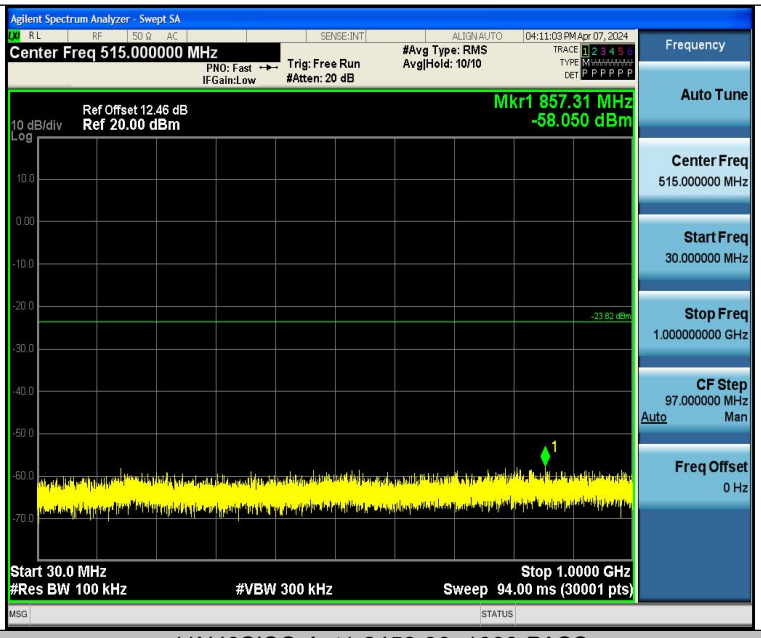
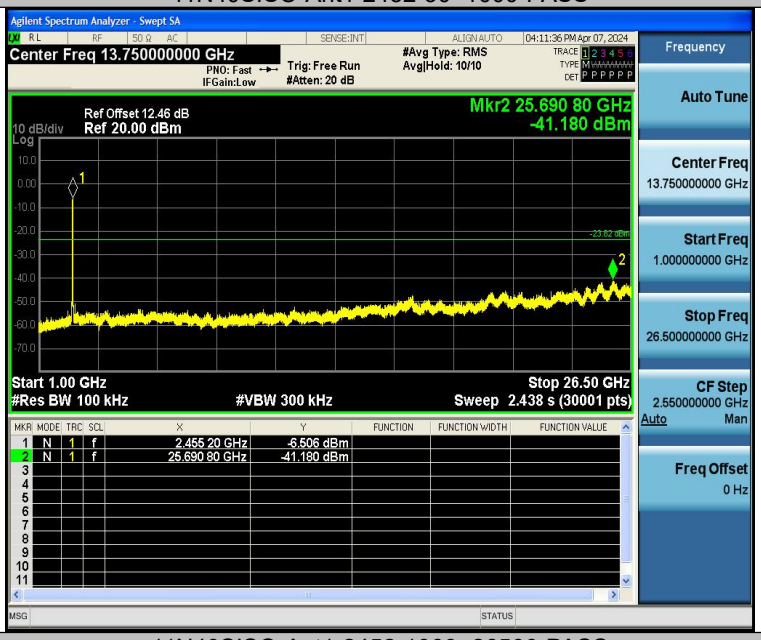


11N40SISO-Ant1-2452-30~1000-PASS



11N40SISO-Ant1-2452-1000~26500-PASS

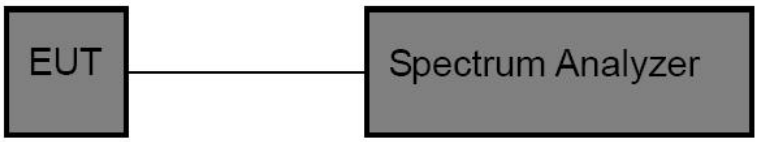
8 Band Edge Measurement

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)).

8.1Test 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

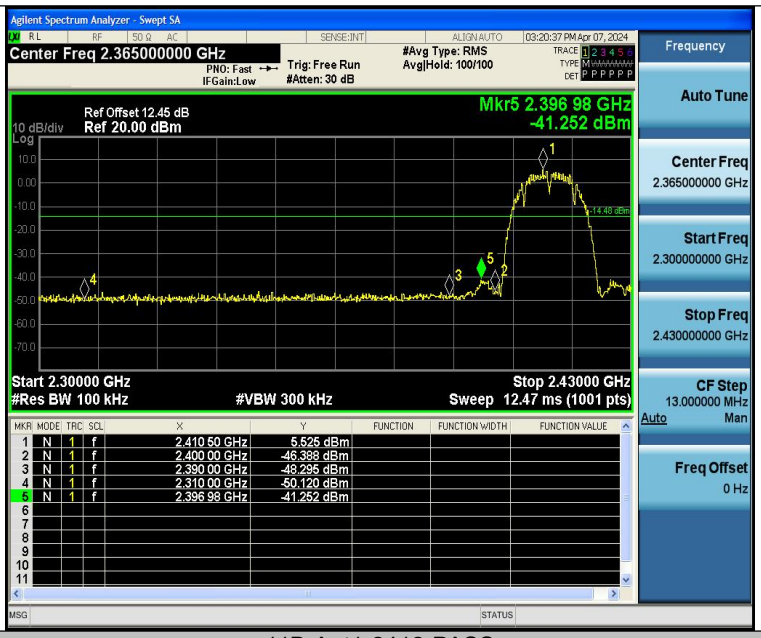
8.2Test Setup



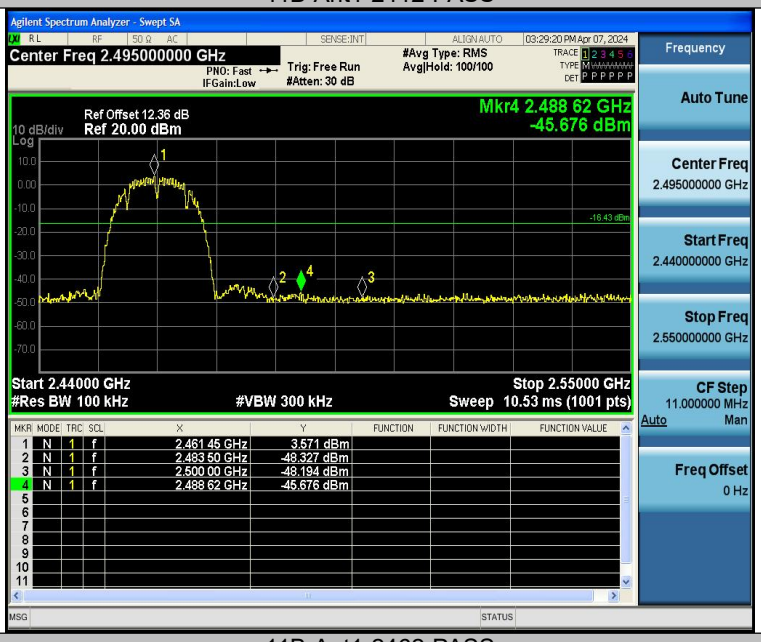
8.3Test Result

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	5.53	-41.25	≤-14.48	PASS
11B	Ant1	High	2462	3.57	-45.68	≤-16.43	PASS
11G	Ant1	Low	2412	3.19	-39.45	≤-16.81	PASS
11G	Ant1	High	2462	1.77	-45.26	≤-18.23	PASS
11N20SISO	Ant1	Low	2412	5.27	-40.76	≤-14.73	PASS
11N20SISO	Ant1	High	2462	2.64	-42.95	≤-17.36	PASS
11N40SISO	Ant1	Low	2422	-1.75	-43.42	≤-21.75	PASS
11N40SISO	Ant1	High	2452	-3.32	-45.33	≤-23.32	PASS

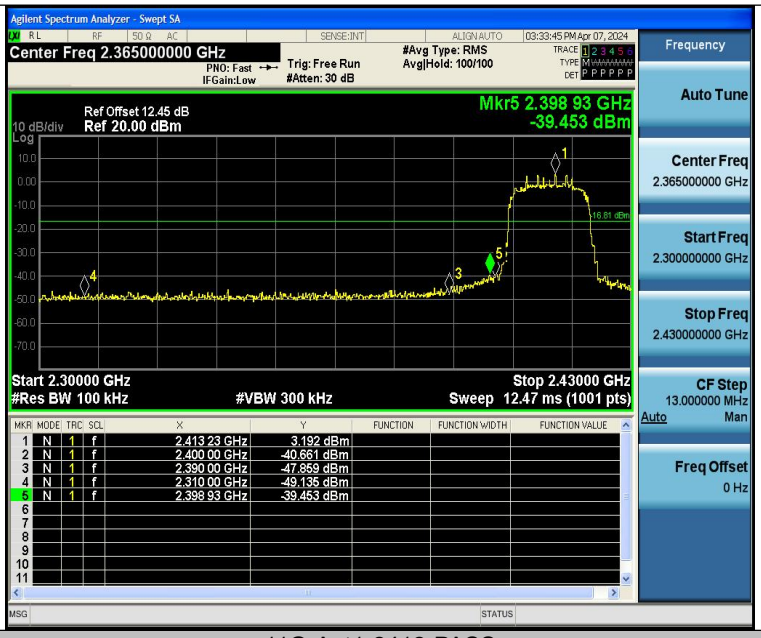
Test Graphs:



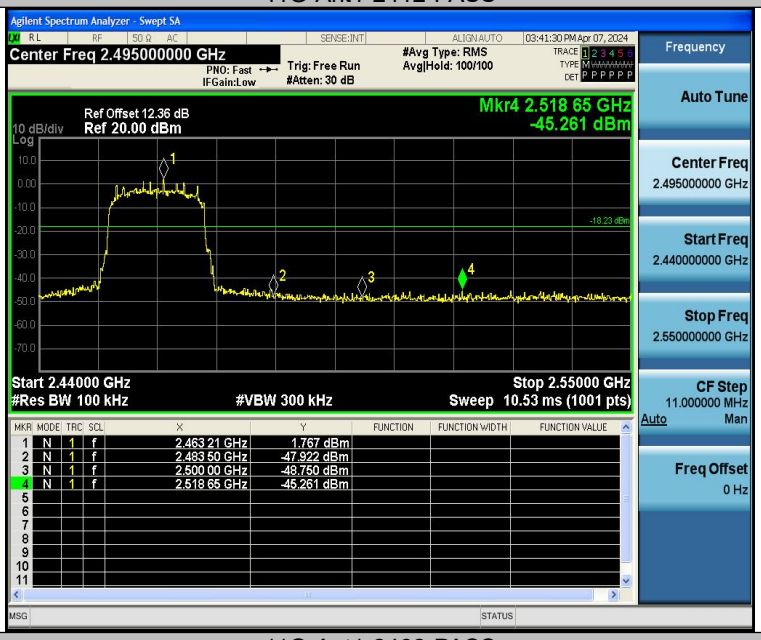
11B-Ant1-2412-PASS



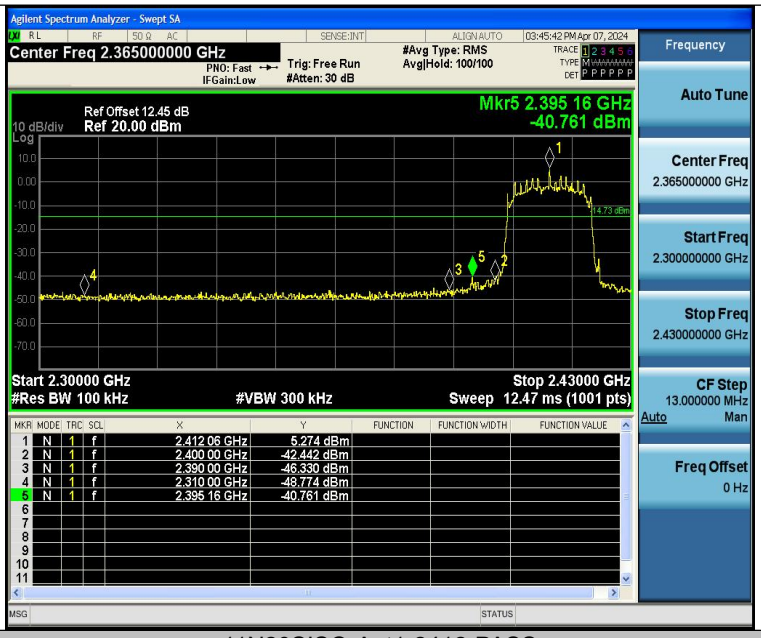
11B-Ant1-2462-PASS



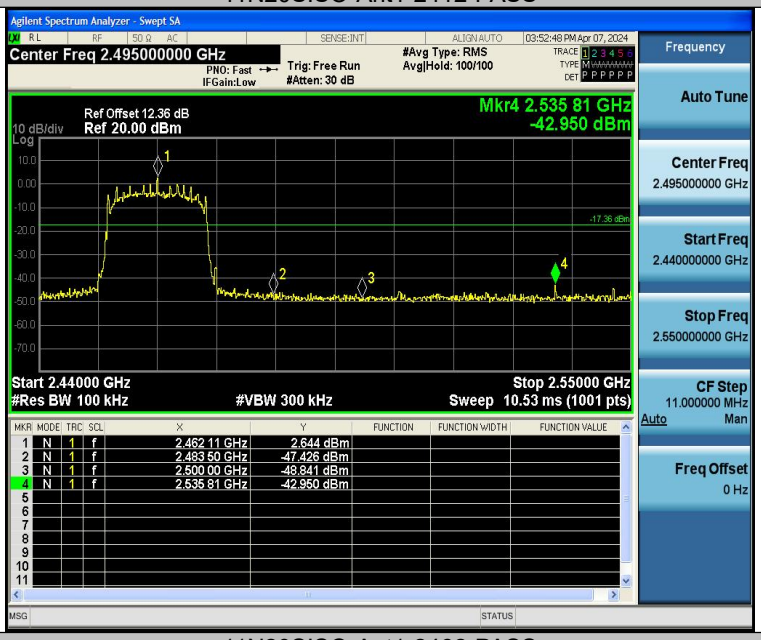
11G-Ant1-2412-PASS



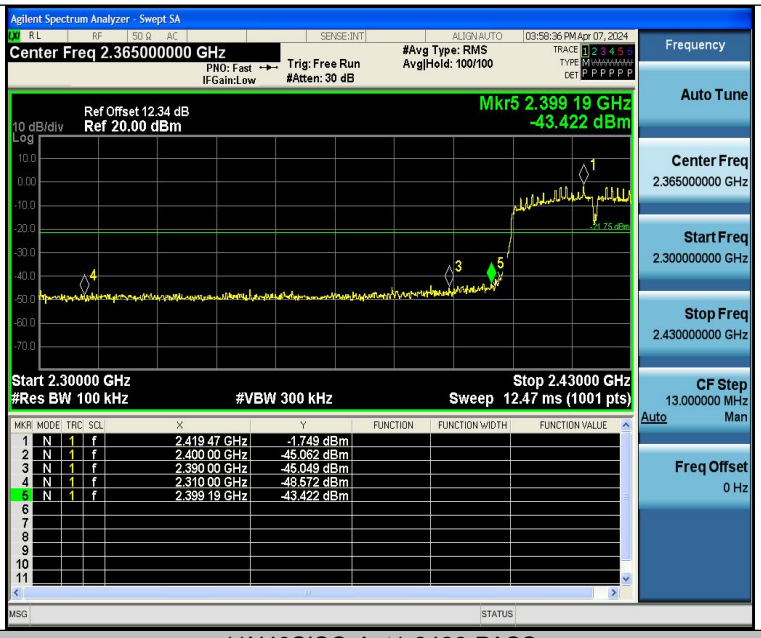
11G-Ant1-2462-PASS



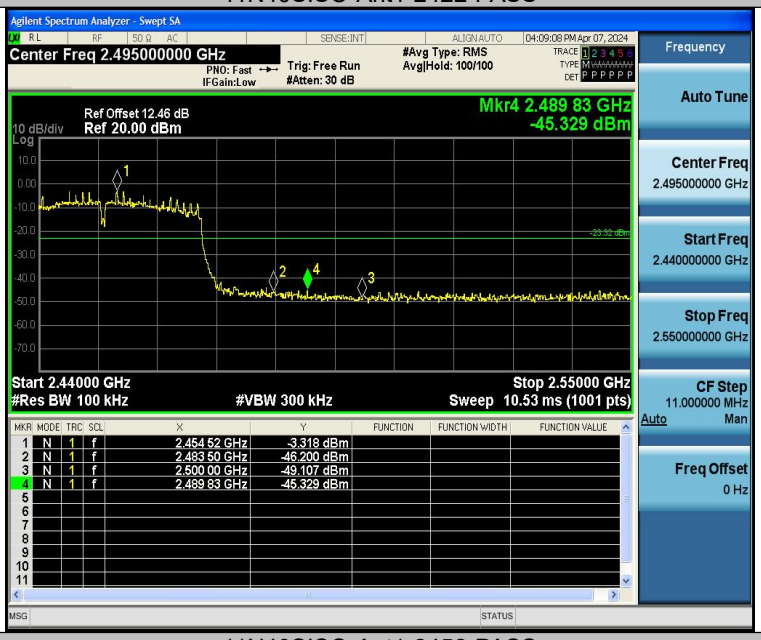
11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2462-PASS



11N40SISO-Ant1-2422-PASS



11N40SISO-Ant1-2452-PASS

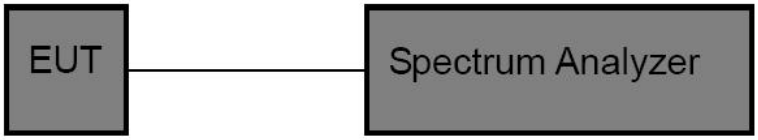
9 6dB Bandwidth Measurement

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.

9.1Test 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

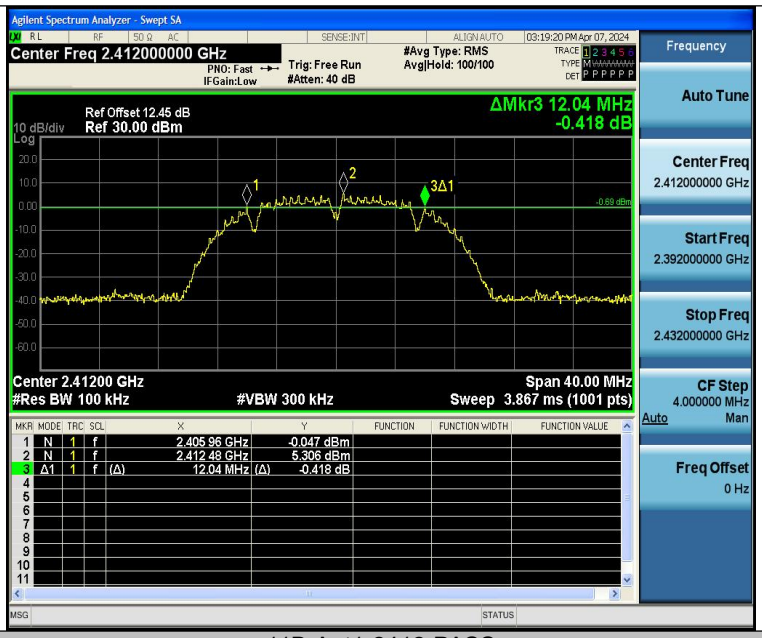
9.2Test Setup



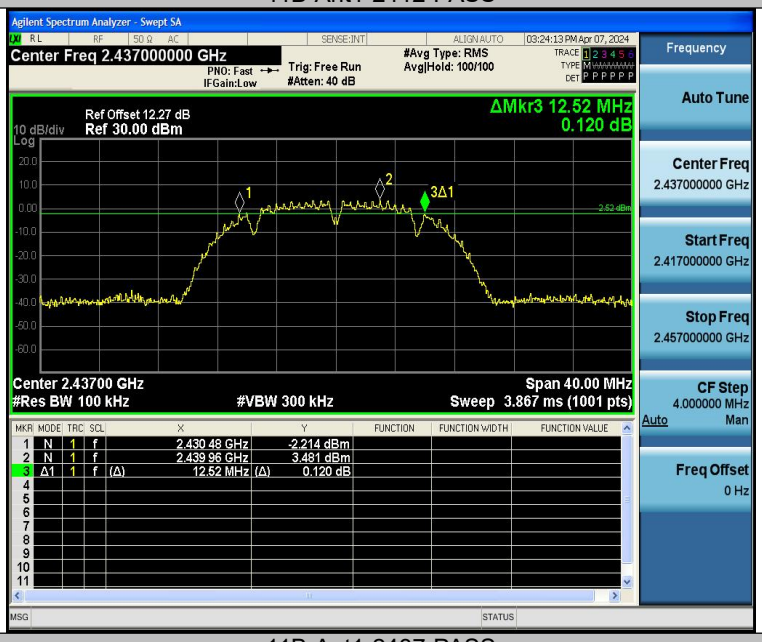
9.3Test Result

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	12.040	2405.960	2418.000	0.5	PASS
11B	Ant1	2437	12.520	2430.480	2443.000	0.5	PASS
11B	Ant1	2462	11.080	2455.960	2467.040	0.5	PASS
11G	Ant1	2412	14.200	2405.320	2419.520	0.5	PASS
11G	Ant1	2437	15.160	2429.400	2444.560	0.5	PASS
11G	Ant1	2462	15.080	2454.400	2469.480	0.5	PASS
11N20SISO	Ant1	2412	10.080	2409.440	2419.520	0.5	PASS
11N20SISO	Ant1	2437	12.560	2429.480	2442.040	0.5	PASS
11N20SISO	Ant1	2462	15.320	2452.880	2468.200	0.5	PASS
11N40SISO	Ant1	2422	33.760	2405.680	2439.440	0.5	PASS
11N40SISO	Ant1	2437	35.040	2419.480	2454.520	0.5	PASS
11N40SISO	Ant1	2452	33.840	2435.680	2469.520	0.5	PASS

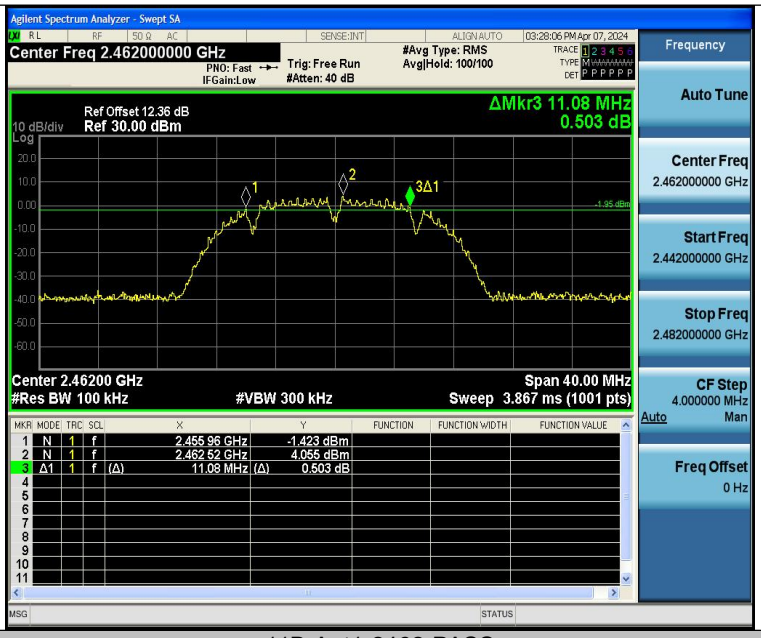
Test Graphs:



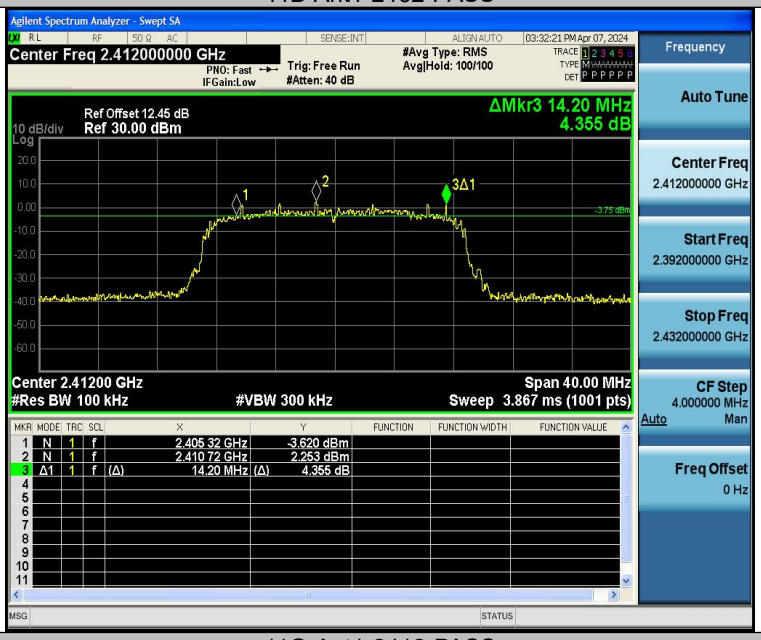
11B-Ant1-2412-PASS



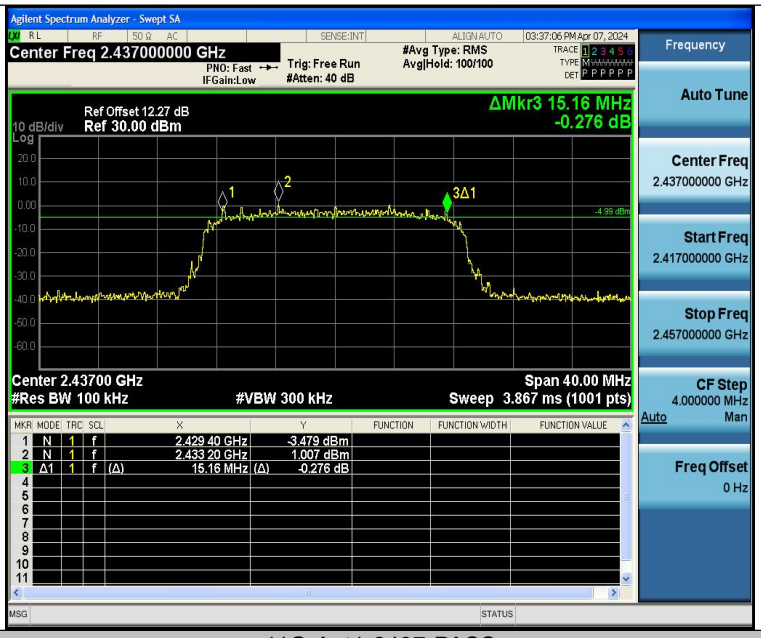
11B-Ant1-2437-PASS



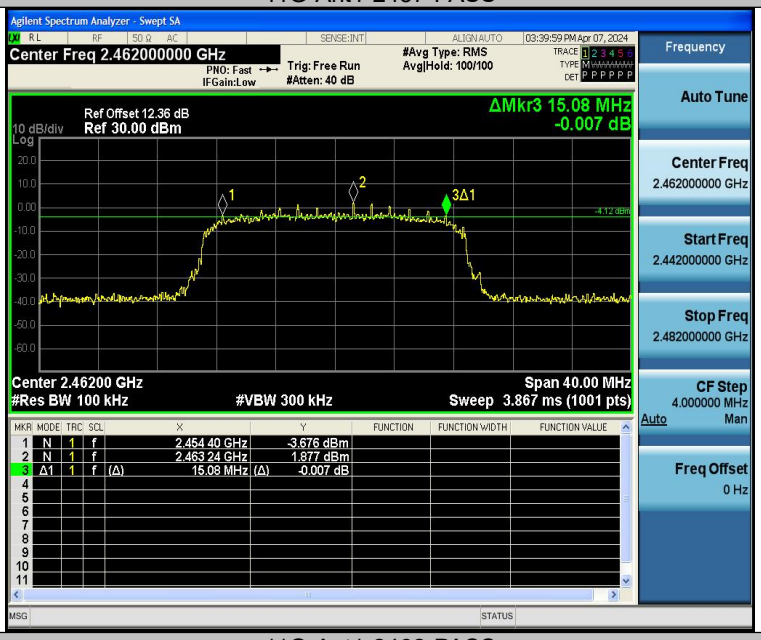
11B-Ant1-2462-PASS



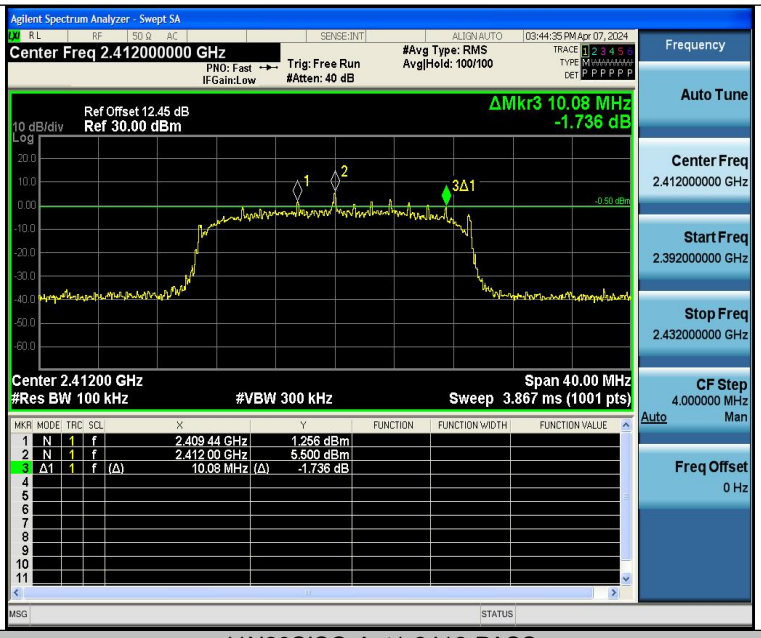
11G-Ant1-2412-PASS



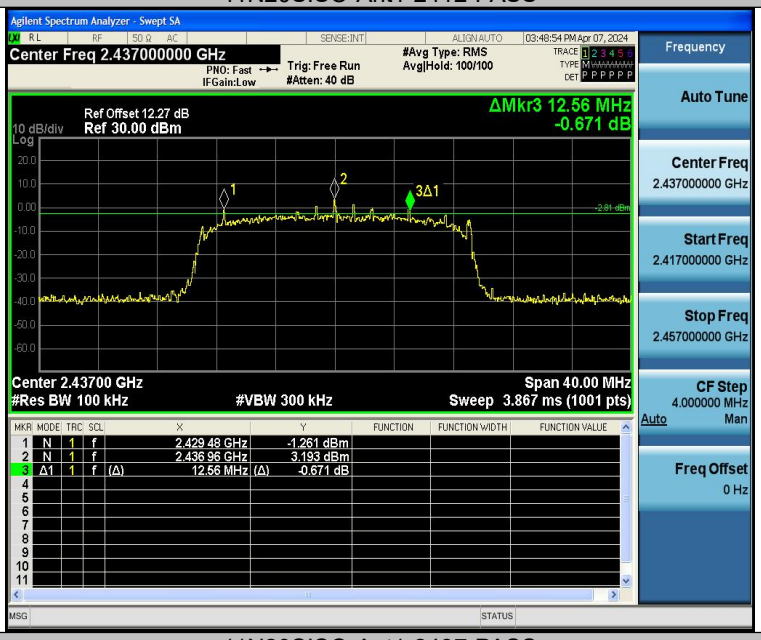
11G-Ant1-2437-PASS



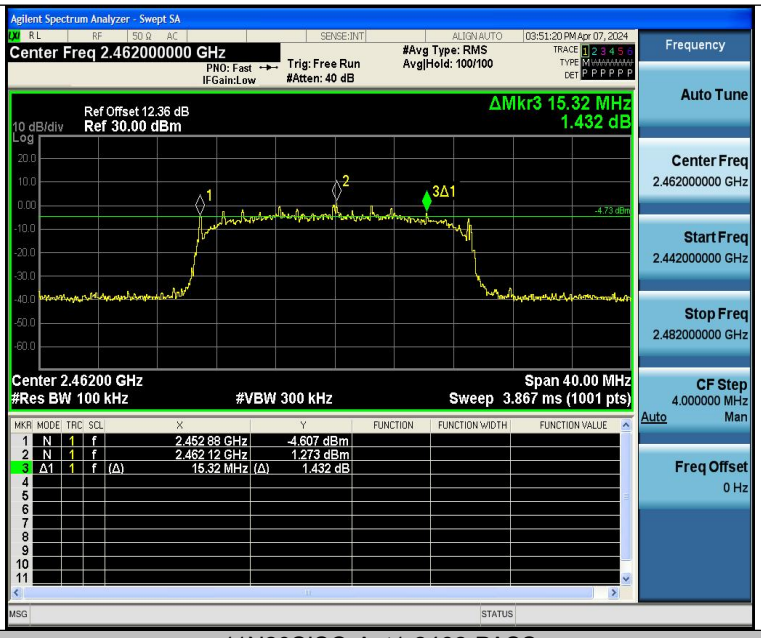
11G-Ant1-2462-PASS



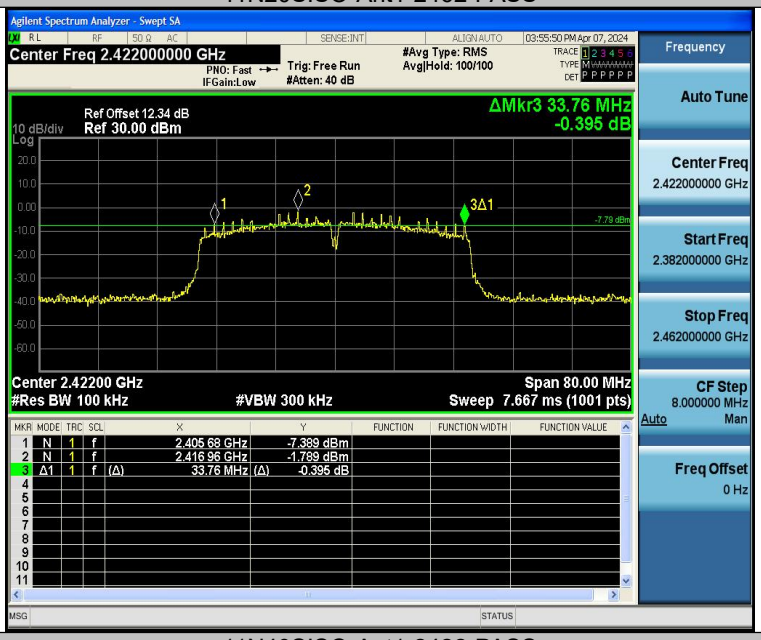
11N20SISO-Ant1-2412-PASS



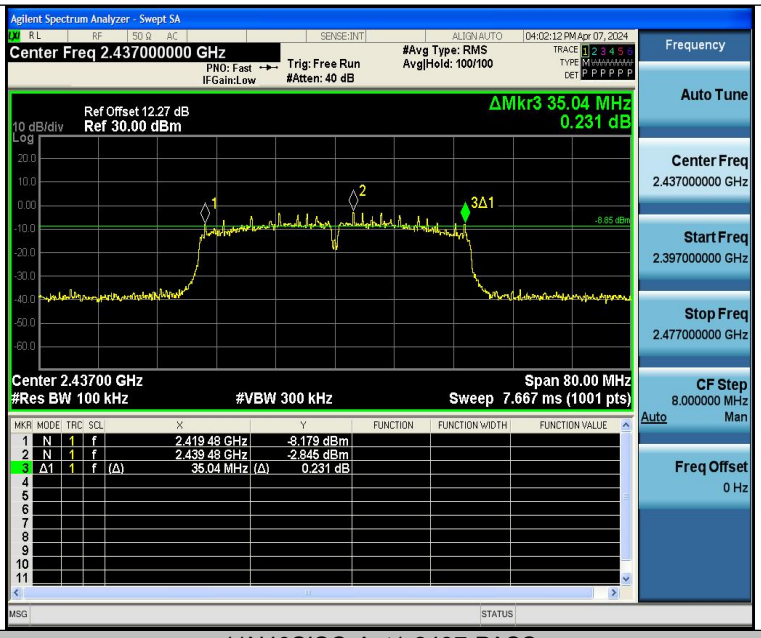
11N20SISO-Ant1-2437-PASS



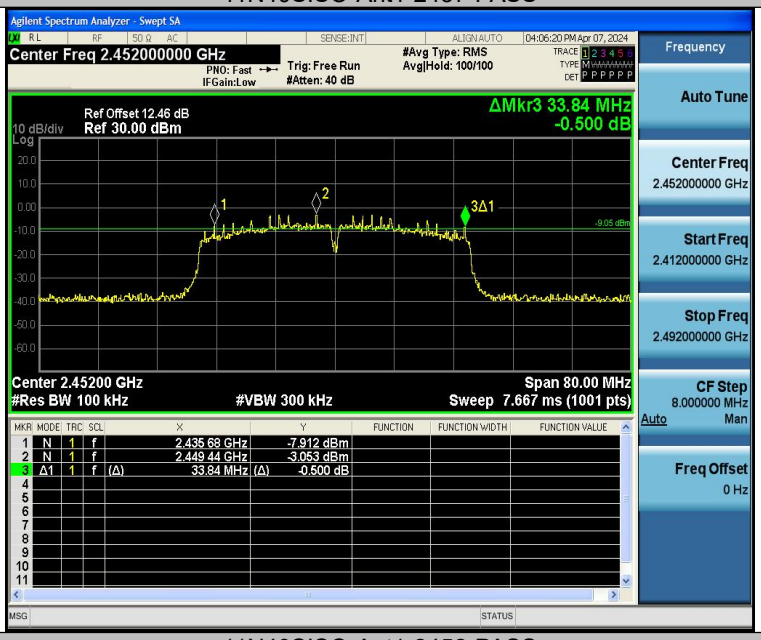
11N20SISO-Ant1-2462-PASS



11N40SISO-Ant1-2422-PASS



11N40SISO-Ant1-2437-PASS



11N40SISO-Ant1-2452-PASS

10 Maximum conducted output power

Test Requirement : FCC CFR47 Part 15 Section 15.247

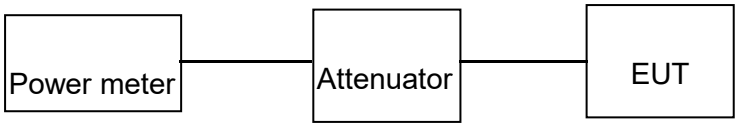
Test Method : ANSI C63.10:2013

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.

10.1Test Procedure

1. According to ANSI C63.10-2013 clause 11.9.1.3 PKPM1 Peak power meter method. The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

10.2Test Setup



10.3Test Result

TestMode	Antenna	Frequency[MHz]	Set Power	Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	---	18.34	≤30.00	PASS
11B	Ant1	2437	---	17.11	≤30.00	PASS
11B	Ant1	2462	---	16.93	≤30.00	PASS
11G	Ant1	2412	---	**19.92**	≤30.00	PASS
11G	Ant1	2437	---	19.03	≤30.00	PASS
11G	Ant1	2462	---	18.46	≤30.00	PASS
11N20SISO	Ant1	2412	---	17.82	≤30.00	PASS
11N20SISO	Ant1	2437	---	17.20	≤30.00	PASS
11N20SISO	Ant1	2462	---	17.17	≤30.00	PASS
11N40SISO	Ant1	2422	---	17.48	≤30.00	PASS
11N40SISO	Ant1	2437	---	16.82	≤30.00	PASS
11N40SISO	Ant1	2452	---	16.44	≤30.00	PASS

11 Power Spectral density

Test Requirement : FCC CFR47 Part 15 Section 15.247

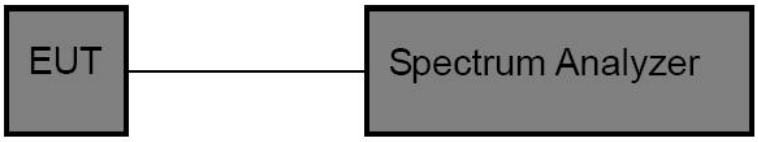
Test Method : ANSI C63.10:2013

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.

11.1Test 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.

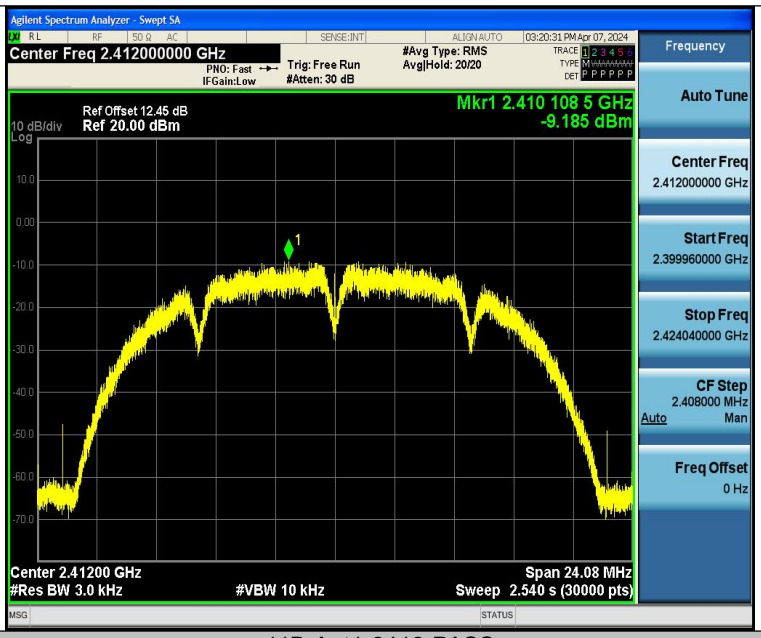
11.2Test Setup



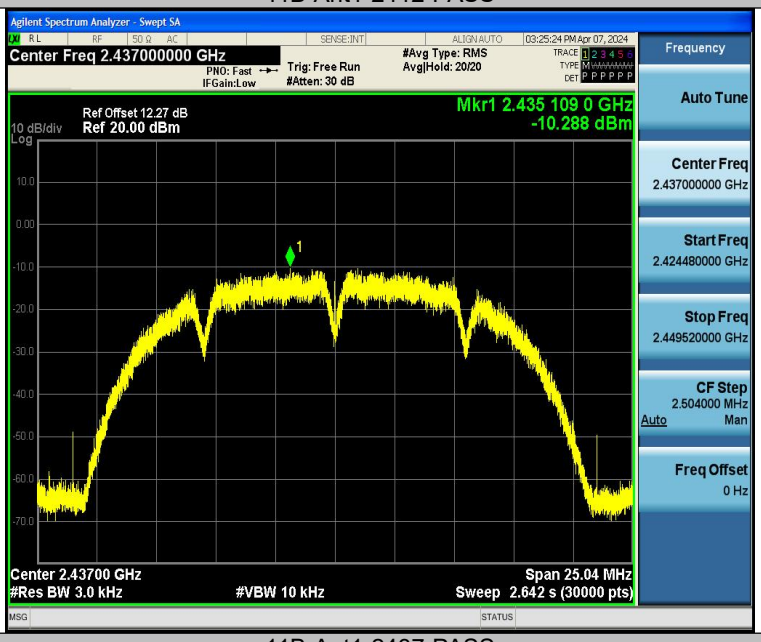
11.3Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-9.19	≤8.00	PASS
11B	Ant1	2437	-10.29	≤8.00	PASS
11B	Ant1	2462	-10.19	≤8.00	PASS
11G	Ant1	2412	-10.89	≤8.00	PASS
11G	Ant1	2437	-12.12	≤8.00	PASS
11G	Ant1	2462	-12.74	≤8.00	PASS
11N20SISO	Ant1	2412	-12	≤8.00	PASS
11N20SISO	Ant1	2437	-13.53	≤8.00	PASS
11N20SISO	Ant1	2462	-13.77	≤8.00	PASS
11N40SISO	Ant1	2422	-16.66	≤8.00	PASS
11N40SISO	Ant1	2437	-17.81	≤8.00	PASS
11N40SISO	Ant1	2452	-17.59	≤8.00	PASS

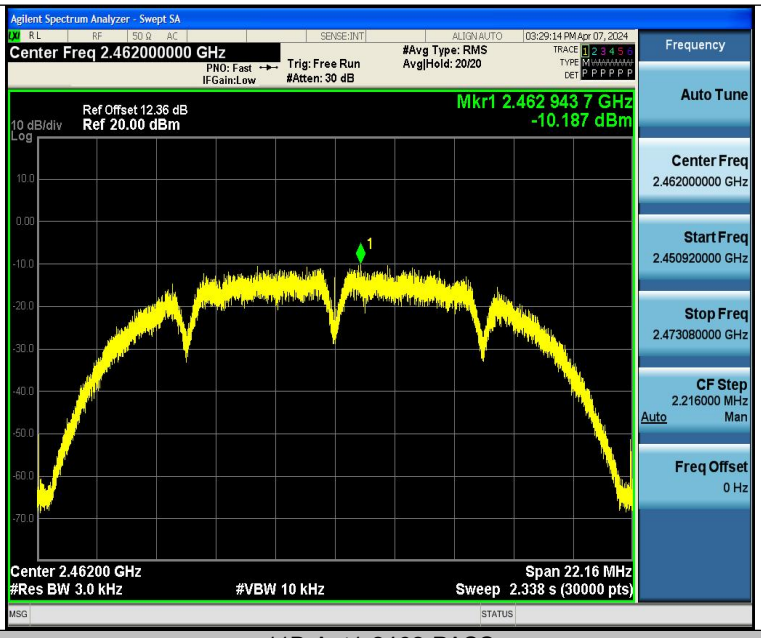
Test Graphs:



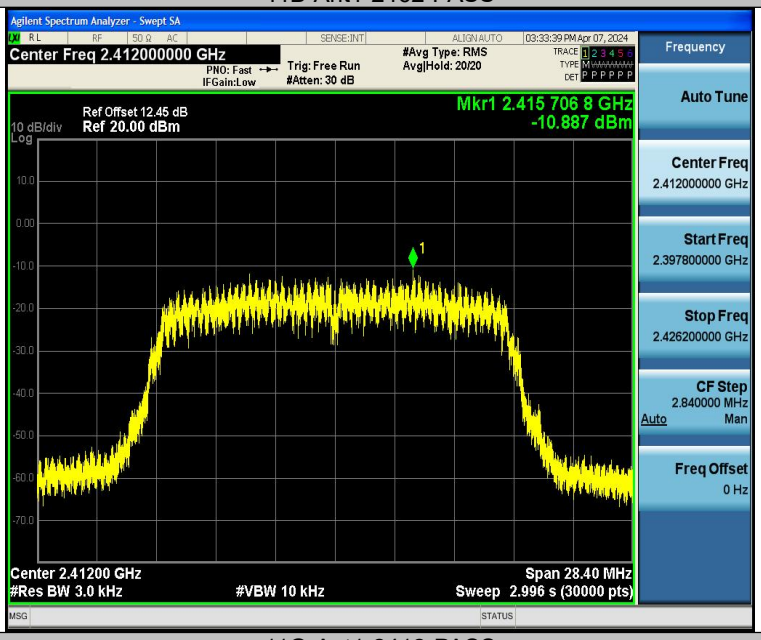
11B-Ant1-2412-PASS



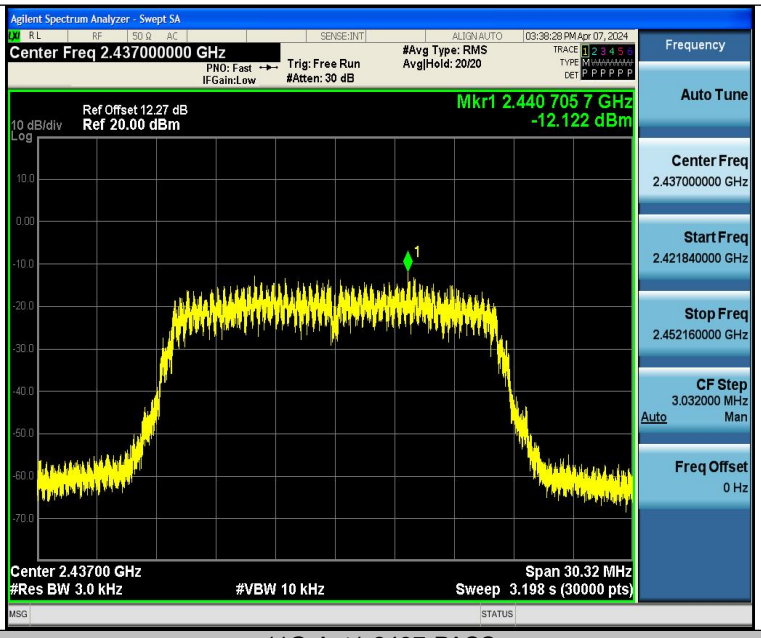
11B-Ant1-2437-PASS



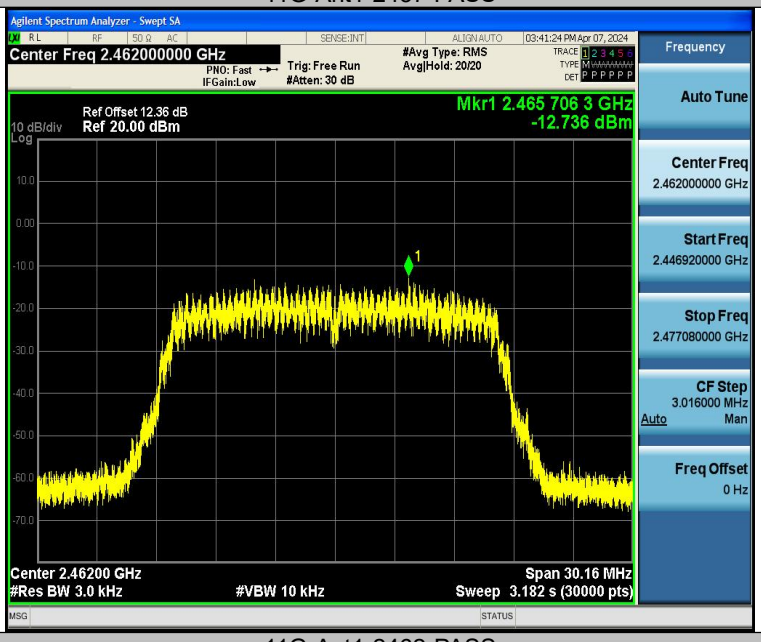
11B-Ant1-2462-PASS



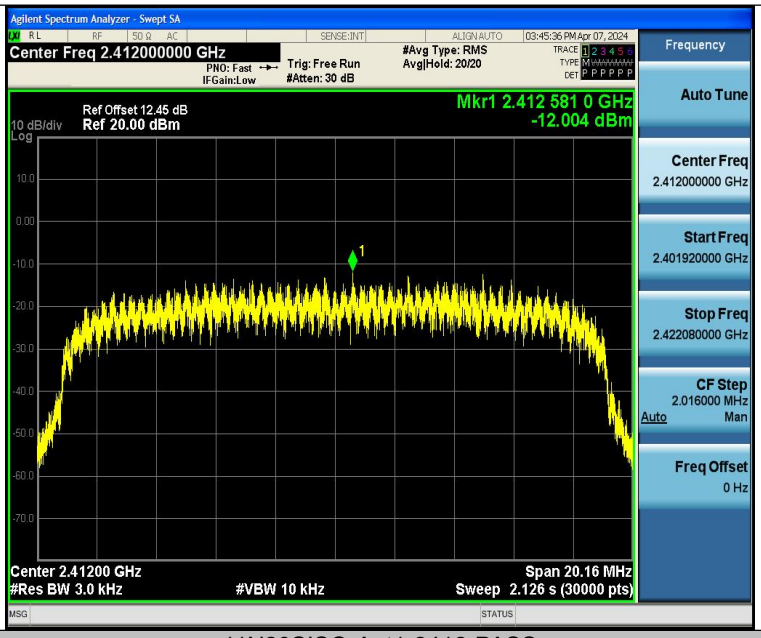
11G-Ant1-2412-PASS



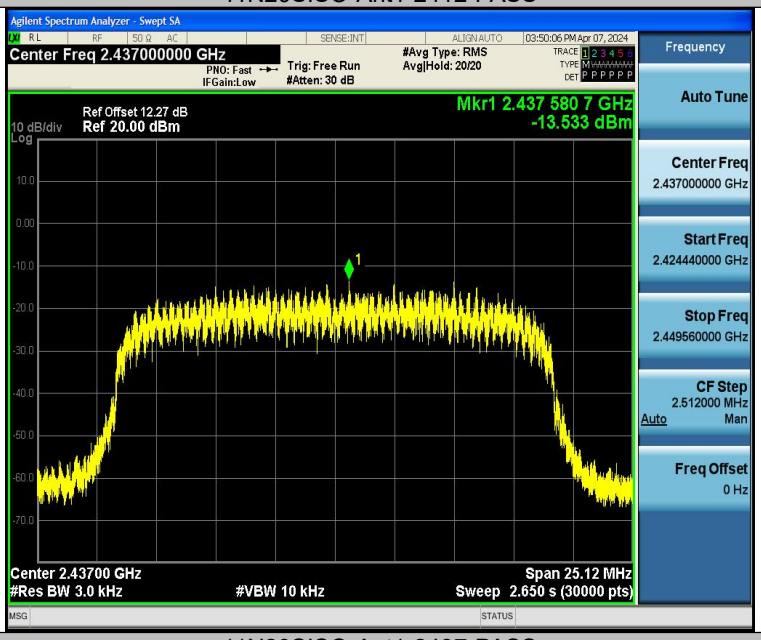
11G-Ant1-2437-PASS



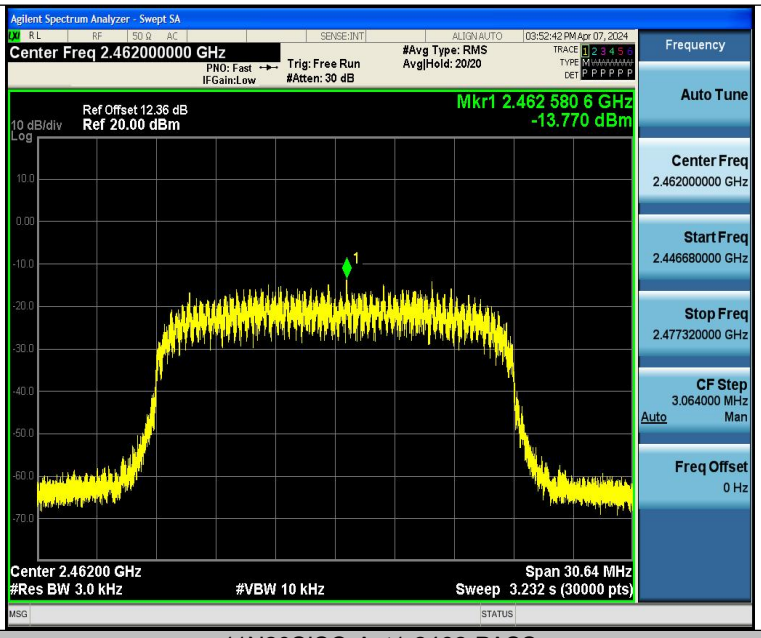
11G-Ant1-2462-PASS



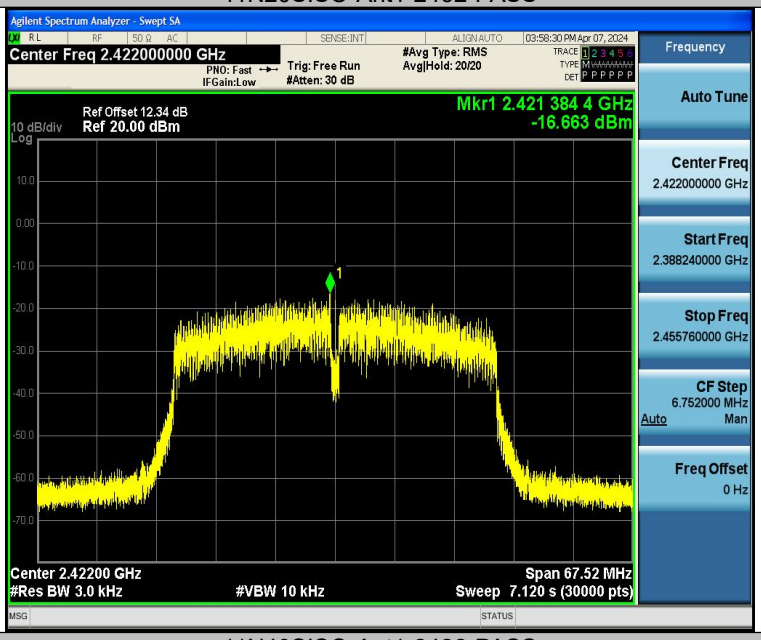
11N20SISO-Ant1-2412-PASS



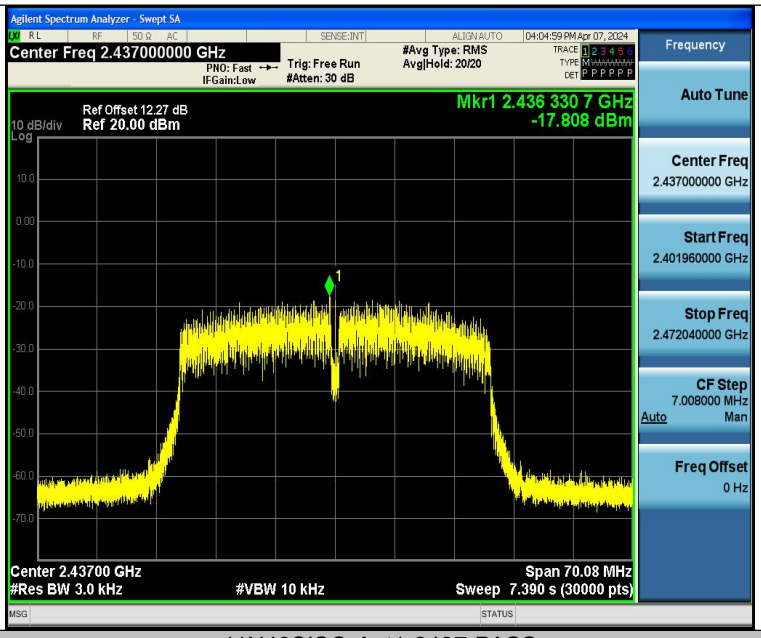
11N20SISO-Ant1-2437-PASS



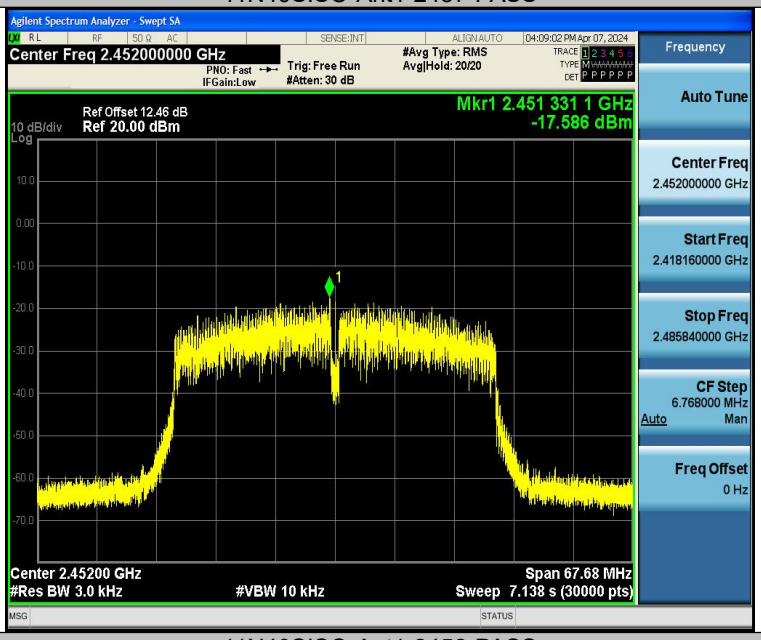
11N20SISO-Ant1-2462-PASS



11N40SISO-Ant1-2422-PASS



11N40SISO-Ant1-2437-PASS



11N40SISO-Ant1-2452-PASS

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.

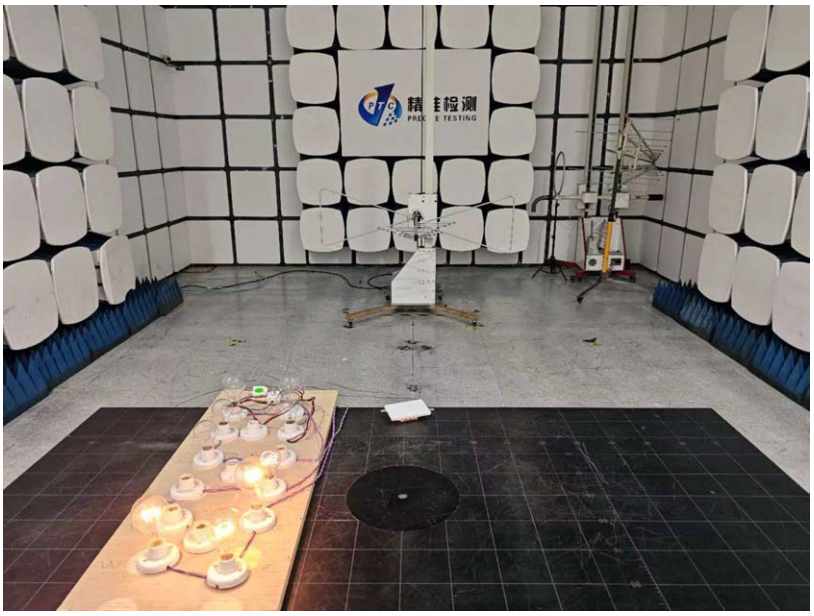
12.2 Result

The EUT'S antenna, permanent attached antenna,is PCB Antenna. The antenna's gain is 1.37 dBi and meets the requirement.

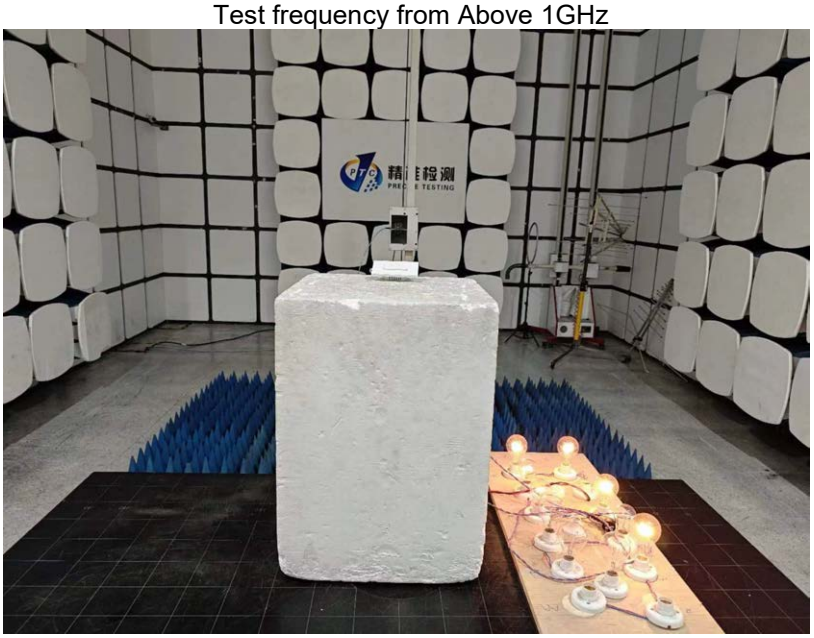
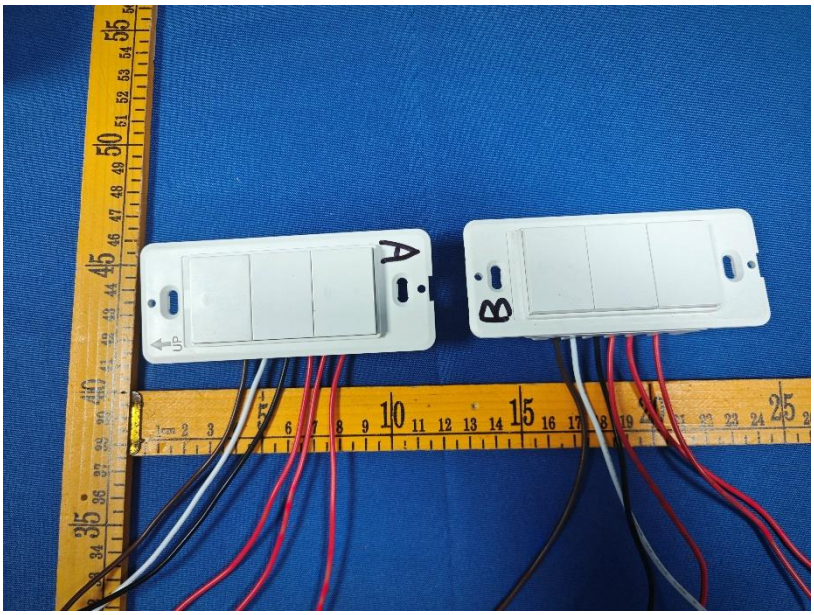
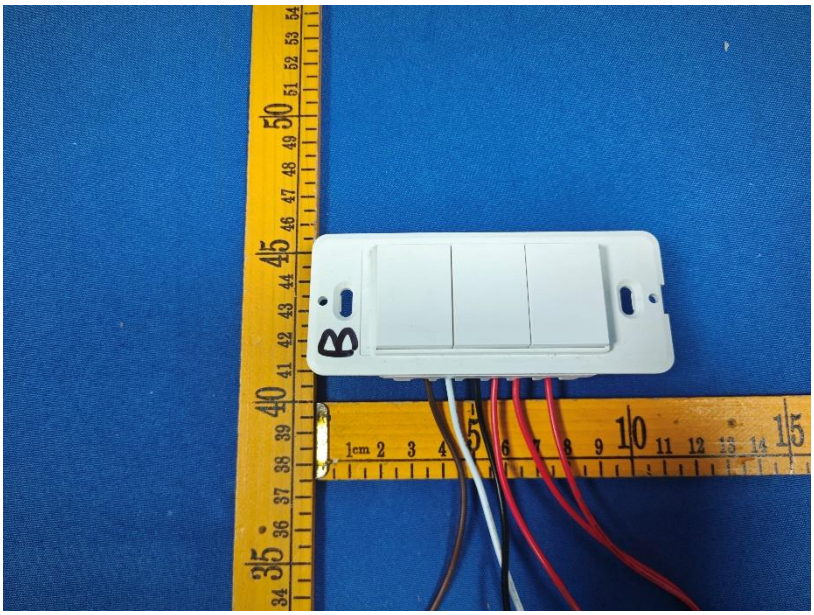
13 Test Setup

Conducted Emissions

Radiated Spurious Emissions
From 30MHz-1000MHz



Test frequency from Above 1GHz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