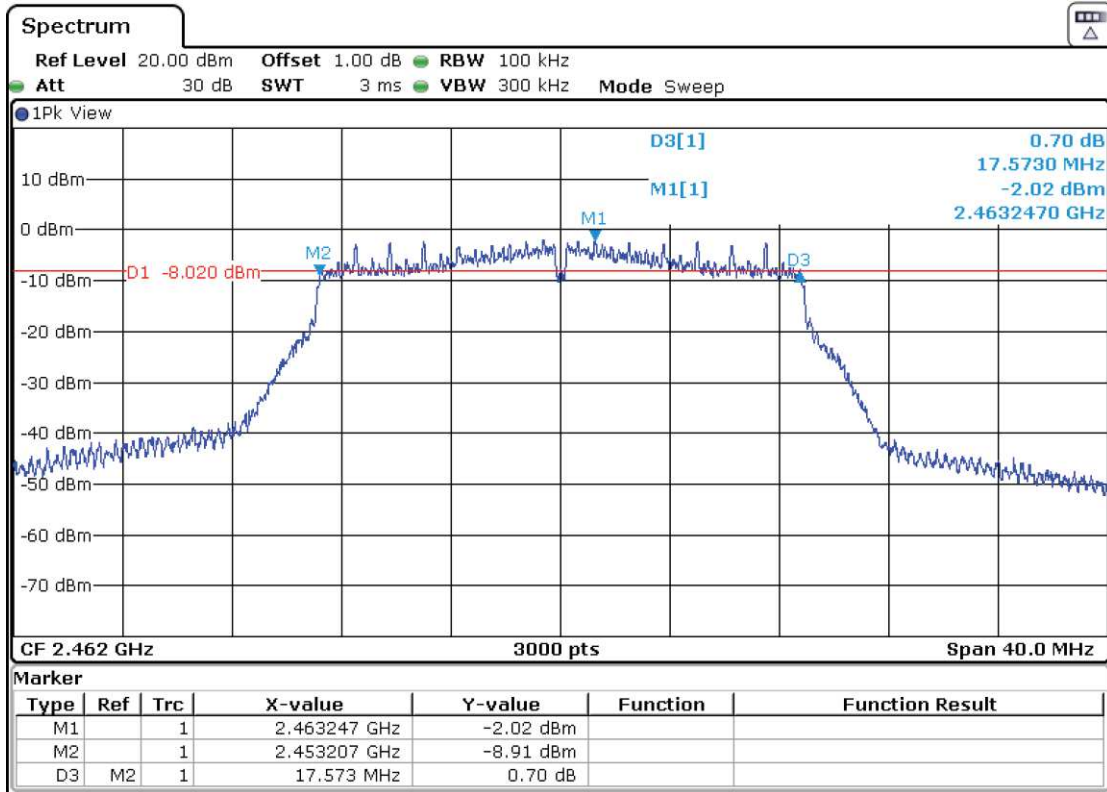
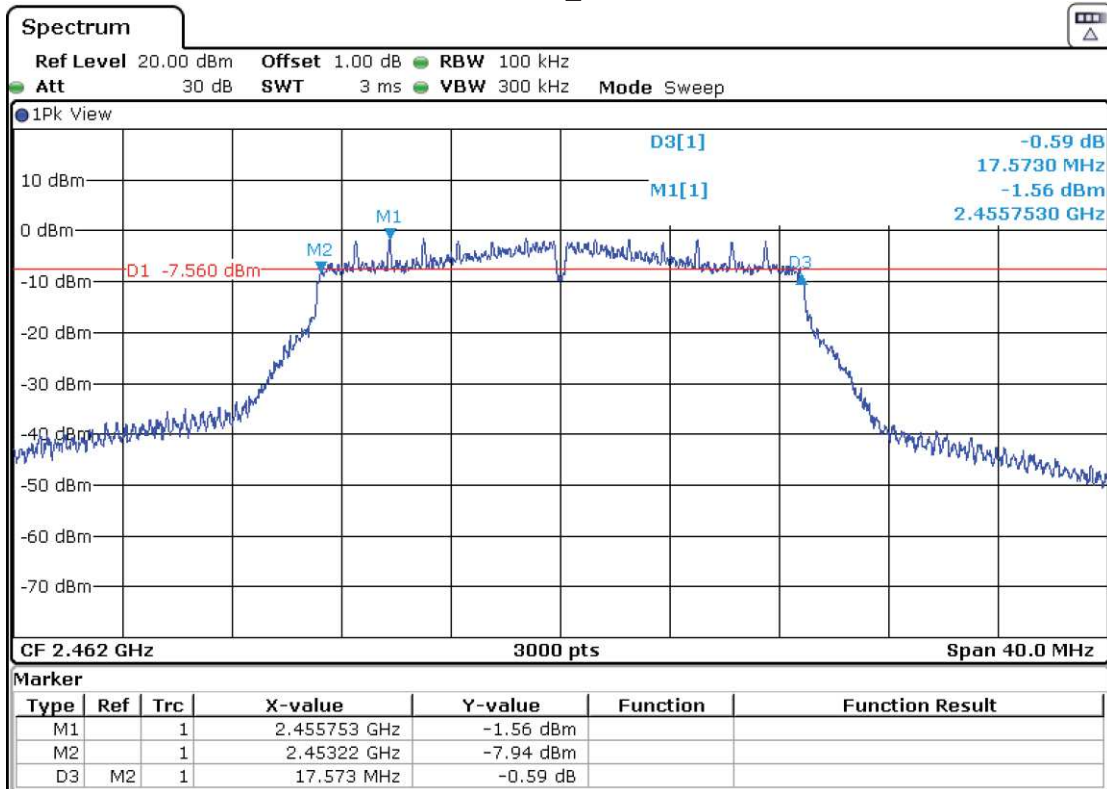


- High Channel:

CORE1_Port4



CORE0_Port2



FCC 15.35 (c) / RSS-Gen 6.10. Transmitter Duty Cycle

SPECIFICATION:

When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

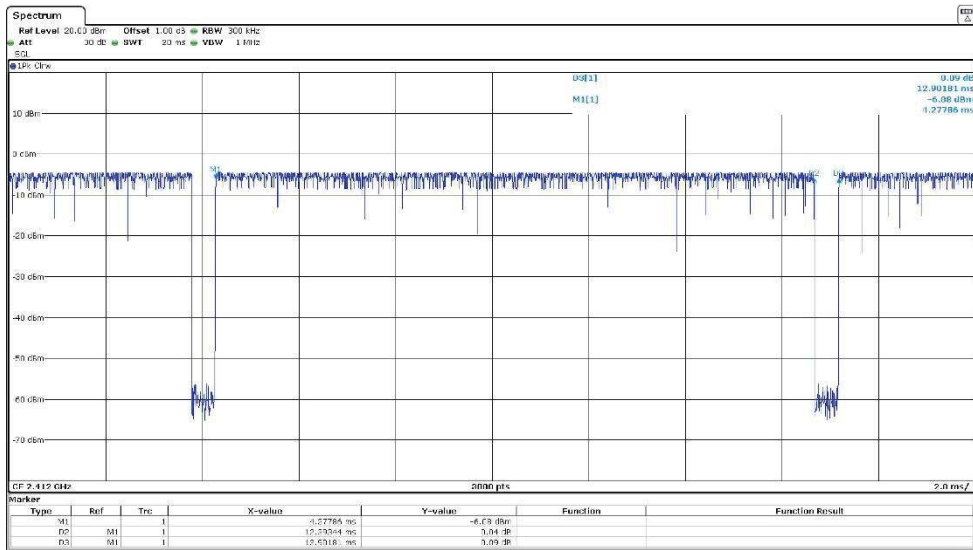
RESULTS:

The results below are for data rates with a duty cycle less than 98%. The results for all rest of modes having a value > 98%.

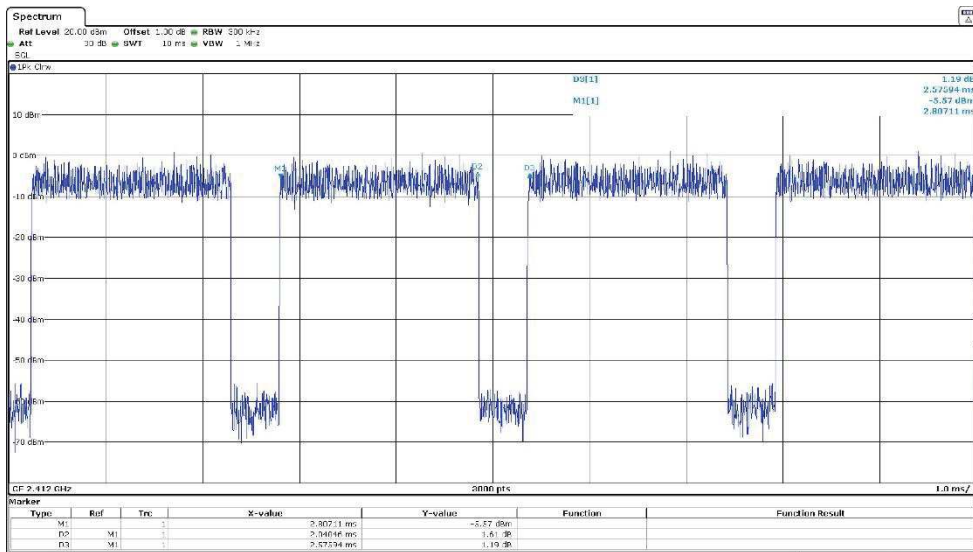
Technique	Mode	Antenna Port	Pulse Duration (ms)	Period (ms)	Duty Cycle Correction (dB)
SISO	802.11 b	CORE1_Port4	12.39344	12.90181	0.174587733
SISO	802.11 g	CORE1_Port4	2.04046	2.57594	1.012076575
SISO	802.11 n20	CORE1_Port4	1.89863	2.42123	1.055957075
SISO	802.11 b	CORE0_Port2	12.38633	12.90781	0.179099176
SISO	802.11 g	CORE0_Port2	2.04857	2.56738	0.980393452
SISO	802.11 n20	CORE0_Port2	1.89863	2.42123	1.044934911
MIMO	802.11 b	CORE1_Port4	12.91097	13.44528	0.176
MIMO	802.11 b	CORE0_Port2	12.37746	12.9051	0.181
MIMO	802.11 g	CORE1_Port4	2.04001	2.56752	0.999
MIMO	802.11 g	CORE0_Port2	2.03768	2.57452	1.016
MIMO	802.11 n20	CORE1_Port4	1.8973	2.42081	1.058
MIMO	802.11 n20	CORE0_Port2	1.87396	2.43081	1.130

SISO CORE1_Port4 Antenna:

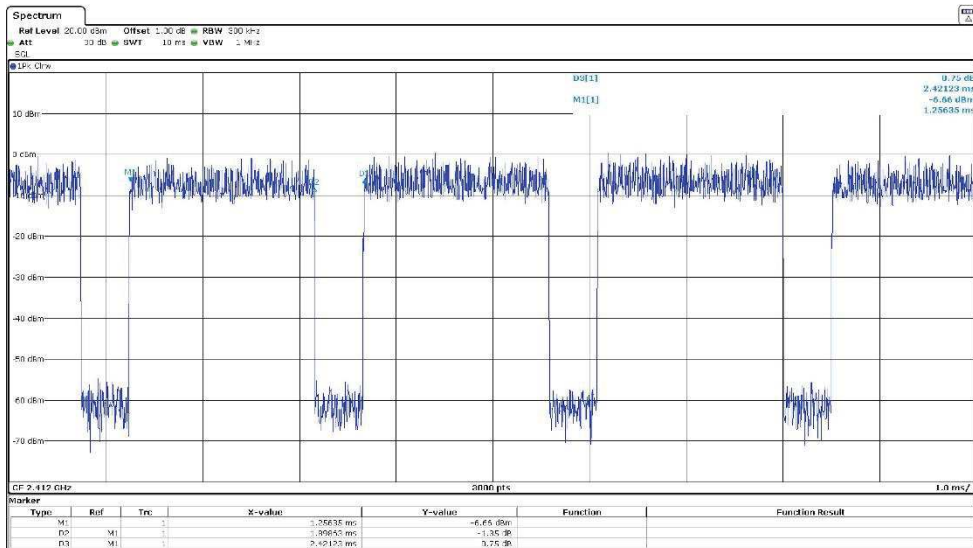
- Mode 802.11 b



- Mode 802.11 g

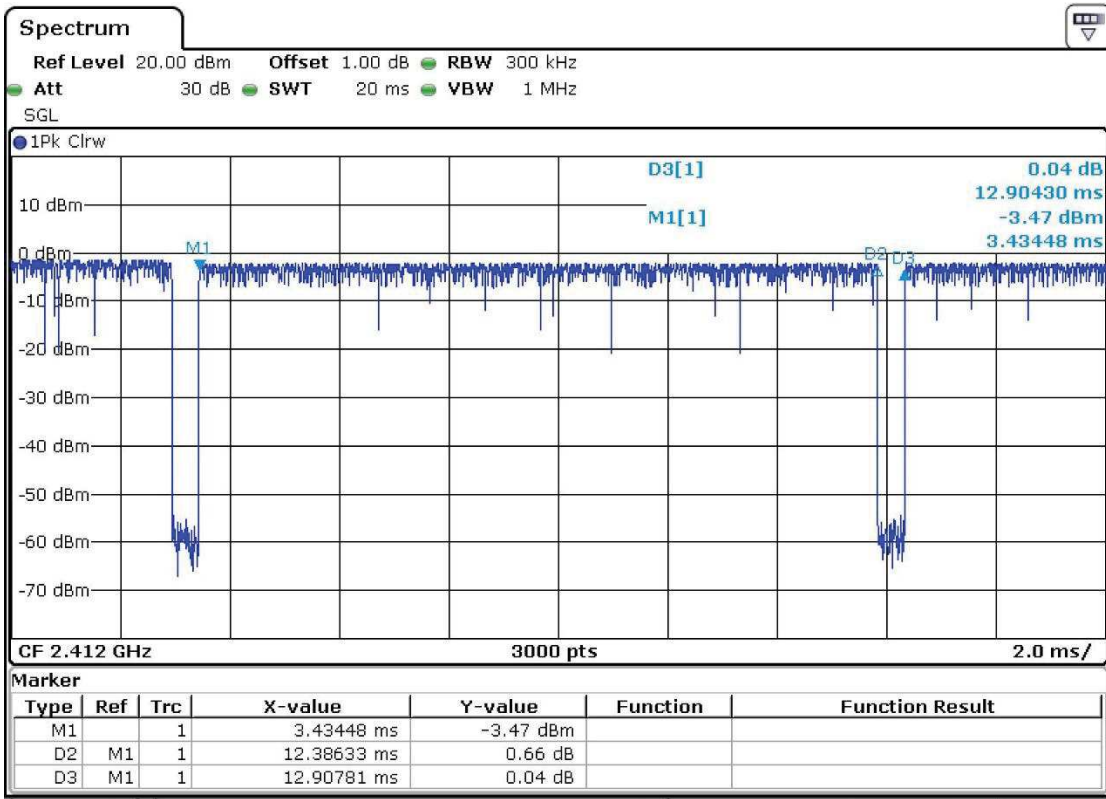


- Mode 802.11 n20

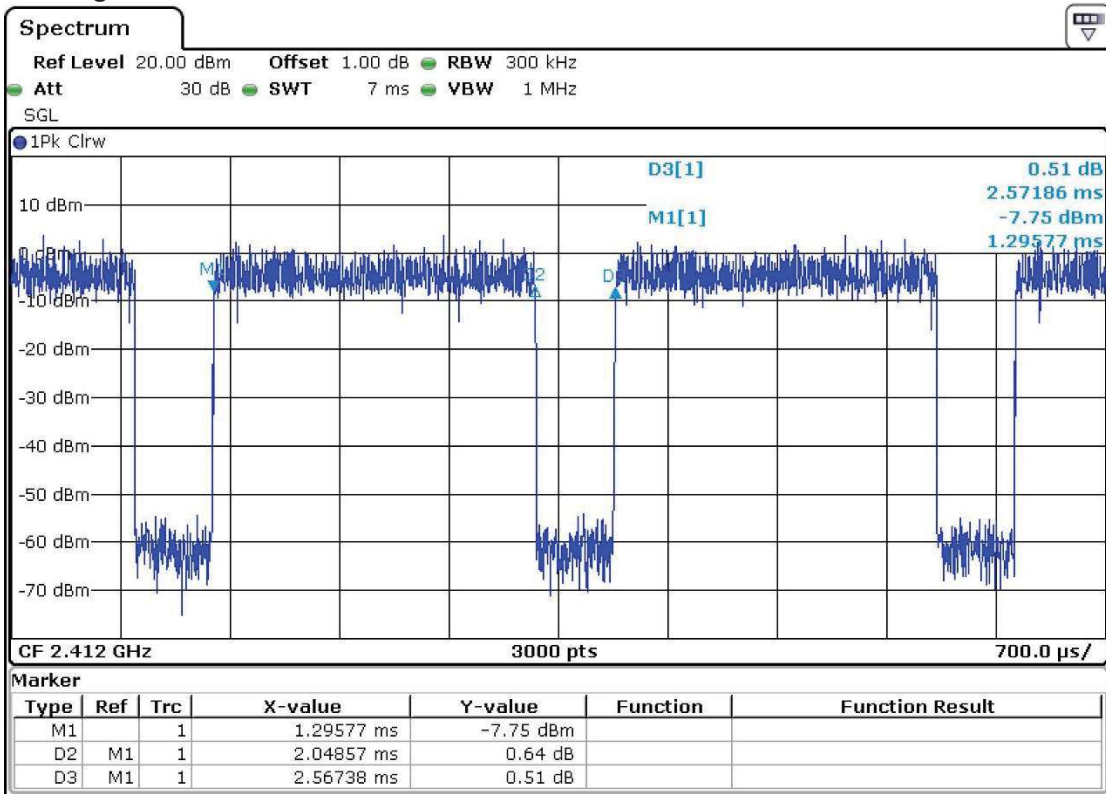


SISO CORE0_Port2 Antenna:

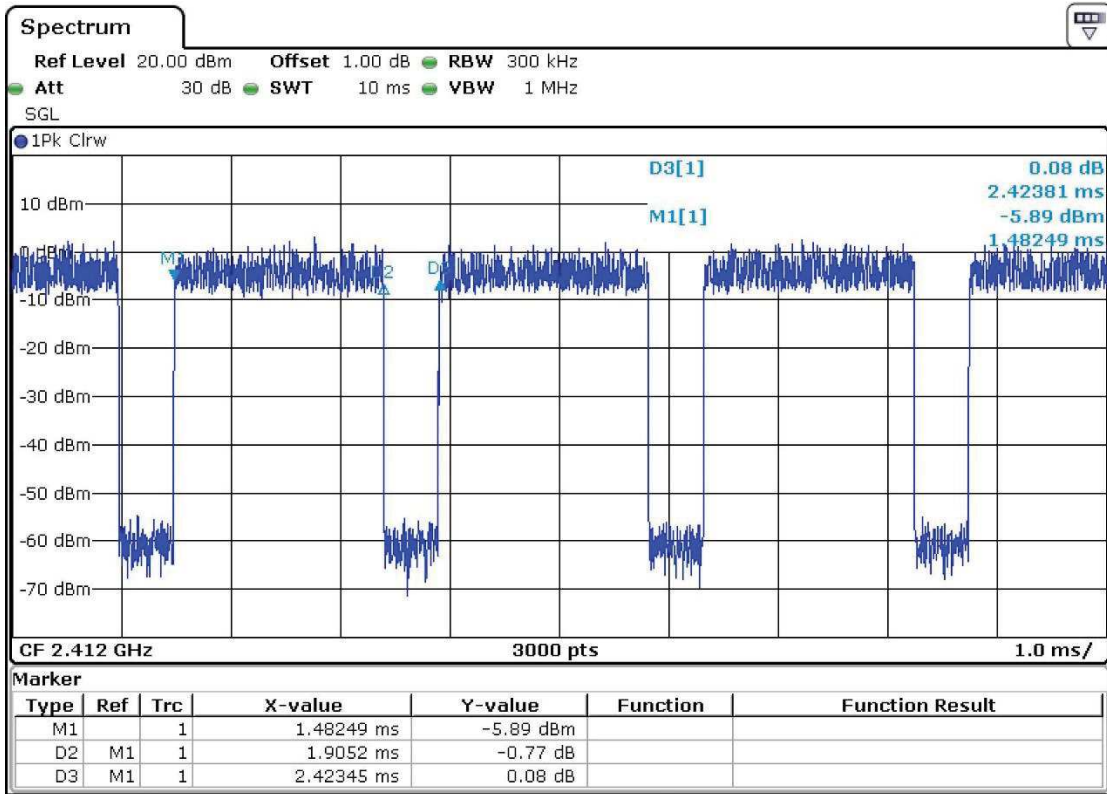
- Mode 802.11 b



- Mode 802.11 g

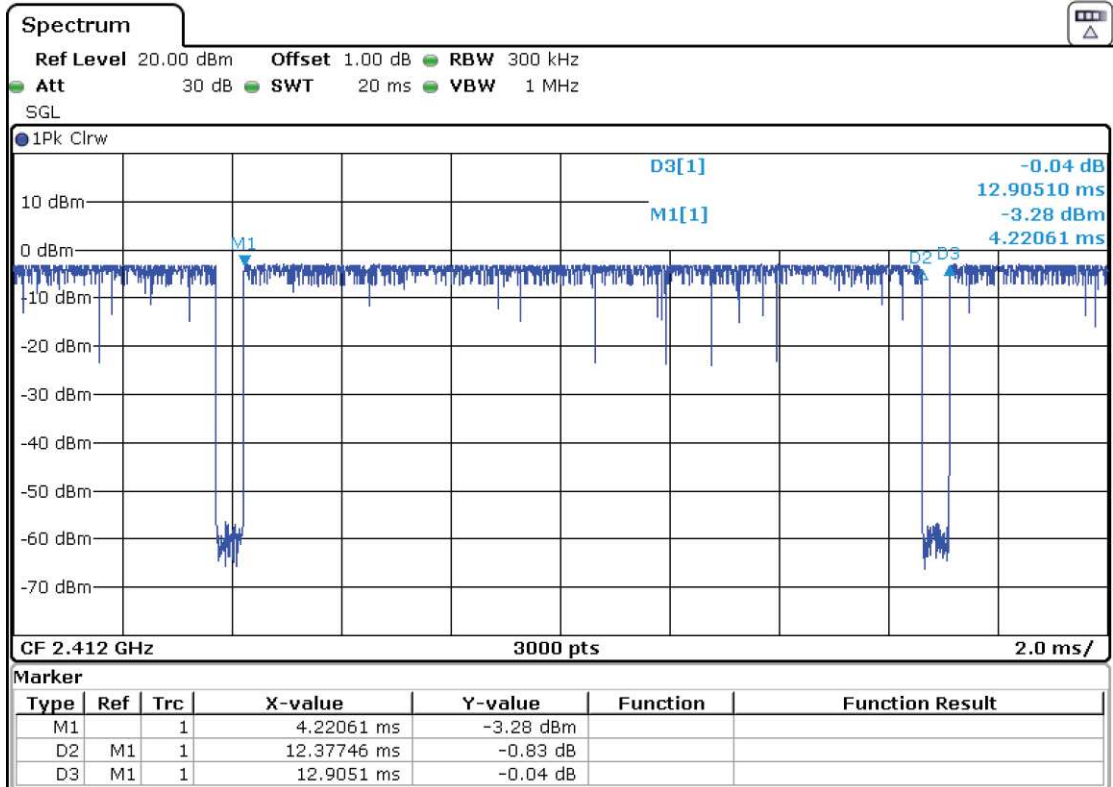


• Mode 802.11 n20

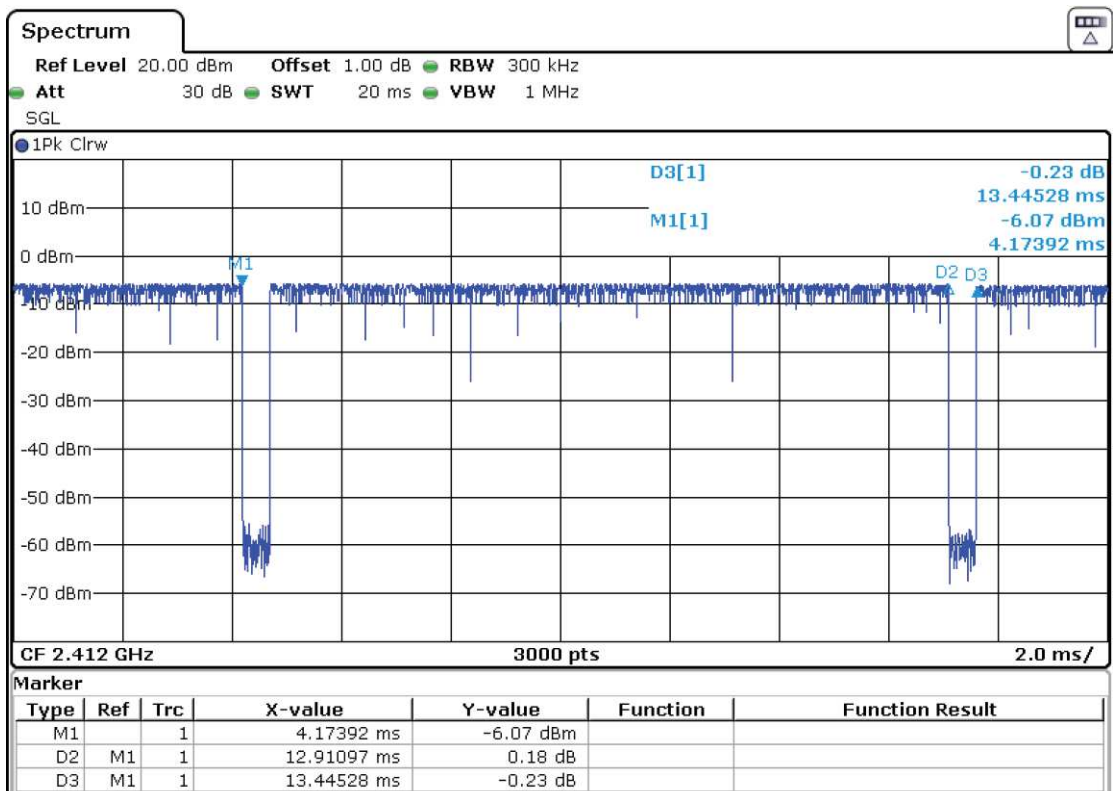


MIMO CORE0+CORE1_Port4+Port2 Antennas:

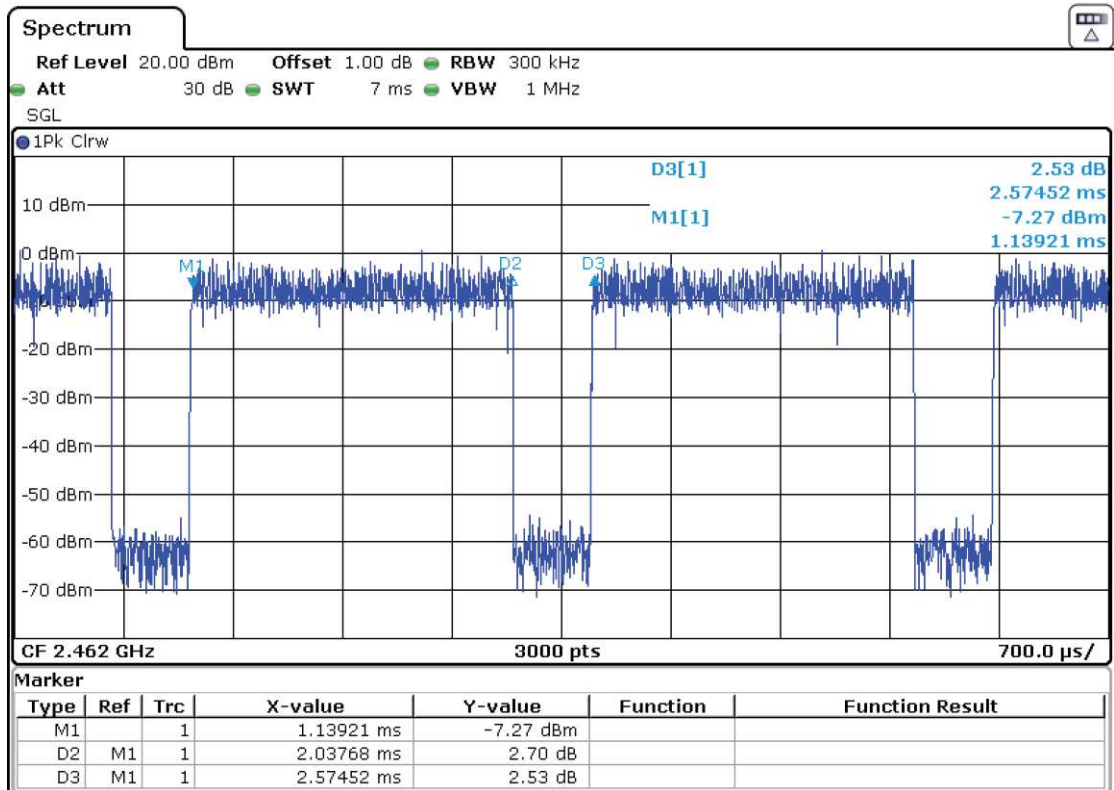
- **Mode 802.11 b**
 - **CORE0_Port2 Antenna:**



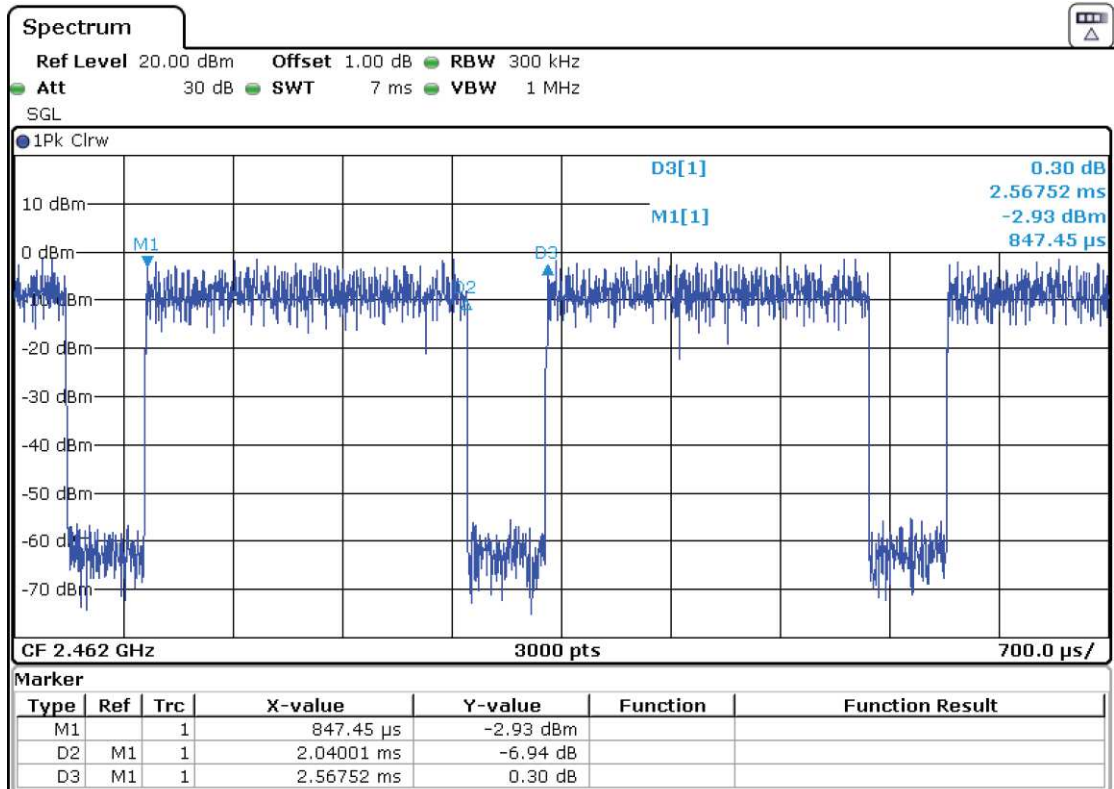
- **CORE1_Port4 Antenna:**



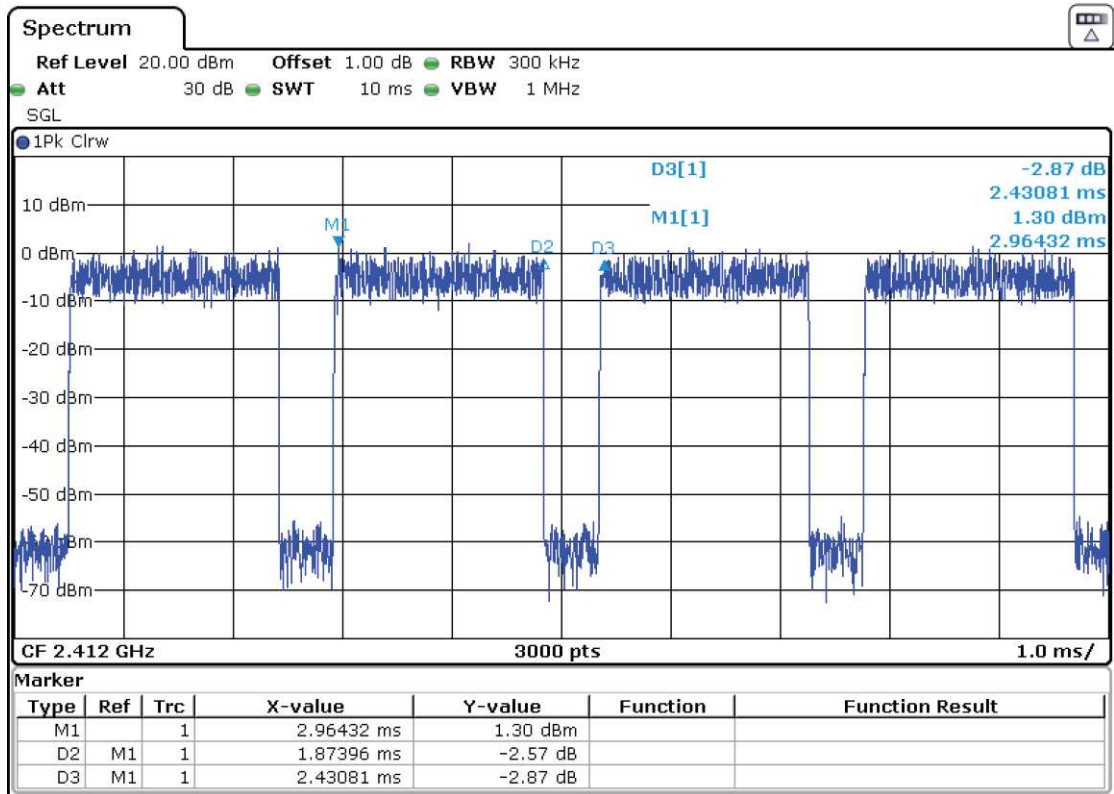
- **Mode 802.11 g**
 - **CORE0_Port2 Antenna:**



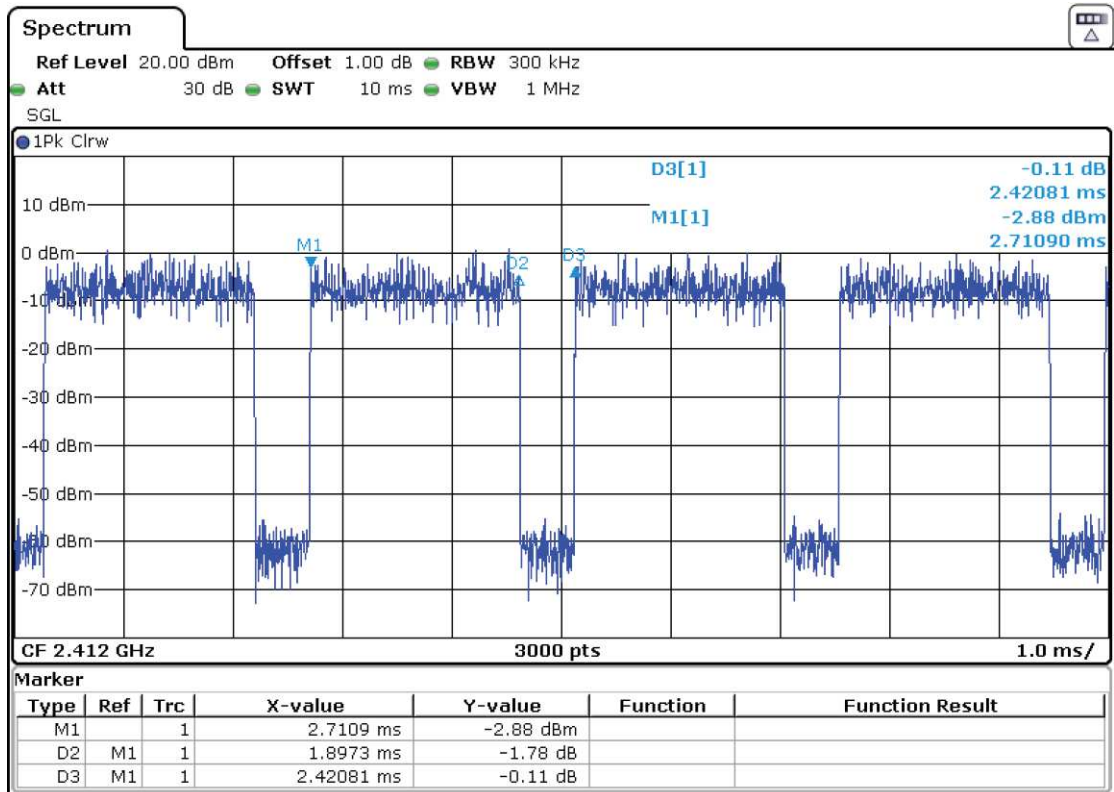
- **CORE1_Port4 Antenna:**



- Mode 802.11 n20
 - CORE0_Port2 Antenna:



- CORE1_Port4 Antenna:



FCC 15.247 (b) / RSS-247 5.4 (d) Maximum output power and antenna gain

SPECIFICATION:

For systems using digital modulation in the 2400-2483.5 MHz band: 1 watt (30 dBm).
 The e.i.r.p. shall not exceed 4 W (36 dBm) (Canada).

RESULTS:

SISO case CORE1_Port4 Antenna and SISO case CORE0_Port2.
 MIMO case CORE1_Port4 Antenna & CORE0_Port2 Antenna.

Maximum Declared Antenna Gain:

CORE1_Port4: +2.4 dBi
 CORE0_Port2: -0.3 dBi

For SISO and MIMO modes b, g and n20, the maximum conducted output power was measured using the method according to point 11.9.2.2.4 “Method AVGSA-2” of ANSI C.63.10-2013.

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

In the measure-and-sum approach for MIMO mode, the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in linear power units (mW—not dBm).

SISO – CORE1_Port4 Antenna:

- **Mode 802.11 b**

	Low Channel	Middle Channel	High Channel
Maximum Average Conducted Power (dBm)	11.15	11.29	11.76
Duty Cycle Correction (dB)	0.174587733		
Max. conducted power corrected (dBm)	11.32458773	11.46458773	11.93458773
Maximum EIRP Power with Duty Cycle Correction (dBm)	13.72458773	13.86458773	14.33458773
Measurement uncertainty (dB)	<±2.997		

- **Mode 802.11 g**

	Low Channel	Middle Channel	High Channel
Maximum Average Conducted Power (dBm)	10.69	9.8	11.52
Duty Cycle Correction (dB)	1.012076575		
Max. conducted power corrected (dBm)	11.70207657	10.81207657	12.53207657
Maximum EIRP Power with Duty Cycle Correction (dBm)	14.10207657	13.21207657	14.93207657
Measurement uncertainty (dB)	<±2.997		

- **Mode 802.11 n20**

	Low Channel	Middle Channel	High Channel
Maximum Average Conducted Power (dBm)	9.47	10.85	11.22
Duty Cycle Correction (dB)	1.055957075		
Max. conducted power corrected (dBm)	10.52595708	11.90595708	12.27595708
Maximum EIRP Power with Duty Cycle Correction (dBm)	12.92595708	14.30595708	14.67595708
Measurement uncertainty (dB)	<±2.997		

Verdict: PASS

SISO – CORE0_Port2 Antenna:

- **Mode 802.11 b**

	Low Channel	Middle Channel	High Channel
Maximum Average Conducted Power (dBm)	13.22	12.58	11.78
Duty Cycle Correction (dB)	0.179099176		
Max. conducted power corrected (dBm)	13.39909918	12.75909918	11.95909918
Maximum EIRP Power with Duty Cycle Correction (dBm)	13.09909918	12.45909918	11.65909918
Measurement uncertainty (dB)	<±2.997		

- **Mode 802.11 g**

	Low Channel	Middle Channel	High Channel
Maximum Average Conducted Power (dBm)	13.57	12	11.36
Duty Cycle Correction (dB)	0.980393452		
Max. conducted power corrected (dBm)	14.55039345	12.98039345	12.34039345
Maximum EIRP Power with Duty Cycle Correction (dBm)	14.25039345	12.68039345	12.04039345
Measurement uncertainty (dB)	<±2.997		

- **Mode 802.11 n20**

	Low Channel	Middle Channel	High Channel
Maximum Average Conducted Power (dBm)	11.54	11.89	11.52
Duty Cycle Correction (dB)	1.044934911		
Max. conducted power corrected (dBm)	12.58493491	12.93493491	12.56493491
Maximum EIRP Power with Duty Cycle Correction (dBm)	12.28493491	12.63493491	12.26493491
Measurement uncertainty (dB)	<±2.997		

Verdict: PASS

MIMO – CORE1_Port4 Antenna & CORE1_Port1 Antenna:

- **Mode 802.11 b**

Gain MIMO mode (port 2+port4)= 4.16dBi.

	Low Channel		Middle Channel		High Channel	
	CORE1_Port4	CORE0_Port2	CORE1_Port4	CORE0_Port2	CORE1_Port4	CORE0_Port2
Maximum Average Conducted Power (dBm)	8.6	11.41	8.39	10,53	8,61	9,71
Maximum Average Conducted Power corrected (dBm)	8.776	11.591	8.566109789	10,71129843	8,786109789	9,891298427
	CORE1_Port4 + CORE0_Port2		CORE1_Port4 + CORE0_Port2		CORE1_Port4 + CORE0_Port2	
Maximum Conducted Power (dBm)	13.41822688		12.7801305		12.38406553	
Maximum EIRP Power (dBm)	17.58		16.94		16.54	
Measurement uncertainty (dB)	<±2.574					

- **Mode 802.11 g**

Gain MIMO mode (port 2+port4)= 4.16dBi.

	Low Channel		Middle Channel		High Channel	
	CORE1_ Port4	CORE0_ Port2	CORE1_ Port4	CORE0_ Port2	CORE1_ Port4	CORE0_ Port2
Maximum Average Conducted Power (dBm)	-5.45	-7.2	8.1	10,31	8,61	9,48
Maximum Average Conducted Power corrected (dBm)	- 4.451184 61	- 6.184397 129	9.098815 39	11,32560 287	9,608815 39	10,49560 287
	CORE1_Port4 + CORE0_Port2		CORE1_Port4 + CORE0_Port2		CORE1_Port4 + CORE0_Port2	
Maximum Conducted Power (dBm)	-2.221595875		13.36369206		13.08510406	
Maximum EIRP Power (dBm)	1.94		17.52		17.25	
Measurement uncertainty (dB)	<±2.574					

- **Mode 802.11 n20**

Gain MIMO mode (port 2+port4)= 4.16dBi.

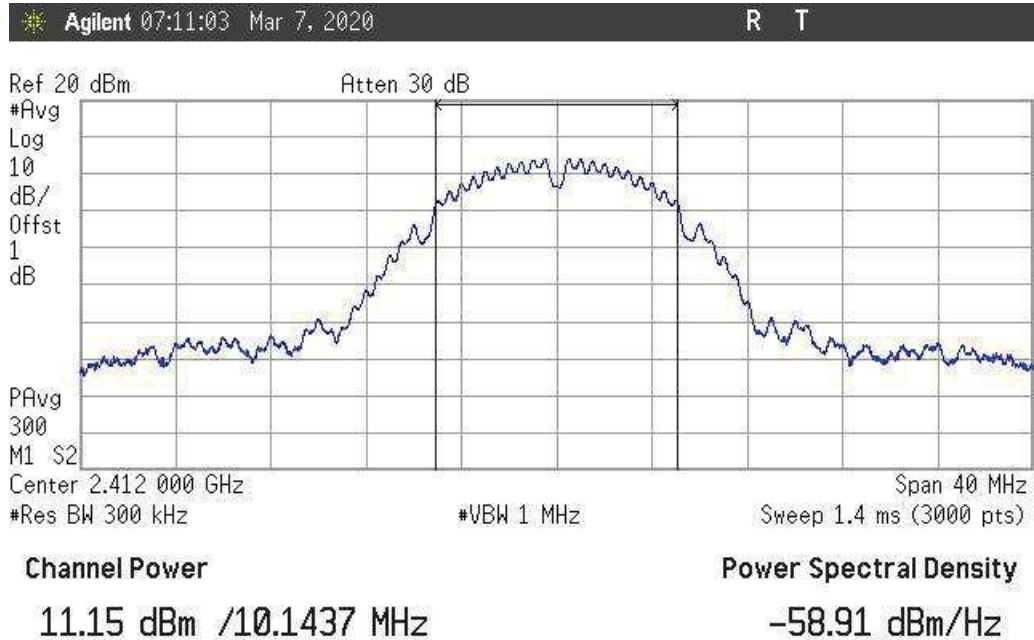
	Low Channel		Middle Channel		High Channel	
	CORE1_ Port4	CORE0_ Port2	CORE1_ Port4	CORE0_ Port2	CORE1_ Port4	CORE0_ Port2
Maximum Average Conducted Power (dBm)	8.28	10.98	7.95	9,84	8,32	9,25
Maximum Average Conducted Power corrected (dBm)	9.338246 98	12.10990 698	9.008246 98	10,96990 698	9,378246 98	10,37990 698
	CORE1_Port4 + CORE0_Port2		CORE1_Port4 + CORE0_Port2		CORE1_Port4 + CORE0_Port2	
Maximum Conducted Power (dBm)	13.95183199		13.10920551		12.9181911	
Maximum EIRP Power (dBm)	18.11		17.27		17.08	
Measurement uncertainty (dB)	<±2.574					

Verdict: PASS

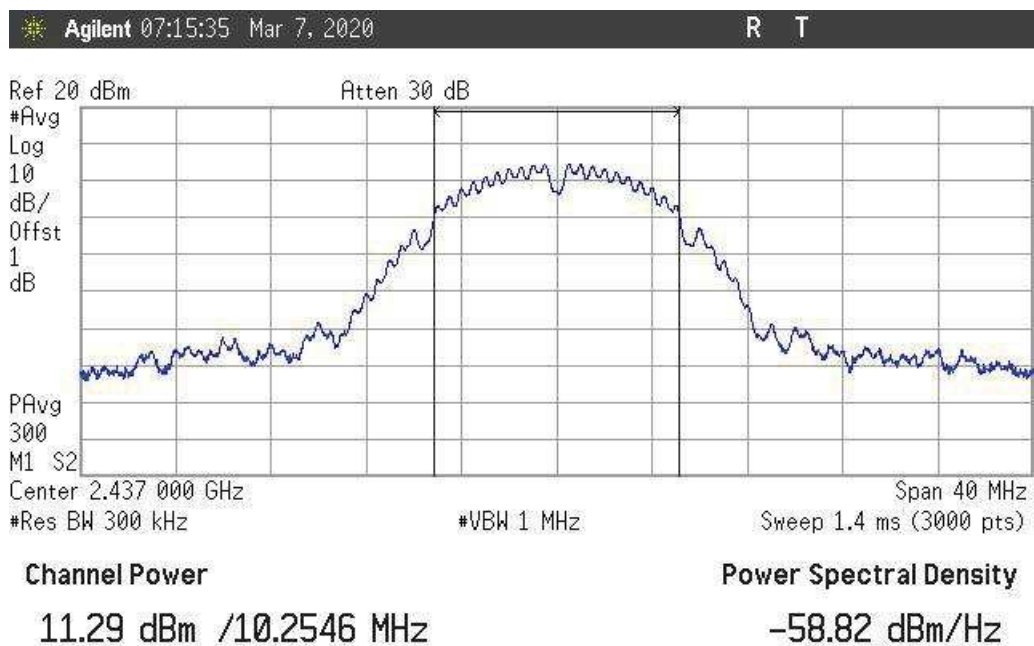
SISO CORE1_Port4 Antenna:

- **Mode 802.11 b**

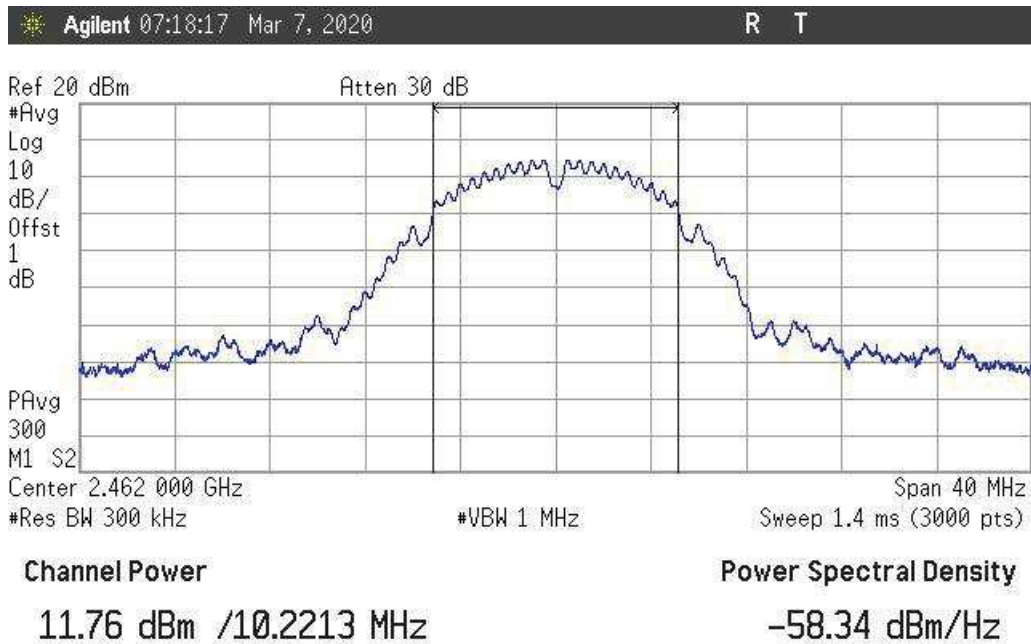
- Low Channel:



- Middle Channel:

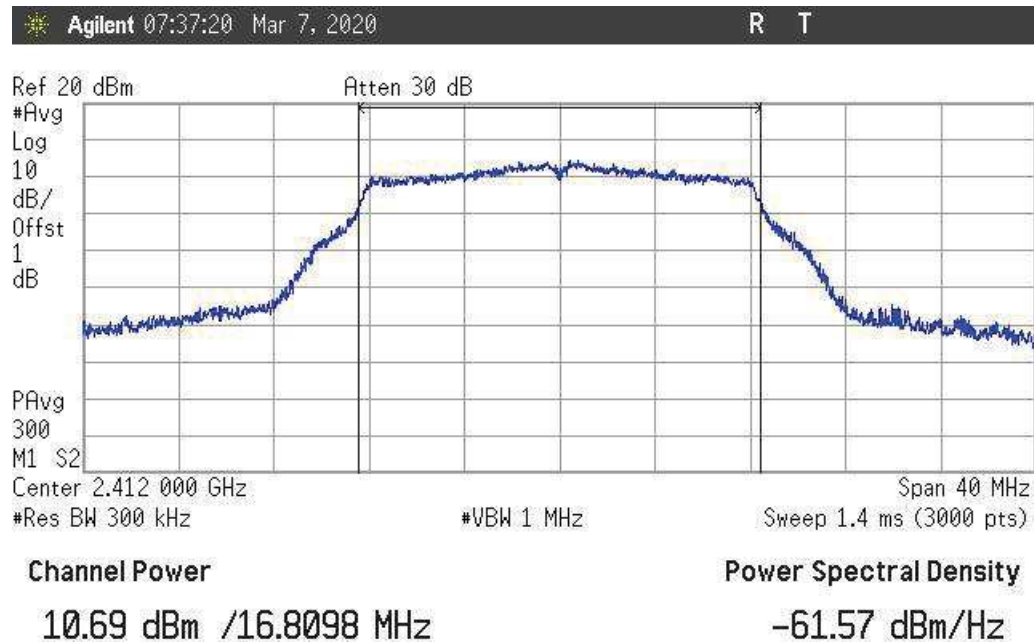


- High Channel:

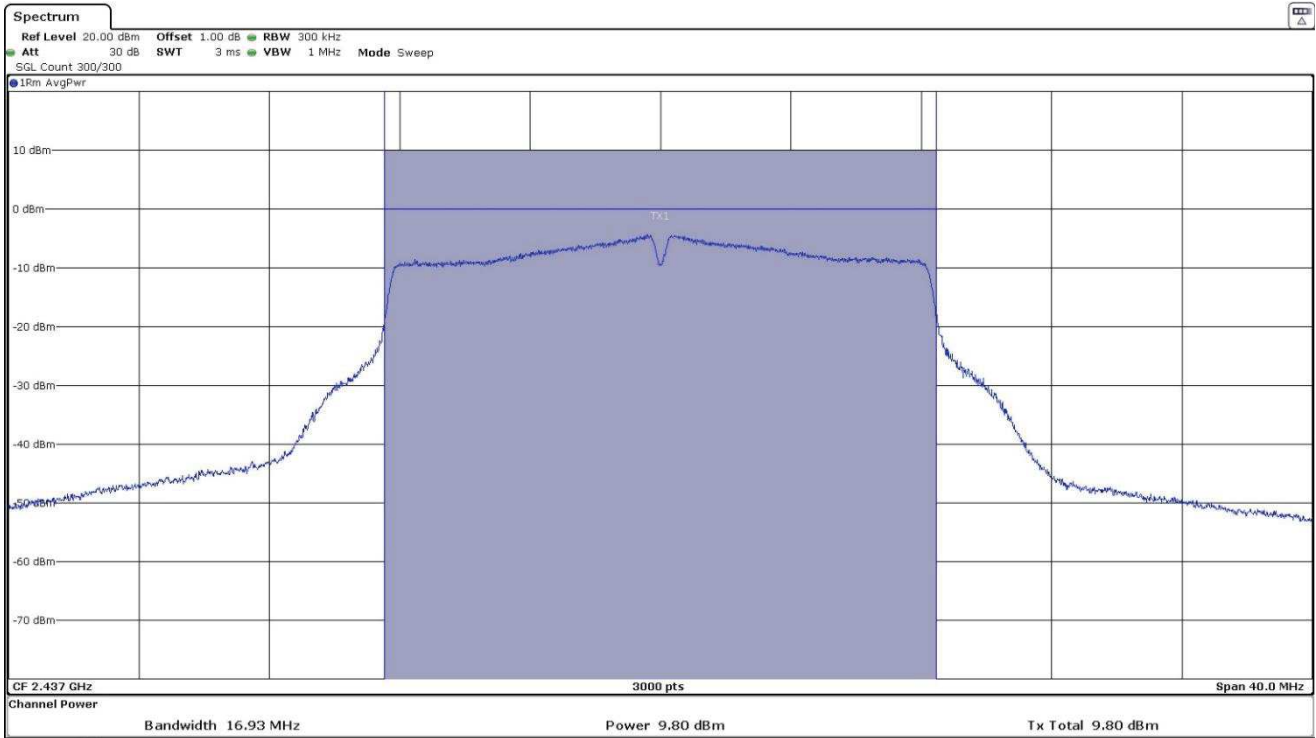


- Mode 802.11 g

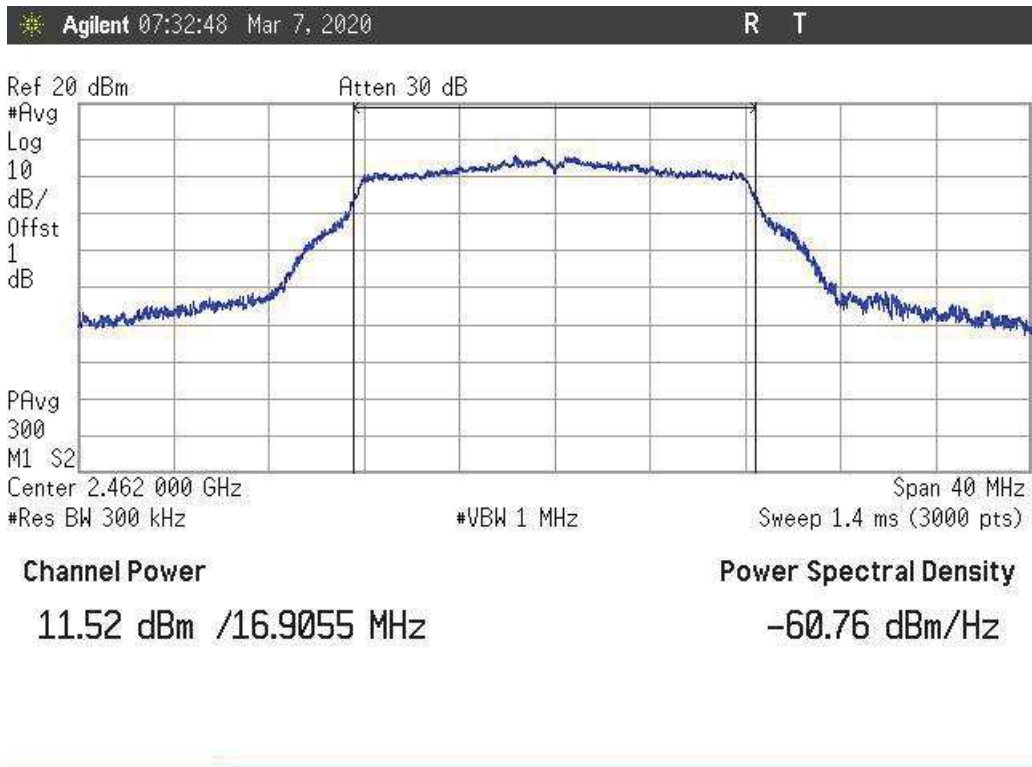
- Low Channel:



- Middle Channel:

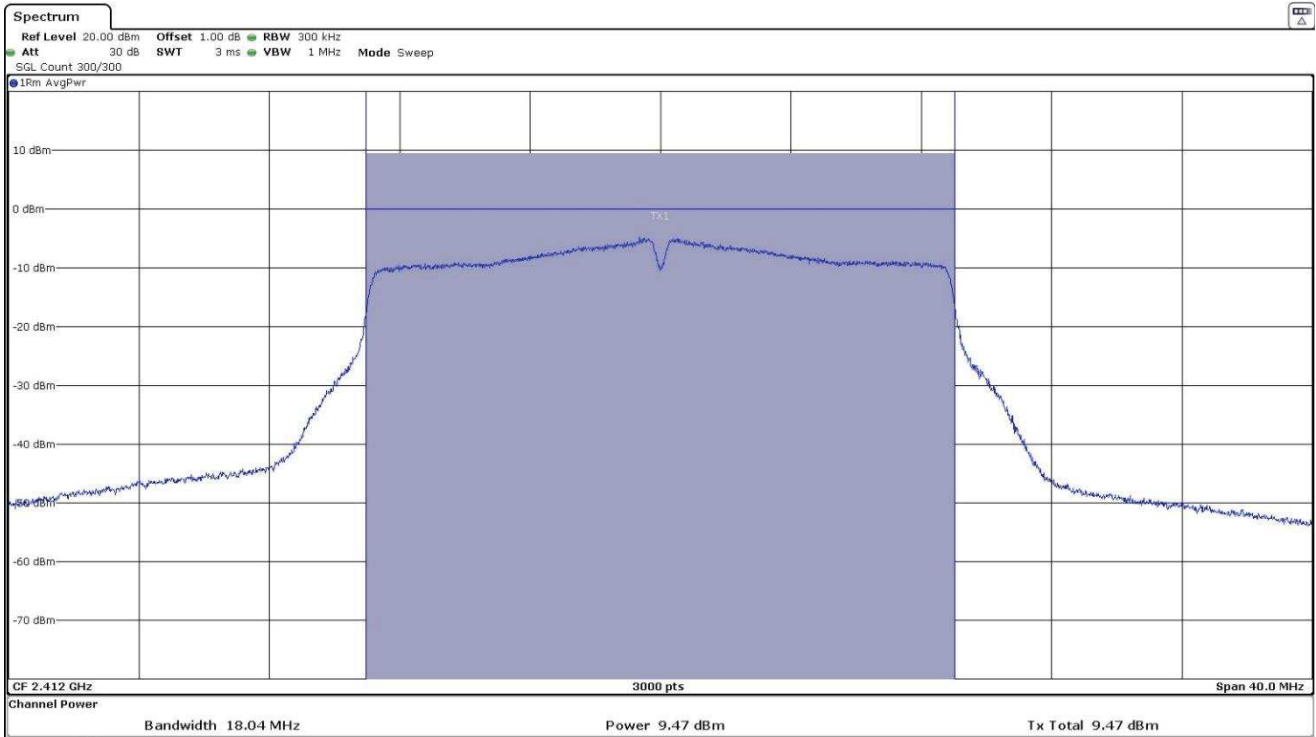


- High Channel:

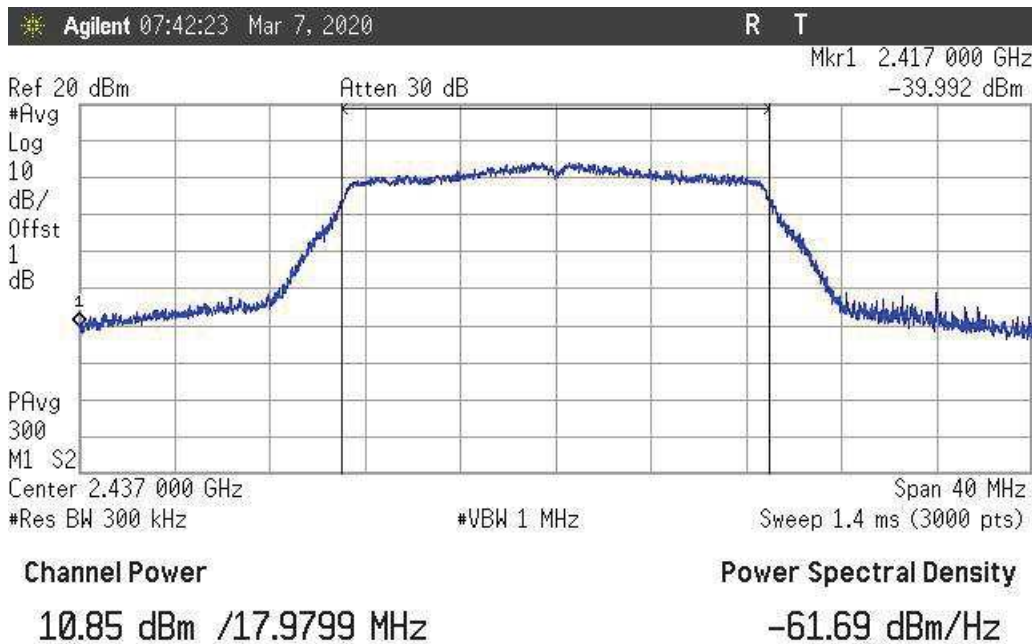


- **Mode 802.11 n20**

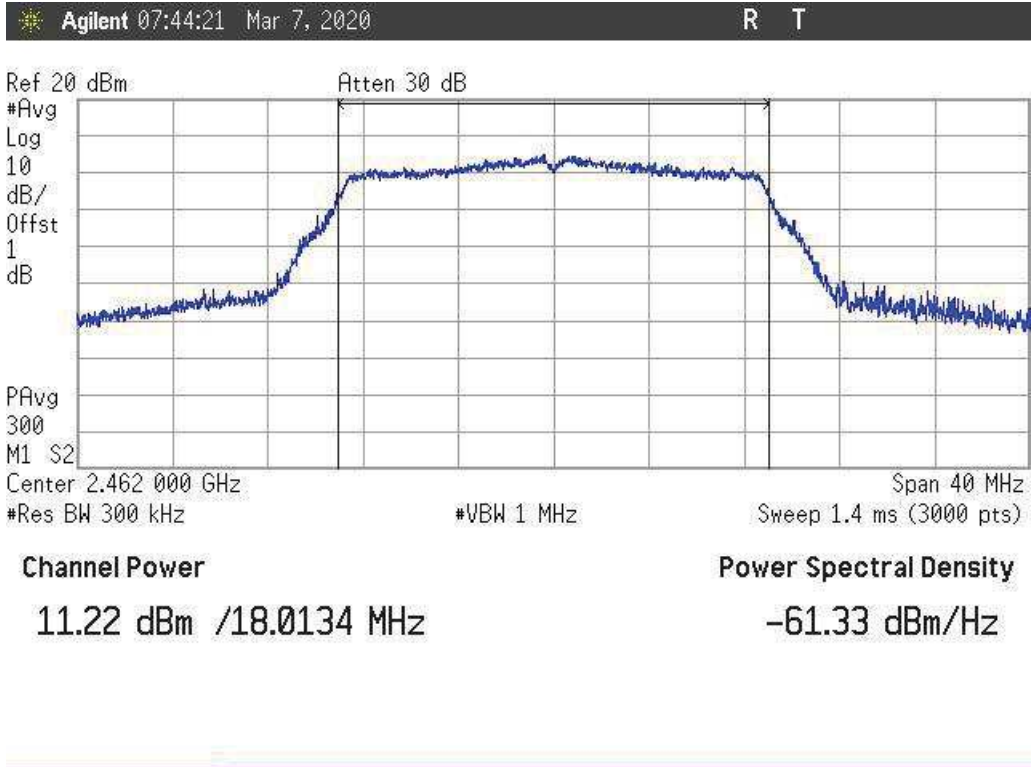
- Low Channel:



- Middle Channel:



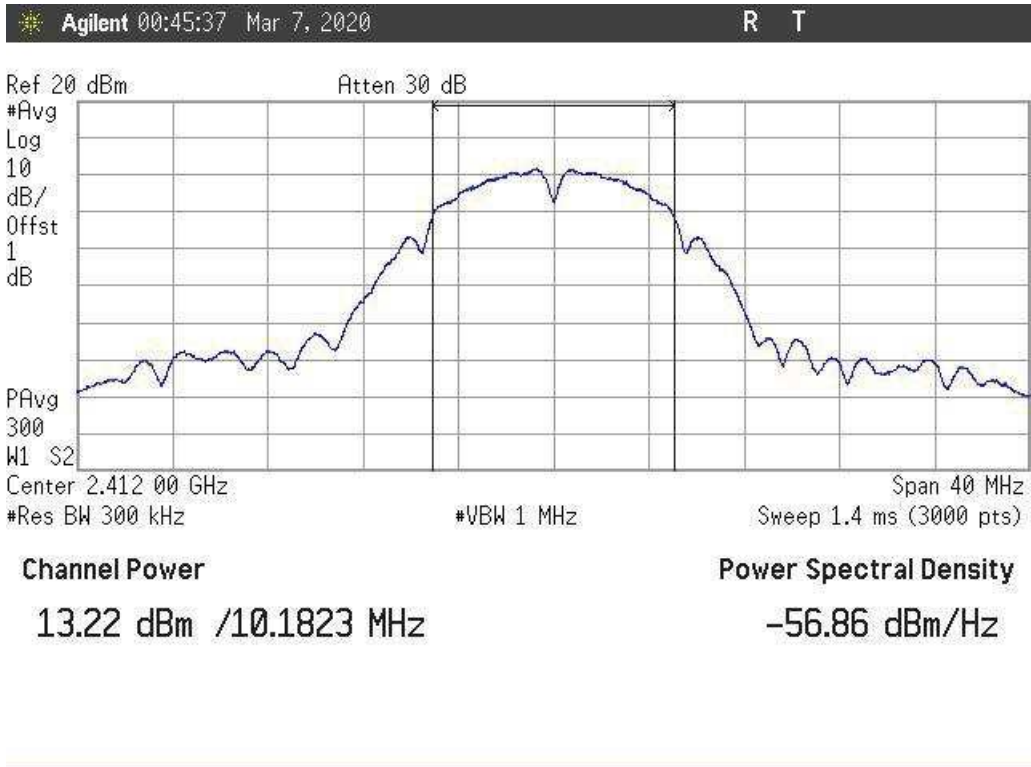
- High Channel:



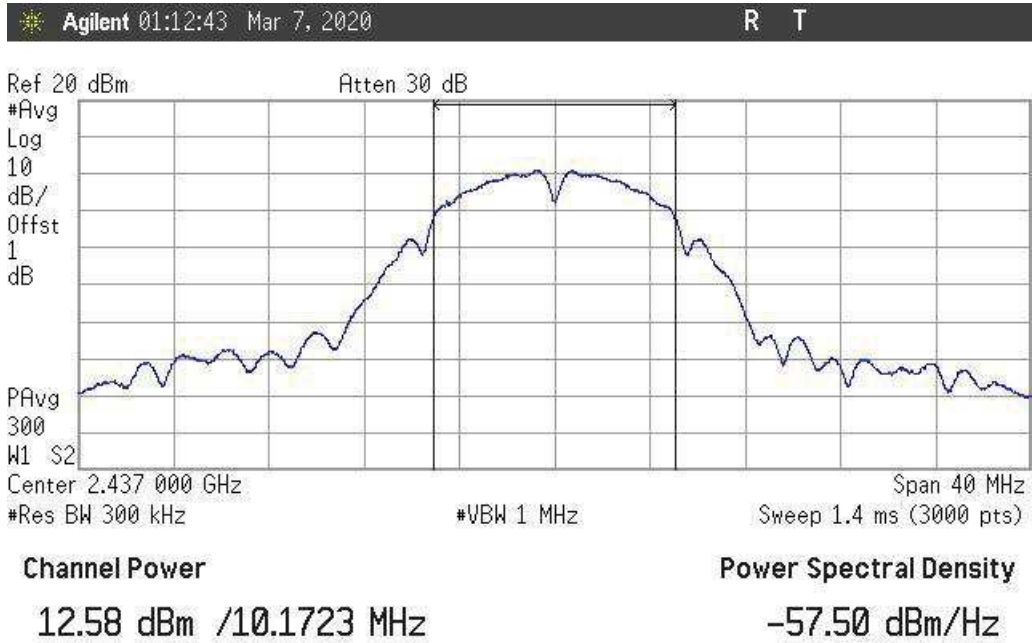
SISO CORE0_Port2 Antenna:

- Mode 802.11 b

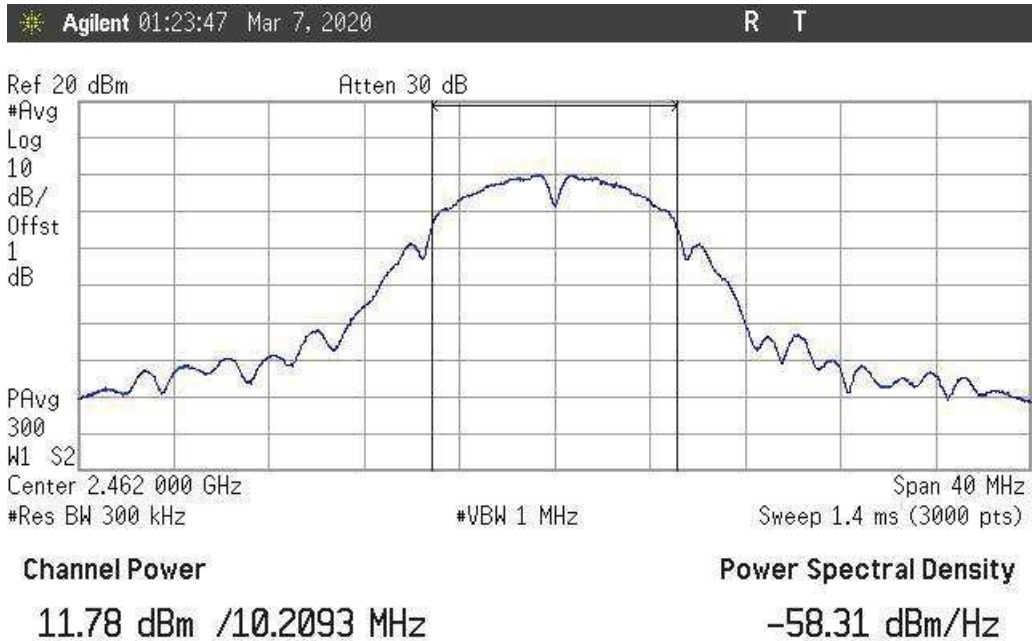
- Low Channel:



- Middle Channel:

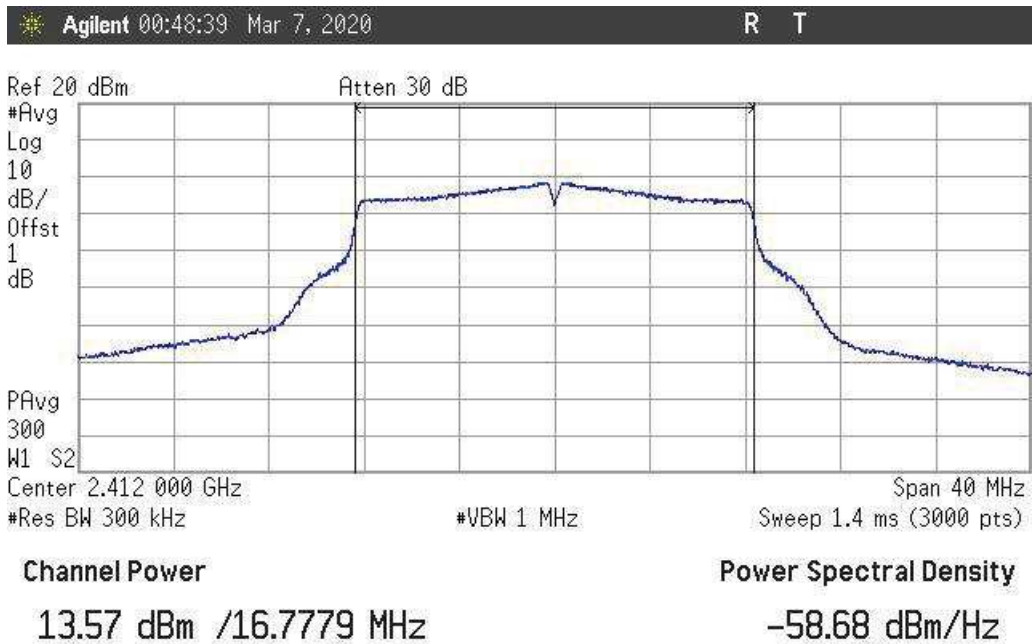


- High Channel:

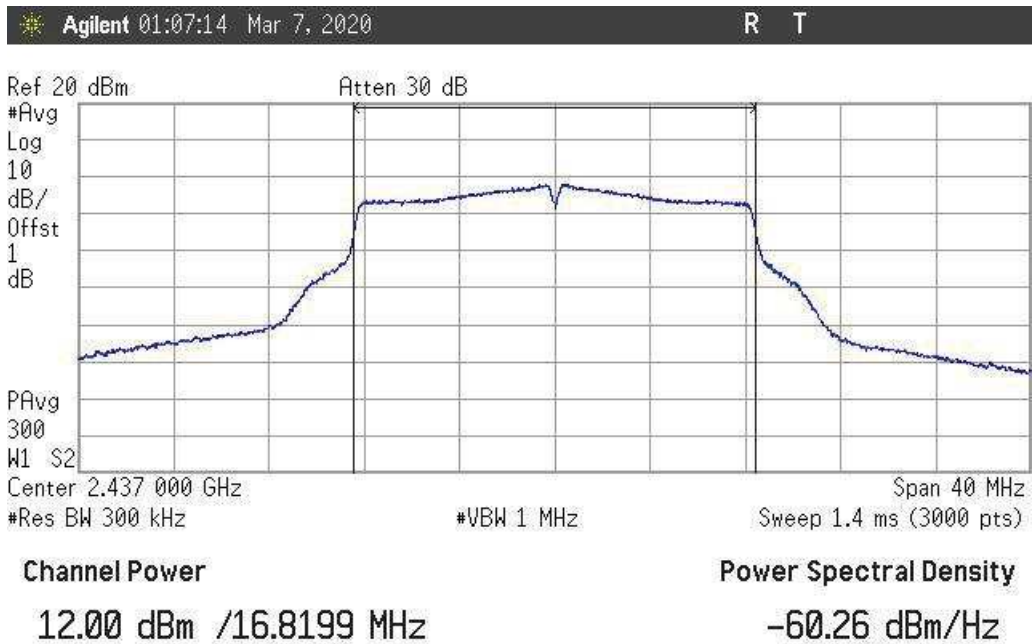


- **Mode 802.11 g**

- Low Channel:



- Middle Channel:

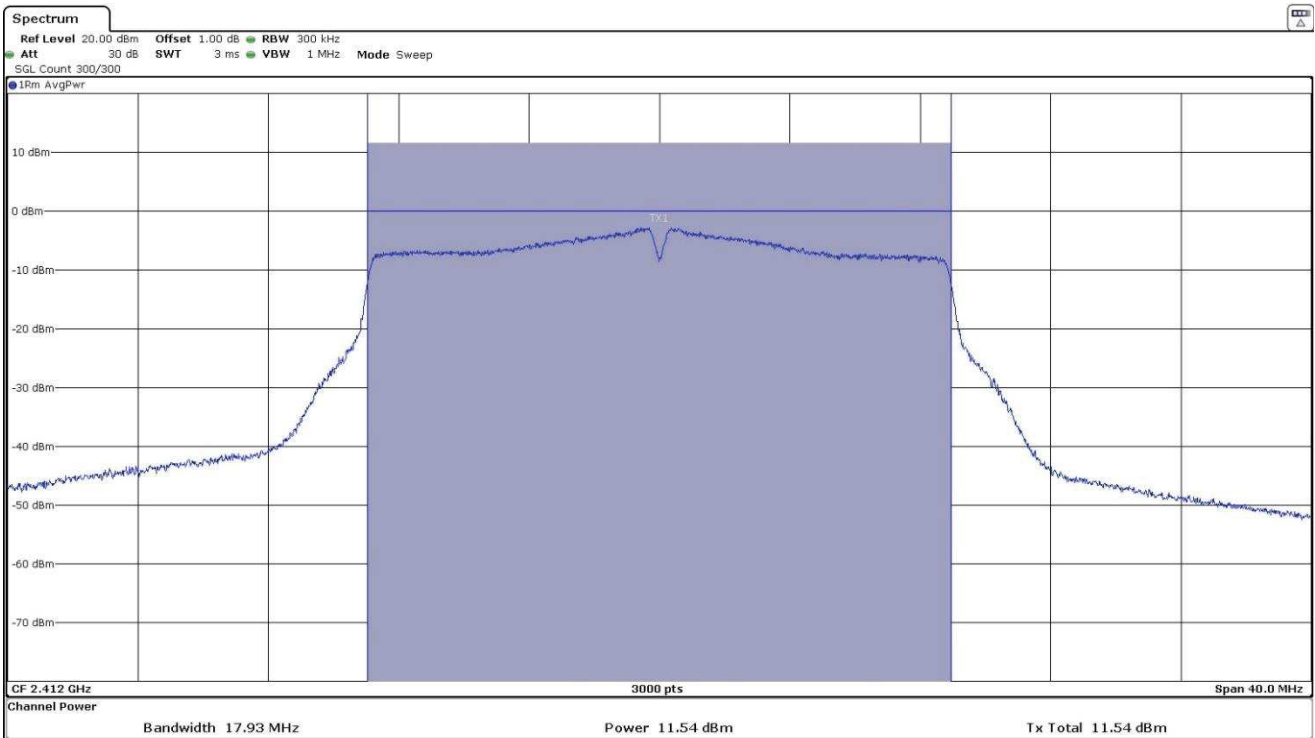


- High Channel:

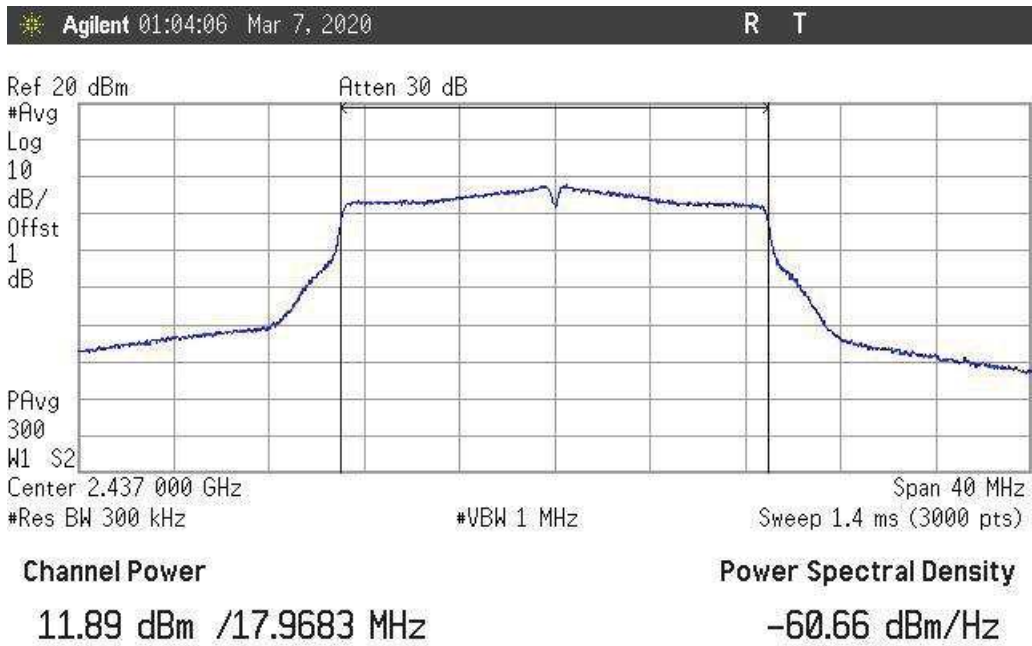


- Mode 802.11 n20

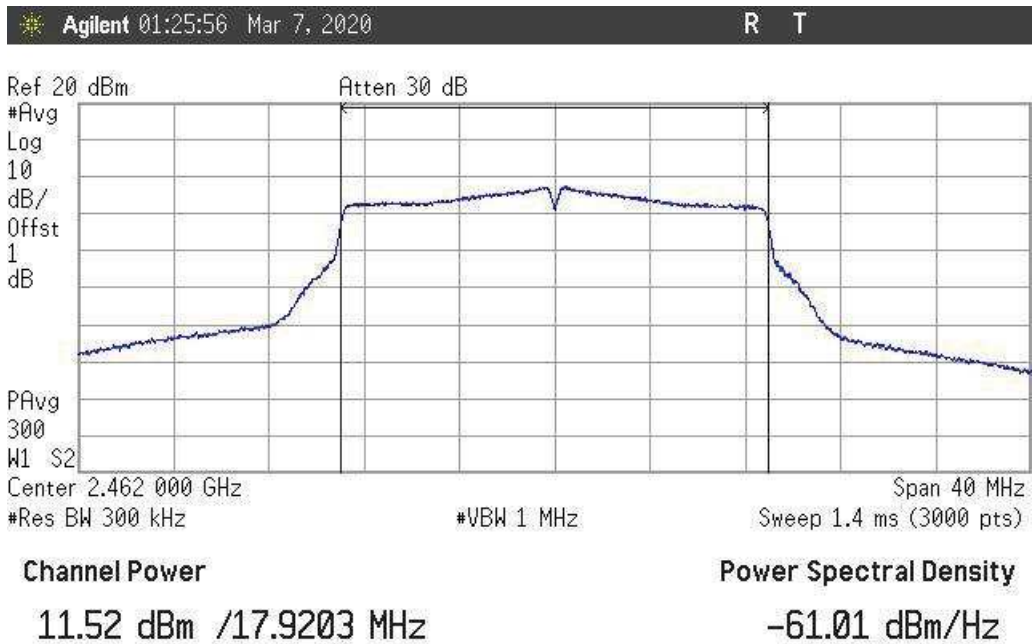
- Low Channel:



- Middle Channel:



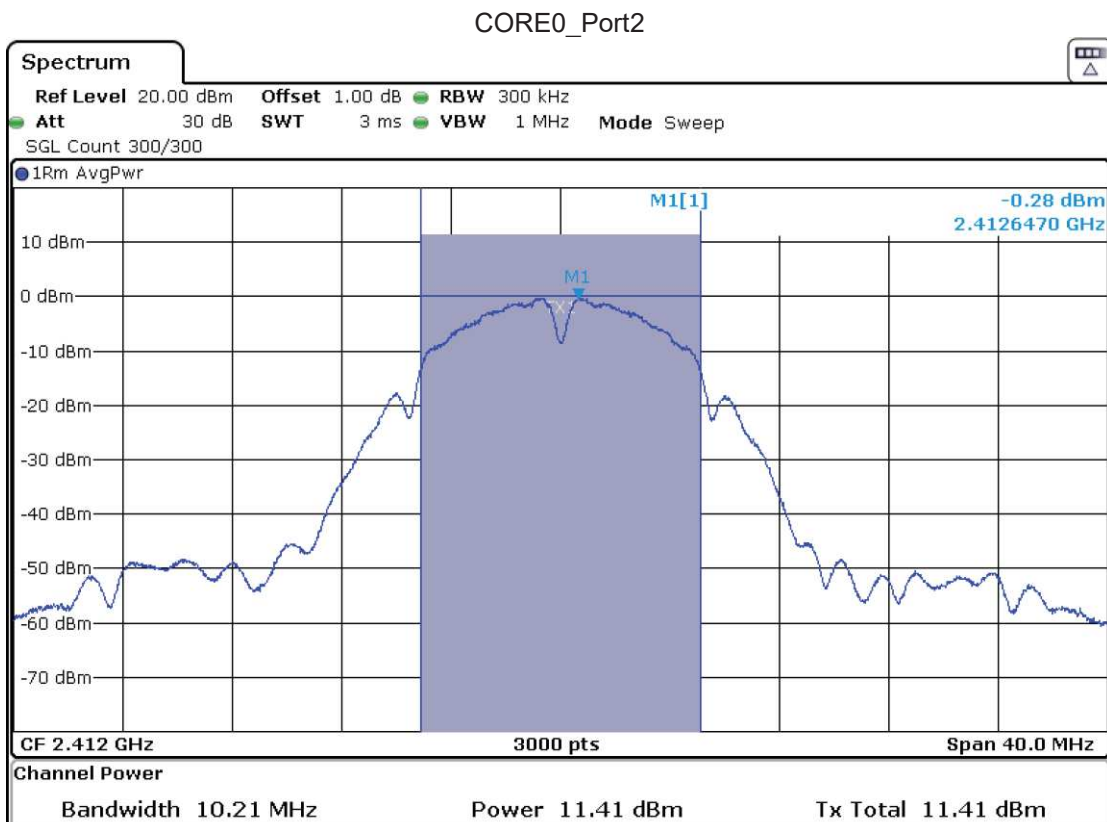
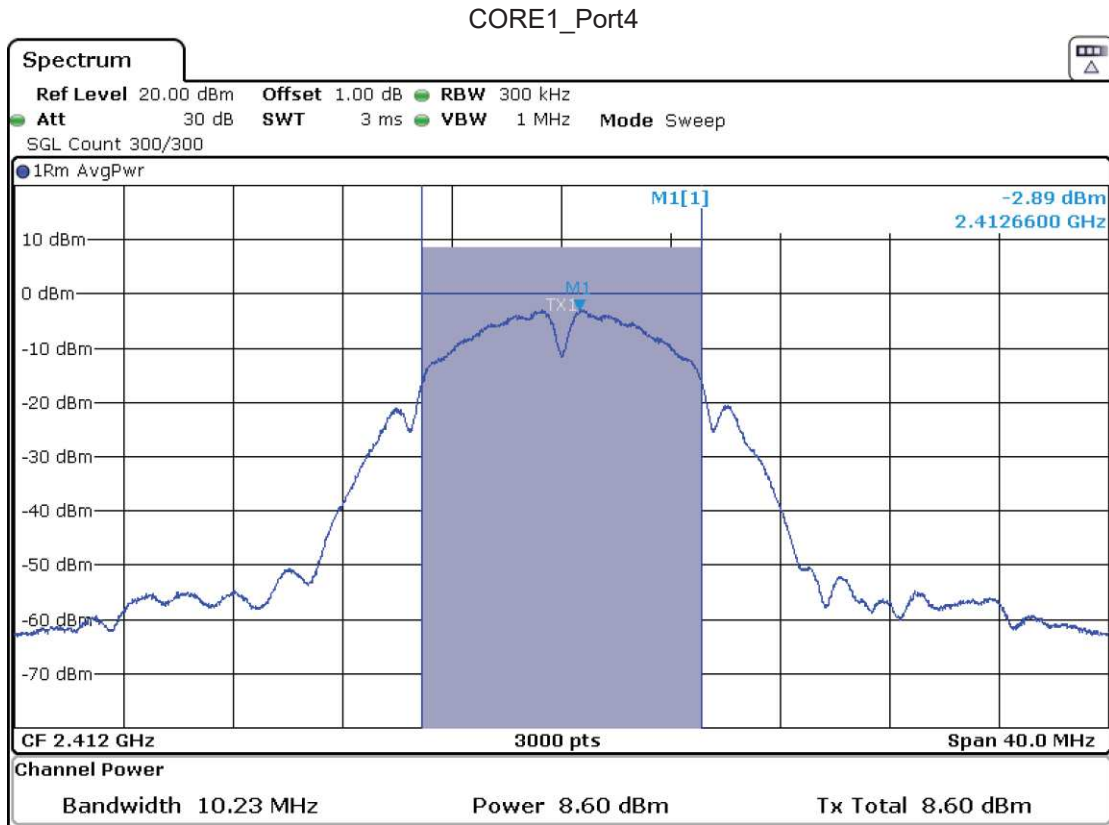
- High Channel:



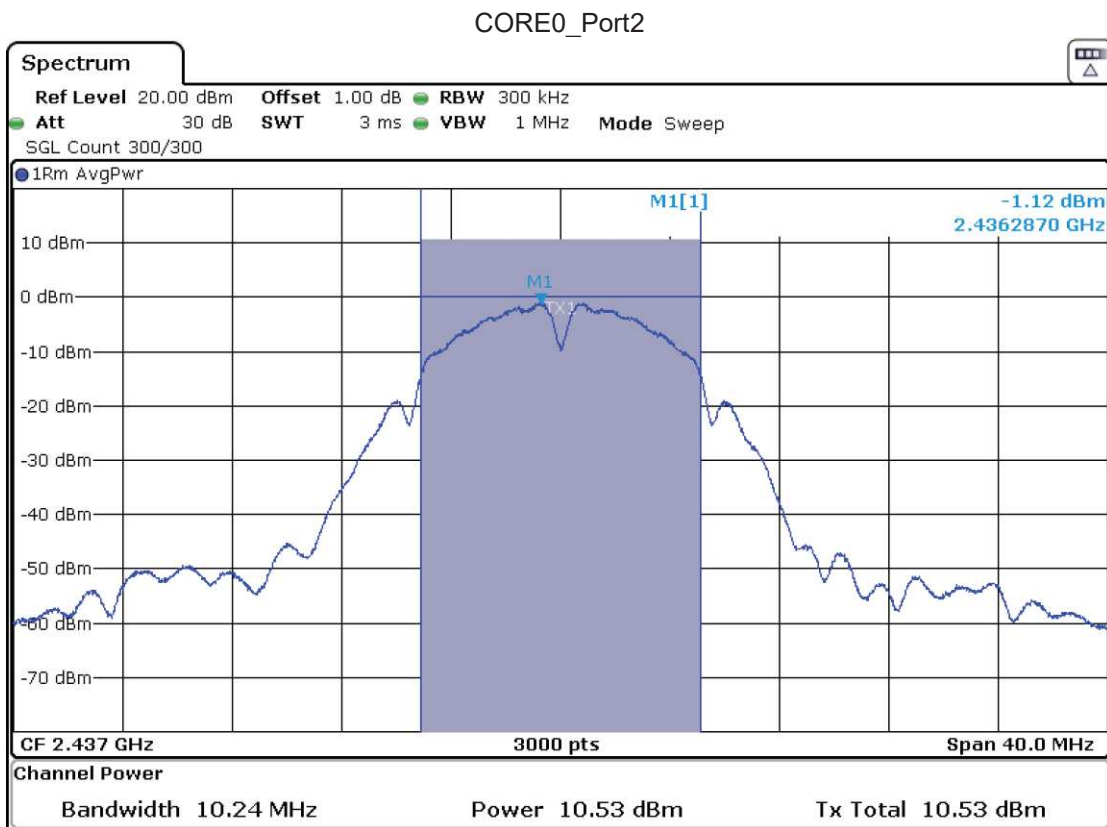
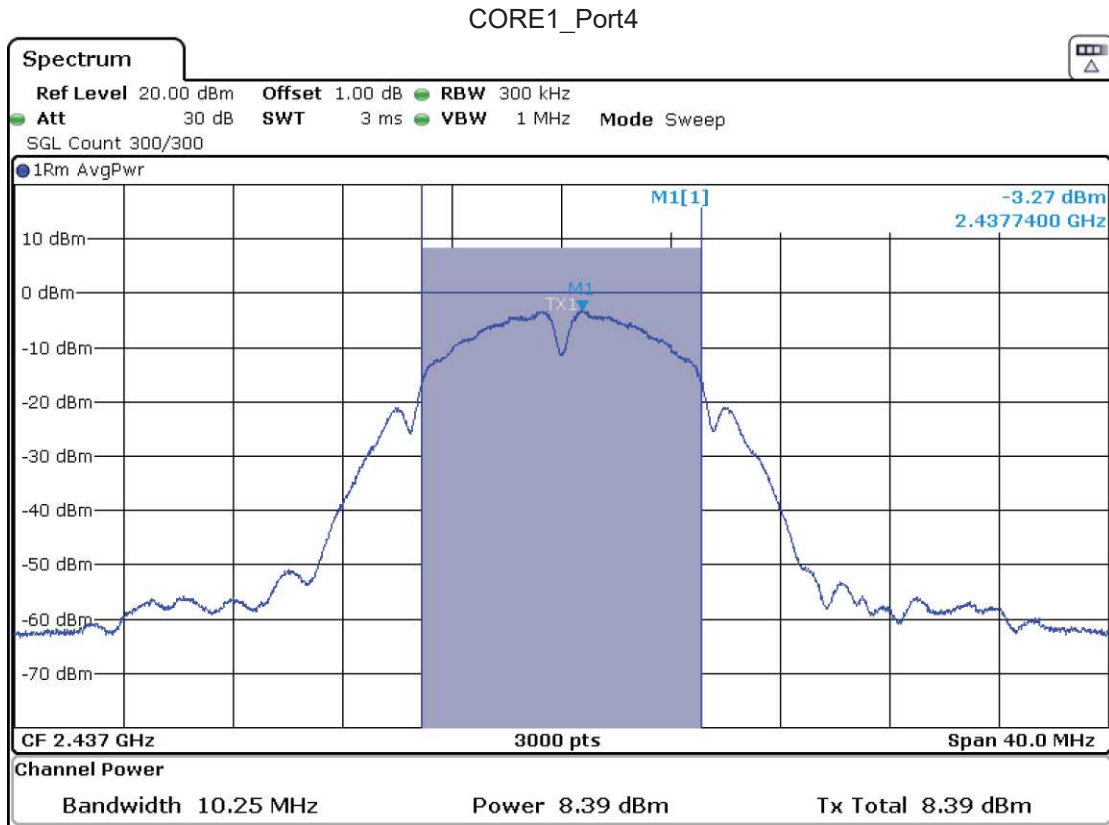
MIMO – CORE1_Port4 Antenna & CORE0_Port2 Antenna:

- **Mode 802.11 b**

- Low Channel:

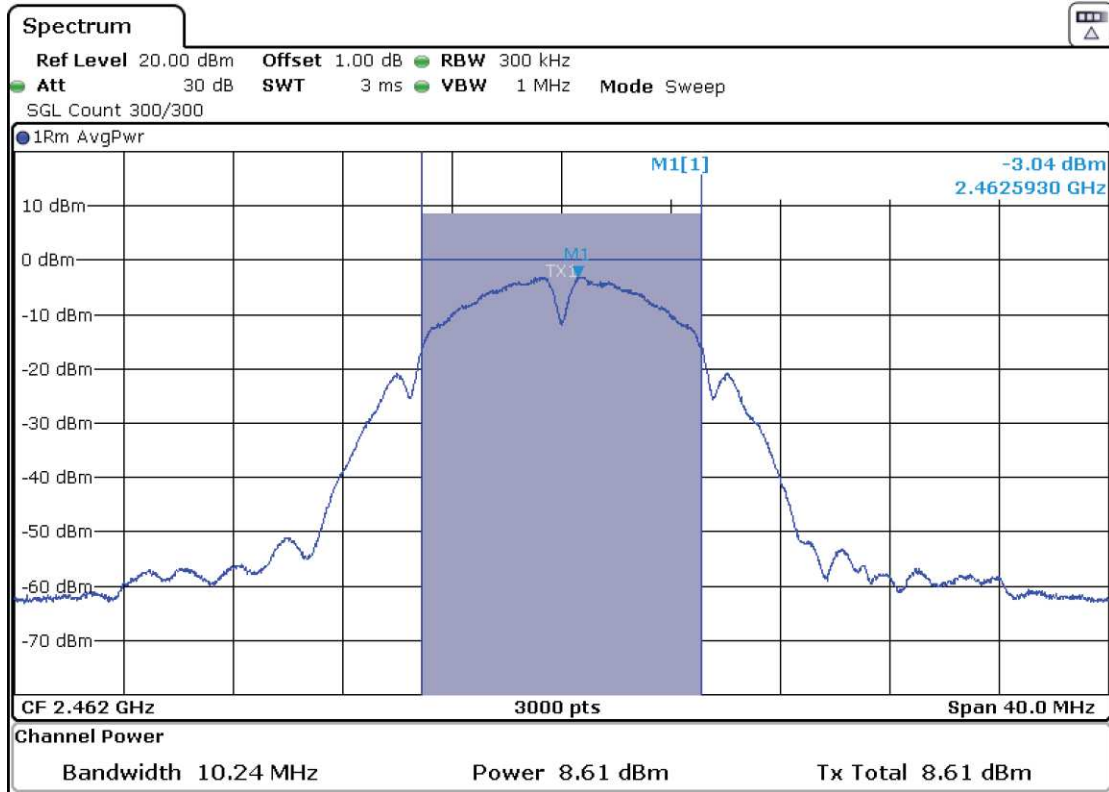


- Middle Channel:

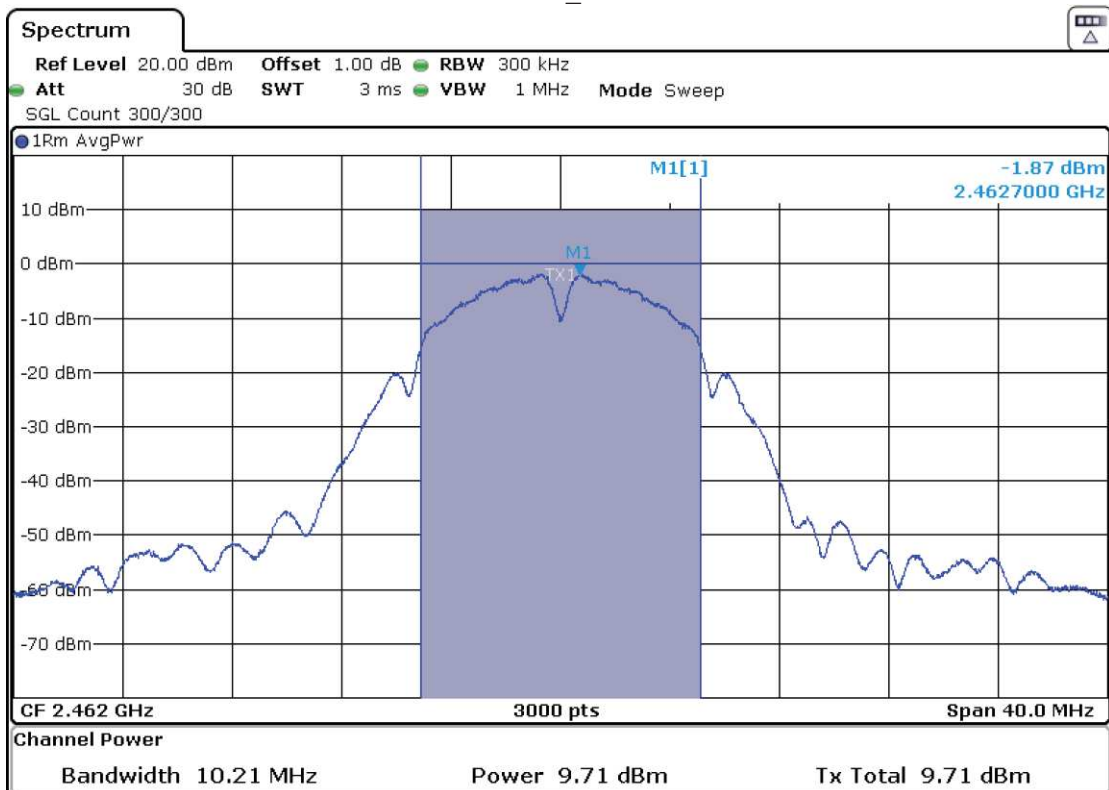


- High Channel:

CORE1_Port4

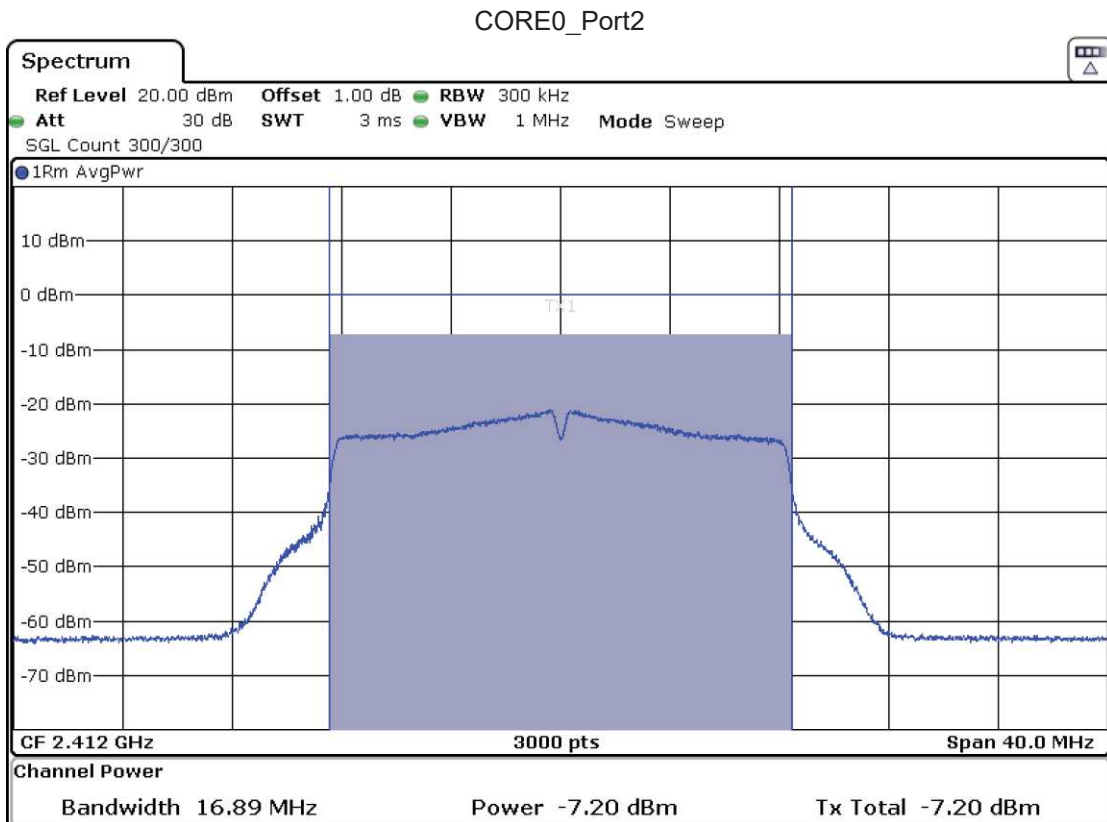
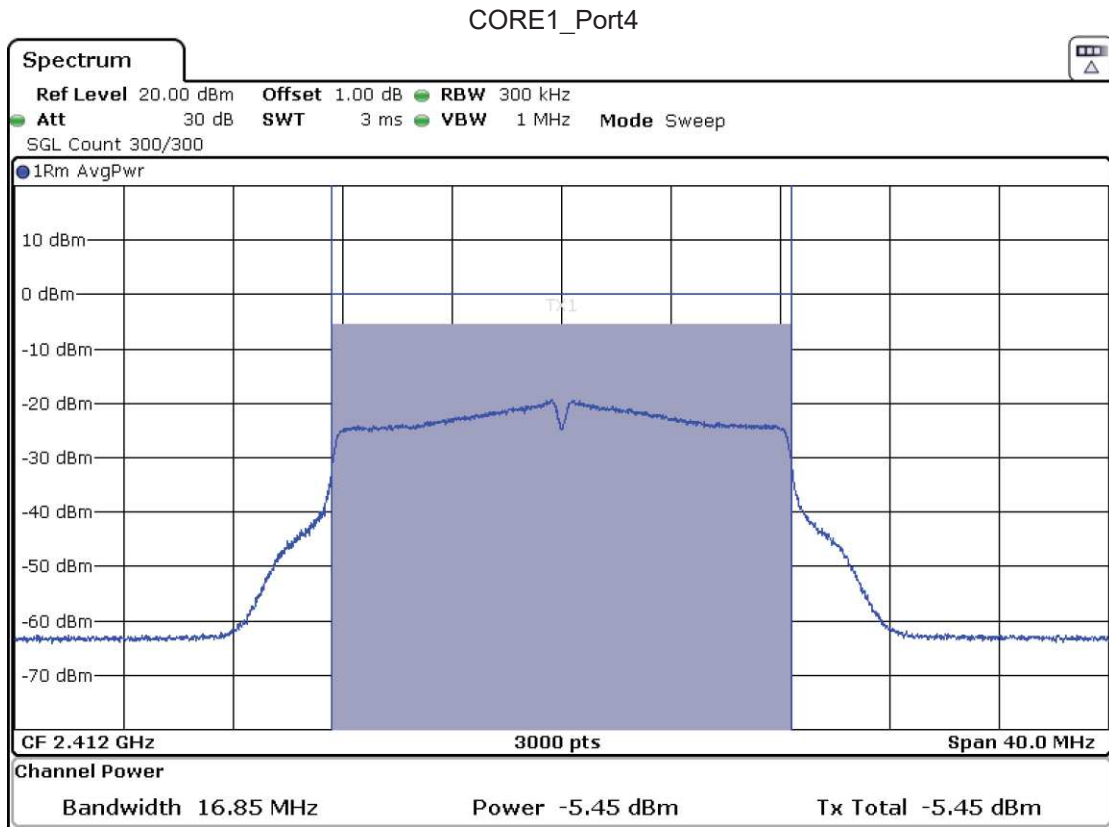


CORE0_Port2

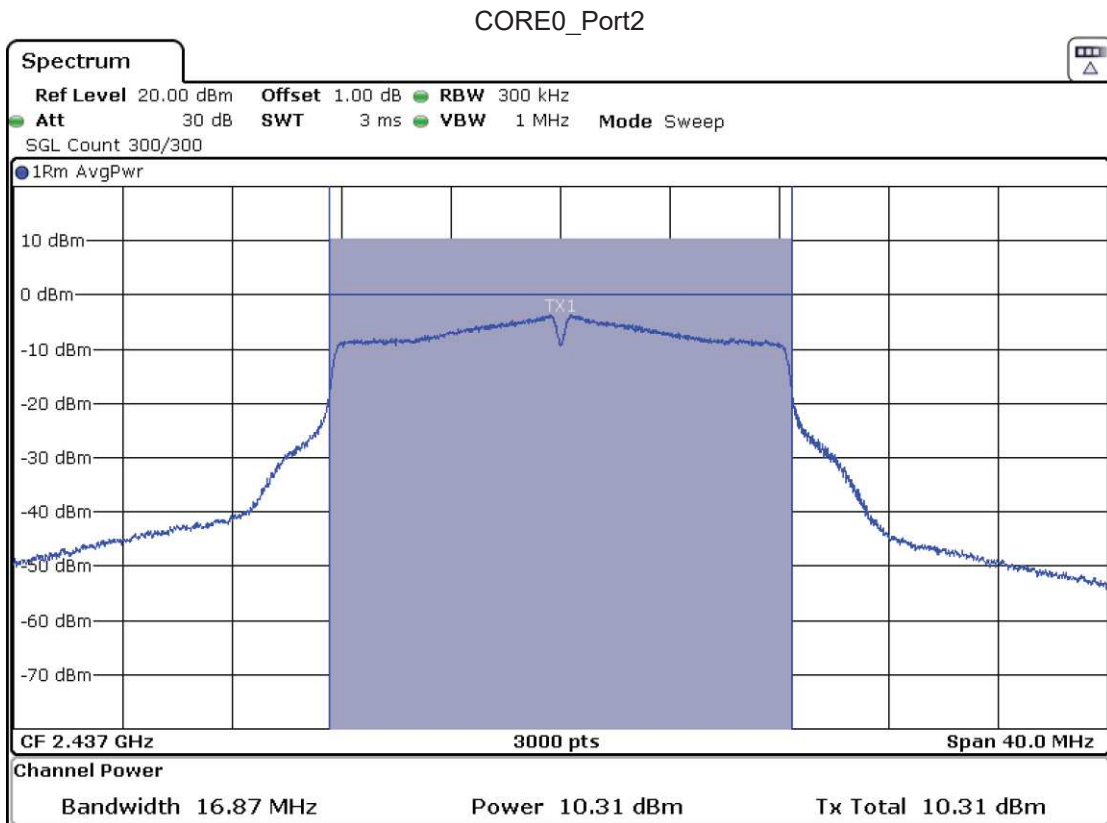
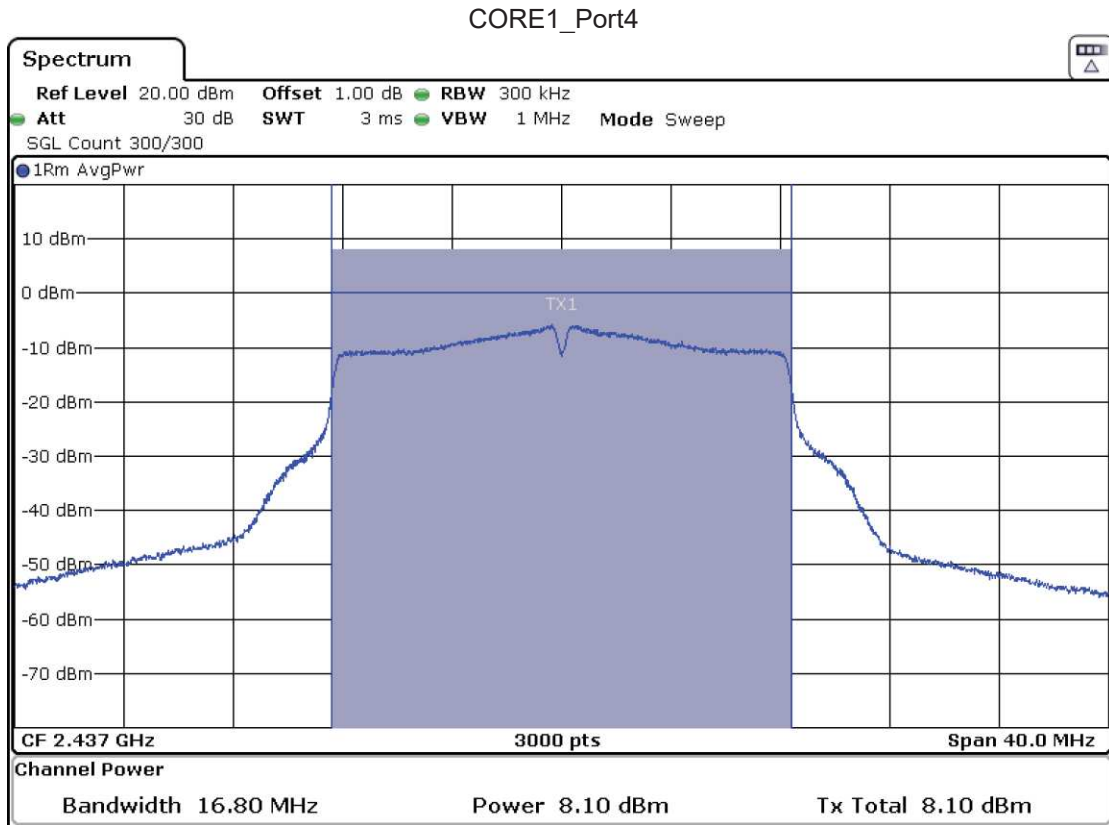


- **Mode 802.11 g**

- Low Channel:

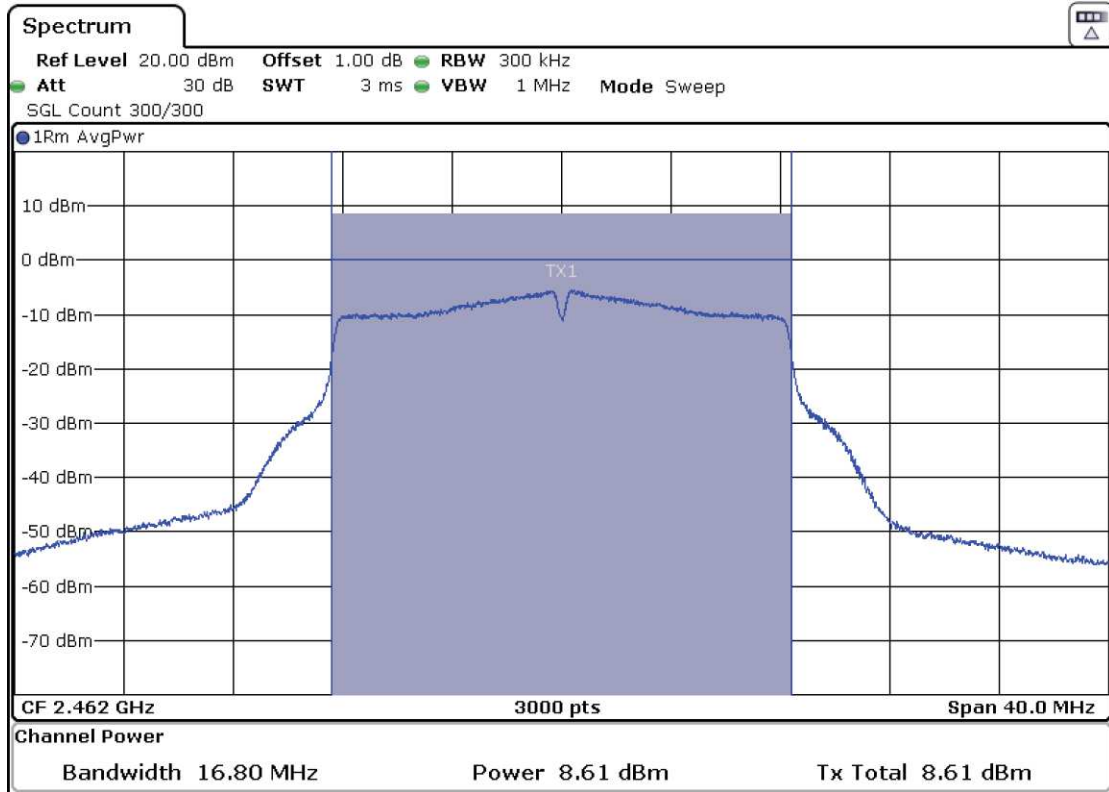


- Middle Channel:

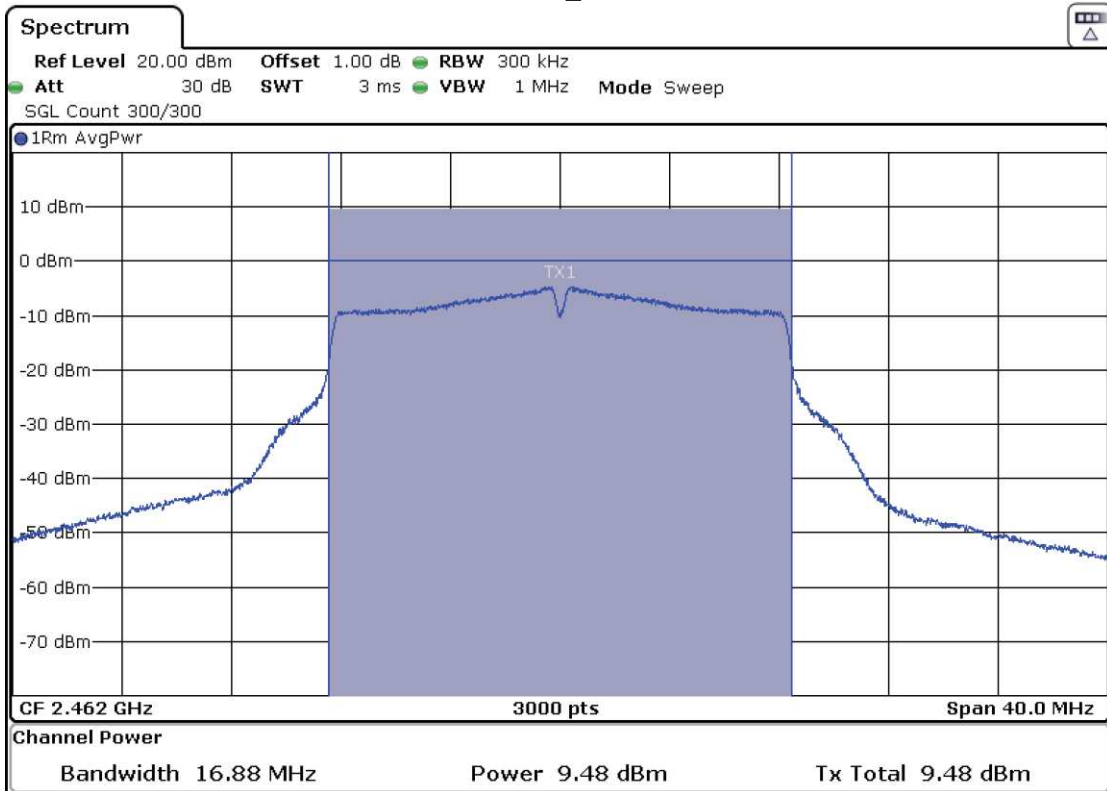


- High Channel:

CORE1_Port4

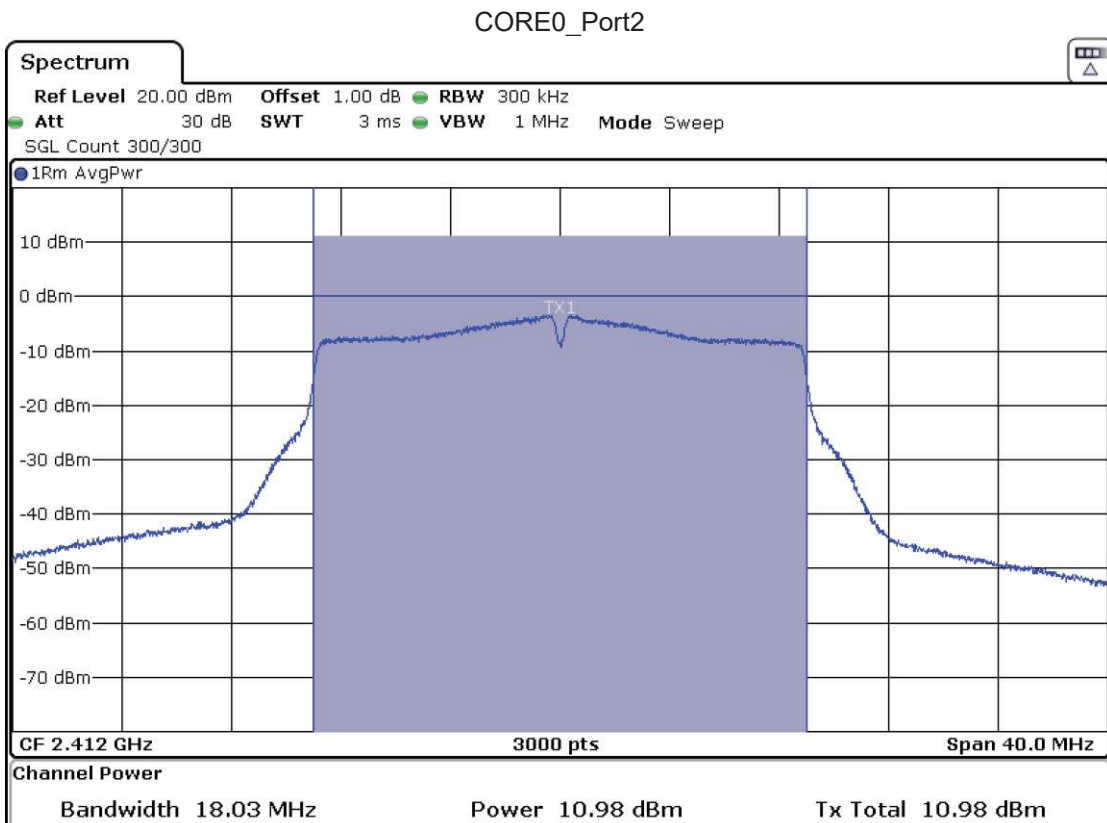
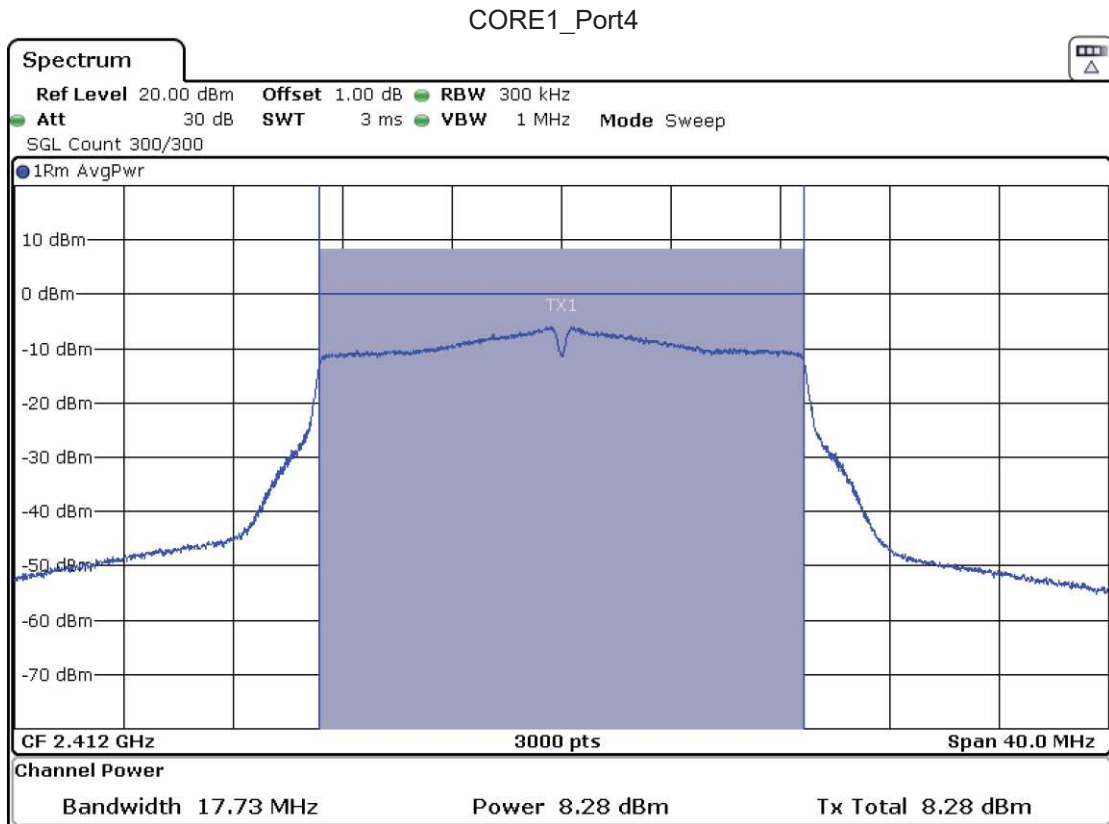


CORE0_Port2



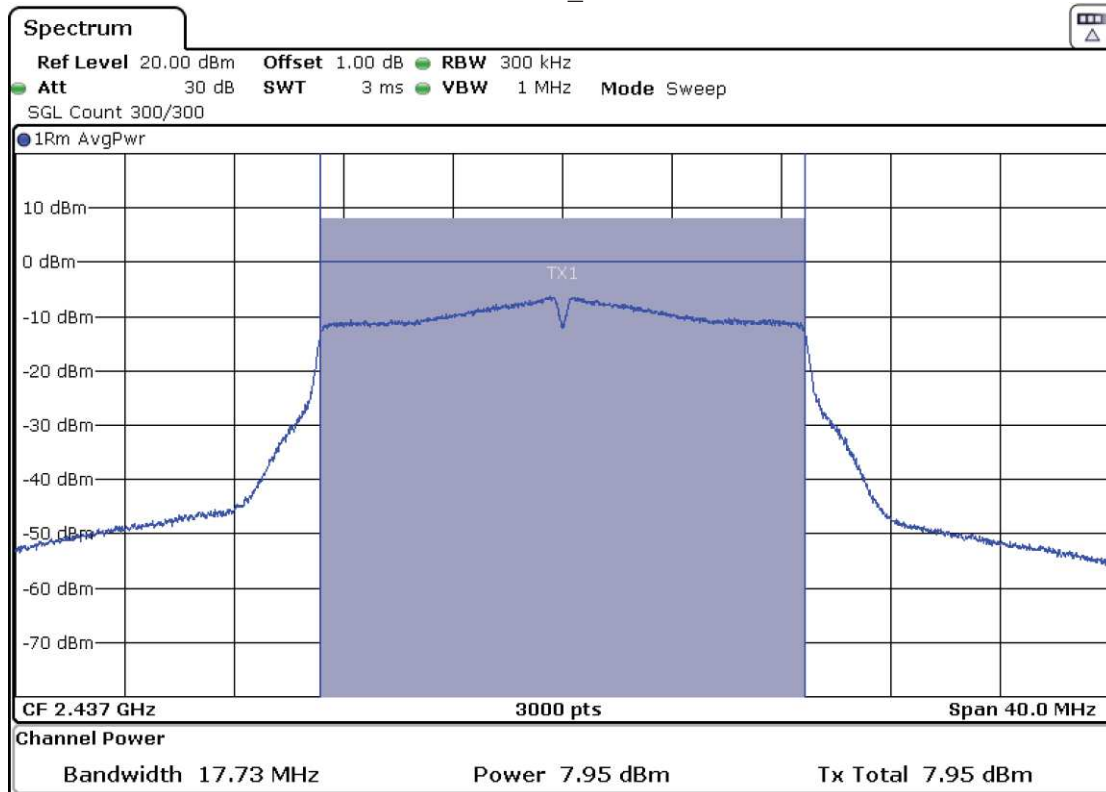
- **Mode 802.11 n20**

- Low Channel:

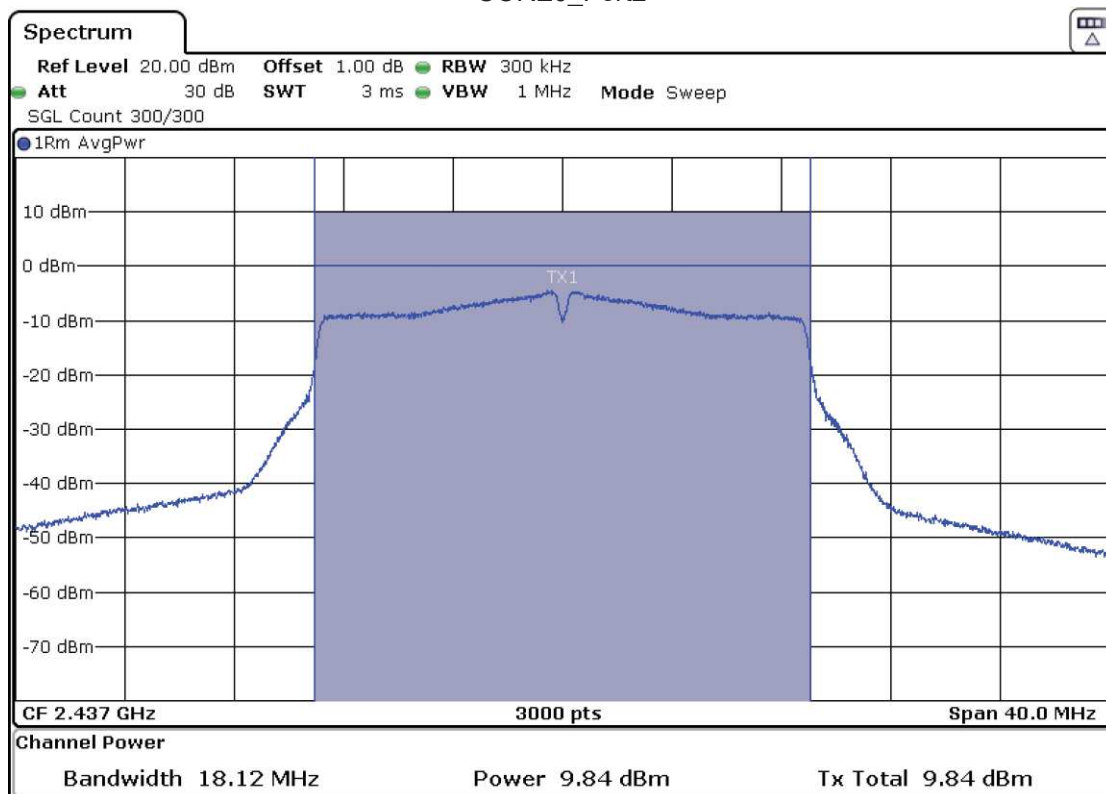


- Middle Channel:

CORE1_Port4

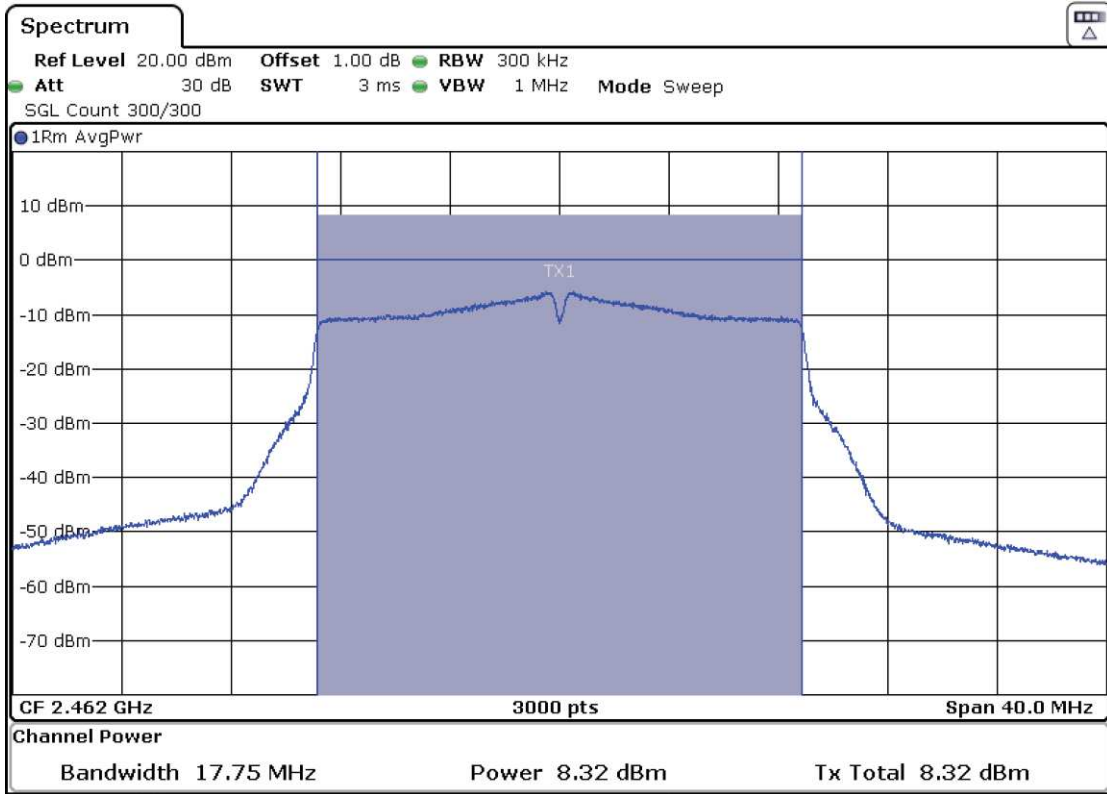


CORE0_Port2

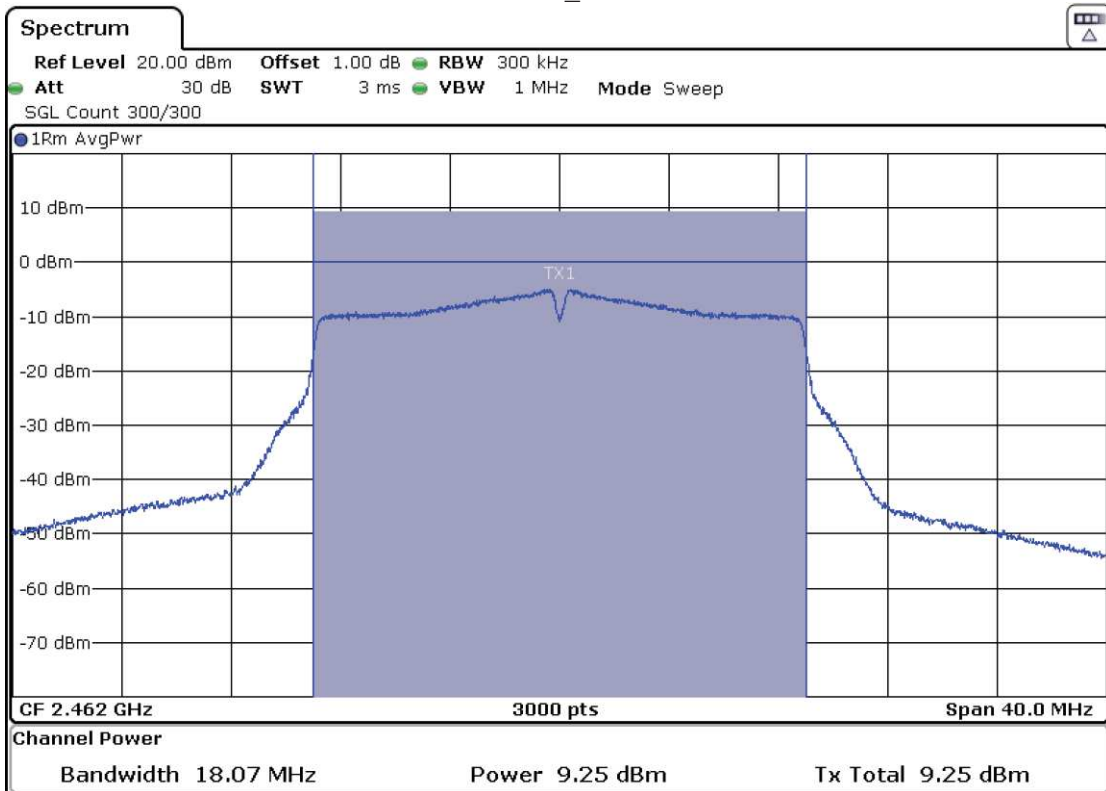


- High Channel:

CORE1_Port4



CORE0_Port2



FCC 15.247 (d) / RSS-247 5.5. Band-edge emissions compliance (Transmitter)

SPECIFICATION:

In any 100 kHz bandwidths outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

RESULTS:

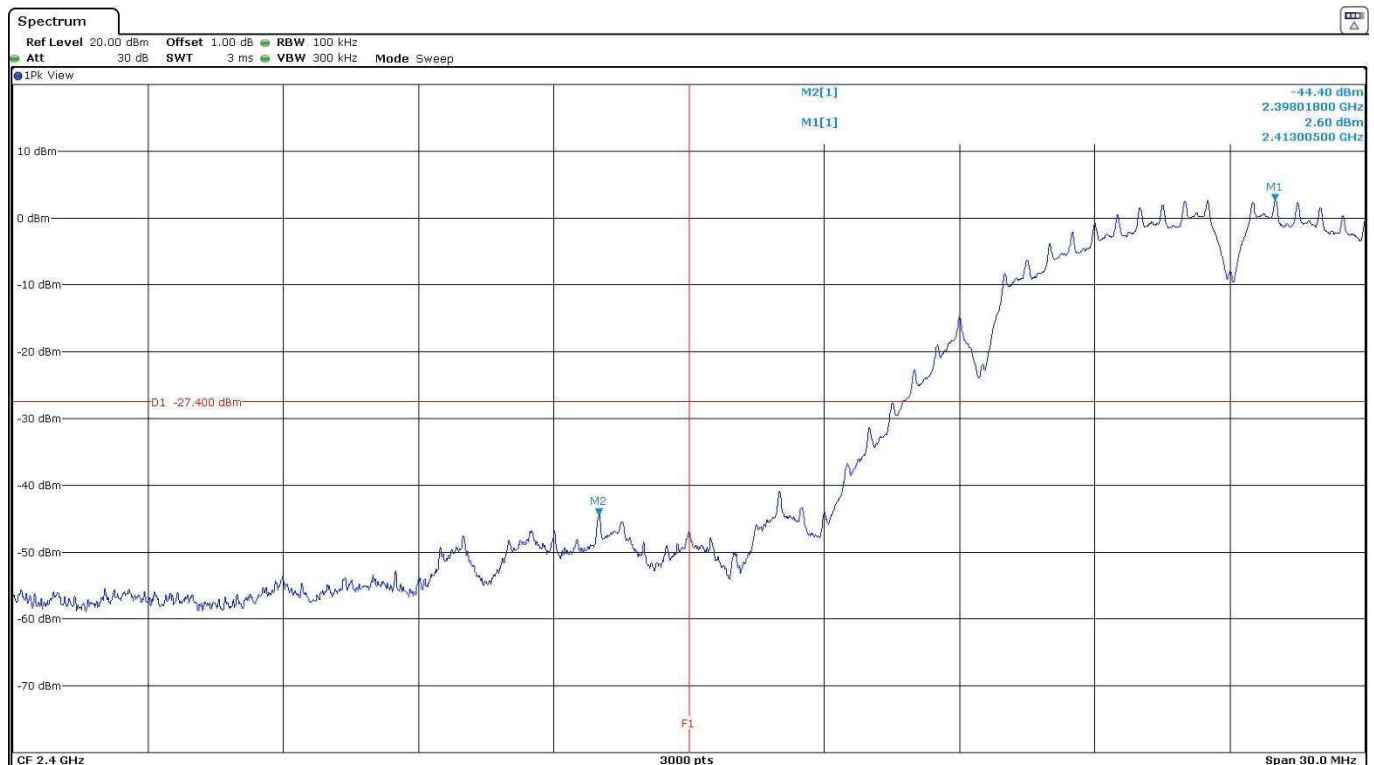
Radiated measurements were used to show compliance with the limits in the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

Measurement uncertainty (dB)	<±2.574
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SISO – CORE1_Port4 Antenna:

- **Mode 802.11 b – Band-edge emissions compliance**

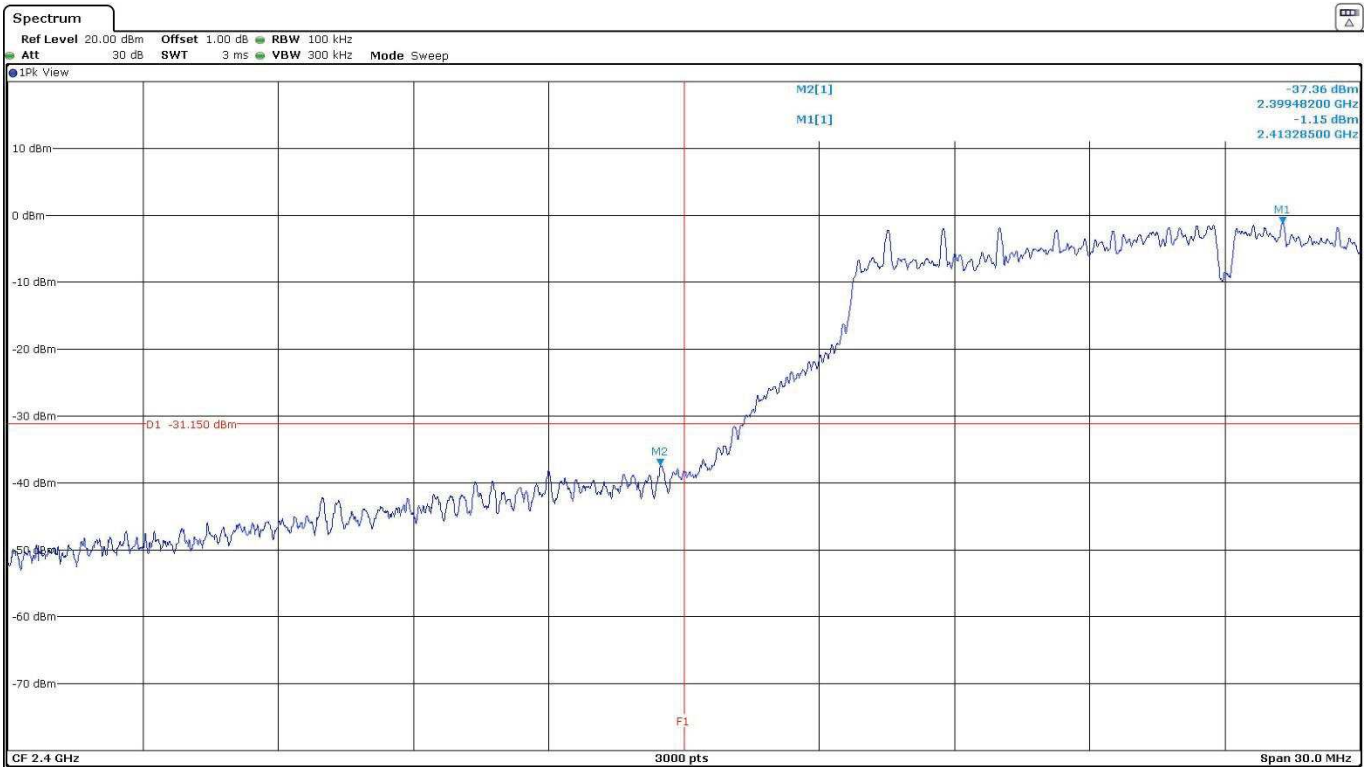
- Low Channel:



Verdict: PASS

- **Mode 802.11 g – Band-edge emissions compliance**

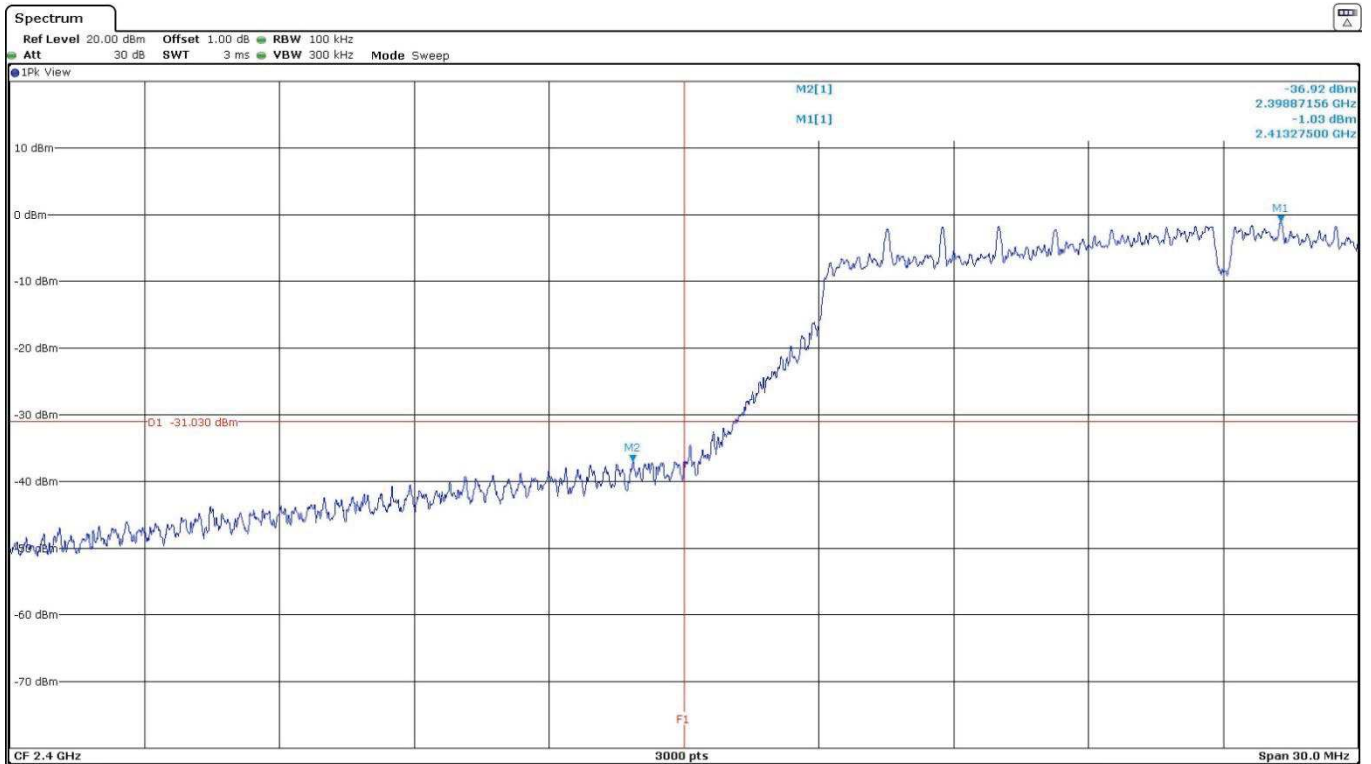
- Low Channel:



Verdict: PASS

- **Mode 802.11 n20 – Band-edge emissions compliance**

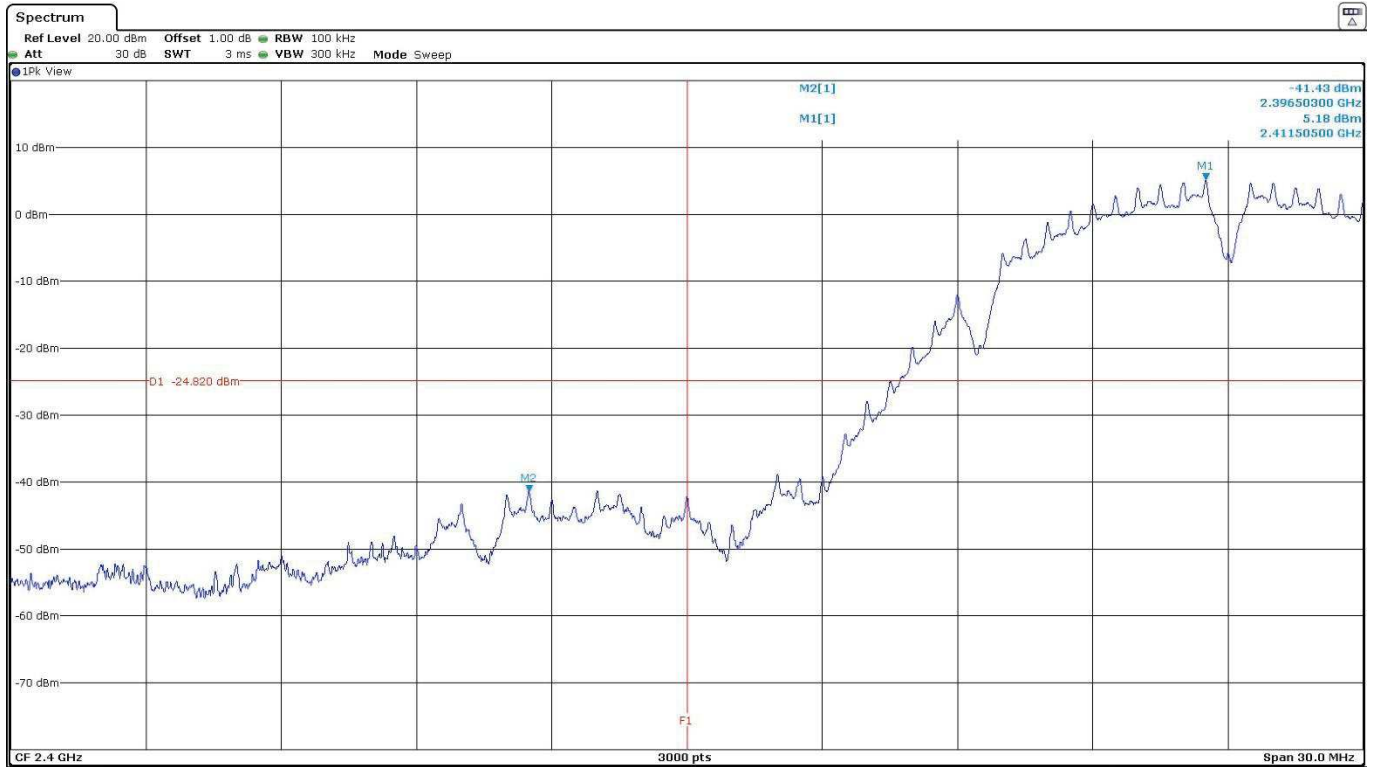
- Low Channel:



Verdict: PASS

SISO – CORE0_Port2 Antenna:

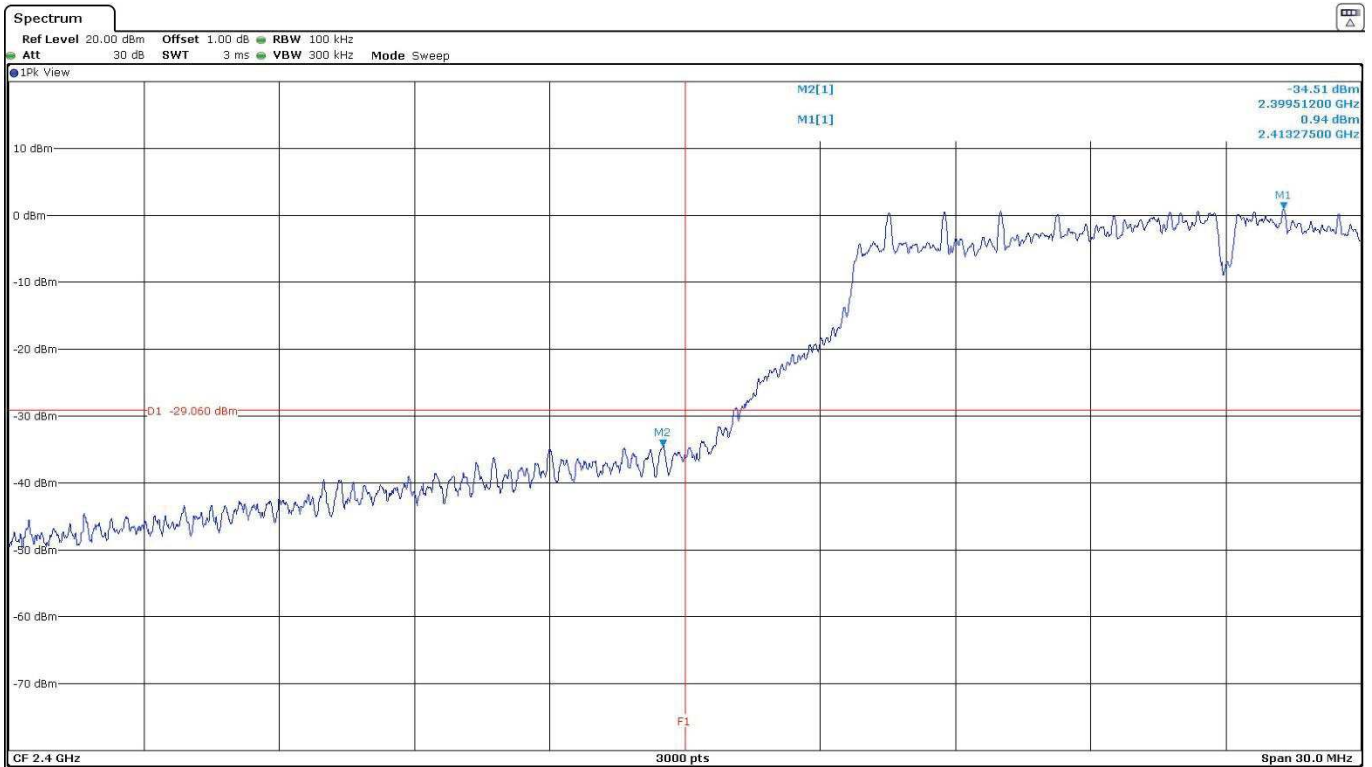
- **Mode 802.11 b – Band-edge emissions compliance**
- Low Channel:



Verdict: PASS

- **Mode 802.11 g – Band-edge emissions compliance**

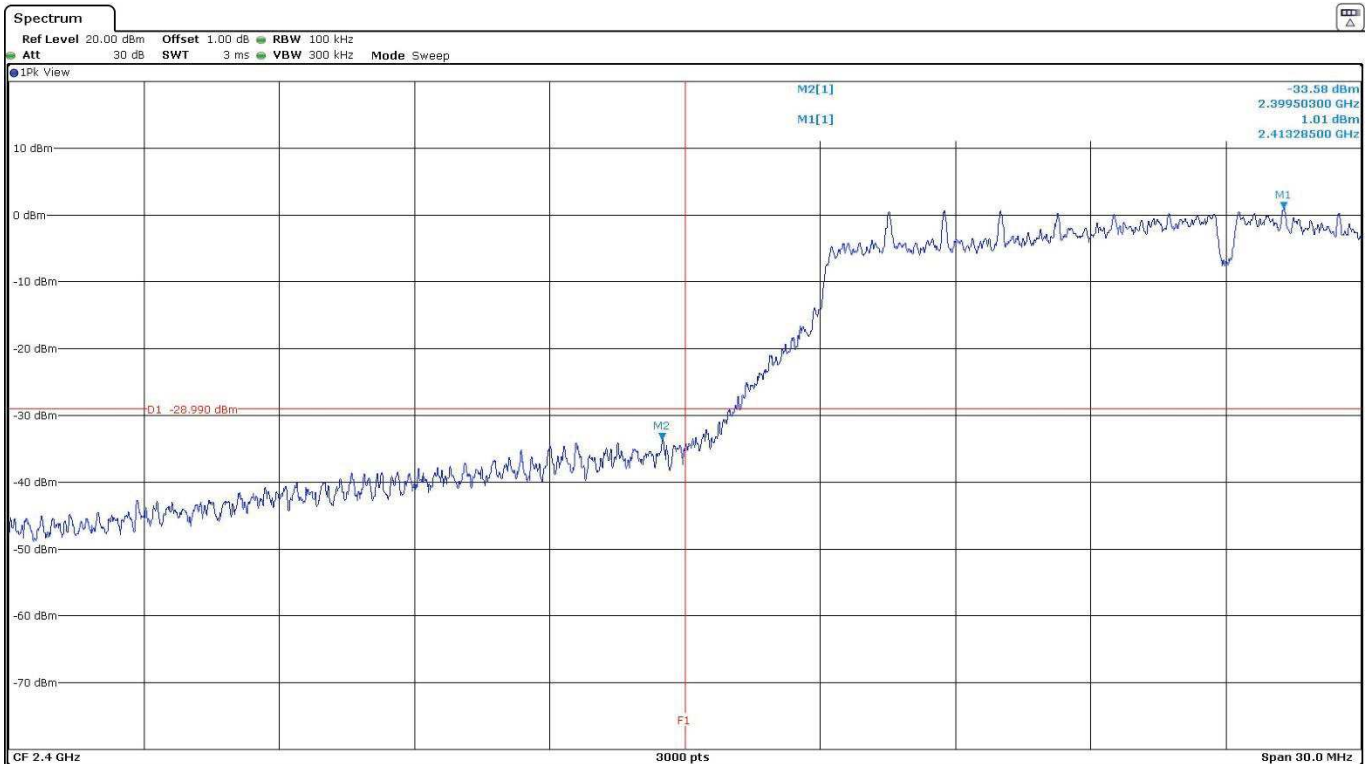
- Low Channel:



Verdict: PASS

- **Mode 802.11 n20 – Band-edge emissions compliance**

- Low Channel:

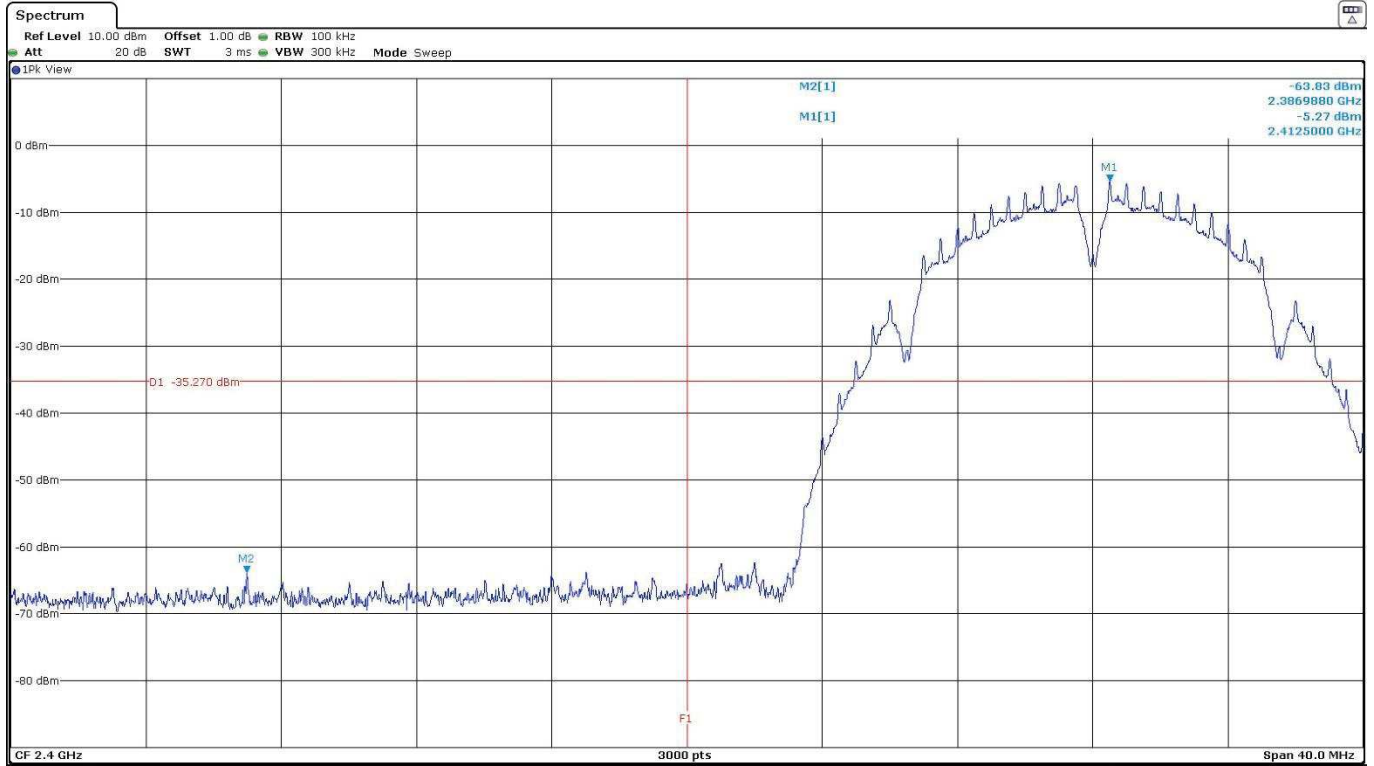


Verdict: PASS

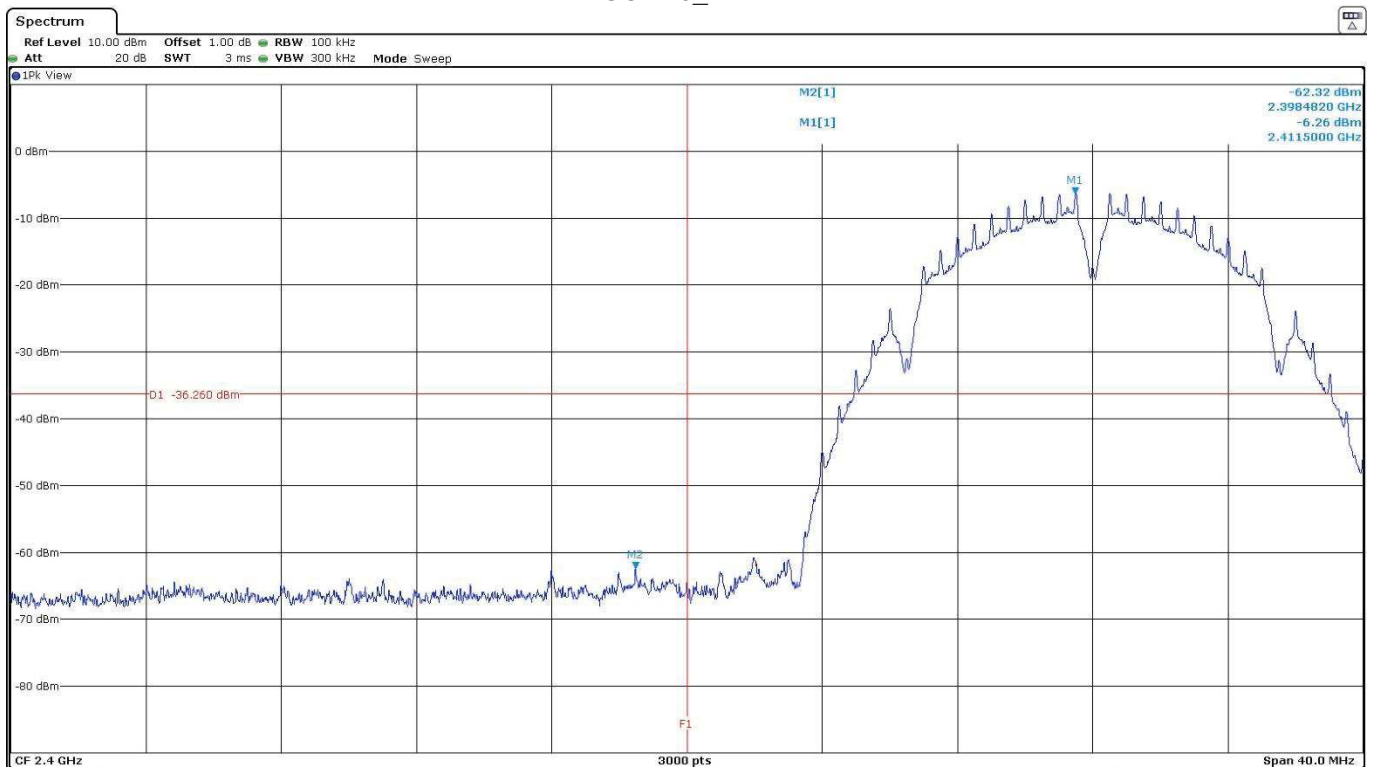
MIMO – CORE1_Port4 Antenna & CORE0_Port2 Antenna:

- **Mode 802.11 b – Band-edge emissions compliance**
- Low Channel:

CORE1_Port4



CORE0_Port2

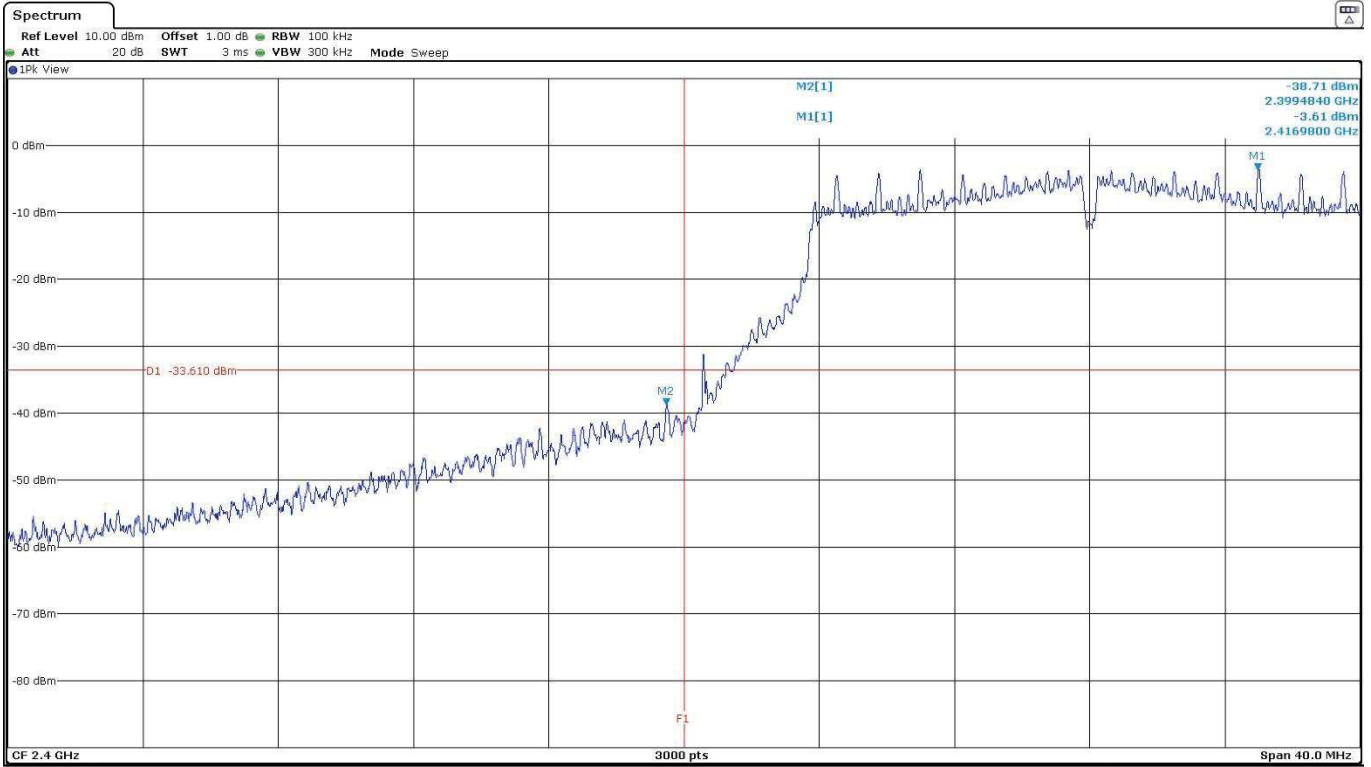


Verdict: PASS

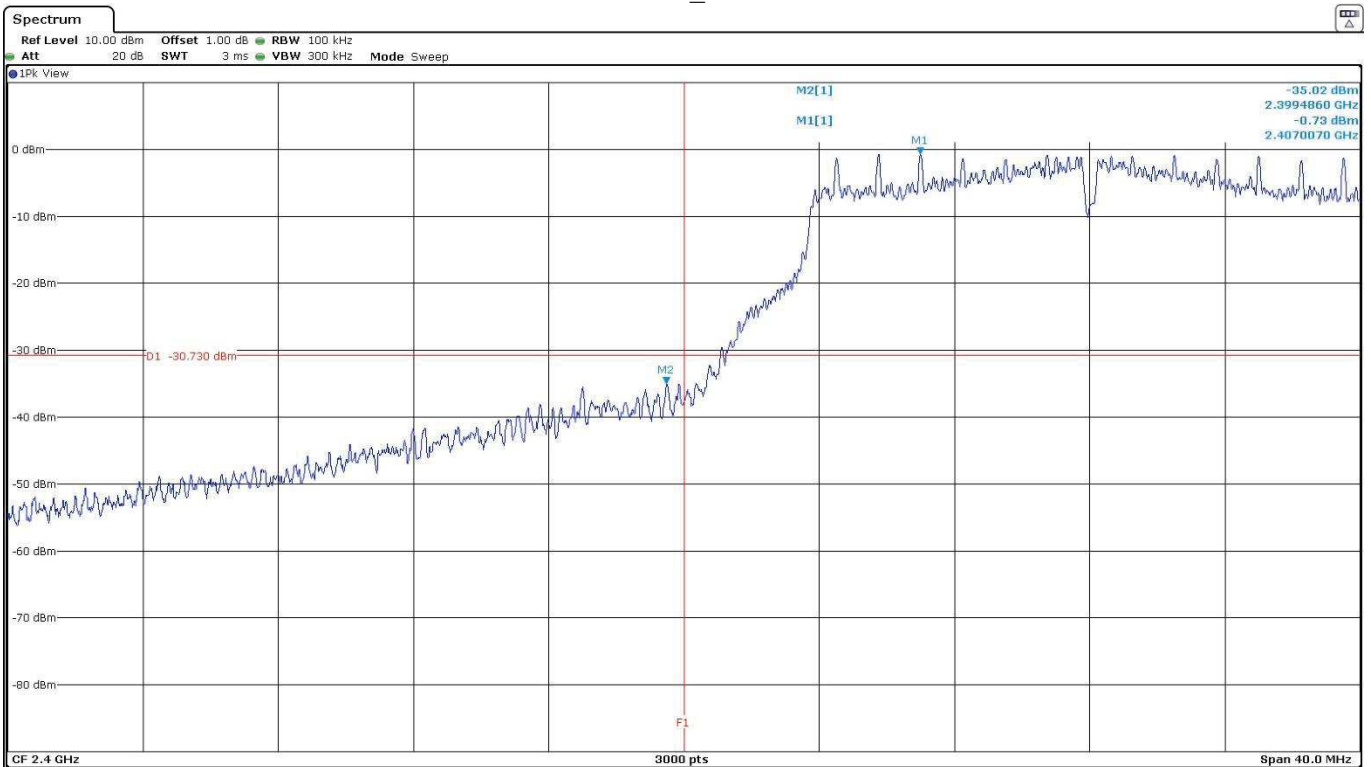
- **Mode 802.11 g – Band-edge emissions compliance**

- Low Channel:

CORE1_Port4



CORE0_Port2

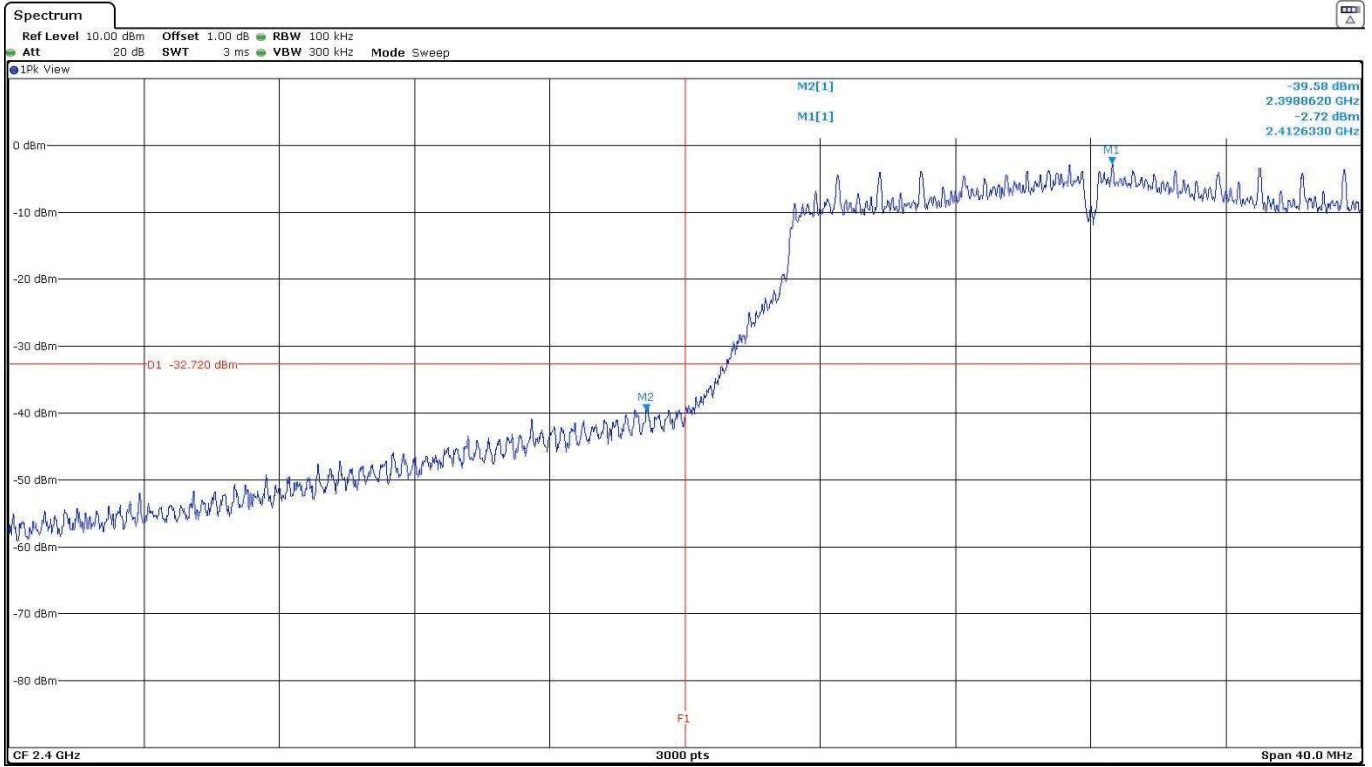


Verdict: PASS

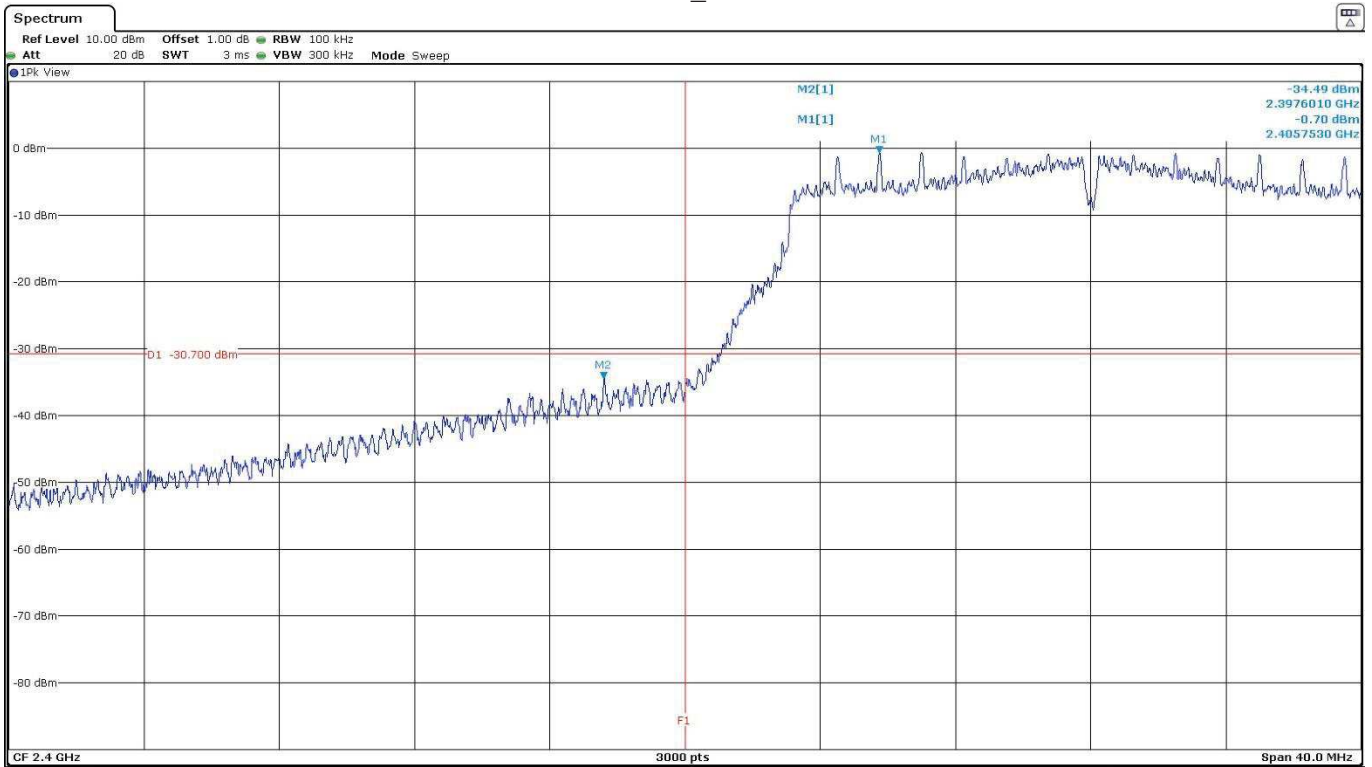
- **Mode 802.11 n20 – Band-edge emissions compliance**

- Low Channel:

CORE1_Port4



CORE0_Port2



Verdict: PASS

FCC 15.247 (e) / RSS-247 5.2. (b) Power spectral density

SPECIFICATION:

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

RESULTS:

For SISO and MIMO modes, the power spectral density was measured using the method according to point 11.10.5 "Method AVGPS-2" of ANSI C.63.10-2013.

SISO case CORE1_Port4 Antenna and SISO case CORE0_Port2 Antenna.
 MIMO case CORE1_Port4 and CORE0_Port2 Antennas.

The PSD was measured on all ports and then using the measure and sum spectral maxima across the outputs technique, stated in FCC KDB 662911 D01 Section E)2)b).

SISO – CORE1_Port4 Antenna:

- **Mode 802.11 b**

	Low Channel	Middle Channel	High Channel
Average Power Spectral Density (dBm)	-5.81	-5.46	-4.52
Duty Cycle (dB)	0.174587733		
Average Power Spectral Density with Duty Cycle Correction (dBm)	-5.64	-5.29	-4.35
Measurement uncertainty (dB)	<±2.574		

- **Mode 802.11 g**

	Low Channel	Middle Channel	High Channel
Average Power Spectral Density (dBm)	-7.59	-7.16	-6.75
Duty Cycle (dB)	1.012076575		
Average Power Spectral Density with Duty Cycle Correction (dBm)	-6.58	-6.15	-5.74
Measurement uncertainty (dB)	<±2.574		

- **Mode 802.11 n20**

	Low Channel	Middle Channel	High Channel
Average Power Spectral Density (dBm)	-8.04	-7.5	-7.43
Duty Cycle (dB)	1.055957075		
Average Power Spectral Density with Duty Cycle Correction (dBm)	-6.98	-6.44	-6.37
Measurement uncertainty (dB)	<±2.574		

Verdict: PASS

SISO – CORE0_Port2 Antenna:

- **Mode 802.11 b**

	Low Channel	Middle Channel	High Channel
Average Power Spectral Density (dBm)	-3.74	-4.6	-4.75
Duty Cycle (dB)	0.179099176		
Average Power Spectral Density with Duty Cycle Correction (dBm)	-3.56	-4.42	-4.57
Measurement uncertainty (dB)	<±2.574		

- **Mode 802.11 g**

	Low Channel	Middle Channel	High Channel
Average Power Spectral Density (dBm)	-5.62	-6.62	-7
Duty Cycle (dB)	0.980393452		
Average Power Spectral Density with Duty Cycle Correction (dBm)	-4.64	-5.64	-6.02
Measurement uncertainty (dB)	<±2.574		

- **Mode 802.11 n20**

	Low Channel	Middle Channel	High Channel
Average Power Spectral Density (dBm)	-6.27	-6.85	-7.35
Duty Cycle (dB)	1.044934911		
Average Power Spectral Density with Duty Cycle Correction (dBm)	-5.23	-5.81	-6.31
Measurement uncertainty (dB)	<±2.574		

Verdict: PASS

MIMO – CORE1_Port4 Antenna & CORE0_Port2 Antenna:

- **Mode 802.11 b**

	Low Channel		Middle Channel		High Channel	
	CORE1_Port4	CORE0_Port2	CORE1_Port4	CORE0_Port2	CORE1_Port4	CORE0_Port2
Average Power Spectral Density (dBm/100KHz)	-7.58	-4.68	-7.68	-5,3	-7,59	-6,17
Duty Cycle Correction (dB)	0.176	0.181	0.176	0,181	0,176	0,181
PSD with Duty Cycle Correction (dBm/100KHz)	-7.404	-4.499	-7.504	-5,119	-7,414	-5,989
	CORE1_Port4 + CORE0_Port2		CORE1_Port4 + CORE0_Port2		CORE1_Port4 + CORE0_Port2	
Combined Conducted PSD (dBm)	-2.702		-3.139		-3.633	
Measurement uncertainty (dB)	<±2.574					

- **Mode 802.11 g**

	Low Channel		Middle Channel		High Channel	
	CORE1_Port4	CORE0_Port2	CORE1_Port4	CORE0_Port2	CORE1_Port4	CORE0_Port2
Average Power Spectral Density (dBm/100KHz)	-8.93	-6.4	-9.48	-7,58	-8,85	-8,04
Duty Cycle Correction (dB)	0.999	1.016	0.999	1,016	0,999	1,016
PSD with Duty Cycle Correction (dBm/100KHz)	-7.931	-5.384	-8.481	-6,564	-7,851	-7,024
	CORE1_Port4 + CORE0_Port2		CORE1_Port4 + CORE0_Port2		CORE1_Port4 + CORE0_Port2	
Combined Conducted PSD (dBm)	-3.463		-4.408		-4.408	
Measurement uncertainty (dB)	<±2.574					