

8 Band Edge Measurement

Test Requirement : Section 15.247(d) In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Test Method : ANSI C63.10:2013

Test Limit : Regulation 15.247 (d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

8.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold
3. Set up:

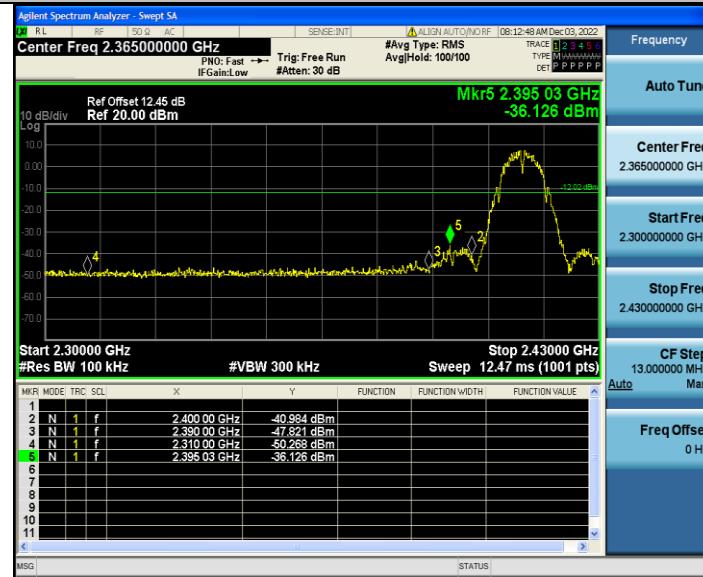




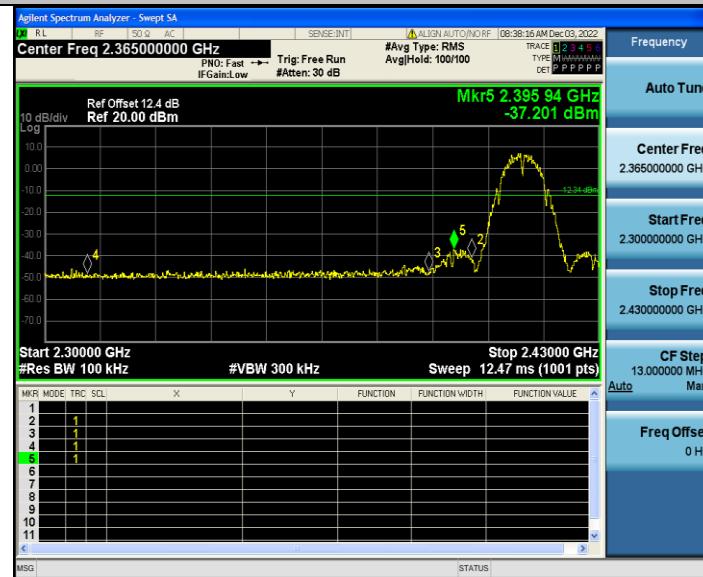
8.2 Test Result

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	7.98	-36.13	≤-12.02	PASS
	Ant2	Low	2412	7.66	-37.2	≤-12.34	PASS
	Ant1	High	2462	6.77	-46.24	≤-13.23	PASS
	Ant2	High	2462	6.75	-45.58	≤-13.25	PASS
11G	Ant1	Low	2412	3.56	-34.37	≤-16.44	PASS
	Ant2	Low	2412	3.59	-33.27	≤-16.41	PASS
	Ant1	High	2462	3.25	-41.73	≤-16.75	PASS
	Ant2	High	2462	2.53	-45.04	≤-17.47	PASS
11N20SISO	Ant1	Low	2412	2.43	-32.85	≤-17.57	PASS
	Ant2	Low	2412	3.05	-32.8	≤-16.95	PASS
	Ant1	High	2462	2.11	-42.66	≤-17.89	PASS
	Ant2	High	2462	2.43	-43.82	≤-17.57	PASS
11N40SISO	Ant1	Low	2422	-4.81	-44.33	≤-24.81	PASS
	Ant2	Low	2422	-4.57	-46.39	≤-24.57	PASS
	Ant1	High	2452	-4.16	-45.47	≤-24.16	PASS
	Ant2	High	2452	-3.76	-46.16	≤-23.76	PASS

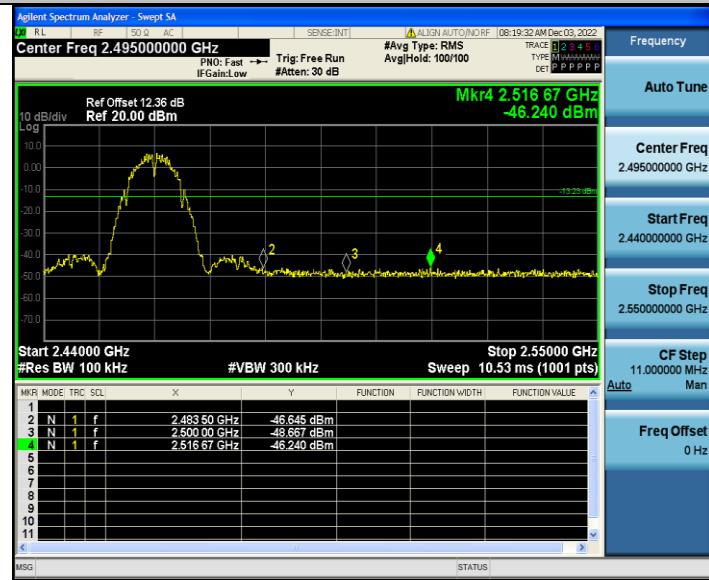
11B_Ant1_Low_2412



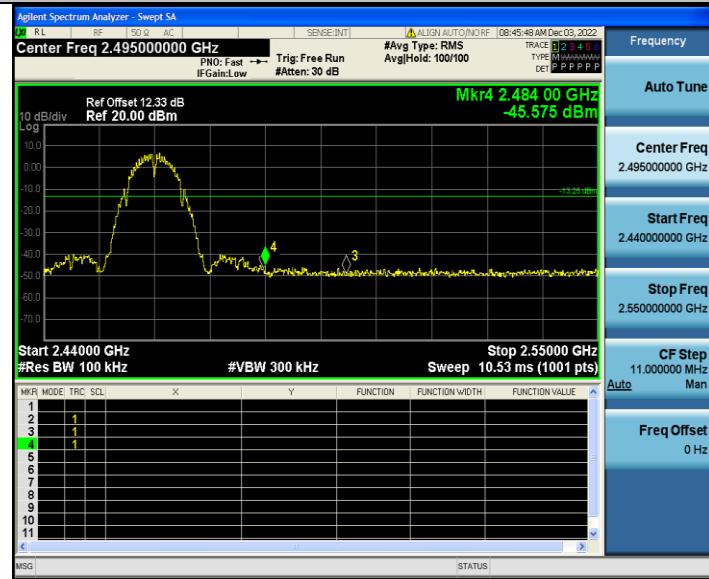
11B_Ant2_Low_2412



11B_Ant1_High_2462



11B_Ant2_High_2462

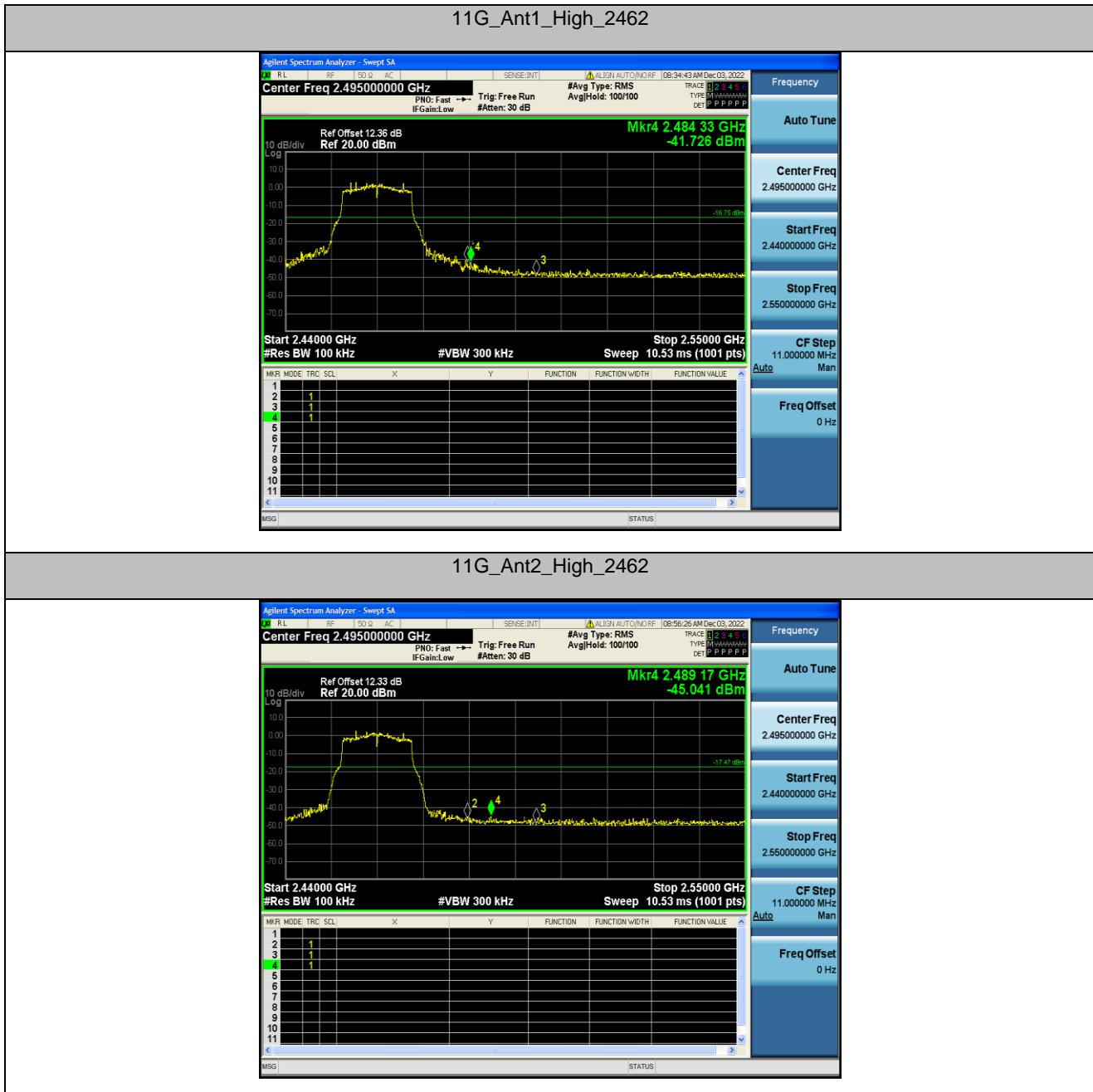


11G_Ant1_Low_2412

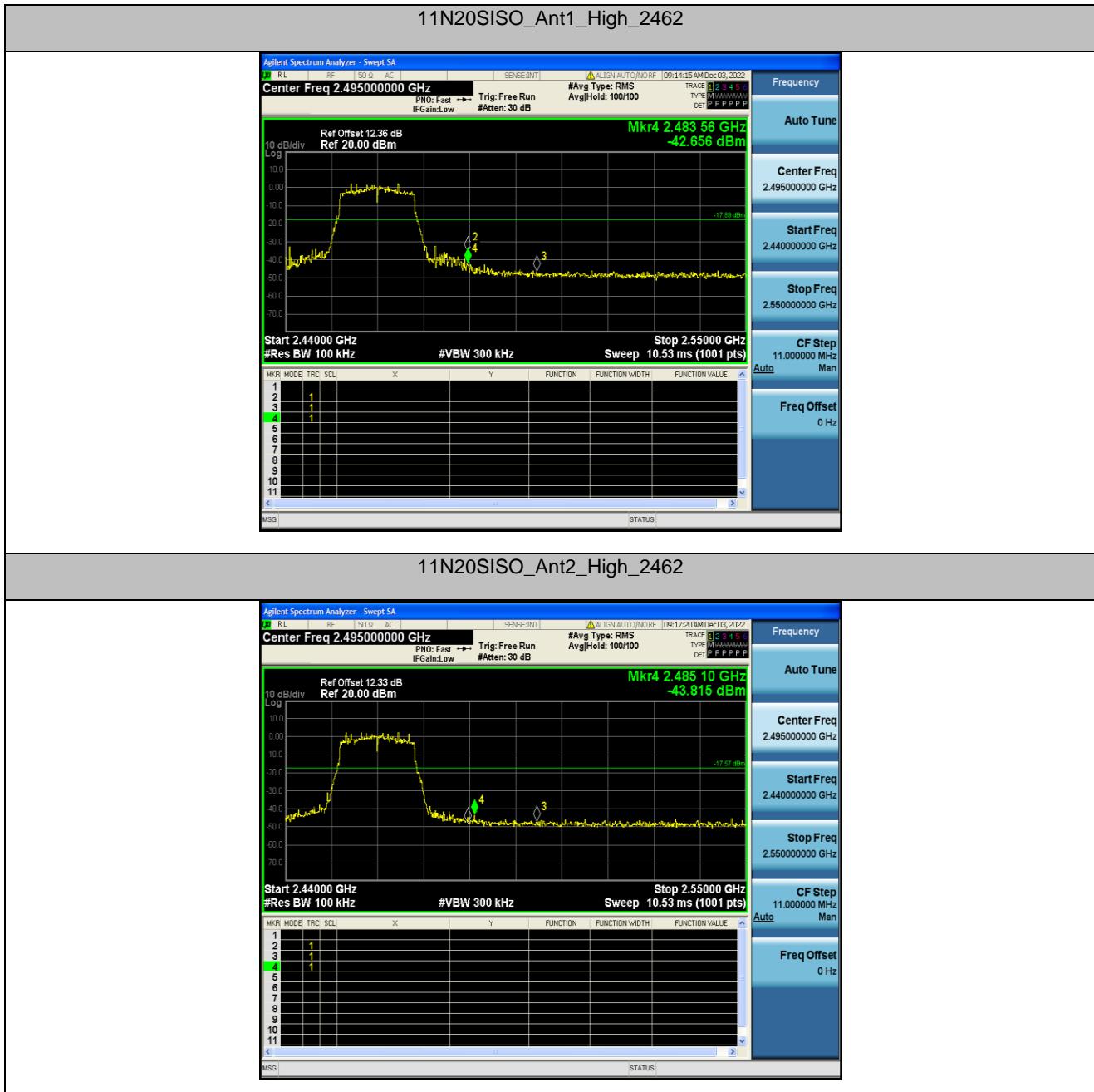


11G_Ant2_Low_2412









9 6dB Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2013

Test Limit
Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

9.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz
3. Set up:

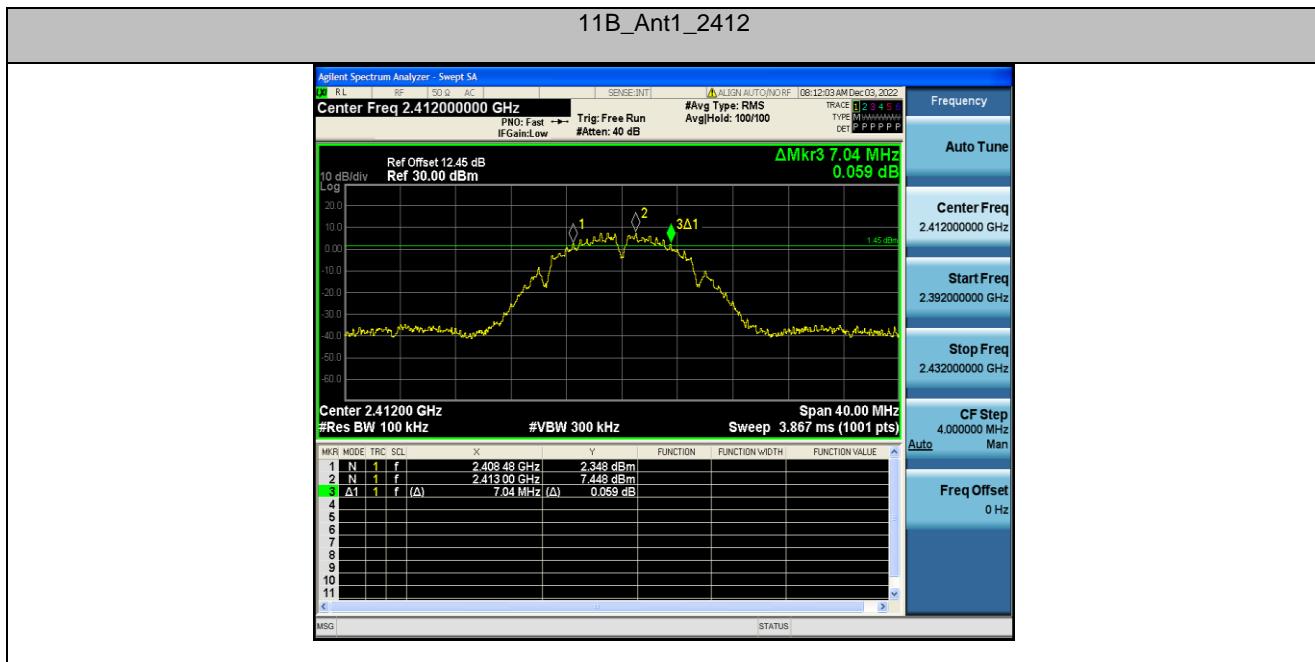


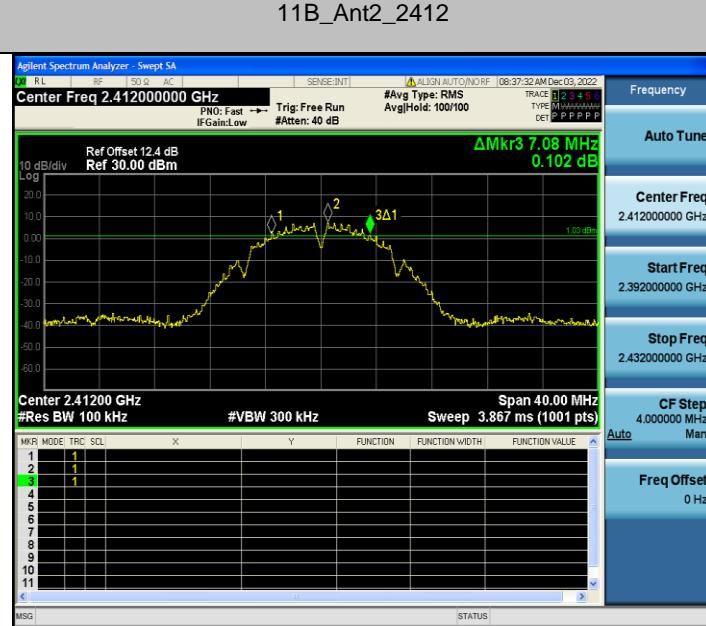
9.2 Test Result

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	7.040	2408.480	2415.520	0.5	PASS
	Ant2	2412	7.080	2408.440	2415.520	0.5	PASS
	Ant1	2437	7.520	2433.480	2441.000	0.5	PASS
	Ant2	2437	7.080	2433.480	2440.560	0.5	PASS
	Ant1	2462	6.560	2458.480	2465.040	0.5	PASS
	Ant2	2462	7.080	2458.480	2465.560	0.5	PASS
11G	Ant1	2412	16.280	2403.840	2420.120	0.5	PASS
	Ant2	2412	16.320	2403.840	2420.160	0.5	PASS
	Ant1	2437	16.320	2428.840	2445.160	0.5	PASS
	Ant2	2437	16.280	2428.840	2445.120	0.5	PASS
	Ant1	2462	16.320	2453.840	2470.160	0.5	PASS
	Ant2	2462	16.320	2453.840	2470.160	0.5	PASS



11N20SISO	Ant1	2412	17.280	2403.240	2420.520	0.5	PASS
	Ant2	2412	17.560	2403.200	2420.760	0.5	PASS
	Ant1	2437	17.120	2428.240	2445.360	0.5	PASS
	Ant2	2437	17.560	2428.200	2445.760	0.5	PASS
	Ant1	2462	17.560	2453.200	2470.760	0.5	PASS
	Ant2	2462	17.600	2453.200	2470.800	0.5	PASS
11N40SISO	Ant1	2422	35.360	2404.400	2439.760	0.5	PASS
	Ant2	2422	35.440	2404.480	2439.920	0.5	PASS
	Ant1	2437	34.000	2418.760	2452.760	0.5	PASS
	Ant2	2437	30.800	2418.920	2449.720	0.5	PASS
	Ant1	2452	36.160	2433.760	2469.920	0.5	PASS
	Ant2	2452	36.000	2433.760	2469.760	0.5	PASS





11B_Ant1_2437





11B_Ant2_2437



11B_Ant1_2462



11B_Ant2_2462



11G_Ant1_2412



11G_Ant2_2412



11G_Ant1_2437



11G_Ant2_2437



11G_Ant1_2462

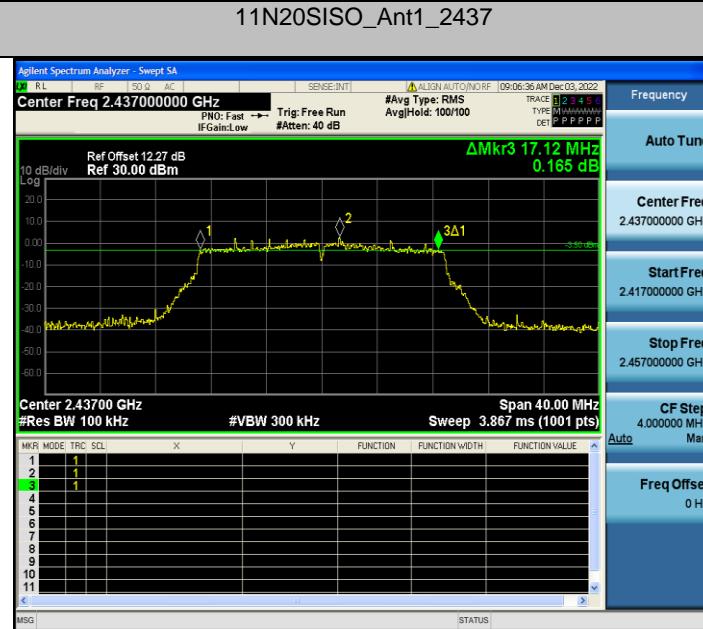
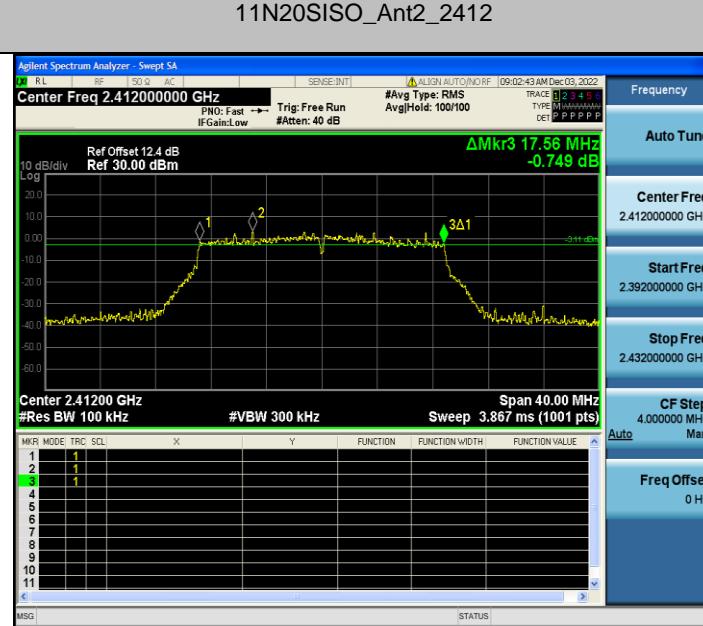


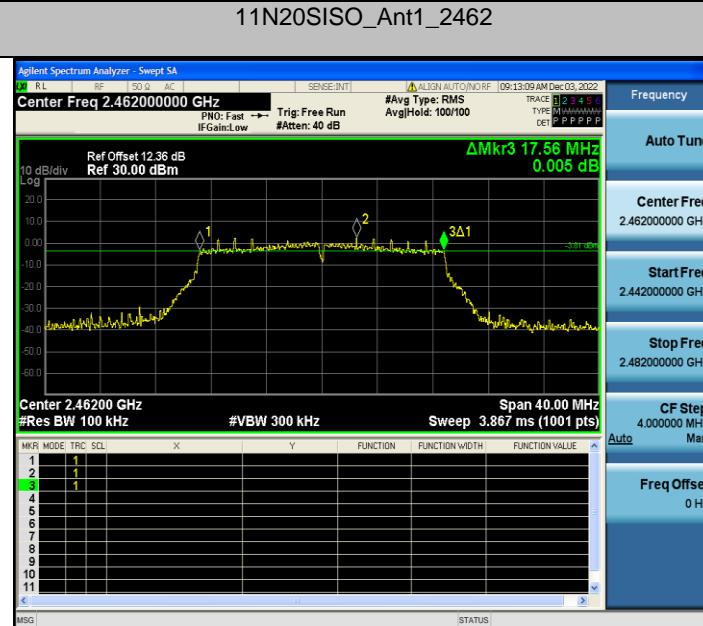
11G_Ant2_2462

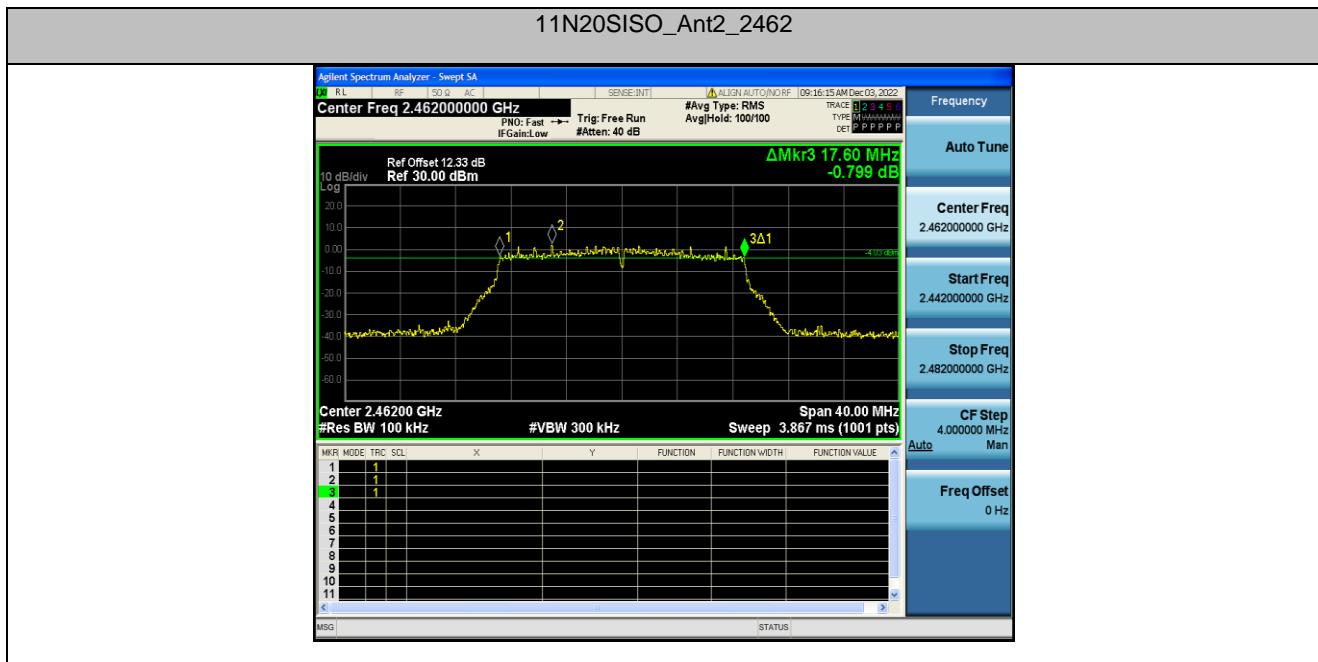


11N20SISO_Ant1_2412









10 Maximum Peak Output Power

Test Requirement : FCC CFR47 Part 15 Section 15.247

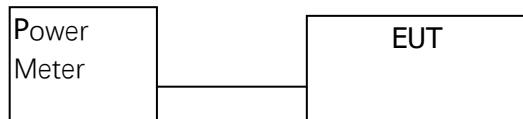
Test Method : ANSI C63.10:2013

Test Limit : Regulation 15.247 (b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.

10.1 Test Procedure

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 D01 15.247 Meas Guidance v05 section 8.3.1.
2. The RF output of EUT was connected to the spectrum by RF cable . The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

5. Set up:



10.2 Test Result

For SISO

TestMode	Antenna	Frequency[MHz]	Set Power	Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	---	17.97	≤30.00	PASS
	Ant2	2412	---	17.94	≤30.00	PASS
	Ant1	2437	---	17.53	≤30.00	PASS
	Ant2	2437	---	17.41	≤30.00	PASS
	Ant1	2462	---	16.76	≤30.00	PASS
	Ant2	2462	---	16.91	≤30.00	PASS
11G	Ant1	2412	---	22.50	≤30.00	PASS
	Ant2	2412	---	22.39	≤30.00	PASS
	Ant1	2437	---	22.03	≤30.00	PASS
	Ant2	2437	---	21.96	≤30.00	PASS

	Ant1	2462	---	21.77	≤ 30.00	PASS
	Ant2	2462	---	21.47	≤ 30.00	PASS
11N20SIS O	Ant1	2412	---	21.05	≤ 30.00	PASS
	Ant2	2412	---	22.28	≤ 30.00	PASS
	MIMO	2412	---	24.72	≤ 30.00	PASS
	Ant1	2437	---	20.93	≤ 30.00	PASS
	Ant2	2437	---	21.57	≤ 30.00	PASS
	MIMO	2437	---	24.27	≤ 30.00	PASS
	Ant1	2462	---	20.88	≤ 30.00	PASS
	Ant2	2462	---	21.13	≤ 30.00	PASS
	MIMO		---	24.02	≤ 30.00	PASS
11N40SIS O	Ant1	2422	---	18.60	≤ 30.00	PASS
	Ant2	2422	---	17.27	≤ 30.00	PASS
	MIMO	2422	---	21.00	≤ 30.00	PASS
	Ant1	2437	---	17.89	≤ 30.00	PASS
	Ant2	2437	---	16.73	≤ 30.00	PASS
	MIMO	2437	---	20.36	≤ 30.00	PASS
	Ant1	2452	---	17.89	≤ 30.00	PASS
	Ant2	2452	---	17.73	≤ 30.00	PASS
	MIMO	2452	---	20.82	≤ 30.00	PASS

11 Power Spectral density

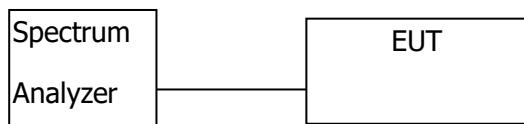
Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2013

Test Limit : Regulation 15.247(f) The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

11.1 Test Procedure

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below:
Center frequency=DTS channel center frequency
Span = 1.5 times the DTS bandwidth
RBW = 3KHz, VBW = 10KHz
Sweep time = auto couple
Detector = peak
Trace mode =max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. Use the peak marker function to determine the maximum amplitude level within the RBW.
5. If measured value exceeds limit, reduce RBW(no less than 3KHz) and repeat.
6. Set up:



11.2 Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-5.98	≤8.00	PASS
	Ant2	2412	-5.38	≤8.00	PASS
	Ant1	2437	-6.77	≤8.00	PASS
	Ant2	2437	-7.46	≤8.00	PASS
	Ant1	2462	-5.88	≤8.00	PASS
	Ant2	2462	-7.36	≤8.00	PASS
11G	Ant1	2412	-8.9	≤8.00	PASS
	Ant2	2412	-8.87	≤8.00	PASS



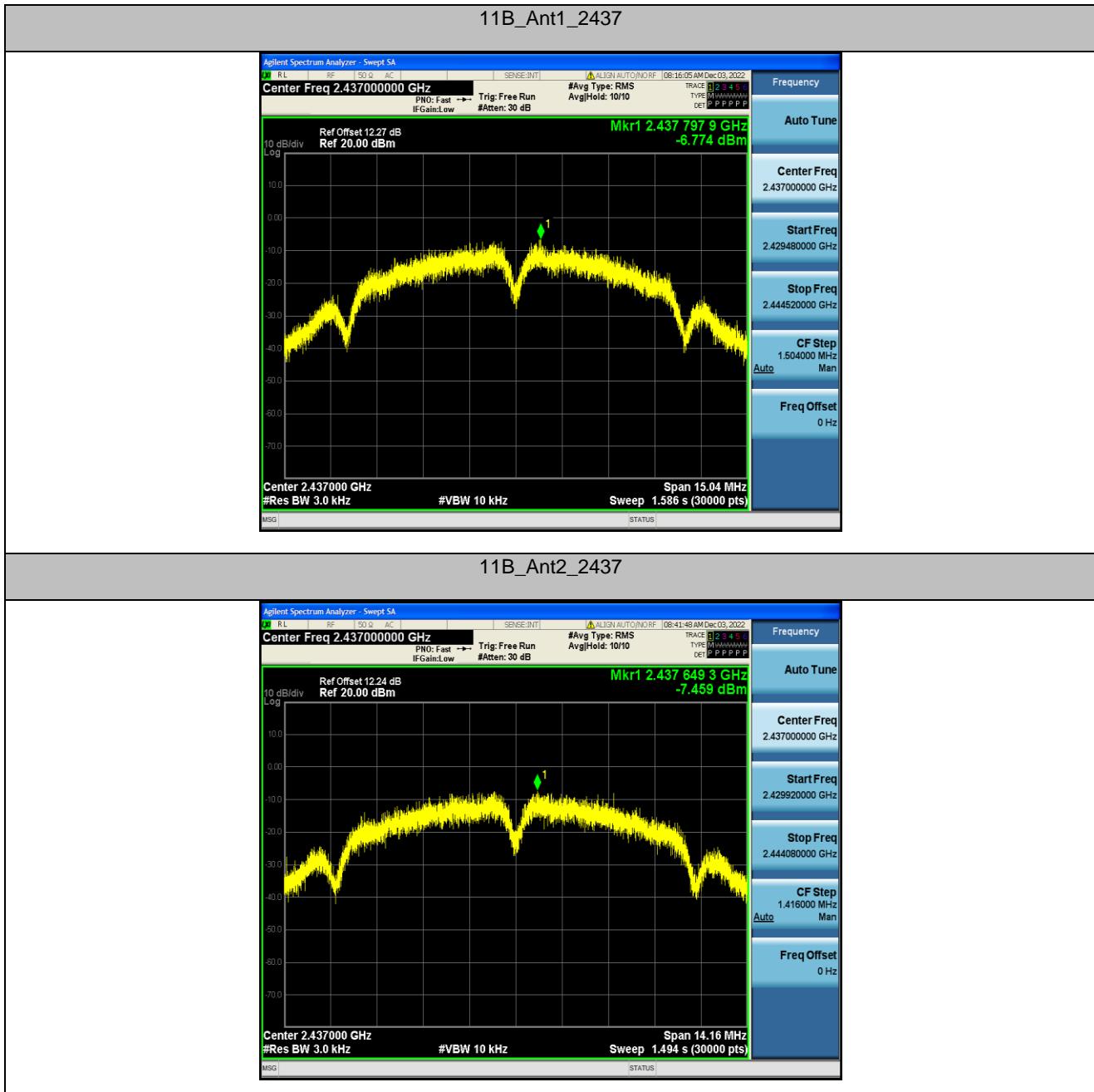
	Ant1	2437	-9.36	≤ 8.00	PASS
	Ant2	2437	-9.41	≤ 8.00	PASS
	Ant1	2462	-9.41	≤ 8.00	PASS
	Ant2	2462	-9.75	≤ 8.00	PASS
11N20SISO	Ant1	2412	-10.5	≤ 8.00	PASS
	Ant2	2412	-9.04	≤ 8.00	PASS
	Ant1	2437	-9.21	≤ 8.00	PASS
	Ant2	2437	-9.4	≤ 8.00	PASS
	Ant1	2462	-10.5	≤ 8.00	PASS
	Ant2	2462	-10.46	≤ 8.00	PASS
11N40SISO	Ant1	2422	-16.83	≤ 8.00	PASS
	Ant2	2422	-18.2	≤ 8.00	PASS
	Ant1	2437	-17.05	≤ 8.00	PASS
	Ant2	2437	-18.13	≤ 8.00	PASS
	Ant1	2452	-17.6	≤ 8.00	PASS
	Ant2	2452	-16.85	≤ 8.00	PASS

11B_Ant1_2412



11B_Ant2_2412



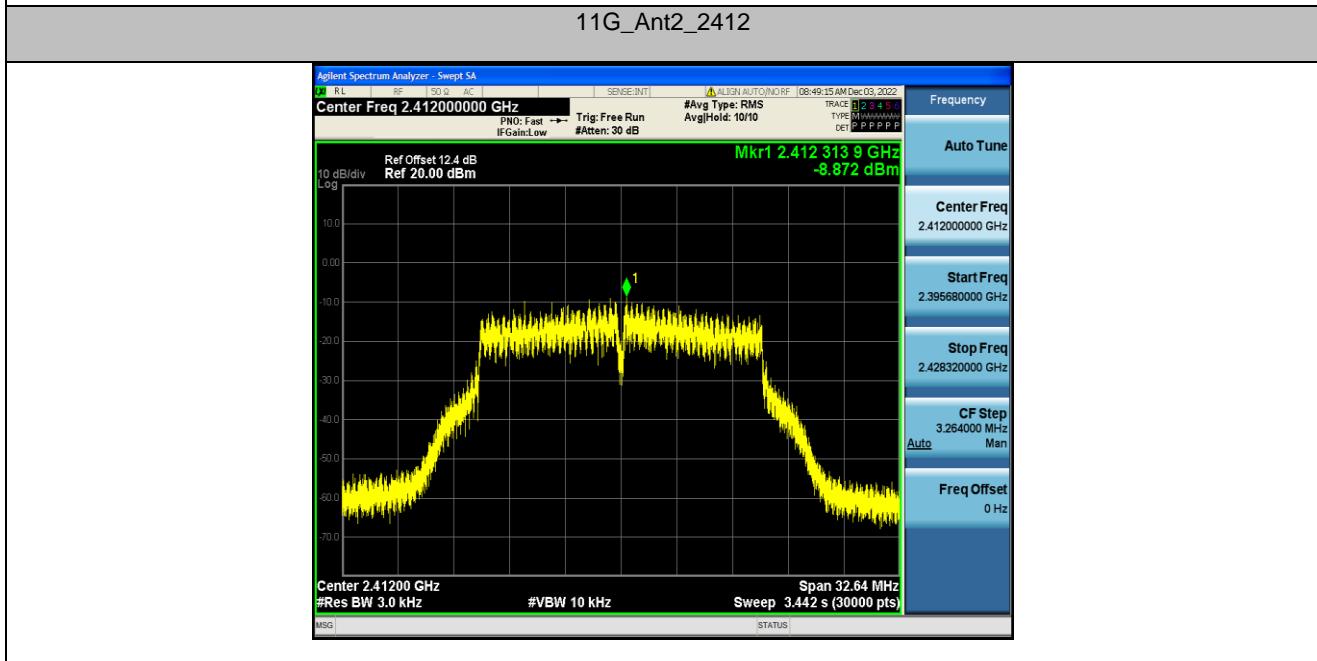
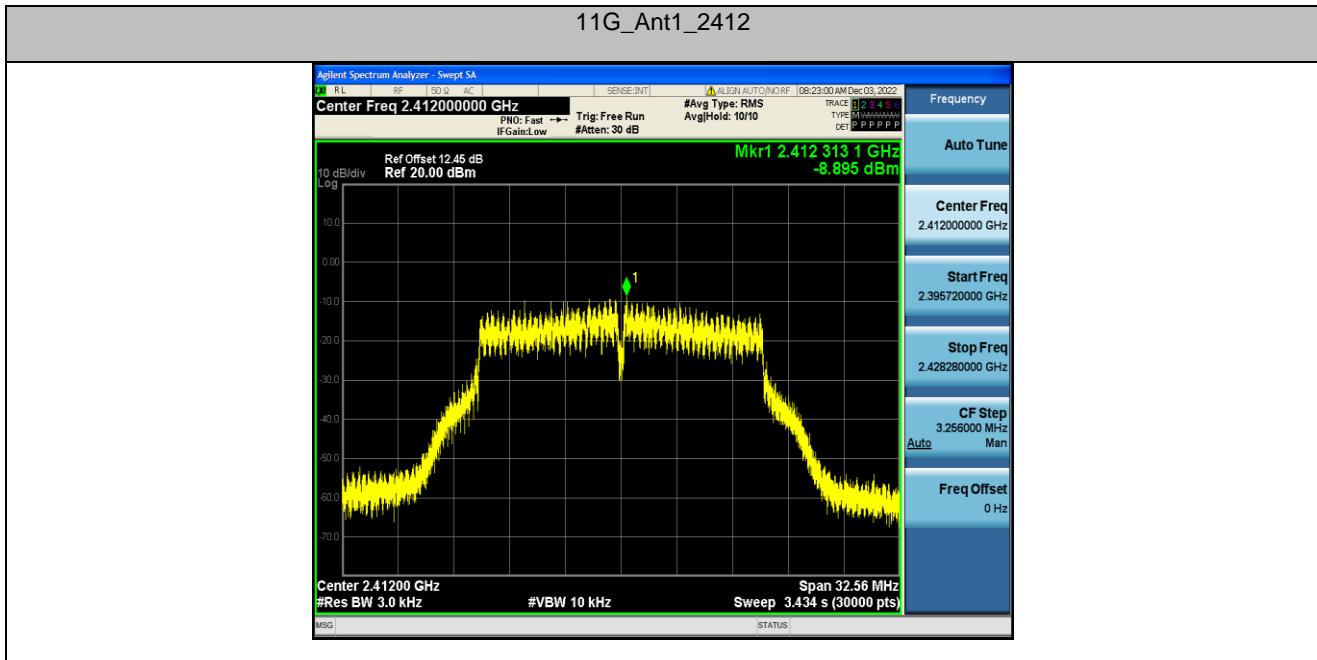


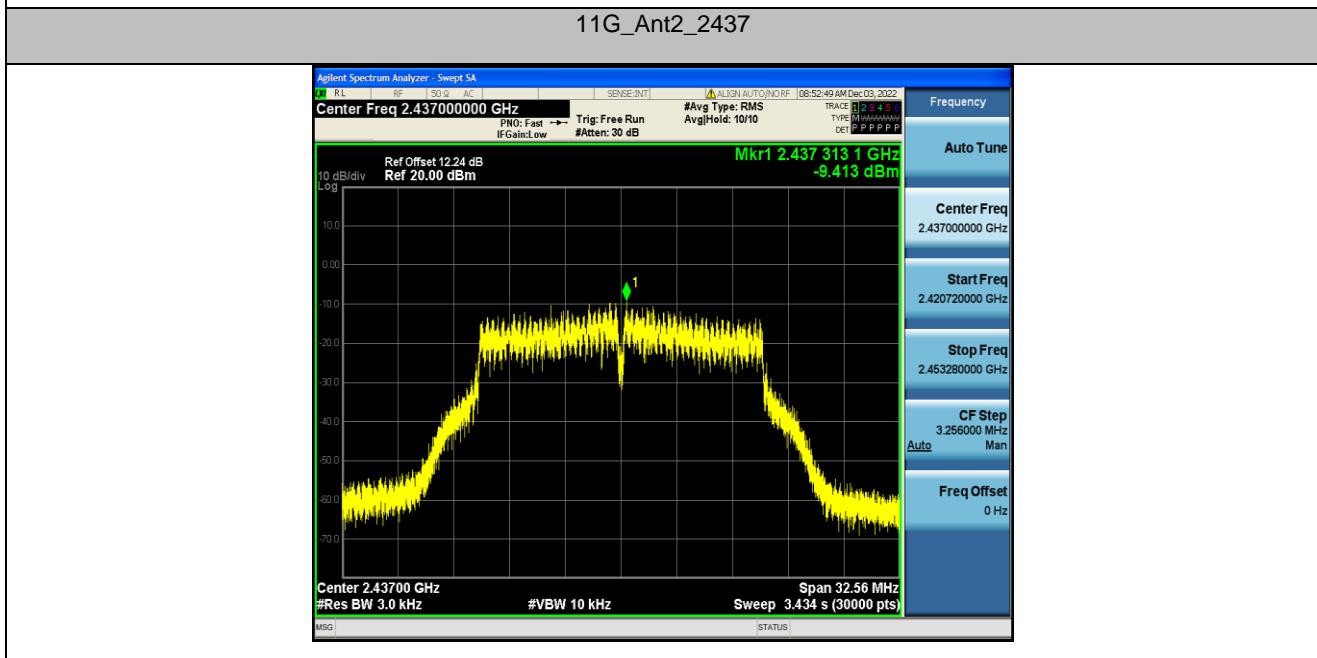
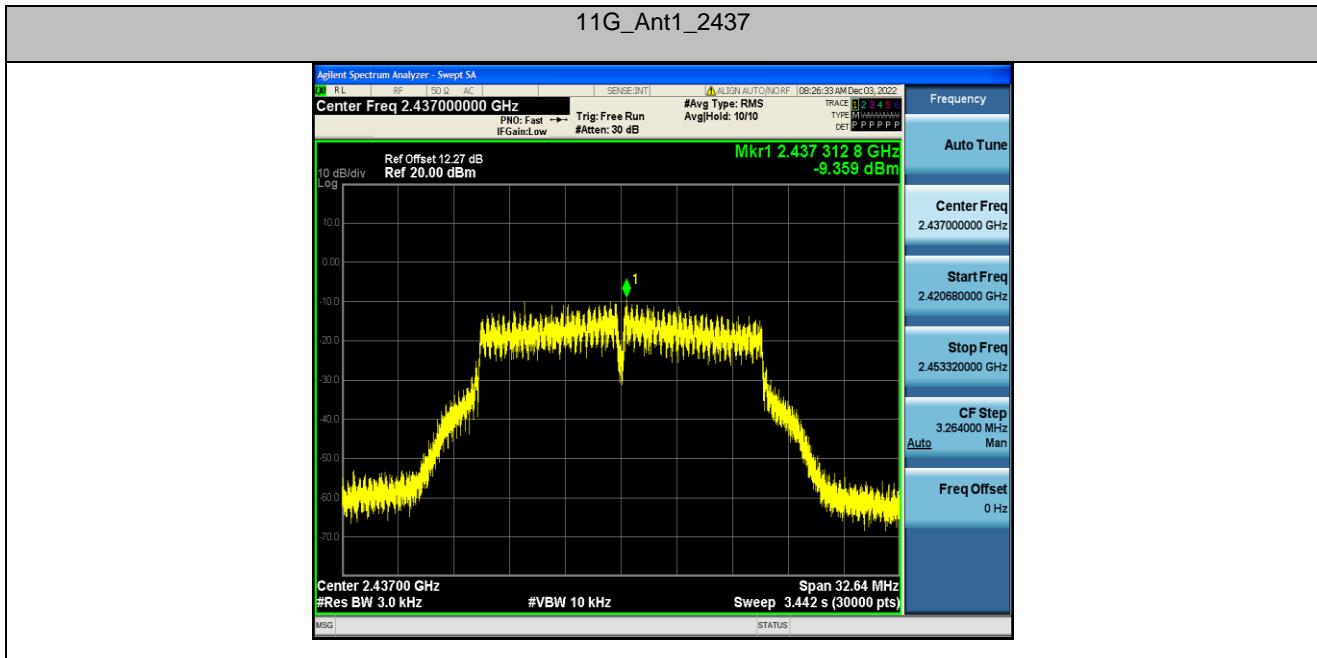
11B_Ant1_2462

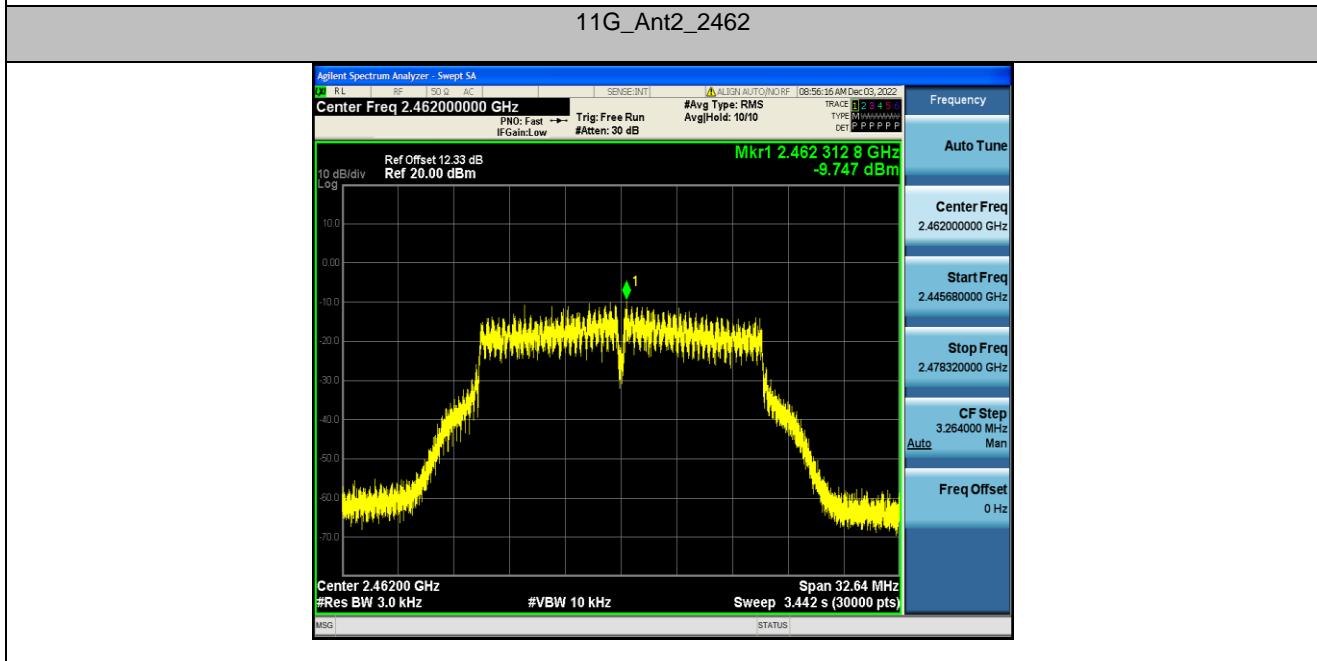
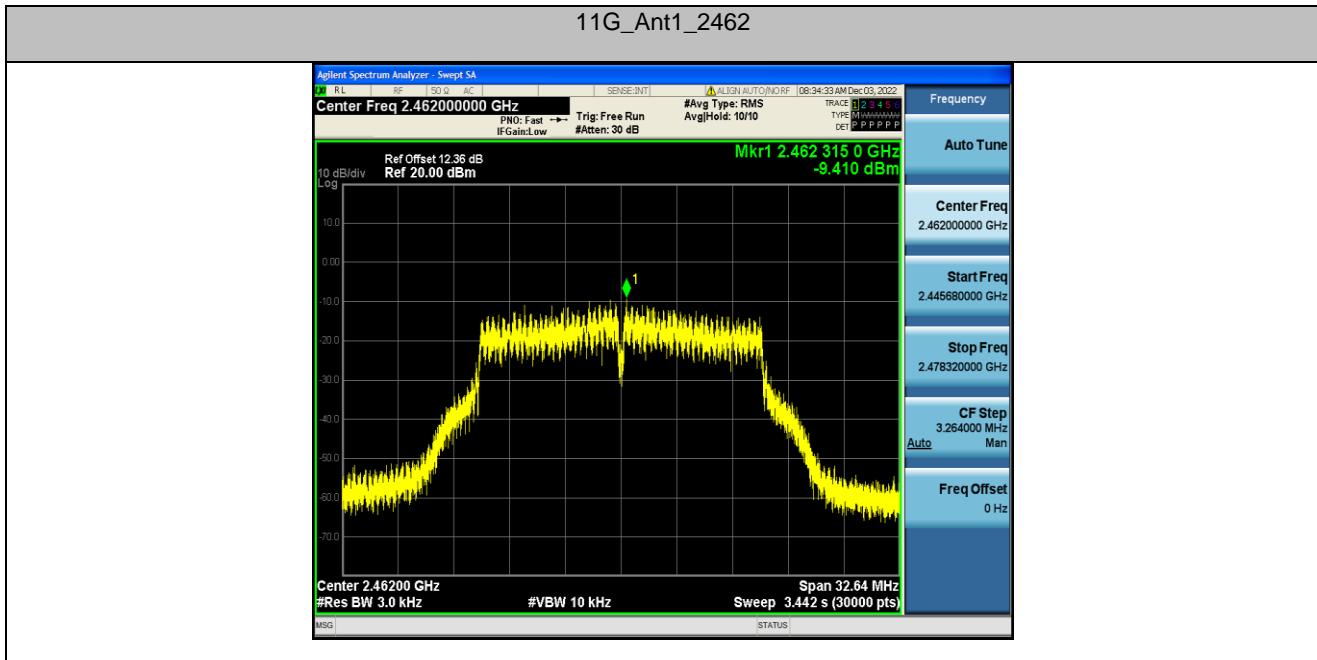


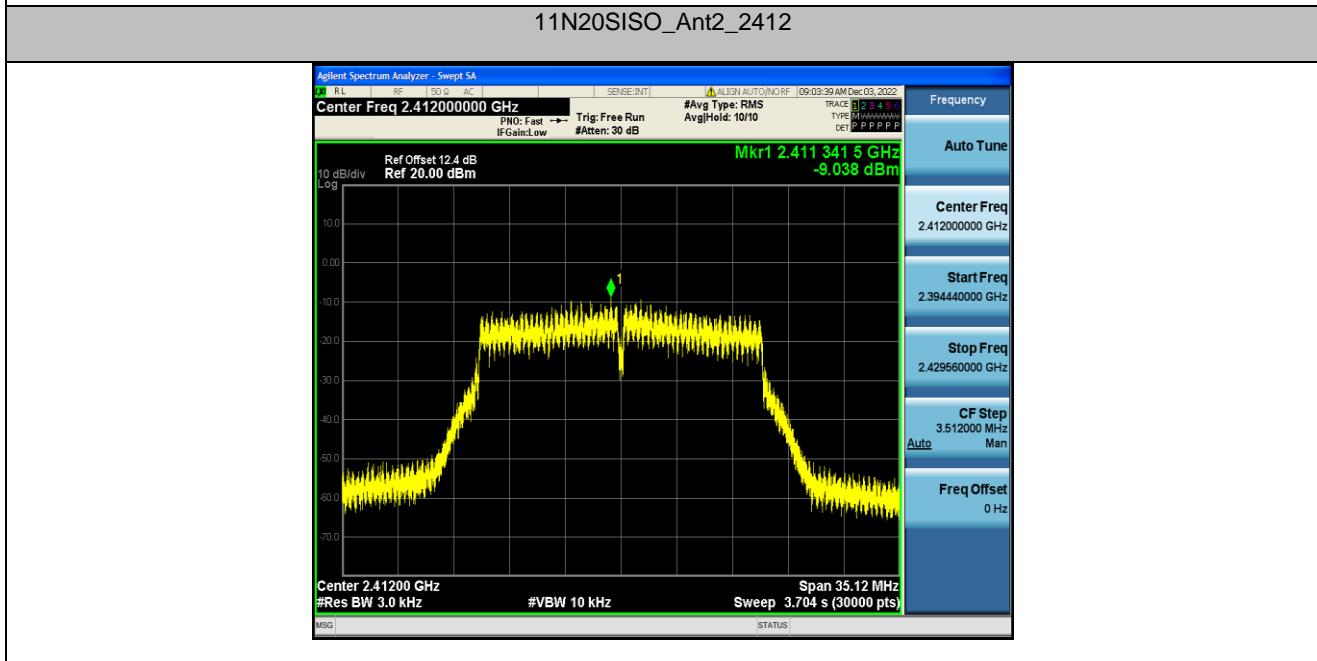
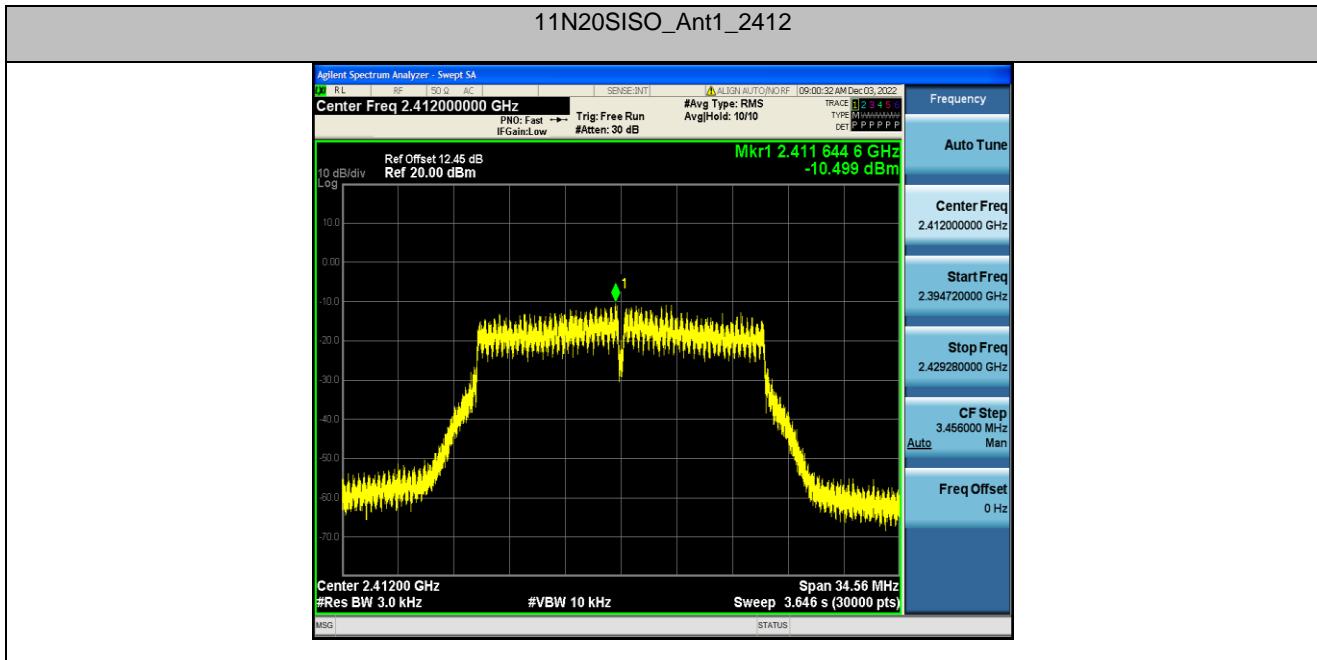
11B_Ant2_2462

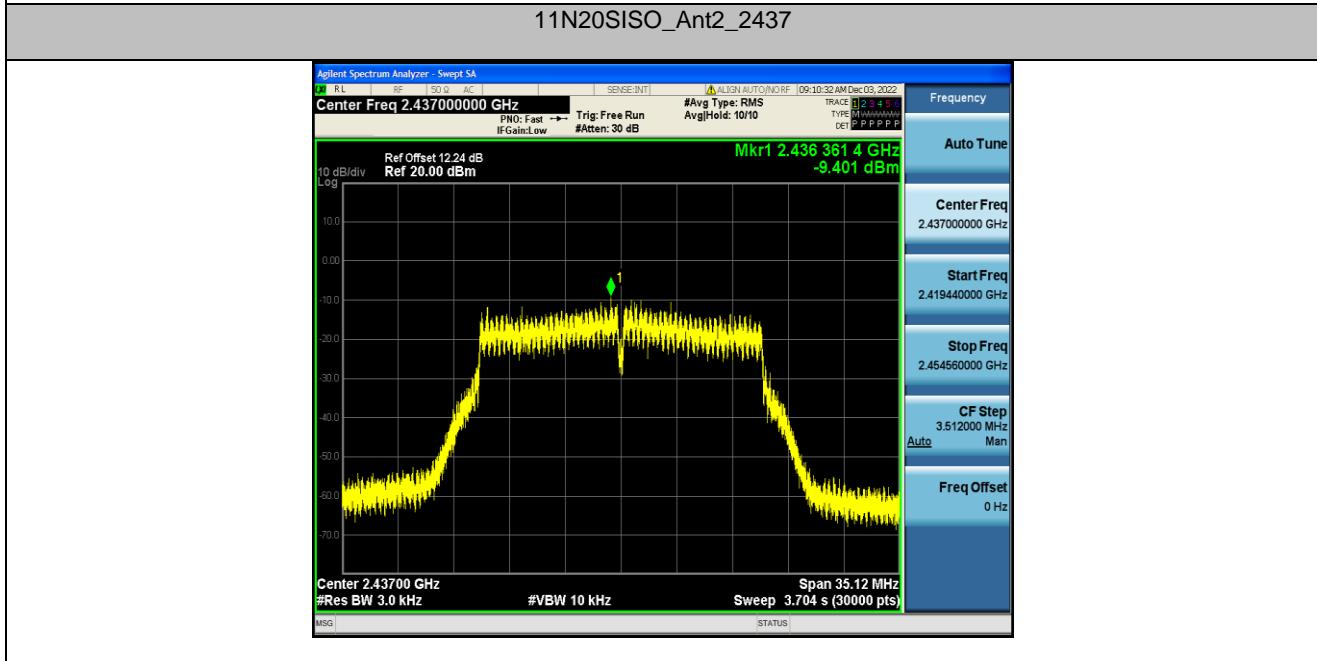
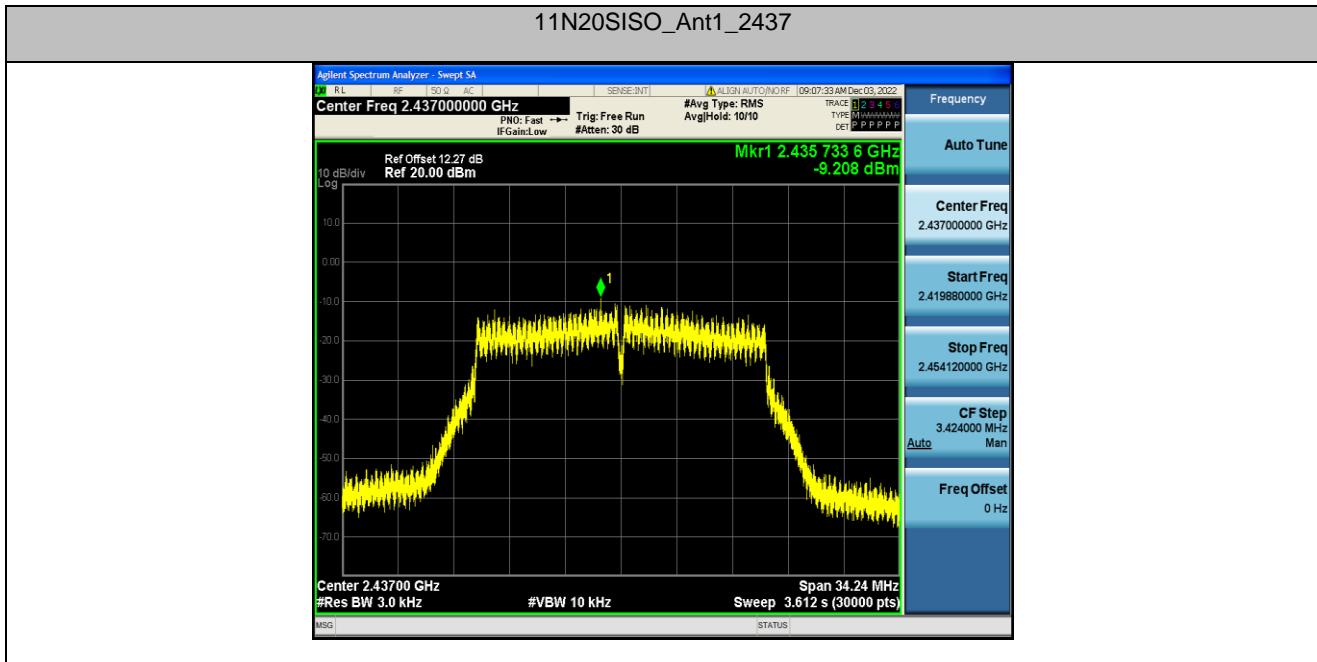


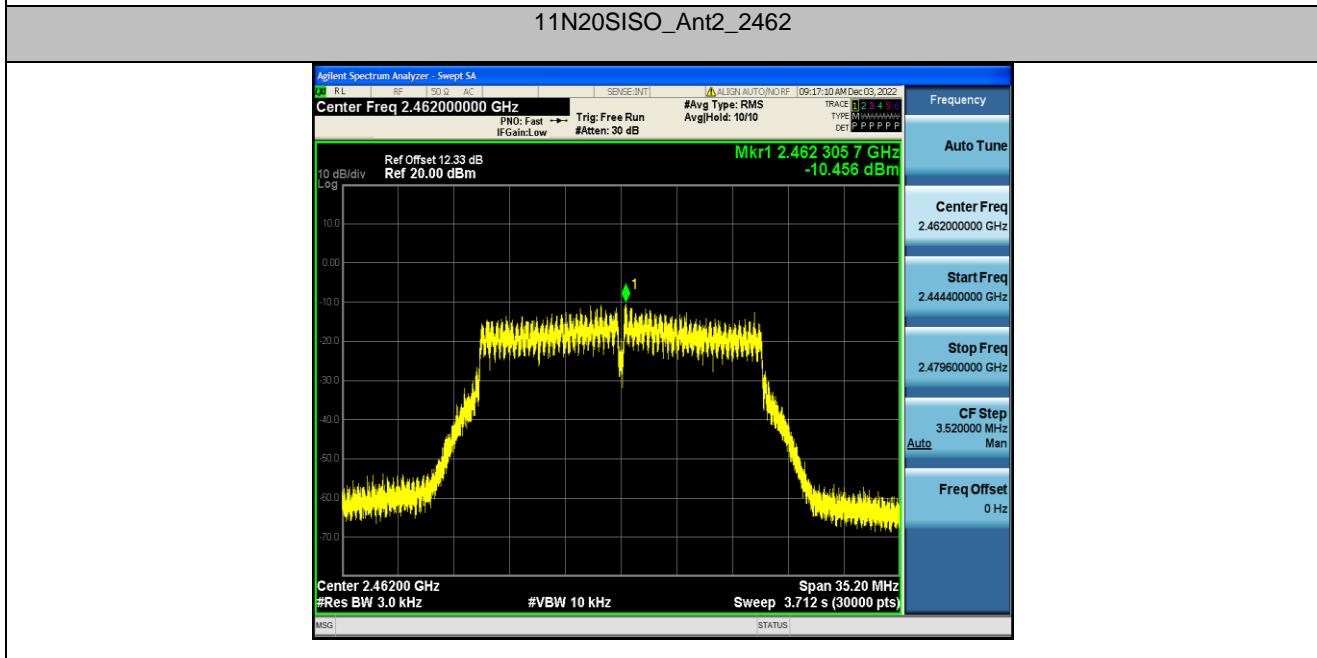
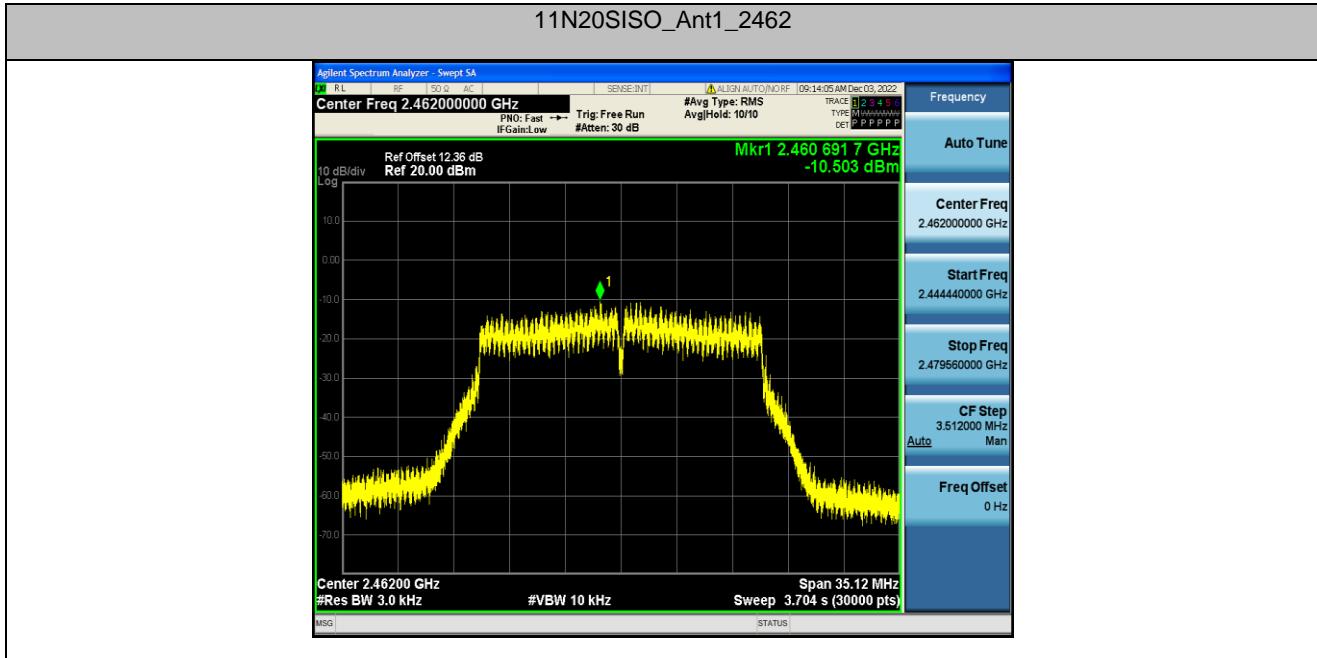














12 Antenna Application

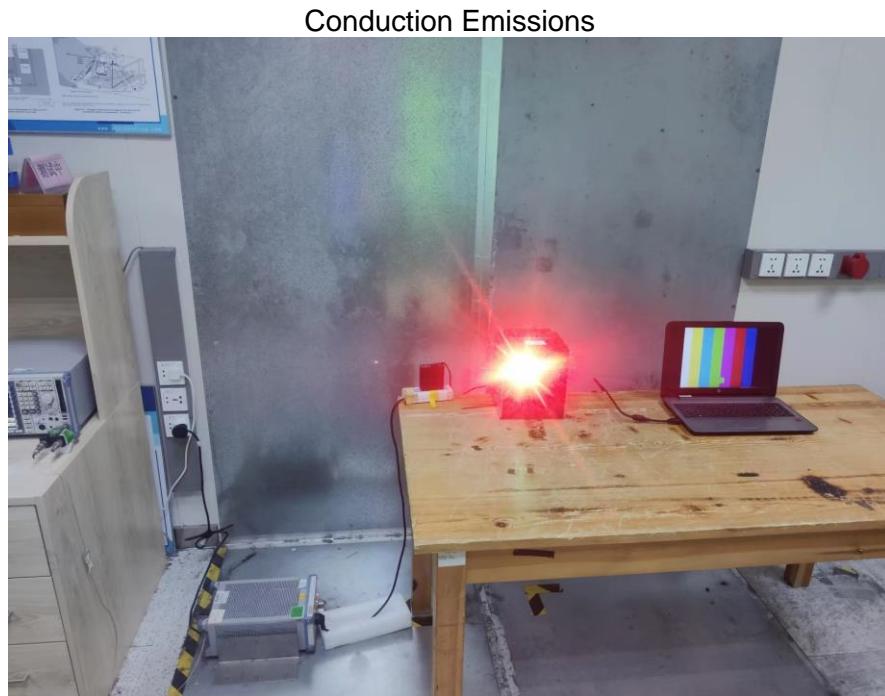
12.1 Antenna Requirement

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

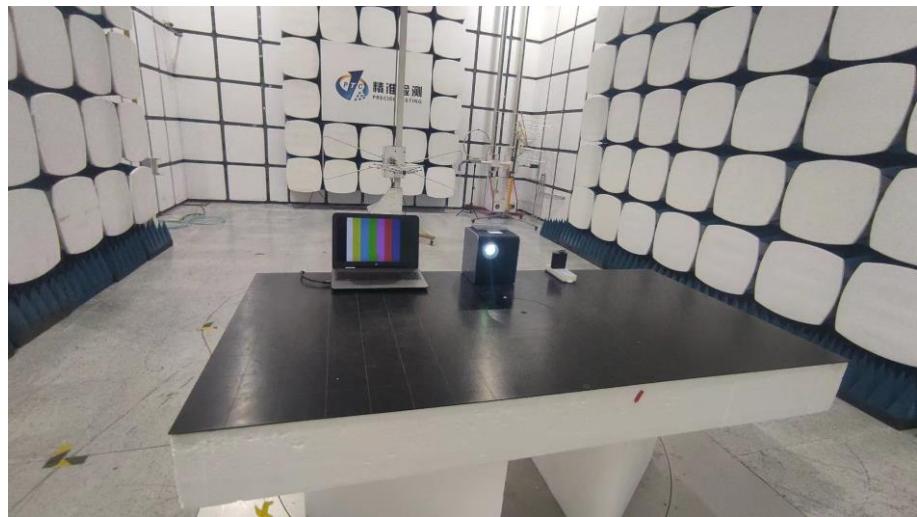
12.2 Result

The EUT'S antenna, permanent attached antenna, is Fpcb Antenna. The antenna's gain is 1.61dBi and meets the requirement.

13 Test Setup



Radiated Spurious Emissions
Test Frequency From 30MHz-1000MHz



Test Frequency above 1G





Report No.: PTC22091504702E-FC03

14 EUT PHOTOS

Reference file External Photo and Internal Photo.

*******THE END REPORT*******