



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

Product Name: Wireless speaker with wireless charger

Trade Mark: SHARPER IMAGE

Test Model: SHRP-BTS12

FCC ID: 2AL9B-SHRPBTS12

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 A: 20dB Emission Bandwidth

Test Result

Test Mode	Antenna	Frequency [MHz]	20db EBW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
DH5	Ant1	2402	0.945	2401.547	2402.492	---	---
DH5	Ant1	2441	0.960	2440.541	2441.501	---	---
DH5	Ant1	2480	0.945	2479.544	2480.489	---	---
2DH5	Ant1	2402	1.266	2401.394	2402.660	---	---
2DH5	Ant1	2441	1.314	2440.349	2441.663	---	---
2DH5	Ant1	2480	1.287	2479.376	2480.663	---	---
3DH5	Ant1	2402	1.299	2401.364	2402.663	---	---
3DH5	Ant1	2441	1.293	2440.361	2441.654	---	---
3DH5	Ant1	2480	1.305	2479.361	2480.666	---	---

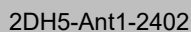
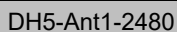
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)





Test Graphs







2DH5-Ant1-2441



2DH5-Ant1-2480





3DH5-Ant1-2402



3DH5-Ant1-2441







Appendix B: Occupied Channel Bandwidth

Test Result

Test Mode	Antenna	Frequency [MHz]	OCB [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
DH5	Ant1	2402	0.87943	2401.5705	2402.4499	---	---
DH5	Ant1	2441	0.86963	2440.5763	2441.4459	---	---
DH5	Ant1	2480	0.87341	2479.5745	2480.4479	---	---
2DH5	Ant1	2402	1.1902	2401.4124	2402.6026	---	---
2DH5	Ant1	2441	1.1935	2440.4132	2441.6067	---	---
2DH5	Ant1	2480	1.1964	2479.4151	2480.6115	---	---
3DH5	Ant1	2402	1.1957	2401.4102	2402.6059	---	---
3DH5	Ant1	2441	1.1845	2440.4207	2441.6052	---	---
3DH5	Ant1	2480	1.1895	2479.4163	2480.6058	---	---

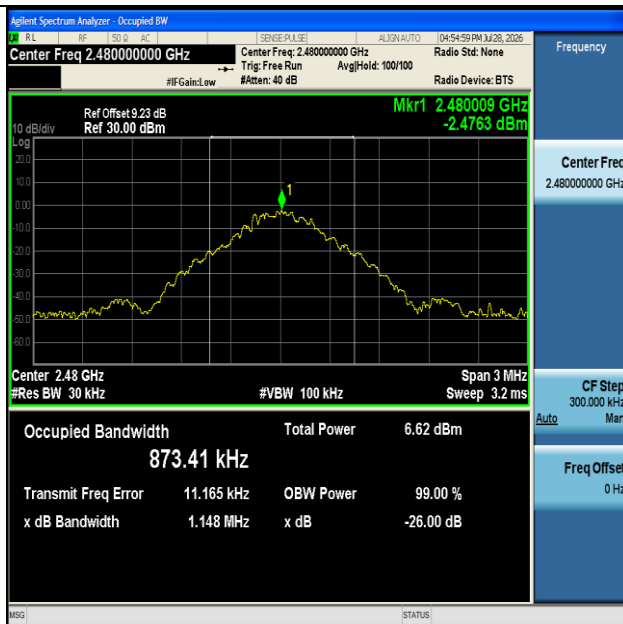
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



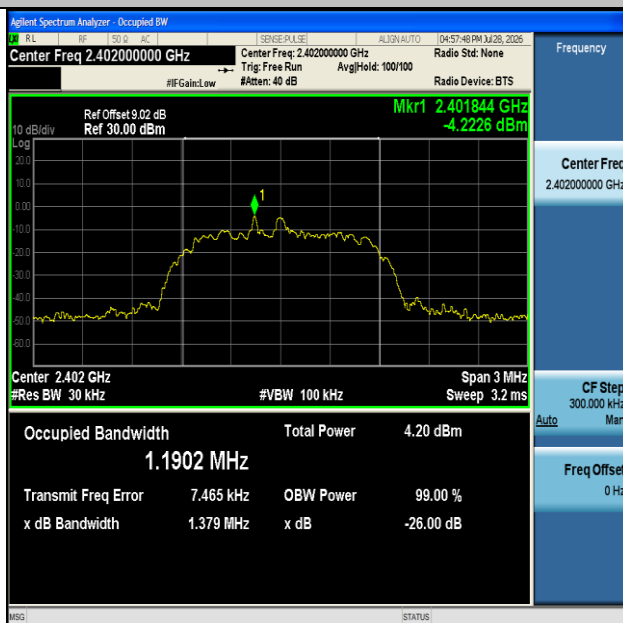


Test Graphs



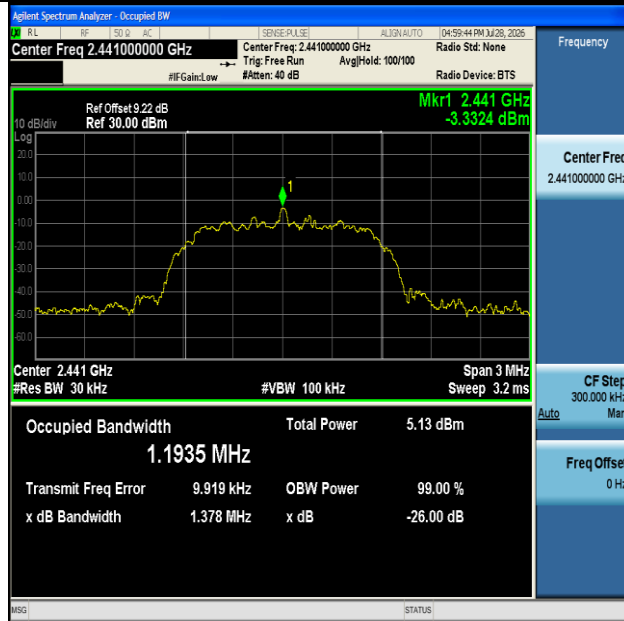


DH5-Ant1-2480



2DH5-Ant1-2402



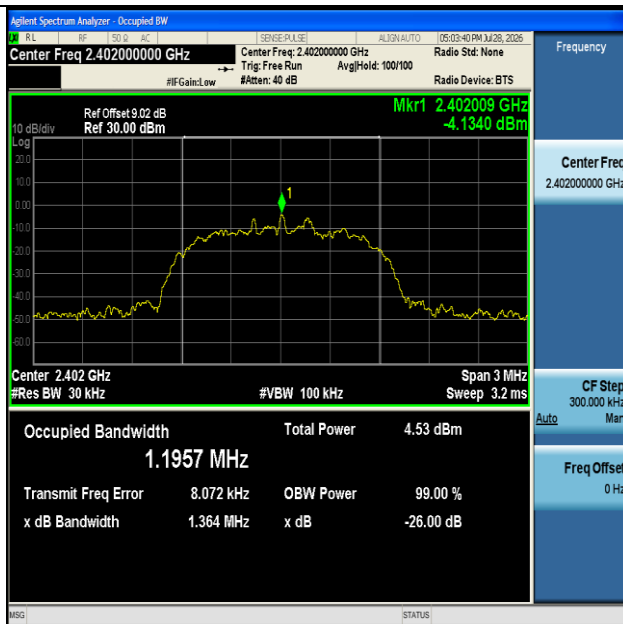


2DH5-Ant1-2441

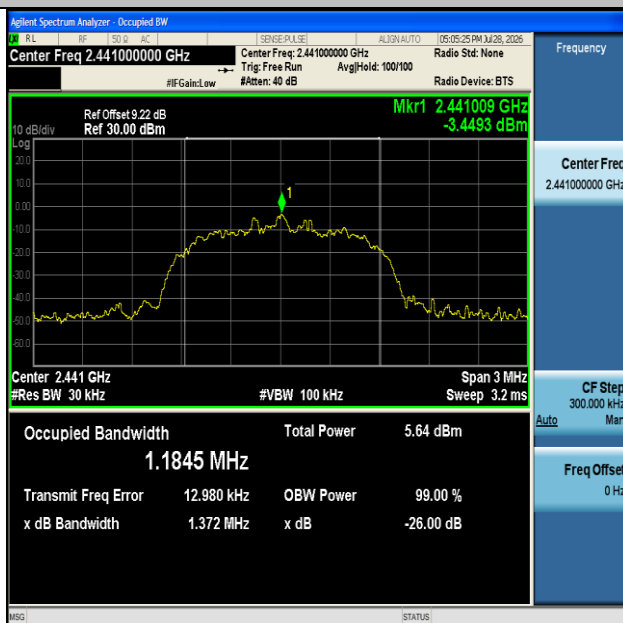


2DH5-Ant1-2480



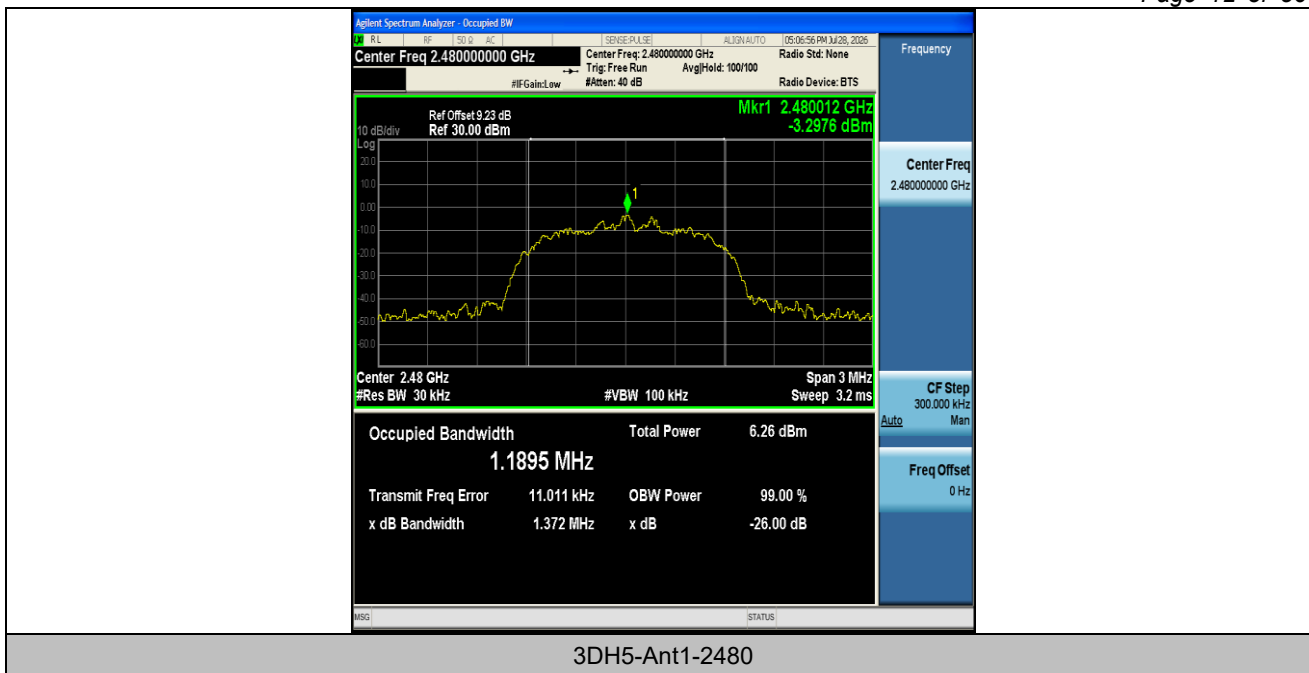


3DH5-Ant1-2402



3DH5-Ant1-2441







Appendix C: Maximum peak conducted output power

Test Result

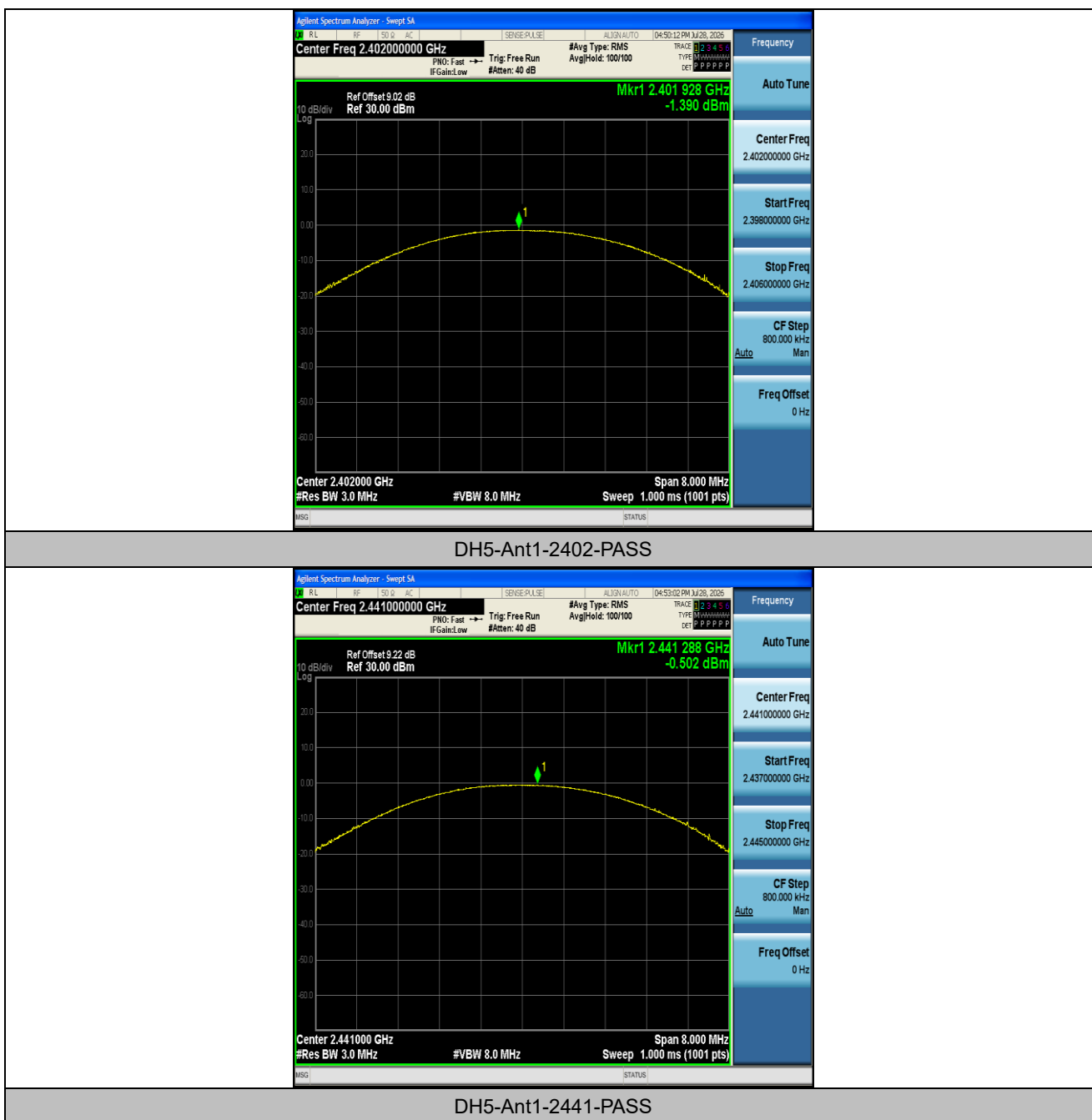
Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Conducted Limit [dBm]	Verdict
DH5	Ant1	2402	-1.39	≤30	PASS
DH5	Ant1	2441	-0.50	≤30	PASS
DH5	Ant1	2480	0.17	≤30	PASS
2DH5	Ant1	2402	-0.65	≤20.97	PASS
2DH5	Ant1	2441	0.37	≤20.97	PASS
2DH5	Ant1	2480	1.02	≤20.97	PASS
3DH5	Ant1	2402	-0.27	≤20.97	PASS
3DH5	Ant1	2441	0.67	≤20.97	PASS
3DH5	Ant1	2480	1.37	≤20.97	PASS

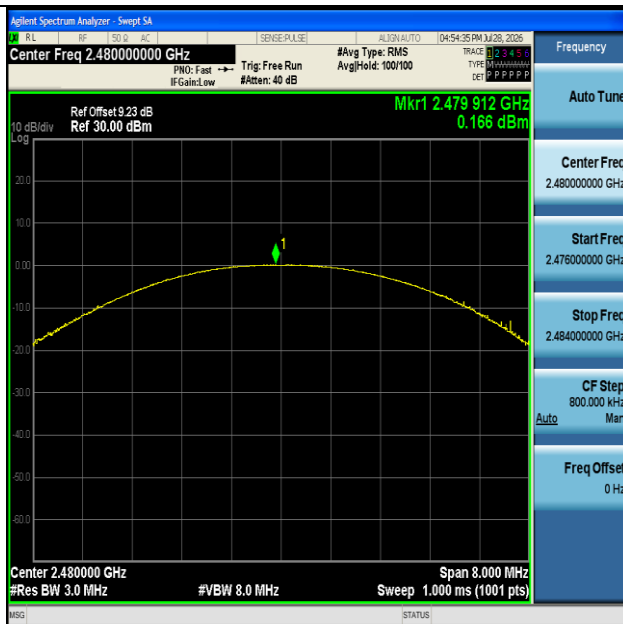
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



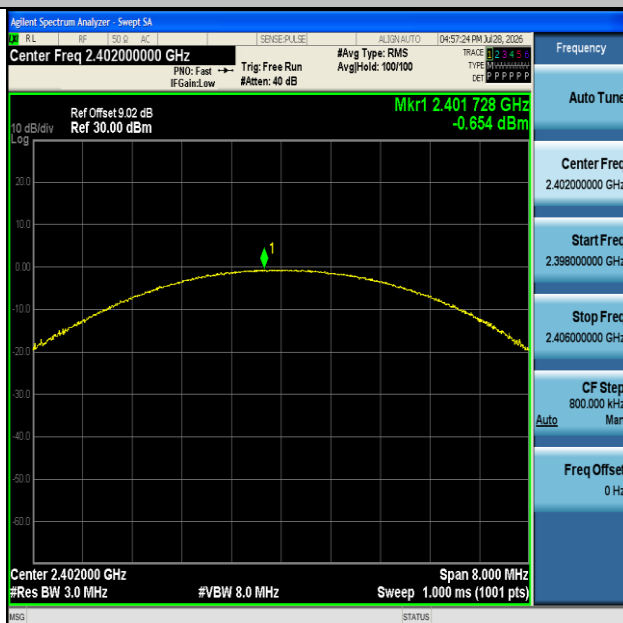


Test Graphs



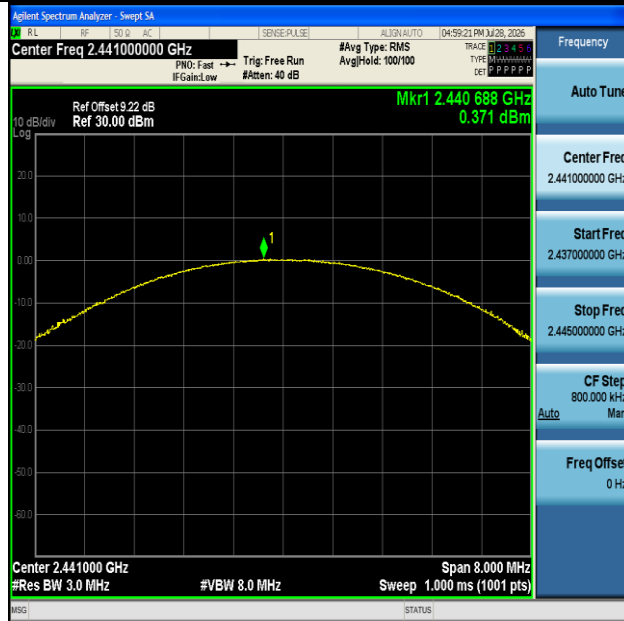


DH5-Ant1-2480-PASS



2DH5-Ant1-2402-PASS



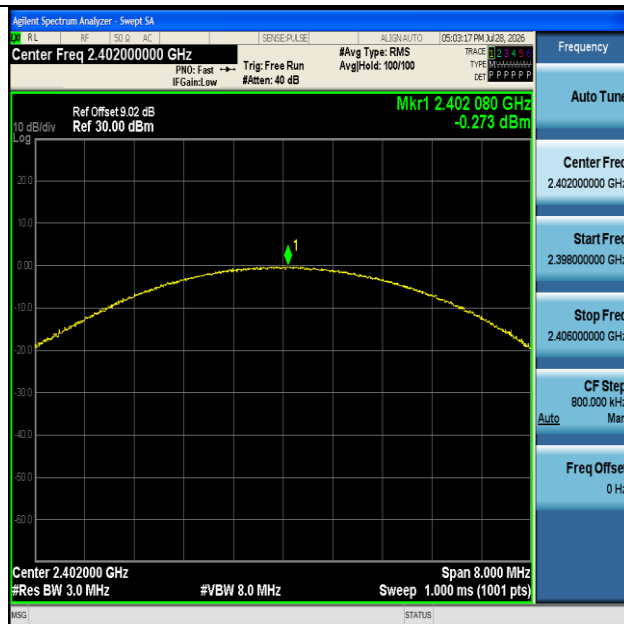


2DH5-Ant1-2441-PASS

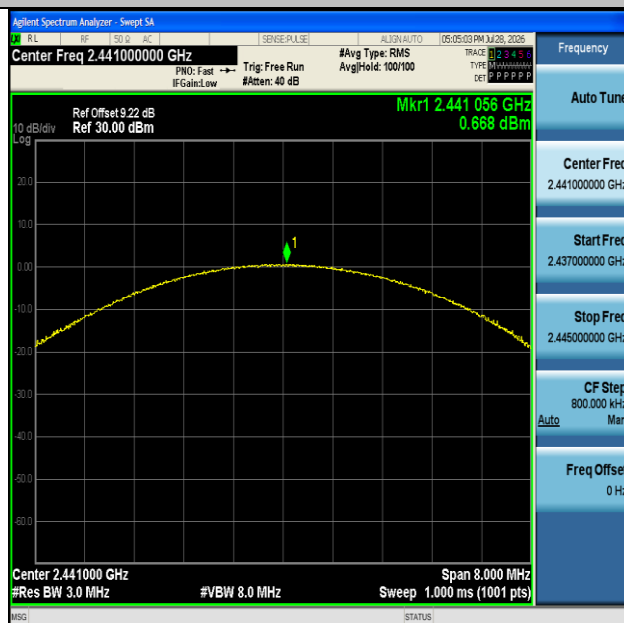


2DH5-Ant1-2480-PASS



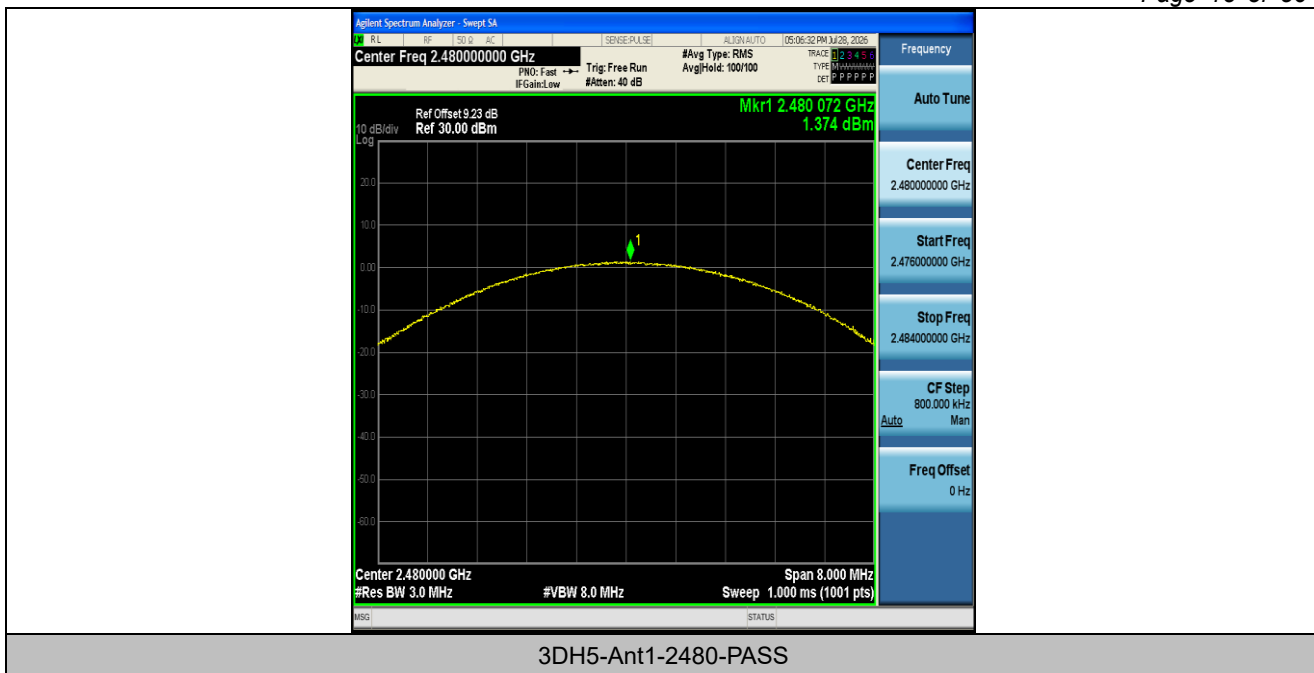


3DH5-Ant1-2402-PASS



3DH5-Ant1-2441-PASS







Appendix D: Carrier frequency separation

Test Result

Test Mode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Verdict
DH5	Ant1	Hop	0.994	≥0.960	PASS
2DH5	Ant1	Hop	0.992	≥0.876	PASS
3DH5	Ant1	Hop	1.006	≥0.870	PASS

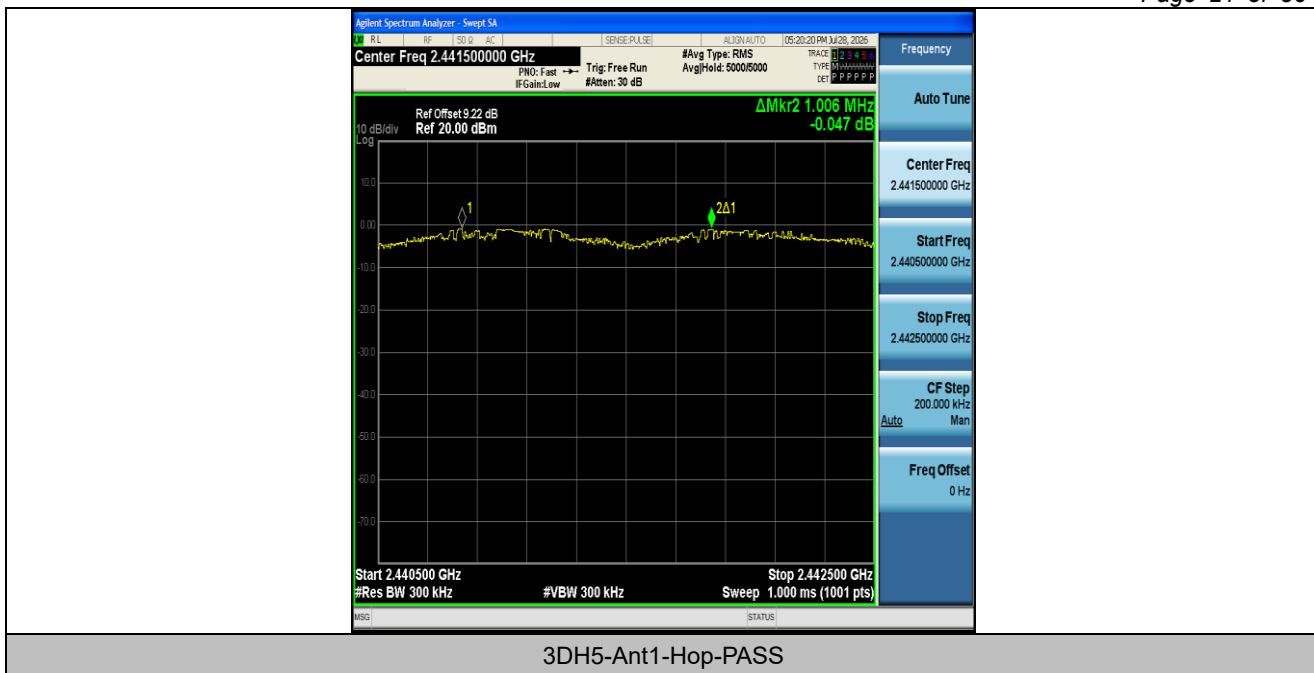
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)





Test Graphs







Appendix E: Time of occupancy

Test Result

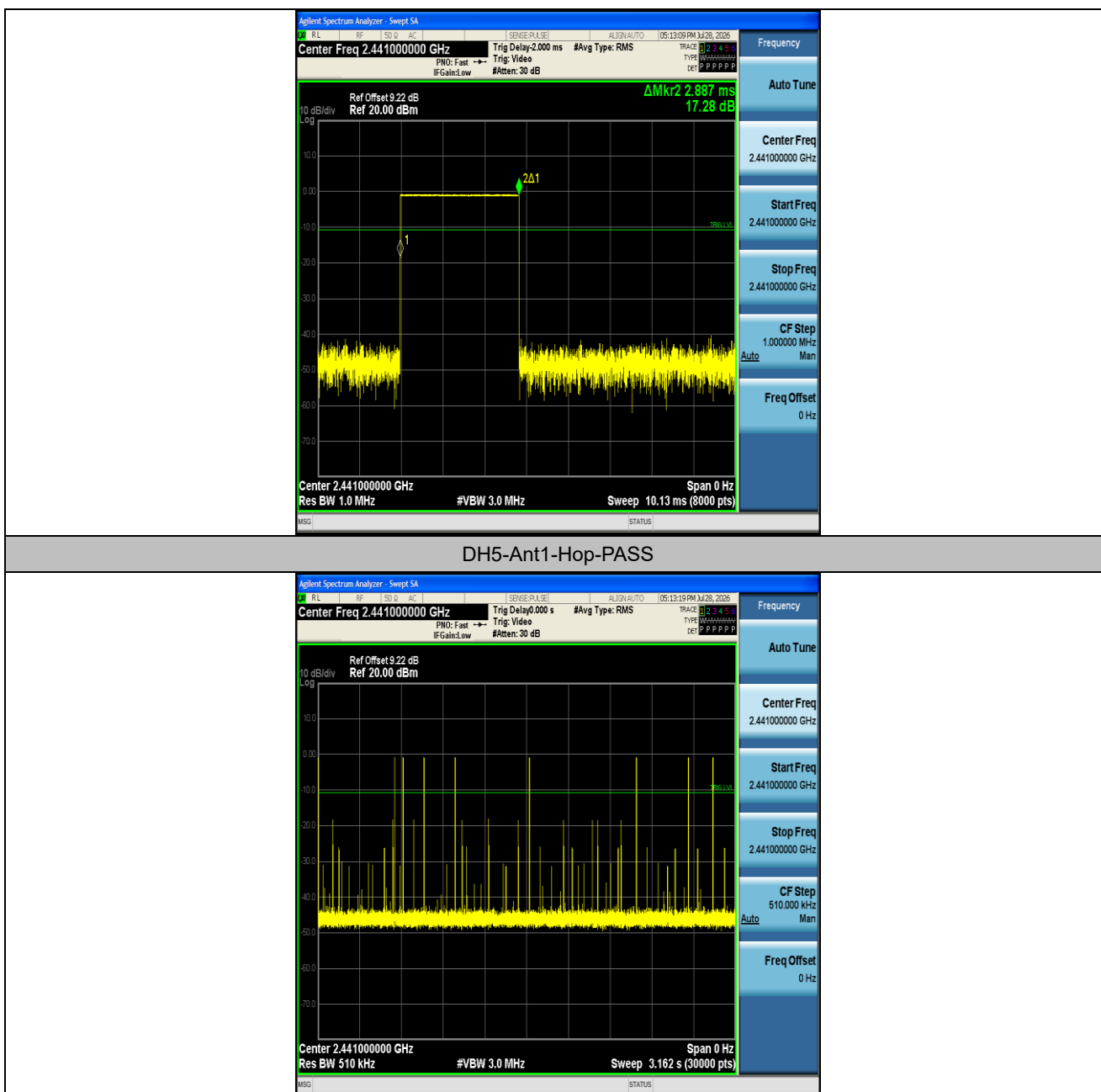
Test Mode	Antenna	Frequency [MHz]	Burst Width [ms]	TotalHops [Num]	Result [s]	Limit [s]	Verdict
DH5	Ant1	Hop	2.887	90	0.26	≤0.4	PASS
2DH5	Ant1	Hop	2.892	80	0.231	≤0.4	PASS
3DH5	Ant1	Hop	2.894	120	0.347	≤0.4	PASS

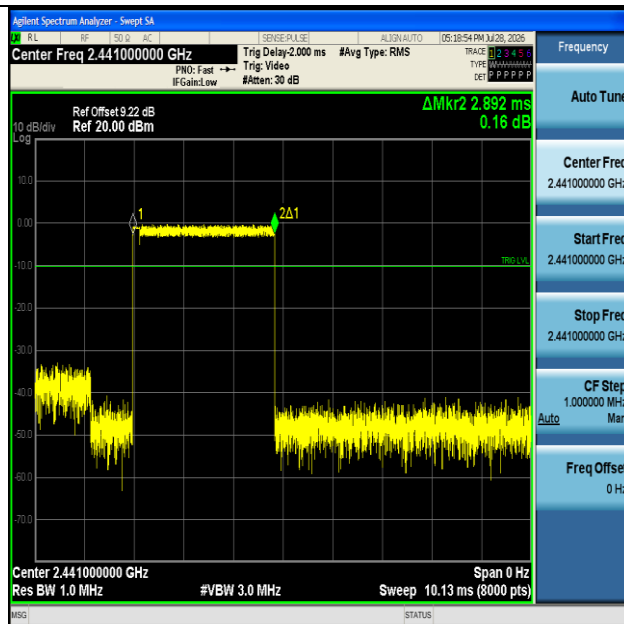
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



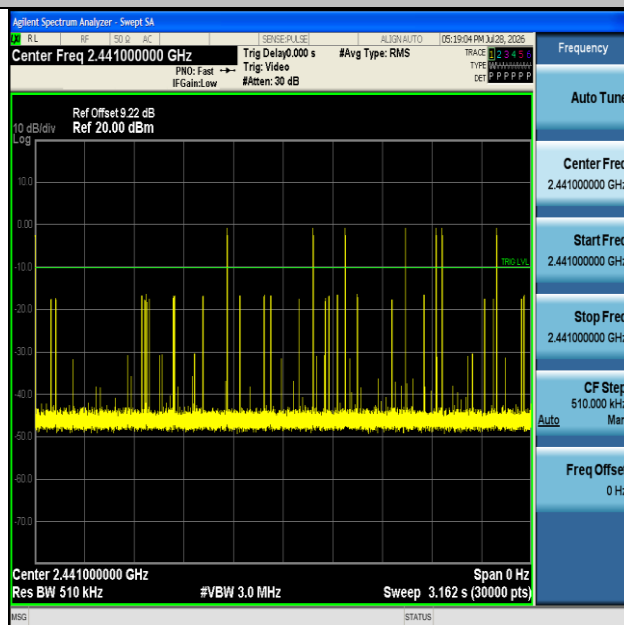


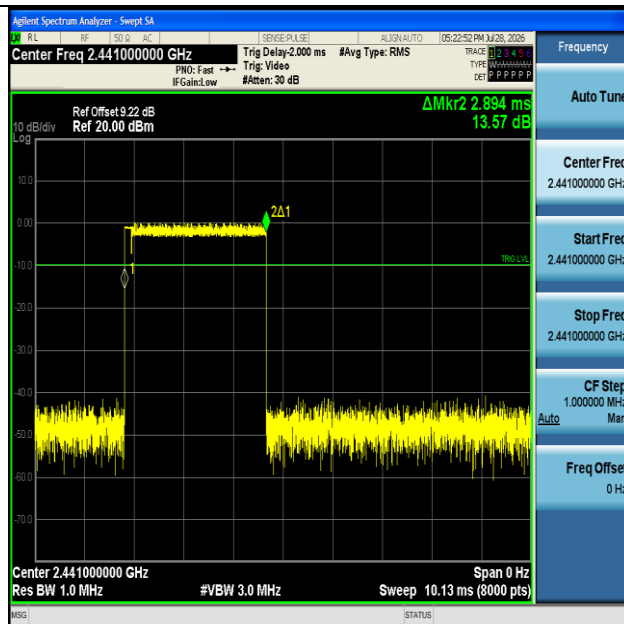
Test Graphs



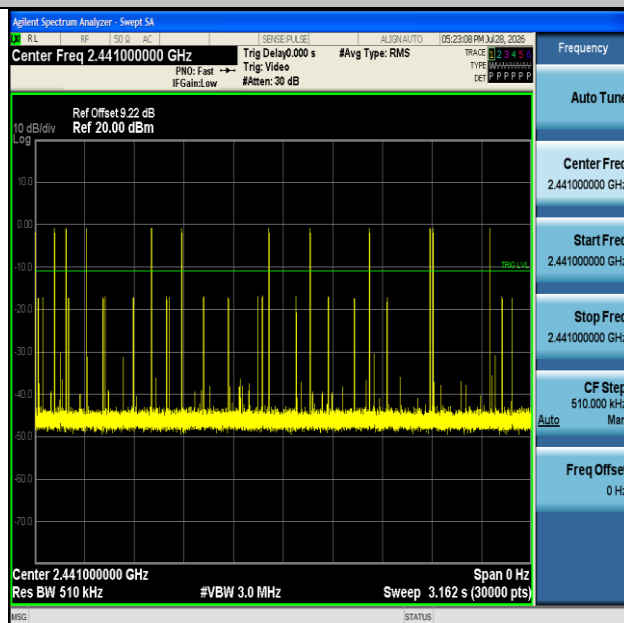


2DH5-Ant1-Hop-PASS





3DH5-Ant1-Hop-PASS





Appendix F: Number of hopping channels

Test Result

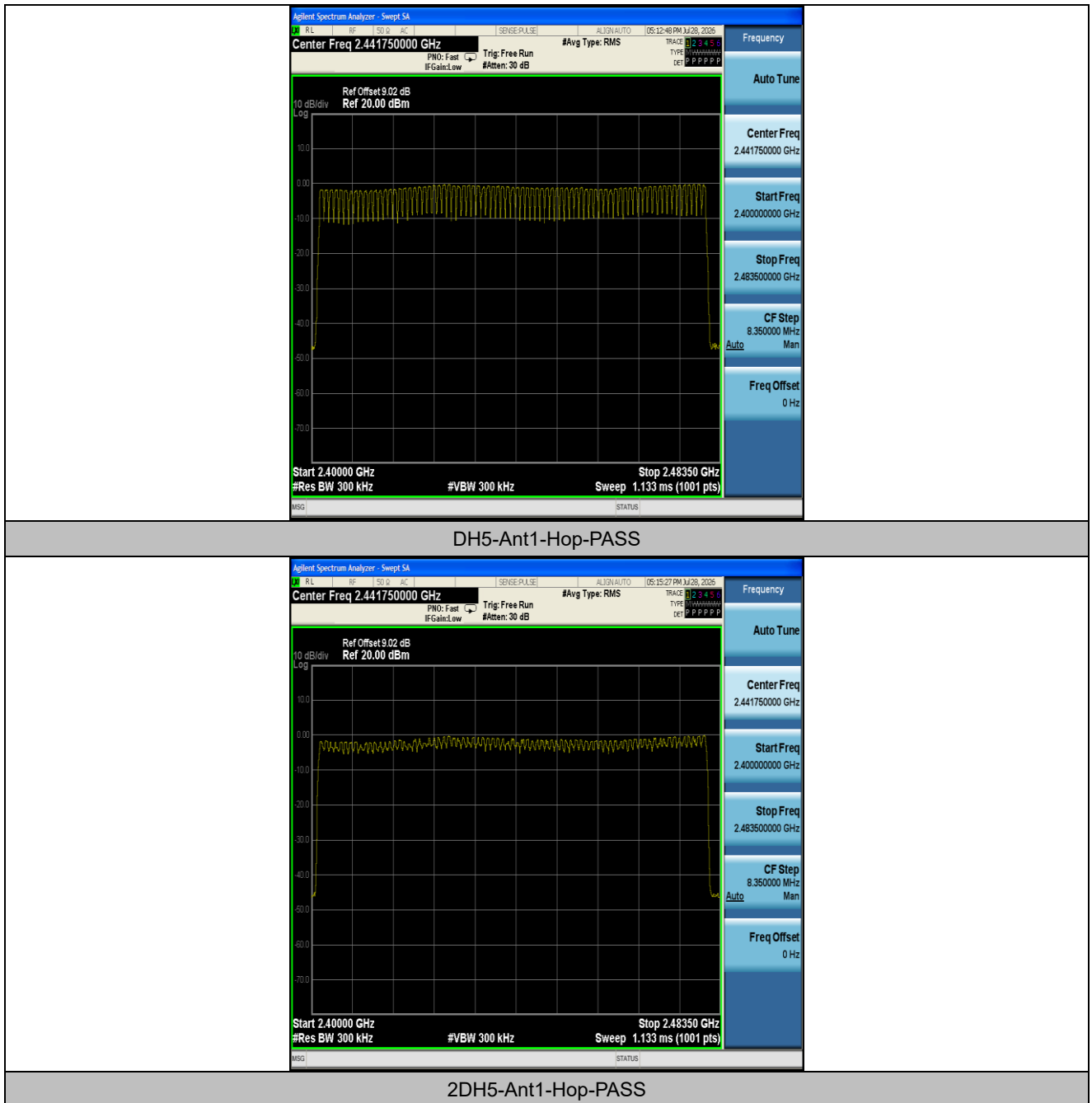
Test Mode	Antenna	Frequency [MHz]	Result [Num]	Limit [Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

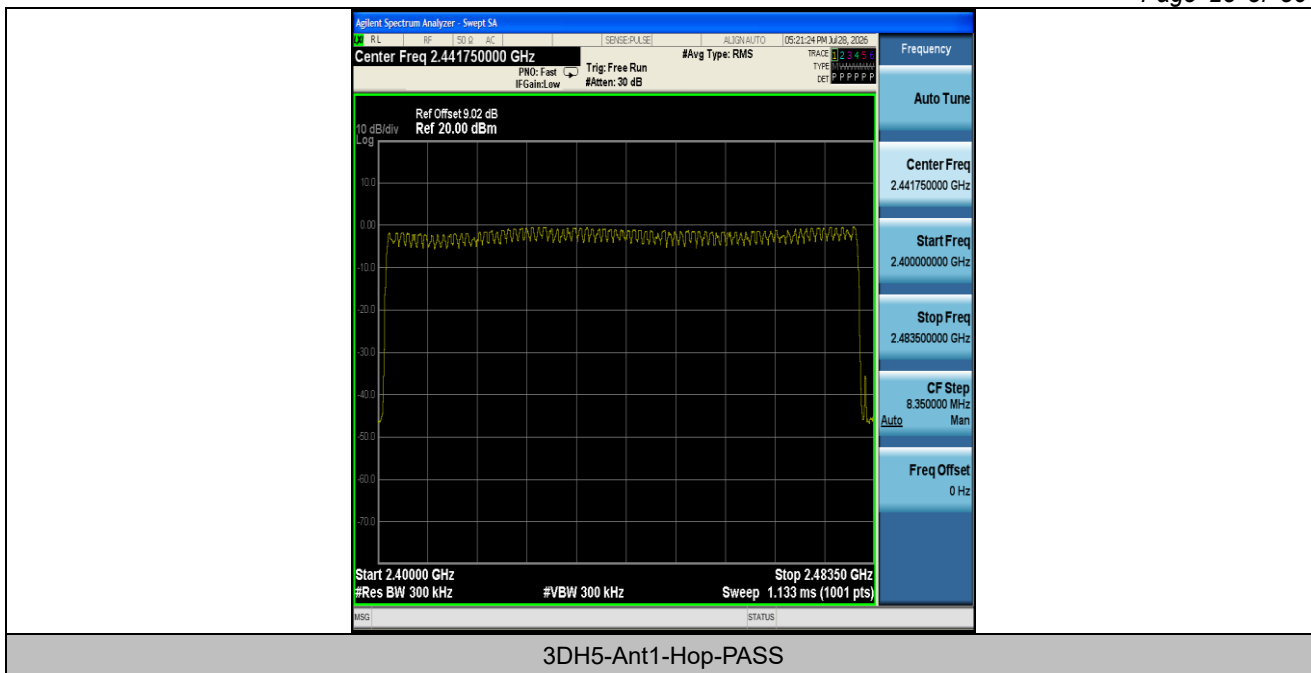
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)





Test Graphs







Appendix G: Band edge measurements

Test Result

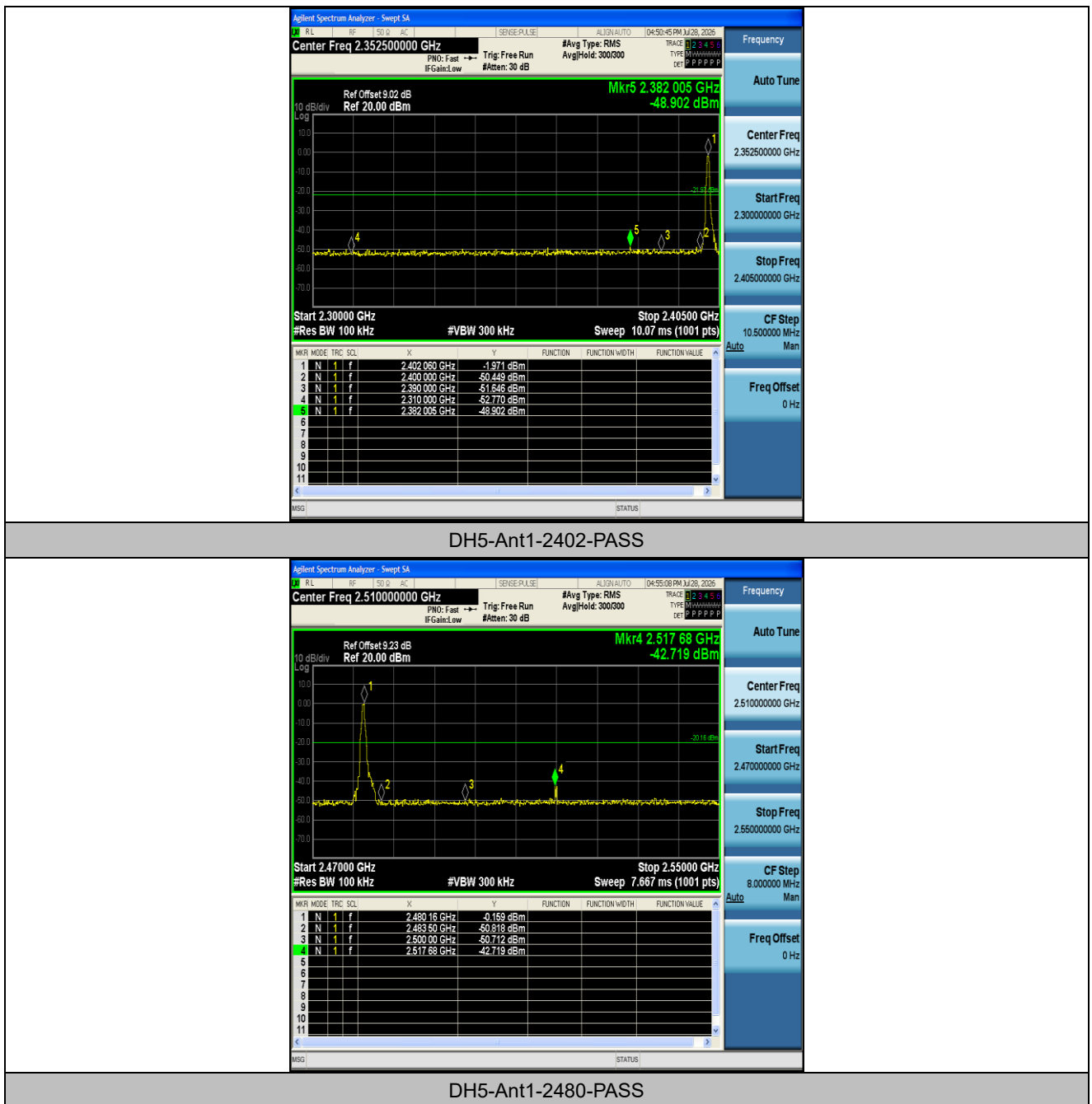
Test Mode	Antenna	Ch.Name	Frequency [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-1.97	-48.9	≤-21.97	PASS
DH5	Ant1	High	2480	-0.16	-42.72	≤-20.16	PASS
DH5	Ant1	Low	Hop_2402	-2.13	-49.32	≤-22.13	PASS
DH5	Ant1	High	Hop_2480	-0.77	-45.79	≤-20.77	PASS
2DH5	Ant1	Low	2402	-1.87	-49.22	≤-21.87	PASS
2DH5	Ant1	High	2480	-0.16	-34.32	≤-20.16	PASS
2DH5	Ant1	Low	Hop_2402	-1.89	-48.41	≤-21.89	PASS
2DH5	Ant1	High	Hop_2480	-0.58	-29.78	≤-20.58	PASS
3DH5	Ant1	Low	2402	-1.84	-49.23	≤-21.84	PASS
3DH5	Ant1	High	2480	-0.74	-39.82	≤-20.74	PASS
3DH5	Ant1	Low	Hop_2402	-3.60	-48.99	≤-23.6	PASS
3DH5	Ant1	High	Hop_2480	-2.44	-32.67	≤-22.44	PASS

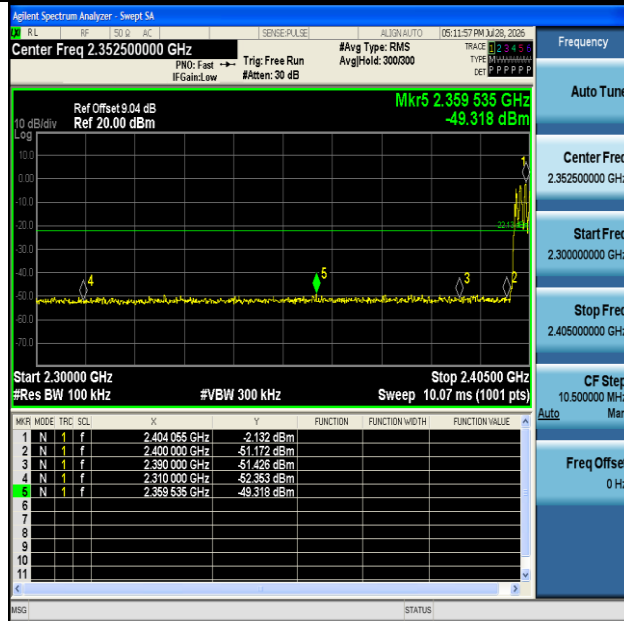
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



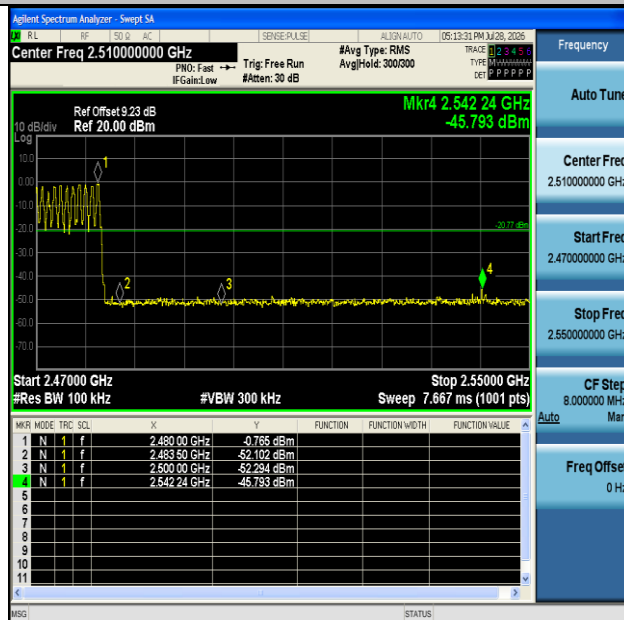


Test Graphs



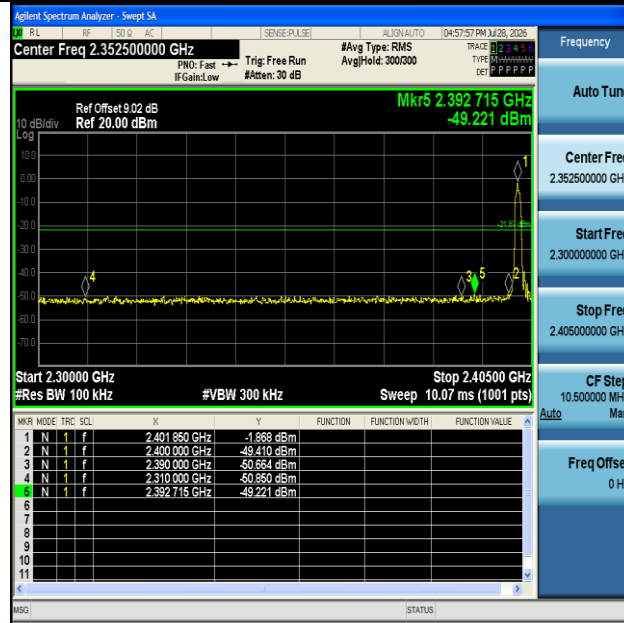


DH5-Ant1-Hop_2402-PASS

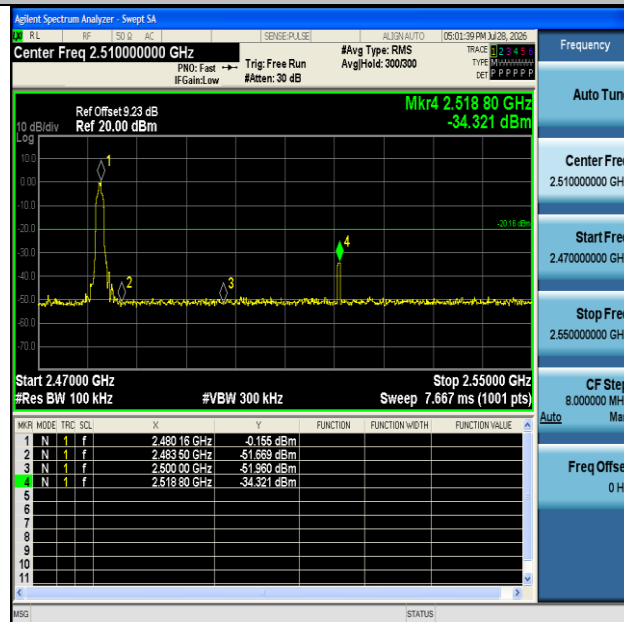


DH5-Ant1-Hop_2480-PASS



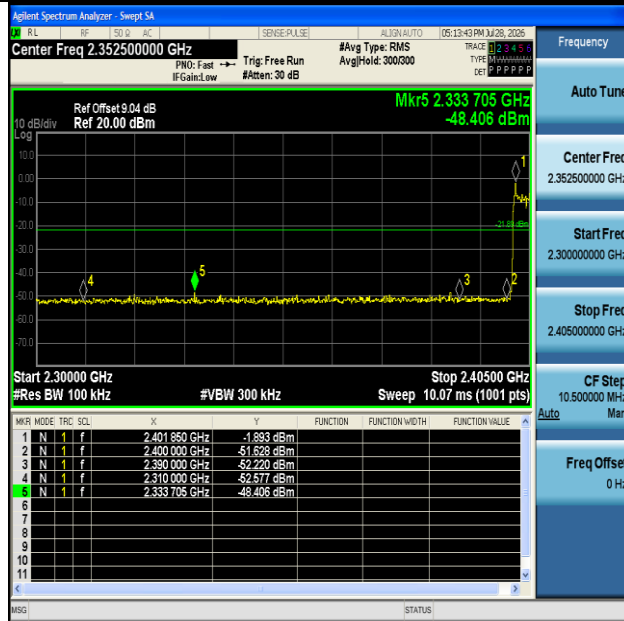


2DH5-Ant1-2402-PASS

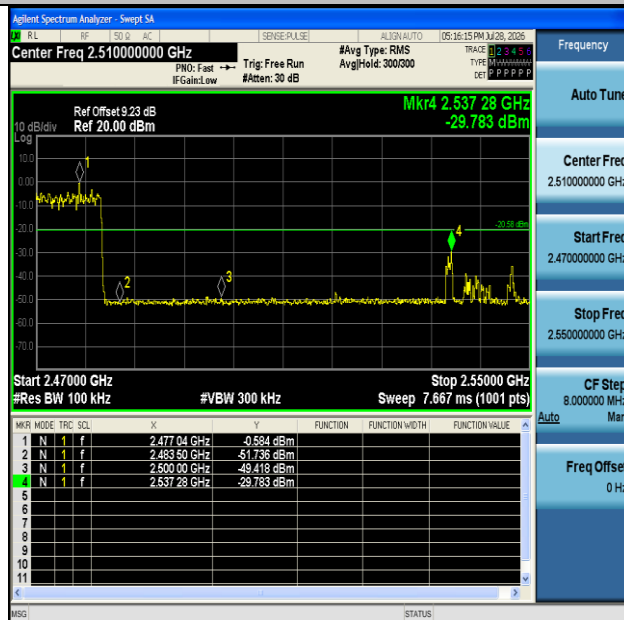


2DH5-Ant1-2480-PASS



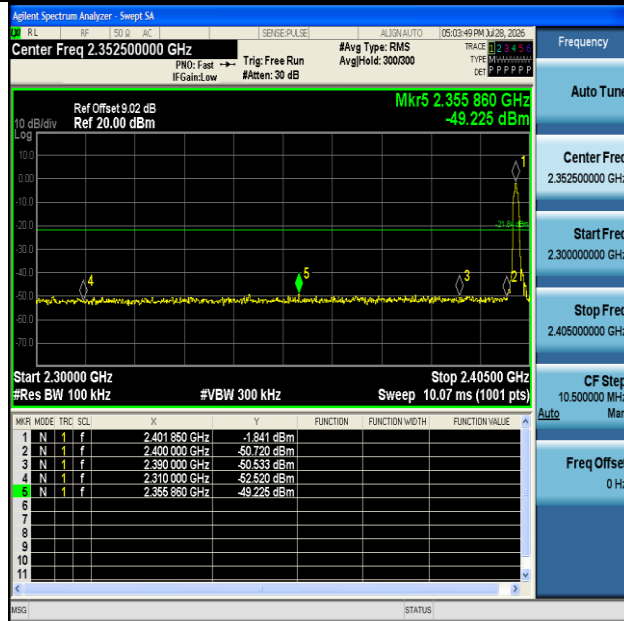


2DH5-Ant1-Hop_2402-PASS

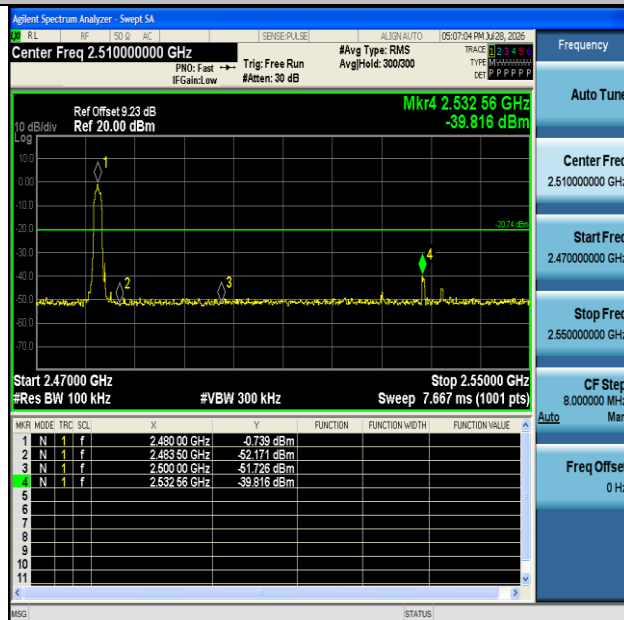


2DH5-Ant1-Hop_2480-PASS



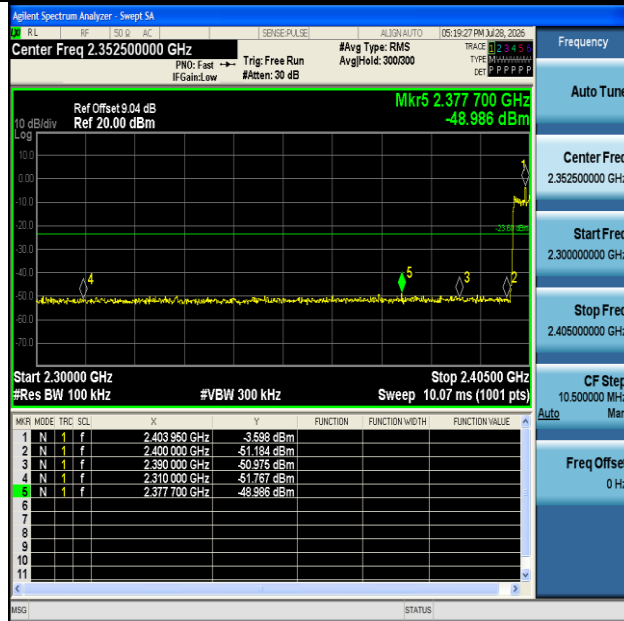


3DH5-Ant1-2402-PASS

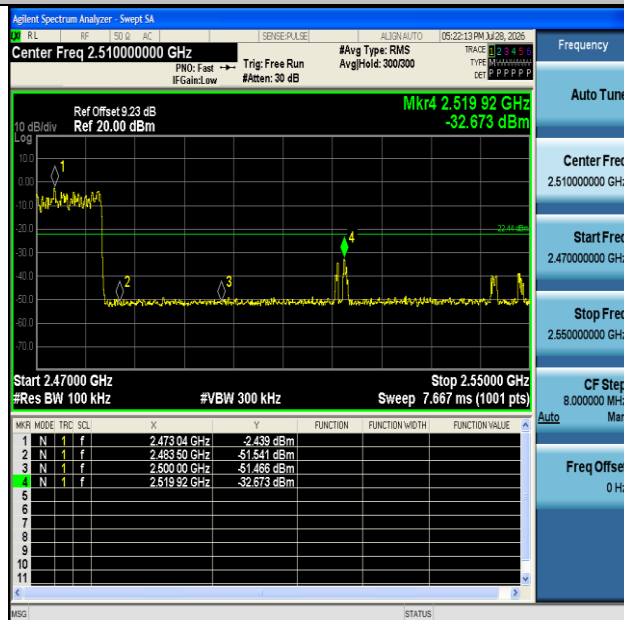


3DH5-Ant1-2480-PASS





3DH5-Ant1-Hop_2402-PASS



3DH5-Ant1-Hop_2480-PASS





Appendix H: Conducted Spurious Emission

Test Result

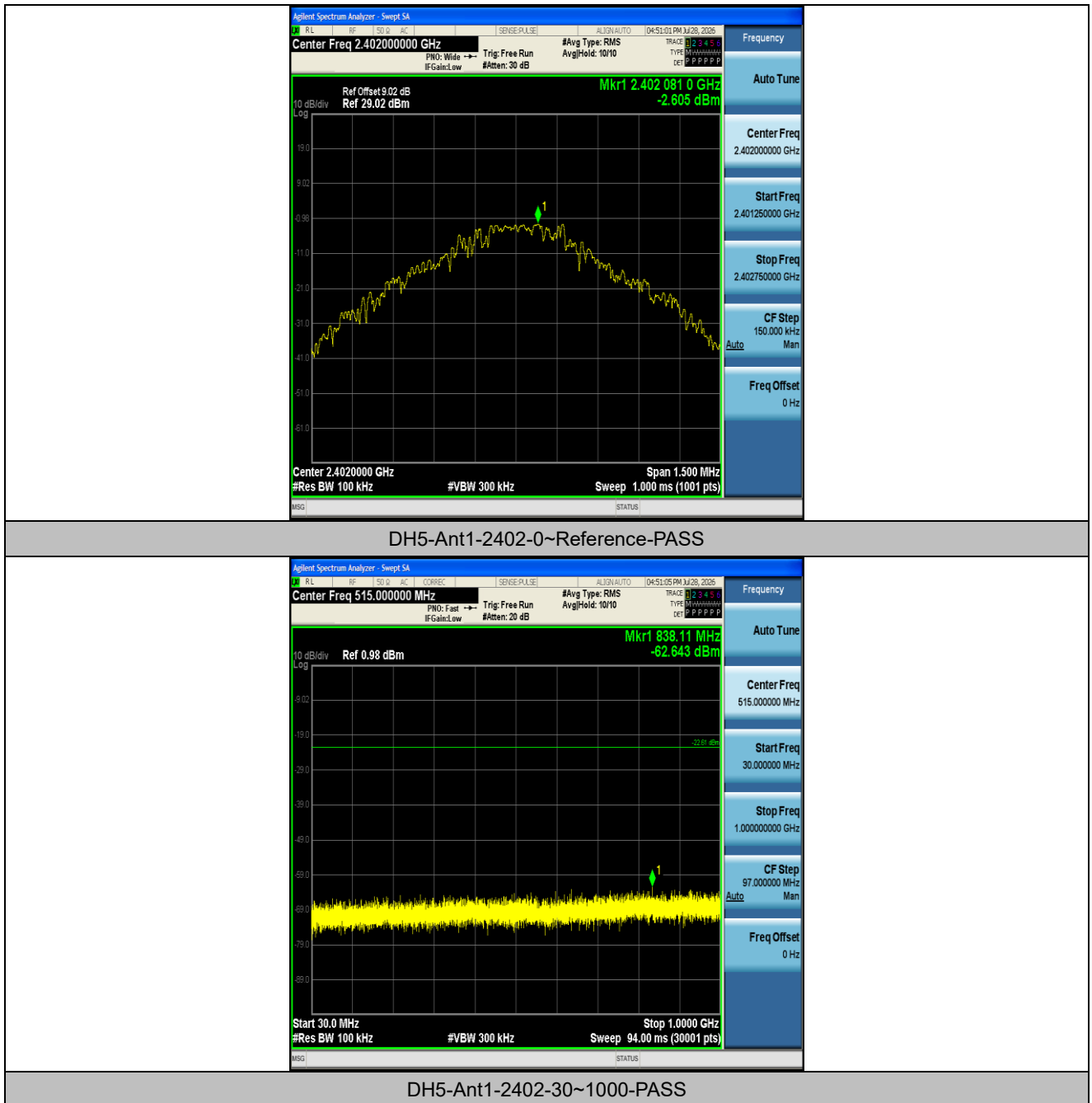
Test Mode	Antenna	Frequency [MHz]	Freq. Range [MHz]	Ref. Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	0~Reference	-2.61	-2.61	---	PASS
DH5	Ant1	2402	30~1000	-2.61	-62.64	≤ -22.61	PASS
DH5	Ant1	2402	1000~26500	-2.61	-37.17	≤ -22.61	PASS
DH5	Ant1	2441	0~Reference	-1.69	-1.69	---	PASS
DH5	Ant1	2441	30~1000	-1.69	-62.88	≤ -21.69	PASS
DH5	Ant1	2441	1000~26500	-1.69	-37.92	≤ -21.69	PASS
DH5	Ant1	2480	0~Reference	-0.91	-0.91	---	PASS
DH5	Ant1	2480	30~1000	-0.91	-62.38	≤ -20.91	PASS
DH5	Ant1	2480	1000~26500	-0.91	-38.02	≤ -20.91	PASS
2DH5	Ant1	2402	0~Reference	-2.18	-2.18	---	PASS
2DH5	Ant1	2402	30~1000	-2.18	-62.17	≤ -22.18	PASS
2DH5	Ant1	2402	1000~26500	-2.18	-37.59	≤ -22.18	PASS
2DH5	Ant1	2441	0~Reference	-1.02	-1.02	---	PASS
2DH5	Ant1	2441	30~1000	-1.02	-63.22	≤ -21.02	PASS
2DH5	Ant1	2441	1000~26500	-1.02	-37.85	≤ -21.02	PASS
2DH5	Ant1	2480	0~Reference	-3.58	-3.58	---	PASS
2DH5	Ant1	2480	30~1000	-3.58	-61.33	≤ -23.58	PASS
2DH5	Ant1	2480	1000~26500	-3.58	-37.85	≤ -23.58	PASS
3DH5	Ant1	2402	0~Reference	-5.59	-5.59	---	PASS
3DH5	Ant1	2402	30~1000	-5.59	-62.23	≤ -25.59	PASS
3DH5	Ant1	2402	1000~26500	-5.59	-37.96	≤ -25.59	PASS
3DH5	Ant1	2441	0~Reference	-1.41	-1.41	---	PASS
3DH5	Ant1	2441	30~1000	-1.41	-62	≤ -21.41	PASS
3DH5	Ant1	2441	1000~26500	-1.41	-37.66	≤ -21.41	PASS
3DH5	Ant1	2480	0~Reference	-1.53	-1.53	---	PASS
3DH5	Ant1	2480	30~1000	-1.53	-63.08	≤ -21.53	PASS
3DH5	Ant1	2480	1000~26500	-1.53	-36.58	≤ -21.53	PASS

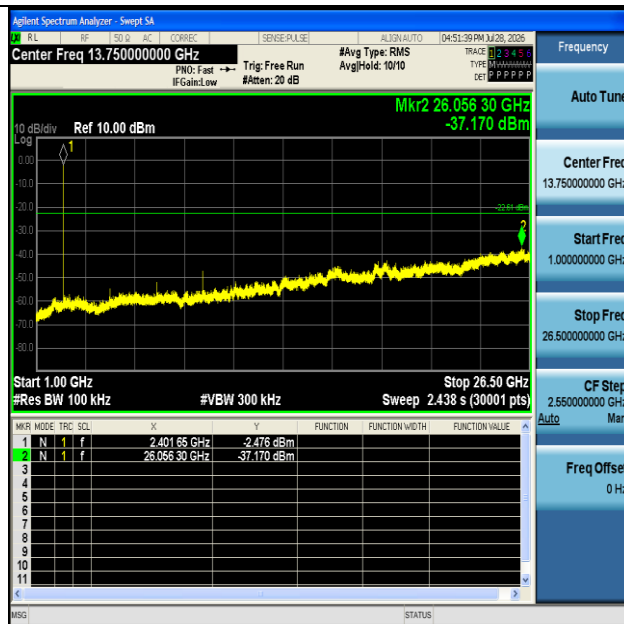
Note: offset(dB) in Reference test plots = cable loss(dB) + attenuator factor(dB); For spurious emissions plots from 30MHz to 26.5GHz, the cable loss and attenuator factors have been set in the 'Input Correction' of the Spectrum Analyzer during the test.



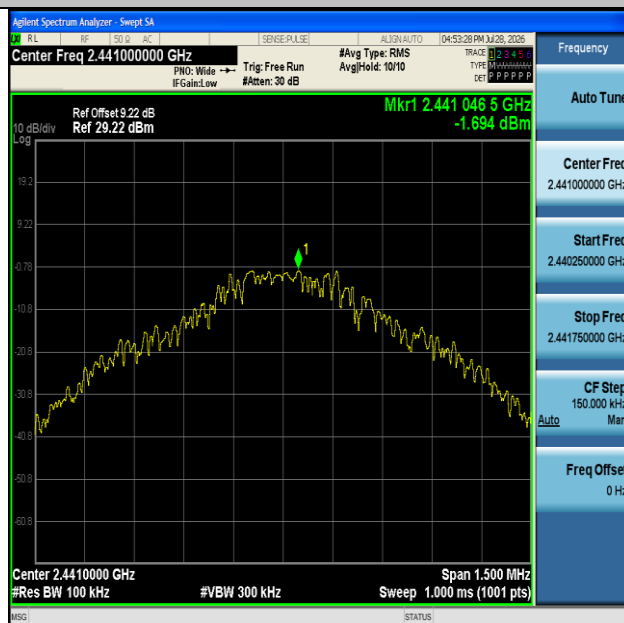


Test Graphs



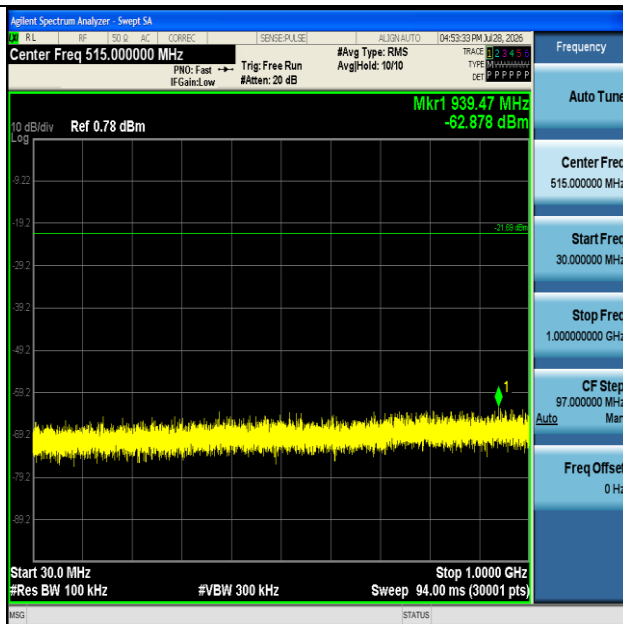


DH5-Ant1-2402-1000~26500-PASS

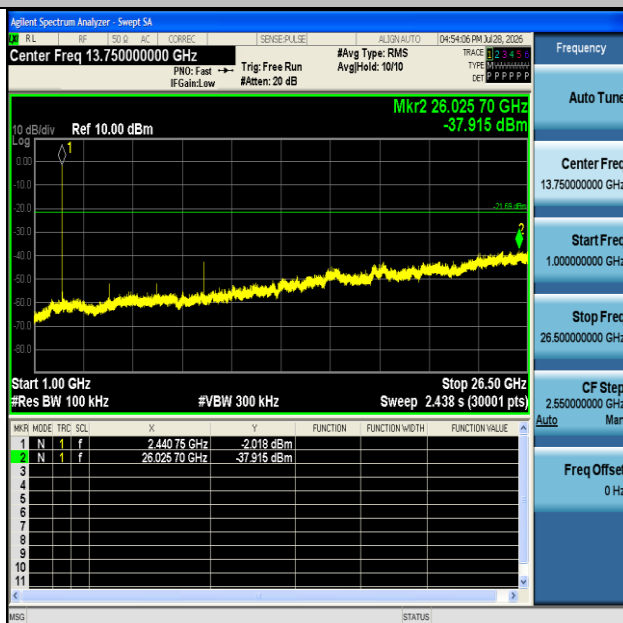


DH5-Ant1-2441-0~Reference-PASS



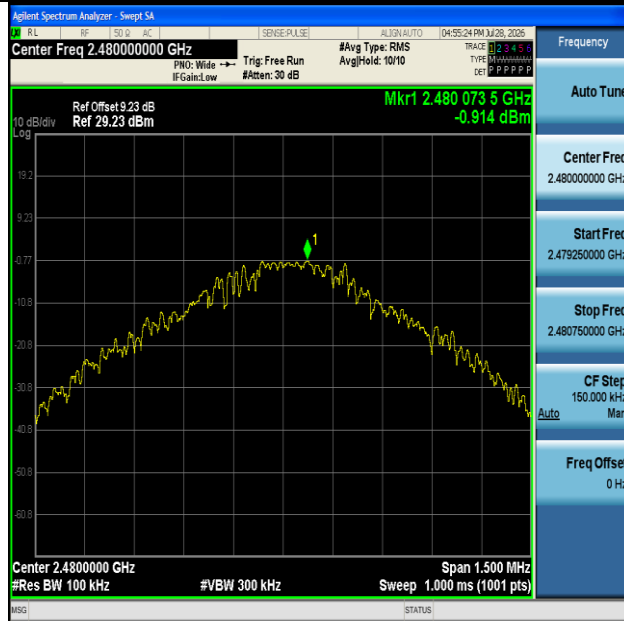


DH5-Ant1-2441-30~1000-PASS

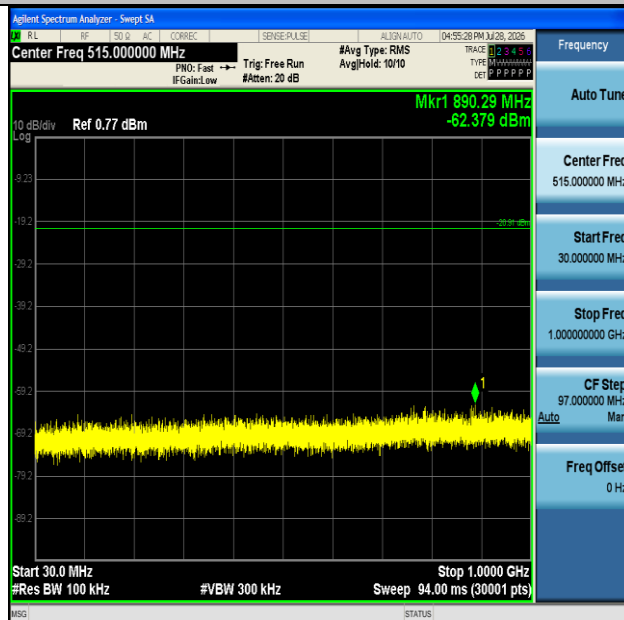


DH5-Ant1-2441-1000~26500-PASS



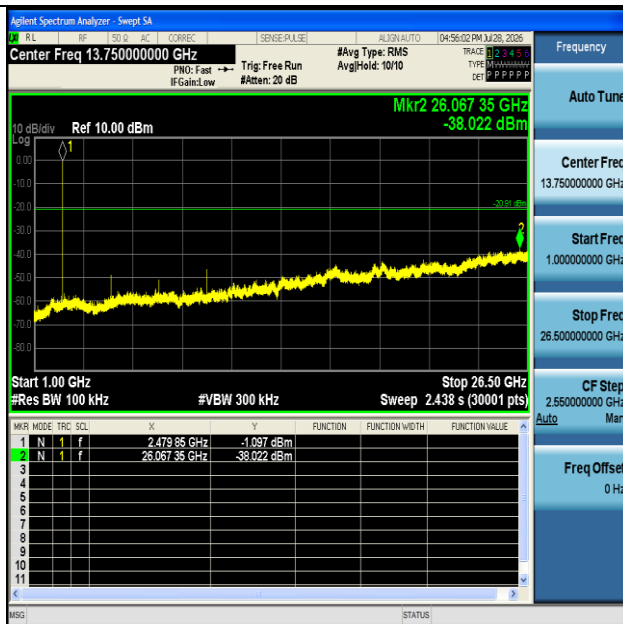


DH5-Ant1-2480-0~Reference-PASS

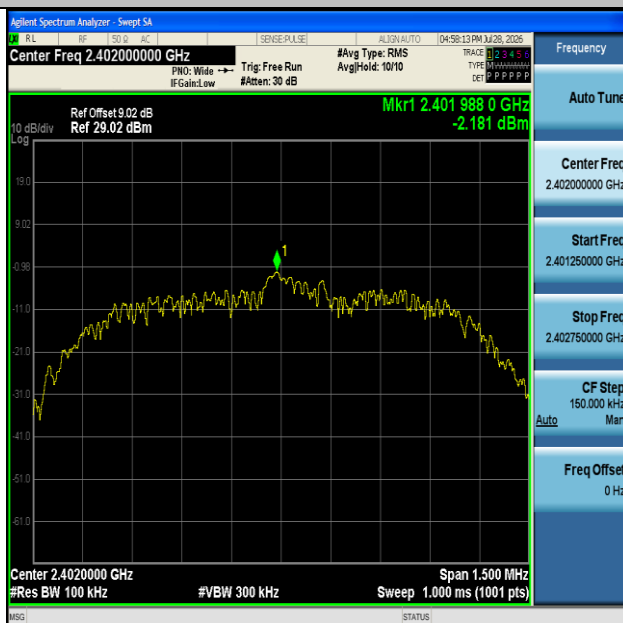


DH5-Ant1-2480-30~1000-PASS



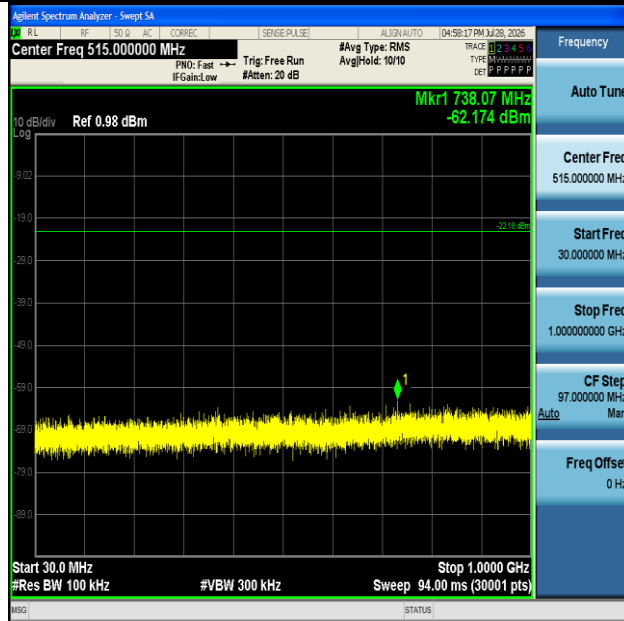


DH5-Ant1-2480-1000~26500-PASS

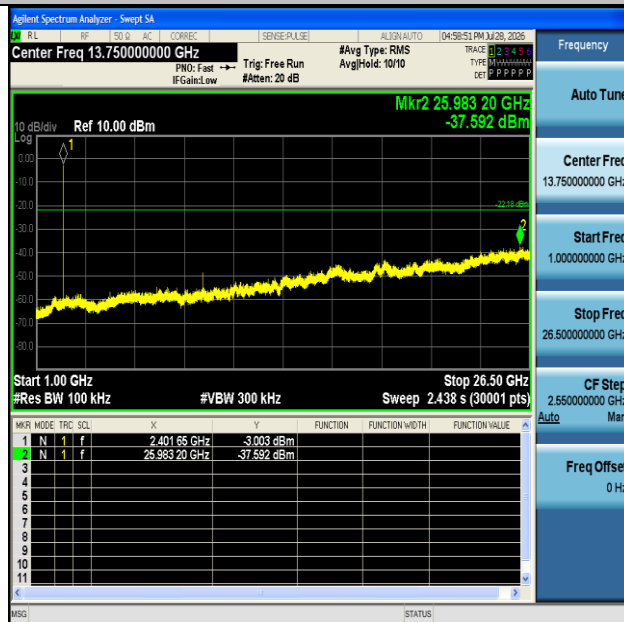


2DH5-Ant1-2402-0~Reference-PASS



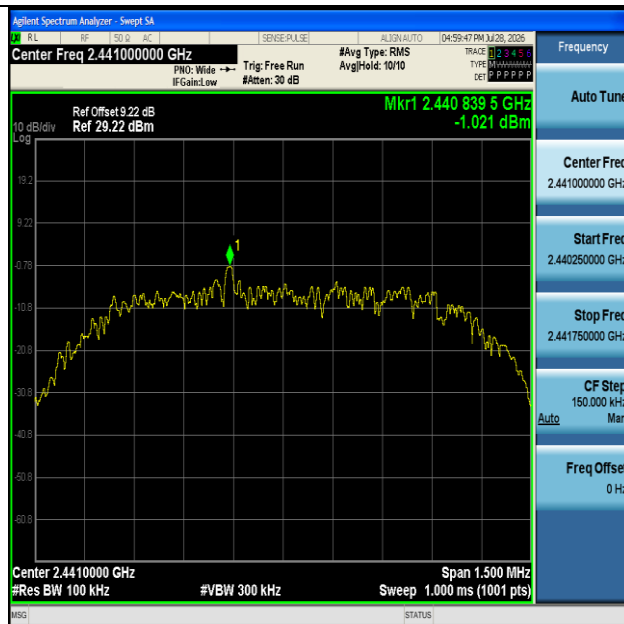


2DH5-Ant1-2402-30~1000-PASS

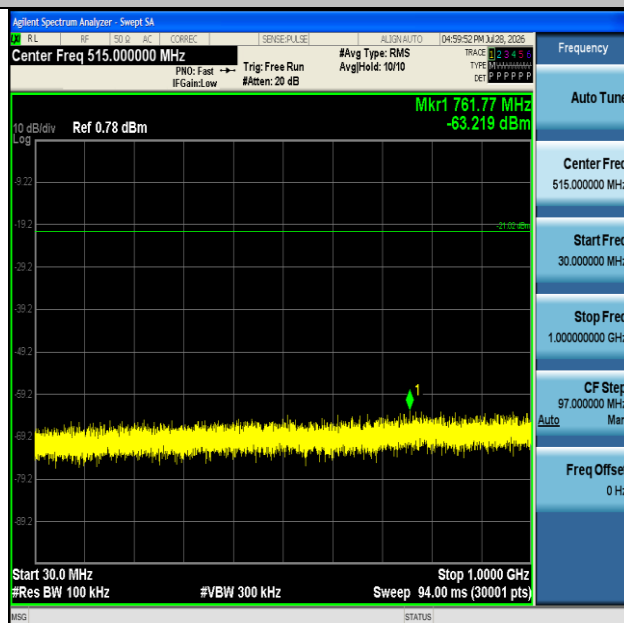


2DH5-Ant1-2402-1000~26500-PASS



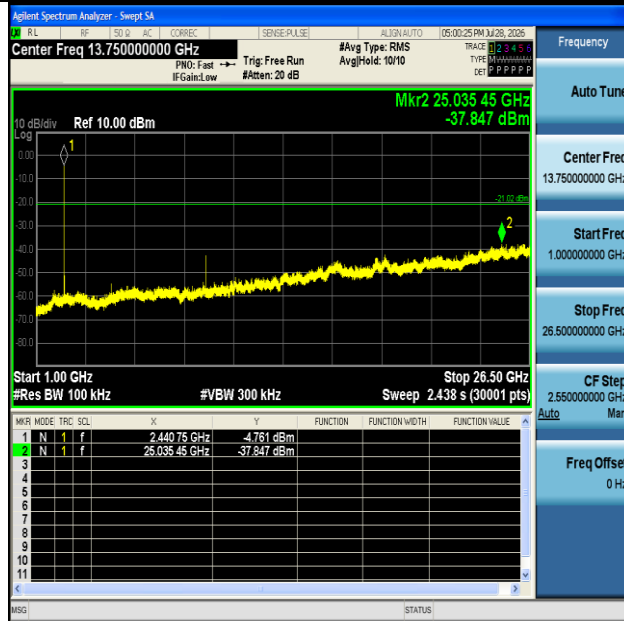


2DH5-Ant1-2441-0~Reference-PASS



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



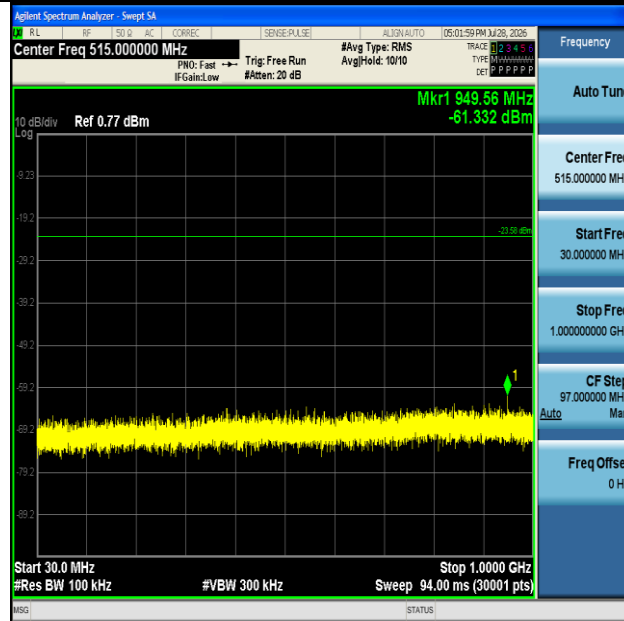


2DH5-Ant1-2441-1000~26500-PASS



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





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

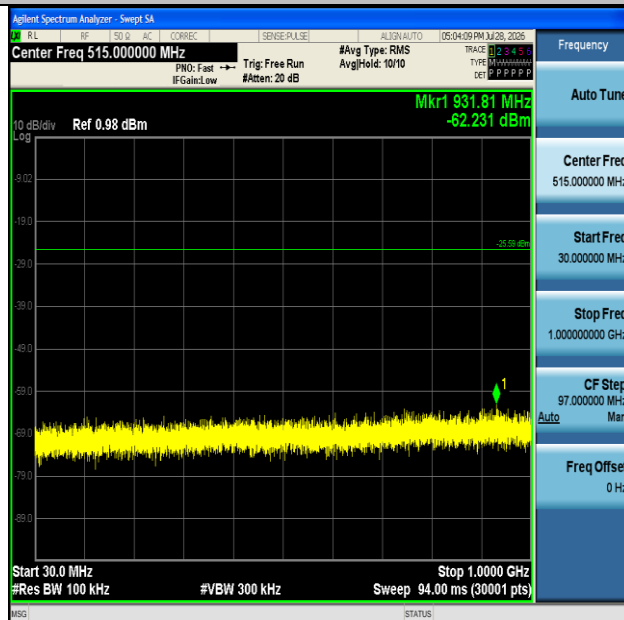


2DH5-Ant1-2480-1000~26500-PASS



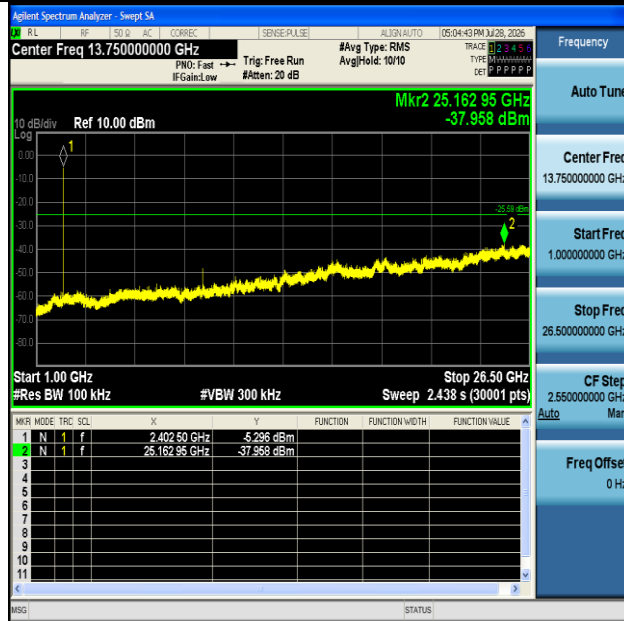


3DH5-Ant1-2402-0~Reference-PASS



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



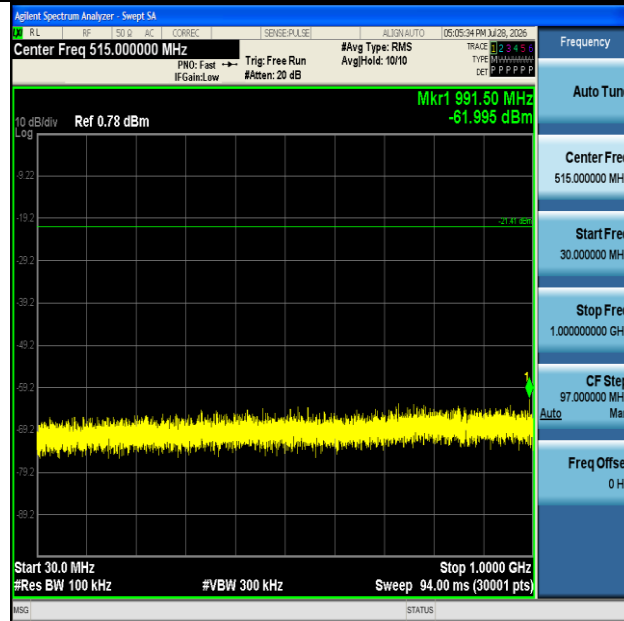


3DH5-Ant1-2402-1000~26500-PASS



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





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

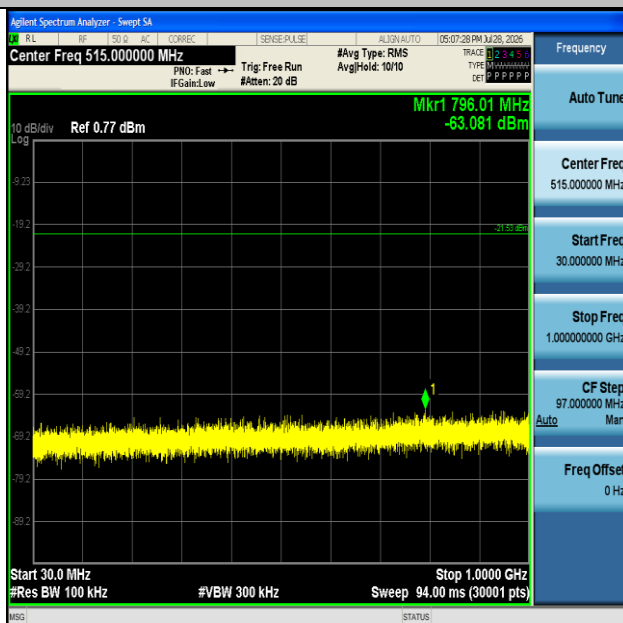


3DH5-Ant1-2441-1000~26500-PASS



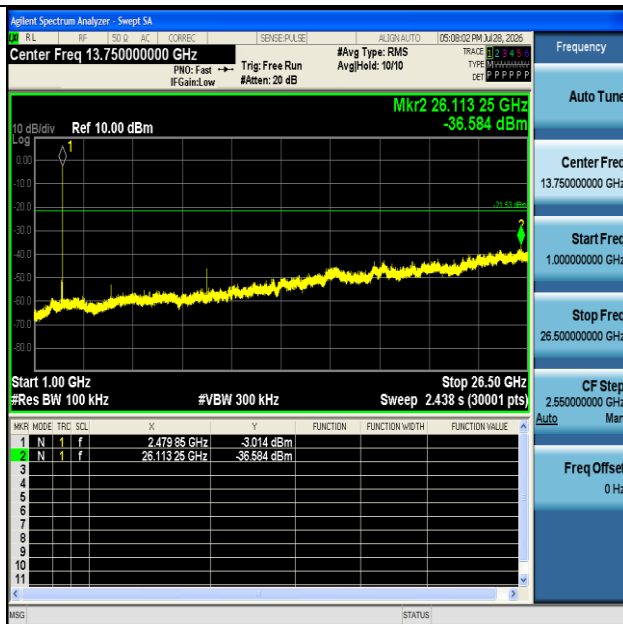


3DH5-Ant1-2480-0~Reference-PASS



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	2.89	3.75	77.07	1.13
DH5	Ant1	2441	2.89	3.75	77.07	1.13
DH5	Ant1	2480	2.88	3.74	77.01	1.13
2DH5	Ant1	2402	2.89	3.75	77.07	1.13
2DH5	Ant1	2441	2.89	3.75	77.07	1.13
2DH5	Ant1	2480	2.90	3.75	77.33	1.12
3DH5	Ant1	2402	2.89	3.75	77.07	1.13
3DH5	Ant1	2441	2.89	3.75	77.07	1.13
3DH5	Ant1	2480	2.90	3.75	77.33	1.12

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



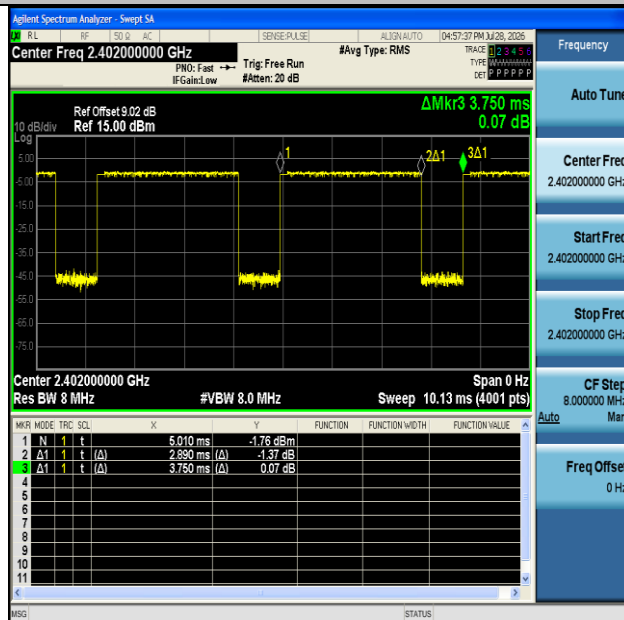


Test Graphs



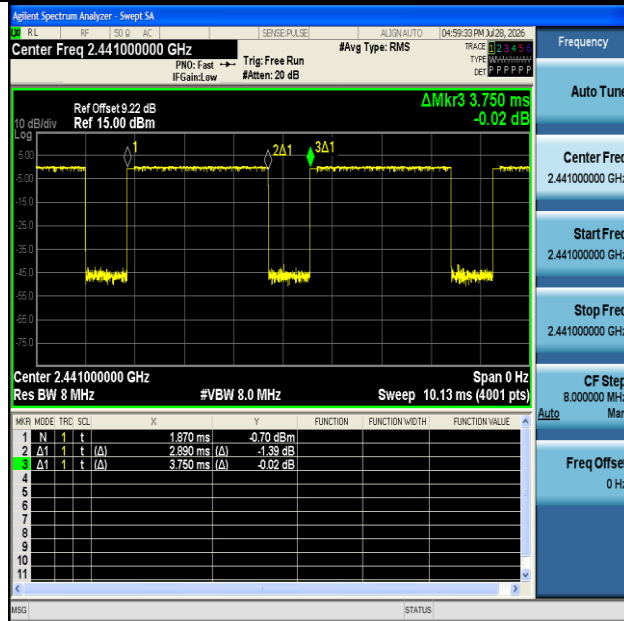


NTNV-DH5-Ant1-2480

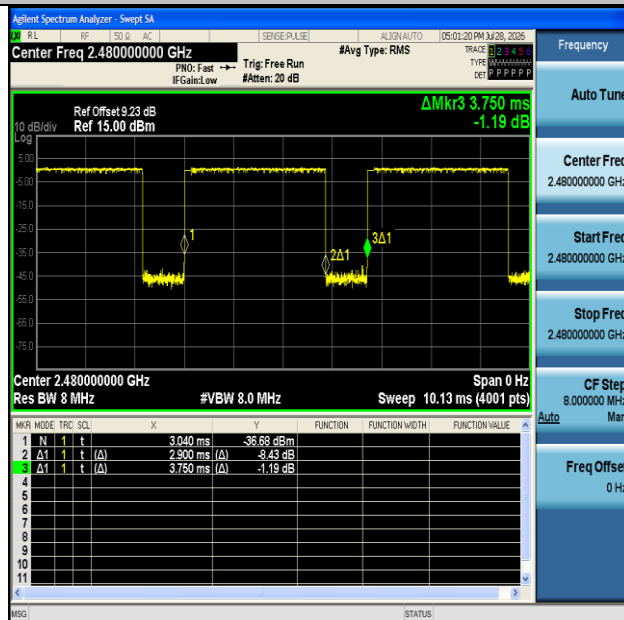


NTNV-2DH5-Ant1-2402



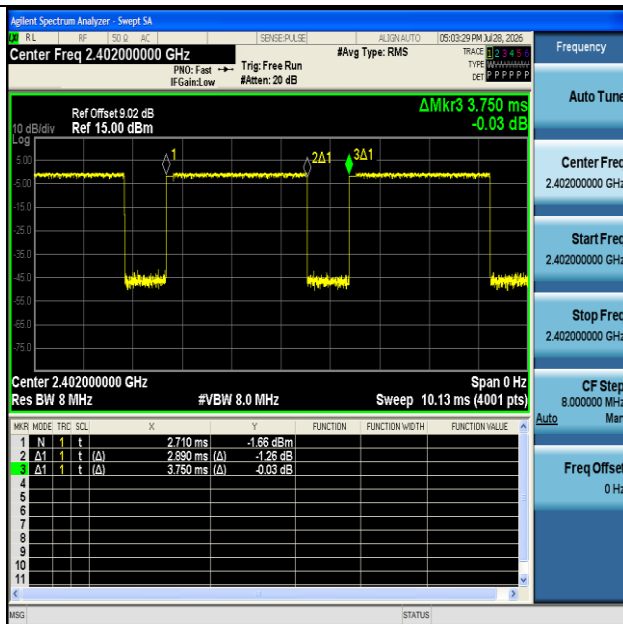


NTNV-2DH5-Ant1-2441

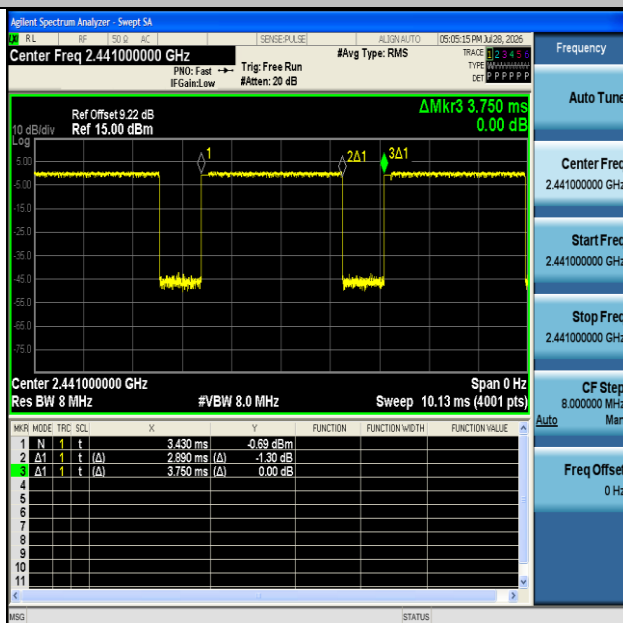


NTNV-2DH5-Ant1-2480





NTNV-3DH5-Ant1-2402



NTNV-3DH5-Ant1-2441





NTNV-3DH5-Ant1-2480

