



Appendix A

RF Test Data for BT V5.0(BDR/EDR) (Conducted Measurement)

Product Name: T18 Wireless Earbuds

Trade Mark: Poweradd

Test Model: T18

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	50%
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Li
Supervised by:	Li Huan

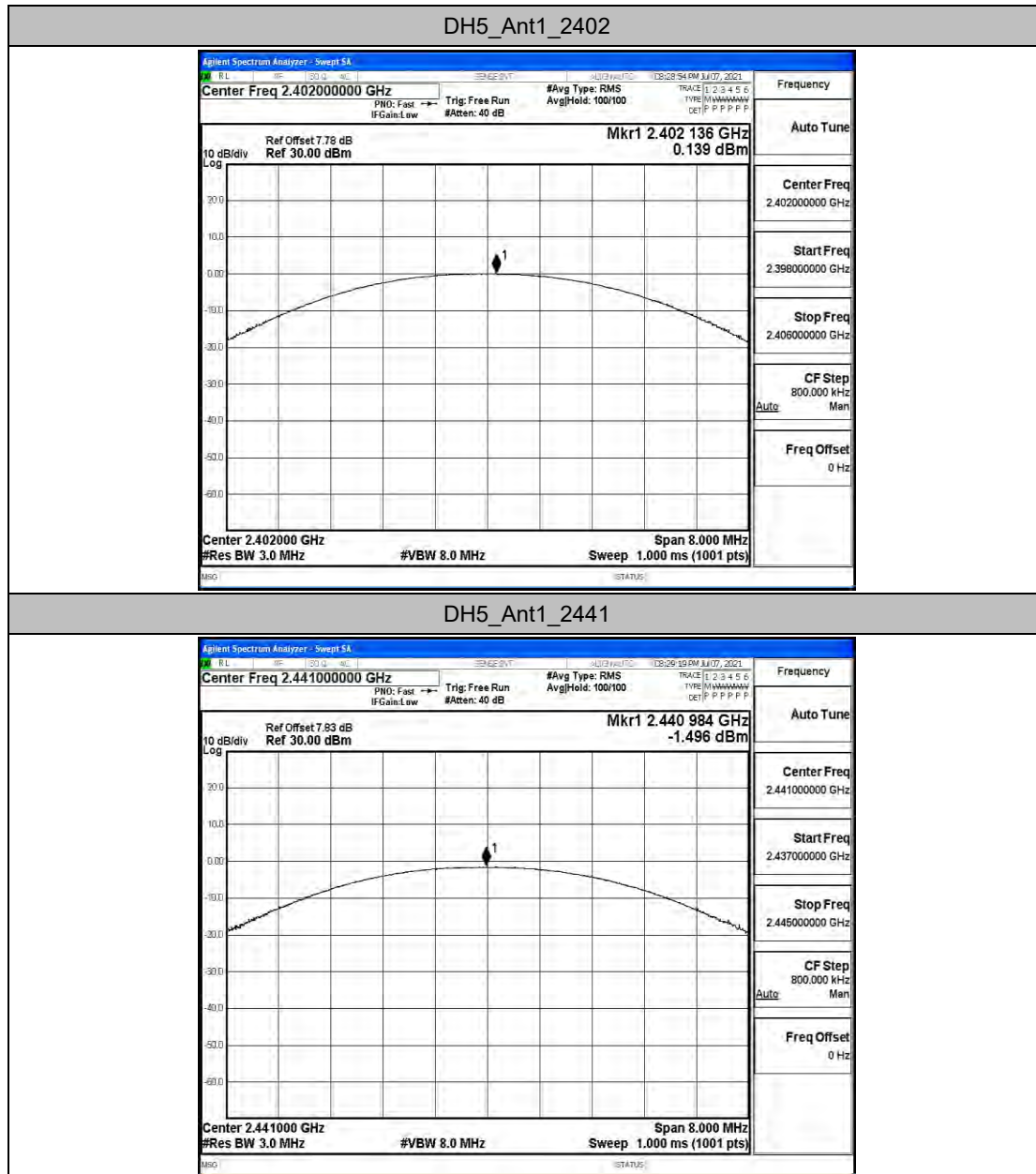
Appendix A.1: Maximum conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	0.14	≤20.97	PASS
		2441	-1.5	≤20.97	PASS
		2480	-0.65	≤20.97	PASS
2DH5	Ant1	2402	-0.85	≤20.97	PASS
		2441	-2.38	≤20.97	PASS
		2480	-1.56	≤20.97	PASS
3DH5	Ant1	2402	-0.71	≤20.97	PASS
		2441	-2.17	≤20.97	PASS
		2480	-1.37	≤20.97	PASS

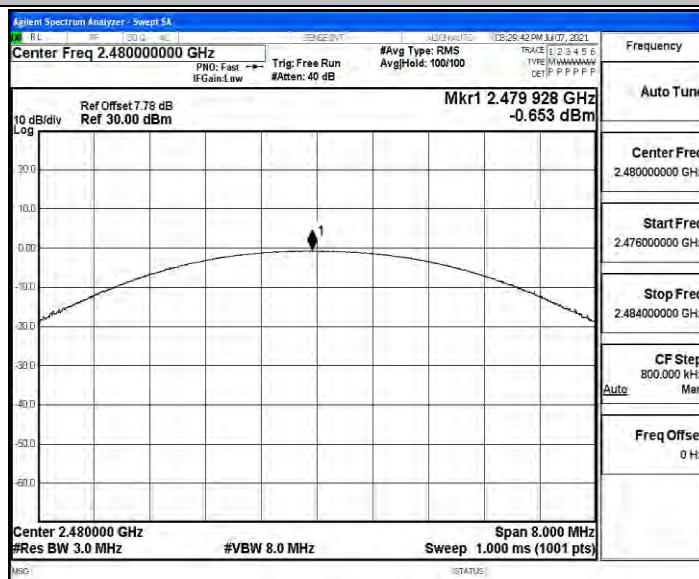


Test Graphs

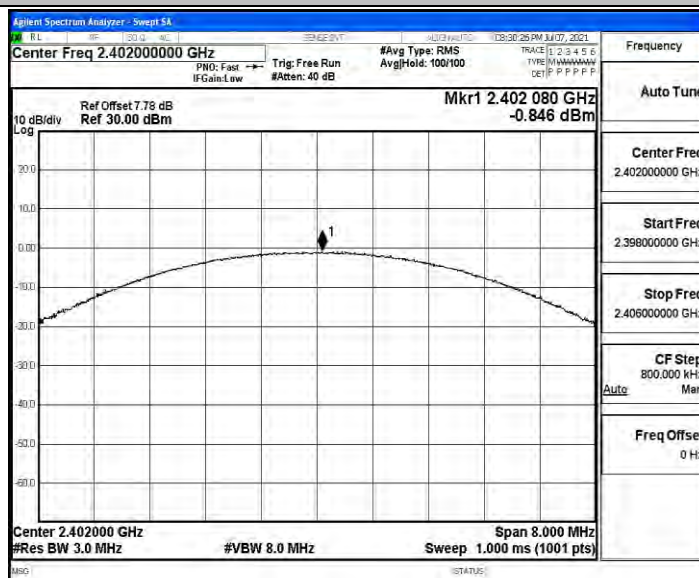




DH5_Ant1_2480

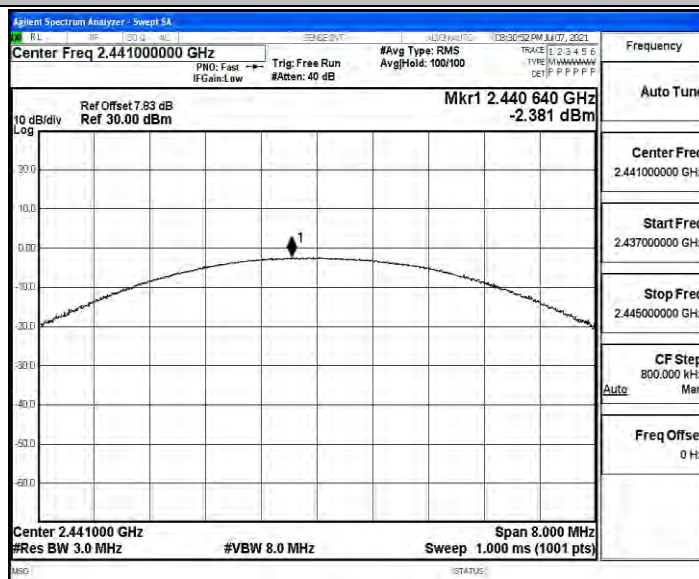


2DH5_Ant1_2402

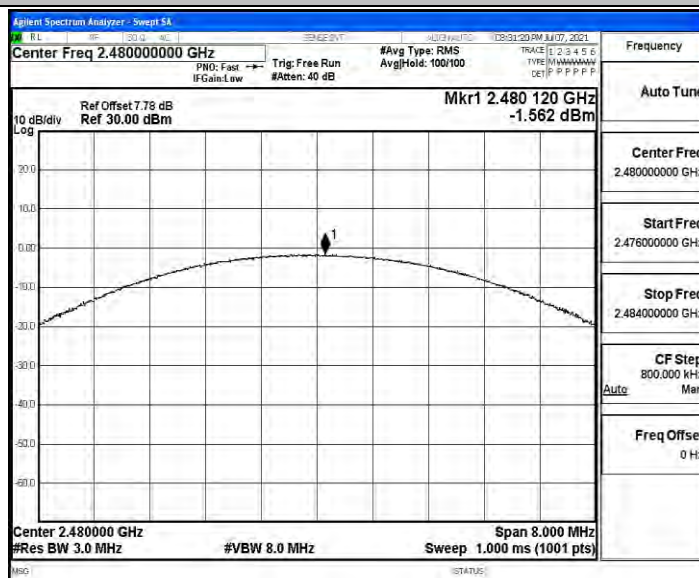




2DH5_Ant1_2441

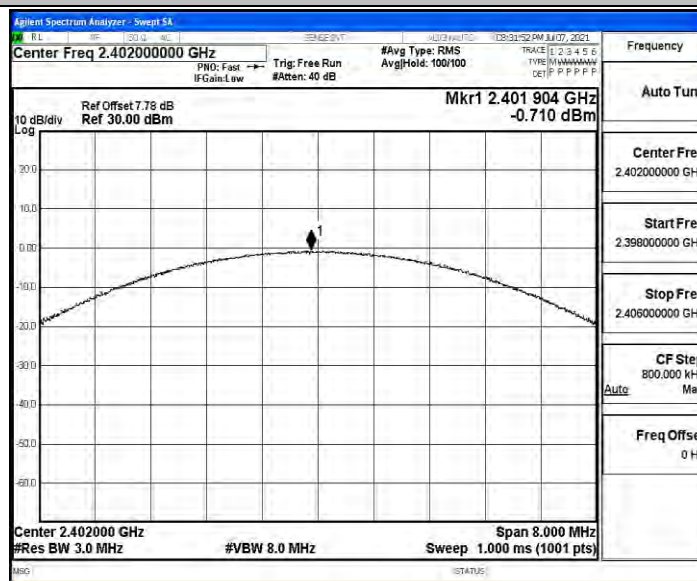


2DH5_Ant1_2480

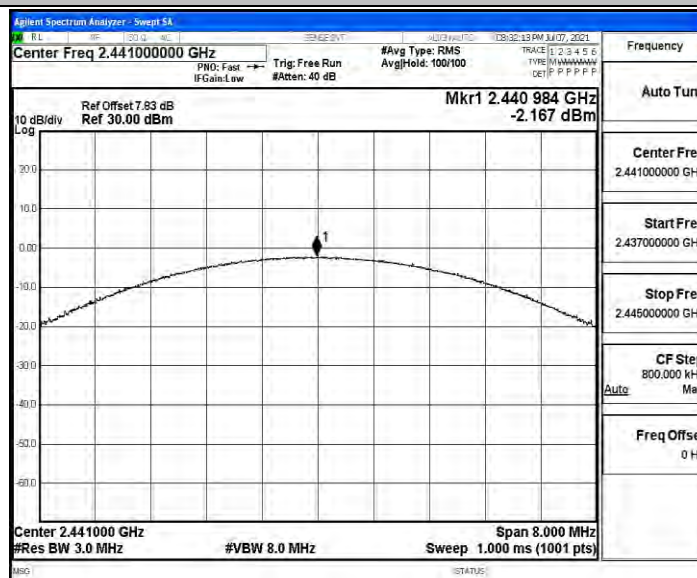




3DH5_Ant1_2402

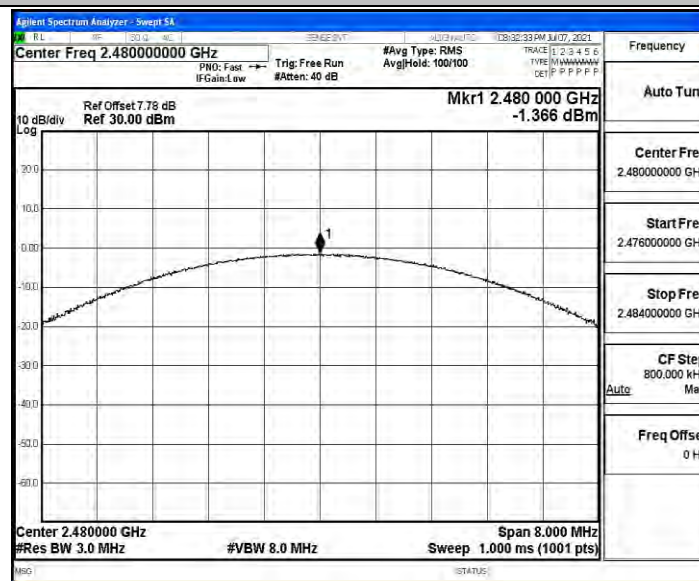


3DH5_Ant1_2441





3DH5_Ant1_2480

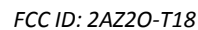




Appendix A.2.1: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.945	2401.541	2402.486	---	PASS
		2441	0.948	2440.541	2441.489	---	PASS
		2480	0.951	2479.541	2480.492	---	PASS
2DH5	Ant1	2402	1.320	2401.340	2402.660	---	PASS
		2441	1.320	2440.340	2441.660	---	PASS
		2480	1.260	2479.373	2480.633	---	PASS
3DH5	Ant1	2402	1.311	2401.349	2402.660	---	PASS
		2441	1.323	2440.337	2441.660	---	PASS
		2480	1.272	2479.355	2480.627	---	PASS



Antenna: DH5_Ant1_2402

Agilent Spectrum Analyzer - Swept SA
 Center Freq 2.402000000 GHz
 Ref Offset 7.78 dB
 Ref 30.00 dBm
 Span 3.000 MHz
 #Res BW 20 kHz
 #VBW 62 kHz
 Sweep 7.200 ms (1001 pts)
 ΔMkr3 945 kHz
 0.479 dB

Marker	Mode	Freq	Power	Function	Function Width	Function Value
1	N	2.401541 GHz	-24.854 dBm			
2	N	2.402050 GHz	-3.742 dBm			
3	A1	945 kHz (Δ)	0.479 dB			

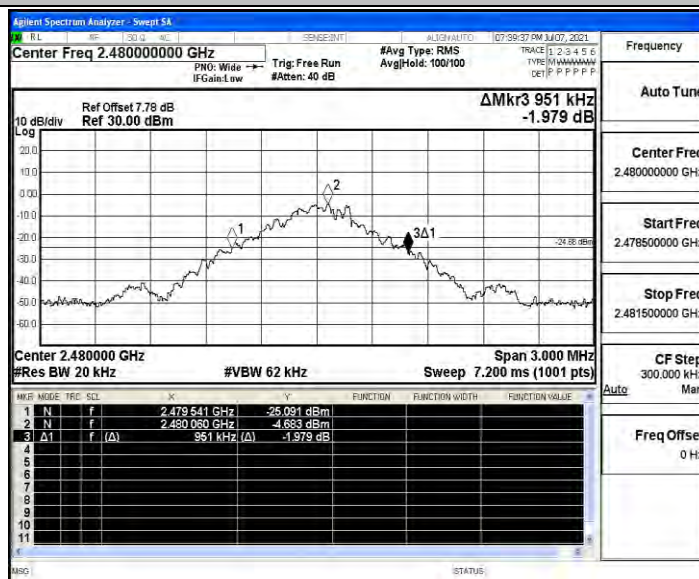
Antenna: DH5_Ant1_2441

Agilent Spectrum Analyzer - Swept SA
 Center Freq 2.441000000 GHz
 Ref Offset 7.83 dB
 Ref 30.00 dBm
 Span 3.000 MHz
 #Res BW 20 kHz
 #VBW 62 kHz
 Sweep 7.200 ms (1001 pts)
 ΔMkr3 948 kHz
 1.005 dB

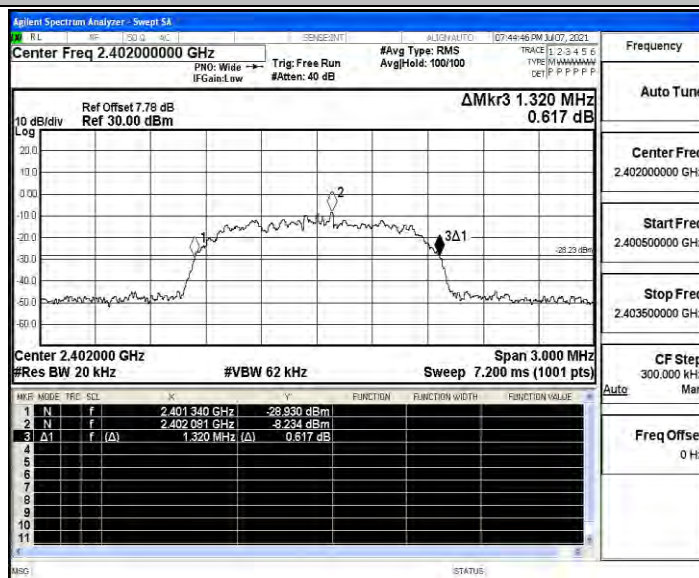
Marker	Mode	Freq	Power	Function	Function Width	Function Value
1	N	2.440541 GHz	-26.477 dBm			
2	N	2.441053 GHz	-6.472 dBm			
3	A1	948 kHz (Δ)	1.005 dB			



DH5_Ant1_2480

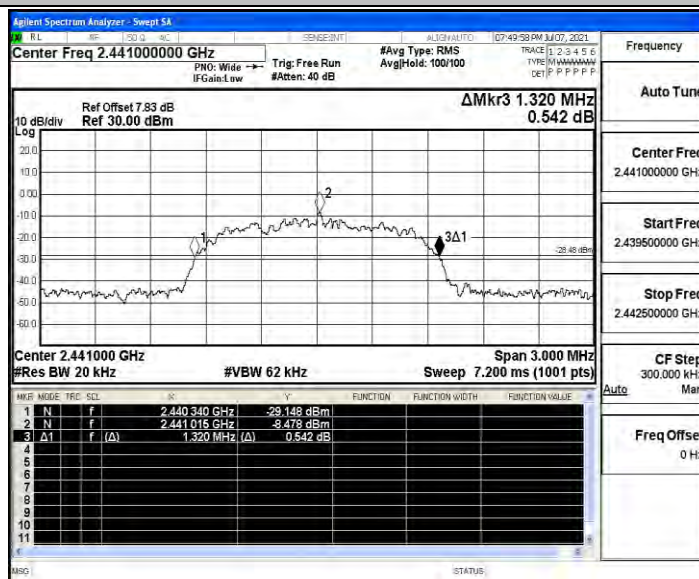


2DH5_Ant1_2402

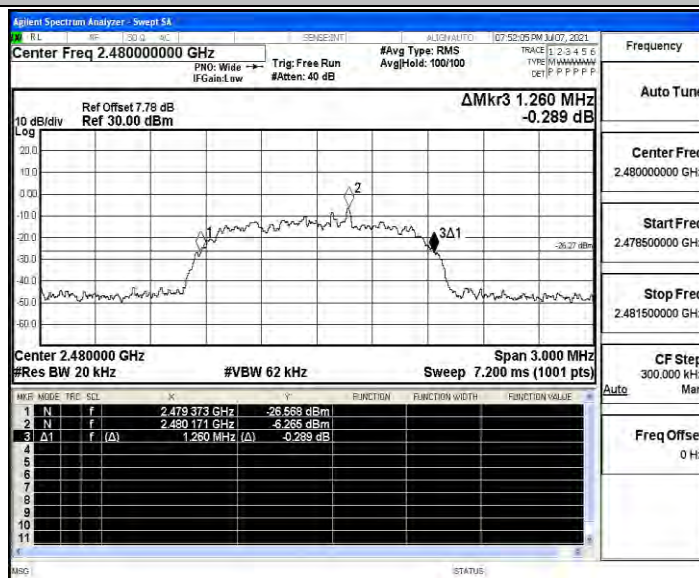




2DH5_Ant1_2441

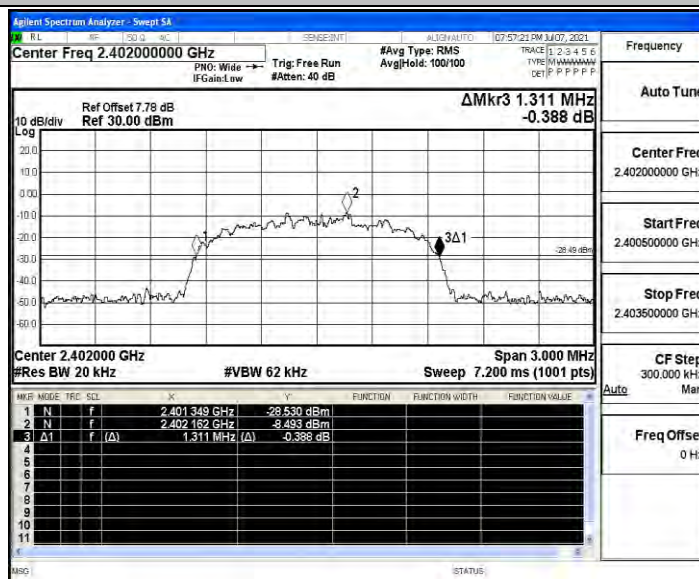


2DH5_Ant1_2480

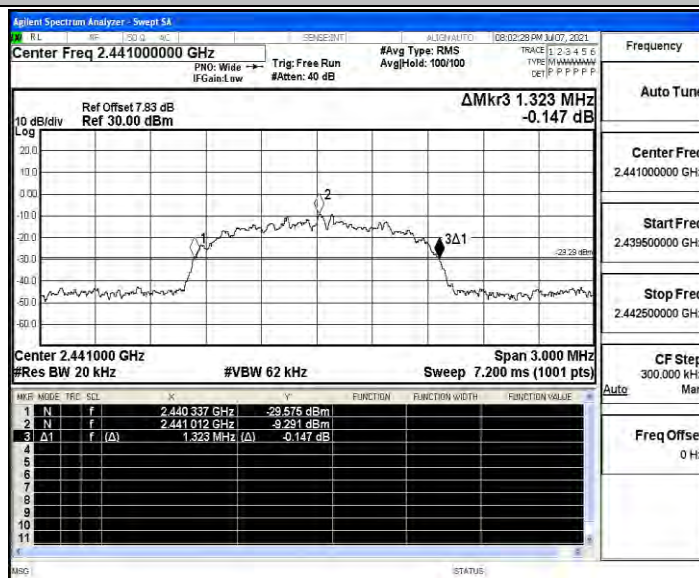


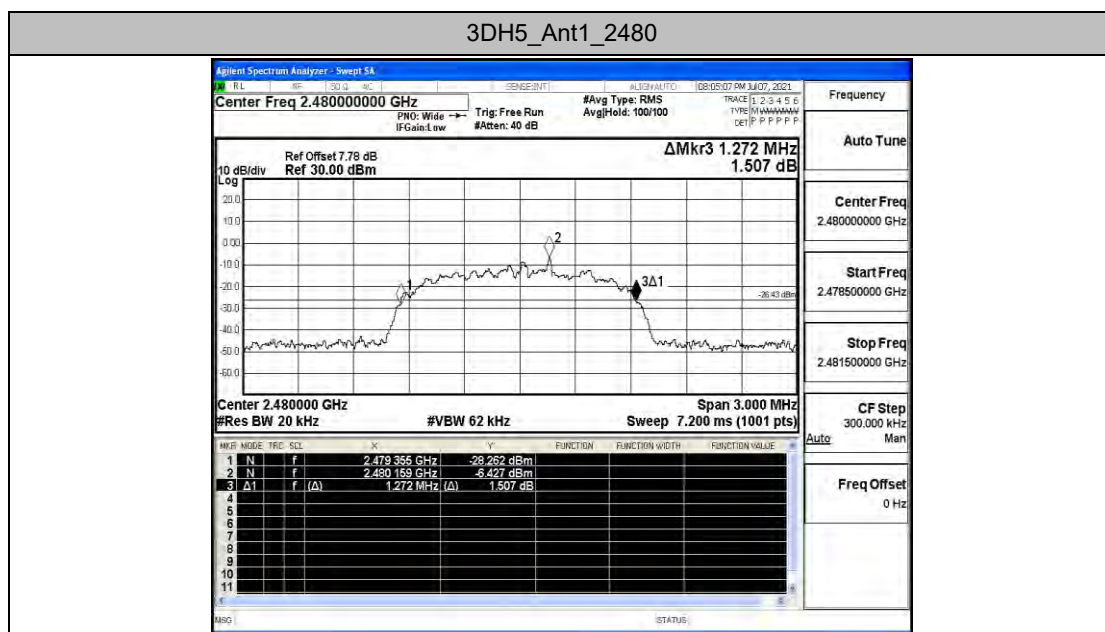
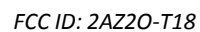


3DH5_Ant1_2402



3DH5_Ant1_2441







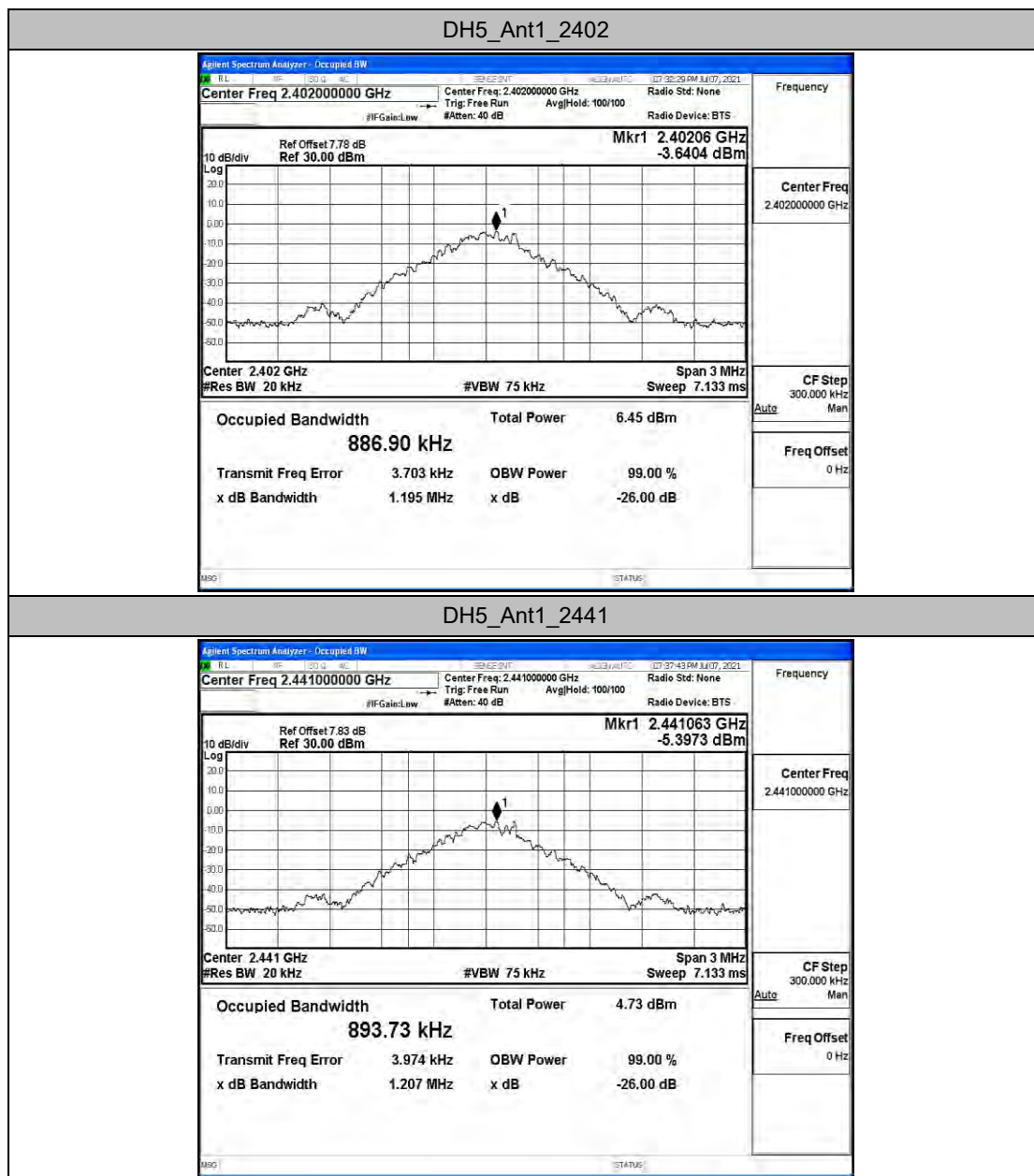
Appendix A.2.2: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.88690	2401.560	2402.447	---	PASS
		2441	0.89373	2440.557	2441.451	---	PASS
		2480	0.89218	2479.557	2480.449	---	PASS
2DH5	Ant1	2402	1.1823	2401.411	2402.593	---	PASS
		2441	1.1912	2440.407	2441.599	---	PASS
		2480	1.1866	2479.407	2480.594	---	PASS
3DH5	Ant1	2402	1.1911	2401.402	2402.594	---	PASS
		2441	1.2093	2440.389	2441.599	---	PASS
		2480	1.1990	2479.395	2480.594	---	PASS

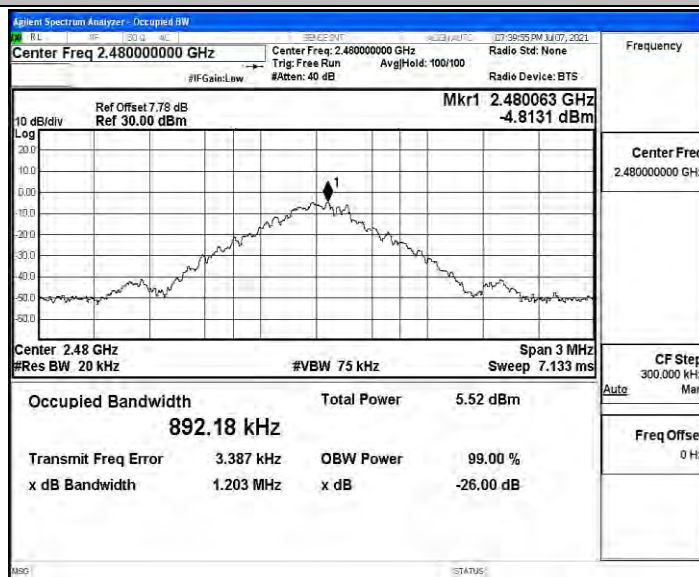


Test Graphs





DH5_Ant1_2480

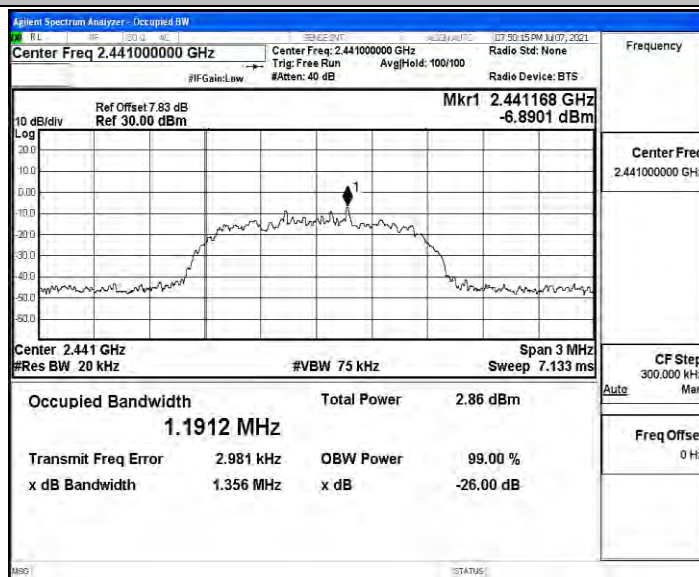


2DH5_Ant1_2402

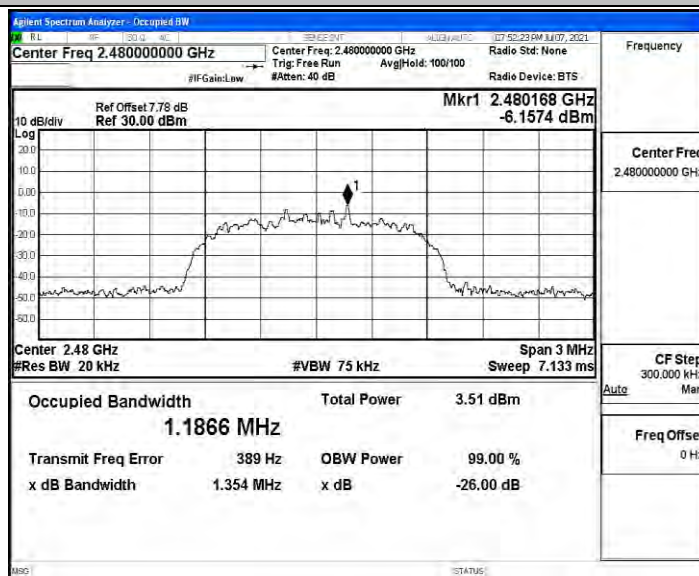




2DH5_Ant1_2441

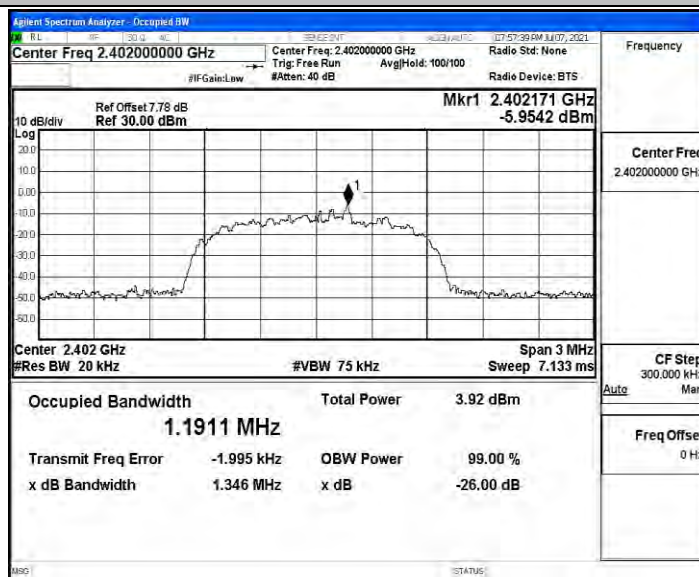


2DH5_Ant1_2480

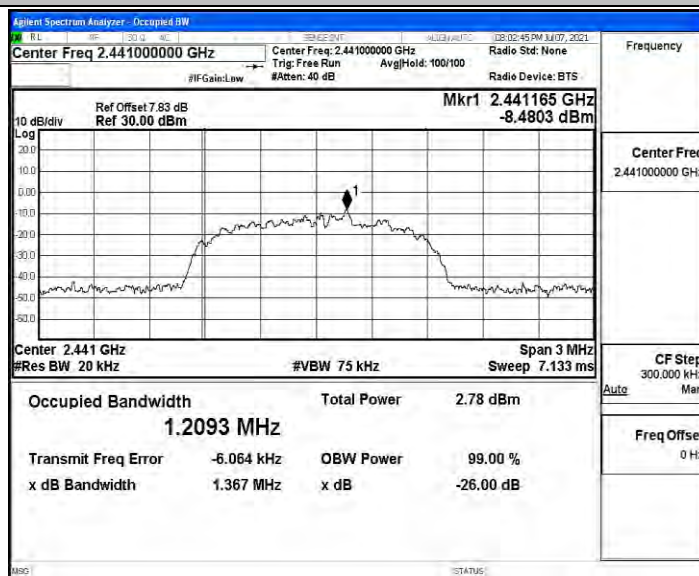




3DH5_Ant1_2402

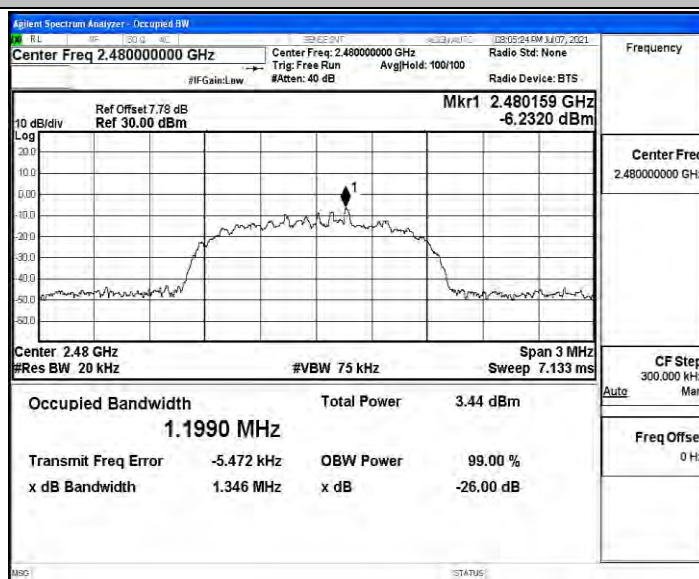


3DH5_Ant1_2441





3DH5_Ant1_2480





Appendix A.3: Carrier frequency separation

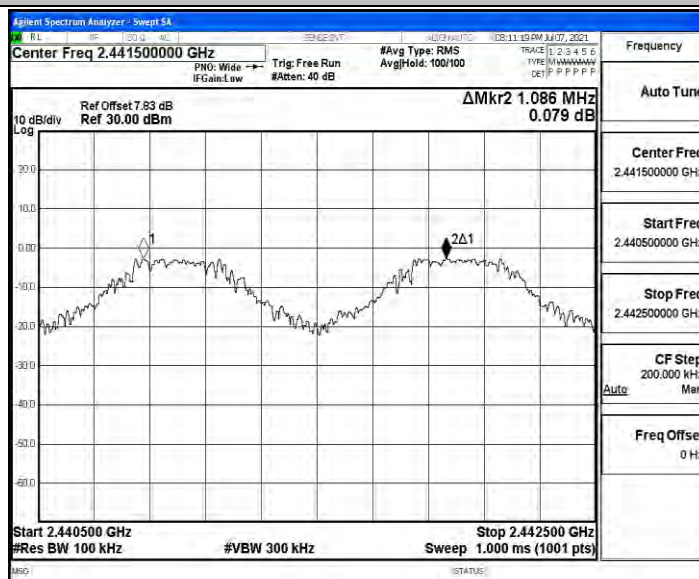
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	Hop	1.086	≥ 0.951	PASS
2DH5	Ant1	Hop	1.22	≥ 0.880	PASS
3DH5	Ant1	Hop	1.068	≥ 0.882	PASS

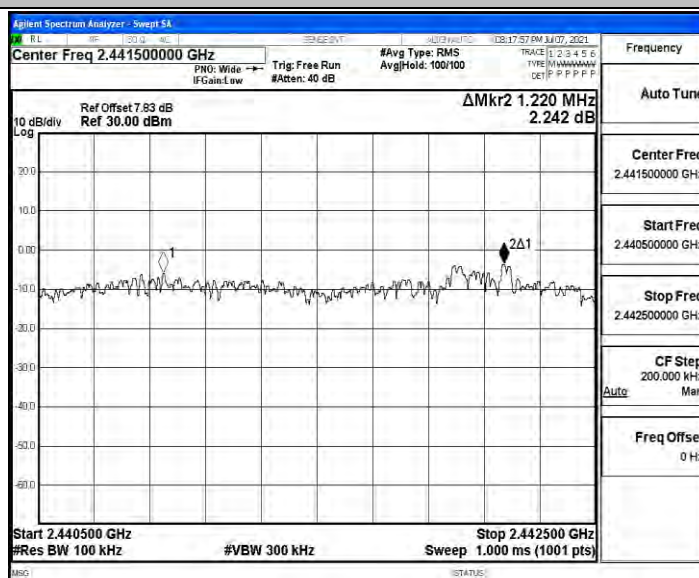


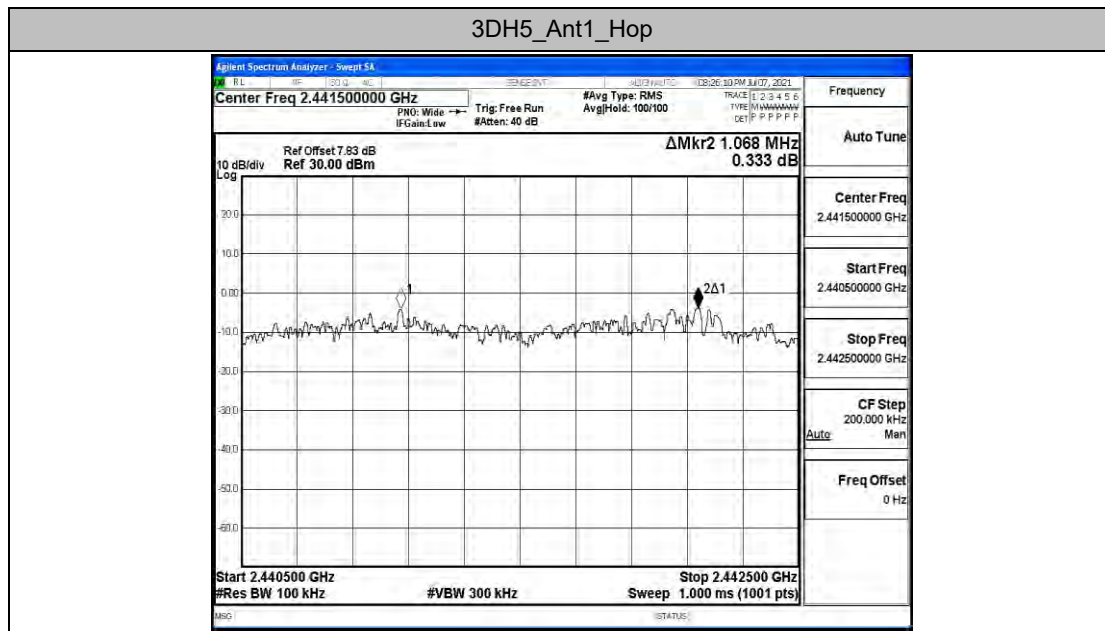
Test Graphs

DH5_Ant1_Hop



2DH5_Ant1_Hop







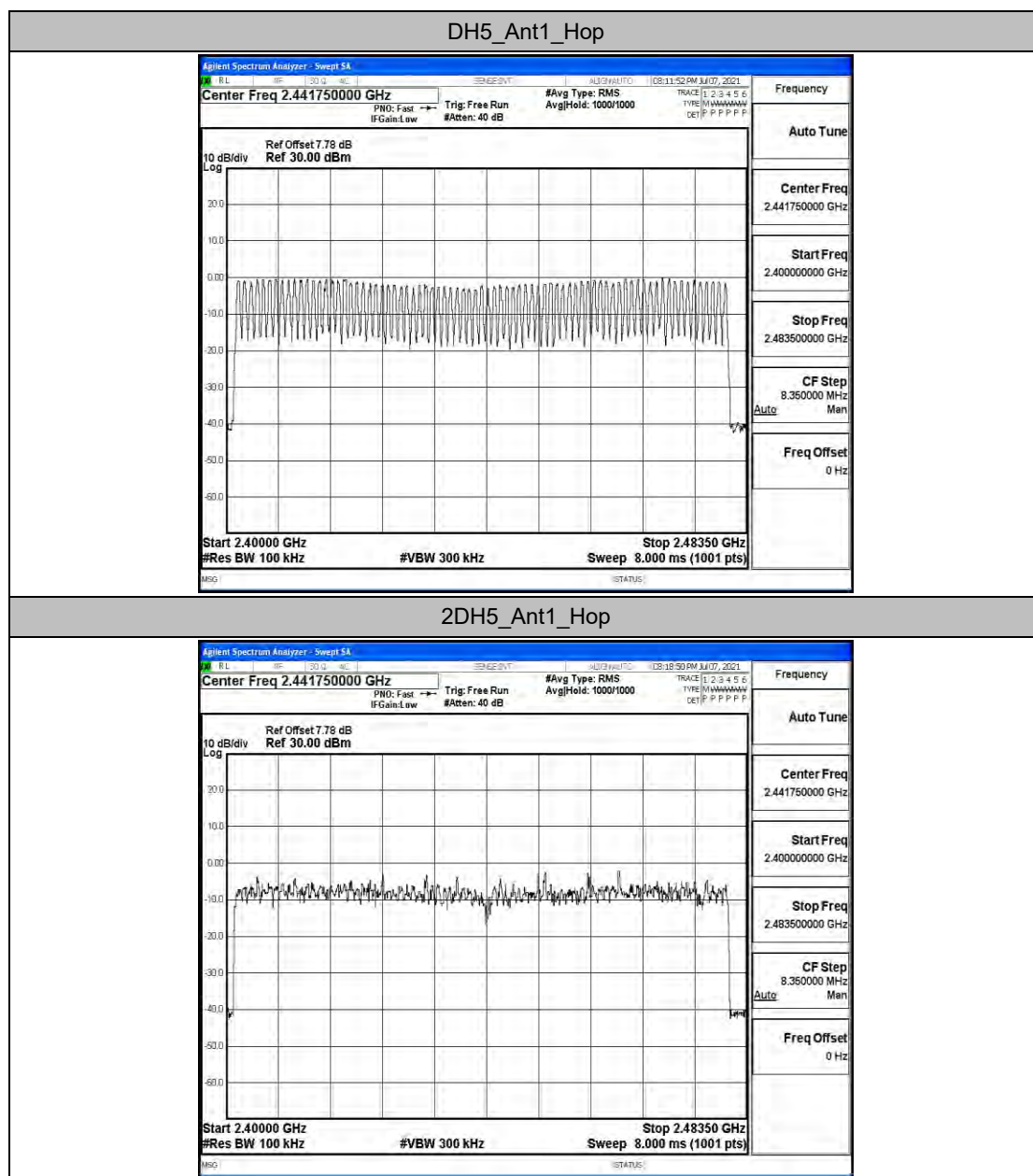
Appendix A.4: Number of hopping channels

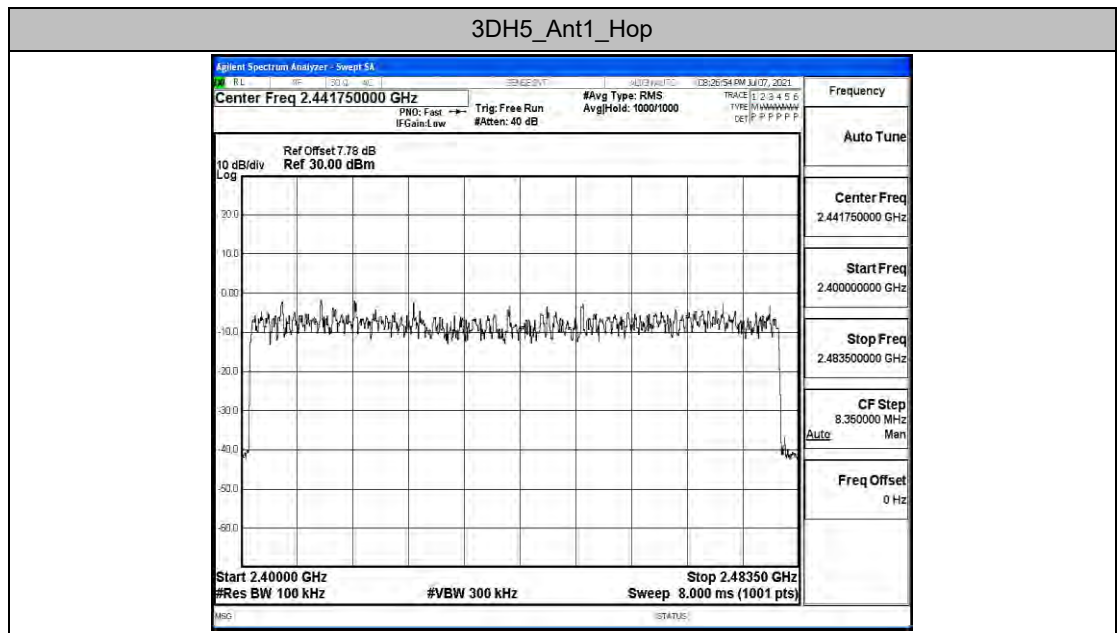
Test Result

TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS



Test Graphs







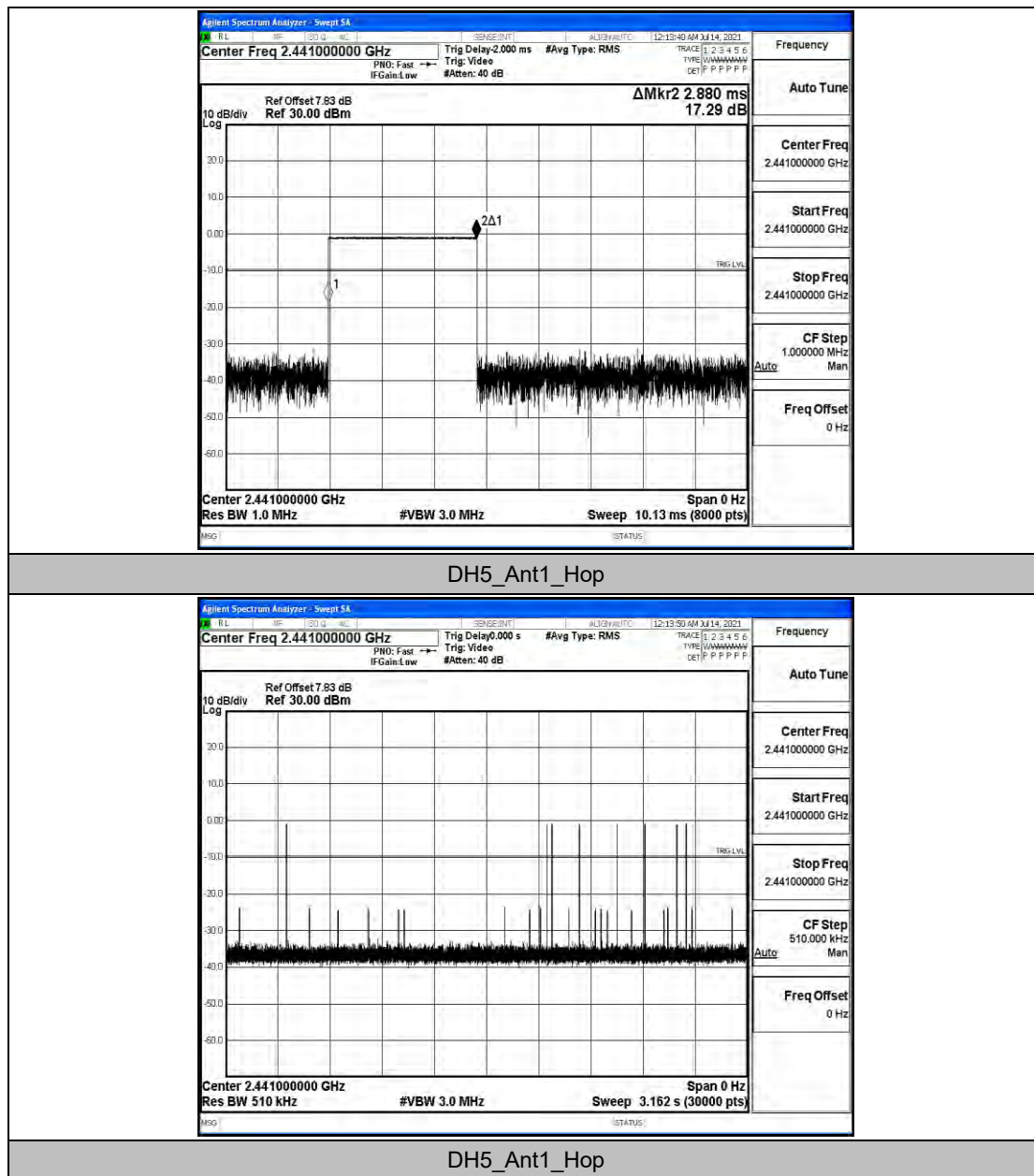
Appendix A.5.1: Time of occupancy

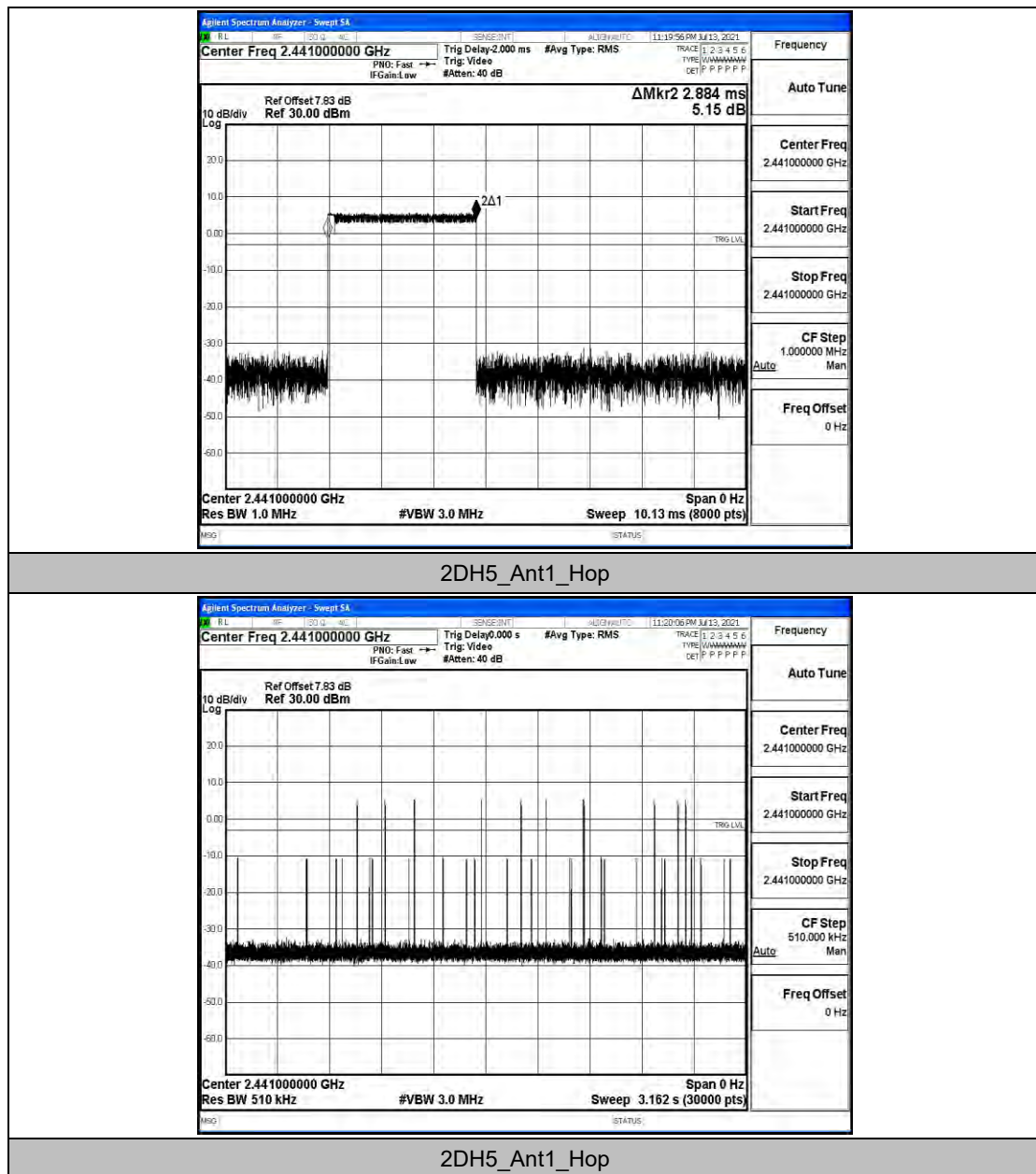
Test Result

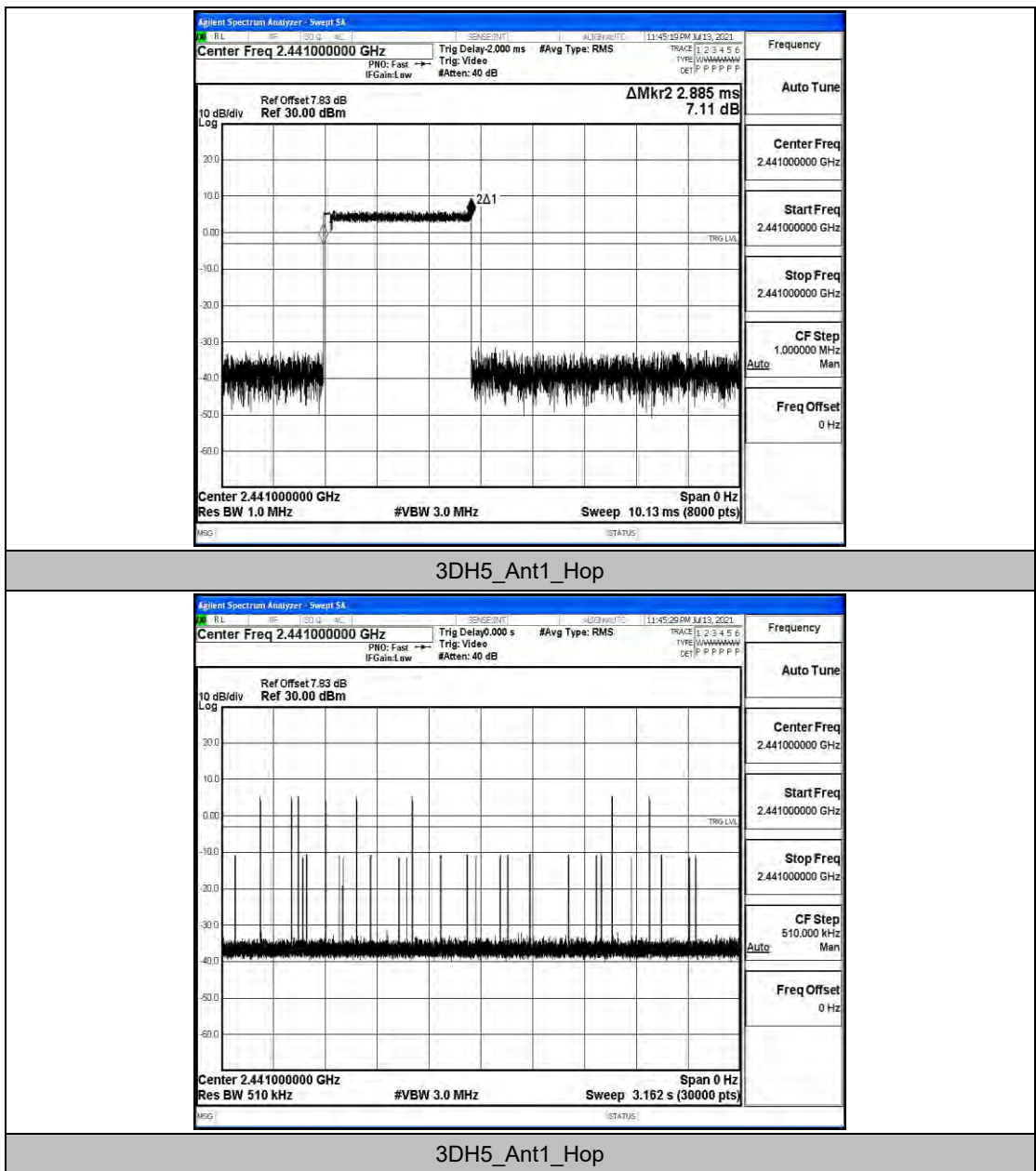
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.88	90	0.259	≤0.4	PASS
2DH5	Ant1	Hop	2.88	130	0.375	≤0.4	PASS
3DH5	Ant1	Hop	2.89	90	0.26	≤0.4	PASS



Test Graphs









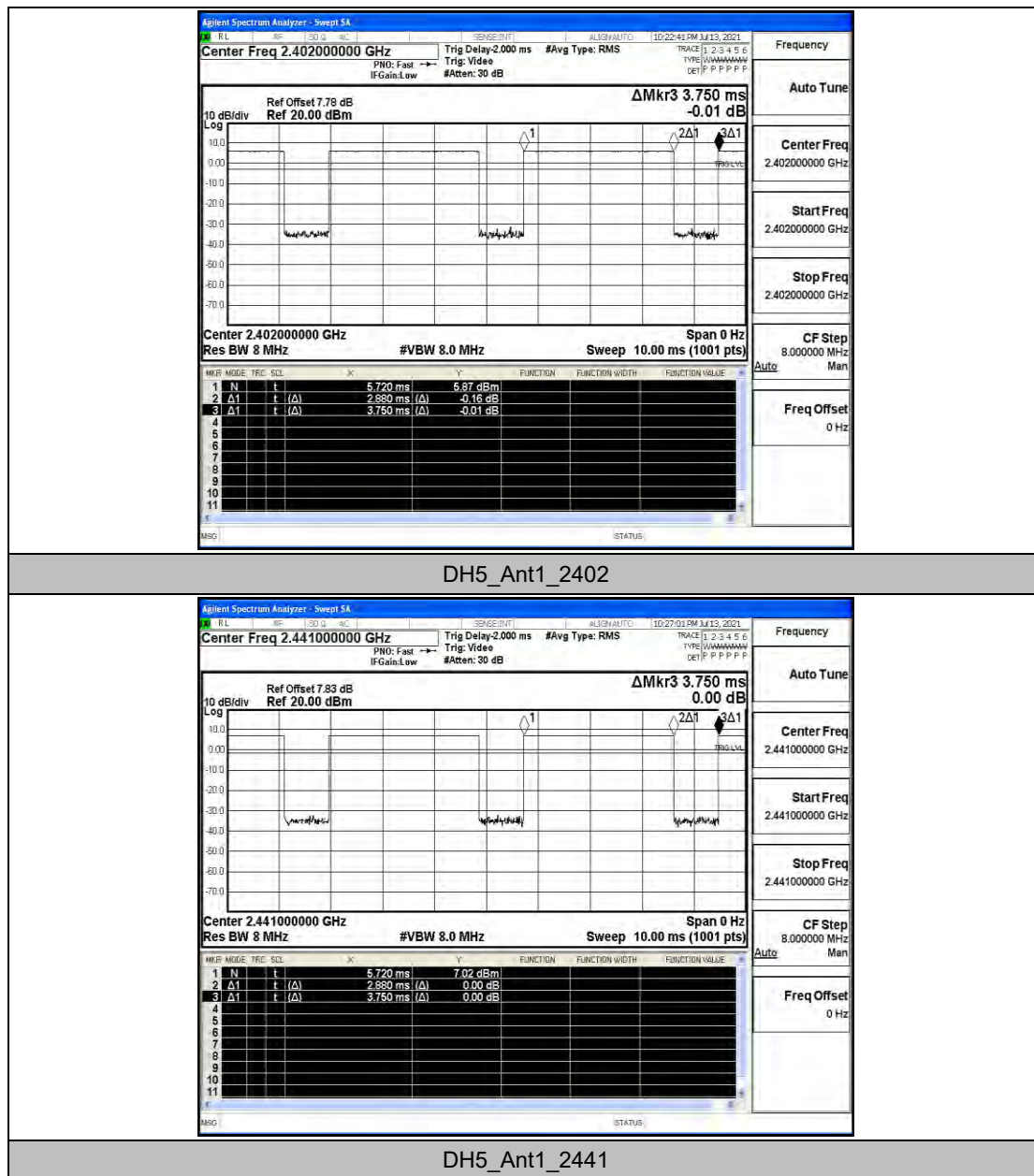
Appendix A.5.2: Duty Cycle

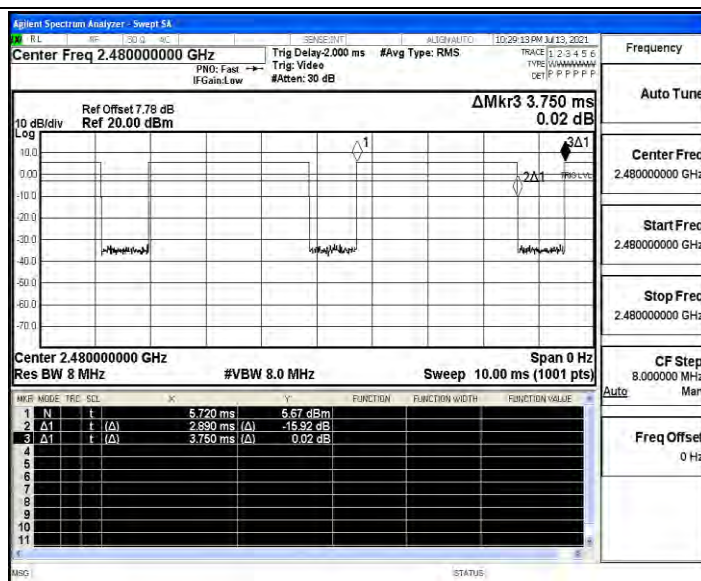
Test Result

TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
DH5	Ant1	2402	2.88	3.75	0.7680	76.80	1.15	---	PASS
		2441	2.88	3.75	0.7680	76.80	1.15	---	PASS
		2480	2.89	3.75	0.7707	77.07	1.13	---	PASS
2DH5	Ant1	2402	2.89	3.75	0.7707	77.07	1.13	---	PASS
		2441	2.89	3.75	0.7707	77.07	1.13	---	PASS
		2480	2.89	3.75	0.7707	77.07	1.13	---	PASS
3DH5	Ant1	2402	2.88	3.75	0.7680	76.80	1.15	---	PASS
		2441	2.89	3.75	0.7707	77.07	1.13	---	PASS
		2480	2.89	3.75	0.7707	77.07	1.13	---	PASS

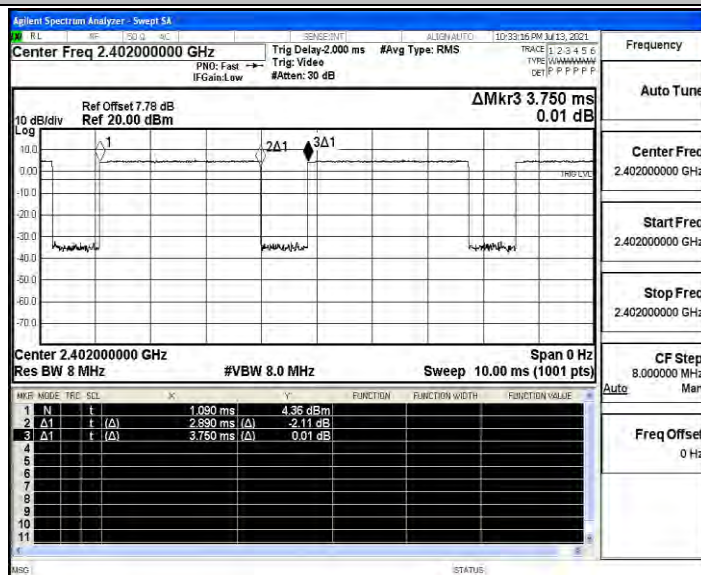


Test Graphs

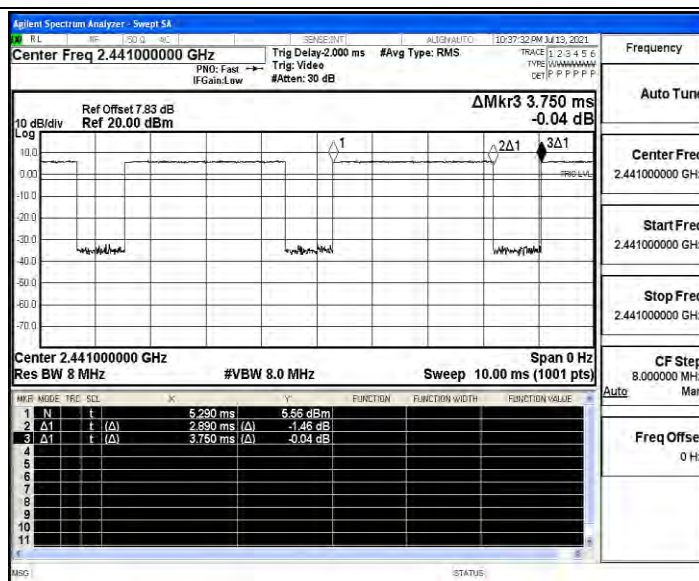




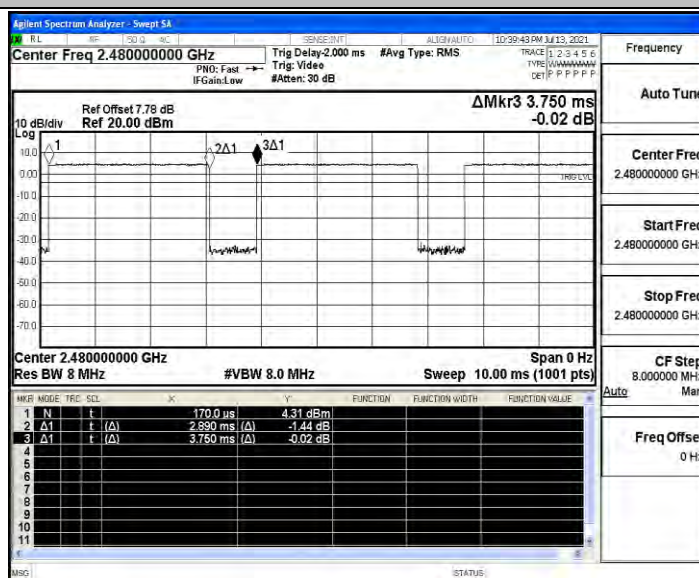
DH5_Ant1_2480



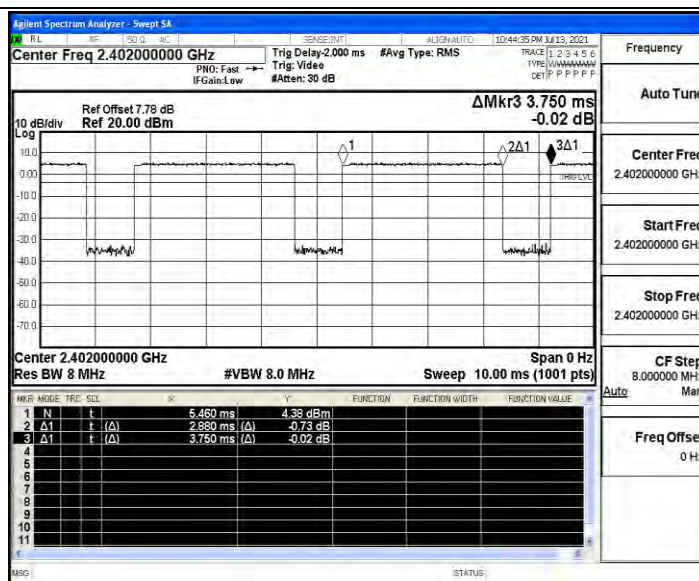
2DH5_Ant1_2402



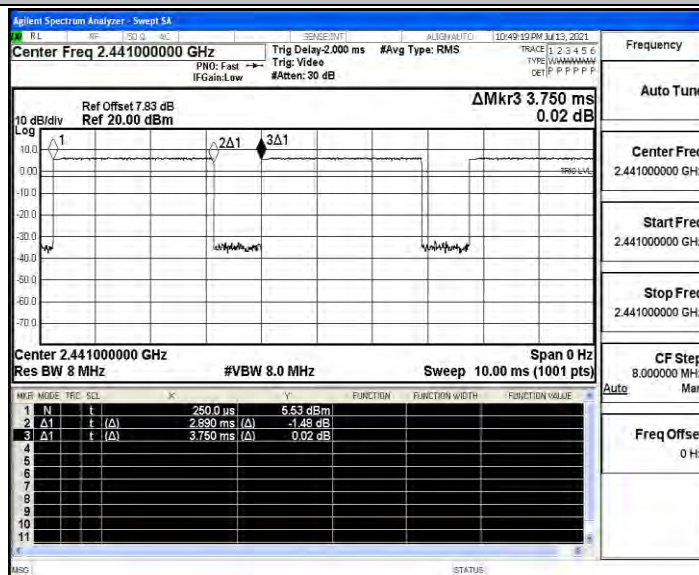
2DH5_Ant1_2441



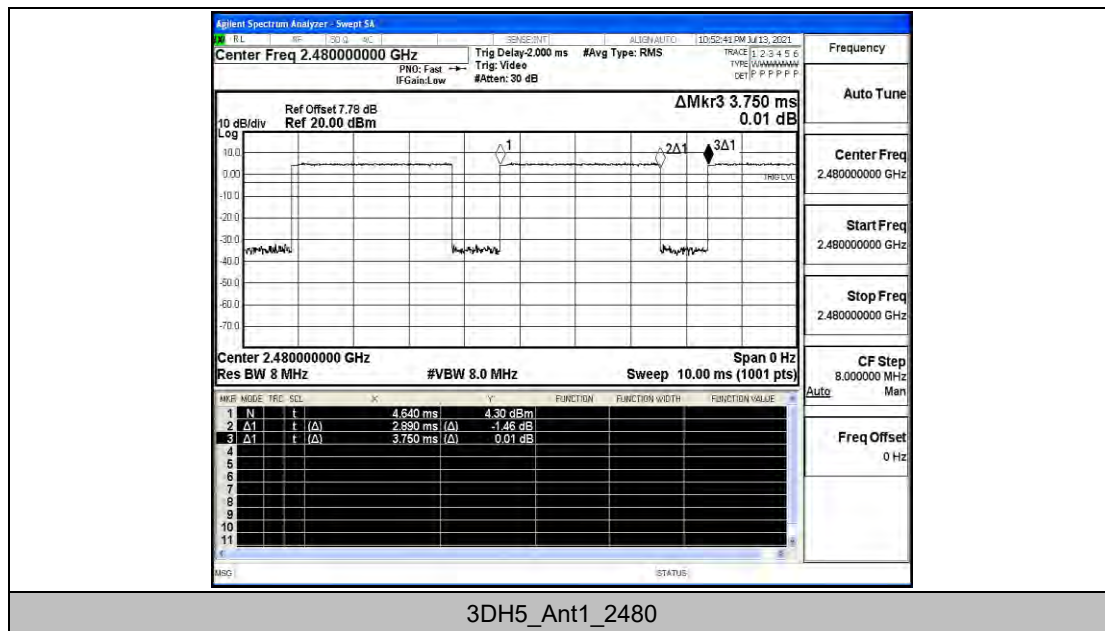
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441





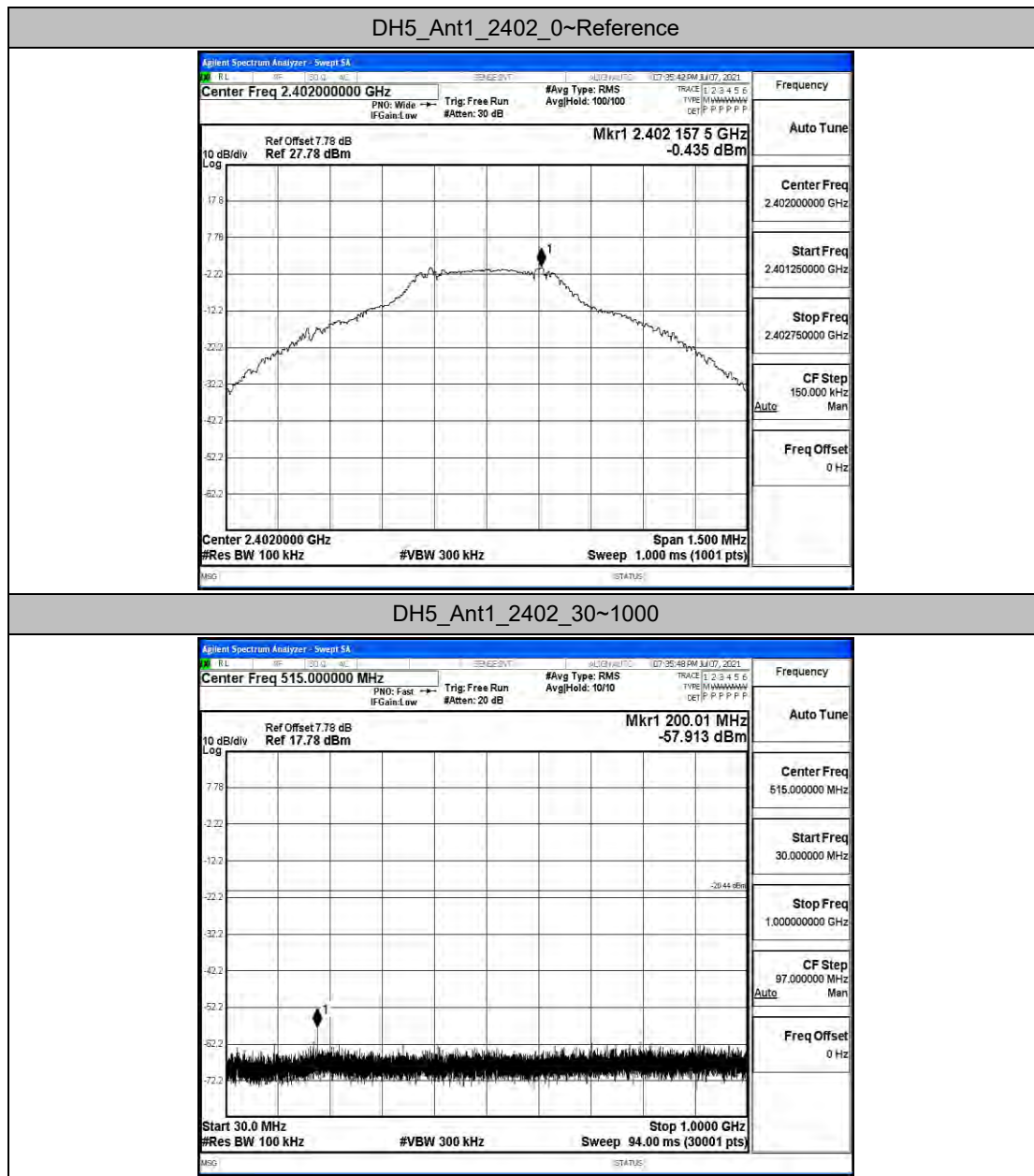
Appendix A.6: Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-0.44	-0.44	---	PASS
			30~1000	-0.44	-57.91	≤-20.44	PASS
			1000~26500	-0.44	-47.61	≤-20.44	PASS
		2441	Reference	-2.15	-2.15	---	PASS
			30~1000	-2.15	-57.63	≤-22.15	PASS
			1000~26500	-2.15	-46.71	≤-22.15	PASS
		2480	Reference	-1.30	-1.30	---	PASS
			30~1000	-1.30	-58.12	≤-21.3	PASS
			1000~26500	-1.30	-47.39	≤-21.3	PASS
2DH5	Ant1	2402	Reference	-2.36	-2.36	---	PASS
			30~1000	-2.36	-57.42	≤-22.36	PASS
			1000~26500	-2.36	-47.39	≤-22.36	PASS
		2441	Reference	-4.39	-4.39	---	PASS
			30~1000	-4.39	-57.02	≤-24.39	PASS
			1000~26500	-4.39	-47.34	≤-24.39	PASS
		2480	Reference	-2.77	-2.77	---	PASS
			30~1000	-2.77	-57.92	≤-22.77	PASS
			1000~26500	-2.77	-46.88	≤-22.77	PASS
3DH5	Ant1	2402	Reference	-2.29	-2.29	---	PASS
			30~1000	-2.29	-56.56	≤-22.29	PASS
			1000~26500	-2.29	-47.12	≤-22.29	PASS
		2441	Reference	-4.31	-4.31	---	PASS
			30~1000	-4.31	-57.05	≤-24.31	PASS
			1000~26500	-4.31	-46.04	≤-24.31	PASS
		2480	Reference	-5.75	-5.75	---	PASS
			30~1000	-5.75	-58.54	≤-25.75	PASS
			1000~26500	-5.75	-46.64	≤-25.75	PASS

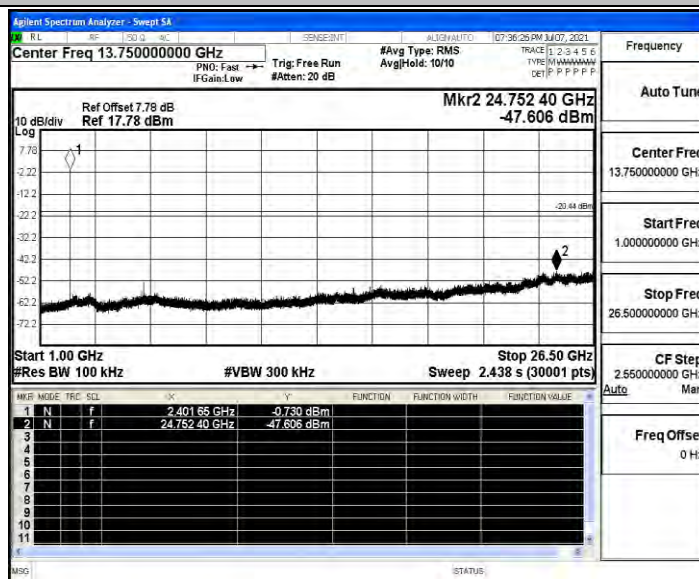


Test Graphs

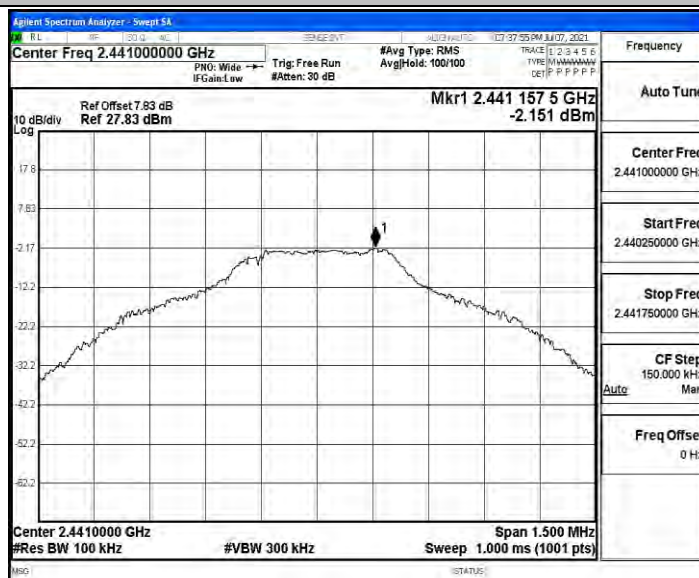




DH5_Ant1_2402_1000~26500

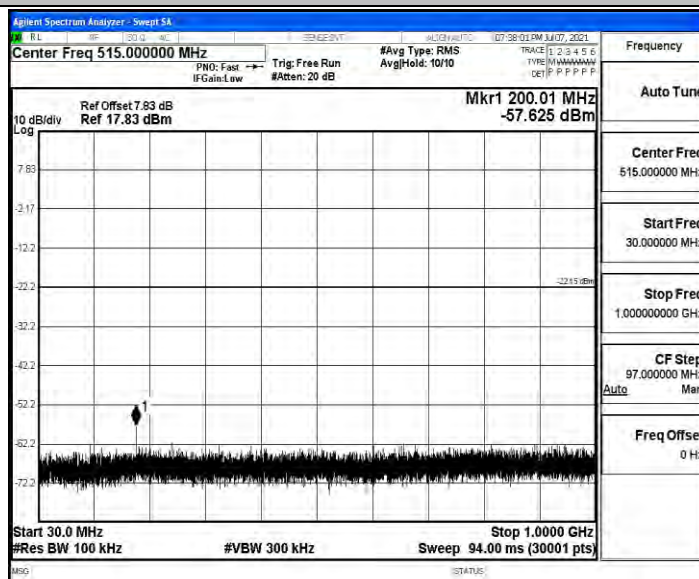


DH5_Ant1_2441_0~Reference

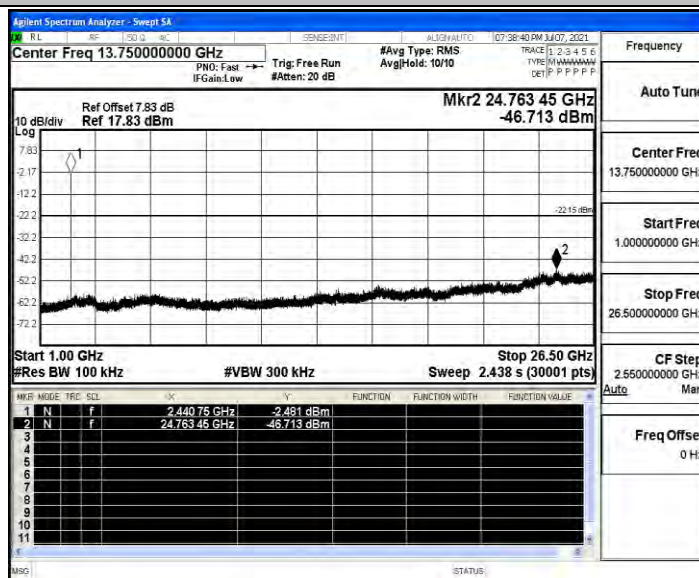




DH5_Ant1_2441_30~1000

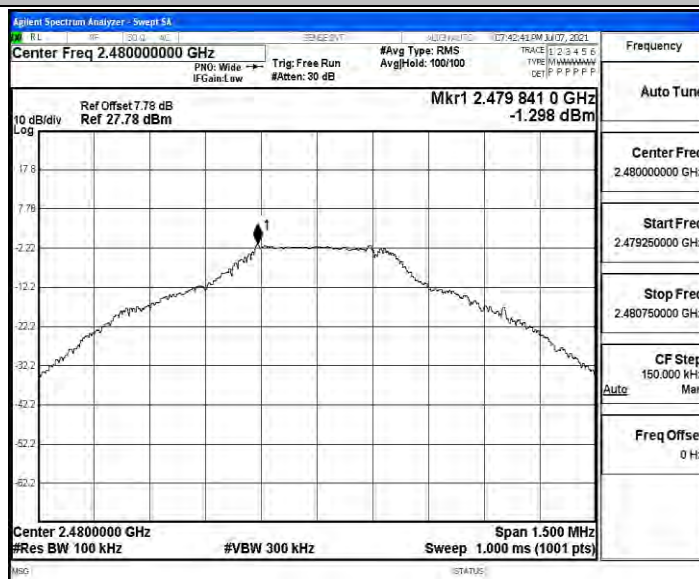


DH5_Ant1_2441_1000~26500

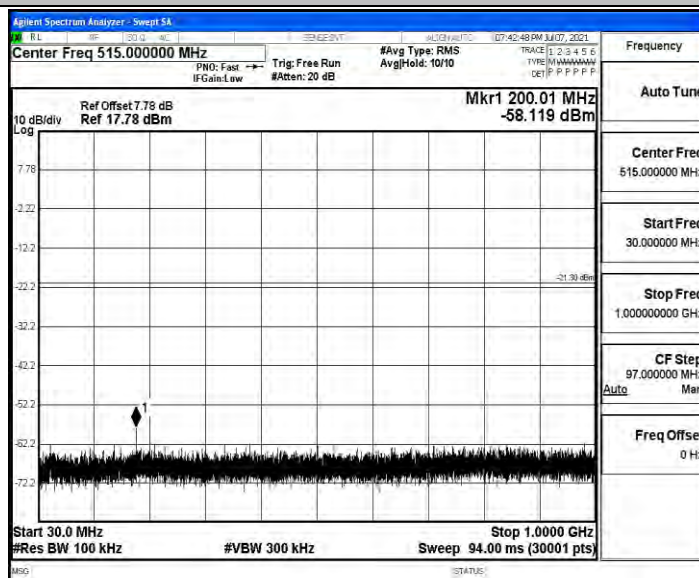




DH5_Ant1_2480_0~Reference

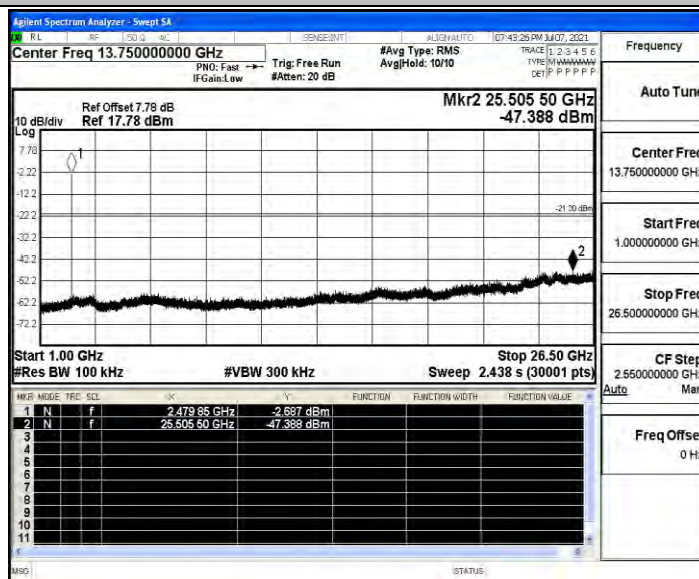


DH5_Ant1_2480_30~1000

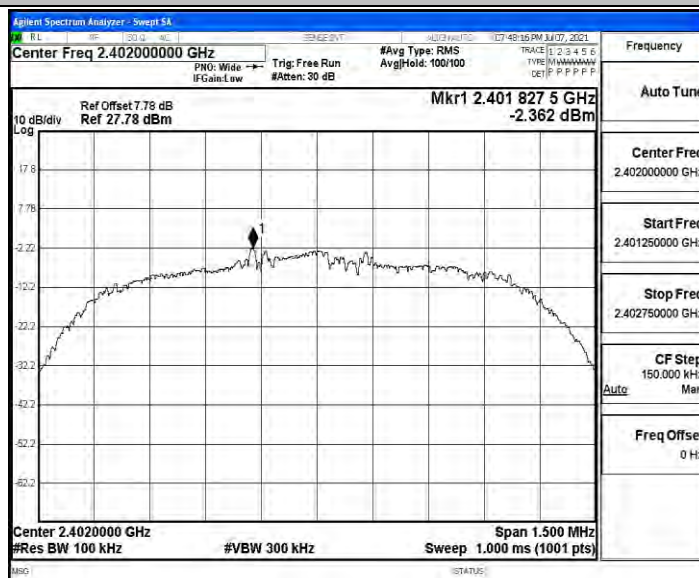




DH5_Ant1_2480_1000~26500

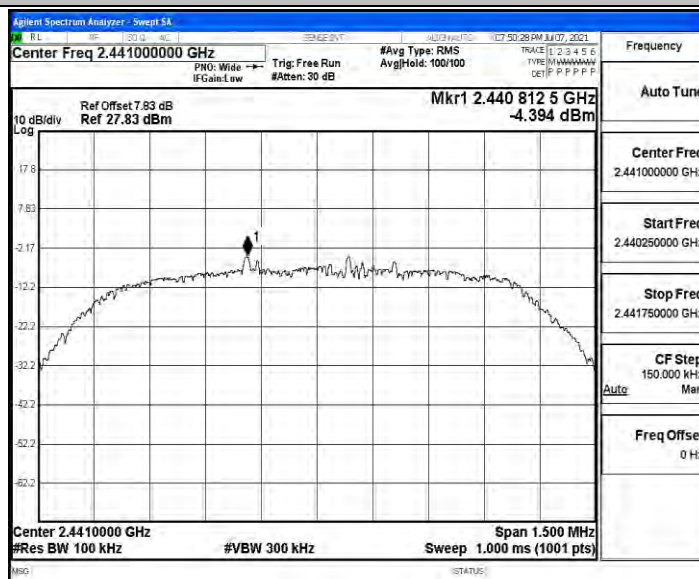


2DH5_Ant1_2402_0~Reference

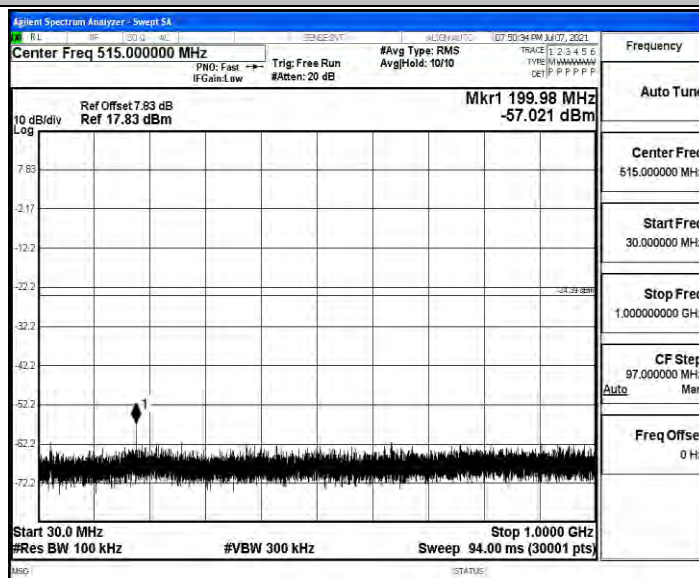




2DH5_Ant1_2441_0~Reference

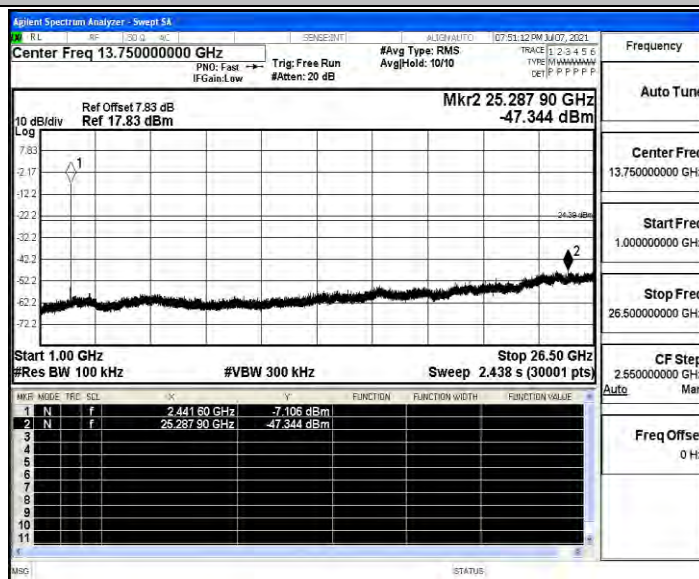


2DH5_Ant1_2441_30~1000

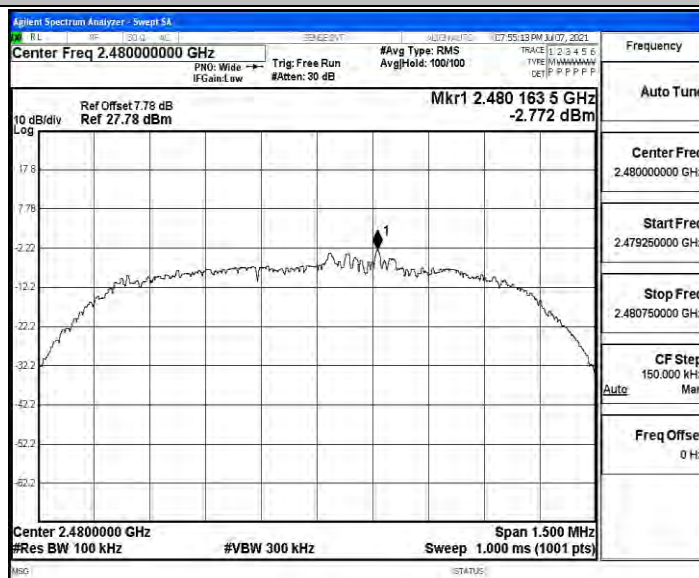




2DH5_Ant1_2441_1000~26500

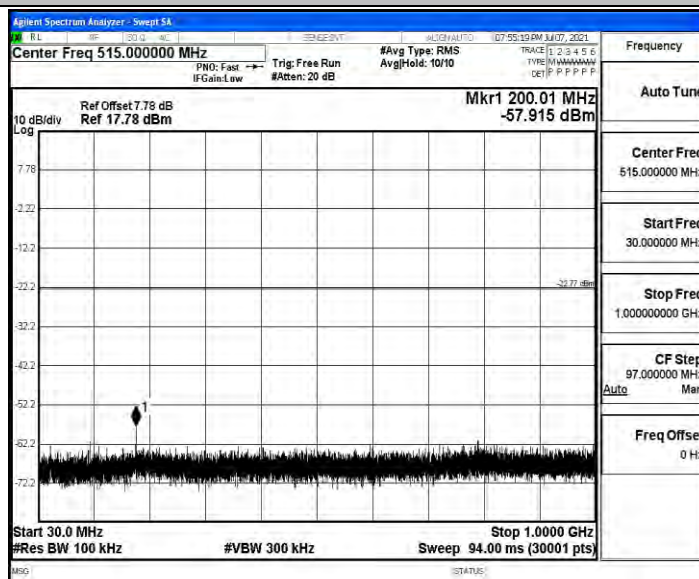


2DH5_Ant1_2480_0~Reference

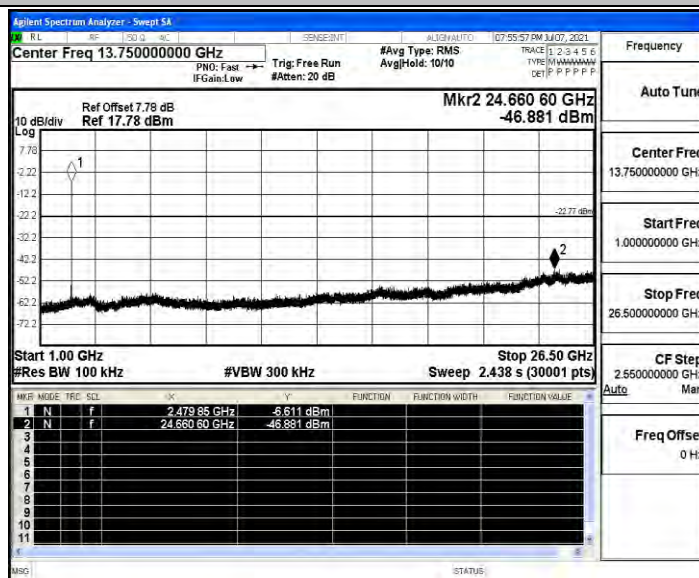




2DH5_Ant1_2480_30~1000

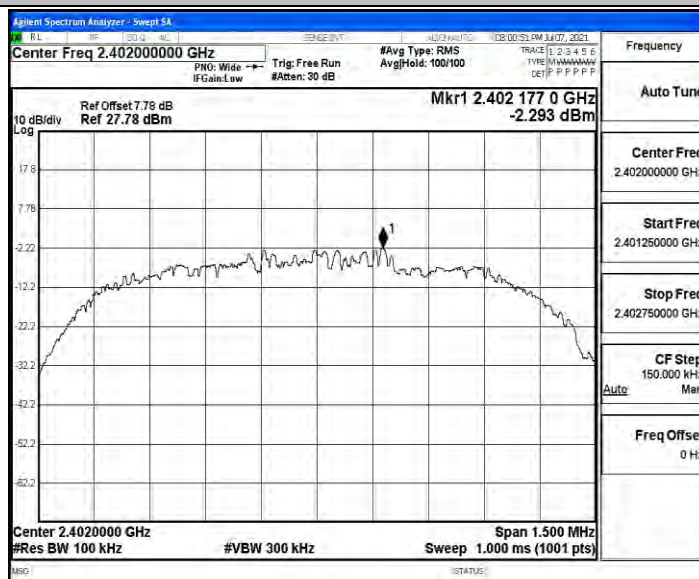


2DH5_Ant1_2480_1000~26500

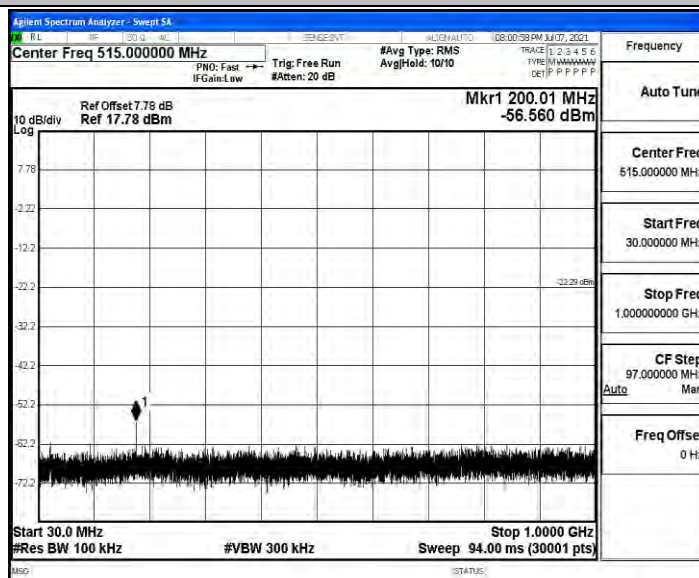




3DH5_Ant1_2402_0~Reference

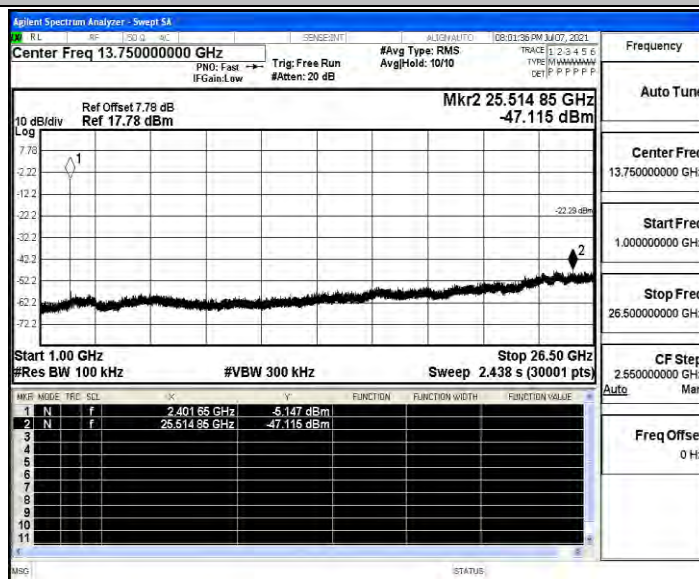


3DH5_Ant1_2402_30~1000

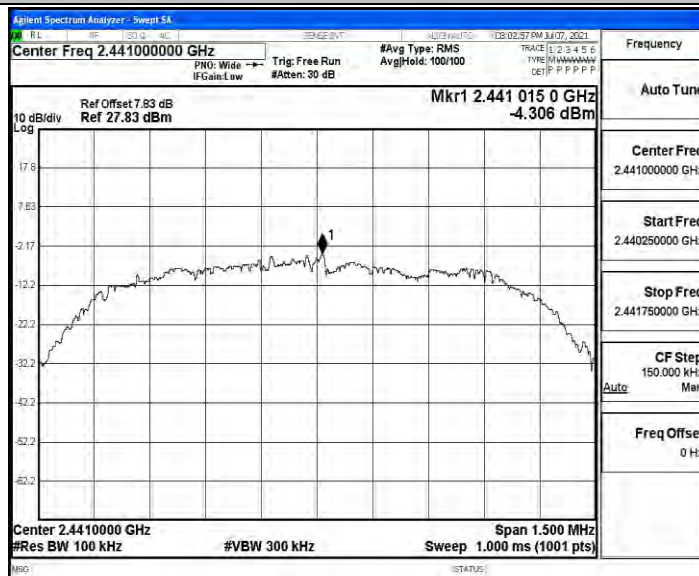




3DH5_Ant1_2402_1000~26500

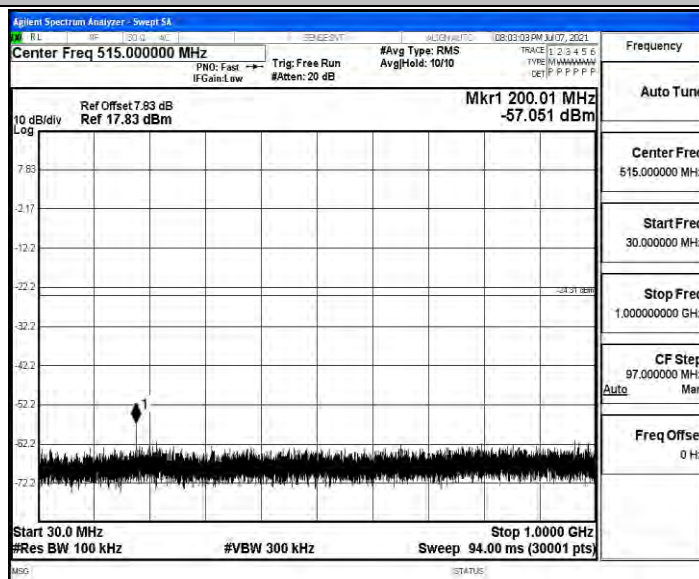


3DH5_Ant1_2441_0~Reference

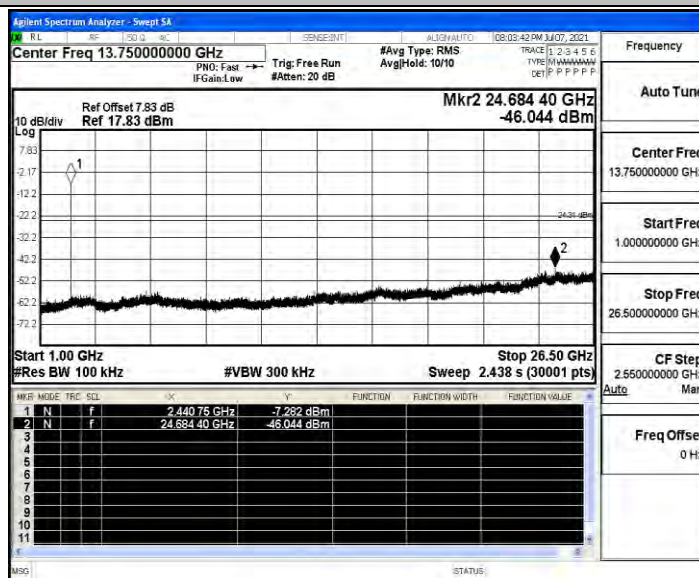




3DH5_Ant1_2441_30~1000

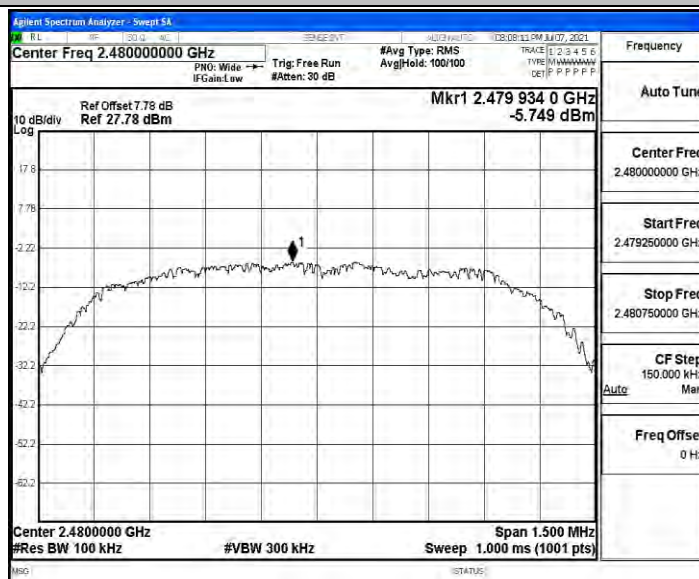


3DH5_Ant1_2441_1000~26500

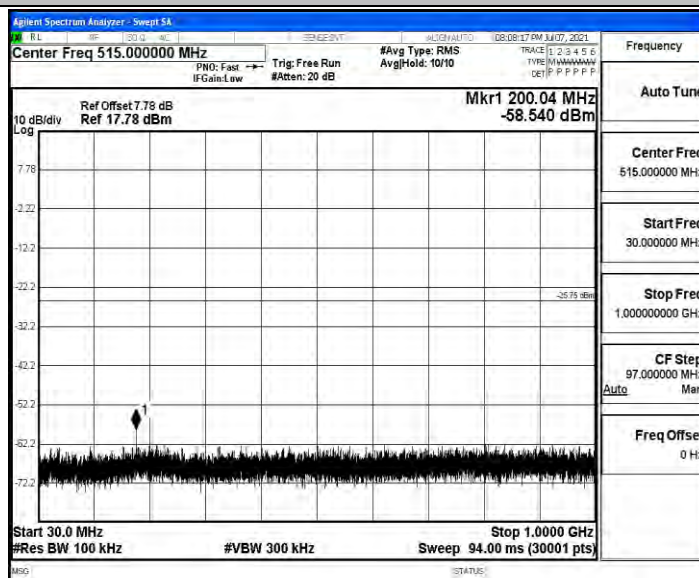


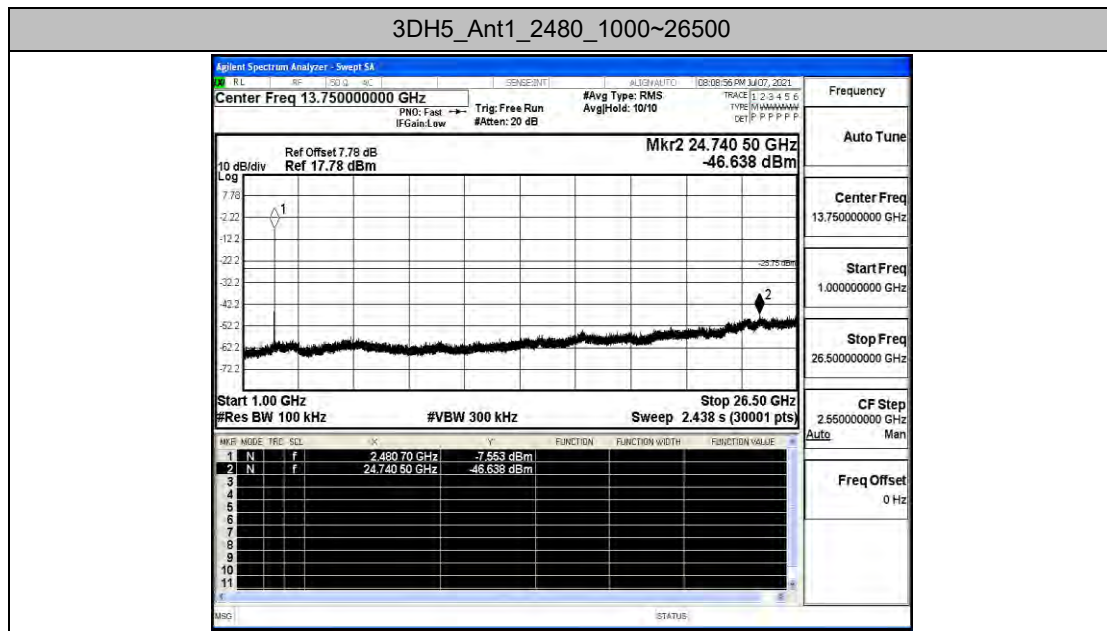


3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000







Appendix A.7: Band edge measurements

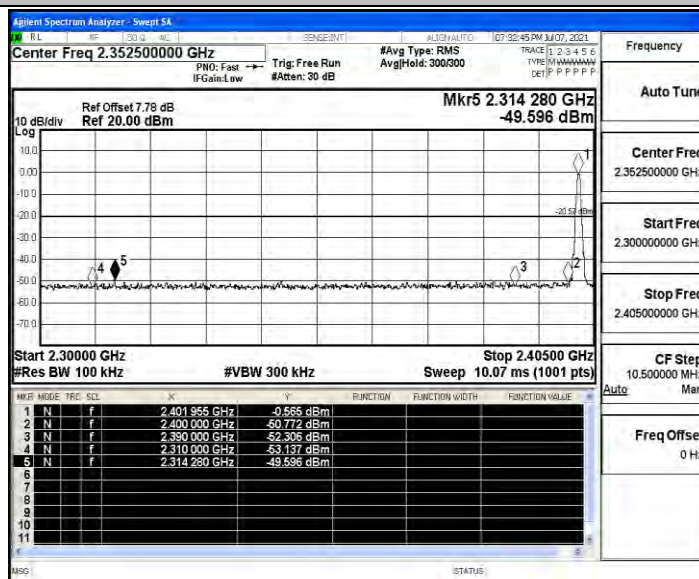
Test Result

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-0.57	-49.6	≤ -20.57	PASS
		High	2480	-1.29	-48.64	≤ -21.29	PASS
		Low	Hop	-1.52	-49.71	≤ -21.52	PASS
		High	Hop	-0.50	-49.22	≤ -20.5	PASS
2DH5	Ant1	Low	2402	-2.09	-49.53	≤ -22.09	PASS
		High	2480	-2.55	-48.58	≤ -22.55	PASS
		Low	Hop	-6.76	-49.81	≤ -26.76	PASS
		High	Hop	-3.37	-49.15	≤ -23.37	PASS
3DH5	Ant1	Low	2402	-3.20	-49.23	≤ -23.2	PASS
		High	2480	-2.61	-48.59	≤ -22.61	PASS
		Low	Hop	-5.50	-49.87	≤ -25.5	PASS
		High	Hop	-2.60	-48.74	≤ -22.6	PASS

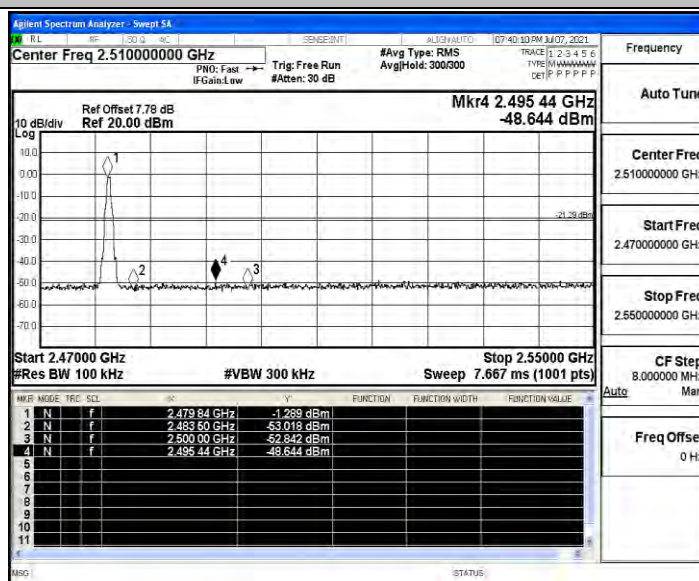


Test Graphs

DH5_Ant1_Low_2402

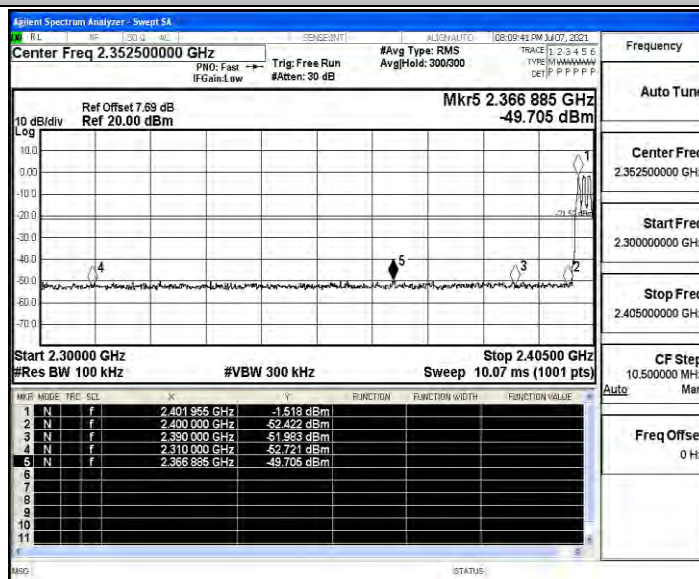


DH5_Ant1_High_2480

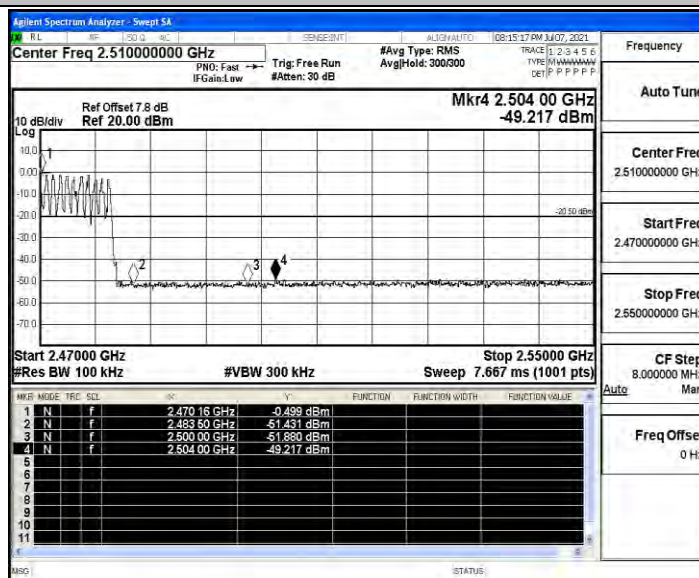




DH5_Ant1_Low_Hop

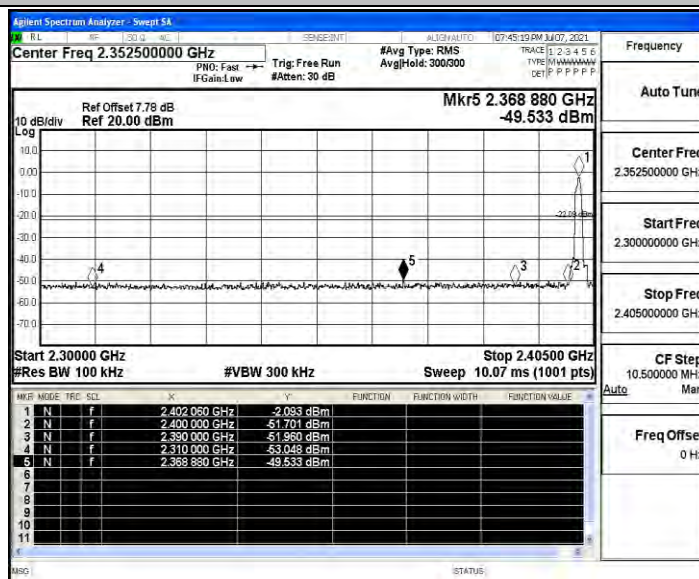


DH5_Ant1_High_Hop

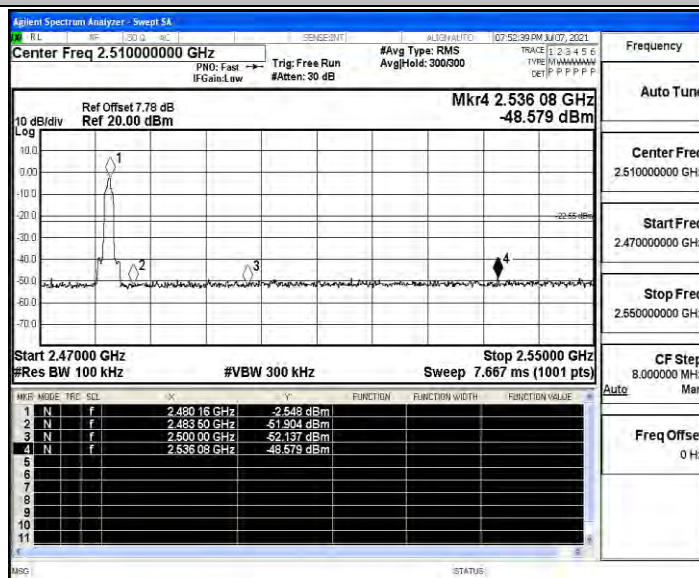




2DH5_Ant1_Low_2402

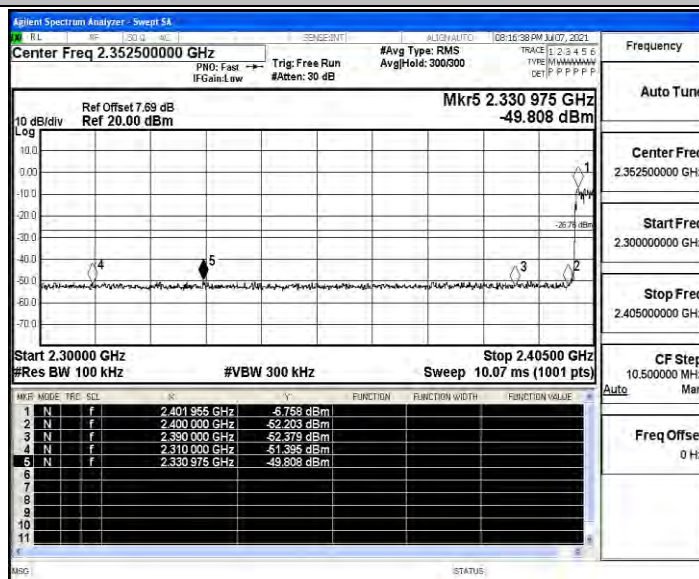


2DH5_Ant1_High_2480

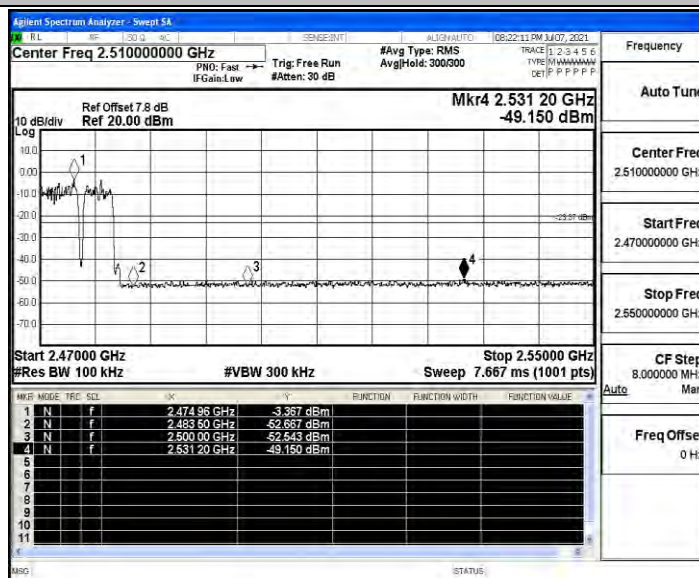




2DH5_Ant1_Low_Hop

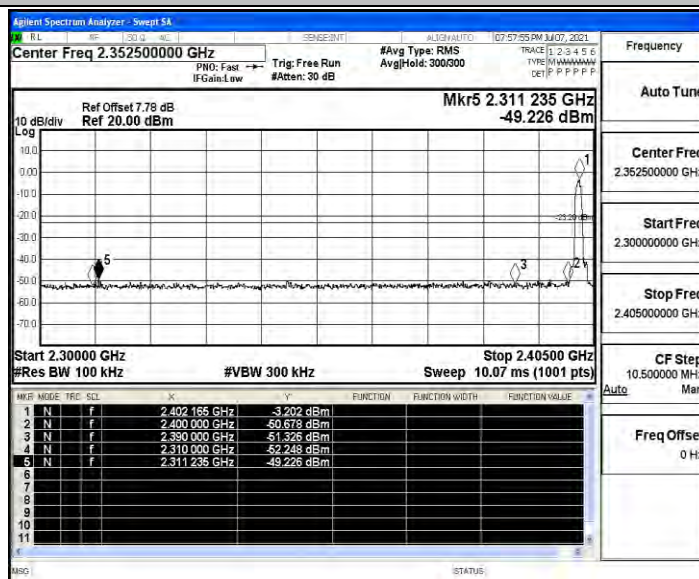


2DH5_Ant1_High_Hop

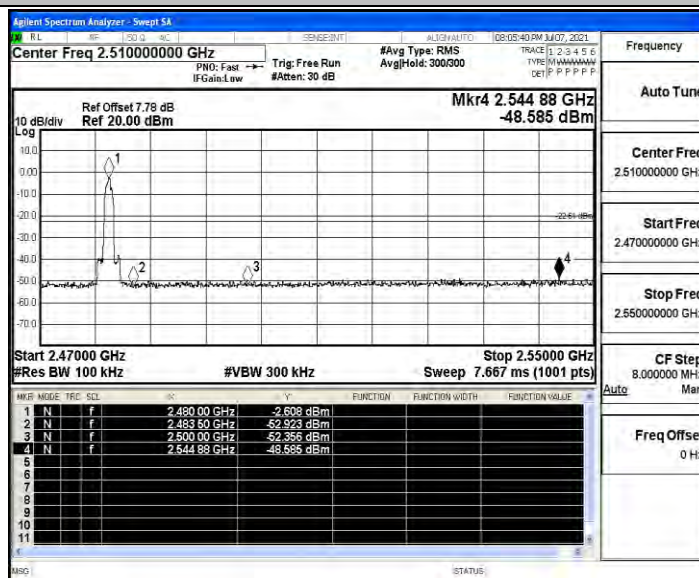




3DH5_Ant1_Low_2402

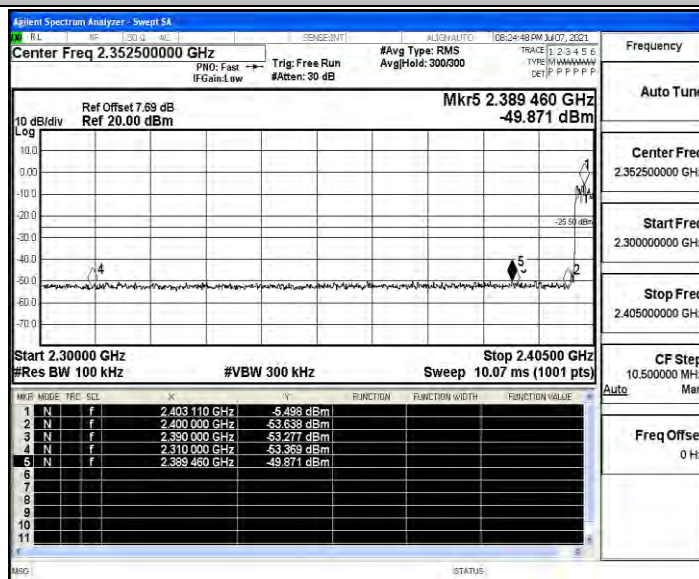


3DH5_Ant1_High_2480

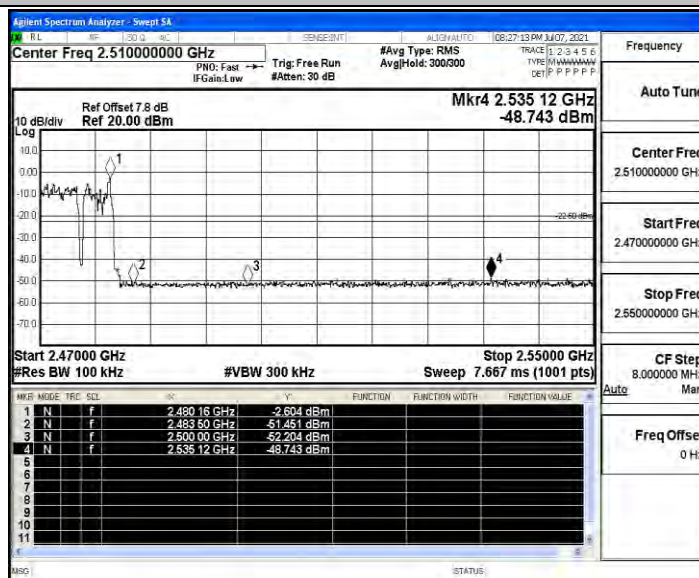




3DH5_Ant1_Low_Hop



3DH5_Ant1_High_Hop





Appendix A.8: Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Channel	Detector	Freq	Result	Limit	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-49.34	≤-41.20	47.89	≤54	PASS
				AV	2389.040	-48.96	≤-41.20	48.27	≤54	PASS
				AV	2390.000	-48.97	≤-41.20	48.26	≤54	PASS
				Peak	2310.000	-44.11	≤-21.20	53.12	≤74	PASS
				Peak	2362.265	-39.88	≤-21.20	57.35	≤74	PASS
				Peak	2390.000	-43.95	≤-21.20	53.28	≤74	PASS
		High	2480	AV	2483.500	-48.37	≤-41.20	48.86	≤54	PASS
				AV	2483.520	-48.37	≤-41.20	48.86	≤54	PASS
				AV	2500.000	-48.4	≤-41.20	48.83	≤54	PASS
				Peak	2483.500	-43.75	≤-21.20	53.48	≤74	PASS
				Peak	2499.040	-38.39	≤-21.20	58.84	≤74	PASS
				Peak	2500.000	-44.83	≤-21.20	52.4	≤74	PASS
		Low	Hop	Peak	2310.000	-41.07	≤-21.20	56.16	≤74	PASS
				Peak	2349.245	-38.17	≤-21.20	59.06	≤74	PASS
				Peak	2390.000	-40.16	≤-21.20	57.07	≤74	PASS
		High	Hop	Peak	2483.500	-40.53	≤-21.20	56.7	≤74	PASS
				Peak	2494.800	-37.31	≤-21.20	59.92	≤74	PASS
				Peak	2500.000	-40.78	≤-21.20	56.45	≤74	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-49.3	≤-41.20	47.93	≤54	PASS
				AV	2389.985	-48.92	≤-41.20	48.31	≤54	PASS
				AV	2390.000	-48.92	≤-41.20	48.31	≤54	PASS
				Peak	2310.000	-42.2	≤-21.20	55.03	≤74	PASS
				Peak	2360.795	-39.21	≤-21.20	58.02	≤74	PASS
				Peak	2390.000	-45.56	≤-21.20	51.67	≤74	PASS
		High	2480	AV	2483.500	-48.29	≤-41.20	48.94	≤54	PASS
				AV	2483.520	-48.29	≤-41.20	48.94	≤54	PASS
				AV	2500.000	-48.3	≤-41.20	48.93	≤54	PASS
				Peak	2483.500	-42.46	≤-21.20	54.77	≤74	PASS
				Peak	2497.040	-38.5	≤-21.20	58.73	≤74	PASS
				Peak	2500.000	-41.1	≤-21.20	56.13	≤74	PASS
		Low	Hop	Peak	2310.000	-41.68	≤-21.20	55.55	≤74	PASS
				Peak	2374.235	-37.81	≤-21.20	59.42	≤74	PASS
				Peak	2390.000	-40.22	≤-21.20	57.01	≤74	PASS
		High	Hop	Peak	2483.500	-40.89	≤-21.20	56.34	≤74	PASS
				Peak	2493.440	-37.17	≤-21.20	60.06	≤74	PASS
				Peak	2500.000	-39.62	≤-21.20	57.61	≤74	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-49.28	≤-41.20	47.95	≤54	PASS



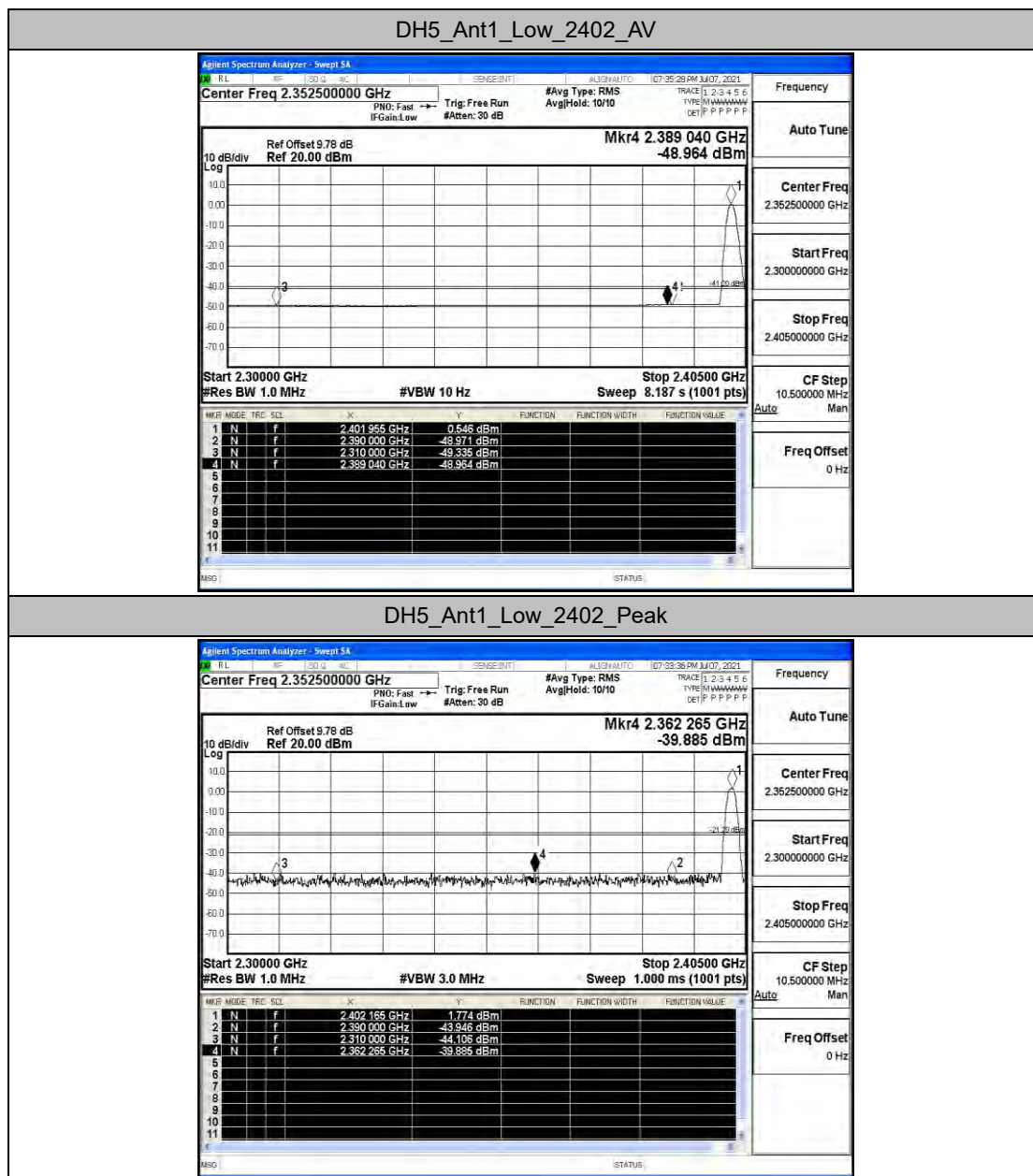
				AV	2389.985	-48.89	≤ -41.20	48.34	≤ 54	PASS
				AV	2390.000	-48.89	≤ -41.20	48.34	≤ 54	PASS
				Peak	2310.000	-47.04	≤ -21.20	50.19	≤ 74	PASS
				Peak	2312.915	-39.46	≤ -21.20	57.77	≤ 74	PASS
				Peak	2390.000	-41.73	≤ -21.20	55.5	≤ 74	PASS
		High	2480	AV	2483.500	-48.26	≤ -41.20	48.97	≤ 54	PASS
				AV	2483.520	-48.26	≤ -41.20	48.97	≤ 54	PASS
				AV	2500.000	-48.28	≤ -41.20	48.95	≤ 54	PASS
				Peak	2483.500	-43.92	≤ -21.20	53.31	≤ 74	PASS
				Peak	2491.360	-39.05	≤ -21.20	58.18	≤ 74	PASS
				Peak	2500.000	-43.68	≤ -21.20	53.55	≤ 74	PASS
		Low	Hop	Peak	2310.000	-41.11	≤ -21.20	56.12	≤ 74	PASS
				Peak	2332.655	-38.54	≤ -21.20	58.69	≤ 74	PASS
				Peak	2390.000	-39.64	≤ -21.20	57.59	≤ 74	PASS
		High	Hop	Peak	2483.500	-39.86	≤ -21.20	57.37	≤ 74	PASS
				Peak	2484.960	-37.91	≤ -21.20	59.32	≤ 74	PASS
				Peak	2500.000	-39.72	≤ -21.20	57.51	≤ 74	PASS

Note:

1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

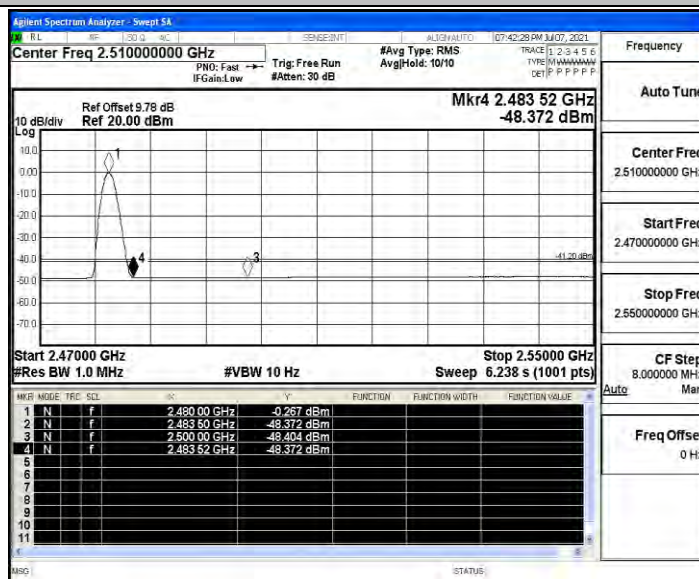


Test Graphs

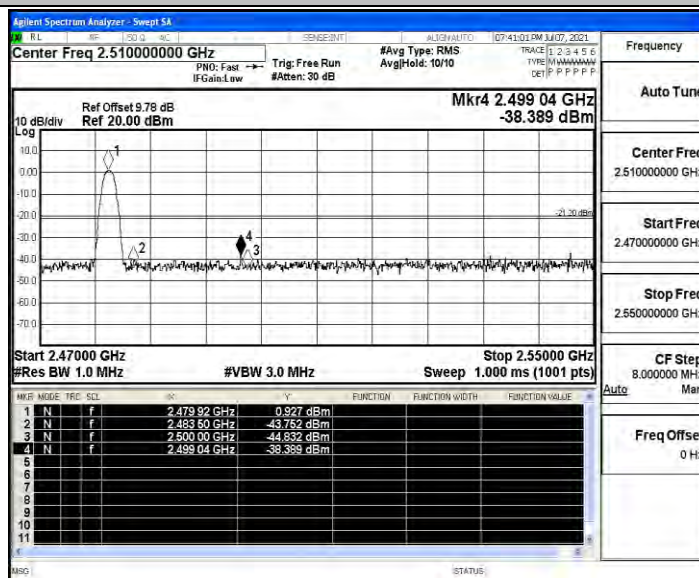




DH5_Ant1_High_2480_AV

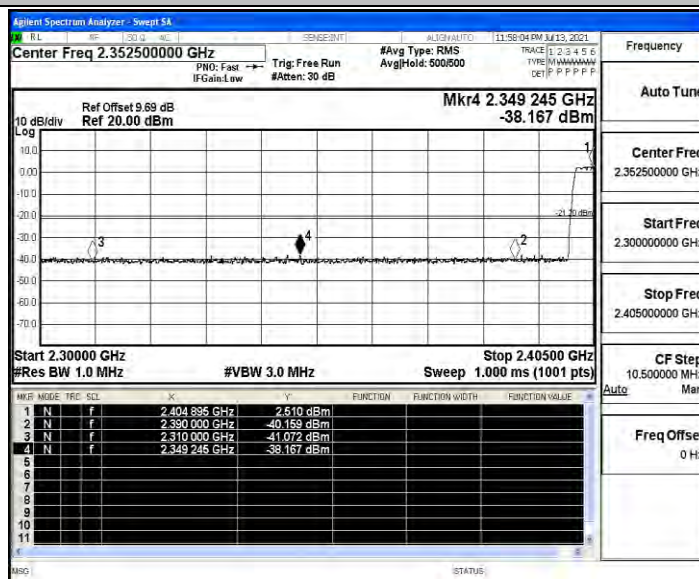


DH5_Ant1_High_2480_Peak

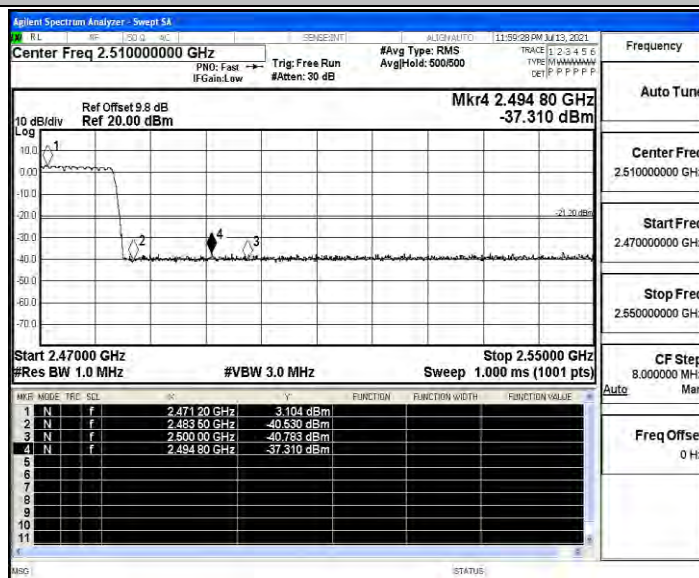




DH5_Ant1_Low_Hop_Peak

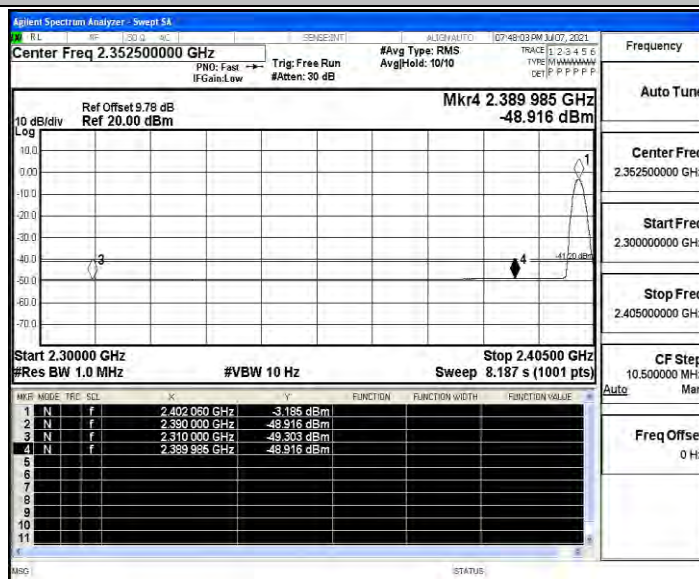


DH5_Ant1_High_Hop_Peak

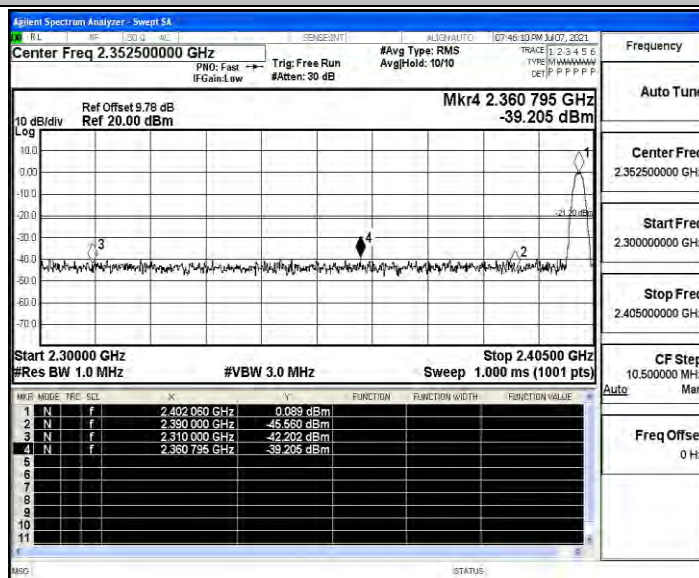




2DH5_Ant1_Low_2402_AV

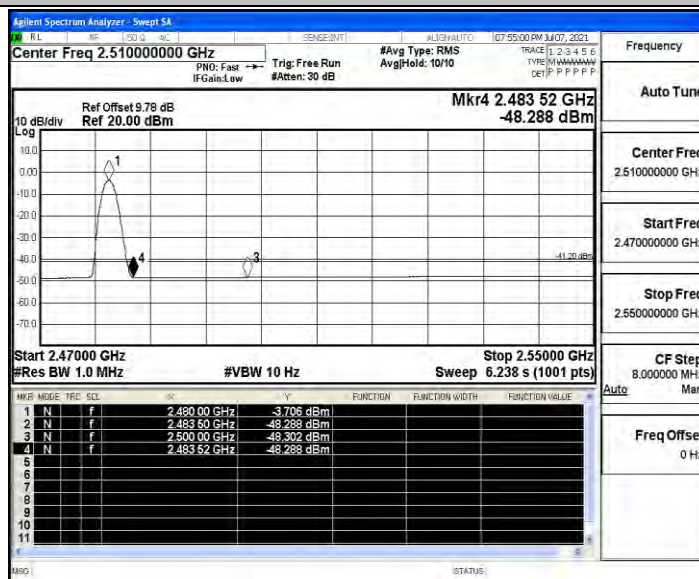


2DH5_Ant1_Low_2402_Peak

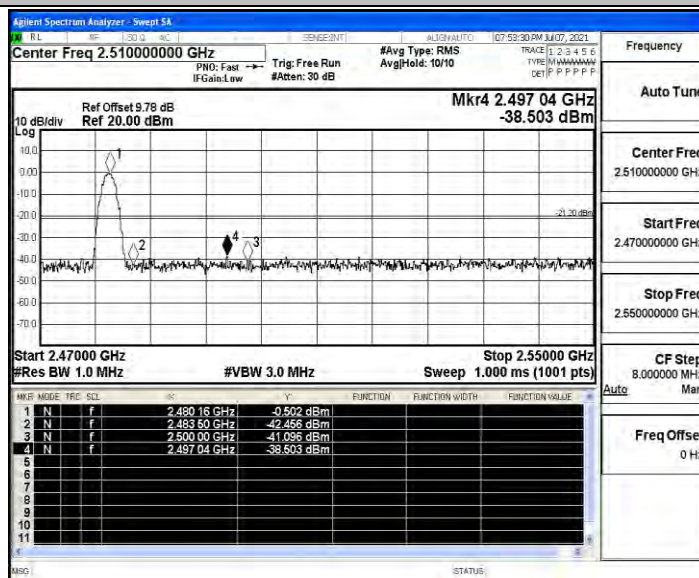




2DH5_Ant1_High_2480_AV

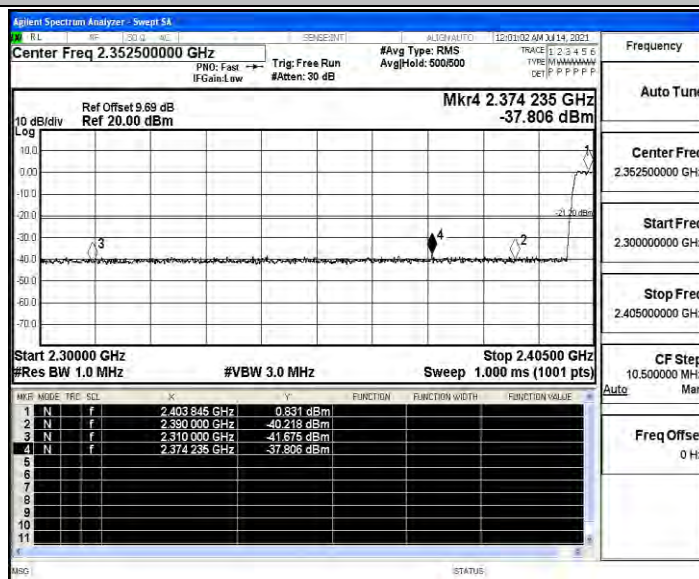


2DH5_Ant1_High_2480_Peak

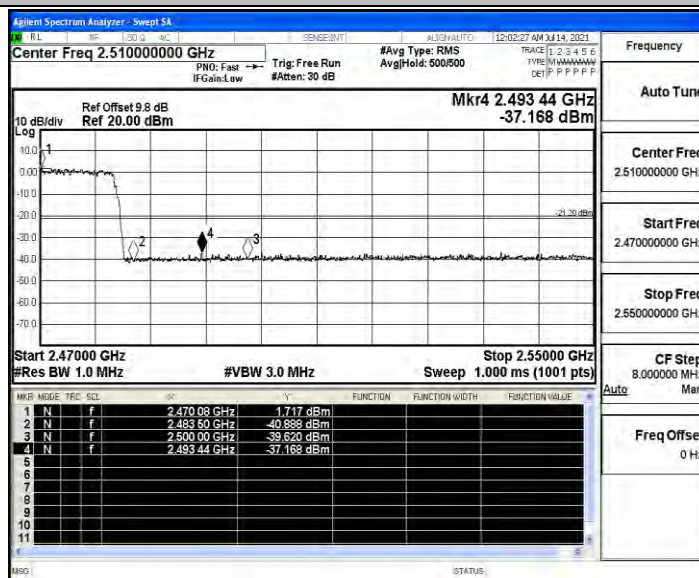




2DH5_Ant1_Low_Hop_Peak

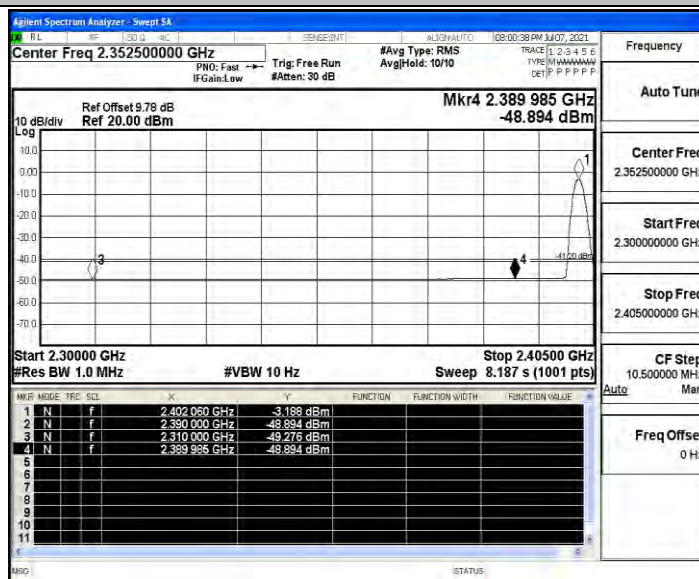


2DH5_Ant1_High_Hop_Peak

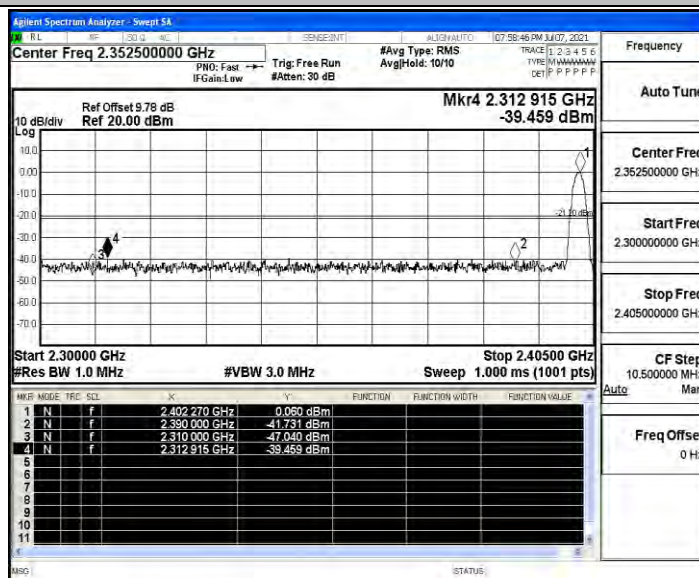




3DH5_Ant1_Low_2402_AV

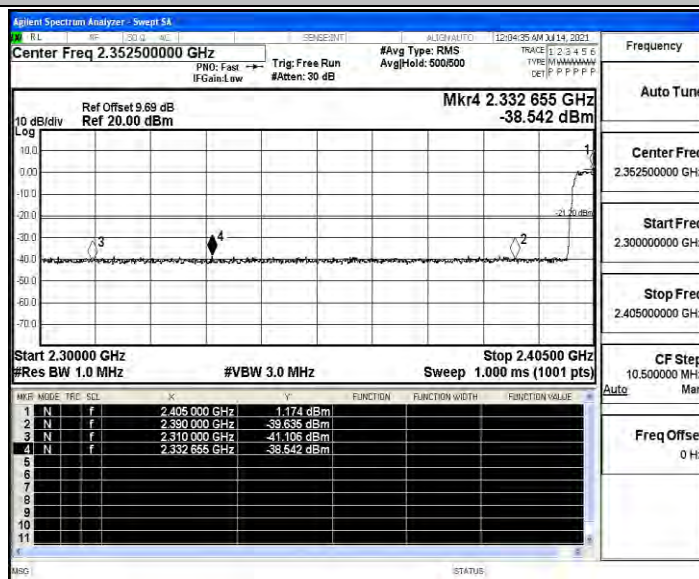


3DH5_Ant1_Low_2402_Peak





3DH5_Ant1_Low_Hop_Peak



3DH5_Ant1_High_Hop_Peak

