

Appendix A

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

Product Name: TRUE WIRELESS EARBUDS

Trade Mark: TZUMI, SOUNDMATES

Test Model: RT50A

FCC ID: 2ATOY-RT50A

Environmental Conditions

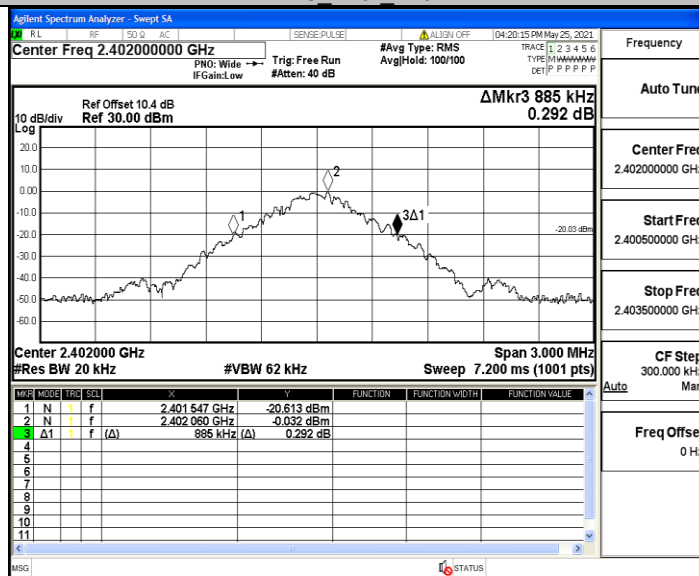
Temperature:	22.8° C
Relative Humidity:	56%
ATM Pressure:	100.0 kPa
Test Engineer:	Nancy Li
Supervised by:	Hugo Chen

A.1 20 dB Bandwidth

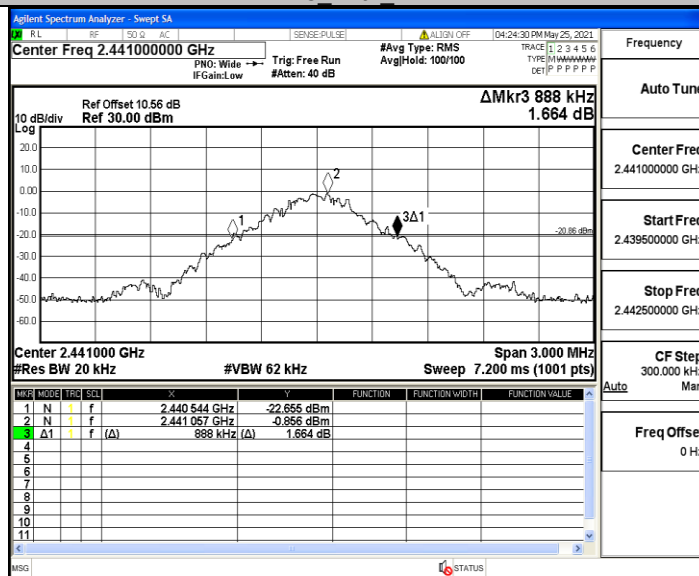
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.885	2401.547	2402.432	---	PASS
		2441	0.888	2440.544	2441.432	---	PASS
		2480	0.888	2479.544	2480.432	---	PASS
2DH5	Ant1	2402	1.332	2401.334	2402.666	---	PASS
		2441	1.332	2440.334	2441.666	---	PASS
		2480	1.320	2479.337	2480.657	---	PASS
3DH5	Ant1	2402	1.188	2401.412	2402.600	---	PASS
		2441	1.188	2440.412	2441.600	---	PASS
		2480	1.239	2479.364	2480.603	---	PASS

Test Graph

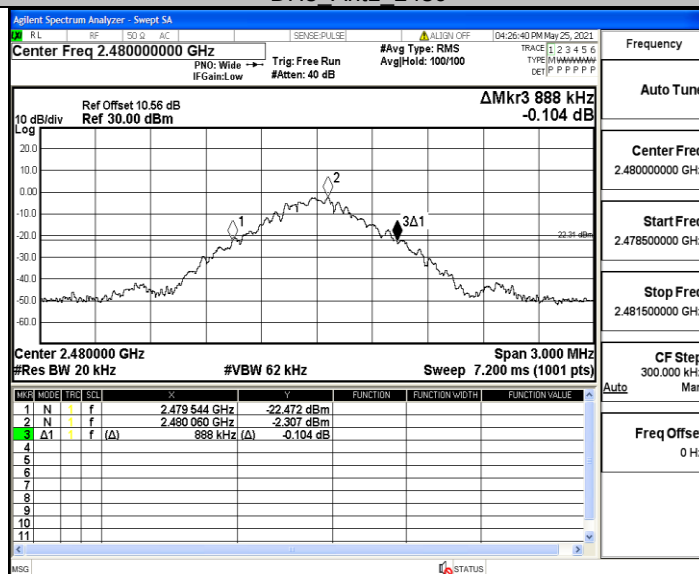
DH5_Ant1_2402



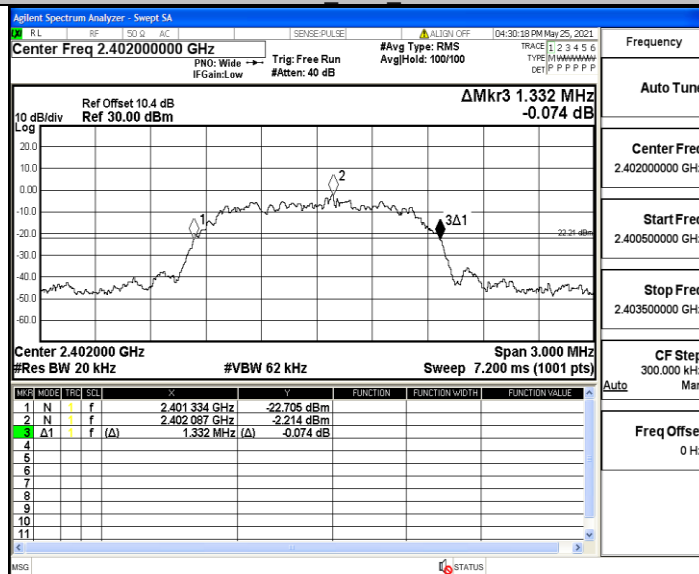
DH5_Ant1_2441



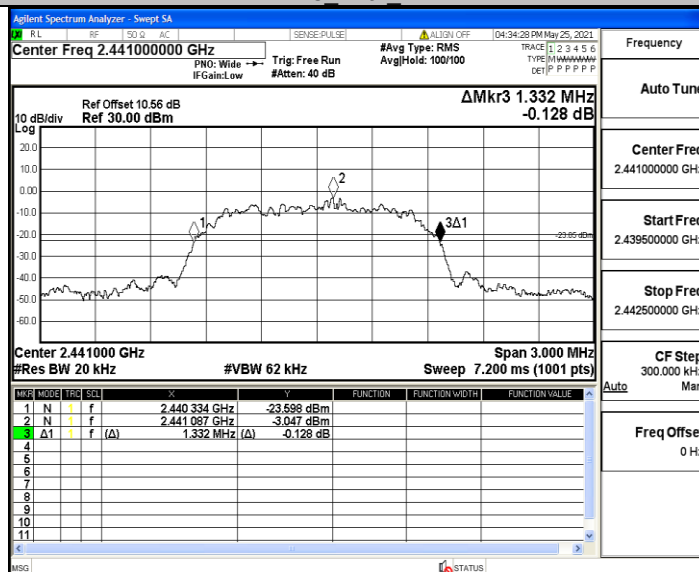
DH5_Ant1_2480



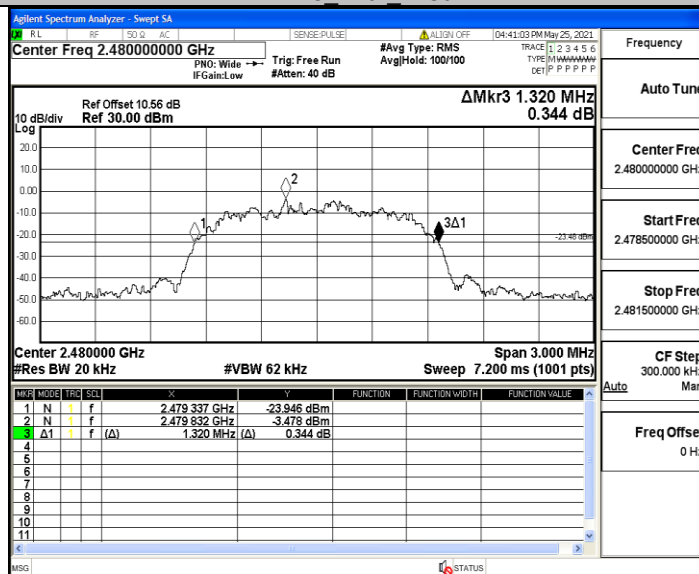
2DH5 Ant1 2402



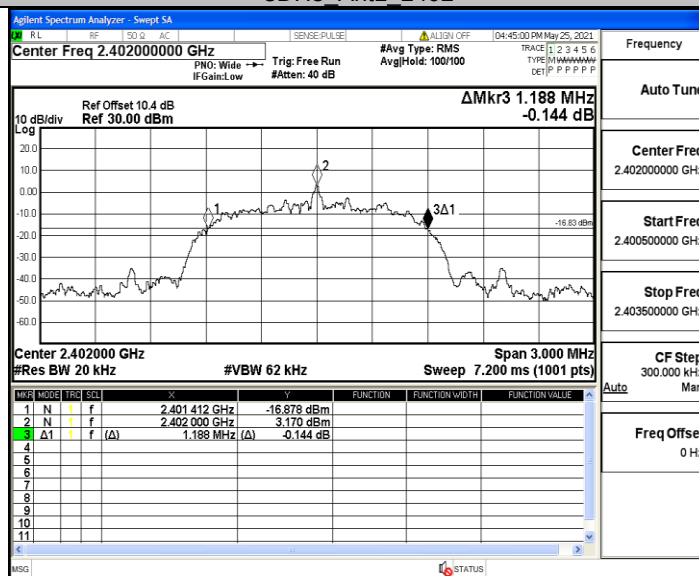
2DH5 Ant1 2441



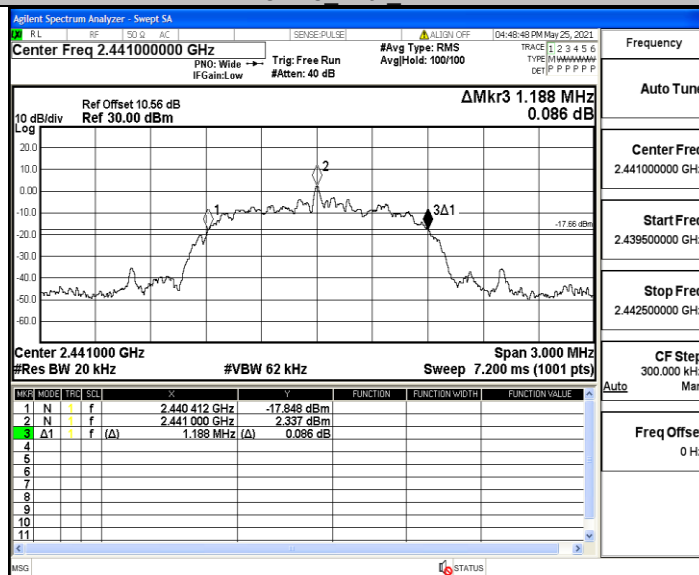
2DH5 Ant1 2480



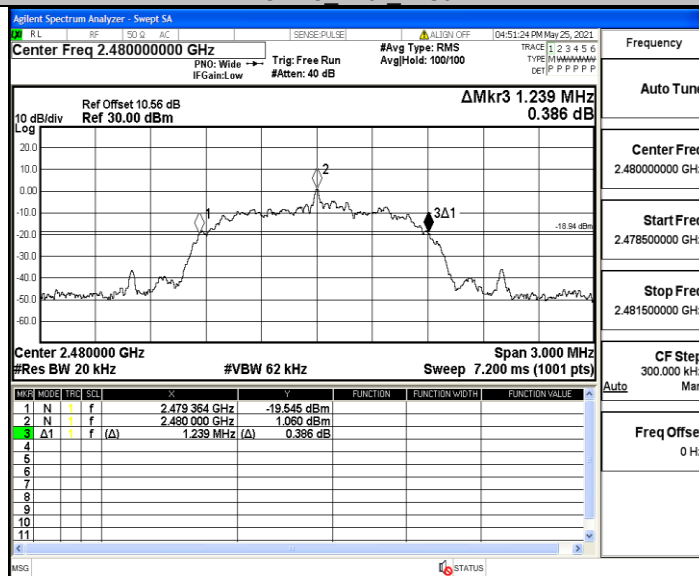
3DH5_Ant1_2402



3DH5_Ant1_2441



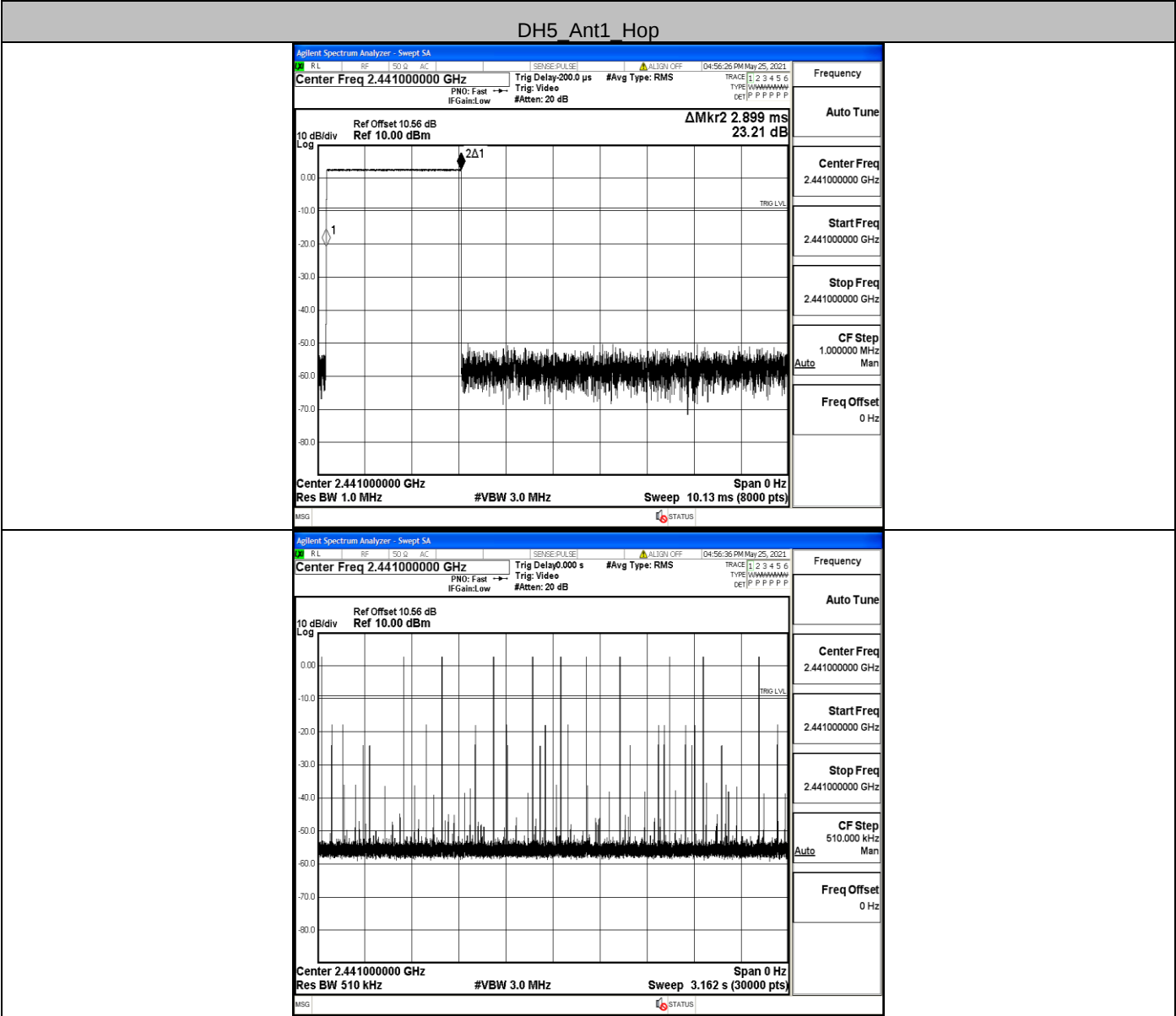
3DH5_Ant1_2480

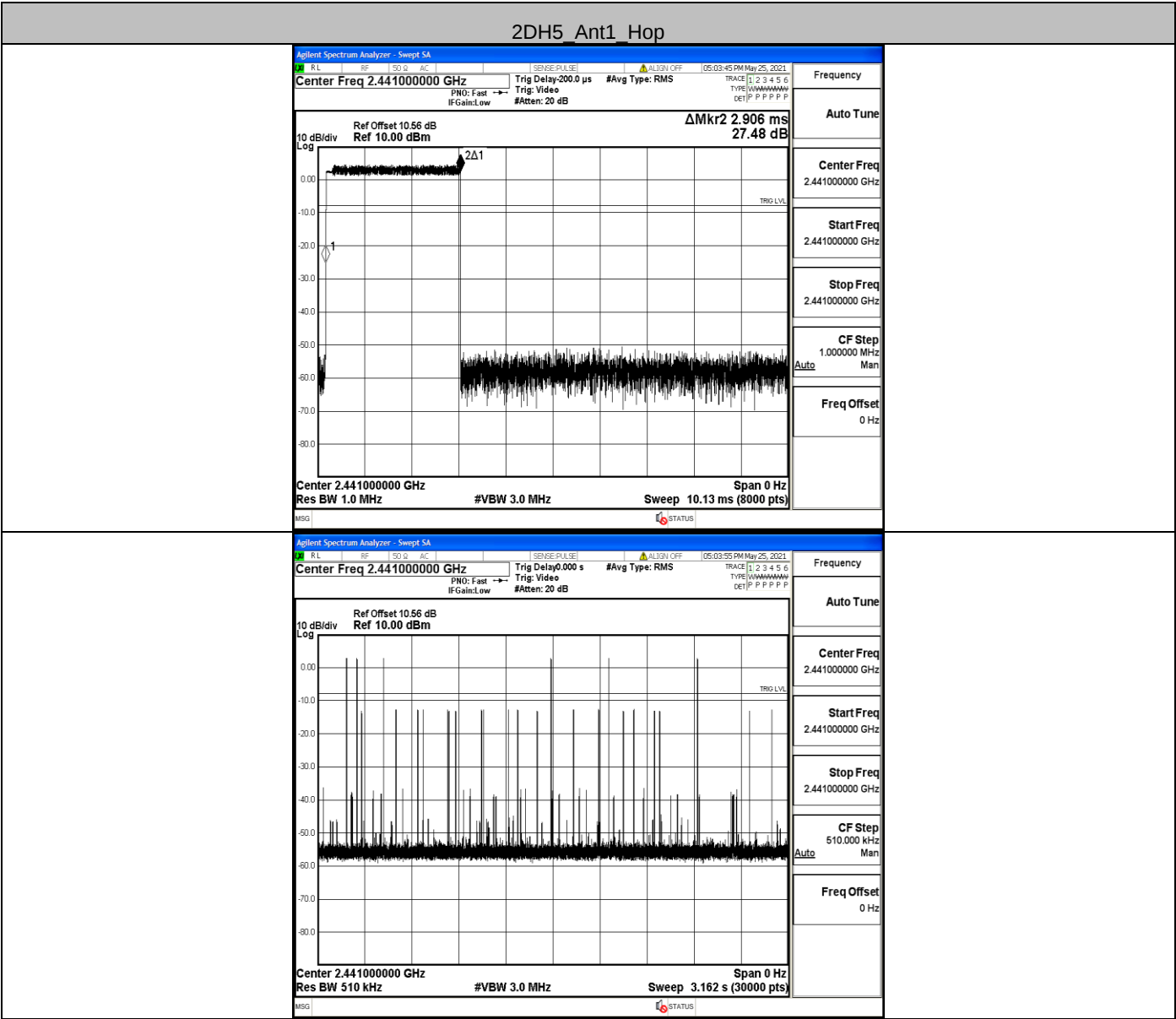


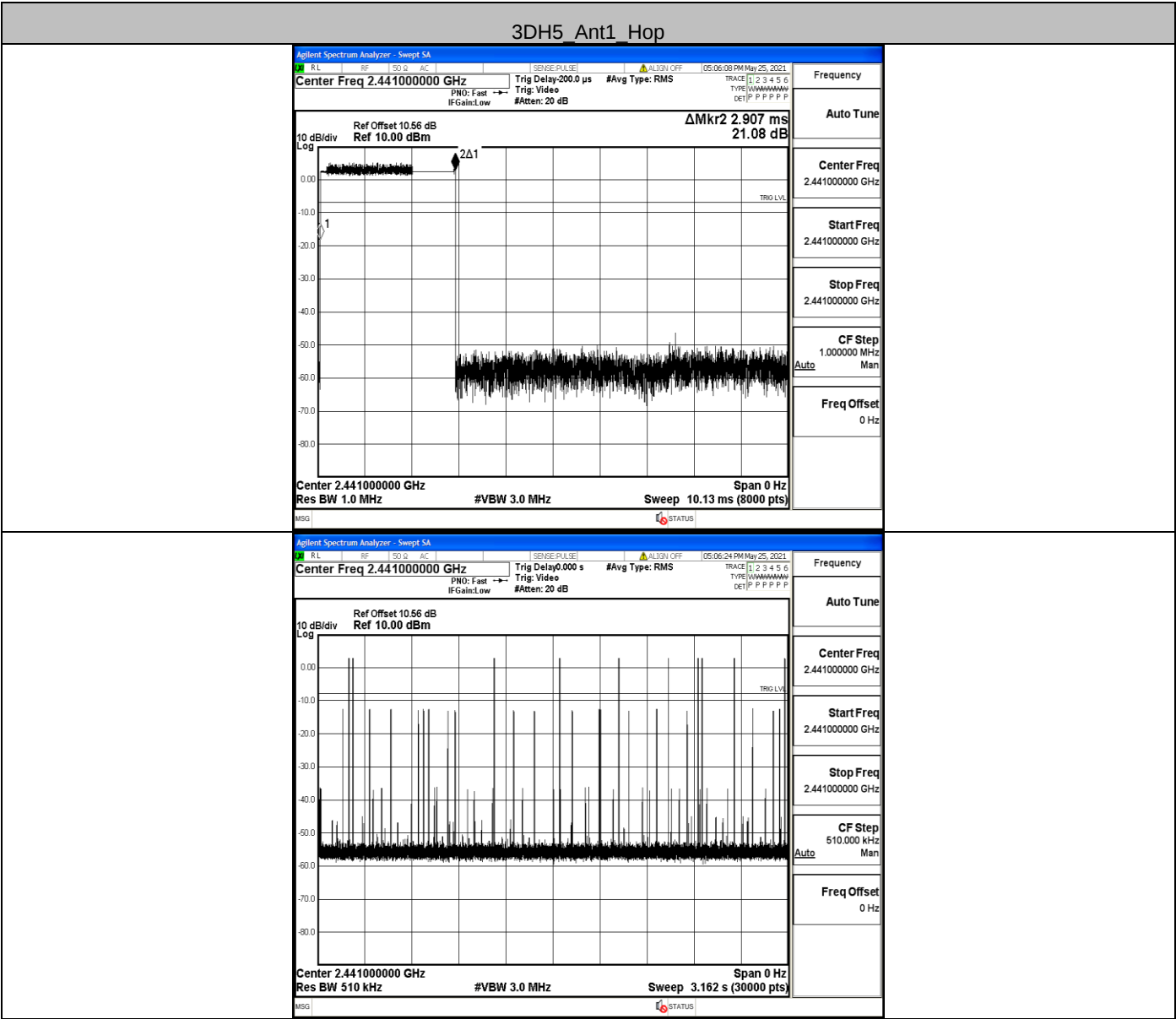
A.2 Dwell Time

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.90	120	0.348	<=0.4	PASS
2DH5	Ant1	Hop	2.91	70	0.203	<=0.4	PASS
3DH5	Ant1	Hop	2.91	110	0.32	<=0.4	PASS

Test Graph





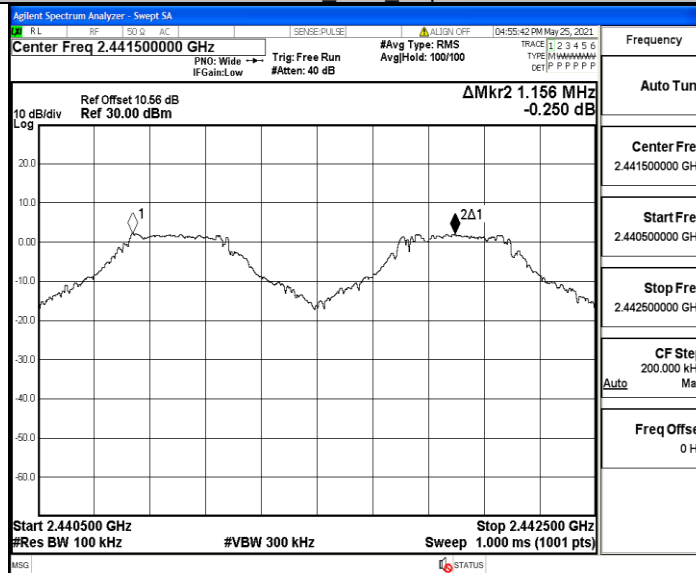


A.3 Carrier Frequency Separation

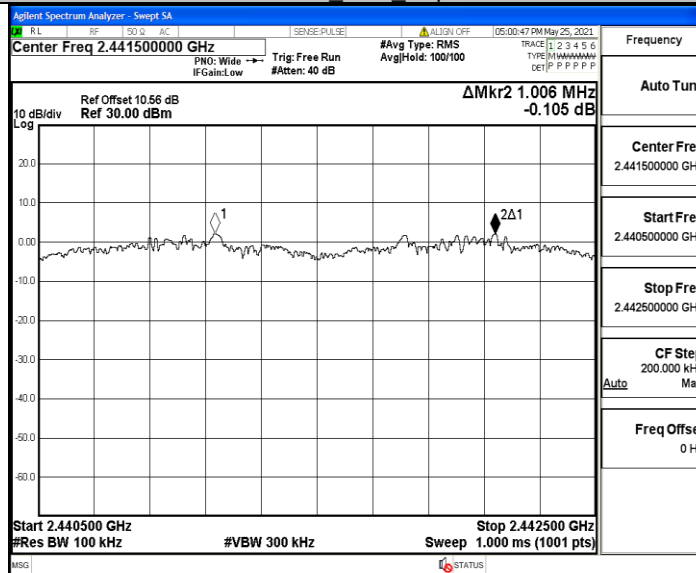
TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.156	≥ 0.888	PASS
2DH5	Ant1	Hop	1.006	≥ 0.888	PASS
3DH5	Ant1	Hop	0.998	≥ 0.826	PASS

Test Graph

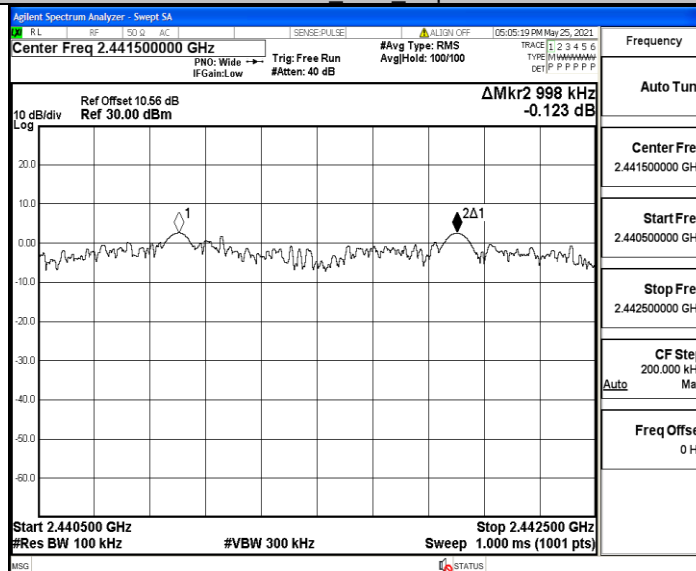
DH5_Ant1_Hop



2DH5_Ant1_Hop



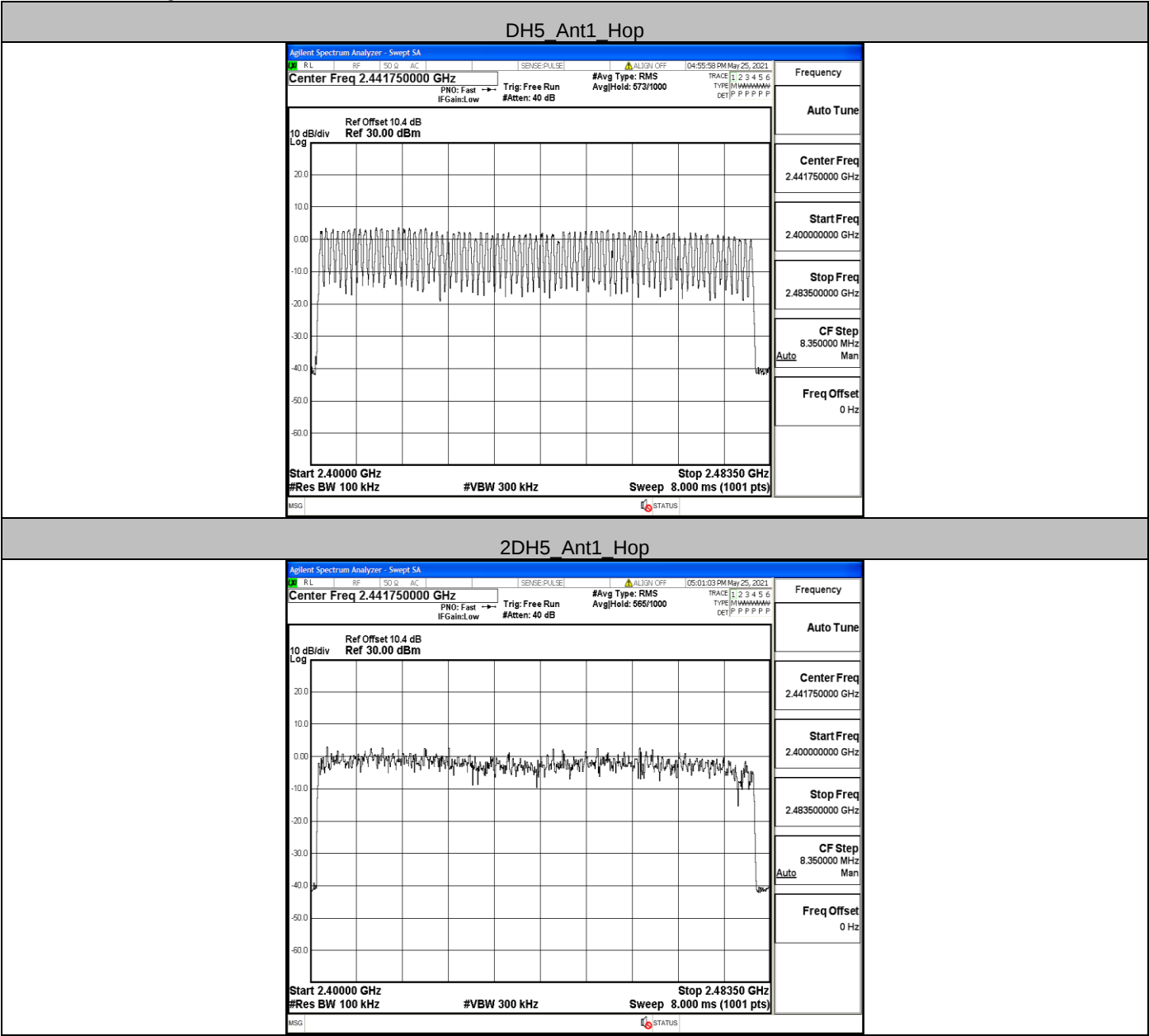
3DH5_Ant1_Hop

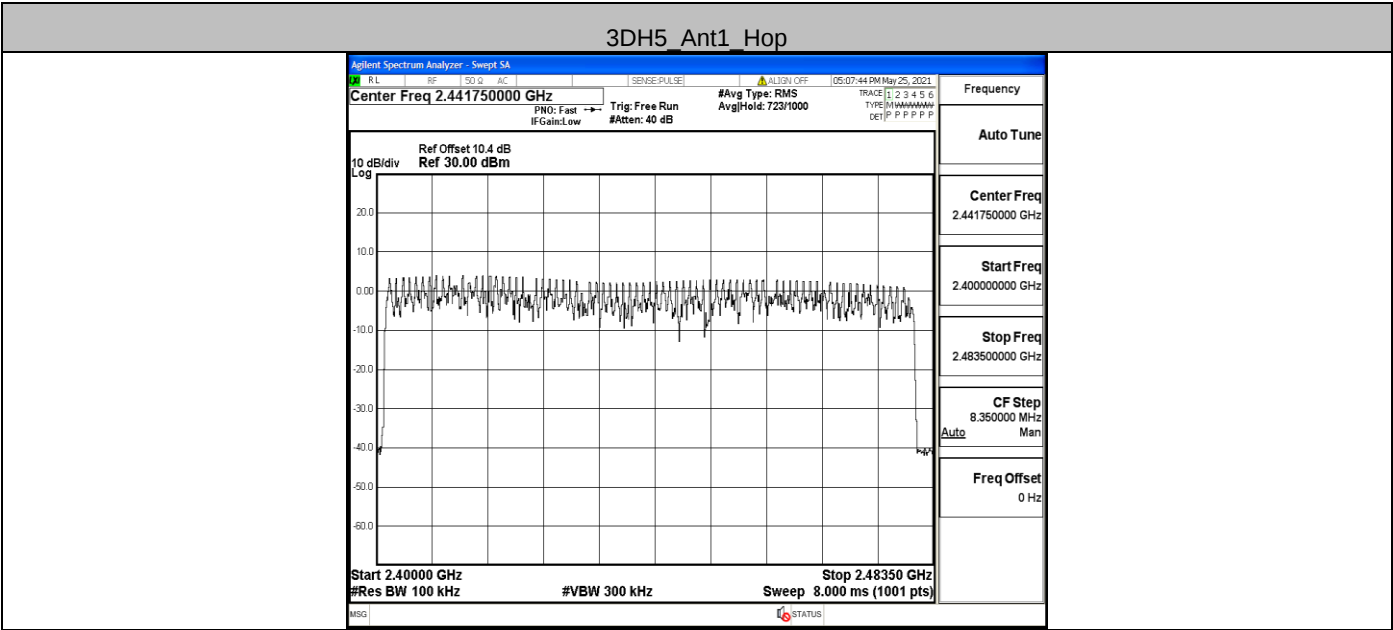


A.4 Hopping Channel Number

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



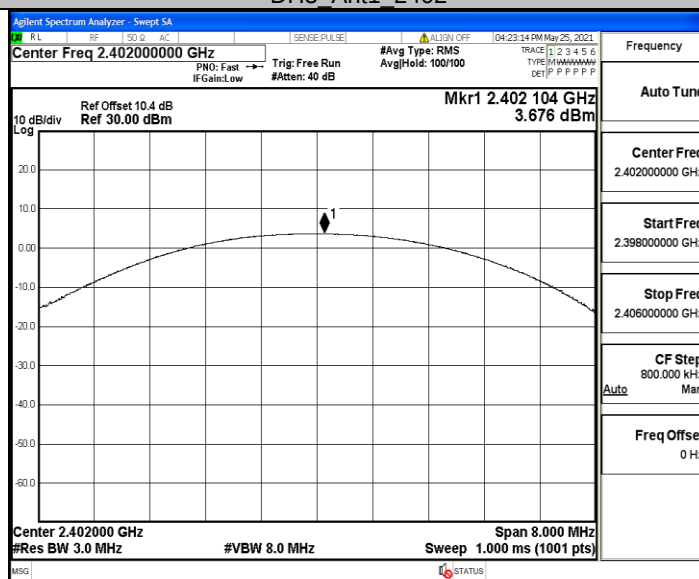


A.5 Conducted Peak Output Power

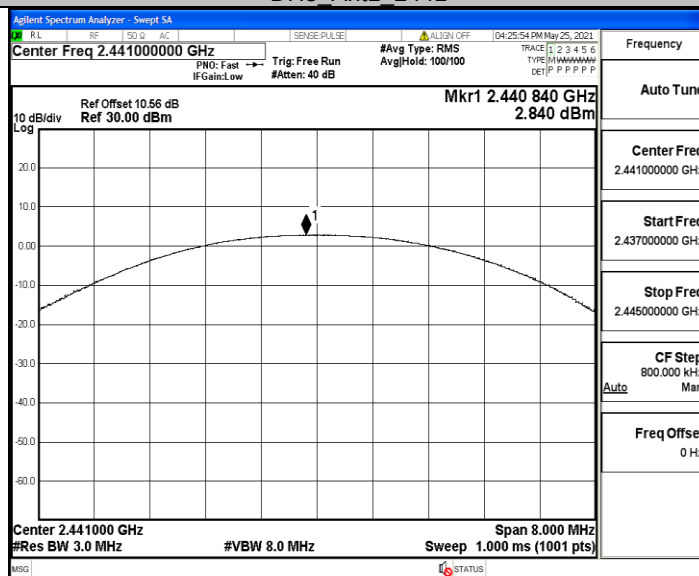
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	3.68	<=20.97	PASS
		2441	2.84	<=20.97	PASS
		2480	1.63	<=20.97	PASS
2DH5	Ant1	2402	5.98	<=20.97	PASS
		2441	5.09	<=20.97	PASS
		2480	3.8	<=20.97	PASS
3DH5	Ant1	2402	6.49	<=20.97	PASS
		2441	5.64	<=20.97	PASS
		2480	4.29	<=20.97	PASS

Test Graph

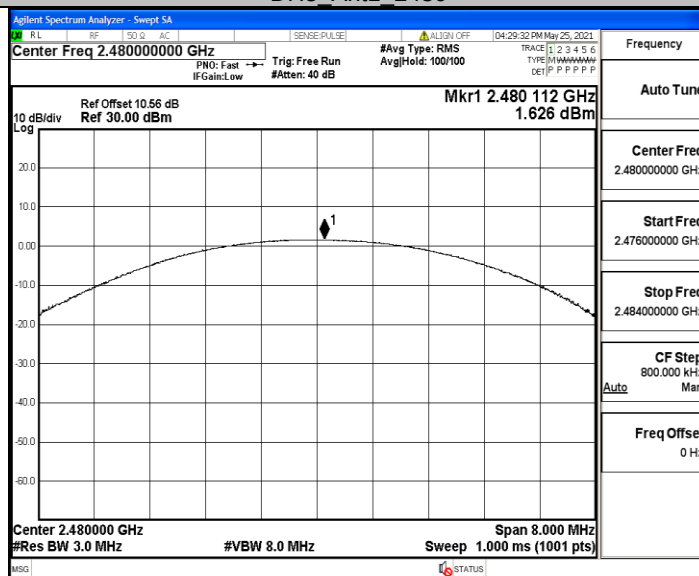
DH5 Ant1 2402



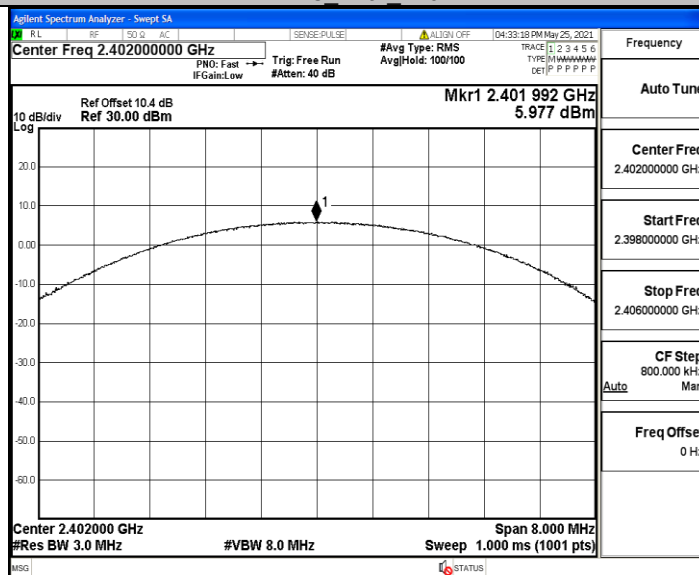
DH5 Ant1 2441



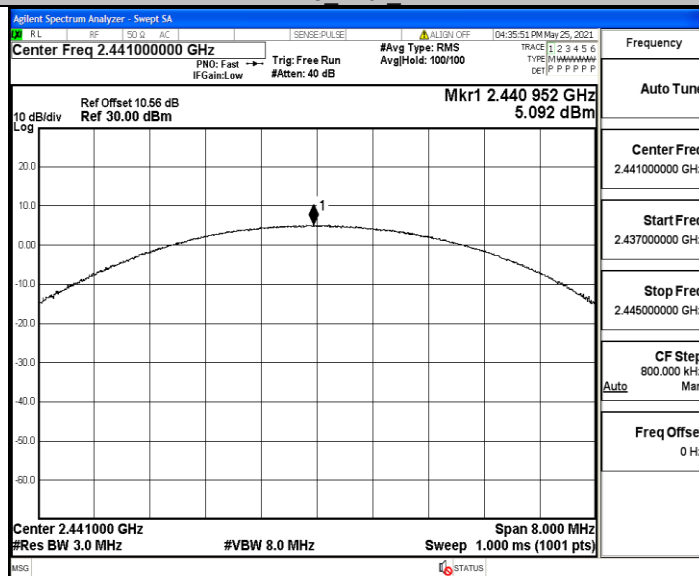
DH5 Ant1_2480



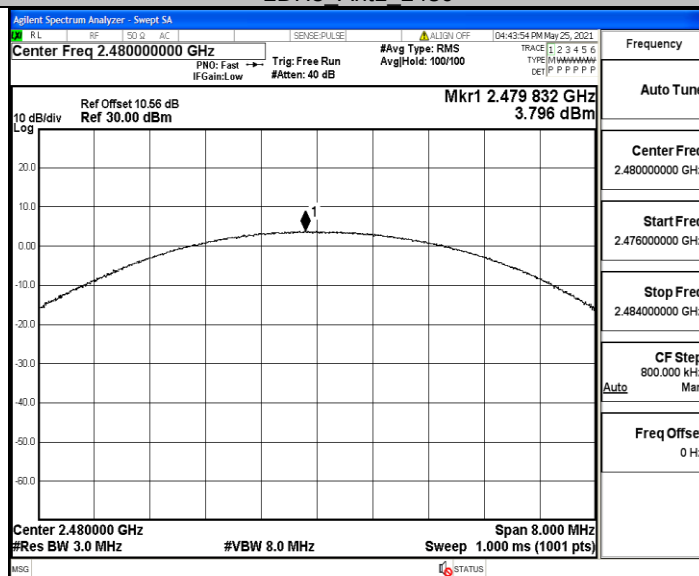
2DH5 Ant1_2402



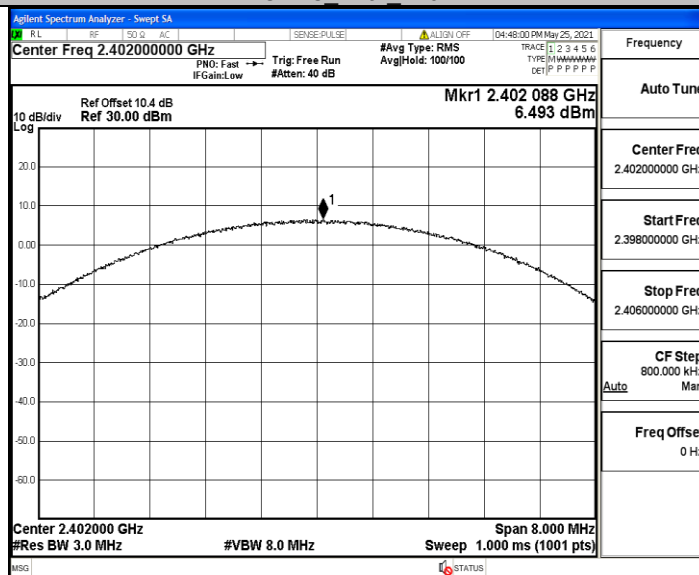
2DH5 Ant1_2441



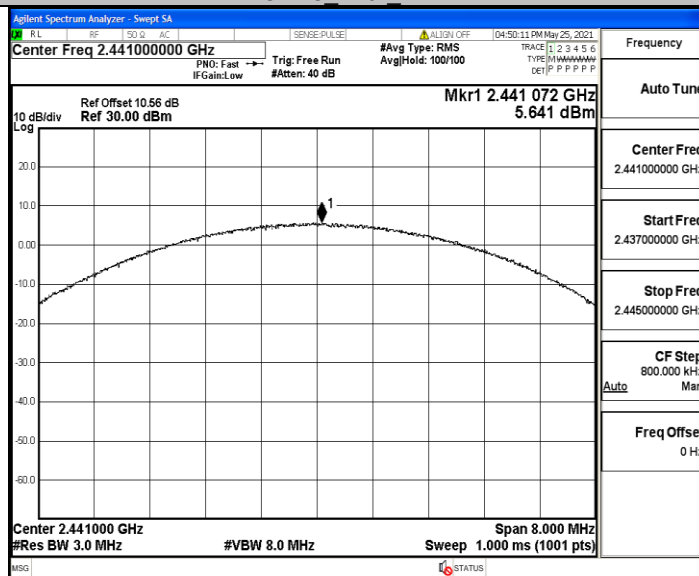
2DH5 Ant1 2480

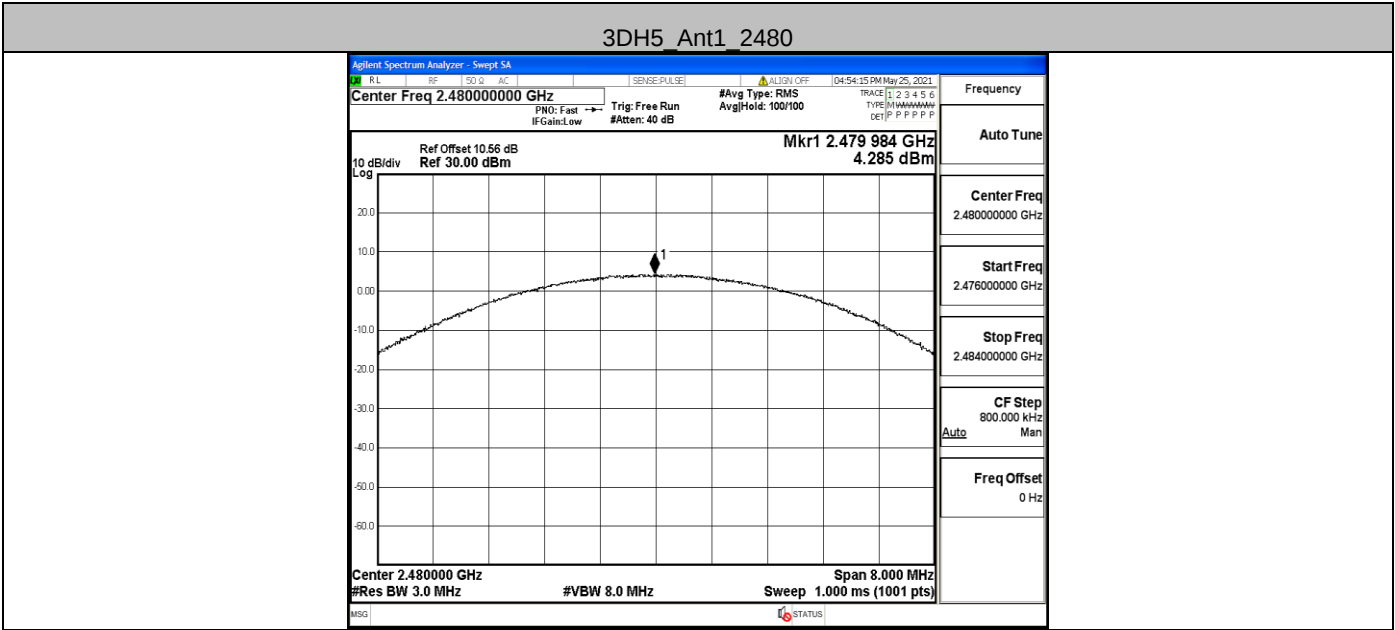


3DH5 Ant1 2402



3DH5 Ant1 2441



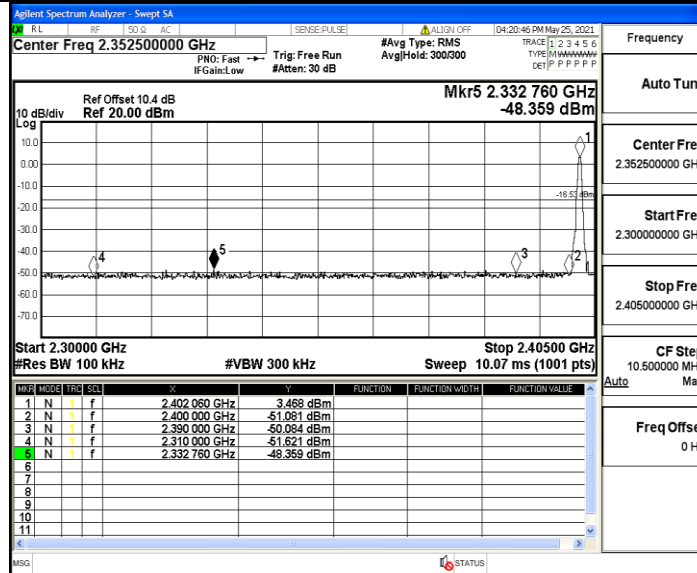


A.6 Band-edge for RF Conducted Emissions

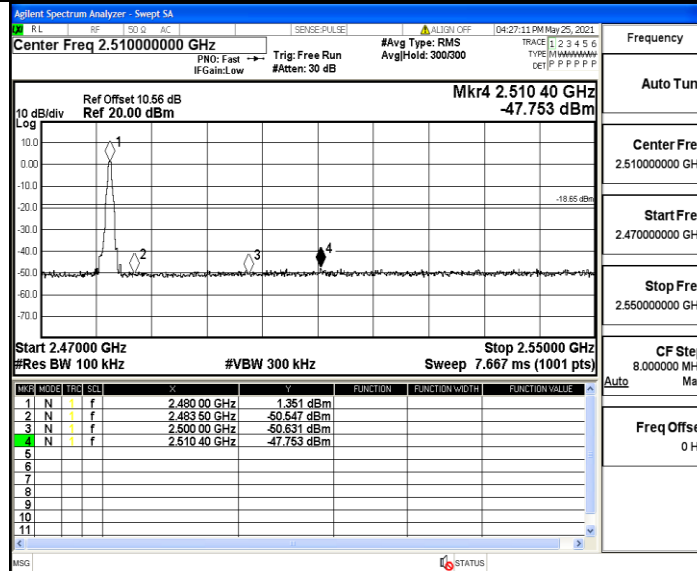
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	3.47	-48.36	<=-16.53	PASS
		High	2480	1.35	-47.75	<=-18.65	PASS
		Low	Hop_2402	3.30	-49.02	<=-16.7	PASS
		High	Hop_2480	1.33	-47.63	<=-18.67	PASS
2DH5	Ant1	Low	2402	3.37	-47.95	<=-16.63	PASS
		High	2480	1.50	-47.41	<=-18.5	PASS
		Low	Hop_2402	1.81	-49.2	<=-18.19	PASS
		High	Hop_2480	1.31	-47.71	<=-18.69	PASS
3DH5	Ant1	Low	2402	3.50	-48.43	<=-16.5	PASS
		High	2480	1.47	-47.82	<=-18.53	PASS
		Low	Hop_2402	3.44	-48.61	<=-16.56	PASS
		High	Hop_2480	2.40	-47.04	<=-17.6	PASS

Test Graph

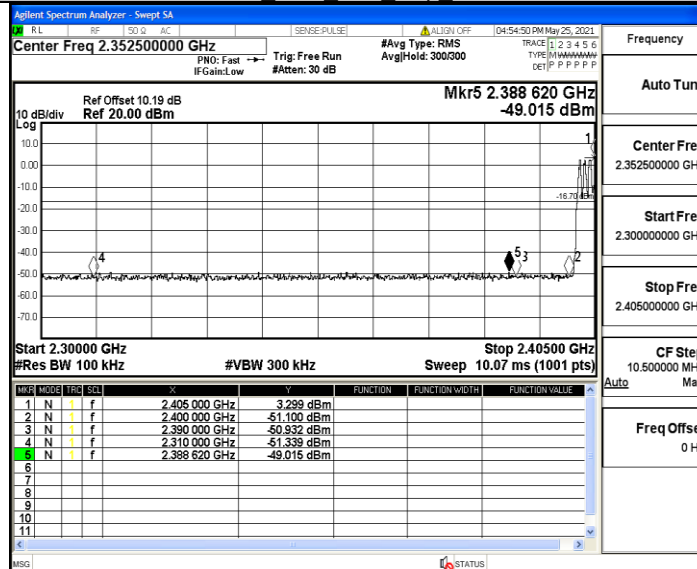
DH5_Ant1_Low_2402



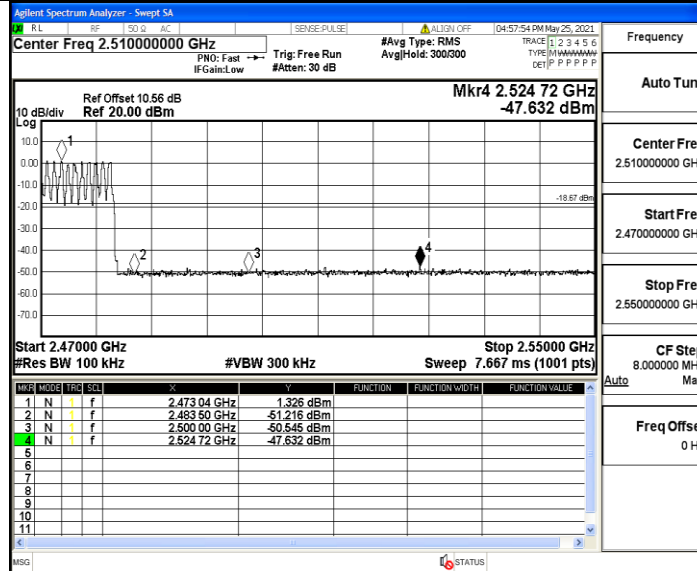
DH5_Ant1_High_2480



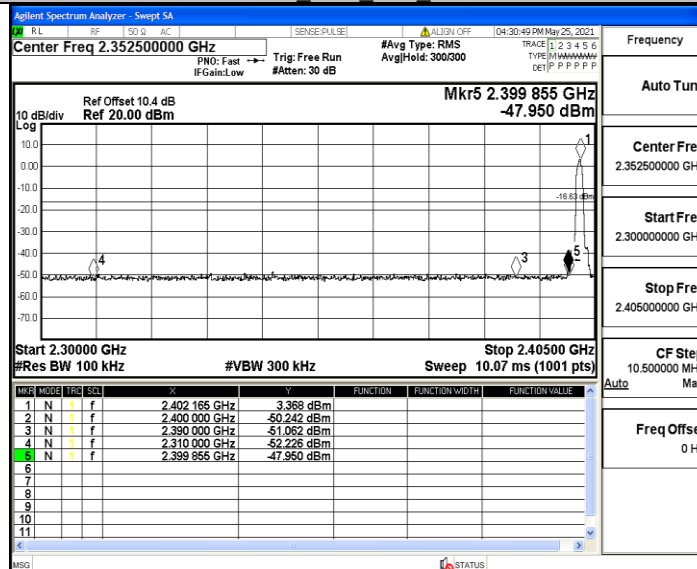
DH5_Ant1_Low_Hop_2402



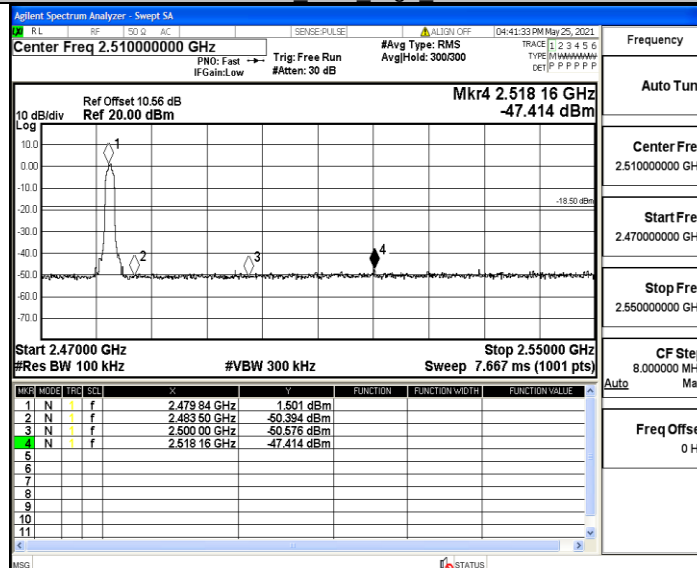
DH5_Ant1_High_Hop_2480



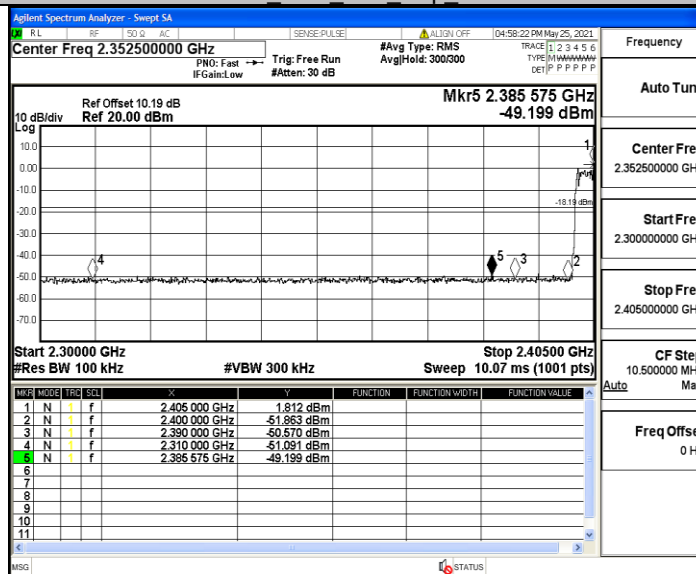
2DH5_Ant1_Low_2402



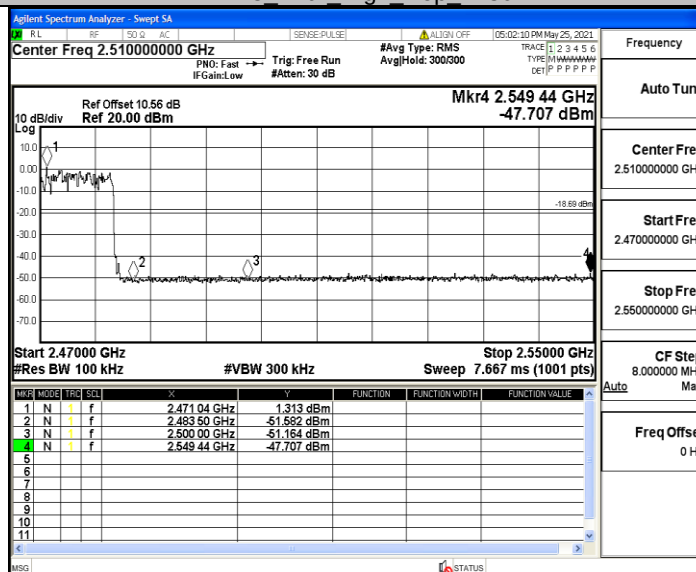
2DH5_Ant1_High_2480



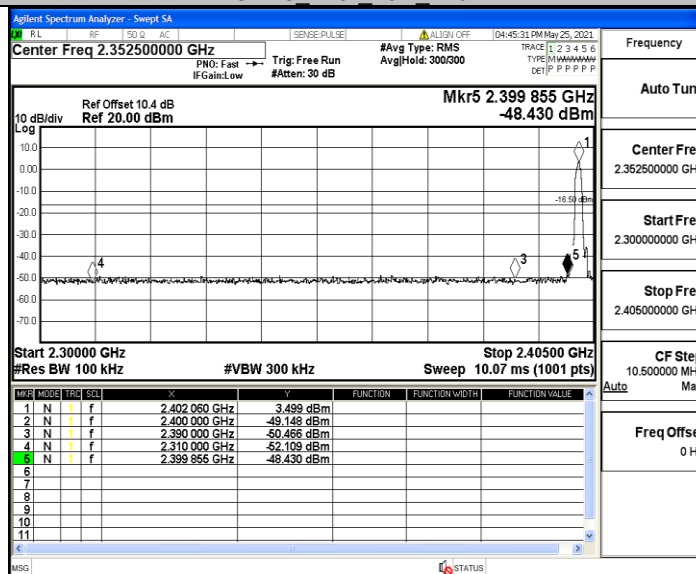
2DH5 Ant1 Low Hop 2402



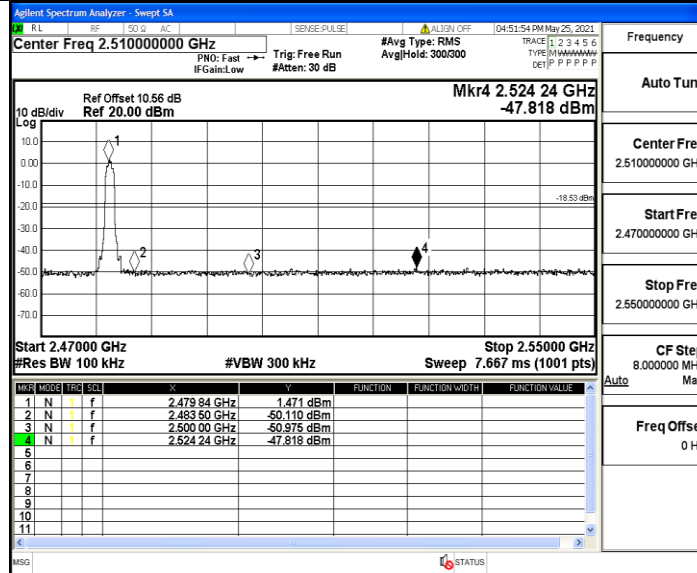
2DH5 Ant1 High Hop 2480



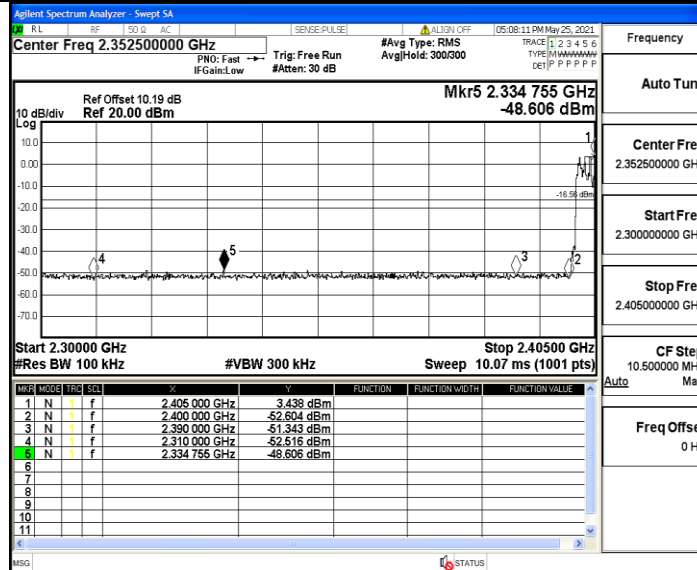
3DH5 Ant1 Low 2402



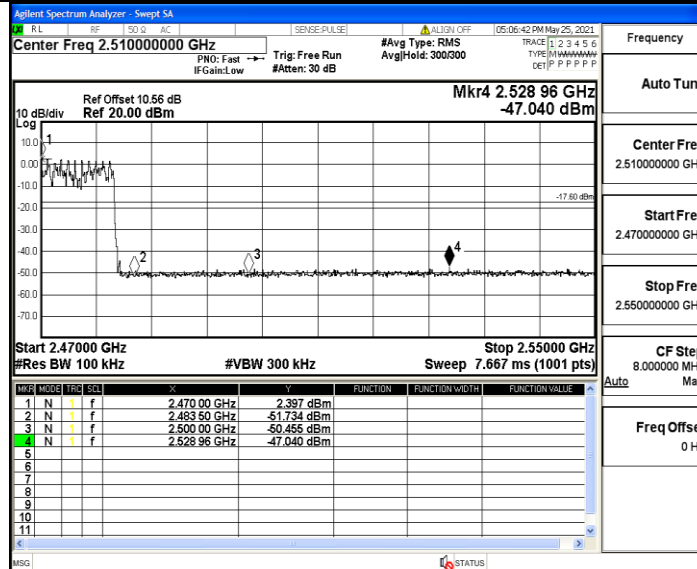
3DH5 Ant1 High 2480



3DH5 Ant1 Low Hop 2402



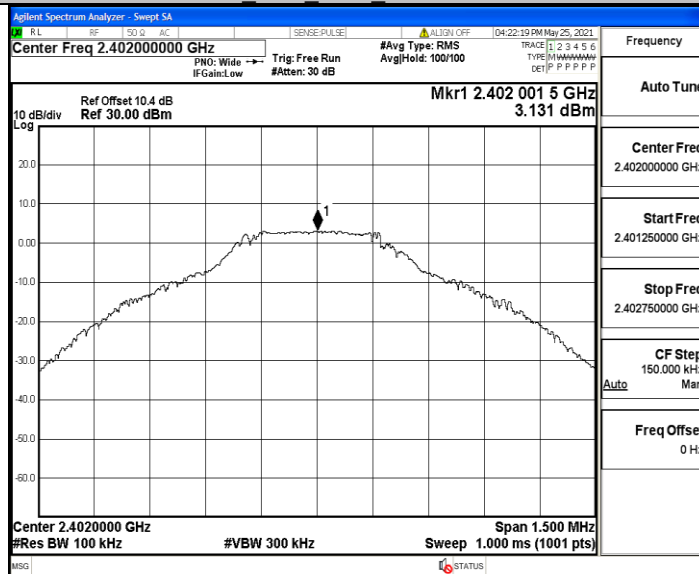
3DH5 Ant1 High Hop 2480



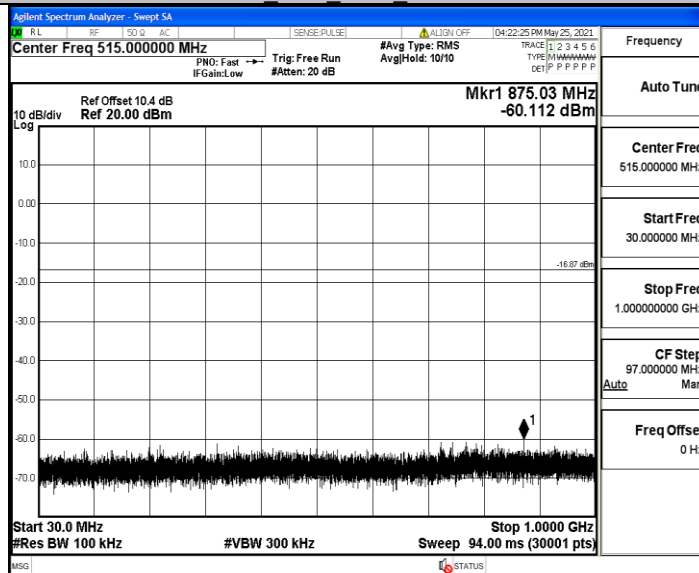
A.7 RF Conducted Spurious Emissions

Test Graph

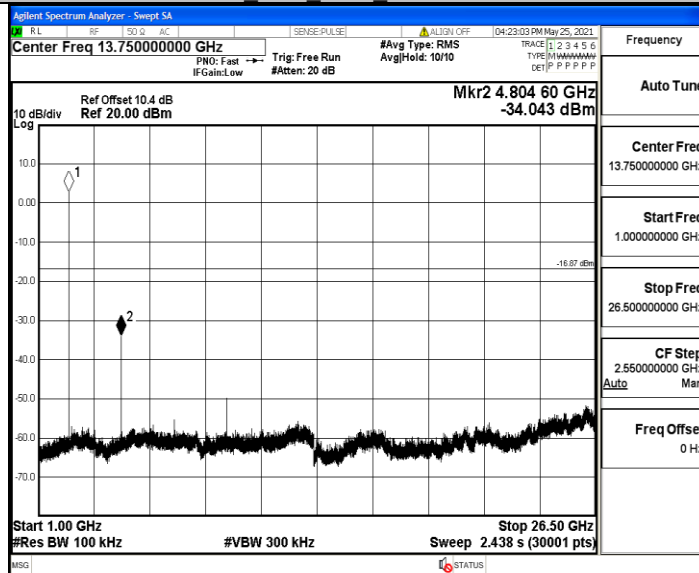
DH5_Ant1_2402_0-Reference



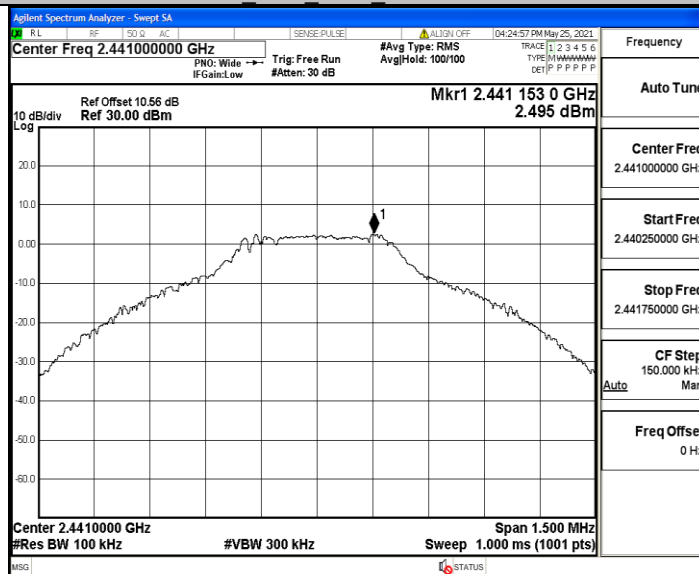
DH5_Ant1_2402_30~1000



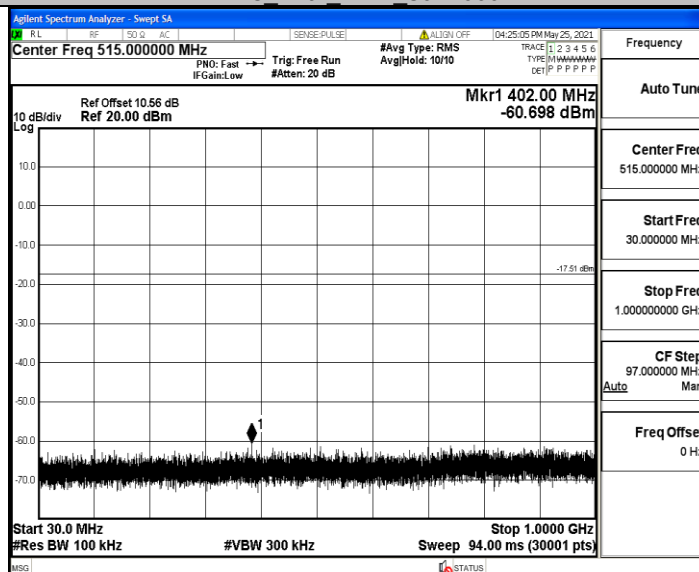
DH5_Ant1_2402_1000~26500



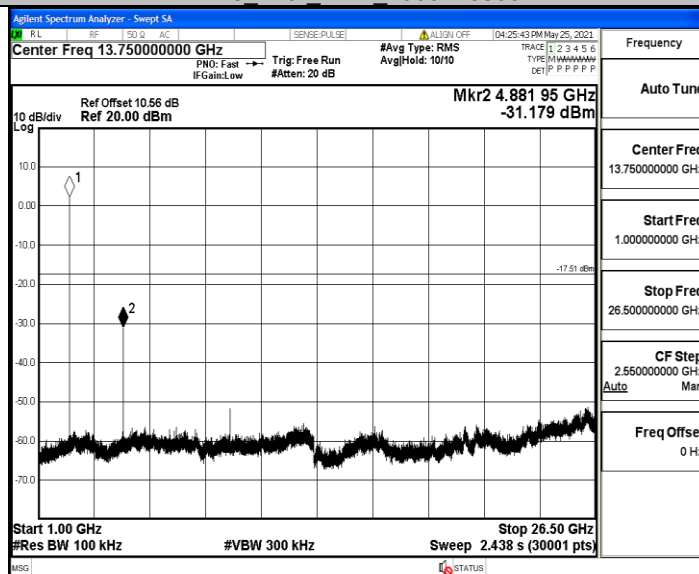
DH5_Ant1_2441_0-Reference



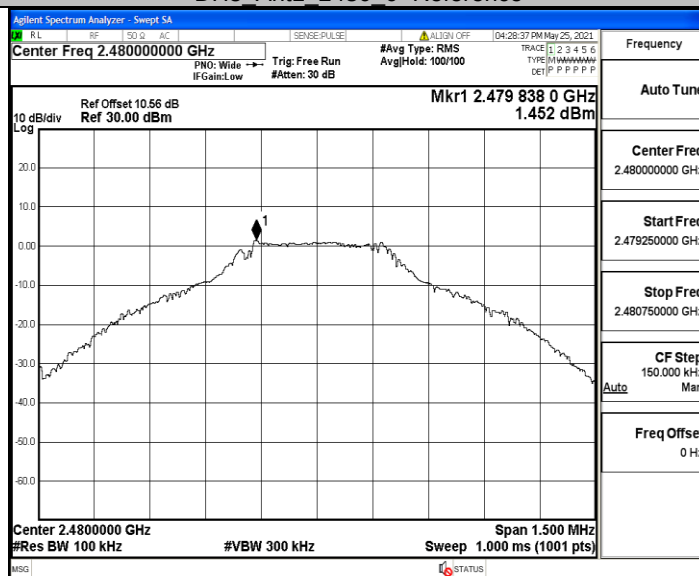
DH5_Ant1_2441_30~1000



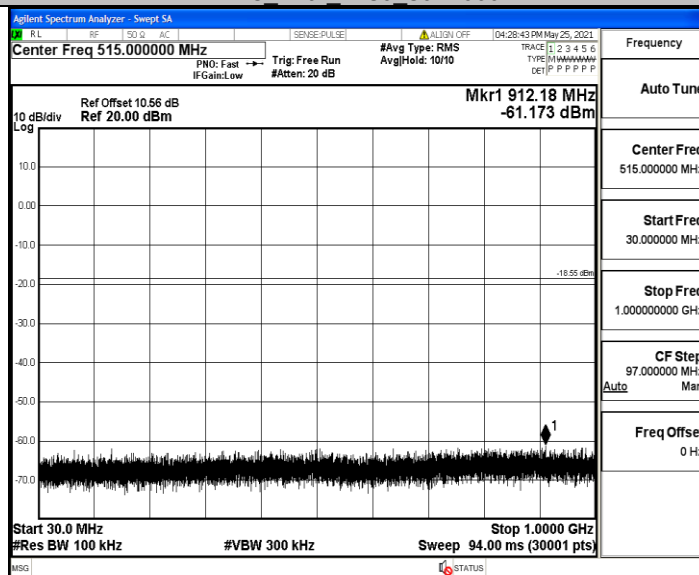
DH5_Ant1_2441_1000~26500



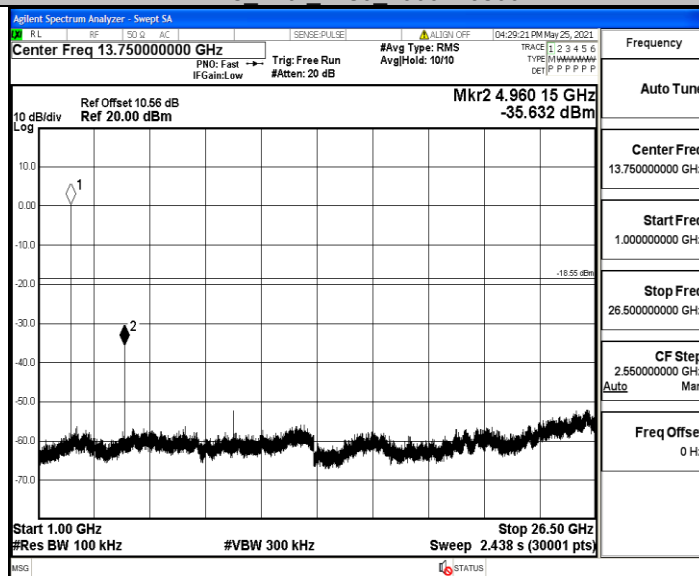
DH5_Ant1_2480_0-Reference



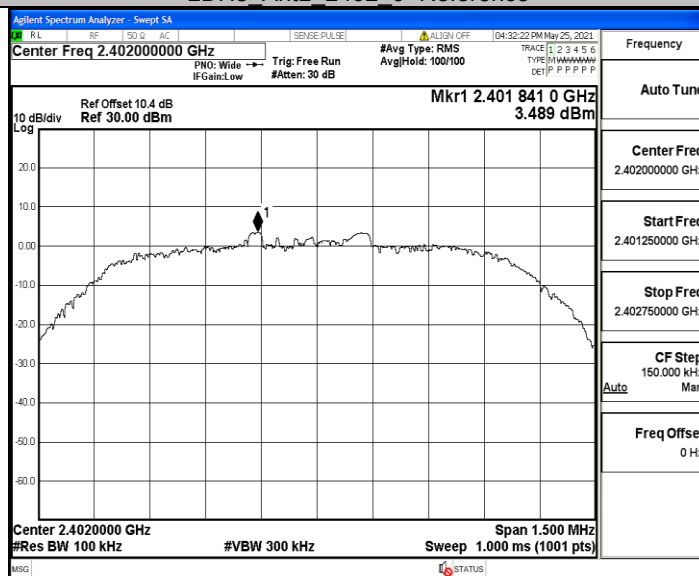
DH5_Ant1_2480_30~1000



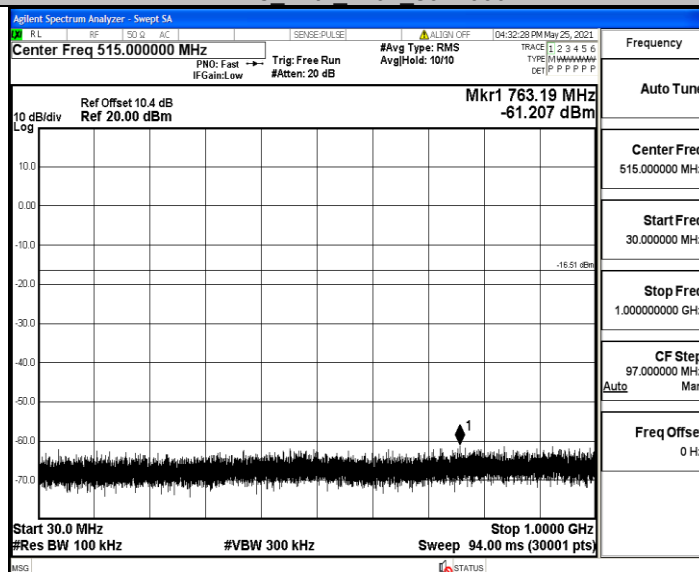
DH5_Ant1_2480_1000~26500



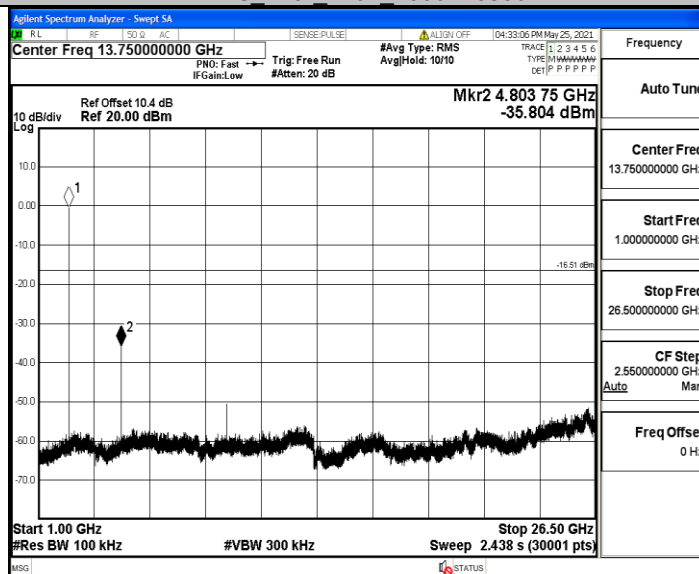
2DH5_Ant1_2402_0~Reference



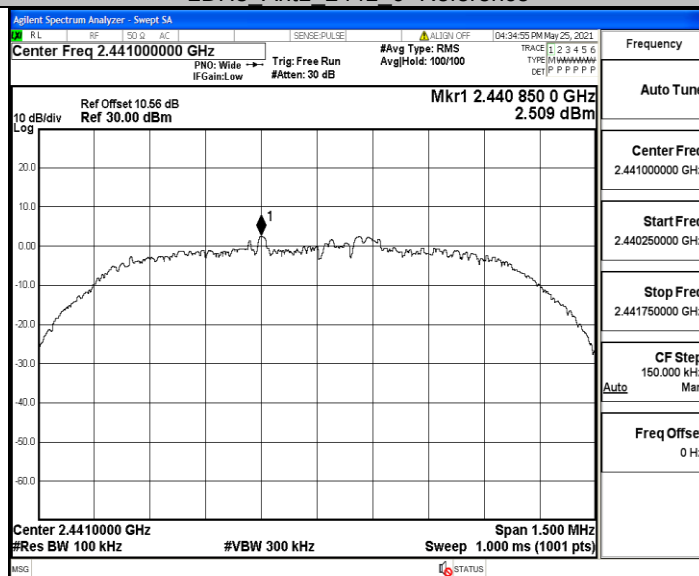
2DH5_Ant1_2402_30~1000



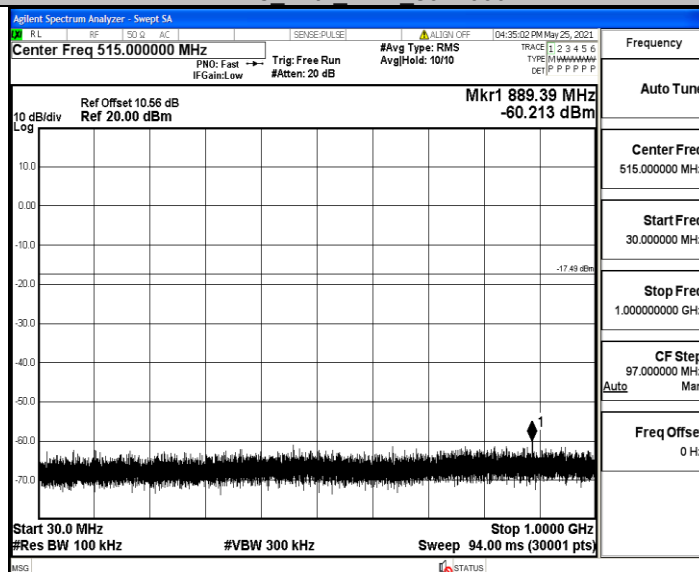
2DH5_Ant1_2402_1000~26500



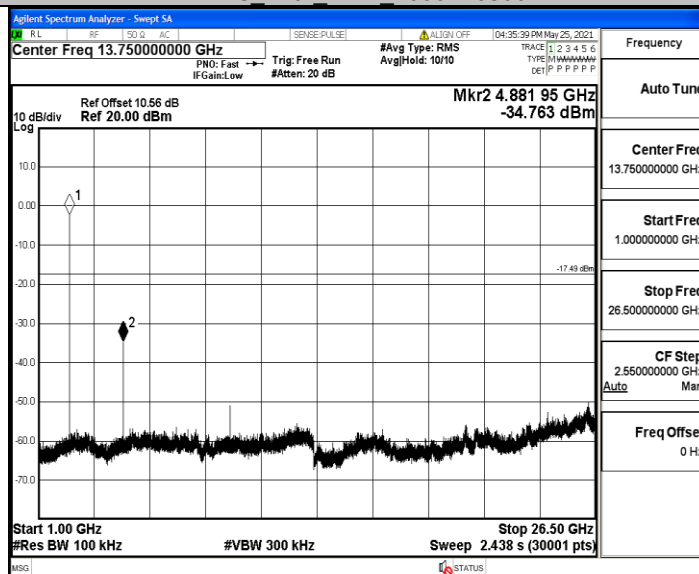
2DH5_Ant1_2441_0~Reference



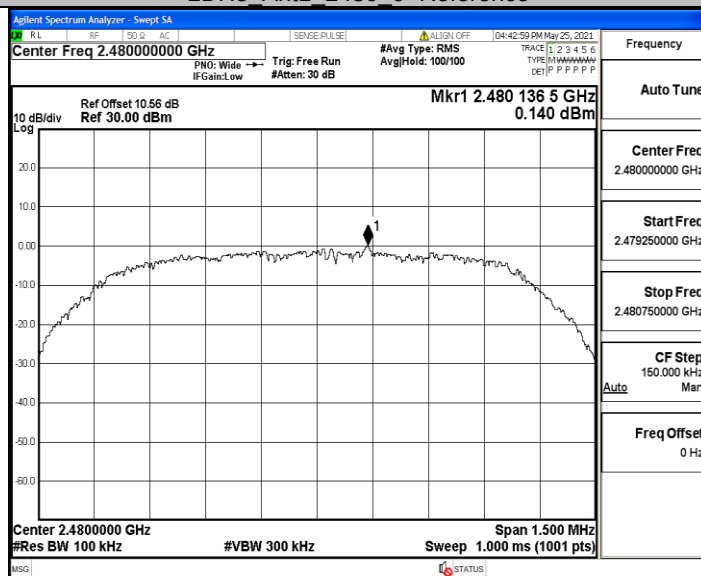
2DH5_Ant1_2441_30~1000



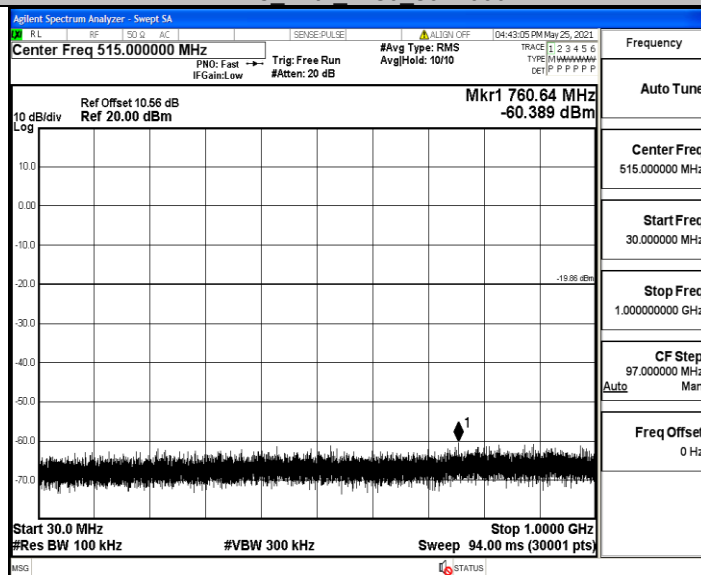
2DH5_Ant1_2441_1000~26500



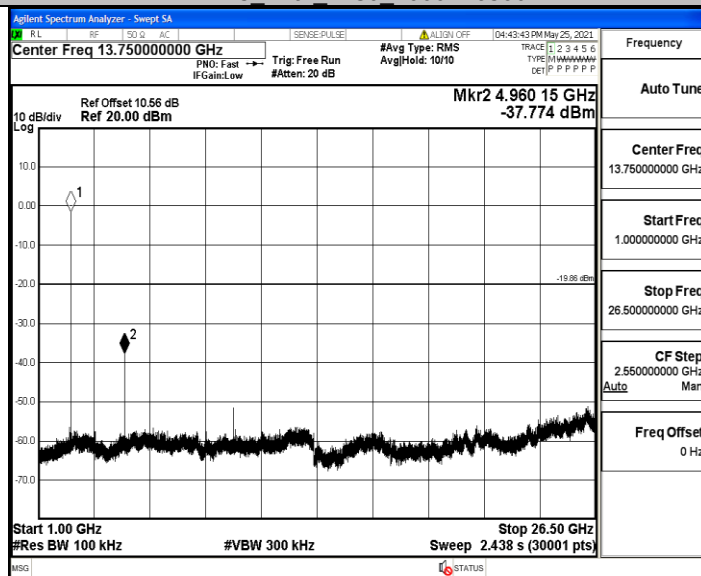
2DH5_Ant1_2480_0~Reference



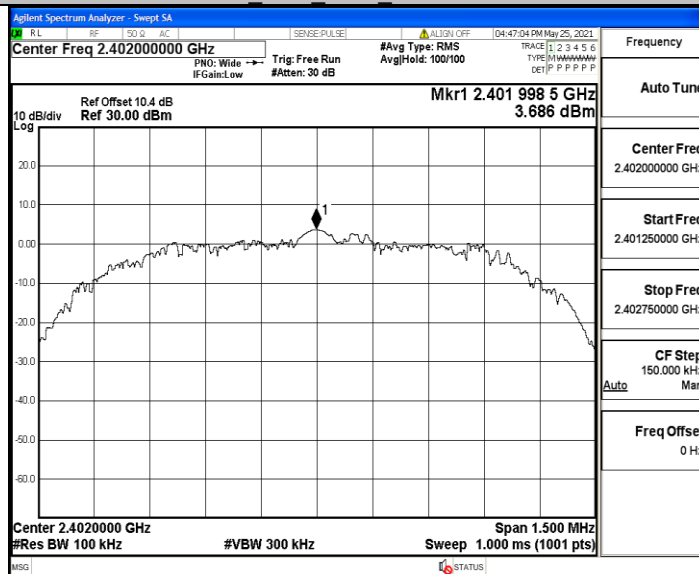
2DH5_Ant1_2480_30~1000



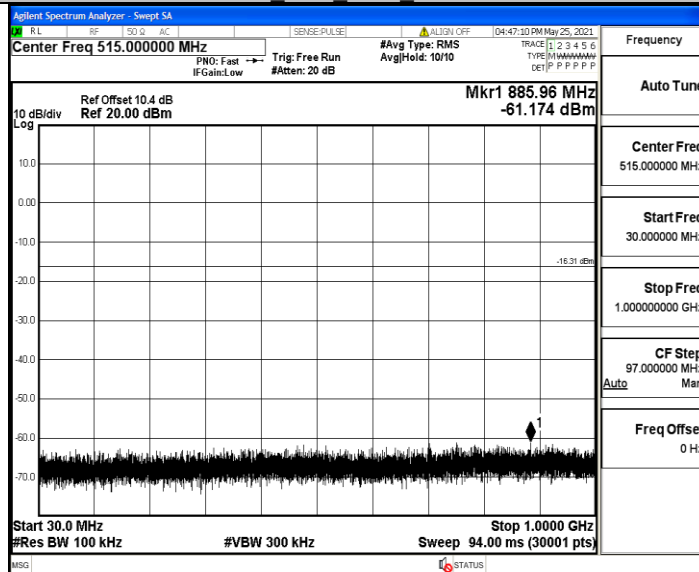
2DH5_Ant1_2480_1000~26500



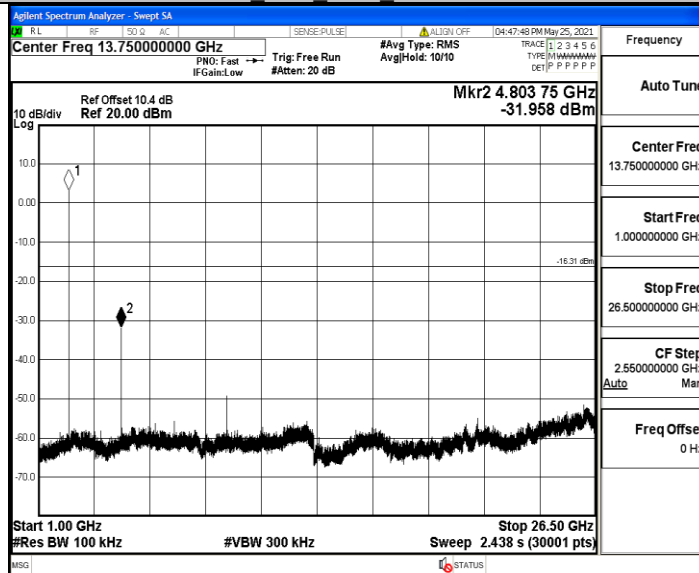
3DH5_Ant1_2402_0~Reference



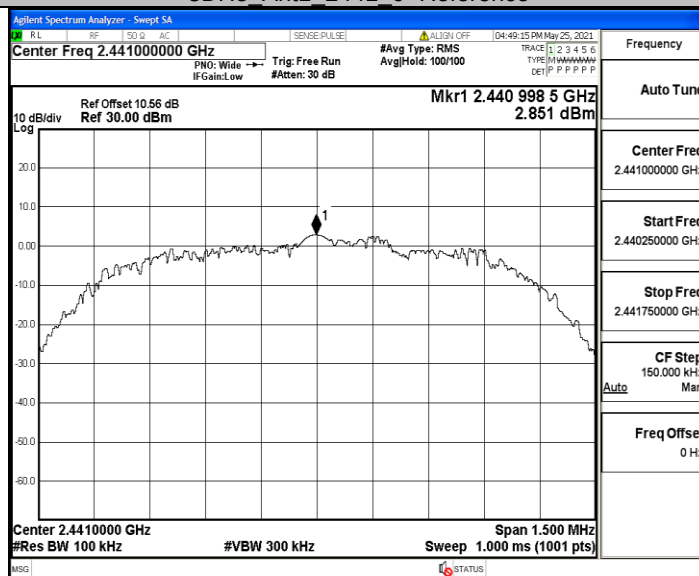
3DH5_Ant1_2402_30~1000



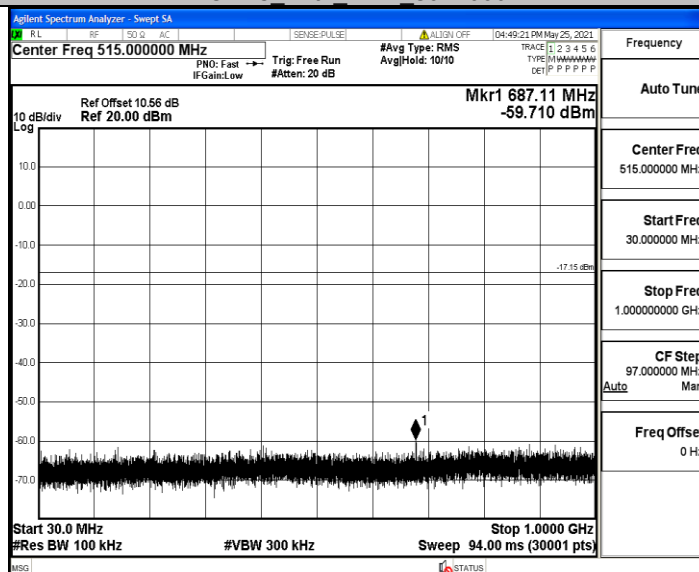
3DH5_Ant1_2402_1000~26500



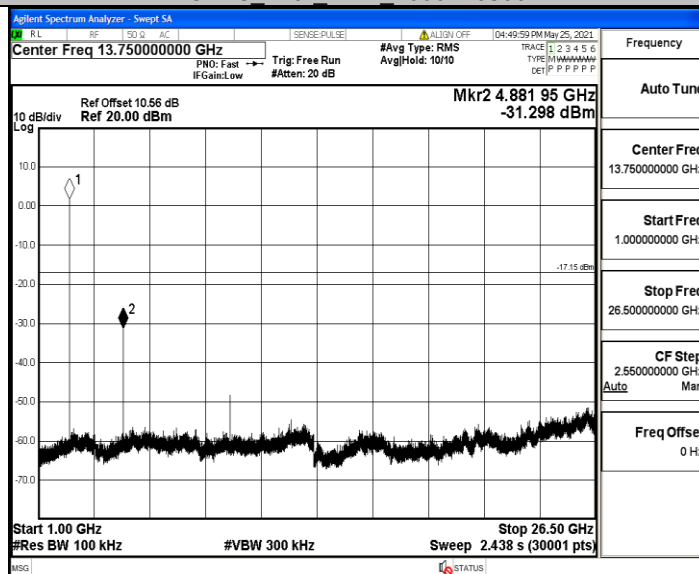
3DH5_Ant1_2441_0~Reference



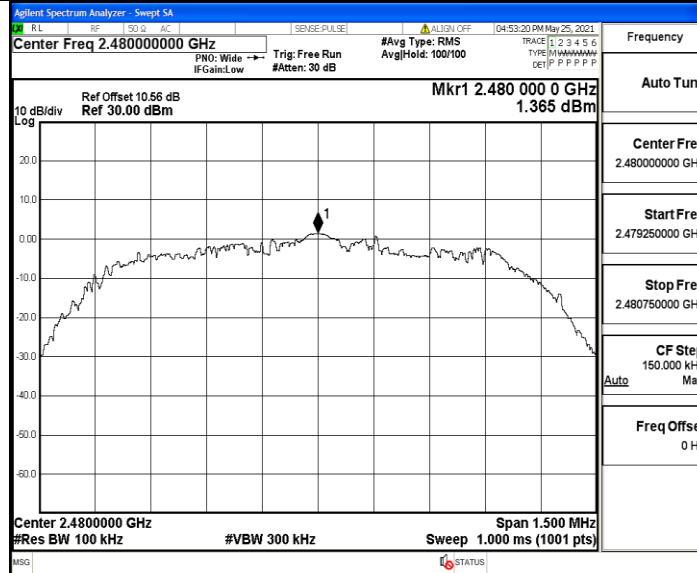
3DH5_Ant1_2441_30~1000



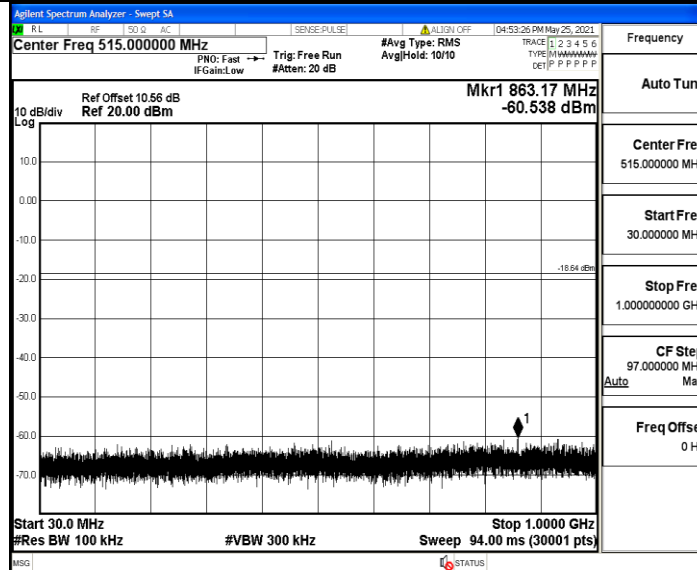
3DH5_Ant1_2441_1000~26500



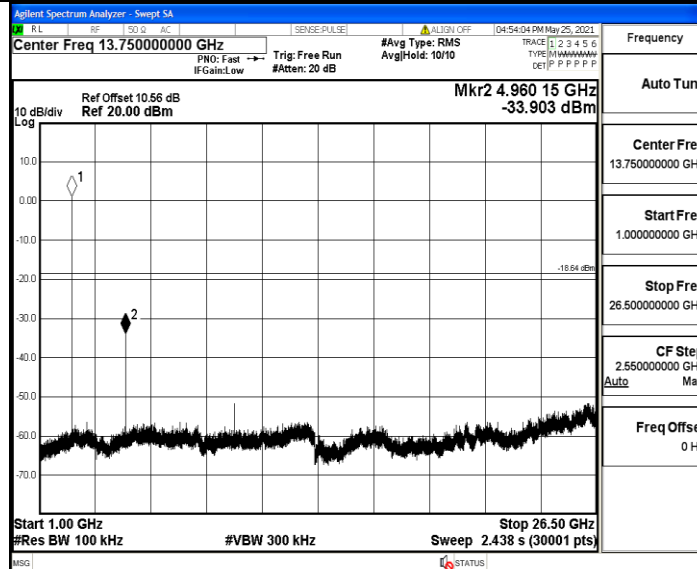
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



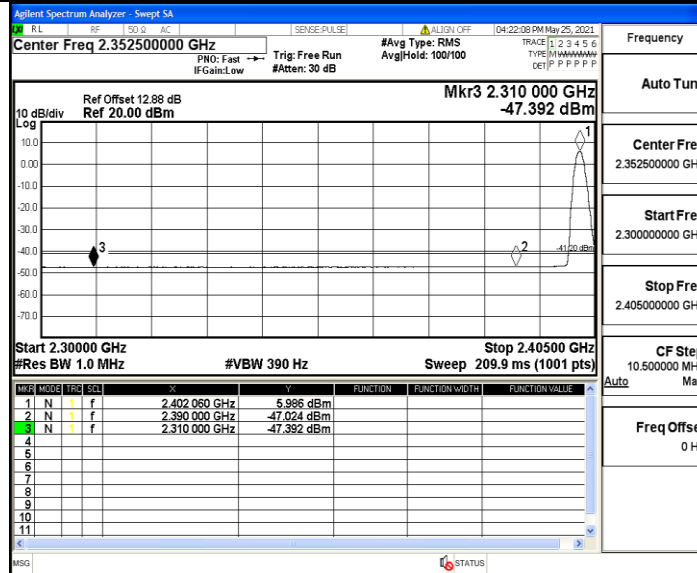
A.8 Restrict-band band-edge measurements

TestMode	Antenna	ChName	Channel	Detector	Freq(MHz)	Result (dBm)	Limit (dBm)	Verdict
DH5	Ant1	Low	2402	AV	2310.000	-47.39	<=-41.20	PASS
				AV	2390.000	-47.02	<=-41.20	PASS
				Peak	2310.000	-40.36	<=-21.20	PASS
				Peak	2349.560	-36.71	<=-21.20	PASS
				Peak	2390.000	-40.02	<=-21.20	PASS
		High	2480	AV	2483.500	-46.3	<=-41.20	PASS
				AV	2497.280	-46.17	<=-41.20	PASS
				AV	2500.000	-46.44	<=-41.20	PASS
				Peak	2483.500	-39.87	<=-21.20	PASS
				Peak	2497.280	-37.33	<=-21.20	PASS
				Peak	2500.000	-40.6	<=-21.20	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-47.34	<=-41.20	PASS
				AV	2387.885	-46.99	<=-41.20	PASS
				AV	2390.000	-47.05	<=-41.20	PASS
				Peak	2310.000	-39.4	<=-21.20	PASS
				Peak	2329.820	-37.57	<=-21.20	PASS
				Peak	2390.000	-40.6	<=-21.20	PASS
		High	2480	AV	2483.500	-45.9	<=-41.20	PASS
				AV	2500.000	-46.42	<=-41.20	PASS
				Peak	2483.500	-39.7	<=-21.20	PASS
				Peak	2494.080	-35.53	<=-21.20	PASS
				Peak	2500.000	-38.68	<=-21.20	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-47.42	<=-41.20	PASS
				AV	2387.675	-46.95	<=-41.20	PASS
				AV	2390.000	-47.02	<=-41.20	PASS
				Peak	2310.000	-40.16	<=-21.20	PASS
				Peak	2361.740	-36.9	<=-21.20	PASS
				Peak	2390.000	-38.53	<=-21.20	PASS
		High	2480	AV	2483.500	-46.12	<=-41.20	PASS
				AV	2500.000	-46.39	<=-41.20	PASS
				Peak	2483.500	-39.66	<=-21.20	PASS
				Peak	2498.800	-36.98	<=-21.20	PASS
				Peak	2500.000	-39.89	<=-21.20	PASS

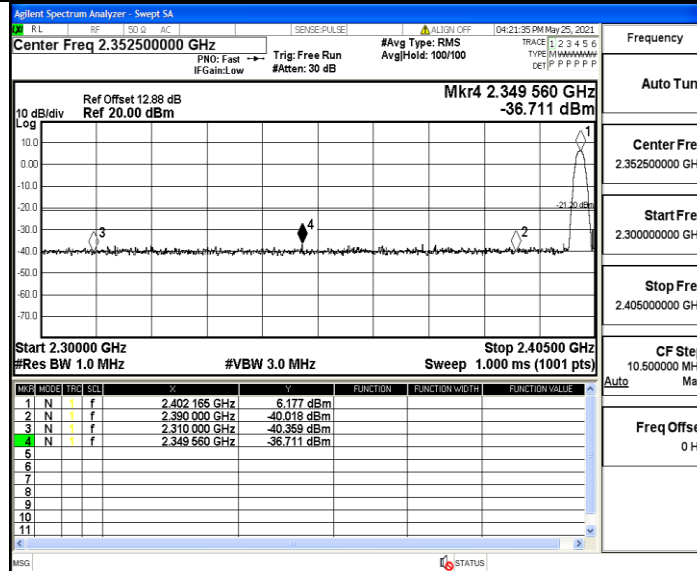
1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

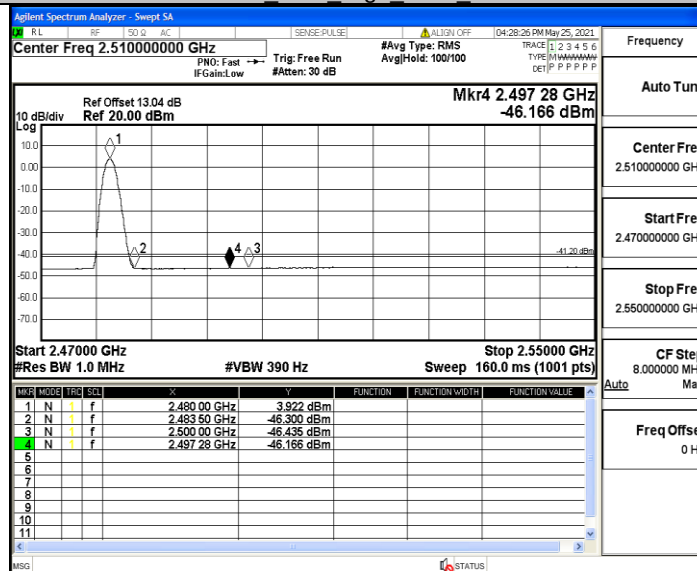
DH5 Ant1 Low 2402 AV



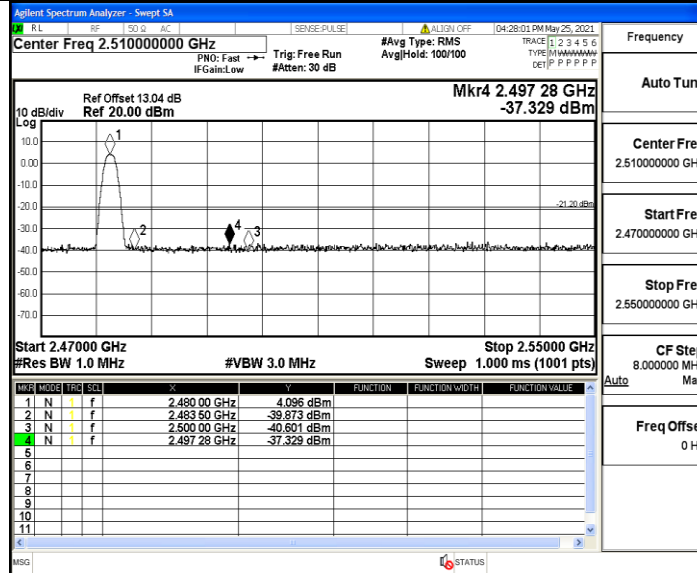
DH5 Ant1 Low 2402 Peak



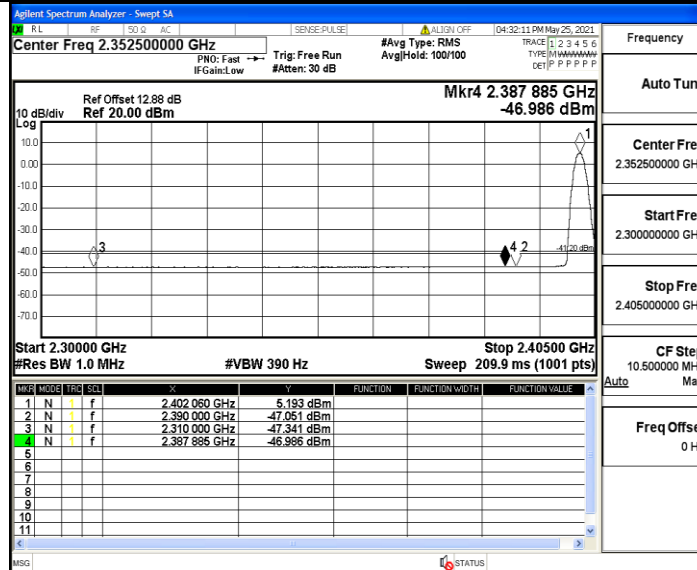
DH5 Ant1 High 2480 AV



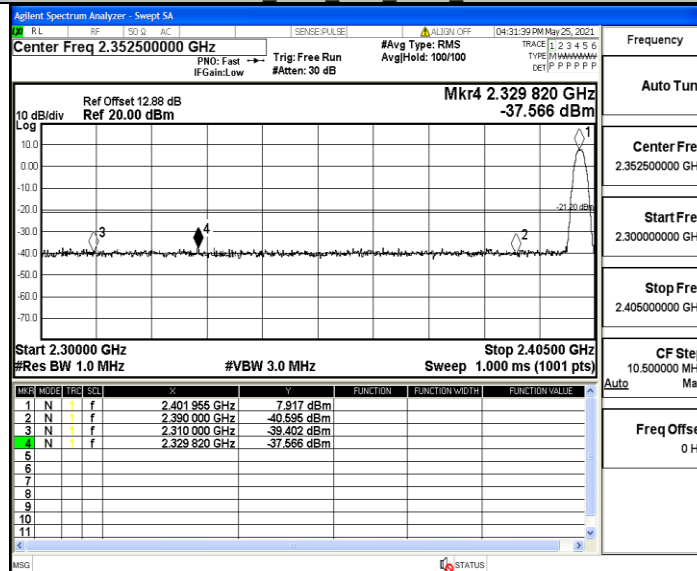
DH5 Ant1 High 2480 Peak



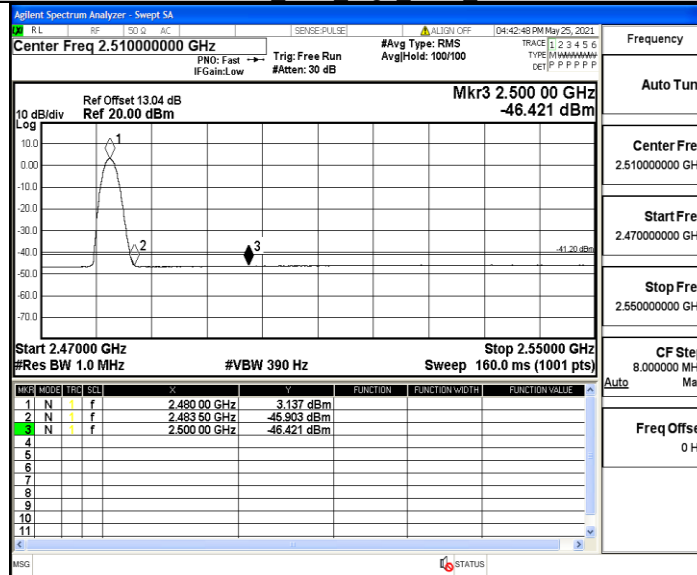
2DH5 Ant1 Low 2402 AV



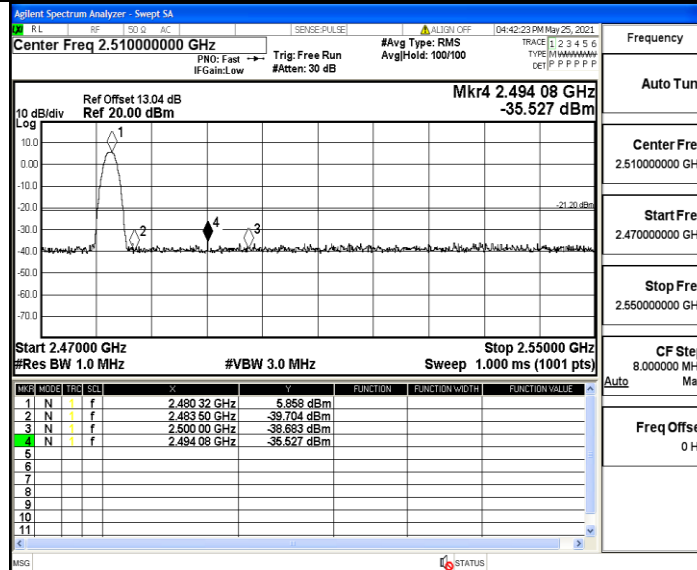
2DH5 Ant1 Low 2402 Peak



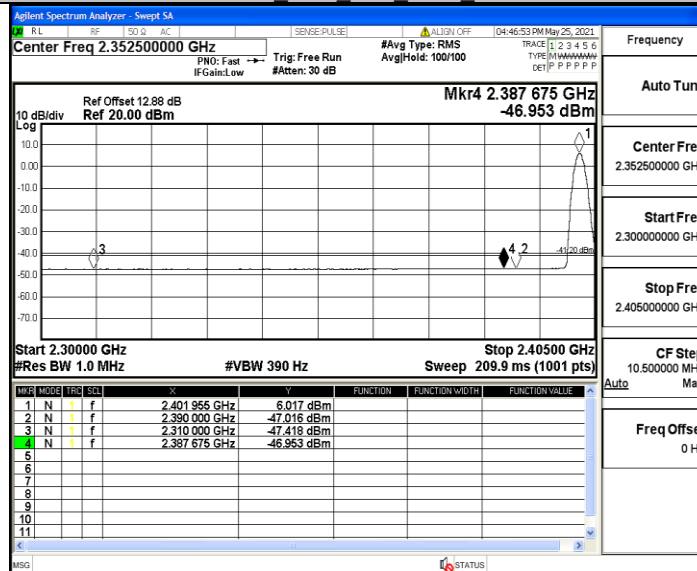
2DH5 Ant1_High_2480_AV



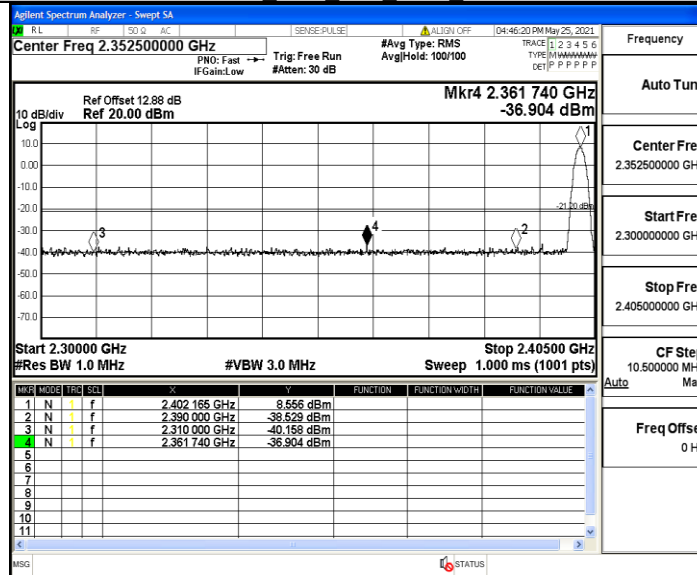
2DH5 Ant1_High_2480_Peak



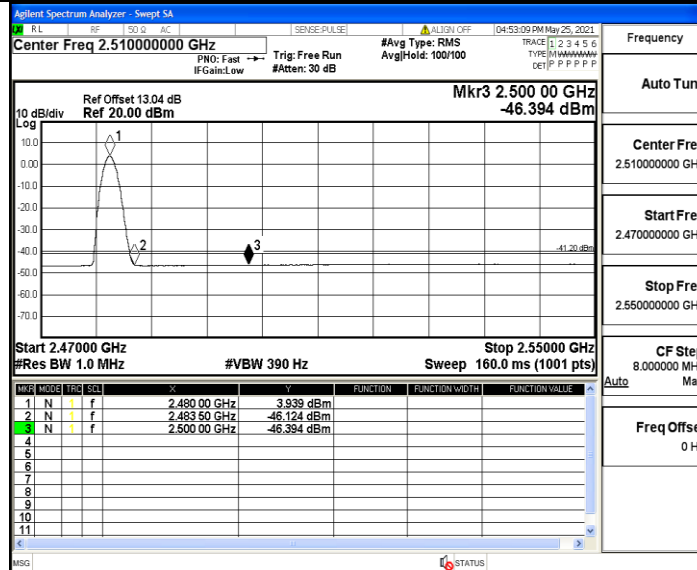
3DH5 Ant1_Low_2402_AV



3DH5_Ant1_Low_2402_Peak



3DH5_Ant1_High_2480_AV



3DH5_Ant1_High_2480_Peak

