



Appendix Test Data for BT(BDR/EDR) (Conducted Measurement)

Product Name: Wanbo Projector

Trade Mark: wanbo

Test Model: X5S

FCC ID: 2A7PI-X5S

Environmental Conditions

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

Appendix A: 20dB Emission Bandwidth

Test Result

Test Mode	Antenna	Frequency [MHz]	20db EBW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
DH5	Ant1	2402	0.963	2401.550	2402.513	---	---
DH5	Ant1	2441	0.945	2440.550	2441.495	---	---
DH5	Ant1	2480	0.951	2479.544	2480.495	---	---
2DH5	Ant1	2402	1.272	2401.388	2402.660	---	---
2DH5	Ant1	2441	1.197	2440.415	2441.612	---	---
2DH5	Ant1	2480	1.194	2479.418	2480.612	---	---
3DH5	Ant1	2402	1.236	2401.391	2402.627	---	---
3DH5	Ant1	2441	1.239	2440.400	2441.639	---	---
3DH5	Ant1	2480	1.257	2479.385	2480.642	---	---

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





Test Graphs





DH5-Ant1-2480



2DH5-Ant1-2402





2DH5-Ant1-2441



2DH5-Ant1-2480





3DH5-Ant1-2402



3DH5-Ant1-2441





3DH5-Ant1-2480





Appendix B: Occupied Channel Bandwidth

Test Result

Test Mode	Antenna	Frequency [MHz]	OCB [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
DH5	Ant1	2402	0.85612	2401.5862	2402.4423	---	---
DH5	Ant1	2441	0.85497	2440.5892	2441.4442	---	---
DH5	Ant1	2480	0.87718	2479.5813	2480.4585	---	---
2DH5	Ant1	2402	1.1731	2401.4285	2402.6016	---	---
2DH5	Ant1	2441	1.1529	2440.4391	2441.5920	---	---
2DH5	Ant1	2480	1.1413	2479.4475	2480.5888	---	---
3DH5	Ant1	2402	1.1590	2401.4386	2402.5976	---	---
3DH5	Ant1	2441	1.1429	2440.4477	2441.5906	---	---
3DH5	Ant1	2480	1.1655	2479.4372	2480.6027	---	---

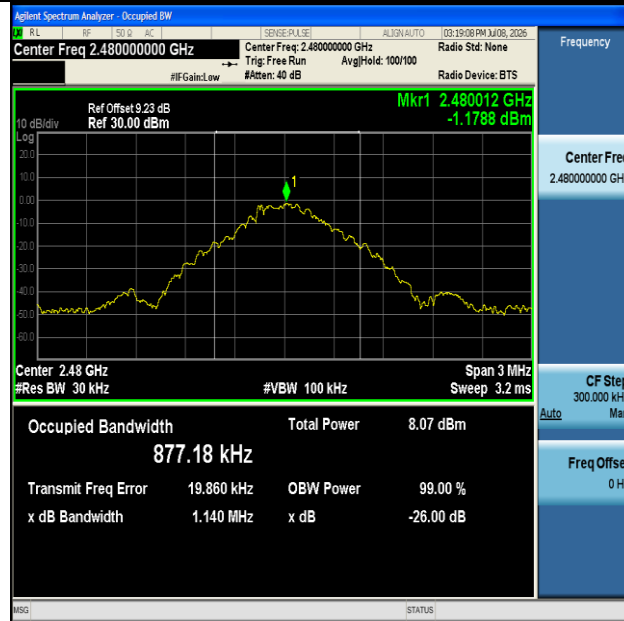
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



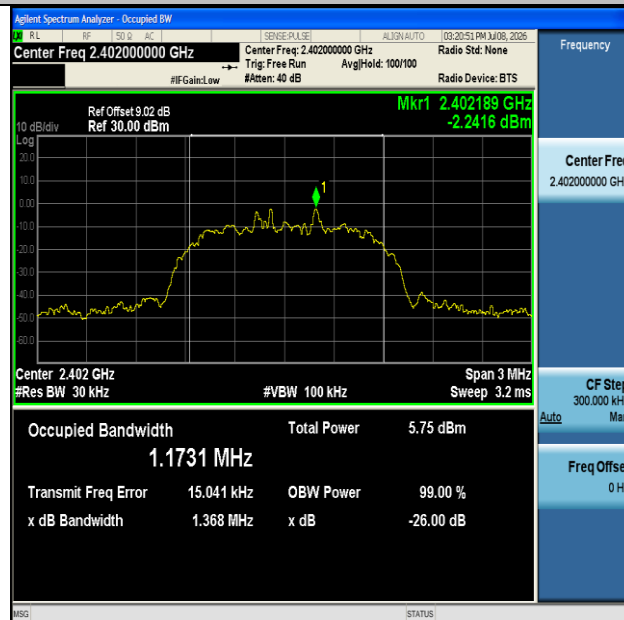


Test Graphs





DH5-Ant1-2480



2DH5-Ant1-2402





2DH5-Ant1-2441

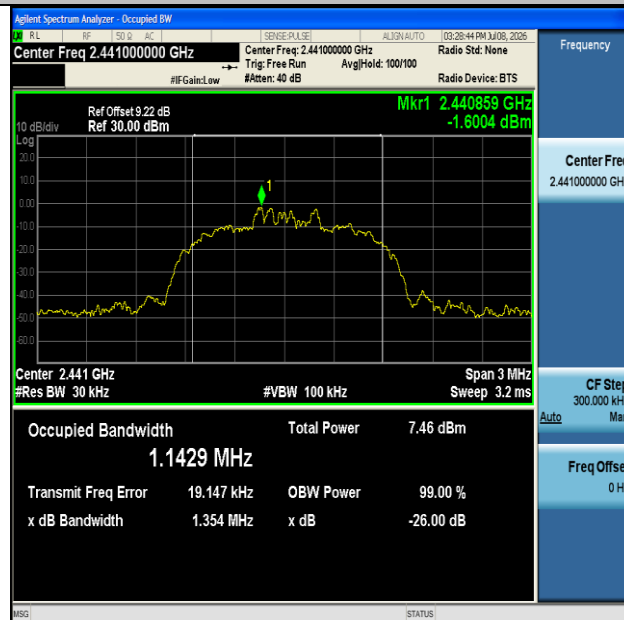


2DH5-Ant1-2480



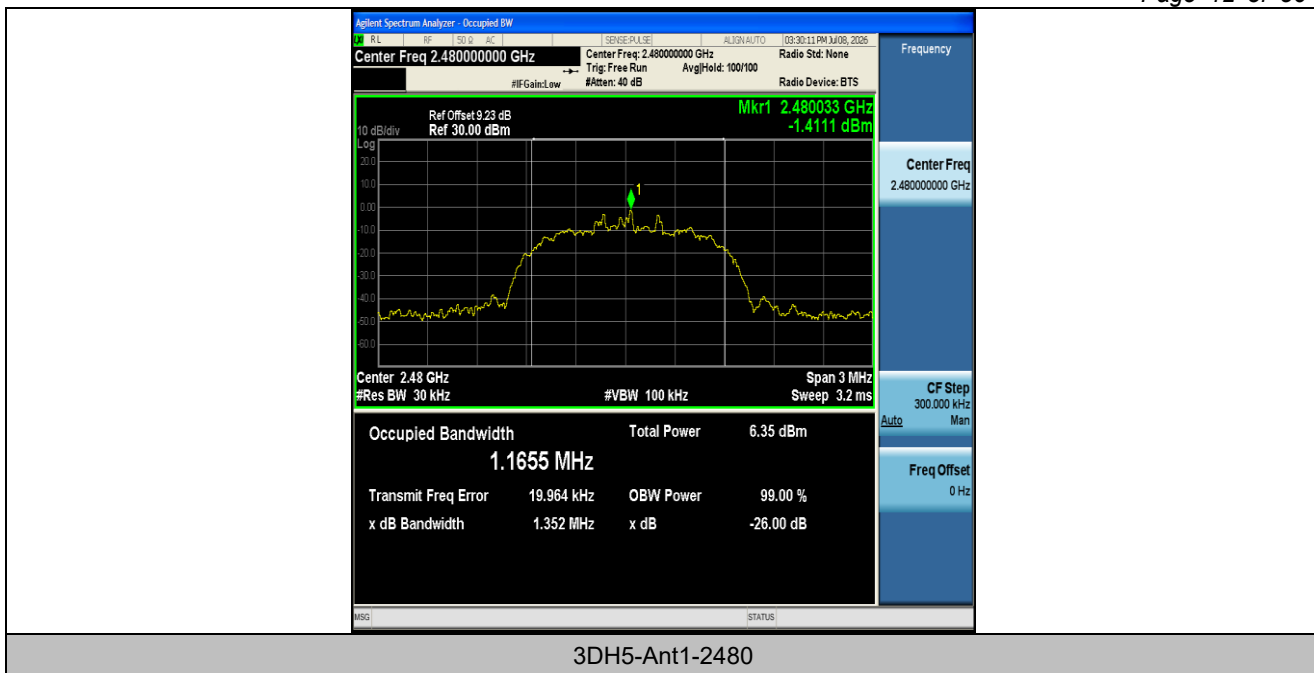


3DH5-Ant1-2402



3DH5-Ant1-2441







Appendix C: Maximum peak conducted output power

Test Result

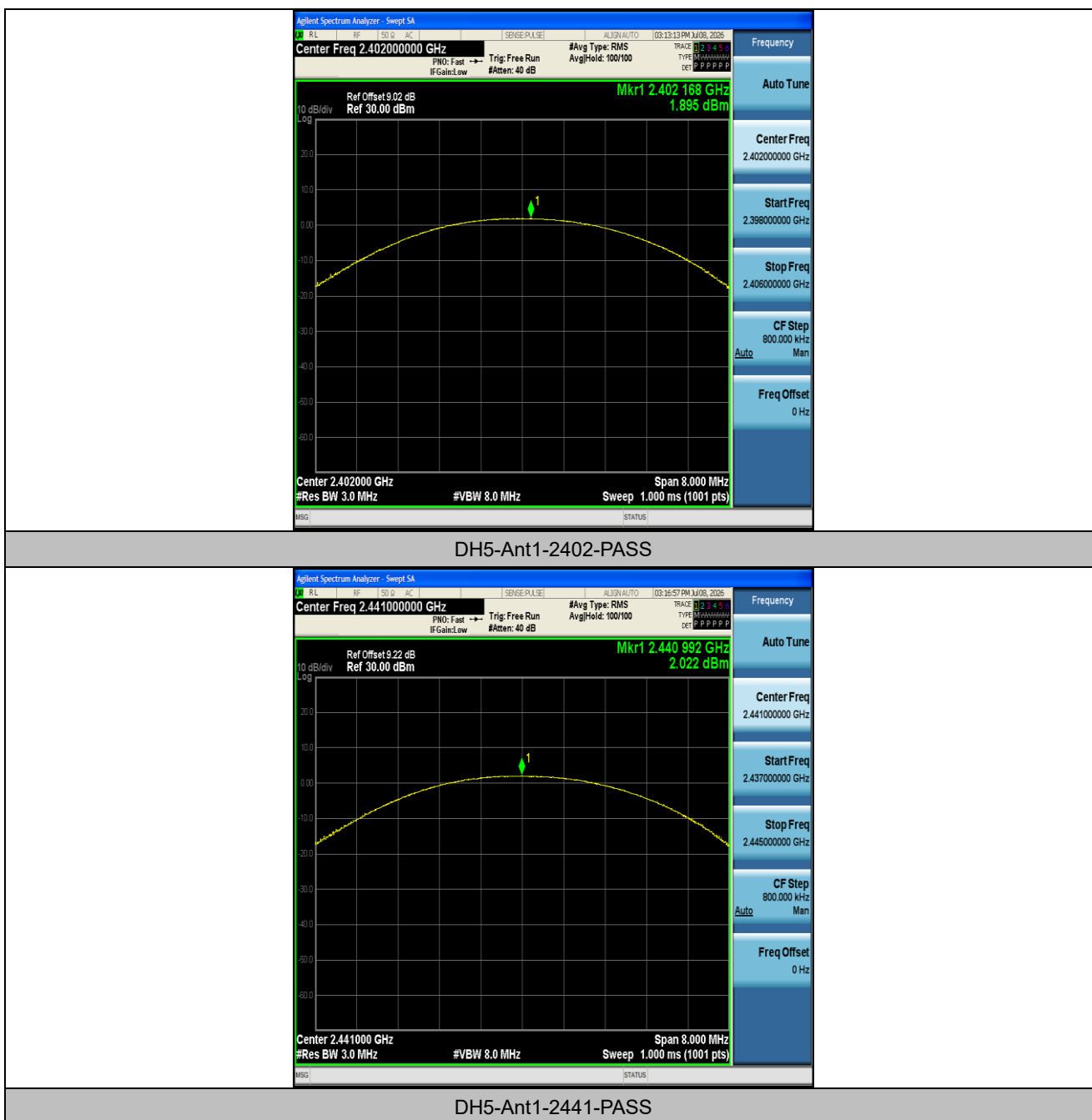
Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Conducted Limit [dBm]	Verdict
DH5	Ant1	2402	1.90	≤30	PASS
DH5	Ant1	2441	2.02	≤20.97	PASS
DH5	Ant1	2480	1.85	≤20.97	PASS
2DH5	Ant1	2402	1.87	≤30	PASS
2DH5	Ant1	2441	2.01	≤20.97	PASS
2DH5	Ant1	2480	1.83	≤20.97	PASS
3DH5	Ant1	2402	1.85	≤30	PASS
3DH5	Ant1	2441	1.97	≤20.97	PASS
3DH5	Ant1	2480	1.65	≤20.97	PASS

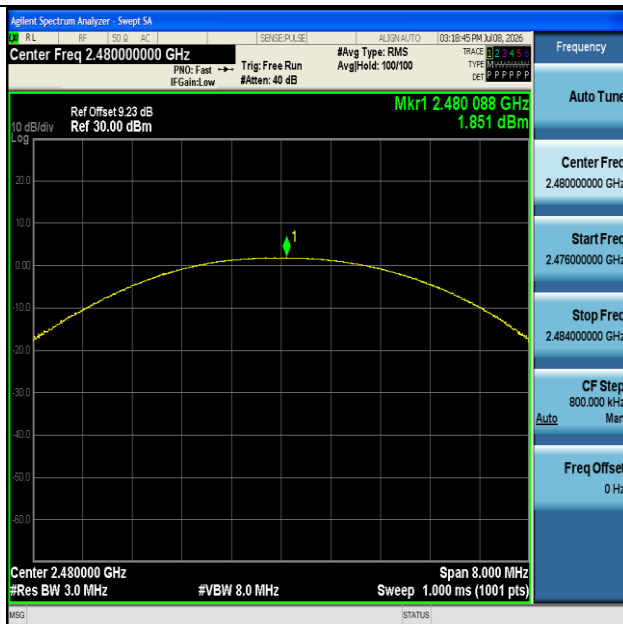
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



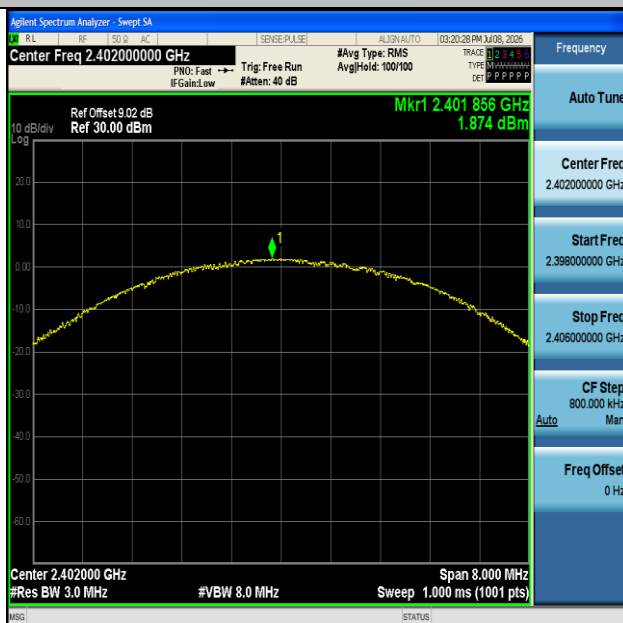


Test Graphs



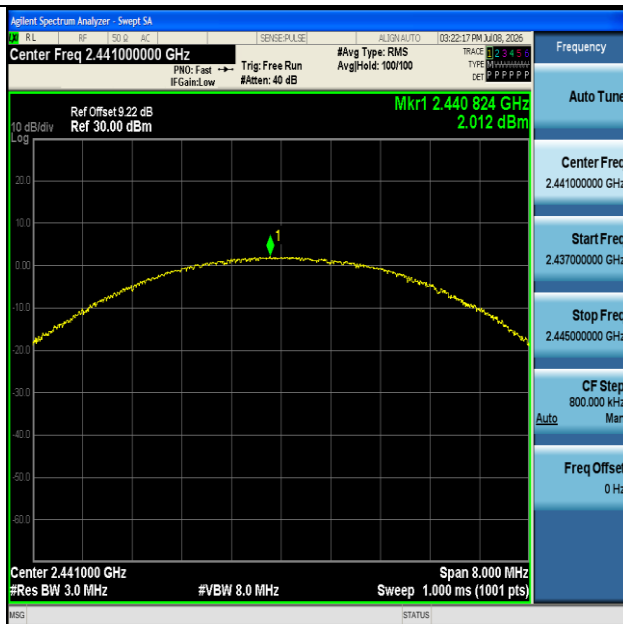


DH5-Ant1-2480-PASS

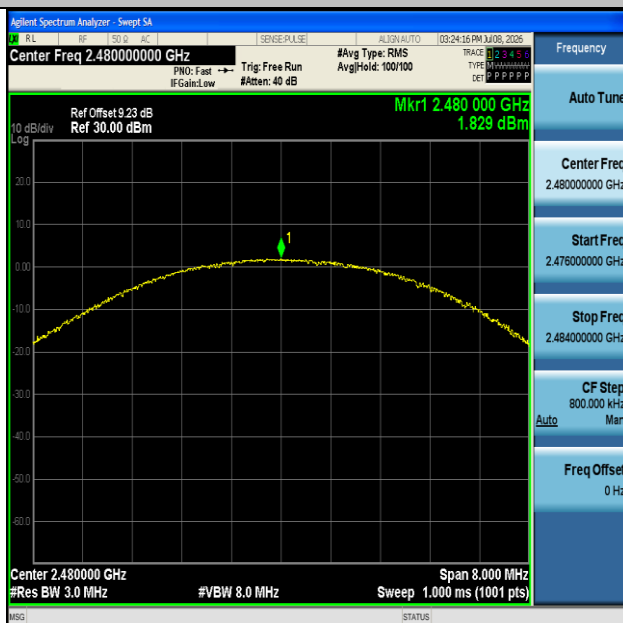


2DH5-Ant1-2402-PASS





2DH5-Ant1-2441-PASS

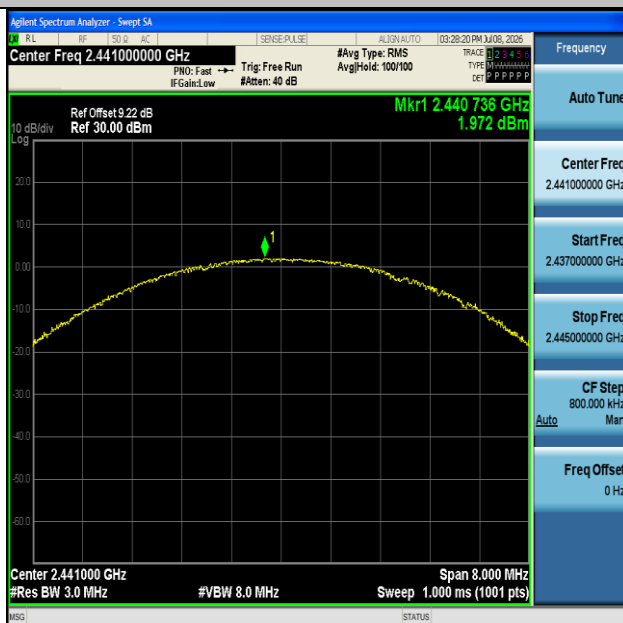


2DH5-Ant1-2480-PASS



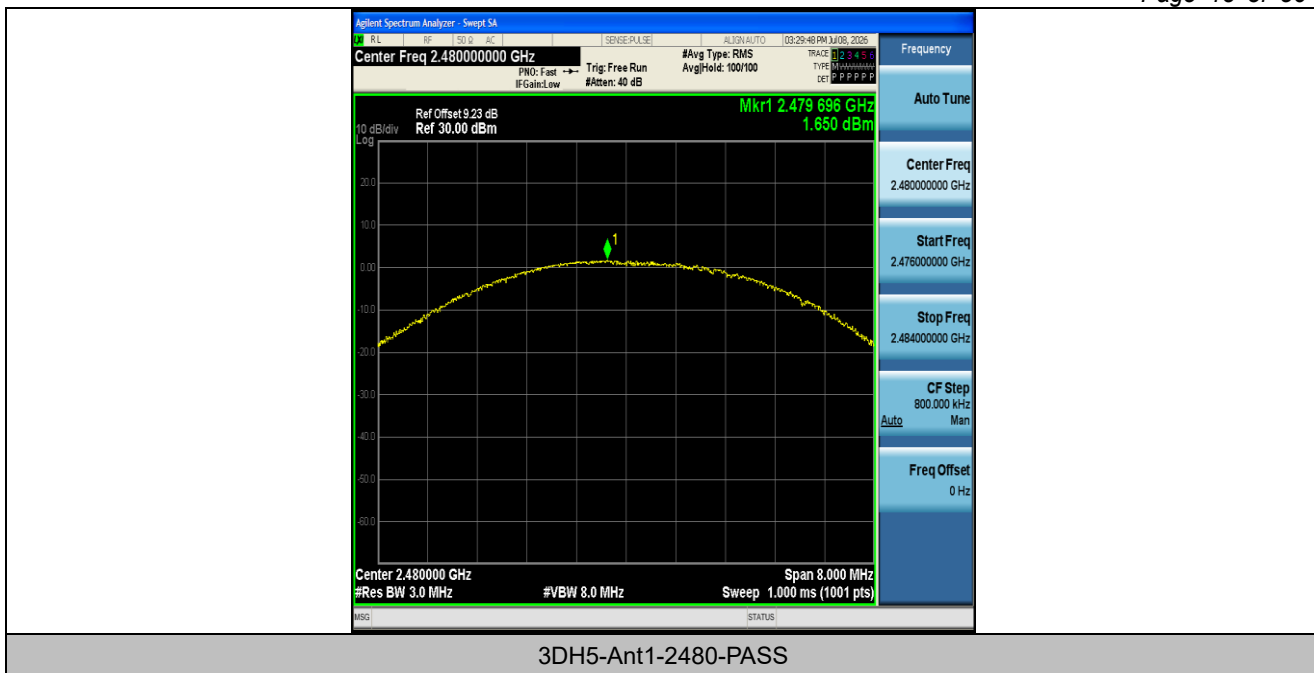


3DH5-Ant1-2402-PASS



3DH5-Ant1-2441-PASS







Appendix D: Carrier frequency separation

Test Result

Test Mode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Verdict
DH5	Ant1	Hop	0.984	≥ 0.963	PASS
2DH5	Ant1	Hop	0.982	≥ 0.848	PASS
3DH5	Ant1	Hop	1.016	≥ 0.838	PASS

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





Test Graphs







Appendix E: Time of occupancy

Test Result

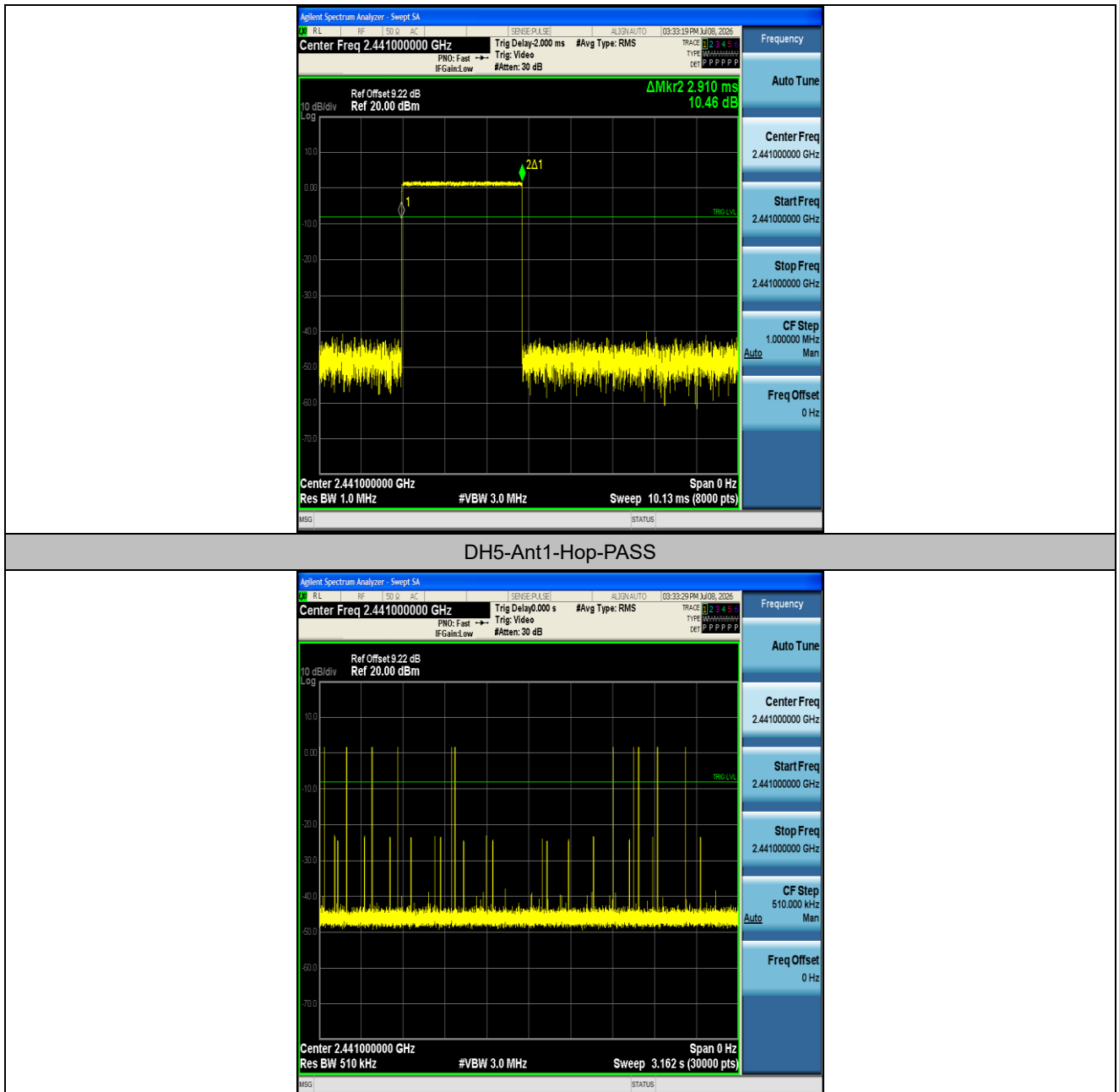
Test Mode	Antenna	Frequency [MHz]	Burst Width [ms]	TotalHops [Num]	Result [s]	Limit [s]	Verdict
DH5	Ant1	Hop	2.910	120	0.349	≤0.4	PASS
2DH5	Ant1	Hop	2.917	130	0.379	≤0.4	PASS
3DH5	Ant1	Hop	2.917	110	0.321	≤0.4	PASS

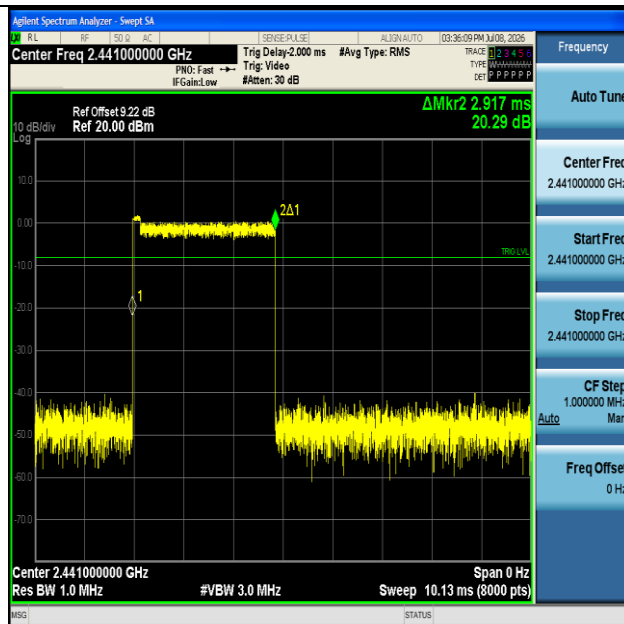
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



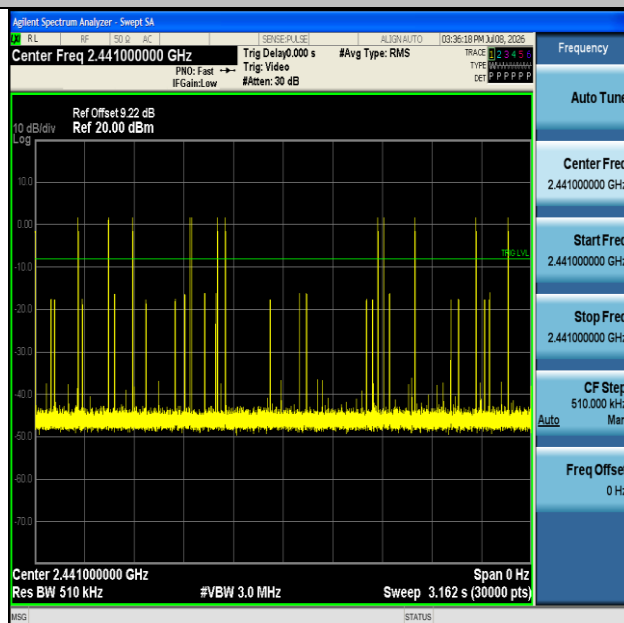


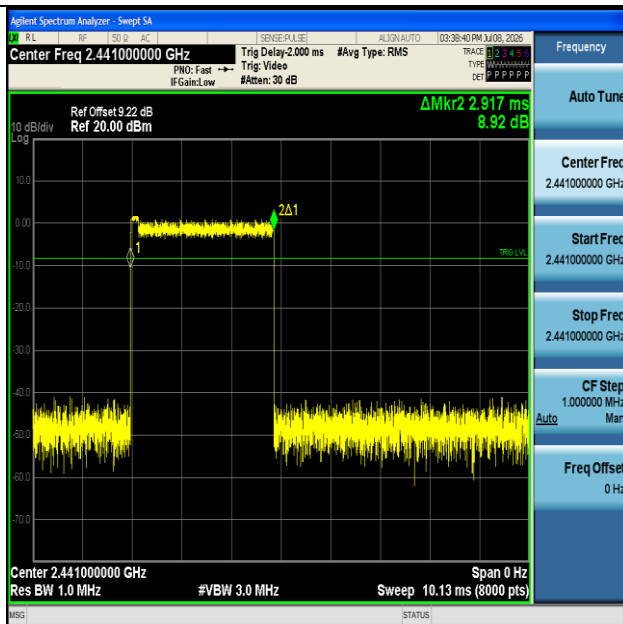
Test Graphs



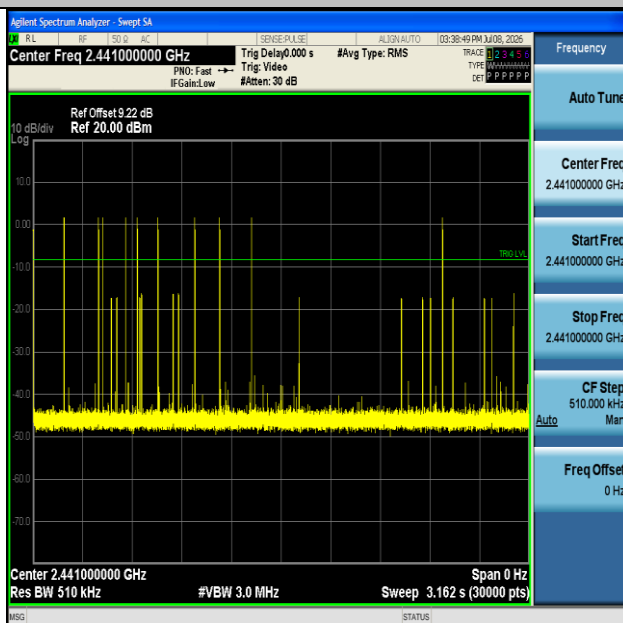


2DH5-Ant1-Hop-PASS





3DH5-Ant1-Hop-PASS





Appendix F: Number of hopping channels

Test Result

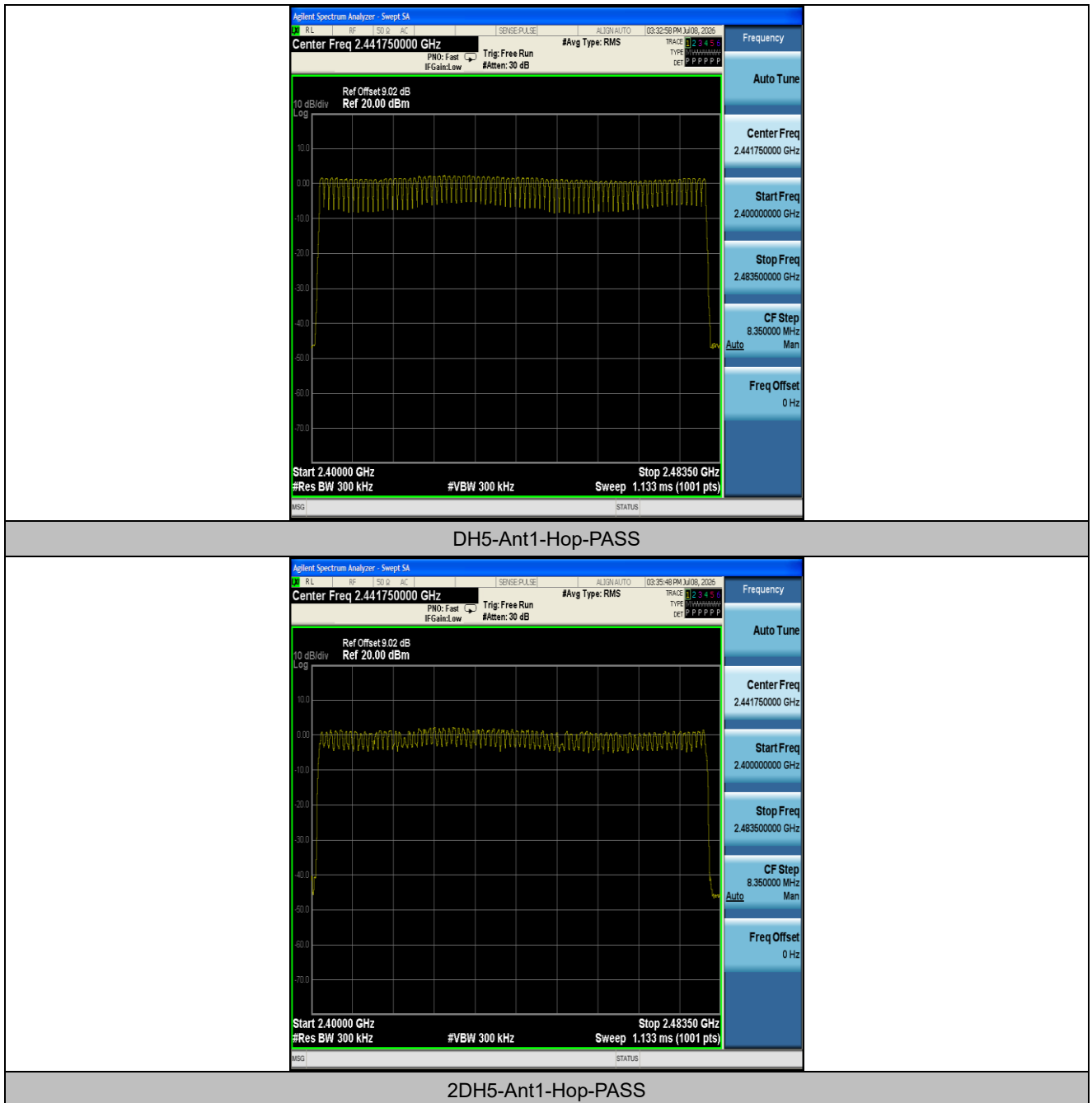
Test Mode	Antenna	Frequency [MHz]	Result [Num]	Limit [Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

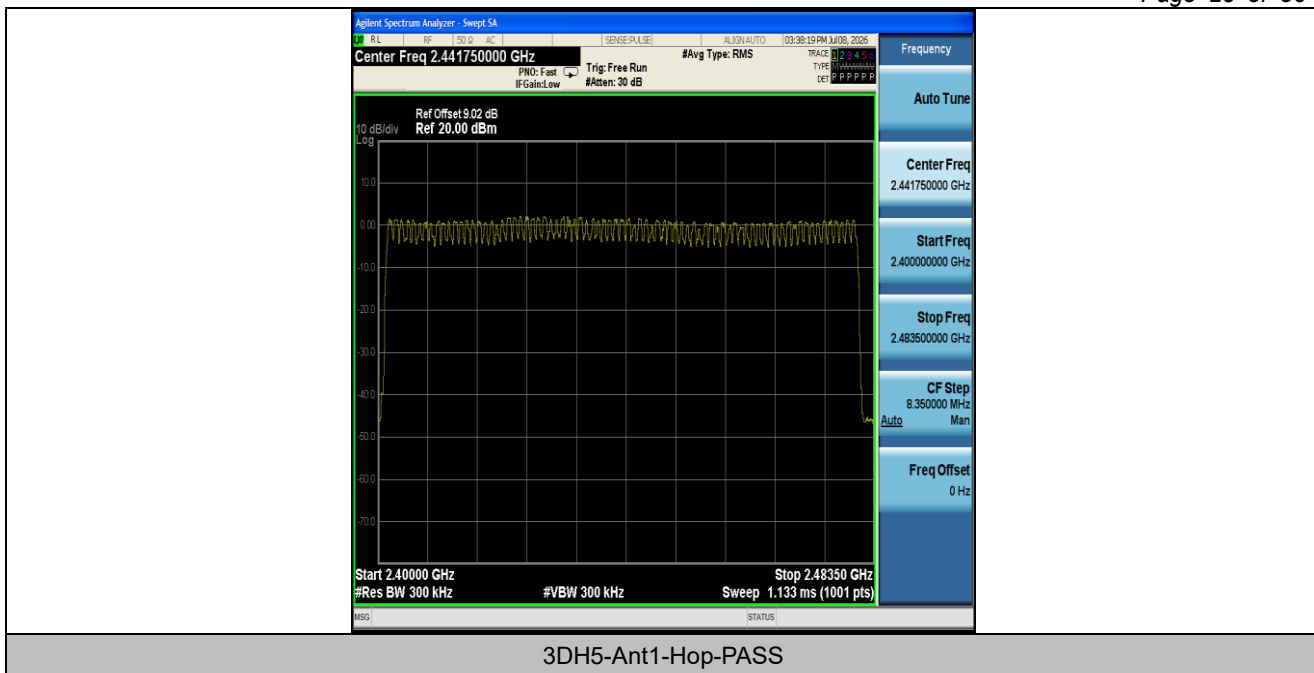
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)





Test Graphs







Appendix G: Band edge measurements

Test Result

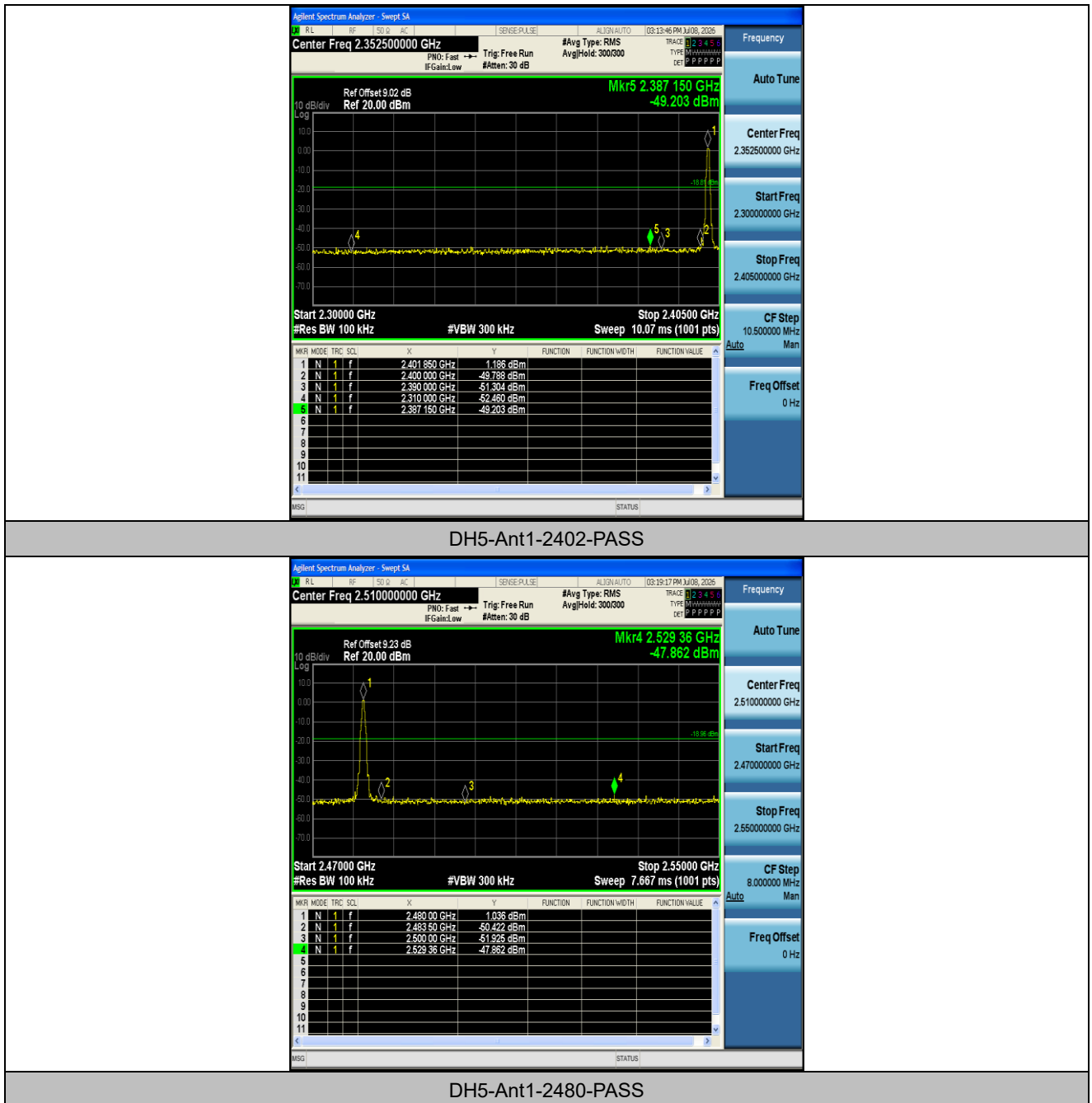
Test Mode	Antenna	Ch.Name	Frequency [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	1.19	-49.2	≤-18.81	PASS
DH5	Ant1	High	2480	1.04	-47.86	≤-18.96	PASS
DH5	Ant1	Low	Hop_2402	-0.18	-49.2	≤-20.18	PASS
DH5	Ant1	High	Hop_2480	1.04	-39.95	≤-18.96	PASS
2DH5	Ant1	Low	2402	1.24	-48.46	≤-18.76	PASS
2DH5	Ant1	High	2480	1.23	-48.8	≤-18.77	PASS
2DH5	Ant1	Low	Hop_2402	1.02	-48.59	≤-18.98	PASS
2DH5	Ant1	High	Hop_2480	0.46	-48.28	≤-19.54	PASS
3DH5	Ant1	Low	2402	1.25	-49.12	≤-18.75	PASS
3DH5	Ant1	High	2480	0.86	-43.49	≤-19.14	PASS
3DH5	Ant1	Low	Hop_2402	-4.60	-49.23	≤-24.6	PASS
3DH5	Ant1	High	Hop_2480	0.50	-45.35	≤-19.51	PASS

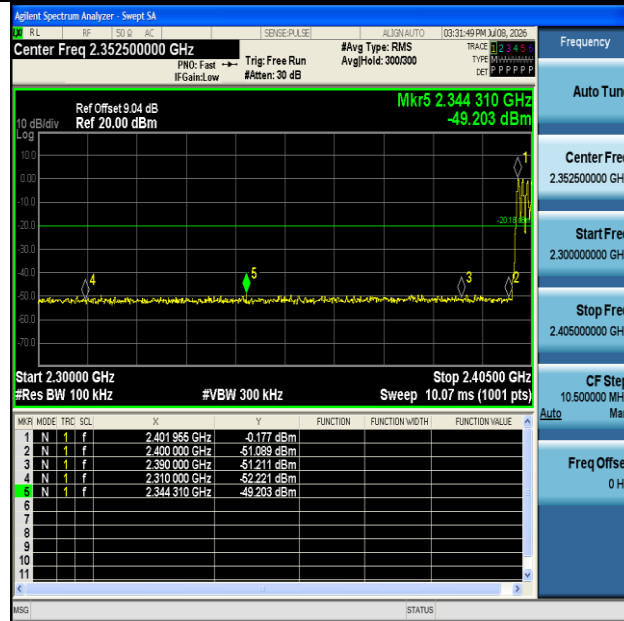
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



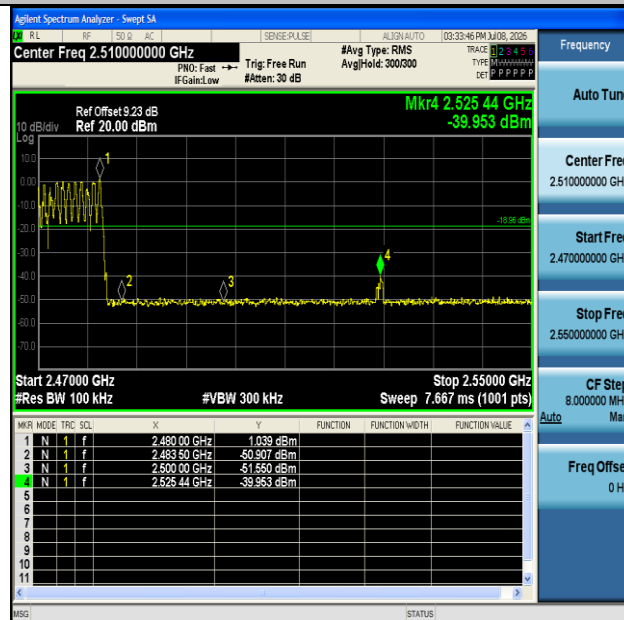


Test Graphs



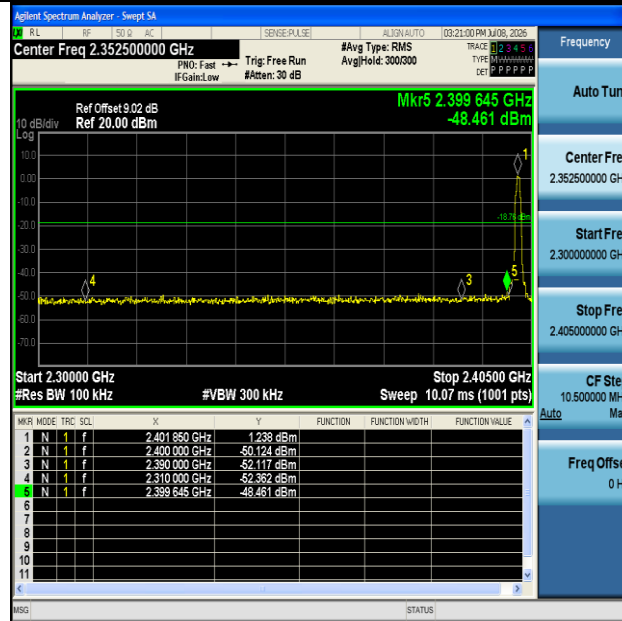


DH5-Ant1-Hop_2402-PASS

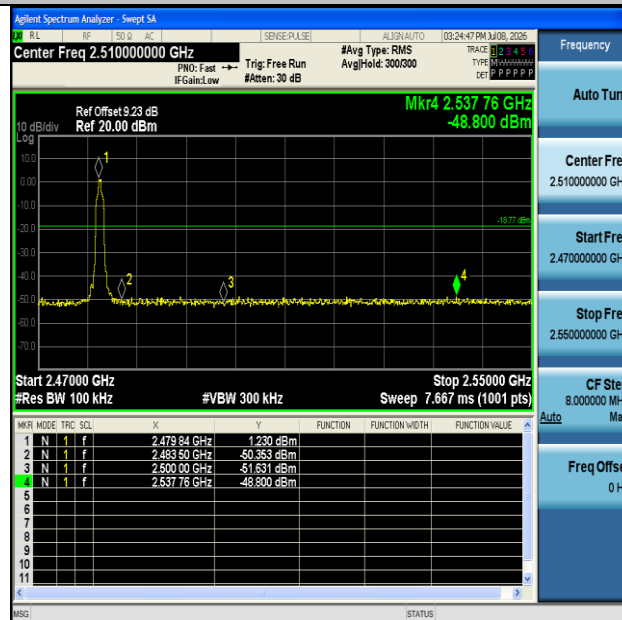


DH5-Ant1-Hop_2480-PASS



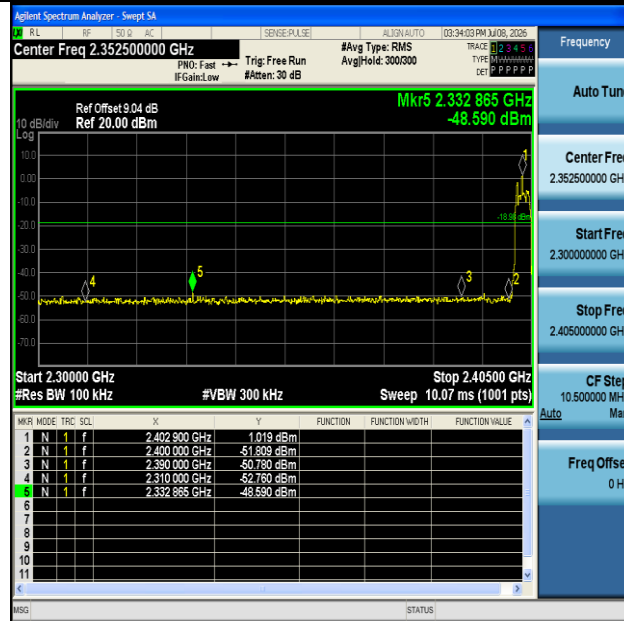


2DH5-Ant1-2402-PASS

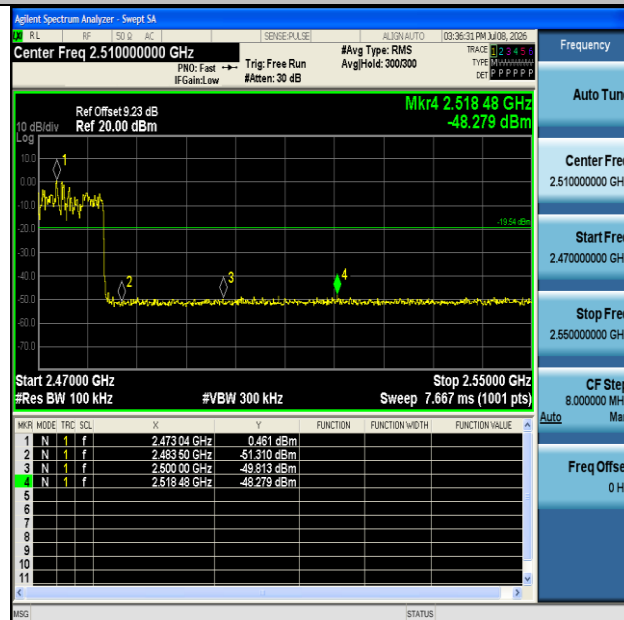


2DH5-Ant1-2480-PASS



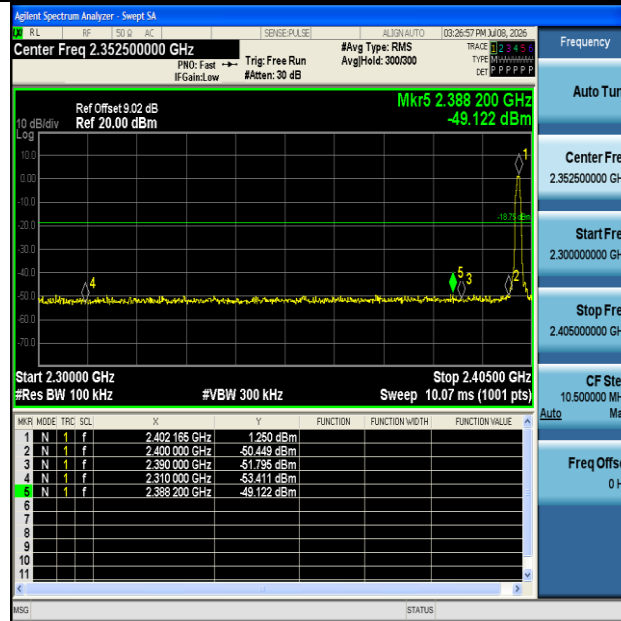


2DH5-Ant1-Hop_2402-PASS

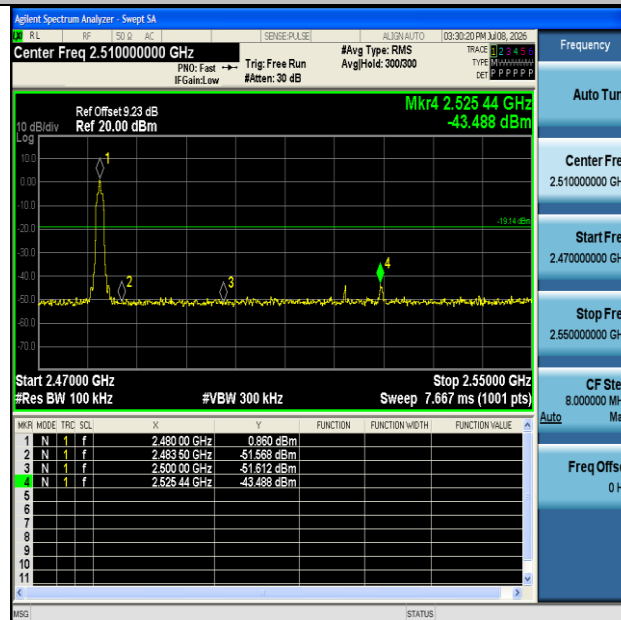


2DH5-Ant1-Hop_2480-PASS



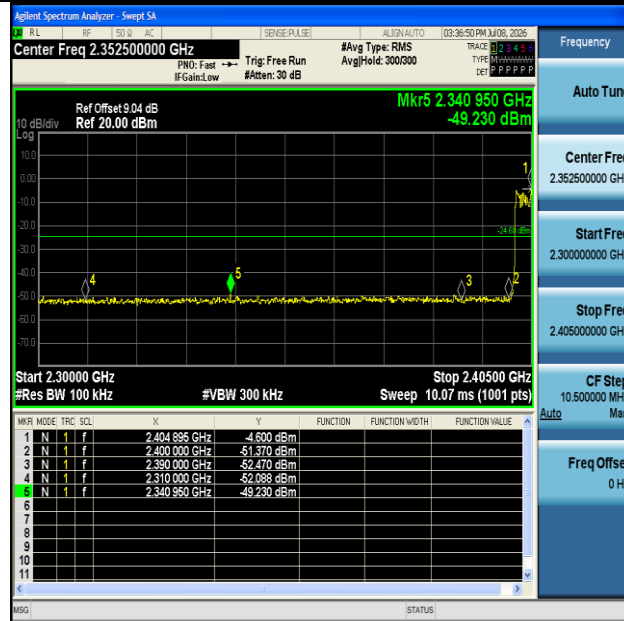


3DH5-Ant1-2402-PASS

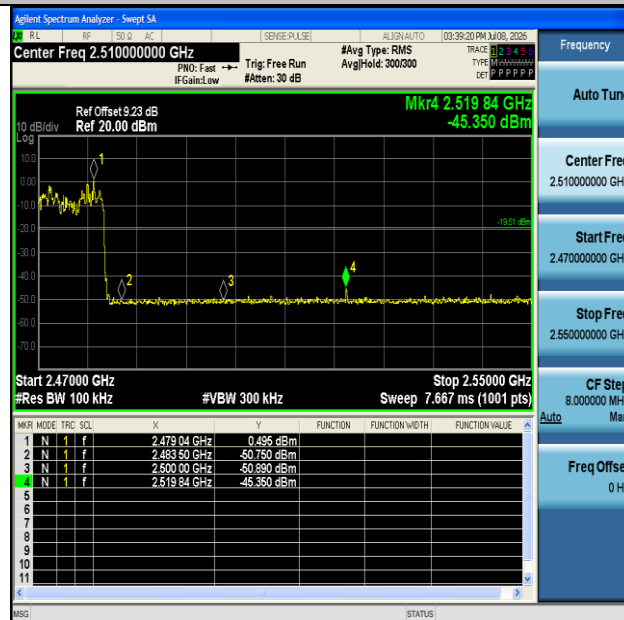


3DH5-Ant1-2480-PASS





3DH5-Ant1-Hop_2402-PASS



3DH5-Ant1-Hop_2480-PASS





Appendix H: Conducted Spurious Emission

Test Result

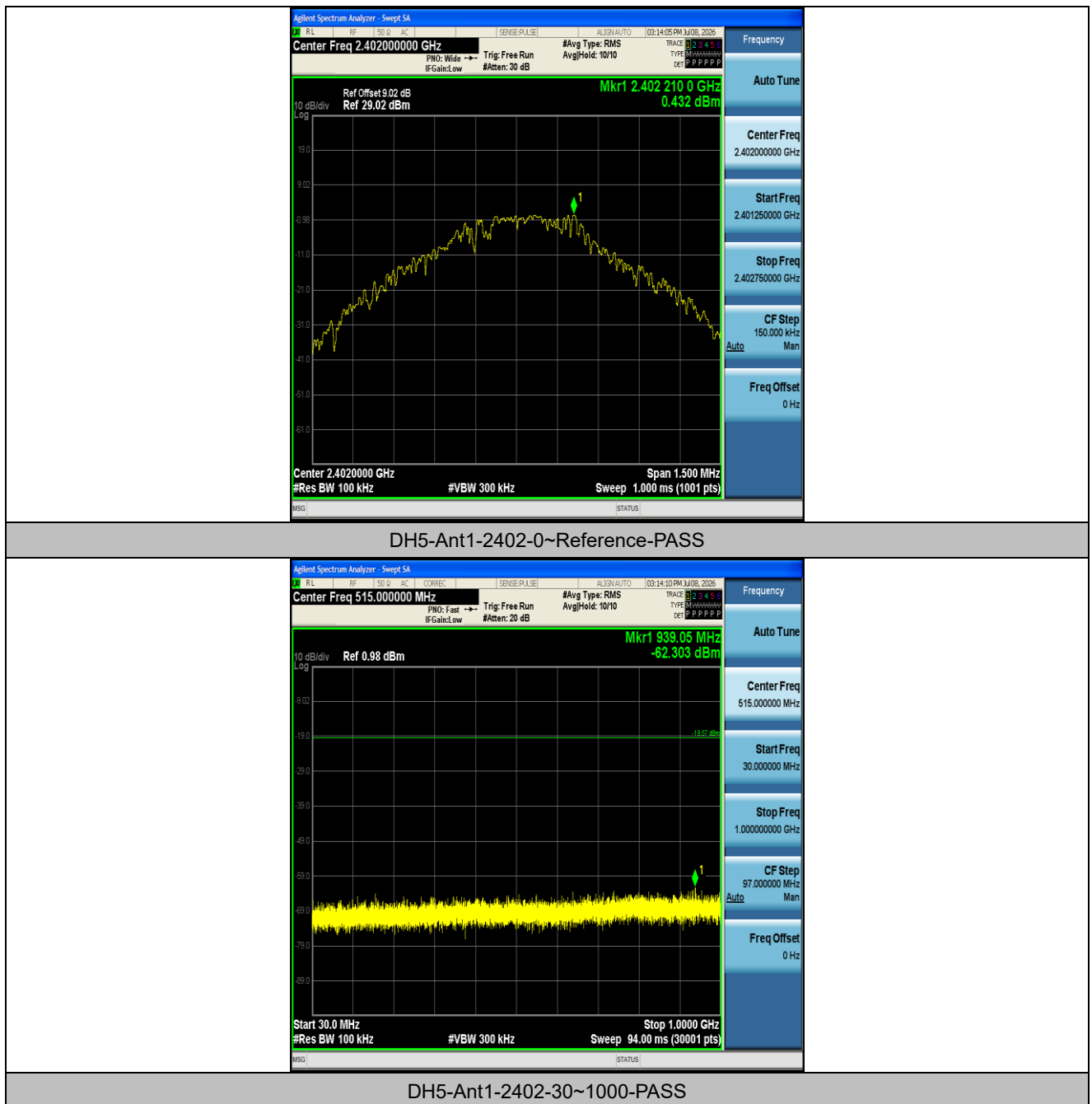
Test Mode	Antenna	Frequency [MHz]	Freq. Range [MHz]	Ref. Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	0~Reference	0.43	0.43	---	PASS
DH5	Ant1	2402	30~1000	0.43	-62.3	≤-19.57	PASS
DH5	Ant1	2402	1000~26500	0.43	-36.84	≤-19.57	PASS
DH5	Ant1	2441	0~Reference	0.80	0.80	---	PASS
DH5	Ant1	2441	30~1000	0.80	-62.07	≤-19.2	PASS
DH5	Ant1	2441	1000~26500	0.80	-36.83	≤-19.2	PASS
DH5	Ant1	2480	0~Reference	0.73	0.73	---	PASS
DH5	Ant1	2480	30~1000	0.73	-63.06	≤-19.27	PASS
DH5	Ant1	2480	1000~26500	0.73	-36.99	≤-19.27	PASS
2DH5	Ant1	2402	0~Reference	-3.64	-3.64	---	PASS
2DH5	Ant1	2402	30~1000	-3.64	-62.75	≤-23.64	PASS
2DH5	Ant1	2402	1000~26500	-3.64	-37.5	≤-23.64	PASS
2DH5	Ant1	2441	0~Reference	-0.14	-0.14	---	PASS
2DH5	Ant1	2441	30~1000	-0.14	-63	≤-20.14	PASS
2DH5	Ant1	2441	1000~26500	-0.14	-37.65	≤-20.14	PASS
2DH5	Ant1	2480	0~Reference	-1.03	-1.03	---	PASS
2DH5	Ant1	2480	30~1000	-1.03	-61.75	≤-21.03	PASS
2DH5	Ant1	2480	1000~26500	-1.03	-37.19	≤-21.03	PASS
3DH5	Ant1	2402	0~Reference	0.27	0.27	---	PASS
3DH5	Ant1	2402	30~1000	0.27	-61.96	≤-19.73	PASS
3DH5	Ant1	2402	1000~26500	0.27	-37.89	≤-19.73	PASS
3DH5	Ant1	2441	0~Reference	-3.95	-3.95	---	PASS
3DH5	Ant1	2441	30~1000	-3.95	-62.13	≤-23.95	PASS
3DH5	Ant1	2441	1000~26500	-3.95	-36.71	≤-23.95	PASS
3DH5	Ant1	2480	0~Reference	0.10	0.10	---	PASS
3DH5	Ant1	2480	30~1000	0.10	-61.73	≤-19.9	PASS
3DH5	Ant1	2480	1000~26500	0.10	-37.63	≤-19.9	PASS

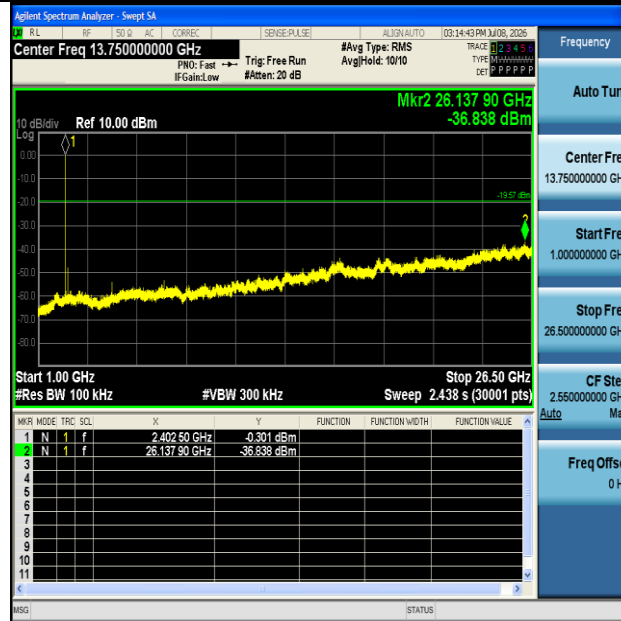
Note: offset(dB) in Reference test plots = cable loss(dB) + attenuator factor(dB); For spurious emissions plots from 30MHz to 26.5GHz, the cable loss and attenuator factors have been set in the 'Input Correction' of the Spectrum Analyzer during the test.



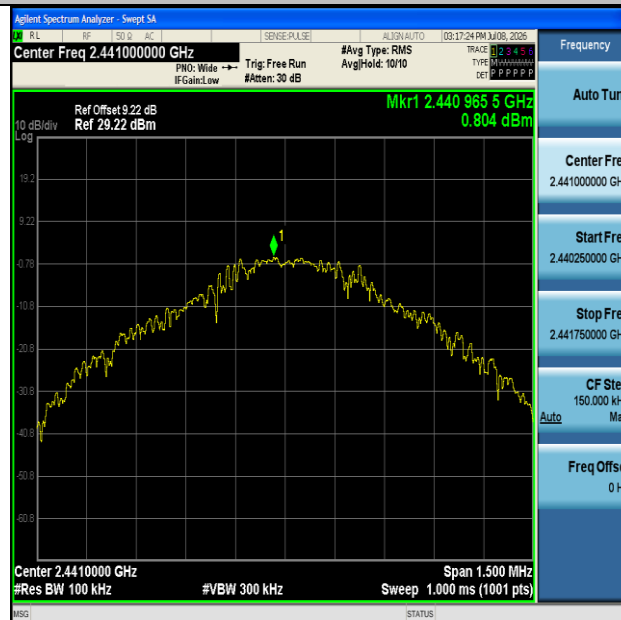


Test Graphs



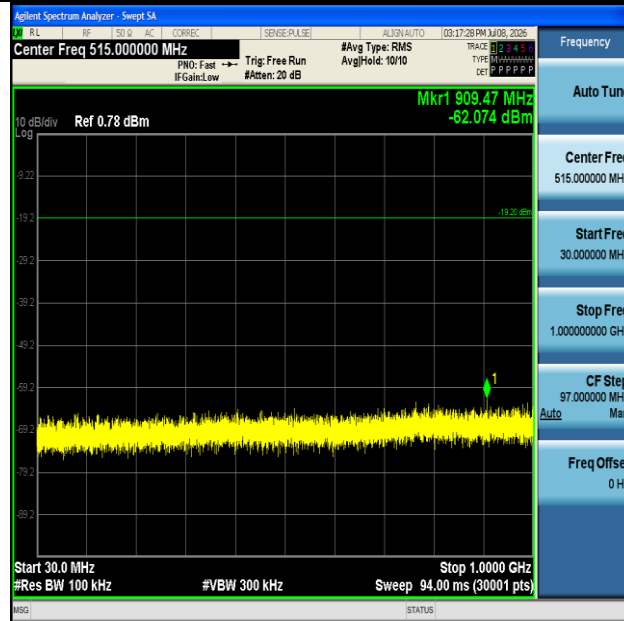


DH5-Ant1-2402-1000~26500-PASS



DH5-Ant1-2441-0~Reference-PASS



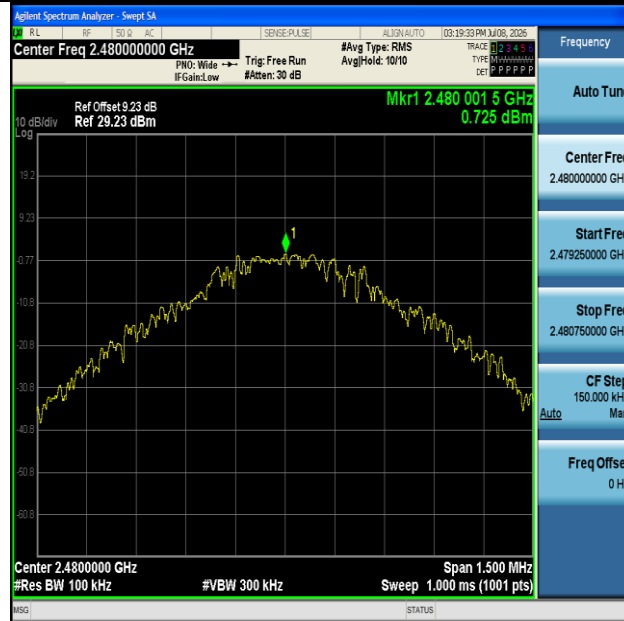


DH5-Ant1-2441-30~1000-PASS

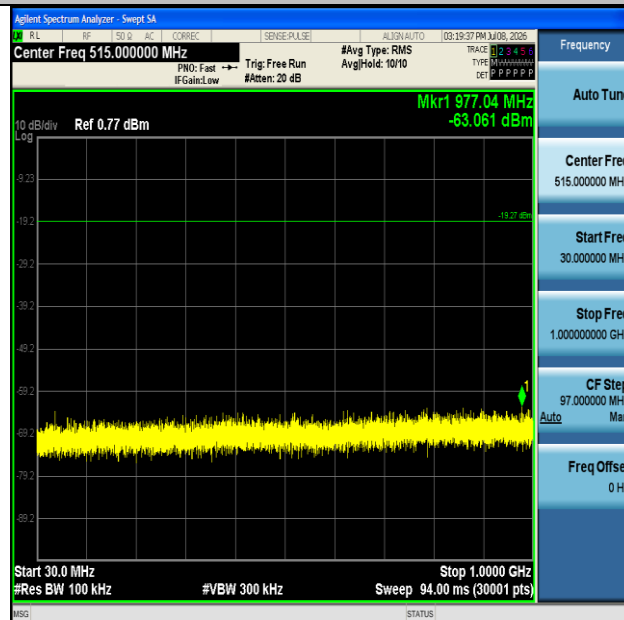


DH5-Ant1-2441-1000~26500-PASS



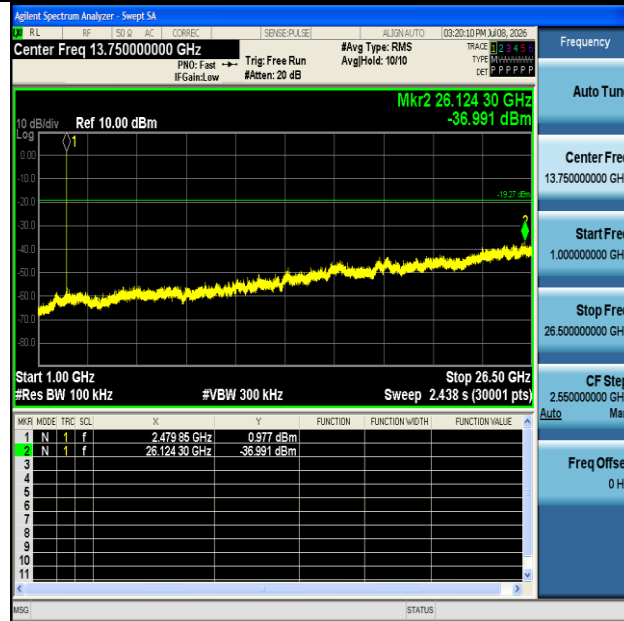


DH5-Ant1-2480-0~Reference-PASS

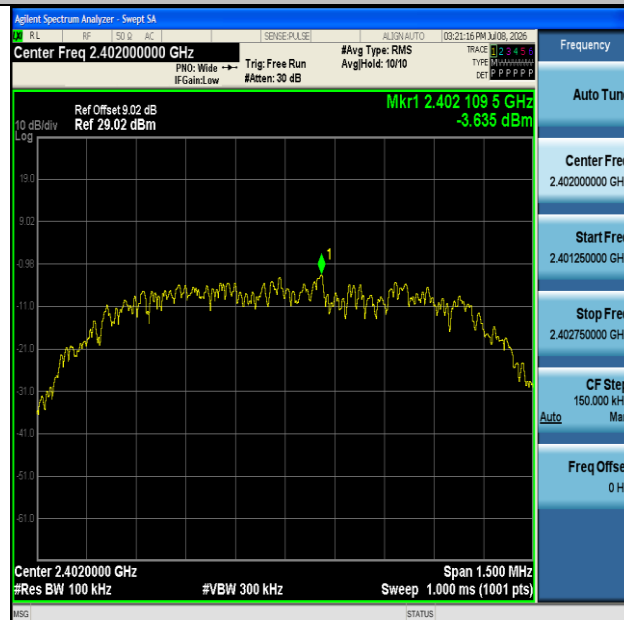


DH5-Ant1-2480-30~1000-PASS



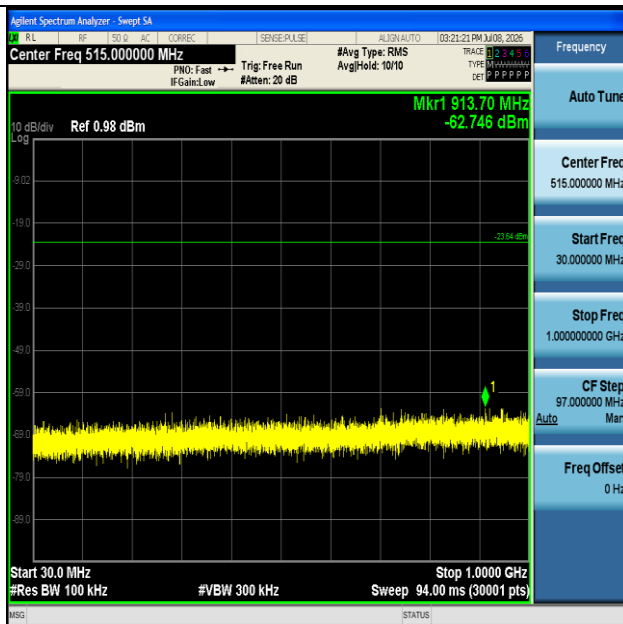


DH5-Ant1-2480-1000~26500-PASS

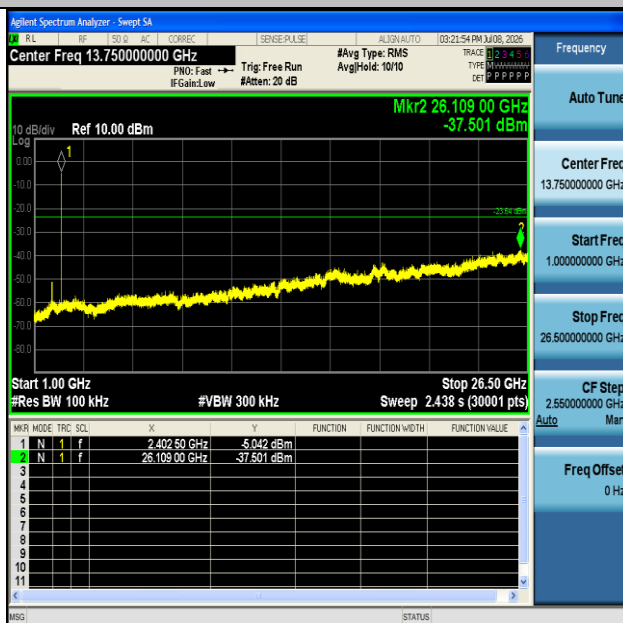


2DH5-Ant1-2402-0~Reference-PASS



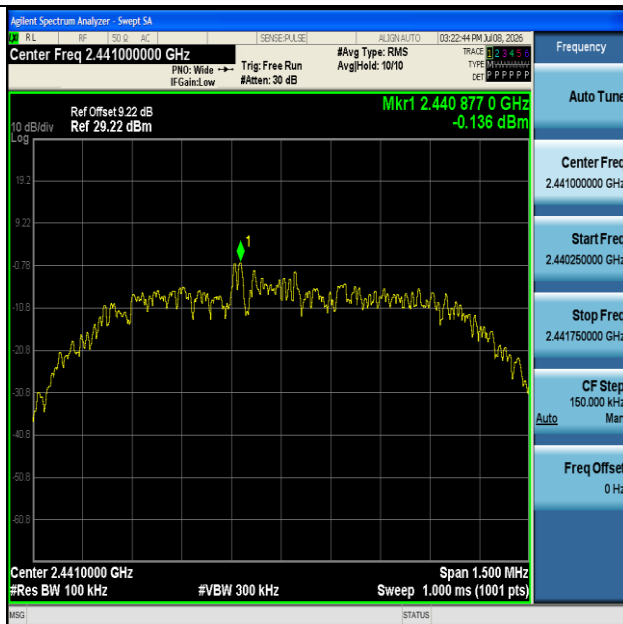


2DH5-Ant1-2402-30~1000-PASS

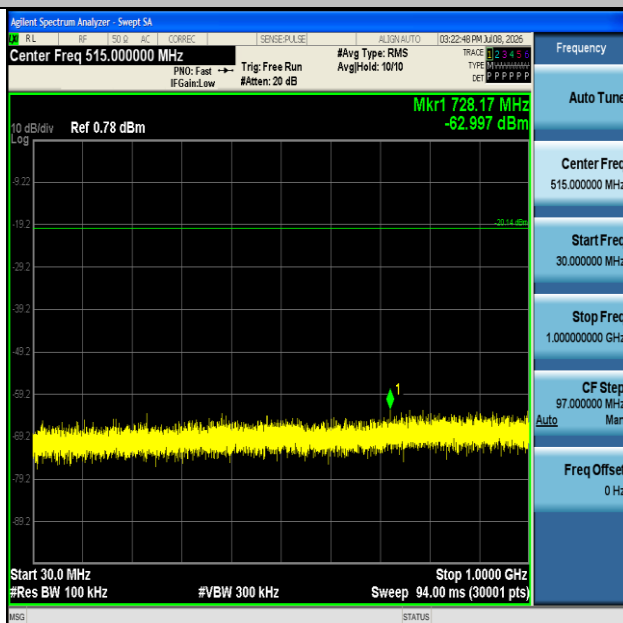


2DH5-Ant1-2402-1000~26500-PASS



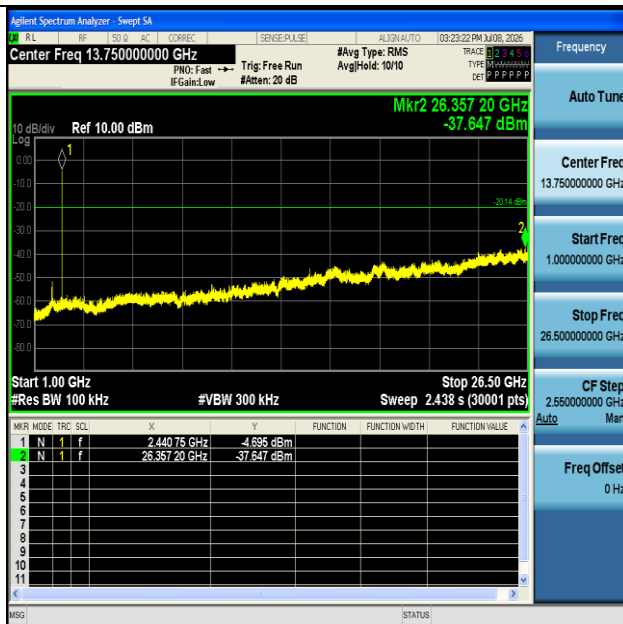


2DH5-Ant1-2441-0~Reference-PASS

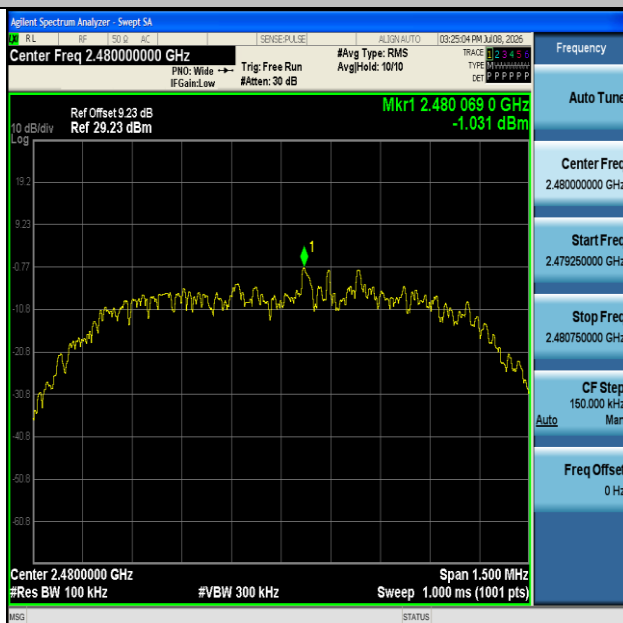


2DH5-Ant1-2441-30~1000-PASS



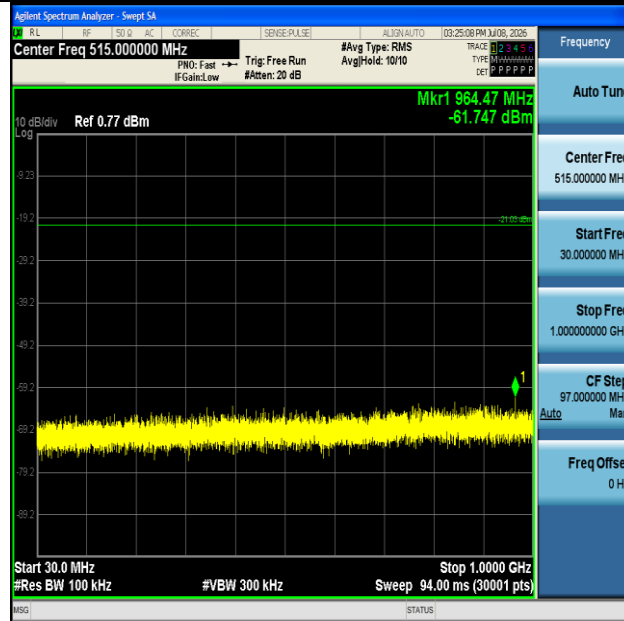


2DH5-Ant1-2441-1000~26500-PASS

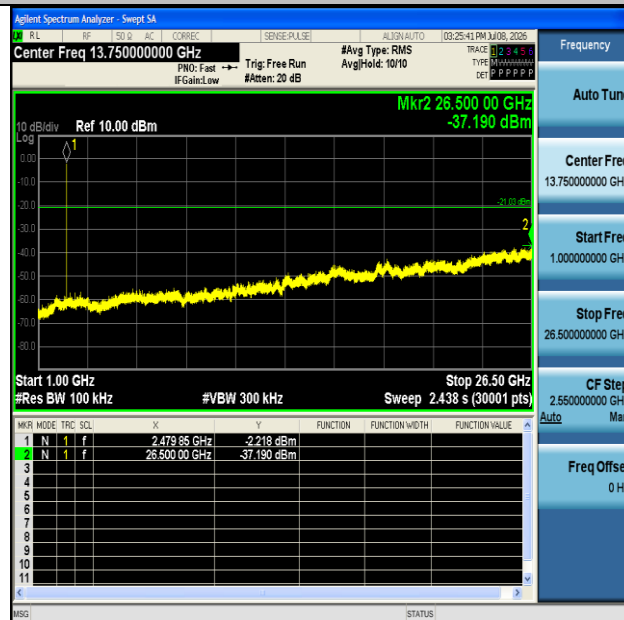


2DH5-Ant1-2480-0~Reference-PASS





2DH5-Ant1-2480-30~1000-PASS

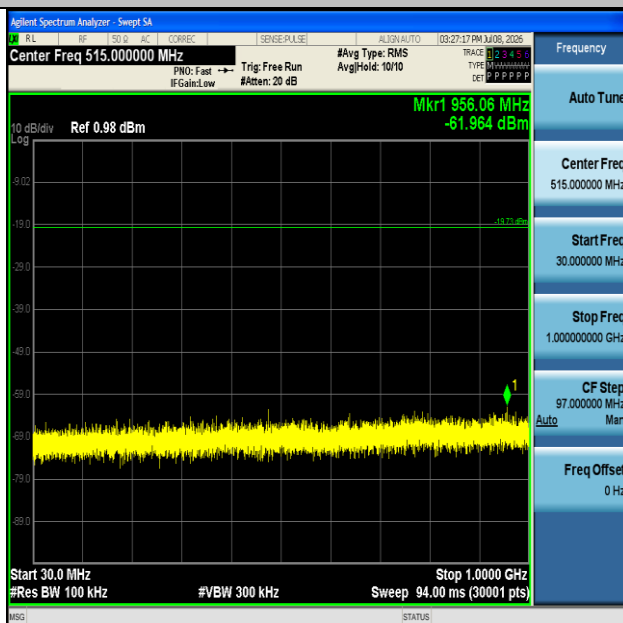


2DH5-Ant1-2480-1000~26500-PASS





3DH5-Ant1-2402-0~Reference-PASS

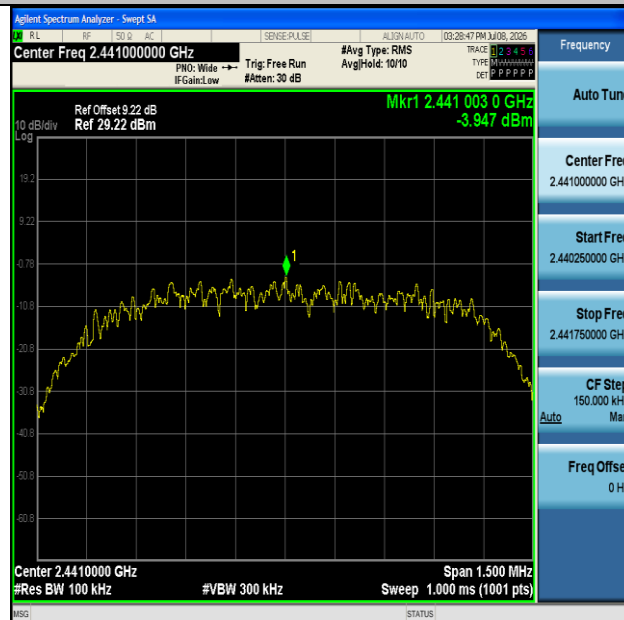


3DH5-Ant1-2402-30~1000-PASS



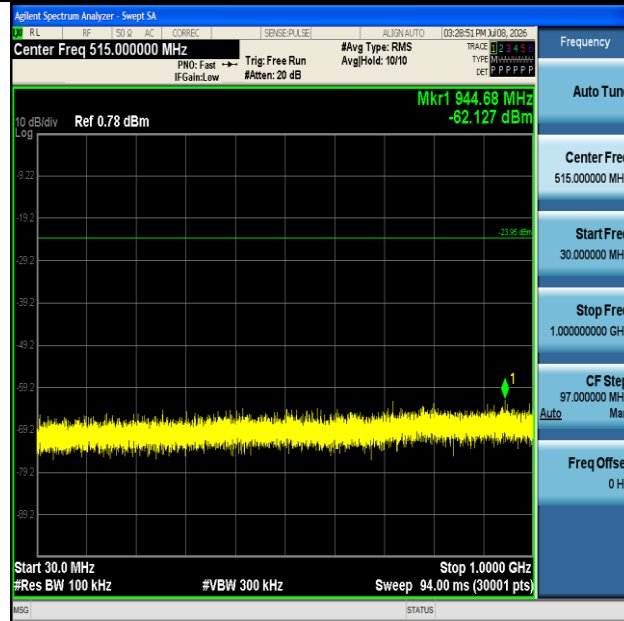


3DH5-Ant1-2402-1000~26500-PASS



3DH5-Ant1-2441-0~Reference-PASS





3DH5-Ant1-2441-30~1000-PASS

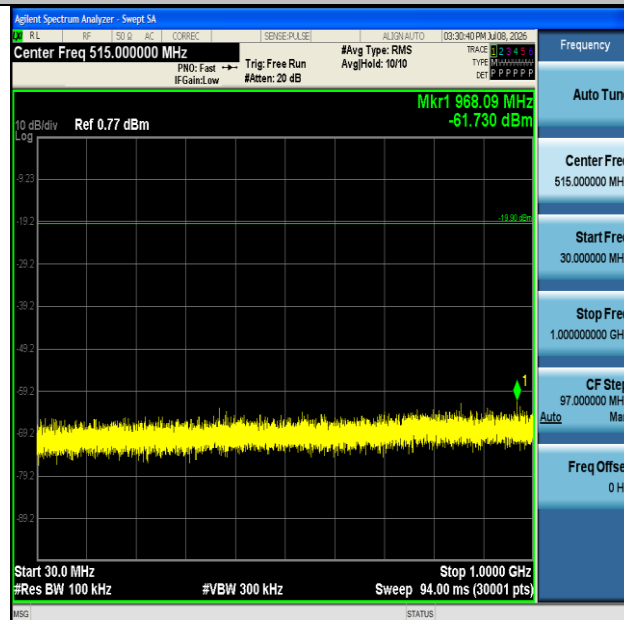


3DH5-Ant1-2441-1000~26500-PASS



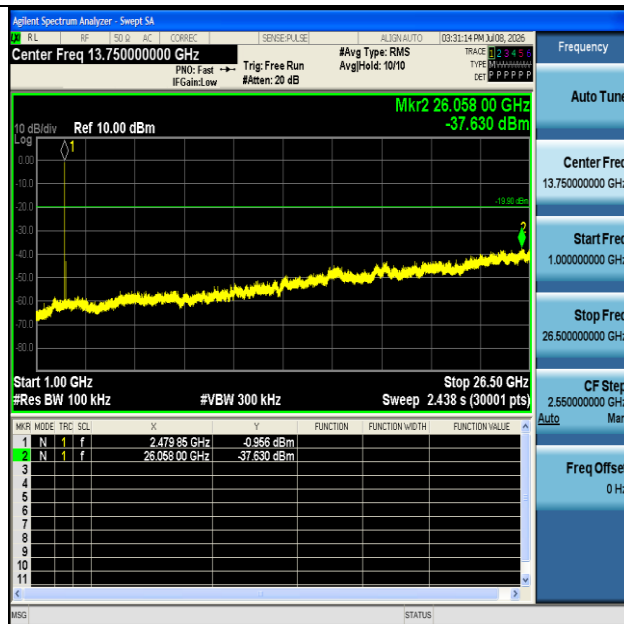


3DH5-Ant1-2480-0~Reference-PASS



3DH5-Ant1-2480-30~1000-PASS





3DH5-Ant1-2480-1000~26500-PASS





Appendix I: Duty Cycle

Test Result

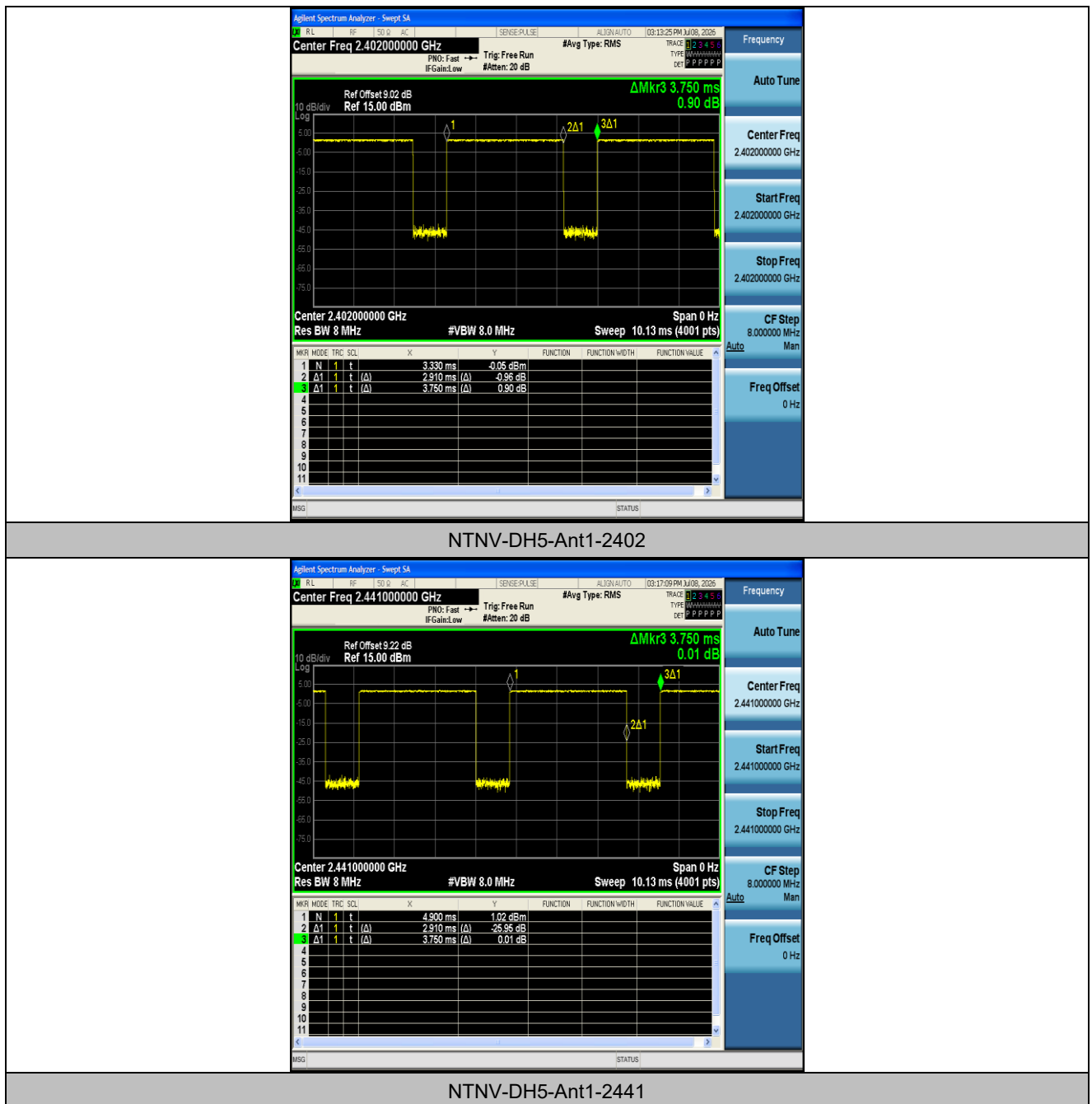
Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor [dB]
DH5	Ant1	2402	2.91	3.75	77.60	1.10
DH5	Ant1	2441	2.91	3.75	77.60	1.10
DH5	Ant1	2480	2.91	3.75	77.60	1.10
2DH5	Ant1	2402	2.92	3.75	77.87	1.09
2DH5	Ant1	2441	2.91	3.75	77.60	1.10
2DH5	Ant1	2480	2.91	3.75	77.60	1.10
3DH5	Ant1	2402	2.91	3.75	77.60	1.10
3DH5	Ant1	2441	2.91	3.75	77.60	1.10
3DH5	Ant1	2480	2.92	3.75	77.87	1.09

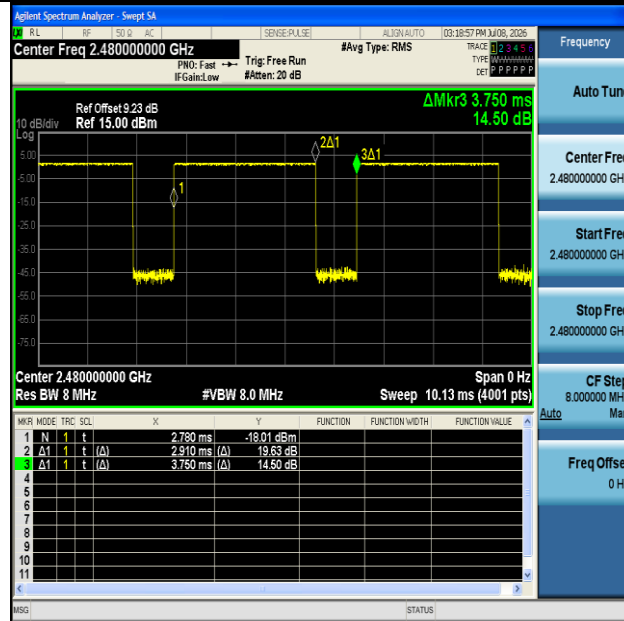
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



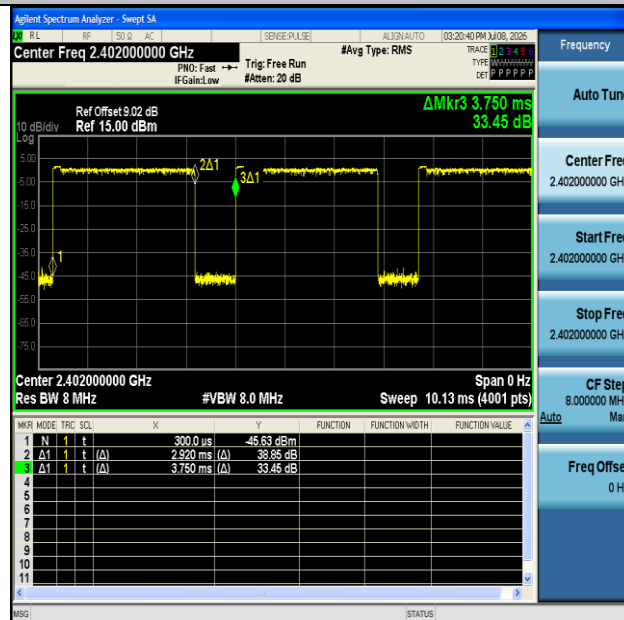


Test Graphs



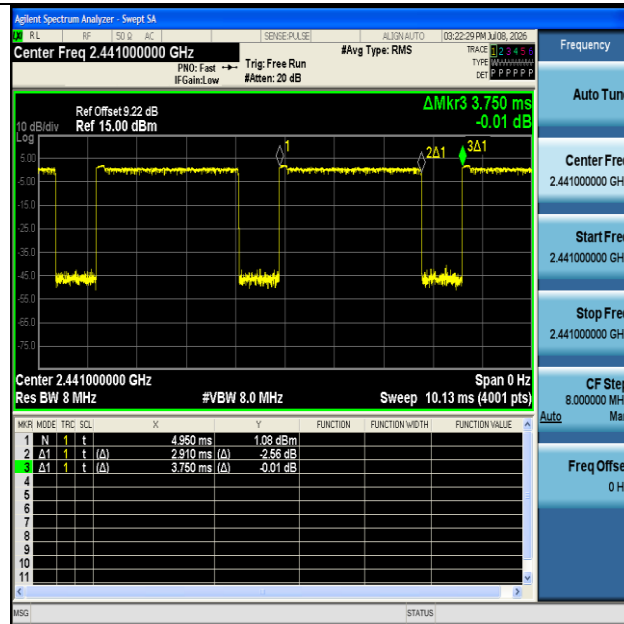


NTNV-DH5-Ant1-2480

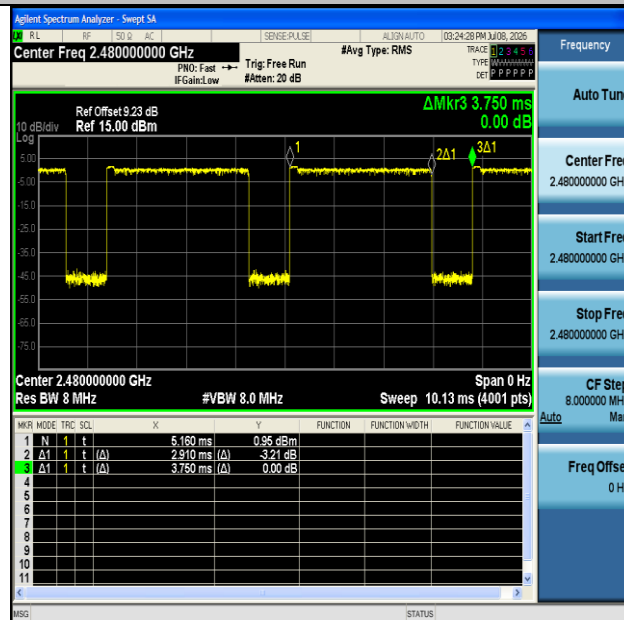


NTNV-2DH5-Ant1-2402



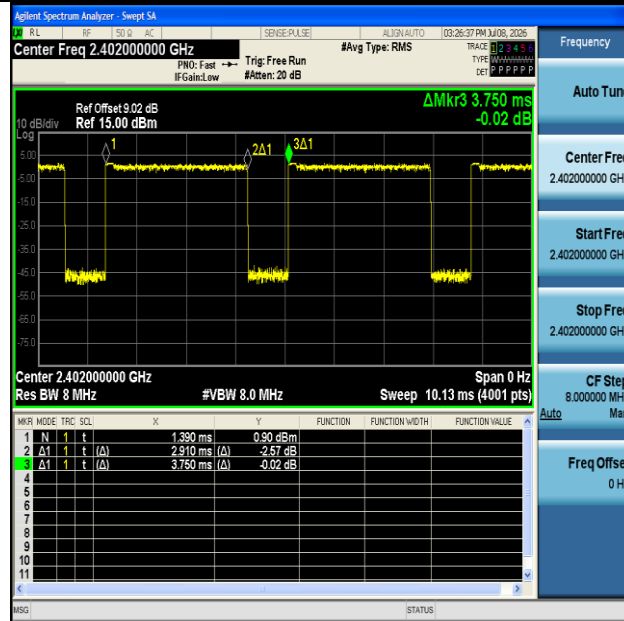


NTNV-2DH5-Ant1-2441

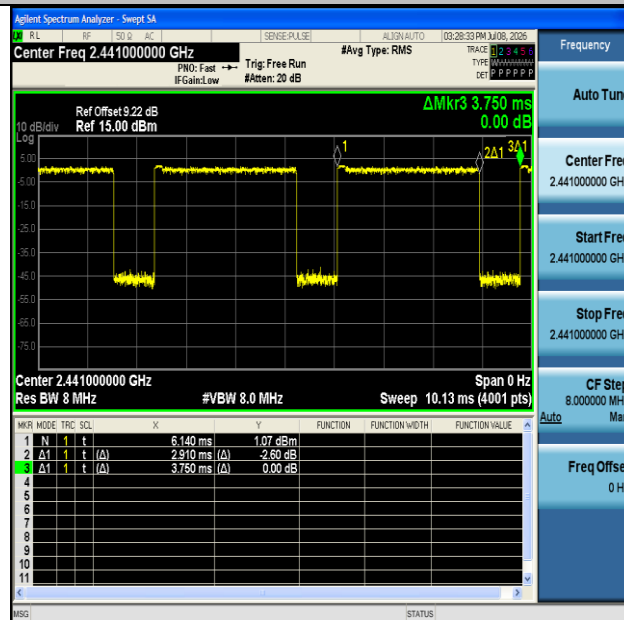


NTNV-2DH5-Ant1-2480



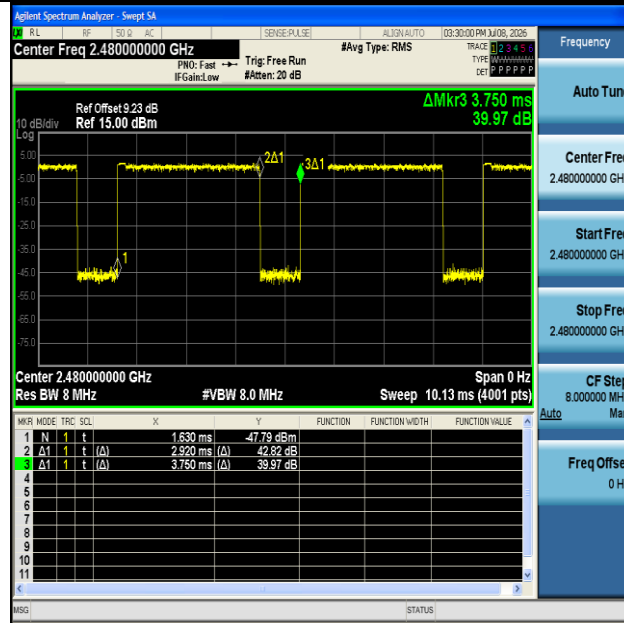


NTNV-3DH5-Ant1-2402



NTNV-3DH5-Ant1-2441





NTNV-3DH5-Ant1-2480

