

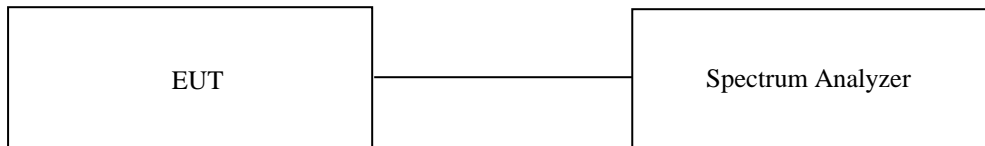
9. MAXIMUM CONDUCTED OUTPUT POWER

9.1 Operating environment

Temperature : 23 °C
 Relative humidity : 45 % R.H.

9.2 Test set-up

The maximum peak output power was measured with the spectrum analyzer connected to the antenna output of the EUT. The spectrum analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 26 dB & 6 dB bandwidth. The EUT was operating in transmit mode at the appropriate center frequency.



9.3 Test Date

June 08, 2021 ~ June 22, 2021

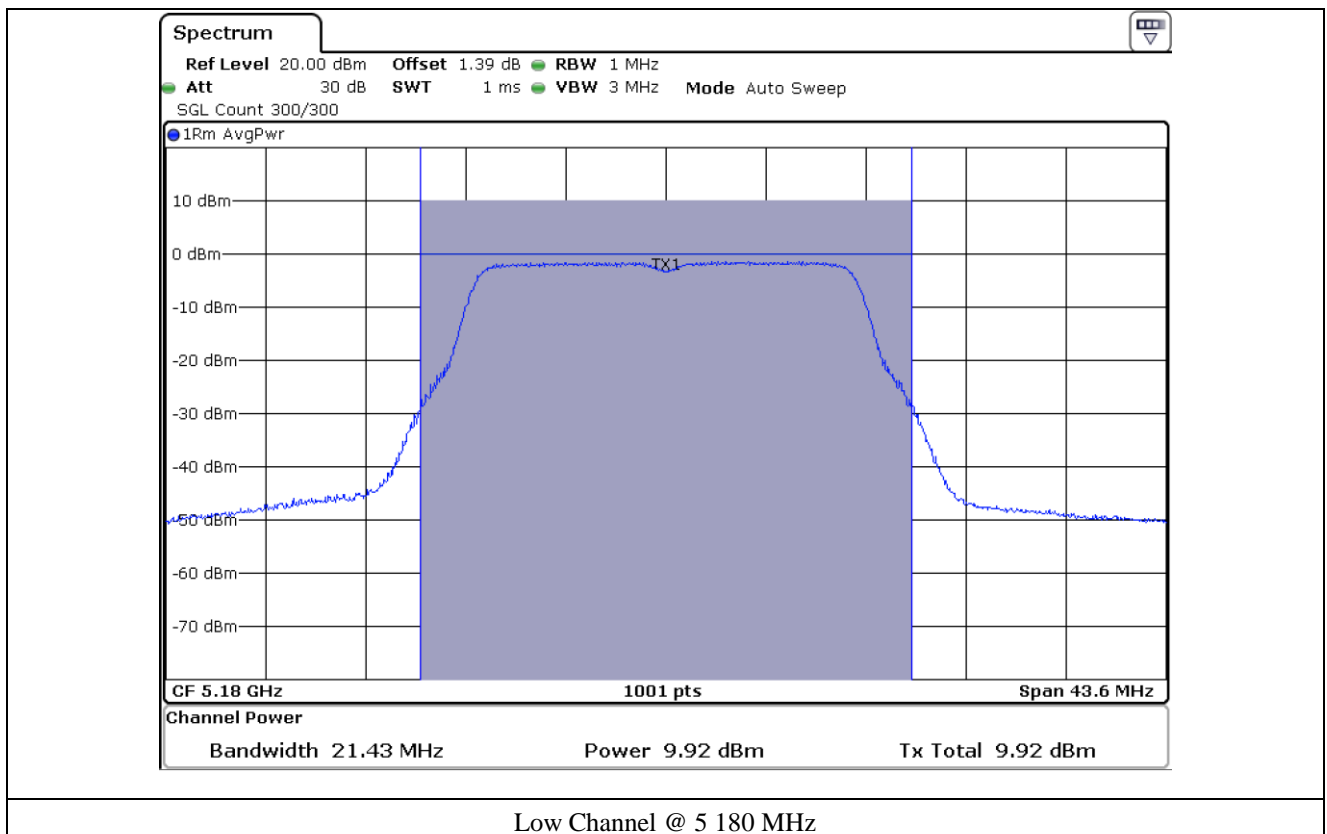
9.4 Test data for 802.11a RLAN Mode

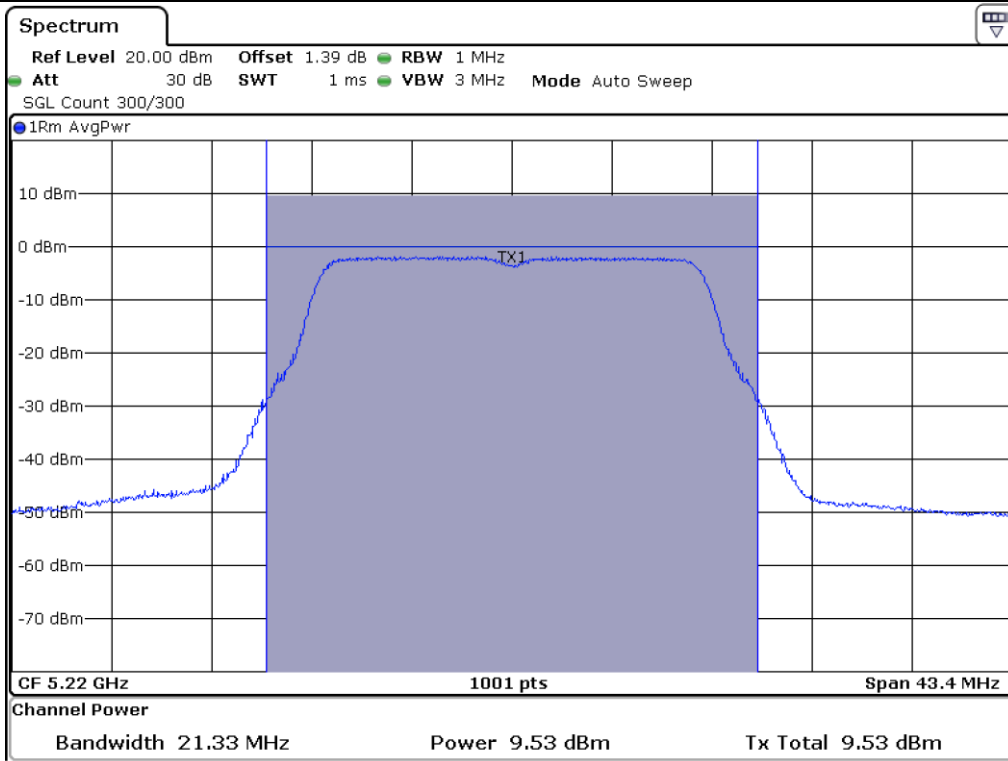
9.4.1 Test data for Antenna 0

- Test Result : Pass
- Duty Cycle : 92.41 % (UNII 1), 91.95 % (UNII 3)

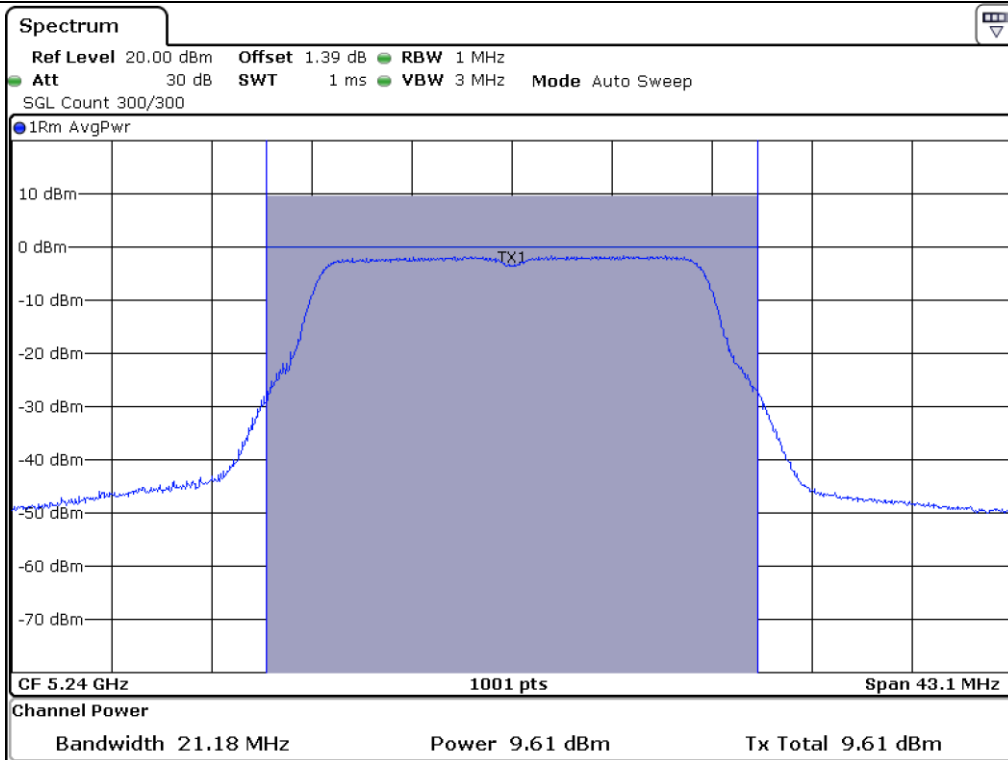
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180.00	9.92	0.34	10.26	24.00	13.74
	Middle	5 220.00	9.53	0.34	9.87	24.00	14.13
	High	5 240.00	9.61	0.34	9.95	24.00	14.05
5 725 ~ 5 850	Low	5 745.00	9.42	0.36	9.78	30.00	20.22
	Middle	5 785.00	9.94	0.36	10.30	30.00	19.70
	High	5 825.00	9.75	0.36	10.11	30.00	19.89

Remark. Margin = Limit – Result (=Measured Value + C.F.)

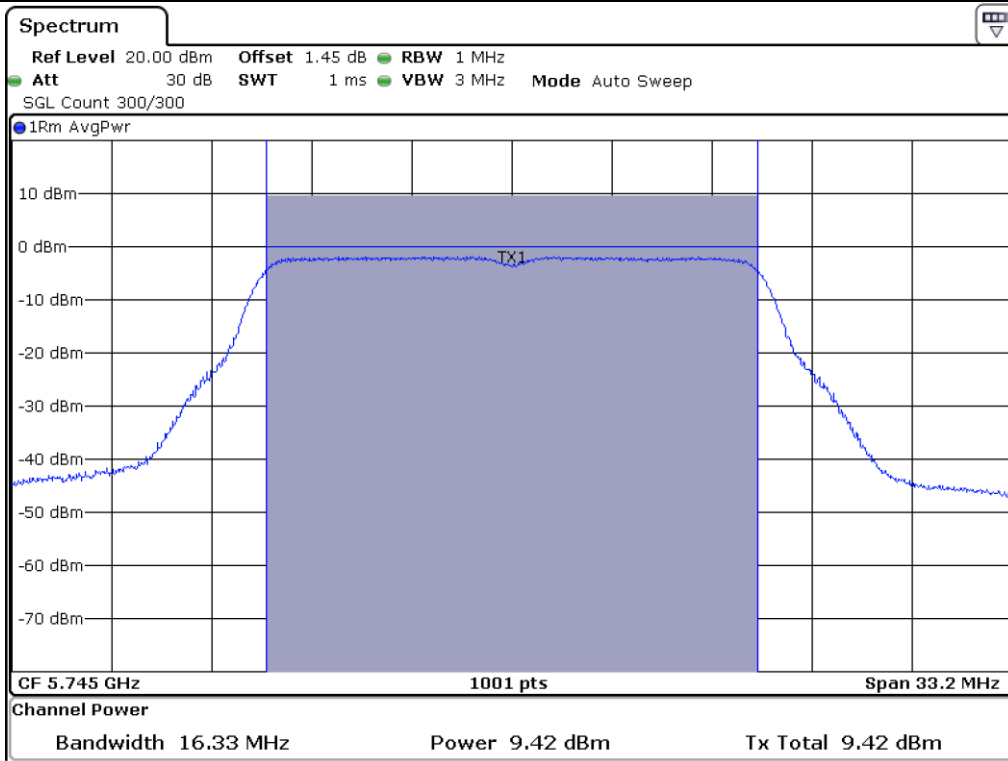




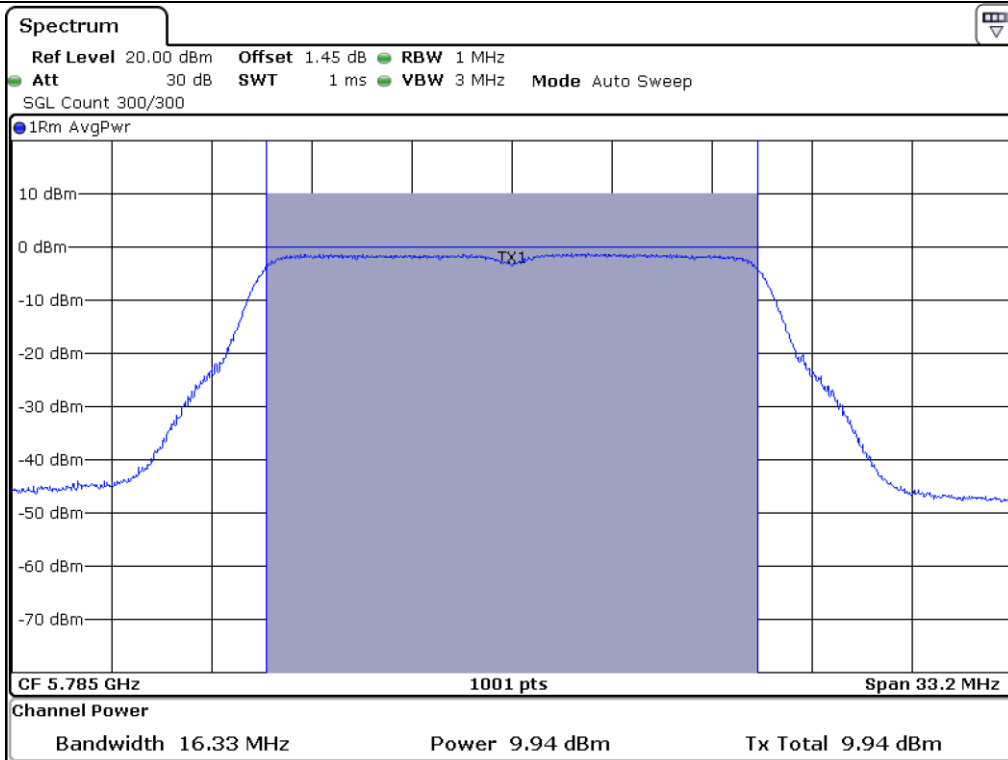
Middle Channel @ 5 220 MHz



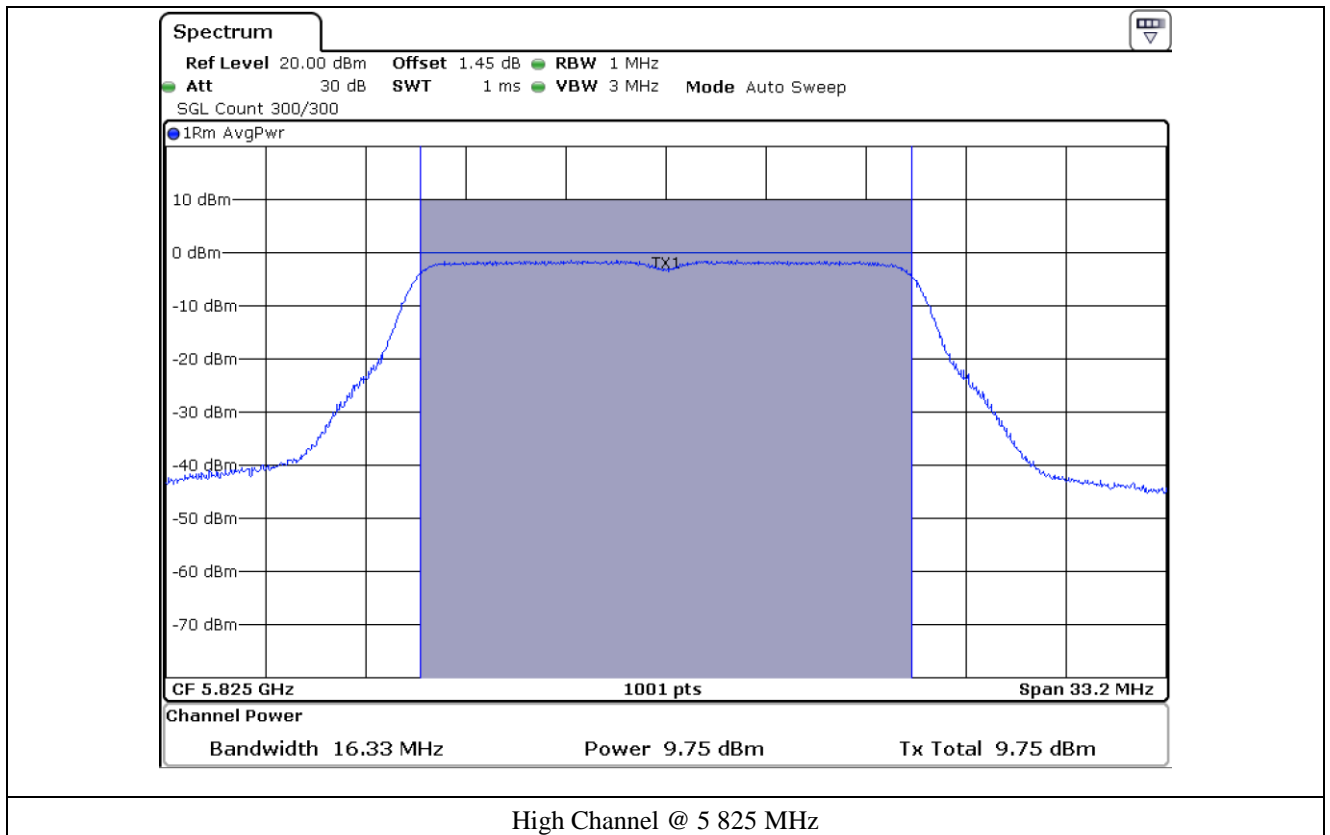
High Channel @ 5 240 MHz



Low Channel @ 5 745 MHz



Middle Channel @ 5 785 MHz

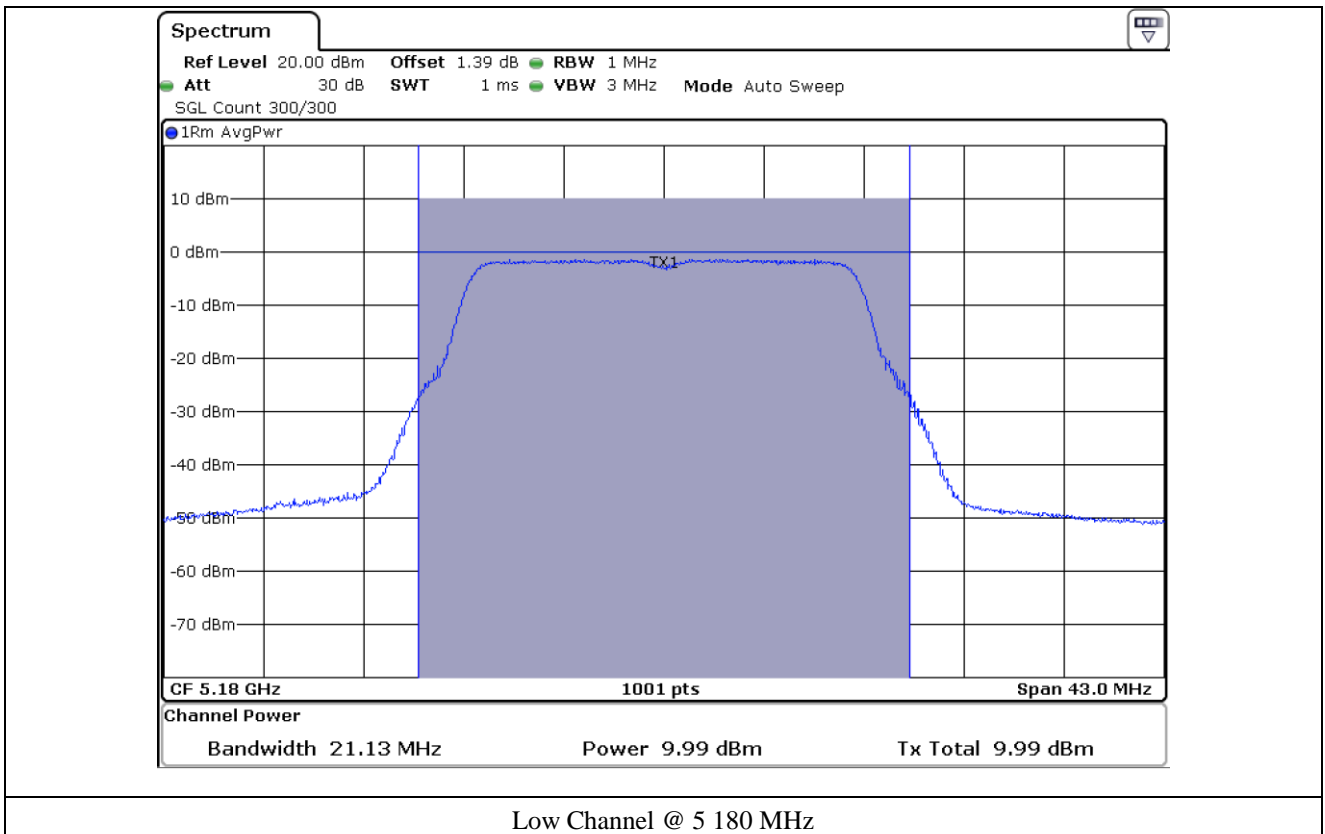


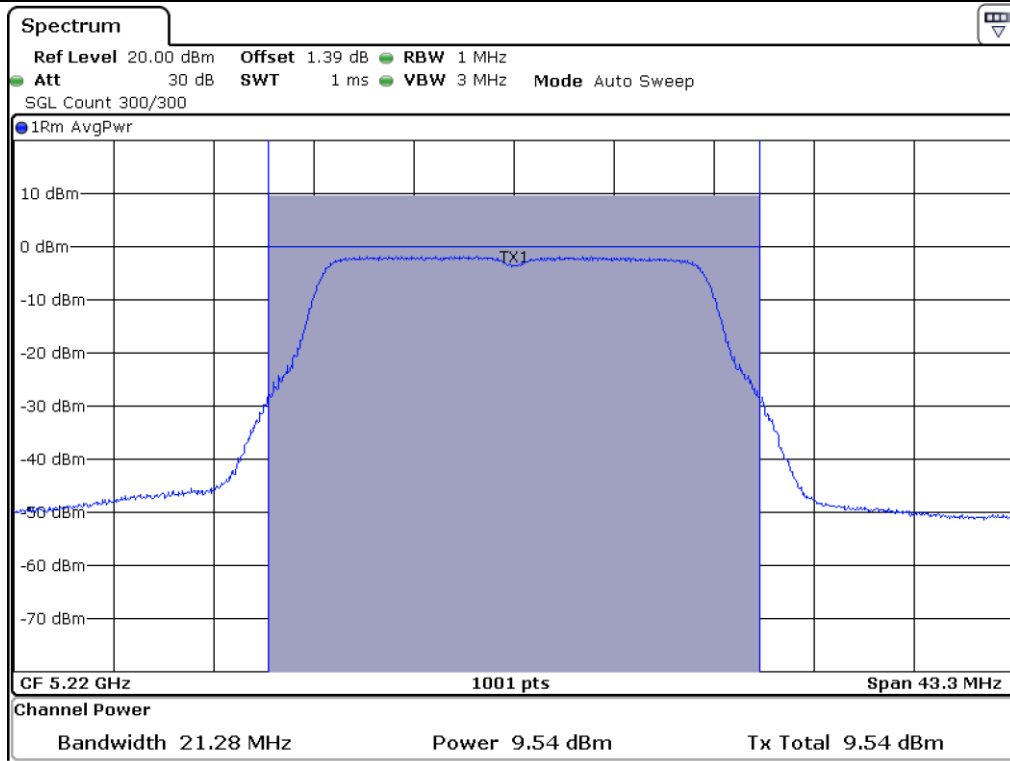
9.4.2 Test data for Antenna 1

-. Test Result : Pass
 -. Duty Cycle : 92.41 % (UNII 1), 91.95 % (UNII 3)

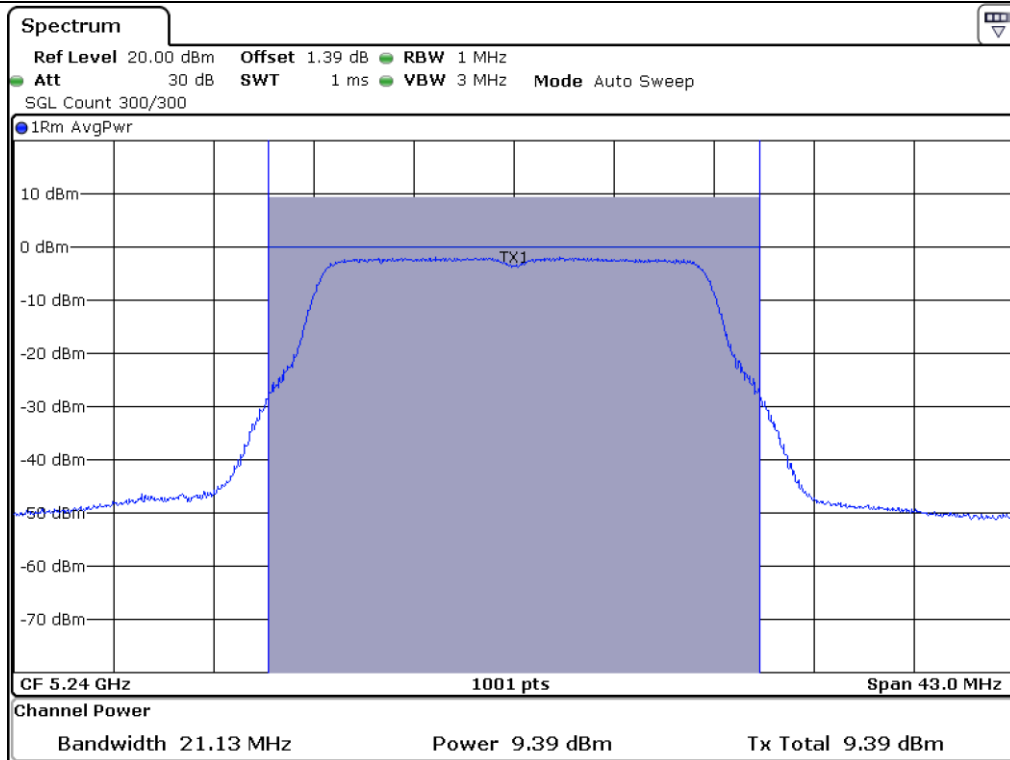
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180.00	9.99	0.34	10.33	24.00	14.01
	Middle	5 220.00	9.54	0.34	9.88	24.00	14.46
	High	5 240.00	9.39	0.34	9.73	24.00	14.61
5 725 ~ 5 850	Low	5 745.00	8.51	0.36	8.87	30.00	21.49
	Middle	5 785.00	8.77	0.36	9.13	30.00	21.23
	High	5 825.00	8.44	0.36	8.80	30.00	21.56

Remark. Margin = Limit – Result (=Measured Value + C.F.)

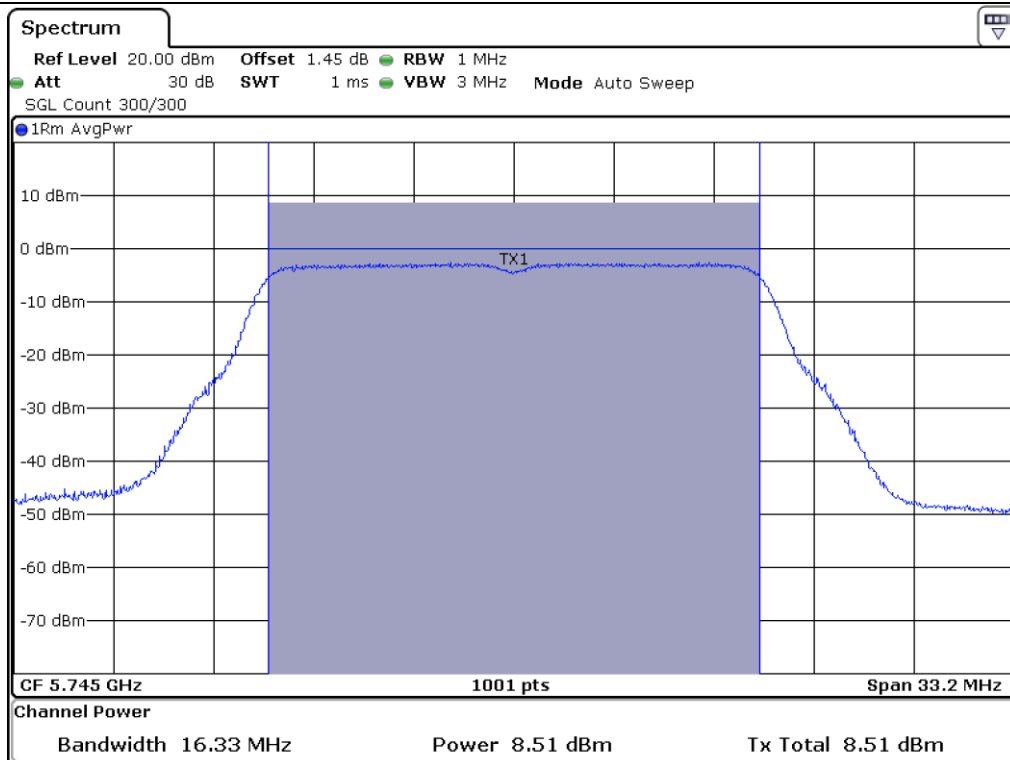




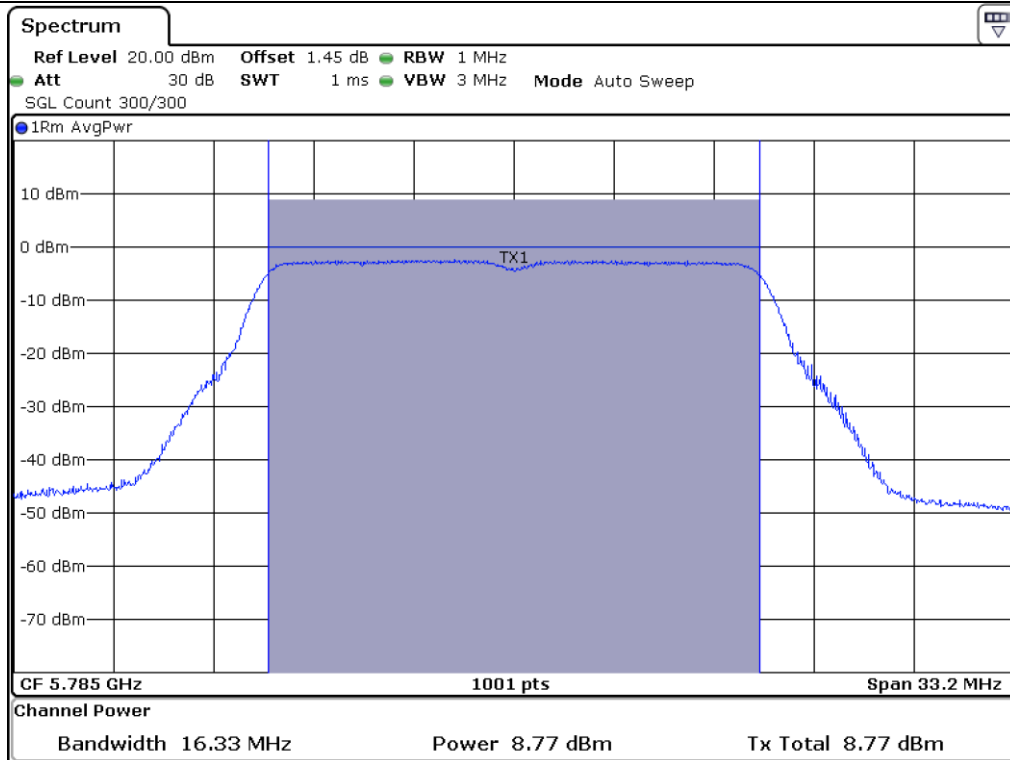
Middle Channel @ 5 220 MHz



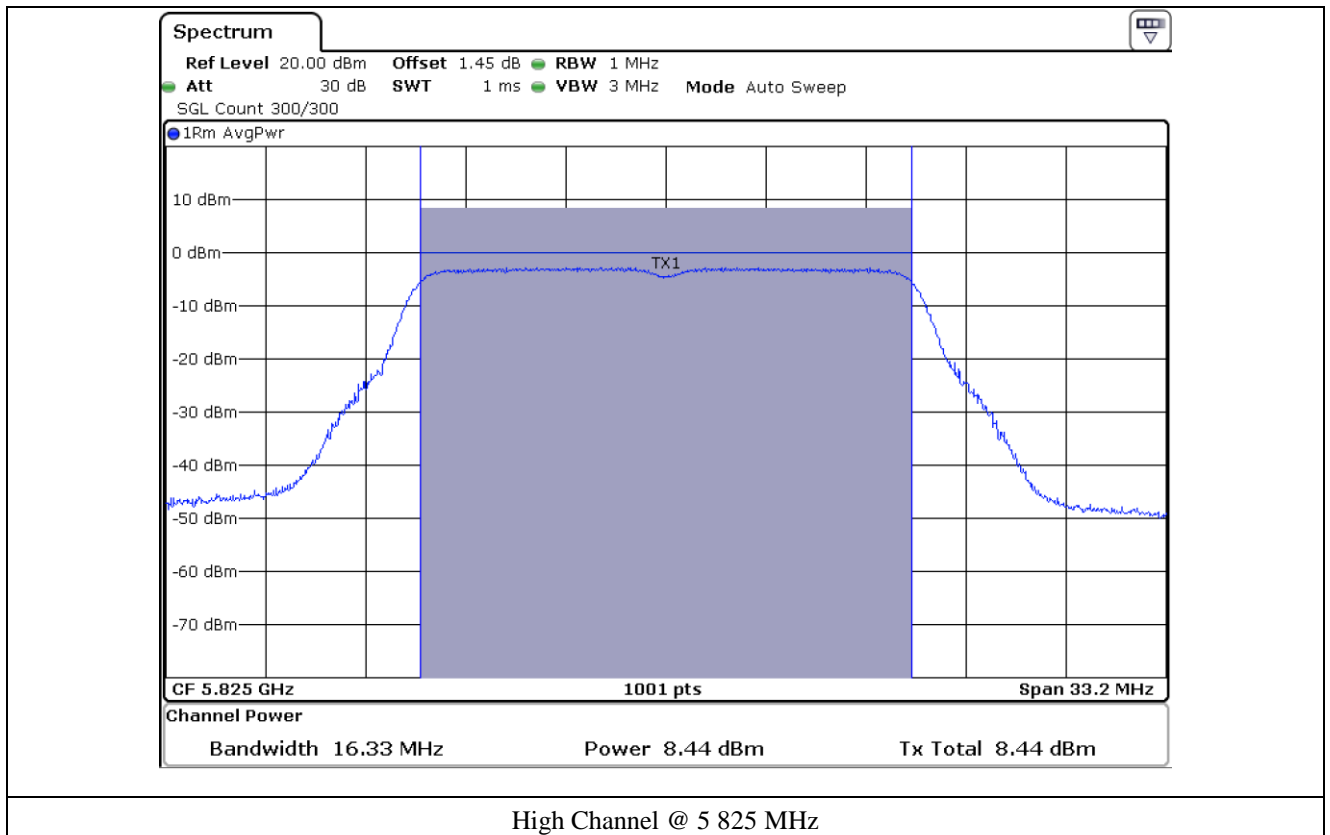
High Channel @ 5 240 MHz



Low Channel @ 5.745 MHz



Middle Channel @ 5.785 MHz



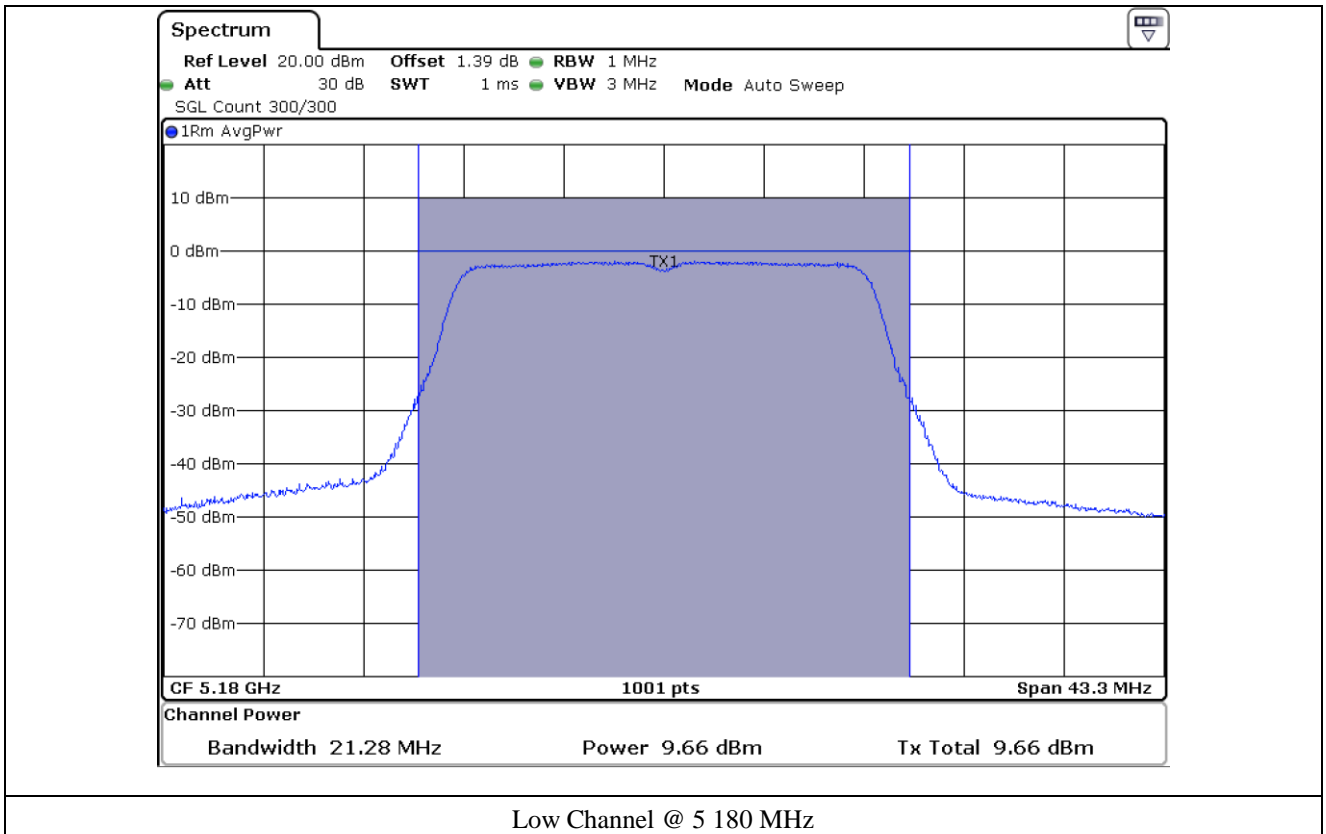
9.5 Test data for 802.11n_HT20 RLAN Mode

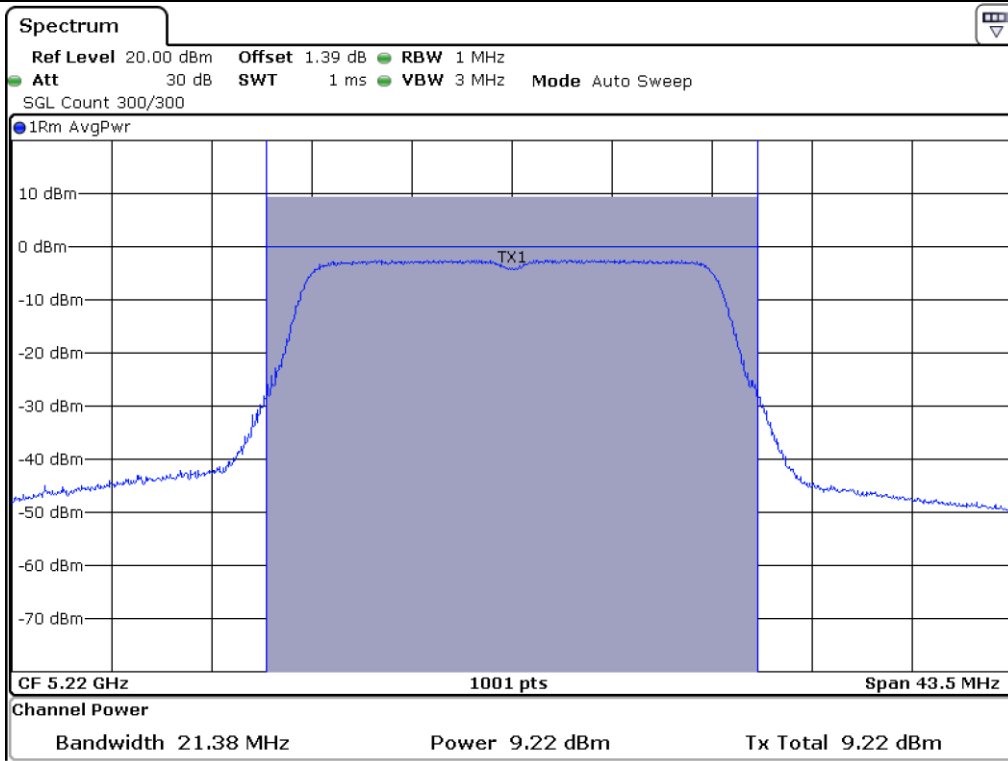
9.5.1 Test data for Antenna 0

- Test Result : Pass
- Duty Cycle : 87.20 % (UNII 1), 87.20 % (UNII 3)

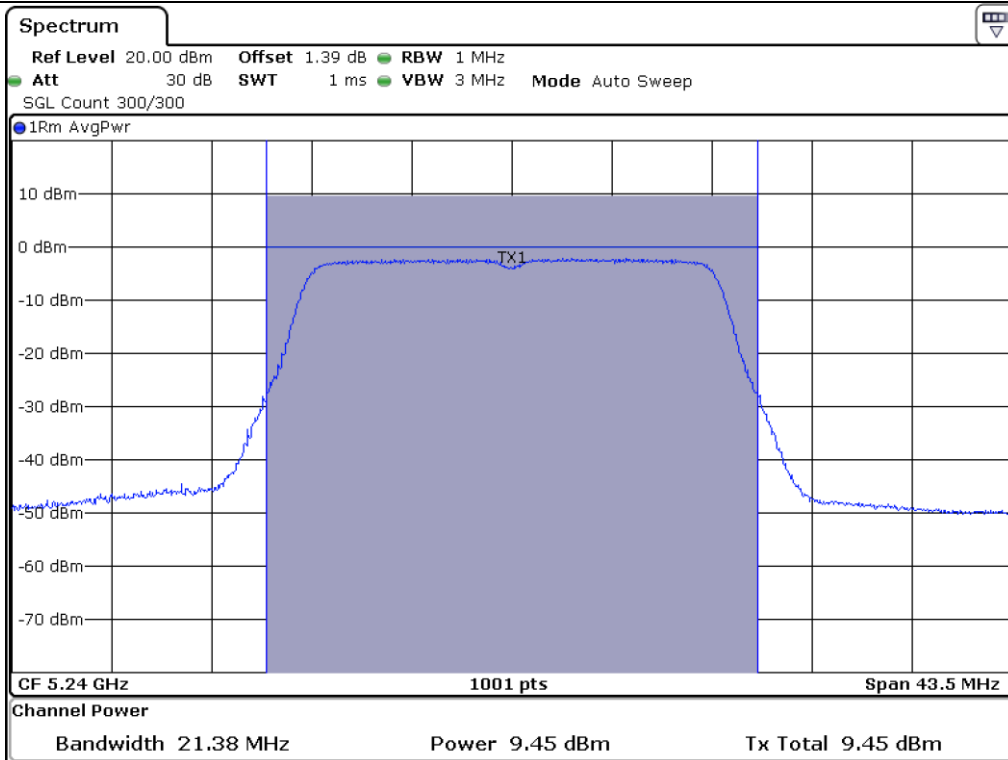
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180.00	9.66	0.59	10.25	24.00	13.75
	Middle	5 220.00	9.22	0.59	9.81	24.00	14.19
	High	5 240.00	9.45	0.59	10.04	24.00	13.96
5 725 ~ 5 850	Low	5 745.00	9.55	0.59	10.14	30.00	19.86
	Middle	5 785.00	9.67	0.59	10.26	30.00	19.74
	High	5 825.00	9.43	0.59	10.02	30.00	19.98

Remark. Margin = Limit – Result (=Measured Value + C.F.)

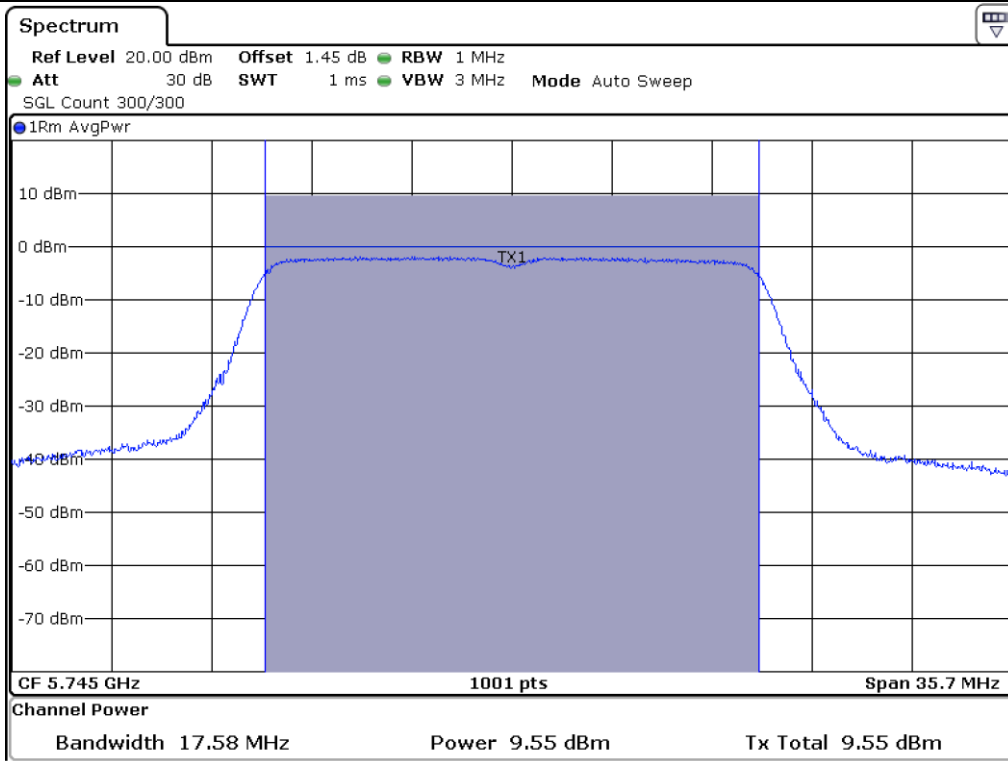




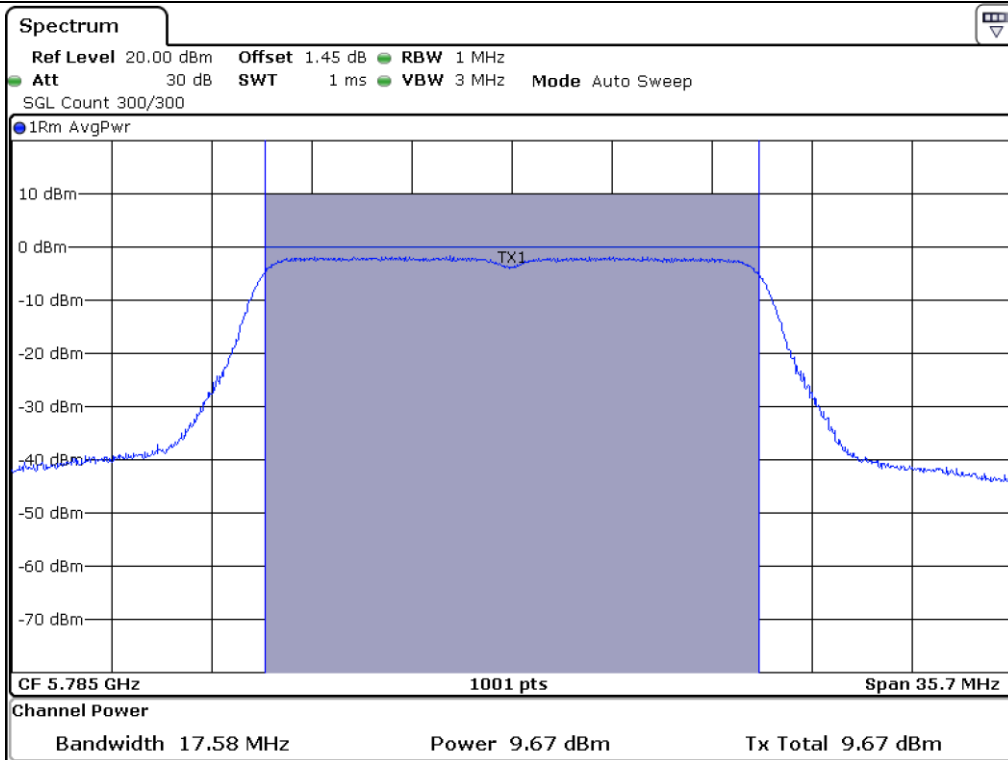
Middle Channel @ 5 220 MHz



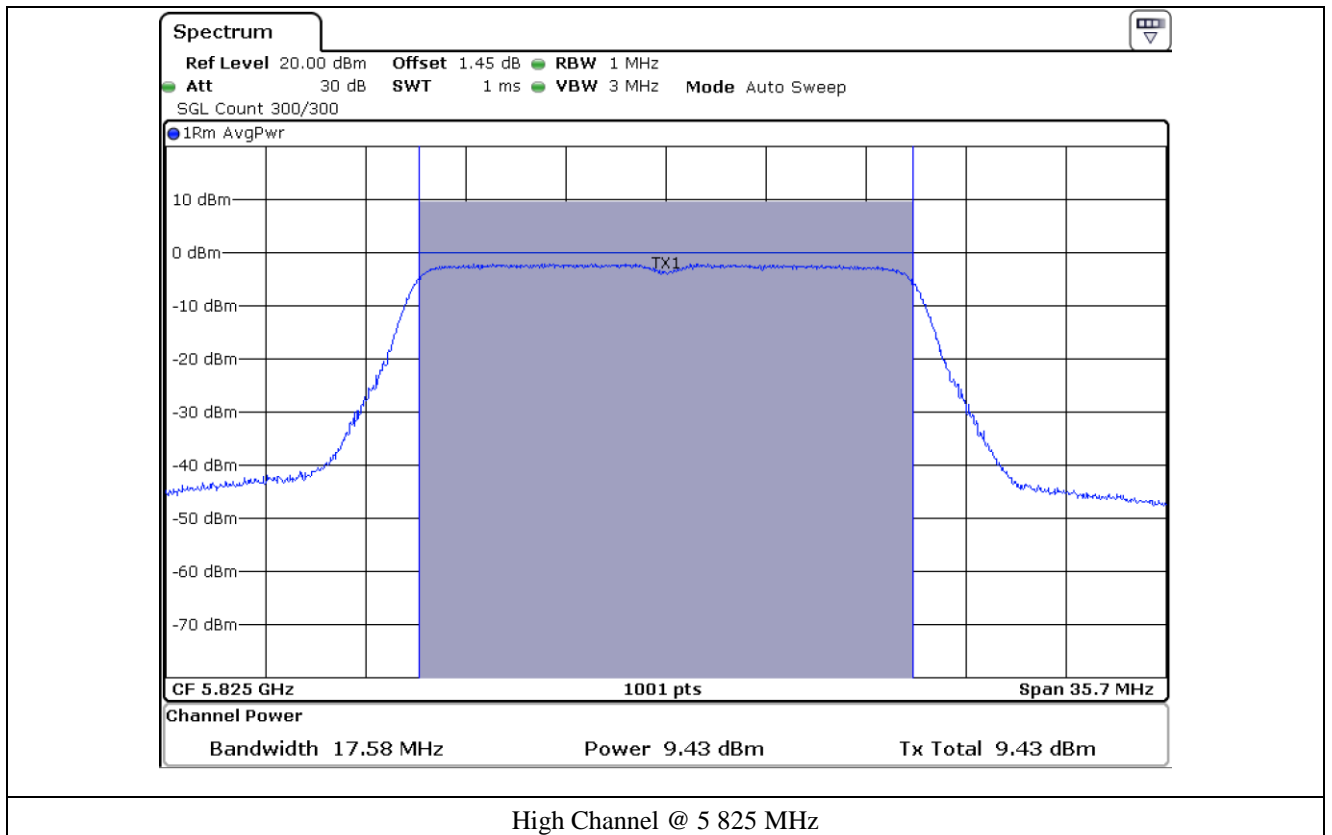
High Channel @ 5 240 MHz



Low Channel @ 5 745 MHz



Middle Channel @ 5 785 MHz



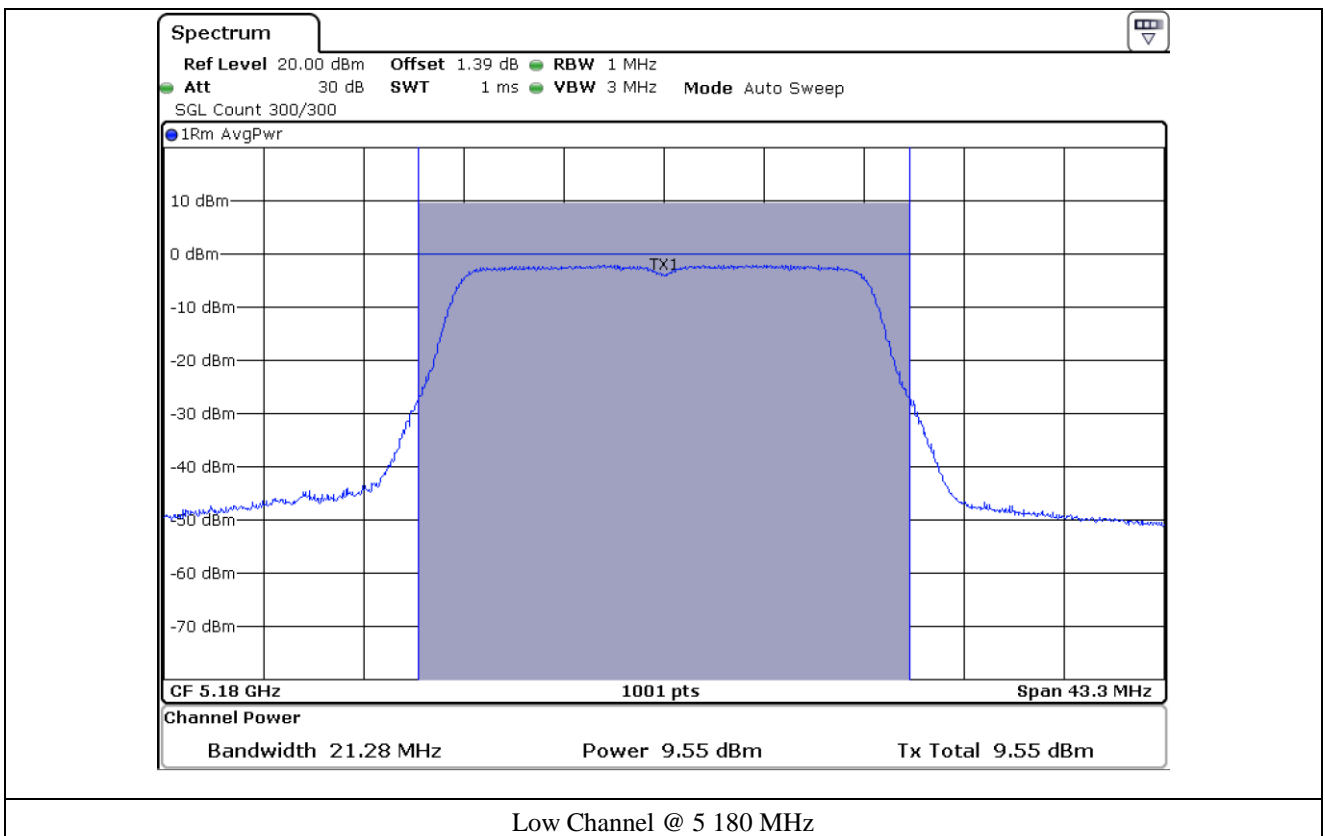
9.5.2 Test data for Antenna 1

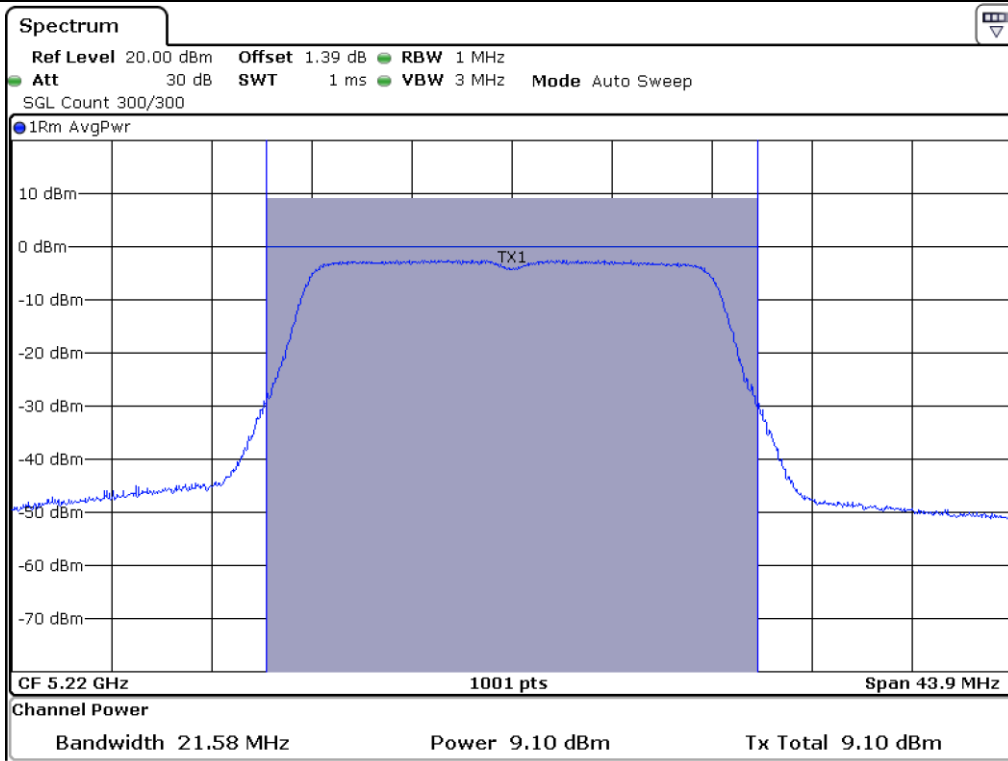
-. Test Result : Pass

-. Duty Cycle : 87.20 % (UNII 1), 87.20 % (UNII 3)

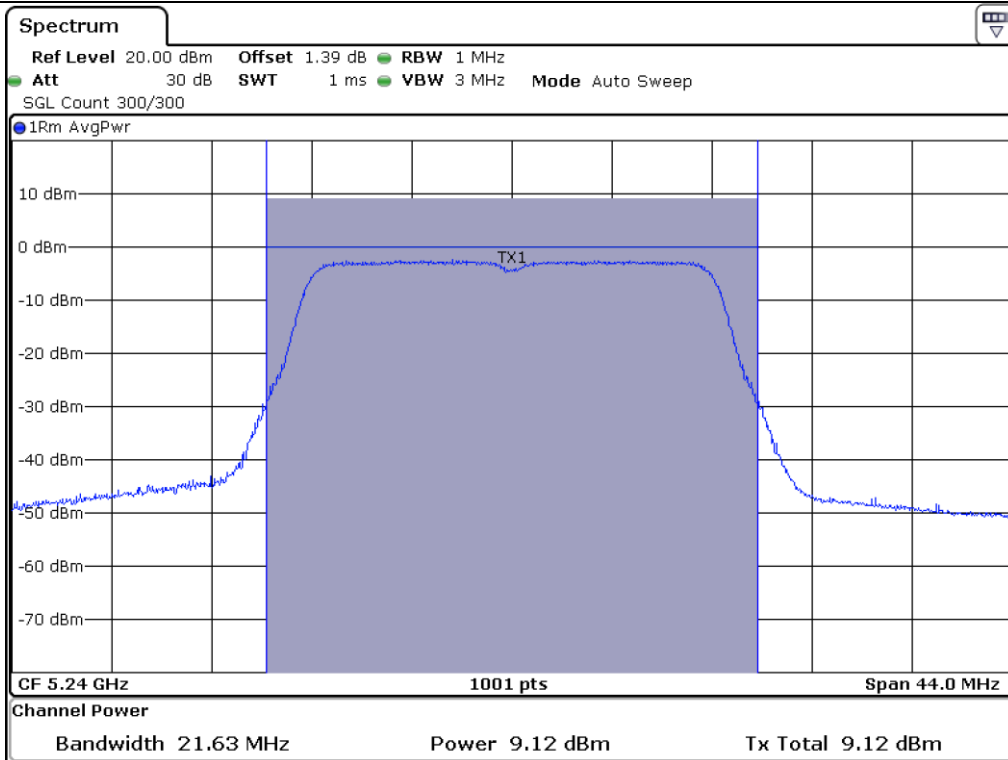
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180.00	9.55	0.59	10.14	24.00	13.86
	Middle	5 220.00	9.10	0.59	9.69	24.00	14.31
	High	5 240.00	9.12	0.59	9.71	24.00	14.29
5 725 ~ 5 850	Low	5 745.00	8.01	0.59	8.60	30.00	21.40
	Middle	5 785.00	8.49	0.59	9.08	30.00	20.92
	High	5 825.00	7.94	0.59	8.53	30.00	21.47

Remark. Margin = Limit – Result (=Measured Value + C.F.)

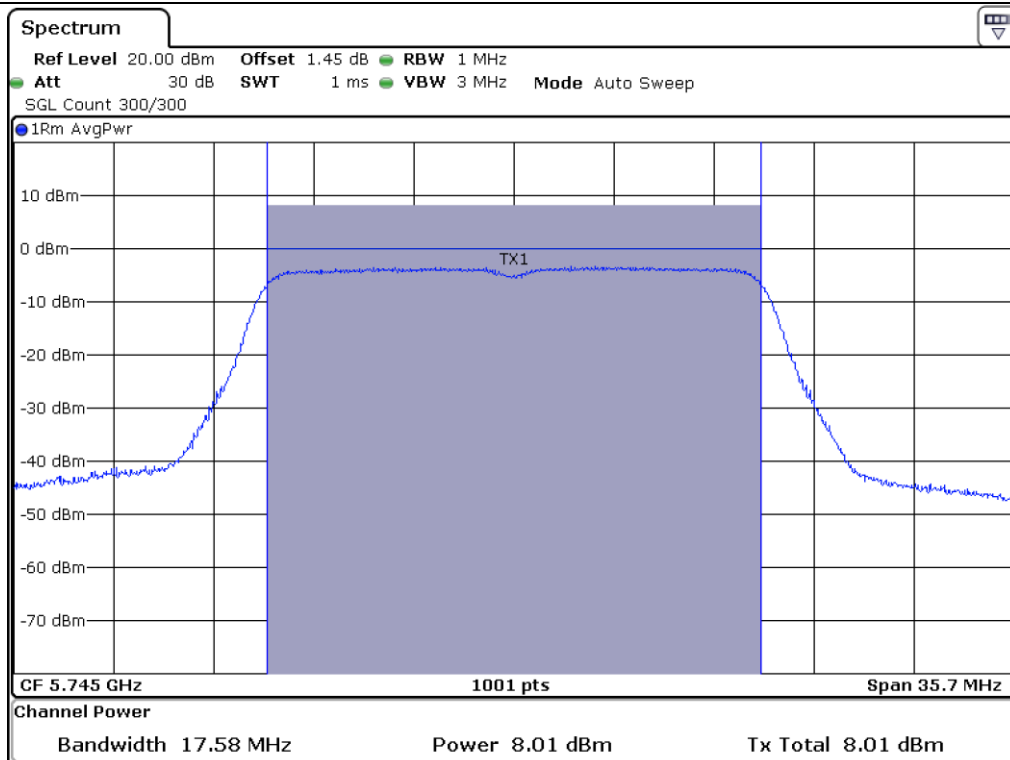




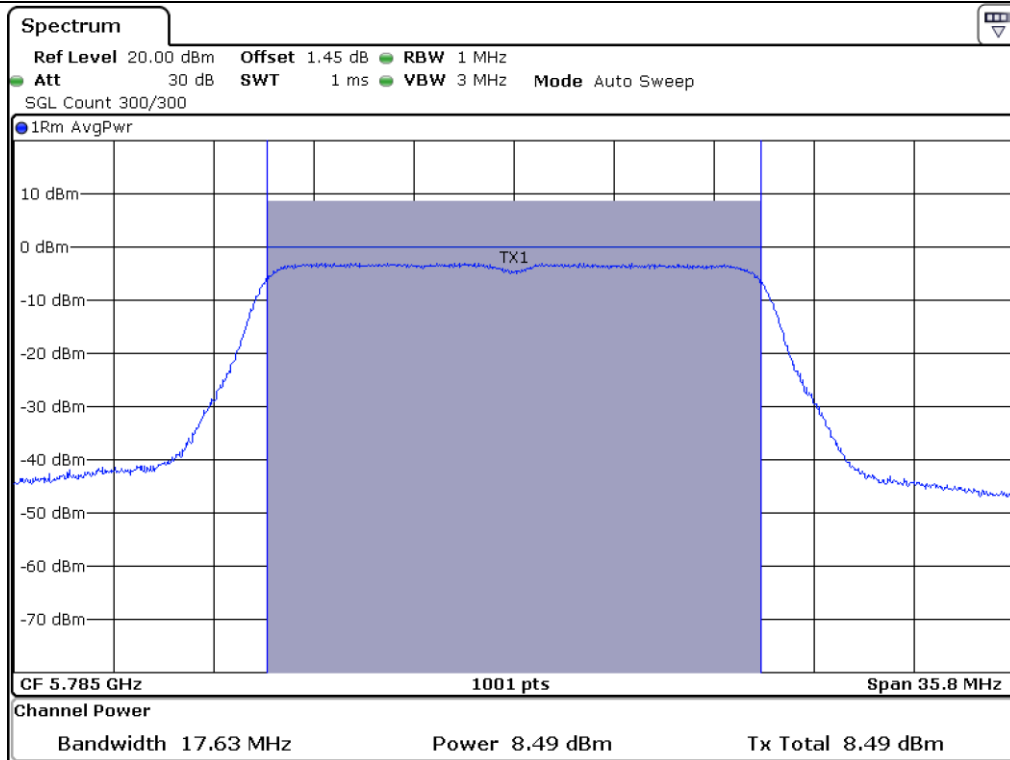
Middle Channel @ 5 220 MHz



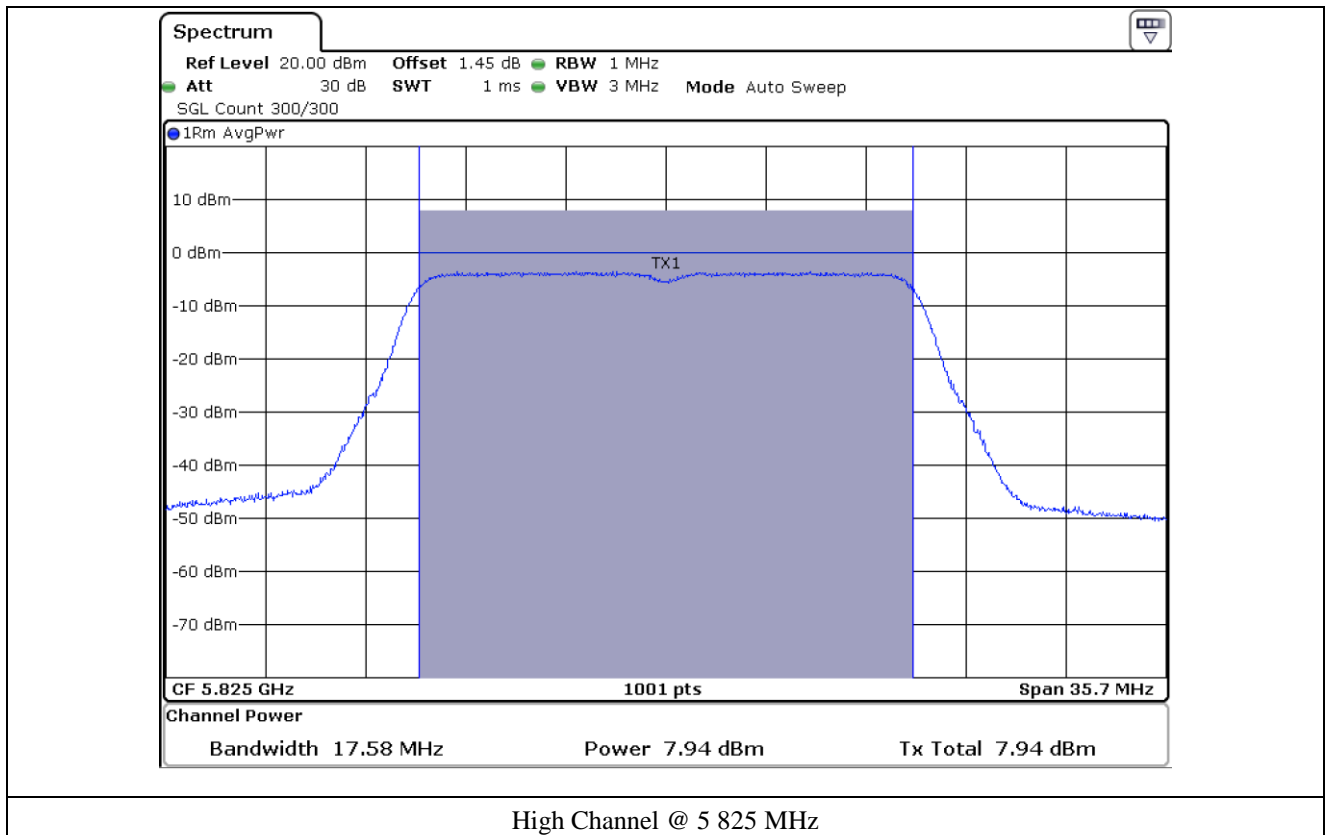
High Channel @ 5 240 MHz



Low Channel @ 5 745 MHz



Middle Channel @ 5 785 MHz



9.5.3 Test data for Multiple Transmit

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 180.00	12.62	0.59	13.21	24.00	10.79
	Middle	5 220.00	12.17	0.59	12.76	24.00	11.24
	High	5 240.00	12.30	0.59	12.89	24.00	11.11
5 725 ~ 5 850	Low	5 745.00	11.86	0.59	12.45	29.21	16.76
	Middle	5 785.00	12.13	0.59	12.72	29.21	16.49
	High	5 825.00	11.76	0.59	12.35	29.21	16.86

Remark. Margin = Limit – Result (=Measured Value + C.F.)

9.6 Test data for 802.11n_HT40 RLAN Mode

9.6.1 Test data for Antenna 0

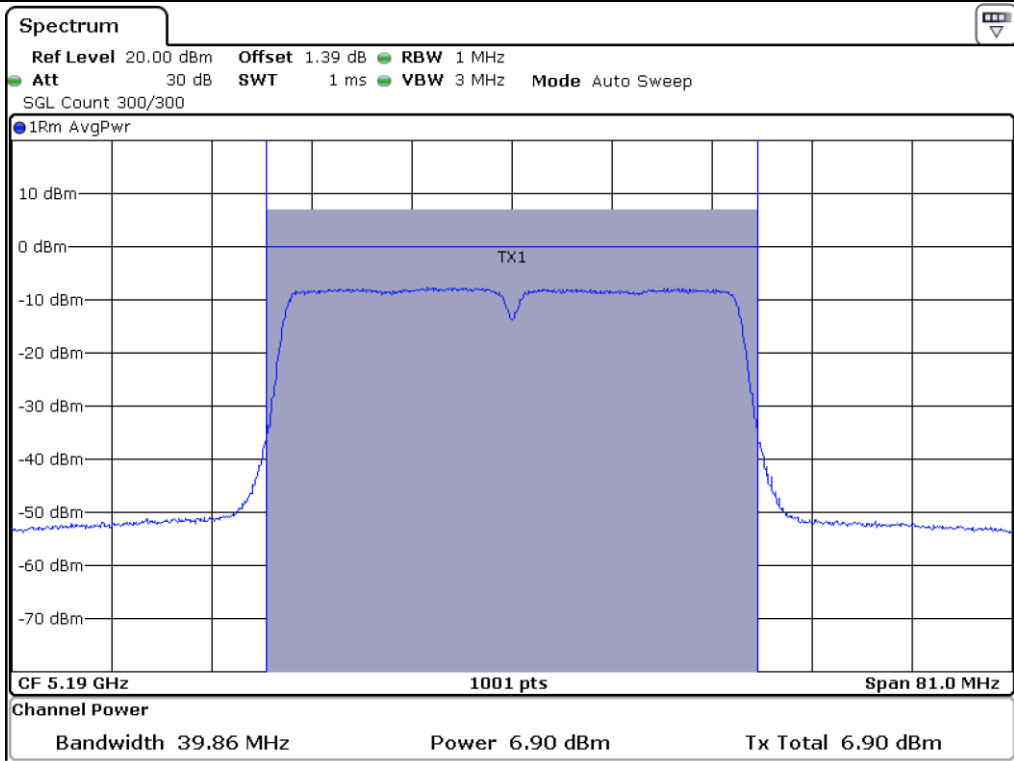
- . Test Result : Pass

- . Duty Cycle : 77.90 % (UNII 1), 77.90 % (UNII 3)

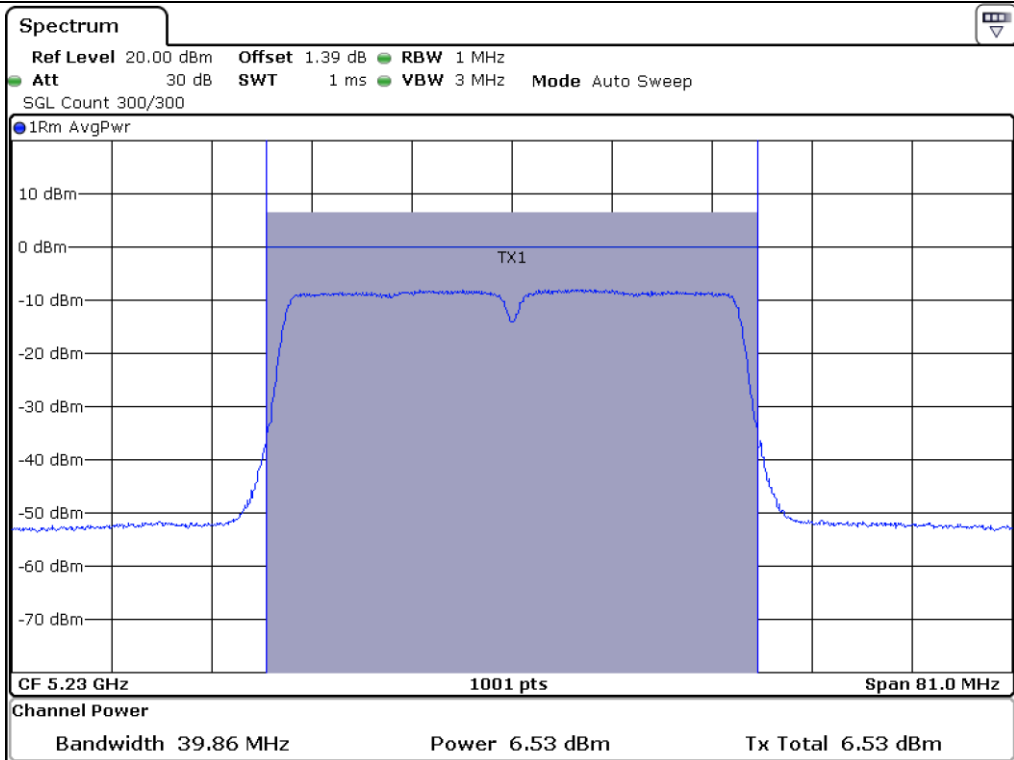
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190.00	6.90	1.08	7.98	24.00	16.02
	High	5 230.00	6.53	1.08	7.61	24.00	16.39
5 725 ~ 5 850	Low	5 755.00	6.75	1.08	7.83	30.00	22.17
	High	5 795.00	7.17	1.08	8.25	30.00	21.75

Remark. Margin = Limit – Result (=Measured Value + C.F.)

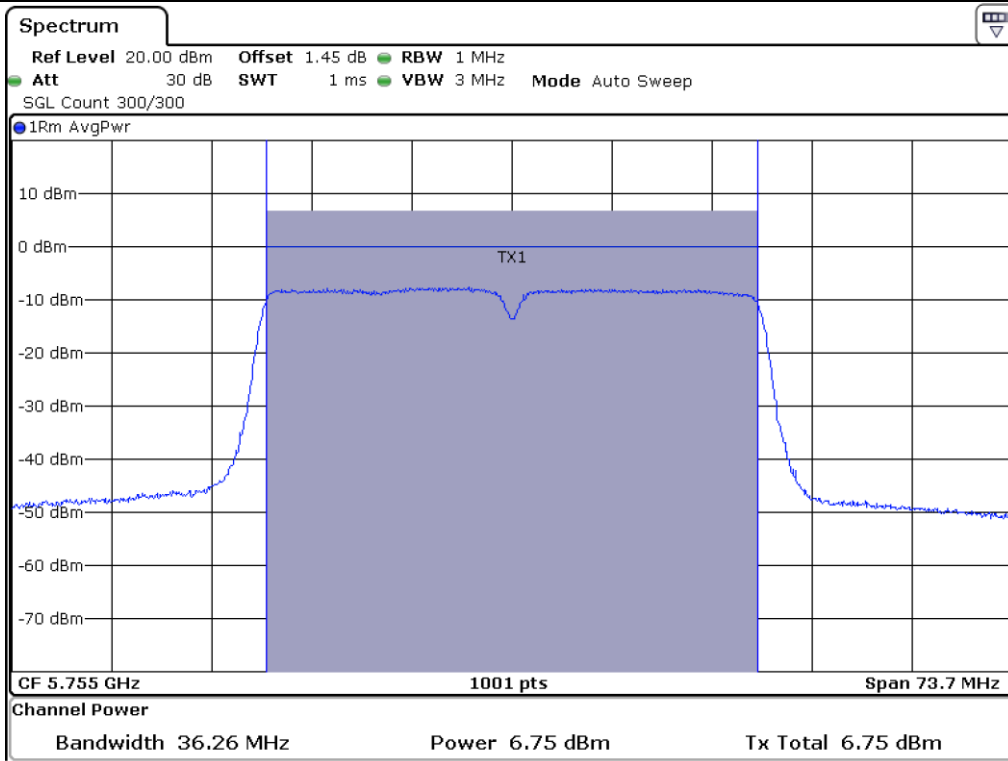
Remark: See next page for measurement data.



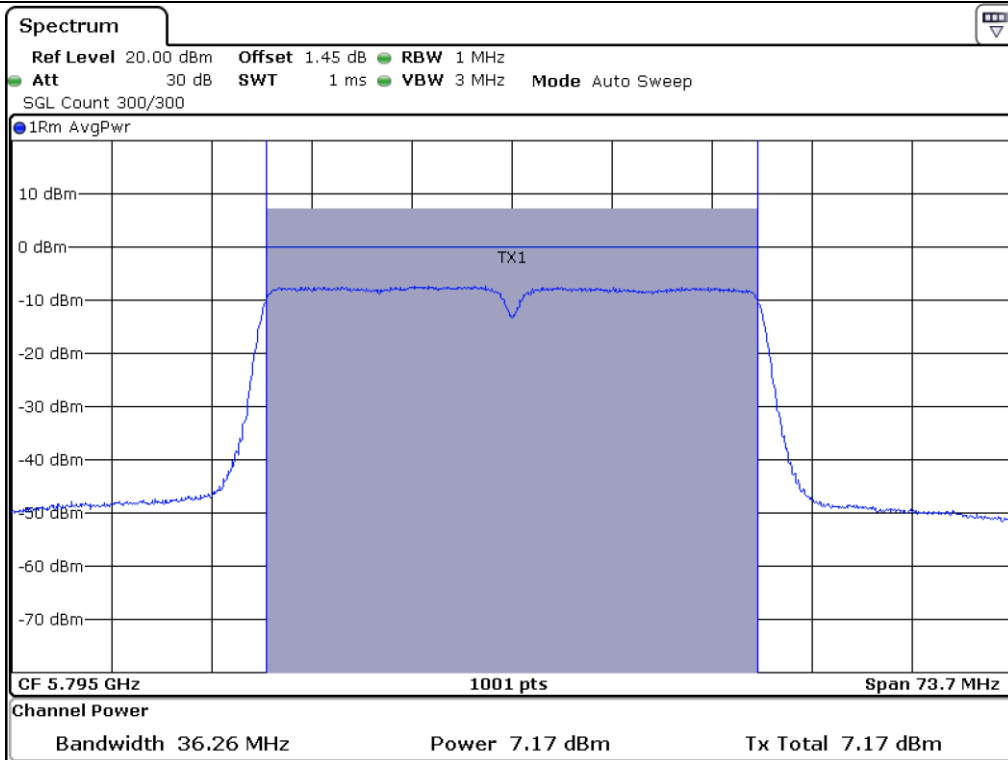
Low Channel @ 5 190 MHz



High Channel @ 5 230 MHz



Low Channel @ 5.755 MHz



High Channel @ 5.795 MHz

9.6.2 Test data for Antenna 1

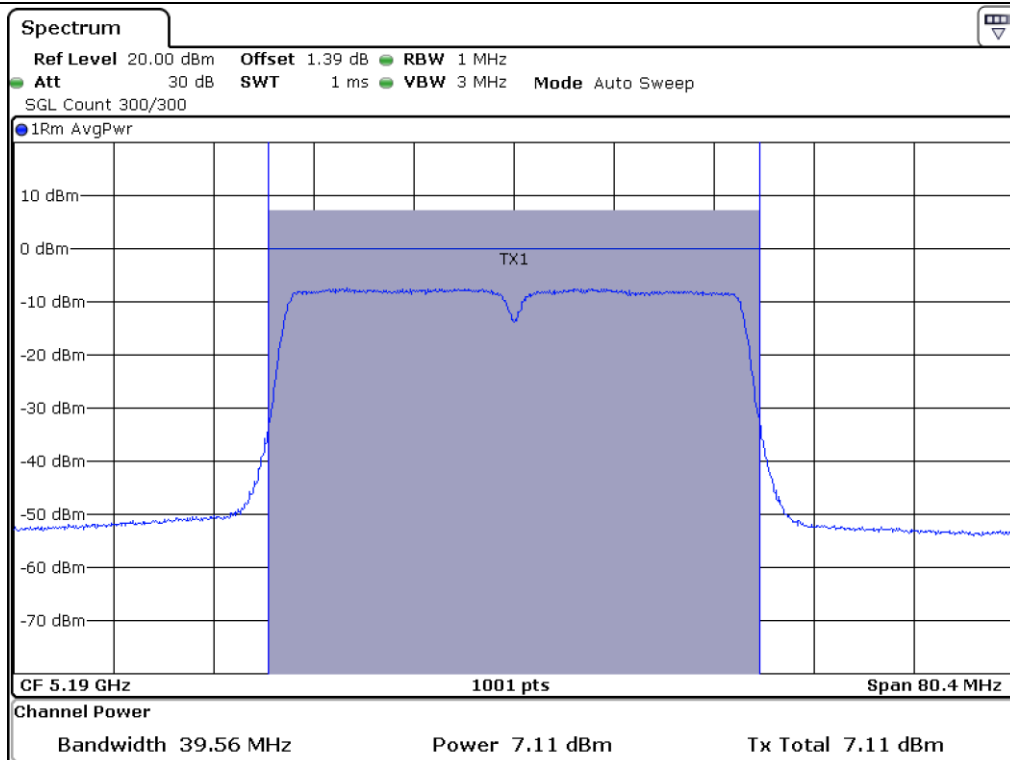
-. Test Result : Pass

-. Duty Cycle : 77.90 % (UNII 1), 77.90 % (UNII 3)

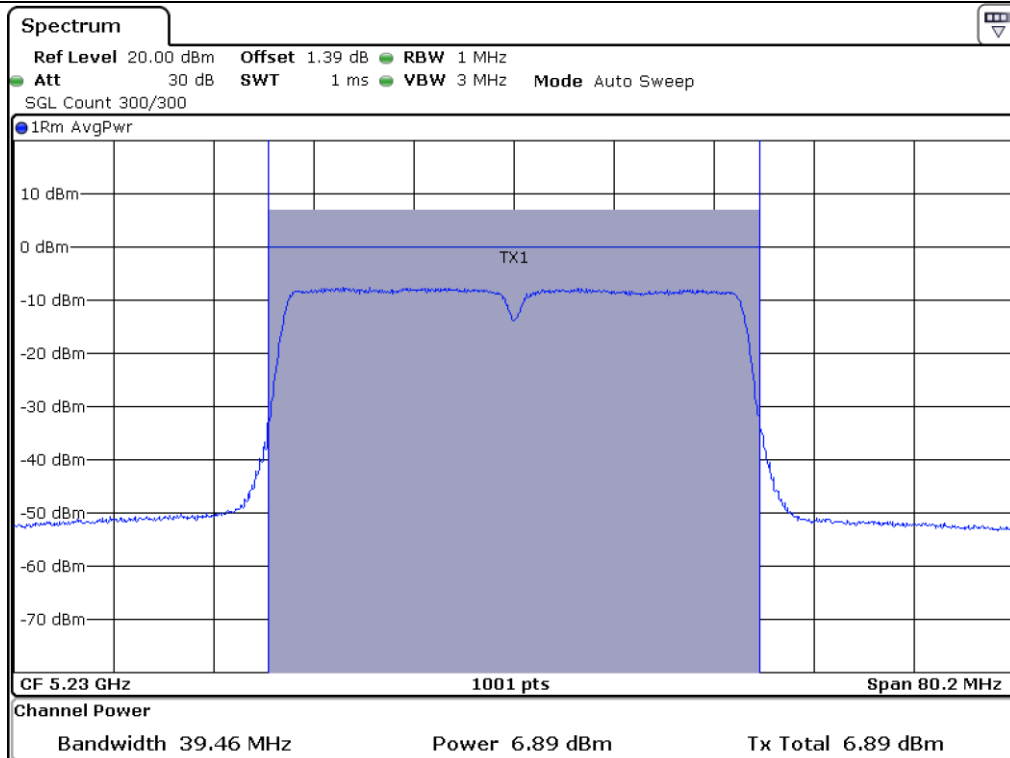
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190.00	7.11	1.08	8.19	24.00	15.81
	High	5 230.00	6.89	1.08	7.97	24.00	16.03
5 725 ~ 5 850	Low	5 755.00	6.17	1.08	7.25	30.00	22.75
	High	5 795.00	6.34	1.08	7.42	30.00	22.58

Remark. Margin = Limit – Result (=Measured Value + C.F.)

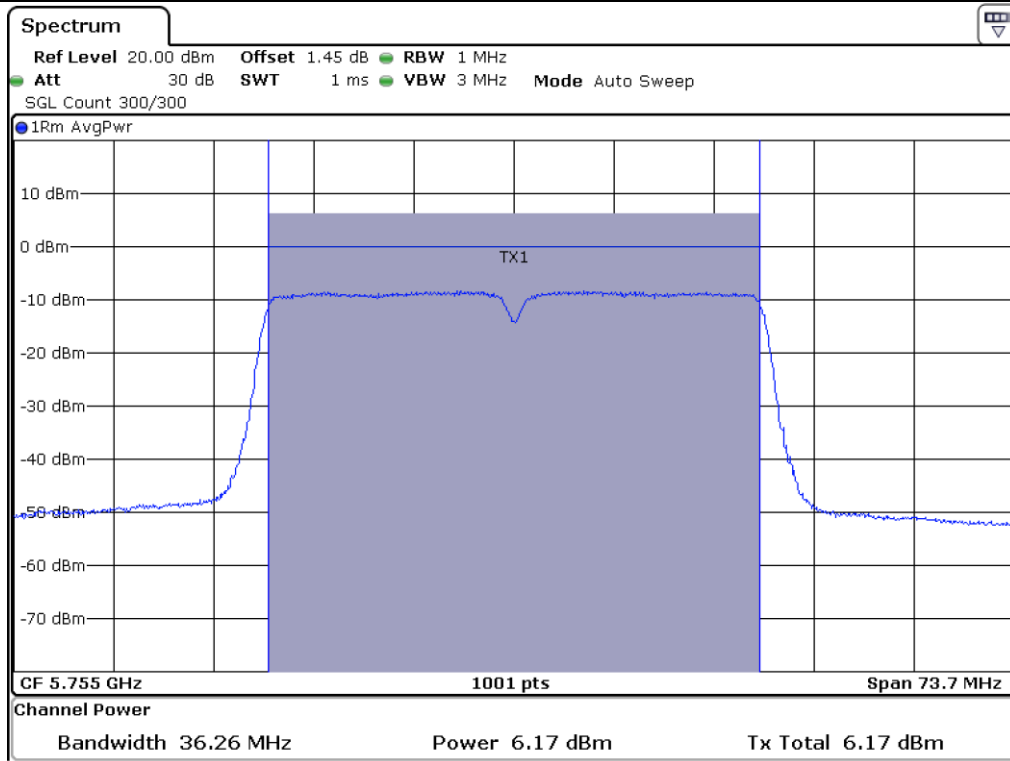
Remark: See next page for measurement data.



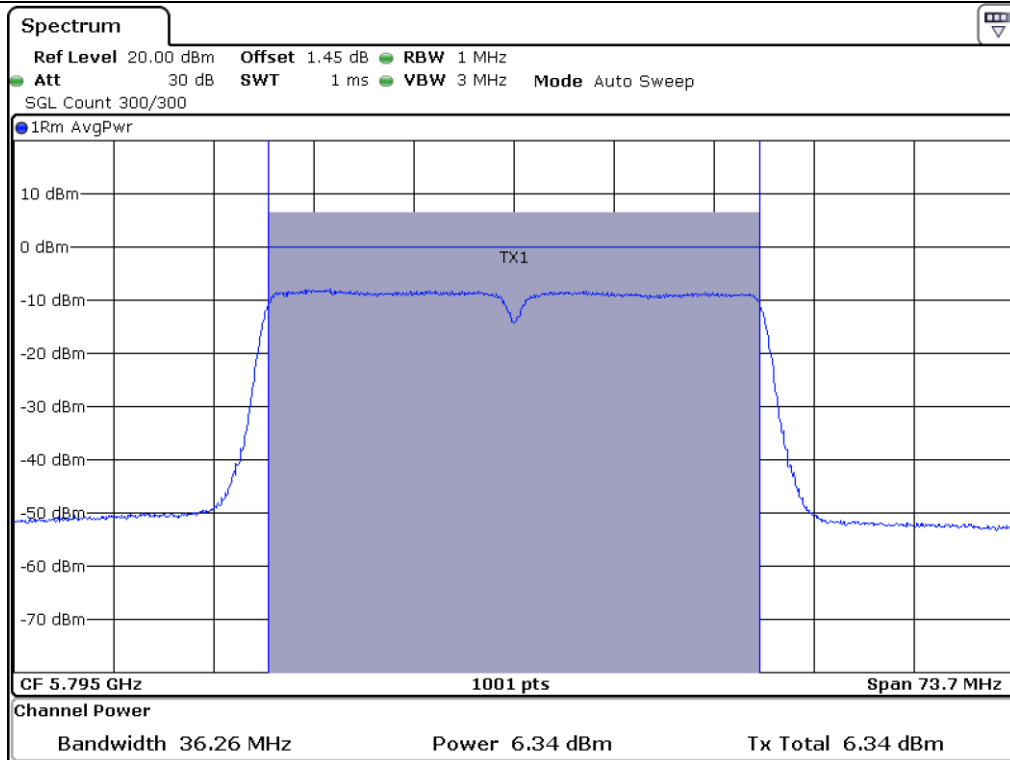
Low Channel @ 5 190 MHz



High Channel @ 5 230 MHz



Low Channel @ 5 755 MHz



High Channel @ 5 795 MHz

9.6.3 Test data for Multiple Transmit

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Low	5 190.00	10.02	1.08	11.10	24.00	12.90
	High	5 230.00	9.72	1.08	10.80	24.00	13.20
5 725 ~ 5 850	Low	5 755.00	9.48	1.08	10.56	29.21	18.65
	High	5 795.00	9.79	1.08	10.87	29.21	18.34

Remark. Margin = Limit – Result (=Measured Value + C.F.)

9.7 Test data for 802.11ac_HT80 RLAN Mode

9.7.1 Test data for Antenna 0

-. Test Result : Pass

-. Duty Cycle : 76.73 % (UNII 1), 76.73 % (UNII 3)

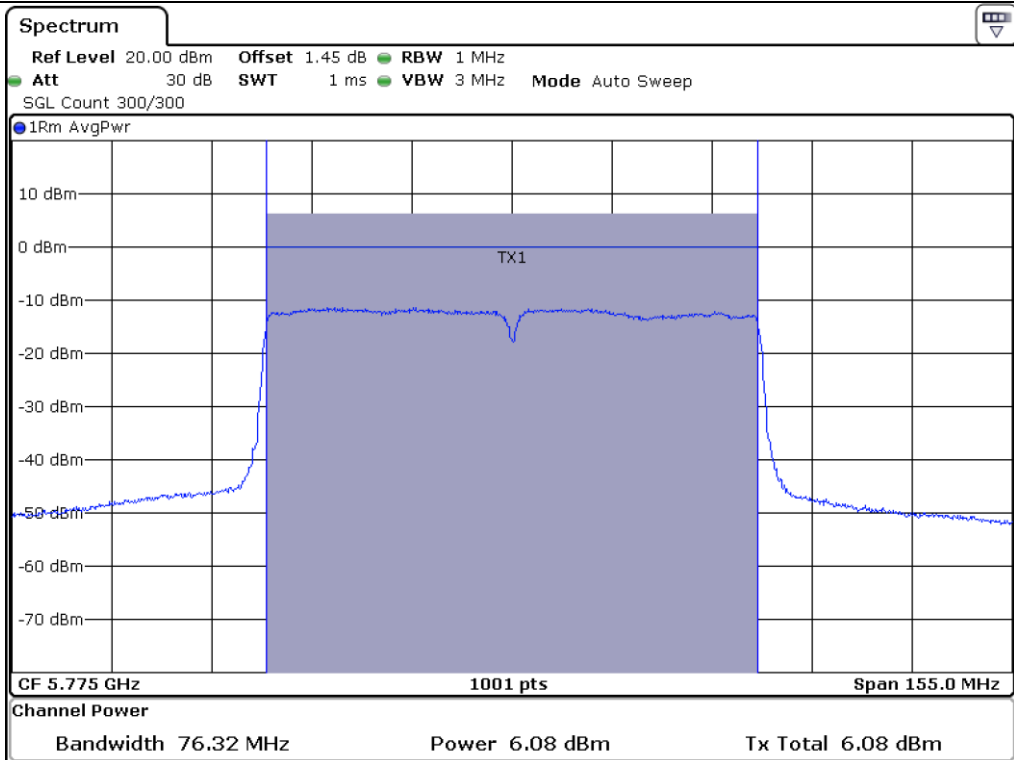
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Middle	5 210.00	5.84	1.15	6.99	24.00	17.01
5 725 ~ 5 850	Middle	5 775.00	6.08	1.15	7.23	30.00	22.77

Remark. Margin = Limit – Result (=Measured Value + C.F.)

Remark: See next page for measurement data.



Middle Channel @ 5.210 MHz



Middle Channel @ 5.775 MHz

9.7.2 Test data for Antenna 1

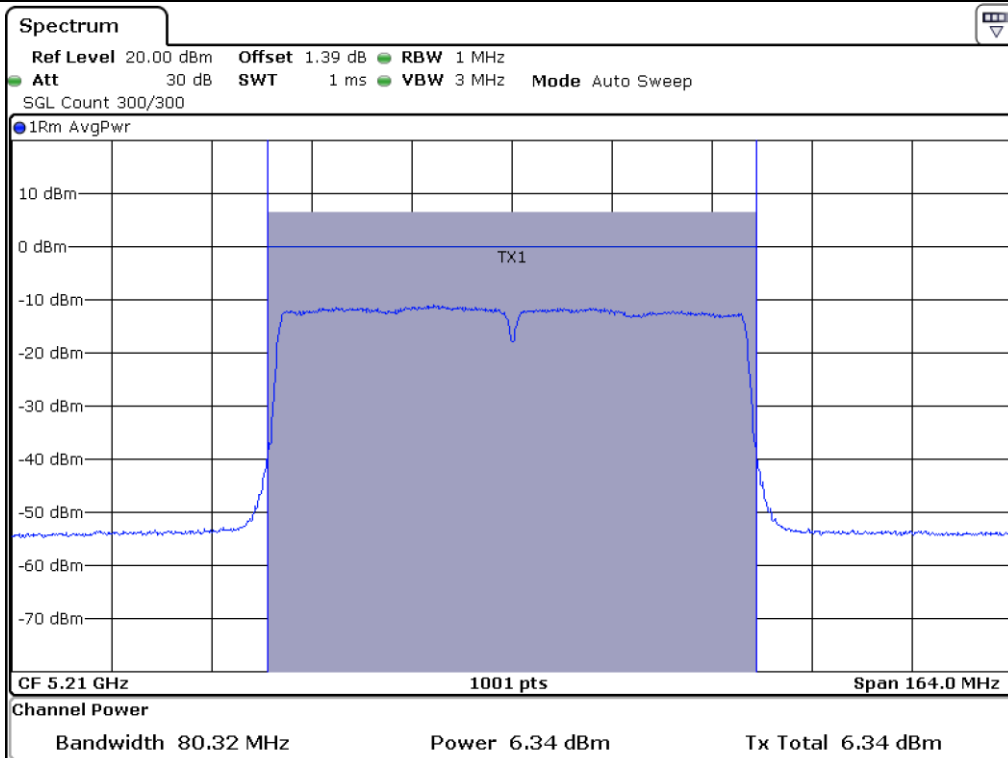
-. Test Result : Pass

-. Duty Cycle : 76.04 % (UNII 1), 76.57 % (UNII 3)

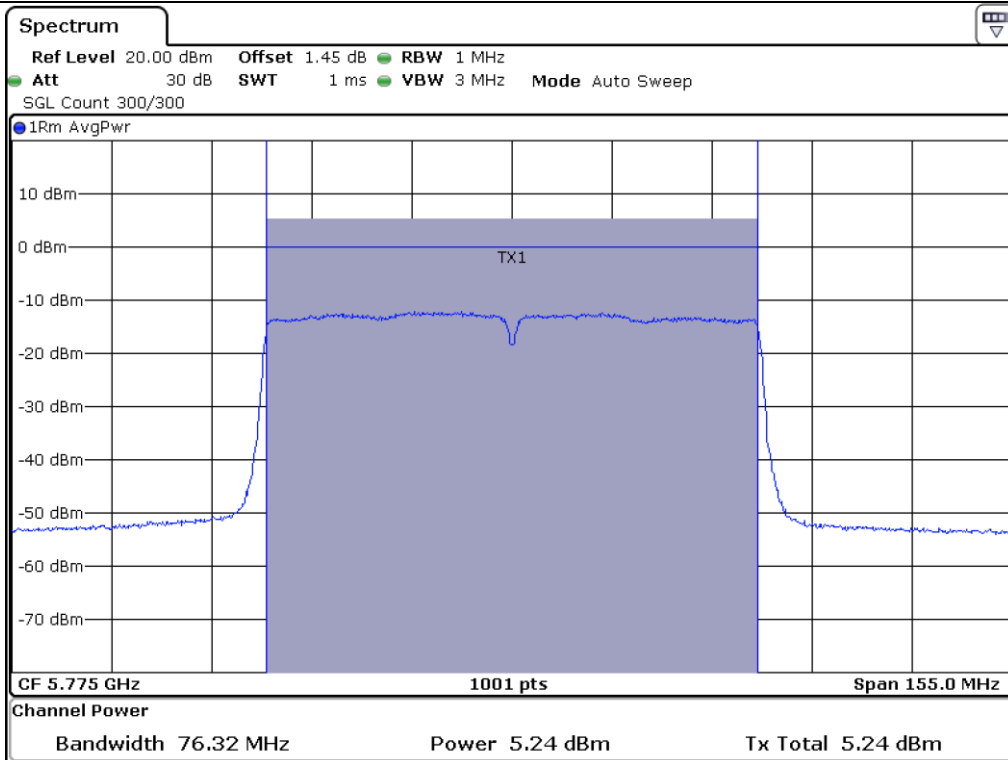
FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Middle	5 210.00	6.34	1.19	7.53	24.00	16.47
5 725 ~ 5 850	Middle	5 775.00	5.24	1.16	6.40	30.00	23.60

Remark. Margin = Limit – Result (=Measured Value + C.F.)

Remark: See next page for measurement data.



Middle Channel @ 5.210 MHz



Middle Channel @ 5.775 MHz

9.7.3 Test data for Multiple Transmit

-. Test Result : Pass

FREQUENCY RANGE (MHz)	CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	Middle	5 210.00	9.11	1.19	10.30	24.00	13.70
5 725 ~ 5 850	Middle	5 775.00	8.69	1.16	9.85	29.21	19.36

Remark. Margin = Limit – Result (=Measured Value + C.F.)

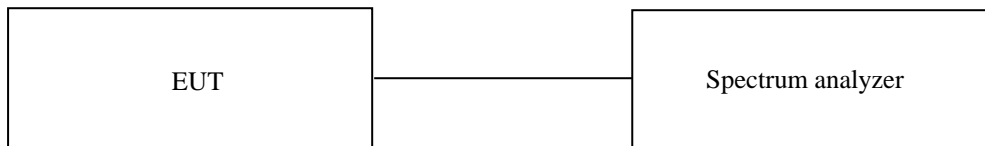
10. PEAK POWER SPECTRUL DENSITY

10.1 Operating environment

Temperature : 23 °C
Relative humidity : 45 % R.H.

10.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz(500 kHz for frequency range 5 725 MHz ~ 5 850 MHz), the video bandwidth is set to 3 times the resolution bandwidth. The maximum level form the EUT in 1 MHz bandwidth was measured with above condition.



10.3 Test Date

June 08, 2021 ~ June 22, 2021

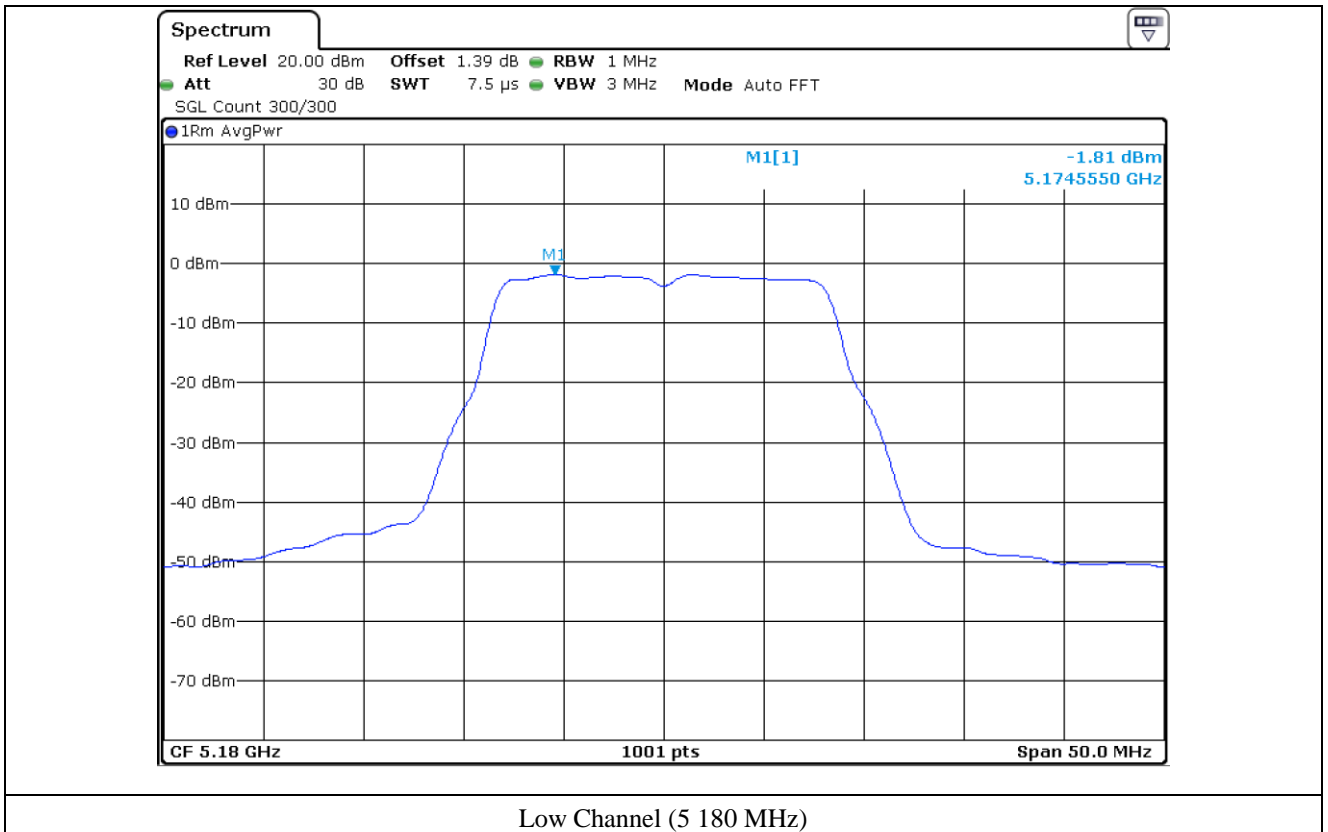
10.4 Test data for 802.11a RLAN Mode

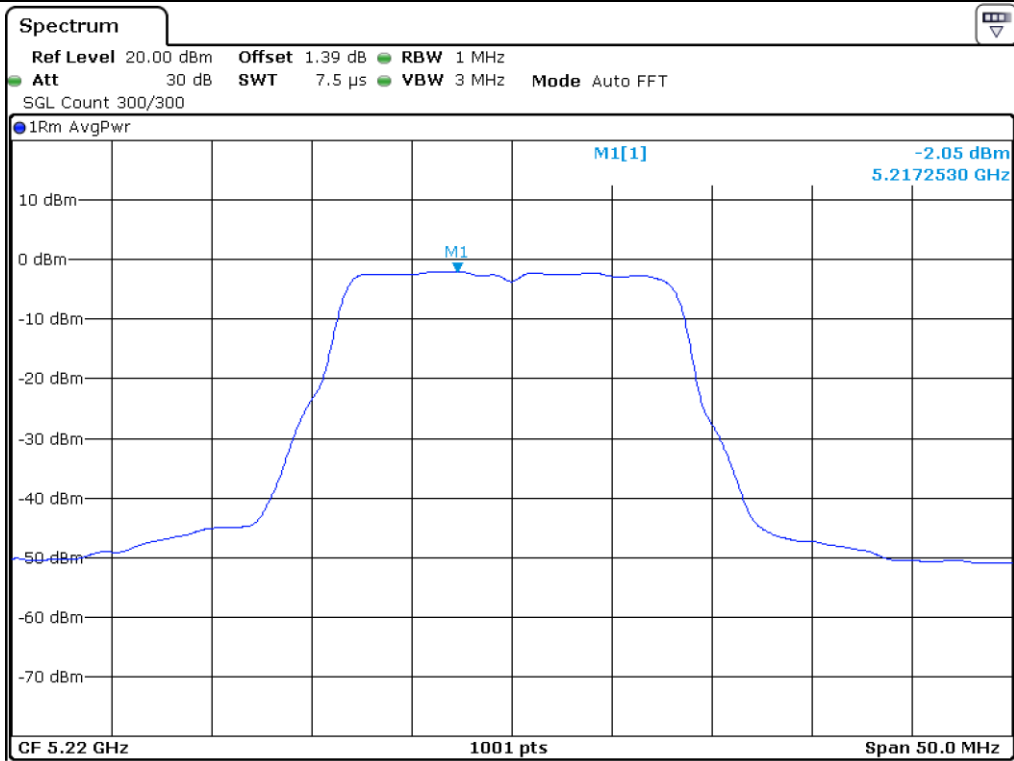
10.4.1 Test data for Antenna 0

- Operating condition : Highest Output Power Transmitting Mode
- Duty Cycle : 92.41 %(UNII 1), 91.95 %(UNII 3)
- Test Result : Pass

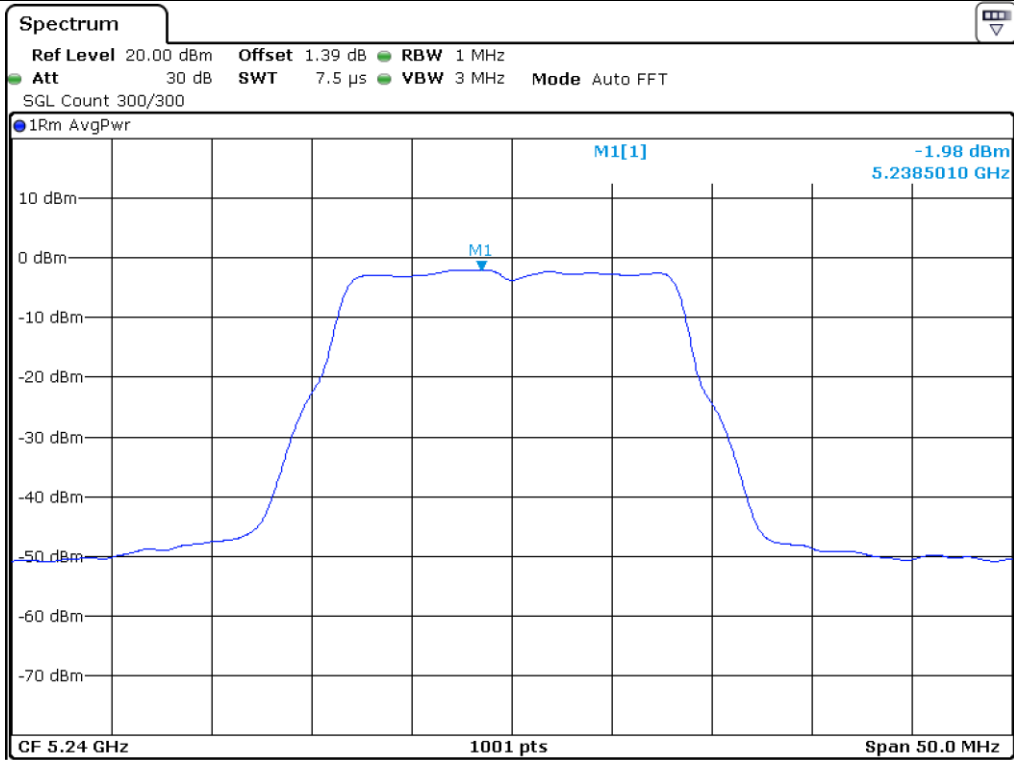
FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 180.00	-1.81	0.34	-1.47	11.00	12.47
	5 220.00	-2.05	0.34	-1.71	11.00	12.71
	5 240.00	-1.98	0.34	-1.64	11.00	12.64
5 725 ~ 5 850	5 745.00	-5.10	0.36	-4.74	30.00	34.74
	5 785.00	-4.72	0.36	-4.36	30.00	34.36
	5 825.00	-4.97	0.36	-4.61	30.00	34.61

Remark. Margin = Limit – Result (=Measured Value + C.F.)

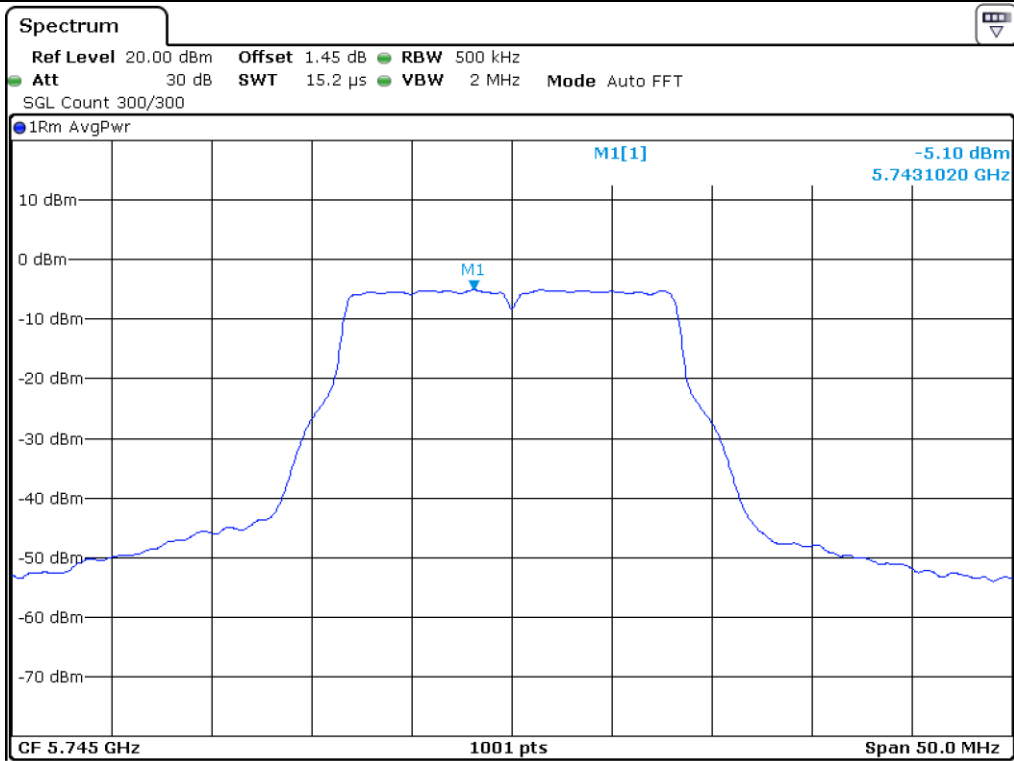




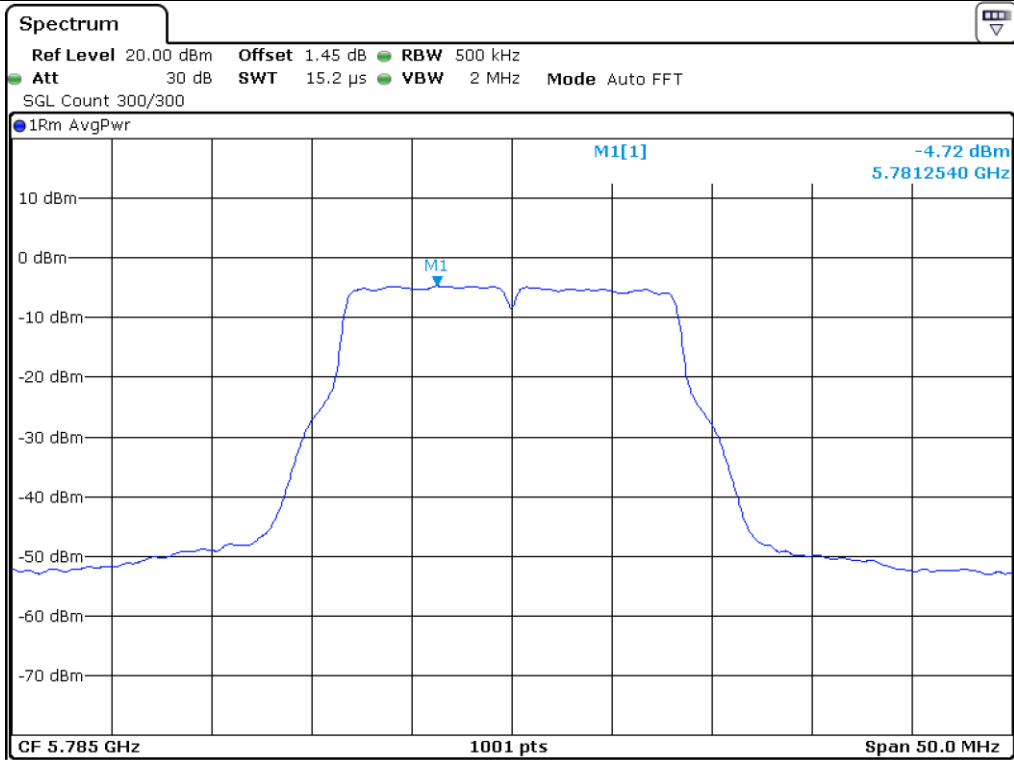
Middle Channel (5 220 MHz)



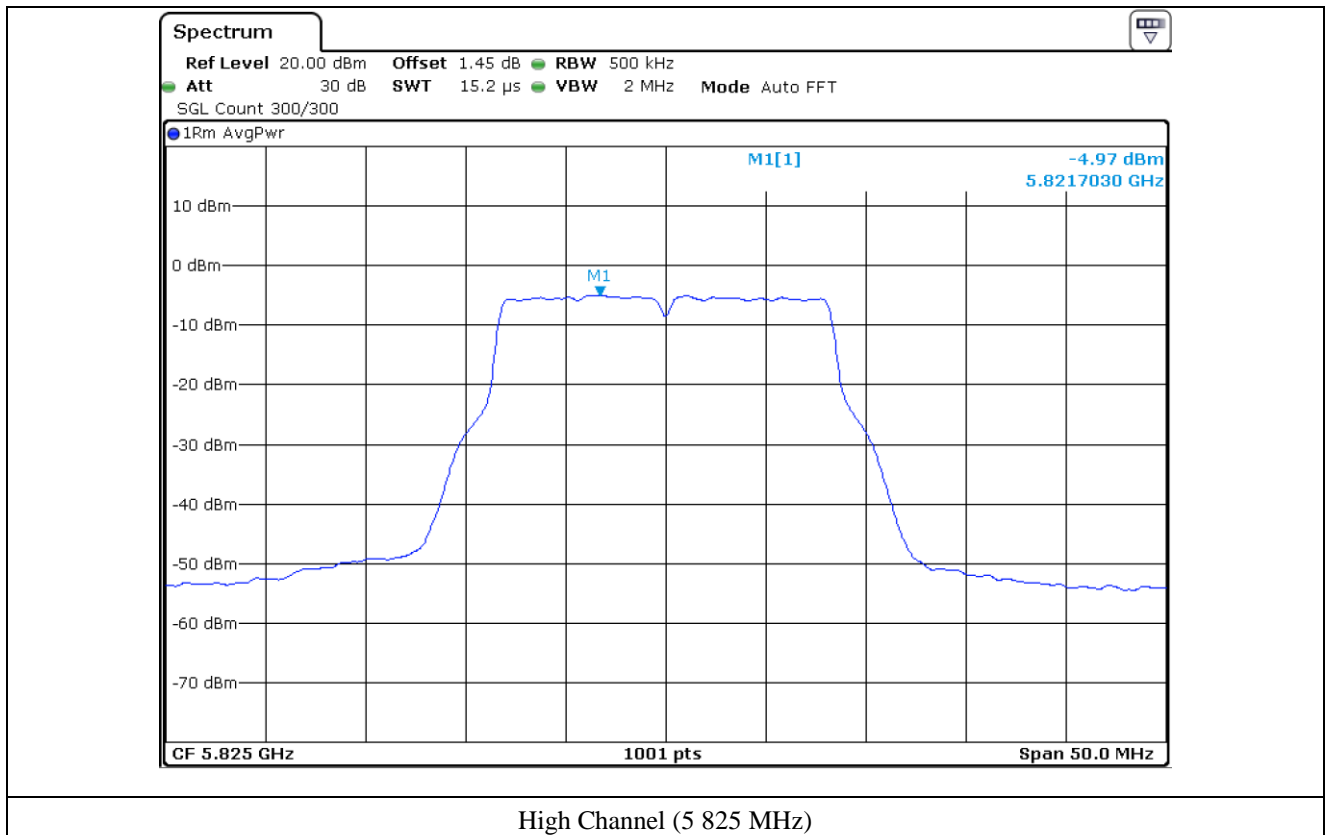
High Channel (5 240 MHz)



Low Channel (5.745 MHz)



Middle Channel (5.785 MHz)

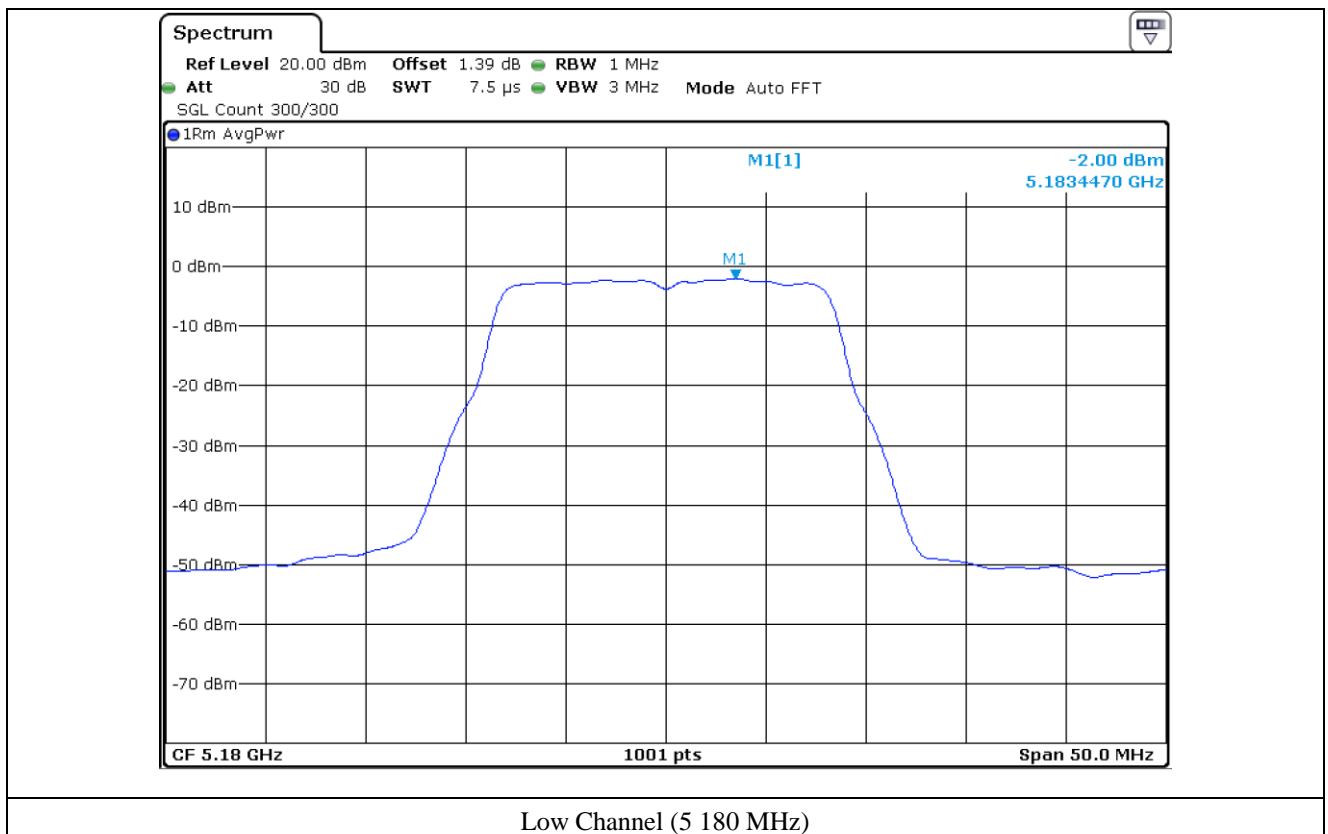


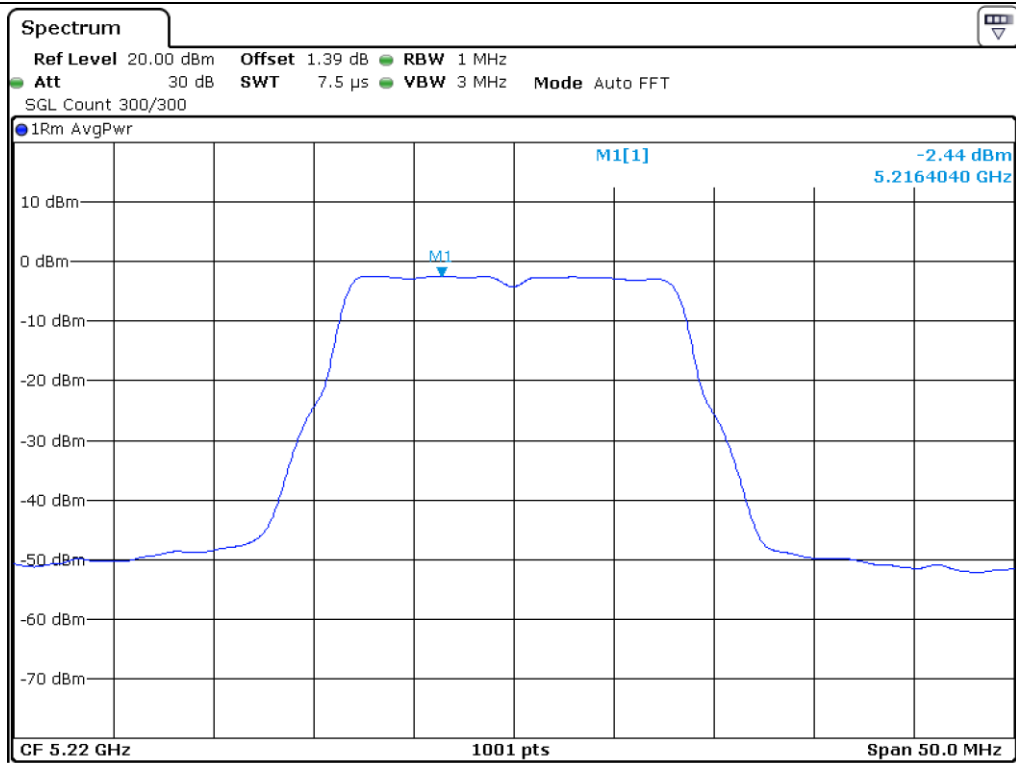
10.4.2 Test data for Antenna 1

- Operating condition : Highest Output Power Transmitting Mode
- Duty Cycle : 92.41 %(UNII 1), 91.95 %(UNII 3)
- Test Result : Pass

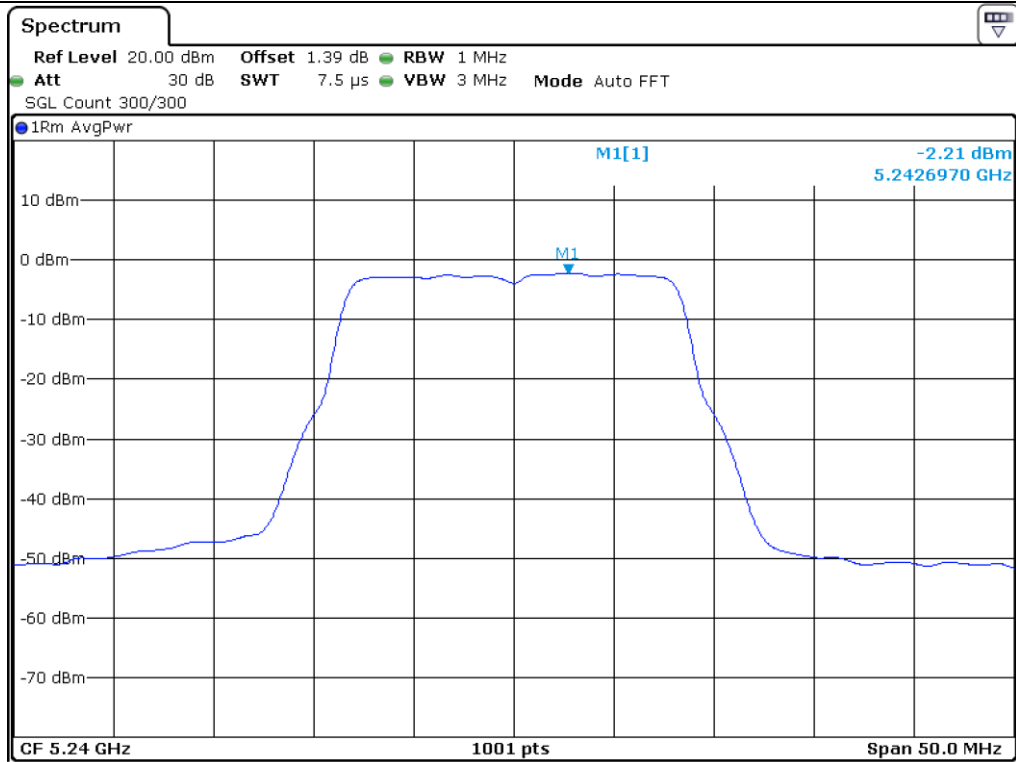
FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 180.00	-2.00	0.34	-1.66	11.00	12.66
	5 220.00	-2.44	0.34	-2.10	11.00	13.10
	5 240.00	-2.21	0.34	-1.87	11.00	12.87
5 725 ~ 5 850	5 745.00	-6.48	0.36	-6.12	30.00	36.12
	5 785.00	-5.59	0.36	-5.23	30.00	35.23
	5 825.00	-5.97	0.36	-5.61	30.00	35.61

Remark. Margin = Limit – Result (=Measured Value + C.F.)

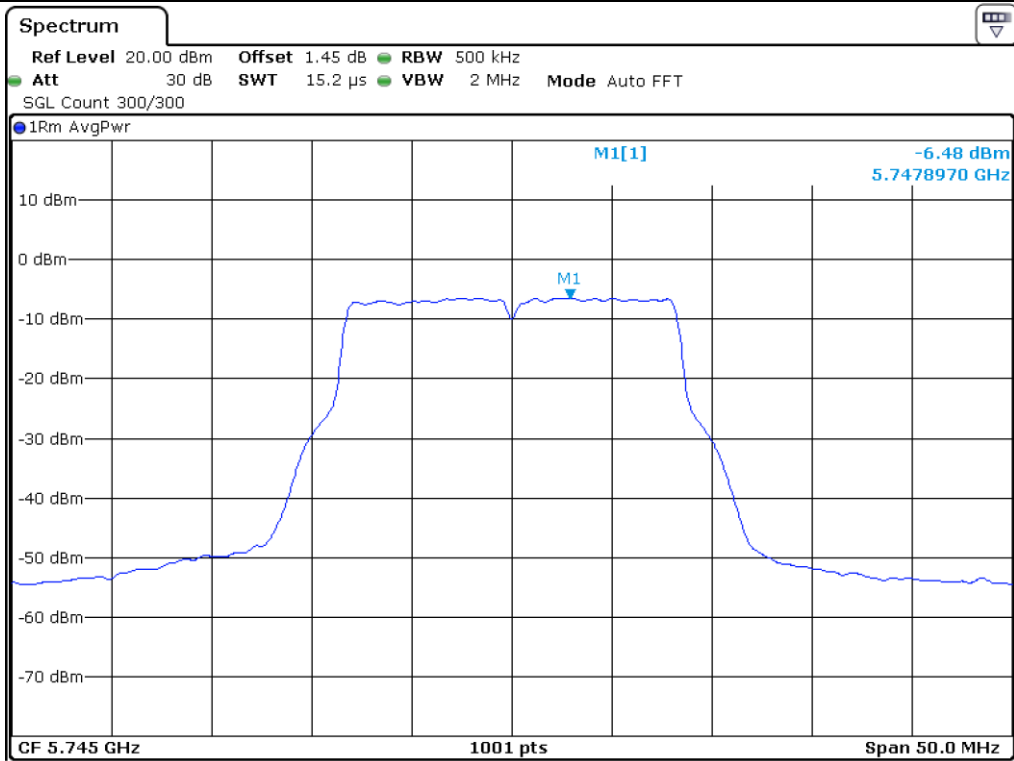




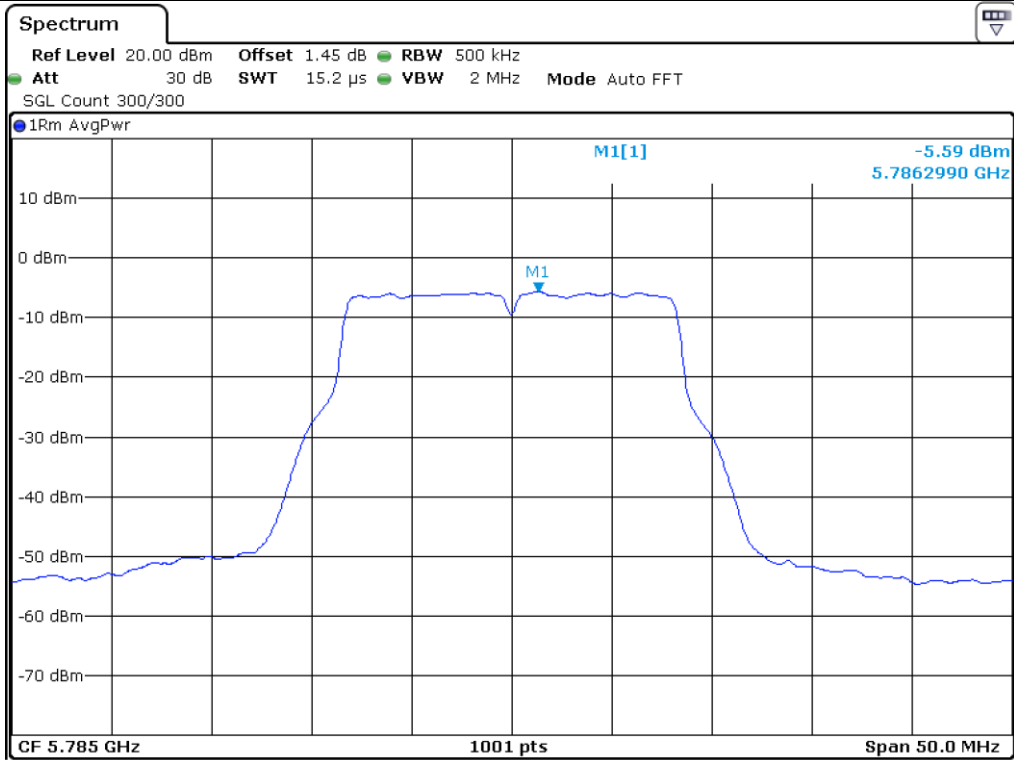
Middle Channel (5 220 MHz)



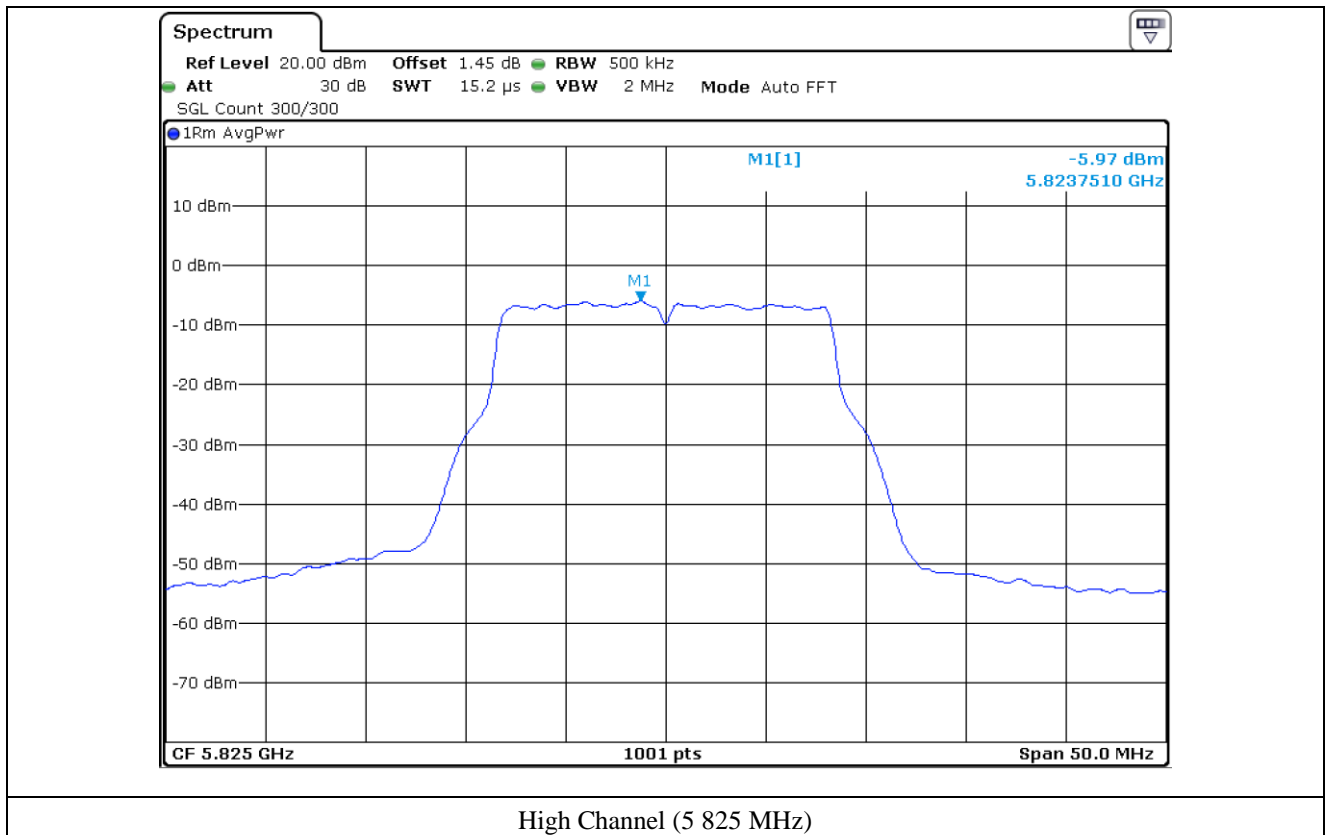
High Channel (5 240 MHz)



Low Channel (5 745 MHz)



Middle Channel (5 785 MHz)



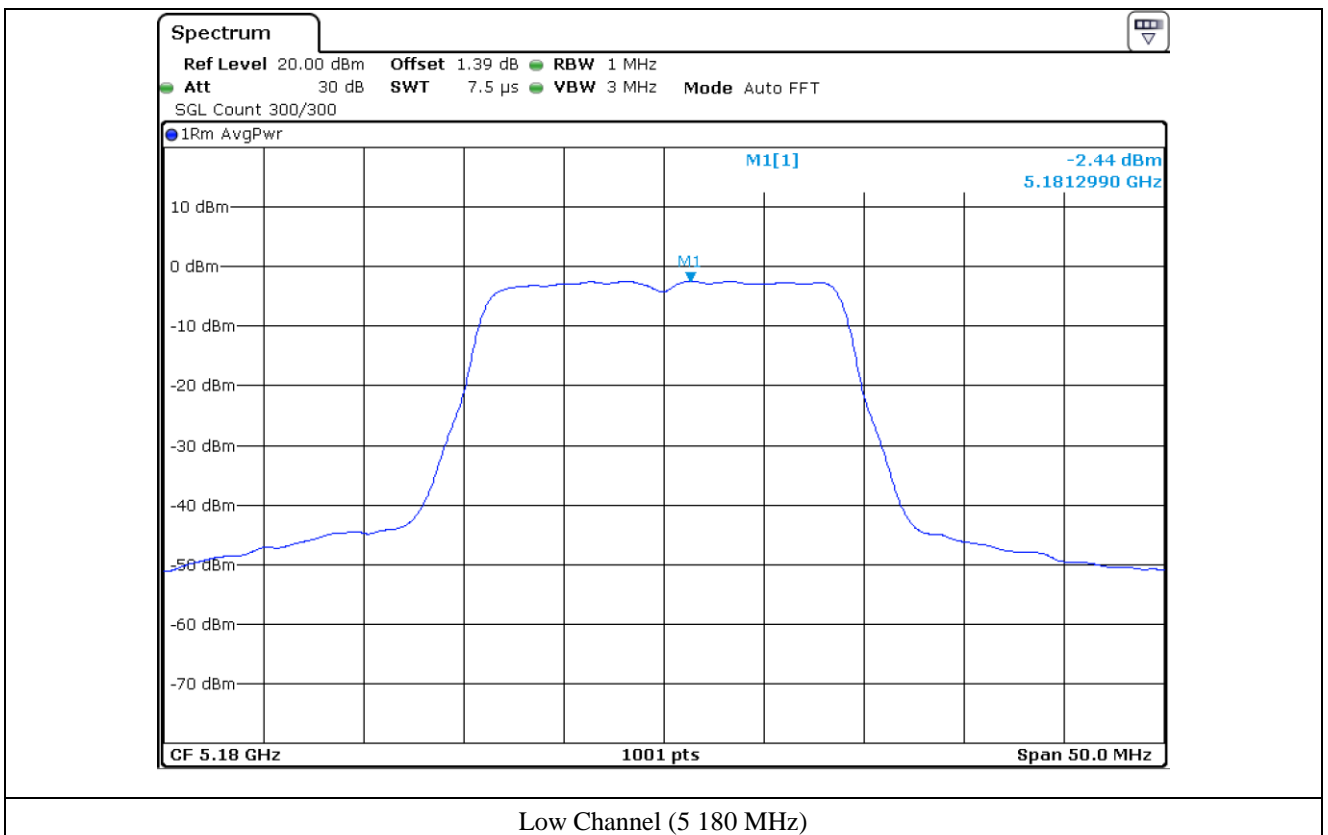
10.5 Test data for 802.11n_HT20 RLAN Mode

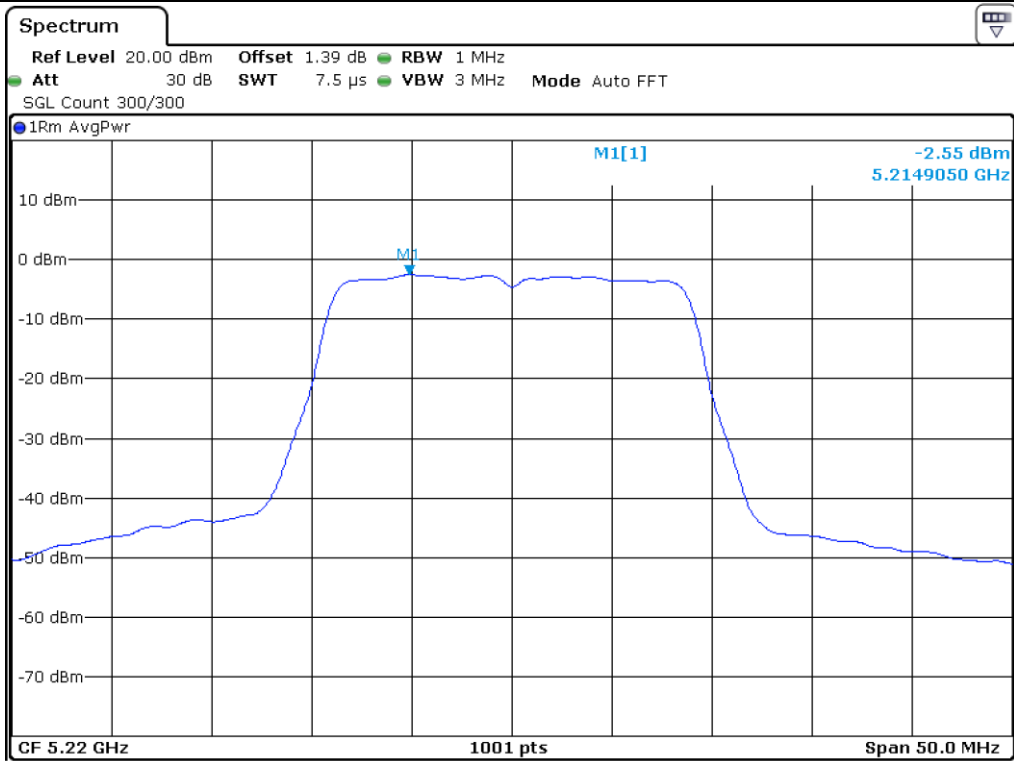
10.5.1 Test data for Antenna 0

- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 87.20 %(UNII 1), 87.20 %(UNII 3)
- . Test Result : Pass

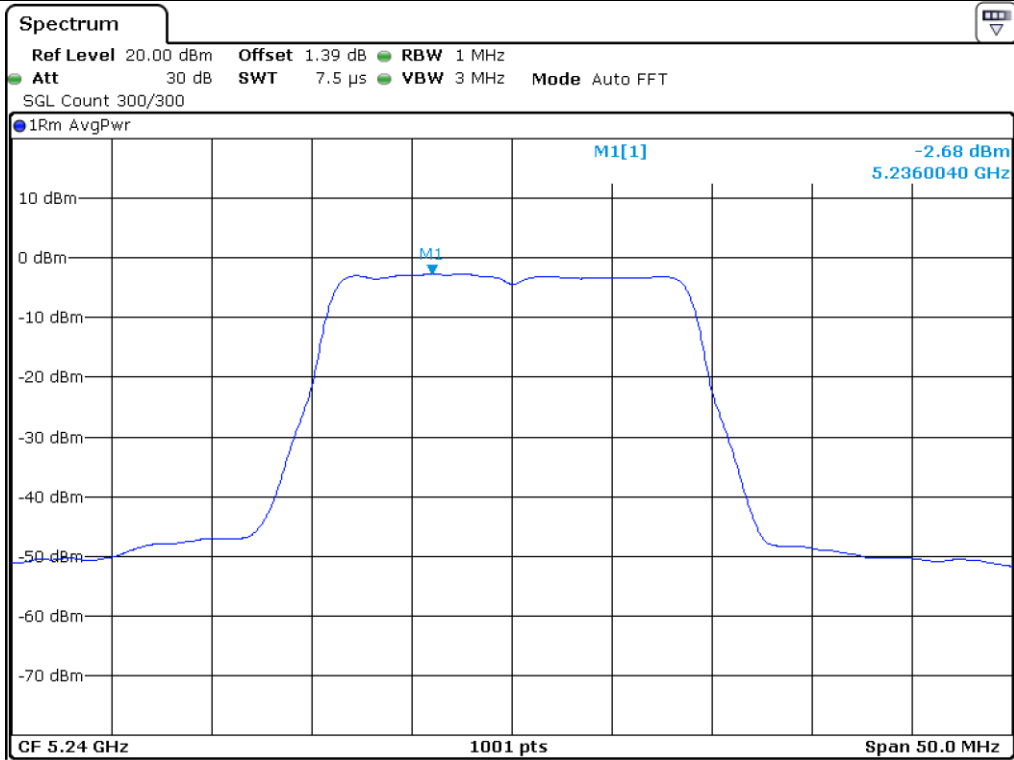
FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 180.00	-2.44	0.59	-1.85	11.00	12.85
	5 220.00	-2.55	0.59	-1.96	11.00	12.96
	5 240.00	-2.68	0.59	-2.09	11.00	13.09
5 725 ~ 5 850	5 745.00	-5.62	0.59	-5.03	30.00	35.03
	5 785.00	-5.72	0.59	-5.13	30.00	35.13
	5 825.00	-5.55	0.59	-4.96	30.00	34.96

Remark. Margin = Limit – Result (=Measured Value + C.F.)

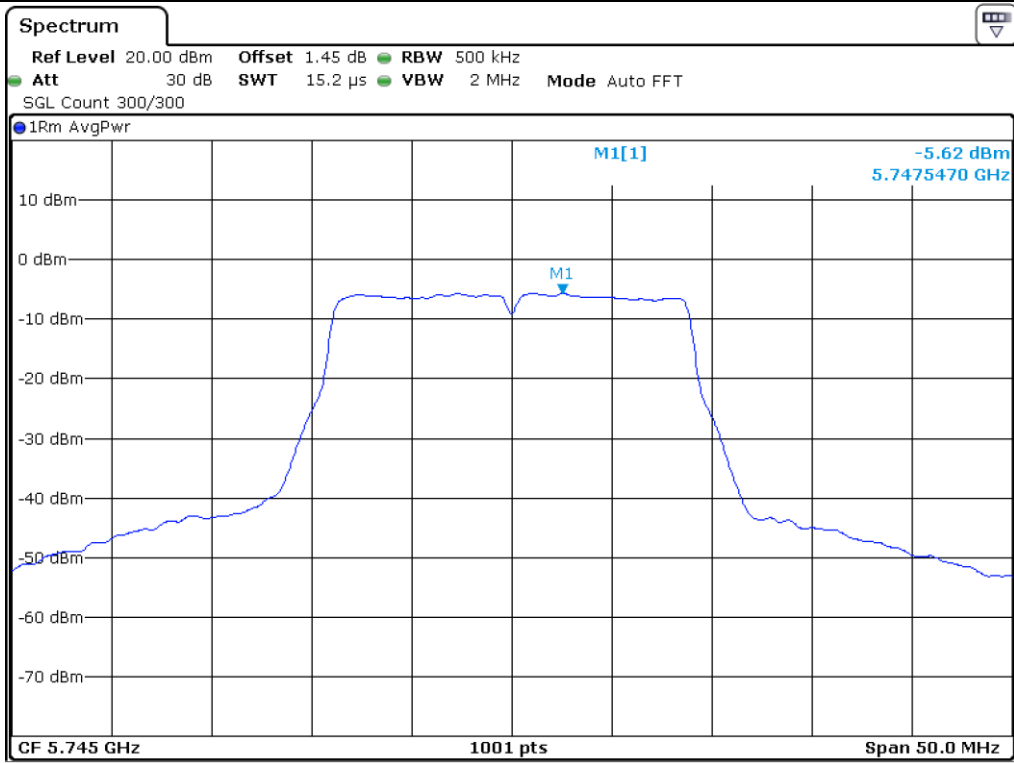




Middle Channel (5 220 MHz)



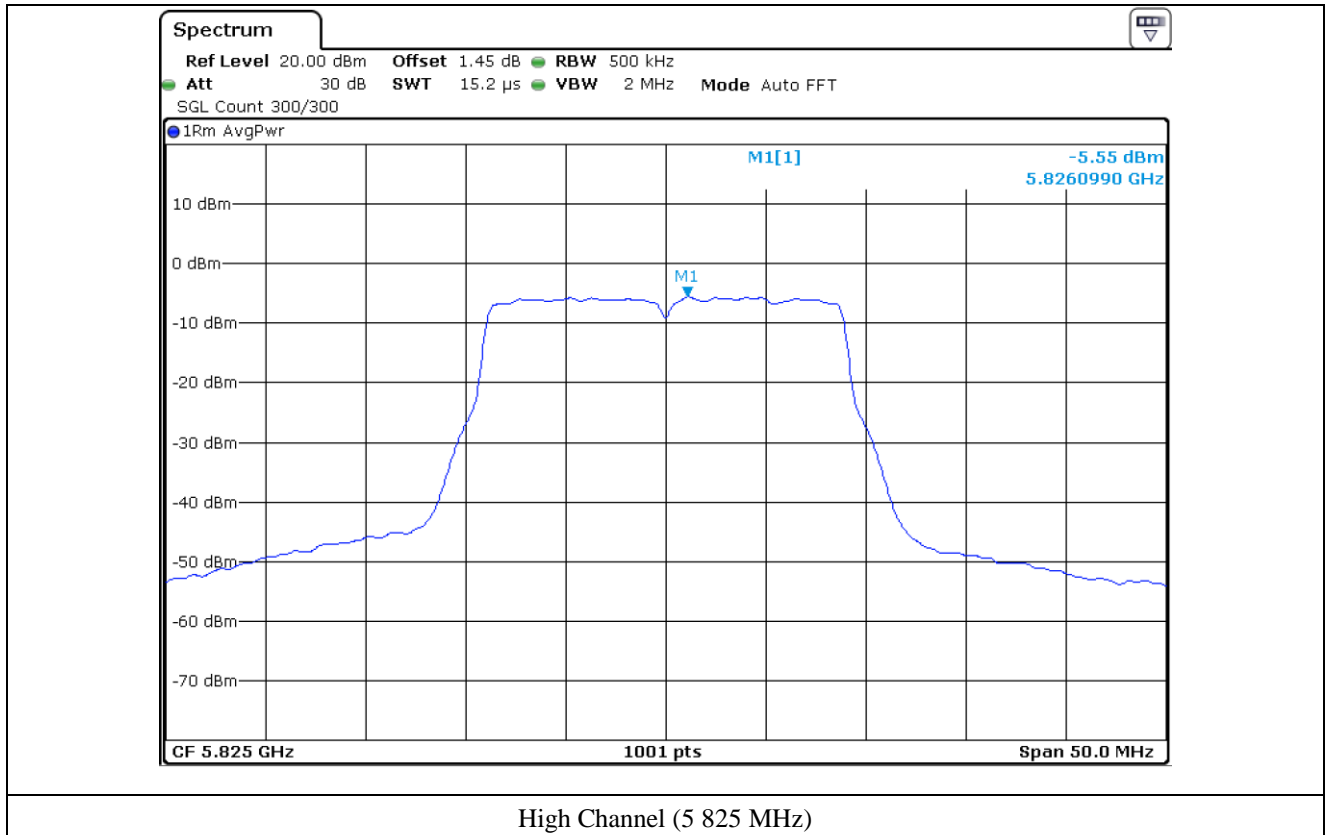
High Channel (5 240 MHz)



Low Channel (5 745 MHz)



Middle Channel (5 785 MHz)

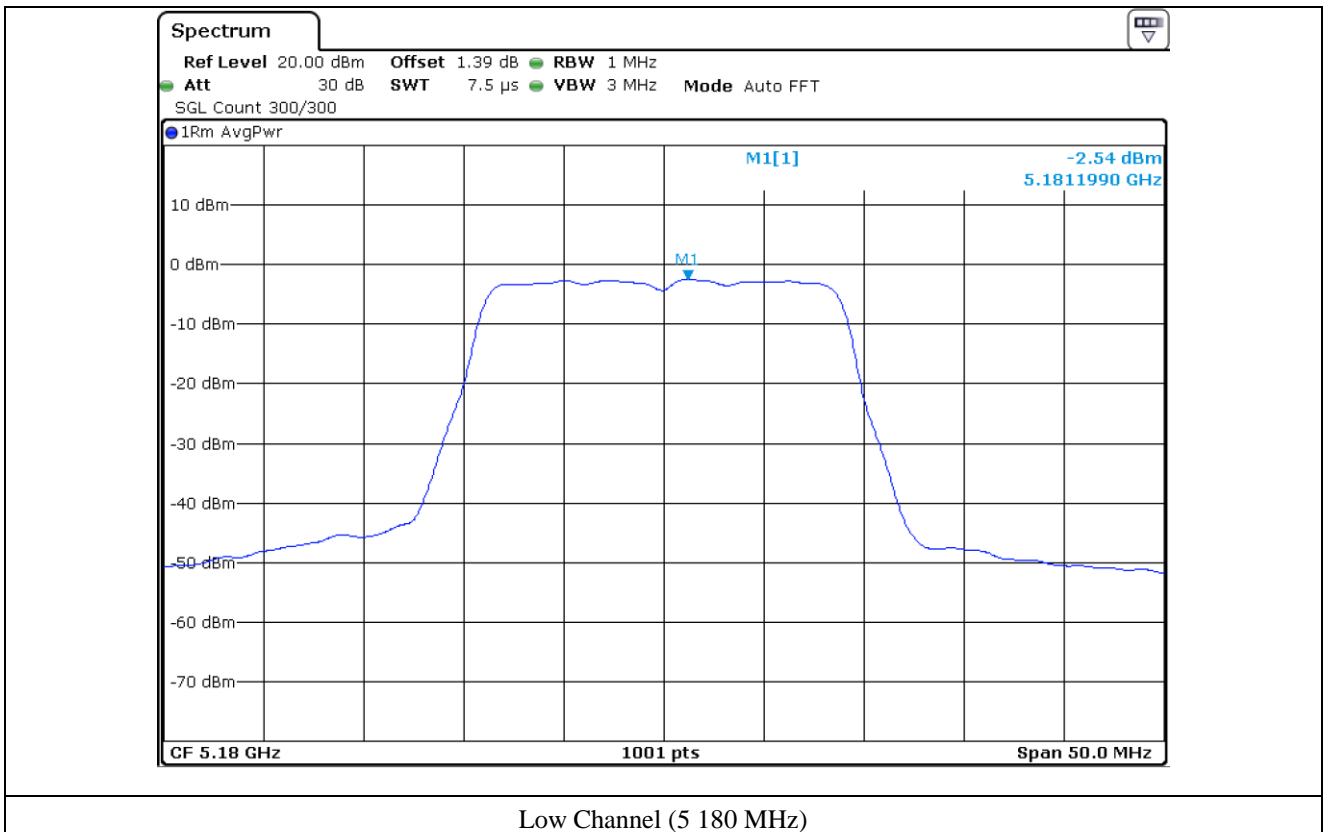


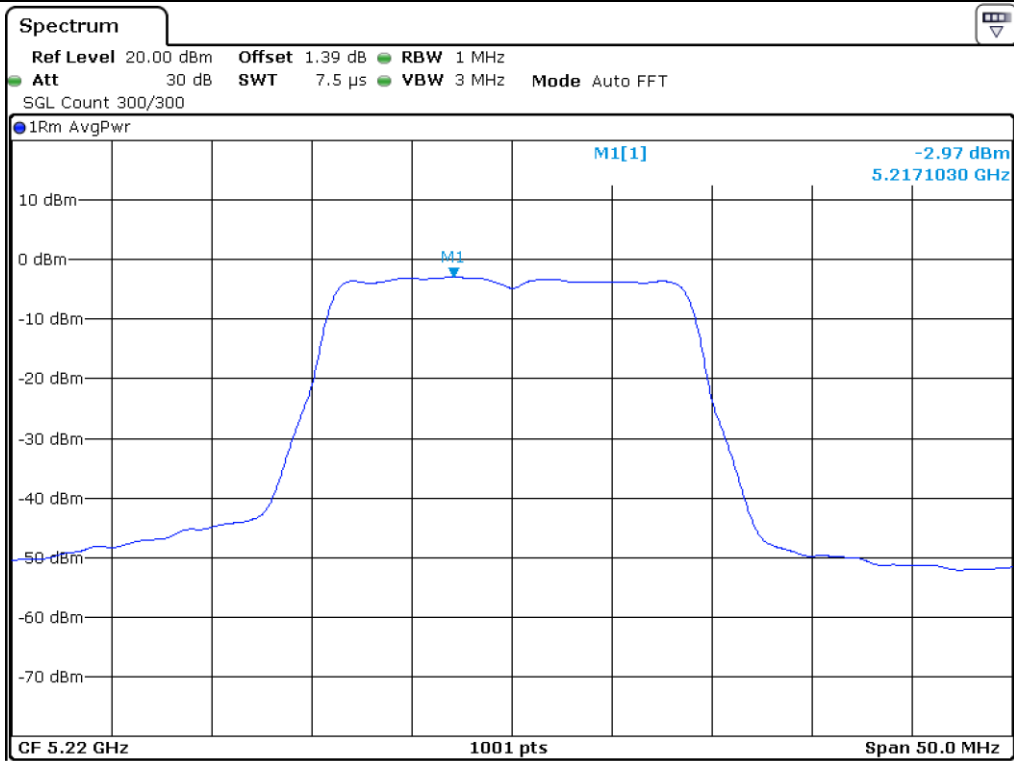
10.5.2 Test data for Antenna 1

- Operating condition : Highest Output Power Transmitting Mode
- Duty Cycle : 87.20 %(UNII 1), 87.20 %(UNII 3)
- Test Result : Pass

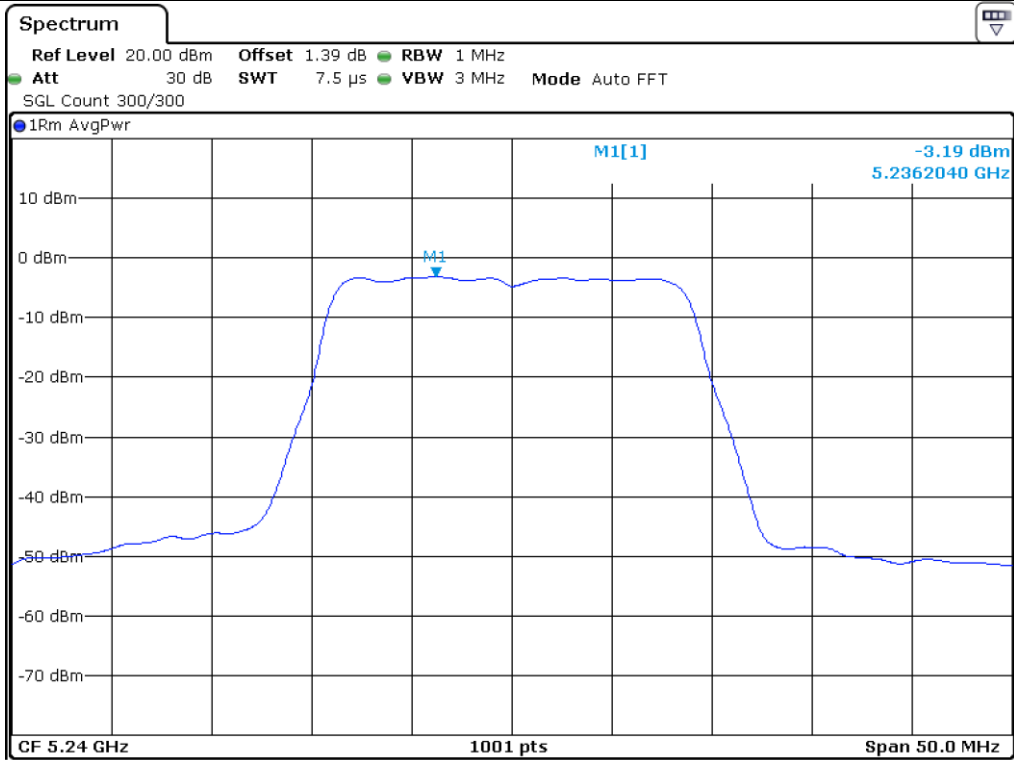
FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 180.00	-2.54	0.59	-1.95	11.00	12.95
	5 220.00	-2.97	0.59	-2.38	11.00	13.38
	5 240.00	-3.19	0.59	-2.60	11.00	13.60
5 725 ~ 5 850	5 745.00	-6.87	0.59	-6.28	30.00	36.28
	5 785.00	-6.52	0.59	-5.93	30.00	35.93
	5 825.00	-6.74	0.59	-6.15	30.00	36.15

Remark. Margin = Limit – Result (=Measured Value + C.F.)

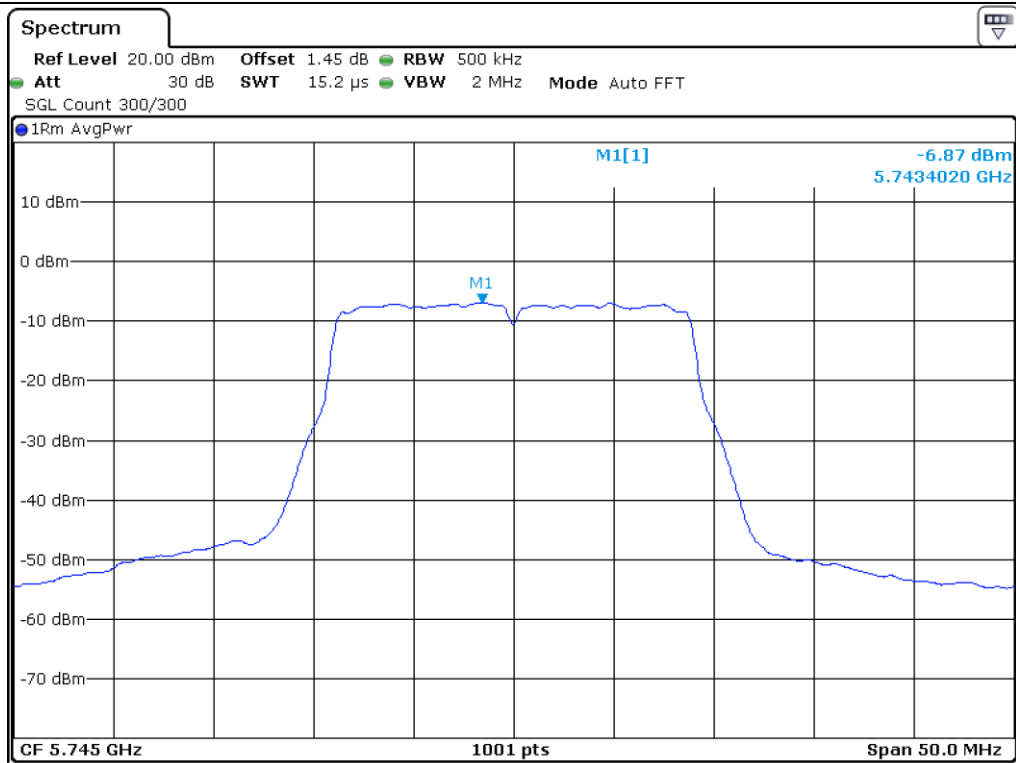




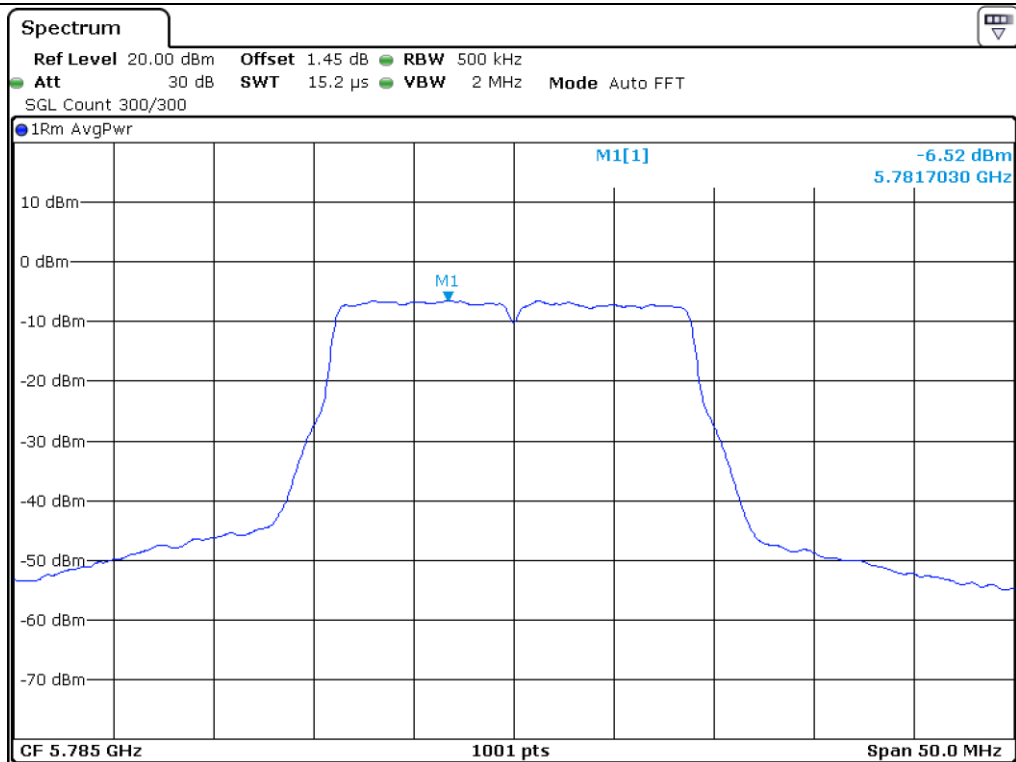
Middle Channel (5 220 MHz)



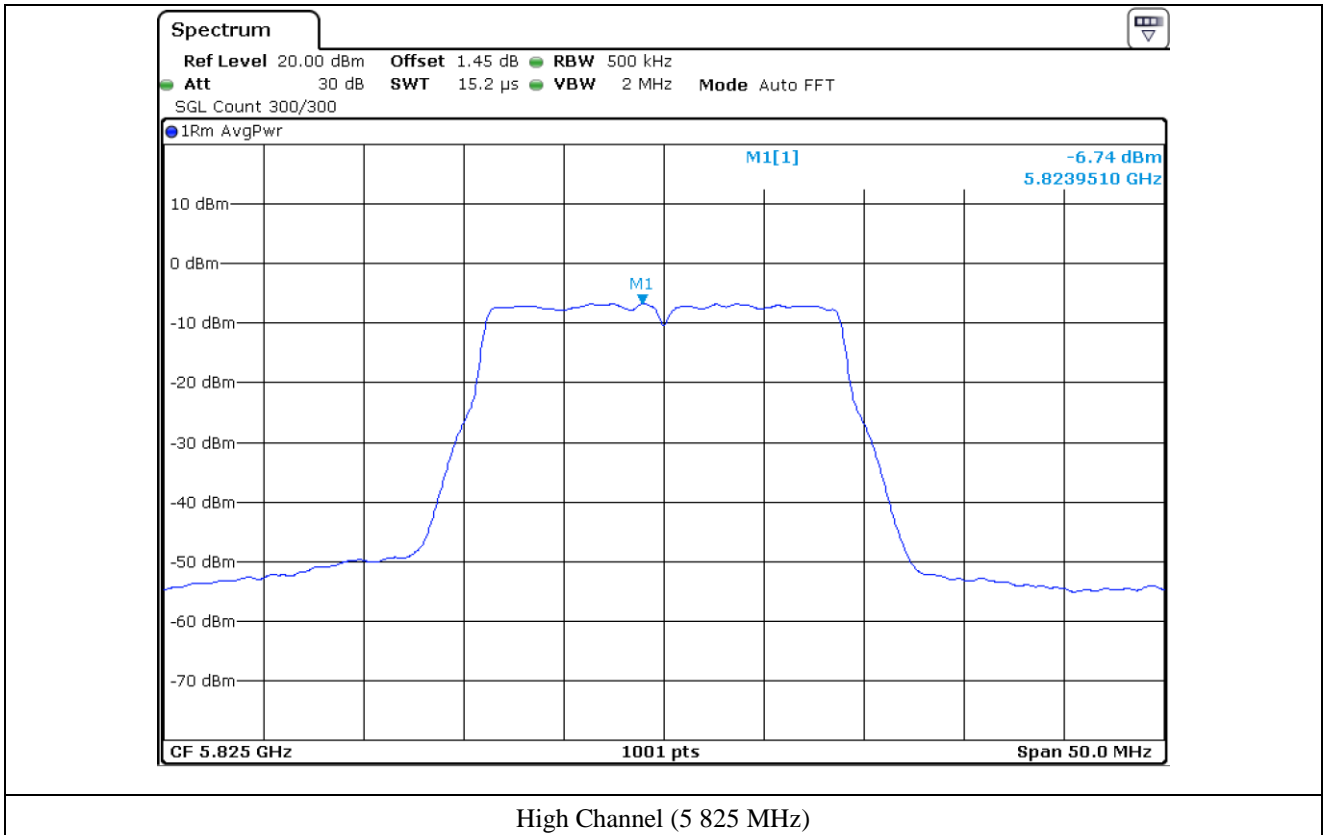
High Channel (5 240 MHz)



Low Channel (5.745 MHz)



Middle Channel (5.785 MHz)



10.5.3 Test data for Multiple Transmit

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F. (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 180.00	0.52	0.59	1.11	11.00	9.89
	5 220.00	0.26	0.59	0.85	11.00	10.15
	5 240.00	0.08	0.59	0.67	11.00	10.33
5 725 ~ 5 850	5 745.00	-3.19	0.59	-2.60	29.21	31.81
	5 785.00	-3.09	0.59	-2.50	29.21	31.71
	5 825.00	-3.09	0.59	-2.50	29.21	31.71

Remark. Margin = Limit – Result (=Measured Value + C.F.)

10.6 Test data for 802.11n_HT40 RLAN Mode

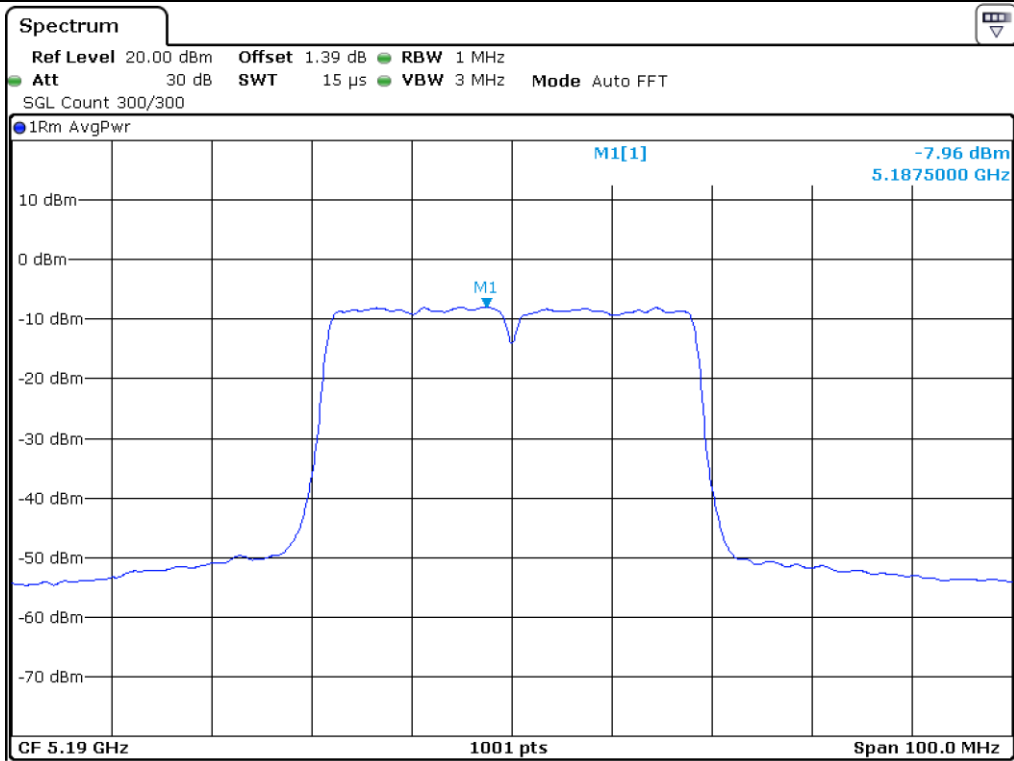
10.6.1 Test data for Antenna 0

- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 77.90 %(UNII 1), 77.90 %(UNII 3)
- . Test Result : Pass

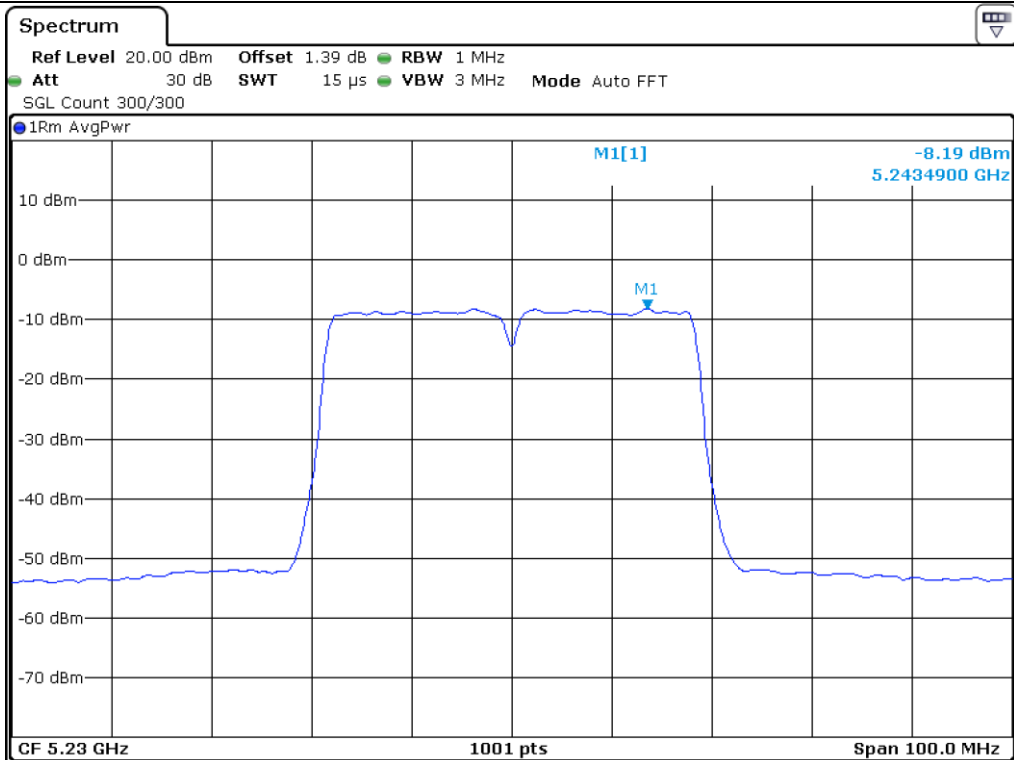
FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 190.00	-7.96	1.08	-6.88	11.00	17.88
	5 230.00	-8.19	1.08	-7.11	11.00	18.11
5 725 ~ 5 850	5 755.00	-11.15	1.08	-10.07	30.00	40.07
	5 795.00	-10.94	1.08	-9.86	30.00	39.86

Remark. Margin = Limit – Result (=Measured Value + C.F.)

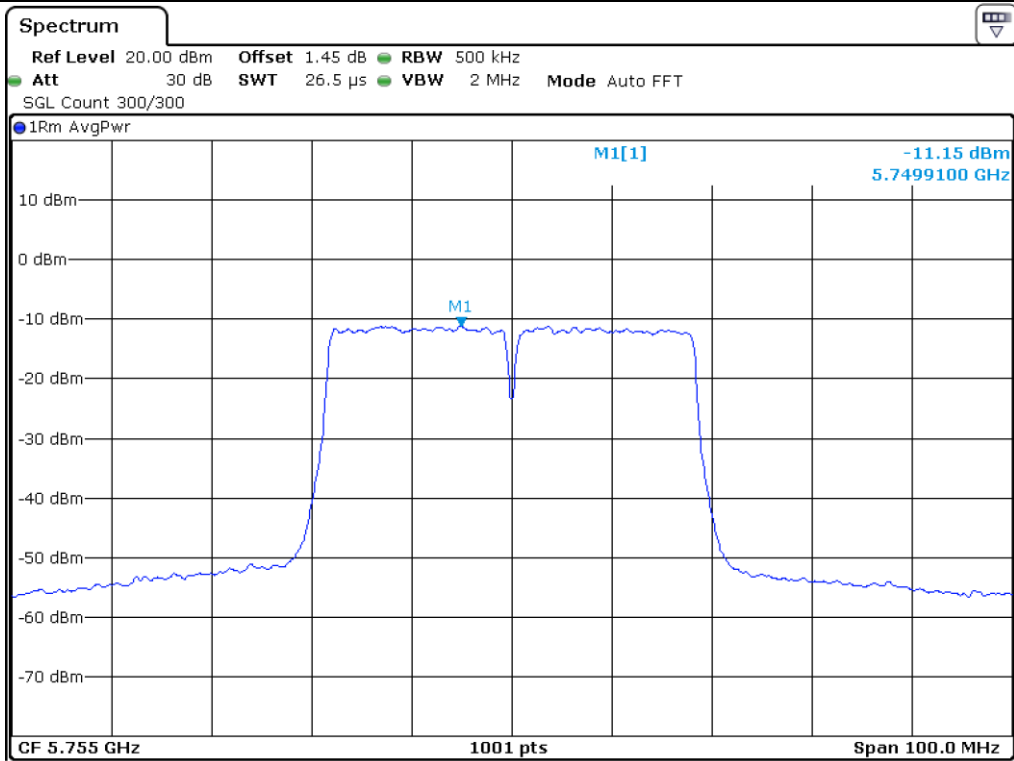
Remark: See next page for measurement data.



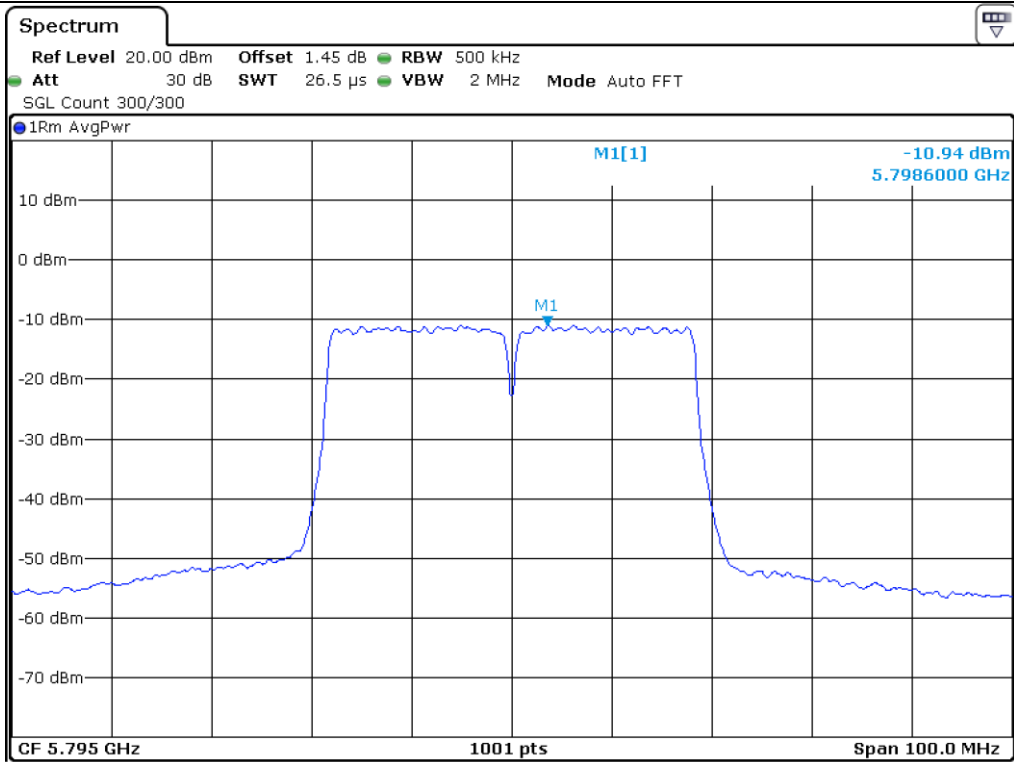
Low Channel (5 190 MHz)



High Channel (5 230 MHz)



Low Channel (5 755 MHz)



High Channel (5 795 MHz)

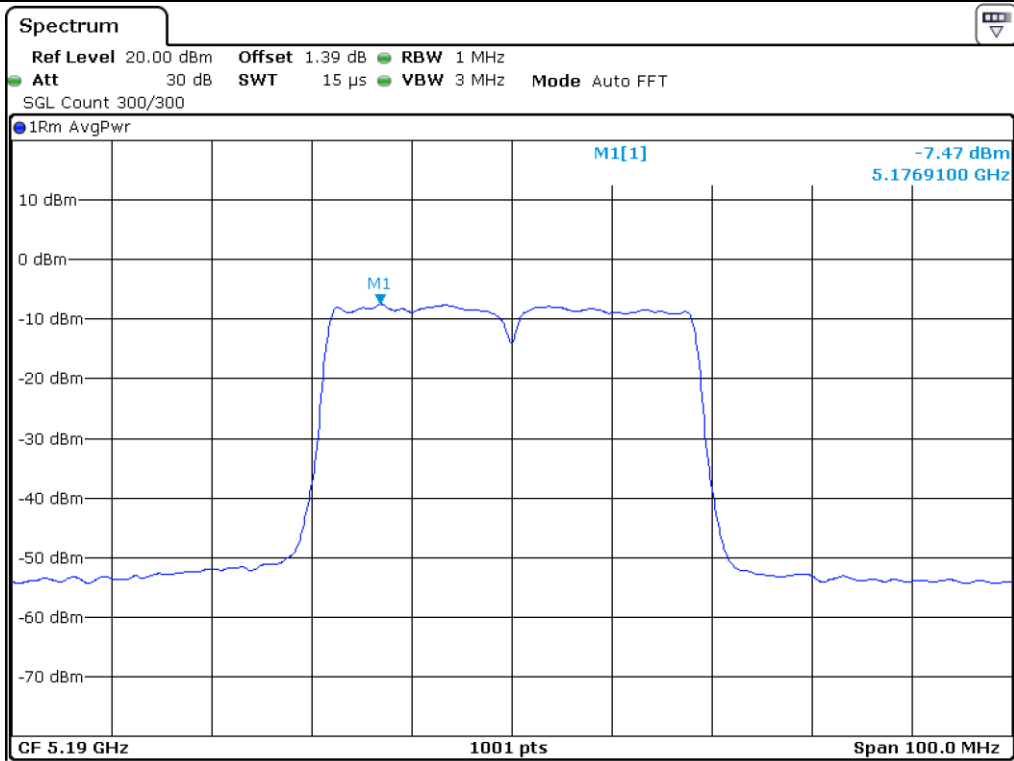
10.6.2 Test data for Antenna 1

- Operating condition : Highest Output Power Transmitting Mode
- Duty Cycle : 77.90 %(UNII 1), 77.90 %(UNII 3)
- Test Result : Pass

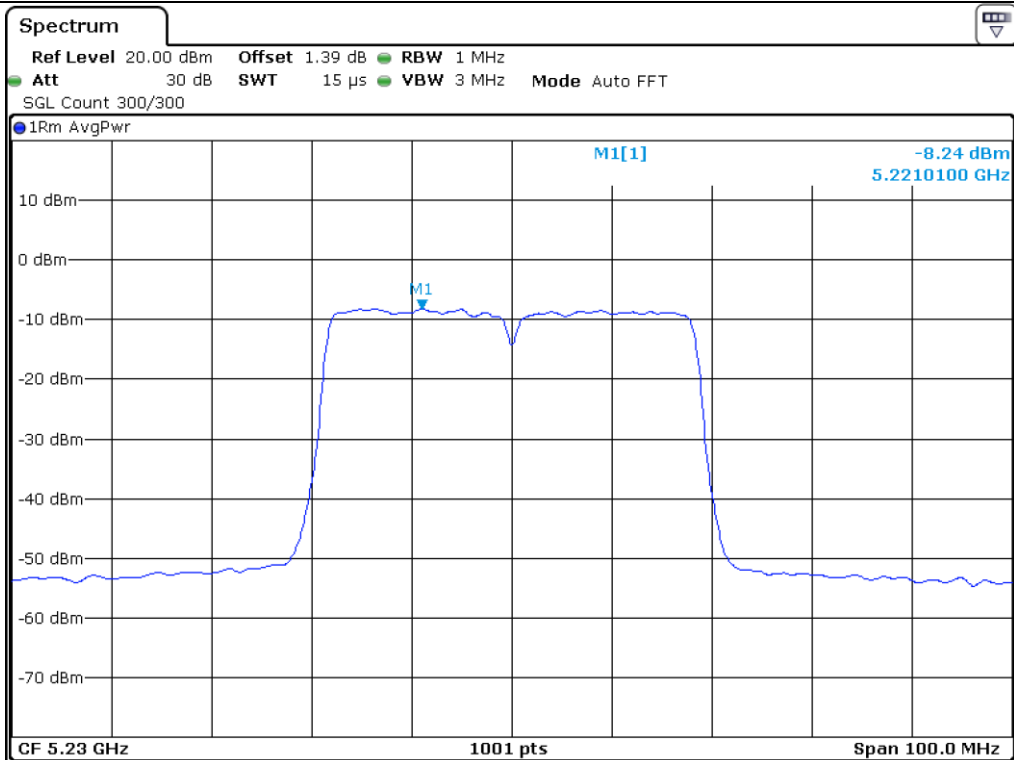
FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 190.00	-7.47	1.08	-6.39	11.00	17.39
	5 230.00	-8.24	1.08	-7.16	11.00	18.16
5 725 ~ 5 850	5 755.00	-11.93	1.08	-10.85	30.00	40.85
	5 795.00	-12.04	1.08	-10.96	30.00	40.96

Remark. Margin = Limit – Result (=Measured Value + C.F.)

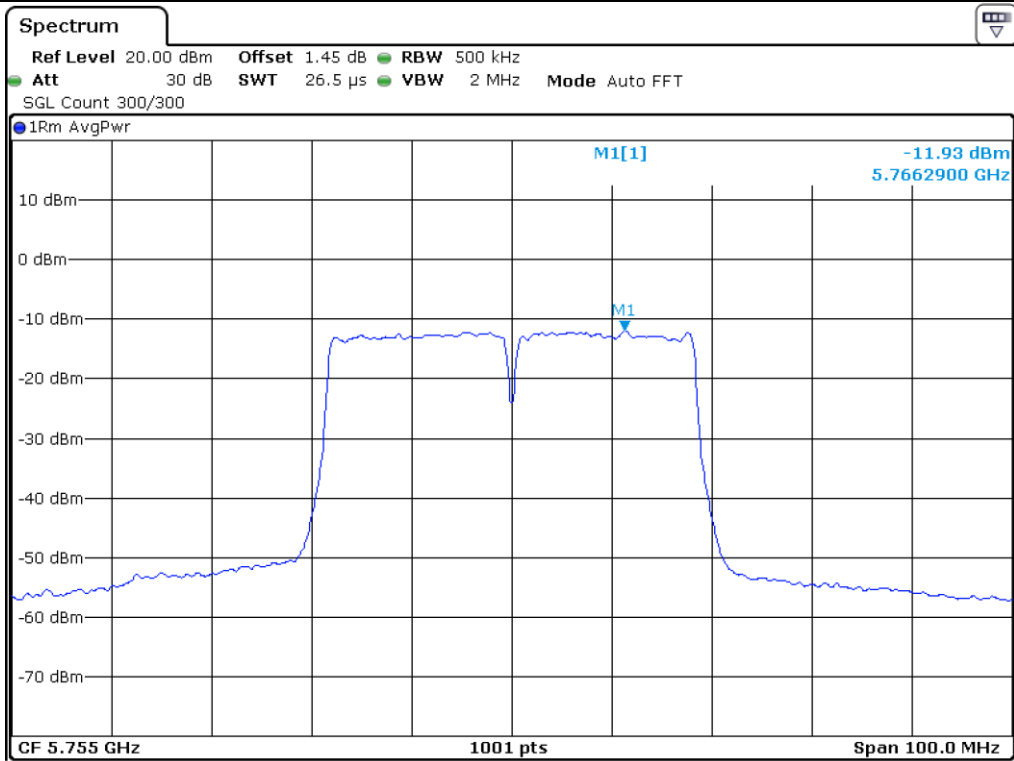
Remark: See next page for measurement data.



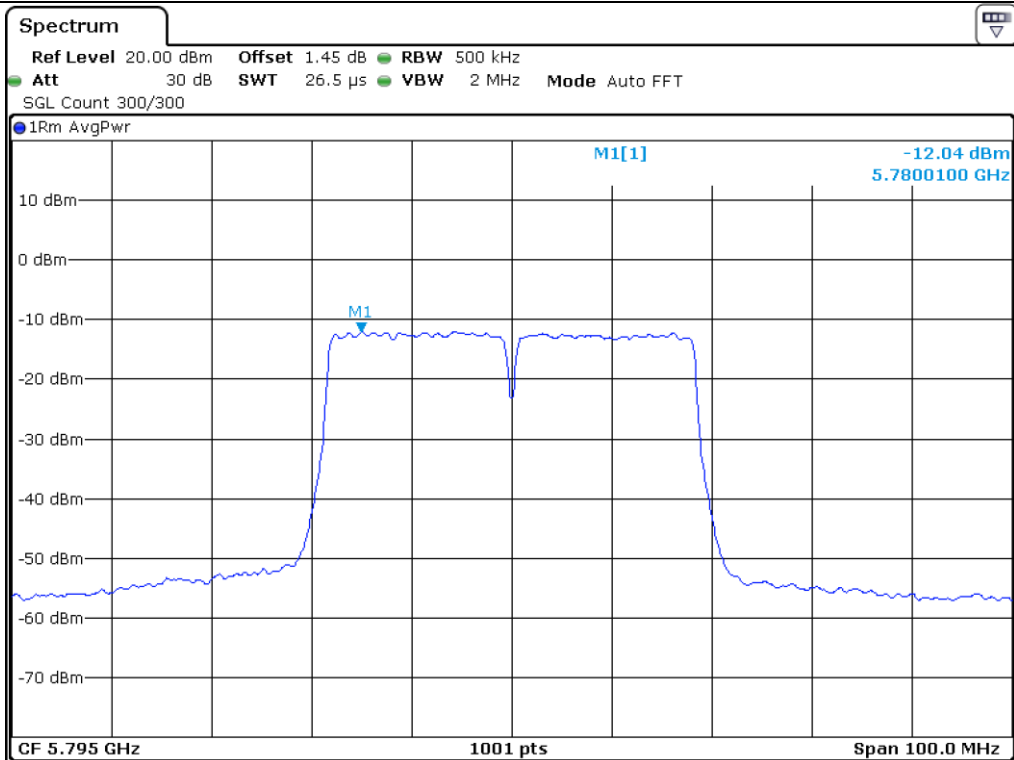
Low Channel (5 190 MHz)



High Channel (5 230 MHz)



Low Channel (5 755 MHz)



High Channel (5 795 MHz)

10.6.3 Test data for Multiple Transmit

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 190.00	-4.70	1.08	-3.62	11.00	14.62
	5 230.00	-5.20	1.08	-4.12	11.00	15.12
5 725 ~ 5 850	5 755.00	-8.51	1.08	-7.43	29.21	36.64
	5 795.00	-8.44	1.08	-7.36	29.21	36.57

Remark. Margin = Limit – Result (=Measured Value + C.F.)

Remark: See next page for measurement data.

10.7 Test data for 802.11ac_HT80 RLAN Mode

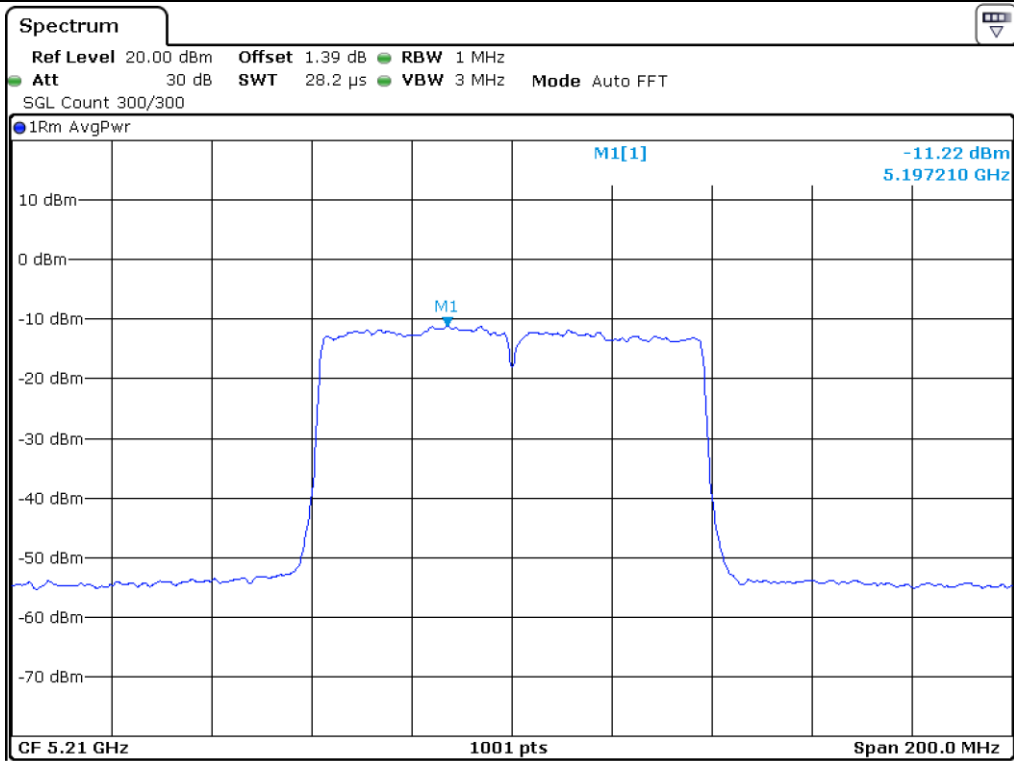
10.7.1 Test data for Antenna 0

- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 76.73 %(UNII 1), 76.73 %(UNII 3)
- . Test Result : Pass

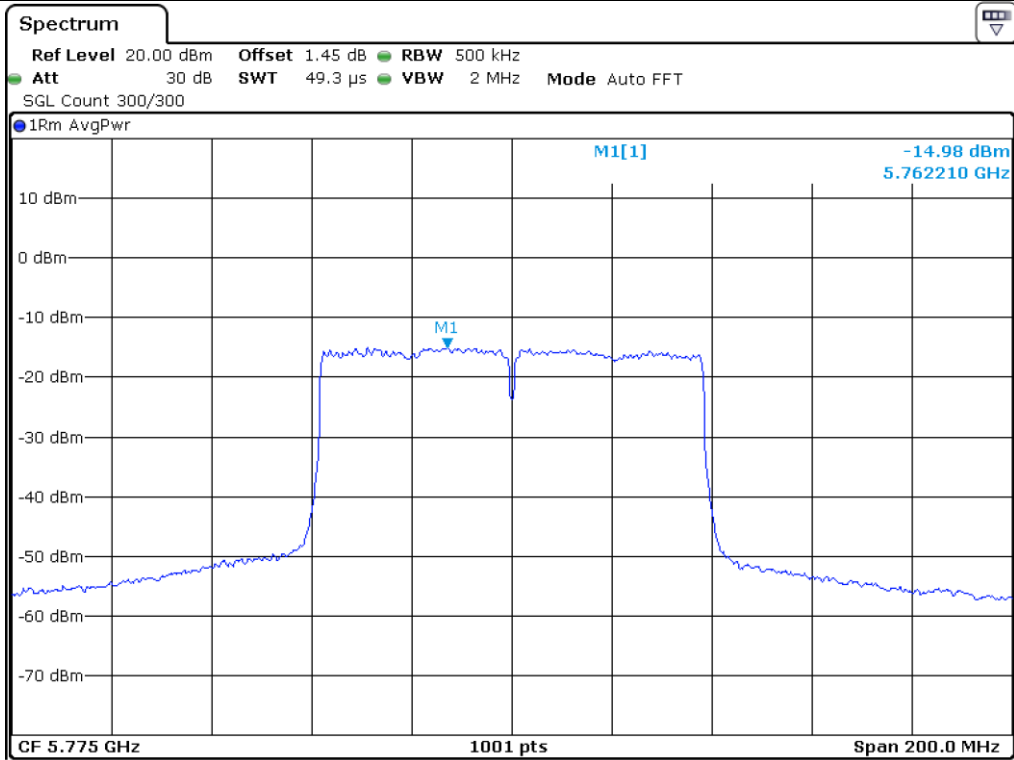
FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 210.00	-11.22	1.15	-10.07	11.00	21.07
5 725 ~ 5 850	5 775.00	-14.98	1.15	-13.83	30.00	43.83

Remark. Margin = Limit – Result (=Measured Value + C.F.)

Remark: See next page for measurement data.



Middle Channel (5 210 MHz)



Middle Channel (5 775 MHz)

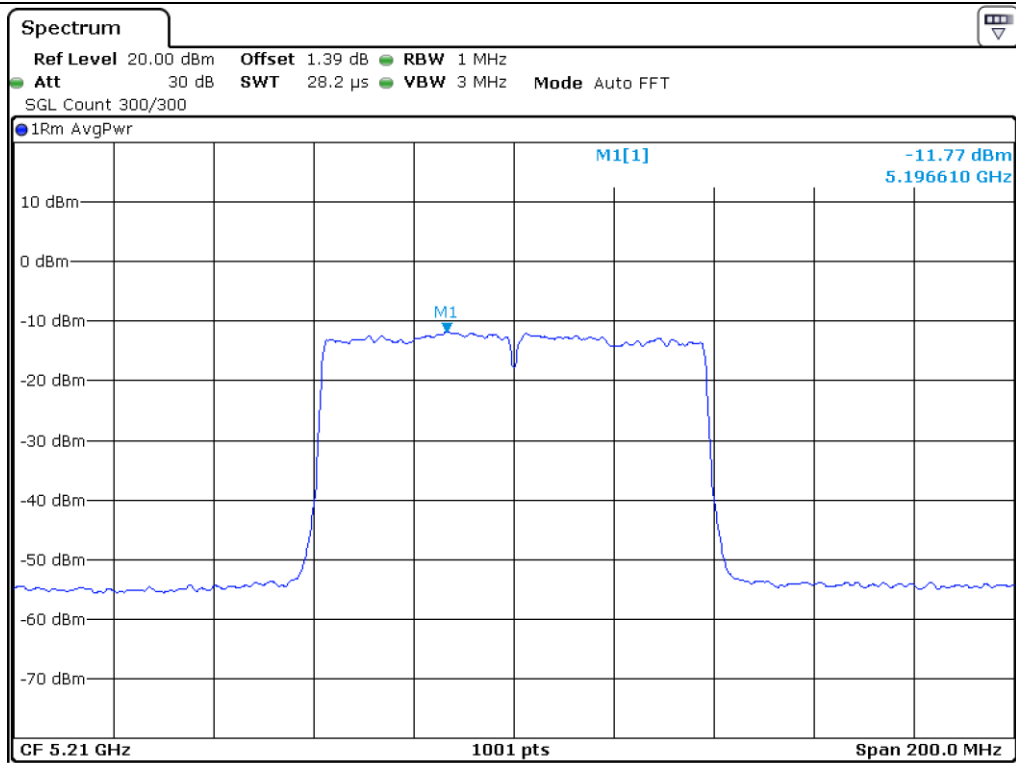
10.7.2 Test data for Antenna 1

- . Operating condition : Highest Output Power Transmitting Mode
- . Duty Cycle : 76.04 %(UNII 1), 76.57 %(UNII 3)
- . Test Result : Pass

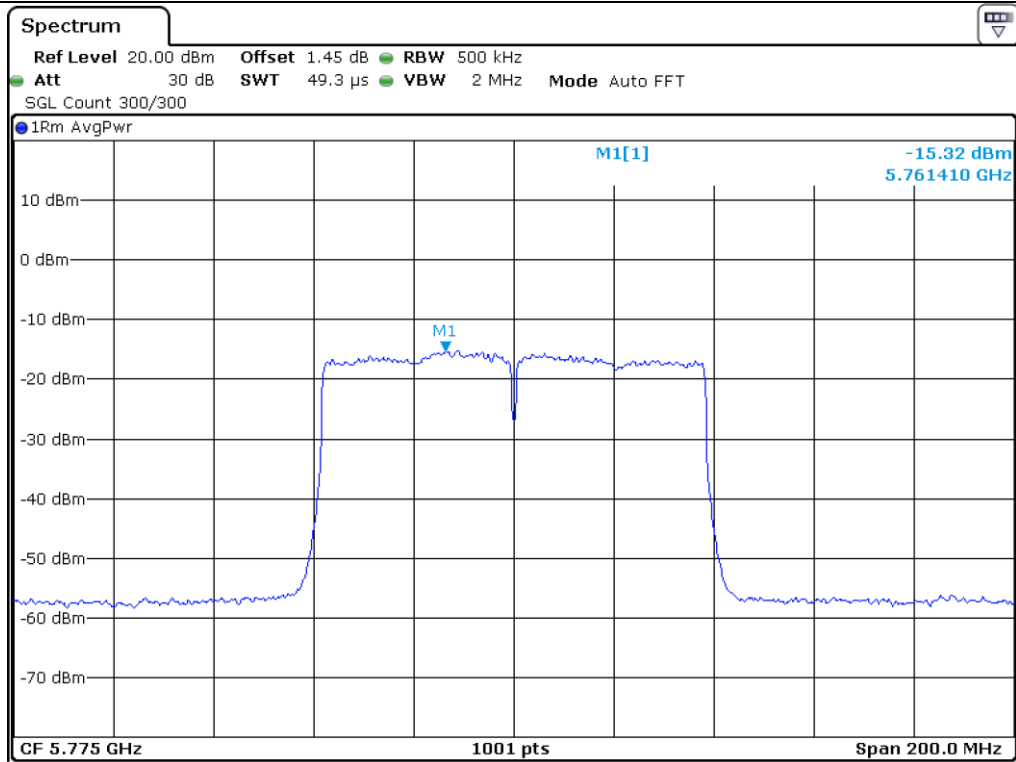
FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 210.00	-11.77	1.19	-10.58	11.00	21.58
5 725 ~ 5 850	5 775.00	-15.32	1.16	-14.16	30.00	44.16

Remark. Margin = Limit – Result (=Measured Value + C.F.)

Remark: See next page for measurement data.



Middle Channel (5 210 MHz)



Middle Channel (5 775 MHz)

10.7.2 Test data for Multiple Transmit

-. Operating condition : Highest Output Power Transmitting Mode

-. Test Result : Pass

FREQUENCY RANGE (MHz)	FREQUENCY (MHz)	MEASURED VALUE (dBm)	C.F (dB)	RESULT (dBm)	LIMIT (dBm)	MARGIN (dB)
5 150 ~ 5 250	5 210.00	-8.48	1.19	-7.29	11.00	18.29
5 725 ~ 5 850	5 775.00	-12.14	1.16	-10.98	29.21	40.19

Remark. Margin = Limit – Result (=Measured Value + C.F.)

11. FREQUENCY STABILITY WITH TEMPERATURE VARIATION

11.1 Operating environment

Temperature : 23 °C
 Relative humidity : 45 % R.H.

11.2 Test set-up

Turn EUT off and set chamber temperature to -40 °C and then allow sufficient time (approximately 20 min to 30 min after chamber reach the assigned temperature) for EUT to stabilize. Turn on the EUT and measure the EUT operating frequency and then turn off the EUT after the measurement. The temperature in the chamber was raised 10 °C step from -40 °C to +70 °C. Repeat above method for frequency measurements every 10 °C step and then record all measured frequencies on each temperature step.



11.3 Test Date

June 08, 2021 ~ June 22, 2021

11.4 Test Data for U-NII-1

-. Result : Pass

Temperature (°C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)	
-40	5 180 000 000	5 179 957 853	-42 147	
-30		5 179 957 925	-42 075	
-20		5 179 958 025	-41 975	
-10		5 179 958 134	-41 866	
0		5 179 958 215	-41 785	
10		5 179 958 342	-41 658	
20		5 179 958 430	-41 570	
30		5 179 958 563	-41 437	
40		5 179 958 663	-41 337	
50		5 179 958 732	-41 268	
60		5 179 958 788	-41 212	
70		5 179 958 824	-41 176	
80		5 179 958 899	-41 101	
-40		5 220 000 000	5 219 956 782	-43 218
-30			5 219 956 835	-43 165
-20	5 219 956 986		-43 014	
-10	5 219 957 047		-42 953	
0	5 219 957 184		-42 816	
10	5 219 957 238		-42 762	
20	5 219 957 319		-42 681	
30	5 219 957 396		-42 604	
40	5 219 957 430		-42 570	
50	5 219 957 535		-42 465	
60	5 219 957 603		-42 397	
70	5 219 957 661		-42 339	
80	5 219 957 704		-42 296	

-40	5 240 000 000	5 239 956 758	-43 242
-30		5 239 956 875	-43 125
-20		5 239 956 990	-43 010
-10		5 239 957 089	-42 911
0		5 239 957 148	-42 852
10		5 239 957 245	-42 755
20		5 239 957 337	-42 663
30		5 239 957 452	-42 548
40		5 239 957 511	-42 489
50		5 239 957 604	-42 396
60		5 239 957 668	-42 332
70		5 239 957 712	-42 288
80		5 239 957 780	-42 220

11.5 Test Data for U-NII-3

-. Result : Pass

Temperature (°C)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)	
-40	5 745 000 000	5 744 952 402	-47 598	
-30		5 744 952 488	-47 512	
-20		5 744 952 569	-47 431	
-10		5 744 952 694	-47 306	
0		5 744 952 768	-47 232	
10		5 744 952 861	-47 139	
20		5 744 952 988	-47 012	
30		5 744 952 105	-47 895	
40		5 744 952 189	-47 811	
50		5 744 952 218	-47 782	
60		5 744 952 304	-47 696	
70		5 744 952 396	-47 604	
80		5 744 952 425	-47 575	
-40		5 785 000 000	5 784 952 683	-47 317
-30			5 784 952 768	-47 232
-20	5 784 952 843		-47 157	
-10	5 784 952 956		-47 044	
0	5 784 953 043		-46 957	
10	5 784 953 148		-46 852	
20	5 784 953 243		-46 757	
30	5 784 953 318		-46 682	
40	5 784 953 397		-46 603	
50	5 784 953 458		-46 542	
60	5 784 953 512		-46 488	
70	5 784 953 604		-46 396	
80	5 784 953 705		-46 295	

-40	5 825 000 000	5 824 951 634	-48 366
-30		5 824 951 753	-48 247
-20		5 824 951 835	-48 165
-10		5 824 951 983	-48 017
0		5 824 952 037	-47 963
10		5 824 952 159	-47 841
20		5 824 952 249	-47 751
30		5 824 952 315	-47 685
40		5 824 952 412	-47 588
50		5 824 952 496	-47 504
60		5 824 952 584	-47 416
70		5 824 952 637	-47 363
80		5 824 952 773	-47 227

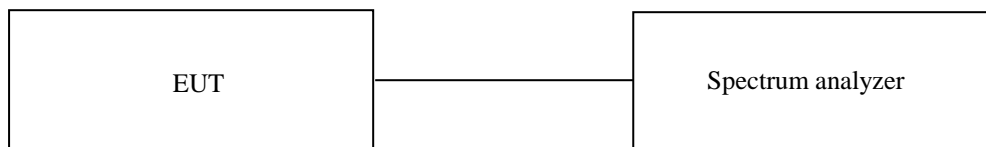
12. FREQUENCY STABILITY WITH VOLTAGE VARIATION

12.1 Operating environment

Temperature : 23 °C
Relative humidity : 45 % R.H.

12.2 Test set-up

An external DC power supply was connected to the input of the EUT. The voltage of EUT set to 110 % of the nominal value and then was reduced to 90 % of nominal voltage. The output frequency was recorded at each step.



12.3 Test Date

June 08, 2021 ~ June 22, 2021

12.4 Test Data for U-NII-1

-. Result : Pass

Voltage (VDC)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
12.0	5 180 000 000	5 179 958 635	-41 365
10.8		5 179 958 524	-41 476
13.2		5 179 958 734	-41 266
12.0	5 220 000 000	521 9957 256	-42 744
10.8		521 9957 120	-42 880
13.2		521 9957 348	-42 652
12.0	5 240 000 000	5 239 957 405	-42 595
10.8		5 239 957 312	-42 688
13.2		5 239 957 531	-42 469

12.5 Test Data for U-NII-3

-. Result : Pass

Voltage (VDC)	Carrier Freq. (Hz)	Measured Freq. (Hz)	Frequency Error (Hz)
12.0	5 745 000 000	5 744 952 853	-47 147
10.8		5 744 952 768	-47 232
13.2		5 744 952 912	-47 088
12.0	5 785 000 000	5 784 953 452	-46 548
10.8		5 784 953 321	-46 679
13.2		5 784 953 563	-46 437
12.0	5 825 000 000	5 804 952 312	-47 688
10.8		5 804 952 196	-47 804
13.2		5 804 952 425	-47 575

13. RADIATED SPURIOUS EMISSIONS

13.1 Operating environment

Temperature : 23 °C
 Relative humidity : 45 % R.H.

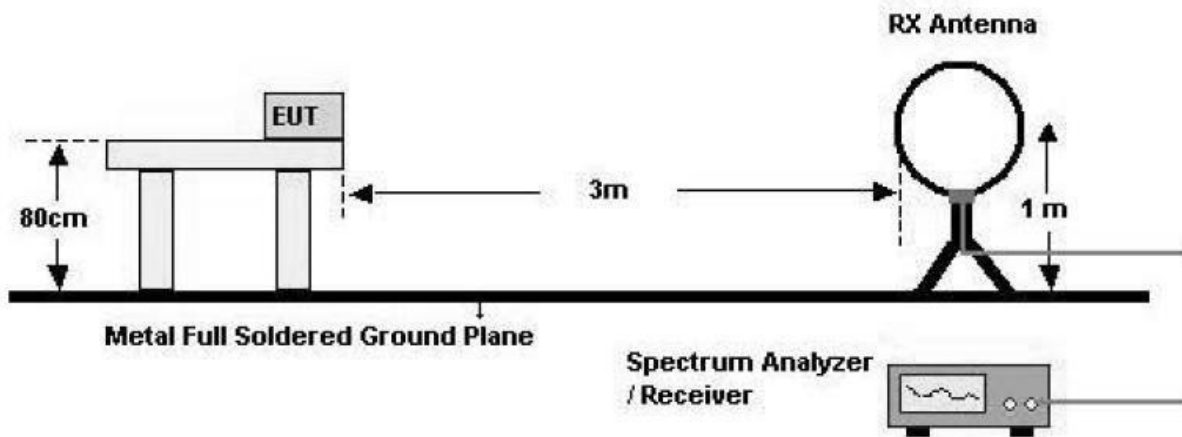
13.2 Test set-up for conducted measurement

The radiated emissions measurements were on the 3 m semi anechoic chamber. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

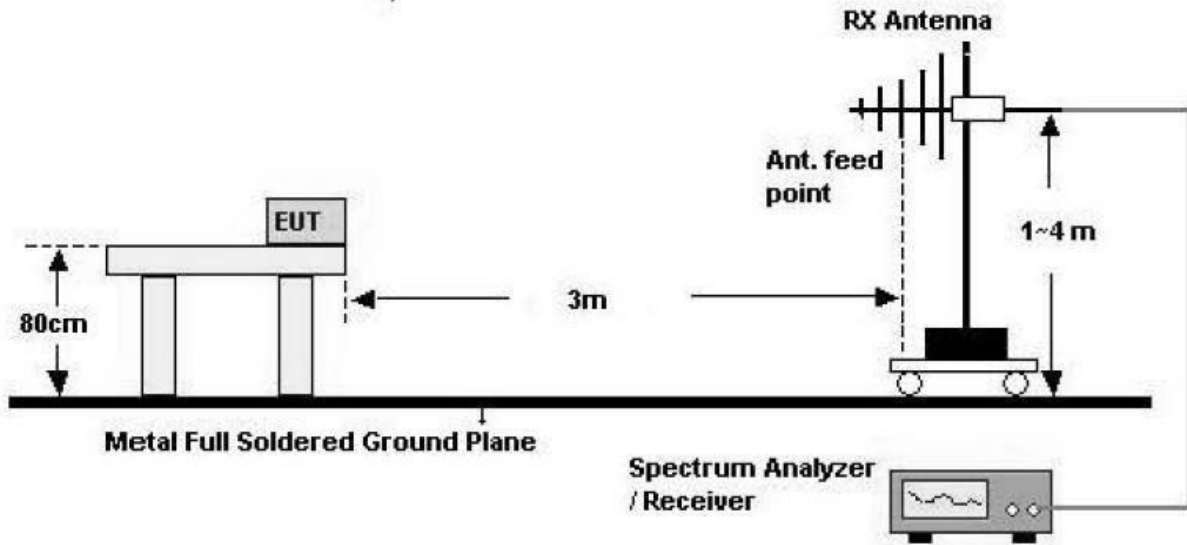
The frequency spectrum from 30 MHz to 40 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

- Test Configuration

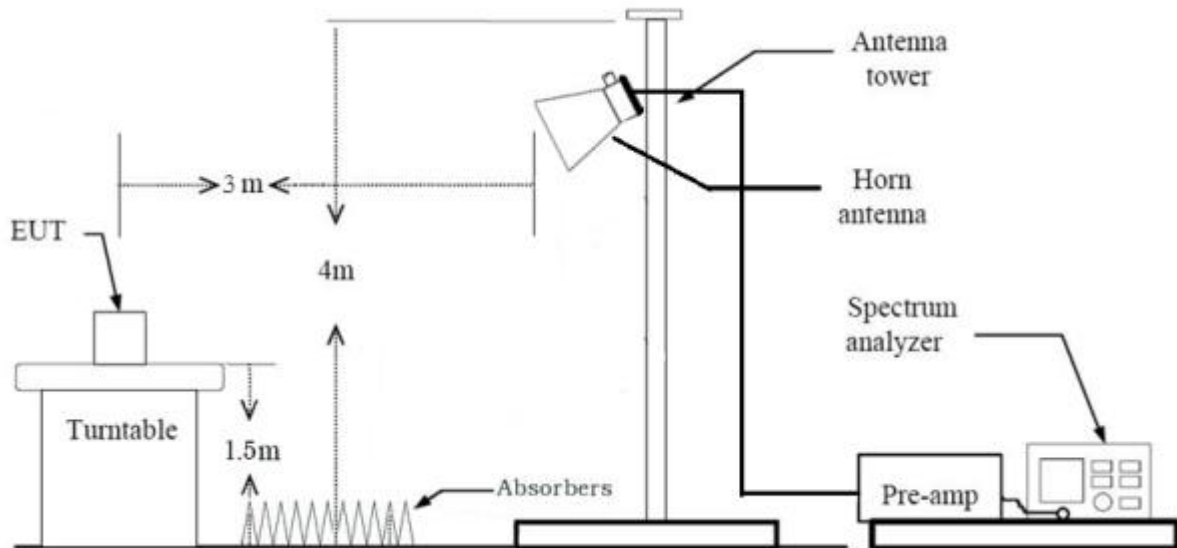
1. Below 30 MHz



2. 30 MHz - 1 GHz



3. Above 1 GHz



13.3 Test Date

June 08, 2021 ~ June 22, 2021

13.4 Test data for Below 30 MHz

- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

13.5 Test data for 30 MHz ~ 1 000 MHz

13.5.1 Test data for WLAN 5 GHz

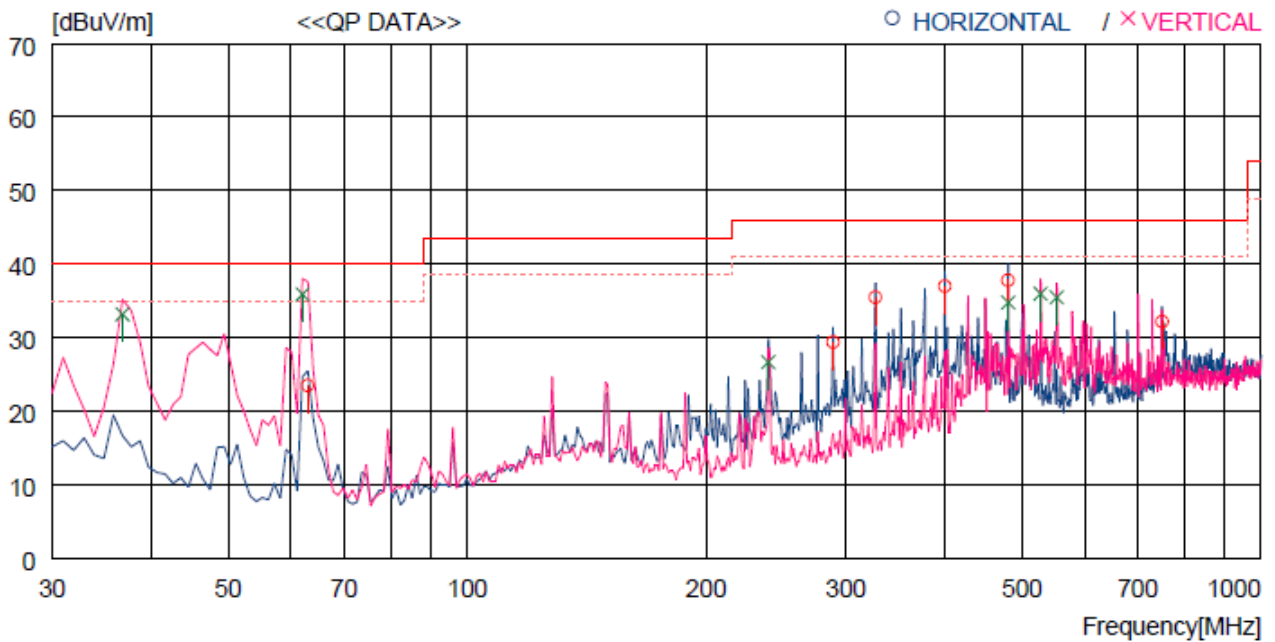
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Car Navigation

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-Antenna 0, Antenna 1 and Multiple transmit tested, but the worst data were recorded.



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
---- Horizontal ----										
1	62.980	42.4	12.3	0.9	32.1	23.5	40.0	16.5	100	234
2	288.990	40.5	18.9	2.0	32.0	29.4	46.0	16.6	100	129
3	326.820	45.7	19.6	2.2	32.0	35.5	46.0	10.5	100	234
4	399.570	46.0	20.7	2.4	32.1	37.0	46.0	9.0	100	234
5	480.081	44.8	22.6	2.7	32.3	37.8	46.0	8.2	100	234
6	750.703	34.1	26.4	3.8	32.1	32.2	46.0	13.8	100	234
---- Vertical ----										
7	36.790	46.1	18.5	0.6	32.0	33.2	40.0	6.8	100	197
8	62.010	54.8	12.3	0.9	32.1	35.9	40.0	4.1	100	260
9	239.520	39.5	17.3	1.9	32.0	26.7	46.0	19.3	100	238
10	480.081	41.8	22.6	2.7	32.3	34.8	46.0	11.2	100	197
11	527.610	42.1	23.4	2.8	32.3	36.0	46.0	10.0	100	197
12	552.829	41.4	23.7	2.8	32.4	35.5	46.0	10.5	100	197

13.6 Test data for Above 1 GHz

13.6.1 Test data for Frequency UNII I

13.6.1.1 Test data for 802.11a RLAN Mode

13.6.1.1.1 Test data for Antenna 0

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 92.41 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F. (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
10 360.00	45.21	Peak	H	39.20	18.57	46.92	-	56.06	68.20	12.14
10 360.00	44.49	Peak	V	39.20	18.57	46.92	-	55.34	68.20	12.86
Middle Channel										
10 440.00	41.85	Peak	H	39.30	18.57	46.92	-	52.80	68.20	15.40
10 440.00	42.80	Peak	V	39.30	18.57	46.92	-	53.75	68.20	14.45
High Channel										
10 480.00	45.46	Peak	H	39.40	18.57	46.92	-	56.51	68.20	11.69
10 480.00	42.39	Peak	V	39.40	18.57	46.92	-	53.44	68.20	14.76

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total (dBμV/m)

13.6.1.1.2 Test data for Antenna 1

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 92.41 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F. (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
10 360.00	43.35	Peak	H	39.20	18.57	46.92	-	54.20	68.20	14.00
10 360.00	44.20	Peak	V	39.20	18.57	46.92	-	55.05	68.20	13.15
Middle Channel										
10 440.00	44.79	Peak	H	39.30	18.57	46.92	-	55.74	68.20	12.46
10 440.00	42.93	Peak	V	39.30	18.57	46.92	-	53.88	68.20	14.32
High Channel										
10 480.00	42.69	Peak	H	39.40	18.57	46.92	-	53.74	68.20	14.46
10 480.00	43.94	Peak	V	39.40	18.57	46.92	-	54.99	68.20	13.21

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total (dBμV/m)

13.6.1.2 Test data for 802.11n_HT20 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 87.20 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F. (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
10 360.00	45.42	Peak	H	39.20	18.57	46.92	-	56.27	68.20	11.93
10 360.00	43.62	Peak	V	39.20	18.57	46.92	-	54.47	68.20	13.73
Middle Channel										
10 440.00	44.66	Peak	H	39.30	18.57	46.92	-	55.61	68.20	12.59
10 440.00	44.56	Peak	V	39.30	18.57	46.92	-	55.51	68.20	12.69
High Channel										
10 480.00	42.89	Peak	H	39.40	18.57	46.92	-	53.94	68.20	14.26
10 480.00	41.87	Peak	V	39.40	18.57	46.92	-	52.92	68.20	15.28

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total (dBμV/m)

13.6.1.3 Test data for 802.11n_HT40 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 77.90 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F. (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
10 380.00	45.40	Peak	H	39.20	18.57	46.92	-	56.25	68.20	11.95
10 380.00	42.53	Peak	V	39.20	18.57	46.92	-	53.38	68.20	14.82
High Channel										
10 460.00	42.86	Peak	H	39.30	18.57	46.92	-	53.81	68.20	14.39
10 460.00	42.04	Peak	V	39.30	18.57	46.92	-	52.99	68.20	15.21

Remark - “H”: Horizontal, “V”: Vertical

Margin (dB) = Limits (dBμV/m) - Total (dBμV/m)

13.6.1.4 Test data for 802.11ac_HT80 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 76.04 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F. (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Middle Channel										
10 420.00	44.04	Peak	H	39.30	18.57	46.92	-	54.99	68.20	13.21
10 420.00	43.80	Peak	V	39.30	18.57	46.92	-	54.75	68.20	13.45

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total (dBμV/m)

13.6.2 Test data for Frequency UNII 3

13.6.2.1 Test data for 802.11a RLAN Mode

13.6.2.1.1 Test data for Antenna 0

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 91.95 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
11 490.00	43.56	Peak	H	39.30	19.15	46.58		55.43	74.00	18.57
11 490.00	33.63	Average	H	39.30	19.15	46.58	0.36	45.86	54.00	8.14
11 490.00	42.88	Peak	V	39.30	19.15	46.58		54.75	74.00	19.25
11 490.00	32.87	Average	V	39.30	19.15	46.58	0.36	45.10	54.00	8.90
Middle Channel										
11 570.00	42.84	Peak	H	39.40	19.17	46.58		54.83	74.00	19.17
11 570.00	33.54	Average	H	39.40	19.17	46.58	0.36	45.89	54.00	8.11
11 570.00	43.65	Peak	V	39.40	19.17	46.58		55.64	74.00	18.36
11 570.00	33.32	Average	V	39.40	19.17	46.58	0.36	45.67	54.00	8.33
High Channel										
11 650.00	43.55	Peak	H	39.70	19.21	46.58		55.88	74.00	18.12
11 650.00	33.58	Average	H	39.70	19.21	46.58	0.36	46.27	54.00	7.73
11 650.00	43.46	Peak	V	39.70	19.21	46.58		55.79	74.00	18.21
11 650.00	33.72	Average	V	39.70	19.21	46.58	0.36	46.41	54.00	7.59

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total (dBμV/m)

13.6.2.1.2 Test data for Antenna 1

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 91.95 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
11 490.00	43.14	Peak	H	39.30	19.15	46.58	-	55.01	74.00	18.99
11 490.00	33.24	Average	H	39.30	19.15	46.58	0.36	45.47	54.00	8.53
11 490.00	42.75	Peak	V	39.30	19.15	46.58	-	54.62	74.00	19.38
11 490.00	33.41	Average	V	39.30	19.15	46.58	0.36	45.64	54.00	8.36
Middle Channel										
11 570.00	43.38	Peak	H	39.40	19.17	46.58	-	55.37	74.00	18.63
11 570.00	33.23	Average	H	39.40	19.17	46.58	0.36	45.58	54.00	8.42
11 570.00	43.45	Peak	V	39.40	19.17	46.58	-	55.44	74.00	18.56
11 570.00	34.08	Average	V	39.40	19.17	46.58	0.36	46.43	54.00	7.57
High Channel										
11 650.00	43.37	Peak	H	39.70	19.21	46.58	-	55.70	74.00	18.30
11 650.00	33.81	Average	H	39.70	19.21	46.58	0.36	46.50	54.00	7.50
11 650.00	43.80	Peak	V	39.70	19.21	46.58	-	56.13	74.00	17.87
11 650.00	33.76	Average	V	39.70	19.21	46.58	0.36	46.45	54.00	7.55

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total (dBμV/m)

13.6.2.2 Test data for 802.11n_HT20 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 87.20 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
11 490.00	43.65	Peak	H	39.30	19.15	46.58	-	55.52	74.00	18.48
11 490.00	33.31	Average	H	39.30	19.15	46.58	0.59	45.77	54.00	8.23
11 490.00	43.01	Peak	V	39.30	19.15	46.58	-	54.88	74.00	19.12
11 490.00	33.56	Average	V	39.30	19.15	46.58	0.59	46.02	54.00	7.98
Middle Channel										
11 570.00	43.31	Peak	H	39.40	19.17	46.58	-	55.30	74.00	18.70
11 570.00	33.89	Average	H	39.40	19.17	46.58	0.59	46.47	54.00	7.53
11 570.00	44.18	Peak	V	39.40	19.17	46.58	-	56.17	74.00	17.83
11 570.00	33.21	Average	V	39.40	19.17	46.58	0.59	45.79	54.00	8.21
High Channel										
11 650.00	43.31	Peak	H	39.70	19.21	46.58	-	55.64	74.00	18.36
11 650.00	33.48	Average	H	39.70	19.21	46.58	0.59	46.40	54.00	7.60
11 650.00	43.31	Peak	V	39.70	19.21	46.58	-	55.64	74.00	18.36
11 650.00	33.25	Average	V	39.70	19.21	46.58	0.59	46.17	54.00	7.83

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total (dBμV/m)

13.6.2.3 Test data for 802.11n_HT40 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 77.90 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
11 510.00	43.07	Peak	H	39.30	19.15	46.58	-	54.94	74.00	19.06
11 510.00	33.79	Average	H	39.30	19.15	46.58	1.08	46.74	54.00	7.26
11 510.00	42.93	Peak	V	39.30	19.15	46.58	-	54.80	74.00	19.20
11 510.00	33.58	Average	V	39.30	19.15	46.58	1.08	46.53	54.00	7.47
High Channel										
11 590.00	43.83	Peak	H	39.40	19.17	46.58	-	55.82	74.00	18.18
11 590.00	33.63	Average	H	39.40	19.17	46.58	1.08	46.70	54.00	7.30
11 590.00	42.85	Peak	V	39.40	19.17	46.58	-	54.84	74.00	19.16
11 590.00	33.44	Average	V	39.40	19.17	46.58	1.08	46.51	54.00	7.49

Remark - “H”: Horizontal, “V”: Vertical

Margin (dB) = Limits (dBμV/m) - Total (dBμV/m)

13.6.2.4 Test data for 802.11ac_HT80 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Duty Cycle : 76.57 %
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Middle Channel										
11 550.00	43.41	Peak	H	39.40	19.17	46.58	-	55.40	74.00	18.60
11 550.00	33.50	Average	H	39.40	19.17	46.58	1.16	46.65	54.00	7.35
11 550.00	43.23	Peak	V	39.40	19.17	46.58	-	55.22	74.00	18.78
11 550.00	33.37	Average	V	39.40	19.17	46.58	1.16	46.52	54.00	7.48

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total (dBμV/m)

14. RADIATED RESTRICTED BAND EDGE MEASUREMENTS

14.1 Operating environment

Temperature : 23 °C
 Relative humidity : 45 % R.H.

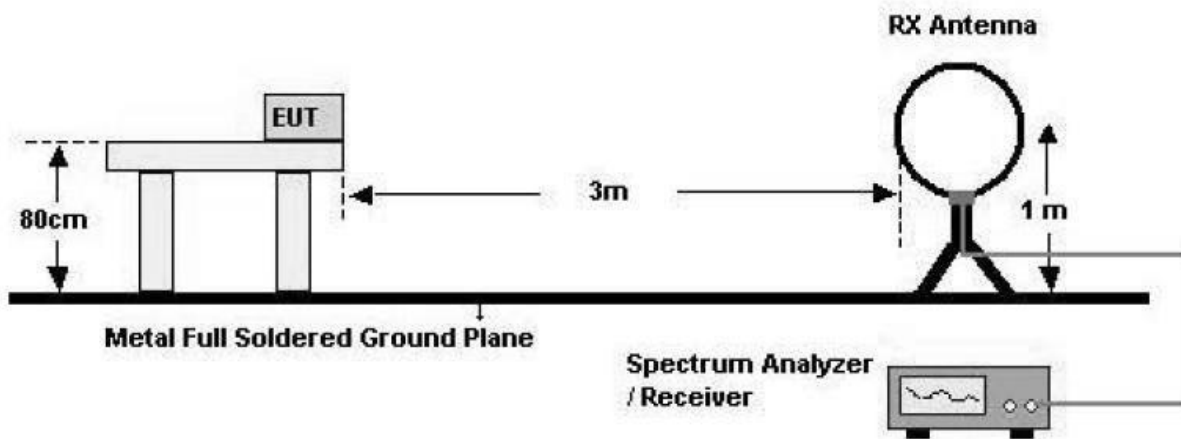
14.2 Test set-up for conducted measurement

The radiated emissions measurements were performed on the 3 m, open-field test site. The EUT was placed on a non-conductive turntable above the ground plane.

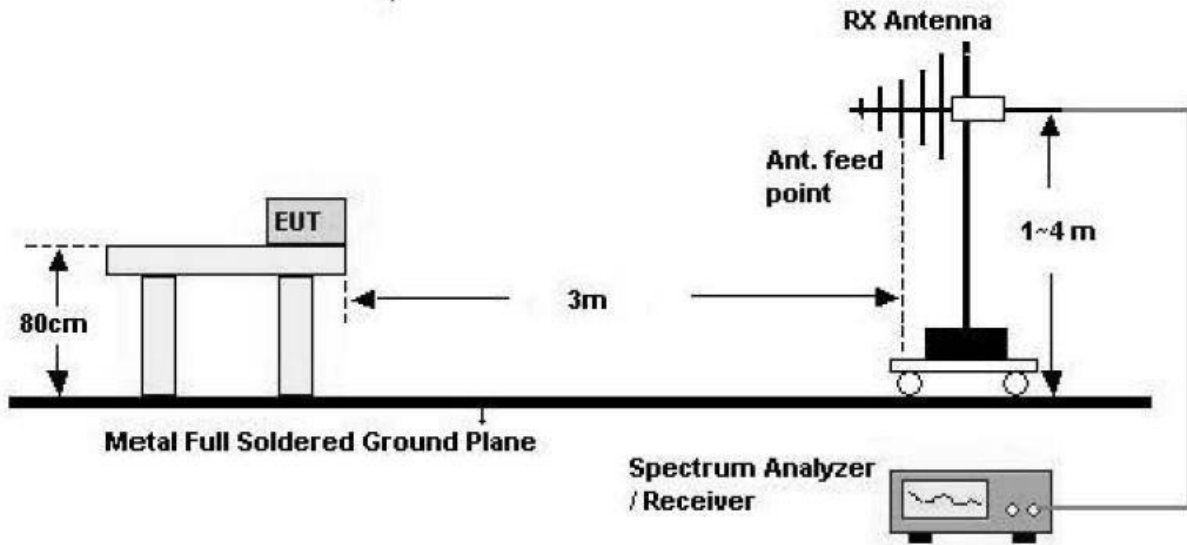
The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

- Test Configuration

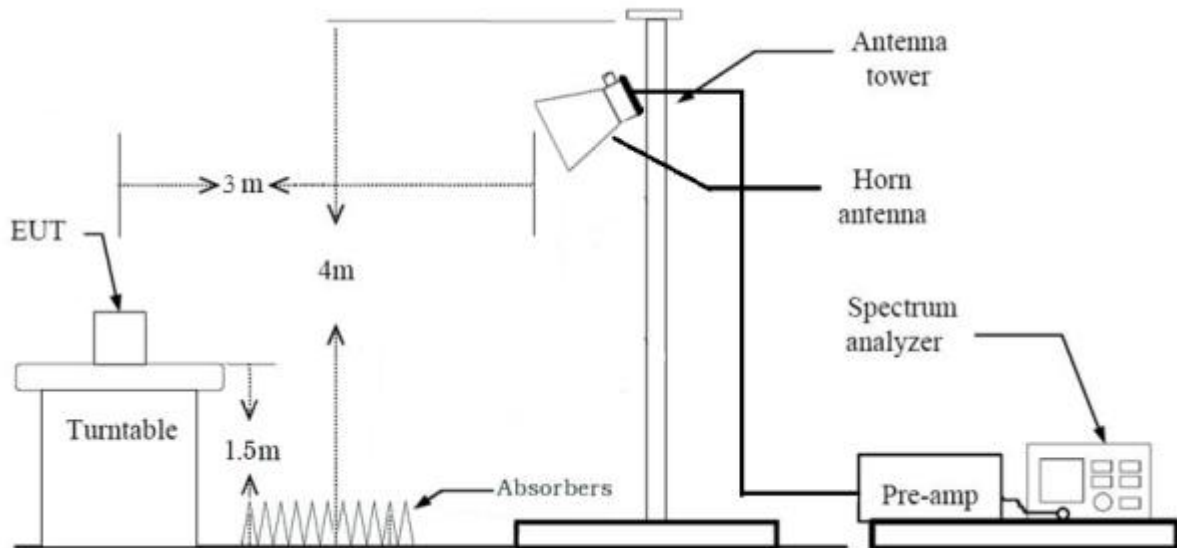
1. Below 30 MHz



2. 30 MHz - 1 GHz



3. Above 1 GHz



14.3 Test Date

June 08, 2021 ~ June 22, 2021

14.4 Test data for Frequency UNII I

14.4.1 Test data for 802.11a RLAN Mode

14.4.1.1 Test data for Antenna 0

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 92.41 %
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 148.380	51.78	Peak	H	34.20	12.80	45.89	-	52.89	74.00	21.11
5 147.730	43.64	Average	H	34.20	12.80	45.89	0.34	45.09	54.00	8.91
5 133.440	51.00	Peak	V	34.20	12.80	45.89	-	52.11	74.00	21.89
5 134.090	42.93	Average	V	34.20	12.80	45.89	0.34	44.38	54.00	9.62

Tabulated test data for Restricted Band

Remark - “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total (dB}\mu\text{V/m)}$$

14.4.1.2 Test data for Antenna 1

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 92.41 %
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 148.380	48.19	Peak	H	34.20	12.80	45.89	-	49.30	74.00	24.70
5 149.030	39.67	Average	H	34.20	12.80	45.89	0.34	41.12	54.00	12.88
5 134.090	49.84	Peak	V	34.20	12.80	45.89	-	50.95	74.00	23.05
5 133.440	42.34	Average	V	34.20	12.80	45.89	0.34	43.79	54.00	10.21

Tabulated test data for Restricted Band

Remark - “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total (dB}\mu\text{V/m)}$$

14.4.2 Test data for 802.11n_HT20 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 87.20 %
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 145.130	54.21	Peak	H	34.20	12.80	45.89	-	55.32	74.00	18.68
5 149.680	43.83	Average	H	34.20	12.80	45.89	0.59	45.53	54.00	8.47
5 144.480	50.43	Peak	V	34.20	12.80	45.89	-	51.54	74.00	22.46
5 134.090	43.17	Average	V	34.20	12.80	45.89	0.59	44.87	54.00	9.13

Tabulated test data for Restricted Band

Remark - “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total (dB}\mu\text{V/m)}$$

14.4.3 Test data for 802.11n_HT40 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 77.90 %
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 143.830	53.61	Peak	H	34.20	12.80	45.89	-	54.72	74.00	19.28
5 149.680	44.84	Average	H	34.20	12.80	45.89	1.08	47.03	54.00	6.97
5 145.780	51.44	Peak	V	34.20	12.80	45.89	-	52.55	74.00	21.45
5 149.680	42.97	Average	V	34.20	12.80	45.89	1.08	45.16	54.00	8.84

Tabulated test data for Restricted Band

Remark - “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total (dB}\mu\text{V/m)}$$

14.4.4 Test data for 802.11ac_HT80 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 76.04 %
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
5 141.880	52.89	Peak	H	34.20	12.80	45.89	-	54.00	74.00	20.00
5 147.080	44.79	Average	H	34.20	12.80	45.89	1.19	47.09	54.00	6.91
5 141.230	50.45	Peak	V	34.20	12.80	45.89	-	51.56	74.00	22.44
5 145.130	42.55	Average	V	34.20	12.80	45.89	1.19	44.85	54.00	9.15

Tabulated test data for Restricted Band

Remark - “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total (dB}\mu\text{V/m)}$$

14.5 Test data for Frequency U-NII-3

14.5.1 Test data for 802.11a RLAN Mode

14.5.1.1 Test data for Antenna 0

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 91.95 %
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
5 650.000	45.26	Peak	H	34.10	15.69	45.84	-	49.21	68.20	18.99
5 710.000	49.54	Peak	H	34.10	15.69	45.84	-	53.49	105.20	51.71
5 715.000	52.60	Peak	H	34.10	15.69	45.84	-	56.55	110.80	54.25
5 725.000	55.99	Peak	H	34.10	15.69	45.84	-	59.94	122.20	62.26
5 650.000	45.48	Peak	V	34.10	15.69	45.84	-	49.43	68.20	18.77
5 710.000	46.36	Peak	V	34.10	15.69	45.84	-	50.31	105.20	54.89
5 715.000	49.04	Peak	V	34.10	15.69	45.84	-	52.99	110.80	57.81
5 725.000	54.77	Peak	V	34.10	15.69	45.84	-	58.72	122.20	63.48
High Channel										
5 850.000	56.82	Peak	H	34.80	15.69	45.84	-	61.47	122.20	60.73
5 855.000	55.80	Peak	H	34.80	15.69	45.84	-	60.45	110.80	50.35
5 875.000	51.66	Peak	H	34.80	15.69	45.84	-	56.31	105.20	48.89
5 925.000	46.38	Peak	H	34.80	15.69	45.84	-	51.03	68.20	17.17
5 850.000	53.65	Peak	V	34.80	15.69	45.84	-	58.30	122.20	63.90
5 855.000	51.24	Peak	V	34.80	15.69	45.84	-	55.89	110.80	54.91
5 875.000	50.48	Peak	V	34.80	15.69	45.84	-	55.13	105.20	50.07
5 925.000	45.32	Peak	V	34.80	15.69	45.84	-	49.97	68.20	18.23

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total (dB}\mu\text{V/m)}$$

14.5.1.2 Test data for Antenna 1

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 91.95 %
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
5 650.000	45.18	Peak	H	34.10	15.69	45.84	-	49.13	68.20	19.07
5 710.000	48.59	Peak	H	34.10	15.69	45.84	-	52.54	105.20	52.66
5 715.000	49.85	Peak	H	34.10	15.69	45.84	-	53.80	110.80	57.00
5 725.000	53.54	Peak	H	34.10	15.69	45.84	-	57.49	122.20	64.71
5 650.000	44.20	Peak	V	34.10	15.69	45.84	-	48.15	68.20	20.05
5 710.000	46.38	Peak	V	34.10	15.69	45.84	-	50.33	105.20	54.87
5 715.000	47.47	Peak	V	34.10	15.69	45.84	-	51.42	110.80	59.38
5 725.000	50.69	Peak	V	34.10	15.69	45.84	-	54.64	122.20	67.56
High Channel										
5 850.000	47.26	Peak	H	34.80	15.69	45.84	-	51.91	122.20	70.29
5 855.000	46.42	Peak	H	34.80	15.69	45.84	-	51.07	110.80	59.73
5 875.000	46.48	Peak	H	34.80	15.69	45.84	-	51.13	105.20	54.07
5 925.000	44.69	Peak	H	34.80	15.69	45.84	-	49.34	68.20	18.86
5 850.000	45.65	Peak	V	34.80	15.69	45.84	-	50.30	122.20	71.90
5 855.000	45.41	Peak	V	34.80	15.69	45.84	-	50.06	110.80	60.74
5 875.000	45.90	Peak	V	34.80	15.69	45.84	-	50.55	105.20	54.65
5 925.000	44.71	Peak	V	34.80	15.69	45.84	-	49.36	68.20	18.84

Tabulated test data for Restricted Band

Remark - “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total (dB}\mu\text{V/m)}$$

14.5.2 Test data for 802.11n_HT20 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 87.20 %
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
5 650.000	45.38	Peak	H	34.10	15.69	45.84	-	49.33	68.20	18.87
5 710.000	56.72	Peak	H	34.10	15.69	45.84	-	60.67	105.20	44.53
5 715.000	62.00	Peak	H	34.10	15.69	45.84	-	65.95	110.80	44.85
5 725.000	66.55	Peak	H	34.10	15.69	45.84	-	70.50	122.20	51.70
5 650.000	44.56	Peak	V	34.10	15.69	45.84	-	48.51	68.20	19.69
5 710.000	52.01	Peak	V	34.10	15.69	45.84	-	55.96	105.20	49.24
5 715.000	57.20	Peak	V	34.10	15.69	45.84	-	61.15	110.80	49.65
5 725.000	64.65	Peak	V	34.10	15.69	45.84	-	68.60	122.20	53.60
High Channel										
5 850.000	58.41	Peak	H	34.80	15.69	45.84	-	63.06	122.20	59.14
5 855.000	59.53	Peak	H	34.80	15.69	45.84	-	64.18	110.80	46.62
5 875.000	50.79	Peak	H	34.80	15.69	45.84	-	55.44	105.20	49.76
5 925.000	45.92	Peak	H	34.80	15.69	45.84	-	50.57	68.20	17.63
5 850.000	55.56	Peak	V	34.80	15.69	45.84	-	60.21	122.20	61.99
5 855.000	53.36	Peak	V	34.80	15.69	45.84	-	58.01	110.80	52.79
5 875.000	47.95	Peak	V	34.80	15.69	45.84	-	52.60	105.20	52.60
5 925.000	44.99	Peak	V	34.80	15.69	45.84	-	49.64	68.20	18.56

Tabulated test data for Restricted Band

Remark - “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total (dB}\mu\text{V/m)}$$

14.5.3 Test data for 802.11n_HT40 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 77.90 %
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
5 650.000	46.23	Peak	H	34.10	15.69	45.84	-	50.18	68.20	18.02
5 710.000	51.84	Peak	H	34.10	15.69	45.84	-	55.79	105.20	49.41
5 715.000	53.48	Peak	H	34.10	15.69	45.84	-	57.43	110.80	53.37
5 725.000	57.53	Peak	H	34.10	15.69	45.84	-	61.48	122.20	60.72
5 650.000	45.06	Peak	V	34.10	15.69	45.84	-	49.01	68.20	19.19
5 710.000	48.25	Peak	V	34.10	15.69	45.84	-	52.20	105.20	53.00
5 715.000	50.74	Peak	V	34.10	15.69	45.84	-	54.69	110.80	56.11
5 725.000	55.64	Peak	V	34.10	15.69	45.84	-	59.59	122.20	62.61
High Channel										
5 850.000	47.62	Peak	H	34.80	15.69	45.84	-	52.27	122.20	69.93
5 855.000	47.32	Peak	H	34.80	15.69	45.84	-	51.97	110.80	58.83
5 875.000	47.57	Peak	H	34.80	15.69	45.84	-	52.22	105.20	52.98
5 925.000	45.22	Peak	H	34.80	15.69	45.84	-	49.87	68.20	18.33
5 850.000	45.10	Peak	V	34.80	15.69	45.84	-	49.75	122.20	72.45
5 855.000	45.98	Peak	V	34.80	15.69	45.84	-	50.63	110.80	60.17
5 875.000	45.15	Peak	V	34.80	15.69	45.84	-	49.80	105.20	55.40
5 925.000	44.70	Peak	V	34.80	15.69	45.84	-	49.35	68.20	18.85

Tabulated test data for Restricted Band

Remark - “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total (dB}\mu\text{V/m)}$$

14.5.4 Test data for 802.11ac_HT80 RLAN Mode

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 76.57 %
- Result : Pass

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Factor	C.F (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Low Channel										
5 650.000	48.07	Peak	H	34.10	15.69	45.84	-	52.02	68.20	16.18
5 710.000	51.33	Peak	H	34.10	15.69	45.84	-	55.28	105.20	49.92
5 715.000	56.07	Peak	H	34.10	15.69	45.84	-	60.02	110.80	50.78
5 725.000	56.14	Peak	H	34.10	15.69	45.84	-	60.09	122.20	62.11
5 650.000	45.45	Peak	V	34.10	15.69	45.84	-	49.40	68.20	18.80
5 710.000	47.96	Peak	V	34.10	15.69	45.84	-	51.91	105.20	53.29
5 715.000	50.92	Peak	V	34.10	15.69	45.84	-	54.87	110.80	55.93
5 725.000	54.07	Peak	V	34.10	15.69	45.84	-	58.02	122.20	64.18
High Channel										
5 850.000	48.22	Peak	H	34.80	15.69	45.84	-	52.87	122.20	69.33
5 855.000	47.68	Peak	H	34.80	15.69	45.84	-	52.33	110.80	58.47
5 875.000	46.76	Peak	H	34.80	15.69	45.84	-	51.41	105.20	53.79
5 925.000	46.56	Peak	H	34.80	15.69	45.84	-	51.21	68.20	16.99
5 850.000	48.37	Peak	V	34.80	15.69	45.84	-	53.02	122.20	69.18
5 855.000	46.91	Peak	V	34.80	15.69	45.84	-	51.56	110.80	59.24
5 875.000	46.64	Peak	V	34.80	15.69	45.84	-	51.29	105.20	53.91
5 925.000	46.10	Peak	V	34.80	15.69	45.84	-	50.75	68.20	17.45

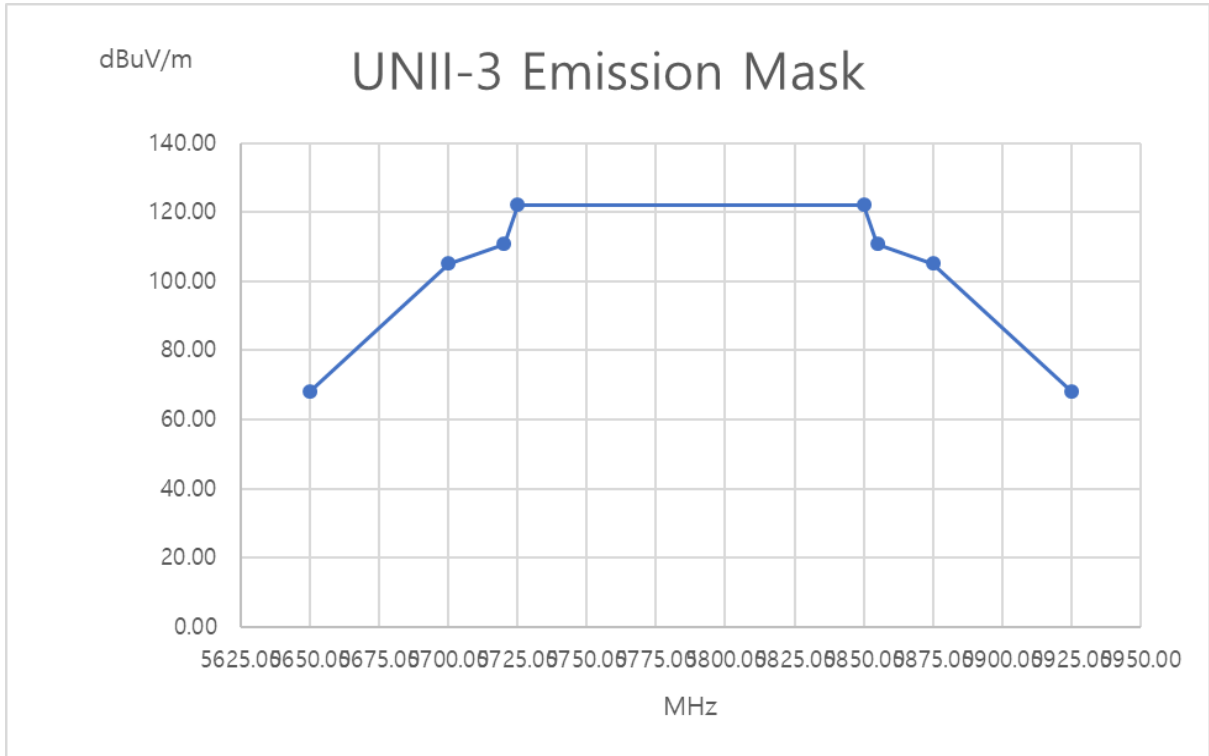
Tabulated test data for Restricted Band

Remark - “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total (dB}\mu\text{V/m)}$$

14.6 U-NII-3 Emission Limits

14.6.1 Emission Mask Plots



Remark.

- Title 47 → Part 15 → Subpart E—UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE DEVICES

§ 15.407 General technical requirements.

(4) For transmitters operating in the 5.725-5.85 GHz band:

- (i) 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.

15. LIST OF TEST EQUIPMENT

Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
FSV40-N	Rohde & Schwarz	Signal Analyzer	101546	Jun. 24, 2020 (1Y)
ESW	Rohde & Schwarz	EMI Test Receiver	101851	Mar. 22, 2021 (1Y)
NRP-Z81	Rohde & Schwarz	Wide band Sensor	101975	Feb. 09, 2021 (1Y)
SSE-43CI-A	Samkun Tech	Humidity Chamber	60712	Feb. 09, 2021 (1Y)
E3632A	FinePower	DC Power supply	MY50370016	Feb. 08, 2021 (1Y)
310N	Sonoma Instrument	Pre-Amplifier	392756	Oct. 16, 2020 (1Y)
PAM-118A	Com-Power	Pre-Amplifier	18040081	Oct. 12, 2020 (1Y)
PAM-840A	Com-Power	Pre-Amplifier	461339	Oct. 16, 2020 (1Y)
DT3000-3t	Innco System	Turn Table	DT3000/093	N/A
MA-4000XPET	Innco System	Antenna Master	MA4000/509	N/A
FMZB 1513	Schwarzbeck	Loop Antenna	1513-235	Mar. 24, 2020 (2Y)
HLP-2008	TDK	Hybrid Antenna	131316	Feb. 27, 2020 (2Y)
AH-118	Com-Power	Horn Antenna	10050061	Oct. 15, 2020 (1Y)
BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Jan. 07, 2021(1Y)
ESR3	Rohde & Schwarz	EMI TEST RECEIVER	102602	Mar. 15, 2021 (1Y)
NSLK8126	Schwarzbeck	AMN	8126-404	Mar. 15, 2021 (1Y)
ESH3Z2	Rohde & Schwarz	PULSE LIMITER	357.8810.52	Mar. 15, 2021 (1Y)
D-05180-2	RLC Electronis Inc.	Combiner	0813	N/A
11636B	Hewlett Packard	Combiner	12268	N/A
SMBV100A	R/S	Signal Generator	260423	Feb. 09, 2021 (1Y)
RF-AX88U	ASUS	Dual Band Gigabit Router	NA	N/A

Note. Dual Band Gigabit Router(Model : RF-AX88U) Information.

; FCC ID : MSQ-RTAXHP00, IC ID : 3568A-RTAXHP00

Note. This Device not support TPC Function.

All test equipment used is calibrated on a regular basis.