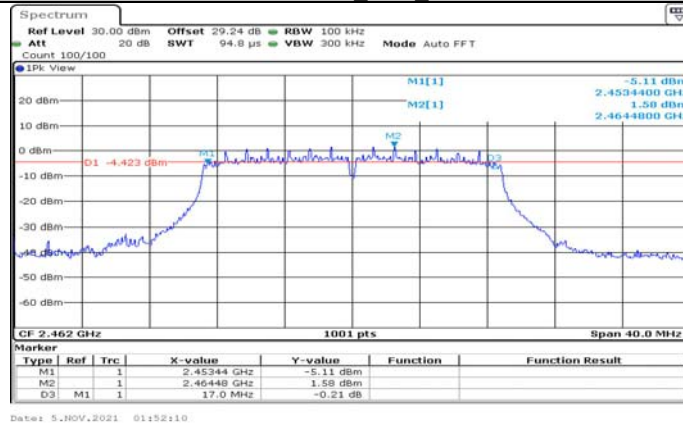


11N20MIMO_Ant0_2462



11N20MIMO_Ant1_2462



11N40MIMO_Ant0_2422



11N40MIMO_Ant1_2422

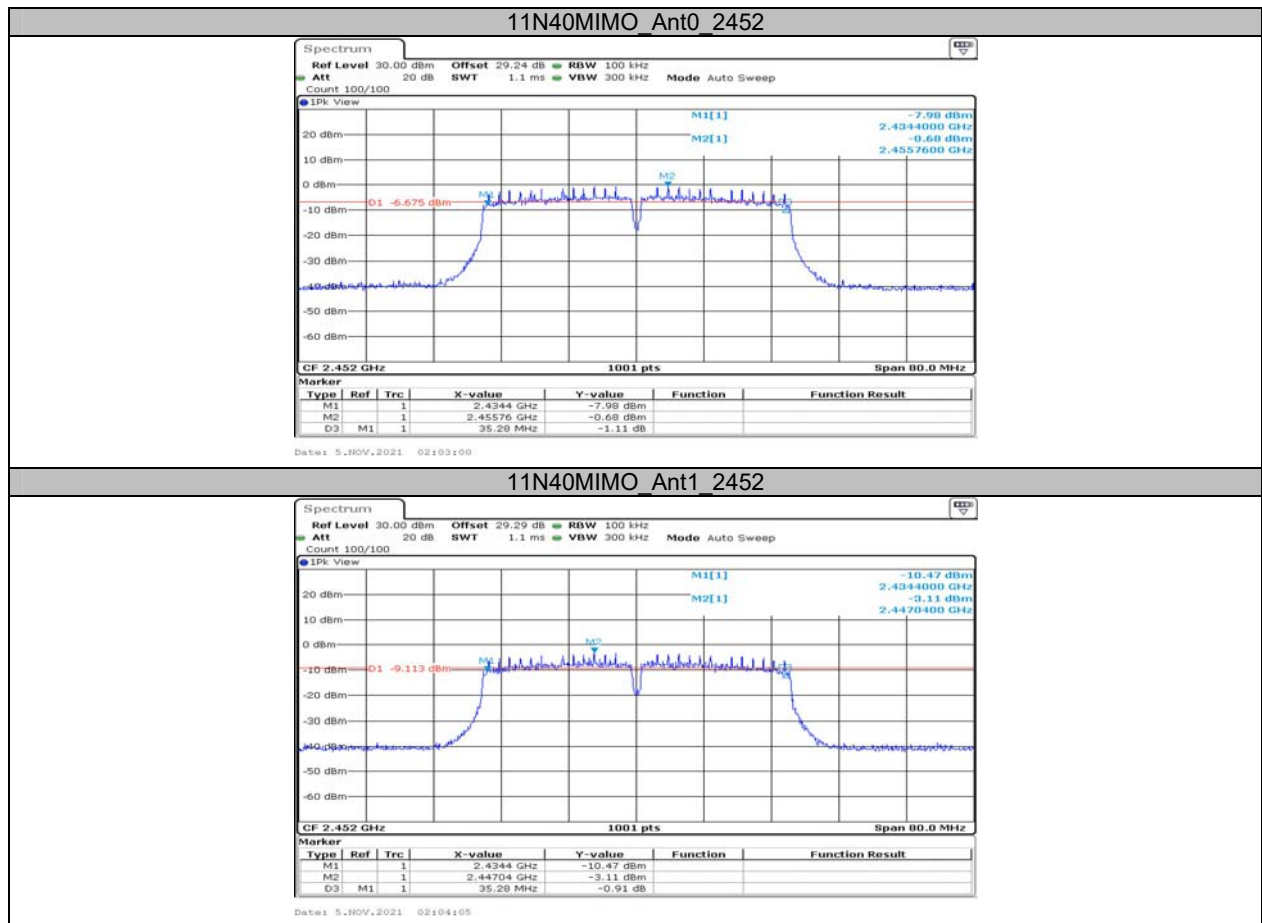


11N40MIMO_Ant0_2437



11N40MIMO_Ant1_2437

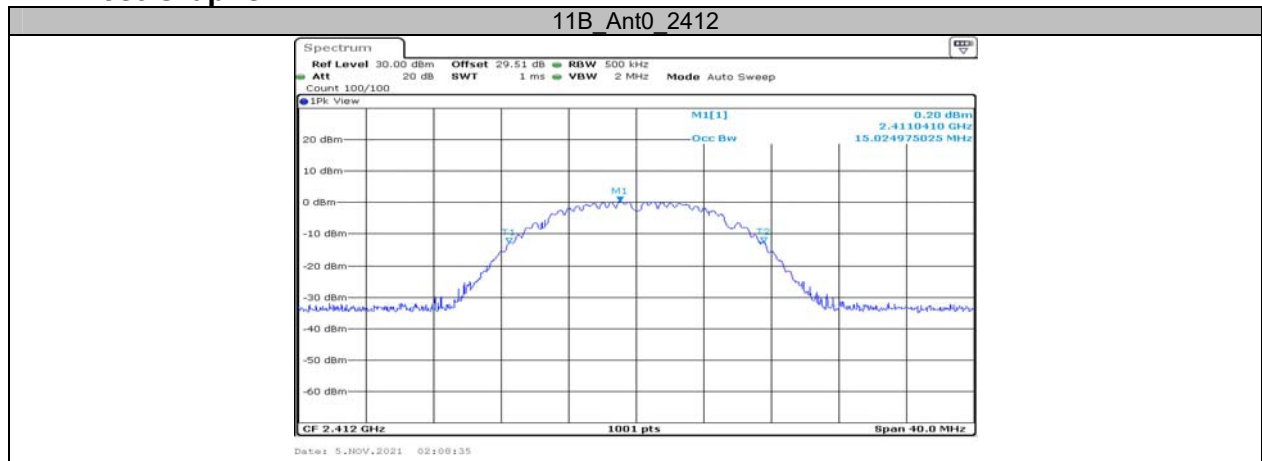




Appendix B: Occupied Channel Bandwidth Test Result

TestMode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
11B	Ant0	2412	15.025	---	PASS
	Ant1	2412	15.345	---	PASS
	Ant0	2437	15.105	---	PASS
	Ant1	2437	15.704	---	PASS
	Ant0	2462	15.265	---	PASS
	Ant1	2462	16.304	---	PASS
11G	Ant0	2412	17.223	---	PASS
	Ant1	2412	17.103	---	PASS
	Ant0	2437	17.143	---	PASS
	Ant1	2437	17.103	---	PASS
	Ant0	2462	17.103	---	PASS
	Ant1	2462	17.263	---	PASS
11N20MIMO	Ant0	2412	18.222	---	PASS
	Ant1	2412	17.862	---	PASS
	Ant0	2437	18.262	---	PASS
	Ant1	2437	17.782	---	PASS
	Ant0	2462	18.182	---	PASS
	Ant1	2462	17.862	---	PASS
11N40MIMO	Ant0	2422	36.523	---	PASS
	Ant1	2422	36.364	---	PASS
	Ant0	2437	36.523	---	PASS
	Ant1	2437	36.364	---	PASS
	Ant0	2452	36.364	---	PASS
	Ant1	2452	36.364	---	PASS

Test Graphs



11B_Ant1_2412



11B_Ant0_2437



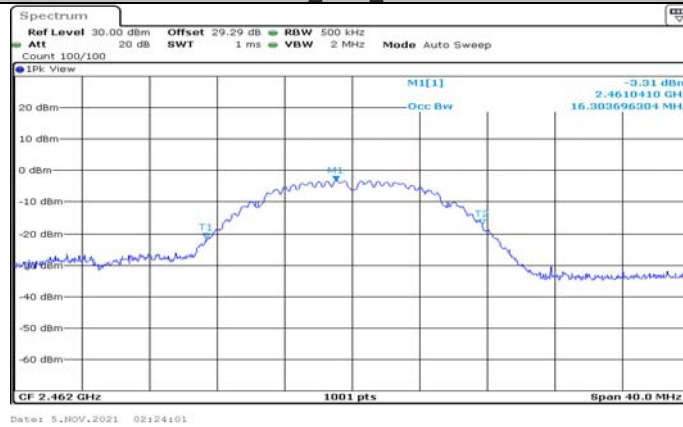
11B_Ant1_2437



11B_Ant0_2462



11B_Ant1_2462



11G_Ant0_2412



11G_Ant1_2412



11G_Ant0_2437



11G_Ant1_2437



11G_Ant0_2462



11G_Ant1_2462



11N20MIMO_Ant0_2412



11N20MIMO_Ant1_2412

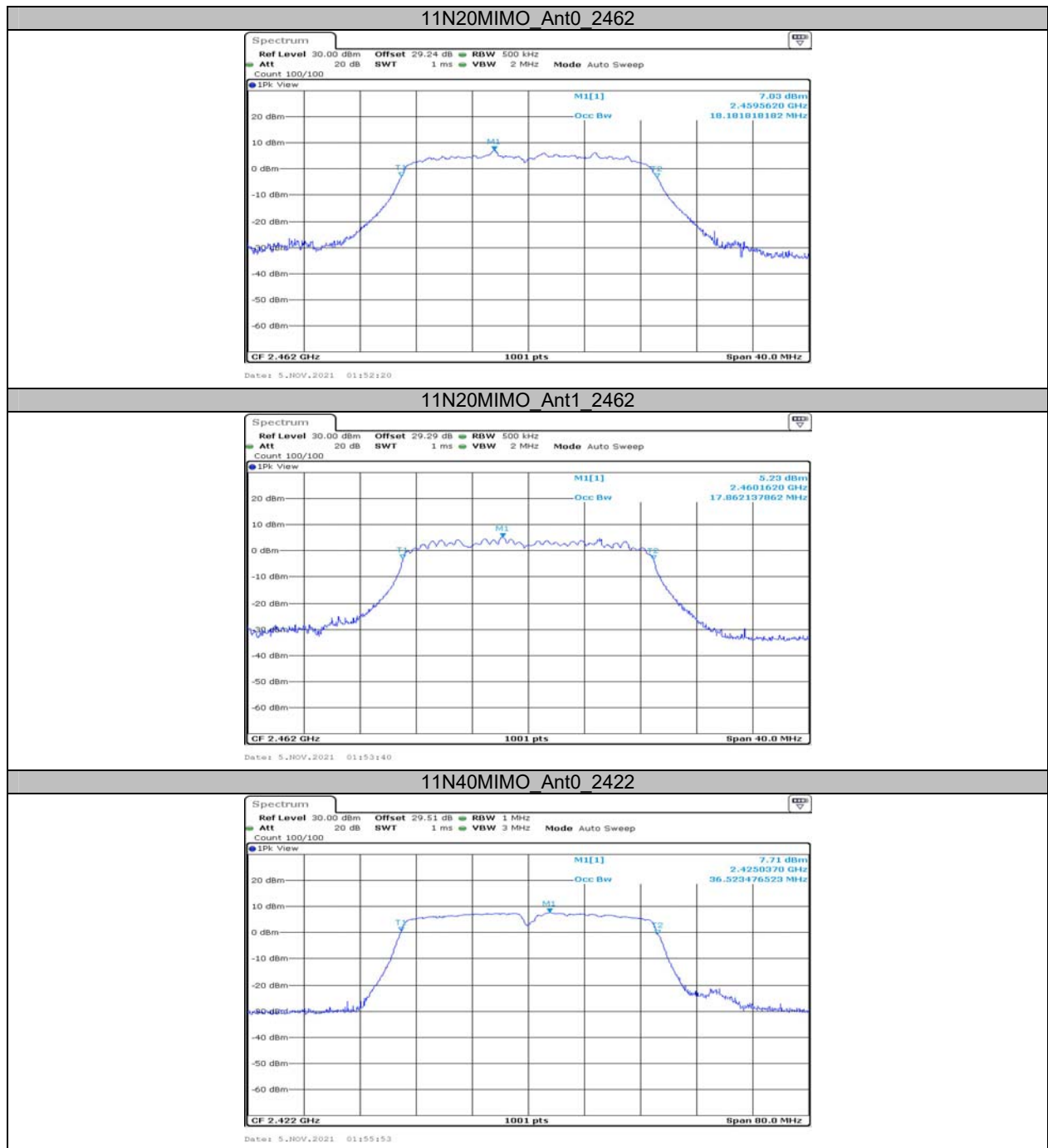


11N20MIMO_Ant0_2437



11N20MIMO_Ant1_2437





11N40MIMO_Ant1_2422

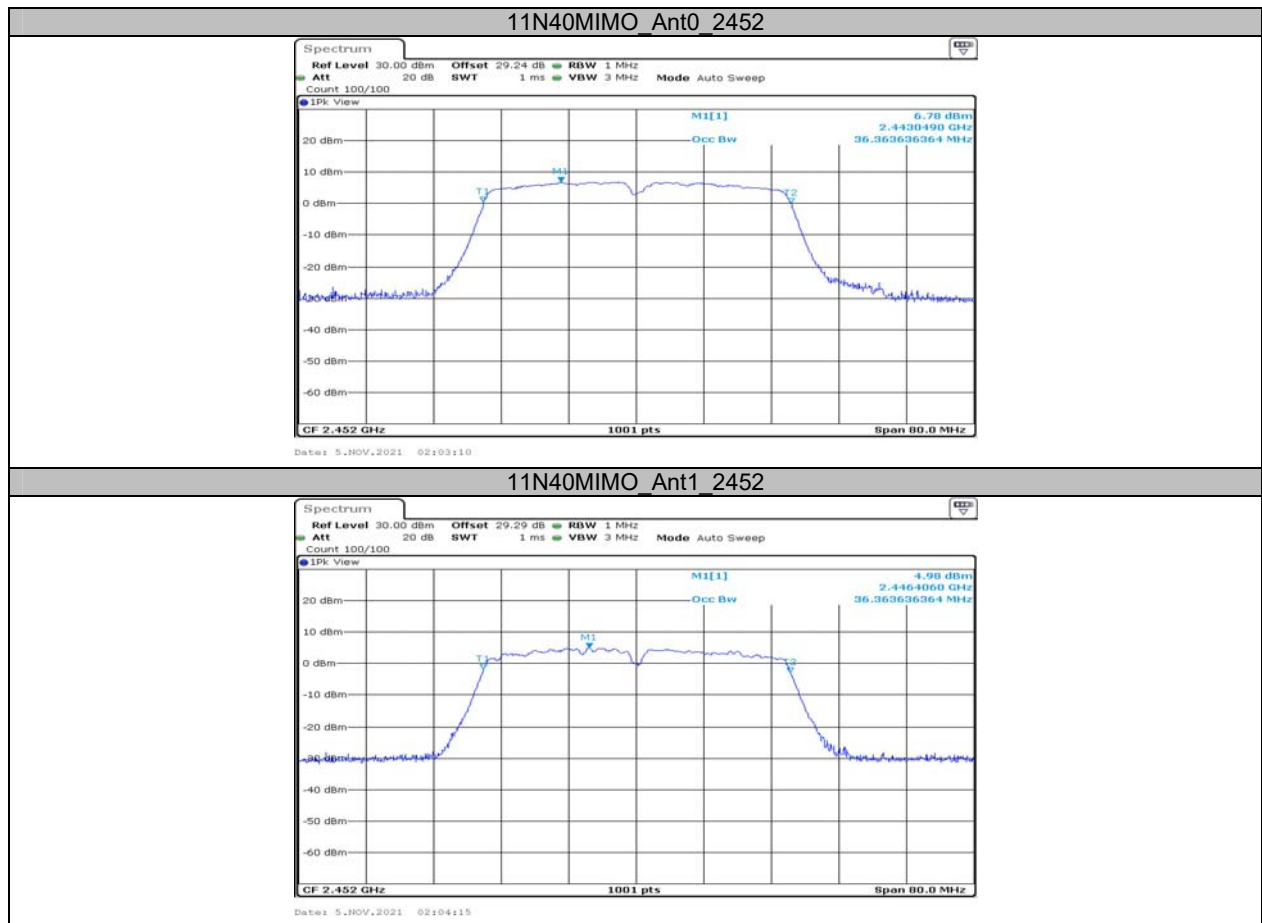


11N40MIMO_Ant0_2437



11N40MIMO_Ant1_2437





Appendix C: Maximum conducted output power Test Result

Peak:

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant0	2412	12.68	≤30	PASS
	Ant1	2412	13.59	≤30	PASS
	Ant0	2437	12.41	≤30	PASS
	Ant1	2437	13.30	≤30	PASS
	Ant0	2462	12.13	≤30	PASS
	Ant1	2462	13.20	≤30	PASS
11G	Ant0	2412	15.67	≤30	PASS
	Ant1	2412	14.75	≤30	PASS
	Ant0	2437	15.52	≤30	PASS
	Ant1	2437	14.25	≤30	PASS
	Ant0	2462	15.67	≤30	PASS
	Ant1	2462	14.43	≤30	PASS
11N20MIMO	Ant0	2412	14.31	≤30	PASS
	Ant1	2412	14.16	≤30	PASS
	total	2412	17.2	≤30	PASS
	Ant0	2437	13.92	≤30	PASS
	Ant1	2437	13.70	≤30	PASS
	total	2437	16.8	≤30	PASS
	Ant0	2462	14.02	≤30	PASS
	Ant1	2462	13.61	≤30	PASS
11N40MIMO	total	2462	16.8	≤30	PASS
	Ant0	2422	14.68	≤30	PASS
	Ant1	2422	14.34	≤30	PASS
	total	2422	17.5	≤30	PASS
	Ant0	2437	13.82	≤30	PASS
	Ant1	2437	13.70	≤30	PASS
	total	2437	16.8	≤30	PASS
	Ant0	2452	13.18	≤30	PASS
	Ant1	2452	14.69	≤30	PASS
	total	2452	17.0	≤30	PASS

Note 1: The maximum antenna gain is 2dBi. The device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power measurements on IEEE 802.11 devices:

Array Gain = 0dB (i.e., no array gain) For $N_{ANT} \leq 4$;

So: Directional gain = 2dBi < 6dBi.

Appendix D: Maximum power spectral density Test Result

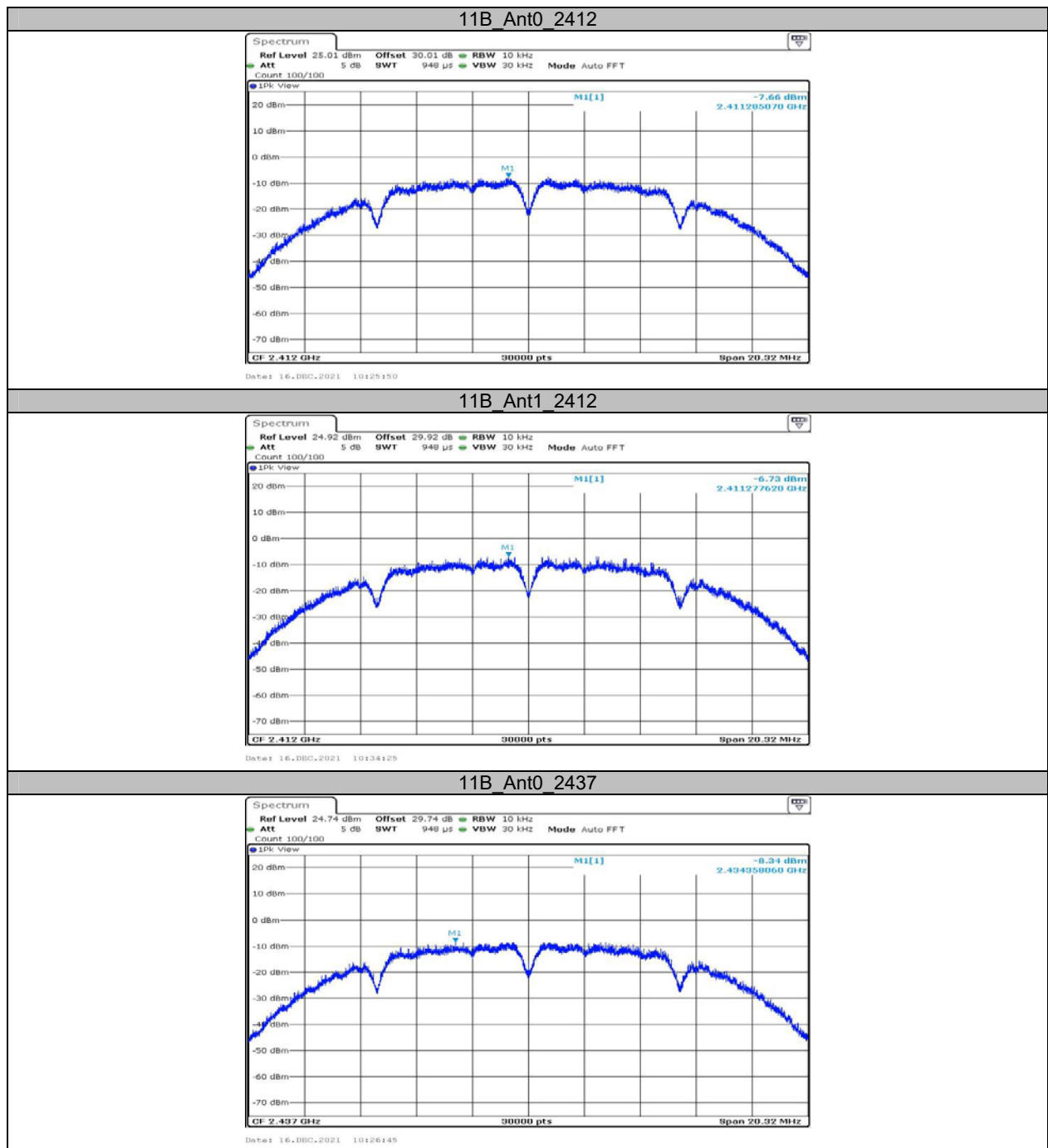
TestMode	Antenna	Channel	Result[dBm/10kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant0	2412	-7.66	≤8	PASS
	Ant1	2412	-6.73	≤8	PASS
	Ant0	2437	-8.34	≤8	PASS
	Ant1	2437	-6.76	≤8	PASS
	Ant0	2462	-7.47	≤8	PASS
	Ant1	2462	-7.44	≤8	PASS
11G	Ant0	2412	-9.75	≤8	PASS
	Ant1	2412	-11.96	≤8	PASS
	Ant0	2437	-10.8	≤8	PASS
	Ant1	2437	-10.11	≤8	PASS
	Ant0	2462	-10.62	≤8	PASS
	Ant1	2462	-10.63	≤8	PASS
11N20MIMO	Ant0	2412	-11.22	≤8	PASS
	Ant1	2412	-12.47	≤8	PASS
	total	2412	-8.79	≤8	PASS
	Ant0	2437	-11.58	≤8	PASS
	Ant1	2437	-12.03	≤8	PASS
	total	2437	-8.79	≤8	PASS
	Ant0	2462	-11.67	≤8	PASS
	Ant1	2462	-13.12	≤8	PASS
11N40MIMO	total	2462	-9.32	≤8	PASS
	Ant0	2422	-13.27	≤8	PASS
	Ant1	2422	-14.4	≤8	PASS
	total	2422	-10.79	≤8	PASS
	Ant0	2437	-13.24	≤8	PASS
	Ant1	2437	-14.82	≤8	PASS
	total	2437	-10.95	≤8	PASS
	Ant0	2452	-14.13	≤8	PASS
	Ant1	2452	-14.66	≤8	PASS
	total	2452	-11.38	≤8	PASS

Note 1: The maximum antenna gain is 2 dBi. The device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices

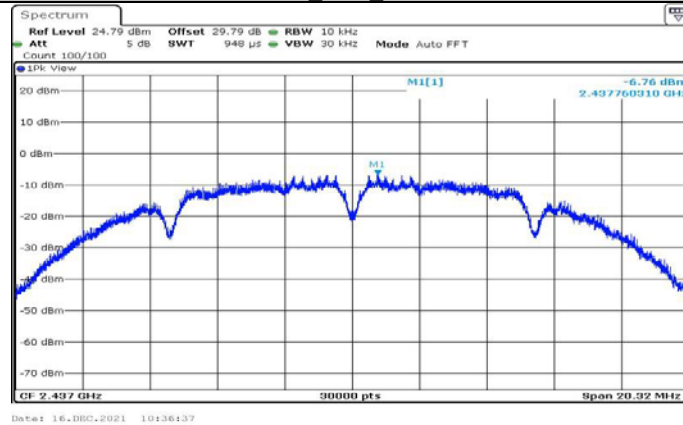
$$\text{Array Gain} = 10 \log(N_{\text{ANT}}/N_{\text{ss}})\text{dB}$$

$$\text{So: Directional gain} = G_{\text{ANT}} + \text{Array Gain} = 2 + 10 \cdot \log(2/1) = 5.01 \text{dBi} < 6 \text{dBi}$$

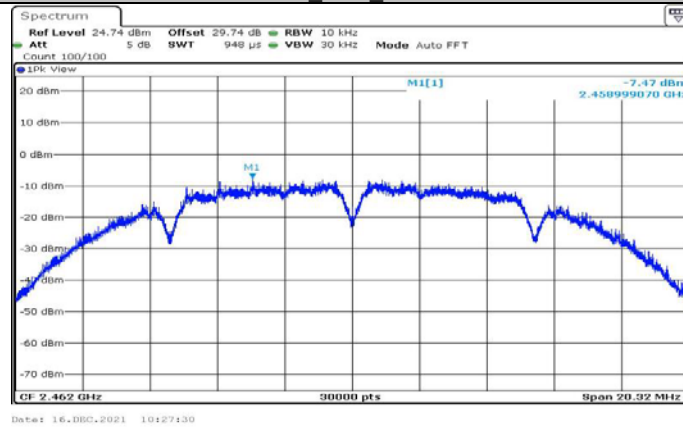
Test Graphs



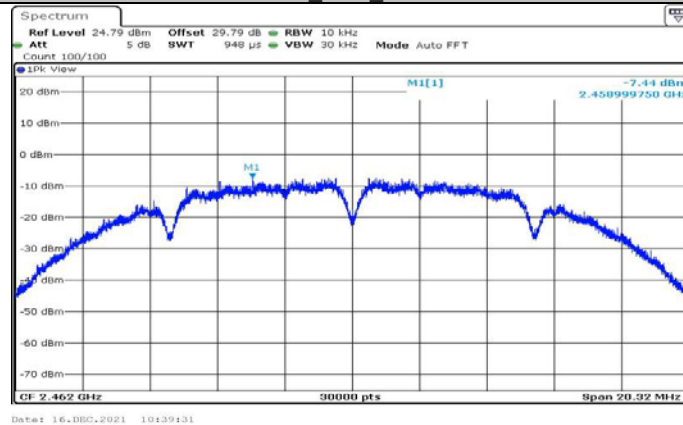
11B_Ant1_2437



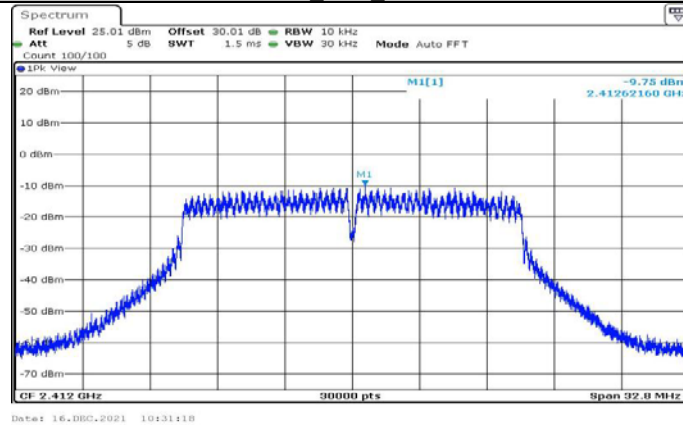
11B_Ant0_2462



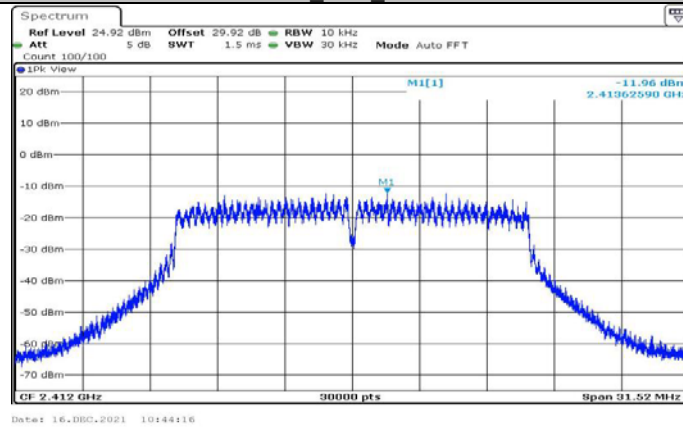
11B_Ant1_2462



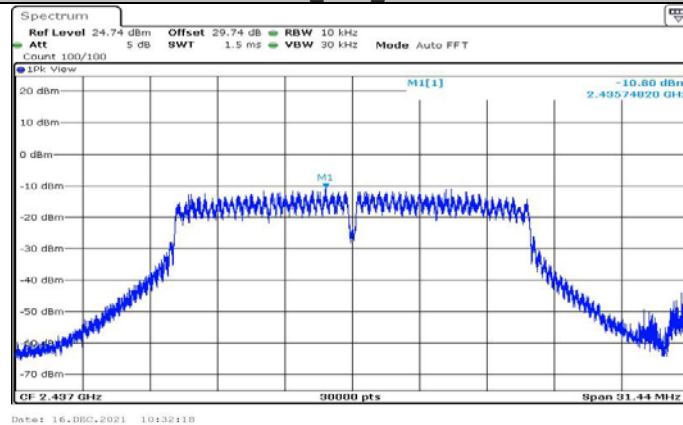
11G_Ant0_2412



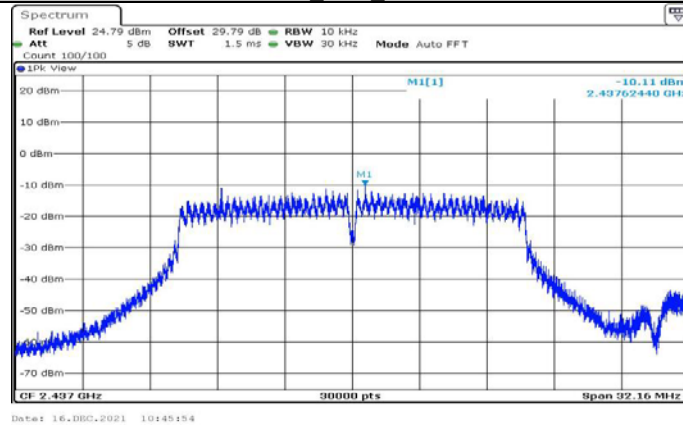
11G_Ant1_2412



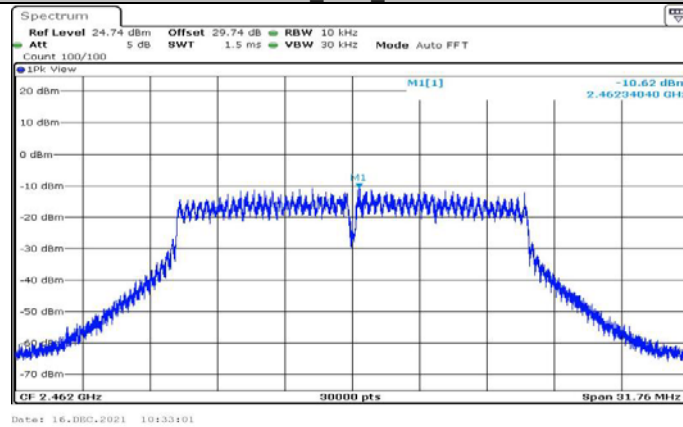
11G_Ant0_2437



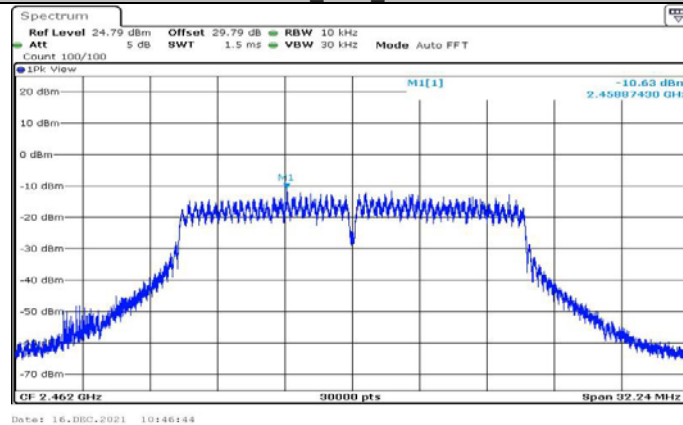
11G_Ant1_2437



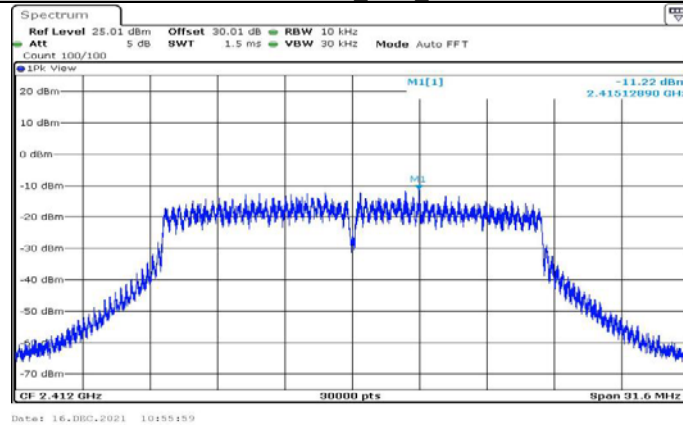
11G_Ant0_2462



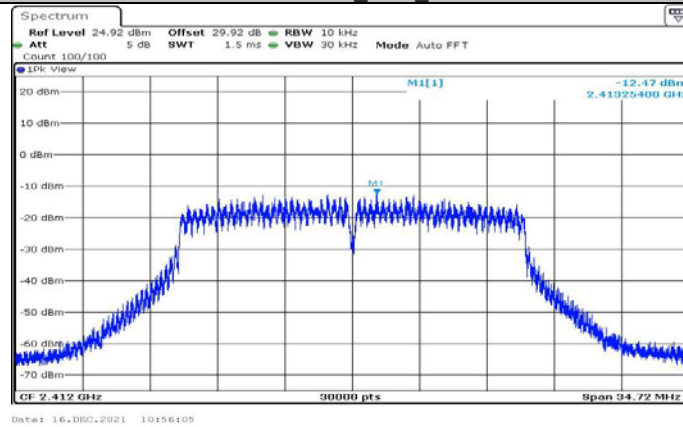
11G_Ant1_2462



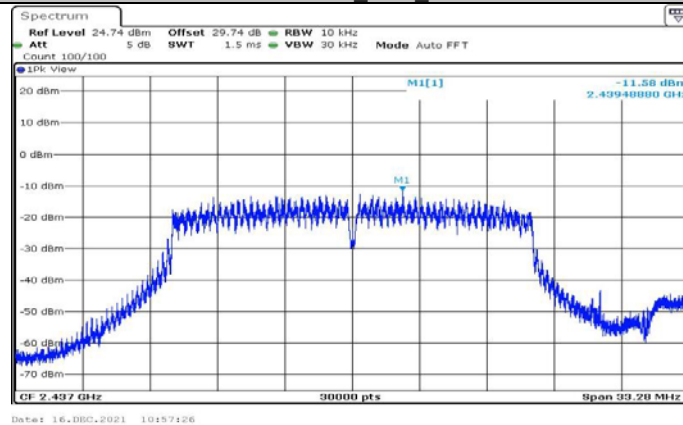
11N20MIMO_Ant0_2412



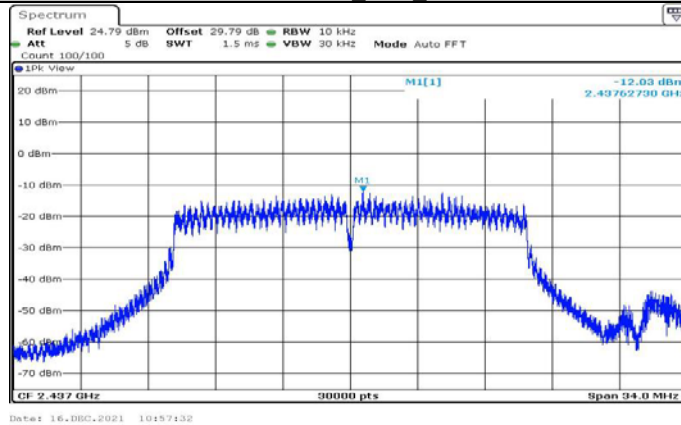
11N20MIMO_Ant1_2412



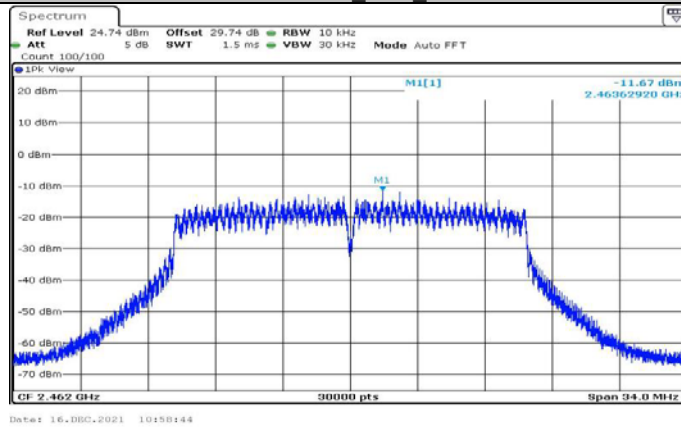
11N20MIMO_Ant0_2437



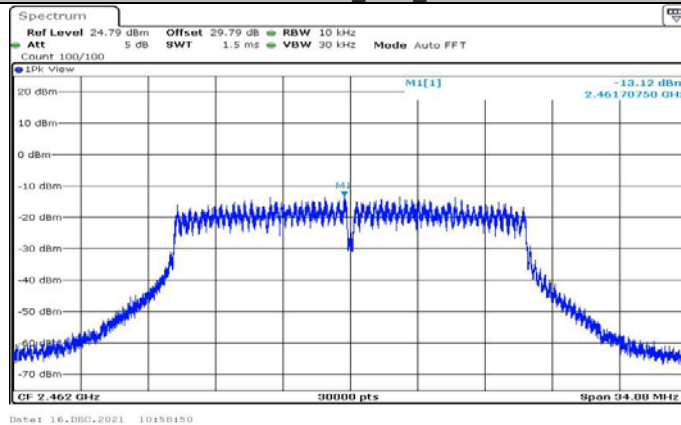
11N20MIMO_Ant1_2437

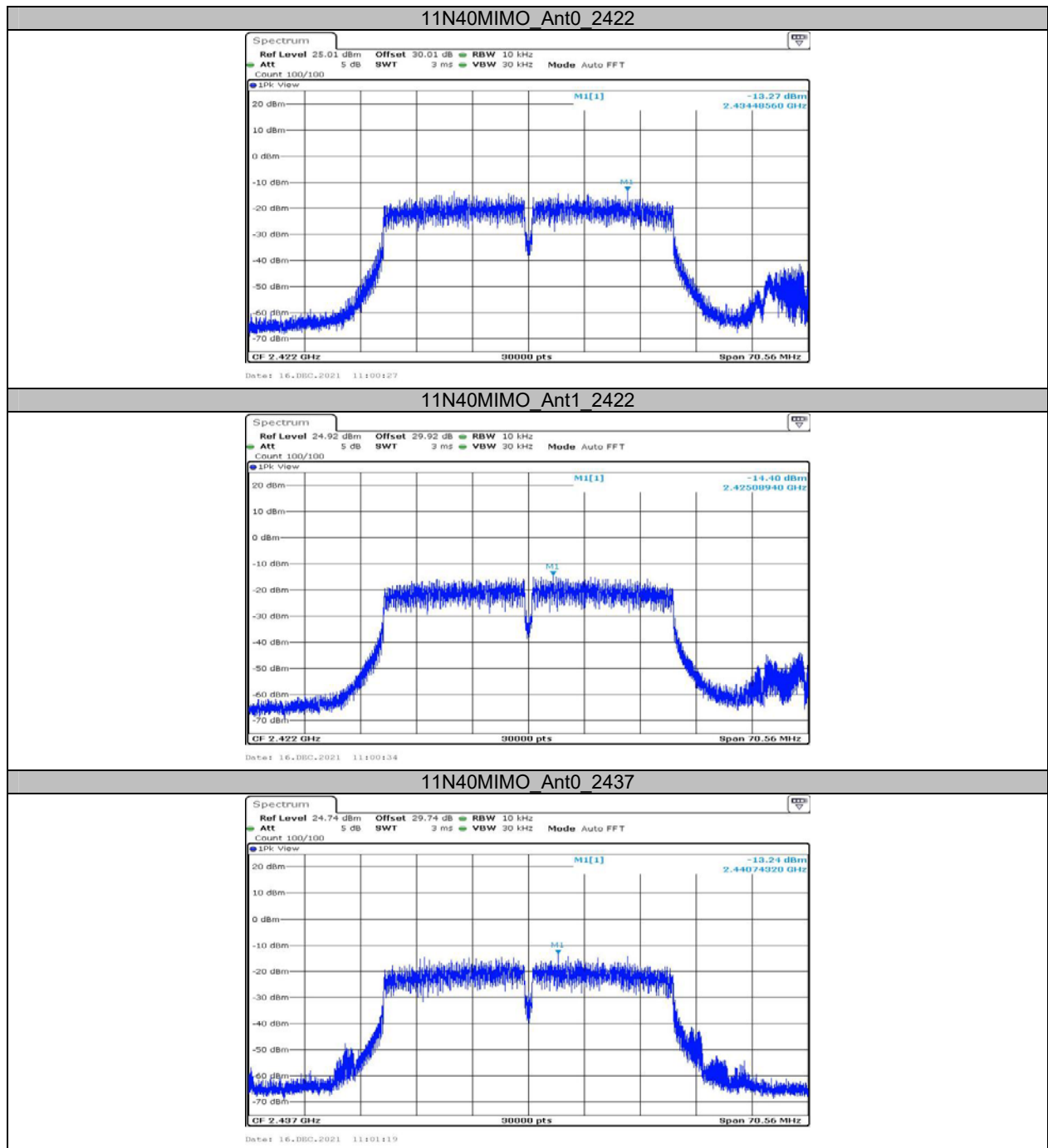


11N20MIMO_Ant0_2462

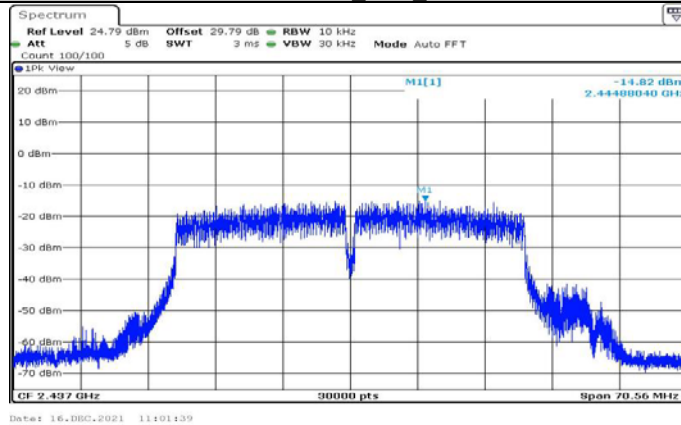


11N20MIMO_Ant1_2462

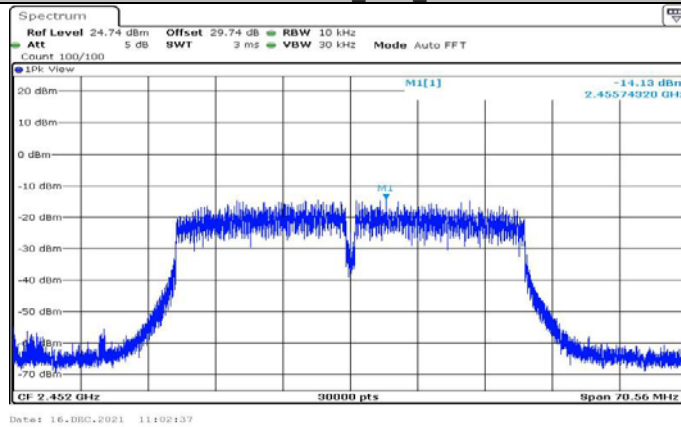




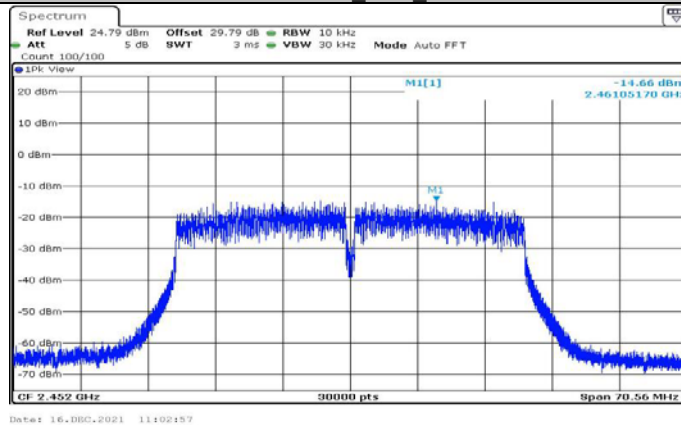
11N40MIMO_Ant1_2437



11N40MIMO_Ant0_2452



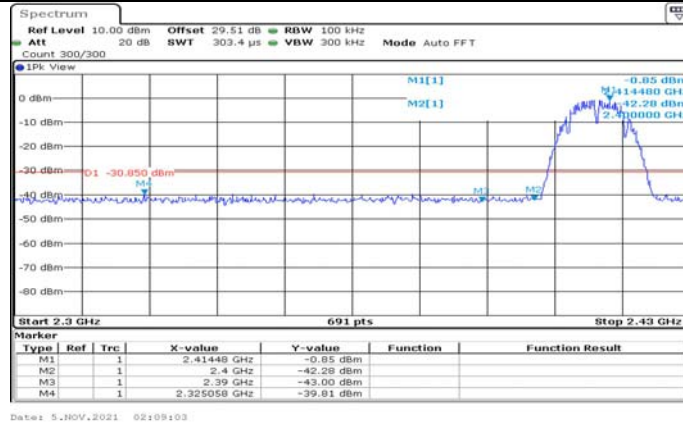
11N40MIMO_Ant1_2452



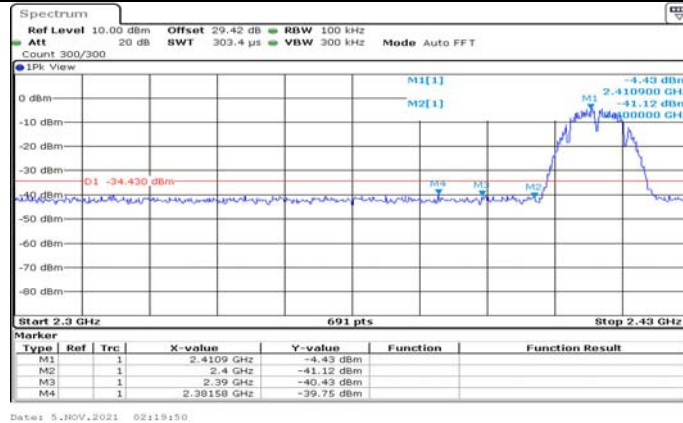
Appendix E: Band edge measurements

Test Graphs

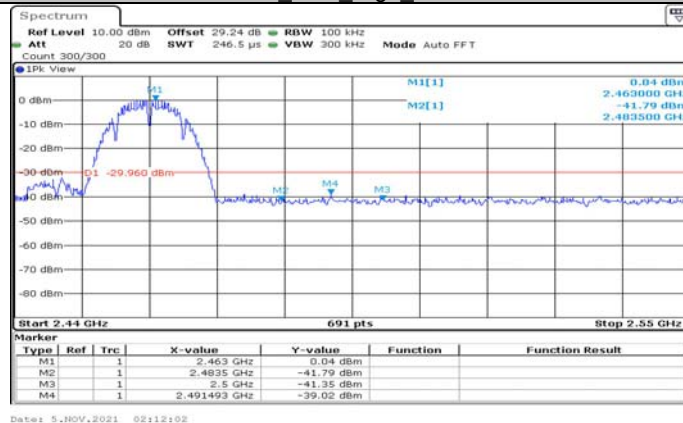
11B_Ant0_Low_2412



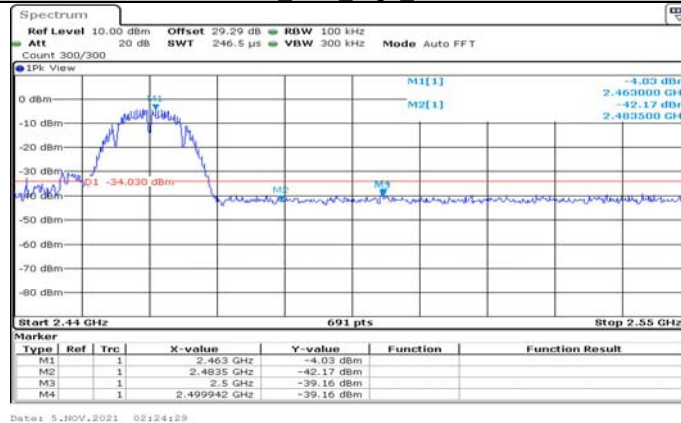
11B_Ant1_Low_2412



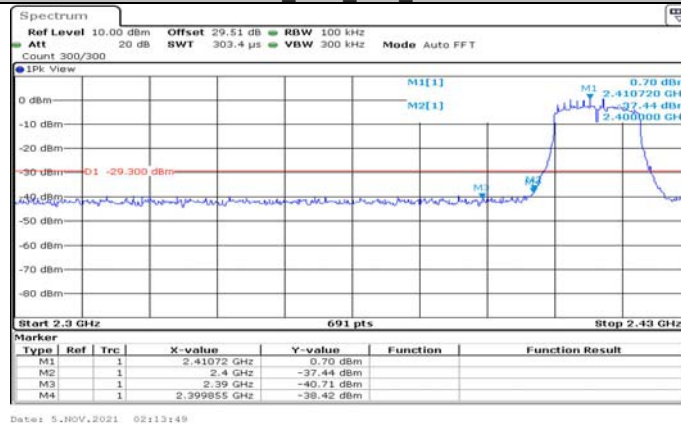
11B_Ant0_High_2462



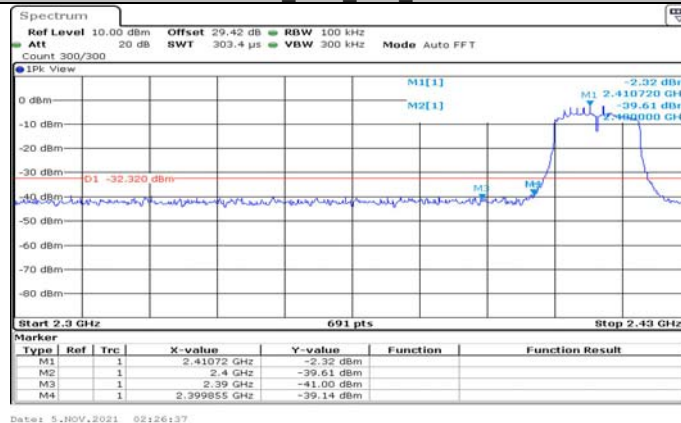
11B Ant1_High_2462



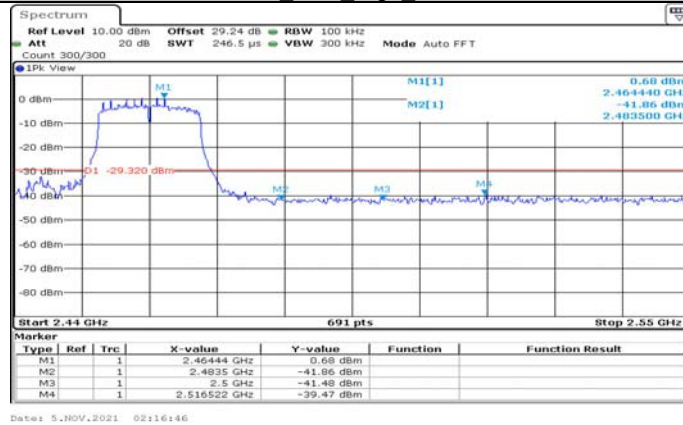
11G Ant0_Low_2412



11G Ant1_Low_2412



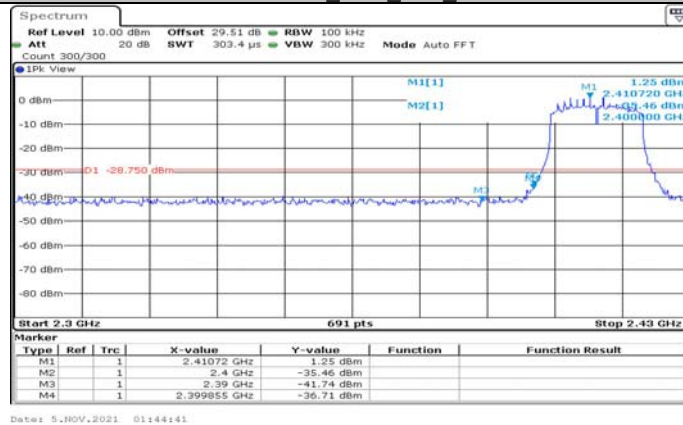
11G Ant0_High_2462

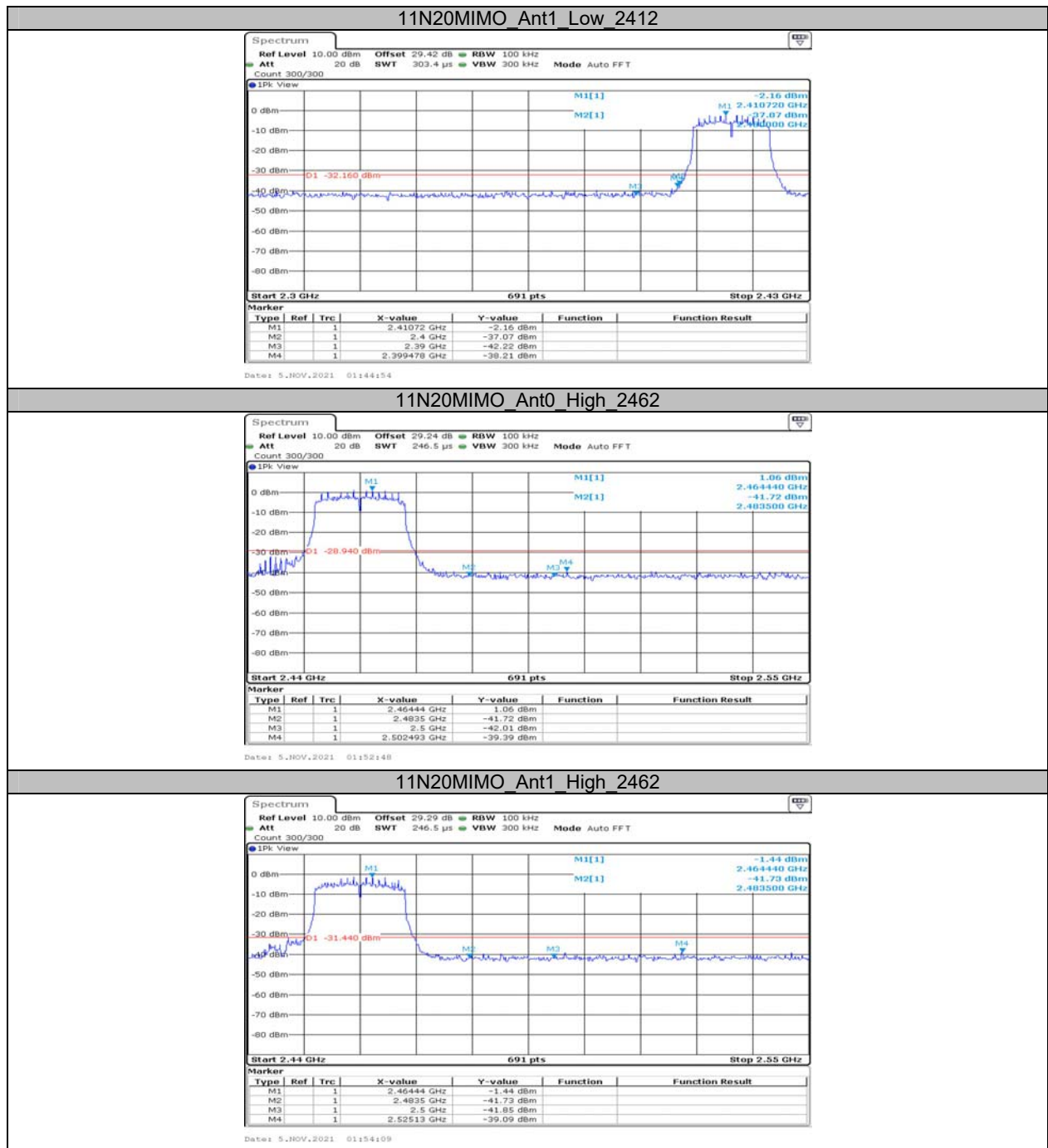


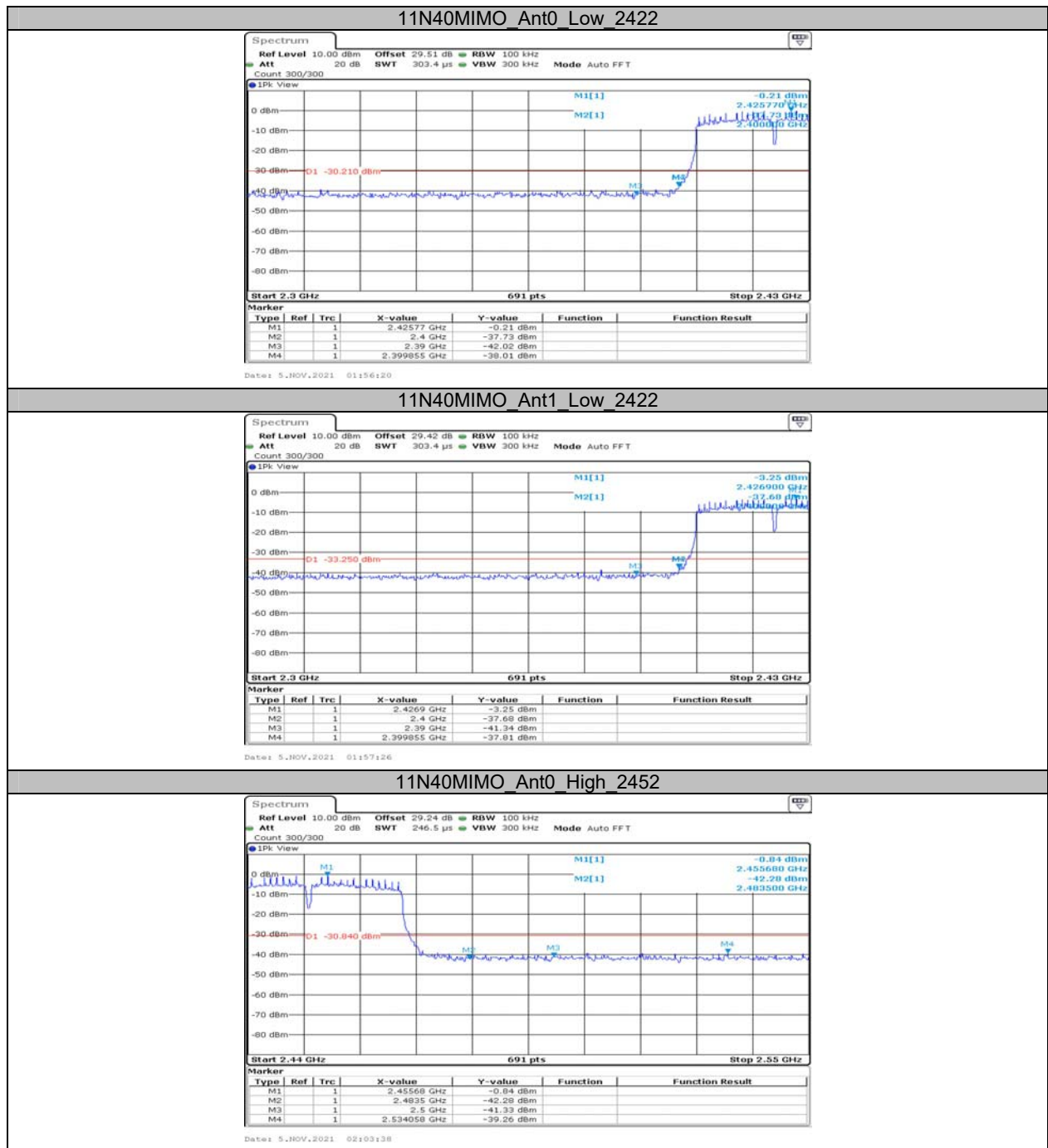
11G Ant1_High_2462

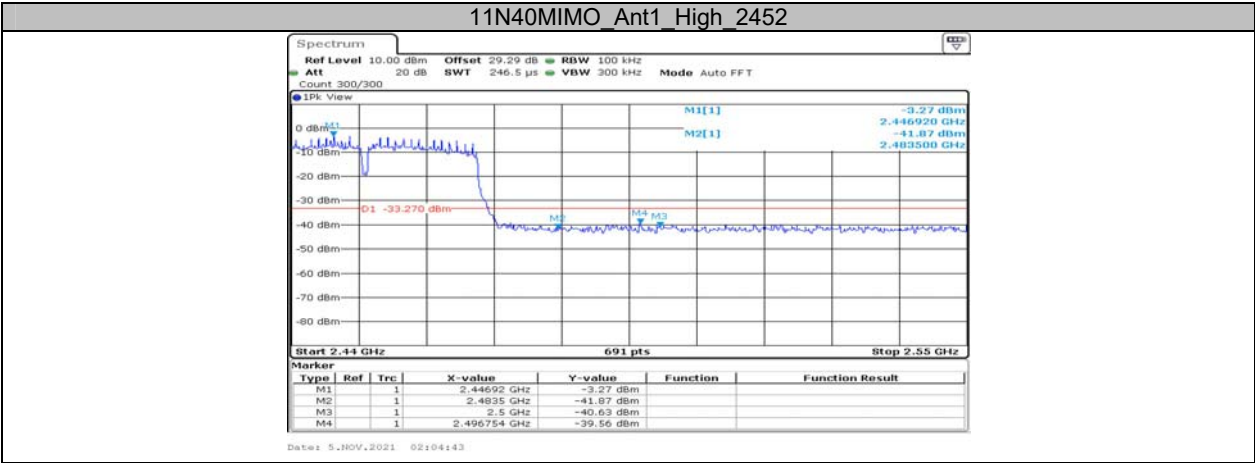


11N20MIMO_Ant0_Low_2412







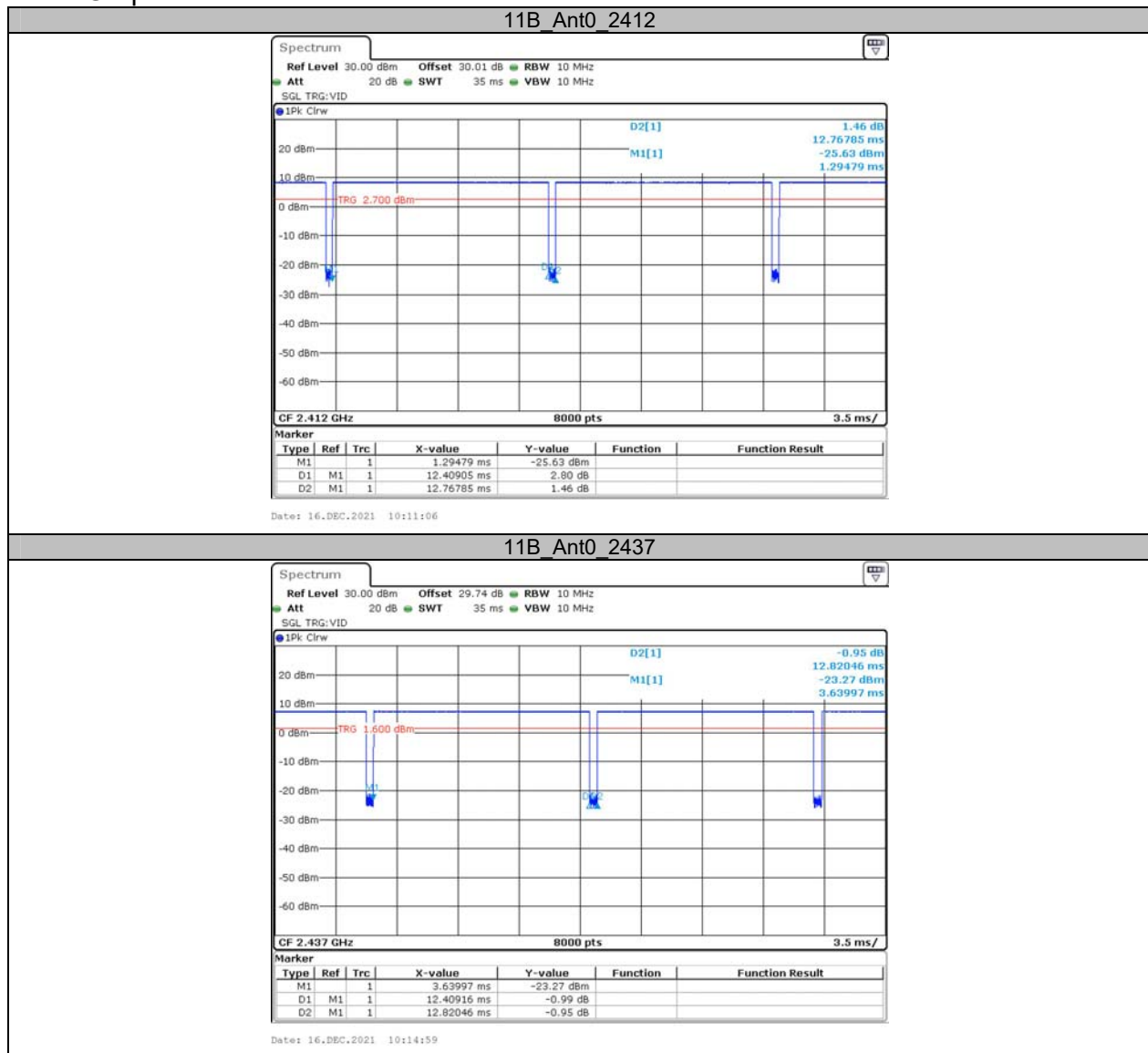


Note: Test results can meet requirements about attenuation for both 20dB and 30dB.

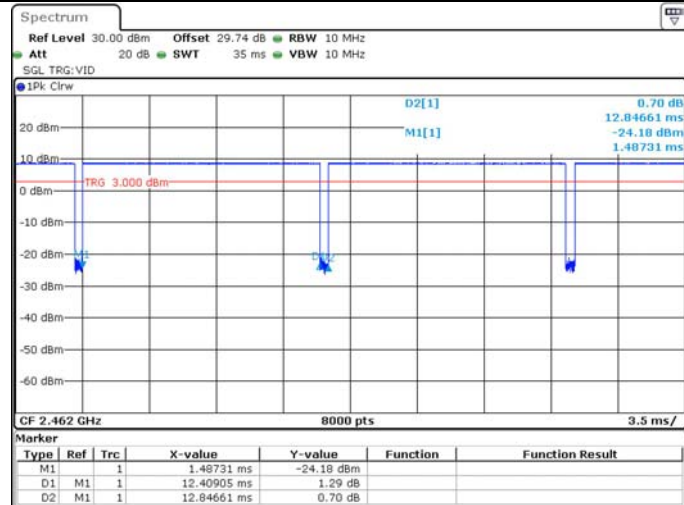
Appendix F: Duty Cycle Test Result

TestMode	Antenna	Channel	TransmissionDuration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	Ant0	2412	12.41	12.77	97.18
	Ant0	2437	12.41	12.82	96.80
	Ant0	2462	12.41	12.84	96.65
11G	Ant0	2412	2.05	2.28	89.91
	Ant0	2437	2.05	2.28	89.91
	Ant0	2462	2.05	2.28	89.91
11N20MIMO	Ant0	2412	0.97	1.17	82.91
	Ant0	2437	0.97	1.20	80.83
	Ant0	2462	0.98	1.16	84.48
11N40MIMO	Ant0	2422	0.49	0.78	62.82
	Ant0	2437	0.49	0.71	69.01
	Ant0	2452	0.50	0.72	69.44

Test Graphs

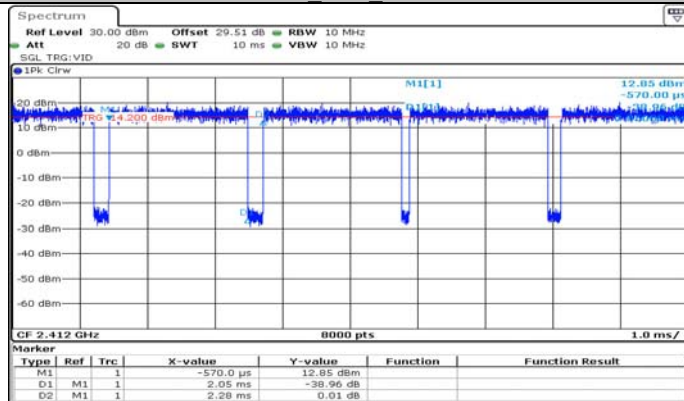


11B_Ant0_2462



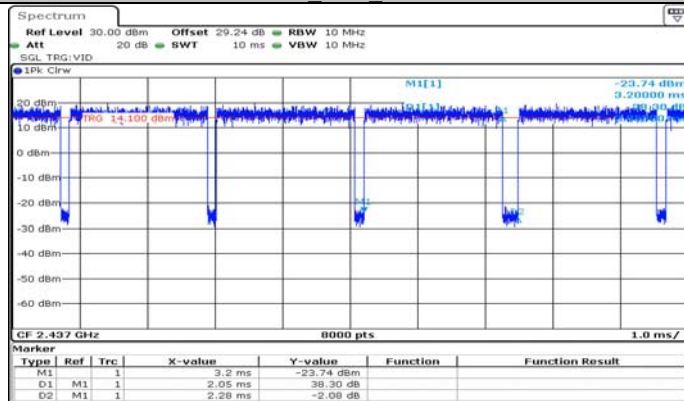
Date: 16.DEC.2021 10:18:16

11G_Ant0_2412



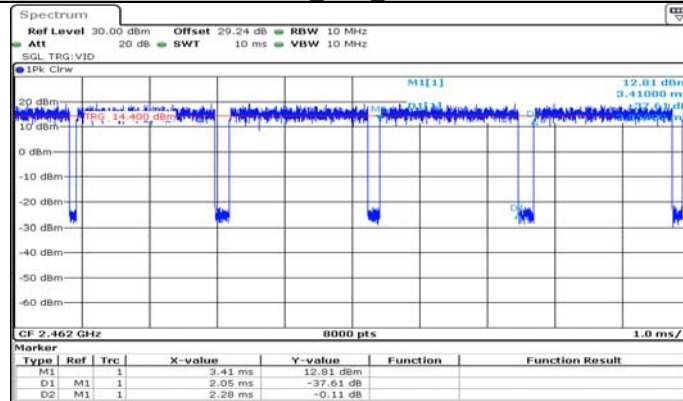
Date: 5.NOV.2021 02:13:00

11G_Ant0_2437



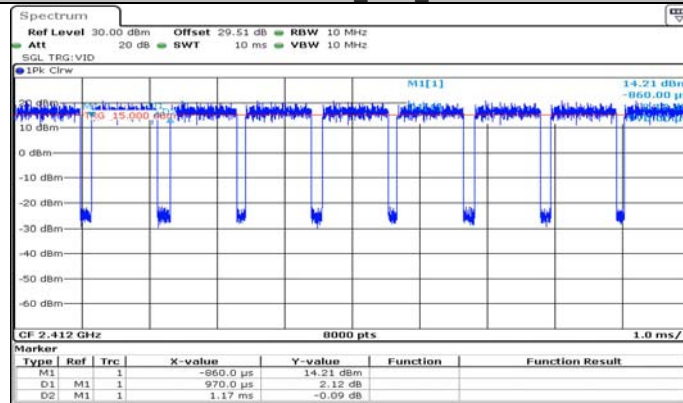
Date: 5.NOV.2021 02:14:16

11G_Ant0_2462



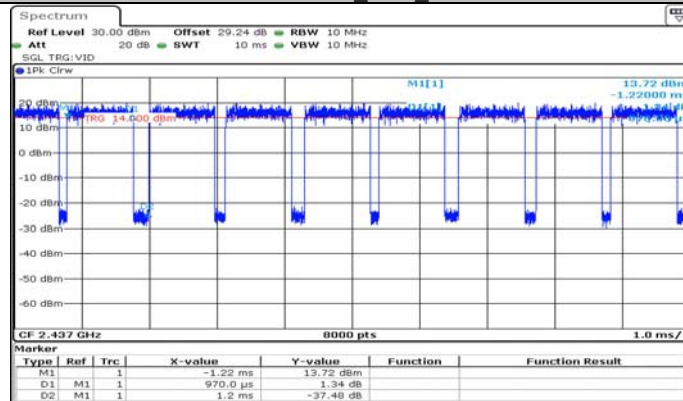
Date: 5.NOV.2021 02:15:57

11N20MIMO_Ant0_2412



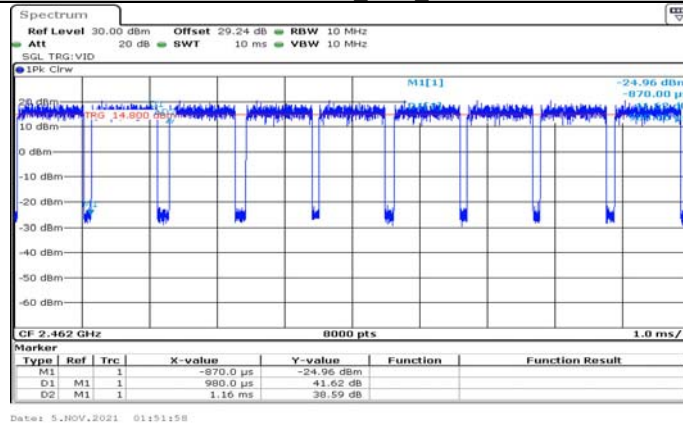
Date: 5.NOV.2021 00:10:57

11N20MIMO_Ant0_2437

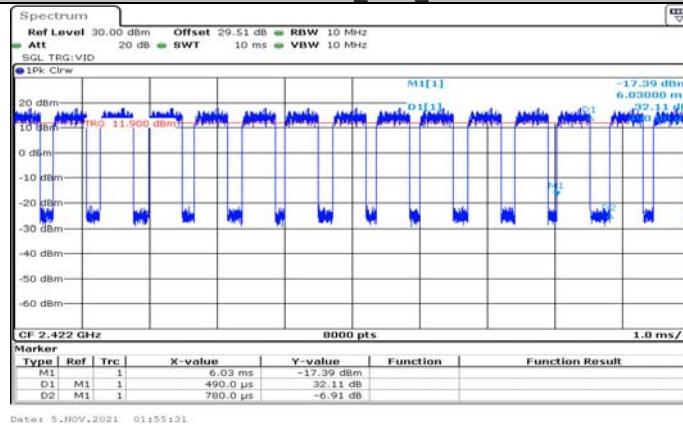


Date: 5.NOV.2021 01:48:51

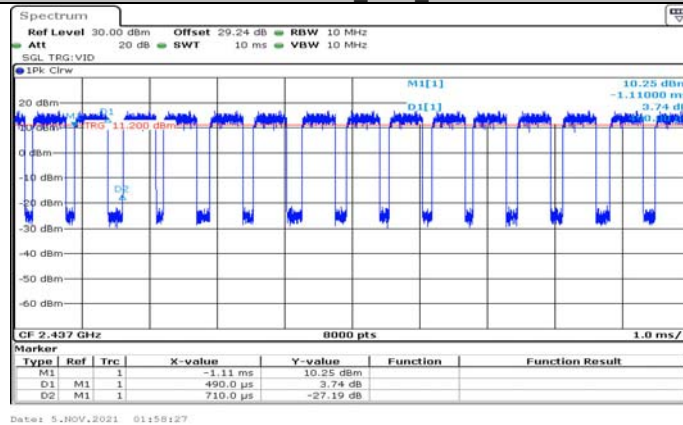
11N20MIMO_Ant0_2462

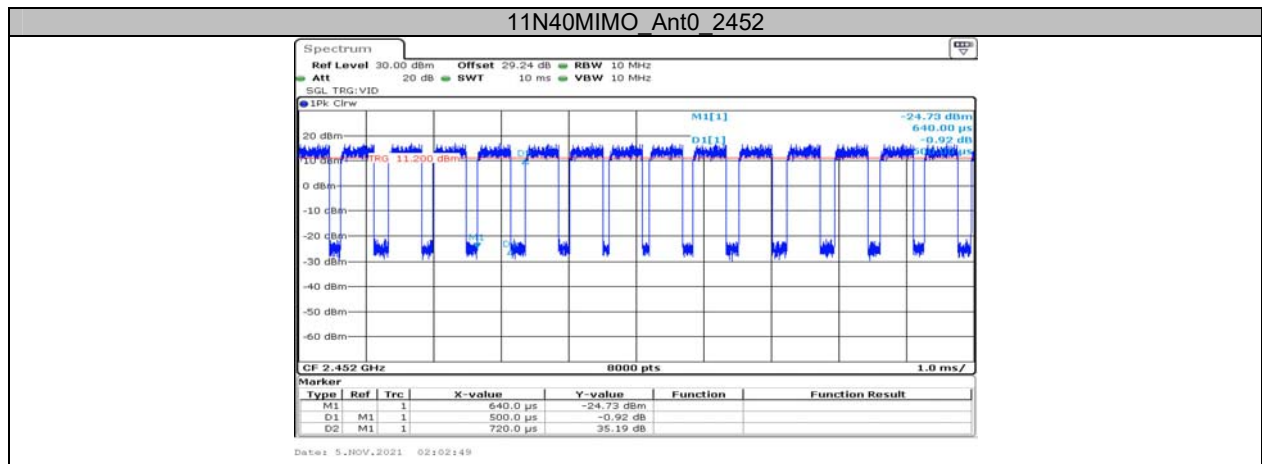


11N40MIMO_Ant0_2422



11N40MIMO_Ant0_2437



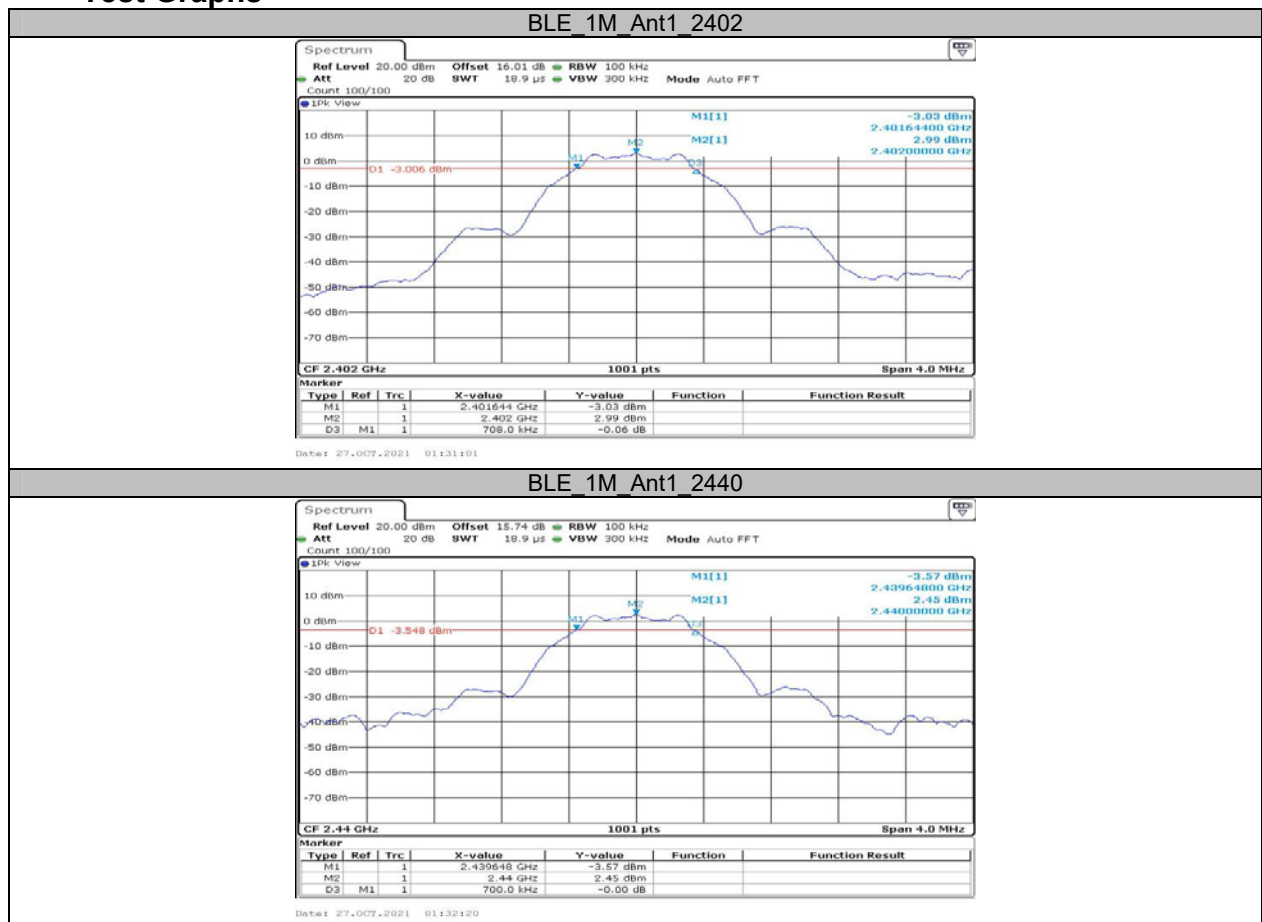


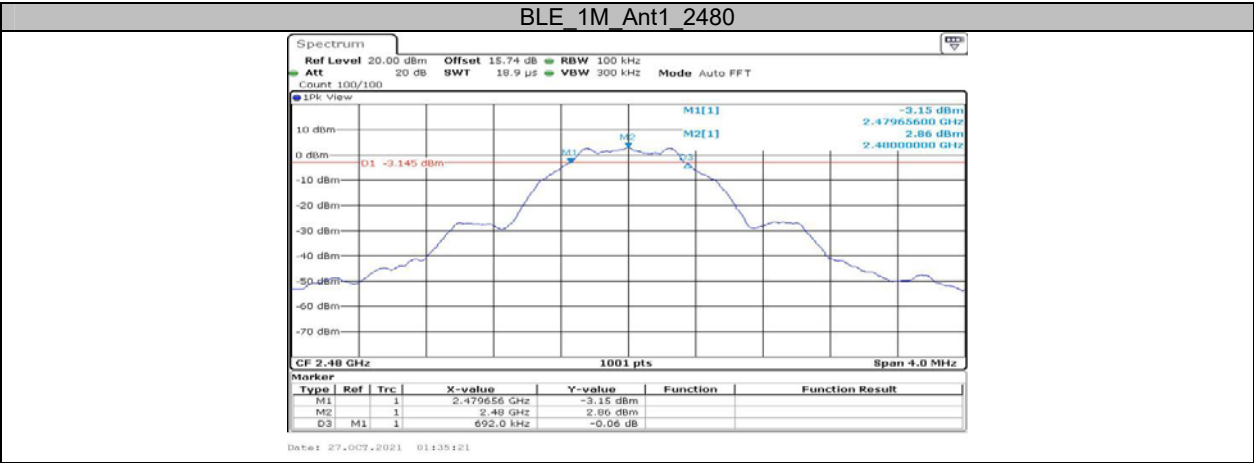
APPENDIX BLE 1M

Appendix A: DTS Bandwidth Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.708	0.5	PASS
		2440	0.700	0.5	PASS
		2480	0.692	0.5	PASS

Test Graphs

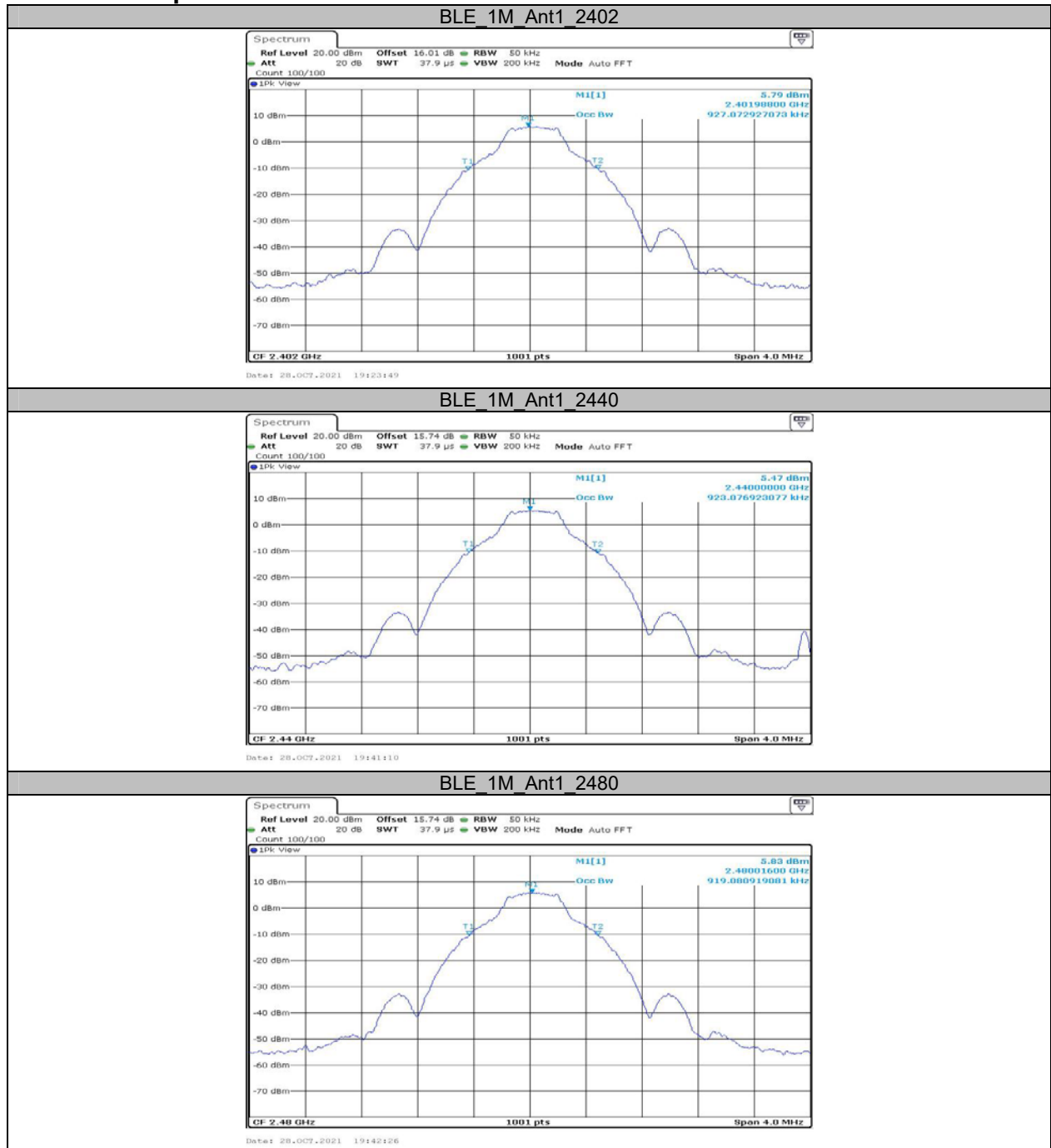




Appendix B: Occupied Channel Bandwidth Test Result

TestMode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.927	---	PASS
		2440	0.923	---	PASS
		2480	0.919	---	PASS

Test Graphs



Appendix C: Maximum conducted Peak output power**Test Result**

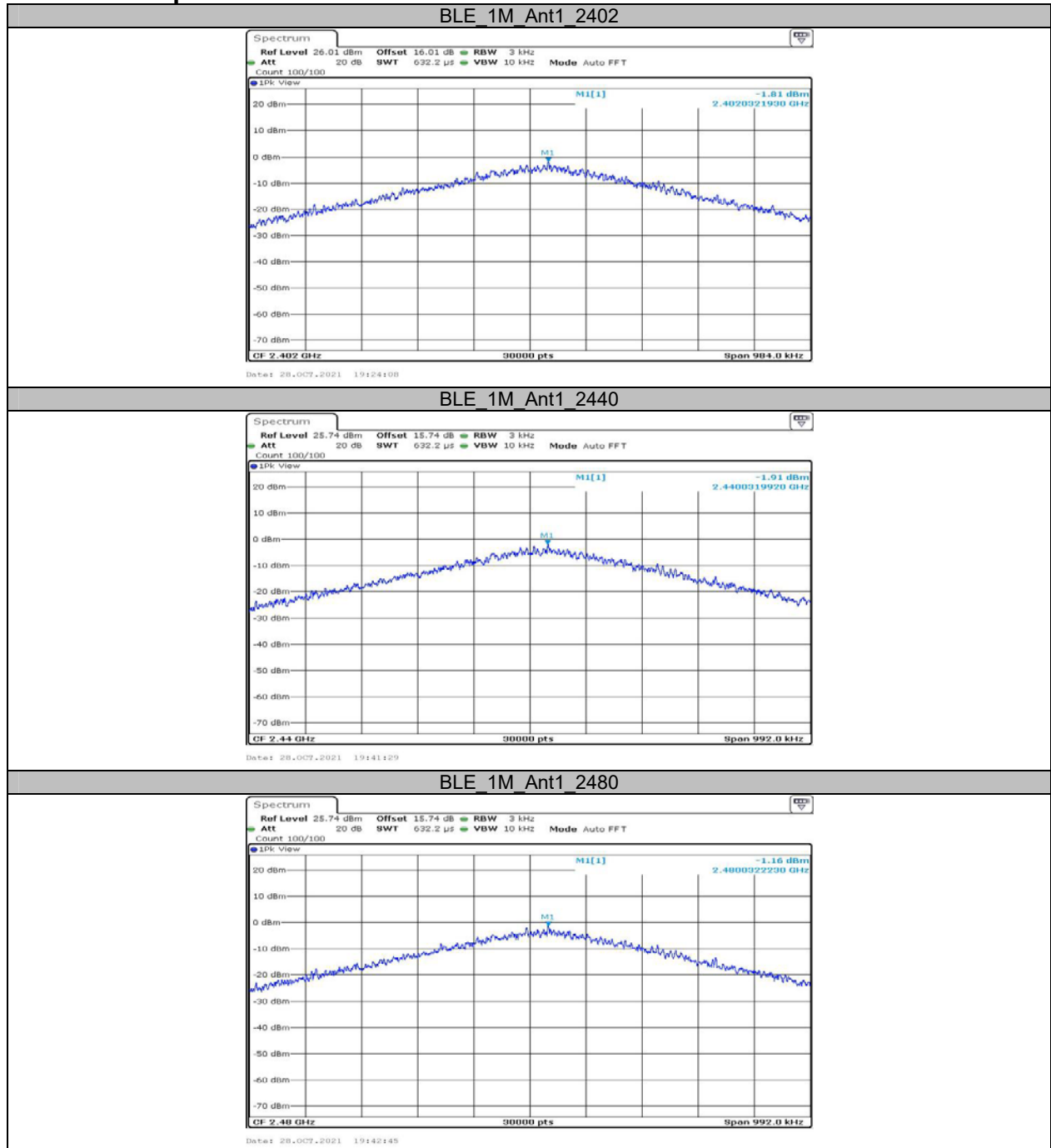
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	7.15	≤30	PASS
		2440	7.31	≤30	PASS
		2480	8.13	≤30	PASS

Appendix D: Maximum power spectral density

Test Result

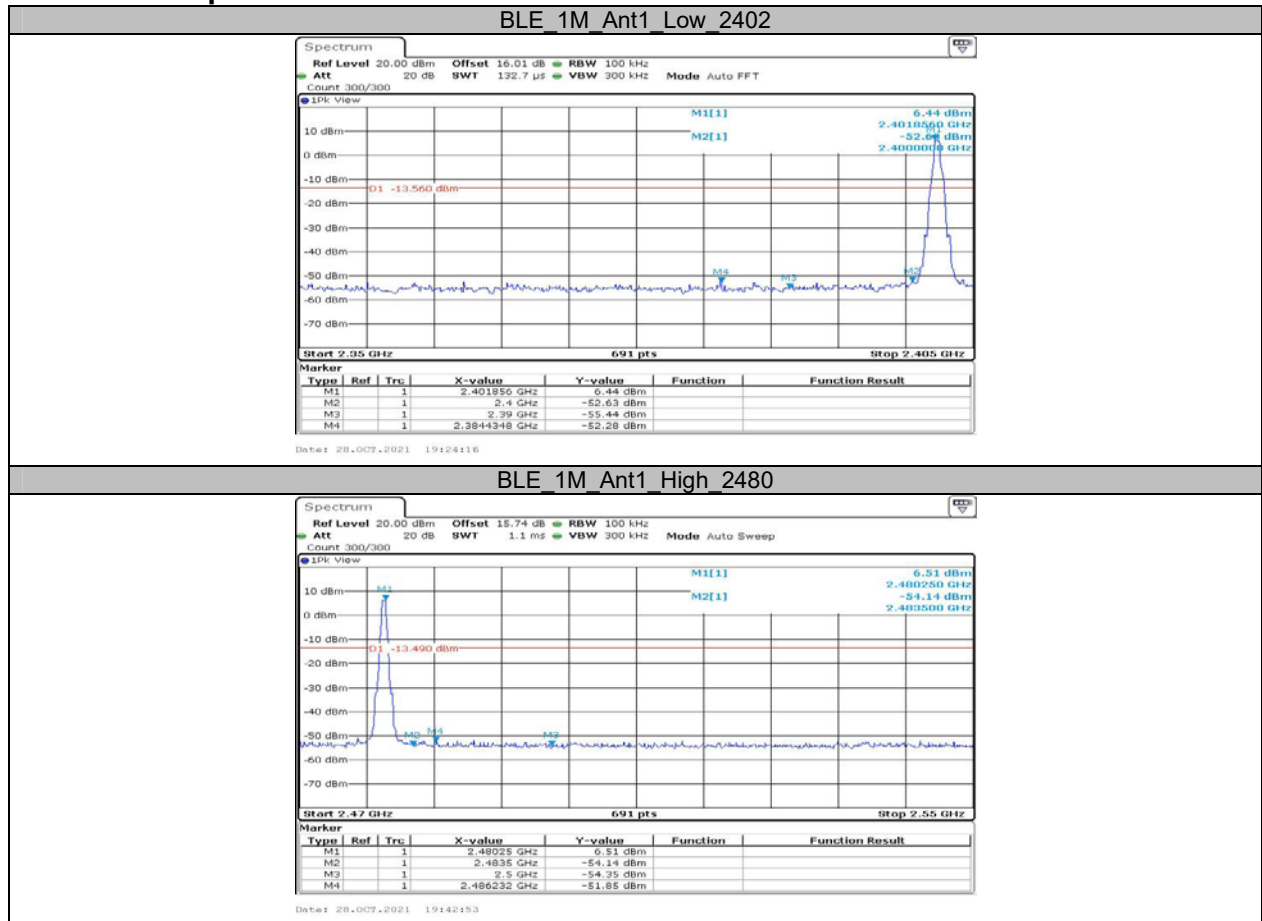
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-1.81	≤8	PASS
		2440	-1.91	≤8	PASS
		2480	-1.16	≤8	PASS

Test Graphs



Appendix E: Band edge measurements

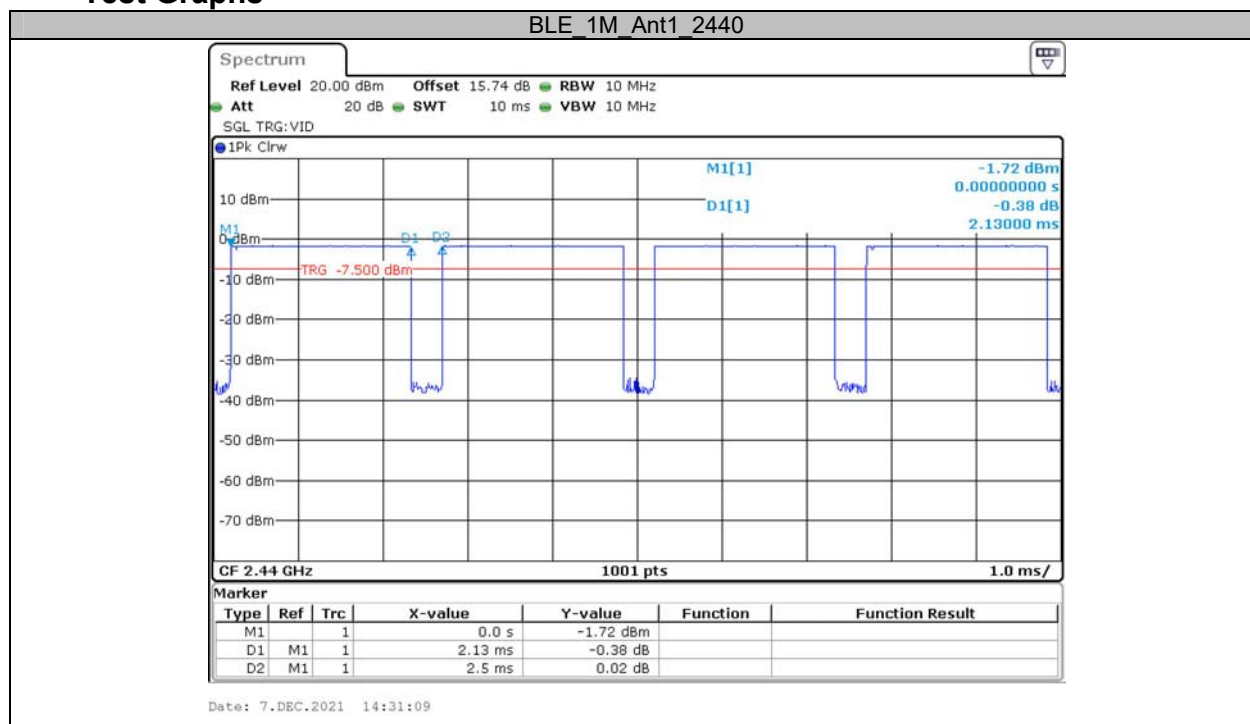
Test Graphs



Appendix F: Duty Cycle Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
BLE_1M	Ant1	2440	2.13	2.5	85.2

Test Graphs



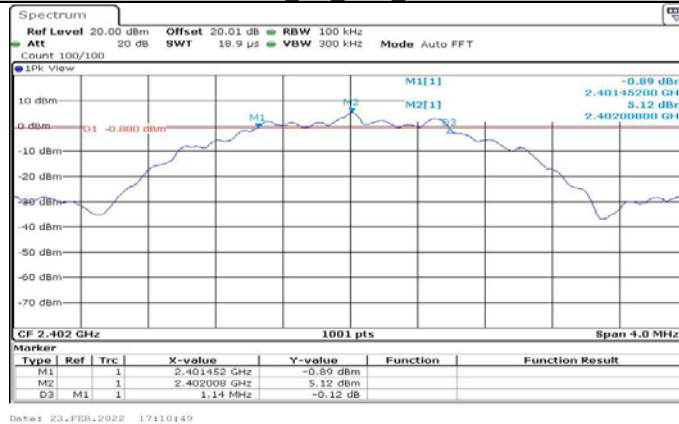
APPENDIX BLE 2M

Appendix A: DTS Bandwidth Test Result

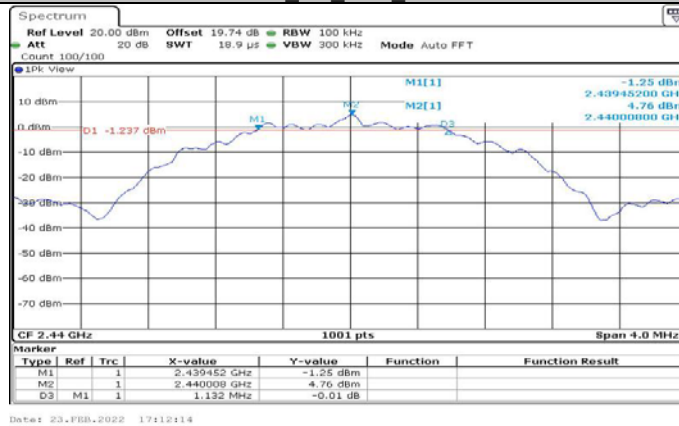
TestMode	Antenna	Channel	DTS BW [MHz]	Limit[MHz]	Verdict
BLE_2M	Ant1	2402	1.140	0.5	PASS
		2440	1.132	0.5	PASS
		2480	1.128	0.5	PASS

Test Graphs

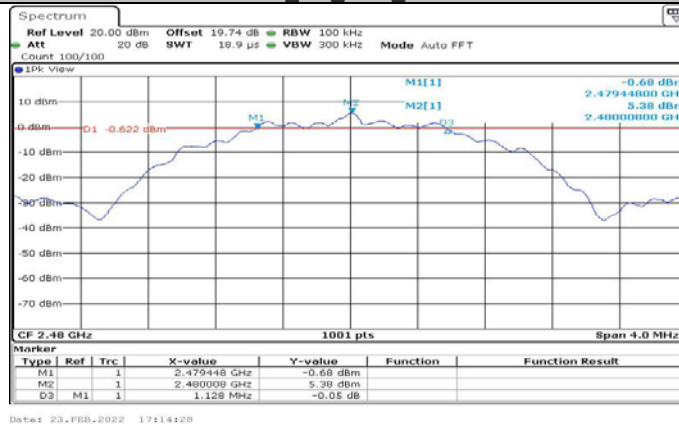
BLE 2M Ant1 2402



BLE 2M Ant1 2440



BLE 2M Ant1 2480



**Appendix B: Occupied Channel Bandwidth
Test Result**

TestMode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
BLE_2M	Ant1	2402	2.046	---	PASS
		2440	2.05	---	PASS
		2480	2.05	---	PASS

Test Graphs

BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



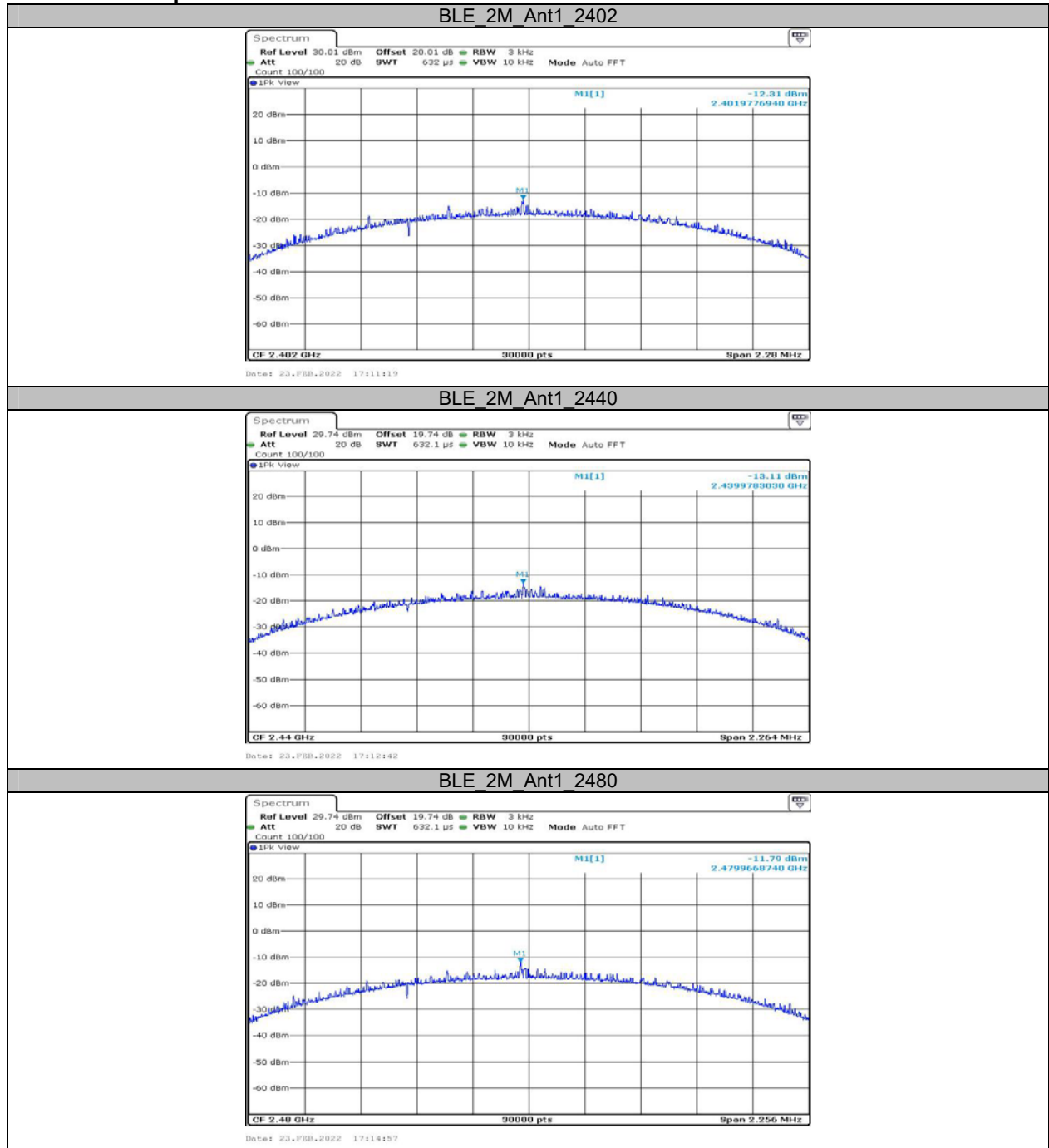
Appendix C: Maximum conducted Peak output power**Test Result**

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_2M	Ant1	2402	5.35	≤30	PASS
		2440	5.36	≤30	PASS
		2480	5.96	≤30	PASS

**Appendix D: Maximum power spectral density
Test Result**

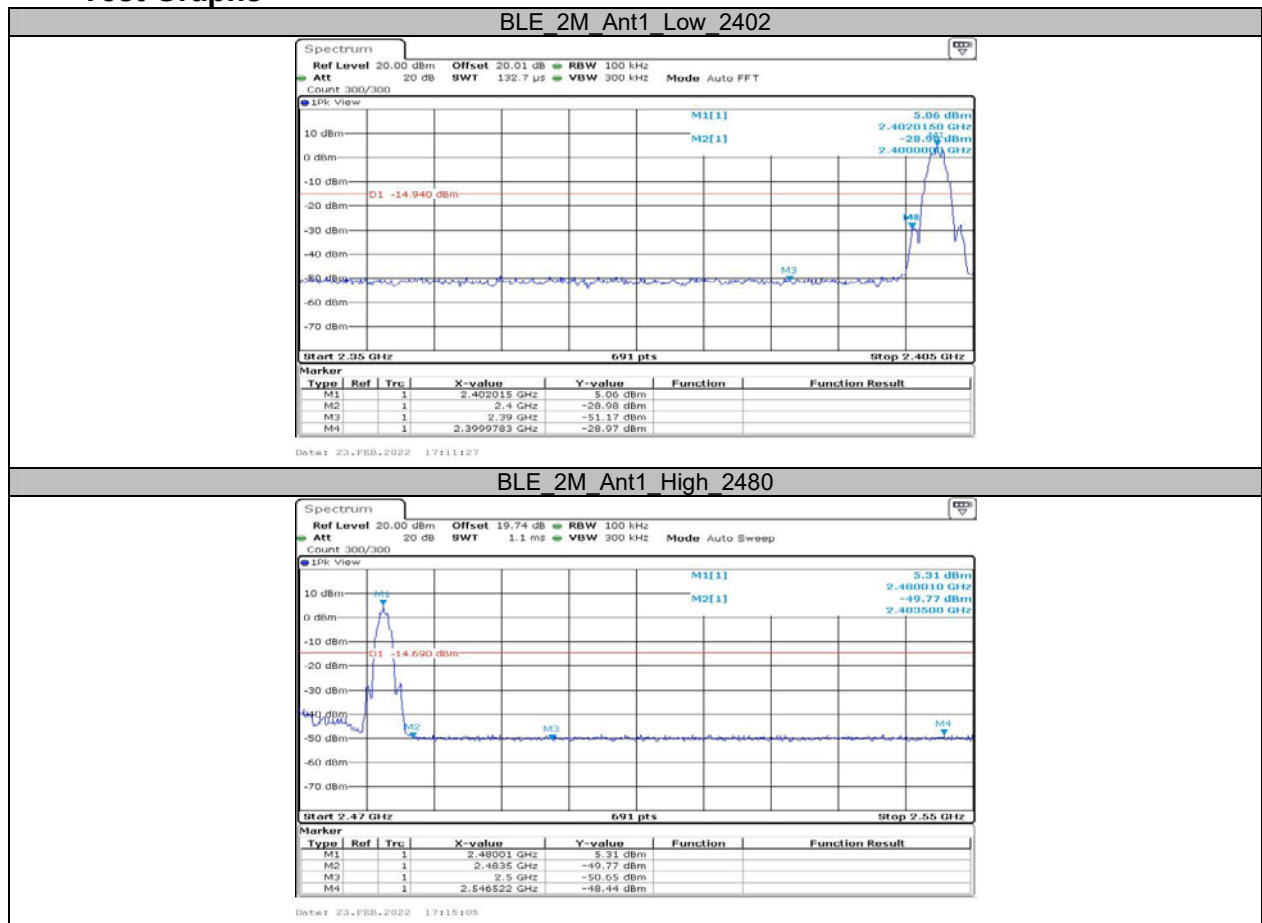
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_2M	Ant1	2402	-12.31	≤8	PASS
		2440	-13.11	≤8	PASS
		2480	-11.79	≤8	PASS

Test Graphs



Appendix E: Band edge measurements

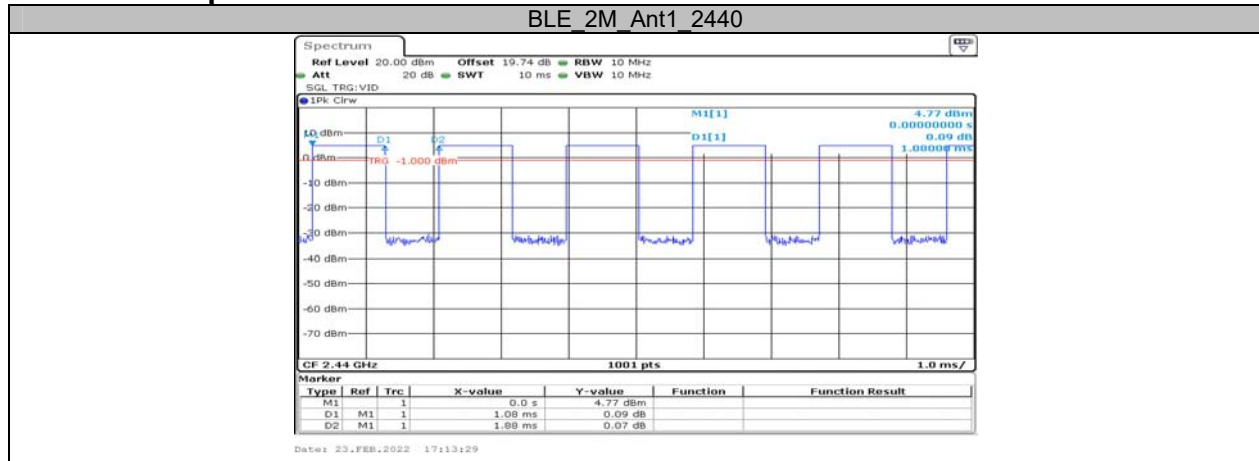
Test Graphs



Appendix F: Duty Cycle Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
BLE_2M	Ant1	2440	1.08	1.88	57.45

Test Graphs



***** END OF REPORT *****