

Appendix A

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

Product Name: 30 PIN Bluetooth Audio Receiver

Trade Mark: ZIOCOM, Smof

Test Model: ZM004871

FCC ID: 2AEK2-ZM004871

Environmental Conditions

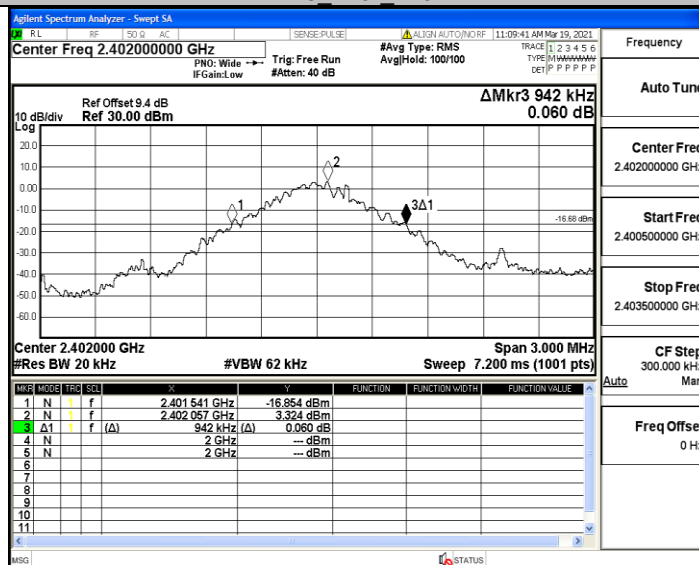
Temperature:	22.8° C
Relative Humidity:	56%
ATM Pressure:	100.0 kPa
Test Engineer:	Nancy Li
Supervised by:	Hugo Chen

A.1 20 dB Bandwidth

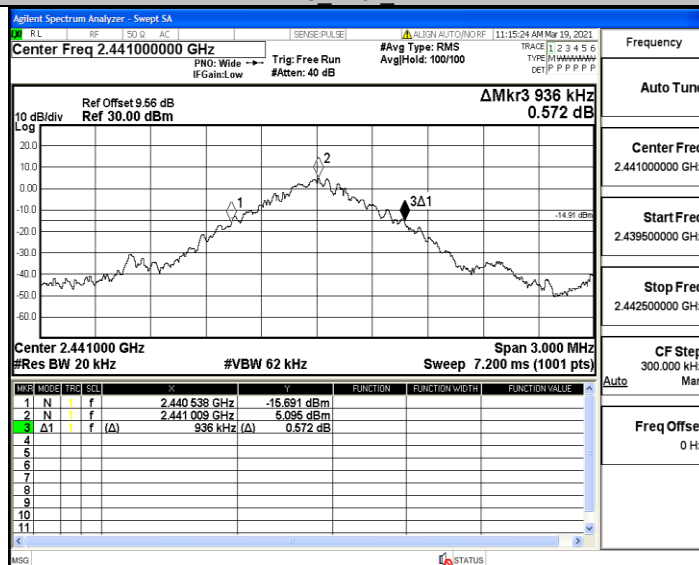
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.942	2401.541	2402.483	---	PASS
		2441	0.936	2440.538	2441.474	---	PASS
		2480	0.951	2479.535	2480.486	---	PASS
2DH5	Ant1	2402	1.260	2401.367	2402.627	---	PASS
		2441	1.227	2440.379	2441.606	---	PASS
		2480	1.254	2479.367	2480.621	---	PASS
3DH5	Ant1	2402	1.299	2401.346	2402.645	---	PASS
		2441	1.308	2440.343	2441.651	---	PASS
		2480	1.308	2479.334	2480.642	---	PASS

Test Graph

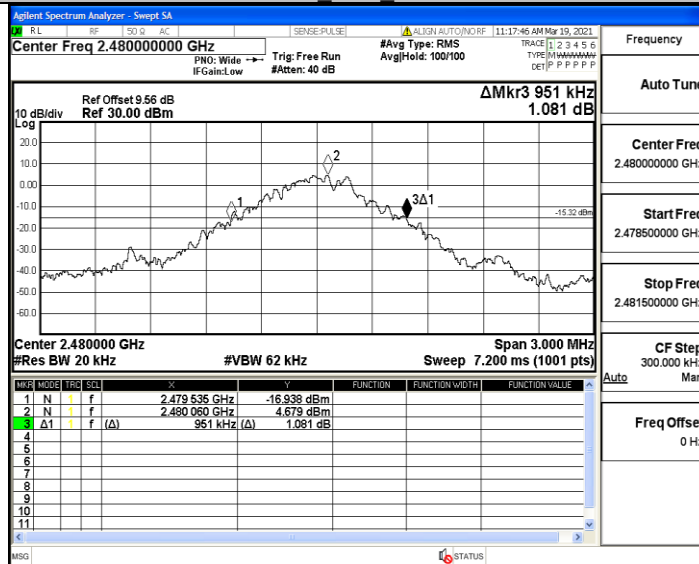
DH5_Ant1_2402



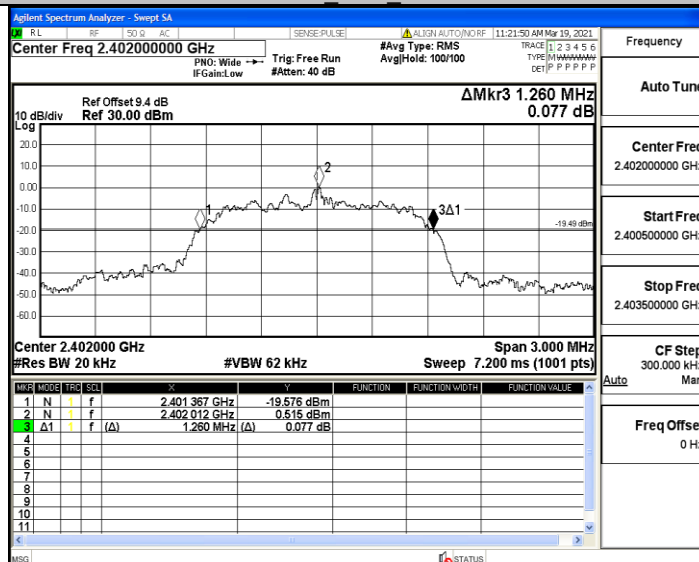
DH5_Ant1_2441



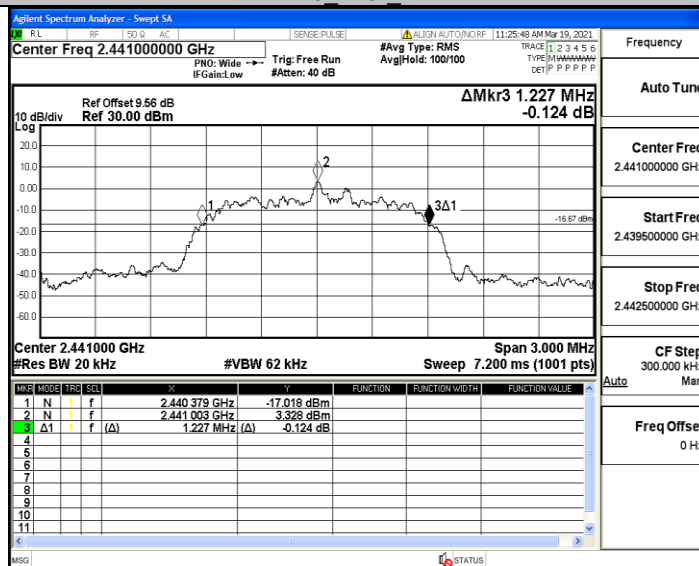
DH5_Ant1_2480



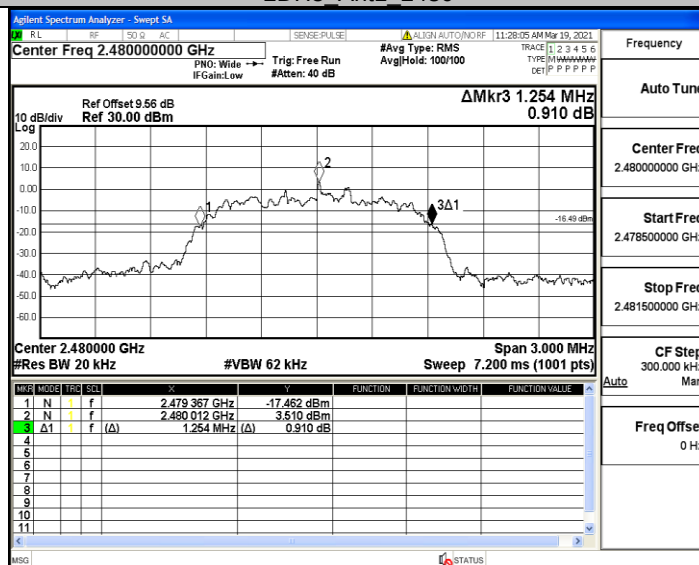
2DH5_Ant1_2402



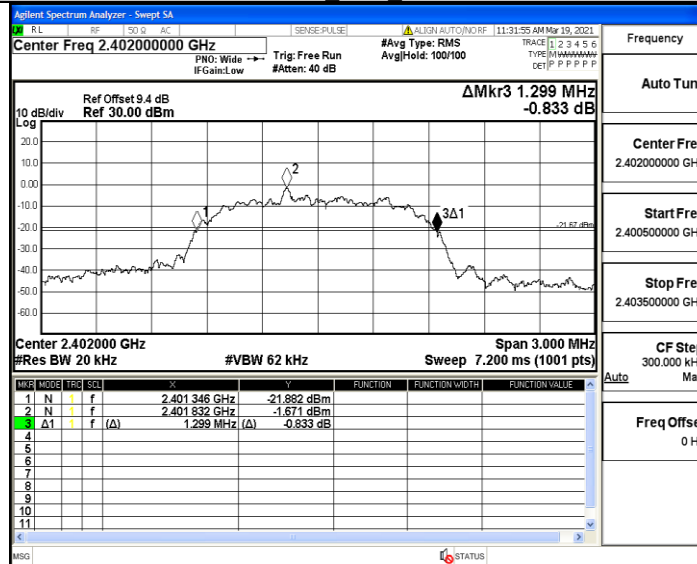
2DH5_Ant1_2441



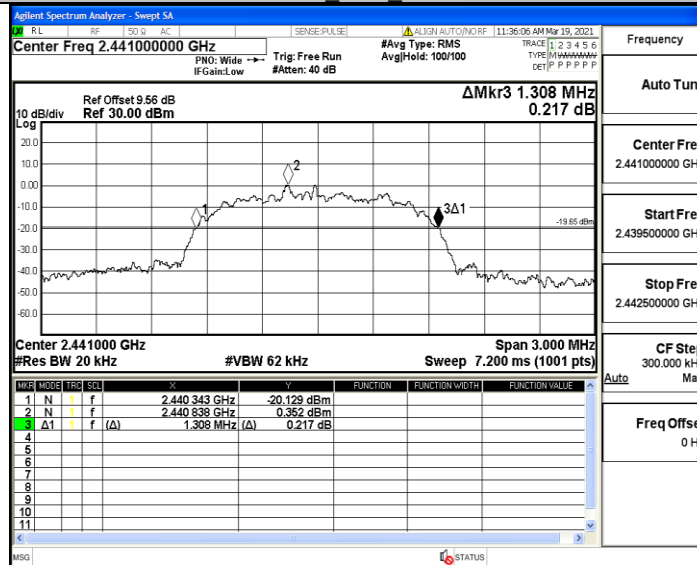
2DH5_Ant1_2480



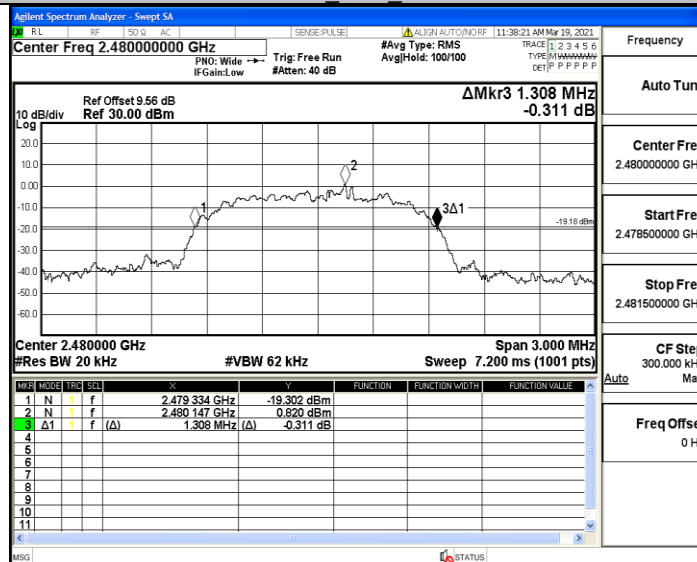
3DH5_Ant1_2402



3DH5_Ant1_2441



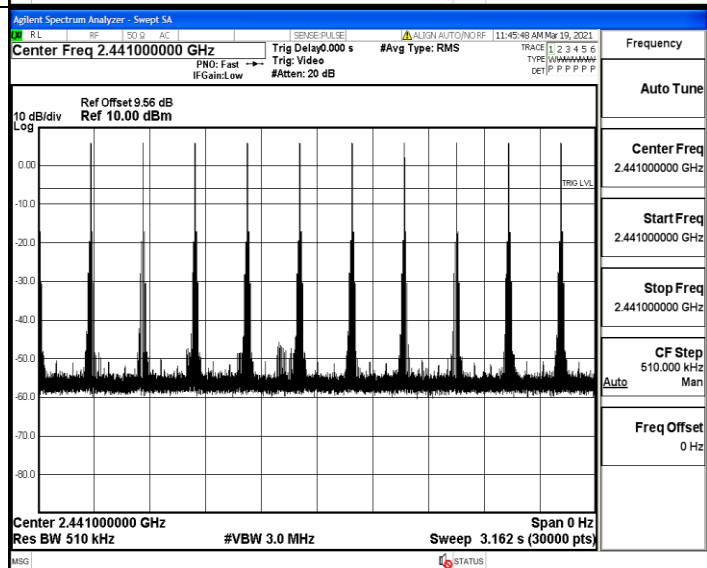
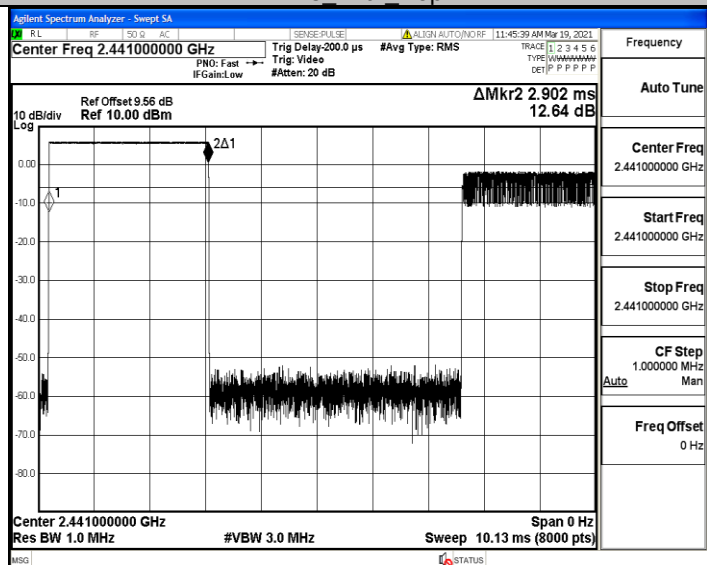
3DH5_Ant1_2480

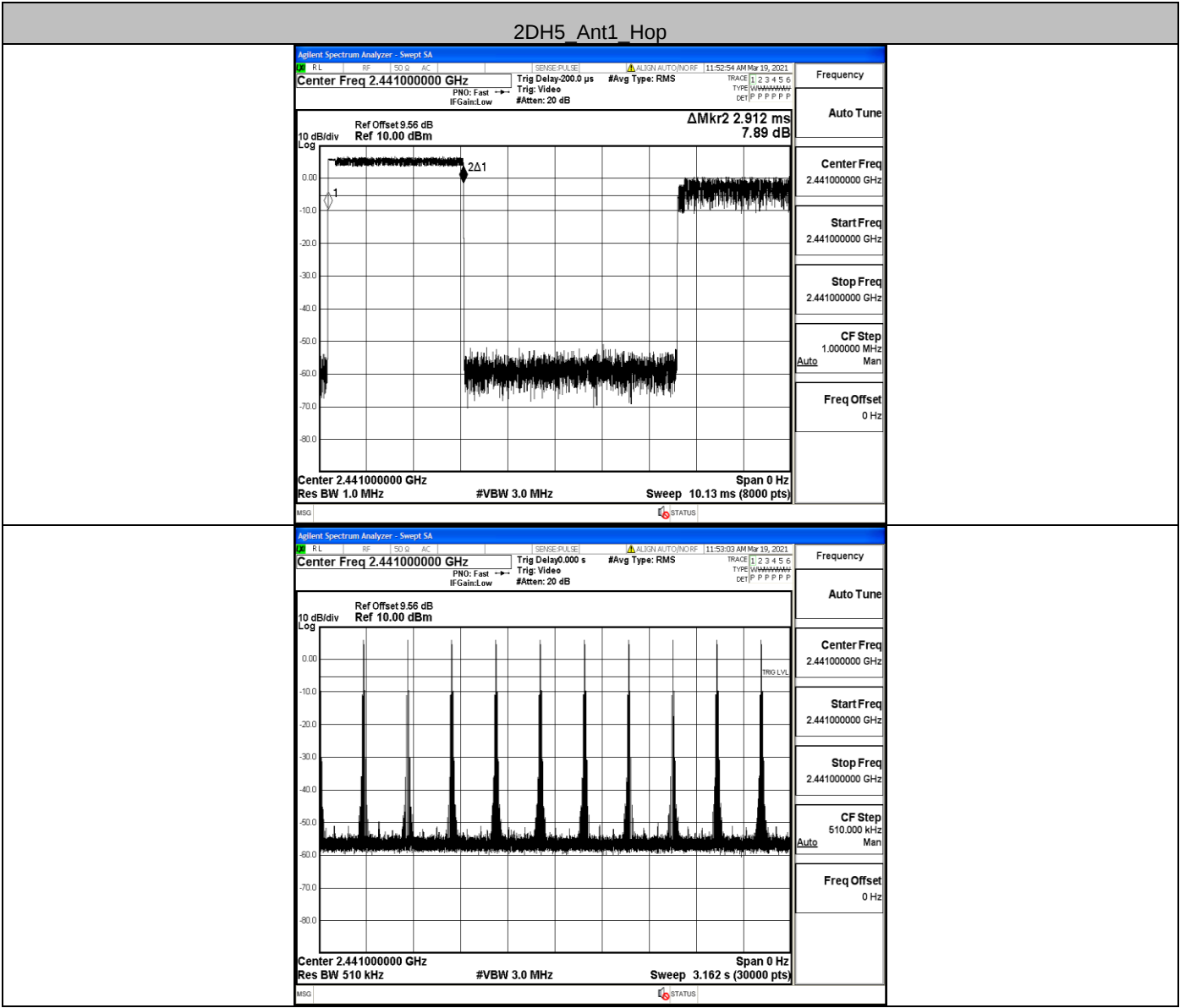


A.2 Dwell Time

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.90	110	0.319	<=0.4	PASS
2DH5	Ant1	Hop	2.91	110	0.32	<=0.4	PASS
3DH5	Ant1	Hop	2.91	110	0.32	<=0.4	PASS

DH5_Ant1_Hop





Agilent Spectrum Analyzer - Swept SA

Center Freq 2.441000000 GHz
 Res BW 1.0 MHz
 #VBW 3.0 MHz
 Sweep 10.13 ms (8000 pts)

Ref Offset 9.56 dB
 Ref 10.00 dBm

Trig Delay 200.0 μ s
 Trig: Video
 #Atten: 20 dB

Trig Delay 200.0 μ s
 Trig: Video
 #Atten: 20 dB

Frequency

Frequency
Auto Tune
Center Freq 2.441000000 GHz
Start Freq 2.441000000 GHz
Stop Freq 2.441000000 GHz
CF Step 1.000000 MHz Auto Man
Freq Offset 0 Hz

Agilent Spectrum Analyzer - Swept SA

Center Freq 2.441000000 GHz
 Res BW 510 kHz
 #VBW 3.0 MHz
 Sweep 3.162 s (30000 pts)

Ref Offset 9.56 dB
 Ref 10.00 dBm

Trig Delay 0.000 s
 Trig: Video
 #Atten: 20 dB

Trig Delay 0.000 s
 Trig: Video
 #Atten: 20 dB

Frequency

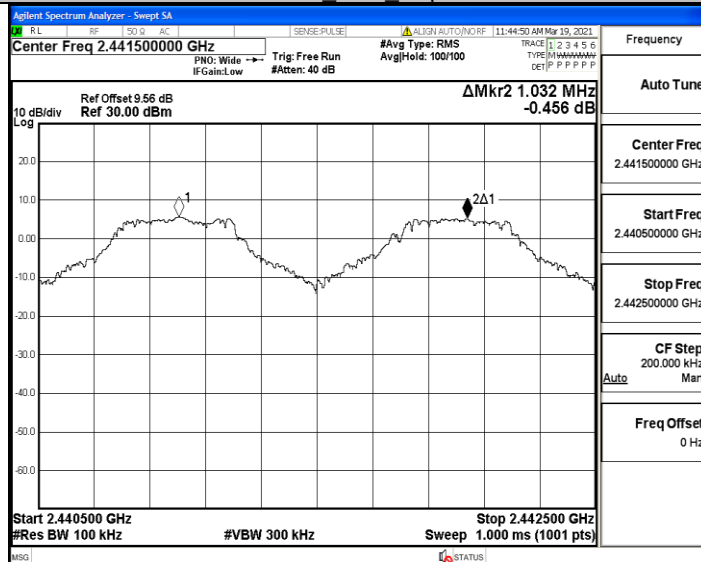
Frequency
Auto Tune
Center Freq 2.441000000 GHz
Start Freq 2.441000000 GHz
Stop Freq 2.441000000 GHz
CF Step 510.000 kHz Auto Man
Freq Offset 0 Hz

A.3 Carrier Frequency Separation

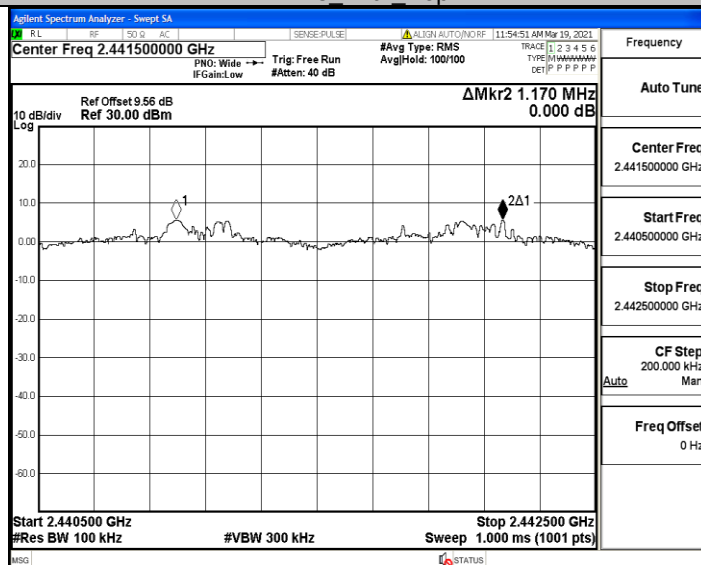
TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.032	≥ 0.951	PASS
2DH5	Ant1	Hop	1.17	≥ 0.840	PASS
3DH5	Ant1	Hop	1.164	≥ 0.872	PASS

Test Graph

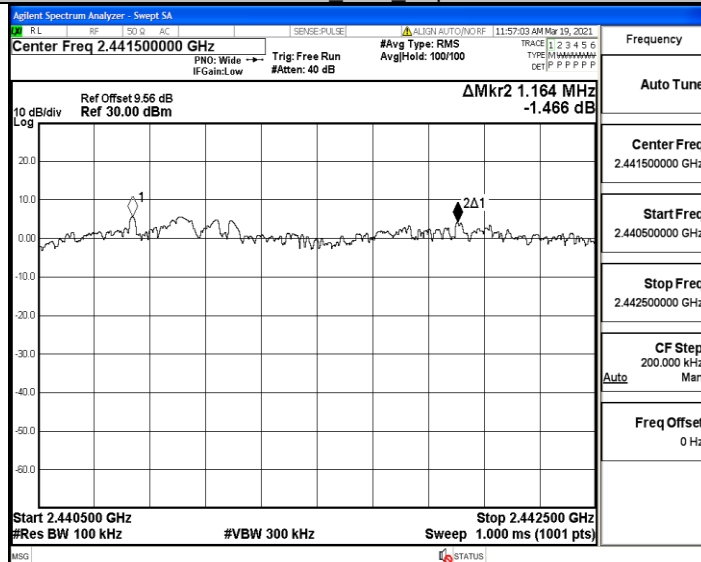
DH5_Ant1_Hop



2DH5_Ant1_Hop



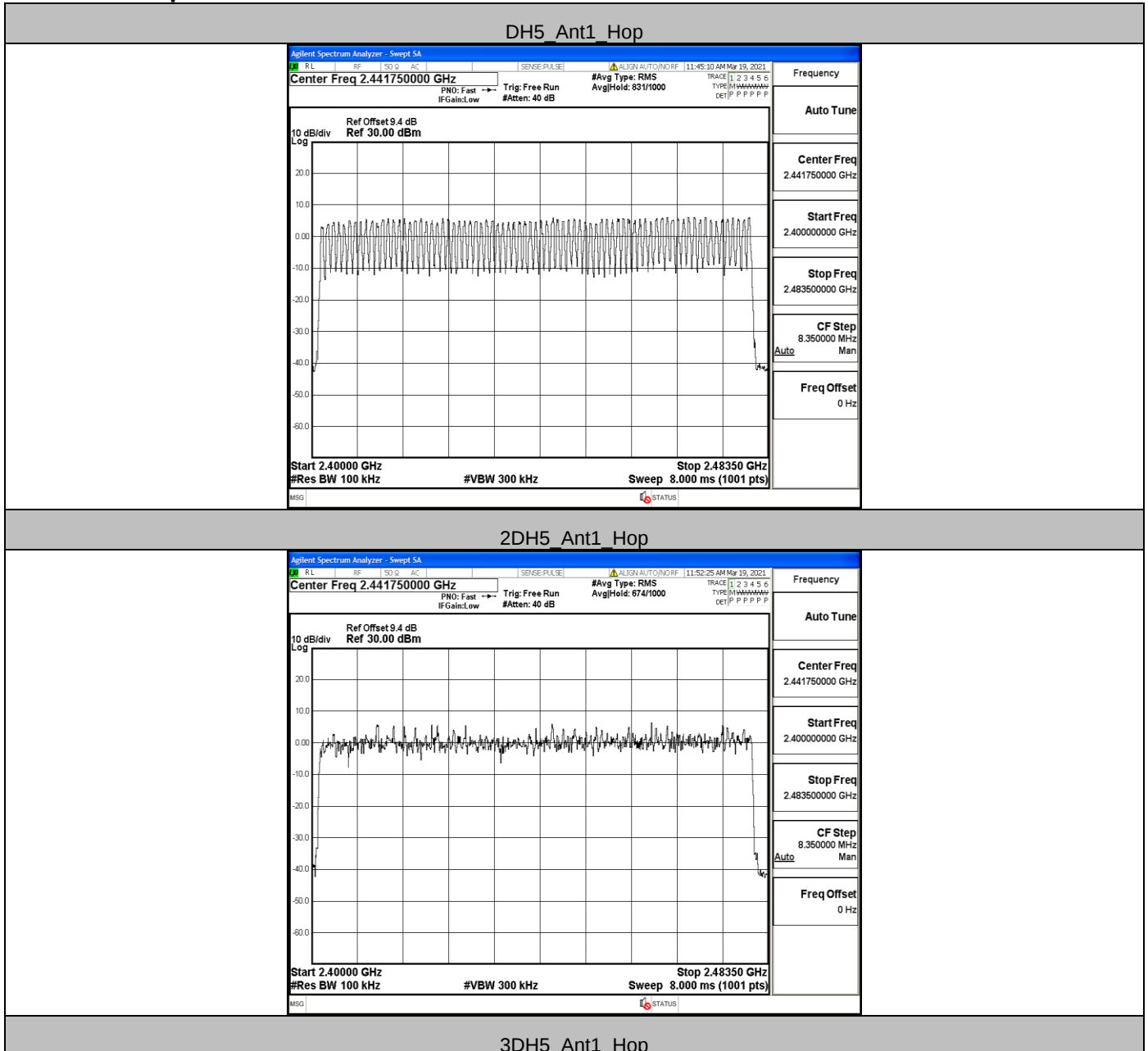
3DH5_Ant1_Hop

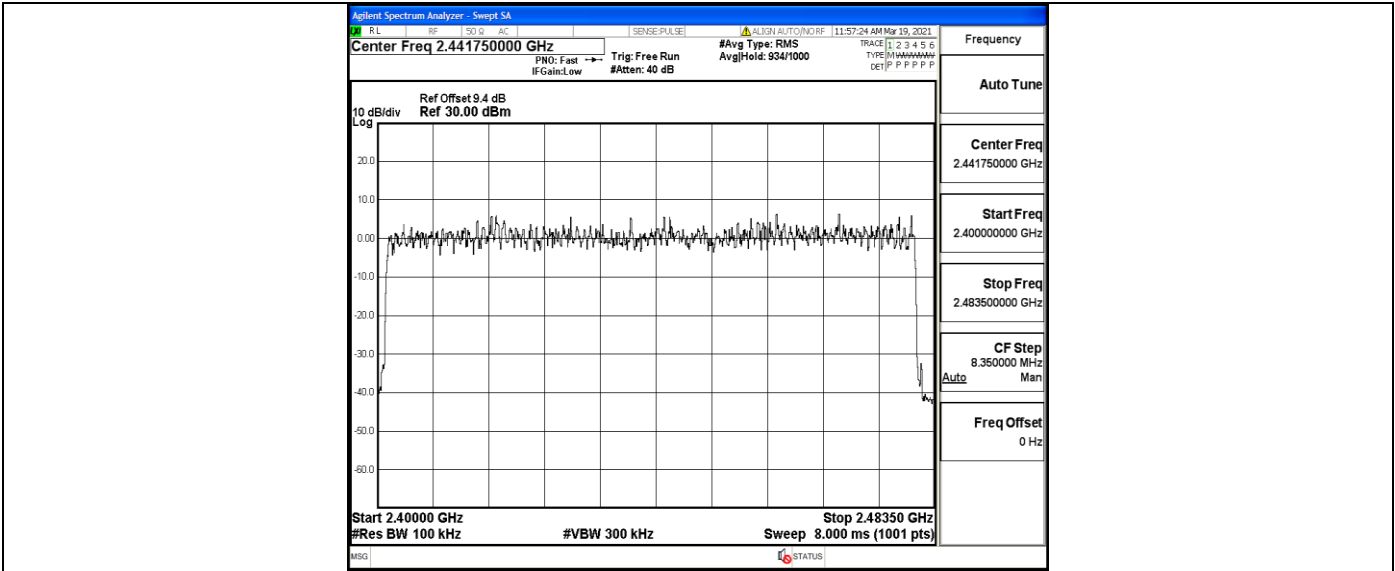


A.4 Hopping Channel Number

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

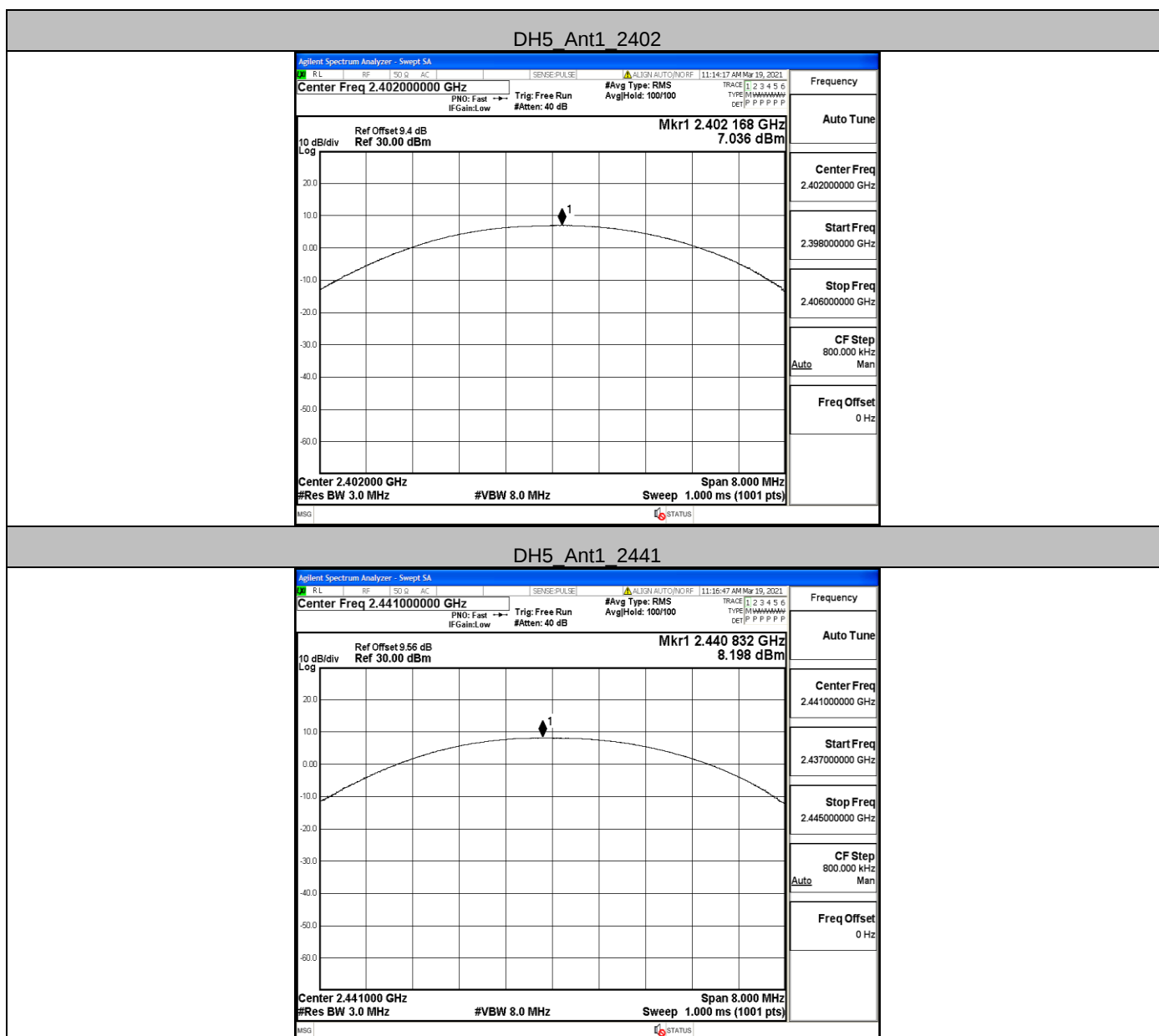




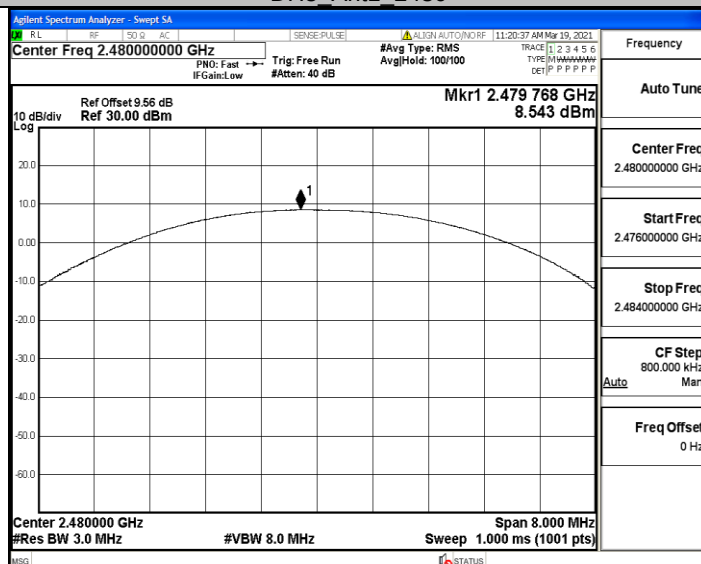
A.5 Conducted Peak Output Power

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	7.04	<=20.97	PASS
		2441	8.20	<=20.97	PASS
		2480	8.54	<=20.97	PASS
2DH5	Ant1	2402	5.15	<=20.97	PASS
		2441	7.09	<=20.97	PASS
		2480	7.46	<=20.97	PASS
3DH5	Ant1	2402	5.68	<=20.97	PASS
		2441	7.33	<=20.97	PASS
		2480	7.72	<=20.97	PASS

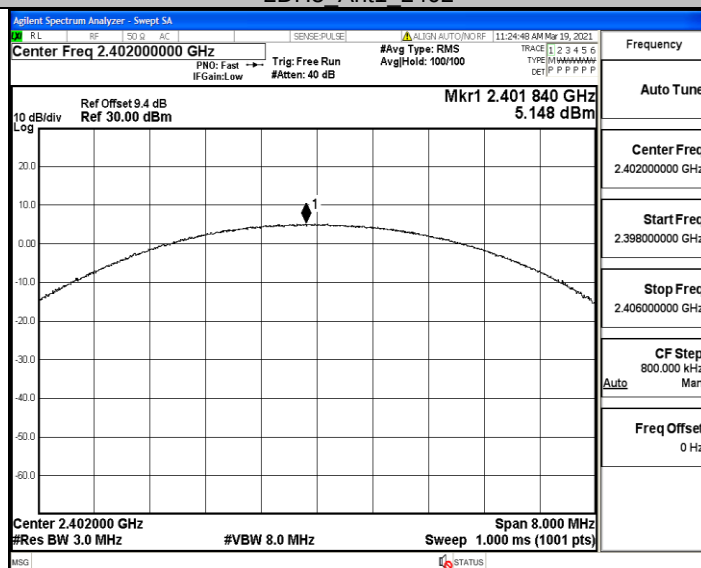
Test Graph



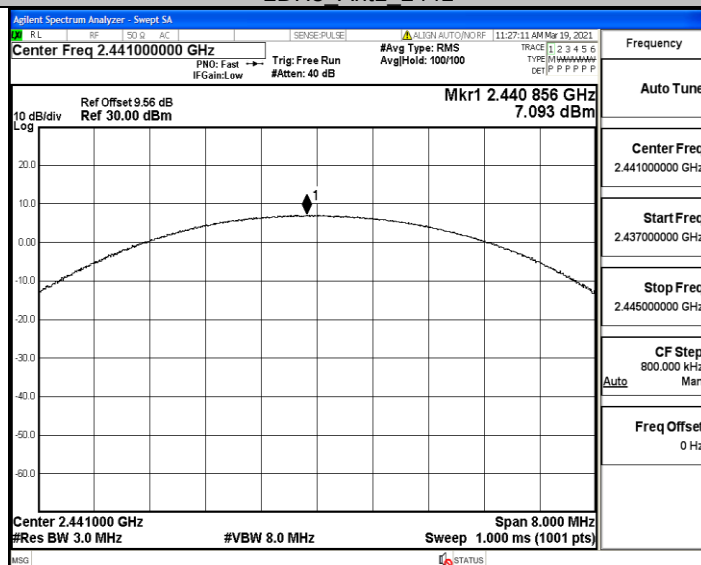
DH5 Ant1_2480



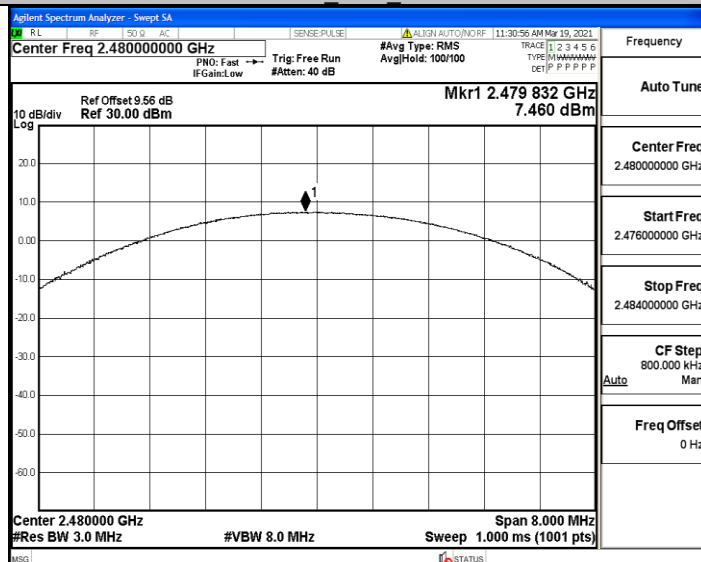
2DH5 Ant1_2402



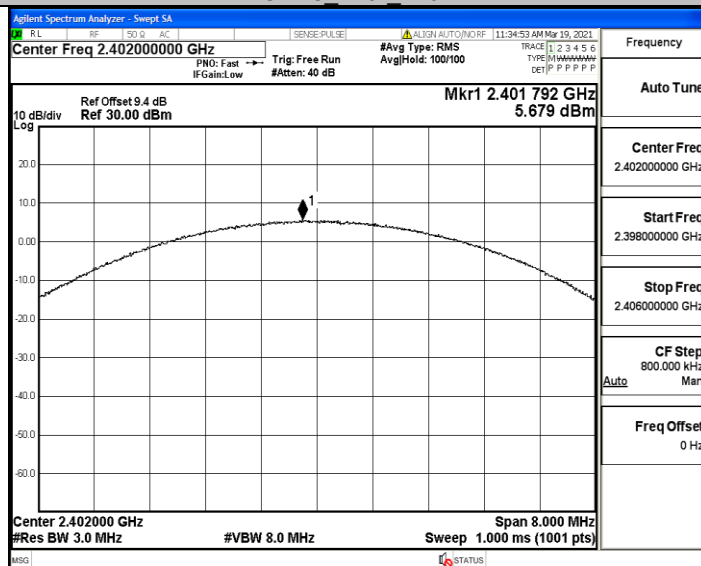
2DH5 Ant1_2441



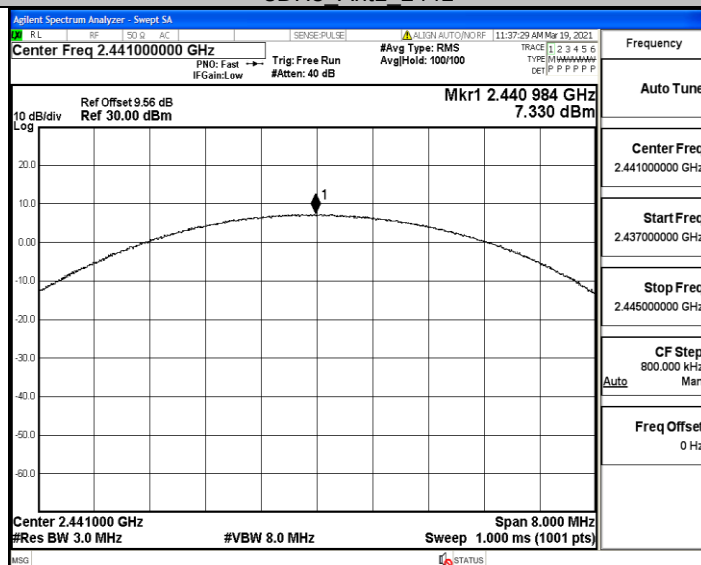
2DH5_Ant1_2480

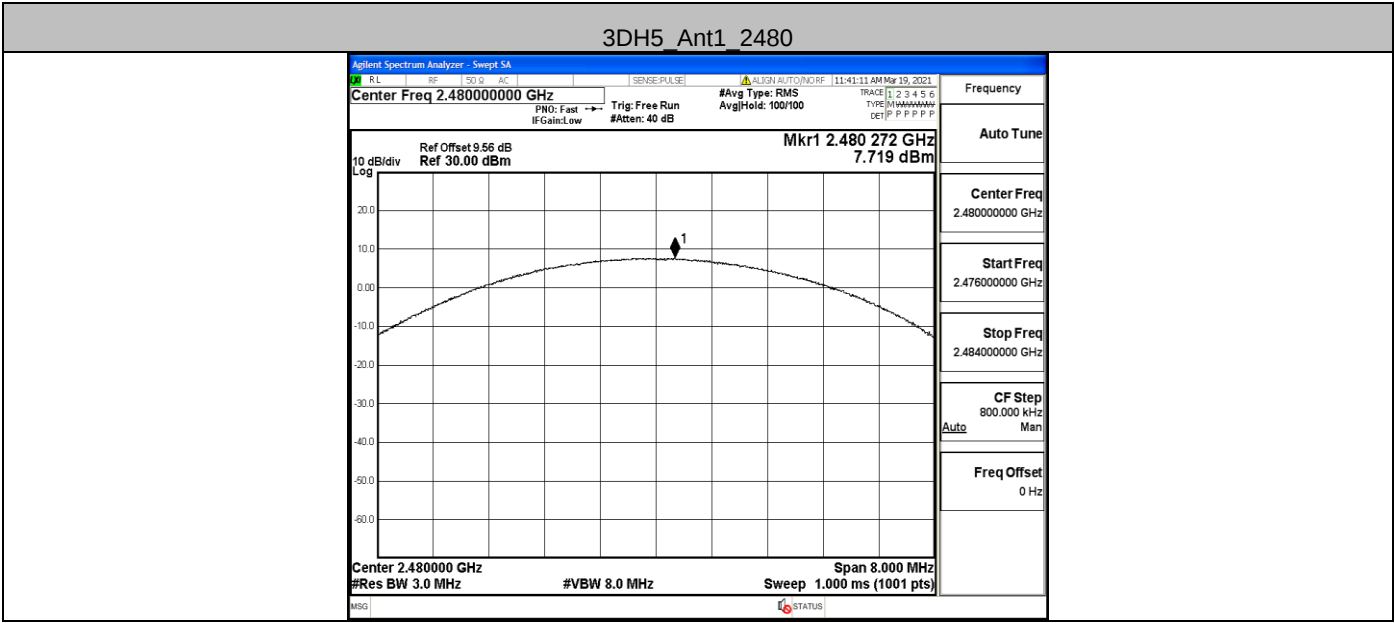


3DH5_Ant1_2402



3DH5_Ant1_2441



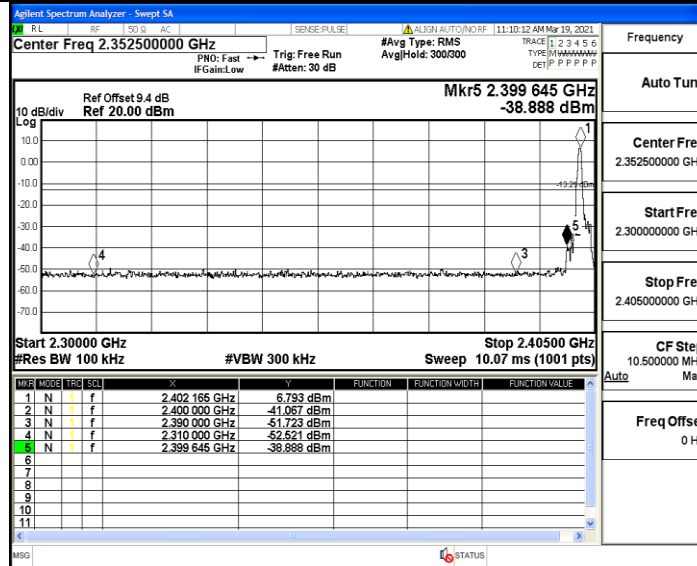


A.6 Band-edge for RF Conducted Emissions

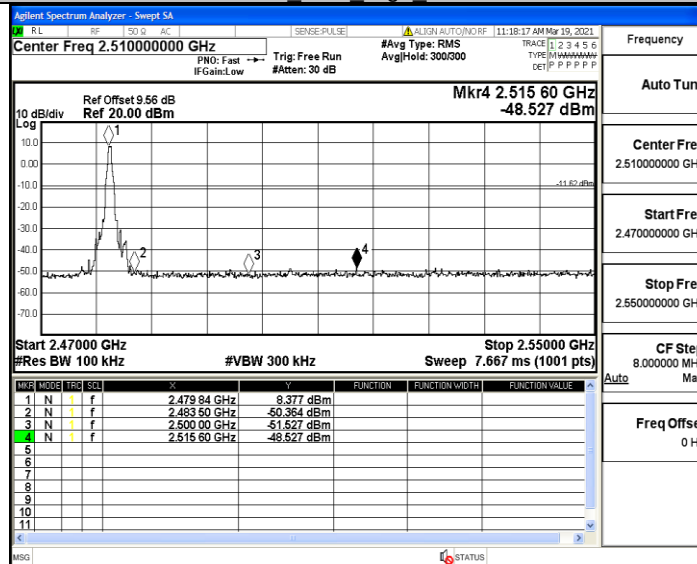
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	6.79	-38.89	<=-13.21	PASS
		High	2480	8.38	-48.53	<=-11.62	PASS
		Low	Hop_2402	4.64	-46.27	<=-15.36	PASS
		High	Hop_2480	5.88	-46.78	<=-14.12	PASS
2DH5	Ant1	Low	2402	3.54	-34.59	<=-16.46	PASS
		High	2480	6.03	-48.74	<=-13.98	PASS
		Low	Hop_2402	2.38	-48.21	<=-17.62	PASS
		High	Hop_2480	6.19	-48.47	<=-13.81	PASS
3DH5	Ant1	Low	2402	3.49	-38.56	<=-16.51	PASS
		High	2480	6.32	-48.31	<=-13.68	PASS
		Low	Hop_2402	3.55	-46.46	<=-16.45	PASS
		High	Hop_2480	6.59	-48.14	<=-13.41	PASS

Test Graph

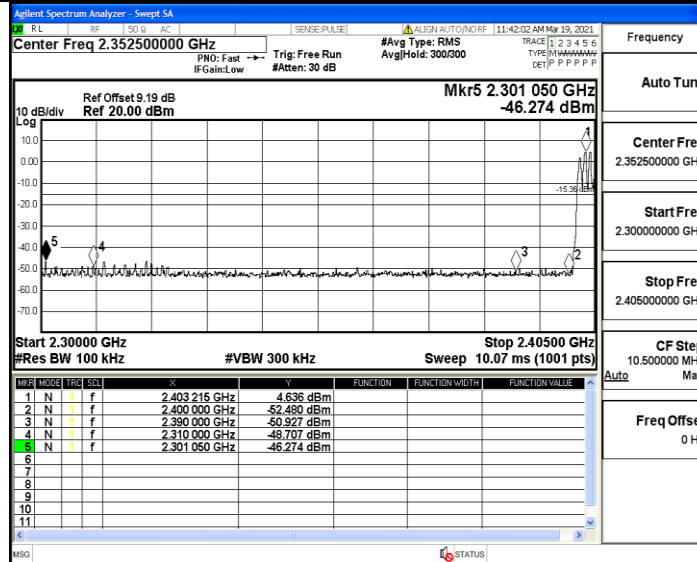
DH5_Ant1_Low_2402



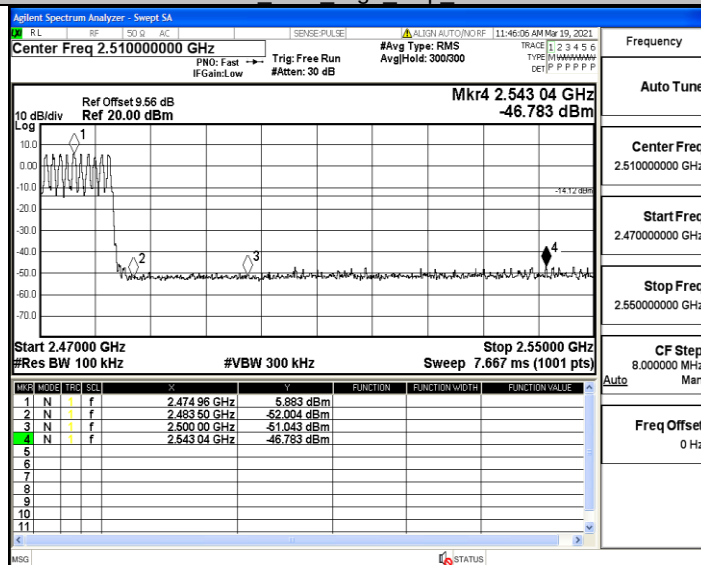
DH5_Ant1_High_2480



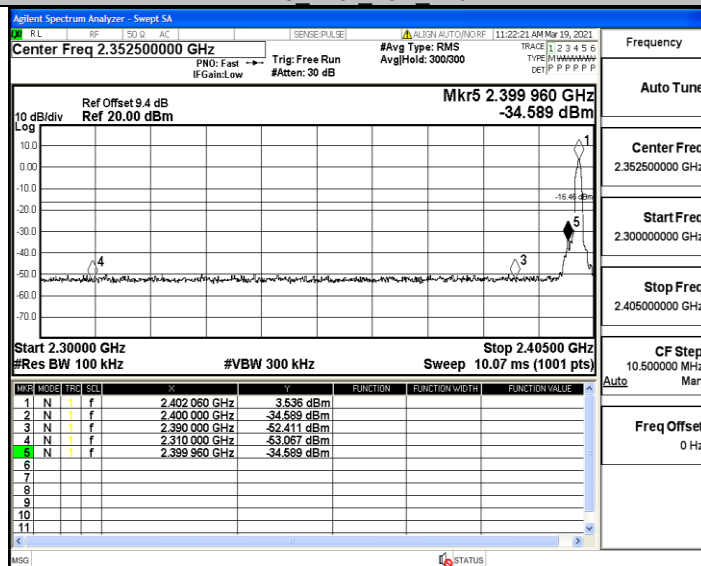
DH5_Ant1_Low_Hop_2402



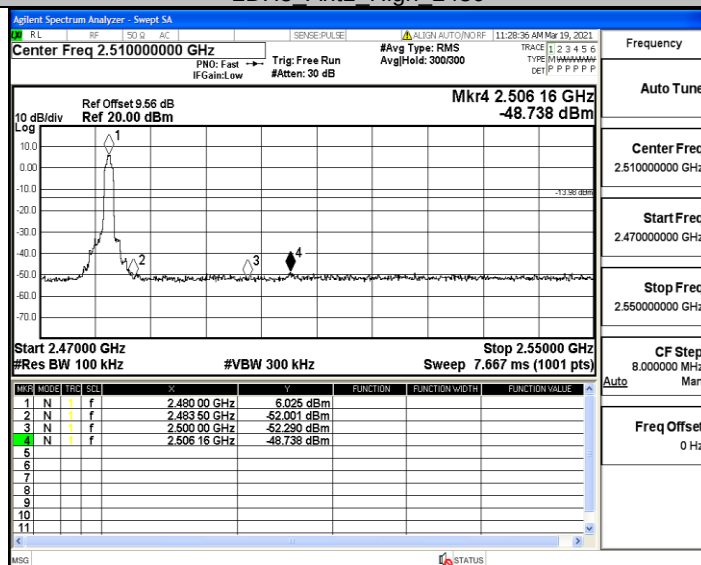
DH5 Ant1 High Hop 2480



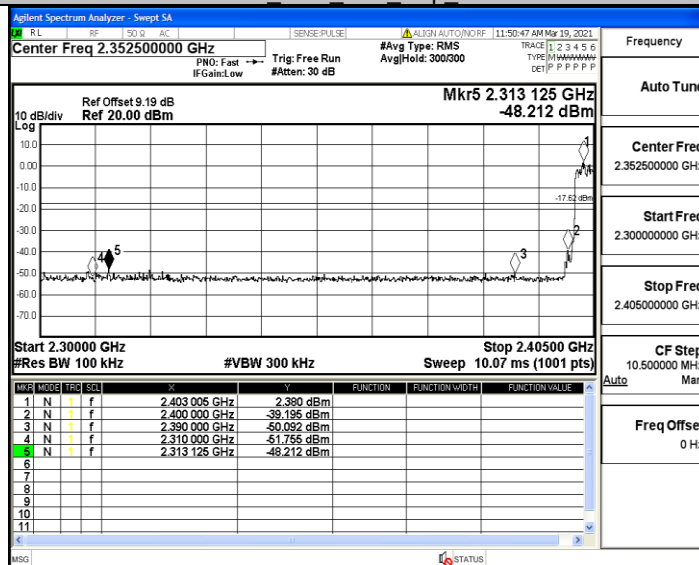
2DH5 Ant1 Low 2402



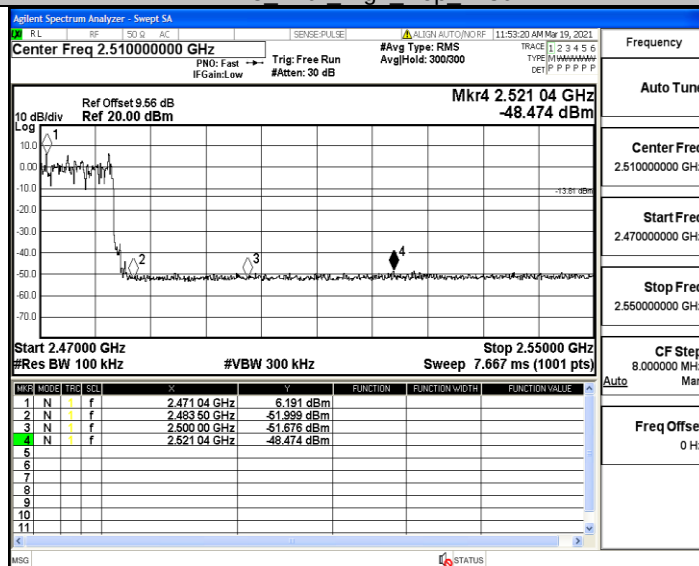
2DH5 Ant1 High 2480



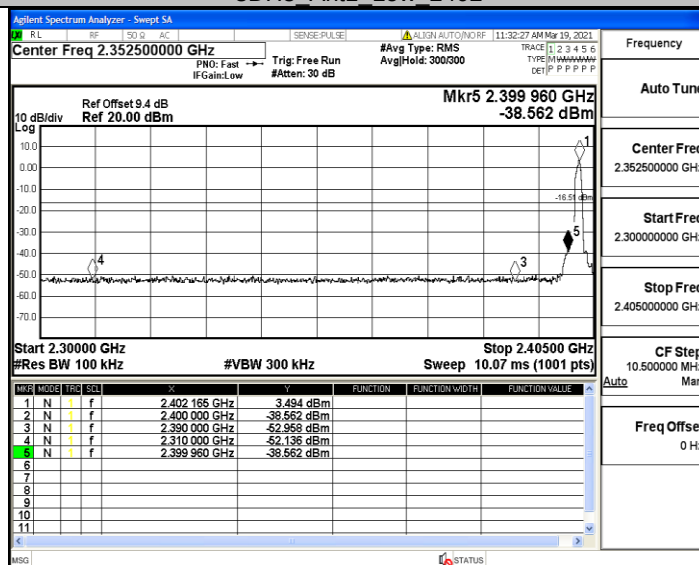
2DH5 Ant1 Low Hop 2402



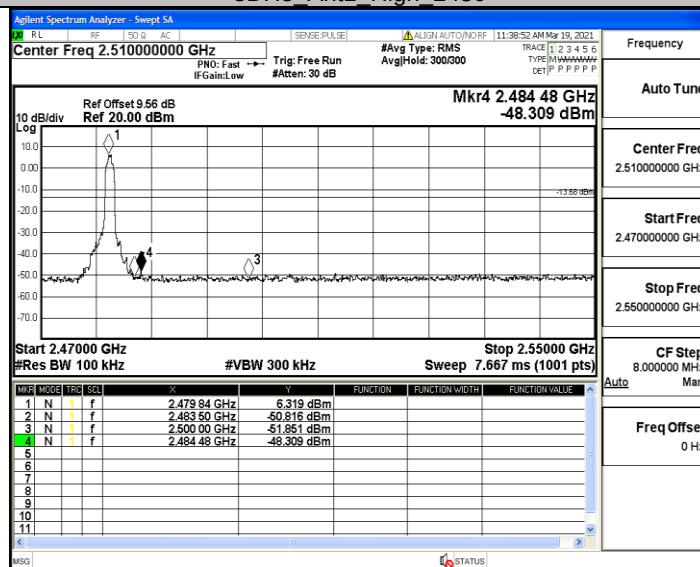
2DH5 Ant1 High Hop 2480



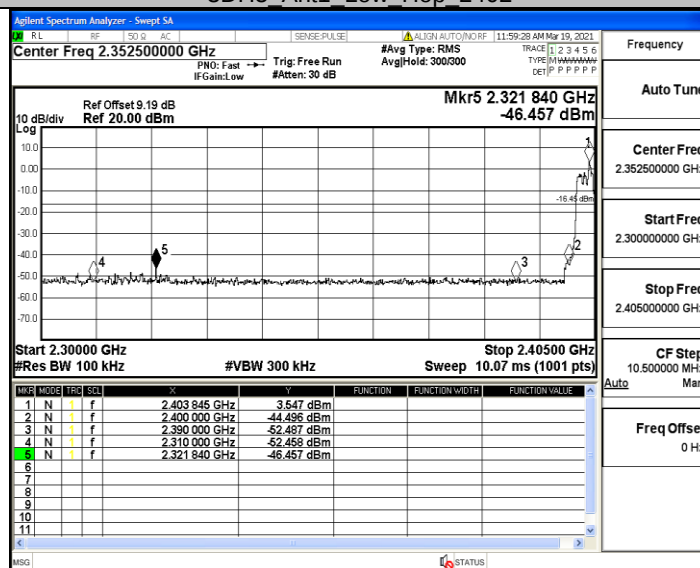
3DH5 Ant1 Low 2402



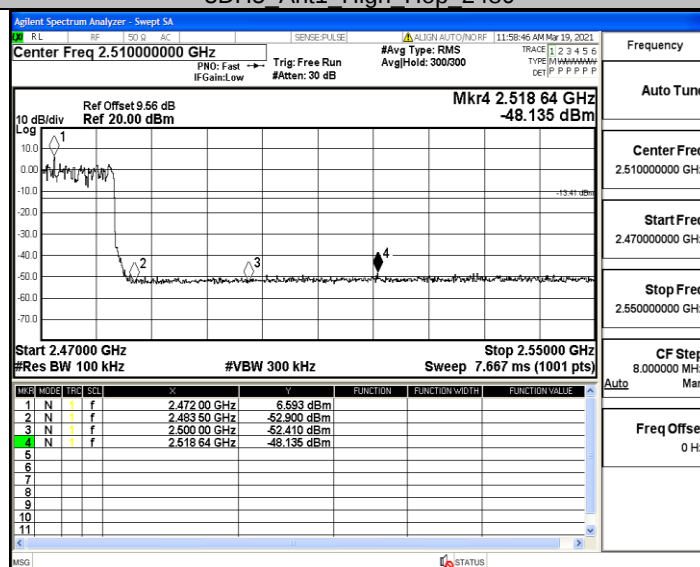
3DH5 Ant1_High 2480



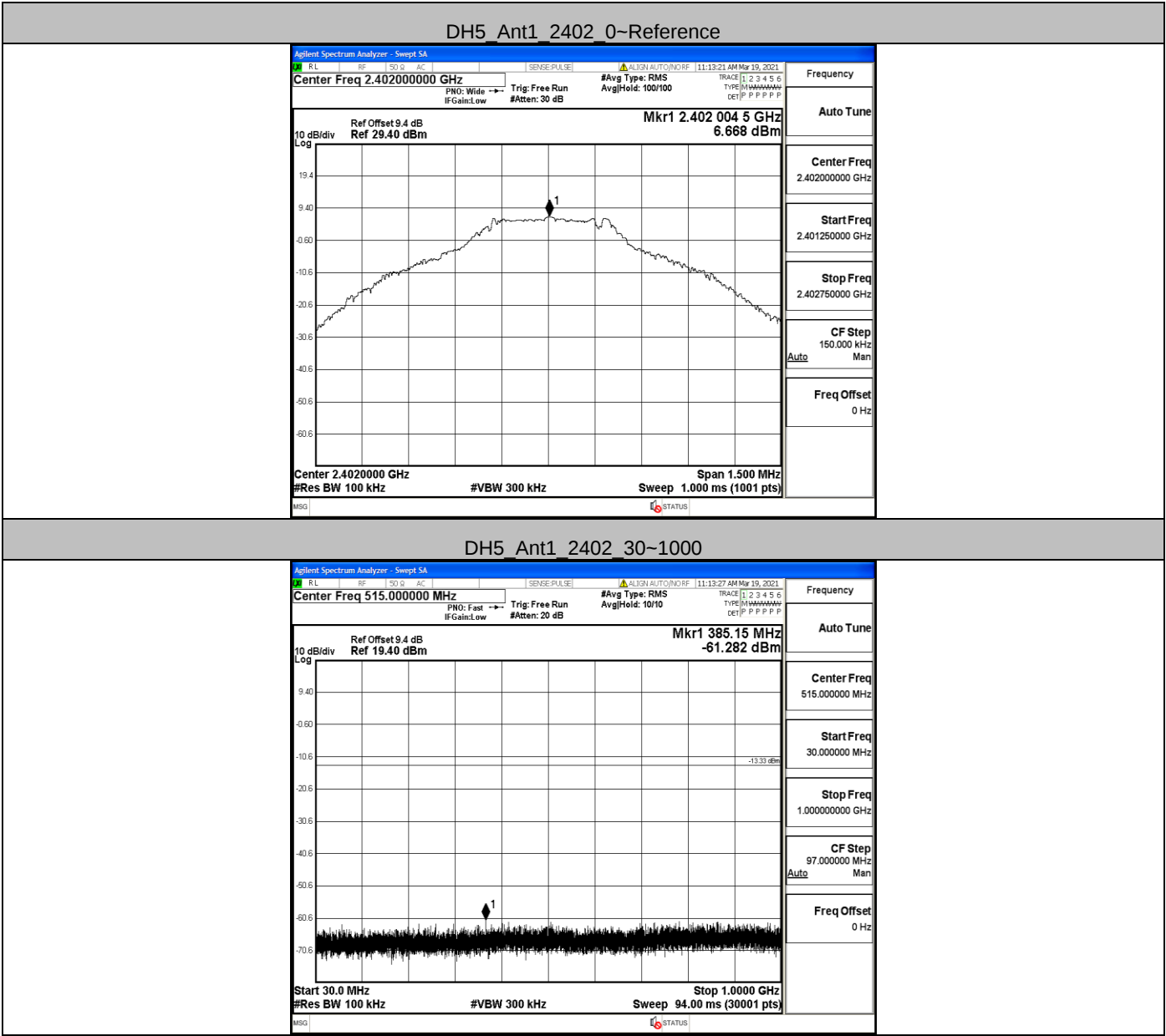
3DH5 Ant1_Low Hop 2402



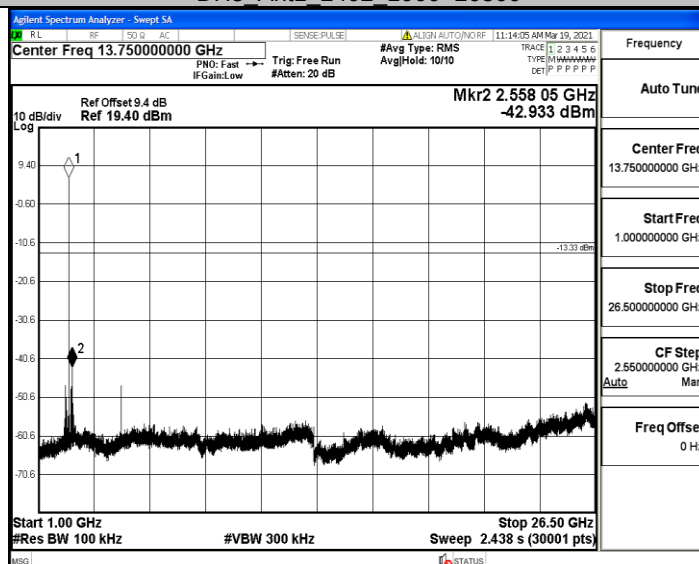
3DH5 Ant1_High Hop 2480



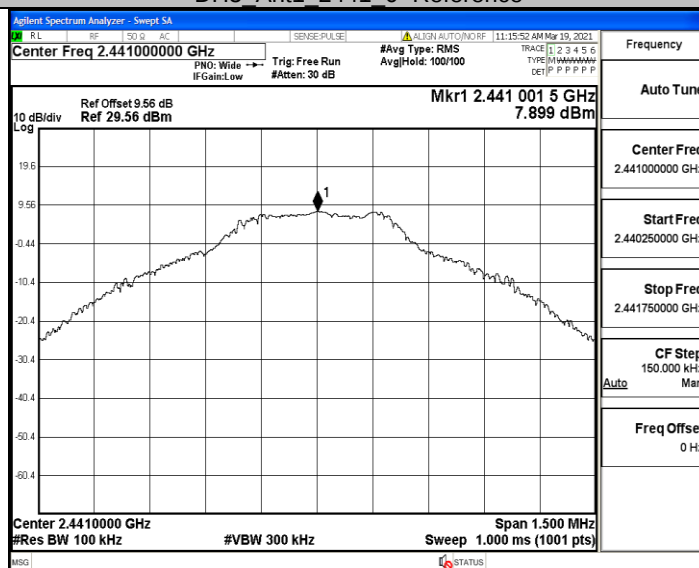
A.7 RF Conducted Spurious Emissions
Test Graph



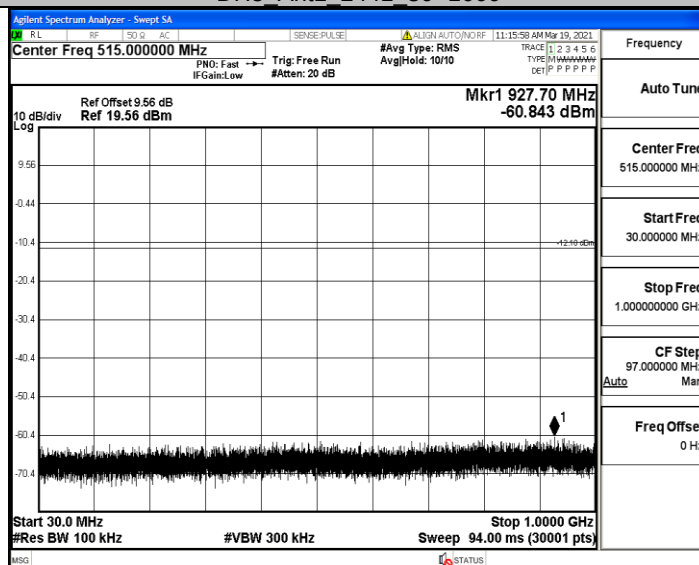
DH5 Ant1 2402 1000~26500



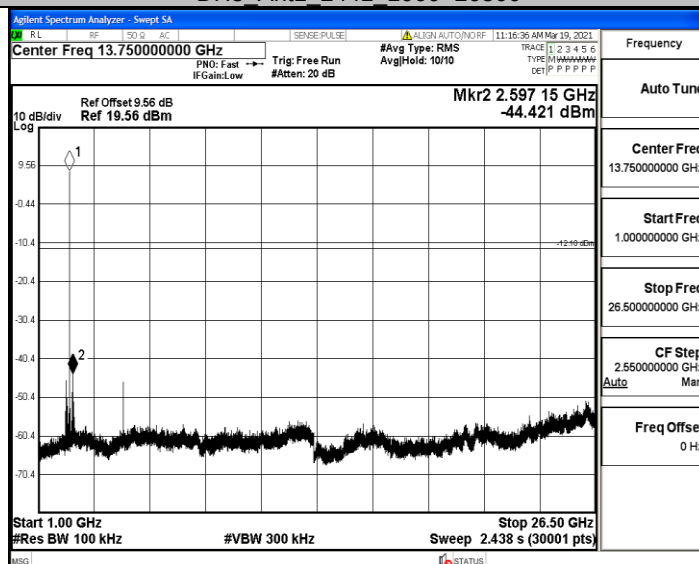
DH5 Ant1 2441 0~Reference



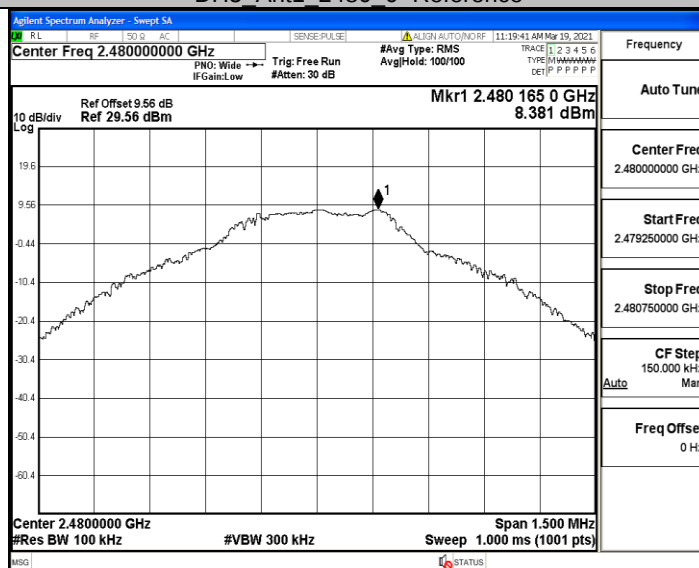
DH5 Ant1 2441 30~1000



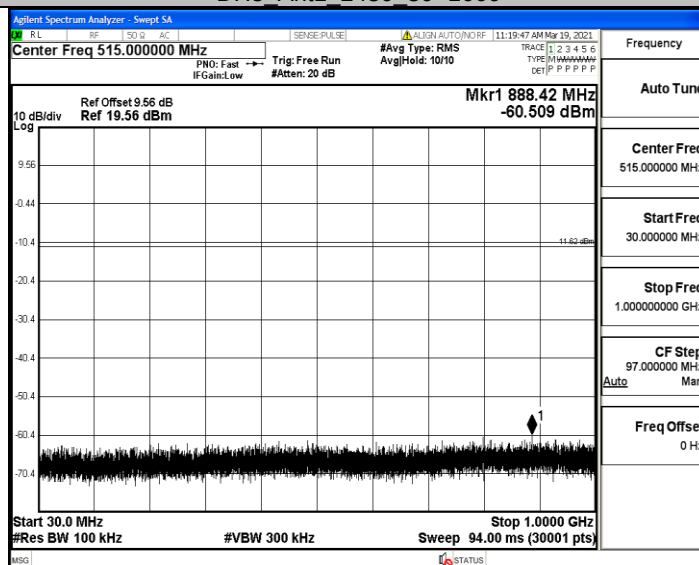
DH5 Ant1 2441 1000~26500



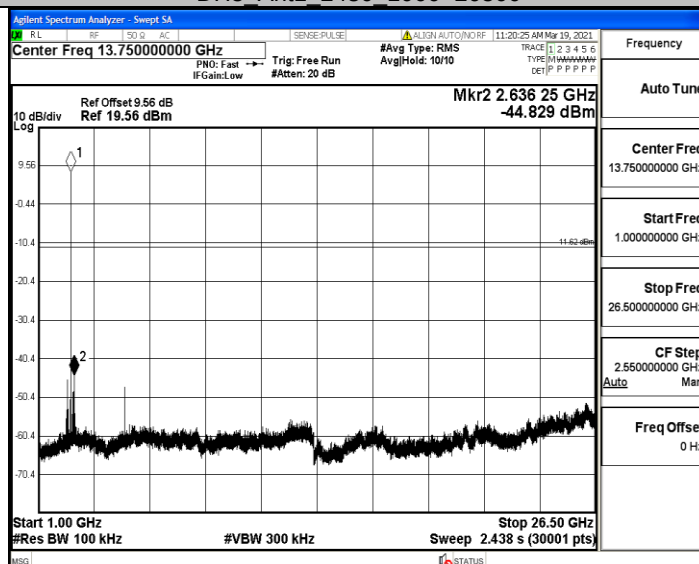
DH5 Ant1 2480 0~Reference



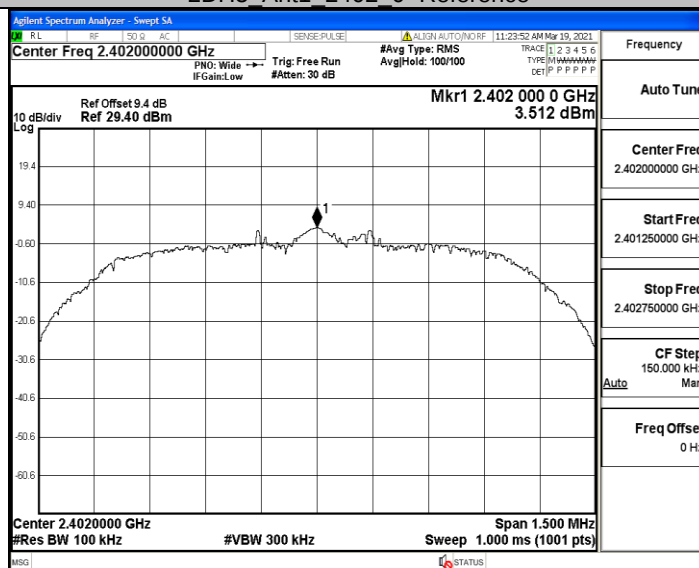
DH5 Ant1 2480 30~1000



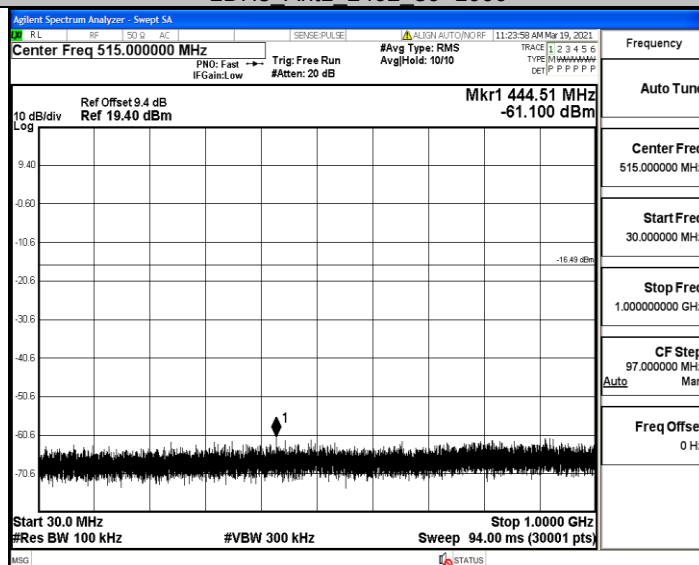
DH5 Ant1 2480 1000~26500



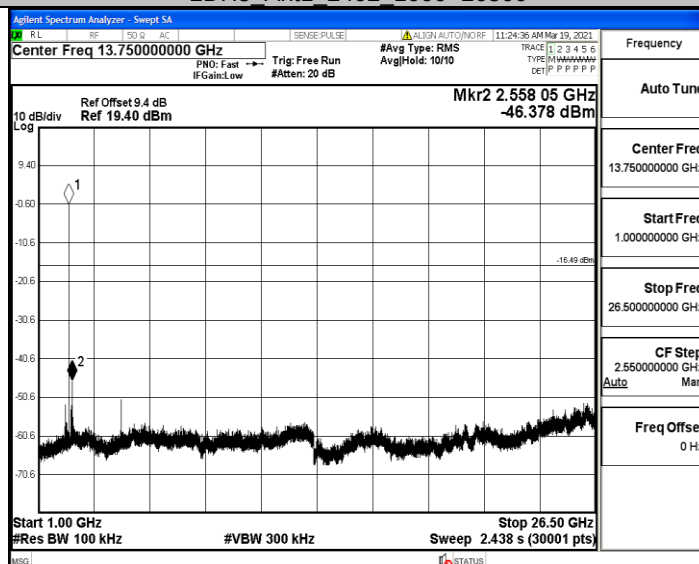
2DH5 Ant1 2402 0~Reference



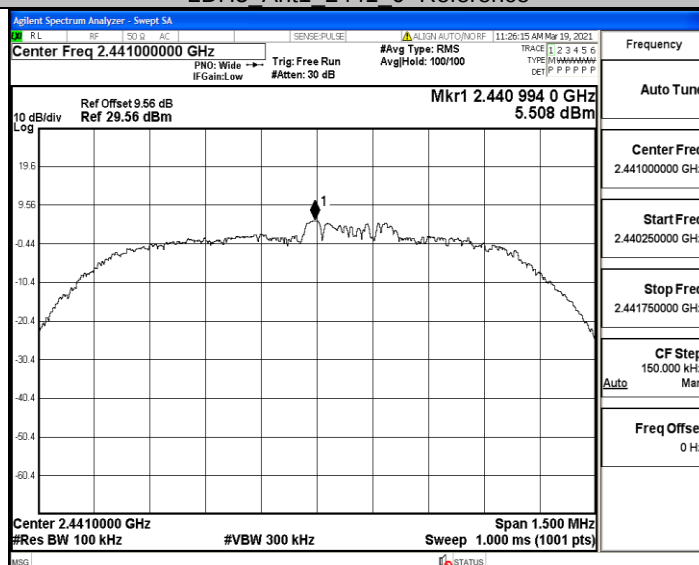
2DH5 Ant1 2402 30~1000



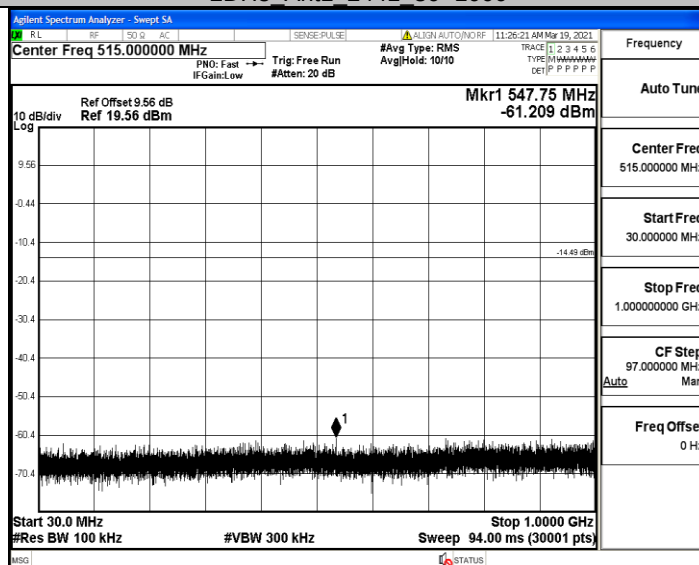
2DH5 Ant1 2402 1000~26500



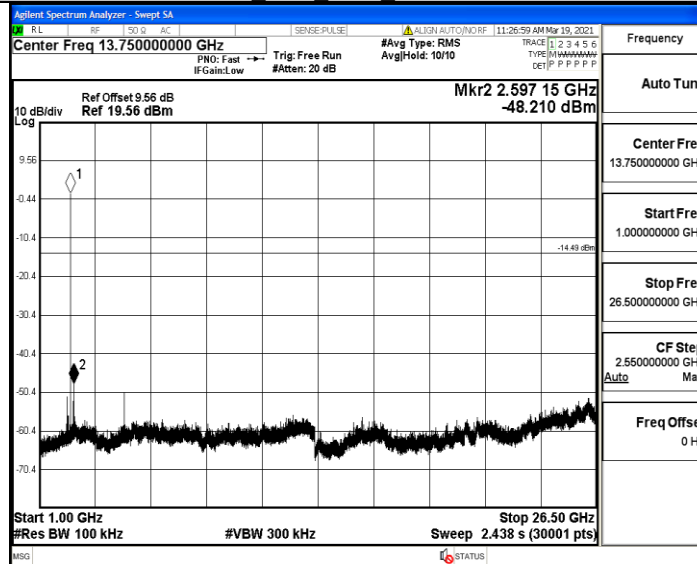
2DH5 Ant1 2441 0~Reference



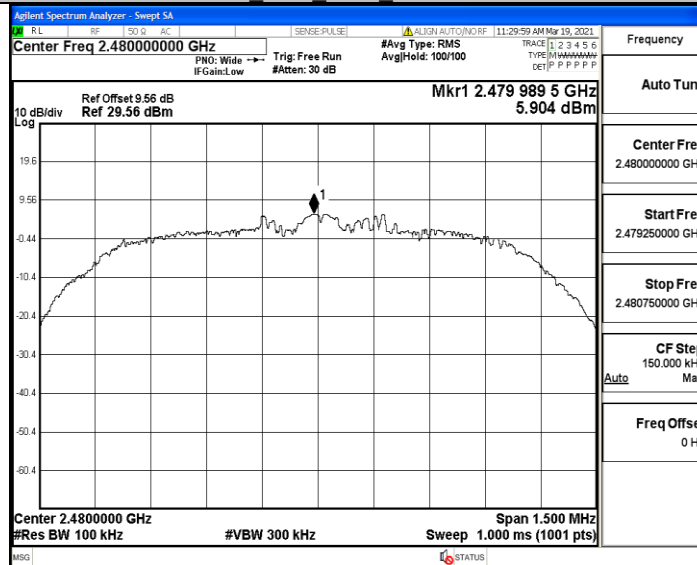
2DH5 Ant1 2441 30~1000



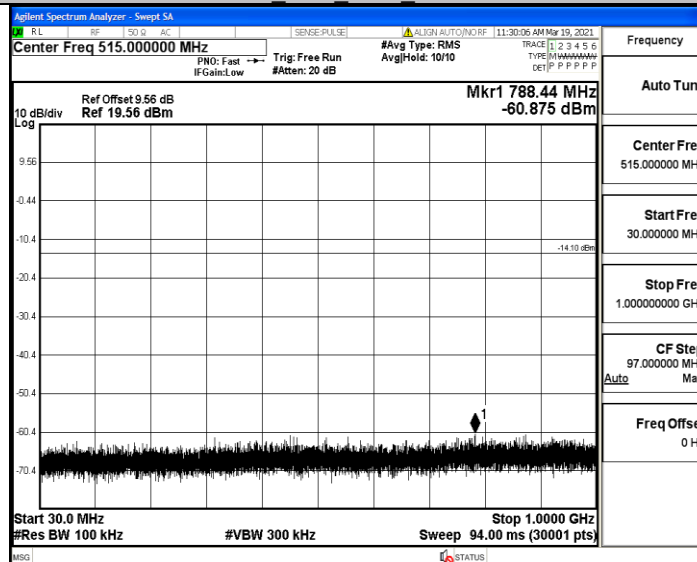
2DH5 Ant1 2441 1000~26500



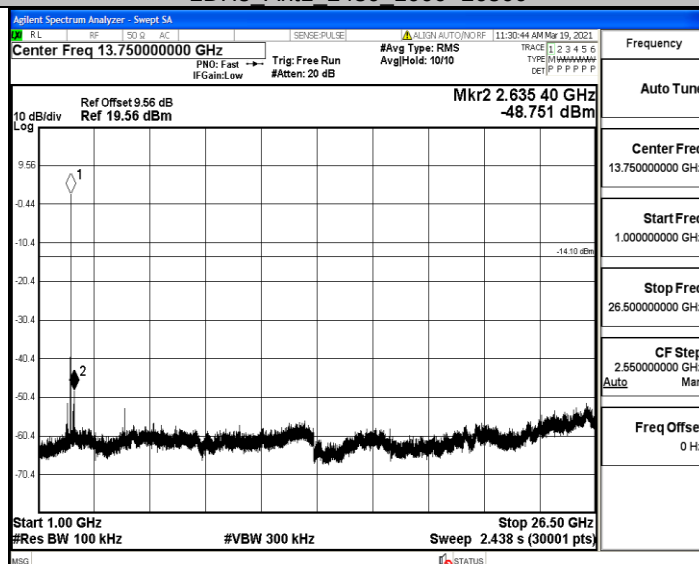
2DH5 Ant1 2480 0~Reference



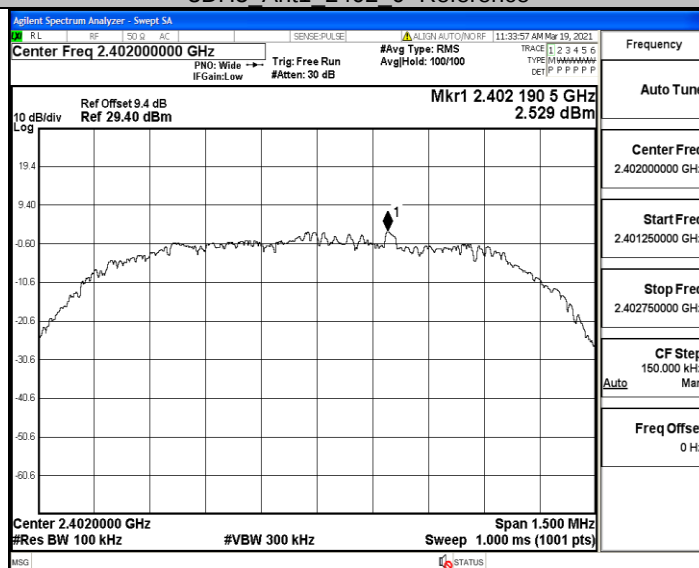
2DH5 Ant1 2480 30~1000



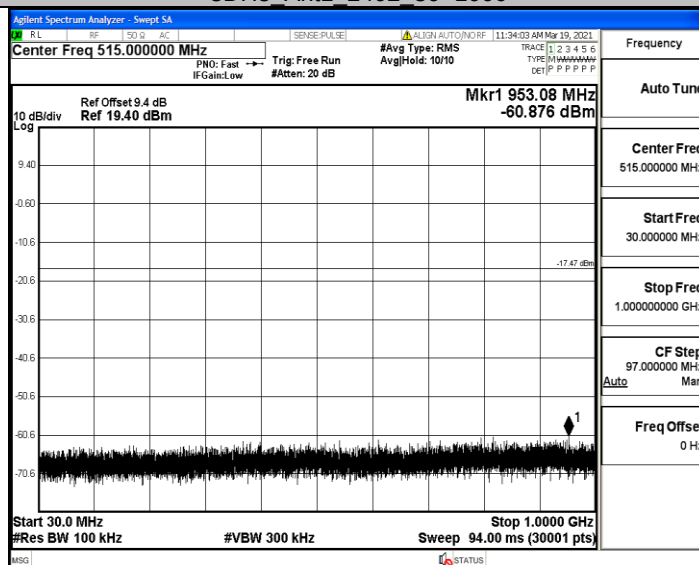
2DH5 Ant1 2480 1000~26500



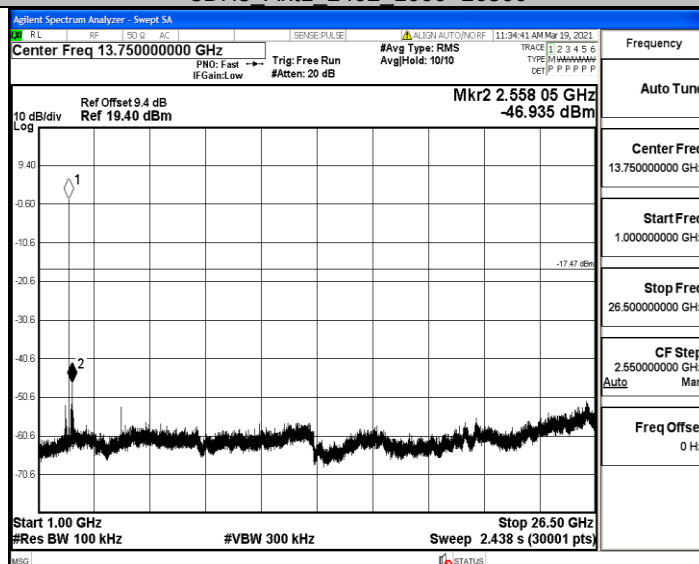
3DH5 Ant1 2402 0~Reference



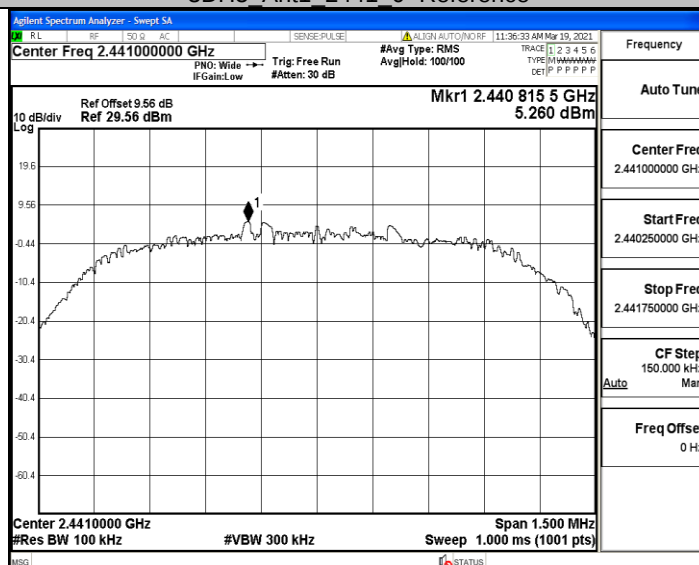
3DH5 Ant1 2402 30~1000



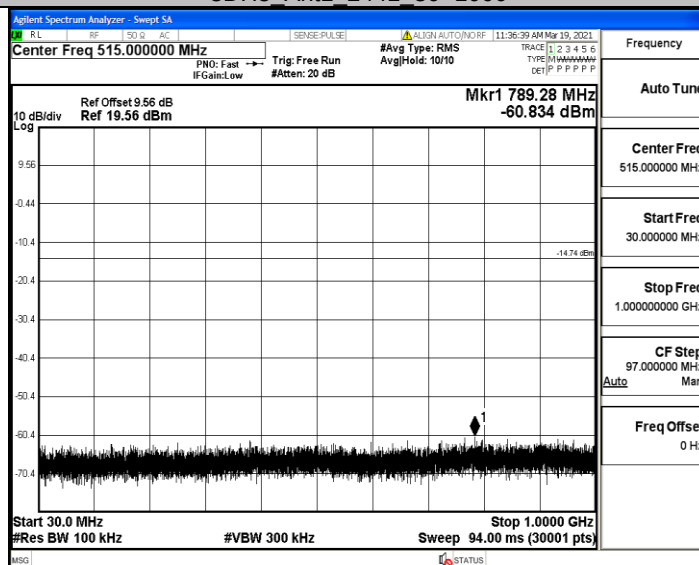
3DH5_Ant1_2402_1000~26500



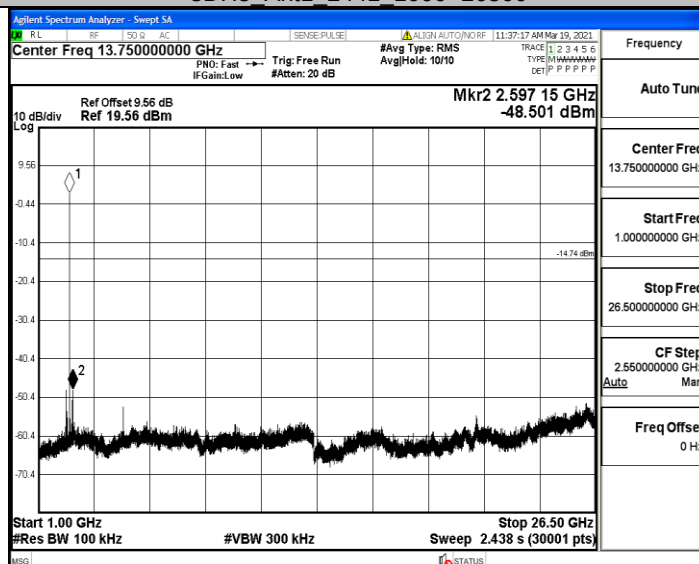
3DH5_Ant1_2441_0~Reference



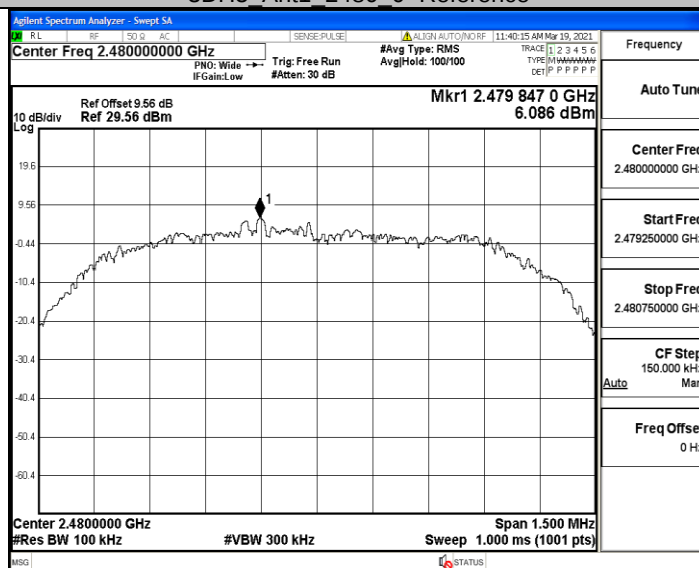
3DH5_Ant1_2441_30~1000



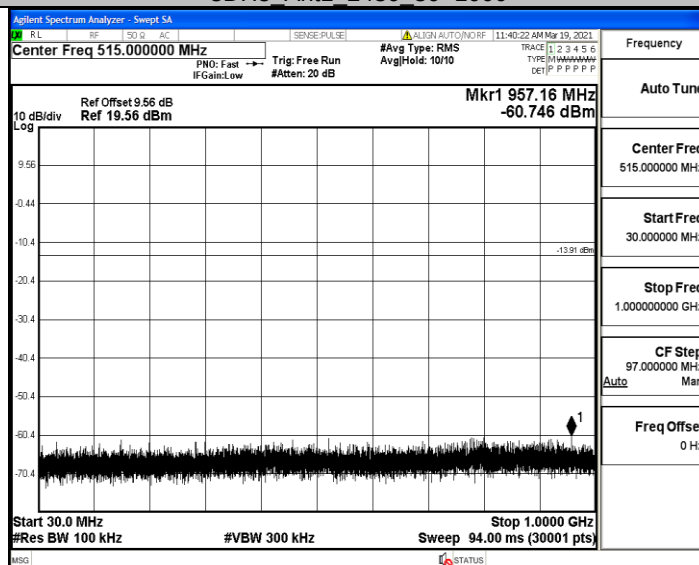
3DH5 Ant1 2441 1000~26500

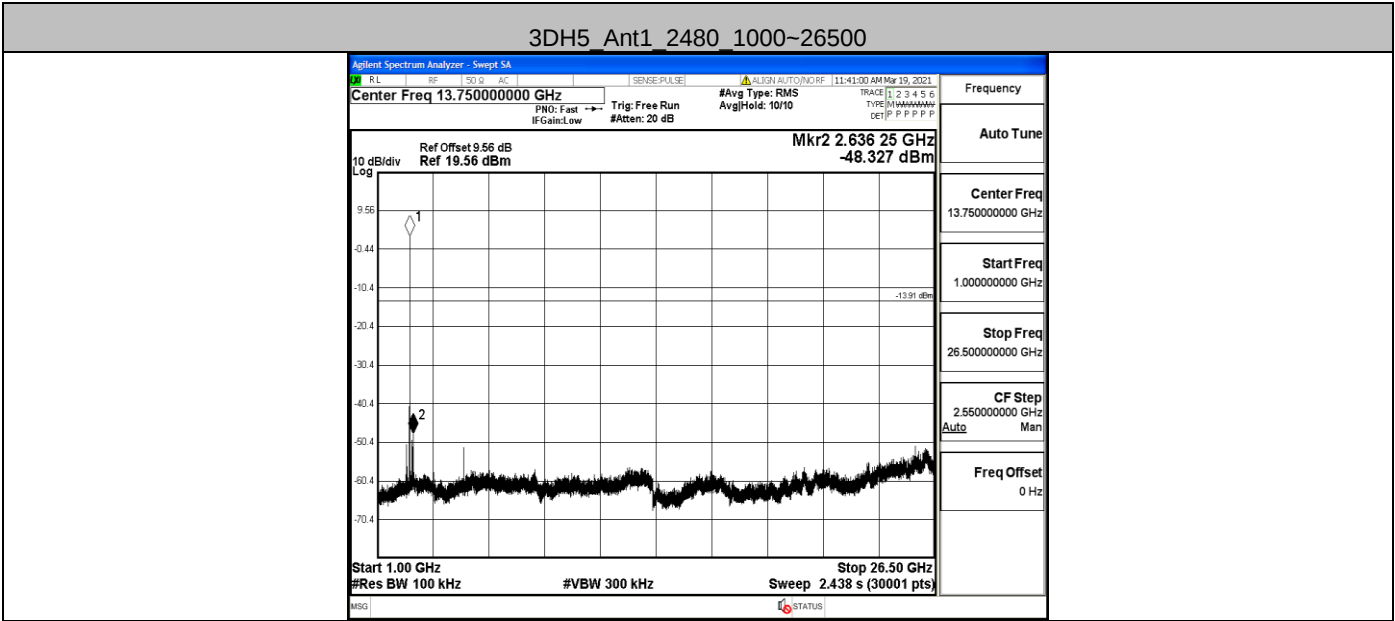


3DH5 Ant1 2480 0~Reference



3DH5 Ant1 2480 30~1000





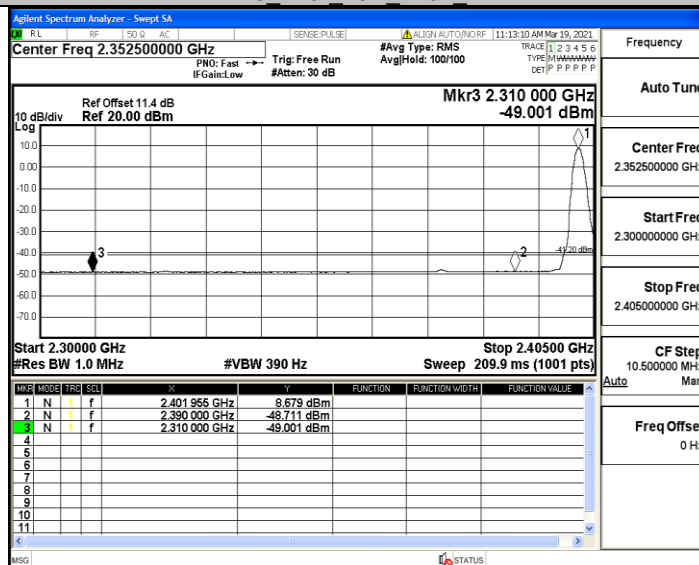
A.8 Restrict-band band-edge measurements

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	2390.000	-48.72	<=-41.20	PASS
				Peak	2310.000	-40.34	<=-21.20	PASS
				Peak	2390.000	-40.79	<=-21.20	PASS
		High	2480	AV	2483.500	-44.18	<=-41.20	PASS
				AV	2500.000	-47.99	<=-41.20	PASS
				Peak	2483.500	-39.35	<=-21.20	PASS
				Peak	2500.000	-42.17	<=-21.20	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-48.85	<=-41.20	PASS
				AV	2390.000	-48.71	<=-41.20	PASS
				Peak	2310.000	-42.83	<=-21.20	PASS
				Peak	2390.000	-41.97	<=-21.20	PASS
		High	2480	AV	2483.500	-45.14	<=-41.20	PASS
				AV	2500.000	-47.98	<=-41.20	PASS
				Peak	2483.500	-36.90	<=-21.20	PASS
				Peak	2500.000	-41.23	<=-21.20	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-48.84	<=-41.20	PASS
				AV	2390.000	-48.74	<=-41.20	PASS
				Peak	2310.000	-42.14	<=-21.20	PASS
				Peak	2390.000	-42.73	<=-21.20	PASS
		High	2480	AV	2483.500	-44.93	<=-41.20	PASS
				AV	2500.000	-47.95	<=-41.20	PASS
				Peak	2483.500	-36.91	<=-21.20	PASS
				Peak	2500.000	-41.06	<=-21.20	PASS

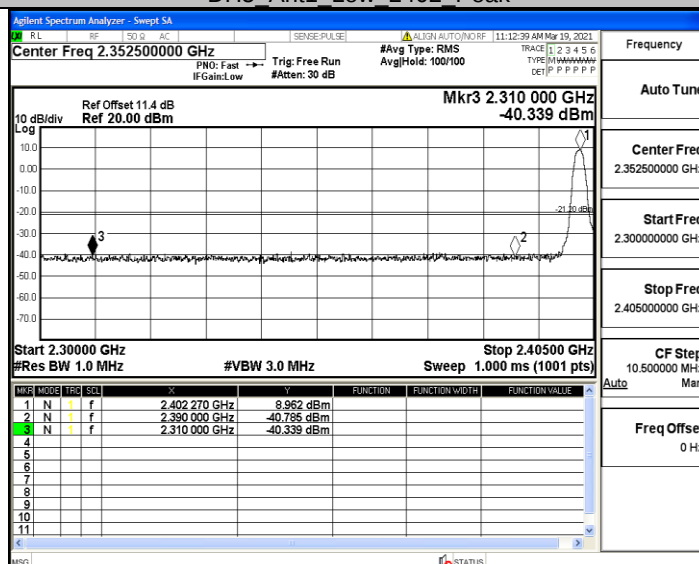
1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

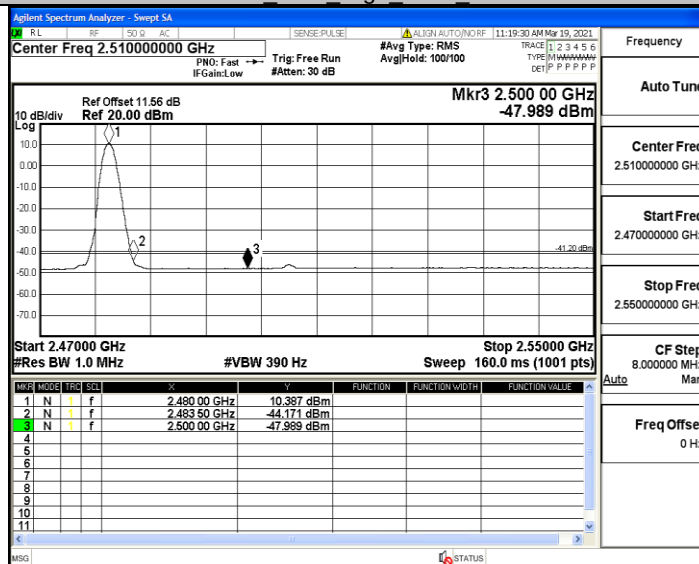
DH5 Ant1 Low 2402 AV



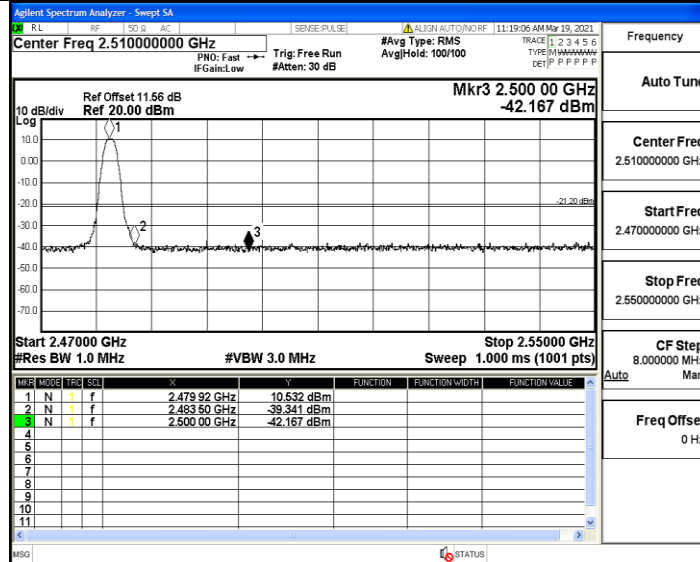
DH5 Ant1 Low 2402 Peak



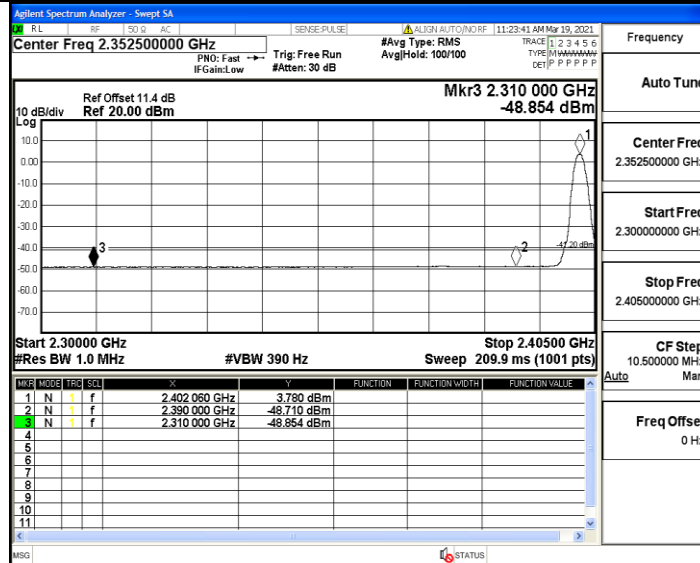
DH5 Ant1 High 2480 AV



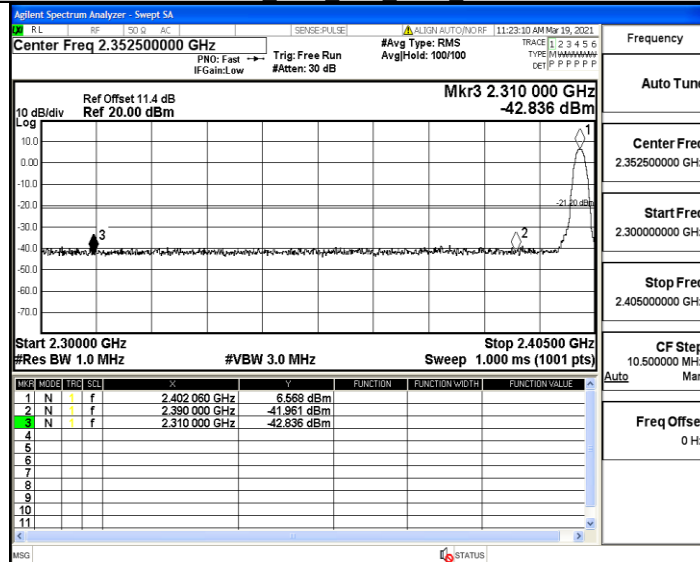
DH5 Ant1 High 2480 Peak



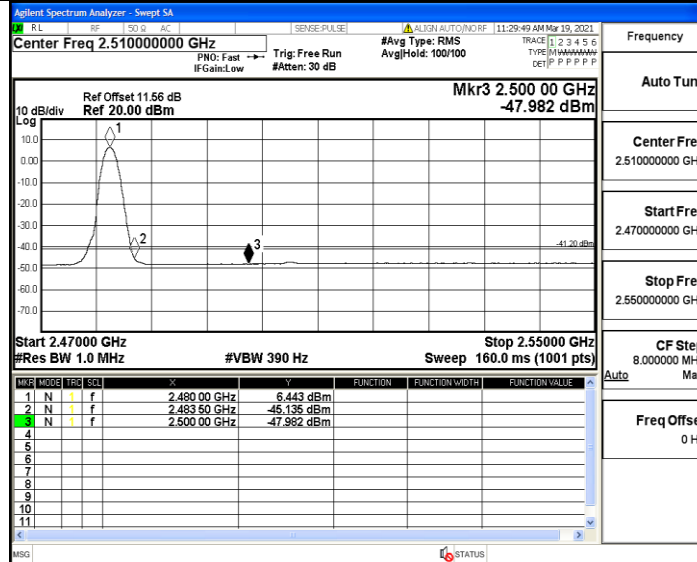
2DH5 Ant1 Low 2402 AV



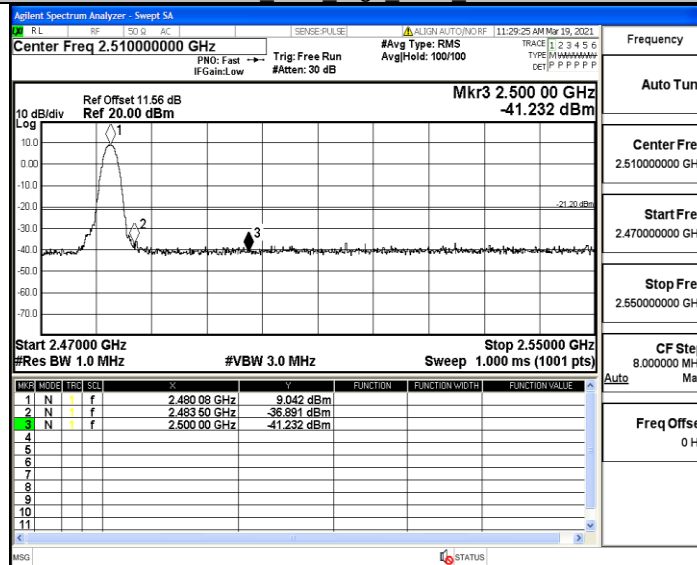
2DH5 Ant1 Low 2402 Peak



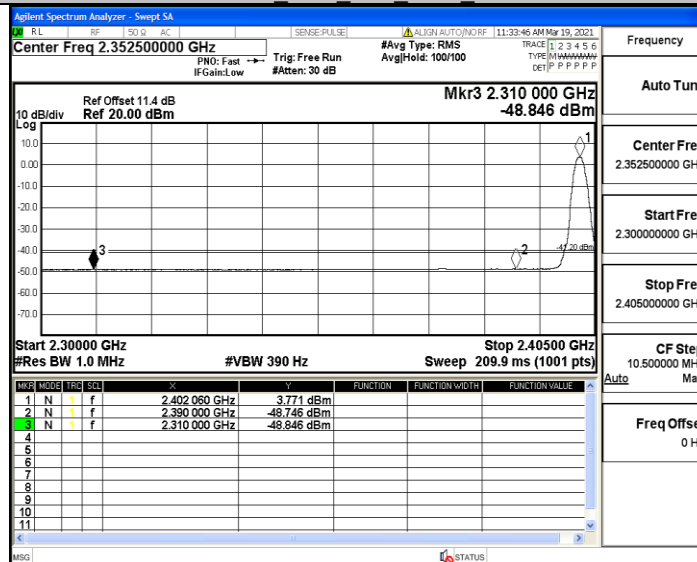
2DH5 Ant1 High 2480 AV



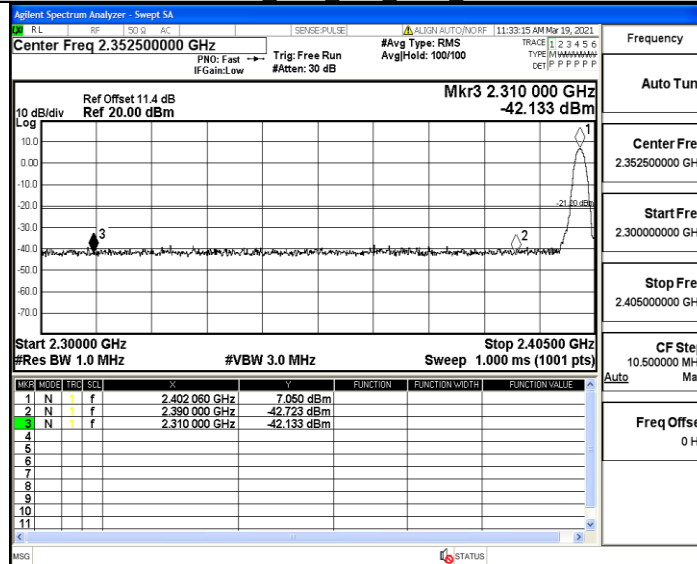
2DH5 Ant1 High 2480 Peak



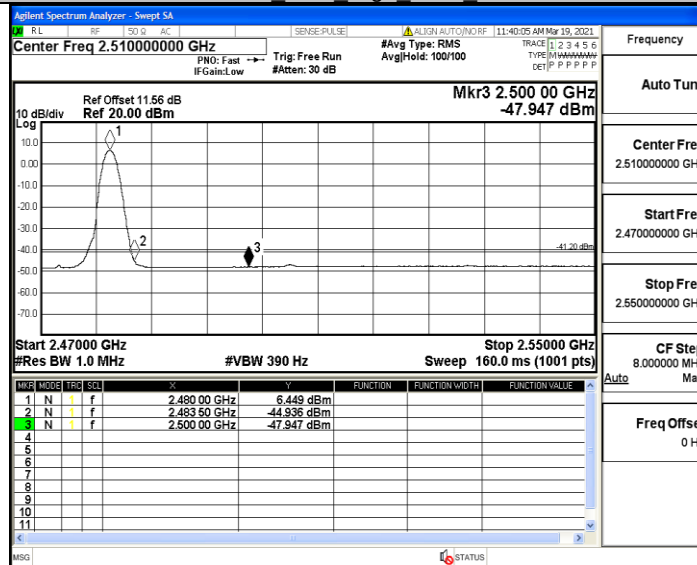
3DH5 Ant1 Low 2402 AV



3DH5 Ant1 Low 2402 Peak



3DH5 Ant1 High 2480 AV



3DH5 Ant1 High 2480 Peak

