Appendix Test Data

Report No.:	18220WC10229201	Test Date:	2021.10.20
Test Engineer:	Tony.He	Auditor:	Edward.Pan
Temperature:	24.3℃	Relative Humidity:	57 %
Pressure:	1012 hPa		

Appendix A: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.777	2401.583	2402.360	---	PASS
		2441	0.855	2440.508	2441.363	---	PASS
		2480	0.846	2479.505	2480.351	---	PASS
2DH5	Ant1	2402	1.293	2401.313	2402.606	---	PASS
		2441	1.293	2440.313	2441.606	---	PASS
		2480	1.296	2479.310	2480.606	---	PASS
3DH5	Ant1	2402	1.284	2401.316	2402.600	---	PASS
		2441	1.281	2440.319	2441.600	---	PASS
		2480	1.281	2479.319	2480.600	---	PASS

Test Graphs

DH5_Ant1_2402

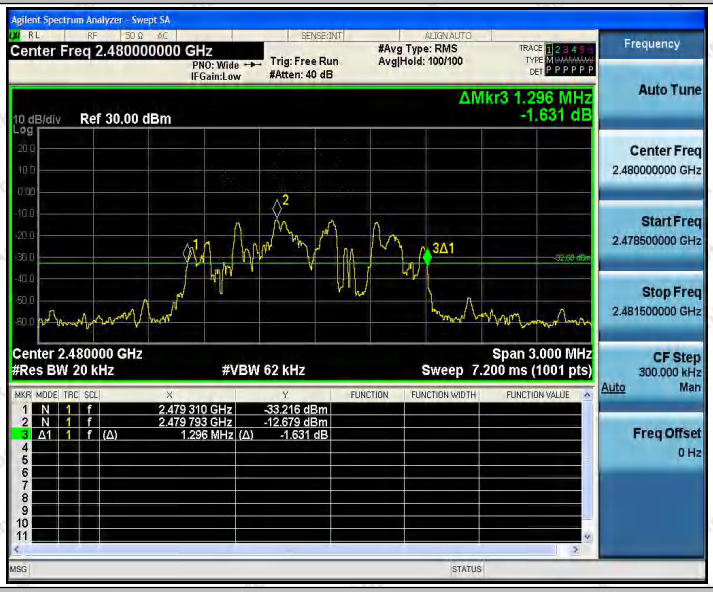
DH5_Ant1_2441

DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441

2DH5_Ant1_2480



3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480

Appendix B: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.74743	2401.582	2402.329	---	PASS
		2441	0.75473	2440.550	2441.305	---	PASS
		2480	0.69669	2479.590	2480.287	---	PASS
2DH5	Ant1	2402	1.2333	2401.343	2402.576	---	PASS
		2441	1.2371	2440.341	2441.578	---	PASS
		2480	1.2393	2479.340	2480.579	---	PASS
3DH5	Ant1	2402	1.1687	2401.373	2402.542	---	PASS
		2441	1.1707	2440.371	2441.542	---	PASS
		2480	1.1880	2479.359	2480.547	---	PASS

Test Graphs

DH5_Ant1_2402

DH5_Ant1_2441

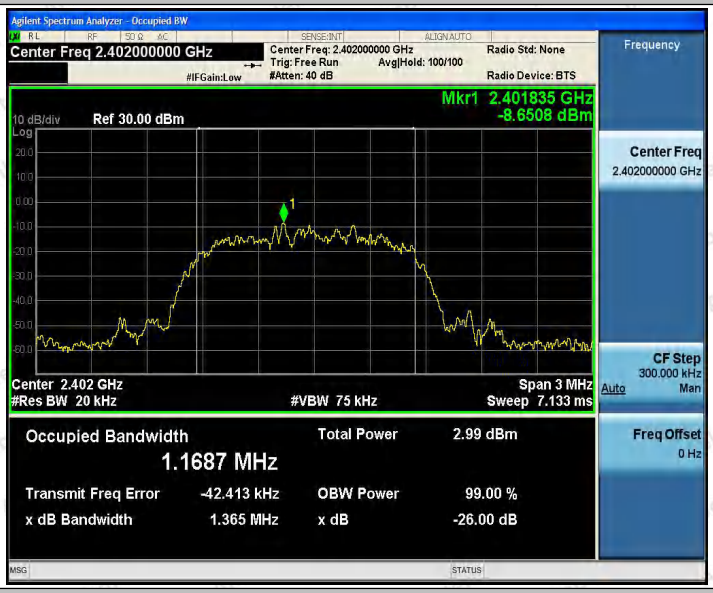
DH5_Ant1_2480

2DH5_Ant1_2402

2DH5_Ant1_2441

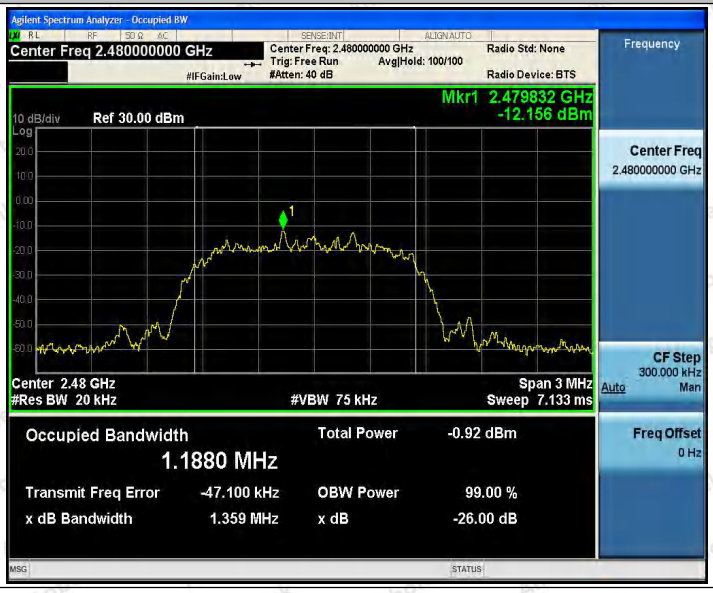
2DH5_Ant1_2480

3DH5_Ant1_2402



3DH5_Ant1_2441

3DH5_Ant1_2480



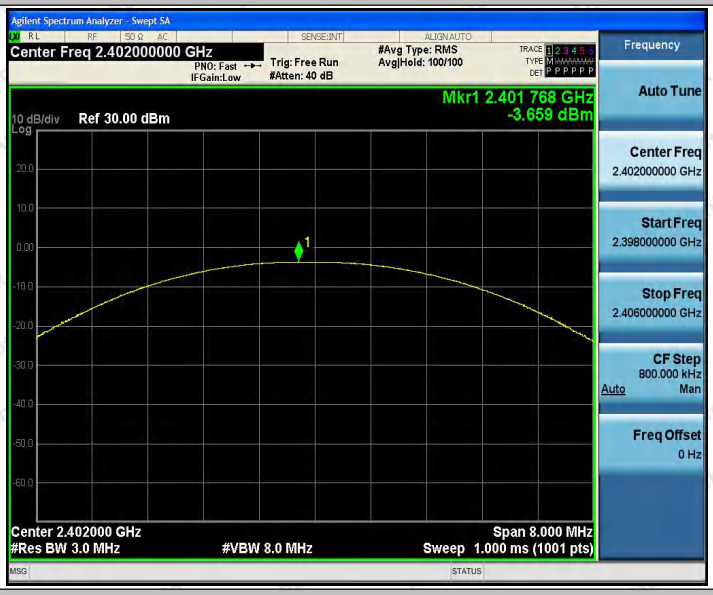
Appendix C: Maximum conducted output power

Test Result

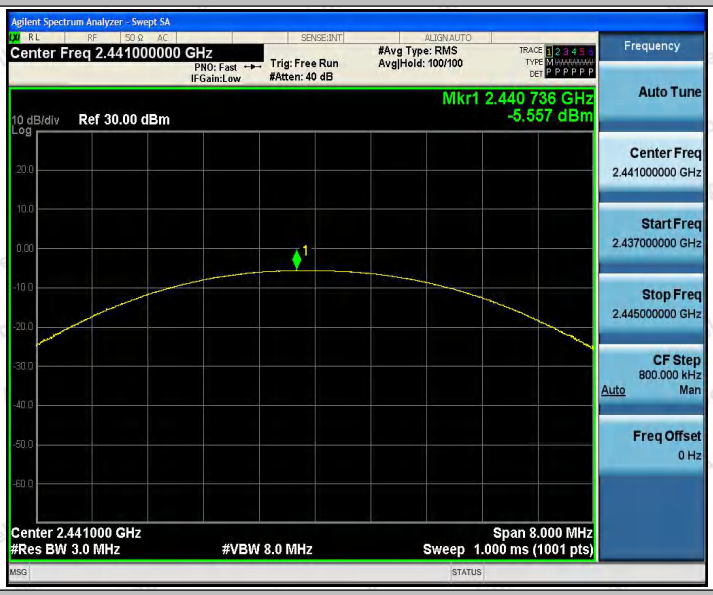
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	-3.66	≤20.97	PASS
		2441	-5.56	≤20.97	PASS
		2480	-6.95	≤20.97	PASS
2DH5	Ant1	2402	-1.95	≤20.97	PASS
		2441	-3.92	≤20.97	PASS
		2480	-5.38	≤20.97	PASS
3DH5	Ant1	2402	-1.31	≤20.97	PASS
		2441	-3.31	≤20.97	PASS
		2480	-4.64	≤20.97	PASS

Test Graphs

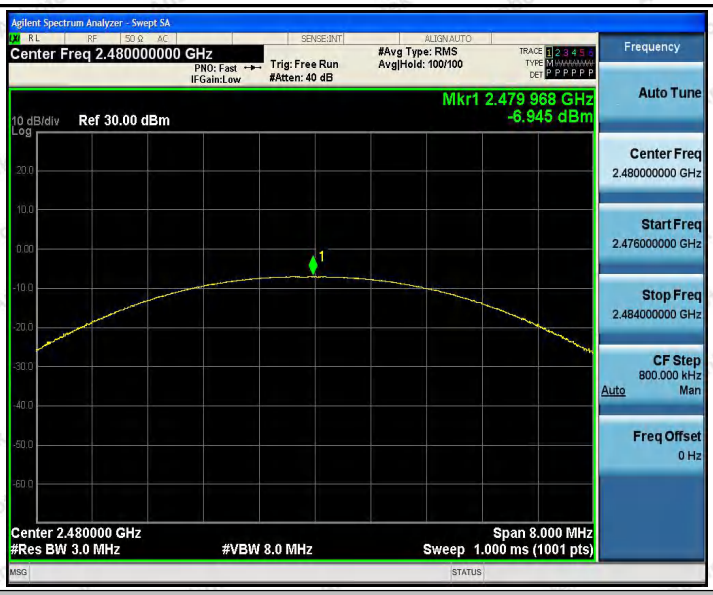
DH5_Ant1_2402



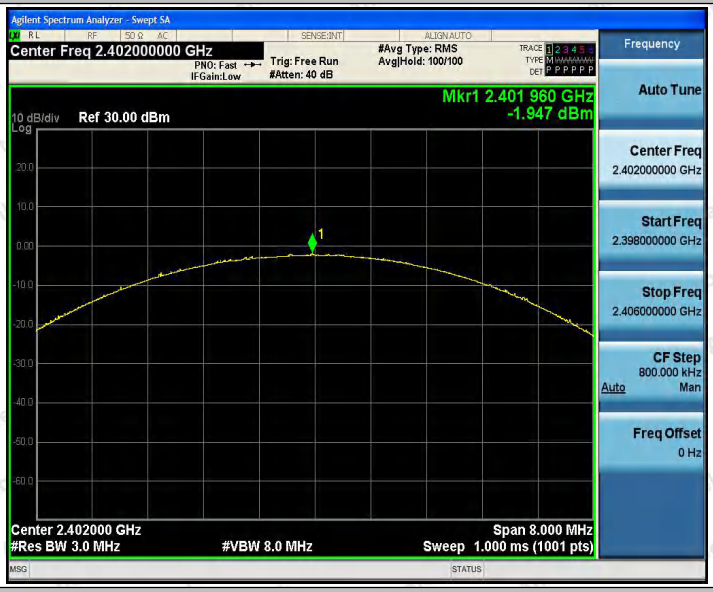
DH5_Ant1_2441



DH5_Ant1_2480



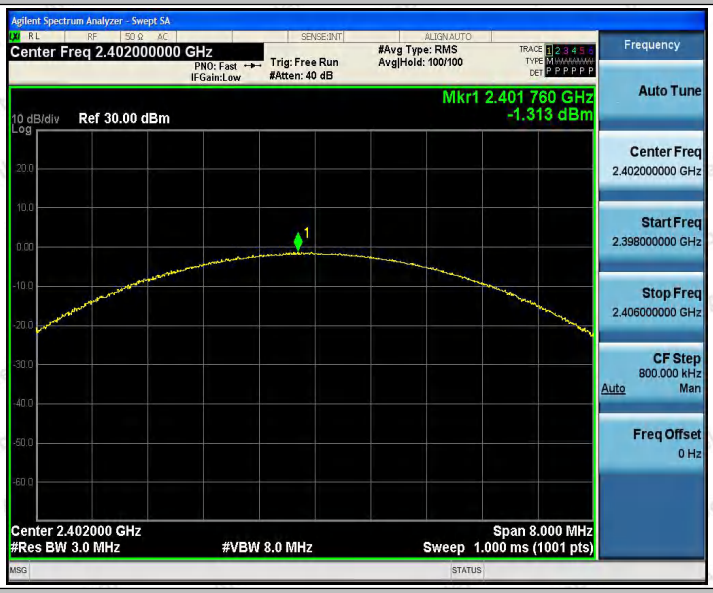
2DH5_Ant1_2402



2DH5_Ant1_2441

2DH5_Ant1_2480

3DH5_Ant1_2402



3DH5_Ant1_2441

3DH5_Ant1_2480

Appendix D: Carrier frequency separation

Test Result

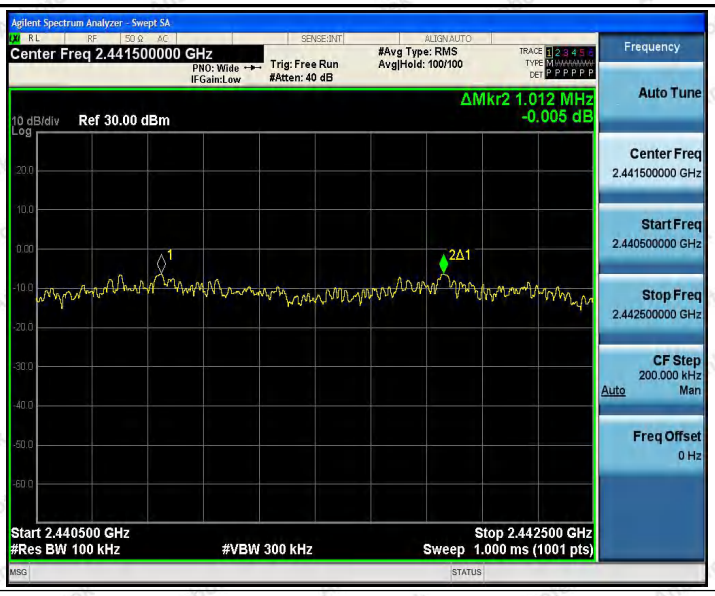
TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.178	≥0.855	PASS
2DH5	Ant1	Hop	1.004	≥0.864	PASS
3DH5	Ant1	Hop	1.012	≥0.856	PASS

Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop

3DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441500000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
ΔMkr2 1.012 MHz
-0.005 dB
10 dB/div
Ref 30.00 dBm
Log
Start 2.440500 GHz
#Res BW 100 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

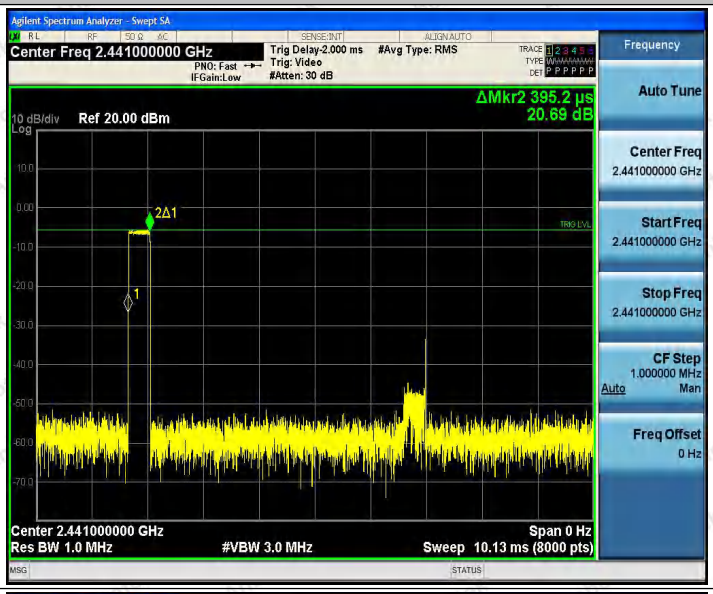
Appendix E: Time of occupancy

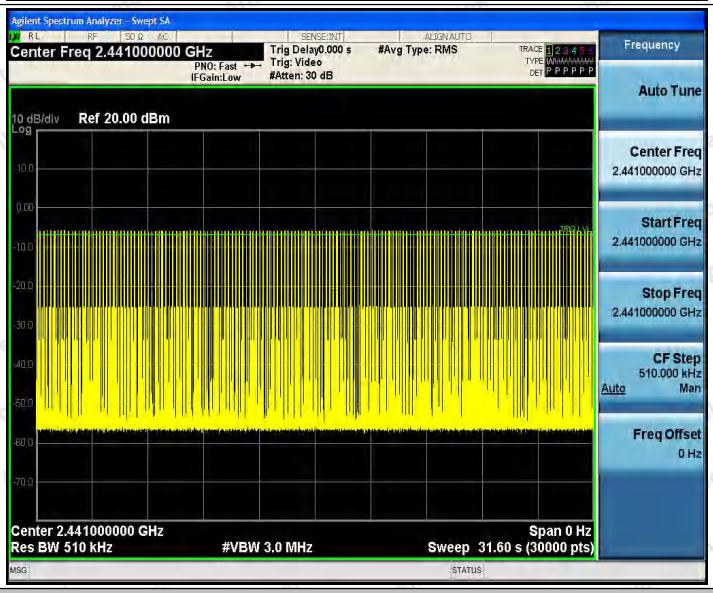
Test Result

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.40	316	0.125	≤0.4	PASS
DH3	Ant1	Hop	1.65	156	0.258	≤0.4	PASS
DH5	Ant1	Hop	2.90	107	0.31	≤0.4	PASS
2DH1	Ant1	Hop	0.41	318	0.129	≤0.4	PASS
2DH3	Ant1	Hop	1.66	153	0.253	≤0.4	PASS
2DH5	Ant1	Hop	2.90	101	0.293	≤0.4	PASS
3DH1	Ant1	Hop	0.41	318	0.13	≤0.4	PASS
3DH3	Ant1	Hop	1.66	164	0.272	≤0.4	PASS
3DH5	Ant1	Hop	2.90	107	0.311	≤0.4	PASS

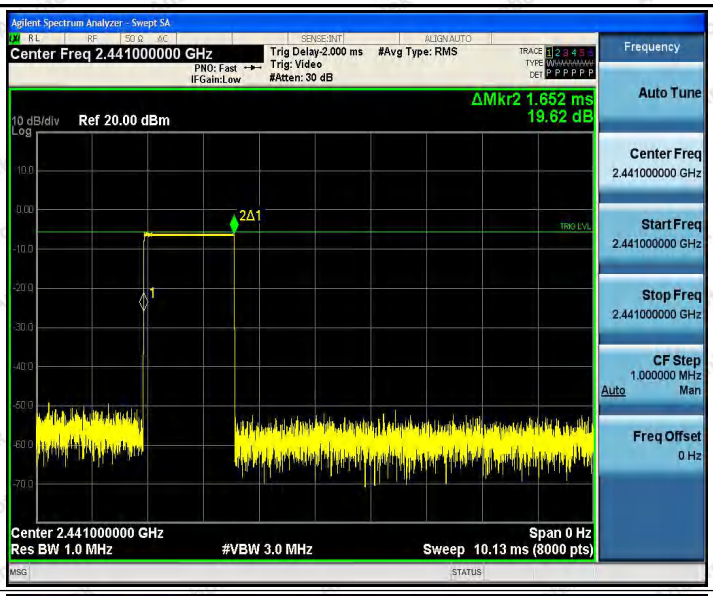
Test Graphs

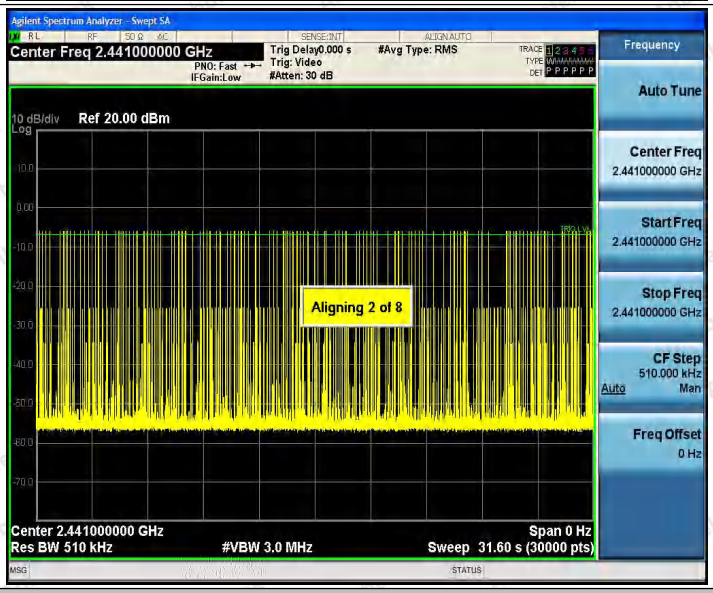
DH1_Ant1_Hop



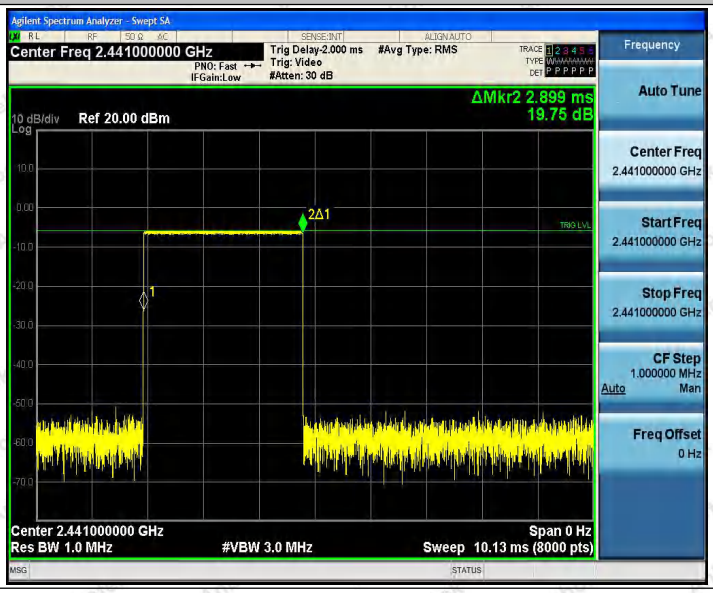


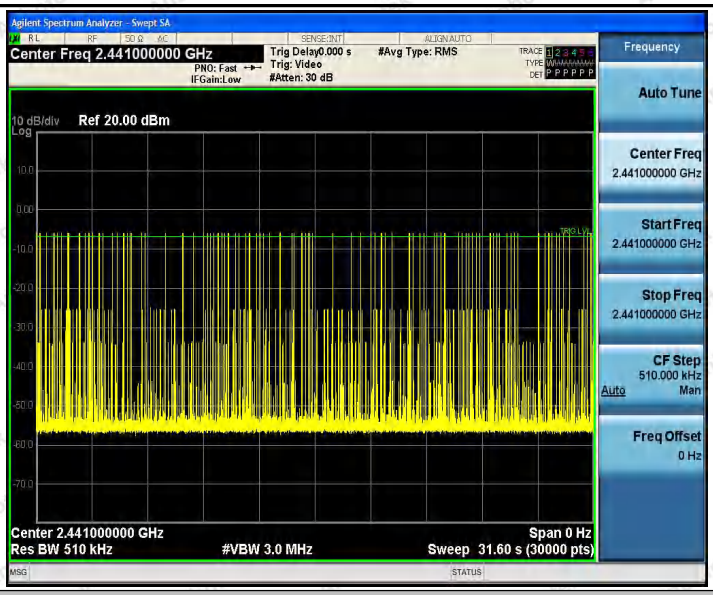
DH3_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 30 dB
PNO: Fast
IFGain:Low
ΔMkr2 1.652 ms
19.62 dB
10 dB/div
Ref 20.00 dBm
Log
2Δ1
1
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

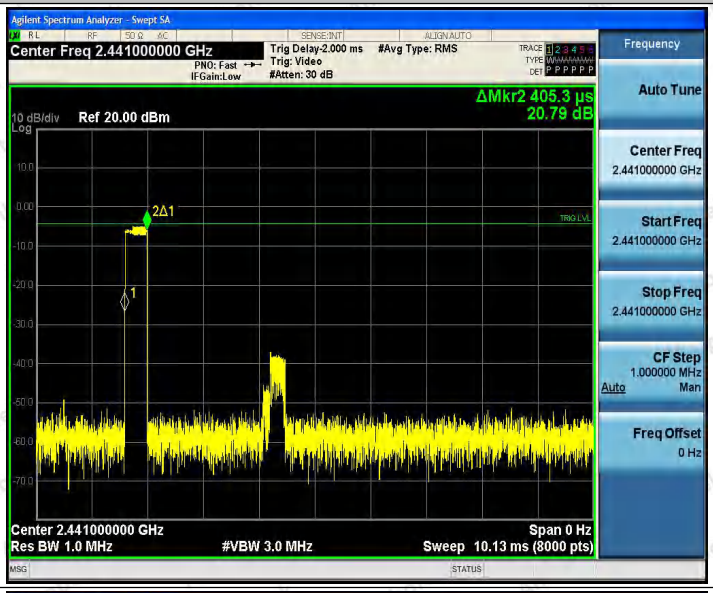

Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 30 dB
PNO: Fast
IFGain:Low
10 dB/div
Ref 20.00 dBm
Log
Aligning 2 of 8
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)
Frequency
Auto Tune
Center 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

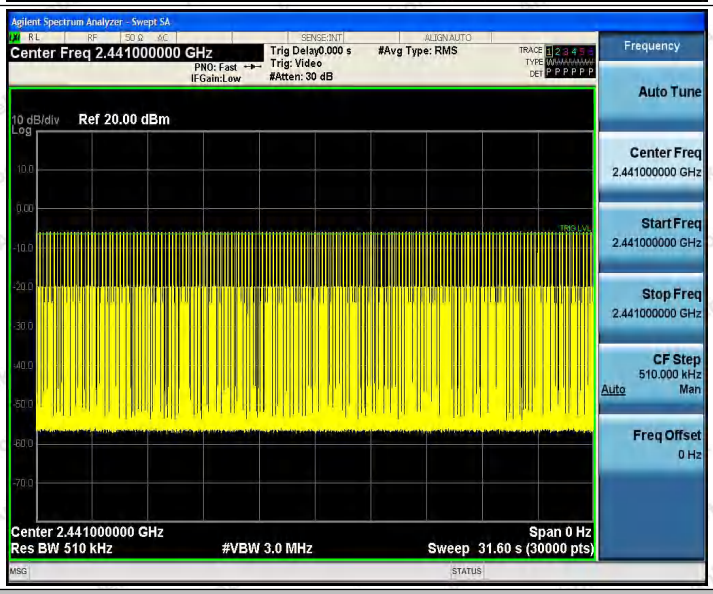
DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 30 dB
PNO: Fast
IFGain:Low
ΔMkr2 2.899 ms
19.75 dB
10 dB/div
Ref 20.00 dBm
Log
2Δ1
1
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

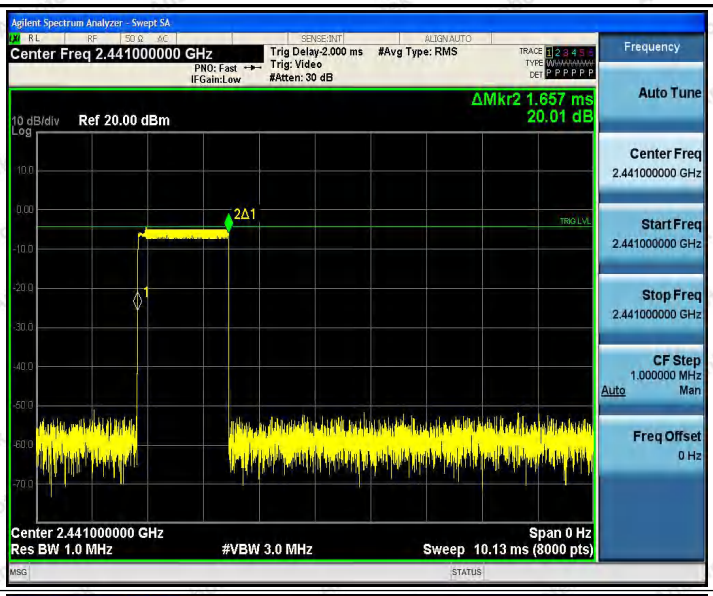


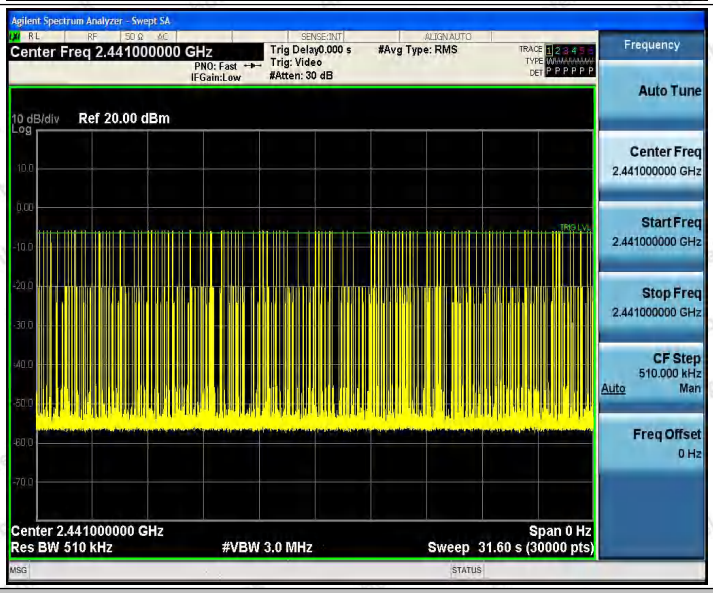
2DH1_Ant1_Hop



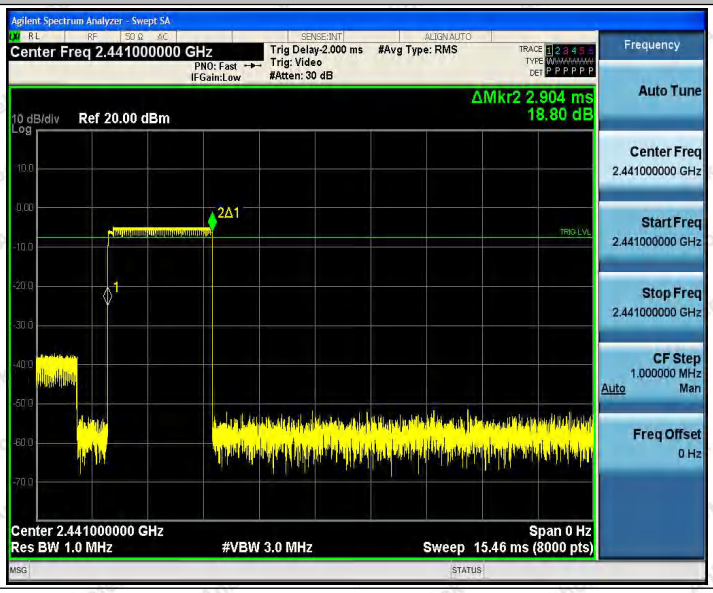


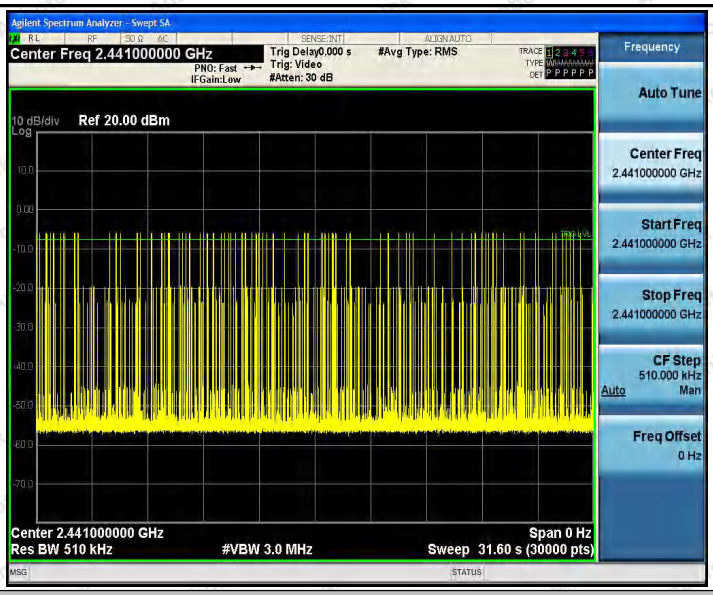
2DH3_Ant1_Hop



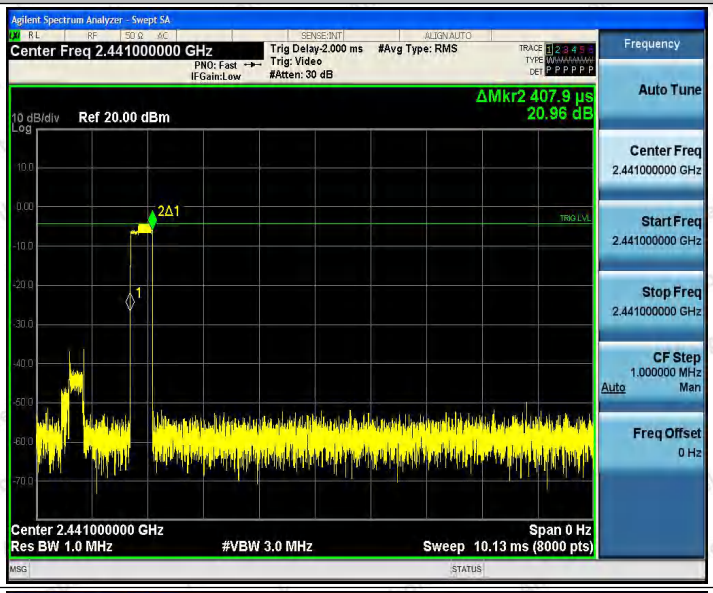


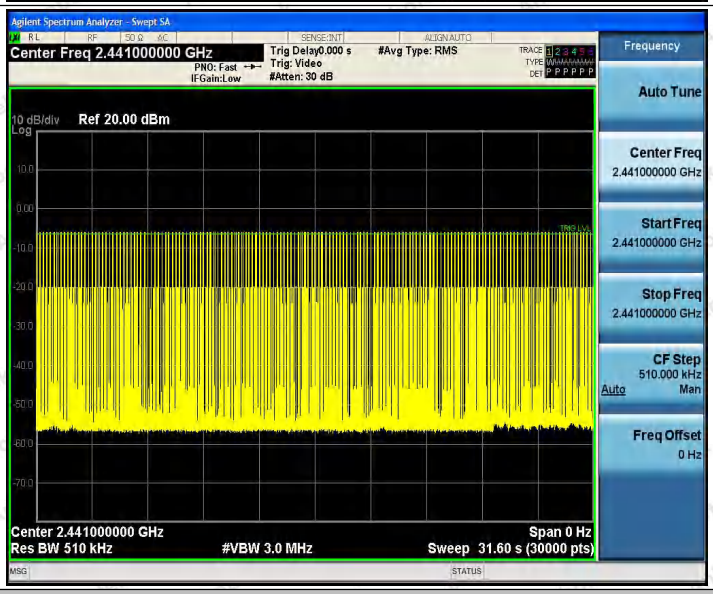
2DH5_Ant1_Hop



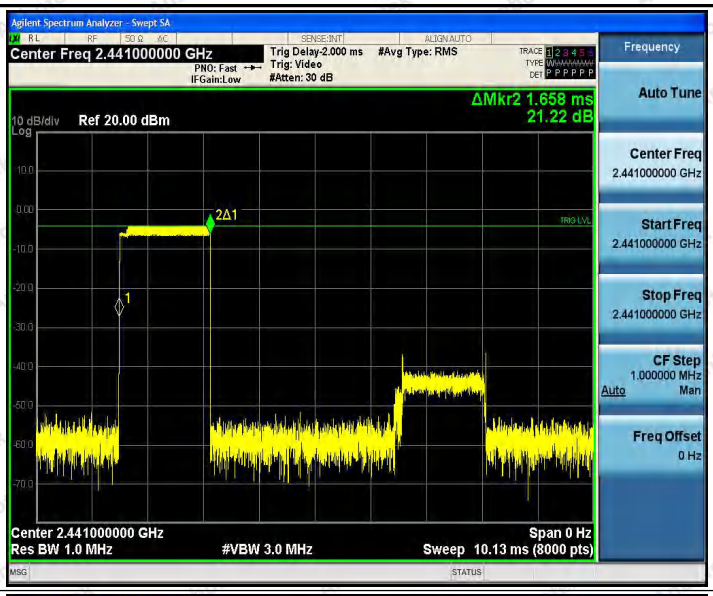


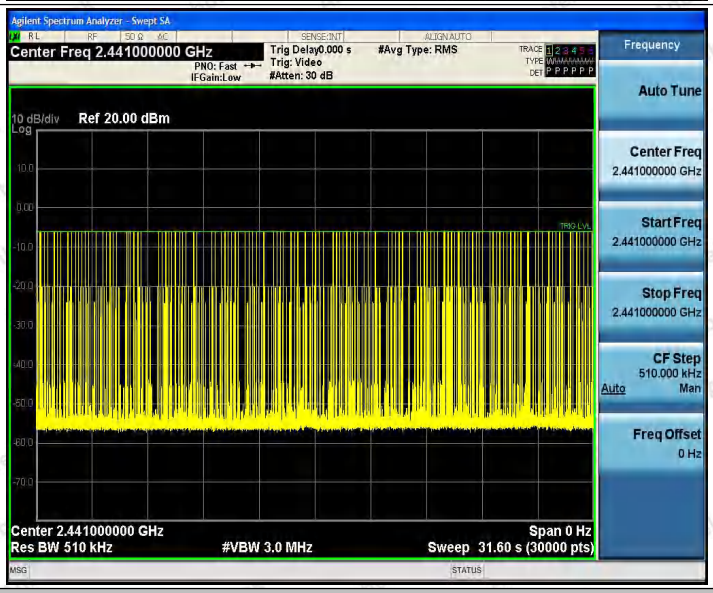
3DH1_Ant1_Hop



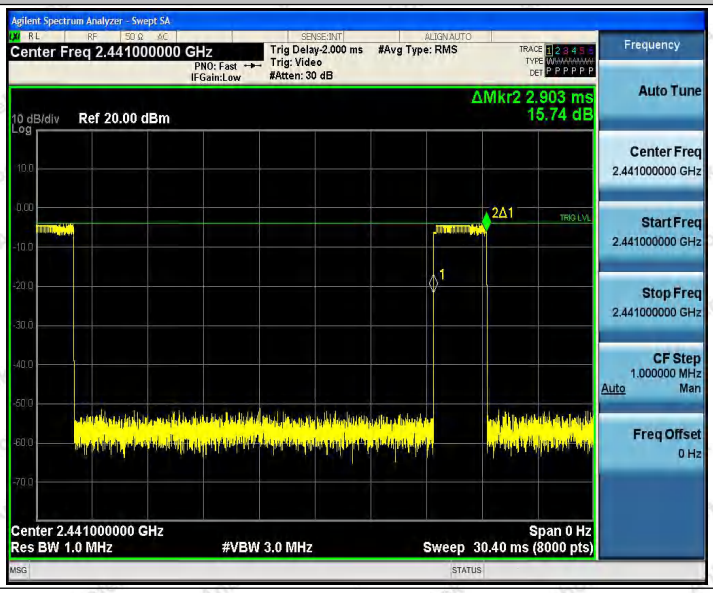


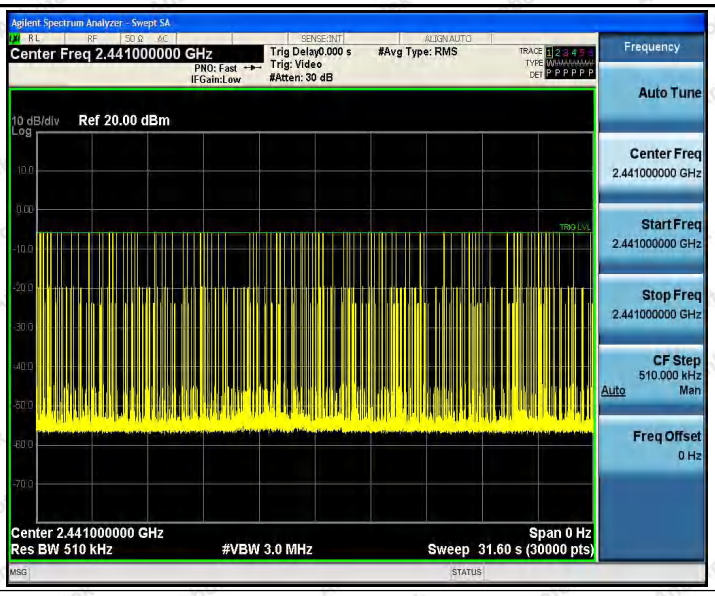
3DH3_Ant1_Hop





3DH5_Ant1_Hop




Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
PNO: Fast
IFGain:Low
Trig Delay0.000 s
Trig: Video
#Atten: 30 dB
#Avg Type: RMS
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
10 dB/div
Log
Ref 20.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 31.60 s (30000 pts)

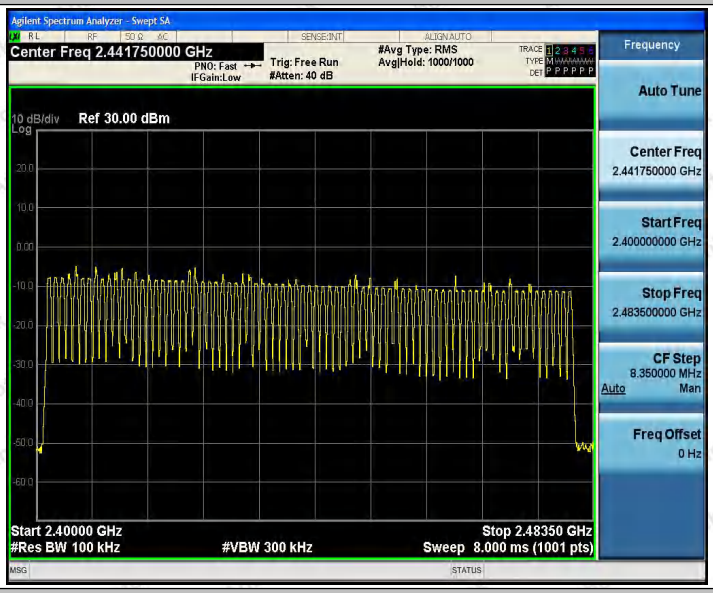
Appendix F: Number of hopping channels

Test Result

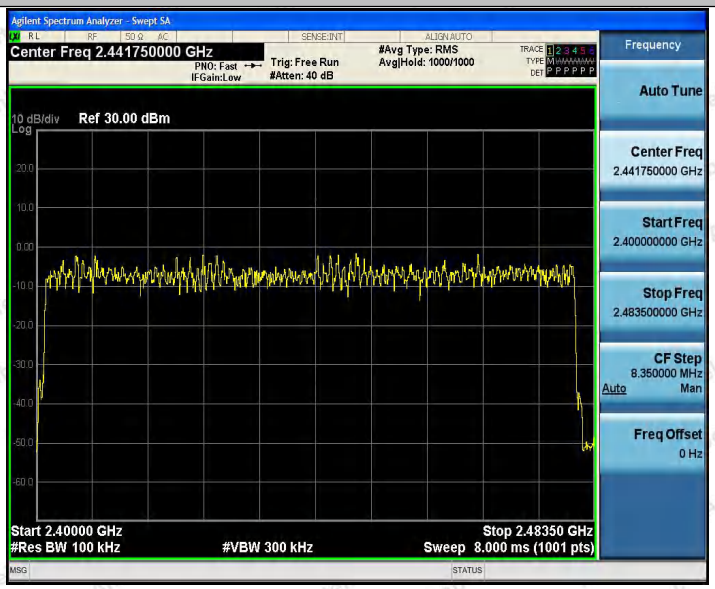
TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs

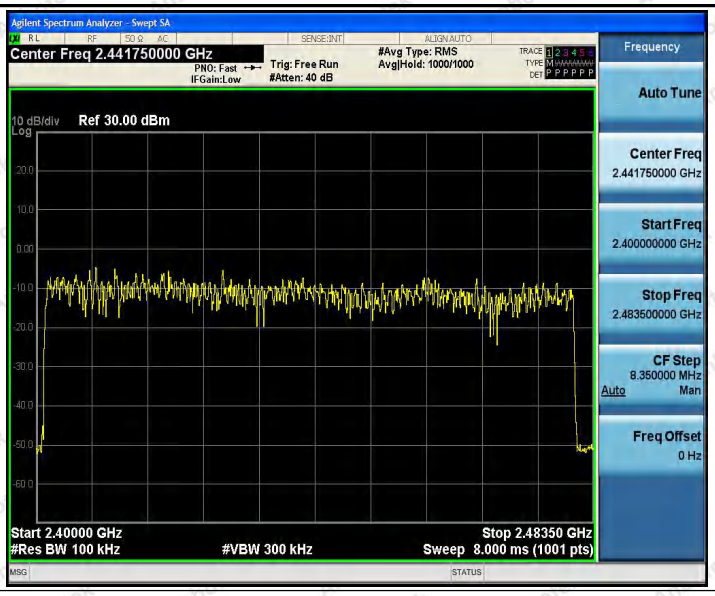
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 1000/1000
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
10 dB/div
Log
Ref 30.00 dBm
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 ms (1001 pts)

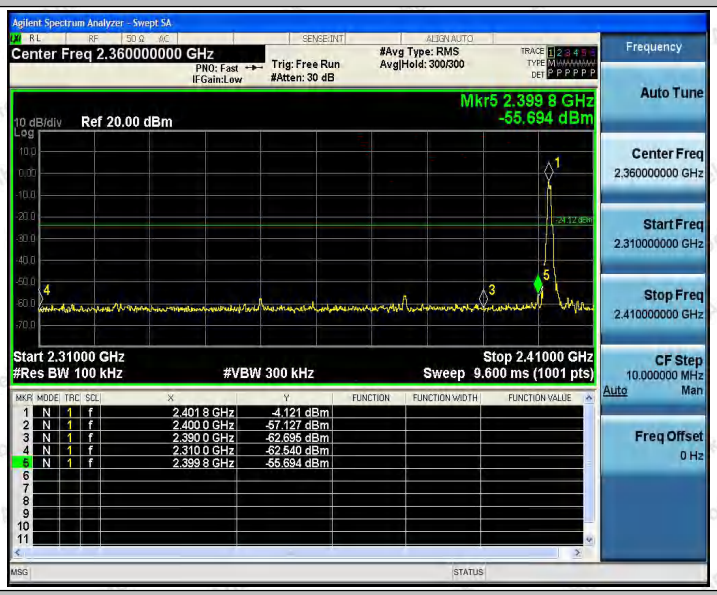
Appendix G: Band edge measurements

Test Result

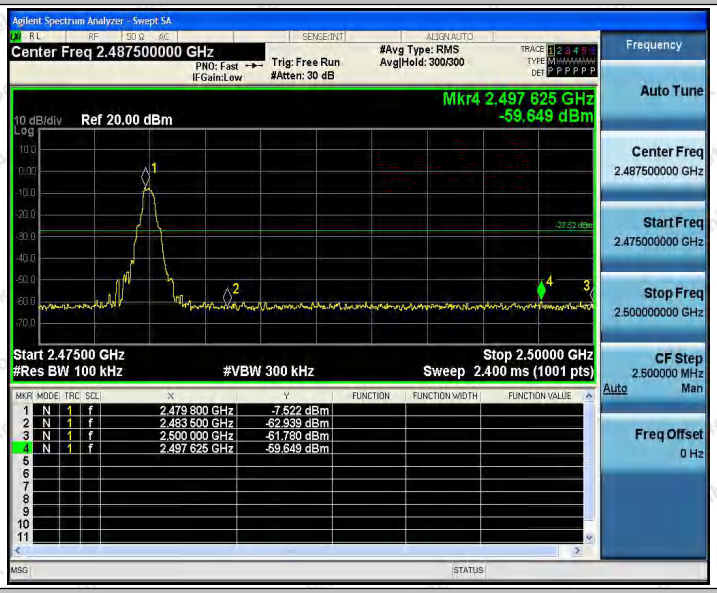
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-4.12	-55.69	≤-24.12	PASS
		High	2480	-7.52	-59.65	≤-27.52	PASS
		Low	Hop	-7.90	-55.94	≤-27.9	PASS
		High	Hop	-7.99	-60	≤-27.99	PASS
2DH5	Ant1	Low	2402	-4.32	-55.62	≤-24.32	PASS
		High	2480	-7.67	-58.89	≤-27.67	PASS
		Low	Hop	-10.34	-51.16	≤-30.34	PASS
		High	Hop	-12.18	-61.32	≤-32.18	PASS
3DH5	Ant1	Low	2402	-4.26	-54.71	≤-24.26	PASS
		High	2480	-7.62	-59.65	≤-27.62	PASS
		Low	Hop	-5.18	-56.37	≤-25.18	PASS
		High	Hop	-9.76	-60.45	≤-29.76	PASS

Test Graphs

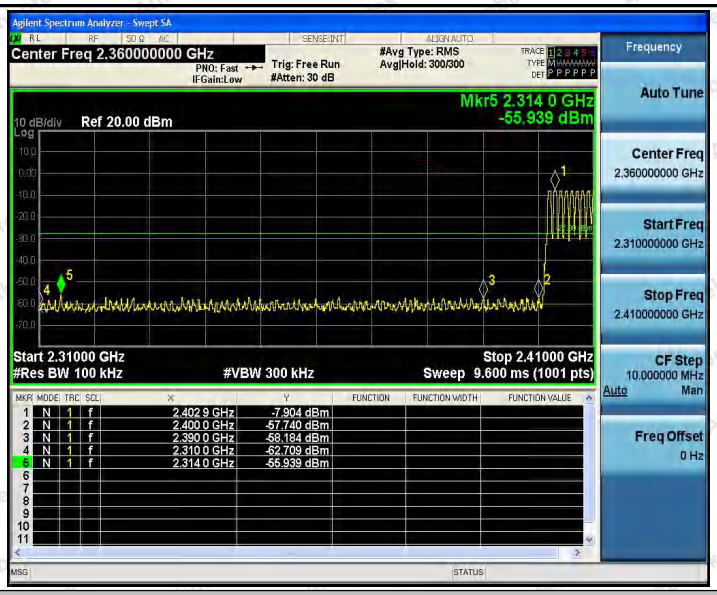
DH5_Ant1_Low_2402



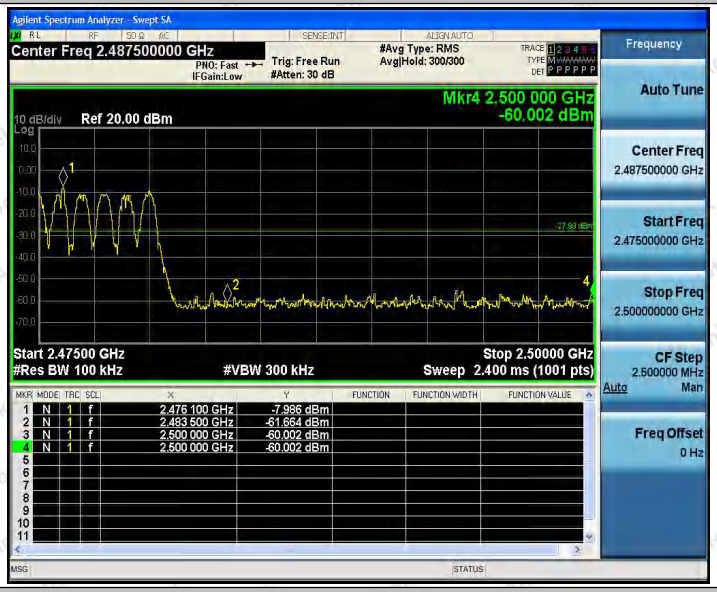
DH5_Ant1_High_2480



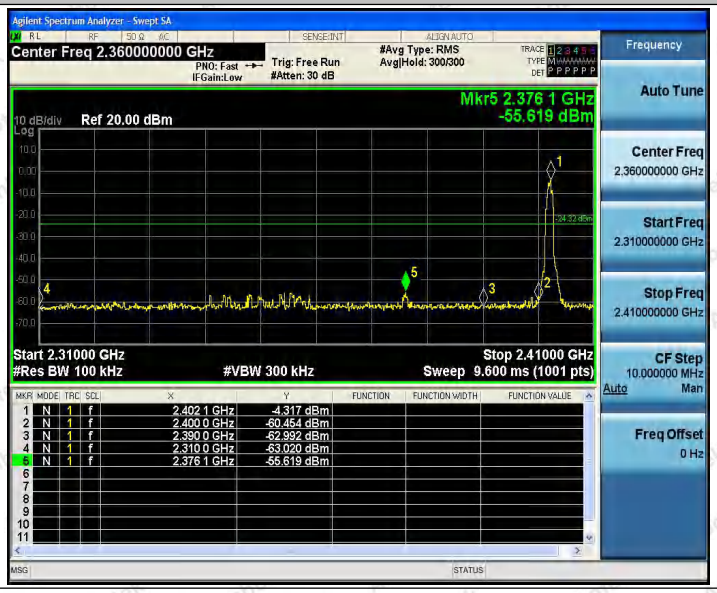
DH5_Ant1_Low_Hop



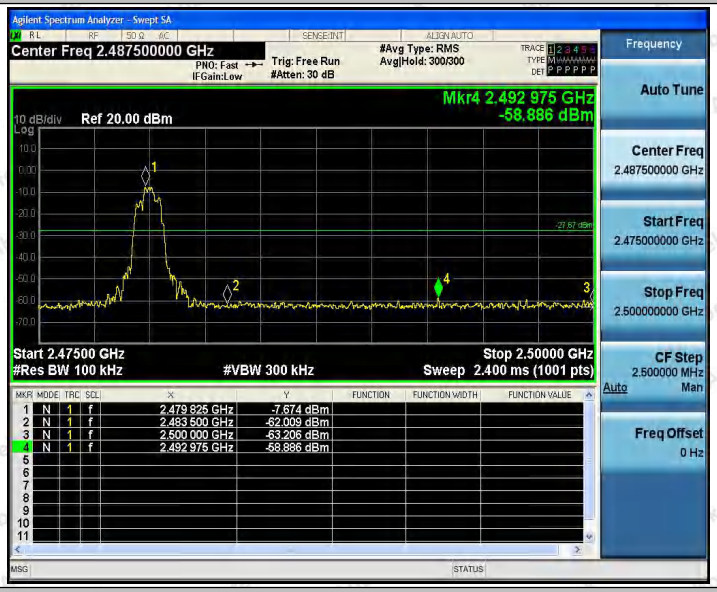
DH5_Ant1_High_Hop



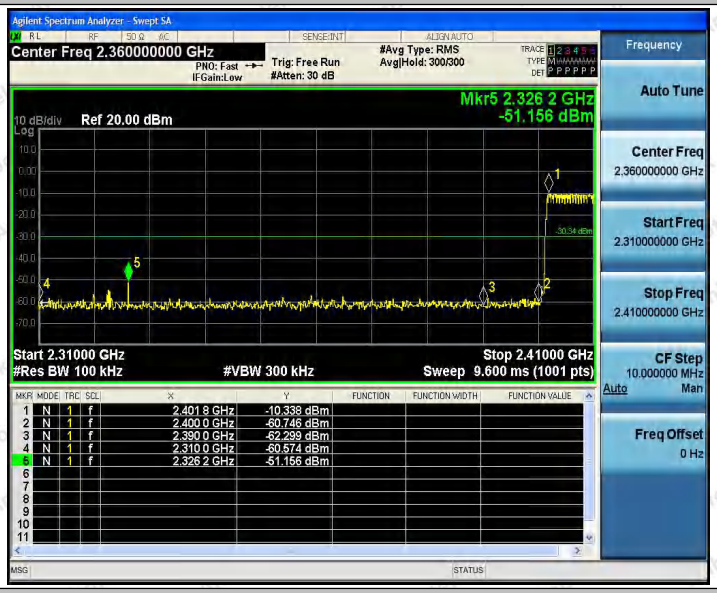
2DH5_Ant1_Low_2402



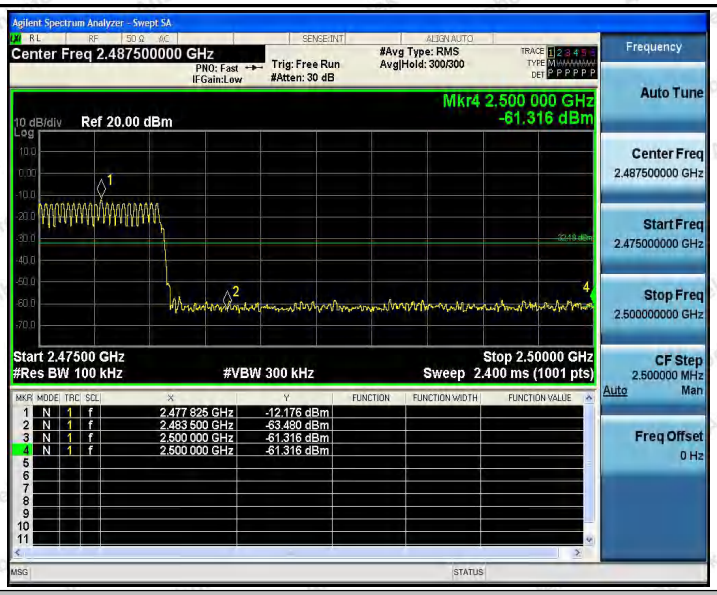
2DH5_Ant1_High_2480



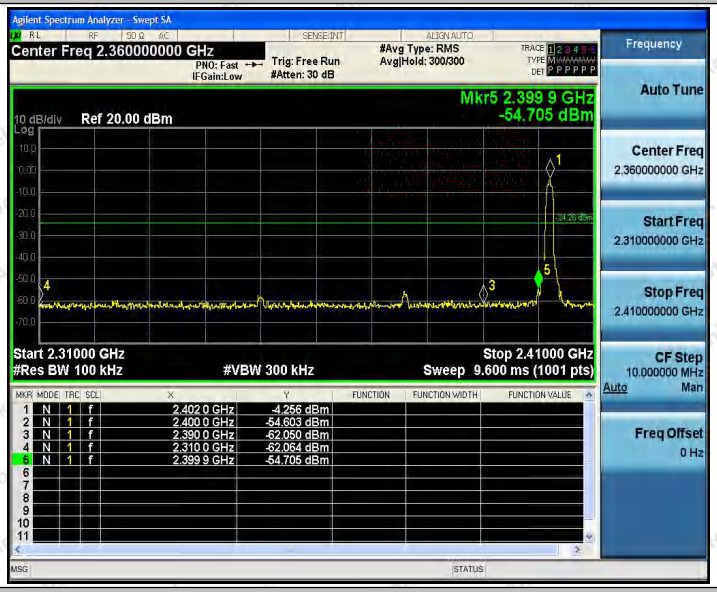
2DH5_Ant1_Low_Hop



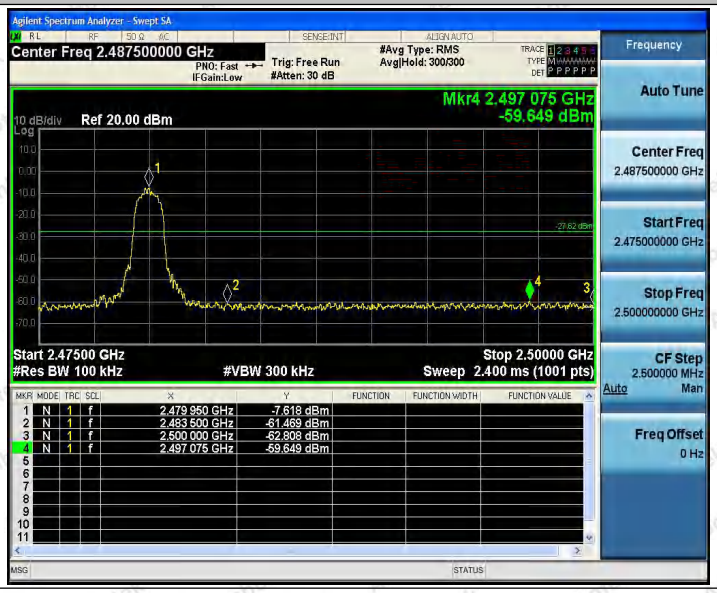
2DH5_Ant1_High_Hop



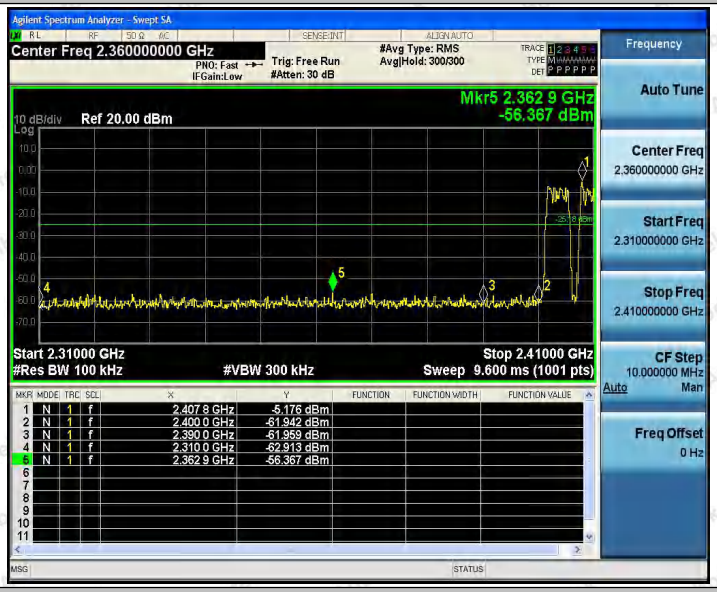
3DH5_Ant1_Low_2402



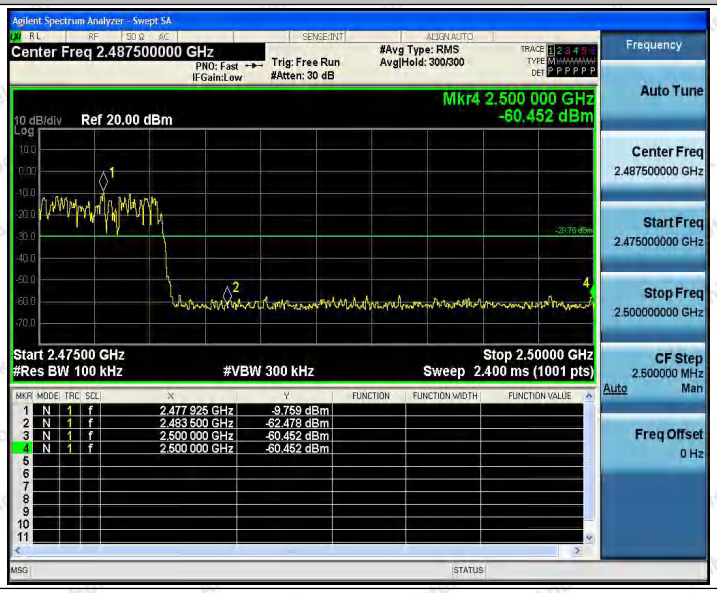
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop



3DH5_Ant1_High_Hop



Appendix H: Conducted Spurious Emission

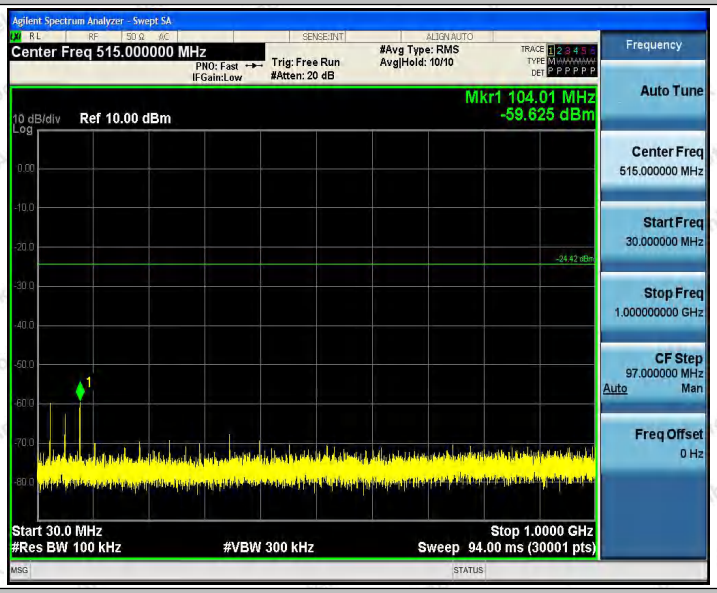
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-4.42	-4.42	---	PASS
			30~1000	-4.42	-59.63	≤-24.42	PASS
			1000~26500	-4.42	-53.74	≤-24.42	PASS
		2441	Reference	-6.36	-6.36	---	PASS
			30~1000	-6.36	-59.25	≤-26.36	PASS
			1000~26500	-6.36	-55.27	≤-26.36	PASS
		2480	Reference	-7.71	-7.71	---	PASS
			30~1000	-7.71	-58.69	≤-27.71	PASS
			1000~26500	-7.71	-53.14	≤-27.71	PASS
2DH5	Ant1	2402	Reference	-4.36	-4.36	---	PASS
			30~1000	-4.36	-59.77	≤-24.36	PASS
			1000~26500	-4.36	-53.27	≤-24.36	PASS
		2441	Reference	-6.63	-6.63	---	PASS
			30~1000	-6.63	-59.16	≤-26.63	PASS
			1000~26500	-6.63	-52.08	≤-26.63	PASS
		2480	Reference	-7.73	-7.73	---	PASS
			30~1000	-7.73	-59.55	≤-27.73	PASS
			1000~26500	-7.73	-53.01	≤-27.73	PASS
3DH5	Ant1	2402	Reference	-4.25	-4.25	---	PASS
			30~1000	-4.25	-59.32	≤-24.25	PASS
			1000~26500	-4.25	-53.09	≤-24.25	PASS
		2441	Reference	-6.68	-6.68	---	PASS
			30~1000	-6.68	-58.82	≤-26.68	PASS
			1000~26500	-6.68	-50.81	≤-26.68	PASS
		2480	Reference	-7.62	-7.62	---	PASS
			30~1000	-7.62	-59.63	≤-27.62	PASS
			1000~26500	-7.62	-49.64	≤-27.62	PASS

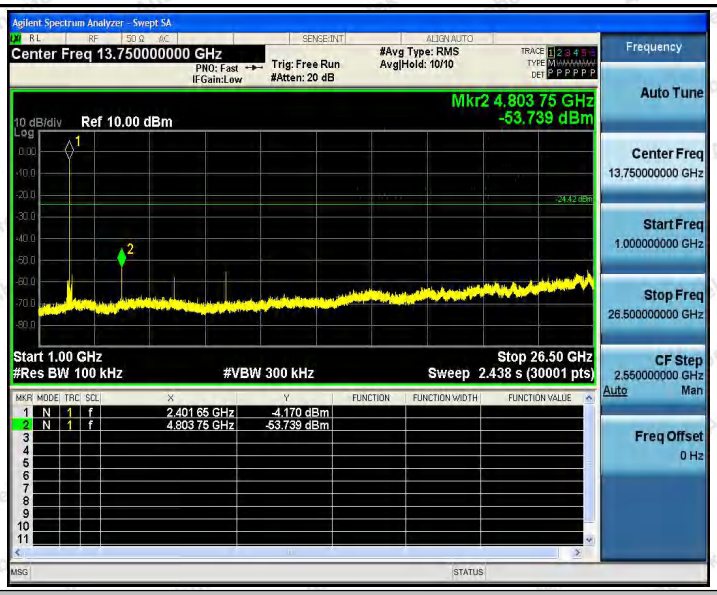
Test Graphs

DH5_Ant1_2402_0~Reference

DH5_Ant1_2402_30~1000

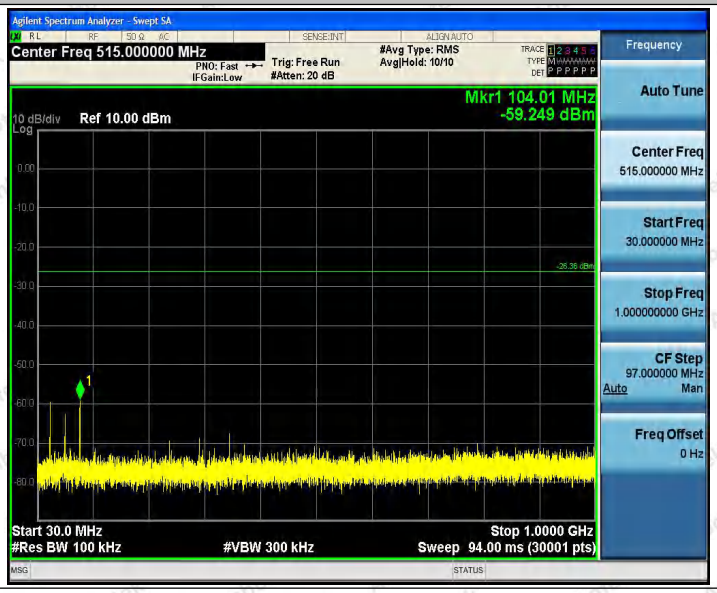


DH5_Ant1_2402_1000~26500

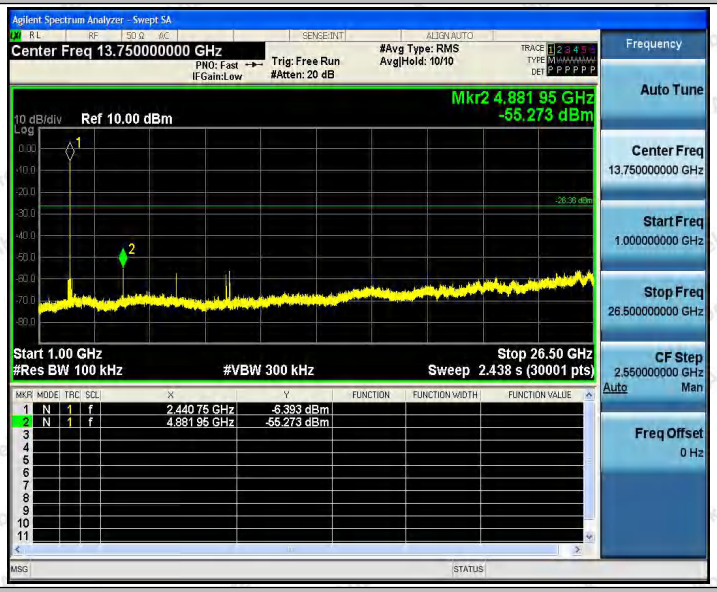


DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000

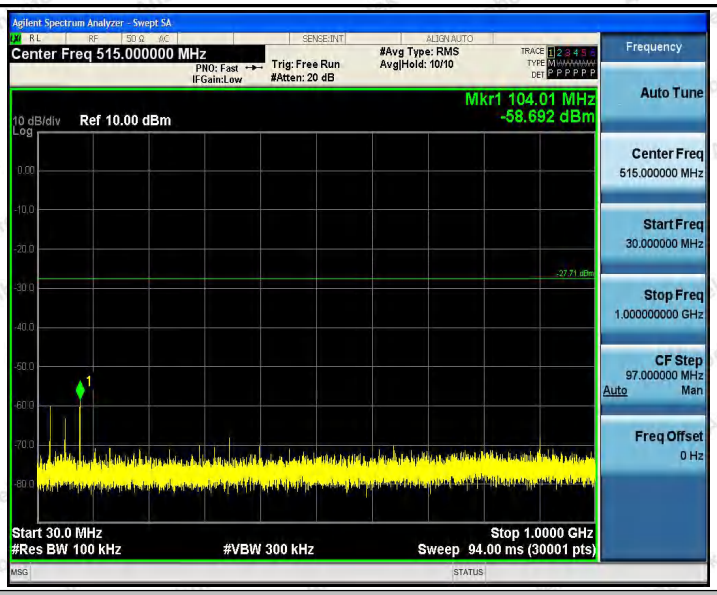


DH5_Ant1_2441_1000~26500

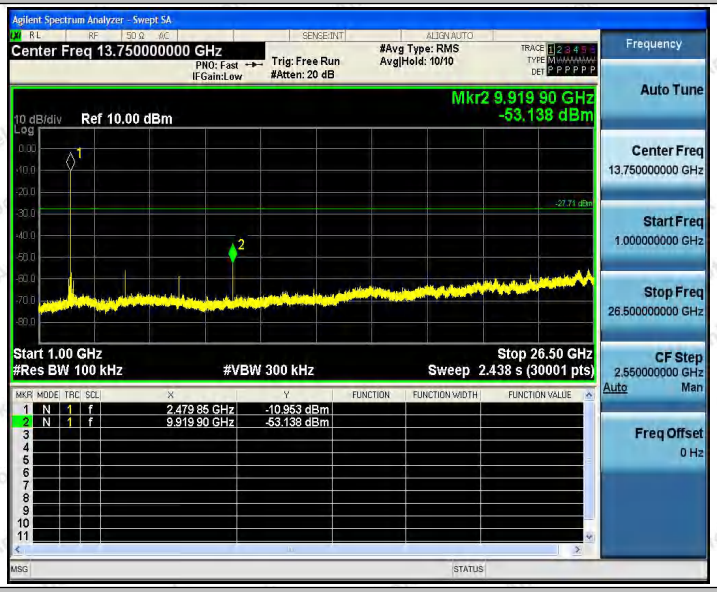


DH5_Ant1_2480_0~Reference

DH5_Ant1_2480_30~1000

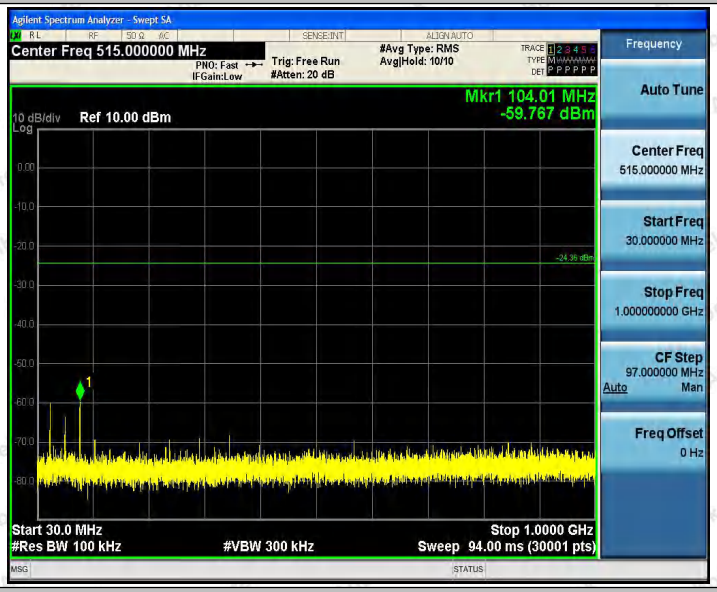


DH5_Ant1_2480_1000~26500

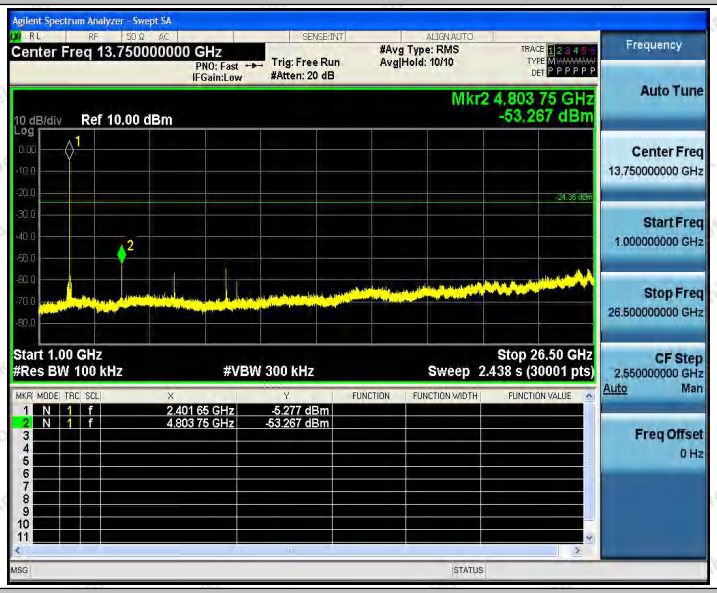


2DH5_Ant1_2402_0~Reference

2DH5_Ant1_2402_30~1000

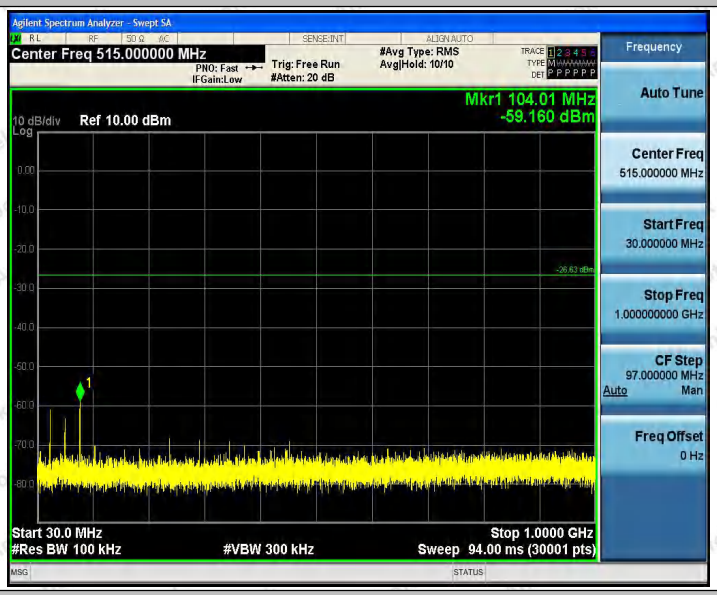


2DH5_Ant1_2402_1000~26500

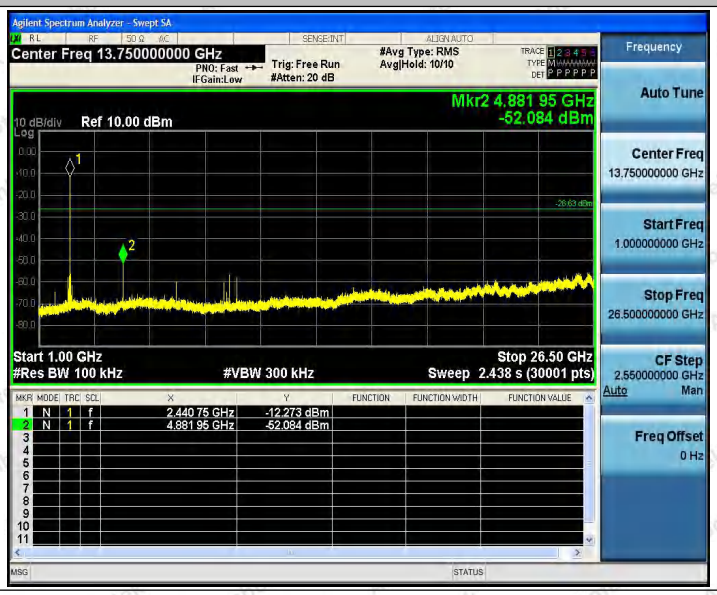


2DH5_Ant1_2441_0~Reference

2DH5_Ant1_2441_30~1000

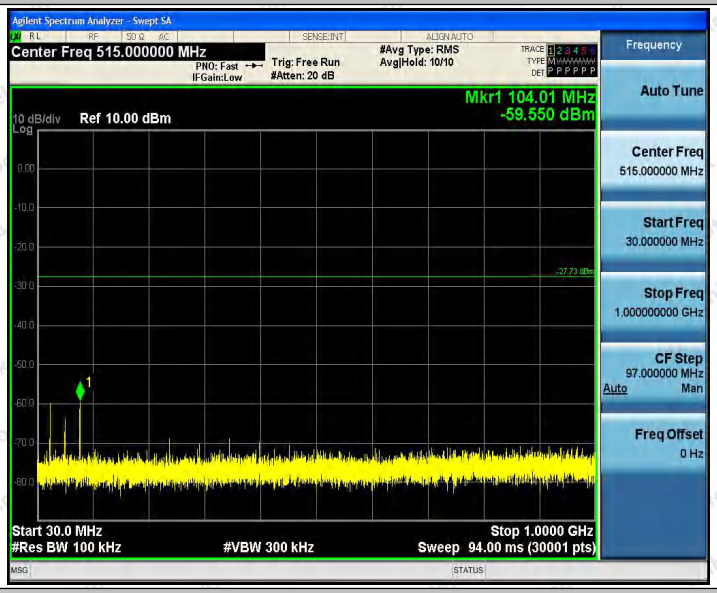


2DH5_Ant1_2441_1000~26500

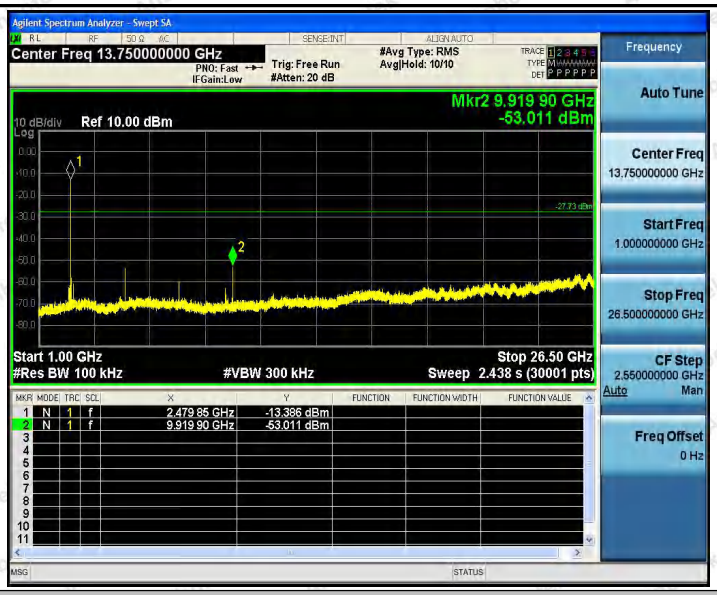


2DH5_Ant1_2480_0~Reference

2DH5_Ant1_2480_30~1000

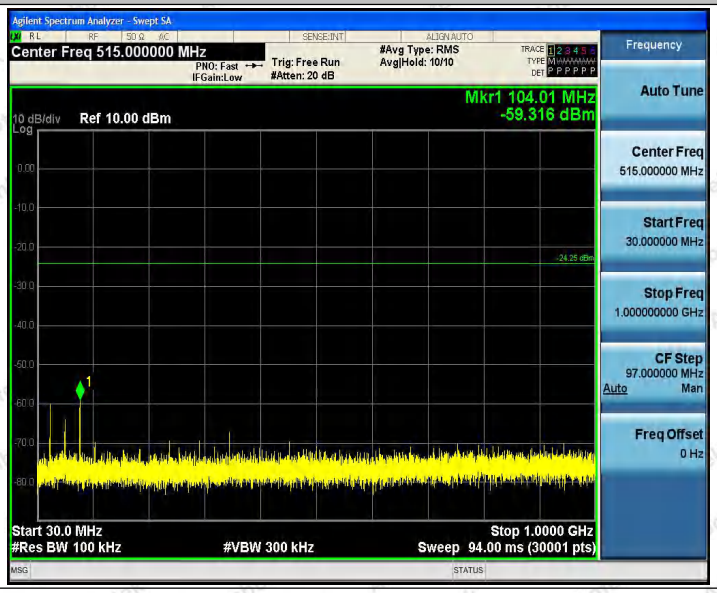


2DH5_Ant1_2480_1000~26500

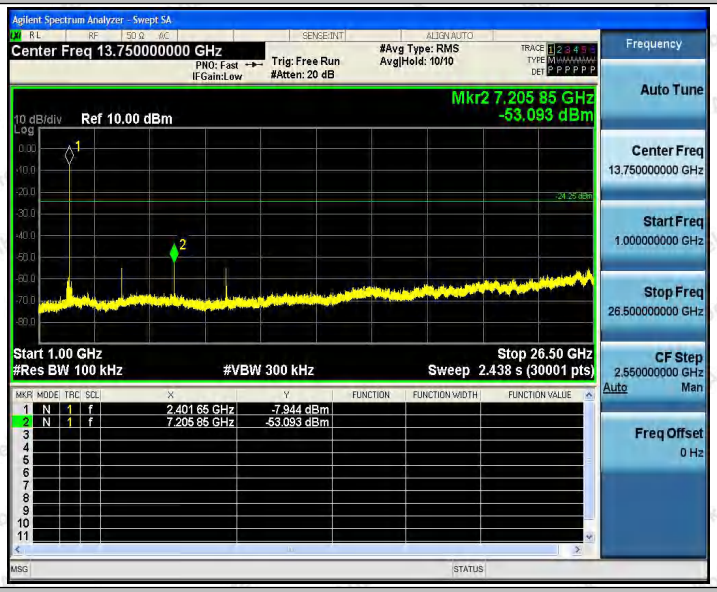


3DH5_Ant1_2402_0~Reference

3DH5_Ant1_2402_30~1000

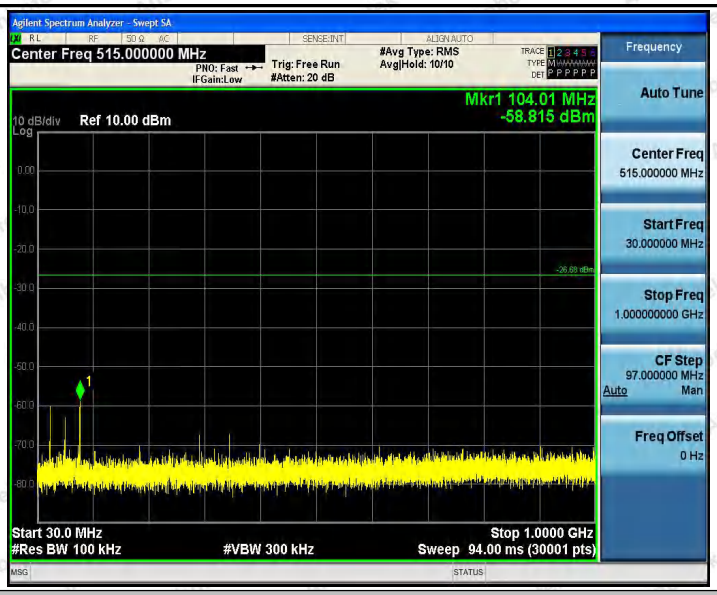


3DH5_Ant1_2402_1000~26500

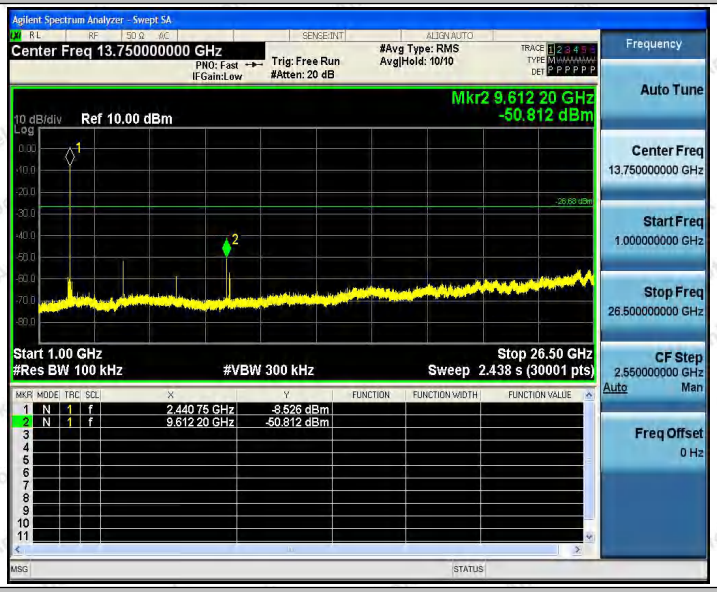


3DH5_Ant1_2441_0~Reference

3DH5_Ant1_2441_30~1000

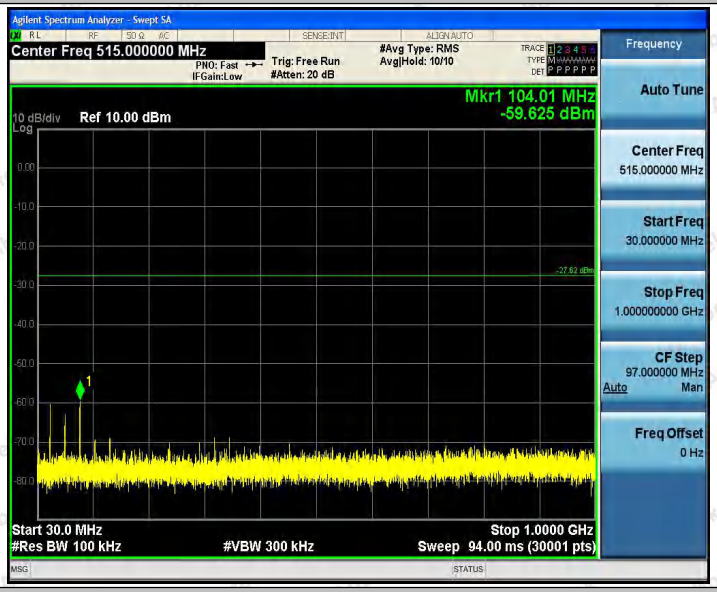


3DH5_Ant1_2441_1000~26500

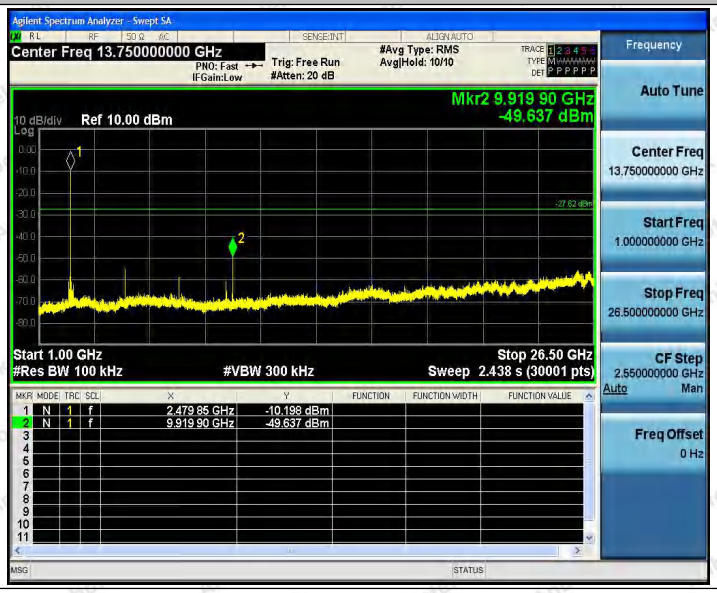


3DH5_Ant1_2480_0~Reference

3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



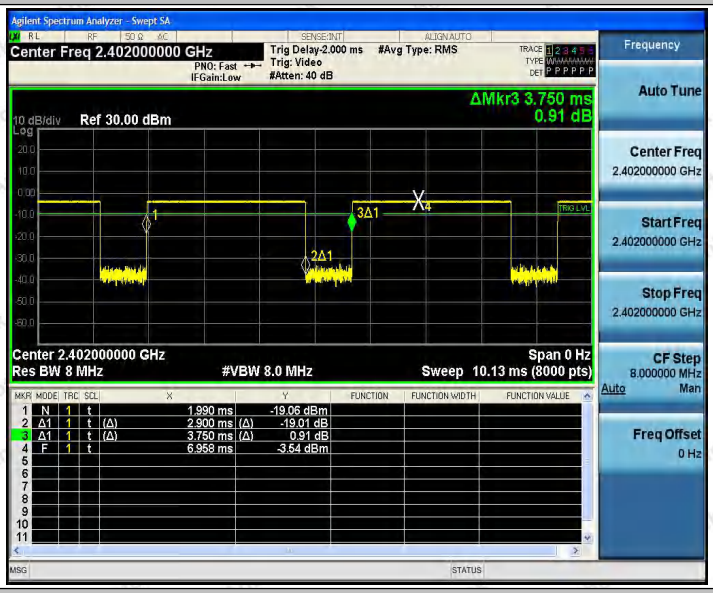
Appendix I: Duty Cycle

Test Result

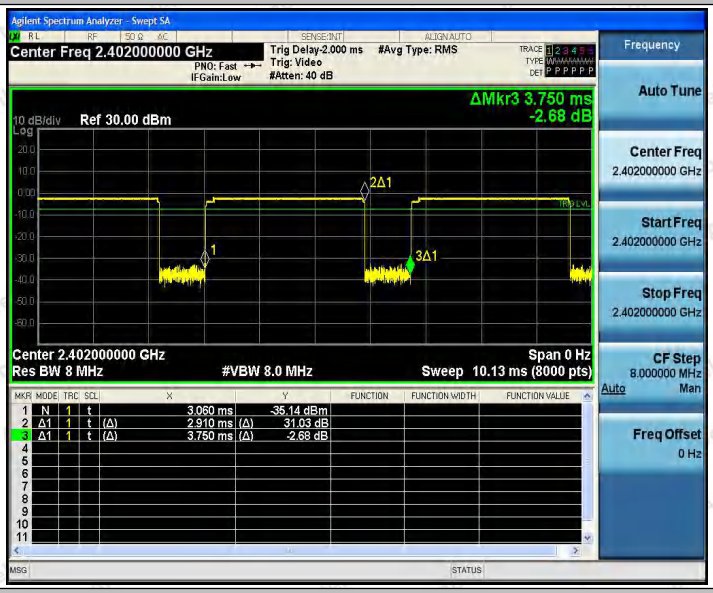
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
DH5	Ant1	2402	2.90	3.75	0.7733	77.33	1.12	---	PASS
2DH5	Ant1	2402	2.91	3.75	0.7760	77.60	1.10	---	PASS
3DH5	Ant1	2402	2.91	3.75	0.7760	77.60	1.10	---	PASS

Test Graphs

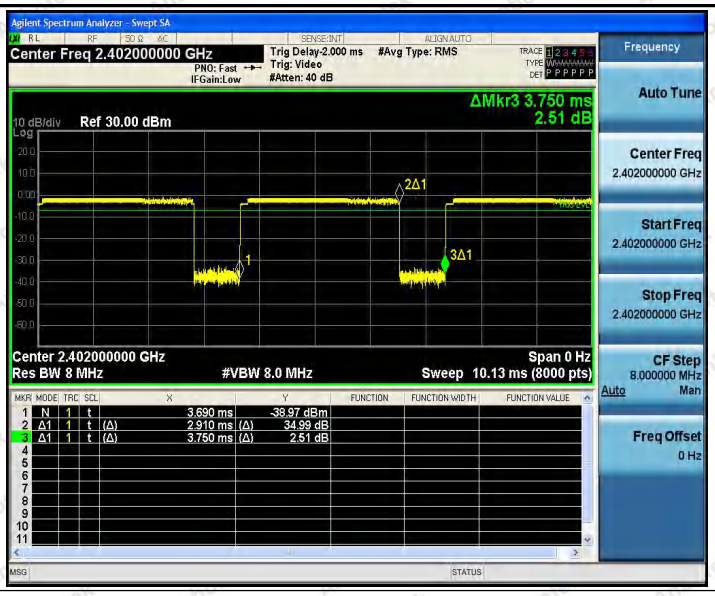
DH5_Ant1_2402



2DH5_Ant1_2402



3DH5_Ant1_2402


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.402000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
ΔMkr3 3.750 ms
2.51 dB
10 dB/div
Ref 30.00 dBm
Log
2Δ1
3Δ1
Center 2.402000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 10.13 ms (8000 pts)
1 N 1 t 3.690 ms -38.97 dBm
2 Δ1 1 t (Δ) 2.910 ms (Δ) 34.99 dB
3 Δ1 1 t (Δ) 3.750 ms (Δ) 2.51 dB
Frequency
Auto Tune
Center Freq
2.402000000 GHz
Start Freq
2.402000000 GHz
Stop Freq
2.402000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz

---End---