

Appendix A

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

Product Name: Bluetooth Headphones

Trade Mark: Altec Lansing

Test Model: MZX4400

FCC ID: 2AL9B-MZX4400

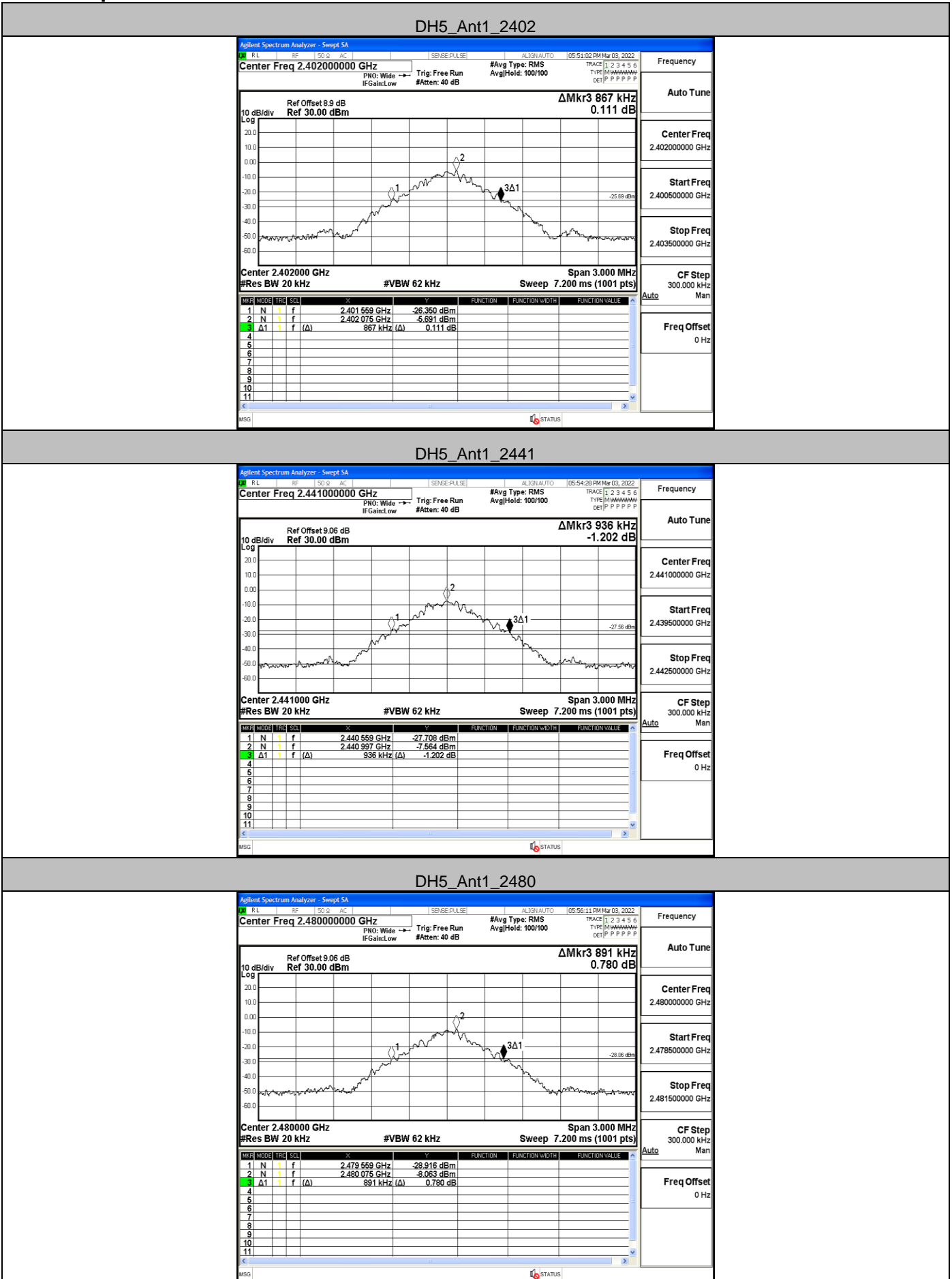
Environmental Conditions

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

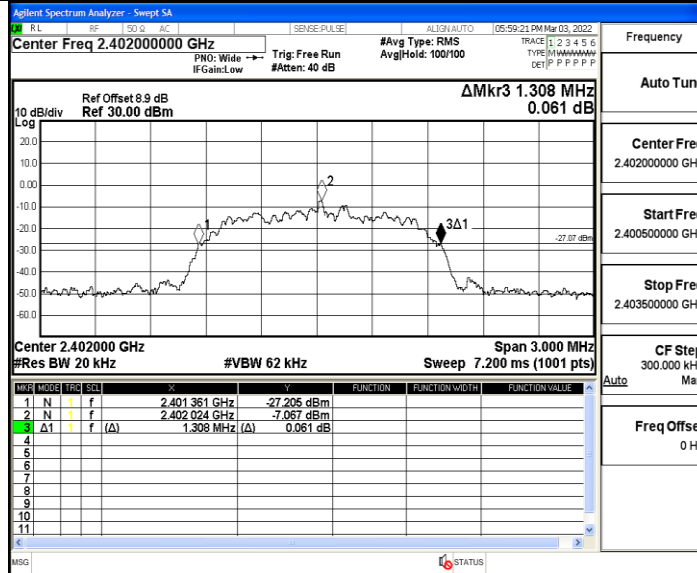
A.1 20 dB Bandwidth

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.867	2401.559	2402.426	---	---
		2441	0.936	2440.559	2441.495	---	---
		2480	0.891	2479.559	2480.450	---	---
2DH5	Ant1	2402	1.308	2401.361	2402.669	---	---
		2441	1.314	2440.358	2441.672	---	---
		2480	1.290	2479.382	2480.672	---	---
3DH5	Ant1	2402	1.284	2401.373	2402.657	---	---
		2441	1.311	2440.361	2441.672	---	---
		2480	1.287	2479.379	2480.666	---	---

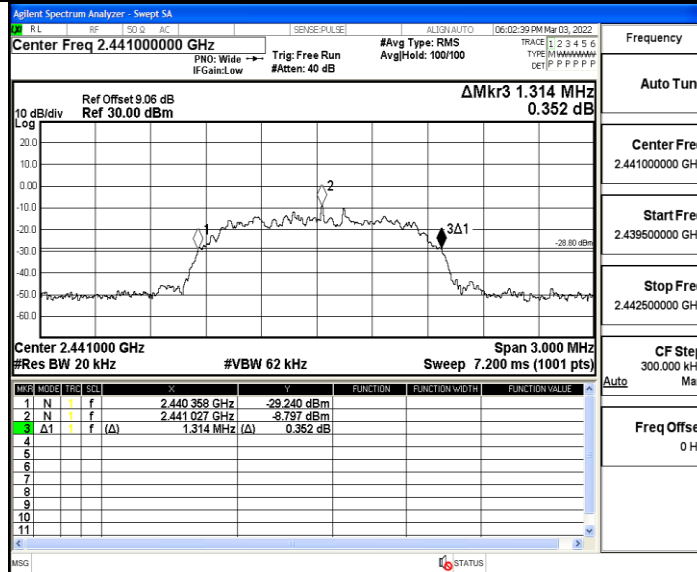
Test Graph



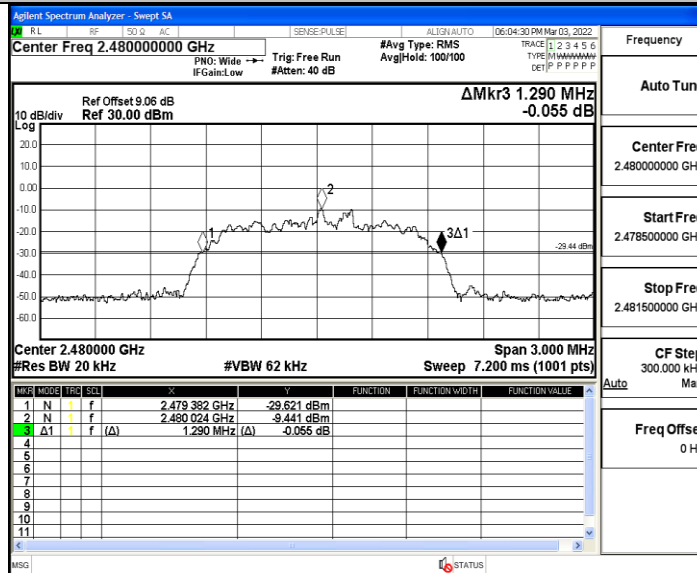
2DH5_Ant1_2402



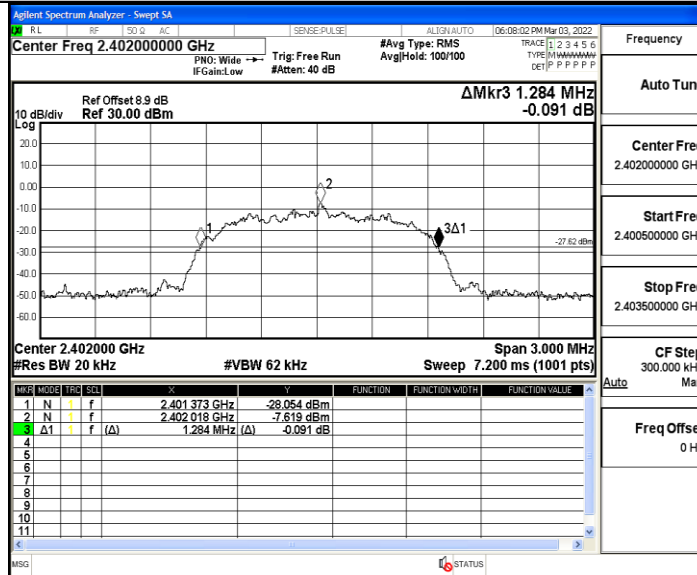
2DH5_Ant1_2441



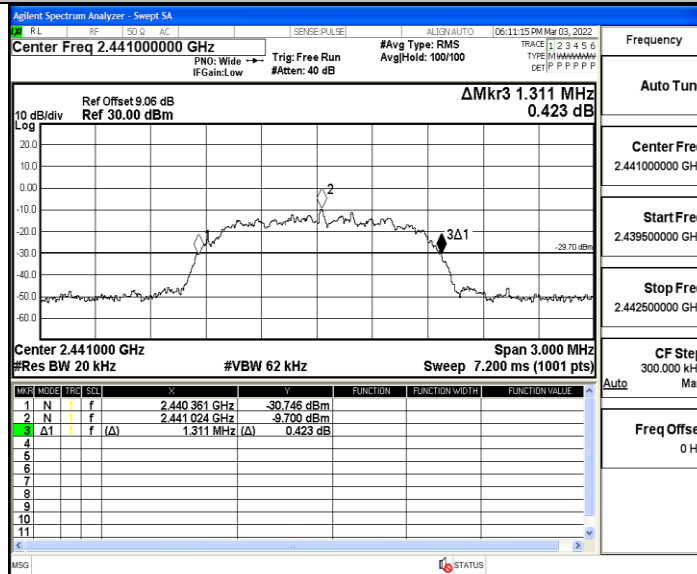
2DH5_Ant1_2480



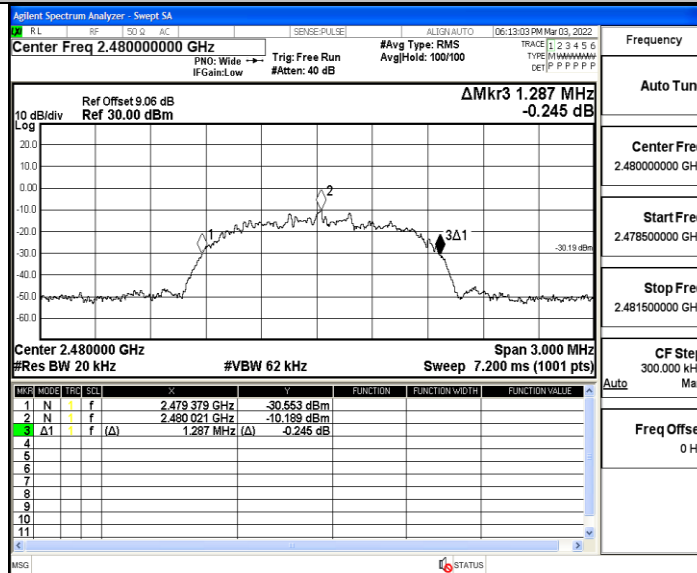
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

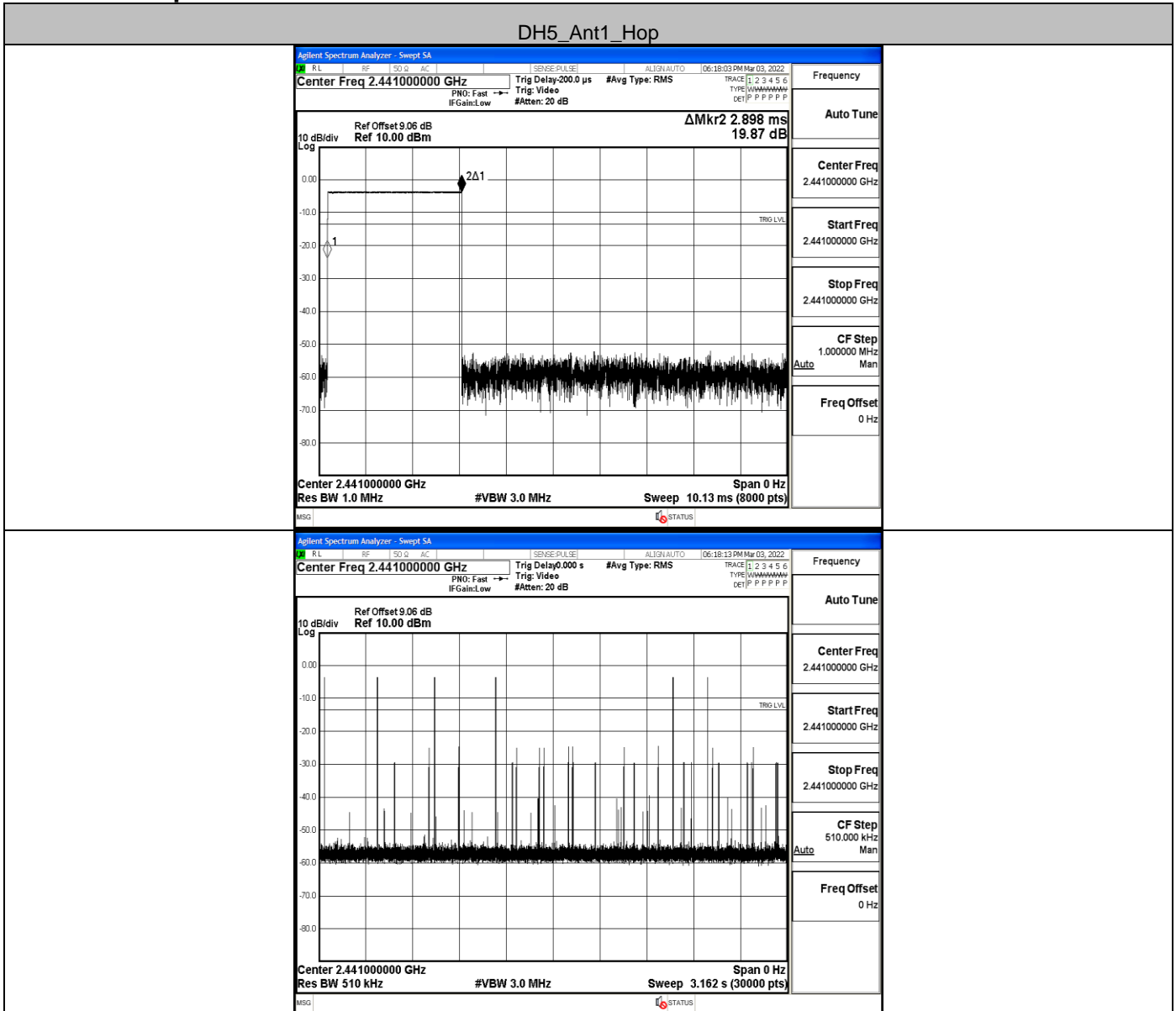


A.2 Dwell Time

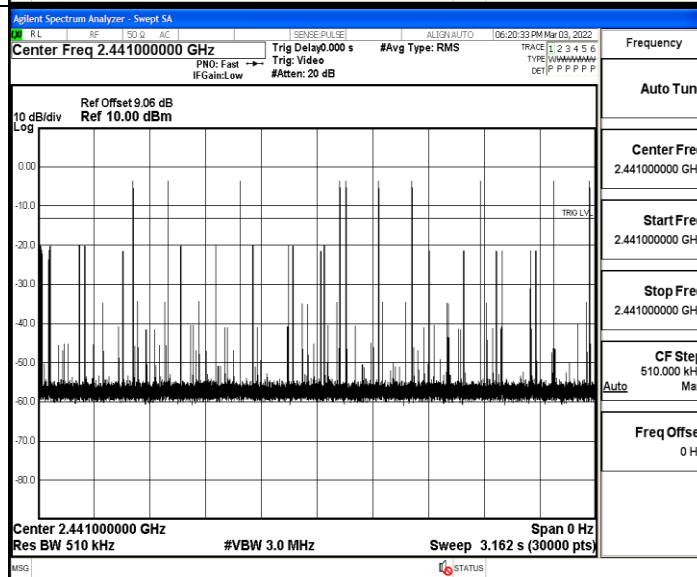
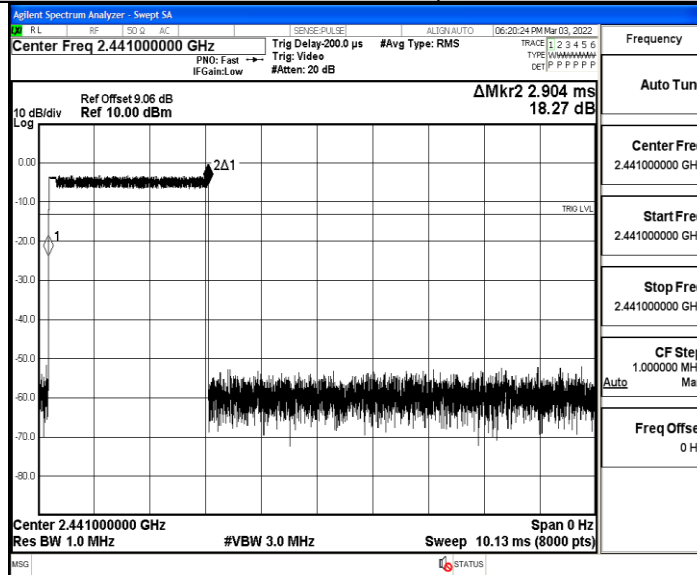
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.90	70	0.203	≤0.4	PASS
2DH5	Ant1	Hop	2.90	110	0.319	≤0.4	PASS
3DH5	Ant1	Hop	2.91	100	0.291	≤0.4	PASS

Test Graph

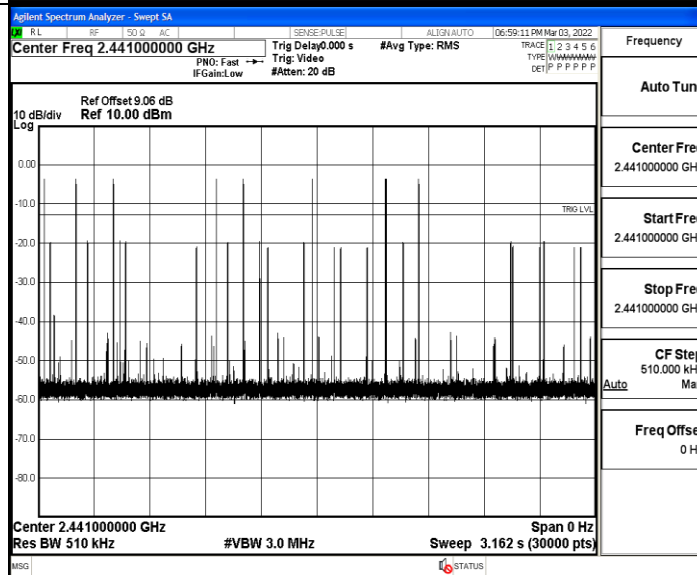
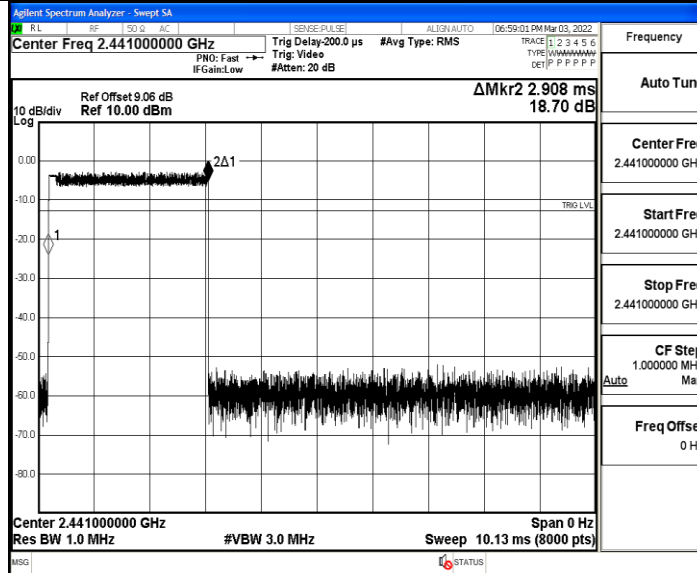
DH5_Ant1_Hop



2DH5_Ant1_Hop



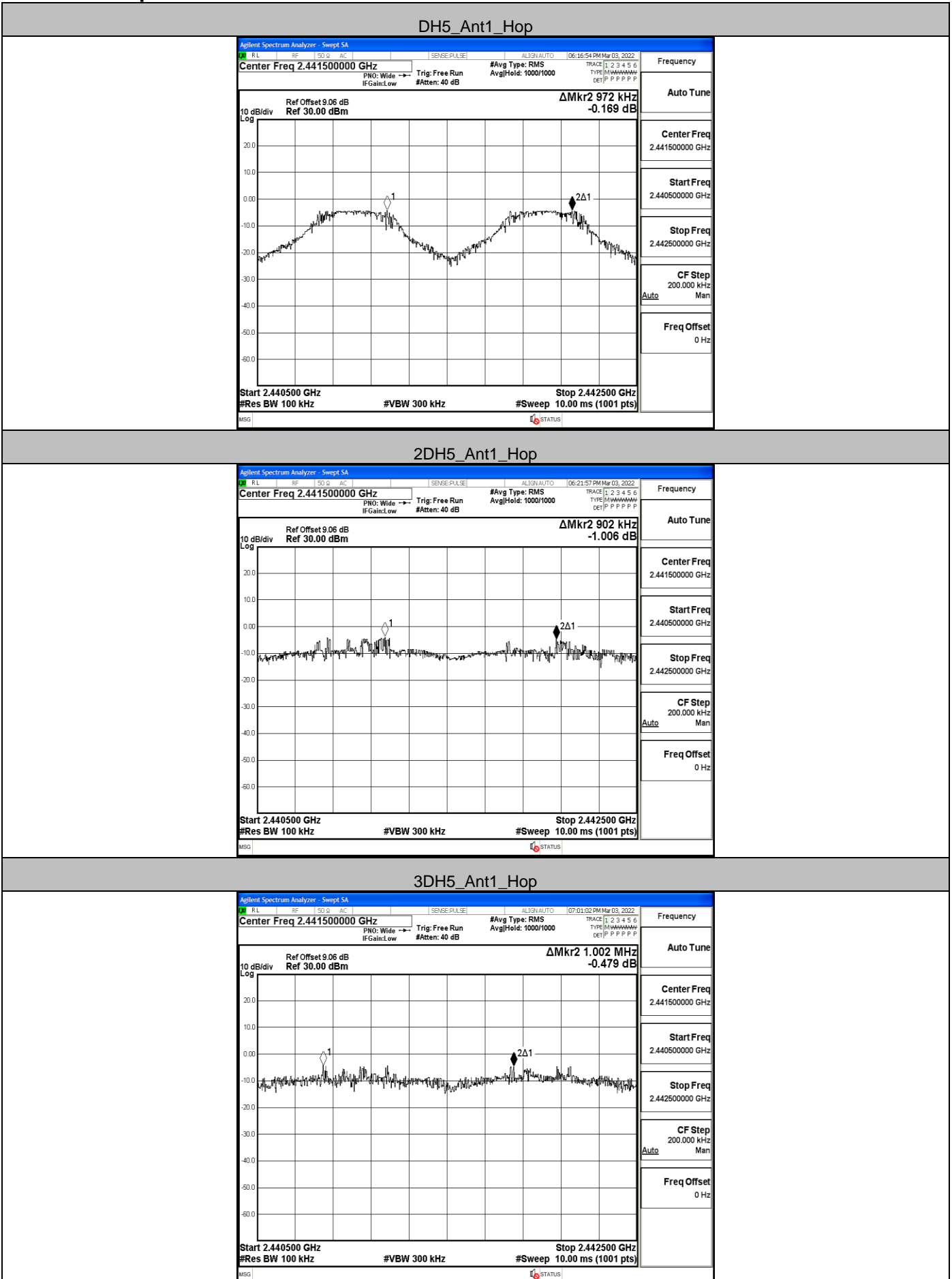
3DH5_Ant1_Hop



A.3 Carrier Frequency Separation

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.972	≥ 0.936	PASS
2DH5	Ant1	Hop	0.902	≥ 0.876	PASS
3DH5	Ant1	Hop	1.002	≥ 0.874	PASS

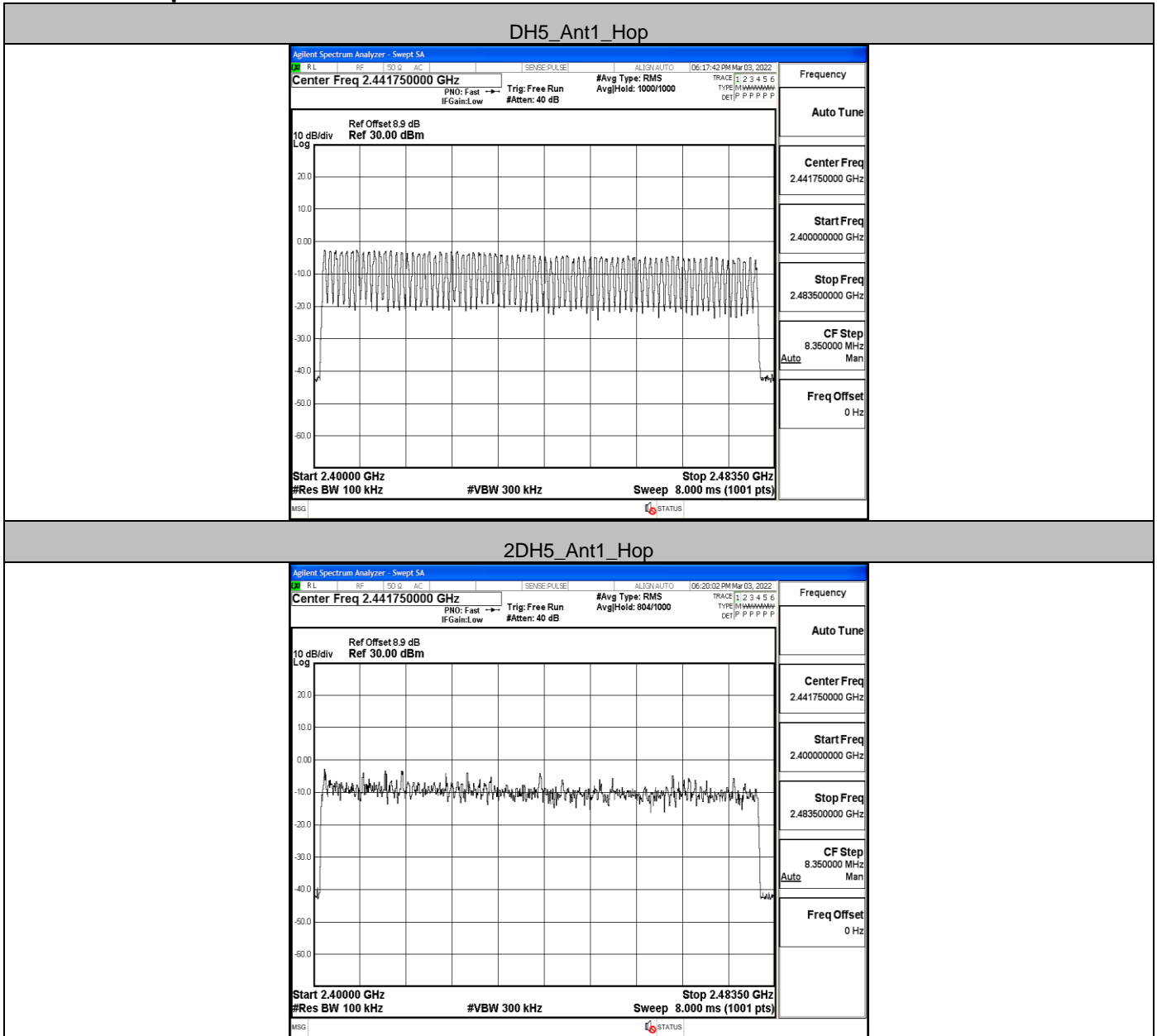
Test Graph



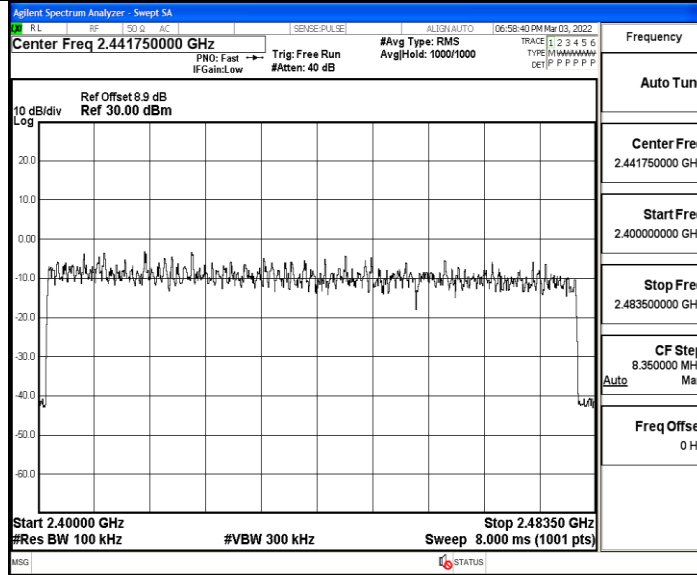
A.4 Hopping Channel Number

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



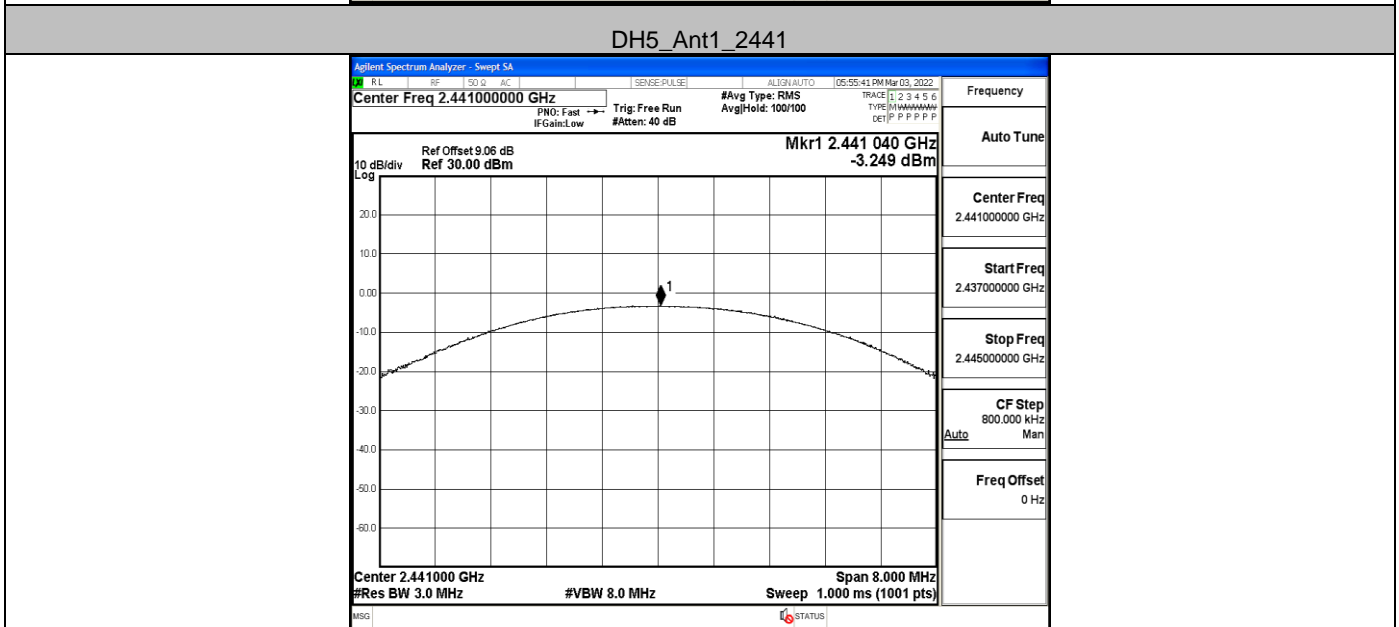
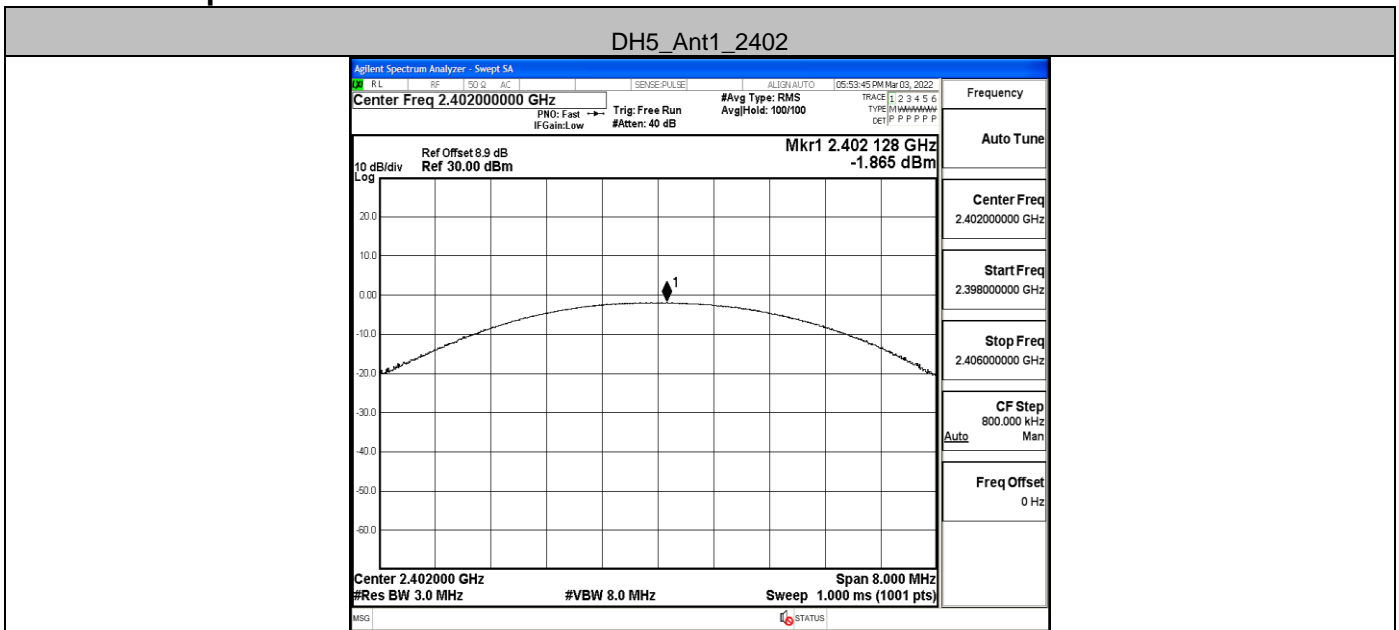
3DH5_Ant1_Hop



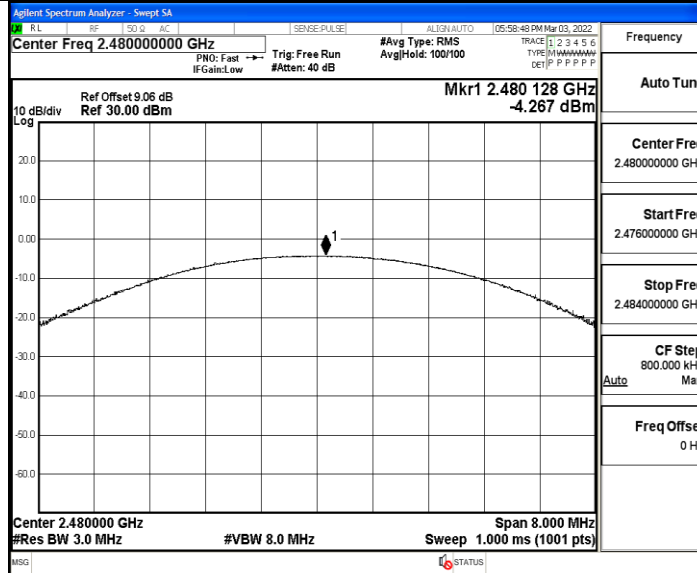
A.5 Conducted Peak Output Power

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	-1.87	≤30	PASS
		2441	-3.25	≤30	PASS
		2480	-4.27	≤30	PASS
2DH5	Ant1	2402	-1.37	≤20.97	PASS
		2441	-2.69	≤20.97	PASS
		2480	-3.53	≤20.97	PASS
3DH5	Ant1	2402	-0.85	≤20.97	PASS
		2441	-2.2	≤20.97	PASS
		2480	-3.22	≤20.97	PASS

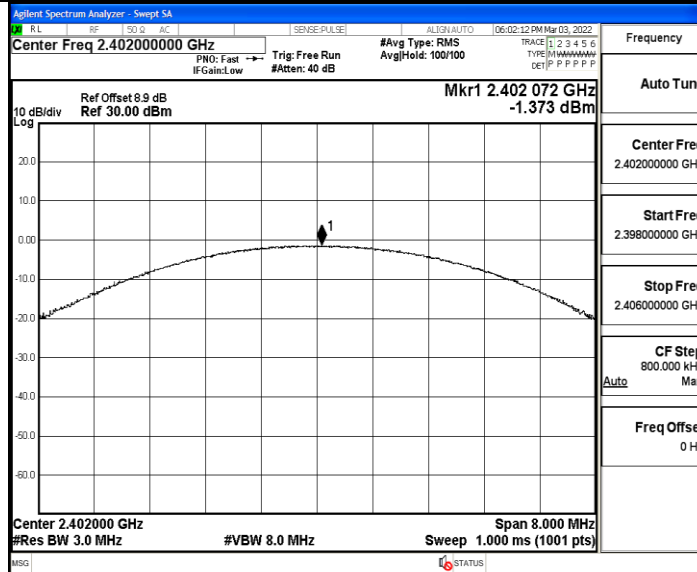
Test Graph



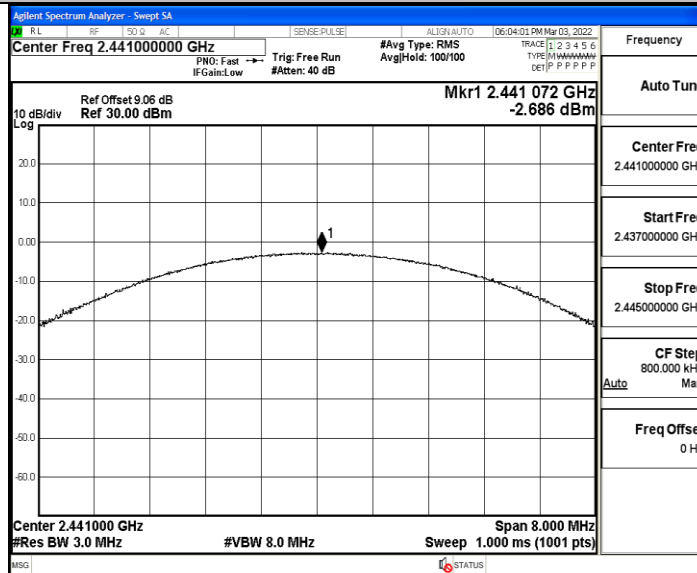
DH5_Ant1_2480



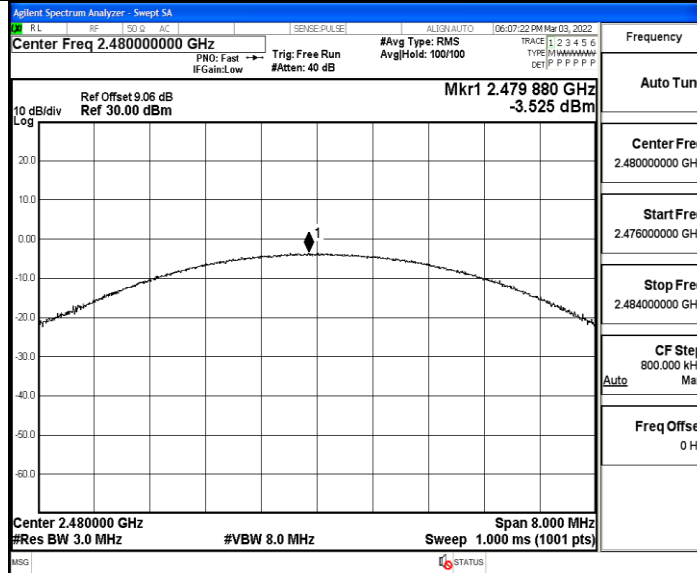
2DH5_Ant1_2402



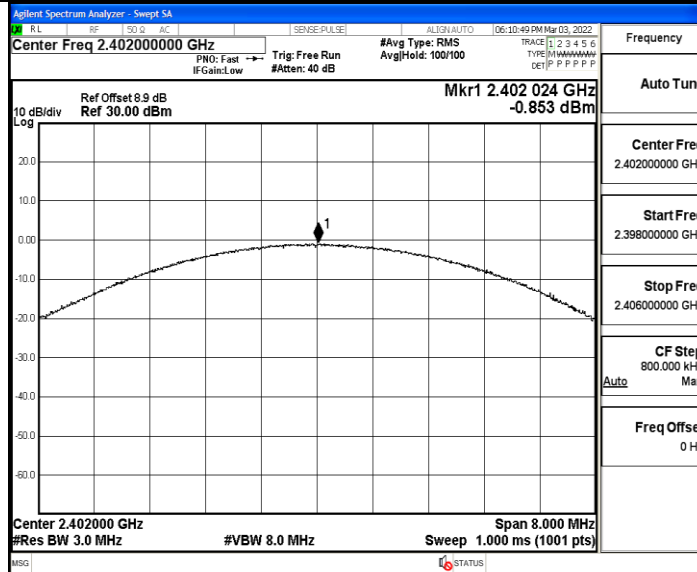
2DH5_Ant1_2441



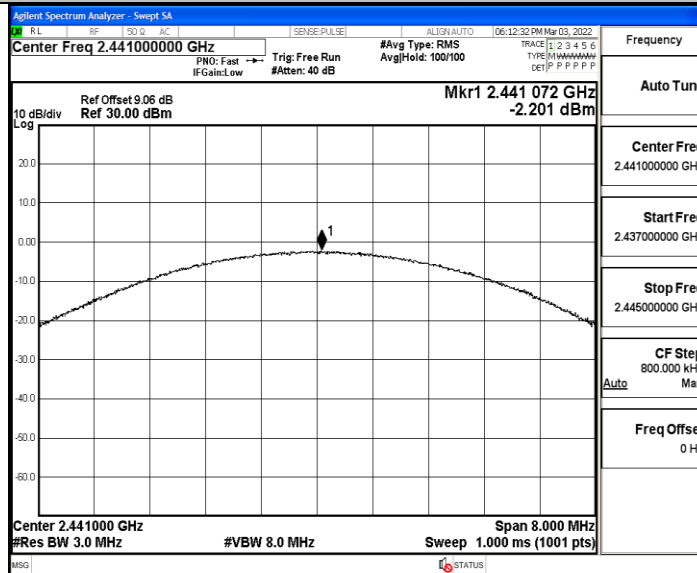
2DH5_Ant1_2480



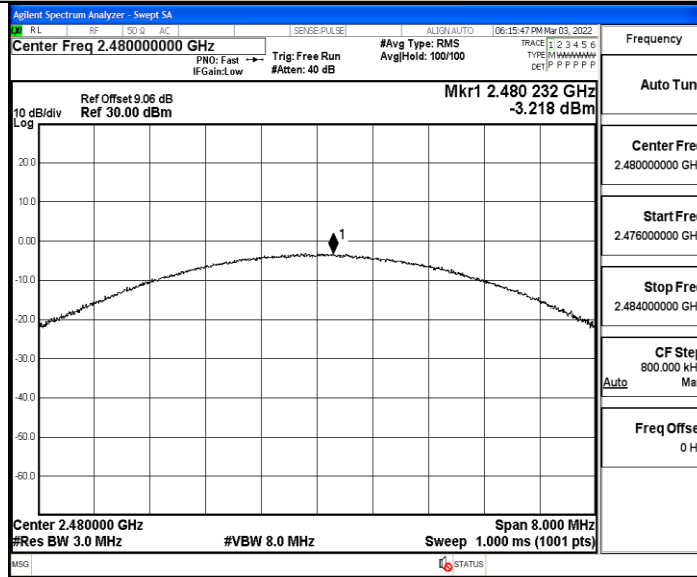
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

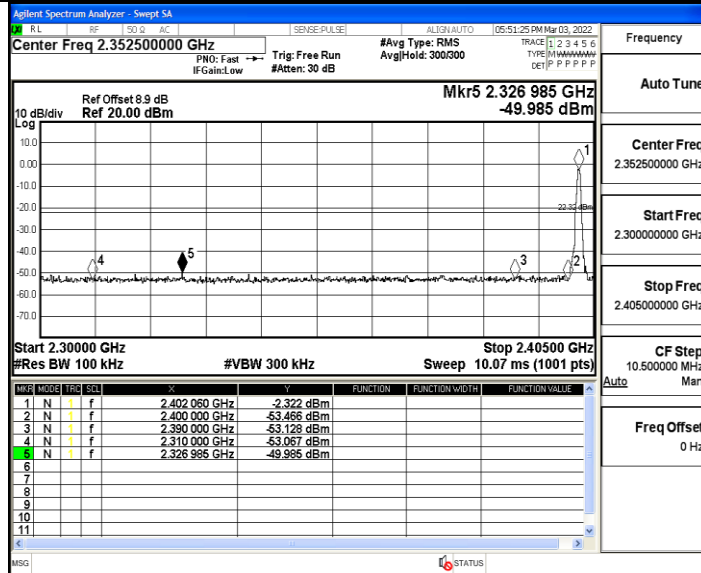


A.6 Band-edge for RF Conducted Emissions

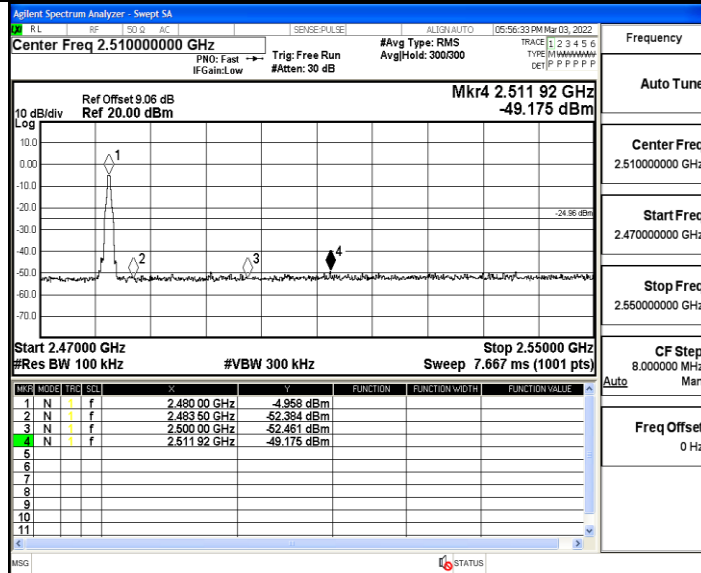
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-2.32	-49.99	≤-22.32	PASS
		High	2480	-4.96	-49.18	≤-24.96	PASS
		Low	Hop_2402	-3.24	-50.68	≤-23.24	PASS
		High	Hop_2480	-4.55	-49.5	≤-24.55	PASS
2DH5	Ant1	Low	2402	-2.31	-50.24	≤-22.31	PASS
		High	2480	-7.43	-49.41	≤-27.43	PASS
		Low	Hop_2402	-6.61	-50.89	≤-26.61	PASS
		High	Hop_2480	-4.54	-49.76	≤-24.54	PASS
3DH5	Ant1	Low	2402	-2.35	-50.42	≤-22.35	PASS
		High	2480	-5.02	-48.75	≤-25.02	PASS
		Low	Hop_2402	-3.78	-50.83	≤-23.78	PASS
		High	Hop_2480	-6.38	-49.87	≤-26.38	PASS

Test Graph

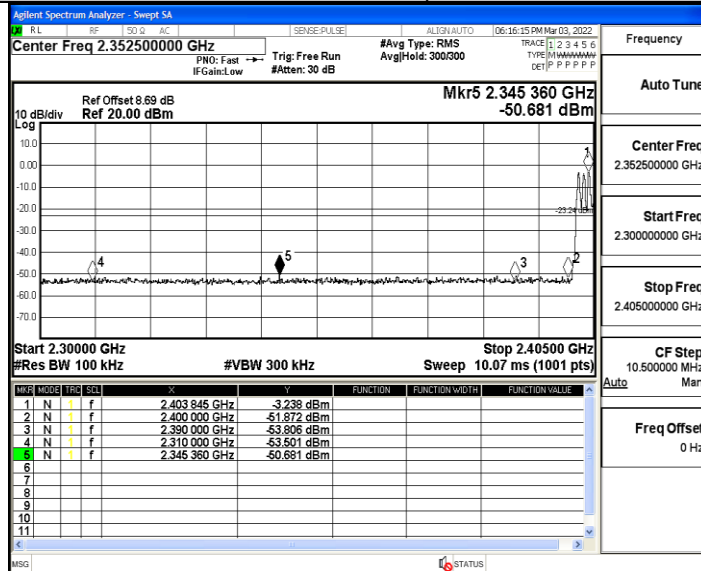
DH5_Ant1_Low_2402



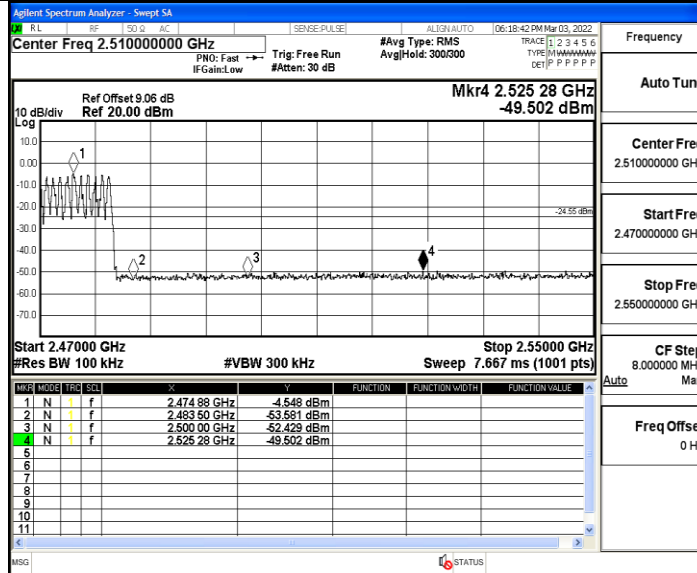
DH5_Ant1_High_2480



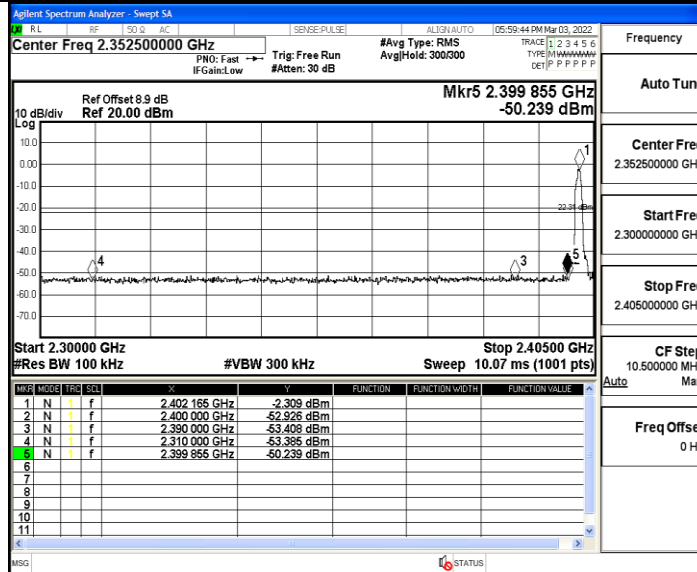
DH5_Ant1_Low_Hop_2402



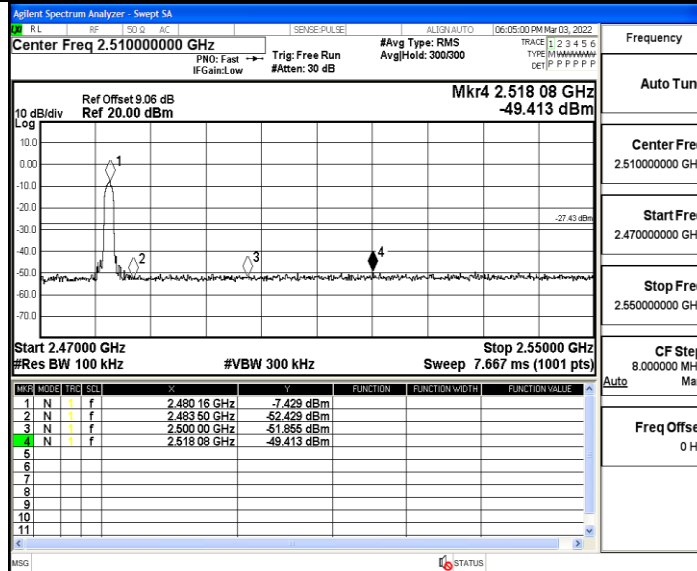
DH5_Ant1_High_Hop_2480



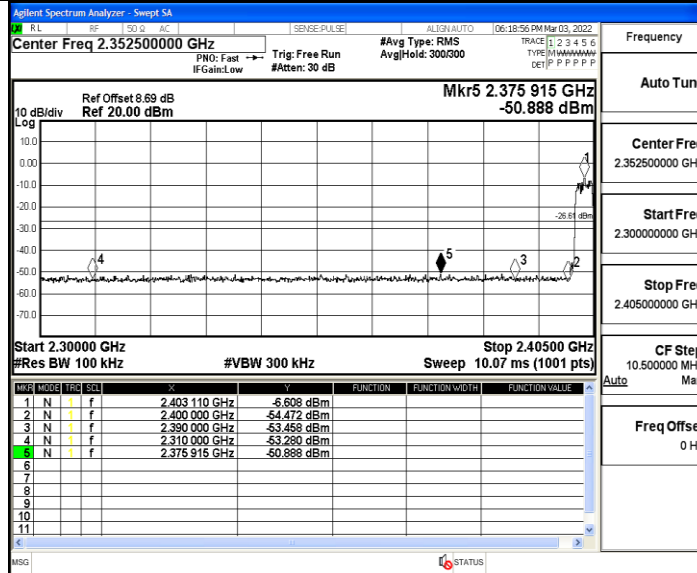
2DH5_Ant1_Low_2402



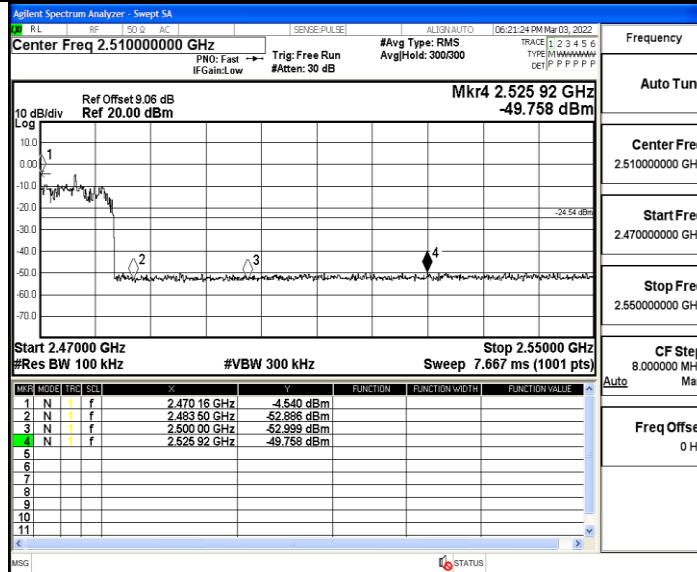
2DH5_Ant1_High_2480



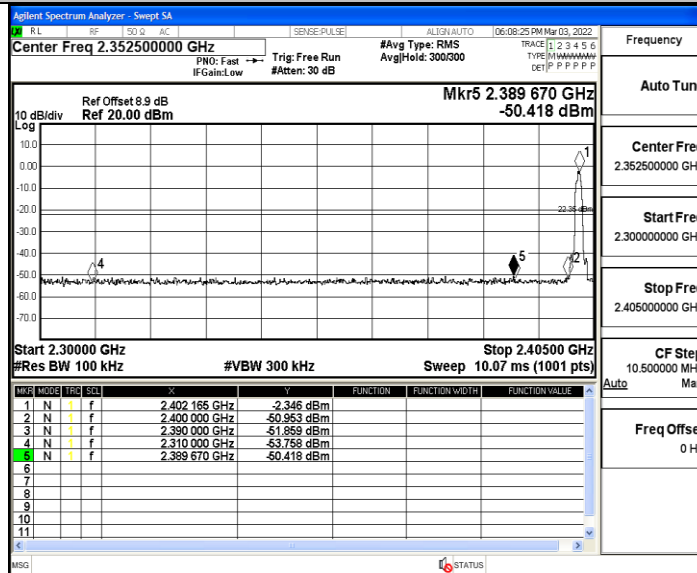
2DH5_Ant1_Low_Hop_2402



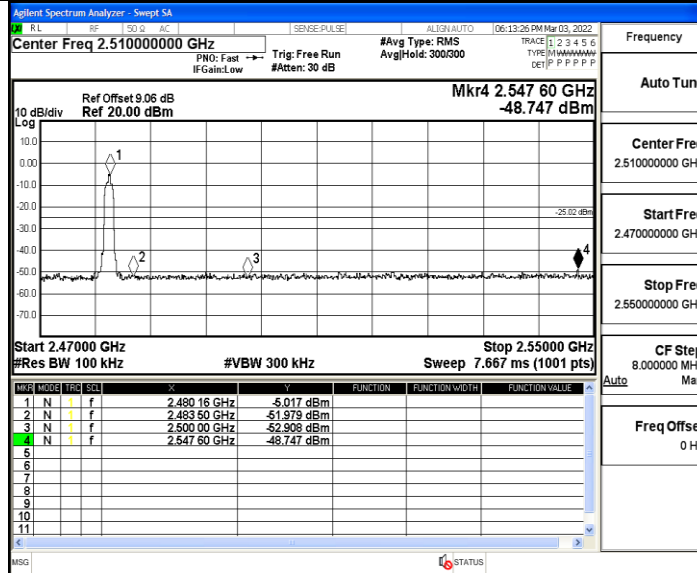
2DH5_Ant1_High_Hop_2480



3DH5_Ant1_Low_2402

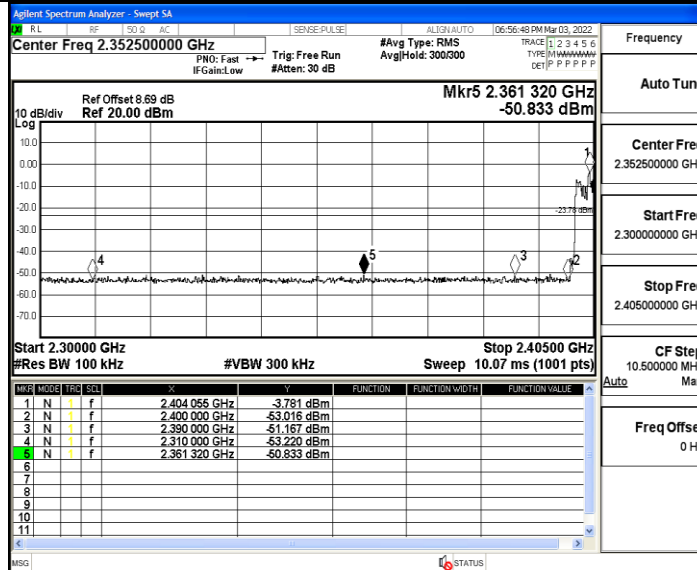


3DH5_Ant1_High_2480



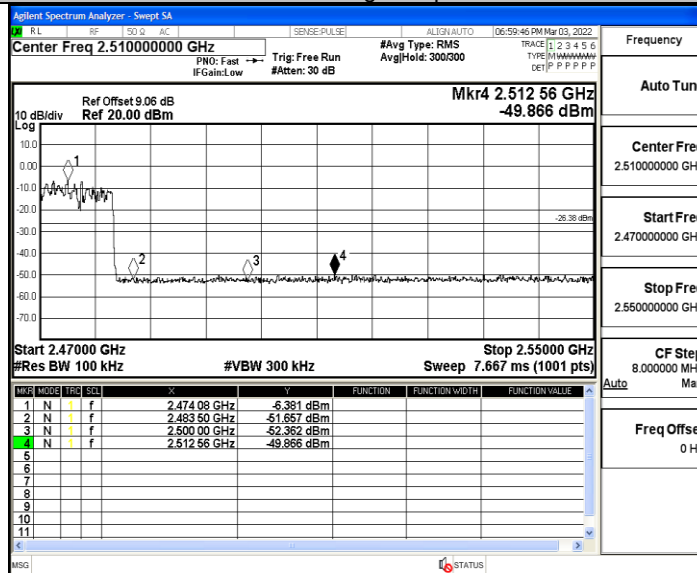
Frequency	Auto Tune
Center Freq	2.51000000 GHz
Start Freq	2.47000000 GHz
Stop Freq	2.55000000 GHz
CF Step	8.000000 MHz
Freq Offset	0 Hz

3DH5_Ant1_Low_Hop_2402



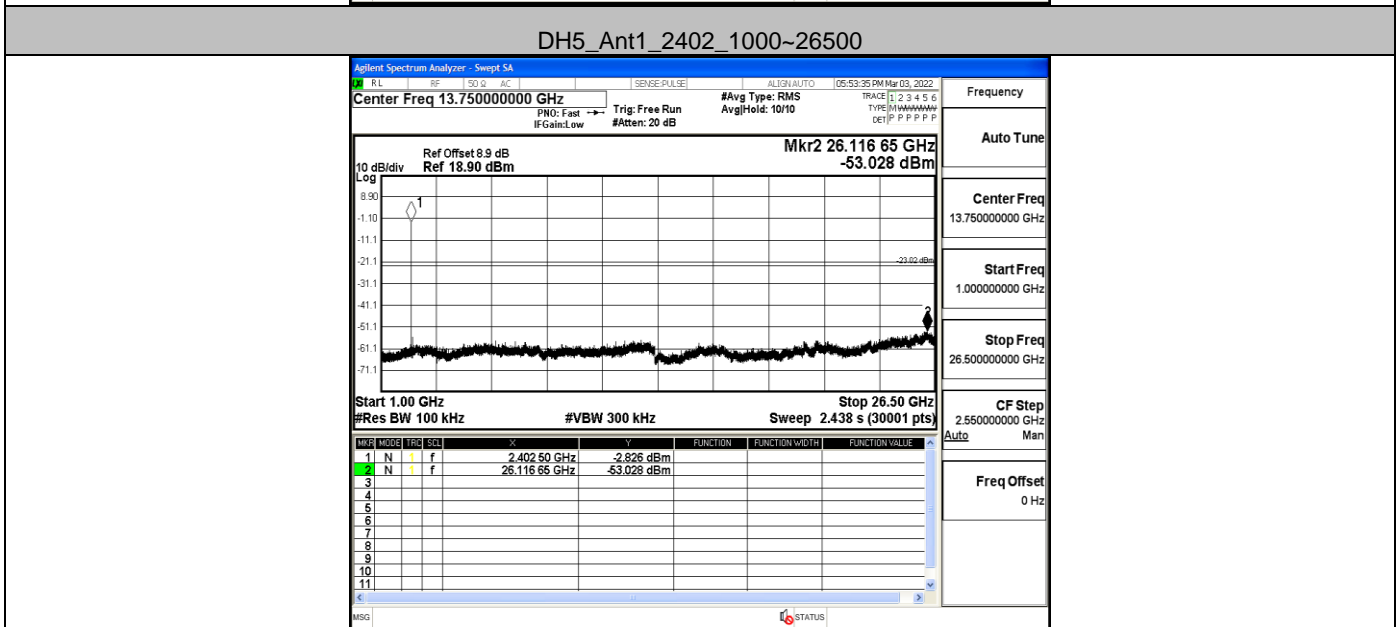
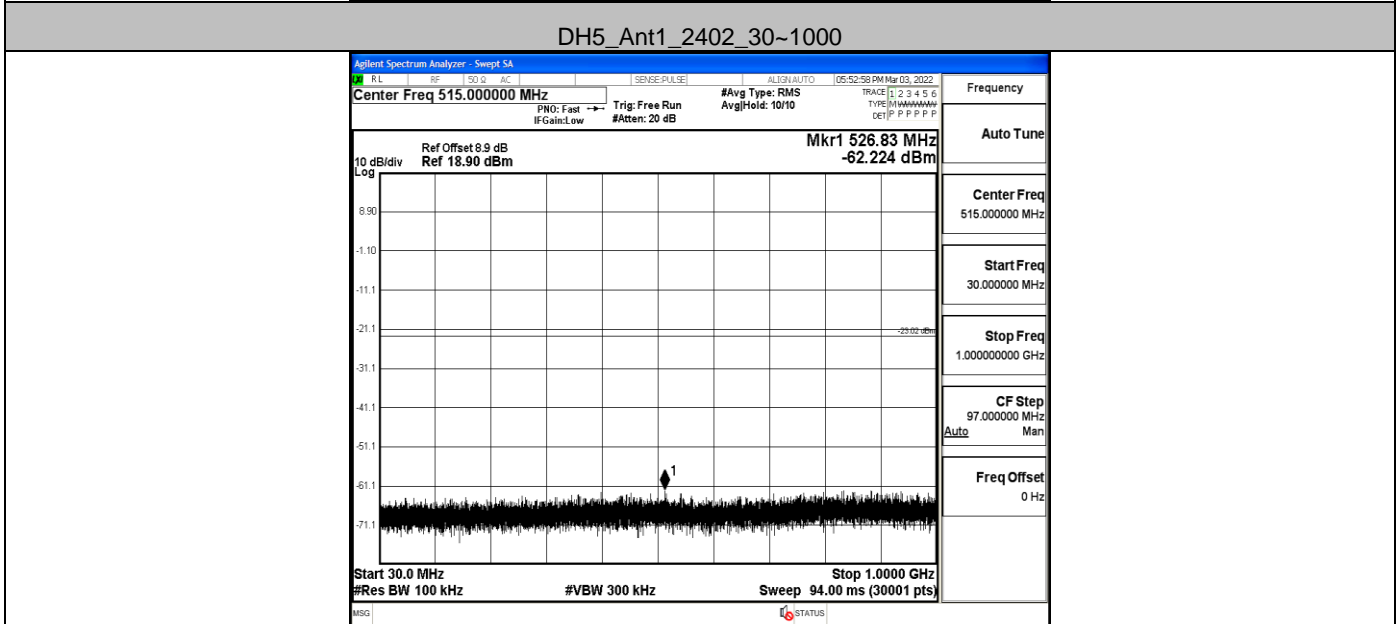
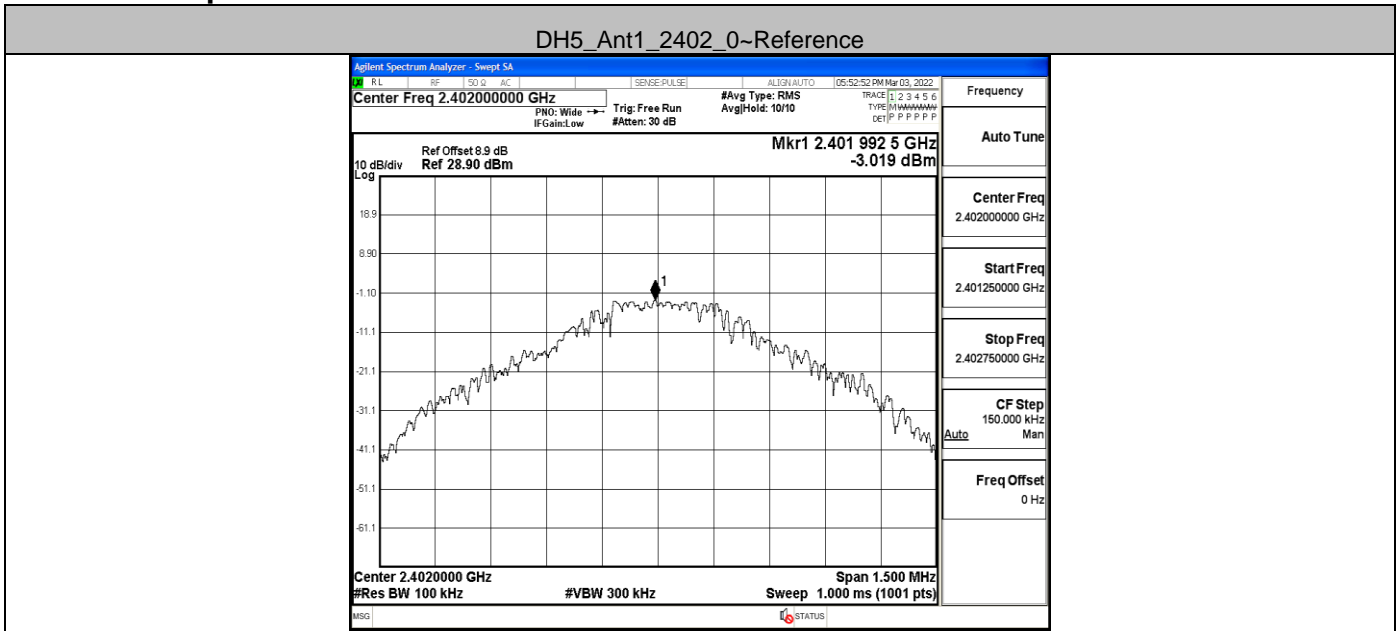
Frequency	Auto Tune
Center Freq	2.35250000 GHz
Start Freq	2.30000000 GHz
Stop Freq	2.40500000 GHz
CF Step	10.500000 MHz
Freq Offset	0 Hz

3DH5_Ant1_High_Hop_2480

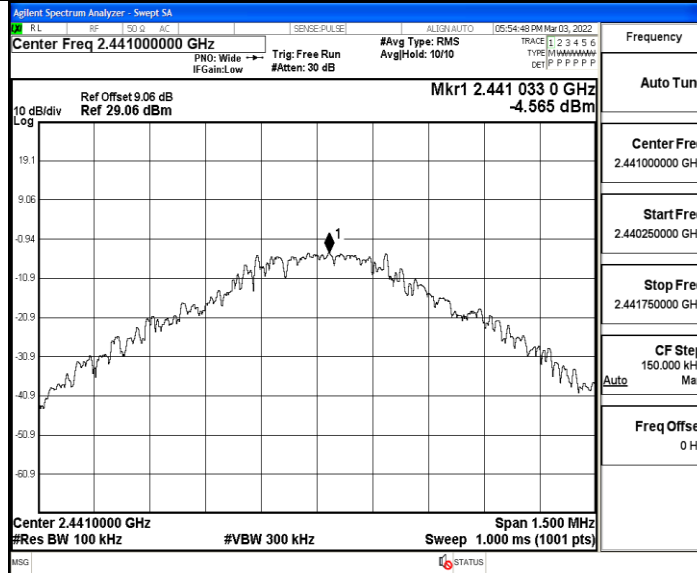


Frequency	Auto Tune
Center Freq	2.51000000 GHz
Start Freq	2.47000000 GHz
Stop Freq	2.55000000 GHz
CF Step	8.000000 MHz
Freq Offset	0 Hz

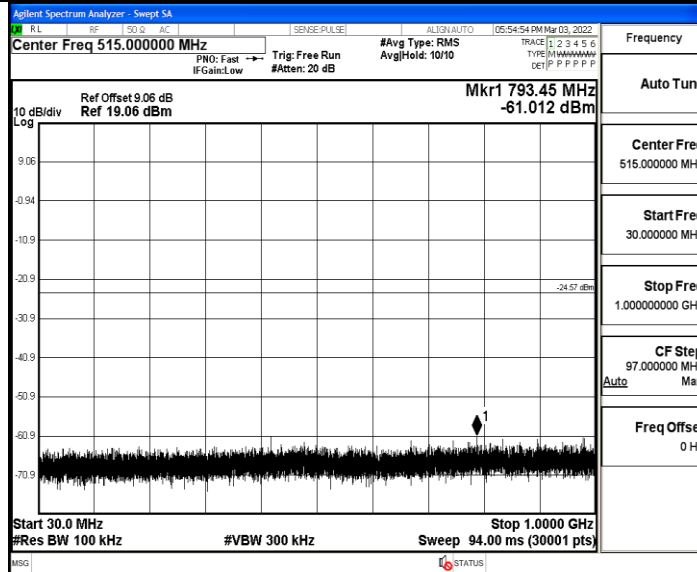
A.7 RF Conducted Spurious Emissions Test Graph



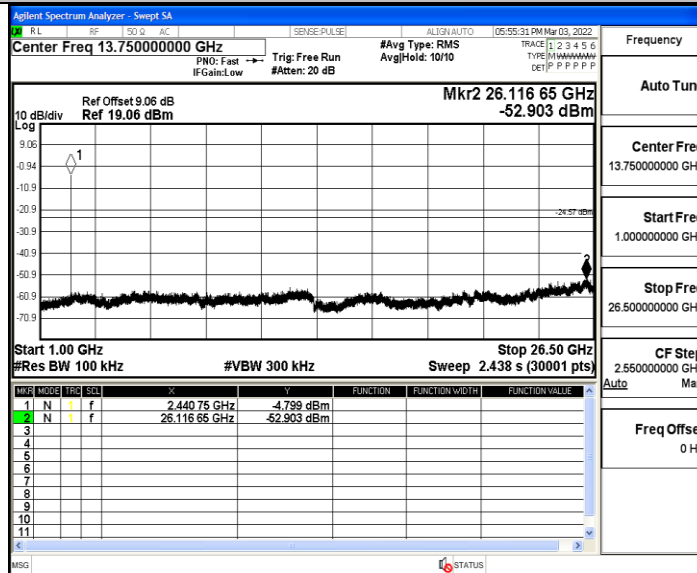
DH5_Ant1_2441_0~Reference



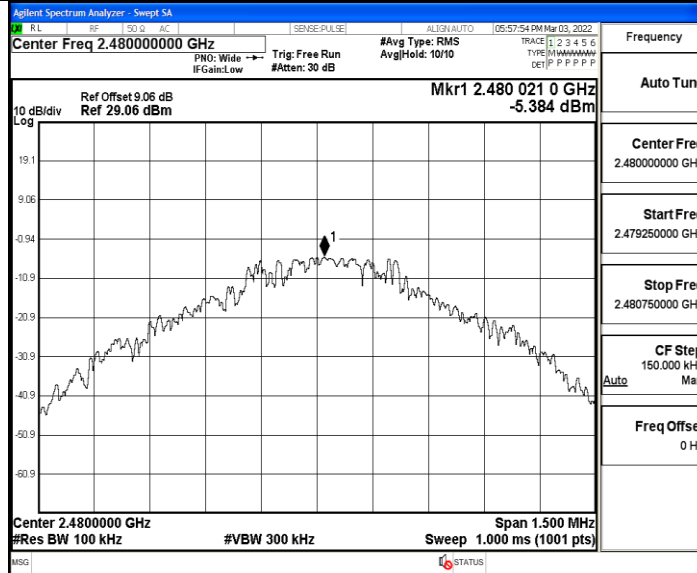
DH5_Ant1_2441_30~1000



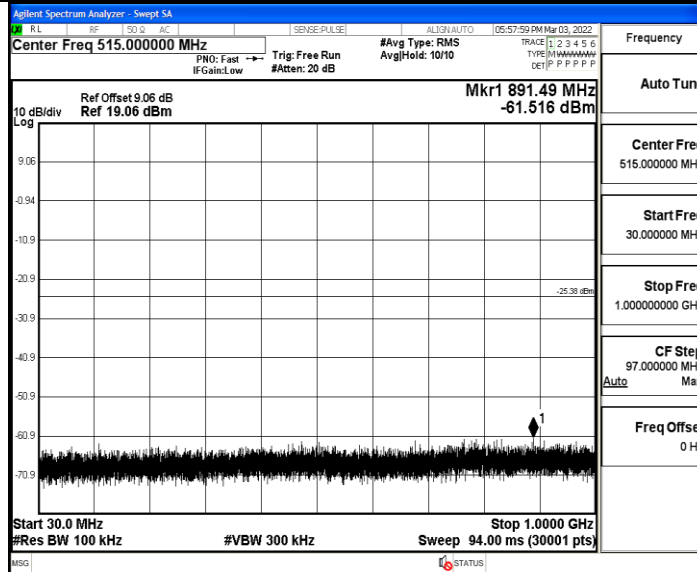
DH5_Ant1_2441_1000~26500



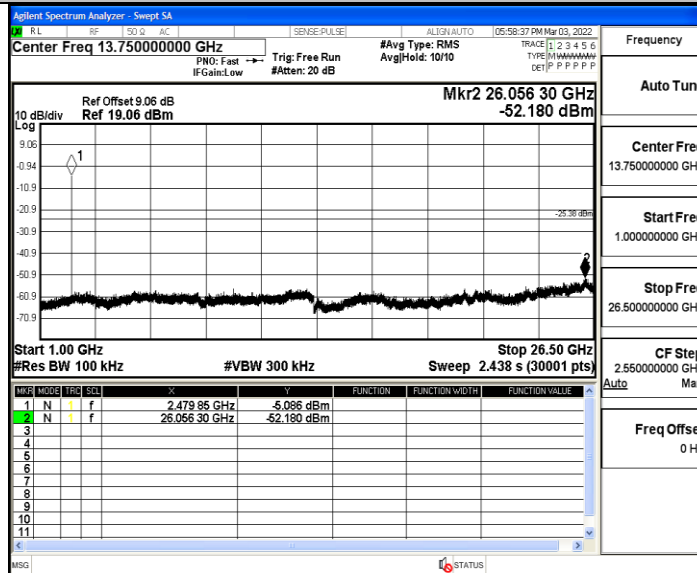
DH5_Ant1_2480_0~Reference



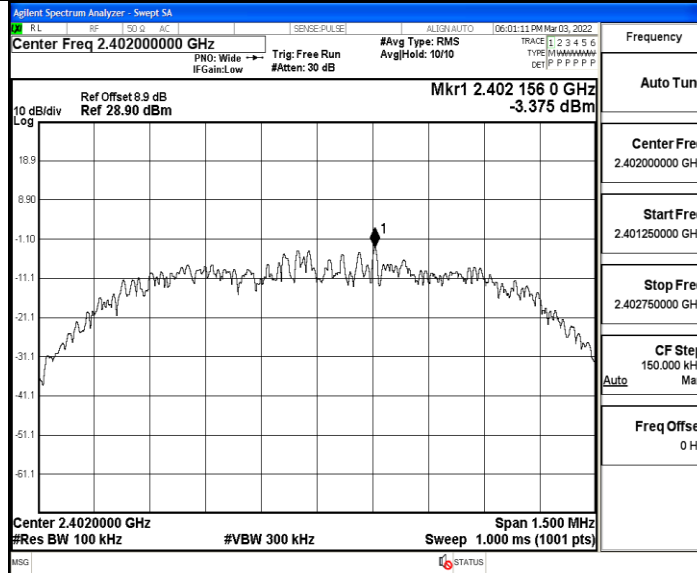
DH5_Ant1_2480_30~1000



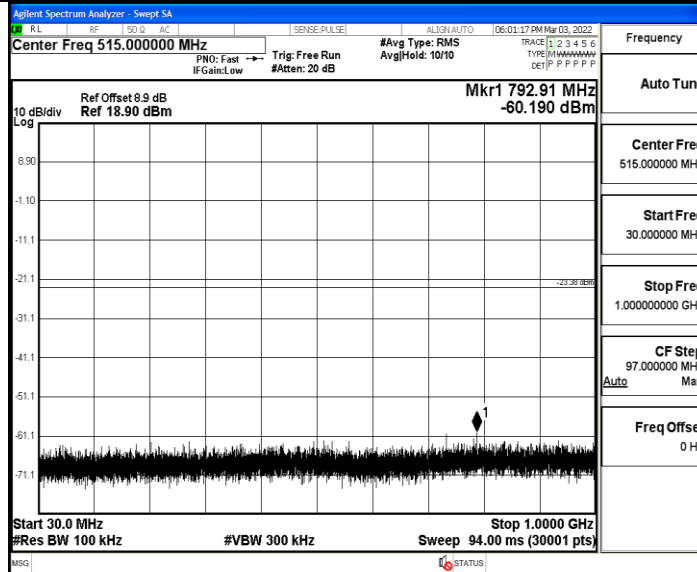
DH5_Ant1_2480_1000~26500



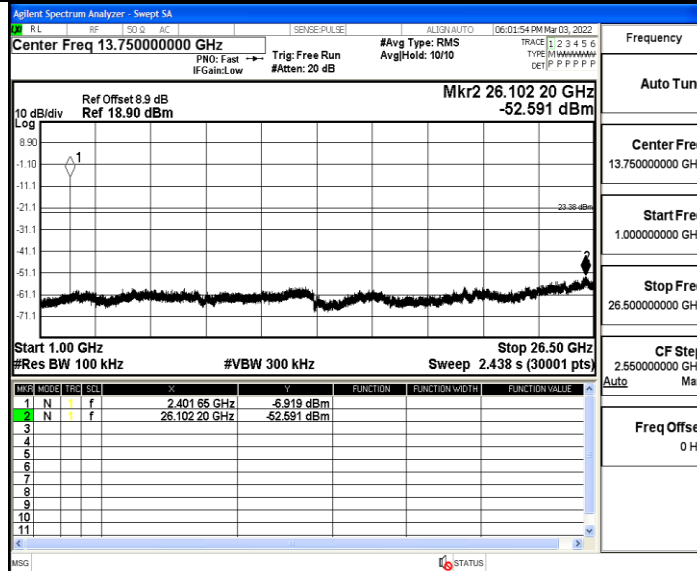
2DH5_Ant1_2402_0~Reference



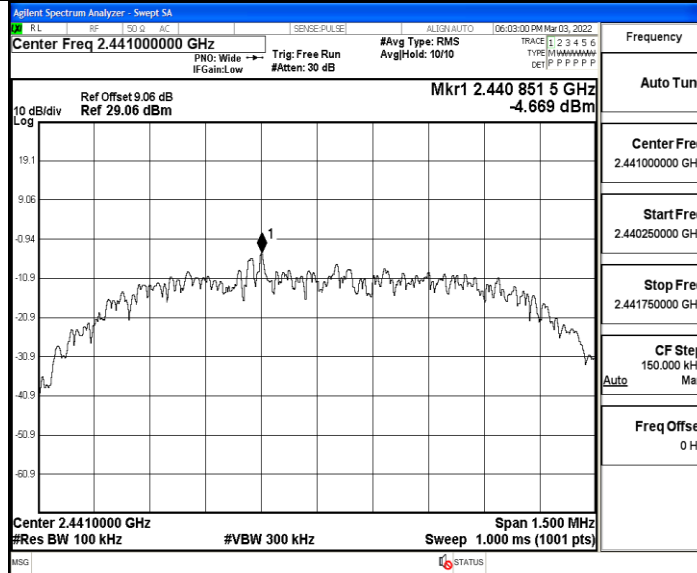
2DH5_Ant1_2402_30~1000



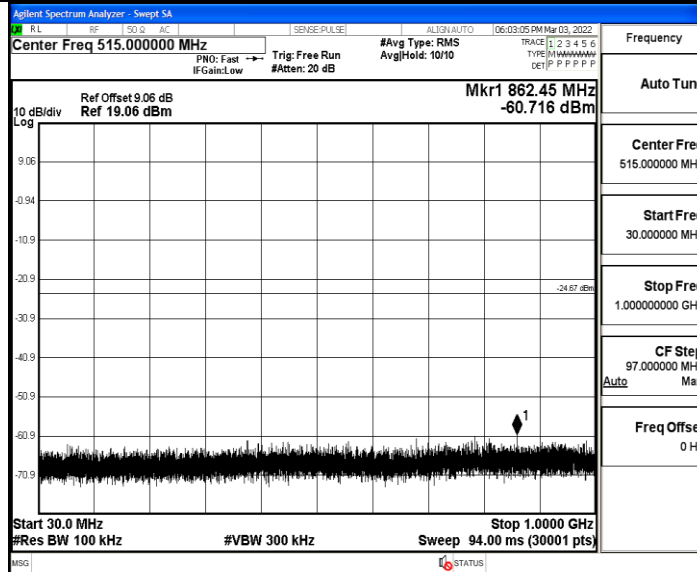
2DH5_Ant1_2402_1000~26500



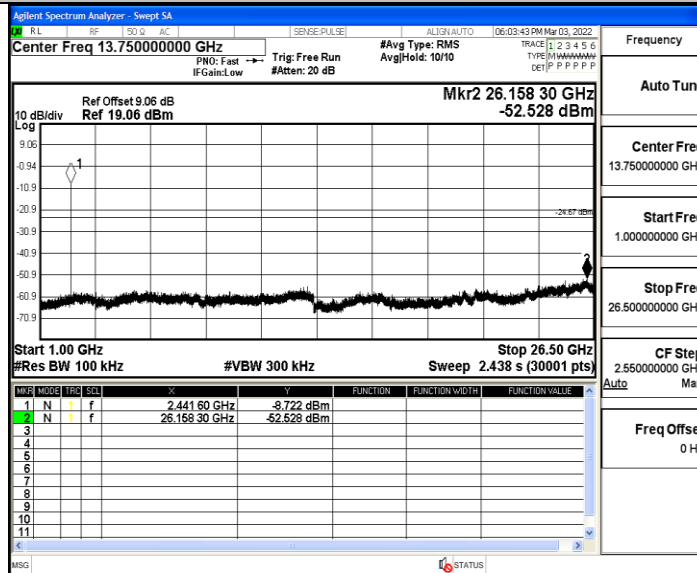
2DH5_Ant1_2441_0~Reference



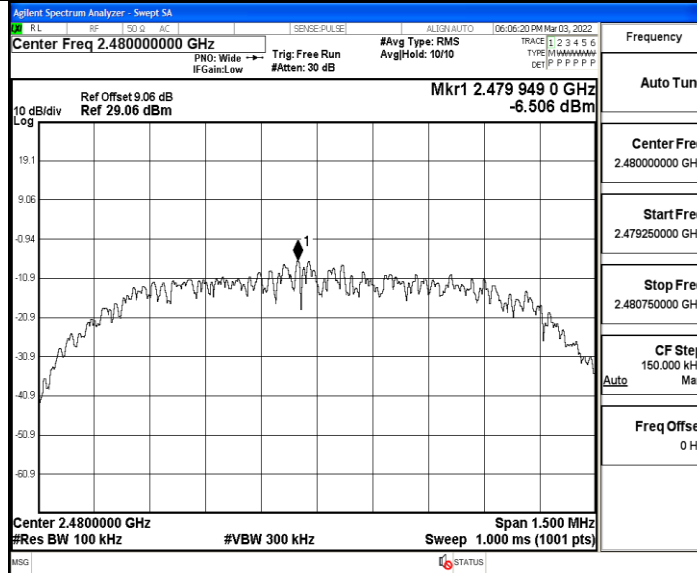
2DH5_Ant1_2441_30~1000



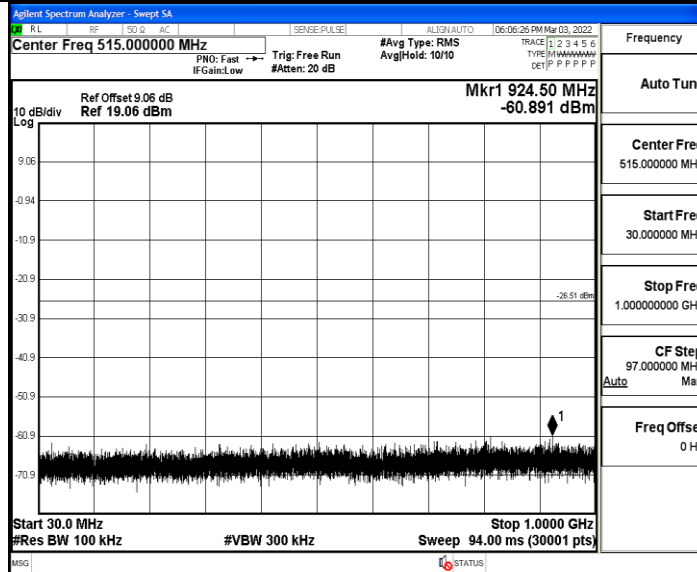
2DH5_Ant1_2441_1000~26500



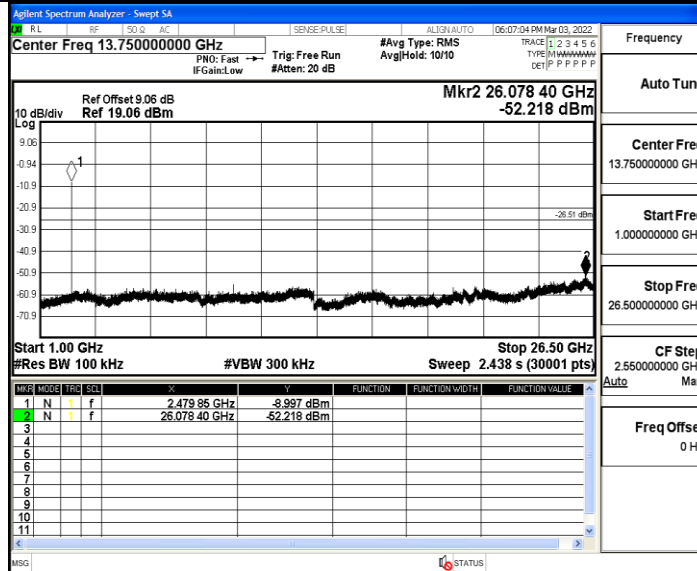
2DH5_Ant1_2480_0~Reference



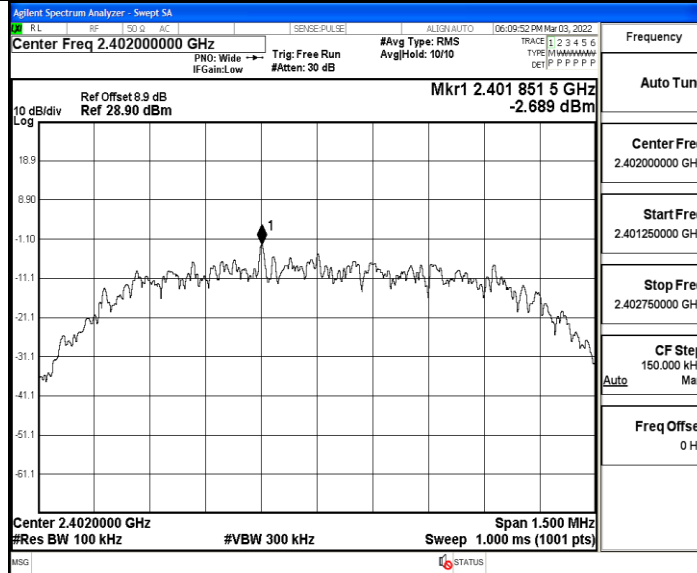
2DH5_Ant1_2480_30~1000



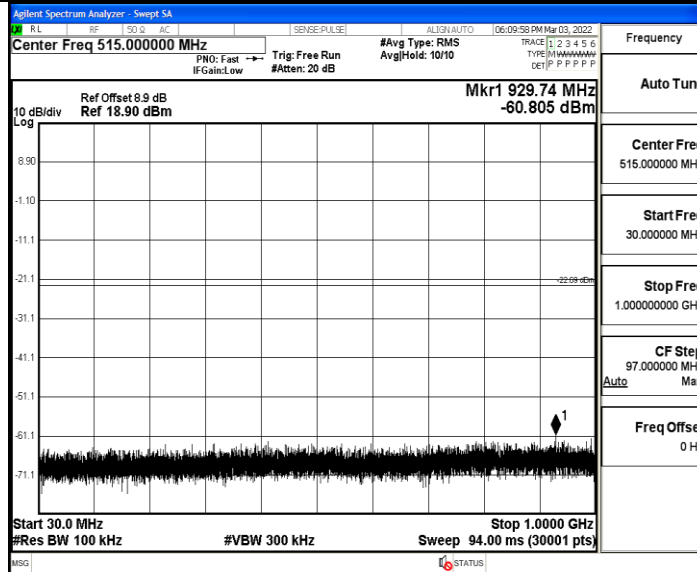
2DH5_Ant1_2480_1000~26500



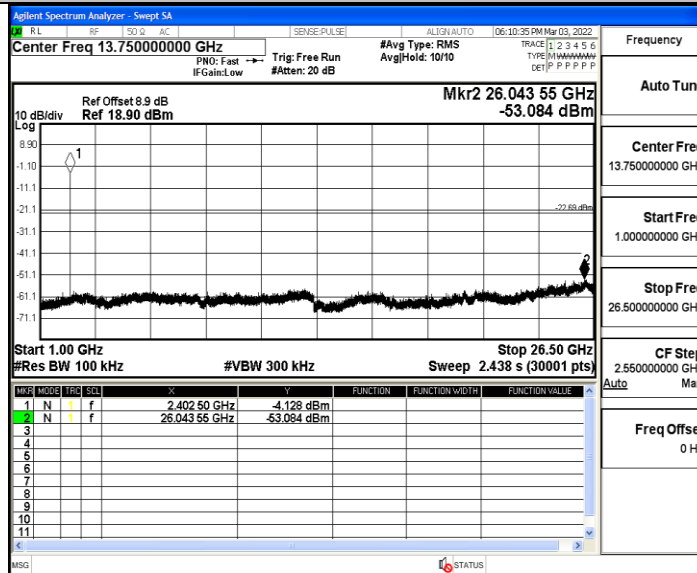
3DH5_Ant1_2402_0~Reference



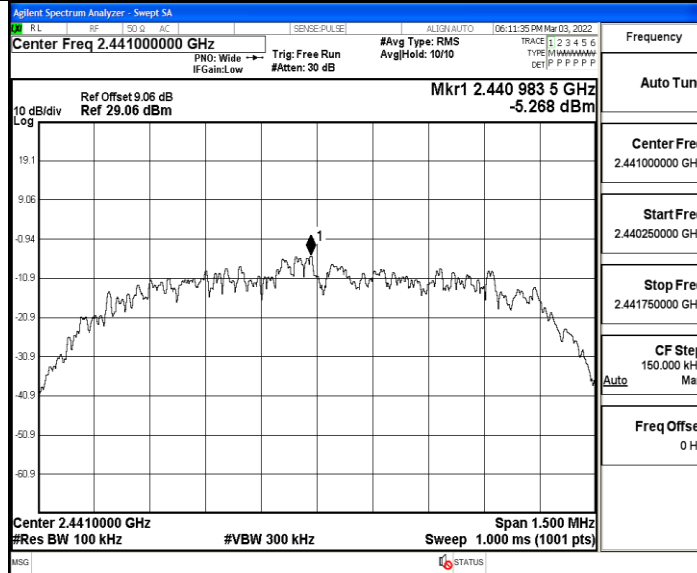
3DH5_Ant1_2402_30~1000



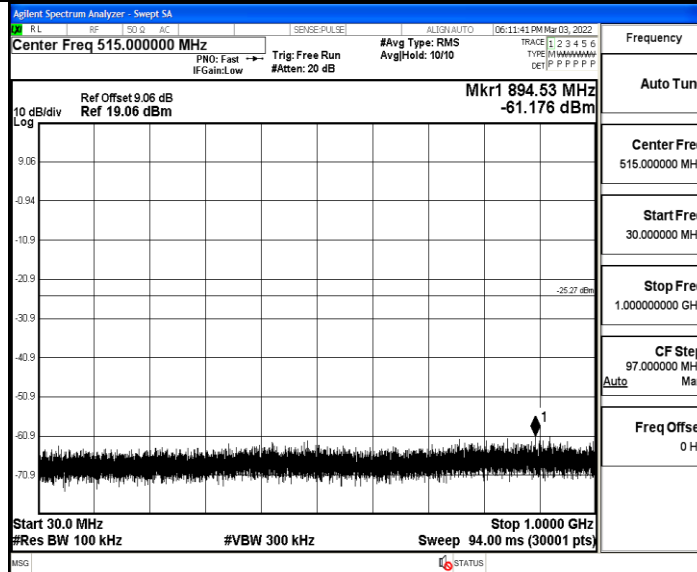
3DH5_Ant1_2402_1000~26500



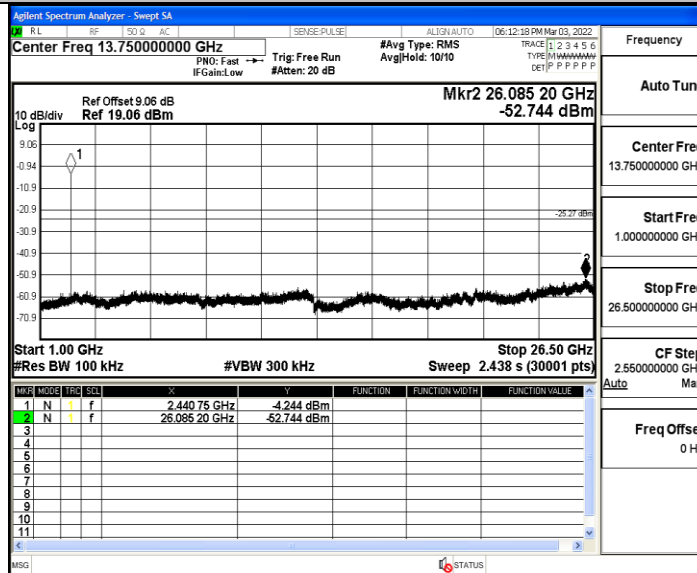
3DH5_Ant1_2441_0~Reference



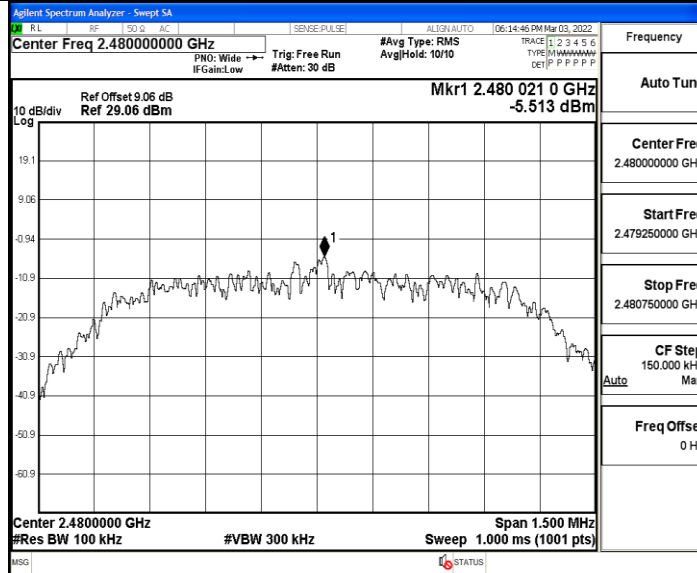
3DH5_Ant1_2441_30~1000



3DH5_Ant1_2441_1000~26500

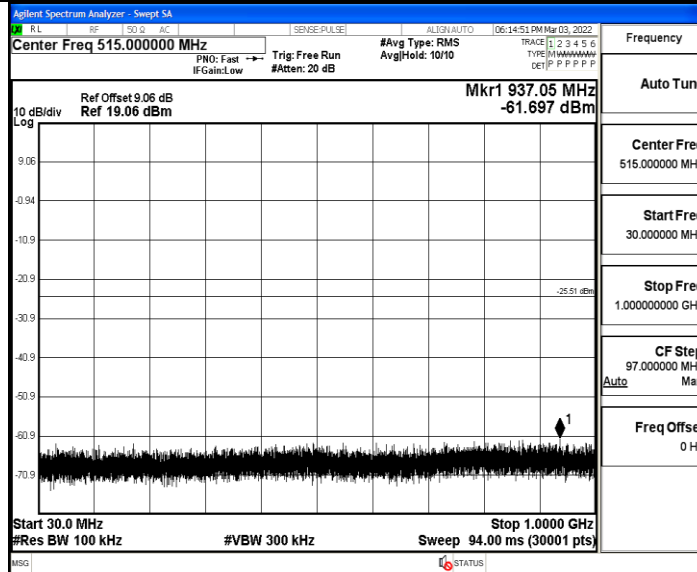


3DH5_Ant1_2480_0~Reference



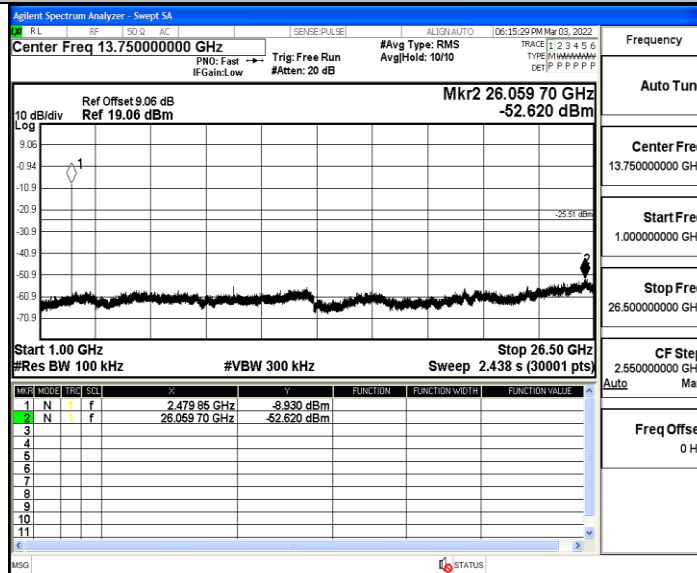
Frequency
Auto Tune
Center Freq 2.48000000 GHz
Start Freq 2.479250000 GHz
Stop Freq 2.480750000 GHz
CF Step 150.000 kHz Auto Man
Freq Offset 0 Hz

3DH5_Ant1_2480_30~1000



Frequency
Auto Tune
Center Freq 515.000000 MHz
Start Freq 30.000000 MHz
Stop Freq 1.000000000 GHz
CF Step 97.000000 MHz Auto Man
Freq Offset 0 Hz

3DH5_Ant1_2480_1000~26500



Frequency
Auto Tune
Center Freq 13.75000000 GHz
Start Freq 1.000000000 GHz
Stop Freq 26.500000000 GHz
CF Step 2.550000000 GHz Auto Man
Freq Offset 0 Hz

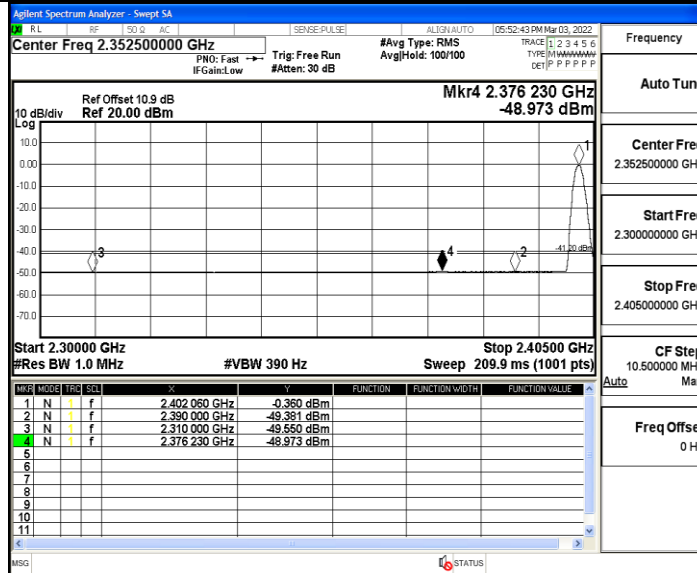
A.8 Restrict-band band-edge measurements

TestMode	Antenna	ChName	Channel	Detector	Freq(MHz)	Result(dBm)	Limit(dBm)	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-49.55	≤-41.20	PASS
				AV	2376.230	-48.97	≤-41.20	PASS
				AV	2390.000	-49.38	≤-41.20	PASS
				Peak	2310.000	-41.15	≤-21.20	PASS
				Peak	2351.975	-37.8	≤-21.20	PASS
				Peak	2390.000	-42.05	≤-21.20	PASS
		High	2480	AV	2483.500	-48.8	≤-41.20	PASS
				AV	2497.040	-48.51	≤-41.20	PASS
				AV	2500.000	-48.64	≤-41.20	PASS
				Peak	2483.500	-39.88	≤-21.20	PASS
				Peak	2496.720	-38.43	≤-21.20	PASS
				Peak	2500.000	-41.66	≤-21.20	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-49.56	≤-41.20	PASS
				AV	2375.915	-49.14	≤-41.20	PASS
				AV	2390.000	-49.43	≤-41.20	PASS
				Peak	2310.000	-41.01	≤-21.20	PASS
				Peak	2366.150	-38.52	≤-21.20	PASS
				Peak	2390.000	-42.12	≤-21.20	PASS
		High	2480	AV	2483.500	-48.63	≤-41.20	PASS
				AV	2498.640	-48.48	≤-41.20	PASS
				AV	2500.000	-48.62	≤-41.20	PASS
				Peak	2483.500	-41.05	≤-21.20	PASS
				Peak	2489.200	-38.83	≤-21.20	PASS
				Peak	2500.000	-41.61	≤-21.20	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-49.63	≤-41.20	PASS
				AV	2375.810	-49.15	≤-41.20	PASS
				AV	2390.000	-49.3	≤-41.20	PASS
				Peak	2310.000	-43.31	≤-21.20	PASS
				Peak	2366.360	-39.69	≤-21.20	PASS
				Peak	2390.000	-41.64	≤-21.20	PASS
		High	2480	AV	2483.500	-48.73	≤-41.20	PASS
				AV	2495.280	-48.54	≤-41.20	PASS
				AV	2500.000	-48.62	≤-41.20	PASS
				Peak	2483.500	-42.13	≤-21.20	PASS
				Peak	2492.240	-39.06	≤-21.20	PASS
				Peak	2500.000	-41.06	≤-21.20	PASS

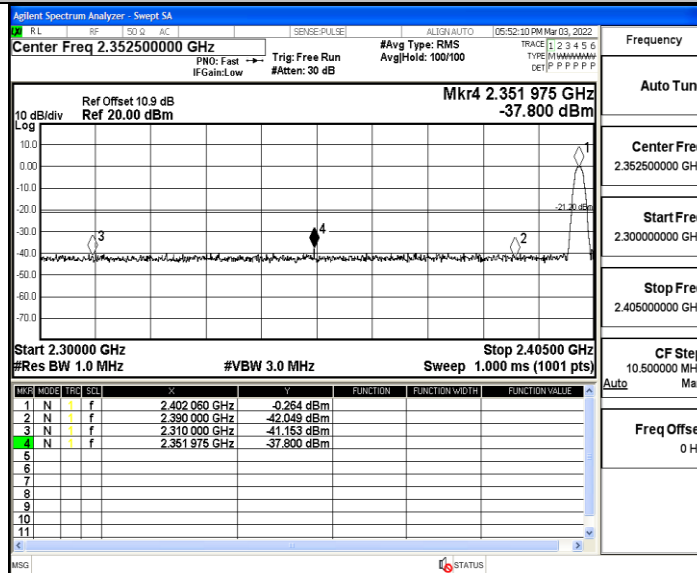
1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

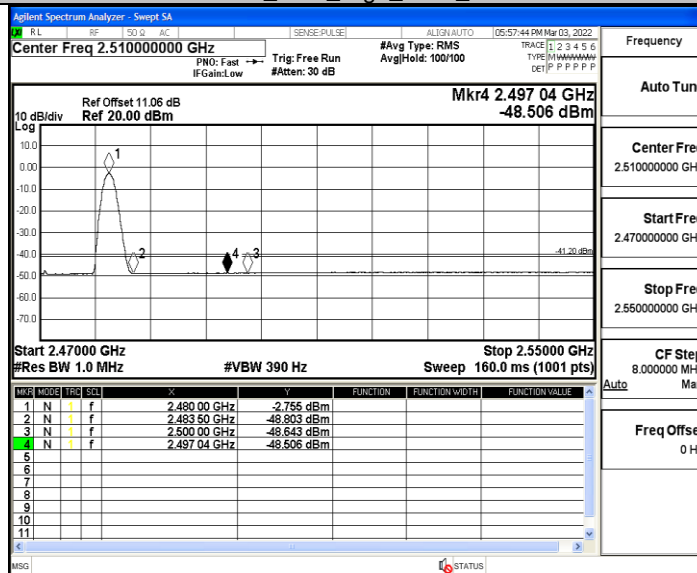
DH5_Ant1_Low_2402_AV



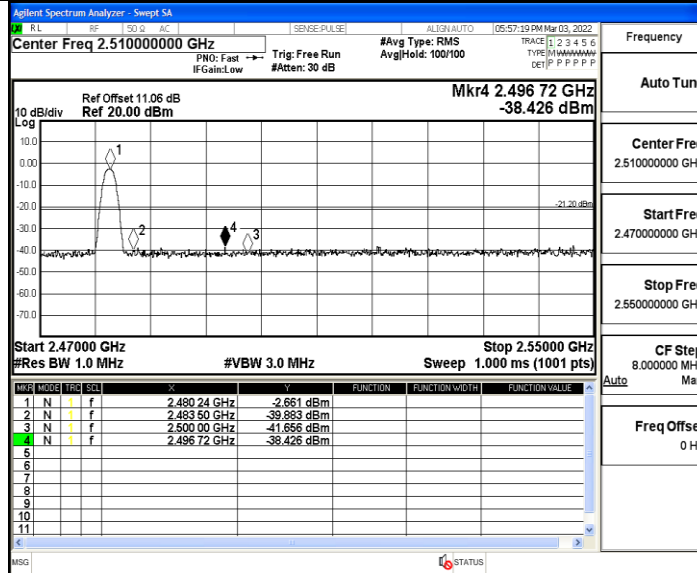
DH5_Ant1_Low_2402_Peak



DH5_Ant1_High_2480_AV

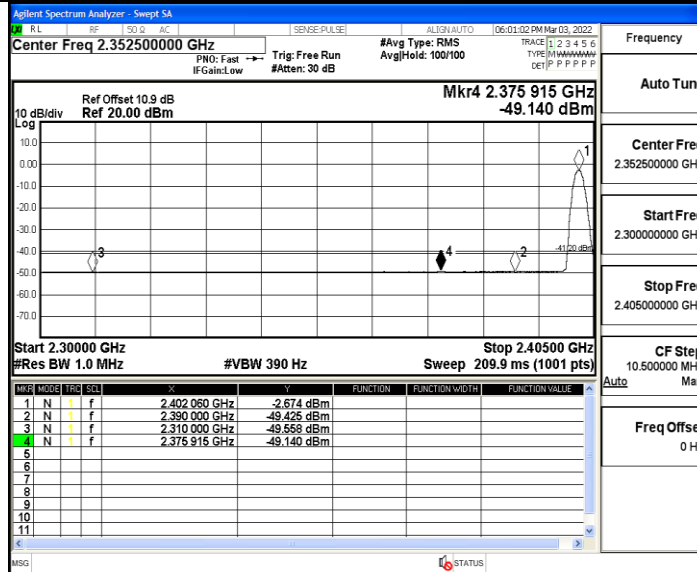


DH5_Ant1_High_2480_Peak



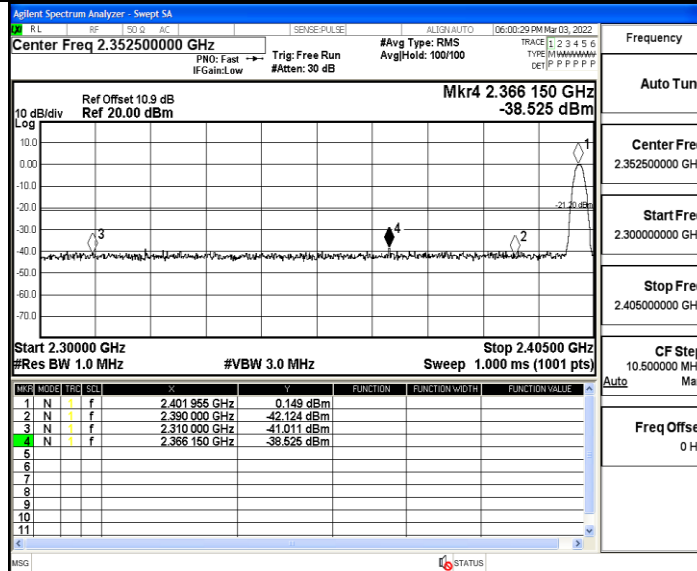
Frequency	Auto Tune
Center Freq	2.510000000 GHz
Start Freq	2.470000000 GHz
Stop Freq	2.550000000 GHz
CF Step	8.000000 MHz
Freq Offset	0 Hz

2DH5_Ant1_Low_2402_AV



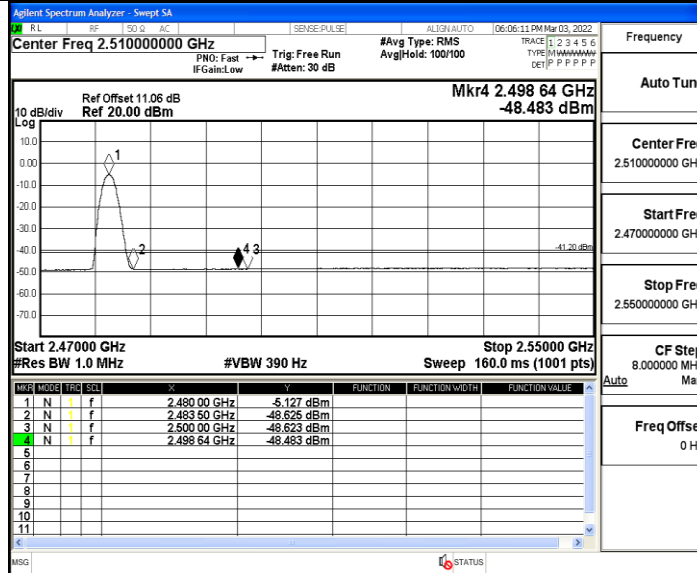
Frequency	Auto Tune
Center Freq	2.352500000 GHz
Start Freq	2.300000000 GHz
Stop Freq	2.405000000 GHz
CF Step	10.500000 MHz
Freq Offset	0 Hz

2DH5_Ant1_Low_2402_Peak

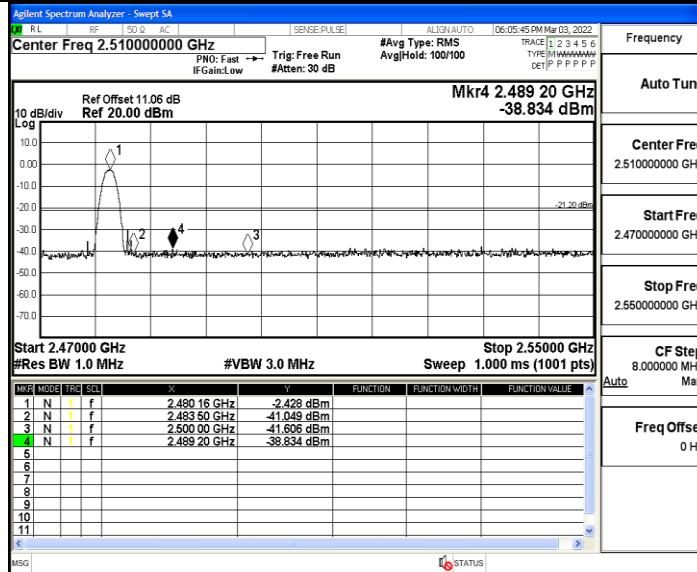


Frequency	Auto Tune
Center Freq	2.352500000 GHz
Start Freq	2.300000000 GHz
Stop Freq	2.405000000 GHz
CF Step	10.500000 MHz
Freq Offset	0 Hz

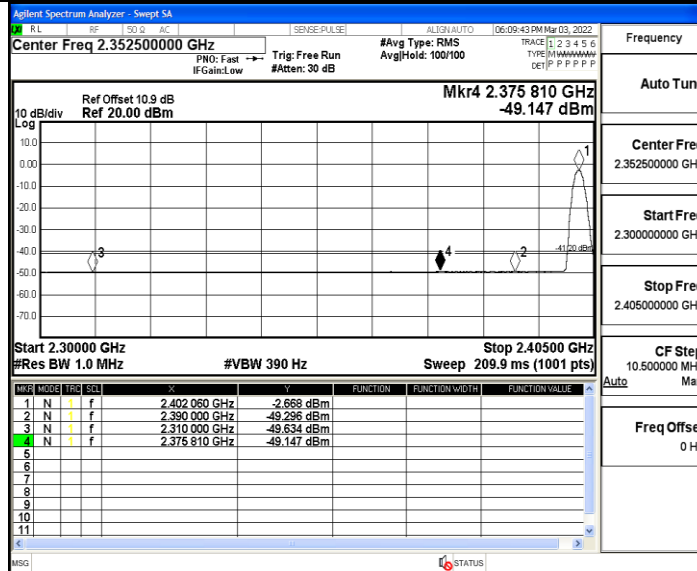
2DH5_Ant1_High_2480_AV



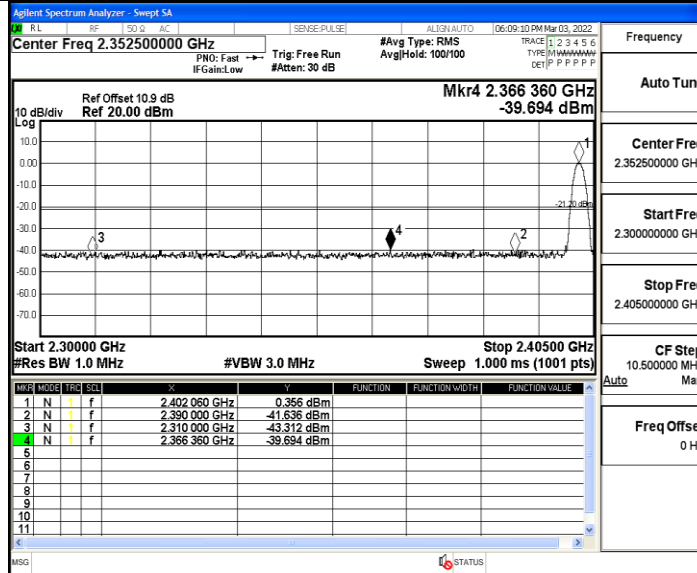
2DH5_Ant1_High_2480_Peak



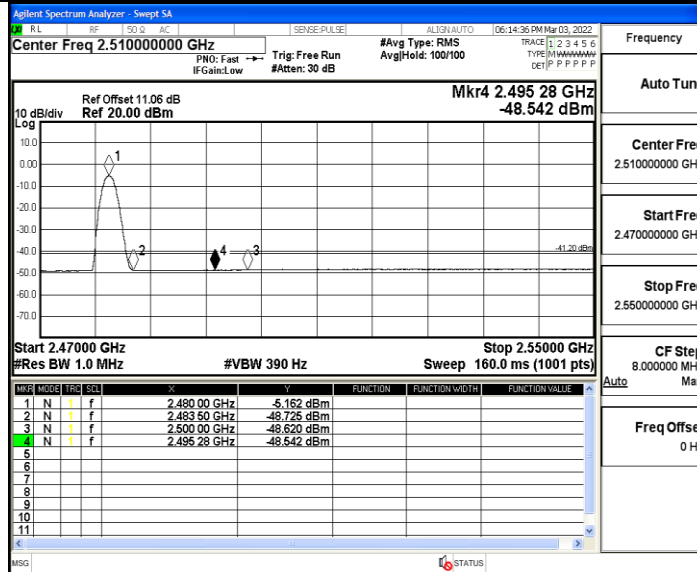
3DH5_Ant1_Low_2402_AV



3DH5_Ant1_Low_2402_Peak



3DH5_Ant1_High_2480_AV



3DH5_Ant1_High_2480_Peak

