# 8.24. 802.11ac VHT80 ANTENNA - B MODE IN THE 5.2 GHz BAND

# 8.24.1. 26 dB BANDWIDTH

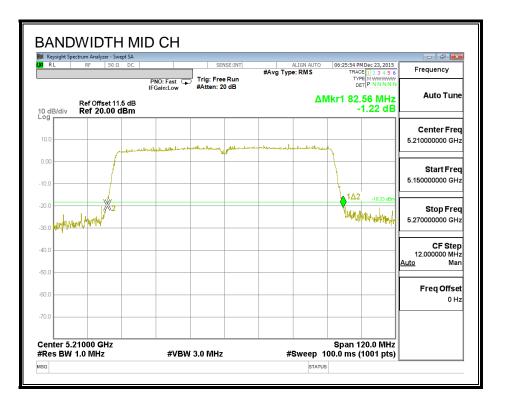
### <u>LIMITS</u>

None; for reporting purposes only.

## **RESULTS**

| Channel | Frequency | 26 dB Bandwidth |  |
|---------|-----------|-----------------|--|
|         | (MHz)     | (MHz)           |  |
| Mid     | 5210      | 82.56           |  |

## 26 dB BANDWIDTH



# 8.24.2. 99% BANDWIDTH

#### <u>LIMITS</u>

None; for reporting purposes only.

### **RESULTS**

| Channel | Frequency | 99% Bandwidth |  |
|---------|-----------|---------------|--|
|         | (MHz)     | (MHz)         |  |
| Mid     | 5210      | 75.816        |  |

#### 99% BANDWIDTH



Page 212 of 1558

# 8.24.3. AVERAGE POWER

### <u>LIMITS</u>

None; for reporting purposes only.

### TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

#### **RESULTS**

| Channel | Frequency | Power |  |
|---------|-----------|-------|--|
|         | (MHz)     | (dBm) |  |
| Mid     | 5210      | 13.48 |  |

Page 213 of 1558

# 8.24.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. 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.

### TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

### DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 214 of 1558
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# RESULTS

#### Antenna Gain and Limits

| Channel | Frequency | Directional | Directional | Power | PSD   |
|---------|-----------|-------------|-------------|-------|-------|
|         |           | Gain        | Gain        | Limit | Limit |
|         |           | for Power   | for PSD     |       |       |
|         | (MHz)     | (dBi)       | (dBi)       | (dBm) | (dBm) |
| Mid     | 5210      | 3.04        | 3.04        | 24.00 | 11.00 |

| Duty Cycle CF (dB) | 0.16 | Included in Calculations of Corr'd PSD |
|--------------------|------|--|
|                    | 0.10 |  |

#### **Output Power Results**

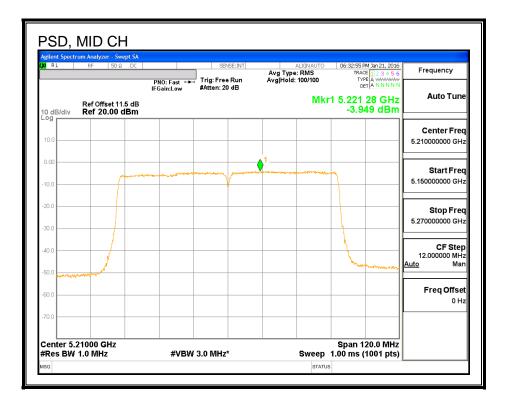
| Channel | Frequency | Antenna B | Total  | Power | Power  |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | Power     | Power  |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Mid     | 5210      | 13.48     | 13.48  | 24.00 | -10.52 |

### **PSD Results**

| Channel | Frequency | Antenna B | Total  | PSD   | PSD    |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | PSD       | PSD    |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Mid     | 5210      | -3.95     | -3.79  | 11.00 | -14.79 |

Page 215 of 1558

<u>PSD</u>



Page 216 of 1558

# 8.25. 802.11ac VHT80 ANTENNA - A MODE IN THE 5.2 GHz BAND

# 8.25.1. 26 dB BANDWIDTH

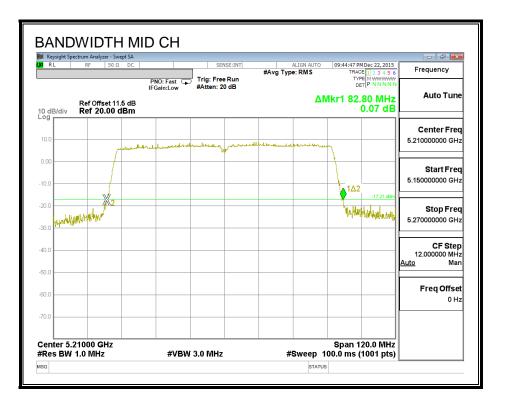
#### <u>LIMITS</u>

None; for reporting purposes only.

### **RESULTS**

| Channel | Frequency | 26 dB Bandwidth |  |
|---------|-----------|-----------------|--|
|         | (MHz)     | (MHz)           |  |
| Mid     | 5210      | 82.80           |  |

### 26 dB BANDWIDTH



# 8.25.2. 99% BANDWIDTH

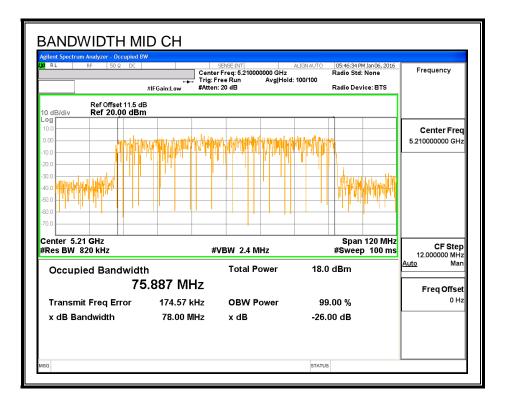
#### <u>LIMITS</u>

None; for reporting purposes only.

### **RESULTS**

| Channel | Frequency | 99% Bandwidth |  |
|---------|-----------|---------------|--|
|         | (MHz)     | (MHz)         |  |
| Mid     | 5210      | 75.887        |  |

#### 99% BANDWIDTH



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Page 218 of 1558

# 8.25.3. AVERAGE POWER

### <u>LIMITS</u>

None; for reporting purposes only.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

### <u>RESULTS</u>

| Channel | Frequency | Power |  |
|---------|-----------|-------|--|
|         | (MHz)     | (dBm) |  |
| Mid     | 5210      | 13.47 |  |

Page 219 of 1558

# 8.25.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. 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.

### TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

### DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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## **RESULTS**

#### Antenna Gain and Limits

| Channel | Frequency | Directional | Directional | Power | PSD   |
|---------|-----------|-------------|-------------|-------|-------|
|         |           | Gain        | Gain        | Limit | Limit |
|         |           | for Power   | for PSD     |       |       |
|         | (MHz)     | (dBi)       | (dBi)       | (dBm) | (dBm) |
| Mid     | 5210      | 2.30        | 2.30        | 24.00 | 11.00 |

| Duty Cycle CF (dB) | 0.16 | Included in Calculations of Corr'd PSD |
|--------------------|------|--|
|                    |      |  |

### **Output Power Results**

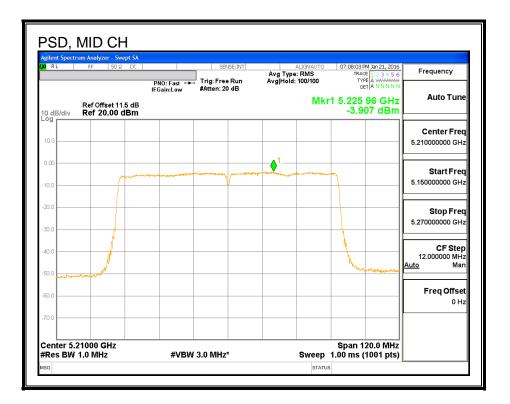
| Channel | Frequency | Antenna A | Total  | Power | Power  |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | Power     | Power  |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Mid     | 5210      | 13.47     | 13.47  | 24.00 | -10.53 |

### **PSD** Results

| Channel | Frequency | Antenna A | Total  | PSD   | PSD    |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | PSD       | PSD    |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Mid     | 5210      | -3.91     | -3.75  | 11.00 | -14.75 |

Page 221 of 1558

<u>PSD</u>



Page 222 of 1558

# 8.26. 802.11ac VHT80 ANTENNA - C MODE IN THE 5.2 GHz BAND

# 8.26.1. 26 dB BANDWIDTH

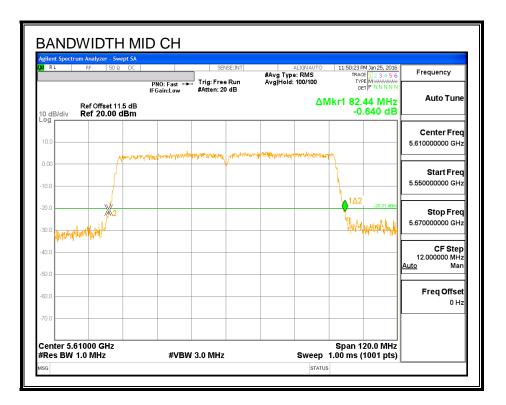
### <u>LIMITS</u>

None; for reporting purposes only.

### **RESULTS**

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Mid     | 5210      | 82.44           |

## 26 dB BANDWIDTH



# 8.26.2. 99% BANDWIDTH

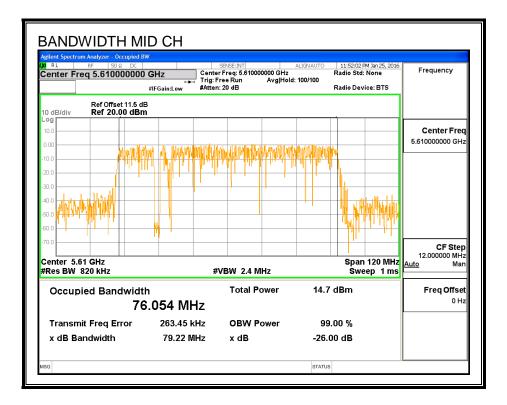
#### <u>LIMITS</u>

None; for reporting purposes only.

### **RESULTS**

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
|         | (MHz)     | (MHz)         |
| Mid     | 5210      | 76.054        |

#### 99% BANDWIDTH



Page 224 of 1558

# 8.26.3. AVERAGE POWER

### <u>LIMITS</u>

None; for reporting purposes only.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

### <u>RESULTS</u>

| Channel  | Frequency | Power |  |
|----------|-----------|-------|--|
|          | (MHz)     | (dBm) |  |
| Mid 5210 |           | 13.50 |  |

Page 225 of 1558

# 8.26.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. 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.

### TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

### DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

 Page 226 of 1558

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## **RESULTS**

#### Antenna Gain and Limits

| Channel | Frequency | Directional | Directional | Power | PSD   |
|---------|-----------|-------------|-------------|-------|-------|
|         |           | Gain        | Gain        | Limit | Limit |
|         |           | for Power   | for PSD     |       |       |
|         | (MHz)     | (dBi)       | (dBi)       | (dBm) | (dBm) |
| Mid     | 5210      | 1.36        | 1.36        | 24.00 | 11.00 |

| Duty Cycle CF (dB) | 0.16 | Included in Calculations of Corr'd PSD |
|--------------------|------|--|
|                    |      |  |

#### **Output Power Results**

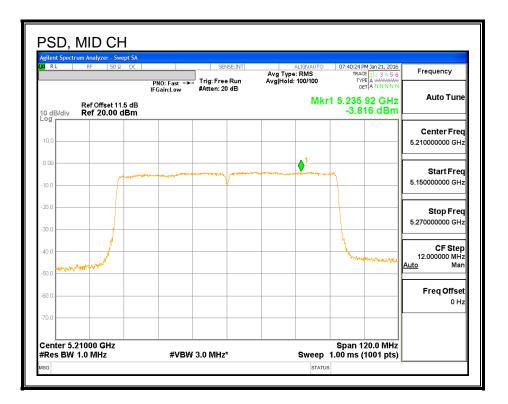
| Channel | Frequency | Antenna C | Total  | Power | Power  |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | Power     | Power  |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Mid     | 5210      | 13.50     | 13.50  | 24.00 | -10.50 |

### **PSD Results**

| Channel | Frequency | Antenna C | Total  | PSD   | PSD    |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | PSD       | PSD    |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Mid     | 5210      | -3.82     | -3.66  | 11.00 | -14.66 |

Page 227 of 1558

<u>PSD</u>



Page 228 of 1558

# 8.27. 802.11ac VHT80 ANTENNA B+A CDD MODE IN THE 5.2 GHz BAND

# 8.27.1. 26 dB BANDWIDTH

## <u>LIMITS</u>

None; for reporting purposes only.

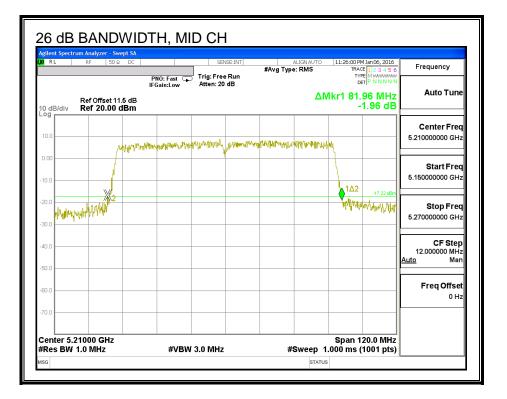
## **RESULTS**

| Channel | Frequency | 26 dB BW  | 26 dB BW  |
|---------|-----------|-----------|-----------|
|         |           | Antenna B | Antenna A |
|         | (MHz)     | (MHz)     | (MHz)     |
| Mid     | 5210      | 81.96     | 81.84     |

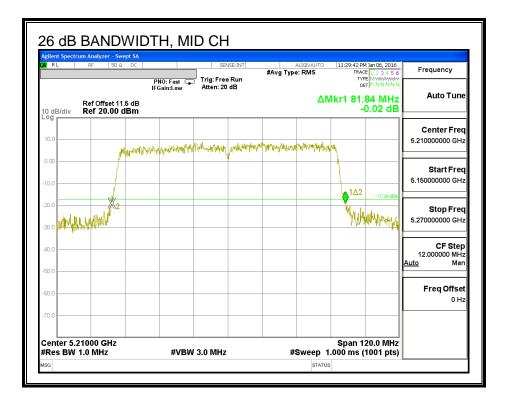
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Page 229 of 1558

#### 26 DB BANDWIDTH, ANTENNA - B



#### 26 DB BANDWIDTH, ANTENNA - A



Page 230 of 1558

# 8.27.2. 99% BANDWIDTH

#### <u>LIMITS</u>

None; for reporting purposes only.

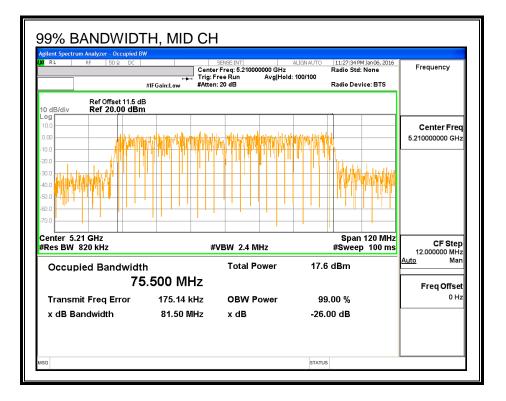
# **RESULTS**

| Channel | Frequency | 99% BW    | 99% BW    |
|---------|-----------|-----------|-----------|
|         |           | Antenna B | Antenna A |
|         | (MHz)     | (MHz)     | (MHz)     |
| Mid     | 5210      | 75.500    | 75.652    |

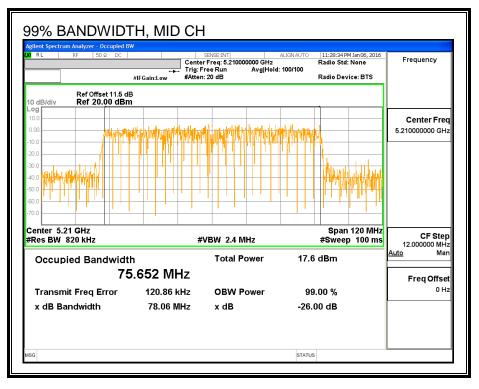
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Page 231 of 1558

### 99% BANDWIDTH, ANTENNA - B



#### 99% BANDWIDTH, ANTENNA - A



Page 232 of 1558

# 8.27.3. AVERAGE POWER

### <u>LIMITS</u>

None; for reporting purposes only.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

### <u>RESULTS</u>

| Channel | Frequency | Antenna | Antenna | Total |
|---------|-----------|---------|---------|-------|
|         |           | В       | Α       |       |
|         |           | Power   | Power   | Power |
|         | (MHz)     | (dBm)   | (dBm)   | (dBm) |
| Mid     | 5210      | 11.83   | 11.89   | 14.87 |

Page 233 of 1558

# 8.27.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. 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.

# TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Page 234 of 1558

### DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

| Antenna B | Antenna A | <b>Uncorrelated Chains</b> |
|-----------|-----------|----------------------------|
|           |           | Directional                |
| Gain      | Gain      | Gain                       |
| (dBi)     | (dBi)     | (dBi)                      |
| 3.04      | 2.30      | 2.69                       |

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

| Antenna B | Antenna A | <b>Correlated Chains</b> |
|-----------|-----------|--------------------------|
|           |           | Directional              |
| Gain      | Gain      | Gain                     |
| (dBi)     | (dBi)     | (dBi)                    |
| 3.04      | 2.30      | 5.69                     |

Page 235 of 1558

# RESULTS

#### Antenna Gain and Limits

| Channel | Frequency | Directional | Directional | Power | PSD   |
|---------|-----------|-------------|-------------|-------|-------|
|         |           | Gain        | Gain        | Limit | Limit |
|         |           | for Power   | for PSD     |       |       |
|         | (MHz)     | (dBi)       | (dBi)       | (dBm) | (dBm) |
| Mid     | 5210      | 2.69        | 5.69        | 24.00 | 11.00 |

| Duty Cycle CF (dB) | 0.20 | Included in Calculations of Corr'd PSD |
|--------------------|------|--|
|                    | 0.20 | included in Calculations of Corr d FSD |

### **Output Power Results**

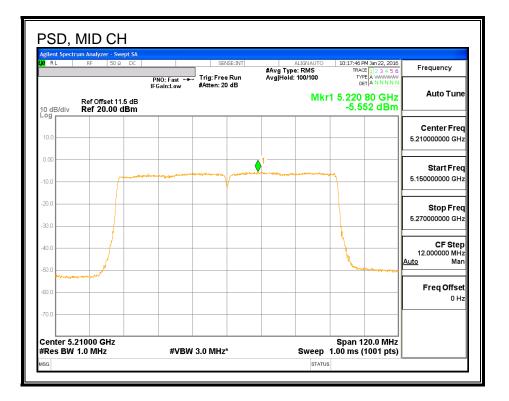
| Channel | Frequency | Antenna B | Antenna A | Total  | Power | Power  |
|---------|-----------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Meas      | Corr'd | Limit | Margin |
|         |           | Power     | Power     | Power  |       |        |
|         | (MHz)     | (dBm)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Mid     | 5210      | 11.83     | 11.89     | 14.87  | 24.00 | -9.13  |

#### **PSD** Results

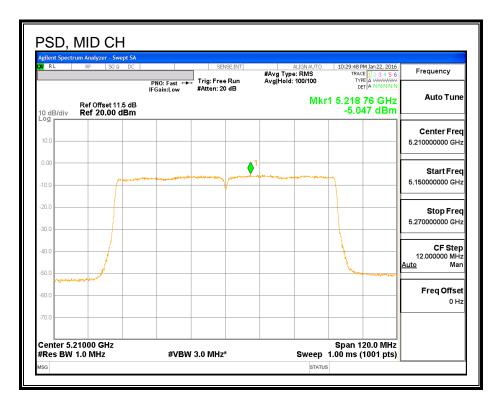
| Channel | Frequency | Antenna B | Antenna A | Total  | PSD   | PSD    |
|---------|-----------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Meas      | Corr'd | Limit | Margin |
|         |           | PSD       | PSD       | PSD    |       |        |
|         | (MHz)     | (dBm)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Mid     | 5210      | -5.55     | -5.05     | -2.08  | 11.00 | -13.08 |

Page 236 of 1558

### PSD, ANTENNA - B



#### PSD, ANTENNA - A



Page 237 of 1558

# 8.28. 802.11ac VHT80 ANTENNA A+C CDD MODE IN THE 5.2 GHz BAND

# 8.28.1. 26 dB BANDWIDTH

### <u>LIMITS</u>

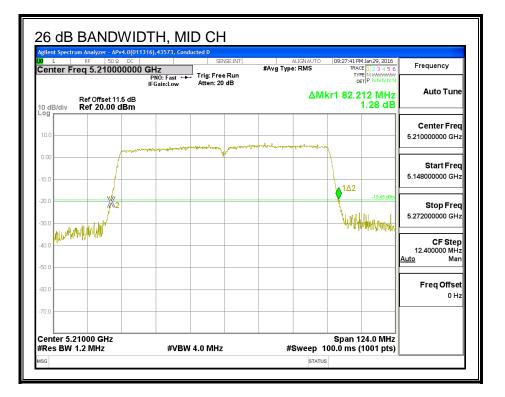
None; for reporting purposes only.

## **RESULTS**

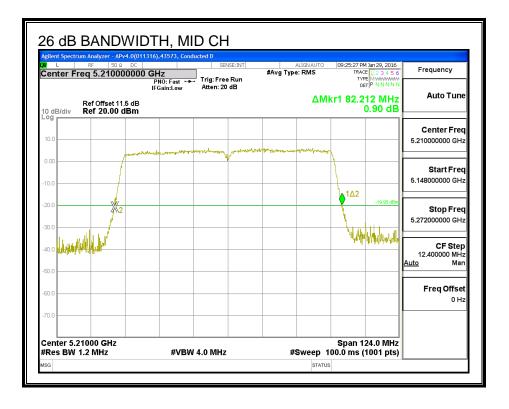
| Channel | Frequency | 26 dB BW  | 26 dB BW  |
|---------|-----------|-----------|-----------|
|         |           | Antenna A | Antenna C |
|         | (MHz)     | (MHz)     | (MHz)     |
| Mid     | 5210      | 82.21     | 82.21     |

Page 238 of 1558

#### 26 DB BANDWIDTH, ANTENNA - A



#### 26 DB BANDWIDTH, ANTENNA - C



Page 239 of 1558

# 8.28.2. 99% BANDWIDTH

#### <u>LIMITS</u>

None; for reporting purposes only.

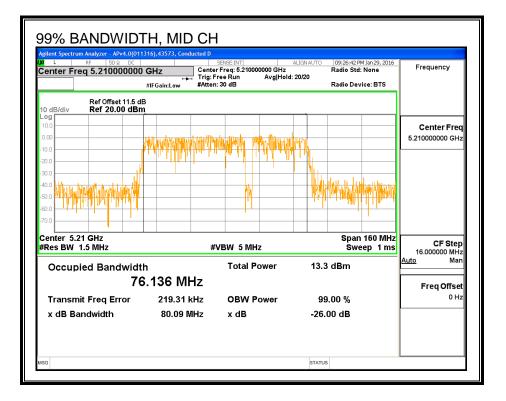
# **RESULTS**

| Channel | Frequency | 99% BW    | 99% BW    |
|---------|-----------|-----------|-----------|
|         |           | Antenna A | Antenna C |
|         | (MHz)     | (MHz)     | (MHz)     |
| Mid     | 5210      | 76.136    | 75.871    |

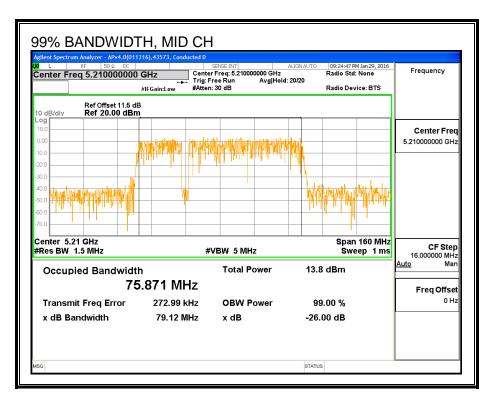
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Page 240 of 1558

### 99% BANDWIDTH, ANTENNA - A



### 99% BANDWIDTH, ANTENNA - C



Page 241 of 1558

# 8.28.3. AVERAGE POWER

### <u>LIMITS</u>

None; for reporting purposes only.

### TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

#### **RESULTS**

### **Average Power Results**

| Channel | Frequency | Antenna | Antenna | Total |
|---------|-----------|---------|---------|-------|
|         |           | Α       | С       |       |
|         |           | Power   | Power   | Power |
|         | (MHz)     | (dBm)   | (dBm)   | (dBm) |
| Mid     | 5210      | 12.00   | 11.85   | 14.94 |

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Page 242 of 1558

# 8.28.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. 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.

# TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Page 243 of 1558

### DIRECTIONAL ANTENNA GAIN

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

| Antenna A | Antenna C | <b>Uncorrelated Chains</b> |
|-----------|-----------|----------------------------|
|           |           | Directional                |
| Gain      | Gain      | Gain                       |
| (dBi)     | (dBi)     | (dBi)                      |
| 2.30      | 1.36      | 1.86                       |

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

| Antenna A | Antenna C | <b>Correlated Chains</b> |
|-----------|-----------|--------------------------|
|           |           | Directional              |
| Gain      | Gain      | Gain                     |
| (dBi)     | (dBi)     | (dBi)                    |
| 2.30      | 1.36      | 4.85                     |

Page 244 of 1558

## **RESULTS**

| Channel | Frequency | Directional | Directional | Power | PSD   |
|---------|-----------|-------------|-------------|-------|-------|
|         |           | Gain        | Gain        | Limit | Limit |
|         |           | for Power   | for PSD     |       |       |
|         | (MHz)     | (dBi)       | (dBi)       | (dBm) | (dBm) |
| Mid     | 5210      | 1.86        | 4.85        | 24.00 | 11.00 |

Duty Cycle CF (dB) 0.20 Included in Calculations of Corr'd PSD

#### **Output Power Results**

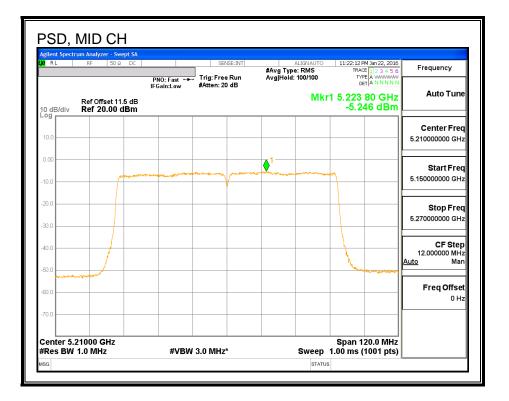
| Channel | Frequency | Antenna A | Antenna C | Total  | Power | Power  |
|---------|-----------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Meas      | Corr'd | Limit | Margin |
|         |           | Power     | Power     | Power  |       |        |
|         | (MHz)     | (dBm)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Mid     | 5210      | 12.00     | 11.85     | 14.94  | 24.00 | -9.06  |

#### **PSD** Results

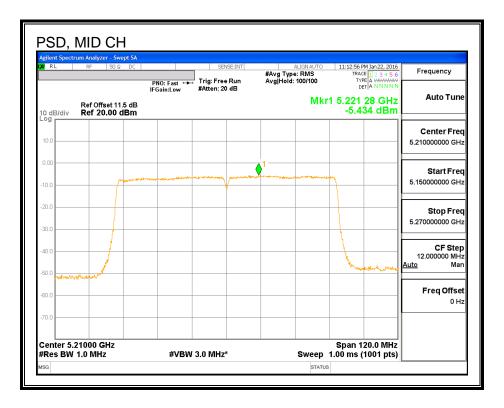
| Channel | Frequency | Antenna A | Antenna C | Total  | PSD   | PSD    |
|---------|-----------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Meas      | Corr'd | Limit | Margin |
|         |           | PSD       | PSD       | PSD    |       |        |
|         | (MHz)     | (dBm)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Mid     | 5210      | -5.25     | -5.43     | -2.13  | 11.00 | -13.13 |

Page 245 of 1558

## PSD, ANTENNA - A



#### PSD, ANTENNA - C



Page 246 of 1558

# 8.29. 802.11ac VHT80 ANTENNA B+A STBC MODE IN THE 5.2 GHz BAND

Noted: Covered by 802.11ac VHT80 ANTENNA B+A CDD MODE IN THE 5.2 GHz BAND

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Page 247 of 1558

# 8.30. 802.11ac VHT80 ANTENNA A+C STBC MODE IN THE 5.2 GHz BAND

Noted: Covered by 802.11ac VHT80 ANTENNA A+C CDD MODE IN THE 5.2 GHz BAND

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Page 248 of 1558

# 8.31. 802.11ac VHT80 ANTENNA B+A SDM MODE IN THE 5.2 GHz BAND

Noted: Covered by 802.11ac VHT80 ANTENNA B+A CDD MODE IN THE 5.2 GHz BAND

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Page 249 of 1558

# 8.32. 802.11ac VHT80 ANTENNA A+C SDM MODE IN THE 5.2 GHz BAND

Noted: Covered by 802.11ac VHT80 ANTENNA B+A CDD MODE IN THE 5.2 GHz BAND

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Page 250 of 1558

# 8.33. 802.11a ANTENNA - B MODE IN THE 5.3 GHz BAND

Note: Covered by 802.11n HT20 ANTENNA B MODE IN THE 5.3 GHz BAND

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Page 251 of 1558

# 8.34. 802.11n HT20 ANTENNA - B MODE IN THE 5.3 GHz BAND

# 8.34.1. 26 dB BANDWIDTH

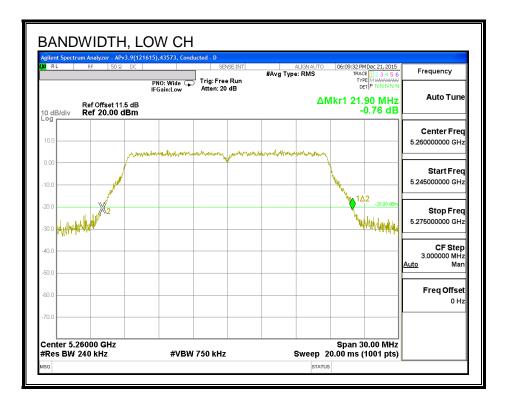
## **LIMITS**

None; for reporting purposes only.

## **RESULTS**

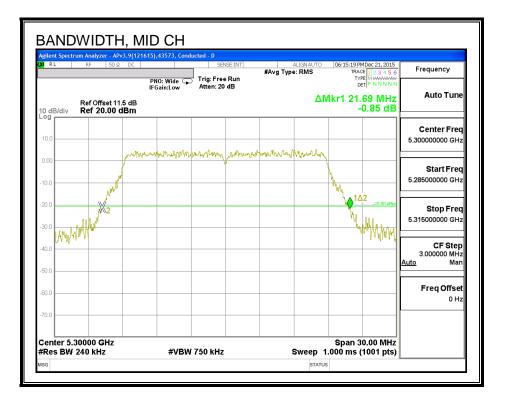
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Low     | 5260      | 21.90           |
| Mid     | 5300      | 21.69           |
| High    | 5320      | 21.66           |

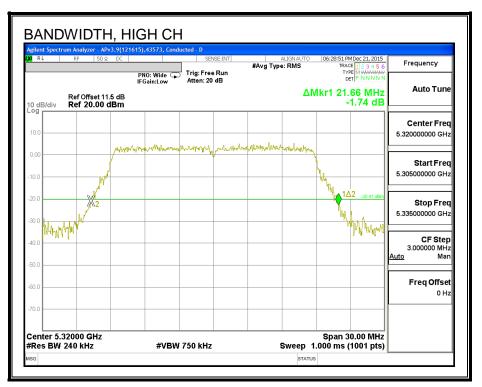
### 26 dB BANDWIDTH



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Page 252 of 1558





Page 253 of 1558

## 8.34.2. 99% BANDWIDTH

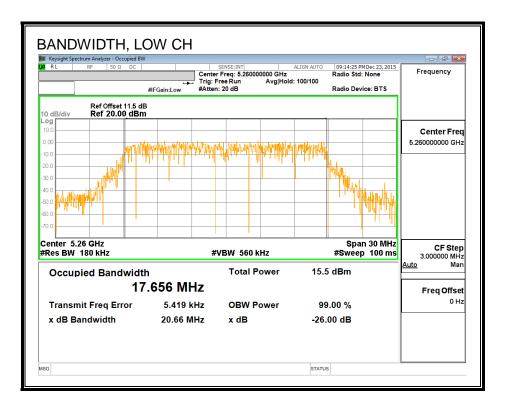
## <u>LIMITS</u>

None; for reporting purposes only.

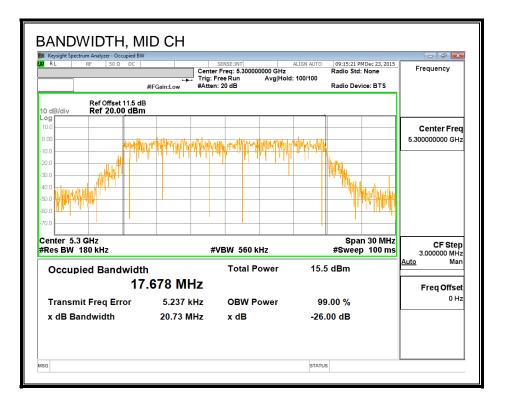
## RESULTS

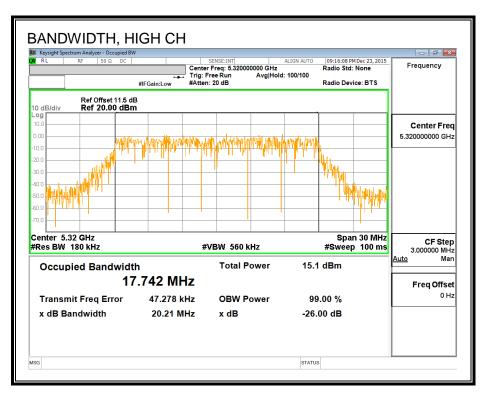
| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
|         | (MHz)     | (MHz)         |
| Low     | 5260      | 17.656        |
| Mid     | 5300      | 17.678        |
| High    | 5320      | 17.742        |

#### 99% BANDWIDTH



Page 254 of 1558





Page 255 of 1558

## 8.34.3. AVERAGE POWER

## <u>LIMITS</u>

None; for reporting purposes only.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

## <u>RESULTS</u>

| Channel | Frequency | Power |
|---------|-----------|-------|
|         | (MHz)     | (dBm) |
| Low     | 5260      | 16.94 |
| Mid     | 5300      | 16.98 |
| High    | 5320      | 15.99 |

Page 256 of 1558

# 8.34.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

## **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 257 of 1558

## RESULTS

#### Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min   | Min    | Directional | Power | PSD   |
|---------|-----------|-------|--------|-------------|-------|-------|
|         |           | 26 dB | 99%    | Gain        | Limit | Limit |
|         |           | BW    | BW     |             |       |       |
|         | (MHz)     | (MHz) | (MHz)  | (dBi)       | (dBm) | (dBm) |
| Low     | 5260      | 21.90 | 17.656 | 3.02        | 23.47 | 11.00 |
| Mid     | 5300      | 21.69 | 17.678 | 3.02        | 23.47 | 11.00 |
| High    | 5320      | 21.66 | 17.742 | 3.02        | 23.49 | 11.00 |

Duty Cycle CF (dB)

Included in Calculations of Corr'd PSD

## **Output Power Results**

| Channel | Frequency | Antenna B | Total  | Power | Power  |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | Power     | Power  |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Low     | 5260      | 16.94     | 16.94  | 23.47 | -6.53  |
| Mid     | 5300      | 16.98     | 16.98  | 23.47 | -6.49  |
| High    | 5320      | 15.99     | 15.99  | 23.49 | -7.50  |

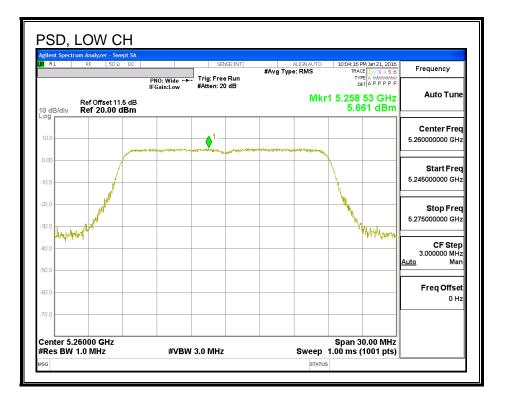
0.00

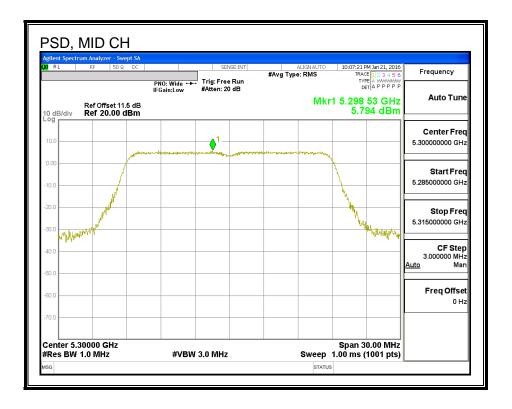
## **PSD Results**

| Channel | Frequency | Antenna B | Total  | PSD   | PSD    |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | PSD       | PSD    |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Low     | 5260      | 5.66      | 5.66   | 11.00 | -5.34  |
| Mid     | 5300      | 5.79      | 5.79   | 11.00 | -5.21  |
| High    | 5320      | 4.83      | 4.83   | 11.00 | -6.17  |

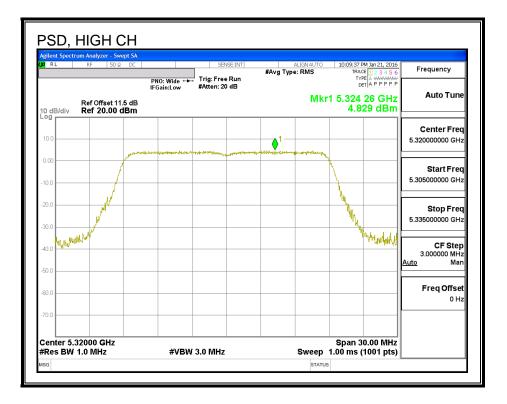
## Page 258 of 1558

<u>PSD</u>





Page 259 of 1558



Page 260 of 1558

# 8.35. 802.11a ANTENNA - A MODE IN THE 5.3 GHz BAND

Note: Covered by 802.11n HT20 ANTENNA A MODE IN THE 5.3 GHz BAND

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Page 261 of 1558

# 8.36. 802.11n HT20 ANTENNA - A MODE IN THE 5.3 GHz BAND

# 8.36.1. 26 dB BANDWIDTH

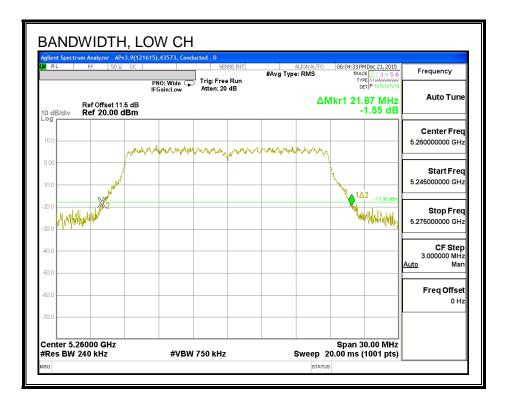
### **LIMITS**

None; for reporting purposes only.

## **RESULTS**

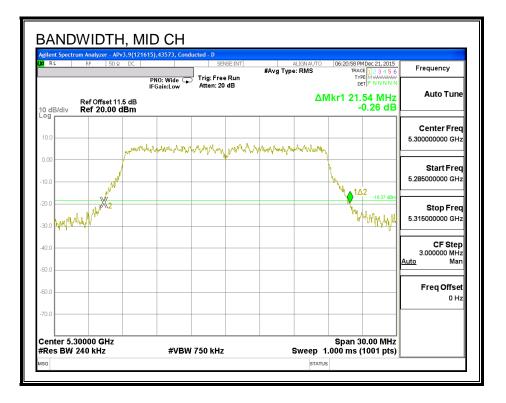
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Low     | 5260      | 21.87           |
| Mid     | 5300      | 21.54           |
| High    | 5320      | 21.60           |

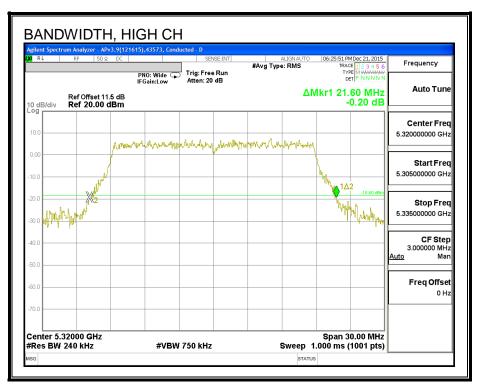
### 26 dB BANDWIDTH



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Page 262 of 1558





Page 263 of 1558

## 8.36.2. 99% BANDWIDTH

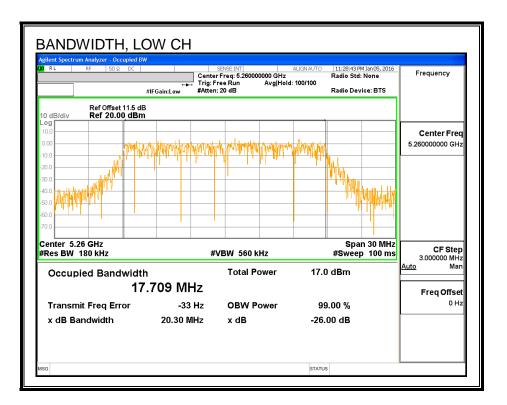
### <u>LIMITS</u>

None; for reporting purposes only.

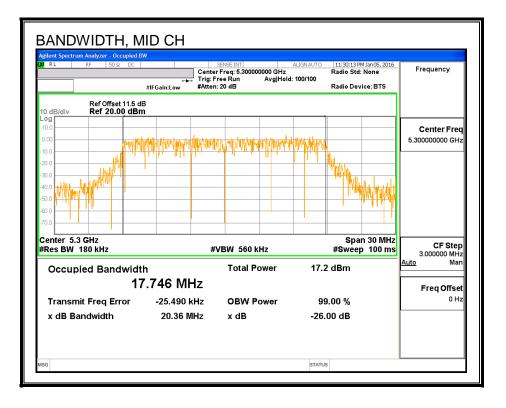
## RESULTS

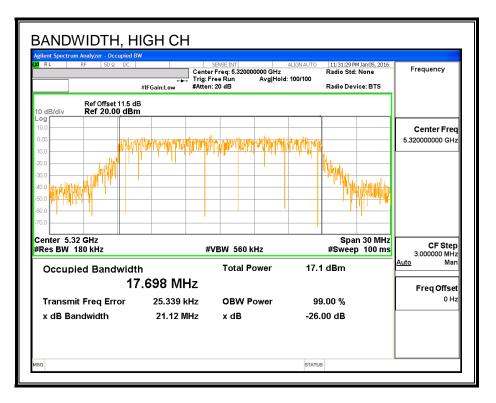
| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
|         | (MHz)     | (MHz)         |
| Low     | 5260      | 17.709        |
| Mid     | 5300      | 17.746        |
| High    | 5320      | 17.698        |

### 99% BANDWIDTH



Page 264 of 1558





Page 265 of 1558

## 8.36.3. AVERAGE POWER

## <u>LIMITS</u>

None; for reporting purposes only.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

## **RESULTS**

| Channel | Frequency | Power |
|---------|-----------|-------|
|         | (MHz)     | (dBm) |
| Low     | 5260      | 17.39 |
| Mid     | 5300      | 17.46 |
| High    | 5320      | 15.94 |

Page 266 of 1558

# 8.36.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 267 of 1558

## RESULTS

#### Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min   | Min    | Directional | Power | PSD   |
|---------|-----------|-------|--------|-------------|-------|-------|
|         |           | 26 dB | 99%    | Gain        | Limit | Limit |
|         |           | BW    | BW     |             |       |       |
|         | (MHz)     | (MHz) | (MHz)  | (dBi)       | (dBm) | (dBm) |
| Low     | 5260      | 21.87 | 17.709 | 2.23        | 23.48 | 11.00 |
| Mid     | 5300      | 21.54 | 17.746 | 2.23        | 23.49 | 11.00 |
| High    | 5320      | 21.60 | 17.698 | 2.23        | 23.48 | 11.00 |

### Duty Cycle CF (dB) 0.00

Included in Calculations of Corr'd PSD

## **Output Power Results**

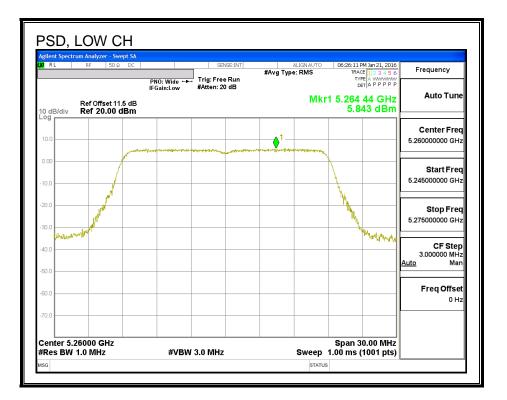
| Channel | Frequency | Antenna A | Total  | Power | Power  |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | Power     | Power  |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Low     | 5260      | 17.39     | 17.39  | 23.48 | -6.09  |
| Mid     | 5300      | 17.46     | 17.46  | 23.49 | -6.03  |
| High    | 5320      | 15.94     | 15.94  | 23.48 | -7.54  |

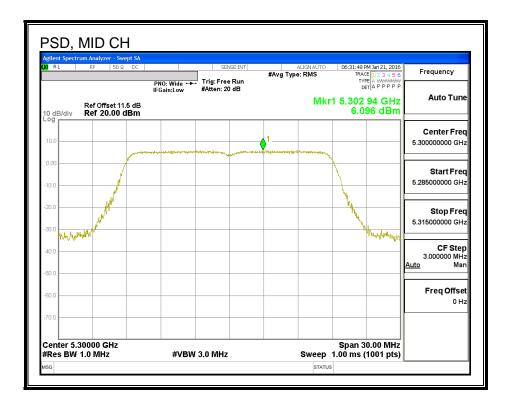
#### **PSD Results**

| Channel | Frequency | Antenna A | Total  | PSD   | PSD    |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | PSD       | PSD    |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Low     | 5260      | 5.84      | 5.84   | 11.00 | -5.16  |
| Mid     | 5300      | 6.10      | 6.10   | 11.00 | -4.90  |
| High    | 5320      | 4.68      | 4.68   | 11.00 | -6.32  |

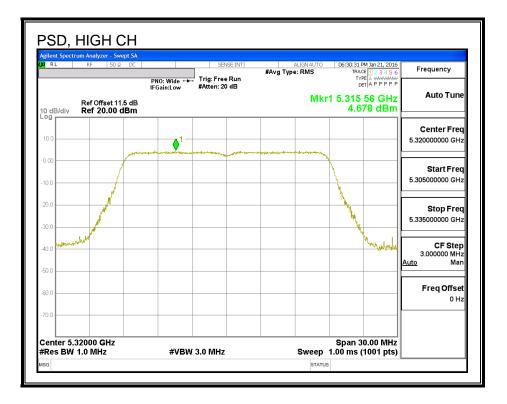
## Page 268 of 1558

<u>PSD</u>





Page 269 of 1558



Page 270 of 1558

# 8.37. 802.11a ANTENNA - C MODE IN THE 5.3 GHz BAND

Note: Covered by 802.11n HT20 ANTENNA C MODE IN THE 5.3 GHz BAND

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Page 271 of 1558

# 8.38. 802.11n HT20 ANTENNA - C MODE IN THE 5.3 GHz BAND

# 8.38.1. 26 dB BANDWIDTH

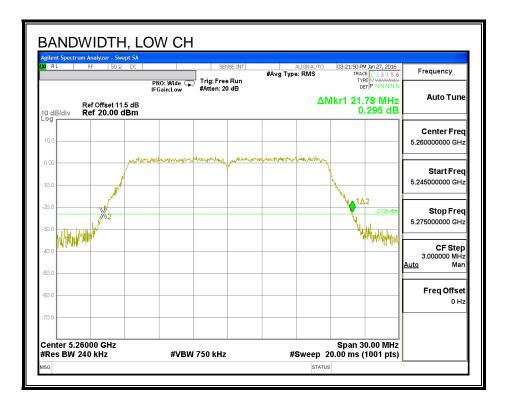
## <u>LIMITS</u>

None; for reporting purposes only.

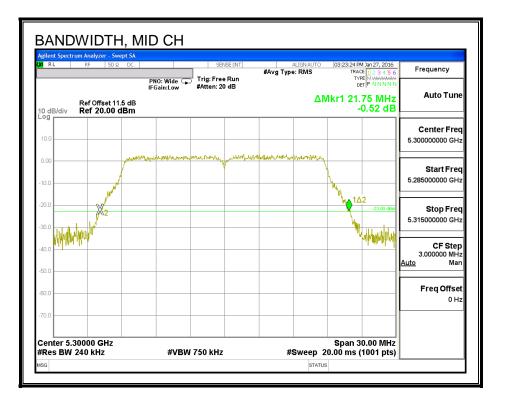
## **RESULTS**

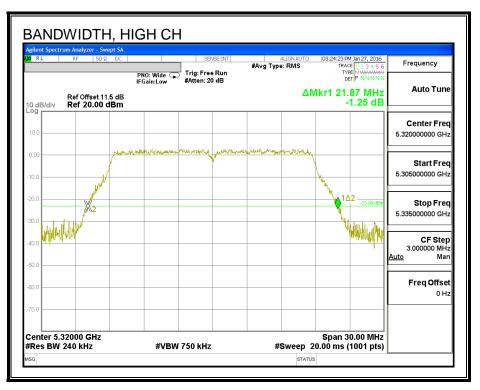
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
| (MHz)   |           | (MHz)           |
| Low     | 5260      | 21.78           |
| Mid     | 5300      | 21.75           |
| High    | 5320      | 21.87           |

### 26 dB BANDWIDTH



Page 272 of 1558





Page 273 of 1558

## 8.38.2. 99% BANDWIDTH

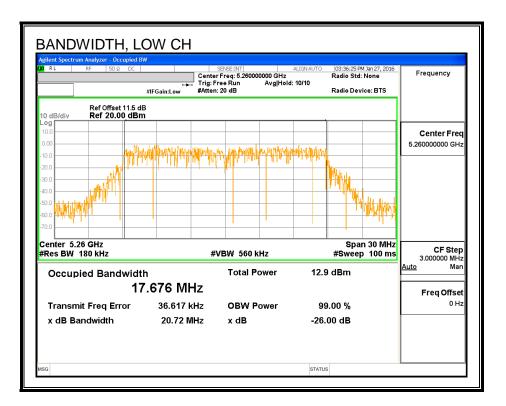
## <u>LIMITS</u>

None; for reporting purposes only.

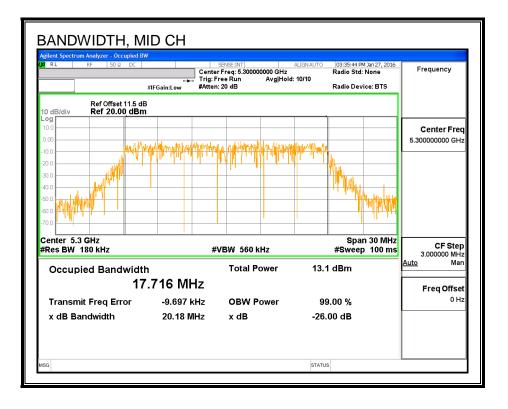
## RESULTS

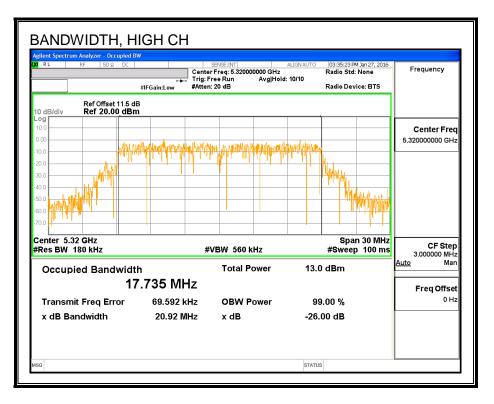
| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| (MHz)   |           | (MHz)         |
| Low     | 5260      | 17.676        |
| Mid     | 5300      | 17.716        |
| High    | 5320      | 17.735        |

#### 99% BANDWIDTH



Page 274 of 1558





Page 275 of 1558 **UL VERIFICATION SERVICES INC.** 47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000

## 8.38.3. AVERAGE POWER

## <u>LIMITS</u>

None; for reporting purposes only.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

## **RESULTS**

| Channel | Frequency | Power |
|---------|-----------|-------|
|         | (MHz)     | (dBm) |
| Low     | 5260      | 15.45 |
| Mid     | 5300      | 15.49 |
| High    | 5320      | 15.48 |

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Page 276 of 1558

# 8.38.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

Page 277 of 1558

## RESULTS

#### Bandwidth, Antenna Gain, and Limits

| Channel | Frequency | Min   | Min    | Directional | Power | PSD   |
|---------|-----------|-------|--------|-------------|-------|-------|
|         |           | 26 dB | 99%    | Gain        | Limit | Limit |
|         |           | BW    | BW     |             |       |       |
|         | (MHz)     | (MHz) | (MHz)  | (dBi)       | (dBm) | (dBm) |
| Low     | 5260      | 21.78 | 17.676 | 2.12        | 23.47 | 11.00 |
| Mid     | 5300      | 21.75 | 17.716 | 2.12        | 23.48 | 11.00 |
| High    | 5320      | 21.87 | 17.735 | 2.12        | 23.49 | 11.00 |

#### Duty Cycle CF (dB)

Included in Calculations of Corr'd PSD

## **Output Power Results**

| Channel | Frequency | Antenna C | Total  | Power | Power  |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | Power     | Power  |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Low     | 5260      | 15.45     | 15.45  | 23.47 | -8.02  |
| Mid     | 5300      | 15.49     | 15.49  | 23.48 | -7.99  |
| High    | 5320      | 15.48     | 15.48  | 23.49 | -8.01  |

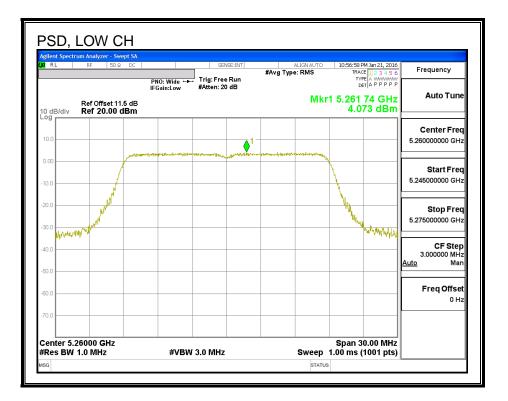
0.00

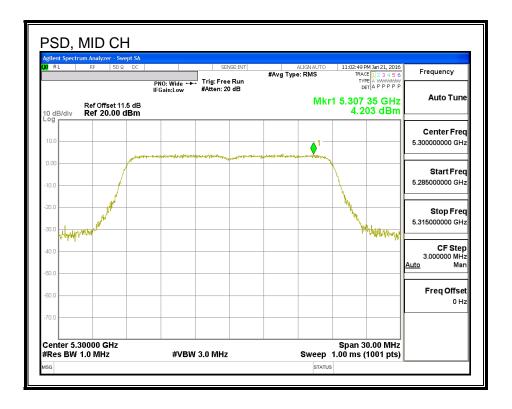
#### **PSD Results**

| Channel | Frequency | Antenna C | Total  | PSD   | PSD    |
|---------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Corr'd | Limit | Margin |
|         |           | PSD       | PSD    |       |        |
|         | (MHz)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Low     | 5260      | 4.07      | 4.07   | 11.00 | -6.93  |
| Mid     | 5300      | 4.20      | 4.20   | 11.00 | -6.80  |
| High    | 5320      | 4.09      | 4.09   | 11.00 | -6.91  |

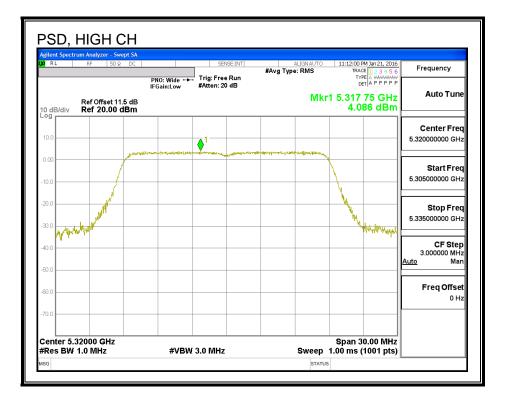
#### Page 278 of 1558

<u>PSD</u>





Page 279 of 1558



Page 280 of 1558

# 8.39. 802.11n HT20 ANTENNA B+A CDD MODE IN THE 5.3 GHz BAND

# 8.39.1. 26 dB BANDWIDTH

## <u>LIMITS</u>

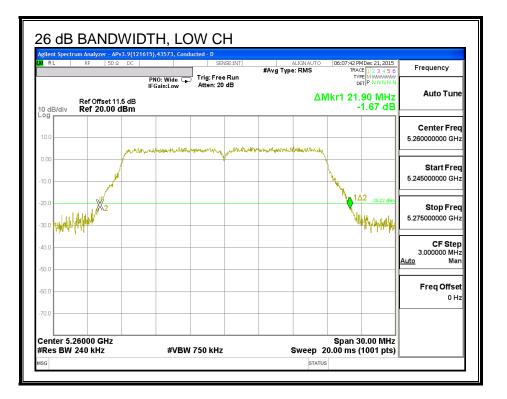
None; for reporting purposes only.

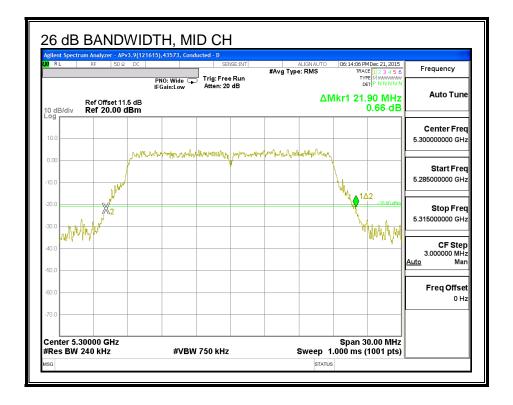
## **RESULTS**

| Channel | Frequency | 26 dB BW  | 26 dB BW  |
|---------|-----------|-----------|-----------|
|         |           | Antenna B | Antenna A |
|         | (MHz)     | (MHz)     | (MHz)     |
| Low     | 5260      | 21.90     | 21.87     |
| Mid     | 5300      | 21.90     | 21.60     |
| High    | 5320      | 21.72     | 21.51     |

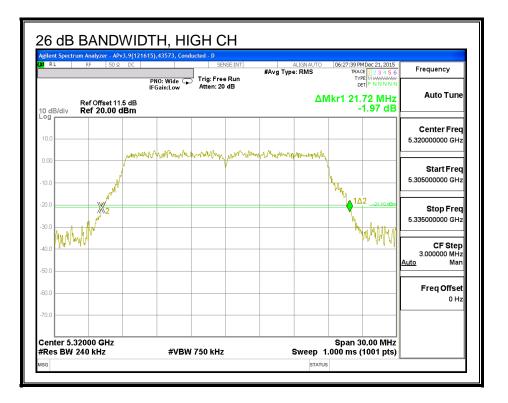
Page 281 of 1558

## 26 DB BANDWIDTH, ANTENNA - B

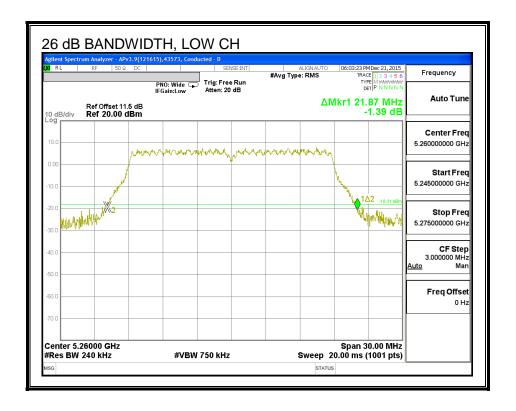




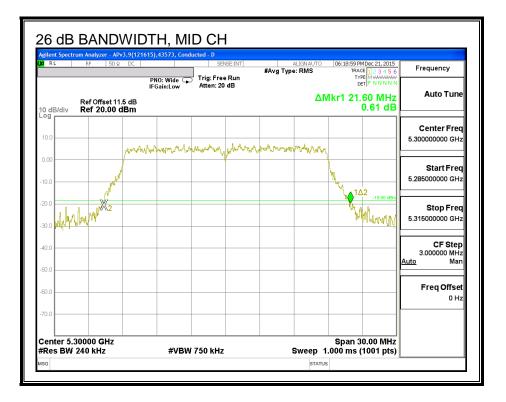
Page 282 of 1558

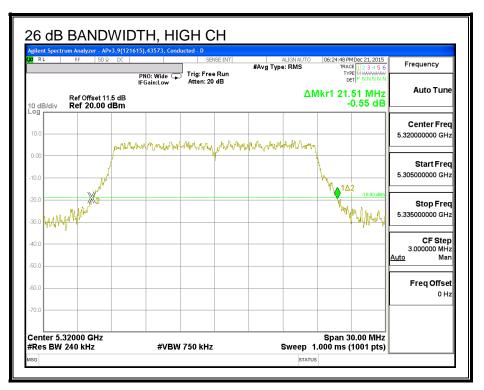


## 26 DB BANDWIDTH, ANTENNA - A



Page 283 of 1558





Page 284 of 1558

## 8.39.2. 99% BANDWIDTH

#### <u>LIMITS</u>

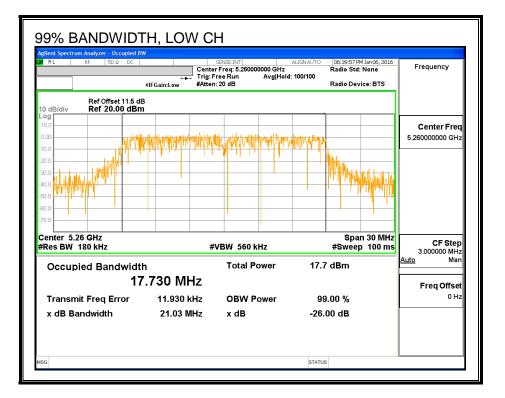
None; for reporting purposes only.

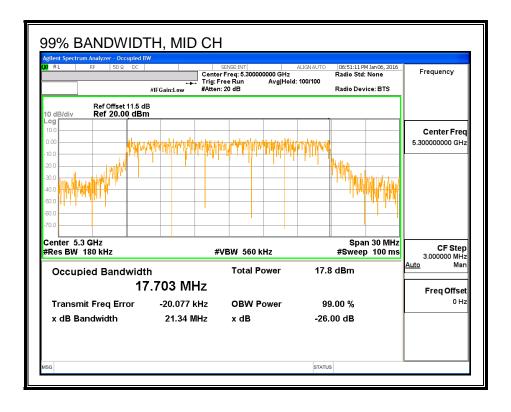
## **RESULTS**

| Channel | Frequency | 99% BW    | 99% BW    |
|---------|-----------|-----------|-----------|
|         |           | Antenna B | Antenna A |
|         | (MHz)     | (MHz)     | (MHz)     |
| Low     | 5260      | 17.730    | 17.713    |
| Mid     | 5300      | 17.703    | 17.687    |
| High    | 5320      | 17.697    | 17.685    |

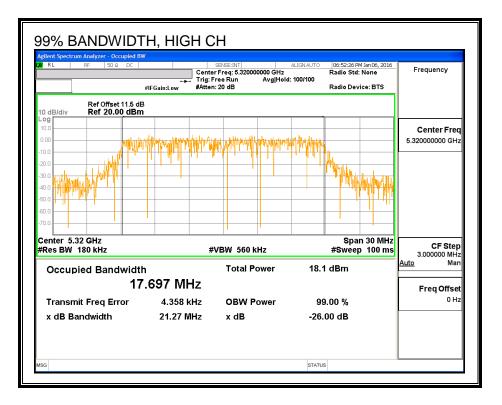
Page 285 of 1558

#### 99% BANDWIDTH, ANTENNA - B

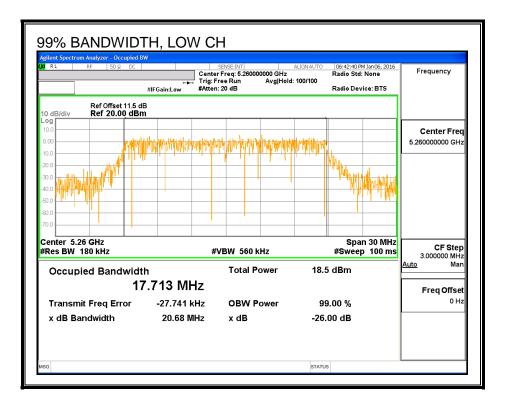




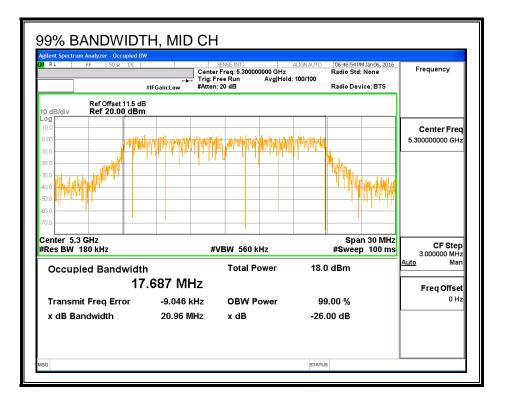
Page 286 of 1558

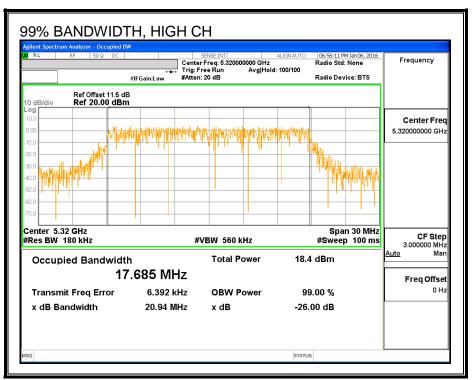


## 99% BANDWIDTH, ANTENNA - A



Page 287 of 1558





Page 288 of 1558

## 8.39.3. AVERAGE POWER

## <u>LIMITS</u>

None; for reporting purposes only.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

#### **RESULTS**

| Channel | Frequency | Antenna | Antenna | Total |
|---------|-----------|---------|---------|-------|
|         |           | В       | Α       |       |
|         |           | Power   | Power   | Power |
|         | (MHz)     | (dBm)   | (dBm)   | (dBm) |
| Low     | 5260      | 15.92   | 15.94   | 18.94 |
| Mid     | 5300      | 15.93   | 15.98   | 18.97 |
| High    | 5320      | 14.48   | 14.47   | 17.49 |

Page 289 of 1558

## 8.39.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

## **DIRECTIONAL ANTENNA GAIN**

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

| Antenna B | Antenna A | Uncorrelated Chains |
|-----------|-----------|---------------------|
|           |           | Directional         |
| Gain      | Gain      | Gain                |
| (dBi)     | (dBi)     | (dBi)               |
| 3.02      | 2.23      | 2.64                |

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

| Antenna B | Antenna A | Correlated Chains |
|-----------|-----------|-------------------|
|           |           | Directional       |
| Gain      | Gain      | Gain              |
| (dBi)     | (dBi)     | (dBi)             |
| 3.02      | 2.23      | 5.64              |

Page 290 of 1558

## RESULTS

#### Bandwidth, Antenna Gain and Limits

0.00

| Channel | Frequency | Min   | Min    | Directional | Directional | Power | PSD   |
|---------|-----------|-------|--------|-------------|-------------|-------|-------|
|         |           | 26 dB | 99%    | Gain        | Gain        | Limit | Limit |
|         |           | BW    | BW     | for Power   | for PSD     |       |       |
|         | (MHz)     | (MHz) | (MHz)  | (dBi)       | (dBi)       | (dBm) | (dBm) |
| Low     | 5260      | 21.90 | 17.730 | 2.64        | 5.64        | 23.49 | 11.00 |
| Mid     | 5300      | 21.90 | 17.703 | 2.64        | 5.64        | 23.48 | 11.00 |
| High    | 5320      | 21.72 | 17.697 | 2.64        | 5.64        | 23.48 | 11.00 |

## Duty Cycle CF (dB)

Included in Calculations of Corr'd PSD

#### **Output Power Results**

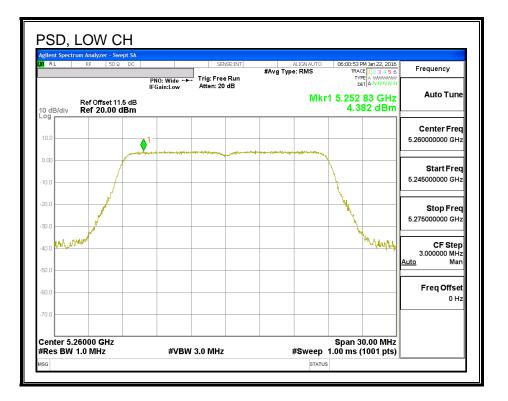
| Channel | Frequency | Antenna B | Antenna A | Total  | Power | Power  |
|---------|-----------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Meas      | Corr'd | Limit | Margin |
|         |           | Power     | Power     | Power  |       |        |
|         | (MHz)     | (dBm)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Low     | 5260      | 15.92     | 15.94     | 18.94  | 23.49 | -4.55  |
| Mid     | 5300      | 15.93     | 15.98     | 18.97  | 23.48 | -4.52  |
| High    | 5320      | 14.48     | 14.47     | 17.49  | 23.48 | -5.99  |

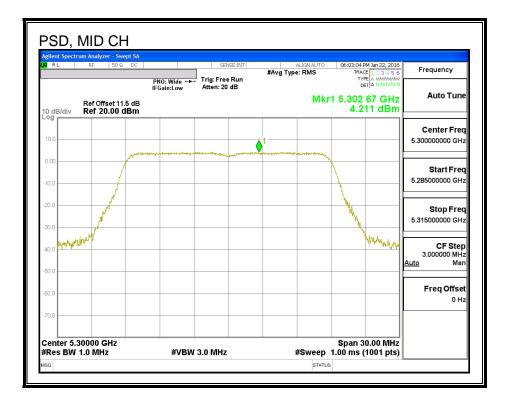
#### **PSD Results**

| Channel | Frequency | Antenna B | Antenna A | Total  | PSD   | PSD    |
|---------|-----------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Meas      | Corr'd | Limit | Margin |
|         |           | PSD       | PSD       | PSD    |       |        |
|         | (MHz)     | (dBm)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Low     | 5260      | 4.38      | 4.55      | 7.48   | 11.00 | -3.52  |
| Mid     | 5300      | 4.21      | 4.63      | 7.44   | 11.00 | -3.56  |
| High    | 5320      | 2.98      | 2.97      | 5.99   | 11.00 | -5.01  |

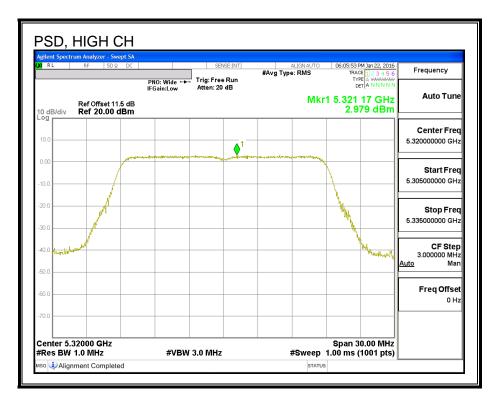
Page 291 of 1558

## PSD, ANTENNA - B

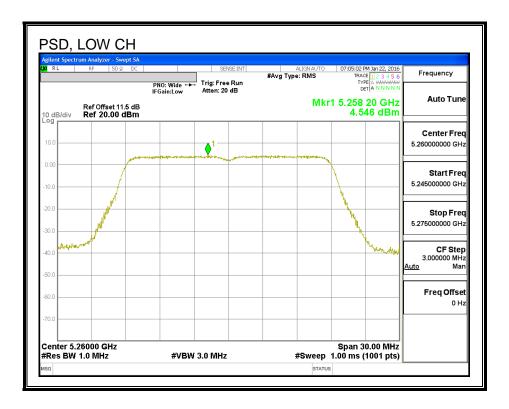




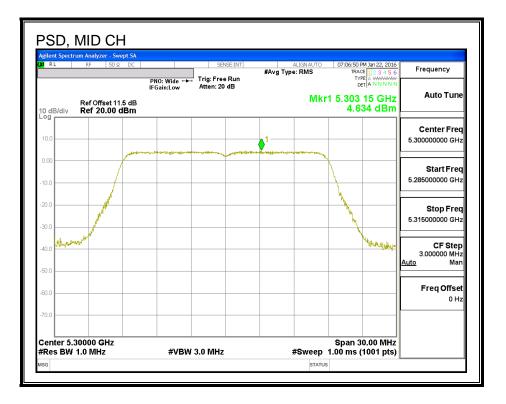
Page 292 of 1558

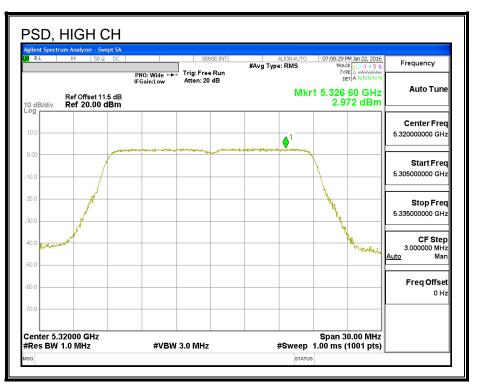


## PSD, ANTENNA - A



Page 293 of 1558





Page 294 of 1558

# 8.40. 802.11n HT20 ANTENNA A+C CDD MODE IN THE 5.3 GHz BAND

## 8.40.1. 26dB BANDWIDTH

## **LIMITS**

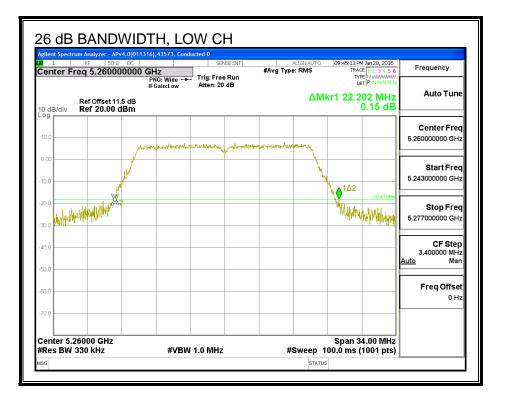
None; for reporting purposes only.

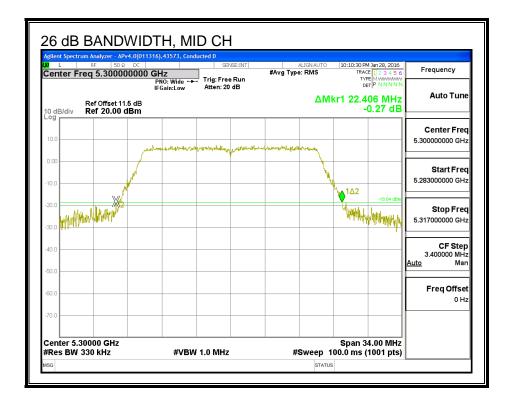
## **RESULTS**

| Channel | Frequency | 26 dB BW  | 26 dB BW  |
|---------|-----------|-----------|-----------|
|         |           | Antenna A | Antenna C |
|         | (MHz)     | (MHz)     | (MHz)     |
| Low     | 5260      | 22.20     | 21.81     |
| Mid     | 5300      | 22.41     | 21.65     |
| High    | 5320      | 22.30     | 21.58     |

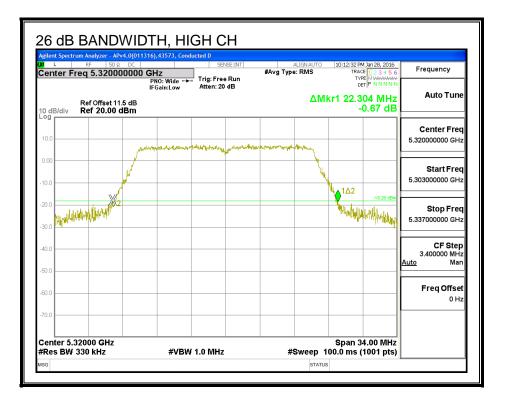
Page 295 of 1558

## 26 DB BANDWIDTH, ANTENNA - A

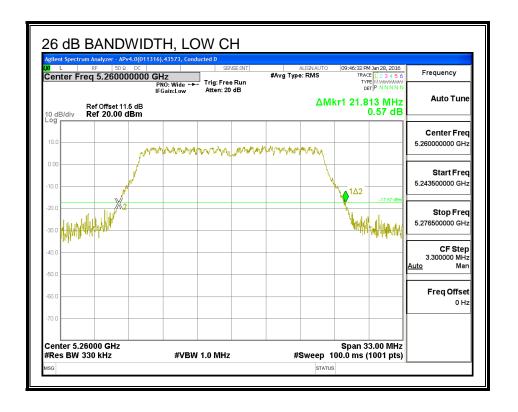




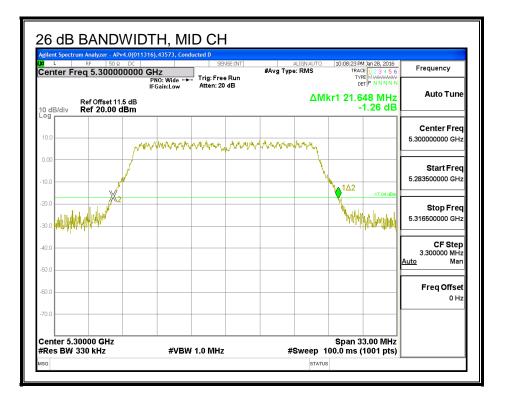
Page 296 of 1558

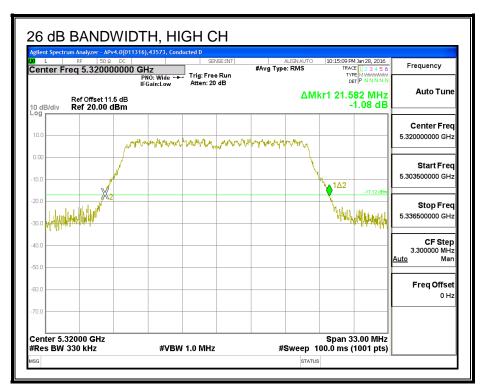


## 26 DB BANDWIDTH, ANTENNA - C



Page 297 of 1558





Page 298 of 1558

## 8.40.2. 99% BANDWIDTH

#### <u>LIMITS</u>

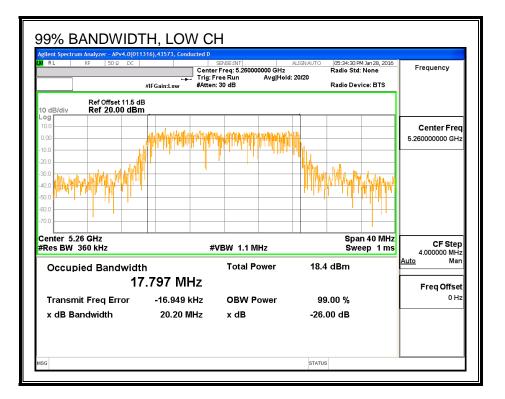
None; for reporting purposes only.

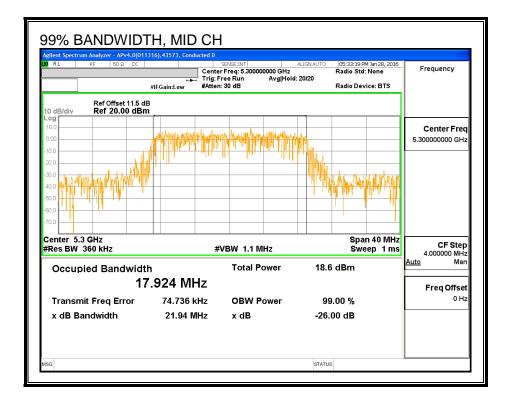
## **RESULTS**

| Channel | Frequency | 99% BW    | 99% BW    |
|---------|-----------|-----------|-----------|
|         |           | Antenna A | Antenna C |
|         | (MHz)     | (MHz)     | (MHz)     |
| Low     | 5260      | 17.797    | 17.794    |
| Mid     | 5300      | 17.924    | 17.799    |
| High    | 5320      | 17.823    | 17.874    |

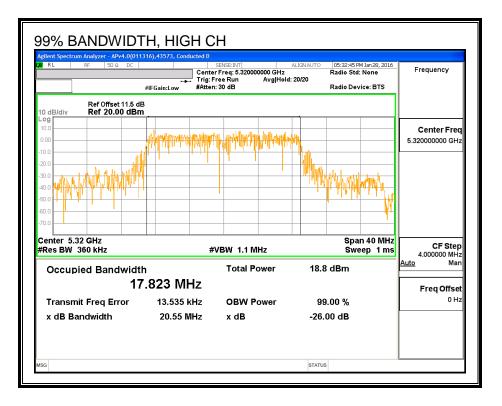
Page 299 of 1558

## 99% BANDWIDTH, ANTENNA - A

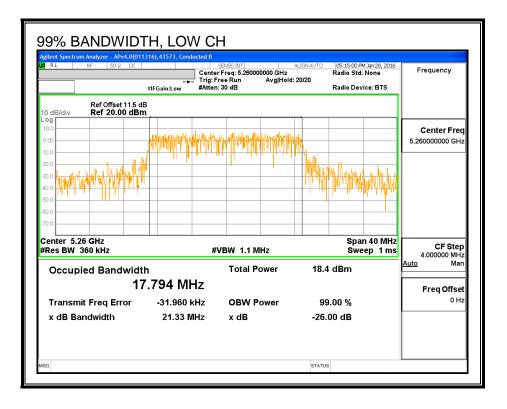




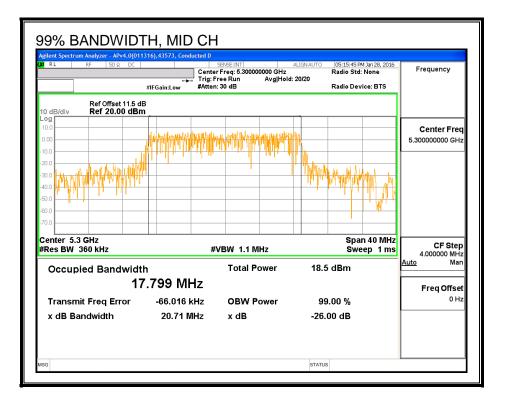
Page 300 of 1558

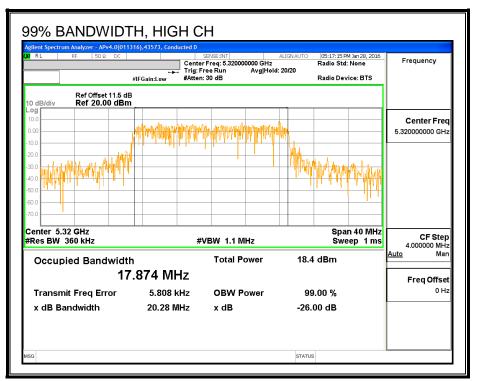


## 99% BANDWIDTH, ANTENNA - C



Page 301 of 1558





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Page 302 of 1558

## 8.40.3. AVERAGE POWER

## <u>LIMITS</u>

None; for reporting purposes only.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

#### **RESULTS**

| Channel | Frequency | Antenna | Antenna | Total |
|---------|-----------|---------|---------|-------|
|         |           | A       | С       |       |
|         |           | Power   | Power   | Power |
|         | (MHz)     | (dBm)   | (dBm)   | (dBm) |
| Low     | 5260      | 16.00   | 15.48   | 18.76 |
| Mid     | 5300      | 15.99   | 15.50   | 18.76 |
| High    | 5320      | 14.35   | 14.45   | 17.41 |

Page 303 of 1558

## 8.40.4. OUTPUT POWER AND PSD

## <u>LIMITS</u>

FCC §15.407 (a) (2)

For the band 5.25–5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26–dB emission bandwidth in MHz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1– MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output 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.

## TEST PROCEDURE

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

## **DIRECTIONAL ANTENNA GAIN**

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

| Antenna A | Antenna C | <b>Uncorrelated Chains</b> |
|-----------|-----------|----------------------------|
|           |           | Directional                |
| Gain      | Gain      | Gain                       |
| (dBi)     | (dBi)     | (dBi)                      |
| 2.23      | 2.12      | 2.18                       |

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

| Antenna A | Antenna C | <b>Correlated Chains</b> |
|-----------|-----------|--------------------------|
|           |           | Directional              |
| Gain      | Gain      | Gain                     |
| (dBi)     | (dBi)     | (dBi)                    |
| 2.23      | 2.12      | 5.19                     |

Page 304 of 1558

## RESULTS

#### Bandwidth, Antenna Gain and Limits

| Channel | Frequency | Min   | Min    | Directional | Directional | Power | PSD   |
|---------|-----------|-------|--------|-------------|-------------|-------|-------|
|         |           | 26 dB | 99%    | Gain        | Gain        | Limit | Limit |
|         |           | BW    | BW     | for Power   | for PSD     |       |       |
|         | (MHz)     | (MHz) | (MHz)  | (dBi)       | (dBi)       | (dBm) | (dBm) |
| Low     | 5260      | 22.20 | 17.797 | 2.18        | 5.19        | 23.50 | 11.00 |
| Mid     | 5300      | 22.41 | 17.924 | 2.18        | 5.19        | 23.53 | 11.00 |
| High    | 5320      | 22.30 | 17.874 | 2.18        | 5.19        | 23.52 | 11.00 |

#### Duty Cycle CF (dB) 0.00

Included in Calculations of Corr'd PSD

#### **Output Power Results**

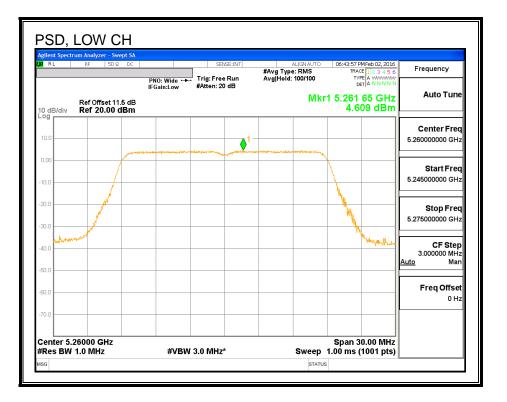
| Channel | Frequency | Antenna A | Antenna C | Total  | Power | Power  |
|---------|-----------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Meas      | Corr'd | Limit | Margin |
|         |           | Power     | Power     | Power  |       |        |
|         | (MHz)     | (dBm)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Low     | 5260      | 16.00     | 15.48     | 18.76  | 23.50 | -4.75  |
| Mid     | 5300      | 15.99     | 15.50     | 18.76  | 23.53 | -4.77  |
| High    | 5320      | 14.35     | 14.45     | 17.41  | 23.52 | -6.11  |

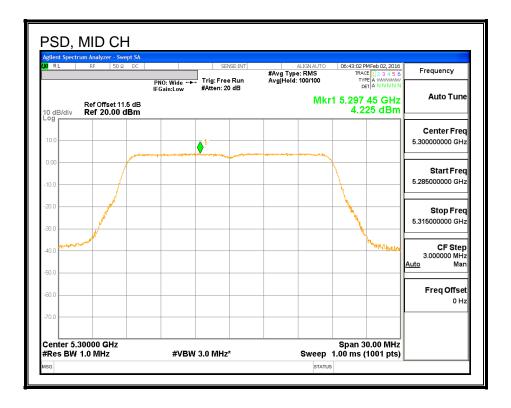
#### **PSD Results**

| Channel | Frequency | Antenna A | Antenna C | Total  | PSD   | PSD    |
|---------|-----------|-----------|-----------|--------|-------|--------|
|         |           | Meas      | Meas      | Corr'd | Limit | Margin |
|         |           | PSD       | PSD       | PSD    |       |        |
|         | (MHz)     | (dBm)     | (dBm)     | (dBm)  | (dBm) | (dB)   |
| Low     | 5260      | 4.61      | 4.29      | 7.46   | 11.00 | -3.54  |
| Mid     | 5300      | 4.23      | 4.00      | 7.12   | 11.00 | -3.88  |
| High    | 5320      | 2.84      | 2.88      | 5.87   | 11.00 | -5.13  |

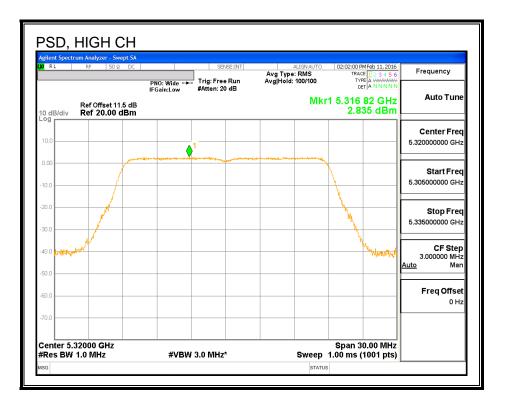
Page 305 of 1558

## PSD, ANTENNA - A

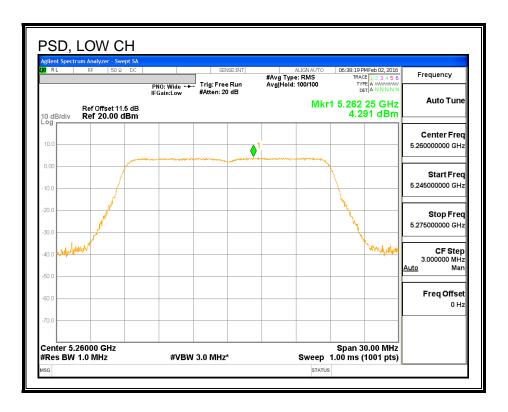




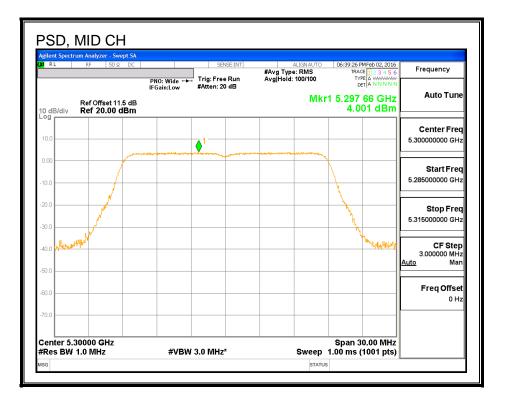
Page 306 of 1558

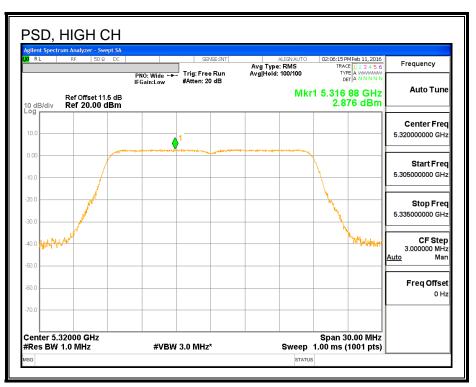


## PSD, ANTENNA - C



Page 307 of 1558





Page 308 of 1558

# 8.41. 802.11n HT20 ANTENNA B+A STBC MODE IN THE 5.3 GHz BAND

## 8.41.1. 26 dB BANDWIDTH

## **LIMITS**

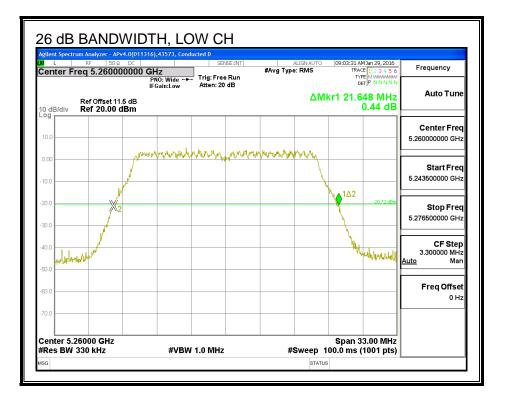
None; for reporting purposes only.

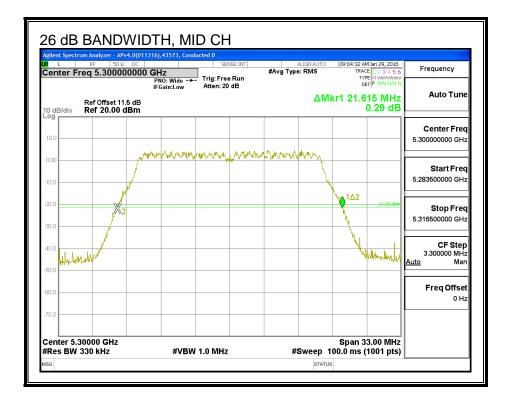
## **RESULTS**

| Channel | Frequency | 26 dB BW  | 26 dB BW  |
|---------|-----------|-----------|-----------|
|         |           | Antenna B | Antenna A |
|         | (MHz)     | (MHz)     | (MHz)     |
| Low     | 5260      | 21.65     | 21.78     |
| Mid     | 5300      | 21.62     | 21.81     |
| High    | 5320      | 21.81     | 21.65     |

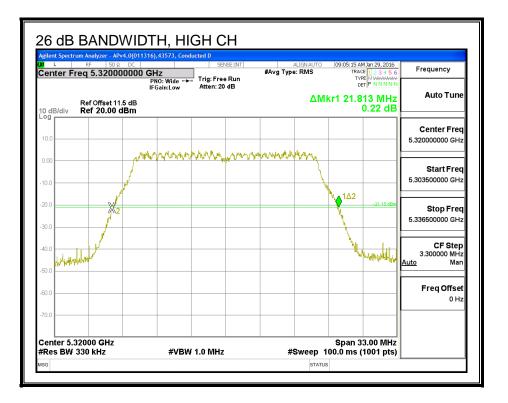
Page 309 of 1558

## 26 dB BANDWIDTH, ANTENNA - B

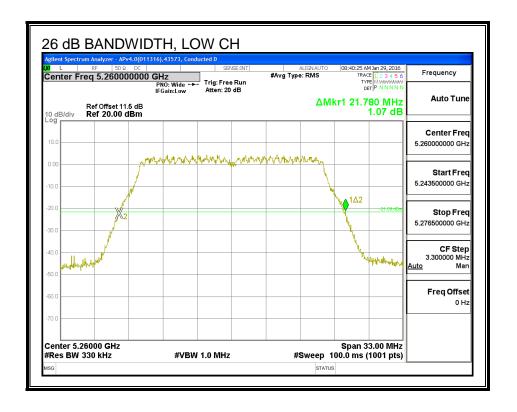




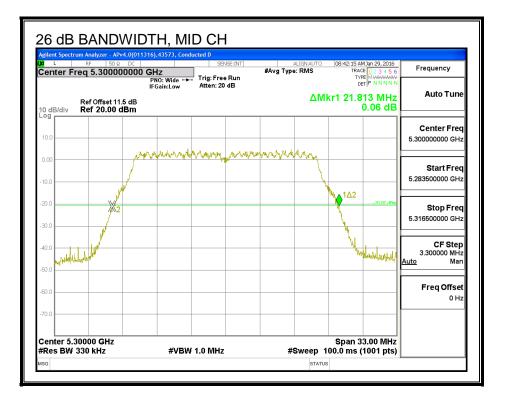
Page 310 of 1558

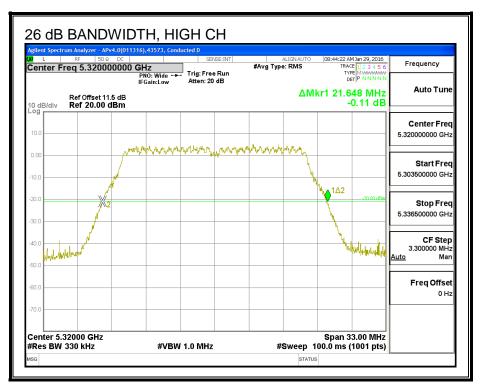


## 26 DB BANDWIDTH, ANTENNA - A



Page 311 of 1558





Page 312 of 1558

## 8.41.2. 99% BANDWIDTH

#### <u>LIMITS</u>

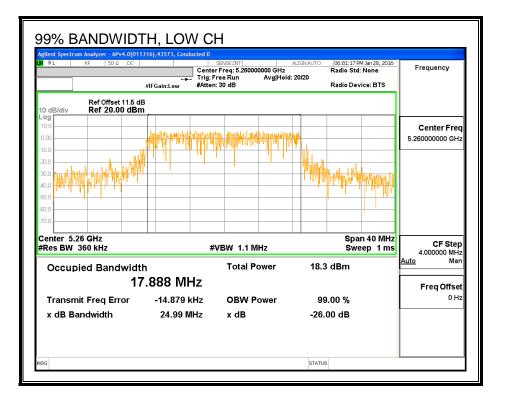
None; for reporting purposes only.

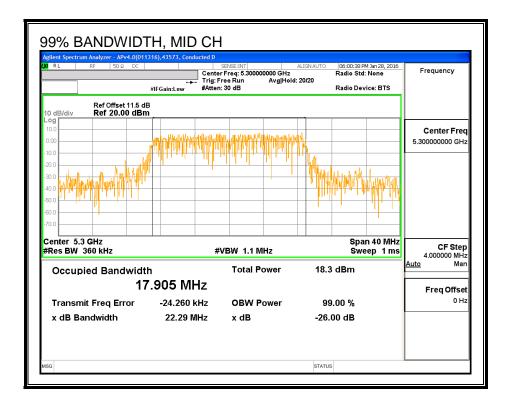
## **RESULTS**

| Channel | Frequency | 99% BW | 99% BW    |
|---------|-----------|--------|-----------|
|         |           |        | Antenna A |
|         | (MHz)     | (MHz)  | (MHz)     |
| Low     | 5260      | 17.888 | 17.822    |
| Mid     | 5300      | 17.905 | 17.788    |
| High    | 5320      | 17.808 | 17.776    |

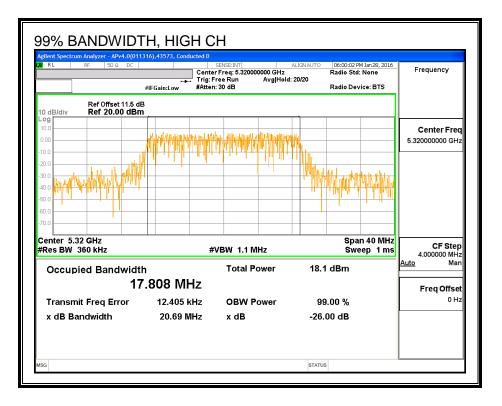
Page 313 of 1558

## 99% BANDWIDTH, ANTENNA - B

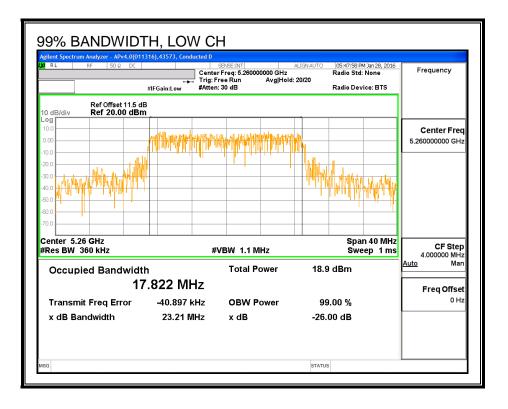




Page 314 of 1558



## 99% BANDWIDTH, ANTENNA - A



Page 315 of 1558