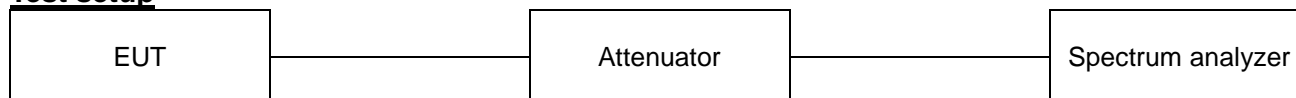


8.4. 6 dB Bandwidth & 99% Bandwidth

Test setup



Limit

According to §15.407(e), RSS-247(6.2.4) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth if U-NII devices shall be at least 500kHz

Test procedure

ANSI C63.10-2013 Section 6.9.2
KDB 789033 D02 v02r01 - Section C.2

Test settings

Minimum Emission Bandwidth for the band 5.725–5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.725–5.85 GHz. The following procedure shall be used for measuring this bandwidth:

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

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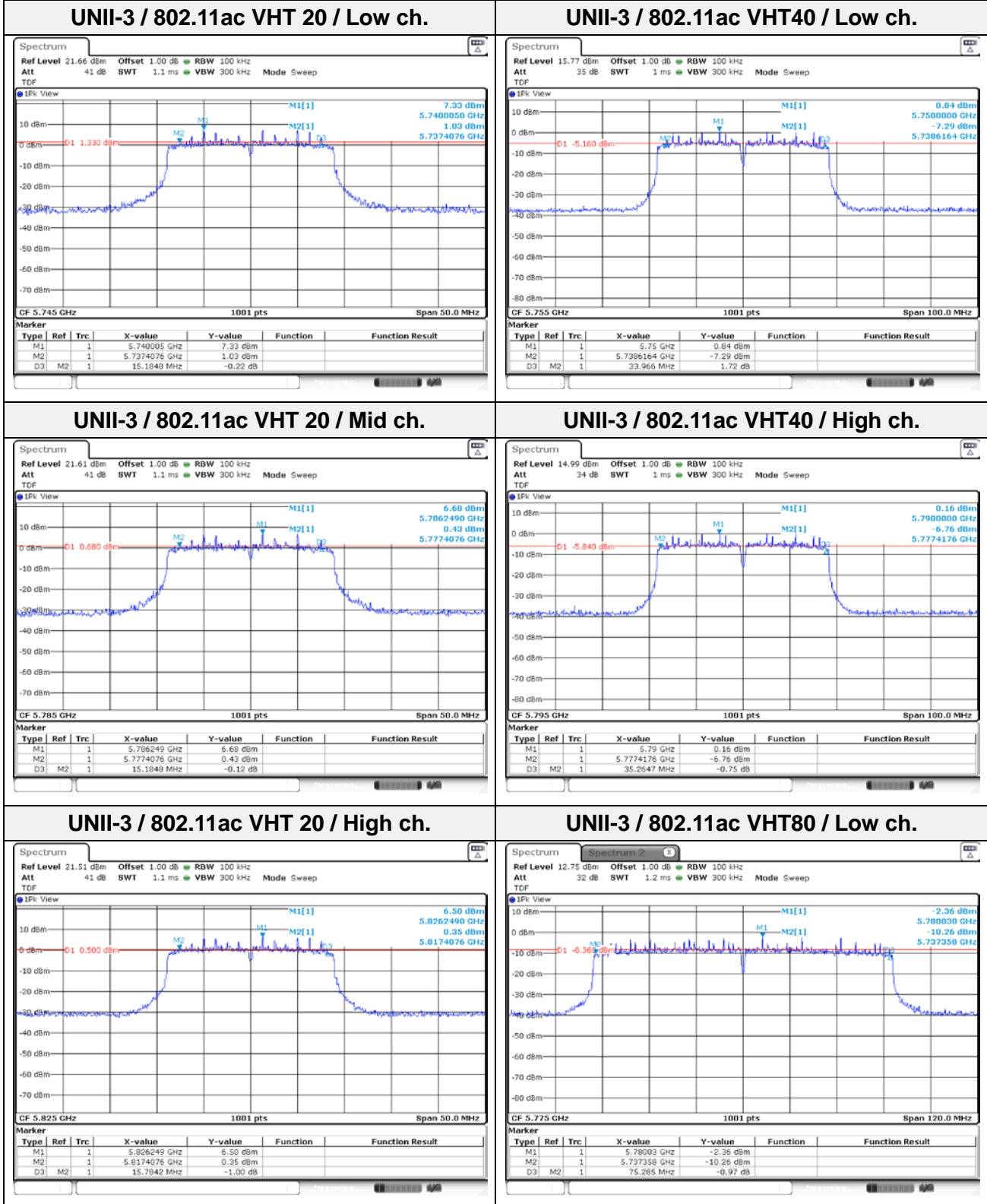
Page (56) of (230)

**Test results**

| Test mode | Band | Frequency (MHz) | 6dB bandwidth (MHz) | | Limit (MHz) | 99% bandwidth (MHz) | |
|-------------------|--------|-----------------|---------------------|-------|-------------|---------------------|-------|
| | | | ANT1 | ANT2 | | ANT1 | ANT2 |
| 802.11a | UNII-3 | 5 745 | 15.18 | 16.33 | 0.50 | 16.23 | 16.38 |
| | | 5 785 | 13.89 | 16.03 | 0.50 | 16.28 | 16.38 |
| | | 5 825 | 15.78 | 15.73 | 0.50 | 16.33 | 16.38 |
| 802.11n HT20 | UNII-3 | 5 745 | 15.23 | 16.58 | 0.50 | 17.58 | 17.58 |
| | | 5 785 | 15.53 | 16.68 | 0.50 | 17.58 | 17.58 |
| | | 5 825 | 15.98 | 16.38 | 0.50 | 17.53 | 17.58 |
| 802.11n HT40 | UNII-3 | 5 755 | 35.16 | 35.36 | 0.50 | 36.16 | 36.16 |
| | | 5 795 | 35.26 | 35.36 | 0.50 | 36.16 | 36.16 |
| 802.11ac VHT20 | UNII-3 | 5 745 | 15.18 | 16.58 | 0.50 | 17.58 | 17.58 |
| | | 5 785 | 15.18 | 16.63 | 0.50 | 17.58 | 17.58 |
| | | 5 825 | 15.78 | 16.63 | 0.50 | 17.53 | 17.58 |
| 802.11ac VHT40 | UNII-3 | 5 755 | 33.97 | 36.06 | 0.50 | 36.16 | 36.16 |
| | | 5 795 | 35.26 | 35.36 | 0.50 | 36.16 | 36.16 |
| 802.11ac VHT80 | UNII-3 | 5 775 | 75.28 | 75.28 | 0.50 | 75.64 | 75.40 |

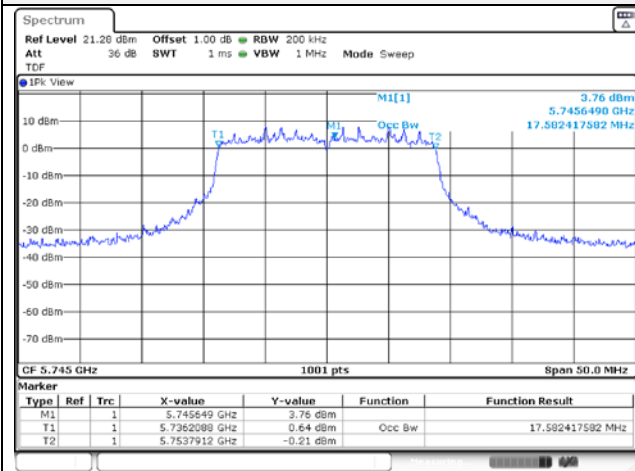
In order to simplify the report, attached plots were only MIMO ANT 1

6 dB bandwidth

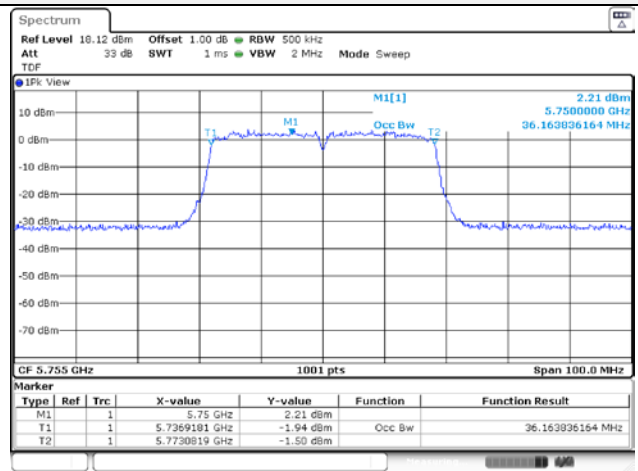


99% bandwidth

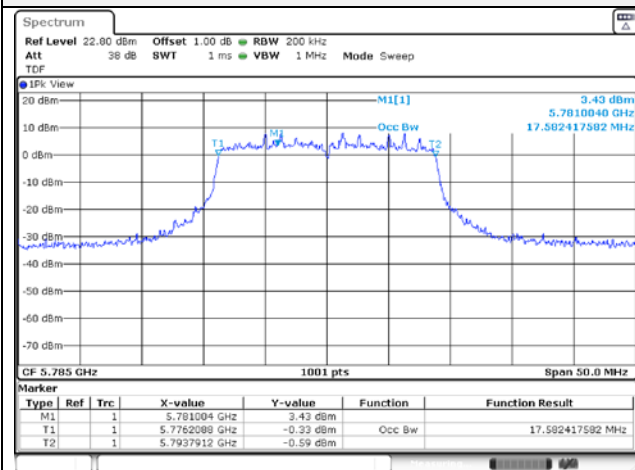
UNII-3 / 802.11ac VHT 20 / Low ch.



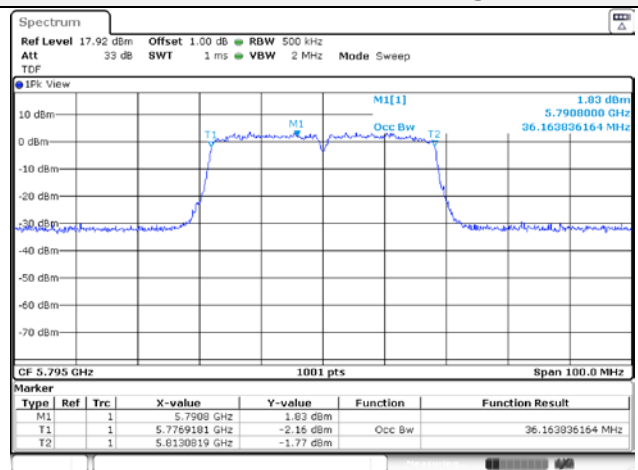
UNII-3 / 802.11ac VHT40 / Low ch.



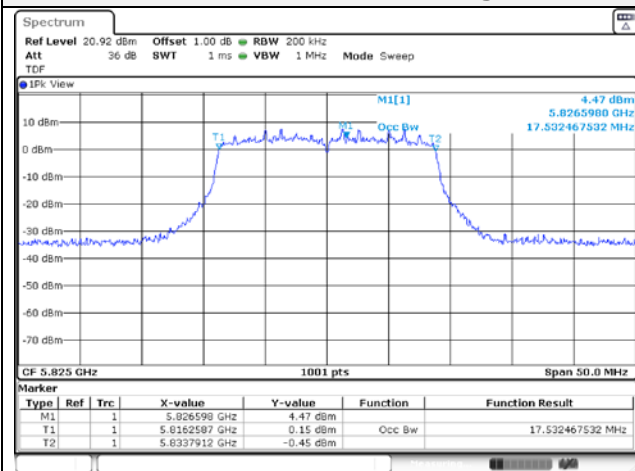
UNII-3 / 802.11ac VHT 20 / Mid ch.



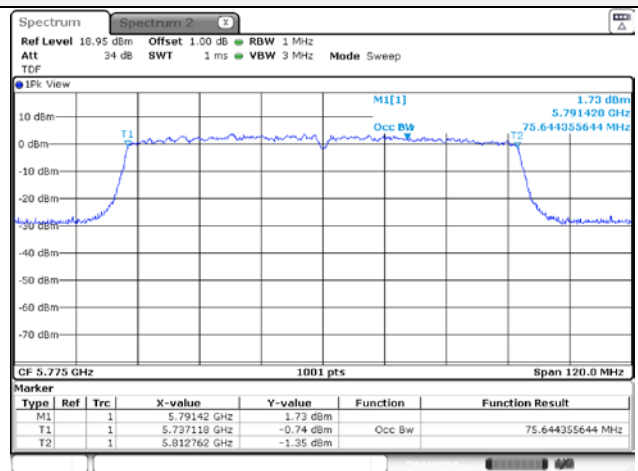
UNII-3 / 802.11ac VHT40 / High ch.



UNII-3 / 802.11ac VHT 20 / High ch.



UNII-3 / 802.11ac VHT80 / Low ch.



8.5. Straddle channel**26dB bandwidth & 99% Bandwidth**

| Test mode | Band | Frequency (MHz) | 26dB Bandwidth (MHz) | | 99% Bandwidth (MHz) | |
|----------------|---------|-----------------|----------------------|-------|---------------------|-------|
| | | | ANT1 | ANT2 | ANT1 | ANT2 |
| 802.11a | UNII-2C | 5 720 | 15.24 | 15.24 | 13.12 | 13.19 |
| 802.11n HT20 | | | 15.99 | 14.94 | 13.79 | 13.79 |
| 802.11ac VHT20 | | | 15.19 | 15.04 | 13.77 | 13.79 |
| 802.11a | UNII-3 | 5 720 | 5.29 | 5.29 | 3.09 | 3.19 |
| 802.11n HT20 | | | 4.94 | 5.14 | 3.79 | 3.79 |
| 802.11ac VHT20 | | | 5.04 | 5.14 | 3.79 | 3.79 |
| 802.11n HT40 | UNII-2C | 5 710 | 35.18 | 34.98 | 33.08 | 33.08 |
| 802.11ac VHT40 | | | 35.28 | 35.08 | 33.03 | 33.08 |
| 802.11n HT40 | UNII-3 | 5 710 | 5.38 | 5.08 | 3.08 | 3.08 |
| 802.11ac VHT40 | | | 5.38 | 5.18 | 3.08 | 3.08 |
| 802.11ac VHT80 | UNII-2C | 5 690 | 76.60 | 76.36 | 72.82 | 72.70 |
| | UNII-3 | 5 690 | 6.60 | 6.36 | 2.88 | 2.76 |

Notes:

1. For 26dB Bandwidth

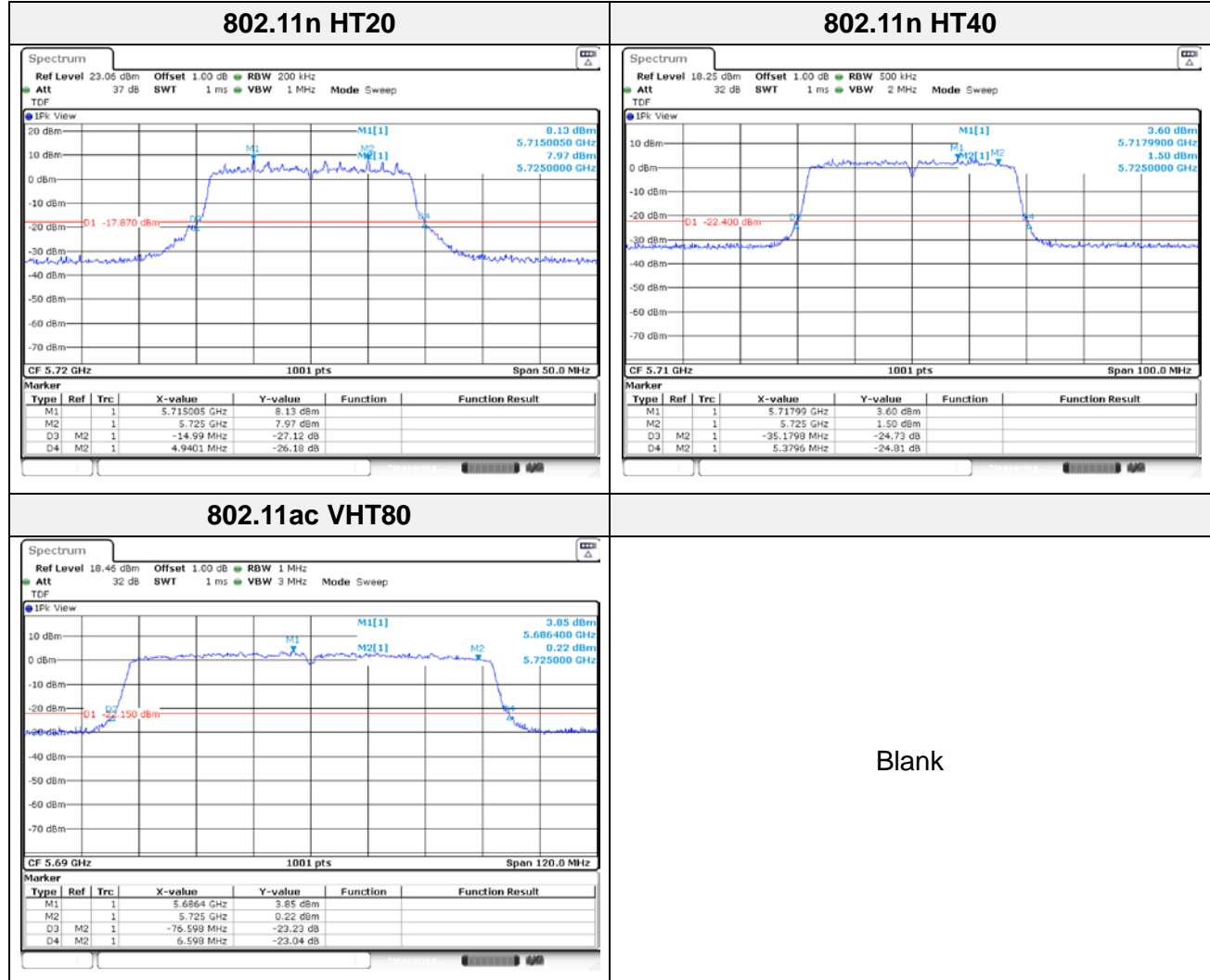
- [UNII-2C] 26dB Bandwidth = 5 725 MHz – Measured Frequency[MHz]
- [UNII-3] 26dB Bandwidth = Measured Frequency[MHz] – 5 725 MHz

2. For 99% Bandwidth

- For UNII band 2C (20M BW) = (99% BW / 2) + 5 MHz because center frequency is set to 5 720 MHz
- For UNII band 2C (40M BW) = (99% BW / 2) + 15 MHz because center frequency is set to 5 710 MHz
- For UNII band 2C (80M BW) = (99% BW / 2) + 35 MHz because center frequency is set to 5 690 MHz
- And for UNII band 3 = Measured frequency(T2) – 5725 MHz

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26dB bandwidth



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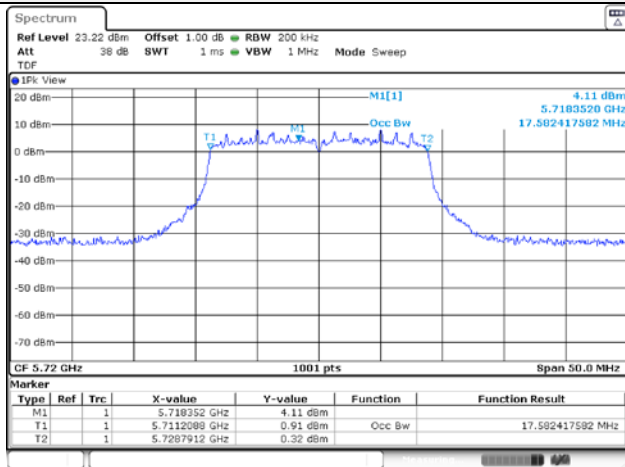
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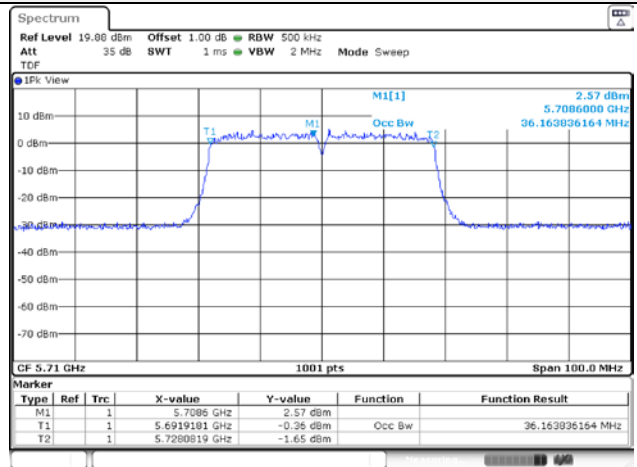


99% bandwidth

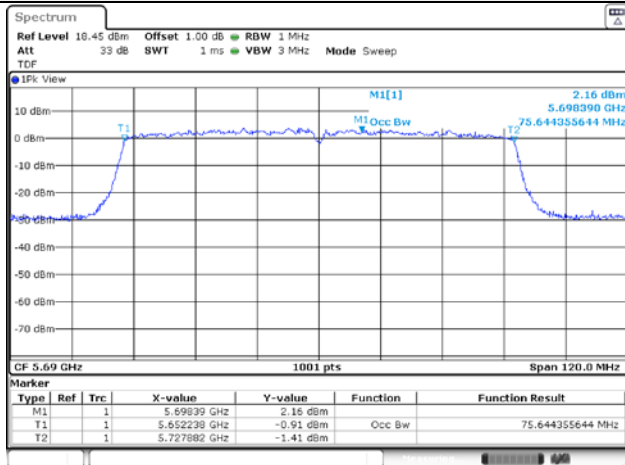
802.11n HT20



802.11n HT40



802.11ac VHT80



Blank

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**6dB bandwidth**

| Test mode | Band | Frequency (MHz) | 6dB Bandwidth (MHz) | | Limit (MHz) |
|----------------|--------|--------------------|------------------------|------|----------------|
| | | | ANT1 | ANT2 | |
| 802.11a | UNII-3 | 5 720 | 2.59 | 3.19 | 0.5 |
| 802.11n HT20 | | | 2.59 | 3.44 | 0.5 |
| 802.11ac VHT20 | | | 2.64 | 3.19 | 0.5 |
| 802.11n HT40 | UNII-3 | 5 710 | 2.58 | 3.18 | 0.5 |
| 802.11ac VHT40 | | | 2.68 | 3.28 | 0.5 |
| 802.11ac VHT80 | UNII-3 | 5 690 | 2.64 | 2.64 | 0.5 |

Notes:

1. 6dB Bandwidth = Measured Frequency[MHz] – 5 725MHz

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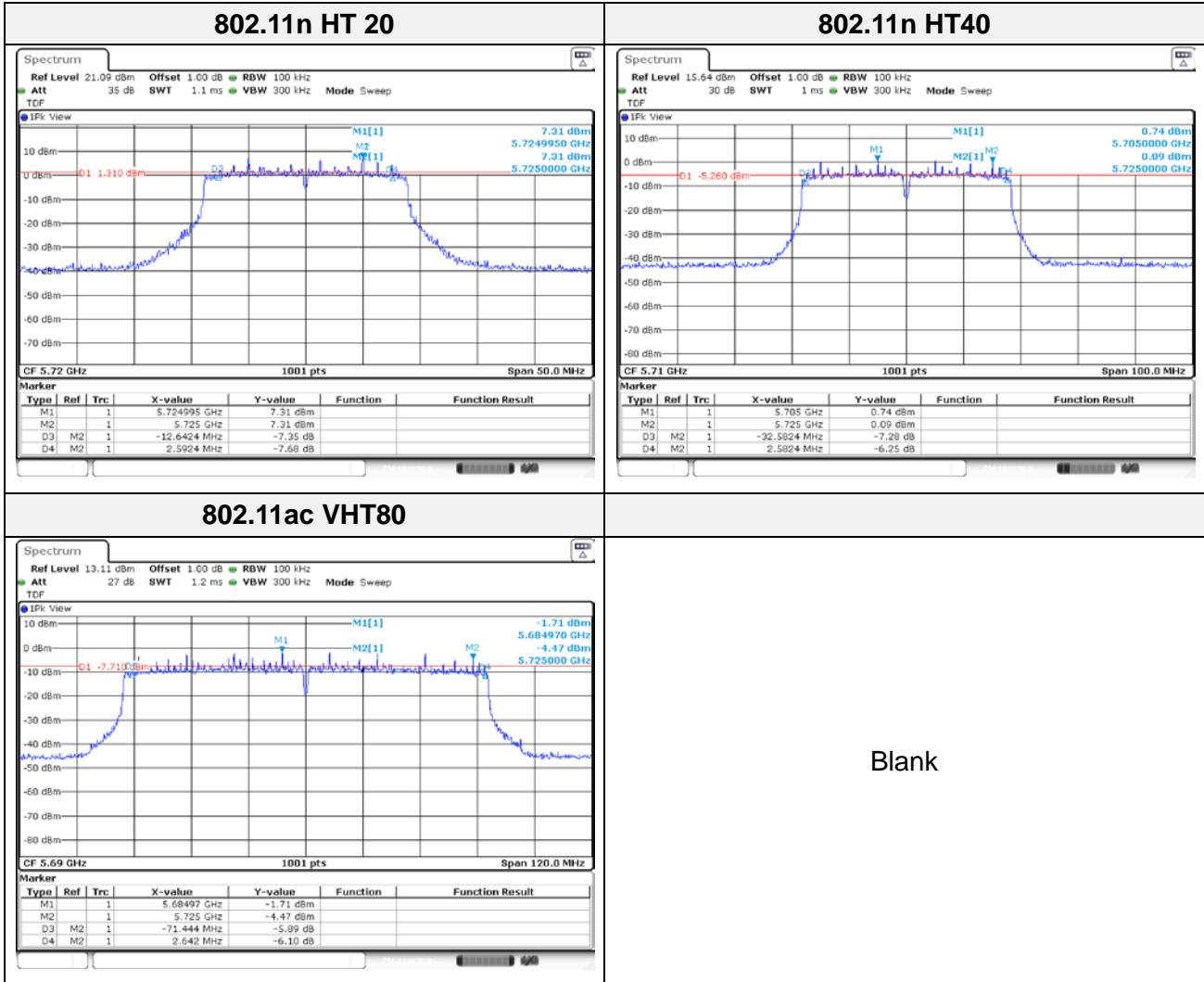
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In order to simplify the report, attached plots were only MIMO ANT 1



Output Power

-SISO Conducted Output Power

| Test mode | Band | Frequency (MHz) | Measured output power | | | | | Limit (dBm) |
|----------------|---------|-----------------|-----------------------|-------|----------|--------------|-------|-------------|
| | | | Reading (dBm) | | DCF (dB) | Result (dBm) | | |
| | | | ANT1 | ANT2 | | ANT1 | ANT2 | |
| 802.11a | UNII-2C | 5 720 | 14.99 | 15.21 | 0.28 | 15.27 | 15.49 | 24.00 |
| 802.11n HT20 | | | 15.03 | 14.77 | 0.33 | 15.36 | 15.10 | |
| 802.11ac VHT20 | | | 14.98 | 14.72 | 0.33 | 15.31 | 15.05 | |
| 802.11a | UNII-3 | 5 720 | 8.68 | 9.09 | 0.28 | 8.96 | 9.37 | 30.00 |
| 802.11n HT20 | | | 9.08 | 8.92 | 0.33 | 9.41 | 9.25 | |
| 802.11ac VHT20 | | | 9.11 | 8.93 | 0.33 | 9.44 | 9.26 | |
| 802.11n HT40 | UNII-2C | 5 710 | 12.20 | 11.65 | 0.63 | 12.83 | 12.28 | 24.00 |
| 802.11ac VHT40 | | | 12.15 | 11.58 | 0.63 | 12.78 | 12.21 | |
| 802.11n HT40 | UNII-3 | 5 710 | 1.36 | 0.95 | 0.63 | 1.99 | 1.58 | 30.00 |
| 802.11ac VHT40 | | | 1.37 | 1.04 | 0.63 | 2.00 | 1.67 | |
| 802.11ac VHT80 | UNII-2C | 5 690 | 10.87 | 11.00 | 1.17 | 12.04 | 12.17 | 24.00 |
| | UNII-3 | 5 690 | -3.75 | -3.66 | 1.17 | -2.58 | -2.49 | 30.00 |

Notes.

1. Result(dB m) = Reading Power + D.C.F

-SISO e.i.r.p.

| Test mode | Band | Frequency (MHz) | Measured output power | | | | | | MAX e.i.r.p Limit (dBm) | |
|----------------|---------|-----------------|------------------------------|-------|---------------|-------|-------------------|-------|-------------------------|-------|
| | | | Conducted Output Power (dBm) | | ANT gain (dB) | | MAX e.i.r.p (dBm) | | ANT1 | ANT 2 |
| | | | ANT1 | ANT2 | ANT1 | ANT2 | ANT1 | ANT2 | | |
| 802.11a | UNII-2C | 5 720 | 15.27 | 15.49 | -1.67 | -5.55 | 13.60 | 9.94 | 28.28 | 28.27 |
| 802.11n HT20 | | | 15.36 | 15.10 | | | 13.69 | 9.55 | 28.46 | 28.46 |
| 802.11ac VHT20 | | | 15.31 | 15.05 | | | 13.64 | 9.50 | 28.46 | 28.46 |
| 802.11a | UNII-3 | 5 720 | 8.96 | 9.37 | -1.51 | -5.17 | 7.45 | 4.20 | 30.00 | 30.00 |
| 802.11n HT20 | | | 9.41 | 9.25 | | | 7.90 | 4.08 | | |
| 802.11ac VHT20 | | | 9.44 | 9.26 | | | 7.93 | 4.09 | | |
| 802.11n HT40 | UNII-2C | 5 710 | 12.83 | 12.28 | -1.67 | -5.55 | 11.16 | 6.73 | 30.00 | 30.00 |
| 802.11ac VHT40 | | | 12.78 | 12.21 | | | 11.11 | 6.66 | | |
| 802.11n HT40 | UNII-3 | 5 710 | 1.99 | 1.58 | -1.51 | -5.17 | 0.48 | -3.59 | 30.00 | 30.00 |
| 802.11ac VHT40 | | | 2.00 | 1.67 | | | 0.49 | -3.50 | | |
| 802.11ac VHT80 | UNII-2C | 5 690 | 12.04 | 12.17 | -1.67 | -5.55 | 10.37 | 6.62 | 30.00 | 30.00 |
| | UNII-3 | 5 690 | -2.58 | -2.49 | -1.51 | -5.17 | -4.09 | -7.66 | 30.00 | 30.00 |

Notes:

1. e.i.r.p. Calculation: e.i.r.p. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

-MIMO Conducted Output Power

| Test mode | Band | Frequency (MHz) | Measured output power | | | | Limit (dBm) |
|----------------|---------|-----------------|-----------------------|-------|----------|--------------|-------------|
| | | | Reading (dBm) | | DCF (dB) | Result (dBm) | |
| | | | ANT1 | ANT2 | | | |
| 802.11a | UNII-2C | 5 720 | 14.85 | 15.76 | 0.28 | 18.62 | 24.00 |
| 802.11n HT20 | | | 14.51 | 15.12 | 0.61 | 18.45 | |
| 802.11ac VHT20 | | | 15.84 | 15.02 | 0.61 | 19.07 | |
| 802.11a | UNII-3 | 5 720 | 8.79 | 9.29 | 0.28 | 12.34 | 30.00 |
| 802.11n HT20 | | | 8.52 | 9.17 | 0.61 | 12.48 | |
| 802.11ac VHT20 | | | 10.01 | 8.98 | 0.61 | 13.14 | |
| 802.11n HT40 | UNII-2C | 5 710 | 10.97 | 11.54 | 1.11 | 15.38 | 24.00 |
| 802.11ac VHT40 | | | 10.93 | 11.53 | 1.10 | 15.35 | |
| 802.11n HT40 | UNII-3 | 5 710 | 0.35 | 1.00 | 1.11 | 4.81 | 30.00 |
| 802.11ac VHT40 | | | 0.07 | 0.52 | 1.10 | 4.41 | |
| 802.11ac VHT80 | UNII-2C | 5 690 | 9.73 | 10.38 | 1.86 | 14.94 | 24.00 |
| | UNII-3 | 5 690 | -4.53 | -4.09 | 1.86 | 0.57 | 30.00 |

Notes:

1. Result(dB m) = 10log(10^(ANT 1/10) + 10^(ANT 2/10)) + D.C.F

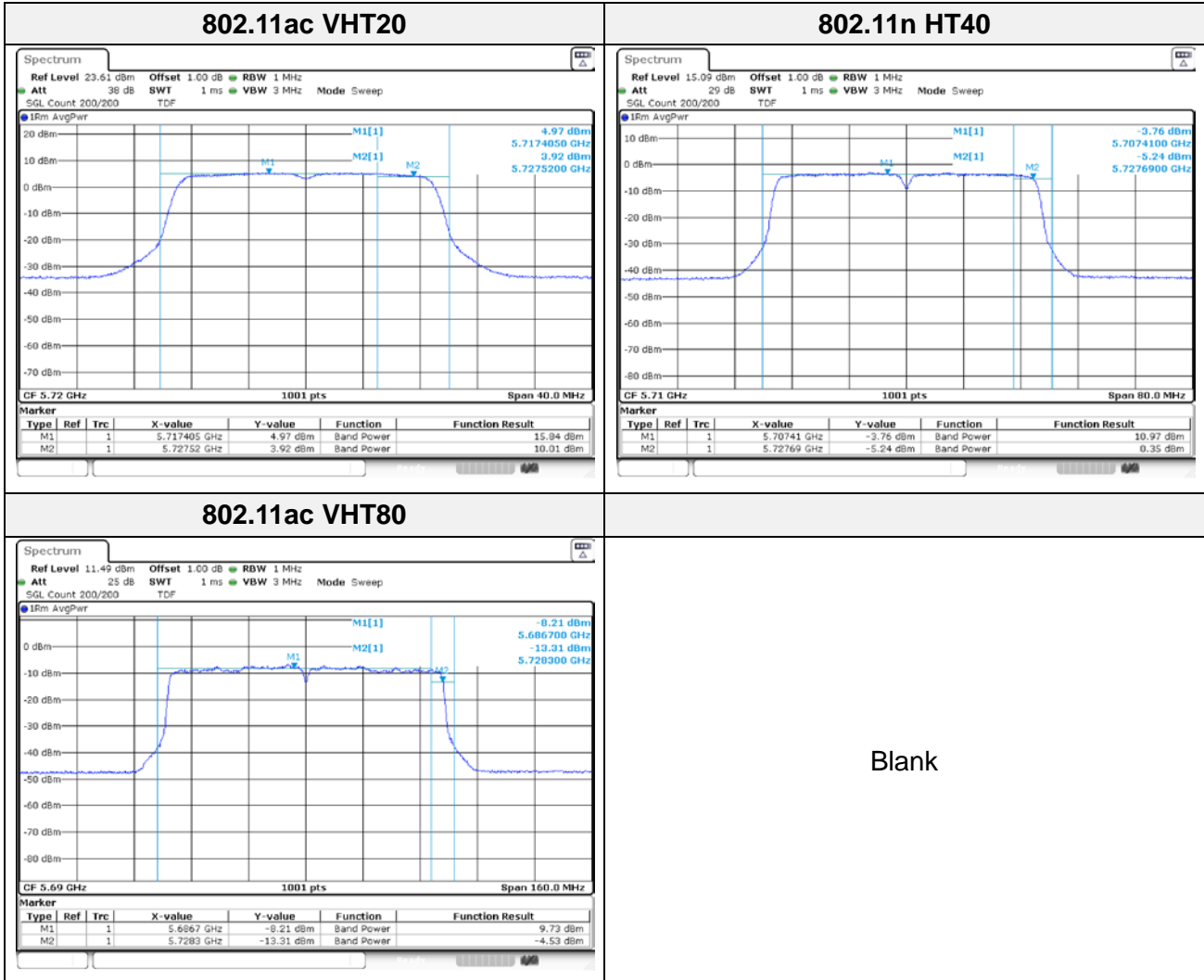
-MIMO e.i.r.p.

| Test mode | Band | Frequency (MHz) | Measured output power | | | Limit (dBm) |
|----------------|---------|-----------------|------------------------------|----------------|-------------------|-------------|
| | | | Conducted output Power (dBm) | ANT gain (dBi) | MAX e.i.r.p (dBm) | |
| 802.11a | UNII-2C | 5 720 | 18.62 | -0.38 | 18.24 | 29.10 |
| 802.11n HT20 | | | 18.45 | | 18.07 | 29.45 |
| 802.11ac VHT20 | | | 3.62 | | 3.24 | 29.44 |
| 802.11a | UNII-3 | 5 720 | 12.34 | -0.14 | 12.20 | 30.00 |
| 802.11n HT20 | | | 12.48 | | 12.34 | |
| 802.11ac VHT20 | | | 3.62 | | 3.48 | |
| 802.11n HT40 | UNII-2C | 5 710 | 15.38 | -0.38 | 15.00 | 30.00 |
| 802.11ac VHT40 | | | 15.35 | | 14.97 | |
| 802.11n HT40 | UNII-3 | 5 710 | 4.81 | -0.14 | 4.67 | 30.00 |
| 802.11ac VHT40 | | | 4.41 | | 4.27 | |
| 802.11ac VHT80 | UNII-2C | 5 690 | 14.94 | -0.38 | 14.56 | 30.00 |
| | UNII-3 | 5 690 | 0.57 | -0.14 | 0.43 | 30.00 |

Notes:

1. e.i.r.p. Calculation: e.i.r.p. (dBm) = Conducted output power (dBm) + Antenna gain (dBi)

In order to simplify the report, attached plots were only MIMO
ANT 1



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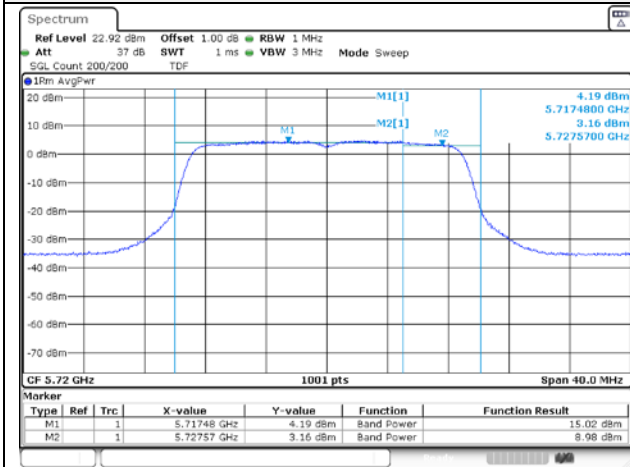
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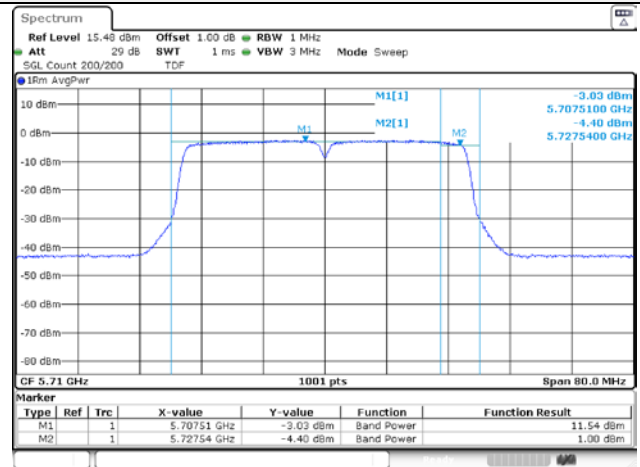


ANT2

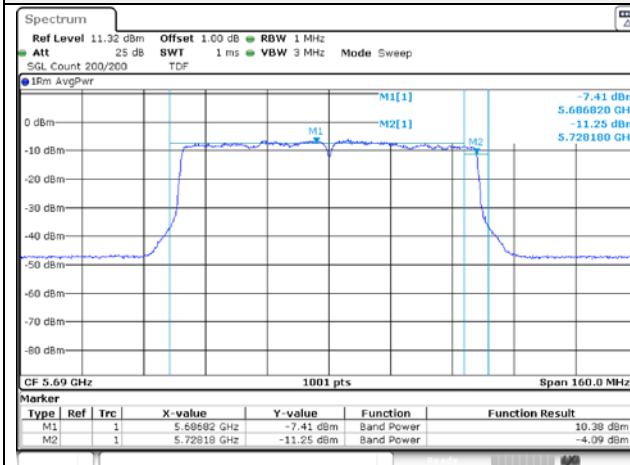
802.11ac VHT20



802.11n HT40



802.11ac VHT80



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Power Spectral Density
-SISO

| Test mode | Band | Frequency (MHz) | Measured PSD (dBm/MHz) | | DCF (dB) | Maximum PSD (dB m/MHz) | | Limit (dBm/MHz) |
|----------------|---------|-----------------|------------------------|-------|----------|------------------------|-------|-----------------|
| | | | ANT1 | ANT2 | | ANT1 | ANT2 | |
| 802.11a | UNII-2C | 5 720 | 4.72 | 5.20 | 0.28 | 5.00 | 5.48 | 11.00 |
| 802.11n HT20 | | | 4.80 | 4.49 | 0.33 | 5.13 | 4.82 | |
| 802.11ac VHT20 | | | 4.66 | 4.33 | 0.33 | 4.99 | 4.66 | |
| 802.11n HT40 | UNII-2C | 5 710 | -1.99 | -2.45 | 0.63 | -1.36 | -1.82 | |
| 802.11ac VHT40 | | | -2.00 | -2.52 | 0.63 | -1.37 | -1.89 | |
| 802.11ac VHT80 | UNII-2C | 5 690 | -6.13 | -5.99 | 1.17 | -4.96 | -4.82 | |

| Test mode | Band | Frequency (MHz) | Measured PSD (dBm/ 500 kHz) | | DCF (dB) | Maximum PSD (dBm/ 500 kHz) | | Limit (dBm/500 kHz) |
|----------------|--------|-----------------|-----------------------------|--------|----------|----------------------------|-------|---------------------|
| | | | ANT1 | ANT2 | | ANT1 | ANT2 | |
| 802.11a | UNII-3 | 5 720 | 1.81 | 1.87 | 0.28 | 2.09 | 2.15 | 30.00 |
| 802.11n HT20 | | | 1.49 | 1.31 | 0.33 | 1.82 | 1.64 | |
| 802.11ac VHT20 | | | 1.56 | 1.43 | 0.33 | 1.89 | 1.76 | |
| 802.11n HT40 | | 5 710 | -5.12 | -6.49 | 0.63 | -4.49 | -5.86 | |
| 802.11ac VHT40 | | | -5.84 | -5.98 | 0.63 | -5.21 | -5.35 | |
| 802.11ac VHT40 | | | 5 690 | -10.88 | -10.52 | 1.17 | -9.71 | |

Notes:

- Maximum PSD calculation
- Maximum PSD = Measured PSD + D.C.F

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**-MIMO**

| Test mode | Band | Frequency (MHz) | Measured PSD (dBm/MHz) | | DCF (dB) | Maximum PSD (dB m/MHz) | Limit (dBm/MHz) |
|----------------|---------|-----------------|------------------------|-------|----------|------------------------|-----------------|
| | | | ANT1 | ANT2 | | | |
| 802.11a | UNII-2C | 5 720 | 6.02 | 5.55 | 0.28 | 9.08 | 11.00 |
| 802.11n HT20 | | | 4.15 | 4.93 | 0.61 | 8.18 | |
| 802.11ac VHT20 | | | 5.75 | 4.73 | 0.61 | 8.89 | |
| 802.11n HT40 | UNII-2C | 5 710 | -3.10 | -2.52 | 1.11 | 1.32 | |
| 802.11ac VHT40 | | | -2.75 | -2.57 | 1.10 | 1.45 | |
| 802.11ac VHT80 | UNII-2C | 5 690 | -6.75 | -6.16 | 1.86 | -1.57 | |

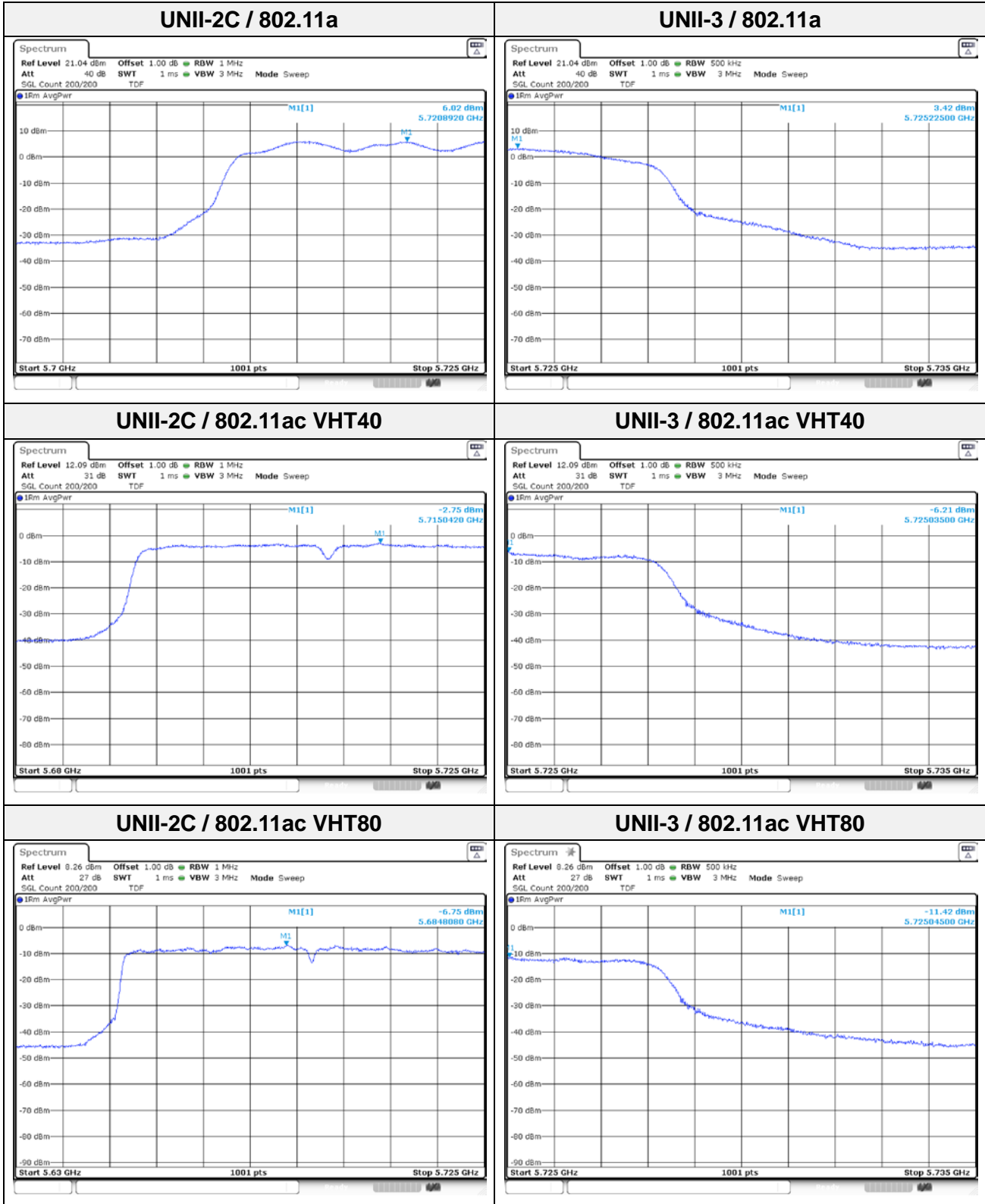
| Test mode | Band | Frequency (MHz) | Measured PSD (dBm/ 500 kHz) | | DCF (dB) | Maximum PSD (dBm / 500 kHz) | Limit (dBm / 500 kHz) |
|----------------|--------|-----------------|-----------------------------|--------|----------|-----------------------------|-----------------------|
| | | | ANT1 | ANT2 | | | |
| 802.11a | UNII-3 | 5 720 | 3.42 | 2.43 | 0.28 | 6.24 | 30.00 |
| 802.11n HT20 | | | 1.10 | 1.66 | 0.61 | 5.01 | |
| 802.11ac VHT20 | | | 2.37 | 1.51 | 0.61 | 5.58 | |
| 802.11n HT40 | | 5 710 | -6.42 | -6.05 | 1.11 | -2.11 | |
| 802.11ac VHT40 | | | -6.21 | -5.73 | 1.10 | -1.85 | |
| 802.11ac VHT80 | | 5 690 | -11.42 | -10.60 | 1.86 | -6.12 | |

Notes:

1. Maximum PSD calculation

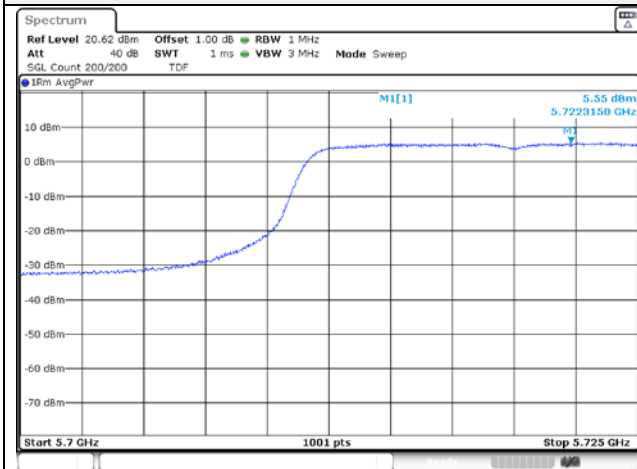
- Maximum PSD = $10 \log(10^{(\text{ANT } 1/10)} + 10^{(\text{ANT } 2/10)}) + \text{D.C.F}$

In order to simplify the report, attached plots were only MIMO
ANT1

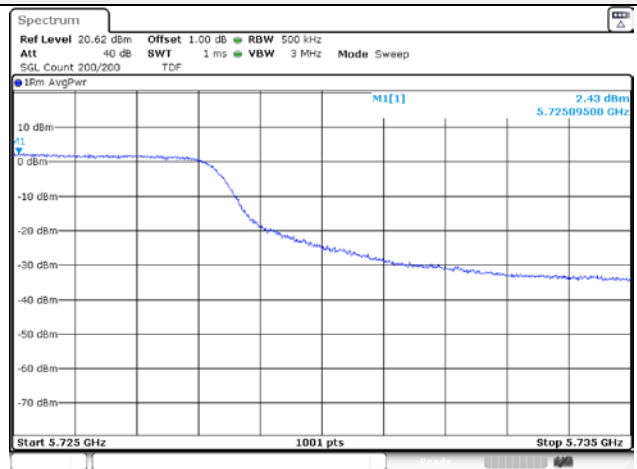


MIMO ANT2

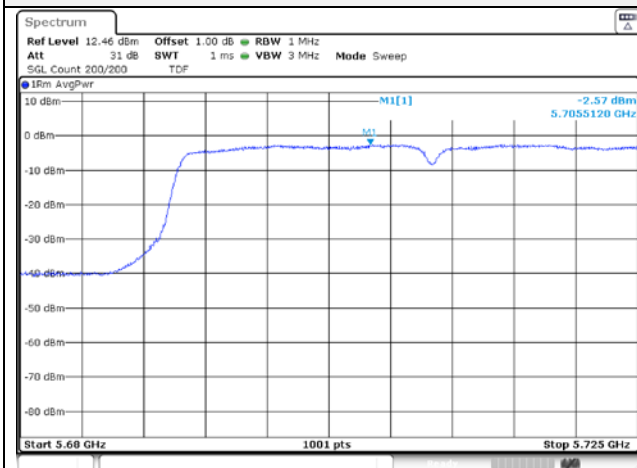
UNII-2C / 802.11a



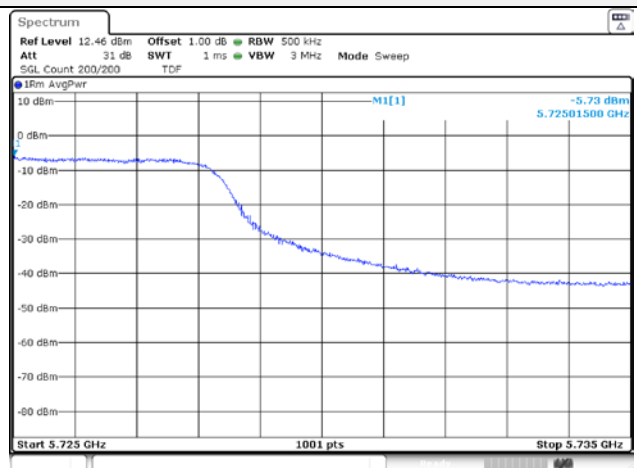
UNII-3 / 802.11a



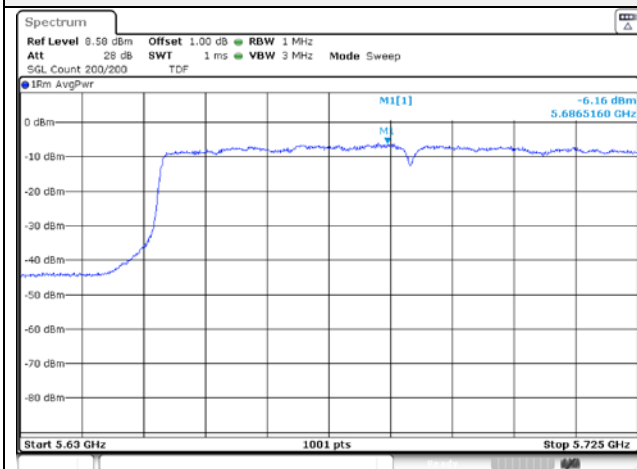
UNII-2C / 802.11ac VHT40



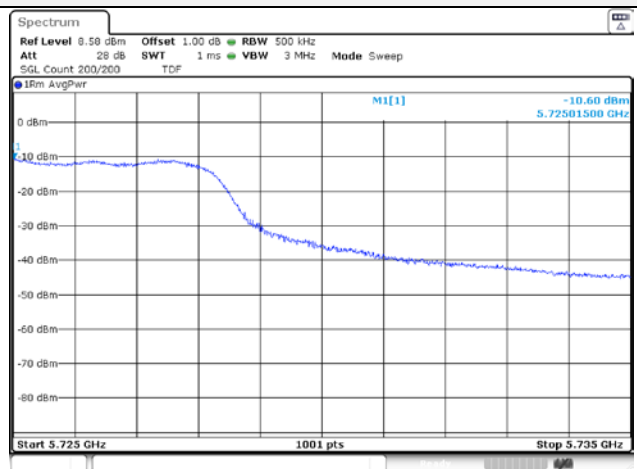
UNII-3 / 802.11ac VHT40



UNII-2C / 802.11ac VHT80



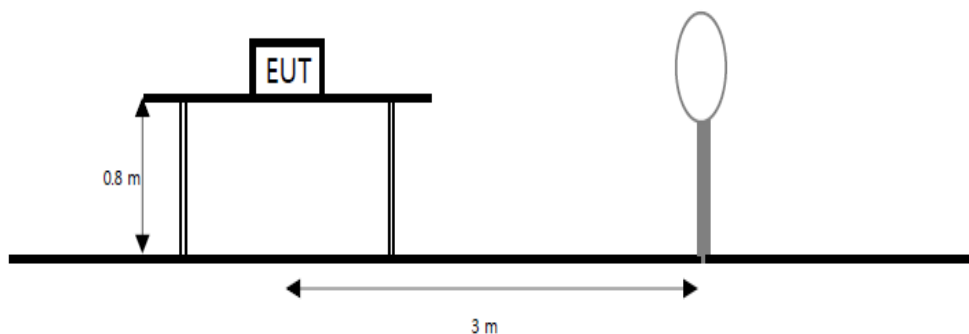
UNII-3 / 802.11ac VHT80



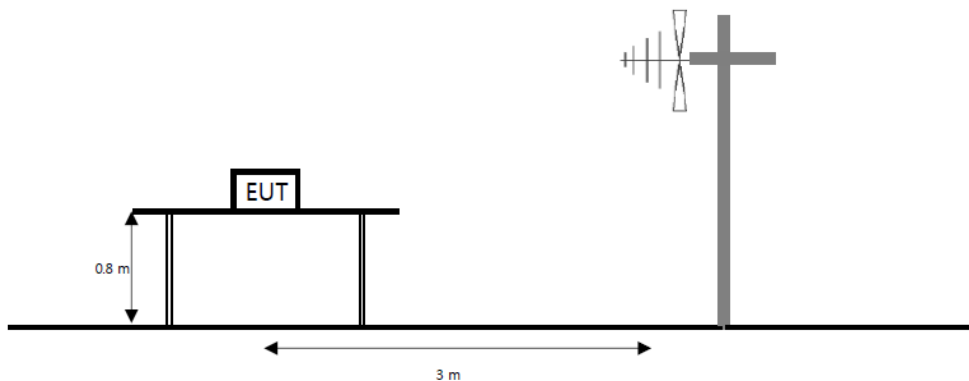
8.6. Spurious Emission, Band Edge and Restricted bands

Test setup

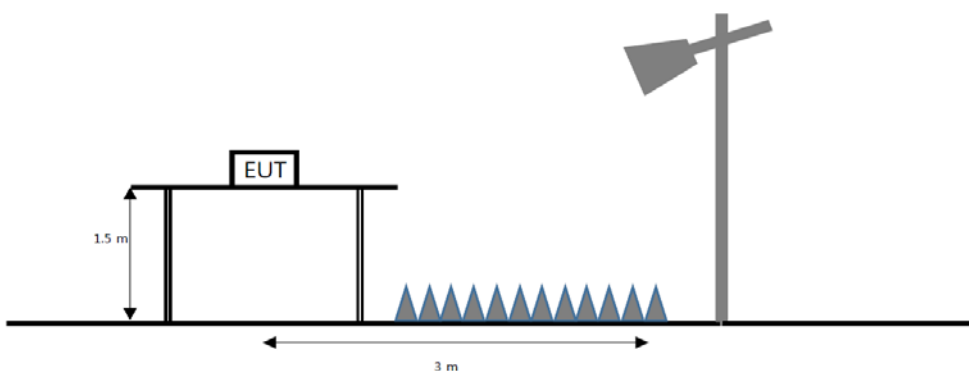
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz emissions, whichever is lower.



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**Limit****FCC**

According to section 15.209(a) except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field strength ($\mu\text{V}/\text{m}$) | Measurement distance (m) |
|-----------------|---|--------------------------|
| 0.009 - 0.490 | 2 400/F(kHz) | 300 |
| 0.490 - 1.705 | 24 000/F(kHz) | 30 |
| 1.705 - 30 | 30 | 30 |
| 30 - 88 | 100** | 3 |
| 88 - 216 | 150** | 3 |
| 216 - 960 | 200** | 3 |
| Above 960 | 500 | 3 |

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., Section 15.231 and 15.241.

According to section 15.205(a) and (b) only spurious emissions are permitted in any of the frequency bands listed below:

| MHz | MHz | MHz | GHz |
|-----------------------|-----------------------|-------------------|---------------|
| 0.009 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| 0.495 - 0.505 | 16.694 75 - 16.695 25 | 608 - 614 | 5.35 - 5.46 |
| 2.173 5 - 2.190 5 | 16.804 25 - 16.804 75 | 960 - 1 240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1 300 - 1 427 | 8.025 - 8.5 |
| 4.177 25 - 4.177 75 | 37.5 - 38.25 | 1 435 - 1 626.5 | 9.0 - 9.2 |
| 4.207 25 - 4.207 75 | 73 - 74.6 | 1 645.5 - 1 646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1 660 - 1 710 | 10.6 - 12.7 |
| 6.267 75 - 6.268 25 | 108 - 121.94 | 1 718.8 - 1 722.2 | 13.25 - 13.4 |
| 6.311 75 - 6.312 25 | 123 - 138 | 2 200 - 2 300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2 310 - 2 390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.524 75 - 156.525 | 2 483.5 - 2 500 | 17.7 - 21.4 |
| 8.376 25 - 8.386 75 | 25 | 2 690 - 2 900 | 22.01 - 23.12 |
| 8.414 25 - 8.414 75 | 156.7 - 156.9 | 3 260 - 3 267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 162.012 5 - 167.17 | 3 332 - 3 339 | 31.2 - 31.8 |
| 12.519 75 - 12.520 25 | 167.72 - 173.2 | 3 345.8 - 3 358 | 36.43 - 36.5 |
| 12.576 75 - 12.577 25 | 240 - 285 | 3 600 - 4 400 | Above 38.6 |
| 13.36 - 13.41 | 322 - 335.4 | | |

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in section 15.209. At frequencies equal to or less than 1 000 MHz, compliance with the limits in section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1 000 MHz, compliance with the emission limits in section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in section 15.35 apply to these measurements.

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According to section 15.407(b), undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

IC

According to RSS-247(5.5), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

According to RSS-Gen(8.9), Except where otherwise indicated in the applicable RSS, radiated emissions shall comply with the field strength limits shown in table 5 and table 6. Additionally, the level of any transmitter unwanted emission shall not exceed the level of the transmitter's fundamental emission.

Table 5- General field strength limits at frequencies above 30 MHz

| Frequency(MHz) | Field strength ($\mu\text{V}/\text{m}$ at 3 m) |
|----------------|--|
| 30 to 88 | 100 |
| 88 to 216 | 150 |
| 216 to 960 | 200 |
| Above 960 | 500 |

Table 6- General field strength limits at frequencies below 30 MHz

| Frequency | Magnetic field strength (H-Field) ($\mu\text{A}/\text{m}$) | Measurement distance(m) |
|---------------------------|---|----------------------------|
| 9 – 490 kHz ¹⁾ | 6.37/F (F in kHz) | 300 |
| 490 – 1705 kHz | 63.7/F (F in kHz) | 30 |
| 1.705 - 30 MHz | 0.08 | 30 |

According to RSS-Gen(8.10), Restricted frequency bands, identified in table 7, are designated primarily for safety-of-life services (distress calling and certain aeronautical activities), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following conditions related to the restricted frequency bands apply:

- The transmit frequency, including fundamental components of modulation, of licence-exempt radio apparatus shall not fall within the restricted frequency bands listed in table 7 except for apparatus compliant with RSS-287, Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD).
- Unwanted emissions that fall into restricted frequency bands listed in table 7 shall comply with the limits specified in table 5 and table 6.
- Unwanted emissions that do not fall within the restricted frequency bands listed in table 7 shall comply either with the limits specified in the applicable RSS or with those specified in table 5 and table 6.

Table 7- Restricted frequency bands*

| MHz | MHz | GHz |
|---------------------|-----------------------|---------------|
| 0.090 - 0.110 | 149.9 - 150.05 | 9.0 - 9.2 |
| 0.495 - 0.505 | 156.52475 - 156.52525 | 9.3 - 9.5 |
| 2.1735 - 2.1905 | 156.7 - 156.9 | 10.6 - 12.7 |
| 3.020 - 3.026 | 162.0125 - 167.17 | 13.25 - 13.4 |
| 4.125 - 4.128 | 167.72 - 173.2 | 14.47 - 14.5 |
| 4.17725 - 4.17775 | 240 - 285 | 15.35 - 16.2 |
| 4.20725 - 4.20775 | 322 - 335.4 | 17.7 - 21.4 |
| 5.677 - 5.683 | 399.9 - 410 | 22.01 - 23.12 |
| 6.215 - 6.218 | 608 - 614 | 23.6 - 24.0 |
| 6.26775 - 6.26825 | 960 - 1427 | 31.2 - 31.8 |
| 6.31175 - 6.31225 | 1435 - 1626.5 | 36.43 - 36.5 |
| 8.291 - 8.294 | 1645.5 - 1646.5 | Above 38.6 |
| 8.362 - 8.366 | 1660 - 1710 | |
| 8.37625 - 8.38675 | 1718.8 - 1722.2 | |
| 8.41425 - 8.41475 | 2200 - 2300 | |
| 12.29 - 12.293 | 2310 - 2390 | |
| 12.51975 - 12.52025 | 2483.5 - 2500 | |
| 12.57675 - 12.57725 | 2655 - 2900 | |
| 13.36 - 13.41 | 3260 - 3267 | |
| 16.42 - 16.423 | 3332 - 3339 | |
| 16.69475 - 16.69525 | 3345.8 - 3358 | |
| 16.80425 - 16.80475 | 3500 - 4400 | |
| 25.5 - 25.67 | 4500 - 5150 | |
| 37.5 - 38.25 | 5350 - 5460 | |
| 73 - 74.6 | 7250 - 7750 | |
| 74.8 - 75.2 | 8025 - 8500 | |
| 108 - 138 | -- | |

* Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

Test procedureANSI C63.10-2013 Section 12.7.7.2, 12.7.5, 12.7.6
KDB 789033 D02 v02r01 – Section G**Test settings****Peak field strength measurements**

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in table
3. VBW \geq (3 \times RBW)
4. Detector = peak
5. Sweep time = auto
6. Trace mode = max hold
7. Allow sweeps to continue until the trace stabilizes

Table. RBW as a function of frequency

| Frequency | RBW |
|---------------------|--------------------|
| 9 kHz to 150 kHz | 200 Hz to 300 Hz |
| 0.15 MHz to 30 MHz | 9 kHz to 10 kHz |
| 30 MHz to 1 000 MHz | 100 kHz to 120 kHz |
| > 1 000 MHz | 1 MHz |

Average field strength measurements**Trace averaging with continuous EUT transmission at full power**

If the EUT can be configured or modified to transmit continuously ($D \geq 98\%$), then the average emission levels shall be measured using the following method (with EUT transmitting continuously):

1. RBW = 1 MHz (unless otherwise specified).
2. VBW \geq (3 \times RBW).
3. Detector = RMS (power averaging), if $[\text{span} / (\# \text{ of points in sweep})] \leq (\text{RBW} / 2)$. Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
4. Averaging type = power (i.e., rms):
 - 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
 - 2) Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.
5. Sweep time = auto.
6. Perform a trace average of at least 100 traces.

Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction

If continuous transmission of the EUT ($D \geq 98\%$) cannot be achieved and the duty cycle is constant (duty cycle variations are less than $\pm 2\%$), then the following procedure shall be used:

1. The EUT shall be configured to operate at the maximum achievable duty cycle.
2. Measure the duty cycle D of the transmitter output signal as described in 11.6.
3. RBW = 1 MHz (unless otherwise specified).
4. VBW \geq [3 \times RBW].
5. Detector = RMS (power averaging), if $[\text{span} / (\# \text{ of points in sweep})] \leq (\text{RBW} / 2)$. Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.

6. Averaging type = power (i.e., rms):
 - 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
 - 2) Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.
7. Sweep time = auto.
8. Perform a trace average of at least 100 traces.
9. A correction factor shall be added to the measurement results prior to comparing with the emission limit to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
 - 1) If power averaging (rms) mode was used in step f), then the applicable correction factor is $[10 \log (1 / D)]$, where D is the duty cycle.
 - 2) If linear voltage averaging mode was used in step f), then the applicable correction factor is $[20 \log (1 / D)]$, where D is the duty cycle.
 - 3) If a specific emission is demonstrated to be continuous ($D \geq 98\%$) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Notes:

1. $f < 30$ MHz, extrapolation factor of 40 dB/decade of distance. $F_d = 40 \log(D_m/D_s)$
 $f \geq 30$ MHz, extrapolation factor of 20 dB/decade of distance. $F_d = 20 \log(D_m/D_s)$
Where:
 - F_d = Distance factor in dB
 - D_m = Measurement distance in meters
 - D_s = Specification distance in meters
2. Factors(dB) = Antenna factor(dB/m) + Cable loss(dB) + or Amp. gain(dB) + or F_d (dB)
3. The worst-case emissions are reported however emissions whose levels were not within 20 dB of respective limits were not reported.
4. Average test would be performed if the peak result were greater than the average limit.
5. ¹⁾ means restricted band.
6. According to part 15.31(f)(2), an extrapolation factor of 40 dB/decade is applied because measured distance of radiated emission is 3m
7. Below 30 MHz frequency range, In order to search for the worst result, all orientations about parallel, perpendicular, and ground-parallel were investigated then reported. when the emission level was higher than 20 dB of the limit, then the following statement shall be made: "No spurious emissions were detected within 20 dB of the limit."
8. For above 1 GHz pre-scan to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 kHz for peak measurements.
9. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X kHz resulted in a level of Y dBμV/m, which is equivalent to $Y - 51.5 = Z$ dBμA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

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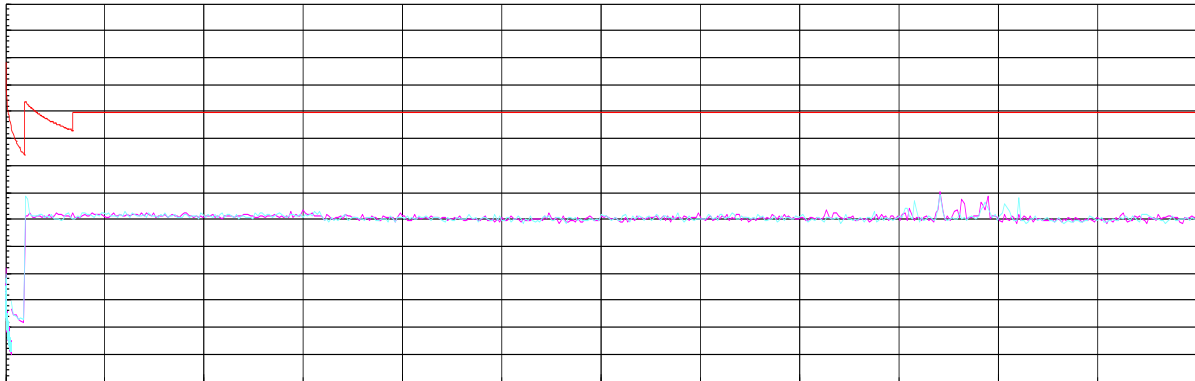
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Test results (Below 30 MHz) – Worst case: 802.11n HT 20 2TX MIMO / UNII-2C 5 700 MHz

| Frequency | Pol. | Reading | Ant. Factor | Amp. +Cable | Distance Factor | DCF | Result | Limit | Margin |
|-----------|-------|----------|-------------|-------------|-----------------|------|------------|------------|--------|
| [MHz] | [V/H] | [dB(μV)] | [dB] | [dB] | [dB] | [dB] | [dB(μV/m)] | [dB(μV/m)] | [dB] |

No spurious emissions were detected within 20 dB of the limit.

Horizontal/Vertical


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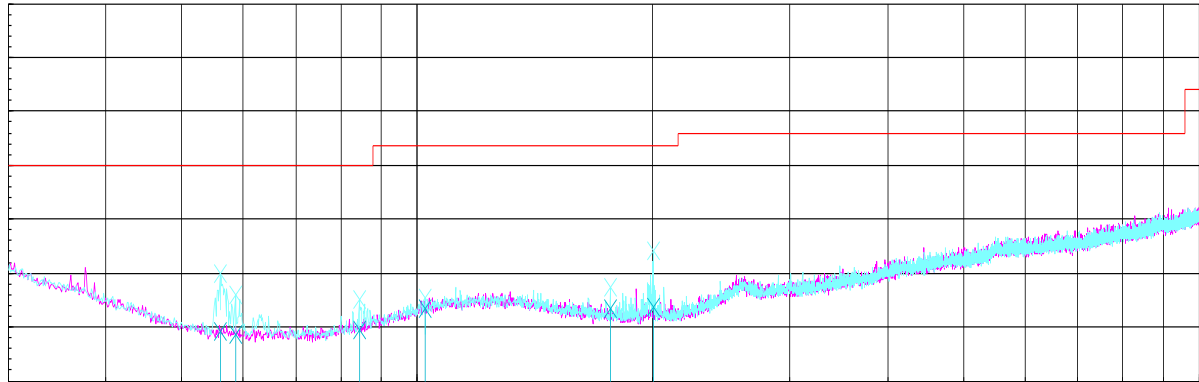
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Test results (Below 1 000 MHz) – Worst case: 802.11n HT 20 2TX MIMO / UNII-2C 5 700 MHz

| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ V/m)) | Limit (dB(μ V/m)) | Margin (dB) |
|------------------------|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Quasi peak data | | | | | | | | |
| 56.07 | V | 26.30 | 12.49 | -29.72 | - | 9.07 | 40.00 | 30.93 |
| 58.62 | V | 26.00 | 12.34 | -29.66 | - | 8.68 | 40.00 | 31.32 |
| 84.44 | V | 24.90 | 13.64 | -29.08 | - | 9.46 | 40.00 | 30.54 |
| 102.51 | V | 25.30 | 16.85 | -28.71 | - | 13.44 | 43.50 | 30.06 |
| 176.71 | V | 25.70 | 15.13 | -27.44 | - | 13.39 | 43.50 | 30.11 |
| 200.96 | V | 25.50 | 15.22 | -27.16 | - | 13.56 | 43.50 | 29.94 |

Horizontal/Vertical



Test results (Above 1 000 MHz)

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Lowest Channel (5 180 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 149.41 ¹⁾ | H | 42.27 | 34.17 | -26.51 | - | 49.93 | 74.00 | 24.07 |
| 10 397.78 | V | 59.09 | 37.60 | -49.73 | - | 46.96 | 68.20 | 21.24 |
| 16 853.59 | V | 56.85 | 41.28 | -46.87 | - | 51.26 | 68.20 | 16.94 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Middle Channel (5 200 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 10 449.53 | H | 58.87 | 37.65 | -49.76 | - | 46.76 | 68.20 | 21.44 |
| 14 921.23 | H | 54.50 | 41.06 | -41.99 | - | 53.57 | 68.20 | 14.63 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Highest Channel (5 240 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|------------------------|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 033.97 ¹⁾ | H | 72.52 | 28.81 | -49.08 | - | 52.25 | 74.00 | 21.75 |
| 10 482.95 | V | 58.82 | 37.68 | -49.77 | - | 46.73 | 68.20 | 21.47 |
| 14 935.97 | V | 54.16 | 41.08 | -41.84 | - | 53.40 | 68.20 | 14.80 |
| Average Data | | | | | | | | |
| 1 033.97 ¹⁾ | H | 67.72 | 28.81 | -49.08 | 0.28 | 47.73 | 54.00 | 6.27 |

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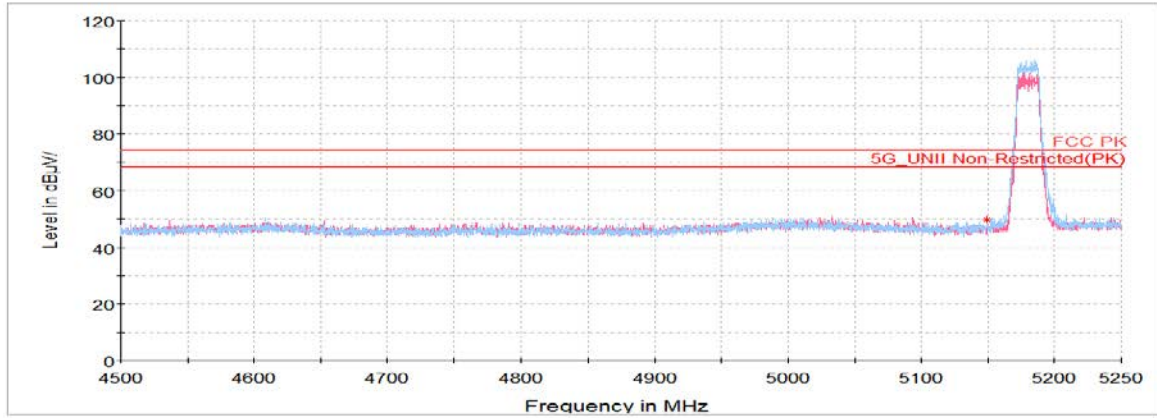
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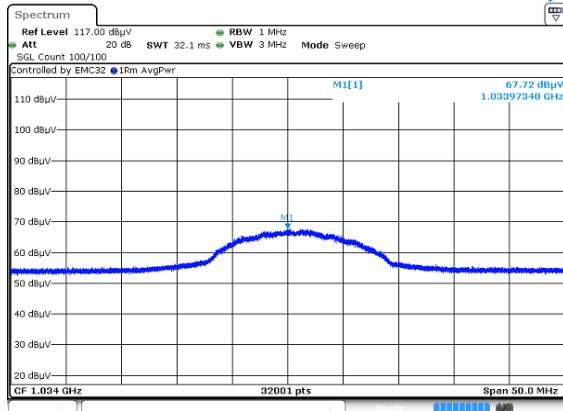
Lowest Channel (5 180 MHz)

Horizontal/Vertical for Band-edge



Highest Channel (5 240 MHz)

Average data



Blank

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**802.11a UNII-1 ANT2****Lowest Channel (5 180 MHz)**

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 081.00 ¹⁾ | H | 42.69 | 34.05 | -26.37 | - | 50.37 | 74.00 | 23.63 |
| 10 329.86 | H | 57.69 | 37.53 | -49.70 | - | 45.52 | 68.20 | 22.68 |
| 15 508.09 ¹⁾ | V | 54.53 | 40.00 | -45.52 | - | 49.01 | 74.00 | 24.99 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Middle Channel (5 200 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|---|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 10 396.70 | V | 57.70 | 37.60 | -49.73 | - | 45.57 | 68.20 | 22.63 |
| 15 600.09 | V | 54.50 | 39.96 | -45.59 | - | 48.87 | 74.00 | 25.13 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit | | | | | | | | |

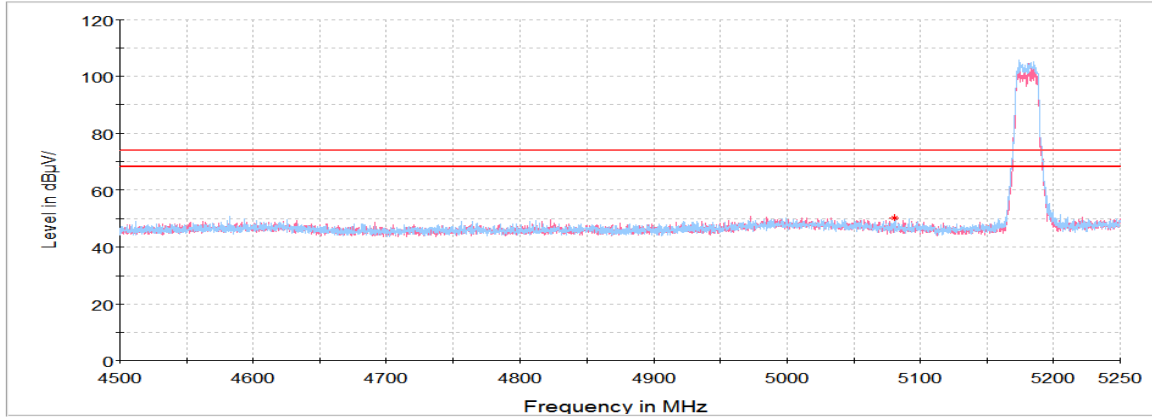
Highest Channel (5 240 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 035.70 ¹⁾ | H | 72.47 | 28.81 | -49.08 | - | 52.20 | 74.00 | 21.80 |
| 10 485.11 | V | 56.89 | 37.69 | -49.78 | - | 44.80 | 68.20 | 23.40 |
| 15 724.44 ¹⁾ | V | 54.08 | 39.91 | -45.68 | - | 48.31 | 74.00 | 25.69 |
| Average Data | | | | | | | | |
| 1 035.70 ¹⁾ | H | 65.11 | 28.81 | -49.08 | 0.21 | 45.05 | 54.00 | 8.95 |

802.11a UNII-1 ANT2

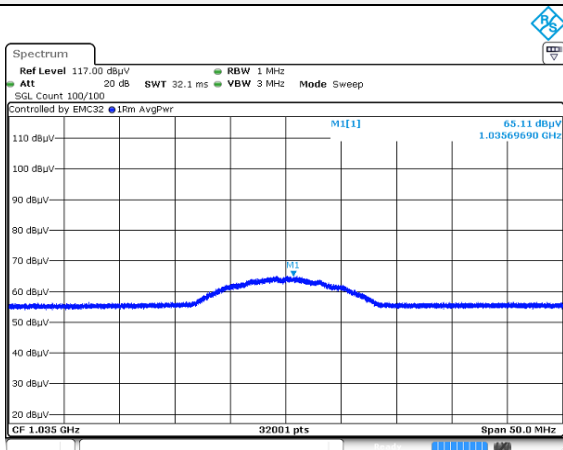
Lowest Channel (5 180 MHz)

Horizontal/Vertical for Band-edge



Highest Channel (5 240 MHz)

Average data



Blank

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Report No.:
KR21-SRF0159

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**802.11a UNII-1 2TX MIMO****Lowest Channel (5 180 MHz)**

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 066.73 ¹⁾ | H | 42.12 | 34.02 | -26.04 | - | 50.10 | 74.00 | 23.90 |
| 10 389.16 | H | 57.82 | 37.59 | -49.73 | - | 45.68 | 68.20 | 22.52 |
| 15 585.00 ¹⁾ | H | 55.87 | 39.97 | -45.57 | - | 50.27 | 74.00 | 23.73 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Middle Channel (5 200 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|---|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 10 400.30 | H | 57.00 | 37.60 | -49.73 | - | 44.87 | 68.20 | 23.33 |
| 15 618.42 ¹⁾ | H | 54.44 | 39.95 | -45.60 | - | 48.79 | 74.00 | 25.21 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit | | | | | | | | |

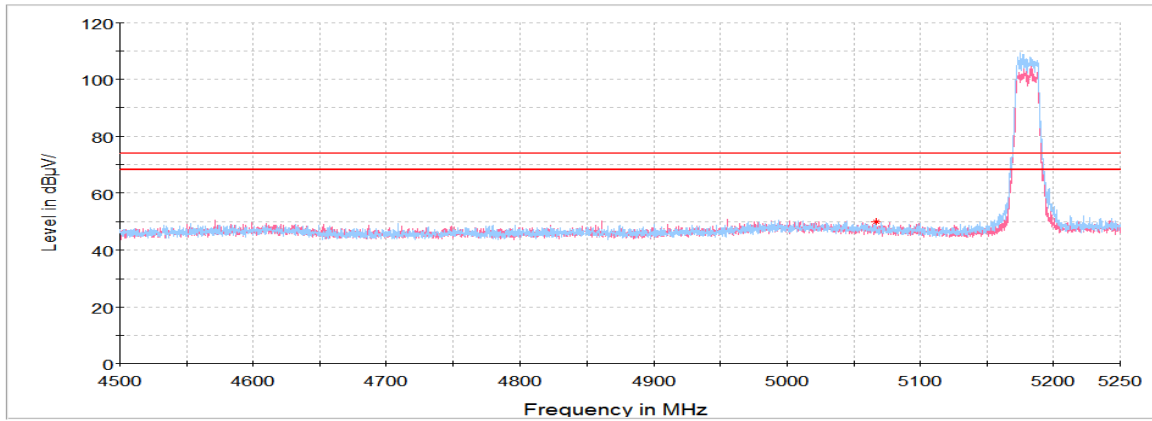
Highest Channel (5 240 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 034.23 ¹⁾ | H | 73.00 | 28.81 | -49.08 | - | 52.73 | 74.00 | 21.27 |
| 10 492.66 | V | 56.50 | 37.69 | -49.78 | - | 44.41 | 68.20 | 23.79 |
| 15 721.20 ¹⁾ | H | 54.75 | 39.91 | -45.67 | - | 48.99 | 74.00 | 25.01 |
| Average Data | | | | | | | | |
| 1 034.23 ¹⁾ | H | 67.31 | 28.81 | -49.08 | 0.28 | 47.32 | 54.00 | 6.68 |

802.11a UNII-1 2TX MIMO

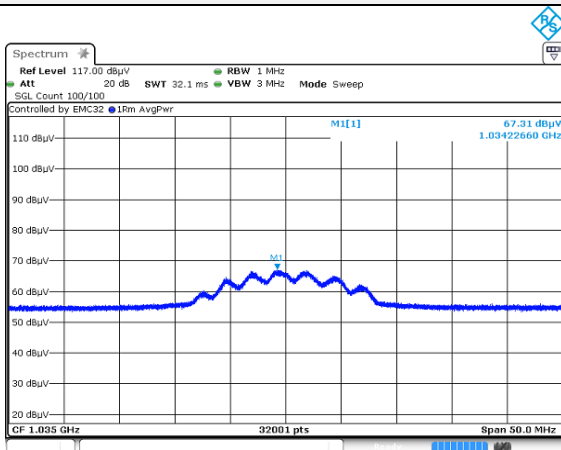
Lowest Channel (5 180 MHz)

Horizontal/Vertical for Band-edge



Highest Channel (5 240 MHz)

Average data



Blank

802.11 HT20 UNII-1 ANT1

Lowest Channel (5 180 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 103.00 ¹⁾ | H | 43.26 | 34.09 | -26.79 | - | 50.56 | 74.00 | 23.44 |
| 10 276.31 | H | 58.94 | 37.48 | -49.67 | - | 46.75 | 68.20 | 21.45 |
| 14 907.22 | V | 55.54 | 41.03 | -42.13 | - | 54.44 | 68.20 | 13.76 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Middle Channel (5 200 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|---|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 10 458.52 | V | 57.93 | 37.66 | -49.76 | - | 45.83 | 68.20 | 22.37 |
| 14 902.19 | H | 54.43 | 41.02 | -42.19 | - | 53.26 | 68.20 | 14.94 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit | | | | | | | | |

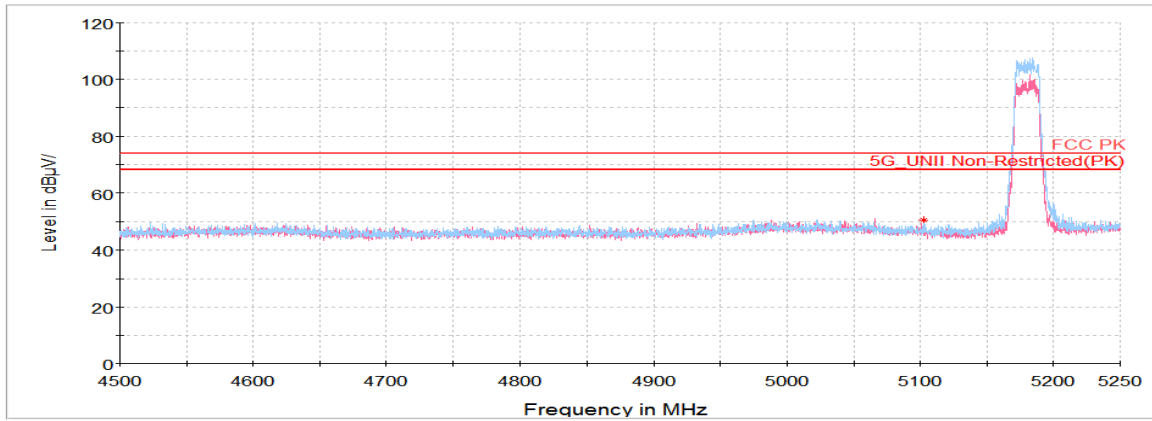
Highest Channel (5 240 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 034.57 ¹⁾ | H | 73.57 | 28.81 | -49.07 | - | 53.31 | 74.00 | 20.69 |
| 10 609.09 ¹⁾ | V | 58.93 | 37.81 | -49.65 | - | 47.09 | 74.00 | 26.91 |
| 14 905.06 | H | 55.33 | 41.03 | -42.16 | - | 54.20 | 68.20 | 14.00 |
| Average Data | | | | | | | | |
| 1 034.57 ¹⁾ | H | 67.24 | 28.81 | -49.07 | 0.33 | 47.31 | 54.00 | 6.69 |

802.11 HT20 UNII-1 ANT1

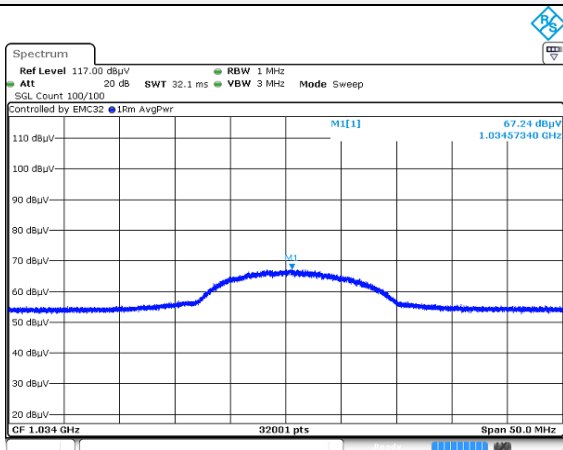
Lowest Channel (5 180 MHz)

Horizontal/Vertical for Band-edge



Highest Channel (5 240 MHz)

Average data



Blank

802.11 HT20 UNII-1 ANT2

Lowest Channel (5 180 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 149.90 ¹⁾ | H | 48.36 | 34.17 | -26.51 | - | 56.02 | 74.00 | 17.98 |
| 10 321.95 | V | 57.82 | 37.52 | -49.69 | - | 45.65 | 68.20 | 22.55 |
| 15 379.44 ¹⁾ | H | 54.42 | 40.12 | -44.47 | - | 50.07 | 74.00 | 23.93 |
| Average Data | | | | | | | | |
| 5 149.90 ¹⁾ | H | 36.12 | 34.17 | -26.51 | 0.33 | 44.11 | 54.00 | 9.89 |

Middle Channel (5 200 MHz)

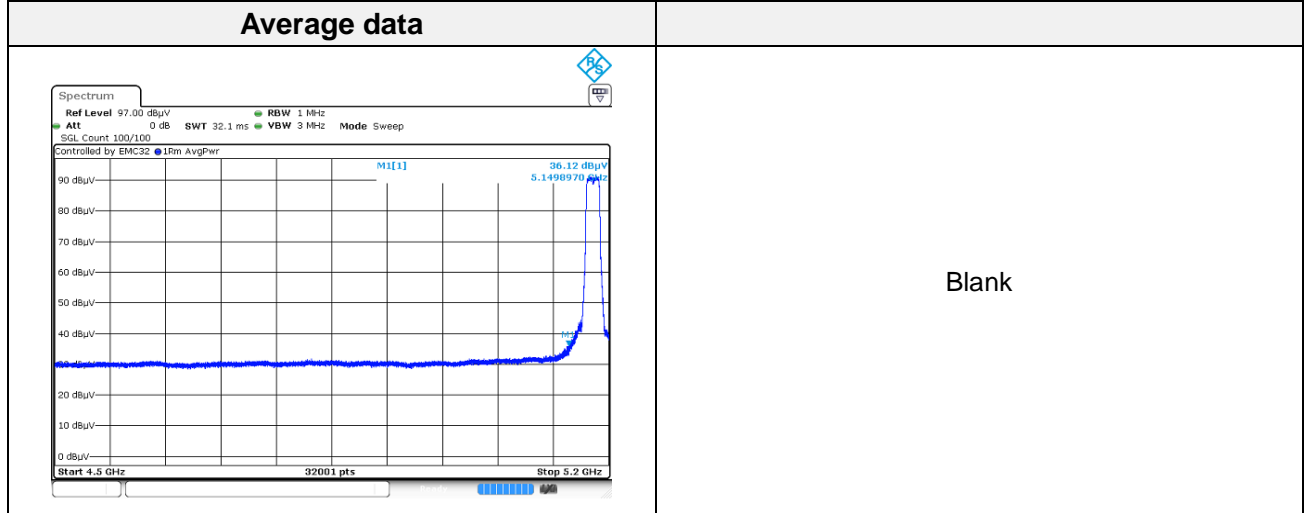
| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|---|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 10 398.50 | V | 58.46 | 37.60 | -49.73 | - | 46.33 | 68.20 | 21.87 |
| 15 606.92 ¹⁾ | V | 54.90 | 39.96 | -45.59 | - | 49.27 | 74.00 | 24.73 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit | | | | | | | | |

Highest Channel (5 240 MHz)

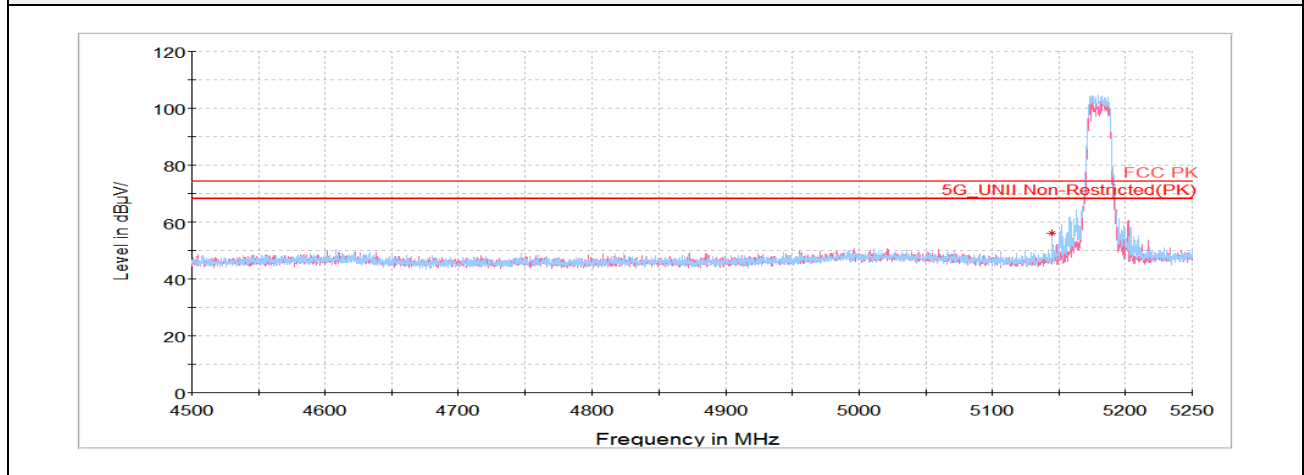
| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 035.34 ¹⁾ | H | 71.43 | 28.81 | -49.08 | - | 51.16 | 74.00 | 22.84 |
| 10 479.00 | V | 57.05 | 37.68 | -49.77 | - | 44.96 | 68.20 | 23.24 |
| 15 720.84 ¹⁾ | V | 55.39 | 39.91 | -45.67 | - | 49.63 | 74.00 | 24.37 |
| Average Data | | | | | | | | |
| 1 035.34 ¹⁾ | H | 64.91 | 28.81 | -49.08 | 0.33 | 44.97 | 54.00 | 9.03 |

802.11 HT20 UNII-1 ANT2

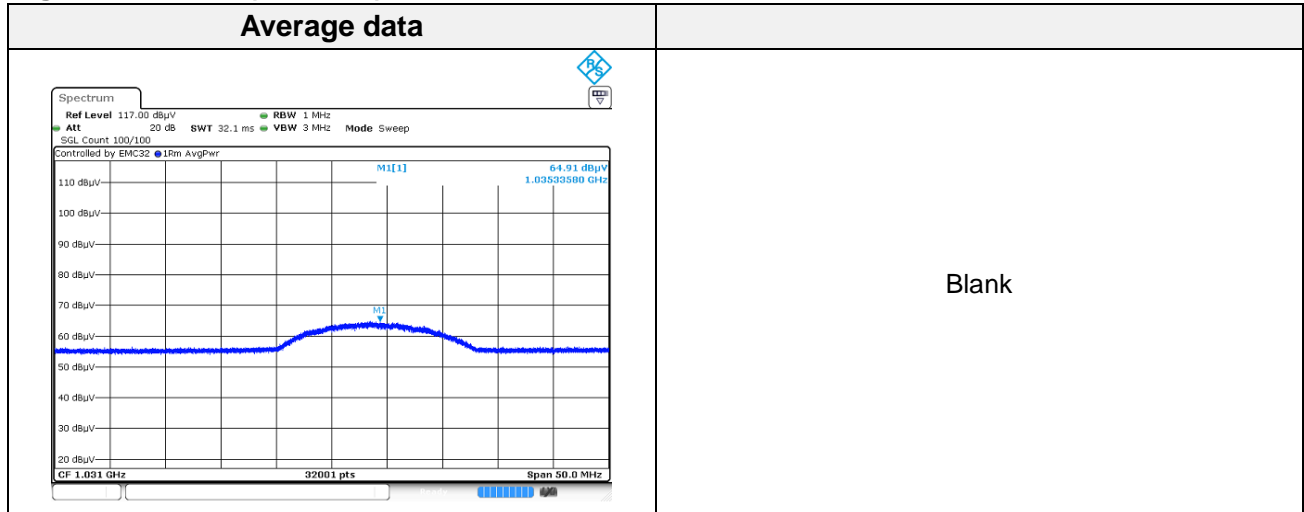
Lowest Channel (5 180 MHz)



Horizontal/Vertical for Band-edge



Highest Channel (5 240 MHz)



802.11 HT20 UNII-1 2TX MIMO

Lowest Channel (5 180 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 147.12 ¹⁾ | H | 47.16 | 34.16 | -26.53 | - | 54.79 | 74.00 | 19.21 |
| 10 361.84 | V | 56.45 | 37.56 | -49.71 | - | 44.30 | 68.20 | 23.90 |
| 15 568.83 ¹⁾ | H | 54.56 | 39.97 | -45.56 | - | 48.97 | 74.00 | 25.03 |
| Average Data | | | | | | | | |
| 5 147.12 ¹⁾ | H | 35.27 | 34.16 | -26.53 | 0.61 | 43.51 | 54.00 | 10.49 |

Middle Channel (5 200 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|---|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 10 405.33 | H | 57.66 | 37.61 | -49.73 | - | 45.54 | 68.20 | 22.66 |
| 15 596.50 ¹⁾ | H | 52.80 | 39.96 | -45.58 | - | 47.18 | 74.00 | 26.82 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit | | | | | | | | |

Highest Channel (5 240 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 034.96 ¹⁾ | H | 72.83 | 28.81 | -49.08 | - | 52.56 | 74.00 | 21.44 |
| 10 482.23 | V | 57.00 | 37.68 | -49.77 | - | 44.91 | 68.20 | 23.29 |
| 15 722.64 ¹⁾ | V | 56.06 | 39.91 | -45.67 | - | 50.30 | 74.00 | 23.70 |
| Average Data | | | | | | | | |
| 1 034.96 ¹⁾ | H | 67.93 | 28.81 | -49.08 | 0.61 | 48.27 | 54.00 | 5.73 |

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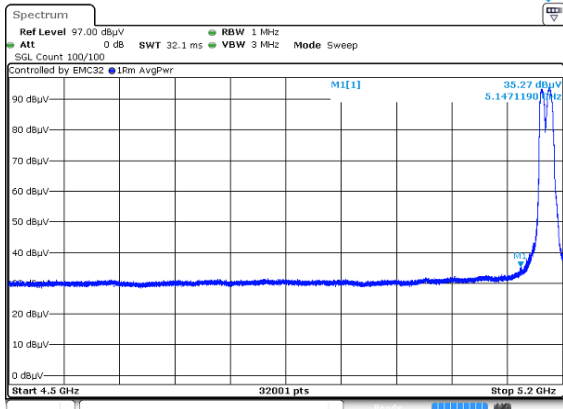
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802.11 HT20 UNII-1 2TX MIMO

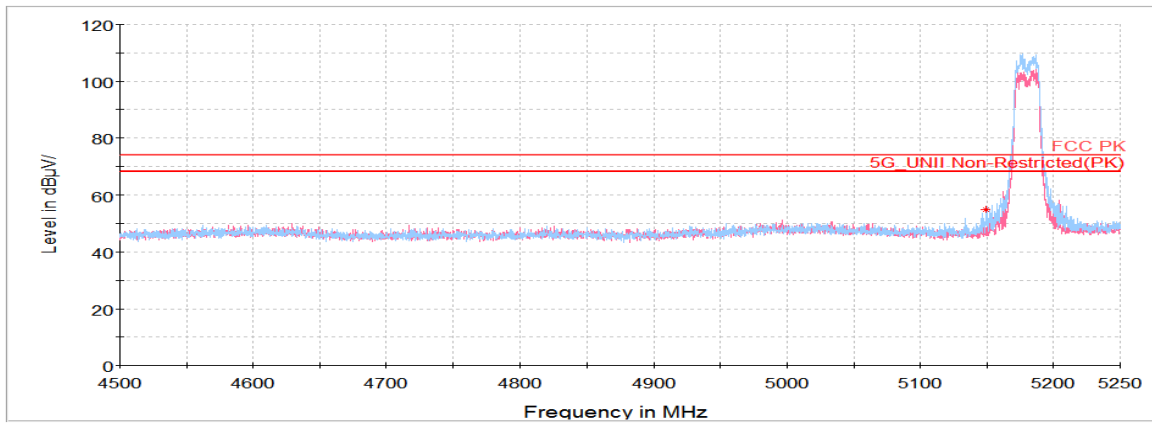
Lowest Channel (5 180 MHz)

Average data



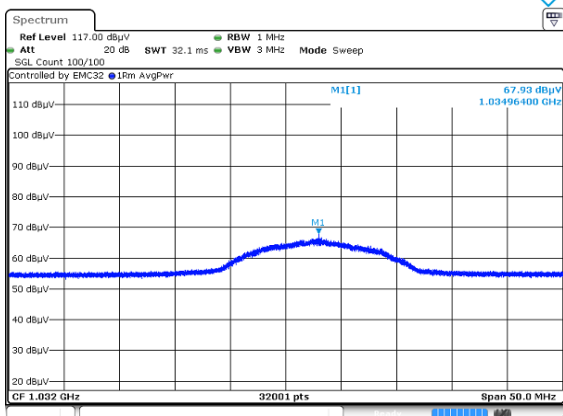
Blank

Horizontal/Vertical for Band-edge



Highest Channel (5 240 MHz)

Average data



Blank

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802.11 HT40 UNII-1 ANT1

Lowest Channel (5 190 MHz)

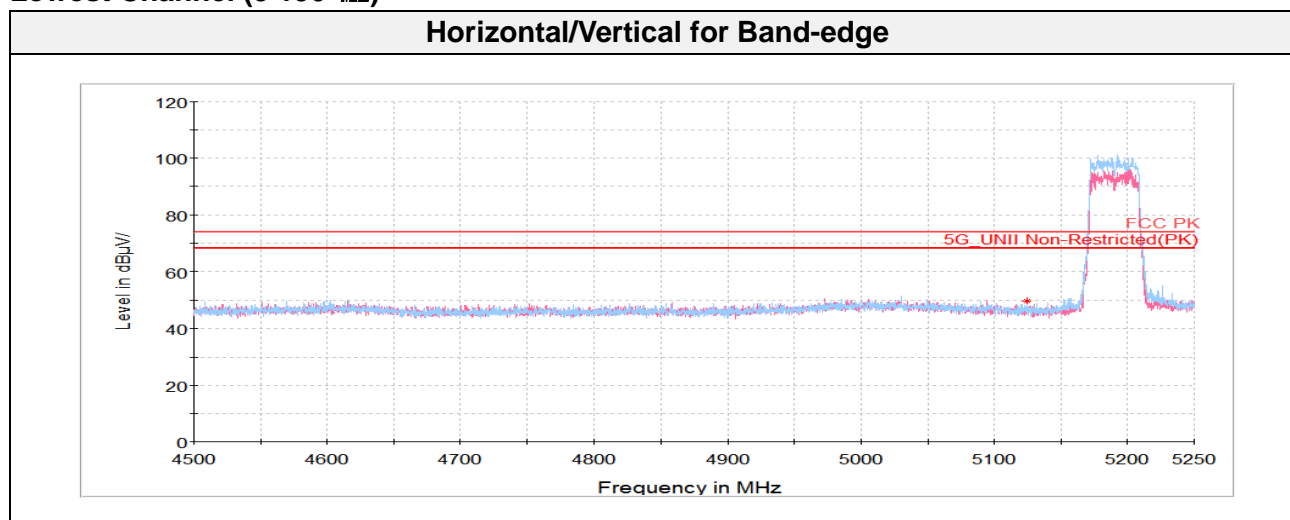
| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ V/m)) | Limit (dB(μ V/m)) | Margin (dB) |
|--|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 5 124.31 ¹⁾ | H | 42.33 | 34.12 | -26.66 | - | 49.79 | 74.00 | 24.21 |
| 10 315.48 | H | 58.87 | 37.52 | -49.69 | - | 46.70 | 68.20 | 21.50 |
| 15 057.44 | V | 54.51 | 40.19 | -41.69 | - | 53.01 | 68.20 | 15.19 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Highest Channel (5 230 MHz)

| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ V/m)) | Limit (dB(μ V/m)) | Margin (dB) |
|--|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 10 497.33 | V | 57.90 | 37.70 | -49.78 | - | 45.82 | 68.20 | 22.38 |
| 14 898.95 | H | 54.26 | 41.02 | -42.22 | - | 53.06 | 68.20 | 15.14 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

802.11 HT40 UNII-1 ANT1

Lowest Channel (5 190 MHz)



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802.11 HT40 UNII-1 ANT2

Lowest Channel (5 190 MHz)

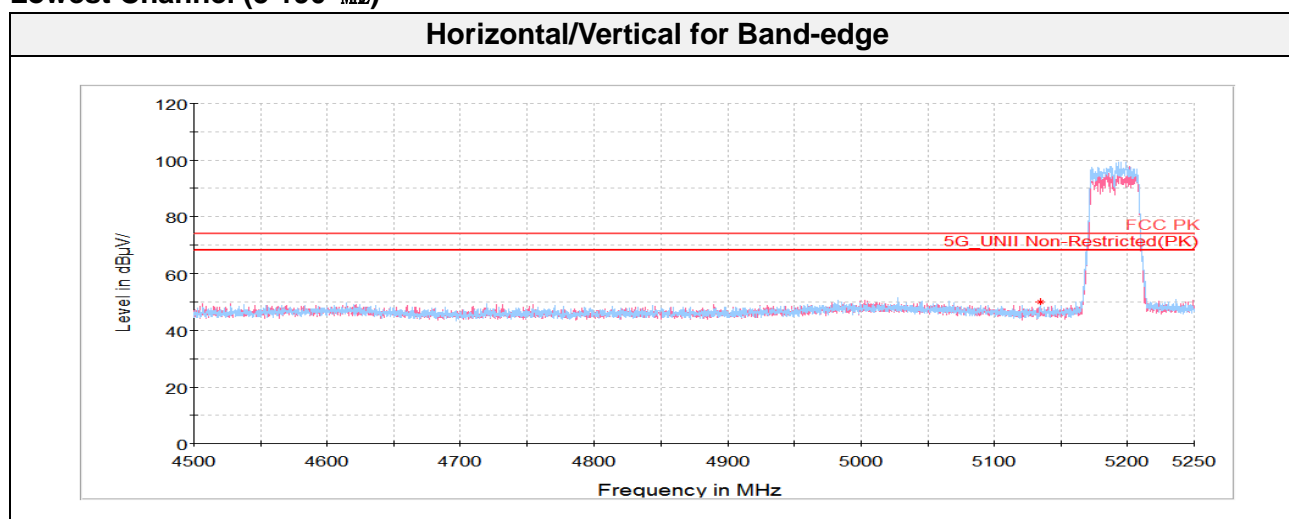
| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ V/m)) | Limit (dB(μ V/m)) | Margin (dB) |
|--|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 5 134.28 ¹⁾ | H | 42.50 | 34.14 | -26.60 | - | 50.04 | 74.00 | 23.96 |
| 10 385.56 | V | 58.17 | 37.59 | -49.72 | - | 46.04 | 68.20 | 22.16 |
| 15 579.97 ¹⁾ | V | 55.38 | 39.97 | -45.57 | - | 49.78 | 74.00 | 24.22 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Highest Channel (5 230 MHz)

| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ V/m)) | Limit (dB(μ V/m)) | Margin (dB) |
|--|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 10 449.53 | H | 58.05 | 37.65 | -49.76 | - | 45.94 | 68.20 | 22.26 |
| 15 715.09 ¹⁾ | V | 55.79 | 39.91 | -45.67 | - | 50.03 | 74.00 | 23.97 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

802.11 HT40 UNII-1 ANT2

Lowest Channel (5 190 MHz)



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802.11 HT40 UNII-1 2TX MIMO

Lowest Channel (5 190 MHz)

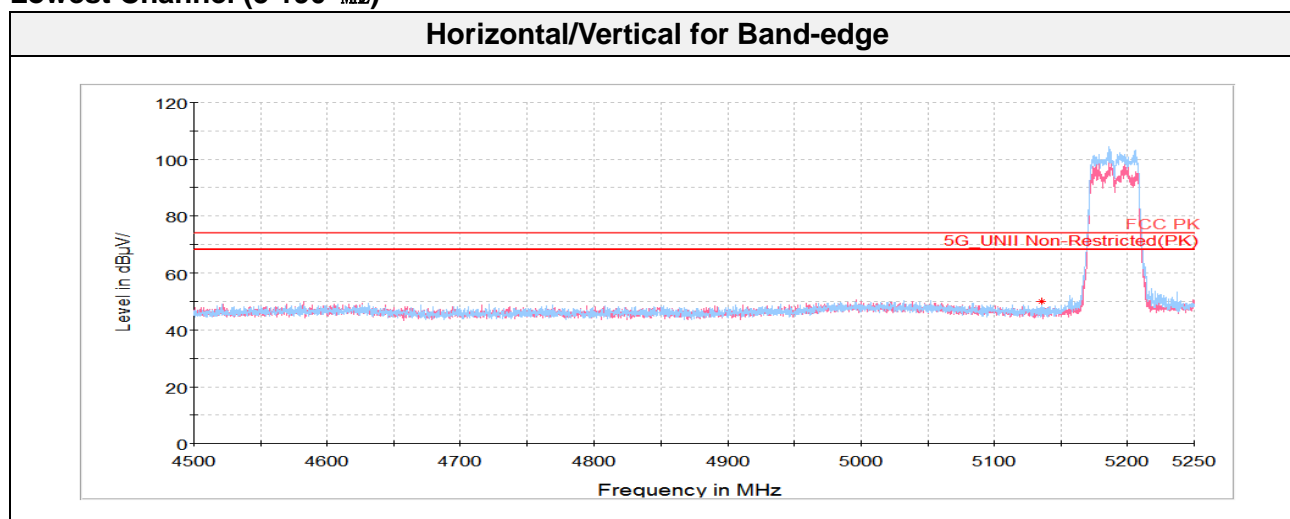
| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ V/m)) | Limit (dB(μ V/m)) | Margin (dB) |
|--|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 5 135.83 ¹⁾ | H | 42.45 | 34.14 | -26.59 | - | 50.00 | 74.00 | 24.00 |
| 10 380.53 | H | 57.21 | 37.58 | -49.72 | - | 45.07 | 68.20 | 23.13 |
| 15 567.39 ¹⁾ | V | 53.83 | 39.97 | -45.56 | - | 48.24 | 74.00 | 25.76 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Highest Channel (5 230 MHz)

| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ V/m)) | Limit (dB(μ V/m)) | Margin (dB) |
|--|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 1 018.91 ¹⁾ | H | 69.11 | 28.80 | -49.09 | - | 48.82 | 74.00 | 25.18 |
| 10 491.94 | V | 58.93 | 37.69 | -49.78 | - | 46.84 | 68.20 | 21.36 |
| 15 712.58 ¹⁾ | V | 55.51 | 39.91 | -45.67 | - | 49.75 | 74.00 | 24.25 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

802.11 HT40 UNII-1 2TX MIMO

Lowest Channel (5 190 MHz)



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**802.11ac VHT20 UNII-1 ANT1****Lowest Channel (5 180 MHz)**

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|---|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 149.75 ¹⁾ | H | 42.48 | 34.17 | -26.51 | - | 50.14 | 74.00 | 23.86 |
| 10 274.52 | H | 59.38 | 37.47 | -49.67 | - | 47.18 | 68.20 | 21.02 |
| 14 908.30 | V | 54.29 | 41.03 | -42.12 | - | 53.20 | 68.20 | 15.00 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit | | | | | | | | |

Middle Channel (5 200 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|---|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 10 456.36 | H | 58.45 | 37.66 | -49.76 | - | 46.35 | 68.20 | 21.85 |
| 15 050.97 | H | 54.24 | 40.19 | -41.64 | - | 52.79 | 68.20 | 15.41 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit | | | | | | | | |

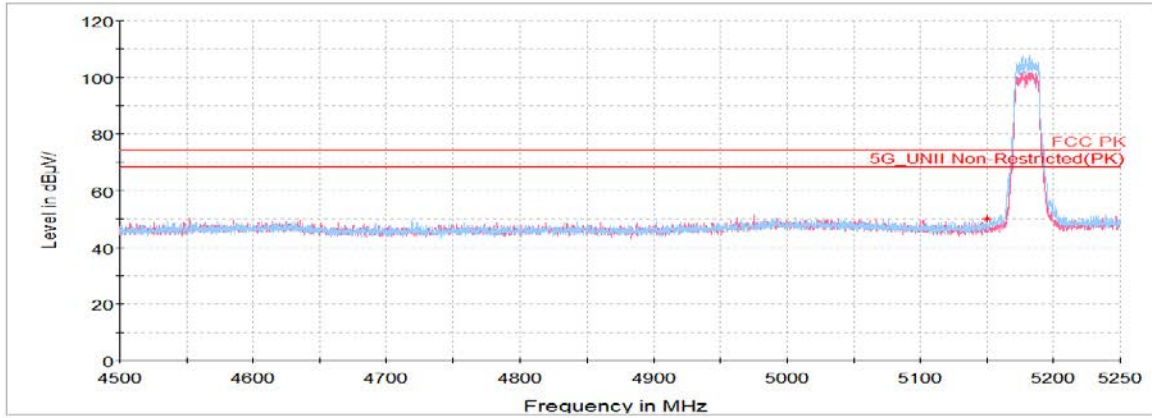
Highest Channel (5 240 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 034.47 ¹⁾ | H | 75.22 | 28.81 | -49.08 | - | 54.95 | 74.00 | 19.05 |
| 10 607.66 ¹⁾ | V | 58.52 | 37.81 | -49.65 | - | 46.68 | 74.00 | 27.32 |
| 14 889.61 | H | 54.67 | 41.00 | -42.31 | - | 53.36 | 68.20 | 14.84 |
| Average Data | | | | | | | | |
| 1 034.47 ¹⁾ | H | 67.41 | 28.81 | -49.08 | 0.32 | 47.46 | 54.00 | 6.54 |

802.11ac VHT20 UNII-1 ANT1

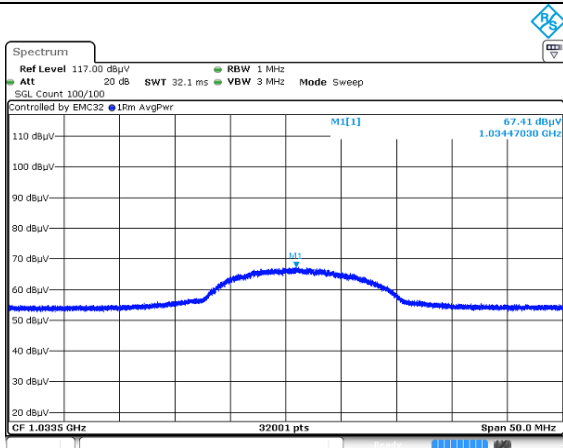
Lowest Channel (5 180 MHz)

Horizontal/Vertical for Band-edge



Highest Channel (5 240 MHz)

Average data



Blank

802.11ac VHT20 UNII-1 ANT2

Lowest Channel (5 180 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|------------------------|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 148.80 ¹⁾ | H | 47.96 | 34.17 | -26.52 | - | 55.61 | 74.00 | 18.39 |
| 10 279.91 | V | 58.33 | 37.48 | -49.67 | - | 46.14 | 68.20 | 22.06 |
| 15 212.69 | H | 55.90 | 40.16 | -43.03 | - | 53.03 | 68.20 | 15.17 |
| Average Data | | | | | | | | |
| 5 148.80 ¹⁾ | H | 33.60 | 34.17 | -26.52 | 0.32 | 41.57 | 54.00 | 12.43 |

Middle Channel (5 200 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|---|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 10 447.02 | H | 58.24 | 37.65 | -49.76 | - | 46.13 | 68.20 | 22.07 |
| 14 900.39 | V | 54.83 | 41.02 | -42.20 | - | 53.65 | 68.20 | 14.55 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit | | | | | | | | |

Highest Channel (5 240 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|------------------------|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 035.58 ¹⁾ | H | 72.10 | 28.81 | -49.08 | - | 51.83 | 74.00 | 22.17 |
| 10 499.84 | H | 58.36 | 37.70 | -49.78 | - | 46.28 | 68.20 | 21.92 |
| 14 897.88 | V | 53.92 | 41.02 | -42.23 | - | 52.71 | 68.20 | 15.49 |
| Average Data | | | | | | | | |
| 1 035.58 ¹⁾ | H | 64.91 | 28.81 | -49.08 | 0.32 | 44.96 | 54.00 | 9.04 |

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Report No.:
KR21-SRF0159

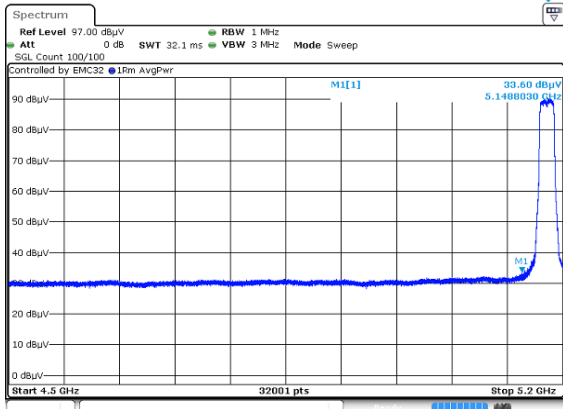
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802.11ac VHT20 UNII-1 ANT2

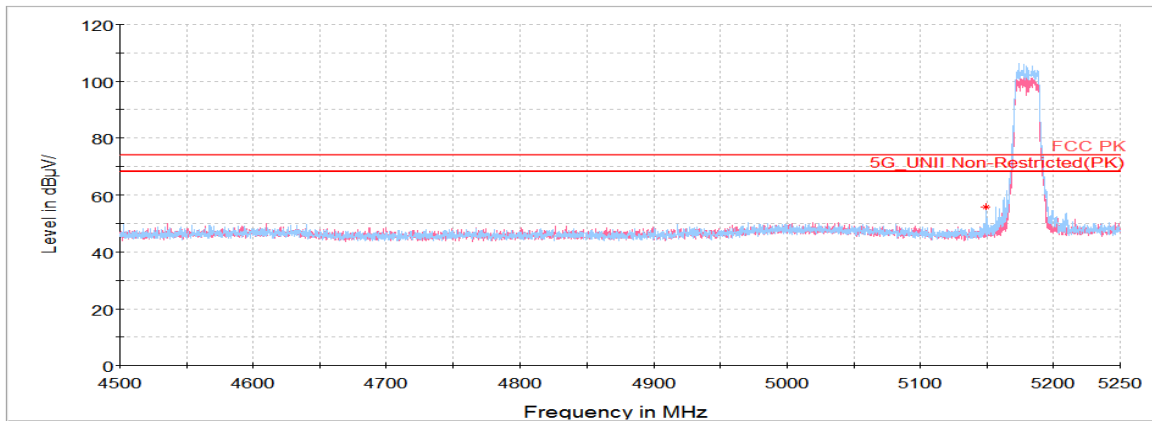
Lowest Channel (5 180 MHz)

Average data



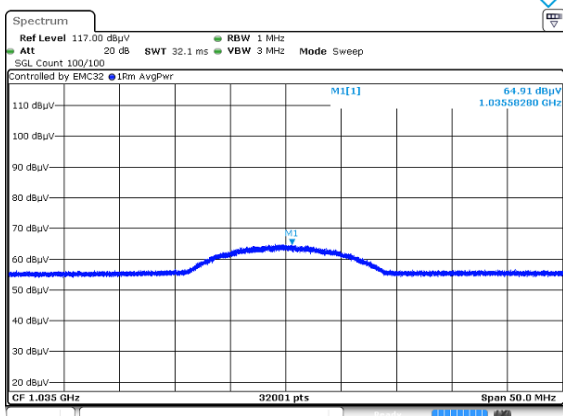
Blank

Horizontal/Vertical for Band-edge



Highest Channel (5 240 MHz)

Average data



Blank

802.11ac VHT20 UNII-1 2TX MIMO

Lowest Channel (5 180 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 149.57 ¹⁾ | H | 43.67 | 34.17 | -26.51 | - | 51.33 | 74.00 | 22.67 |
| 10 358.61 | V | 56.63 | 37.56 | -49.71 | - | 44.48 | 68.20 | 23.72 |
| 15 533.97 ¹⁾ | V | 53.01 | 39.99 | -45.54 | - | 47.46 | 74.00 | 26.54 |
| Average Data | | | | | | | | |
| 5 149.57 ¹⁾ | H | 36.11 | 34.17 | -26.51 | 0.61 | 44.38 | 54.00 | 9.62 |

Middle Channel (5 200 MHz)

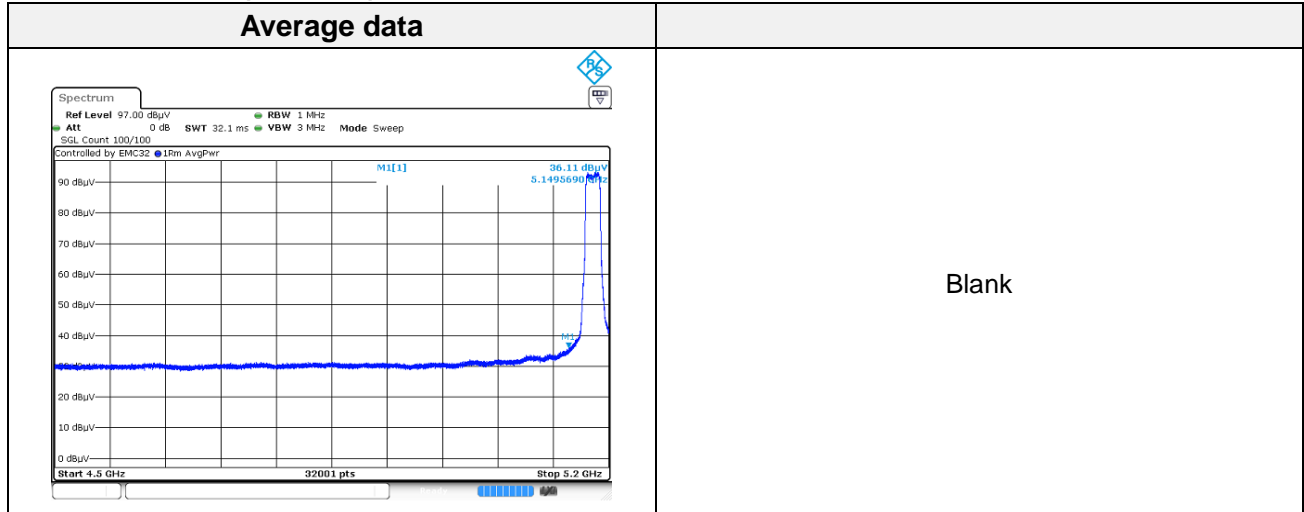
| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|---|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 10 410.36 | H | 57.27 | 37.61 | -49.74 | - | 45.14 | 68.20 | 23.06 |
| 15 613.75 ¹⁾ | V | 54.37 | 39.95 | -45.60 | - | 48.72 | 74.00 | 25.28 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit | | | | | | | | |

Highest Channel (5 240 MHz)

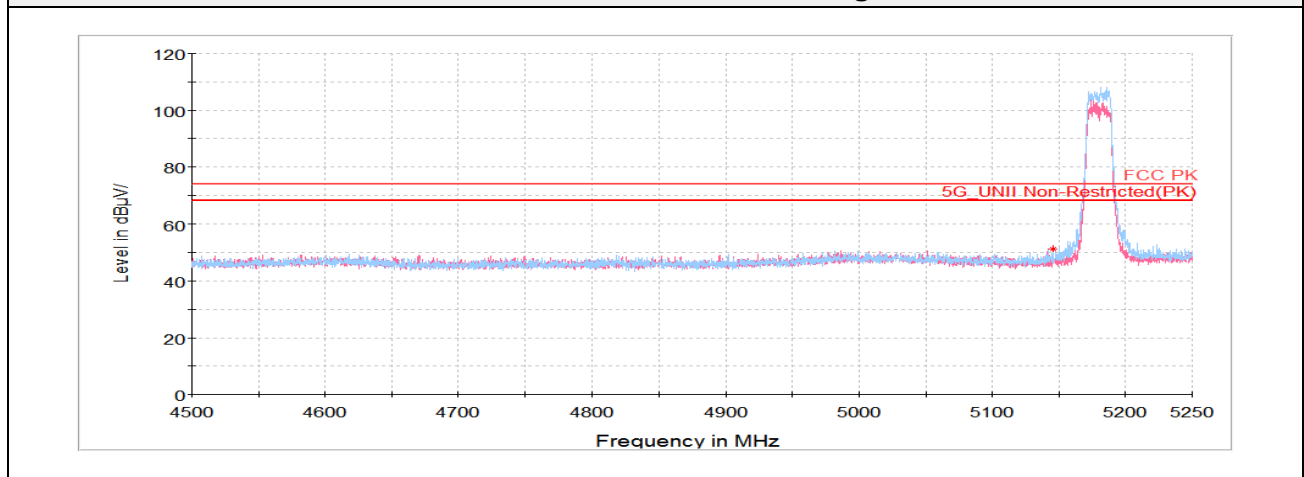
| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 034.93 ¹⁾ | H | 74.15 | 28.81 | -49.07 | - | 53.89 | 74.00 | 20.11 |
| 10 479.72 | H | 57.41 | 37.68 | -49.77 | - | 45.32 | 68.20 | 22.88 |
| 15 721.20 ¹⁾ | H | 54.42 | 39.91 | -45.67 | - | 48.66 | 74.00 | 25.34 |
| Average Data | | | | | | | | |
| 1 034.93 ¹⁾ | H | 67.35 | 28.81 | -49.07 | 0.61 | 47.70 | 54.00 | 6.30 |

802.11ac VHT20 UNII-1 2TX MIMO

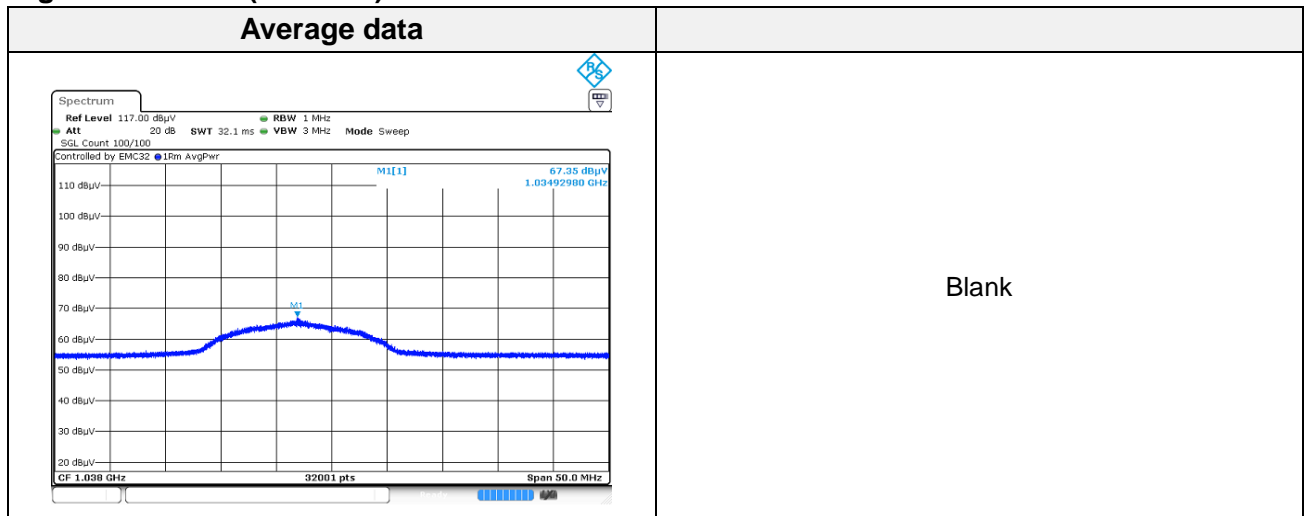
Lowest Channel (5 180 MHz)



Horizontal/Vertical for Band-edge



Highest Channel (5 240 MHz)



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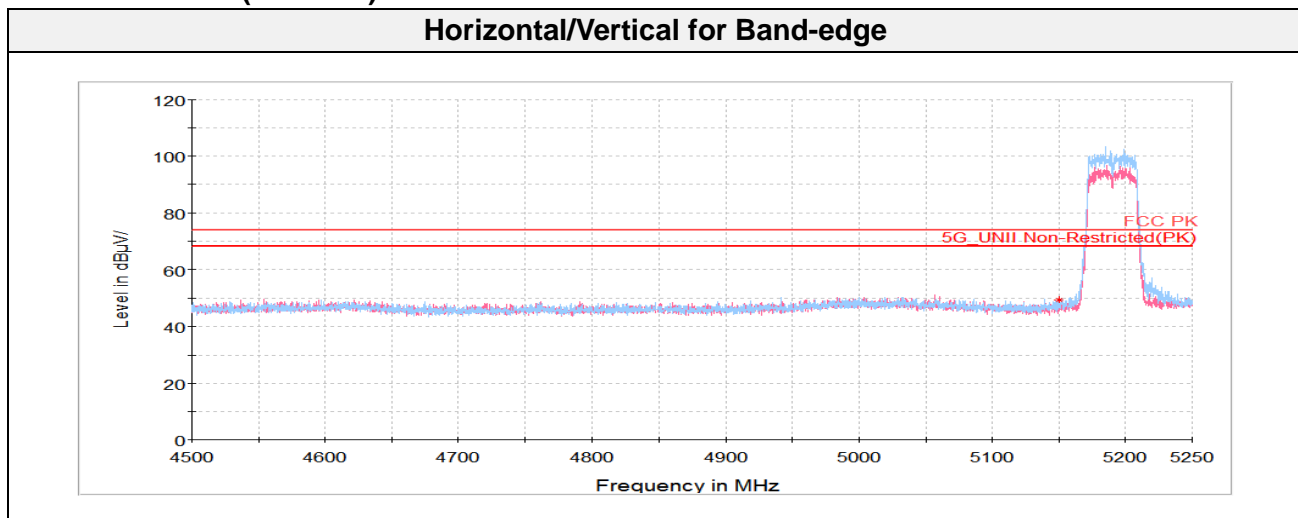
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**802.11ac VHT40 UNII-1 ANT1****Lowest Channel (5 190 MHz)**

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 149.75 ¹⁾ | H | 41.90 | 34.17 | -26.51 | - | 49.56 | 74.00 | 24.44 |
| 10 395.63 | H | 58.25 | 37.60 | -49.73 | - | 46.12 | 68.20 | 22.08 |
| 14 924.47 | V | 53.76 | 41.06 | -41.96 | - | 52.86 | 68.20 | 15.34 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Highest Channel (5 230 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 10 484.03 | V | 58.65 | 37.68 | -49.78 | - | 46.55 | 68.20 | 21.65 |
| 14 927.70 | H | 53.84 | 41.07 | -41.93 | - | 52.98 | 68.20 | 15.22 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

802.11ac VHT40 UNII-1 ANT1**Lowest Channel (5 190 MHz)**

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802.11ac VHT40 UNII-1 ANT2

Lowest Channel (5 190 MHz)

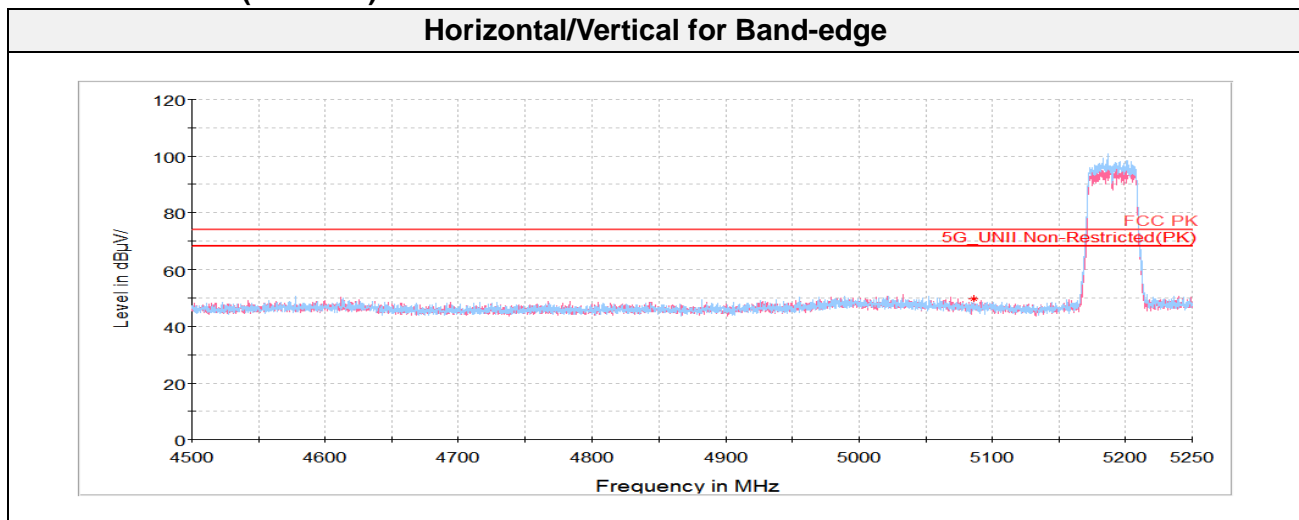
| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 085.98 ¹⁾ | H | 42.18 | 34.05 | -26.48 | - | 49.75 | 74.00 | 24.25 |
| 10 383.77 | V | 57.45 | 37.58 | -49.72 | - | 45.31 | 68.20 | 22.89 |
| 15 573.86 ¹⁾ | H | 54.08 | 39.97 | -45.57 | - | 48.48 | 74.00 | 25.52 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Highest Channel (5 230 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 10 462.11 | H | 56.57 | 37.66 | -49.76 | - | 44.47 | 68.20 | 23.73 |
| 15 706.11 ¹⁾ | V | 54.60 | 39.92 | -45.66 | - | 48.86 | 74.00 | 25.14 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

802.11ac VHT40 UNII-1 ANT2

Lowest Channel (5 190 MHz)



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802.11ac VHT40 UNII-1 2TX MIMO

Lowest Channel (5 190 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 5 149.06 ¹⁾ | H | 43.08 | 34.17 | -26.51 | - | 50.74 | 74.00 | 23.26 |
| 10 389.16 | H | 56.76 | 37.59 | -49.73 | - | 44.62 | 68.20 | 23.58 |
| 15 565.59 ¹⁾ | H | 54.43 | 39.97 | -45.56 | - | 48.84 | 74.00 | 25.16 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

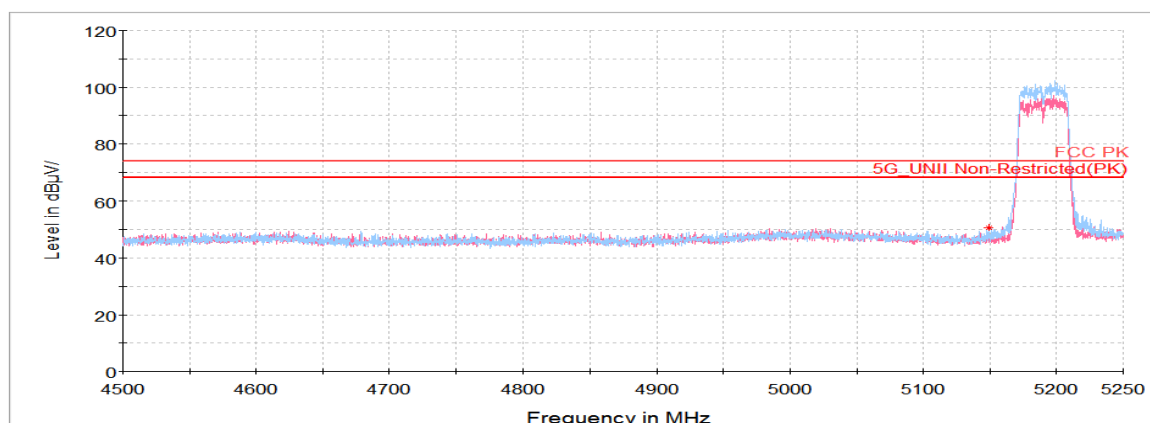
Highest Channel (5 230 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 024.06 ¹⁾ | H | 70.36 | 28.80 | -49.09 | - | 50.07 | 74.00 | 23.93 |
| 10 394.55 | V | 58.89 | 37.59 | -49.73 | - | 46.75 | 68.20 | 21.45 |
| 15 703.23 ¹⁾ | H | 55.16 | 39.92 | -45.66 | - | 49.42 | 74.00 | 24.58 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

802.11ac VHT40 UNII-1 2TX MIMO

Lowest Channel (5 190 MHz)

Horizontal/Vertical for Band-edge

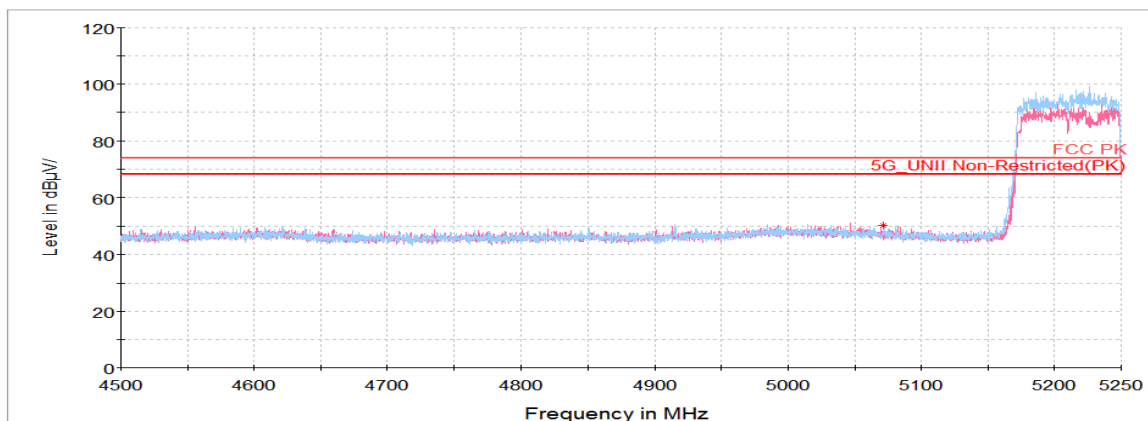


802.11ac VHT80 UNII-1 ANT1

Lowest Channel (5 210 MHz)

| Frequency (MHz) | Pol. (V/H) | Reading (dB(μV)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μV/m)) | Limit (dB(μV/m)) | Margin (dB) |
|--|---------------|---------------------|---------------------|--------------------|-------------|----------------------|---------------------|----------------|
| Peak data | | | | | | | | |
| 5 071.72 ¹⁾ | H | 42.48 | 34.03 | -26.15 | - | 50.36 | 74.00 | 23.64 |
| 10 551.23 | H | 58.04 | 37.75 | -49.72 | - | 46.07 | 68.20 | 22.13 |
| 14 902.19 | H | 53.88 | 41.02 | -42.19 | - | 52.71 | 68.20 | 15.49 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Horizontal/Vertical for Band-edge



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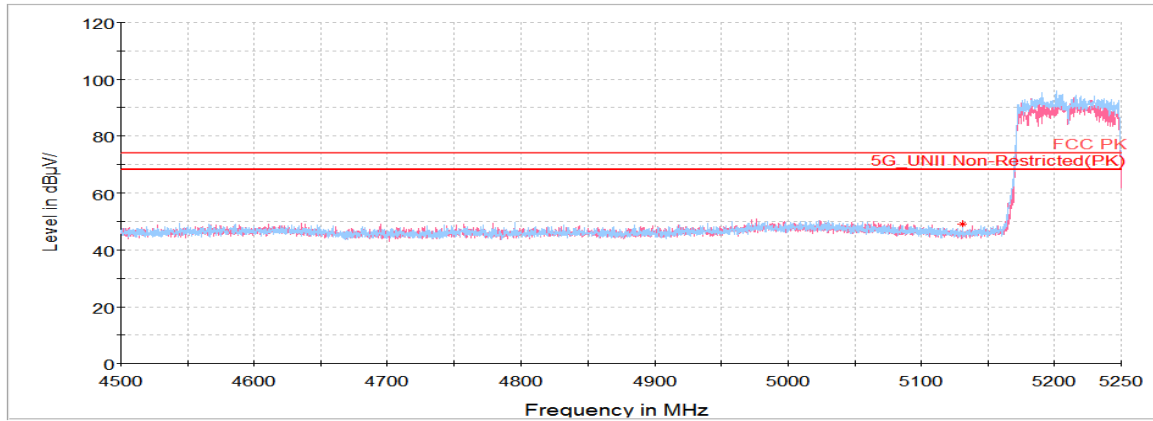


802.11ac VHT80 UNII-1 ANT2

Lowest Channel (5 210 MHz)

| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ V/m)) | Limit (dB(μ V/m)) | Margin (dB) |
|--|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 5 130.84 ¹⁾ | H | 41.72 | 34.14 | -26.62 | - | 49.24 | 74.00 | 24.76 |
| 10 413.59 | H | 57.14 | 37.61 | -49.74 | - | 45.01 | 68.20 | 23.19 |
| 15 635.31 ¹⁾ | V | 54.05 | 39.95 | -45.61 | - | 48.39 | 74.00 | 25.61 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Horizontal/Vertical for Band-edge



KCTL Inc.

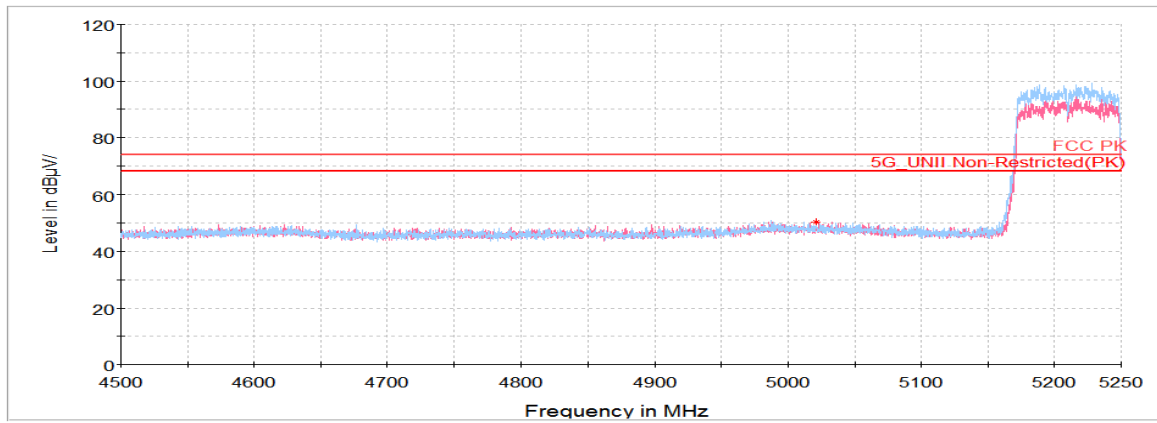
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**802.11ac VHT80 UNII-1 2TX MIMO****Lowest Channel (5 210 MHz)**

| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ V/m)) | Limit (dB(μ V/m)) | Margin (dB) |
|--|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 5 021.19 ¹⁾ | H | 41.51 | 33.94 | -24.98 | - | 50.47 | 74.00 | 23.53 |
| 10 406.41 | V | 58.38 | 37.61 | -49.74 | - | 46.25 | 68.20 | 21.95 |
| 15 642.50 ¹⁾ | H | 53.58 | 39.94 | -45.62 | - | 47.90 | 74.00 | 26.10 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

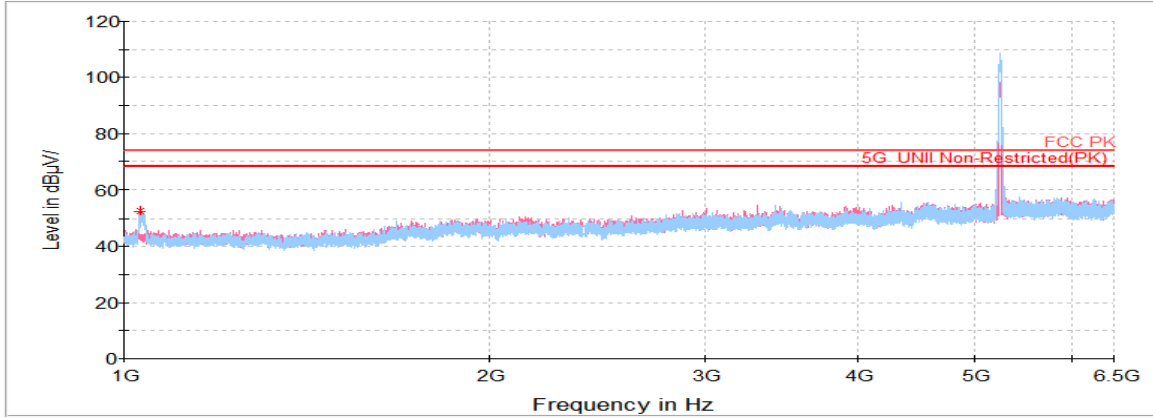
Horizontal/Vertical for Band-edge

Plot of Harmonics and Spurious Emissions

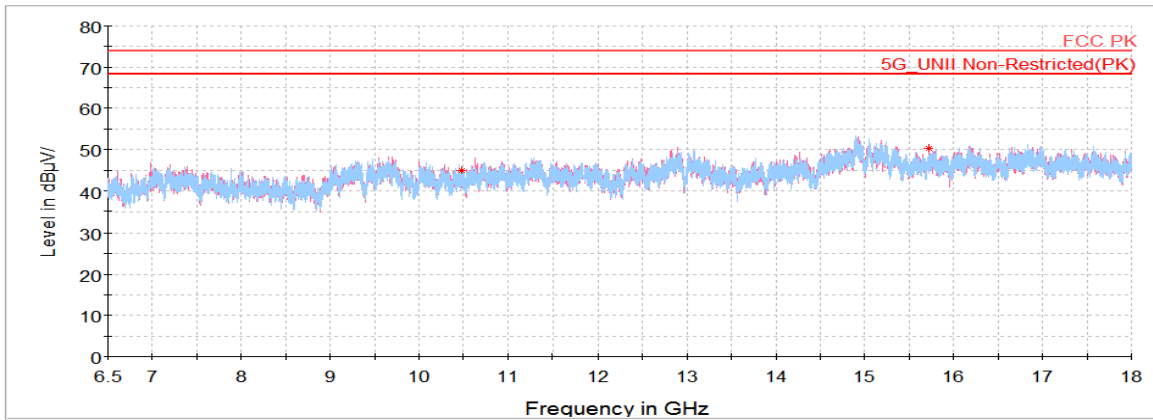
In order to simplify the report, attached plots were only the lowest margin condition

802.11n HT20_UNII-1_2TX MIMO_Highest Channel (5 240 MHz)

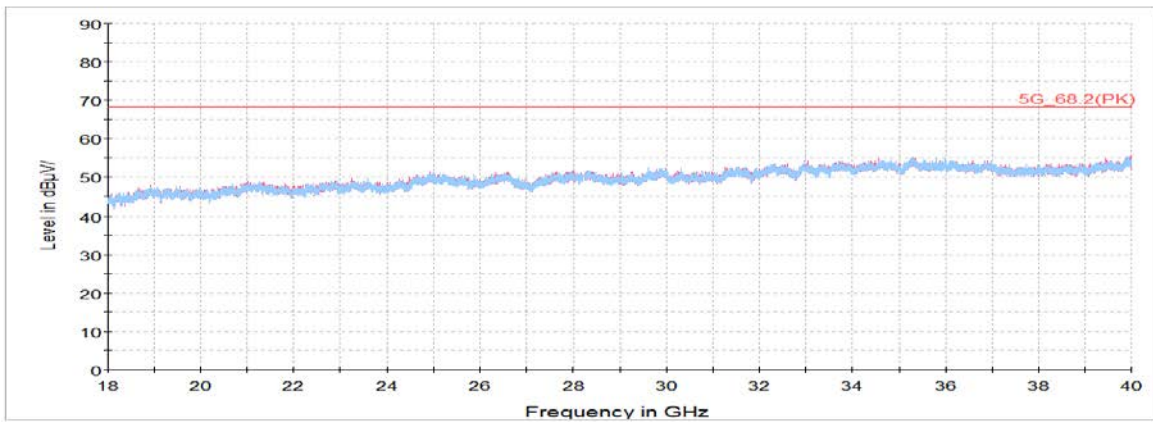
Horizontal/Vertical for 1 GHz ~ 6.5 GHz



Horizontal/Vertical for 6.5 GHz ~ 18 GHz



Horizontal/Vertical for 18 GHz ~ 40 GHz



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**802.11a UNII-2A ANT1****Lowest Channel (5 260 MHz)**

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 055.08 ¹⁾ | H | 74.59 | 28.81 | -49.06 | - | 54.34 | 74.00 | 19.66 |
| 10 442.34 | H | 59.43 | 37.64 | -49.75 | - | 47.32 | 68.20 | 20.88 |
| 14 918.00 | H | 55.34 | 41.05 | -42.03 | - | 54.36 | 68.20 | 13.84 |
| Average Data | | | | | | | | |
| 1 055.08 ¹⁾ | H | 67.25 | 28.81 | -49.06 | 0.28 | 47.28 | 54.00 | 6.72 |

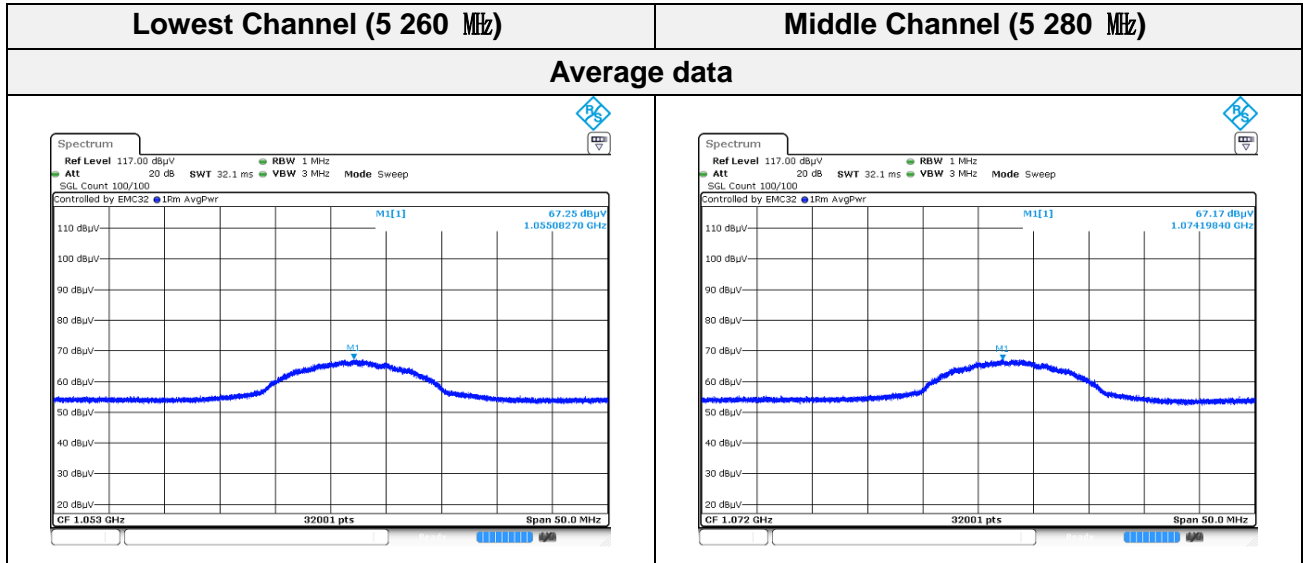
Middle Channel (5 280 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 074.20 ¹⁾ | H | 73.48 | 28.81 | -49.04 | - | 53.25 | 74.00 | 20.75 |
| 10 613.41 ¹⁾ | V | 58.52 | 37.81 | -49.64 | - | 46.69 | 74.00 | 27.31 |
| 14 907.22 | H | 54.54 | 41.03 | -42.13 | - | 53.44 | 68.20 | 14.76 |
| Average Data | | | | | | | | |
| 1 074.20 ¹⁾ | H | 67.17 | 28.81 | -49.04 | 0.28 | 47.22 | 54.00 | 6.78 |

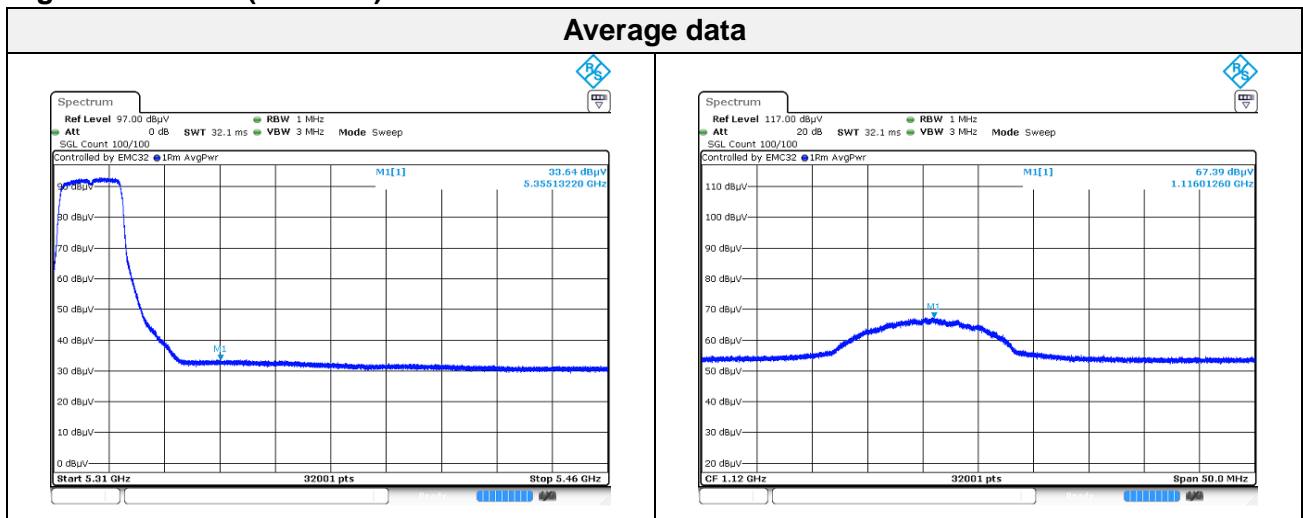
Highest Channel (5 320 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 116.01 ¹⁾ | H | 73.36 | 28.82 | -48.89 | - | 53.29 | 74.00 | 20.71 |
| 5 355.13 ¹⁾ | H | 42.38 | 34.54 | -25.44 | - | 51.48 | 74.00 | 22.52 |
| 10 639.64 ¹⁾ | H | 59.20 | 37.84 | -49.61 | - | 47.43 | 74.00 | 26.57 |
| 15 197.59 | V | 56.43 | 40.16 | -42.90 | - | 53.69 | 68.20 | 14.51 |
| Average Data | | | | | | | | |
| 1 116.01 ¹⁾ | H | 67.39 | 28.82 | -48.89 | 0.28 | 47.60 | 54.00 | 6.40 |
| 5 355.13 ¹⁾ | H | 33.64 | 34.54 | -25.44 | 0.28 | 43.02 | 54.00 | 10.98 |

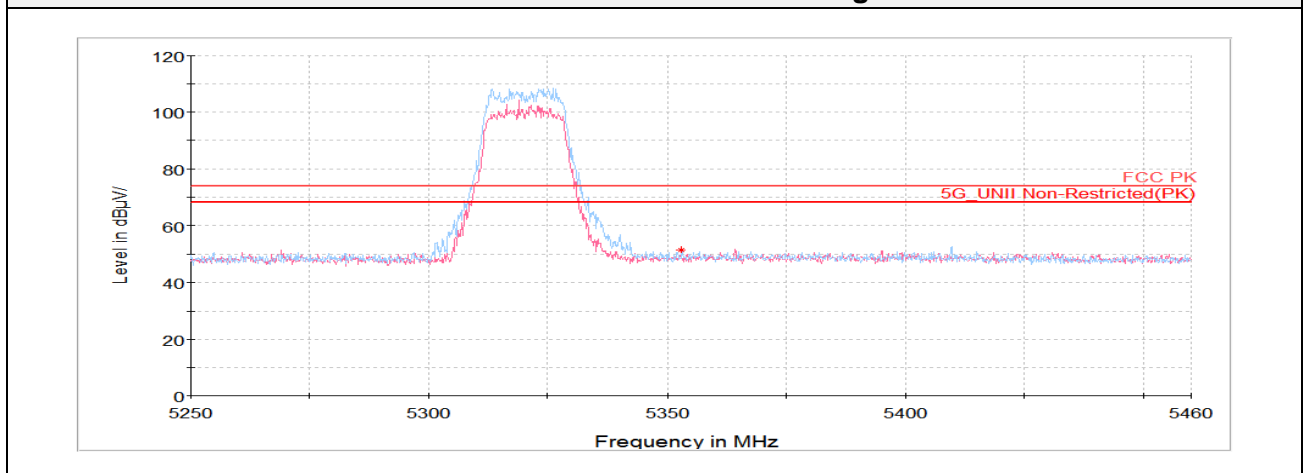
802.11a UNII-2A ANT1



Highest Channel (5 320 MHz)



Horizontal/Vertical for Band-edge



802.11a UNII-2A ANT2

Lowest Channel (5 260 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 052.94 ¹⁾ | H | 69.62 | 28.81 | -49.06 | - | 49.37 | 74.00 | 24.63 |
| 10 553.03 | H | 57.70 | 37.75 | -49.72 | - | 45.73 | 68.20 | 22.47 |
| 15 786.25 ¹⁾ | V | 56.02 | 39.89 | -45.72 | - | 50.19 | 74.00 | 23.81 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Middle Channel (5 280 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 076.14 ¹⁾ | H | 69.31 | 28.82 | -49.03 | - | 49.10 | 74.00 | 24.90 |
| 10 560.22 | V | 57.53 | 37.76 | -49.71 | - | 45.58 | 68.20 | 22.62 |
| 15 838.00 ¹⁾ | H | 54.83 | 39.86 | -45.76 | - | 48.93 | 74.00 | 25.07 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

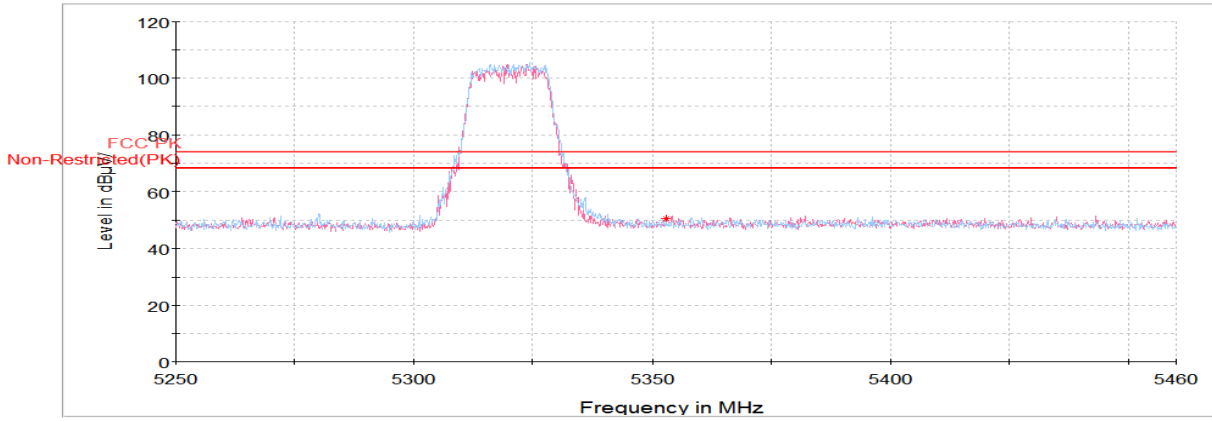
Highest Channel (5 320 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------|-------------|------------|------|------------|------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB(μV/m)) | (dB(μV/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 112.75 ¹⁾ | H | 67.80 | 28.82 | -48.93 | - | 47.69 | 74.00 | 26.31 |
| 5 352.91 ¹⁾ | V | 41.64 | 34.54 | -25.46 | - | 50.72 | 74.00 | 23.28 |
| 10 641.08 ¹⁾ | V | 58.99 | 37.84 | -49.61 | - | 47.22 | 74.00 | 26.78 |
| 16 008.34 ¹⁾ | H | 54.49 | 40.61 | -45.90 | - | 49.20 | 74.00 | 24.80 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

802.11a UNII-2A ANT2

Highest Channel (5 320 MHz)

Horizontal/Vertical for Band-edge



KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
 Suwon-si, Gyeonggi-do, 16677, Korea
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www.kctl.co.kr

Report No.:
 KR21-SRF0159

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**802.11a UNII-2A 2TX MIMO****Lowest Channel (5 260 MHz)**

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|-----------------|-------------|------------|------|-------------------|-------------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB($\mu V/m$)) | (dB($\mu V/m$)) | (dB) |
| Peak data | | | | | | | | |
| 1 053.82 ¹⁾ | H | 73.19 | 28.81 | -49.05 | - | 52.95 | 74.00 | 21.05 |
| 10 512.42 | V | 57.01 | 37.71 | -49.77 | - | 44.95 | 68.20 | 23.25 |
| 15 792.00 ¹⁾ | H | 56.46 | 39.88 | -45.72 | - | 50.62 | 74.00 | 23.38 |
| Average Data | | | | | | | | |
| 1 053.82 ¹⁾ | H | 67.68 | 28.81 | -49.05 | 0.28 | 47.72 | 54.00 | 6.28 |

Middle Channel (5 280 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|-----------------|-------------|------------|------|-------------------|-------------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB($\mu V/m$)) | (dB($\mu V/m$)) | (dB) |
| Peak data | | | | | | | | |
| 1 074.19 ¹⁾ | H | 75.23 | 28.81 | -49.04 | - | 55.00 | 74.00 | 19.00 |
| 10 571.00 | V | 58.00 | 37.77 | -49.70 | - | 46.07 | 68.20 | 22.13 |
| 15 905.20 ¹⁾ | V | 56.39 | 39.84 | -45.81 | - | 50.42 | 74.00 | 23.58 |
| Average Data | | | | | | | | |
| 1 074.19 ¹⁾ | H | 67.43 | 28.81 | -49.04 | 0.28 | 47.48 | 54.00 | 6.52 |

Highest Channel (5 320 MHz)

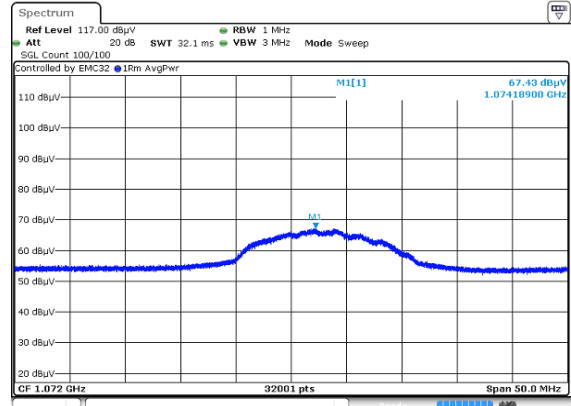
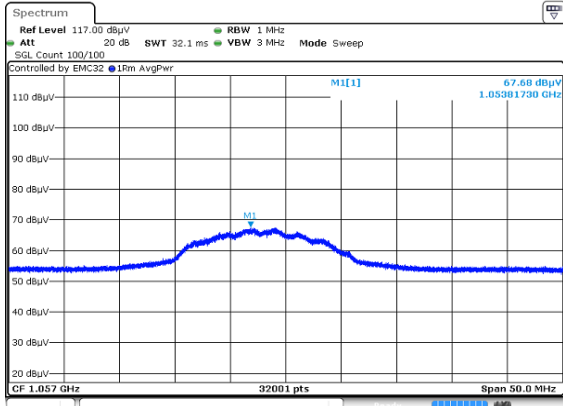
| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|-----------------|-------------|------------|------|-------------------|-------------------|--------|
| (MHz) | (V/H) | (dB(μV)) | (dB) | (dB) | (dB) | (dB($\mu V/m$)) | (dB($\mu V/m$)) | (dB) |
| Peak data | | | | | | | | |
| 1 113.84 ¹⁾ | H | 72.99 | 28.82 | -48.93 | - | 52.88 | 74.00 | 21.12 |
| 5 352.12 ¹⁾ | H | 43.01 | 34.53 | -25.47 | - | 52.07 | 74.00 | 21.93 |
| 10 645.75 ¹⁾ | V | 58.28 | 37.85 | -49.60 | - | 46.53 | 74.00 | 27.47 |
| 15 960.55 ¹⁾ | H | 55.42 | 39.82 | -45.85 | - | 49.39 | 74.00 | 24.61 |
| Average Data | | | | | | | | |
| 1 113.84 ¹⁾ | H | 67.58 | 28.82 | -48.93 | 0.28 | 47.75 | 54.00 | 6.25 |
| 5 352.12 ¹⁾ | H | 36.49 | 34.53 | -25.47 | 0.28 | 45.83 | 54.00 | 8.17 |

802.11a UNII-2A 2TX MIMO

Lowest Channel (5 260 MHz)

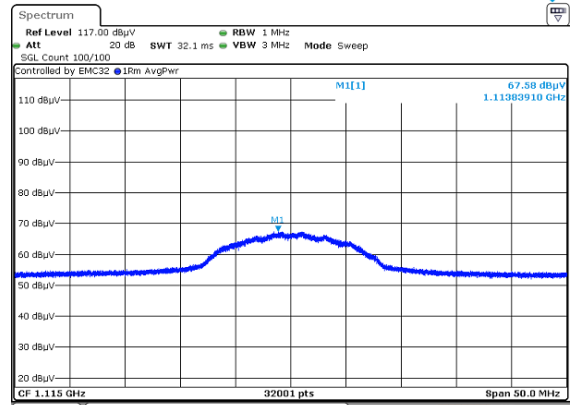
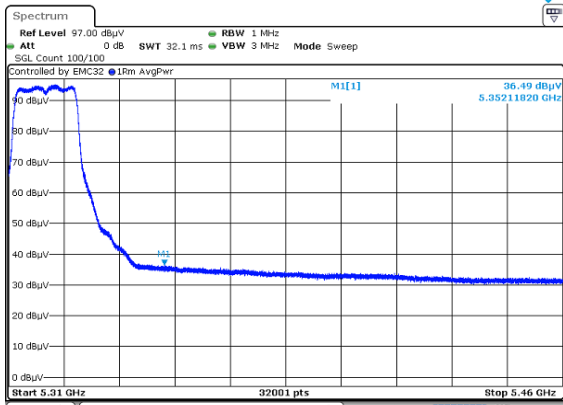
Middle Channel (5 280 MHz)

Average data

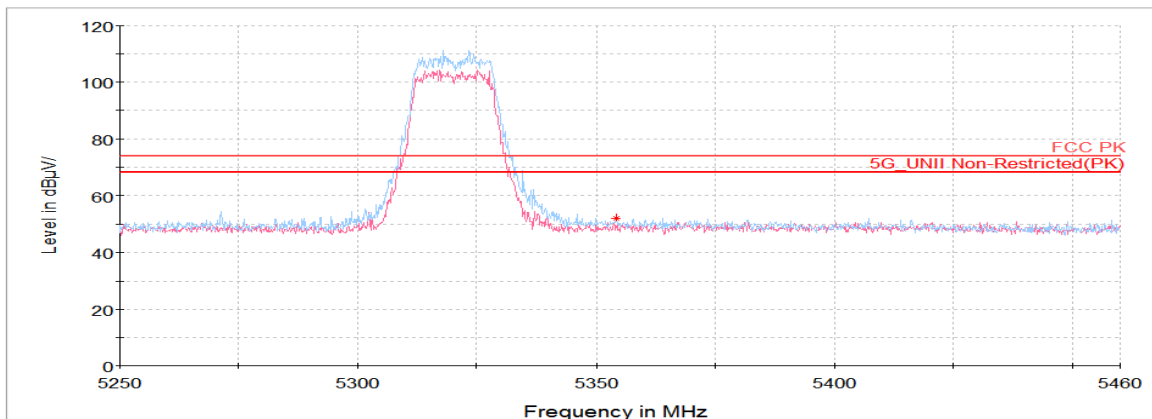


Highest Channel (5 320 MHz)

Average data



Horizontal/Vertical for Band-edge



KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
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www.kctl.co.kr

Report No.:
KR21-SRF0159

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**802.11n HT20 UNII-2A ANT1****Lowest Channel (5 260 MHz)**

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 054.51 ¹⁾ | H | 73.90 | 28.81 | -49.06 | - | 53.65 | 74.00 | 20.35 |
| 10 399.22 | V | 58.06 | 37.60 | -49.73 | - | 45.93 | 68.20 | 22.27 |
| 15 785.17 ¹⁾ | H | 56.16 | 39.89 | -45.72 | - | 50.33 | 74.00 | 23.67 |
| Average Data | | | | | | | | |
| 1 054.51 ¹⁾ | H | 66.72 | 28.81 | -49.06 | 0.33 | 46.80 | 54.00 | 7.20 |

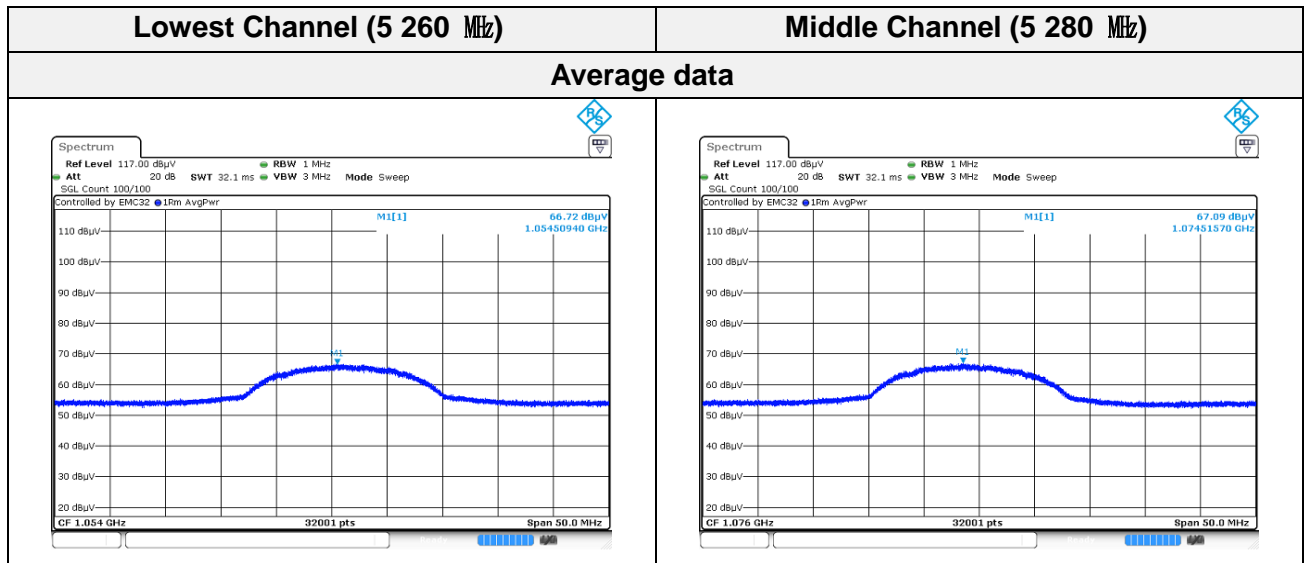
Middle Channel (5 280 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 074.52 ¹⁾ | H | 72.34 | 28.82 | -49.03 | - | 52.13 | 74.00 | 21.87 |
| 10 586.09 | V | 57.92 | 37.79 | -49.68 | - | 46.03 | 68.20 | 22.17 |
| 14 921.95 | V | 53.73 | 41.06 | -41.99 | - | 52.80 | 68.20 | 15.40 |
| Average Data | | | | | | | | |
| 1 074.52 ¹⁾ | H | 67.09 | 28.82 | -49.03 | 0.33 | 47.21 | 54.00 | 6.79 |

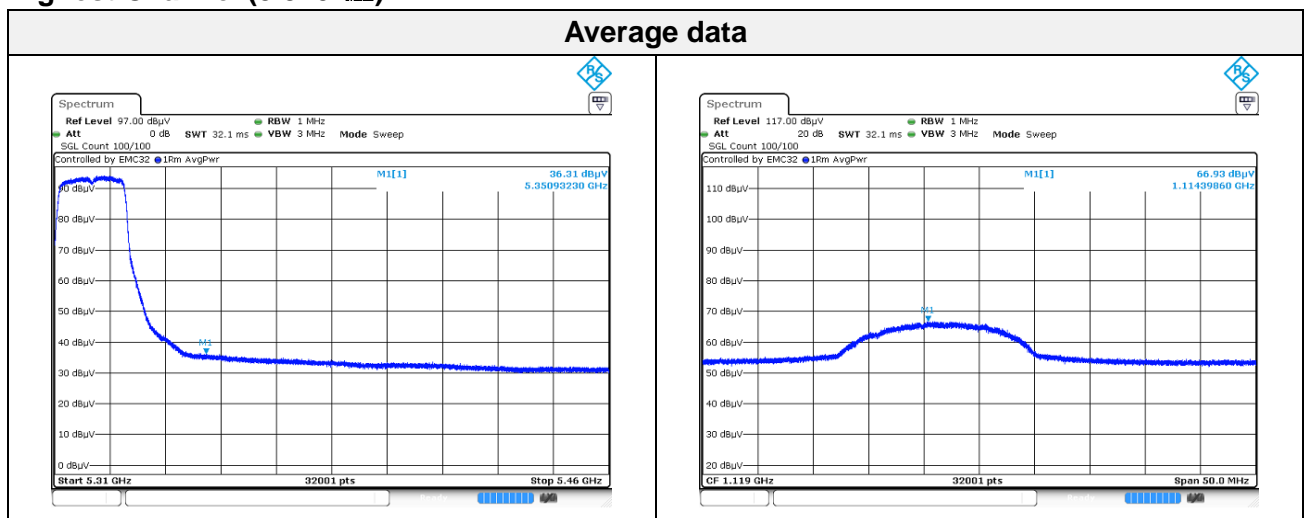
Highest Channel (5 320 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 114.40 ¹⁾ | H | 74.92 | 28.82 | -48.89 | - | 54.85 | 74.00 | 19.15 |
| 5 350.93 ¹⁾ | H | 43.90 | 34.53 | -25.48 | - | 52.95 | 74.00 | 21.05 |
| 10 634.61 ¹⁾ | V | 58.97 | 37.83 | -49.62 | - | 47.18 | 74.00 | 26.82 |
| 15 117.81 | H | 55.28 | 40.18 | -42.22 | - | 53.24 | 68.20 | 14.96 |
| Average Data | | | | | | | | |
| 1 114.40 ¹⁾ | H | 66.93 | 28.82 | -48.89 | 0.33 | 47.19 | 54.00 | 6.81 |
| 5 350.93 ¹⁾ | H | 36.31 | 34.53 | -25.48 | 0.33 | 45.69 | 54.00 | 8.31 |

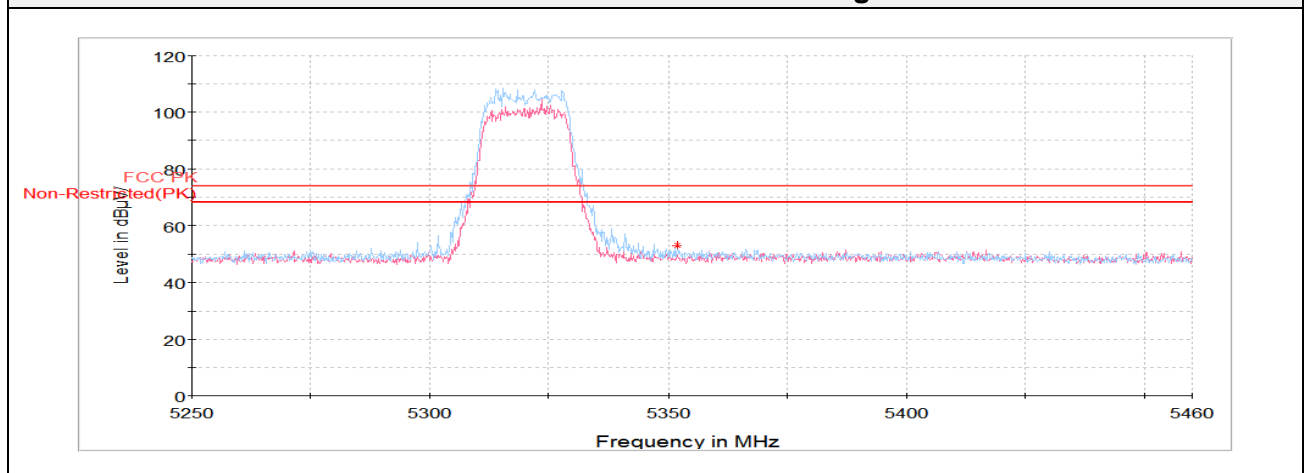
802.11n HT20 UNII-2A ANT1



Highest Channel (5 320 MHz)



Horizontal/Vertical for Band-edge



KCTL Inc.

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Suwon-si, Gyeonggi-do, 16677, Korea
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www.kctl.co.kr

Report No.:
KR21-SRF0159

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**802.11n HT20 UNII-2A ANT2****Lowest Channel (5 260 MHz)**

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 053.11 ¹⁾ | H | 70.40 | 28.81 | -49.06 | - | 50.15 | 74.00 | 23.85 |
| 10 539.73 | V | 56.88 | 37.74 | -49.73 | - | 44.89 | 68.20 | 23.31 |
| 15 781.22 ¹⁾ | V | 55.76 | 39.89 | -45.72 | - | 49.93 | 74.00 | 24.07 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Middle Channel (5 280 MHz)

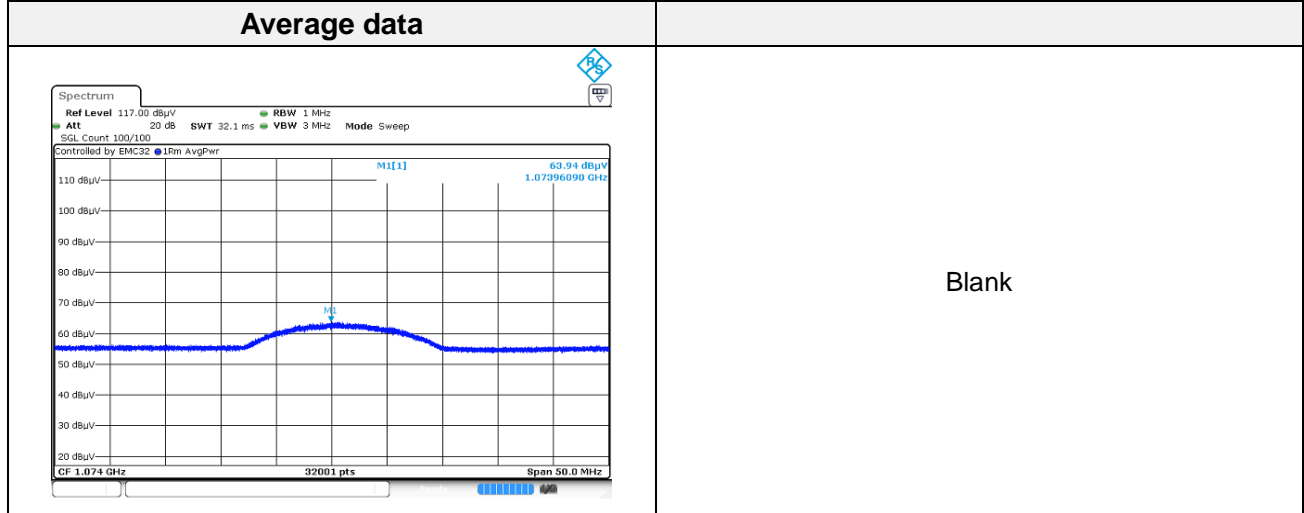
| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 073.96 ¹⁾ | H | 71.41 | 28.81 | -49.03 | - | 51.19 | 74.00 | 22.81 |
| 10 564.17 | V | 57.31 | 37.76 | -49.70 | - | 45.37 | 68.20 | 22.83 |
| 15 840.88 ¹⁾ | H | 54.81 | 39.86 | -45.76 | - | 48.91 | 74.00 | 25.09 |
| Average Data | | | | | | | | |
| 1 073.96 ¹⁾ | H | 63.94 | 28.81 | -49.03 | 0.33 | 44.05 | 54.00 | 9.95 |

Highest Channel (5 320 MHz)

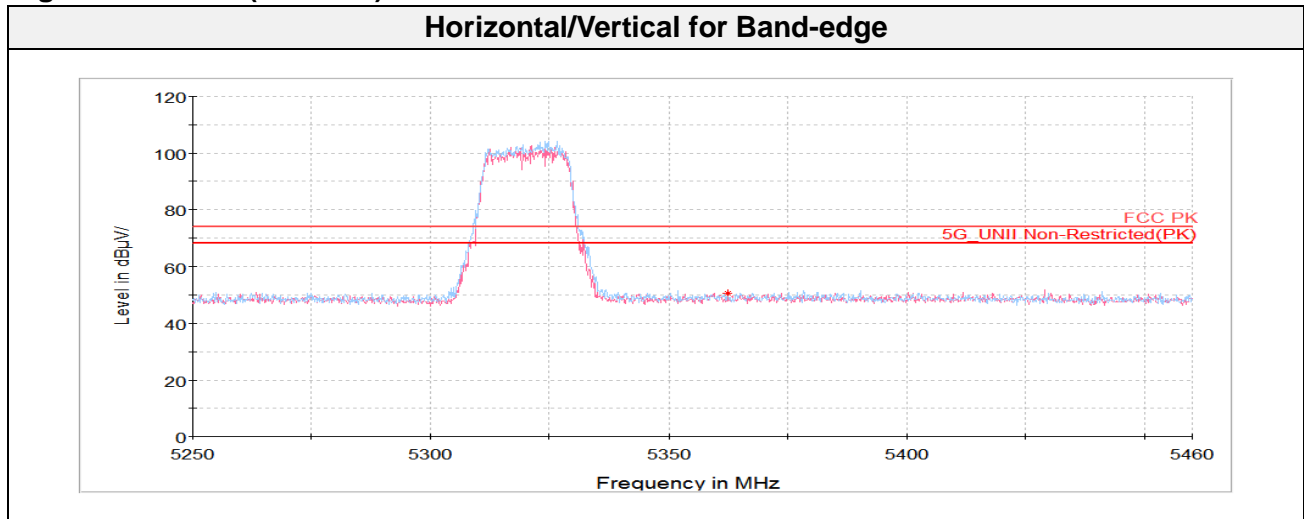
| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 117.05 ¹⁾ | H | 69.05 | 28.82 | -48.91 | - | 48.96 | 74.00 | 25.04 |
| 5 362.19 ¹⁾ | V | 41.61 | 34.55 | -25.39 | - | 50.77 | 74.00 | 23.23 |
| 10 640.36 ¹⁾ | V | 58.80 | 37.84 | -49.61 | - | 47.03 | 74.00 | 26.97 |
| 16 028.47 ¹⁾ | V | 55.75 | 40.63 | -45.96 | - | 50.42 | 74.00 | 23.58 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

802.11n HT20 UNII-2A ANT2

Middle Channel (5 280 MHz)



Highest Channel (5 320 MHz)



KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
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Report No.:
KR21-SRF0159

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**802.11n HT20 UNII-2A 2TX MIMO****Lowest Channel (5 260 MHz)**

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 055.41 ¹⁾ | H | 73.48 | 28.81 | -49.05 | - | 53.24 | 74.00 | 20.76 |
| 10 544.41 | H | 56.99 | 37.74 | -49.73 | - | 45.00 | 68.20 | 23.20 |
| 15 774.39 ¹⁾ | H | 56.08 | 39.89 | -45.71 | - | 50.26 | 74.00 | 23.74 |
| Average Data | | | | | | | | |
| 1 055.41 ¹⁾ | H | 66.95 | 28.81 | -49.05 | 0.61 | 47.32 | 54.00 | 6.68 |

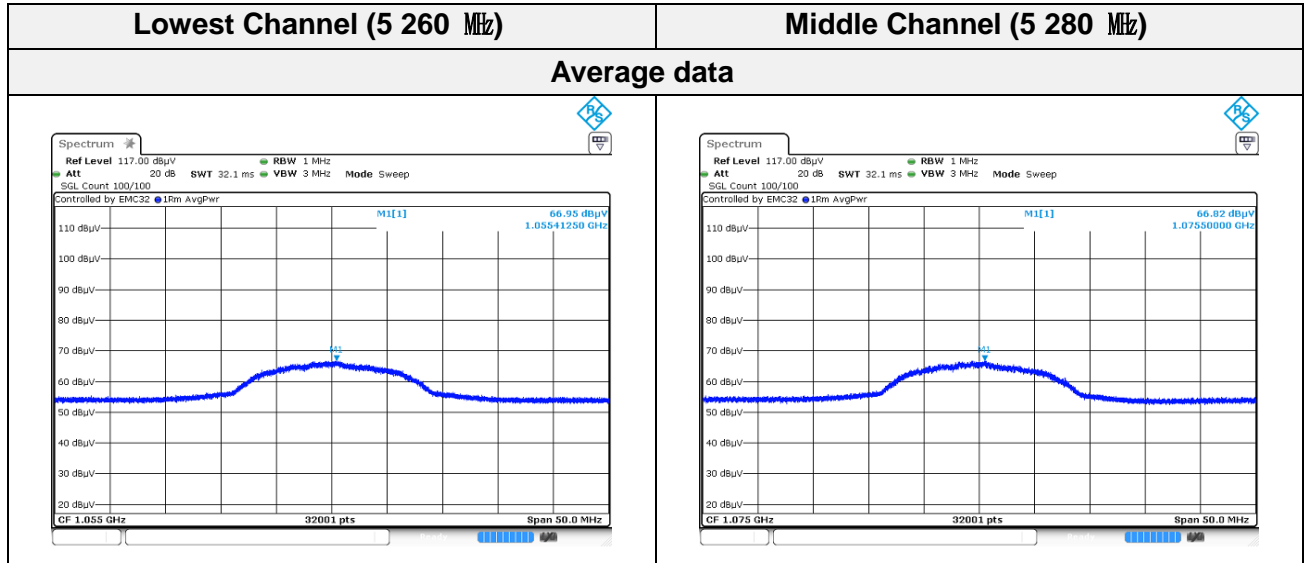
Middle Channel (5 280 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 075.50 ¹⁾ | H | 72.11 | 28.82 | -49.03 | - | 51.90 | 74.00 | 22.10 |
| 10 594.00 | H | 58.04 | 37.79 | -49.67 | - | 46.16 | 68.20 | 22.04 |
| 15 831.89 ¹⁾ | V | 55.64 | 39.87 | -45.75 | - | 49.76 | 74.00 | 24.24 |
| Average Data | | | | | | | | |
| 1 075.50 ¹⁾ | H | 66.82 | 28.82 | -49.03 | 0.61 | 47.22 | 54.00 | 6.78 |

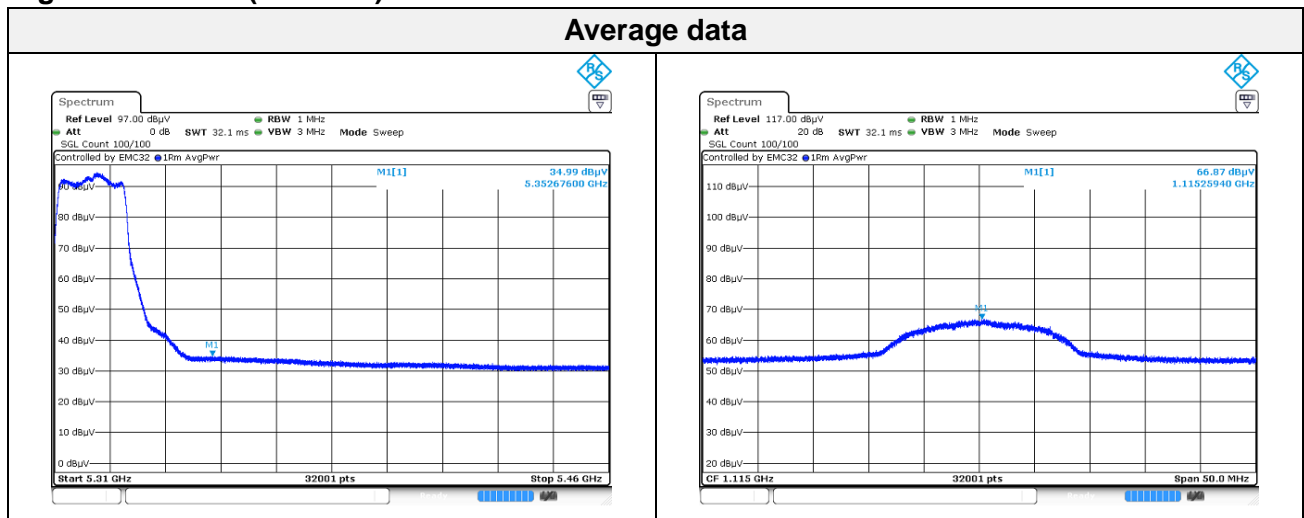
Highest Channel (5 320 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 115.26 ¹⁾ | H | 73.71 | 28.82 | -48.92 | - | 53.61 | 74.00 | 20.39 |
| 5 352.68 ¹⁾ | H | 44.96 | 34.53 | -25.46 | - | 54.03 | 74.00 | 19.97 |
| 10 652.22 ¹⁾ | V | 58.48 | 37.85 | -49.60 | - | 46.73 | 74.00 | 27.27 |
| 15 923.89 ¹⁾ | V | 55.68 | 39.83 | -45.82 | - | 49.69 | 74.00 | 24.31 |
| Average Data | | | | | | | | |
| 1 115.26 ¹⁾ | H | 66.87 | 28.82 | -48.92 | 0.61 | 47.38 | 54.00 | 6.62 |
| 5 352.68 ¹⁾ | H | 34.99 | 34.53 | -25.46 | 0.61 | 44.67 | 54.00 | 9.33 |

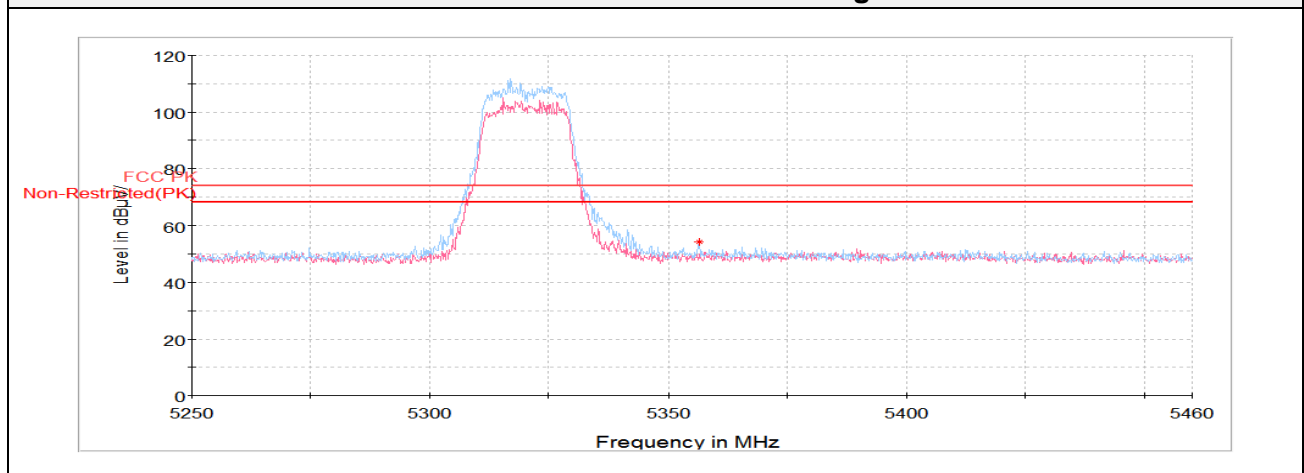
802.11n HT20 UNII-2A 2TX MIMO



Highest Channel (5 320 MHz)



Horizontal/Vertical for Band-edge



KCTL Inc.

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**802.11n HT40 UNII-2A ANT1****Lowest Channel (5 270 MHz)**

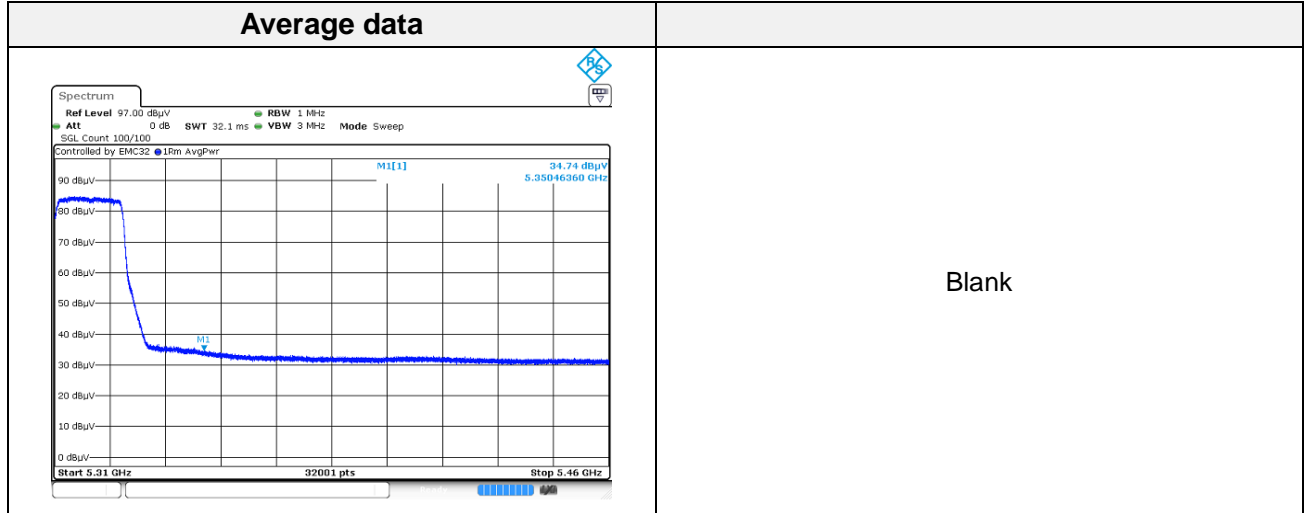
| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ N/m)) | Limit (dB(μ N/m)) | Margin (dB) |
|--|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 1 062.91 ¹⁾ | H | 68.30 | 28.81 | -49.05 | - | 48.06 | 74.00 | 25.94 |
| 10 550.16 | V | 58.41 | 37.75 | -49.72 | - | 46.44 | 68.20 | 21.76 |
| 15 041.63 | H | 54.52 | 40.19 | -41.56 | - | 53.15 | 68.20 | 15.05 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Highest Channel (5 310 MHz)

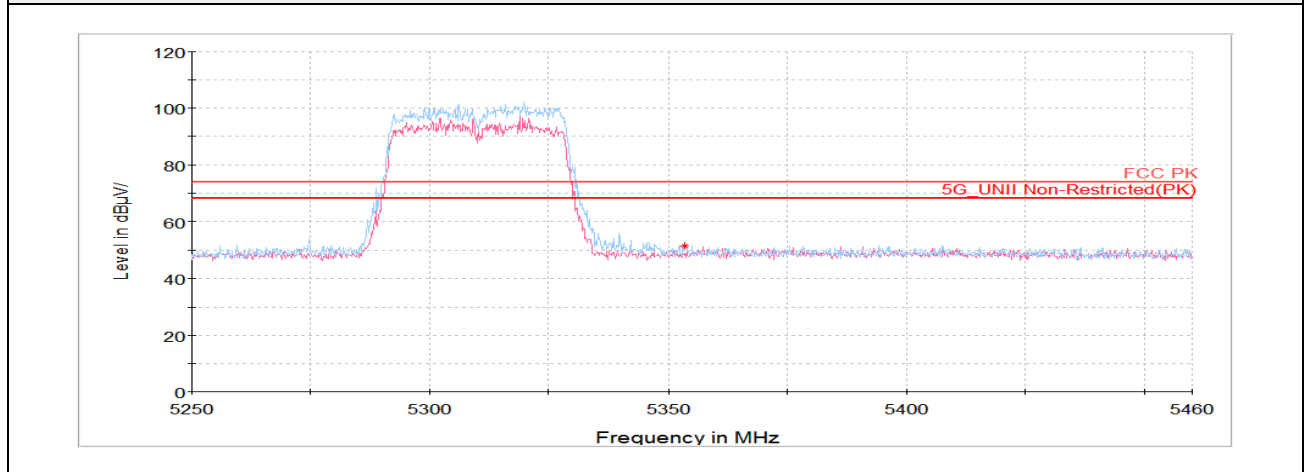
| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ N/m)) | Limit (dB(μ N/m)) | Margin (dB) |
|-------------------------|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 1 106.56 ¹⁾ | H | 68.92 | 28.82 | -48.97 | - | 48.77 | 74.00 | 25.23 |
| 5 350.46 ¹⁾ | H | 42.58 | 34.53 | -25.48 | - | 51.63 | 74.00 | 22.37 |
| 10 733.08 ¹⁾ | H | 59.29 | 37.93 | -49.49 | - | 47.73 | 74.00 | 26.27 |
| 14 919.08 | H | 53.94 | 41.05 | -42.02 | - | 52.97 | 68.20 | 15.23 |
| Average Data | | | | | | | | |
| 5 350.46 ¹⁾ | H | 34.74 | 34.53 | -25.48 | 0.63 | 44.42 | 54.00 | 9.58 |

802.11n HT40 UNII-2A ANT1

Highest Channel (5 310 MHz)



Horizontal/Vertical for Band-edge



KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
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Report No.:
KR21-SRF0159

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802.11n HT40 UNII-2A ANT2

Lowest Channel (5 270 MHz)

| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ V/m)) | Limit (dB(μ V/m)) | Margin (dB) |
|--|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 10 542.25 | H | 56.84 | 37.74 | -49.73 | - | 44.85 | 68.20 | 23.35 |
| 15 813.20 ¹⁾ | V | 55.42 | 39.87 | -45.74 | - | 49.55 | 74.00 | 24.45 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

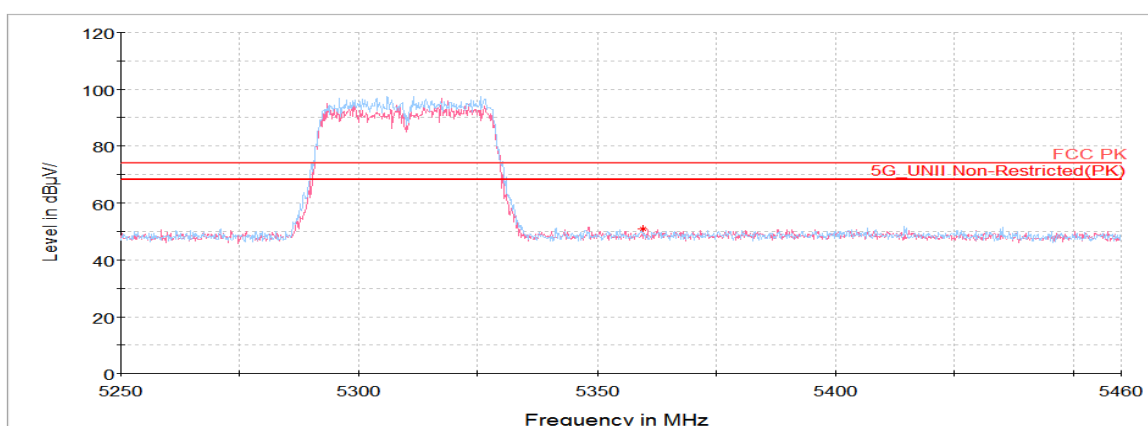
Highest Channel (5 310 MHz)

| Frequency (MHz) | Pol. (V/H) | Reading (dB(μ V)) | Ant. Factor (dB) | Amp.+Cable (dB) | DCF (dB) | Result (dB(μ V/m)) | Limit (dB(μ V/m)) | Margin (dB) |
|--|---------------|---------------------------|---------------------|--------------------|-------------|----------------------------|---------------------------|----------------|
| Peak data | | | | | | | | |
| 5 359.44 ¹⁾ | V | 41.73 | 34.55 | -25.41 | - | 50.87 | 74.00 | 23.13 |
| 10 621.67 ¹⁾ | H | 56.75 | 37.82 | -49.63 | - | 44.94 | 74.00 | 29.06 |
| 15 930.72 ¹⁾ | V | 54.25 | 39.83 | -45.82 | - | 48.26 | 74.00 | 25.74 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

802.11n HT40 UNII-2A ANT2

Highest Channel (5 310 MHz)

Horizontal/Vertical for Band-edge



KCTL Inc.

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KR21-SRF0159

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**802.11n HT40 UNII-2A 2TX MIMO****Lowest Channel (5 270 MHz)**

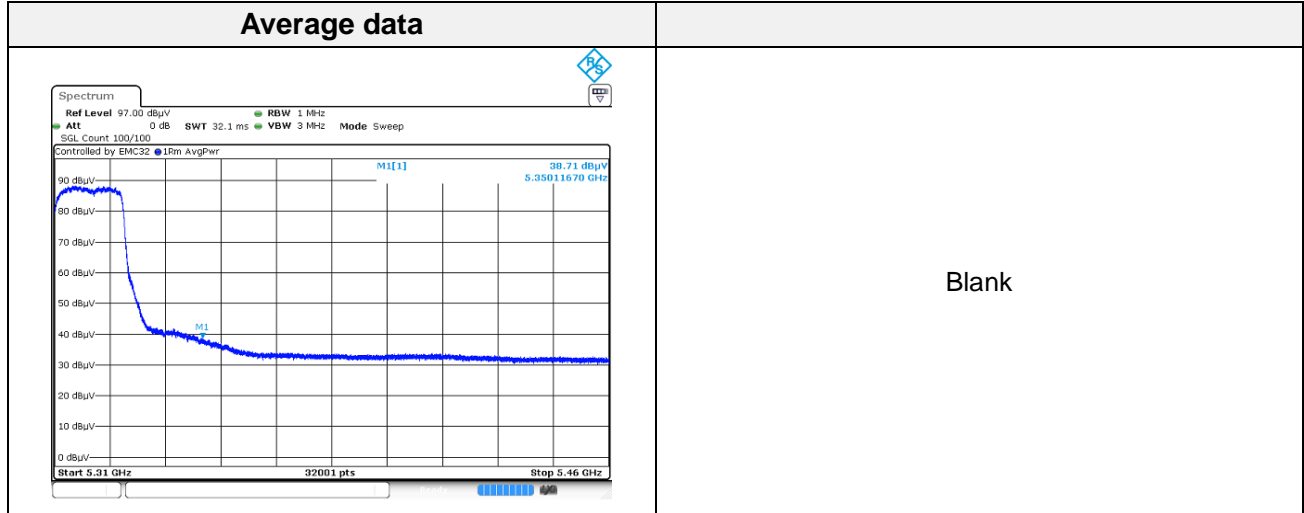
| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ N/m)) | (dB(μ N/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 063.25 ¹⁾ | H | 69.61 | 28.81 | -49.05 | - | 49.37 | 74.00 | 24.63 |
| 10 551.23 | H | 58.39 | 37.75 | -49.72 | - | 46.42 | 68.20 | 21.78 |
| 15 794.16 ¹⁾ | H | 55.39 | 39.88 | -45.73 | - | 49.54 | 74.00 | 24.46 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Highest Channel (5 310 MHz)

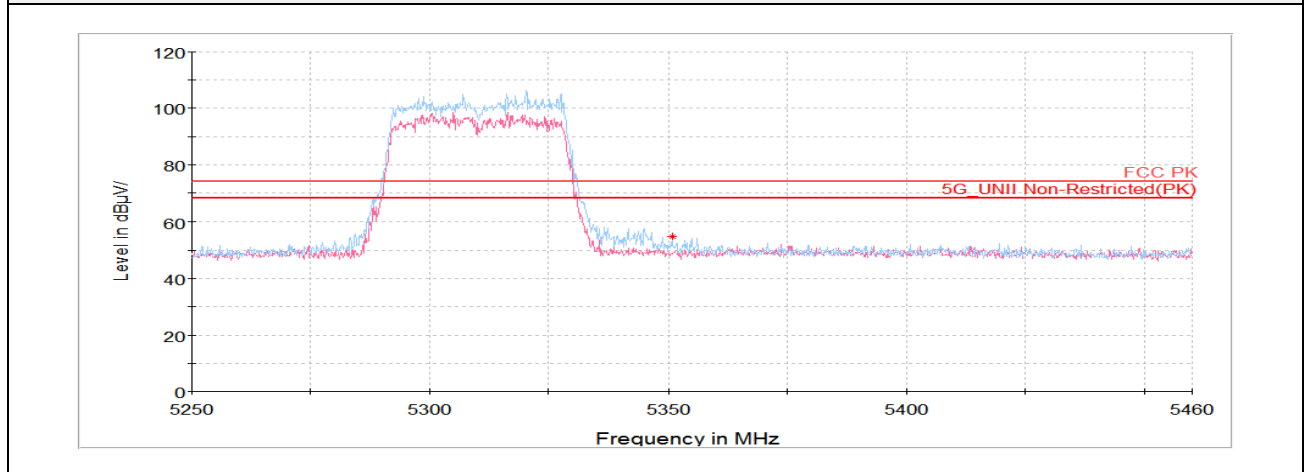
| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ N/m)) | (dB(μ N/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 103.30 ¹⁾ | H | 70.23 | 28.82 | -48.99 | - | 50.06 | 74.00 | 23.94 |
| 5 350.12 ¹⁾ | H | 45.58 | 34.53 | -25.48 | - | 54.63 | 74.00 | 19.37 |
| 10 626.70 ¹⁾ | V | 58.82 | 37.83 | -49.63 | - | 47.02 | 74.00 | 26.98 |
| 15 916.34 ¹⁾ | H | 55.20 | 39.83 | -45.81 | - | 49.22 | 74.00 | 24.78 |
| Average Data | | | | | | | | |
| 5 350.12 ¹⁾ | H | 38.71 | 34.53 | -25.48 | 1.11 | 48.87 | 54.00 | 5.13 |

802.11n HT40 UNII-2A 2TX MIMO

Highest Channel (5 310 MHz)



Horizontal/Vertical for Band-edge



KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR21-SRF0159

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**802.11ac VHT20 UNII-2A ANT1****Lowest Channel (5 260 MHz)**

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 054.29 ¹⁾ | H | 73.49 | 28.81 | -49.06 | - | 53.24 | 74.00 | 20.76 |
| 10 584.30 | V | 58.18 | 37.78 | -49.68 | - | 46.28 | 68.20 | 21.92 |
| 15 743.84 ¹⁾ | H | 56.17 | 39.90 | -45.69 | - | 50.38 | 74.00 | 23.62 |
| Average Data | | | | | | | | |
| 1 054.29 ¹⁾ | H | 66.85 | 28.81 | -49.06 | 0.32 | 46.92 | 54.00 | 7.08 |

Middle Channel (5 280 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 075.26 ¹⁾ | H | 72.17 | 28.81 | -49.03 | - | 51.95 | 74.00 | 22.05 |
| 10 587.17 | H | 58.74 | 37.79 | -49.68 | - | 46.85 | 68.20 | 21.35 |
| 14 969.03 | H | 52.96 | 41.14 | -41.51 | - | 52.59 | 68.20 | 15.61 |
| Average Data | | | | | | | | |
| 1 075.26 ¹⁾ | H | 66.15 | 28.81 | -49.03 | 0.32 | 46.27 | 54.00 | 7.73 |

Highest Channel (5 320 MHz)

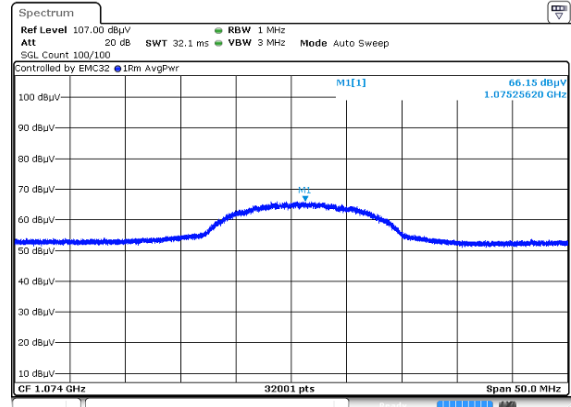
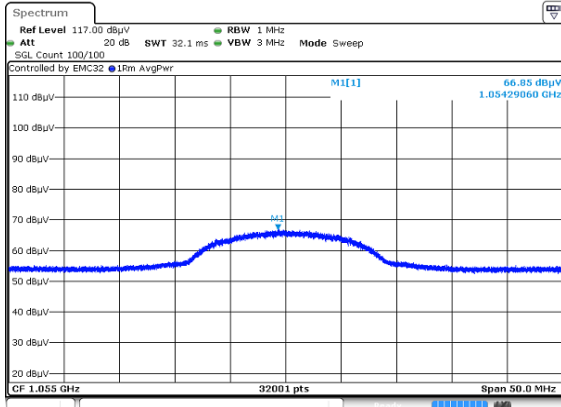
| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|-------------------------|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 114.47 ¹⁾ | H | 73.68 | 28.82 | -48.89 | - | 53.61 | 74.00 | 20.39 |
| 5 356.32 ¹⁾ | H | 44.93 | 34.54 | -25.44 | - | 54.03 | 74.00 | 19.97 |
| 10 636.05 ¹⁾ | H | 58.78 | 37.84 | -49.62 | - | 47.00 | 74.00 | 27.00 |
| 14 924.83 | H | 54.20 | 41.06 | -41.96 | - | 53.30 | 68.20 | 14.90 |
| Average Data | | | | | | | | |
| 1 114.47 ¹⁾ | H | 66.97 | 28.82 | -48.89 | 0.32 | 47.22 | 54.00 | 6.78 |
| 5 356.32 ¹⁾ | H | 34.75 | 34.54 | -25.44 | 0.32 | 44.17 | 54.00 | 9.83 |

802.11ac VHT20 UNII-2A ANT1

Lowest Channel (5 260 MHz)

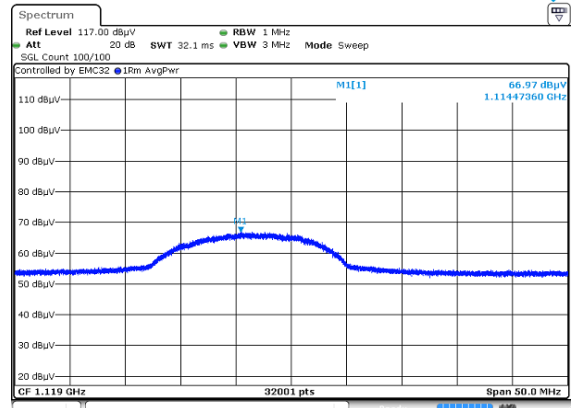
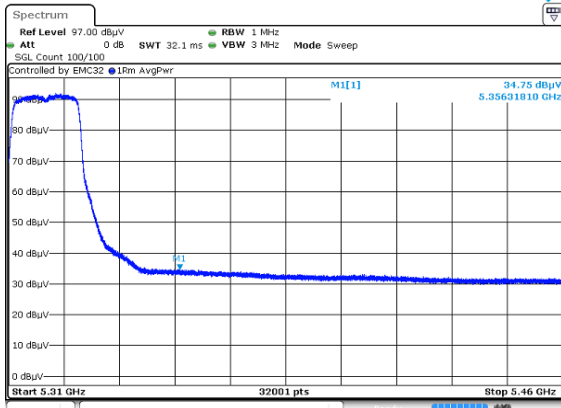
Middle Channel (5 280 MHz)

Average data

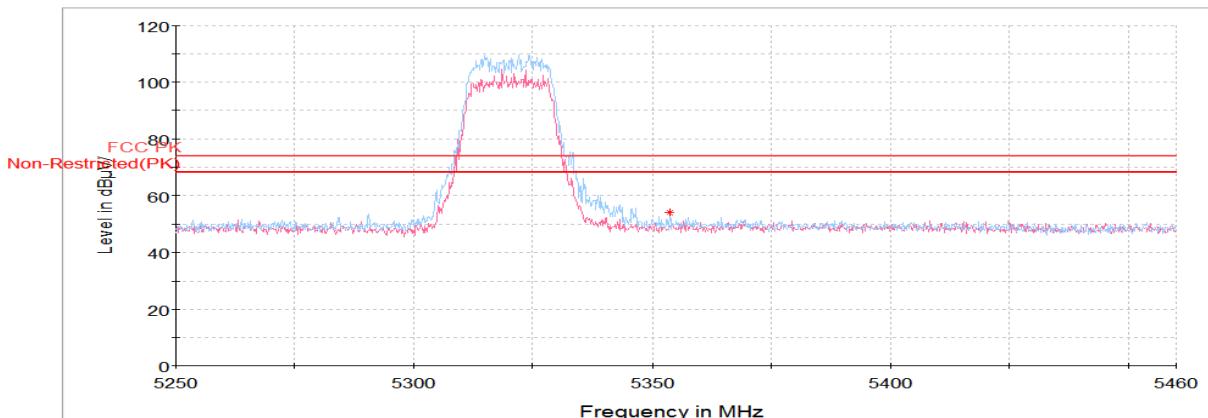


Highest Channel (5 320 MHz)

Average data



Horizontal/Vertical for Band-edge



KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR21-SRF0159

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**802.11ac VHT20 UNII-2A ANT2****Lowest Channel (5 260 MHz)**

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 060.50 ¹⁾ | H | 70.26 | 28.81 | -49.05 | - | 50.02 | 74.00 | 23.98 |
| 10 537.58 | V | 58.23 | 37.74 | -49.74 | - | 46.23 | 68.20 | 21.97 |
| 15 780.50 ¹⁾ | H | 55.37 | 39.89 | -45.72 | - | 49.54 | 74.00 | 24.46 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

Middle Channel (5 280 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 073.73 ¹⁾ | H | 70.28 | 28.81 | -49.04 | - | 50.05 | 74.00 | 23.95 |
| 10 559.50 | H | 56.73 | 37.76 | -49.71 | - | 44.78 | 68.20 | 23.42 |
| 15 841.23 ¹⁾ | V | 53.42 | 39.86 | -45.76 | - | 47.52 | 74.00 | 26.48 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

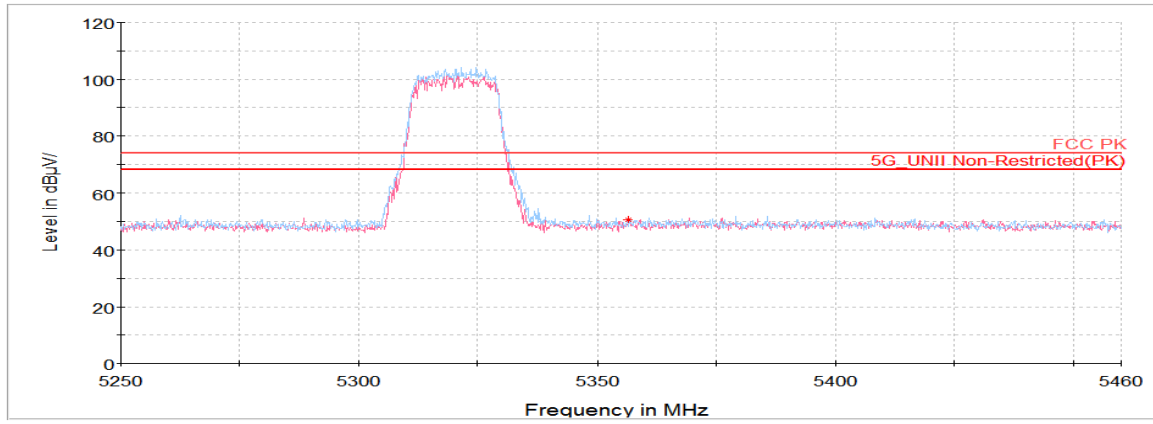
Highest Channel (5 320 MHz)

| Frequency | Pol. | Reading | Ant. Factor | Amp.+Cable | DCF | Result | Limit | Margin |
|--|-------|----------------|-------------|------------|------|------------------|------------------|--------|
| (MHz) | (V/H) | (dB(μ V)) | (dB) | (dB) | (dB) | (dB(μ V/m)) | (dB(μ V/m)) | (dB) |
| Peak data | | | | | | | | |
| 1 114.30 ¹⁾ | H | 67.95 | 28.82 | -48.92 | - | 47.85 | 74.00 | 26.15 |
| 5 356.34 ¹⁾ | V | 41.54 | 34.54 | -25.43 | - | 50.65 | 74.00 | 23.35 |
| 10 642.16 ¹⁾ | H | 58.81 | 37.84 | -49.61 | - | 47.04 | 74.00 | 26.96 |
| 16 012.66 ¹⁾ | V | 54.54 | 40.62 | -45.91 | - | 49.25 | 74.00 | 24.75 |
| Average Data | | | | | | | | |
| No spurious emissions were detected within 20 dB of the limit. | | | | | | | | |

802.11ac VHT20 UNII-2A ANT2

Highest Channel (5 320 MHz)

Horizontal/Vertical for Band-edge



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