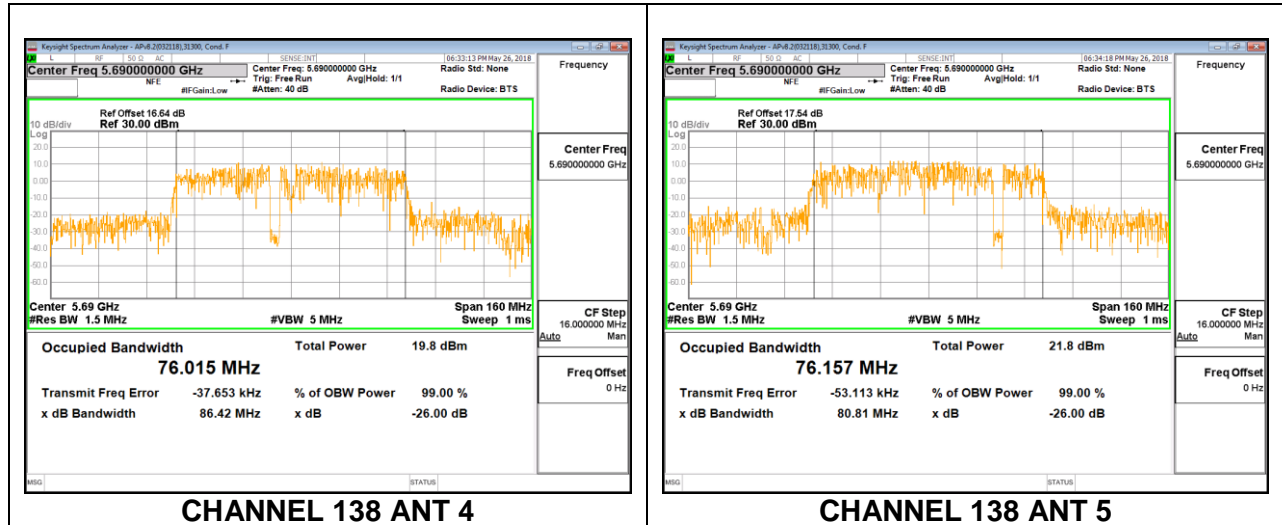


CHANNEL 138



8.3.10. 802.11n HT20 MODE IN THE 5.8 GHz BAND

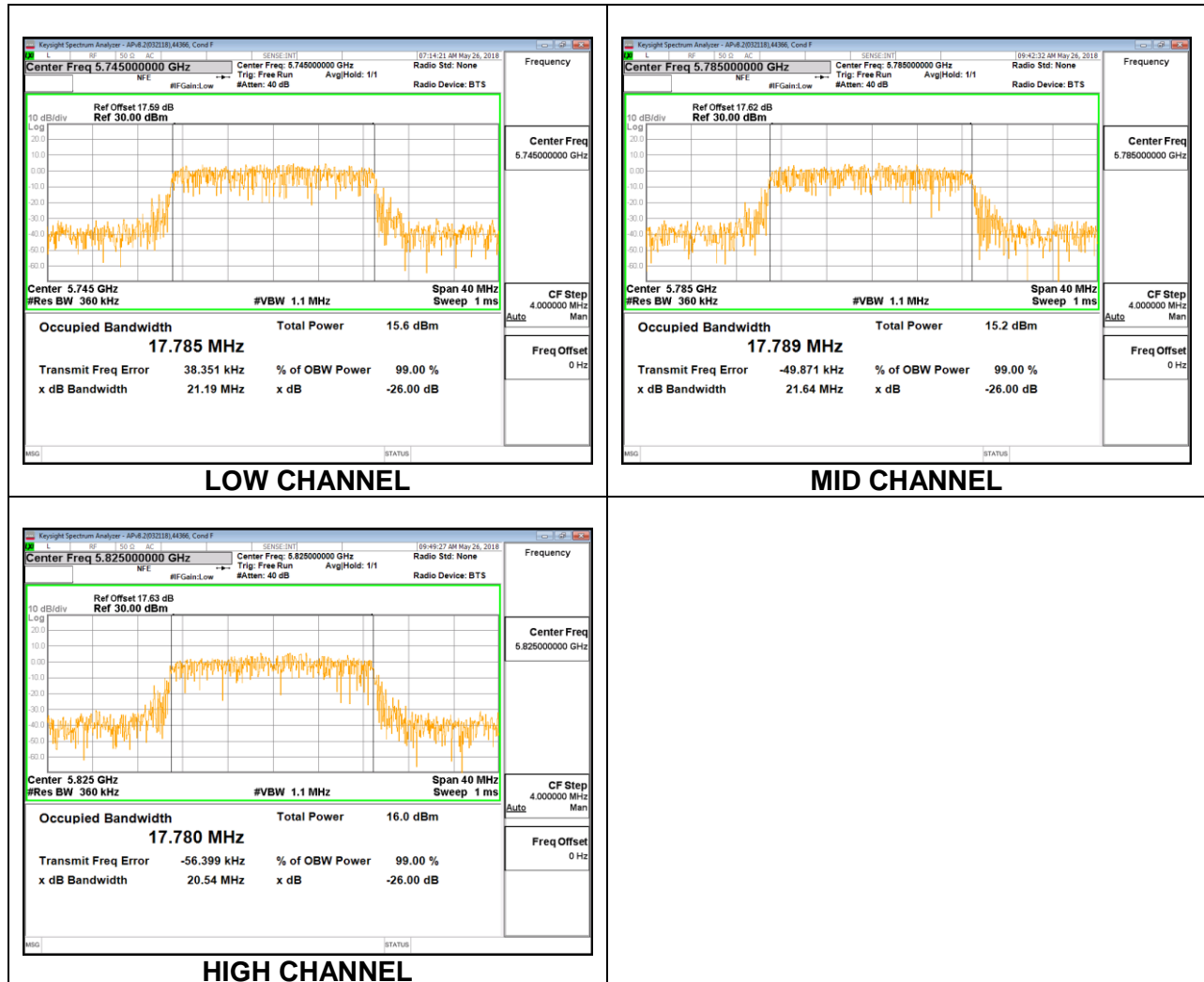
1TX Antenna 4

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|--------------------|------------------------|
| Low | 5745 | 17.831 |
| Mid | 5785 | 17.789 |
| High | 5825 | 17.767 |



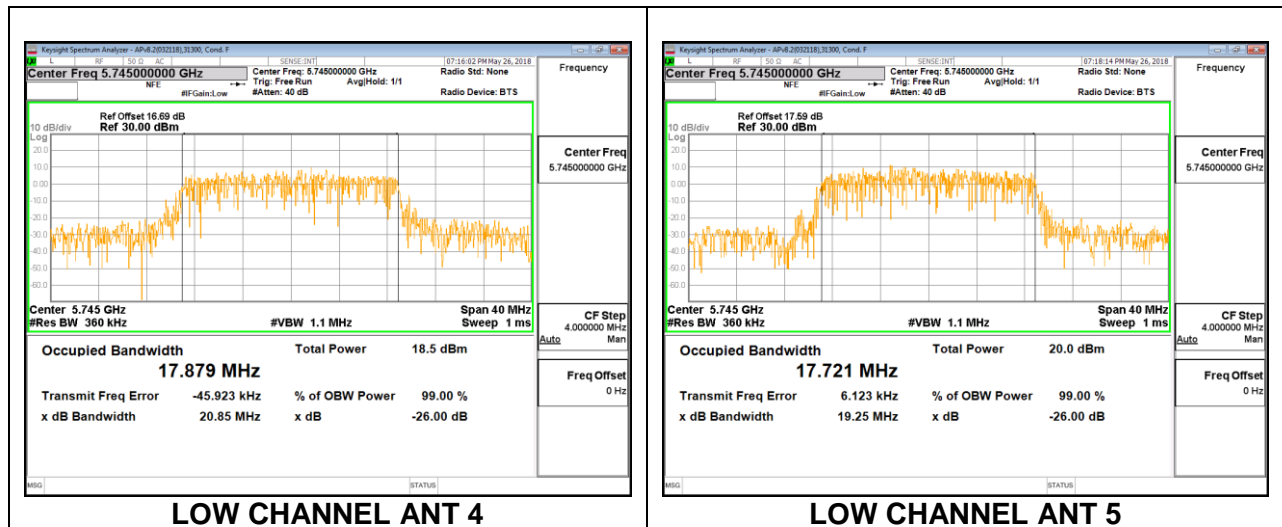
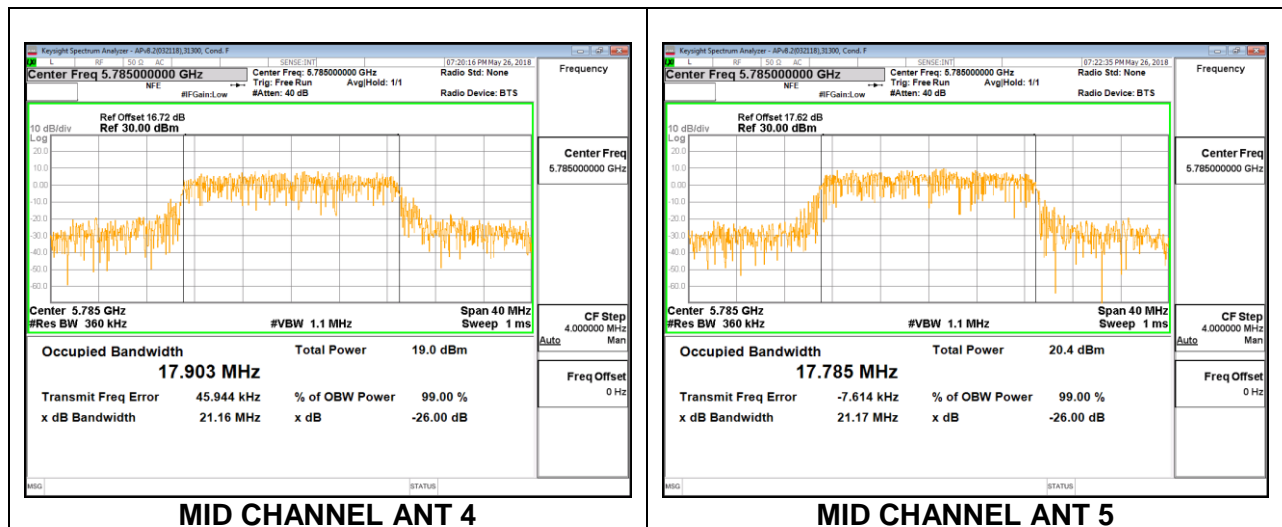
1TX Antenna 5

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|--------------------|------------------------|
| Low | 5745 | 17.785 |
| Mid | 5785 | 17.789 |
| High | 5825 | 17.780 |

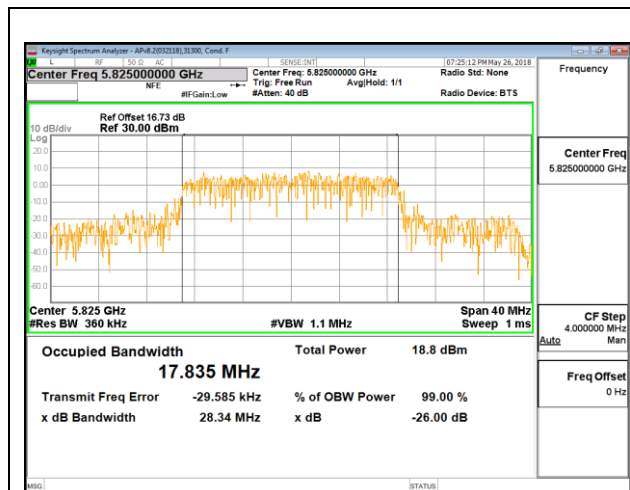


2TX Antenna 4 + Antenna 5 CDD MODE

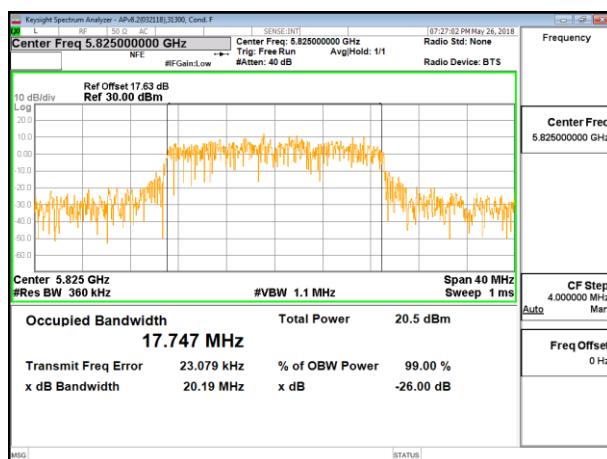
| Channel | Frequency (MHz) | 99% Bandwidth ANT 4 (MHz) | 99% Bandwidth ANT 5 (MHz) |
|---------|--------------------|---------------------------------|---------------------------------|
| Low | 5745 | 17.879 | 17.721 |
| Mid | 5785 | 17.903 | 17.785 |
| High | 5825 | 17.835 | 17.747 |

LOW CHANNEL**MID CHANNEL**

HIGH CHANNEL



HIGH CHANNEL ANT 4

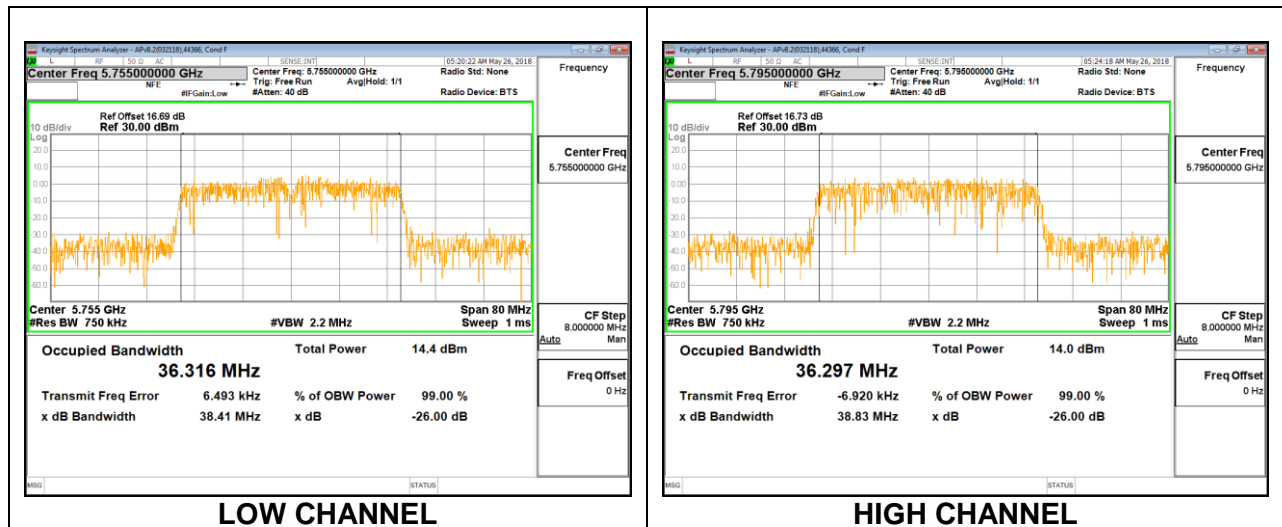


HIGH CHANNEL ANT 5

8.3.11. 802.11n HT40 MODE IN THE 5.8 GHz BAND

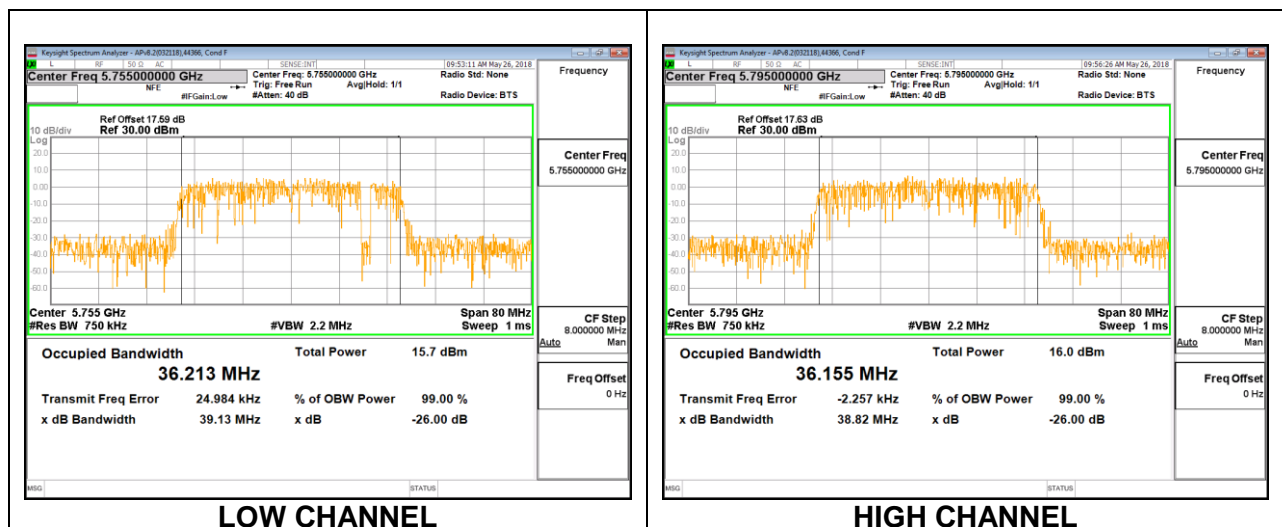
1TX Antenna 4

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5755 | 36.316 |
| High | 5795 | 36.297 |



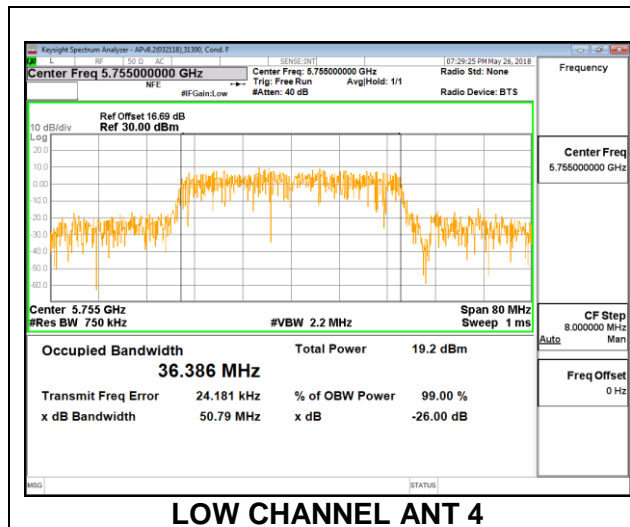
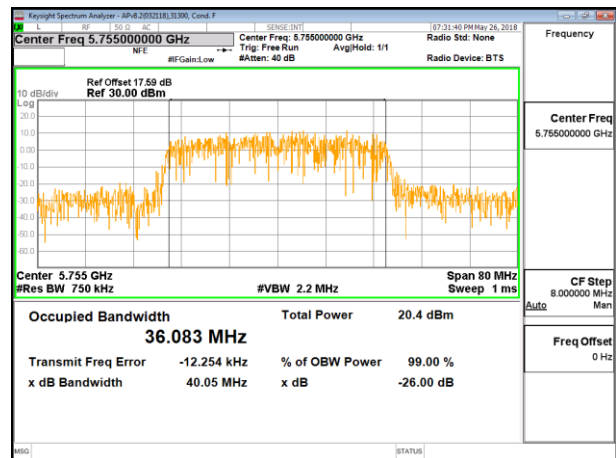
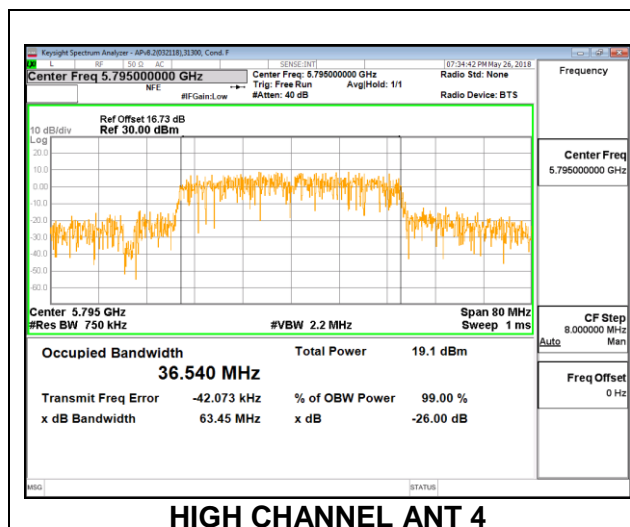
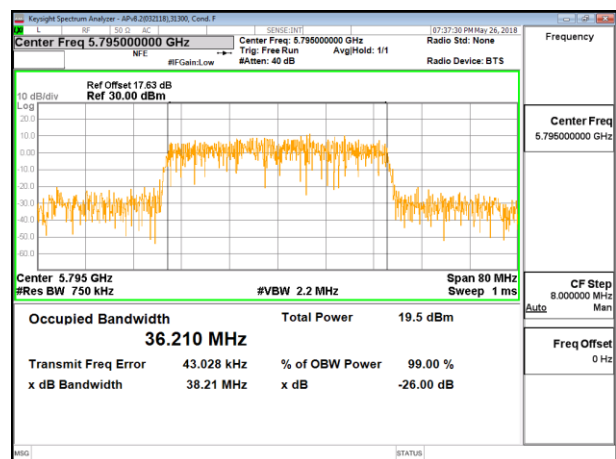
1TX Antenna 5

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Low | 5755 | 36.213 |
| High | 5795 | 36.155 |



2TX Antenna 4 + Antenna 5 CDD MODE

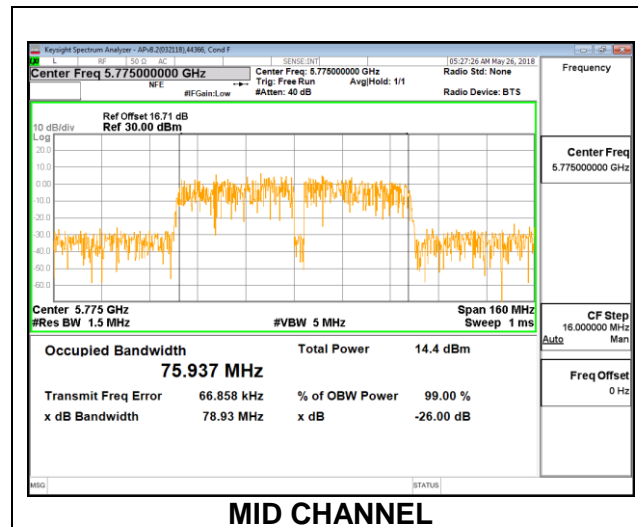
| Channel | Frequency | 99% Bandwidth ANT 4 (MHz) | 99% Bandwidth ANT 5 (MHz) |
|---------|-----------|---------------------------------|---------------------------------|
| Low | 5755 | 36.386 | 36.083 |
| High | 5795 | 36.540 | 36.210 |

LOW CHANNEL**LOW CHANNEL ANT 4****LOW CHANNEL ANT 5****HIGH CHANNEL****HIGH CHANNEL ANT 4****HIGH CHANNEL ANT 5**

8.3.12. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

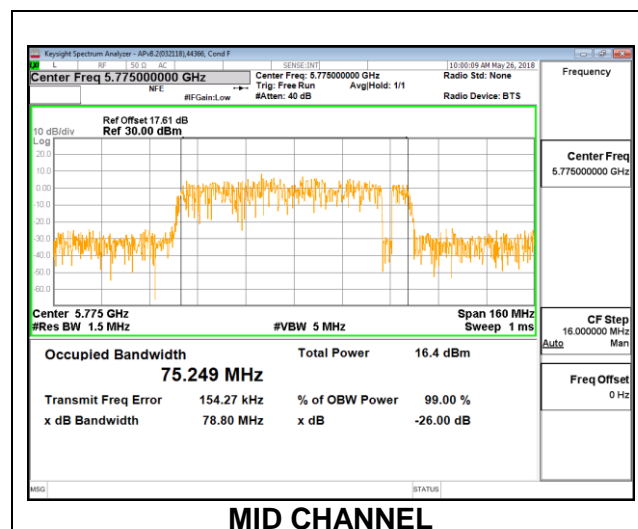
1TX Antenna 4

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Mid | 5775 | 75.937 |



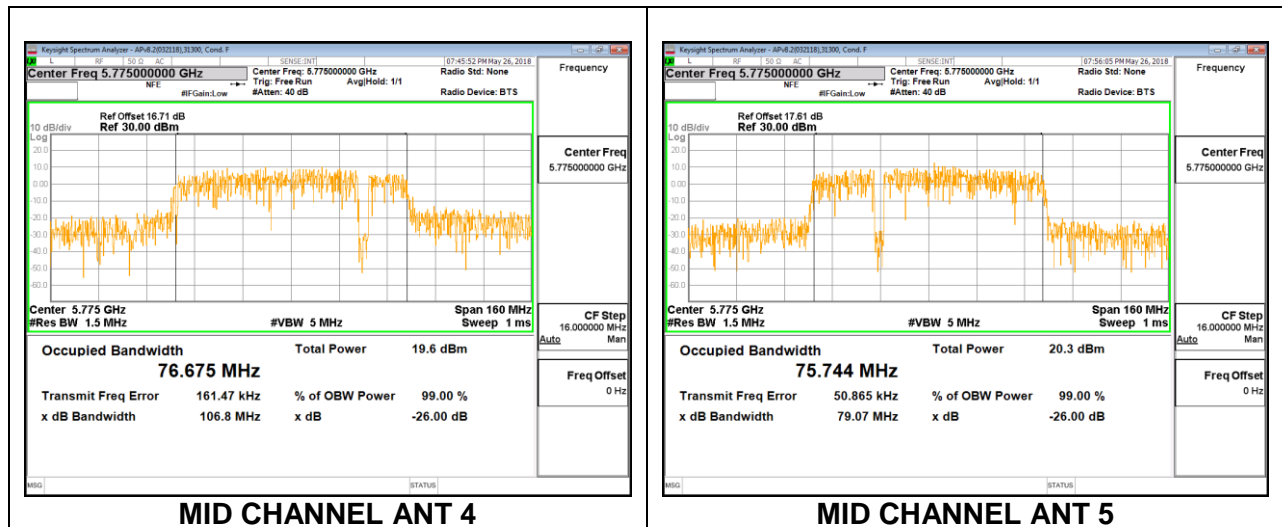
1TX Antenna 5

| Channel | Frequency | 99% Bandwidth |
|---------|-----------|---------------|
| | (MHz) | (MHz) |
| Mid | 5775 | 75.249 |



2TX Antenna 4 + Antenna 5 CDD MODE

| Channel | Frequency | 99% Bandwidth ANT 4 (MHz) | 99% Bandwidth ANT 5 (MHz) |
|---------|-----------|---------------------------------|---------------------------------|
| Mid | 5775 | 76.675 | 75.744 |

MID CHANNEL

8.4. 6 dB BANDWIDTH**LIMITS**

FCC §15.407 (e)

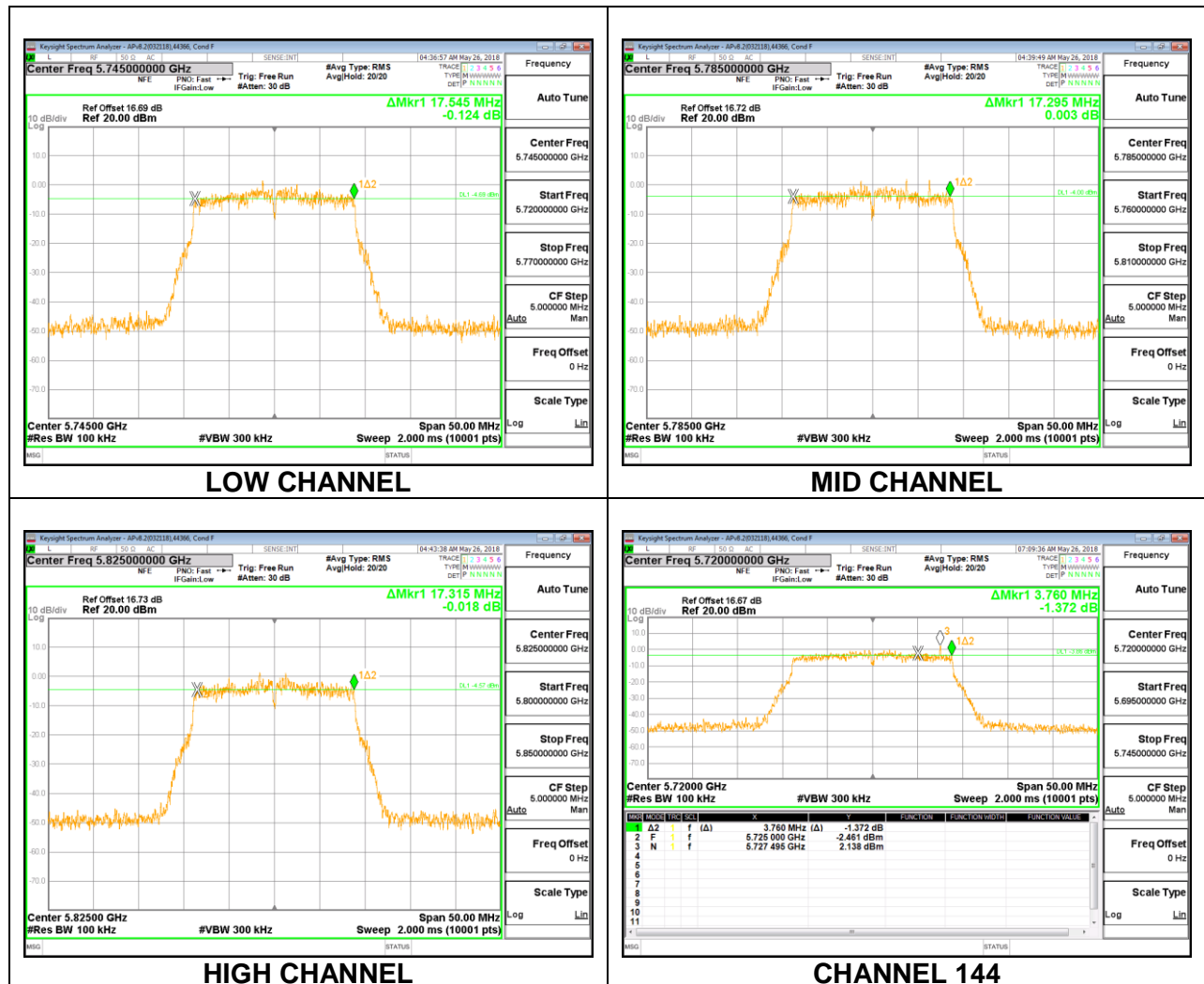
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

8.4.1. 802.11n HT20 MODE IN THE 5.8 GHz BAND

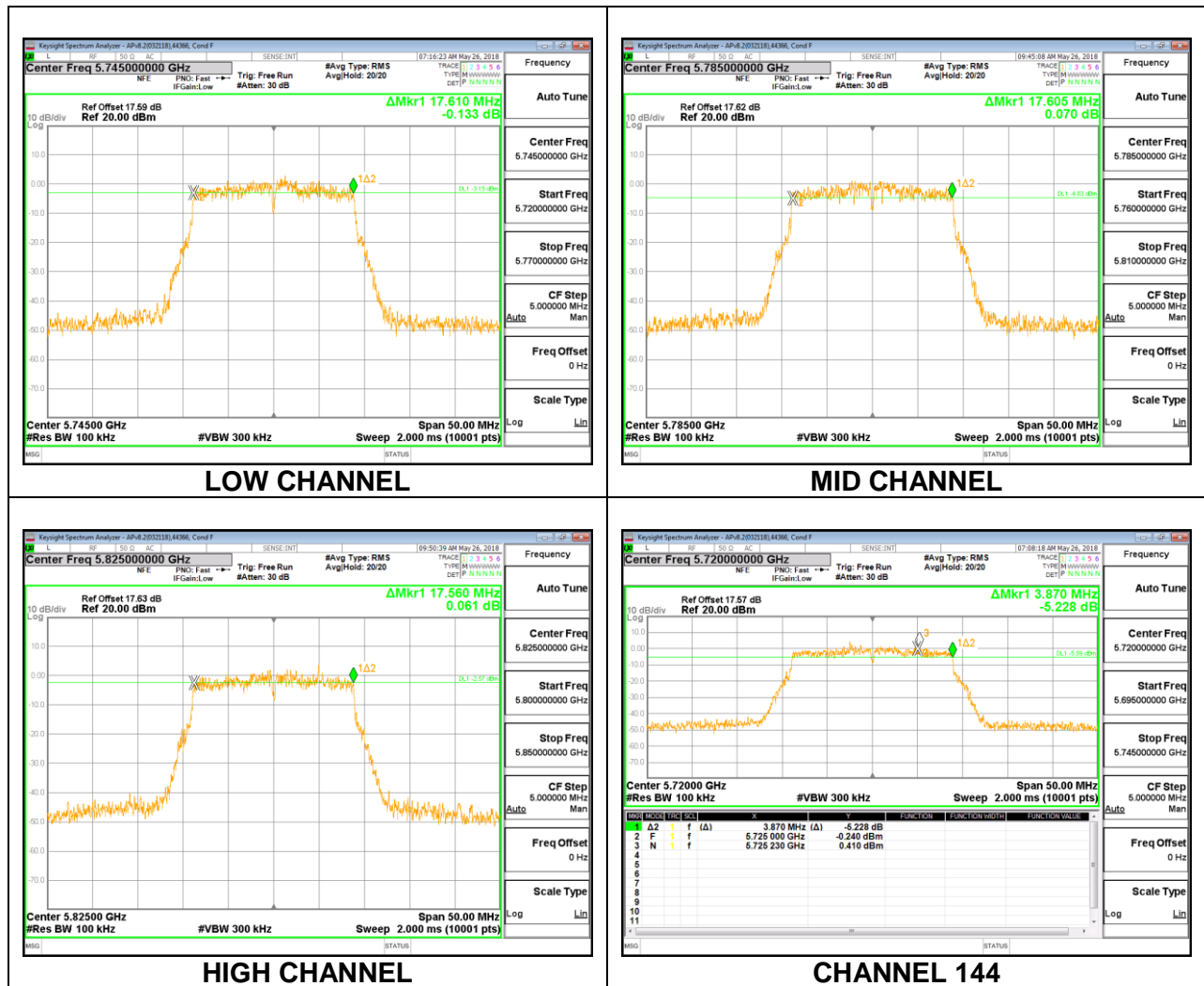
1TX Antenna 4

| Channel | Frequency | 6 dB Bandwidth | Minimum Limit |
|---------|-----------|----------------|---------------|
| | (MHz) | (MHz) | (MHz) |
| Low | 5745 | 17.545 | 0.5 |
| Mid | 5785 | 17.295 | 0.5 |
| High | 5825 | 17.315 | 0.5 |
| 144 | 5720 | 3.760 | 0.5 |



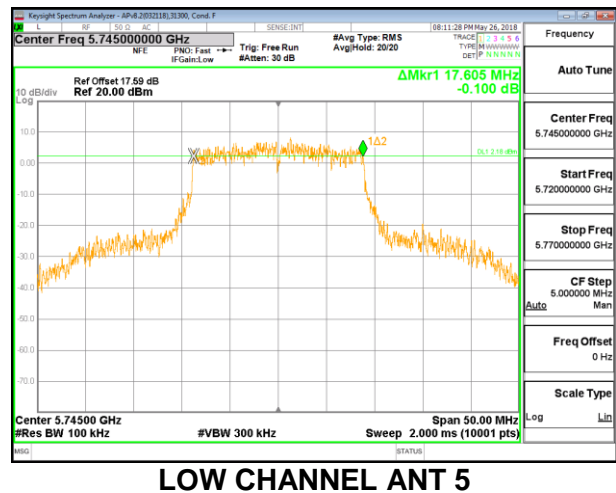
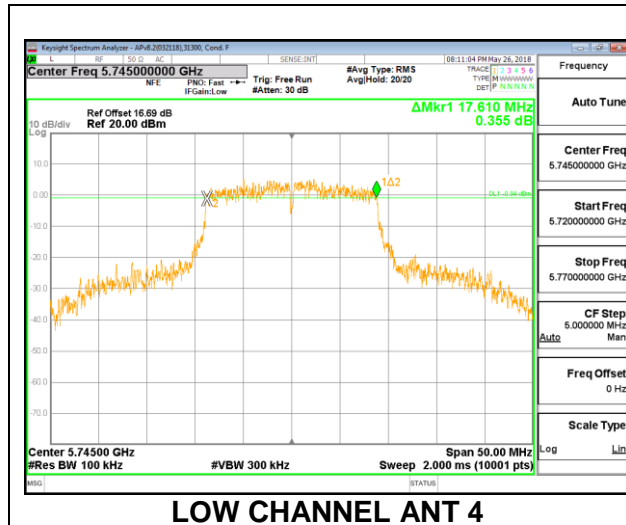
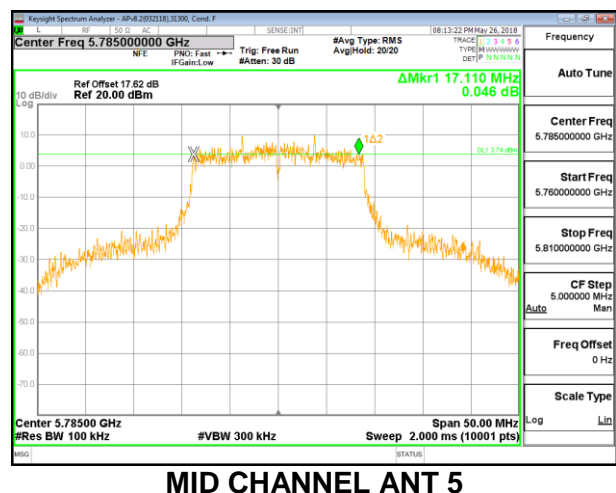
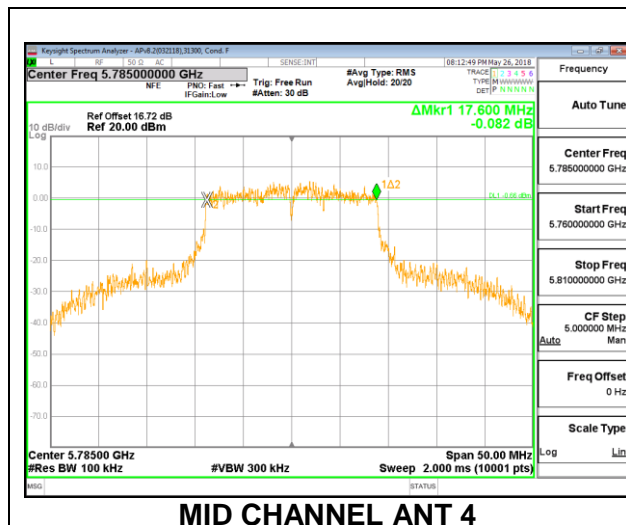
1TX Antenna 5

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|--------------------|-------------------------|------------------------|
| Low | 5745 | 17.610 | 0.5 |
| Mid | 5785 | 17.605 | 0.5 |
| High | 5825 | 17.560 | 0.5 |
| 144 | 5720 | 3.870 | 0.5 |

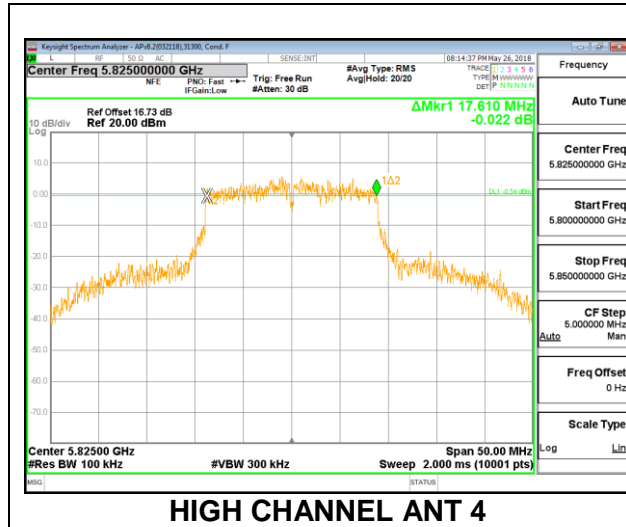


2TX Antenna 4 + Antenna 5 CDD MODE

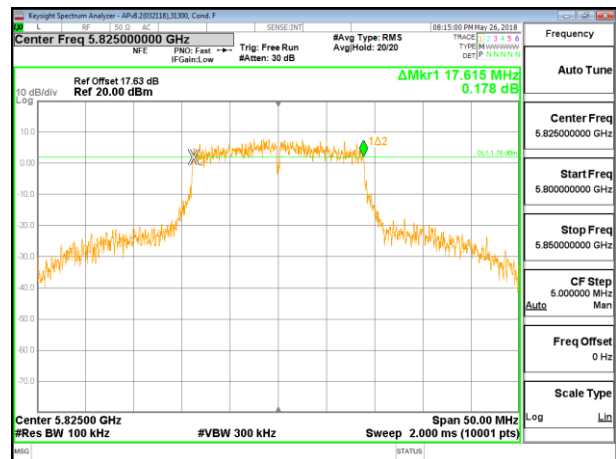
| Channel | Frequency (MHz) | 6 dB BW ANT 4 (MHz) | 6 dB BW ANT 5 (MHz) | Minimum Limit (MHz) |
|---------|--------------------|---------------------------|---------------------------|---------------------------|
| Low | 5745 | 17.610 | 17.605 | 0.5 |
| Mid | 5785 | 17.600 | 17.110 | 0.5 |
| High | 5825 | 17.610 | 17.615 | 0.5 |
| 144 | 5720 | 3.760 | 3.785 | 0.5 |

LOW CHANNEL**MID CHANNEL**

HIGH CHANNEL

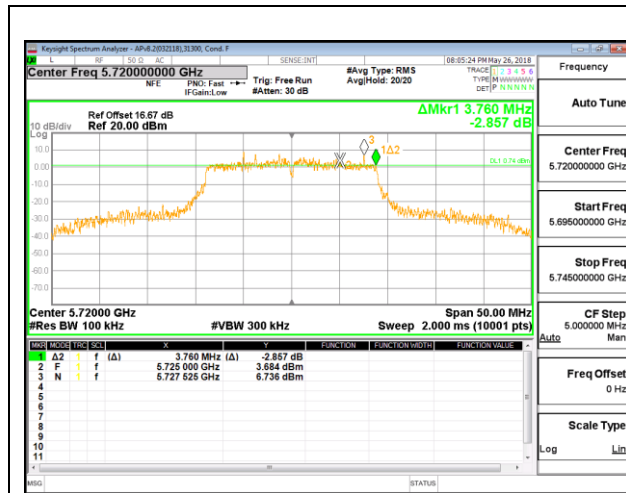


HIGH CHANNEL ANT 4

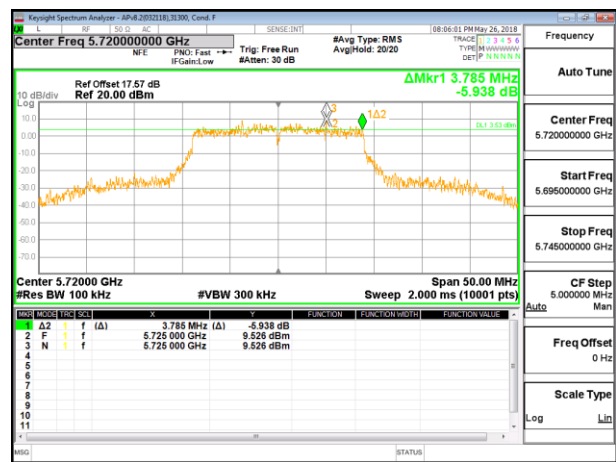


HIGH CHANNEL ANT 5

CHANNEL 144



CHANNEL 144 ANT 4

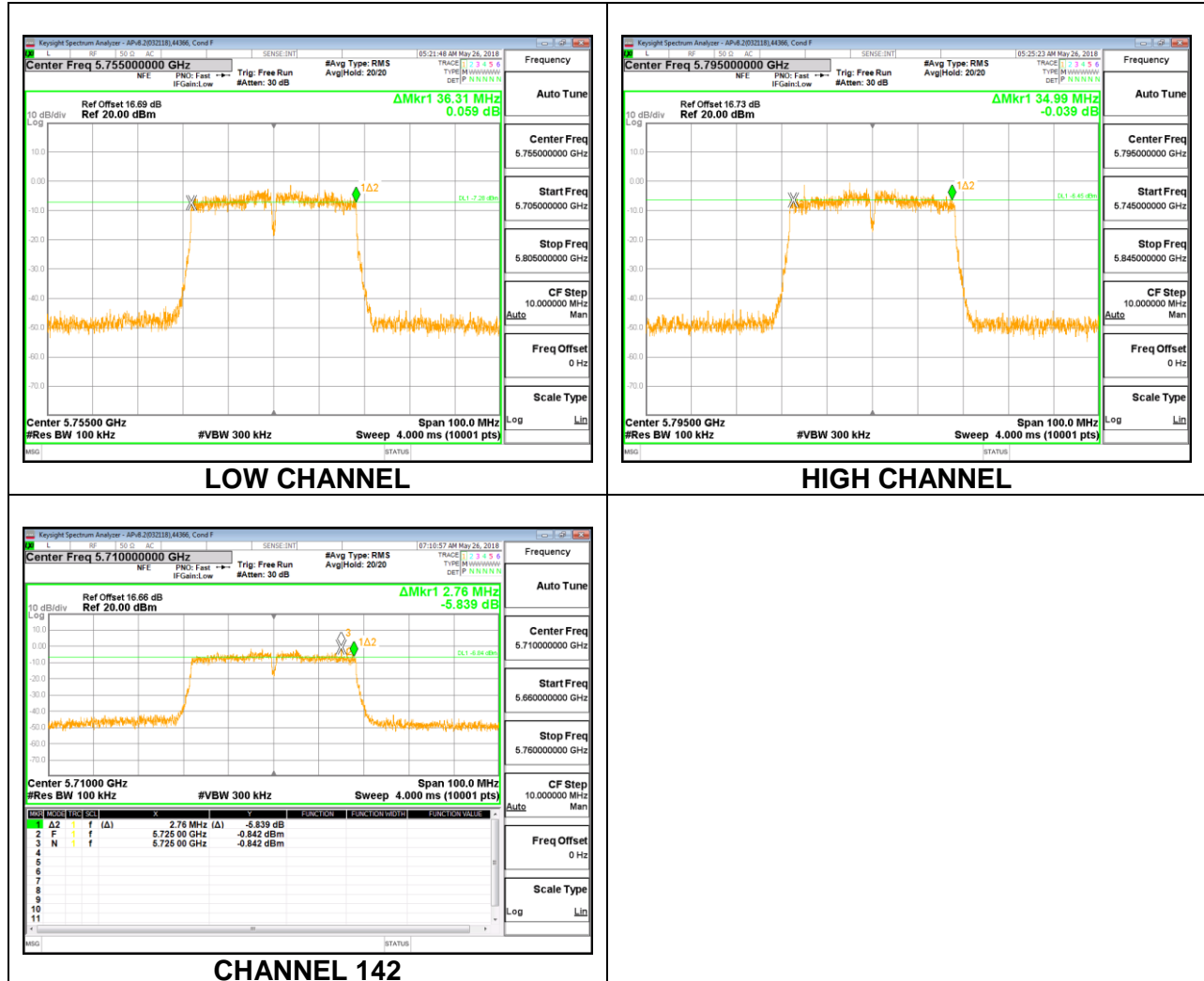


CHANNEL 144 ANT 5

8.4.2. 802.11n HT40 MODE IN THE 5.8 GHz BAND

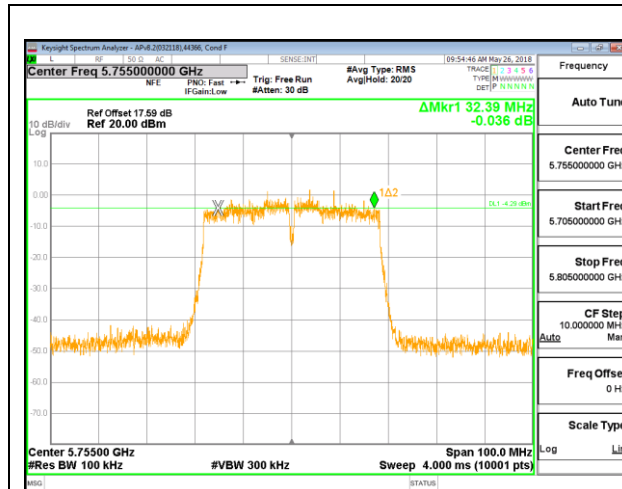
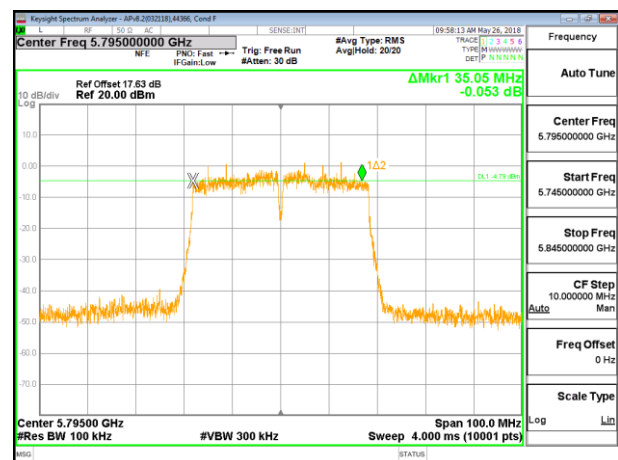
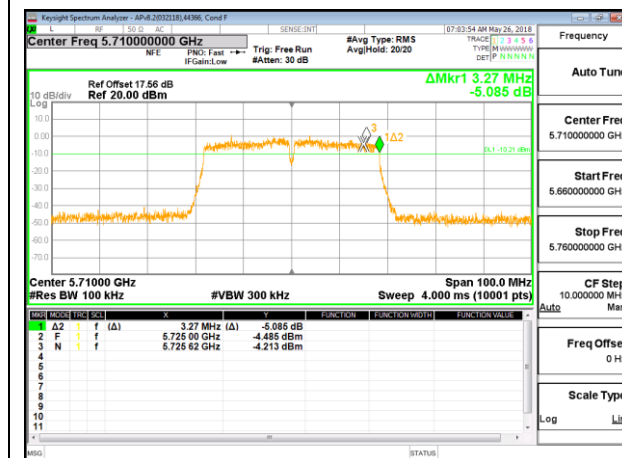
1TX Antenna 4

| Channel | Frequency | 6 dB Bandwidth | Minimum Limit |
|---------|-----------|----------------|---------------|
| | (MHz) | (MHz) | (MHz) |
| Low | 5755 | 36.310 | 0.5 |
| High | 5795 | 34.990 | 0.5 |
| 142 | 5710 | 2.760 | 0.5 |



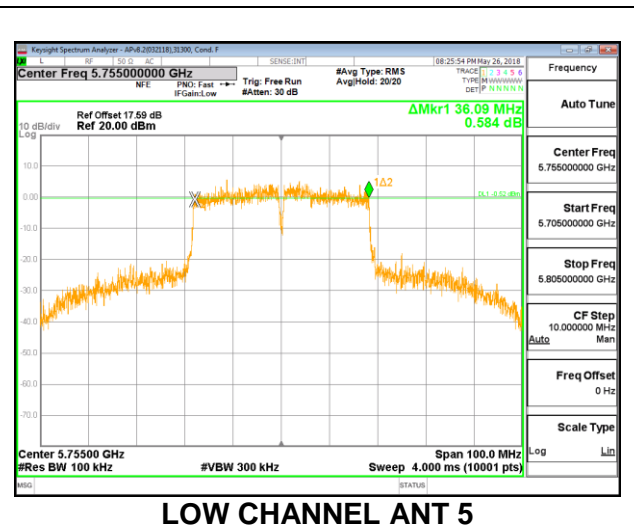
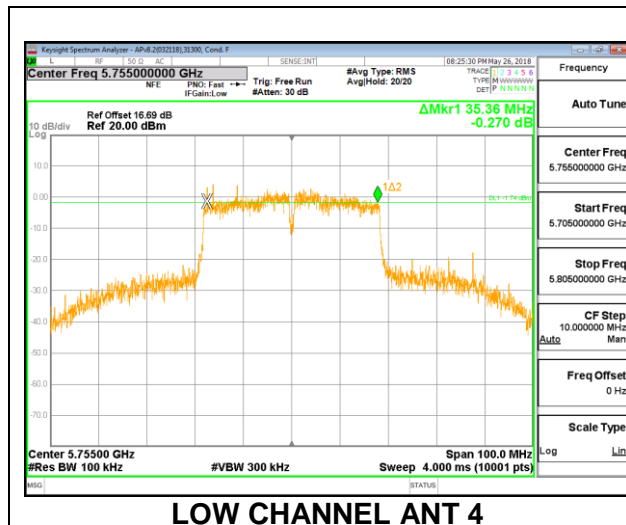
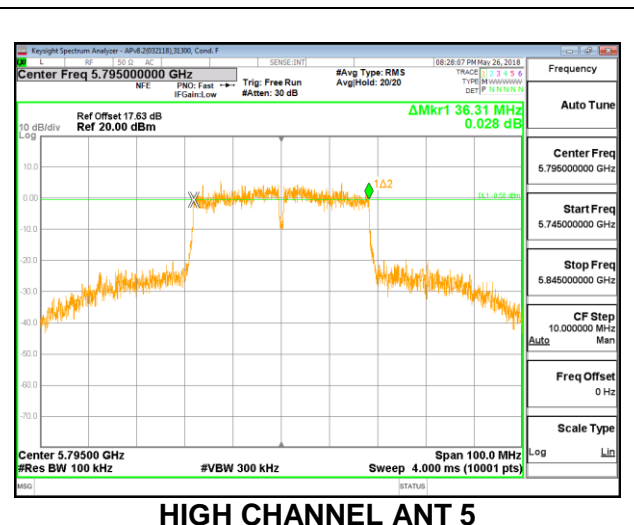
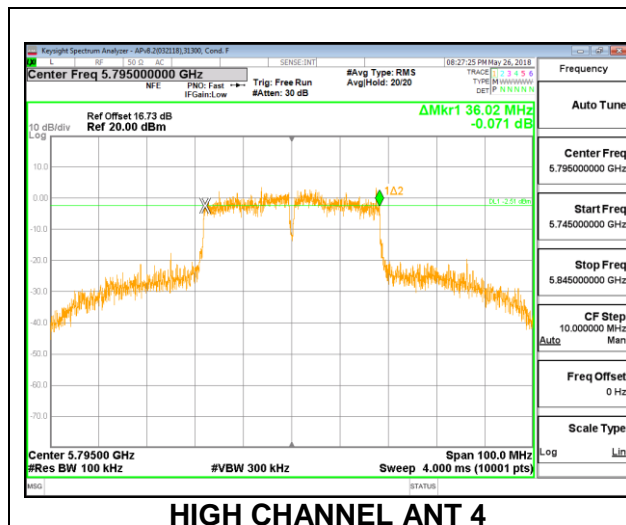
1TX Antenna 5

| Channel | Frequency | 6 dB Bandwidth | Minimum Limit |
|---------|-----------|----------------|---------------|
| | (MHz) | (MHz) | (MHz) |
| Low | 5755 | 32.390 | 0.5 |
| High | 5795 | 35.050 | 0.5 |
| 142 | 5710 | 3.270 | 0.5 |

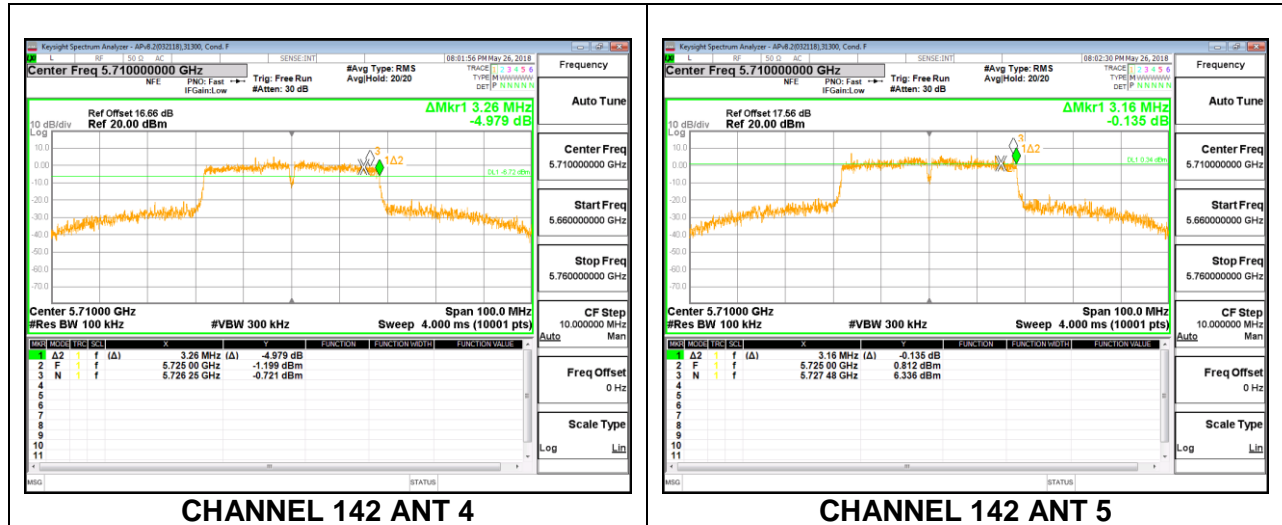
**LOW CHANNEL****HIGH CHANNEL****CHANNEL 142**

2TX Antenna 4 + Antenna 5 CDD MODE

| Channel | Frequency (MHz) | 6 dB BW ANT 4 (MHz) | 6 dB BW ANT 5 (MHz) | Minimum Limit (MHz) |
|---------|--------------------|---------------------------|---------------------------|---------------------------|
| Low | 5755 | 35.360 | 36.090 | 0.5 |
| High | 5795 | 36.020 | 36.310 | 0.5 |
| 142 | 5710 | 3.260 | 3.160 | 0.5 |

LOW CHANNEL**HIGH CHANNEL**

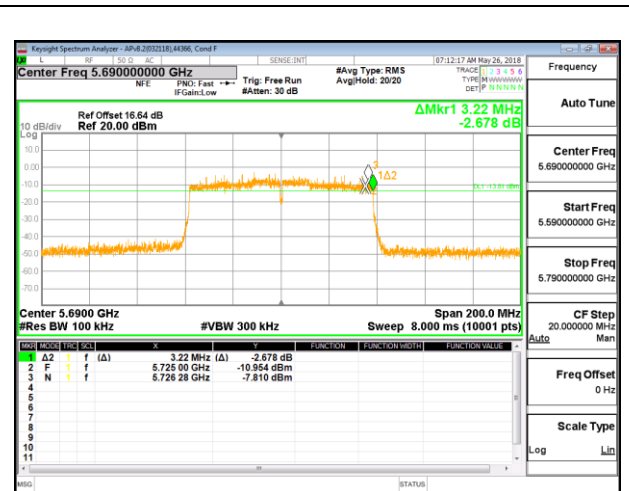
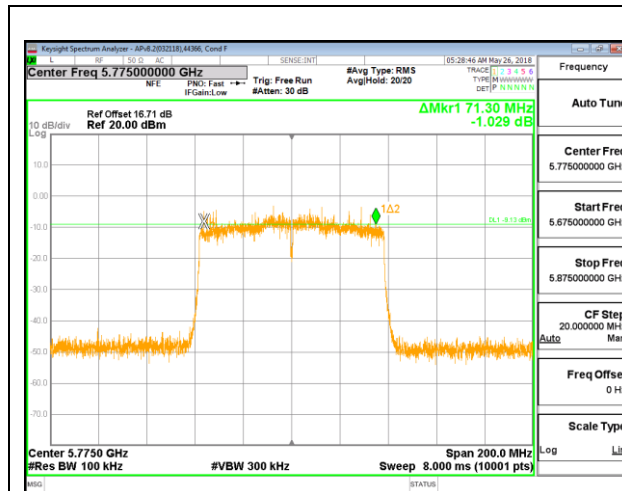
CHANNEL 142



8.4.3. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

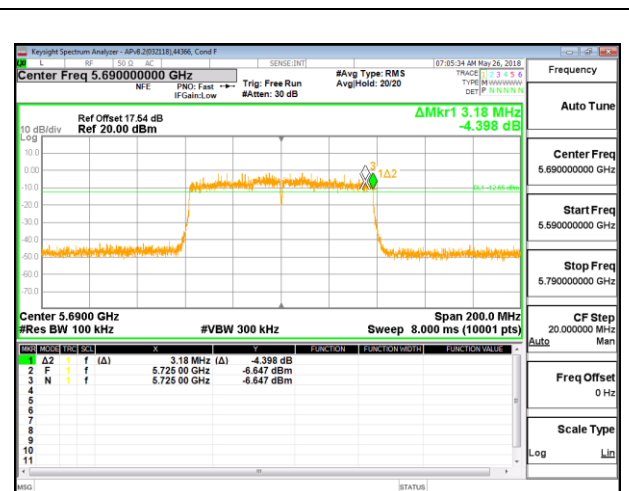
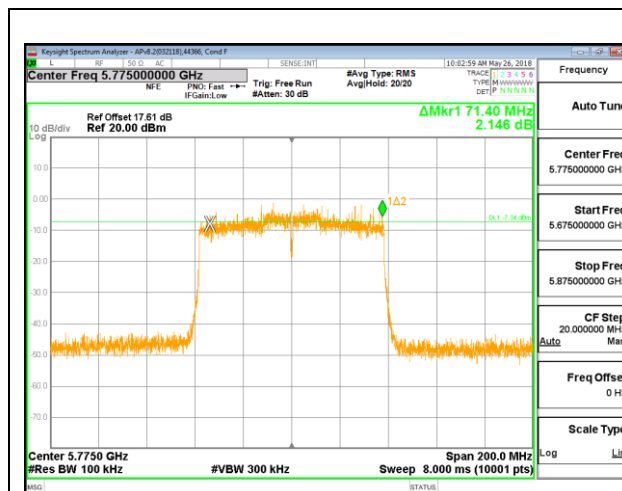
1TX Antenna 4

| Channel | Frequency | 6 dB Bandwidth | Minimum Limit |
|---------|-----------|----------------|---------------|
| | (MHz) | (MHz) | (MHz) |
| Mid | 5775 | 71.300 | 0.5 |
| 138 | 5690 | 3.220 | 0.5 |



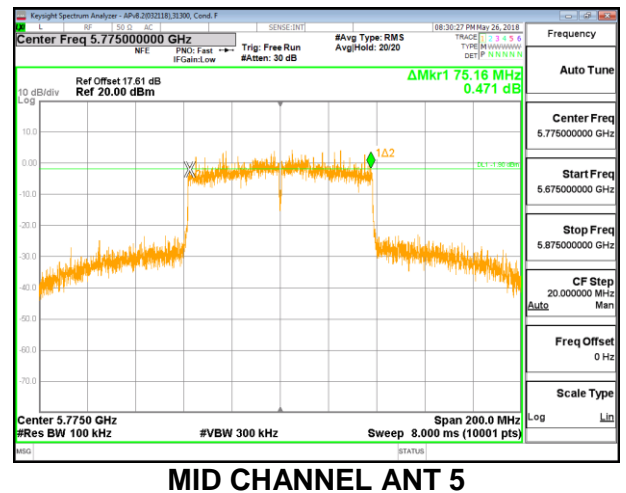
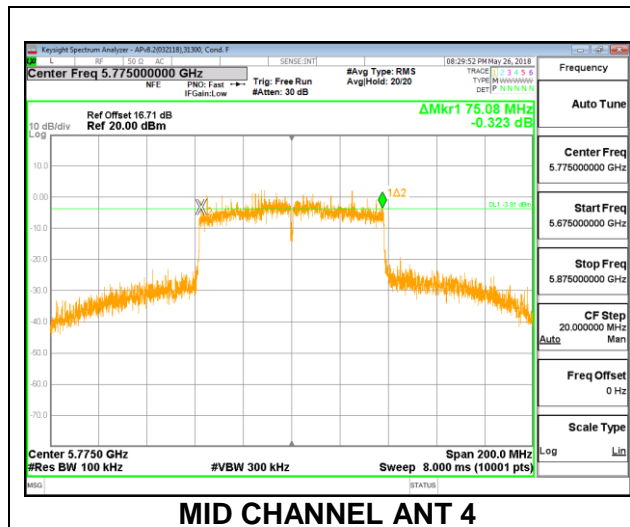
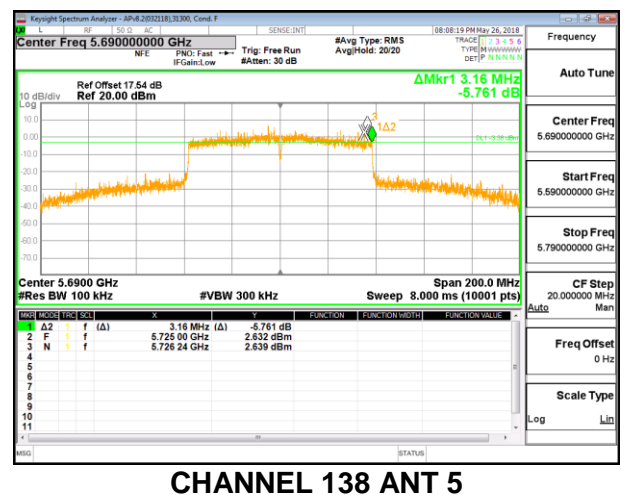
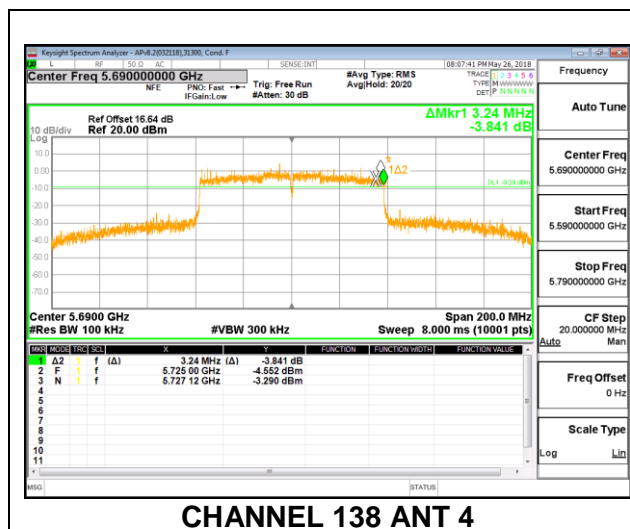
1TX Antenna 5

| Channel | Frequency | 6 dB Bandwidth | Minimum Limit |
|---------|-----------|----------------|---------------|
| | (MHz) | (MHz) | (MHz) |
| Mid | 5775 | 71.400 | 0.5 |
| 138 | 5690 | 3.180 | 0.5 |



2TX Antenna 4 + Antenna 5 CDD MODE

| Channel | Frequency (MHz) | 6 dB BW ANT 4 (MHz) | 6 dB BW ANT 5 (MHz) | Minimum Limit (MHz) |
|---------|--------------------|---------------------------|---------------------------|---------------------------|
| Mid | 5775 | 75.080 | 75.160 | 0.5 |
| 138 | 5690 | 3.240 | 3.160 | 0.5 |

MID CHANNEL**CHANNEL 138**

8.5. OUTPUT POWER AND PSD

LIMITS

FCC §15.407

Band 5.15–5.25 GHz

(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.

Bands 5.25-5.35 GHz and 5.47-5.725 GHz

The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, 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.

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.

TEST PROCEDURE

The measurement method used for output power is KDB 789033 D02 v02r01, Section E.3.b (Method PM-G) and for straddles channels KDB 789033 D02 v02r01, Section E.2.b (Method SA-2) was used.

The measurement method used for power spectral density is KDB 789033 D02 v02r01, Section F

DIRECTIONAL ANTENNA GAIN

For 1 TX:

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

For 2 TX:

Tx chains are uncorrelated for power and correlated for PSD due to the device supporting CDD in all MIMO modes. The directional gains are as follows:

| Band (GHz) | Ant 4 Antenna Gain (dBi) | Ant 5 Antenna Gain (dBi) | Uncorrelated Chains Directional Gain (dBi) | Correlated Chains Directional Gain (dBi) |
|-----------------------|---|---|---|---|
| 5.2 | -5.3 | -5.0 | -5.15 | -2.14 |
| 5.3 | -5.0 | -5.2 | -5.10 | -2.09 |
| 5.6 | -3.8 | -3.9 | -3.85 | -0.84 |
| 5.8 | -3.7 | -4.9 | -4.26 | -1.27 |

RESULTS**8.5.1. 802.11n HT20 MODE IN THE 5.2 GHz BAND****1TX Antenna 4 (FCC) MOBILE****Antenna Gain and Limits**

| Channel | Frequency (MHz) | Directional Gain (dBi) | Power Limit (dBm) | PSD Limit (dBm/ 1MHz) |
|---------|--------------------|------------------------------|-------------------------|--------------------------------|
| Low | 5180 | -5.30 | 24.00 | 11.00 |
| Mid | 5200 | -5.30 | 24.00 | 11.00 |
| High | 5240 | -5.30 | 24.00 | 11.00 |

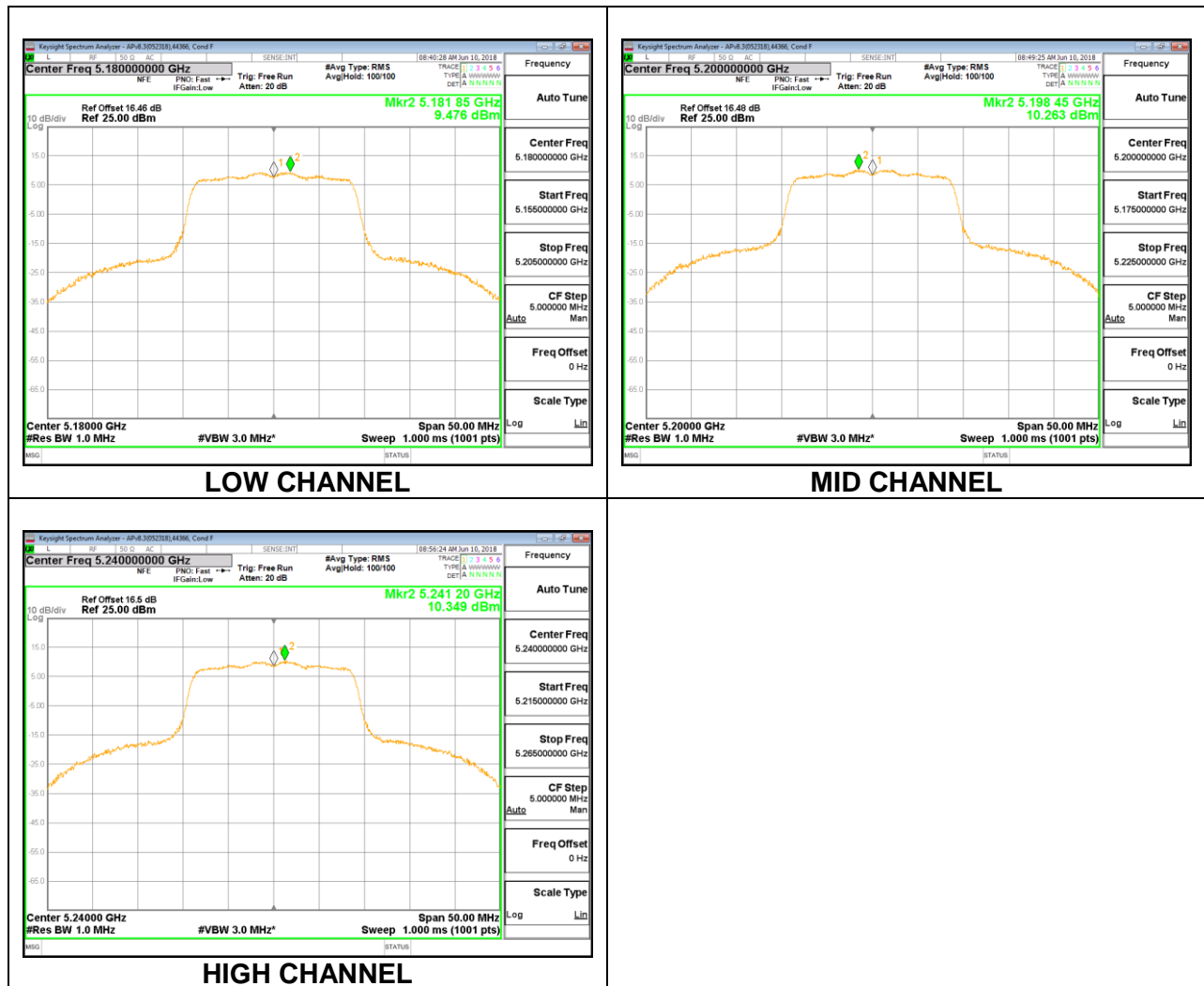
| | | |
|---------------------------|------|---|
| Duty Cycle CF (dB) | 0.00 | Included in Calculations of Corr'd PSD |
|---------------------------|------|---|

Output Power Results

| Channel | Frequency (MHz) | Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Power Margin (dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low | 5180 | 18.93 | 18.93 | 24.00 | -5.07 |
| Mid | 5200 | 20.84 | 20.84 | 24.00 | -3.16 |
| High | 5240 | 20.85 | 20.85 | 24.00 | -3.15 |

PSD Results

| Channel | Frequency (MHz) | Meas PSD (dBm/1MHz) | Total Corr'd PSD (dBm/1MHz) | PSD Limit (dBm/ 1MHz) | PSD Margin (dB) |
|---------|--------------------|---------------------------|--------------------------------------|--------------------------------|-----------------------|
| Low | 5180 | 9.48 | 9.48 | 11.00 | -1.52 |
| Mid | 5200 | 10.26 | 10.26 | 11.00 | -0.74 |
| High | 5240 | 10.35 | 10.35 | 11.00 | -0.65 |



1TX Antenna 5 (FCC) MOBILE**Antenna Gain and Limits**

| Channel | Frequency (MHz) | Directional Gain (dBi) | Power Limit (dBm) | PSD Limit (dBm/ 1MHz) |
|---------|--------------------|------------------------------|-------------------------|--------------------------------|
| Low | 5180 | -5.00 | 24.00 | 11.00 |
| Mid | 5200 | -5.00 | 24.00 | 11.00 |
| High | 5240 | -5.00 | 24.00 | 11.00 |

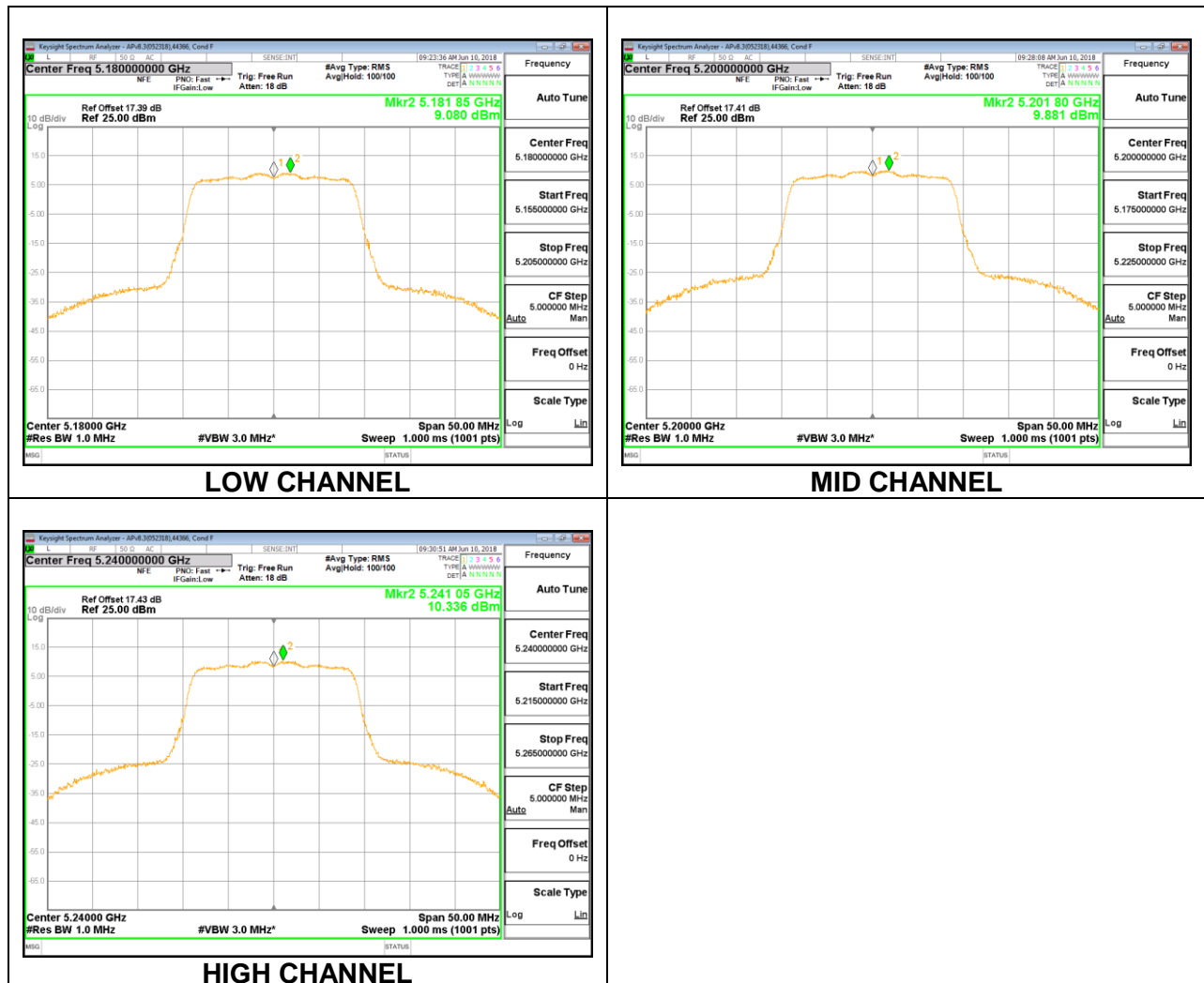
| | | |
|---------------------------|------|---|
| Duty Cycle CF (dB) | 0.00 | Included in Calculations of Corr'd PSD |
|---------------------------|------|---|

Output Power Results

| Channel | Frequency (MHz) | Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Power Margin (dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low | 5180 | 18.97 | 18.97 | 24.00 | -5.03 |
| Mid | 5200 | 20.89 | 20.89 | 24.00 | -3.11 |
| High | 5240 | 20.94 | 20.94 | 24.00 | -3.06 |

PSD Results

| Channel | Frequency (MHz) | Meas PSD (dBm/1MHz) | Total Corr'd PSD (dBm/1MHz) | PSD Limit (dBm/ 1MHz) | PSD Margin (dB) |
|---------|--------------------|---------------------------|--------------------------------------|--------------------------------|-----------------------|
| Low | 5180 | 9.08 | 9.08 | 11.00 | -1.92 |
| Mid | 5200 | 9.88 | 9.88 | 11.00 | -1.12 |
| High | 5240 | 10.34 | 10.34 | 11.00 | -0.66 |



2TX Antenna 4 + Antenna 5 CDD MODE (FCC) MOBILE**Antenna Gain and Limits**

| Channel | Frequency (MHz) | Directional Gain for Power (dBi) | Directional Gain for PSD (dBi) | Power Limit (dBm) | PSD Limit (dBm/ 1MHz) |
|---------|--------------------|---|---|-------------------------|--------------------------------|
| Low | 5180 | -5.15 | -2.14 | 24.00 | 11.00 |
| Mid | 5200 | -5.15 | -2.14 | 24.00 | 11.00 |
| High | 5240 | -5.15 | -2.14 | 24.00 | 11.00 |

| | | |
|---------------------------|------|---|
| Duty Cycle CF (dB) | 0.00 | Included in Calculations of Corr'd PSD |
|---------------------------|------|---|

Output Power Results

| Channel | Frequency (MHz) | Antenna 4 Meas Power (dBm) | Antenna 5 Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Power Margin (dB) |
|---------|--------------------|-------------------------------------|-------------------------------------|-----------------------------------|-------------------------|-------------------------|
| Low | 5180 | 17.97 | 17.89 | 20.94 | 24.00 | -3.06 |
| Mid | 5200 | 17.98 | 17.93 | 20.97 | 24.00 | -3.03 |
| High | 5240 | 17.93 | 17.91 | 20.93 | 24.00 | -3.07 |

PSD Results

| Channel | Frequency (MHz) | Antenna 4 Meas PSD (dBm/1MHz) | Antenna 5 Meas PSD (dBm/1MHz) | Total Corr'd PSD (dBm/1MHz) | PSD Limit (dBm/ 1MHz) | PSD Margin (dB) |
|---------|--------------------|--|--|--------------------------------------|--------------------------------|-----------------------|
| Low | 5180 | 7.03 | 7.32 | 10.19 | 11.00 | -0.81 |
| Mid | 5200 | 7.03 | 7.36 | 10.21 | 11.00 | -0.79 |
| High | 5240 | 7.43 | 7.65 | 10.55 | 11.00 | -0.45 |