Appendix Test Data

Report No.:	18220WC30033401	Test Sample No.:	1-2-2
Start Test Date:	2023.03.04	Finish Test Date:	2023.03.08
Test Engineer:	Tony.He	Auditor:	Edward.Pan
Temperature:	23.8℃	Relative Humidity:	42%
Pressure:	1012 hPa		

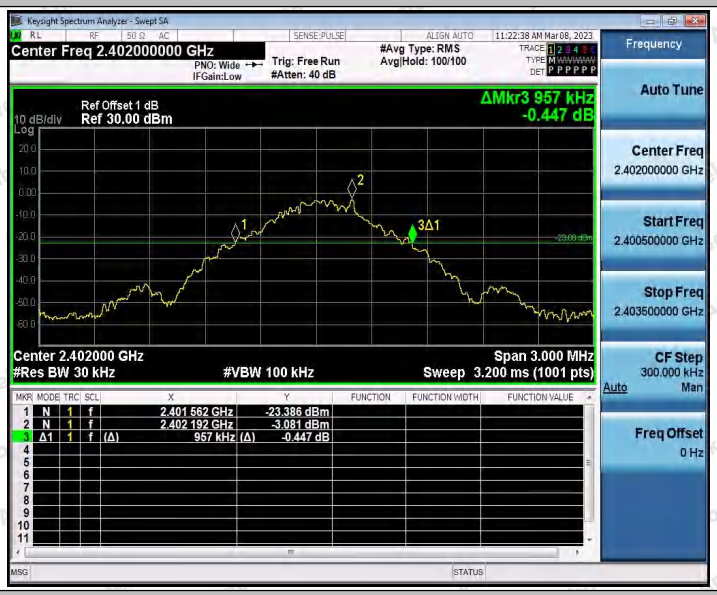
Appendix A: 20dB Emission Bandwidth

Test Result

Test Mode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]
DH5	Ant1	2402	0.957	2401.562	2402.519
		2441	0.963	2440.559	2441.522
		2480	0.963	2479.556	2480.519
2DH5	Ant1	2402	1.326	2401.364	2402.690
		2441	1.335	2440.361	2441.696
		2480	1.356	2479.349	2480.705
3DH5	Ant1	2402	1.314	2401.373	2402.687
		2441	1.350	2440.352	2441.702
		2480	1.311	2479.376	2480.687

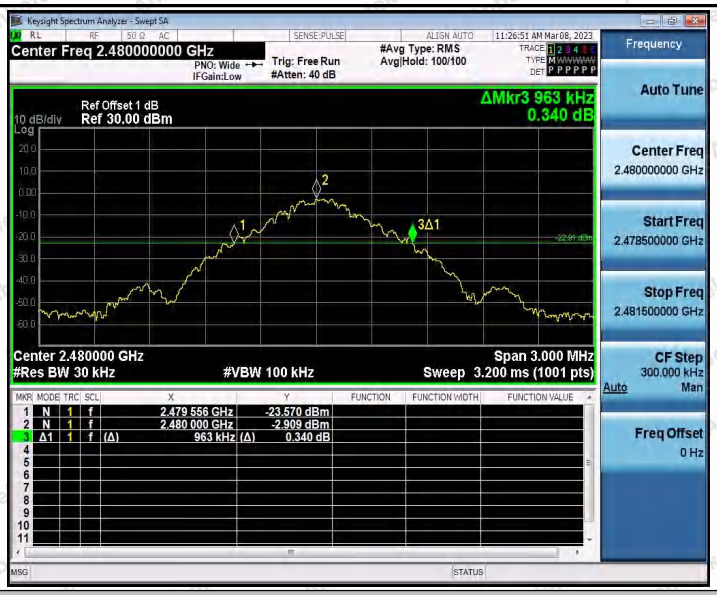
Test Graphs

DH5_Ant1_2402

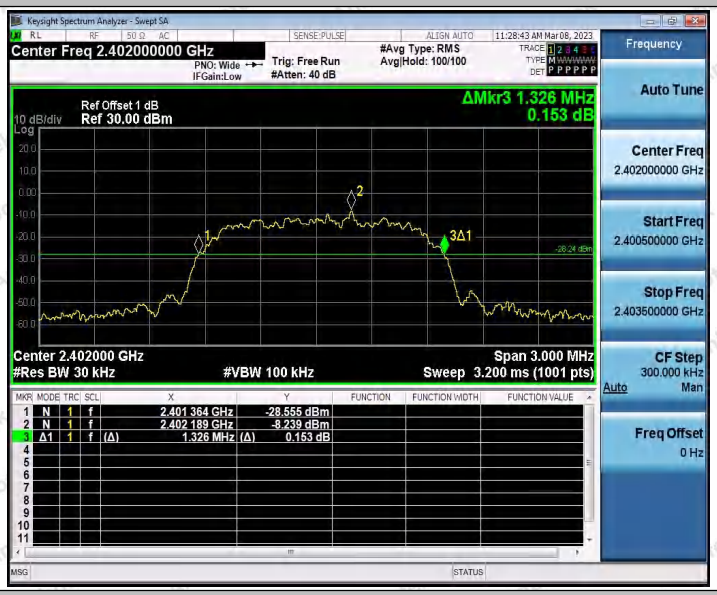


DH5_Ant1_2441

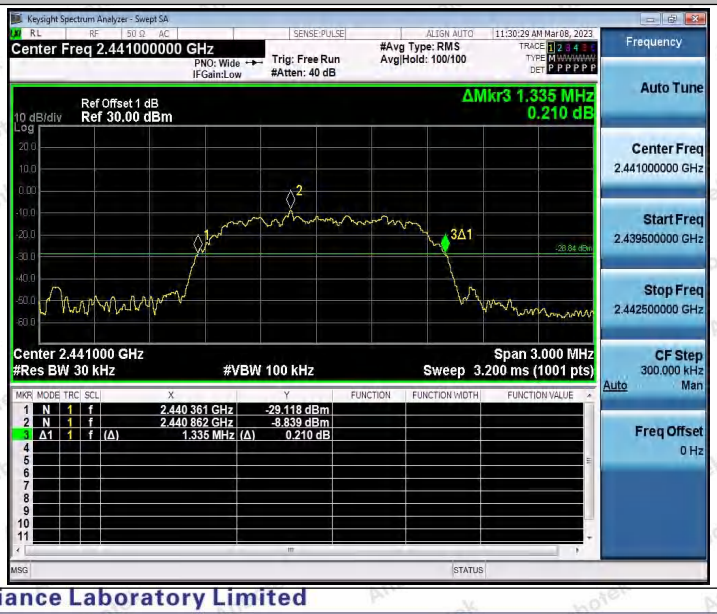
DH5_Ant1_2480



2DH5_Ant1_2402



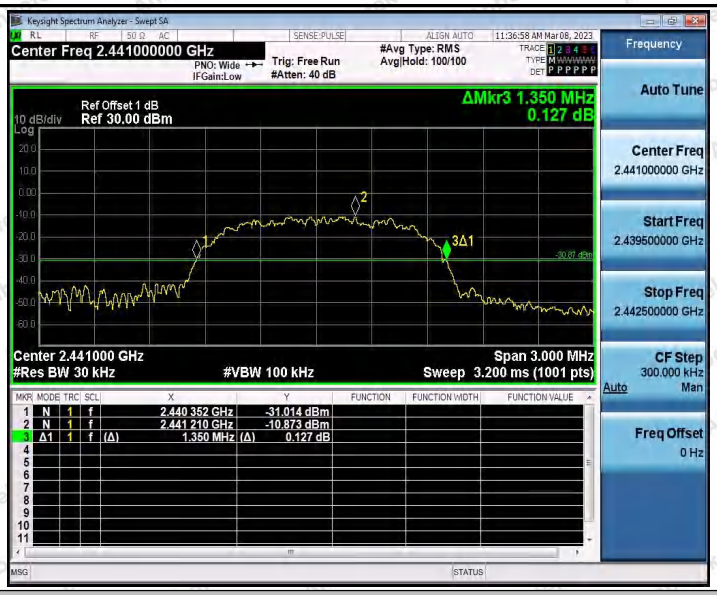
2DH5_Ant1_2441



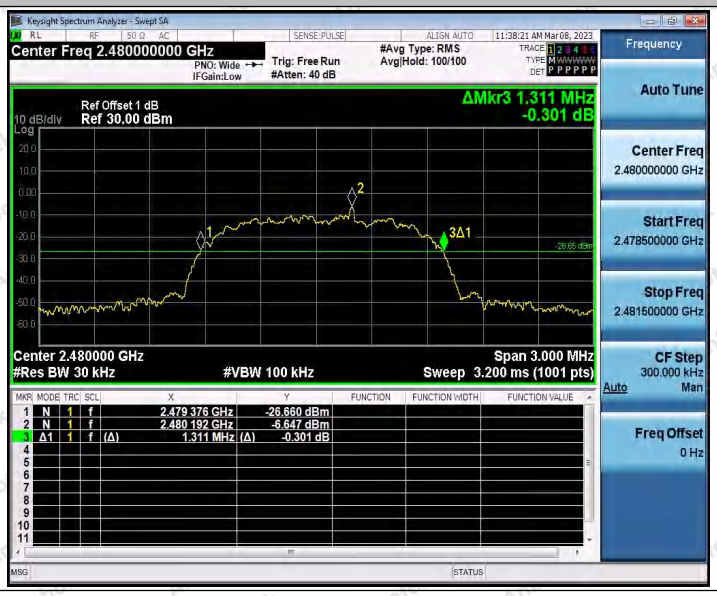
2DH5_Ant1_2480

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	0.88436	2401.5870	2402.4714
		2441	0.89224	2440.5847	2441.4770
		2480	0.86030	2479.5915	2480.4518
2DH5	Ant1	2402	1.19940	2401.4268	2402.6262
		2441	1.19750	2440.4286	2441.6261
		2480	1.19870	2479.4315	2480.6302
3DH5	Ant1	2402	1.19730	2401.4304	2402.6277
		2441	1.21350	2440.4165	2441.6300
		2480	1.19710	2479.4287	2480.6258

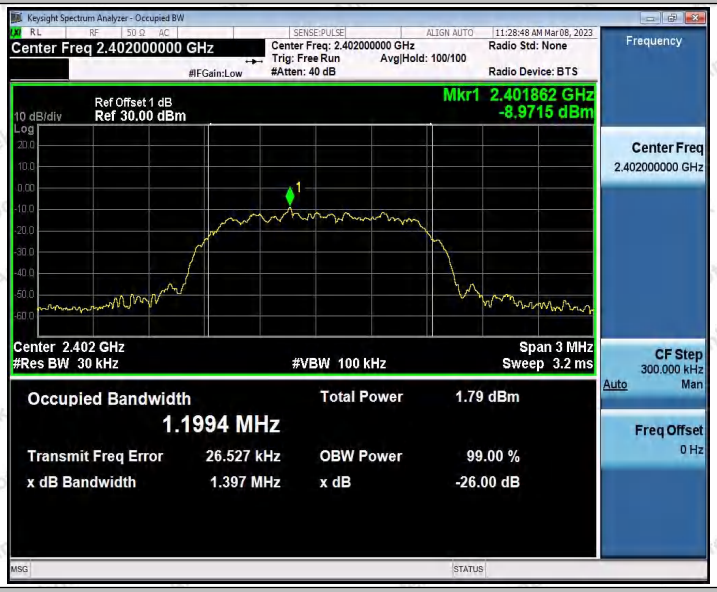
Test Graphs

DH5_Ant1_2402

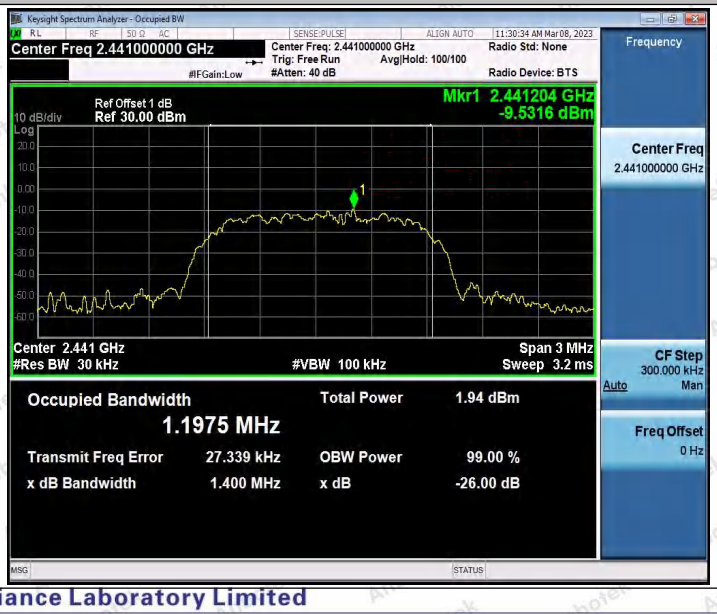
DH5_Ant1_2441

DH5_Ant1_2480

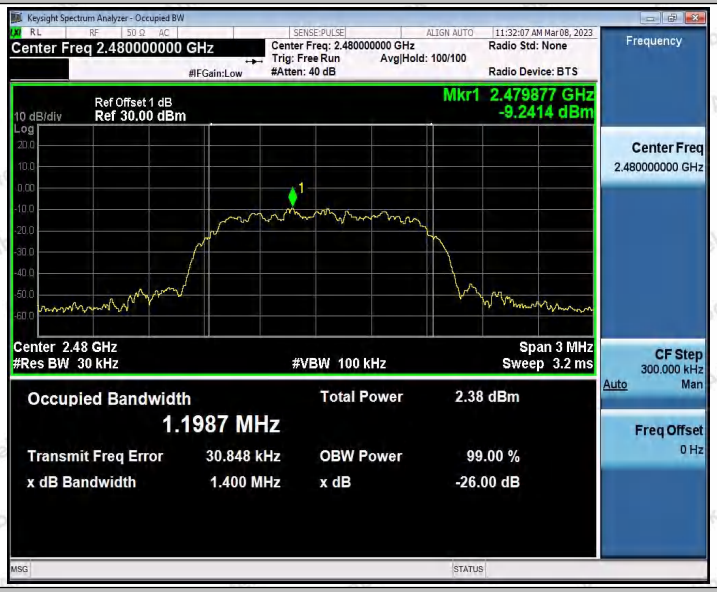
2DH5_Ant1_2402



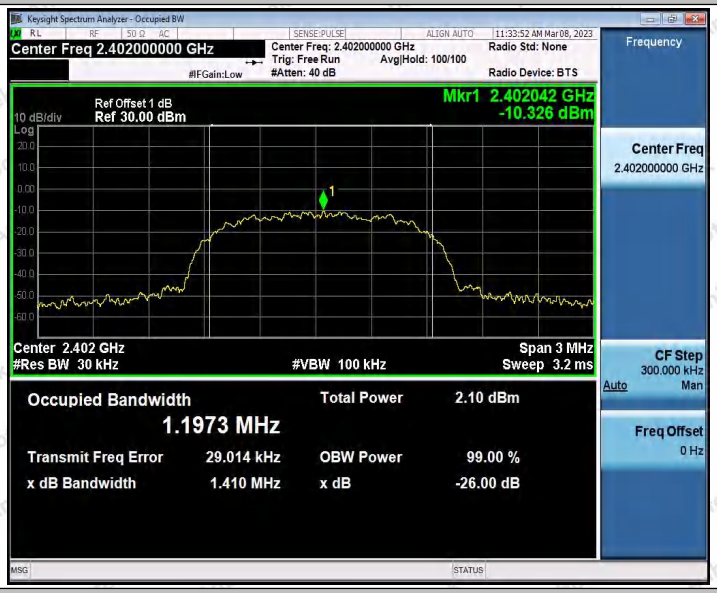
2DH5_Ant1_2441



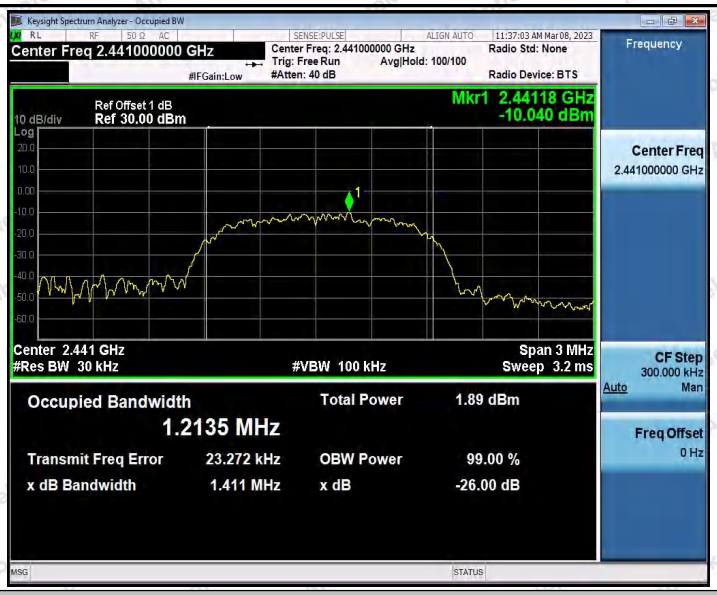
2DH5_Ant1_2480



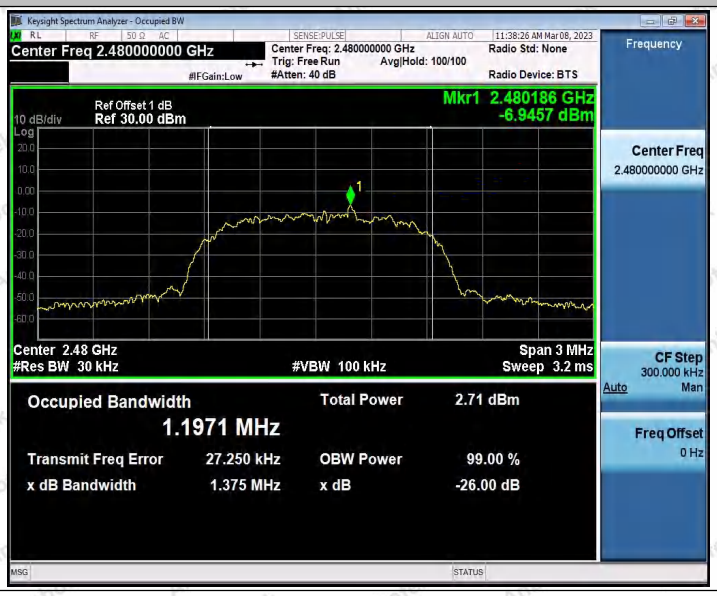
3DH5_Ant1_2402



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	-0.74	≤20.97	PASS
		2441	-0.61	≤20.97	PASS
		2480	-0.20	≤20.97	PASS
2DH5	Ant1	2402	-2.37	≤20.97	PASS
		2441	-2.27	≤20.97	PASS
		2480	-1.82	≤20.97	PASS
3DH5	Ant1	2402	-1.83	≤20.97	PASS
		2441	-1.82	≤20.97	PASS
		2480	-1.36	≤20.97	PASS

Test Graphs

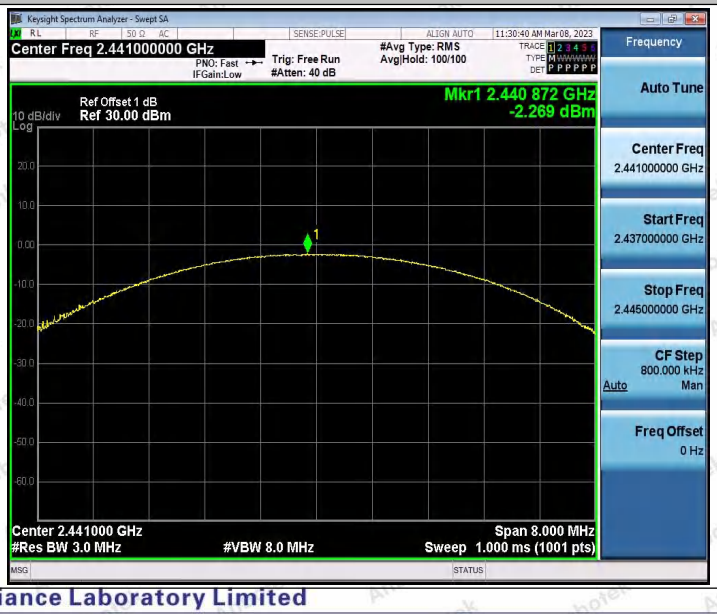
DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441

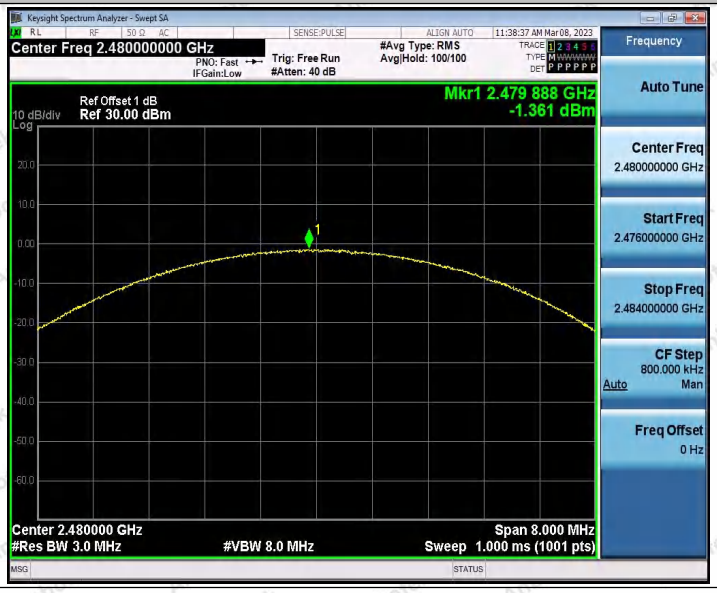


2DH5_Ant1_2480

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	0.672	≥0.642	PASS
2DH5	Ant1	Hop	1.008	≥0.904	PASS
3DH5	Ant1	Hop	1.002	≥0.900	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
11:55:45 AM Mar 08, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.002 MHz
-0.056 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

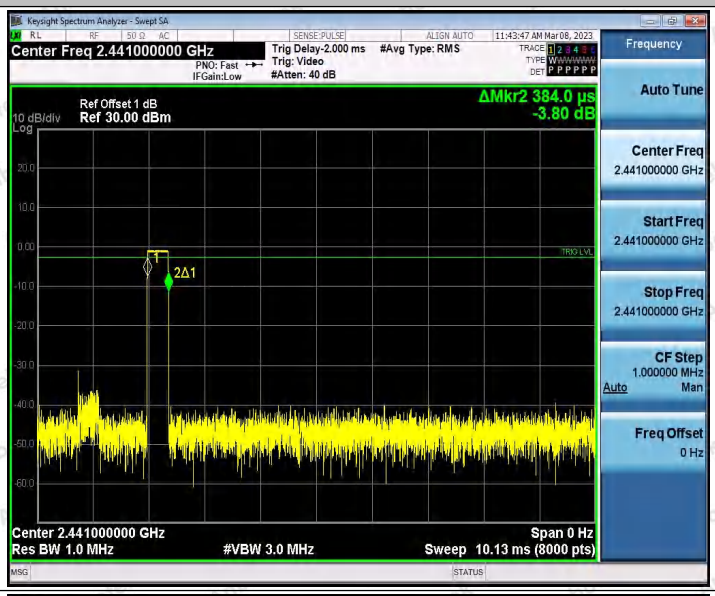
Appendix E: Time of occupancy

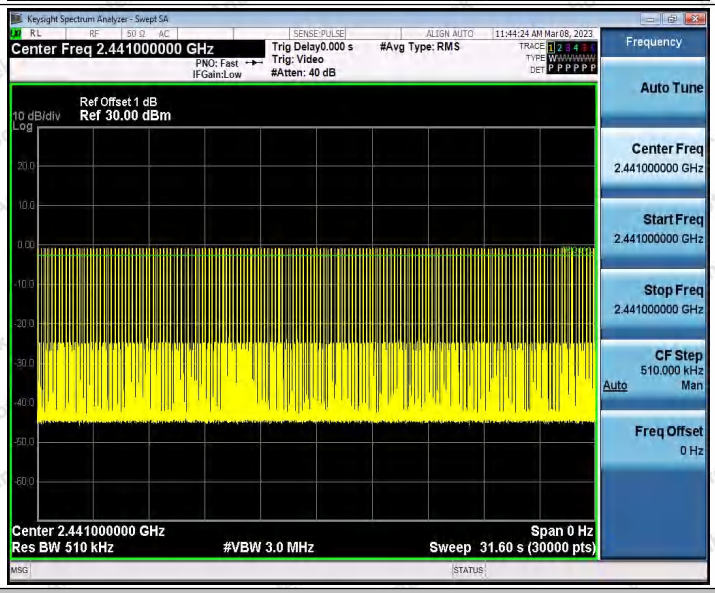
Test Result

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.384	318	0.122	≤0.4	PASS
DH3	Ant1	Hop	1.640	157	0.257	≤0.4	PASS
DH5	Ant1	Hop	2.888	105	0.303	≤0.4	PASS
2DH1	Ant1	Hop	0.386	319	0.123	≤0.4	PASS
2DH3	Ant1	Hop	1.638	166	0.272	≤0.4	PASS
2DH5	Ant1	Hop	2.887	115	0.332	≤0.4	PASS
3DH1	Ant1	Hop	0.386	319	0.123	≤0.4	PASS
3DH3	Ant1	Hop	1.638	171	0.280	≤0.4	PASS
3DH5	Ant1	Hop	2.888	113	0.326	≤0.4	PASS

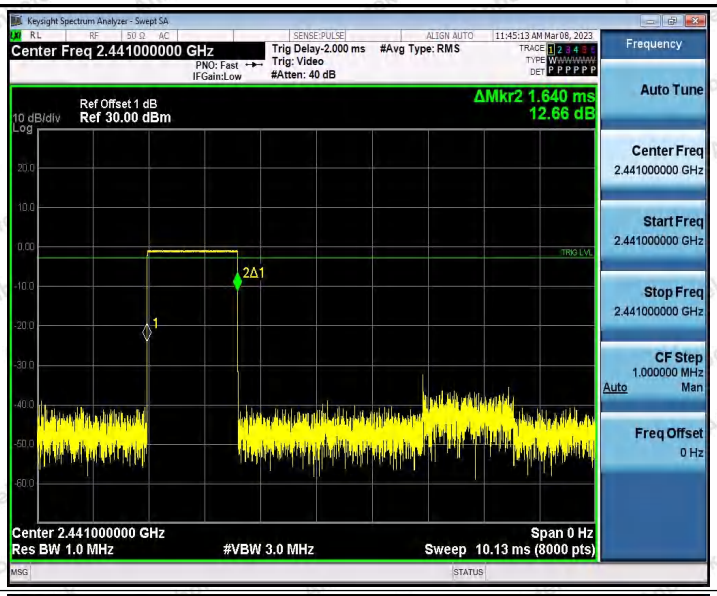
Test Graphs

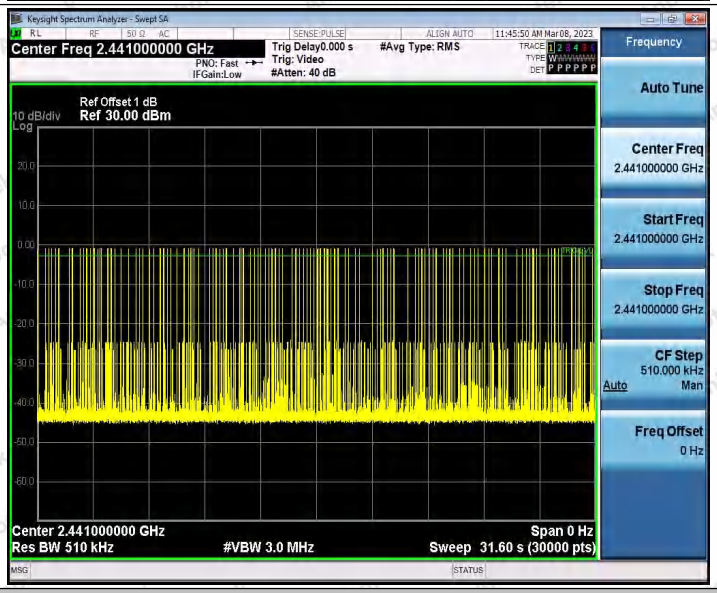
DH1_Ant1_Hop



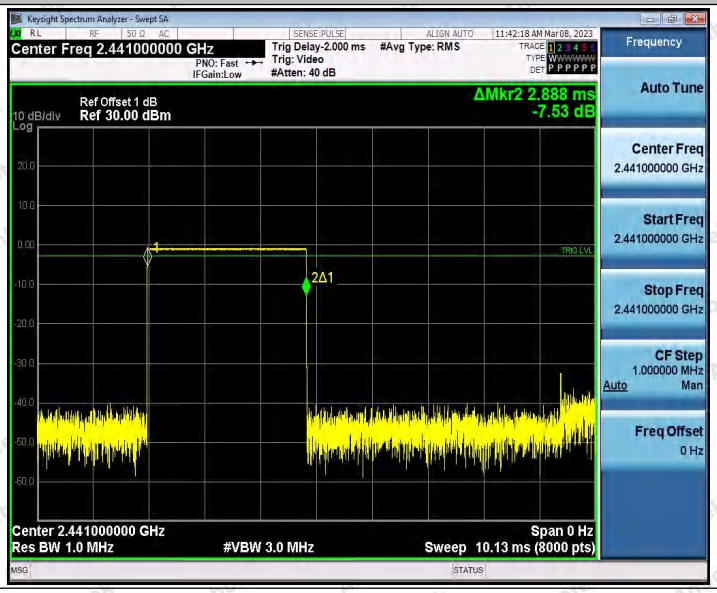


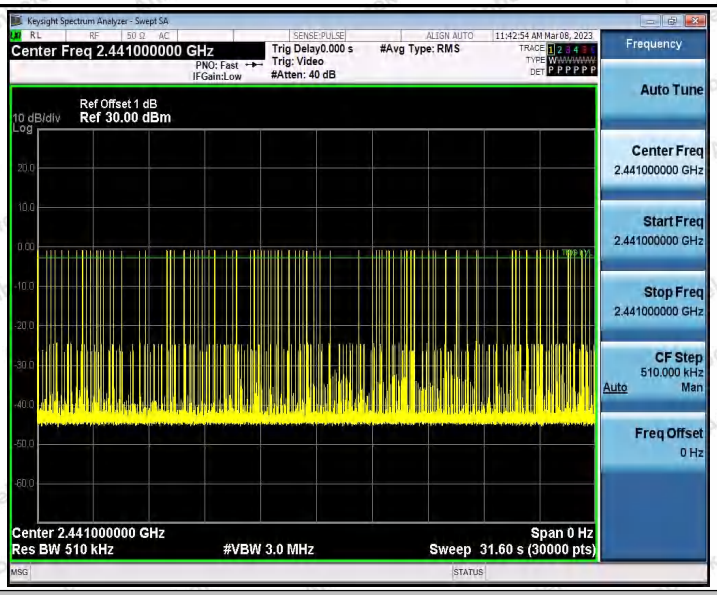
DH3_Ant1_Hop


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 1.640 ms
12.66 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
Freq Offset 0 Hz

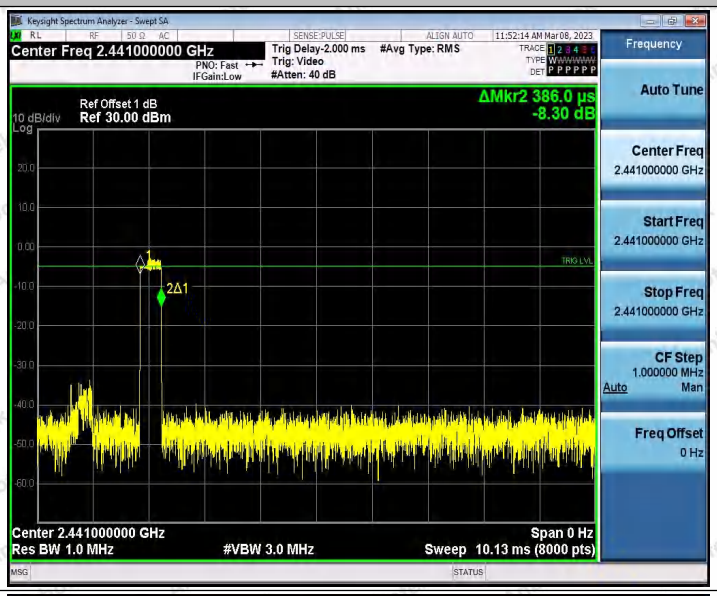

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
Ref Offset 1 dB
10 dB/div Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center Freq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

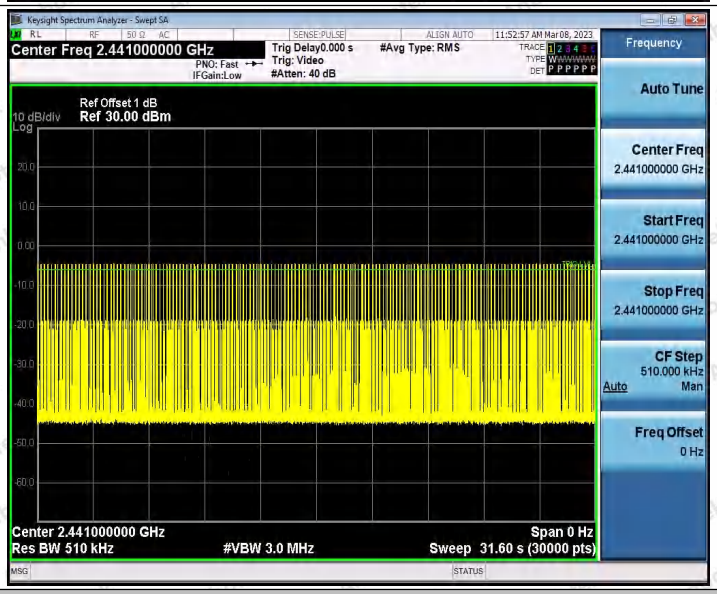
DH5_Ant1_Hop


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 2.888 ms
-7.53 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
Freq Offset 0 Hz

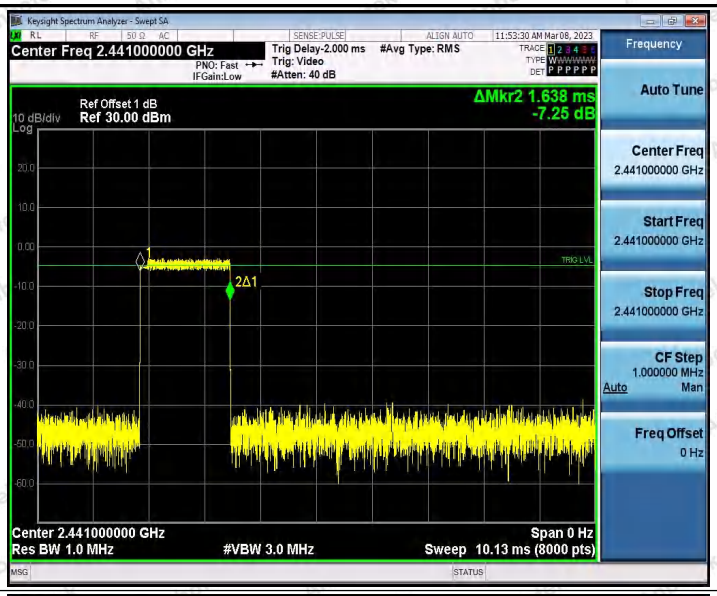


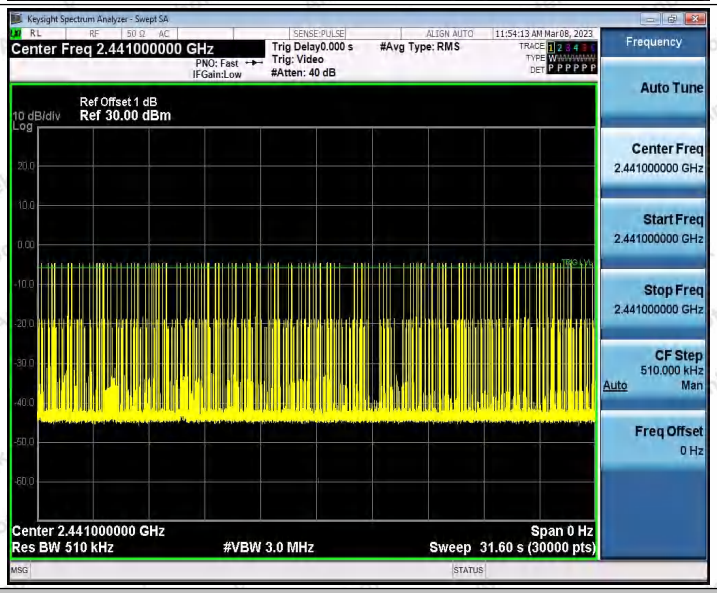
2DH1_Ant1_Hop



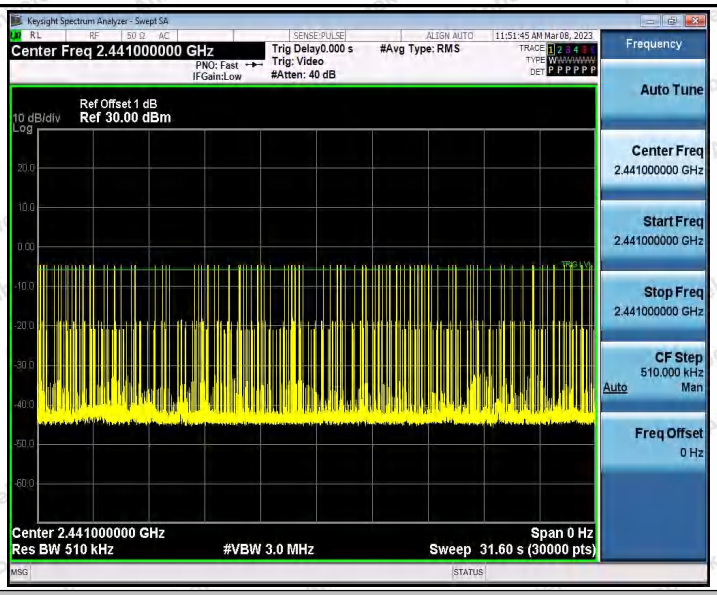


2DH3_Ant1_Hop

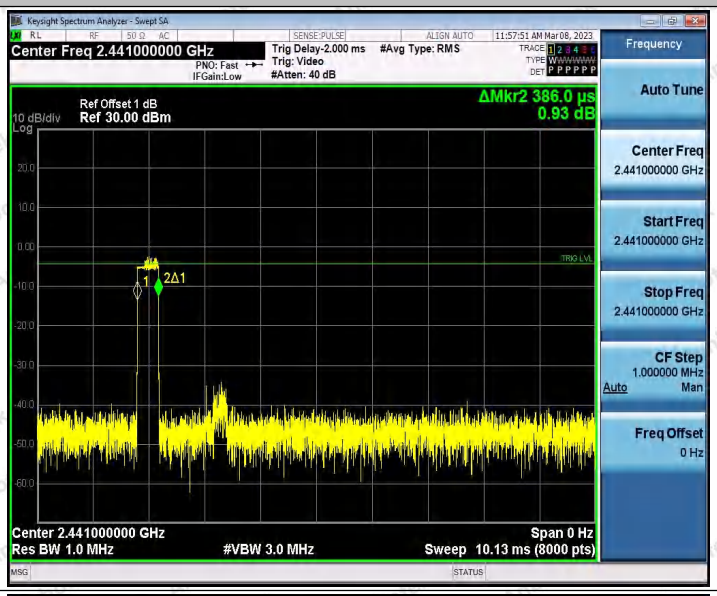


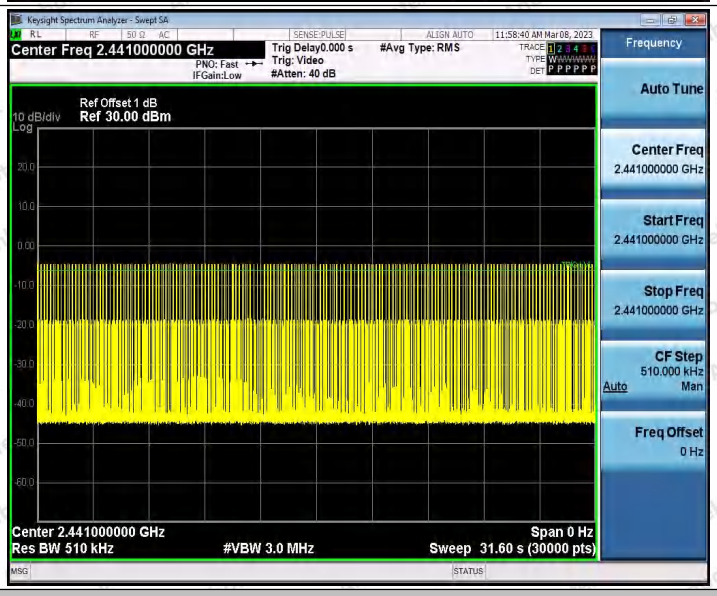


2DH5_Ant1_Hop

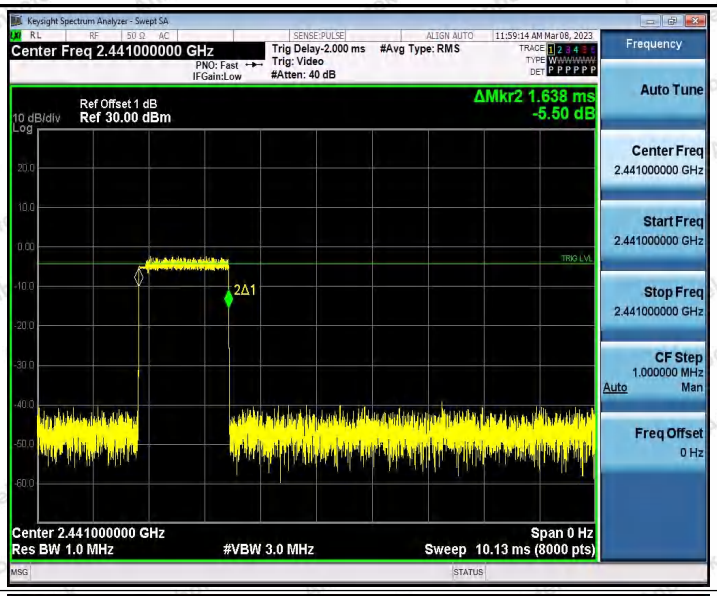


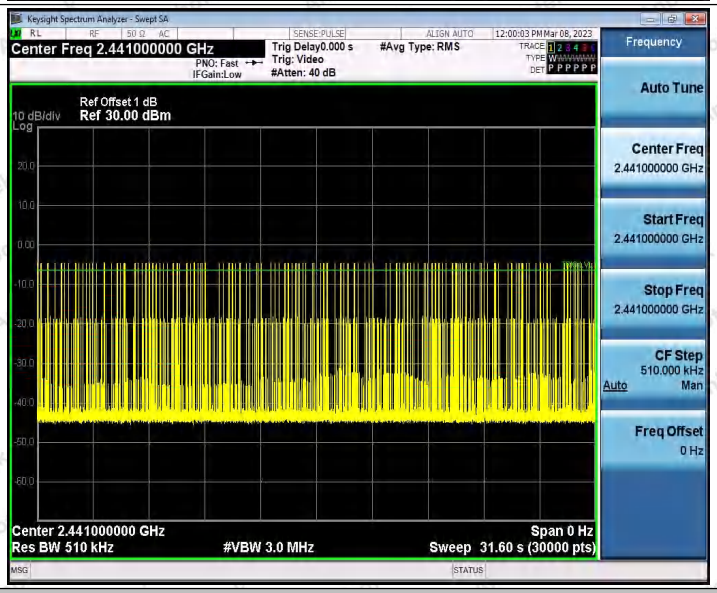
3DH1_Ant1_Hop



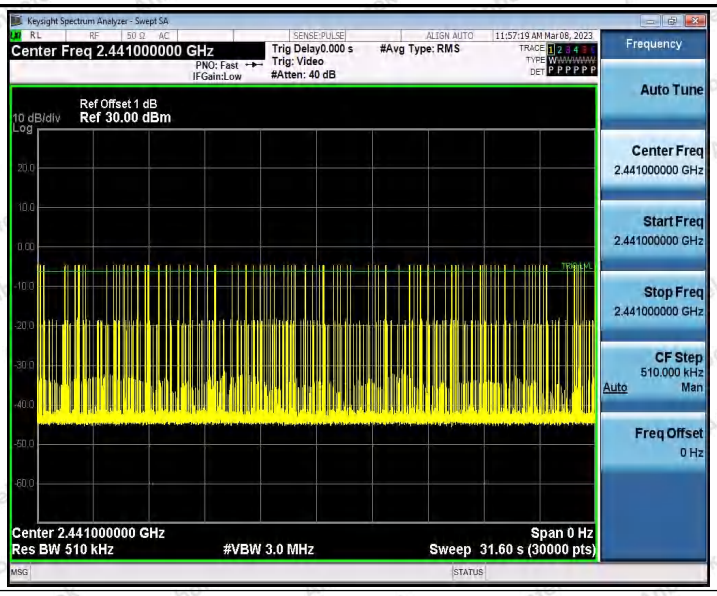


3DH3_Ant1_Hop





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
11:57:19 AM Mar 08, 2023
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
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)

Appendix F: Number of hopping channels

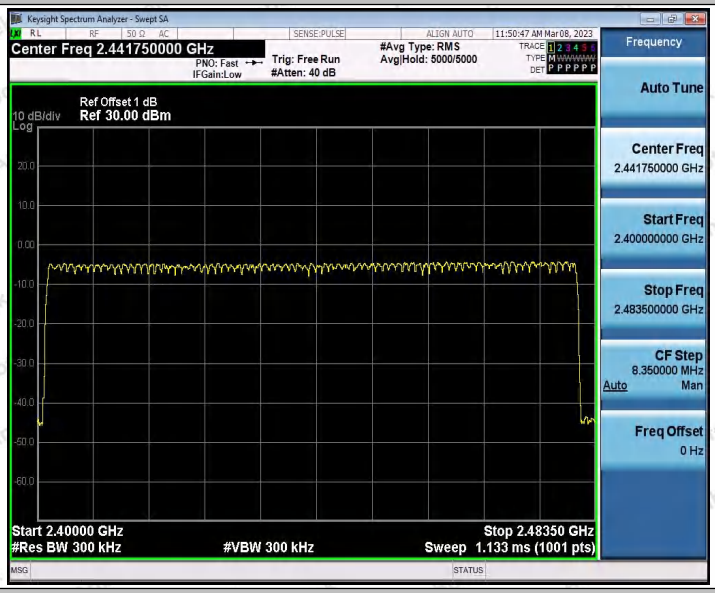
Test Result

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

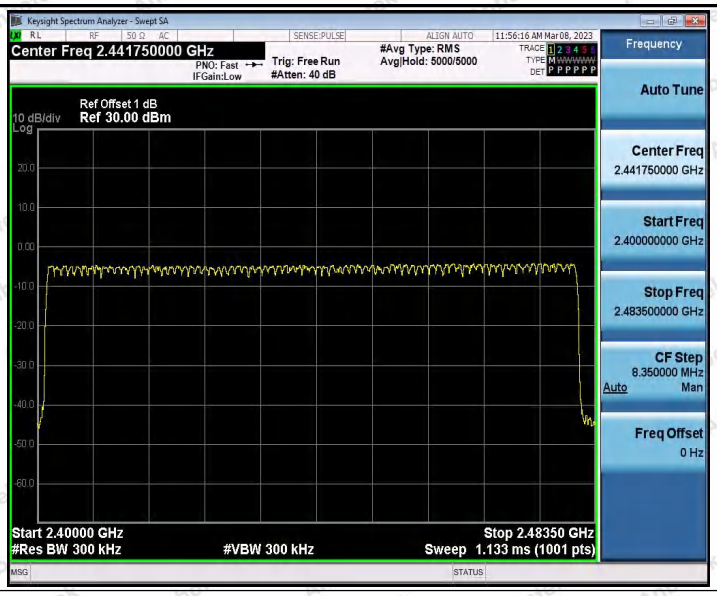
Test Graphs

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
11:56:16 AM Mar 08, 2023
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

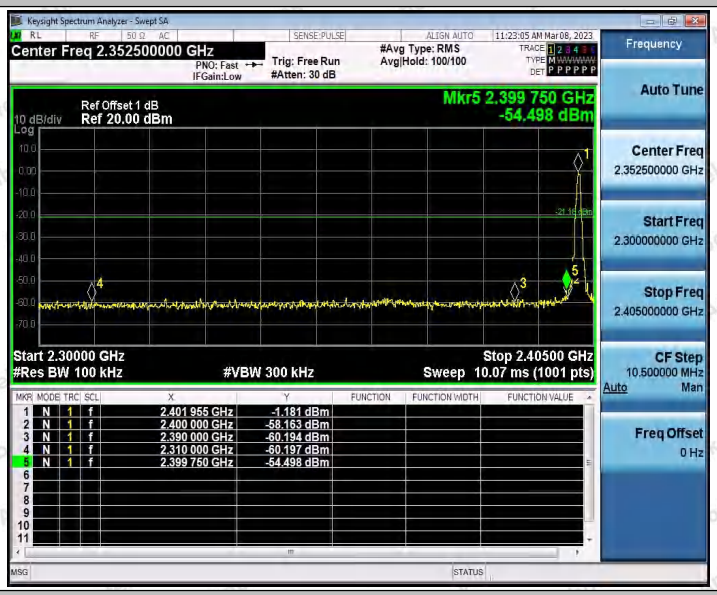
Appendix G: Band edge measurements

Test Result

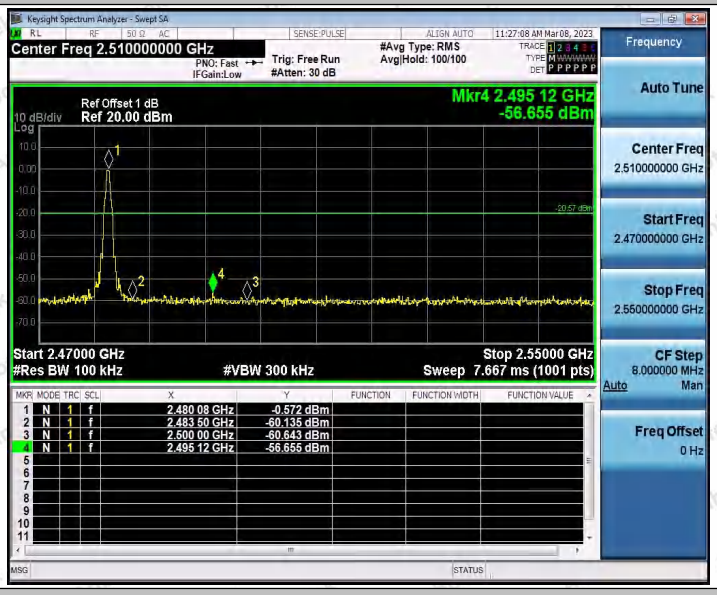
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-1.18	-54.50	≤-21.18	PASS
		High	2480	-0.57	-56.66	≤-20.57	PASS
		Low	Hop_2402	-1.35	-57.33	≤-21.35	PASS
		High	Hop_2480	-0.54	-56.21	≤-20.54	PASS
2DH5	Ant1	Low	2402	-5.40	-57.27	≤-25.4	PASS
		High	2480	-5.13	-56.50	≤-25.13	PASS
		Low	Hop_2402	-6.17	-58.00	≤-26.17	PASS
		High	Hop_2480	-5.59	-30.06	≤-25.59	PASS
3DH5	Ant1	Low	2402	-5.67	-56.53	≤-25.67	PASS
		High	2480	-5.60	-56.91	≤-25.6	PASS
		Low	Hop_2402	-6.36	-57.01	≤-26.36	PASS
		High	Hop_2480	-5.87	-49.61	≤-25.87	PASS

Test Graphs

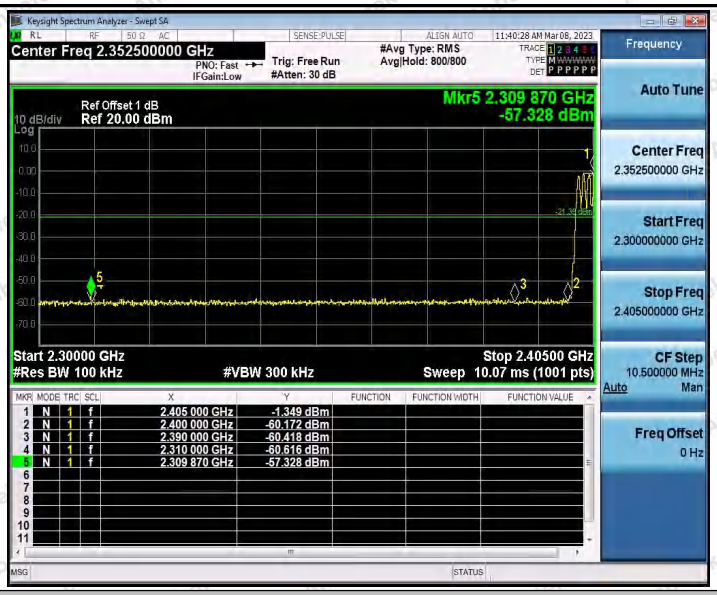
DH5_Ant1_Low_2402



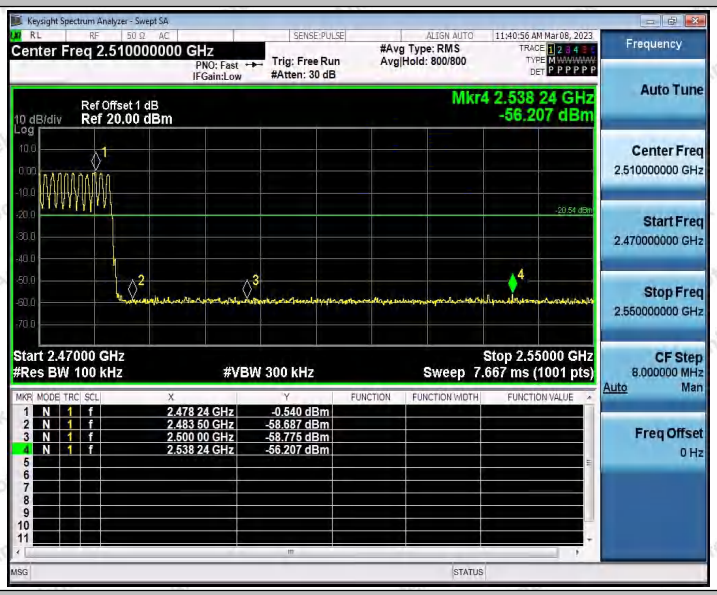
DH5_Ant1_High_2480



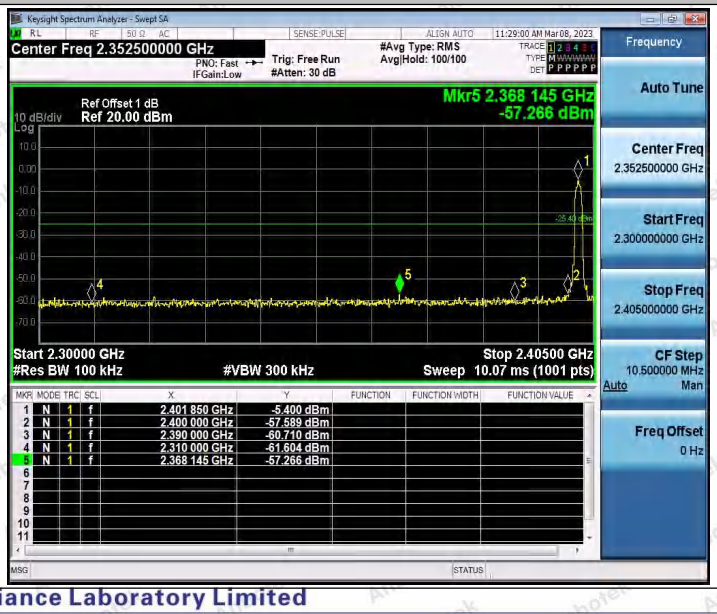
DH5_Ant1_Low_Hop_2402



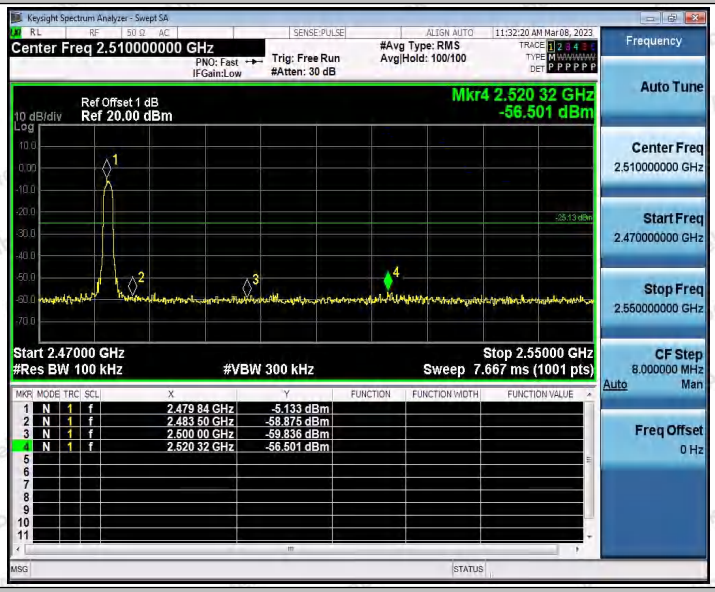
DH5_Ant1_High_Hop_2480



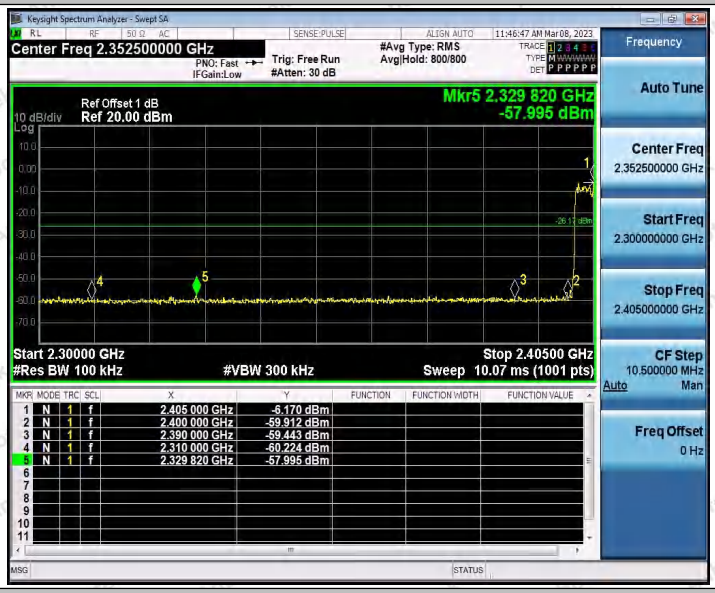
2DH5_Ant1_Low_2402



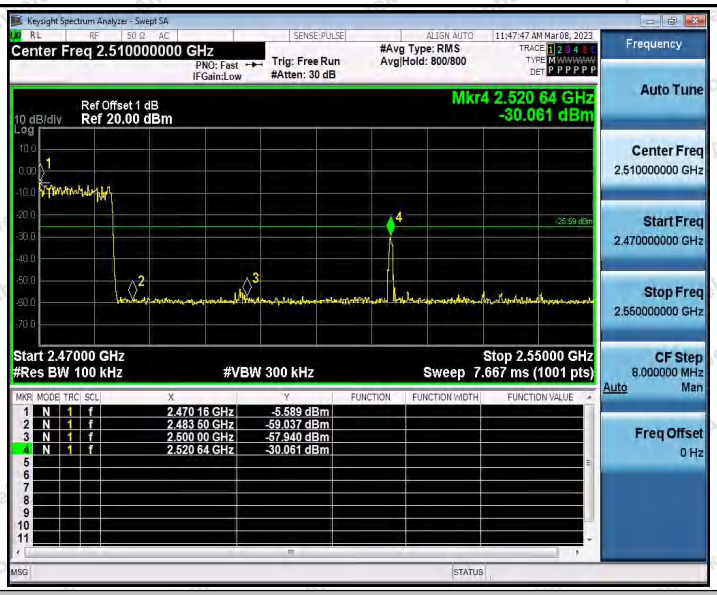
2DH5_Ant1_High_2480



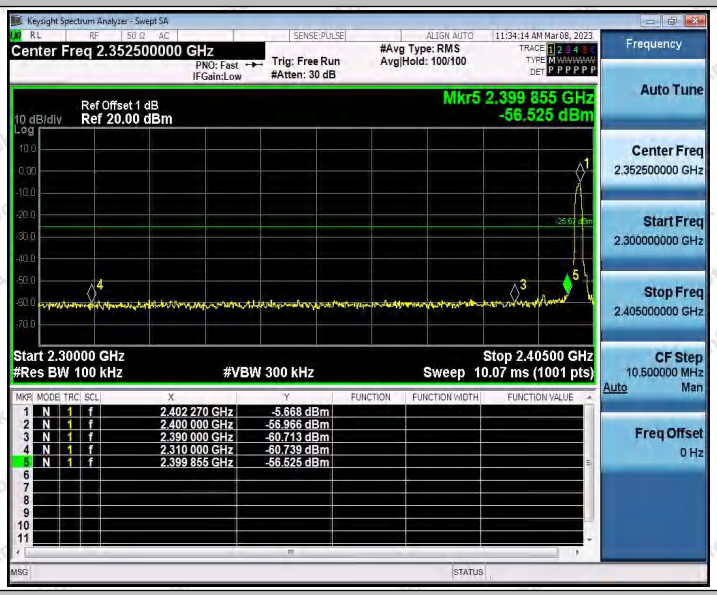
2DH5_Ant1_Low_Hop_2402



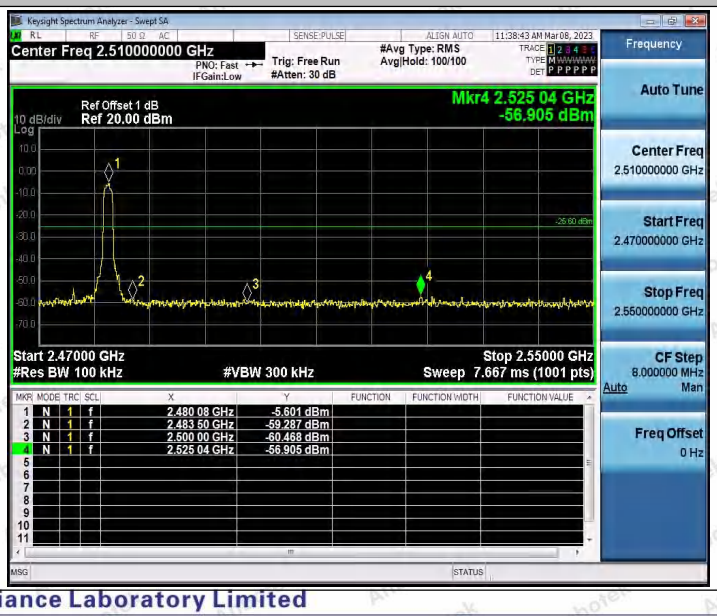
2DH5_Ant1_High_Hop_2480



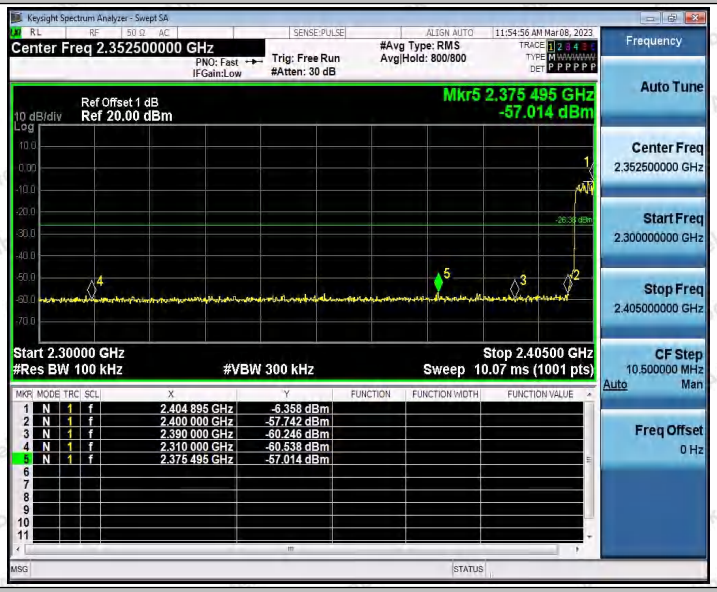
3DH5_Ant1_Low_2402



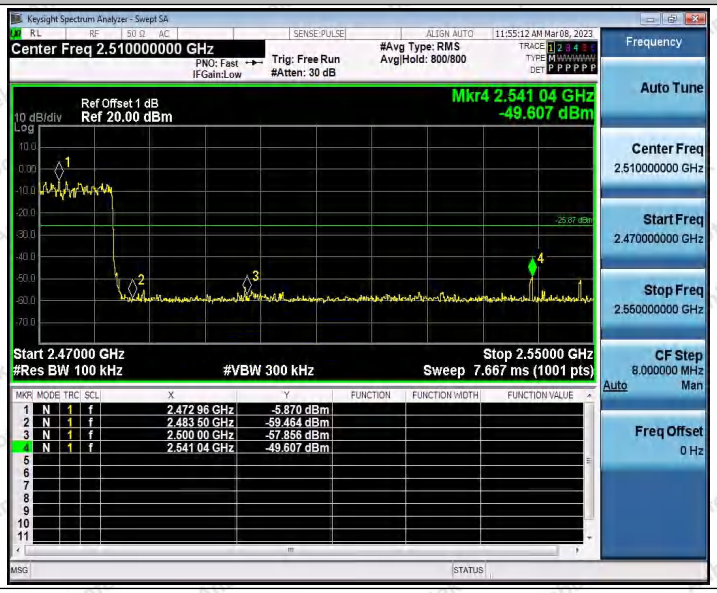
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

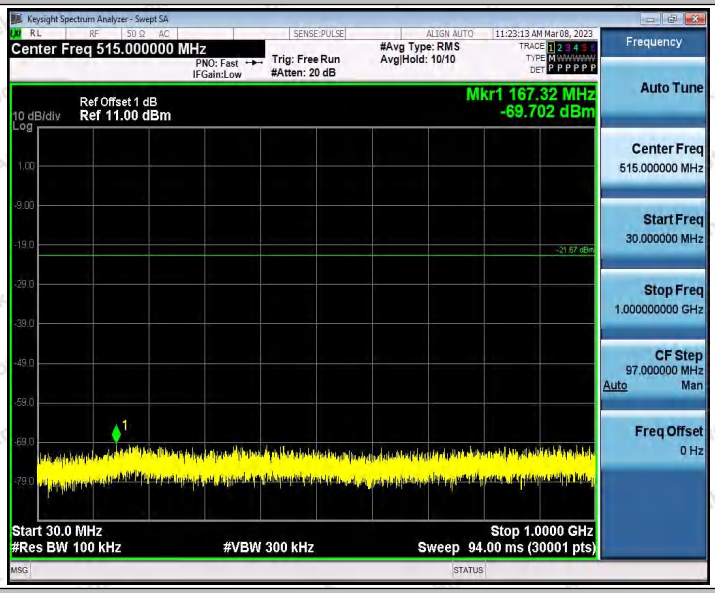
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-1.67	-1.67	---	PASS
			30~1000	-1.67	-69.70	≤-21.67	PASS
			1000~26500	-1.67	-41.89	≤-21.67	PASS
		2441	Reference	-1.55	-1.55	---	PASS
			30~1000	-1.55	-68.78	≤-21.55	PASS
			1000~26500	-1.55	-42.13	≤-21.55	PASS
		2480	Reference	-1.16	-1.16	---	PASS
			30~1000	-1.16	-68.19	≤-21.16	PASS
			1000~26500	-1.16	-41.90	≤-21.16	PASS
2DH5	Ant1	2402	Reference	-7.62	-7.62	---	PASS
			30~1000	-7.62	-68.51	≤-27.62	PASS
			1000~26500	-7.62	-45.76	≤-27.62	PASS
		2441	Reference	-7.12	-7.12	---	PASS
			30~1000	-7.12	-68.26	≤-27.12	PASS
			1000~26500	-7.12	-45.27	≤-27.12	PASS
		2480	Reference	-6.35	-6.35	---	PASS
			30~1000	-6.35	-68.24	≤-26.35	PASS
			1000~26500	-6.35	-46.22	≤-26.35	PASS
3DH5	Ant1	2402	Reference	-7.27	-7.27	---	PASS
			30~1000	-7.27	-69.09	≤-27.27	PASS
			1000~26500	-7.27	-47.07	≤-27.27	PASS
		2441	Reference	-5.07	-5.07	---	PASS
			30~1000	-5.07	-69.26	≤-25.07	PASS
			1000~26500	-5.07	-45.35	≤-25.07	PASS
		2480	Reference	-6.41	-6.41	---	PASS
			30~1000	-6.41	-69.11	≤-26.41	PASS
			1000~26500	-6.41	-45.56	≤-26.41	PASS

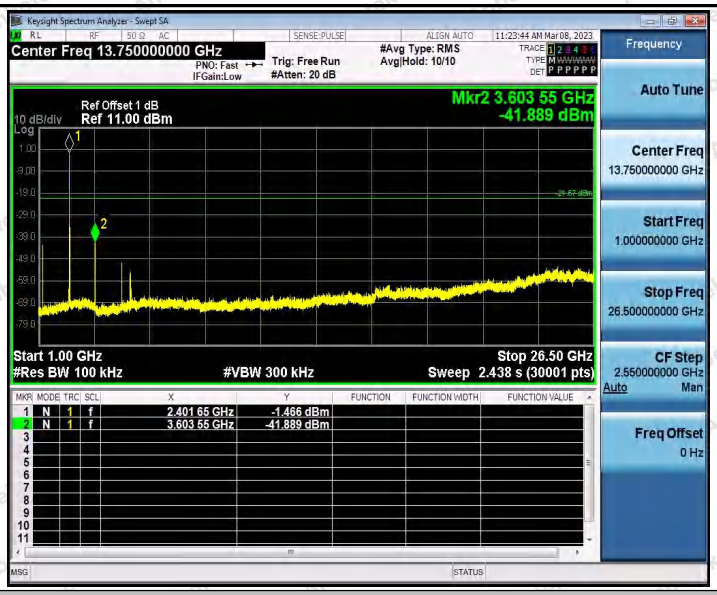
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

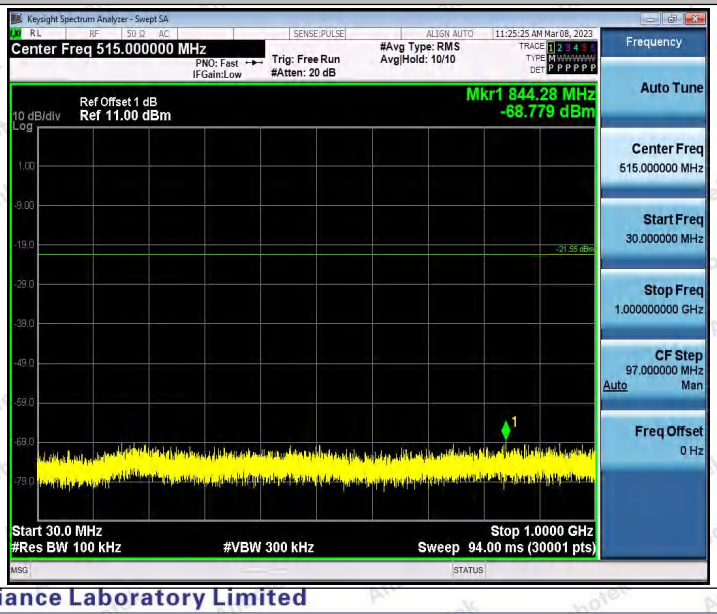


DH5_Ant1_2402_1000~26500

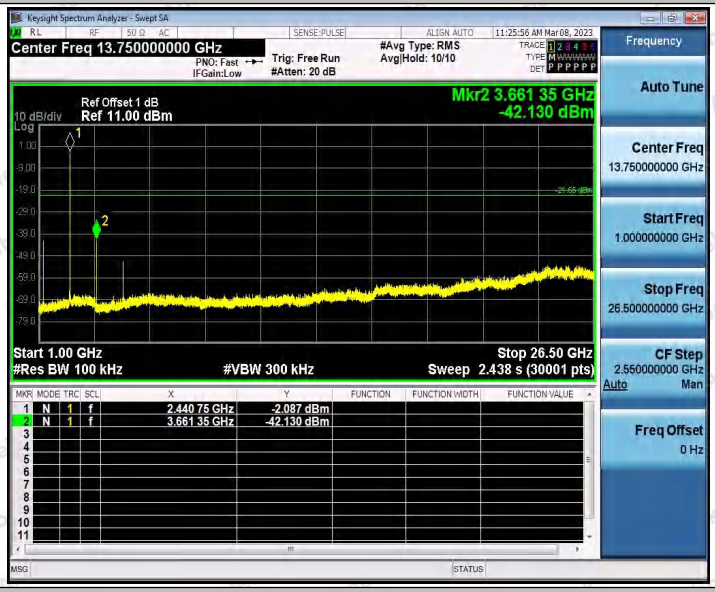


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

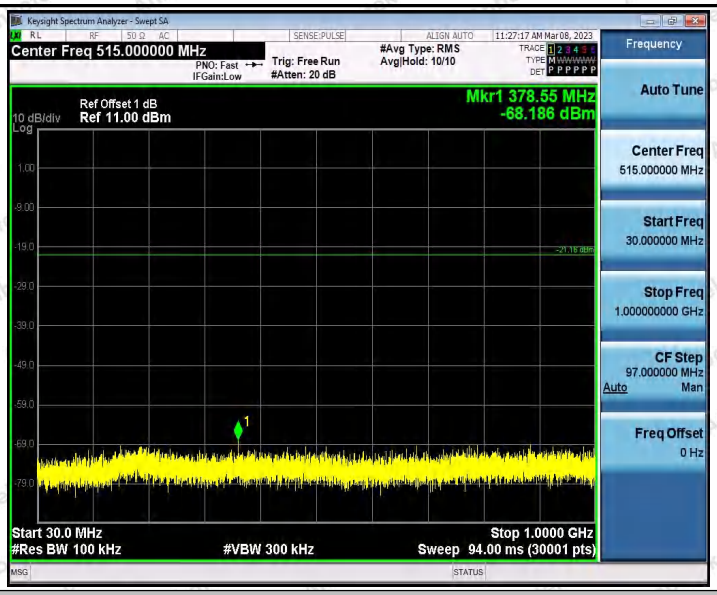


DH5_Ant1_2441_1000~26500



DH5_Ant1_2480_0~Reference

DH5_Ant1_2480_30~1000



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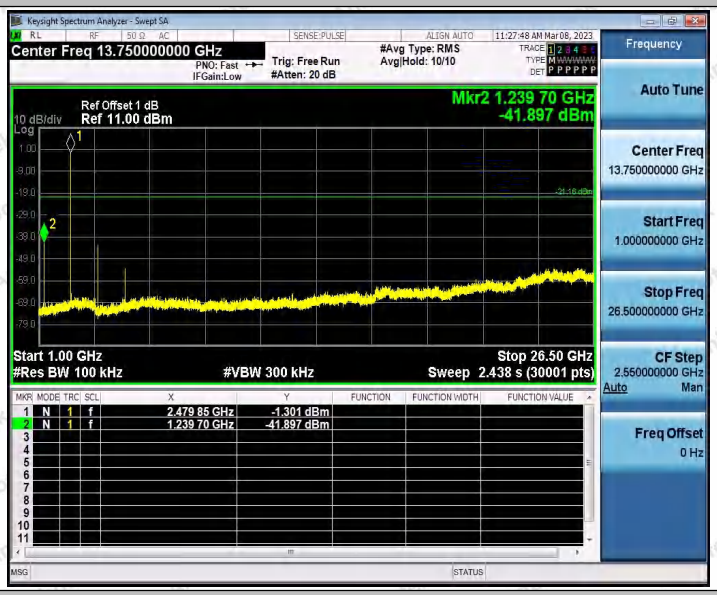
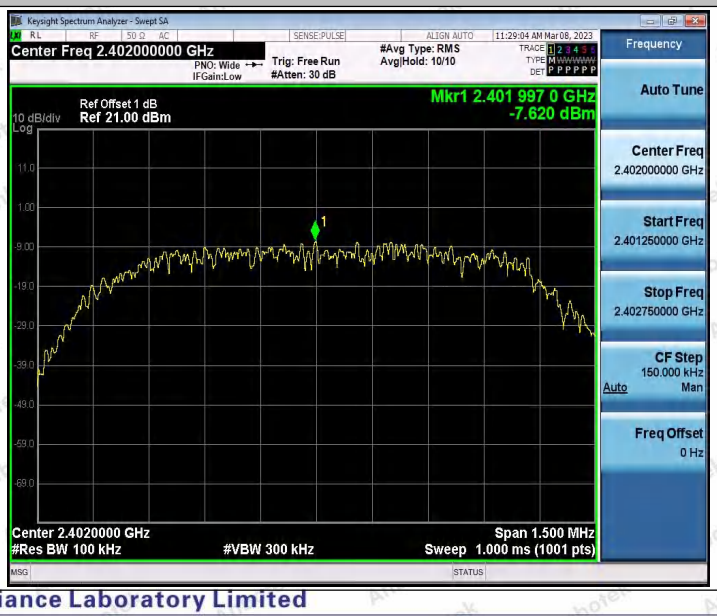
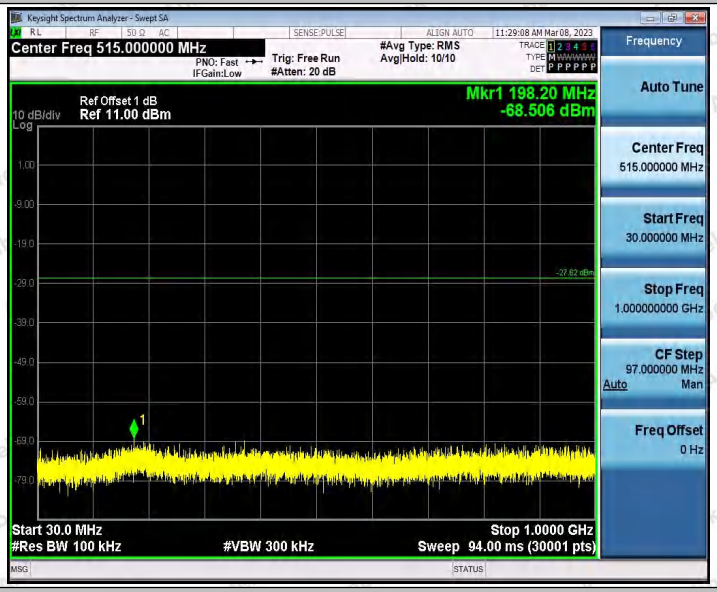


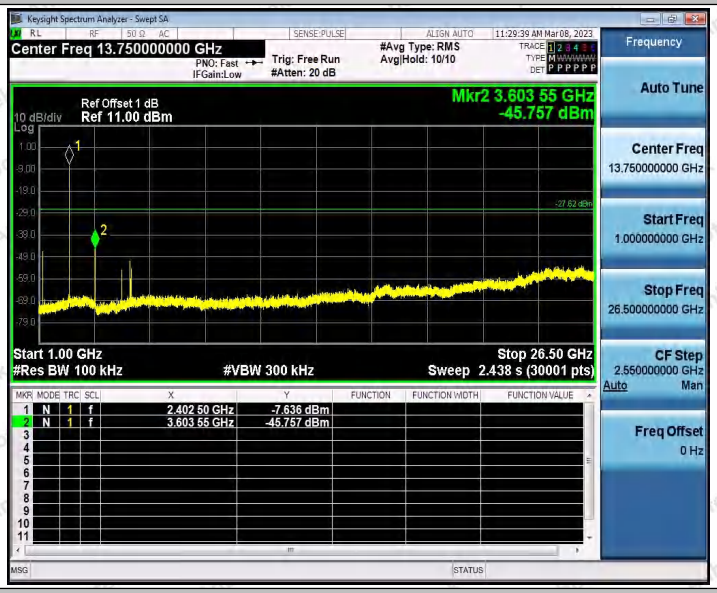
2DH5_Ant1_2402_0~Reference



2DH5_Ant1_2402_30~1000

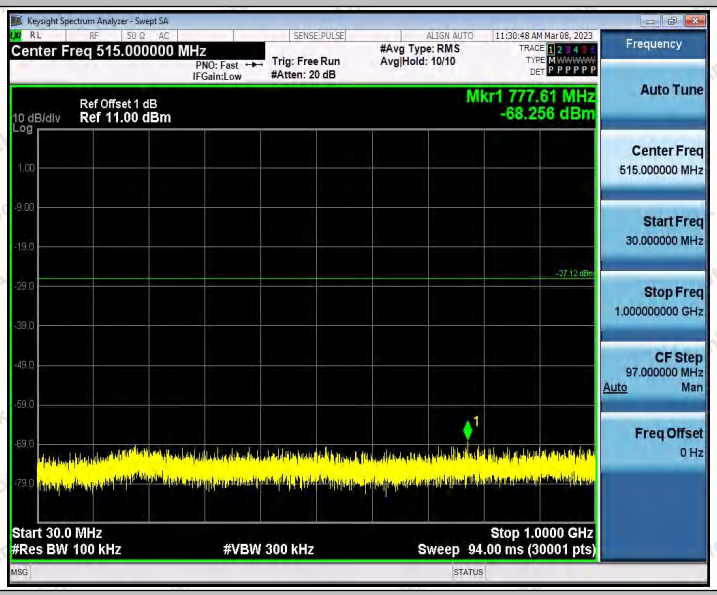


2DH5_Ant1_2402_1000~26500

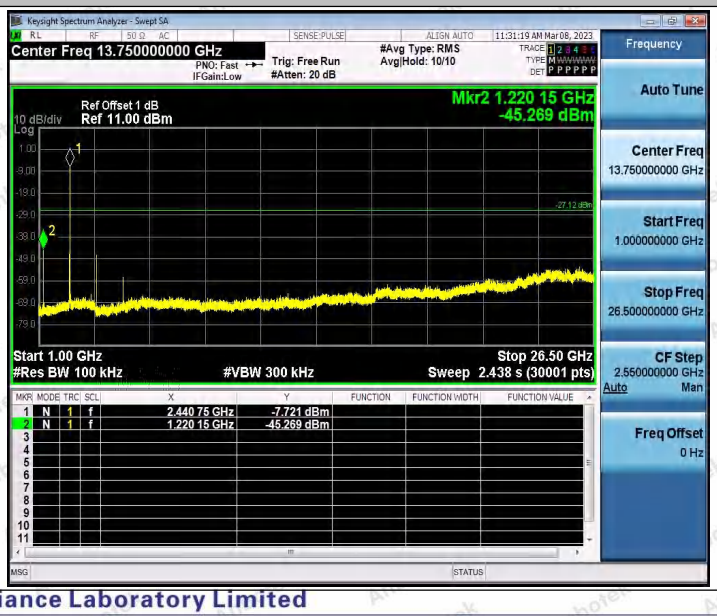


2DH5_Ant1_2441_0~Reference

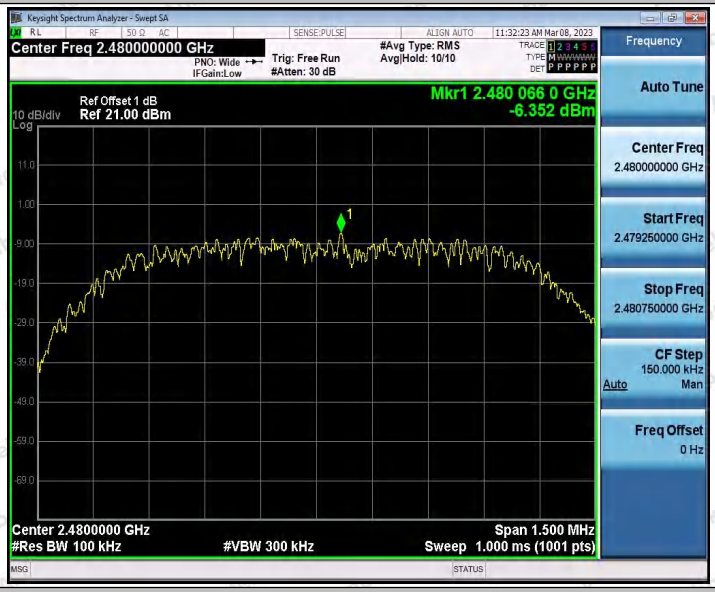
2DH5_Ant1_2441_30~1000



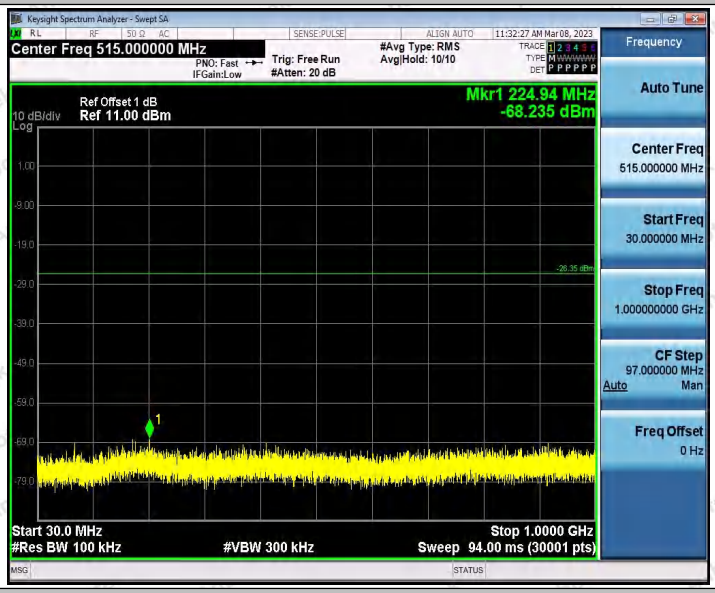
2DH5_Ant1_2441_1000~26500



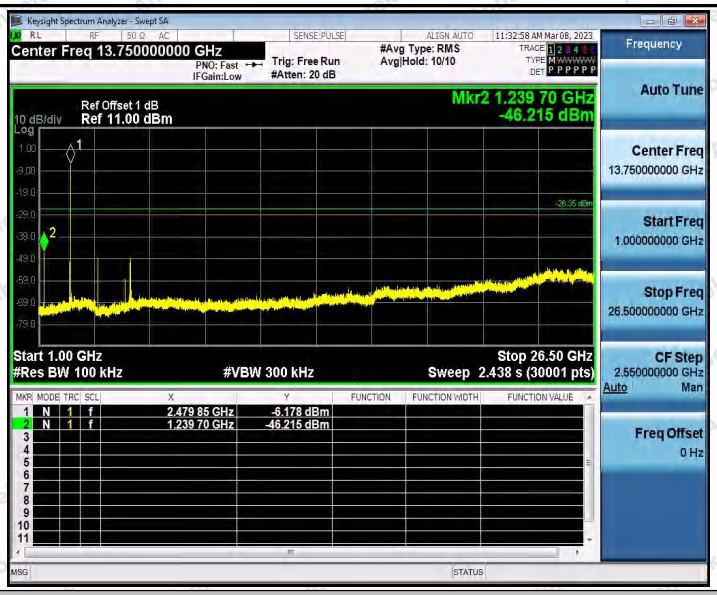
2DH5_Ant1_2480_0~Reference



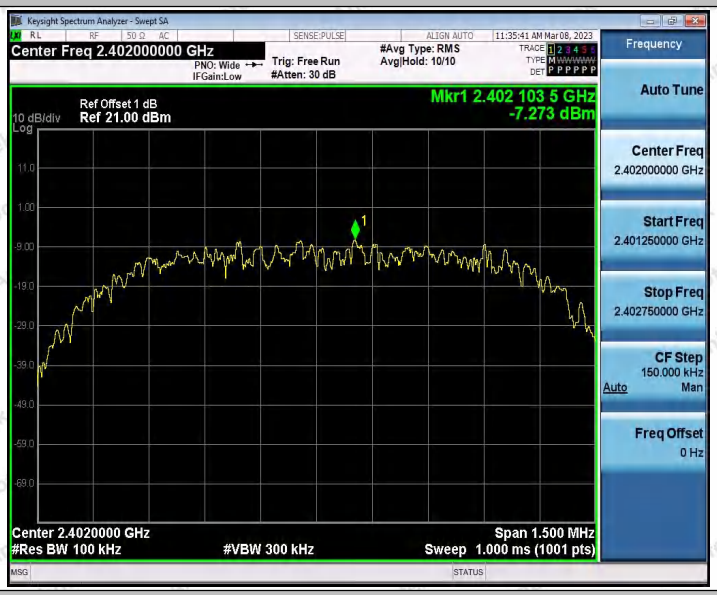
2DH5_Ant1_2480_30~1000



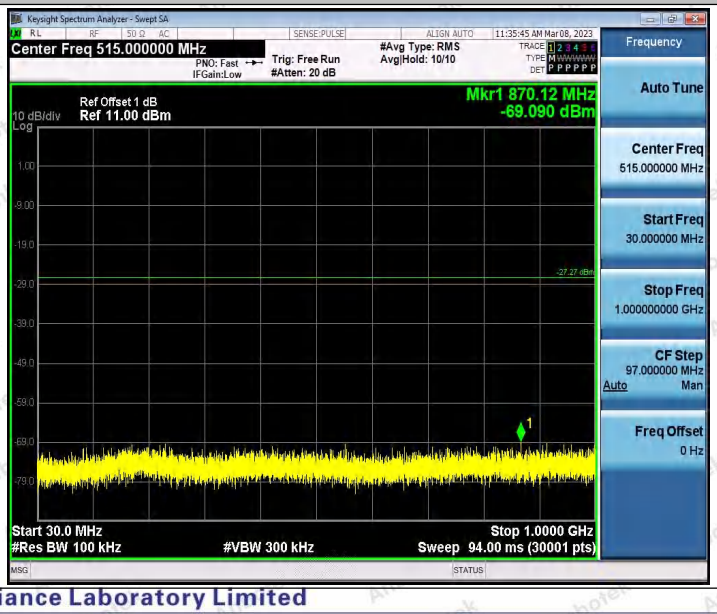
2DH5_Ant1_2480_1000~26500



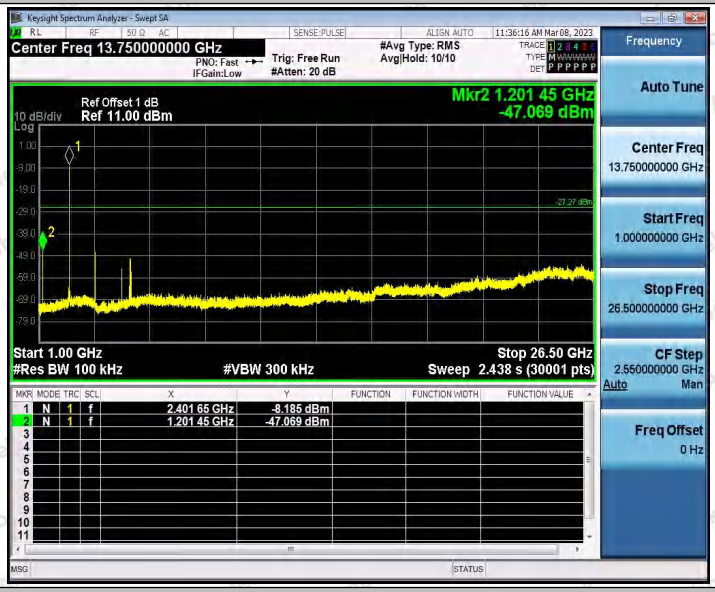
3DH5_Ant1_2402_0~Reference



3DH5_Ant1_2402_30~1000

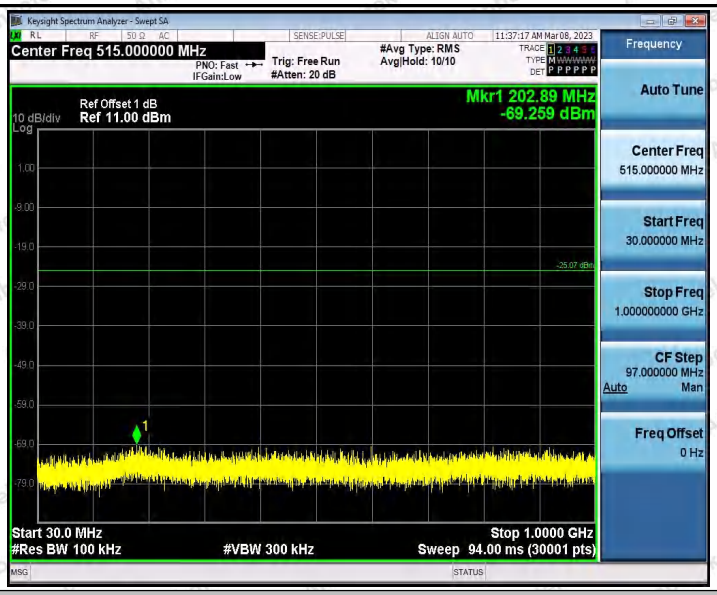


3DH5_Ant1_2402_1000~26500

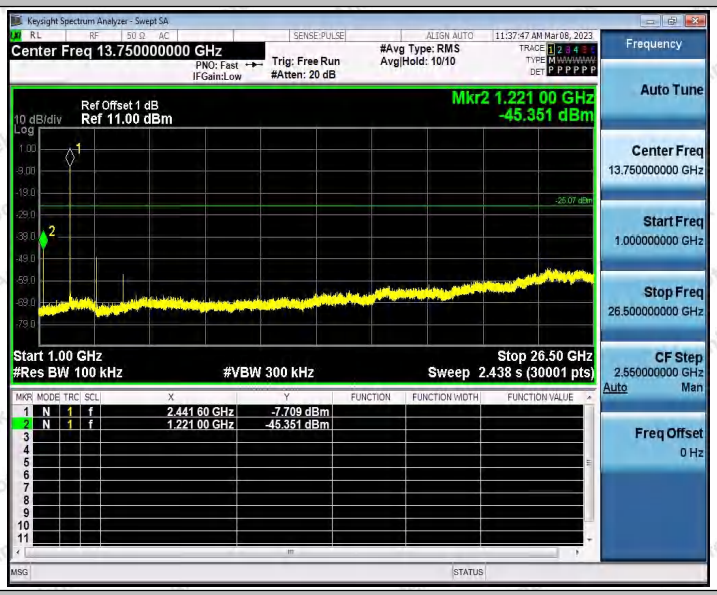


3DH5_Ant1_2441_0~Reference

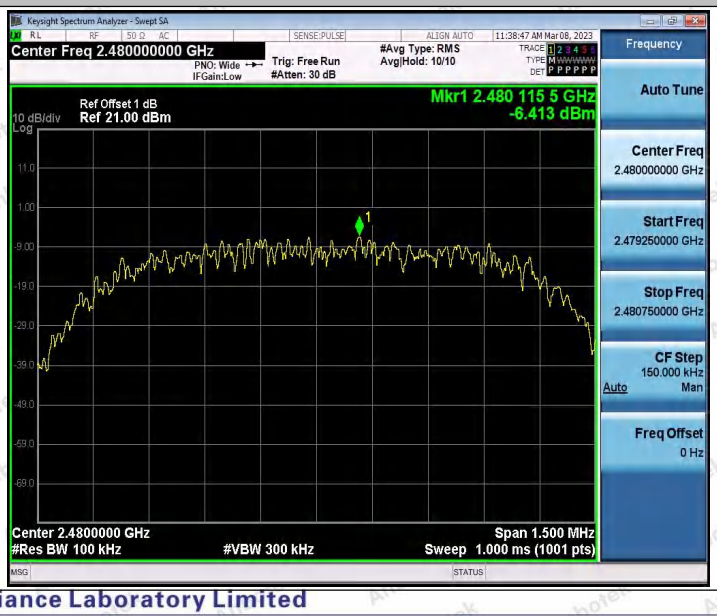
3DH5_Ant1_2441_30~1000



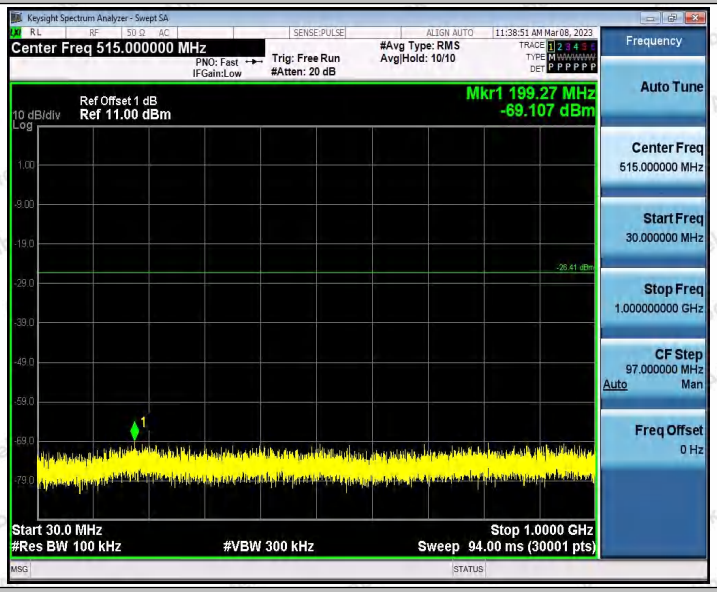
3DH5_Ant1_2441_1000~26500



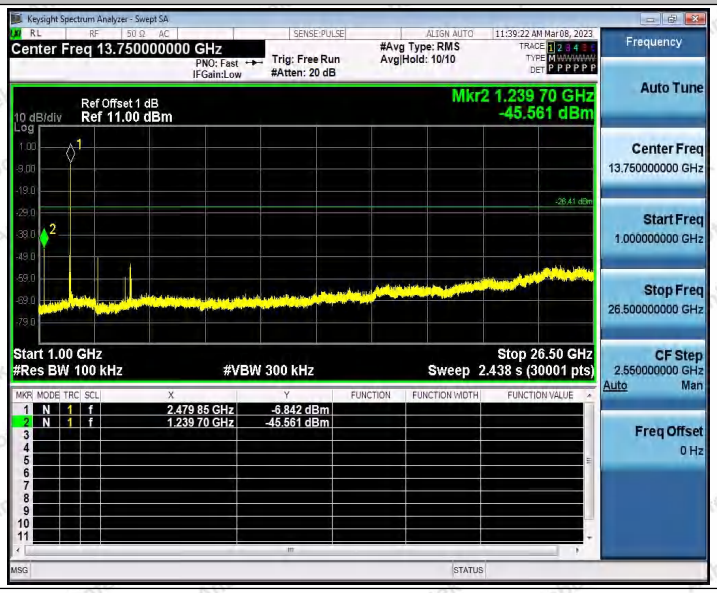
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



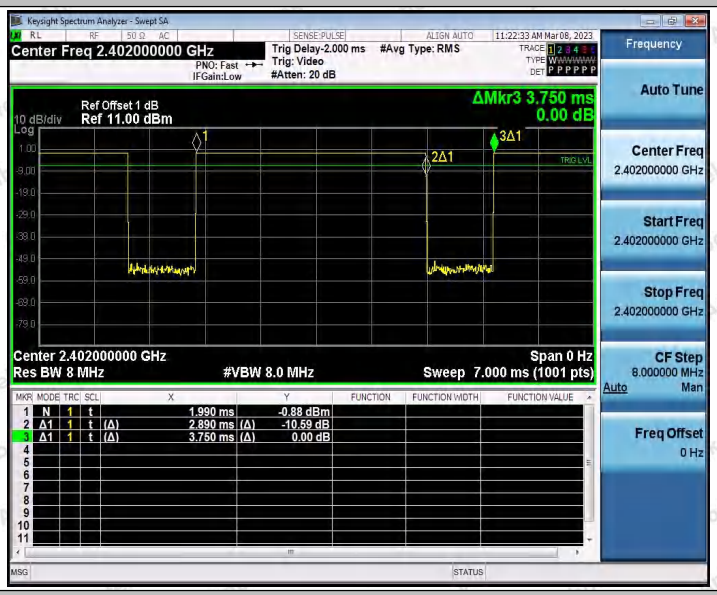
Appendix I: Duty Cycle

Test Result

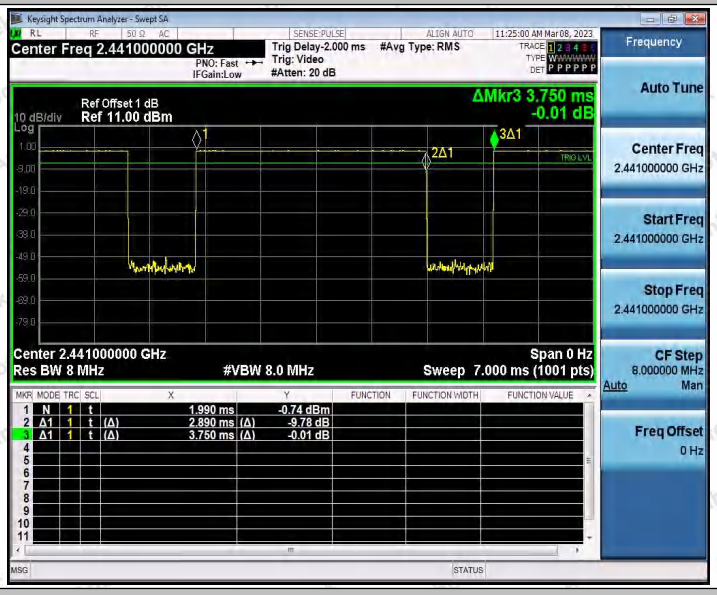
Test Mode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
DH5	Ant1	2402	2.89	3.75	77.07	1.13
		2441	2.89	3.75	77.07	1.13
		2480	2.88	3.74	77.01	1.13
2DH5	Ant1	2402	2.89	3.75	77.07	1.13
		2441	2.89	3.75	77.07	1.13
		2480	2.90	3.76	77.13	1.13
3DH5	Ant1	2402	2.89	3.75	77.07	1.13
		2441	2.89	3.75	77.07	1.13
		2480	2.89	3.76	76.86	1.14

Test Graphs

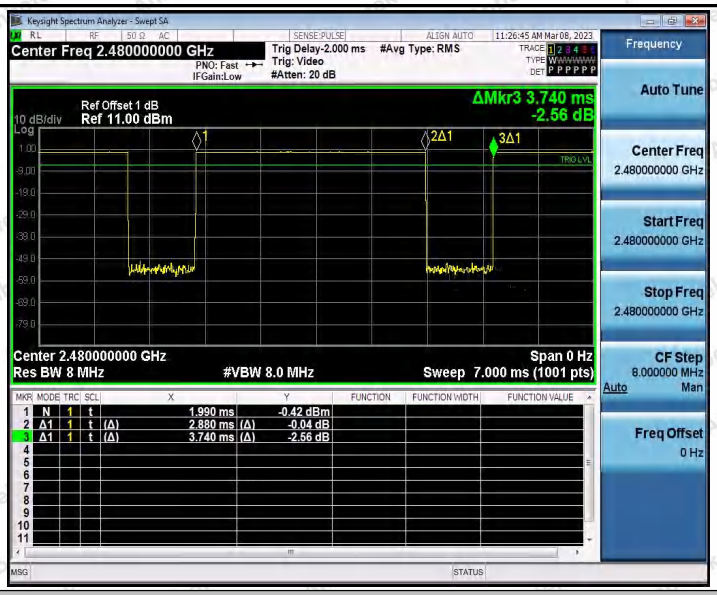
DH5_Ant1_2402



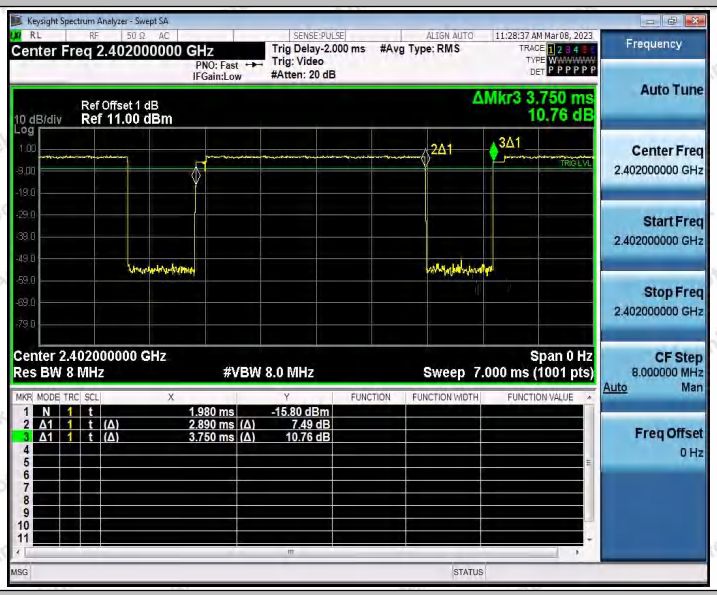
DH5_Ant1_2441



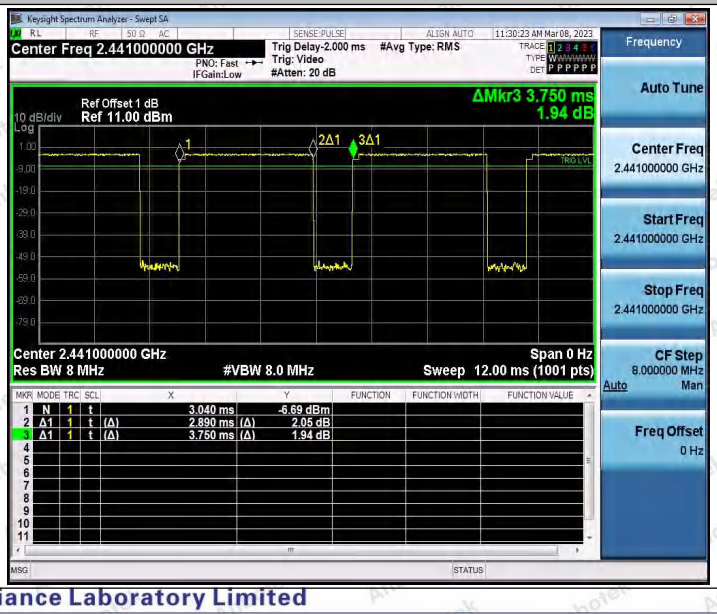
DH5_Ant1_2480



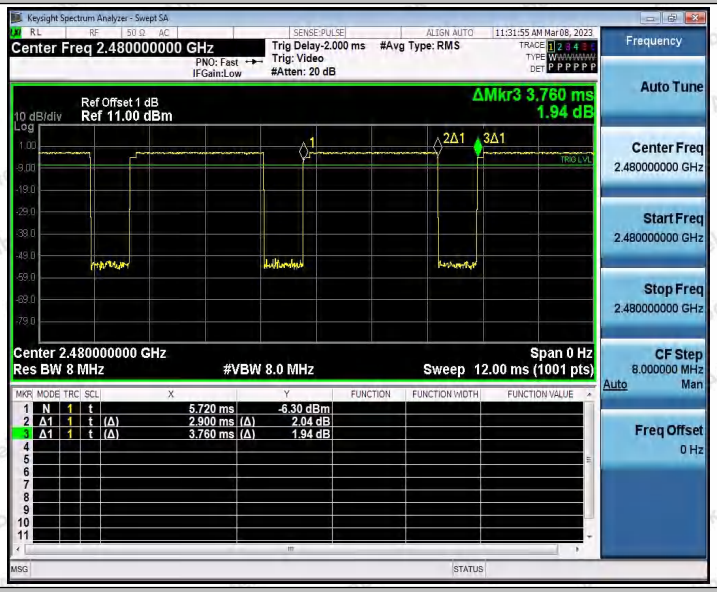
2DH5_Ant1_2402



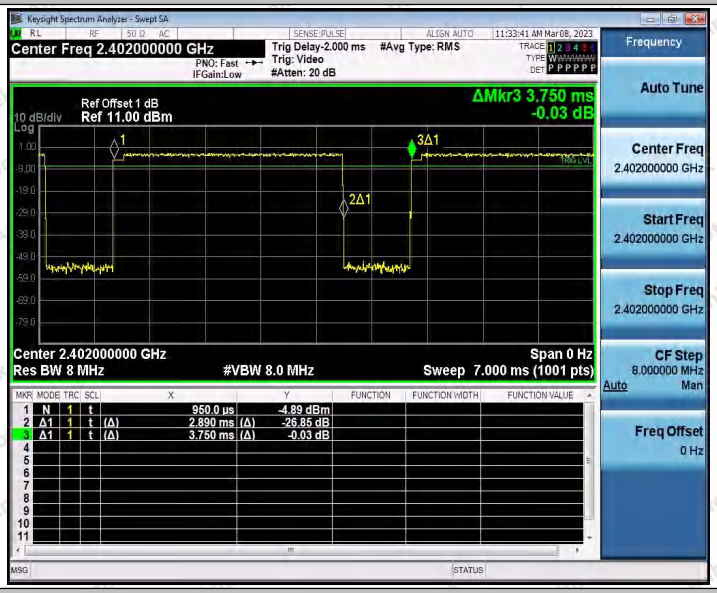
2DH5_Ant1_2441



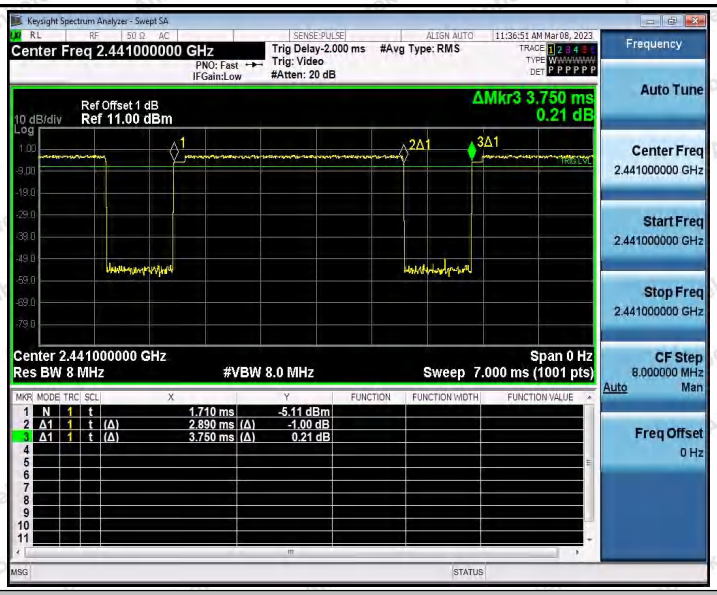
2DH5_Ant1_2480



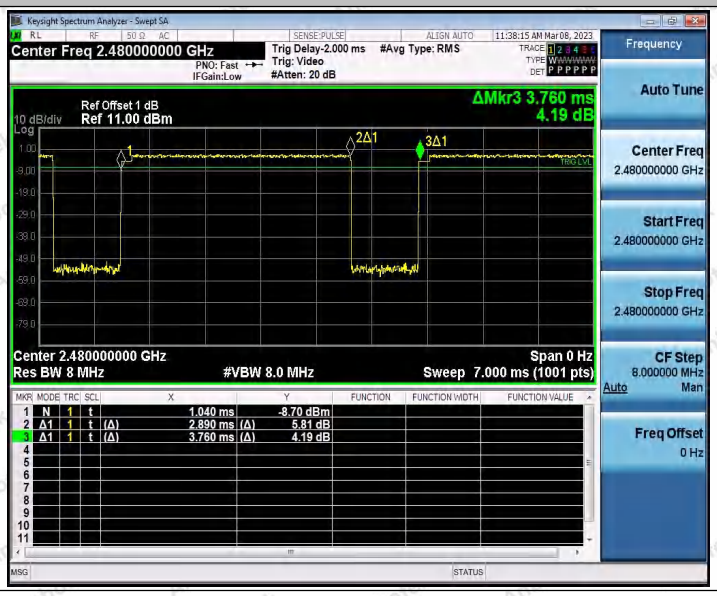
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



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