

Appendix A

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

Product Name: Bluetooth Transmitter Receiver with Bypass function 3-in-1

Trade Mark: ZIOCOM

Test Model: ZM005808

FCC ID: RCT-ZM005808

Environmental Conditions

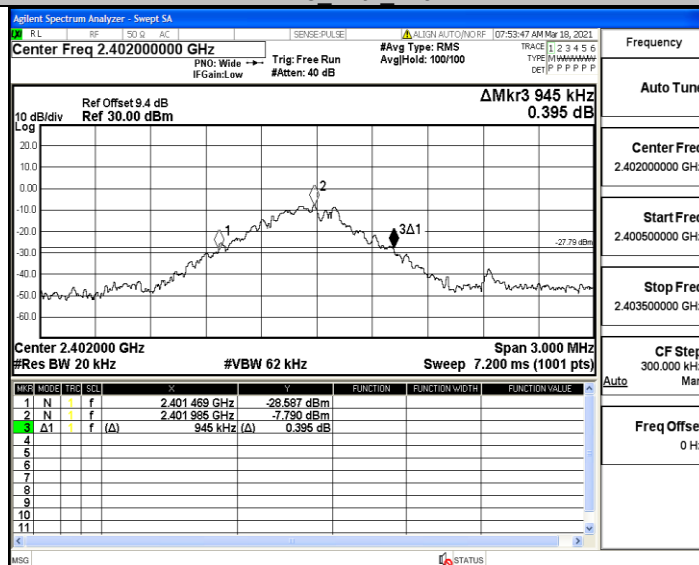
Temperature:	22.8° C
Relative Humidity:	56%
ATM Pressure:	100.0 kPa
Test Engineer:	Nancy Li
Supervised by:	Hugo Chen

A.1 20 dB Bandwidth

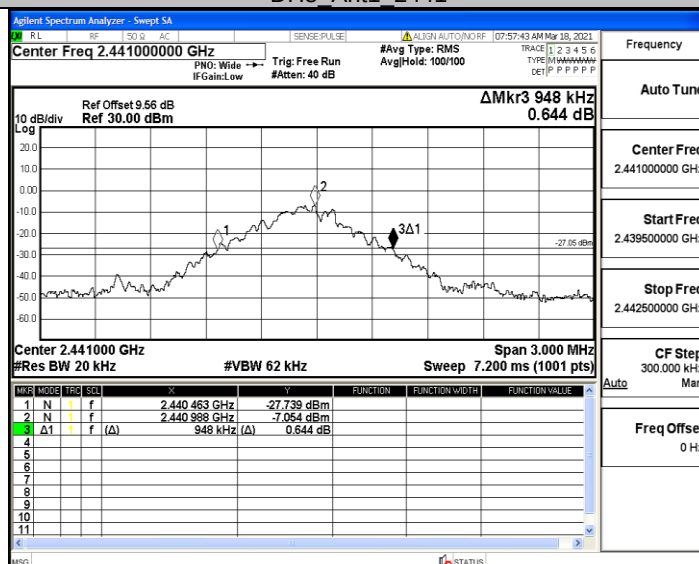
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.945	2401.469	2402.414	---	PASS
		2441	0.948	2440.463	2441.411	---	PASS
		2480	0.939	2479.466	2480.405	---	PASS
2DH5	Ant1	2402	1.257	2401.298	2402.555	---	PASS
		2441	1.257	2440.295	2441.552	---	PASS
		2480	1.239	2479.295	2480.534	---	PASS
3DH5	Ant1	2402	1.257	2401.283	2402.540	---	PASS
		2441	1.299	2440.277	2441.576	---	PASS
		2480	1.263	2479.280	2480.543	---	PASS

Test Graph

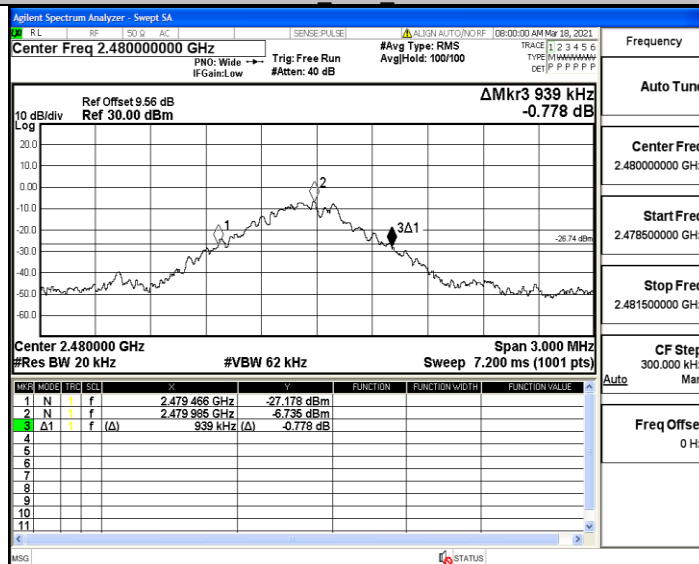
DH5_Ant1_2402



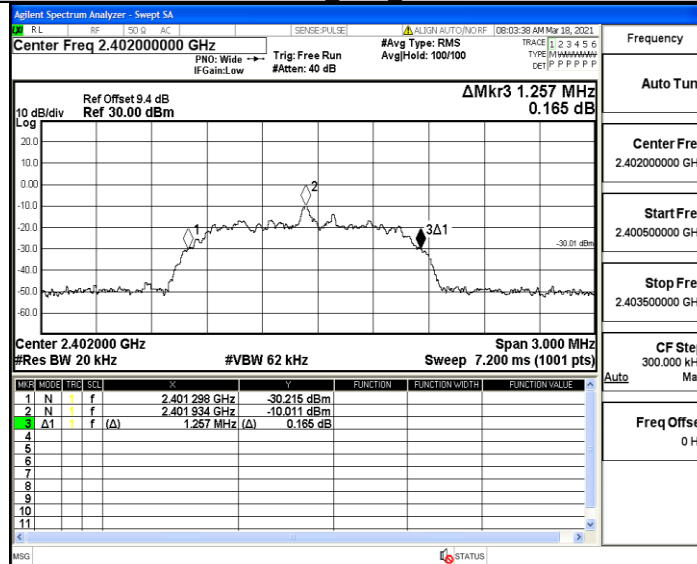
DH5_Ant1_2441



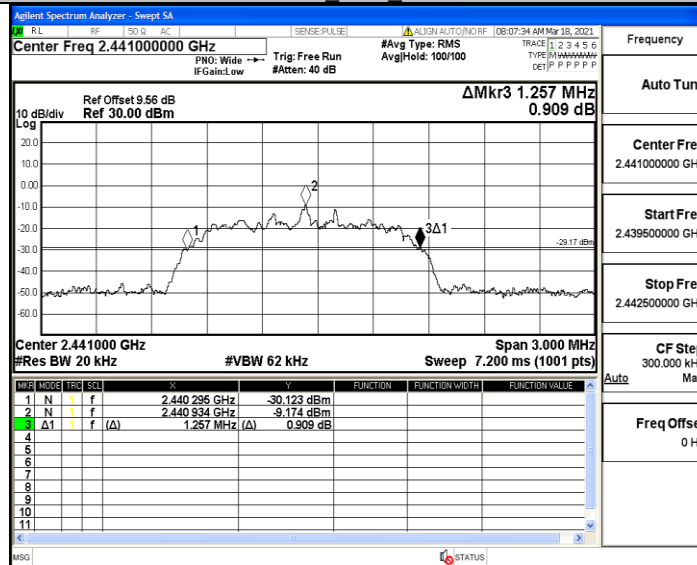
DH5_Ant1_2480



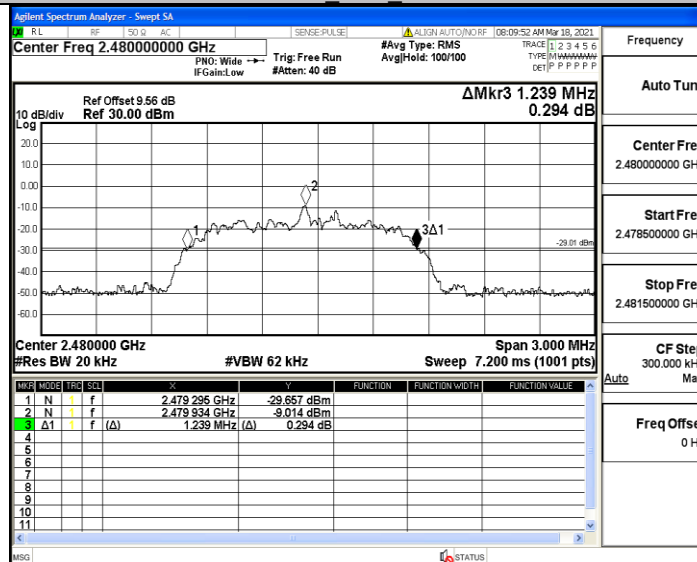
2DH5_Ant1_2402



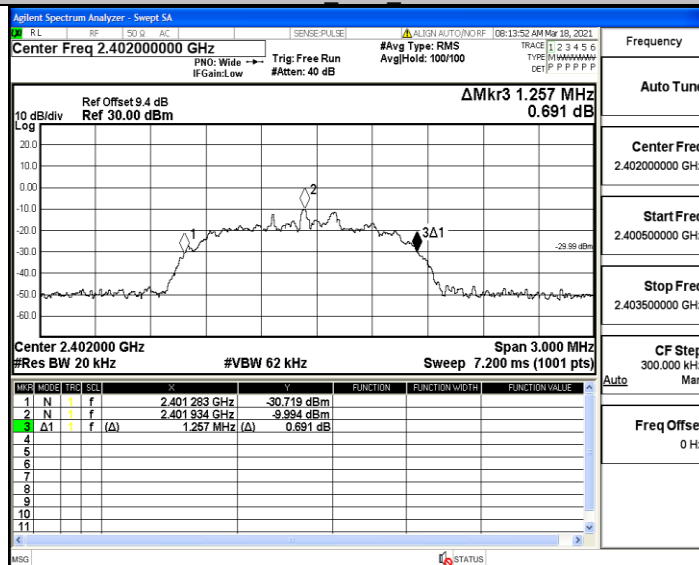
2DH5_Ant1_2441



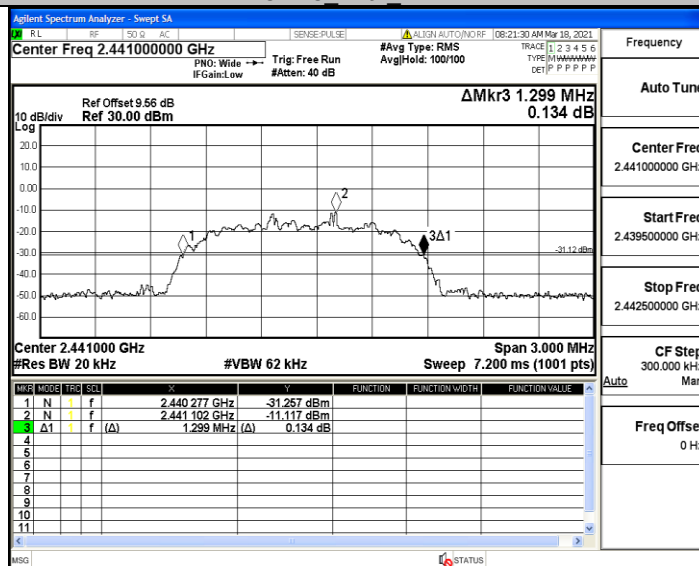
2DH5_Ant1_2480



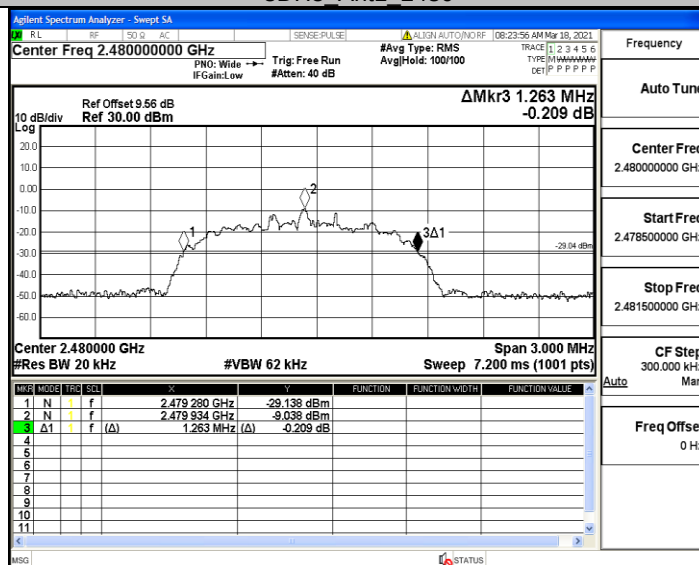
3DH5_Ant1_2402



3DH5_Ant1_2441



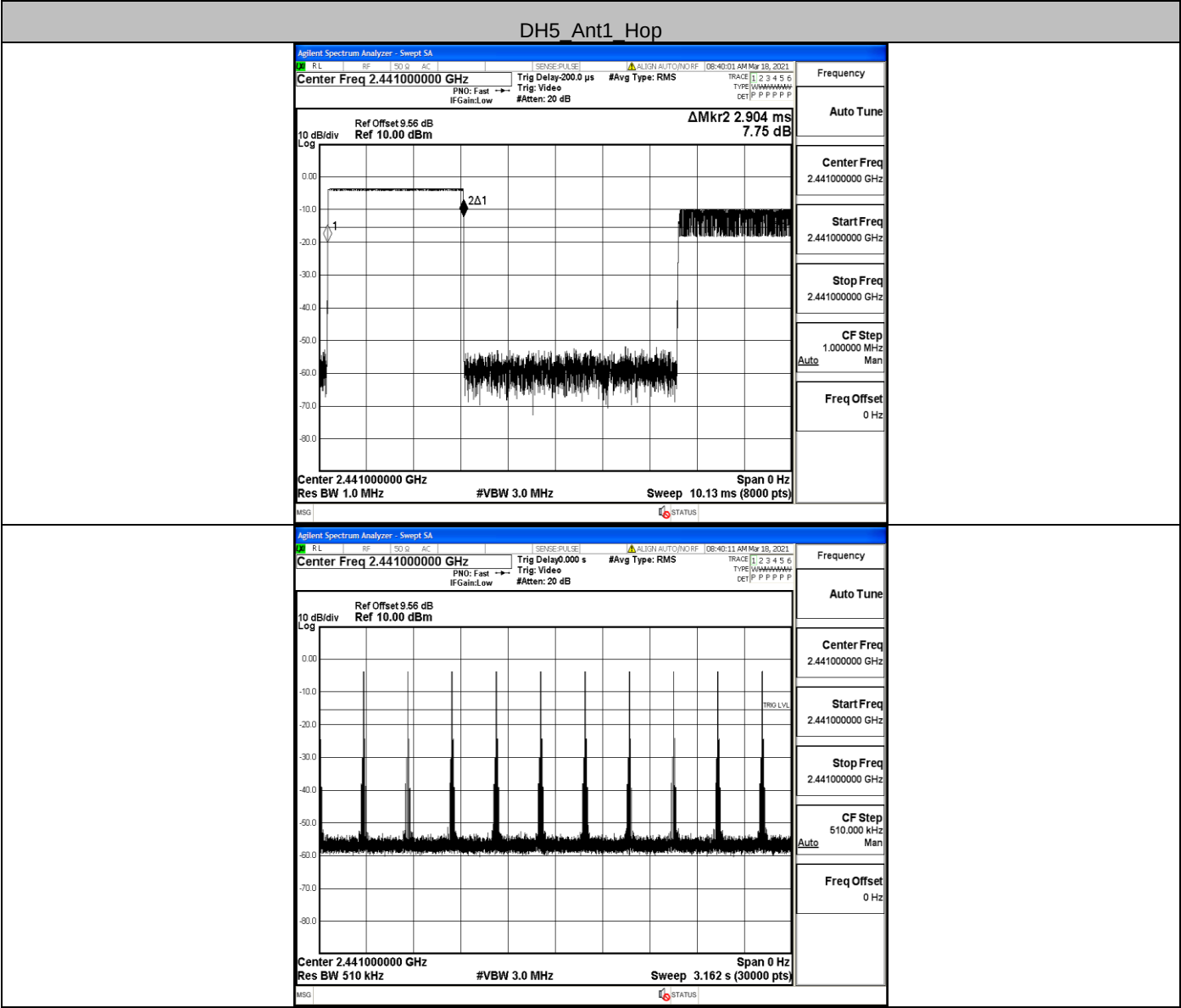
3DH5_Ant1_2480



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	2.92	110	0.321	<=0.4	PASS
3DH5	Ant1	Hop	2.92	110	0.322	<=0.4	PASS

Test Graph



Agilent Spectrum Analyzer - Sweep SA

SENSE: FLSGL ALIB: AUTO/NO RF 08:43:44 AM May 10, 2021

Center Freq 2.441000000 GHz Trig Delay: 200.0 μ s #Avg Type: RMS TRACE 1 12 3 4 5

PHO: Fast IF Gain: Low Trig: Video #Atten: 20 dB TYPE: WWWWMMWW

DET: P P P P P P

Ref Offset 9.56 dB Δ Mkr2 2.922 ms

Ref 10.00 dBm -6.91 dB

10 dB/div Auto Tune

Log

1 20 dBm

Center 2.441000000 GHz Span 0 Hz

Res BW 1.0 MHz #VBW 3.0 MHz Sweep 10.13 ms (8000 pts)

USG STATUS

Frequency

Auto Tune

Center Freq

2.441000000 GHz

Start Freq

2.441000000 GHz

Stop Freq

2.441000000 GHz

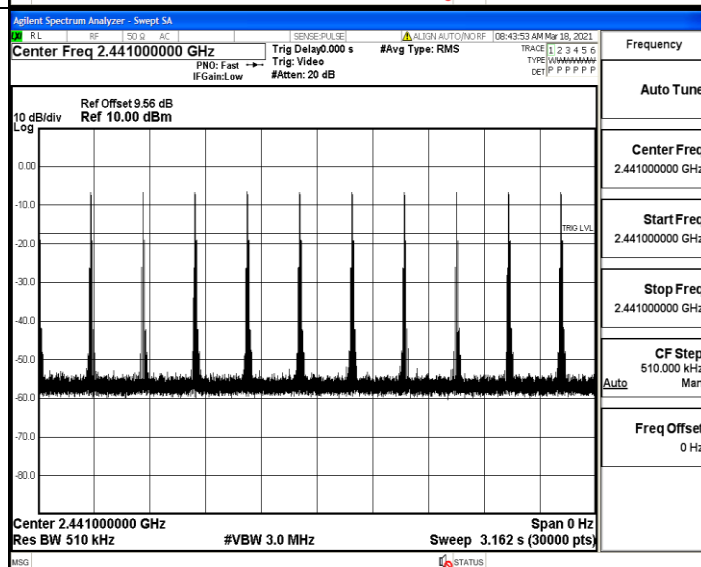
CF Step

1.000000 MHz

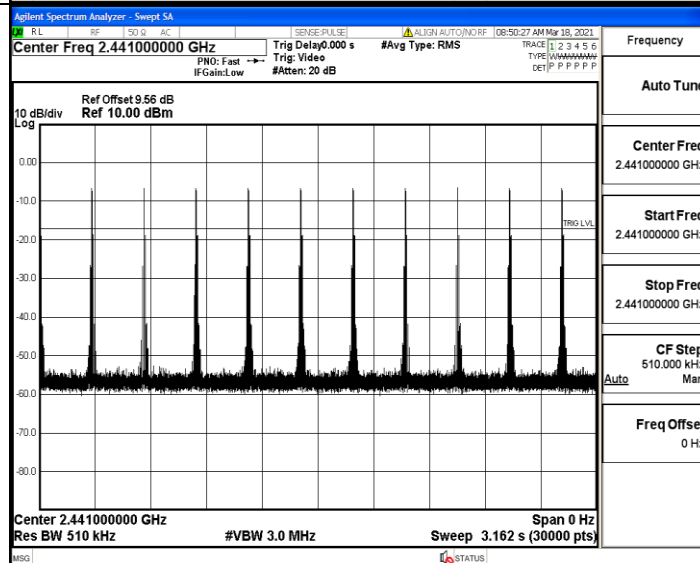
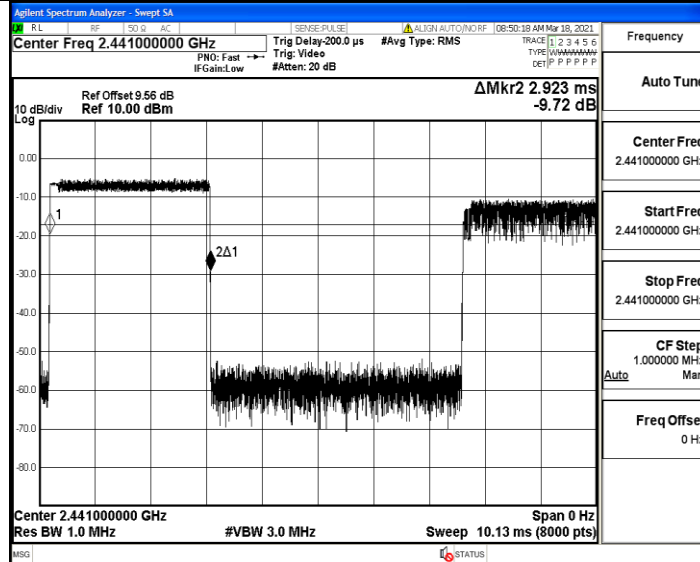
Auto Man

Freq Offset

0 Hz



3DH5_Ant1_Hop

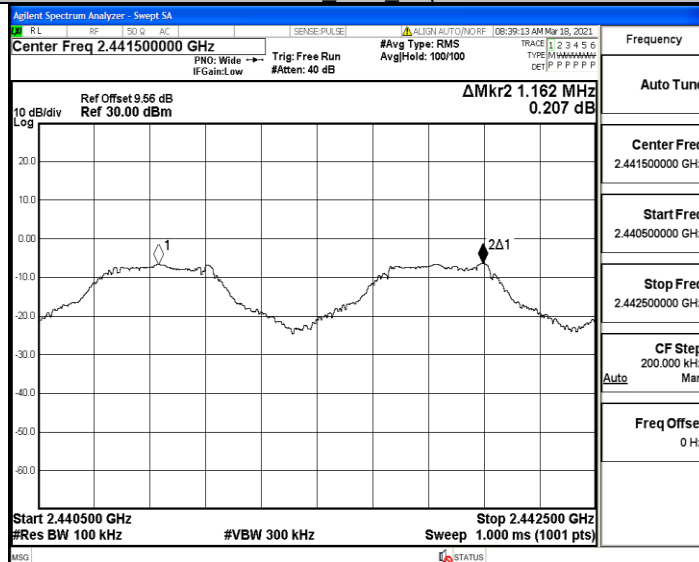


A.3 Carrier Frequency Separation

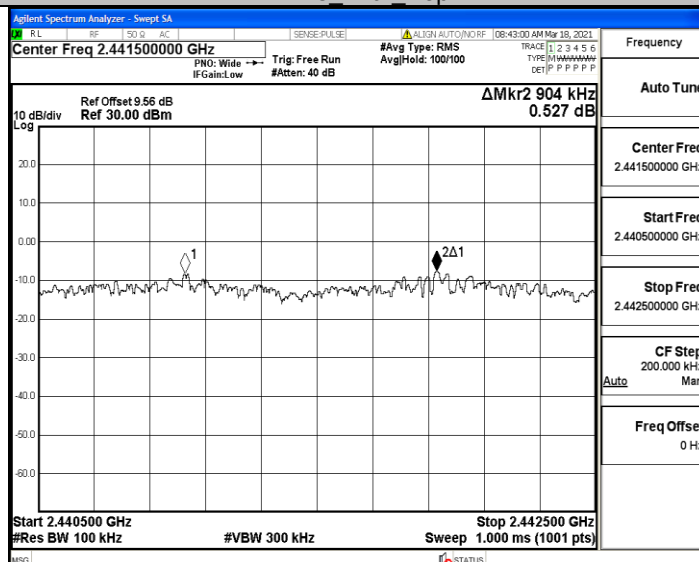
TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.162	≥ 0.948	PASS
2DH5	Ant1	Hop	0.904	≥ 0.838	PASS
3DH5	Ant1	Hop	1.002	≥ 0.866	PASS

Test Graph

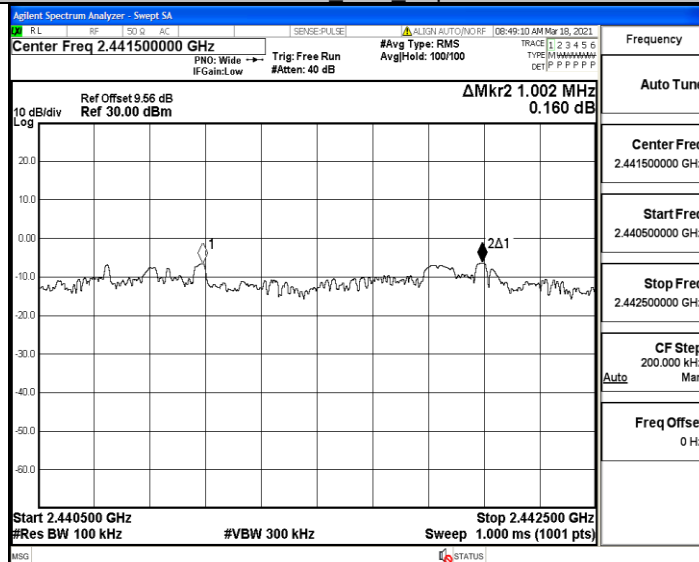
DH5_Ant1_Hop



2DH5_Ant1_Hop



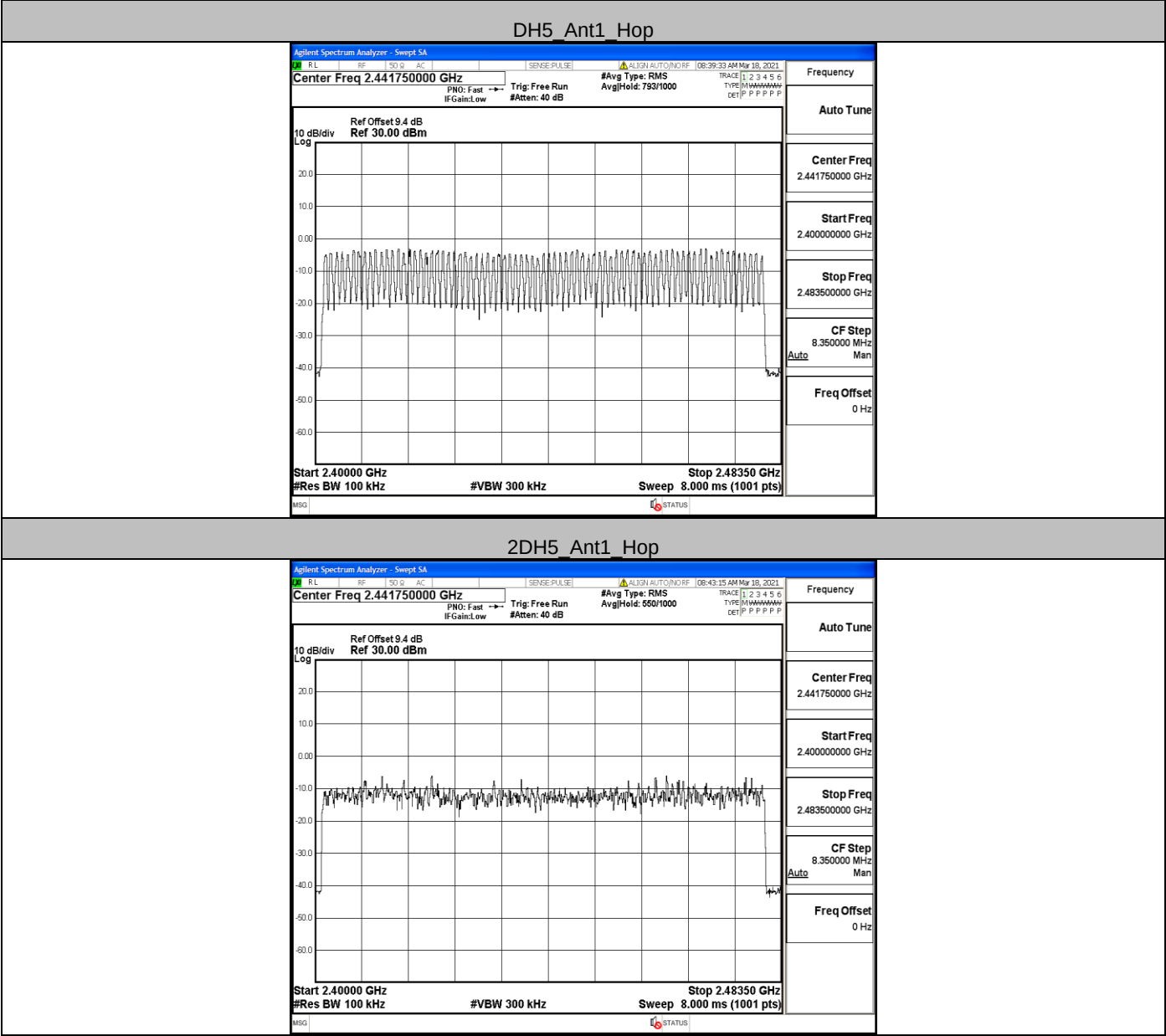
3DH5_Ant1_Hop

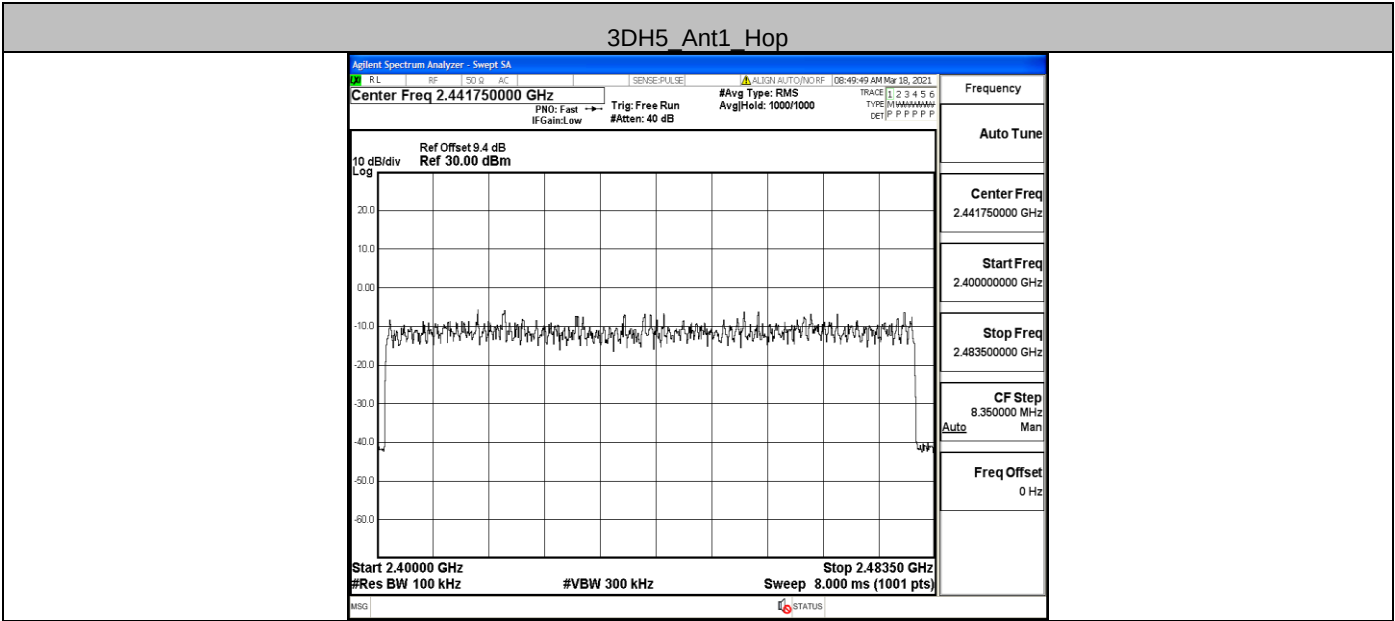


A.4 Hopping Channel Number

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



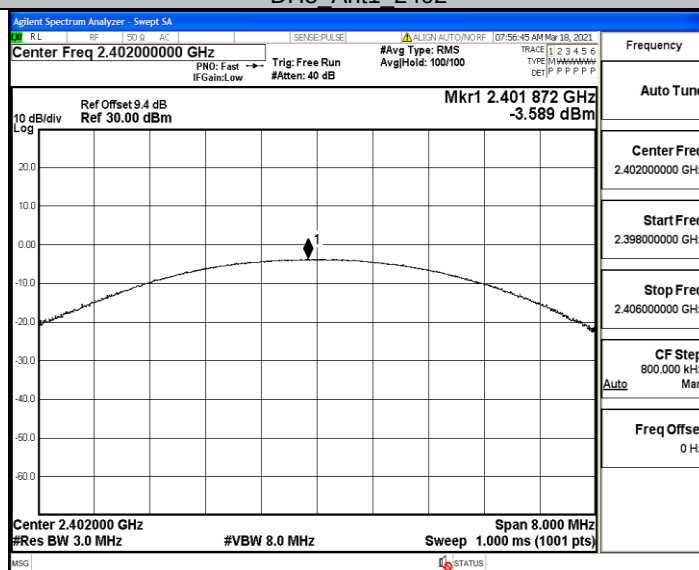


A.5 Conducted Peak Output Power

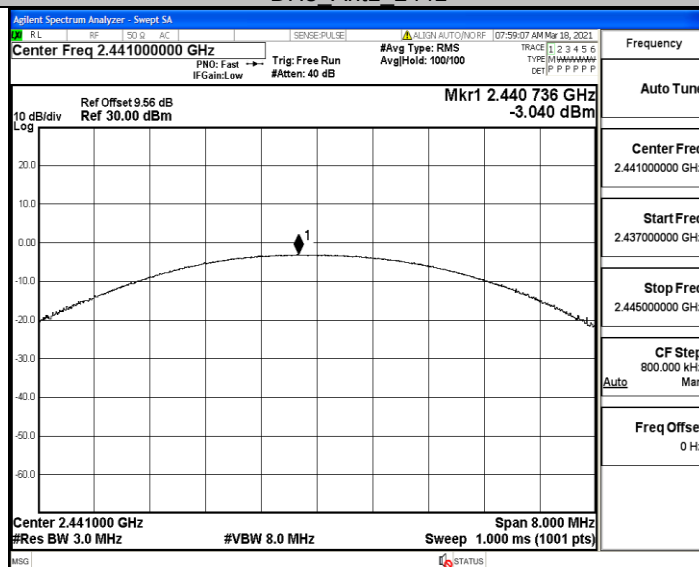
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	-3.59	<=20.97	PASS
		2441	-3.04	<=20.97	PASS
		2480	-2.92	<=20.97	PASS
2DH5	Ant1	2402	-5.71	<=20.97	PASS
		2441	-4.82	<=20.97	PASS
		2480	-4.38	<=20.97	PASS
3DH5	Ant1	2402	-5.24	<=20.97	PASS
		2441	-4.42	<=20.97	PASS
		2480	-4.15	<=20.97	PASS

Test Graph

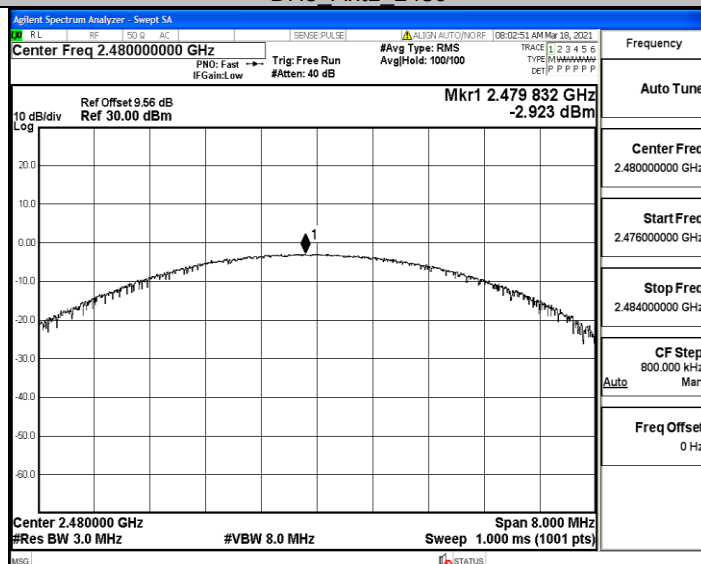
DH5_Ant1_2402



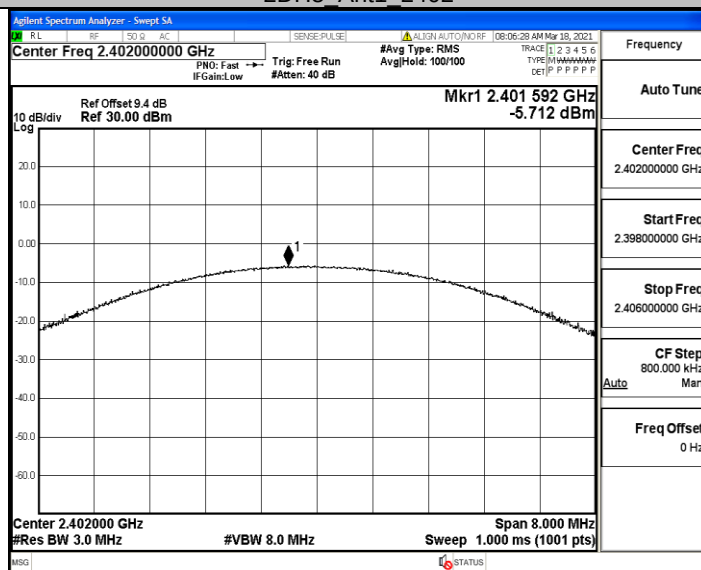
DH5_Ant1_2441



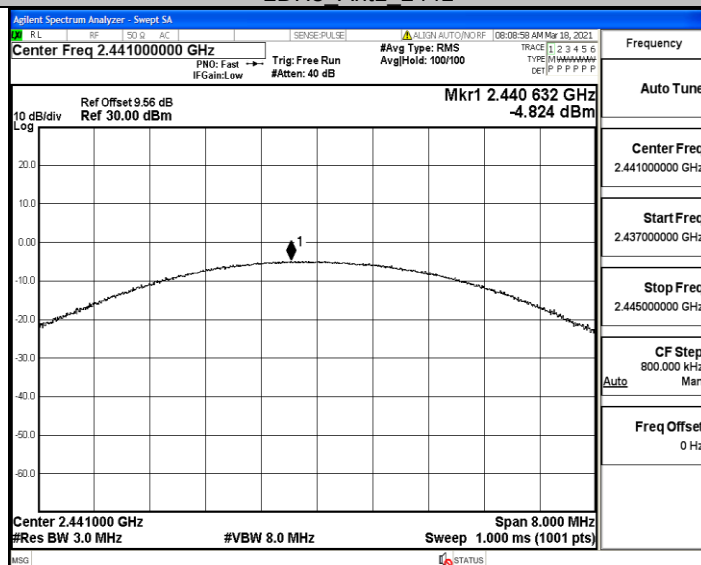
DH5 Ant1_2480



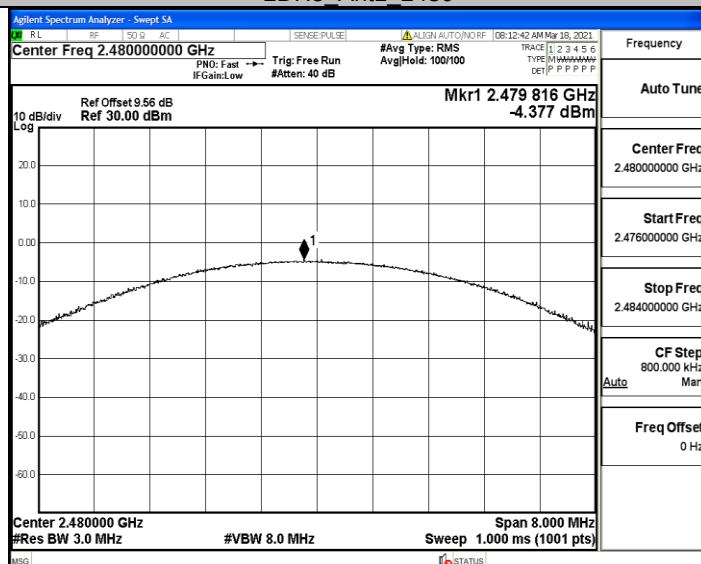
2DH5 Ant1_2402



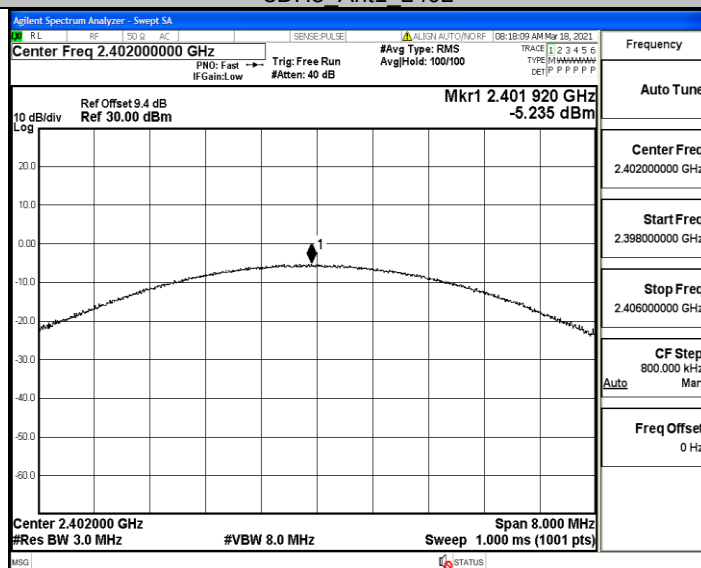
2DH5 Ant1_2441



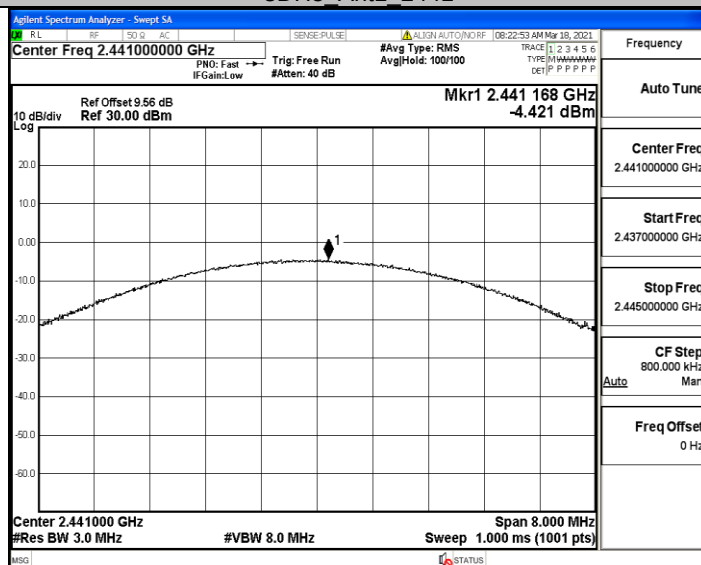
2DH5 Ant1 2480

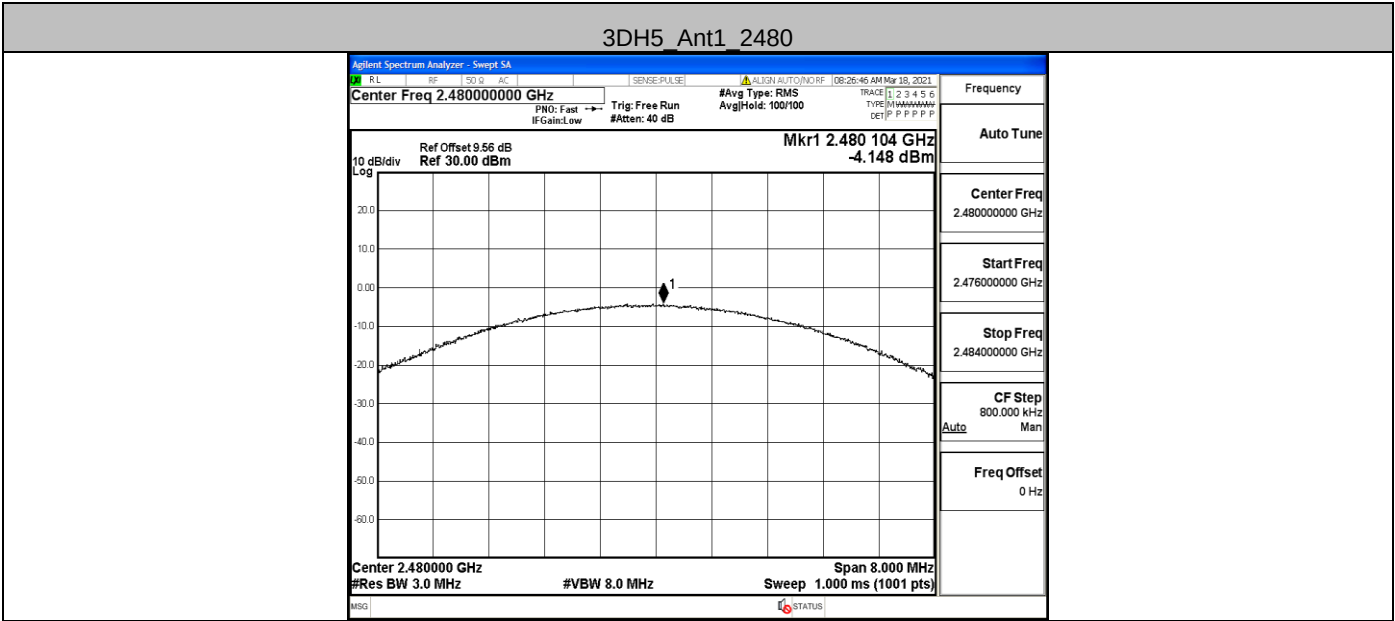


3DH5 Ant1 2402



3DH5 Ant1 2441



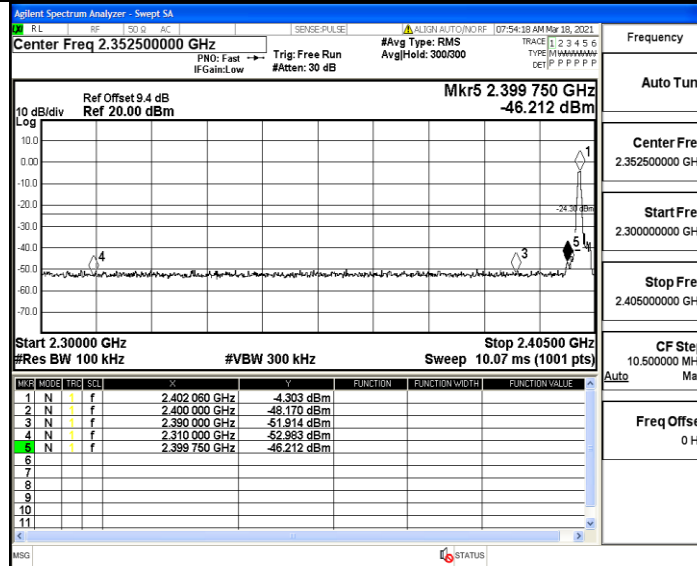


A.6 Band-edge for RF Conducted Emissions

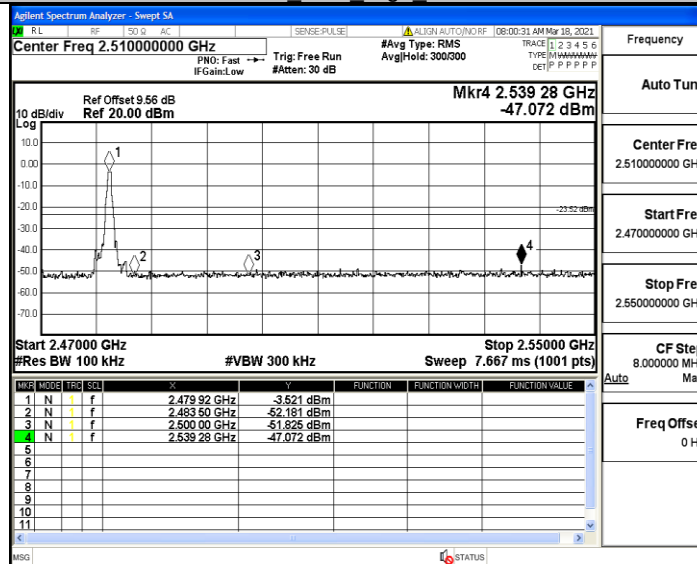
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-4.30	-46.21	<=-24.3	PASS
		High	2480	-3.52	-47.07	<=-23.52	PASS
		Low	Hop_2402	-7.32	-49.05	<=-27.32	PASS
		High	Hop_2480	-2.98	-48.98	<=-22.98	PASS
2DH5	Ant1	Low	2402	-7.40	-46.03	<=-27.4	PASS
		High	2480	-6.36	-49.15	<=-26.36	PASS
		Low	Hop_2402	-7.93	-50.14	<=-27.93	PASS
		High	Hop_2480	-6.32	-49.03	<=-26.32	PASS
3DH5	Ant1	Low	2402	-7.29	-44.61	<=-27.29	PASS
		High	2480	-7.47	-48.48	<=-27.47	PASS
		Low	Hop_2402	-10.29	-50.42	<=-30.29	PASS
		High	Hop_2480	-7.29	-48.75	<=-27.29	PASS

Test Graph

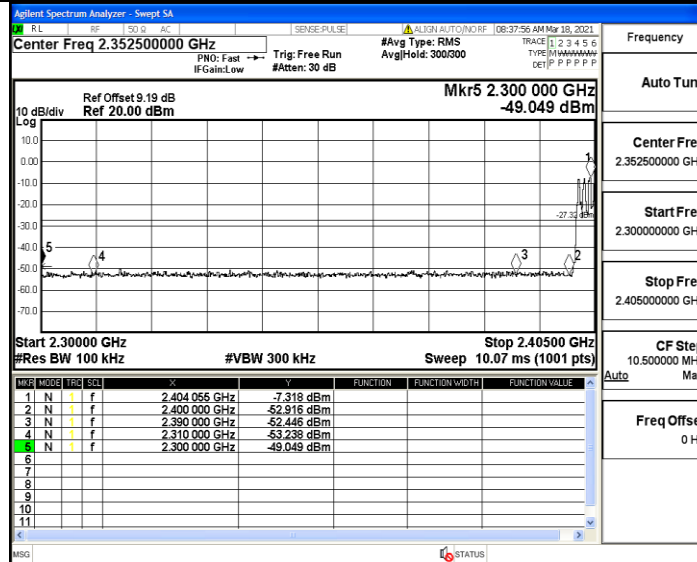
DH5_Ant1_Low_2402



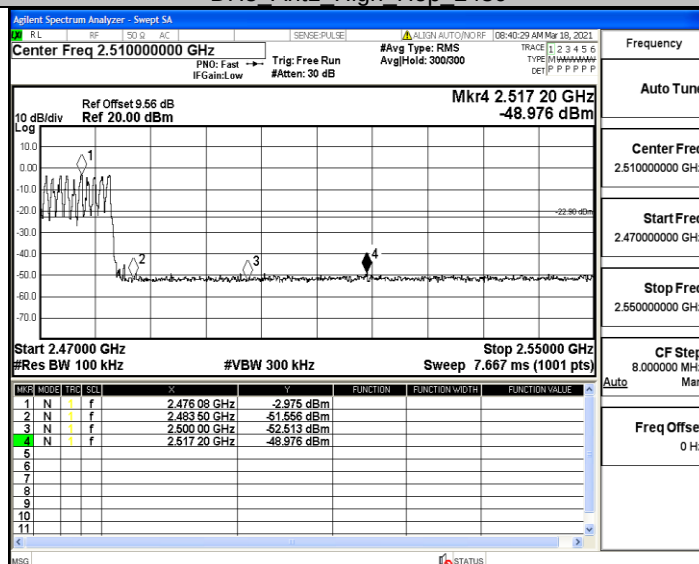
DH5_Ant1_High_2480



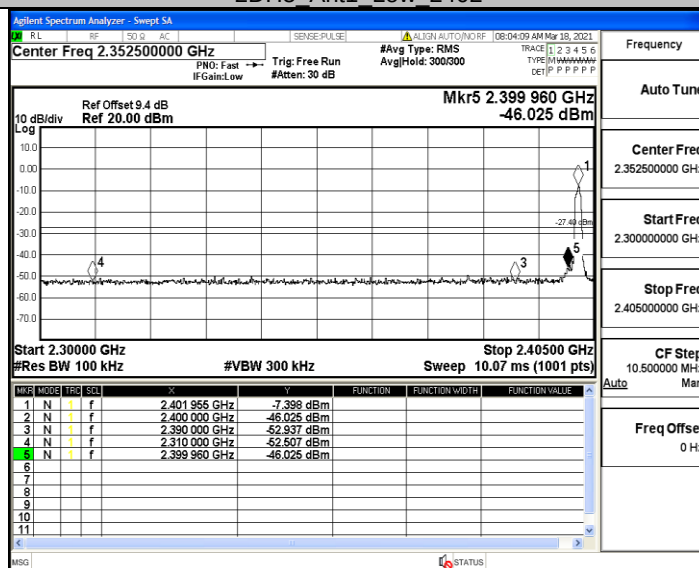
DH5_Ant1_Low_Hop_2402



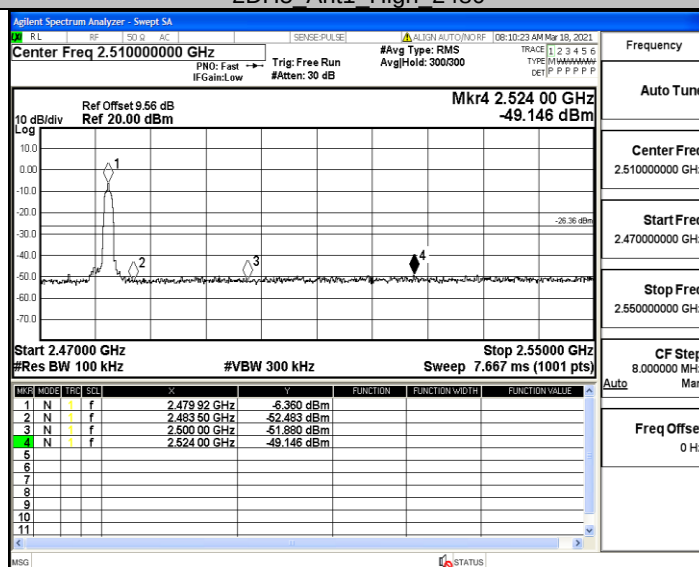
DH5_Ant1_High_Hop_2480



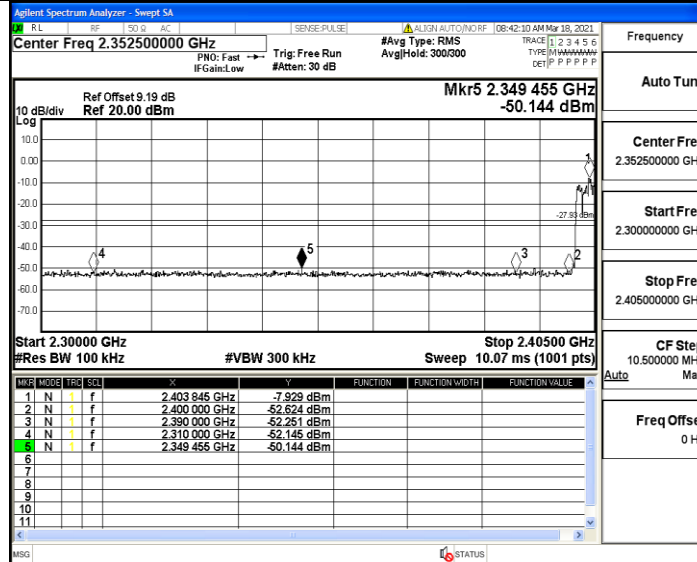
2DH5_Ant1_Low_2402



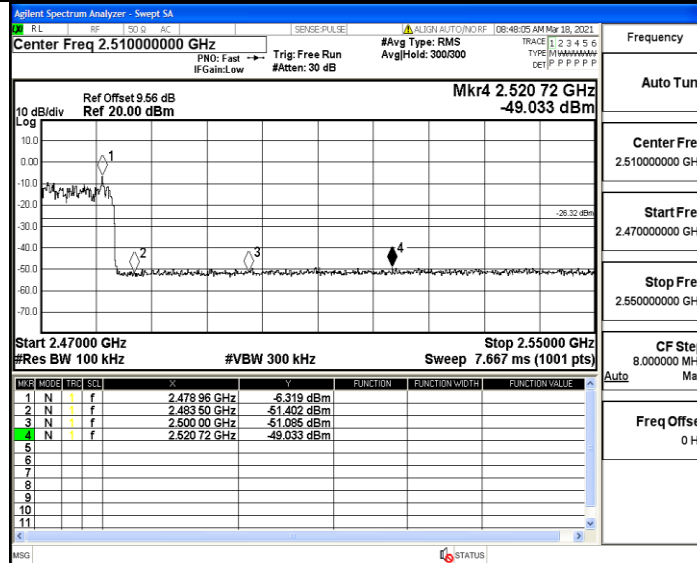
2DH5_Ant1_High_2480



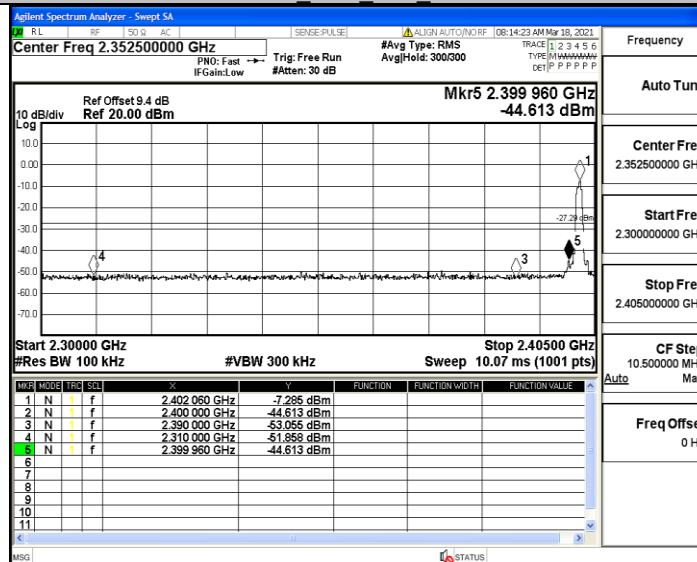
2DH5 Ant1 Low Hop 2402



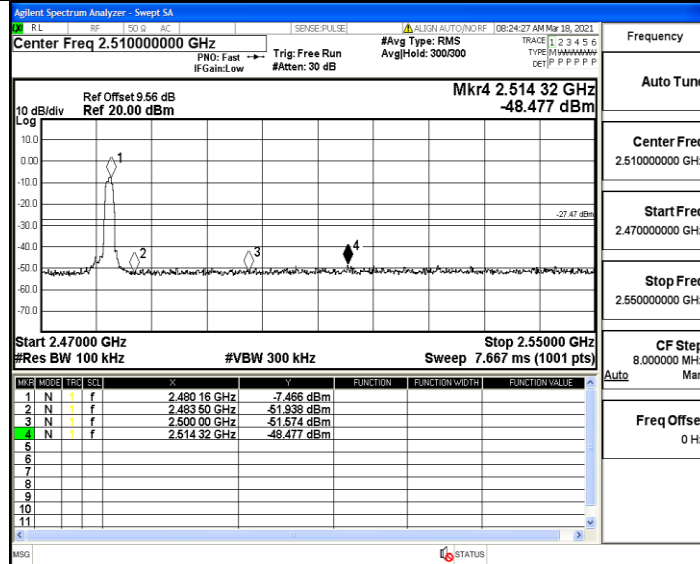
2DH5 Ant1 High Hop 2480



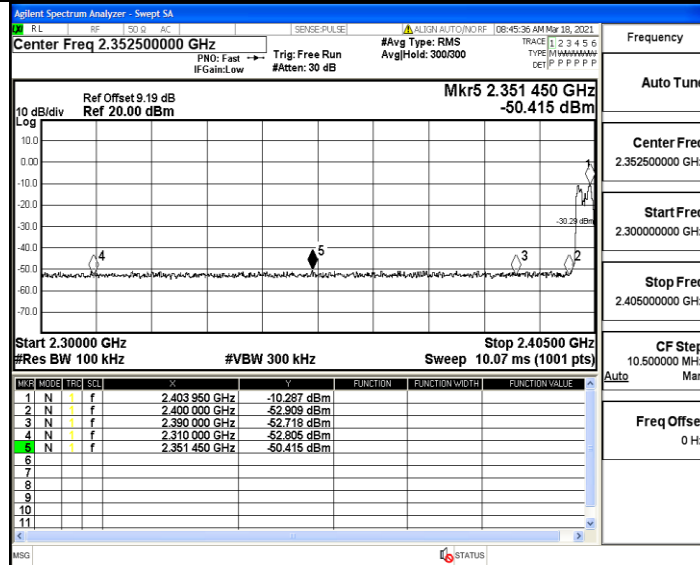
3DH5 Ant1 Low 2402



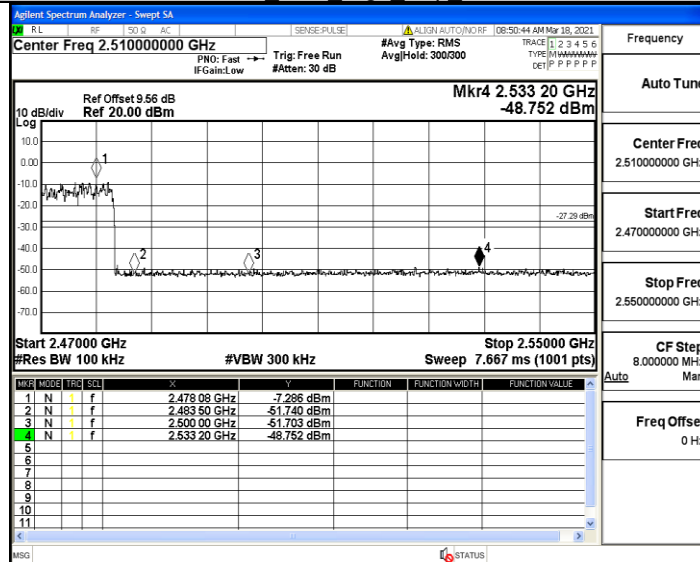
3DH5 Ant1_High 2480



3DH5 Ant1_Low Hop 2402

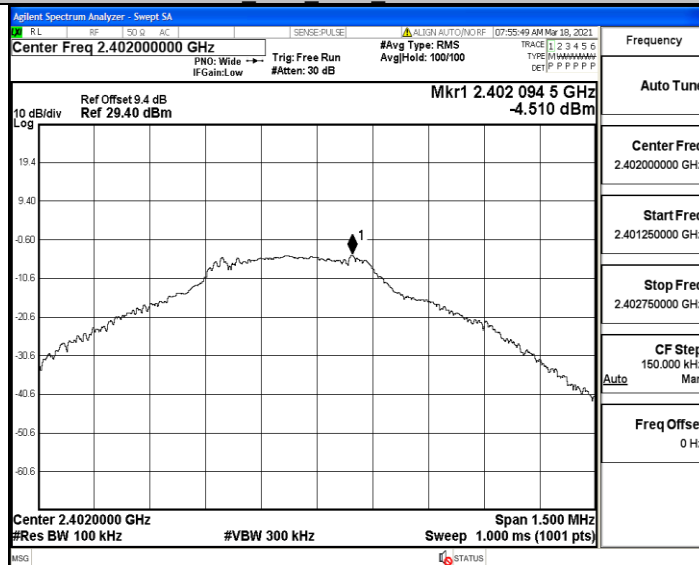


3DH5 Ant1_High Hop 2480

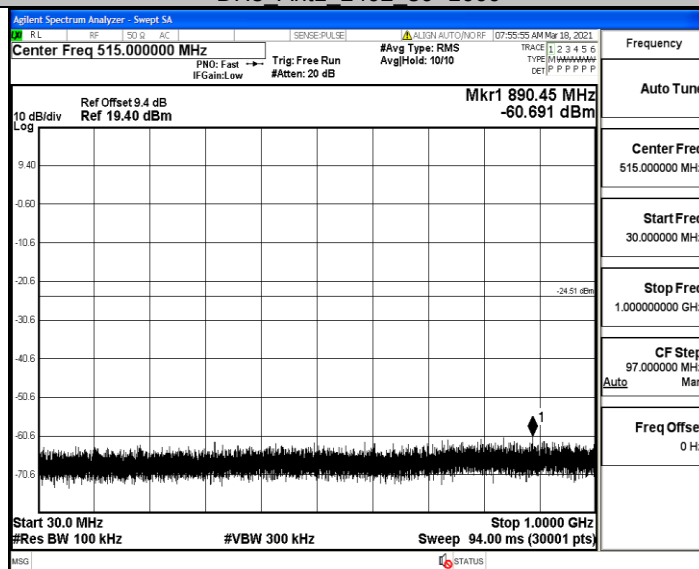


A.7 RF Conducted Spurious Emissions Test Graph

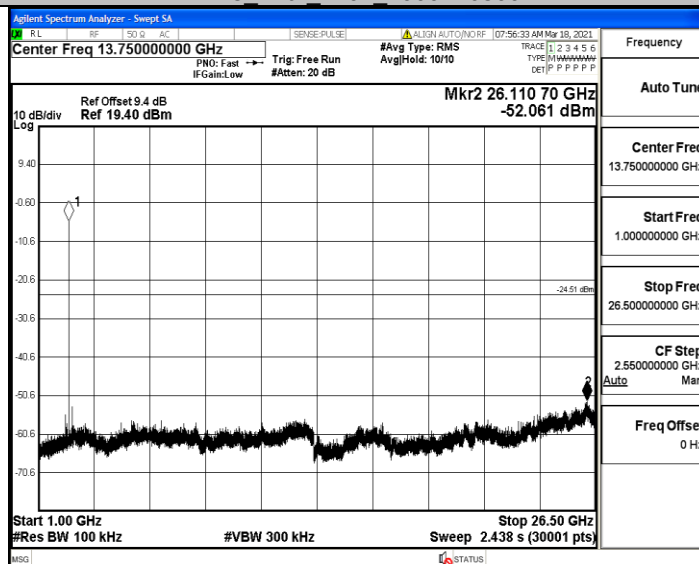
DH5_Ant1_2402_0-Reference



DH5_Ant1_2402_30~1000



DH5_Ant1_2402_1000~26500



Agilent Spectrum Analyzer - Sweep SA

IF R L RF SO G AC SENSE:PUSE

Center Freq 2.441000000 GHz

Ref Offset 9.56 dB

Ref 29.56 dBm

Trig: Free Run

#Atten: 30 dB

#Avg Type: RMS

Avg/Hold: 100/100

07:58:11 AM Mar 18, 2021

Trace 1 2 3 4 5 6

TYPE: W W W W W W W W

DET: P P P P P P

Frequency

Auto Tun

Center Freq

2.441000000 GHz

Start Freq

2.440250000 GHz

Stop Freq

2.441750000 GHz

CF Step

150.000 kHz

Auto

Freq Offset

0 Hz

10 dB/div

Log

19.6

9.56

-0.44

-10.4

-20.4

-30.4

-40.4

-50.4

-60.4

Mkr1 2.440 764 5 GHz

-3.826 dBm

Center 2.4410000 GHz

#Res BW 100 kHz

#VBW 300 kHz

Span 1.500 MHz

Sweep 1.000 ms (1001 pts)

MSO

STATUS

Agilent Spectrum Analyzer - Sweep SA

RL RF SO AC SENSE: PULSE

Center Freq 515.000000 MHz

PRNG: Fast IF Gain: Low Trig: Free Run #Atten: 20 dB

ALISON AUTO (NO RF) 07:58:17 AM Mar 18, 2021

#Avg Type: RMS AvgHeld: 10/10

TRAC: 1 2 3 4 5
TYPE: WWWWMMW
DETP: P P P P P

Frequency

Auto Tune

Center Freq 515.000000 MHz

Start Freq 30.000000 MHz

Stop Freq 1.00000000 GHz

CF Stop 97.000000 MHz

Auto

Freq Offset 0 Hz

Ref Offset 9.56 dB

Ref 19.56 dBm

Mkr1 857.51 MHz -60.895 dBm

10 dB/div

Log

9.56

-0.44

-10.4

-20.4

-30.4

-40.4

-50.4

-60.4

-70.4

-23.03 dBm

Start 30.0 MHz

#Res BW 100 kHz

#VBW 300 kHz

Stop 1.0000 GHz

Sweep 94.00 ms (30001 pts)

Agilent Spectrum Analyzer - Sweep SA

RL RF 50 G AC SENSE:PLUSE

ALIGN AUTO (NO RF) 07:58:55 AM Mar 18, 2021

Center Freq 13.75000000 GHz

PNO: Fast IF Gain:Low Trig: Free Run #Avt: 20 dB

#Avg Type: RMS AvgHeld: 10/10

TRACE 1 2 3 4 5 6
TYPE:RAW
DET:PPPP

Frequency

Auto Tune

Center Freq 13.75000000 GHz

Start Freq 1.00000000 GHz

Stop Freq 26.50000000 GHz

CF Stop 2.55000000 GHz

Auto

Freq Offset 0 Hz

10 dB/div
Log

Ref Offset 9.56 dB
Ref 19.56 dBm

Mkr2 2.285 20 GHz
-52.130 dBm

-23.83 dBm

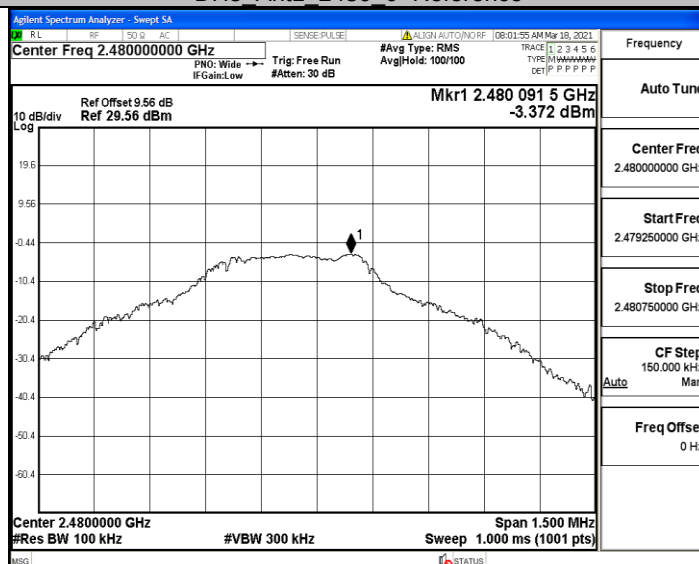
Start 1.00 GHz
#Res BW 100 kHz

Stop 26.50 GHz
Sweep 2.438 s (30001 pts)

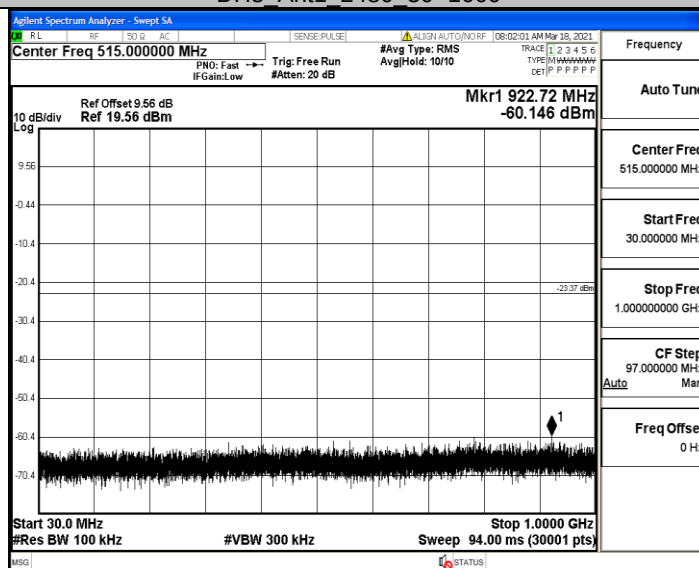
#VBW 300 kHz

MSO STATUS

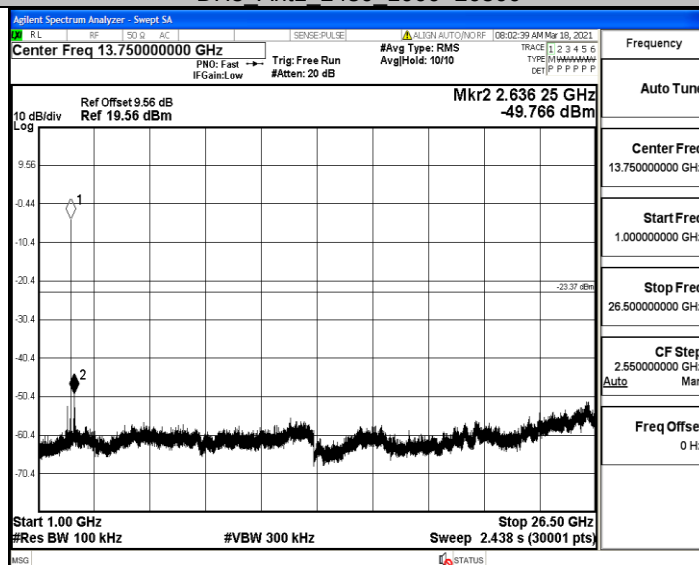
DH5_Ant1_2480_0-Reference



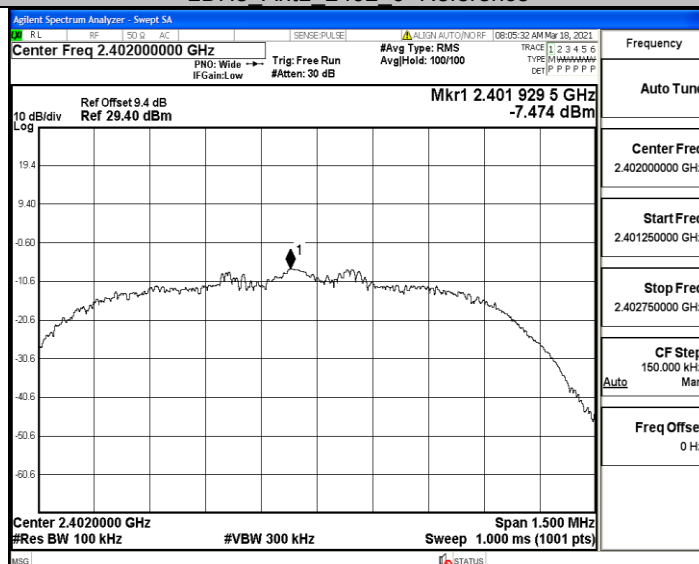
DH5_Ant1_2480_30~1000



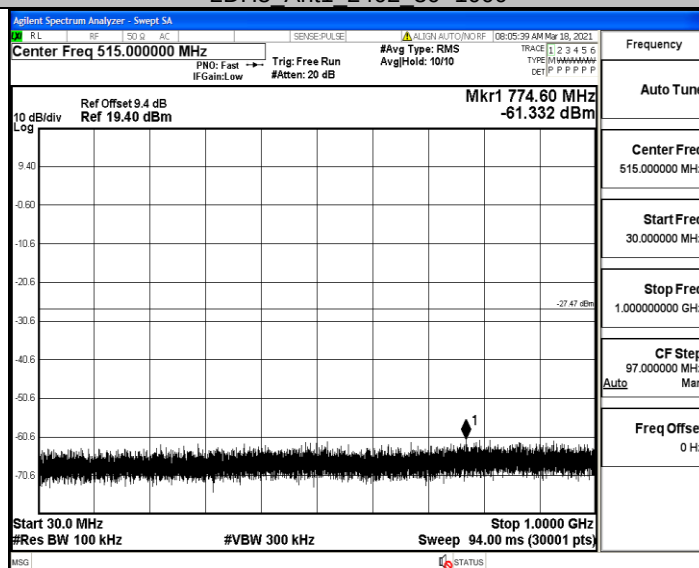
DH5_Ant1_2480_1000~26500



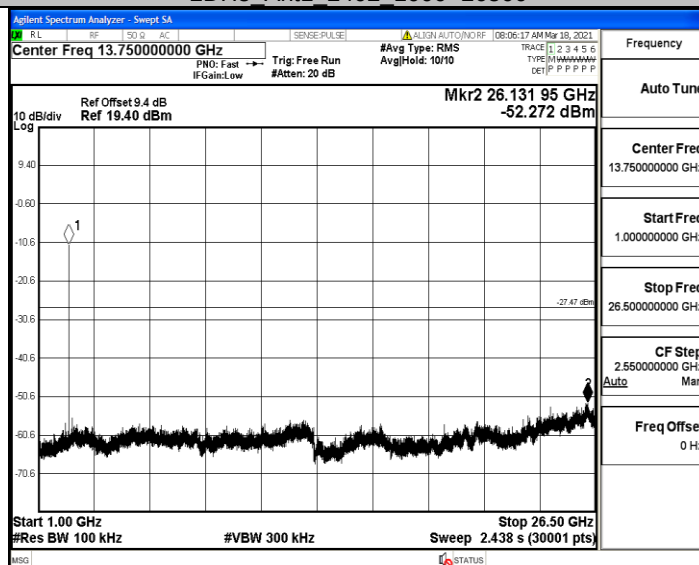
2DH5_Ant1_2402_0~Reference



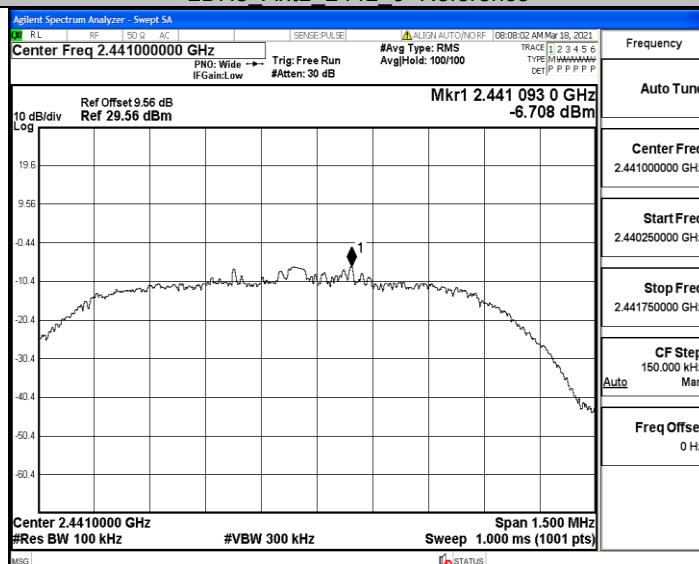
2DH5_Ant1_2402_30~1000



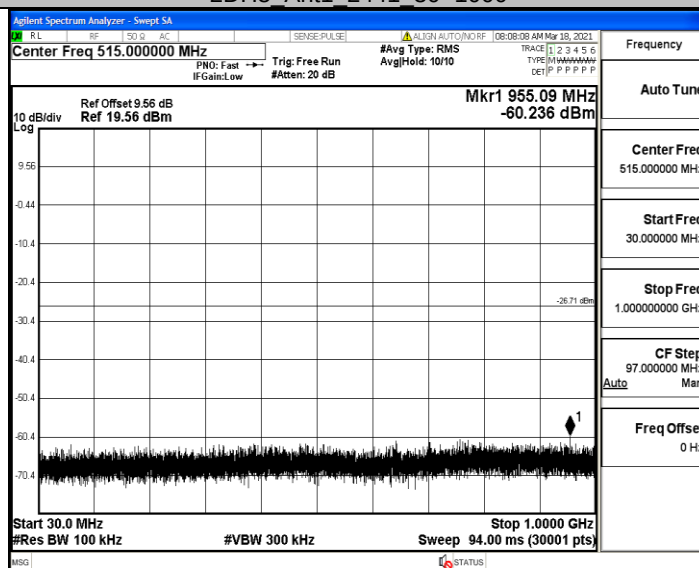
2DH5_Ant1_2402_1000~26500



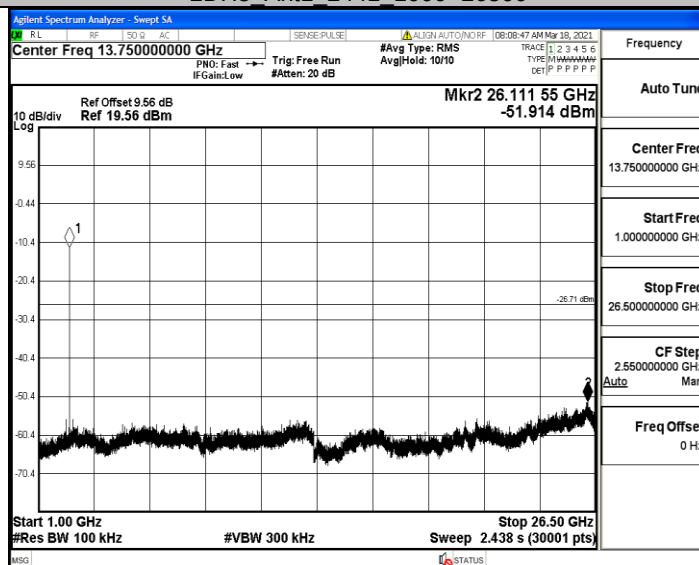
2DH5_Ant1_2441_0~Reference



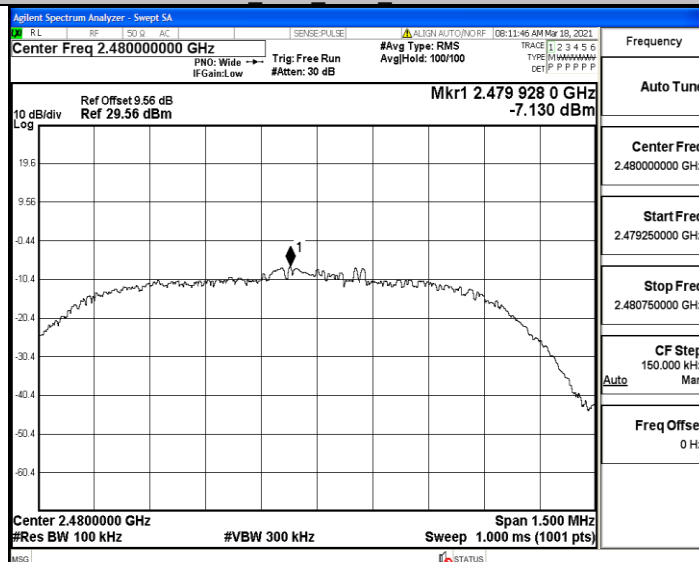
2DH5_Ant1_2441_30~1000



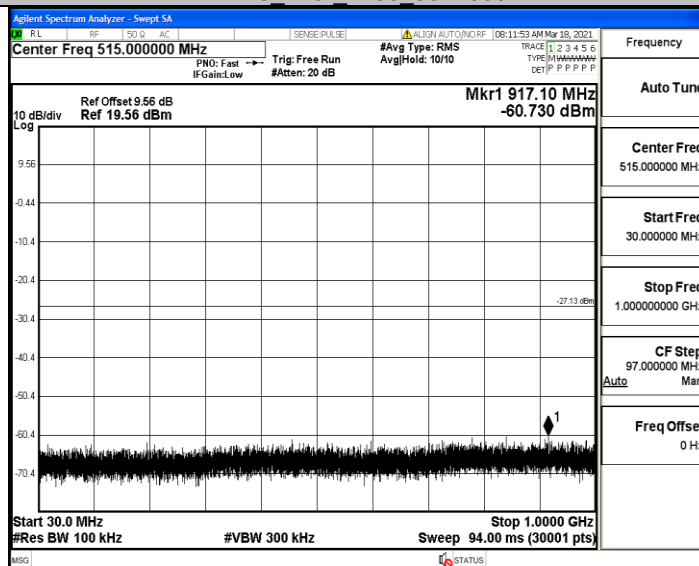
2DH5_Ant1_2441_1000~26500



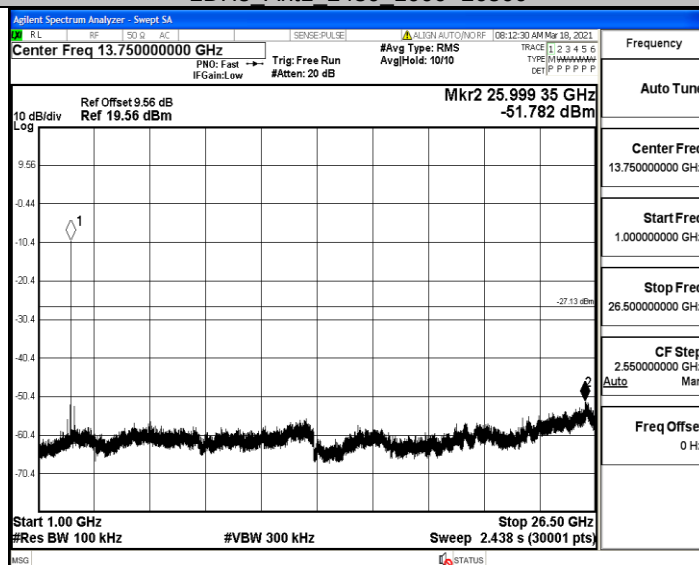
2DH5_Ant1_2480_0~Reference



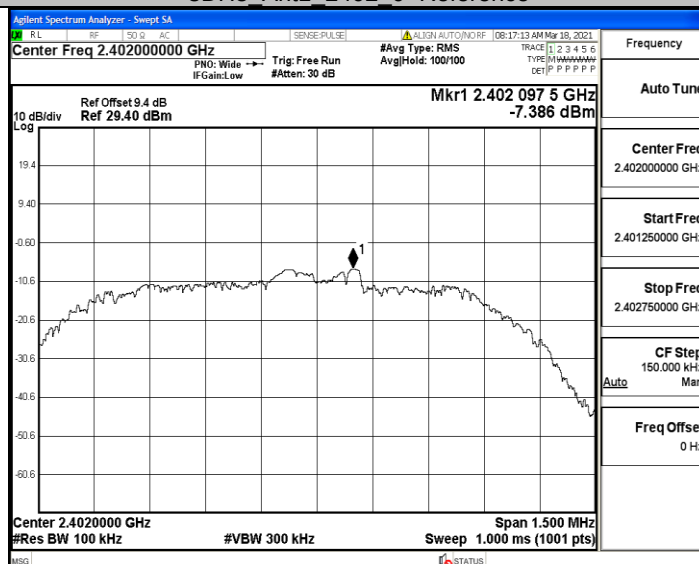
2DH5_Ant1_2480_30~1000



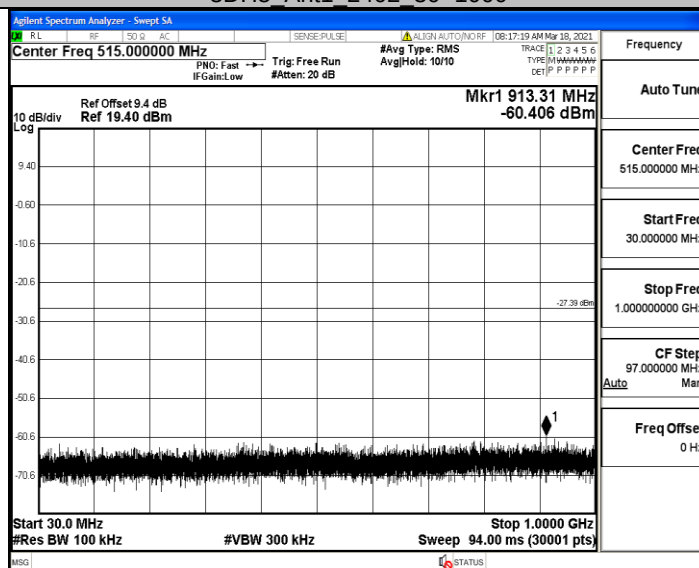
2DH5_Ant1_2480_1000~26500



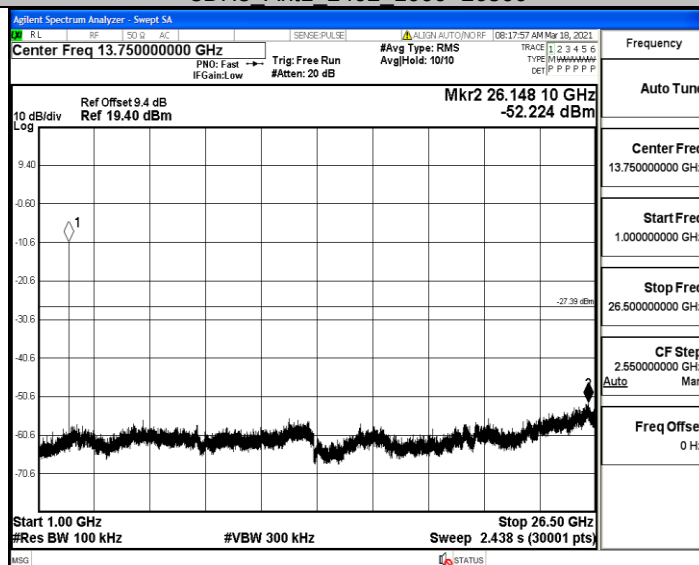
3DH5_Ant1_2402_0~Reference



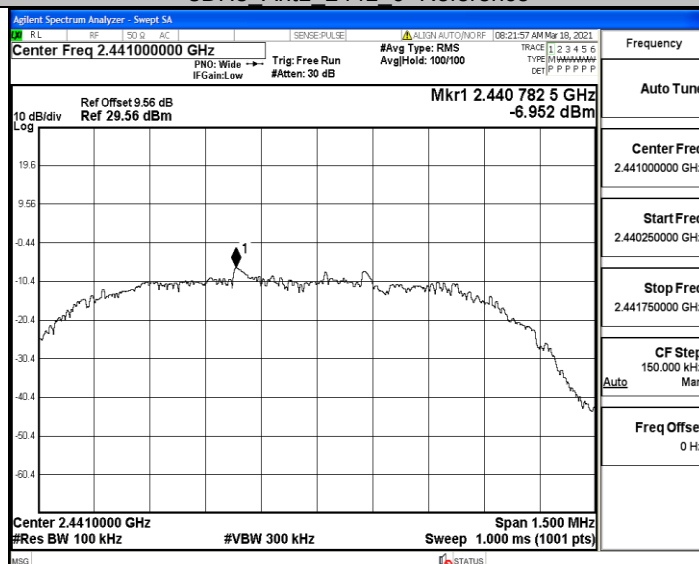
3DH5_Ant1_2402_30~1000



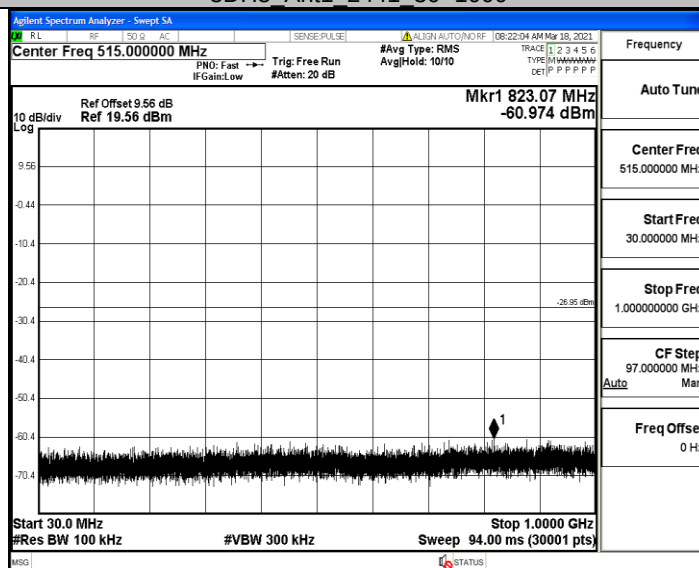
3DH5_Ant1_2402_1000~26500



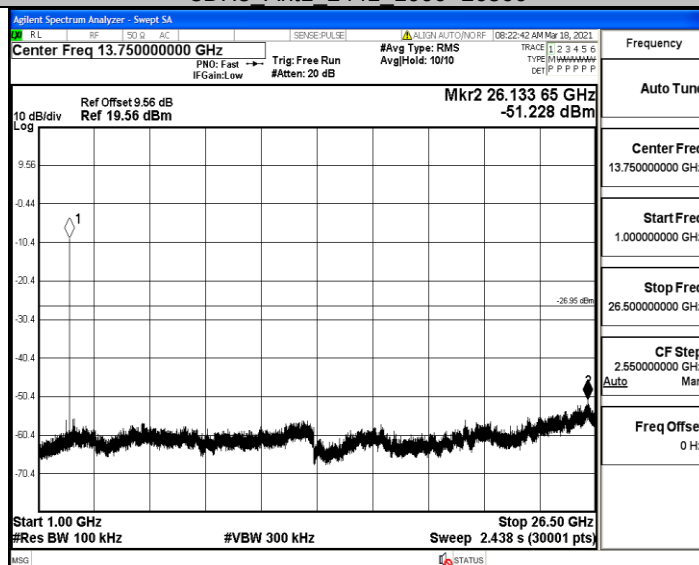
3DH5_Ant1_2441_0~Reference



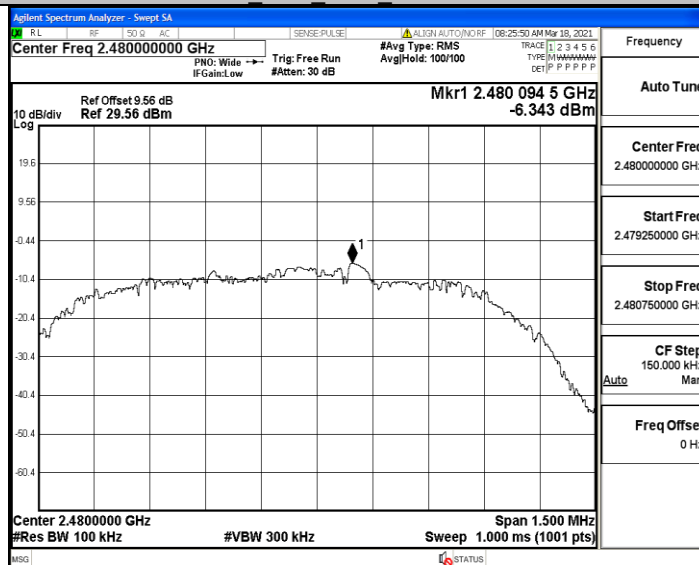
3DH5_Ant1_2441_30~1000



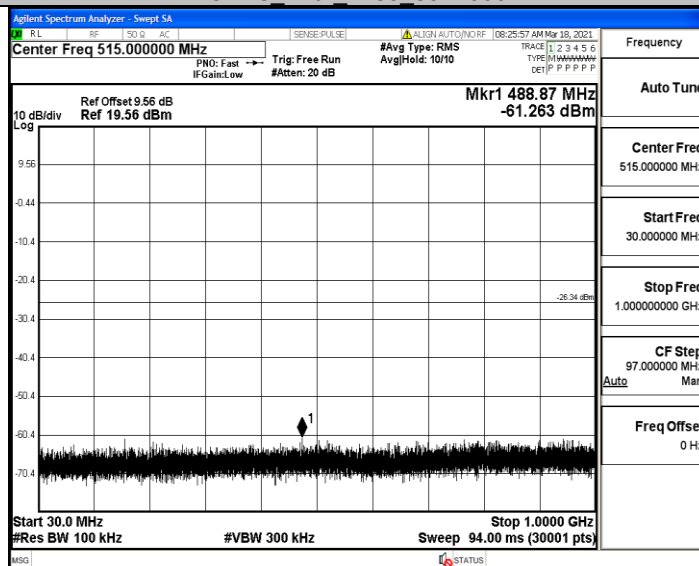
3DH5_Ant1_2441_1000~26500



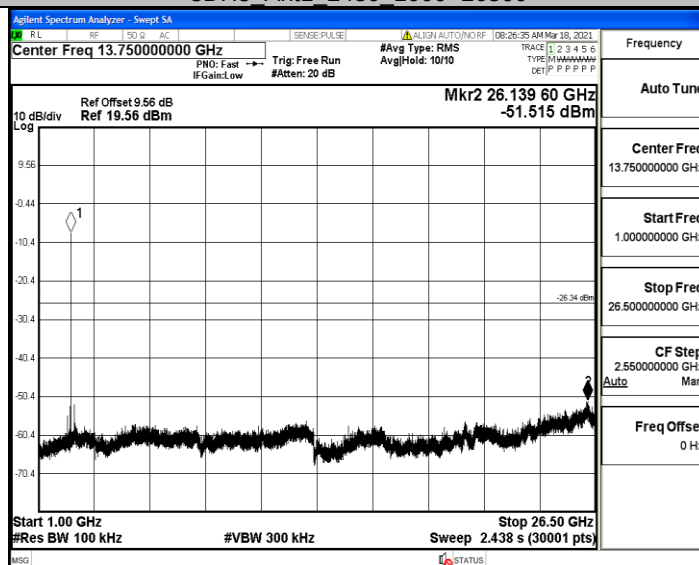
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



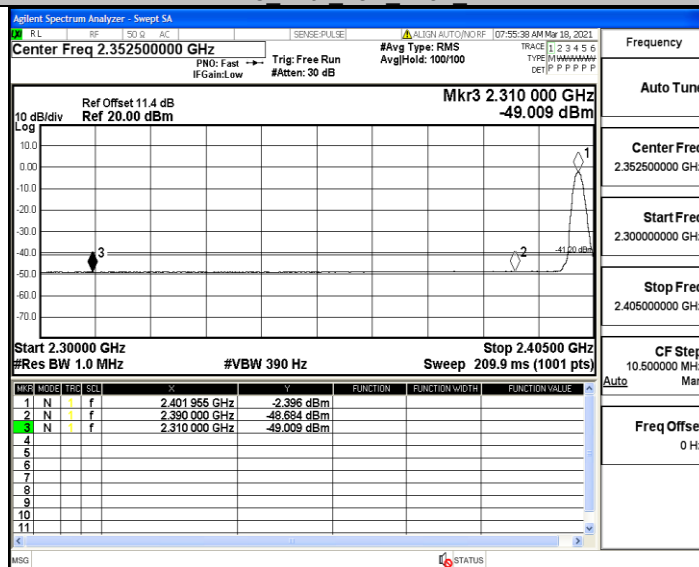
A.8 Restrict-band band-edge measurements

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	2390.000	-48.68	<=-41.20	PASS
				Peak	2310.000	-43.58	<=-21.20	PASS
				Peak	2390.000	-43.01	<=-21.20	PASS
		High	2480	AV	2483.500	-47.86	<=-41.20	PASS
				AV	2500.000	-47.99	<=-41.20	PASS
				Peak	2483.500	-40.46	<=-21.20	PASS
				Peak	2500.000	-41.71	<=-21.20	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-49.23	<=-41.20	PASS
				AV	2390.000	-48.87	<=-41.20	PASS
				Peak	2310.000	-45.78	<=-21.20	PASS
				Peak	2390.000	-43.90	<=-21.20	PASS
		High	2480	AV	2483.500	-48.19	<=-41.20	PASS
				AV	2500.000	-48.08	<=-41.20	PASS
				Peak	2483.500	-43.43	<=-21.20	PASS
				Peak	2500.000	-42.68	<=-21.20	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-49.37	<=-41.20	PASS
				AV	2390.000	-49.12	<=-41.20	PASS
				Peak	2310.000	-42.87	<=-21.20	PASS
				Peak	2390.000	-44.36	<=-21.20	PASS
		High	2480	AV	2483.500	-48.13	<=-41.20	PASS
				AV	2500.000	-48.13	<=-41.20	PASS
				Peak	2483.500	-41.29	<=-21.20	PASS
				Peak	2500.000	-40.97	<=-21.20	PASS

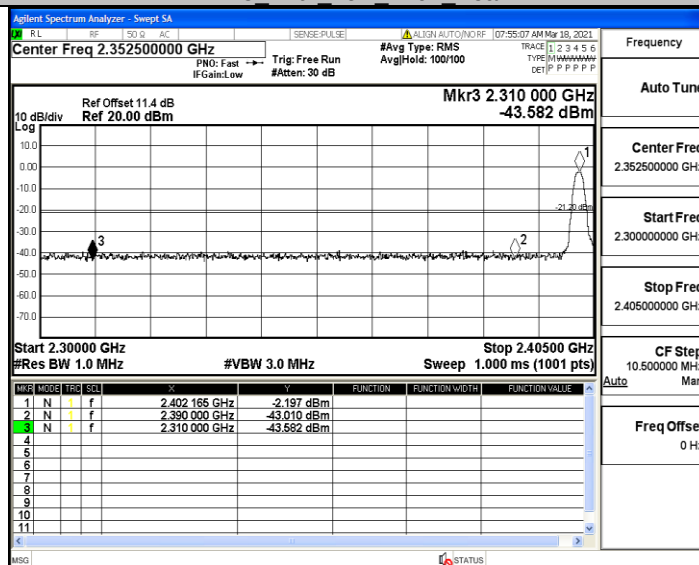
1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

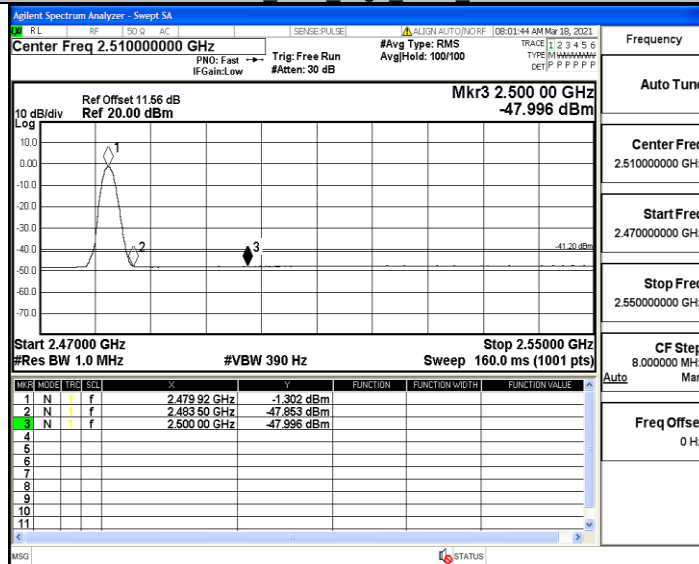
DH5 Ant1 Low 2402 AV



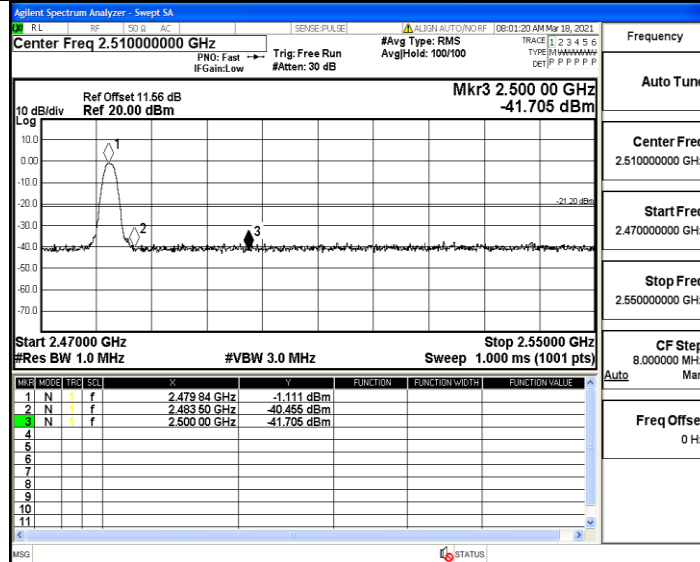
DH5 Ant1 Low 2402 Peak



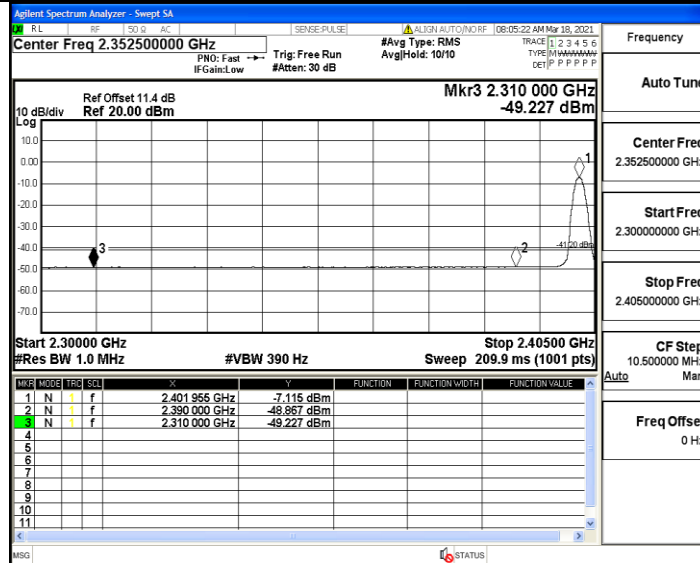
DH5 Ant1 High 2480 AV



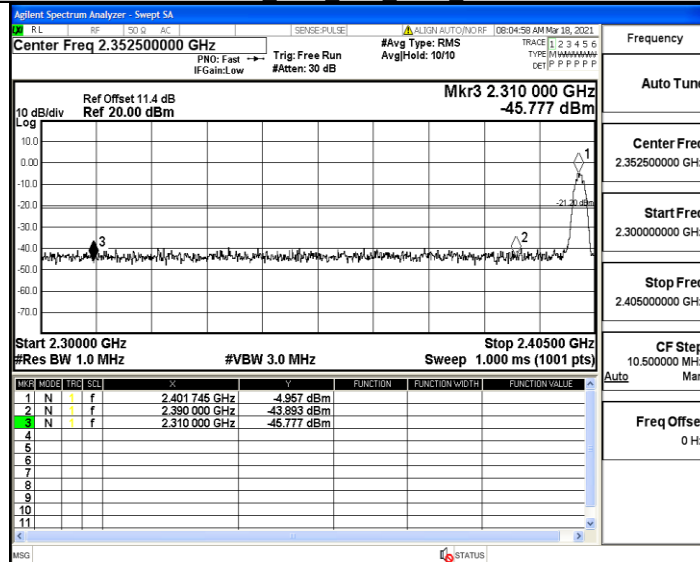
DH5 Ant1 High 2480 Peak



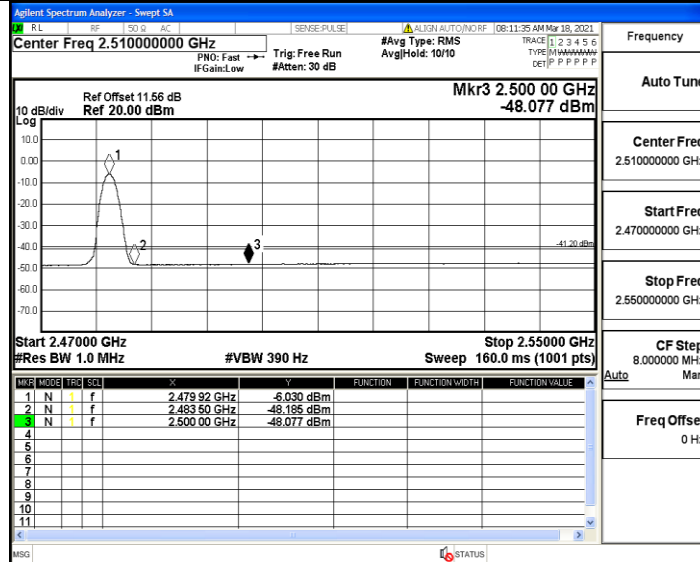
2DH5 Ant1 Low 2402 AV



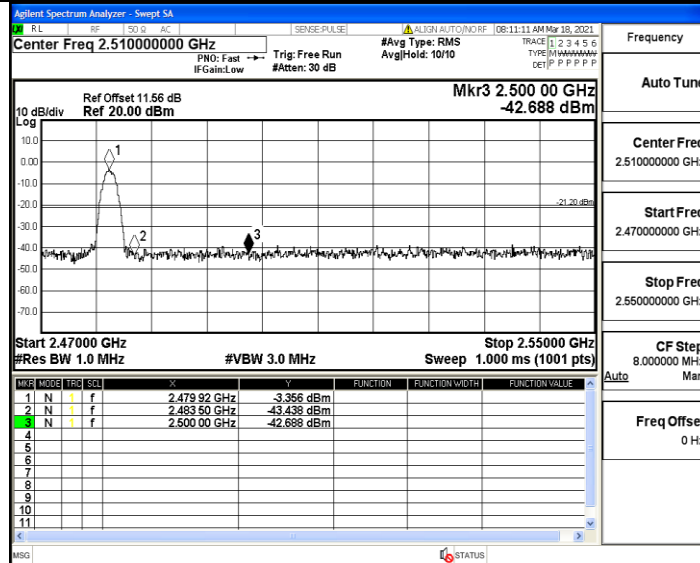
2DH5 Ant1 Low 2402 Peak



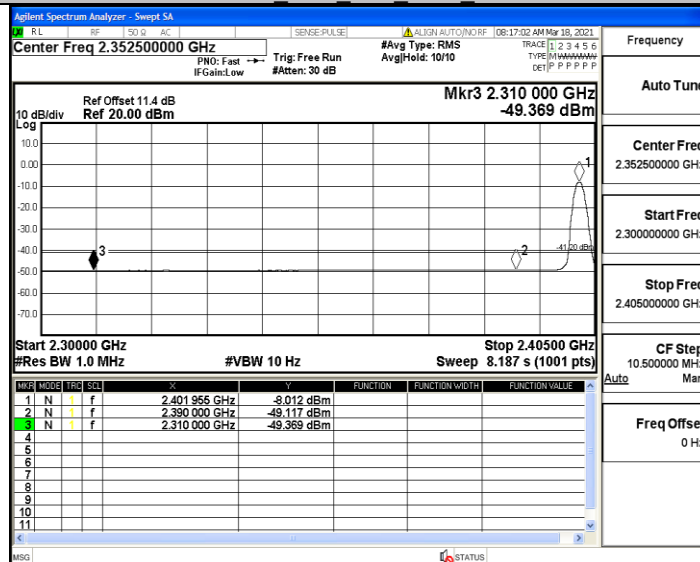
2DH5 Ant1_High_2480_AV



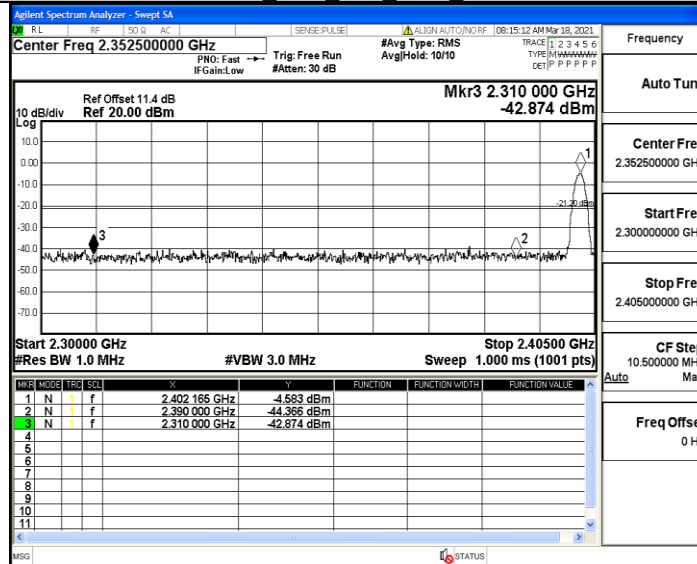
2DH5 Ant1_High_2480_Peak



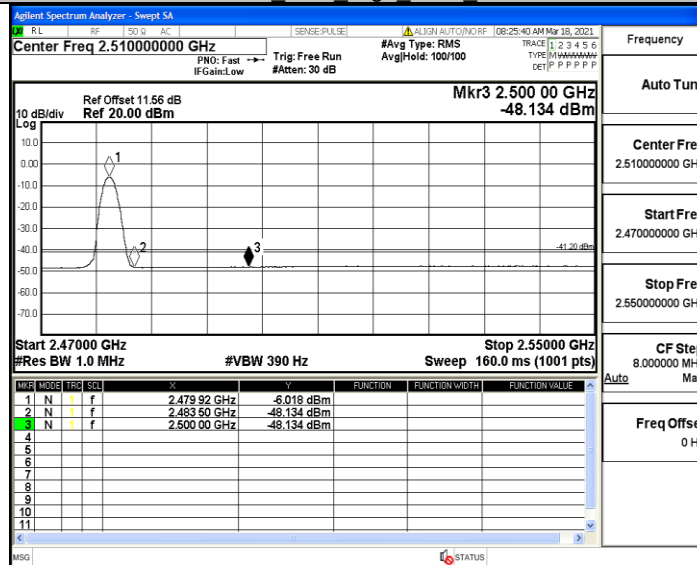
3DH5 Ant1_Low_2402_AV



3DH5 Ant1 Low 2402 Peak



3DH5 Ant1 High 2480 AV



3DH5 Ant1 High 2480 Peak

