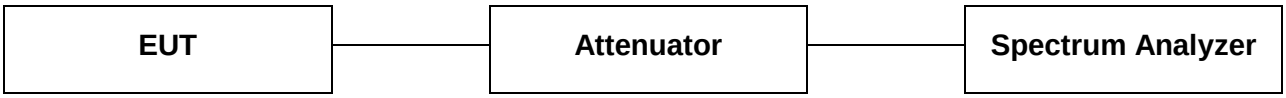
3. 26 ㏈ Bandwidth & 99 % Bandwidth

3.1. Test Setup



3.2. Limit

None; for reporting purpose only.

3.3. Test Procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

3.3.1. 26 ㏈ Bandwidth

1. This measurement settings are specified in section C.1 of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW = approximately 1 % of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 ㏈ down from the peak 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 %.

Remark;

In case of band crossing channels 138, 142 and 144, the measurement is complied with section Ⅲ.A of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

3.2.2. 99 % Bandwidth

1. This measurement settings are specified in section D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set center frequency to the nominal EUT channel center frequency.
3. Set span = 1.5 times to 5.0 times the OBW.
4. Set RBW = 1 % to 5 % of the OBW.
5. Set VBW ≥ 3 x RBW.
6. 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.
7. Use the 99 % power bandwidth function of the instrument (if available).
8. 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.

In the result,
- DFS requirements are not applicable in the 5 150 ㎒ ~ 5 250 ㎒.

3.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

Test mode: 11a

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 180	36	6	20.955	-
	5 220	44		21.129	-
	5 240	48		21.129	17.019
U-NII 2A	5 260	52		21.071	-
	5 300	60		21.187	-
	5 320	64		20.955	-
U-NII 2C	5 500	100		20.955	-
	5 580	116		20.897	-
	5 720	144		21.187	-
U-NII 3	5 745	149		21.129	-
	5 785	157		21.129	-
	5 825	165		20.955	-

Test mode: 11ac_VHT20

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 180	36	MCS6	21.360	-
	5 220	44		21.418	-
	5 240	48		21.129	17.945
U-NII 2A	5 260	52		21.303	-
	5 300	60		21.476	-
	5 320	64		21.360	-
U-NII 2C	5 500	100		21.476	-
	5 580	116		21.360	-
	5 720	144		21.360	-
U-NII 3	5 745	149		21.360	-
	5 785	157		21.245	-
	5 825	165		21.418	-

Test mode: 11ac_VHT40

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 190	38	MCS5	39.595	-
	5 230	46		39.479	36.237
U-NII 2A	5 270	54		39.826	-
	5 310	62		39.711	-
U-NII 2C	5 510	102		39.711	-
	5 550	110		39.942	-
	5 710	142		39.826	-
U-NII 3	5 755	151		39.595	-
	5 795	159		39.711	-

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 210	42	MCS7	82.894	75.948
U-NII 2A	5 290	58		82.894	-
U-NII 2C	5 530	106		82.894	-
	5 690	138		82.894	-
U-NII 3	5 775	155		82.663	-

Band-crossing channel

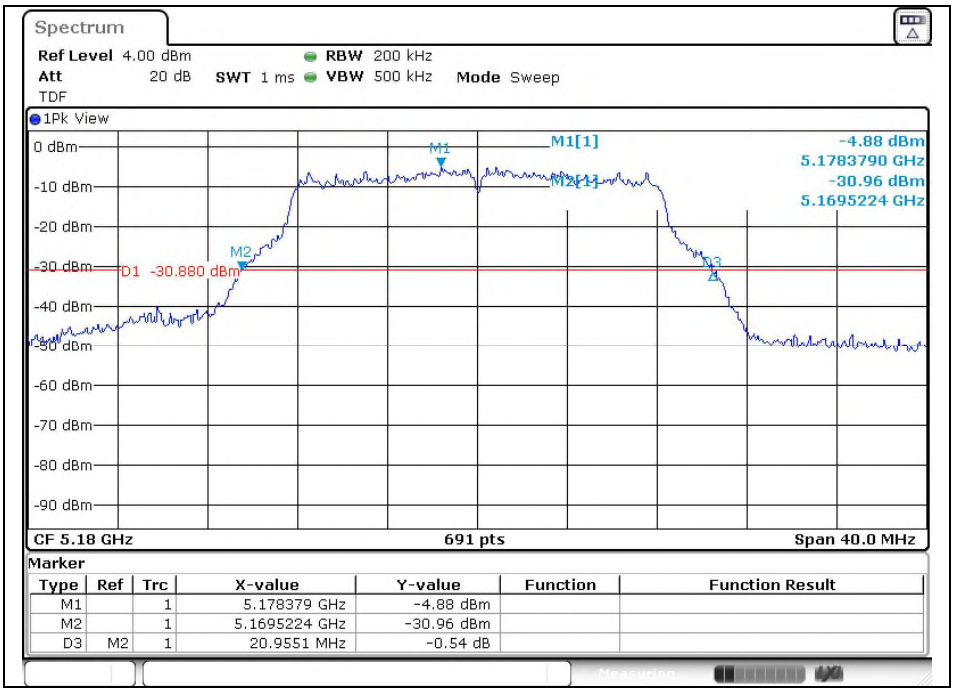
Mode	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)
11a	5 720	144	6	15.536
11ac_VHT20	5 720	144	MCS6	15.651
11ac_VHT40	5 710	142	MCS5	34.797
11ac_VHT80	5 690	138	MCS7	75.984

- Test plots

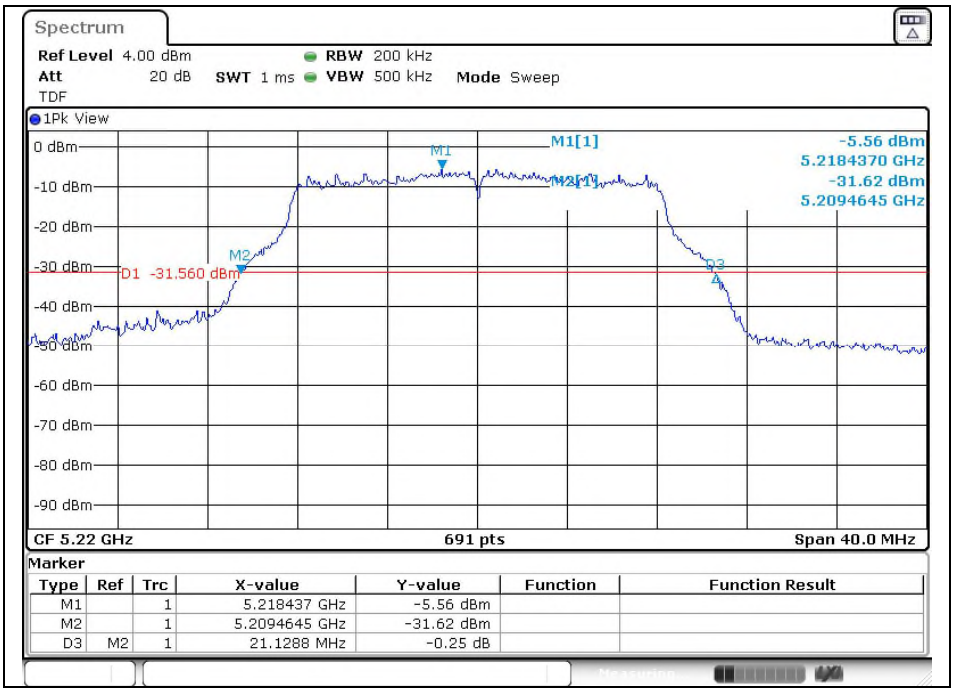
26 dB Bandwidth

802.11a (Band 1)

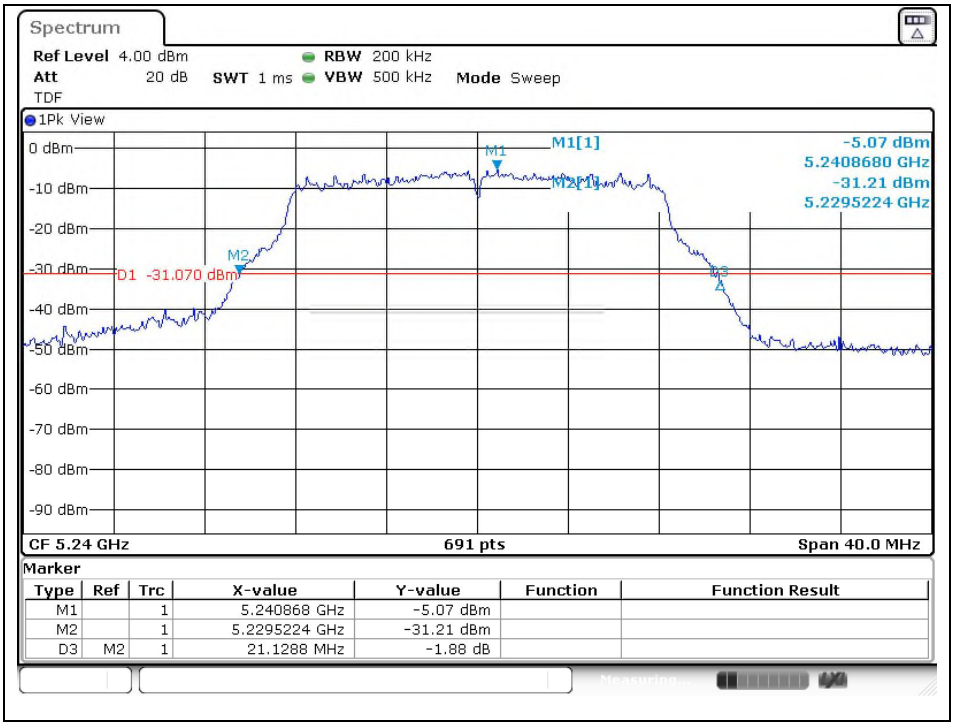
Low Channel (5 180 ㎒)



Middle Channel (5 220 ㎒)

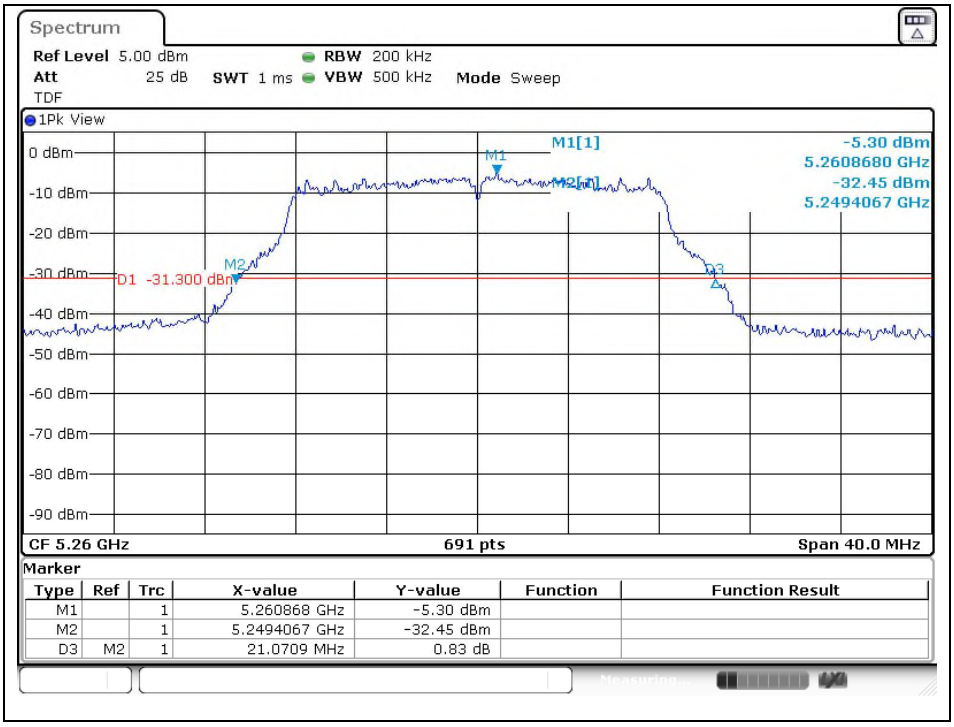


High Channel (5 240 ㎒)

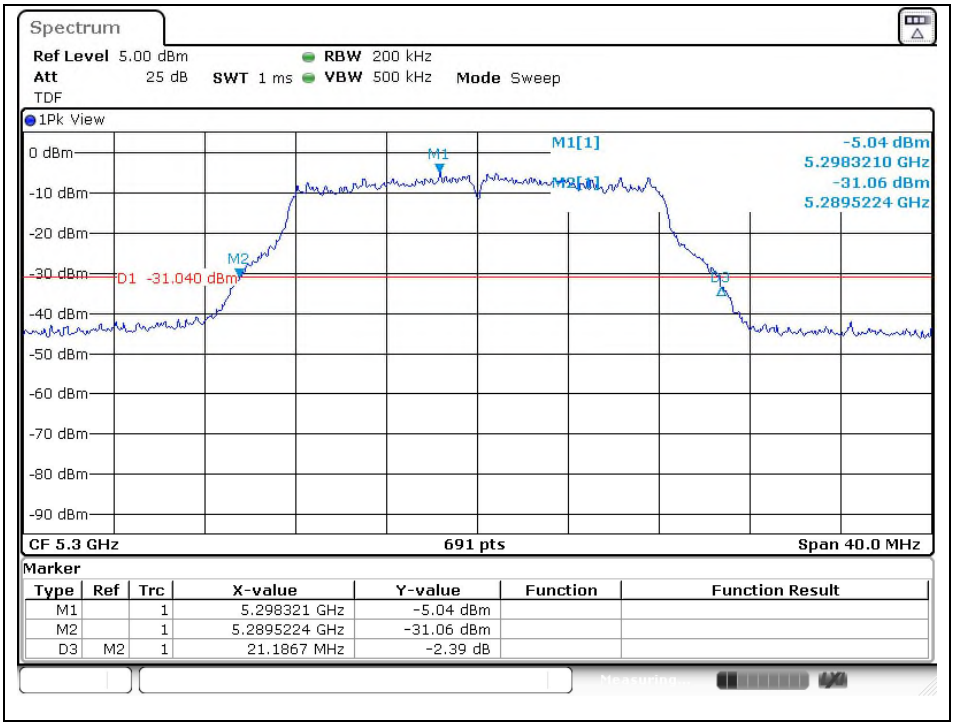


802.11a (Band 2A)

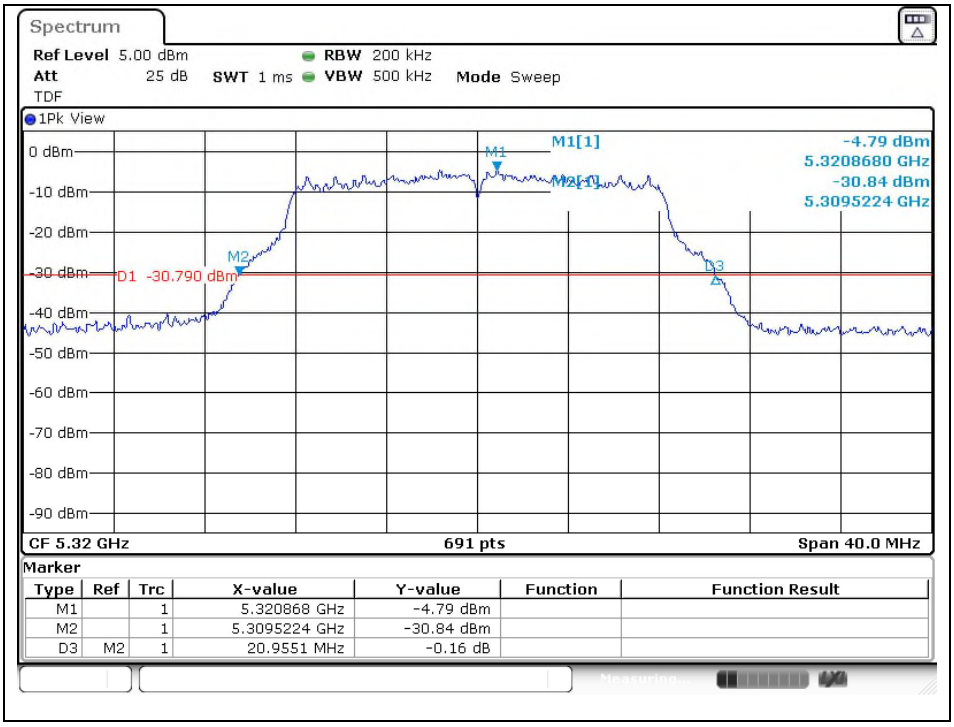
Low Channel (5 260 ㎒)



Middle Channel (5 300 ㎒)

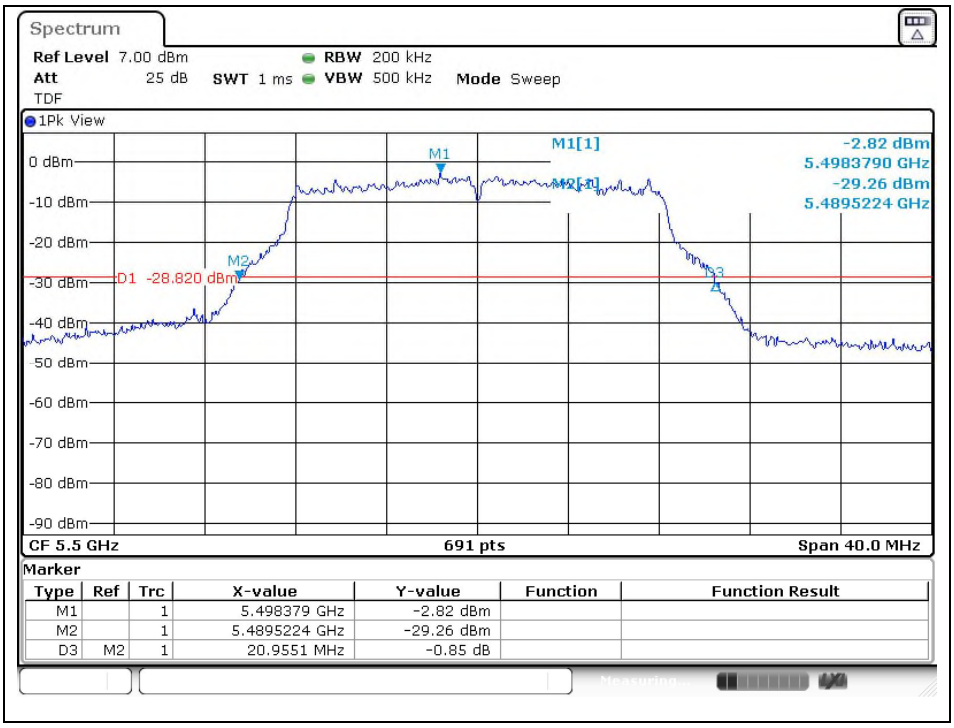


High Channel (5 320 ㎒)

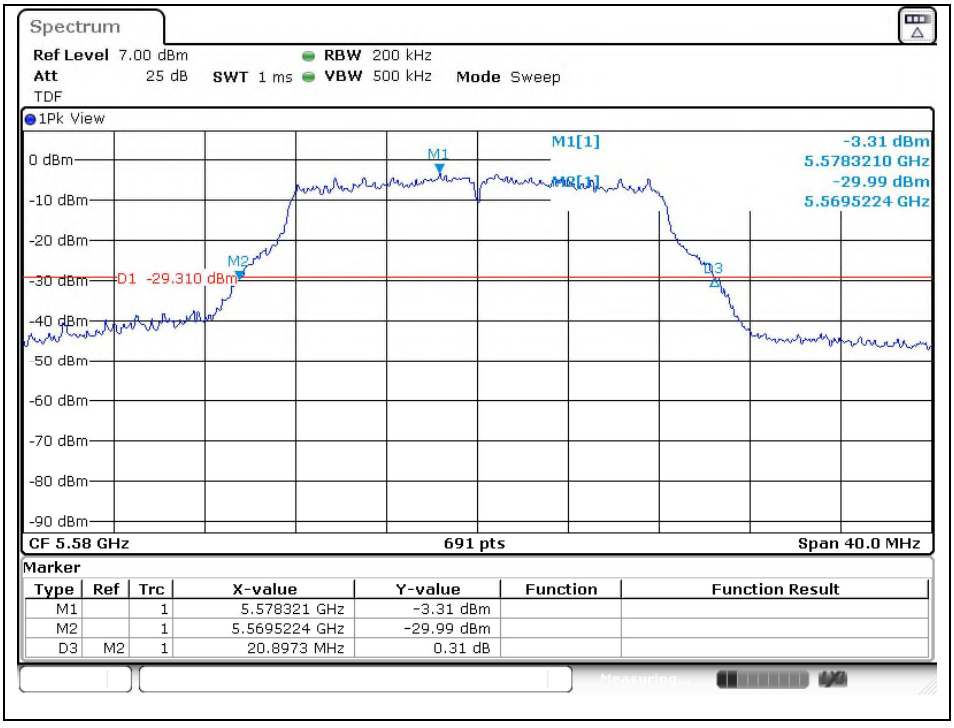


802.11a (Band 2C)

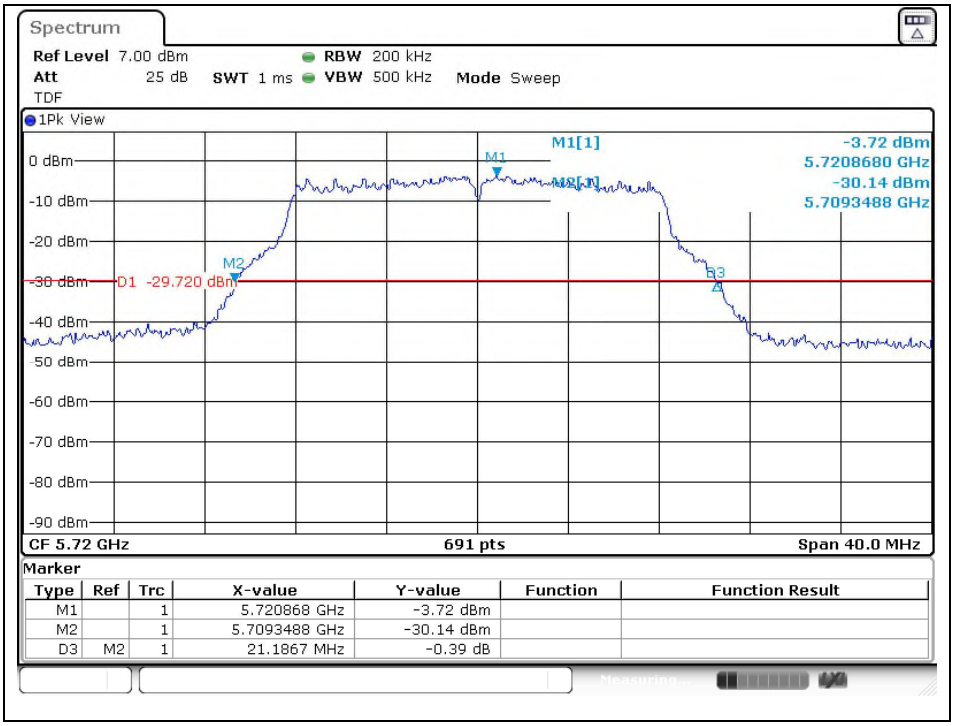
Low Channel (5 500 ㎒)



Middle Channel (5 580 ㎒)

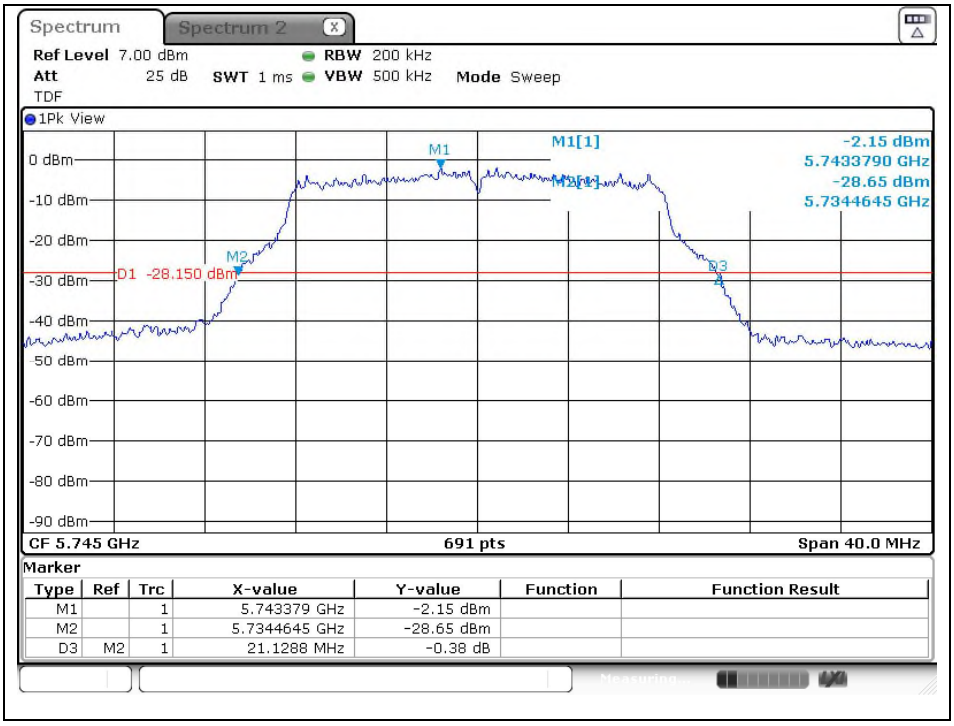


High Channel (5 720 ㎒)

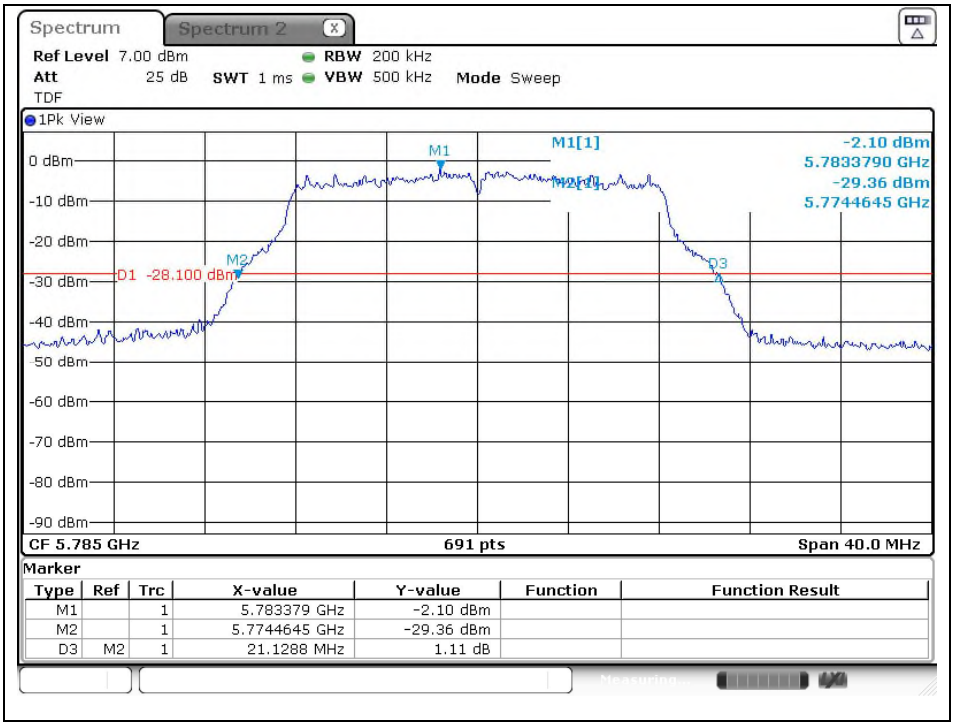


802.11a (Band 3)

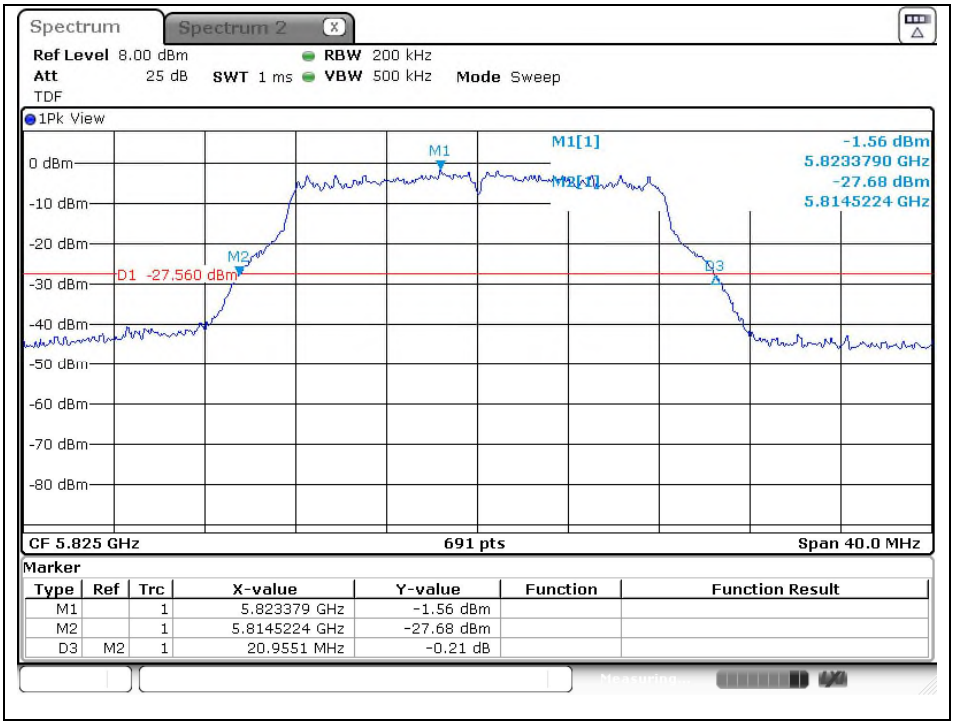
Low Channel (5 745 ㎒)



Middle Channel (5 785 ㎒)

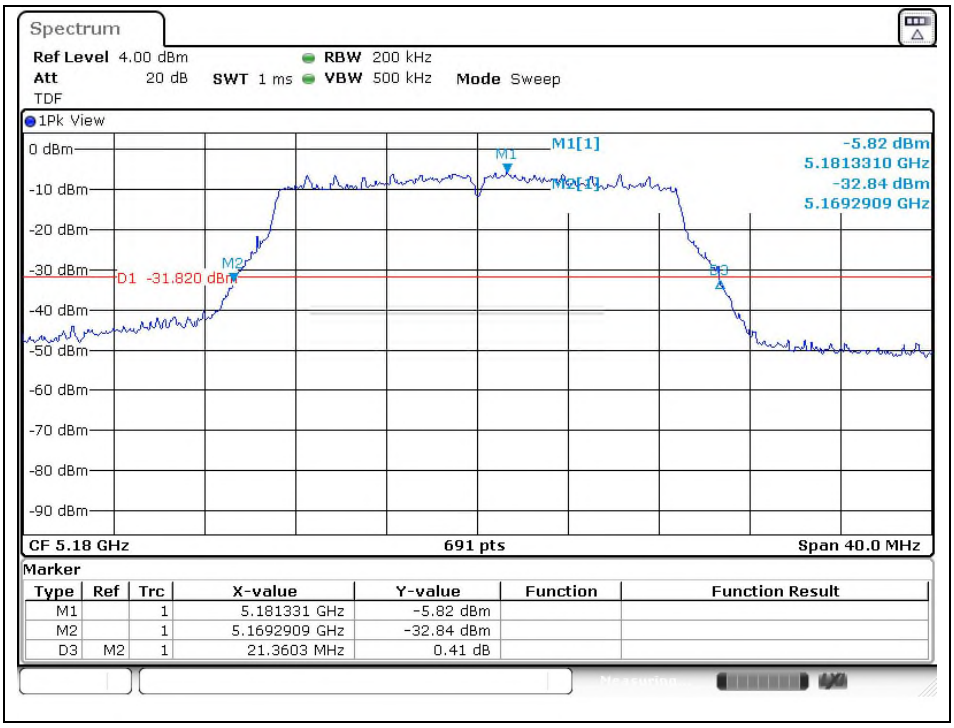


High Channel (5 825 ㎒)

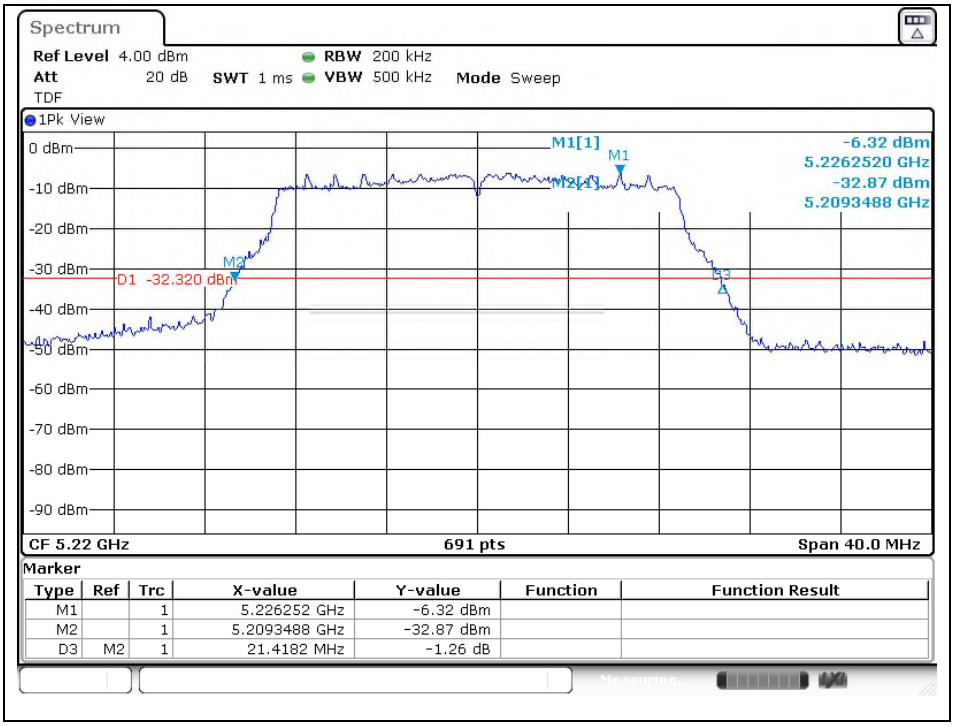


802.11ac_VHT20 (Band 1)

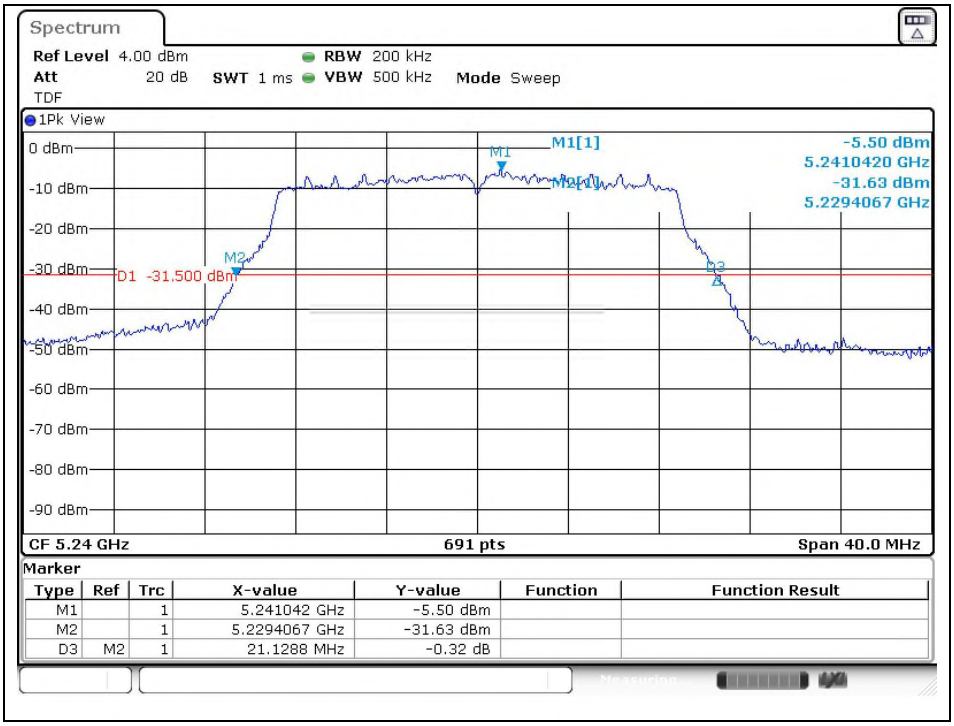
Low Channel (5 180 ㎒)



Middle Channel (5 220 ㎒)

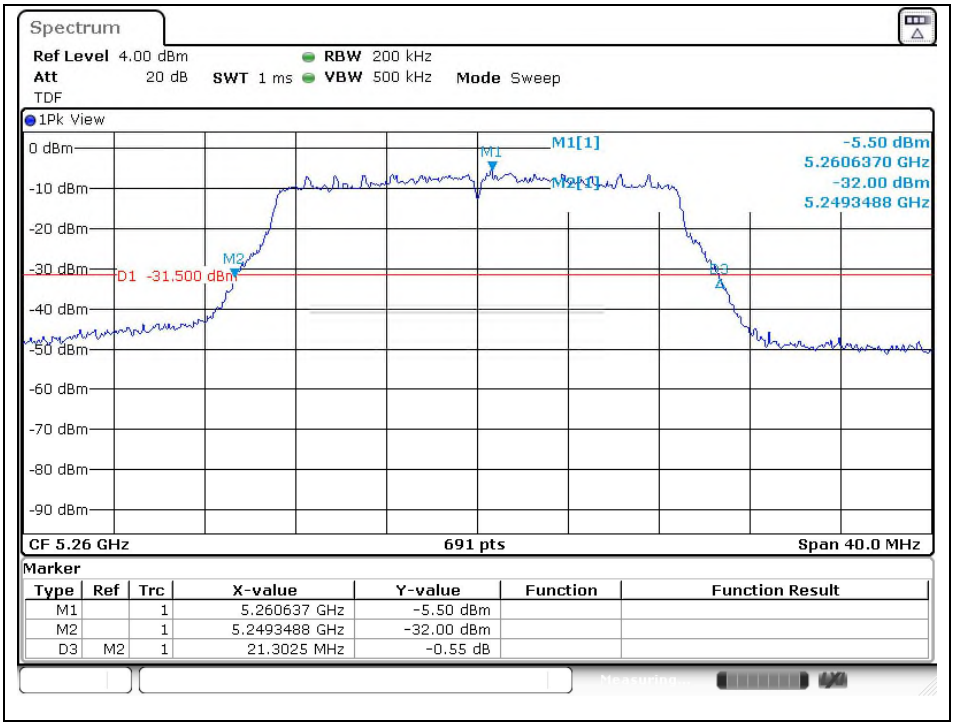


High Channel (5 240 ㎒)

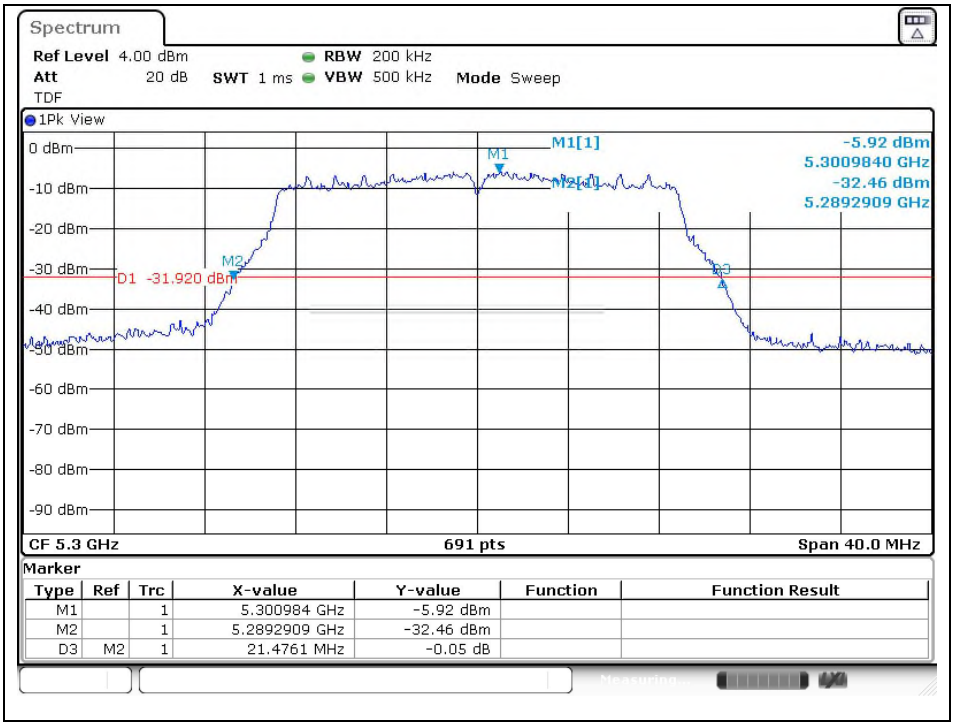


802.11ac_VHT20 (Band 2A)

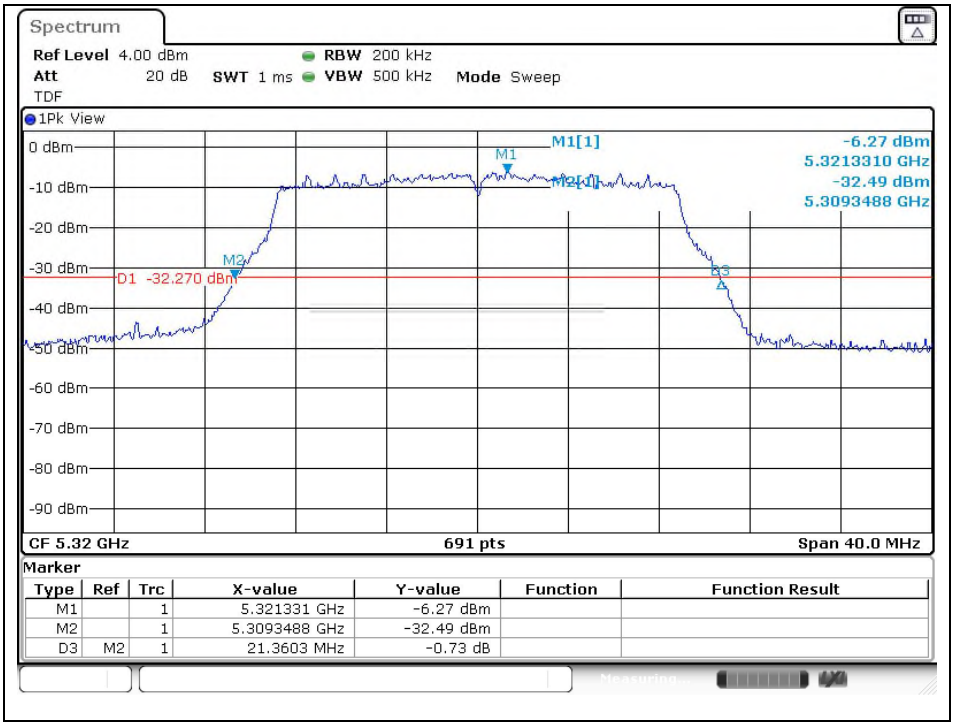
Low Channel (5 260 ㎒)



Middle Channel (5 300 ㎒)

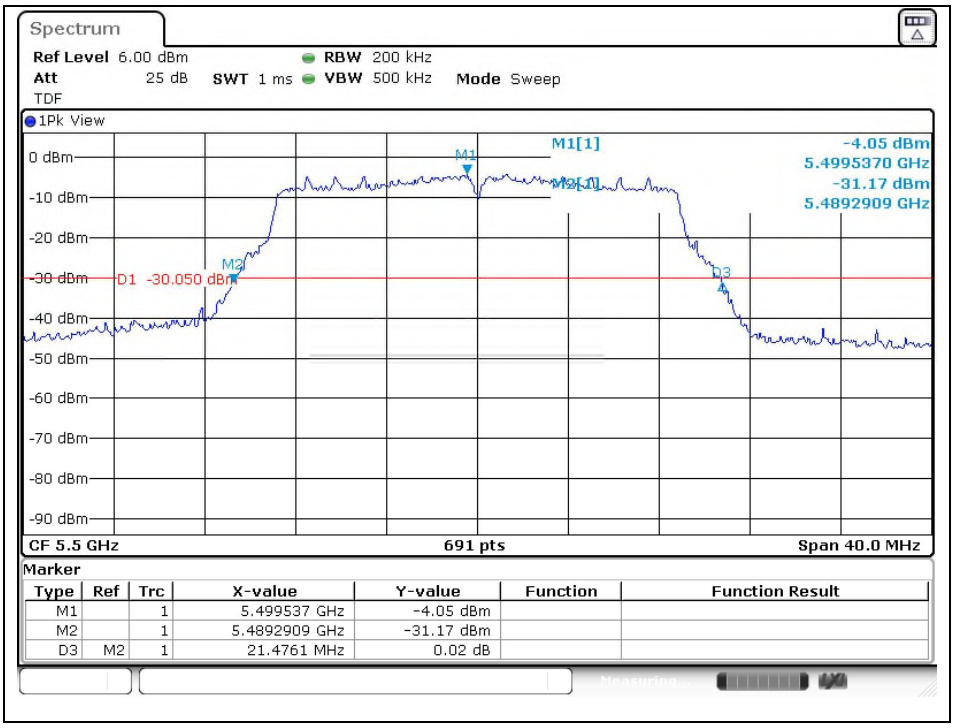


High Channel (5 320 ㎒)

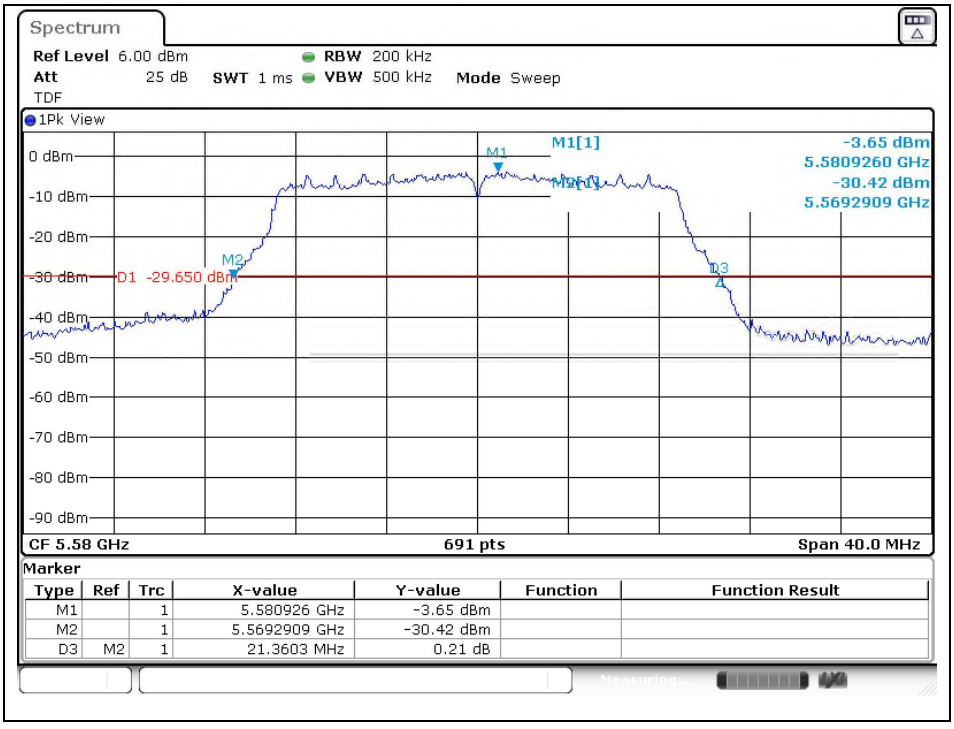


802.11ac_VHT20 (Band 2C)

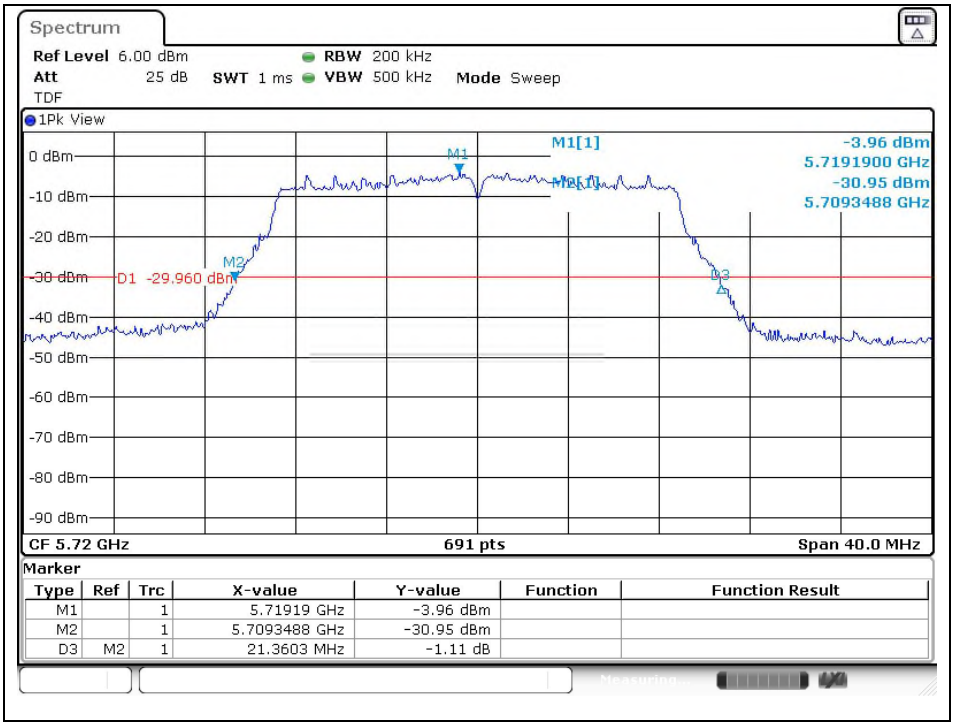
Low Channel (5 500 ㎒)



Middle Channel (5 580 ㎒)

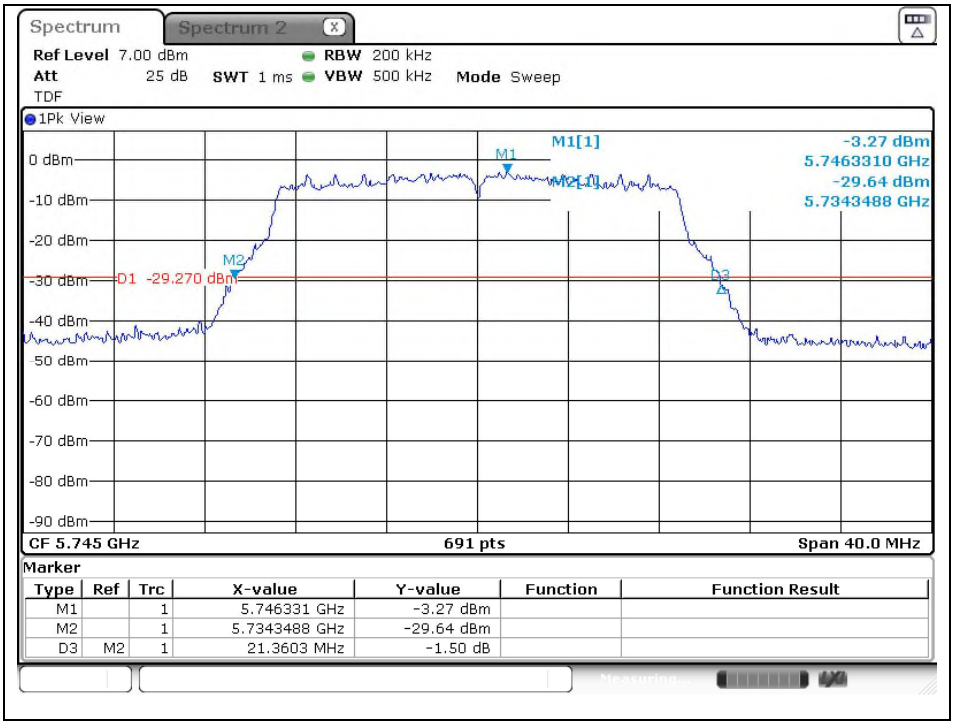


High Channel (5 720 ㎒)

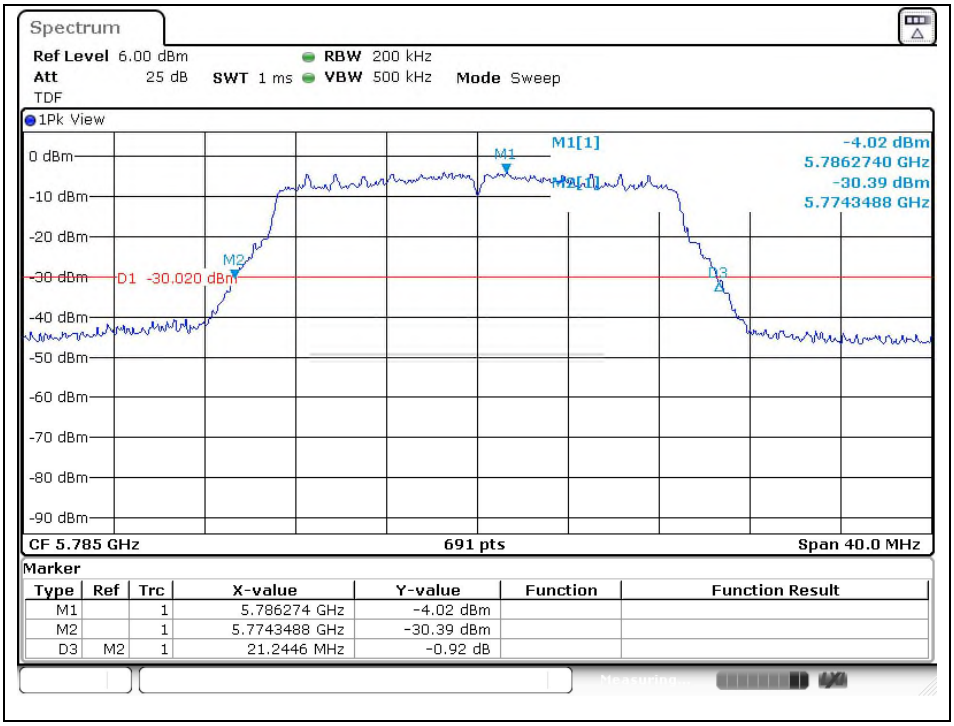


802.11ac_VHT20 (Band 3)

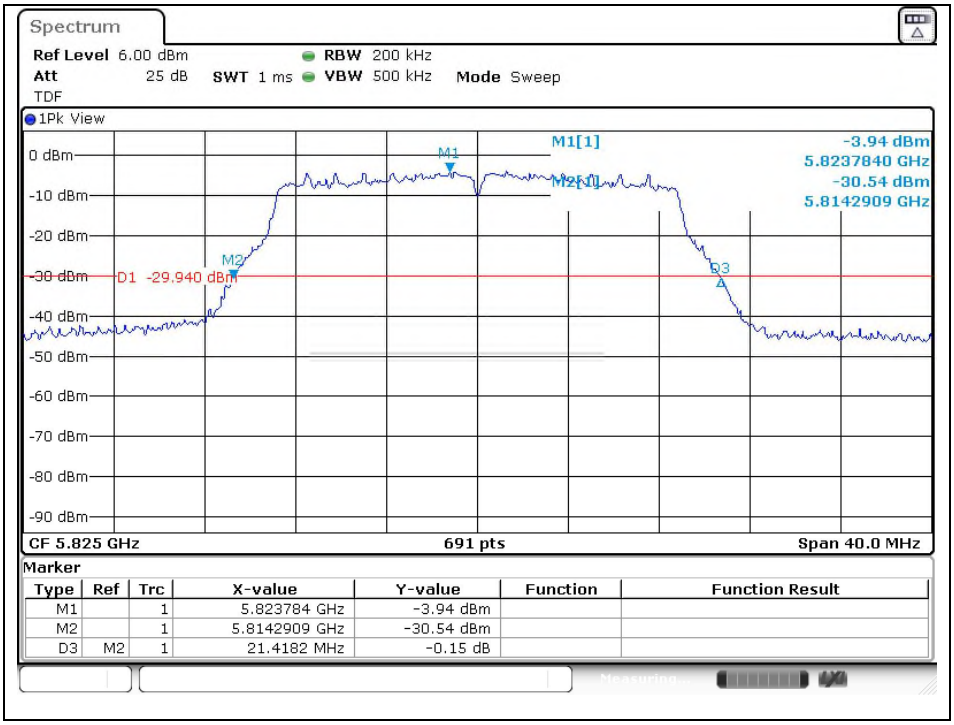
Low Channel (5 745 ㎒)



Middle Channel (5 785 ㎒)

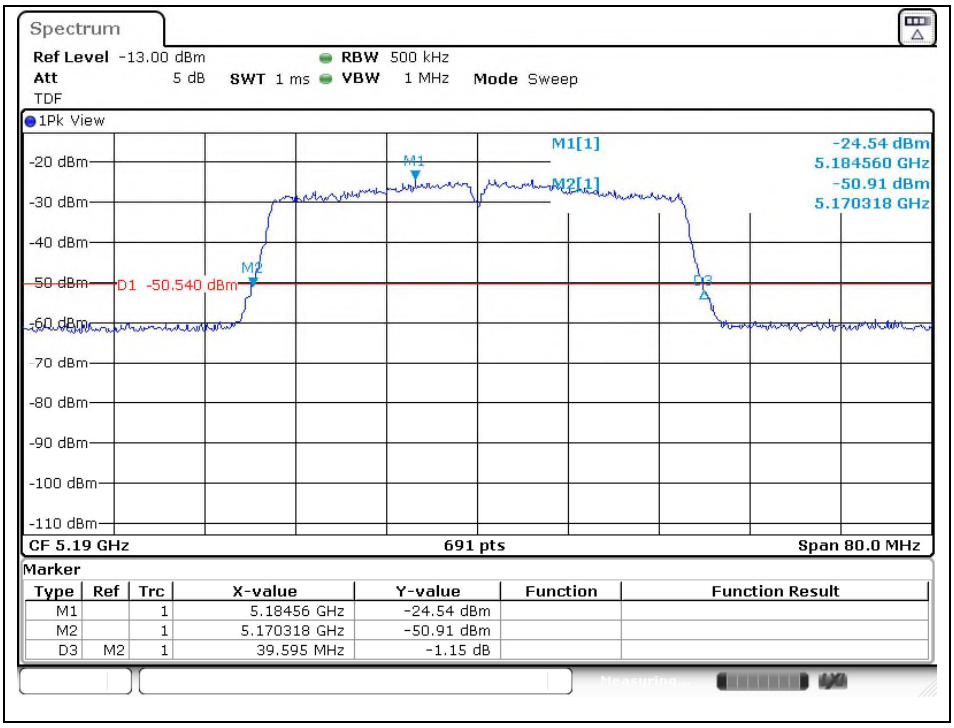


High Channel (5 825 ㎒)

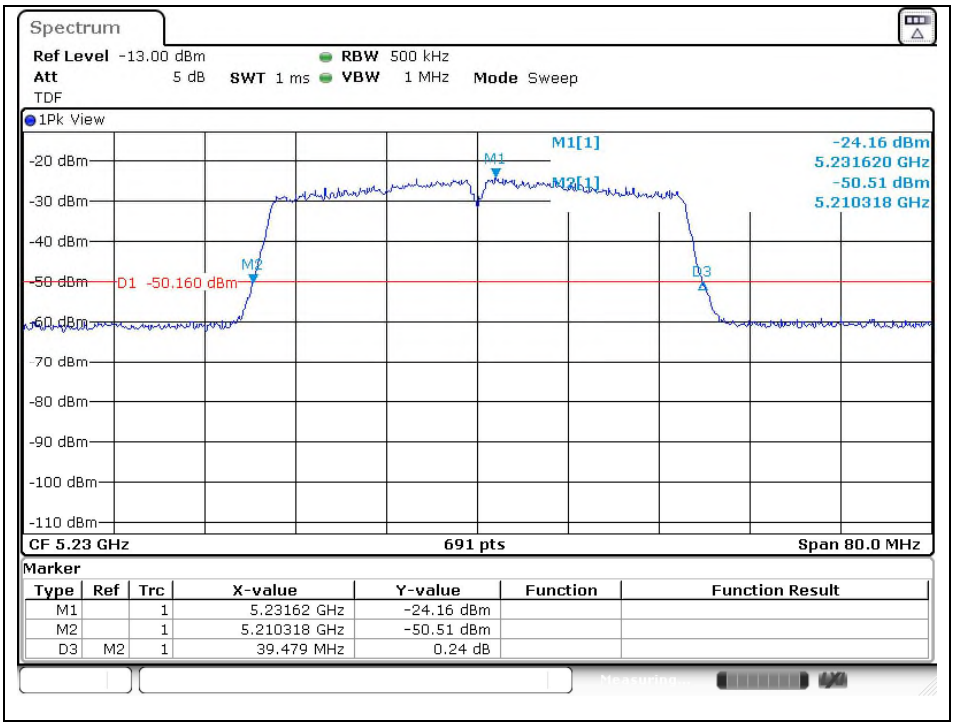


802.11ac_VHT40 (Band 1)

Low Channel (5 190 ㎒)

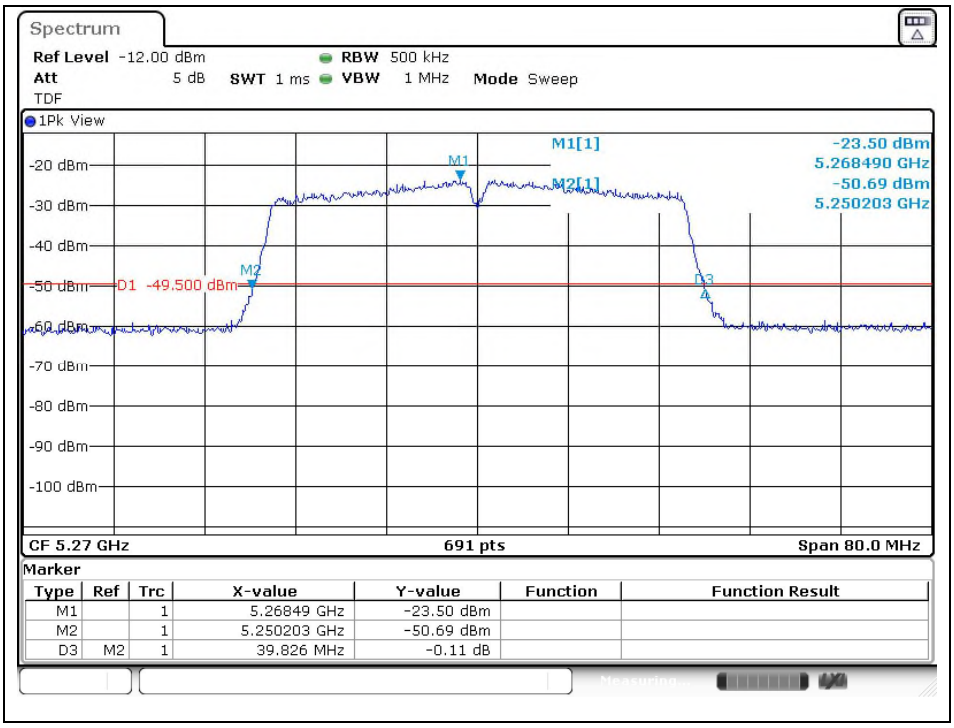


High Channel (5 230 ㎒)

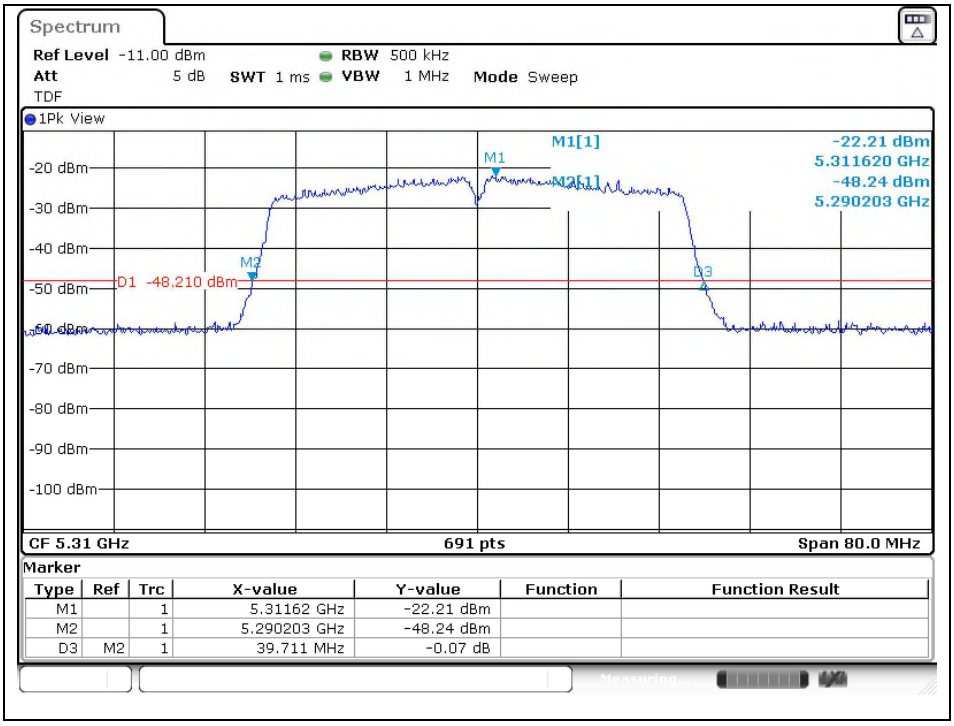


802.11ac_VHT40 (Band 2A)

Low Channel (5 270 ㎒)

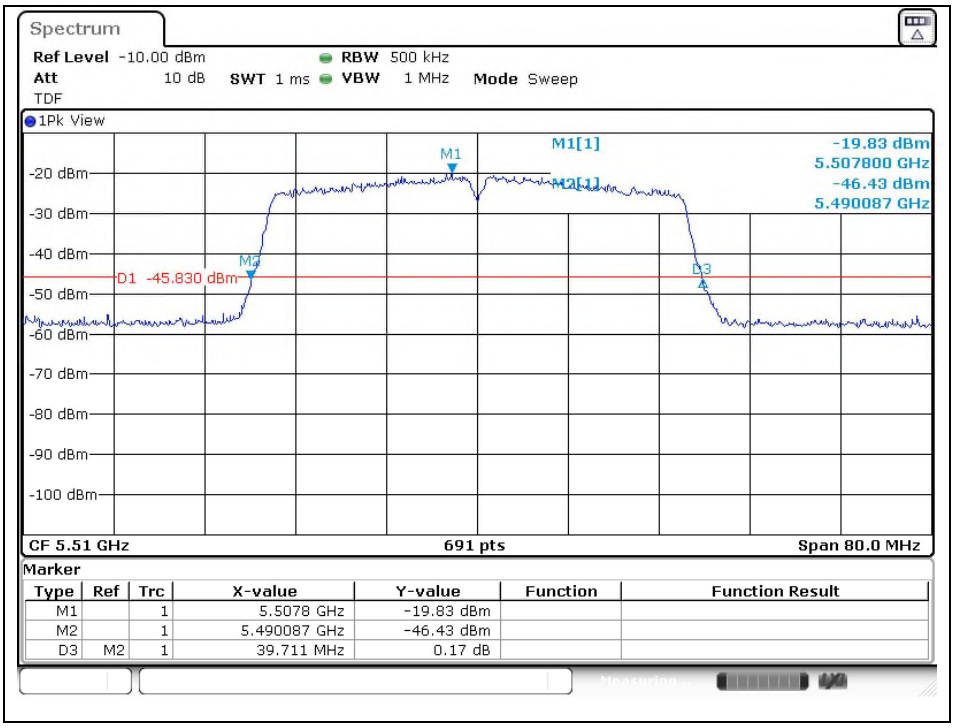


High Channel (5 310 ㎒)

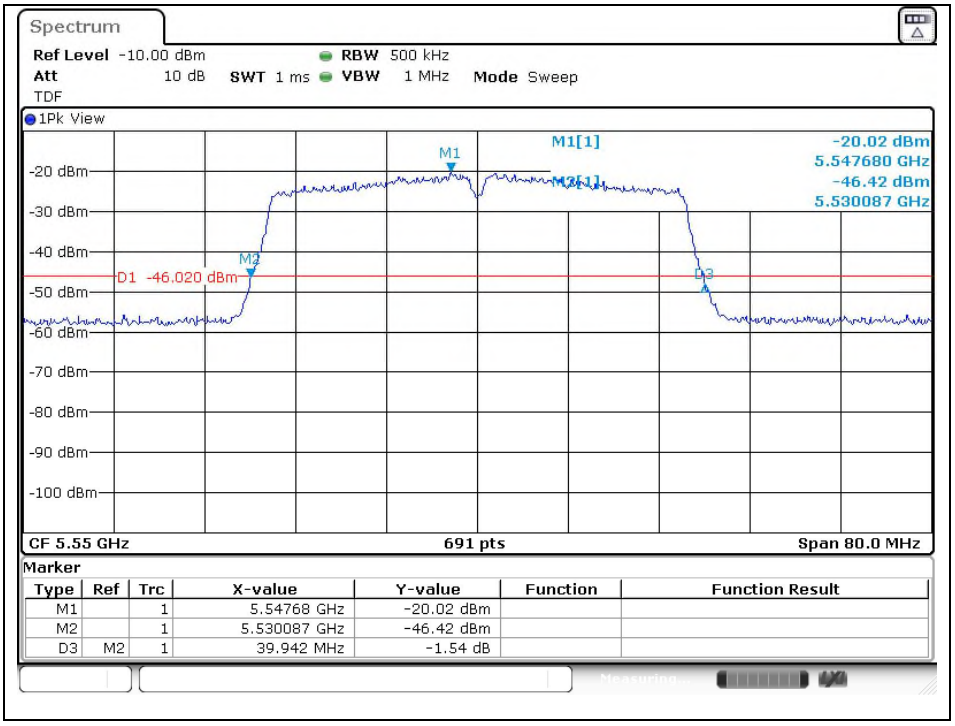


802.11ac_VHT40 (Band 2C)

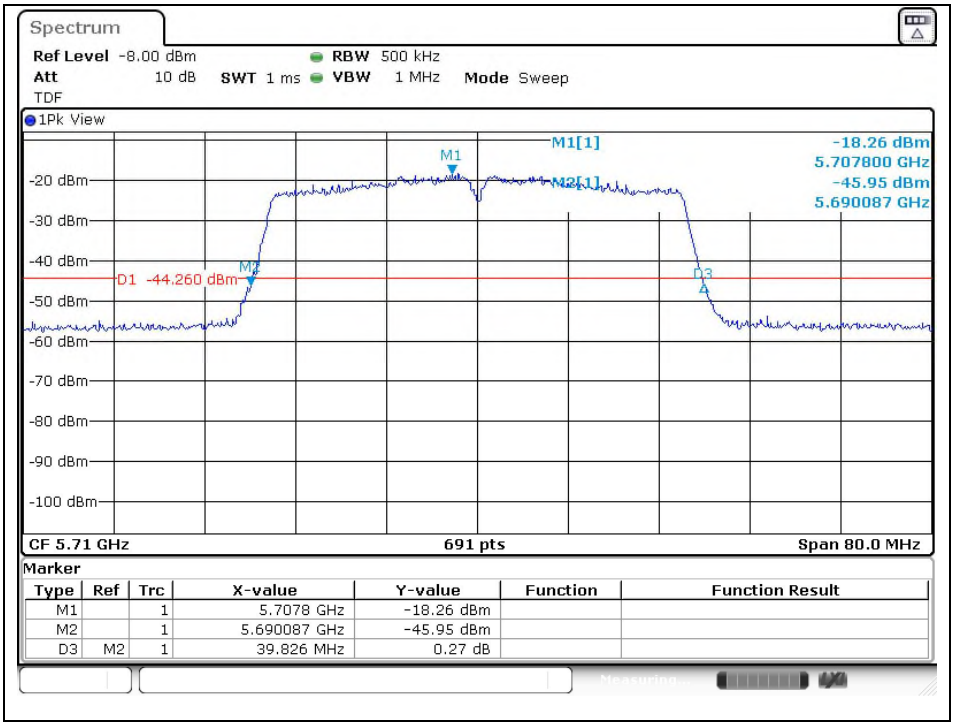
Low Channel (5 510 ㎒)



Middle Channel (5 550 ㎒)

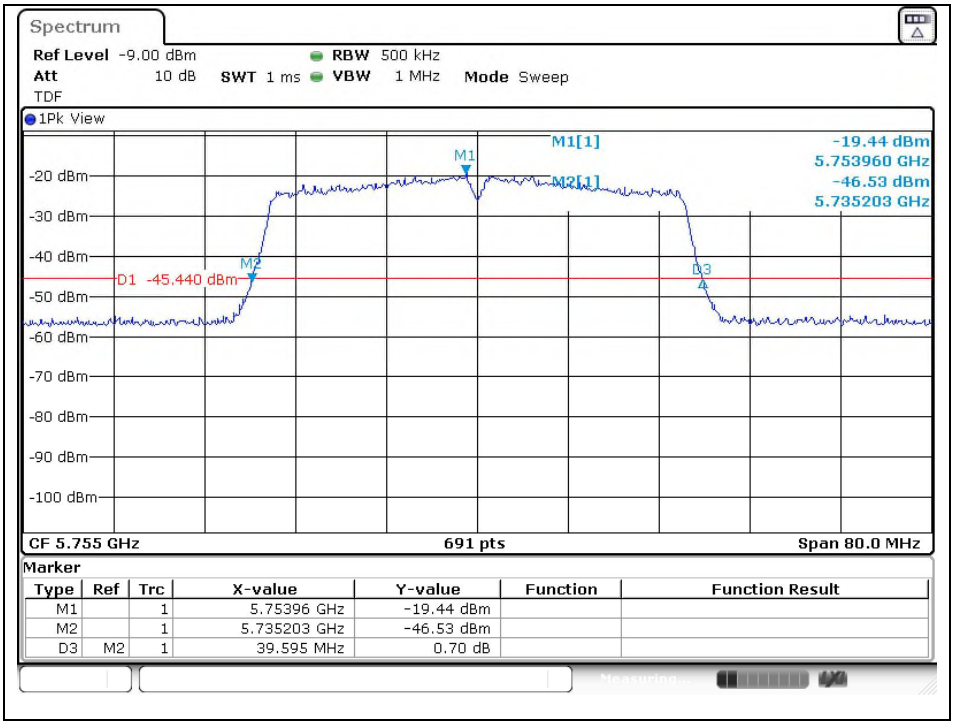


High Channel (5 710 ㎒)

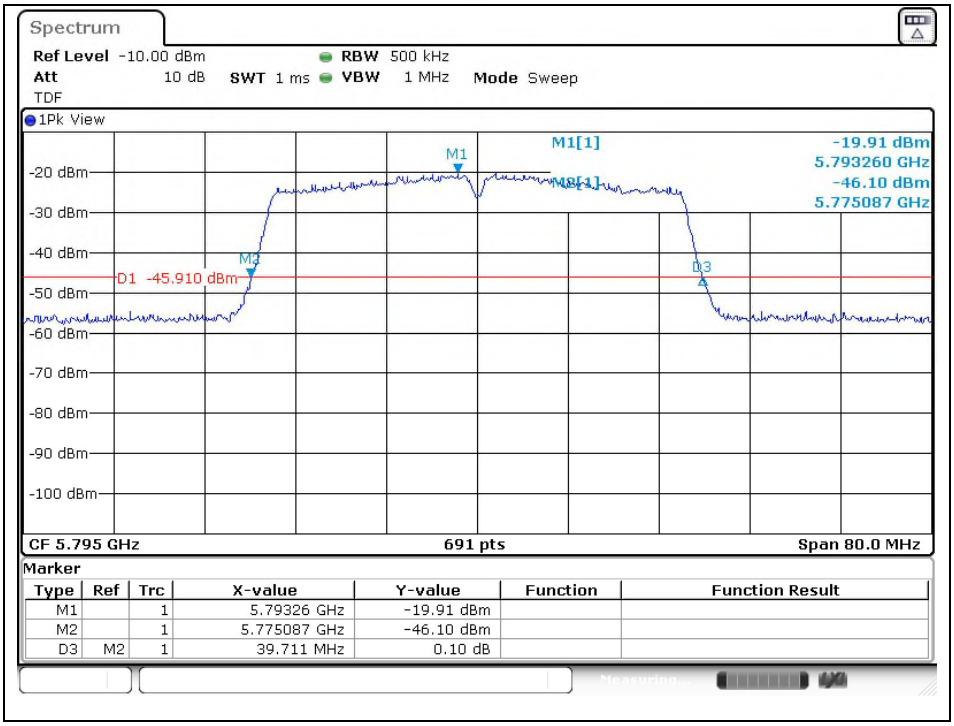


802.11ac_VHT40 (Band 3)

Low Channel (5 755 ㎒)

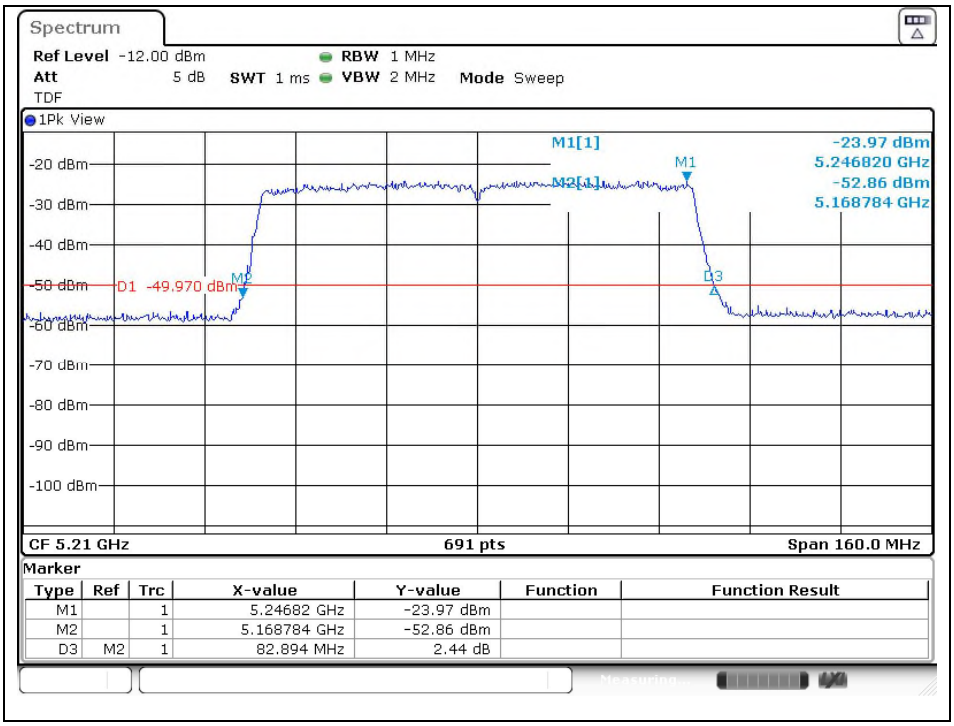


High Channel (5 795 ㎒)



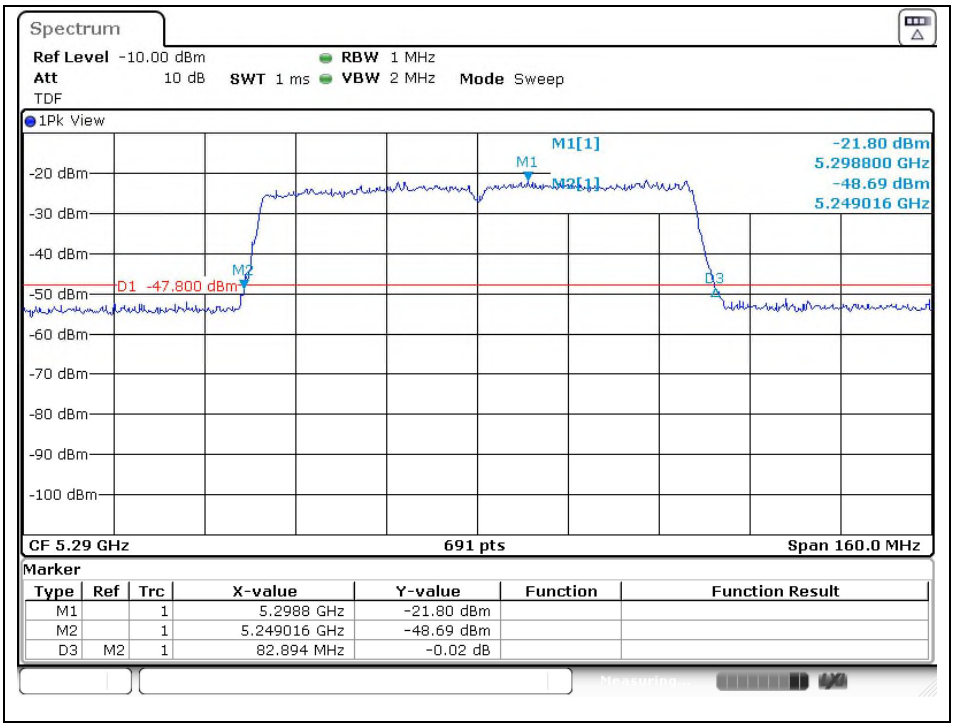
802.11ac_VHT80 (Band 1)

Middle Channel (5 210 ㎒)



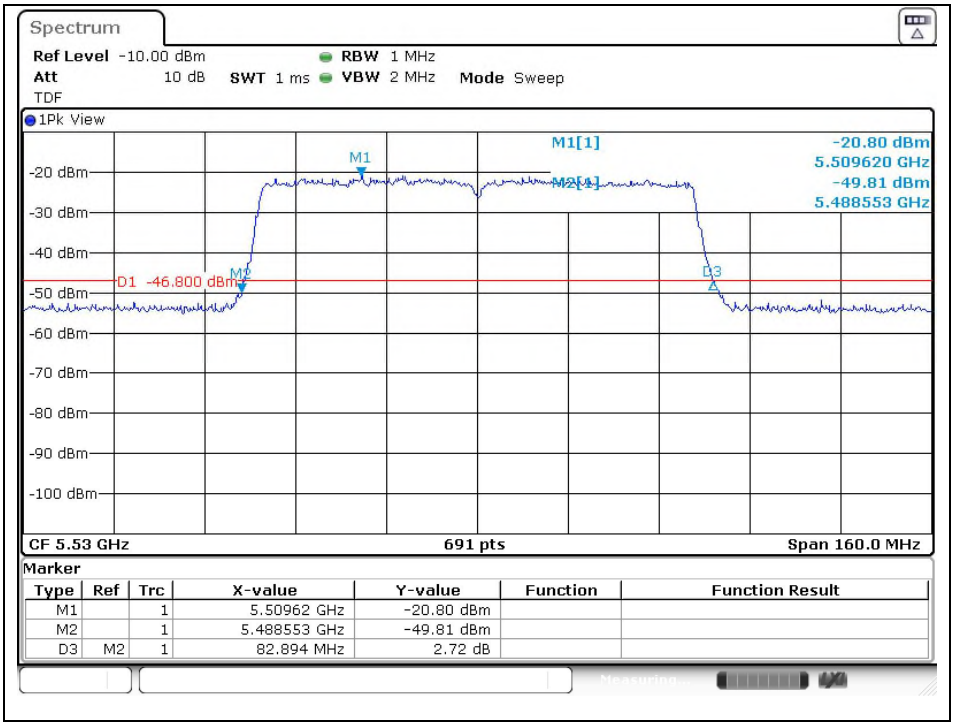
802.11ac_VHT80 (Band 2A)

Middle Channel (5 290 ㎒)



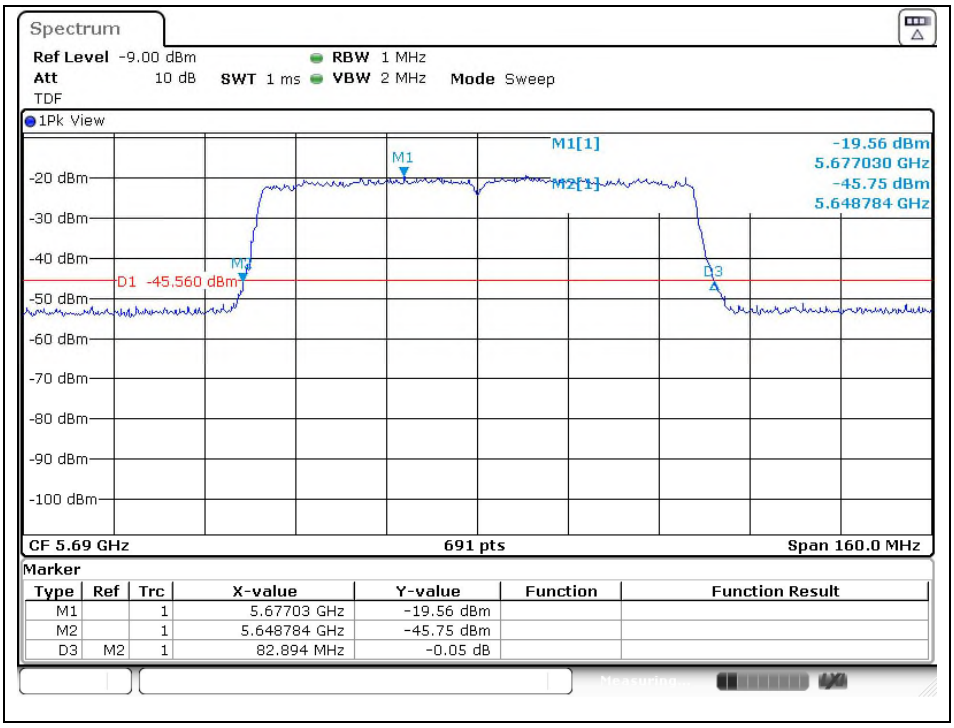
802.11ac_VHT80 (Band 2C)

Low Channel (5 530 ㎒)



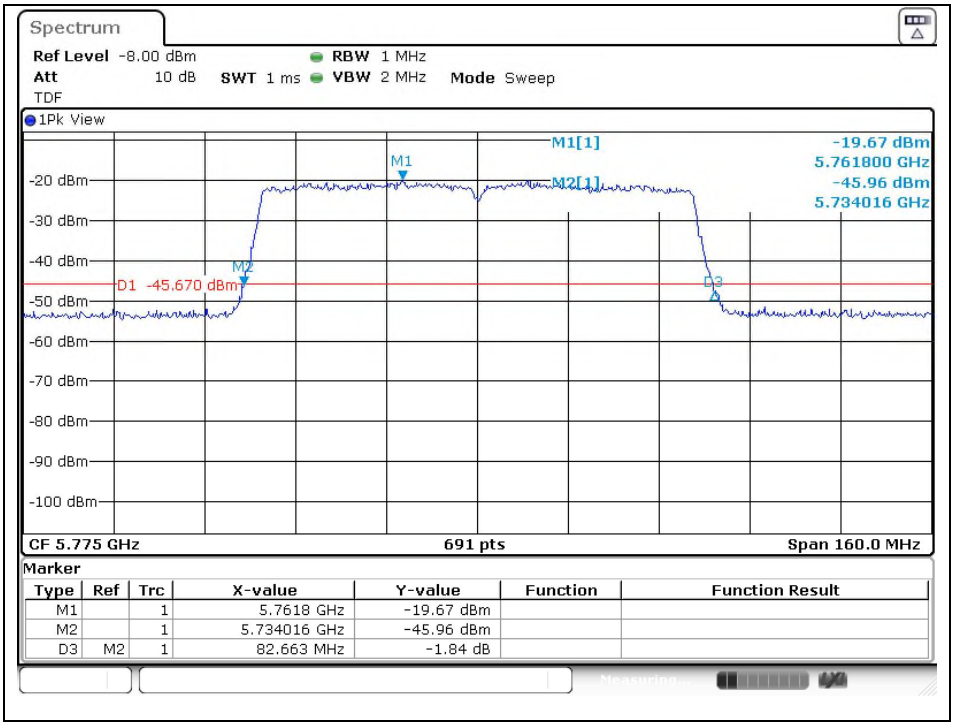
802.11ac_VHT80 (Band 2C)

High Channel (5 690 ㎒)



802. 11ac_VHT80 (Band 3)

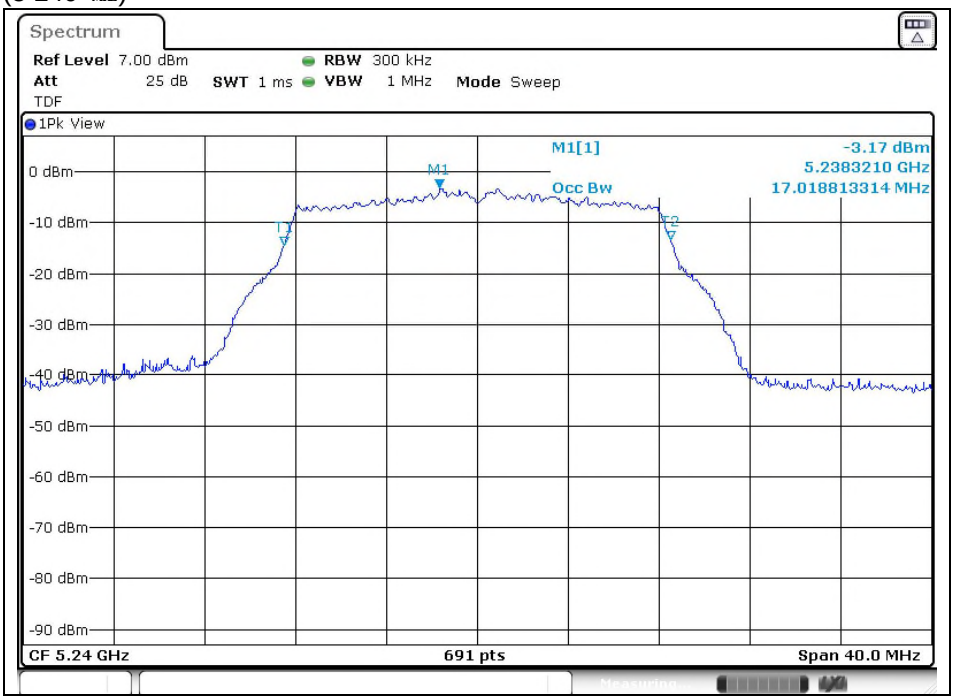
Middle Channel (5 775 ㎒)



99 % Bandwidth

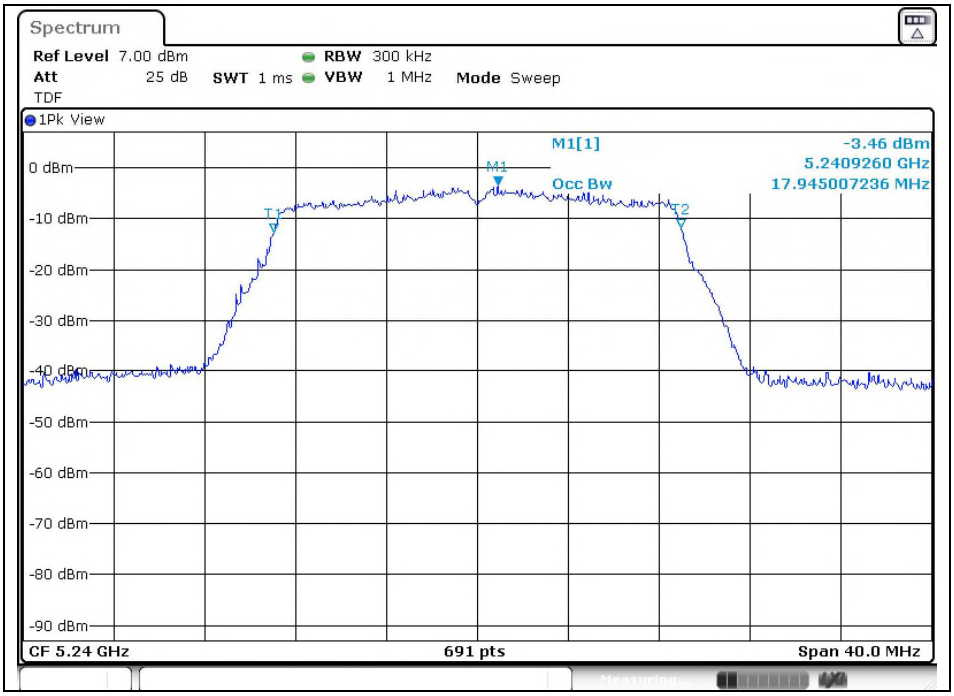
802.11a (Band 1)

High Channel (5 240 ㎒)



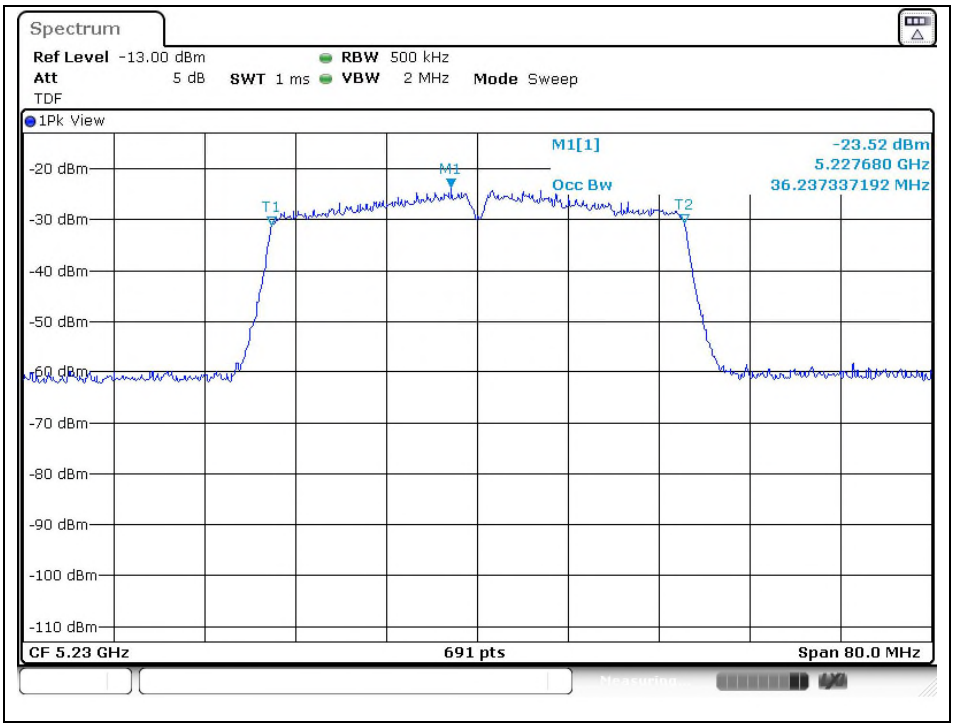
802.11ac_VHT20 (Band 1)

High Channel (5 240 ㎒)



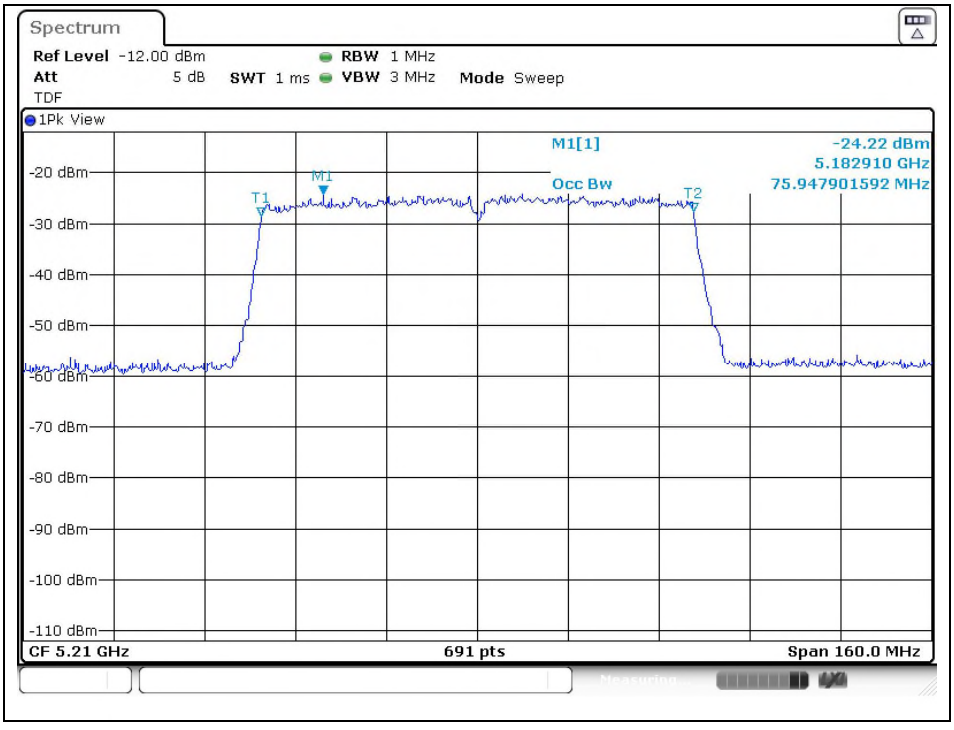
802.11ac_VHT40 (Band 1)

High Channel (5 230 ㎒)



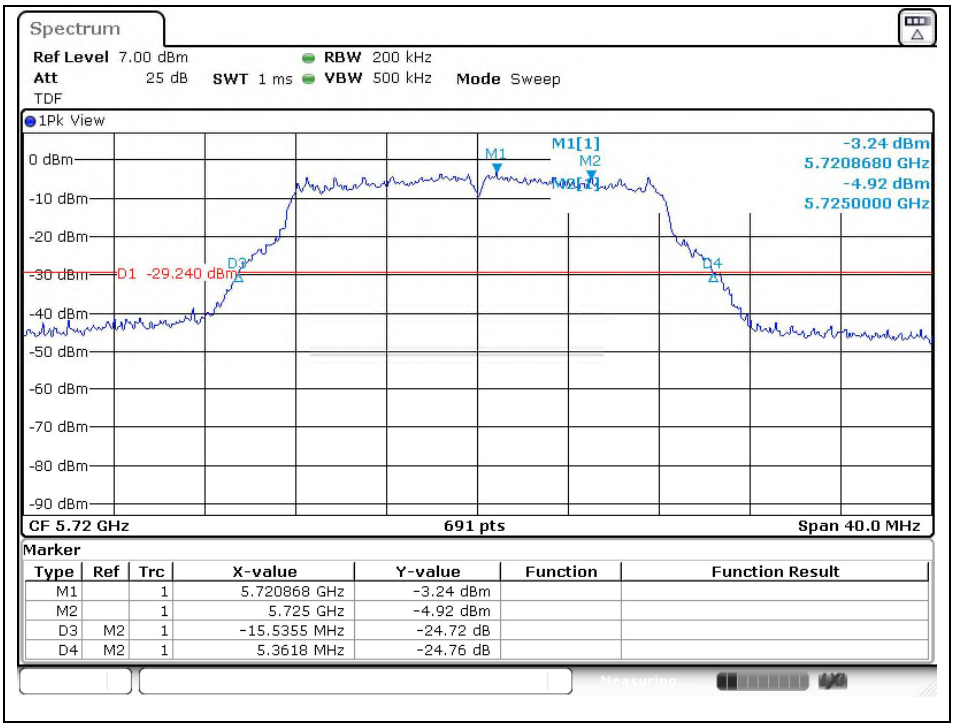
802.11ac_VHT80 (Band 1)

Middle Channel (5 210 ㎒)

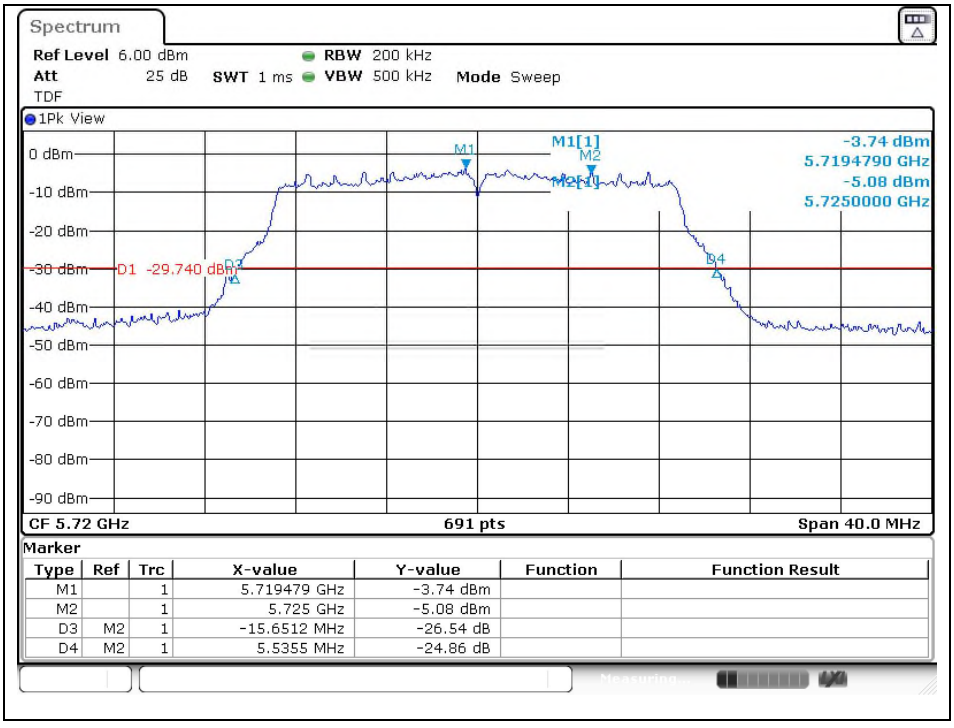


Band-crossing channels

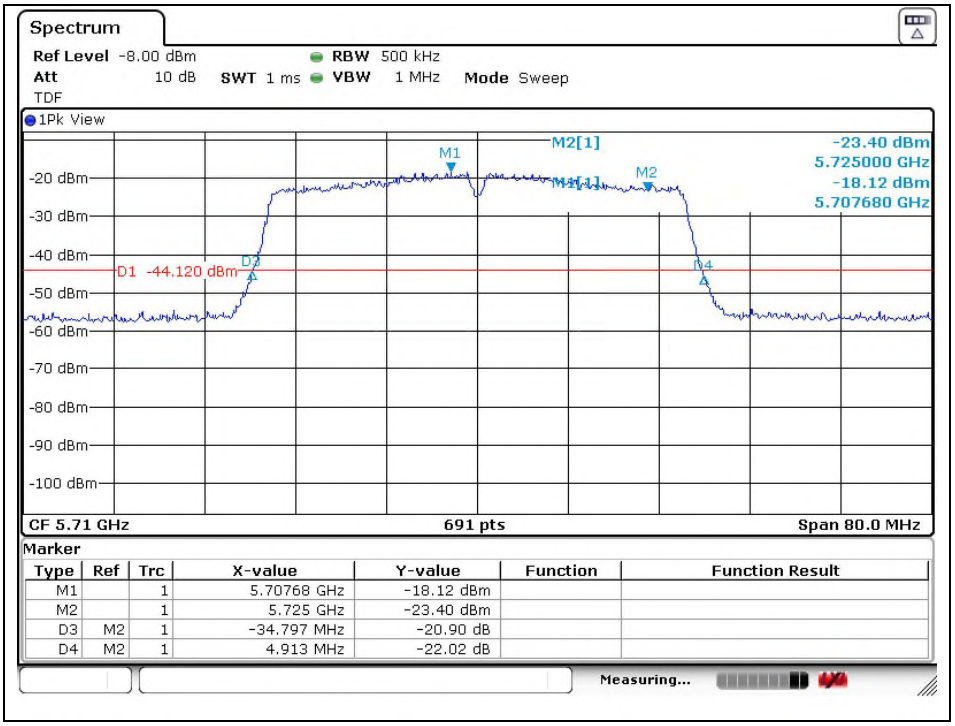
802.11a (5 720 ㎒)



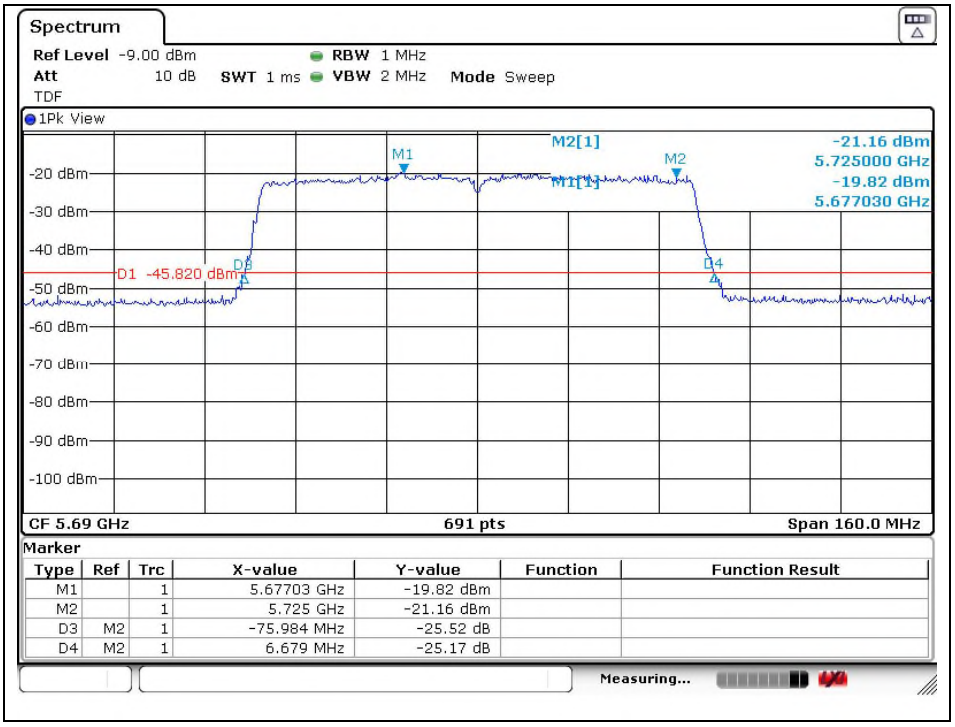
802.11ac_VHT20 (5 720 ㎒)



802.11ac_VHT40 (5 710 ㎒)

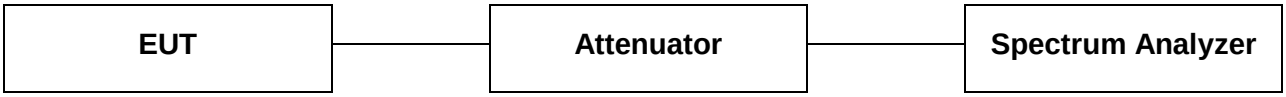


802.11ac_VHT80 (5 690 ㎒)



4. 6 dB Bandwidth

4.1. Test Setup



4.2. Limit

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

4.3. Test Procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in section C.2 of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW = 100 ㎑.
3. Set the video bandwidth (VBW) ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. 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 ㏈ relative to the maximum level measured in the fundamental emission.

Remark;

In case of band crossing channels 138, 142 and 144, the measurement is complied with section Ⅲ.A of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

4.4. Test Result

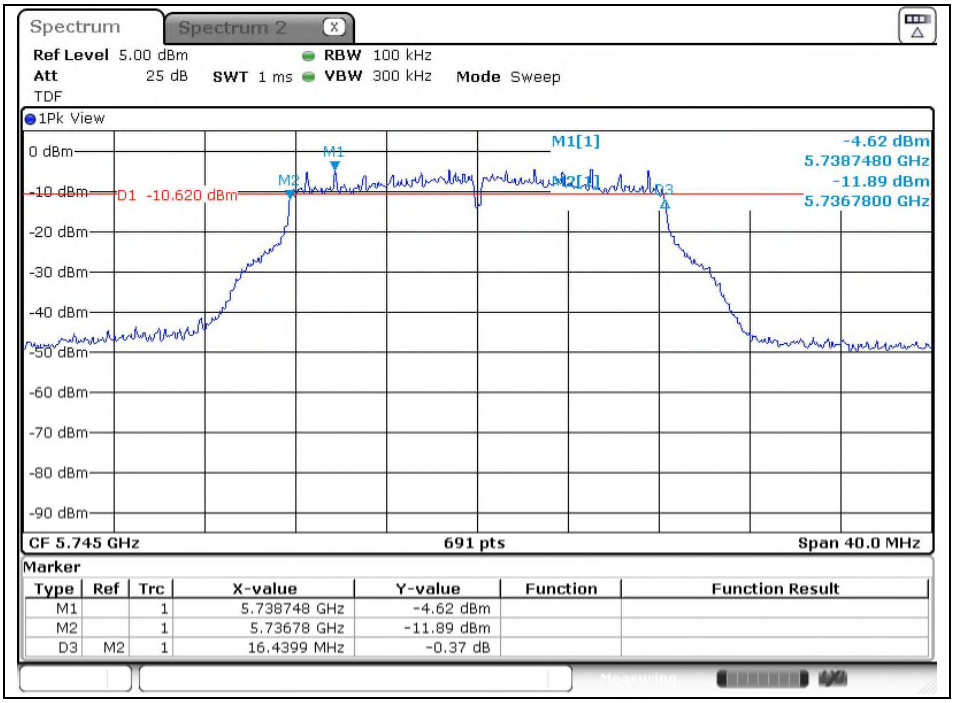
Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

Band	Mode	Frequency (㎒)	Ch.	Data Rate (Mbps)	6 ㏈ Bandwidth (㎒)	Minimum Bandwidth (㎑)
U-NII 3	11a	5 745	149	6	16.440	500
		5 785	157		16.440	
		5 825	165		16.440	
	11ac_VHT20	5 745	149	MCS6	17.714	
		5 785	157		17.714	
		5 825	165		17.714	
	11ac_VHT40	5 755	151	MCS5	36.585	
		5 795	159		36.585	
	11ac_VHT80	5 775	155	MCS7	76.874	
U-NII 3 (Band-crossing channels)	11a	5 720	144	6	3.220	
	11ac_VHT20	5 720	144	MCS6	3.857	
	11ac_VHT40	5 710	142	MCS5	3.292	
	11ac_VHT80	5 690	138	MCS7	3.437	

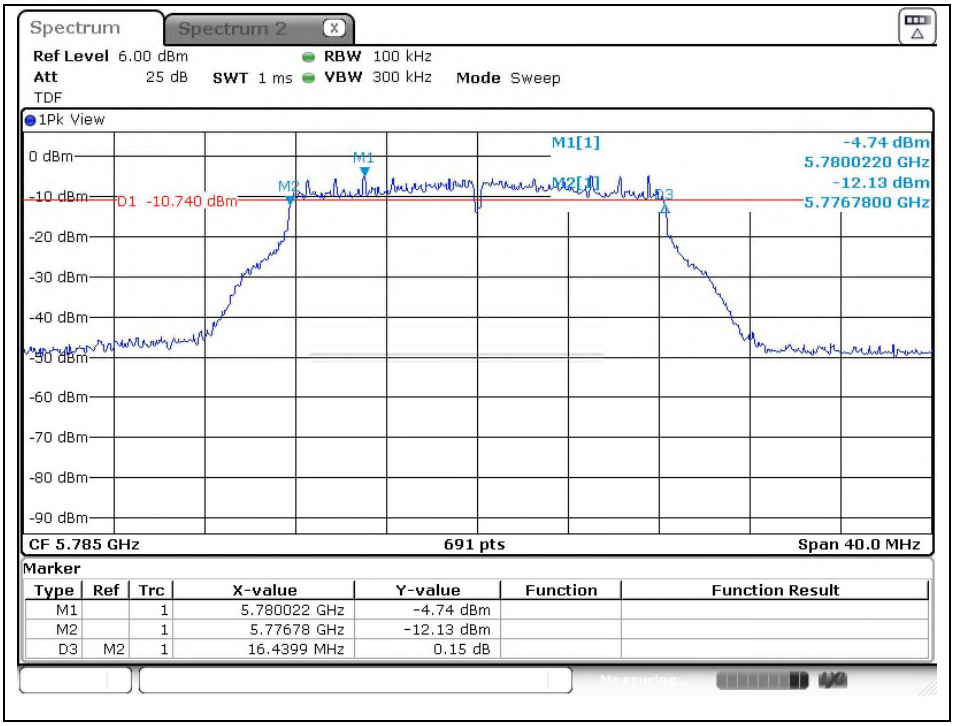
- Test plots

802.11a (Band 3)

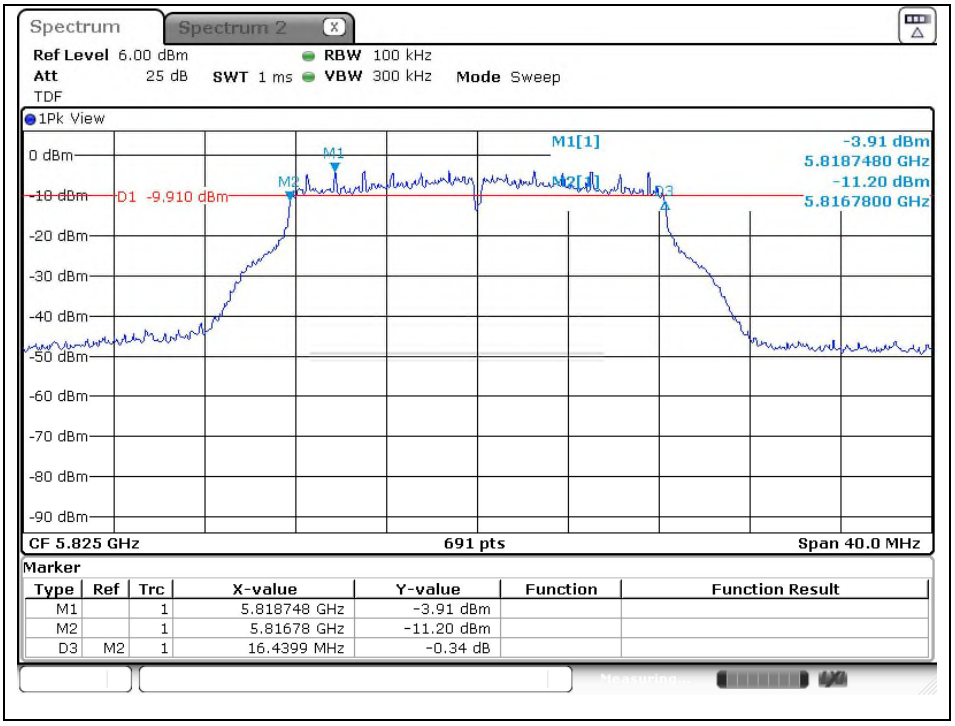
Low Channel (5 745 ㎒)



Middle Channel (5 785 ㎒)

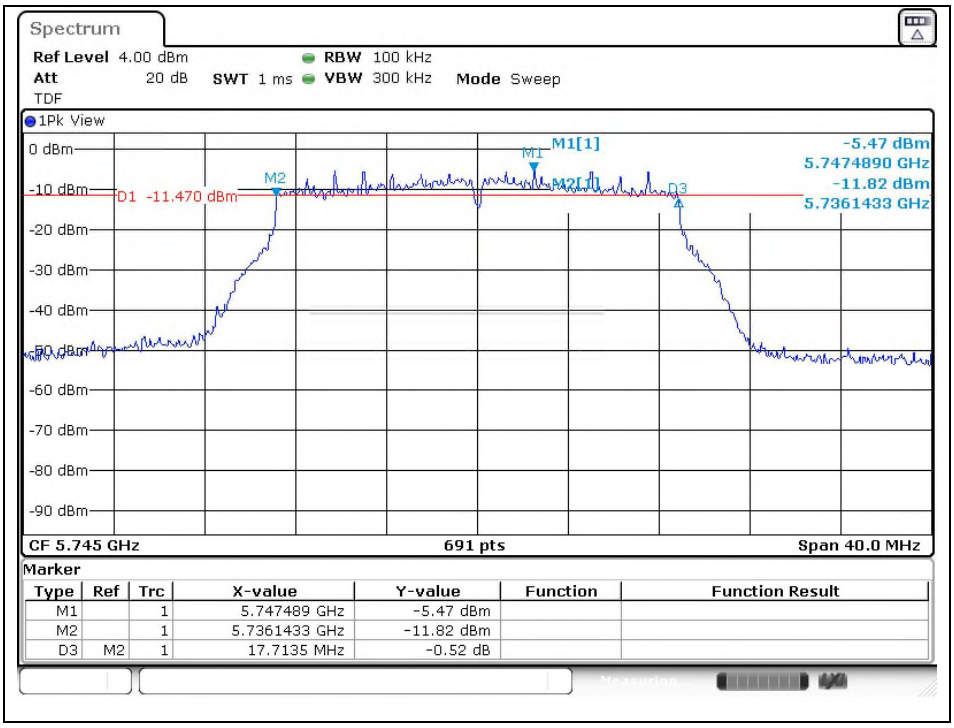


High Channel (5 825 ㎒)

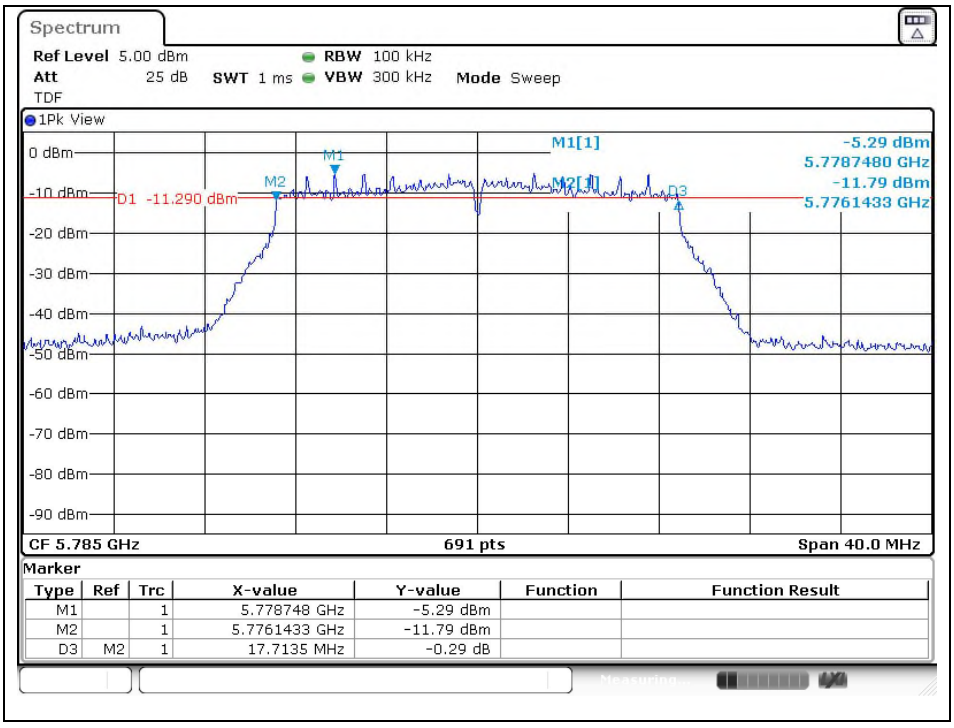


802.11ac_VHT20 (Band 3)

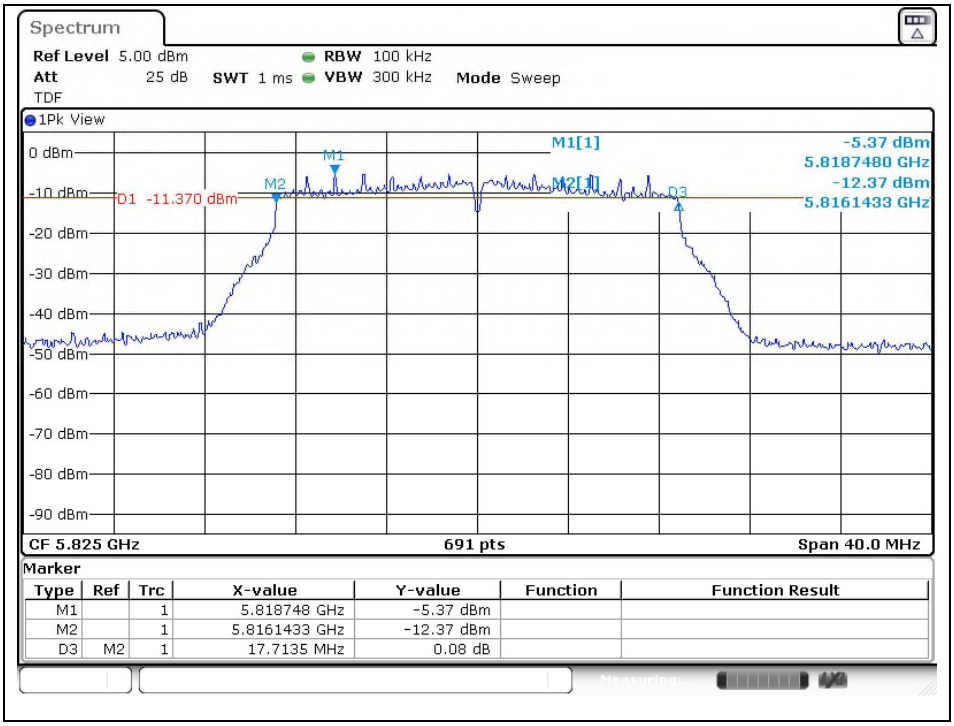
Low Channel (5 745 ㎒)



Middle Channel (5 785 ㎒)

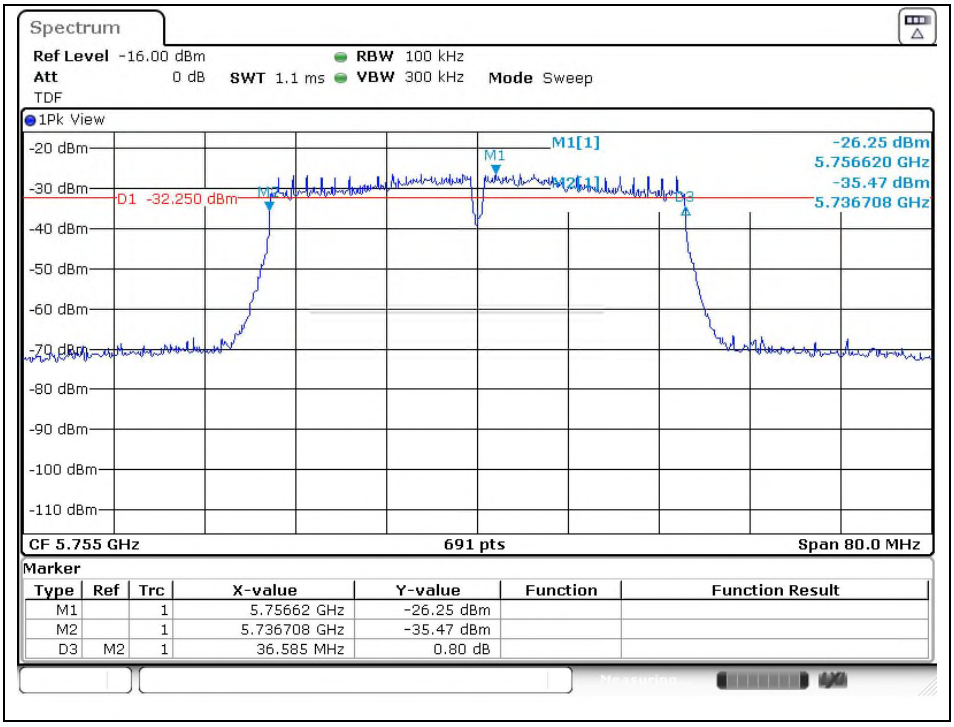


High Channel (5 825 ㎒)

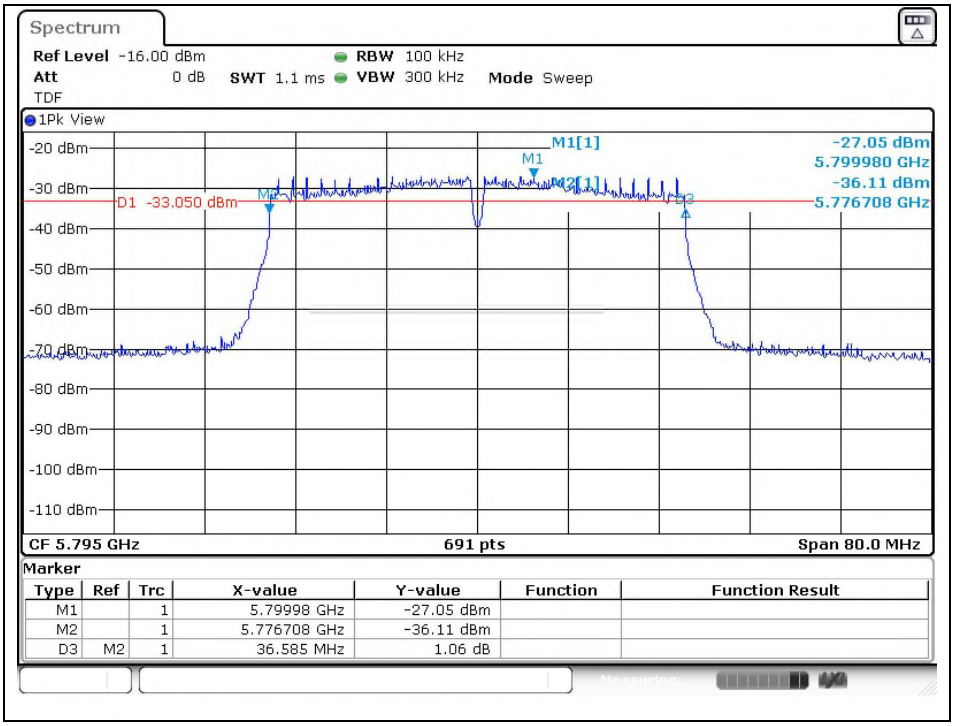


802.11ac_VHT40 (Band 3)

Low Channel (5 755 ㎒)

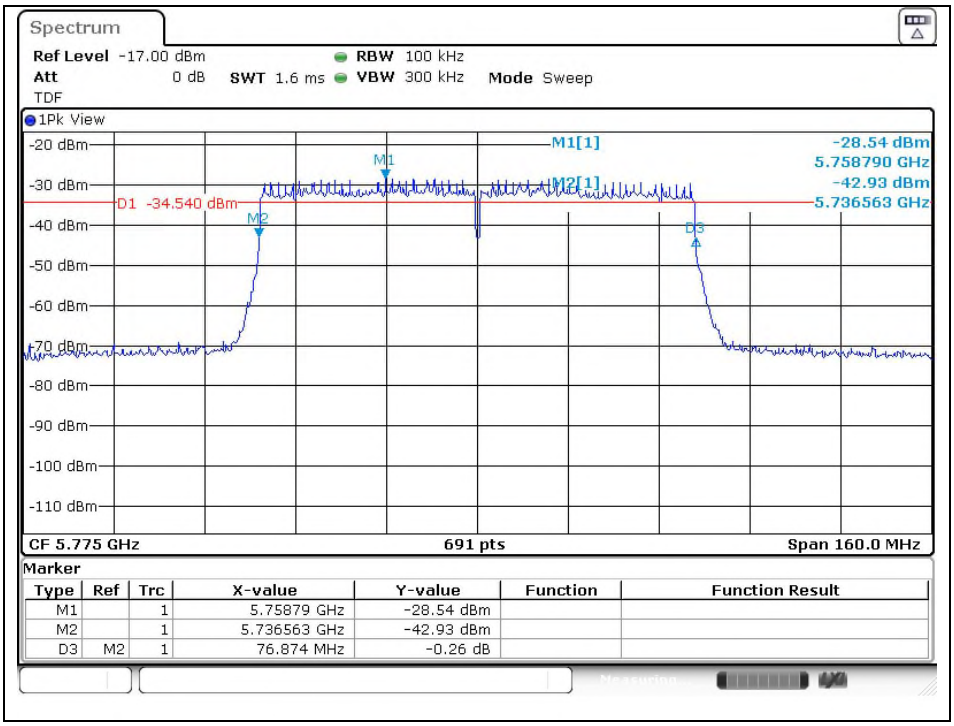


High Channel (5 795 ㎒)



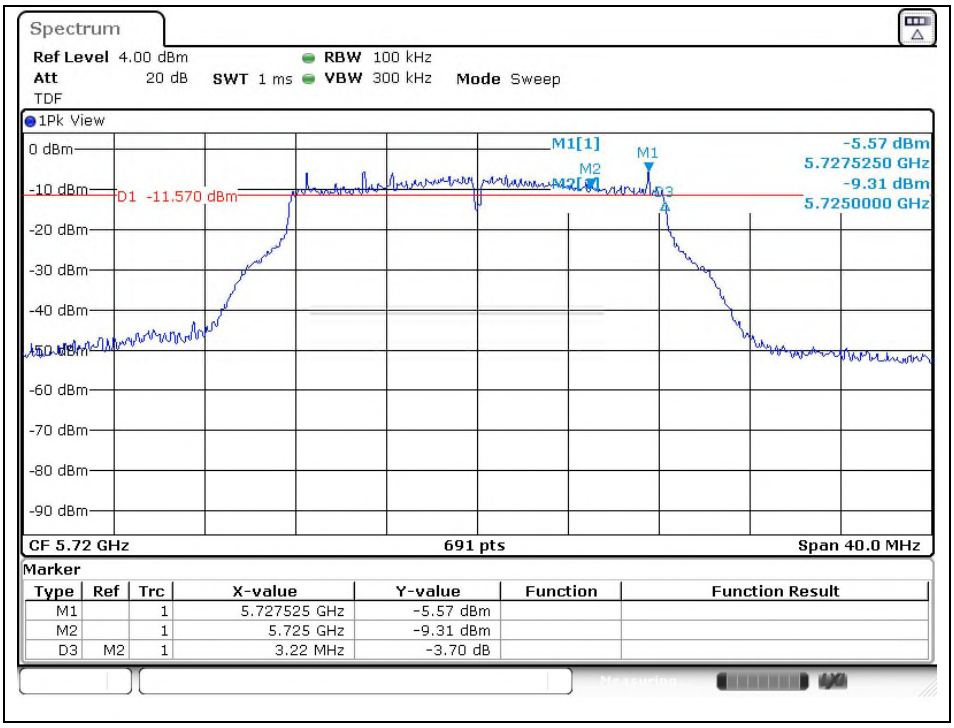
802.11ac_VHT80 (Band 3)

Middle Channel (5 775 ㎒)

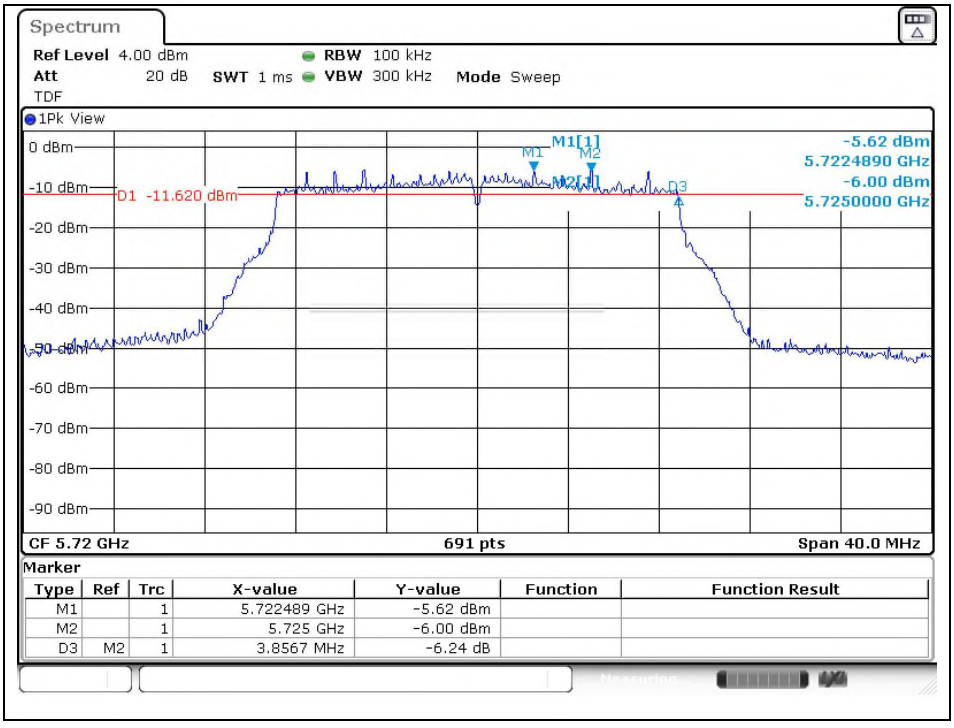


Band-crossing channels

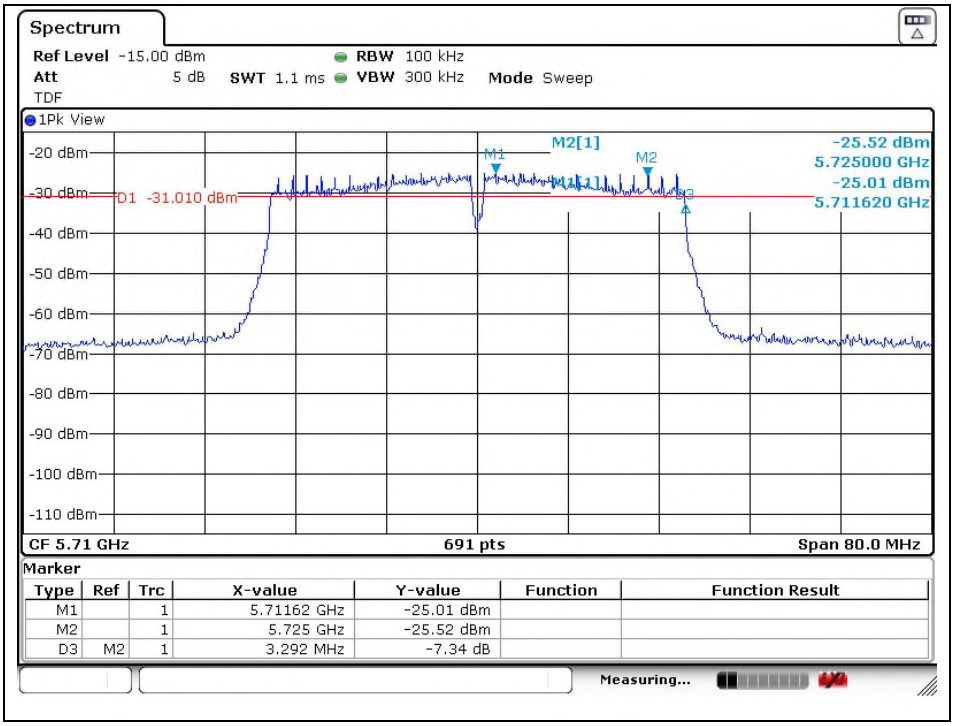
802.11a (5 720 ㎒)



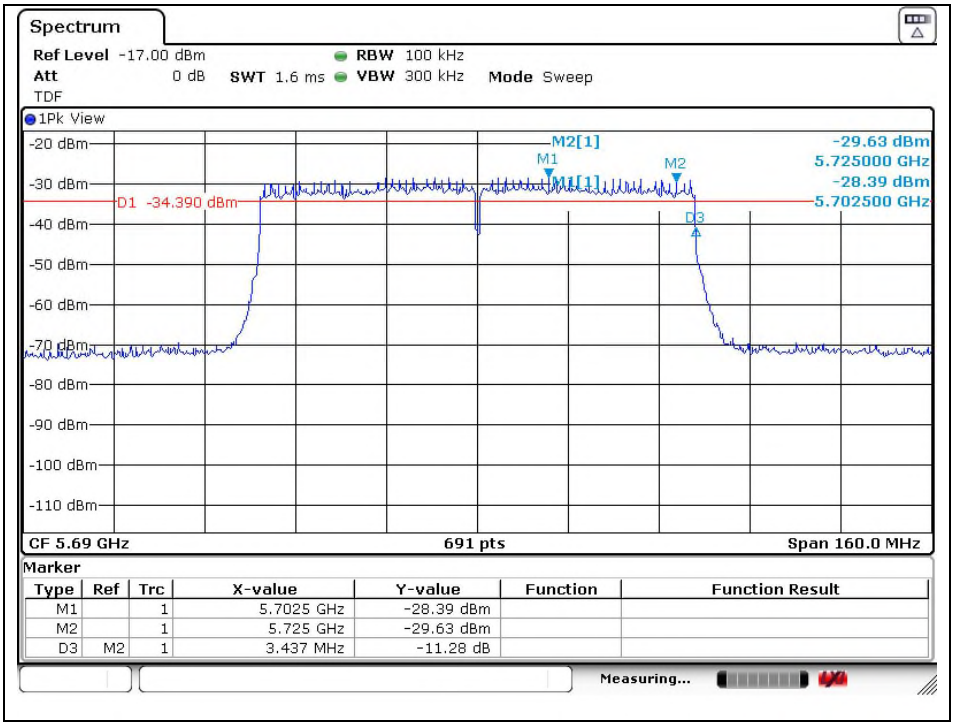
802.11ac_VHT20 (5 720 ㎒)



802.11ac_VHT40 (5 710 ㎒)

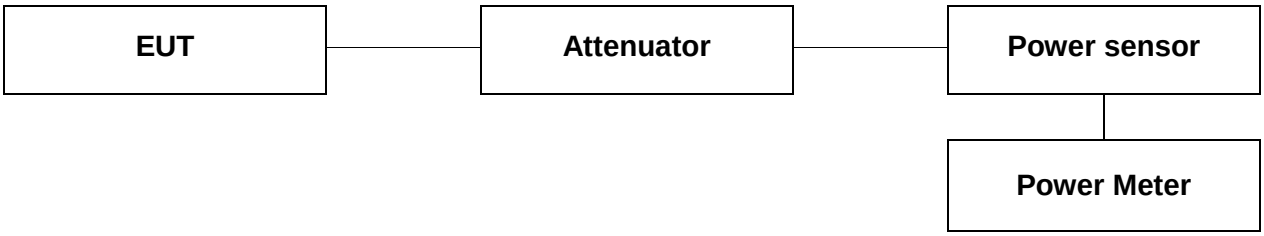


802.11ac_VHT80 (5 690 ㎒)



5. Maximum Conducted Output Power

5.1. Test Setup



5.2. Limit

According to 15.407(a)(1)(iv)
For client devices in the 5.15-5.25 ㎓ band, the maximum conducted output power over the frequency band of operation shall not exceed 250 ㎽ provided the maximum antenna gain does not exceed 6 ㏈i. In addition, the maximum power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

According to 15.407(a)(2)
For the 5.25-5.35 ㎓ and 5.47-5.725 ㎓ bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 ㎽ or 11 ㏈m + 10 log B, where B is the 26 ㏈ emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

According to 15.407(a)(3)
For the band 5.725-5.85 ㎓, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 ㏈m in any 500-㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈ i without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.3. Test Procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in section E.3.a of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied:
   - The EUT is configured to transmit continuously or to transmit with a consistent duty cycle.
   - At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
   - The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
3. If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section II.B.
4. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
5. Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g., 10 log (1/0.25) if the duty cycle is 25 %).
6. In case of band crossing channels 138, 142 and 144, the measurement is complied with section Ⅲ.A of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

5.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

Test mode: 11a

Band	Frequency (㎒)	Data Rate (Mbps)	Average Power (㏈m)	Duty Cycle Correction Factor (㏈)	Average Power Result (㏈m)
U-NII 1	5 180	6	7.75	0.21	7.96
	5 220		7.51		7.72
	5 240		7.54		7.75
U-NII 2A	5 260		7.80		8.01
	5 300		7.78		7.99
	5 320		7.77		7.98
U-NII 2C	5 500		6.93		7.14
	5 580		6.68		6.89
	5 720		6.25		6.46
U-NII 3	5 745		6.15		6.36
	5 785		5.92		6.13
	5 825		6.28		6.49

Band	Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	26 ㏈ BW (㎒)	11+10LogB (㏈m)	Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 180	23.98			-0.61	23.98
	5 220					
	5 240					
U-NII 2A	5 260	23.98	21.071	24.24	-0.18	23.98
	5 300		21.187	24.26		
	5 320		20.955	24.21		
U-NII 2C	5 500	23.98	20.955	24.21	-0.77	23.98
	5 580		20.897	24.20		
	5 720		21.187	24.26		
U-NII 3	5 745	30			-0.18	30
	5 785					
	5 825					

Remark;

1. Average Power Result (㏈m) = Average Power (㏈m) + Duty Cycle Correction Factor (㏈)

Test mode: 11ac_VHT20

Band	Frequency (㎒)	Data Rate (Mbps)	Average Power (㏈m)	Duty Cycle Correction Factor (㏈)	Average Power Result (㏈m)
U-NII 1	5 180	MCS6	7.30	0.42	7.72
	5 220		7.04		7.46
	5 240		7.00		7.42
U-NII 2A	5 260		7.19		7.61
	5 300		7.16		7.58
	5 320		7.18		7.60
U-NII 2C	5 500		6.25		6.67
	5 580		6.55		6.97
	5 720		6.18		6.60
U-NII 3	5 745		6.09		6.51
	5 785		5.89		6.31
	5 825		5.70		6.12

Band	Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	26 ㏈ BW (㎒)	11+10LogB (㏈m)	Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 180	23.98			-0.61	23.98
	5 220					
	5 240					
U-NII 2A	5 260	23.98	21.303	24.28	-0.18	23.98
	5 300		21.476	24.32		
	5 320		21.360	24.30		
U-NII 2C	5 500	23.98	21.476	24.32	-0.77	23.98
	5 580		21.360	24.30		
	5 720		21.360	24.30		
U-NII 3	5 745	30			-0.18	30
	5 785					
	5 825					

Remark;

1. Average Power Result (㏈m) = Average Power (㏈m) + Duty Cycle Correction Factor (㏈)

Test mode: 11ac_VHT40

Band	Frequency (㎒)	Data Rate (Mbps)	Average Power (㏈m)	Duty Cycle Correction Factor (㏈)	Average Power Result (㏈m)
U-NII 1	5 190	MCS5	1.38	2.16	3.54
	5 230		1.24		3.40
U-NII 2A	5 270		4.02		6.18
	5 310		3.99		6.15
U-NII 2C	5 510		4.24		6.40
	5 550		4.35		6.51
	5 710		3.93		6.09
U-NII 3	5 755		3.45		5.61
	5 795		3.88		6.04

Band	Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	26 ㏈ BW (㎒)	11+10LogB (㏈m)	Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 190	23.98			-0.61	23.98
	5 230					
U-NII 2A	5 270	23.98	39.826	27.00	-0.18	23.98
	5 310		39.711	26.99		
U-NII 2C	5 510	23.98	39.711	26.99	-0.77	23.98
	5 550		39.942	27.01		
	5 710		39.826	27.00		
U-NII 3	5 755	30			-0.18	30
	5 795					

Remark;

1. Average Power Result (㏈m) = Average Power (㏈m) + Duty Cycle Correction Factor (㏈)

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Data Rate (Mbps)	Average Power (㏈m)	Duty Cycle Correction Factor (㏈)	Average Power Result (㏈m)
U-NII 1	5 210	MCS7	0.96	3.45	4.41
U-NII 2A	5 290		3.21		6.66
U-NII 2C	5 530		3.45		6.90
	5 690		3.20		6.65
U-NII 3	5 755		2.89		6.34

Band	Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	26 ㏈ BW (㎒)	11+10LogB (㏈m)	Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 210	23.98			-0.61	23.98
U-NII 2A	5 290	23.98	82.894	30.19	-0.18	23.98
U-NII 2C	5 530	23.98	82.894	30.19	-0.77	23.98
	5 690	23.98	82.894	30.19		23.98
U-NII 3	5 775	30			-0.18	30

Remark;

1. Average Power Result (㏈m) = Average Power (㏈m) + Duty Cycle Correction Factor (㏈)

- Band-crossing channels

Mode	Band	Frequency (㎒)	Data Rate (Mbps)	Average Power (㏈m)	Duty Cycle Correction Factor (㏈)	Average Power Result (㏈m)
11a	U-NII 2C	5 720	6	6.03	0.21	6.24
	U-NII 3			-1.58		-1.37
11ac_VHT20	U-NII 2C	5 720	MCS6	6.00	0.42	6.42
	U-NII 3			-0.70		-0.28
11ac_VHT40	U-NII 2C	5 710	MCS5	3.20	2.16	5.36
	U-NII 3			-8.01		-5.85
11ac_VHT80	U-NII 2C	5 690	MCS7	1.97	3.45	5.42
	U-NII 3			-12.13		-8.68

Mode	Band	Limit					
		Frequency (㎒)	Fixed Limit (㏈m)	26 ㏈ BW (㎒)	11+10LogB (㏈m)	Antenna Gain (㏈i)	Limit (㏈m)
11a	U-NII 2C	5 720	23.98	15.536	22.91	-0.77	22.91
	U-NII 3					-0.18	30
11ac_VHT20	U-NII 2C	5 720	23.98	15.651	22.95	-0.77	22.95
	U-NII 3					-0.18	30
11ac_VHT40	U-NII 2C	5 710	23.98	34.797	26.42	-0.77	23.98
	U-NII 3					-0.18	30
11ac_VHT80	U-NII 2C	5 690	23.98	75.984	29.81	-0.77	23.98
	U-NII 3					-0.18	30

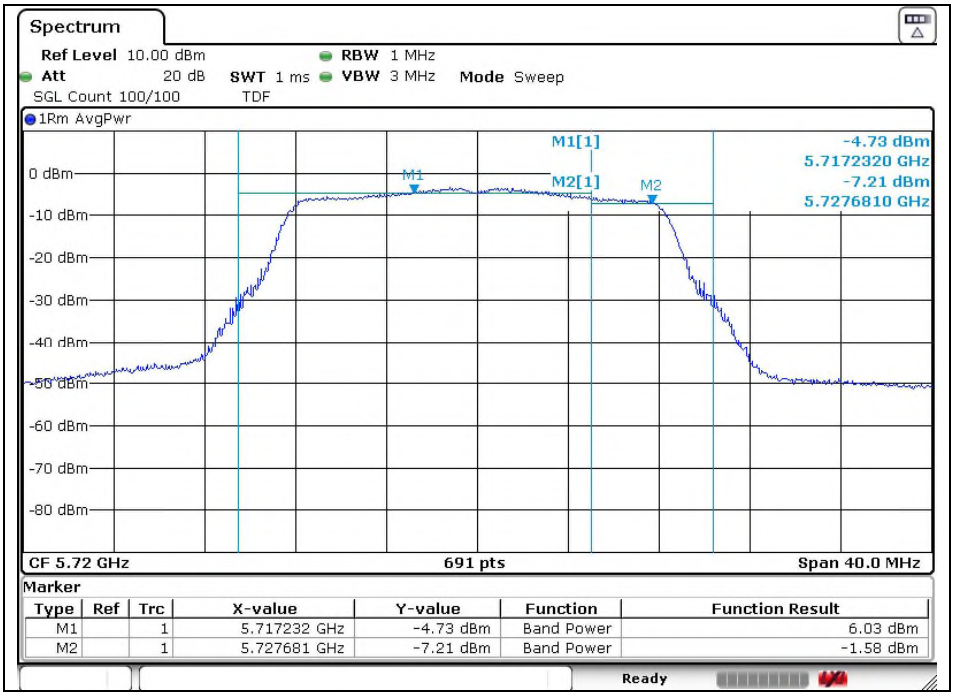
Remark;

1. Average Power Result (㏈m) = Average Power (㏈m) + Duty Cycle Correction Factor (㏈)

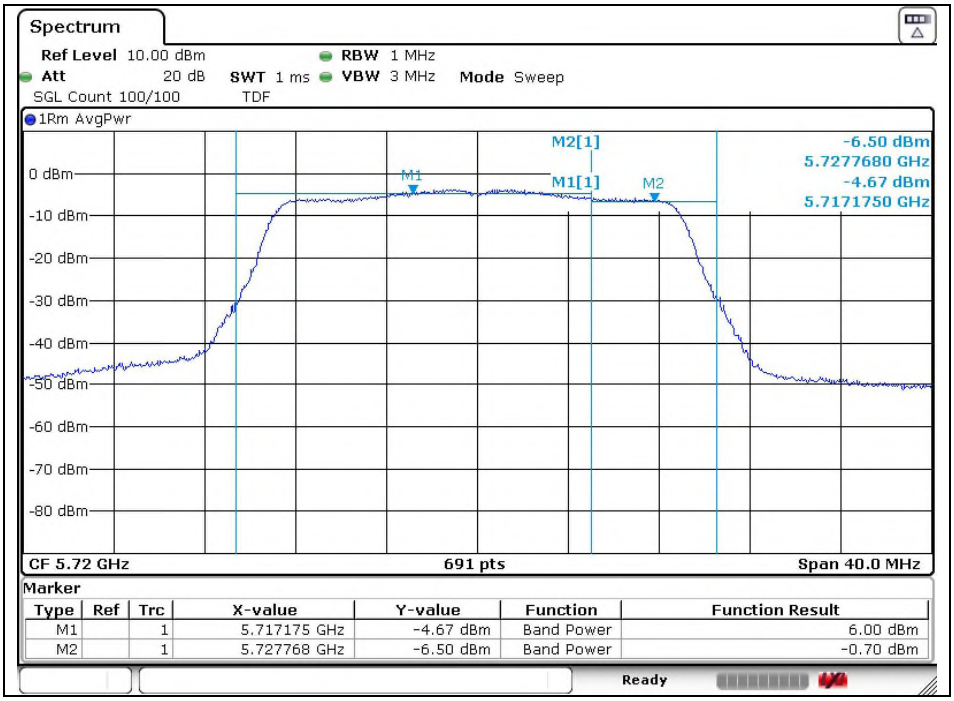
- Test plots

Band-crossing channels

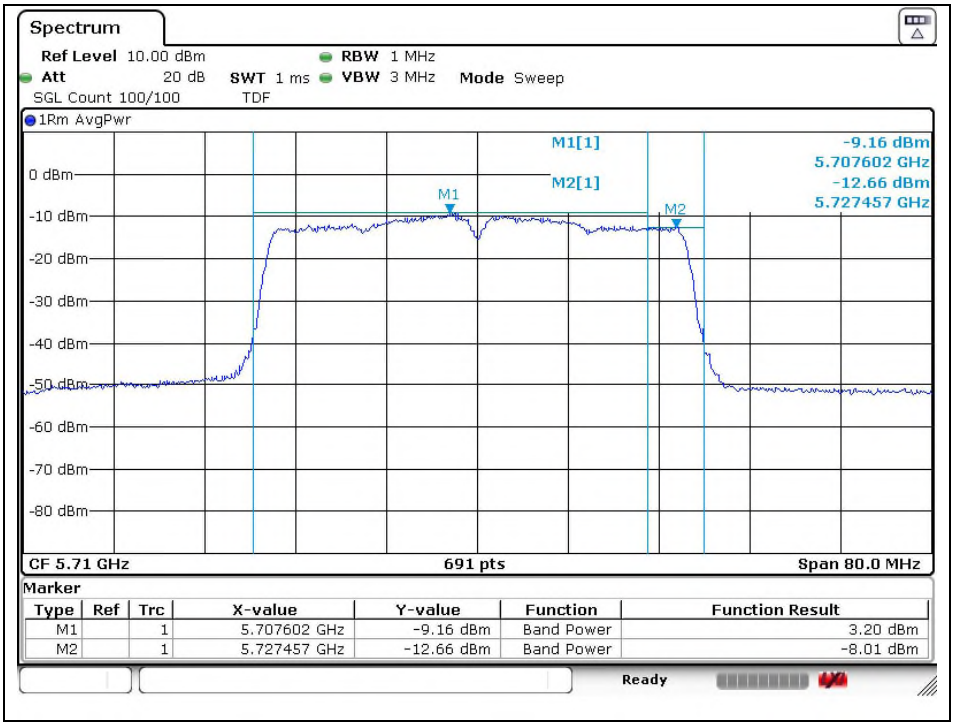
802.11a (5 720 ㎒)



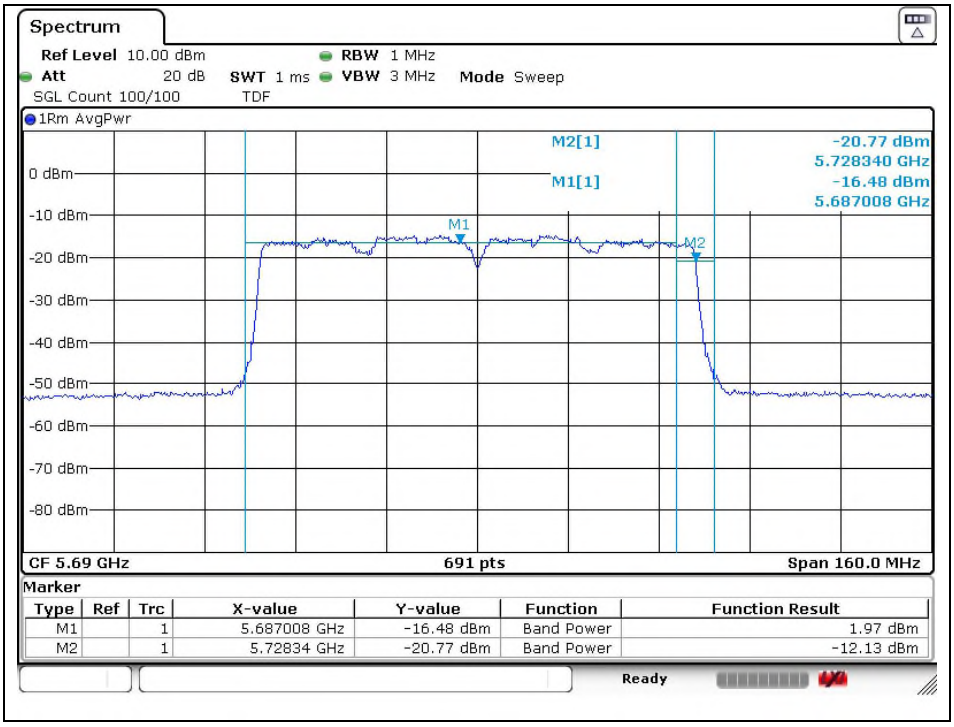
802.11ac_VHT20 (5 720 ㎒)



802.11ac_VHT40 (5 710 ㎒)

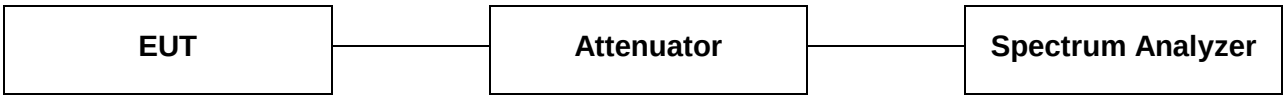


802.11ac_VHT80 (5 690 ㎒)



6. Peak Power Spectral Density

6.1. Test Setup



6.2. Limit

According to 15.407(a)(1)(iv)
For client devices in the 5.15-5.25 ㎓ band, the maximum conducted output power over the frequency band of operation shall not exceed 250 ㎽ provided the maximum antenna gain does not exceed 6 ㏈i. In addition, the maximum power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

According to 15.407(a)(2)
For the 5.25-5.35 ㎓ and 5.47-5.725 ㎓ bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 ㎽ or 11 ㏈m + 10 log B, where B is the 26 ㏈ emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 ㏈m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

According to 15.407(a)(3)
For the band 5.725-5.85 ㎓, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 ㏈m in any 500-㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈ i without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

6.3. Test Procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in section F of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

2. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”. (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)

3. Use the peak search function on the instrument to find the peak of the spectrum and record its value.

4. Make the following adjustments to the peak value of the spectrum, if applicable:

   a) **If Method SA-2 or SA-2 Alternative was used, add 10 log (1/x), where x is the duty cycle, to the peak of the spectrum.**
   b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 ㏈ to the final result to compensate for the difference between linear averaging and power averaging.

5. The result is the Maximum PSD over 1 ㎒ reference bandwidth.

6. For devices operating in the bands 5.15-5.25 ㎓, 5.25-5.35 ㎓, and 5.47-5.725 ㎓, the above procedures make use of 1 ㎒ RBW to satisfy directly the 1 ㎒ reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 ㎓, the rules specify a measurement bandwidth of 500 ㎑. Many spectrum analyzers do not have 500 ㎑ RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 ㎒, or 500 ㎑, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (*i.e.,* 1 ㎒, or 500 ㎑). If measurements are performed using a reduced resolution bandwidth (< 1 ㎒, or < 500 ㎑) and integrated over 1 ㎒, or 500 ㎑ bandwidth, the following adjustments to the procedures apply:

   a) Set RBW ≥ 1/*T*, where *T* is defined in section II.B.1.a).
   b) Set VBW ≥ 3 RBW.
   c) If measurement bandwidth of Maximum PSD is specified in 500 ㎑, add 10log(500 ㎑/RBW) to the measured result, whereas RBW (< 500 ㎑) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
   d) If measurement bandwidth of Maximum PSD is specified in 1 ㎒, add 10log(1 ㎒/RBW) to the measured result, whereas RBW (< 1 ㎒) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
   e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

7. In case of band crossing channels 138, 142 and 144, the measurement is complied with section Ⅲ.A of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

6.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

Test mode: 11a

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	Measured PPSD (㏈m)	Duty Cycle Correction Factor (㏈)	Final PPSD (㏈m)	Limit (㏈m/1 ㎒)
U-NII 1	5 180	36	6	-4.08	0.21	-3.87	11
	5 220	44		-4.11		-3.90	
	5 240	48		-3.85		-3.64	
U-NII 2A	5 260	52		-3.96		-3.75	
	5 300	60		-3.83		-3.62	
	5 320	64		-3.98		-3.77	
U-NII 2C	5 500	100		-2.66		-2.45	
	5 580	116		-2.72		-2.51	
	5 720	144		-2.96		-2.75	
Band	**Frequency (㎒)**	**Ch.**	**Data Rate (Mbps)**	**Measured PPSD (㏈m)**	**Duty Cycle Correction Factor (㏈)**	**Final PPSD (㏈m)**	**Limit (㏈m/500 ㎑)**
U-NII 3	5 745	149	6	-6.05	0.21	-5.84	30
	5 785	157		-5.81		-5.60	
	5 825	165		-5.52		-5.31	

Test mode: 11ac_VHT20

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	Measured PPSD (㏈m)	Duty Cycle Correction Factor (㏈)	Final PPSD (㏈m)	Limit (㏈m/1 ㎒)
U-NII 1	5 180	36	MCS6	-5.20	0.42	-4.78	11
	5 220	44		-4.63		-4.21	
	5 240	48		-5.19		-4.77	
U-NII 2A	5 260	52		-4.50		-4.08	
	5 300	60		-4.77		-4.35	
	5 320	64		-4.31		-3.89	
U-NII 2C	5 500	100		-3.39		-2.97	
	5 580	116		-3.54		-3.12	
	5 720	144		-3.55		-3.13	
Band	**Frequency (㎒)**	**Ch.**	**Data Rate (Mbps)**	**Measured PPSD (㏈m)**	**Duty Cycle Correction Factor (㏈)**	**Final PPSD (㏈m)**	**Limit (㏈m/500 ㎑)**
U-NII 3	5 745	149	MCS6	-6.32	0.42	-5.90	30
	5 785	157		-6.57		-6.15	
	5 825	165		-6.36		-5.94	

Test mode: 11ac_VHT40

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	Measured PPSD (㏈ m)	Duty Cycle Correction Factor (㏈)	Final PPSD (㏈ m)	Limit (㏈ m/1 ㎒)
U-NII 1	5 190	38	MCS5	-13.06	2.16	-10.90	11
	5 230	46		-13.49		-11.33	
U-NII 2A	5 270	54		-10.71		-8.55	
	5 310	62		-9.71		-7.55	
U-NII 2C	5 510	102		-8.27		-6.11	
	5 550	110		-9.31		-7.15	
	5 710	142		-8.77		-6.61	
Band	**Frequency (㎒)**	**Ch.**	**Data Rate (Mbps)**	**Measured PPSD (㏈ m)**	**Duty Cycle Correction Factor (㏈)**	**Final PPSD (㏈ m)**	**Limit (㏈ m/500 ㎑)**
U-NII 3	5 755	151	MCS5	-11.96	2.16	-9.80	30
	5 795	159		-11.86		-9.70	

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	Measured PPSD (㏈ m)	Duty Cycle Correction Factor (㏈)	Final PPSD (㏈ m)	Limit (㏈ m/1 ㎒)
U-NII 1	5 210	42	MCS7	-17.86	3.45	-14.41	11
U-NII 2A	5 290	58		-15.21		-11.76	
U-NII 2C	5 530	106		-14.40		-10.95	
	5 690	138		-14.51		-11.06	
Band	**Frequency (㎒)**	**Ch.**	**Data Rate (Mbps)**	**Measured PPSD (㏈ m)**	**Duty Cycle Correction Factor (㏈)**	**Final PPSD (㏈ m)**	**Limit (㏈ m/500 ㎑)**
U-NII 3	5 775	155	MCS7	-17.06	3.45	-13.61	30

Remark;

1. Final PPSD (㏈ m) = Measured PPSD (㏈ m) + Duty Cycle Correction Factor (㏈)

Band-crossing channels

Mode	Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	Measured PPSD (㏈m)	Duty Cycle Correction Factor (㏈)	Final PPSD (㏈m)	Limit (㏈m/1㎒ or ㏈m/500㎑)
11a	U-NII 2C	5 720	144	6	-3.09	0.21	-2.88	11
	U-NII 3	5 720	144		-7.59		-7.59	30
11ac_VHT20	U-NII 2C	5 720	144	MCS6	-3.12	0.42	-2.70	11
	U-NII 3	5 720	144		-8.27		-8.27	30
11ac_VHT40	U-NII 2C	5 710	142	MCS5	-8.79	2.16	-6.63	11
	U-NII 3	5 710	142		-14.35		-14.35	30
11ac_VHT80	U-NII 2C	5 690	138	MCS7	-14.68	3.45	-11.23	11
	U-NII 3	5 690	138		-17.79		-17.79	30

Remark;

1. Final PPSD (㏈m) = Measured PPSD (㏈m) + Duty Cycle Correction Factor (㏈)