

RF Test Data for RLAN(5.2G) (Conducted Measurement)

Product Name: WIFI TOUCH SCREEN KARAOKE SYSTEM

Trade Mark: singing machine

Test Model: ISM9033

FCC ID: 2AAXO-ISM9033

Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	58%
ATM Pressure:	100.0 kPa
Test Engineer:	Allen Lai
Supervised by:	Max Zhang
NOTE	N/A

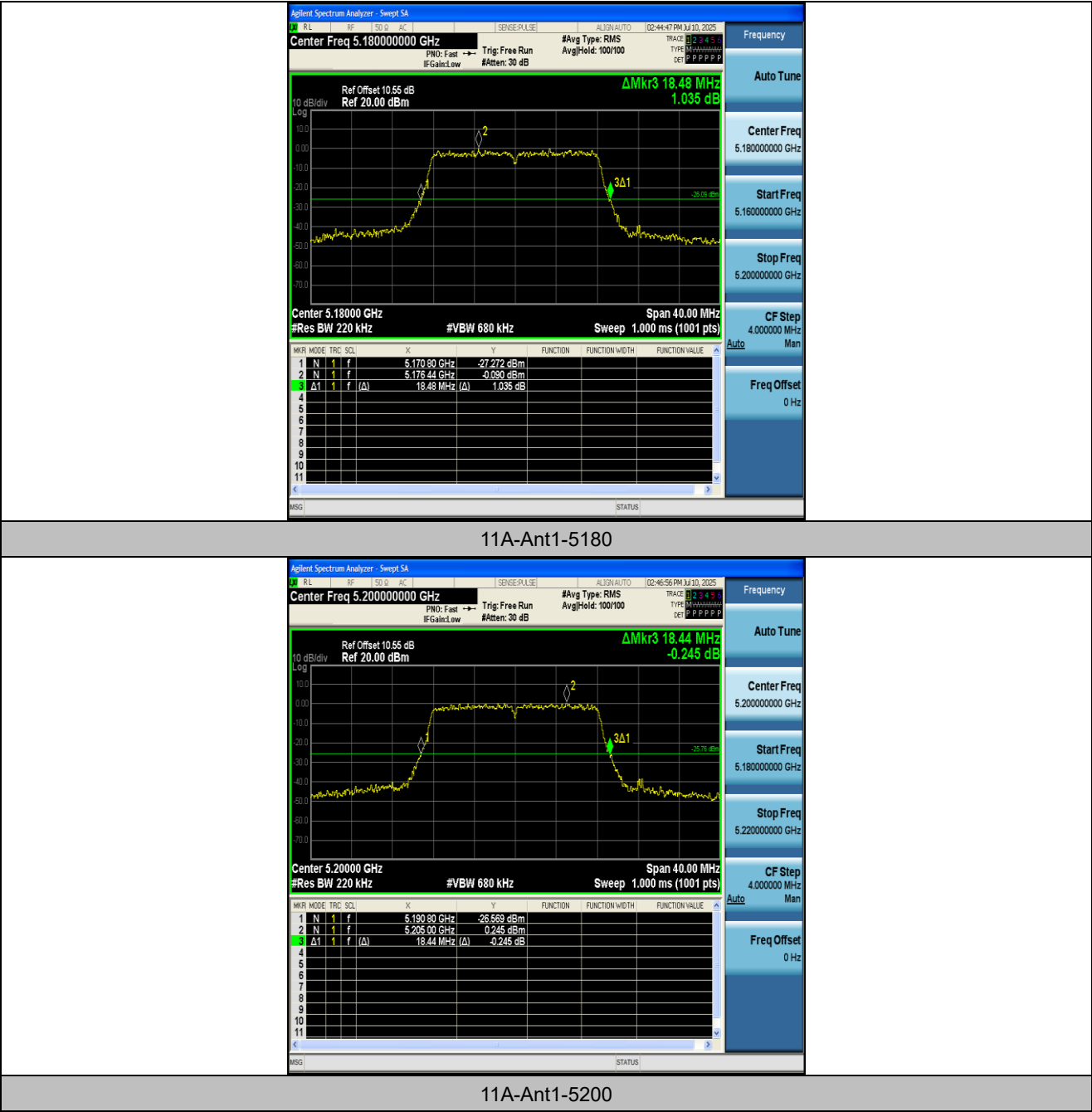
Appendix A1: Emission Bandwidth

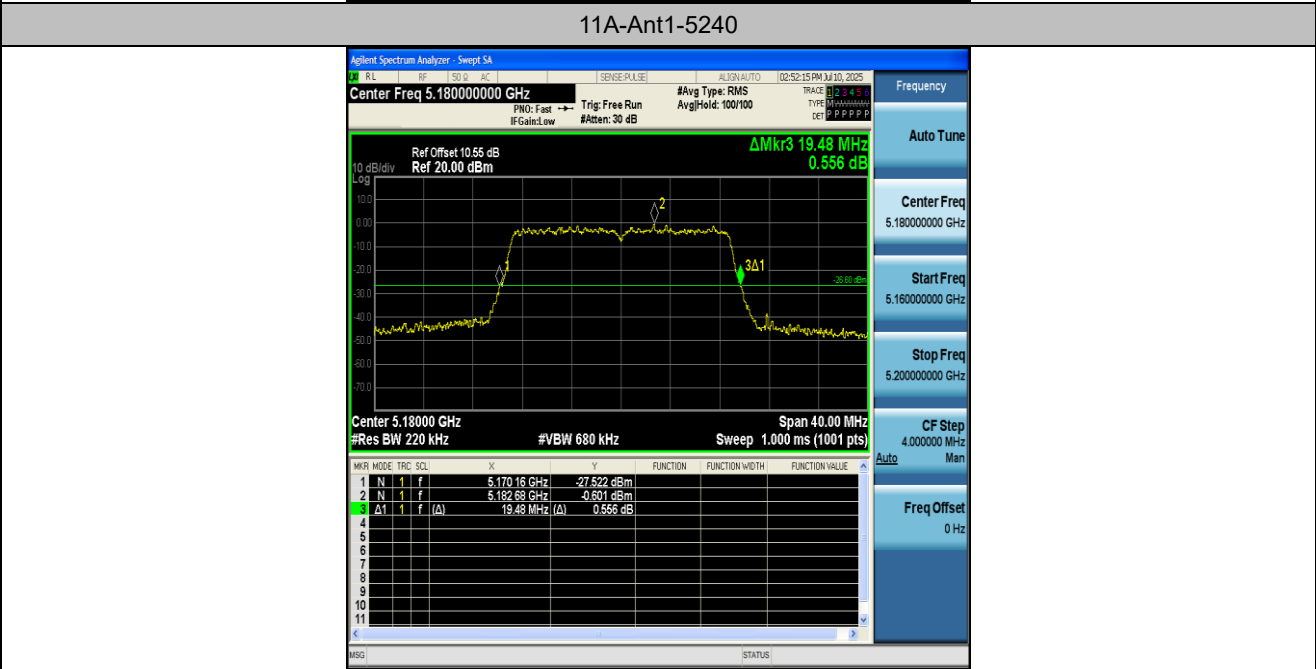
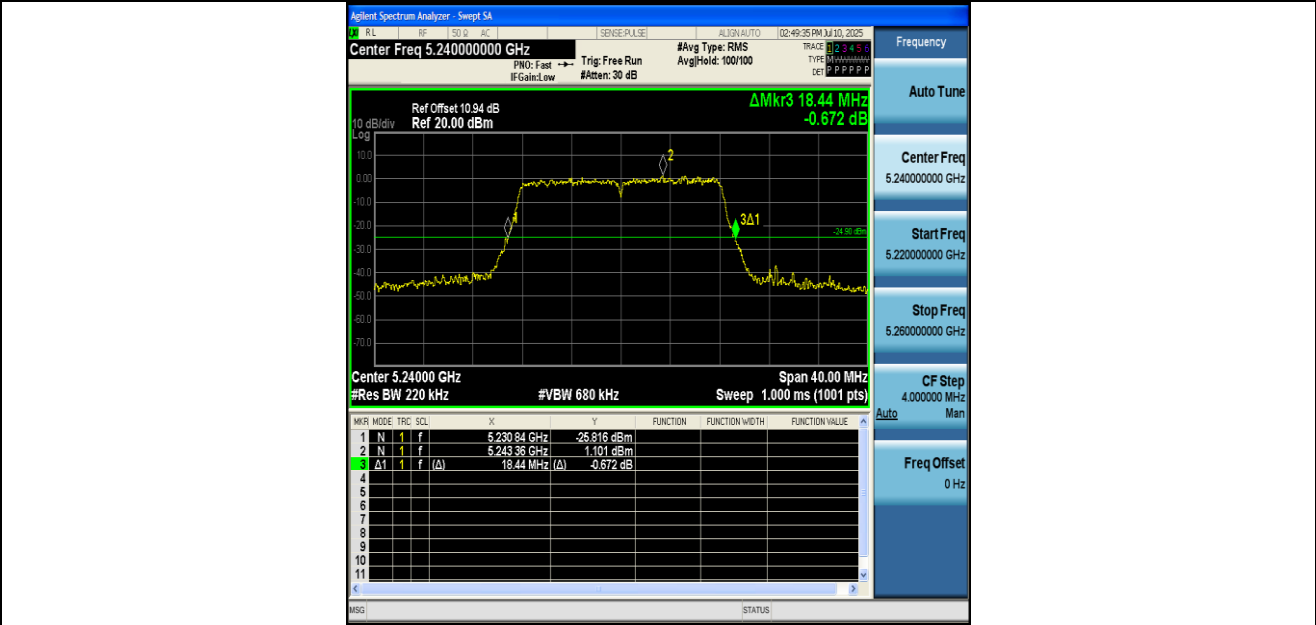
Test Result

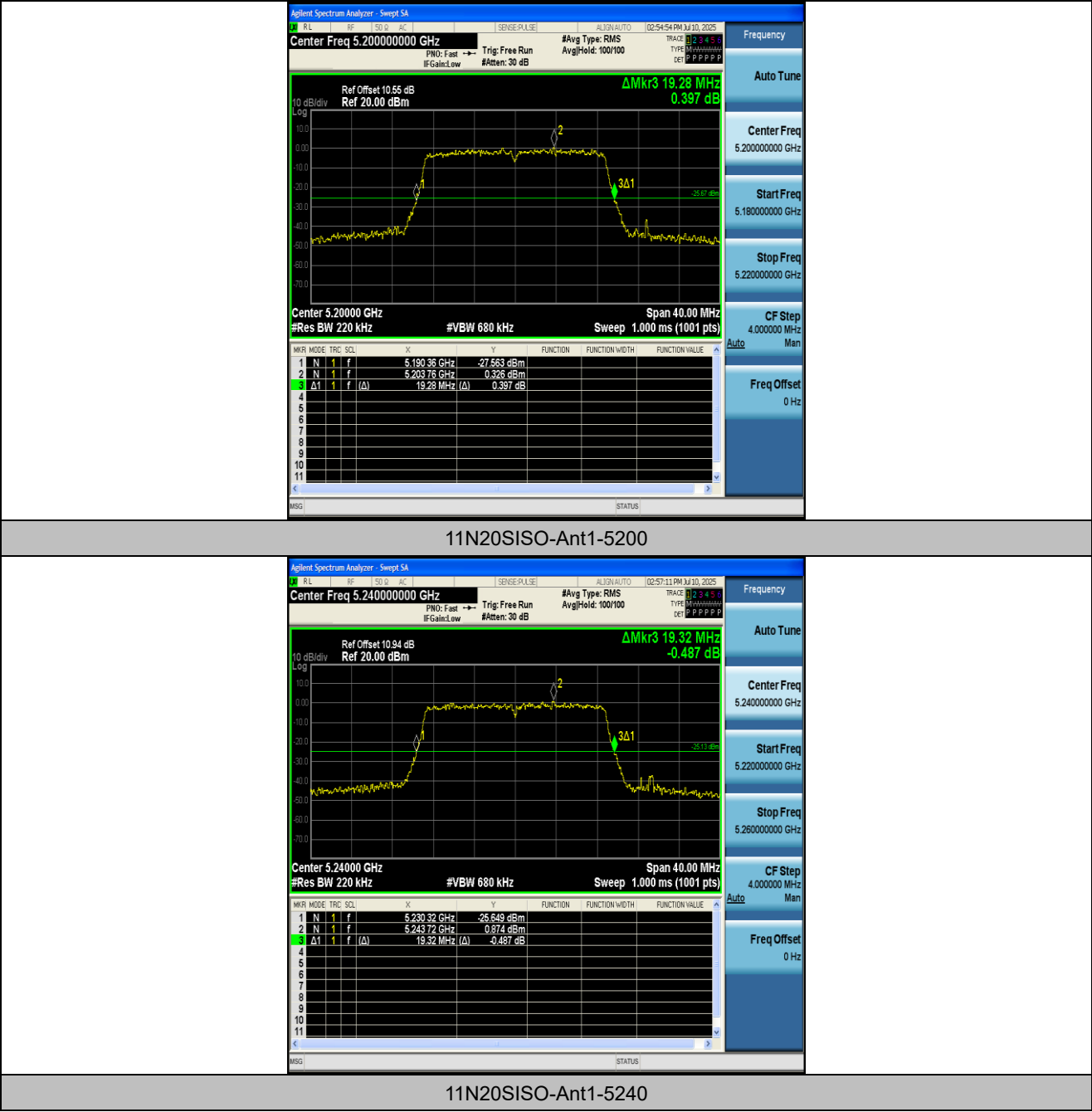
Test Mode	Antenna	Frequency [MHz]	26db EBW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11A	Ant1	5180	18.480	5170.800	5189.280	---	---
11A	Ant1	5200	18.440	5190.800	5209.240	---	---
11A	Ant1	5240	18.440	5230.840	5249.280	---	---
11N20SISO	Ant1	5180	19.480	5170.160	5189.640	---	---
11N20SISO	Ant1	5200	19.280	5190.360	5209.640	---	---
11N20SISO	Ant1	5240	19.320	5230.320	5249.640	---	---
11AC20SISO	Ant1	5180	19.360	5170.360	5189.720	---	---
11AC20SISO	Ant1	5200	19.400	5190.360	5209.760	---	---
11AC20SISO	Ant1	5240	19.200	5230.360	5249.560	---	---

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

Test Graphs

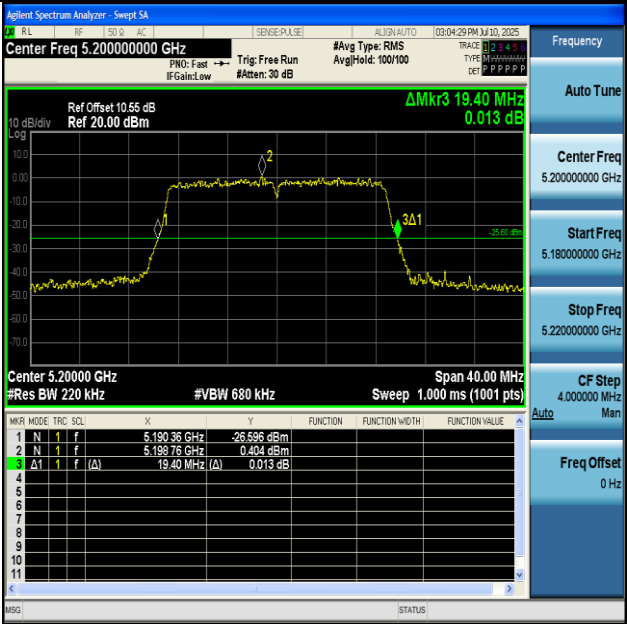








11AC20SISO-Ant1-5180



11AC20SISO-Ant1-5200



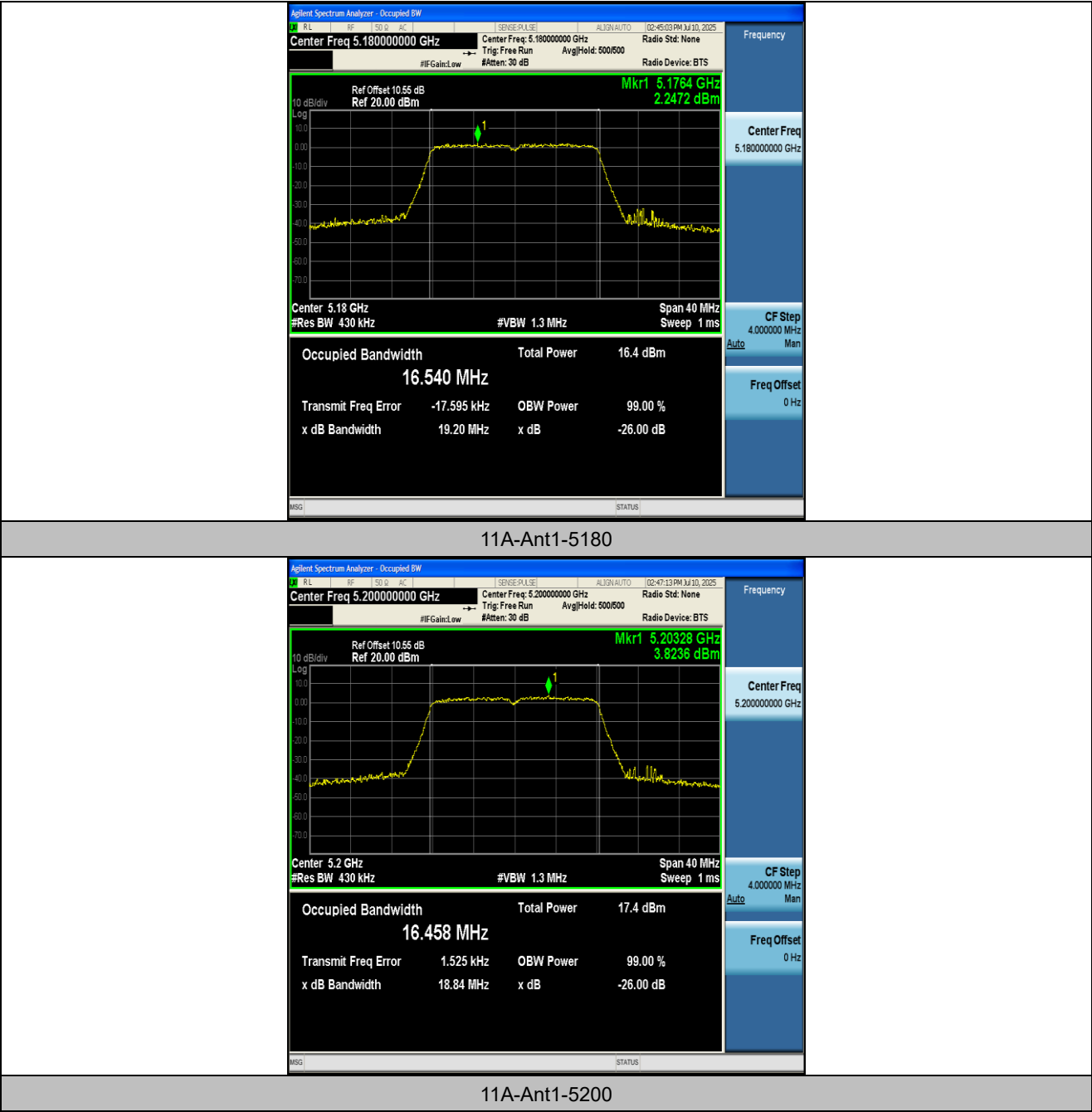
Appendix A2: Occupied channel bandwidth

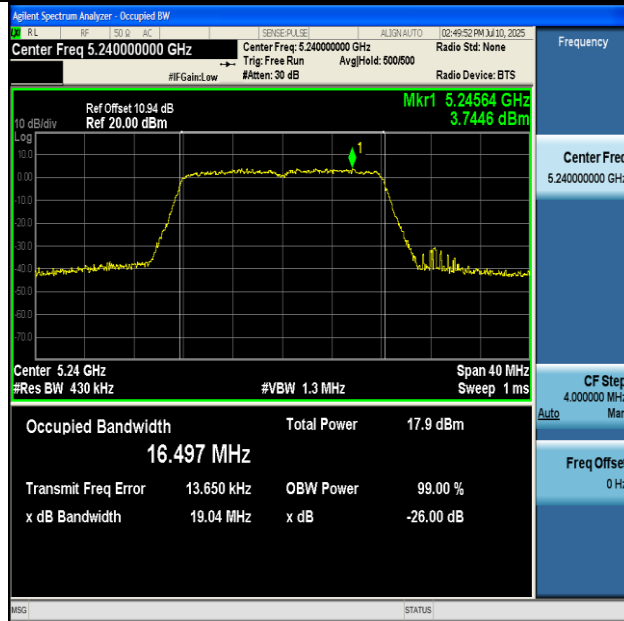
Test Result

Test Mode	Antenna	Frequency [MHz]	OCB [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11A	Ant1	5180	16.540	5171.7124	5188.2524	---	---
11A	Ant1	5200	16.458	5191.7725	5208.2305	---	---
11A	Ant1	5240	16.497	5231.7652	5248.2622	---	---
11N20SISO	Ant1	5180	17.670	5171.1459	5188.8159	---	---
11N20SISO	Ant1	5200	17.598	5191.2015	5208.7995	---	---
11N20SISO	Ant1	5240	17.610	5231.2103	5248.8203	---	---
11AC20SISO	Ant1	5180	17.634	5171.1728	5188.8068	---	---
11AC20SISO	Ant1	5200	17.618	5191.2015	5208.8195	---	---
11AC20SISO	Ant1	5240	17.605	5231.2073	5248.8123	---	---

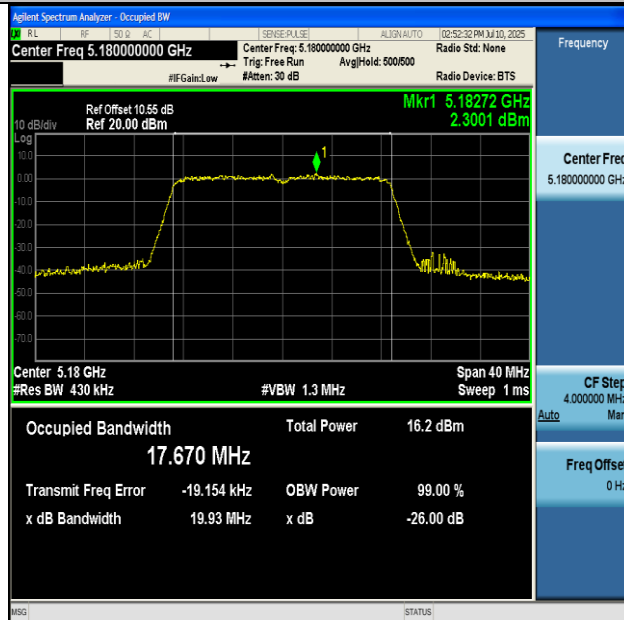
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

Test Graphs

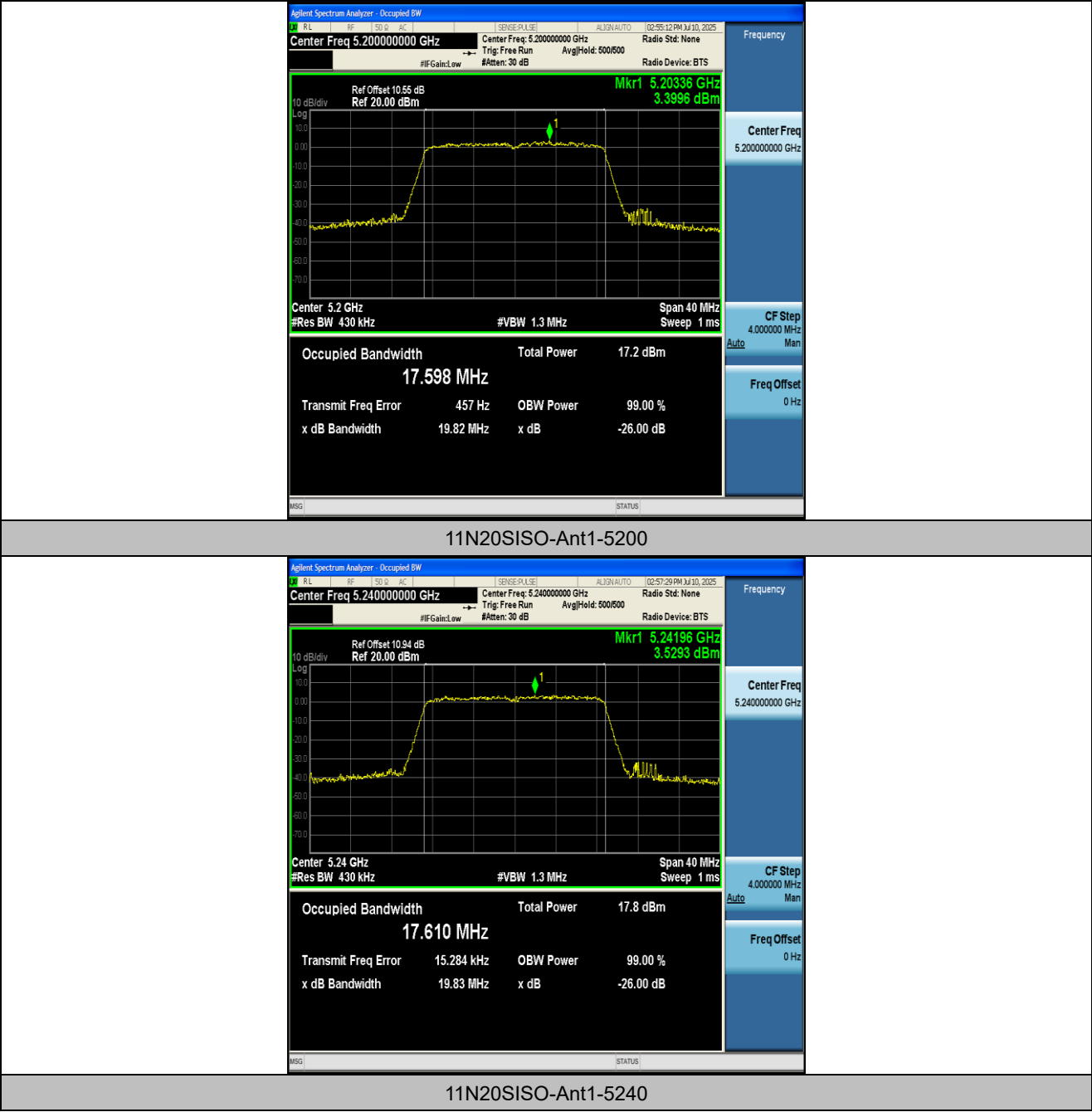


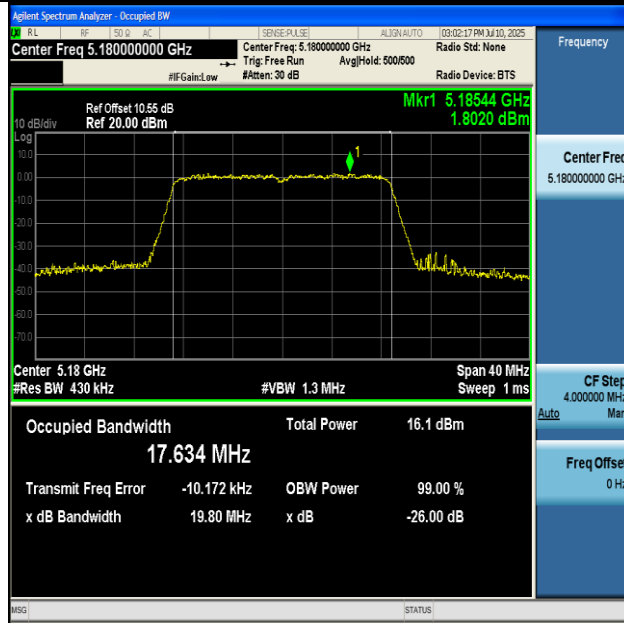


11A-Ant1-5240

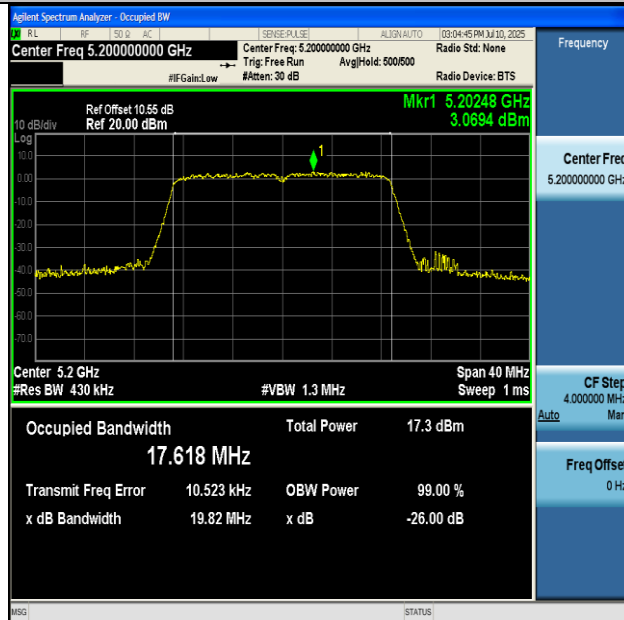


11N20SISO-Ant1-5180





11AC20SISO-Ant1-5180



11AC20SISO-Ant1-5200



Appendix B: Maximum conducted output power

Test Result

Test Mode	Antenna	Frequency [MHz]	Conducted Power [dBm]	Conducted Limit [dBm]	Verdict
11A	Ant1	5180	9.84	≤23.98	PASS
11A	Ant1	5200	10.99	≤23.98	PASS
11A	Ant1	5240	11.32	≤23.98	PASS
11N20SISO	Ant1	5180	9.50	≤23.98	PASS
11N20SISO	Ant1	5200	10.73	≤23.98	PASS
11N20SISO	Ant1	5240	11.30	≤23.98	PASS
11AC20SISO	Ant1	5180	9.51	≤23.98	PASS
11AC20SISO	Ant1	5200	10.76	≤23.98	PASS
11AC20SISO	Ant1	5240	11.21	≤23.98	PASS

Note: offset(dB) = cable loss(dB) + attenuator factor(dB) + Duty Cycle Factor(dB)

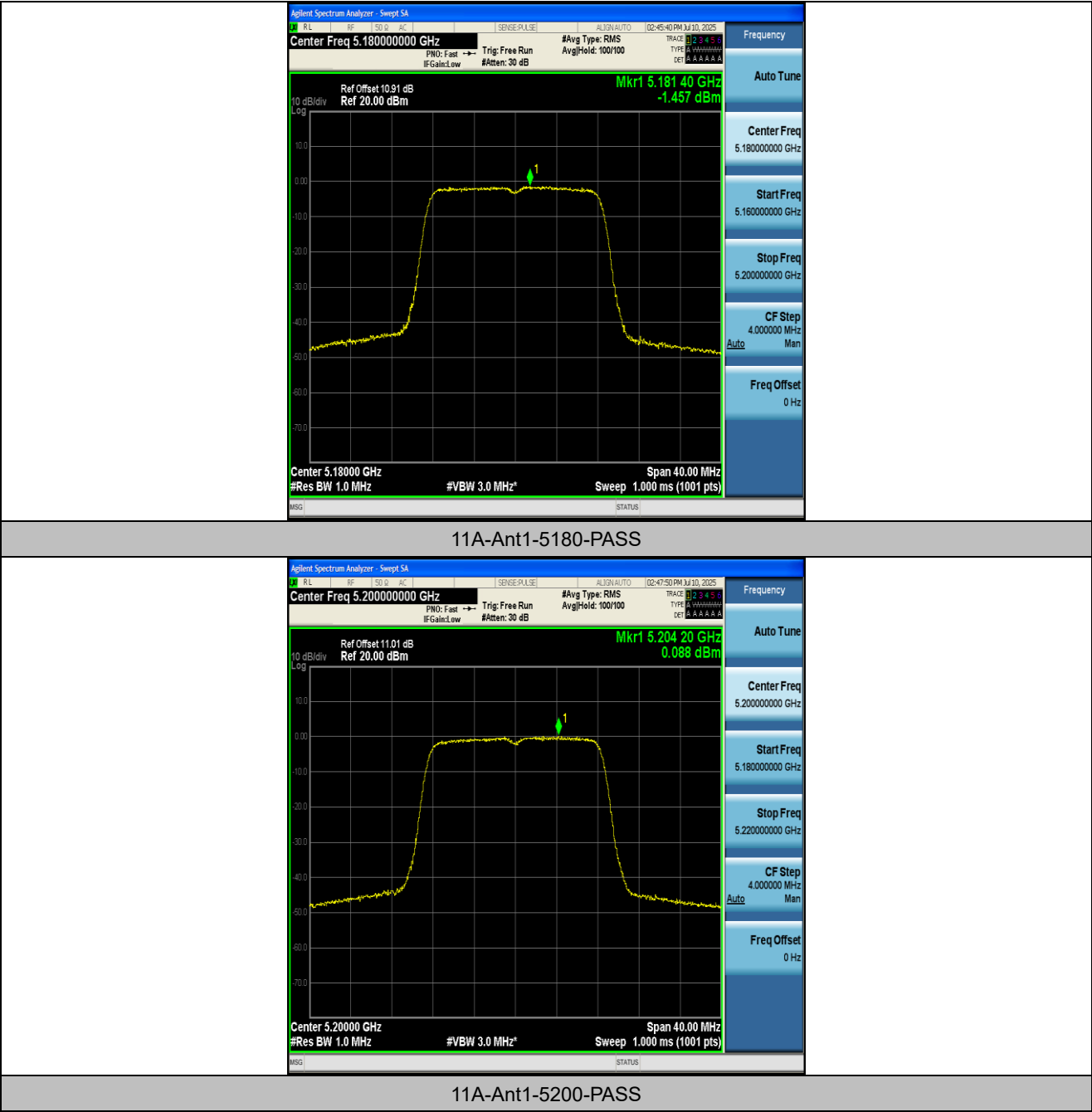
Appendix C: Maximum power spectral density

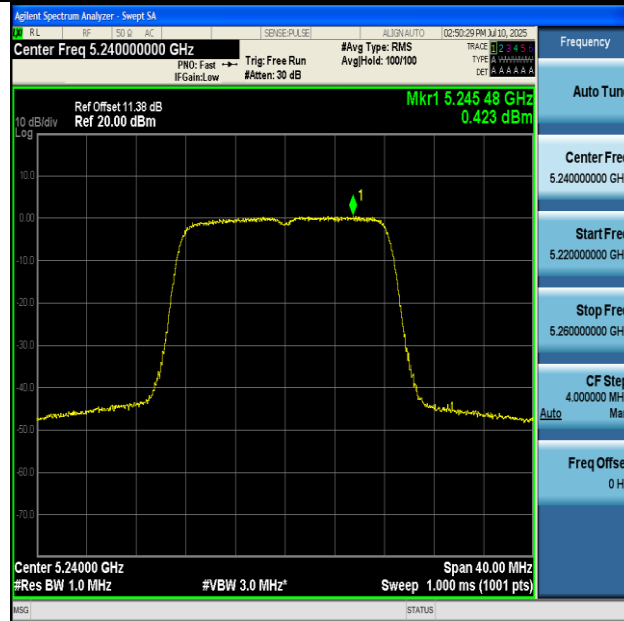
Test Result

Test Mode	Antenna	Frequency [MHz]	Result [dBm/MHz]	Limit [dBm/MHz]	Verdict
11A	Ant1	5180	-1.46	≤11.00	PASS
11A	Ant1	5200	0.09	≤11.00	PASS
11A	Ant1	5240	0.42	≤11.00	PASS
11N20SISO	Ant1	5180	-1.64	≤11.00	PASS
11N20SISO	Ant1	5200	-0.32	≤11.00	PASS
11N20SISO	Ant1	5240	0.22	≤11.00	PASS
11AC20SISO	Ant1	5180	-1.73	≤11.00	PASS
11AC20SISO	Ant1	5200	-0.36	≤11.00	PASS
11AC20SISO	Ant1	5240	0.18	≤11.00	PASS

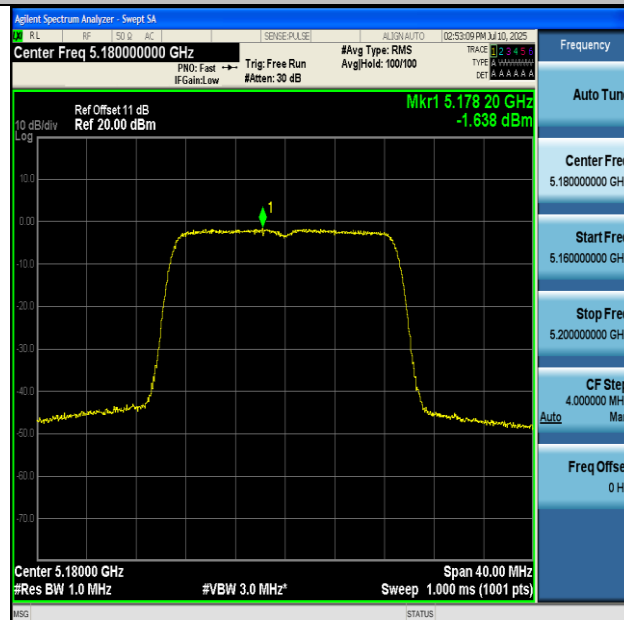
Note: offset(dB) = cable loss(dB) + attenuator factor(dB) + Duty Cycle Factor(dB)

Test Graphs

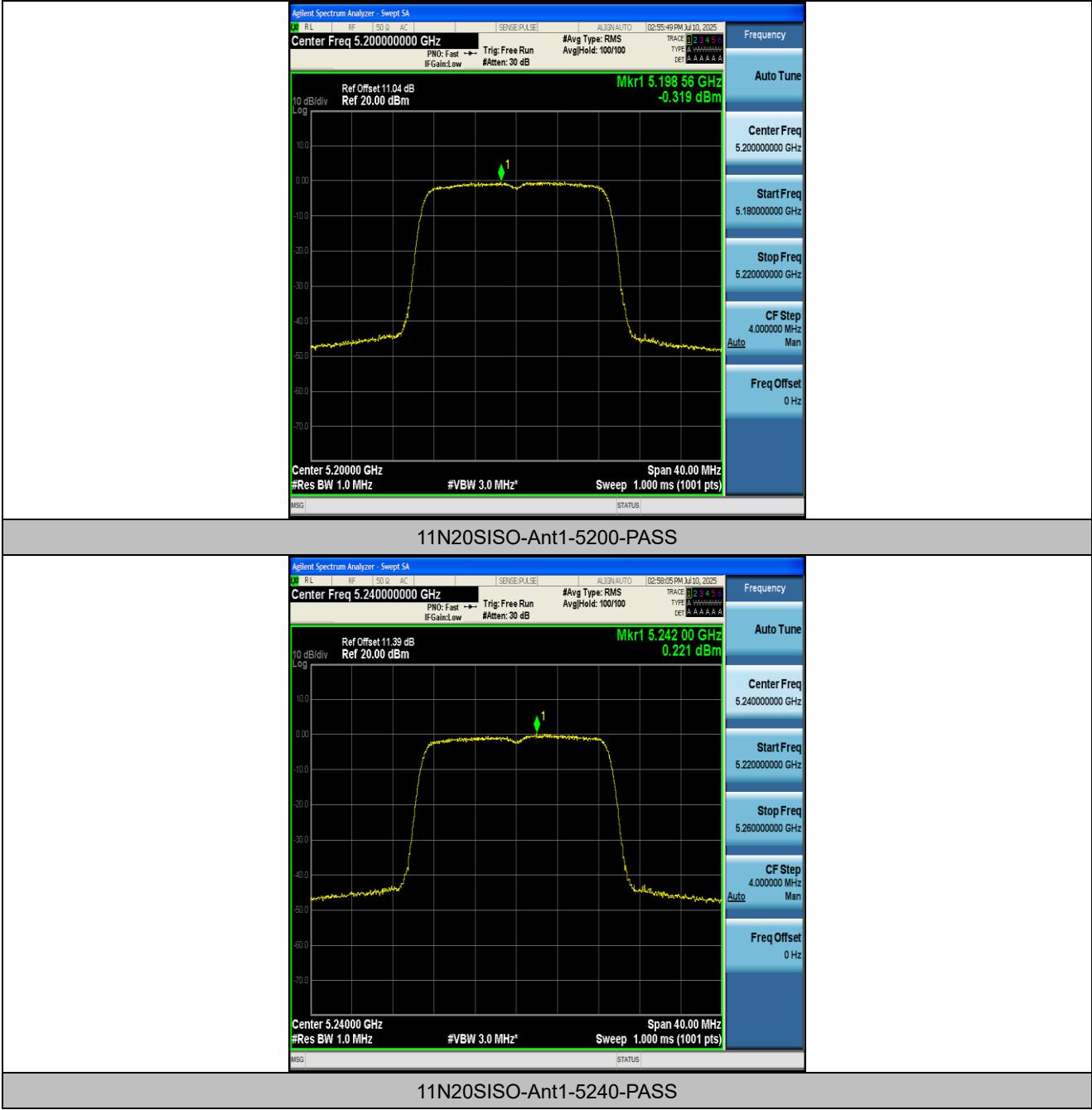


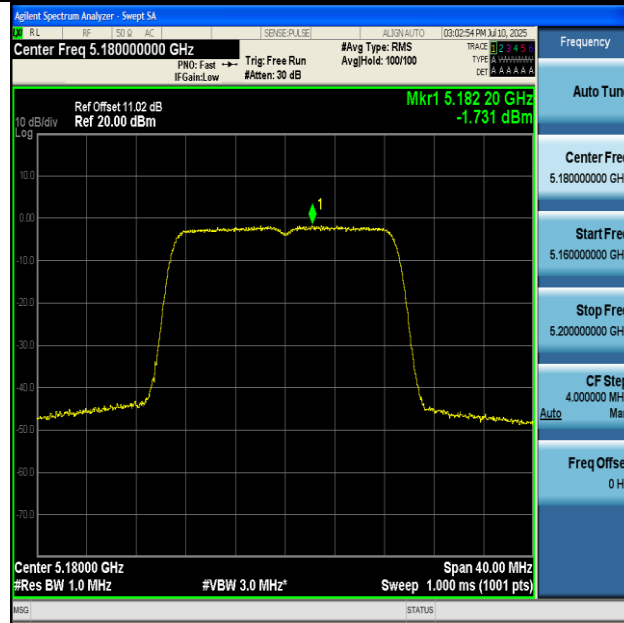


11A-Ant1-5240-PASS

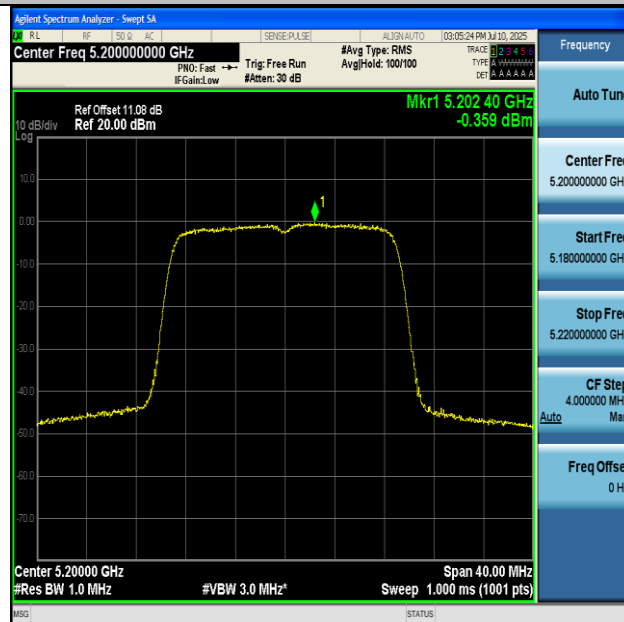


11N20SISO-Ant1-5180-PASS

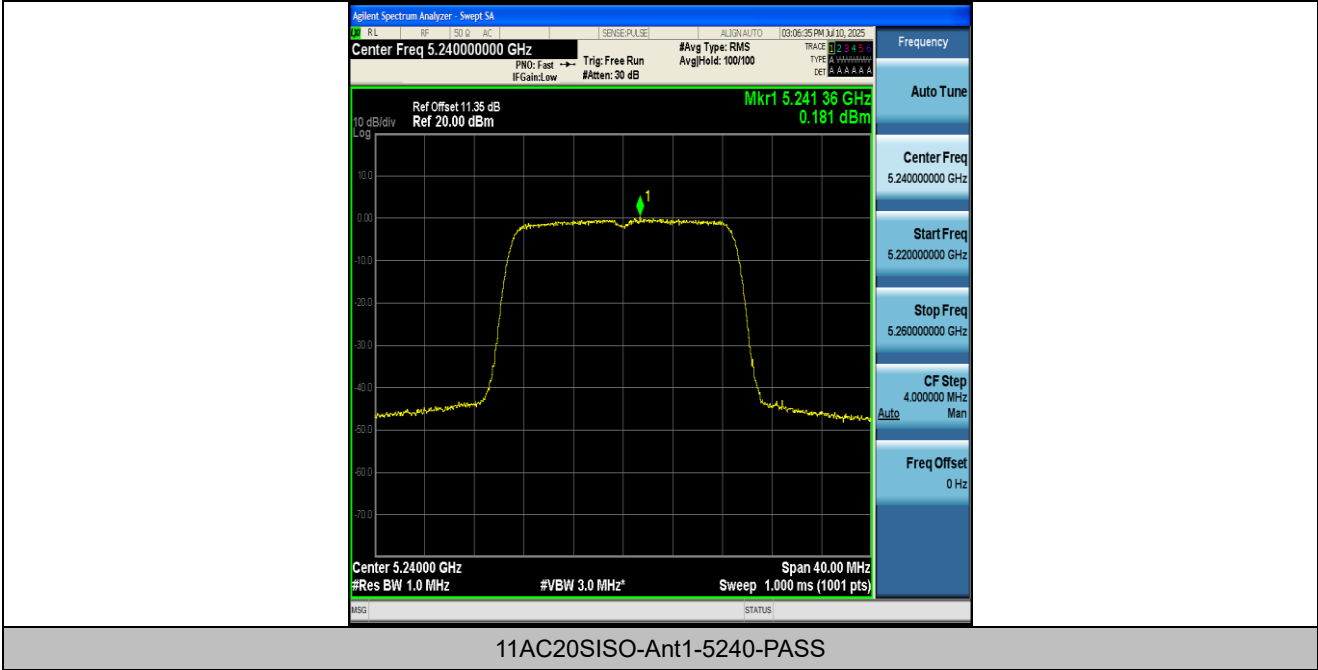




11AC20SISO-Ant1-5180-PASS



11AC20SISO-Ant1-5200-PASS



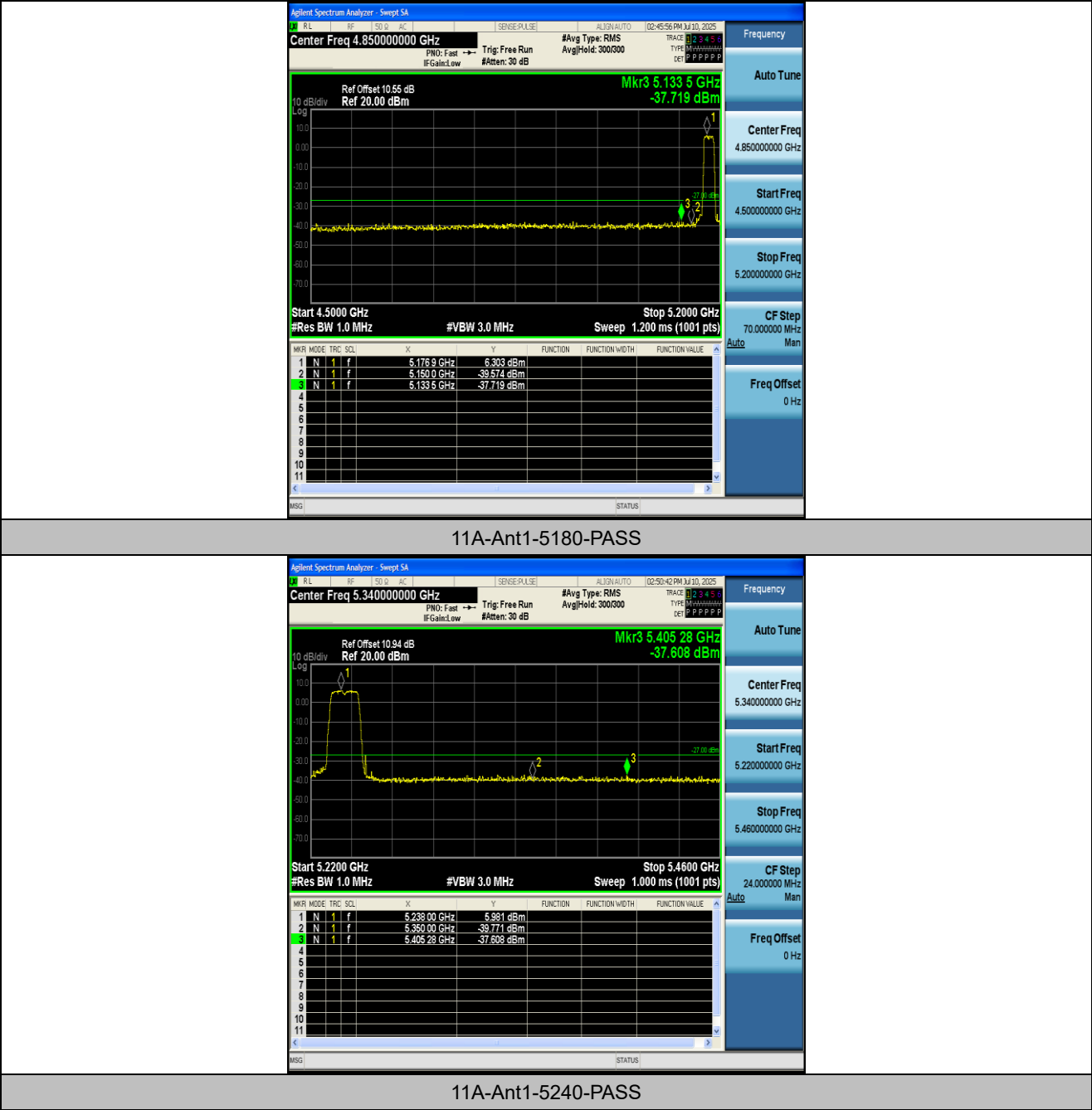
Appendix D: Band edge measurements

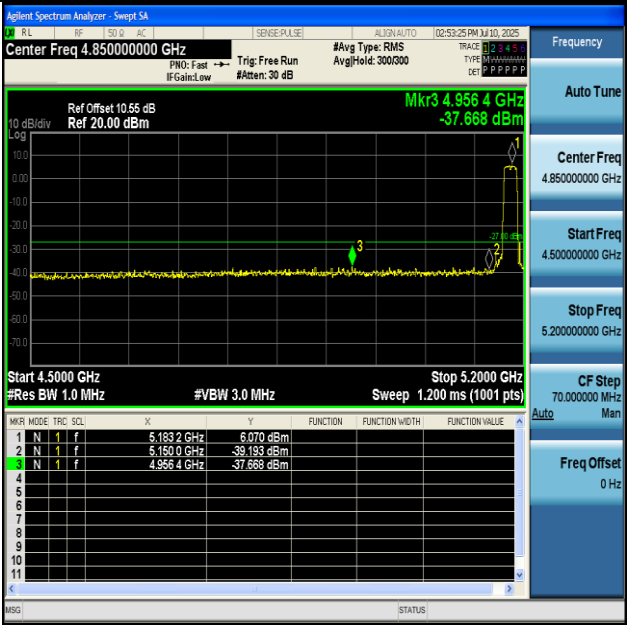
Test Result

Test Mode	Antenna	Ch. Name	Frequency [MHz]	Result [dBm]	Limit [dBm]	Verdict
11A	Ant1	Low	5180	-37.72	≤-27	PASS
11A	Ant1	High	5240	-37.61	≤-27	PASS
11N20SISO	Ant1	Low	5180	-37.67	≤-27	PASS
11N20SISO	Ant1	High	5240	-37.29	≤-27	PASS
11AC20SISO	Ant1	Low	5180	-37.53	≤-27	PASS
11AC20SISO	Ant1	High	5240	-37	≤-27	PASS

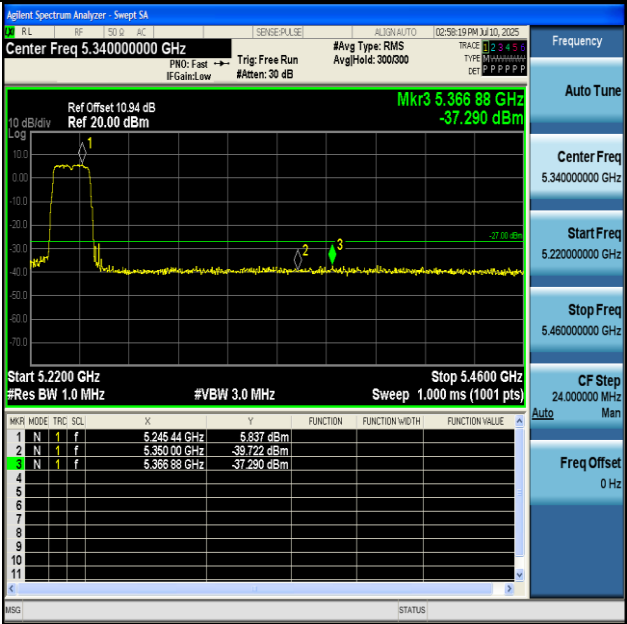
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

Test Graphs

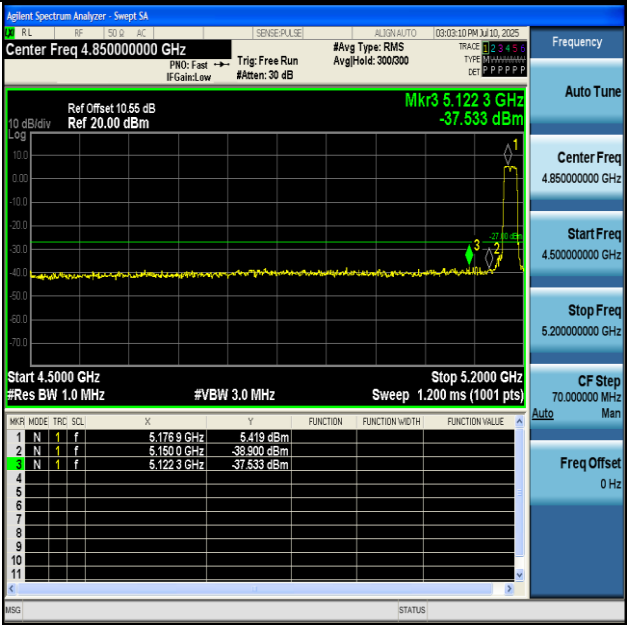




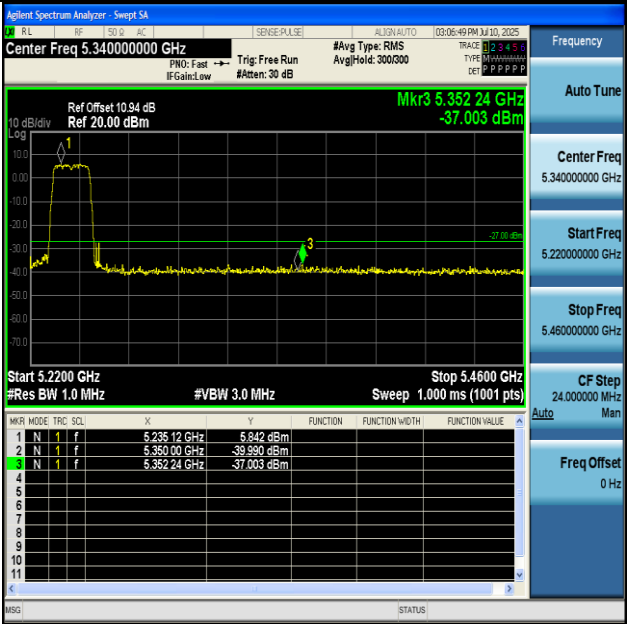
11N20SISO-Ant1-5180-PASS



11N20SISO-Ant1-5240-PASS



11AC20SISO-Ant1-5180-PASS



11AC20SISO-Ant1-5240-PASS

Appendix E: Frequency Stability

Test Result

Ant1

Frequency (MHz)	Environment Temperature (Degree)	Voltage (VAC)	Measured Frequency (MHz)	Limit Range (MHz)	Test Results
5180	20	132	5180.005129	5150 – 5250	PASS
5180	20	108	5179.969335	5150 – 5250	PASS
5180	50	120	5180.034933	5150 – 5250	PASS
5180	40	120	5179.961207	5150 – 5250	PASS
5180	30	120	5179.944016	5150 – 5250	PASS
5180	20	120	5179.953366	5150 – 5250	PASS
5180	10	120	5179.926704	5150 – 5250	PASS
5180	0	120	5179.968161	5150 – 5250	PASS
5180	-10	120	5180.093015	5150 – 5250	PASS
5180	-20	120	5179.977630	5150 – 5250	PASS
5180	-30	120	5179.939434	5150 – 5250	PASS

Ant1

Frequency (MHz)	Enviroment Temperature (Degree)	Voltage (VAC)	Measured Frequency (MHz)	Limit Range (MHz)	Test Results
5200	20	132	5199.946412	5150 – 5250	PASS
5200	20	108	5200.094176	5150 – 5250	PASS
5200	50	120	5200.039637	5150 – 5250	PASS
5200	40	120	5199.934464	5150 – 5250	PASS
5200	30	120	5200.037124	5150 – 5250	PASS
5200	20	120	5200.046432	5150 – 5250	PASS
5200	10	120	5199.944760	5150 – 5250	PASS
5200	0	120	5199.947695	5150 – 5250	PASS
5200	-10	120	5199.921535	5150 – 5250	PASS
5200	-20	120	5200.068697	5150 – 5250	PASS
5200	-30	120	5200.019136	5150 – 5250	PASS

Ant1

Frequency (MHz)	Enviroment Temperature (Degree)	Voltage (VAC)	Measured Frequency (MHz)	Limit Range (MHz)	Test Results
5240	20	132	5240.022422	5150 – 5250	PASS
5240	20	108	5239.979973	5150 – 5250	PASS
5240	50	120	5239.911140	5150 – 5250	PASS
5240	40	120	5240.011221	5150 – 5250	PASS
5240	30	120	5240.076001	5150 – 5250	PASS
5240	20	120	5240.097196	5150 – 5250	PASS
5240	10	120	5239.964981	5150 – 5250	PASS
5240	0	120	5239.934266	5150 – 5250	PASS
5240	-10	120	5239.964559	5150 – 5250	PASS
5240	-20	120	5240.005501	5150 – 5250	PASS
5240	-30	120	5239.949387	5150 – 5250	PASS

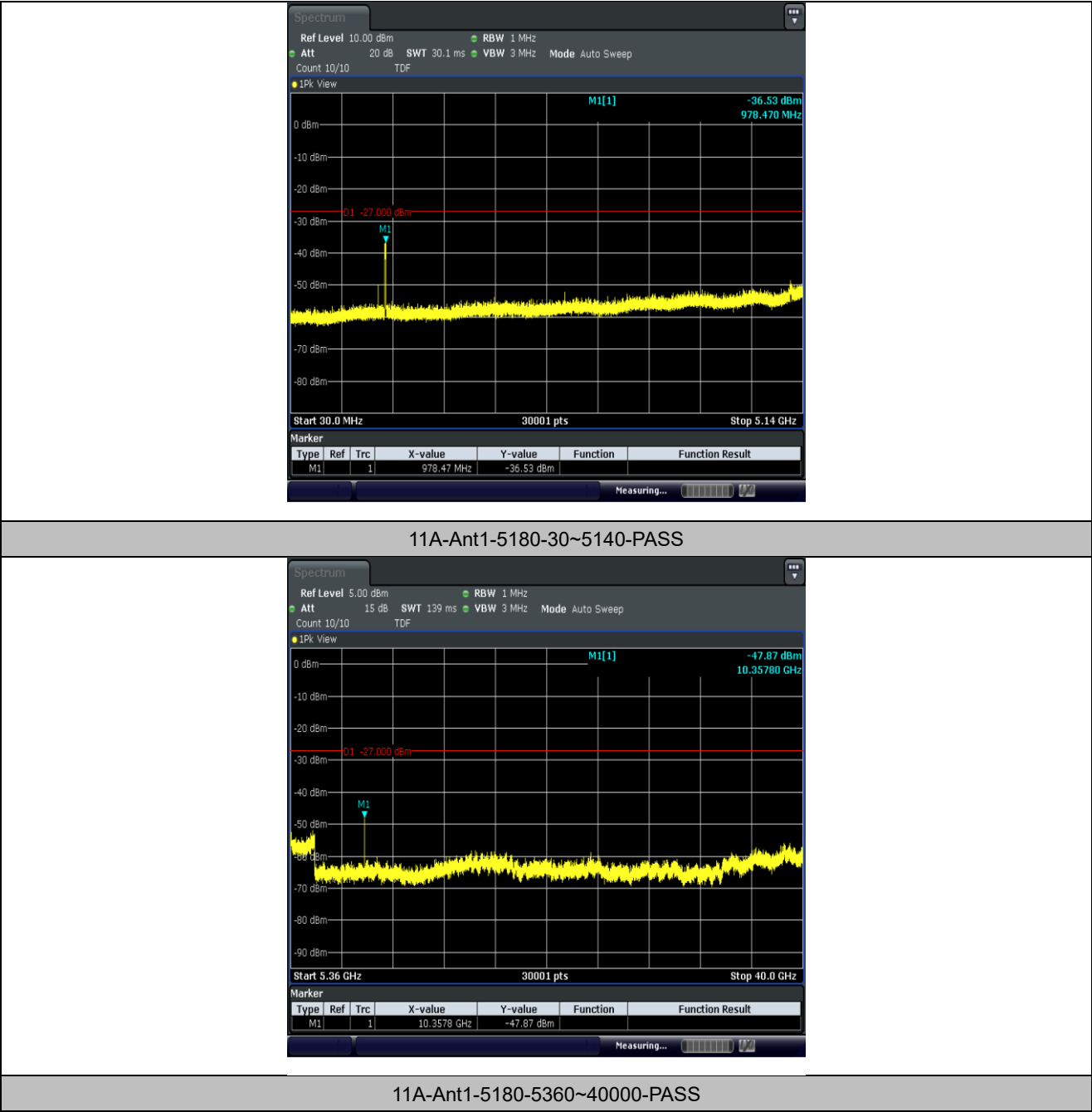
Appendix F: Conducted Spurious Emission

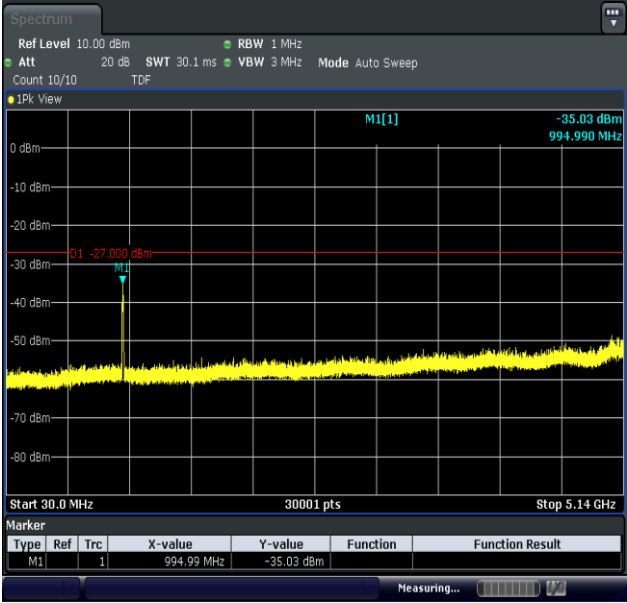
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	Max. Fre [MHz]	Max. Level [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	30~5140	978.47	-36.53	≤-27	PASS
11A	Ant1	5180	5360~40000	10357.8	-47.87	≤-27	PASS
11A	Ant1	5200	30~5140	994.99	-35.03	≤-27	PASS
11A	Ant1	5200	5360~40000	10398.2	-47.58	≤-27	PASS
11A	Ant1	5240	30~5140	1036.89	-34.39	≤-27	PASS
11A	Ant1	5240	5360~40000	10483.7	-49.13	≤-27	PASS
11N20SISO	Ant1	5180	30~5140	974.21	-36.37	≤-27	PASS
11N20SISO	Ant1	5180	5360~40000	10361.3	-47.05	≤-27	PASS
11N20SISO	Ant1	5200	30~5140	975.57	-35.71	≤-27	PASS
11N20SISO	Ant1	5200	5360~40000	10359	-47.94	≤-27	PASS
11N20SISO	Ant1	5240	30~5140	973.87	-34.05	≤-27	PASS
11N20SISO	Ant1	5240	5360~40000	10360.1	-48.87	≤-27	PASS
11AC20SISO	Ant1	5180	30~5140	974.72	-36.13	≤-27	PASS
11AC20SISO	Ant1	5180	5360~40000	10356.7	-49.63	≤-27	PASS
11AC20SISO	Ant1	5200	30~5140	975.4	-36.25	≤-27	PASS
11AC20SISO	Ant1	5200	5360~40000	10364.7	-49.44	≤-27	PASS
11AC20SISO	Ant1	5240	30~5140	974.38	-36.23	≤-27	PASS
11AC20SISO	Ant1	5240	5360~40000	10360.1	-48.78	≤-27	PASS

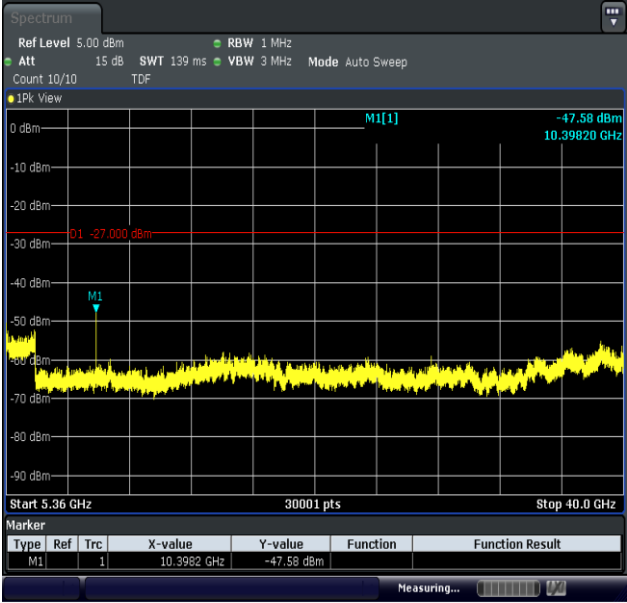
Note: offset(dB) in Reference test plots = cable loss(dB) + attenuator factor(dB); For spurious emissions plots from 30MHz to 40 GHz, the cable loss and attenuator factors have been set in the 'Input Correction' of the Spectrum Analyzer during the test.

Test Graphs

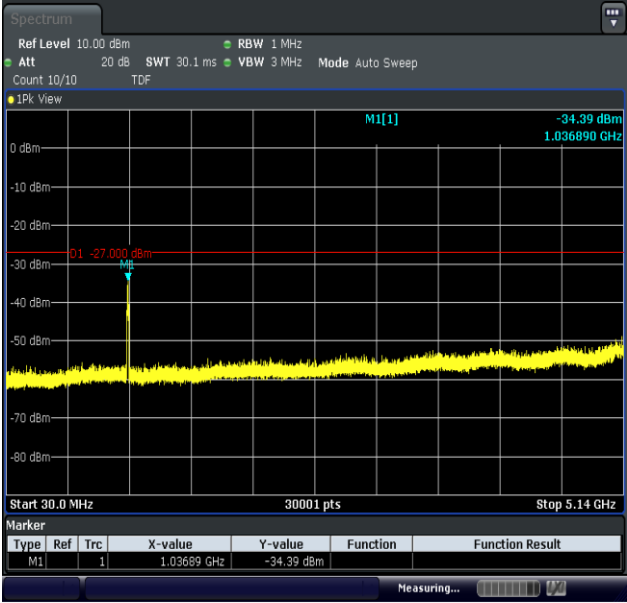




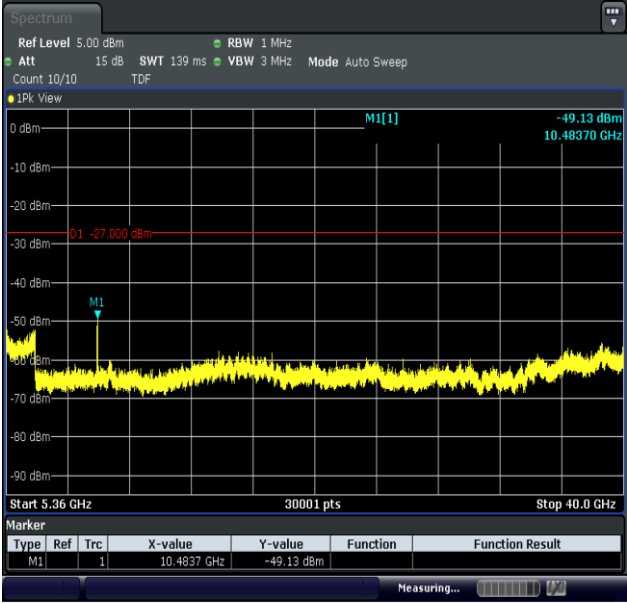
11A-Ant1-5200-30~5140-PASS



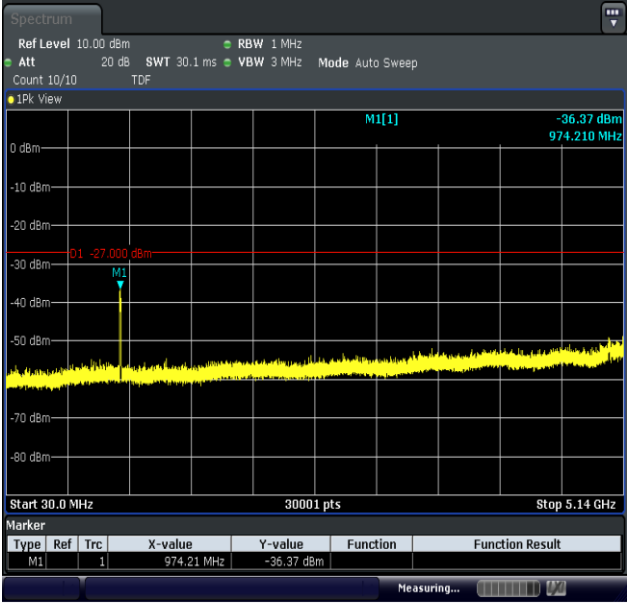
11A-Ant1-5200-5360~40000-PASS



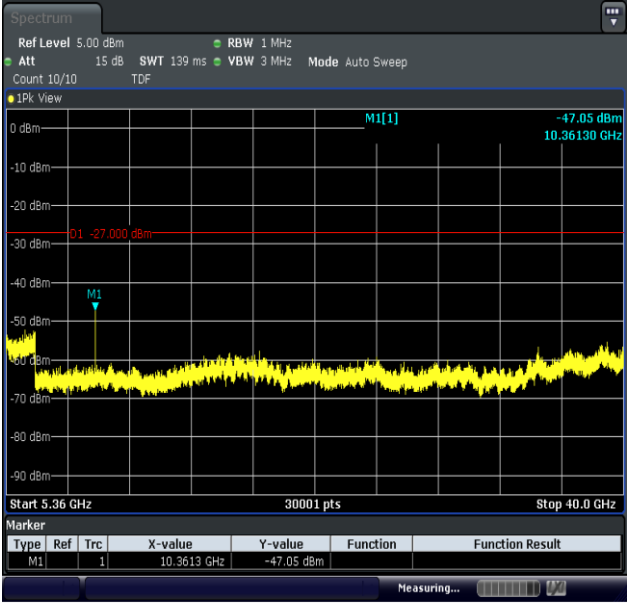
11A-Ant1-5240-30~5140-PASS



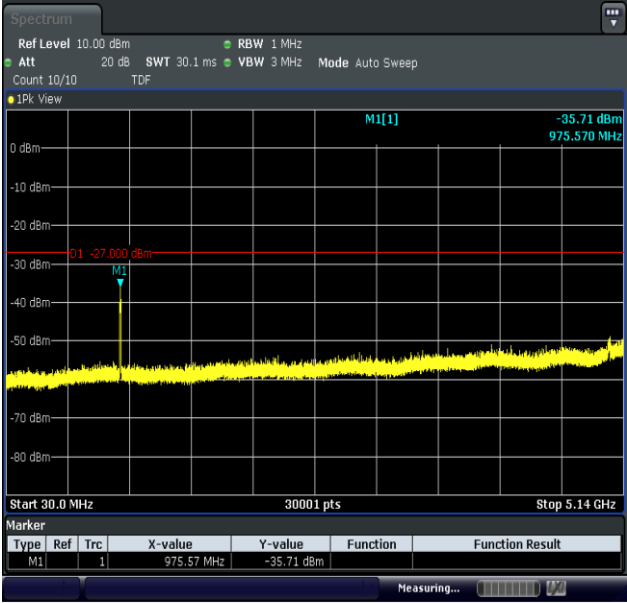
11A-Ant1-5240-5360~40000-PASS



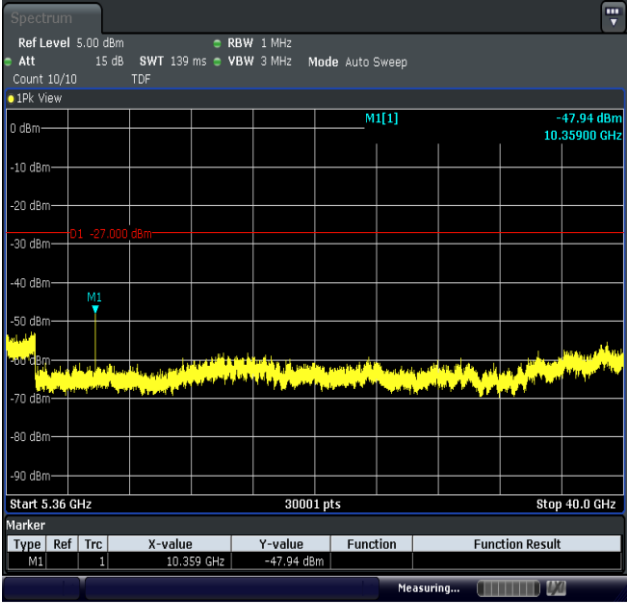
11N20SISO-Ant1-5180-30~5140-PASS



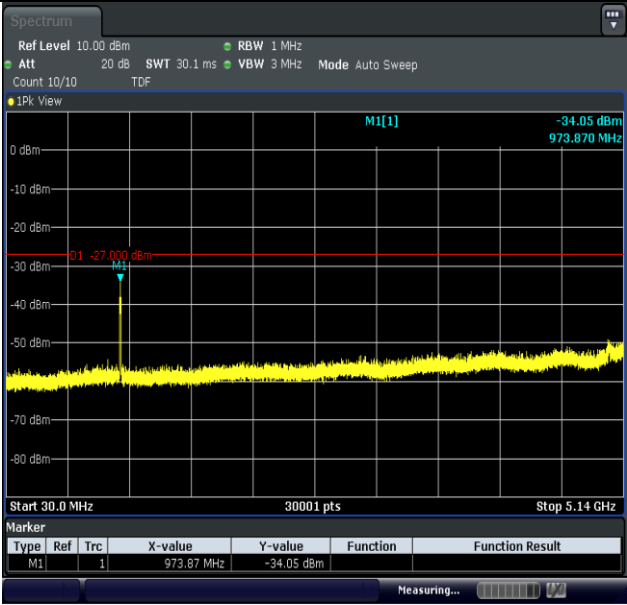
11N20SISO-Ant1-5180-5360~40000-PASS



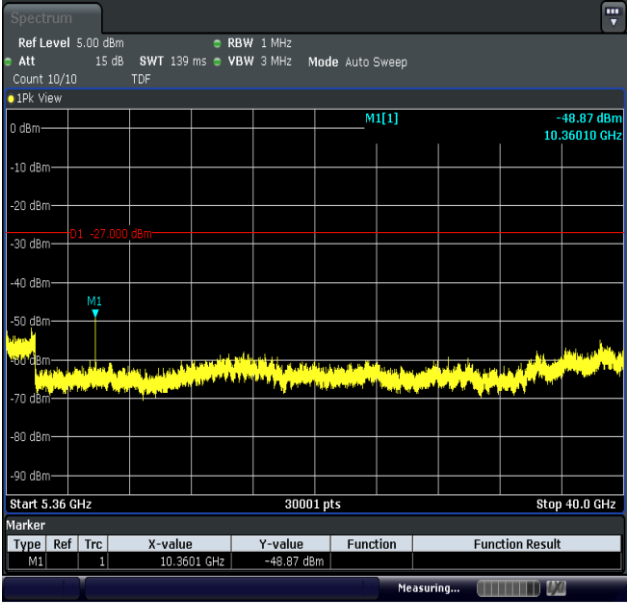
11N20SISO-Ant1-5200-30~5140-PASS



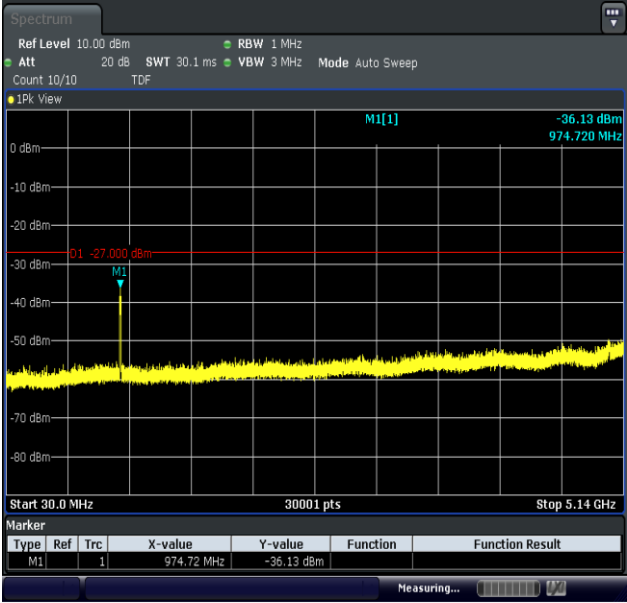
11N20SISO-Ant1-5200-5360~40000-PASS



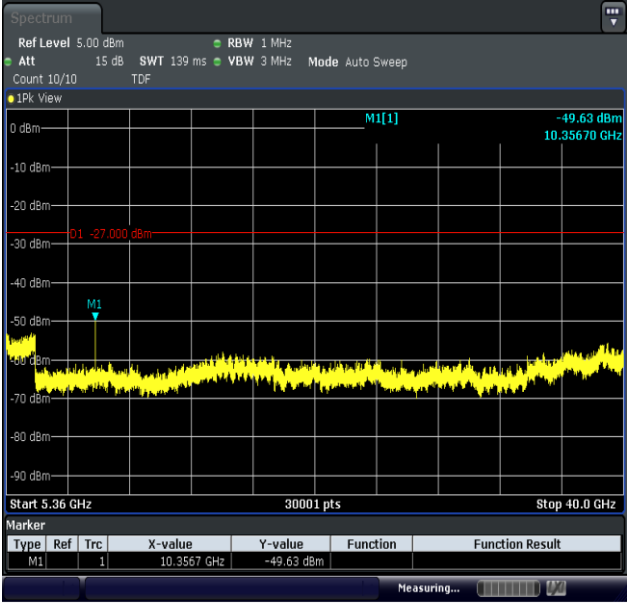
11N20SISO-Ant1-5240-30~5140-PASS



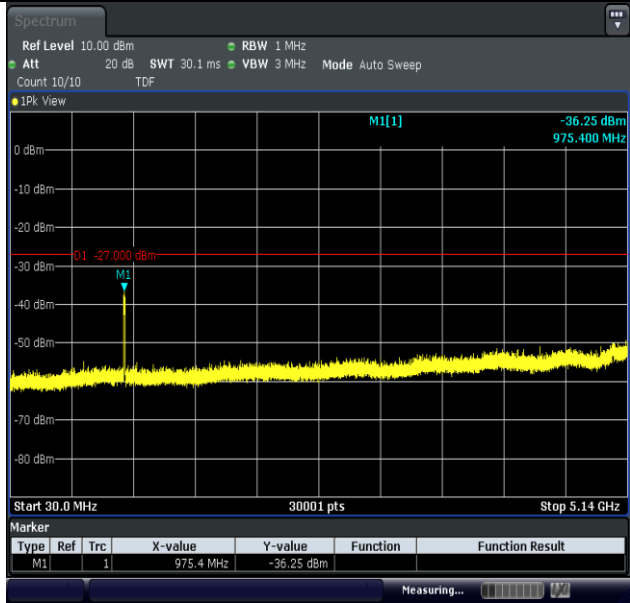
11N20SISO-Ant1-5240-5360~40000-PASS



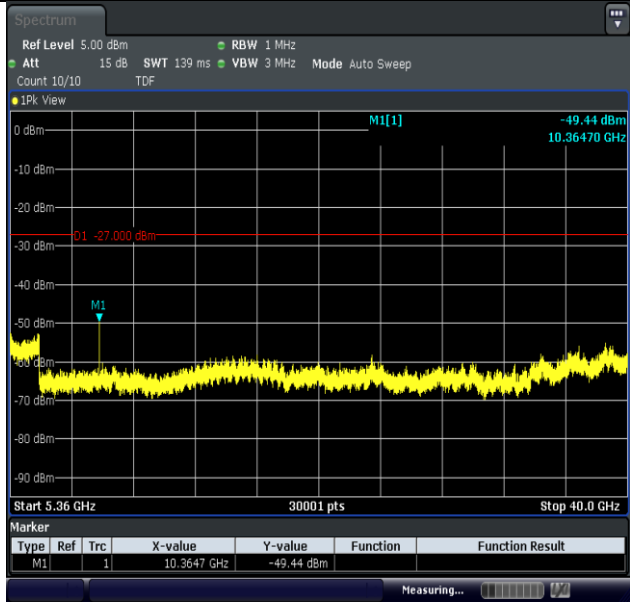
11AC20SISO-Ant1-5180-30~5140-PASS



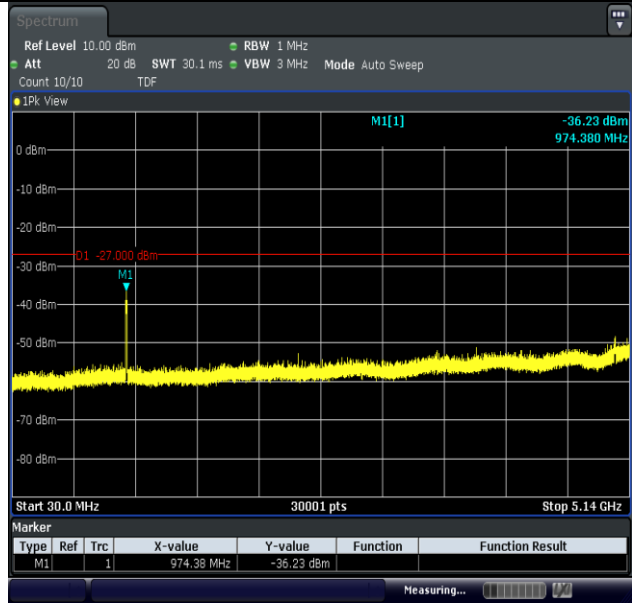
11AC20SISO-Ant1-5180-5360~40000-PASS



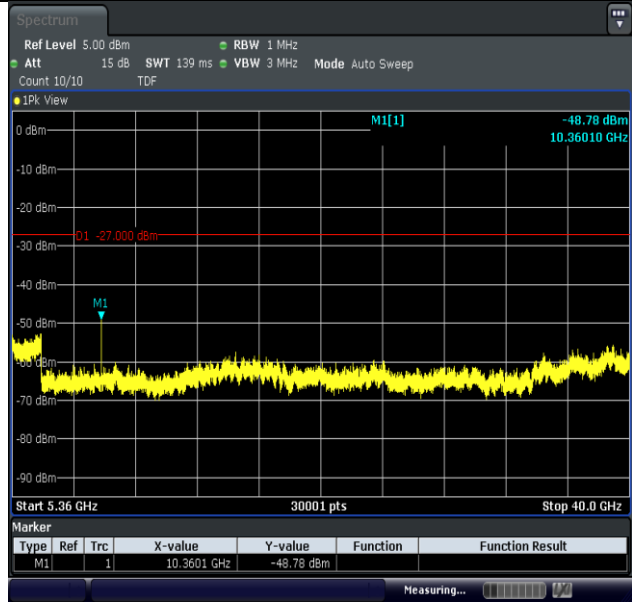
11AC20SISO-Ant1-5200-30~5140-PASS



11AC20SISO-Ant1-5200-5360~40000-PASS



11AC20SISO-Ant1-5240-30~5140-PASS



11AC20SISO-Ant1-5240-5360~40000-PASS

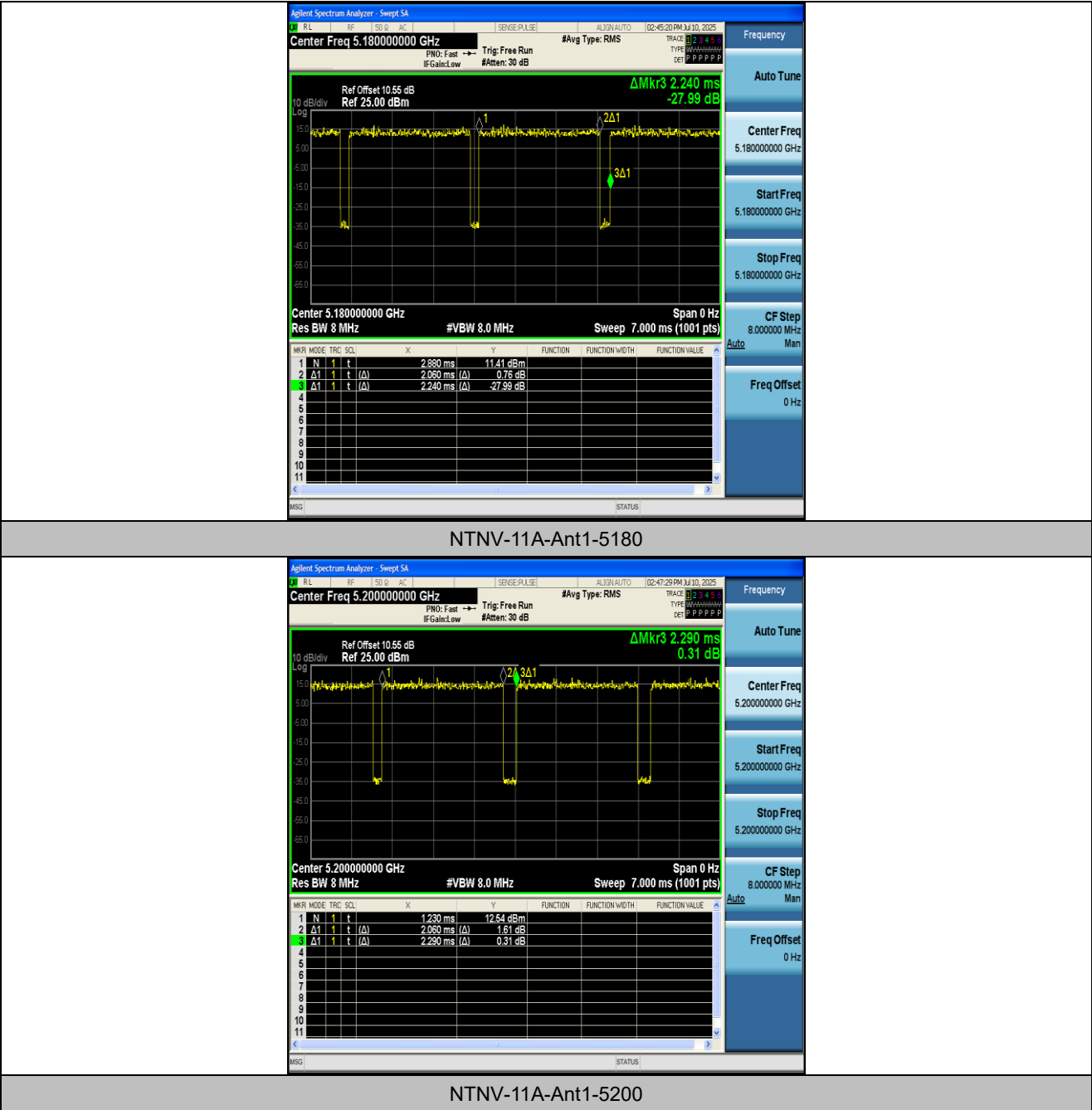
Appendix G: Duty Cycle

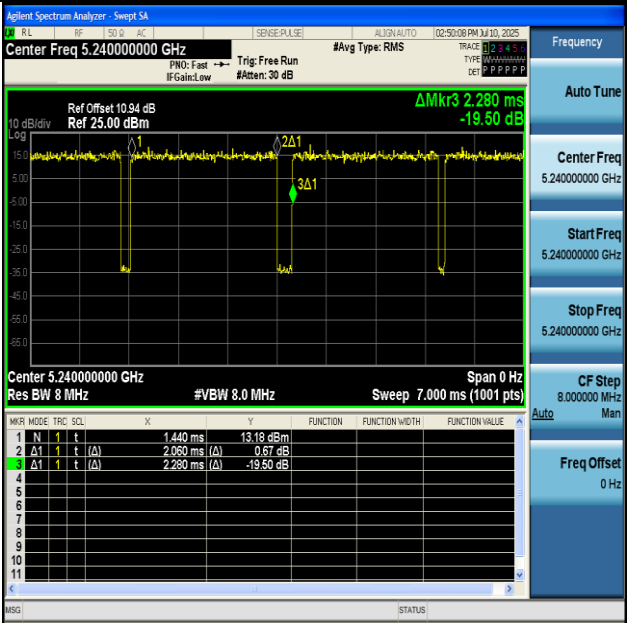
Test Result

Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Dc. Factor [%]	1/T [kHz]
11A	Ant1	5180	2.06	2.24	91.96	0.36	0.49
11A	Ant1	5200	2.06	2.29	89.96	0.46	0.49
11A	Ant1	5240	2.06	2.28	90.35	0.44	0.49
11N20SISO	Ant1	5180	1.92	2.13	90.14	0.45	0.52
11N20SISO	Ant1	5200	1.91	2.14	89.25	0.49	0.52
11N20SISO	Ant1	5240	1.93	2.14	90.19	0.45	0.52
11AC20SISO	Ant1	5180	1.93	2.15	89.77	0.47	0.52
11AC20SISO	Ant1	5200	1.93	2.18	88.53	0.53	0.52
11AC20SISO	Ant1	5240	1.93	2.12	91.04	0.41	0.52

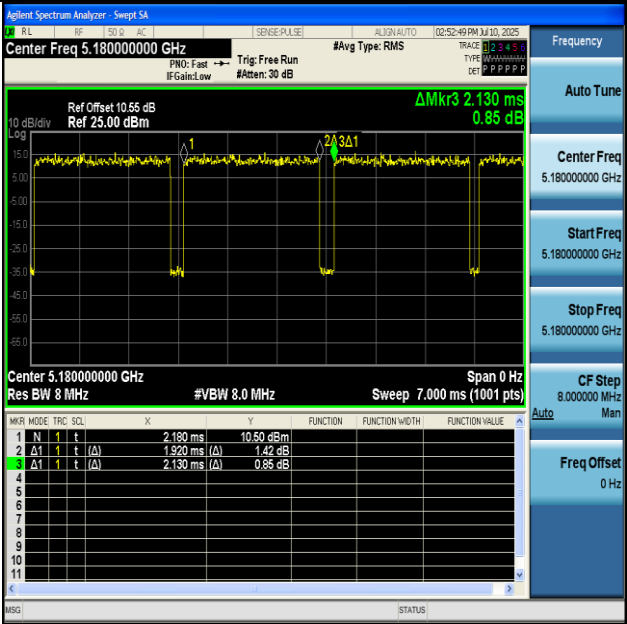
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

Test Graphs

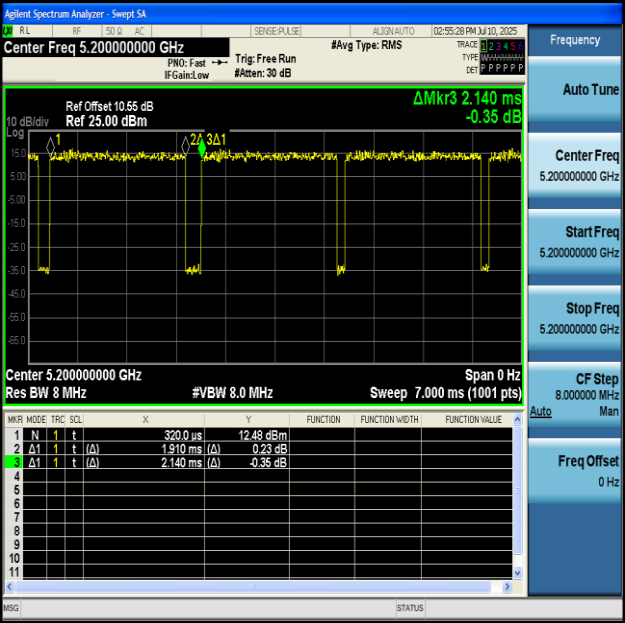




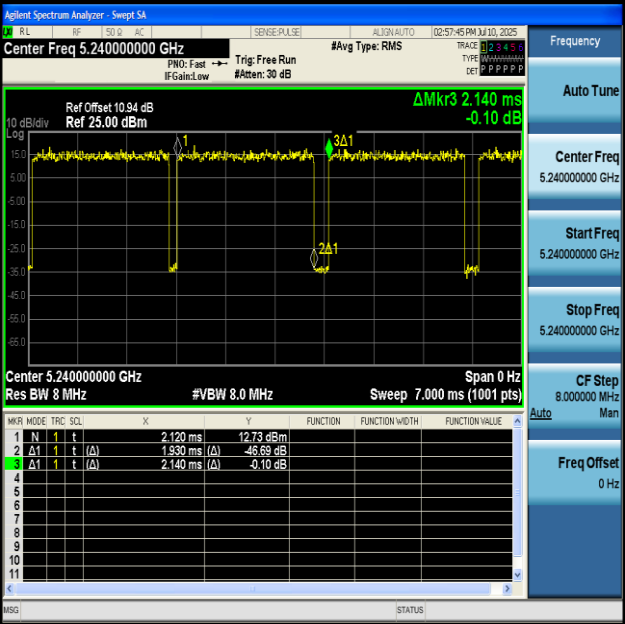
NTNV-11A-Ant1-5240



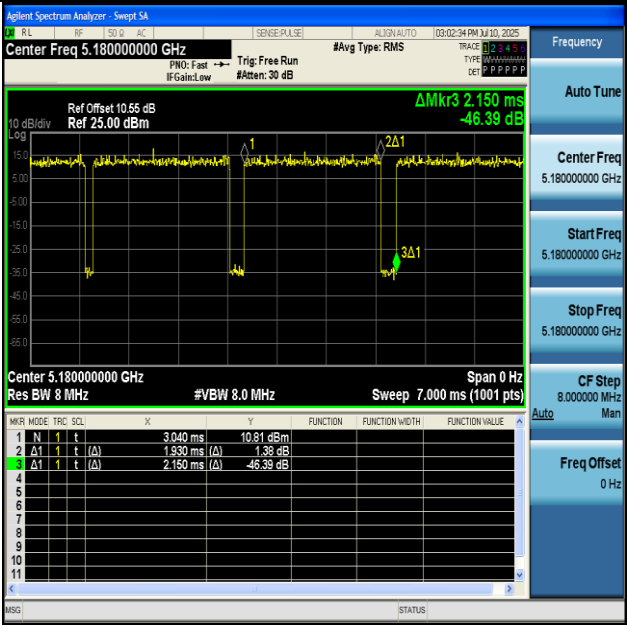
NTNV-11N20SISO-Ant1-5180



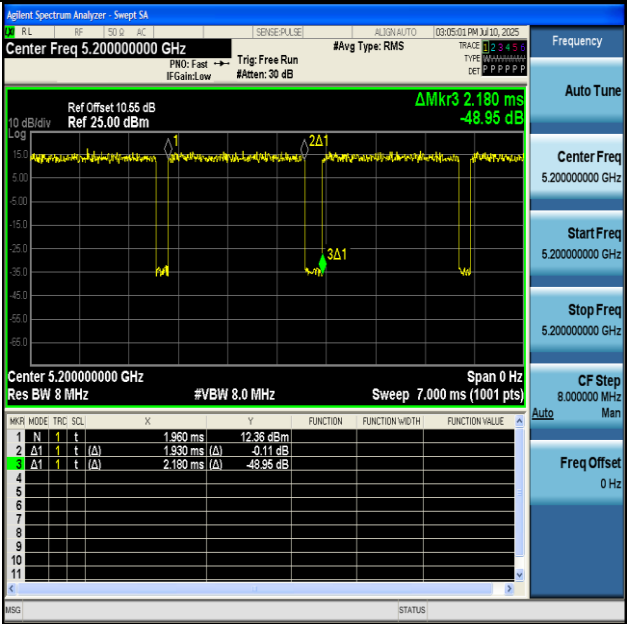
NTNV-11N20SISO-Ant1-5200



NTNV-11N20SISO-Ant1-5240



NTNV-11AC20SISO-Ant1-5180



NTNV-11AC20SISO-Ant1-5200

