

Appendix A

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

Product Name: Bluetooth Controller

Trade Mark: N/A

Test Model: 21178-0005

FCC ID: 2AUK4-211780005

Environmental Conditions

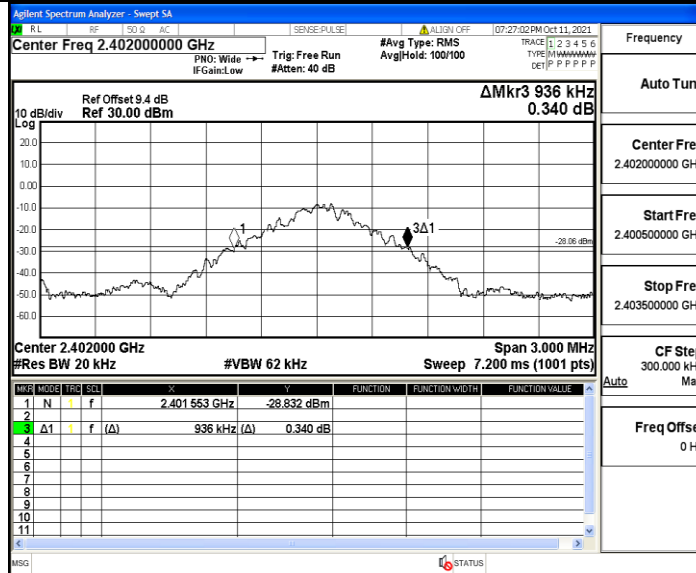
Temperature:	22.8° C
Relative Humidity:	56%
ATM Pressure:	100.0 kPa
Test Engineer:	Nancy Li
Supervised by:	Hugo Chen

A.1 20 dB Bandwidth

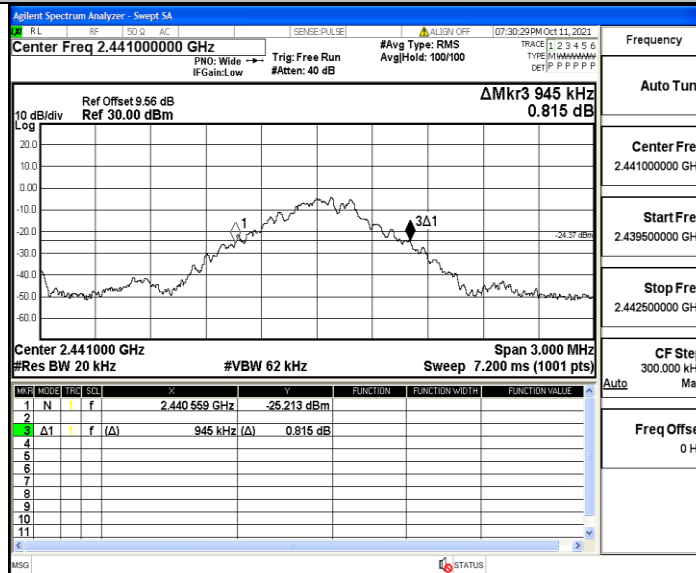
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.936	2401.553	2402.489	---	PASS
		2441	0.945	2440.559	2441.504	---	PASS
		2480	0.933	2479.559	2480.492	---	PASS
2DH5	Ant1	2402	1.251	2401.394	2402.645	---	PASS
		2441	1.236	2440.391	2441.627	---	PASS
		2480	1.296	2479.355	2480.651	---	PASS
3DH5	Ant1	2402	1.275	2401.367	2402.642	---	PASS
		2441	1.275	2440.367	2441.642	---	PASS
		2480	1.257	2479.373	2480.630	---	PASS

Test Graph

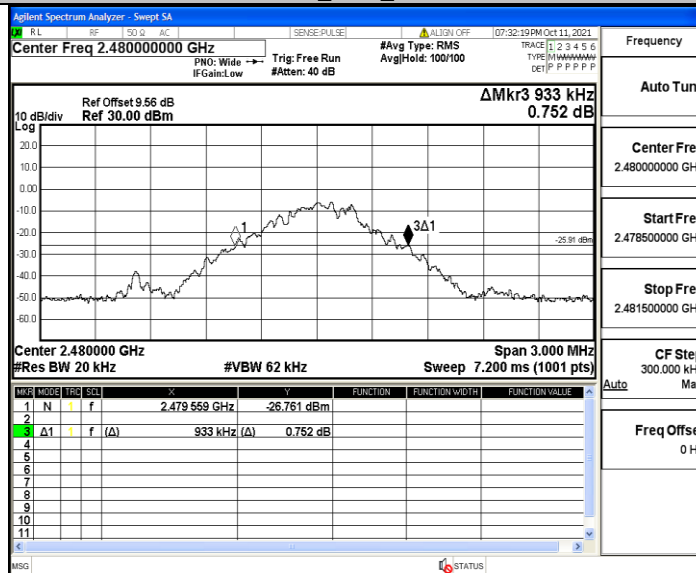
DH5_Ant1_2402



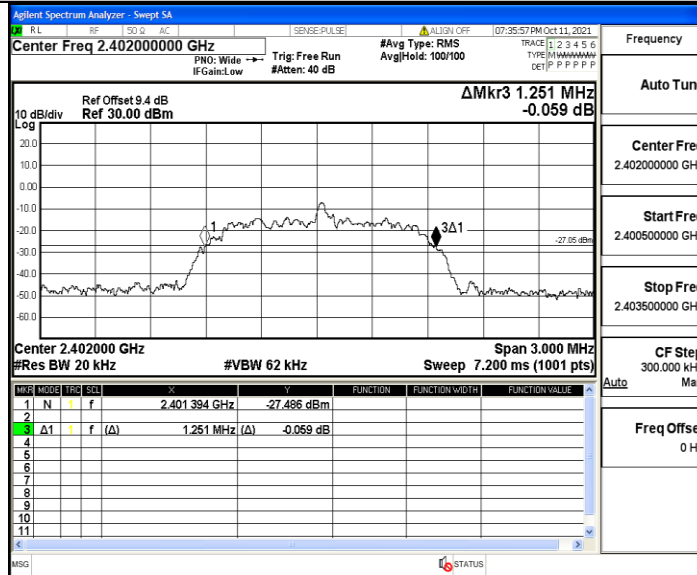
DH5_Ant1_2441



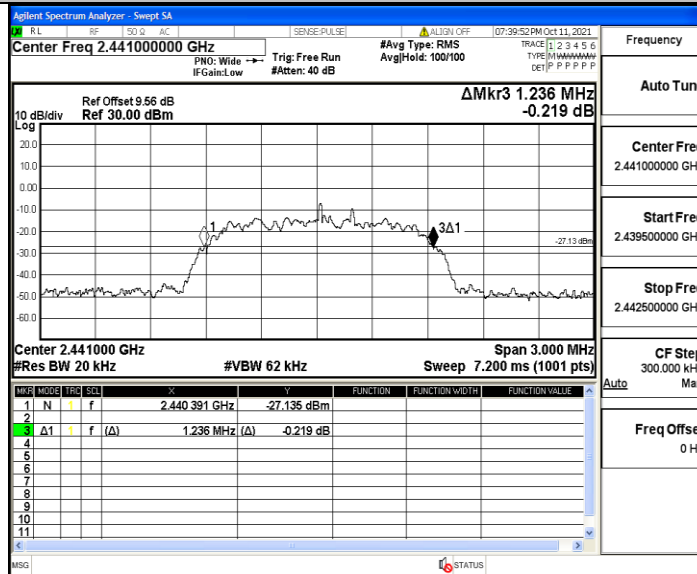
DH5_Ant1_2480



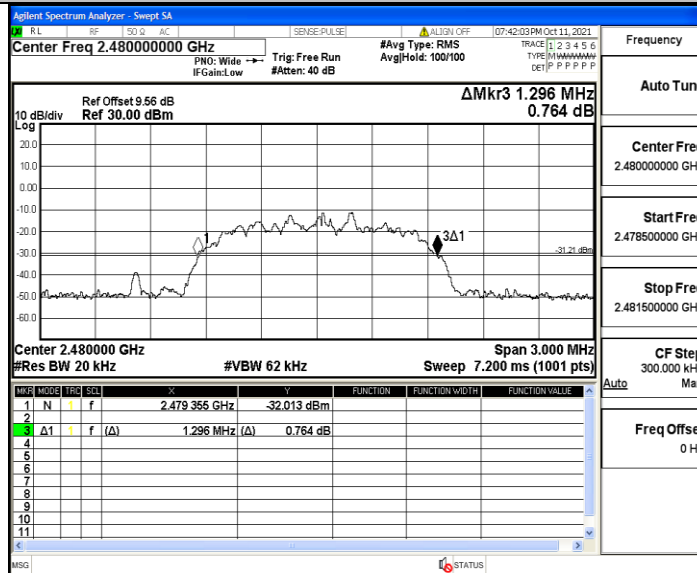
2DH5_Ant1_2402



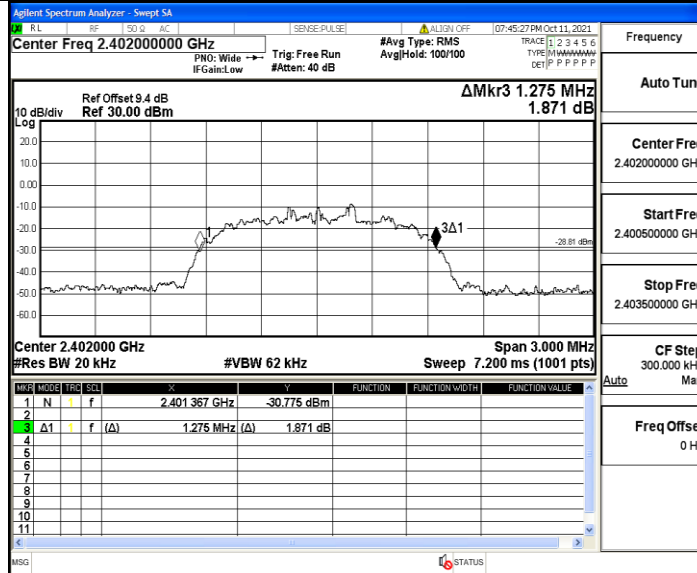
2DH5_Ant1_2441



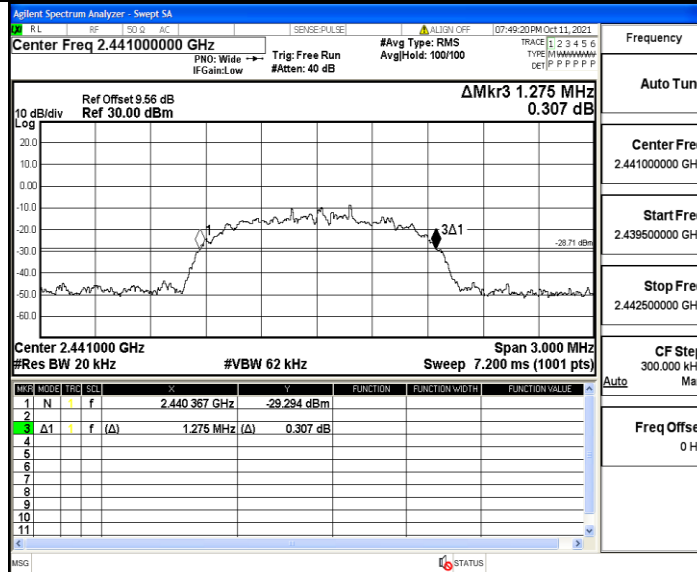
2DH5_Ant1_2480



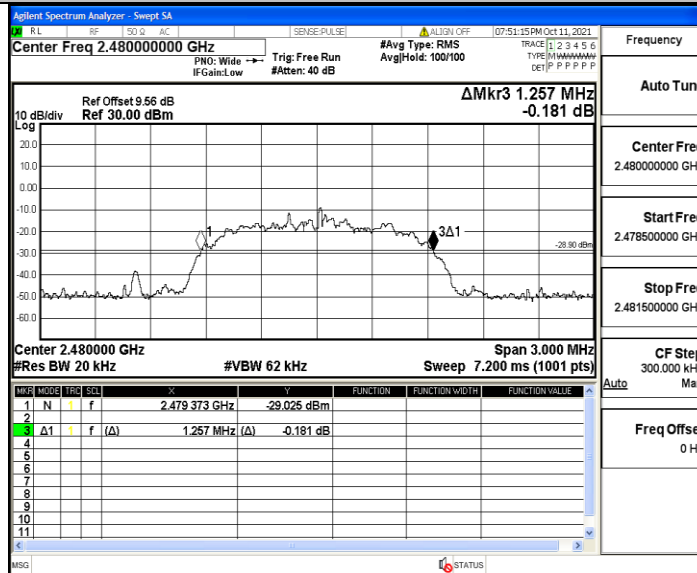
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

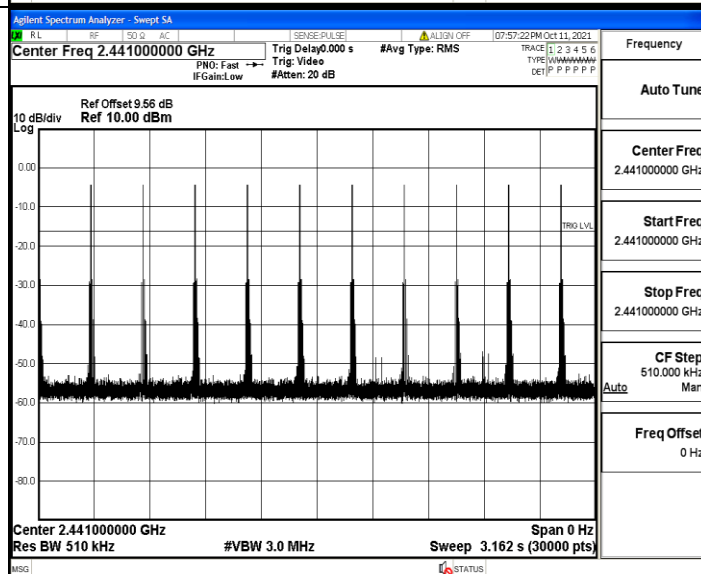
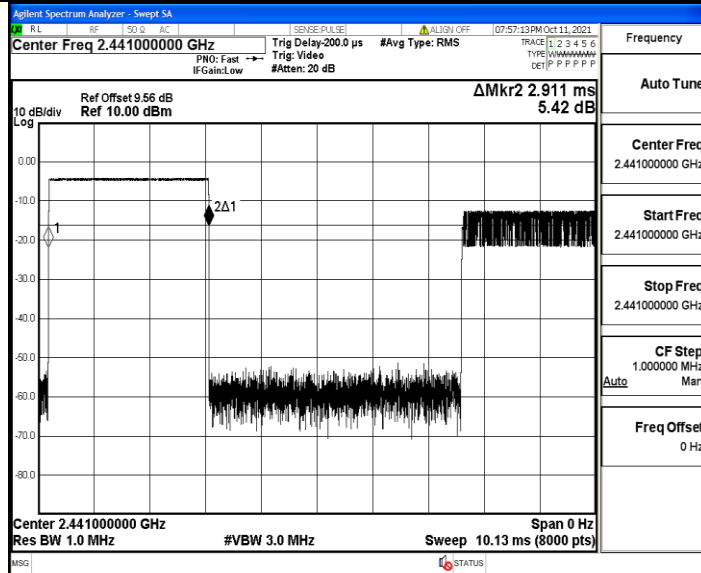


A.2 Dwell Time

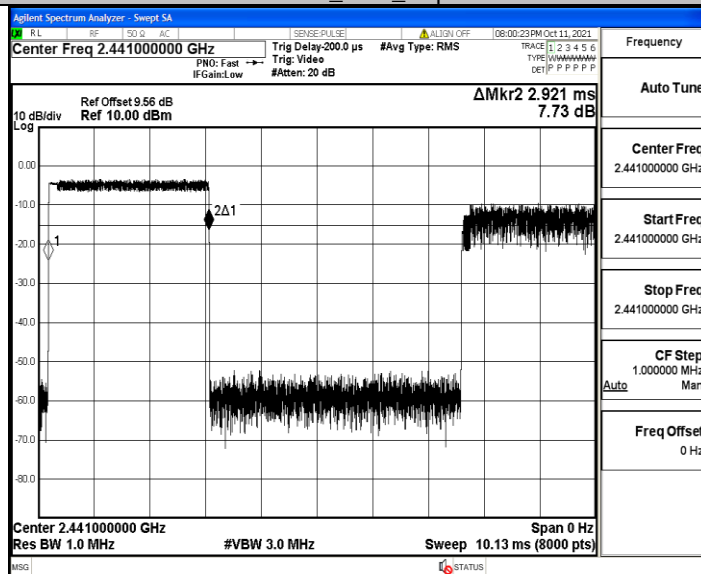
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.91	110	0.32	≤0.4	PASS
2DH5	Ant1	Hop	2.92	110	0.321	≤0.4	PASS
3DH5	Ant1	Hop	2.92	110	0.321	≤0.4	PASS

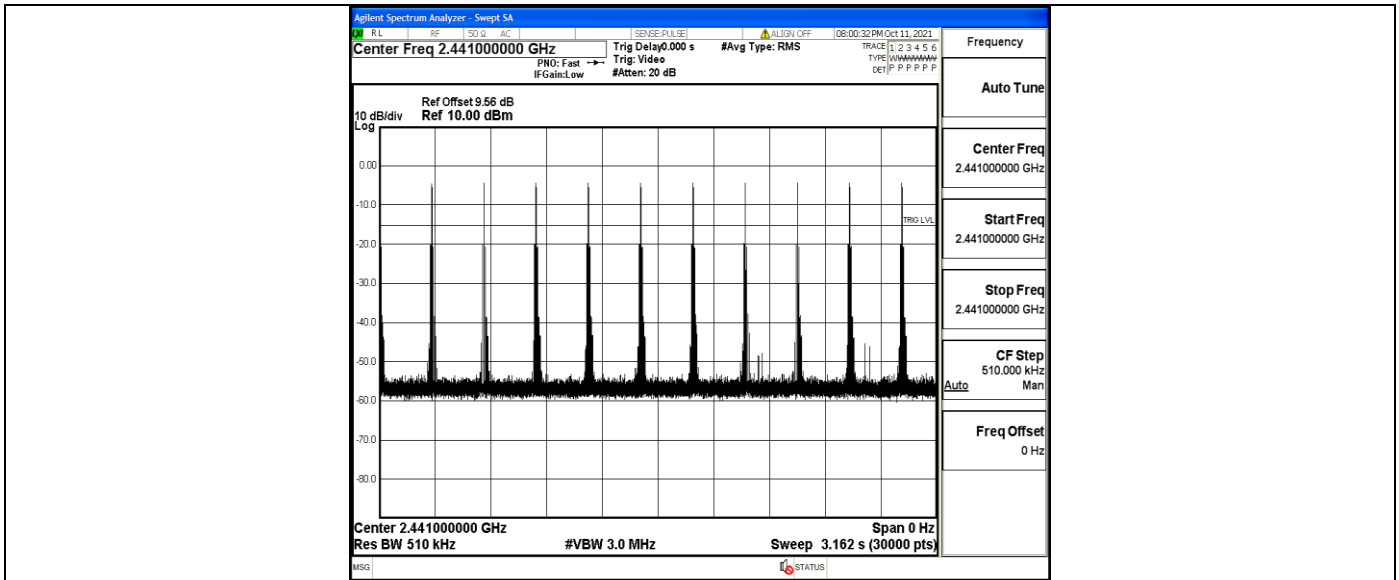
Test Graph

DH5_Ant1_Hop

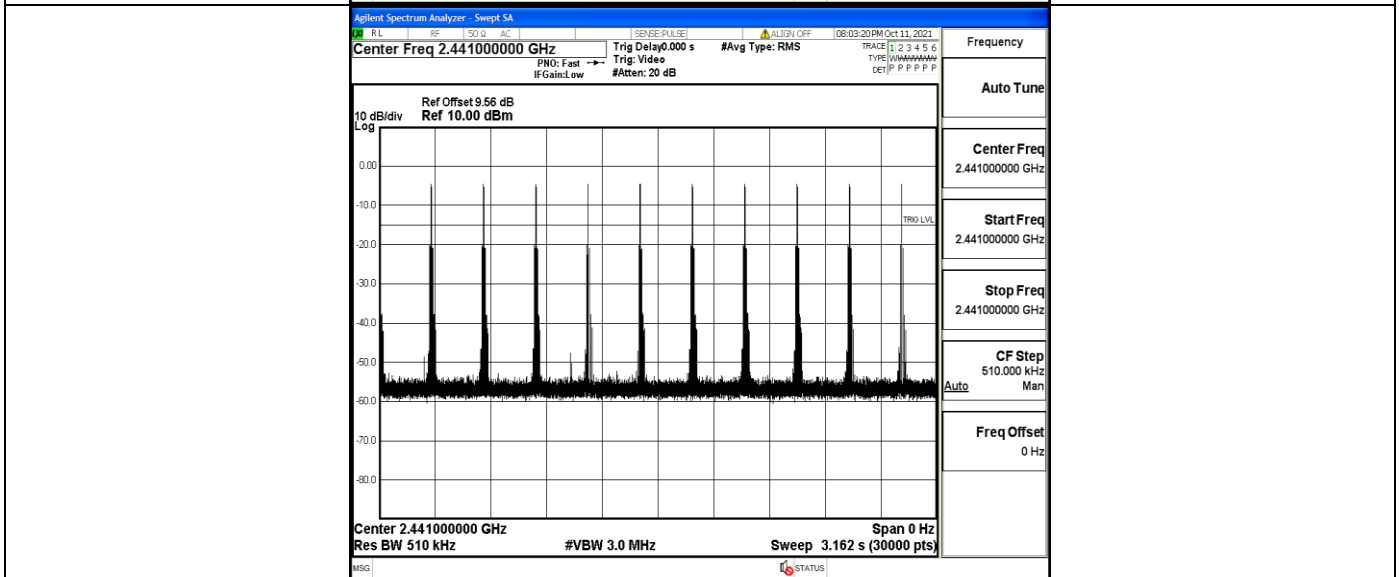
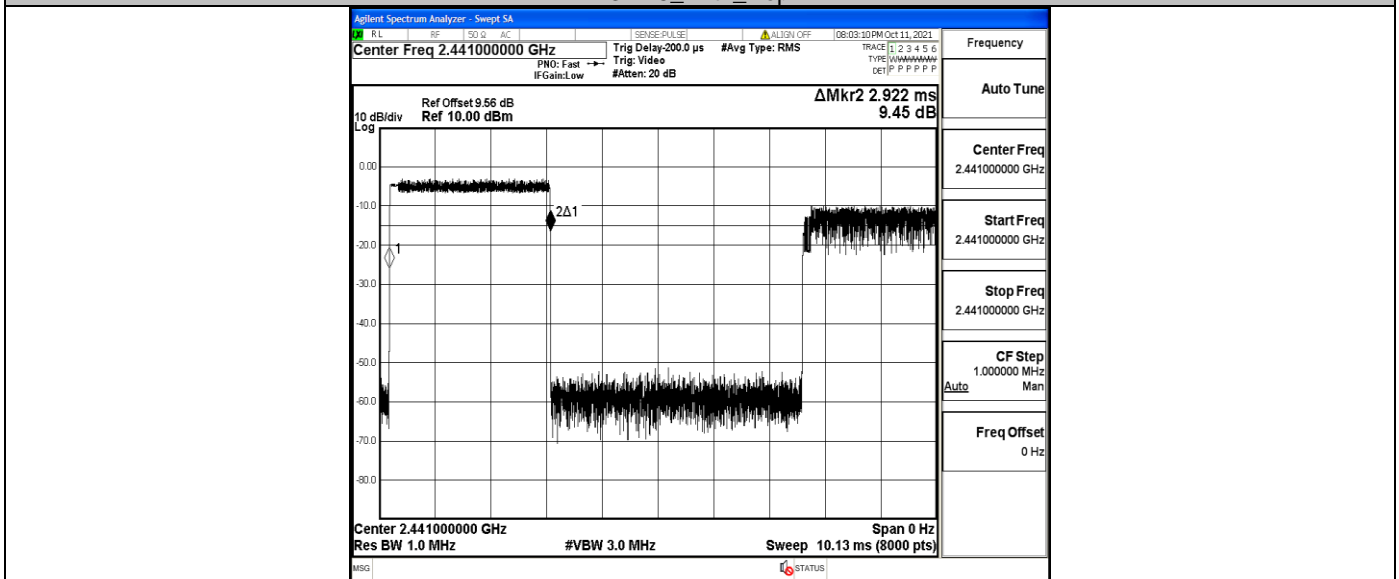


2DH5_Ant1_Hop





3DH5_Ant1_Hop

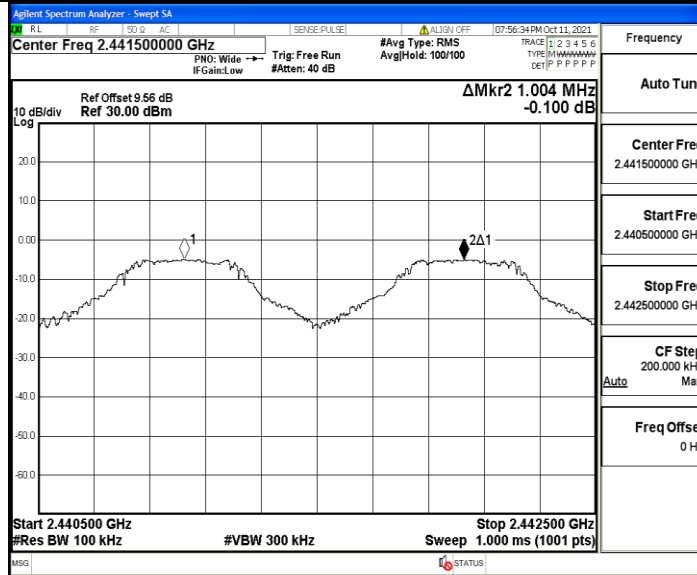


A.3 Carrier Frequency Separation

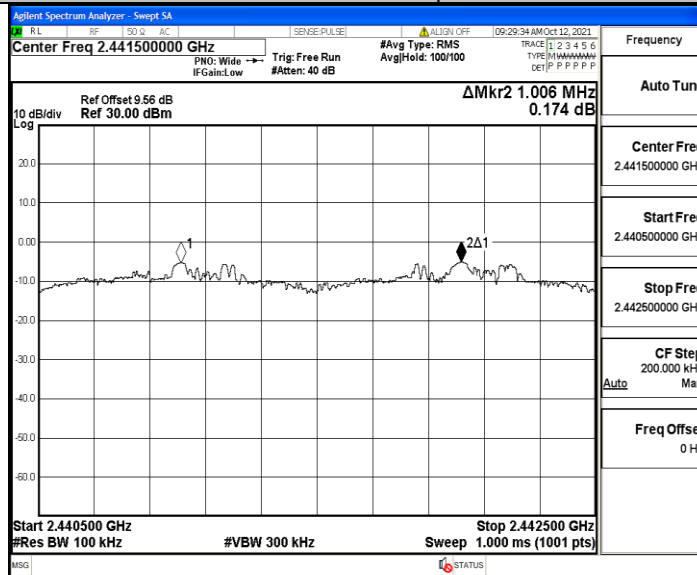
TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.004	≥ 0.945	PASS
2DH5	Ant1	Hop	1.006	≥ 0.864	PASS
3DH5	Ant1	Hop	0.954	≥ 0.850	PASS

Test Graph

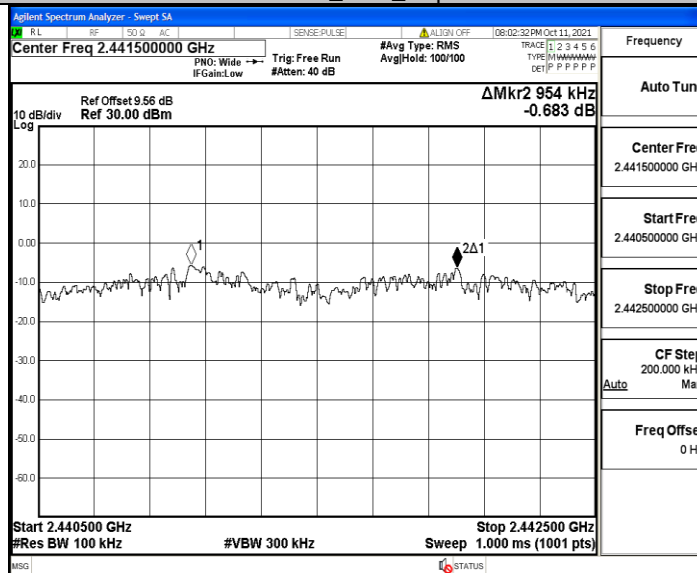
DH5_Ant1_Hop



2DH5_Ant1_Hop



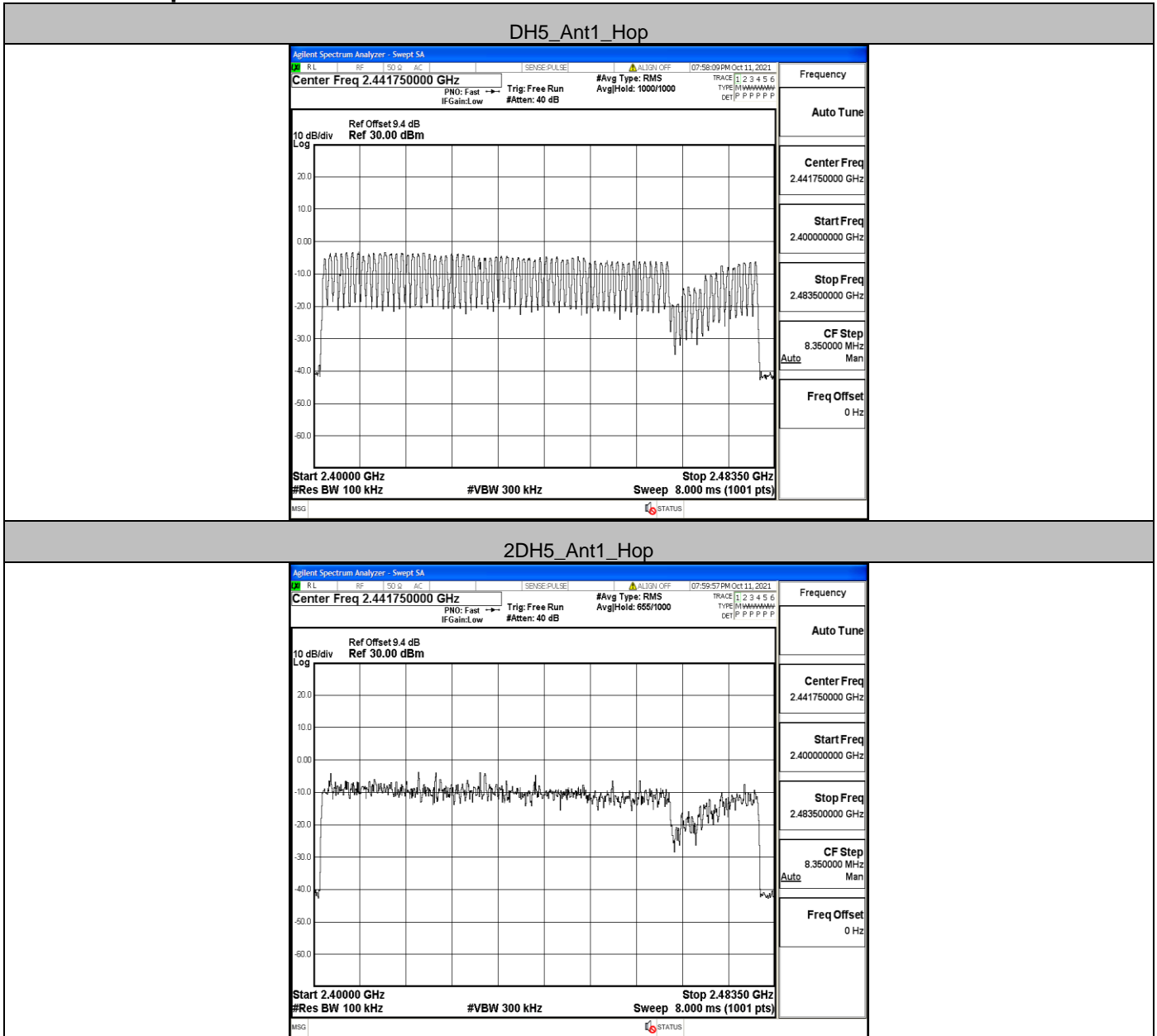
3DH5_Ant1_Hop



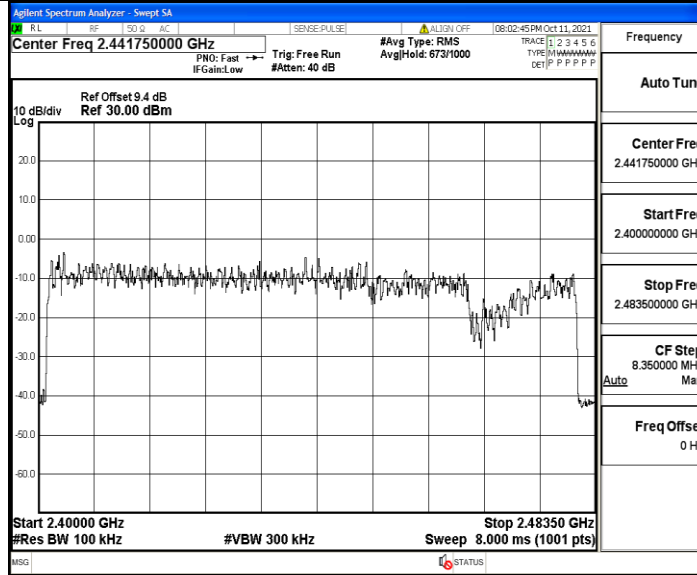
A.4 Hopping Channel Number

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 Graph



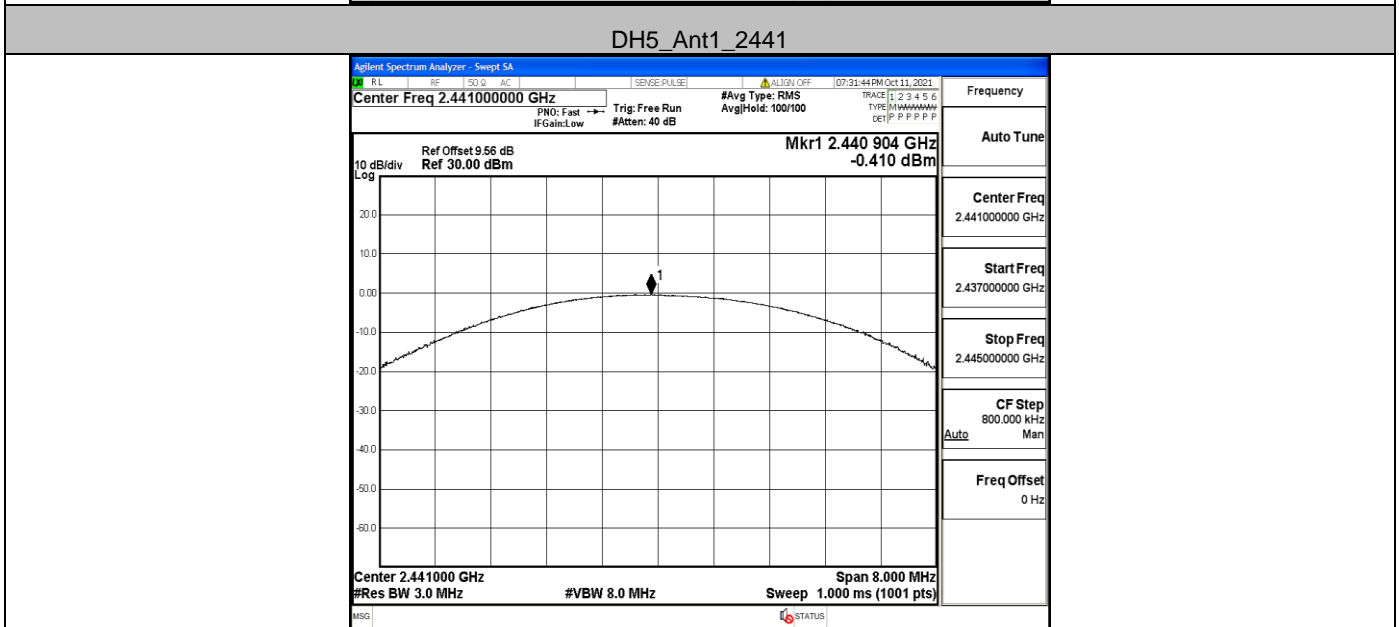
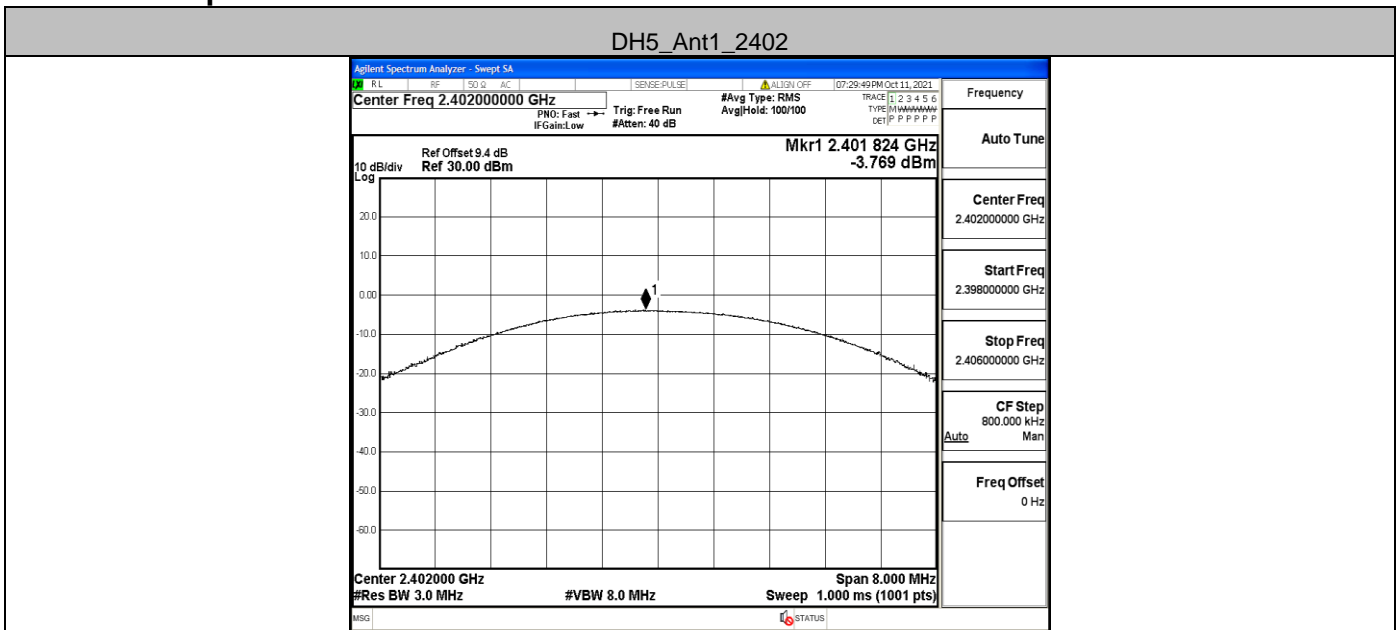
3DH5_Ant1_Hop



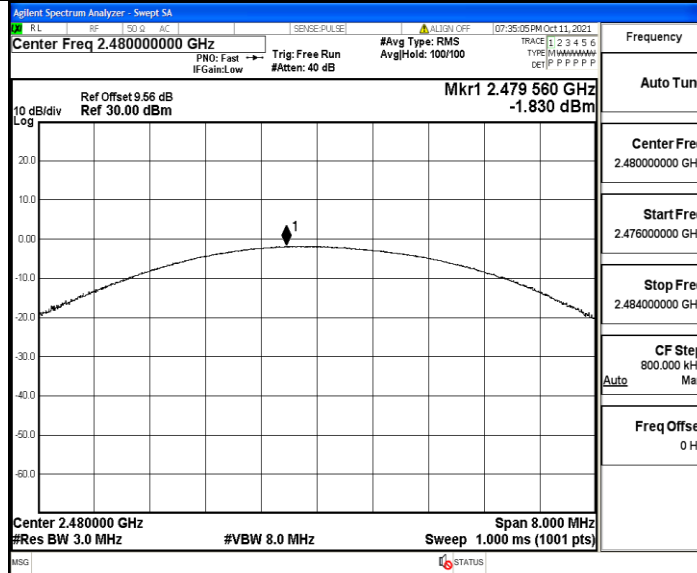
A.5 Conducted Peak Output Power

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	-3.77	≤20.97	PASS
		2441	-0.41	≤20.97	PASS
		2480	-1.83	≤20.97	PASS
2DH5	Ant1	2402	-2.73	≤20.97	PASS
		2441	-2.69	≤20.97	PASS
		2480	-4.1	≤20.97	PASS
3DH5	Ant1	2402	-2.61	≤20.97	PASS
		2441	-2.27	≤20.97	PASS
		2480	-3.86	≤20.97	PASS

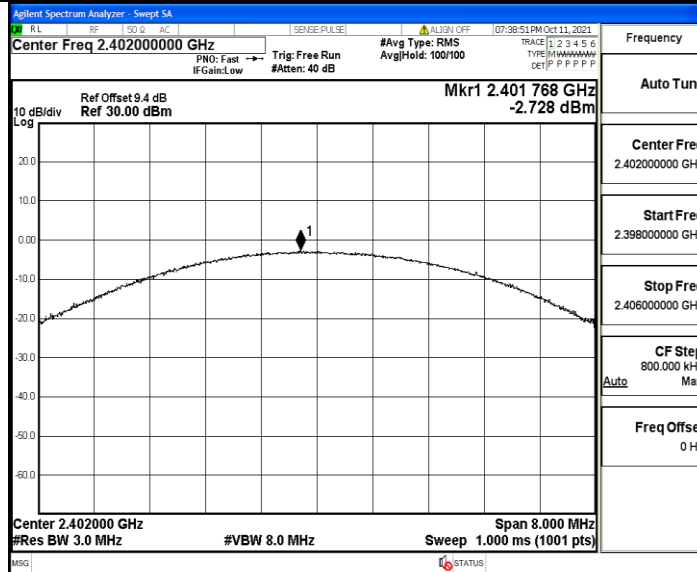
Test Graph



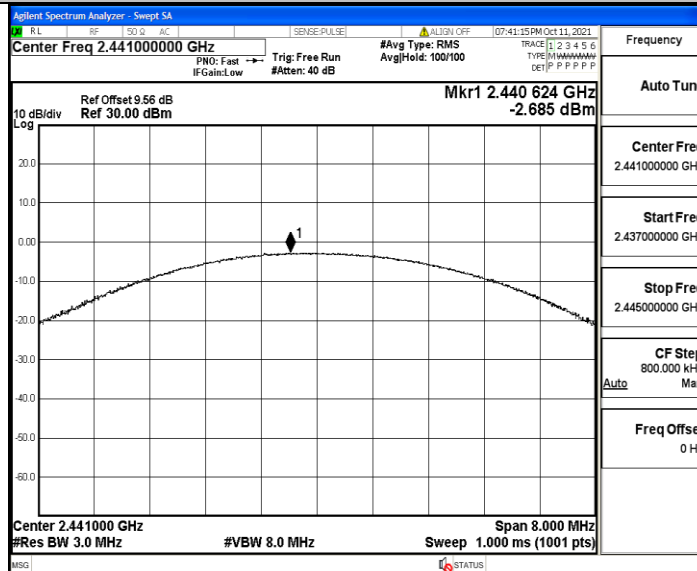
DH5_Ant1_2480



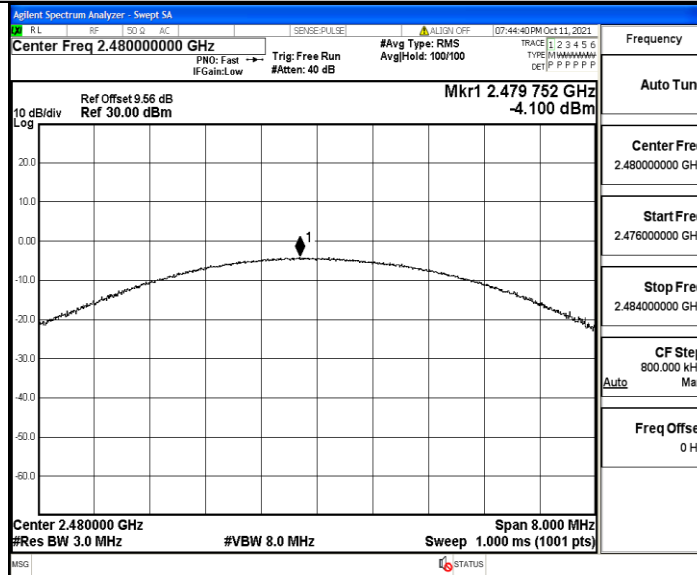
2DH5_Ant1_2402



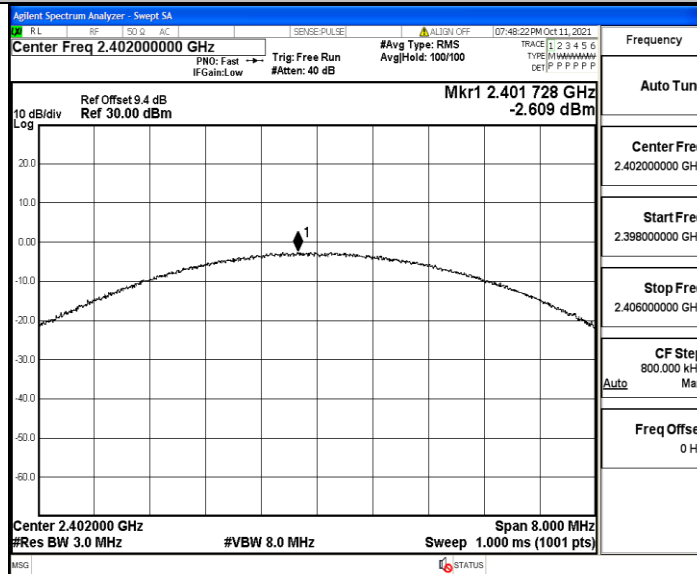
2DH5_Ant1_2441



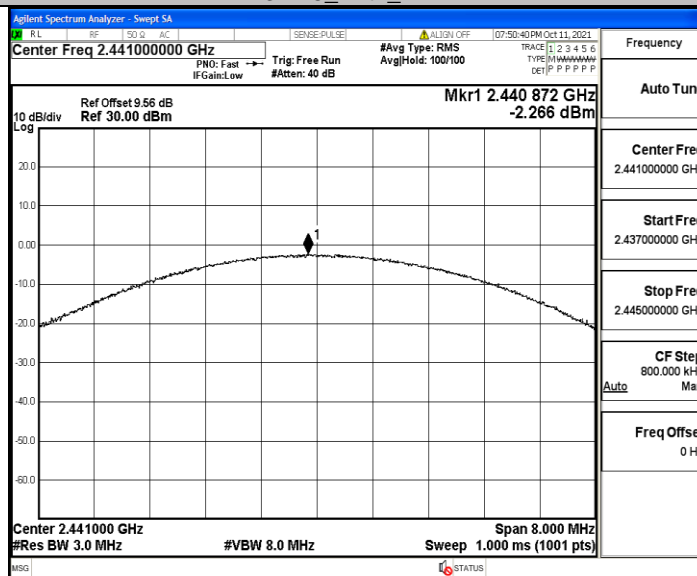
2DH5_Ant1_2480



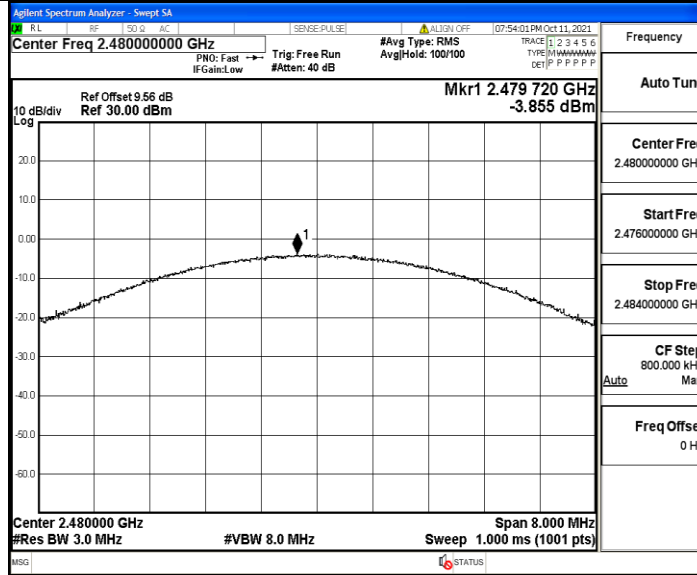
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

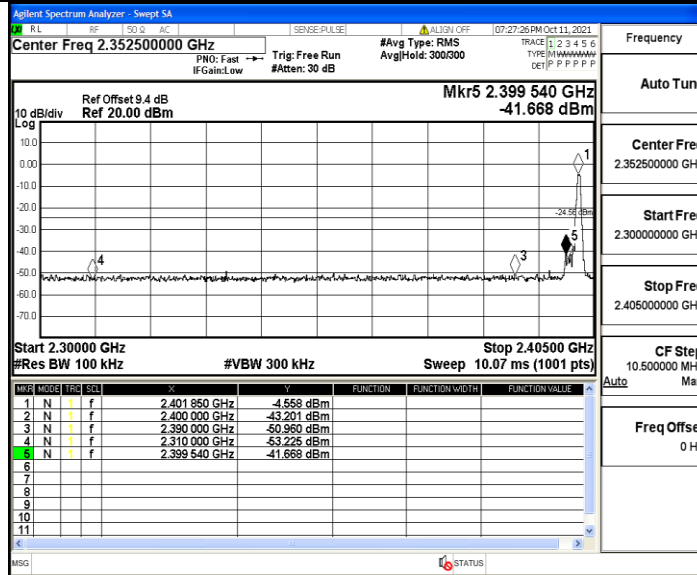


A.6 Band-edge for RF Conducted Emissions

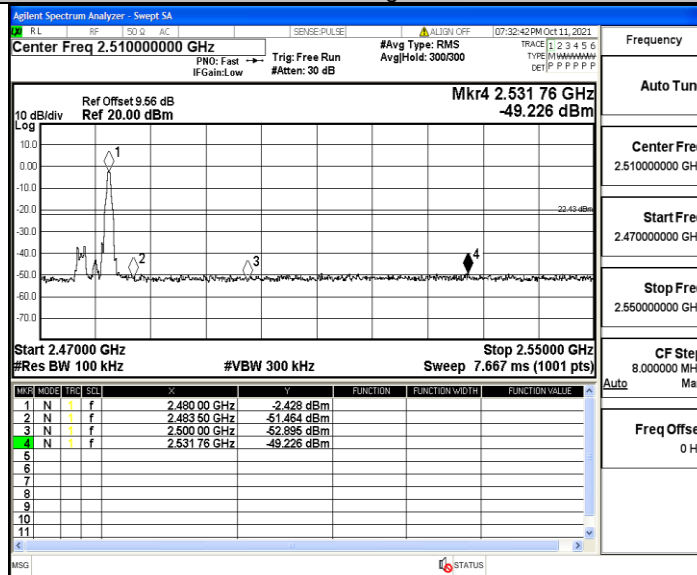
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-4.56	-41.67	≤-24.56	PASS
		High	2480	-2.43	-49.23	≤-22.43	PASS
		Low	Hop_2402	-3.99	-49.31	≤-23.99	PASS
		High	Hop_2480	-6.04	-48.84	≤-26.04	PASS
2DH5	Ant1	Low	2402	-7.33	-42.21	≤-27.33	PASS
		High	2480	-7.59	-48.44	≤-27.59	PASS
		Low	Hop_2402	-6.24	-49.69	≤-26.24	PASS
		High	Hop_2480	-9.01	-48.24	≤-29.01	PASS
3DH5	Ant1	Low	2402	-5.04	-44.64	≤-25.04	PASS
		High	2480	-6.21	-48.58	≤-26.21	PASS
		Low	Hop_2402	-6.57	-49.9	≤-26.57	PASS
		High	Hop_2480	-10.07	-49.04	≤-30.07	PASS

Test Graph

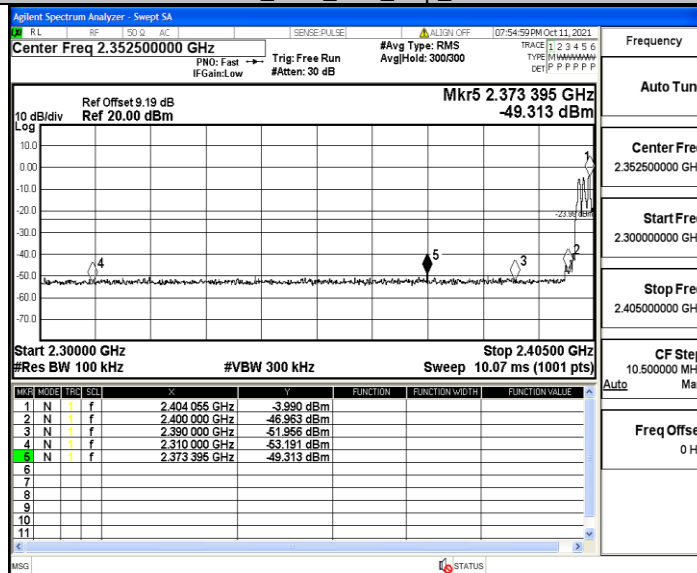
DH5_Ant1_Low_2402



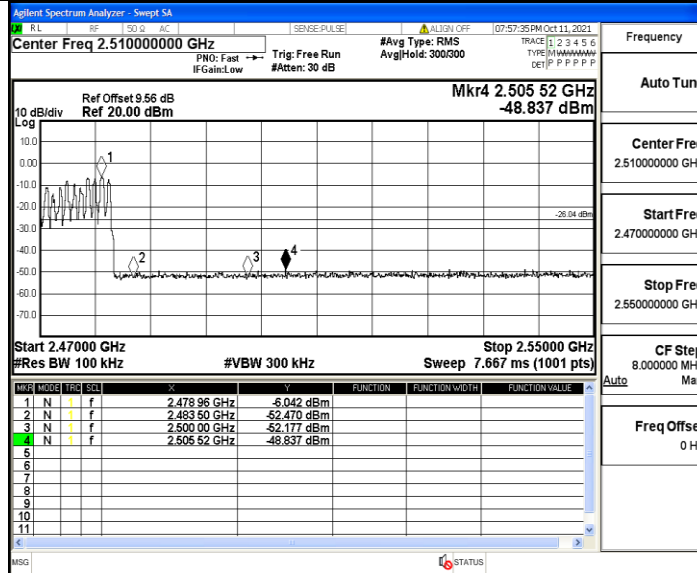
DH5_Ant1_High_2480



DH5_Ant1_Low_Hop_2402

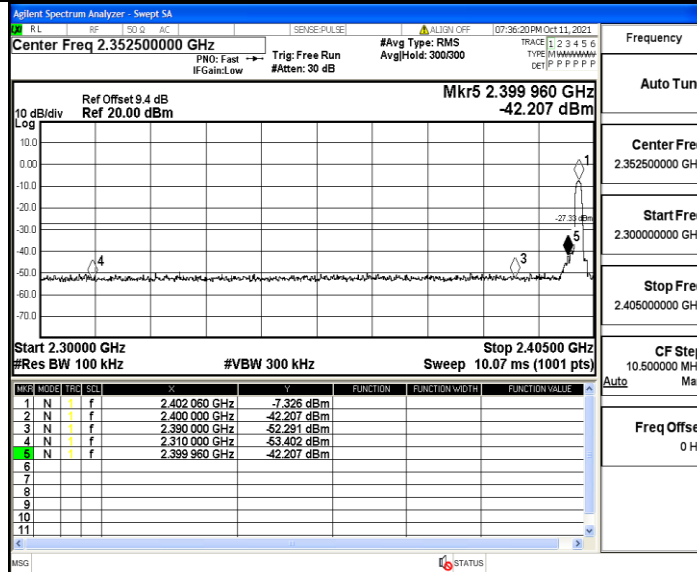


DH5_Ant1_High_Hop_2480



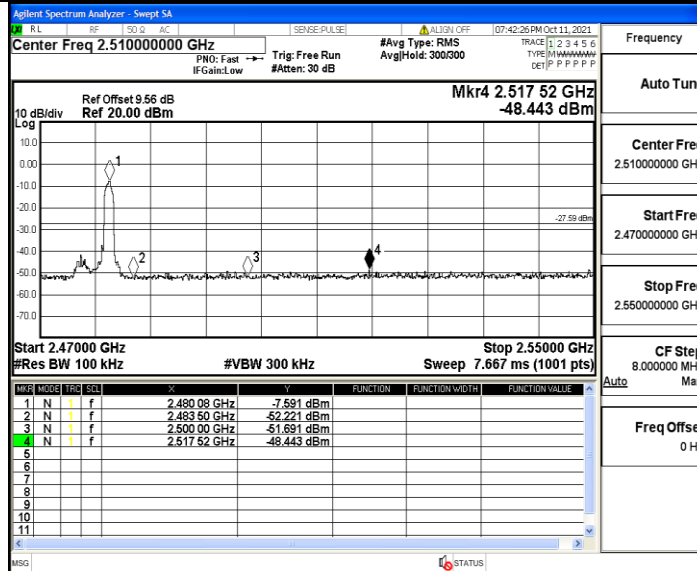
Frequency	Auto Tune
Center Freq	2.51000000 GHz
Start Freq	2.47000000 GHz
Stop Freq	2.55000000 GHz
CF Step	8.000000 MHz
Freq Offset	0 Hz

2DH5_Ant1_Low_2402



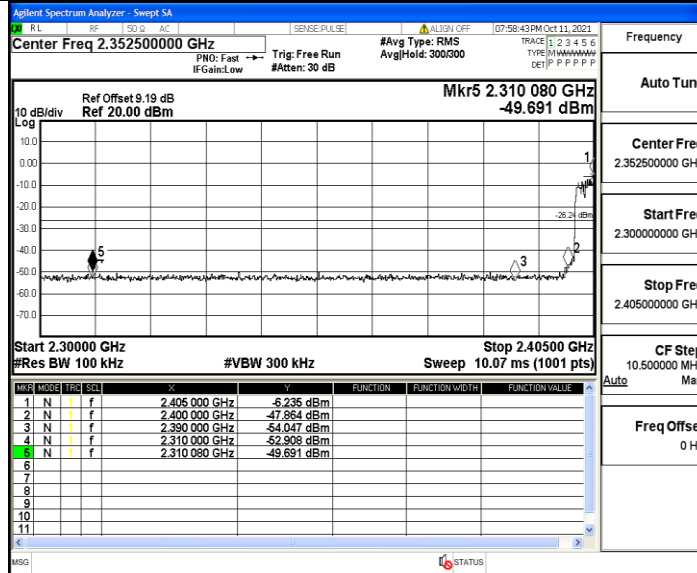
Frequency	Auto Tune
Center Freq	2.35250000 GHz
Start Freq	2.30000000 GHz
Stop Freq	2.40500000 GHz
CF Step	10.500000 MHz
Freq Offset	0 Hz

2DH5_Ant1_High_2480

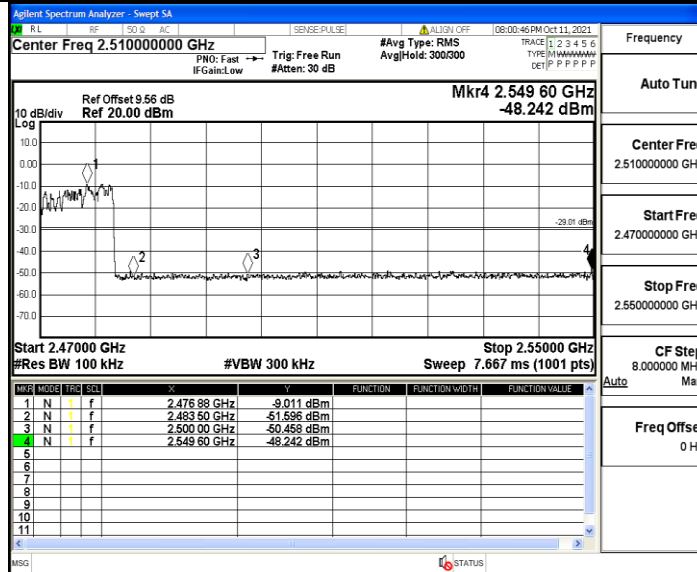


Frequency	Auto Tune
Center Freq	2.51000000 GHz
Start Freq	2.47000000 GHz
Stop Freq	2.55000000 GHz
CF Step	8.000000 MHz
Freq Offset	0 Hz

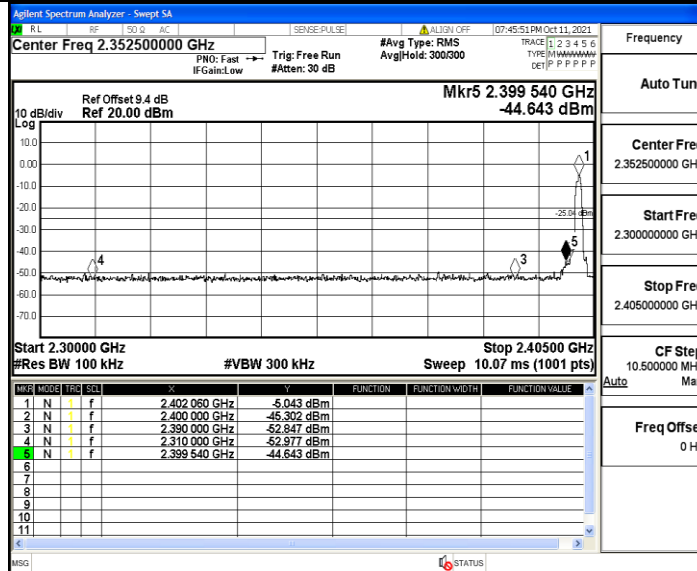
2DH5_Ant1_Low_Hop_2402



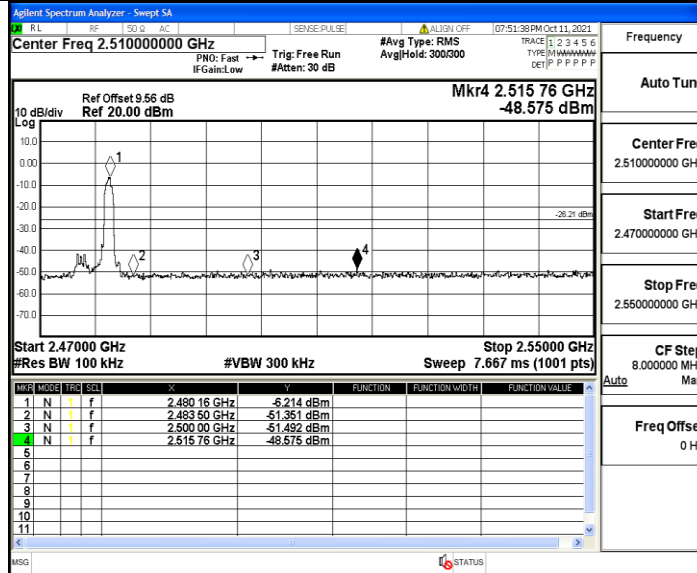
2DH5_Ant1_High_Hop_2480



3DH5_Ant1_Low_2402

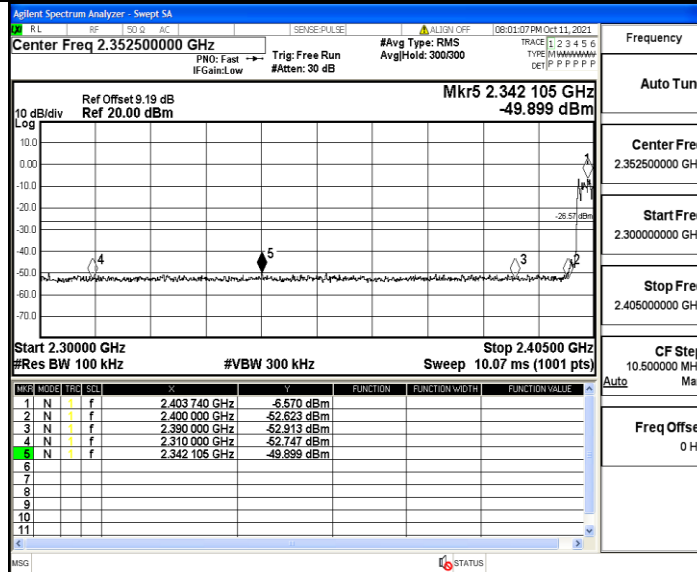


3DH5_Ant1_High_2480



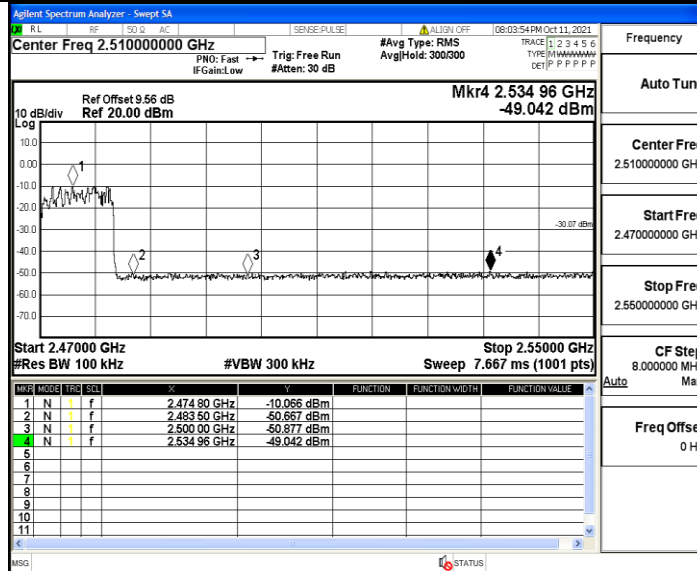
Frequency	Auto Tune
Center Freq	2.51000000 GHz
Start Freq	2.47000000 GHz
Stop Freq	2.55000000 GHz
CF Step	8.000000 MHz
Freq Offset	0 Hz

3DH5_Ant1_Low_Hop_2402



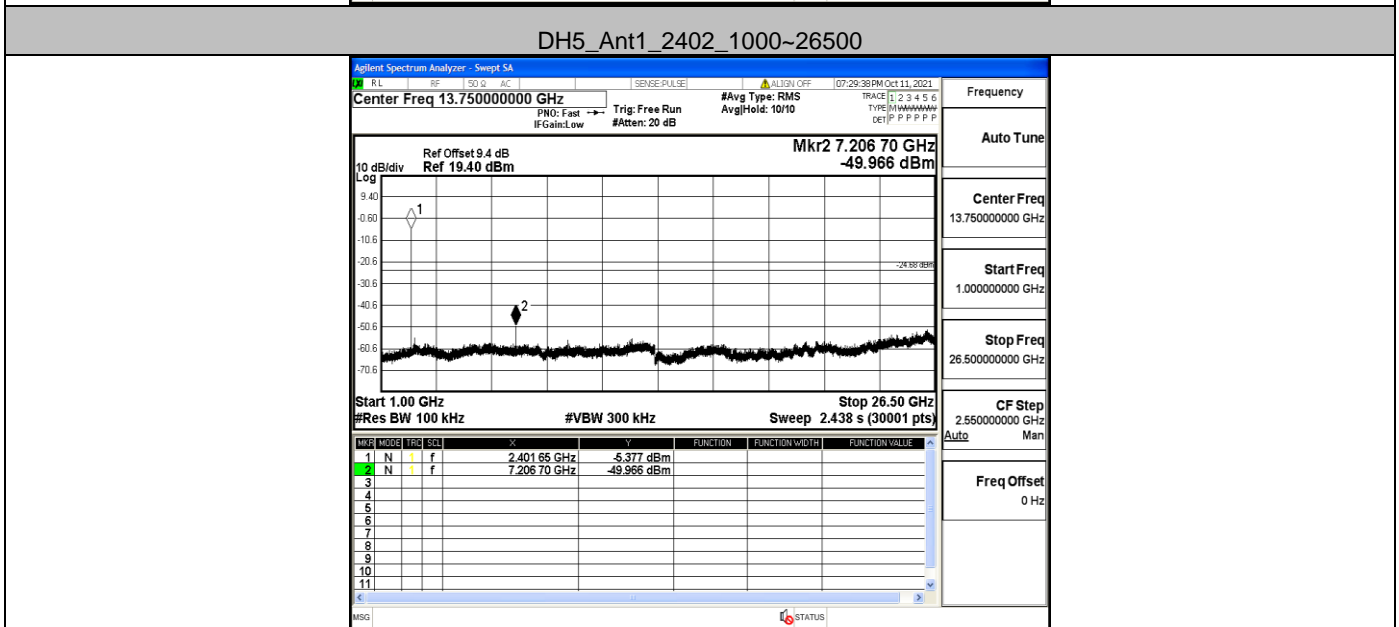
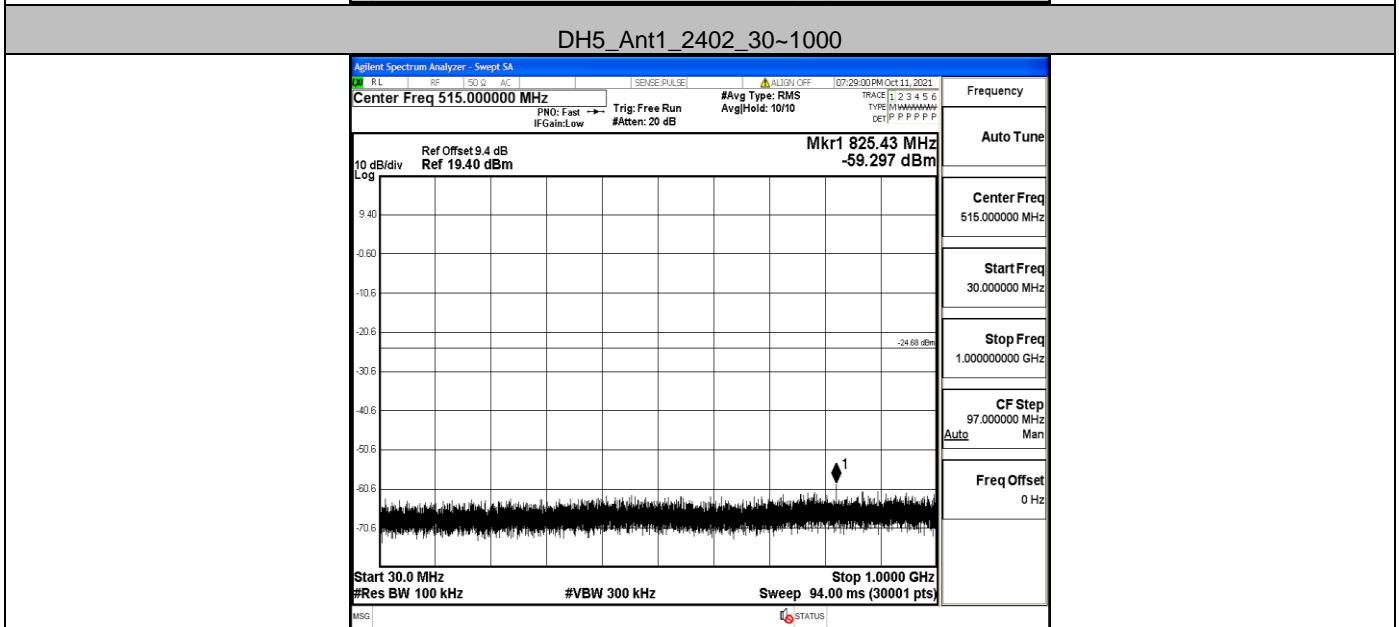
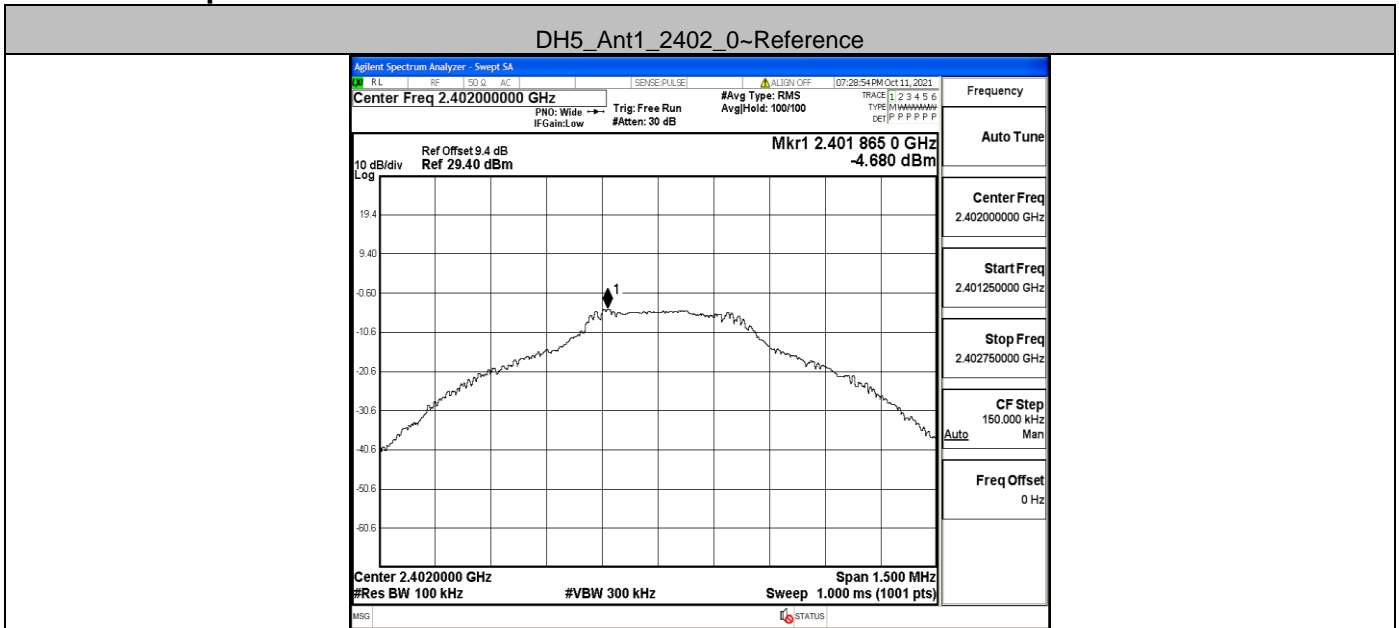
Frequency	Auto Tune
Center Freq	2.35250000 GHz
Start Freq	2.30000000 GHz
Stop Freq	2.40500000 GHz
CF Step	10.500000 MHz
Freq Offset	0 Hz

3DH5_Ant1_High_Hop_2480

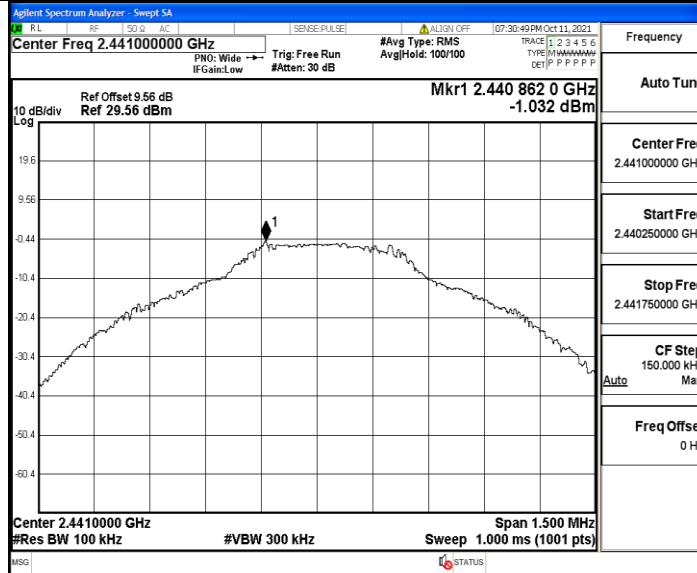


Frequency	Auto Tune
Center Freq	2.51000000 GHz
Start Freq	2.47000000 GHz
Stop Freq	2.55000000 GHz
CF Step	8.000000 MHz
Freq Offset	0 Hz

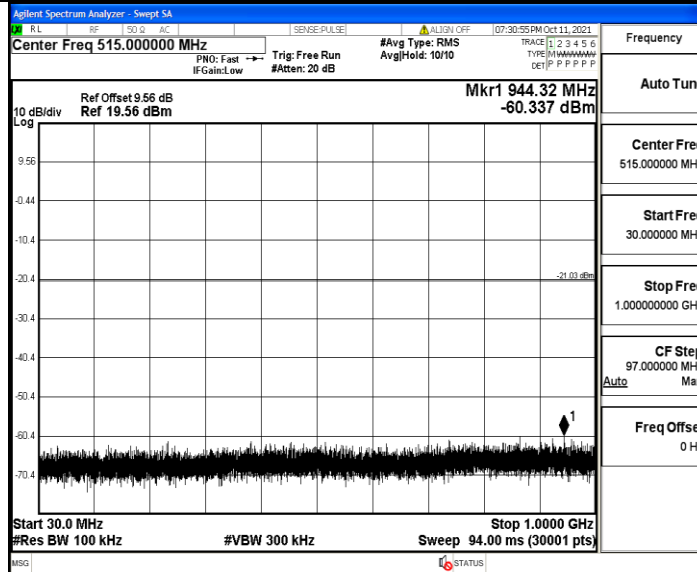
A.7 RF Conducted Spurious Emissions Test Graph



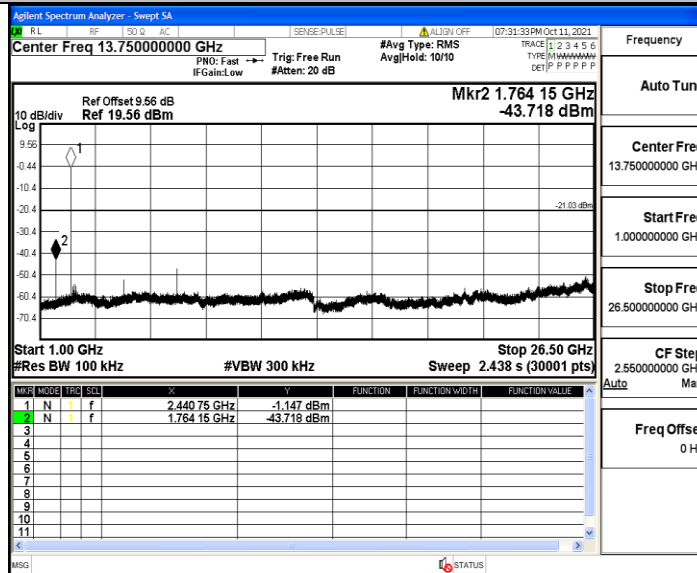
DH5_Ant1_2441_0~Reference



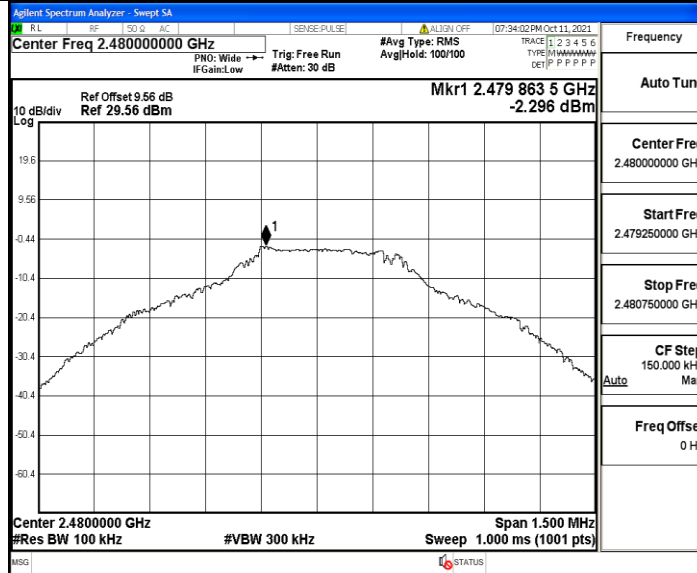
DH5_Ant1_2441_30~1000



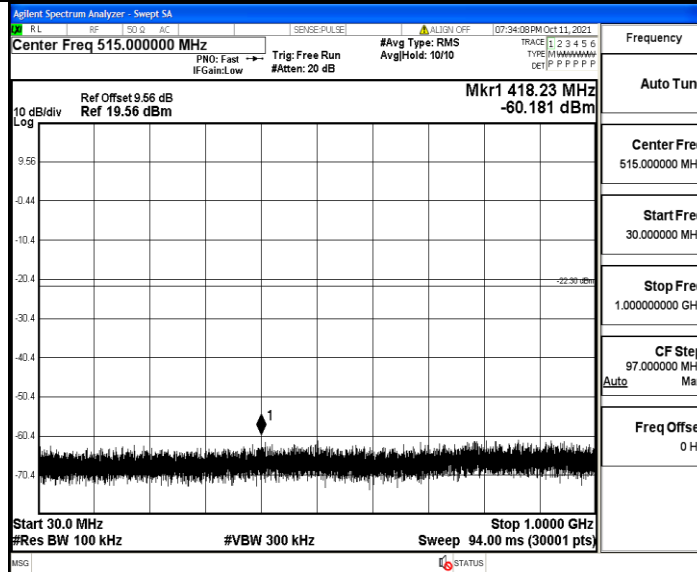
DH5_Ant1_2441_1000~26500



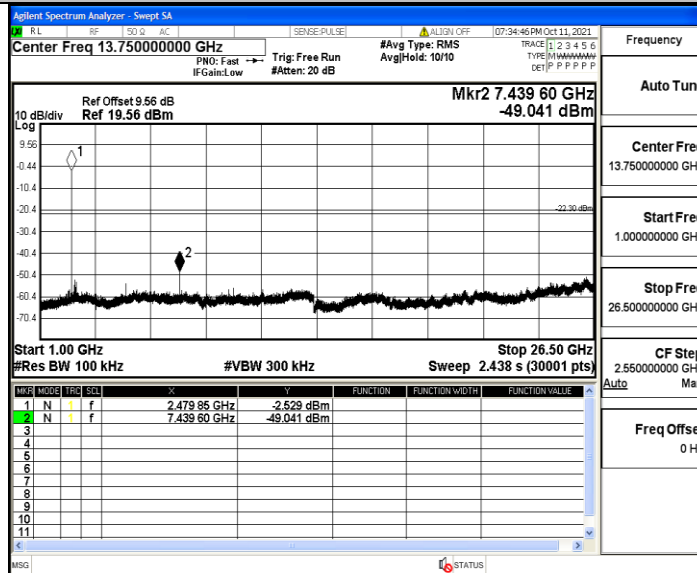
DH5_Ant1_2480_0~Reference



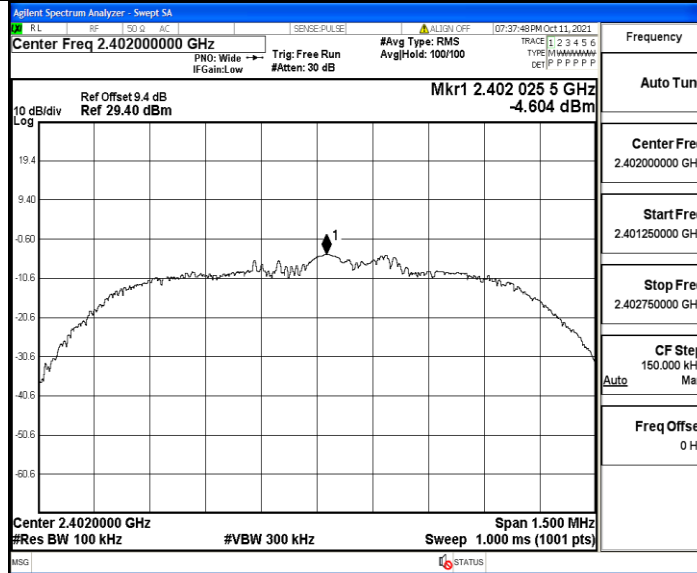
DH5_Ant1_2480_30~1000



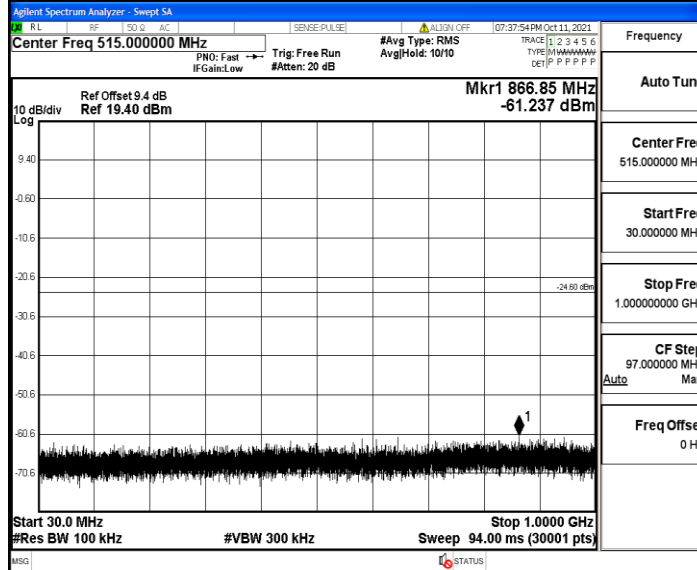
DH5_Ant1_2480_1000~26500



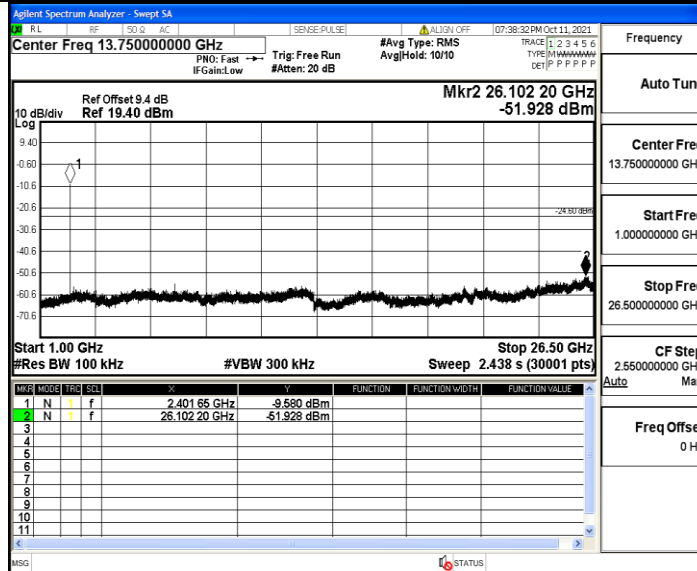
2DH5_Ant1_2402_0~Reference



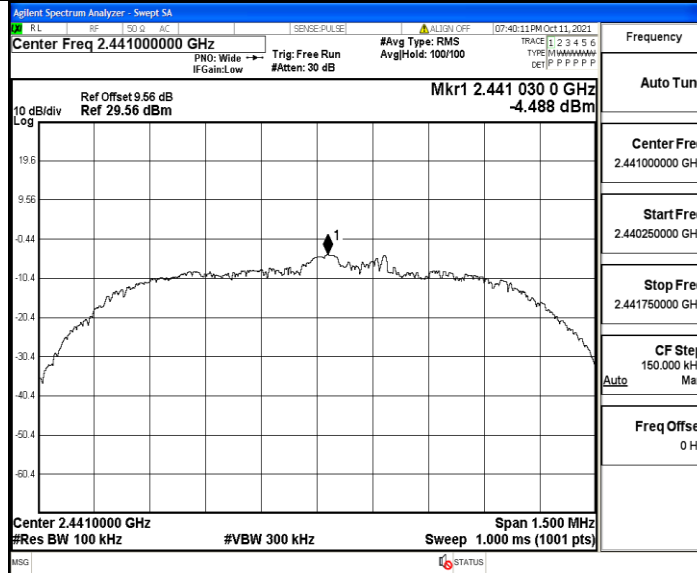
2DH5_Ant1_2402_30~1000



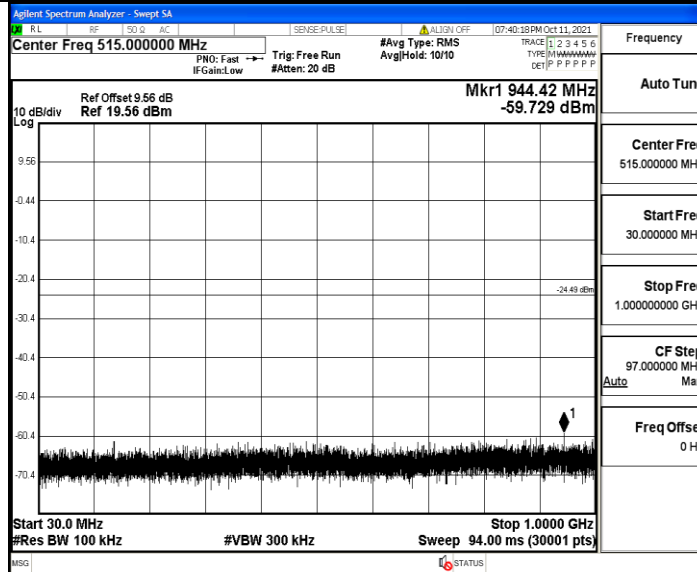
2DH5_Ant1_2402_1000~26500



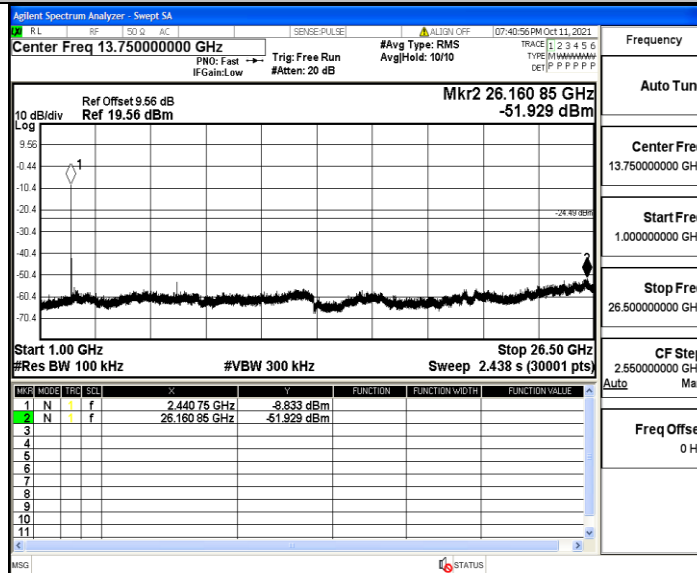
2DH5_Ant1_2441_0~Reference



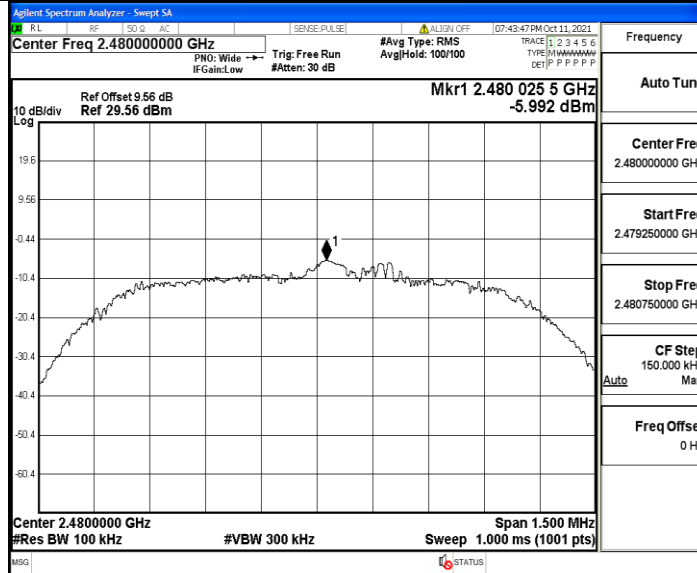
2DH5_Ant1_2441_30~1000



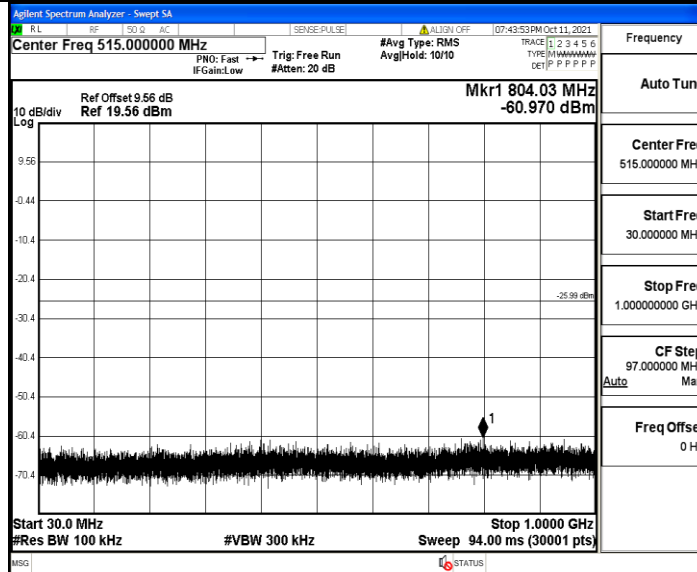
2DH5_Ant1_2441_1000~26500



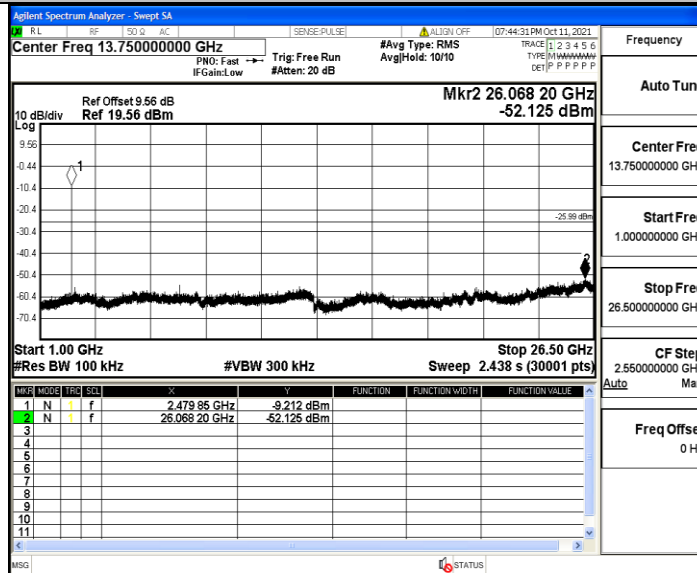
2DH5_Ant1_2480_0~Reference



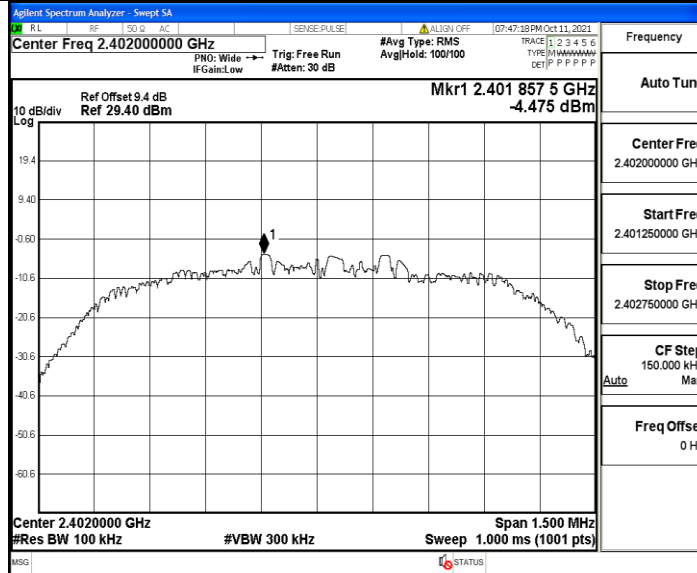
2DH5_Ant1_2480_30~1000



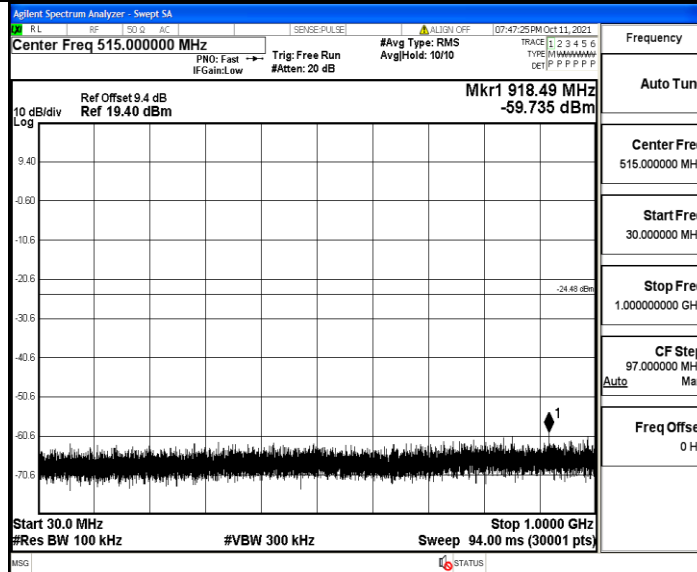
2DH5_Ant1_2480_1000~26500



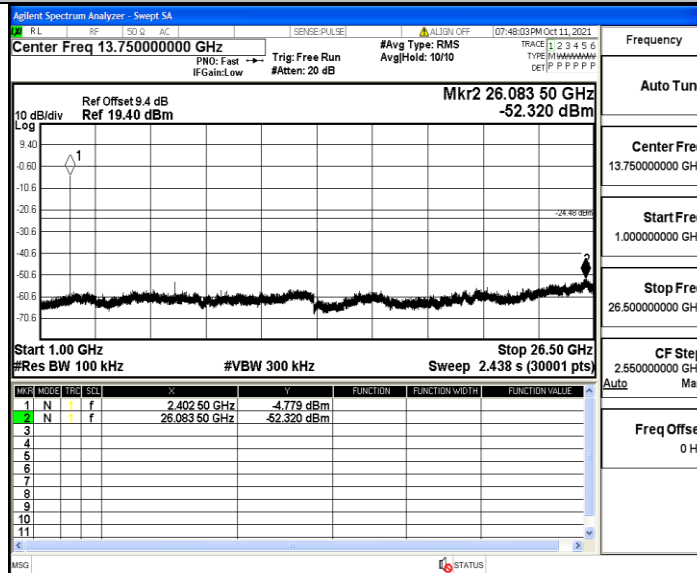
3DH5_Ant1_2402_0~Reference



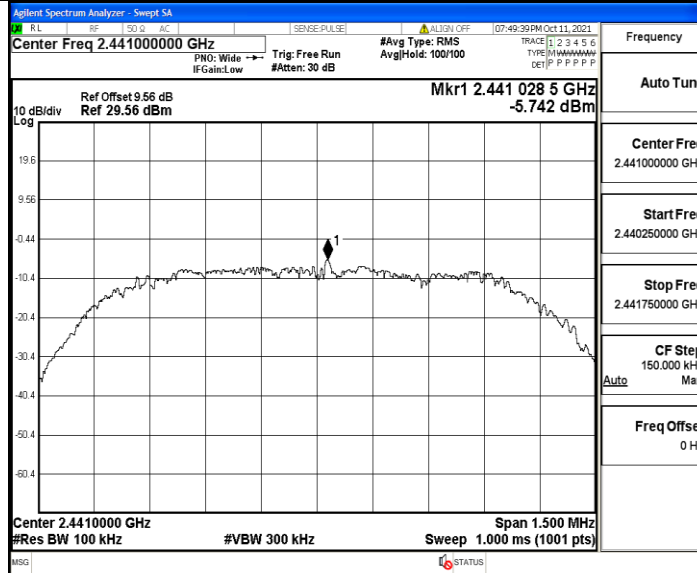
3DH5_Ant1_2402_30~1000



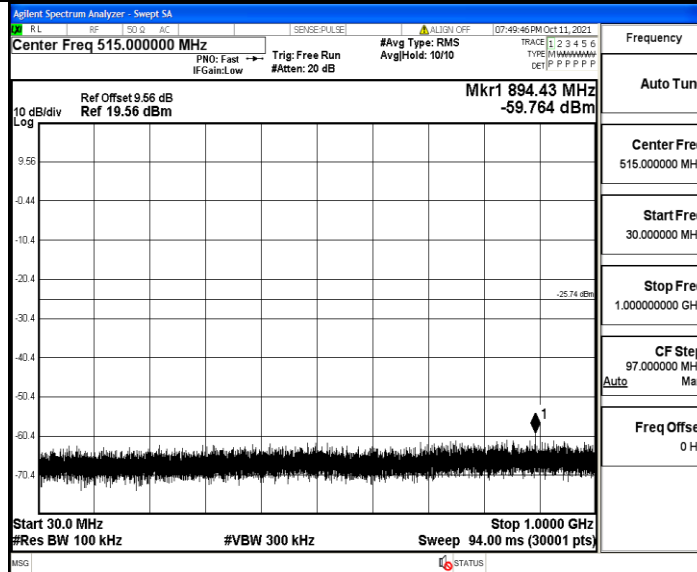
3DH5_Ant1_2402_1000~26500



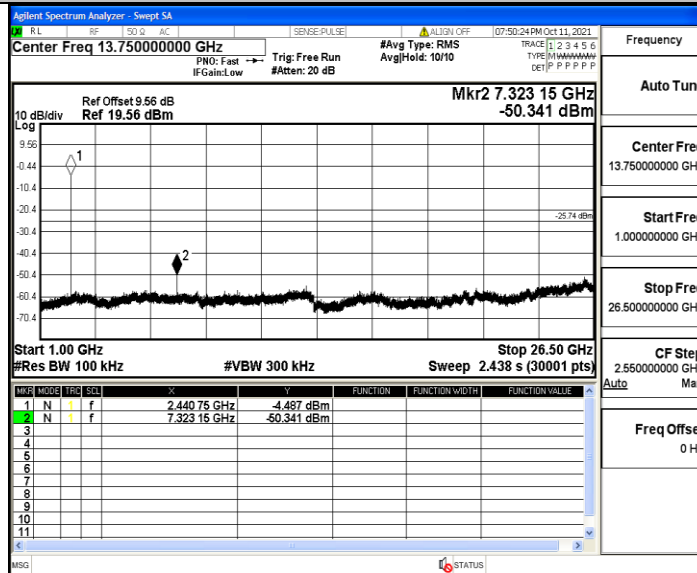
3DH5_Ant1_2441_0~Reference



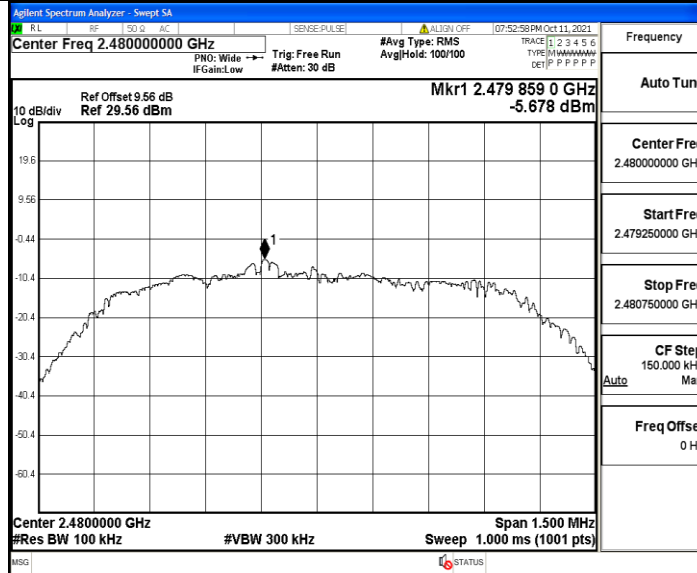
3DH5_Ant1_2441_30~1000



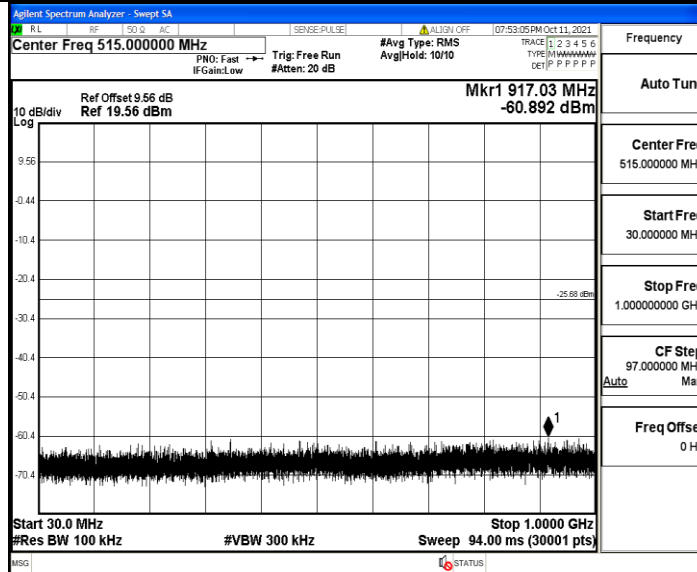
3DH5_Ant1_2441_1000~26500



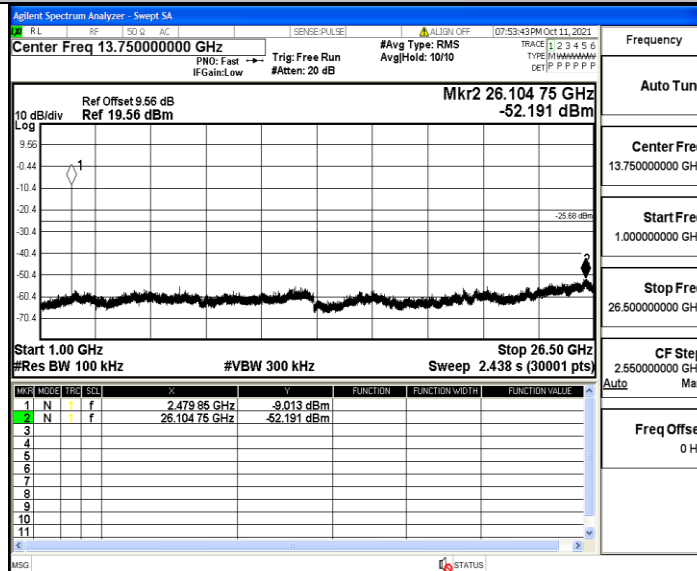
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



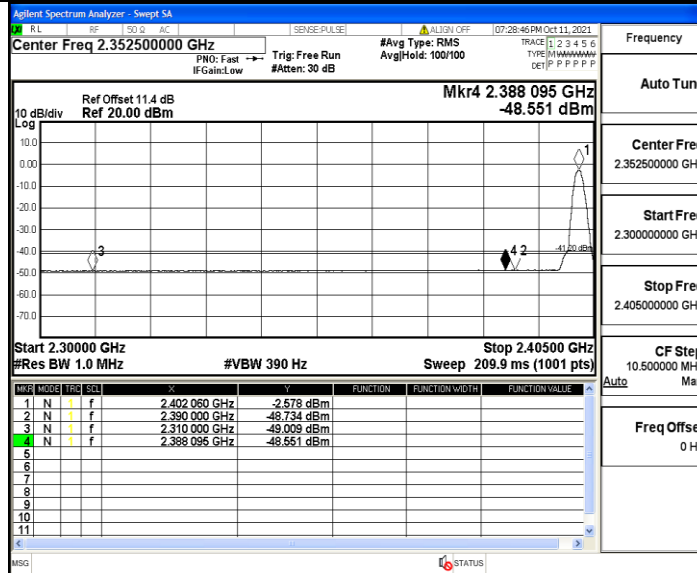
A.8 Restrict-band band-edge measurements

TestMode	Antenna	ChName	Channel	Detector	Freq(MHz)	Result(dBm)	Limit(dBm)	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-49.01	≤-41.20	PASS
				AV	2388.095	-48.55	≤-41.20	PASS
				AV	2390.000	-48.73	≤-41.20	PASS
				Peak	2310.000	-41.04	≤-21.20	PASS
				Peak	2358.695	-38.58	≤-21.20	PASS
				Peak	2390.000	-41.74	≤-21.20	PASS
		High	2480	AV	2483.500	-47.49	≤-41.20	PASS
				AV	2483.600	-47.45	≤-41.20	PASS
				AV	2500.000	-48	≤-41.20	PASS
				Peak	2483.500	-40.42	≤-21.20	PASS
				Peak	2489.600	-36.88	≤-21.20	PASS
				Peak	2500.000	-40.11	≤-21.20	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-48.98	≤-41.20	PASS
				AV	2387.885	-48.6	≤-41.20	PASS
				AV	2390.000	-48.78	≤-41.20	PASS
				Peak	2310.000	-42.81	≤-21.20	PASS
				Peak	2382.425	-38.66	≤-21.20	PASS
				Peak	2390.000	-42.09	≤-21.20	PASS
		High	2480	AV	2483.500	-48.1	≤-41.20	PASS
				AV	2494.480	-47.9	≤-41.20	PASS
				AV	2500.000	-47.97	≤-41.20	PASS
				Peak	2483.500	-40.13	≤-21.20	PASS
				Peak	2484.160	-38.51	≤-21.20	PASS
				Peak	2500.000	-40.71	≤-21.20	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-49.04	≤-41.20	PASS
				AV	2376.650	-48.57	≤-41.20	PASS
				AV	2390.000	-48.7	≤-41.20	PASS
				Peak	2310.000	-41.56	≤-21.20	PASS
				Peak	2370.560	-38.07	≤-21.20	PASS
				Peak	2390.000	-41.1	≤-21.20	PASS
		High	2480	AV	2483.500	-48.18	≤-41.20	PASS
				AV	2498.800	-47.92	≤-41.20	PASS
				AV	2500.000	-47.92	≤-41.20	PASS
				Peak	2483.500	-40.02	≤-21.20	PASS
				Peak	2495.280	-39.09	≤-21.20	PASS
				Peak	2500.000	-41.55	≤-21.20	PASS

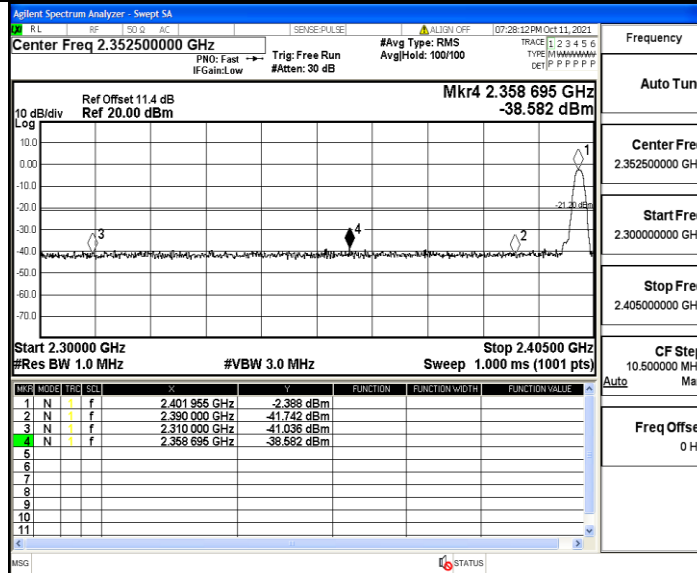
1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

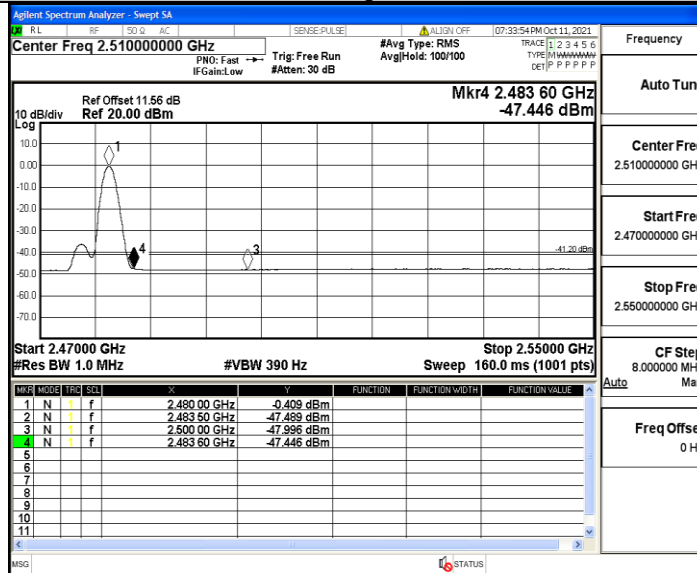
DH5_Ant1_Low_2402_AV



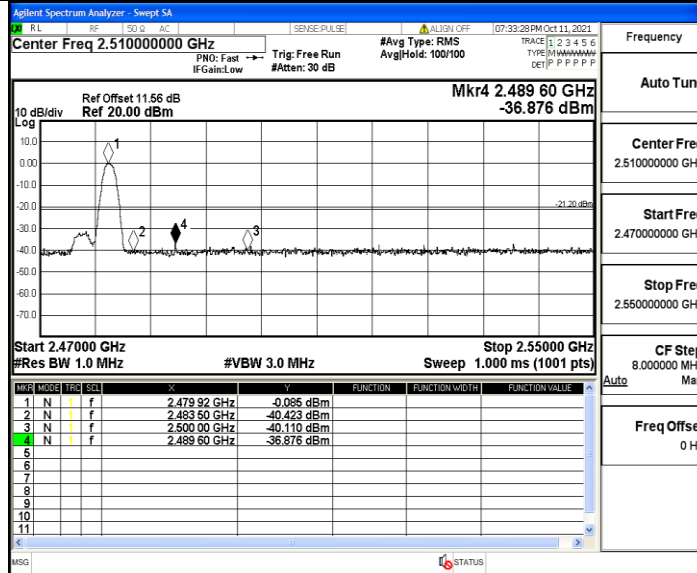
DH5_Ant1_Low_2402_Peak



DH5_Ant1_High_2480_AV

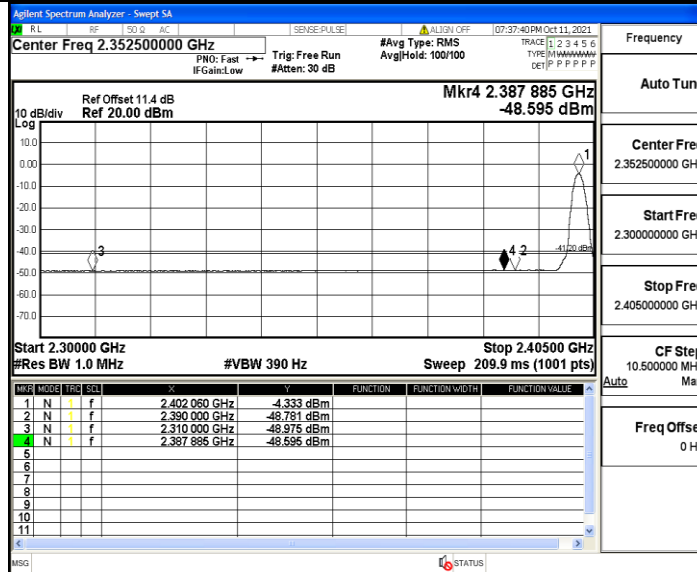


DH5_Ant1_High_2480_Peak



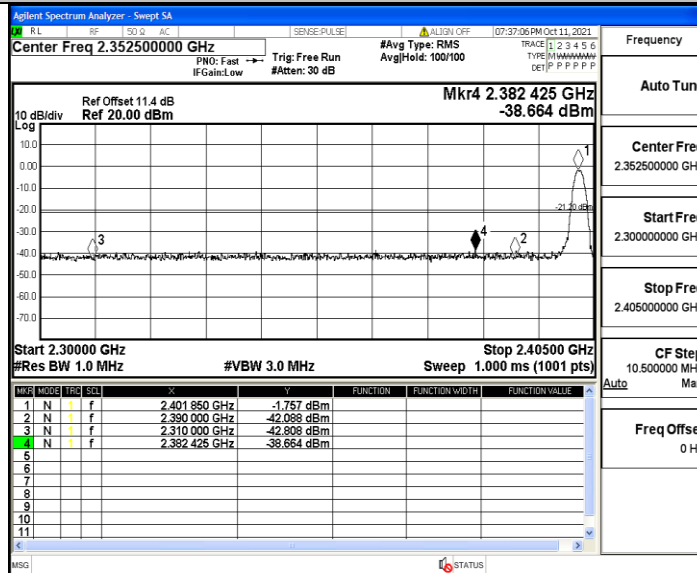
Frequency	Auto Tune
Center Freq	2.510000000 GHz
Start Freq	2.470000000 GHz
Stop Freq	2.550000000 GHz
CF Step	8.000000 MHz
Freq Offset	0 Hz

2DH5_Ant1_Low_2402_AV



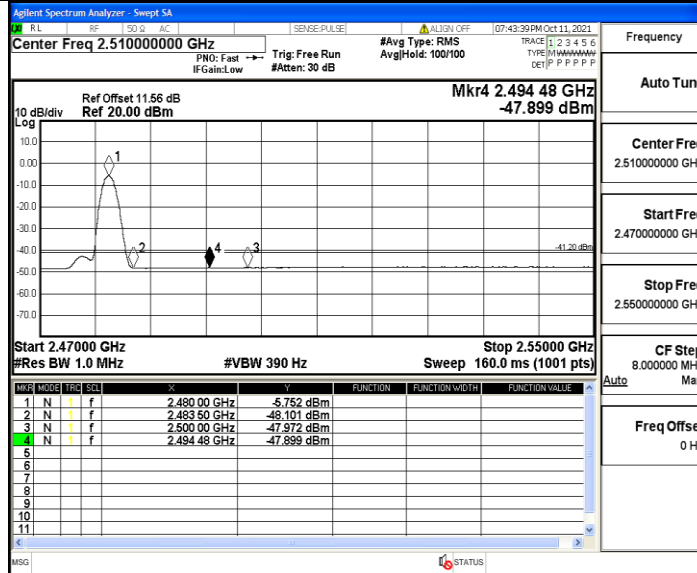
Frequency	Auto Tune
Center Freq	2.352500000 GHz
Start Freq	2.300000000 GHz
Stop Freq	2.405000000 GHz
CF Step	10.500000 MHz
Freq Offset	0 Hz

2DH5_Ant1_Low_2402_Peak

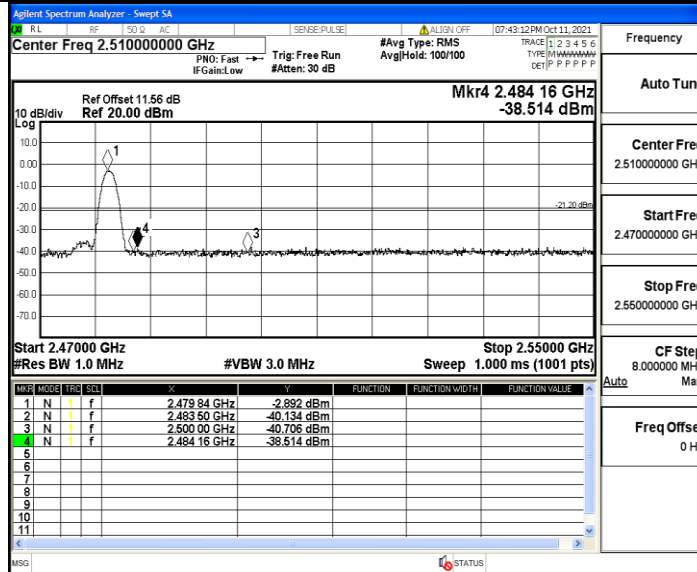


Frequency	Auto Tune
Center Freq	2.352500000 GHz
Start Freq	2.300000000 GHz
Stop Freq	2.405000000 GHz
CF Step	10.500000 MHz
Freq Offset	0 Hz

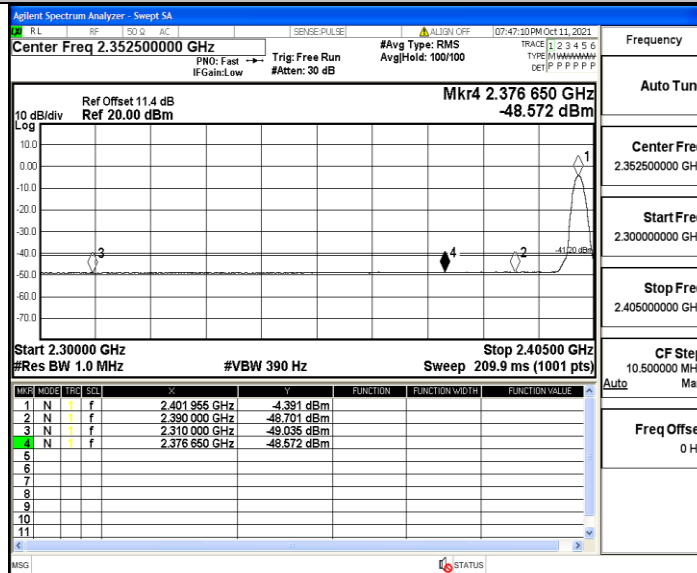
2DH5_Ant1_High_2480_AV



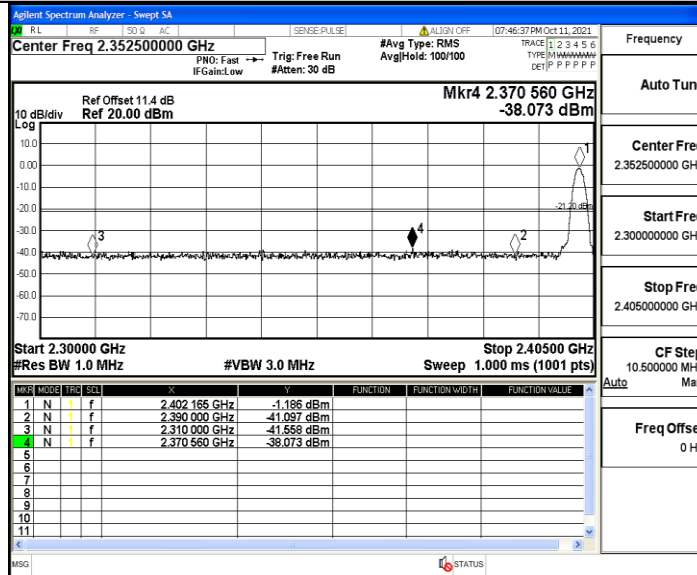
2DH5_Ant1_High_2480_Peak



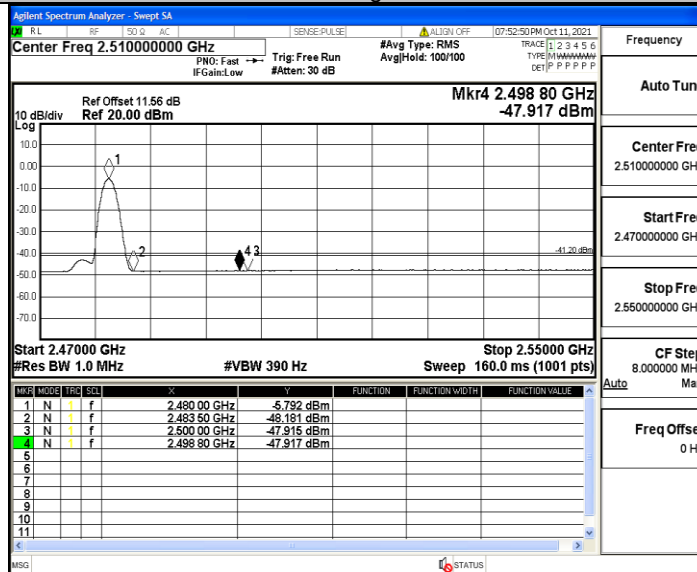
3DH5_Ant1_Low_2402_AV



3DH5_Ant1_Low_2402_Peak



3DH5_Ant1_High_2480_AV



3DH5_Ant1_High_2480_Peak

