Appendix Test Data

Report No.:	18220WC20230201	Test Sample No.:	1-2-2
Start Test Date:	2022.9.26	Finish Test Date:	2022.9.28
Test Engineer:	Tony.He	Auditor:	Edward.Pan
Temperature:	27.3℃	Relative Humidity:	47 %
Pressure:	1012 hPa		

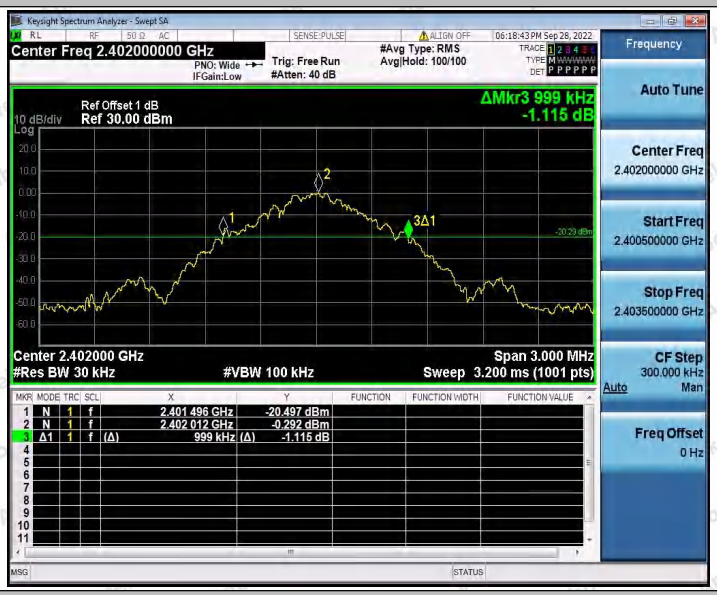
Appendix A: 20dB Emission Bandwidth

Test Result

Test Mode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]
DH5	Ant1	2402	0.999	2401.496	2402.495
		2441	0.996	2440.487	2441.483
		2480	1.026	2479.481	2480.507
2DH5	Ant1	2402	1.227	2401.376	2402.603
		2441	1.230	2440.373	2441.603
		2480	1.203	2479.394	2480.597
3DH5	Ant1	2402	1.305	2401.346	2402.651
		2441	1.278	2440.349	2441.627
		2480	1.278	2479.349	2480.627

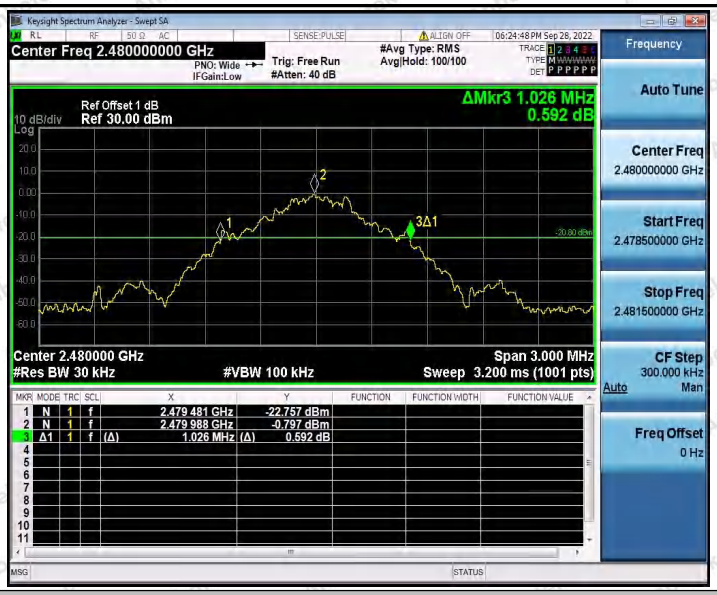
Test Graphs

DH5_Ant1_2402



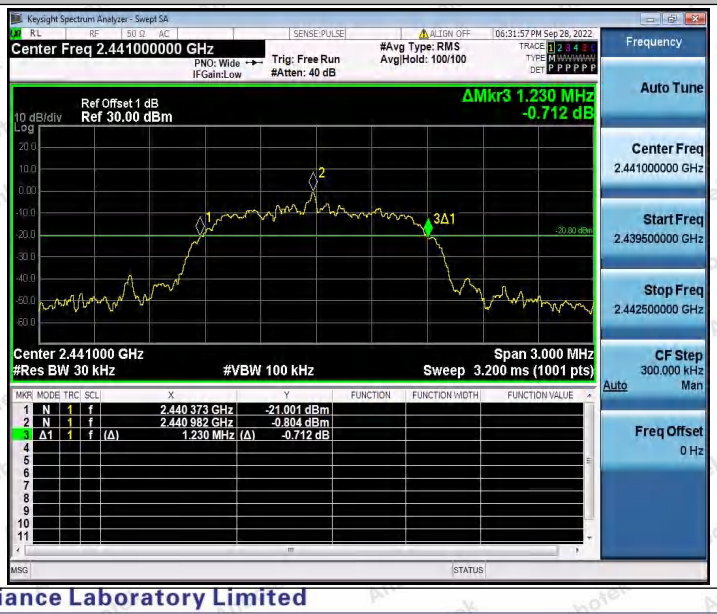
DH5_Ant1_2441

DH5_Ant1_2480

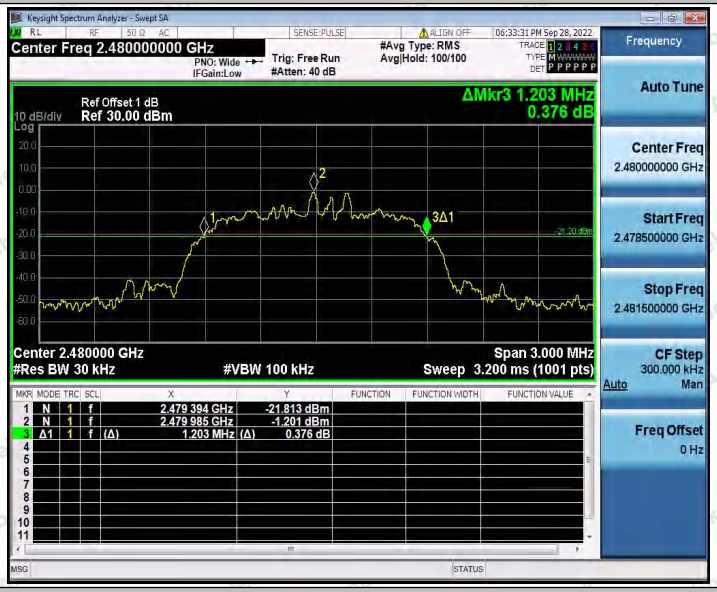


2DH5_Ant1_2402

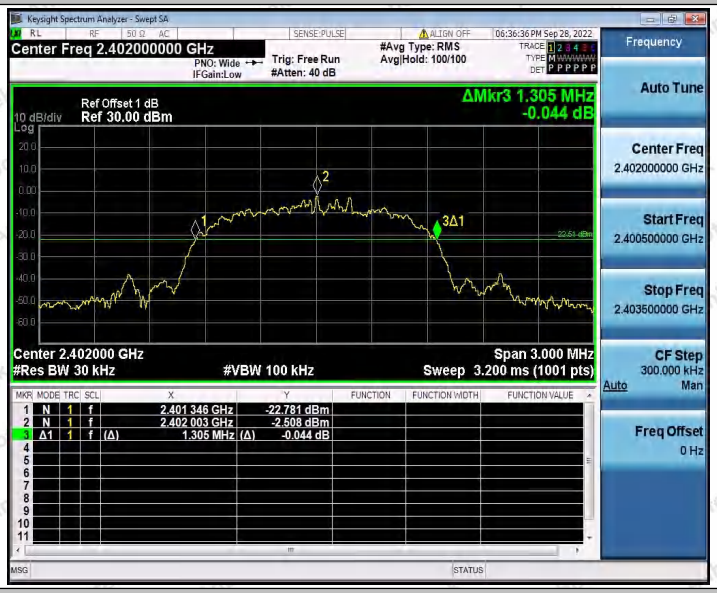
2DH5_Ant1_2441



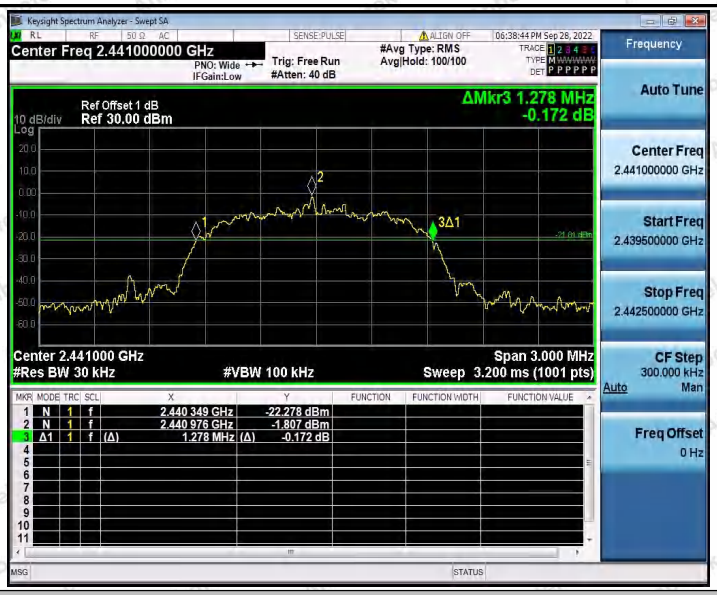
2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

Appendix B: Occupied Channel Bandwidth

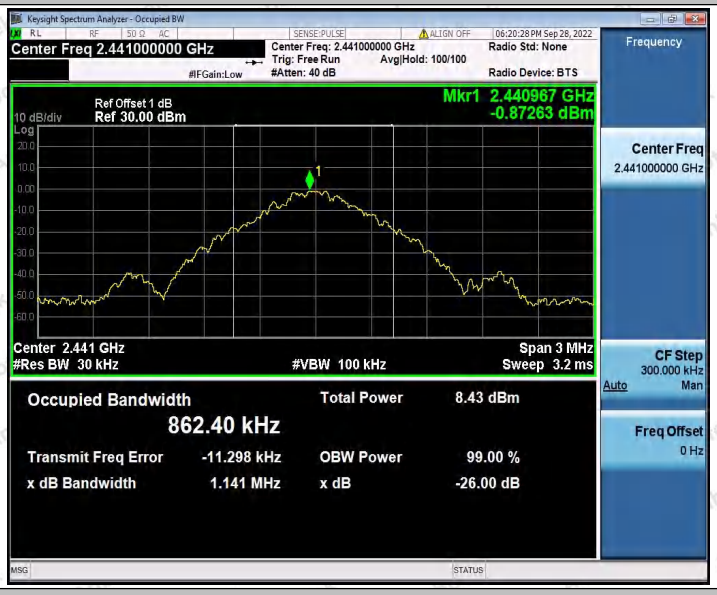
Test Result

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]
DH5	Ant1	2402	0.91724	2401.5405	2402.4578
		2441	0.86240	2440.5575	2441.4199
		2480	0.88783	2479.5478	2480.4356
2DH5	Ant1	2402	1.1463	2401.4181	2402.5644
		2441	1.1593	2440.4103	2441.5696
		2480	1.1663	2479.4104	2480.5767
3DH5	Ant1	2402	1.1645	2401.4154	2402.5799
		2441	1.1442	2440.4270	2441.5712
		2480	1.1620	2479.4117	2480.5737

Test Graphs

DH5_Ant1_2402

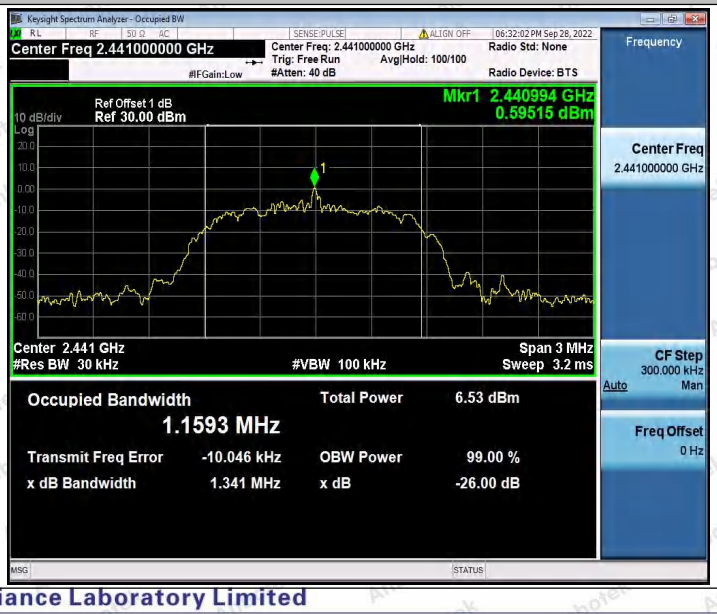
DH5_Ant1_2441



DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441



2DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480

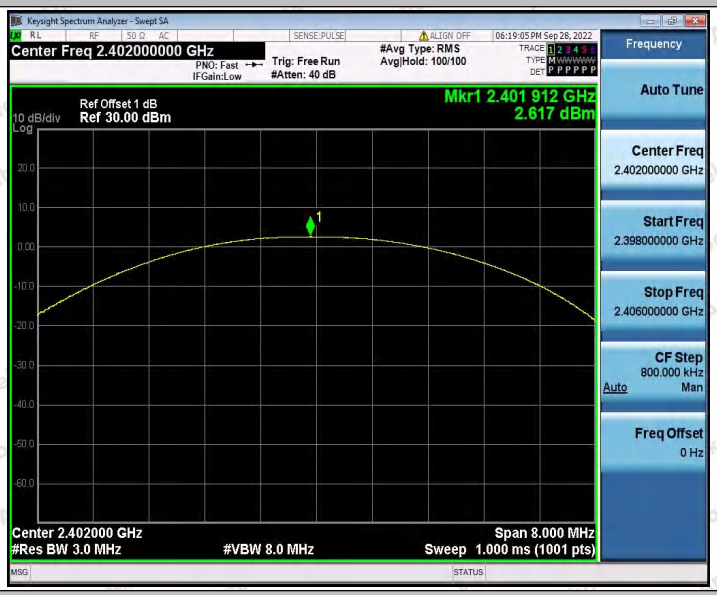
Appendix C: Maximum conducted output power

Test Result Peak

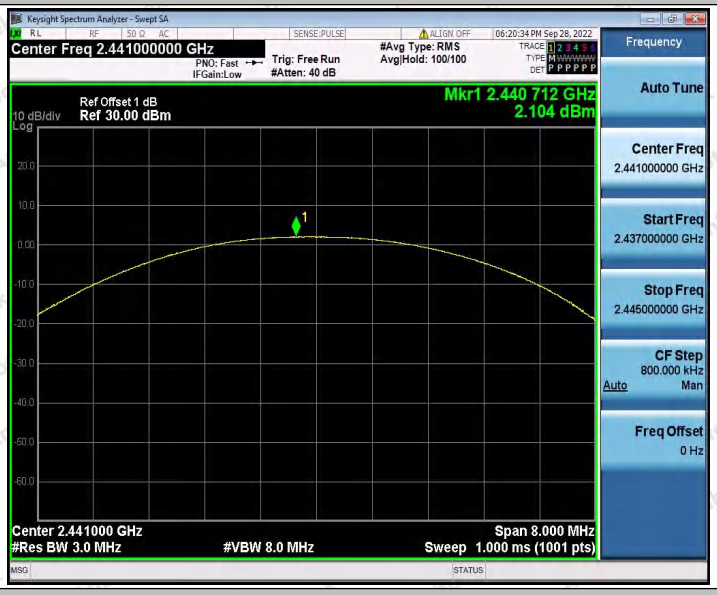
Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	2.62	≤30	PASS
		2441	2.1	≤30	PASS
		2480	1.19	≤30	PASS
2DH5	Ant1	2402	2.65	≤20.97	PASS
		2441	2.06	≤20.97	PASS
		2480	1.14	≤20.97	PASS
3DH5	Ant1	2402	2.55	≤20.97	PASS
		2441	2.02	≤20.97	PASS
		2480	1.2	≤20.97	PASS

Test Graphs

DH5_Ant1_2402



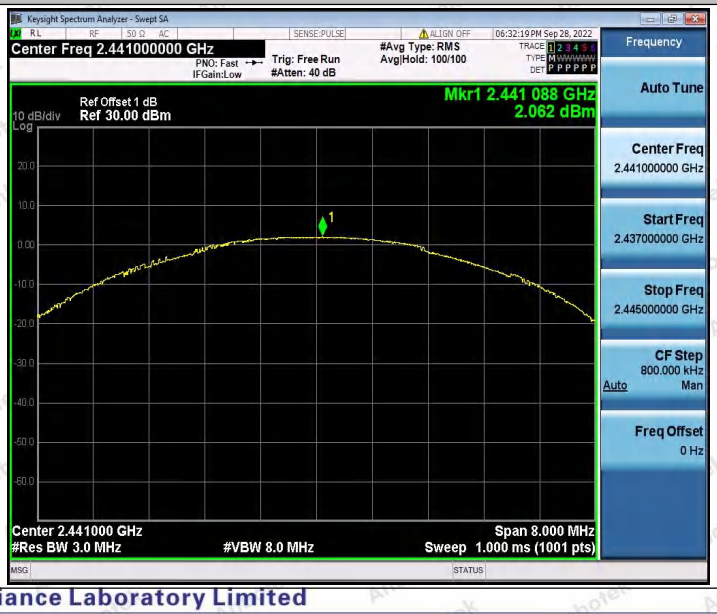
DH5_Ant1_2441



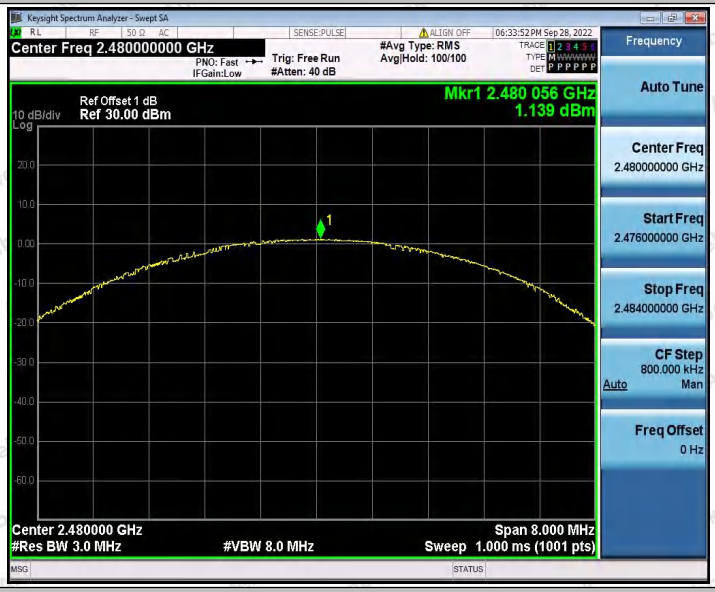
DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441



2DH5_Ant1_2480



3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480

Appendix D: Carrier frequency separation

Test Result

Test Mode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.998	≥0.684	PASS
2DH5	Ant1	Hop	1.008	≥0.820	PASS
3DH5	Ant1	Hop	1.356	≥1.305	PASS

Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop

3DH5_Ant1_Hop

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441500000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 5000/5000
06:57:42 PM Sep 28, 2022
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.356 MHz
0.025 dB
Start 2.440500 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.442500 GHz
Sweep 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.441500000 GHz
Start Freq
2.440500000 GHz
Stop Freq
2.442500000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

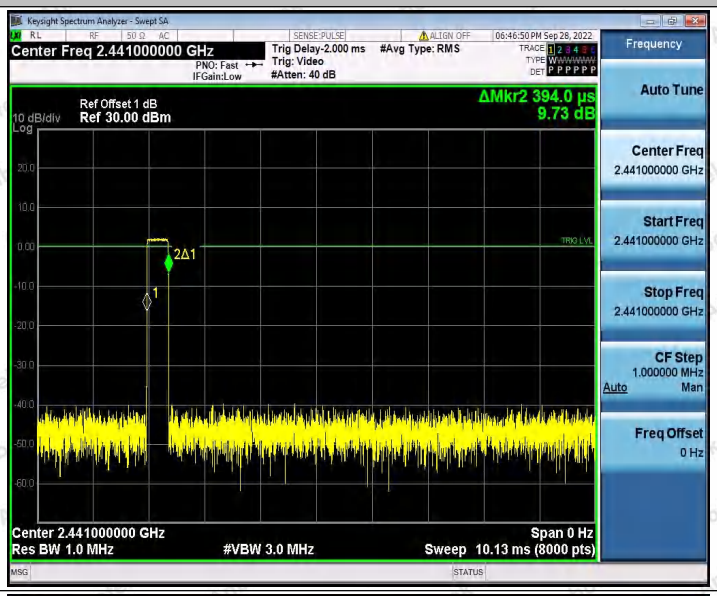
Appendix E: Time of occupancy

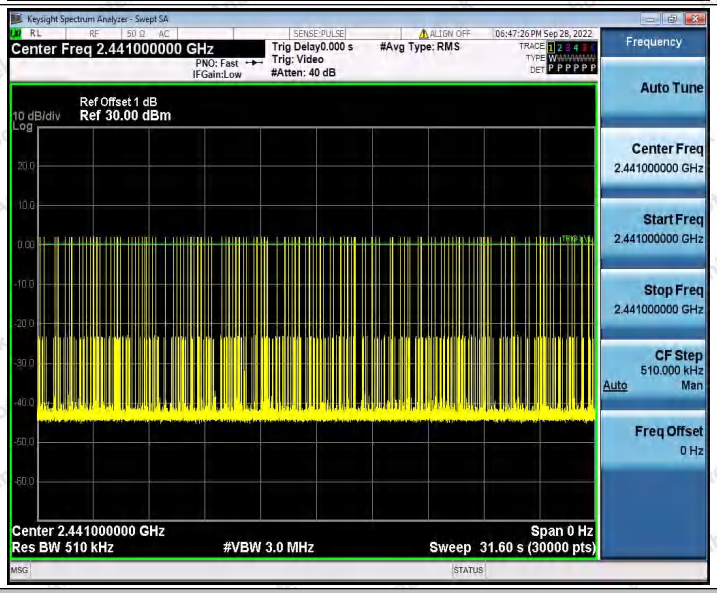
Test Result

Test Mode	Antenna	Frequency[MHz]	Burst Width [ms]	Total Hops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.394	166	0.065	≤0.4	PASS
DH3	Ant1	Hop	1.650	96	0.158	≤0.4	PASS
DH5	Ant1	Hop	2.898	89	0.258	≤0.4	PASS
2DH1	Ant1	Hop	0.403	166	0.067	≤0.4	PASS
2DH3	Ant1	Hop	1.656	112	0.185	≤0.4	PASS
2DH5	Ant1	Hop	2.904	76	0.221	≤0.4	PASS
3DH1	Ant1	Hop	0.403	165	0.066	≤0.4	PASS
3DH3	Ant1	Hop	1.654	100	0.165	≤0.4	PASS
3DH5	Ant1	Hop	2.904	76	0.221	≤0.4	PASS

Test Graphs

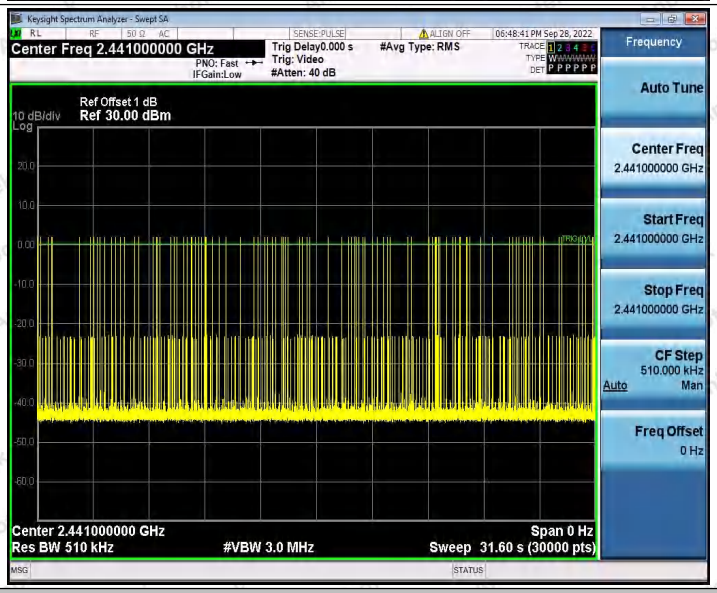
DH1_Ant1_Hop



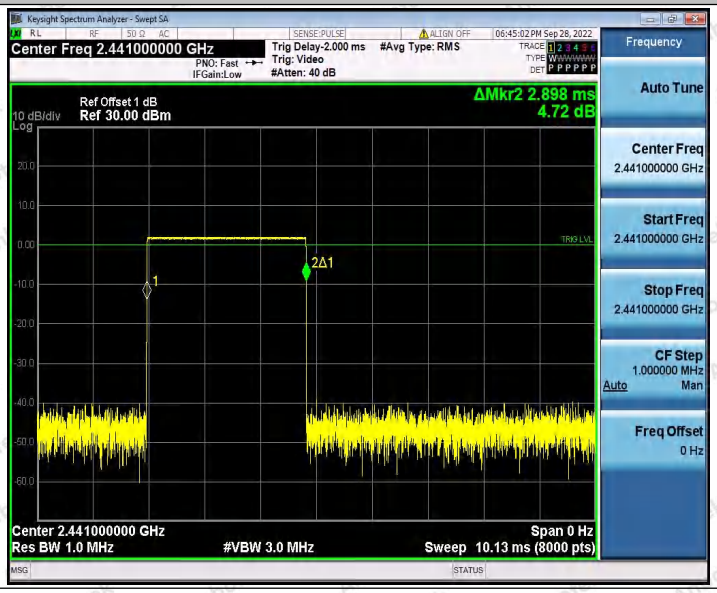


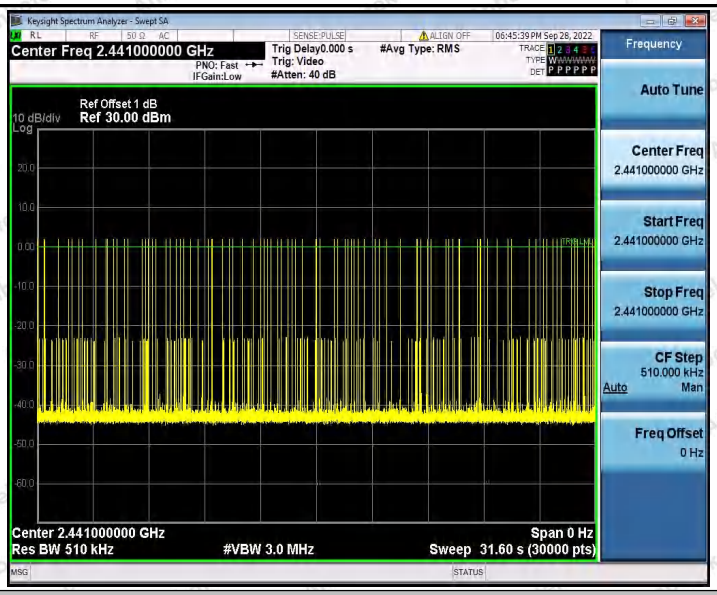
DH3_Ant1_Hop

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.650 ms
12.33 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
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

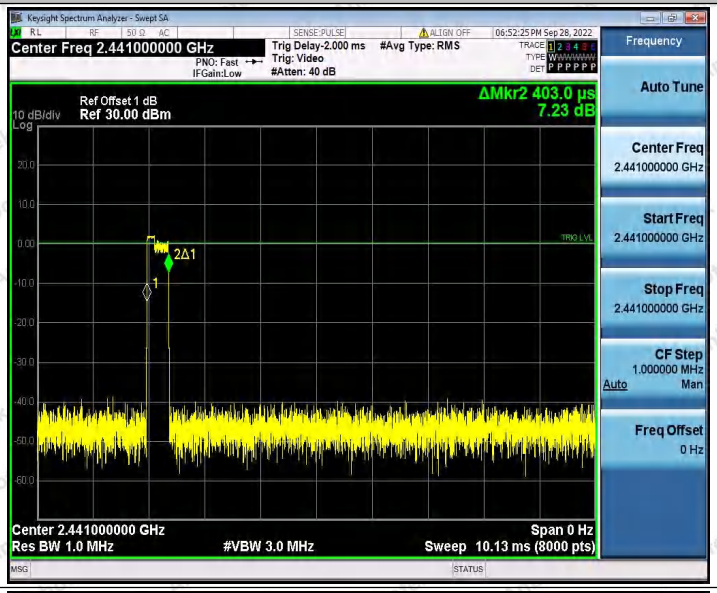

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center Freq
2.441000000 GHz
Start Freq
2.441000000 GHz
Stop Freq
2.441000000 GHz
CF Step
510.000 kHz
Auto
Man
Freq Offset
0 Hz

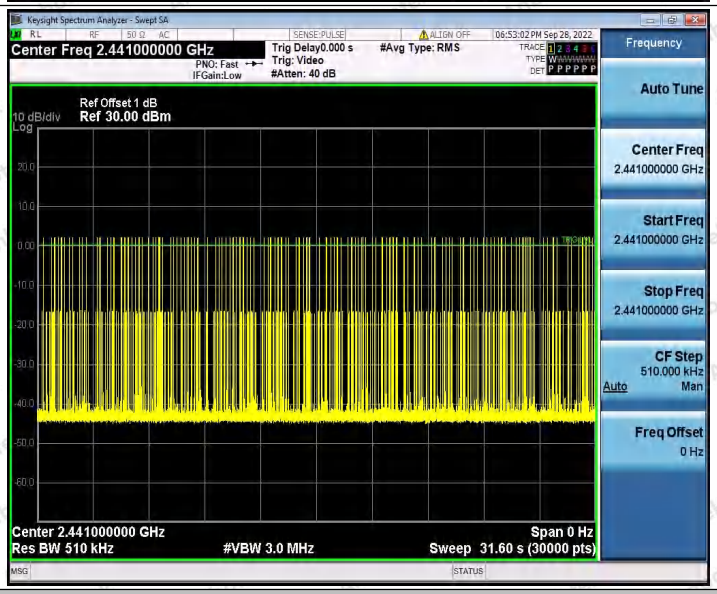
DH5_Ant1_Hop


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.898 ms
4.72 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
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

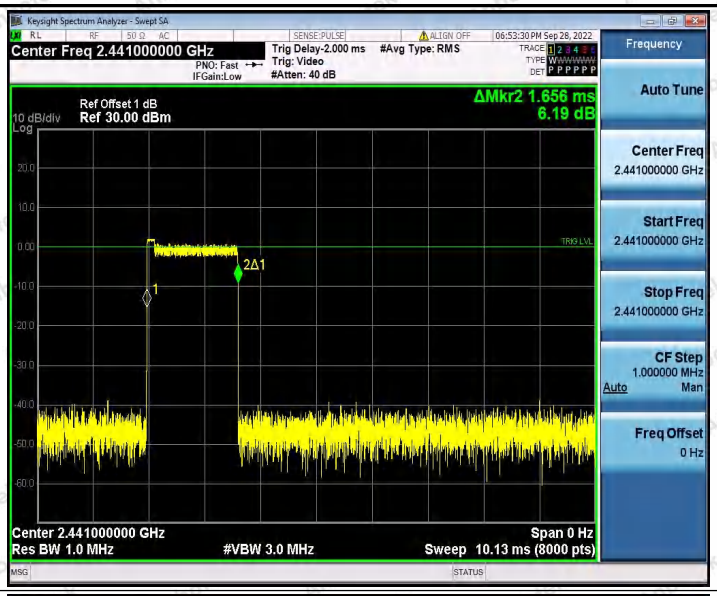


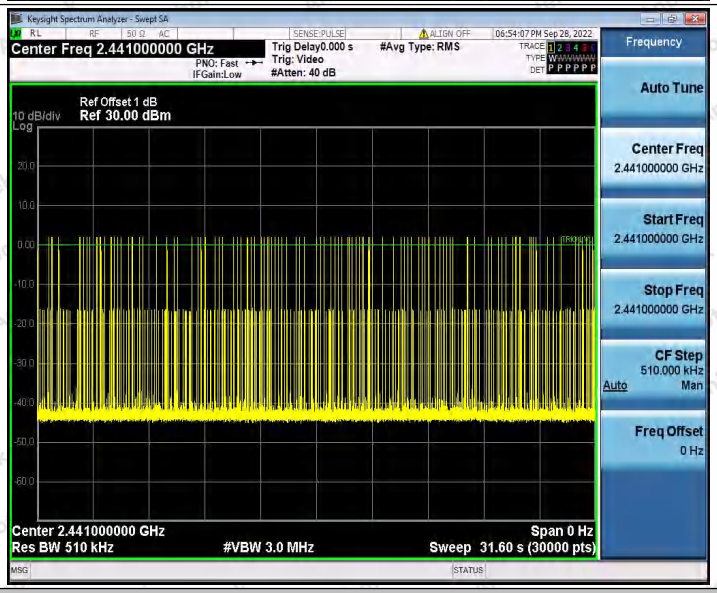
2DH1_Ant1_Hop



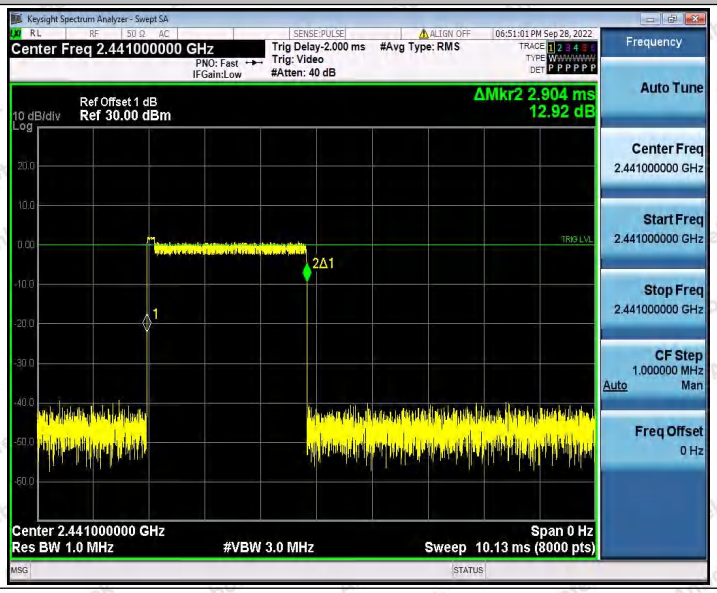


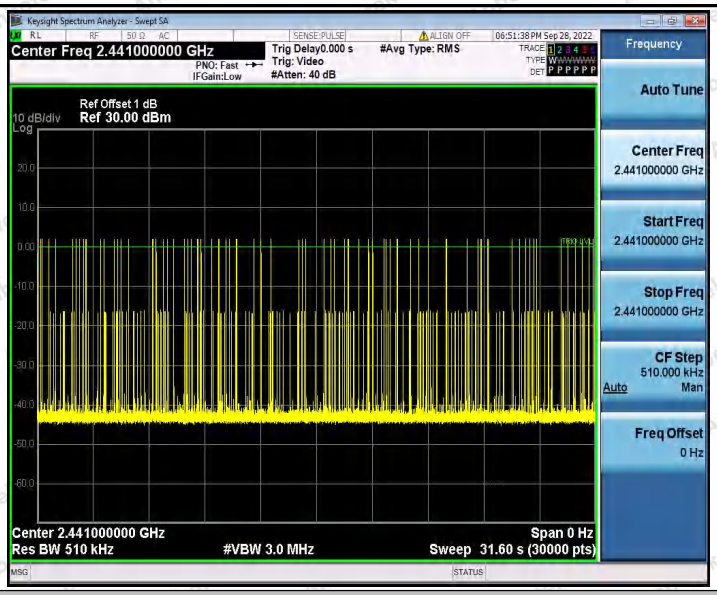
2DH3_Ant1_Hop



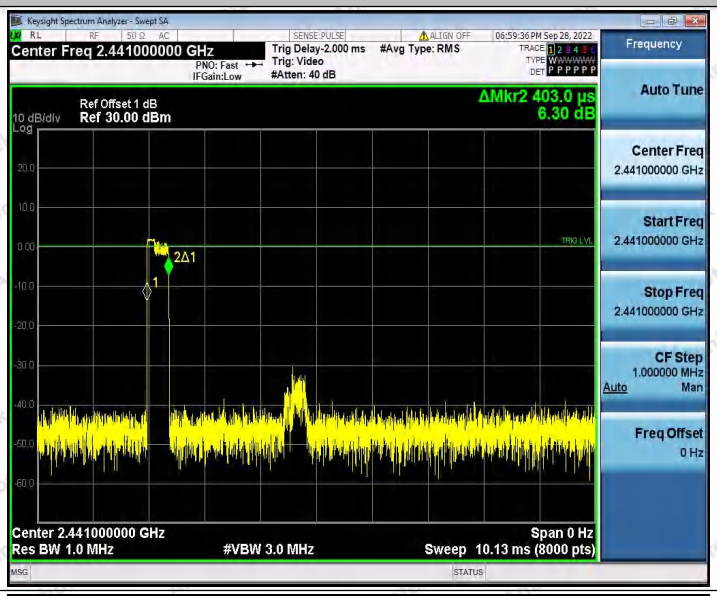


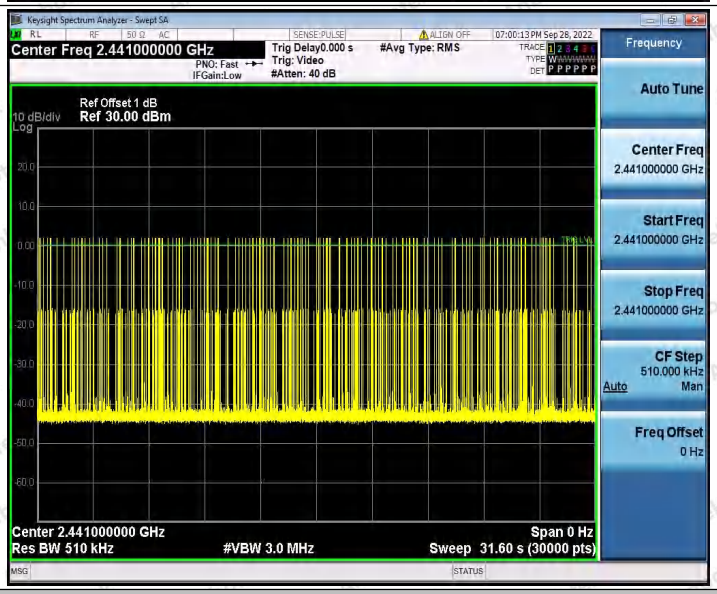
2DH5_Ant1_Hop



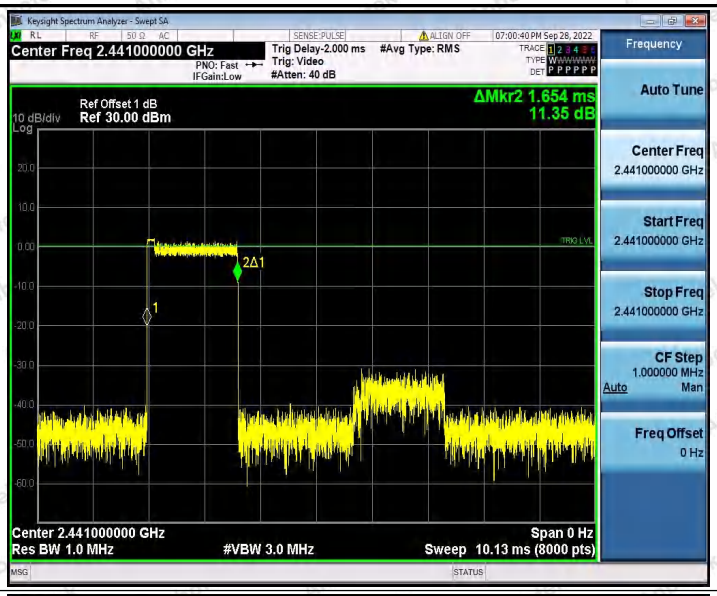


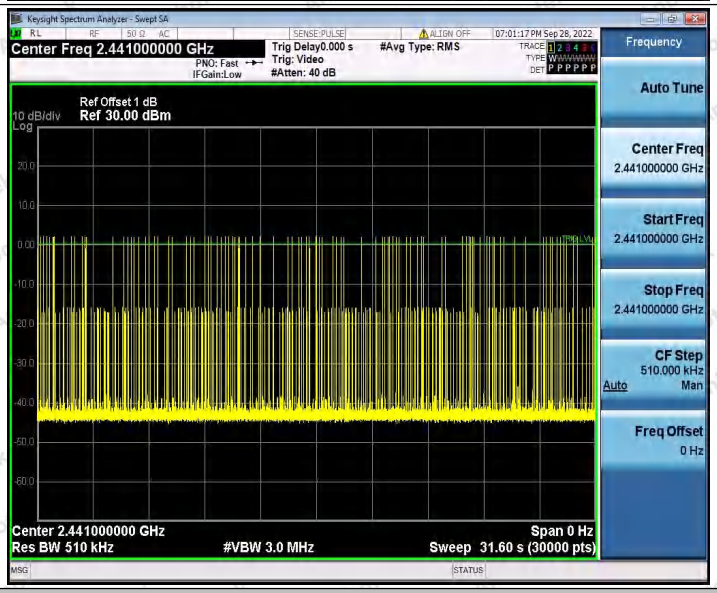
3DH1_Ant1_Hop



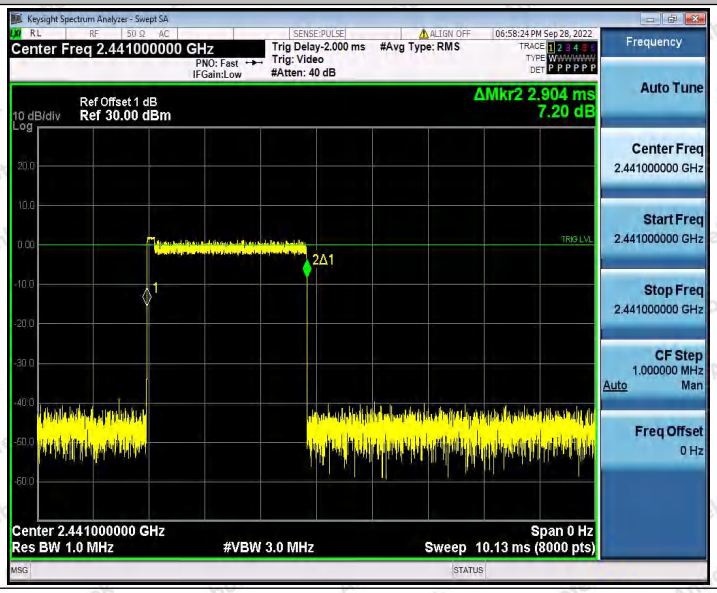


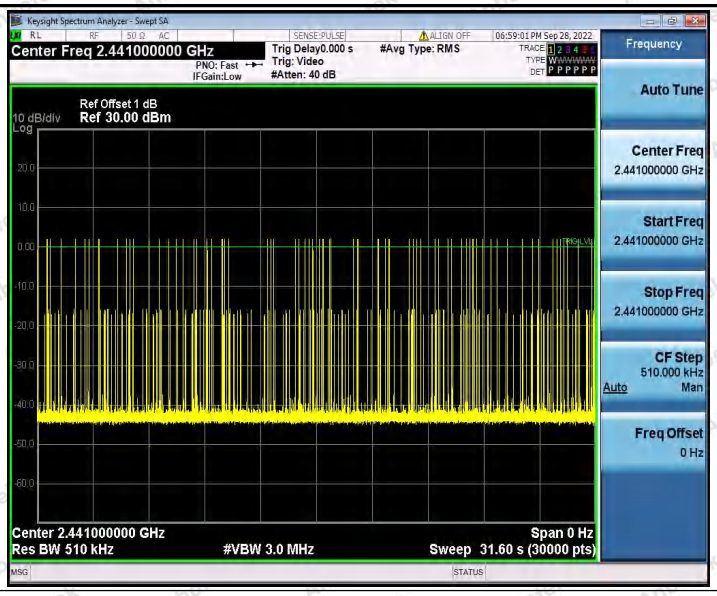
3DH3_Ant1_Hop





3DH5_Ant1_Hop




Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
06:59:01 PM Sep 28, 2022
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
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
Center 2.441000000 GHz
Span 0 Hz
Res BW 510 kHz
#VBW 3.0 MHz
Sweep 31.60 s (30000 pts)

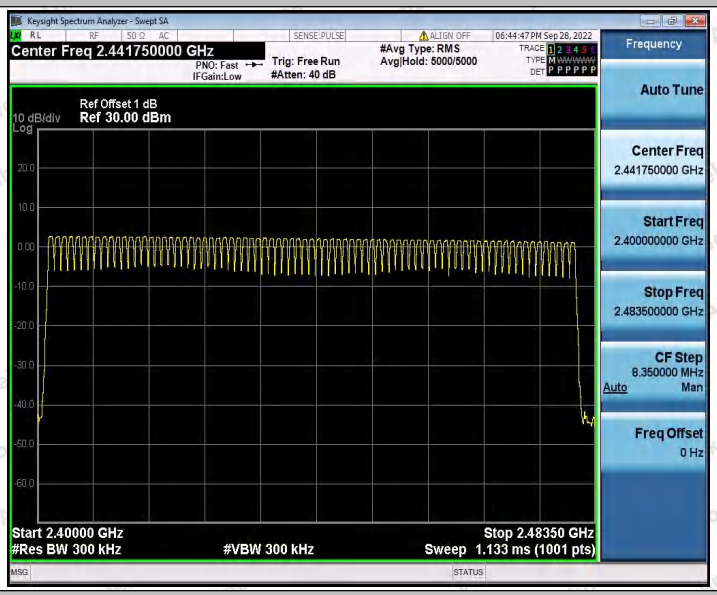
Appendix F: Number of hopping channels

Test Result

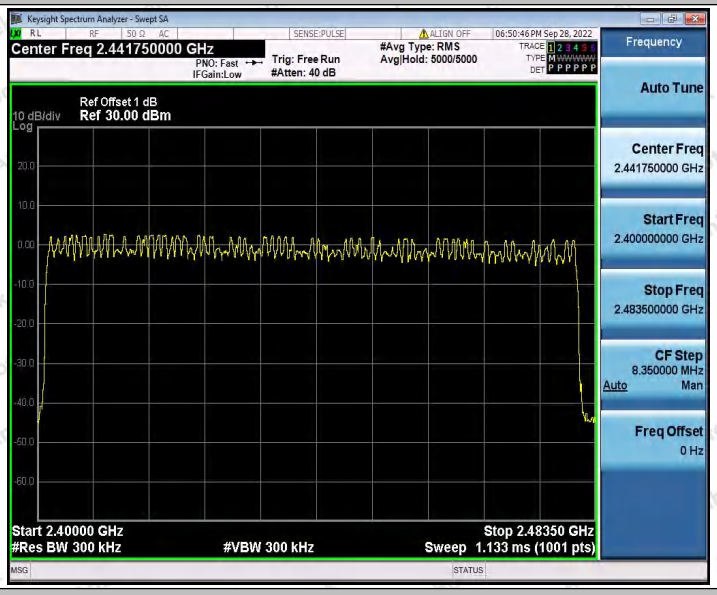
Test Mode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs

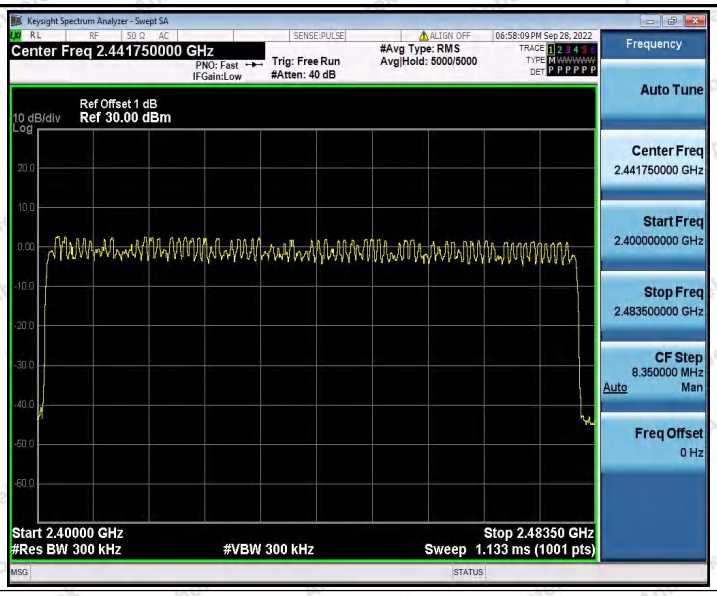
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 5000/5000
06:58:09 PM Sep 28, 2022
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
Start 2.40000 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 1.133 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.441750000 GHz
Start Freq
2.400000000 GHz
Stop Freq
2.483500000 GHz
CF Step
8.350000 MHz
Auto
Man
Freq Offset
0 Hz

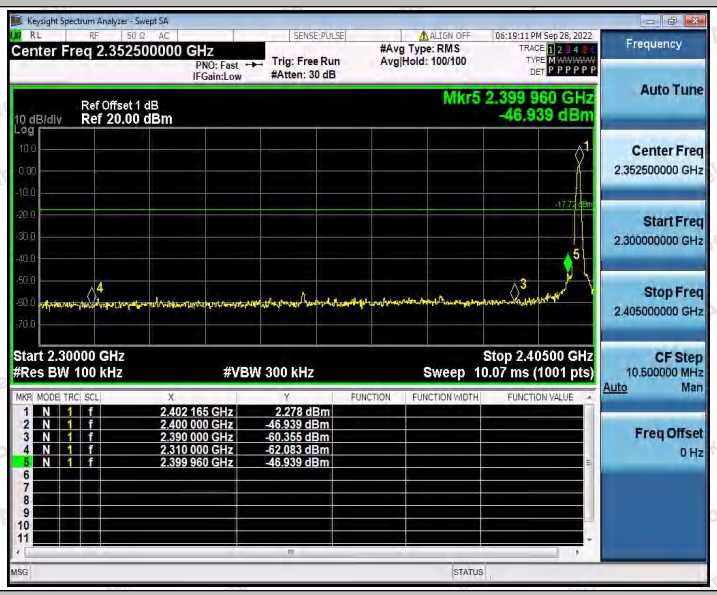
Appendix G: Band edge measurements

Test Result

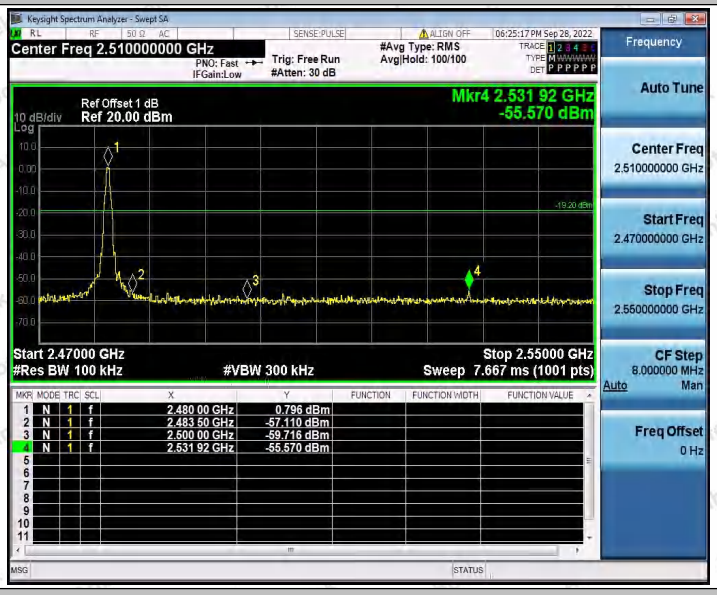
Test Mode	Antenna	Ch Name	Frequency[MHz]	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	2.28	-46.94	≤-17.72	PASS
		High	2480	0.80	-55.57	≤-19.2	PASS
		Low	Hop_2402	2.03	-56.1	≤-17.97	PASS
		High	Hop_2480	0.44	-56.02	≤-19.56	PASS
2DH5	Ant1	Low	2402	2.07	-50.79	≤-17.93	PASS
		High	2480	-3.66	-56.83	≤-23.66	PASS
		Low	Hop_2402	-4.39	-54.91	≤-24.39	PASS
		High	Hop_2480	0.95	-56.26	≤-19.05	PASS
3DH5	Ant1	Low	2402	2.11	-51.17	≤-17.89	PASS
		High	2480	0.66	-55.3	≤-19.34	PASS
		Low	Hop_2402	1.48	-54.41	≤-18.52	PASS
		High	Hop_2480	0.02	-56.93	≤-19.98	PASS

Test Graphs

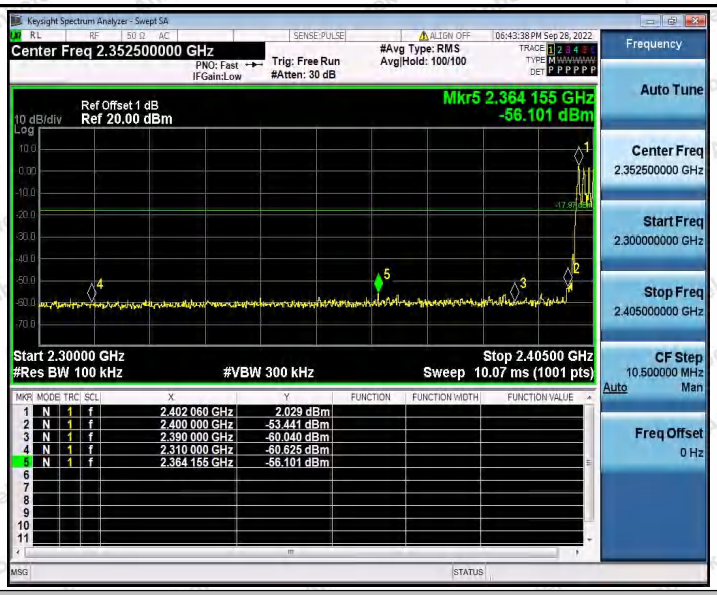
DH5_Ant1_Low_2402



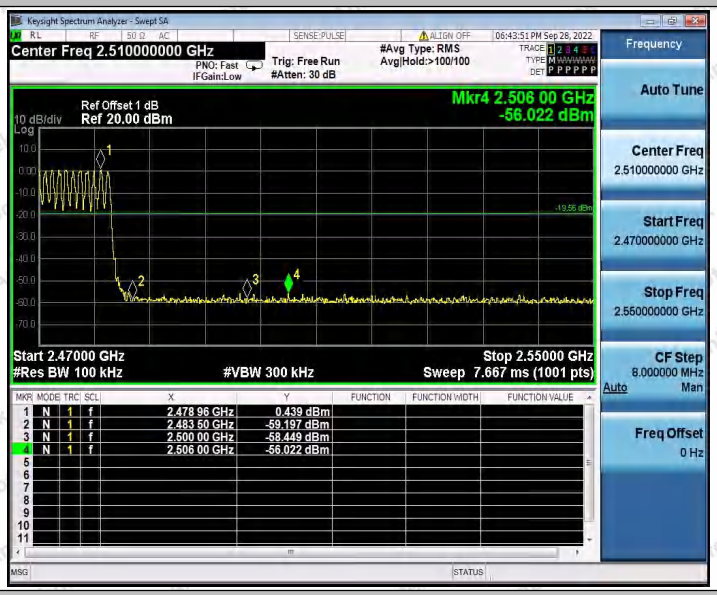
DH5_Ant1_High_2480



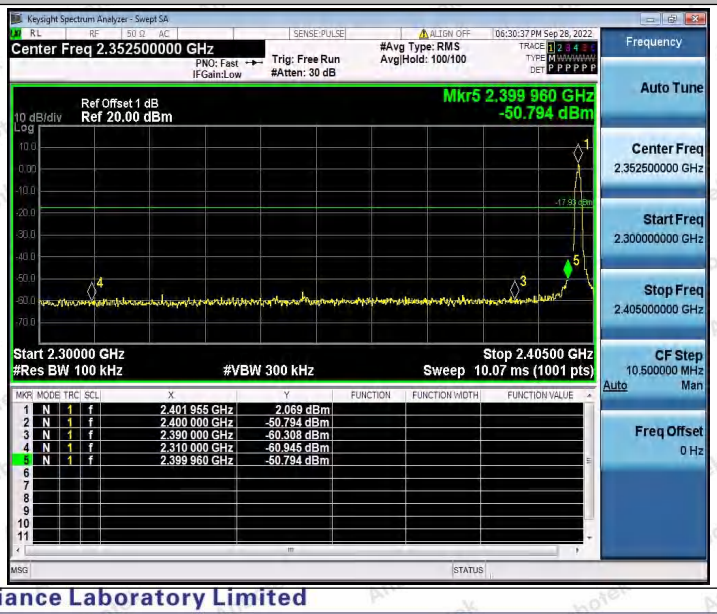
DH5_Ant1_Low_Hop_2402



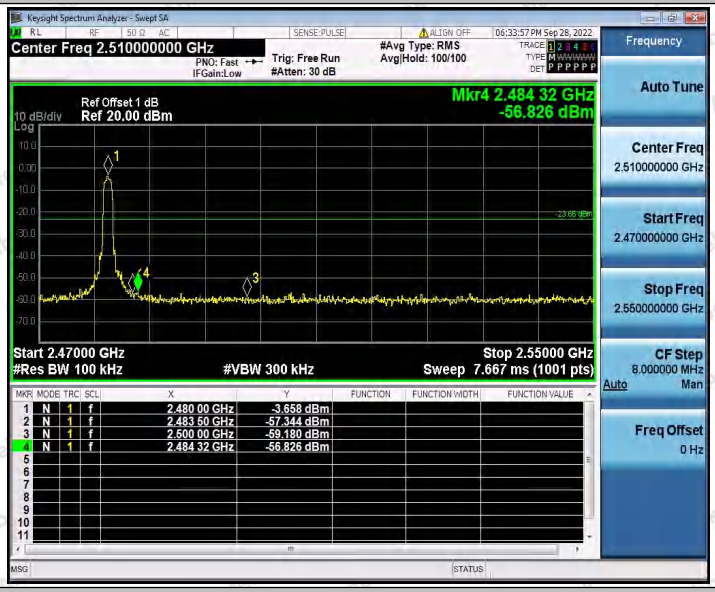
DH5_Ant1_High_Hop_2480



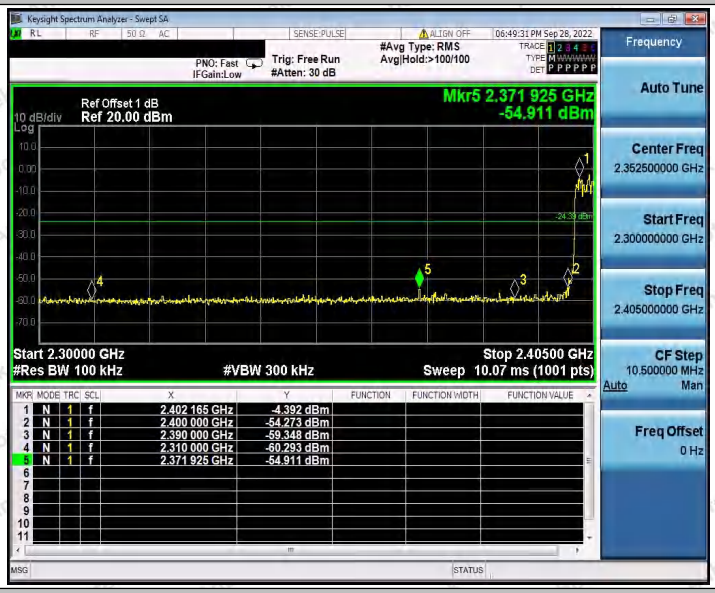
2DH5_Ant1_Low_2402



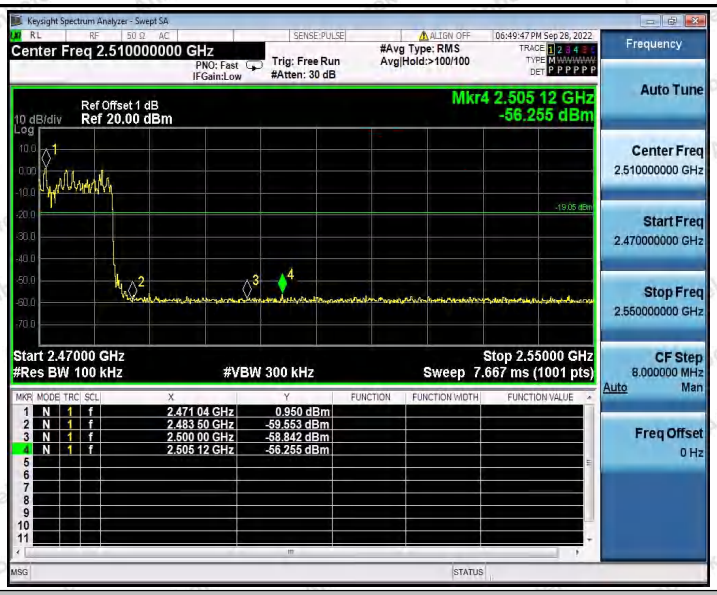
2DH5_Ant1_High_2480



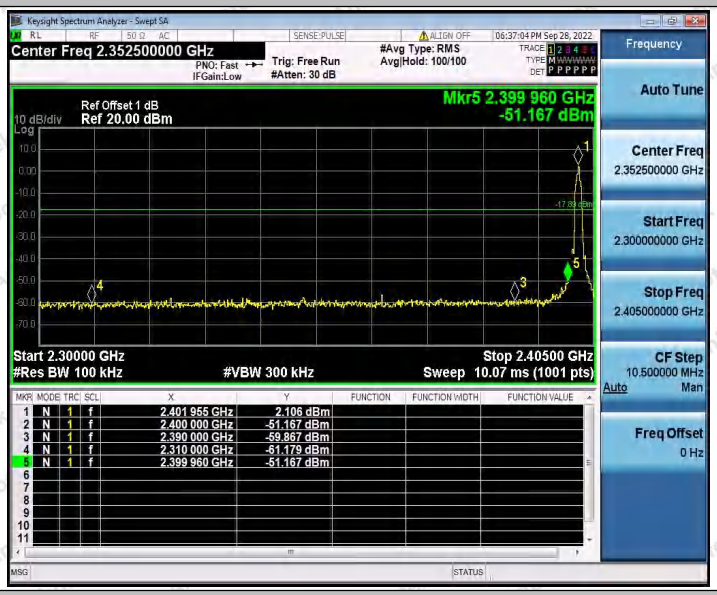
2DH5_Ant1_Low_Hop_2402



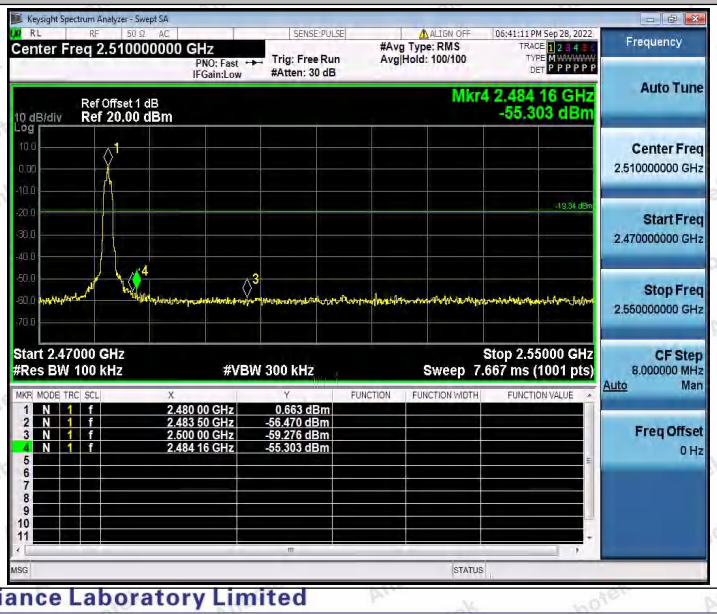
2DH5_Ant1_High_Hop_2480



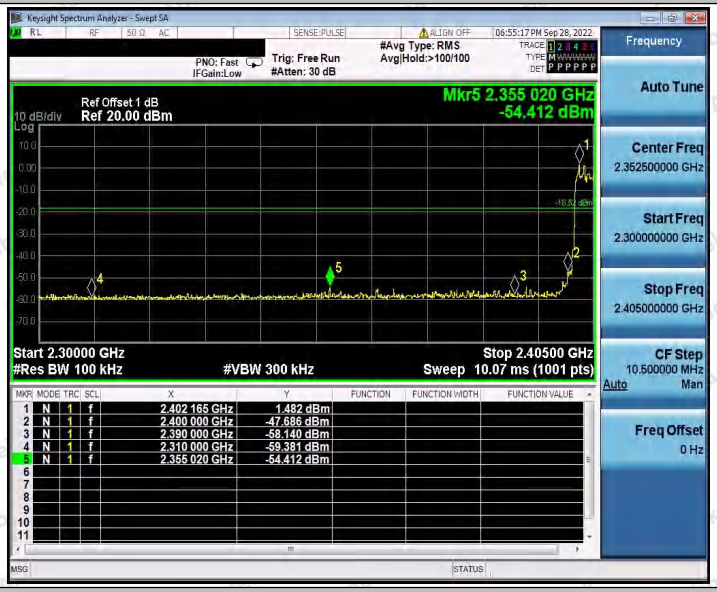
3DH5_Ant1_Low_2402



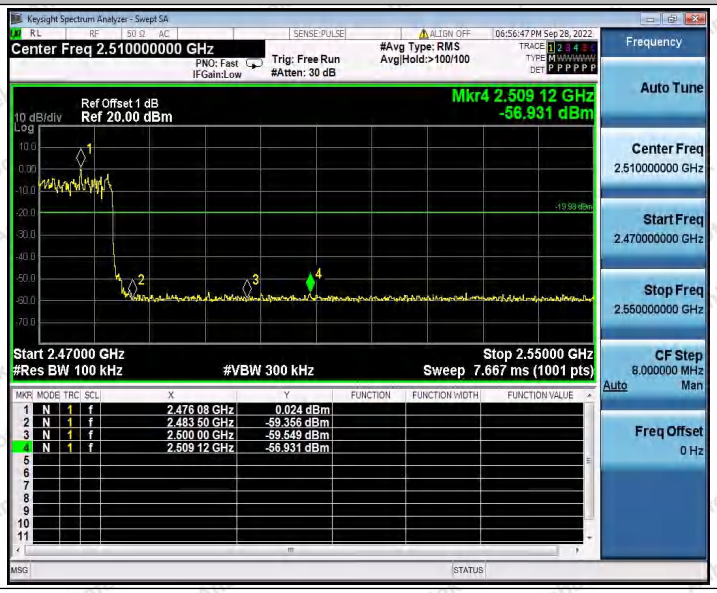
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

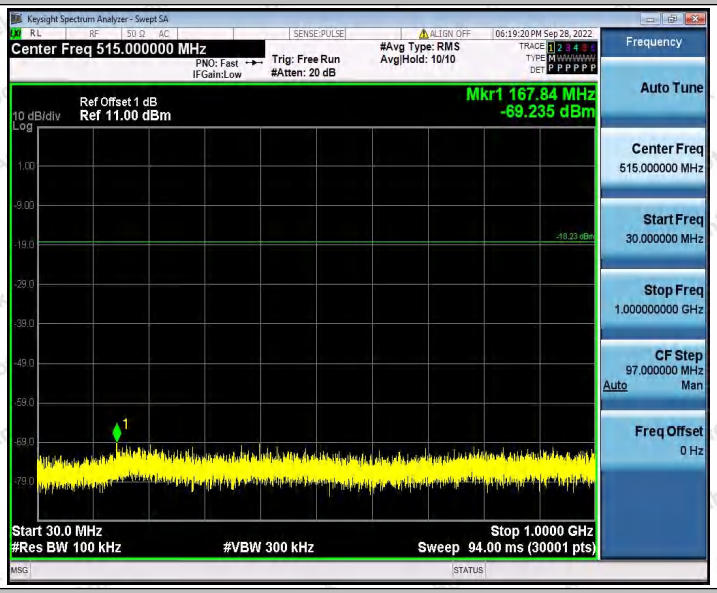
Test Result

Test Mode	Antenna	Frequency[MHz]	Freq Range [MHz]	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	1.77	1.77	---	PASS
			30~1000	1.77	-69.24	≤-18.23	PASS
			1000~26500	1.77	-46.36	≤-18.23	PASS
		2441	Reference	1.04	1.04	---	PASS
			30~1000	1.04	-68.26	≤-18.96	PASS
			1000~26500	1.04	-45.97	≤-18.96	PASS
		2480	Reference	0.26	0.26	---	PASS
			30~1000	0.26	-68.51	≤-19.74	PASS
			1000~26500	0.26	-45.13	≤-19.74	PASS
2DH5	Ant1	2402	Reference	0.54	0.54	---	PASS
			30~1000	0.54	-69.62	≤-19.46	PASS
			1000~26500	0.54	-52.75	≤-19.46	PASS
		2441	Reference	1.61	1.61	---	PASS
			30~1000	1.61	-69.51	≤-18.39	PASS
			1000~26500	1.61	-46.42	≤-18.39	PASS
		2480	Reference	-5.41	-5.41	---	PASS
			30~1000	-5.41	-68.78	≤-25.41	PASS
			1000~26500	-5.41	-50.93	≤-25.41	PASS
3DH5	Ant1	2402	Reference	2.29	2.29	---	PASS
			30~1000	2.29	-69.02	≤-17.71	PASS
			1000~26500	2.29	-51.69	≤-17.71	PASS
		2441	Reference	-0.83	-0.83	---	PASS
			30~1000	-0.83	-69.45	≤-20.83	PASS
			1000~26500	-0.83	-46.17	≤-20.83	PASS
		2480	Reference	0.80	0.80	---	PASS
			30~1000	0.80	-69.9	≤-19.2	PASS
			1000~26500	0.80	-47.35	≤-19.2	PASS

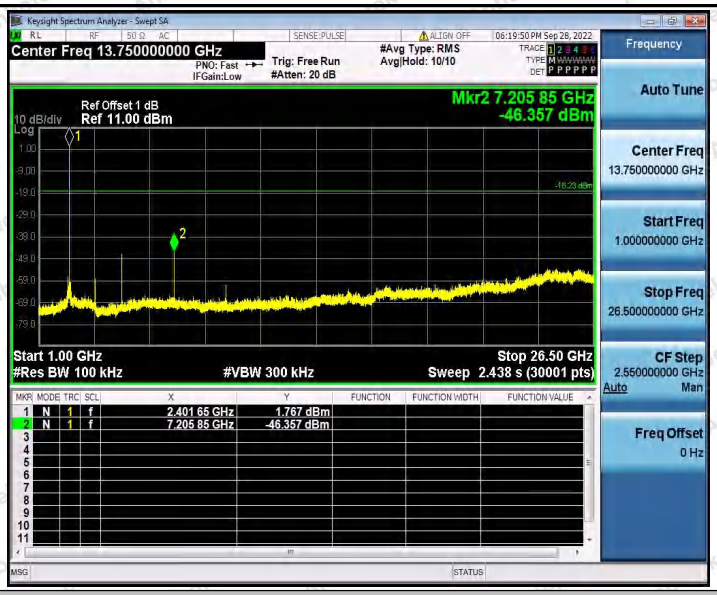
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

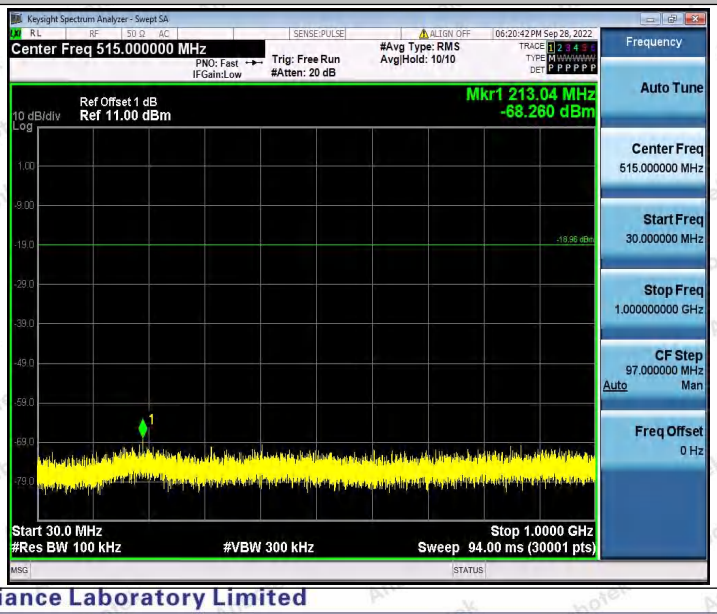


DH5_Ant1_2402_1000~26500

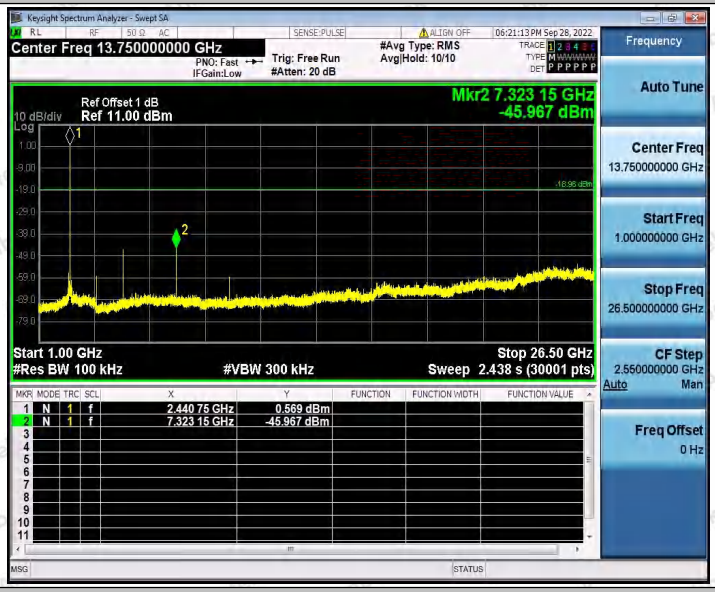


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

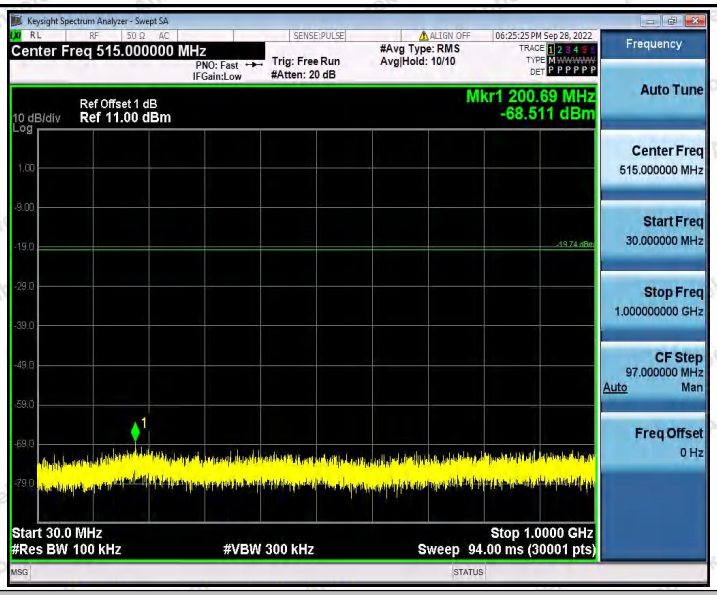


DH5_Ant1_2441_1000~26500

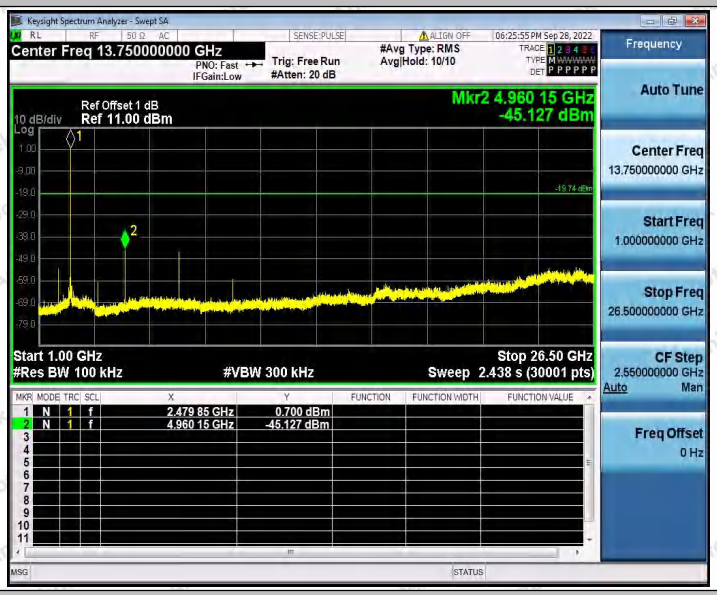


DH5_Ant1_2480_0~Reference

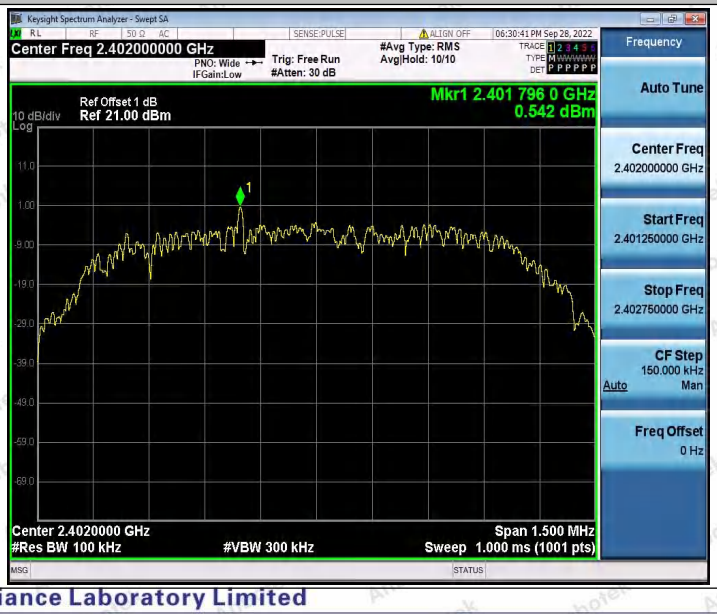
DH5_Ant1_2480_30~1000



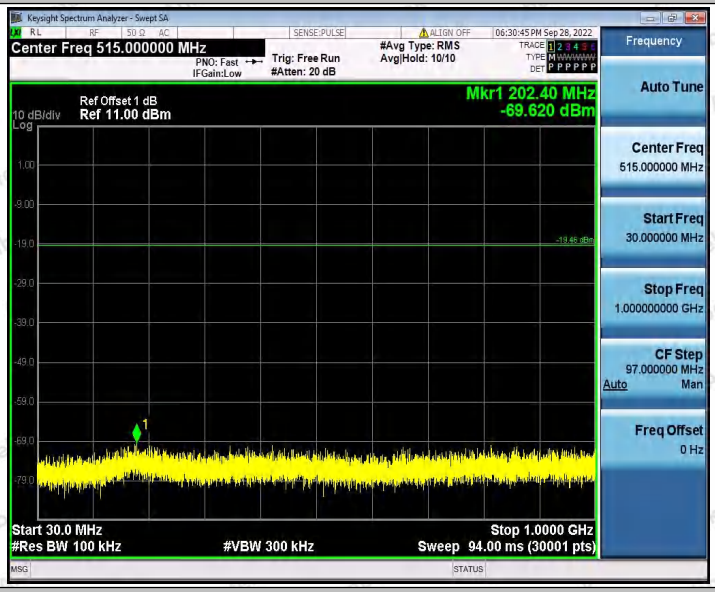
DH5_Ant1_2480_1000~26500



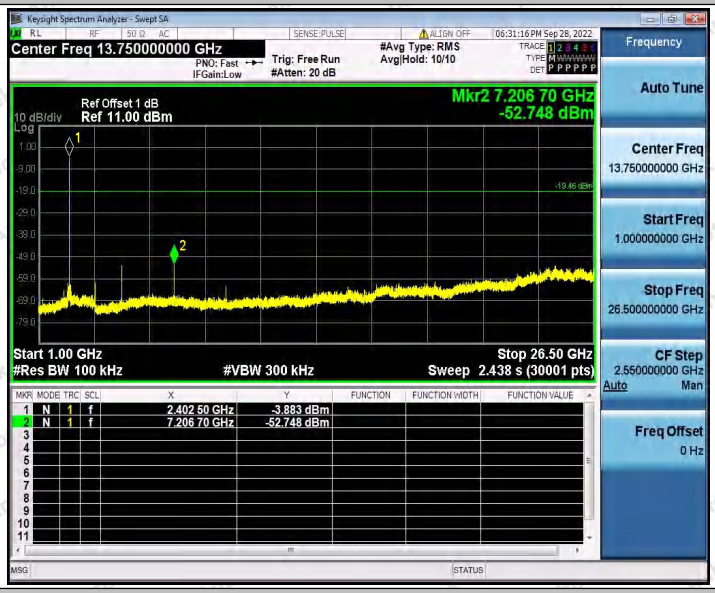
2DH5_Ant1_2402_0~Reference



2DH5_Ant1_2402_30~1000

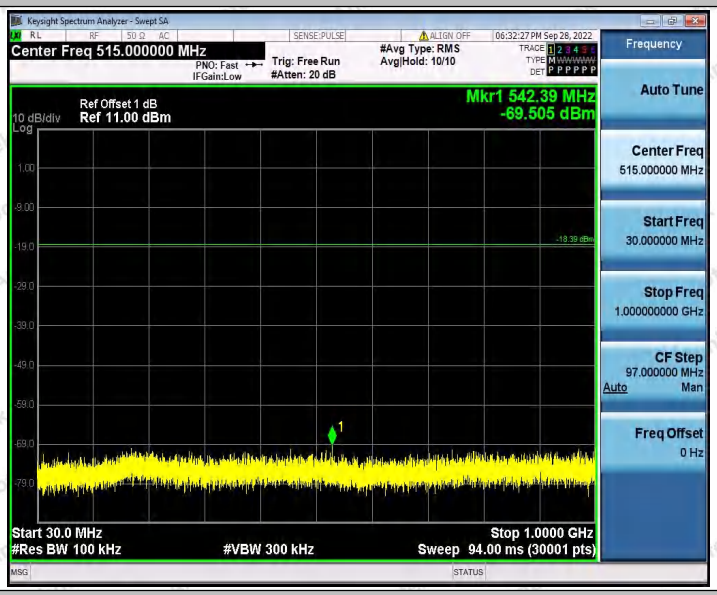


2DH5_Ant1_2402_1000~26500

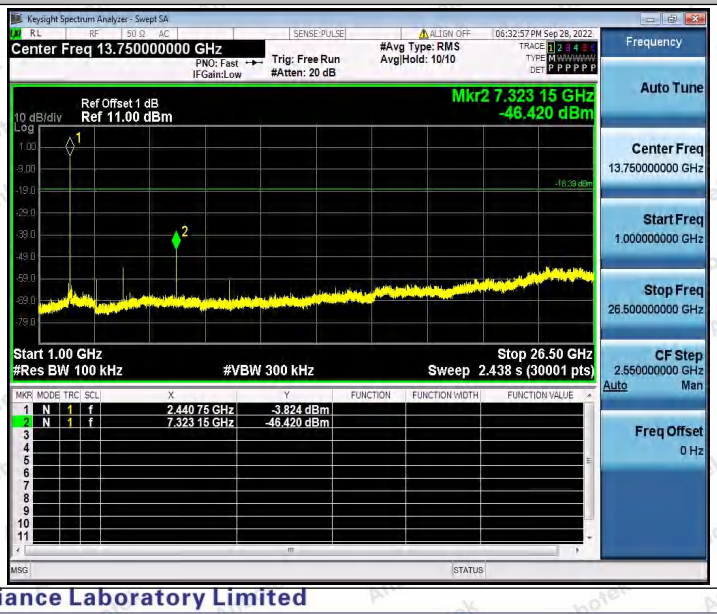


2DH5_Ant1_2441_0~Reference

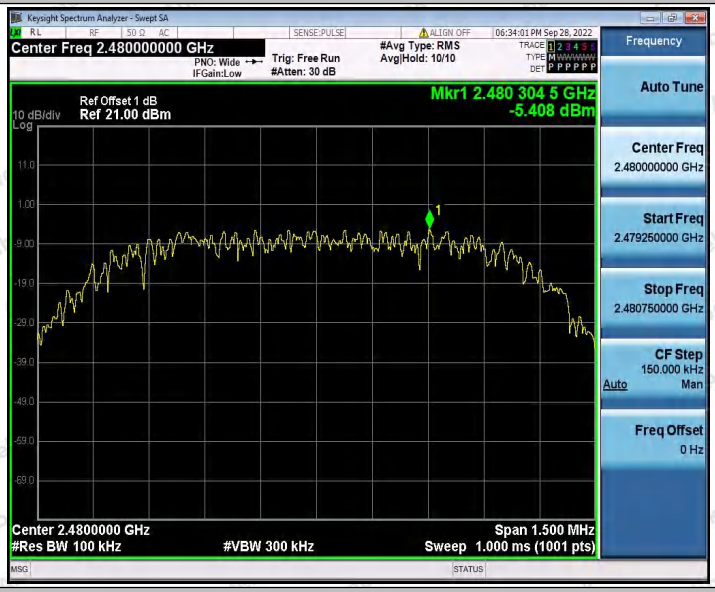
2DH5_Ant1_2441_30~1000



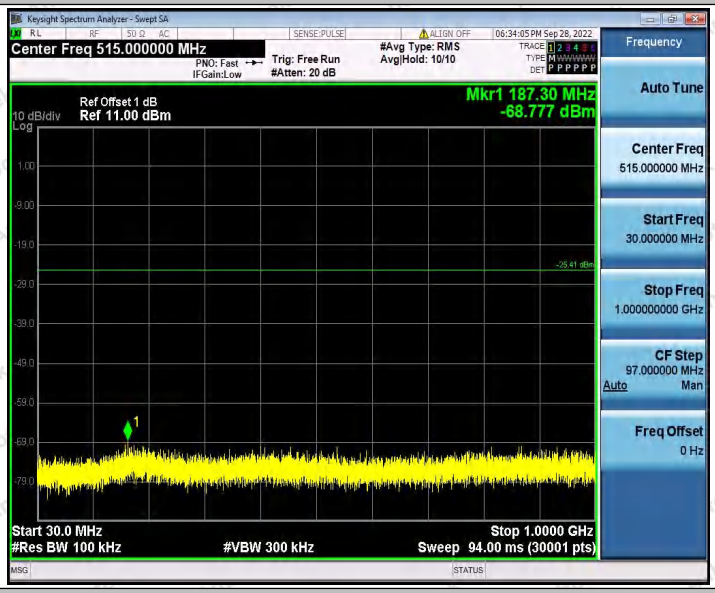
2DH5_Ant1_2441_1000~26500



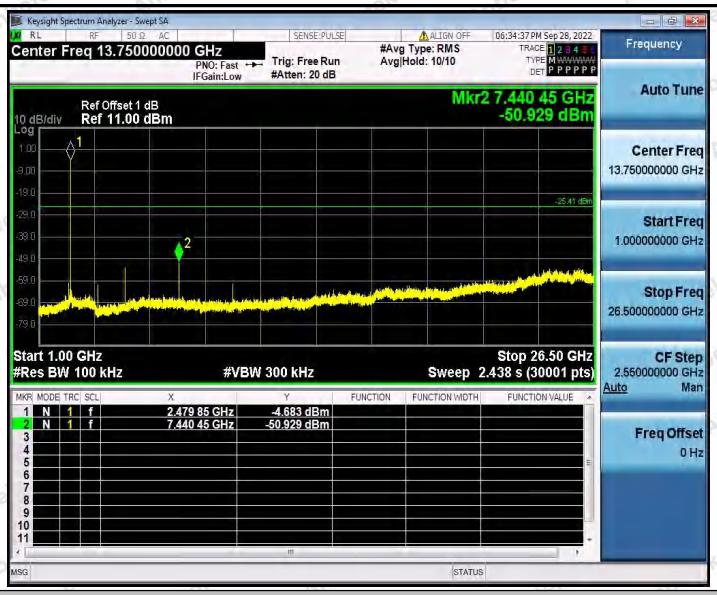
2DH5_Ant1_2480_0~Reference



2DH5_Ant1_2480_30~1000

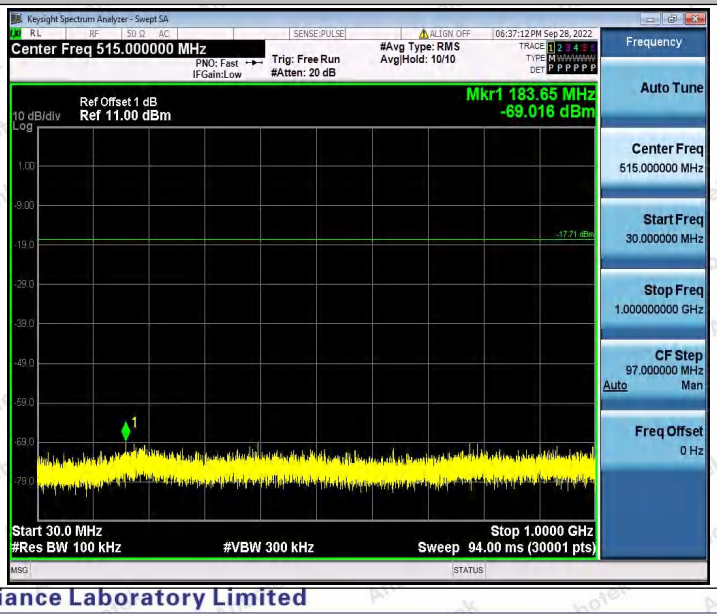


2DH5_Ant1_2480_1000~26500

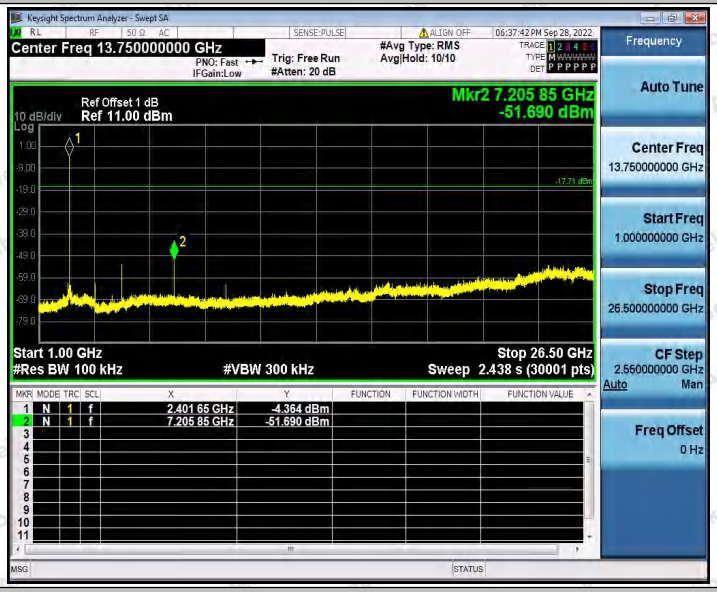


3DH5_Ant1_2402_0~Reference

3DH5_Ant1_2402_30~1000

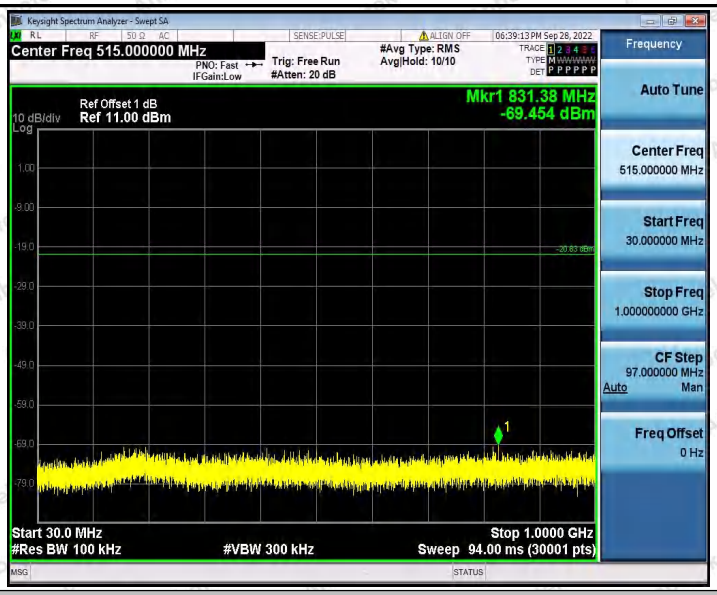


3DH5_Ant1_2402_1000~26500

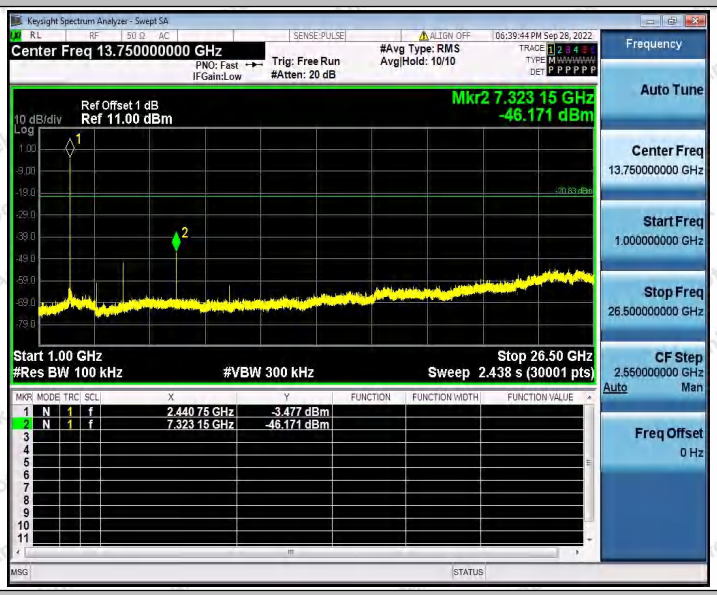


3DH5_Ant1_2441_0~Reference

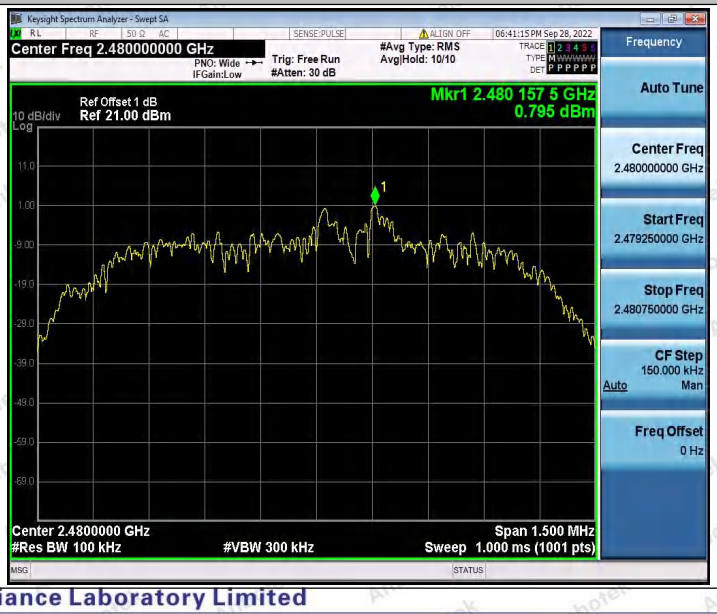
3DH5_Ant1_2441_30~1000



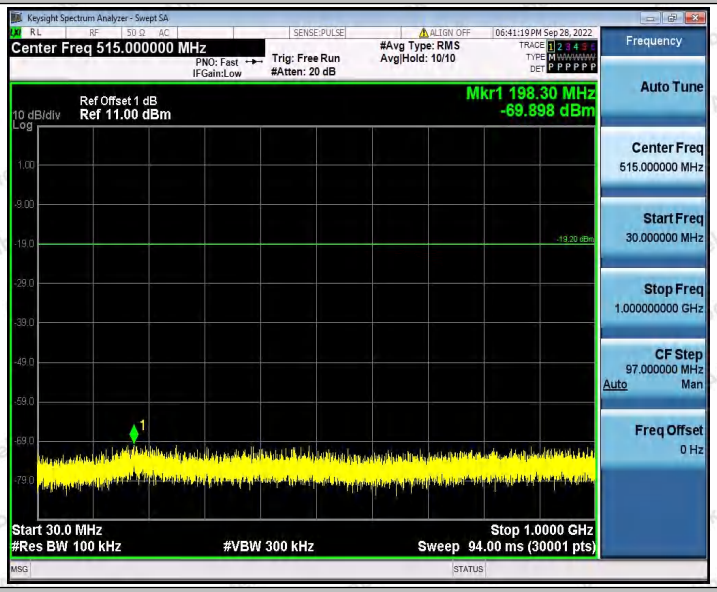
3DH5_Ant1_2441_1000~26500



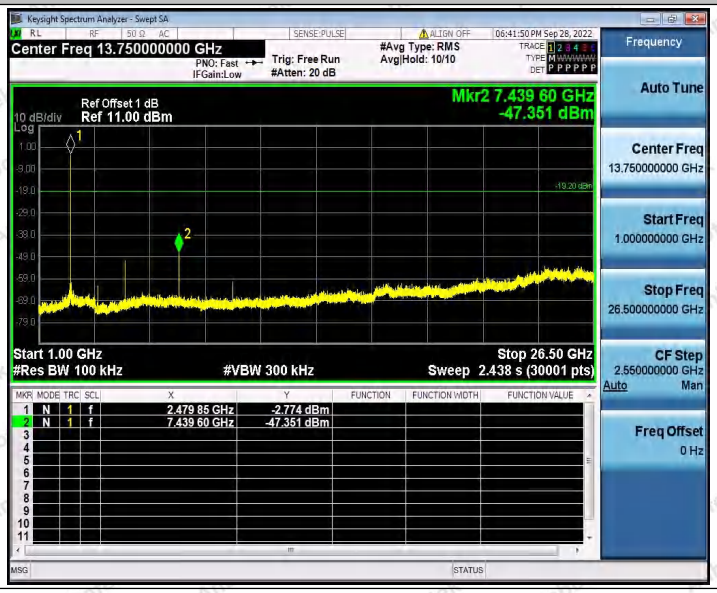
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



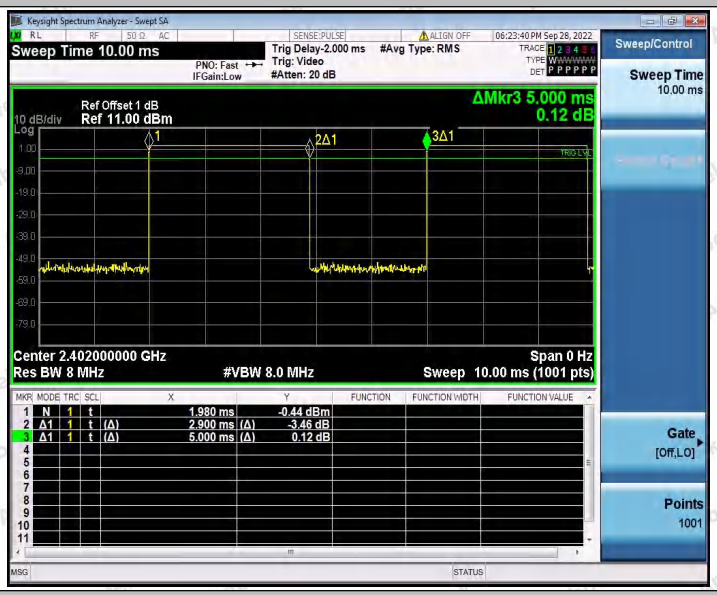
Appendix I: Duty Cycle

Test Result

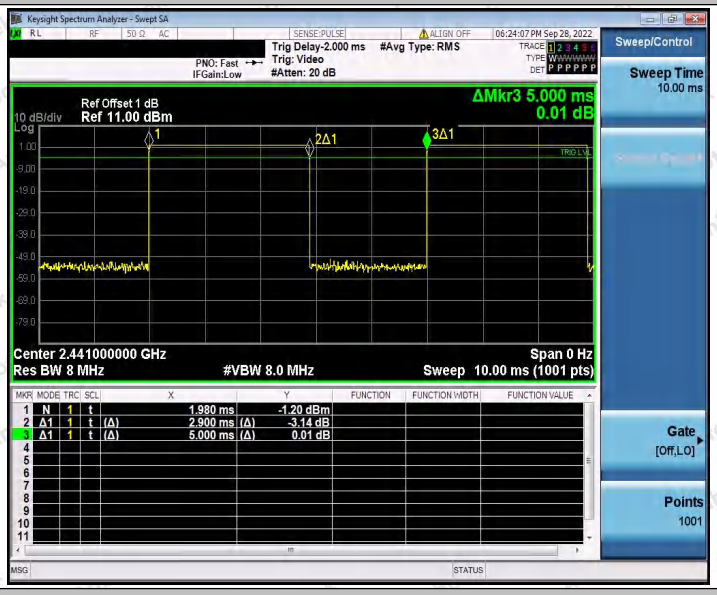
Test Mode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
DH5	Ant1	2402	2.90	5.00	58.00	2.37
		2441	2.90	5.00	58.00	2.37
		2480	2.90	5.00	58.00	2.37
2DH5	Ant1	2402	2.91	5.00	58.20	2.35
		2441	2.90	5.00	58.00	2.37
		2480	2.90	5.00	58.00	2.37
3DH5	Ant1	2402	2.91	5.00	58.20	2.35
		2441	2.90	5.00	58.00	2.37
		2480	2.90	5.00	58.00	2.37

Test Graphs

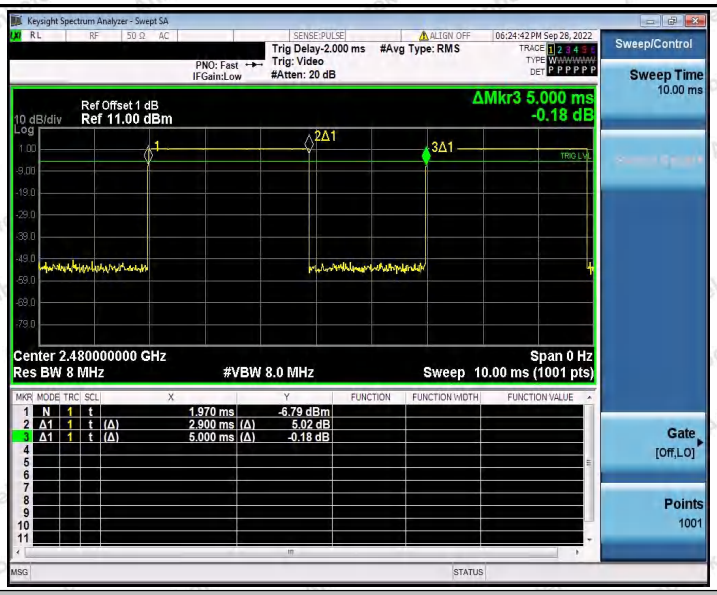
DH5_Ant1_2402



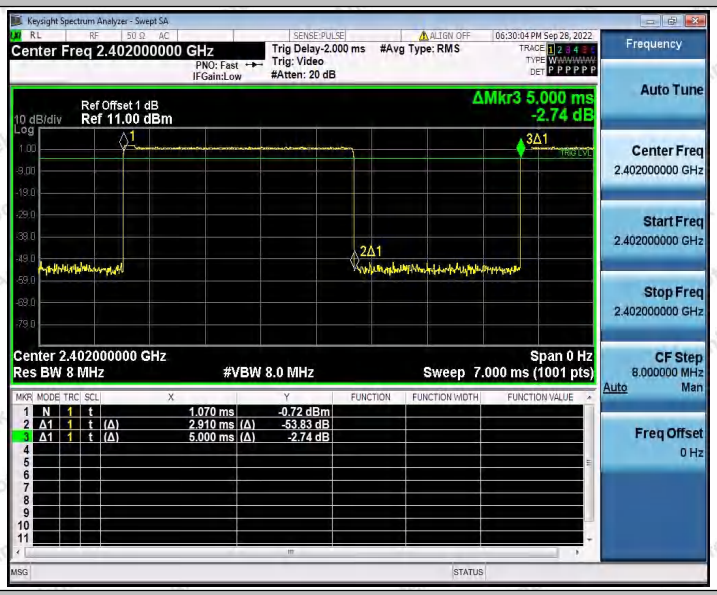
DH5_Ant1_2441



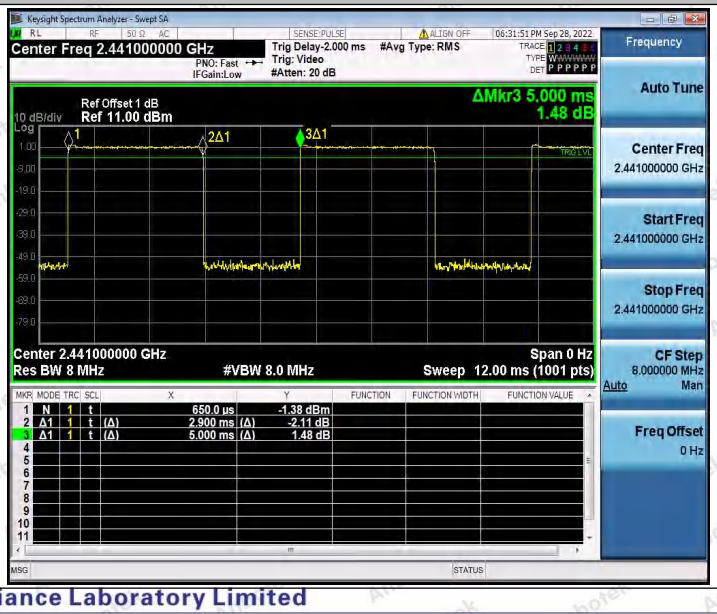
DH5_Ant1_2480



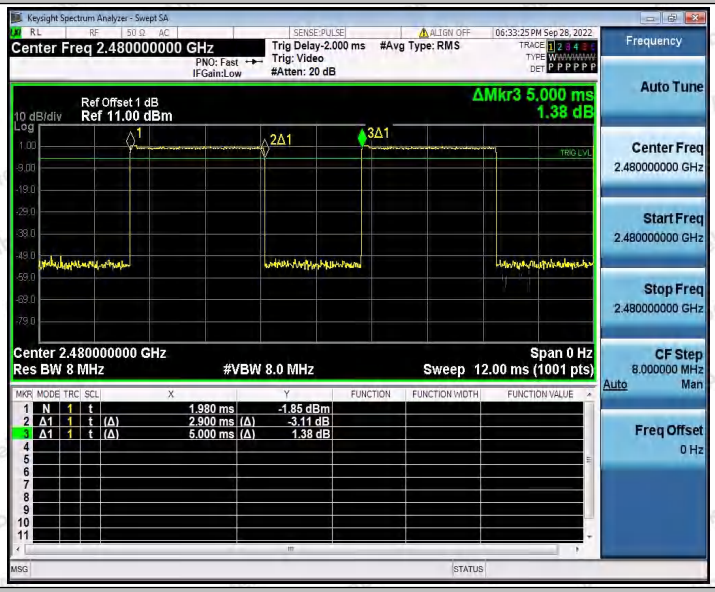
2DH5_Ant1_2402



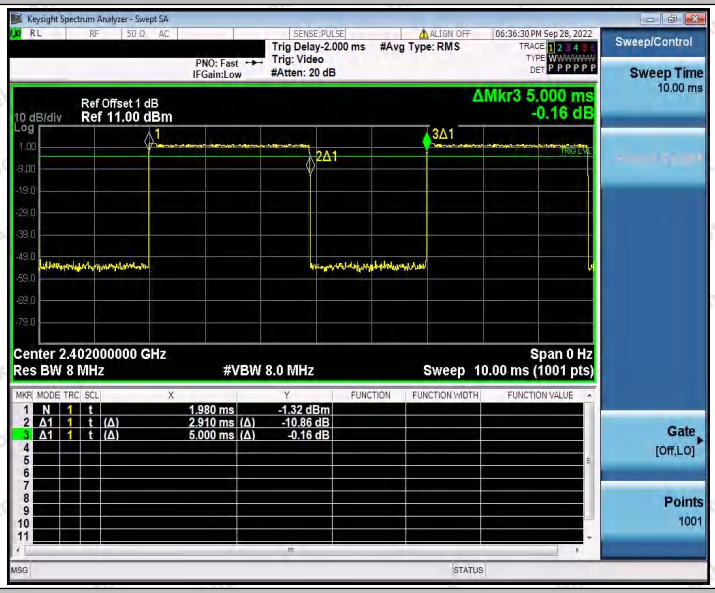
2DH5_Ant1_2441



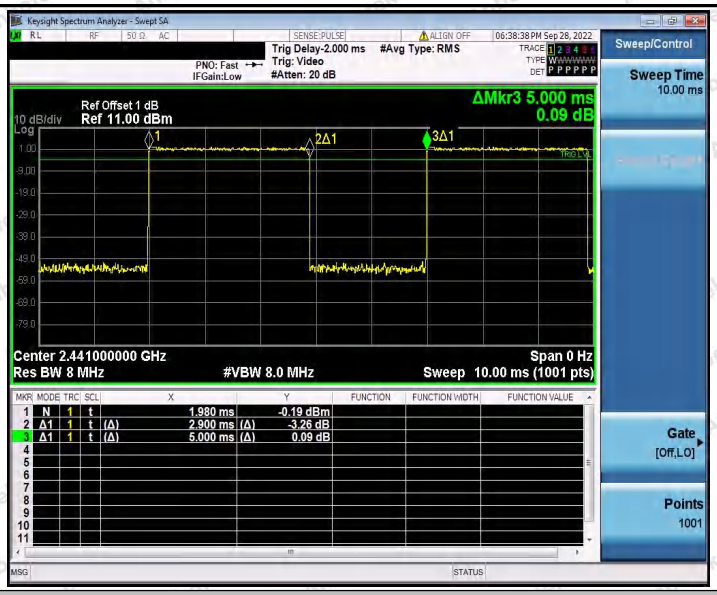
2DH5_Ant1_2480



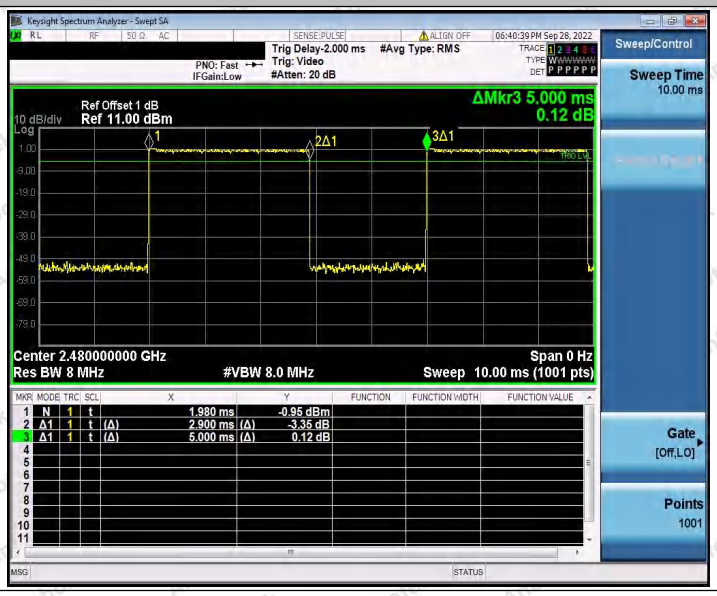
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



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