 53.19                  | 74                     | -20.81               |
| 11400.00     | H               | Average                      | 18.37                     |      | 20.81        | 39.18                  | 54                     | -14.82               |

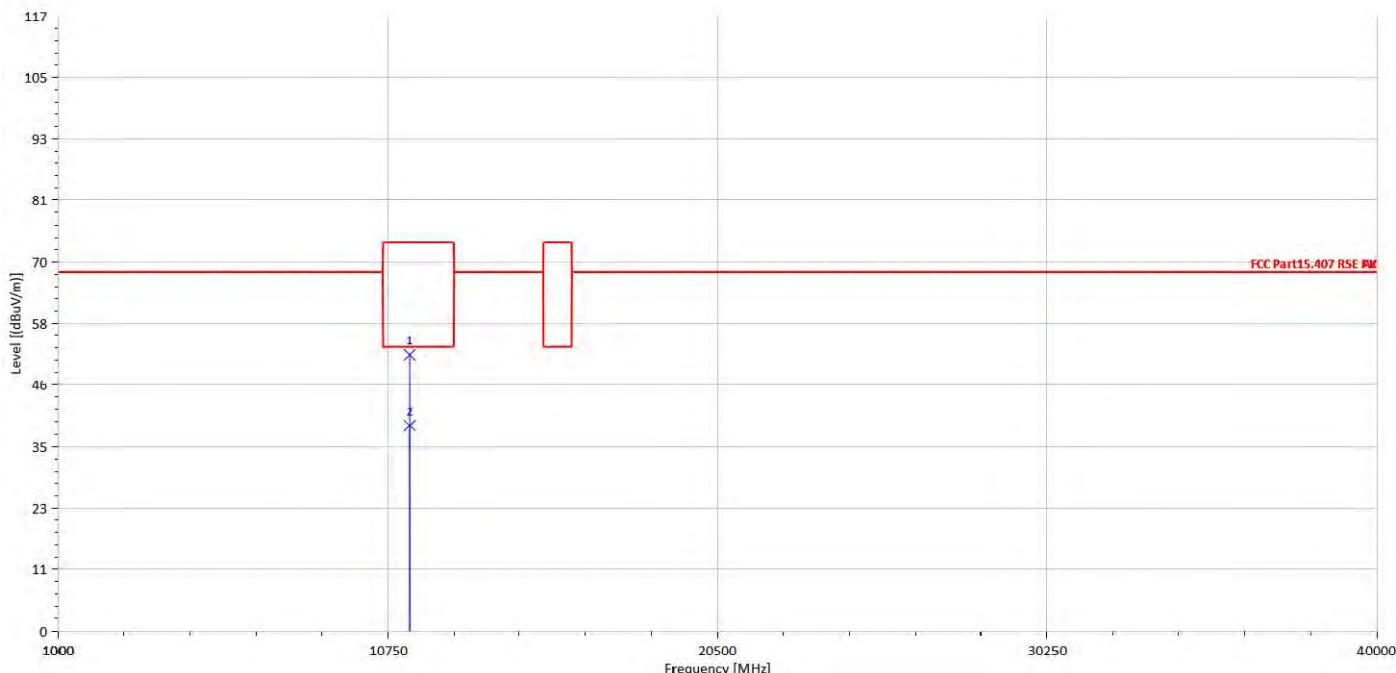
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Operation Band :802.11 a  
 Fundamental Frequency :5700 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |                 | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-----------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak<br>dBμV              | Average<br>dBμV |              |                        |                        |                      |
| 11400.00     | H               | Peak                         | 31.71                     | 20.81           | 52.52        | 74                     | -21.48                 |                      |
| 11400.00     | H               | Average                      | 18.27                     | 20.81           | 39.08        | 54                     | -14.92                 |                      |

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**Band edge falling to restricted band**

Operation Band :802.11 a  
 Fundamental Frequency :5500 MHz  
 Operation Mode :Band Edge LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5459.72      | S               | Peak                         | 52.01                                   | 11.46        | 63.47              | 74                  | -10.53 |
| 5459.72      | S               | Average                      | 34.30                                   | 11.46        | 45.76              | 54                  | -8.24  |
| 5460.00      | E               | Peak                         | 50.56                                   | 11.46        | 62.02              | 74                  | -11.98 |
| 5460.00      | E               | Average                      | 34.35                                   | 11.46        | 45.81              | 54                  | -8.19  |
| 5470.00      | E               | Peak                         | 55.72                                   | 11.46        | 67.18              | 68.3                | -1.12  |

Operation Band :802.11 a  
 Fundamental Frequency :5500 MHz  
 Operation Mode :Band Edge LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual             | Limit               | Margin |
|--------------|-----------------|------------------------------|---|--------------|--------------------|---------------------|--------|
|              |                 |                              |   |              | FS<br>dB $\mu$ V/m | @3m<br>dB $\mu$ V/m | dB     |
| 5460.00      | E               | Peak                         | 46.16                                   | 11.46        | 57.62              | 74                  | -16.38 |
| 5460.00      | E               | Average                      | 32.89                                   | 11.46        | 44.35              | 54                  | -9.65  |
| 5470.00      | E               | Peak                         | 52.01                                   | 11.46        | 63.46              | 68.3                | -4.84  |

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Operation Band :802.11 a  
Fundamental Frequency :5700 MHz  
Operation Mode :Band Edge HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Burly  
Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual<br>dB $\mu$ V/m | Limit<br>@3m | Margin |
|--------------|-----------------|------------------------------|---|--------------|------------------------|--------------|--------|
|              |                 |                              |   |              |                        | dB $\mu$ V/m | dB     |
| 5725.00      | E               | Peak                         | 53.01                                   | 12.27        | 65.28                  | 68.3         | -3.02  |

Operation Band :802.11 a  
Fundamental Frequency :5700 MHz  
Operation Mode :Band Edge HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Burly  
Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual<br>dB $\mu$ V/m | Limit<br>@3m | Margin |
|--------------|-----------------|------------------------------|---|--------------|------------------------|--------------|--------|
|              |                 |                              |   |              |                        | dB $\mu$ V/m | dB     |
| 5725.00      | E               | Peak                         | 48.34                                   | 12.27        | 60.61                  | 68.3         | -7.69  |

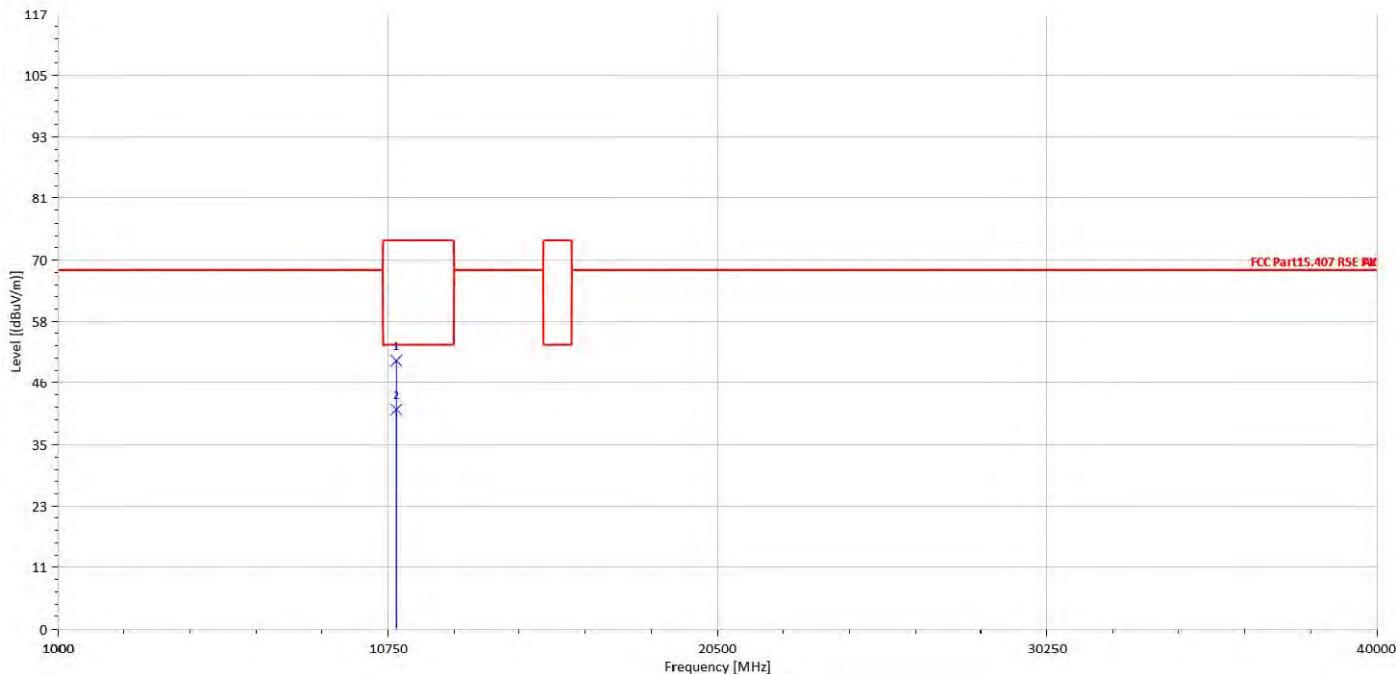
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**Radiated Spurious Emission Measurement Result 802.11n HT20, 5470~5725 MHz**

Operation Band :802.11 n20M Test Date :2015-12-17  
 Fundamental Frequency :5500 MHz Temp./Humi. :26.5 deg\_C / 50 RH  
 Operation Mode :TX LOW Engineer :Vito  
 EUT Pol. :H Plan Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |      | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | dBμV |              |                        |                        |                      |
| 11000.00     | H               | Peak                         | 31.05                     |      | 20.02        | 51.06                  | 74                     | -22.94               |
| 11000.00     | H               | Average                      | 21.77                     |      | 20.02        | 41.79                  | 54                     | -12.21               |

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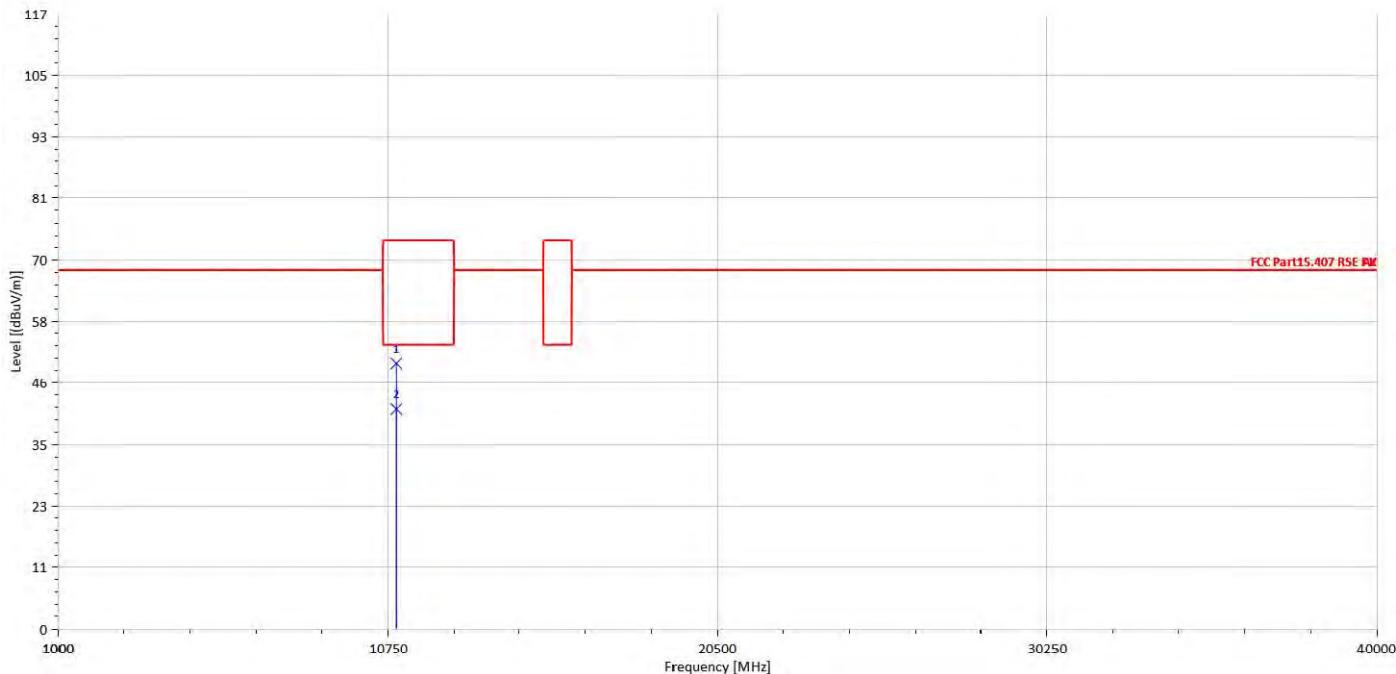
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Operation Band :802.11 n20M  
 Fundamental Frequency :5500 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |               | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|---------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Reading                   | Level<br>dBμV |              |                        |                        |                      |
| 11000.00     | H               | Peak                         | 30.52                     |               | 20.02        | 50.54                  | 74                     | -23.46               |
| 11000.00     | H               | Average                      | 21.85                     |               | 20.02        | 41.87                  | 54                     | -12.13               |

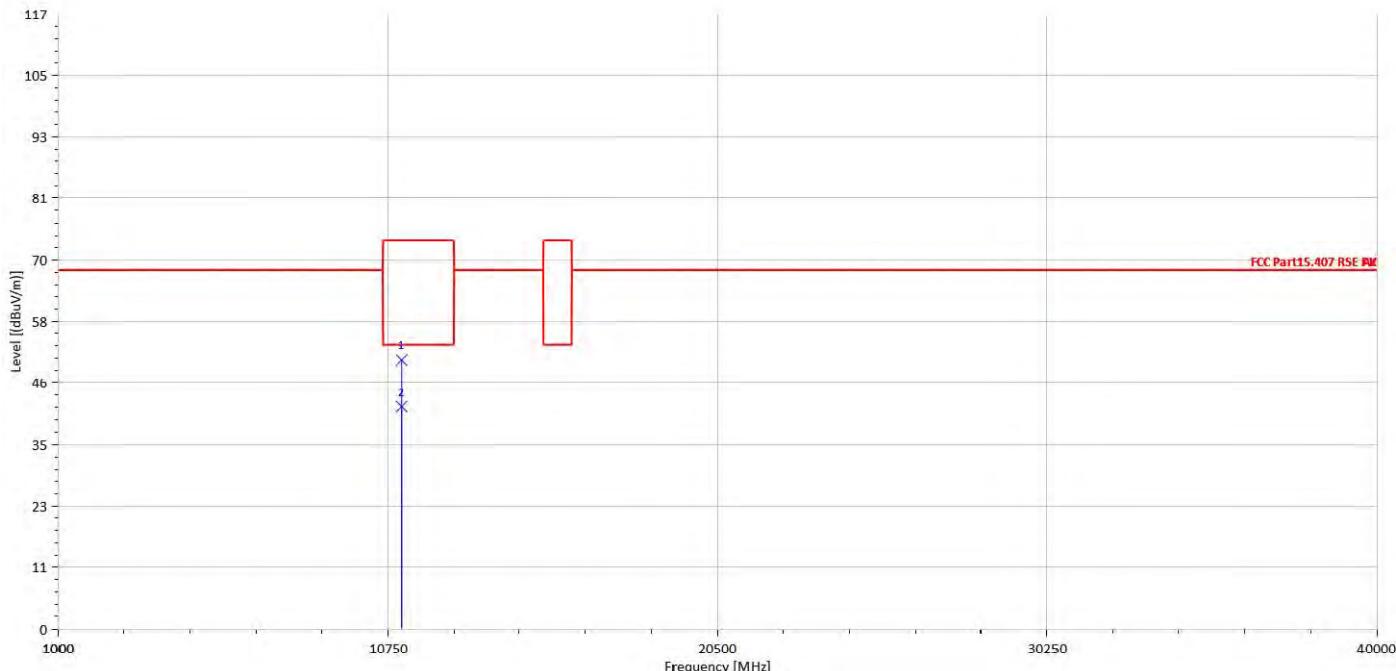
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Operation Band :802.11 n20M  
Fundamental Frequency :5580 MHz  
Operation Mode :TX MID  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | 21.97 |              |                        |                        |                      |
| 11160.00     | H               | Peak                         | 30.78                     |       | 20.38        | 51.16                  | 74                     | -22.84               |
| 11160.00     | H               | Average                      | 21.97                     |       | 20.38        | 42.35                  | 54                     | -11.65               |

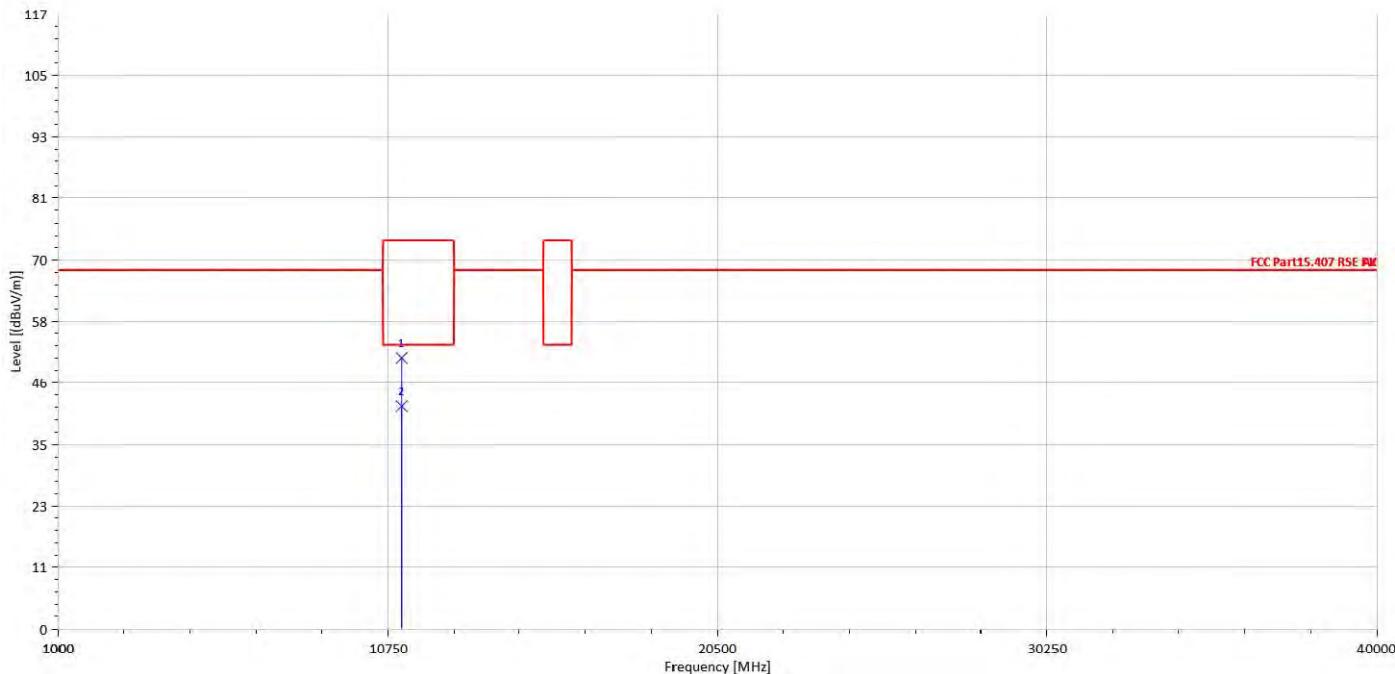
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Operation Band :802.11 n20M  
 Fundamental Frequency :5580 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :26.5 deg\_C / 50 RH  
 Engineer :Vito  
 Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |              | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|--------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Spectrum<br>Reading Level | Factor<br>dB |              |                        |                        |                      |
| 11160.00     | H               | Peak                         | 31.18                     | 20.38        | 51.56        | 74                     | -22.44                 |                      |
| 11160.00     | H               | Average                      | 22.03                     | 20.38        | 42.41        | 54                     | -11.59                 |                      |

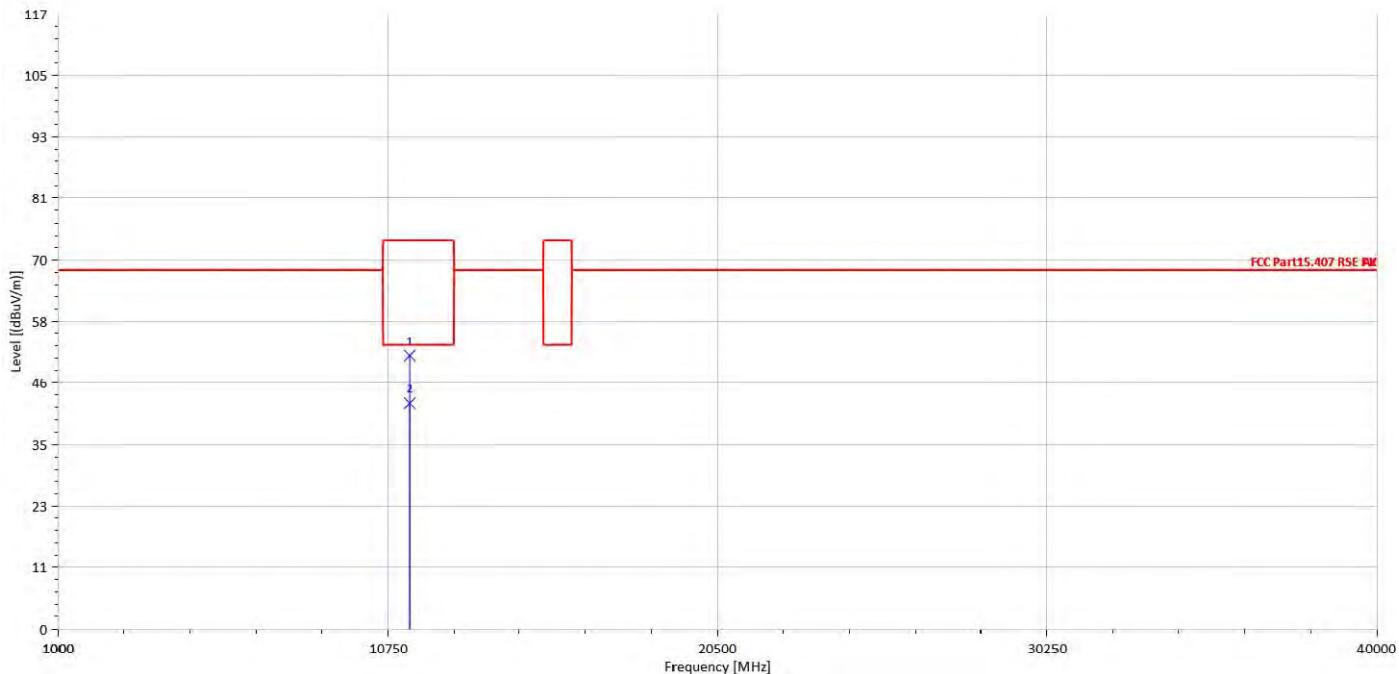
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Operation Band :802.11 n20M  
Fundamental Frequency :5700 MHz  
Operation Mode :TX HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |            | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|------------|--------------|------------------------------|------------------------------|----------------------|
|              |                 |                              | Peak                      | dB $\mu$ V |              |                              |                              |                      |
| 11400.00     | H               | Peak                         | 31.19                     |            | 20.81        | 52.00                        | 74                           | -22.00               |
| 11400.00     | H               | Average                      | 22.14                     |            | 20.81        | 42.95                        | 54                           | -11.05               |

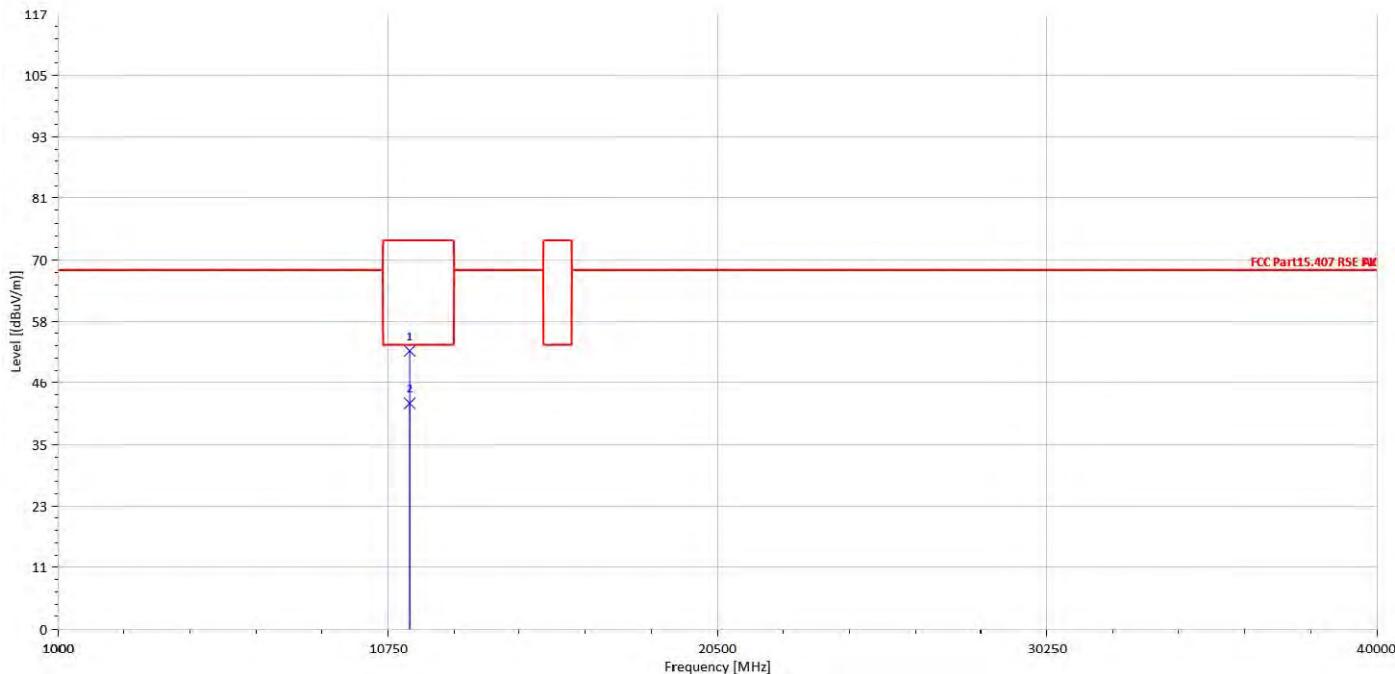
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Operation Band :802.11 n20M  
Fundamental Frequency :5700 MHz  
Operation Mode :TX HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | 32.07 |              |                        |                        |                      |
| 11400.00     | H               | Peak                         | 32.07                     | 20.81 | 52.88        | 74                     | -21.12                 |                      |
| 11400.00     | H               | Average                      | 22.12                     | 20.81 | 42.93        | 54                     | -11.07                 |                      |

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**Band edge falling to restricted band**

Operation Band :802.11 n20  
 Fundamental Frequency :5500 MHz  
 Operation Mode :Band Edge LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor | Actual | Limit | Margin |
|--------------|-----------------|------------------|---------------------------|--------|--------|-------|--------|
|              |                 |                  |                           |        | FS     | @3m   | dB     |
| 5460.00      | E               | Peak             | 46.13                     | 11.46  | 57.59  | 74    | -16.41 |
| 5460.00      | E               | Average          | 33.19                     | 11.46  | 44.65  | 54    | -9.35  |
| 5470.00      | E               | Peak             | 51.98                     | 11.46  | 63.43  | 68.3  | -4.87  |

Operation Band :802.11 n20  
 Fundamental Frequency :5500 MHz  
 Operation Mode :Band Edge LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor | Actual | Limit | Margin |
|--------------|-----------------|------------------|---------------------------|--------|--------|-------|--------|
|              |                 |                  |                           |        | FS     | @3m   | dB     |
| 5460.00      | E               | Peak             | 45.27                     | 11.46  | 56.73  | 74    | -17.27 |
| 5460.00      | E               | Average          | 32.66                     | 11.46  | 44.12  | 54    | -9.88  |
| 5470.00      | E               | Peak             | 49.62                     | 11.46  | 61.08  | 68.3  | -7.22  |

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Operation Band :802.11 n20  
Fundamental Frequency :5700 MHz  
Operation Mode :Band Edge HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Burly  
Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual<br>dB $\mu$ V/m | Limit<br>@3m | Margin |
|--------------|-----------------|------------------------------|---|--------------|------------------------|--------------|--------|
|              |                 |                              |   |              |                        | dB $\mu$ V/m | dB     |
| 5725.00      | E               | Peak                         | 53.97                                   | 12.27        | 66.24                  | 68.3         | -2.06  |

Operation Band :802.11 n20  
Fundamental Frequency :5700 MHz  
Operation Mode :Band Edge HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :24 deg\_C / 61 RH  
Engineer :Burly  
Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual<br>dB $\mu$ V/m | Limit<br>@3m | Margin |
|--------------|-----------------|------------------------------|---|--------------|------------------------|--------------|--------|
|              |                 |                              |   |              |                        | dB $\mu$ V/m | dB     |
| 5725.00      | E               | Peak                         | 51.33                                   | 12.27        | 63.60                  | 68.3         | -4.70  |

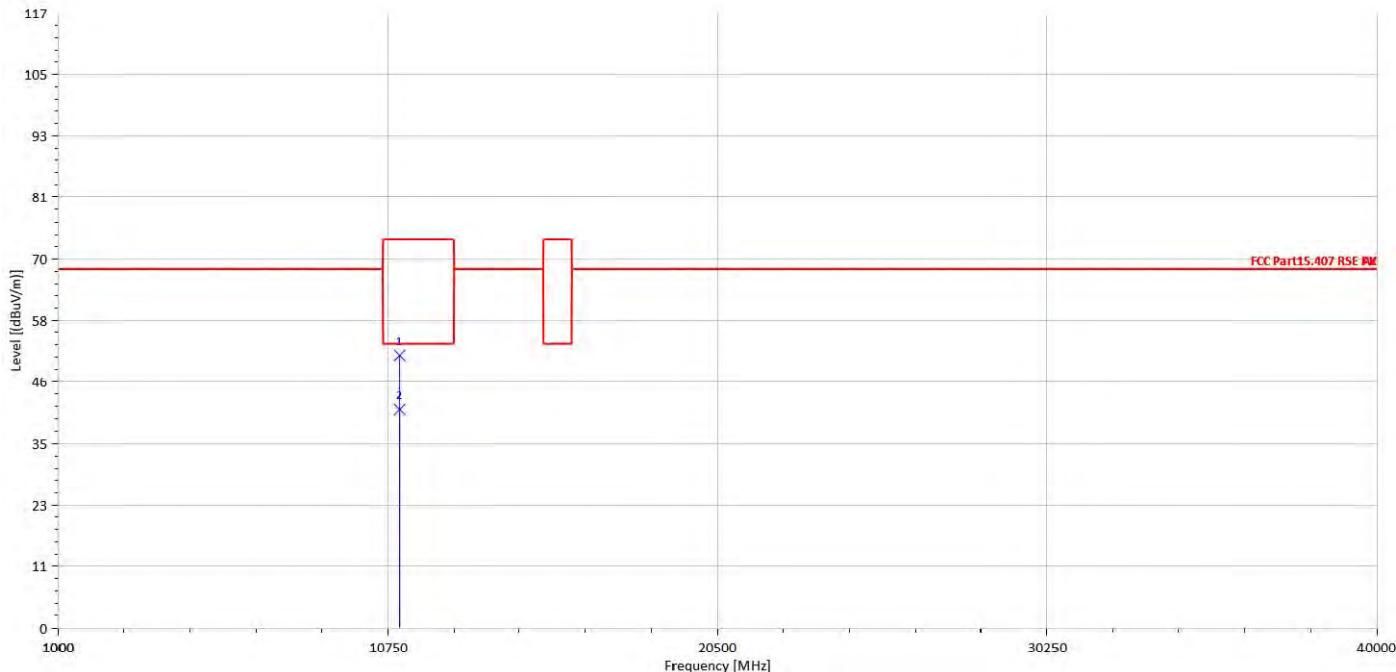
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## Radiated Spurious Emission Measurement Result 802.11n HT40, 5470~5725 MHz

|                       |              |                          |                     |
|-----------------------|--------------|--------------------------|---------------------|
| Operation Band        | :802.11 n40M | Test Date                | :2015-12-17         |
| Fundamental Frequency | :5550 MHz    | Temp./Humi.              | :26.5 deg_C / 50 RH |
| Operation Mode        | :TX LOW      | Engineer                 | :Vito               |
| EUT Pol.              | :H Plan      | Measurement Antenna Pol. | :VERTICAL           |



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dBμV | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|-----------------------------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              |                                   |              |                        | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
| 11100.00     | H               | Peak                         | 31.64                             | 20.21        | 51.85                  | 74                     | -22.15               |
| 11100.00     | H               | Average                      | 21.38                             | 20.21        | 41.59                  | 54                     | -12.41               |

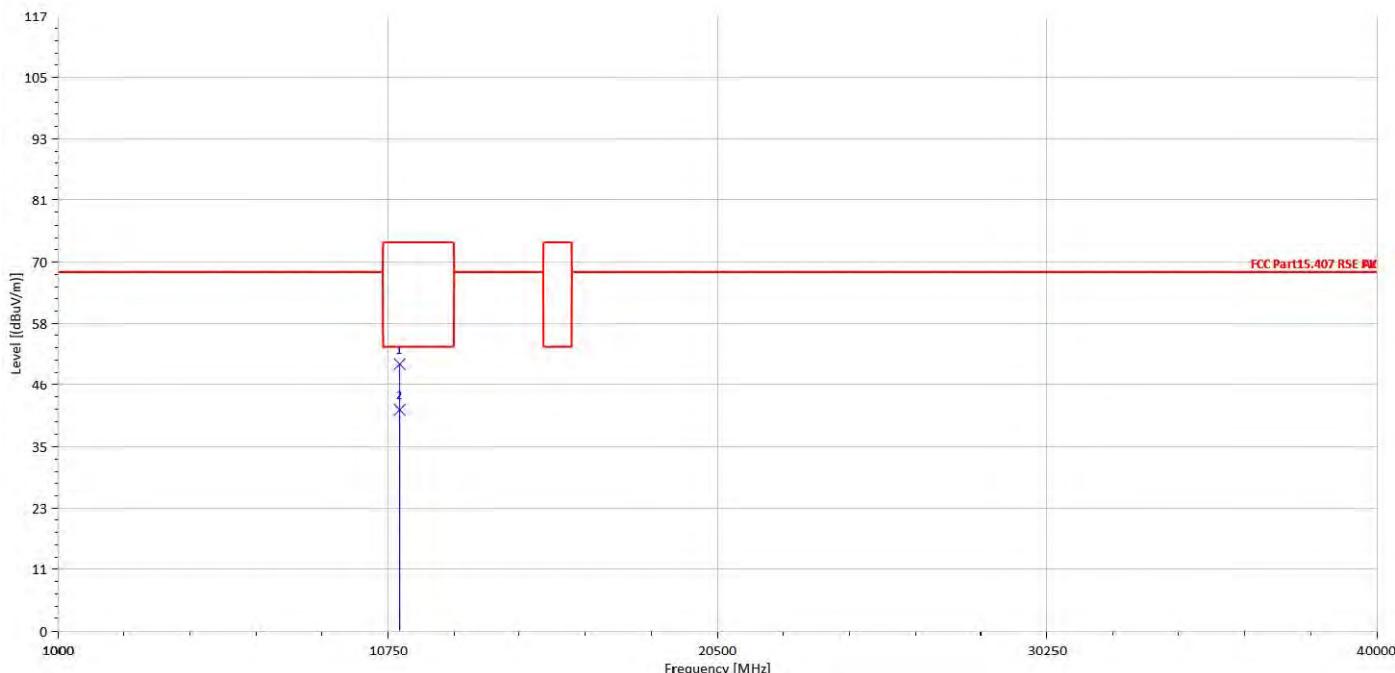
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Operation Band :802.11 n40M  
Fundamental Frequency :5550 MHz  
Operation Mode :TX LOW  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |       | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | 21.89 |              |                        |                        |                      |
| 11100.00     | H               | Peak                         | 30.57                     |       | 20.21        | 50.78                  | 74                     | -23.22               |
| 11100.00     | H               | Average                      | 21.89                     |       | 20.21        | 42.10                  | 54                     | -11.90               |

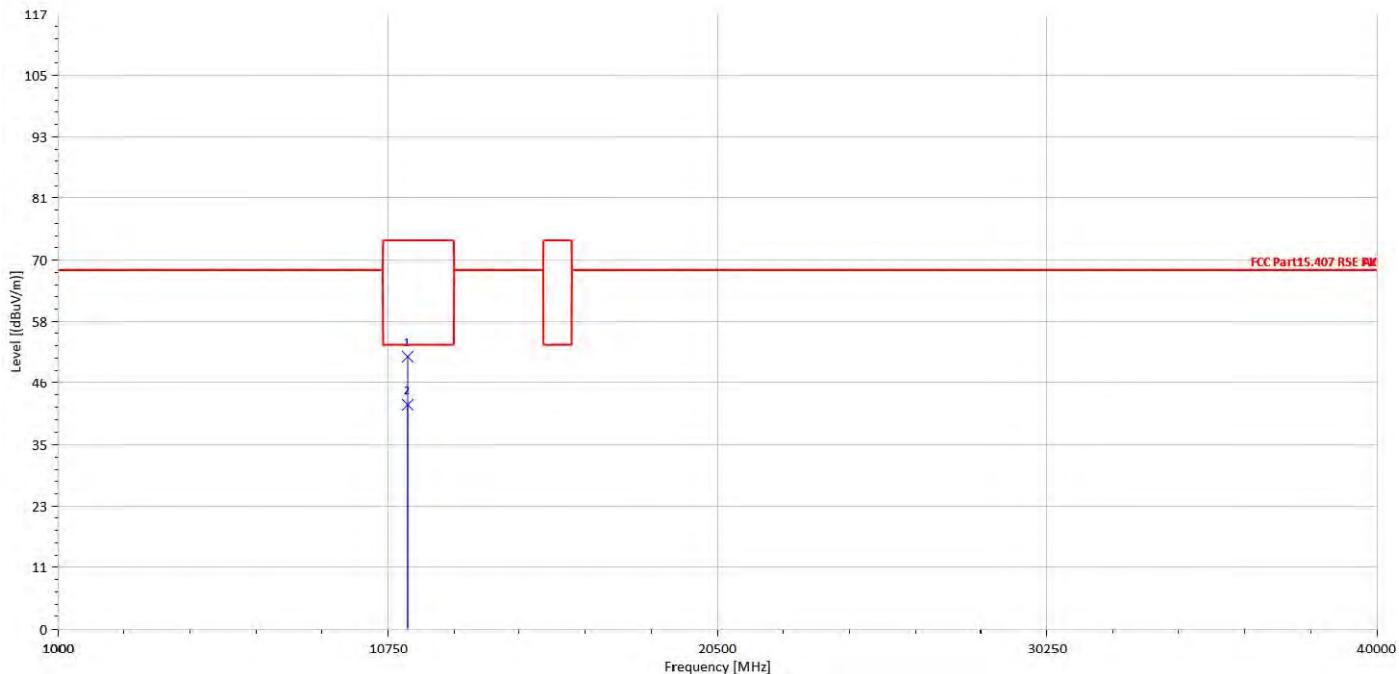
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Operation Band :802.11 n40M  
Fundamental Frequency :5670 MHz  
Operation Mode :TX HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :VERTICAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |                 | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|-----------------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak<br>dBμV              | Average<br>dBμV |              |                        |                        |                      |
| 11340.00     | H               | Peak                         | 31.18                     |                 | 20.61        | 51.79                  | 74                     | -22.21               |
| 11340.00     | H               | Average                      |                           | 22.04           | 20.61        | 42.65                  | 54                     | -11.35               |

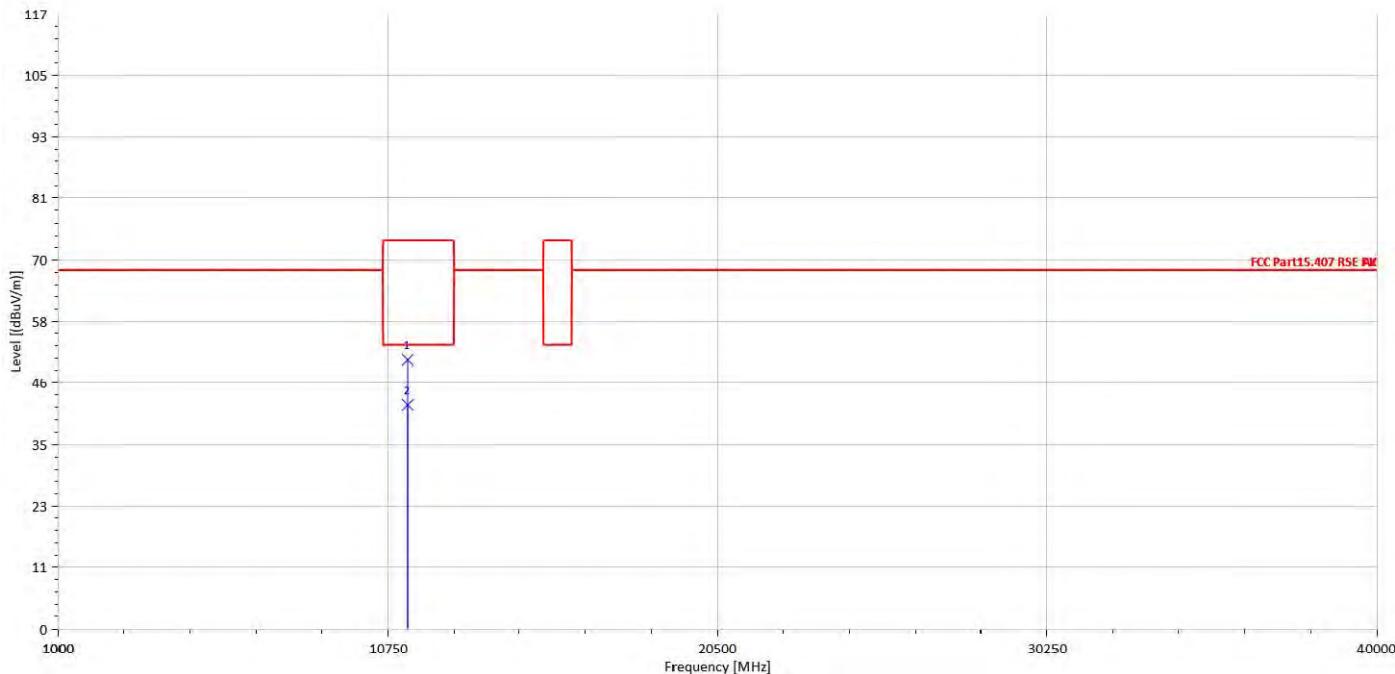
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Operation Band :802.11 n40M  
Fundamental Frequency :5670 MHz  
Operation Mode :TX HIGH  
EUT Pol. :H Plan

Test Date :2015-12-17  
Temp./Humi. :26.5 deg\_C / 50 RH  
Engineer :Vito  
Measurement Antenna Pol. :HORIZONTAL



| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level |      | Factor<br>dB | Actual<br>FS<br>dBμV/m | Limit<br>@3m<br>dBμV/m | Safe<br>Margin<br>dB |
|--------------|-----------------|------------------------------|---------------------------|------|--------------|------------------------|------------------------|----------------------|
|              |                 |                              | Peak                      | dBμV |              |                        |                        |                      |
| 11340.00     | H               | Peak                         | 30.62                     |      | 20.61        | 51.23                  | 74                     | -22.77               |
| 11340.00     | H               | Average                      | 22.03                     |      | 20.61        | 42.64                  | 54                     | -11.36               |

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**Band edge falling to restricted band**

Operation Band :802.11 n40  
 Fundamental Frequency :5550 MHz  
 Operation Mode :Band Edge LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :VERTICAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---|--------------|------------------------------|------------------------------|--------------|
|              |                 |                              |   |              |                              | dB $\mu$ V/m                 | dB           |
| 5460.00      | E               | Peak                         | 46.16                                   | 11.46        | 57.63                        | 74                           | -16.37       |
| 5460.00      | E               | Average                      | 33.76                                   | 11.46        | 45.22                        | 54                           | -8.78        |
| 5470.00      | E               | Peak                         | 50.12                                   | 11.46        | 61.58                        | 68.3                         | -6.72        |

Operation Band :802.11 n40  
 Fundamental Frequency :5550 MHz  
 Operation Mode :Band Edge LOW  
 EUT Pol. :H Plan

Test Date :2015-12-17  
 Temp./Humi. :24 deg\_C / 61 RH  
 Engineer :Burly  
 Measurement Antenna Pol. :HORIZONTAL

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode<br>PK/QP/AV | Spectrum<br>Reading Level<br>dB $\mu$ V | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin<br>dB |
|--------------|-----------------|------------------------------|---|--------------|------------------------------|------------------------------|--------------|
|              |                 |                              |   |              |                              | dB $\mu$ V/m                 | dB           |
| 5460.00      | E               | Peak                         | 45.84                                   | 11.46        | 57.30                        | 74                           | -16.70       |
| 5460.00      | E               | Average                      | 33.12                                   | 11.46        | 44.58                        | 54                           | -9.42        |
| 5469.60      | S               | Peak                         | 46.89                                   | 11.46        | 58.35                        | 68.3                         | -9.95        |
| 5470.00      | E               | Peak                         | 45.58                                   | 11.46        | 57.04                        | 68.3                         | -11.26       |

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|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 n40     | Test Date                | :2015-12-17       |
| Fundamental Frequency | :5670 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Burly            |
| EUT Pol.              | :H Plan         | Measurement Antenna Pol. | :VERTICAL         |

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5725.00 | E       | Peak     | 48.06      | 12.27         | 60.33        | 68.3         | -7.97 |        |
| 5726.24 | S       | Peak     | 49.02      | 12.27         | 61.28        | 68.3         | -7.02 |        |

|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 n40     | Test Date                | :2015-12-17       |
| Fundamental Frequency | :5670 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Burly            |
| EUT Pol.              | :H Plan         | Measurement Antenna Pol. | :HORIZONTAL       |

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5725.00 | E       | Peak     | 46.51      | 12.27         | 58.78        | 68.3         | -9.52 |        |

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## 12. TRANSMISSION IN THE ABSENCE OF DATA

### 12.1 Standard Applicable

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

### 12.2 Result

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. the EUT can detect the controlling signal of ASK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

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## 13. FREQUENCY STABILITY

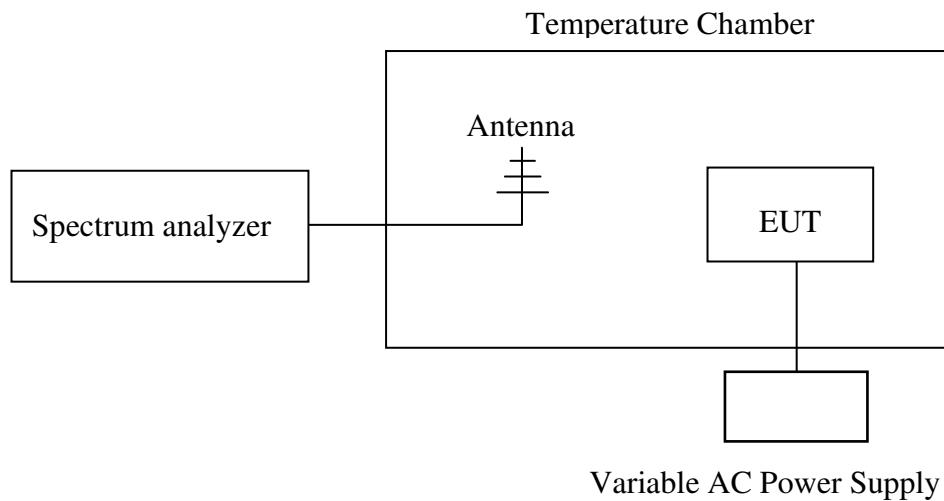
### 13.1 Standard Applicable

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

### 13.2 Measurement Procedure

1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.
2. Set EUT as normal operation.
3. Turn the EUT on and couple its output to spectrum.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT and measure the operating frequency.
6. Repeat step with the temperature chamber set to the lowest temperature.

### 13.3 Test SET-UP



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### 13.4 Measurement Equipment Used

| Conducted Emission Test Site |          |              |               |            |            |
|------------------------------|----------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE               | MFR      | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Spectrum Analyzer            | KEYSIGHT | N9010A       | MY54510568    | 04/14/2015 | 04/13/2016 |
| Temperature Chamber          | TERCHY   | MHK-120LK    | 1020582       | 06/18/2015 | 06/17/2016 |
| DC Power Supply              | Agilent  | E3640A       | MY53140006    | 05/04/2015 | 05/03/2016 |

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### 13.5 Measurement Result

|                |       |           |            |
|----------------|-------|-----------|------------|
| Operation Mode | TX    | Test Date | 2015.06.20 |
| Temperature    | 25 °C | Test By   | Wayne      |
| Humidity       | 62 %  |           |            |

| Test Temp. | Test Voltage | Channel | Measured Frequency (MHz) | Spectrum Frequency (MHz) | ΔFrequency (MHz) |
|------------|--------------|---------|--------------------------|--------------------------|------------------|
| -10 °C     | 16.15V       | 36      | 5180.0000                | 5,179.967102             | 0.0329           |
|            |              | 44      | 5220.0000                | 5,219.966654             | 0.0333           |
|            |              | 48      | 5240.0000                | 5,239.966156             | 0.0338           |
|            |              | 52      | 5260.0000                | 5,259.965547             | 0.0345           |
|            |              | 60      | 5300.0000                | 5,299.965845             | 0.0342           |
|            |              | 64      | 5320.0000                | 5,319.965360             | 0.0346           |
|            |              | 100     | 5500.0000                | 5,499.964131             | 0.0359           |
|            |              | 116     | 5580.0000                | 5,579.964317             | 0.0357           |
|            |              | 140     | 5700.0000                | 5,699.963870             | 0.0361           |
| 25°C       | 19V          | 36      | 5180.0000                | 5,179.967102             | 0.0329           |
|            |              | 44      | 5220.0000                | 5,219.966654             | 0.0333           |
|            |              | 48      | 5240.0000                | 5,239.966156             | 0.0338           |
|            |              | 52      | 5260.0000                | 5,259.965547             | 0.0345           |
|            |              | 60      | 5300.0000                | 5,299.965845             | 0.0342           |
|            |              | 64      | 5320.0000                | 5,319.965360             | 0.0346           |
|            |              | 100     | 5500.0000                | 5,499.964131             | 0.0359           |
|            |              | 116     | 5580.0000                | 5,579.964317             | 0.0357           |
|            |              | 140     | 5700.0000                | 5,699.963870             | 0.0361           |

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|        |        |     |           |              |        |
|--------|--------|-----|-----------|--------------|--------|
| 55°C   | 16.15V | 36  | 5180.0000 | 5,179.967102 | 0.0329 |
|        |        | 44  | 5220.0000 | 5,219.966654 | 0.0333 |
|        |        | 48  | 5240.0000 | 5,239.966156 | 0.0338 |
|        |        | 52  | 5260.0000 | 5,259.965547 | 0.0345 |
|        |        | 60  | 5300.0000 | 5,299.965845 | 0.0342 |
|        |        | 64  | 5320.0000 | 5,319.965360 | 0.0346 |
|        |        | 100 | 5500.0000 | 5,499.964131 | 0.0359 |
|        |        | 116 | 5580.0000 | 5,579.964317 | 0.0357 |
|        |        | 140 | 5700.0000 | 5,699.963870 | 0.0361 |
| -10 °C | 22.8V  | 36  | 5180.0000 | 5,179.967102 | 0.0329 |
|        |        | 44  | 5220.0000 | 5,219.966654 | 0.0333 |
|        |        | 48  | 5240.0000 | 5,239.966156 | 0.0338 |
|        |        | 52  | 5260.0000 | 5,259.965547 | 0.0345 |
|        |        | 60  | 5300.0000 | 5,299.965845 | 0.0342 |
|        |        | 64  | 5320.0000 | 5,319.965360 | 0.0346 |
|        |        | 100 | 5500.0000 | 5,499.964131 | 0.0359 |
|        |        | 116 | 5580.0000 | 5,579.964317 | 0.0357 |
|        |        | 140 | 5700.0000 | 5,699.963870 | 0.0361 |
| 55 °C  | 22.8V  | 36  | 5180.0000 | 5,179.967102 | 0.0329 |
|        |        | 44  | 5220.0000 | 5,219.966654 | 0.0333 |
|        |        | 48  | 5240.0000 | 5,239.966156 | 0.0338 |
|        |        | 52  | 5260.0000 | 5,259.965547 | 0.0345 |
|        |        | 60  | 5300.0000 | 5,299.965845 | 0.0342 |
|        |        | 64  | 5320.0000 | 5,319.965360 | 0.0346 |
|        |        | 100 | 5500.0000 | 5,499.964131 | 0.0359 |
|        |        | 116 | 5580.0000 | 5,579.964317 | 0.0357 |
|        |        | 140 | 5700.0000 | 5,699.963870 | 0.0361 |

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|                |       |           |            |
|----------------|-------|-----------|------------|
| Operation Mode | TX    | Test Date | 2015.06.20 |
| Temperature    | 25 °C | Test By   | Wayne      |
| Humidity       | 62 %  |           |            |

| Test Temp. | Test Voltage | Channel | Measured Frequency (MHz) | Spectrum Frequency (MHz) | ΔFrequency (MHz) |
|------------|--------------|---------|--------------------------|--------------------------|------------------|
| -10 °C     | 16.15V       | 38      | 5190.0000                | 5,189.996544             | 0.0035           |
|            |              | 46      | 5230.0000                | 5,229.991253             | 0.0087           |
|            |              | 54      | 5270.0000                | 5,269.992394             | 0.0076           |
|            |              | 62      | 5310.0000                | 5,309.992431             | 0.0076           |
|            |              | 110     | 5550.0000                | 5,549.992422             | 0.0076           |
|            |              | 134     | 5670.0000                | 5,669.992513             | 0.0075           |
| 25 °C      | 19V          | 38      | 5190.0000                | 5,189.996544             | 0.0035           |
|            |              | 46      | 5230.0000                | 5,229.991253             | 0.0087           |
|            |              | 54      | 5270.0000                | 5,269.992394             | 0.0076           |
|            |              | 62      | 5310.0000                | 5,309.992431             | 0.0076           |
|            |              | 110     | 5550.0000                | 5,549.992422             | 0.0076           |
|            |              | 134     | 5670.0000                | 5,669.992513             | 0.0075           |
| 55 °C      | 16.15V       | 38      | 5190.0000                | 5,189.996544             | 0.0035           |
|            |              | 46      | 5230.0000                | 5,229.991253             | 0.0087           |
|            |              | 54      | 5270.0000                | 5,269.992394             | 0.0076           |
|            |              | 62      | 5310.0000                | 5,309.992431             | 0.0076           |
|            |              | 110     | 5550.0000                | 5,549.992422             | 0.0076           |
|            |              | 134     | 5670.0000                | 5,669.992513             | 0.0075           |

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|        |       |     |           |              |        |
|--------|-------|-----|-----------|--------------|--------|
| -10 °C | 22.8V | 38  | 5190.0000 | 5,189.996544 | 0.0035 |
|        |       | 46  | 5230.0000 | 5,229.991253 | 0.0087 |
|        |       | 54  | 5270.0000 | 5,269.992394 | 0.0076 |
|        |       | 62  | 5310.0000 | 5,309.992431 | 0.0076 |
|        |       | 110 | 5550.0000 | 5,549.992422 | 0.0076 |
|        |       | 134 | 5670.0000 | 5,669.992513 | 0.0075 |
| 55 °C  | 22.8V | 38  | 5190.0000 | 5,189.996544 | 0.0035 |
|        |       | 46  | 5230.0000 | 5,229.991253 | 0.0087 |
|        |       | 54  | 5270.0000 | 5,269.992394 | 0.0076 |
|        |       | 62  | 5310.0000 | 5,309.992431 | 0.0076 |
|        |       | 110 | 5550.0000 | 5,549.992422 | 0.0076 |
|        |       | 134 | 5670.0000 | 5,669.992513 | 0.0075 |

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## 14. ANTENNA REQUIREMENT

### 14.1 Standard Applicable

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

According to §15.407, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 14.2 Antenna Connected Construction

An embedded-in antenna design is used.

Please see EUT photo and antenna spec. for details.

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

*~ End of Report ~*

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