Appendix Test Data

Report No.:	18220WC30194901	Test Sample No.:	1-2-2
Start Test Date:	2023.09.08	Finish Test Date:	2023.09.13
Test Engineer:	Hayman Chen	Auditor:	Rick Luo
Temperature:	25.3℃	Relative Humidity:	48%
Pressure:	102 kPa		

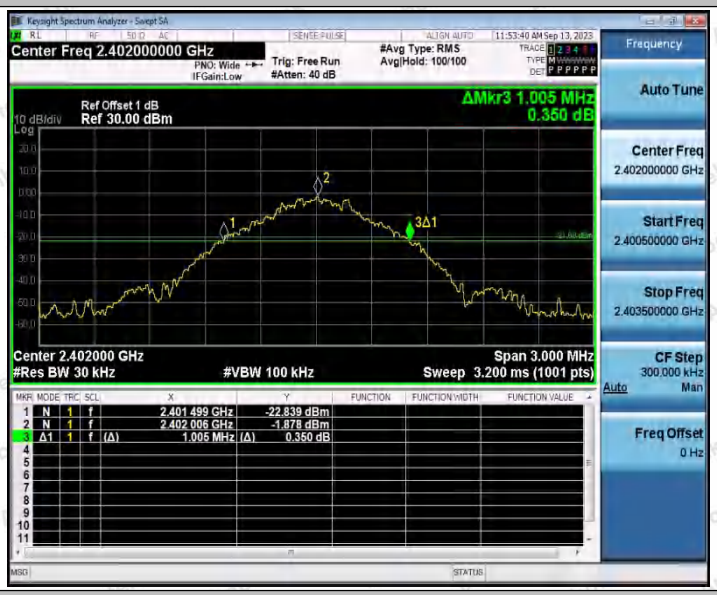
Appendix A: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	1.005	2401.499	2402.504	---	---
		2441	1.062	2440.481	2441.543	---	---
		2480	1.005	2479.487	2480.492	---	---
2DH5	Ant1	2402	1.266	2401.358	2402.624	---	---
		2441	1.296	2440.346	2441.642	---	---
		2480	1.344	2479.304	2480.648	---	---
3DH5	Ant1	2402	1.281	2401.346	2402.627	---	---
		2441	1.302	2440.328	2441.630	---	---
		2480	1.287	2479.343	2480.630	---	---

Test Graphs

DH5_Ant1_2402

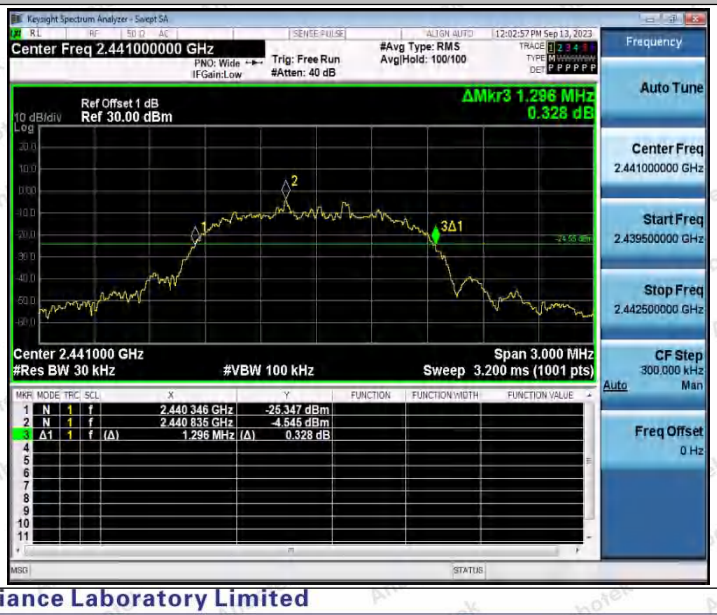


DH5_Ant1_2441

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

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.90213	2401.5486	2402.4507	---	---
		2441	0.89766	2440.5441	2441.4418	---	---
		2480	0.88712	2479.5393	2480.4264	---	---
2DH5	Ant1	2402	1.2005	2401.3838	2402.5843	---	---
		2441	1.2014	2440.3876	2441.5890	---	---
		2480	1.1922	2479.3852	2480.5774	---	---
3DH5	Ant1	2402	1.1956	2401.3961	2402.5917	---	---
		2441	1.1810	2440.3996	2441.5806	---	---
		2480	1.1876	2479.3892	2480.5768	---	---

Test Graphs

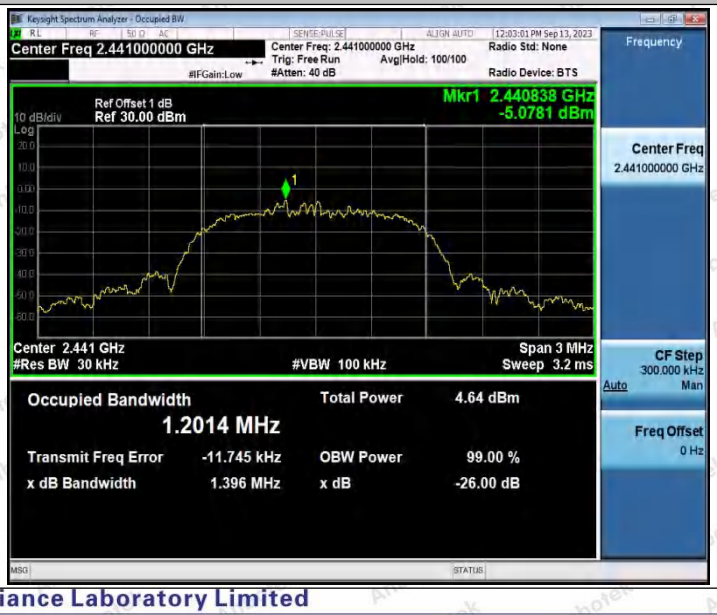
DH5_Ant1_2402

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	0.61	≤20.97	PASS
		2441	-0.22	≤20.97	PASS
		2480	-1.73	≤20.97	PASS
2DH5	Ant1	2402	0.48	≤20.97	PASS
		2441	-0.33	≤20.97	PASS
		2480	-1.81	≤20.97	PASS
3DH5	Ant1	2402	0.29	≤20.97	PASS
		2441	-0.42	≤20.97	PASS
		2480	-1.91	≤20.97	PASS

Test Graphs

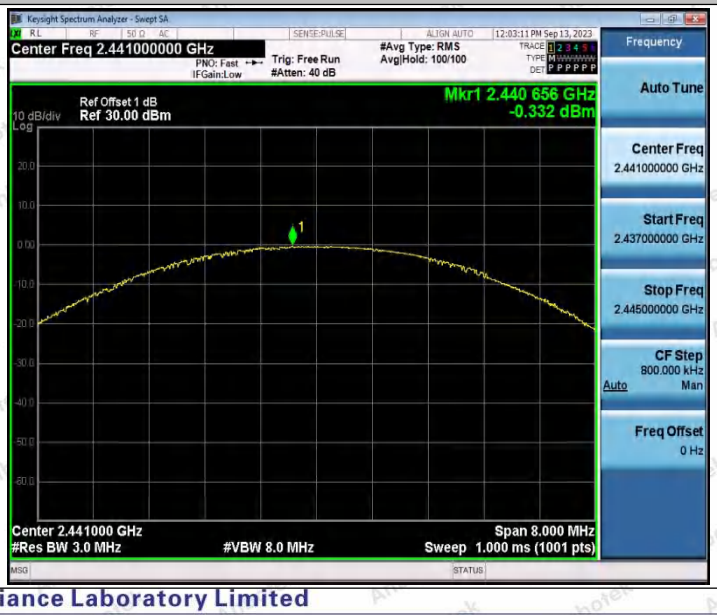
DH5_Ant1_2402

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

TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.004	≥0.708	PASS
2DH5	Ant1	Hop	1.018	≥0.896	PASS
3DH5	Ant1	Hop	0.988	≥0.868	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
12:27:17 PM Sep 13, 2023
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
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
ΔMkr2 988 kHz
-0.127 dB
Start 2.440500 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.442500 GHz
Sweep 1.000 ms (1001 pts)

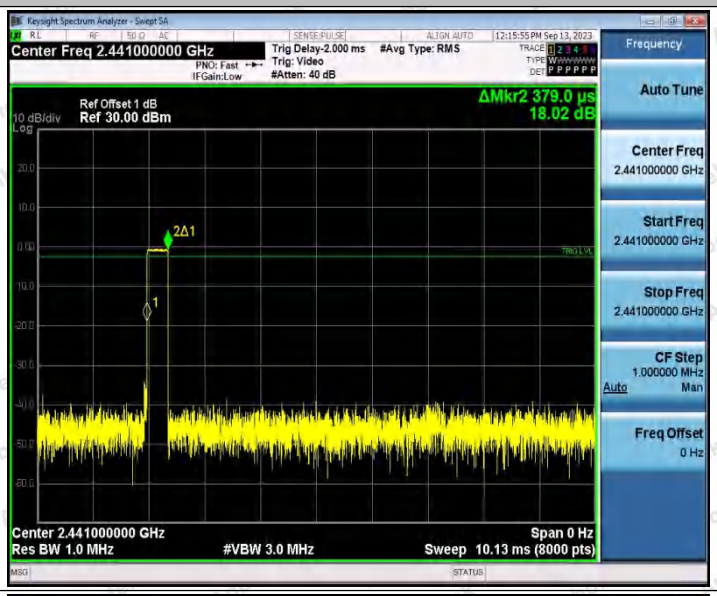
Appendix E: Time of occupancy

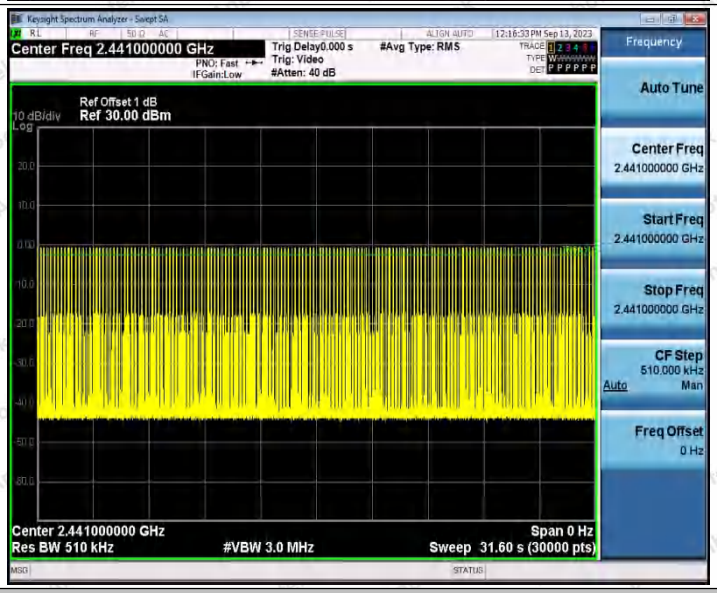
Test Result

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.379	313	0.119	≤0.4	PASS
DH3	Ant1	Hop	1.643	173	0.284	≤0.4	PASS
DH5	Ant1	Hop	2.891	104	0.301	≤0.4	PASS
2DH1	Ant1	Hop	0.386	310	0.12	≤0.4	PASS
2DH3	Ant1	Hop	1.638	172	0.282	≤0.4	PASS
2DH5	Ant1	Hop	2.885	107	0.309	≤0.4	PASS
3DH1	Ant1	Hop	0.386	310	0.12	≤0.4	PASS
3DH3	Ant1	Hop	1.635	172	0.281	≤0.4	PASS
3DH5	Ant1	Hop	2.887	109	0.315	≤0.4	PASS

Test Graphs

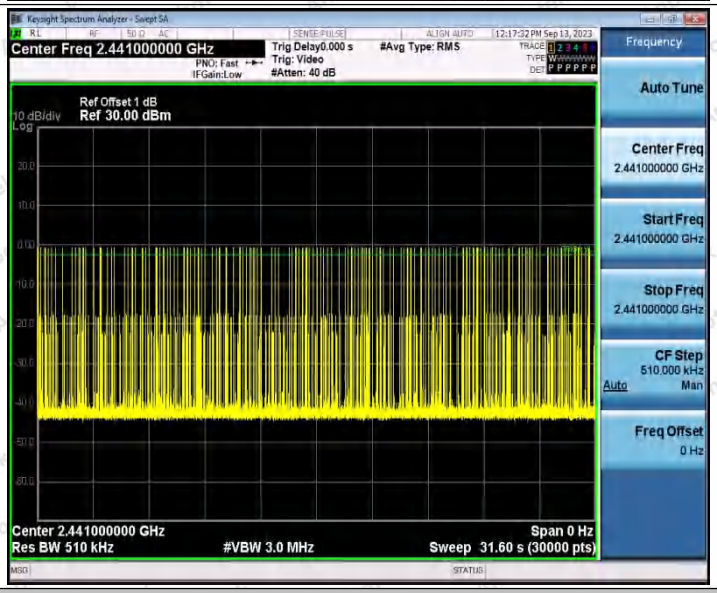
DH1_Ant1_Hop



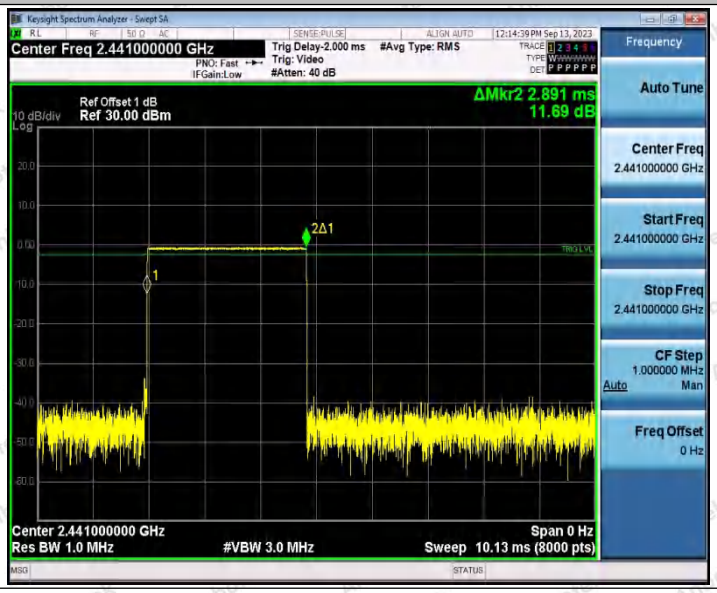


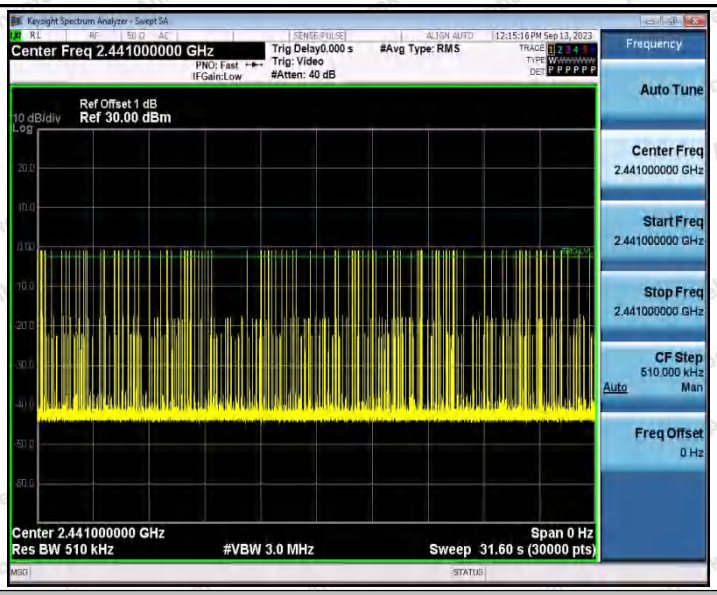
DH3_Ant1_Hop

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
12:16:55 PM Sep 13, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.643 ms
19.00 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

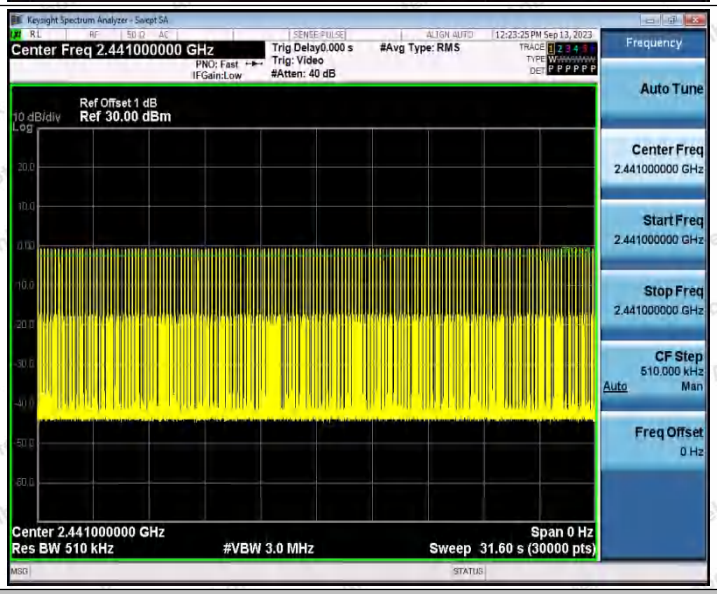

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
12:17:32 PM Sep 13, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)
Frequency
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

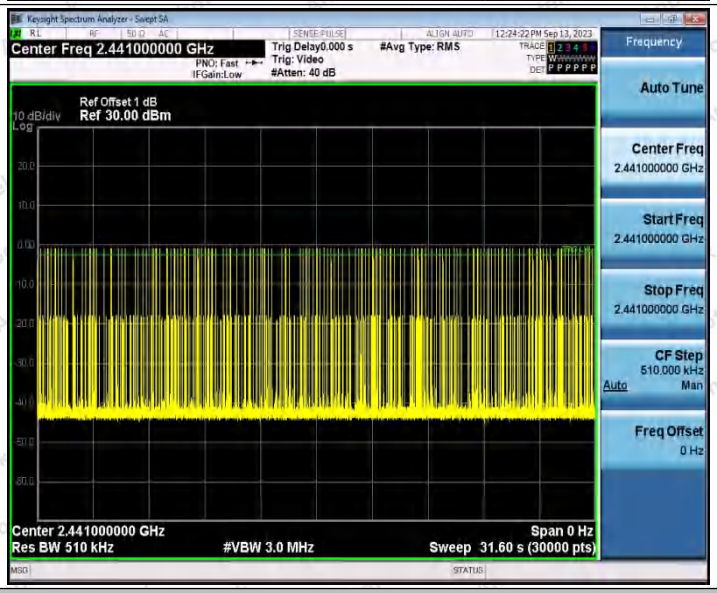

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
12:14:39 PM Sep 13, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.891 ms
11.69 dB
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 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



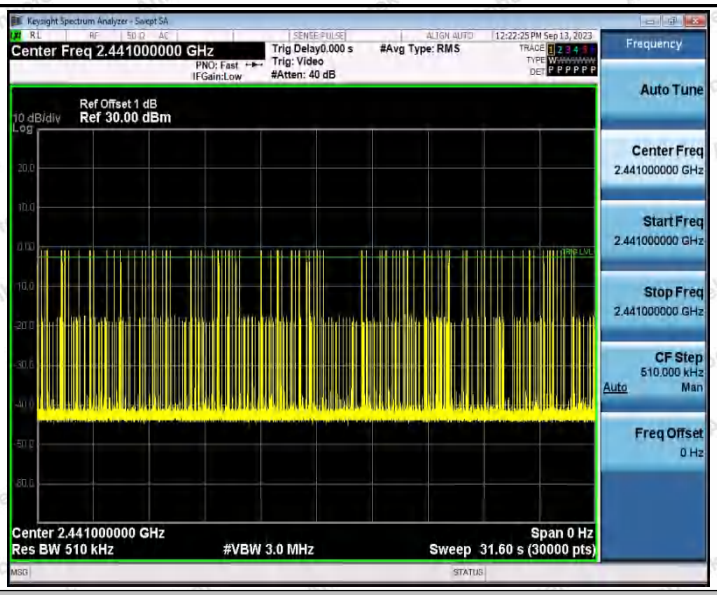
2DH1_Ant1_Hop



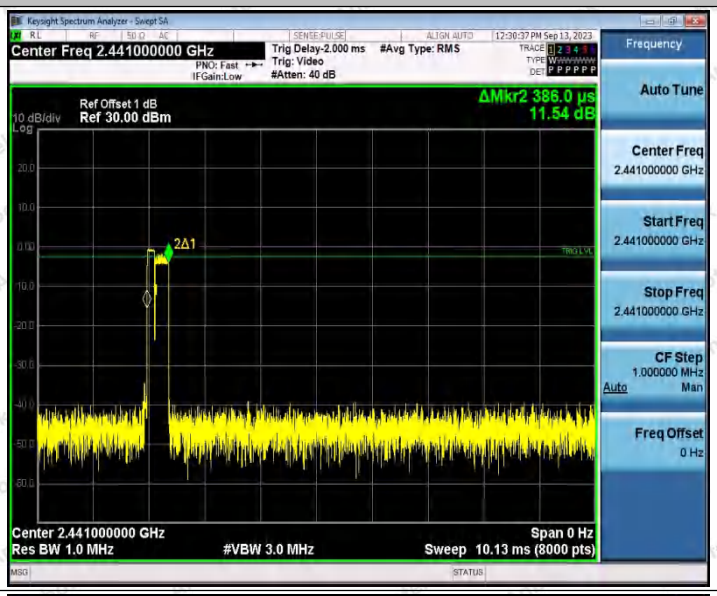
2DH3_Ant1_Hop

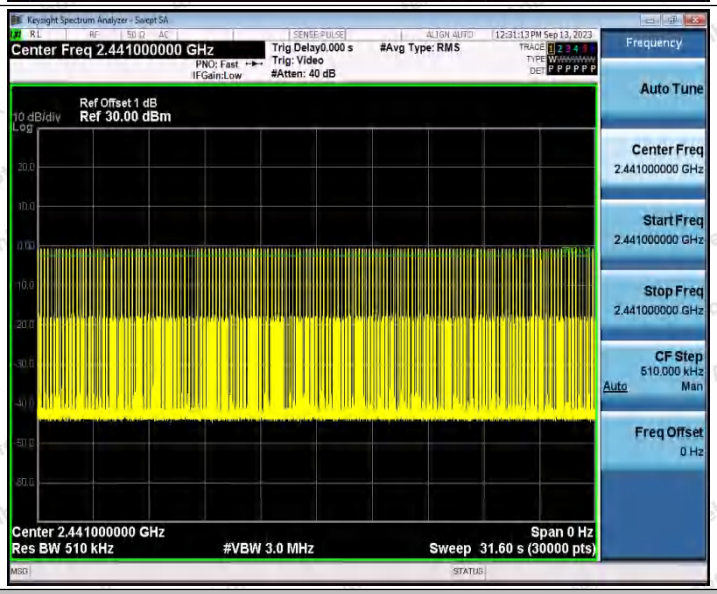


2DH5_Ant1_Hop

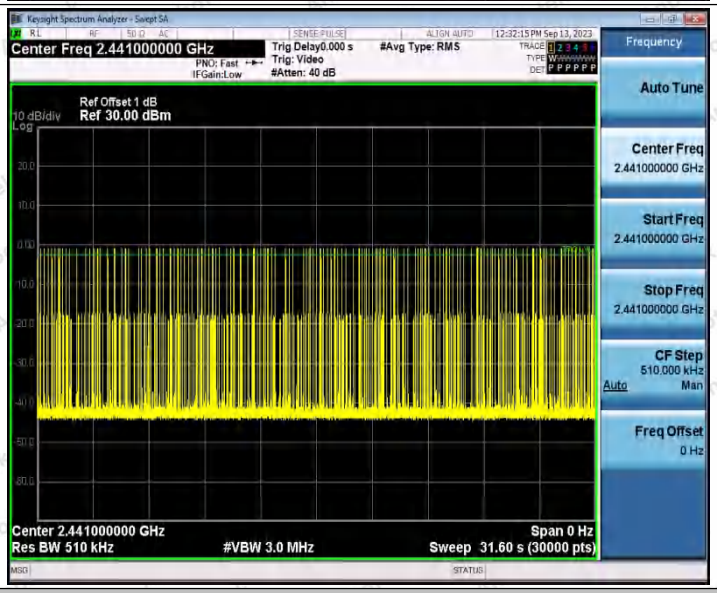


3DH1_Ant1_Hop

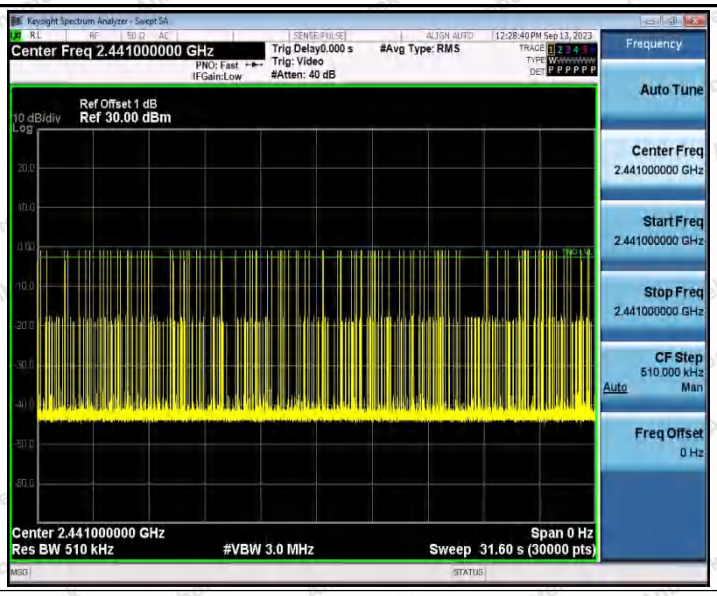




3DH3_Ant1_Hop



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
12:28:40 PM Sep 13, 2023
Frequency
Auto Tune
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
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
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

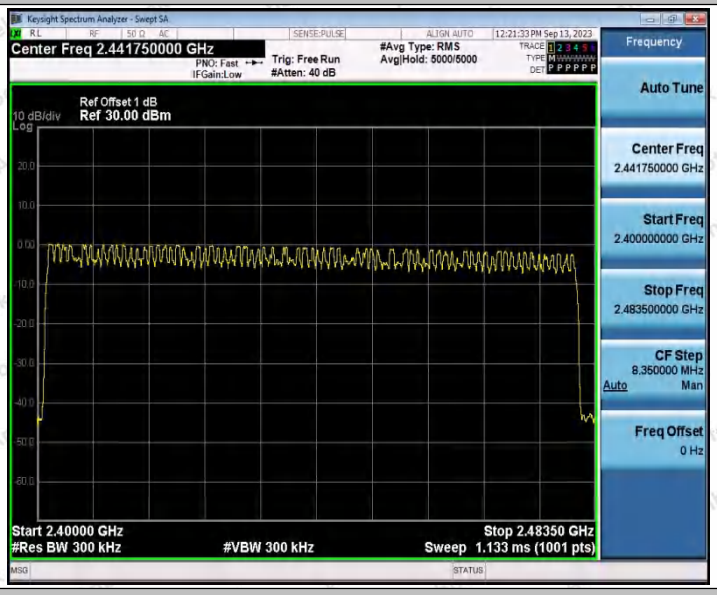
Test Result

TestMode	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

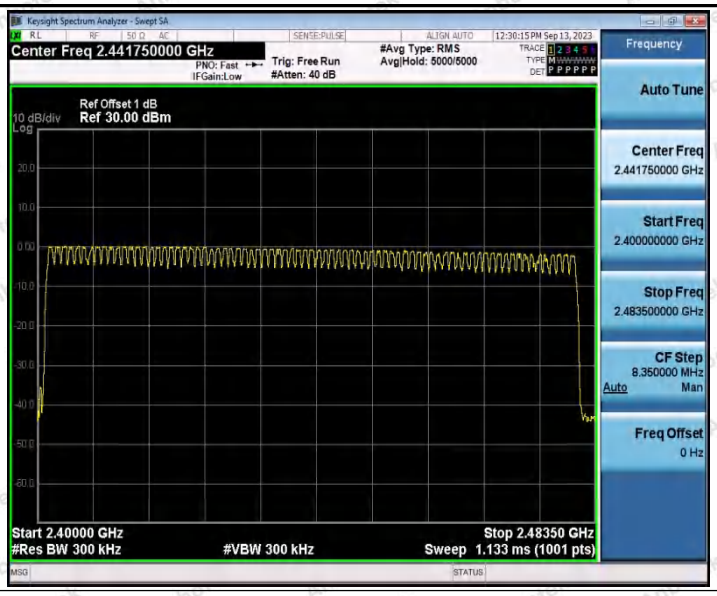
Test Graphs

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
12:30:15 PM Sep 13, 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

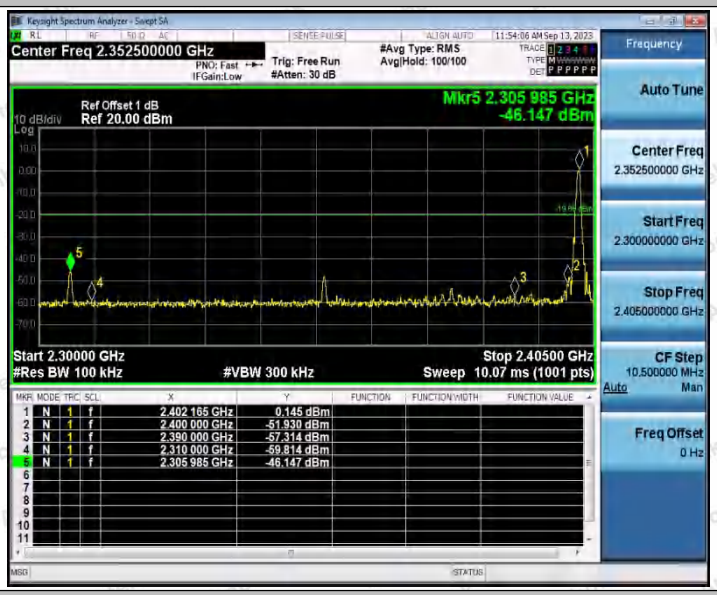
Appendix G: Band edge measurements

Test Result

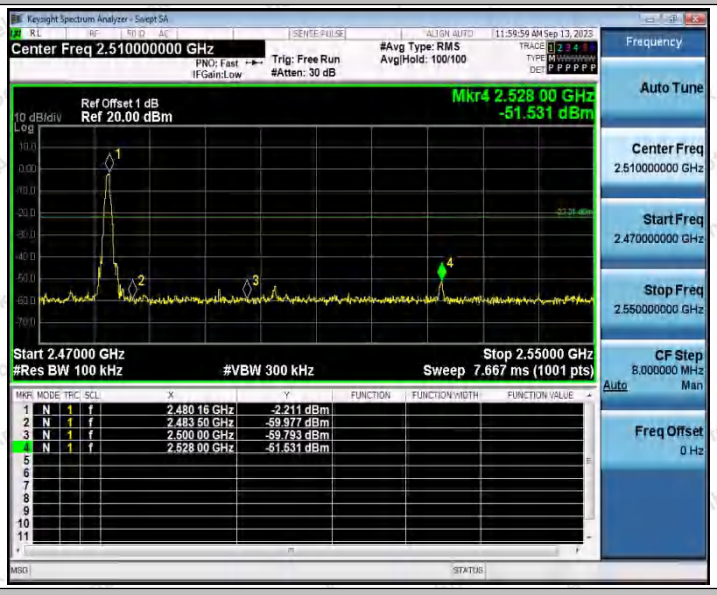
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	0.15	-46.15	≤-19.86	PASS
		High	2480	-2.21	-51.53	≤-22.21	PASS
		Low	Hop_2402	0.19	-45.56	≤-19.81	PASS
		High	Hop_2480	-1.69	-44.8	≤-21.69	PASS
2DH5	Ant1	Low	2402	-0.05	-48.81	≤-20.05	PASS
		High	2480	-2.71	-51.72	≤-22.71	PASS
		Low	Hop_2402	-5.13	-46.59	≤-25.13	PASS
		High	Hop_2480	-3.06	-46.8	≤-23.06	PASS
3DH5	Ant1	Low	2402	0.13	-47.31	≤-19.87	PASS
		High	2480	-2.07	-53.22	≤-22.07	PASS
		Low	Hop_2402	-5.38	-46.07	≤-25.38	PASS
		High	Hop_2480	-2.30	-45.29	≤-22.3	PASS

Test Graphs

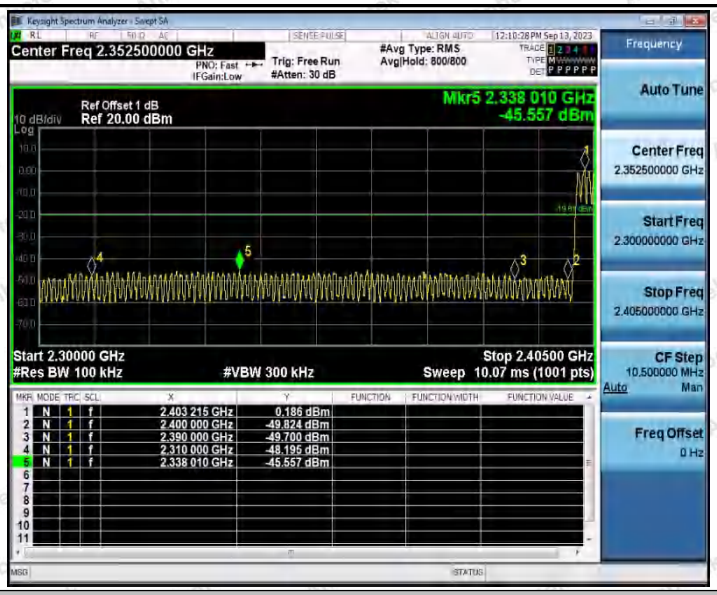
DH5_Ant1_Low_2402



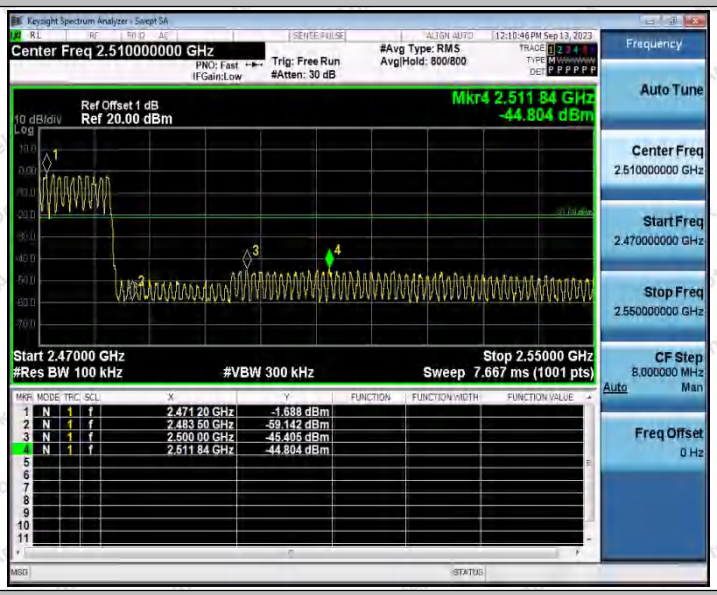
DH5_Ant1_High_2480



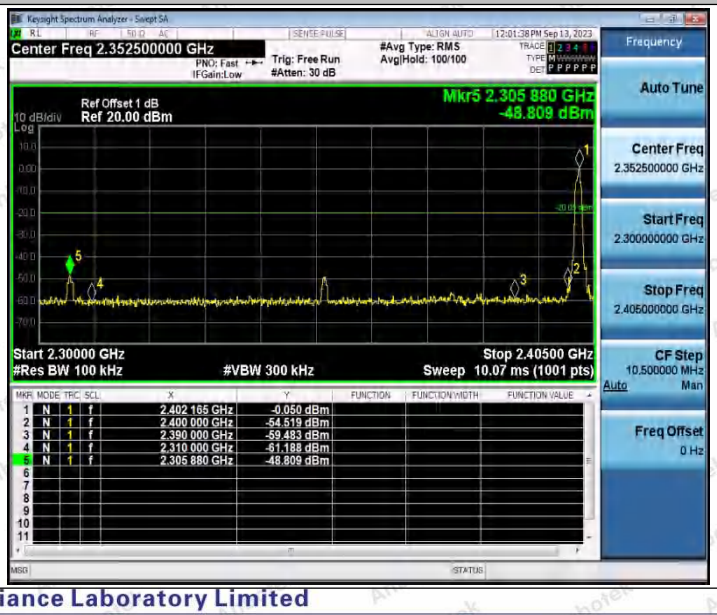
DH5_Ant1_Low_Hop_2402



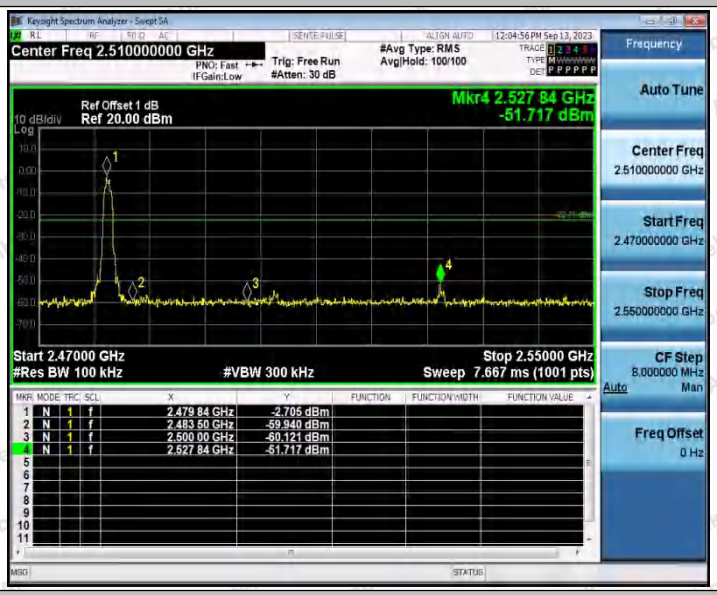
DH5_Ant1_High_Hop_2480



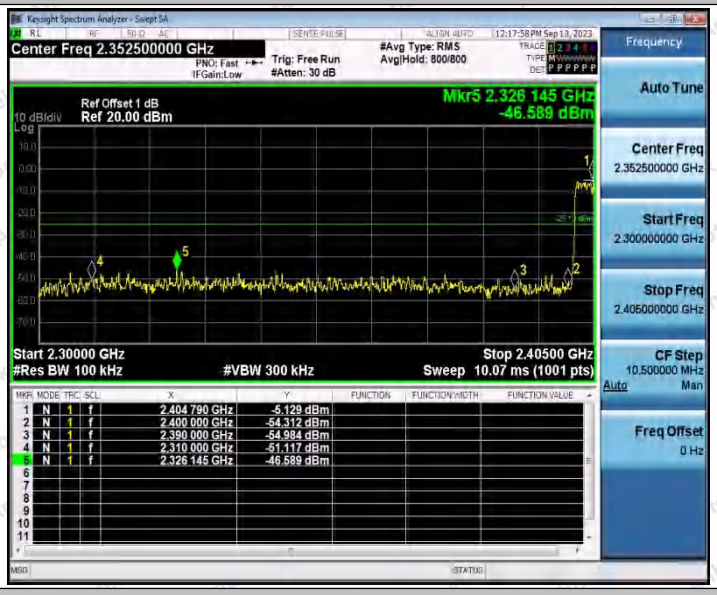
2DH5_Ant1_Low_2402



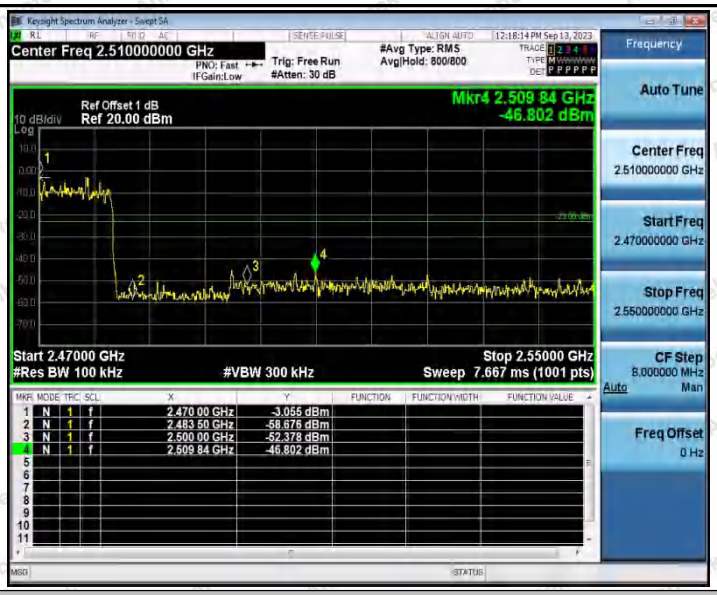
2DH5_Ant1_High_2480



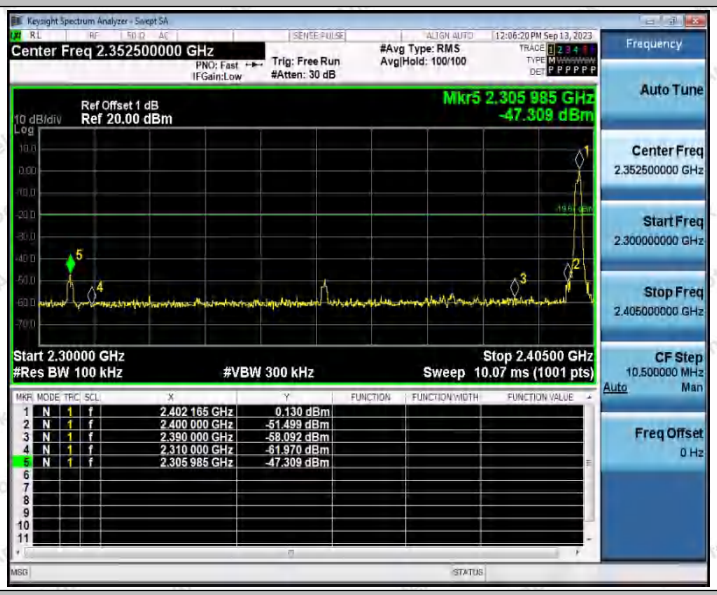
2DH5_Ant1_Low_Hop_2402



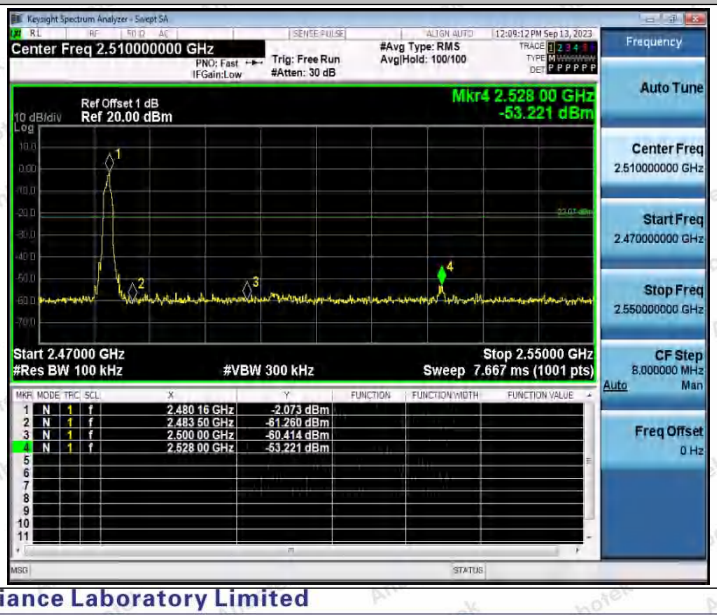
2DH5_Ant1_High_Hop_2480



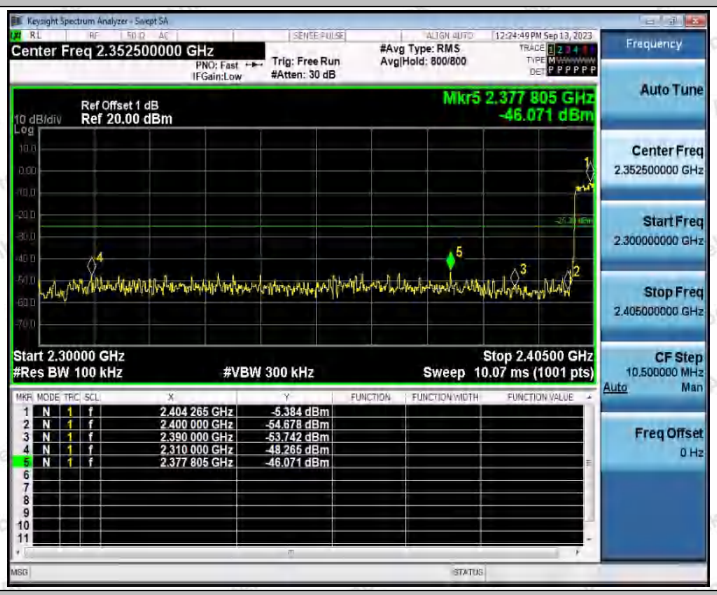
3DH5_Ant1_Low_2402



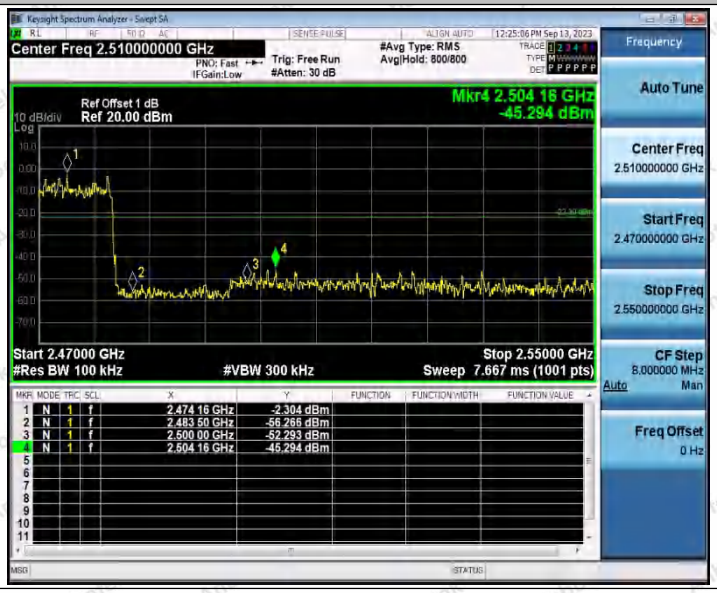
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

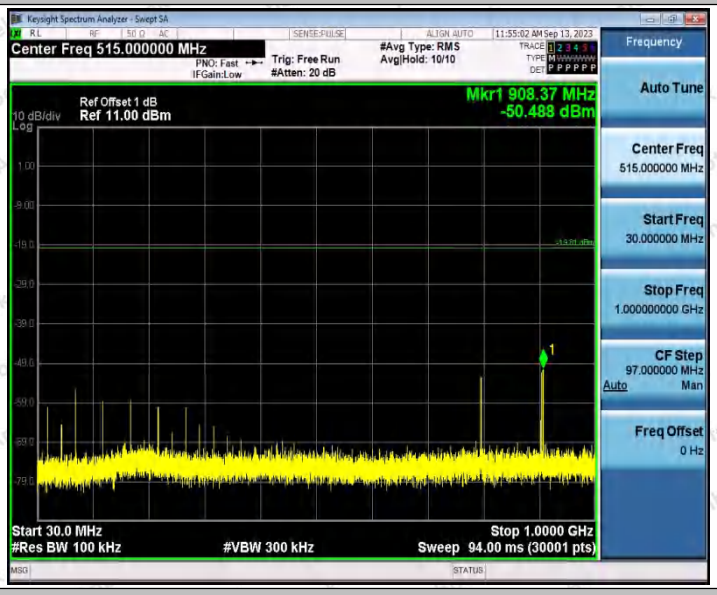
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	0.19	0.19	---	PASS
			30~1000	0.19	-50.49	≤-19.81	PASS
			1000~26500	0.19	-45.94	≤-19.81	PASS
		2441	Reference	-1.49	-1.49	---	PASS
			30~1000	-1.49	-45.26	≤-21.49	PASS
			1000~26500	-1.49	-47.11	≤-21.49	PASS
		2480	Reference	-2.00	-2.00	---	PASS
			30~1000	-2.00	-53.3	≤-22	PASS
			1000~26500	-2.00	-47.24	≤-22	PASS
2DH5	Ant1	2402	Reference	-5.49	-5.49	---	PASS
			30~1000	-5.49	-45.52	≤-25.49	PASS
			1000~26500	-5.49	-47.56	≤-25.49	PASS
		2441	Reference	-1.34	-1.34	---	PASS
			30~1000	-1.34	-54.09	≤-21.34	PASS
			1000~26500	-1.34	-48.32	≤-21.34	PASS
		2480	Reference	-3.00	-3.00	---	PASS
			30~1000	-3.00	-55.62	≤-23	PASS
			1000~26500	-3.00	-48.15	≤-23	PASS
3DH5	Ant1	2402	Reference	-1.04	-1.04	---	PASS
			30~1000	-1.04	-54.17	≤-21.04	PASS
			1000~26500	-1.04	-47.7	≤-21.04	PASS
		2441	Reference	-3.27	-3.27	---	PASS
			30~1000	-3.27	-53.59	≤-23.27	PASS
			1000~26500	-3.27	-46.61	≤-23.27	PASS
		2480	Reference	-3.20	-3.20	---	PASS
			30~1000	-3.20	-46.22	≤-23.2	PASS
			1000~26500	-3.20	-48.38	≤-23.2	PASS

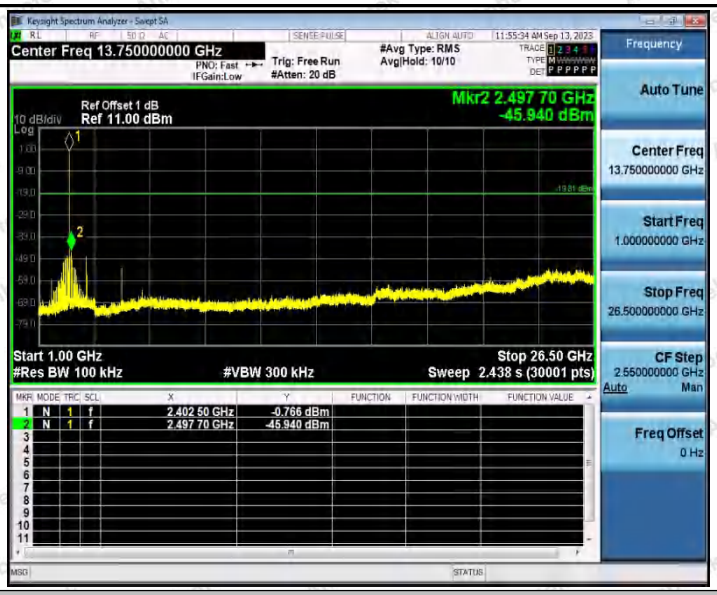
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

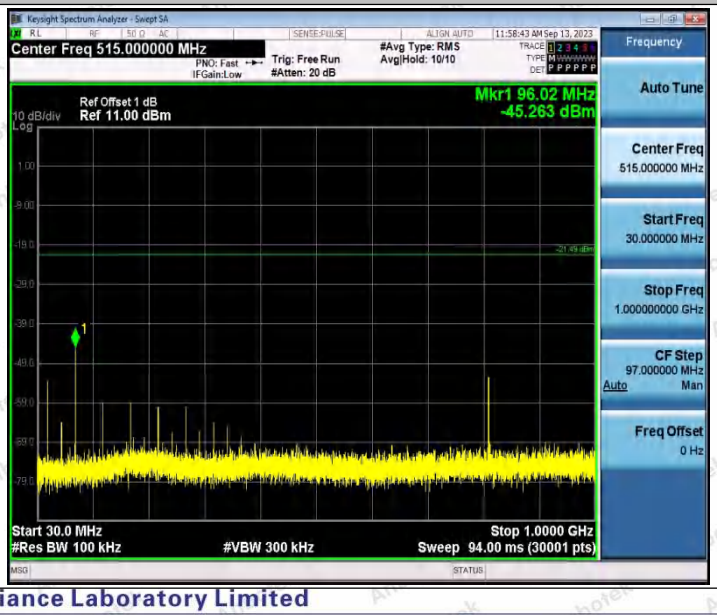


DH5_Ant1_2402_1000~26500

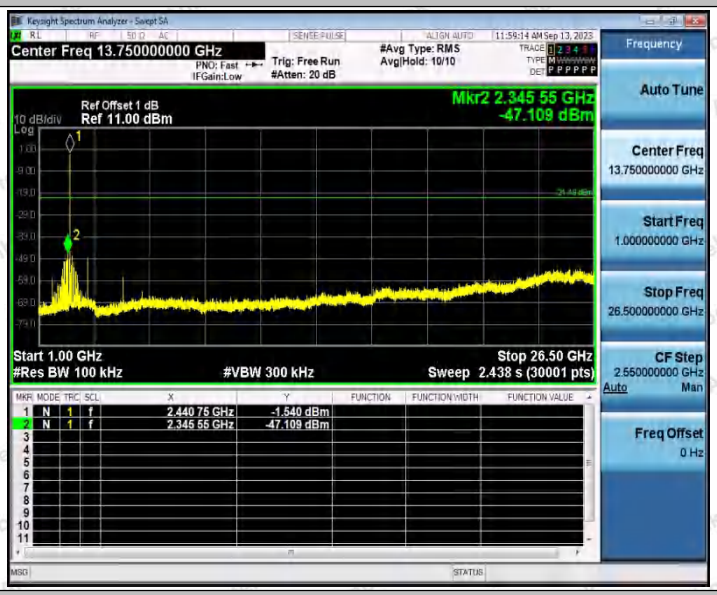


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

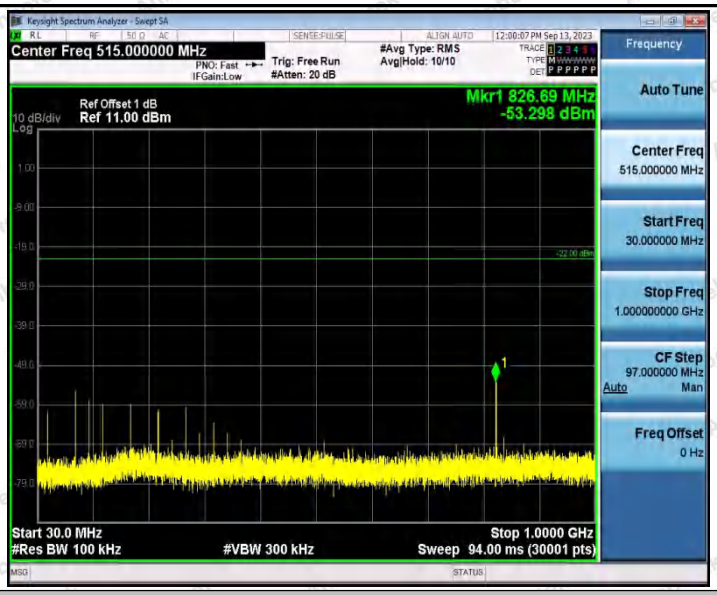


DH5_Ant1_2441_1000~26500

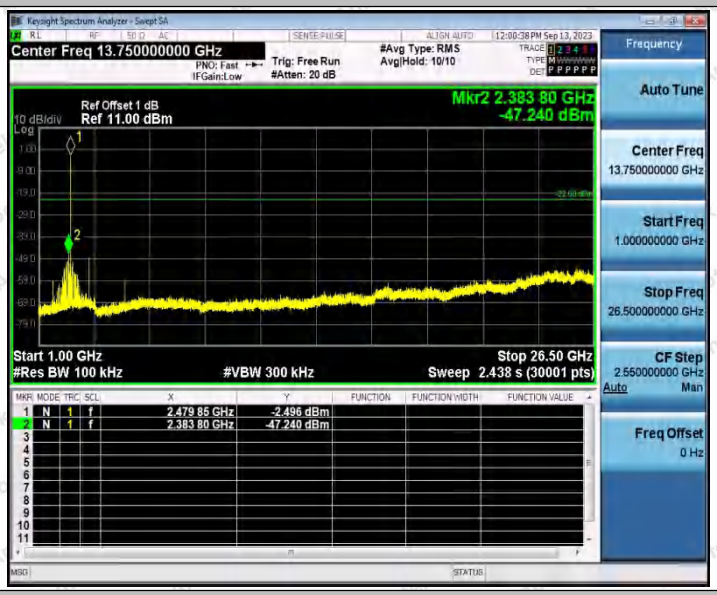


DH5_Ant1_2480_0~Reference

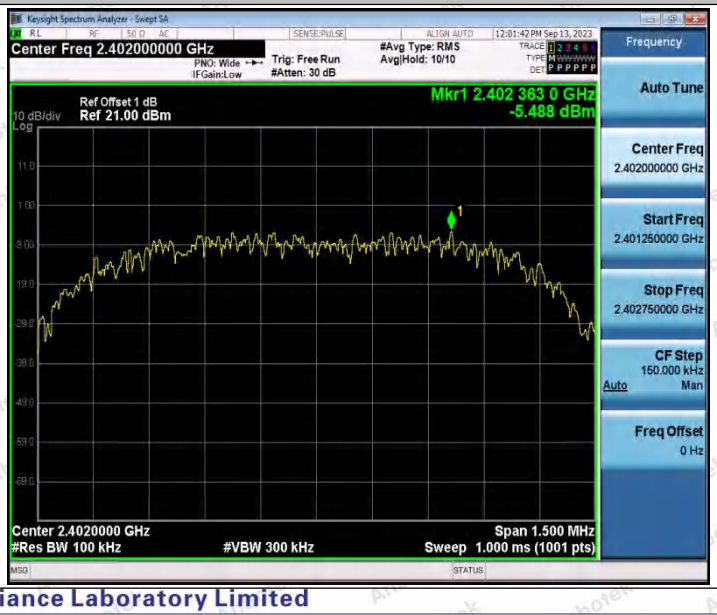
DH5_Ant1_2480_30~1000



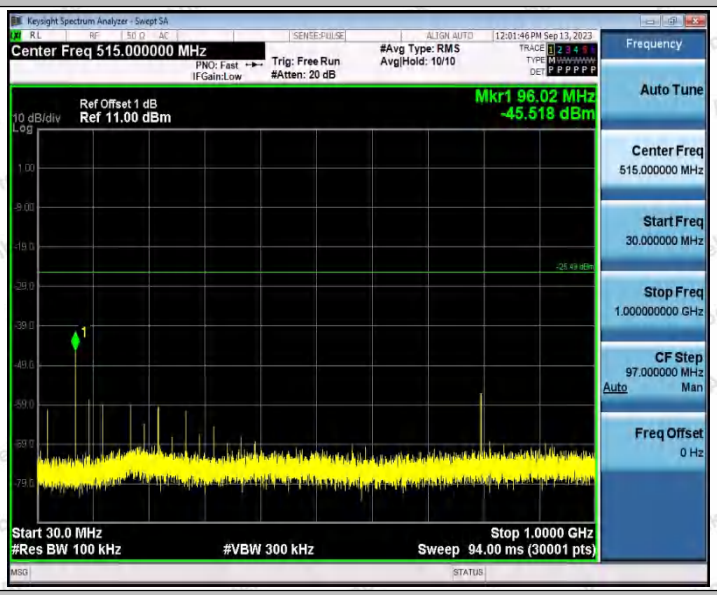
DH5_Ant1_2480_1000~26500



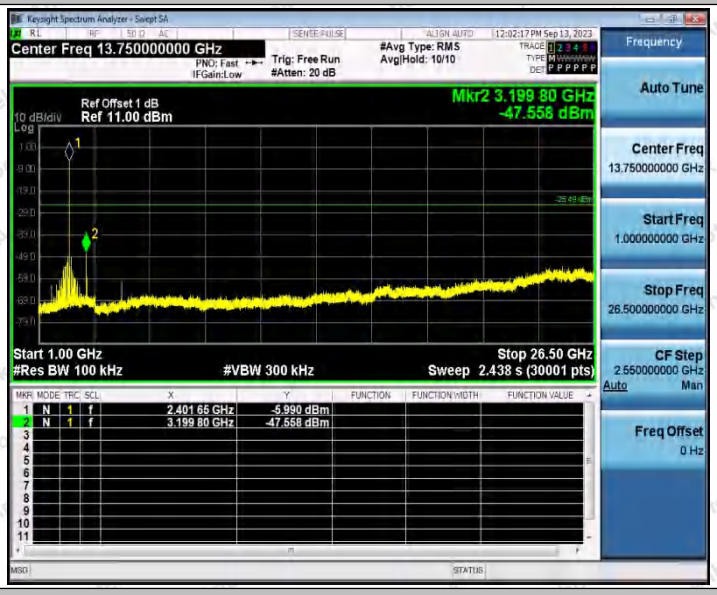
2DH5_Ant1_2402_0~Reference



2DH5_Ant1_2402_30~1000



2DH5_Ant1_2402_1000~26500



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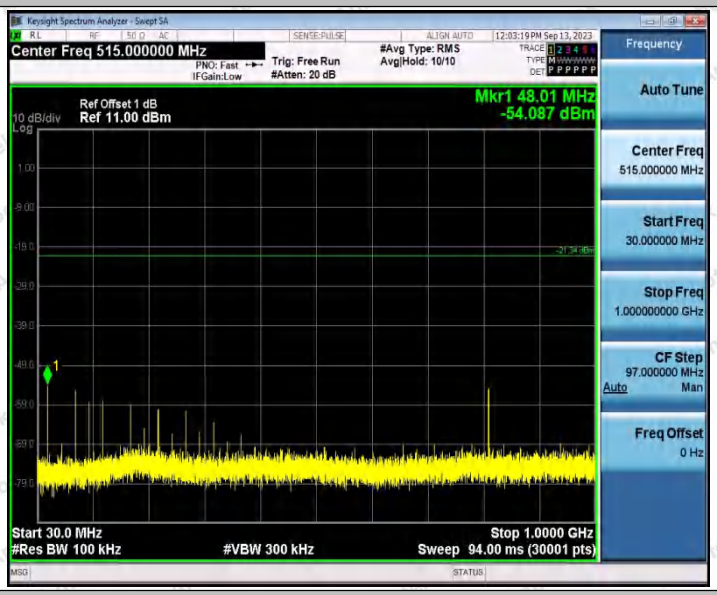
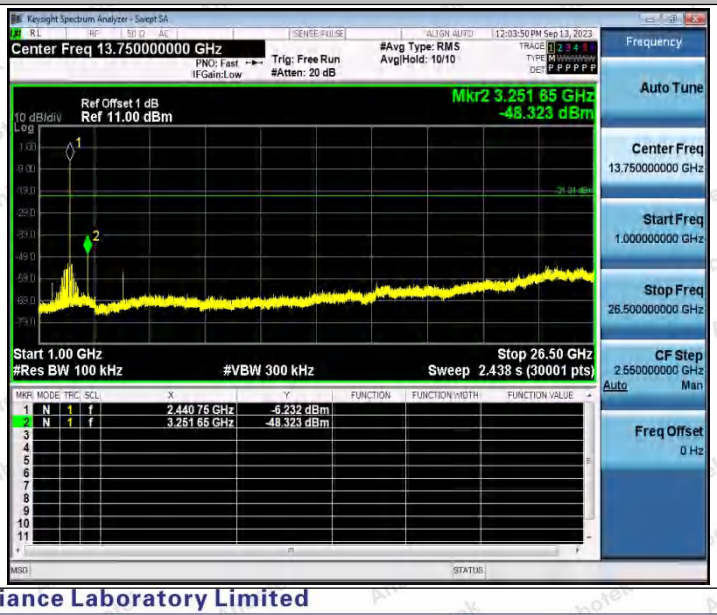
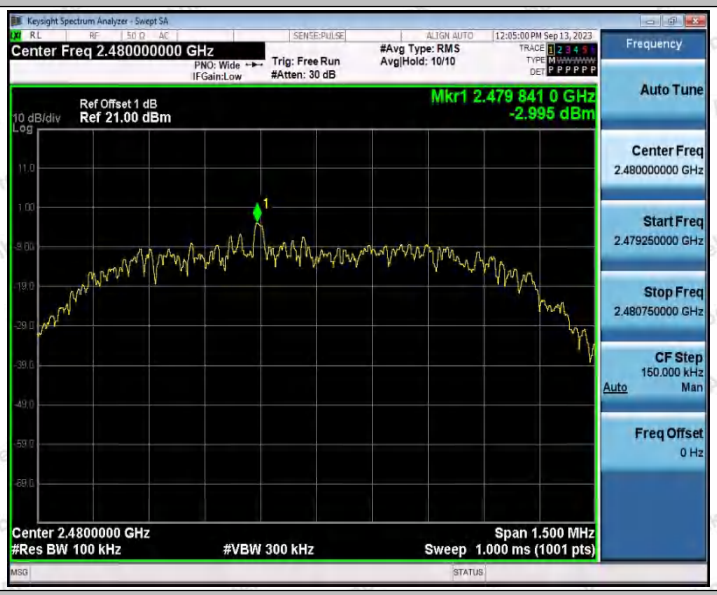
2DH5_Ant1_2441_30~1000



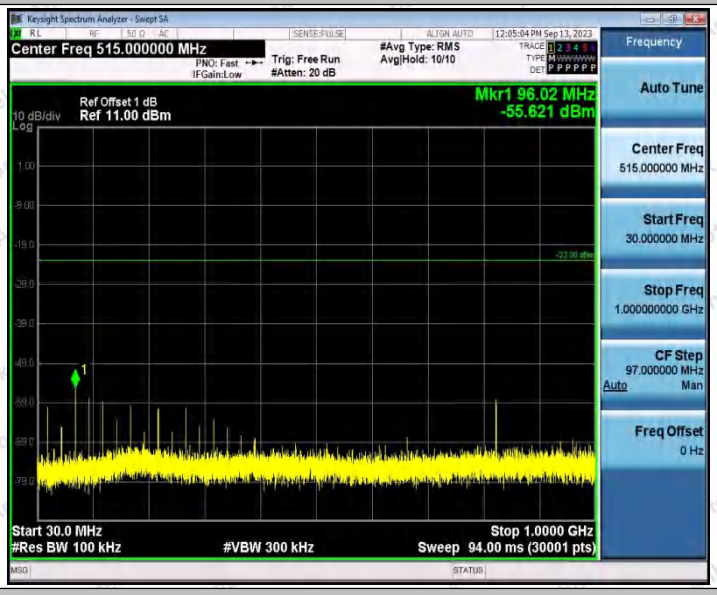
2DH5_Ant1_2441_1000~26500



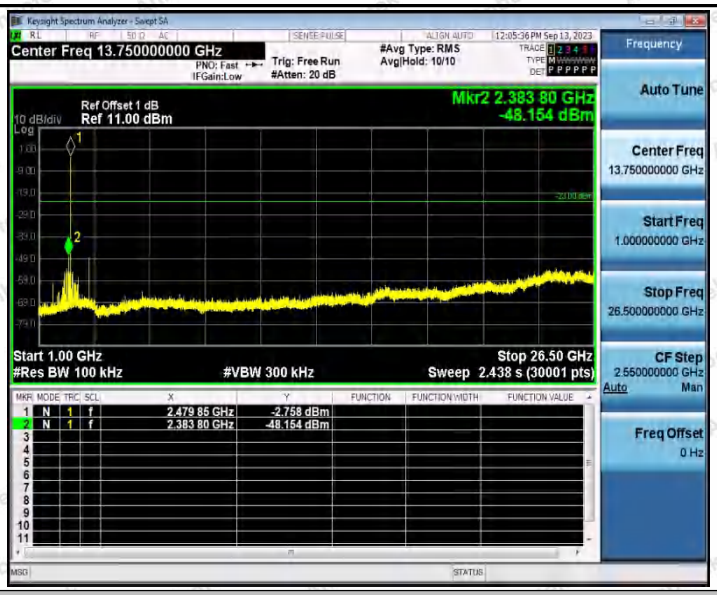
2DH5_Ant1_2480_0~Reference



2DH5_Ant1_2480_30~1000

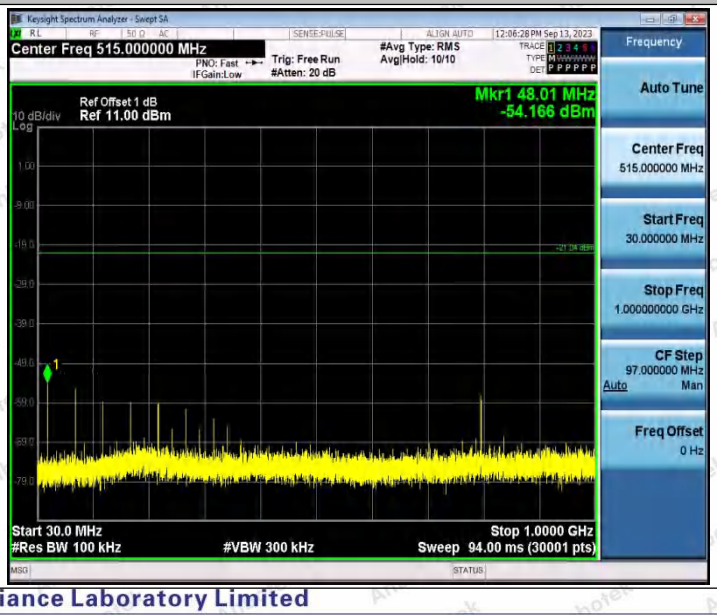


2DH5_Ant1_2480_1000~26500

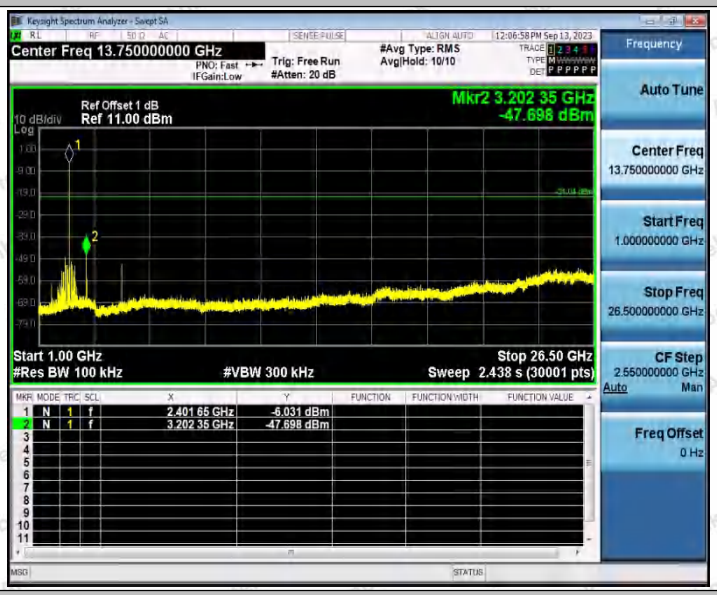


3DH5_Ant1_2402_0~Reference

3DH5_Ant1_2402_30~1000

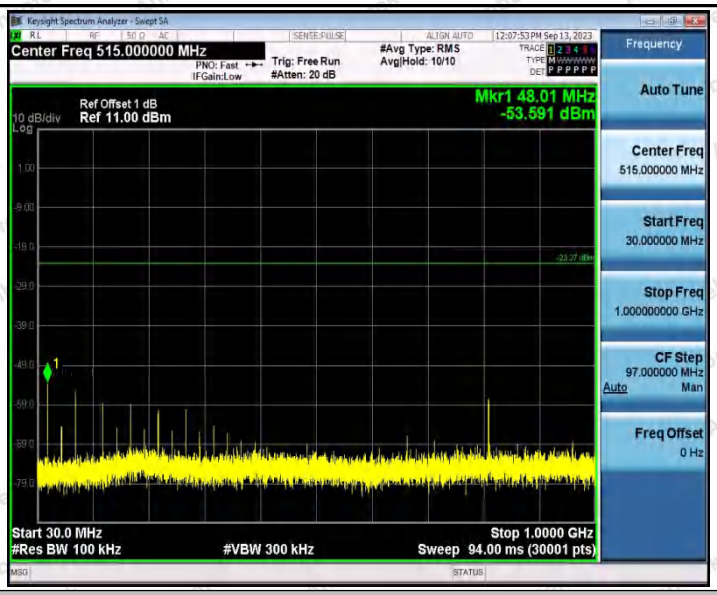


3DH5_Ant1_2402_1000~26500

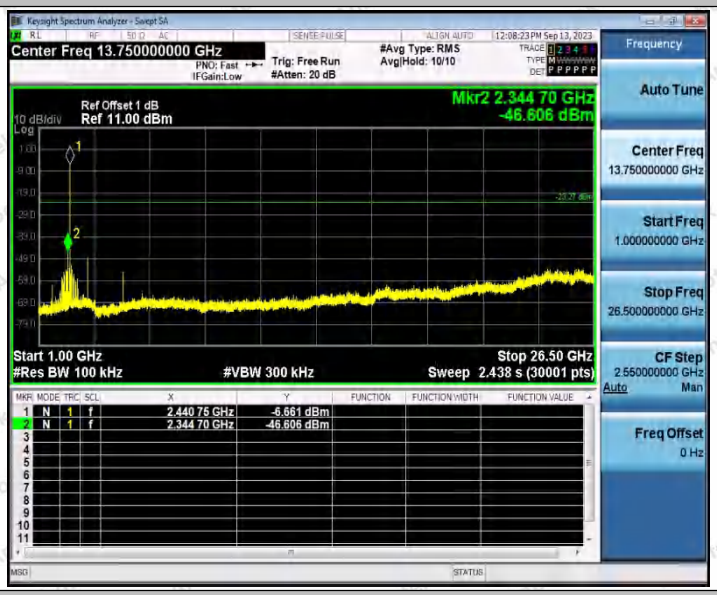


3DH5_Ant1_2441_0~Reference

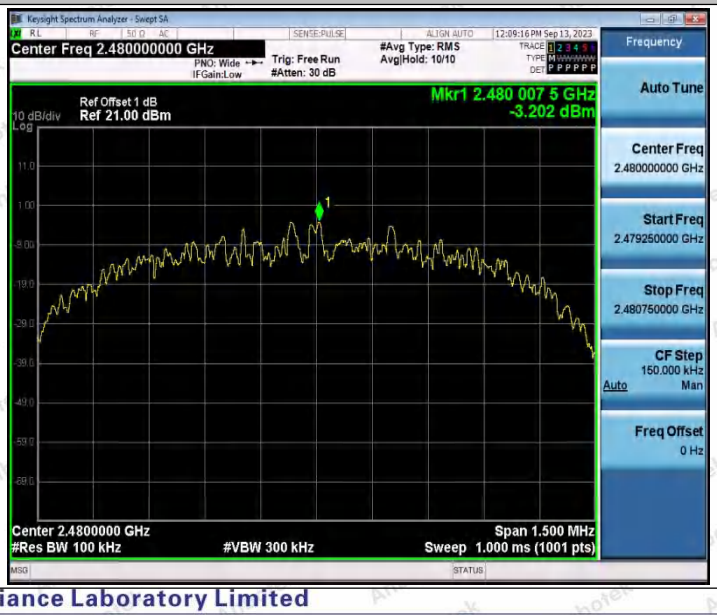
3DH5_Ant1_2441_30~1000



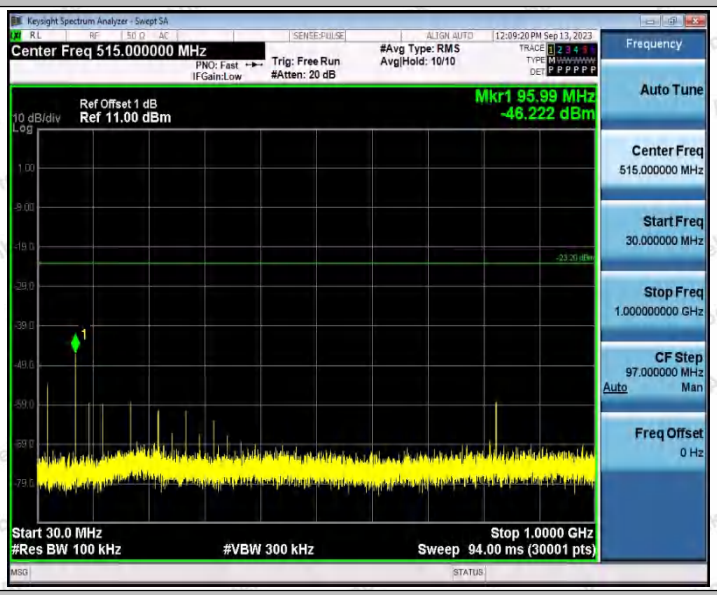
3DH5_Ant1_2441_1000~26500



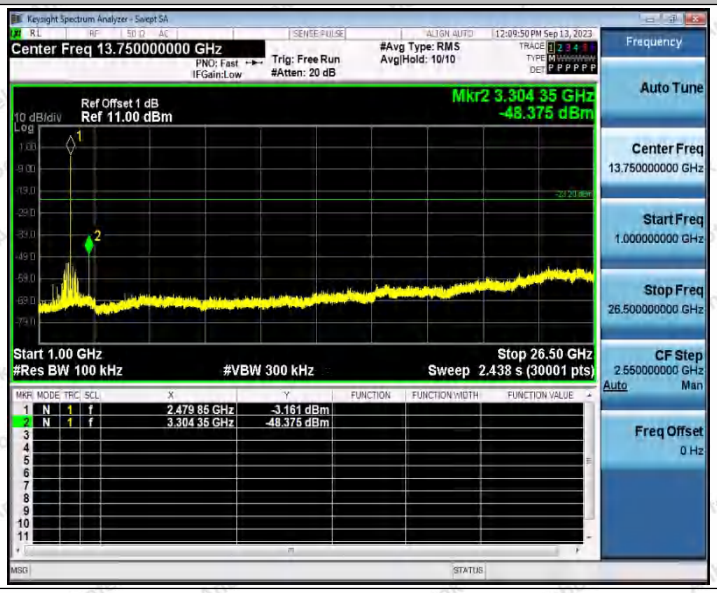
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



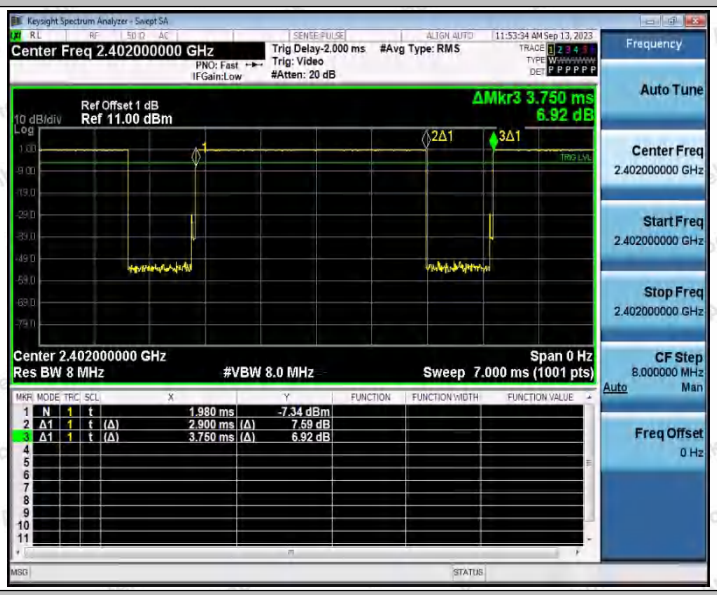
Appendix I: Duty Cycle

Test Result

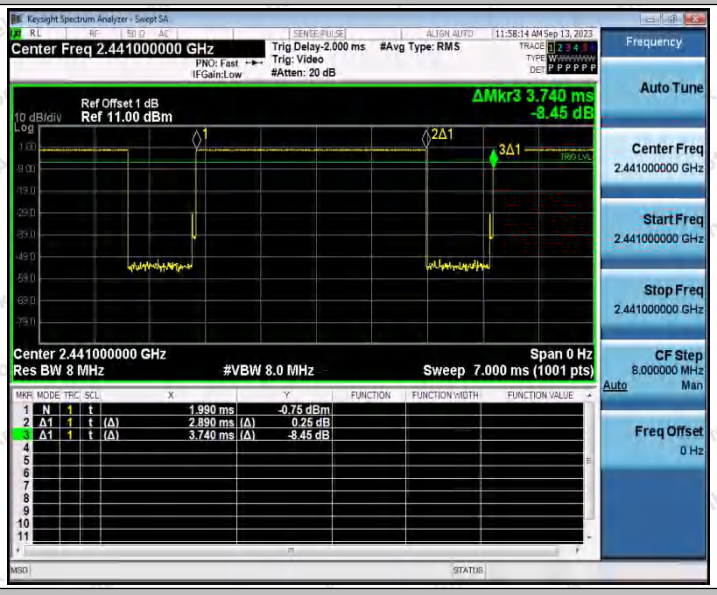
TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
DH5	Ant1	2402	2.90	3.75	77.33	1.12
		2441	2.89	3.74	77.27	1.12
		2480	2.89	3.74	77.27	1.12
2DH5	Ant1	2402	2.89	3.75	77.07	1.13
		2441	2.89	3.75	77.07	1.13
		2480	2.89	3.75	77.07	1.13
3DH5	Ant1	2402	2.89	3.75	77.07	1.13
		2441	2.89	3.75	77.07	1.13
		2480	2.88	3.75	76.80	1.15

Test Graphs

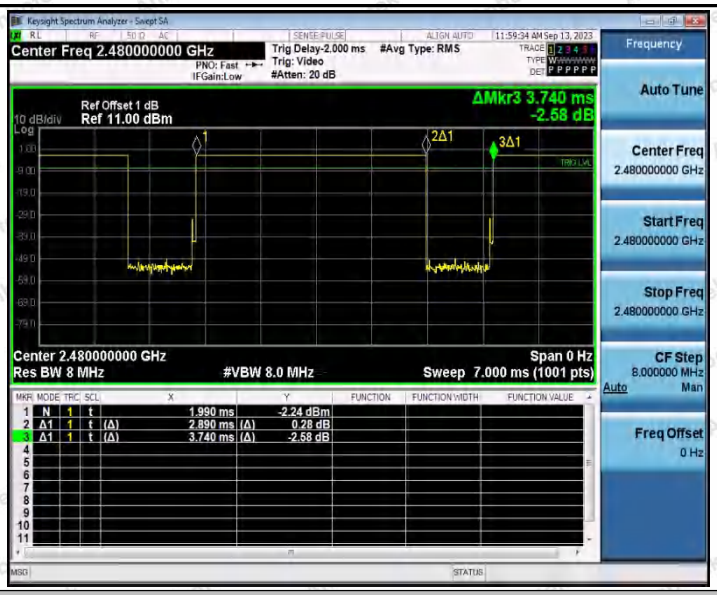
DH5_Ant1_2402



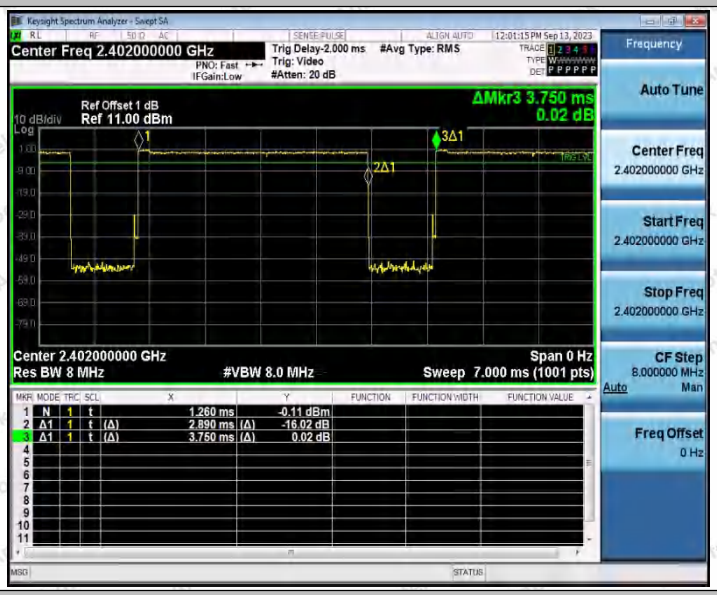
DH5_Ant1_2441



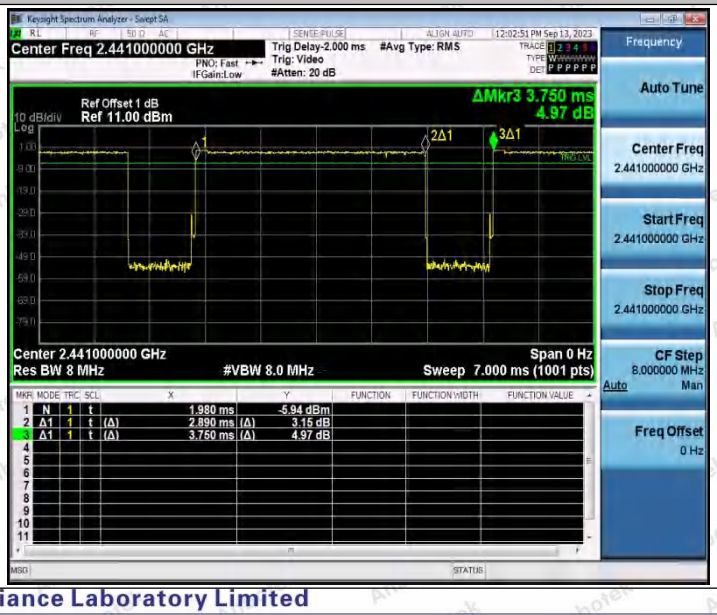
DH5_Ant1_2480



2DH5_Ant1_2402

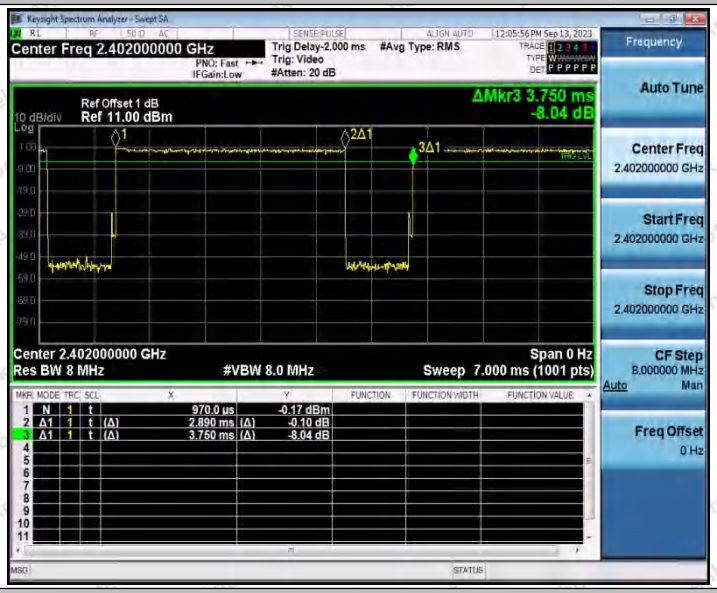


2DH5_Ant1_2441

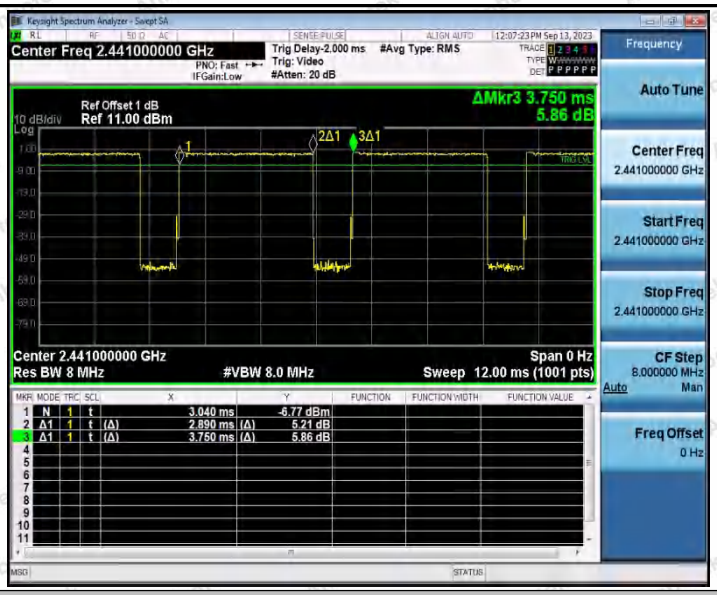


2DH5_Ant1_2480

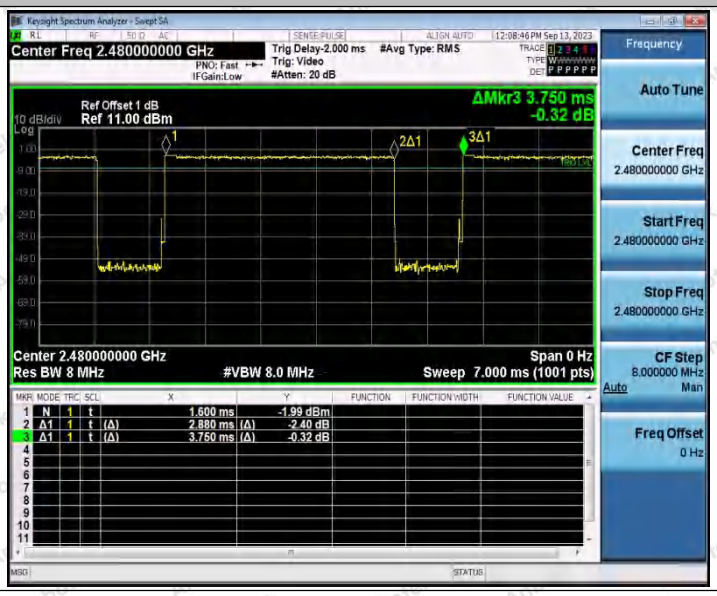
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



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