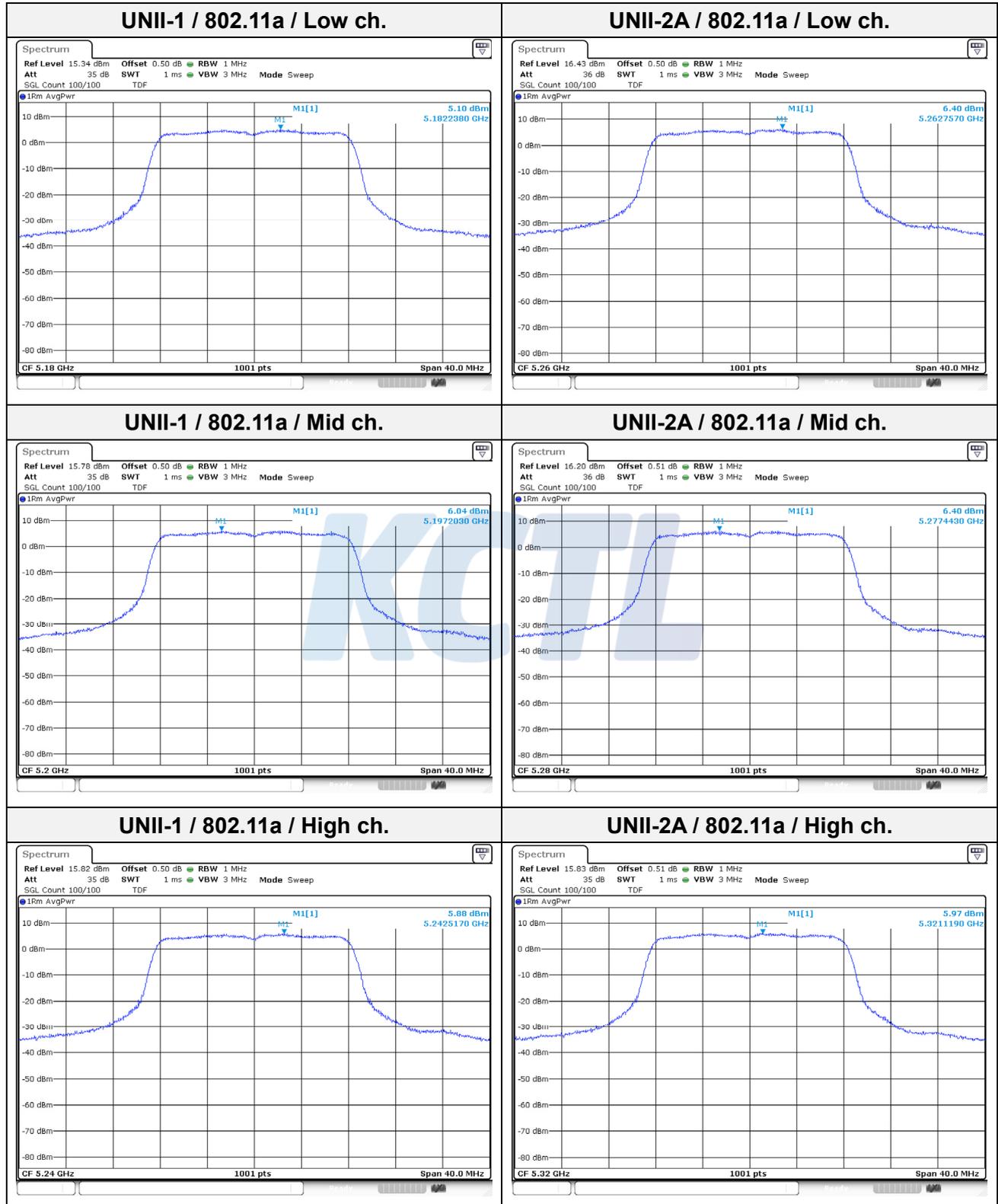


MIMO ANT 2

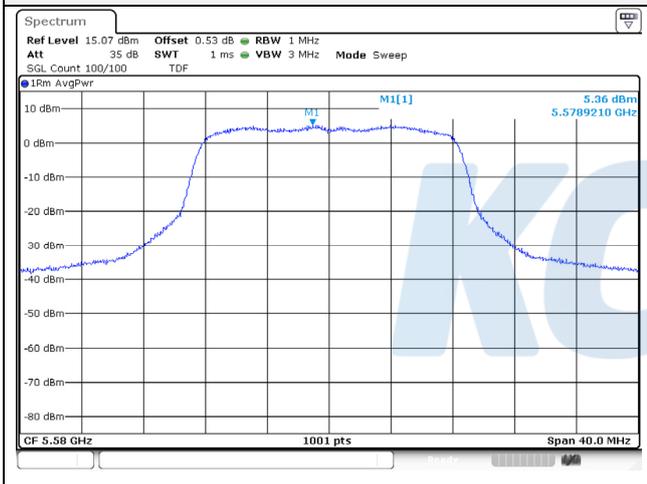
UNII-2C / 802.11a / Low ch.



UNII-3 / 802.11a / Low ch.



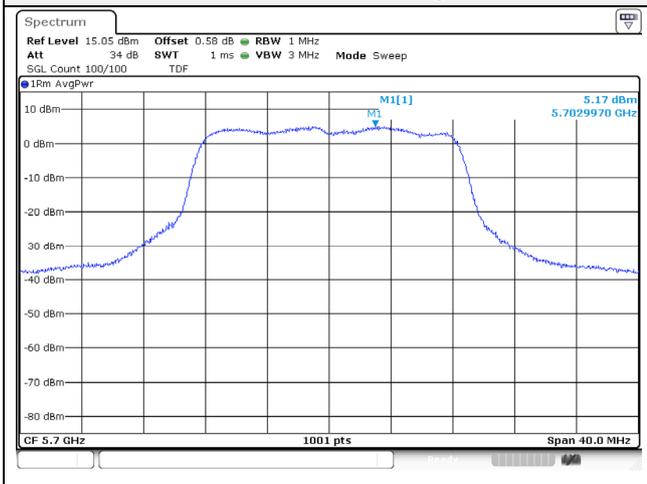
UNII-2C / 802.11a / Mid ch.



UNII-3 / 802.11a / Mid ch.



UNII-2C / 802.11a / High ch.



UNII-3 / 802.11a / High ch.



UNII-1 / 802.11n HT40 / Low ch.



UNII-2A / 802.11n HT40 / Low ch.



UNII-1 / 802.11n HT40 / High ch.



UNII-2A / 802.11n HT40 / High ch.



UNII-2C / 802.11n HT40 / Low ch.



UNII-3 / 802.11n HT40 / Low ch.



UNII-2C / 802.11n HT40 / Mid ch.



UNII-3 / 802.11n HT40 / High ch.



UNII-2C / 802.11n HT40 / High ch.



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UNII-1 / 802.11ac VHT80 / Low ch.



UNII-2A / 802.11ac VHT80 / Low ch.



UNII-2C / 802.11ac VHT80 / Low ch.



UNII-2C / 802.11ac VHT80 / High ch.



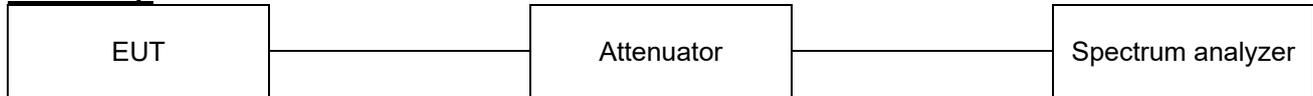
UNII-3 / 802.11ac VHT80 / Low ch.



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7.3. 26 dB Bandwidth & 99% Bandwidth

Test setup



Limit

N/A

Test procedure

ANSI C63.10-2013 Section 12.4

KDB 789033 D02 v02r01 - Section C.1 (26dBbandwidth)

KDB 789033 D02 v02r01 - Section D (99% bandwidth)

Test settings

1. 26 dB Bandwidth

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. 99% Occupied Bandwidth

- Set center frequency to the nominal EUT channel center frequency.
- Set span = 1.5 times to 5.0 times the OBW.
- Set RBW = 1% to 5% of the OBW
- Set VBW $\geq 3 \times$ RBW
- Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- Use the 99% power bandwidth function of the instrument (if available).
- If the instrument does not have a 99% power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

Test results**26 dB bandwidth**

Test mode	Band	Frequency(MHz)	Measured Bandwidth (MHz)	
			ANT1	ANT2
802.11a	UNII-1	5 180	19.08	19.28
		5 200	19.33	19.18
		5 240	19.08	19.13
	UNII-2A	5 260	19.18	18.93
		5 280	19.68	19.03
		5 320	19.48	19.28
	UNII-2C	5 500	19.28	19.73
		5 600	19.03	18.98
		5 700	18.73	19.28
802.11n HT20	UNII-1	5 180	20.38	20.38
		5 200	20.38	20.33
		5 240	20.23	20.23
	UNII-2A	5 260	20.13	19.93
		5 280	19.98	20.18
		5 320	20.18	20.38
	UNII-2C	5 500	20.13	19.78
		5 600	20.18	20.68
		5 700	20.83	20.03
802.11n HT40	UNII-1	5 190	40.16	40.26
		5 230	39.96	40.06
	UNII-2A	5 270	40.06	39.76
		5 310	40.16	39.86
	UNII-2C	5 510	40.06	39.86
		5 590	40.06	39.86
		5 670	40.46	40.06

Test mode	Band	Frequency(MHz)	Measured Bandwidth (MHz)	
			ANT1	ANT2
802.11ac VHT20	UNII-1	5 180	20.38	20.23
		5 200	19.88	20.18
		5 240	20.43	19.83
	UNII-2A	5 260	19.98	20.38
		5 280	20.08	20.28
		5 320	20.18	19.88
	UNII-2C	5 500	20.58	20.38
		5 600	20.68	20.48
		5 700	20.48	19.78
802.11ac VHT40	UNII-1	5 190	39.56	40.16
		5 230	40.06	40.16
	UNII-2A	5 270	40.16	39.86
		5 310	40.26	40.36
	UNII-2C	5 510	40.36	40.26
		5 590	39.96	39.96
802.11ac VHT80	UNII-1	5 210	82.12	82.24
	UNII-2A	5 290	82.24	82.24
		5 530	82.24	82.00
	UNII-2C	5 610	82.36	82.24

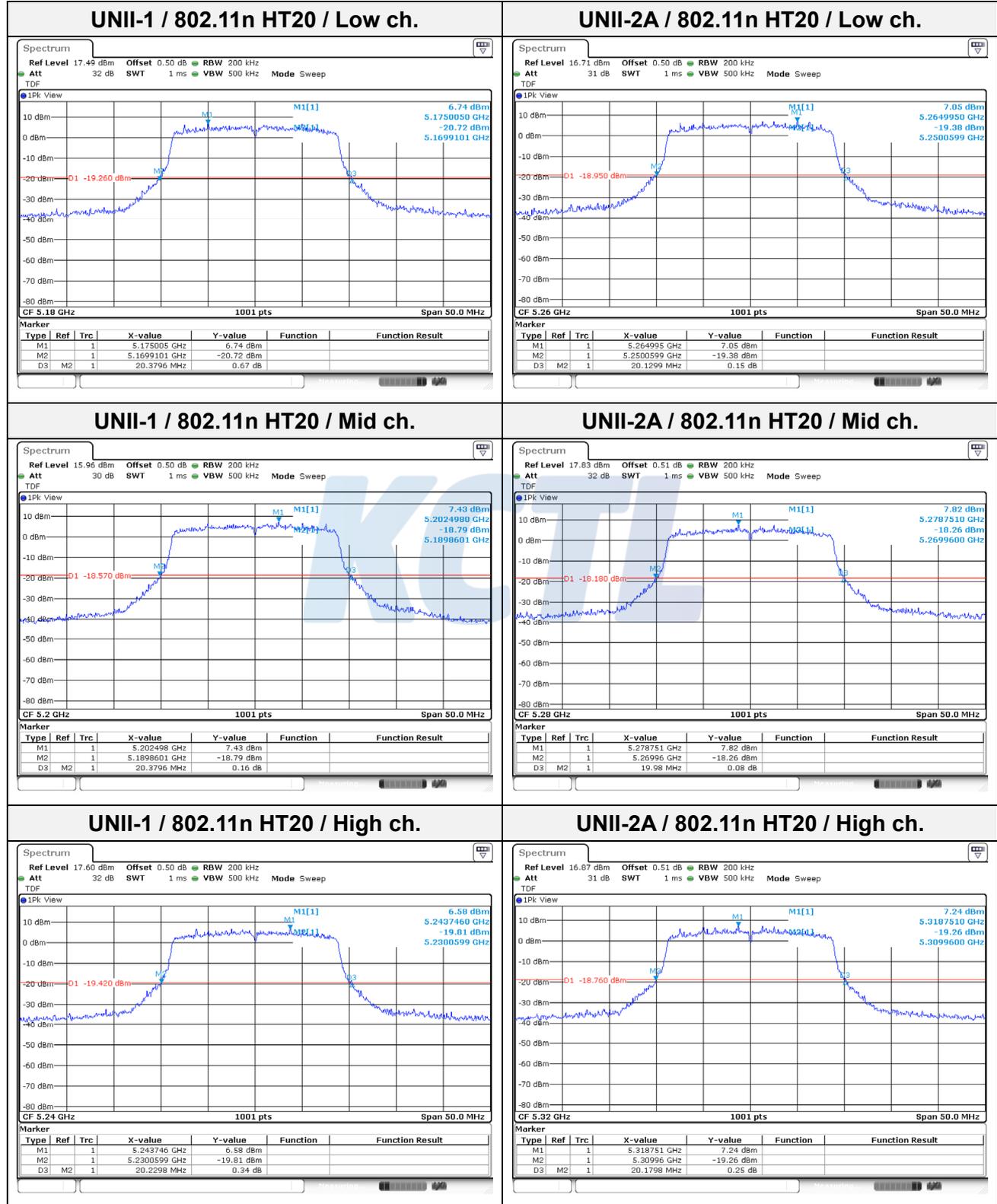
99% bandwidth

Test mode	Band	Frequency(MHz)	Measured Bandwidth (MHz)	
			ANT1	ANT2
802.11a	UNII-1	5 240	16.38	16.33
	UNII-2A	5 260	16.38	16.33
802.11n HT20	UNII-1	5 240	17.53	17.53
	UNII-2A	5 260	17.53	17.53
802.11n HT40	UNII-1	5 230	36.06	36.06
	UNII-2A	5 270	36.06	35.96
802.11ac VHT20	UNII-1	5 240	17.53	17.53
	UNII-2A	5 260	17.53	17.53
802.11ac VHT40	UNII-1	5 230	36.06	36.06
	UNII-2A	5 270	36.06	36.06
802.11ac VHT80	UNII-1	5 210	75.28	75.28
	UNII-2A	5 290	75.28	75.28

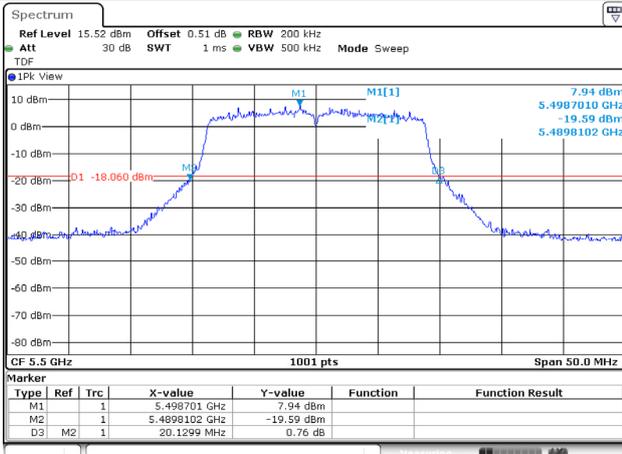
KCTL

In order to simplify the report, attached plots were only ANT 1
26 dB bandwidth

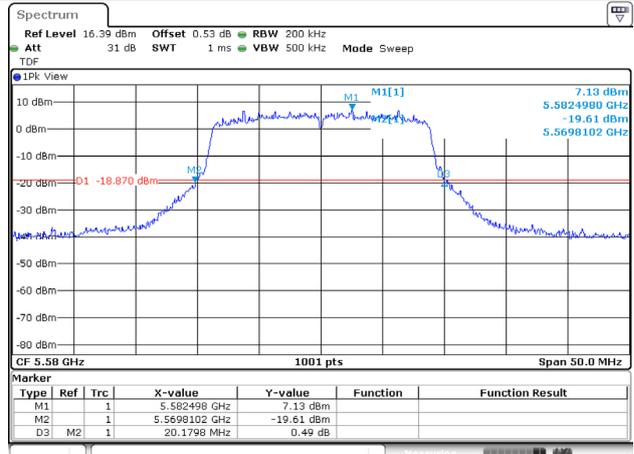
ANT 1



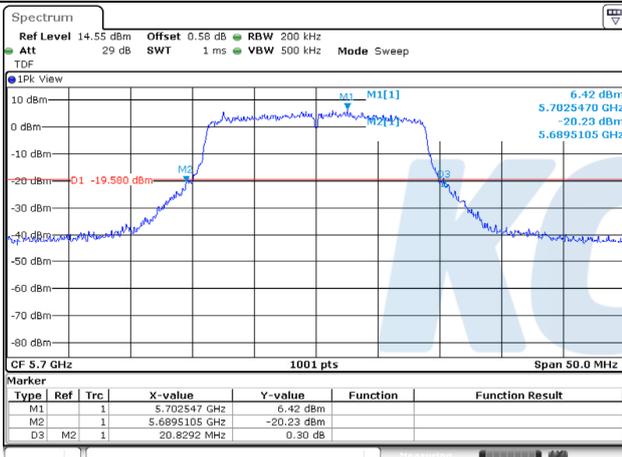
UNII-2C / 802.11n HT20 / Low ch.



UNII-2C / 802.11n HT20 / Mid ch.

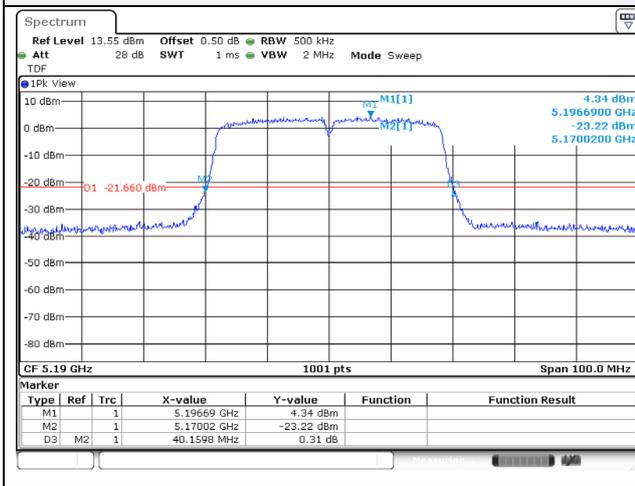


UNII-2C / 802.11n HT20 / High ch.

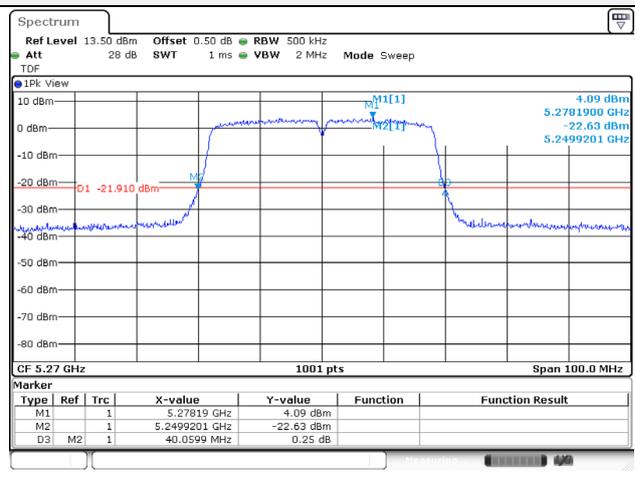


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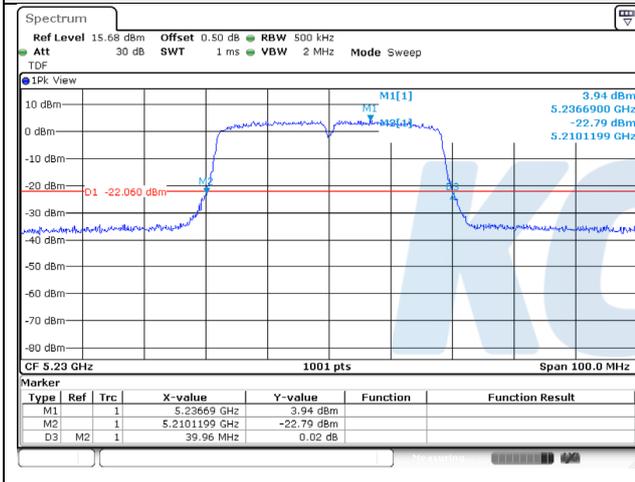
UNII-1 / 802.11n HT40 / Low ch.



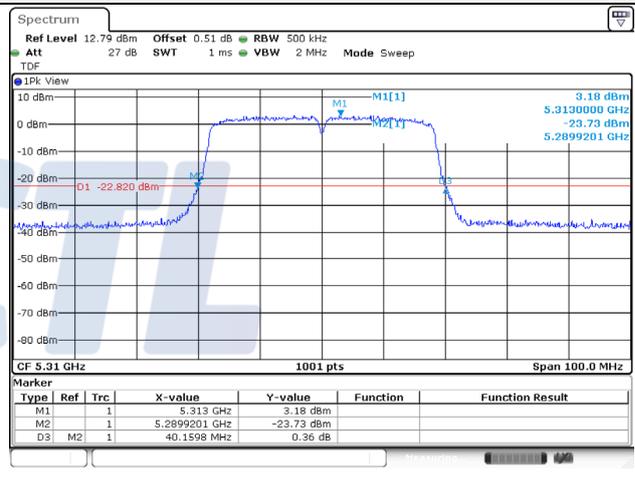
UNII-2A / 802.11n HT40 / Low ch.



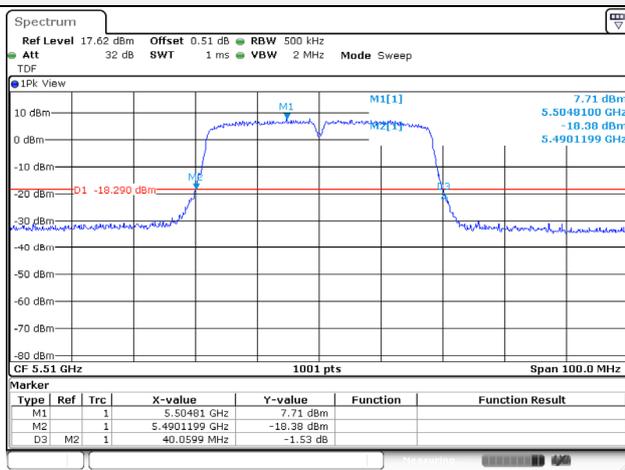
UNII-1 / 802.11n HT40 / High ch.



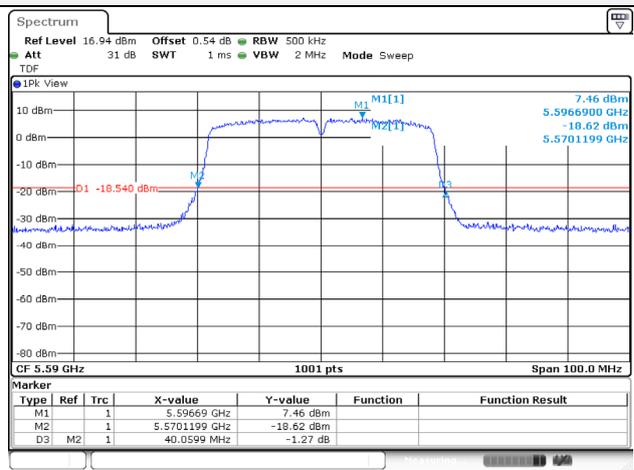
UNII-2A / 802.11n HT40 / High ch.



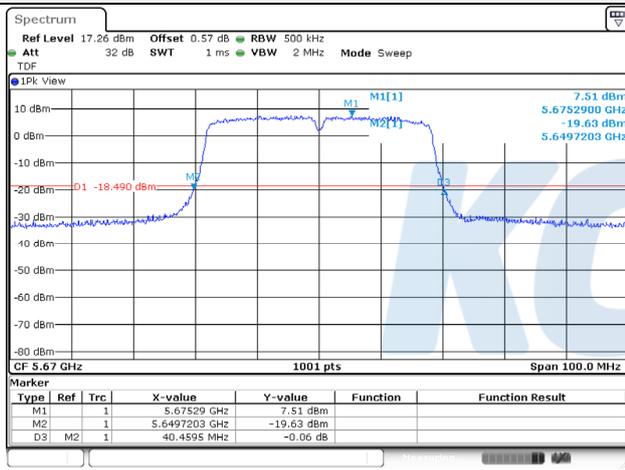
UNII-2C / 802.11n HT40 / Low ch.



UNII-2C / 802.11n HT40 / Mid ch.

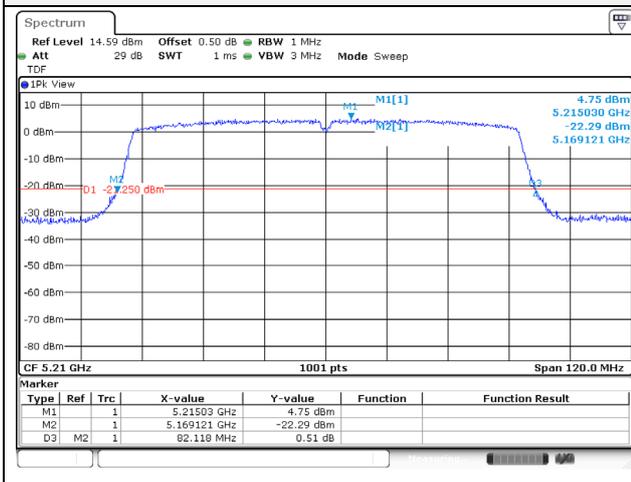


UNII-2C / 802.11n HT40 / High ch.

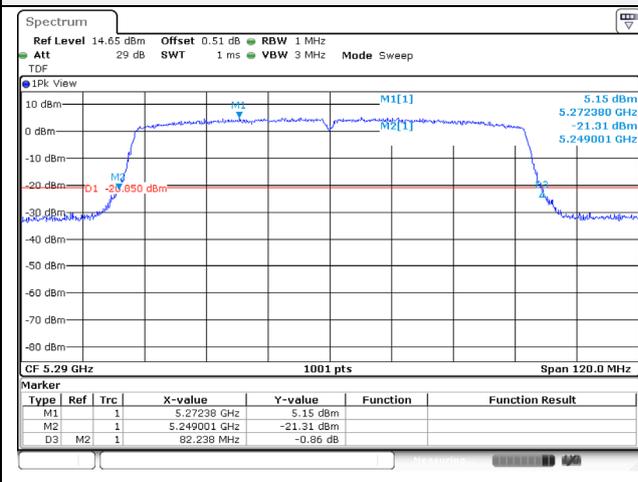


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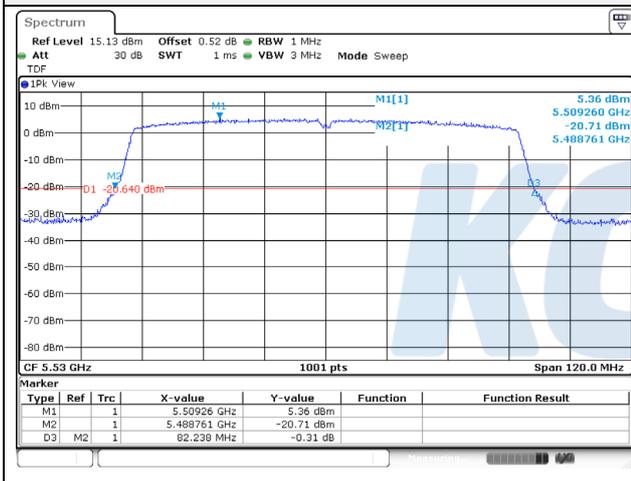
UNII-1 / 802.11ac VHT80 / Low ch.



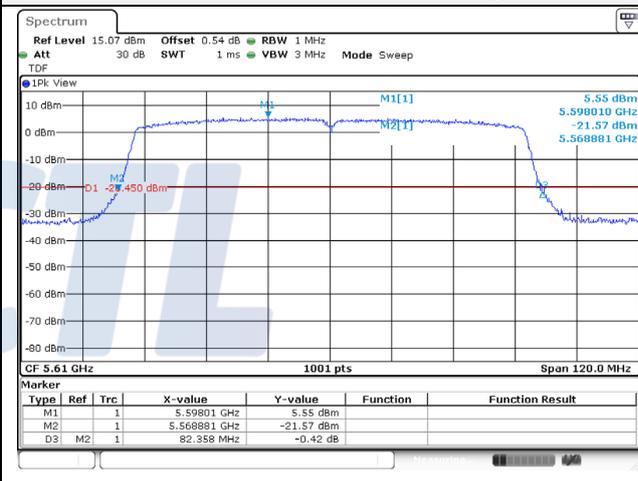
UNII-2A / 802.11ac VHT80 / Low ch.



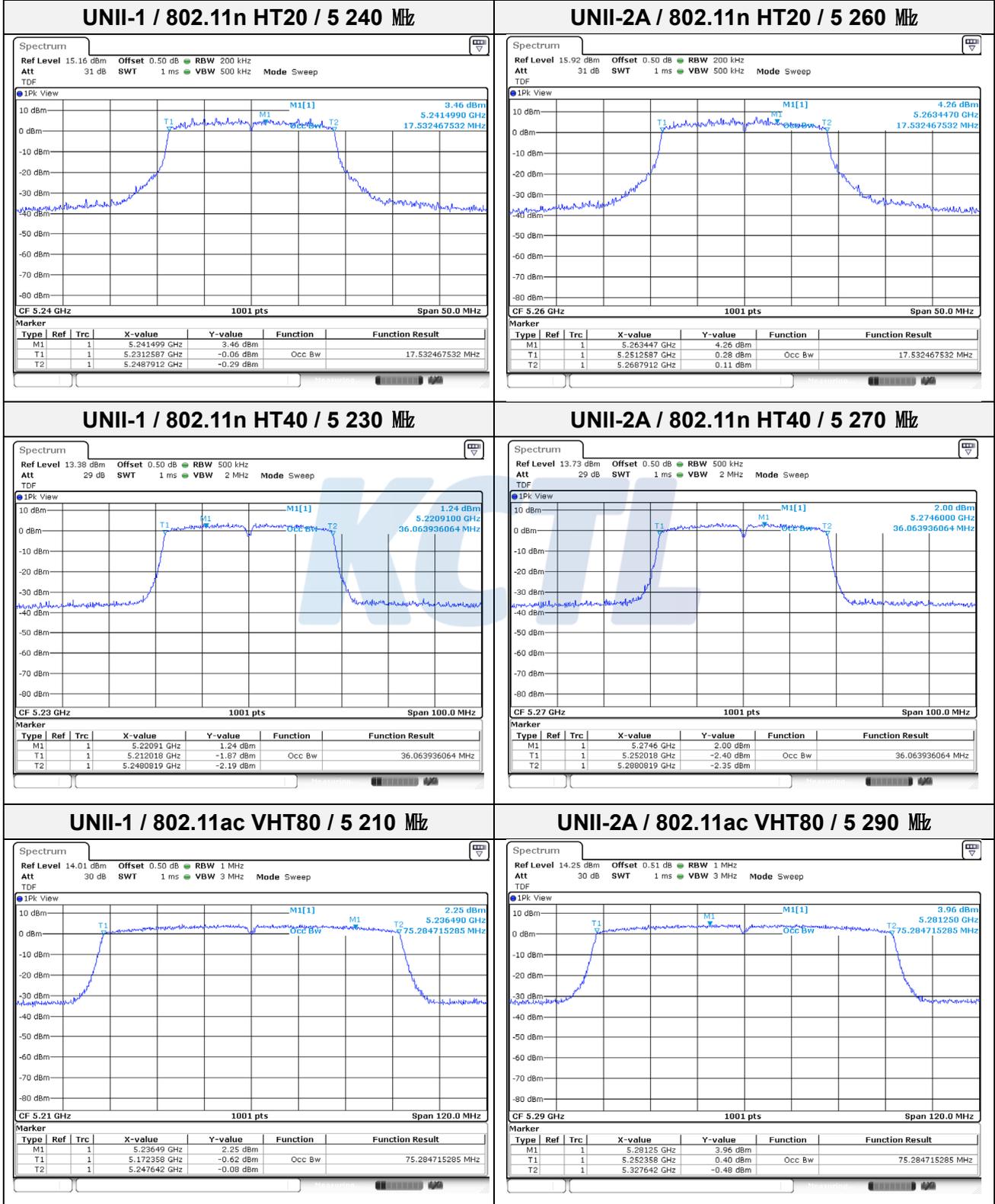
UNII-2C / 802.11ac VHT80 / Low ch.



UNII-2C / 802.11ac VHT80 / High ch.

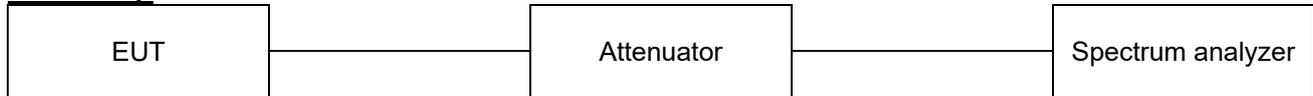


In order to simplify the report, attached plots were only ANT 1
99% bandwidth
ANT 1



7.4. 6 dB Bandwidth

Test setup



Limit

According to §15.407(e), RSS-247(6.2.4)

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth if U-NII devices shall be at least 500kHz

Test procedure

ANSI C63.10-2013 Section 6.9.2

KDB 789033 D02 v02r01 - Section C.2

Test settings

Minimum Emission Bandwidth for the band 5.725–5.85 GHz

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

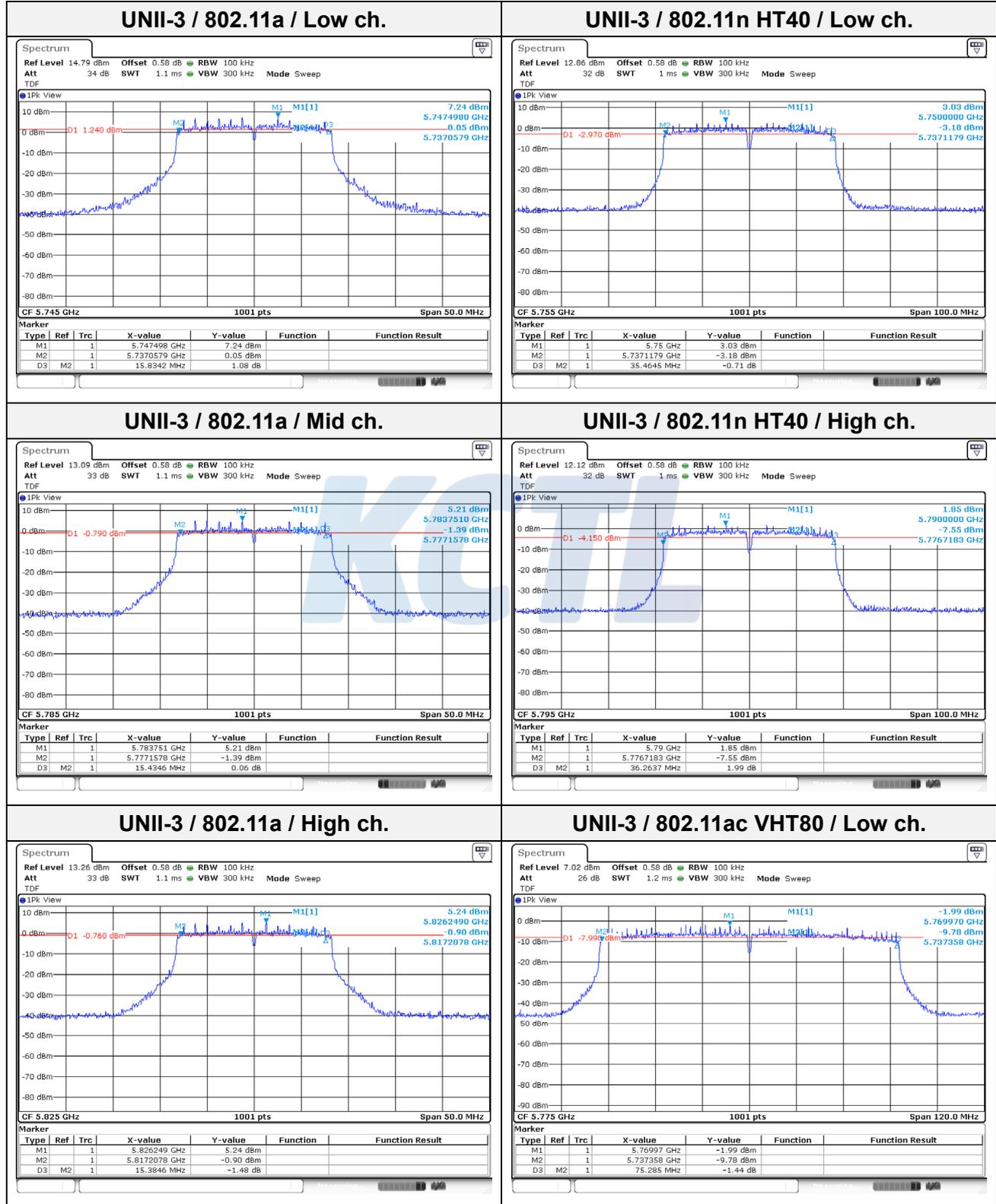
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points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

Test results

Test mode	Band	Frequency (MHz)	Measured Bandwidth (MHz)		Limit (MHz)
			ANT1	ANT2	
802.11a	UNII-3	5 745	15.83	16.33	0.50
		5 785	15.43	15.78	0.50
		5 825	15.38	15.43	0.50
802.11n HT20	UNII-3	5 745	16.33	16.38	0.50
		5 785	16.63	16.38	0.50
		5 825	16.63	16.63	0.50
802.11n HT40	UNII-3	5 755	35.46	35.76	0.50
		5 795	36.26	35.56	0.50
802.11ac VHT20	UNII-3	5 745	15.73	16.58	0.50
		5 785	16.63	15.38	0.50
		5 825	16.88	16.63	0.50
802.11ac VHT40	UNII-3	5 755	35.56	35.86	0.50
		5 795	35.56	35.66	0.50
802.11ac VHT80	UNII-3	5 775	75.28	75.28	0.50

In order to simplify the report, attached plots were only ANT 1
6 dB bandwidth

ANT1



7.5. Straddle channel**26dB bandwidth**

Test mode	Band	Frequency (MHz)	26dB Bandwidth (MHz)	
			ANT1	ANT2
802.11a	UNII-2C	5 720	14.49	14.34
802.11n HT20			15.14	15.04
802.11ac VHT20			15.09	14.89
802.11a	UNII-3	5 720	4.64	4.39
802.11n HT20			5.14	5.04
802.11ac VHT20			4.89	4.89
802.11n HT40	UNII-2C	5 710	35.18	34.98
802.11ac VHT40			35.28	35.08
802.11n HT40	UNII-3	5 710	5.08	5.18
802.11ac VHT40			4.98	4.98
802.11ac VHT80	UNII-2C	5 690	76.36	76.36
	UNII-3	5 690	6.00	6.36

Notes:

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