





























# 6.2 6dB BANDWIDTH MEASUREMENT

# 6.2.1 LIMITS

According to §15.407(e), Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

# 6.2.2 TEST INSTRUMENTS

| Name of<br>Equipment | Manufacturer | Model  | Serial Number | Last<br>Calibration | Calibration<br>Due |
|----------------------|--------------|--------|---------------|---------------------|--------------------|
| Spectrum Analyzer    | Agilent      | N9010A | MY52221469    | 02/21/2017          | 02/20/2018         |

# 6.2.3 TEST PROCEDURES (please refer to measurement standard)

# 8.1 Option 2:

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW  $\geq$  3 RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be  $\geq$  6 dB.

# 6.2.4 TEST SETUP





# 6.2.5 TEST RESULTS

No non-compliance noted

# Test Data

### Test mode: IEEE 802.11a mode / 5745 ~ 5825MHz

| Channel | Frequency | 6dB Bandwidth(B)<br>(MHz) |           | Limit     | Test Result |      |
|---------|-----------|---------------------------|-----------|-----------|-------------|------|
| •       | (MHz)     | Antenna 0                 | Antenna 1 | Antenna 2 | (kHz)       |      |
| Low     | 5745      | 16.29                     | 16.49     | 16.37     |             | PASS |
| Mid     | 5785      | 16.45                     | 16.39     | 16.43     | >500        | PASS |
| High    | 5825      | 16.39                     | 16.41     | 16.39     |             | PASS |

#### Test mode: IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

| Channel | Frequency | 6dB Bandwidth(B)<br>(MHz) |           |           | Limit | Test Result |
|---------|-----------|---------------------------|-----------|-----------|-------|-------------|
|         | (MHz)     | Antenna 0                 | Antenna 1 | Antenna 2 | (kHz) |             |
| Low     | 5745      | 17.59                     | 17.63     | 16.72     |       | PASS        |
| Mid     | 5785      | 17.63                     | 17.58     | 17.63     | >500  | PASS        |
| High    | 5825      | 17.62                     | 17.62     | 17.62     |       | PASS        |

#### Test mode: IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

| Channel | Frequency | 6dB Bandwidth(B)<br>(MHz) |           | Limit     | Test Result |      |
|---------|-----------|---------------------------|-----------|-----------|-------------|------|
|         | (MHz)     | Antenna 0                 | Antenna 1 | Antenna 2 | (kHz)       |      |
| Low     | 5755      | 36.45                     | 36.50     | 36.41     | > E00       | PASS |
| High    | 5795      | 36.48                     | 36.42     | 36.43     | >000        | PASS |

#### Test mode: IEEE 802.11ac 80 mode / 5775MHz

| Channel | Frequency | 6dB Bandwidth(B)<br>(MHz) |           |           | Limit | Test Result |
|---------|-----------|---------------------------|-----------|-----------|-------|-------------|
| (MHz)   |           | Antenna 0                 | Antenna 1 | Antenna 2 | (kHz) |             |
|         | 5775      | 76.23                     | 76.40     | 76.41     | >500  | PASS        |



# Test Plot































































# 6.3 ANTENNA GAIN

# **MEASUREMENT**

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For UNII devices, the IEEE 802.11a mode is used.

# **MEASUREMENT PARAMETERS**

| Measurement parameter |          |  |  |
|-----------------------|----------|--|--|
| Detector              | Peak     |  |  |
| Sweep time            | Auto     |  |  |
| Resolution bandwidth  | 3 MHz    |  |  |
| Video bandwidth       | 3 MHz    |  |  |
| Trace-Mode            | Max hold |  |  |

# **LIMITS**

| FCC          | IC |  |  |
|--------------|----|--|--|
| Antenna Gain |    |  |  |
| 6 dBi        |    |  |  |



# **TEST RESULTS**

### IEEE 802.11a mode

### Antenna 0

# IEEE 802.11a mode / 5180 ~ 5240MHz

| T <sub>nom</sub>                                    | V <sub>nom</sub> | Lowest channel<br>5180MHz | Highest channel<br>5240MHz |
|-----------------------------------------------------|------------------|---------------------------|----------------------------|
| Conducted power [dBm] Measured with OFDM modulation |                  | 9.94                      | 10.24                      |
| Radiated power [dBm] Measured with OFDM modulation  |                  | 11.52                     | 11.79                      |
| Gain [dBi] Calculated                               |                  | 1.58                      | 1.55                       |
| Measurement und                                     | certainty        | ± 1.5 dB (cond.           | ) / ± 3 dB (rad.)          |
| EEE 902 110 m                                       | ada / 5260 - 5   | 220MU-                    |                            |

### IEEE 802.11a mode / 5260 ~ 5320MHz

| T <sub>nom</sub>                                    | V <sub>nom</sub> | Lowest channel<br>5260MHz | Highest channel<br>5320MHz |
|-----------------------------------------------------|------------------|---------------------------|----------------------------|
| Conducted power [dBm] Measured with OFDM modulation |                  | 9.55                      | 9.65                       |
| Radiated power [dBm] Measured with OFDM modulation  |                  | 11.43                     | 11.61                      |
| Gain [dBi] Calculated                               |                  | 1.88                      | 1.96                       |
| Measurement unc                                     | ertainty         | ± 1.5 dB (cond.           | ) / ± 3 dB (rad.)          |

### IEEE 802.11a mode / 5500 ~ 5700MHz

| T <sub>nom</sub>                                    | V <sub>nom</sub> | Lowest channel<br>5500MHz | Highest channel<br>5700MHz |
|-----------------------------------------------------|------------------|---------------------------|----------------------------|
| Conducted power [dBm] Measured with OFDM modulation |                  | 9.04                      | 8.54                       |
| Radiated power [dBm] Measured with OFDM modulation  |                  | 11.93                     | 10.25                      |
| Gain [dBi] Calculated                               |                  | 2.89                      | 1.71                       |
| Measurement und                                     | ertainty         | ± 1.5 dB (cond.           | ) / ± 3 dB (rad.)          |

| T <sub>nom</sub>                                    | V <sub>nom</sub> | Lowest channel<br>5745MHz        | Highest channel<br>5825MHz |
|-----------------------------------------------------|------------------|----------------------------------|----------------------------|
| Conducted power [dBm] Measured with OFDM modulation |                  | 9.24                             | 8.84                       |
| Radiated power [dBm] Measured with OFDM modulation  |                  | 10.21                            | 10.85                      |
| Gain [dBi] Calculated                               |                  | 0.97                             | 2.01                       |
| Measurement uncertainty                             |                  | ± 1.5 dB (cond.) / ± 3 dB (rad.) |                            |



# <u>Antenna 1</u>

# IEEE 802.11a mode / 5180 ~ 5240MHz

| T <sub>nom</sub>                                    | V <sub>nom</sub> | Lowest channel<br>5180MHz        | Highest channel<br>5240MHz |  |
|-----------------------------------------------------|------------------|----------------------------------|----------------------------|--|
| Conducted power [dBm] Measured with OFDM modulation |                  | 7.94                             | 7.95                       |  |
| Radiated power [dBm] Measured with OFDM modulation  |                  | 9.29                             | 10.15                      |  |
| Gain [dBi] Calculated                               |                  | 1.35                             | 2.20                       |  |
| Measurement uncertainty                             |                  | ± 1.5 dB (cond.) / ± 3 dB (rad.) |                            |  |

# IEEE 802.11a mode / 5260 ~ 5320MHz

| T <sub>nom</sub>                 | V <sub>nom</sub>         | Lowest channel<br>5260MHz | Highest channel<br>5320MHz |
|----------------------------------|--------------------------|---------------------------|----------------------------|
| Conducted power with OFDM modu   | [dBm] Measured<br>lation | 8.76                      | 8.05                       |
| Radiated power [o with OFDM modu | dBm] Measured<br>lation  | 11.25                     | 10.09                      |
| Gain [dBi] Calcula               | ated                     | 2.49                      | 2.04                       |
| Measurement und                  | certainty                | ± 1.5 dB (cond.           | ) / ± 3 dB (rad.)          |

### IEEE 802.11a mode / 5500 ~ 5700MHz

| T <sub>nom</sub>                 | V <sub>nom</sub>         | Lowest channel<br>5500MHz | Highest channel<br>5700MHz |
|----------------------------------|--------------------------|---------------------------|----------------------------|
| Conducted power with OFDM modu   | [dBm] Measured<br>lation | 7.94                      | 7.26                       |
| Radiated power [o with OFDM modu | dBm] Measured<br>lation  | 9.45                      | 8.54                       |
| Gain [dBi] Calcula               | ited                     | 1.51                      | 1.28                       |
| Measurement und                  | certainty                | ± 1.5 dB (cond.           | ) / ± 3 dB (rad.)          |

| T <sub>nom</sub>                     | V <sub>nom</sub>         | Lowest channel<br>5745MHz | Highest channel<br>5825MHz |
|--------------------------------------|--------------------------|---------------------------|----------------------------|
| Conducted power with OFDM modu       | [dBm] Measured<br>lation | 8.16                      | 8.23                       |
| Radiated power [c<br>with OFDM modul | dBm] Measured<br>lation  | 11.13                     | 10.87                      |
| Gain [dBi] Calcula                   | ated                     | 2.97                      | 2.64                       |
| Measurement und                      | certainty                | ± 1.5 dB (cond.           | ) / ± 3 dB (rad.)          |



# Antenna 2

# IEEE 802.11a mode / 5180 ~ 5240MHz

| T <sub>nom</sub>                 | V <sub>nom</sub>         | Lowest channel<br>5180MHz        | Highest channel<br>5240MHz |  |  |  |
|----------------------------------|--------------------------|----------------------------------|----------------------------|--|--|--|
| Conducted power with OFDM modu   | [dBm] Measured<br>lation | 9.75                             | 9.04                       |  |  |  |
| Radiated power [o with OFDM modu | dBm] Measured<br>lation  | 11.29                            | 11.15                      |  |  |  |
| Gain [dBi] Calculated            |                          | 1.54                             | 2.11                       |  |  |  |
| Measurement und                  | certainty                | ± 1.5 dB (cond.) / ± 3 dB (rad.) |                            |  |  |  |

### IEEE 802.11a mode / 5260 ~ 5320MHz

| T <sub>nom</sub>                 | V <sub>nom</sub>         | Lowest channel<br>5260MHz | Highest channel<br>5320MHz |
|----------------------------------|--------------------------|---------------------------|----------------------------|
| Conducted power with OFDM modu   | [dBm] Measured<br>lation | 9.55                      | 9.76                       |
| Radiated power [o with OFDM modu | dBm] Measured<br>lation  | 11.25                     | 11.09                      |
| Gain [dBi] Calcula               | ated                     | 1.70                      | 1.33                       |
| Measurement und                  | certainty                | ± 1.5 dB (cond.           | ) / ± 3 dB (rad.)          |

### IEEE 802.11a mode / 5500 ~ 5700MHz

| T <sub>nom</sub>                 | V <sub>nom</sub>         | Lowest channel<br>5500MHz        | Highest channel<br>5700MHz |  |  |  |
|----------------------------------|--------------------------|----------------------------------|----------------------------|--|--|--|
| Conducted power with OFDM modu   | [dBm] Measured<br>lation | 9.04                             | 8.63                       |  |  |  |
| Radiated power [o with OFDM modu | dBm] Measured<br>lation  | 11.86                            | 11.54                      |  |  |  |
| Gain [dBi] Calculated            |                          | 2.82                             | 2.91                       |  |  |  |
| Measurement und                  | certainty                | ± 1.5 dB (cond.) / ± 3 dB (rad.) |                            |  |  |  |

| T <sub>nom</sub>                 | V <sub>nom</sub>         | Lowest channel<br>5745MHz        | Highest channel<br>5825MHz |  |  |  |  |
|----------------------------------|--------------------------|----------------------------------|----------------------------|--|--|--|--|
| Conducted power with OFDM modu   | [dBm] Measured<br>lation | 8.73                             | 9.93                       |  |  |  |  |
| Radiated power [o with OFDM modu | dBm] Measured<br>lation  | 10.13                            | 11.87                      |  |  |  |  |
| Gain [dBi] Calculated            |                          | 1.40                             | 1.94                       |  |  |  |  |
| Measurement und                  | certainty                | ± 1.5 dB (cond.) / ± 3 dB (rad.) |                            |  |  |  |  |



# 6.4 OUTPUT POWER

# 6.4.1 LIMIT

# According to §15.407(a)& FCC R&O FCC 14 - 30,

(1) For the band 5.15-5.25 GHz.

(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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. 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.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands 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 megahertz. 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.



(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. 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.

Note to paragraph (a)(3): The Commission strongly recommends that parties employing U-NII devices to provide critical communications services should determine if there are any nearby Government radar systems that could affect their operation.



#### Specified Limit of the Output Power

#### Test mode: IEEE 802.11a mode / 5260 ~ 5320MHz

| Channel | Frequency<br>(MHz) | 26 dB Bandwidth (B)<br>cy (MHz) |           |           | 10*Log(B)<br>(dB)             |       |           | 11 + 10*Log(B)<br>(dBm) |           |           | Maximum Conducted<br>Output Power Limit (dBm) |           |       |
|---------|--------------------|---------------------------------|-----------|-----------|-------------------------------|-------|-----------|-------------------------|-----------|-----------|-----------------------------------------------|-----------|-------|
|         |                    | Antenna 0                       | Antenna 1 | Antenna 2 | Antenna 0 Antenna 1 Antenna 2 |       | Antenna 0 | Antenna 1               | Antenna 2 | Antenna 0 | Antenna 1                                     | Antenna 2 |       |
| Low     | 5260               | 21.01                           | 20.77     | 20.59     | 13.22                         | 13.17 | 13.14     | 24.22                   | 24.17     | 24.14     | 24.00                                         | 24.00     | 24.00 |
| Mid     | 5300               | 20.54                           | 20.60     | 20.70     | 13.13                         | 13.14 | 13.16     | 24.13                   | 24.14     | 24.16     | 24.00                                         | 24.00     | 24.00 |
| High    | 5320               | 20.53                           | 20.64     | 20.93     | 13.12                         | 13.15 | 13.21     | 24.12                   | 24.15     | 24.21     | 24.00                                         | 24.00     | 24.00 |

### Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

| Channel | 26 dB Bandwidth (B)<br>Frequency (MHz)<br>(MHz) |           |           |           |                               | 10*Log(B)<br>(dB) |       |           | 11 + 10*Log(B)<br>(dBm) |           |           | Maximum Conducted<br>Output Power Limit (dBm) |           |  |  |
|---------|-------------------------------------------------|-----------|-----------|-----------|-------------------------------|-------------------|-------|-----------|-------------------------|-----------|-----------|-----------------------------------------------|-----------|--|--|
|         |                                                 | Antenna 0 | Antenna 1 | Antenna 2 | Antenna 0 Antenna 1 Antenna 2 |                   |       | Antenna 0 | Antenna 1               | Antenna 2 | Antenna 0 | Antenna 1                                     | Antenna 2 |  |  |
| Low     | 5500                                            | 20.96     | 20.67     | 20.87     | 13.21                         | 13.15             | 13.20 | 24.21     | 24.15                   | 24.20     | 24.00     | 24.00                                         | 24.00     |  |  |
| Mid     | 5580                                            | 20.86     | 20.83     | 20.65     | 13.19                         | 13.19             | 13.15 | 24.19     | 24.19                   | 24.15     | 24.00     | 24.00                                         | 24.00     |  |  |
| High    | 5700                                            | 20.49     | 20.95     | 20.93     | 13.12                         | 13.21             | 13.21 | 24.12     | 24.21                   | 24.21     | 24.00     | 24.00                                         | 24.00     |  |  |

#### Test mode: IEEE 802.11n HT 20 MHz mode / 5260 ~ 5320MHz

| Channel (MHz) |      | 26 dB Bandwidth (B)<br>(MHz) |           |           | 10*Log(B)<br>(dB)             |       |           | 11 + 10*Log(B)<br>(dBm) |           |           | Maximum Conducted<br>Output Power Limit (dBm) |           |       |
|---------------|------|------------------------------|-----------|-----------|-------------------------------|-------|-----------|-------------------------|-----------|-----------|-----------------------------------------------|-----------|-------|
|               |      | Antenna 0                    | Antenna 1 | Antenna 2 | Antenna 0 Antenna 1 Antenna 2 |       | Antenna 0 | Antenna 1               | Antenna 2 | Antenna 0 | Antenna 1                                     | Antenna 2 |       |
| Low           | 5260 | 21.06                        | 20.92     | 21.06     | 13.23                         | 13.21 | 13.23     | 24.23                   | 24.21     | 24.23     | 24.00                                         | 24.00     | 24.00 |
| Mid           | 5300 | 21.05                        | 20.87     | 20.87     | 13.23                         | 13.20 | 13.20     | 24.23                   | 24.20     | 24.20     | 24.00                                         | 24.00     | 24.00 |
| High          | 5320 | 20.84                        | 21.01     | 20.92     | 13.19                         | 13.22 | 13.21     | 24.19                   | 24.22     | 24.21     | 24.00                                         | 24.00     | 24.00 |

#### Test mode: IEEE 802.11n HT 20 MHz mode / 5500 ~ 5700MHz

| Channel | Frequency<br>(MHz) | 26 dB Bandwidth (B)<br>;y (MHz) |           |           | 10*Log(B)<br>(dB)             |       |           | 11 + 10*Log(B)<br>(dBm) |           |           | Maximum Conducted<br>Output Power Limit (dBm) |           |       |
|---------|--------------------|---------------------------------|-----------|-----------|-------------------------------|-------|-----------|-------------------------|-----------|-----------|-----------------------------------------------|-----------|-------|
|         |                    | Antenna 0                       | Antenna 1 | Antenna 2 | Antenna 0 Antenna 1 Antenna 2 |       | Antenna 0 | Antenna 1               | Antenna 2 | Antenna 0 | Antenna 1                                     | Antenna 2 |       |
| Low     | 5500               | 20.66                           | 20.72     | 21.08     | 13.15                         | 13.16 | 13.24     | 24.15                   | 24.16     | 24.24     | 24.00                                         | 24.00     | 24.00 |
| Mid     | 5580               | 20.52                           | 20.88     | 20.85     | 13.12                         | 13.20 | 13.19     | 24.12                   | 24.20     | 24.19     | 24.00                                         | 24.00     | 24.00 |
| High    | 5700               | 20.89                           | 21.00     | 20.98     | 13.20                         | 13.22 | 13.22     | 24.20                   | 24.22     | 24.22     | 24.00                                         | 24.00     | 24.00 |



| Channel | Frequency<br>(MHz) | 26 d      | B Bandwidt<br>(MHz) | :h (B)    | 10*Log(B)<br>(dB) |           |           | 11 + 10*Log(B)<br>(dBm) |           |           | Maximum Conducted<br>Output Power Limit (dBm) |           |           |
|---------|--------------------|-----------|---------------------|-----------|-------------------|-----------|-----------|-------------------------|-----------|-----------|-----------------------------------------------|-----------|-----------|
|         |                    | Antenna 0 | Antenna 1           | Antenna 2 | Antenna 0         | Antenna 1 | Antenna 2 | Antenna 0               | Antenna 1 | Antenna 2 | Antenna 0                                     | Antenna 1 | Antenna 2 |
| Low     | 5270               | 39.82     | 39.74               | 39.94     | 16.00             | 15.99     | 16.01     | 27.00                   | 26.99     | 27.01     | 24.00                                         | 24.00     | 24.00     |
| High    | 5310               | 39.64     | 39.80               | 39.98     | 15.98             | 16.00     | 16.02     | 26.98                   | 27.00     | 27.02     | 24.00                                         | 24.00     | 24.00     |

#### IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz

# IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz

| Channel | Frequency<br>(MHz) | 26 dB Bandwidth (B)<br>(MHz) |           |           | 10*Log(B)<br>(dB) |           |           | 11 + 10*Log(B)<br>(dBm) |           |           | Maximum Conducted<br>Output Power Limit (dBm) |           |           |
|---------|--------------------|------------------------------|-----------|-----------|-------------------|-----------|-----------|-------------------------|-----------|-----------|-----------------------------------------------|-----------|-----------|
|         |                    | Antenna 0                    | Antenna 1 | Antenna 2 | Antenna 0         | Antenna 1 | Antenna 2 | Antenna 0               | Antenna 1 | Antenna 2 | Antenna 0                                     | Antenna 1 | Antenna 2 |
| Low     | 5510               | 39.28                        | 39.93     | 39.86     | 15.94             | 16.01     | 16.01     | 26.94                   | 27.01     | 27.01     | 24.00                                         | 24.00     | 24.00     |
| Mid     | 5550               | 39.79                        | 39.63     | 40.16     | 16.00             | 15.98     | 16.04     | 27.00                   | 26.98     | 27.04     | 24.00                                         | 24.00     | 24.00     |
| High    | 5670               | 39.53                        | 39.78     | 39.79     | 15.97             | 16.00     | 16.00     | 26.97                   | 27.00     | 27.00     | 24.00                                         | 24.00     | 24.00     |

#### IEEE 802.11ac 80 mode / 5290MHz

| Channel | Frequency<br>(MHz) | 26 d      | 26 dB Bandwidth (B)<br>(MHz) |           | 10*Log(B)<br>(dB) |           | 1         | 11 + 10*Log(B)<br>(dBm) |           | Maximum Conducted<br>Output Power Limit (dBm) |           |           |           |
|---------|--------------------|-----------|------------------------------|-----------|-------------------|-----------|-----------|-------------------------|-----------|-----------------------------------------------|-----------|-----------|-----------|
|         |                    | Antenna 0 | Antenna 1                    | Antenna 2 | Antenna 0         | Antenna 1 | Antenna 2 | Antenna 0               | Antenna 1 | Antenna 2                                     | Antenna 0 | Antenna 1 | Antenna 2 |
|         | 5290               | 81.19     | 81.47                        | 81.21     | 19.10             | 19.11     | 19.10     | 30.10                   | 30.11     | 30.10                                         | 24.00     | 24.00     | 24.00     |

#### IEEE 802.11ac 80 mode / 5530MHz

| Channel | Frequency<br>(MHz) | 26 d              | 26 dB Bandwidth (B)<br>(MHz) |           | 10*Log(B)<br>(dB) |           | 1                 | 11 + 10*Log(B)<br>(dBm) |                   | Maximum Conducted<br>Output Power Limit (dBm) |           |           |
|---------|--------------------|-------------------|------------------------------|-----------|-------------------|-----------|-------------------|-------------------------|-------------------|-----------------------------------------------|-----------|-----------|
|         |                    | Antenna 0         | Antenna 1                    | Antenna 2 | Antenna 0         | Antenna 1 | Antenna 2         | Antenna 0               | Antenna 1         | Antenna 2                                     | Antenna 0 | Antenna 1 |
|         | 5530               | 81.18 81.14 81.21 |                              | 19.09     | 19.09             | 19.10     | 30.09 30.09 30.10 |                         | 24.00 24.00 24.00 |                                               | 24.00     |           |



# 6.4.2 MEASUREMENT EQUIPMENT USED

| Name of<br>Equipment | Manufacturer | Model   | Serial Number | Last<br>Calibration | Calibration<br>Due |
|----------------------|--------------|---------|---------------|---------------------|--------------------|
| Power Meter          | Anritsu      | ML2495A | 1204003       | 02/21/2017          | 02/20/2018         |
| Power Sensor         | Anritsu      | MA2411B | 1126150       | 02/21/2017          | 02/20/2018         |

**Remark:** Each piece of equipment is scheduled for calibration once a year.

# 6.4.3 TEST CONFIGURATIONS



# 6.4.4 TEST PROCEDURE

The EUT was connected to a Power Meter through a 50  $\Omega$  RF cable.

# 6.4.5 TEST RESULTS

No non-compliance noted



# 6.4.6 TEST DATA

### IEEE 802.11a mode / 5180 ~ 5240MHz

| Channel | Frequency<br>(MHz) | AVG Output Power<br>(dBm) |           |           | AVC       | GOutput Po<br>(W) | wer       | Limit<br>(dBm) | Result |
|---------|--------------------|---------------------------|-----------|-----------|-----------|-------------------|-----------|----------------|--------|
|         | (11112)            | Antenna 0                 | Antenna 1 | Antenna 2 | Antenna 0 | Antenna 1         | Antenna 2 | (ubili)        |        |
| Low     | 5180               | 12.60                     | 10.00     | 12.60     | 0.01820   | 0.01000           | 0.01820   |                | PASS   |
| Mid     | 5200               | 12.20                     | 10.10     | 12.40     | 0.01660   | 0.01023           | 0.01738   | 30.00          | PASS   |
| High    | 5240               | 12.40                     | 9.80      | 12.40     | 0.01738   | 0.00955           | 0.01738   |                | PASS   |

#### IEEE 802.11a mode / 5260~ 5320MHz

| Channel | Frequency<br>(MHz) | AVC       | G Output Po<br>(dBm) | ower      | AVC       | GOutput Po<br>(W) | wer       | Limit<br>(dBm) | Result |
|---------|--------------------|-----------|----------------------|-----------|-----------|-------------------|-----------|----------------|--------|
|         | (101112)           | Antenna 0 | Antenna 1            | Antenna 2 | Antenna 0 | Antenna 1         | Antenna 2 | (ubiii)        |        |
| Low     | 5260               | 12.40     | 10.70                | 12.60     | 0.01738   | 0.01175           | 0.01820   |                | PASS   |
| Mid     | 5300               | 12.20     | 10.70                | 12.80     | 0.01660   | 0.01175           | 0.01905   | 24.00          | PASS   |
| High    | 5320               | 12.20     | 10.90                | 12.70     | 0.01660   | 0.01230           | 0.01862   |                | PASS   |
|         | 0.44               |           | EZOONILI-            |           |           |                   |           |                |        |

#### IEEE 802.11a mode / 5500 ~ 5700MHz

| Channel | Frequency<br>(MHz) | AVG Output Power<br>(dBm) |           |           | AVG       | GOutput Po<br>(W) | wer       | Limit<br>(dBm) | Result |
|---------|--------------------|---------------------------|-----------|-----------|-----------|-------------------|-----------|----------------|--------|
|         | (101112)           | Antenna 0                 | Antenna 1 | Antenna 2 | Antenna 0 | Antenna 1         | Antenna 2 | (ubiii)        |        |
| Low     | 5500               | 11.20                     | 10.40     | 11.50     | 0.01318   | 0.01096           | 0.01413   |                | PASS   |
| Mid     | 5580               | 11.20                     | 10.30     | 11.00     | 0.01318   | 0.01072           | 0.01259   | 24.00          | PASS   |
| High    | 5700               | 11.00                     | 10.40     | 11.20     | 0.01259   | 0.01096           | 0.01318   |                | PASS   |

| Channel | Frequency<br>(MHz) | AVO       | GOutput Po<br>(dBm) | ower      | AVG       | Goutput Po<br>(W) | wer       | Limit<br>(dBm) | Result |
|---------|--------------------|-----------|---------------------|-----------|-----------|-------------------|-----------|----------------|--------|
|         | (191112)           | Antenna 0 | Antenna 1           | Antenna 2 | Antenna 0 | Antenna 1         | Antenna 2 | (ubiii)        |        |
| Low     | 5745               | 11.70     | 10.90               | 12.10     | 0.01479   | 0.01230           | 0.01622   |                | PASS   |
| Mid     | 5785               | 11.80     | 10.90               | 12.40     | 0.01514   | 0.01230           | 0.01738   | 30.00          | PASS   |
| High    | 5825               | 11.70     | 10.80               | 12.40     | 0.01479   | 0.01202           | 0.01738   |                | PASS   |



#### IEEE 802.11n HT 20 MHz mode / 5180 ~ 5240MHz

| Channel | Frequency<br>(MHz) |           | AVG Outp<br>(dB | out Power<br>m) |       | AVG Output | Limit   | Result |
|---------|--------------------|-----------|-----------------|-----------------|-------|------------|---------|--------|
|         | (11172)            | Antenna 0 | Antenna 1       | Antenna 2       | Total | Fower (W)  | (ubiii) |        |
| Low     | 5180               | 11.90     | 9.20            | 12.10           | 16.02 | 0.04002    |         | PASS   |
| Mid     | 5200               | 12.10     | 9.40            | 11.90           | 16.07 | 0.04042    | 30.00   | PASS   |
| High    | 5240               | 11.80     | 9.40            | 12.10           | 16.03 | 0.04006    |         | PASS   |

#### IEEE 802.11n HT 20 MHz mode / 5260~ 5320MHz

| Channel | Frequency<br>(MHz) |           | AVG Outp<br>(dB | out Power<br>m) |       | AVG Output | Limit   | Result |
|---------|--------------------|-----------|-----------------|-----------------|-------|------------|---------|--------|
|         | (11112)            | Antenna 0 | Antenna 1       | Antenna 2       | Total | Power (W)  | (ubiii) |        |
| Low     | 5260               | 12.00     | 10.20           | 12.40           | 16.40 | 0.04370    |         | PASS   |
| Mid     | 5300               | 11.90     | 10.30           | 12.20           | 16.31 | 0.04280    | 24.00   | PASS   |
| High    | 5320               | 12.10     | 10.20           | 12.40           | 16.44 | 0.04407    |         | PASS   |

#### IEEE 802.11n HT 20 MHz mode / 5500 ~ 5700MHz

| Channel | Frequency<br>(MHz) |           | AVG Outp<br>(dB | out Power<br>sm) |       | AVG Output | Limit   | Result |
|---------|--------------------|-----------|-----------------|------------------|-------|------------|---------|--------|
|         | (11112)            | Antenna 0 | Antenna 1       | Antenna 2        | Total |            | (ubiii) |        |
| Low     | 5500               | 11.00     | 10.10           | 11.00            | 15.49 | 0.03541    |         | PASS   |
| Mid     | 5580               | 10.80     | 10.20           | 10.80            | 15.38 | 0.03452    | 24.00   | PASS   |
| High    | 5700               | 10.90     | 10.30           | 10.80            | 15.45 | 0.03504    |         | PASS   |

#### IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

| Channel | Frequency<br>(MHz) |           | AVG Outp<br>(dB | out Power<br>m) |       | AVG Output | Limit   | Result |
|---------|--------------------|-----------|-----------------|-----------------|-------|------------|---------|--------|
|         | (11112)            | Antenna 0 | Antenna 1       | Antenna 2       | Total |            | (ubiii) |        |
| Low     | 5745               | 11.40     | 10.70           | 11.90           | 16.13 | 0.04104    |         | PASS   |
| Mid     | 5785               | 11.50     | 10.60           | 11.90           | 16.14 | 0.04110    | 30.00   | PASS   |
| High    | 5825               | 11.50     | 10.30           | 11.70           | 15.98 | 0.03963    |         | PASS   |



| Channel                                      | Frequency                  |                 | (dBm)                                |                                      | AVG Output            | Limit<br>(dBm)                     | Result         |                       |
|----------------------------------------------|----------------------------|-----------------|--------------------------------------|--------------------------------------|-----------------------|------------------------------------|----------------|-----------------------|
|                                              | (11112)                    | Antenna 0       | Antenna 1                            | Antenna 2                            | Total                 | Power (W)                          | (ubiii)        |                       |
| Low                                          | 5190                       | 10.50           | 7.40                                 | 10.20                                | 14.34                 | 0.02719                            | 30.00          | PASS                  |
| High                                         | 5230                       | 10.50           | 7.50                                 | 10.10                                | 14.33                 | 0.02708                            | 30.00          | PASS                  |
| IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz |                            |                 |                                      |                                      |                       |                                    |                |                       |
|                                              | 211111111                  |                 | 0210 02                              |                                      |                       |                                    |                |                       |
| Channel                                      | Frequency                  |                 | AVG Outp<br>(dB                      | ut Power<br>m)                       |                       | AVG Output                         | Limit<br>(dBm) | Result                |
| Channel                                      | Frequency<br>(MHz)         | Antenna 0       | AVG Outp<br>(dB<br>Antenna 1         | ut Power<br>m)<br>Antenna 2          | Total                 | AVG Output<br>Power (W)            | Limit<br>(dBm) | Result                |
| Channel                                      | Frequency<br>(MHz)<br>5270 | Antenna 0 10.40 | AVG Outp<br>(dB<br>Antenna 1<br>8.30 | ut Power<br>m)<br>Antenna 2<br>10.70 | <b>Total</b><br>14.69 | AVG Output<br>Power (W)<br>0.02947 | Limit<br>(dBm) | <b>Result</b><br>PASS |

#### IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz

#### IEEE 802.11n HT 40 MHz mode / 5510 $\sim$ 5670MHz

| Channel | Frequency |           | AVG Outp<br>(dB | out Power<br>m) | AVG Output | Limit   | Result |      |
|---------|-----------|-----------|-----------------|-----------------|------------|---------|--------|------|
|         | (11112)   | Antenna 0 | Antenna 1       | Antenna 2       | Total      |         | (dBm)  |      |
| Low     | 5510      | 9.30      | 8.20            | 9.30            | 13.73      | 0.02363 |        | PASS |
| Mid     | 5550      | 9.10      | 8.20            | 8.90            | 13.52      | 0.02250 | 24.00  | PASS |
| High    | 5670      | 9.10      | 8.10            | 8.60            | 13.39      | 0.02183 |        | PASS |

#### IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

| Channel | Frequency |           | AVG Output Power<br>(dBm) |           |       | AVG Output | Limit  | Result |
|---------|-----------|-----------|---------------------------|-----------|-------|------------|--------|--------|
|         | (11112)   | Antenna 0 | Antenna 1                 | Antenna 2 | Total | Power (W)  | (автт) |        |
| Low     | 5755      | 9.30      | 8.50                      | 9.90      | 14.04 | 0.02536    | 30.00  | PASS   |
| High    | 5795      | 9.50      | 8.40                      | 10.00     | 14.12 | 0.02583    | 30.00  | PASS   |



PASS

24.00

#### AVG Output Power Frequency **AVG Output** Limit (dBm) Channel Result (dBm) (MHz) Power (W) Antenna 0 Antenna 1 Antenna 2 Total 5210 10.00 7.50 9.90 14.05 0.02540 30.00 PASS IEEE 802.11ac 80 mode / 5290MHz **AVG Output Power AVG Output** Frequency Limit (dBm) Channel Result (MHz) Power (W) (dBm) Antenna 0 Antenna 1 Antenna 2 Total

10.10

14.25

0.02661

8.20

#### IEEE 802.11ac 80 mode / 5210MHz

#### IEEE 802.11ac 80 mode / 5530MHz

9.90

5290

| Channel | Frequency |           | AVG Output Power<br>(dBm) |           |       | AVG Output | Limit   | Result |
|---------|-----------|-----------|---------------------------|-----------|-------|------------|---------|--------|
|         | (101112)  | Antenna 0 | Antenna 1                 | Antenna 2 | Total | Power (W)  | (ubiii) |        |
|         | 5530      | 8.80      | 7.90                      | 8.70      | 13.26 | 0.02116    | 24.00   | PASS   |

#### IEEE 802.11ac 80 mode / 5775MHz

| Channel |         | AVG Output Power<br>(dBm) |           |           |       | AVG Output | Limit   | Result |
|---------|---------|---------------------------|-----------|-----------|-------|------------|---------|--------|
|         | (11112) | Antenna 0                 | Antenna 1 | Antenna 2 | Total | Power (W)  | (ubiii) |        |
|         | 5775    | 9.60                      | 8.70      | 9.80      | 14.16 | 0.02608    | 30.00   | PASS   |



# 6.5 BAND EDGES MEASUREMENT

# 6.5.1 LIMIT

According to §15.407(b)

- (1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
- (2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

|                                 | Radiated I     | Emission Test | Site 966(2)      |                     |                    |
|---------------------------------|----------------|---------------|------------------|---------------------|--------------------|
| Name of Equipment               | Manufacturer   | Model Number  | Serial<br>Number | Last<br>Calibration | Due<br>Calibration |
| PSA Series Spectrum<br>Analyzer | Agilent        | N9010A        | MY52221469       | 02/21/2017          | 02/20/2018         |
| EMI TEST RECEIVER               | ROHDE&SCHWARZ  | ESCI          | 100783           | 02/21/2017          | 02/20/2018         |
| Amplifier                       | EMEC           | EM330         | 060661           | 03/18/2017          | 03/17/2018         |
| High Noise Amplifier            | Agilent        | 8449B         | 3008A01838       | 02/21/2017          | 02/20/2018         |
| Loop Antenna                    | COM-POWER      | AL-130        | 121044           | 09/25/2016          | 09/24/2017         |
| Bilog Antenna                   | SCHAFFNER      | CBL6143       | 5082             | 02/21/2017          | 02/20/2018         |
| Horn Antenna                    | SCHWARZBECK    | BBHA9120      | D286             | 02/28/2017          | 02/27/2018         |
| Board-Band Horn Antenna         | Schwarzbeck    | BBHA 9170     | 9170-497         | 02/28/2017          | 02/27/2018         |
| Turn Table                      | N/A            | N/A           | N/A              | N.C.R               | N.C.R              |
| Antenna Tower                   | SUNOL          | TLT2          | N/A              | N.C.R               | N.C.R              |
| Controller                      | Sunol Sciences | SC104V        | 022310-1         | N.C.R               | N.C.R              |
| Controller                      | СТ             | N/A           | N/A              | N.C.R               | N.C.R              |
| Temp. / Humidity Meter          | Anymetre       | JR913         | N/A              | 02/21/2017          | 02/20/2018         |
| Test S/W                        | FARAD          |               | LZ-RF / CC       | S-SZ-3A2            |                    |

### 6.5.2 MEASUREMENT EQUIPMENT USED

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The FCC Site Registration number is 101879.

3. N.C.R = No Calibration Required.





# 6.5.3 TEST CONFIGURATION



# 6.5.4 TEST PROCEDURE

- 1. The EUT is placed on a turntable, which is 1.5m above the ground plane.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- 4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
  - (a) PEAK: RBW=1 / VBW=3MHz / Sweep=AUTO
  - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO / Detector=Peak
- 5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.



# 6.5.5 TEST RESULT

### IEEE 802.11a mode / 5500 ~ 5700MHz

# Antenna 0:

- 1. Operating Frequency: 5500-5700MHz
- 2. CH Low: 5500MHz, CH High: 5700MHz
- 3. 26dB bandwidth: CH Low: 20.96MHz, CH High: 20.49MHz
- 4. Frequency Range: 5489.5200MHz, 5710.2450MHz

# Antenna 1:

- 1. Operating Frequency: 5500-5700MHz
- 2. CH Low: 5500MHz, CH High: 5700MHz
- 3. 26dB bandwidth: CH Low: 20.67MHz, CH High: 20.95MHz
- 4. Frequency Range: 5489.6650MHz, 5710.4750MHz

# Antenna 2:

- 1. Operating Frequency: 5500-5700MHz
- 2. CH Low: 5500MHz, CH High: 5700MHz
- 3. 26dB bandwidth: CH Low: 20.87MHz, CH High: 20.93MHz
- 4. Frequency Range: 5489.5650MHz, 5710.4650MHz

# IEEE 802.11a mode / 5745 ~ 5825MHz

### Antenna 0:

- 1. Operating Frequency: 5745-5825MHz
- 2. CH Low: 5745MHz, CH High: 5825MHz
- 3. 26dB bandwidth: CH Low: 20.97MHz, CH High: 20.69MHz
- 4. Frequency Range: 5734.5150MHz, 5835.3450MHz

# Antenna 1:

- 1. Operating Frequency: 5745-5825MHz
- 2. CH Low: 5745MHz, CH High: 5825MHz
- 3. 26dB bandwidth: CH Low: 20.98MHz, CH High: 20.90MHz
- 4. Frequency Range: 5734.5100MHz, 5835.4500MHz

### Antenna 2:

- 1. Operating Frequency: 5745-5825MHz
- 2. CH Low: 5745MHz, CH High: 5825MHz
- 3. 26dB bandwidth: CH Low: 20.88MHz, CH High: 20.67MHz
- 4. Frequency Range: 5734.5600MHz, 5835.3350MHz



### IEEE 802.11n HT 20 MHz mode / 5500 ~ 5700MHz

### Antenna 0:

- 1. Operating Frequency: 5500-5700MHz
- 2. CH Low: 5500MHz, CH High: 5700MHz
- 3. 26dB bandwidth: CH Low: 20.66MHz, CH High: 20.89MHz
- 4. Frequency Range: 5489.6700MHz, 5710.4450MHz

# Antenna 1:

- 1. Operating Frequency: 5500-5700MHz
- 2. CH Low: 5500MHz, CH High: 5700MHz
- 3. 26dB bandwidth: CH Low: 20.72MHz, CH High: 21.00MHz
- 4. Frequency Range: 5489.6400MHz, 5710.500MHz

# Antenna 2:

- 1. Operating Frequency: 5500-5700MHz
- 2. CH Low: 5500MHz, CH High: 5700MHz
- 3. 26dB bandwidth: CH Low: 21.08MHz, CH High: 20.98MHz
- 4. Frequency Range: 5489.4600MHz, 5710.4900MHz

# IEEE 802.11n HT 20 MHz mode / 5745 ~ 5825MHz

# Antenna 0:

- 1. Operating Frequency: 5745-5825MHz
- 2. CH Low: 5745MHz, CH High: 5825MHz
- 3. 26dB bandwidth: CH Low: 20.83MHz, CH High: 20.60MHz
- 4. Frequency Range: 5734.5850MHz, 5835.3000MHz

# Antenna 1:

- 1. Operating Frequency: 5745-5825MHz
- 2. CH Low: 5745MHz, CH High: 5825MHz
- 3. 26dB bandwidth: CH Low: 20.91MHz, CH High: 20.76MHz
- 4. Frequency Range: 5734.5450MHz, 5835.3800MHz

# Antenna 2:

- 1. Operating Frequency: 5745-5825MHz
- 2. CH Low: 5745MHz, CH High: 5825MHz
- 3. 26dB bandwidth: CH Low: 20.83MHz, CH High: 20.71MHz
- 4. Frequency Range: 5734.5850MHz, 5835.3550MHz



# IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz

### Antenna 0:

- 1. Operating Frequency: 5510-5670MHz
- 2. CH Low: 5510MHz, CH High: 5670MHz
- 3. 26dB bandwidth: CH Low: 39.28MHz, CH High: 39.53MHz
- 4. Frequency Range: 5490.3600MHz, 5689.7650MHz

# Antenna 1:

- 1. Operating Frequency: 5510-5670MHz
- 2. CH Low: 5510MHz, CH High: 5670MHz
- 3. 26dB bandwidth: CH Low: 39.93MHz, CH High: 39.78MHz
- 4. Frequency Range: 5490.0350MHz, 5689.8900MHz

# Antenna 2:

- 1. Operating Frequency: 5510-5670MHz
- 2. CH Low: 5510MHz, CH High: 5670MHz
- 3. 26dB bandwidth: CH Low: 39.86MHz, CH High: 39.79MHz
- 4. Frequency Range: 5490.0700MHz, 5689.8950MHz

### IEEE 802.11n HT 40 MHz mode / 5755 ~ 5795MHz

### Antenna 0:

- 1. Operating Frequency: 5755-5795MHz
- 2. CH Low: 5755MHz, CH High: 5795MHz
- 3. 26dB bandwidth: CH Low: 40.04MHz, CH High: 39.69MHz
- 4. Frequency Range: 5734.9800MHz, 5814.8450MHz

# Antenna 1:

- 1. Operating Frequency: 5755-5795MHz
- 2. CH Low: 5755MHz, CH High: 5795MHz
- 3. 26dB bandwidth: CH Low: 39.69MHz, CH High: 39.69MHz
- 4. Frequency Range: 5735.1550MHz, 5814.8450MHz

### Antenna 2:

- 1. Operating Frequency: 5755-5795MHz
- 2. CH Low: 5755MHz, CH High: 5795MHz
- 3. 26dB bandwidth: CH Low: 40.11MHz, CH High: 39.66MHz
- 4. Frequency Range: 5734.9450MHz, 5814.8300MHz



### IEEE 802.11ac 80 mode / 5530MHz

### Antenna 0:

- 1. Operating Frequency: 5530MHz
- 2. CH: 5530MHz
- 3. 26dB bandwidth: CH: 81.18MHz
- 4. Frequency Range: 5489.4100MHz, 5570.5900MHz

#### Antenna 1:

- 1. Operating Frequency: 5530MHz
- 2. CH: 5530MHz
- 3. 26dB bandwidth: CH: 81.14MHz
- 4. Frequency Range: 5489.4300MHz, 5570.5700MHz

#### Antenna 2:

- 1. Operating Frequency: 5530MHz
- 2. CH: 5530MHz
- 3. 26dB bandwidth: CH: 81.21MHz
- 4. Frequency Range: 5489.3950MHz, 5570.6050MHz

#### IEEE 802.11ac 80 mode / 5775MHz

#### Antenna 0:

- 1. Operating Frequency: 5775MHz
- 2. CH: 5775MHz
- 3. 26dB bandwidth: CH: 81.15MHz
- 4. Frequency Range: 5734.4250MHz, 5815.5750MHz

#### Antenna 1:

- 1. Operating Frequency: 5775MHz
- 2. CH: 5775MHz
- 3. 26dB bandwidth: CH: 81.05MHz
- 4. Frequency Range: 5734.4750MHz, 5815.5250MHz

#### Antenna 2:

- 1. Operating Frequency: 5775MHz
- 2. CH: 5775MHz
- 3. 26dB bandwidth: CH: 81.02MHz
- 4. Frequency Range: 5734.4900MHz, 5815.5100MHz

Because the mentioned conditions the Fundamental Frequency Range was far away from the restricted bands in the table published in 15.205, the test is not applicable.



Test Plot



| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5150.000           | 55.72           | 5.25             | 60.97            | 74.00           | -13.03         | Peak    | Vertical         |
| 2   | 5181.600           | 103.38          | 5.30             | 108.68           |                 |                | Peak    | Vertical         |
| 1   | 5150.000           | 44.00           | 5.25             | 49.25            | 54.00           | -4.75          | Average | Vertical         |
| 2   | 5180.890           | 91.94           | 5.30             | 97.24            |                 |                | Average | Vertical         |





| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1.  | 5150.000           | 55.06           | 5.25             | 60.31            | 74.00           | -13.69         | Peak    | Horizontal       |
| 2.  | 5179.470           | 93.98           | 5.30             | 99.28            |                 |                | Peak    | Horizontal       |
| 1   | 5150.000           | 43.52           | 5.25             | 48.77            | 54.00           | -5.23          | Average | Horizontal       |
| 2   | 5180.890           | 82.86           | 5.30             | 88.16            |                 |                | Average | Horizontal       |



# IEEE 802.11a mode / 5180MHz (Antenna 1)



| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5150.000           | 56.44           | 5.25             | 61.69            | 74.00           | -12.31         | Peak    | Vertical         |
| 2   | 5180.890           | 101.79          | 5.30             | 107.09           |                 |                | Peak    | Vertical         |
| 1   | 5150.000           | 44.08           | 5.25             | 49.33            | 54.00           | -4.67          | Average | Vertical         |
| 2   | 5180.890           | 91.10           | 5.30             | 96.40            |                 |                | Average | Vertical         |





| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5150.000           | 54.11           | 5.25             | 59.36            | 74.00           | -14.64         | Peak    | Horizontal       |
| 2   | 5178.050           | 92.24           | 5.30             | 97.54            |                 |                | Peak    | Horizontal       |
| 1   | 5150.000           | 43.53           | 5.25             | 48.78            | 54.00           | -5.22          | Average | Horizontal       |
| 2   | 5180.890           | 81.90           | 5.30             | 87.20            |                 |                | Average | Horizontal       |



# IEEE 802.11a mode / 5180MHz (Antenna 2)



| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1.  | 5150.000           | 54.03           | 5.25             | 59.28            | 74.00           | -14.72         | Peak    | Vertical         |
| 2.  | 5185.860           | 103.93          | 5.31             | 109.24           |                 |                | Peak    | Vertical         |
| 1.  | 5150.000           | 44.33           | 5.25             | 49.58            | 54.00           | -4.42          | Average | Vertical         |
| 2.  | 5180.890           | 93.81           | 5.30             | 99.11            |                 |                | Average | Vertical         |





| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5150.000           | 54.07           | 5.25             | 59.32            | 74.00           | -14.68         | Peak    | Horizontal       |
| 2   | 5179.470           | 97.62           | 5.30             | 102.92           |                 |                | Peak    | Horizontal       |
| 1   | 5150.000           | 43.74           | 5.25             | 48.99            | 54.00           | -5.01          | Average | Horizontal       |
| 2   | 5181.600           | 86.82           | 5.30             | 92.12            |                 |                | Average | Horizontal       |

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# IEEE 802.11a mode / 5320(Antenna 0)



| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5321.250           | 88.48           | 5.55             | 94.03            |                 |                | Peak    | Vertical         |
| 2   | 5350.000           | 53.27           | 5.60             | 58.87            | 74.00           | -15.13         | Peak    | Vertical         |
| 1   | 5319.000           | 78.12           | 5.55             | 83.67            |                 |                | Average | Vertical         |
| 2   | 5350.000           | 42.34           | 5.60             | 47.94            | 54.00           | -6.06          | Average | Vertical         |





| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5318.250           | 90.95           | 5.55             | 96.50            |                 |                | Peak    | Horizontal       |
| 2   | 5350.000           | 53.97           | 5.60             | 59.57            | 74.00           | -14.43         | Peak    | Horizontal       |
| 1   | 5318.700           | 79.96           | 5.55             | 85.51            |                 |                | Average | Horizontal       |
| 2   | 5350.000           | 42.33           | 5.60             | 47.93            | 54.00           | -6.07          | Average | Horizontal       |



IEEE 802.11a mode / 5320(Antenna 1)



| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5318.700           | 102.35          | 5.55             | 107.90           |                 |                | Peak    | Vertical         |
| 2   | 5350.000           | 53.17           | 5.60             | 58.77            | 74.00           | -15.23         | Peak    | Vertical         |
| 1   | 5321.250           | 91.59           | 5.55             | 97.14            |                 |                | Average | Vertical         |
| 2   | 5350.000           | 42.70           | 5.60             | 48.30            | 54.00           | -5.70          | Average | Vertical         |





| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1.  | 5320.050           | 88.71           | 5.55             | 94.26            |                 |                | Peak    | Horizontal       |
| 2.  | 5350.000           | 53.24           | 5.60             | 58.84            | 74.00           | -15.16         | Peak    | Horizontal       |
| 1.  | 5321.100           | 76.97           | 5.55             | 82.52            |                 |                | Average | Horizontal       |
| 2.  | 5350.000           | 42.39           | 5.60             | 47.99            | 54.00           | -6.01          | Average | Horizontal       |





#### IEEE 802.11a mode / 5320(Antenna 2)

| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5318.850           | 103.86          | 5.55             | 109.41           |                 |                | Peak    | Vertical         |
| 2   | 5350.000           | 52.38           | 5.60             | 57.98            | 74.00           | -16.02         | Peak    | Vertical         |
| 1   | 5321.100           | 92.80           | 5.55             | 98.35            |                 |                | Average | Vertical         |
| 2   | 5350.000           | 42.83           | 5.60             | 48.43            | 54.00           | -5.57          | Average | Vertical         |





| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1.  | 5318.250           | 97.66           | 5.55             | 103.21           |                 |                | Peak    | Horizontal       |
| 2.  | 5350.000           | 50.71           | 5.60             | 56.31            | 74.00           | -17.69         | Peak    | Horizontal       |
| 1.  | 5321.250           | 86.88           | 5.55             | 92.43            |                 |                | Average | Horizontal       |
| 2.  | 5350.000           | 42.49           | 5.60             | 48.09            | 54.00           | -5.91          | Average | Horizontal       |



# IEEE 802.11n HT 20 MHz mode / 5180 MHz (Antenna 0+ Antenna 1+ Antenna 2)



| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5150.000           | 54.31           | 5.25             | 59.56            | 74.00           | -14.44         | Peak    | Vertical         |
| 2   | 5182.310           | 106.13          | 5.30             | 111.43           |                 |                | Peak    | Vertical         |
| 1   | 5150.000           | 44.41           | 5.25             | 49.66            | 54.00           | -4.34          | Average | Vertical         |
| 2   | 5181.600           | 96.27           | 5.30             | 101.57           |                 |                | Average | Vertical         |





| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5150.000           | 54.88           | 5.25             | 60.13            | 74.00           | -13.87         | Peak    | Horizontal       |
| 2   | 5182.310           | 95.01           | 5.30             | 100.31           |                 |                | Peak    | Horizontal       |
| 1   | 5150.000           | 43.80           | 5.25             | 49.05            | 54.00           | -4.95          | Average | Horizontal       |
| 2   | 5178.050           | 84.67           | 5.30             | 89.97            |                 |                | Average | Horizontal       |







| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5319.150           | 100.30          | 5.55             | 105.85           |                 |                | Peak    | Vertical         |
| 2   | 5350.000           | 56.14           | 5.60             | 61.74            | 74.00           | -12.26         | Peak    | Vertical         |
| 1   | 5316.150           | 78.85           | 5.54             | 84.39            |                 |                | Average | Vertical         |
| 2   | 5350.000           | 45.90           | 5.60             | 51.50            | 54.00           | -2.50          | Average | Vertical         |

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| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5313.450           | 87.86           | 5.54             | 93.40            |                 |                | Peak    | Horizontal       |
| 2   | 5350.000           | 53.23           | 5.60             | 58.83            | 74.00           | -15.17         | Peak    | Horizontal       |
| 1   | 5316.150           | 69.24           | 5.54             | 74.78            |                 |                | Average | Horizontal       |
| 2   | 5350.000           | 43.11           | 5.60             | 48.71            | 54.00           | -5.29          | Average | Horizontal       |





#### IEEE 802.11n HT 40 MHz mode / 5190 MHz (Antenna 0+ Antenna 1+ Antenna 2)

| No. | Frequency<br>(MHz) | Reading<br>(dB) | Factor<br>(dB/m) | Result<br>(dB/m) | Limit<br>(dB/m) | Margin<br>(dB) | Remark  | Antenna<br>Polar |
|-----|--------------------|-----------------|------------------|------------------|-----------------|----------------|---------|------------------|
| 1   | 5150.000           | 56.16           | 5.25             | 61.41            | 74.00           | -12.59         | Peak    | Vertical         |
| 2   | 5180.890           | 101.53          | 5.30             | 106.83           |                 |                | Peak    | Vertical         |
| 1   | 5150.000           | 47.33           | 5.25             | 52.58            | 54.00           | -1.42          | Average | Vertical         |
| 2   | 5196.510           | 88.48           | 5.33             | 93.81            |                 |                | Average | Vertical         |