



Appendix A

RF Test Data for 2.4G BT (Conducted Measurement)

Product Name: MCMP1021

Trade Mark: N/A

Test Model: MCMP1021

Environmental Conditions

Temperature:	23.6 ° C
Relative Humidity:	52.7%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan



A.1 20dB Emission Bandwidth

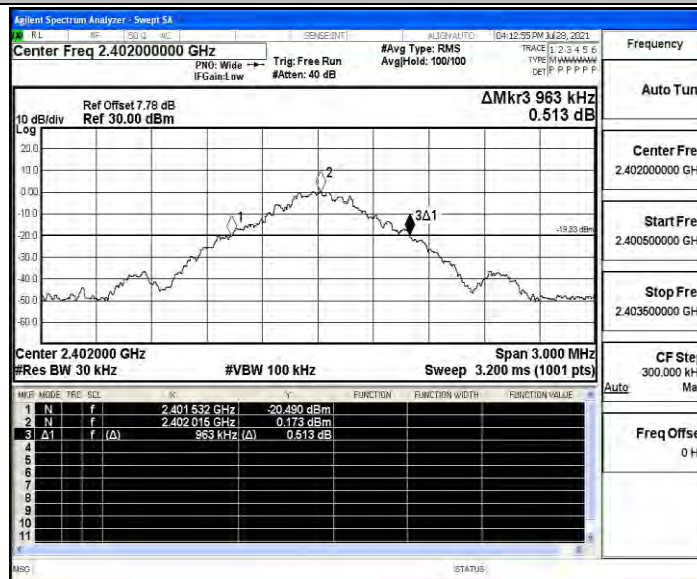
Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.963	2401.532	2402.495	---	PASS
		2441	1.041	2440.466	2441.507	---	PASS
		2480	1.035	2479.469	2480.504	---	PASS
2DH5	Ant1	2402	1.287	2401.367	2402.654	---	PASS
		2441	1.329	2440.337	2441.666	---	PASS
		2480	1.290	2479.364	2480.654	---	PASS
3DH5	Ant1	2402	1.296	2401.352	2402.648	---	PASS
		2441	1.305	2440.349	2441.654	---	PASS
		2480	1.299	2479.349	2480.648	---	PASS

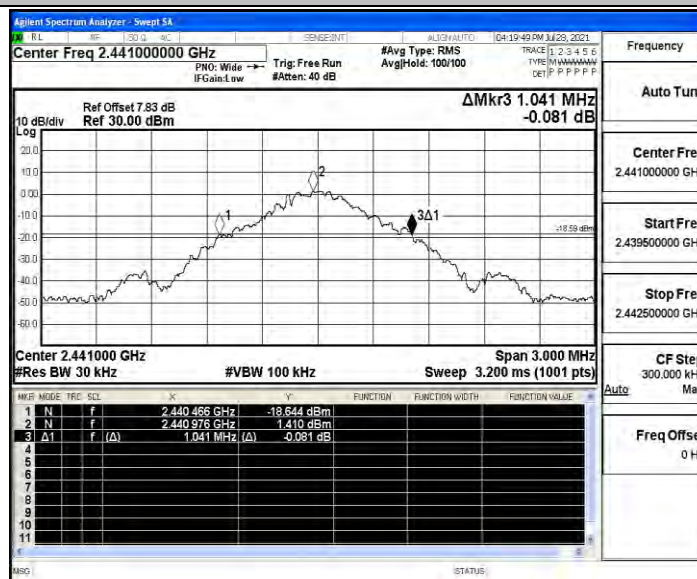


Test Graphs

DH5_Ant1_2402



DH5_Ant1_2441

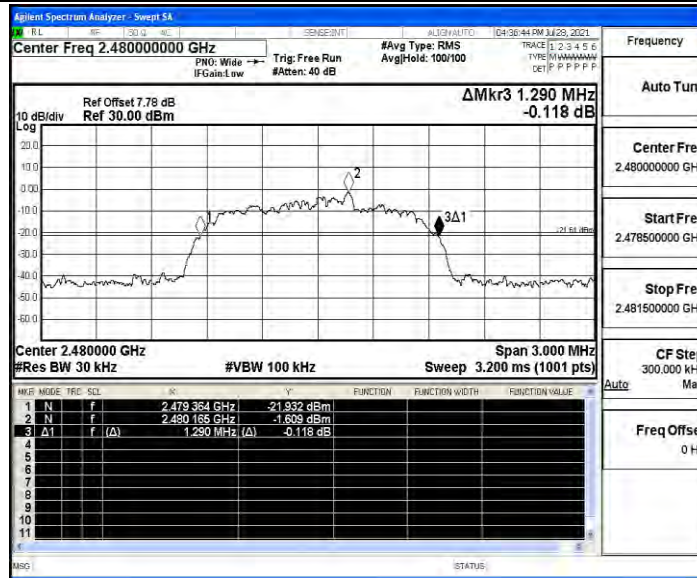


DH5_Ant1_2480

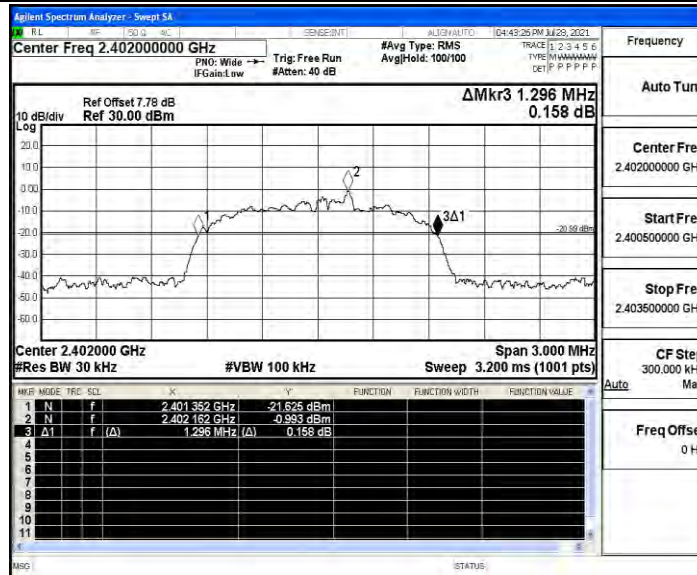




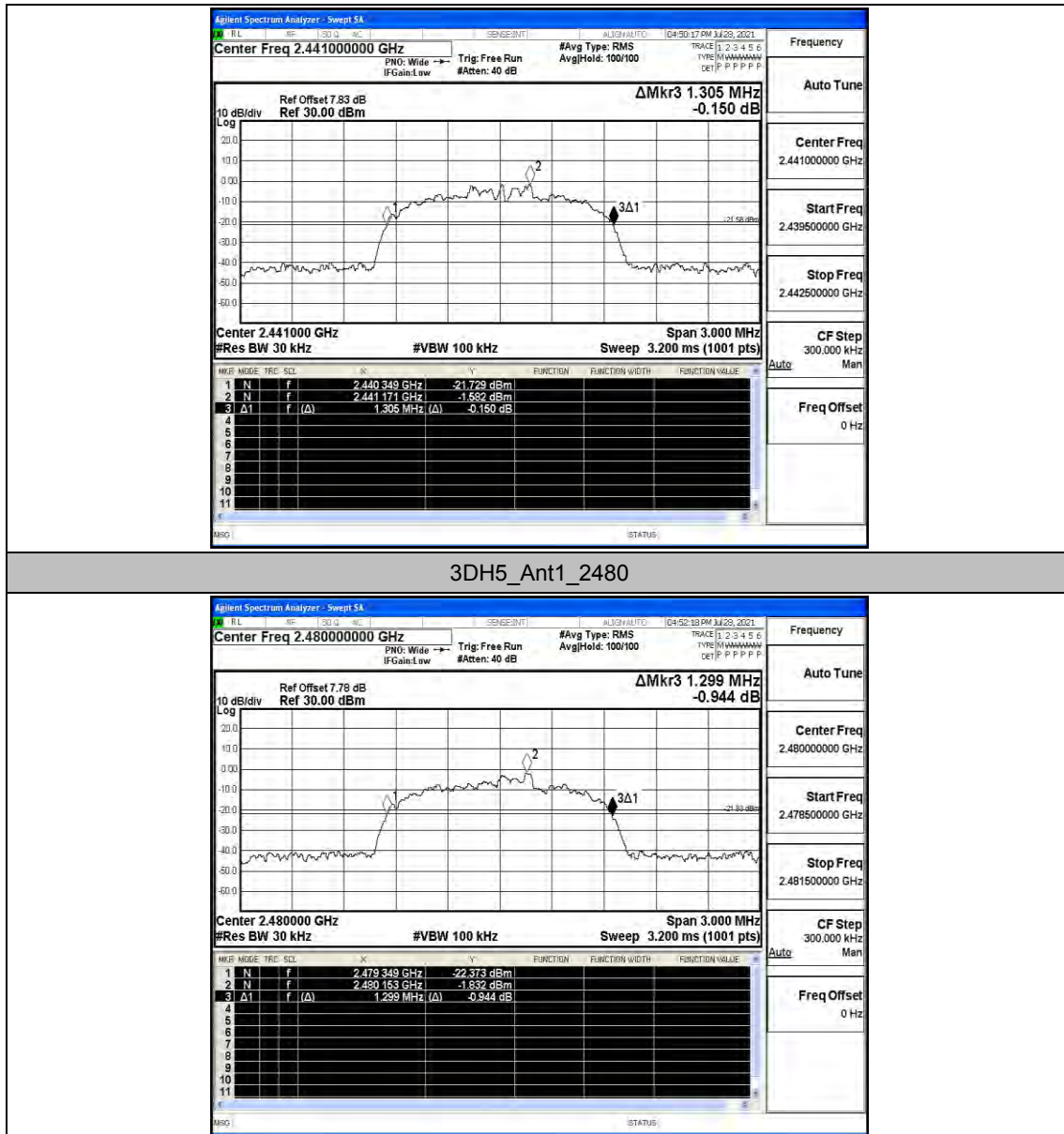
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441





A.2 Occupied Channel Bandwidth

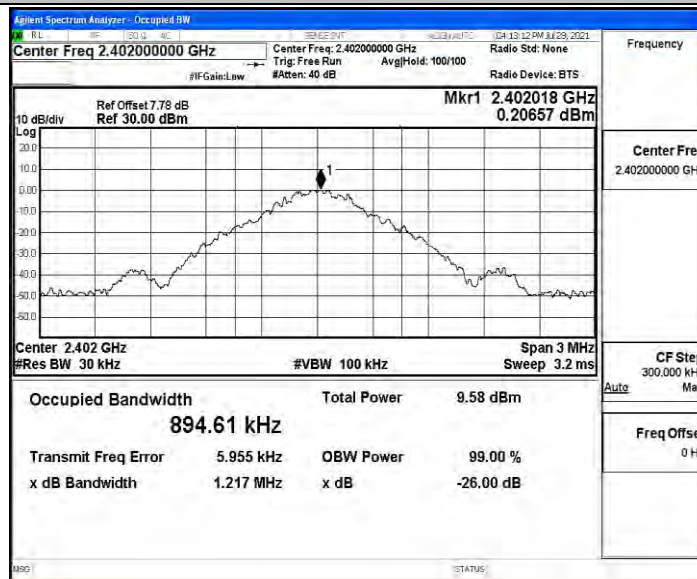
Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.89461	2401.559	2402.453	---	PASS
		2441	0.89558	2440.552	2441.447	---	PASS
		2480	0.89519	2479.561	2480.456	---	PASS
2DH5	Ant1	2402	1.1925	2401.407	2402.599	---	PASS
		2441	1.1785	2440.411	2441.589	---	PASS
		2480	1.1872	2479.406	2480.593	---	PASS
3DH5	Ant1	2402	1.1929	2401.404	2402.597	---	PASS
		2441	1.2016	2440.398	2441.600	---	PASS
		2480	1.1907	2479.403	2480.594	---	PASS

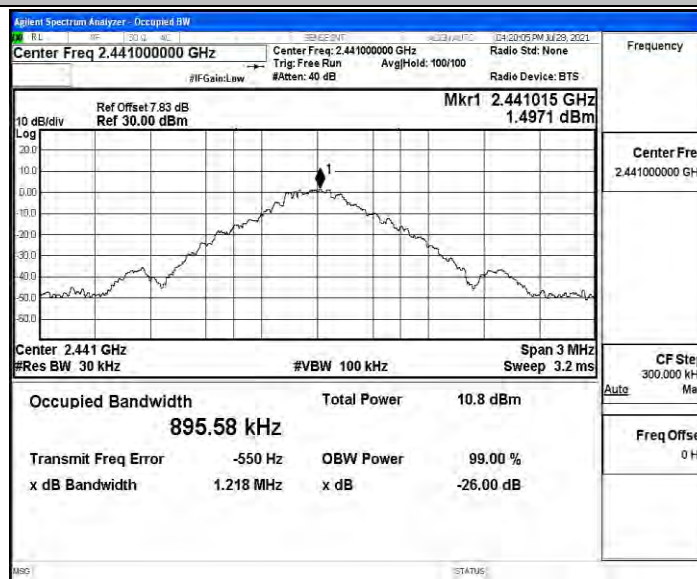


Test Graphs

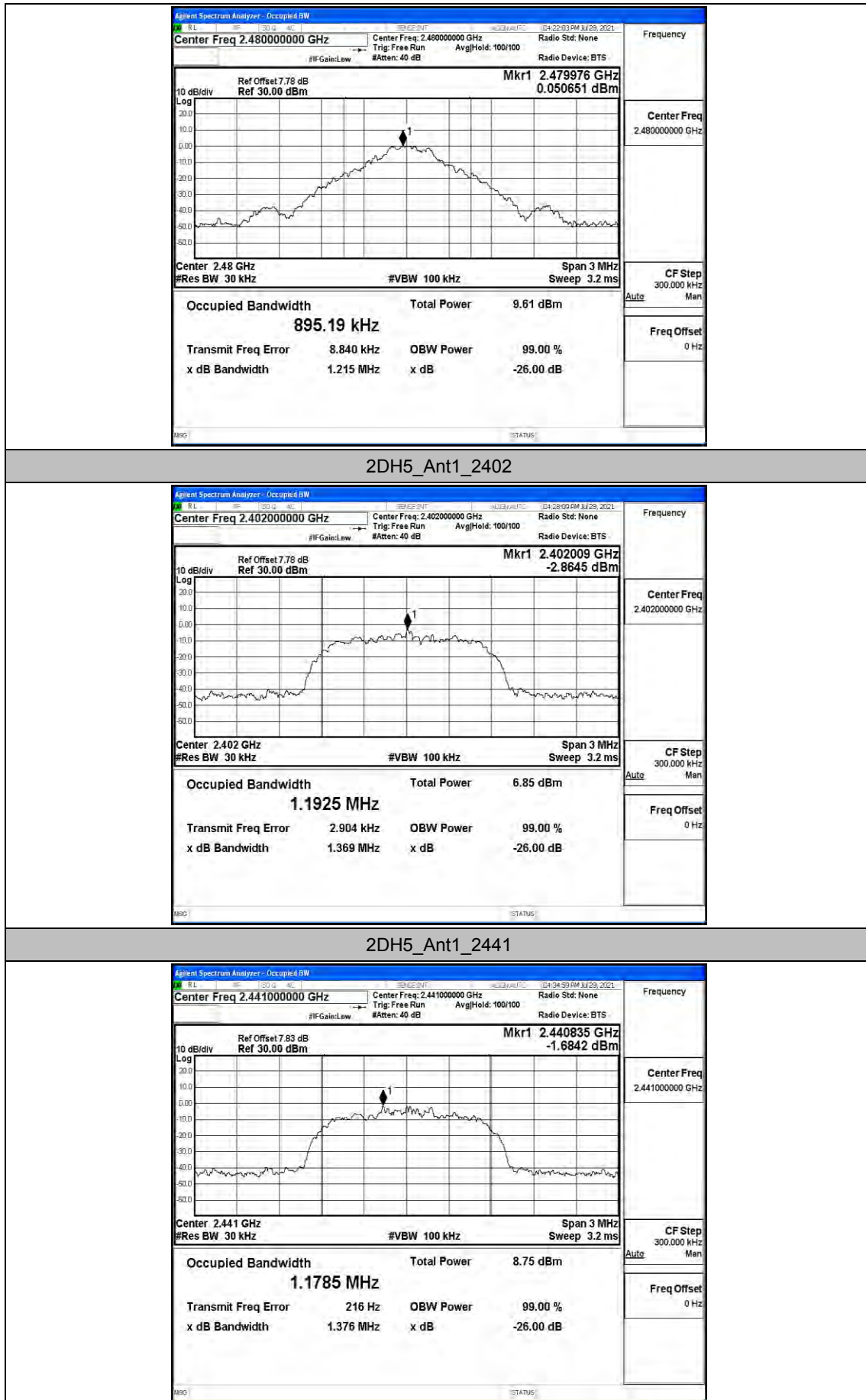
DH5_Ant1_2402



DH5_Ant1_2441

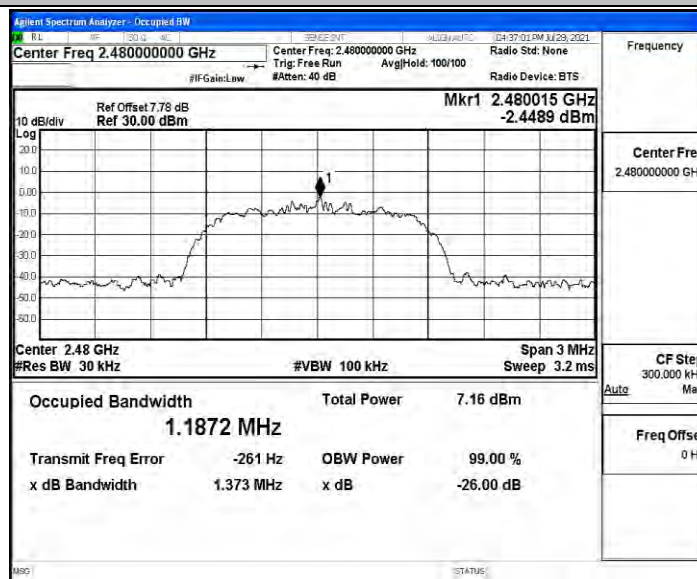


DH5_Ant1_2480

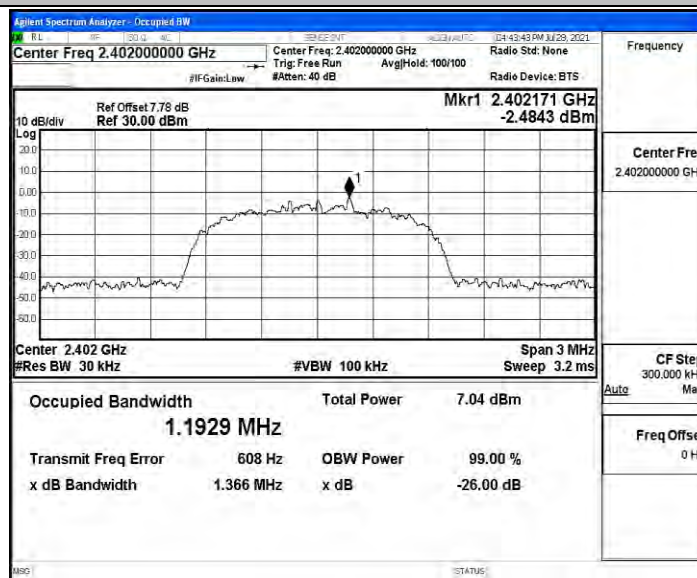




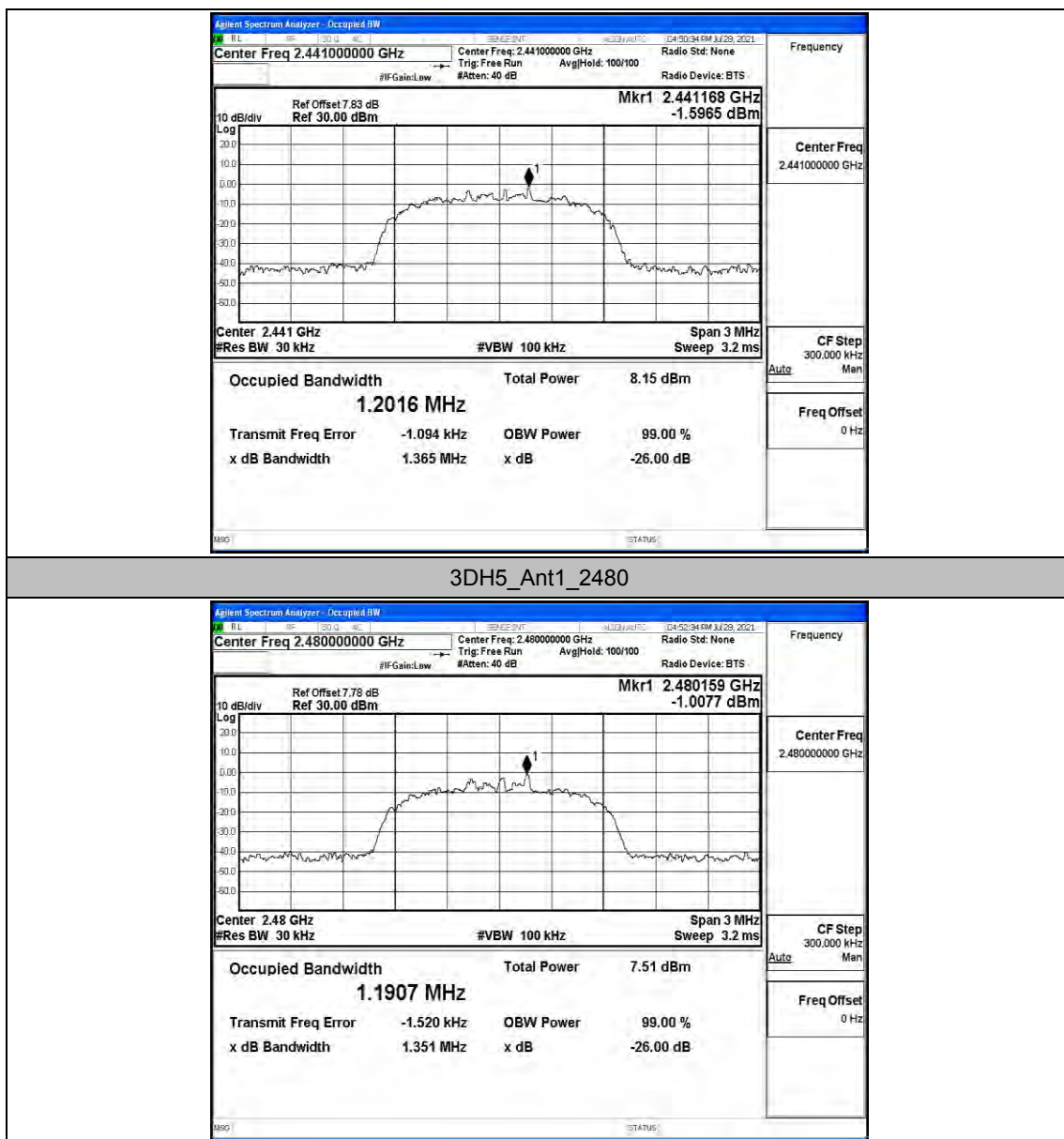
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441





A.3 Maximum conducted output power

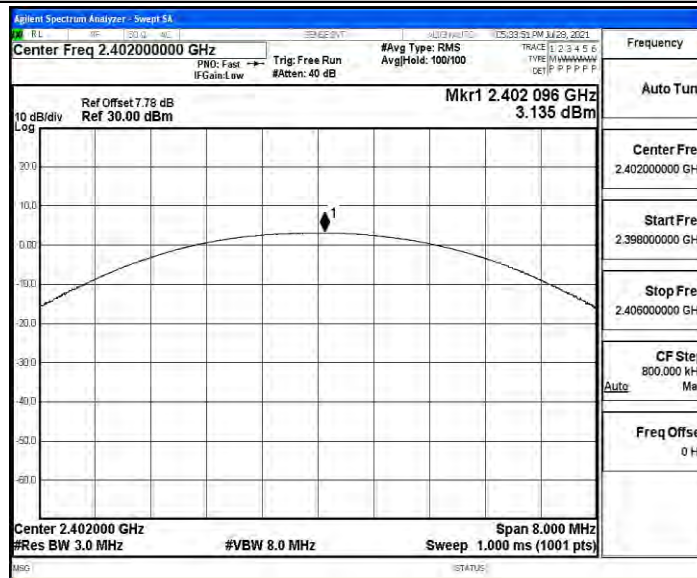
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	3.14	≤30	PASS
		2441	4.36	≤30	PASS
		2480	2.99	≤30	PASS
2DH5	Ant1	2402	2.18	≤20.97	PASS
		2441	3.51	≤20.97	PASS
		2480	2.2	≤20.97	PASS
3DH5	Ant1	2402	2.43	≤20.97	PASS
		2441	3.66	≤20.97	PASS
		2480	2.27	≤20.97	PASS

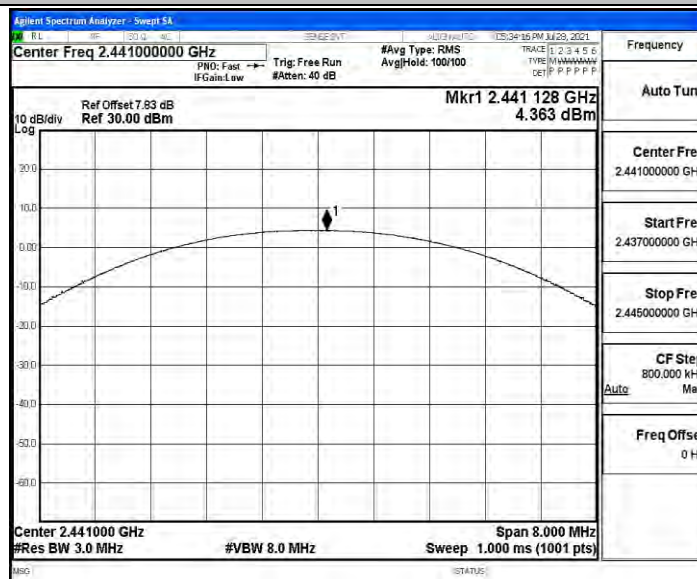


Test Graphs

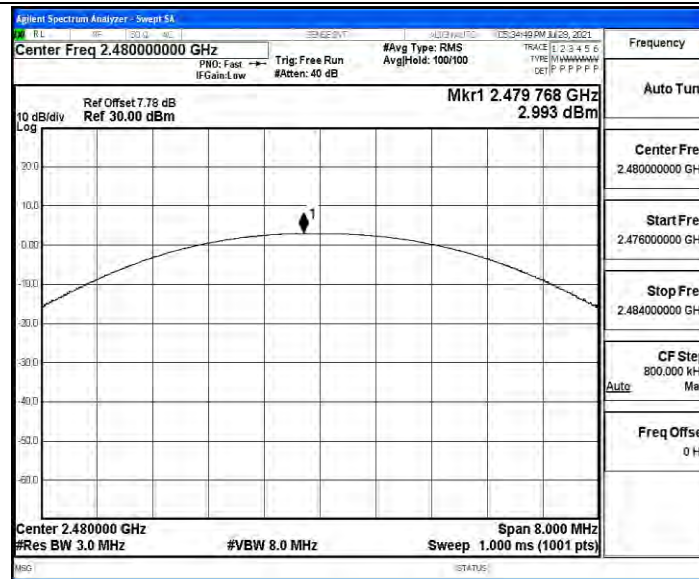
DH5_Ant1_2402



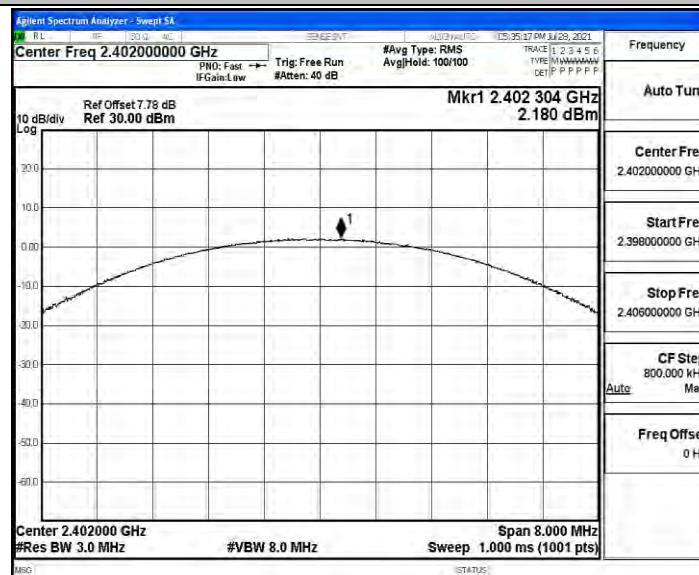
DH5_Ant1_2441



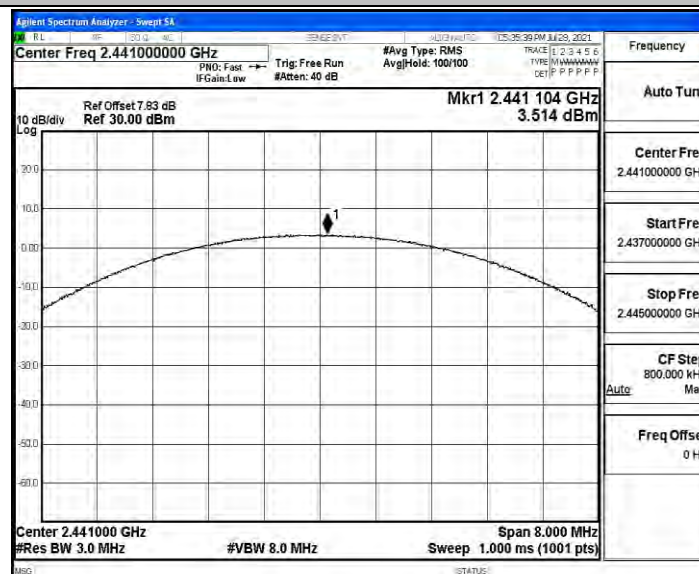
DH5_Ant1_2480



2DH5_Ant1_2402

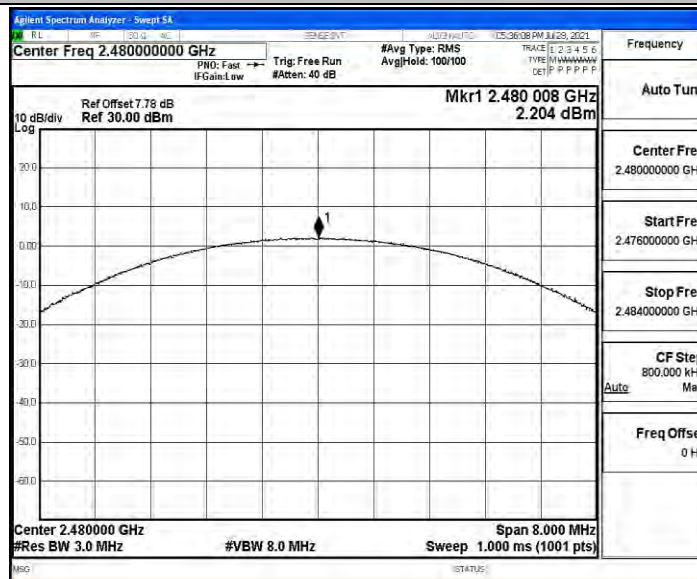


2DH5_Ant1_2441

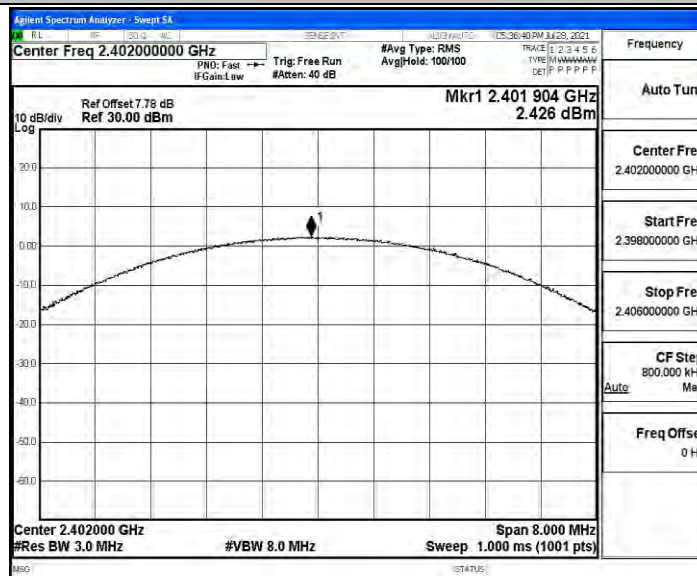




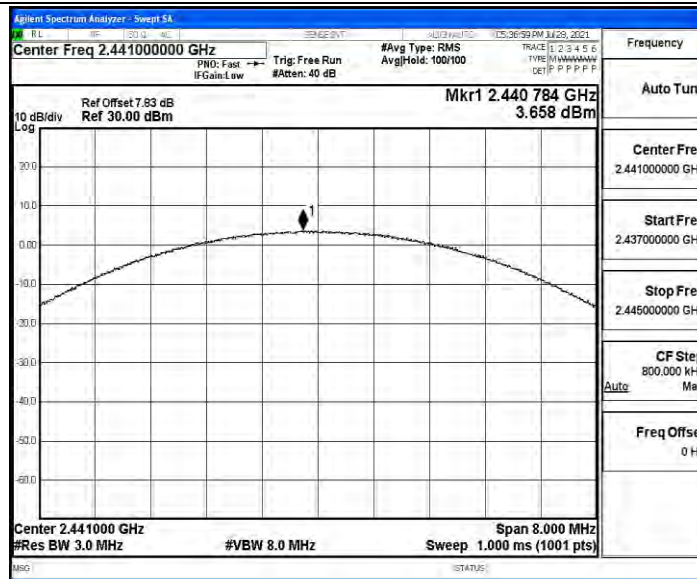
2DH5_Ant1_2480



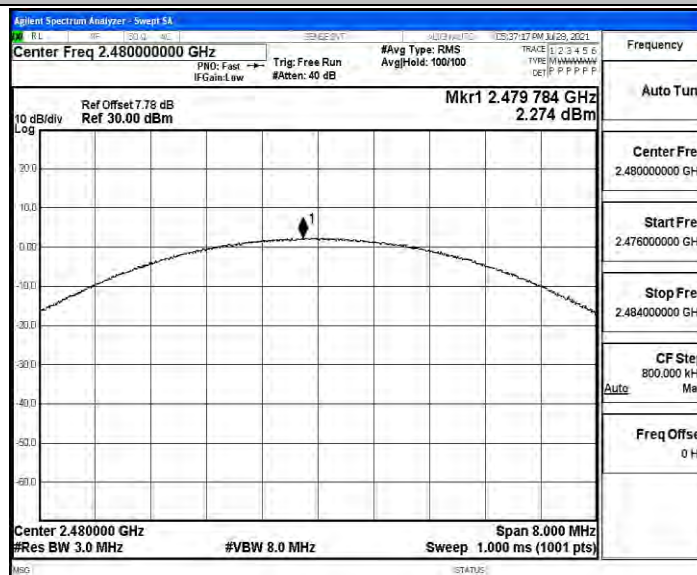
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480





A.4 Carrier frequency separation

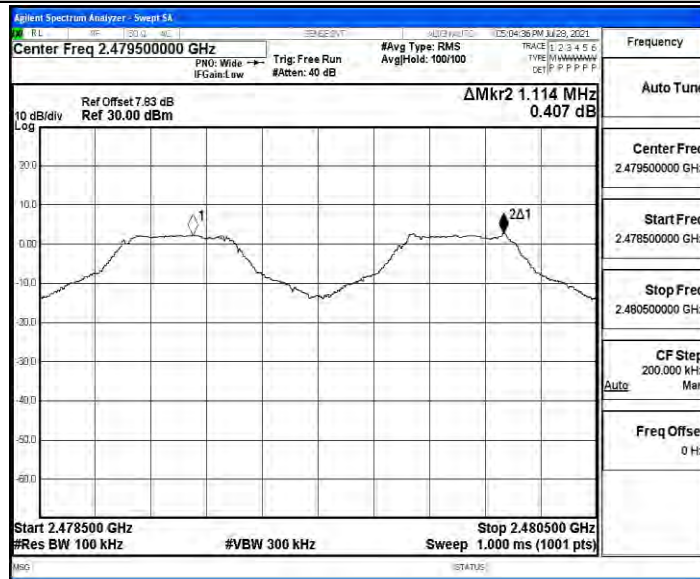
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	Hop	1.114	≥ 1.041	PASS
2DH5	Ant1	Hop	1.206	≥ 0.886	PASS
3DH5	Ant1	Hop	0.98	≥ 0.870	PASS

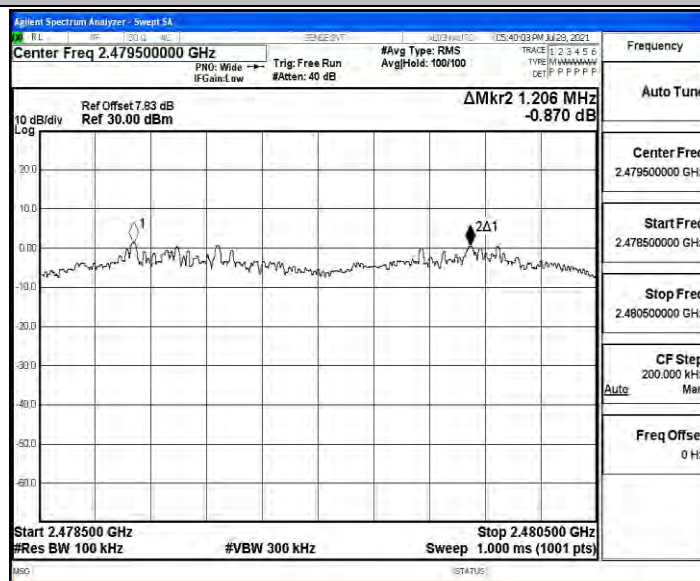


Test Graphs

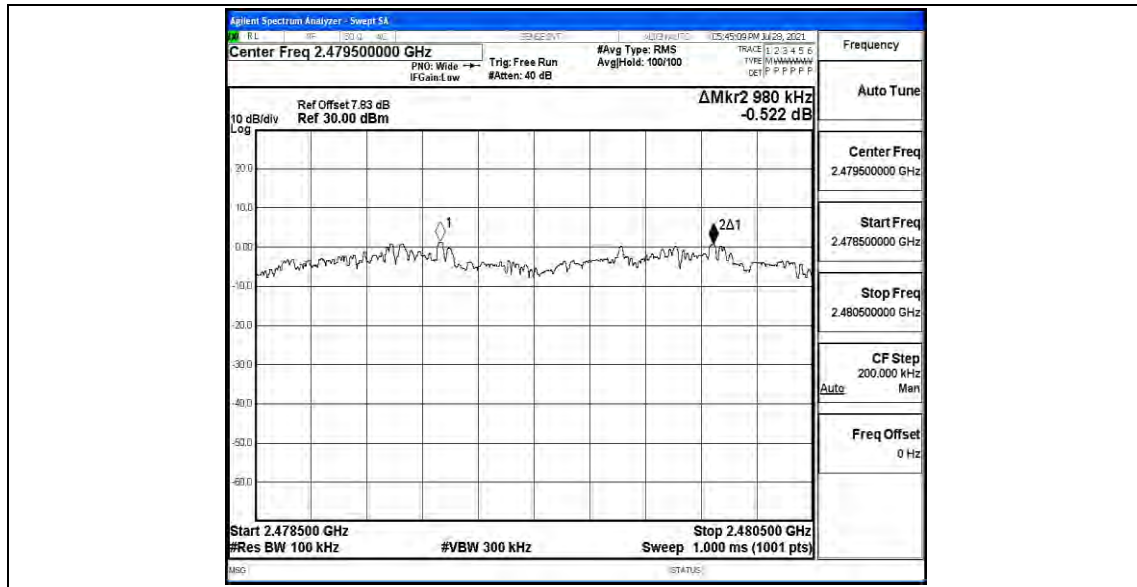
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop





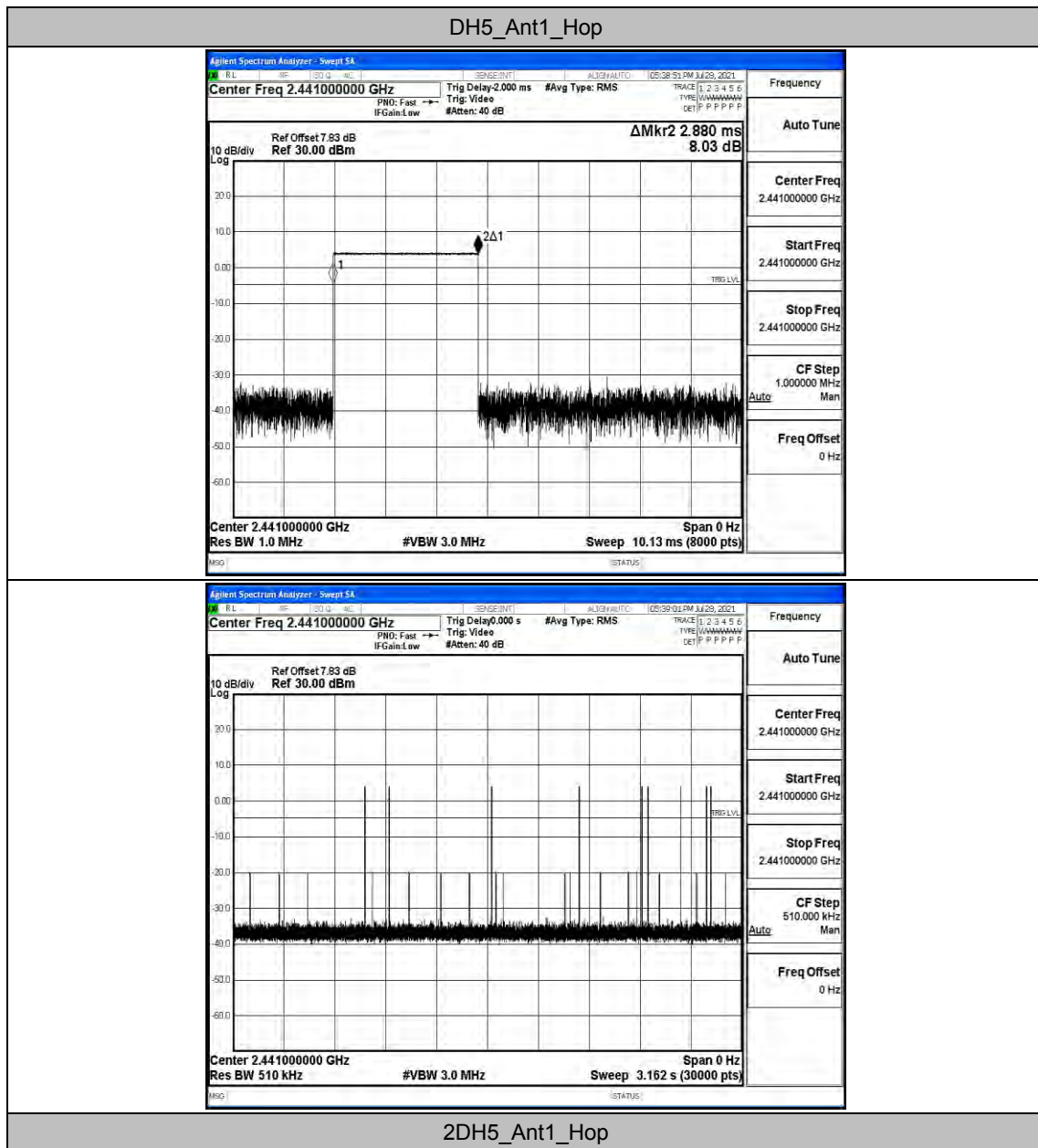
A.5 Time of occupancy

Test Result

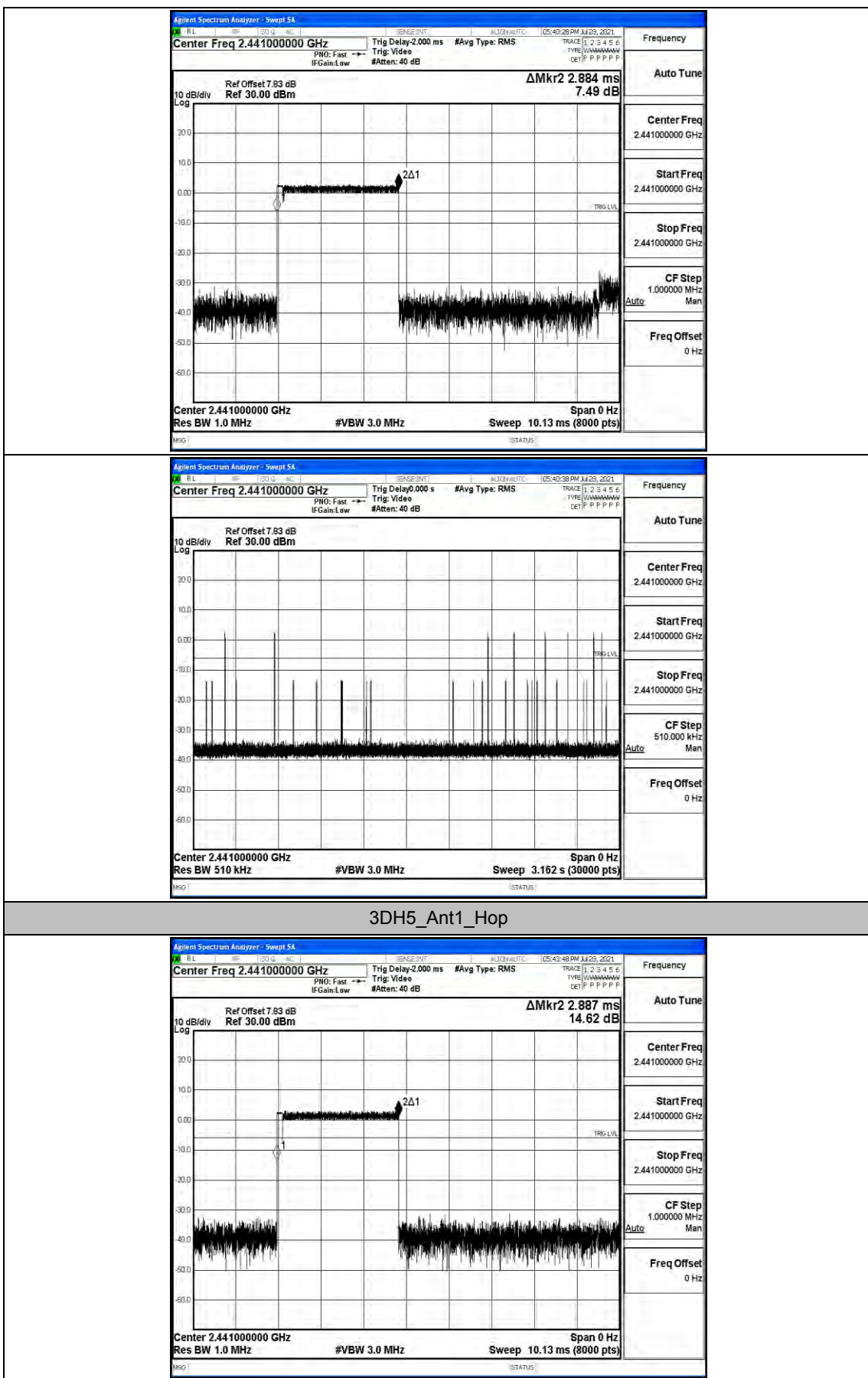
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.88	100	0.288	≤0.4	PASS
2DH5	Ant1	Hop	2.88	100	0.288	≤0.4	PASS
3DH5	Ant1	Hop	2.89	120	0.346	≤0.4	PASS

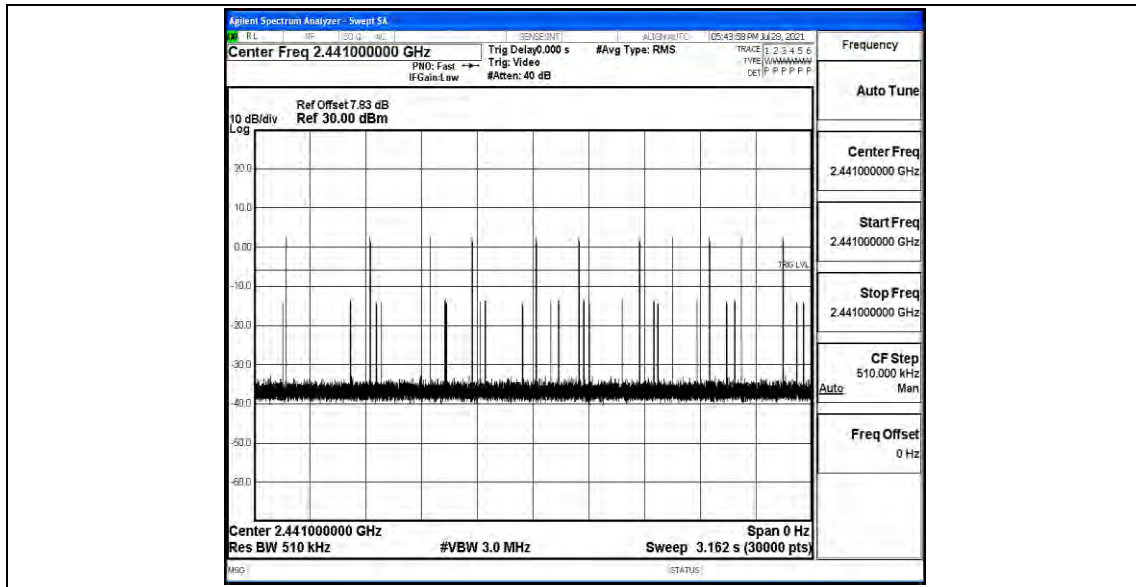


Test Graphs



2DH5_Ant1_Hop







A.6 Number of hopping channels

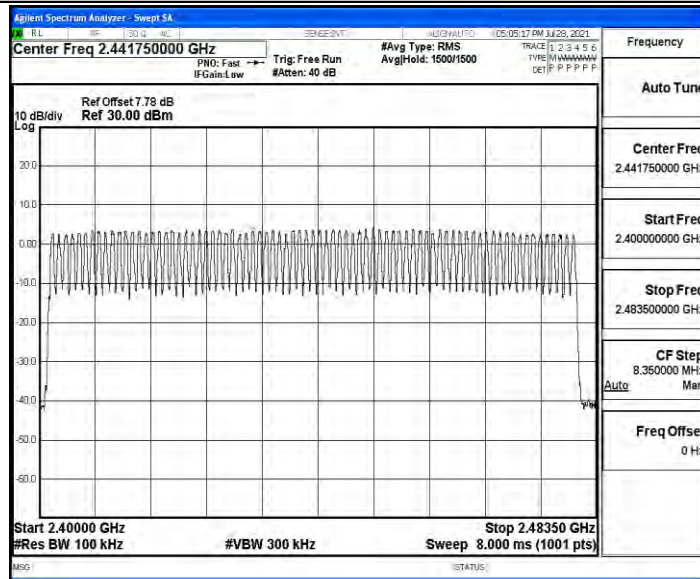
Test Result

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

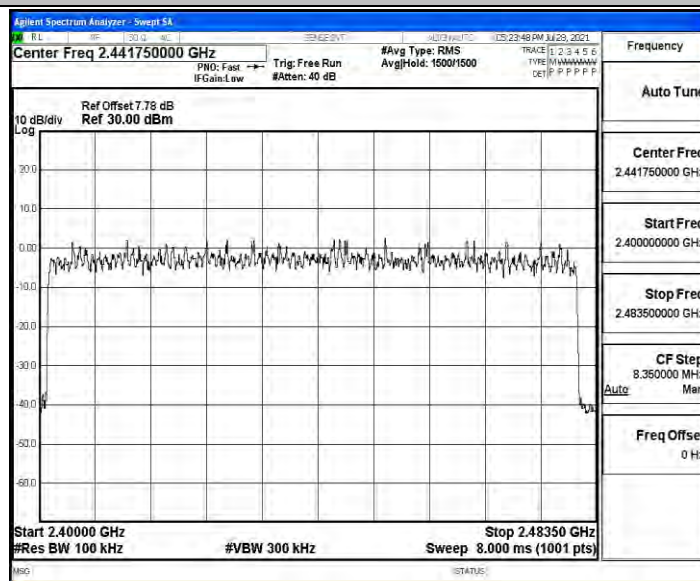


Test Graphs

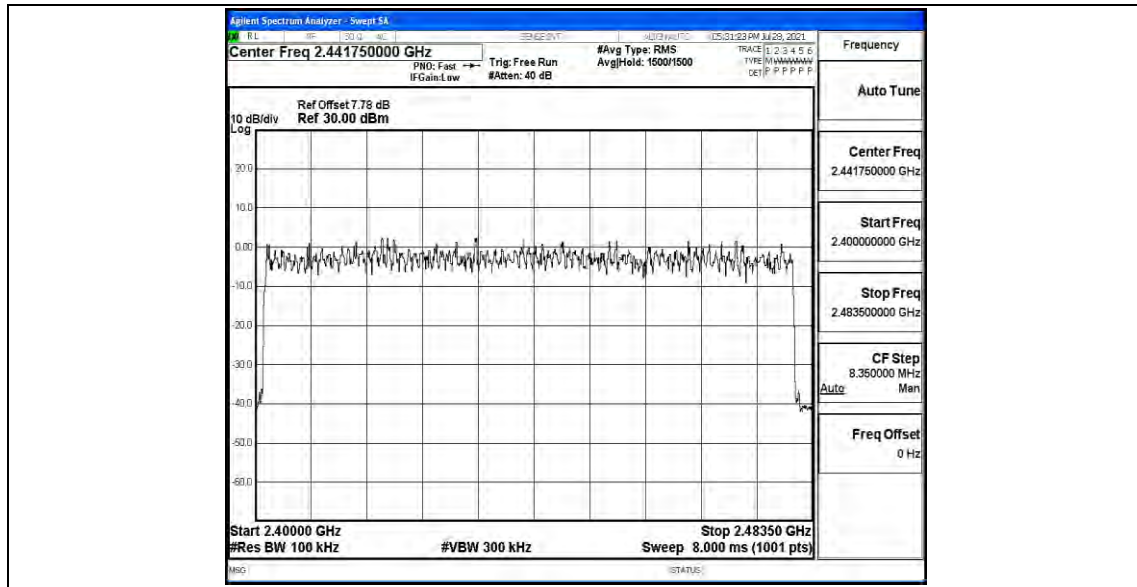
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop





A.7 Band edge measurements

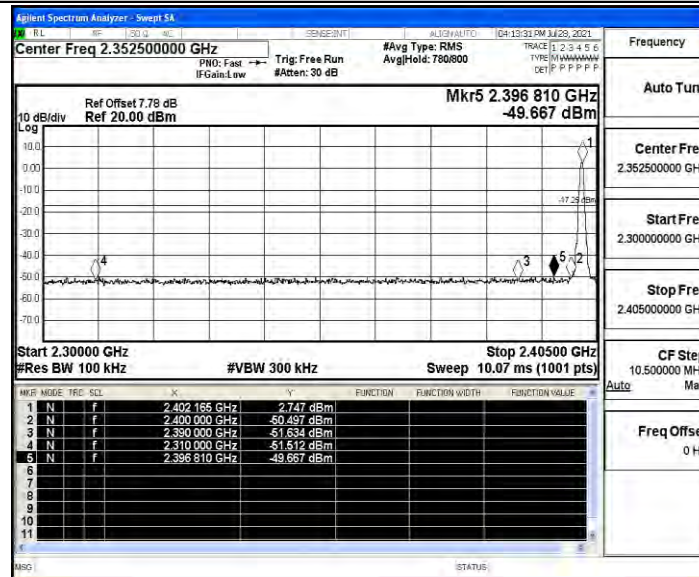
Test Result

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	2.75	-49.67	≤ -17.25	PASS
		High	2480	2.49	-48.95	≤ -17.52	PASS
		Low	Hop_2402	3.13	-49.88	≤ -16.88	PASS
		High	Hop_2480	3.24	-48.59	≤ -16.76	PASS
2DH5	Ant1	Low	2402	0.71	-49.93	≤ -19.29	PASS
		High	2480	1.31	-49.18	≤ -18.69	PASS
		Low	Hop_2402	-1.45	-49.5	≤ -21.45	PASS
		High	Hop_2480	-0.40	-48.98	≤ -20.4	PASS
3DH5	Ant1	Low	2402	-1.80	-50.07	≤ -21.8	PASS
		High	2480	-0.40	-48.49	≤ -20.4	PASS
		Low	Hop_2402	-0.81	-50.03	≤ -20.81	PASS
		High	Hop_2480	0.45	-48.5	≤ -19.55	PASS

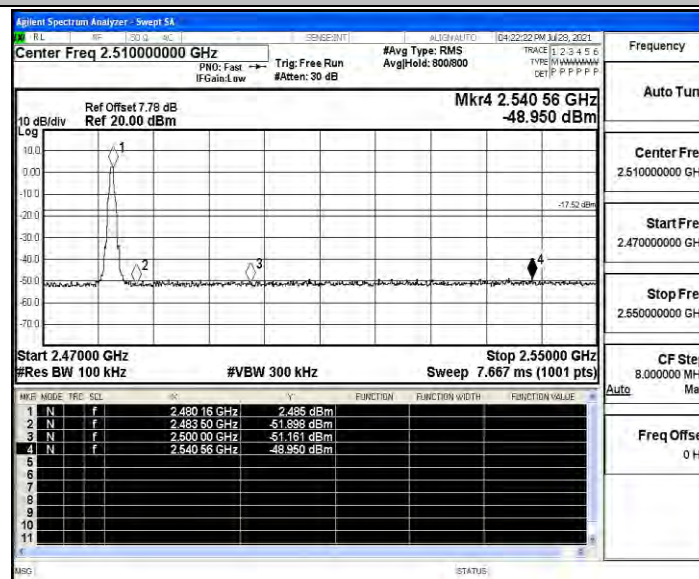


Test Graphs

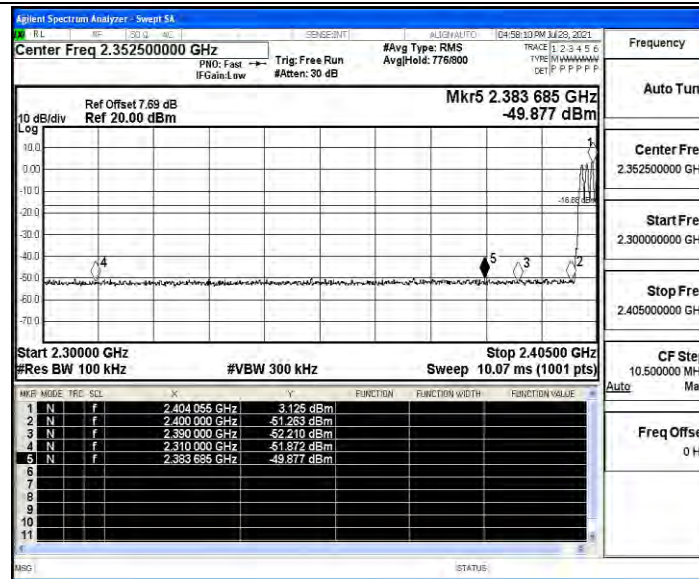
DH5_Ant1_Low_2402



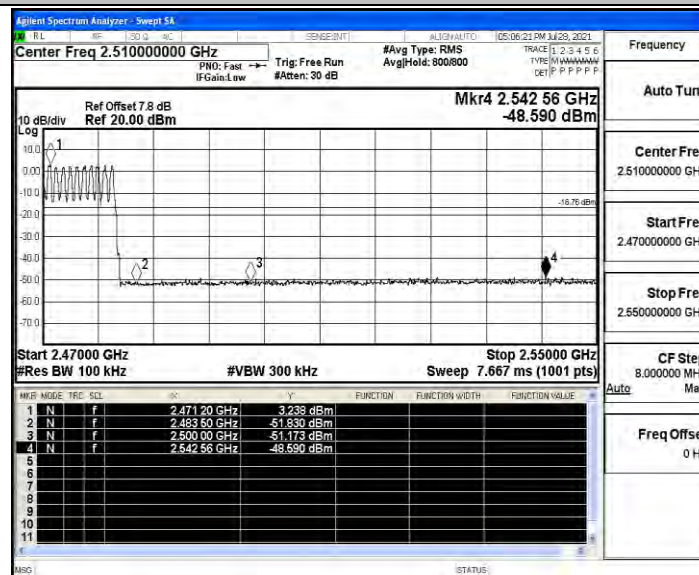
DH5_Ant1_High_2480



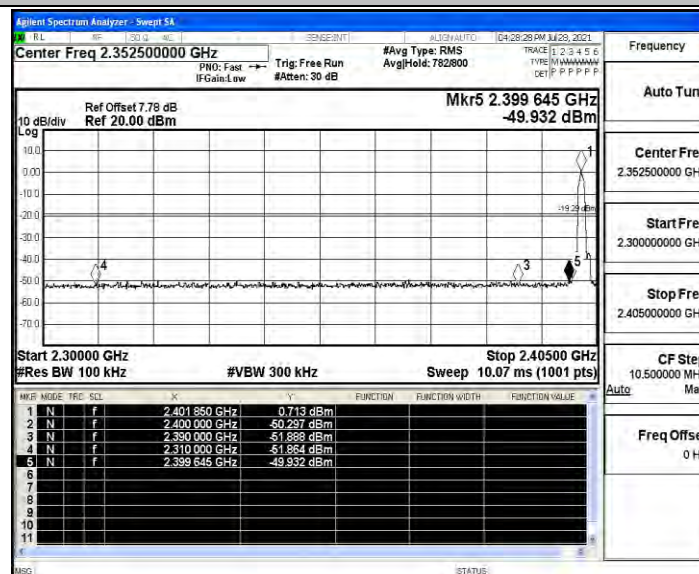
DH5_Ant1_Low_Hop_2402



DH5_Ant1_High_Hop_2480

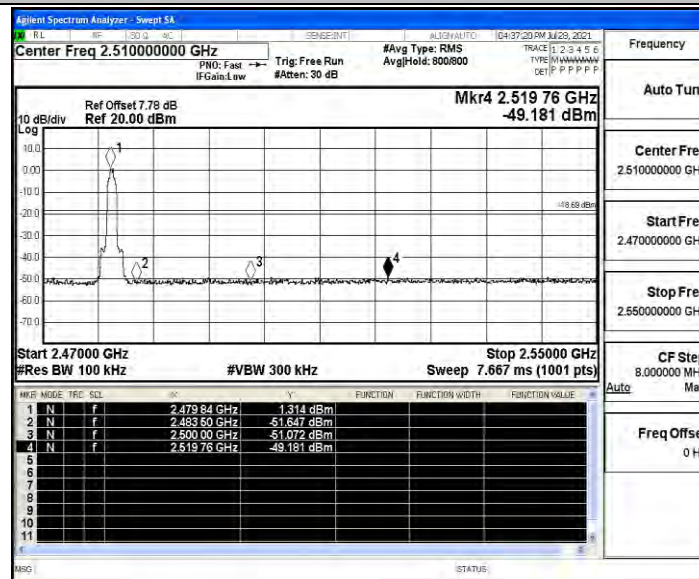


2DH5_Ant1_Low_2402

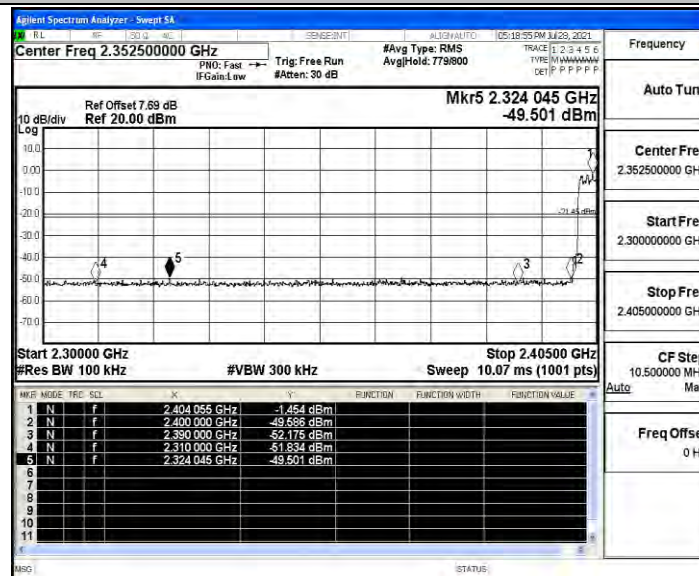




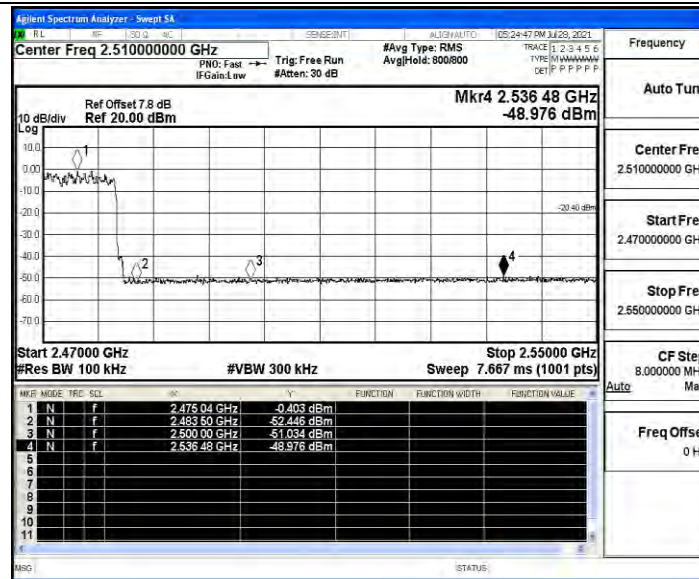
2DH5_Ant1_High_2480



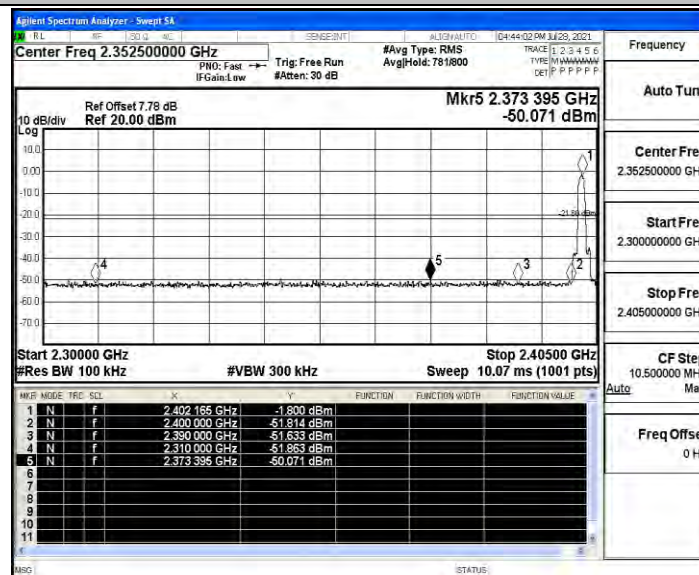
2DH5_Ant1_Low_Hop_2402



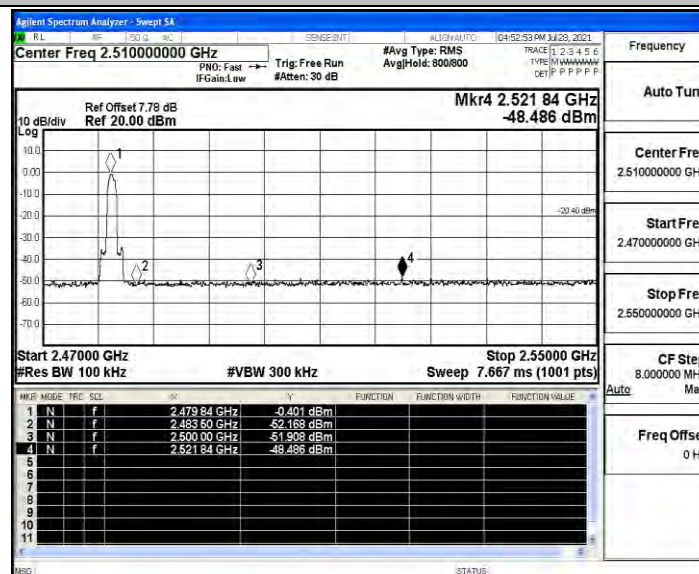
2DH5_Ant1_High_Hop_2480



3DH5_Ant1_Low_2402

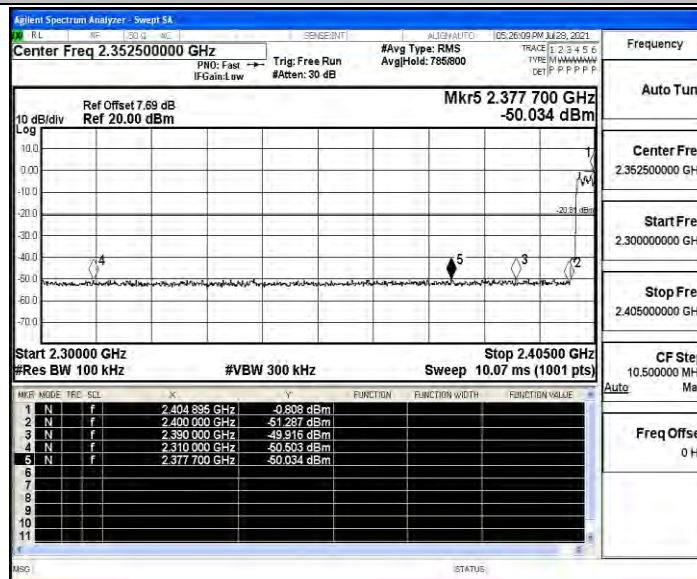


3DH5_Ant1_High_2480

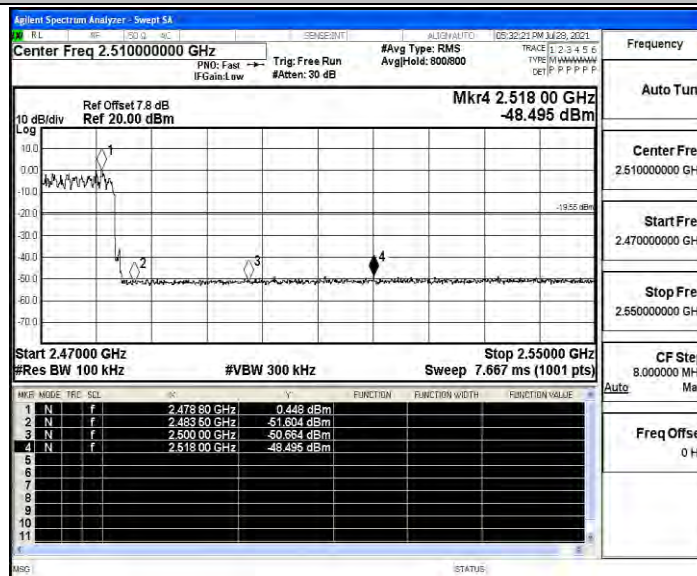




3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480





A.8 Conducted Spurious Emission

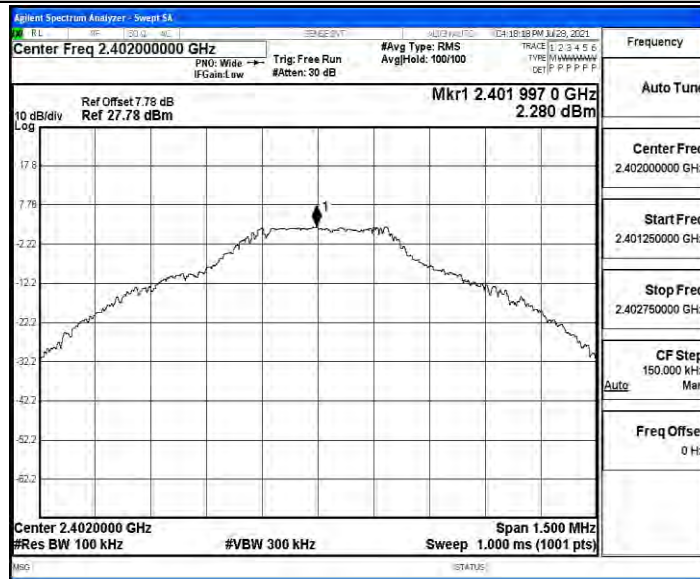
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	2.28	2.28	---	PASS
			30~1000	2.28	-61.64	≤-17.72	PASS
			1000~26500	2.28	-47.95	≤-17.72	PASS
		2441	Reference	3.89	3.89	---	PASS
			30~1000	3.89	-60.98	≤-16.12	PASS
			1000~26500	3.89	-47.3	≤-16.12	PASS
		2480	Reference	2.19	2.19	---	PASS
			30~1000	2.19	-61.65	≤-17.81	PASS
			1000~26500	2.19	-47.61	≤-17.81	PASS
2DH5	Ant1	2402	Reference	0.74	0.74	---	PASS
			30~1000	0.74	-61.46	≤-19.26	PASS
			1000~26500	0.74	-47.37	≤-19.26	PASS
		2441	Reference	2.33	2.33	---	PASS
			30~1000	2.33	-60.86	≤-17.67	PASS
			1000~26500	2.33	-46.72	≤-17.67	PASS
		2480	Reference	0.84	0.84	---	PASS
			30~1000	0.84	-60.57	≤-19.16	PASS
			1000~26500	0.84	-48.24	≤-19.16	PASS
3DH5	Ant1	2402	Reference	0.22	0.22	---	PASS
			30~1000	0.22	-60.76	≤-19.78	PASS
			1000~26500	0.22	-48.19	≤-19.78	PASS
		2441	Reference	1.67	1.67	---	PASS
			30~1000	1.67	-62.2	≤-18.33	PASS
			1000~26500	1.67	-47.3	≤-18.33	PASS
		2480	Reference	1.04	1.04	---	PASS
			30~1000	1.04	-59.45	≤-18.96	PASS
			1000~26500	1.04	-47.4	≤-18.96	PASS

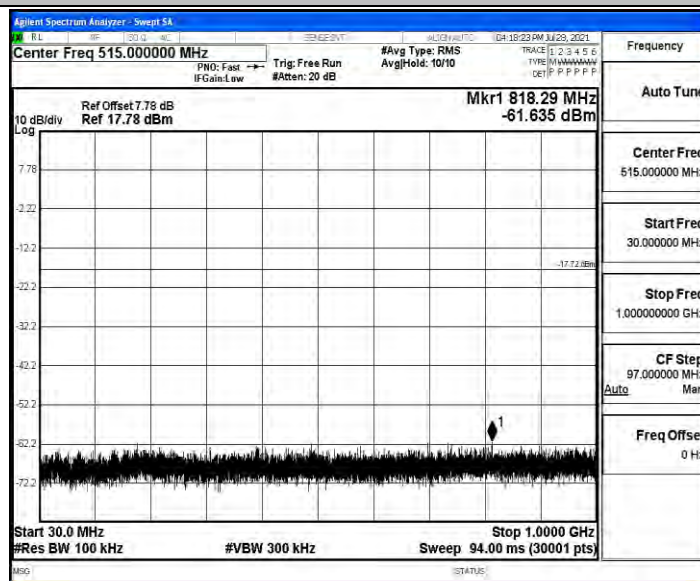


Test Graphs

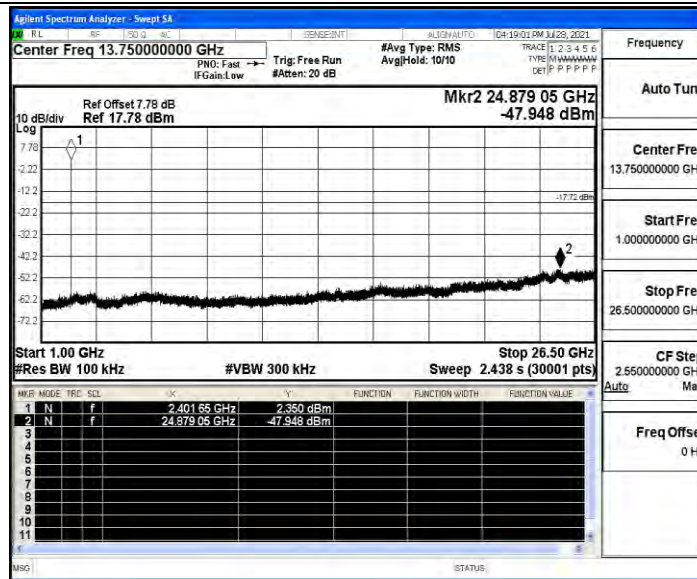
DH5_Ant1_2402_0~Reference



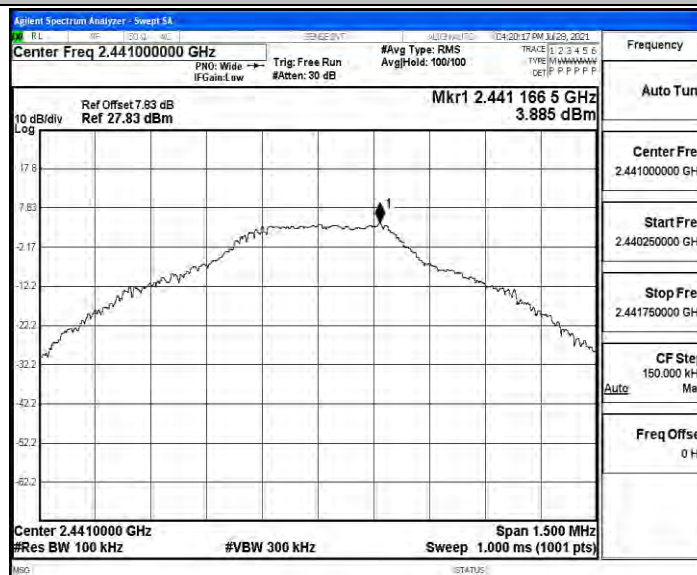
DH5_Ant1_2402_30~1000



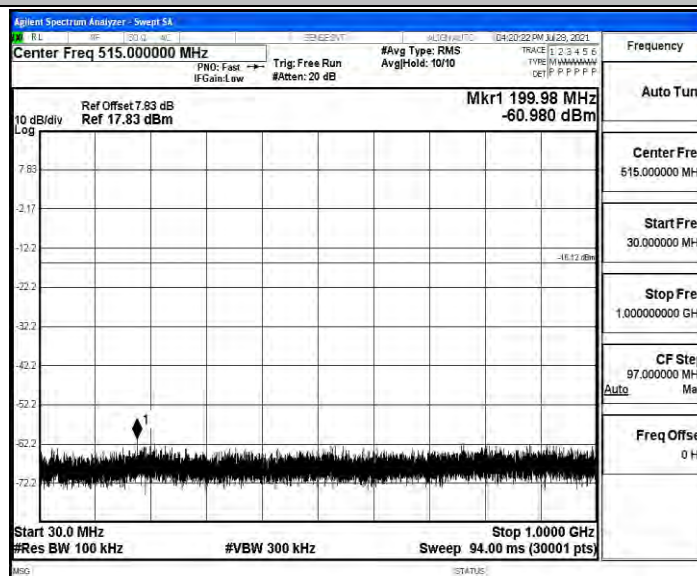
DH5_Ant1_2402_1000~26500



DH5_Ant1_2441_0~Reference

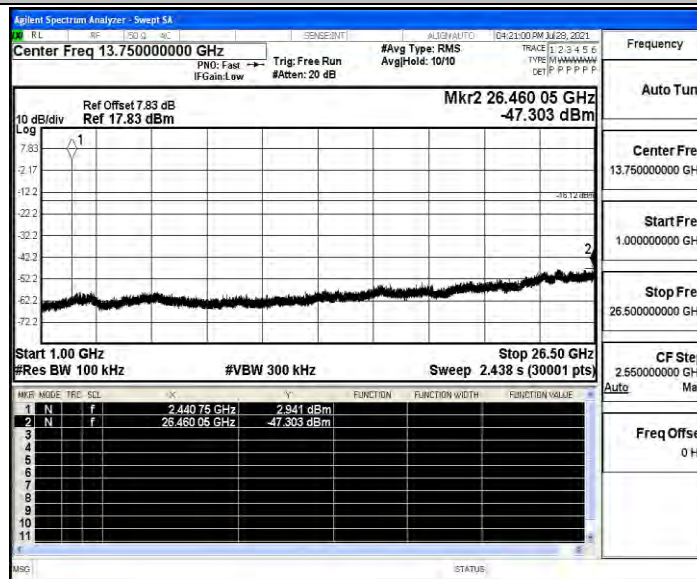


DH5_Ant1_2441_30~1000

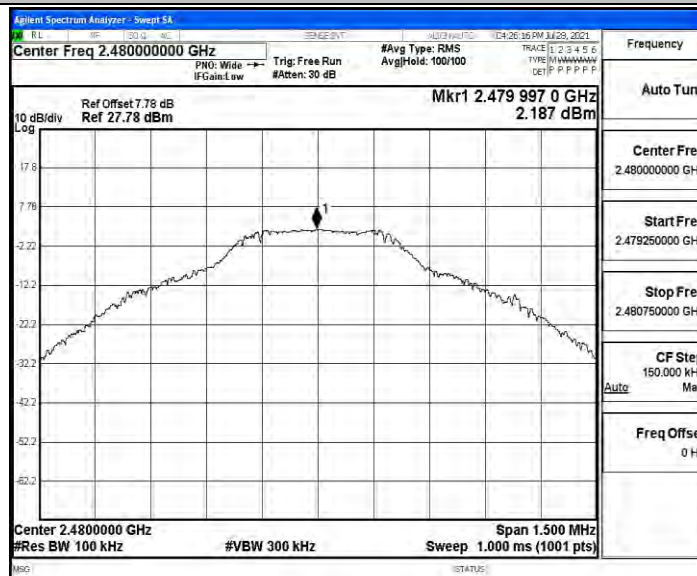




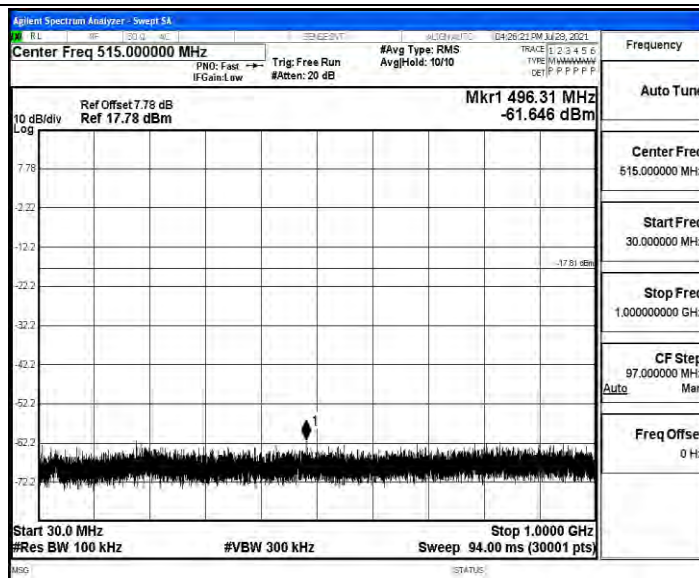
DH5_Ant1_2441_1000~26500



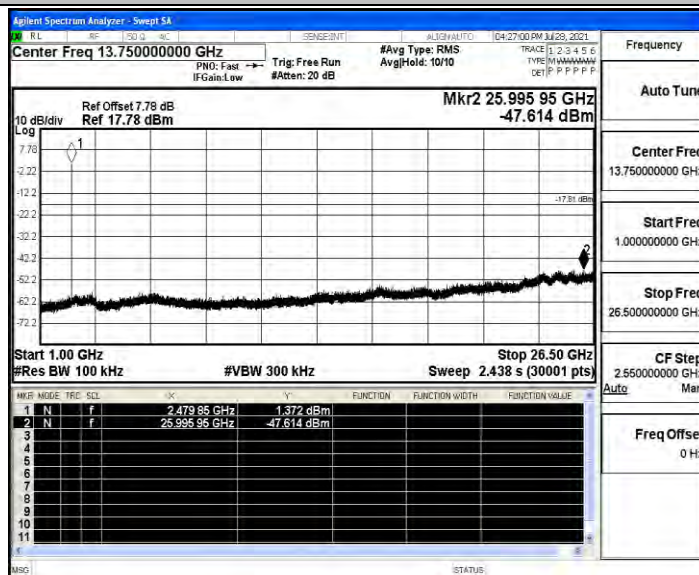
DH5_Ant1_2480_0~Reference



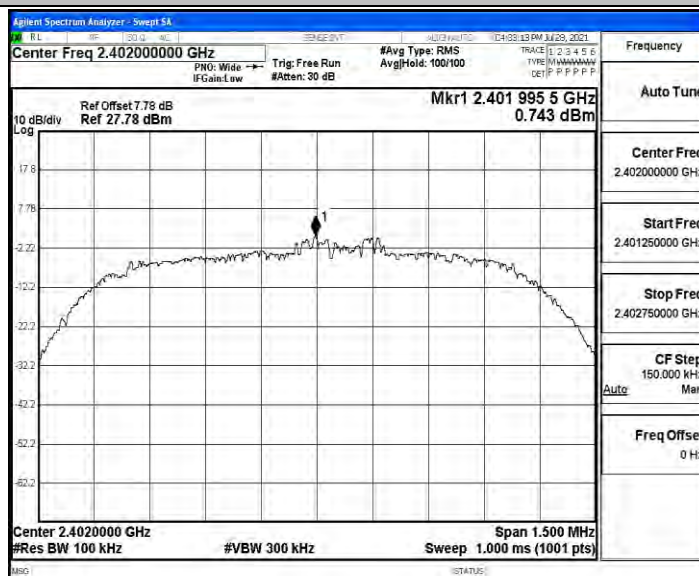
DH5_Ant1_2480_30~1000



DH5_Ant1_2480_1000~26500

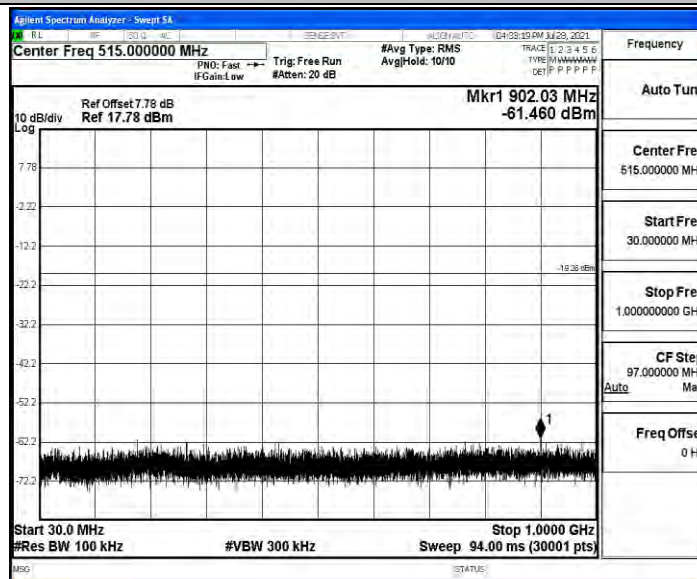


2DH5_Ant1_2402_0~Reference

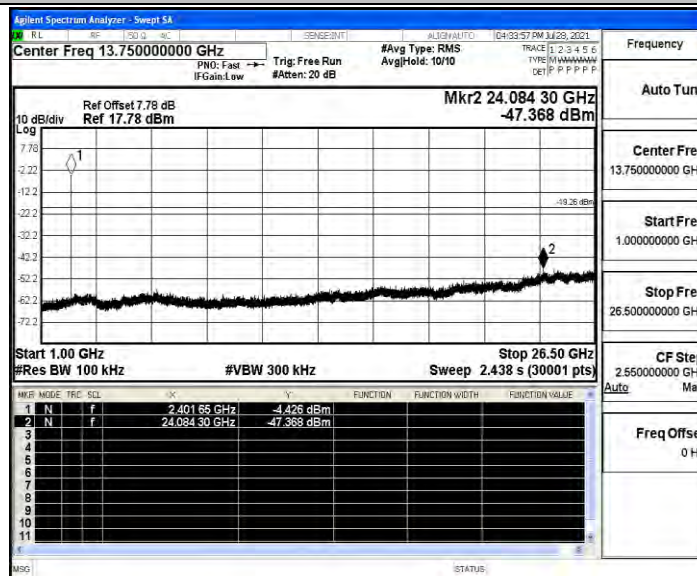




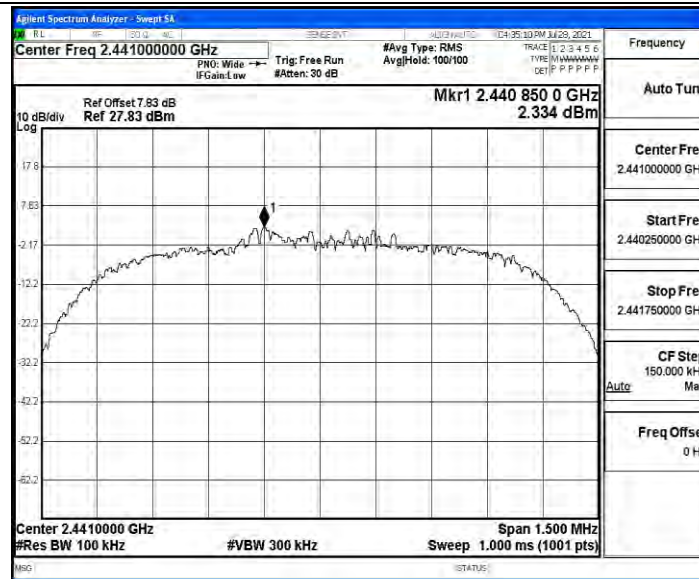
2DH5_Ant1_2402_30~1000



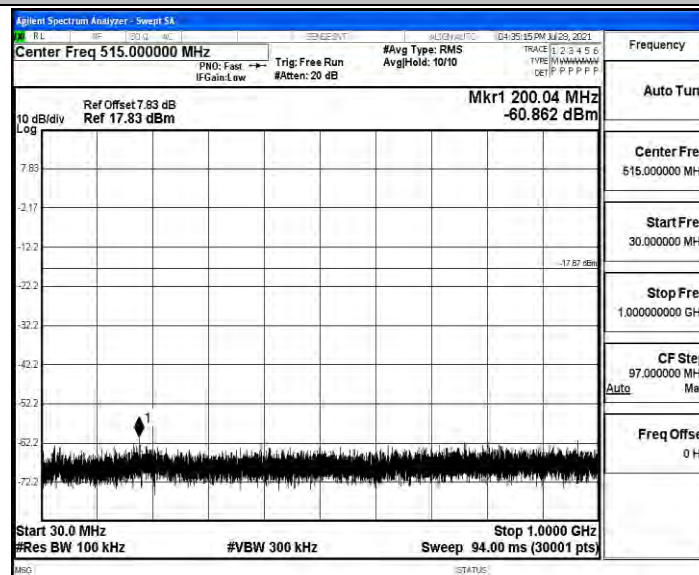
2DH5_Ant1_2402_1000~26500



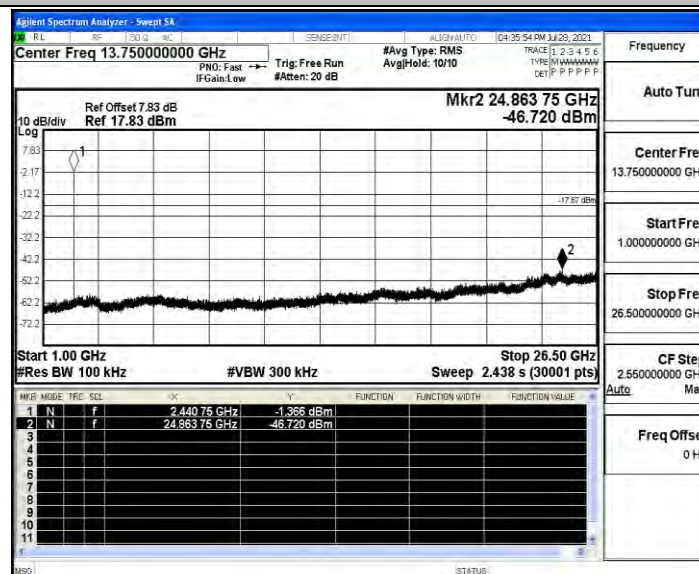
2DH5_Ant1_2441_0~Reference



2DH5_Ant1_2441_30~1000

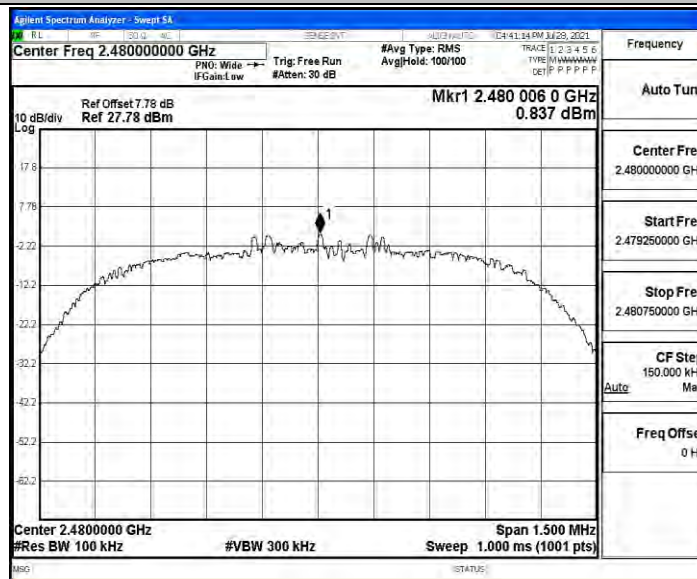


2DH5_Ant1_2441_1000~26500

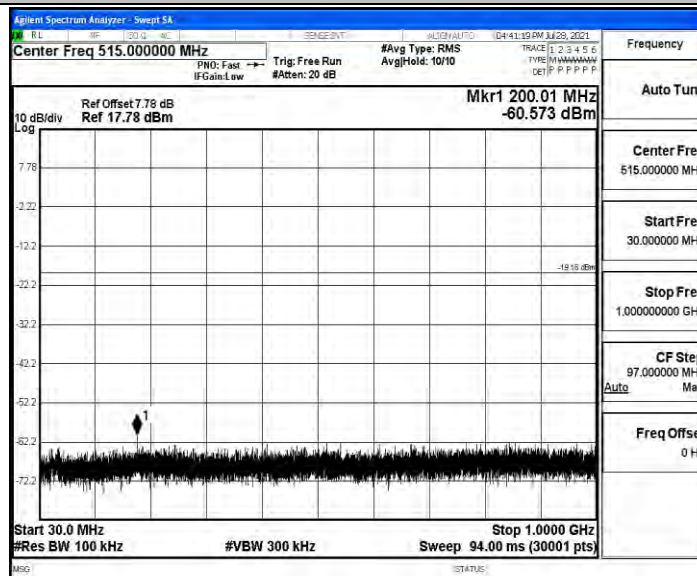




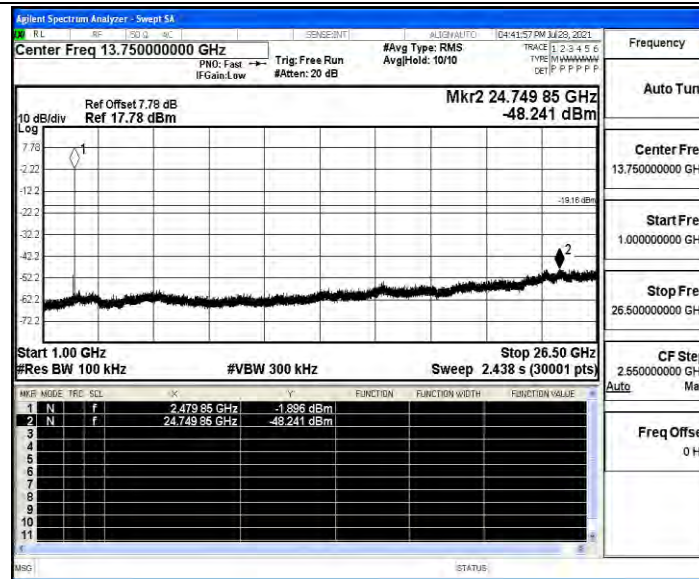
2DH5_Ant1_2480_0~Reference



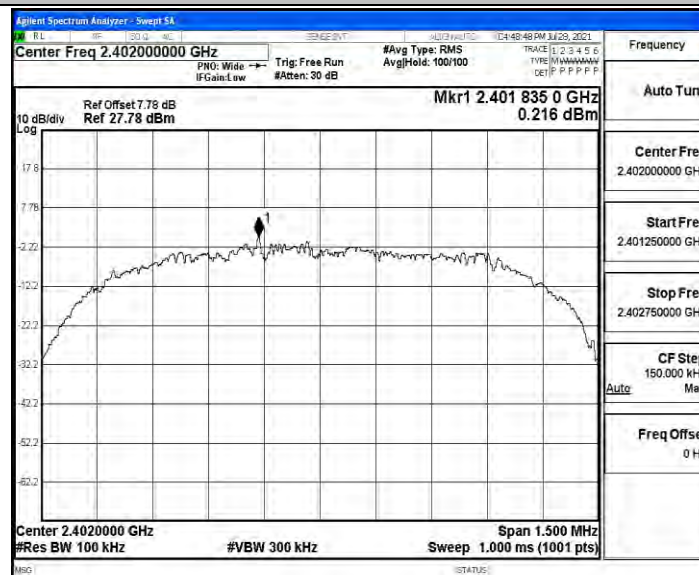
2DH5_Ant1_2480_30~1000



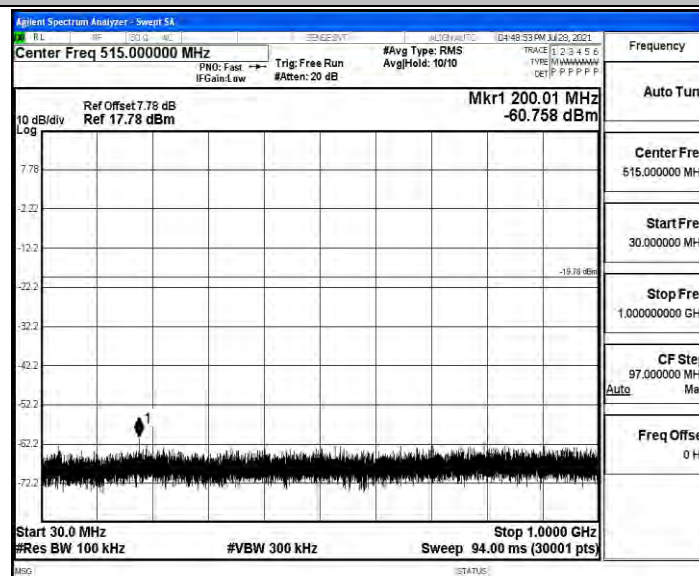
2DH5_Ant1_2480_1000~26500



3DH5_Ant1_2402_0~Reference

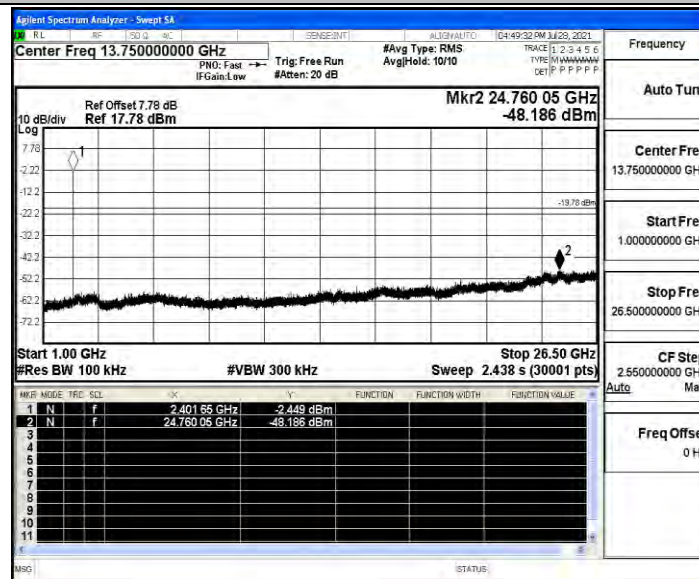


3DH5_Ant1_2402_30~1000

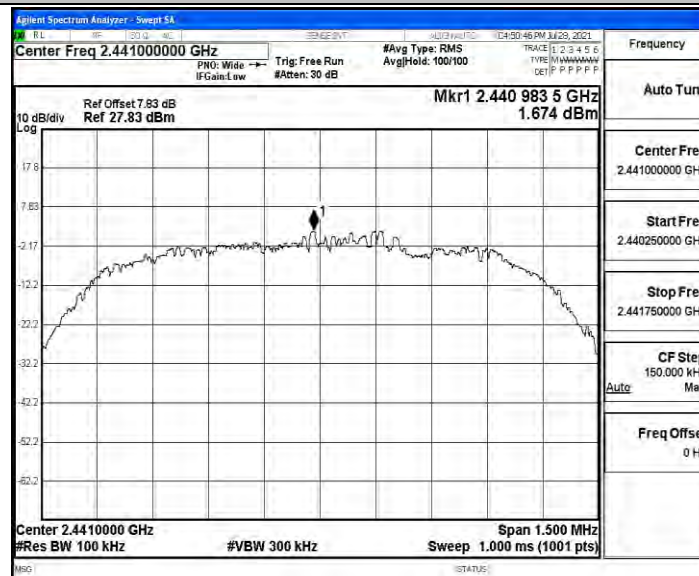




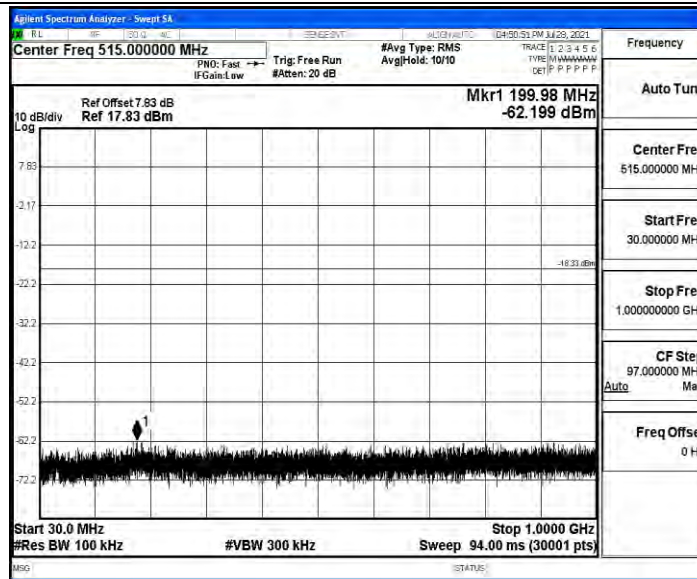
3DH5_Ant1_2402_1000~26500



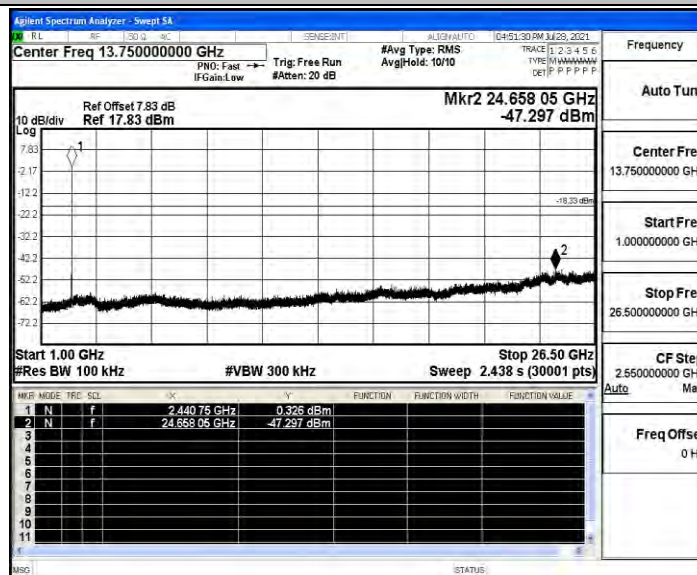
3DH5_Ant1_2441_0~Reference



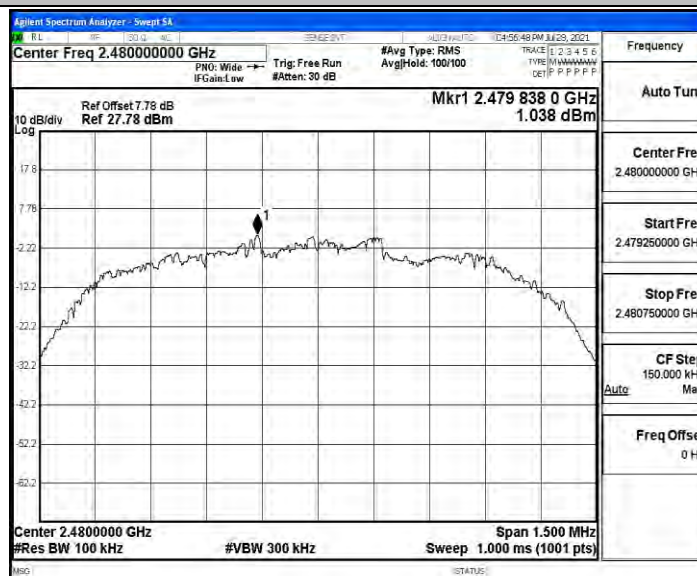
3DH5_Ant1_2441_30~1000



3DH5_Ant1_2441_1000~26500

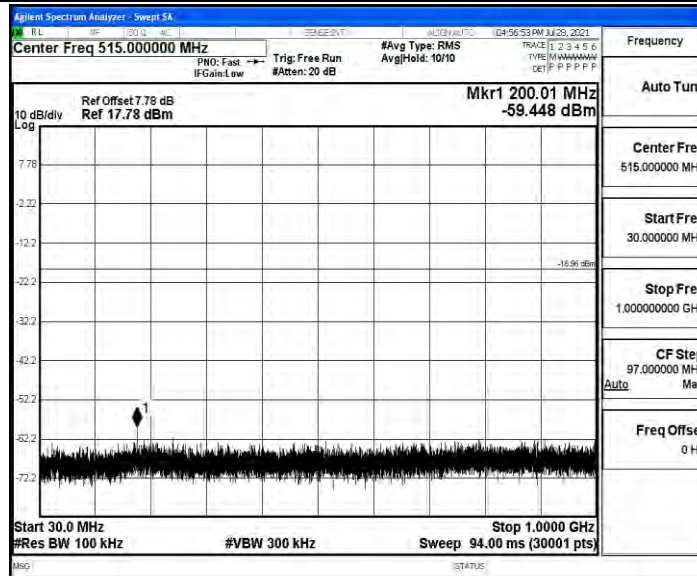


3DH5_Ant1_2480_0~Reference

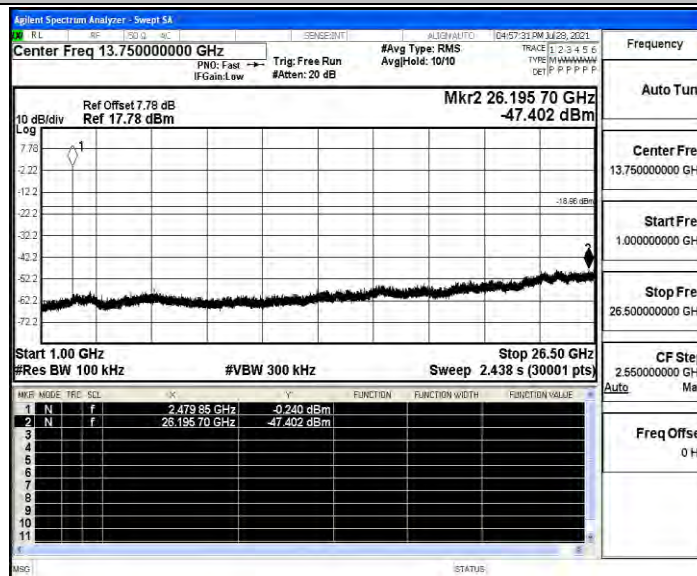




3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500





A.9 Duty Cycle

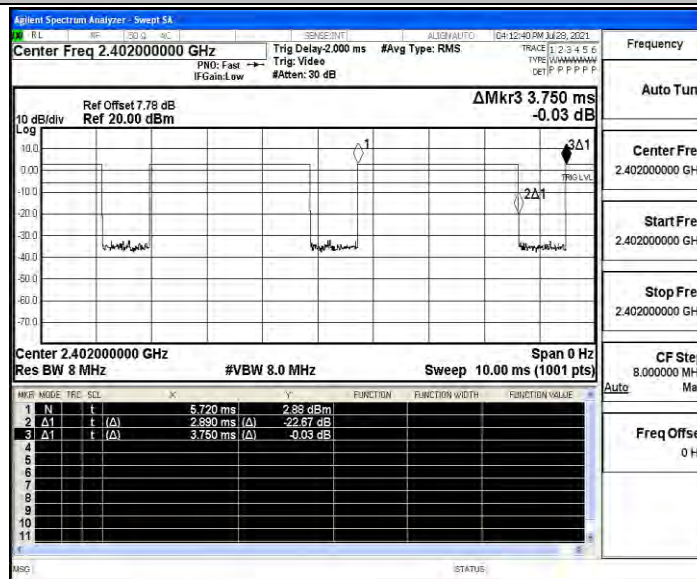
Test Result

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

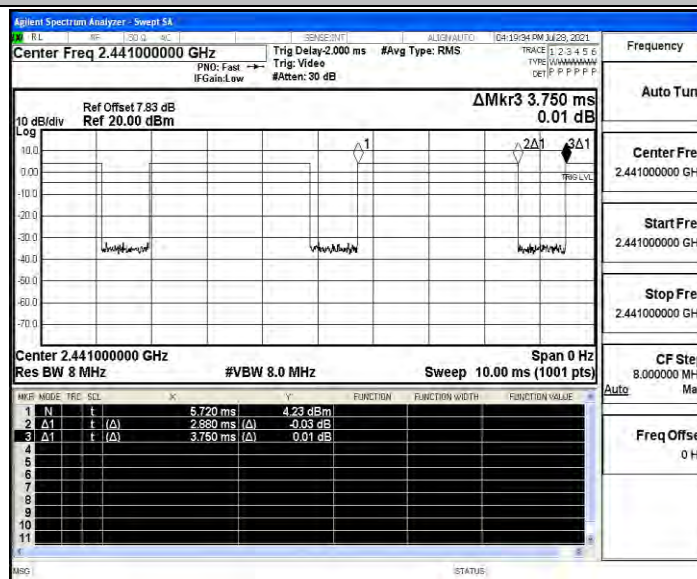


Test Graphs

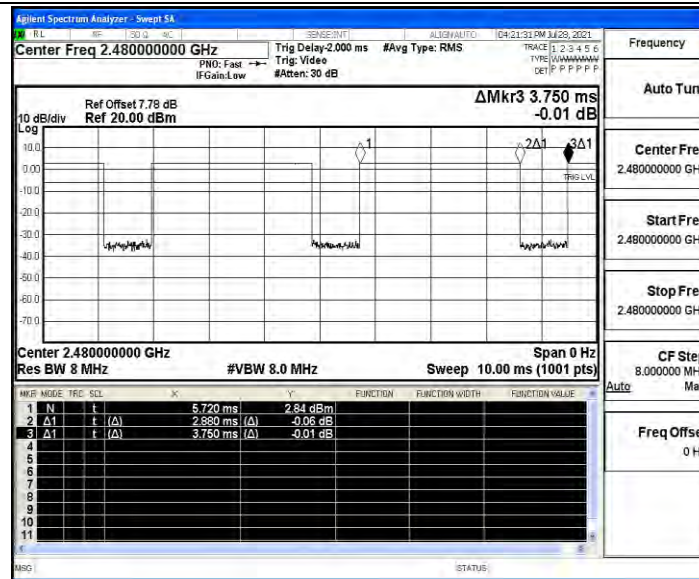
DH5_Ant1_2402



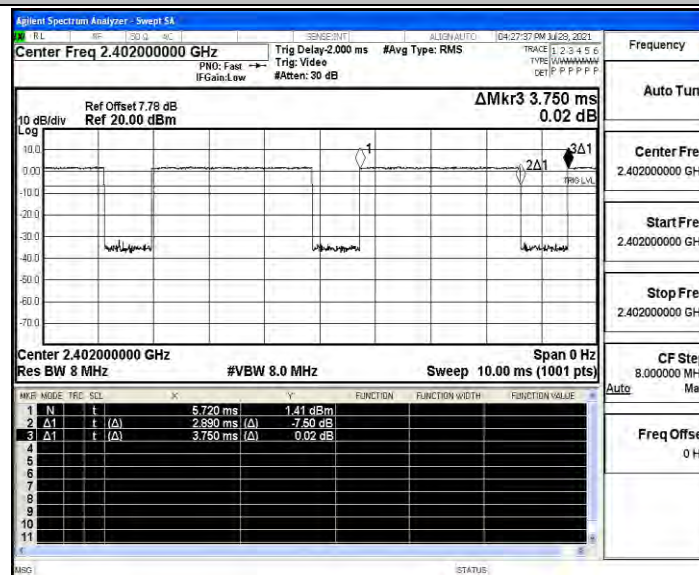
DH5_Ant1_2441



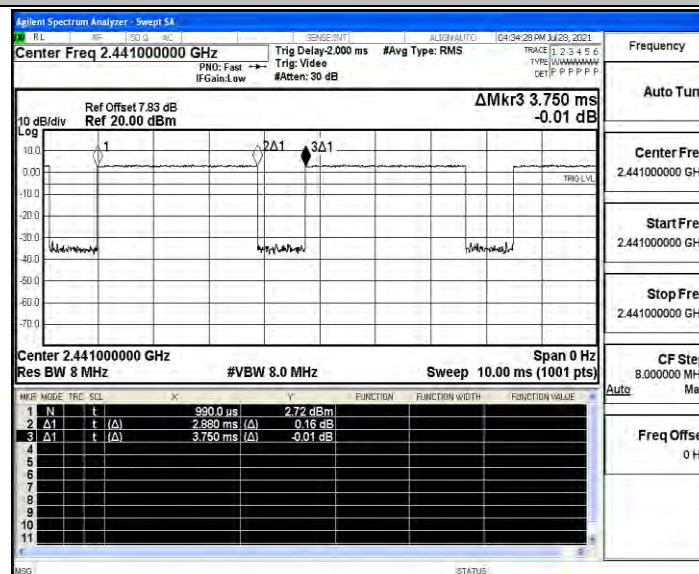
DH5_Ant1_2480



2DH5_Ant1_2402

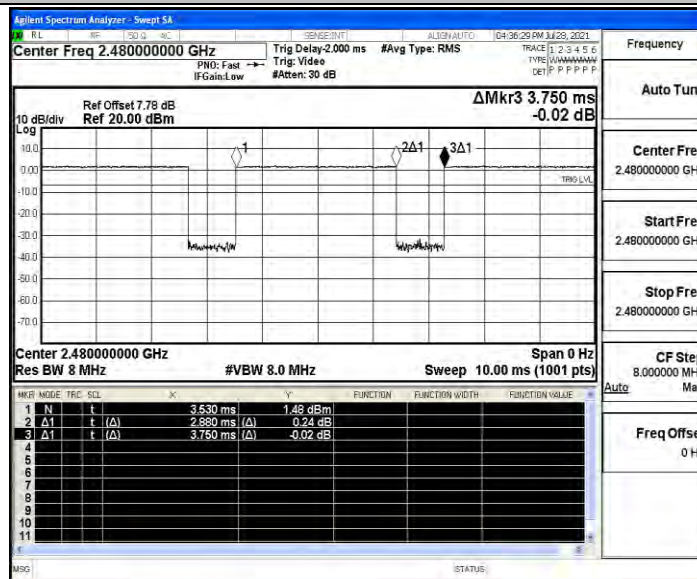


2DH5_Ant1_2441

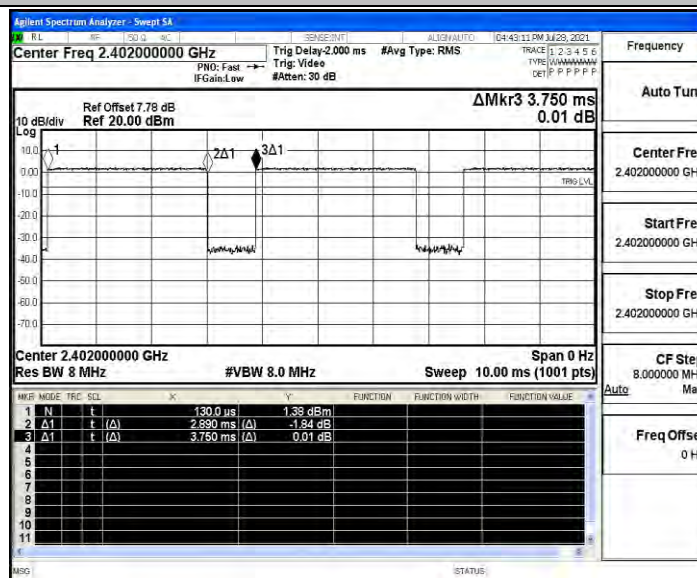




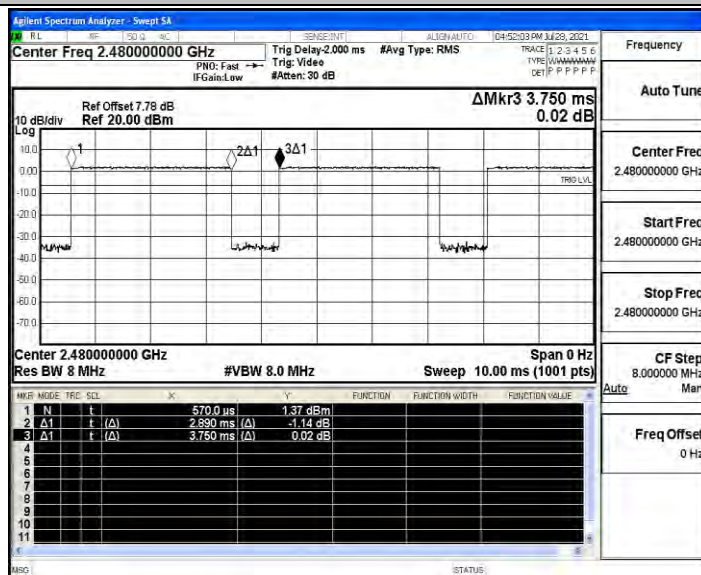
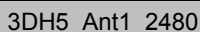
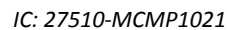
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441





A.10 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-49.07	≤-41.20	46.13	≤54	PASS
				AV	2389.670	-48.48	≤-41.20	46.72	≤54	PASS
				AV	2390.000	-48.64	≤-41.20	46.56	≤54	PASS
				Peak	2310.000	-40.89	≤-21.20	54.31	≤74	PASS
				Peak	2318.900	-38.06	≤-21.20	57.14	≤74	PASS
				Peak	2390.000	-40.12	≤-21.20	55.08	≤74	PASS
		High	2480	AV	2483.500	-47.79	≤-41.20	47.41	≤54	PASS
				AV	2483.520	-47.79	≤-41.20	47.41	≤54	PASS
				AV	2500.000	-48.15	≤-41.20	47.05	≤54	PASS
				Peak	2483.500	-39.93	≤-21.20	55.27	≤74	PASS
				Peak	2493.520	-37.32	≤-21.20	57.88	≤74	PASS
				Peak	2500.000	-40.16	≤-21.20	55.04	≤74	PASS
		Low	Hop_24 02	Peak	2310.000	-40.75	≤-21.20	54.45	≤74	PASS
				Peak	2379.800	-37.51	≤-21.20	57.69	≤74	PASS
				Peak	2390.000	-40.08	≤-21.20	55.12	≤74	PASS
		High	Hop_24 80	Peak	2483.500	-40.14	≤-21.20	55.06	≤74	PASS
				Peak	2493.360	-37.51	≤-21.20	57.69	≤74	PASS
				Peak	2500.000	-41.08	≤-21.20	54.12	≤74	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-49.14	≤-41.20	46.06	≤54	PASS
				AV	2378.960	-48.63	≤-41.20	46.57	≤54	PASS
				AV	2390.000	-48.64	≤-41.20	46.56	≤54	PASS
				Peak	2310.000	-41.4	≤-21.20	53.80	≤74	PASS
				Peak	2365.940	-38.17	≤-21.20	57.03	≤74	PASS
				Peak	2390.000	-40.66	≤-21.20	54.54	≤74	PASS
		High	2480	AV	2483.500	-47.77	≤-41.20	47.43	≤54	PASS
				AV	2483.520	-47.77	≤-41.20	47.43	≤54	PASS
				AV	2500.000	-48.2	≤-41.20	47.00	≤54	PASS
				Peak	2483.500	-39.26	≤-21.20	55.94	≤74	PASS
				Peak	2490.640	-36.97	≤-21.20	58.23	≤74	PASS
				Peak	2500.000	-40.35	≤-21.20	54.85	≤74	PASS
		Low	Hop_24 02	Peak	2310.000	-41.05	≤-21.20	54.15	≤74	PASS
				Peak	2367.410	-37.98	≤-21.20	57.22	≤74	PASS
				Peak	2390.000	-40.43	≤-21.20	54.77	≤74	PASS
		High	Hop_24 80	Peak	2483.500	-39.55	≤-21.20	55.65	≤74	PASS
				Peak	2494.240	-37.35	≤-21.20	57.85	≤74	PASS
				Peak	2500.000	-39.84	≤-21.20	55.36	≤74	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-49.13	≤-41.20	46.07	≤54	PASS



				AV	2385.890	-48.56	≤ -41.20	46.64	≤ 54	PASS
				AV	2390.000	-48.65	≤ -41.20	46.55	≤ 54	PASS
				Peak	2310.000	-41.24	≤ -21.20	53.96	≤ 74	PASS
				Peak	2372.660	-38.29	≤ -21.20	56.91	≤ 74	PASS
				Peak	2390.000	-40.54	≤ -21.20	54.66	≤ 74	PASS
		High	2480	AV	2483.500	-47.72	≤ -41.20	47.48	≤ 54	PASS
				AV	2483.520	-47.72	≤ -41.20	47.48	≤ 54	PASS
				AV	2500.000	-48.12	≤ -41.20	47.08	≤ 54	PASS
				Peak	2483.500	-40.39	≤ -21.20	54.81	≤ 74	PASS
				Peak	2495.440	-38.07	≤ -21.20	57.13	≤ 74	PASS
				Peak	2500.000	-40	≤ -21.20	55.20	≤ 74	PASS
		Low	Hop_24 02	Peak	2310.000	-40.28	≤ -21.20	54.92	≤ 74	PASS
				Peak	2386.625	-38.22	≤ -21.20	56.98	≤ 74	PASS
				Peak	2390.000	-40.24	≤ -21.20	54.96	≤ 74	PASS
		High	Hop_24 80	Peak	2483.500	-39.66	≤ -21.20	55.54	≤ 74	PASS
				Peak	2485.680	-37.74	≤ -21.20	57.46	≤ 74	PASS
				Peak	2500.000	-40.1	≤ -21.20	55.10	≤ 74	PASS

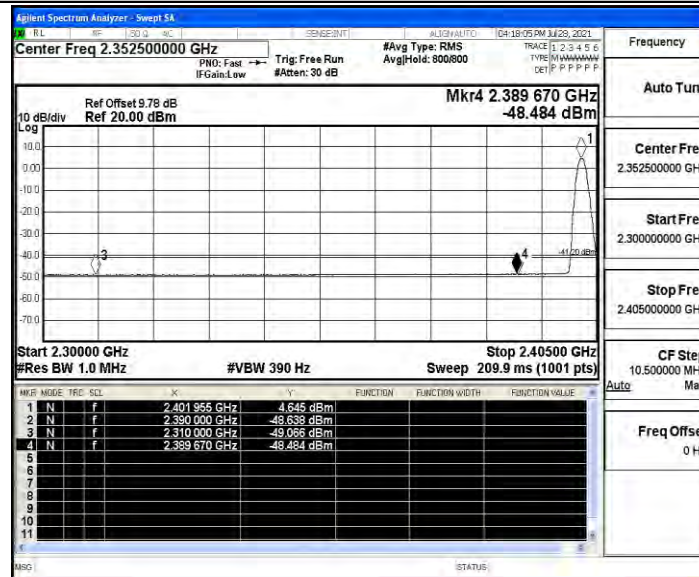
Note:

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.

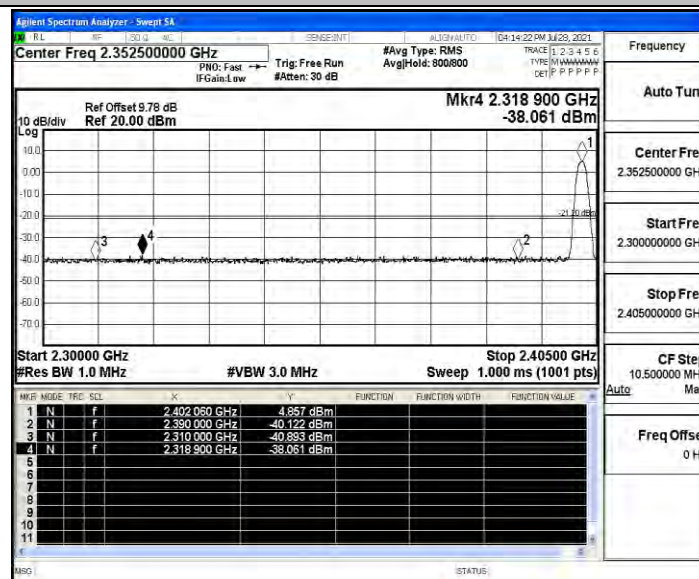


Test Graphs

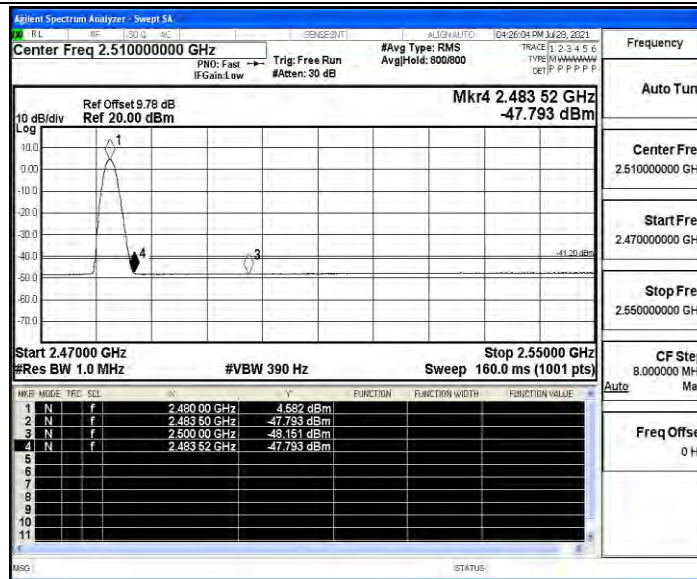
DH5_Ant1_Low_2402_AV



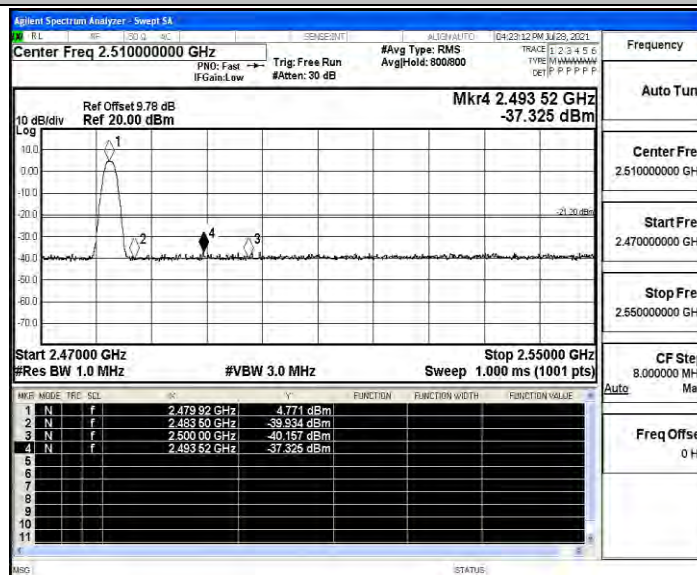
DH5_Ant1_Low_2402_Peak



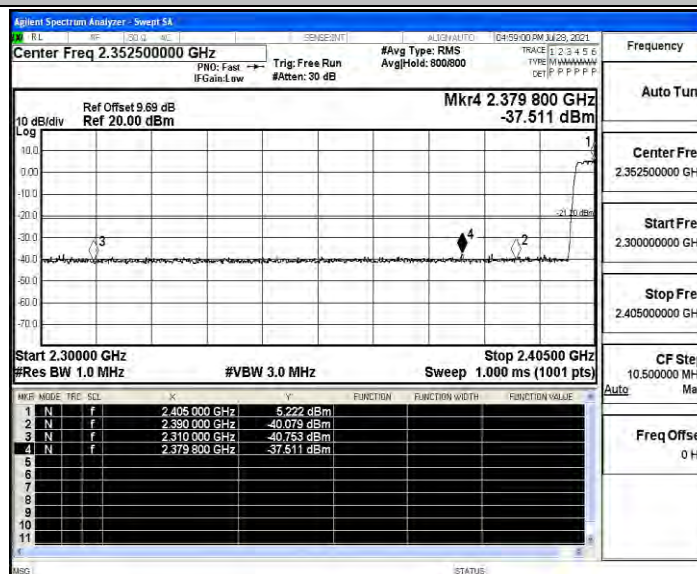
DH5_Ant1_High_2480_AV



DH5_Ant1_High_2480_Peak

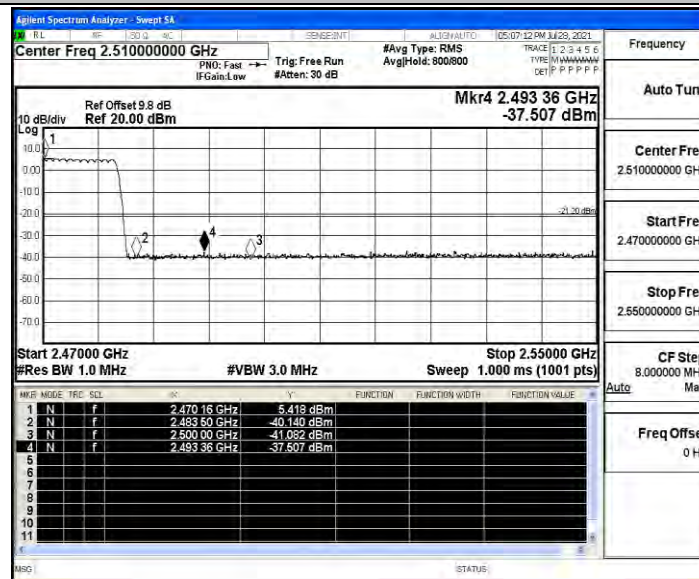


DH5_Ant1_Low_Hop_2402_Peak

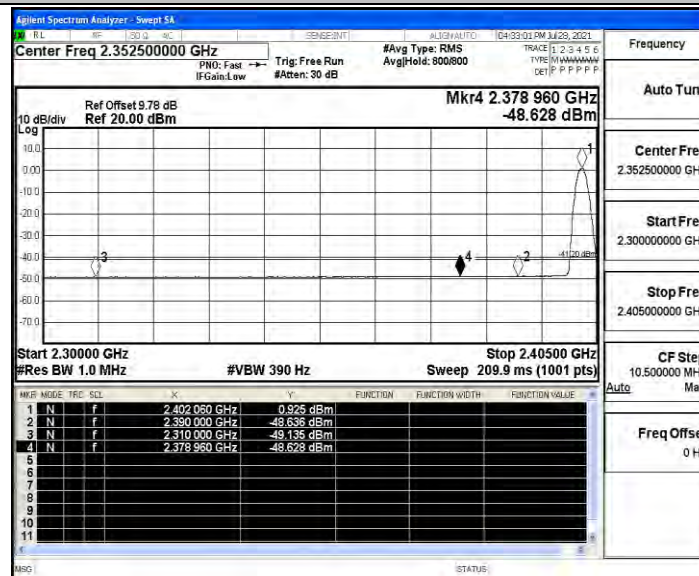




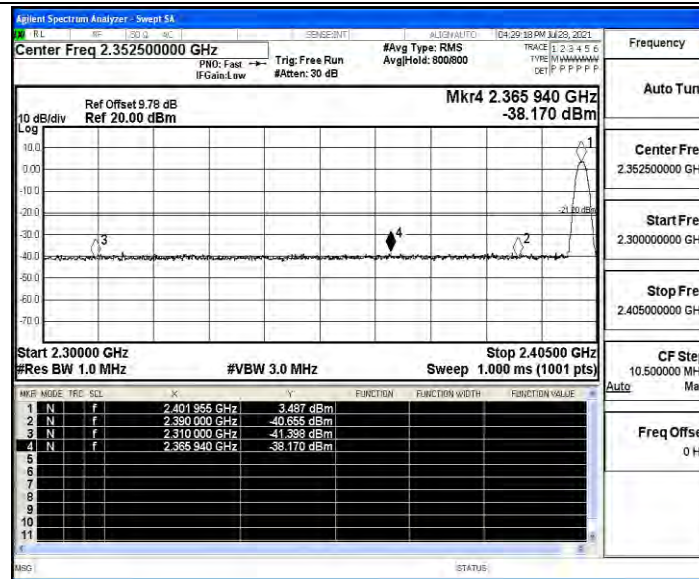
DH5_Ant1_High_Hop_2480_Peak



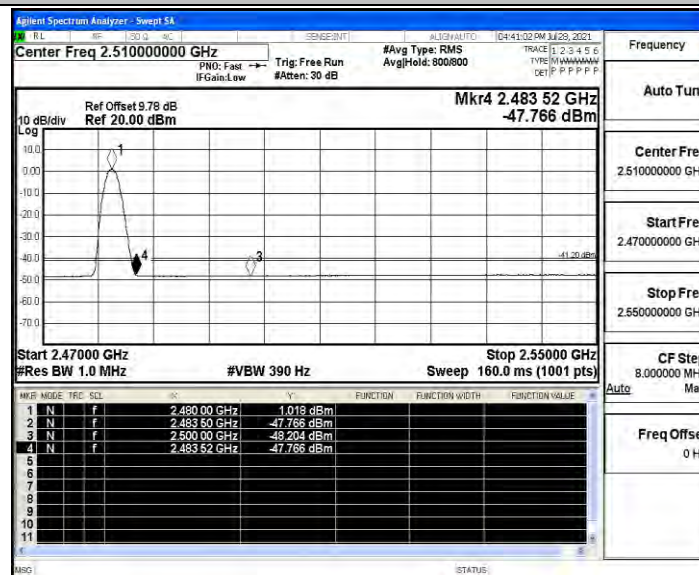
2DH5_Ant1_Low_2402_AV



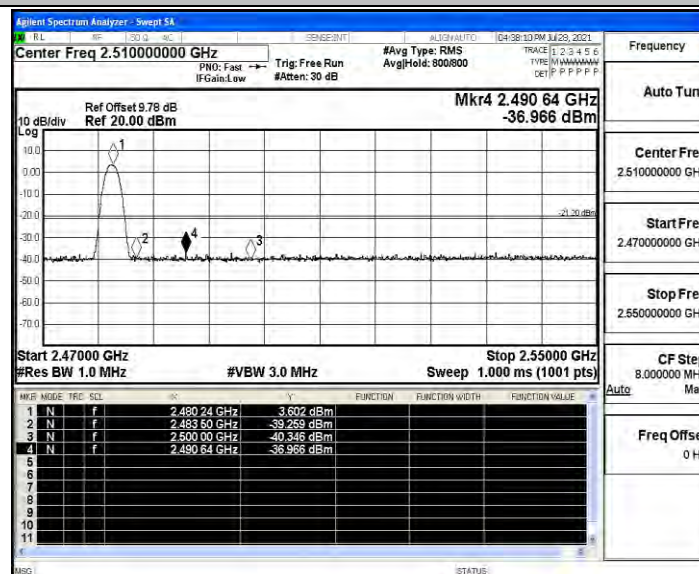
2DH5_Ant1_Low_2402_Peak



2DH5_Ant1_High_2480_AV

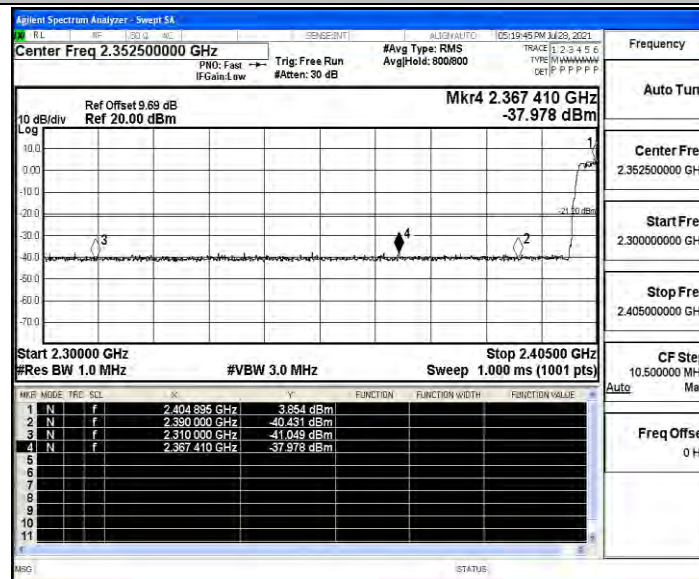


2DH5_Ant1_High_2480_Peak

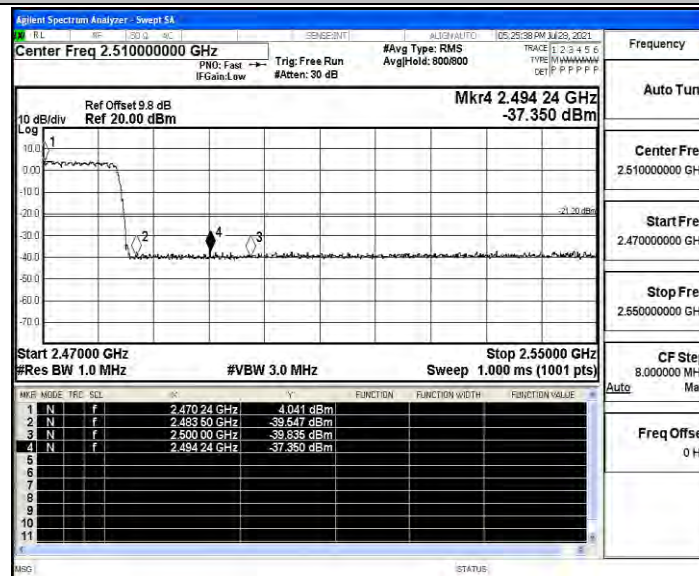




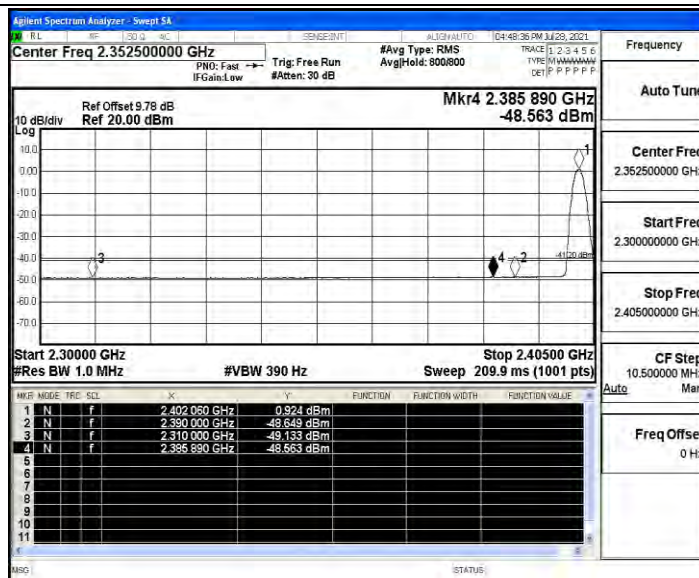
2DH5_Ant1_Low_Hop_2402_Peak



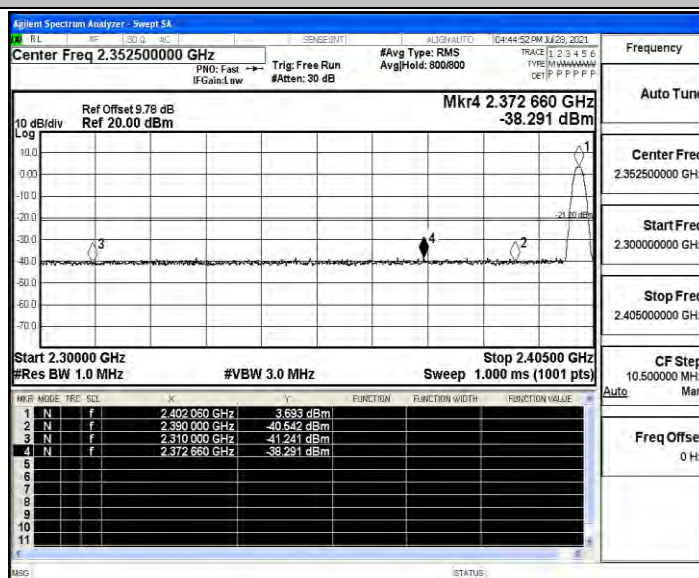
2DH5_Ant1_High_Hop_2480_Peak



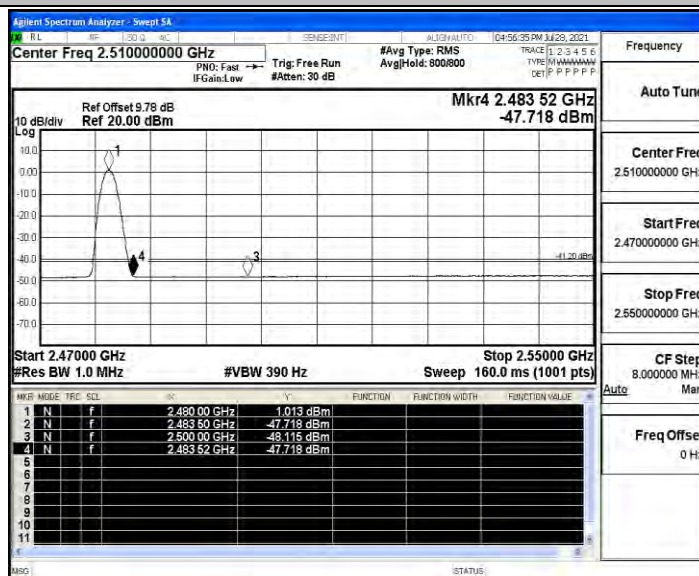
3DH5_Ant1_Low_2402_AV



3DH5_Ant1_Low_2402_Peak

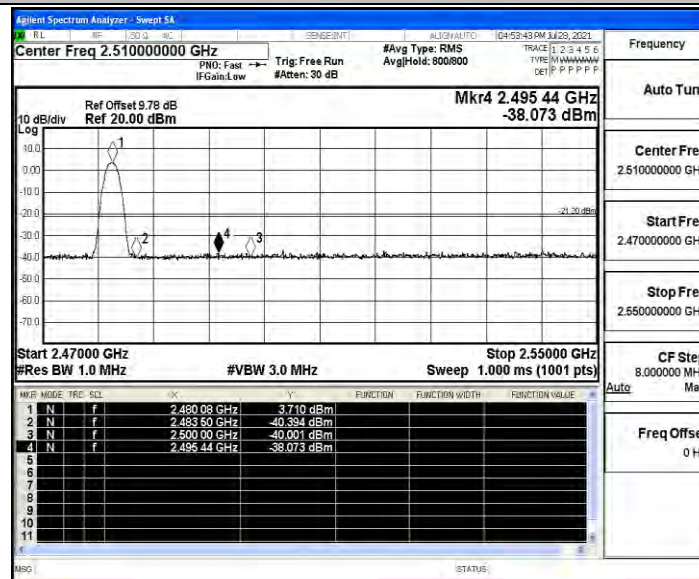


3DH5_Ant1_High_2480_AV

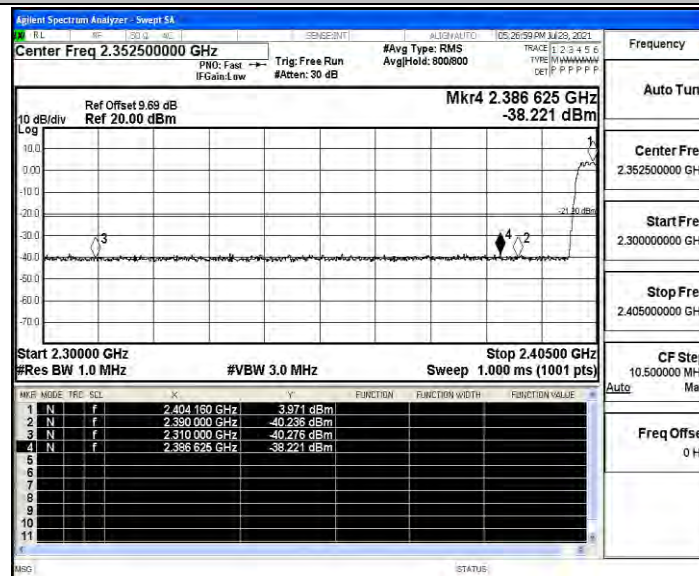




3DH5_Ant1_High_2480_Peak



3DH5_Ant1_Low_Hop_2402_Peak



3DH5_Ant1_High_Hop_2480_Peak

