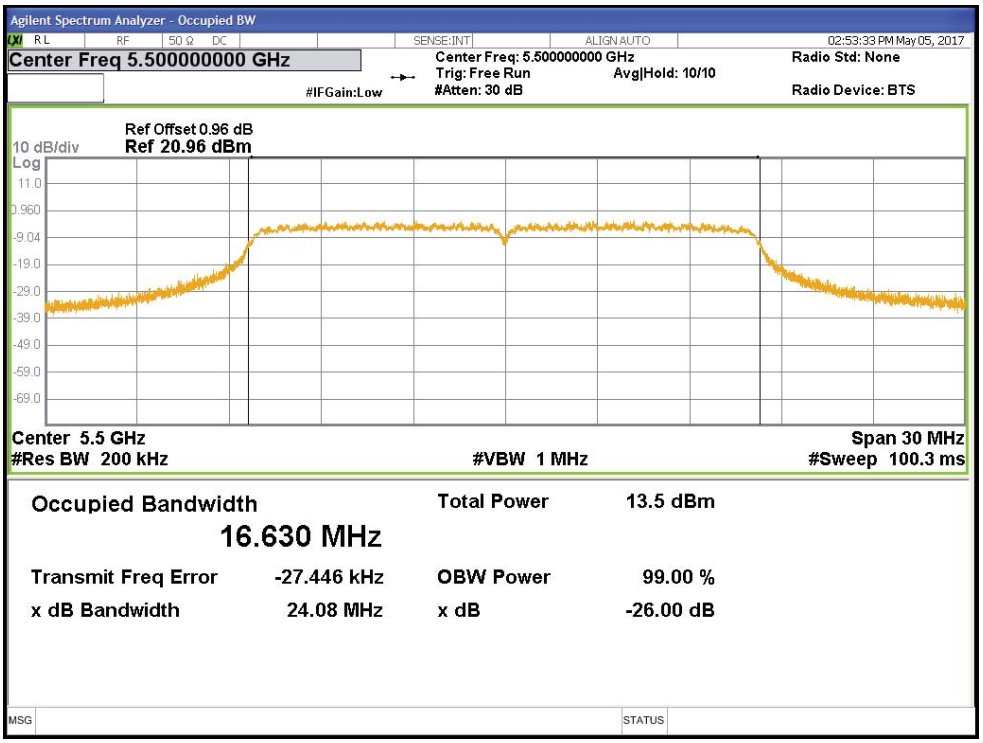


Figure 33: Occupied Bandwidth-5500 MHz-11a 2

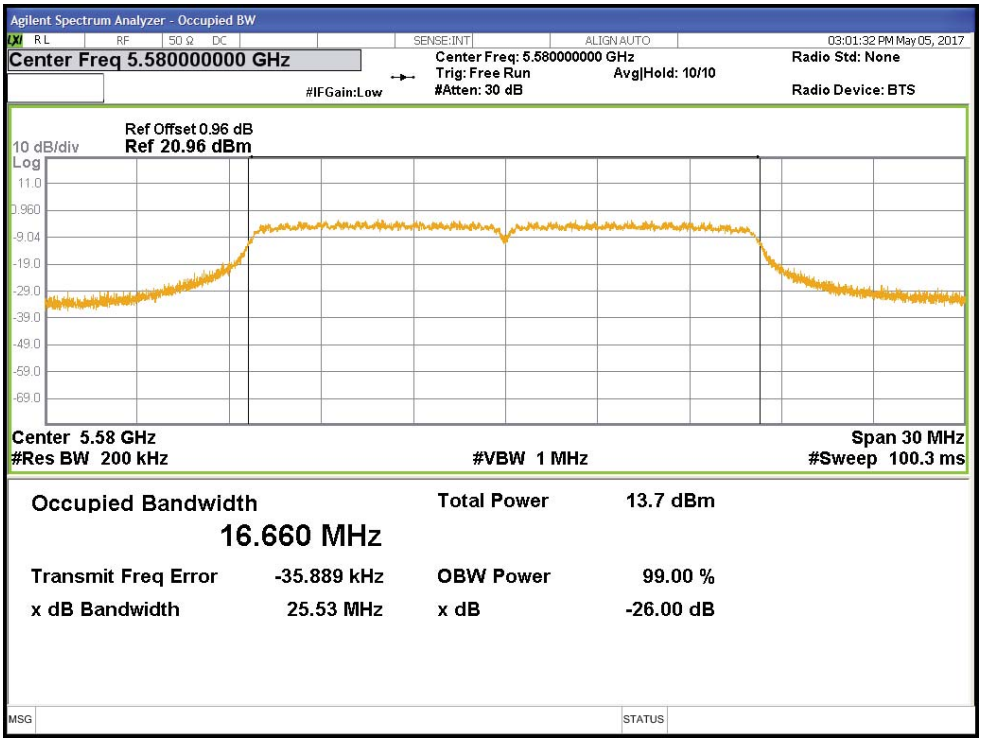


Figure 34: Occupied Bandwidth-5580 MHz-11a

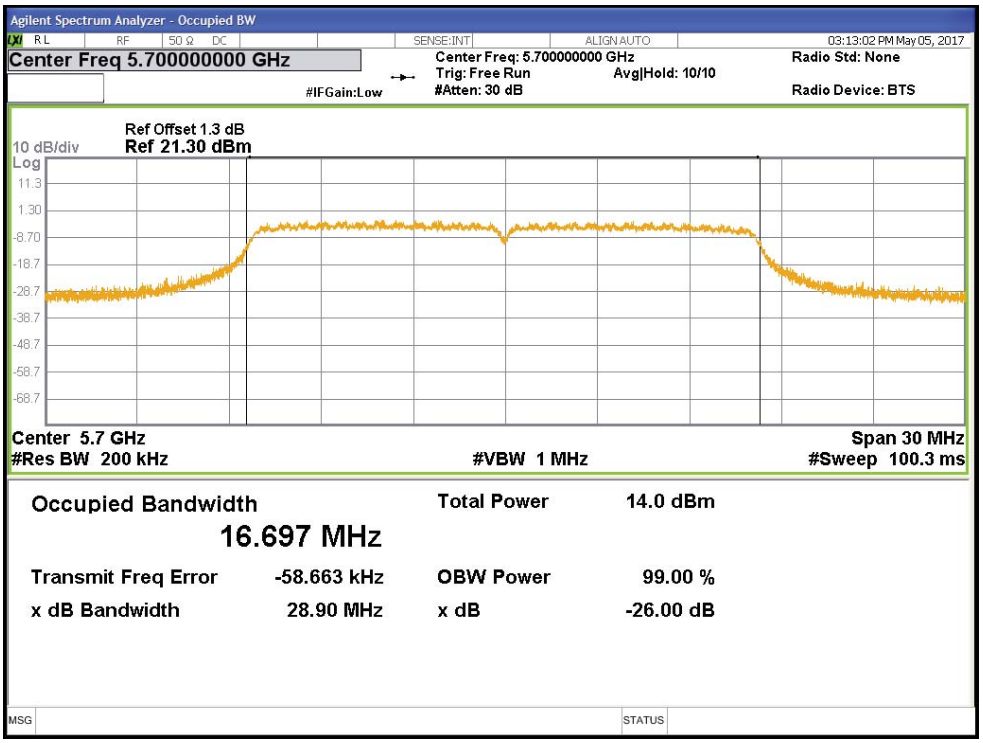


Figure 35: Occupied Bandwidth-5700 MHz-11a

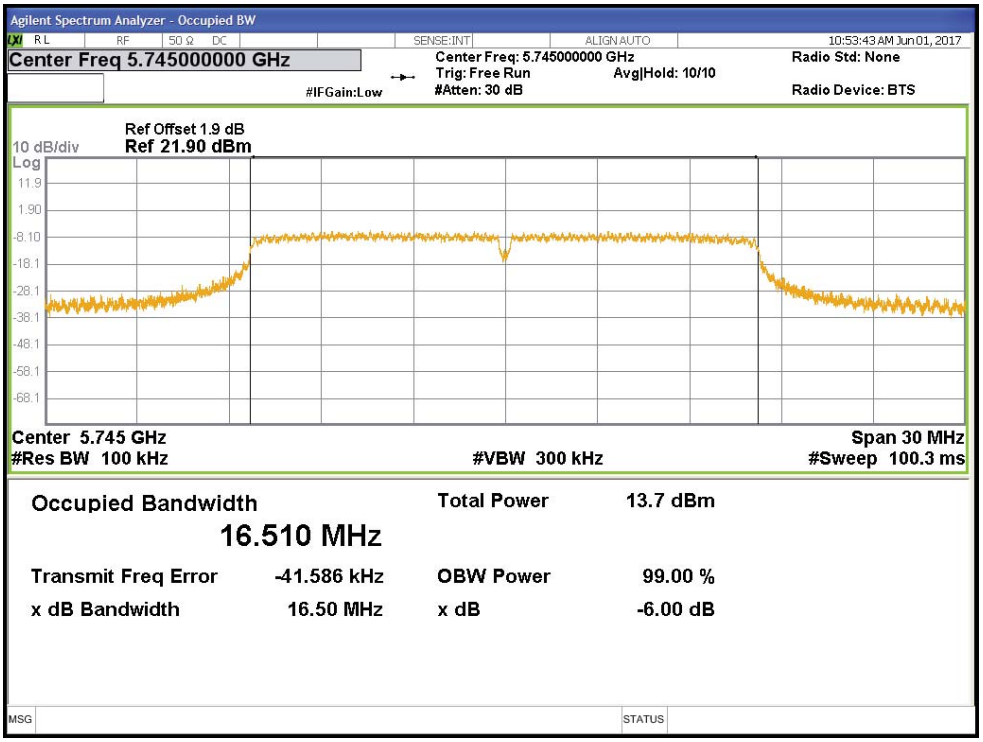


Figure 36: Occupied Bandwidth-5745 MHz-11a

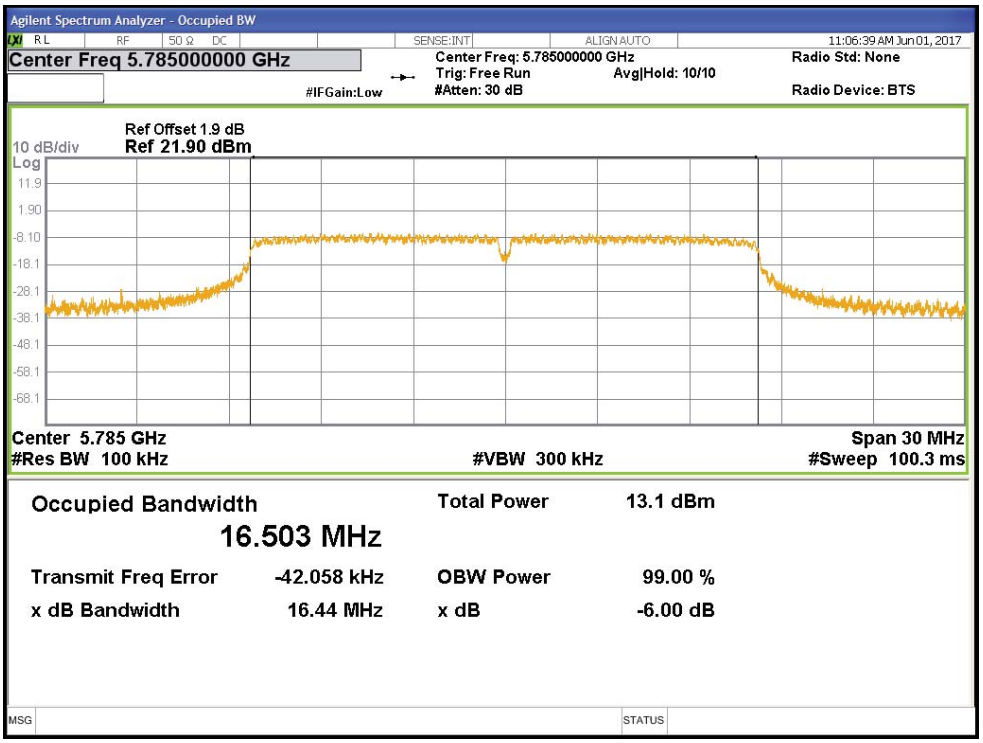


Figure 37: Occupied Bandwidth-5785 MHz-11a

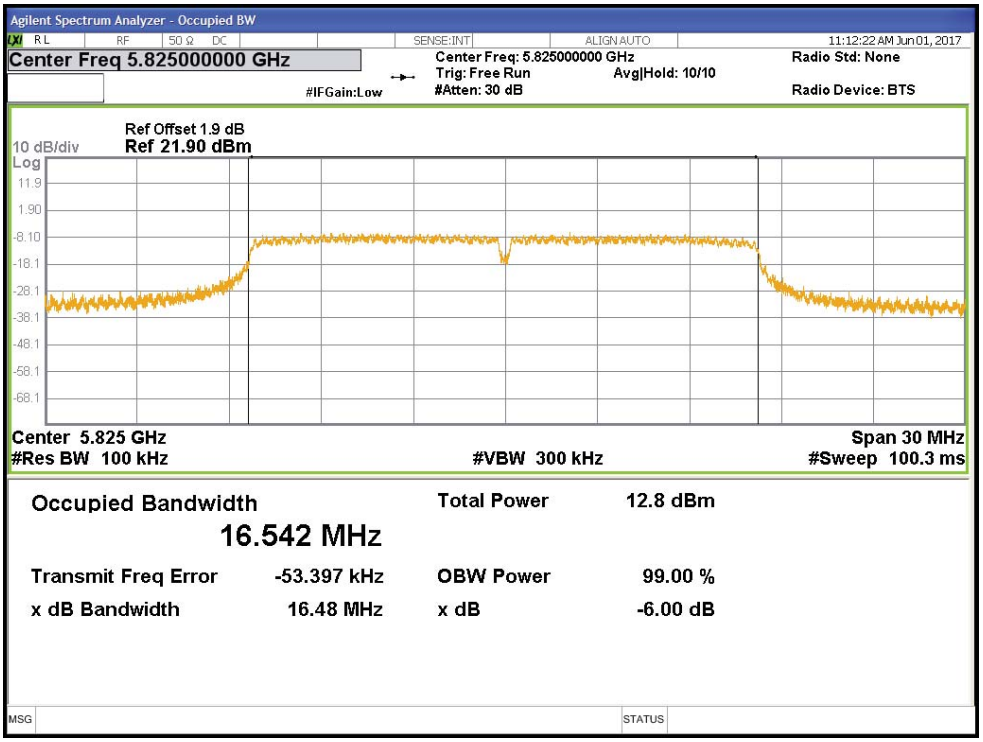


Figure 38: Occupied Bandwidth-5825 MHz-11a

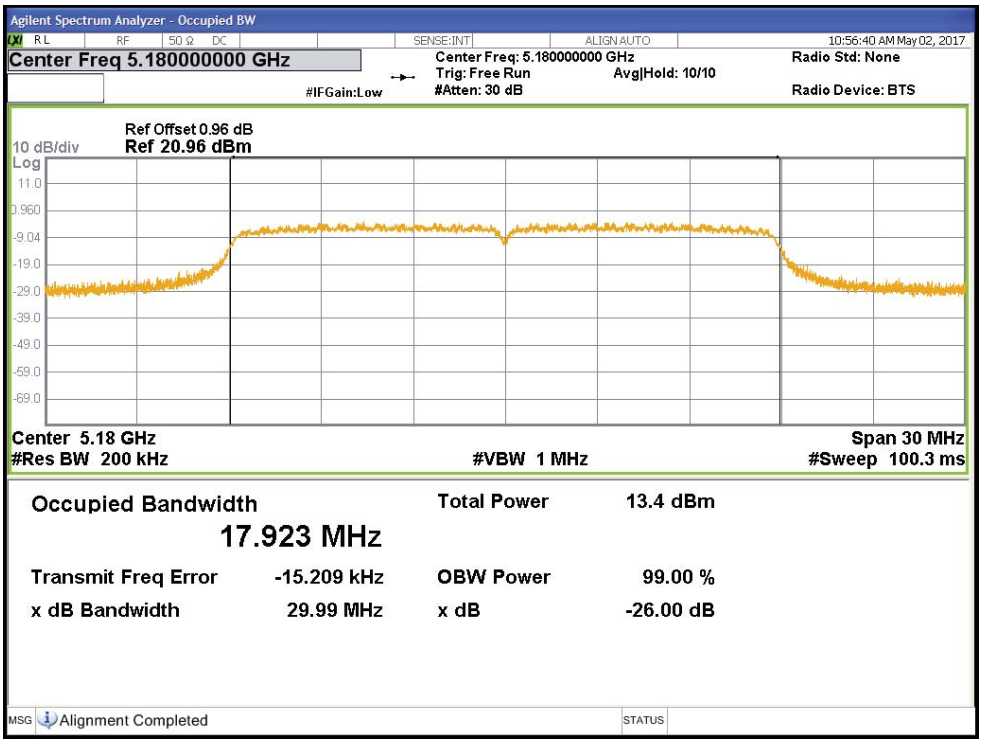


Figure 39: Occupied Bandwidth-5180 MHz-HT20

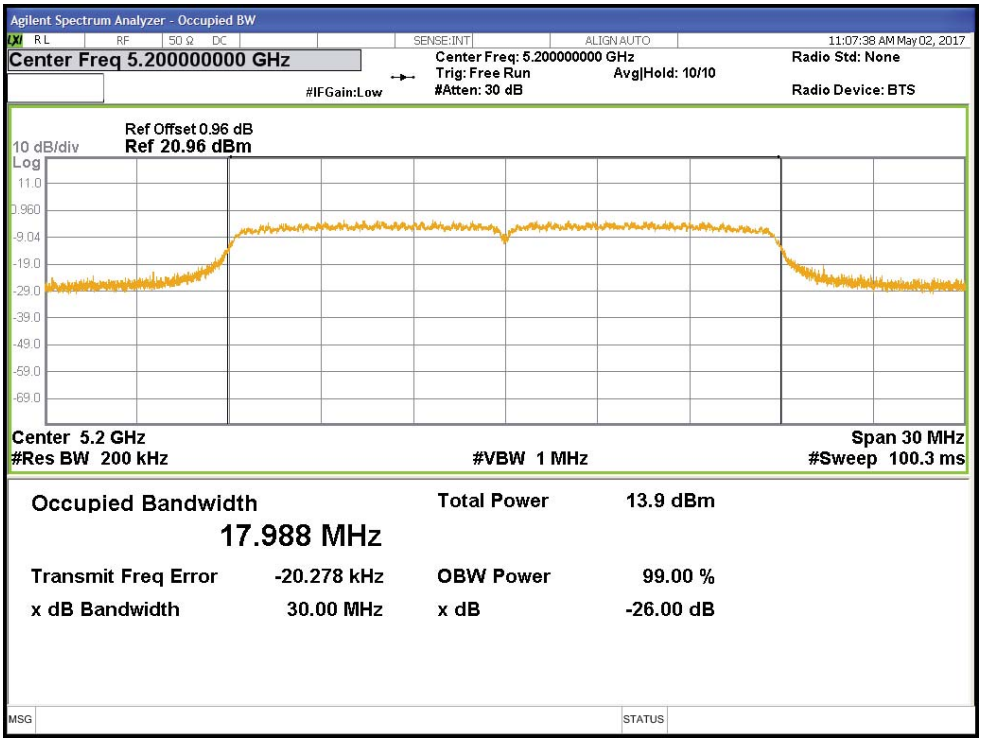


Figure 40: Occupied Bandwidth-5200 MHz-HT20

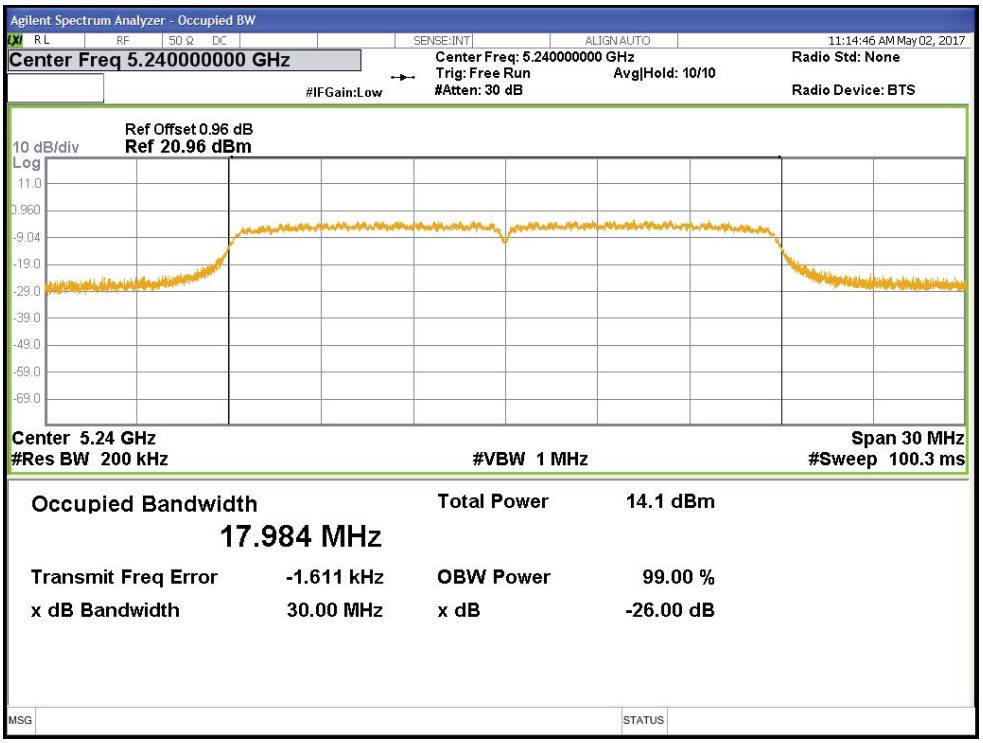


Figure 41: Occupied Bandwidth-5240 MHz-HT20

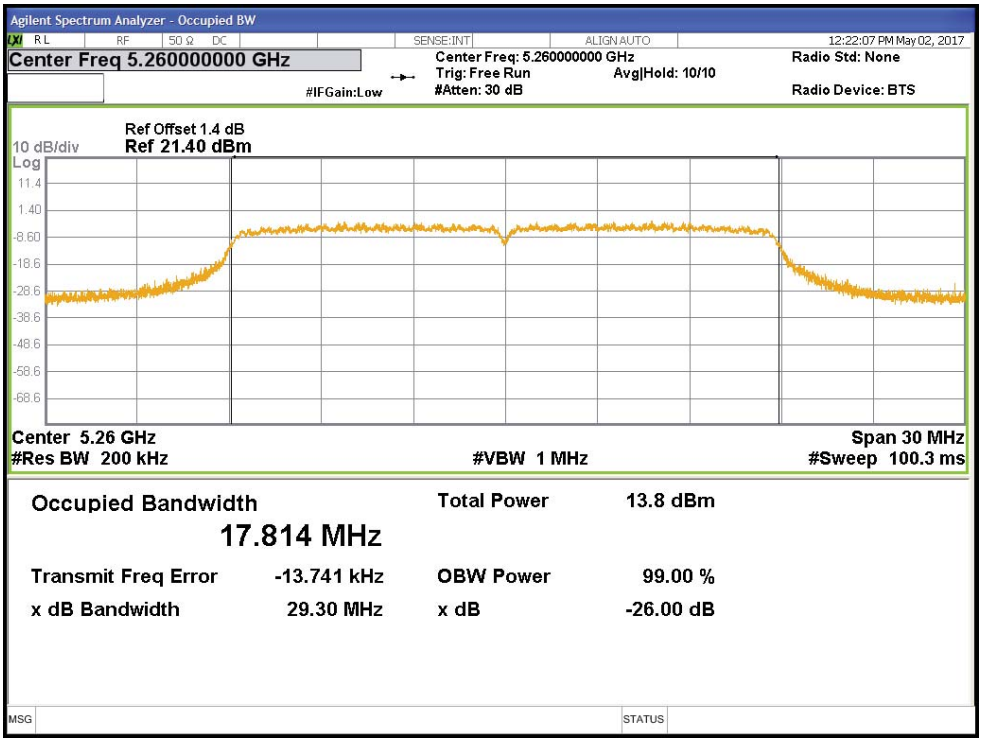


Figure 42: Occupied Bandwidth-5260 MHz-HT20

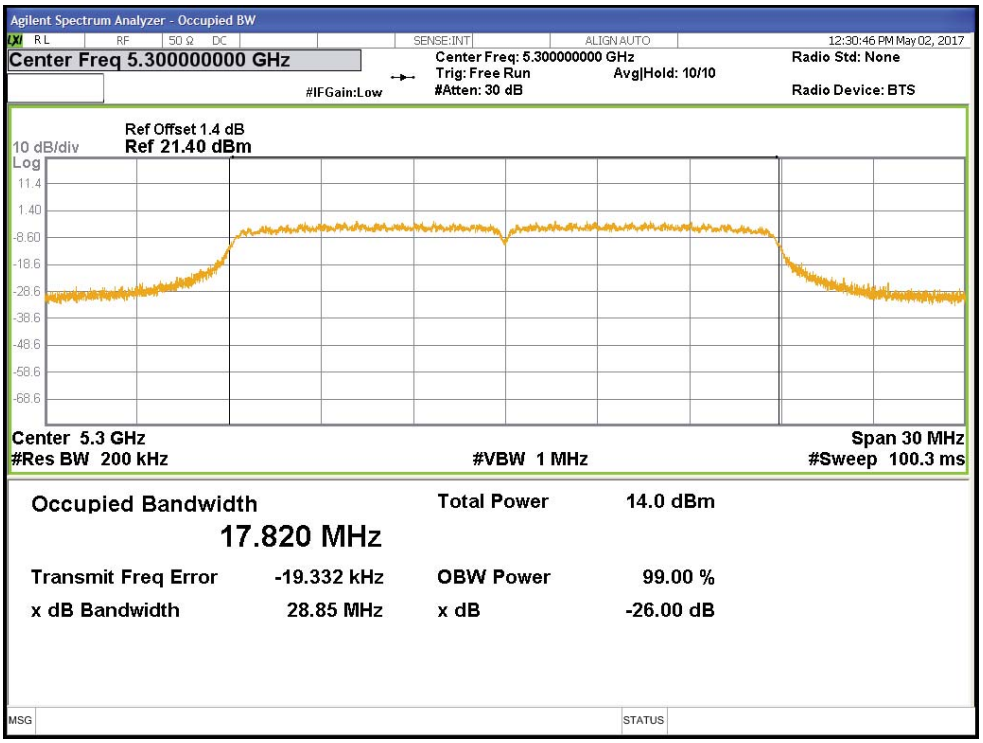


Figure 43: Occupied Bandwidth-5300 MHz-HT20

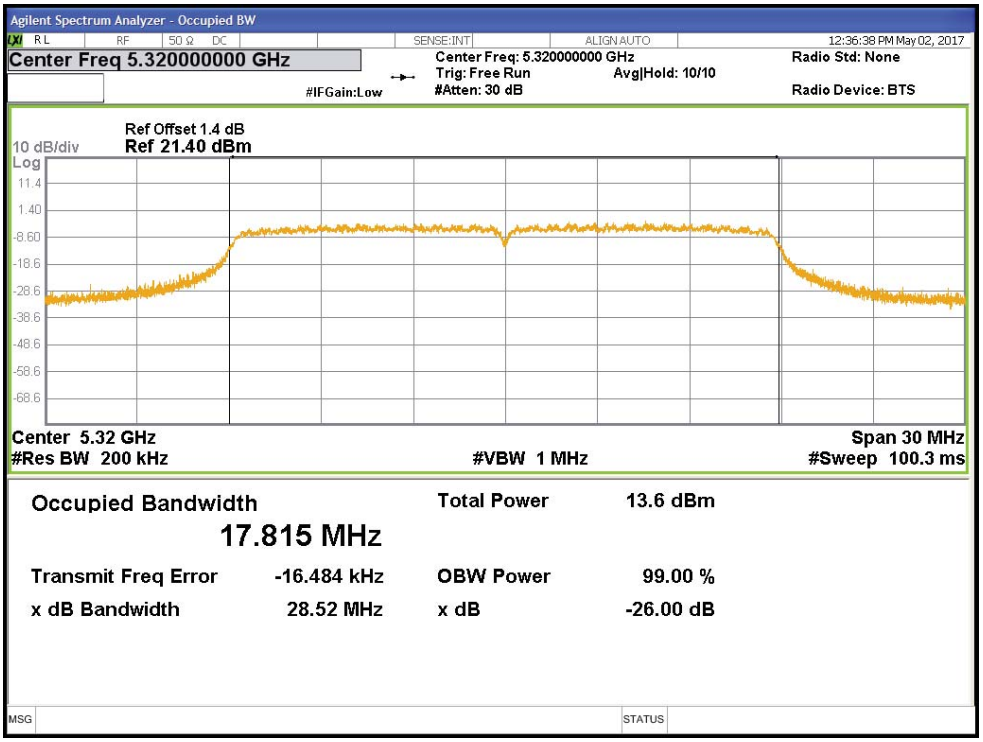


Figure 44: Occupied Bandwidth-5320 MHz-HT20

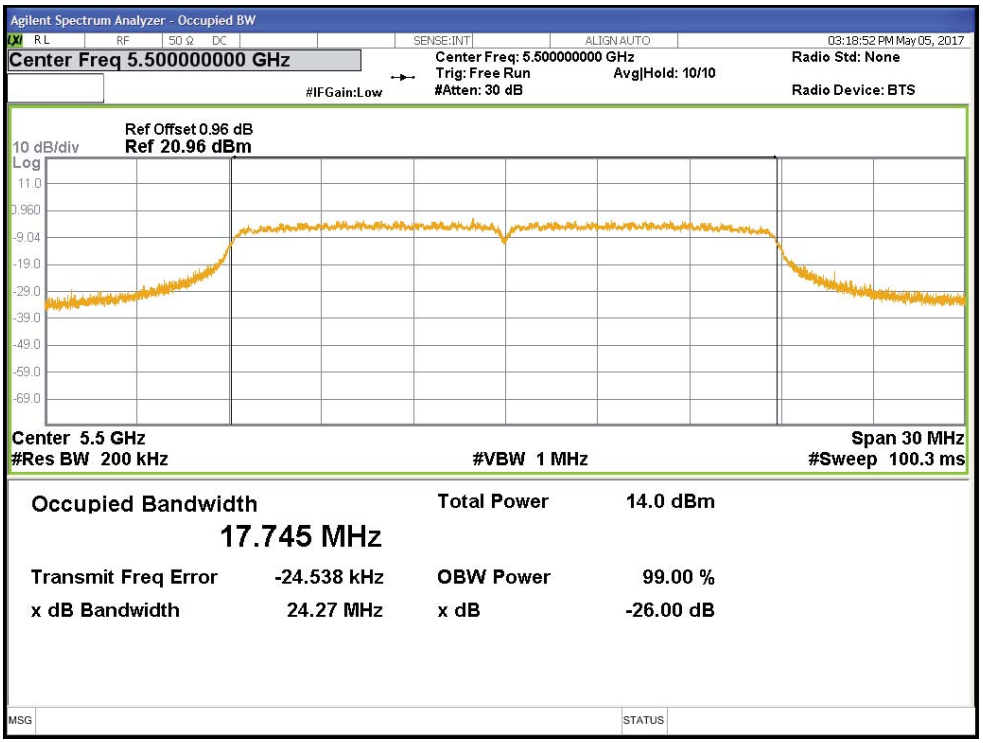


Figure 45: Occupied Bandwidth-5500 MHz-HT20

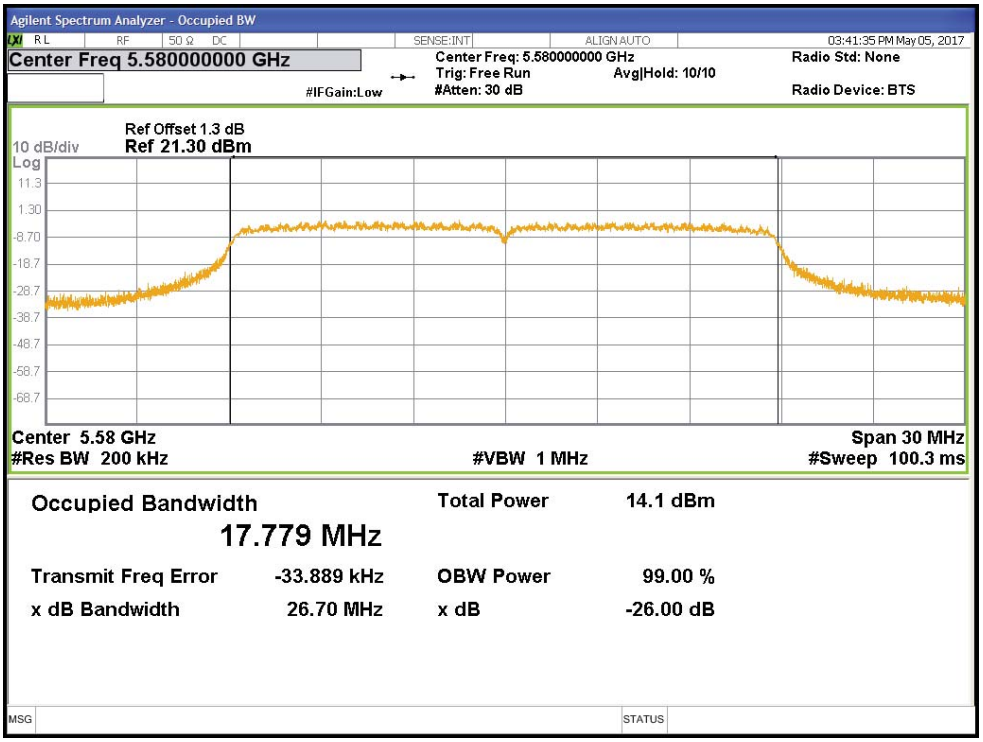


Figure 46: Occupied Bandwidth-5580 MHz-HT20

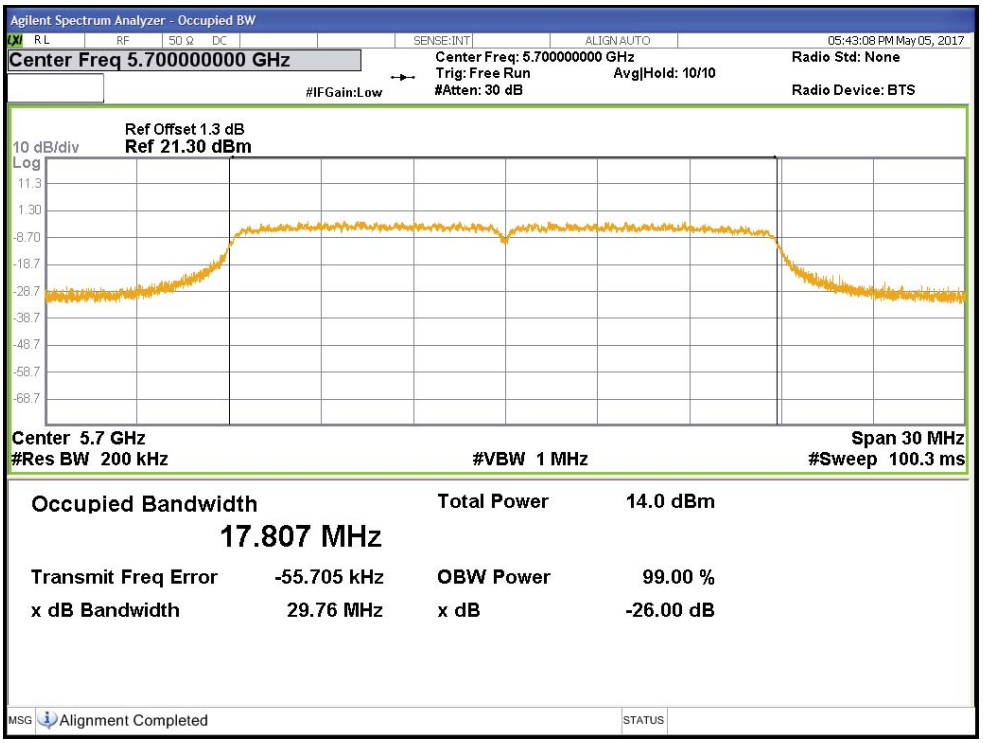


Figure 47: Occupied Bandwidth-5700 MHz-HT20

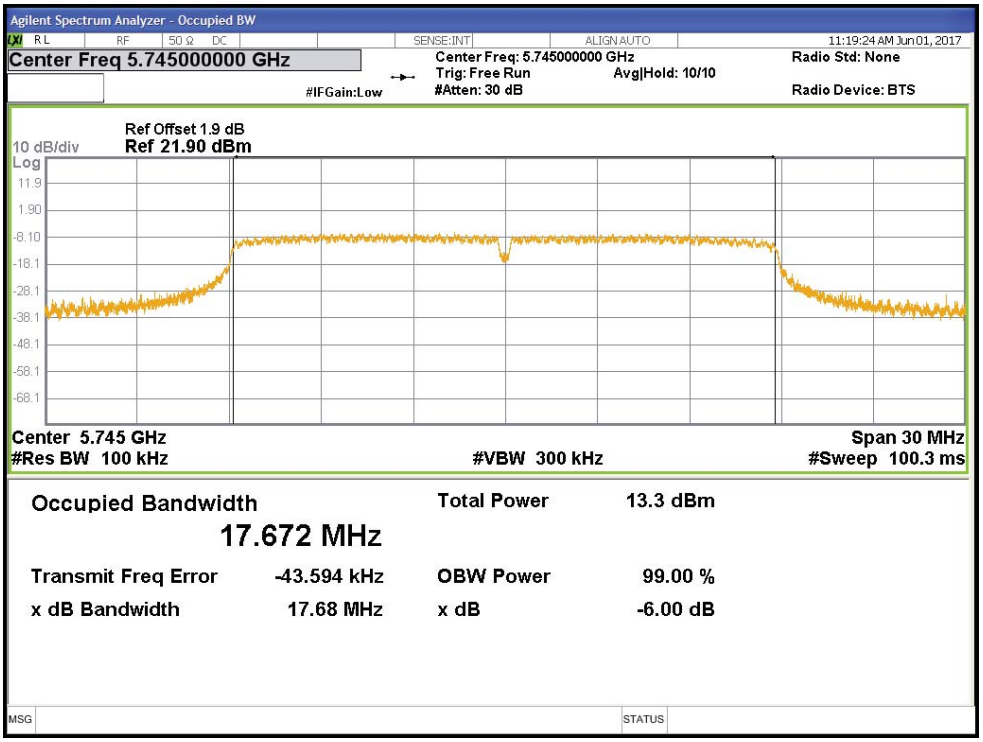


Figure 48: Occupied Bandwidth-5745 MHz-HT20

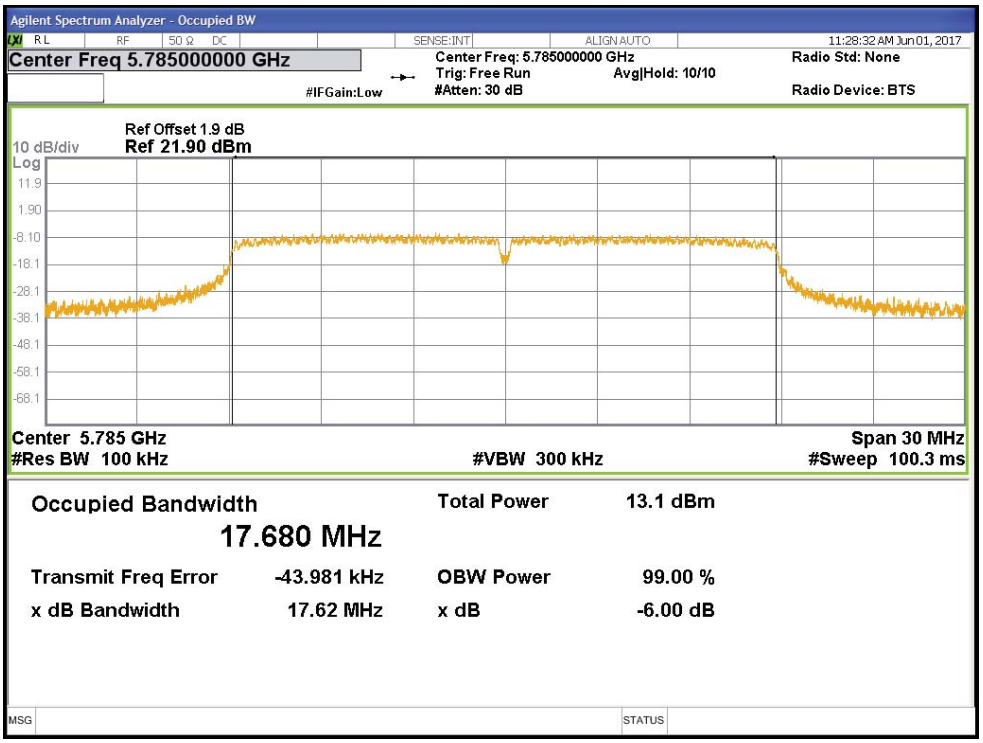


Figure 49: Occupied Bandwidth-5785 MHz-HT20

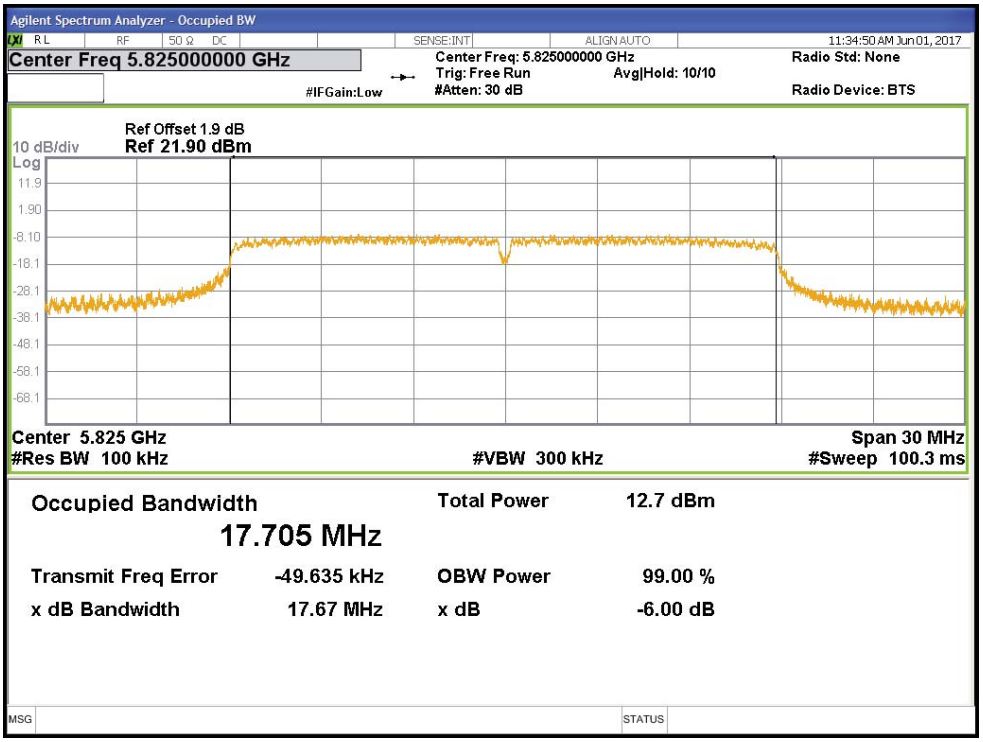


Figure 50: Occupied Bandwidth-5825 MHz-HT20

4.3 Power Spectral Density

According to the CFR47 Part 15.407 (a) and RSS 247 Sect. 6.2, the spectral power density output of the antenna port shall be as followed listed below during any time interval of continuous transmission.

The power spectral density limits per CFR47 Part 15.407 (a):

Band 5150-5250 MHz, 5250-5350 MHz, and 5470-5725 MHz: 11 dBm in any 1 MHz band

Band 5725-5850 MHz: 30 dBm in any 500 kHz band.

The power spectral density limits per RSS-247 Section 6.2:

Band 5150-5250 MHz: 10 dBm in any 1 MHz band, E.I.R.P.

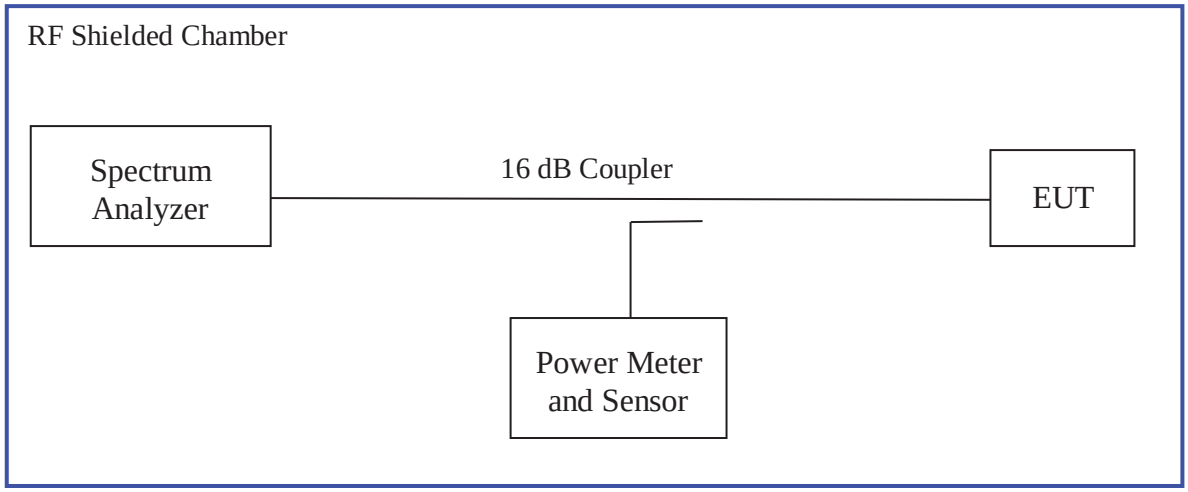
Band 5250-5350 MHz, and 5470-5725 MHz: 11 dBm in any 1 MHz band

Band 5725-5850 MHz: *30 dBm in any 500 kHz band*

4.3.1 Test Method

The conducted method was used to measure the channel power output per ANSI C63.10-2013 Section 12.3.2.2. The measurement was performed with modulation per CFR47 Part 15.407 (a) and RSS 247 Sect. 6.2. The pre-evaluation was performed to find the worst modes. The worst findings were conducted on 3 channels in each operating frequency range. The worst sample result indicated below.

Test Setup:



4.3.2 Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 5: Power Spectral Density – Test Results for 802.11a

Test Conditions: Conducted Measurement			**Date:** May 2, 2017		
Antenna Type: Chip			**Power Setting:** See test plan.		
Antenna Gain: 4.9 dBi			**Signal State:** Modulated at 100%, 6 Mbps		
Ambient Temp.: 23 °C			**Relative Humidity:**33%		
802.11a					
Freq. (MHz)	**Output [dBm]**	**CF [dB]**	**Total PPD [dBm]**	**Limit [dBm]**	**Margin [dB]**
5180	-2.69			11.00*	-13.69
5200	-2.58			11.00*	-13.58
5240	-2.19			11.00*	-13.19
5260	-2.91			11.00	-13.91
5300	-2.61			11.00	-13.61
5320	-2.90			11.00	-13.90
5500	-3.08			11.00	-14.08
5580	-2.81			11.00	-13.81
5700	-2.50			11.00	-13.50
5745	-2.49	-3.01	-5.50	30.00	-35.50
5785	-2.98	-3.01	-5.99	30.00	-35.99
5825	-3.03	-3.01	-6.04	30.00	-36.04
802.11a (RSS-247 Limit)					
5180	-2.69			5.10	-7.79
5200	-2.58			5.10	-7.68
5240	-2.19			5.10	-7.29

Note: (*) FCC limit only, 5150-5250 MHz.
RSS-247 and CFR47 Part 15.407 have same PPD limit in 5250-5350 MHz, 5470-5725 MHz, and 5725-5850 MHz bands.
CF accounted for the measured RBW; 10*log (500kHz/1000kHz) or -3.01 dB.
RSS-247 Limit at 5150-5250 MHz is eirp; 10dBm - 4.9dBi = 5.1 dBm

Table 6: Power Spectral Density – Test Results for 802.11n HT20

Test Conditions: Conducted Measurement	**Date:** May 2, 2017
Antenna Type: Chip	**Power Setting:** See test plan.
Antenna Gain: 4.9 dBi	**Signal State:** Modulated at 100%, 6.5 Mbps
Ambient Temp.: 23 °C	**Relative Humidity:**33%

802.11n HT20					
Freq. (MHz)	**Output [dBm]**	**CF [dB]**	**Total PPD [dBm]**	**Limit [dBm]**	**Margin [dB]**
5180	-2.93			11.00	-13.93
5200	-3.10			11.00	-14.10
5240	-2.83			11.00	-13.83
5260	-3.08			11.00	-14.08
5300	-2.68			11.00	-13.68
5320	-3.18			11.00	-14.18
5500	-2.71			11.00	-13.71
5580	-2.69			11.00	-13.69
5700	-2.74			11.00	-13.74
5745	-3.35	-3.01	-6.36	30.00	-36.36
5785	-3.02	-3.01	-6.03	30.00	-36.03
5825	-2.99	-3.01	-6.00	30.00	-36.00
802.11n HT20 (RSS-247 Limit)					
5180	-2.93			5.10	-8.03
5200	-3.10			5.10	-8.20
5240	-2.83			5.10	-7.93

Note: (*) FCC limit only, 5150-5250 MHz.
RSS-247 and CFR47 Part 15.407 have same PPD limit in 5250-5350 MHz, 5470-5725 MHz, and 5725-5850 MHz bands.
CF accounted for the measured RBW; 10*log (500kHz/1000kHz) or -3.01 dB.
RSS-247 Limit at 5150-5250 MHz is eirp; 10dBm - 4.9dBi = 5.1 dBm

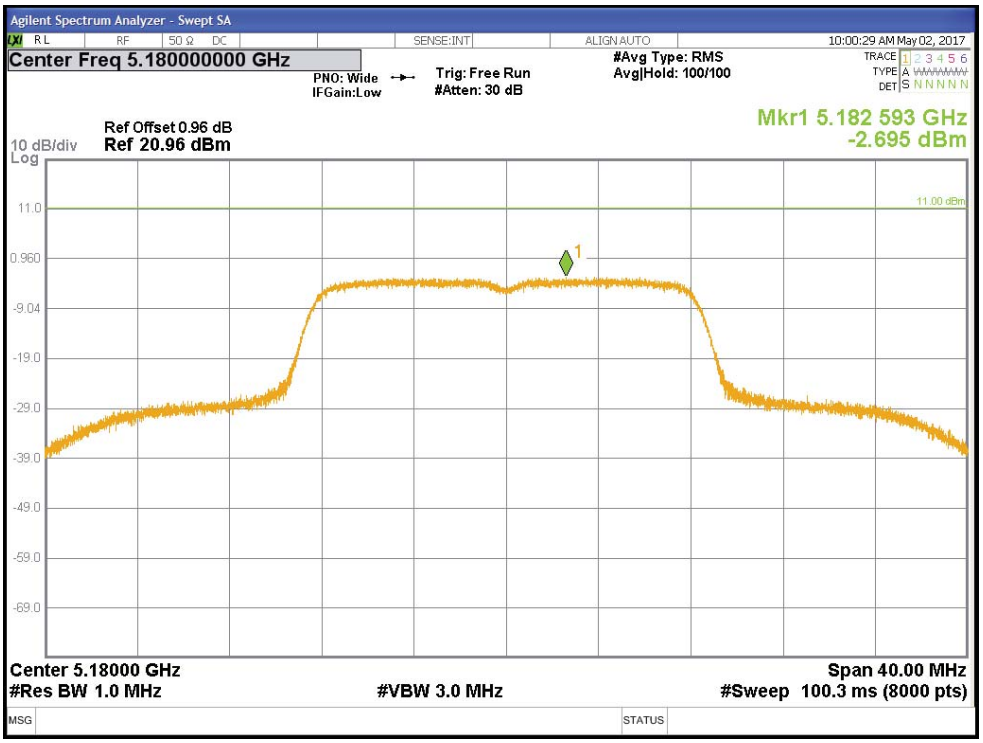


Figure 51: FCC-PPSD-5 GHz-5180 MHz-11a-6 Mbps

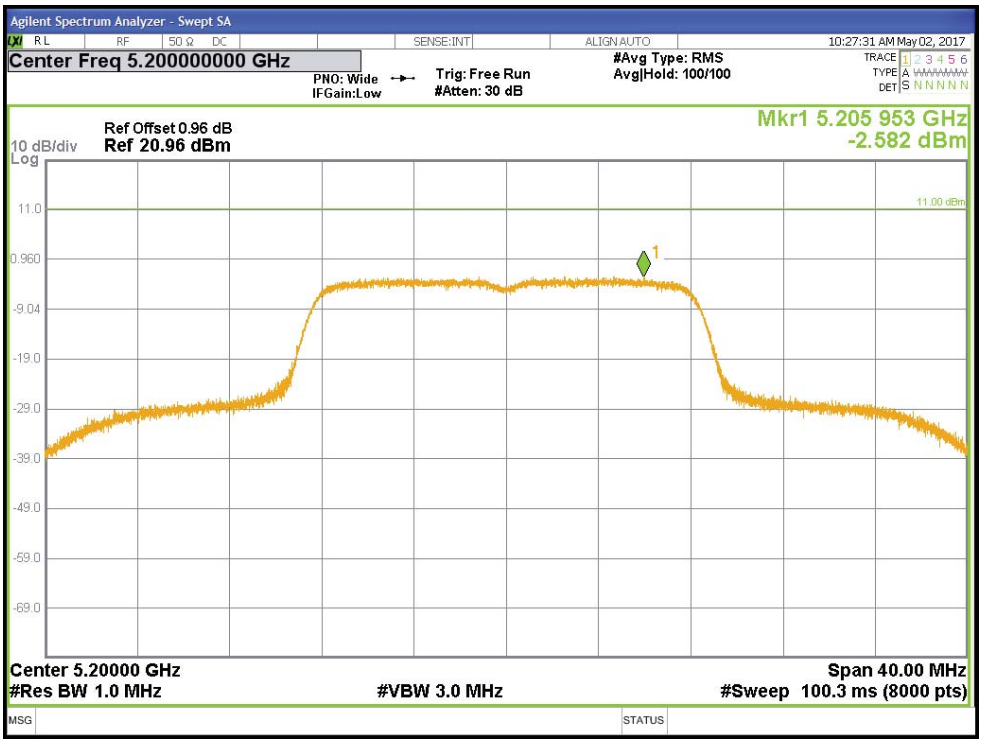


Figure 52: FCC-PPSD-5 GHz-5200 MHz-11a-6 Mbps

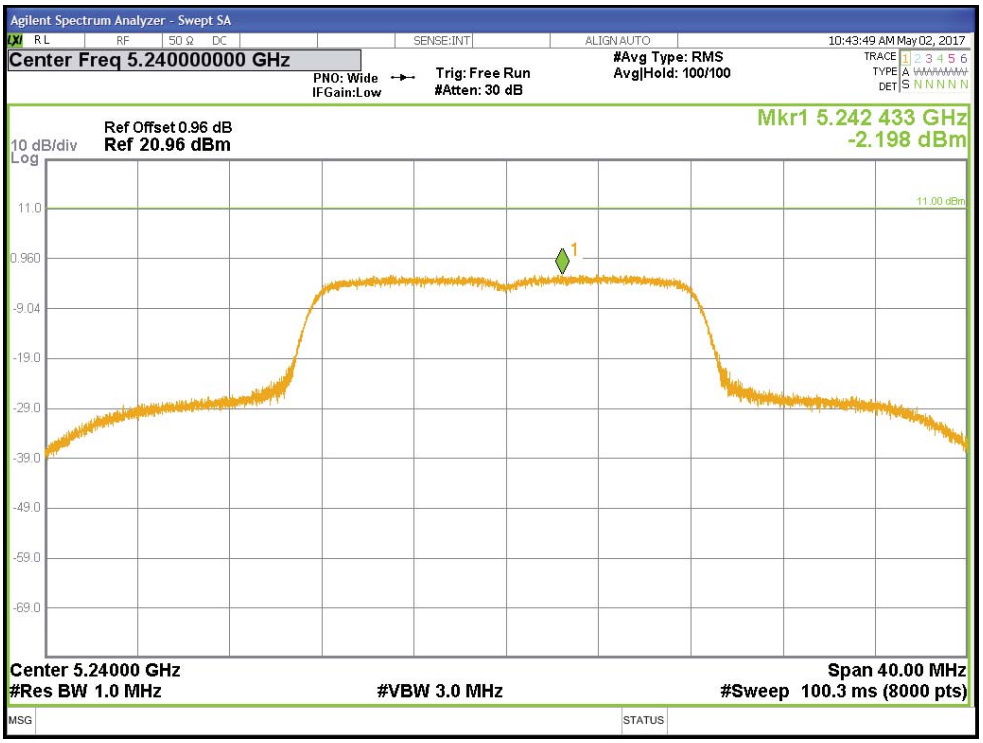


Figure 53: FCC-PPSD-5 GHz-5240 MHz-11a-6 Mbps

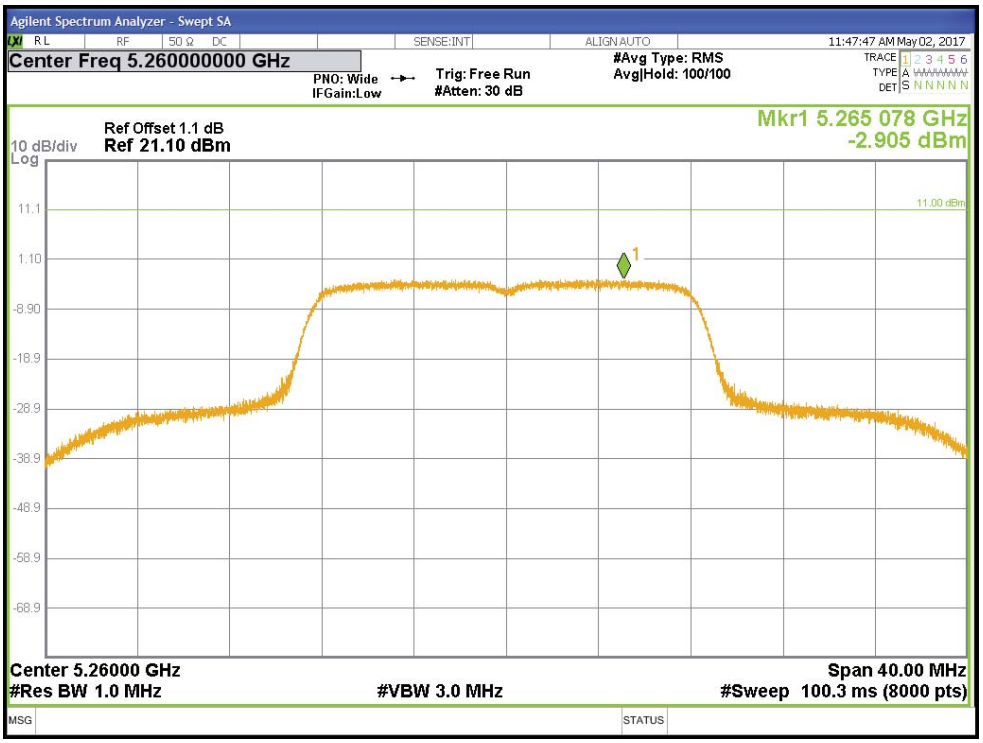


Figure 54: FCC-PPSD-5 GHz-5260 MHz-11a-6 Mbps

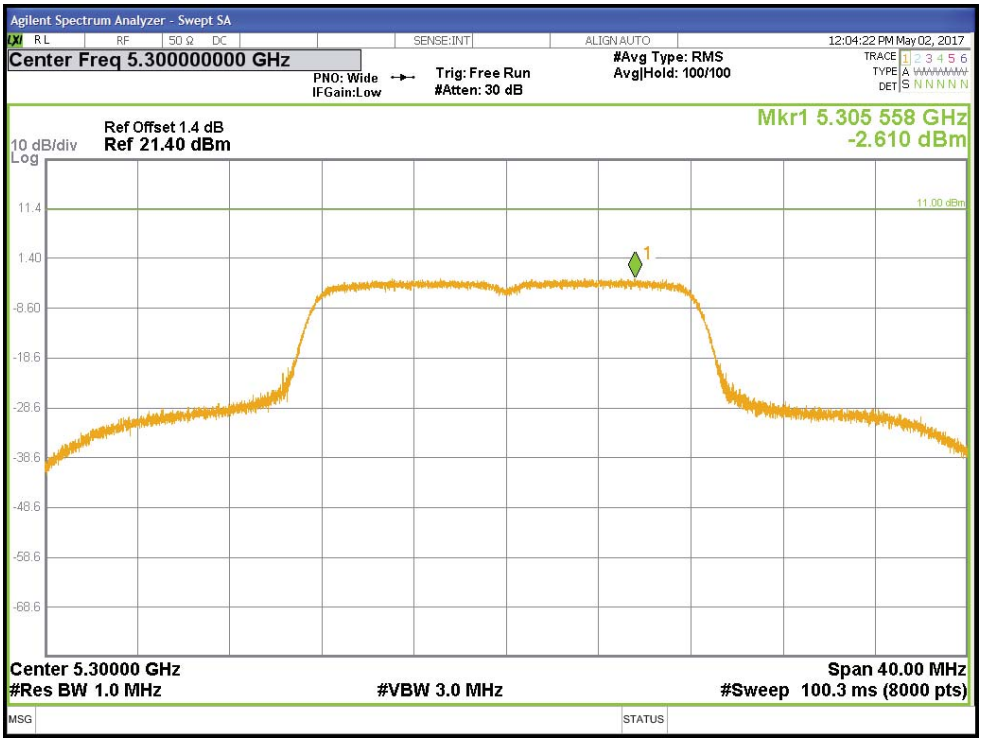


Figure 55: FCC-PPSD-5 GHz-5300 MHz-11a-6 Mbps

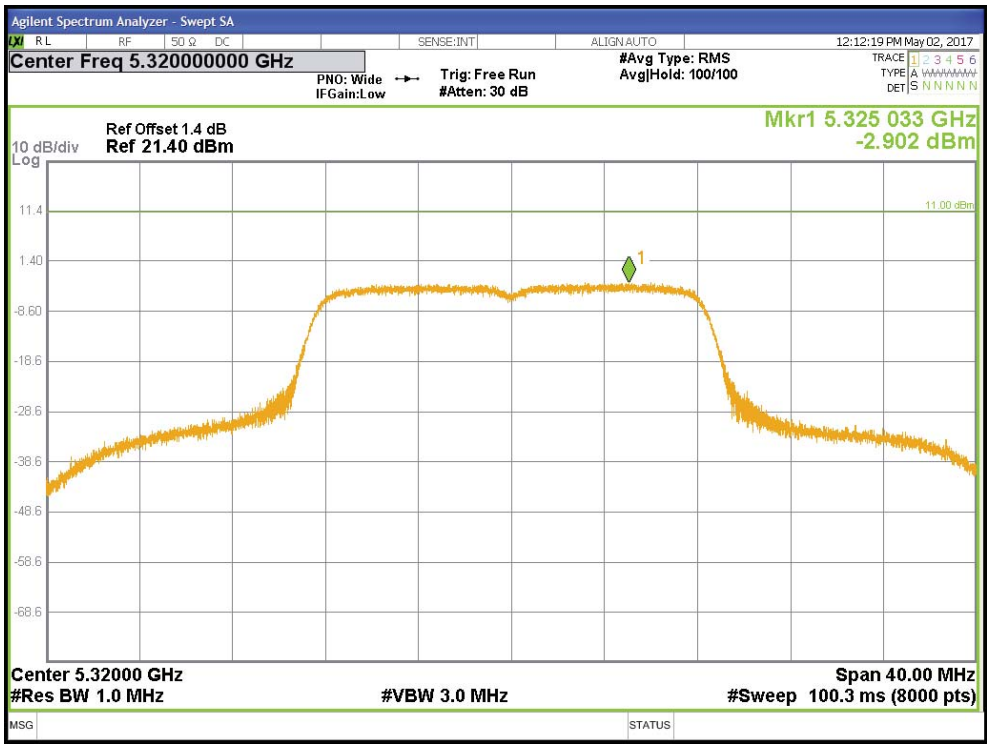


Figure 56: FCC-PPSD-5 GHz-5320 MHz-11a-6 Mbps

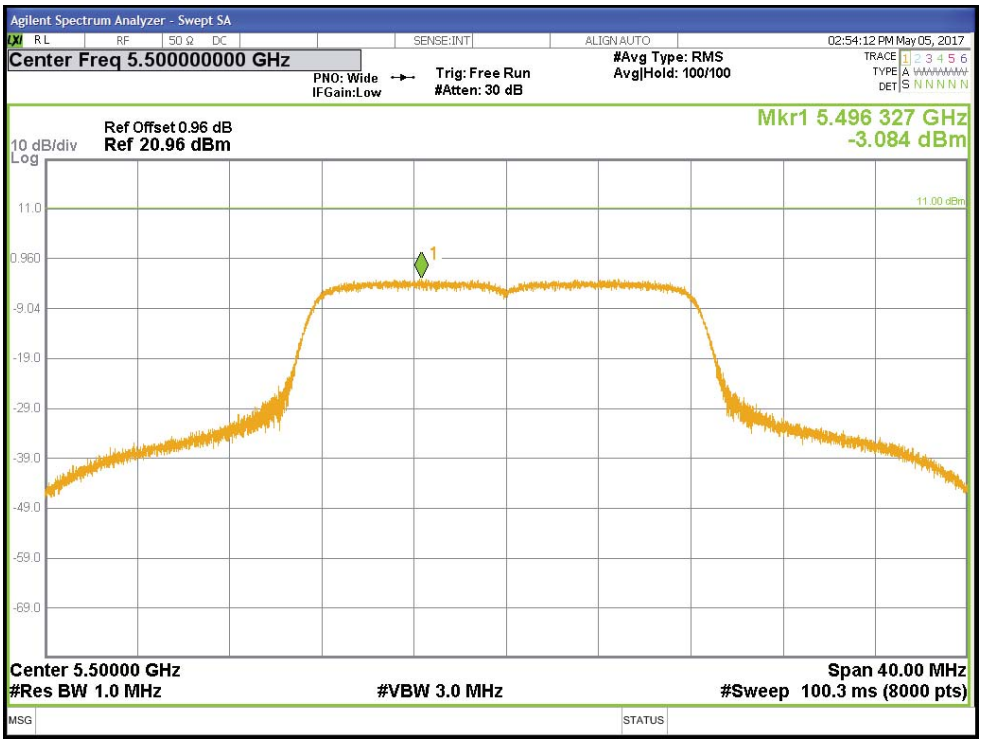


Figure 57: FCC-PPSD-5 GHz-5500 MHz-11a-6 Mbps

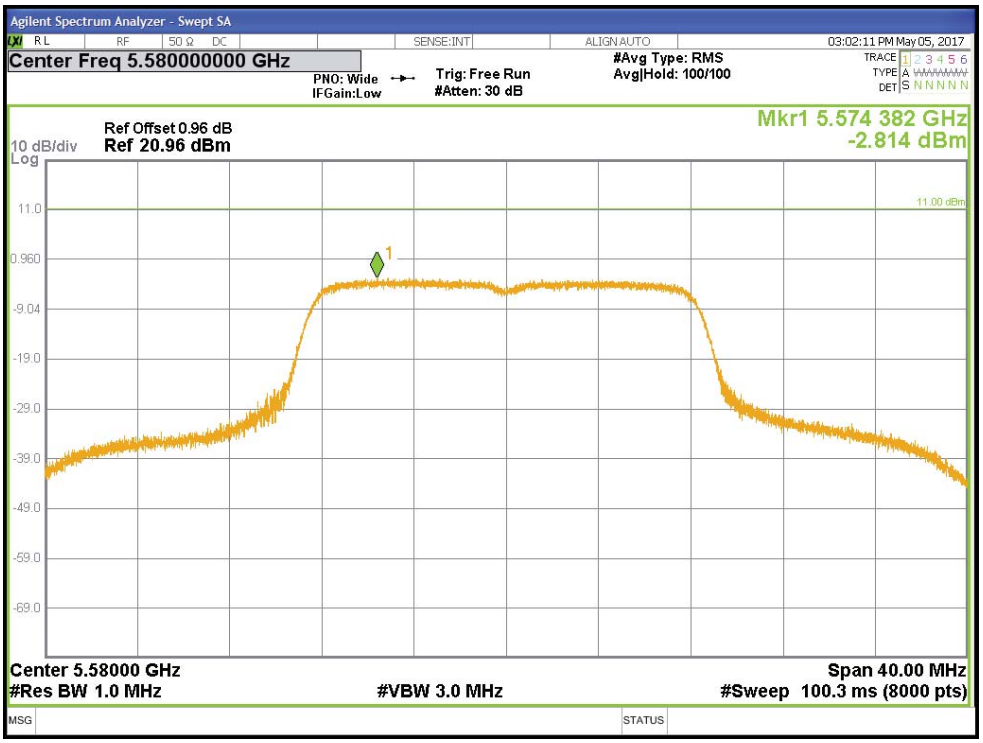


Figure 58: FCC-PPSD-5 GHz-5580 MHz-11a-6 Mbps

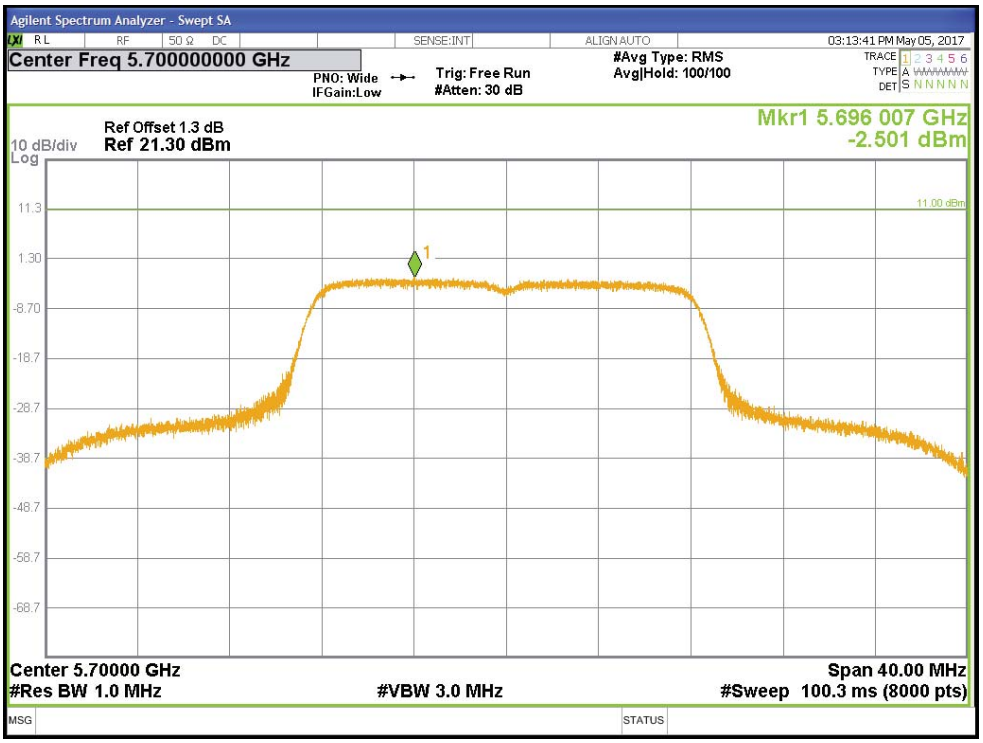


Figure 59: FCC-PPSD-5 GHz-5700 MHz-11a-6 Mbps

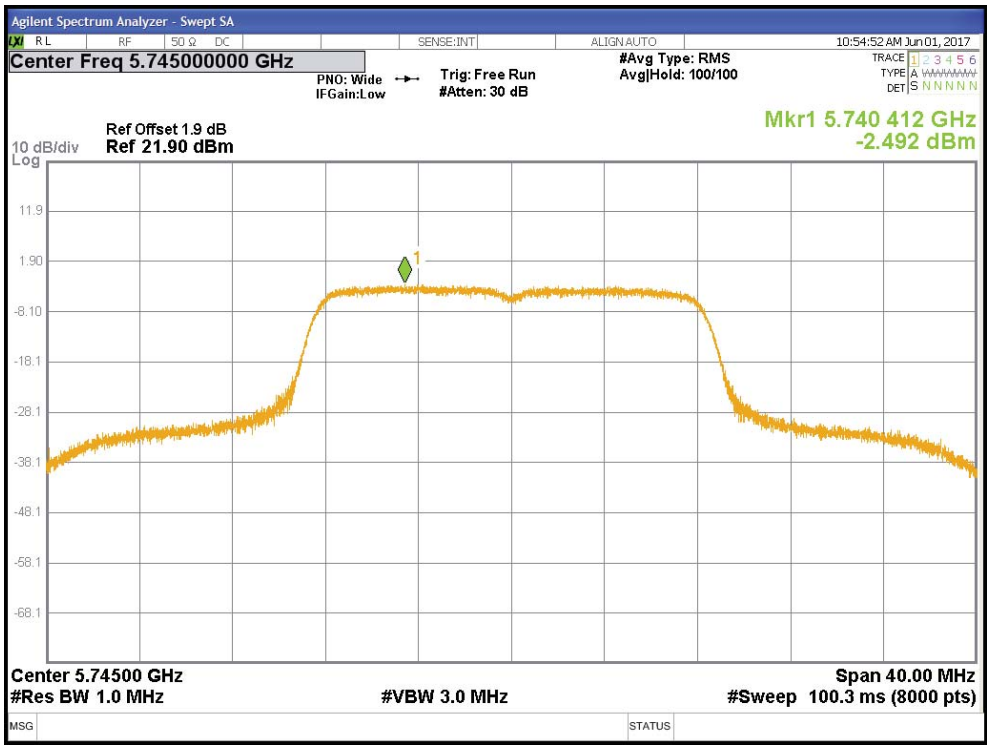


Figure 60: FCC-PPSD-5 GHz-5745 MHz-11a-6 Mbps

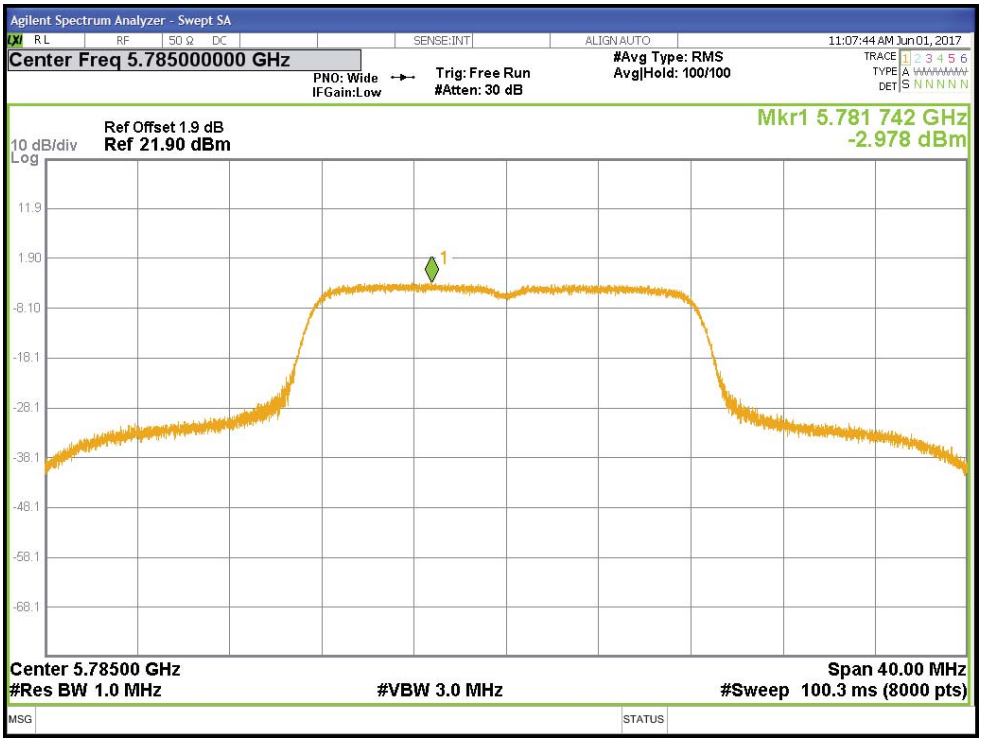


Figure 61: FCC-PPSD-5 GHz-5785 MHz-11a-6 Mbps

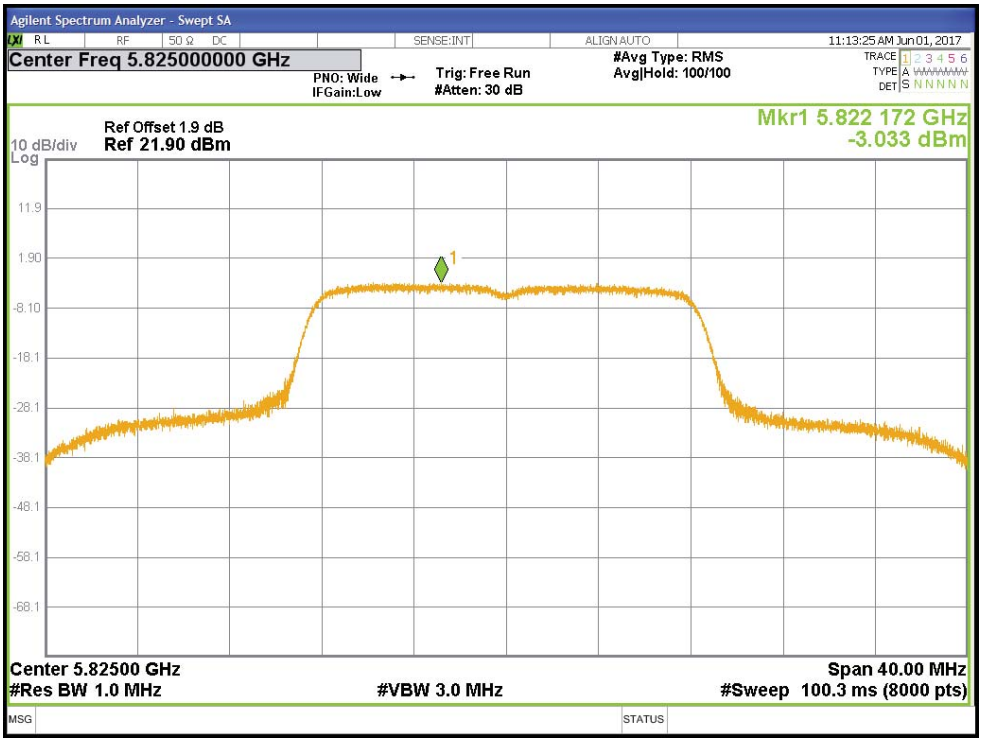


Figure 62: FCC-PPSD-5 GHz-5825 MHz-11a-6 Mbps

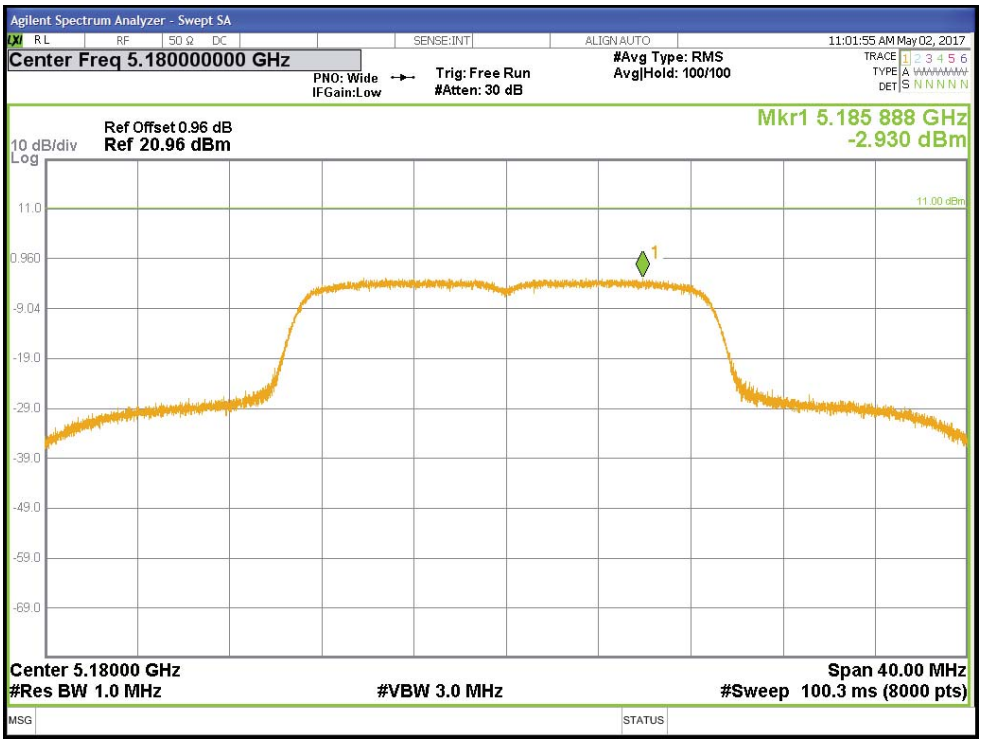


Figure 63: FCC-PPSD-5 GHz-5180 MHz-HT20-6.5 Mbps

4.4 Undesirable Emission Limits

CFR47 15.407 (b) and RSS 247 Sect.6.2.1.2, 6.2.2.2, and 6.2.3.2: 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.

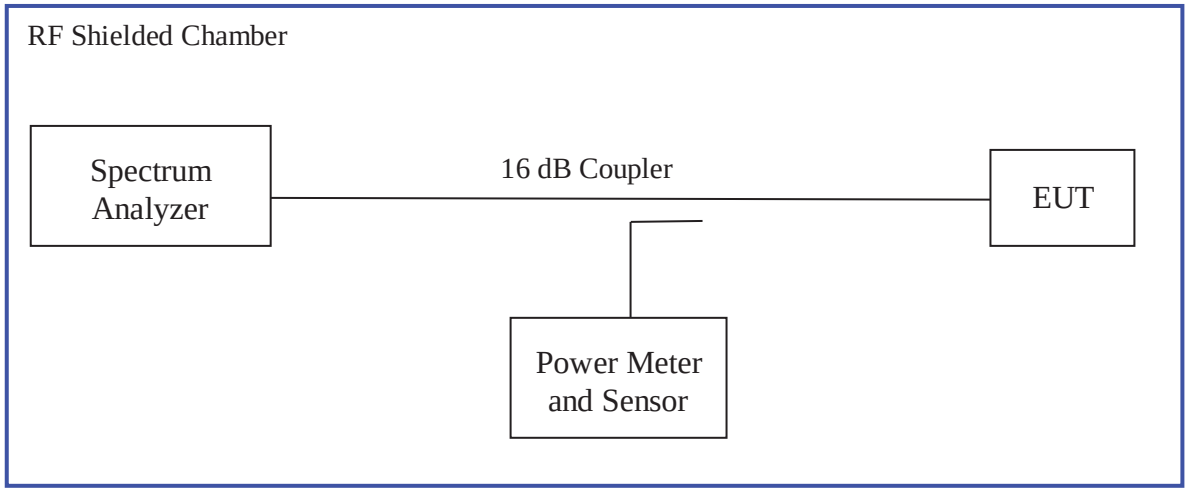
For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

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.

4.4.1 Test Method

The conducted method was used to measure the undesirable emission requirement. The measurement was performed with modulation. This test was conducted on 3 channels of Sample in each mode on Sample. The worst sample result indicated below.

Test Setup:



4.4.2 Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 7: Undesired Emissions for 802.11a – Test Results

Test Conditions: Conducted Measurement	**Date:** May 18, 2017
Antenna Type: Chip	**Power Setting:** See test plan.
Antenna Gain: 4.9 dBi	**Signal State:** Modulated at 100%
Ambient Temp.: 22° C	**Relative Humidity:**39%

Undesired Emissions for 802.11a

Frequency	Raw	Ant. Gain	CF	Level	Det.	Port	Limit	Margin	Comments
MHz	dBuV/m	dBi	dB	dBuV/m			cm	dB	
1729.88	-43.69	4.90	1.70	-37.09	Pk	RF	-27	-10.09	11a, 5180MHz, 6.0Mbps
3453.29	-50.89	4.90	1.70	-44.29	Pk	RF	-27	-17.29	11a, 5180MHz, 6.0Mbps
6906.50	-50.47	4.90	1.70	-43.87	Pk	RF	-27	-16.87	11a, 5180MHz, 6.0Mbps
10363.66	-43.15	4.90	1.70	-36.55	Pk	RF	-27	-9.55	11a, 5180MHz, 6.0Mbps
39126.78	-44.36	4.90	1.70	-37.76	Pk	RF	-27	-10.76	11a, 5180MHz, 6.0Mbps
1734.57	-44.55	4.90	1.70	-37.95	Pk	RF	-27	-10.95	11a, 5200MHz, 6.0Mbps
3466.51	-48.99	4.90	1.70	-42.39	Pk	RF	-27	-15.39	11a, 5200MHz, 6.0Mbps
6932.66	-52.09	4.90	1.70	-45.49	Pk	RF	-27	-18.49	11a, 5200MHz, 6.0Mbps
10408.96	-43.10	4.90	1.70	-36.50	Pk	RF	-27	-9.50	11a, 5200MHz, 6.0Mbps
1752.53	-43.47	4.90	1.70	-36.87	Pk	RF	-27	-9.87	11a, 5240MHz, 6.0Mbps
3489.60	-46.40	4.90	1.70	-39.80	Pk	RF	-27	-12.80	11a, 5240MHz, 6.0Mbps
10481.60	-45.76	4.90	1.70	-39.16	Pk	RF	-27	-12.16	11a, 5240MHz, 6.0Mbps
1754.10	-42.22	4.90	1.70	-35.62	Pk	RF	-27	-8.62	11a, 5260MHz, 6.0Mbps
3506.78	-44.37	4.90	1.70	-37.77	Pk	RF	-27	-10.77	11a, 5260MHz, 6.0Mbps
10521.43	-45.28	4.90	1.70	-38.68	Pk	RF	-27	-11.68	11a, 5260MHz, 6.0Mbps
1772.06	-42.70	4.90	1.70	-36.10	Pk	RF	-27	-9.10	11a, 5300MHz, 6.0Mbps
3533.34	-42.29	4.90	1.70	-35.69	Pk	RF	-27	-8.69	11a, 5300MHz, 6.0Mbps
10599.32	-53.21	4.90	1.70	-46.61	Pk	RF	-27	-19.61	11a, 5300MHz, 6.0Mbps
1776.75	-41.20	4.90	1.70	-34.60	Pk	RF	-27	-7.60	11a, 5320MHz, 6.0Mbps
3550.52	-41.91	4.90	1.70	-35.31	Pk	RF	-27	-8.31	11a, 5320MHz, 6.0Mbps
10643.23	-49.90	4.90	1.70	-43.30	Pk	RF	-27	-16.30	11a, 5320MHz, 6.0Mbps
1830.64	-45.28	4.90	1.70	-38.68	Pk	RF	-27	-11.68	11a, 5500MHz, 6.0Mbps
3666.77	-49.04	4.90	1.70	-42.44	Pk	RF	-27	-15.44	11a, 5500MHz, 6.0Mbps
1854.85	-45.54	4.90	1.70	-38.94	Pk	RF	-27	-11.94	11a, 5580MHz, 6.0Mbps

3720.01	-46.26	4.90	1.70	-39.66	Pk	RF	-27	-12.66	11a, 5580MHz, 6.0Mbps
1896.80	-49.85	4.90	1.70	-43.25	Pk	RF	-27	-16.25	11a, 5700MHz, 6.0Mbps
3799.68	-46.34	4.90	1.70	-39.74	Pk	RF	-27	-12.74	11a, 5700MHz, 6.0Mbps
11393.76	-52.43	4.90	1.70	-45.83	Pk	RF	-27	-18.83	11a, 5700MHz, 6.0Mbps
1911.01	-52.31	4.90	1.70	-45.71	Pk	RF	-27	-18.71	11a, 5745MHz, 6.0Mbps
3830.14	-46.88	4.90	1.70	-40.28	Pk	RF	-27	-13.28	11a, 5745MHz, 6.0Mbps
1932.38	-54.03	4.90	1.70	-47.43	Pk	RF	-27	-20.43	11a, 5785MHz, 6.0Mbps
3875.44	-37.39	4.90	1.70	-30.79	Pk	RF	-27	-3.79	11a, 5785MHz, 6.0Mbps
4814.27	-38.70	4.90	1.70	-32.10	Pk	RF	-27	-5.10	11a, 5785MHz, 6.0Mbps
6738.07	-49.20	4.90	1.70	-42.60	Pk	RF	-27	-15.60	11a, 5785MHz, 6.0Mbps
3890.28	-37.09	4.90	1.70	-30.49	Pk	RF	-27	-3.49	11a, 5825MHz, 6.0Mbps
4844.73	-34.99	4.90	1.70	-28.39	Pk	RF	-27	-1.39	11a, 5825MHz, 6.0Mbps

Note: 1. Worst case observed at 6.0Mbps.

2. All out of band emissions are lower than the -27dBm level.

3. 99% OBW emission of 5240MHz operating channel did not leak into 5250 MHz-5350 MHz band. See Fig. 112.

4. Emissions of UNII3 channels met the band-edge spectrum mask.

Table 8: Undesired Emissions for 802.11n HT20 – Test Results

Test Conditions: Conducted Measurement	**Date:** May 18, 2017
Antenna Type: Chip	**Power Setting:** See test plan.
Antenna Gain: 4.9 dBi	**Signal State:** Modulated at 100%
Ambient Temp.: 22° C	**Relative Humidity:**39%

Undesired Emissions for 802.11n HT20

Frequency	Raw	Ant. Gain	CF	Level	Det.	Port	Limit	Margin	Comments
MHz	dBuV/m	dBi	dB	dBuV/m			cm	dB	
1733.79	-44.76	4.90	1.70	-38.16	Pk	RF	-27	-11.16	HT20, 5180MHz, 6.5Mbps
3453.60	-50.70	4.90	1.70	-44.10	Pk	RF	-27	-17.10	HT20, 5180MHz, 6.5Mbps
6906.46	-50.19	4.90	1.70	-43.59	Pk	RF	-27	-16.59	HT20, 5180MHz, 6.5Mbps
10354.29	-41.97	4.90	1.70	-35.37	Pk	RF	-27	-8.37	HT20, 5180MHz, 6.5Mbps
1738.47	-43.50	4.90	1.70	-36.90	Pk	RF	-27	-9.90	HT20, 5200MHz, 6.5Mbps
3466.91	-48.95	4.90	1.70	-42.35	Pk	RF	-27	-15.35	HT20, 5200MHz, 6.5Mbps
6932.79	-51.71	4.90	1.70	-45.11	Pk	RF	-27	-18.11	HT20, 5200MHz, 6.5Mbps
10399.59	-44.06	4.90	1.70	-37.46	Pk	RF	-27	-10.46	HT20, 5200MHz, 6.5Mbps
1754.10	-43.05	4.90	1.70	-36.45	Pk	RF	-27	-9.45	HT20, 5240MHz, 6.5Mbps
3493.70	-48.63	4.90	1.70	-42.03	Pk	RF	-27	-15.03	HT20, 5240MHz, 6.5Mbps
6986.45	-52.54	4.90	1.70	-45.94	Pk	RF	-27	-18.94	HT20, 5240MHz, 6.5Mbps
10484.73	-45.68	4.90	1.70	-39.08	Pk	RF	-27	-12.08	HT20, 5240MHz, 6.5Mbps
1760.34	-42.91	4.90	1.70	-36.31	Pk	RF	-27	-9.31	HT20, 5260MHz, 6.5Mbps
3506.00	-46.59	4.90	1.70	-39.99	Pk	RF	-27	-12.99	HT20, 5260MHz, 6.5Mbps
10524.58	-50.84	4.90	1.70	-44.24	Pk	RF	-27	-17.24	HT20, 5260MHz, 6.5Mbps
1764.25	-43.21	4.90	1.70	-36.61	Pk	RF	-27	-9.61	HT20, 5300MHz, 6.5Mbps
3532.56	-43.51	4.90	1.70	-36.91	Pk	RF	-27	-9.91	HT20, 5300MHz, 6.5Mbps
10601.50	-51.27	4.90	1.70	-44.67	Pk	RF	-27	-17.67	HT20, 5300MHz, 6.5Mbps
1779.87	-41.50	4.90	1.70	-34.90	Pk	RF	-27	-7.90	HT20, 5320MHz, 6.5Mbps
3546.62	-42.93	4.90	1.70	-36.33	Pk	RF	-27	-9.33	HT20, 5320MHz, 6.5Mbps
10644.76	-52.59	4.90	1.70	-45.99	Pk	RF	-27	-18.99	HT20, 5320MHz, 6.5Mbps
1829.86	-43.65	4.90	1.70	-37.05	Pk	RF	-27	-10.05	HT20, 5500MHz, 6.5Mbps
2435.96	-46.43	4.90	1.70	-39.83	Pk	RF	-27	-12.83	HT20, 5500MHz, 6.5Mbps
3678.61	-45.59	4.90	1.70	-38.99	Pk	RF	-27	-11.99	HT20, 5500MHz, 6.5Mbps
10996.36	-51.74	4.90	1.70	-45.14	Pk	RF	-27	-18.14	HT20, 5500MHz, 6.5Mbps
1859.54	-46.42	4.90	1.70	-39.82	Pk	RF	-27	-12.82	HT20, 5580MHz, 6.5Mbps
2474.48	-53.00	4.90	1.70	-46.40	Pk	RF	-27	-19.40	HT20, 5580MHz, 6.5Mbps
3720.01	-46.79	4.90	1.70	-40.19	Pk	RF	-27	-13.19	HT20, 5580MHz, 6.5Mbps

3830.14	-46.97	4.90	1.70	-40.37	Pk	RF	-27	-13.37	HT20, 5745MHz, 6.5Mbps
3874.66	-37.26	4.90	1.70	-30.66	Pk	RF	-27	-3.66	HT20, 5785MHz, 6.5Mbps
4827.55	-39.02	4.90	1.70	-32.42	Pk	RF	-27	-5.42	HT20, 5785MHz, 6.5Mbps
11568.43	-50.21	4.90	1.70	-43.61	Pk	RF	-27	-16.61	HT20, 5785MHz, 6.5Mbps
3887.94	-39.99	4.90	1.70	-33.39	Pk	RF	-27	-6.39	HT20, 5825MHz, 6.5Mbps
4846.29	-35.97	4.90	1.70	-29.37	Pk	RF	-27	-2.37	HT20, 5825MHz, 6.5Mbps

Note: 1. Worst case observed at 6.5Mbps.
2. All out of band emissions are lower than the -27dBm level.
3. 99% OBW emission of 5240MHz operating channel did not leak into 5250 MHz-5350 MHz band. See Fig. 113.
4. Emissions of UNII3 channels met the band-edge spectrum mask.

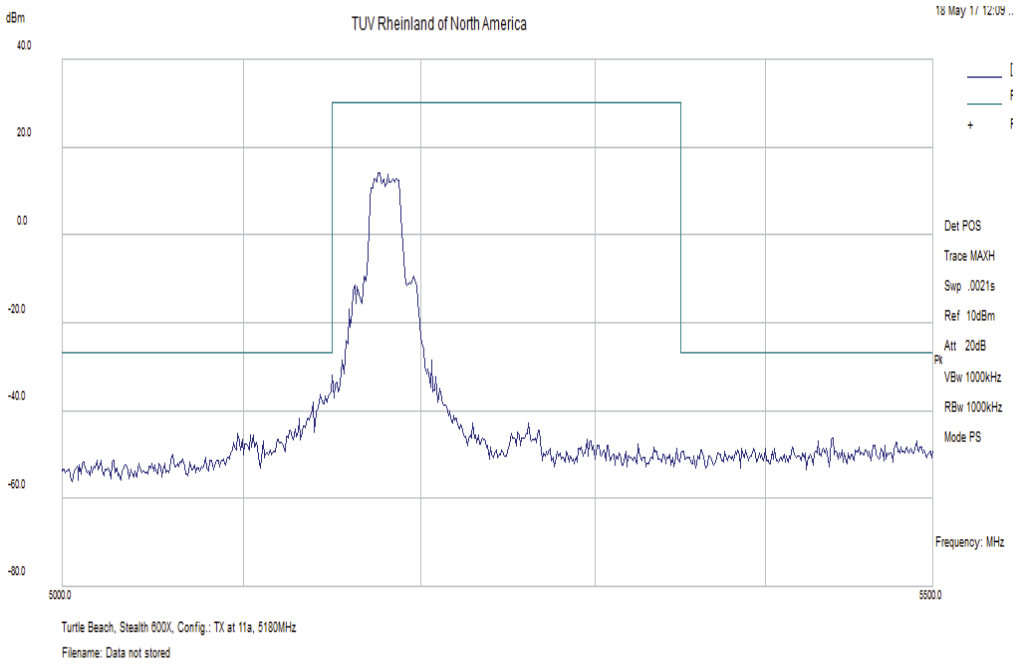


Figure 64: Measured Band-edge for 802.11a-6 Mbps at 5180 MHz

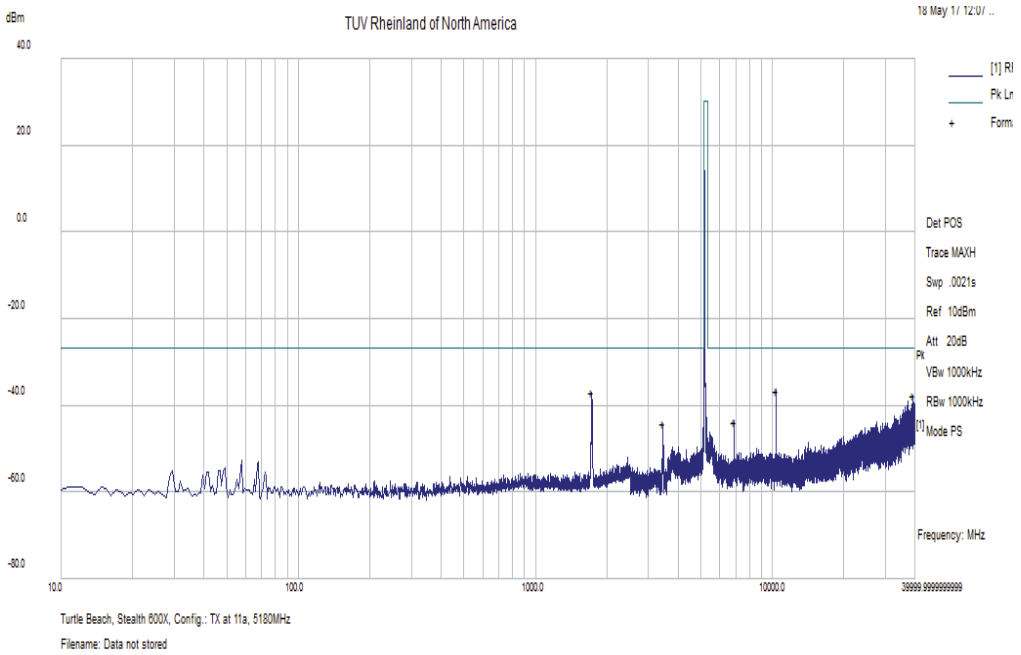


Figure 65: Undesirable Emission for 802.11a-6 Mbps at 5180 MHz

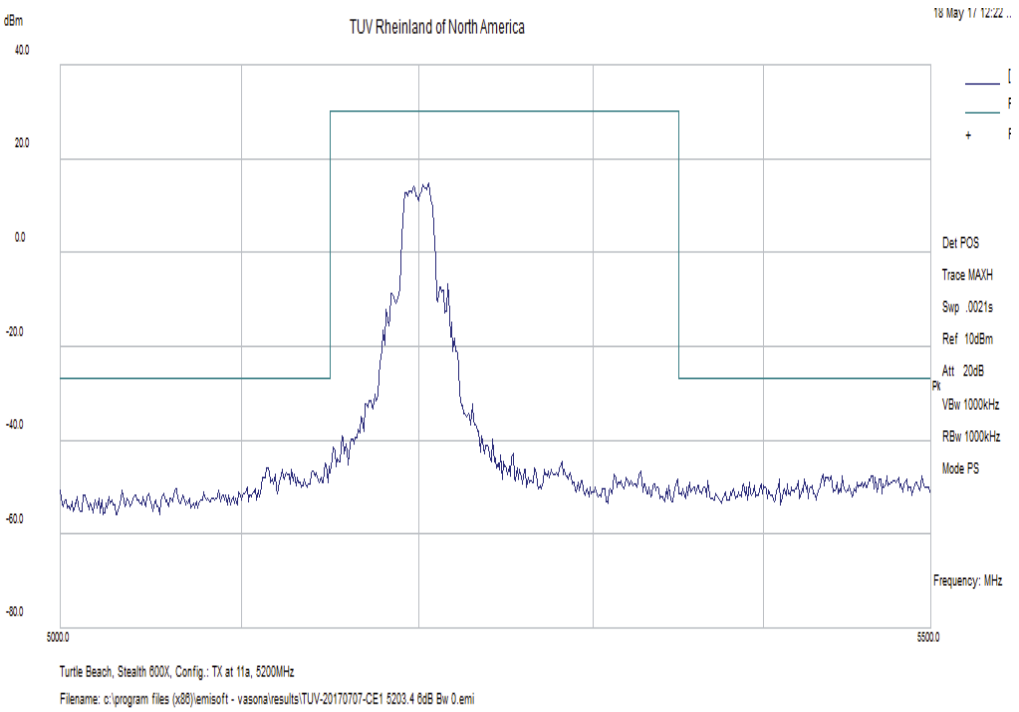


Figure 66: Measured Band-edge for 802.11a-6 Mbps at 5200 MHz

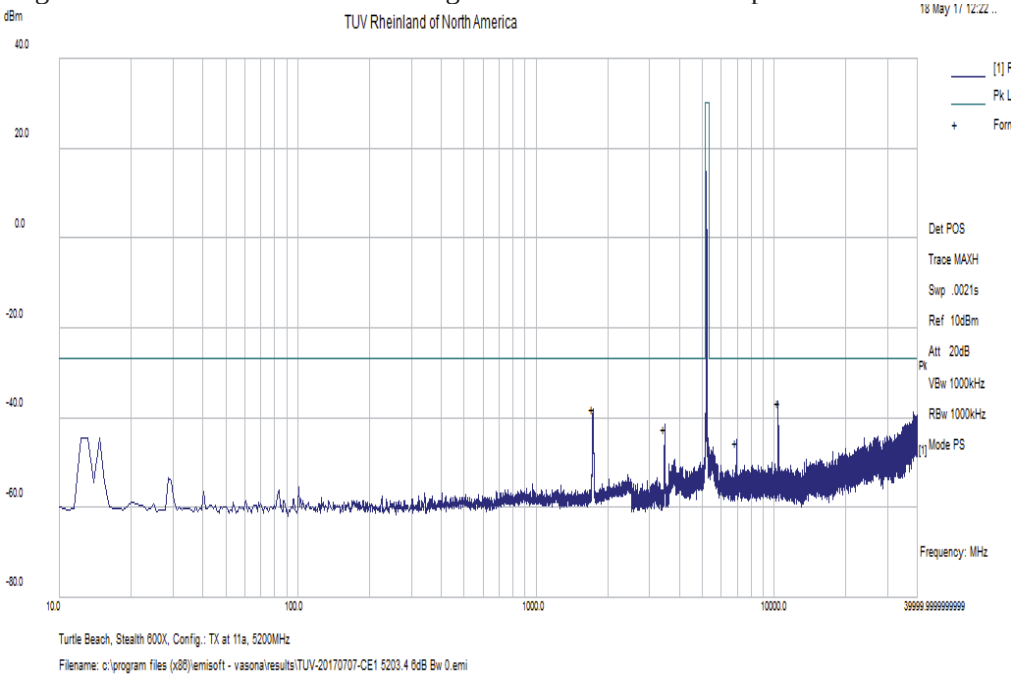


Figure 67: Undesirable Emission for 802.11a-6 Mbps at 5200 MHz

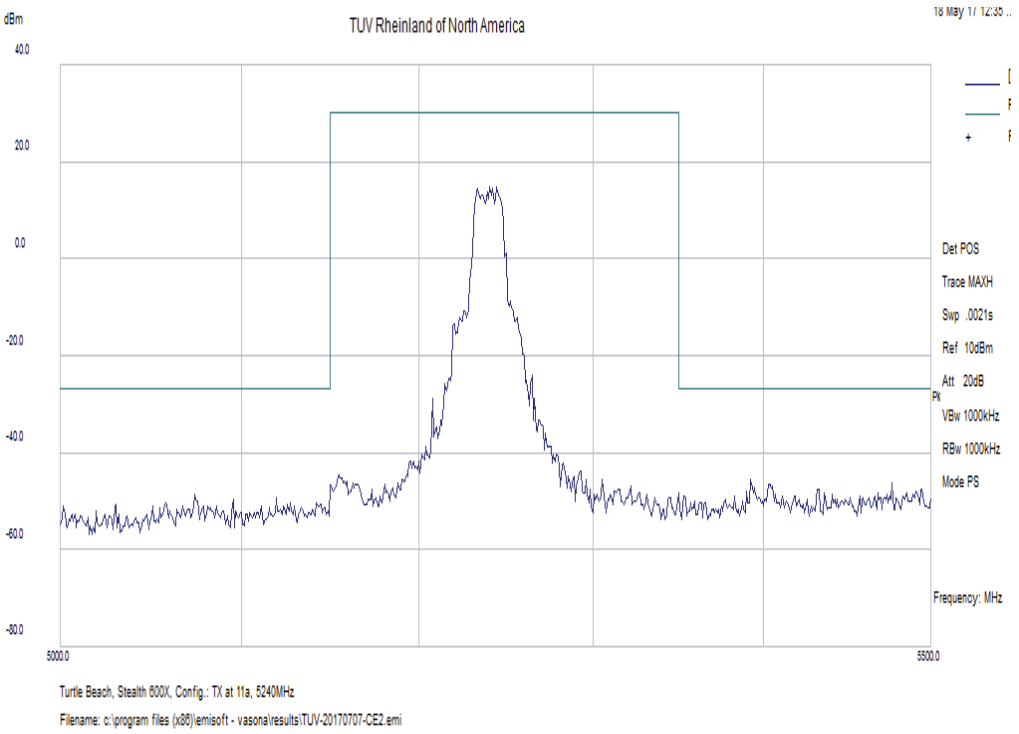


Figure 68: Measured In-Band Band-edge for 802.11a-6 Mbps at 5240 MHz

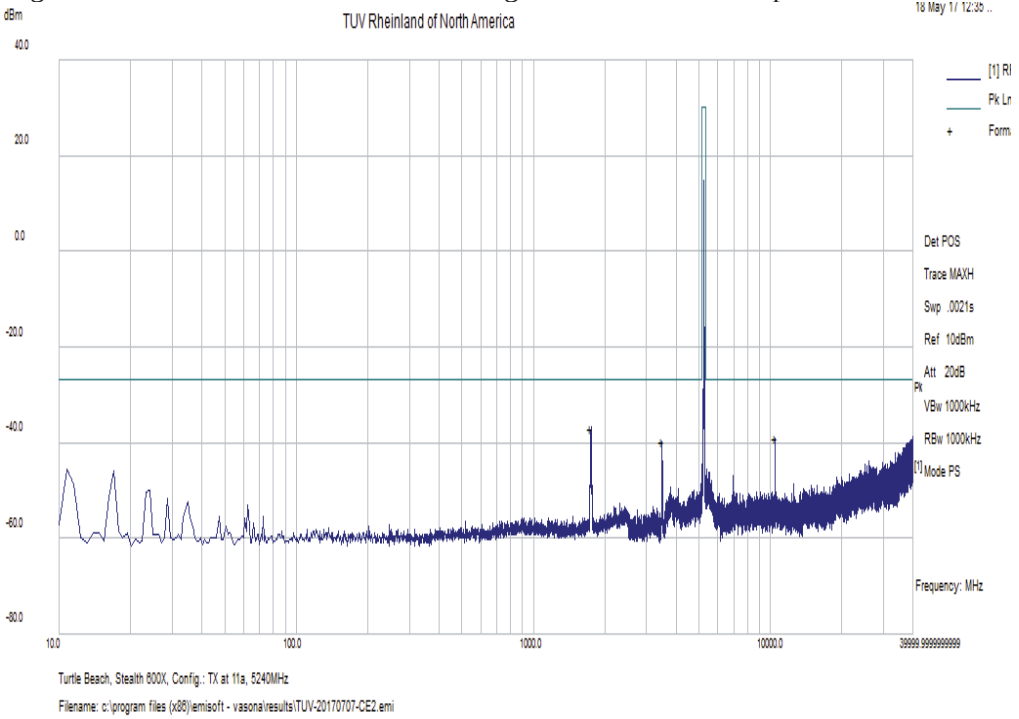


Figure 69: Measured In-Band Band-edge for 802.11a-6 Mbps at 5240 MHz

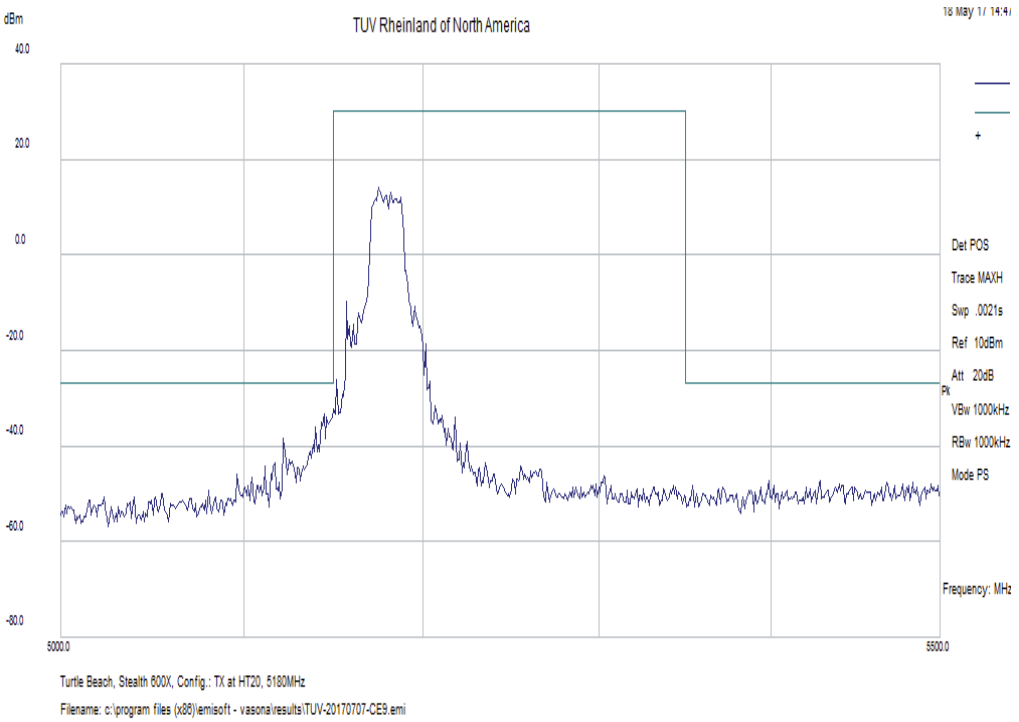


Figure 70: Measured Band-edge for HT20-MCS0 at 5180 MHz

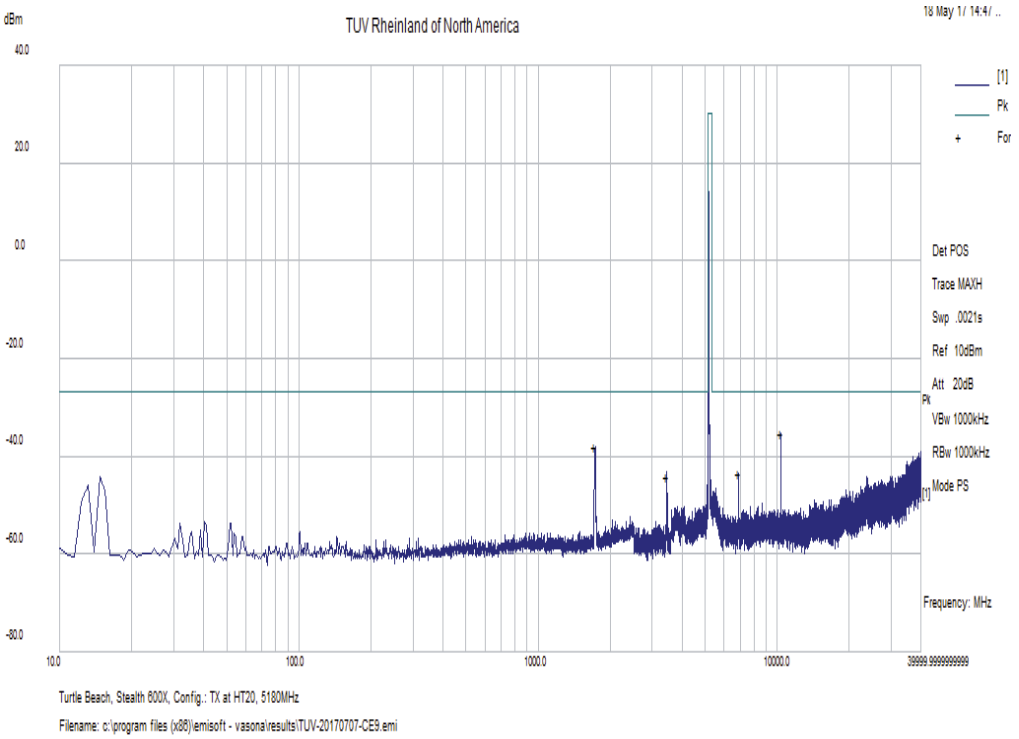


Figure 71: Undesirable Emission for HT20-MCS0 at 5180 MHz

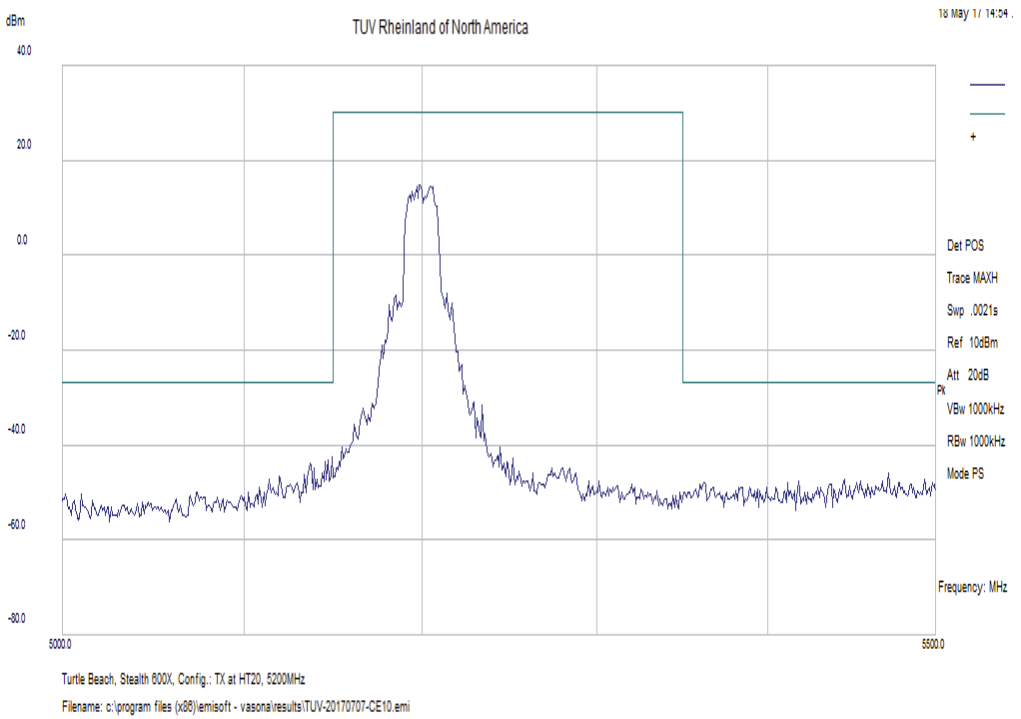


Figure 72: Measured In-Band Band-edge for HT20-MCS0 at 5200 MHz

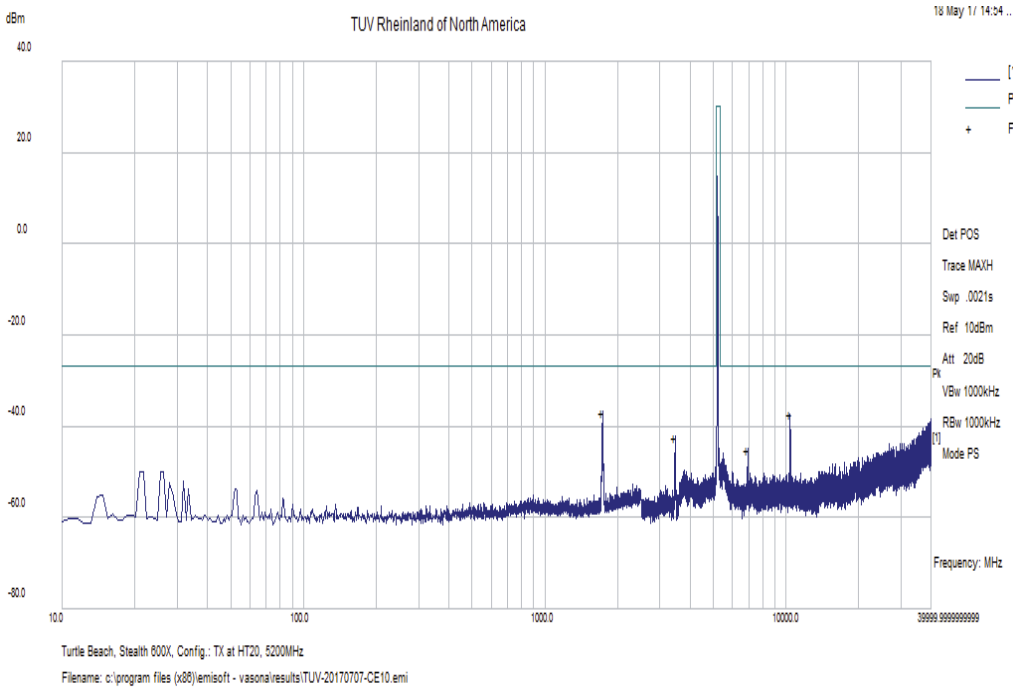


Figure 73: Measured In-Band Band-edge for HT20-MCS0 at 5200 MHz

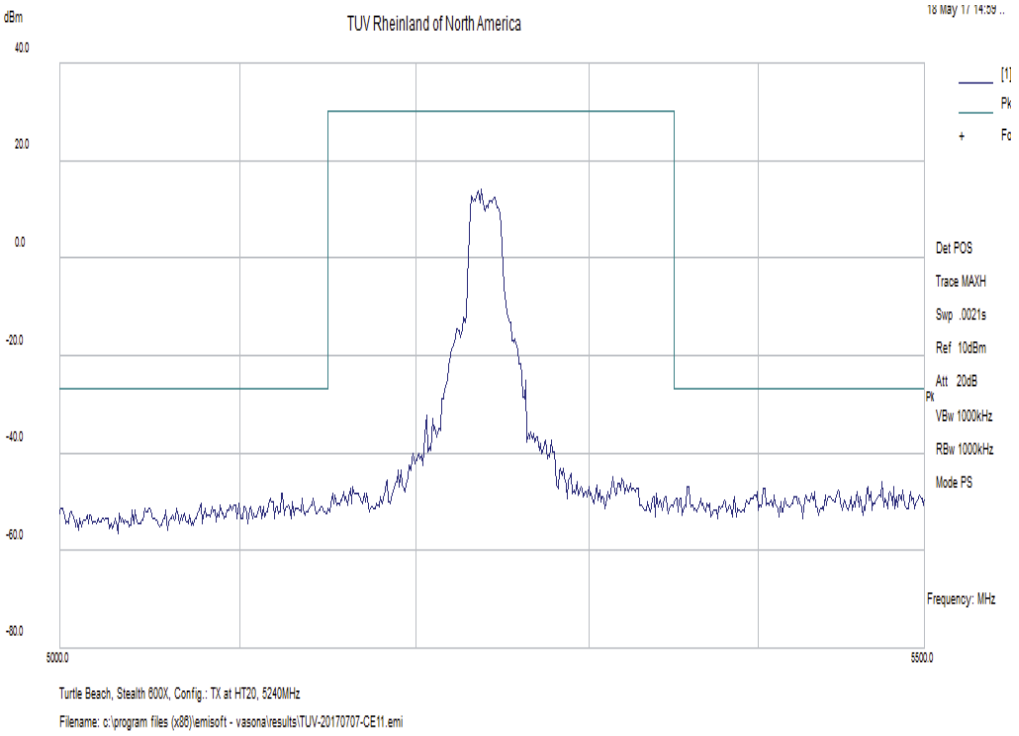


Figure 74: Measured Band-edge for HT20-MCS0 at 5240 MHz

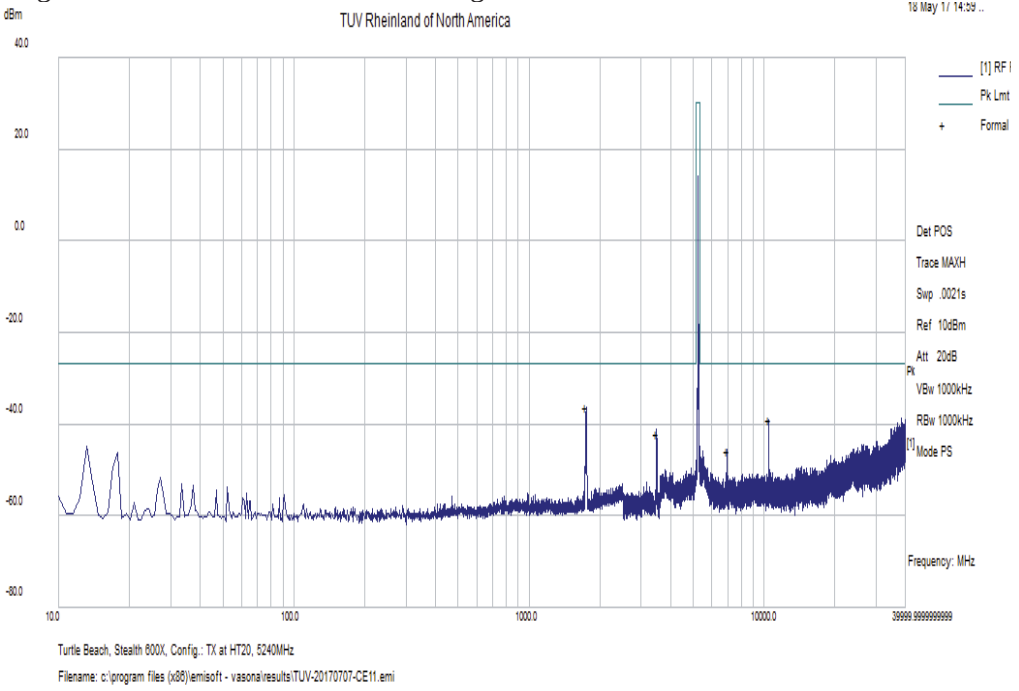


Figure 75: Undesirable Emission for HT20-MCS0 at 5240 MHz

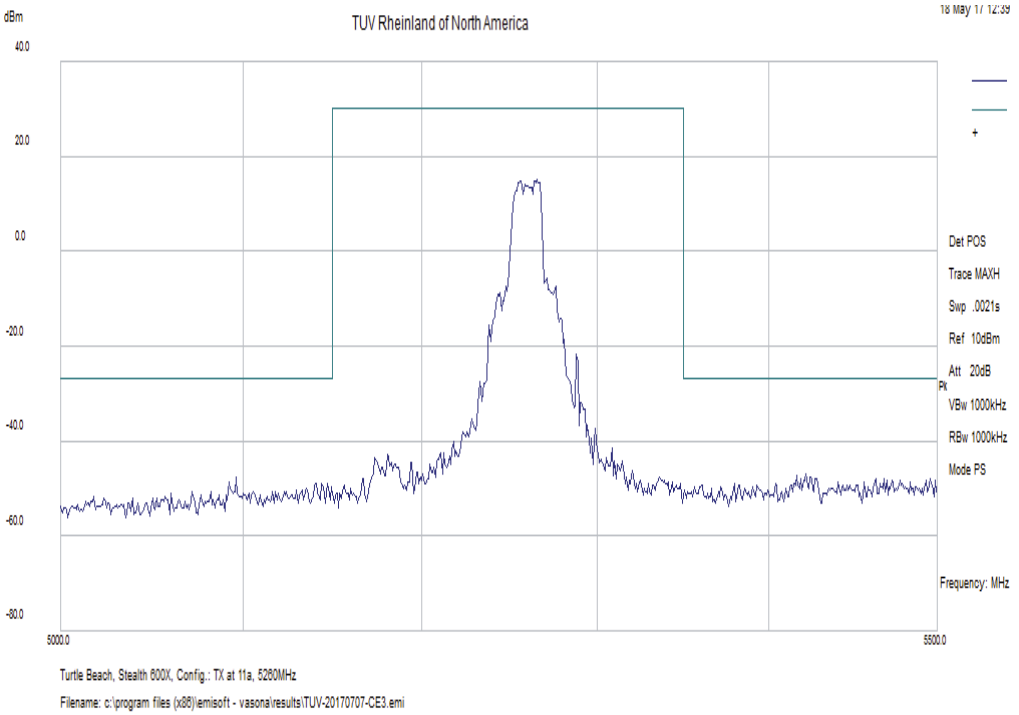


Figure 76: Measured Band-edge for 802.11a-6 Mbps at 5260 MHz

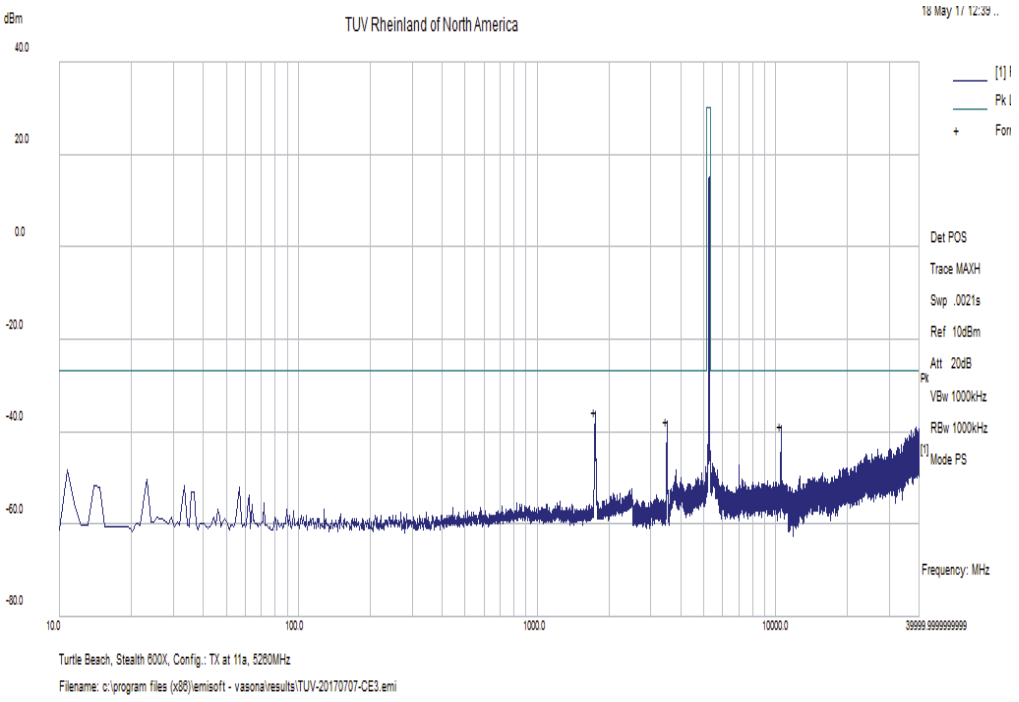


Figure 77: Undesirable Emission for 802.11a-6 Mbps at 5260 MHz

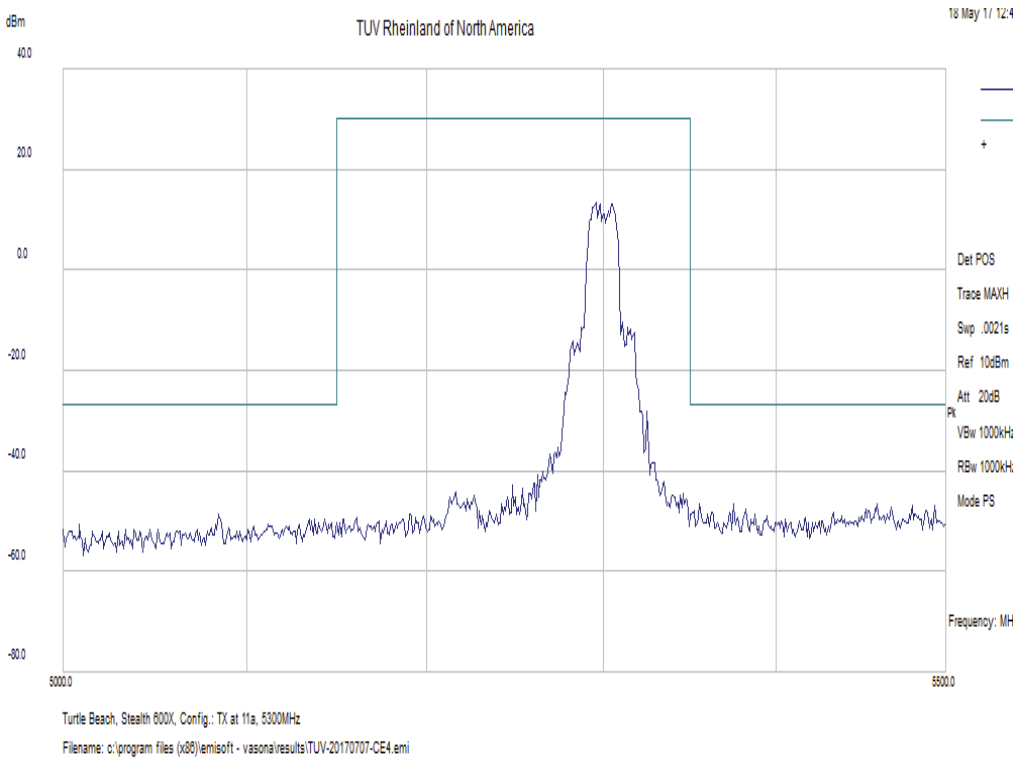


Figure 78: Measured Band-edge for 802.11a-6 Mbps at 5300 MHz

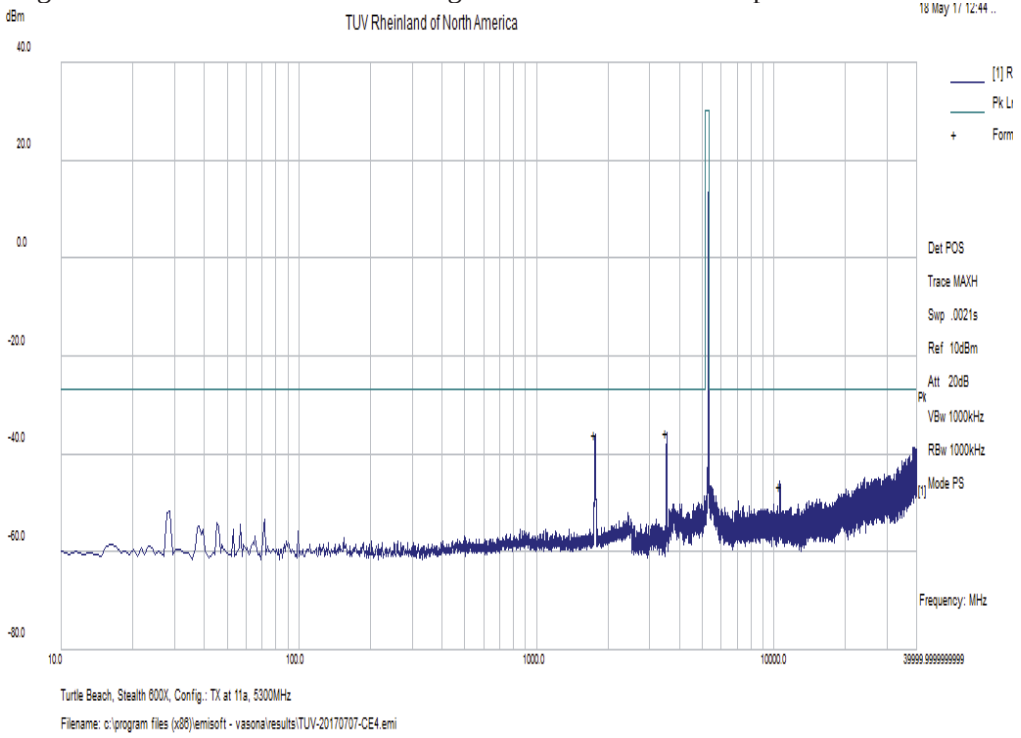


Figure 79: Undesirable Emission for 802.11a-6 Mbps at 5300 MHz

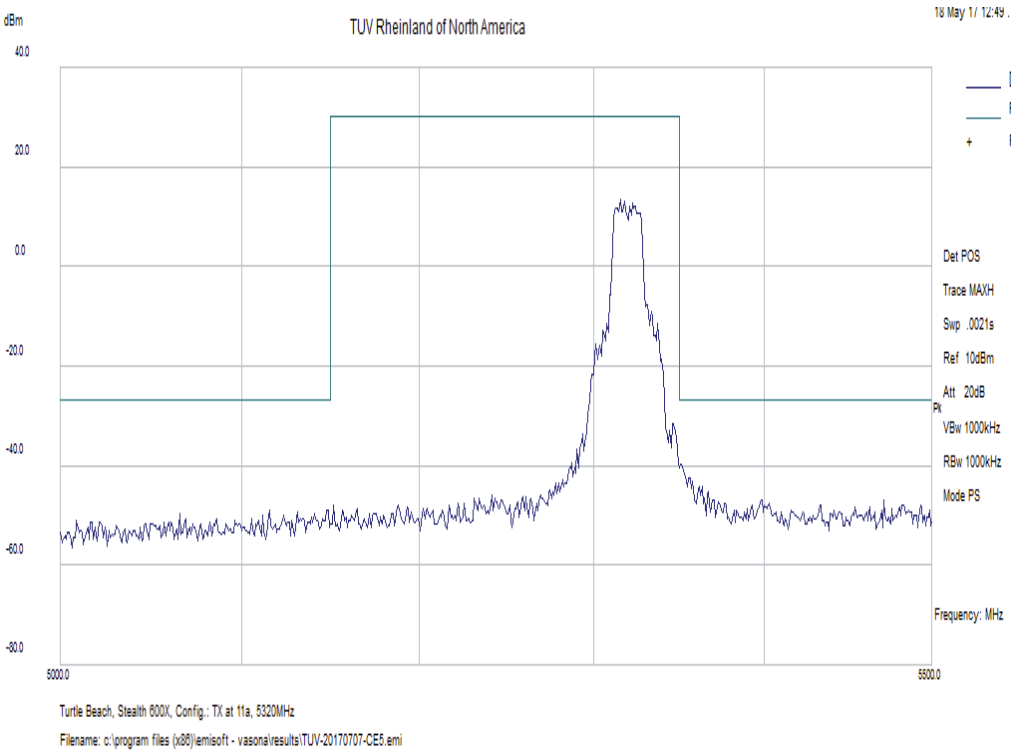


Figure 80: Measured In-Band Band-edge for 802.11a-6 Mbps at 5320 MHz

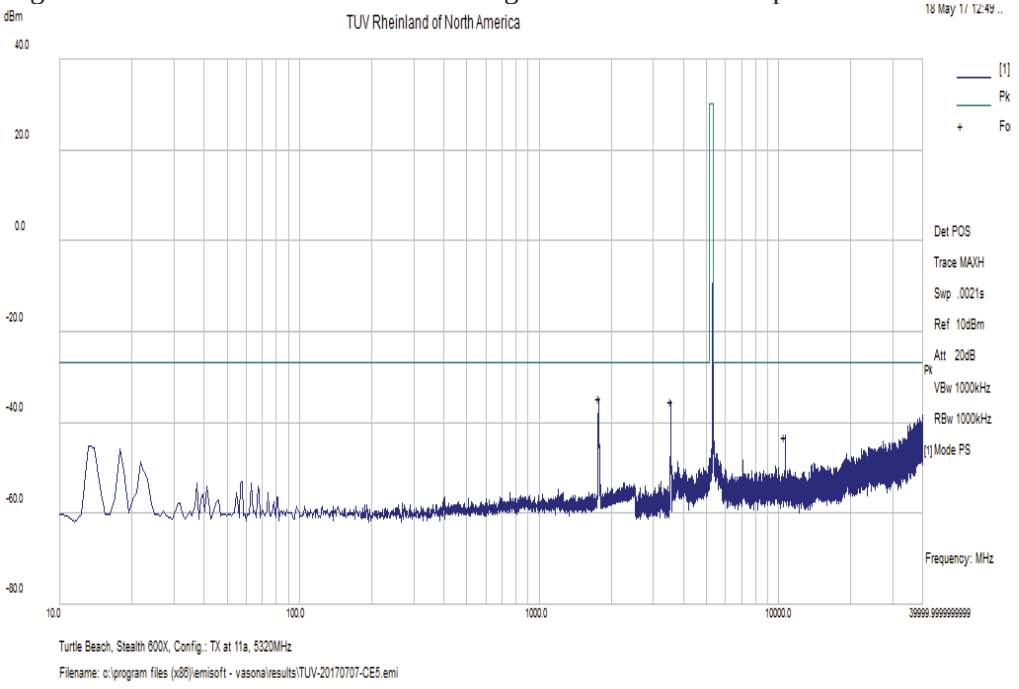


Figure 81: Measured In-Band Band-edge for 802.11a-6 Mbps at 5320 MHz

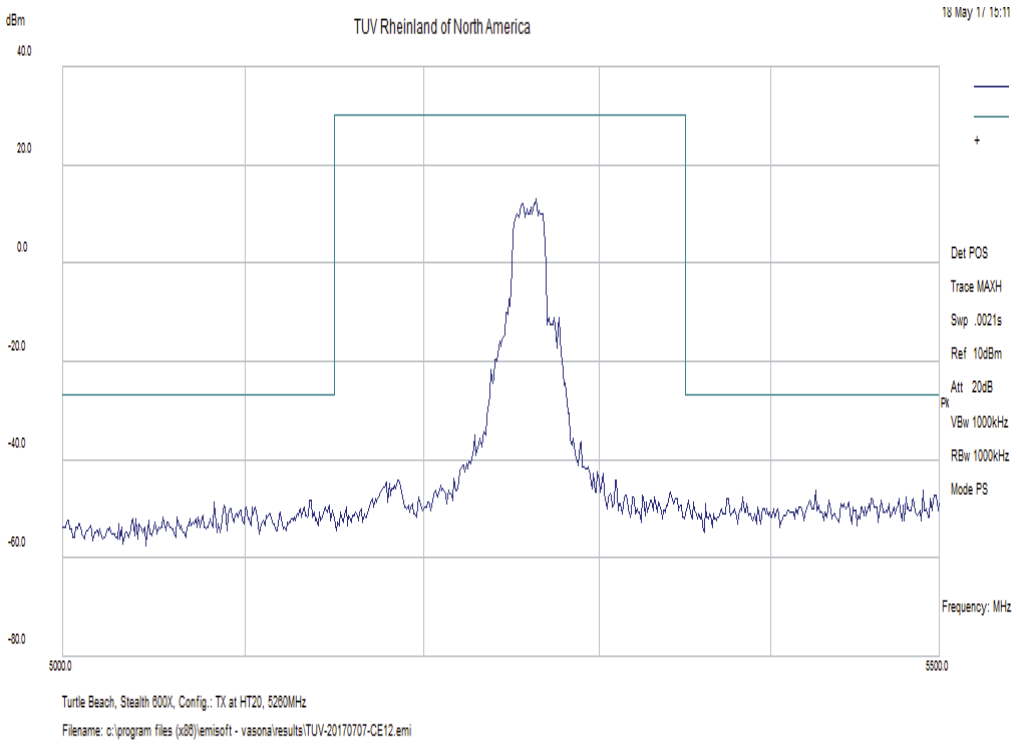


Figure 82: Measured Band-edge for HT20-MCS0 at 5260 MHz

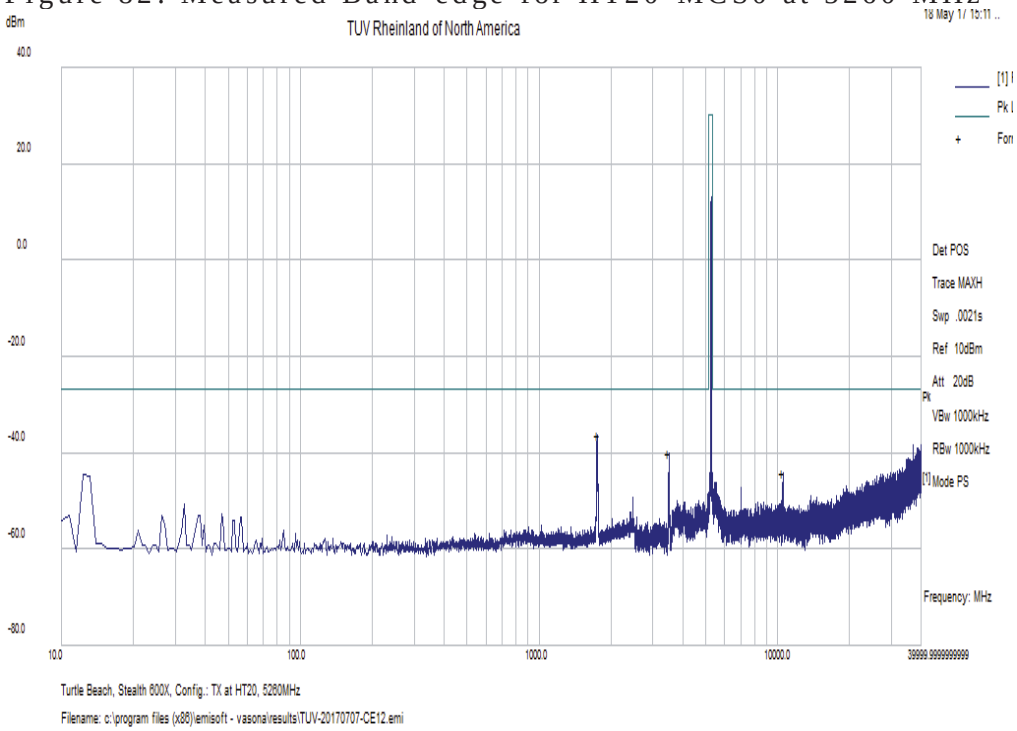


Figure 83: Undesirable Emission for HT20-MCS0 at 5260 MHz

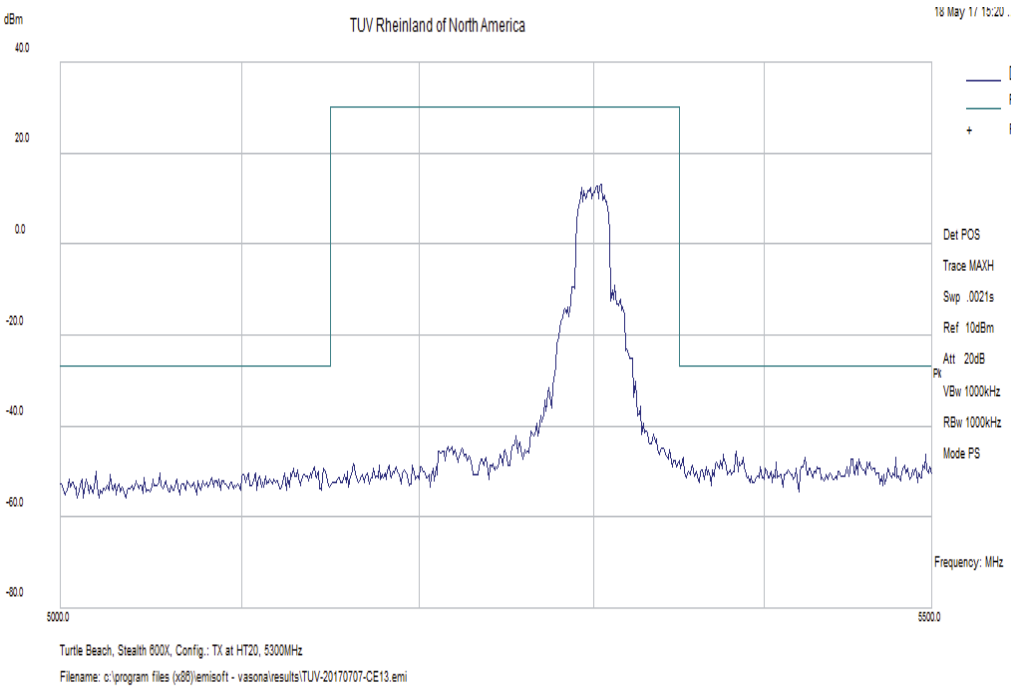


Figure 84: Measured In-Band Band-edge for HT20-MCS0 at 5300 MHz

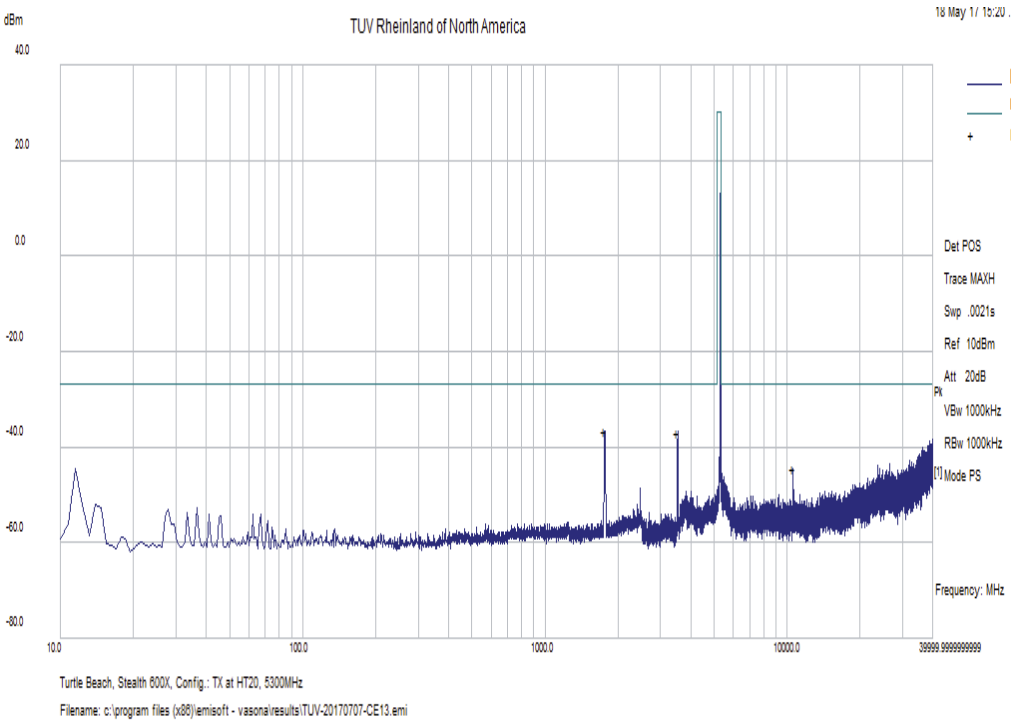


Figure 85: Measured In-Band Band-edge for HT20-MCS0 at 5300 MHz

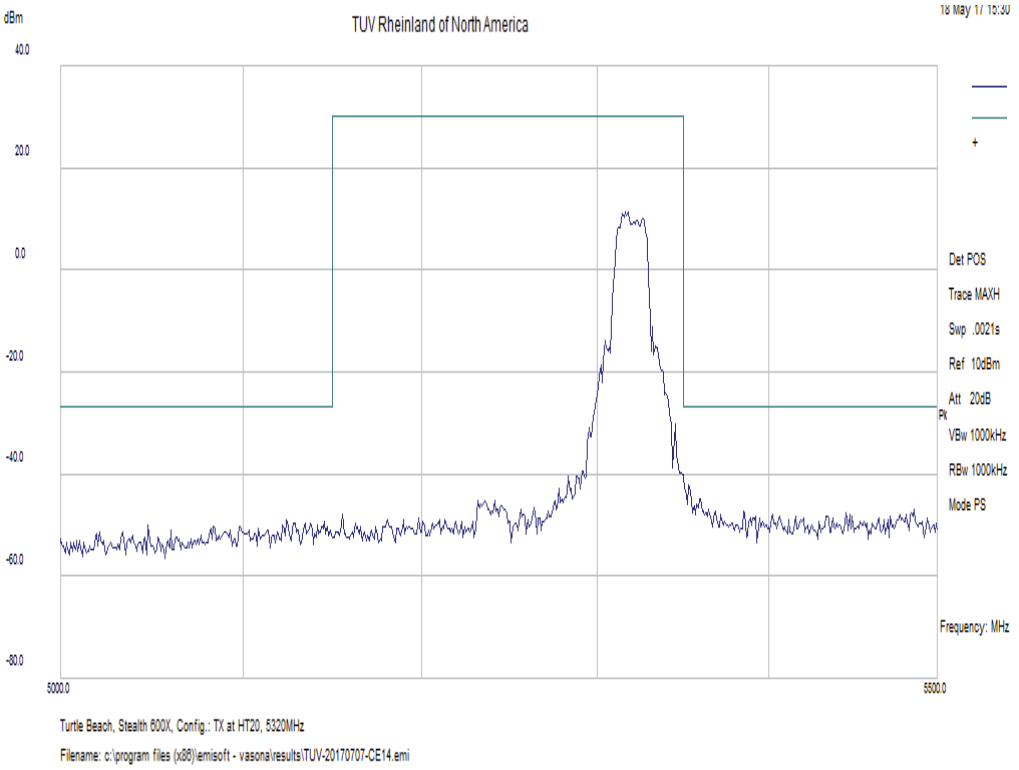


Figure 86: Measured Band-edge for HT20-MCS0 at 5320 MHz

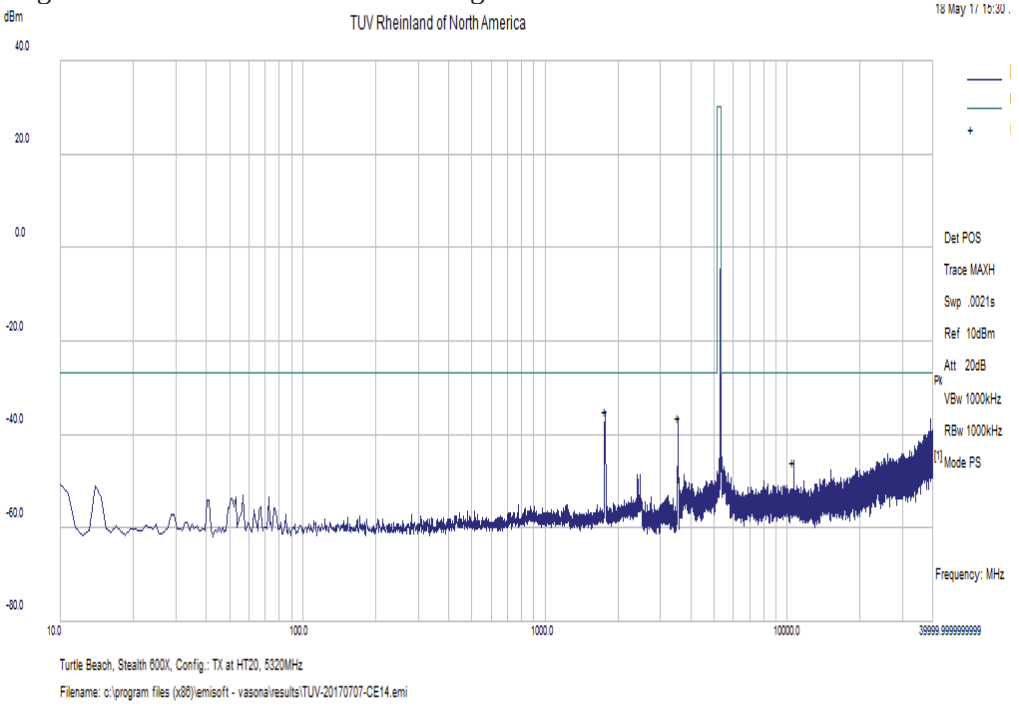


Figure 87: Undesirable Emission for HT20-MCS0 at 5320 MHz

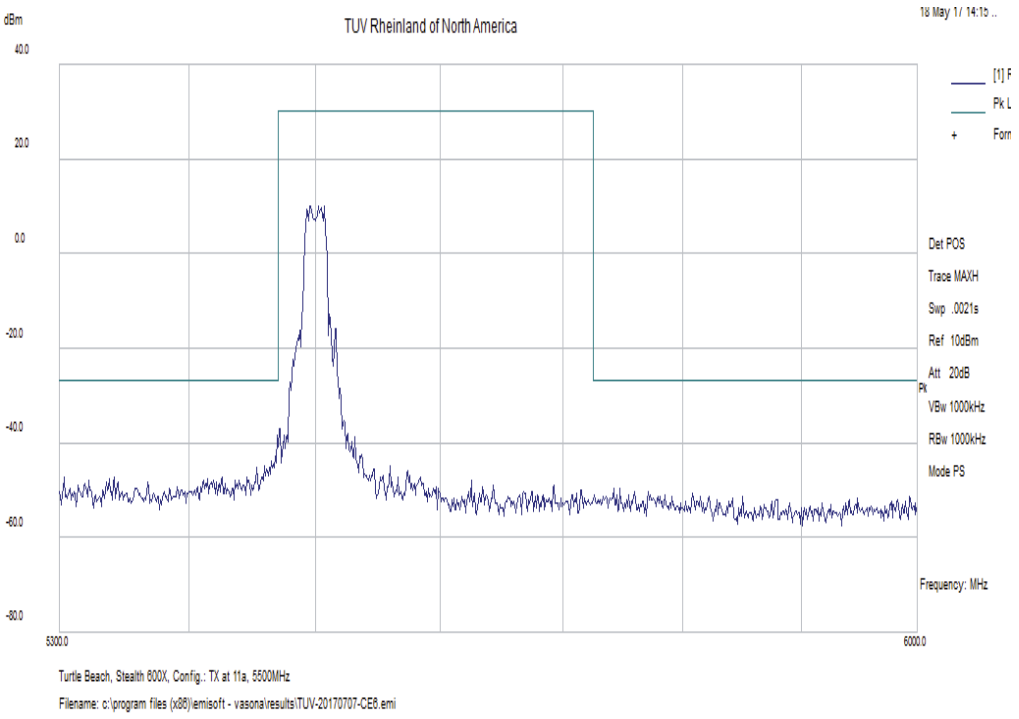


Figure 88: Measured Band-edge for 802.11a-6 Mbps at 5500 MHz

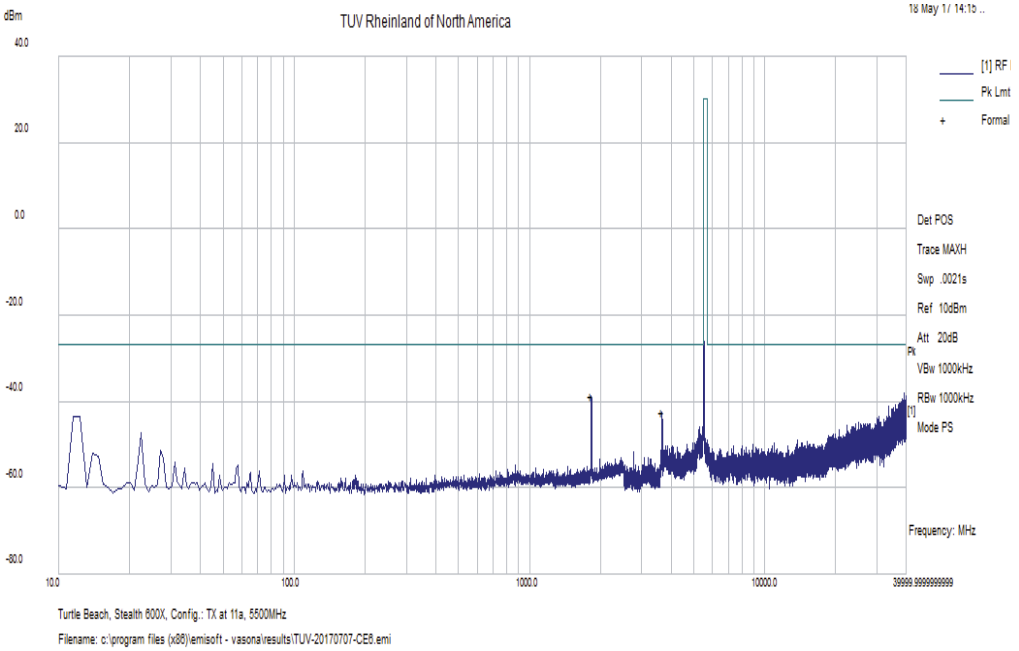


Figure 89: Undesirable Emission for 802.11a-6 Mbps at 5550 MHz

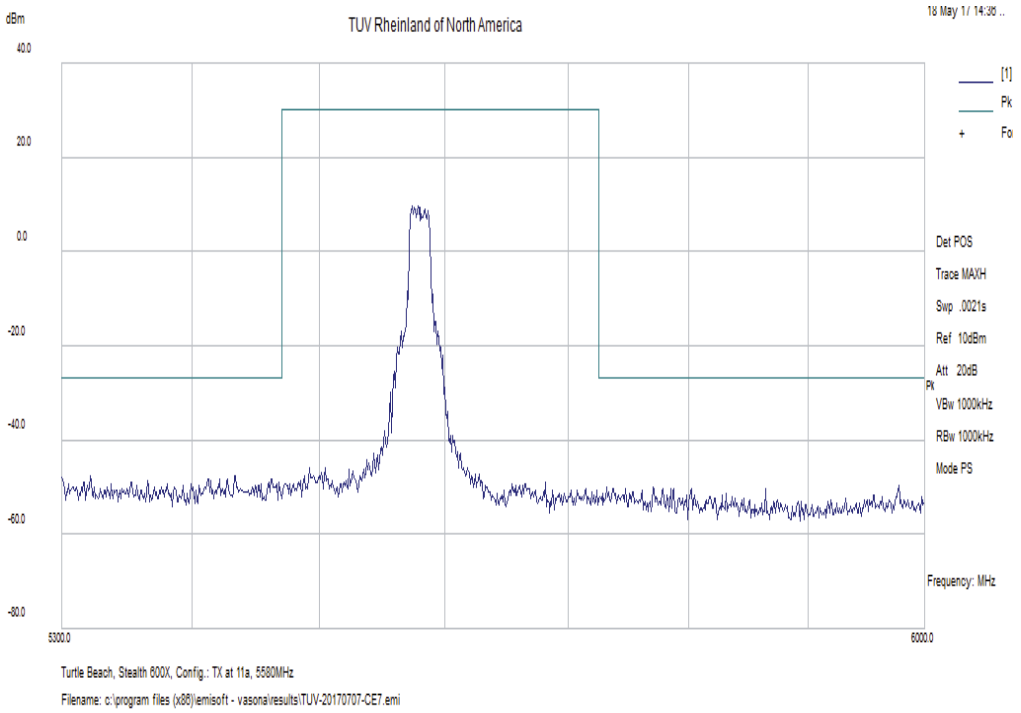


Figure 90: Measured Band-edge for 802.11a-6 Mbps at 5580 MHz

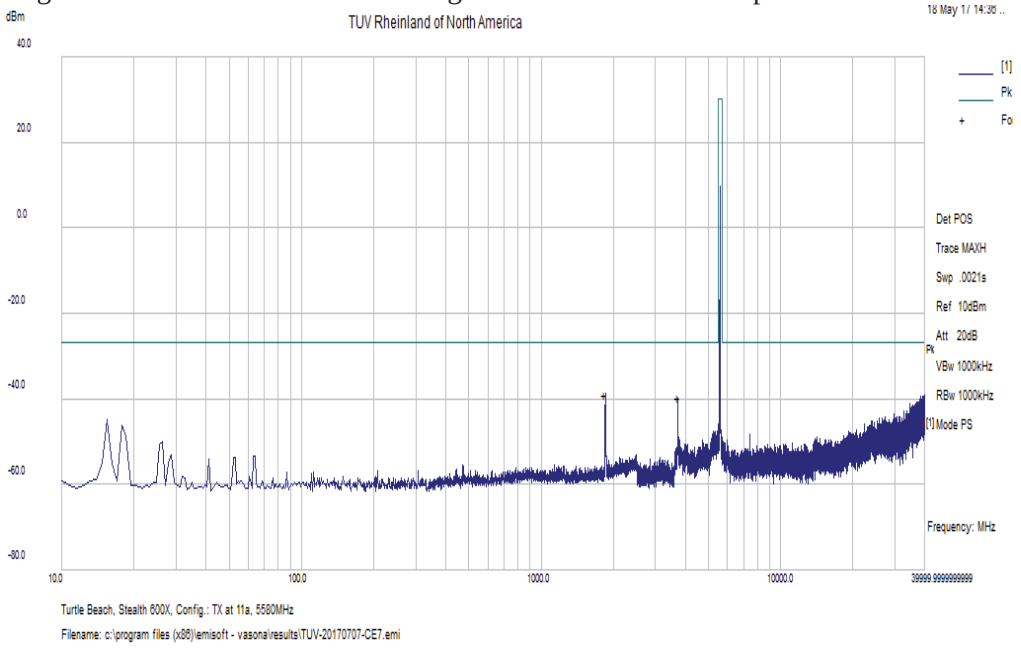


Figure 91: Undesirable Emission for 802.11a-6 Mbps at 5580 MHz

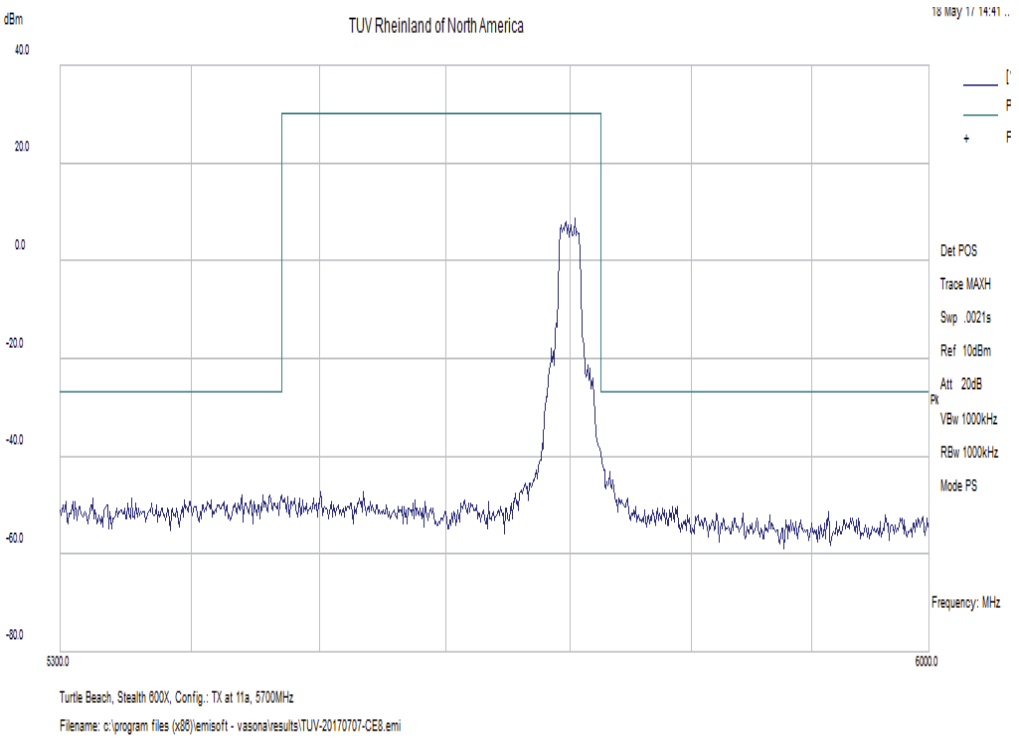


Figure 92: Measured In-Band Band-edge for 802.11a-6 Mbps at 5700 MHz

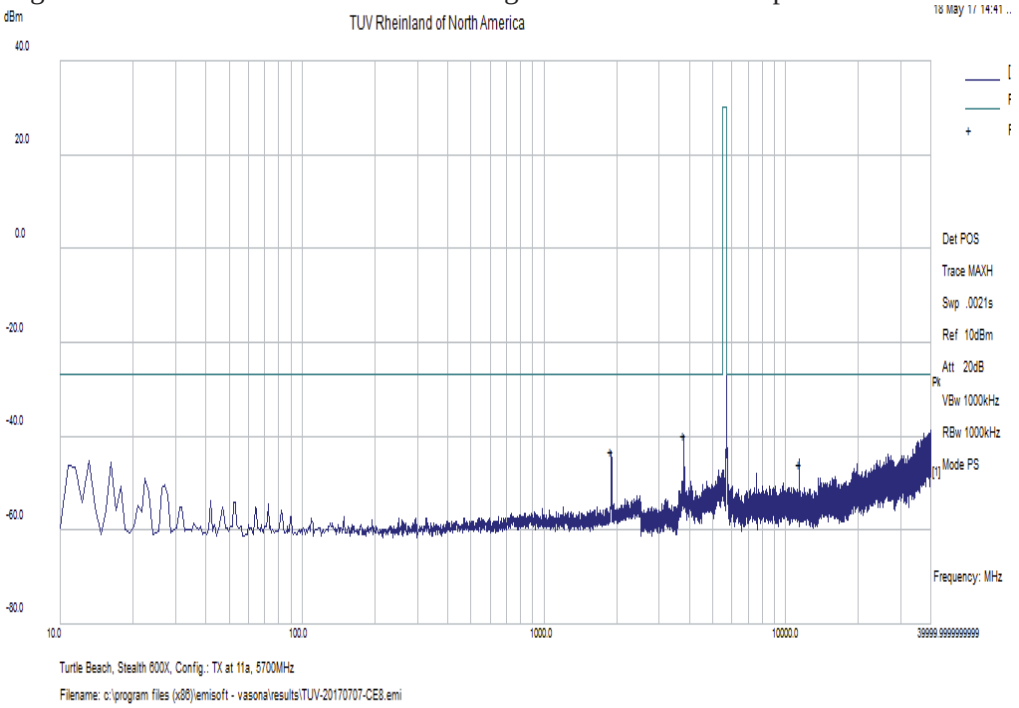


Figure 93: Measured In-Band Band-edge for 802.11a-6 Mbps at 5700 MHz

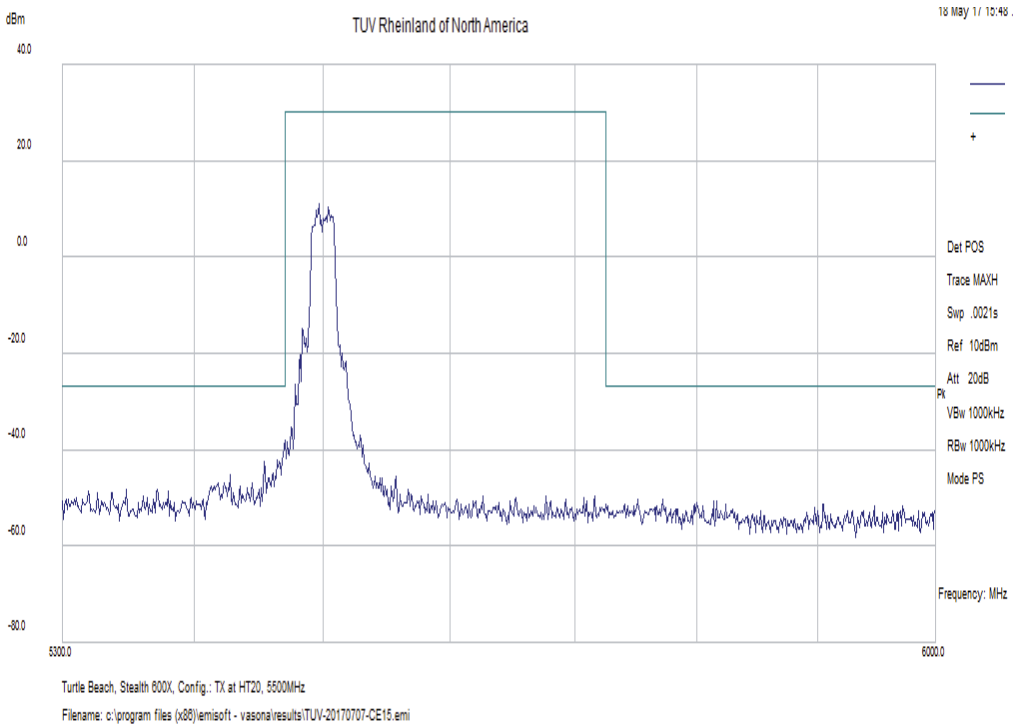


Figure 94: Measured Band-edge for HT20-MCS0 at 5500 MHz

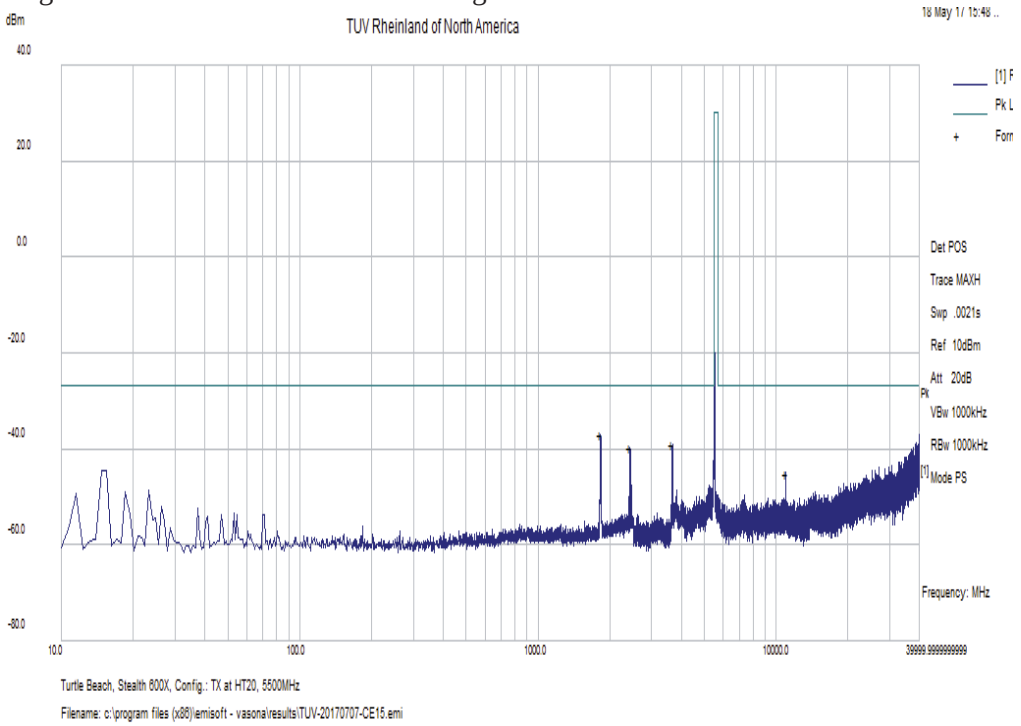


Figure 95: Undesirable Emission for HT20-MCS0 at 5500 MHz

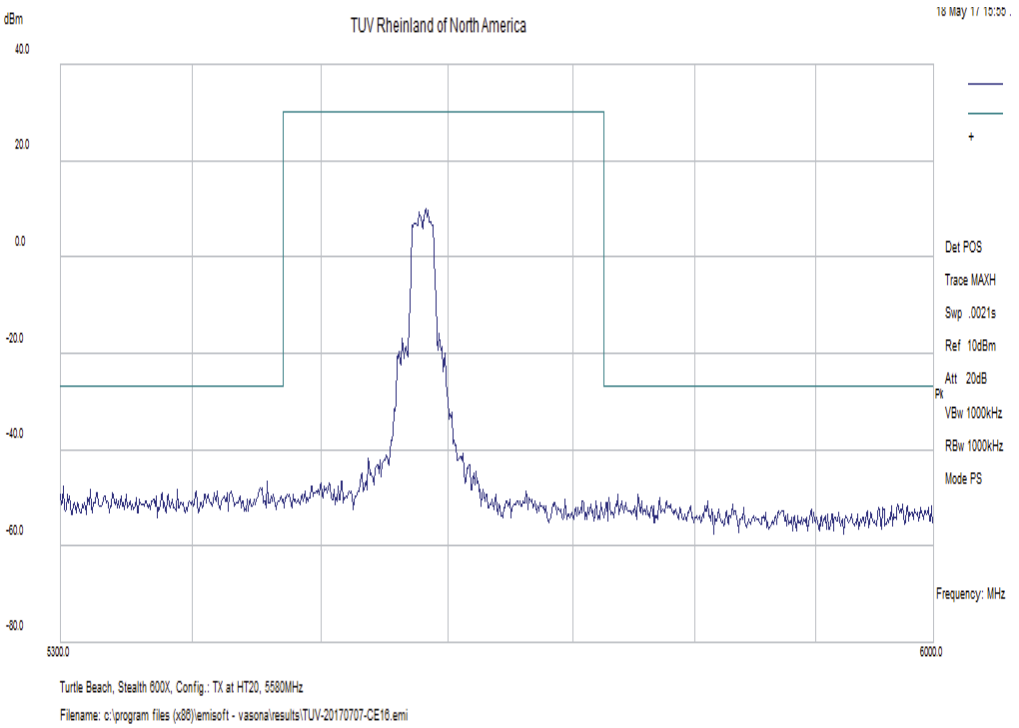


Figure 96: Measured In-Band Band-edge for HT20-MCS0 at 5580 MHz

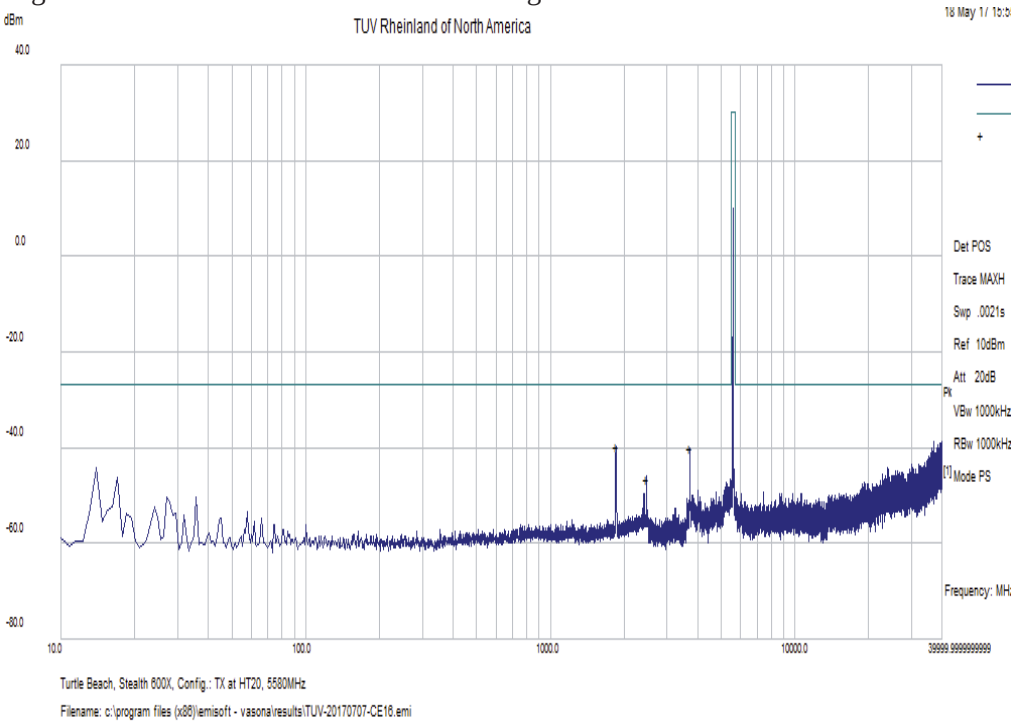


Figure 97: Measured In-Band Band-edge for HT20-MCS0 at 5580 MHz

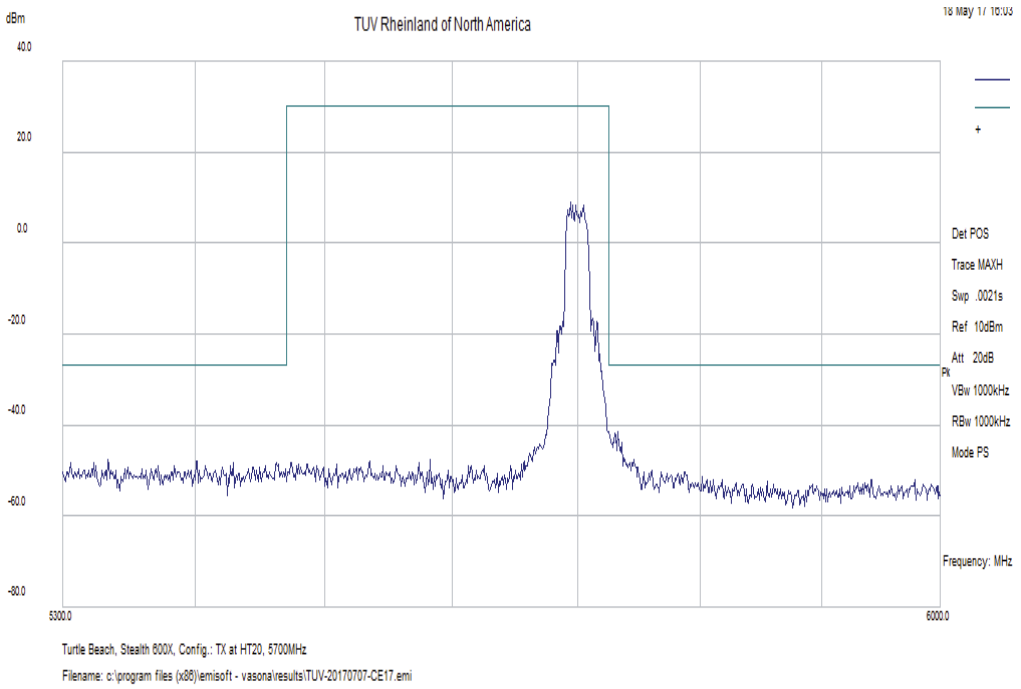


Figure 98: Measured Band-edge for HT20-MCS0 at 5700 MHz

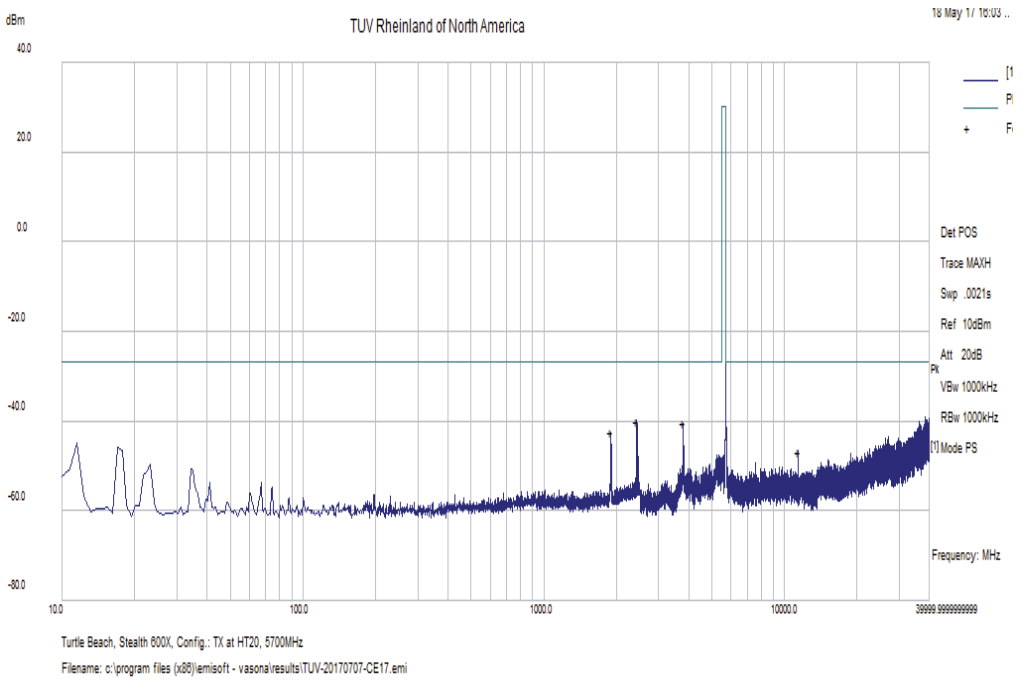


Figure 99: Undesirable Emission for HT20-MCS0 at 5700 MHz

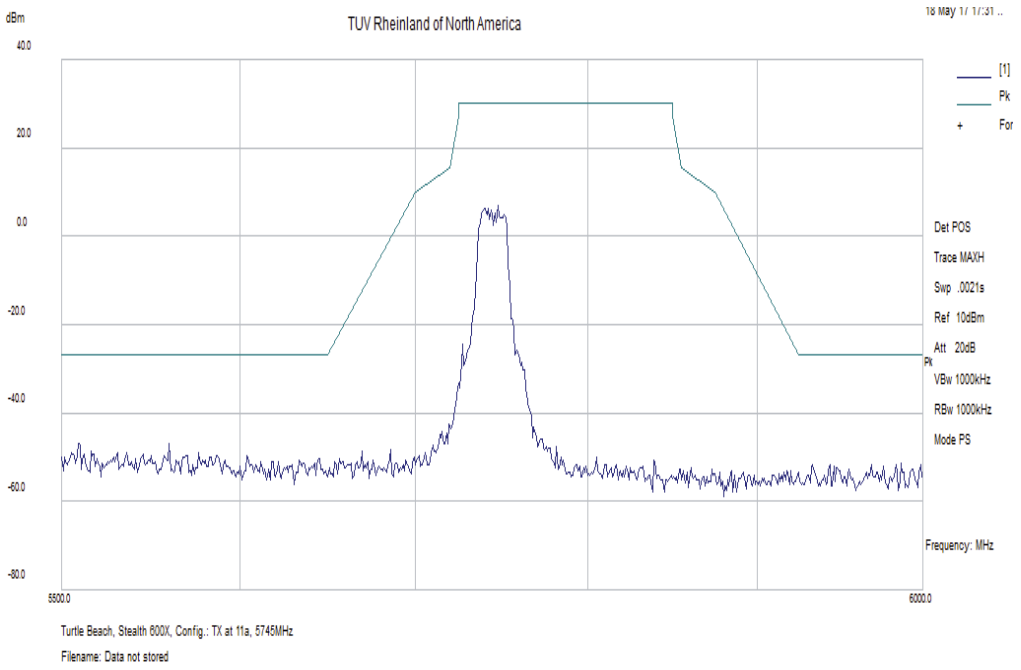


Figure 100: Measured Band-edge for 802.11a-6 Mbps at 5745 MHz

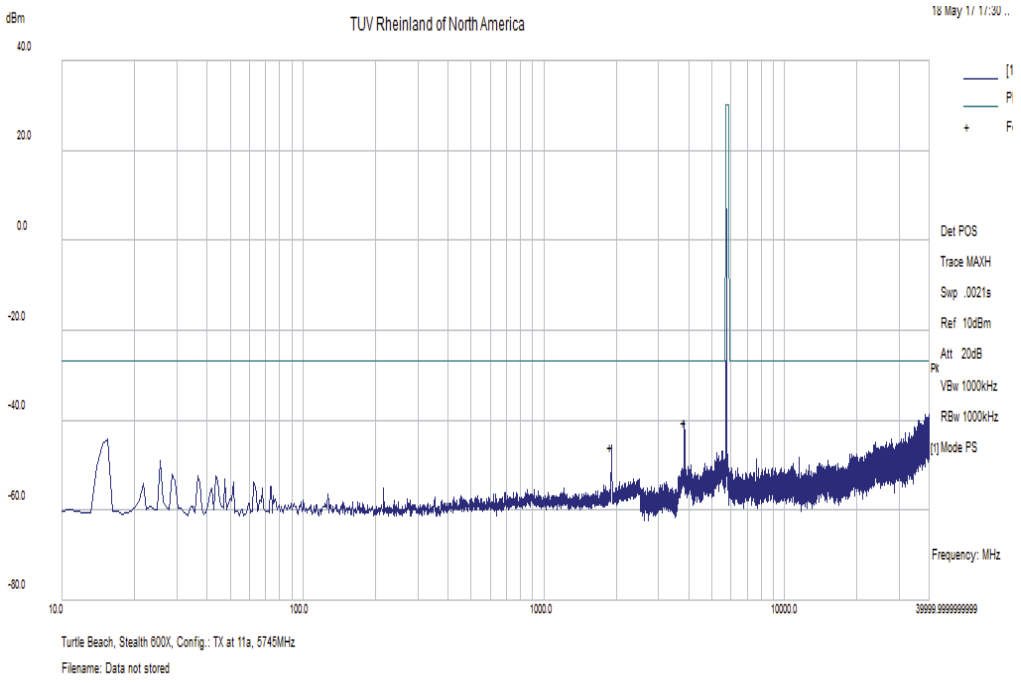


Figure 101: Undesirable Emission for 802.11a-6 Mbps at 5745 MHz

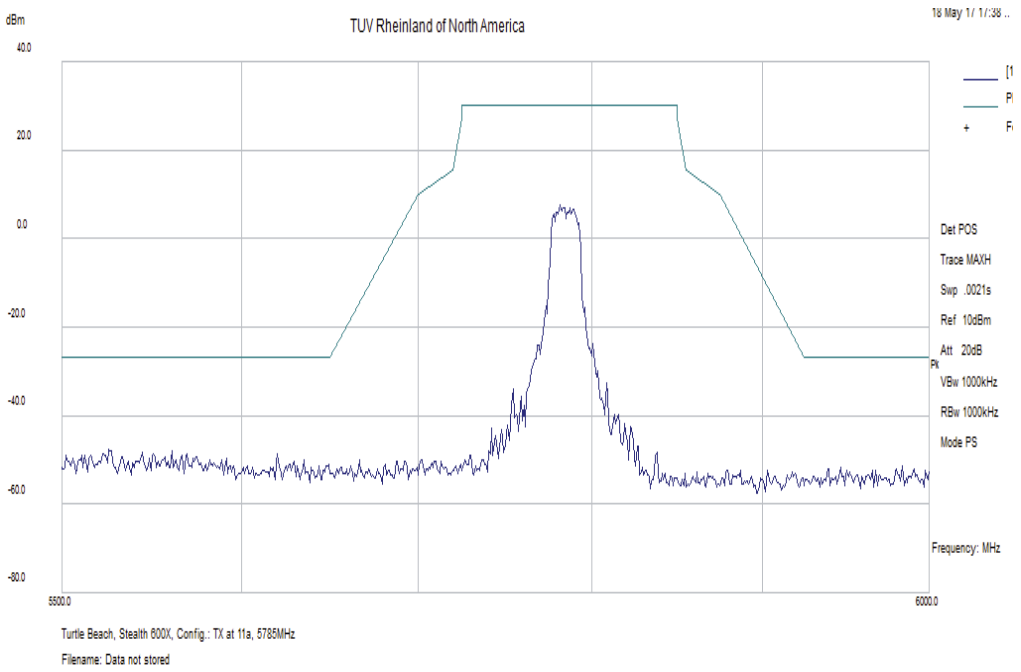


Figure 102: Measured Band-edge for 802.11a-6 Mbps at 5785 MHz

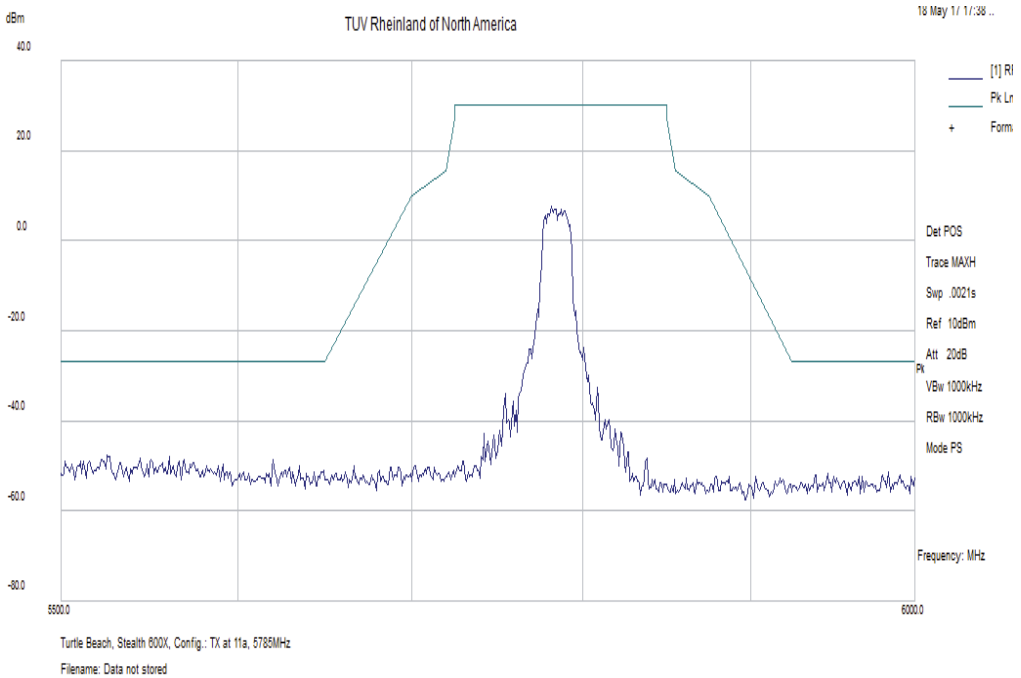


Figure 103: Undesirable Emission for 802.11a-6 Mbps at 5785 MHz

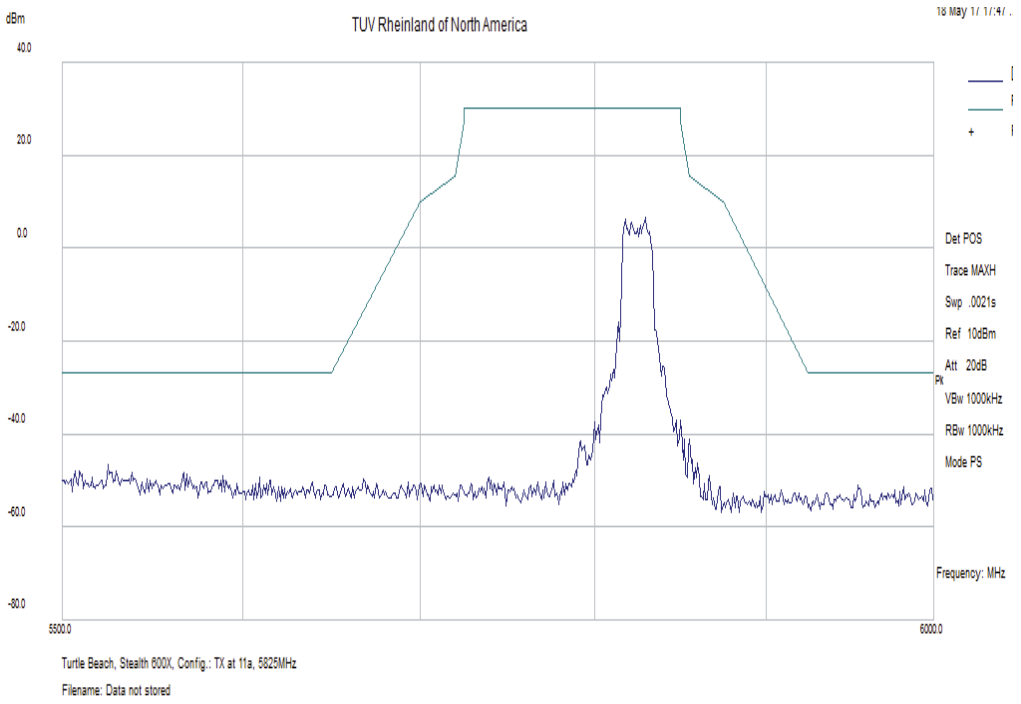


Figure 104: Measured In-Band Band-edge for 802.11a-6 Mbps at 5825 MHz

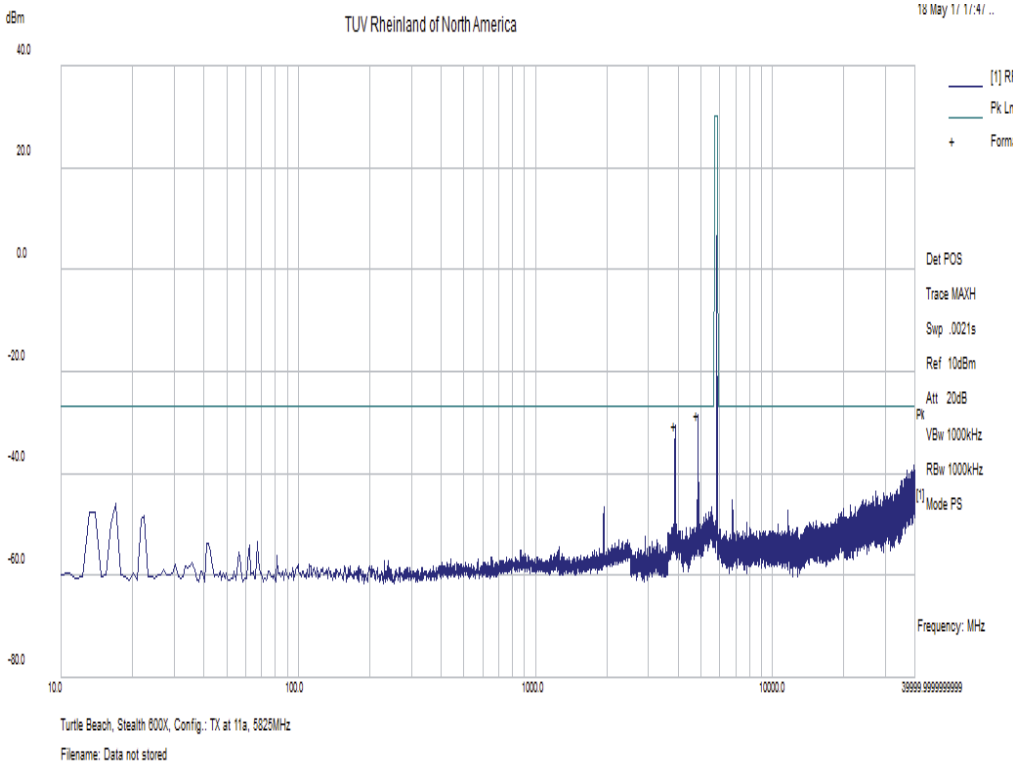


Figure 105: Measured In-Band Band-edge for 802.11a-6 Mbps at 5825 MHz

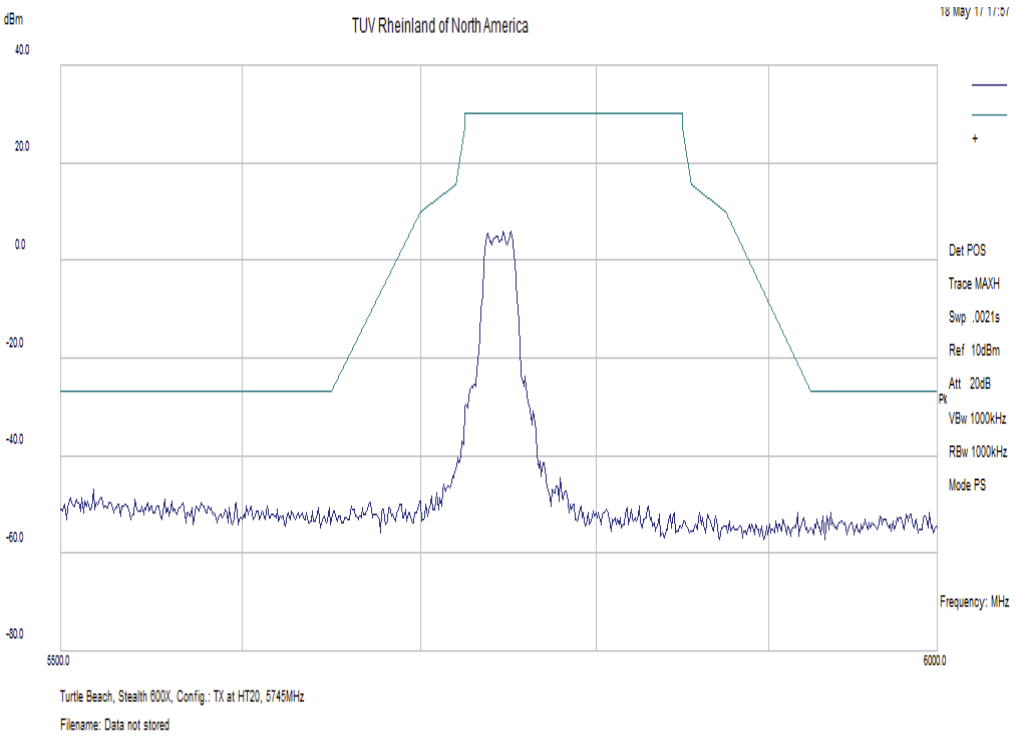


Figure 106: Measured Band-edge for HT20-MCS0 at 5745 MHz

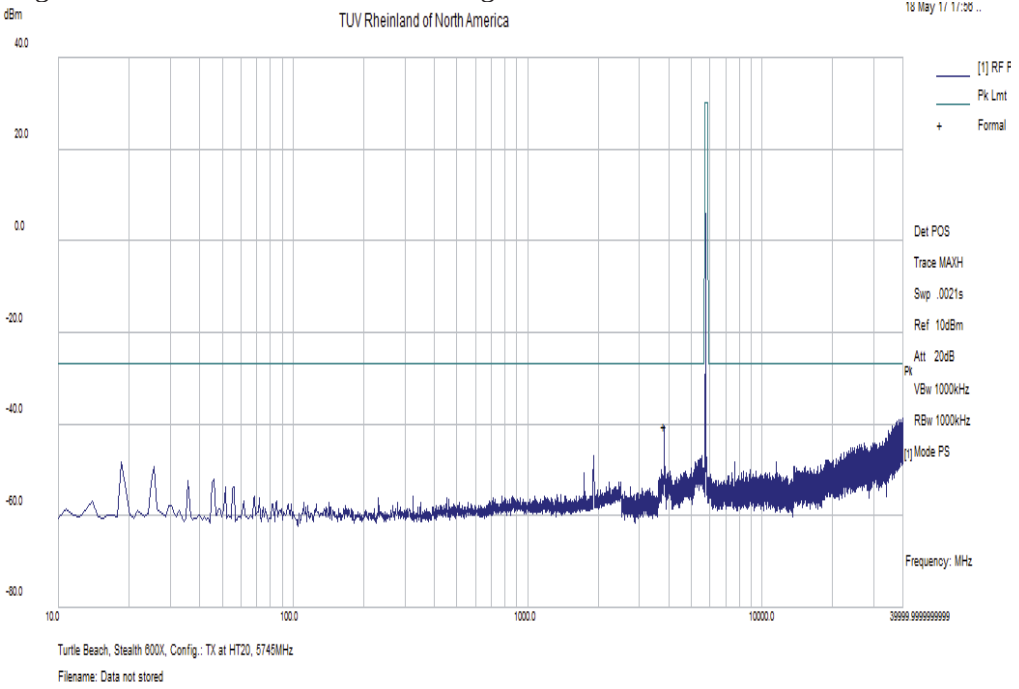


Figure 107: Undesirable Emission for HT20-MCS0 at 5745 MHz

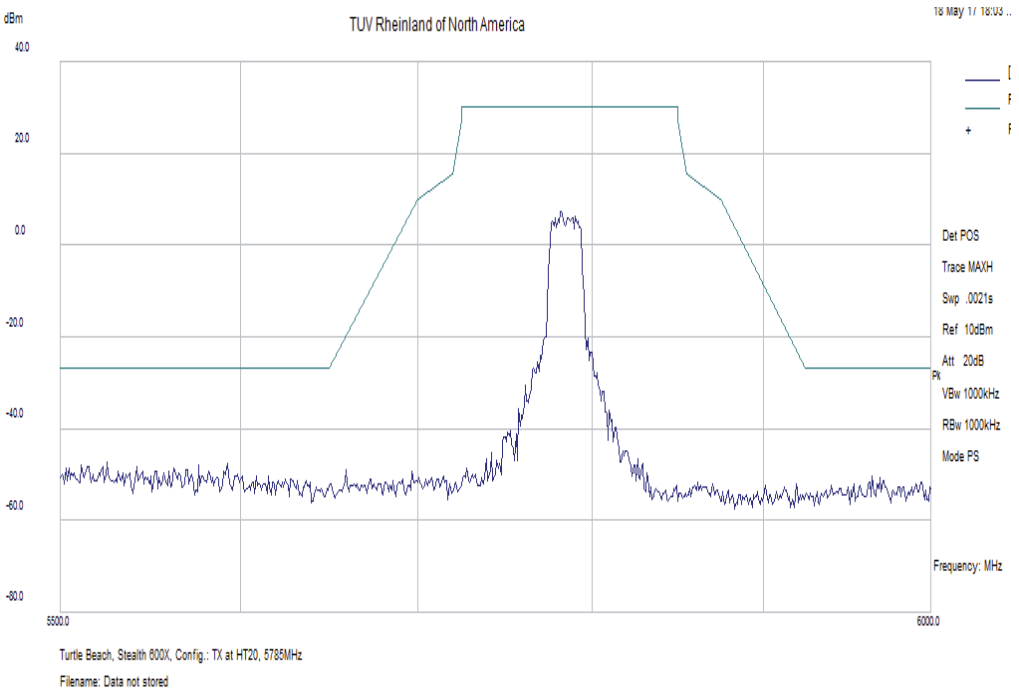


Figure 108: Measured In-Band Band-edge for HT20-MCS0 at 5785 MHz

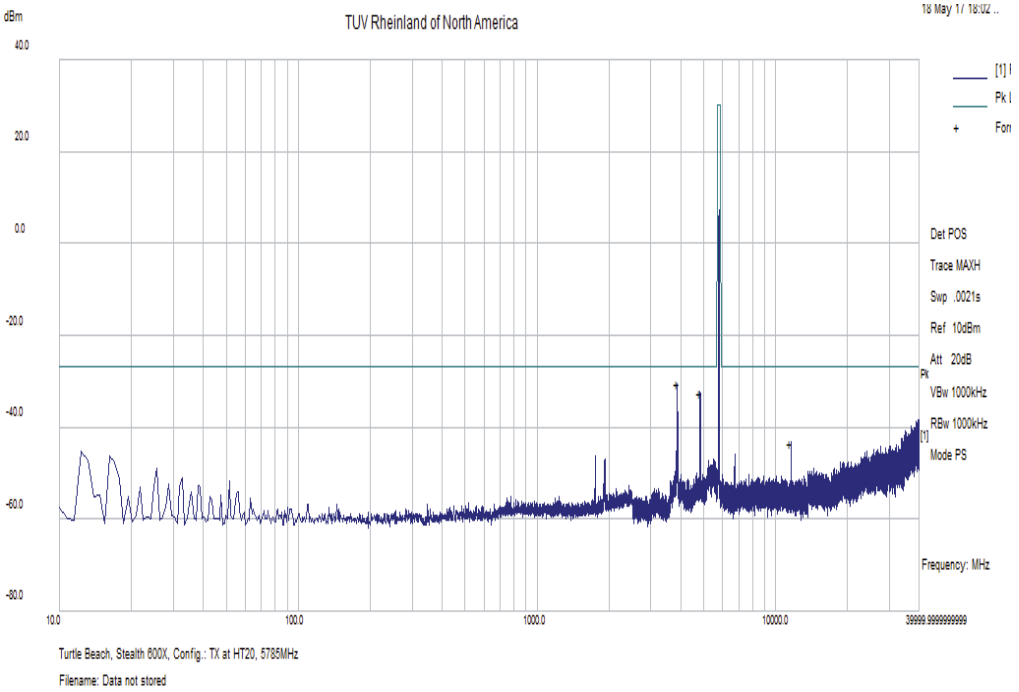


Figure 109: Measured In-Band Band-edge for HT20-MCS0 at 5785 MHz

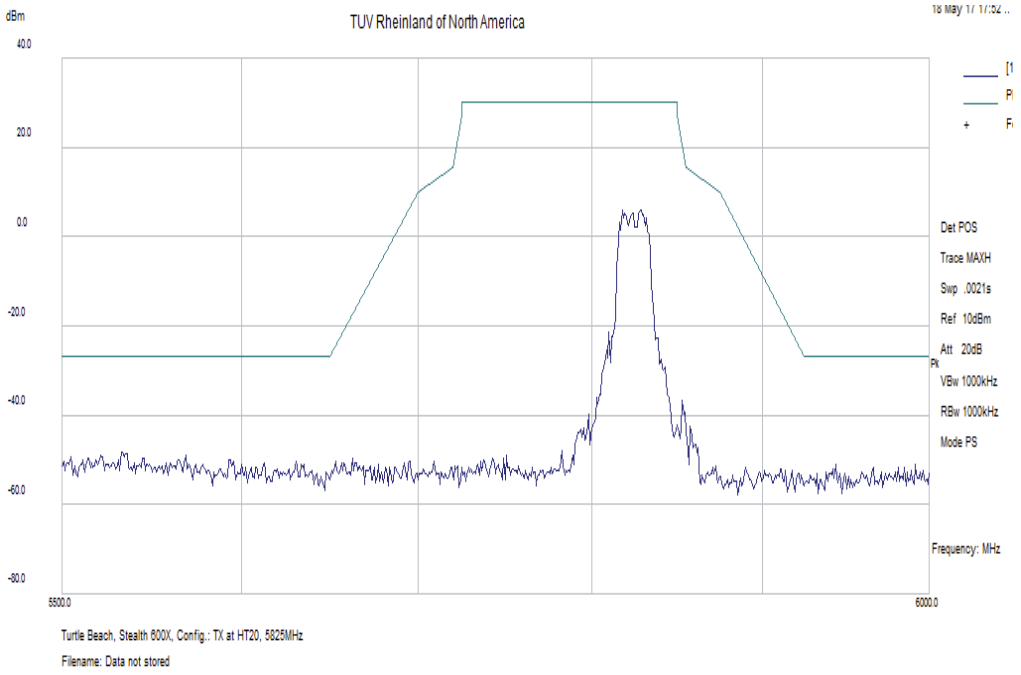


Figure 110: Measured Band-edge for HT20-MCS0 at 5825 MHz

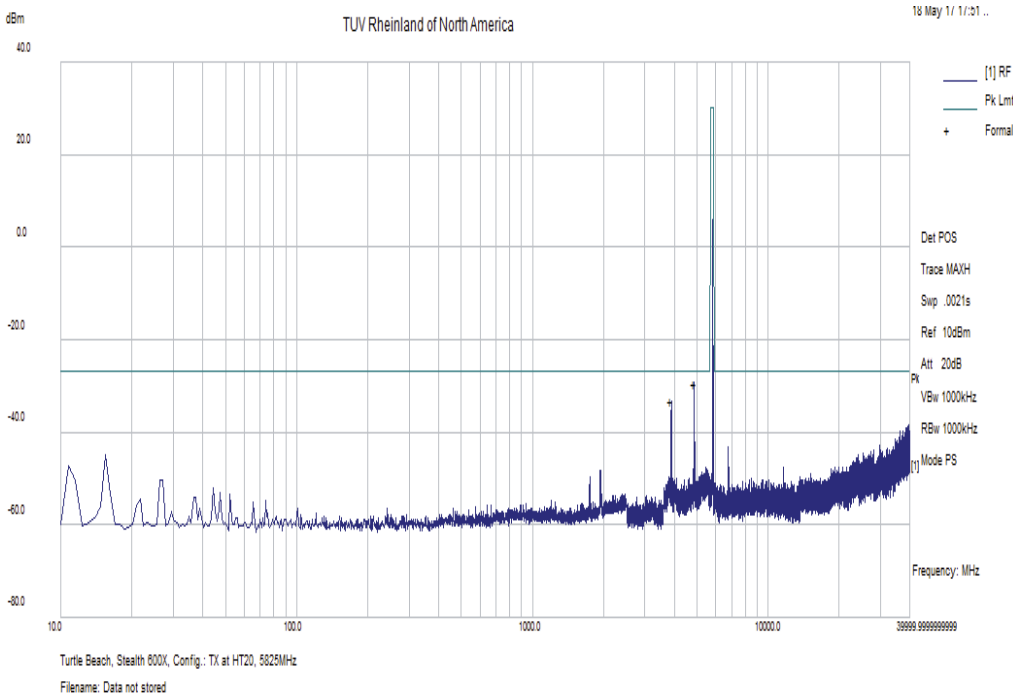


Figure 111: Undesirable Emission for HT20-MCS0 at 5825 MHz

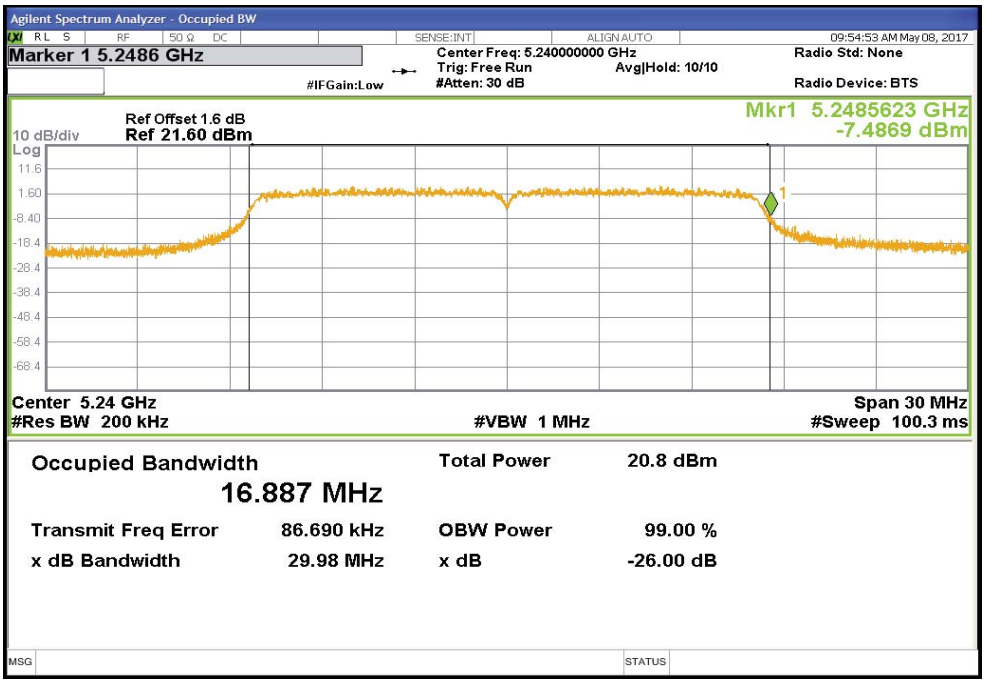


Figure 112: Measured Band-edge for 11a-6 Mbps at 5240 MHz

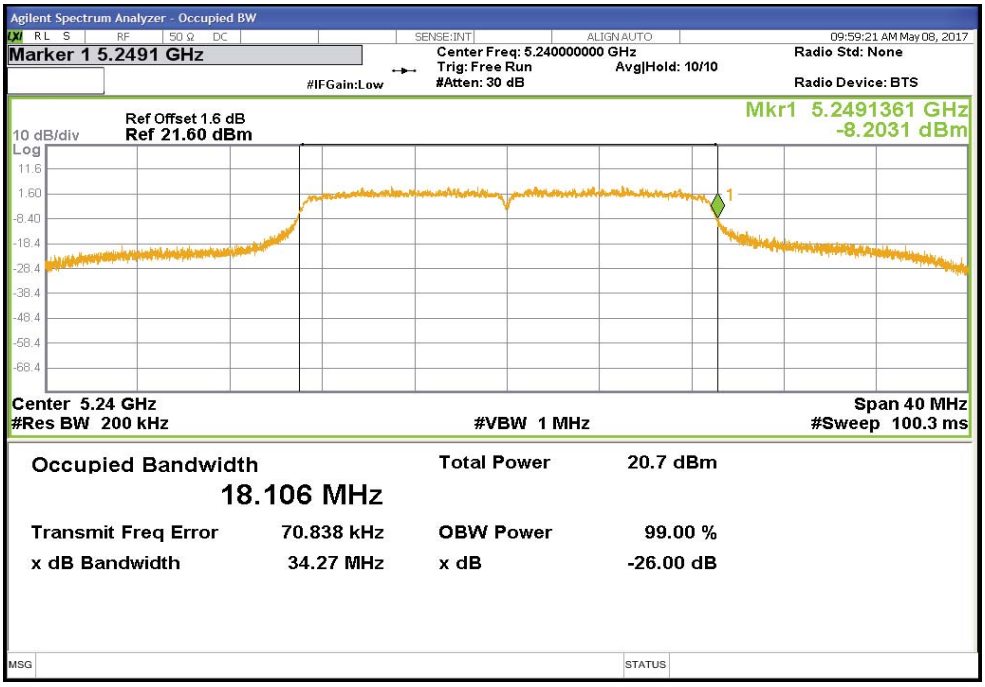


Figure 113: Measured Band-edge for HT20-MCS0 at 5240 MHz

Note: Since the 99% bandwidth emission did not cross over into the UNII2a band, DFS is not require for 5240MHz operating channel.

4.5 Transmitter Spurious Emissions

Transmitter spurious emissions are emissions outside the frequency range of the equipment when the equipment is in transmit mode; per requirement of CFR47 15.205:2017, 15.209:2017, 15.407(b:2017), RSS 247 Sect. 6:2017, RSS GEN Sect.8.9 and 8.10:2014

4.5.1 Test Methodology

4.5.1.1 Preliminary Test

A test program that controls instrumentation and data logging was used to automate the preliminary RF emission test procedure. The frequency range of interest was divided into sub-ranges to yield a frequency resolution of approximately 120 kHz and provide a reading at each frequency for no more than 12° of turntable rotation. For each frequency sub-range the turntable was rotated 360° while peak emission data was recorded and plotted over the frequency range of interest in horizontal and vertical antenna polarization's.

Preliminary emission profile testing was performed inside the anechoic chamber. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm (<1 GHz) and 150cm (>1 GHz) above the floor. The EUT was positioned as shown in the setup photographs. The receiving antenna was placed at a distance of 3m at a fixed height of 1m. Measurement equipment was located outside of the chamber. A video camera was placed inside the chamber to view the EUT.

Pres-scans were performed to determine the worst, data rate/ chains for 802.11a and 802.11n (HT20).

4.5.1.2 Final Test

For each frequency measured, the peak emission was maximized by manipulating the receiving antenna from 1 to 4 meters above the ground plane and placing it at the position that produced the maximum signal strength reading. The turntable was then rotated through 360° while observing the peak signal and placing the EUT at the position that produced maximum radiation. The six highest emissions relative to the limit were measured unless such emissions were more than 20 dB below the limit. If less than six emissions are within 20 dB of the limit, than the noise level of the receiver is measured at frequencies where emissions are expected. Multiples of all oscillator and microprocessor frequencies were also checked.

Final testing was performed on an NSA compliant test site. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm (<1 GHz) and 150cm (>1 GHz) above the ground plane. The placement of EUT and cables were the same as for preliminary testing and is shown in the setup photographs.

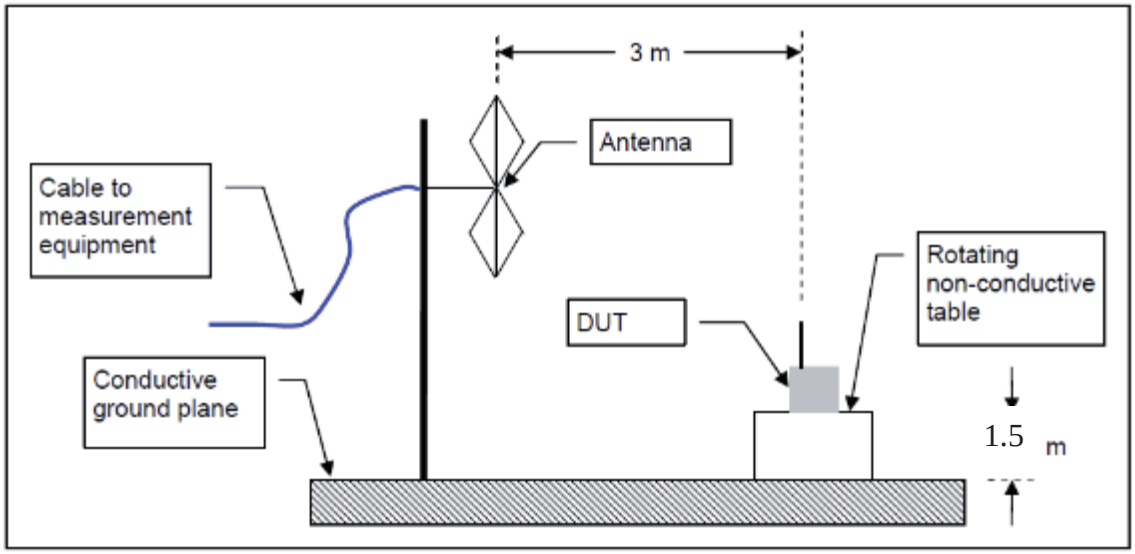
Final results are:

802.11a at 6Mbps and 802.11n (HT20) at 6.5Mbps on upright position.

4.5.1.3 Deviations

None.

Test Setup:



4.5.2 Transmitter Spurious Emission Limit

The spurious emissions of the transmitter shall not exceed the values in CFR47 Part 15.205, 15.209, RSS 247 Sect. 6, RSS GEN Sect. 8.9 and 8.10

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

According to CFR47 15.407 (b) and RSS 247 Sect. 6.2, all harmonics and spurious emissions which are outside the 5150 MHz - 5250 MHz, 5250 MHz – 5350 MHz, or 5470 MHz – 5725 MHz shall not exceed -27 dBm/MHz. This is equivalent to 68.2 dBuV/m at 3 meter distance.

4.5.3 Results

The final measurement data was taken under the worst case operating modes, configurations, and/or cable positions. It also reflects the results including any modifications and/or special accessories listed in Sections 1.4 and test plan.

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 9: Transmit Spurious Emission at Band-Edge Requirements

Test Conditions: Radiated Measurement, Normal Temperature and Voltage only	**Date:** May 10, 2017
Antenna Type: Chip	**Power Setting:** See test plan
Max. Gain: + 4.9 dBi	**Signal State:** Modulated at 100%.
Ambient Temp.: 19° C	**Relative Humidity:**35%

Band-Edge Results for 5150 MHz to 5350MHz

Freq. (MHz)	Level (dBuV/m)	Pol. (H/V)	Limit (dBuV/m)	Margin (dB)	Det.	Table Deg.	Tower (cm)	Note
5150.00	62.74	V	74	−11.26	Pk	345	167	11a−5180MHz−6Mbps
5150.00	49.02	V	54	−4.98	Ave	345	167	11a−5180MHz−6Mbps
5150.00	61.16	H	74	−12.84	Pk	103	152	11a−5180MHz−6Mbps
5150.00	48.05	H	54	−5.95	Ave	103	152	11a−5180MHz−6Mbps
5150.00	61.26	H	74	−12.74	Pk	108	157	HT20−5180MHz−6.5Mbps
5150.00	48.10	H	54	−5.90	Ave	108	157	HT20−5180MHz−6.5Mbps
5150.00	62.35	V	74	−11.65	Pk	0	157	HT20−5180MHz−6.5Mbps
5150.00	48.97	V	54	−5.03	Ave	0	157	HT20−5180MHz−6.5Mbps
5350.00	62.64	H	74	−11.36	Pk	96	134	11a−5320MHz−6Mbps
5350.00	48.85	H	54	−5.15	Ave	96	134	11a−5320MHz−6Mbps
5350.00	60.15	V	74	−13.85	Pk	4	180	11a−5320MHz−6Mbps
5350.00	48.96	V	54	−5.04	Ave	4	180	11a−5320MHz−6Mbps
5350.00	61.54	V	74	−12.46	Pk	343	199	HT20−5320MHz−6.5Mbps
5350.00	49.01	V	54	−4.99	Ave	343	199	HT20−5320MHz−6.5Mbps
5350.00	62.14	H	74	−11.86	Pk	99	122	HT20−5320MHz−6.5Mbps
5350.00	48.88	H	54	−5.12	Ave	99	122	HT20−5320MHz−6.5Mbps

Note: 1. Band-edge frequencies were taken at 5150 MHz and 5350 MHz since these band-edges are adjacent to the restricted bands.

2. All the band-edge measurements met the restricted band requirements of CFR47 15.205.

3. For 5250 MHz In-band-edge, refer to Section 4.4.2.

4. Since the band-edge measurements have margins in the present of in-band leakage, the band-edge plots captured with spectrum analyzer's span wider than 2 MHz.

Table 10: Transmit Spurious Emission at Band-Edge Requirements Continued

Test Conditions: Radiated Measurement, Normal Temperature and Voltage only	**Date:** May 10, 2017
Antenna Type: Chip	**Power Setting:** See test plan
Max. Gain: + 4.9 dBi	**Signal State:** Modulated at 100%.
Ambient Temp.: 23° C	**Relative Humidity:**35%

Band-Edge Results for 5470 MHz to 5725MHz

Freq. (MHz)	Level (dBuV/m)	Pol. (H/V)	Limit (dBuV/m)	Margin (dB)	Det.	Table Deg.	Tower (cm)	Note
5470.00	63.76	V	74	−10.24	Pk	0	169	11a−5500MHz−6Mbps
5470.00	50.12	V	54	−3.88	Ave	0	169	11a−5500MHz−6Mbps
5470.00	62.48	H	74	−11.52	Pk	319	114	11a−5500MHz−6Mbps
5470.00	50.05	H	54	−3.95	Ave	319	114	11a−5500MHz−6Mbps
5470.00	64.16	H	74	−9.84	Pk	91	125	HT20−5500MHz−6.5Mbps
5470.00	50.11	H	54	−3.89	Ave	91	125	HT20−5500MHz−6.5Mbps
5470.00	62.66	V	74	−11.34	Pk	0	200	HT20−5500MHz−6.5Mbps
5470.00	50.07	V	54	−3.93	Ave	0	200	HT20−5500MHz−6.5Mbps
5725.00	63.20	H	74	−10.80	Pk	110	220	11a−5700MHz−6Mbps
5725.00	50.01	H	54	−3.99	Ave	110	220	11a−5700MHz−6Mbps
5725.00	62.54	V	74	−11.46	Pk	198	220	11a−5700MHz−6Mbps
5725.00	49.88	V	54	−4.12	Ave	198	220	11a−5700MHz−6Mbps
5725.00	62.58	V	74	−11.42	Pk	146	222	HT20−5700MHz−6.5Mbps
5725.00	49.87	V	54	−4.13	Ave	146	222	HT20−5700MHz−6.5Mbps
5725.00	63.05	H	74	−10.95	Pk	115	204	HT20−5700MHz−6.5Mbps
5725.00	50.05	H	54	−3.95	Ave	115	204	HT20−5700MHz−6.5Mbps

Note: 1. Band-edge frequencies were evaluated at 5470 MHz and 5725 MHz.

2. All the band-edge measurements met the restricted band requirements of CFR47 15.205.

3. Refer to Section 4.4.2. for additional undesired emission at the band-edge.

4. Since the band-edge measurements have margins in the present of in-band leakage, the band-edge plots captured with spectrum analyzer's span wider than 2 MHz.

Table 11: Transmit Spurious Emission at Band-Edge Requirements Continued

Test Conditions: Radiated Measurement, Normal Temperature and Voltage only	**Date:** May 10, 2017
Antenna Type: Chip	**Power Setting:** See test plan
Max. Gain: + 4.9 dBi	**Signal State:** Modulated at 100%.
Ambient Temp.: 23° C	**Relative Humidity:**35%

Band-Edge Results for 5725 MHz to 5850 MHz

Freq. (MHz)	Level (dBuV/m)	Pol. (H/V)	Limit (dBuV/m)	Margin (dB)	Det.	Table Deg.	Tower (cm)	Note
5926.15	65.26	H	68.3	-3.04	Pk	107	217	11a-5745MHz-6Mbps
5929.66	65.21	V	68.3	-3.09	Pk	184	220	11a-5745MHz-6Mbps
5924.05	64.65	H	68.3	-3.65	Pk	95	233	11a-5825MHz-6Mbps
5924.05	63.87	V	68.3	-4.43	Pk	134	238	11a-5825MHz-6Mbps
5930.36	64.48	H	68.3	-3.82	Pk	112	213	HT20-5745MHz-6.5Mbps
5924.75	64.97	V	68.3	-3.33	Pk	164	180	HT20-5745MHz-6.5Mbps
5942.99	65.14	H	68.3	-3.16	Pk	119	238	HT20-5825MHz-6.5Mbps
5924.05	64.52	V	68.3	-3.78	Pk	157	165	HT20-5825MHz-6.5Mbps

Note: 1. The spectrum mask was evaluated at band-edge frequencies for the lowest and highest operating channels.
2. All the band-edge measurements met the undesired emission limit, where 27dBm eirp is 68.3 dBuV/m at 3m.
3. Refer to Section 4.4.2. for additional undesired emission at the band-edge.
4. Fig. 144 to Fig. 151 show the full spectrum mask for above configurations.

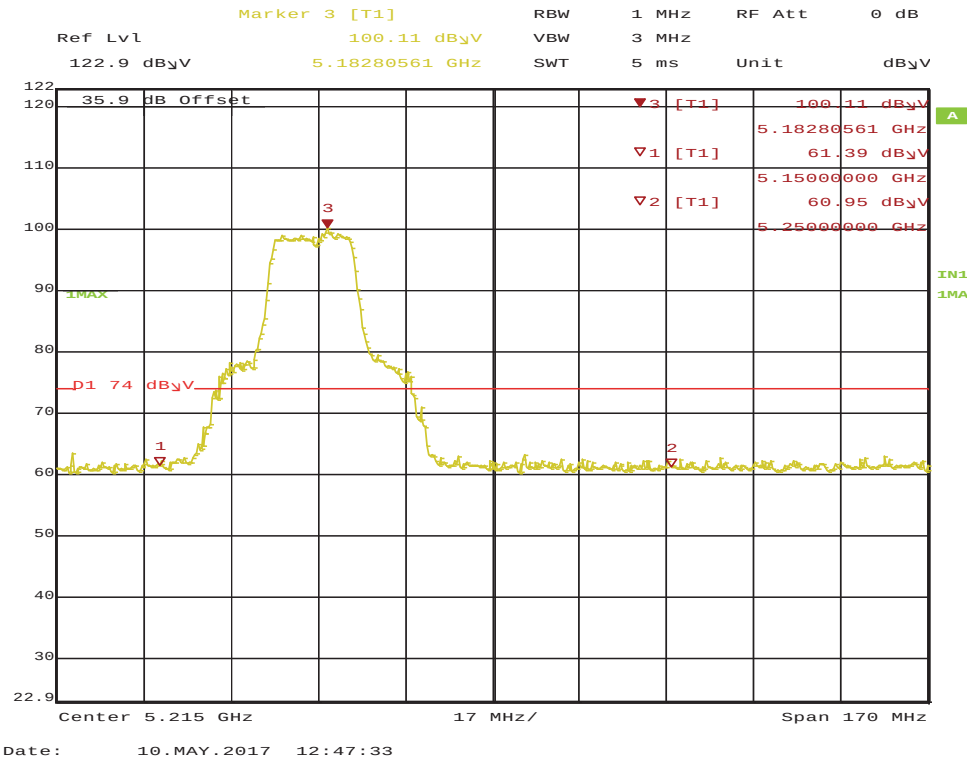


Figure 114: Radiated Emission 5150.0 MHz Edge for 11a 5180 MHz – Horz. (Pk)

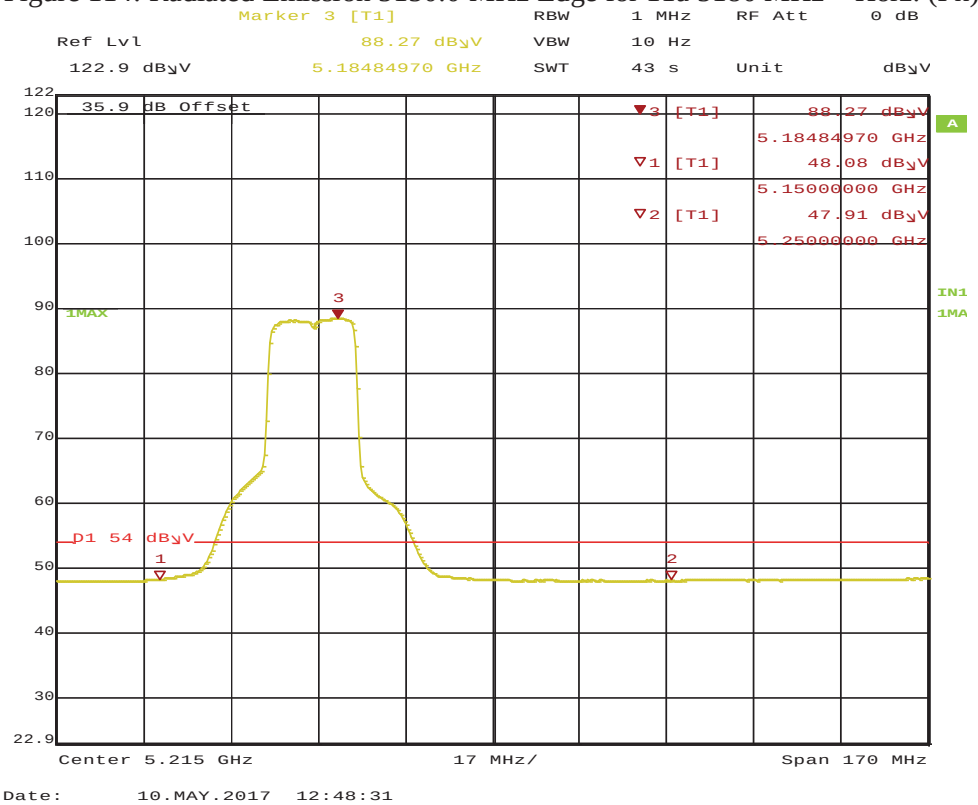


Figure 115: Radiated Emission 5150.0 MHz Edge for 11a 5180 MHz – Horz. (Ave)

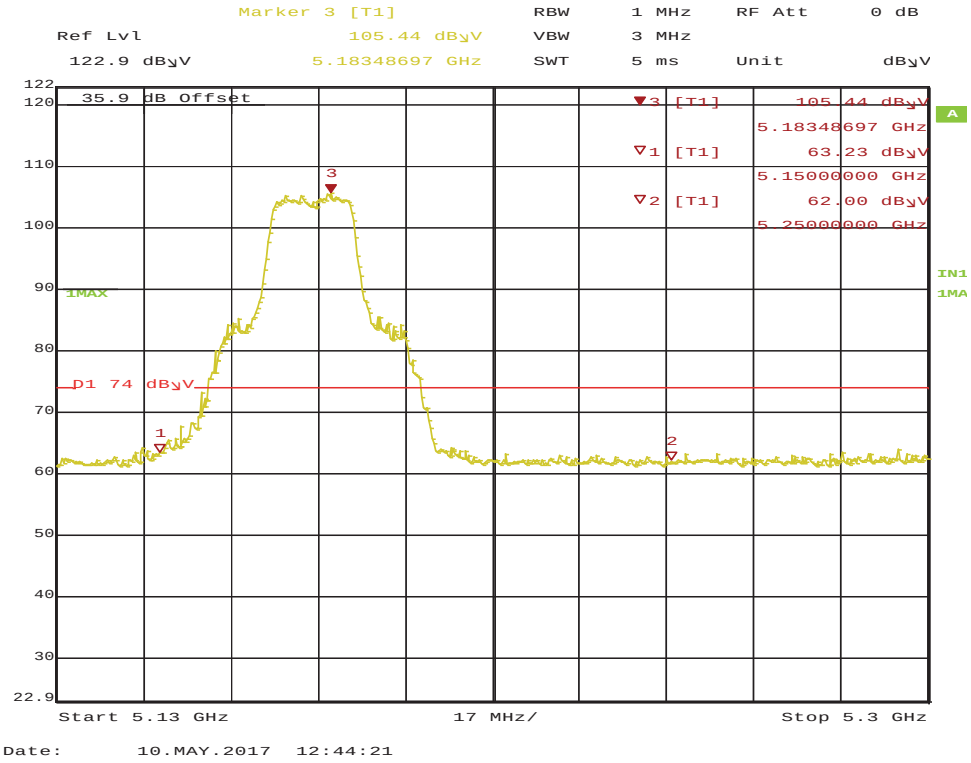


Figure 116: Radiated Emission 5150.0 MHz Edge for 11a 5180 MHz – Vert. (Pk)

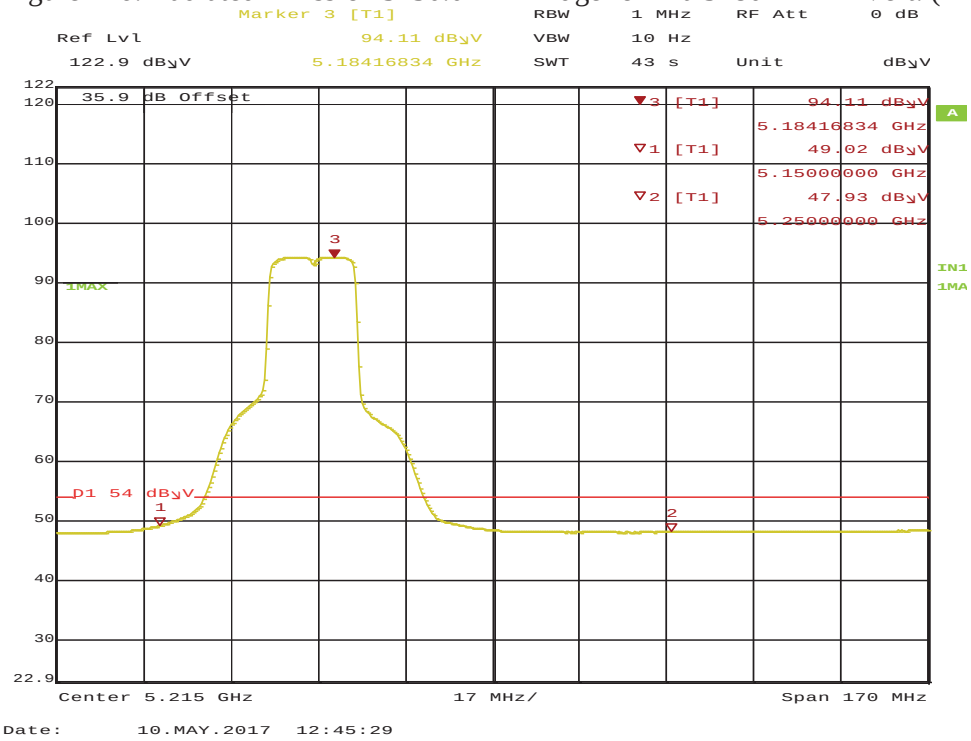


Figure 117: Radiated Emission 5150.0 MHz Edge for 11a 5180 MHz – Vert. (Ave)

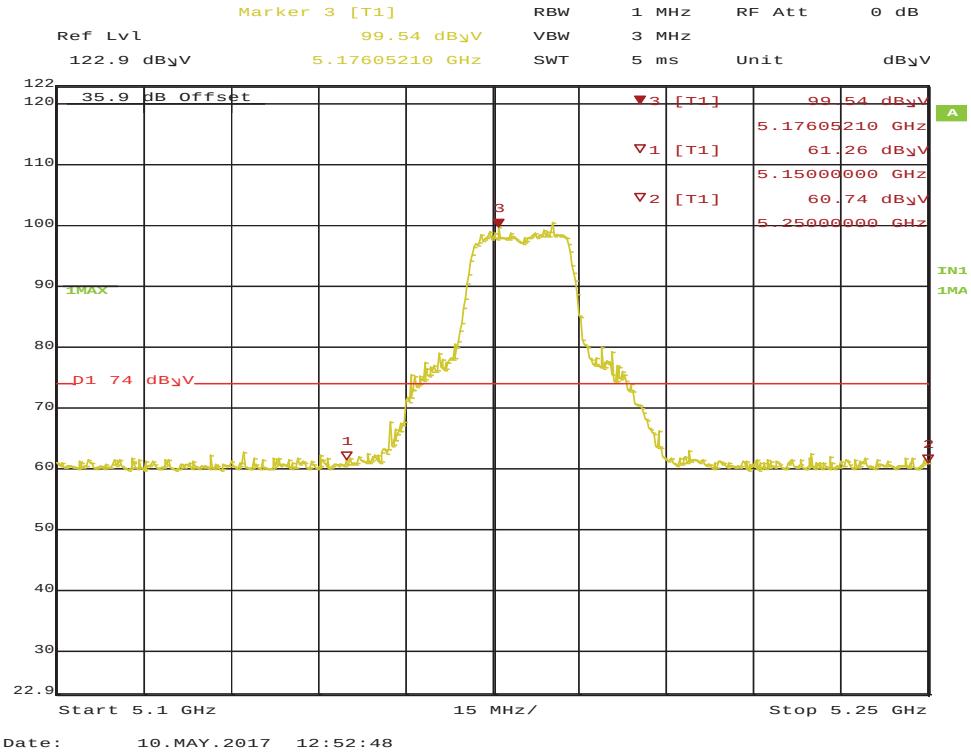


Figure 118: Radiated Emission 5150.0 MHz Edge for HT20 5180 MHz – Horz. (Pk)

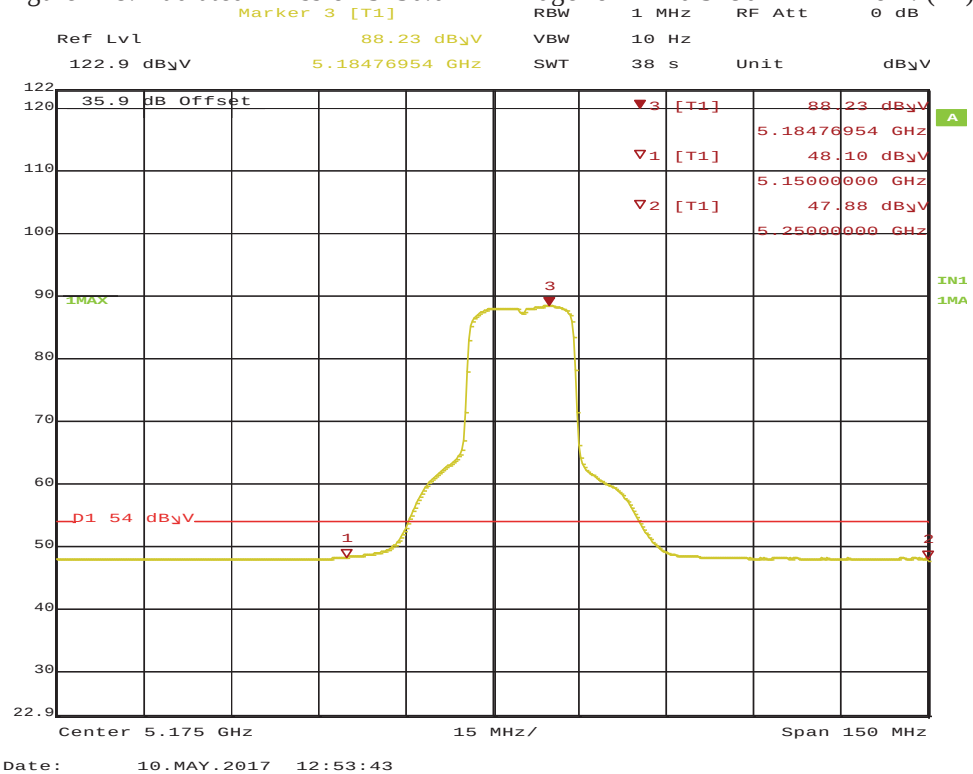


Figure 119: Radiated Emission 5150.0 MHz Edge for HT20 5180 MHz – Horz. (Ave)

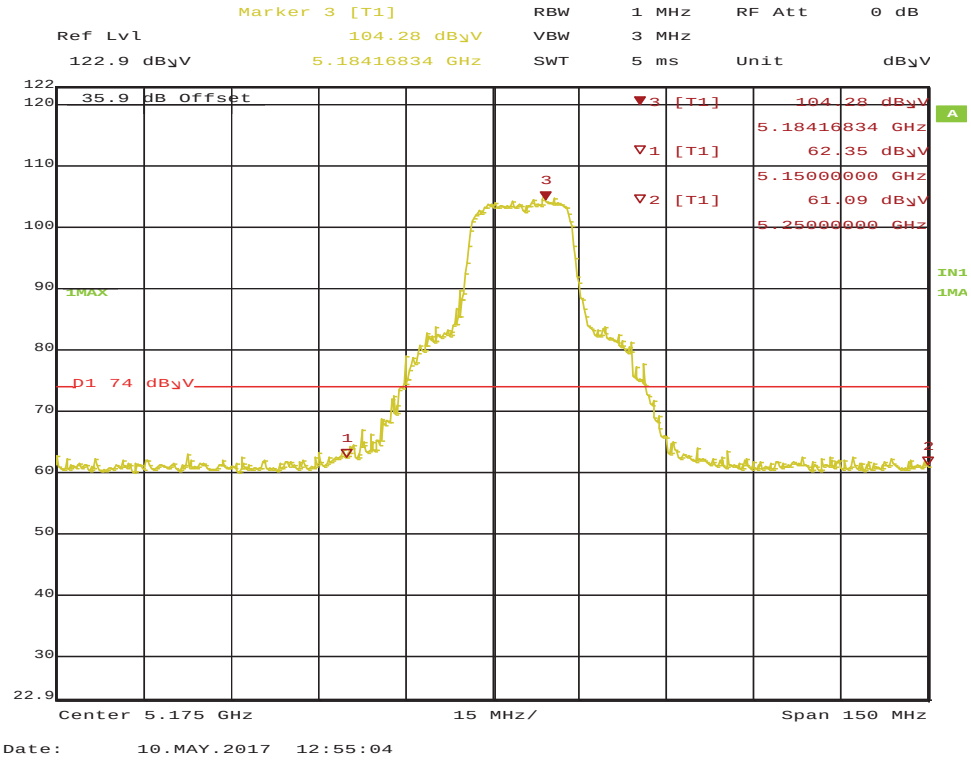


Figure 120: Radiated Emission 5150.0 MHz Edge for HT20 5180 MHz – Vert. (Pk)

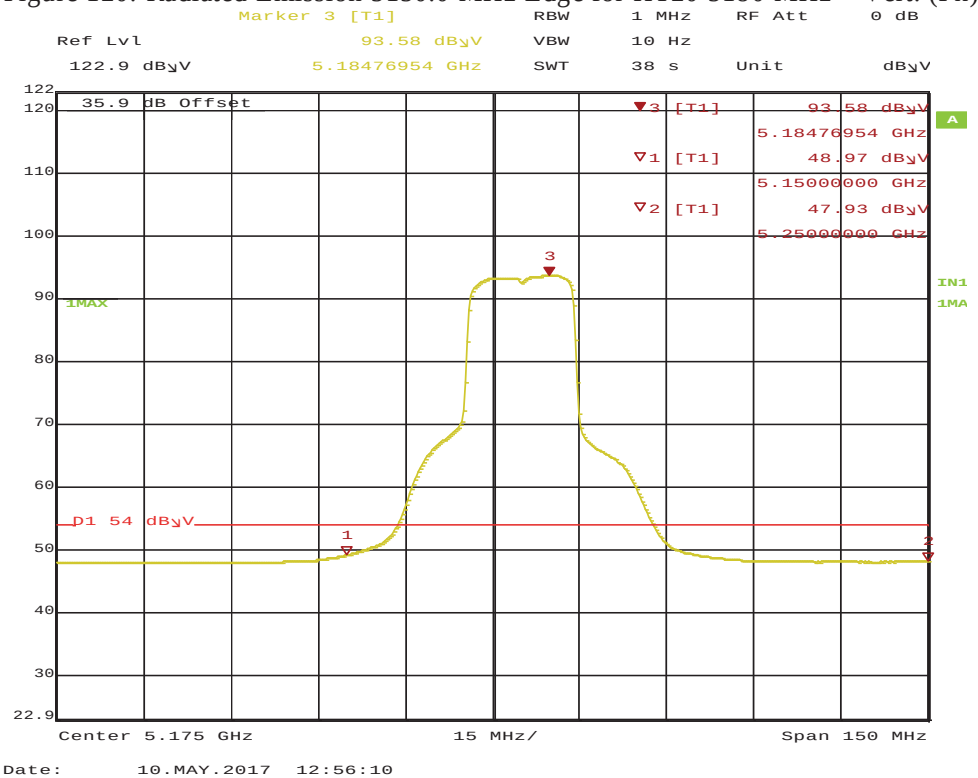


Figure 121: Radiated Emission 5150.0 MHz Edge for HT20 5180 MHz – Vert. (Ave)

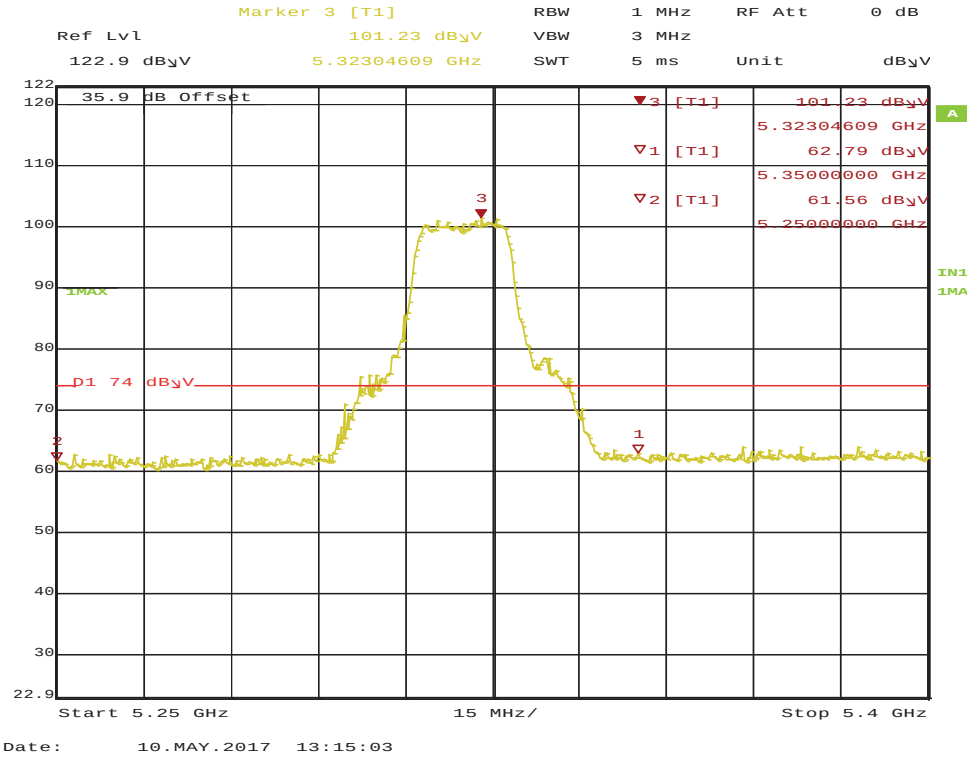


Figure 122: Radiated Emission 5350.0 MHz Edge for 11a 5320 MHz – Horz. (Pk)

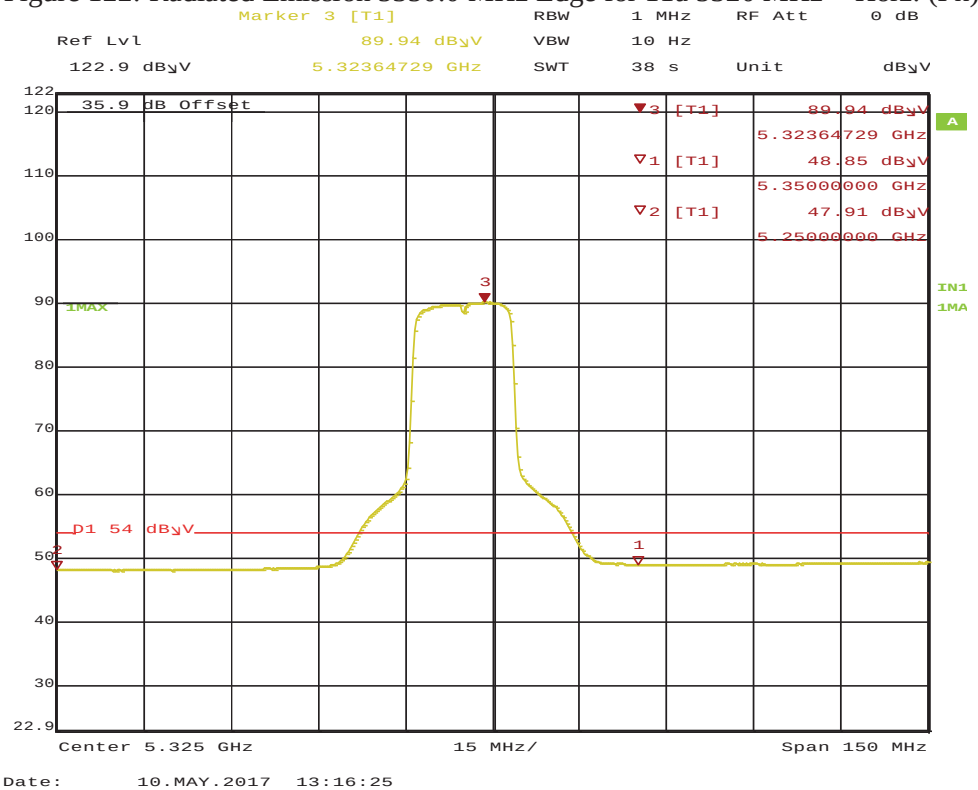


Figure 123: Radiated Emission 5350.0 MHz Edge for 11a 5320 MHz – Horz. (Ave)

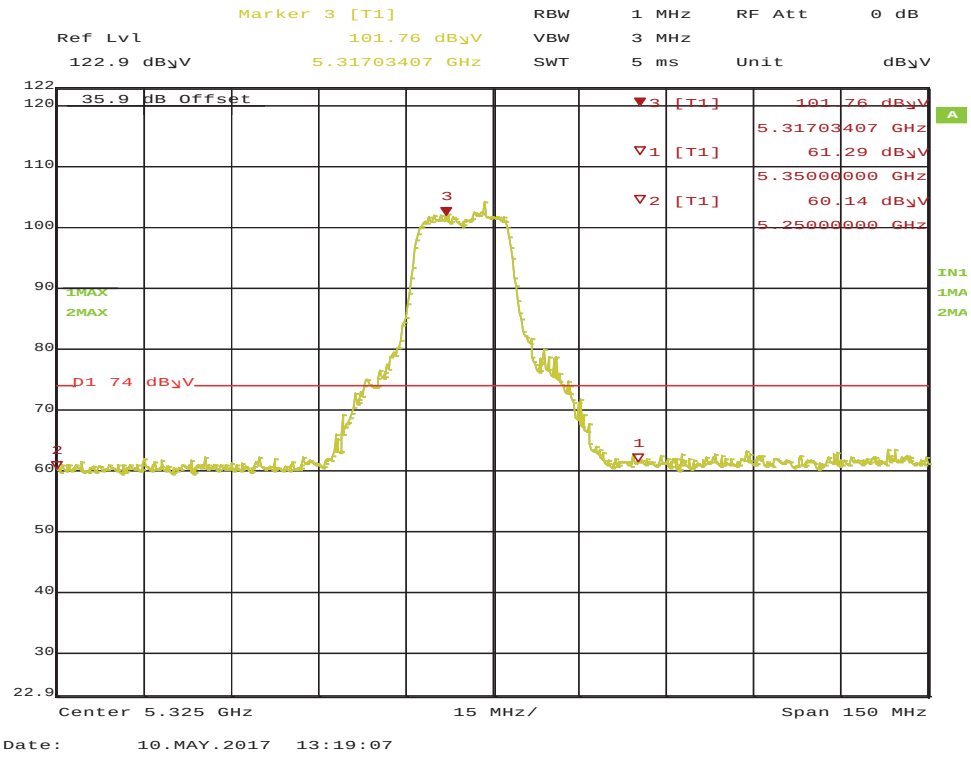


Figure 124: Radiated Emission 5350.0 MHz Edge for 11a 5320 MHz – Vert. (Pk)

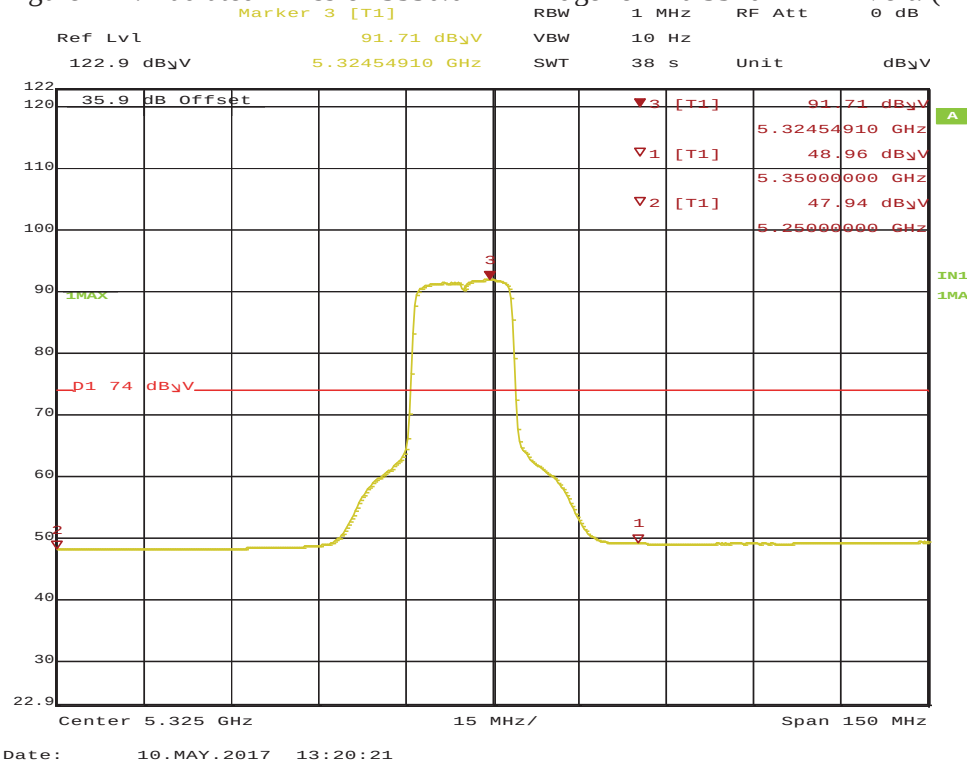


Figure 125: Radiated Emission 5350.0 MHz Edge for 11a 5320 MHz – Vert. (Ave)

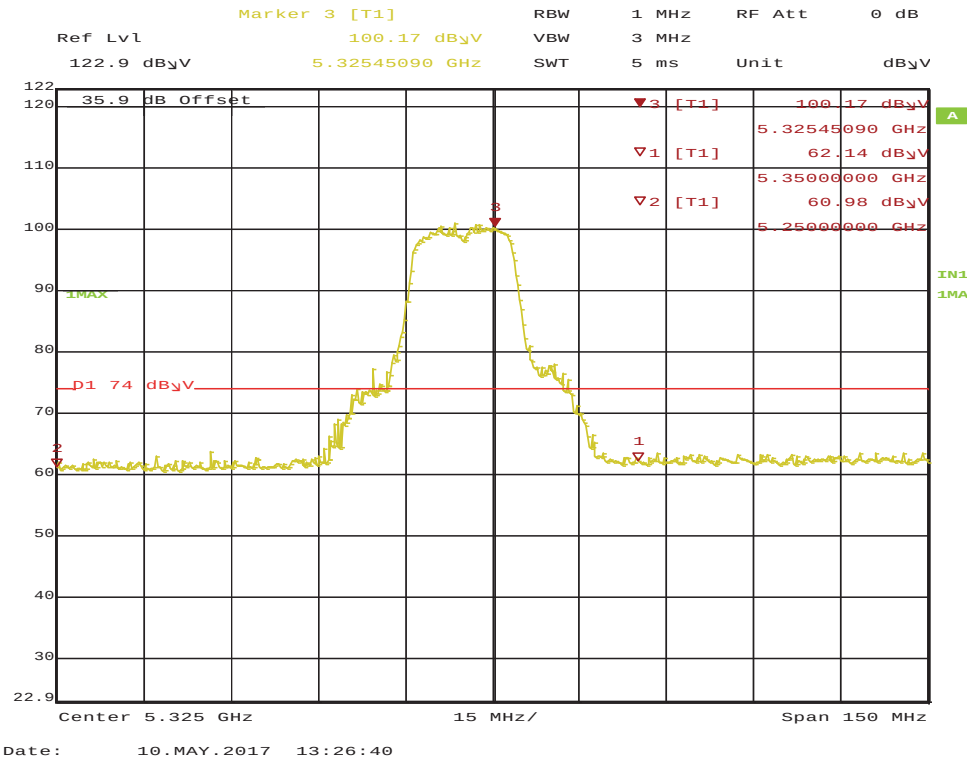


Figure 126: Radiated Emission 5350.0 MHz Edge for HT20 5320 MHz – Horz. (Pk)

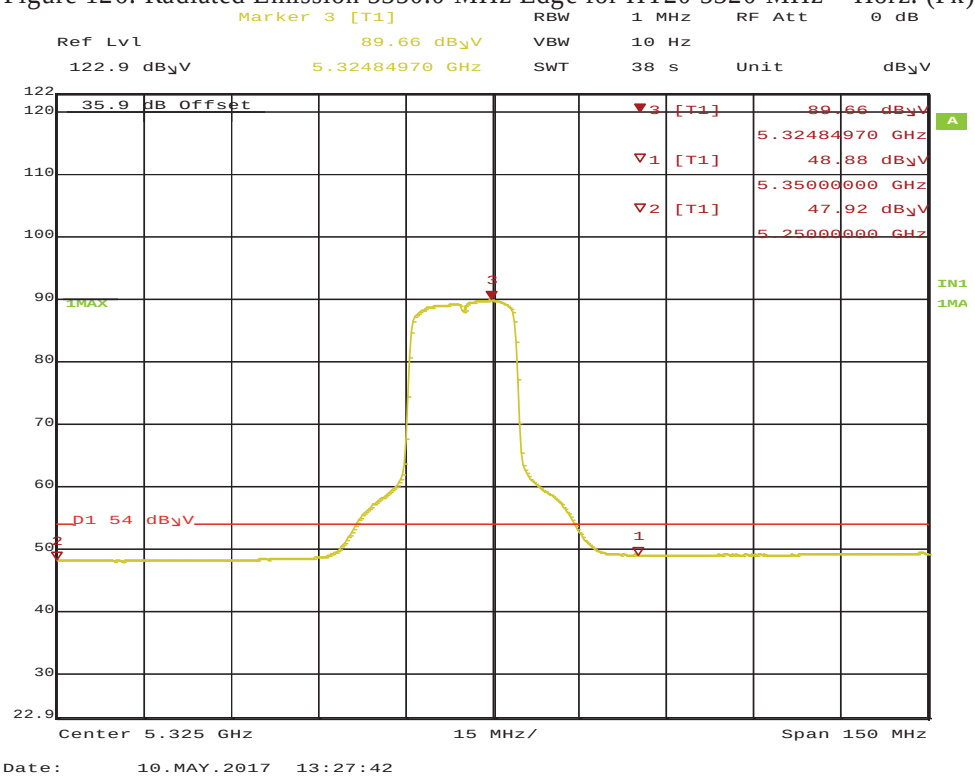


Figure 127: Radiated Emission 5350.0 MHz Edge for HT20 5320 MHz – Horz. (Ave)

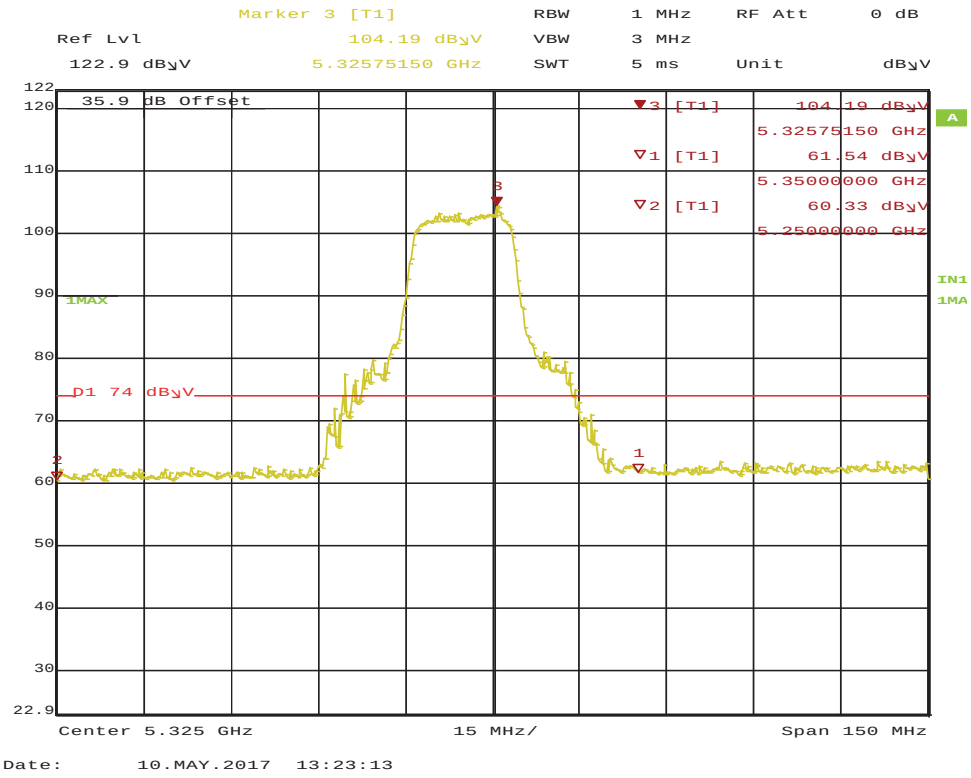


Figure 128: Radiated Emission 5350.0 MHz Edge for HT20 5320 MHz – Vert. (Pk)

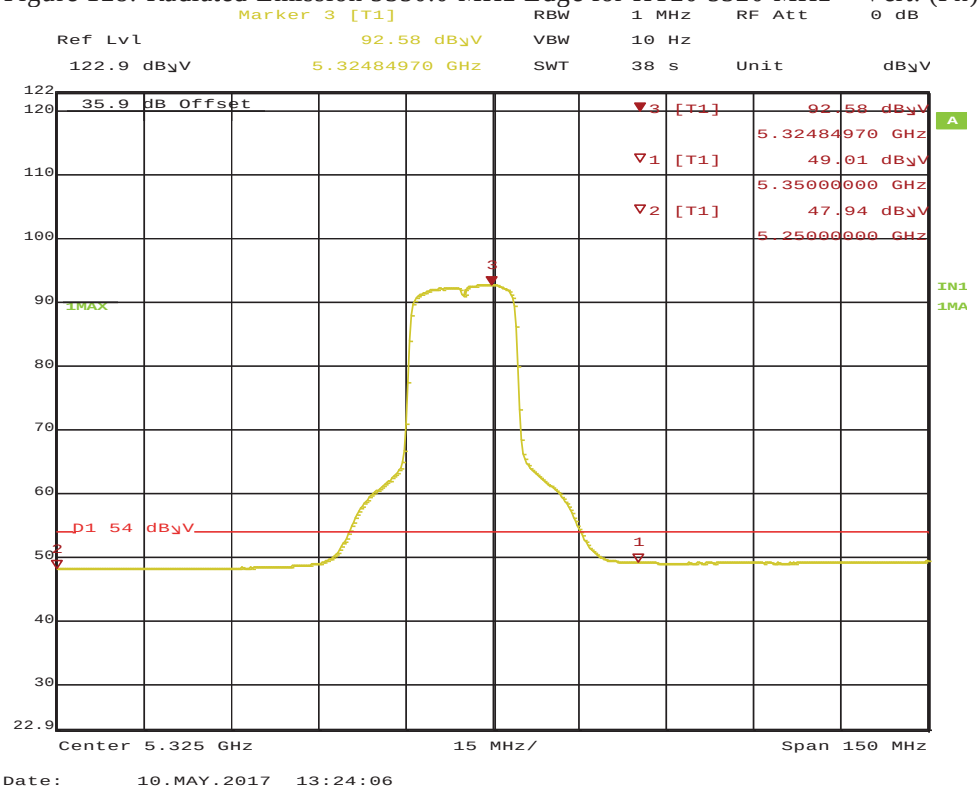


Figure 129: Radiated Emission 5350.0 MHz Edge for HT20 5320 MHz – Vert. (Ave)

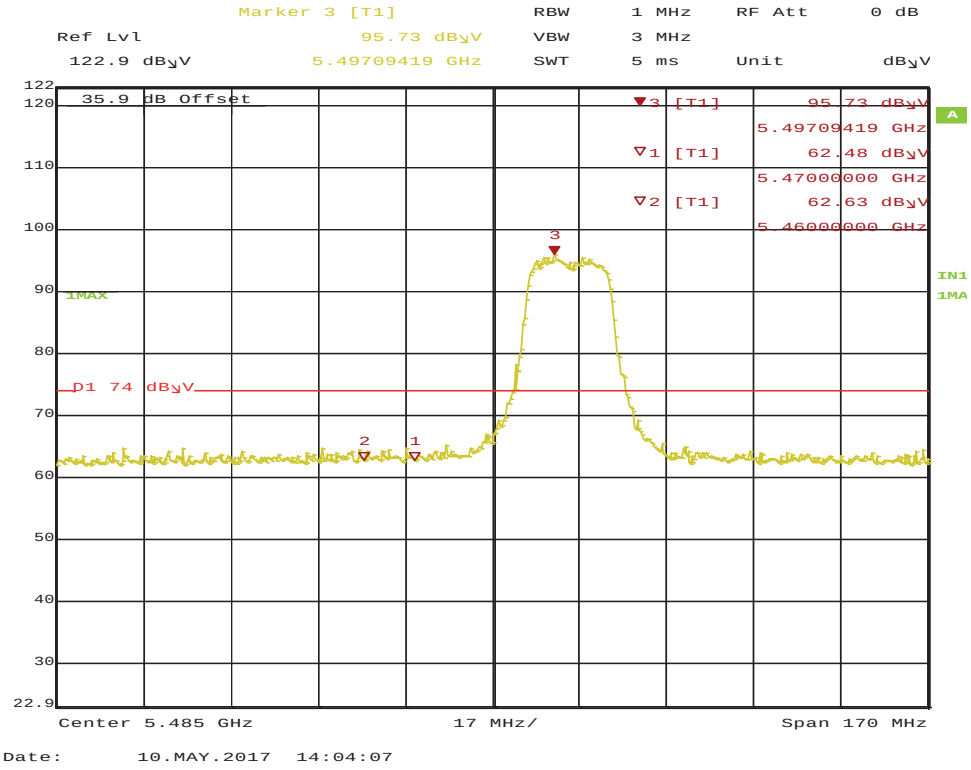


Figure 130: Radiated Emission 5470.0 MHz Edge for 11a 5500 MHz – Horz. (Pk)

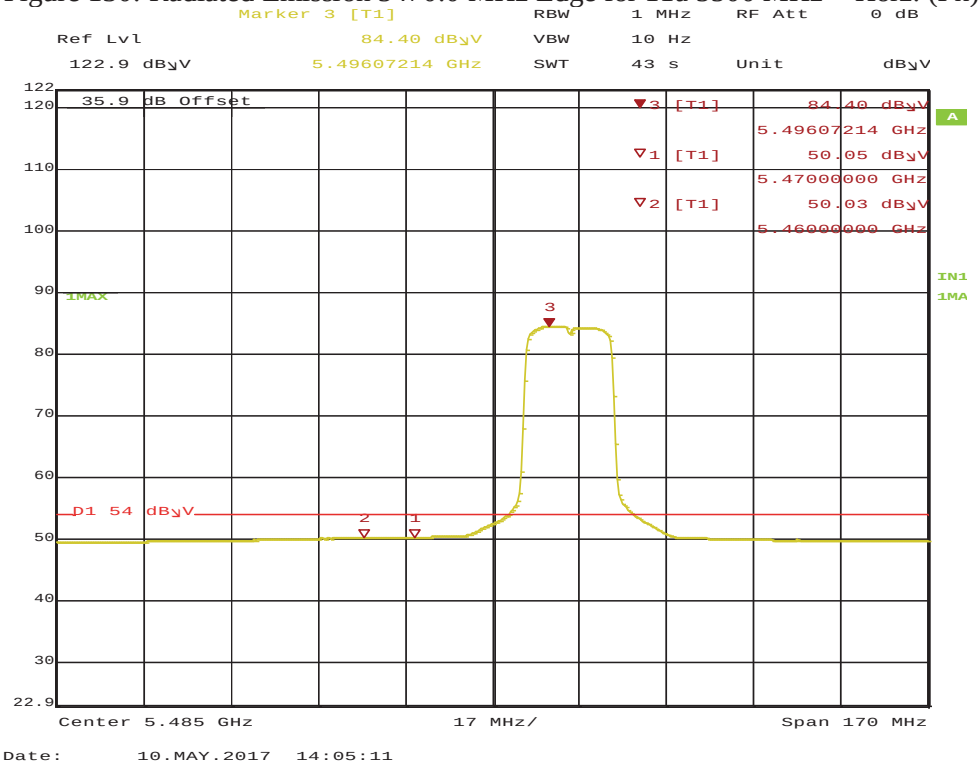


Figure 131: Radiated Emission 5470.0 MHz Edge for 11a 5500 MHz – Horz. (Ave)

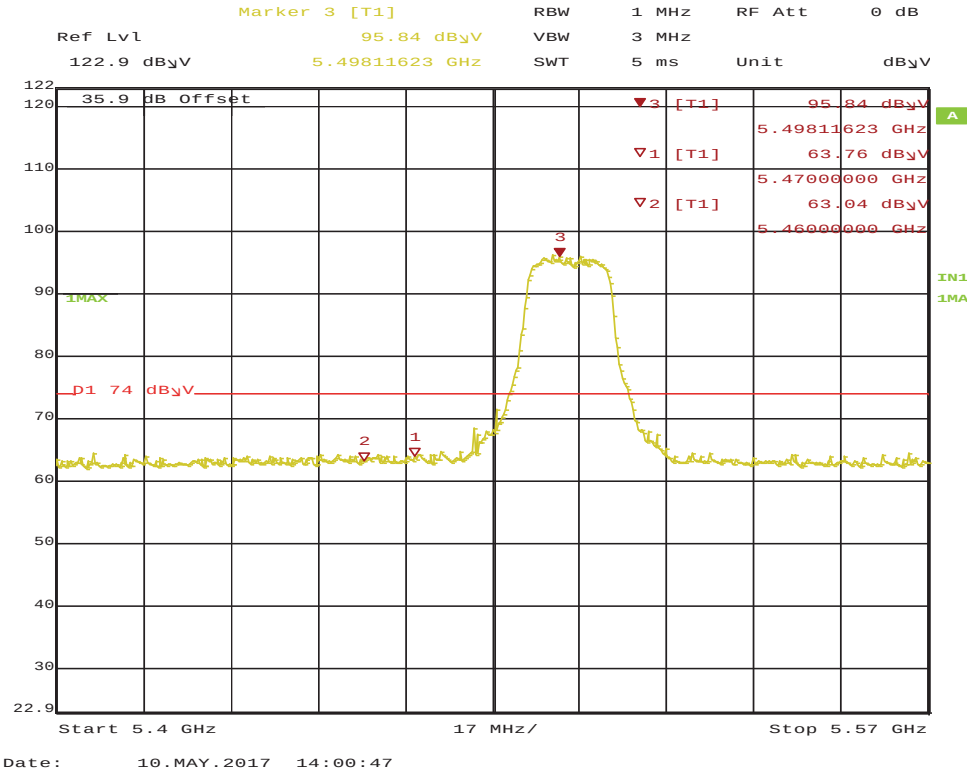


Figure 132: Radiated Emission 5470.0 MHz Edge for 11a 5500 MHz – Vert. (Pk)

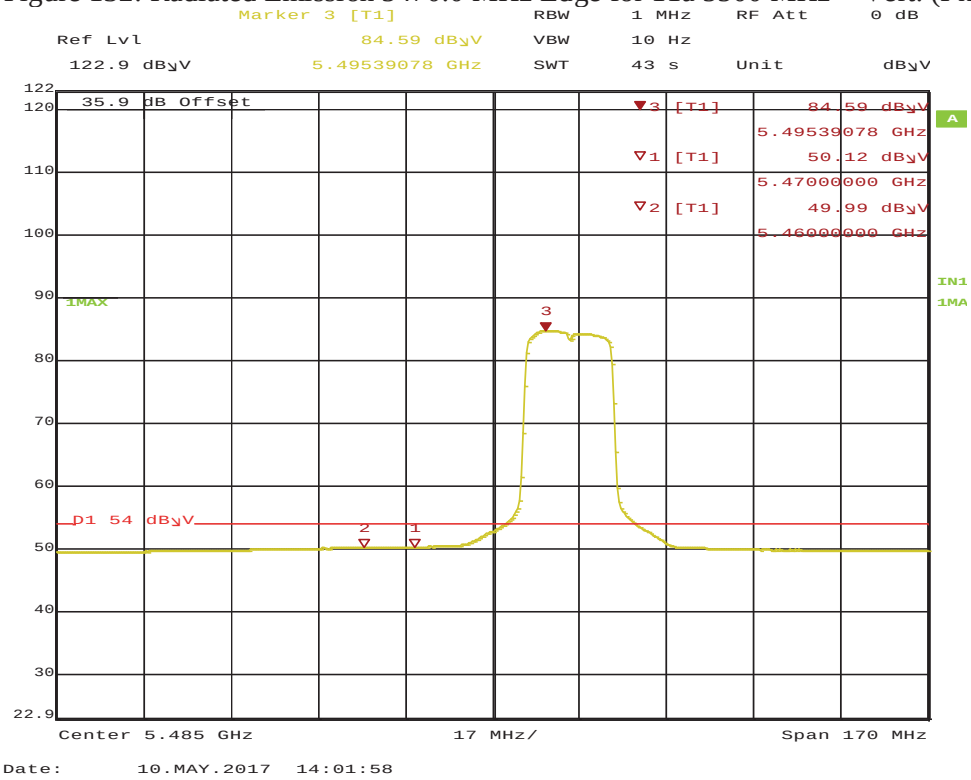


Figure 133: Radiated Emission 5470.0 MHz Edge for 11a 5500 MHz – Vert. (Ave)

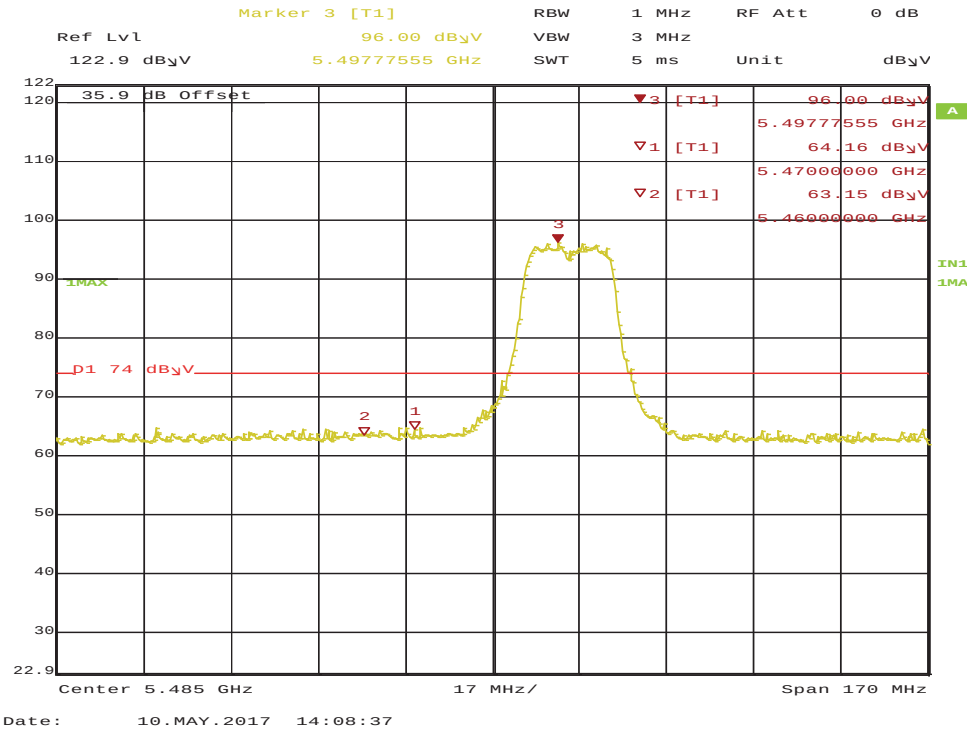


Figure 134: Radiated Emission 5470.0 MHz Edge for HT20 5500 MHz – Horz. (Pk)

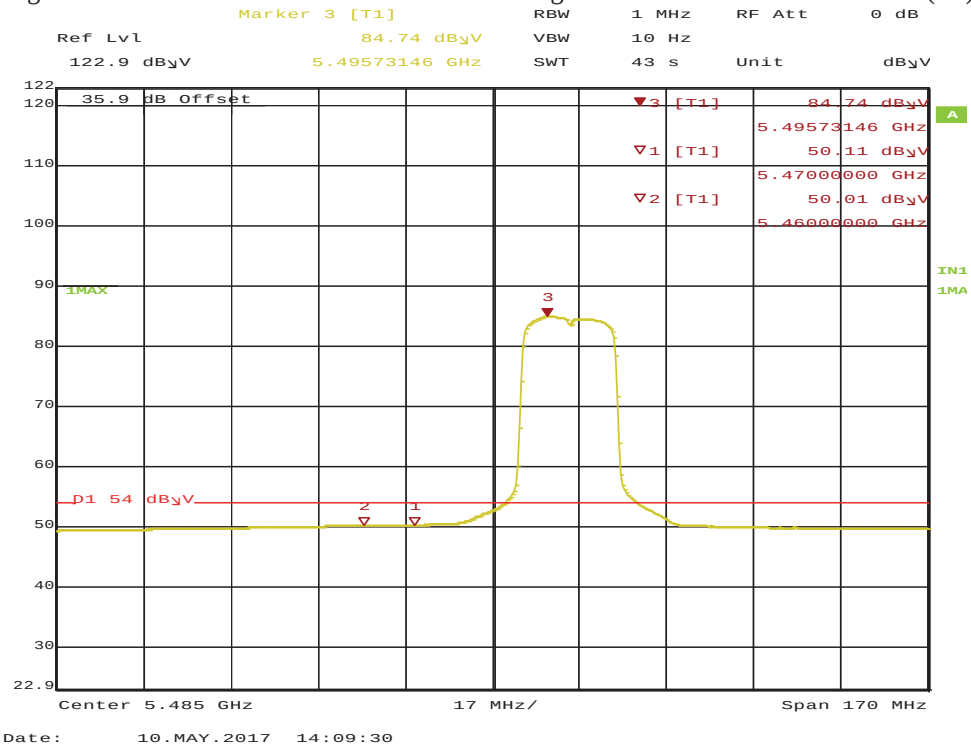


Figure 135: Radiated Emission 5470.0 MHz Edge for HT20 5500 MHz – Horz. (Ave)

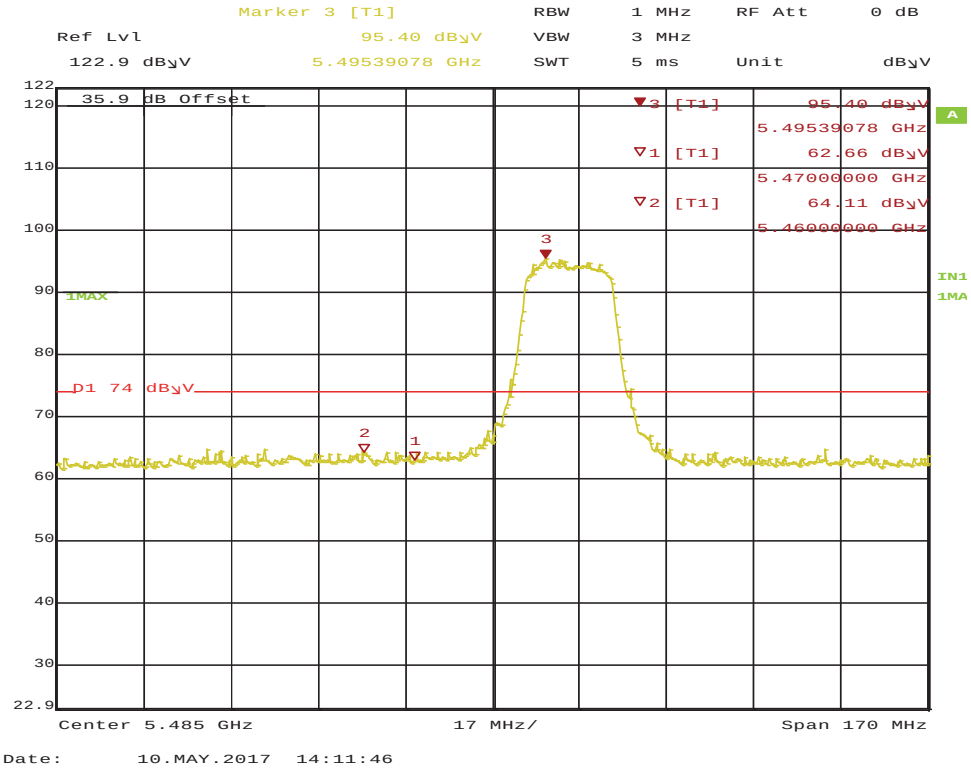


Figure 136: Radiated Emission 5470.0 MHz Edge for HT20 5500 MHz – Vert. (Pk)

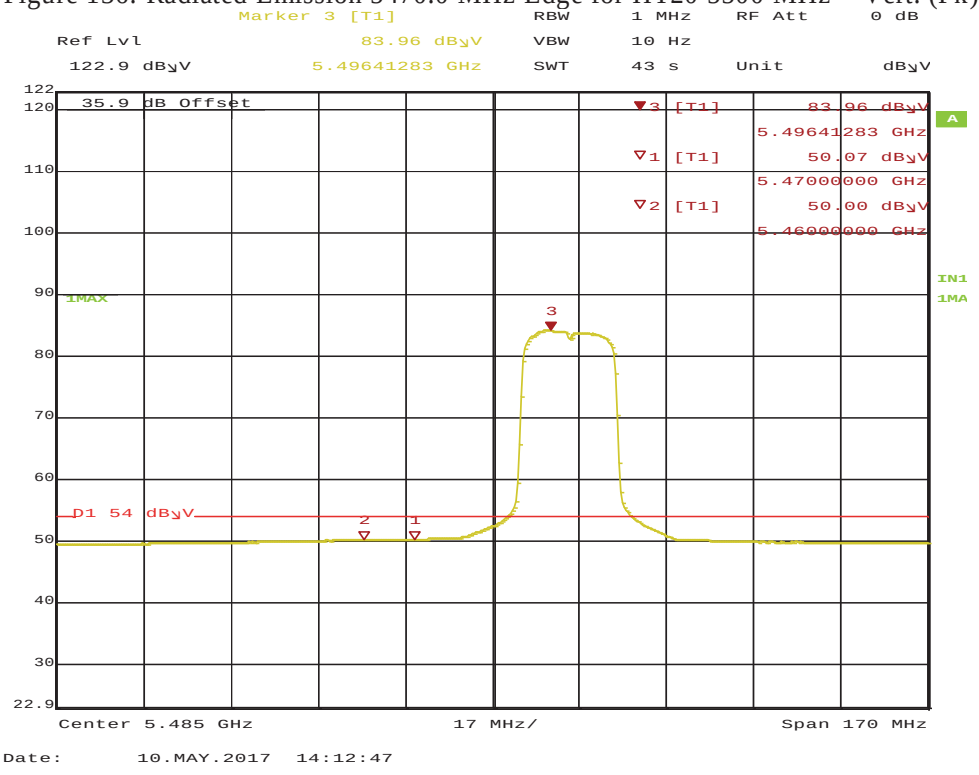


Figure 137: Radiated Emission 5470.0 MHz Edge for HT20 5500 MHz – Vert. (Ave)

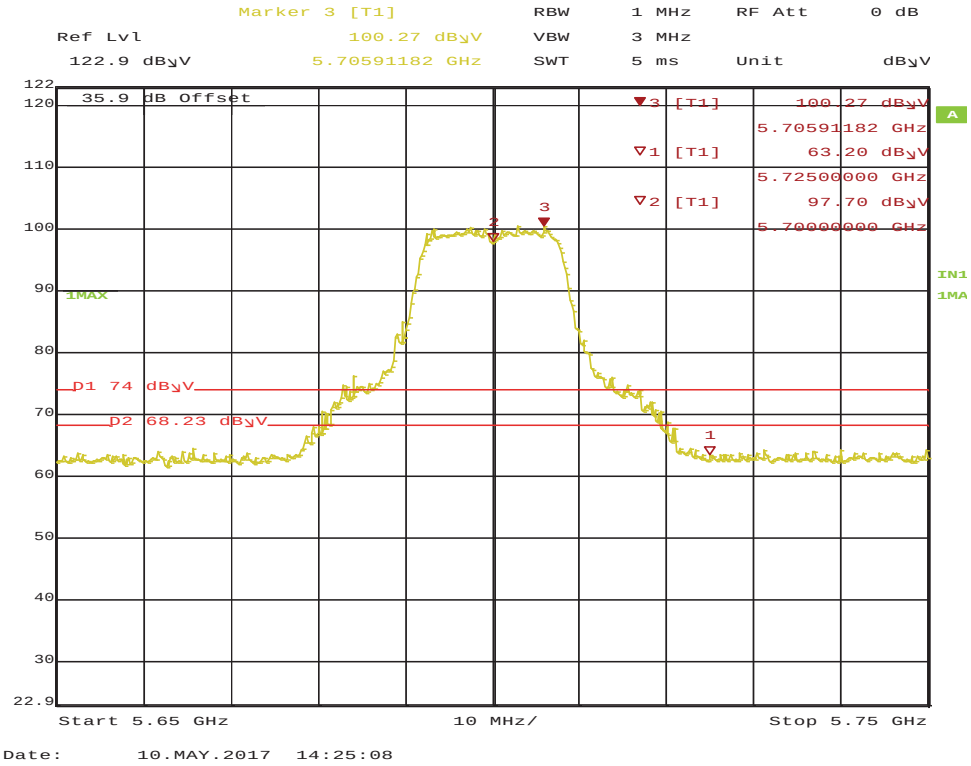


Figure 138: Radiated Emission 5725.0 MHz Edge for 11a 5700 MHz – Horz. (Pk)

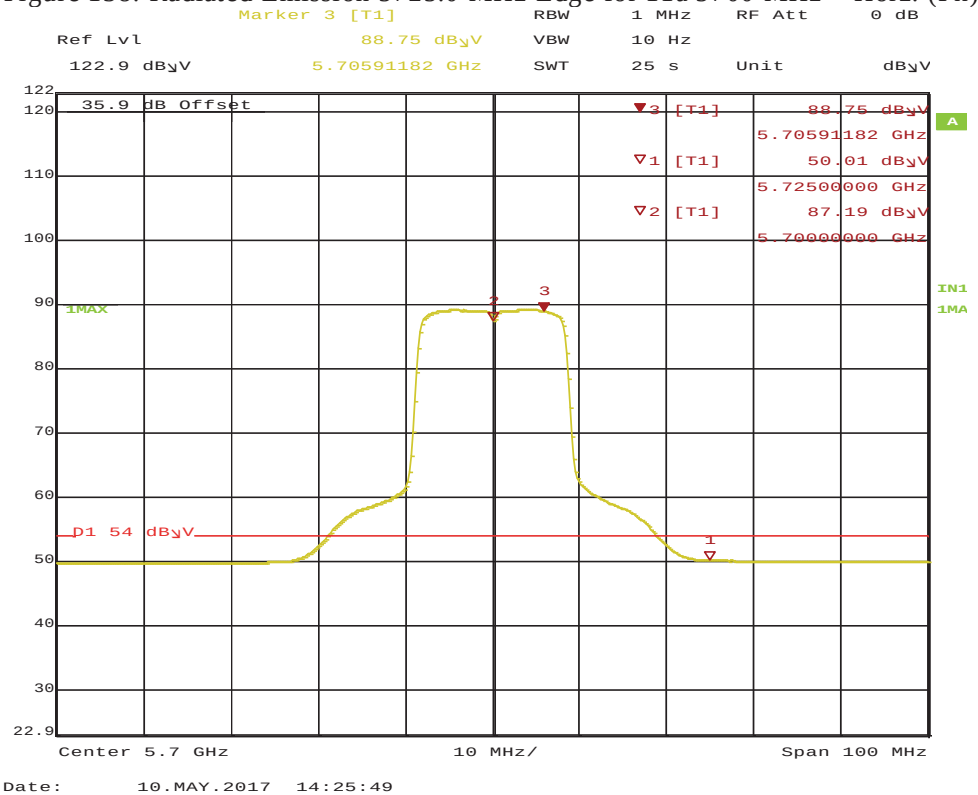


Figure 139: Radiated Emission 5725.0 MHz Edge for 11a 5700 MHz – Horz. (Ave)

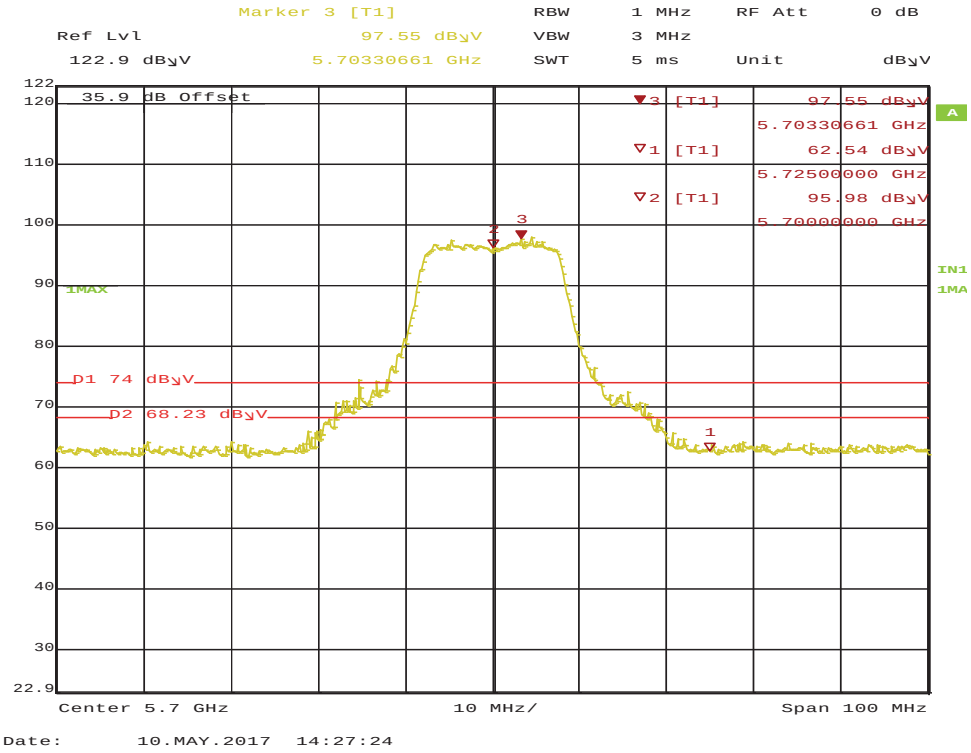


Figure 140: Radiated Emission 5725.0 MHz Edge for 11a 5700 MHz – Vert. (Pk)

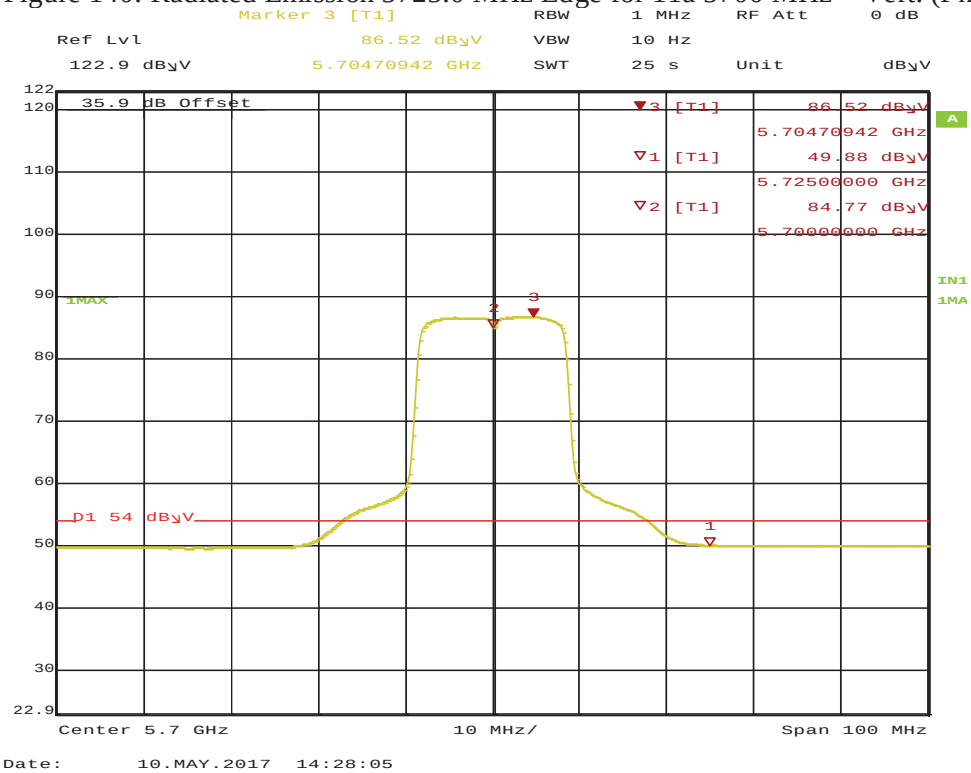


Figure 141: Radiated Emission 5725.0 MHz Edge for 11a 5700 MHz – Vert. (Ave)

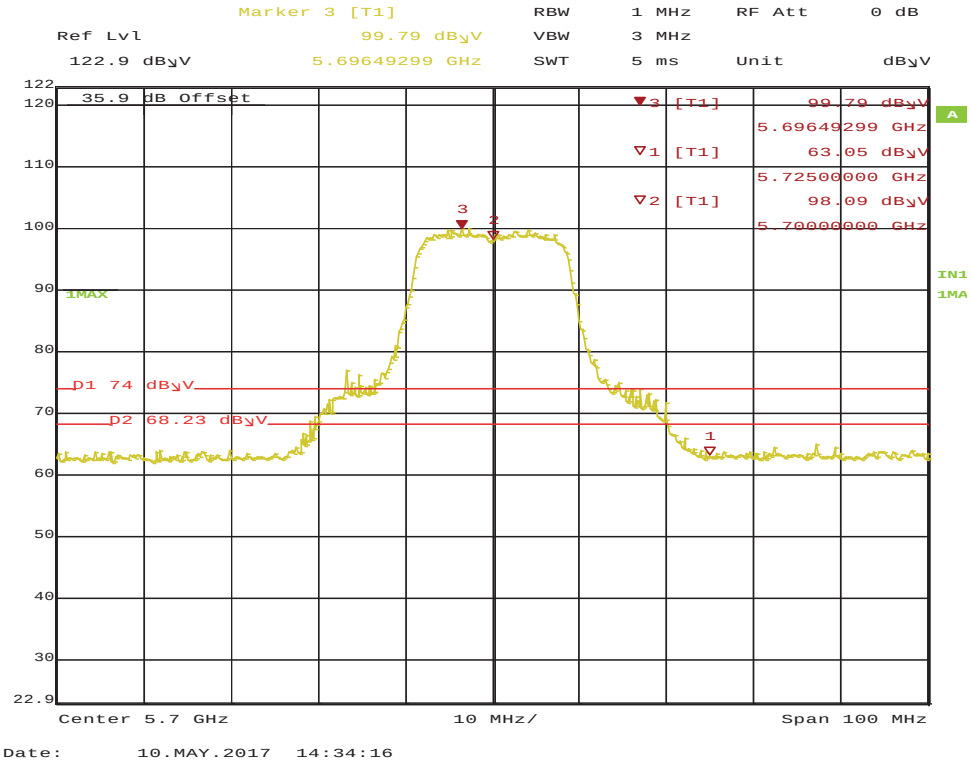


Figure 142: Radiated Emission 5725.0 MHz Edge for HT20 5700 MHz – Horz. (Pk)

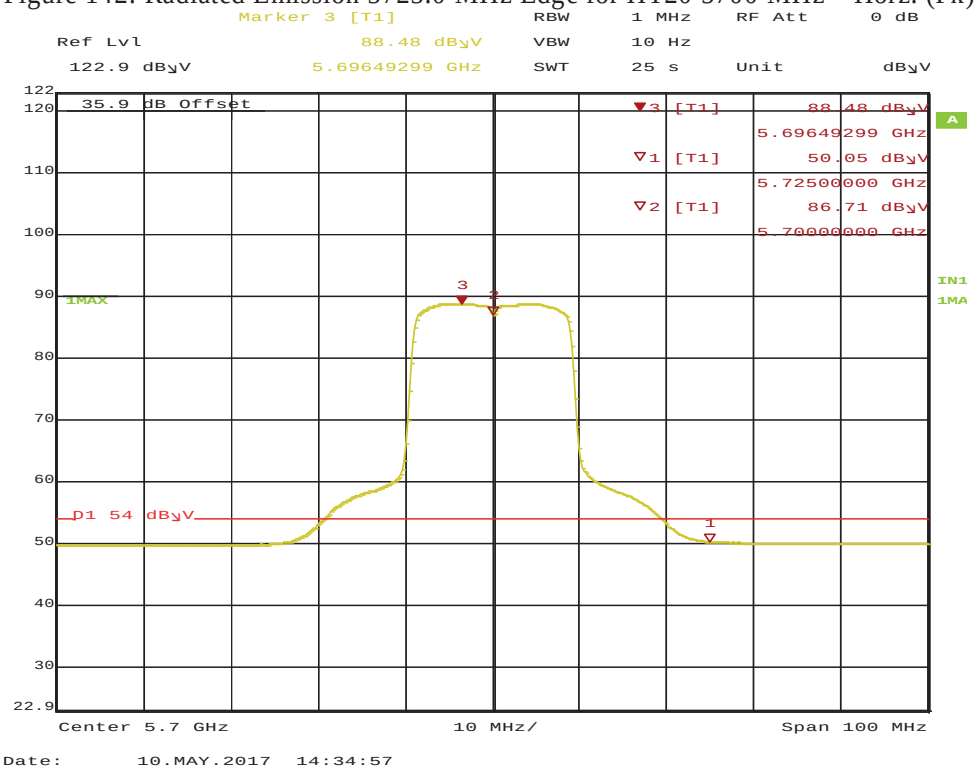


Figure 143: Radiated Emission 5725.0 MHz Edge for HT20 5700 MHz – Horz. (Ave)

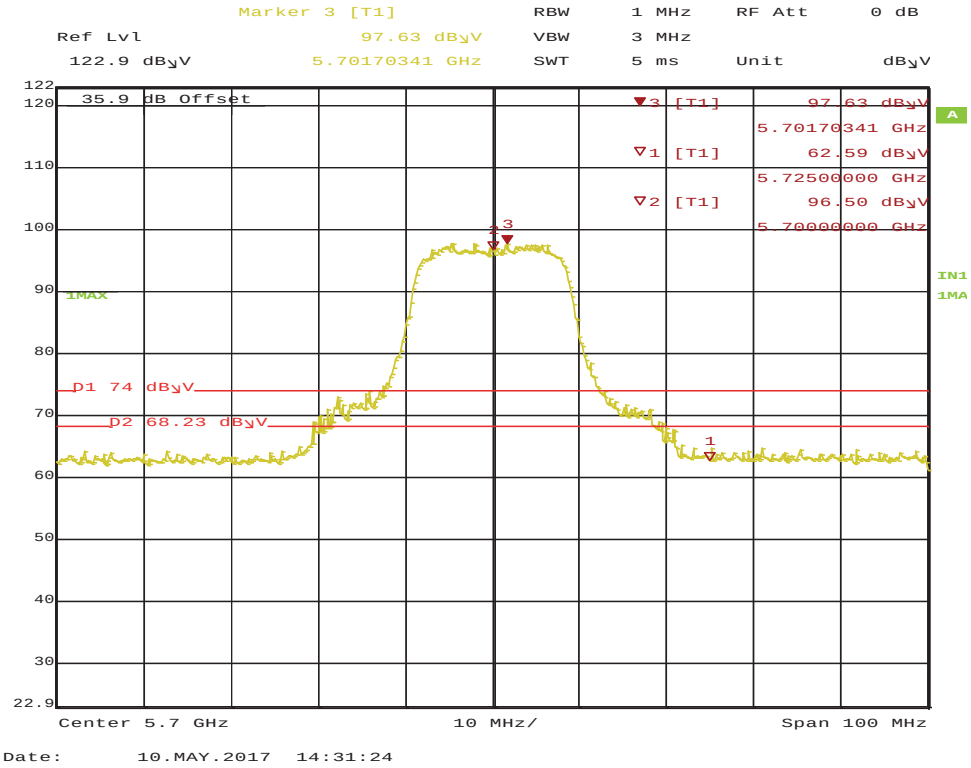


Figure 144: Radiated Emission 5725.0 MHz Edge for HT20 5700 MHz – Vert. (Pk)

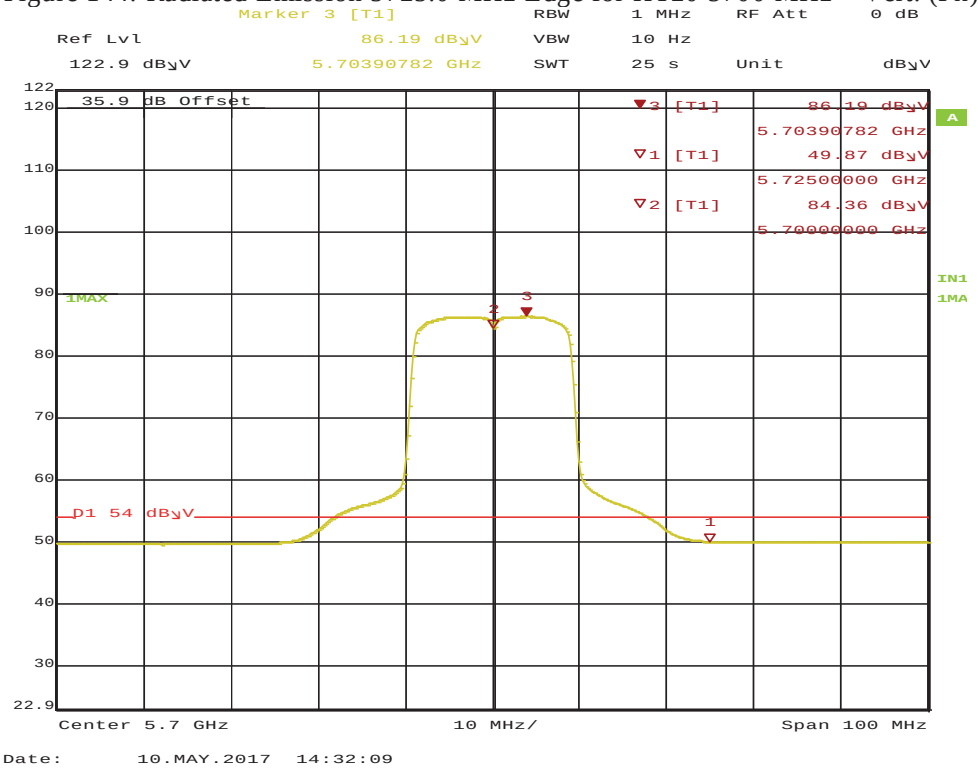


Figure 145: Radiated Emission 5725.0 MHz Edge for HT20 5700 MHz – Vert. (Ave)

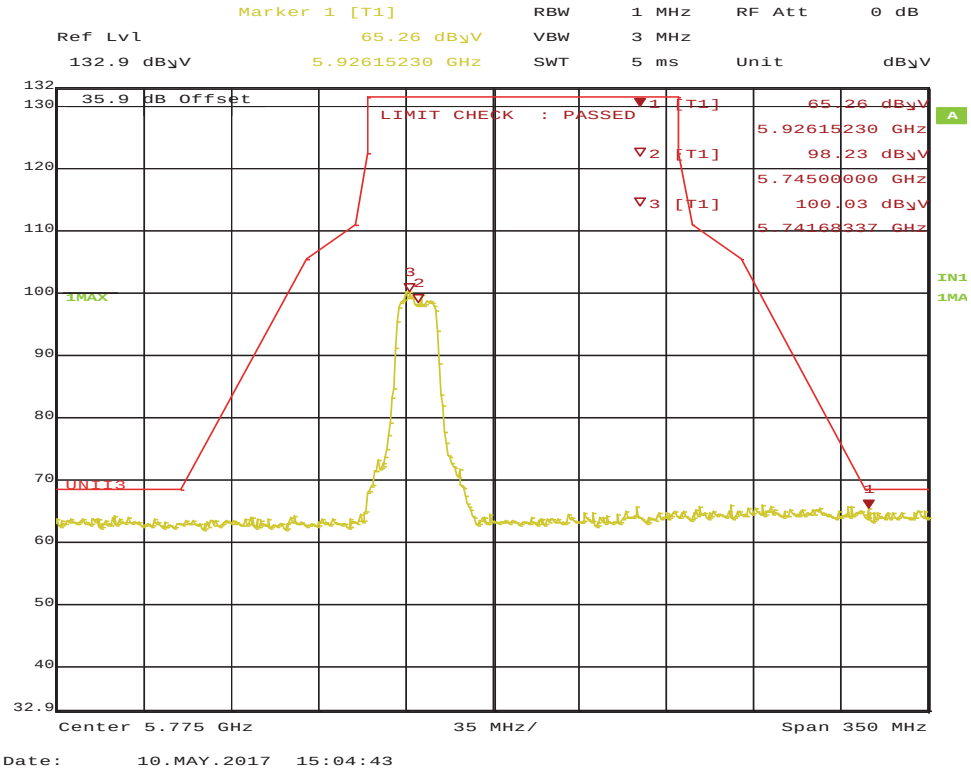


Figure 146: Radiated Emission Mask for 11a 5745 MHz – Horz. (Pk)

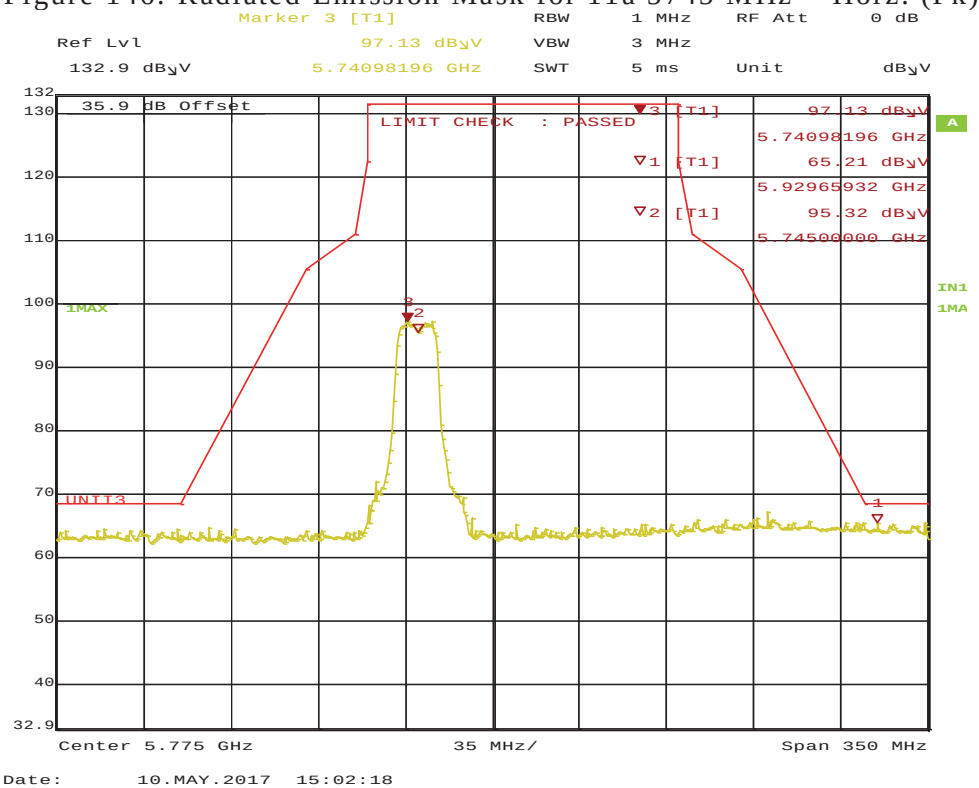


Figure 147: Radiated Emission Mask for 11a 5745 MHz – Vert (Pk)

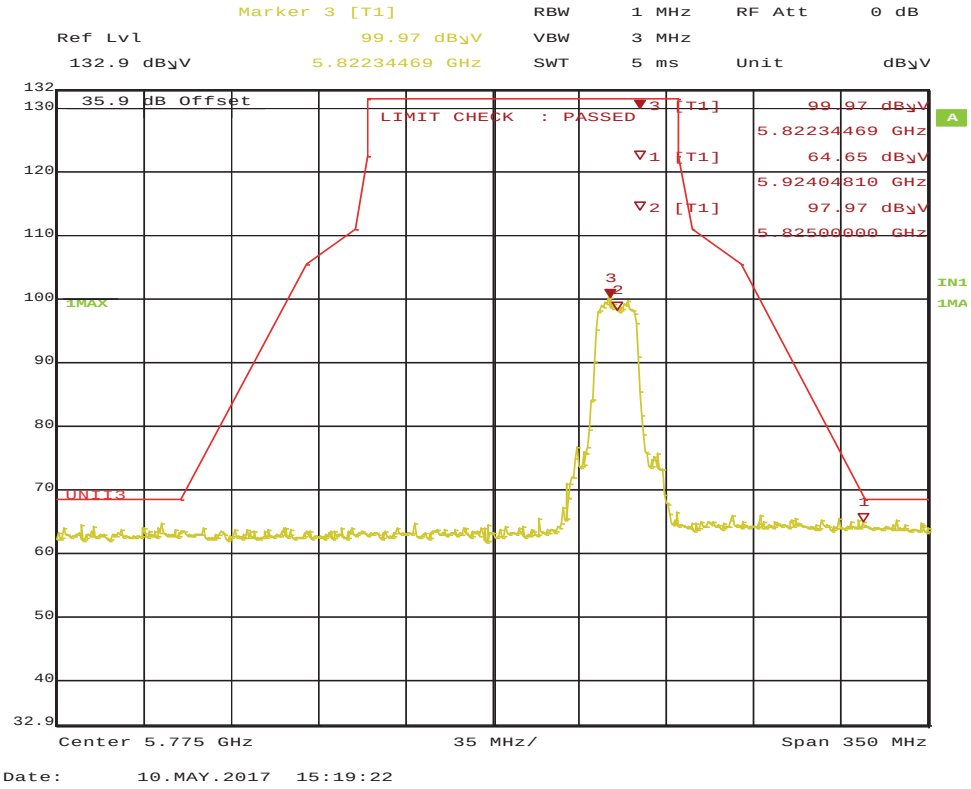


Figure 148: Radiated Emission Mask for 11a 5825 MHz – Horz. (Pk)

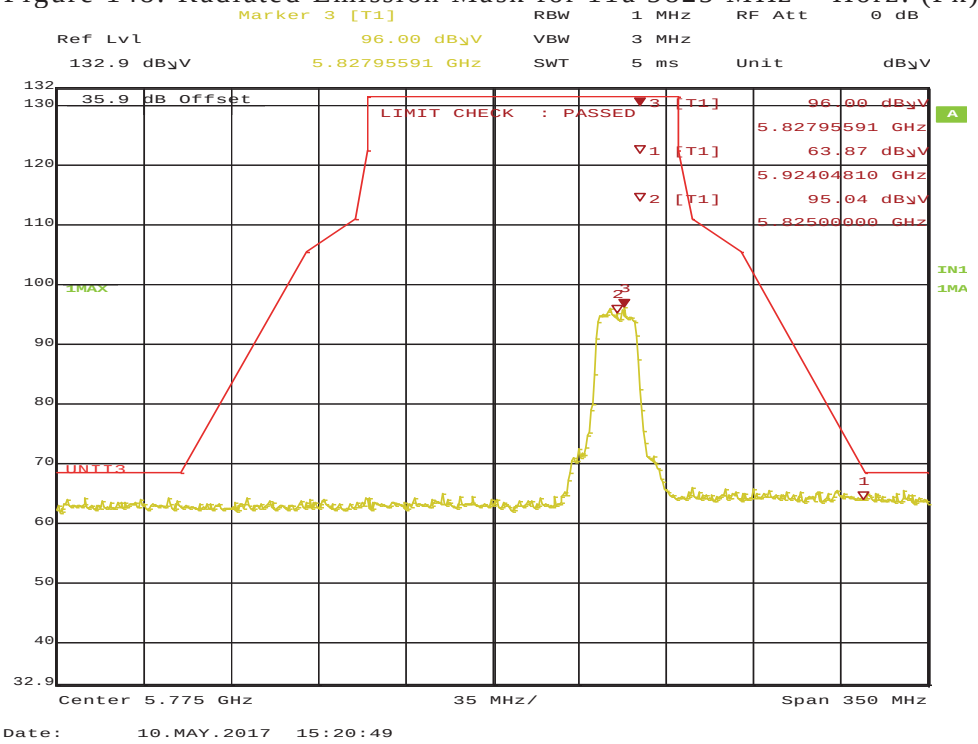


Figure 149: Radiated Emission Mask for 11a 5825 MHz – Vert. (Pk)

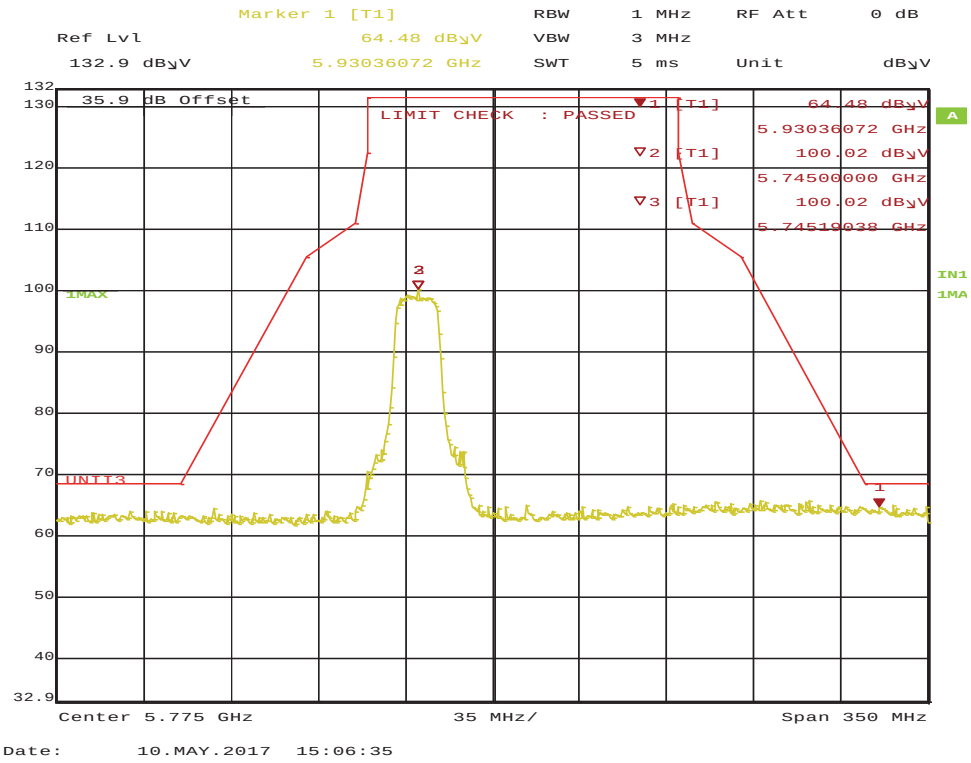


Figure 150: Radiated Emission Mask for HT20 5745 MHz – Horz. (Pk)

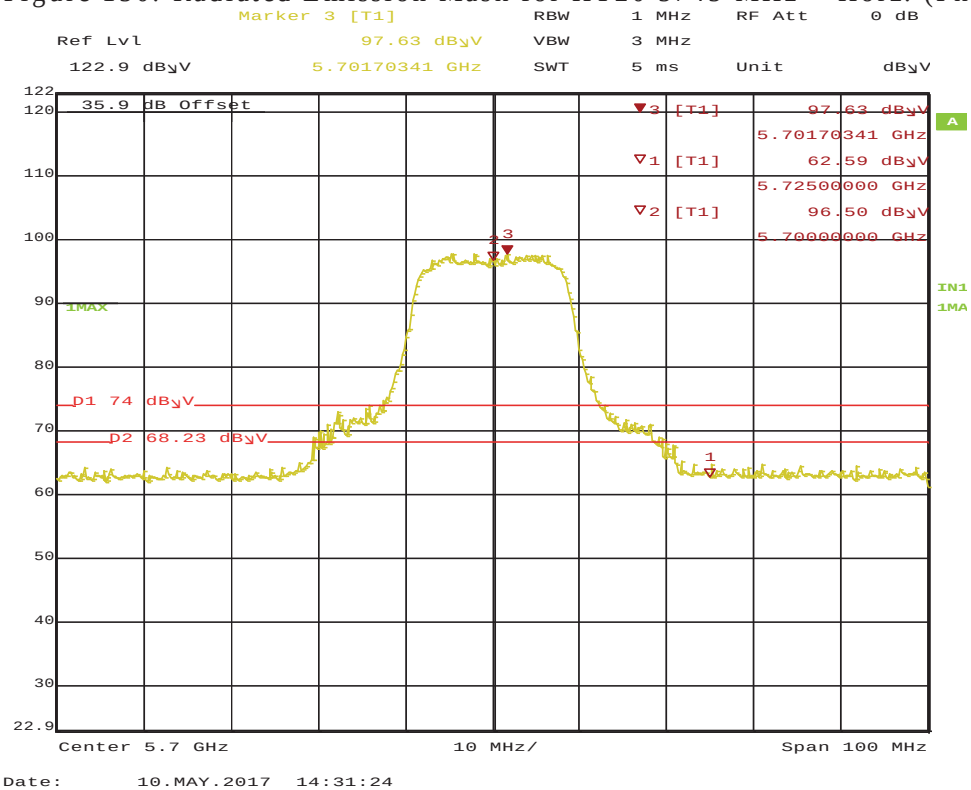


Figure 151: Radiated Emission Mask for HT20 5745 MHz – Vert. (Pk)

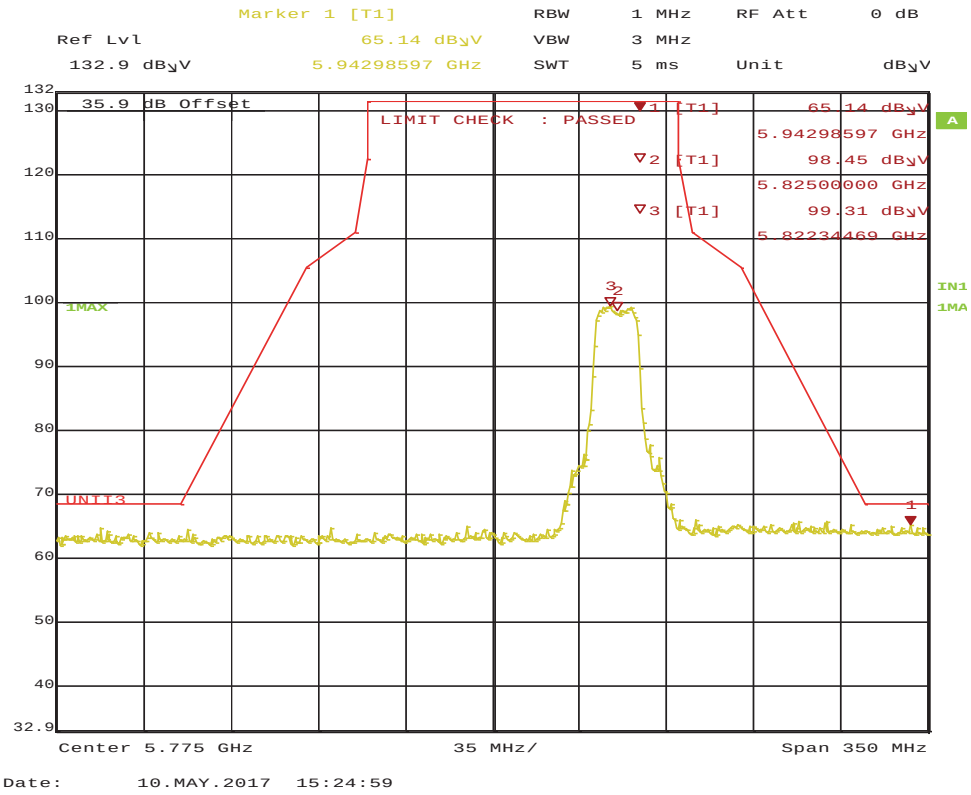


Figure 152: Radiated Emission Mask for HT20 5825 MHz – Horz. (Pk)

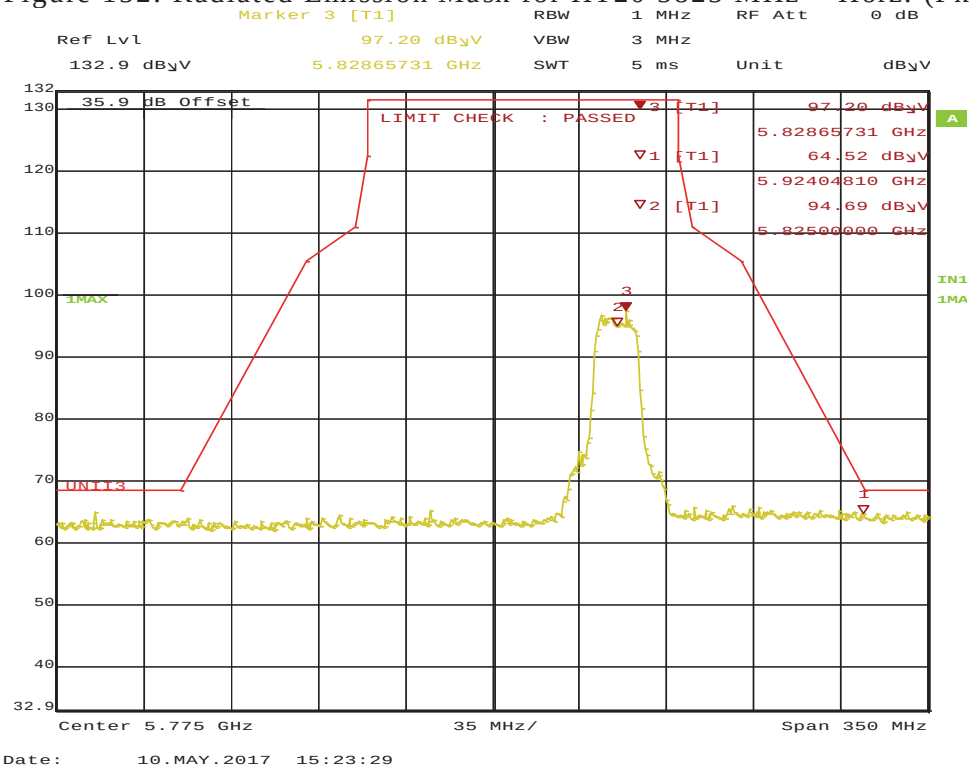


Figure 153: Radiated Emission Mask for HT20 5825 MHz – Vert. (Pk)

SOP 1 Radiated Emissions		Tracking # 31761683.001 Page 1 of 34	
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 35%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	120 kHz/ 300 kHz
Dist/Ant Used	3m / JB3	**Performed by**	Kerwinn Corpuz

9 kHz – 1 GHz Transmit at 5300 MHz

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
36.06	34.10	2.60	-11.40	25.30	QP	V	123	332	40.00	-14.70
54.25	43.70	2.80	-20.60	25.80	QP	V	145	310	40.00	-14.20
120.03	45.80	3.20	-14.50	34.50	QP	V	151	254	43.50	-9.00
240.07	49.10	3.70	-16.00	36.80	QP	V	162	314	46.00	-9.20
719.91	35.10	5.10	-7.10	33.10	QP	V	148	250	46.00	-12.90
959.99	21.40	5.70	-3.30	23.70	QP	V	131	154	46.00	-22.30

Spec Margin = E-Field QP - Limit, E-Field QP = FIM QP+ Total CF ± Uncertainty
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: 1. Mode tested are 802.11a and HT20, (low, mid & high channel).
2. Worst case emission was observed on 802.11a at 6Mbps, 5300 MHz mode for 20MHz channel BW.
3. No significant emission was observed below 30MHz

SOP 1 Radiated Emissions

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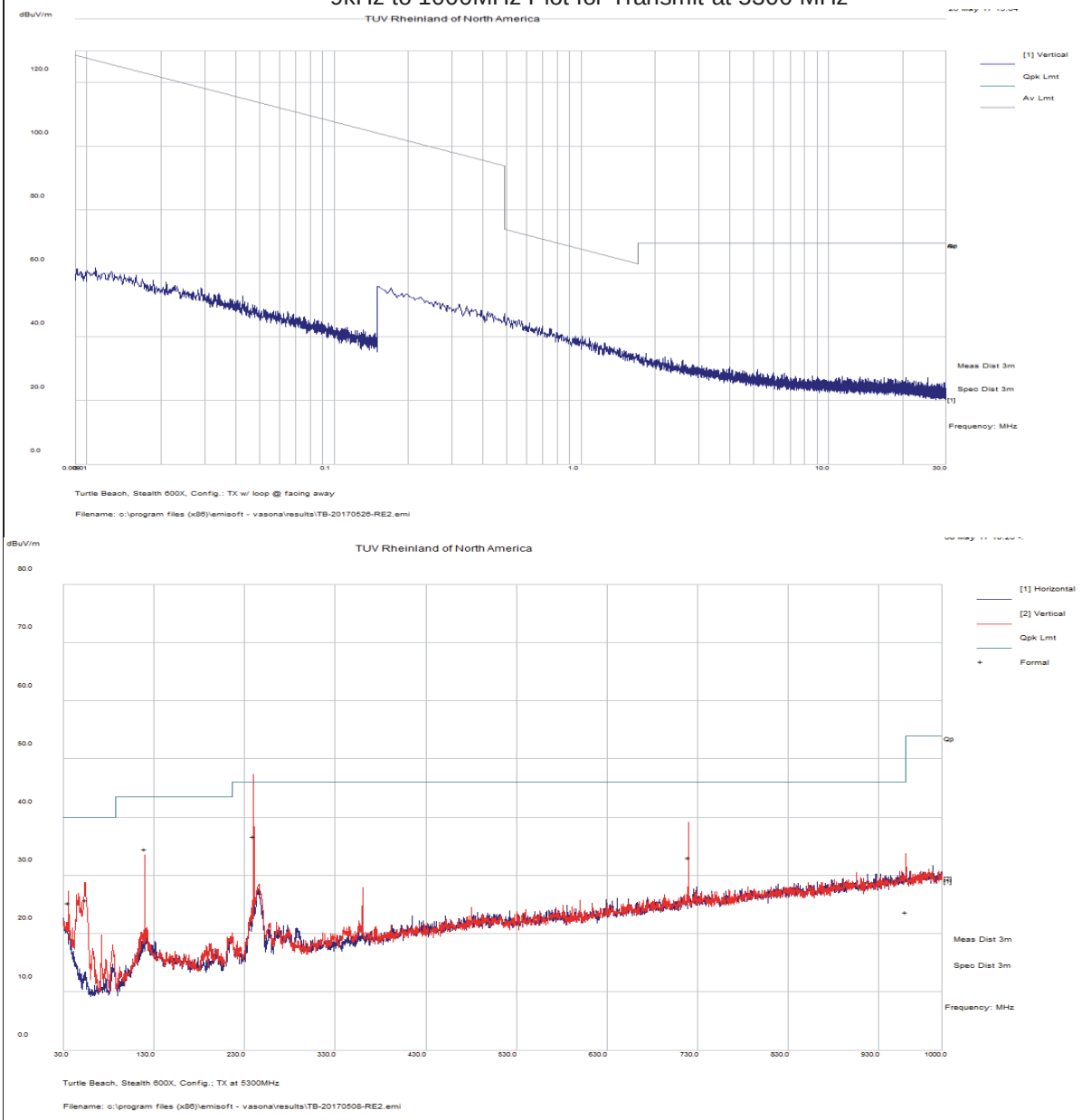
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 35%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	120 kHz/ 300 kHz
Dist/Ant Used	3m / JB3 & 6505	**Date**	Jeremy Luong

9kHz to 1000MHz Plot for Transmit at 5300 MHz



Notes: None.

SOP 1 Radiated Emissions		Tracking # 31761682.001 Page 3 of 34	
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m – AHA-840	**Performed by**	Jeremy Luong

1 – 40 GHz Transmit at 5180 MHz (Low Channel)

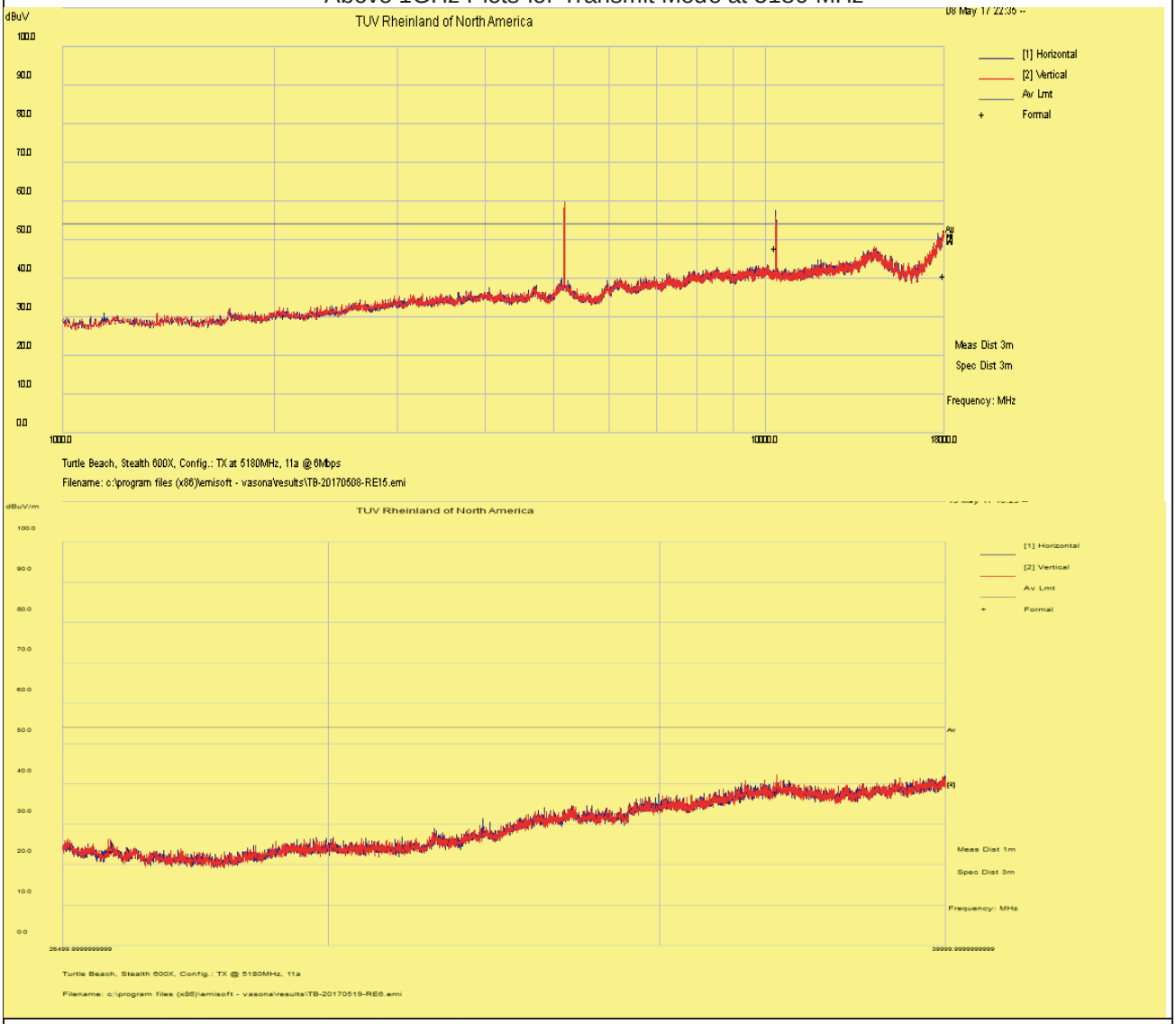
Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
10359.81	57.90	2.70	-12.80	47.80	Ave	H	188	110	54.00	-6.20
17977.60	39.92	3.77	-2.97	40.71	Ave	H	190	6	54.00	-13.29
27105.82	44.33	8.44	-29.43	23.34	Ave	H	128	350	54.00	-30.66
36963.23	47.86	10.23	-20.04	38.05	Ave	V	111	244	54.00	-15.95
1 – 40 GHz Transmit at 5200 MHz (Middle Channel)										
10400.77	56.10	2.70	-12.80	46.00	Ave	H	132	96	54.00	-8.00
17963.85	40.33	3.77	-3.04	41.05	Ave	V	167	56	54.00	-12.95
1 – 40 GHz Transmit at 5240 MHz (High Channel)										
10480.58	56.50	2.70	-12.70	46.50	Ave	H	144	102	54.00	-7.50
17996.55	39.58	3.74	-2.88	40.44	Ave	H	124	140	54.00	-13.56
37192.76	47.91	10.12	-19.94	38.09	Ave	H	114	142	54.00	-15.91

Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: Worst case was observed at 6Mbps for 802.11a mode.
Headset intended to transmit less than 8dBm.

SOP 1 Radiated Emissions		Tracking # 31761682.001 Page 4 of 34	
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

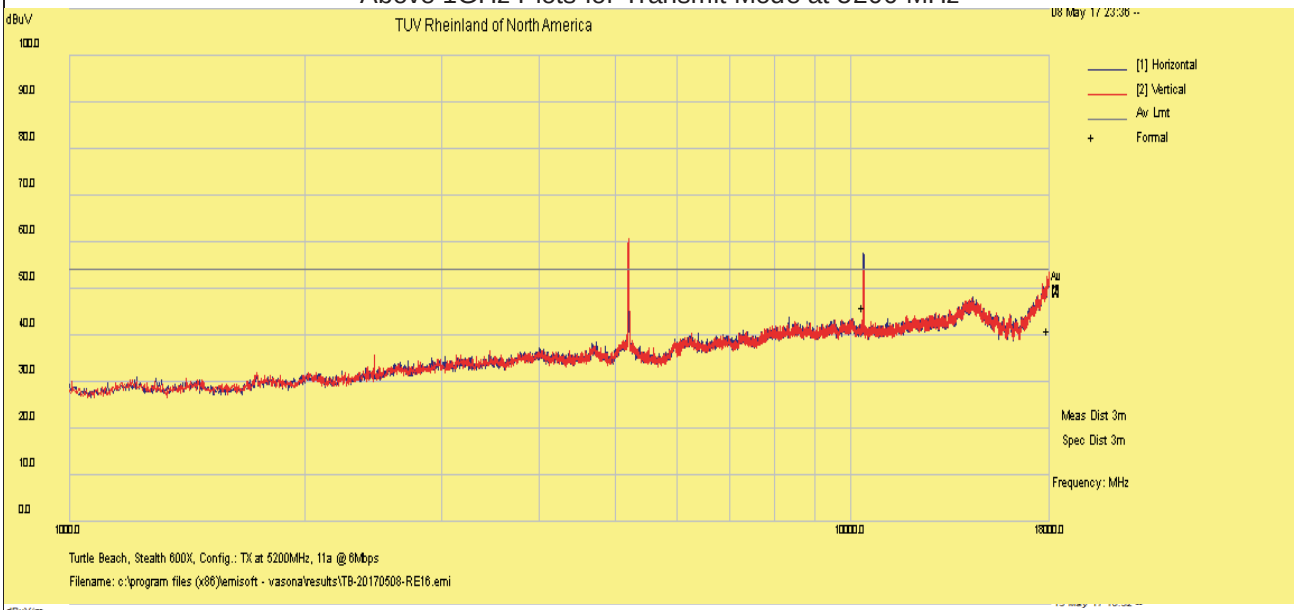
Above 1GHz Plots for Transmit Mode at 5180 MHz

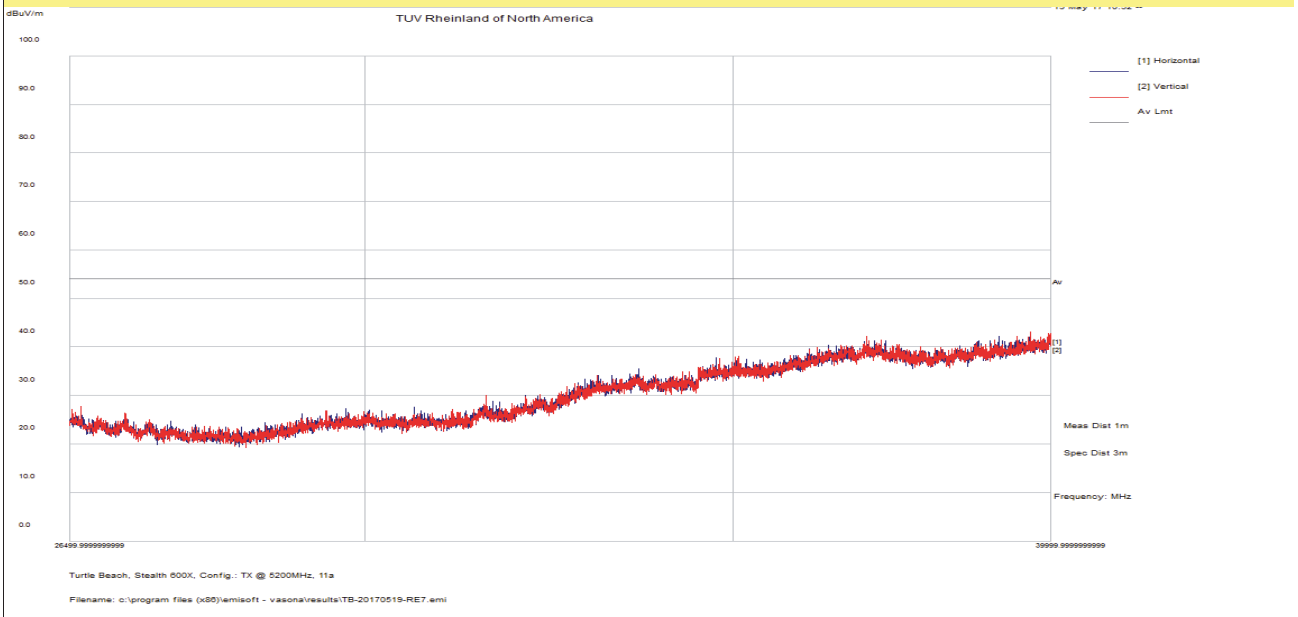


Notes: No significant emission observed from 18 - 26 GHz.

SOP 1 Radiated Emissions		Tracking # 31761682.001 Page 5 of 34	
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5200 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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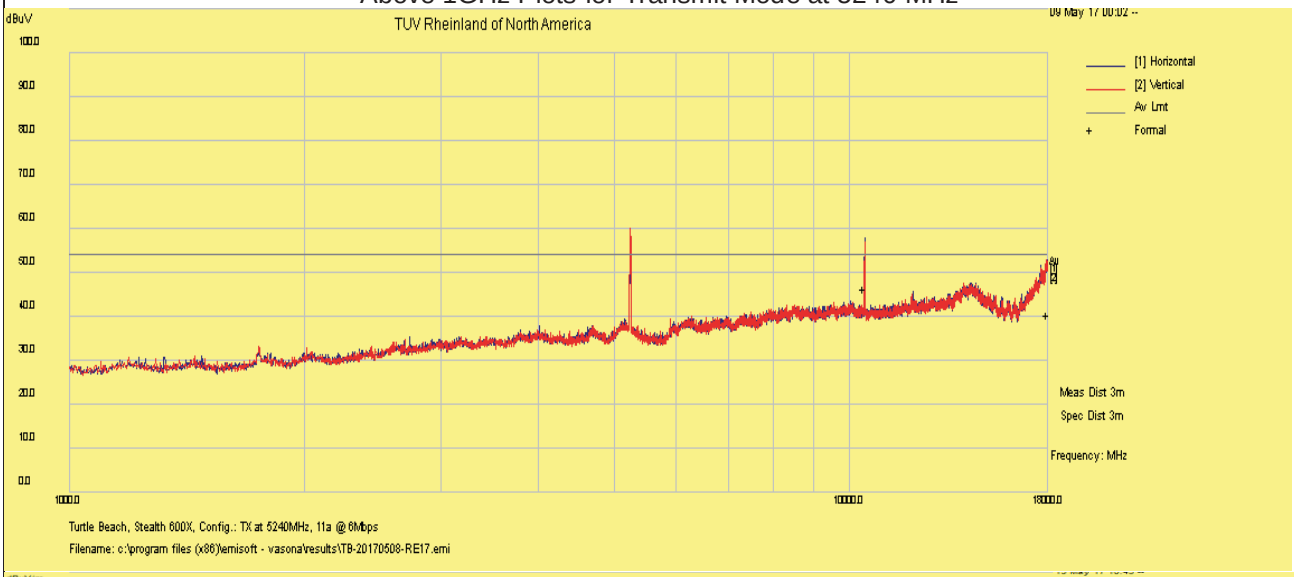
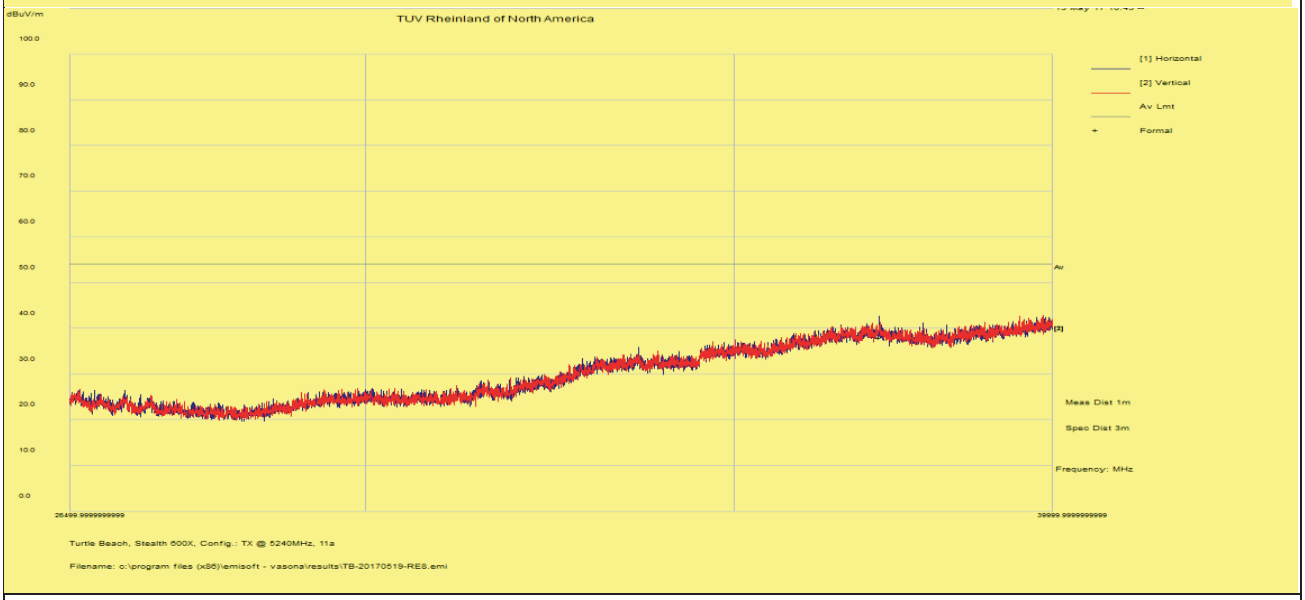
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5240 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions		Tracking # 31761682.001 Page 7 of 34	
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m – AHA-840	**Performed by**	Jeremy Luong

1 – 40 GHz Transmit at 5180 MHz (Low Channel)

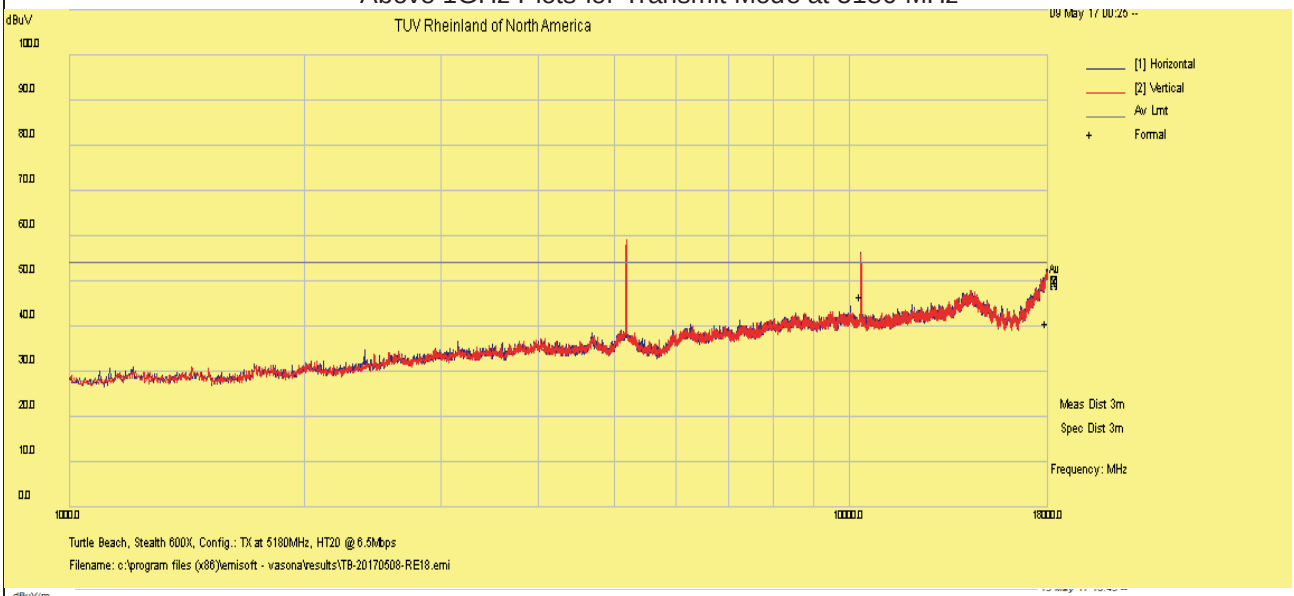
Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
10360.26	56.70	2.68	-12.75	46.63	Ave	H	108	128	54.00	-7.37
17931.73	40.25	3.73	-3.20	40.78	Ave	H	195	292	54.00	-13.22
1 – 40 GHz Transmit at 5200 MHz (Middle Channel)										
10402.17	54.70	2.68	-12.75	44.63	Ave	H	118	100	54.00	-9.37
17965.64	40.33	3.77	-3.03	41.07	Ave	H	176	0	54.00	-12.93
1 – 40 GHz Transmit at 5240 MHz (High Channel)										
10399.56	55.60	2.70	-12.80	45.50	Ave	H	176	0	54.00	-8.50
17935.47	40.33	3.74	-3.18	40.88	Ave	H	104	144	54.00	-13.12

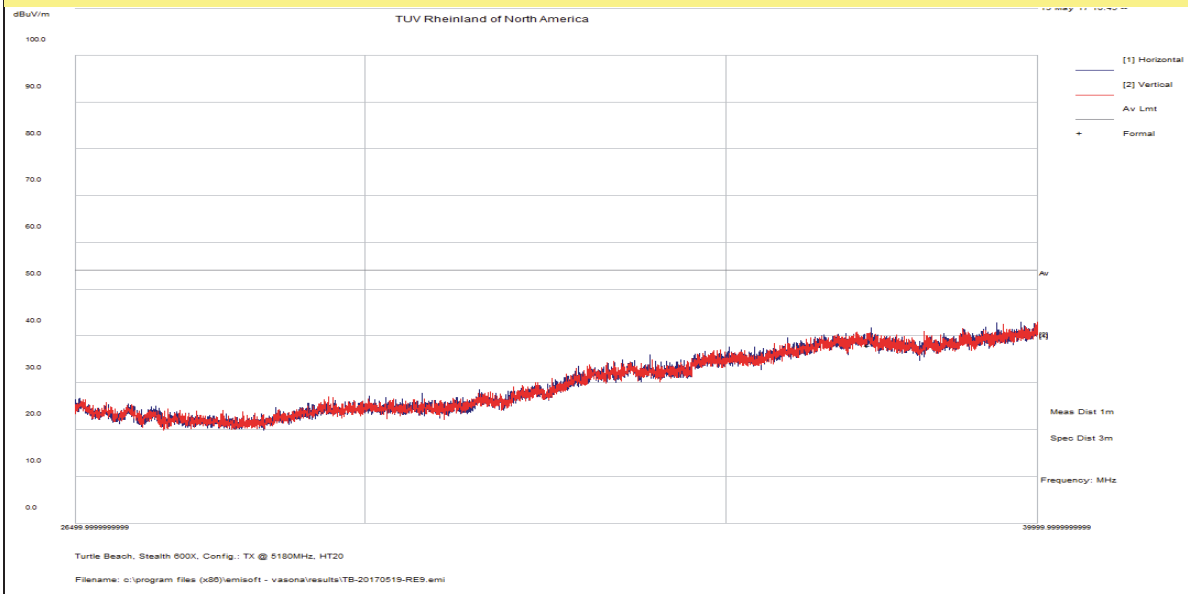
Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: Worst case emission was observed at 6.5Mbps for 802.1n HT20 mode.
Headset intended to transmit less than 8dBm.

SOP 1 Radiated Emissions		Tracking # 31761682.001 Page 8 of 34	
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5180 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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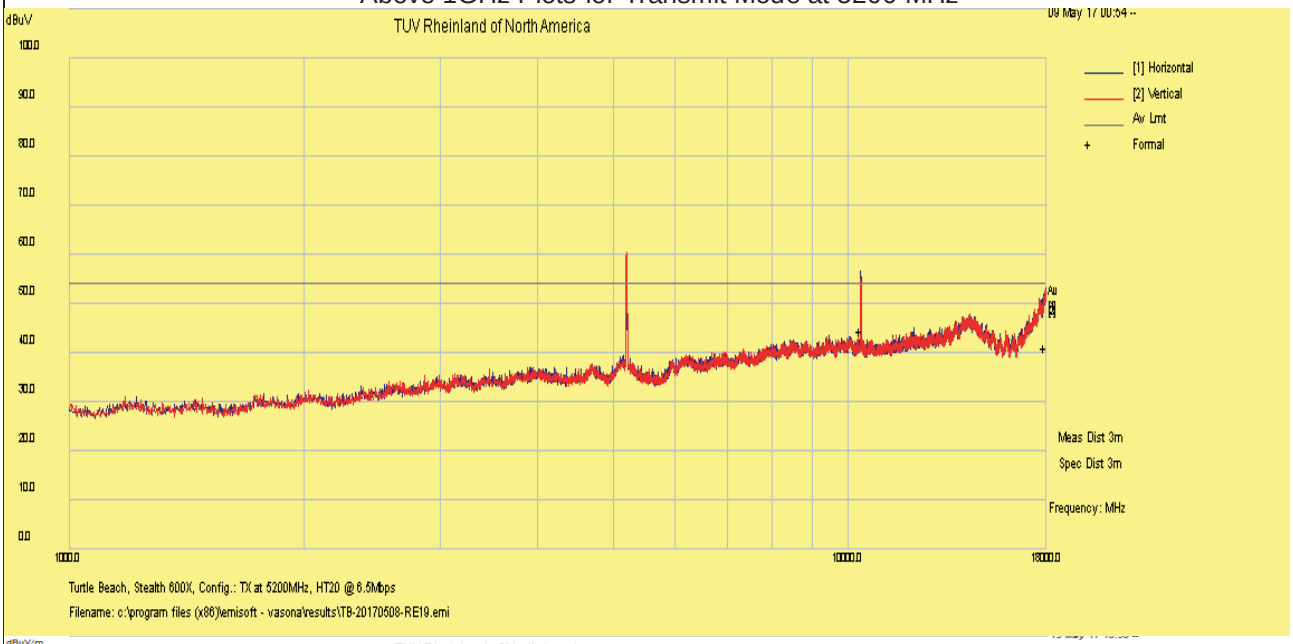
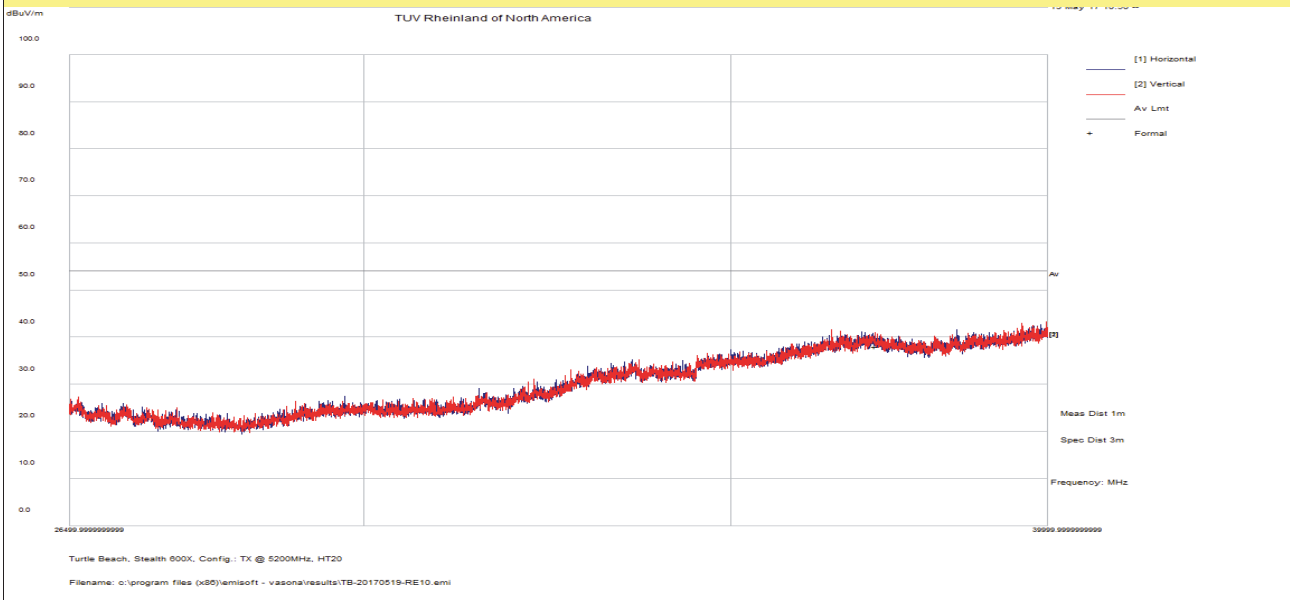
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5200 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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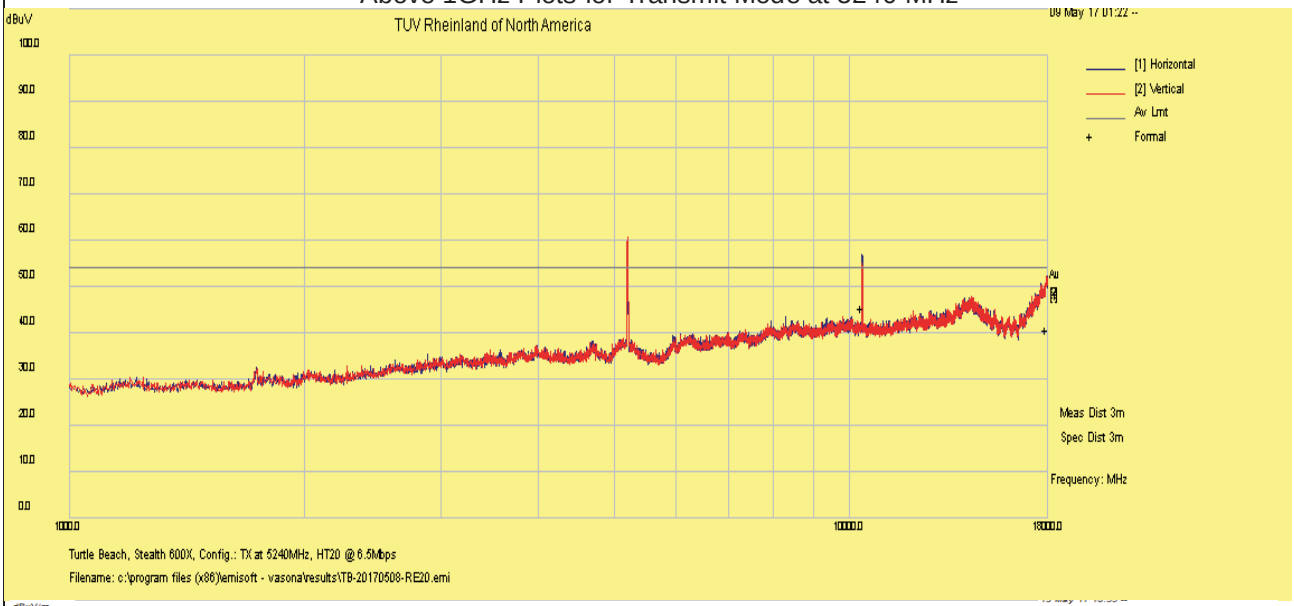
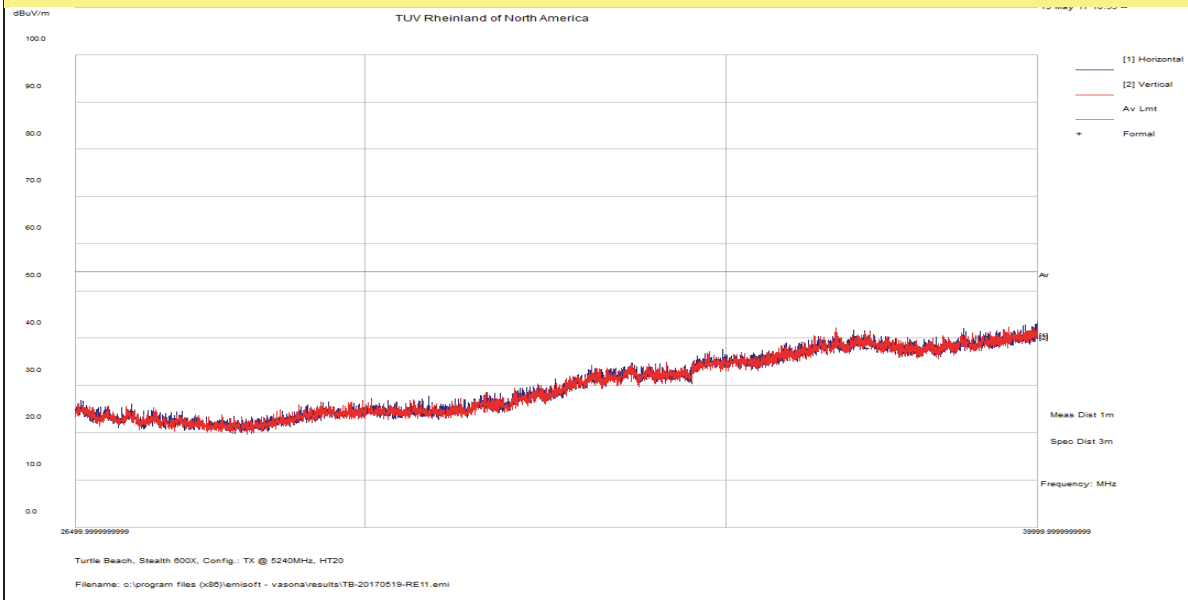
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5240 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions		Tracking # 31761682.001 Page 11 of 34	
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m – AHA-840	**Performed by**	Jeremy Luong

1 – 40 GHz Transmit at 5260 MHz (Low Channel)

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
10521.53	56.40	2.70	-12.70	46.40	Ave	H	107	132	54.00	-7.60
17953.93	40.36	3.76	-3.09	41.04	Ave	V	211	300	54.00	-12.97
1 – 40 GHz Transmit at 5300 MHz (Middle Channel)										
10518.50	55.50	2.70	-12.70	45.50	Ave	H	241	100	54.00	-8.50
17940.88	40.64	3.75	-3.15	41.23	Ave	V	104	214	54.00	-12.77
36978.82	47.88	10.24	-20.03	38.09	Ave	V	120	328	54.00	-15.91
1 – 40 GHz Transmit at 5320 MHz (High Channel)										
10638.44	55.70	2.70	-12.50	45.90	Ave	H	244	114	54.00	-8.10
15965.47	42.19	3.47	-12.83	32.83	Ave	V	183	360	54.00	-21.17
17911.95	40.40	3.72	-3.30	40.81	Ave	V	180	254	54.00	-13.19
37166.37	48.51	10.15	-19.95	38.71	Ave	H	100	340	54.00	-15.29

Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: Worst case emission was observed at 6Mbps for 802.11a mode.
Headset intended to transmit less than 8dBm.

SOP 1 Radiated Emissions

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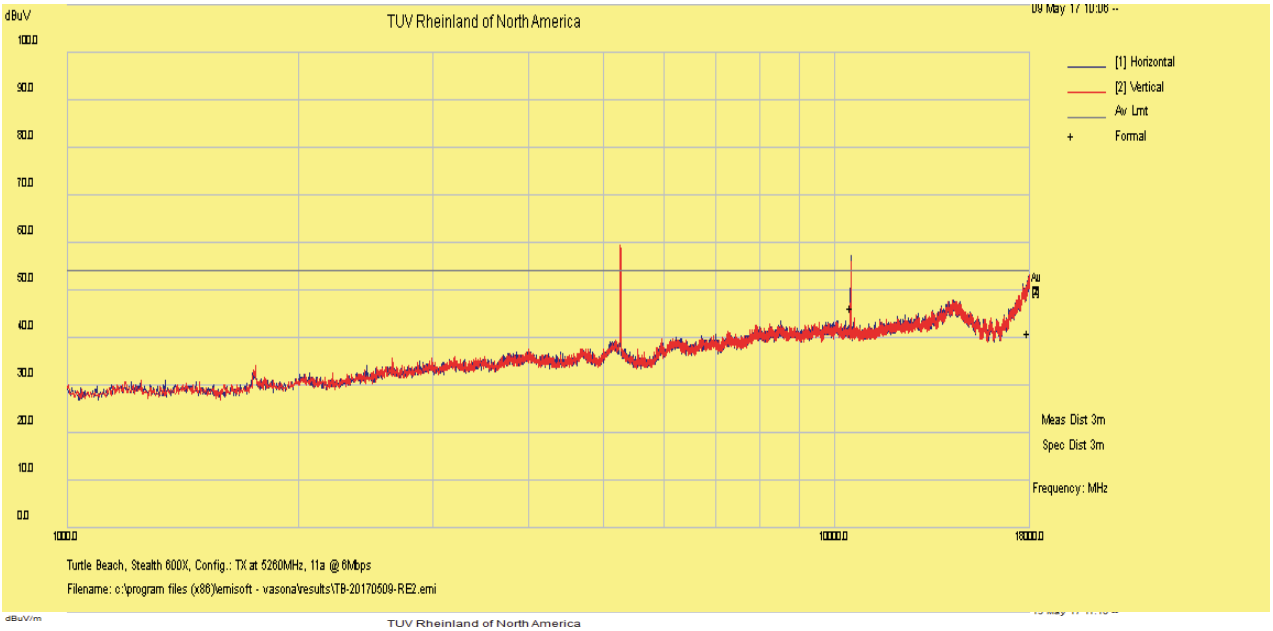
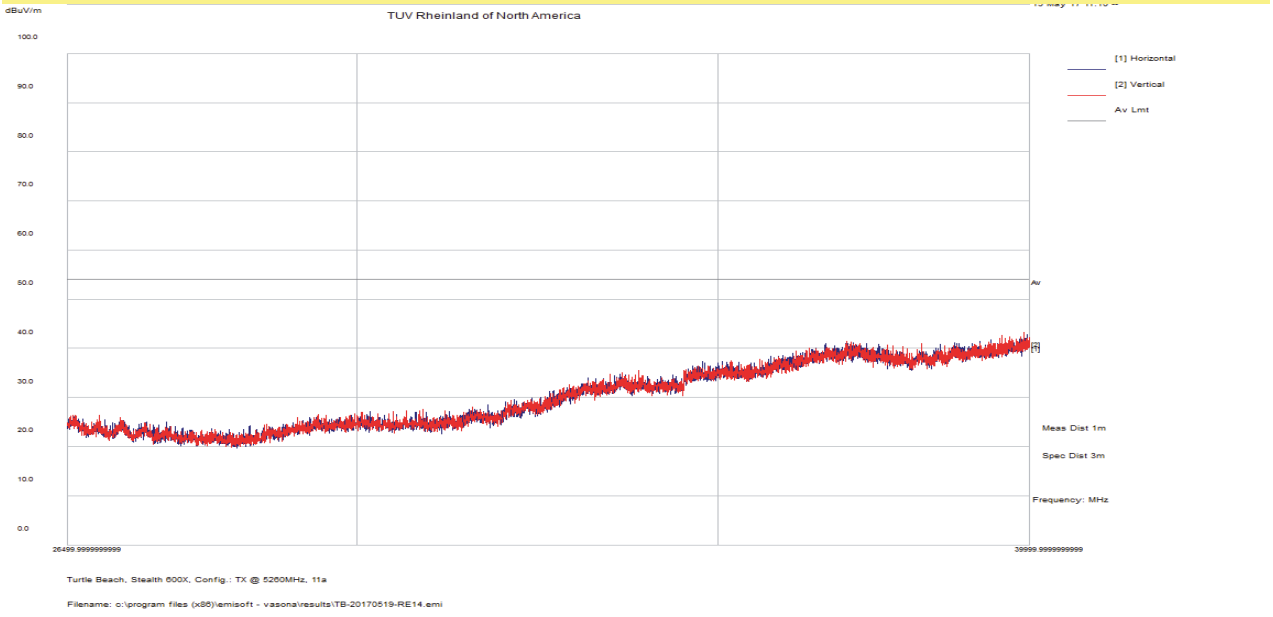
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5260 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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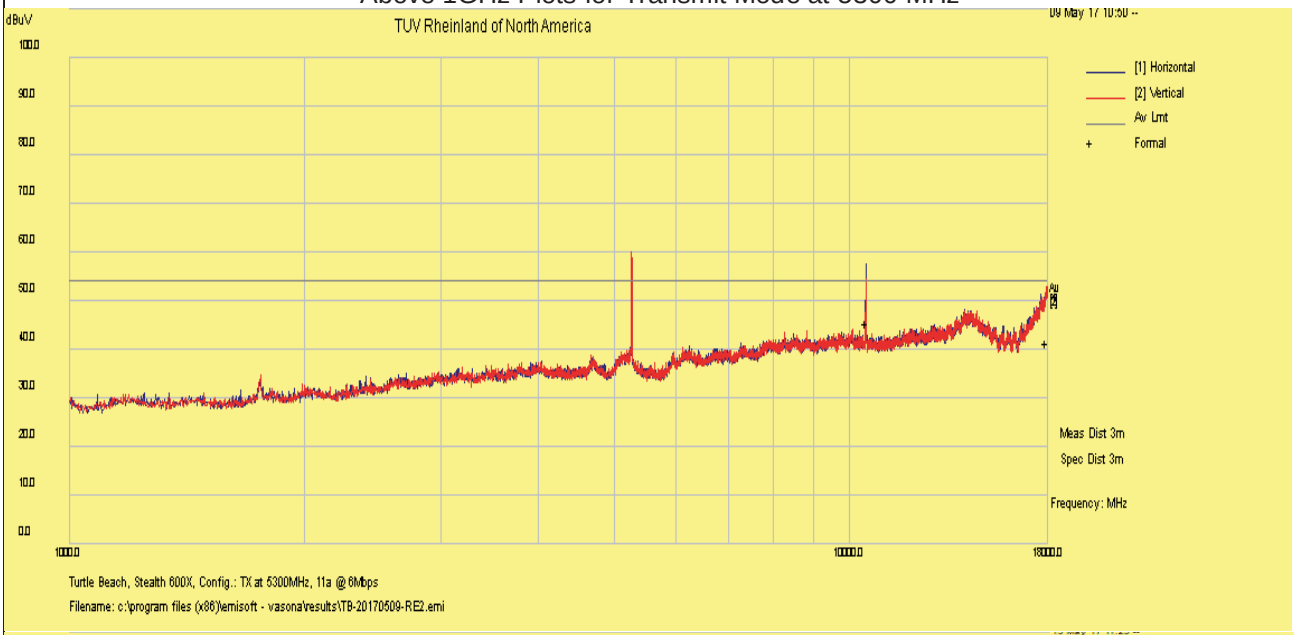
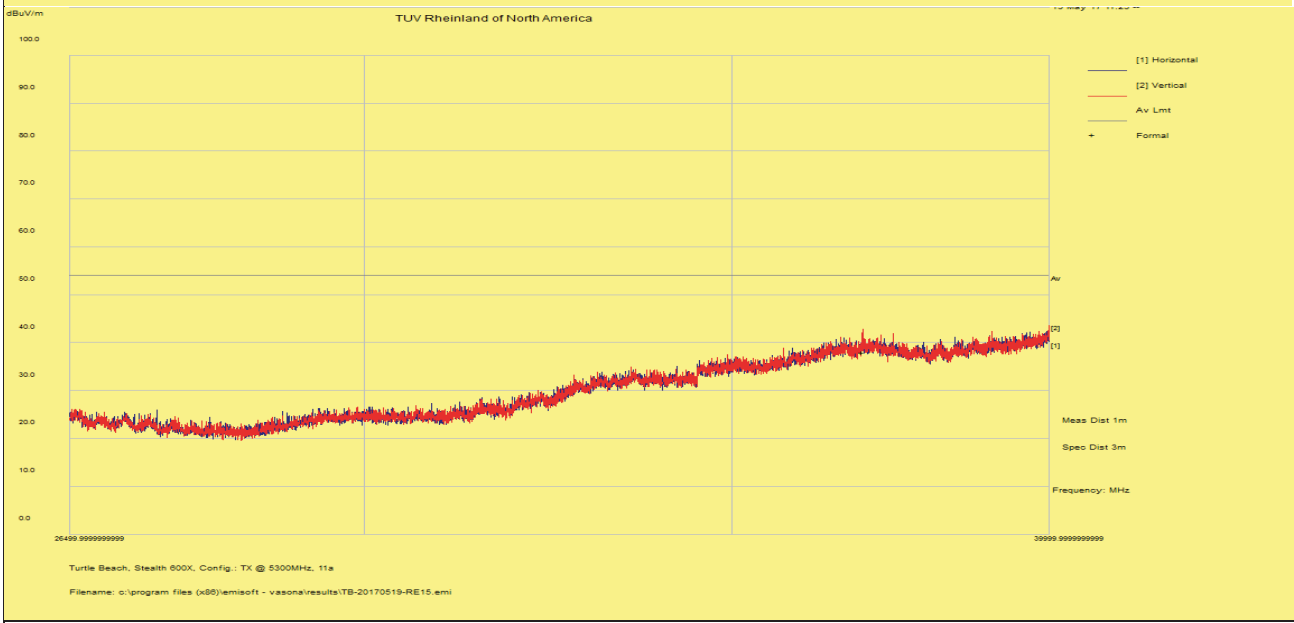
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5300 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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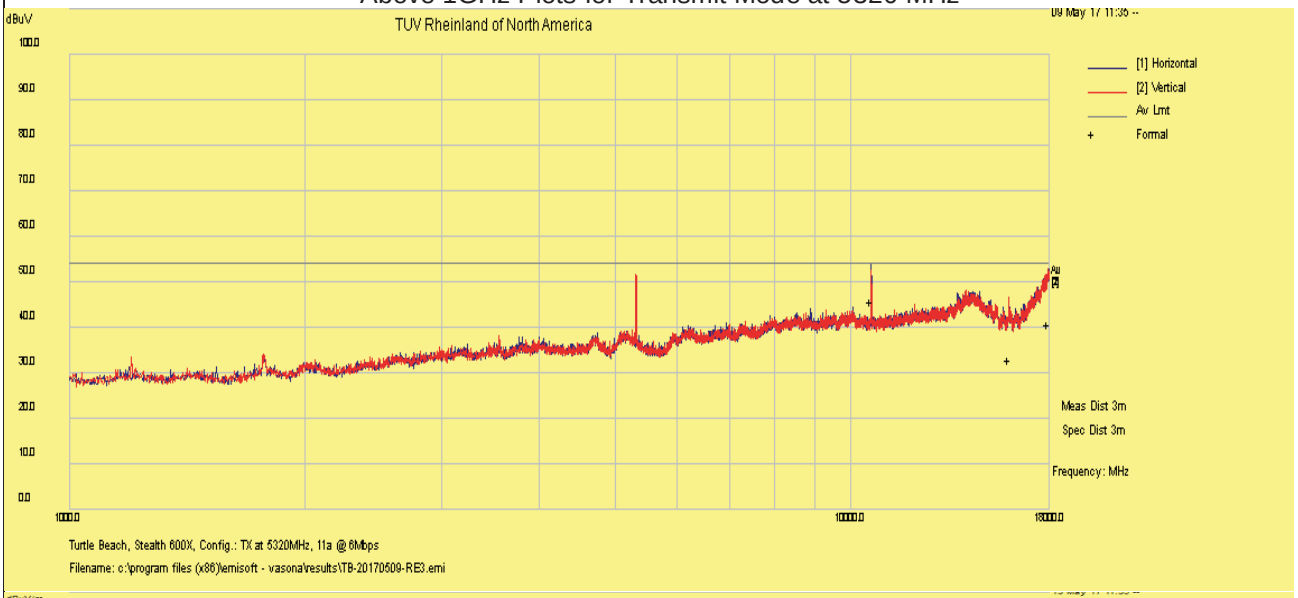
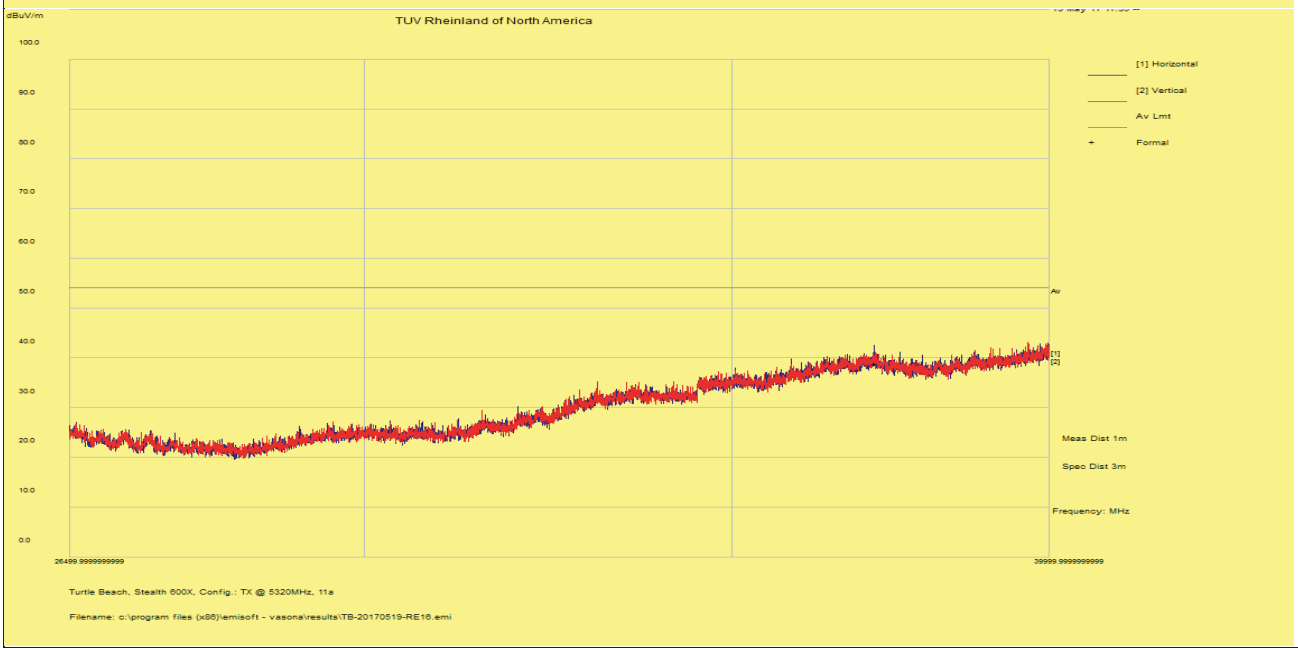
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5320 MHz





Notes: No significant emission observed above 18 GHz.

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EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m – AHA-840	**Performed by**	Jeremy Luong

1 – 40 GHz Transmit at 5260 MHz (Low Channel)

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
10521.37	56.69	2.71	-12.67	46.73	Ave	H	239	126	54.00	-7.27
15786.58	39.63	3.43	-12.90	30.17	Ave	V	195	254	54.00	-23.84
17979.85	39.90	3.76	-2.96	40.70	Ave	V	147	8	54.00	-13.30
1 – 40 GHz Transmit at 5300 MHz (Middle Channel)										
10597.84	53.70	2.70	-12.60	43.80	Ave	H	114	204	54.00	-10.20
17923.17	40.54	3.72	-3.25	41.02	Ave	V	151	240	54.00	-12.99
1 – 40 GHz Transmit at 5320 MHz (High Channel)										
10634.90	54.00	2.70	-12.50	44.20	Ave	H	150	132	54.00	-9.80
15963.54	46.07	3.47	-12.83	36.71	Ave	H	186	324	54.00	-17.29
17988.67	40.00	3.75	-2.92	40.84	Ave	V	192	254	54.00	-13.16

Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: Worst case emission was observed at 6.5Mbps for 802.11n HT20 mode.
Headset intended to transmit less than 8dBm.

SOP 1 Radiated Emissions

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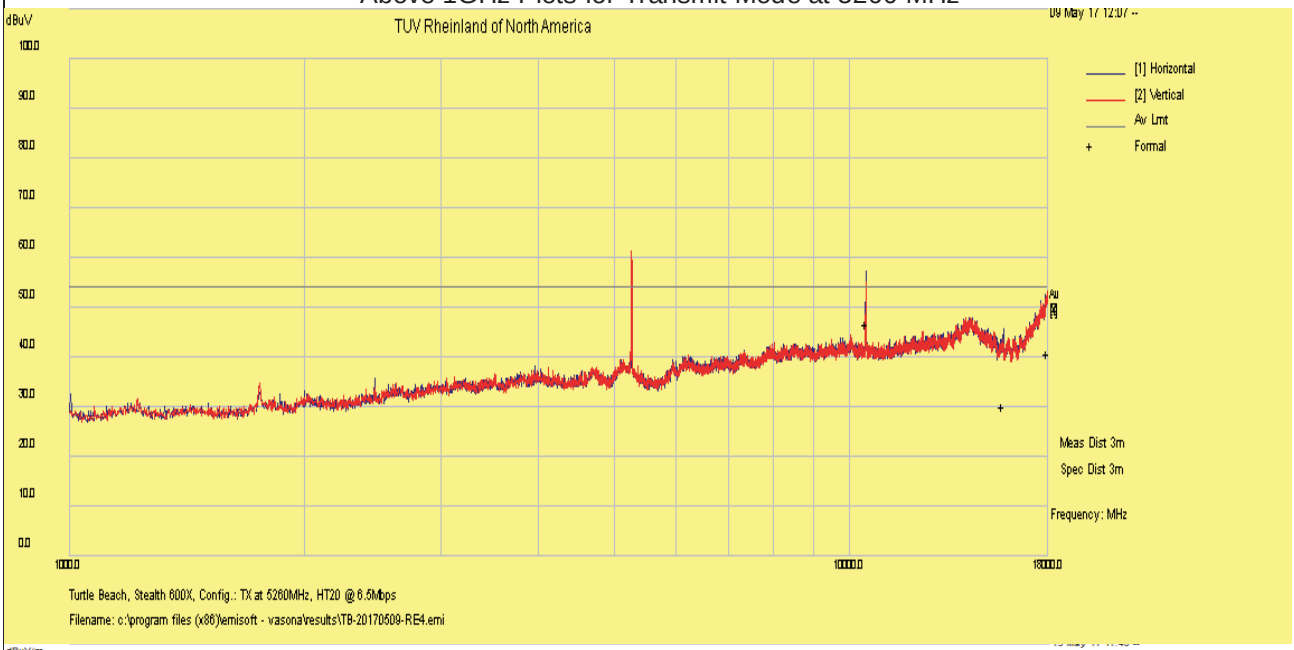
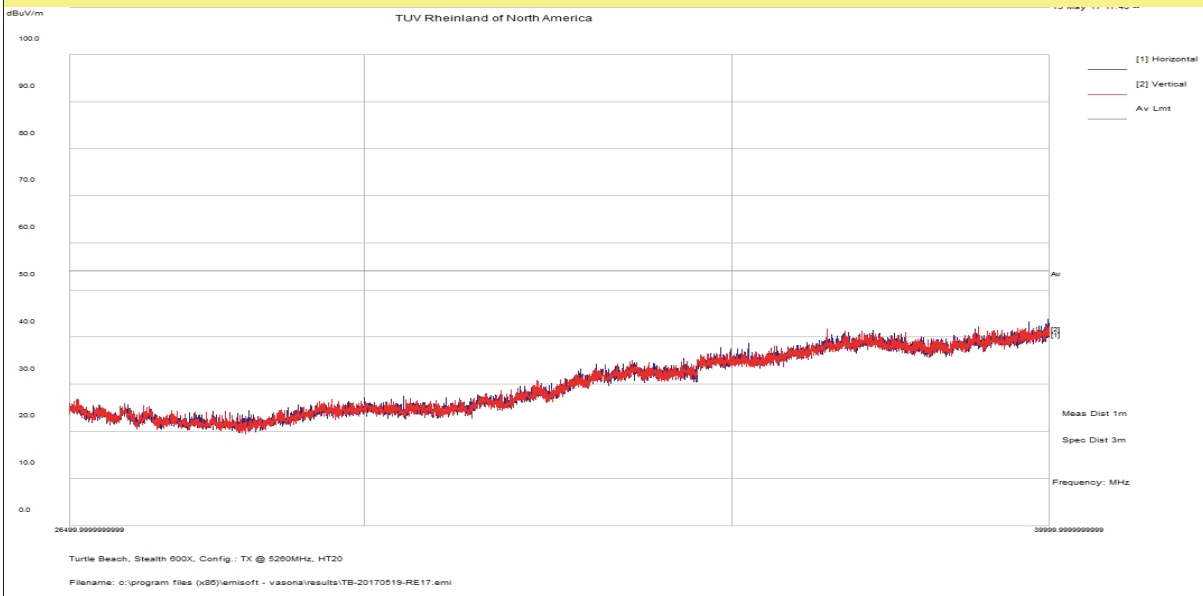
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5260 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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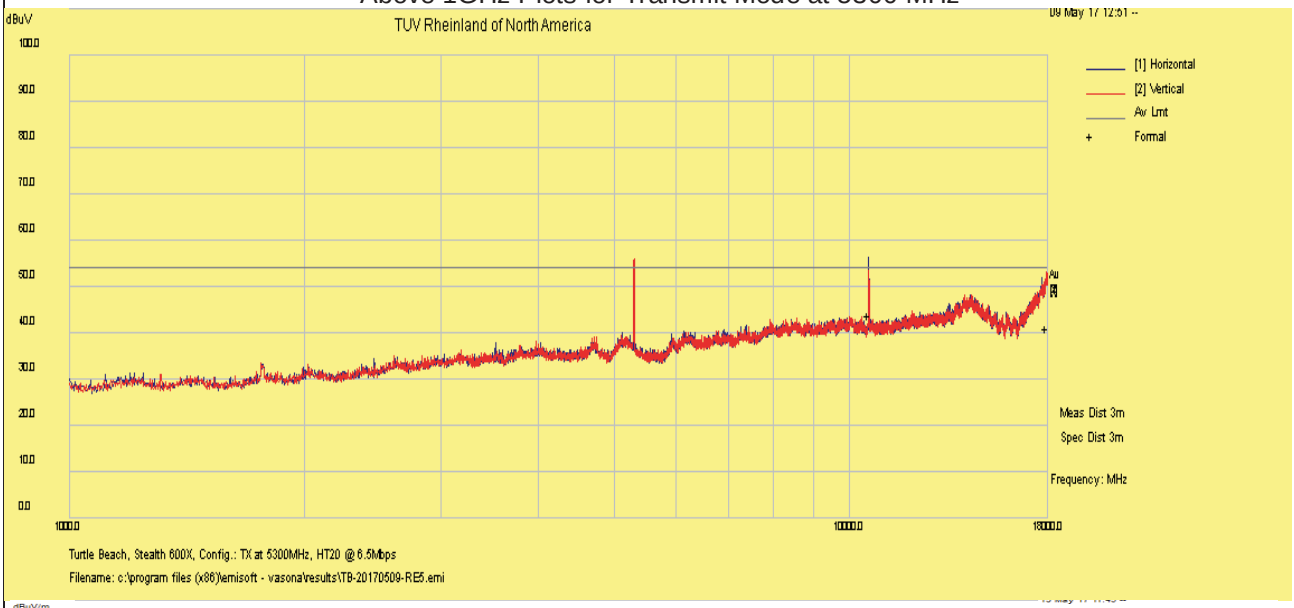
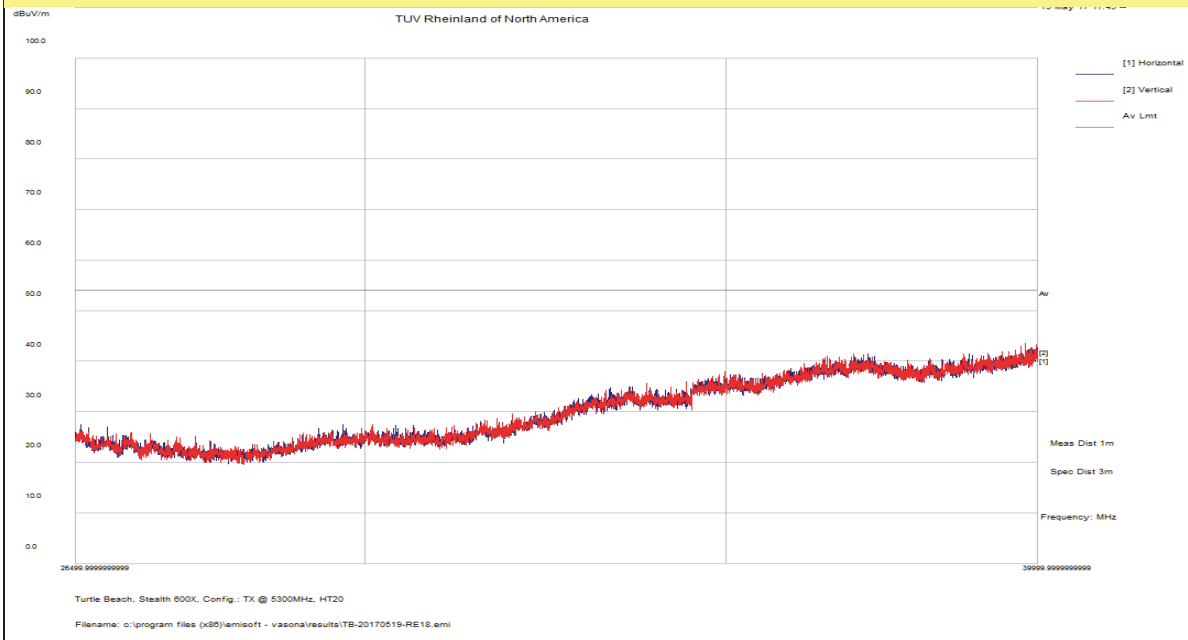
EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5300 MHz



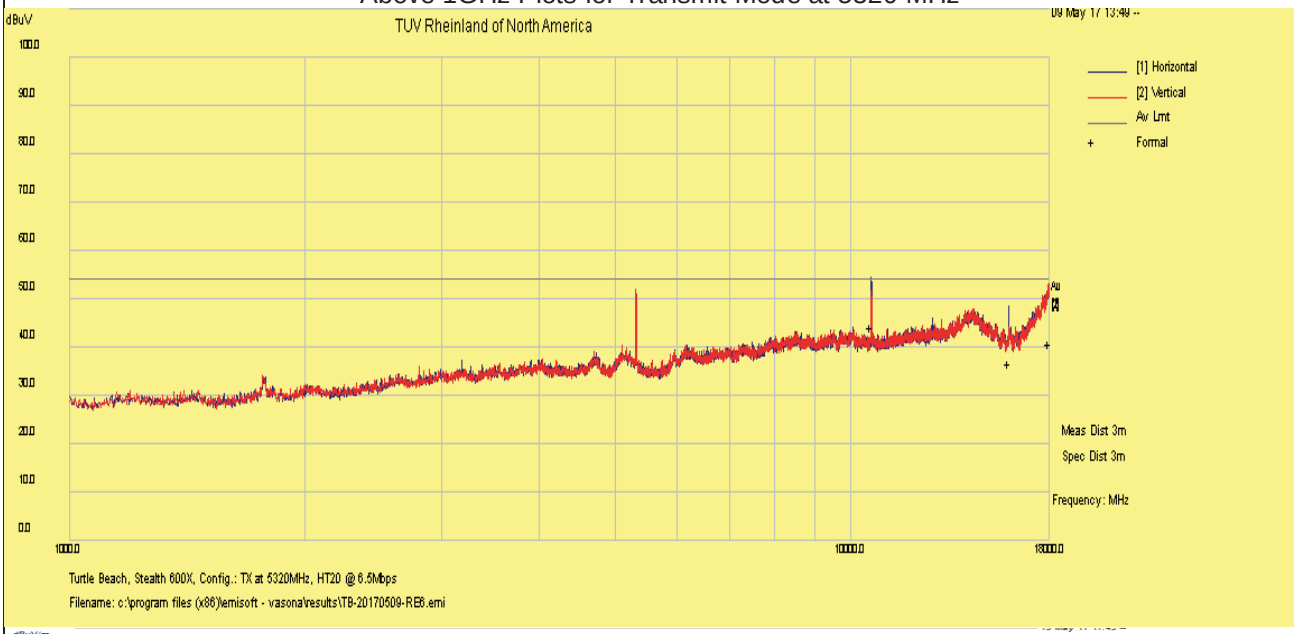


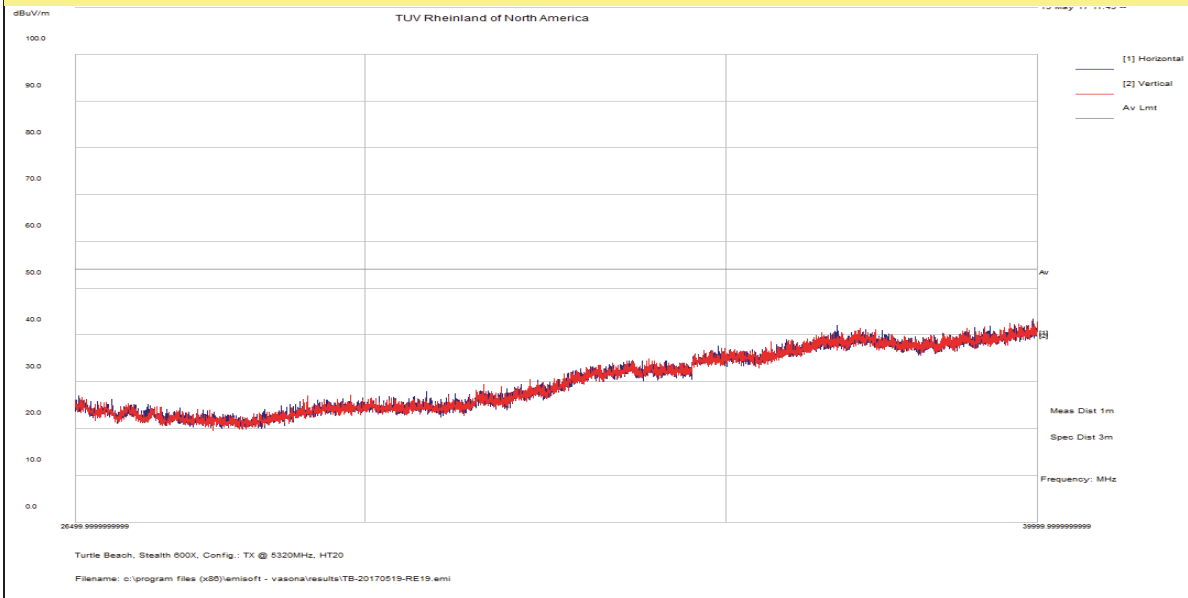
Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

EUT Name	Wireless Audio Headset	**Date**	May 8, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	21° C / 34%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5320 MHz





Notes: No significant emission observed above 18 GHz.

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EUT Name	Wireless Audio Headset	**Date**	May 9, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 35%rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m – AHA-840	**Performed by**	Jeremy Luong

1 – 40 GHz Transmit at 5500 MHz (Low Channel)

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
11002.15	41.80	2.75	-12.59	31.96	Ave	H	164	12	54.00	-22.04
14341.55	40.91	3.20	-8.29	35.83	Ave	H	201	136	54.00	-18.18
15085.56	40.35	3.37	-10.61	33.11	Ave	H	232	206	54.00	-20.89
17959.57	32.50	3.80	-3.10	33.20	Ave	H	150	66	54.00	-20.80
1 – 40 GHz Transmit at 5580 MHz (Middle Channel)										
11162.87	44.60	2.79	-12.46	34.94	Ave	H	146	224	54.00	-19.07
17975.14	40.09	3.77	-2.99	40.87	Ave	H	126	15	54.00	-13.13
1 – 40 GHz Transmit at 5700 MHz (High Channel)										
3830.12	43.63	1.54	-20.47	24.70	Ave	V	103	248	54.00	-29.30
4762.90	42.60	1.73	-20.28	24.06	Ave	V	185	336	54.00	-29.94
11398.40	39.18	2.77	-12.20	29.75	Ave	V	109	312	54.00	-24.25
17966.16	40.49	3.77	-3.03	41.23	Ave	V	131	0	54.00	-12.77

Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: Worst case emission was observed at 6Mbps for 802.11a mode.
Headset intended to transmit less than 8dBm.

SOP 1 Radiated Emissions

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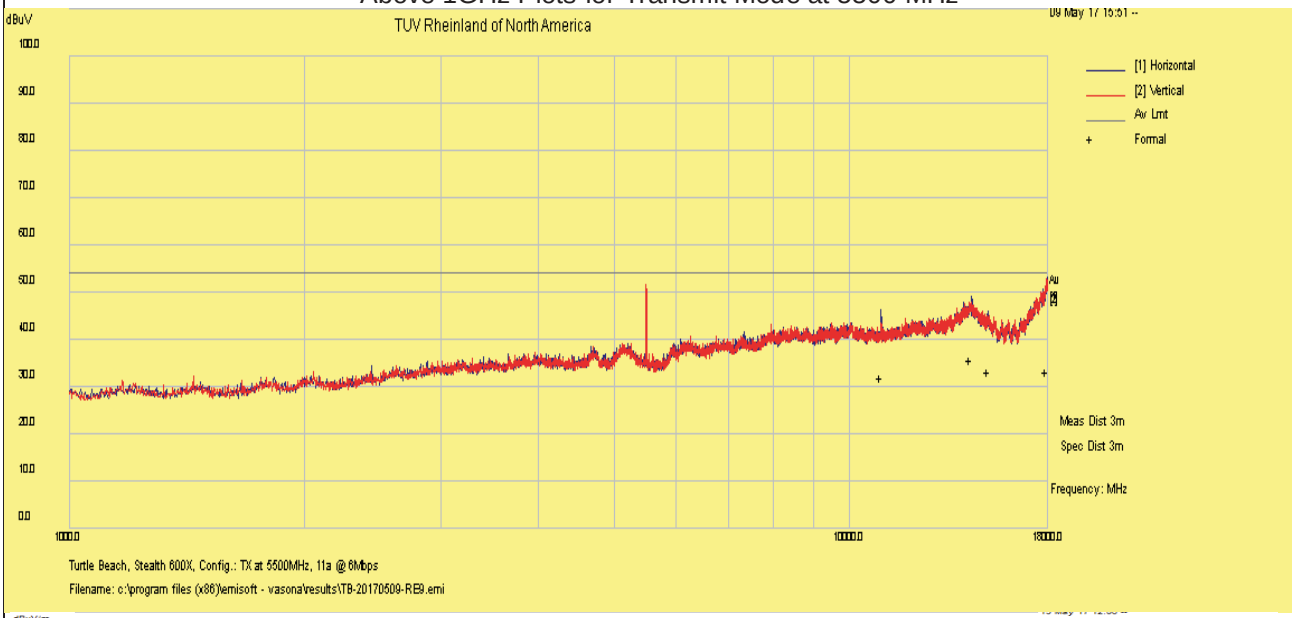
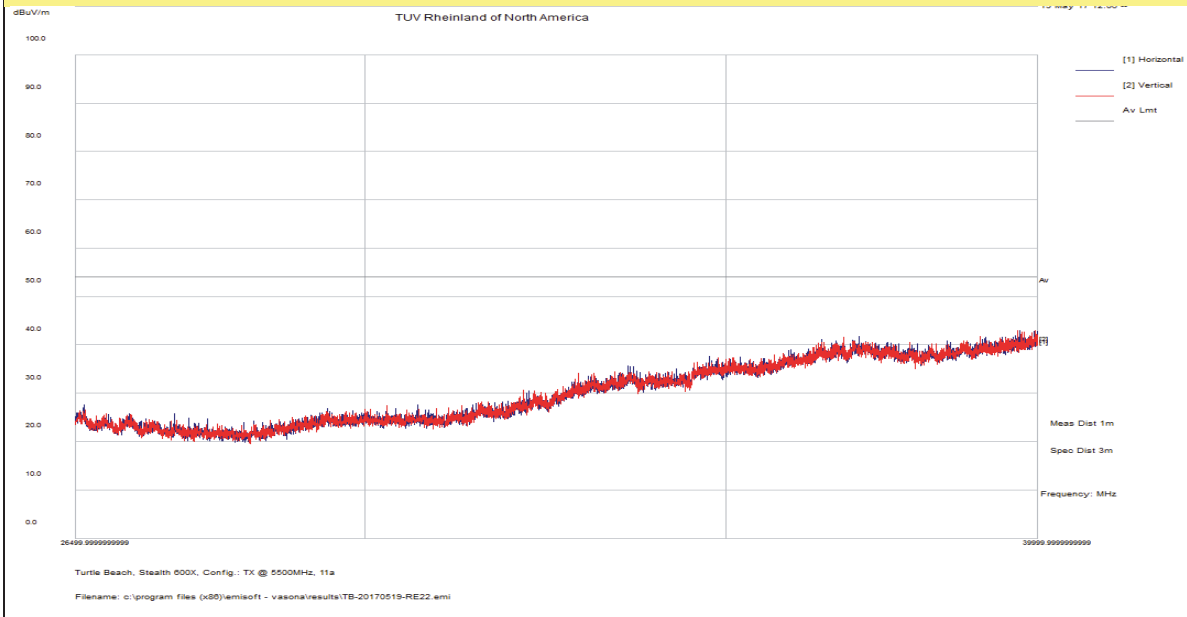
EUT Name	Wireless Audio Headset	**Date**	May 9, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 35%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5500 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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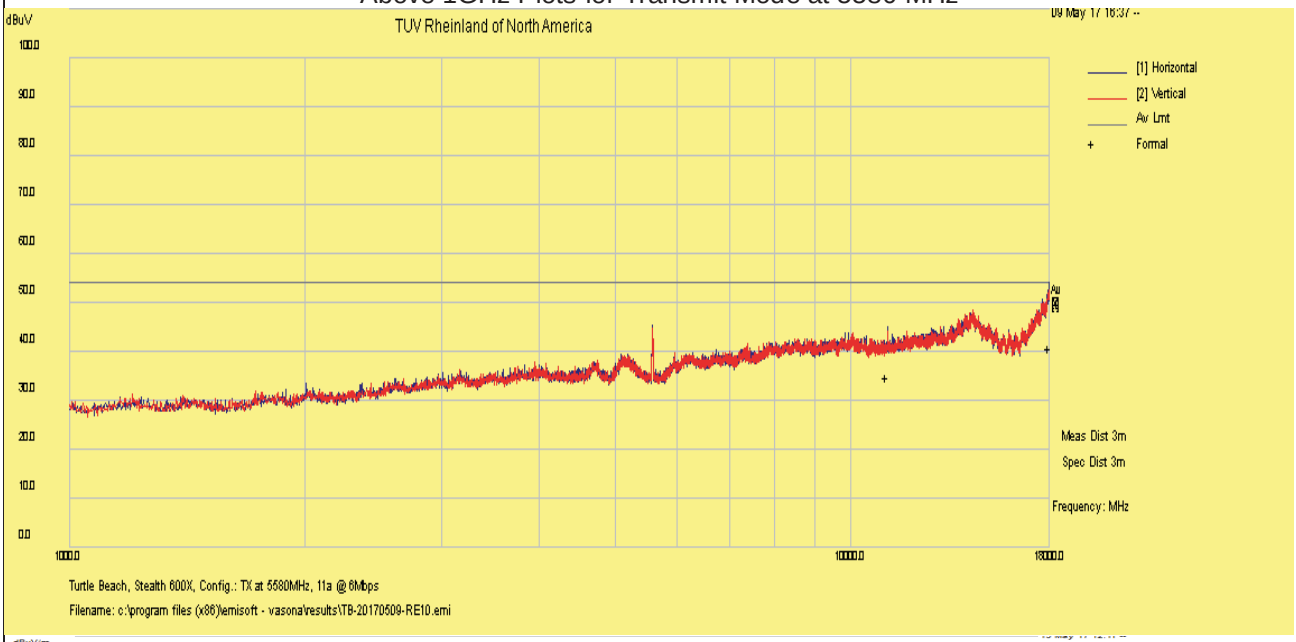
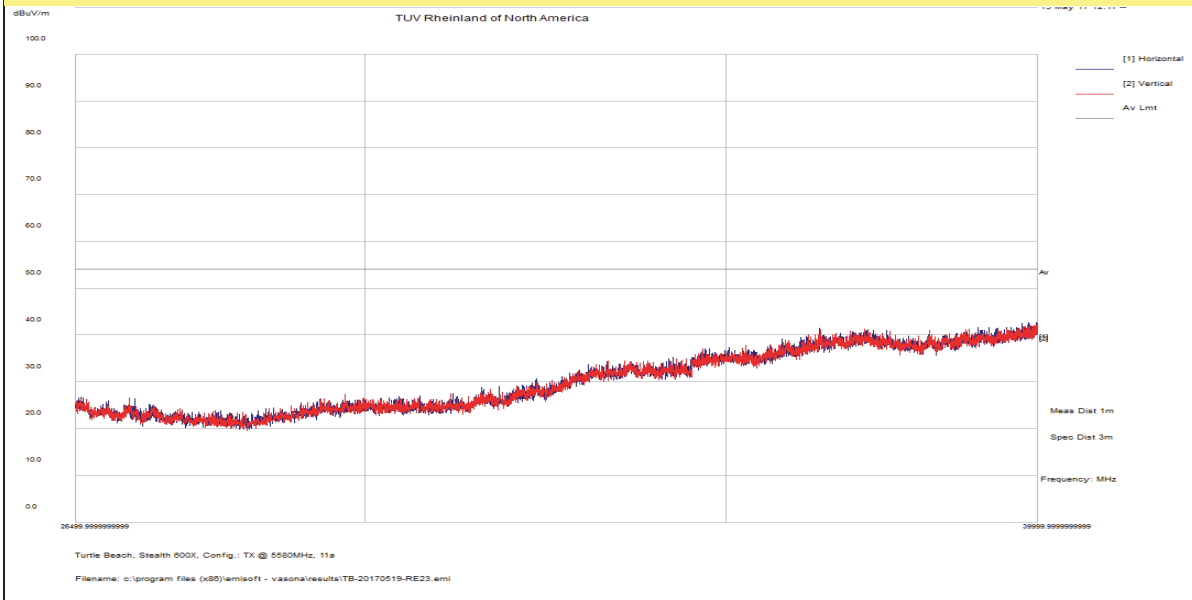
EUT Name	Wireless Audio Headset	**Date**	May 9, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 35%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5580 MHz



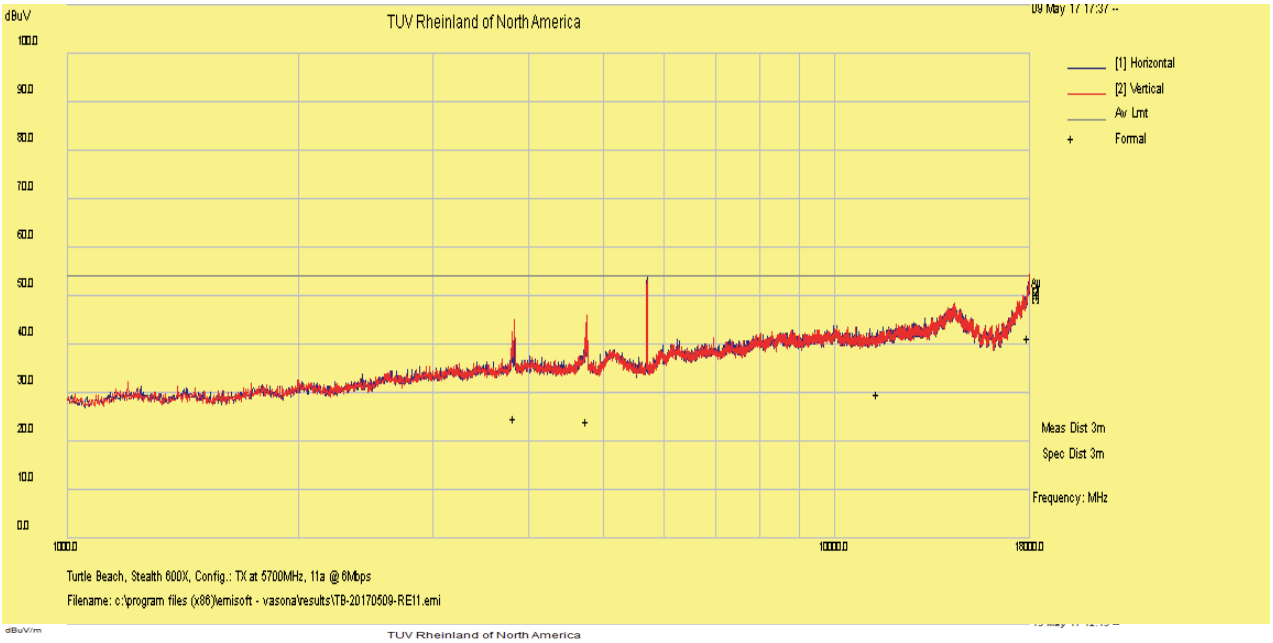


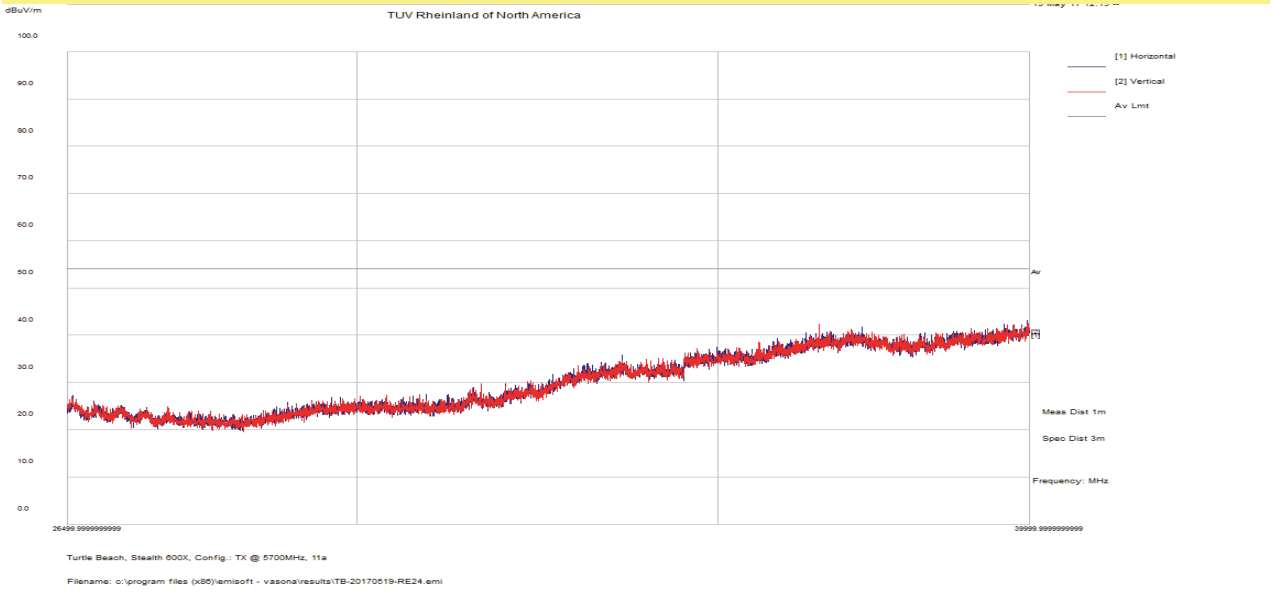
Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

EUT Name	Wireless Audio Headset	**Date**	May 9, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 35%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5700 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions — Tracking # 31761682.001 Page 23 of 34

EUT Name	Wireless Audio Headset	**Date**	May 9, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 35%rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m – AHA-840	**Performed by**	Jeremy Luong

1 – 40 GHz Transmit at 5500 MHz (Low Channel)

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
10999.02	43.50	2.75	-12.59	33.66	Ave	V	160	220	54.00	-20.34
14449.81	40.10	3.27	-8.55	34.83	Ave	V	141	360	54.00	-19.17
17969.64	40.34	3.77	-3.01	41.09	Ave	V	172	278	54.00	-12.91
1 – 40 GHz Transmit at 5580 MHz (Middle Channel)										
17975.43	39.93	3.77	-2.98	40.71	Ave	H	242	186	54.00	-13.29
5112.78	44.87	1.79	-19.73	26.94	Ave	V	130	352	54.00	-27.06
11161.83	41.95	2.80	-12.46	32.28	Ave	V	146	232	54.00	-21.72
1 – 40 GHz Transmit at 5700 MHz (High Channel)										
3824.80	43.37	1.55	-20.50	24.42	Ave	H	196	84	54.00	-29.58
17976.33	39.94	3.77	-2.98	40.73	Ave	H	130	226	54.00	-13.27
4759.37	43.67	1.73	-20.29	25.11	Ave	V	199	360	54.00	-28.89
11411.82	39.14	2.79	-12.18	29.75	Ave	V	198	82	54.00	-24.25

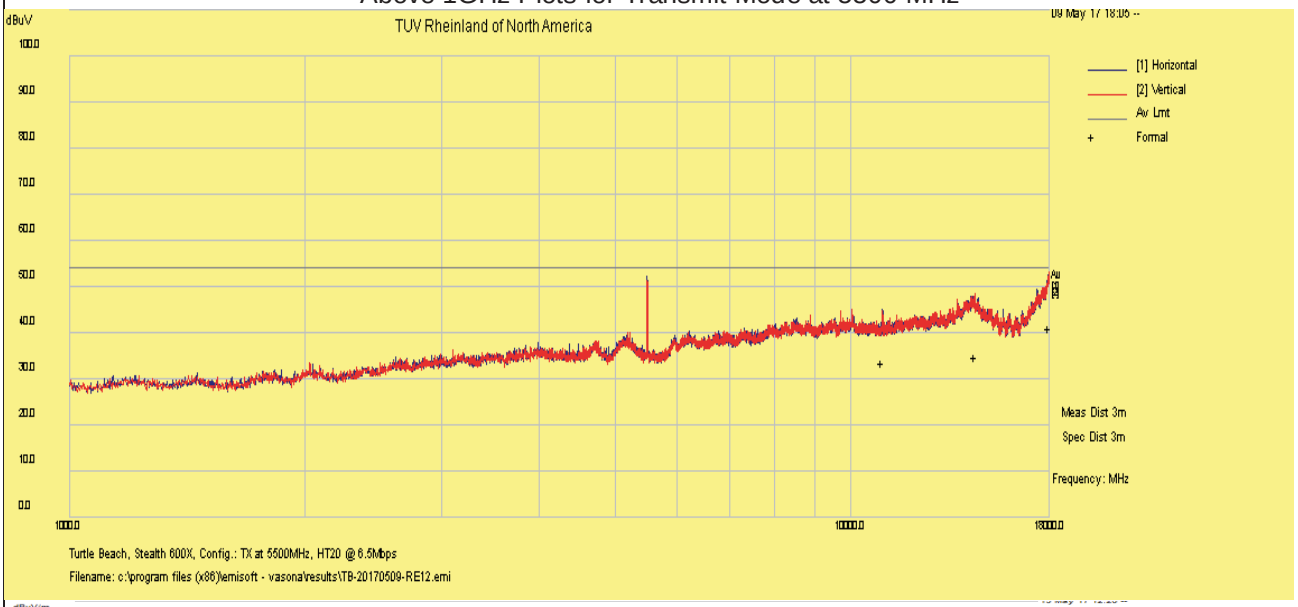
Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

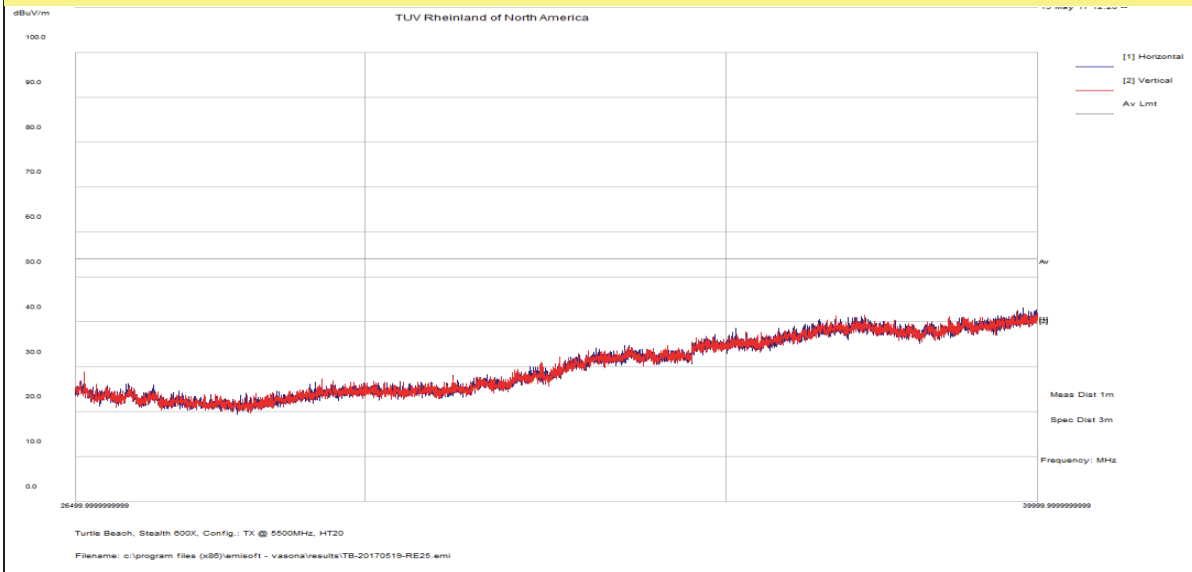
Note: Worst case emission was observed at 6.5Mbps for 802.1n HT20 mode.
Headset intended to transmit less than 8dBm.

SOP 1 Radiated Emissions

EUT Name	Wireless Audio Headset	**Date**	May 9, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 35%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5500 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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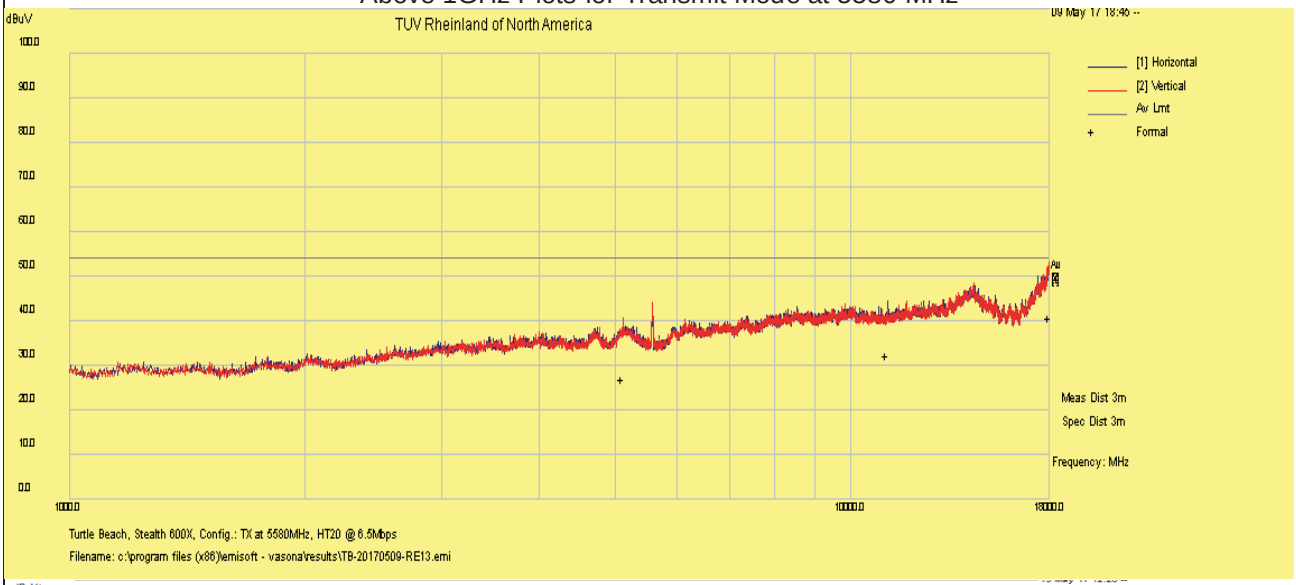
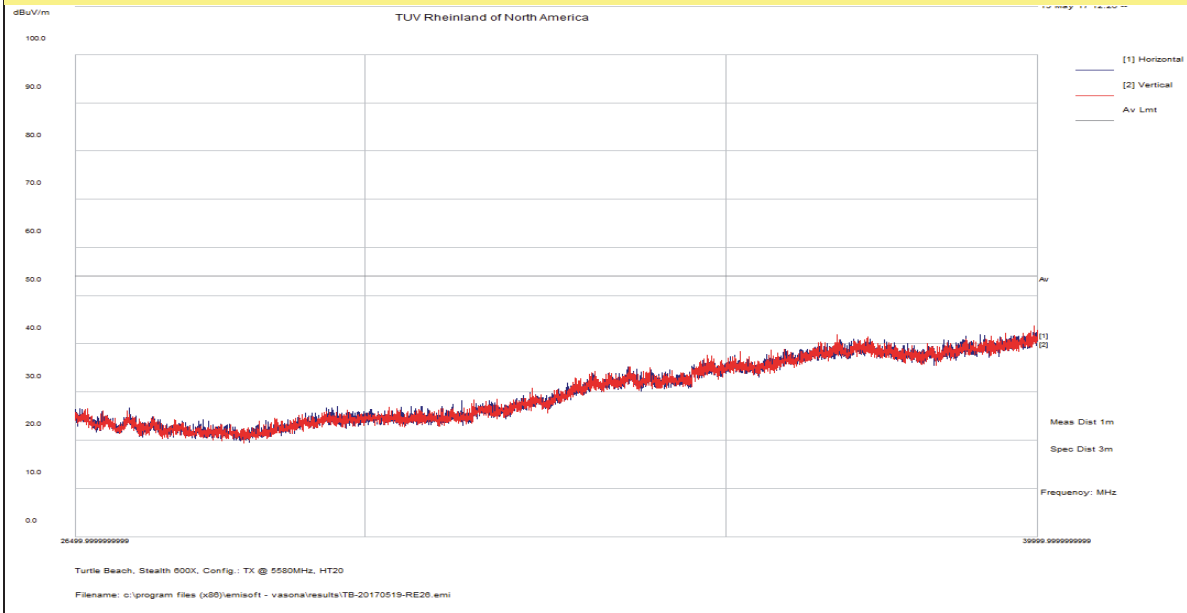
EUT Name	Wireless Audio Headset	**Date**	May 9, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 35%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5580 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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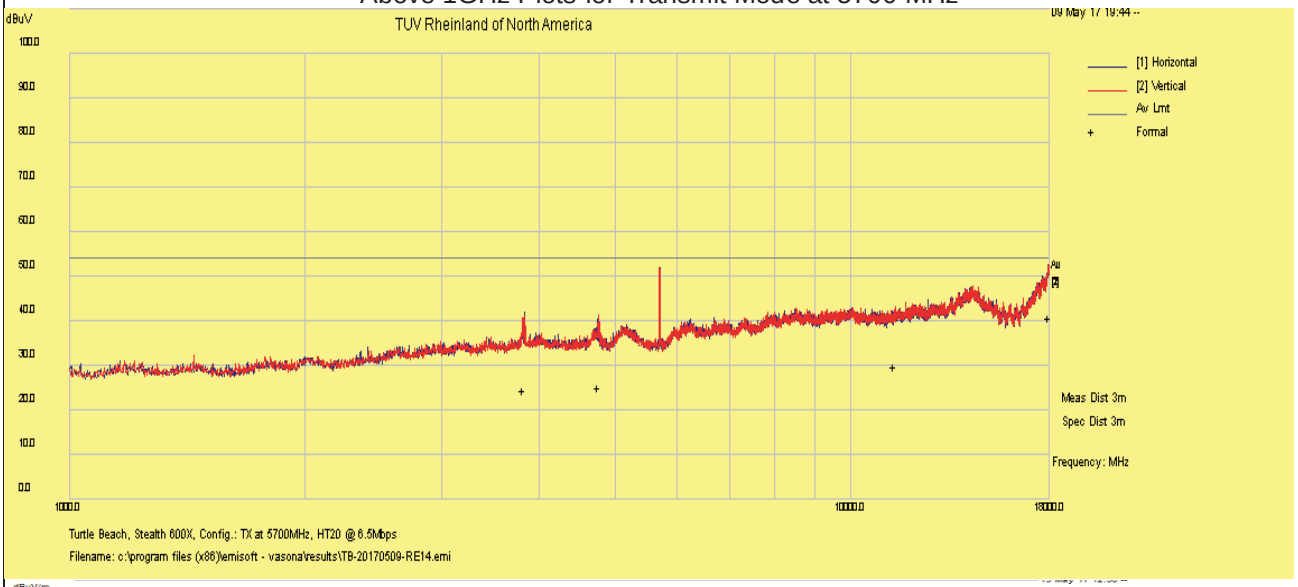
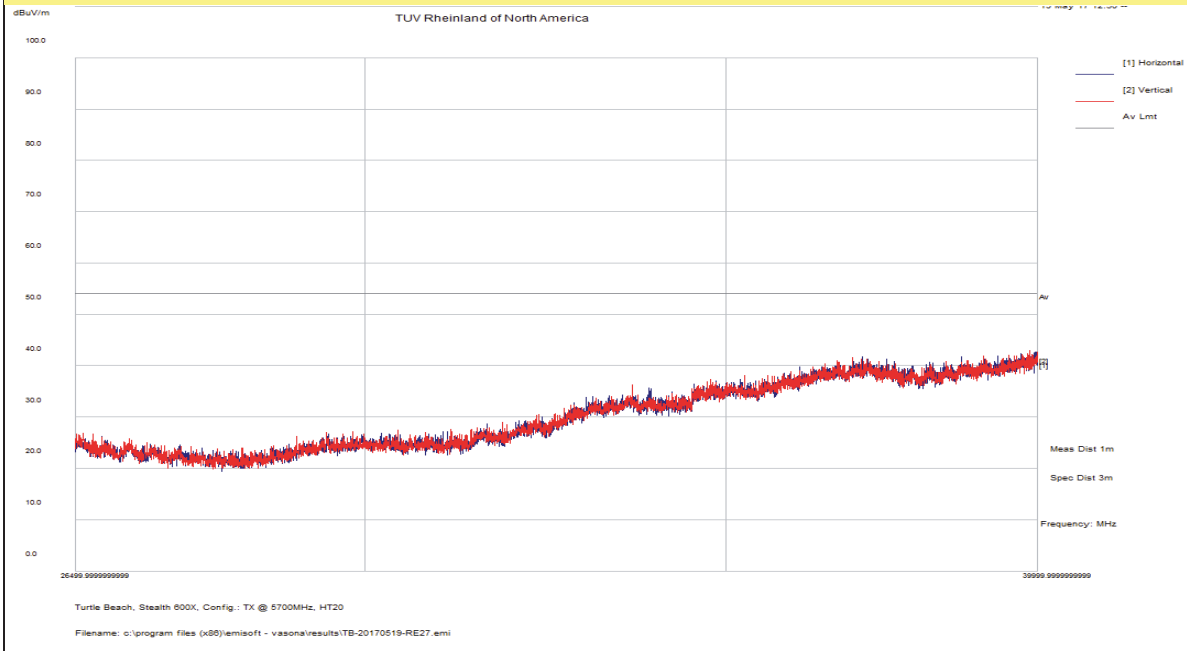
EUT Name	Wireless Audio Headset	**Date**	May 9, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 35%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5700 MHz





Notes: No significant emission observed above 18 GHz.

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EUT Name	Wireless Audio Headset	**Date**	May 17, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 33%rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m – AHA-840	**Performed by**	Jeremy Luong

1 – 40 GHz Transmit at 5745 MHz (Low Channel)

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
11435.37	39.80	2.81	-12.15	30.47	Ave	H	156	360	54.00	-23.53
17974.19	40.16	3.77	-2.99	40.94	Ave	H	179	186	54.00	-13.06
2435.80	45.19	1.21	-24.74	21.66	Ave	V	131	264	54.00	-32.34
3840.60	50.40	1.50	-20.40	31.50	Ave	V	102	287	54.00	-22.50
4785.97	50.00	1.70	-20.20	31.60	Ave	V	160	150	54.00	-22.40
4808.40	50.70	1.80	-20.10	32.30	Ave	V	151	0	54.00	-21.70
1 – 40 GHz Transmit at 5785 MHz (Middle Channel)										
6751.27	45.55	2.09	-17.56	30.08	Ave	H	181	100	54.00	-23.92
11576.37	40.47	2.77	-11.93	31.32	Ave	H	244	349	54.00	-22.69
17919.24	40.69	3.72	-3.27	41.14	Ave	H	199	348	54.00	-12.86
3842.02	46.23	1.52	-20.42	27.33	Ave	V	193	224	54.00	-26.67
4813.06	57.20	1.80	-20.10	38.80	Ave	V	191	70	54.00	-15.20
1 – 40 GHz Transmit at 5825 MHz (High Channel)										
17963.82	40.37	3.77	-3.04	41.09	Ave	H	131	0	54.00	-12.91
2434.40	46.05	1.21	-24.74	22.53	Ave	V	123	108	54.00	-31.48
3862.17	47.79	1.53	-20.39	28.94	Ave	V	126	140	54.00	-25.06
4836.53	67.70	1.80	-20.10	49.30	Ave	V	219	20	54.00	-4.70
6799.55	46.52	2.10	-17.49	31.13	Ave	V	177	192	54.00	-22.87

Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: Worst case emission was observed at 6Mbps for 802.11a mode.
Headset intended to transmit less than 8dBm.

SOP 1 Radiated Emissions

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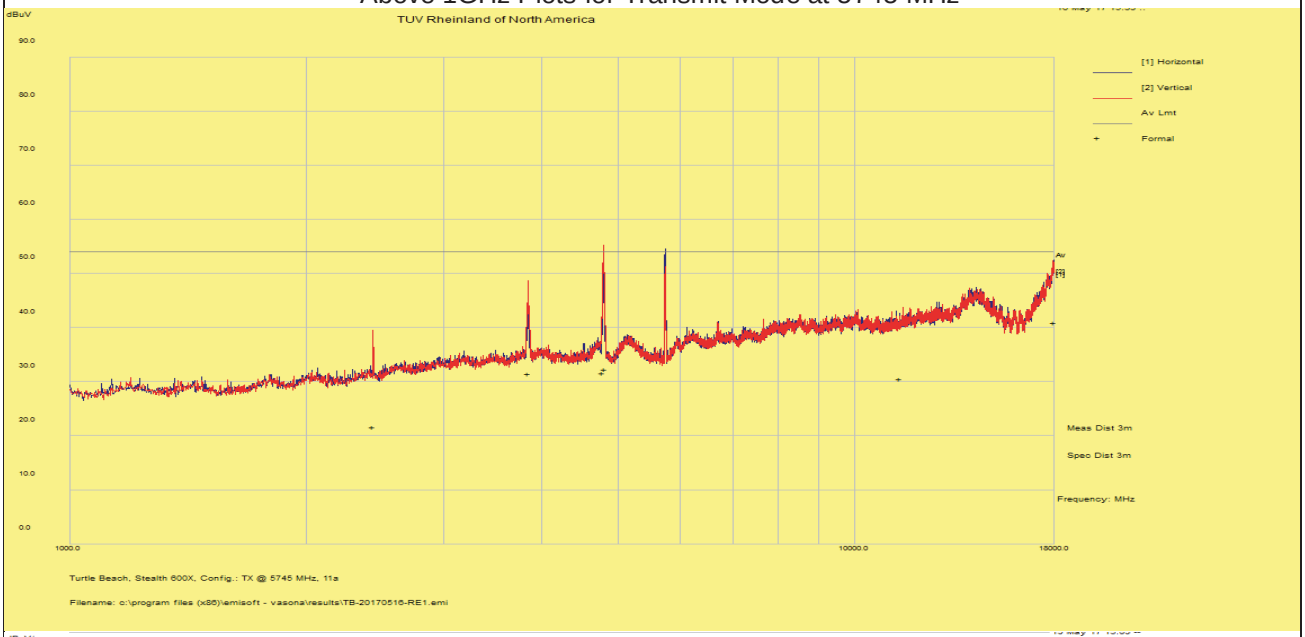
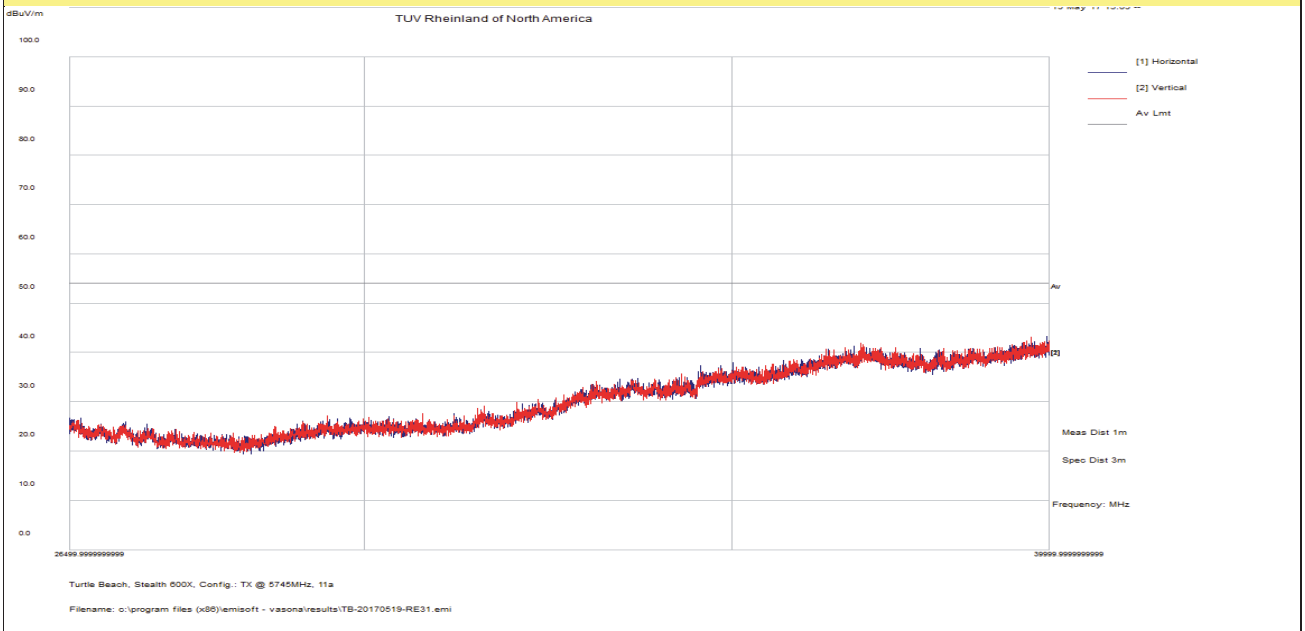
EUT Name	Wireless Audio Headset	**Date**	May 17, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 33%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5745 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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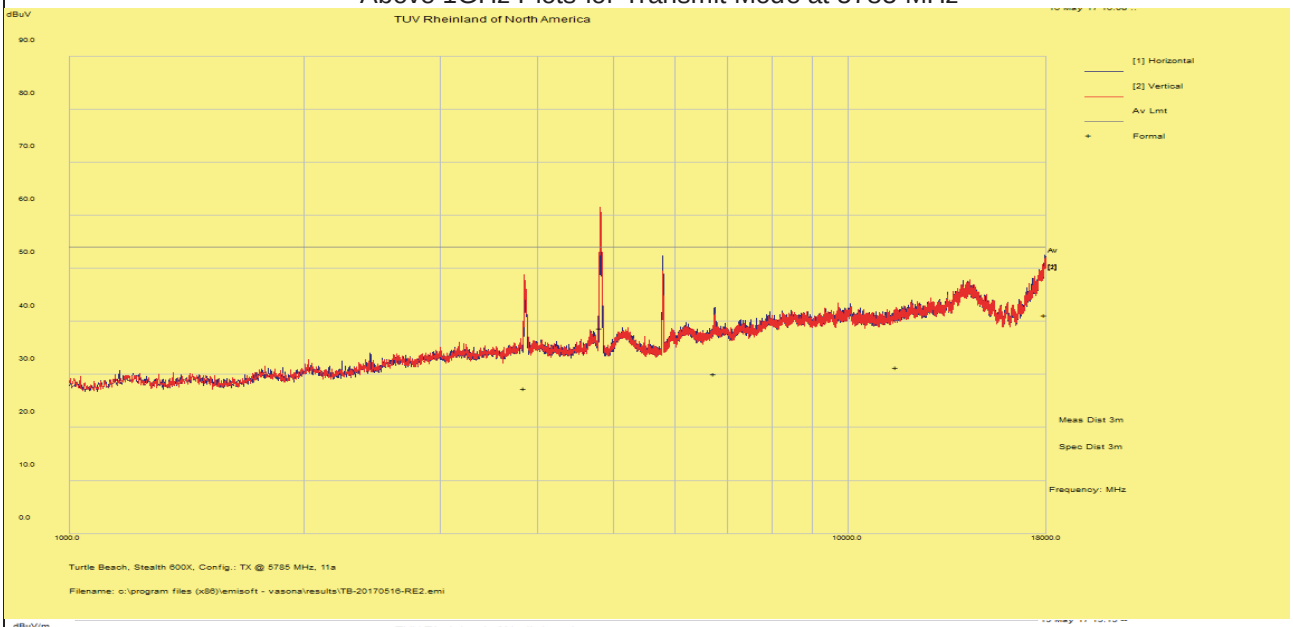
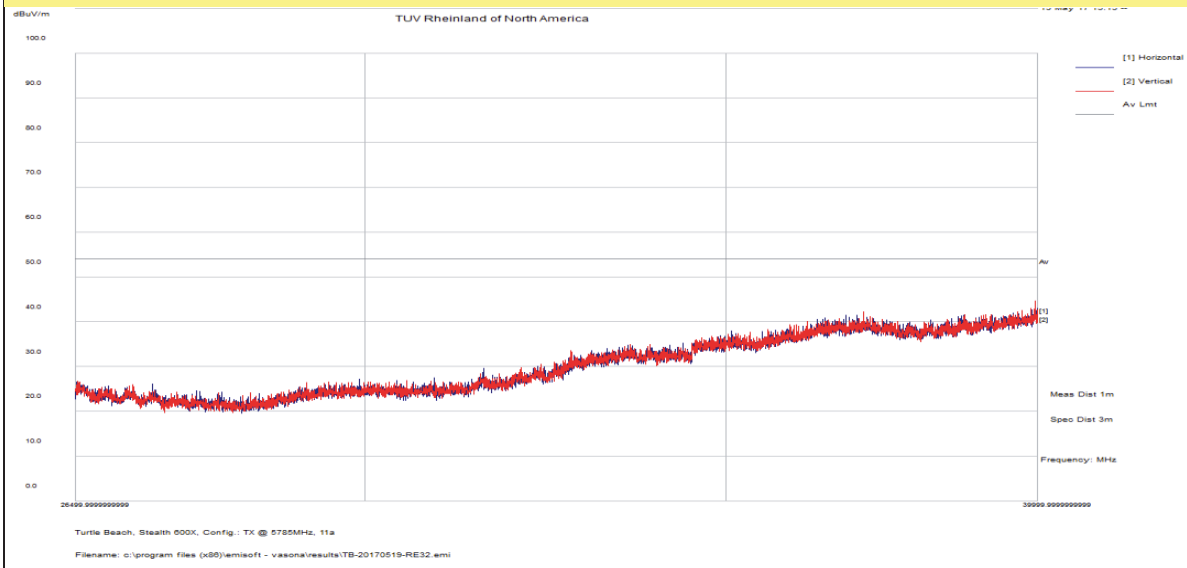
EUT Name	Wireless Audio Headset	**Date**	May 17, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 33%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5785 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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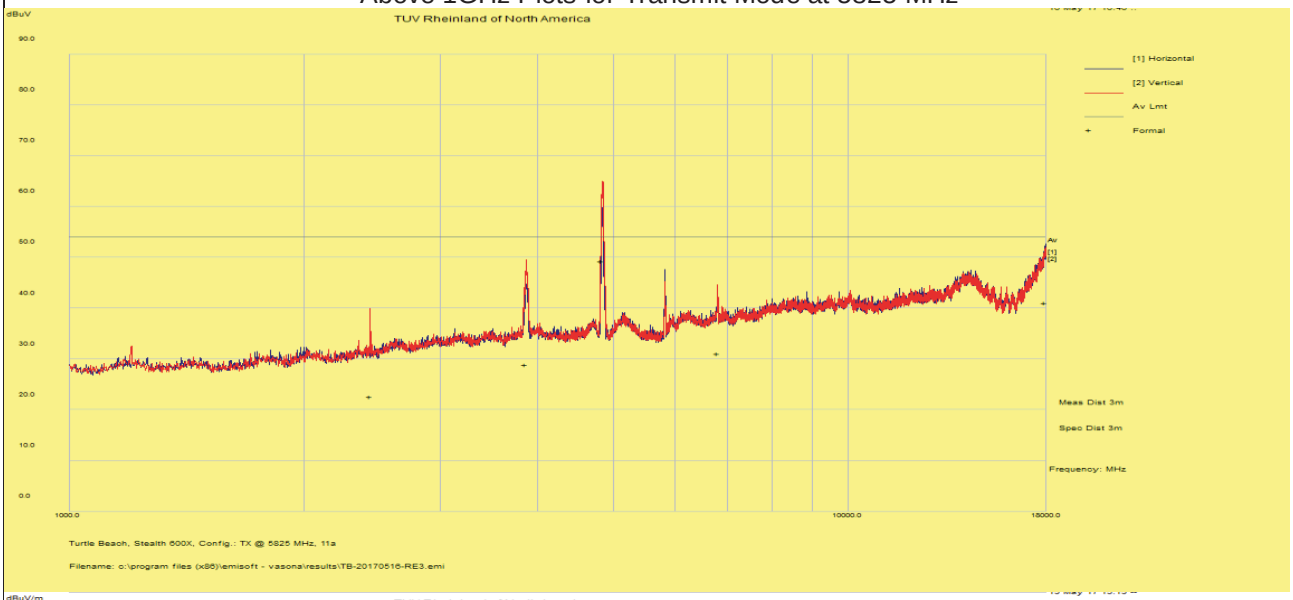
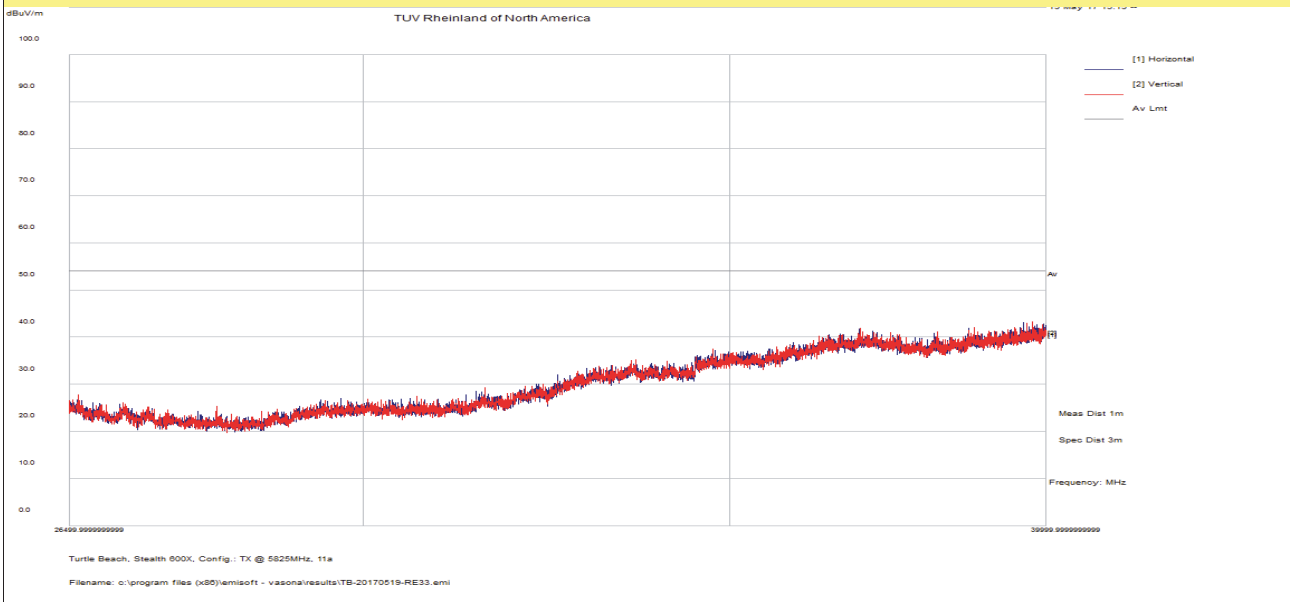
EUT Name	Wireless Audio Headset	**Date**	May 17, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 33%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11a mode at 6Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5825 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions		Tracking # 31761682.001 Page 31 of 34	
EUT Name	Wireless Audio Headset	**Date**	May 17, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 33%rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m - EMCO3115 / 1m – AHA-840	**Performed by**	Jeremy Luong

1 – 40 GHz Transmit at 5745 MHz (Low Channel)

Frequency	Raw	Cable Loss	AF	Level	Detector	Polarity	Height	Azimuth	Limit	Margin
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB
6693.59	44.71	2.10	-17.74	29.07	Ave	H	148	116	54.00	-24.93
14347.24	41.02	3.20	-8.29	35.92	Ave	H	178	86	54.00	-18.08
17975.11	40.07	3.77	-2.99	40.85	Ave	H	114	332	54.00	-13.15
1199.96	46.16	0.83	-28.08	18.91	Ave	V	134	156	54.00	-35.09
3843.40	47.61	1.52	-20.41	28.72	Ave	V	113	284	54.00	-25.28
3859.63	44.21	1.53	-20.38	25.35	Ave	V	227	224	54.00	-28.65
4790.76	51.30	1.70	-20.20	32.90	Ave	V	111	18	54.00	-21.10
4804.97	53.70	1.80	-20.10	35.30	Ave	V	137	194	54.00	-18.70
1 – 40 GHz Transmit at 5785 MHz (Middle Channel)										
17928.66	40.58	3.73	-3.22	41.09	Ave	H	120	64	54.00	-12.91
3851.34	47.04	1.51	-20.38	28.17	Ave	V	103	54	54.00	-25.84
4818.13	54.60	1.80	-20.10	36.20	Ave	V	221	222	54.00	-17.80
4829.07	55.10	1.80	-20.10	36.70	Ave	V	126	236	54.00	-17.30
6744.19	43.40	2.10	-17.58	27.92	Ave	V	242	328	54.00	-26.08
1 – 40 GHz Transmit at 5825 MHz (High Channel)										
3864.74	49.83	1.54	-20.39	30.99	Ave	V	242	206	54.00	-23.01
4847.63	61.90	1.80	-20.10	43.50	Ave	V	107	360	54.00	-10.50
4855.12	64.20	1.80	-20.10	45.80	Ave	V	237	343	54.00	-8.20
17955.28	40.25	3.76	-3.08	40.93	Ave	V	115	42	54.00	-13.07

Spec Margin = E-Field AVG - Limit, E-Field AVG = FIM AVG+ Total CF ± Uncertainty
Total CF= AF+ Cable Loss AF= Antenna factor + Preamp

Note: Worst case emission was observed at 6.5Mbps for 802.11n HT20 mode.
Headset intended to transmit less than 8dBm.

SOP 1 Radiated Emissions

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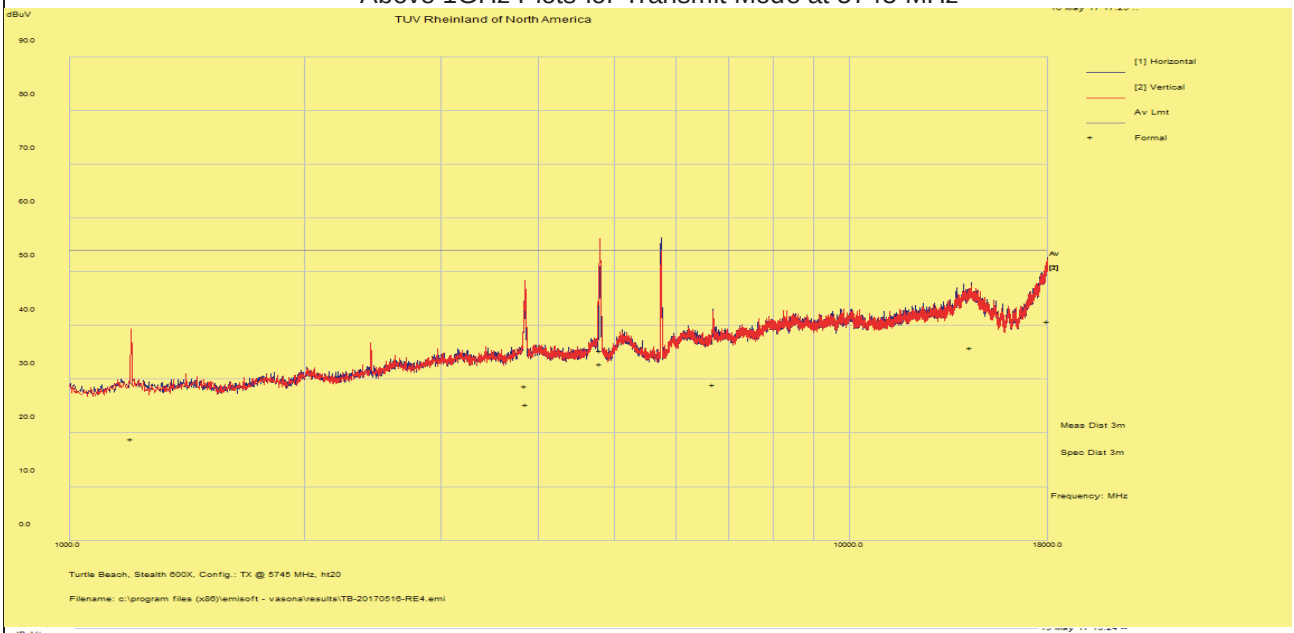
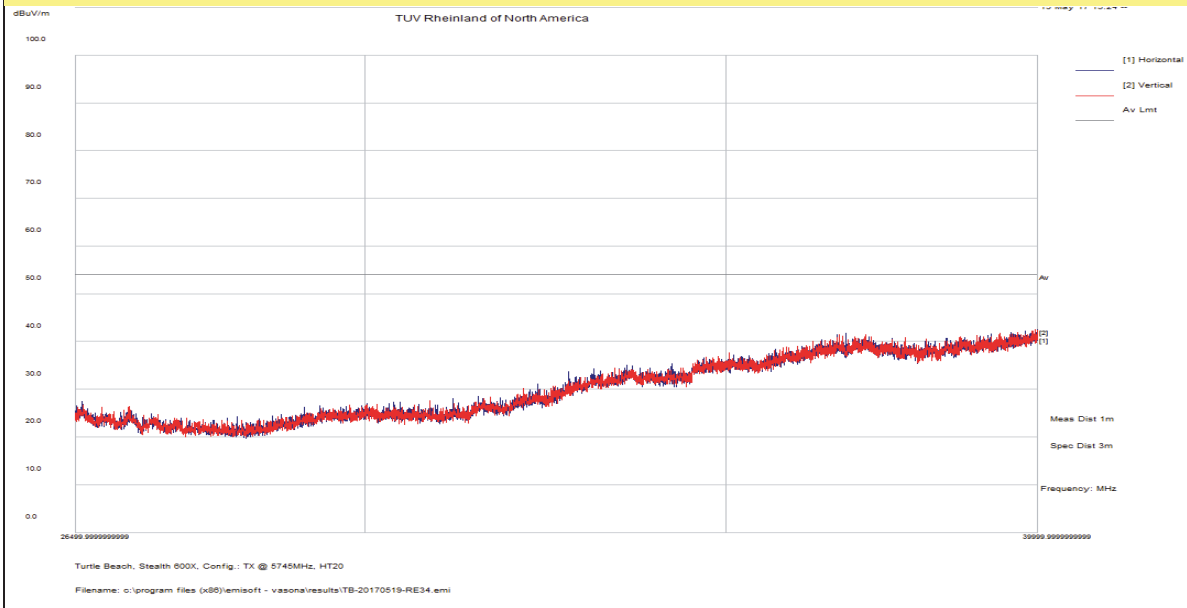
EUT Name	Wireless Audio Headset	**Date**	May 17, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 33%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C, RSS-247, RSS-GEN	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5745 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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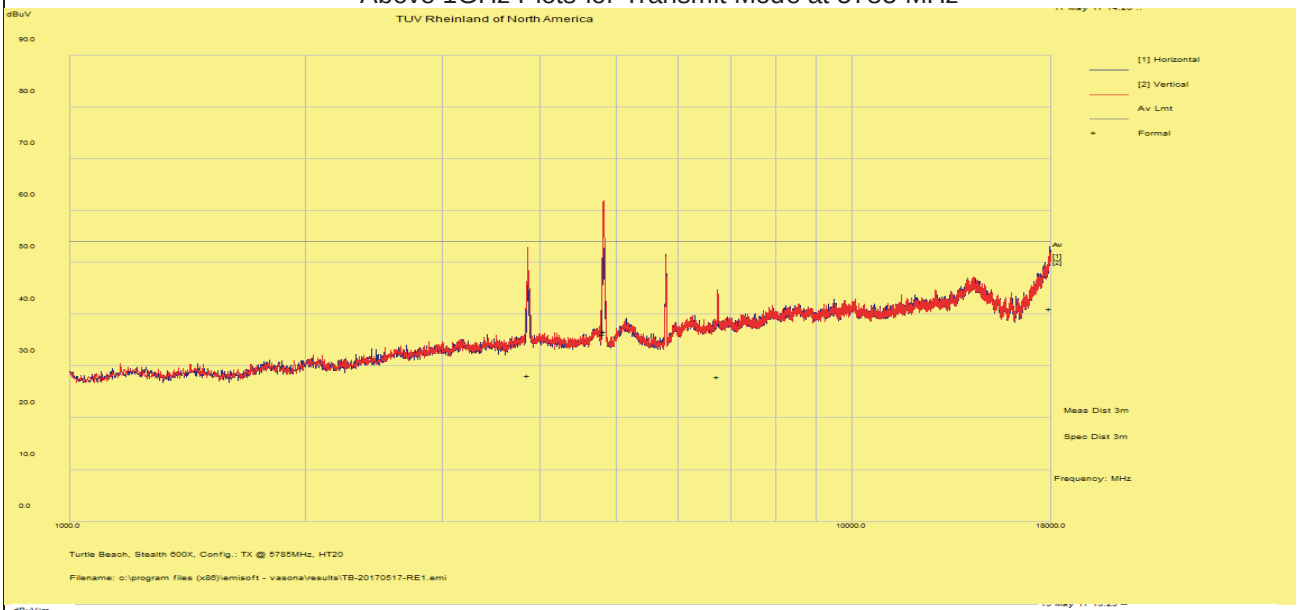
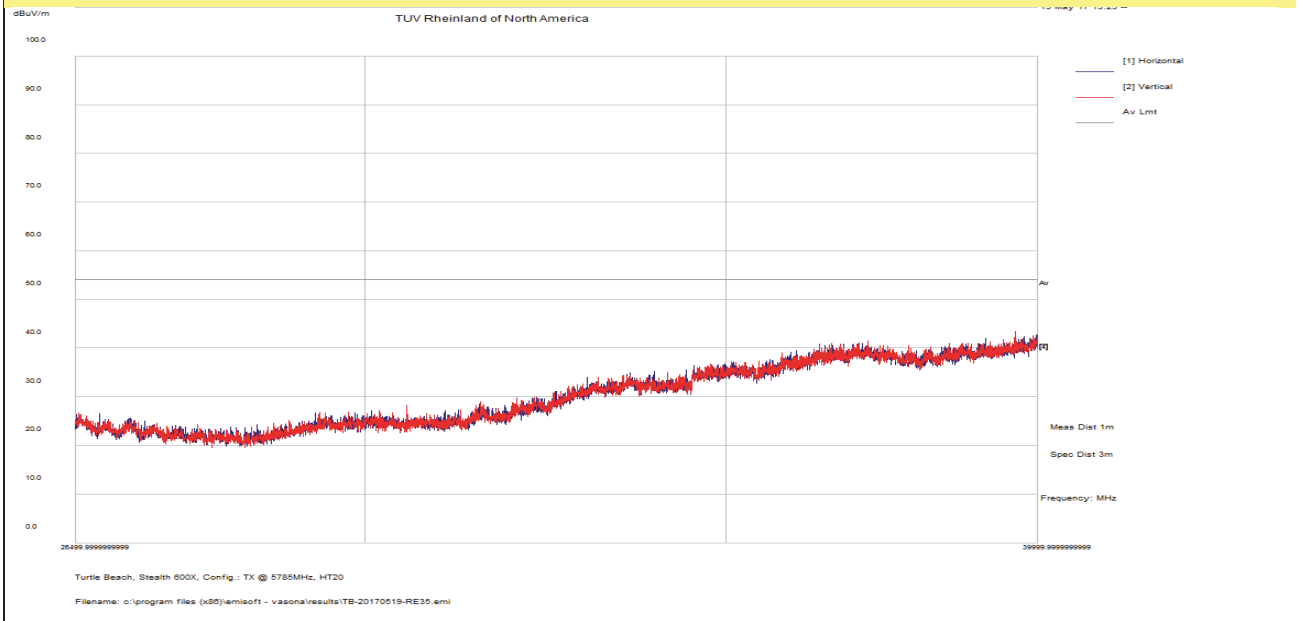
EUT Name	Wireless Audio Headset	**Date**	May 17, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 33%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5785 MHz





Notes: No significant emission observed above 18 GHz.

SOP 1 Radiated Emissions

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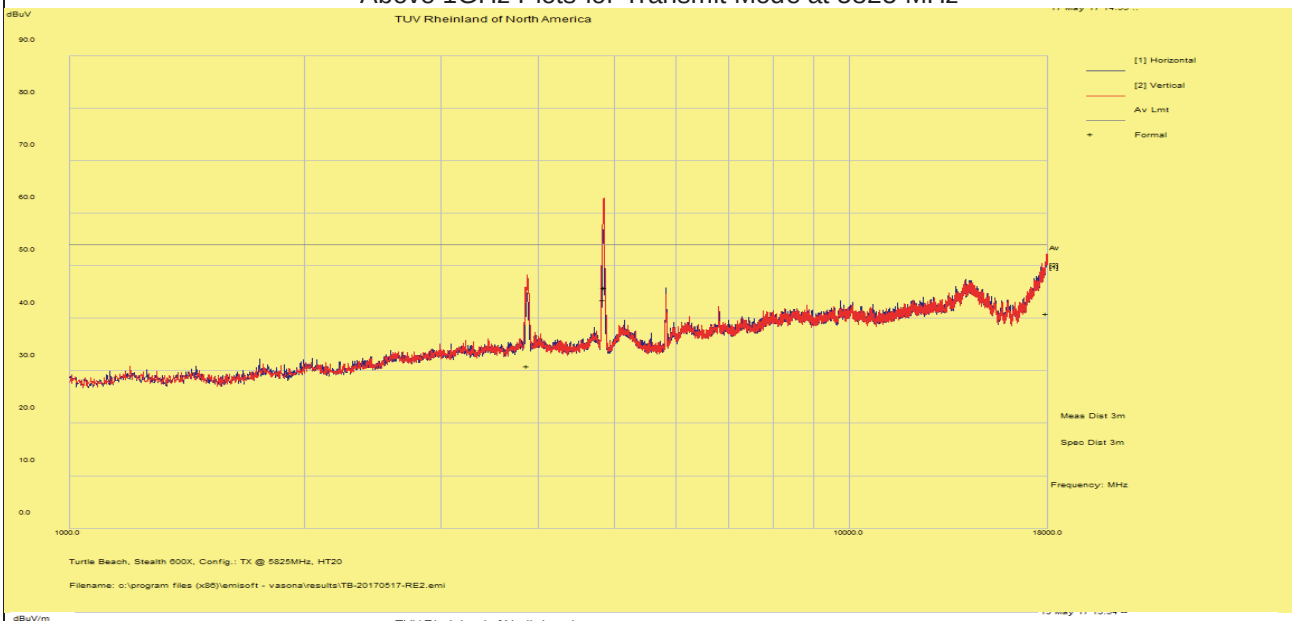
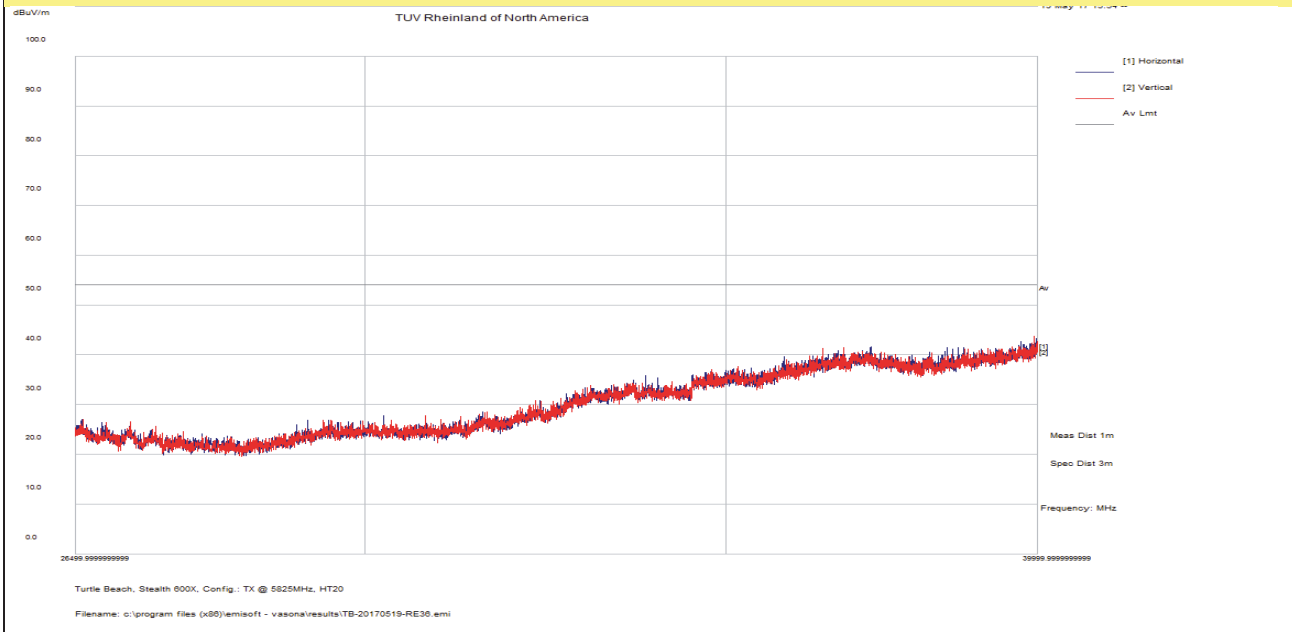
EUT Name	Wireless Audio Headset	**Date**	May 17, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	23° C / 33%rh
EUT Serial	PP #2	**Temp / Hum out**	N/A
EUT Config.	Headset upright in 802.11n HT20 mode 6.5Mbps	**Line AC / Freq**	3.7Vdc
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1 MHz/ 3 MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 5825 MHz





Notes: No significant emission observed above 18 GHz.

4.6 AC Conducted Emissions

Testing was performed in accordance with ANSI C63.4: 2014. These test methods are listed under the laboratory's A2LA Scope of Accreditation.

This test measures the levels emanating from the EUT's AC input port, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices.

The AC conducted emissions of equipment under test shall not exceed the values in CFR47 Part 15.207: 2017 and RSS GEN: 2014.

4.6.1 Test Methodology

A test program that controls instrumentation and data logging was used to automate the AC Power Line Conducted emission test procedure. The frequency range of interest was divided into sub-ranges such as to yield a frequency resolution of 9 kHz. Each phase and neutral of the AC power line were measured with respect to ground. Measurements were performed using a set of 50μH / 50Ω LISNs.

Testing is performed in Lab 5. The setup photographs clearly identify which site was used. The vertical ground plane used in the semi-anechoic chamber is a 2m x 2m solid aluminum frame and panel, and it is bonded to the horizontal ground plane.

In the case of tabletop equipment, the EUT is placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane and 40cm from a vertical ground reference plane. The rear of the EUT was positioned flush with the backside of the table and directly over the LISNs. The power and I/O cables were routed over the edge of the table and bundled approximately 40cm from the ground plane. Support equipment was powered from a separate LISN.

4.6.1.1 Deviations

There were no deviations from this test methodology.

4.6.2 Test Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 12: AC Conducted Emissions – Test Results

Test Conditions: Conducted Measurement at Normal Conditions only	Date: May 12, 2017
Antenna Type: Chip	**Power Level:** See Test Plan
AC Power: 110 Vac/60 Hz at host device	**Configuration:** Tabletop
Ambient Temperature: 23° C	**Relative Humidity:** 34% RH

Configuration	Frequency Range	Test Result
Line 1 (Hot)	0.15 to 30 MHz	Pass
Line 2 (Neutral)	0.15 to 30 MHz	Pass

SOP 2 Conducted Emissions Tracking # 31761683.001 Page 1 of 4

EUT Name	Wireless Audio Headset	**Date**	May 12, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	22° C / 36% rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	TX mode: 802.11a mode at 6Mbps, 5500 MHz	**Line AC / Freq**	110Vac / 60Hz (host)
Standard	CFR47 Part 15.207 and RSS Gen	**RBW / VBW**	9 kHz / 30 kHz
Lab/LISN	Lab #5 /Com-Power, Line 1	**Performed by**	Jeremy Luong

Frequency	Raw	Limiter	Ins. Loss	Level	Detector	Line	Limit	Margin	Result
MHz	dBuV	dB	dB	dBuV			dBuV	dB	
0.163	38.62	9.82	0.05	48.49	QP	Live	65.31	-16.82	Pass
0.163	23.31	9.82	0.05	33.18	Ave	Live	55.31	-22.12	Pass
0.172	35.94	9.82	0.05	45.82	QP	Live	64.84	-19.03	Pass
0.172	17.51	9.82	0.05	27.38	Ave	Live	54.84	-27.46	Pass
0.186	35.84	9.82	0.04	45.71	QP	Live	64.23	-18.52	Pass
0.186	19.57	9.82	0.04	29.44	Ave	Live	54.23	-24.79	Pass
0.272	36.35	9.83	0.04	46.22	QP	Live	61.07	-14.85	Pass
0.272	30.32	9.83	0.04	40.18	Ave	Live	51.07	-10.89	Pass
0.303	25.10	9.83	0.03	34.96	QP	Live	60.15	-25.19	Pass
0.303	16.82	9.83	0.03	26.68	Ave	Live	50.15	-23.47	Pass
0.567	24.78	9.85	0.03	34.65	QP	Live	56.00	-21.35	Pass
0.567	17.86	9.85	0.03	27.74	Ave	Live	46.00	-18.26	Pass
25.878	24.83	10.09	-0.06	34.86	QP	Live	60.00	-25.14	Pass
25.878	23.06	10.09	-0.06	33.09	Ave	Live	50.00	-16.91	Pass

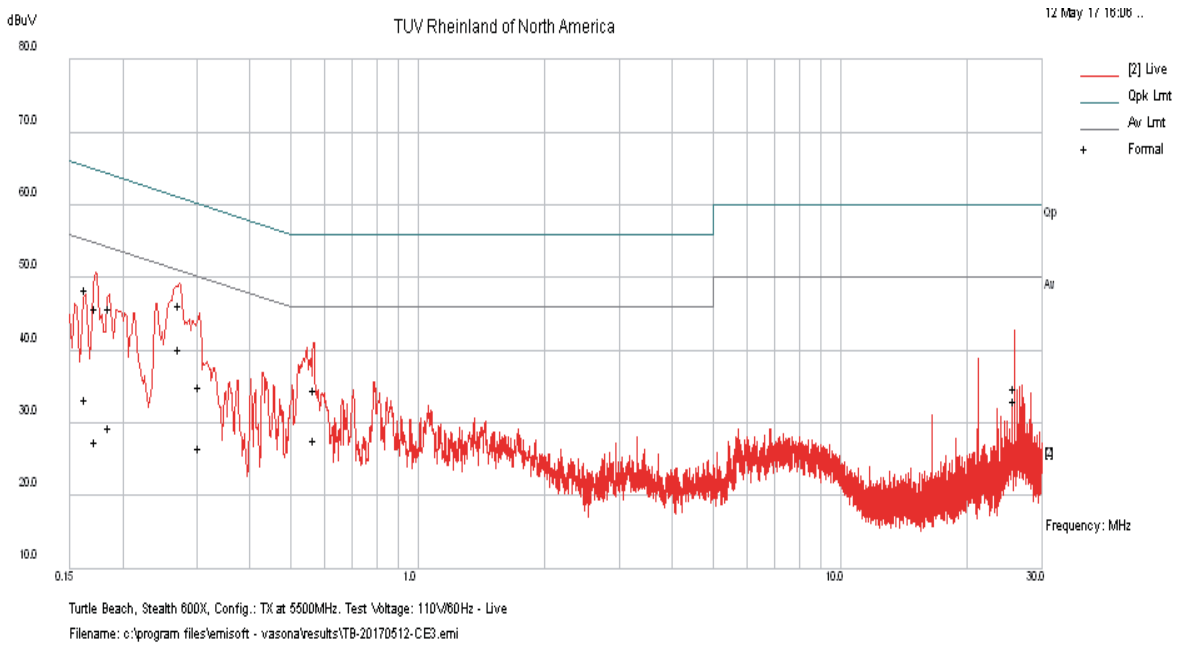
Spec Margin = QP./Ave. - Limit, ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.2 dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: EUT was setup as table top equipment and transmitted at 5500 MHz in 802.11a mode at 6Mbps (worse case).

SOP 2 Conducted Emissions		Tracking # 31761683.001 Page 2 of 4	
EUT Name	Wireless Audio Headset	**Date**	May 12, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	22° C / 36% rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	TX mode: 802.11a mode at 6Mbps, 5500 MHz	**Line AC**	110Vac / 60Hz (host)
Standard	CFR47 Part 15.207 and RSS Gen	**RBW / VBW**	9 kHz / 30 kHz
Lab/LISN	Lab #5 /Com-Power, Line 1	**Performed by**	Jeremy Luong

150 kHz to 30 MHz Plot for Line 1 (Live)



Note: Met FCC Class B limit.

SOP 2 Conducted Emissions

Tracking # 31761683.001 Page 3 of 4

EUT Name	Wireless Audio Headset	**Date**	May 12, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	22° C / 36% rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	TX mode: 802.11a mode at 6Mbps, 5500 MHz	**Line AC / Freq**	110Vac / 60Hz (host)
Standard	CFR47 Part 15.207 and RSS Gen	**RBW / VBW**	9 kHz / 30 kHz
Lab/LISN	Lab #5 /Com-Power, Line 2	**Performed by**	Jeremy Luong

Frequency	Raw	Limiter	Ins. Loss	Level	Detector	Line	Limit	Margin	Result
MHz	dBuV	dB	dB	dBuV			dBuV	dB	
0.161	34.44	9.82	0.05	44.31	QP	Neutral	65.40	-21.09	Pass
0.161	22.56	9.82	0.05	32.43	Ave	Neutral	55.40	-22.97	Pass
0.208	31.23	9.83	0.04	41.10	QP	Neutral	63.29	-22.19	Pass
0.208	17.01	9.83	0.04	26.88	Ave	Neutral	53.29	-26.41	Pass
0.268	36.09	9.83	0.04	45.95	QP	Neutral	61.19	-15.23	Pass
0.268	33.08	9.83	0.04	42.94	Ave	Neutral	51.19	-8.24	Pass
0.296	32.39	9.83	0.03	42.25	QP	Neutral	60.36	-18.10	Pass
0.296	26.90	9.83	0.03	36.76	Ave	Neutral	50.36	-13.60	Pass
0.438	23.77	9.84	0.03	33.64	QP	Neutral	57.10	-23.46	Pass
0.438	24.24	9.84	0.03	34.11	Ave	Neutral	47.10	-13.00	Pass
0.455	21.15	9.84	0.03	31.02	QP	Neutral	56.79	-25.76	Pass
0.455	13.26	9.84	0.03	23.13	Ave	Neutral	46.79	-23.66	Pass
0.569	26.78	9.85	0.03	36.65	QP	Neutral	56.00	-19.35	Pass
0.569	19.17	9.85	0.03	29.05	Ave	Neutral	46.00	-16.95	Pass

Spec Margin = QP./Ave. - Limit, ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.2 dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

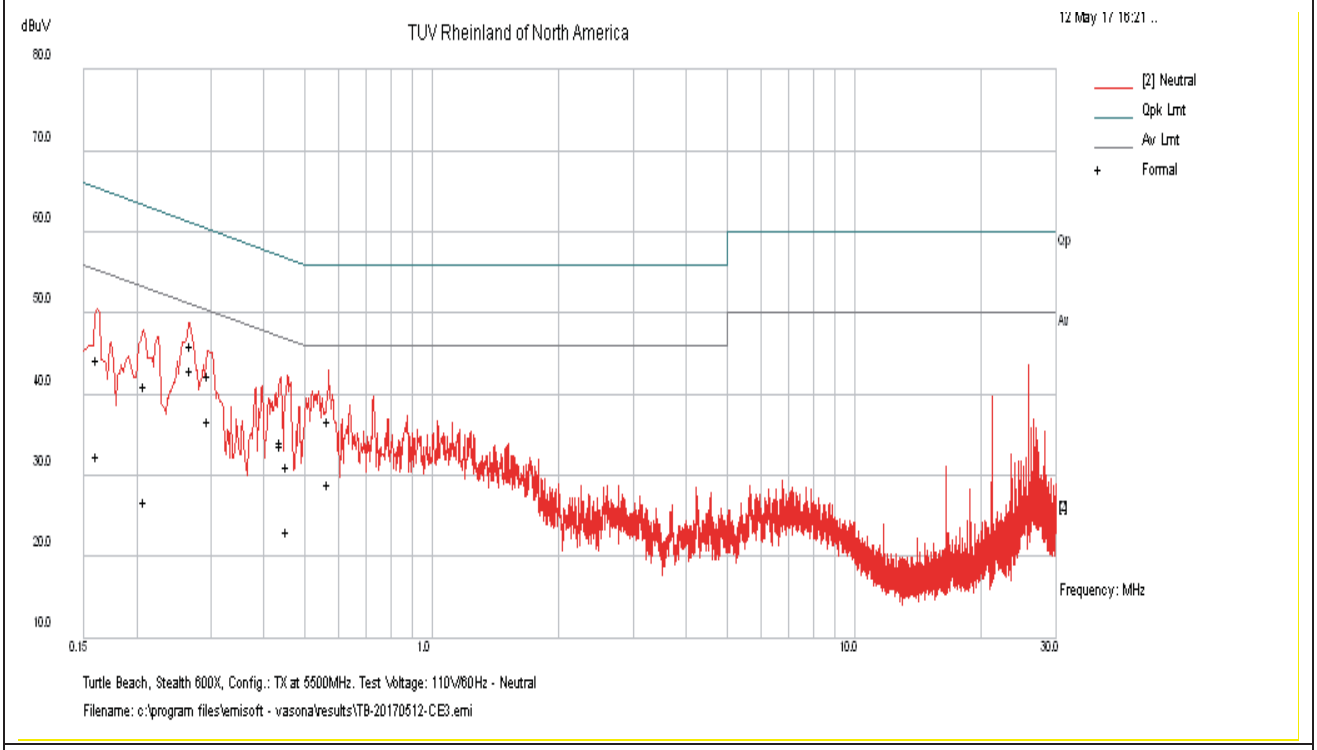
Notes: EUT was setup as table top equipment and transmitted at 5500 MHz in 802.11a mode at 6Mbps (worse case).

SOP 2 Conducted Emissions

Tracking # 31761683.001 Page 4 of 4

EUT Name	Wireless Audio Headset	**Date**	May 12, 2017
EUT Model	Ear Force Stealth 600X	**Temp / Hum in**	22° C / 36% rh
EUT Serial	PP#2	**Temp / Hum out**	N/A
EUT Config.	TX mode: 802.11a mode at 6Mbps, 5500 MHz	**Line AC**	110Vac / 60Hz (host)
Standard	CFR47 Part 15.207 and RSS Gen	**RBW / VBW**	9 kHz / 30 kHz
Lab/LISN	Lab #5 /Com-Power, Line 2	**Performed by**	Jeremy Luong

150 kHz to 30 MHz Plot for Line 2 (Neutral)



Note: Met FCC Class B Limit.

4.7 Frequency Stability

In accordance with 47 CFR Part 15.407(g) and RSS GEN Sect. 6.11 the frequency stability of U-NII devices must be such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual. The Manufacturer calls out operating temperature ranges of +0º to +50º C

4.7.1 Test Methodology

The manufacturer of the equipment is responsible for ensuring that the frequency stability is such that emissions are always maintained within the band of operation under all conditions. This test performs according to ANSI C63.10-2013 Section 6.8

4.7.2 Manufacturer Declaration

The frequency stability of the reference oscillator sets the frequency stability of the RF transceiver signals. Therefore all of the RF signal should have ±20 ppm stability.

This stability accounts for room temp tolerance of the crystal oscillator circuit, frequency variation across temperature, and crystal ageing.

Worst case:
5.30 GHz - ±20 ppm/106 kHz

±20 ppm at 5.30 GHz translates to a maximum frequency shift of ±106 kHz. As the edge of the channels are at least one MHz from either of the band edges, ±106 kHz is more than sufficient to guarantee that the intentional emission will remain in the band over the entire operating range of the radio.

4.7.3 Limit

CFR47 Part 15.407(g) and RSS GEN Sect. 6.11 - Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

4.7.4 Test results:

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s) since the maximum frequency drift was 7.89 ppm.

Table 13: Frequency Stability – Test Results

Temperature	Time	PPM
0° C	Start	0.07
	2 Min.	0.50
	5 Min	0.67
	10 min	1.10
10° C	Start	1.20
	2 Min.	1.24
	5 Min	1.20
	10 min	2.62
20° C	Start	4.53
	2 Min.	4.46
	5 Min	4.46
	10 min	4.46
30° C	Start	4.92
	2 Min.	5.27
	5 Min	5.48
	10 min	5.66
40° C	Start	7.18
	2 Min.	7.15
	5 Min	7.29
	10 min	7.39
50° C	Start	7.68
	2 Min.	7.64
	5 Min	7.89
	10 min	7.78
Note: All frequency drifts were less than ±20 ppm. The worst frequency drift was 7.89 ppm		

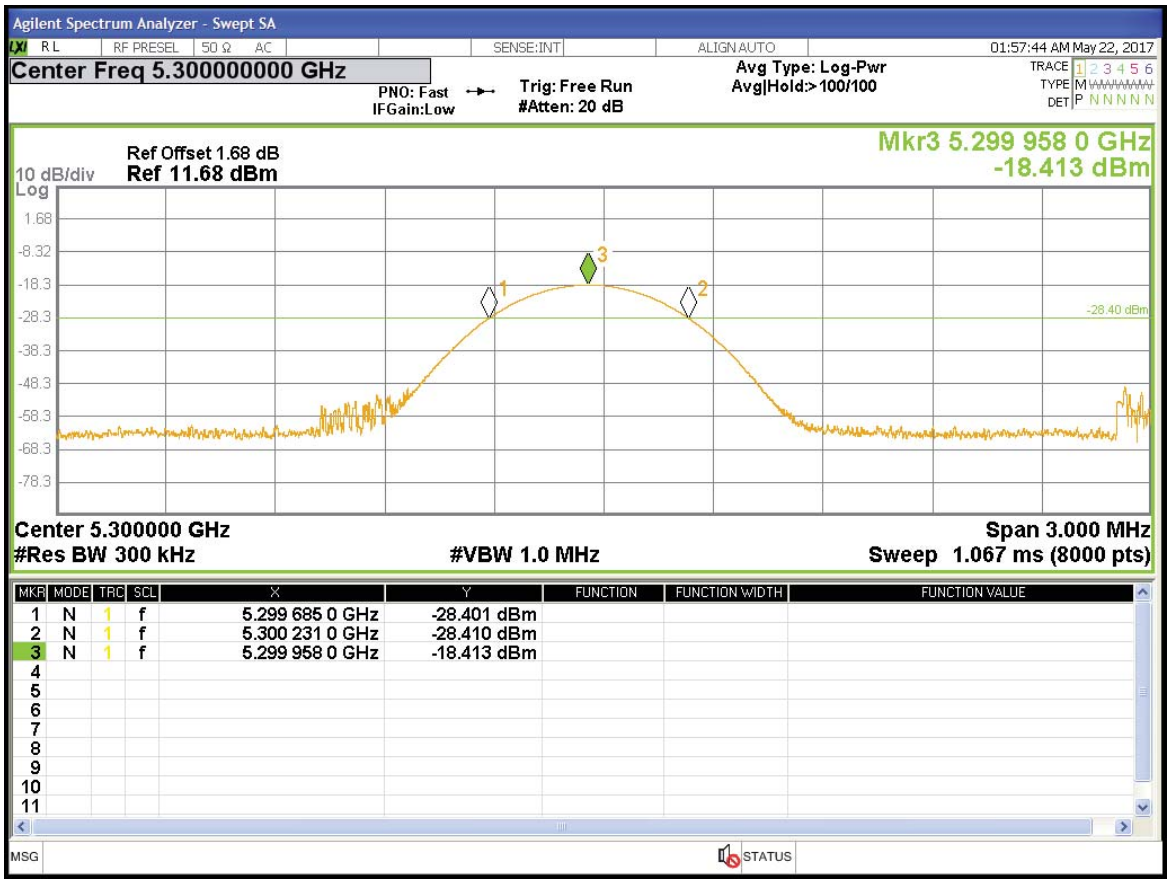


Figure 154: Frequency Stability – Worst Case

4.8 Voltage Variation

In accordance with 47 CFR Part 15.31 (e) intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

4.8.1 Test Methodology

The supply voltage was varied between 85% and 115% of the nominal rated supply voltage. The fundamental frequency was observed during the variation. The EUT was powered 3.7 Vdc by programmable power supply. The voltage was varied from 3.15 Vac to 4.26 Vac mean while the fundamental frequencies were observed and record for the maximum drift in ppm; part per millions.

4.8.2 Test results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s). The fundamental frequencies drifted less than ±20 ppm.

Table 14: Voltage Variation – Test Results

Frequency	**Nominal (3.7 Vdc)**	**Lo Voltage (3.3Vdc)**	**Hi Voltage (4.07Vdc)**	**Max Drift**
MHz	MHz	MHz	MHz	ppm
5300	2.83	2.26	3.40	3.40
Note: EUT has operating voltage of 3.3 Vdc to 4.07 Vdc.				

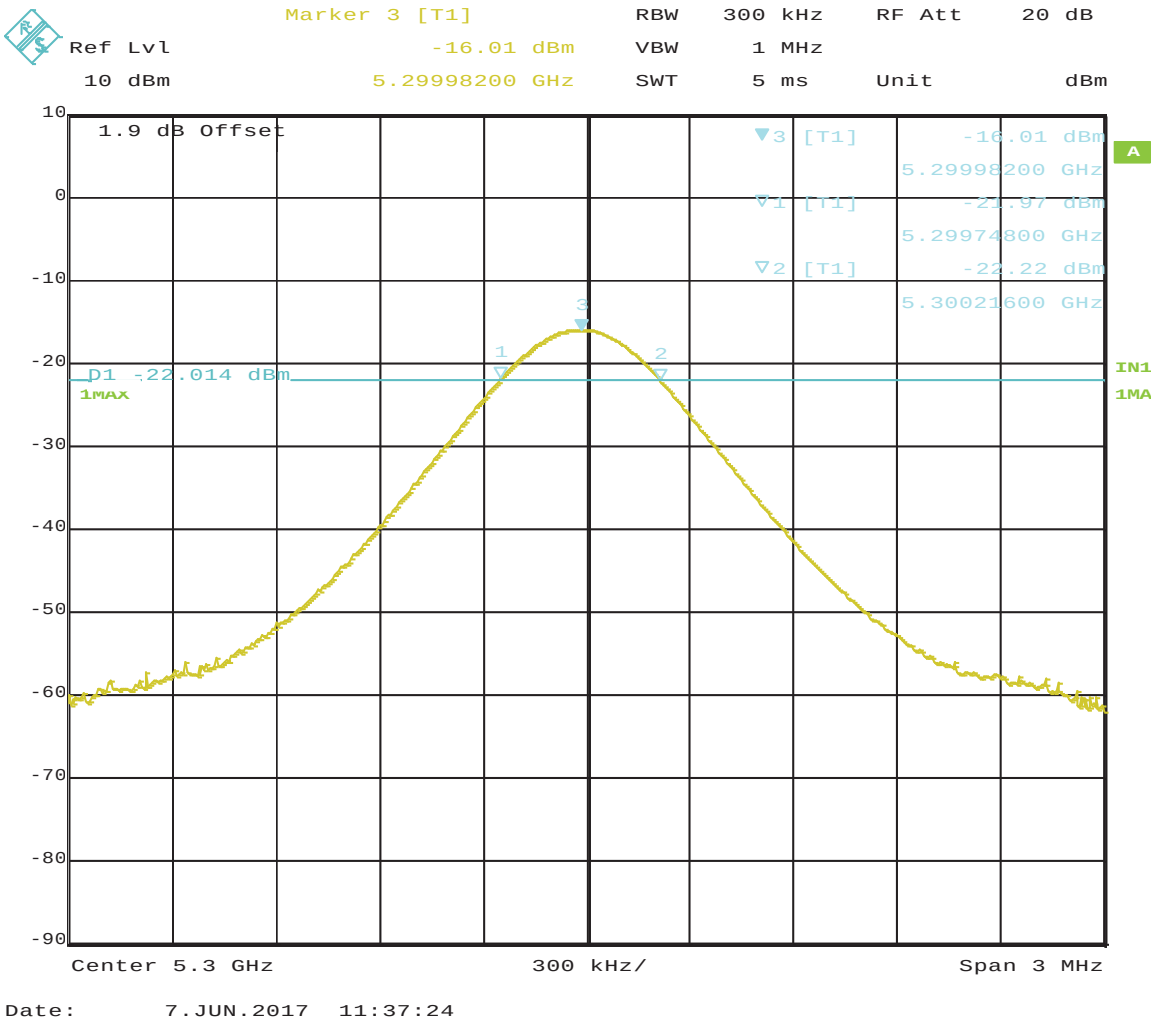


Figure 155: Voltage Variation – Worst Case

4.9 Maximum Permissible Exposure

4.9.1 Test Methodology

In this section, we try to prove the safety of radiation harmfulness to the human body for our product. The KDB 447498 D01v06 General RF Exposure Guidance is followed. The Gain of the antenna used in this calculation is declared by the manufacturer, and the maximum average power input to the antenna is measured. Using the general SAR test exclusion guidance in Section 4.3 of KDB 447498, we show the device meeting the SAR exclusion threshold found in Appendix A of KDB 447498 D01v06 and SAR exemption limits found in Table 1 of RSS-102 Issue 5.

ISED accepts the KDB 447498 D01 Procedure.

4.9.2 FCC KDB 447498 D01 – General SAR Test Exclusion Guidance

The SAR exclusion threshold conditions are listed:

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

Exclusion Threshold = [P / d] * [√f]

Where

P = max power of channel (including tune-up tolerance) in mW
d = min. test separation distance in mm
f = the RF channel transmit frequency in GHz
Power and distance are rounded to the nearest mW and mm before calculation
The result is rounded to one decimal place for comparison

Limit: ≤ 3.0 of 1-g SAR ≤7.5 of 10-g extremity SAR

The test exclusions are applicable only when the minimum test separation distance is <50 mm for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR exclusion.

4.9.3 EUT Operating Condition

The software provided by Manufacturer enabled the EUT to transmit data at lowest, middle and highest channel individually.

4.9.4 Classification

The antenna of the product, under normal use condition, is 2 cm away from the body of the user; per manufacturer's declaration. This device is classified as a **Portable Device**.

4.9.5 Antenna Gain

The antenna used is 4.9 dBi / 3.09 (numeric).

4.9.6 SAR Test Exclusion Threshold

FCC SAR Exclusion Threshold Calculation

Mode	Frequency (GHz)	Max. Power (dBm)	Max. Power (mW)	Ant. Gain (dbi)	Min. Distance (mm)	Max. EIRP (mW)	SAR Excl. Threshold (mW)	Result
Modulated	5	8.0	6.30	4.9	20	19.5	≤ 25.0	Exempted *

Note:
1. Since EUT can operate at distance of 20 mm, the SAR Test Exclusion Threshold was taken from KDB 447498 D01 General RF Exposure Guidance v06 Appendix A at 5800 MHz
2. The maximum output power was taken from Table 2 of "Turtle Beach - Ear Force Stealth 600X - FCC 15.407 Report 31761683.001.
3. (*) The maximum eirp power is less than 25mW; therefore, EUT is SAR exempted for routine SAR evaluation.

RSS-102 SAR Exclusion Threshold Calculation

Mode	Frequency (GHz)	Max. Power (dBm)	Max. Power (mW)	Ant. Gain (dbi)	Min. Distance (mm)	Max. EIRP (mW)	SAR Exemption Limit (mW)	Result
Modulated	5	8.0	6.30	4.9	20	19.5	≤ 27.0	Exempted *

Note:
1. The SAR Exemption Limit was taken from RSS-102 Iss. 5, Sect. 2.5.1 Table 1 for device operating at 20 mm distance.
2. The maximum output power was taken from Table 3 of "Turtle Beach - Ear Force Stealth 600X - FCC 15.407 Report 31761683.001.
3. (*) The maximum eirp power is less than 27mW; therefore, EUT is SAR exempted for routine SAR evaluation.

5 Test Equipment List

5.1 Equipment List

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal mm/dd/yyyy	Next Cal mm/dd/yyyy
Bilog Antenna	Sunol Sciences	JB3	A102606	06/15/2016	06/15/2018
Horn Antenna	Sunol Sciences	3115	9710-5301	10/08/2015	10/08/2017
Antenna (18-40 GHz)	Com-Power	AHA-840	105005	07/08/2015	07/08/2017
Loop Antenna	ETS-Lindgren	6502	62531	06/08/2017	06/08/2018
Spectrum Analyzer	Rohde & Schwarz	FSL6	100169	01/13/2017	01/13/2018
Spectrum Analyzer	Agilent	N9038A	MY552260210	01/16/2017	01/16/2018
Spectrum Analyzer	Agilent	N9030A	US51350291	01/08/2017	01/08/2018
Spectrum Analyzer	Rohde Schwarz	ESIB40	832427/002	01/16/2017	01/16/2018
Spectrum Analyzer	Rohde Schwarz	FSV40	1321.3008K40	08/30/2016	08/30/2017
Amplifier	Sonoma Instruments	310	165516	01/19/2017	01/19/2018
Amplifier	Miteq	TTA1800-30-HG	2020728	11/12/2016	11/12/2017
Amplifier	Rohde & Schwarz	TS-PR26	100011	11/04/2017	11/04/2018
Amplifier	Rohde & Schwarz	TS-PR40	100012	08/02/2017	08/02/2017
Power Meter	Agilent	E4418B	MY45103902	01/11/2017	01/11/2018
Power Sensor	Hewlett Packard	8482A	1925A04647	01/01/2017	01/01/2018
Thermometer	Fluke	52II	88650033	11/04/2016	11/04/2017
Thermo Chamber	Espec	BTZ-133	0613436	NCR	NCR
Multimeter	Fluke	177	92780312	01/11/2017	01/11/2018
DC Power Supply	Agilent	E3634A	MY400004331	01/12/2017	01/12/2018
Notch Filter	Micro-Tronics	BRM50716	003	01/18/2017	01/18/2018
Signal Generator	Anritsu	MG3694A	42803	01/13/2017	01/13/2018
Signal Generator	Rohde & Schwarz	SMF100A	1167.0000K02	09/06/2016	09/06/2017
Signal Generator	Rohde & Schwarz	SMBV100A	1407.6004K02	09/06/2016	09/06/2017
Power Sensors	Rohde & Schwarz	OSP120	1520.9010.02	09/06/2016	09/06/2017

* Calibration of equipment past due for re-calibration will be performed expeditiously. If any equipment is found to be out of tolerance at that time, affected customers will be notified accordingly.

6 EMC Test Plan

6.1 Introduction

This section provides a description of the Equipment Under Test (EUT), configurations, operating conditions, and performance acceptance criteria. It is an overview of information provided by the manufacturer so that the test laboratory may perform the requested testing.

6.2 Customer

Table 15: Customer Information

Company Name	Voyetra Turtle Beach, Inc.
Address	100 Summit Lake Drive, Suite 100
City, State, Zip	Valhalla, New York 10595 USA
Country	USA
Phone	(530) 277-3482

Table 16: Technical Contact Information

Name	Tim Blaney
E-mail	tim@commcepts.net
Phone	(530) 277-3482

6.3 Equipment Under Test (EUT)

Table 17: EUT Specifications

EUT Specifications	
Dimensions	225mm (8.9”) x 252mm (9.9”) x 115mm (4.5”)
DC Input	Headset Input Voltage: 3.7 Vdc (battery)
Environment	Indoor
Operating Temperature Range:	0 to 50 degrees C
Multiple Feeds:	☐ Yes and how many ☒ No
Product Marketing Name (PMN)	Ear Force Stealth 600X
Hardware Version Identification Number (HVIN)	Stealth 600X
Firmware Version Identification Number (FVIN)	1.0.2
802.11-radio modules	
Operating Mode	802.11a, b, g, 802.11n HT20
Transmitter Frequency Band	2.4 GHz – 2.4835 GHz, 5.15 GHz – 5.25 GHz, 5.25 GHz – 5.35 GHz, 5.47 GHz – 5.7 GHz, and 5.725 GHz – 5.85 GHz
Max. Rated Power Output	8.00 dBm
Power Setting @ Operating Channel	See Channel Planning Table.
Antenna Type	PCB Chip
Max. Peak Antenna Gain	+1.8 dBi at 2.4GHz. +4.9 dBi at 5 GHz
Modulation Type	☐ Thread (Zigbee) ☐ BLE ☒ DSSS ☒ OFDM ☒ Other describe: 16QAM
Data Rate	802.11b: 1, 2, 5.5, and 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n HT20: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps
TX/RX Chain (s)	1
Directional Gain Type	☐ Correlated ☐ Beam-Forming ☒ Other describe: No beam-forming or correlated.
Type of Equipment	☐ Table Top ☐ Wall-mount ☐ Floor standing cabinet ☒ Other: Head wear device.
Note: The radio can only operate in one band and on one channel at a time. This report is for operation in the 5.0 GHz bands only.	

Table 18: Antenna Information

Number	Antenna Type	Description	Max Gain (dBi)
Antenna 1	Chip	Max. peak gain at 2.4 GHz	+1.8
		Max. peak gain at 5 GHz	+4.9

Table 19: EUT Channel Power Specifications

No.	Frequency (MHz)	Target Power Level in ART2					
		802.11b	802.11g	802.11a	802.11n HT20	802.11n HT40	
1	2412	4.5	4.0		4.0		
2	2417						
3	2422						
4	2427						
5	2432						
6	2437	4.5	4.0		4.0		
7	2442						
8	2447						
9	2452						
10	2457						
11	2462	4.5	4.0		4.0		
36	5180			85	86		
40	5200			85	86		
44	5220						
48	5240			84	85		
52	5260			83	79		
56	5280						
60	5300			81	78		
64	5320			76	76		
100	5500			3.5	4.0		
104	5520						
108	5540						
112	5560						
116	5580			4.0	4.0		
120	5600						
124	5620						
128	5640						
132	5660						
136	5680						
140	5700			6.0	6.0		
144	5720						
149	5745			6.0	6.0		
153	5765						
157	5785			7.0	7.0		
161	5805						
165	5825			8.0	8.0		

Note: 2.4GHz, UNII2C, and UNII3 power outputs are set using TX power, and UNII1 and UNII2A power outputs are set using TX Gain in the ART2.

Table 20: Interface Specifications

Interface Type	Cabled with what type of cable?	Is the cable shielded?	Maximum potential length of the cable?	Metallic (M), Coax (C), Fiber (F), or Not Applicable?
USB	Laptop	☒ Yes	☒ Metric:3m	☒ M

Table 21: Supported Equipment

Equipment	Manufacturer	Model	Serial	Used for
Laptop	Dell	Latitude	35521341769	Setup EUT operating channel
Note: None.				

Table 22: Description of Sample used for Testing

Device	Serial	RF Connection	CFR47 Part 15.407
Ear Force Stealth 600X	PP#2	Radiated Sample	TX Emissions, AC Conducted Emission
	PP#1	Conducted Sample	Output Power, Power Spectral Density, Occupied Bandwidth Band-Edge Out-of-Band Emission Frequency Stability Voltage Variation
Note: N/A			

Table 23: Description of Test Configuration used for Radiated Measurement.

Device	Antenna	Mode	Setup Photo (X-Axis)	Setup Photo (Y-Axis)	Setup Photo (Z-Axis)
Ear Force Stealth 600X	Chip (FR05-S1-NO-1-004)	Transmit	EUT laid flat	Normal usage. Up right.	On the side
Note: The Y-Axis setup configuration used for final testing.					

6.4 Test Specifications

Testing requirements

Table 24: Test Specifications

Emissions and Immunity	
Standard	**Requirement**
CFR 47 Part 15.407: 2017	All
RSS 247 Issue 2, 2017	All

END OF REPORT