Appendix Test Data

Report No.:	18220WC10165201	Test Date:	2021.7.27
Test Engineer:	Tony.He	Auditor:	Edward.Pan
Temperature:	24.6℃	Relative Humidity:	54 %
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	0.852	2401.547	2402.399	---	PASS
		2441	0.948	2440.535	2441.483	---	PASS
		2480	0.858	2479.544	2480.402	---	PASS
2DH5	Ant1	2402	1.224	2401.397	2402.621	---	PASS
		2441	1.344	2440.328	2441.672	---	PASS
		2480	1.293	2479.337	2480.630	---	PASS
3DH5	Ant1	2402	1.260	2401.355	2402.615	---	PASS
		2441	1.254	2440.355	2441.609	---	PASS
		2480	1.323	2479.331	2480.654	---	PASS

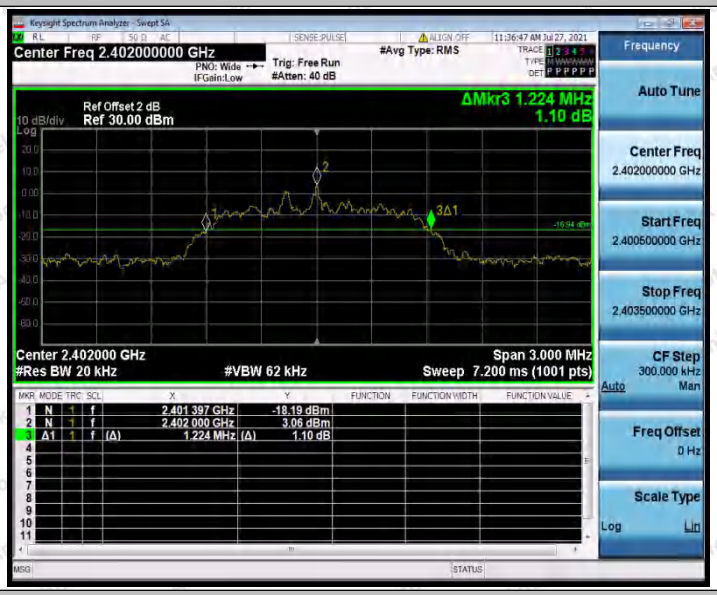
Test Graphs

DH5_Ant1_2402

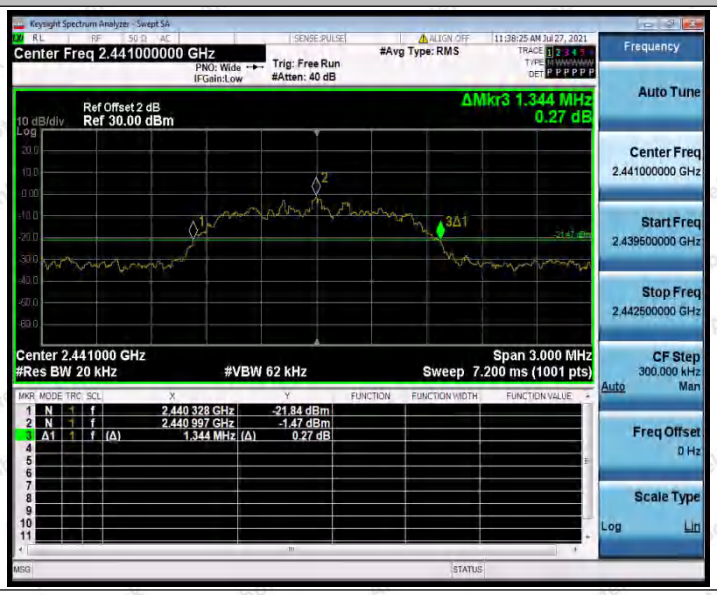
DH5_Ant1_2441

DH5_Ant1_2480

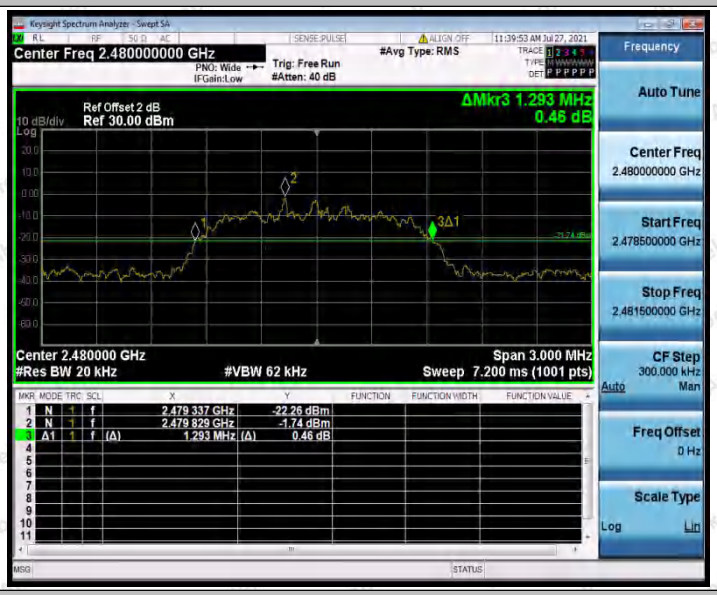
2DH5_Ant1_2402



2DH5_Ant1_2441

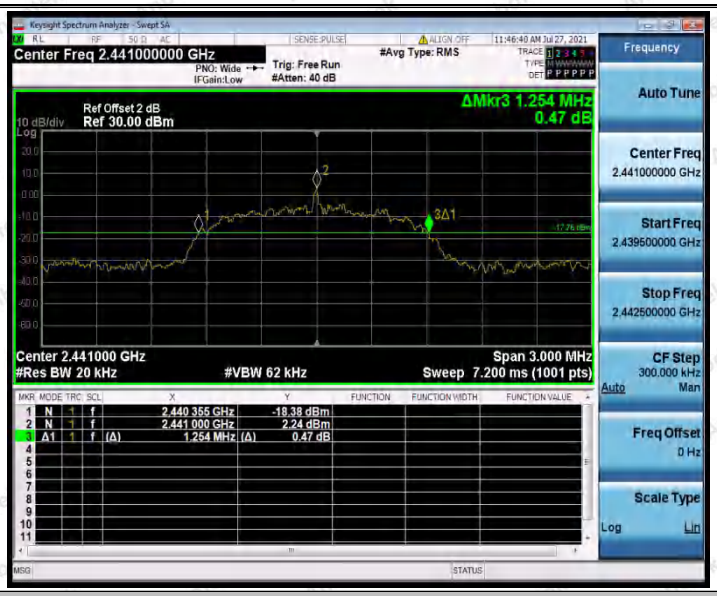


2DH5_Ant1_2480



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	0.87063	2401.563	2402.434	---	PASS
		2441	0.87924	2440.554	2441.433	---	PASS
		2480	0.87745	2479.552	2480.429	---	PASS
2DH5	Ant1	2402	1.2655	2401.374	2402.639	---	PASS
		2441	1.2814	2440.357	2441.639	---	PASS
		2480	1.2078	2479.388	2480.595	---	PASS
3DH5	Ant1	2402	1.2749	2401.364	2402.639	---	PASS
		2441	1.2477	2440.363	2441.611	---	PASS
		2480	1.2219	2479.376	2480.597	---	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

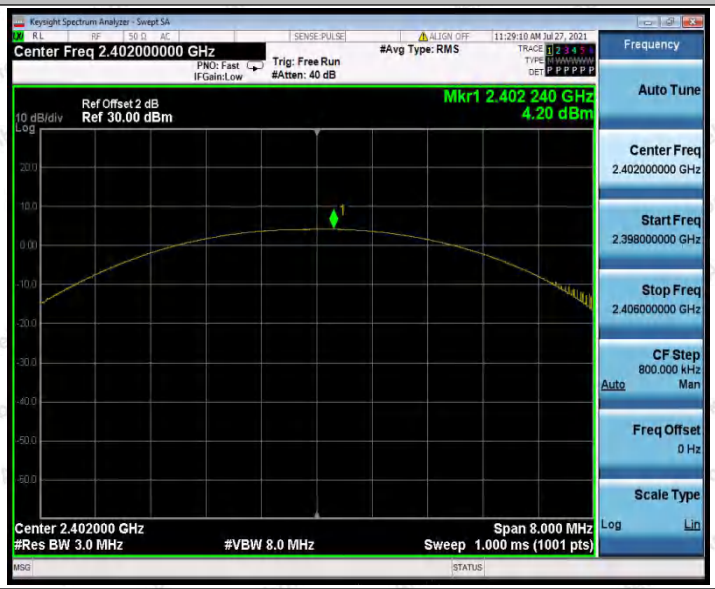
Appendix C: Maximum conducted output power

Test Result

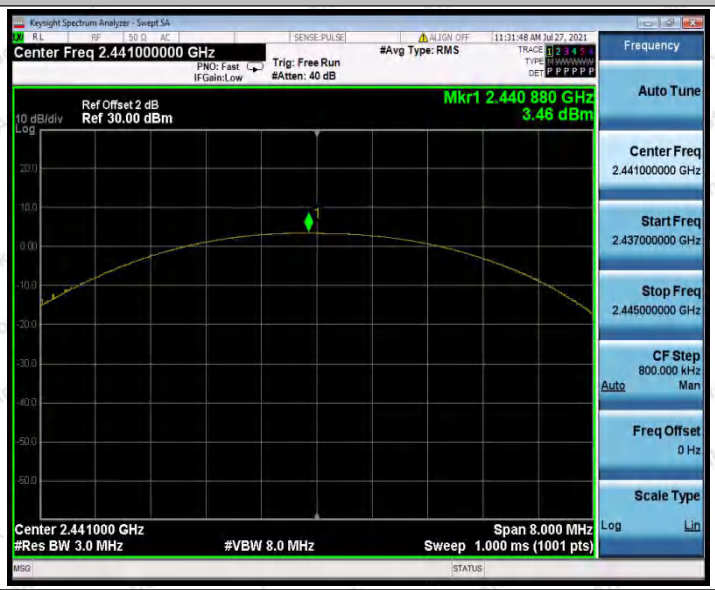
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	2402	4.2	<=20.97	PASS
		2441	3.46	<=20.97	PASS
		2480	1.9	<=20.97	PASS
2DH5	Ant1	2402	4.46	<=20.97	PASS
		2441	3.72	<=20.97	PASS
		2480	2.35	<=20.97	PASS
3DH5	Ant1	2402	4.59	<=20.97	PASS
		2441	3.84	<=20.97	PASS
		2480	2.45	<=20.97	PASS

Test Graphs

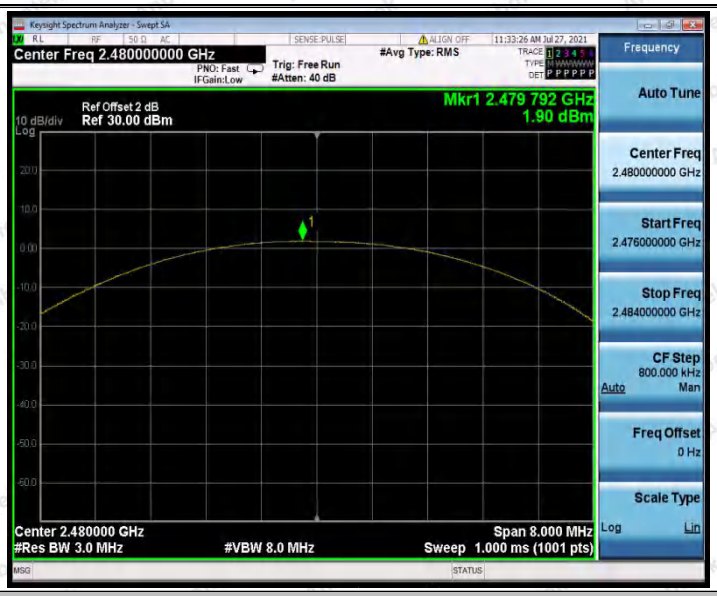
DH5_Ant1_2402



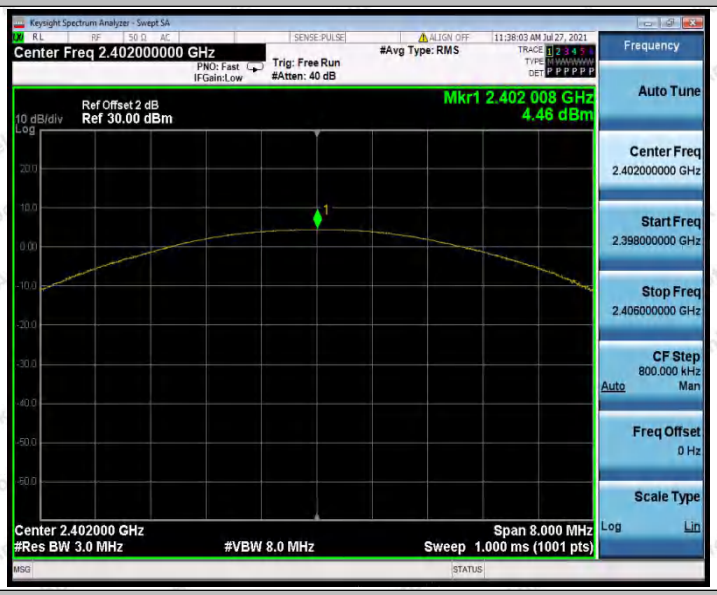
DH5_Ant1_2441



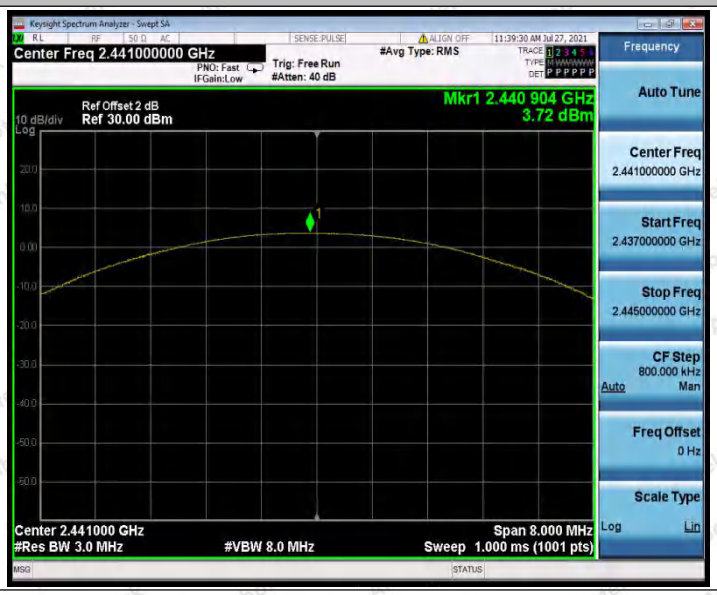
DH5_Ant1_2480



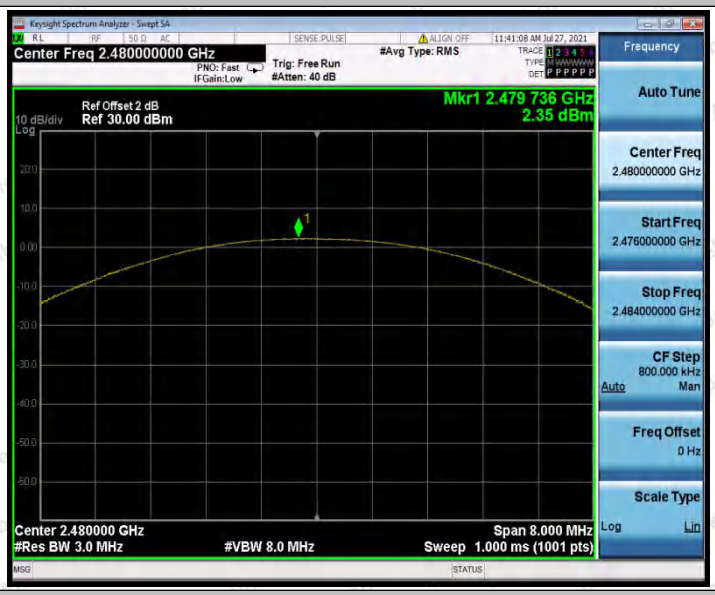
2DH5_Ant1_2402



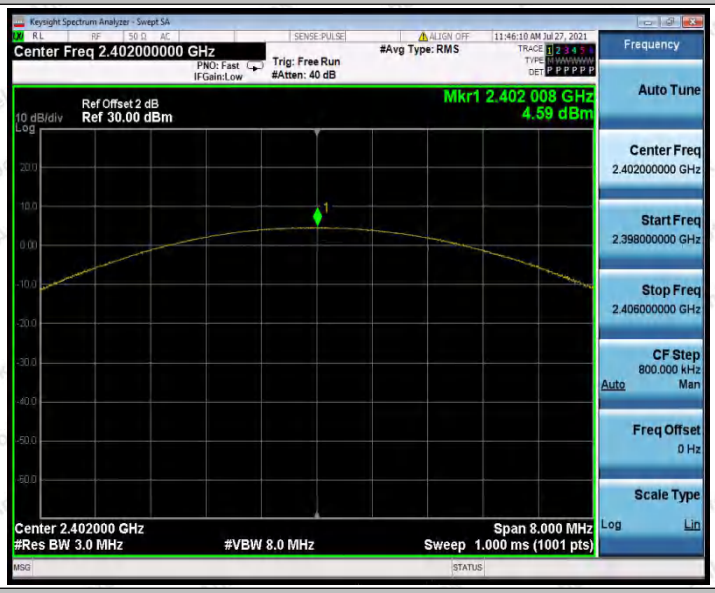
2DH5_Ant1_2441



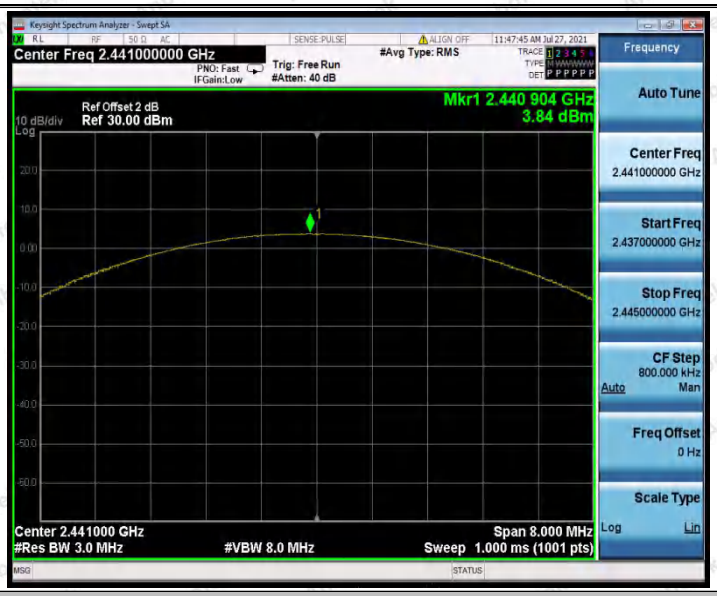
2DH5_Ant1_2480



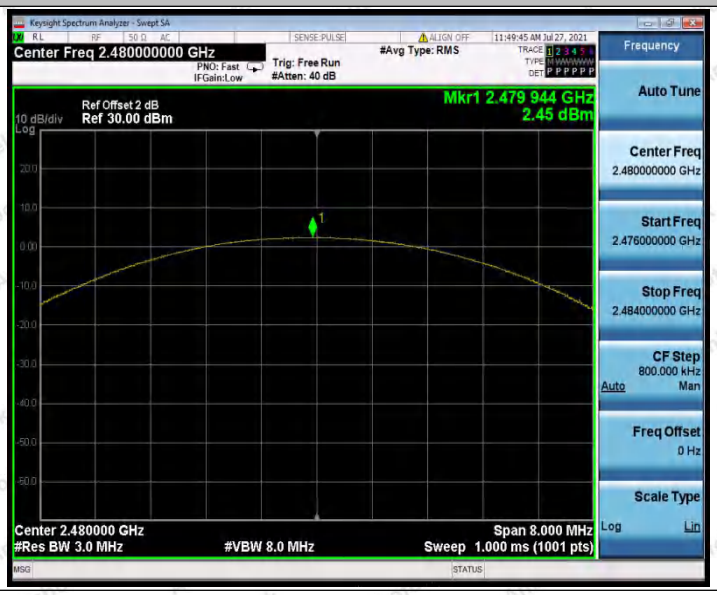
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



Appendix D: Carrier frequency separation

Test Result

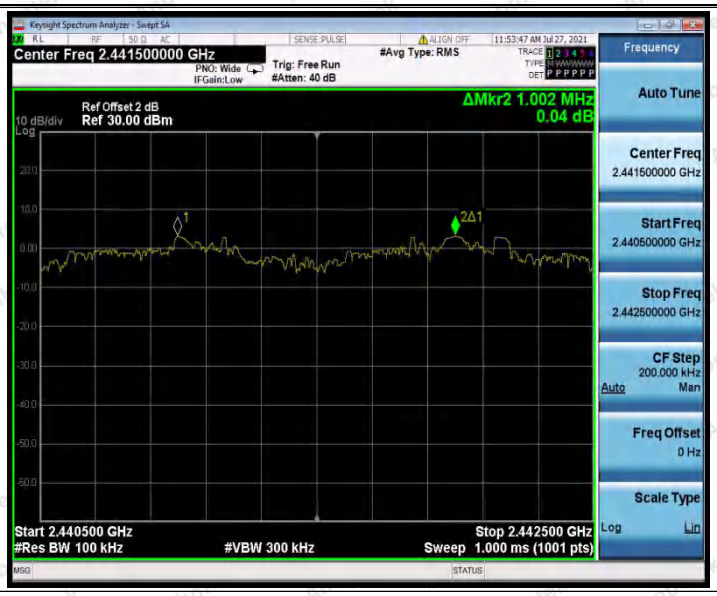
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	Hop	1.022	>=0.948	PASS
2DH5	Ant1	Hop	0.998	>=0.896	PASS
3DH5	Ant1	Hop	1.002	>=0.882	PASS

Test Graphs

DH5_Ant1_Hop

2DH5_Ant1_Hop

3DH5_Ant1_Hop


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441500000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
11:53:47 AM Jul 27, 2021
Ref Offset 2 dB
10 dB/div Ref 30.00 dBm
Log
ΔMkr2 1.002 MHz
0.04 dB
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
Scale Type
Log
Lin

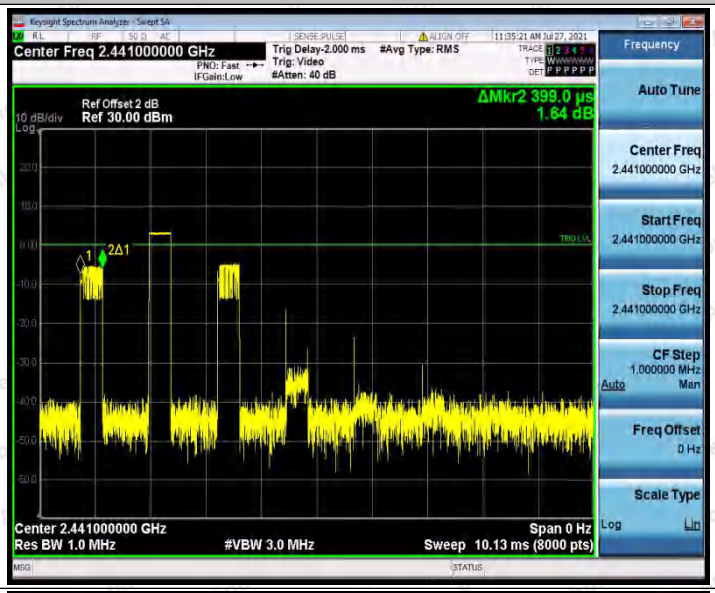
Appendix E: Time of occupancy

Test Result

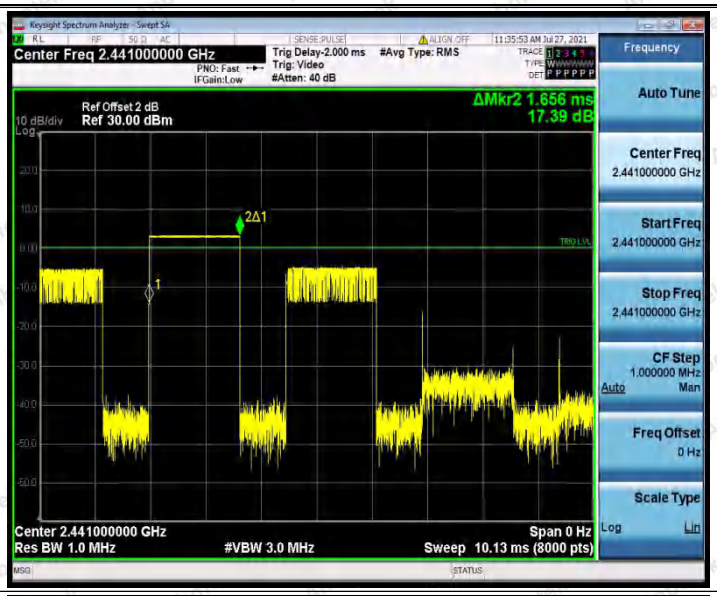
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.40	330	0.132	<=0.4	PASS
DH3	Ant1	Hop	1.66	160	0.265	<=0.4	PASS
DH5	Ant1	Hop	2.90	110	0.319	<=0.4	PASS
2DH1	Ant1	Hop	0.41	330	0.135	<=0.4	PASS
2DH3	Ant1	Hop	1.66	160	0.265	<=0.4	PASS
2DH5	Ant1	Hop	2.91	110	0.32	<=0.4	PASS
3DH1	Ant1	Hop	0.41	330	0.135	<=0.4	PASS
3DH3	Ant1	Hop	1.66	160	0.265	<=0.4	PASS
3DH5	Ant1	Hop	2.91	110	0.32	<=0.4	PASS

Test Graphs

DH1_Ant1_Hop

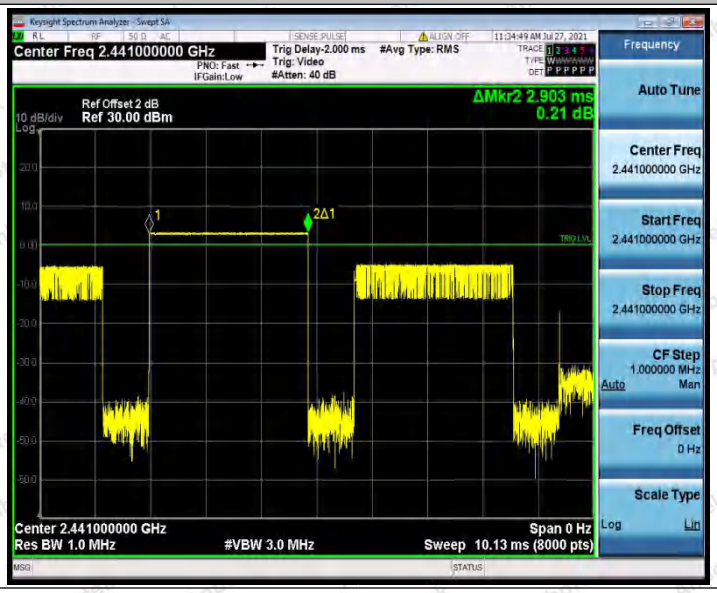


DH3_Ant1_Hop

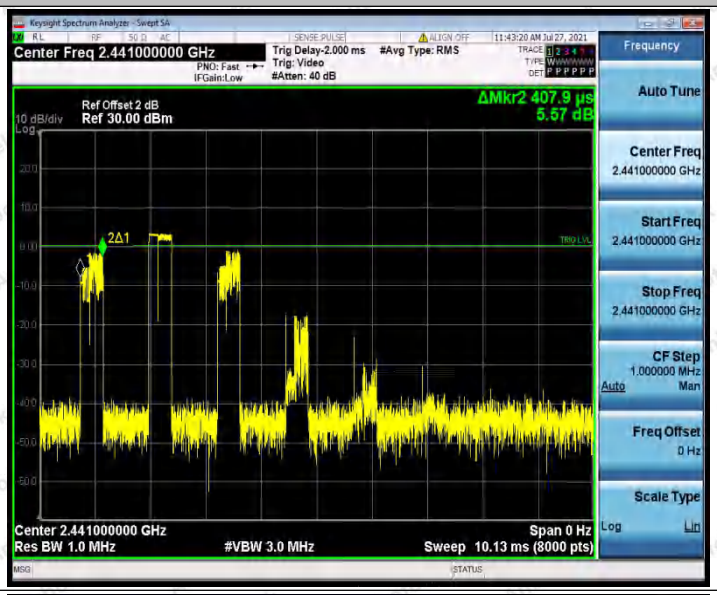

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
11:35:53 AM Jul 27, 2021
Ref Offset 2 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 1.656 ms
17.39 dB
2Δ1
1
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 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
Scale Type
Log
Lin

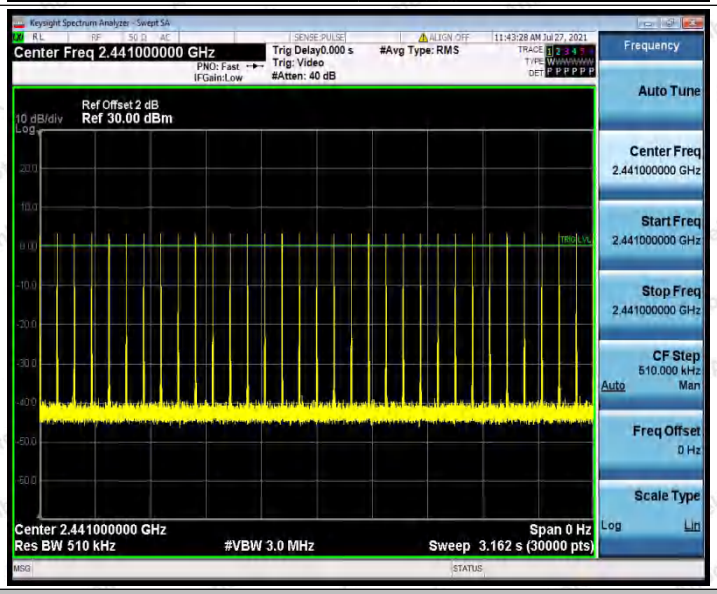
Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay0.000 s
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
11:36:00 AM Jul 27, 2021
Ref Offset 2 dB
10 dB/div
Ref 30.00 dBm
Center 2.441000000 GHz
Res BW 510 kHz
#VBW 3.0 MHz
Span 0 Hz
Sweep 3.162 s (30000 pts)
Frequency
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
Scale Type
Log
Lin

DH5_Ant1_Hop

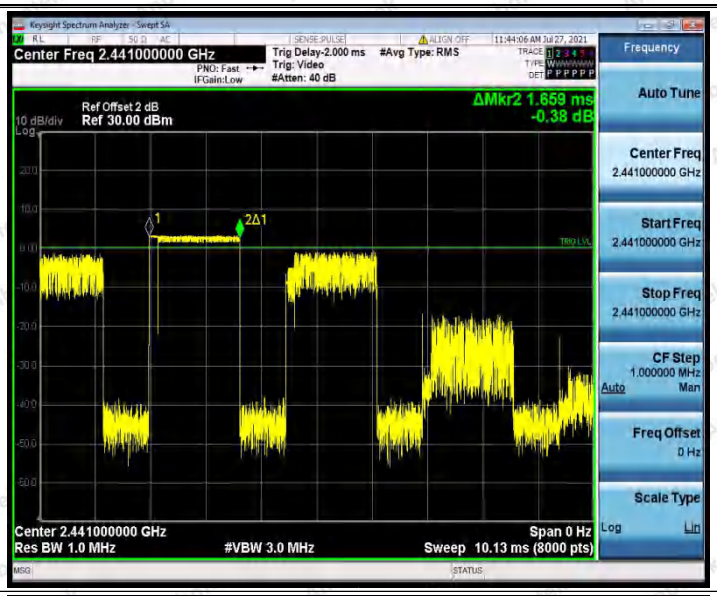

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
#Avg Type: RMS
Trig: Video
#Atten: 40 dB
PNO: Fast
IFGain:Low
11:34:49 AM Jul 27, 2021
Ref Offset 2 dB
10 dB/div
Ref 30.00 dBm
ΔMkr2 2.903 ms
0.21 dB
1
2Δ1
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 3.0 MHz
Span 0 Hz
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
Scale Type
Log
Lin

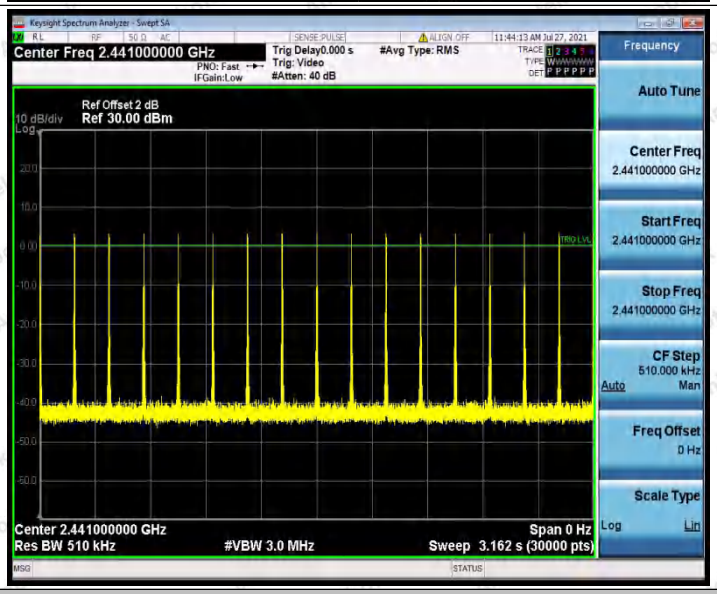
2DH1_Ant1_Hop



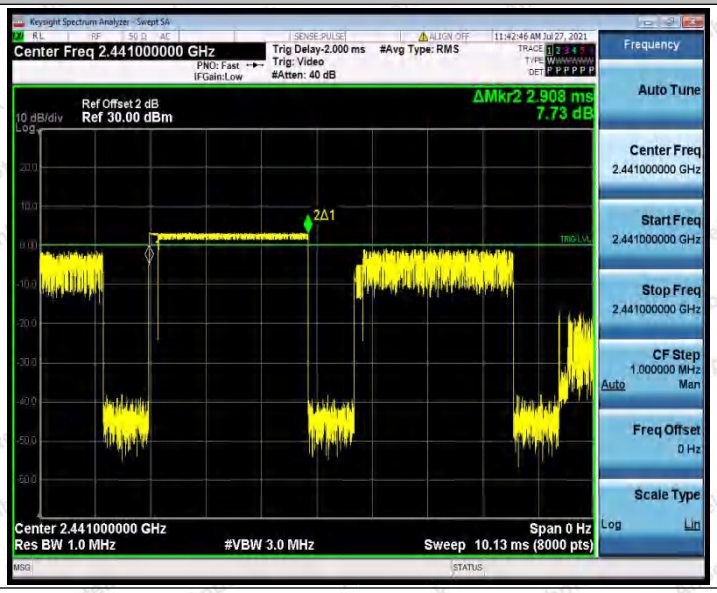


2DH3_Ant1_Hop

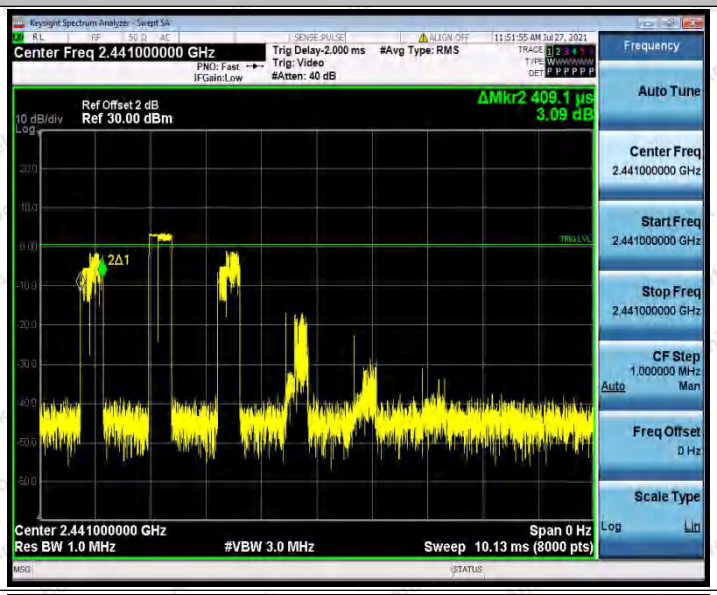


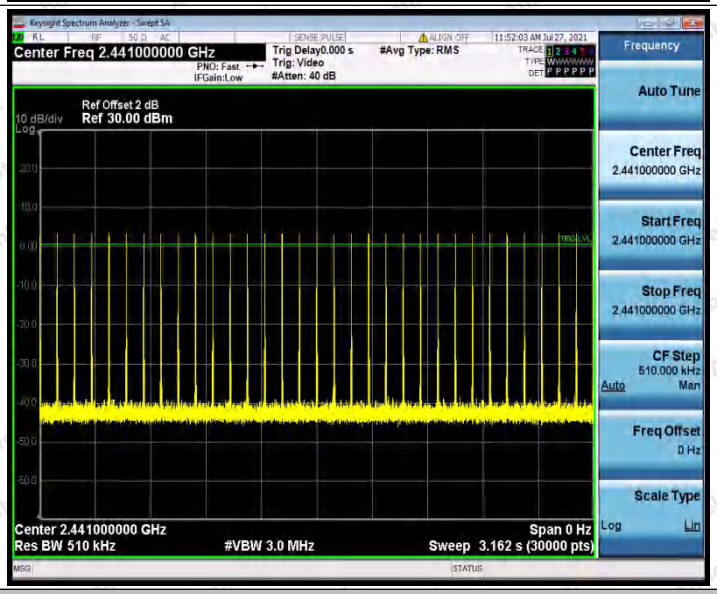


2DH5_Ant1_Hop

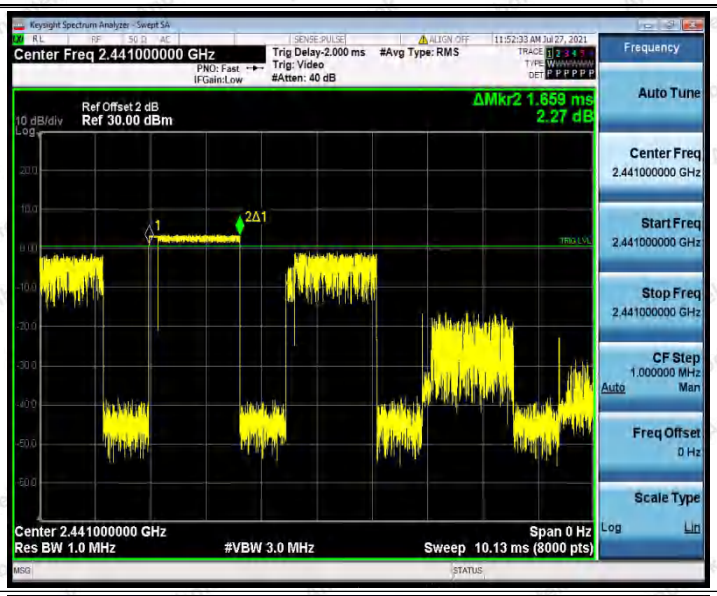


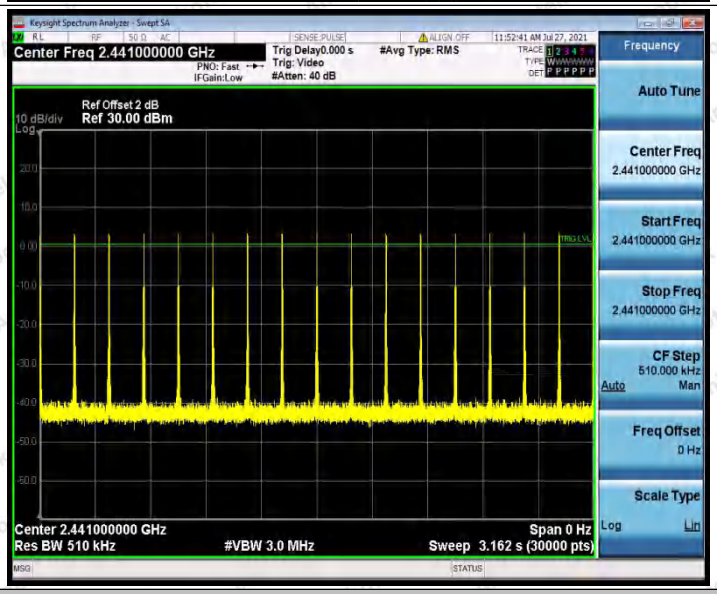
3DH1_Ant1_Hop



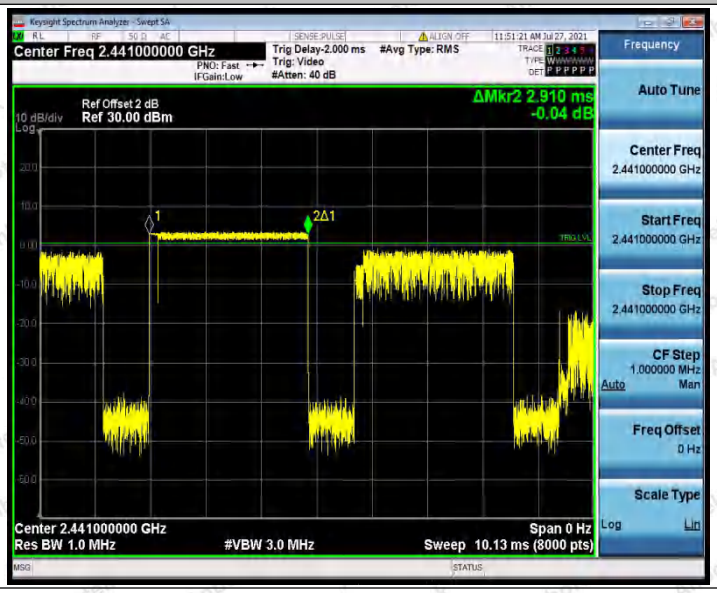


3DH3_Ant1_Hop





3DH5_Ant1_Hop



Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay 0.000 s
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
Ref Offset 2 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 3.162 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
Scale Type
Log
Lin

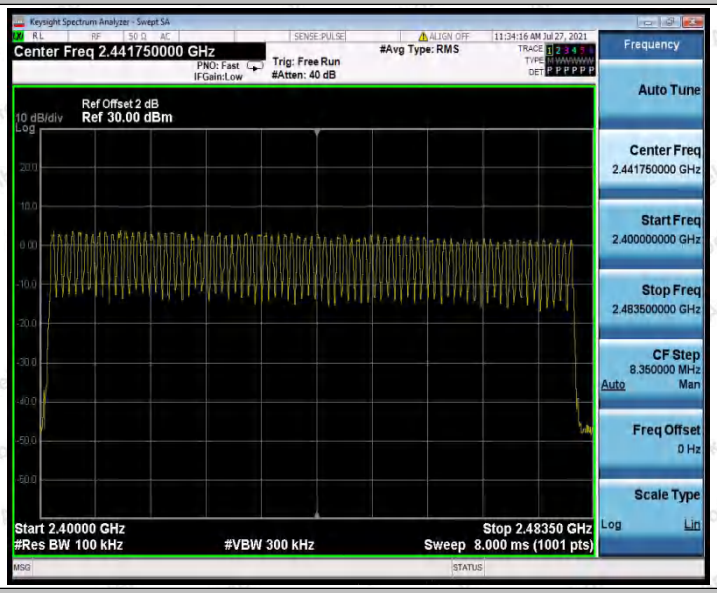
Appendix F: Number of hopping channels

Test Result

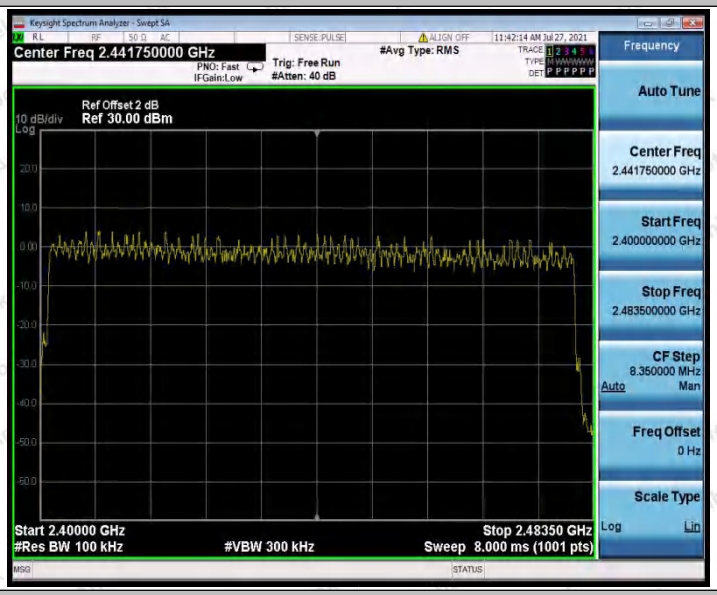
TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	>=15	PASS
2DH5	Ant1	Hop	79	>=15	PASS
3DH5	Ant1	Hop	79	>=15	PASS

Test Graphs

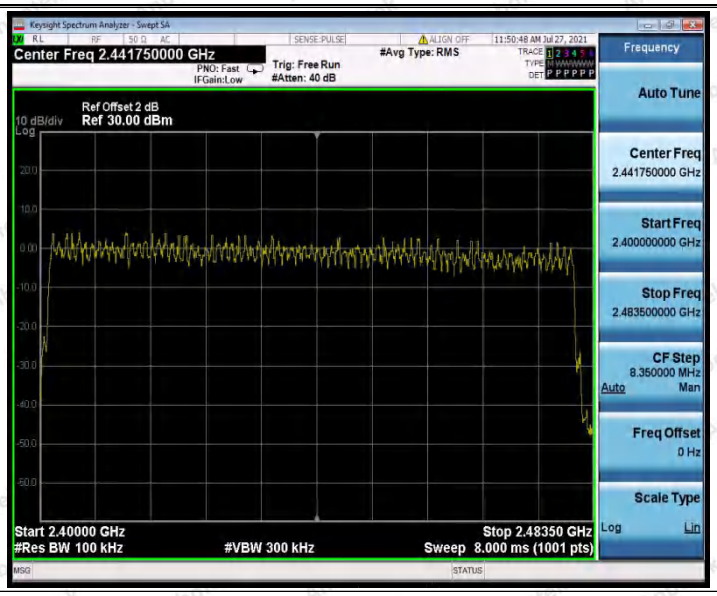
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
11:50:48 AM Jul 27, 2021
Ref Offset 2 dB
10 dB/div Ref 30.00 dBm
Log
Start 2.40000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.48350 GHz
Sweep 8.000 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
Scale Type
Log
Lin

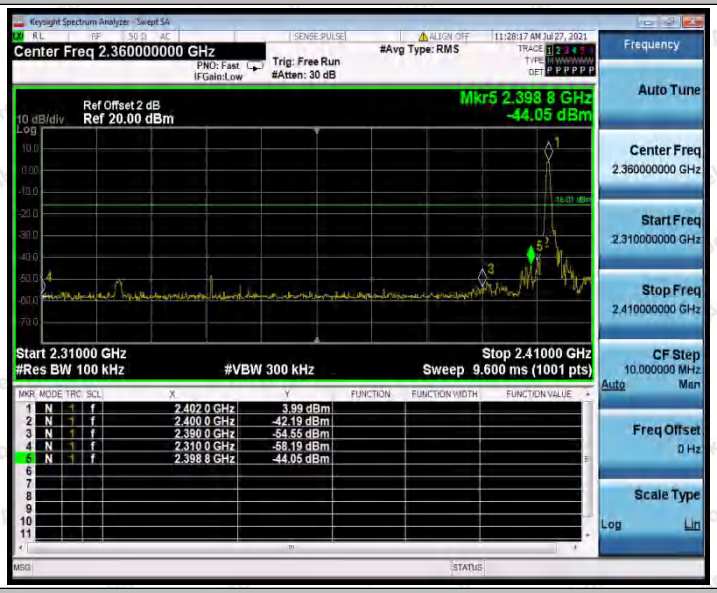
Appendix G: Band edge measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	3.99	-44.05	<=-16.01	PASS
		High	2480	1.50	-46.56	<=-18.5	PASS
		Low	Hop	3.44	-49.94	<=-16.56	PASS
		High	Hop	1.55	-57.14	<=-18.45	PASS
2DH5	Ant1	Low	2402	3.94	-35.04	<=-16.06	PASS
		High	2480	1.61	-46.46	<=-18.39	PASS
		Low	Hop	1.07	-49.42	<=-18.93	PASS
		High	Hop	1.67	-58.05	<=-18.33	PASS
3DH5	Ant1	Low	2402	3.96	-33.91	<=-16.04	PASS
		High	2480	1.54	-46.44	<=-18.46	PASS
		Low	Hop	3.72	-48.9	<=-16.28	PASS
		High	Hop	1.14	-57.64	<=-18.86	PASS

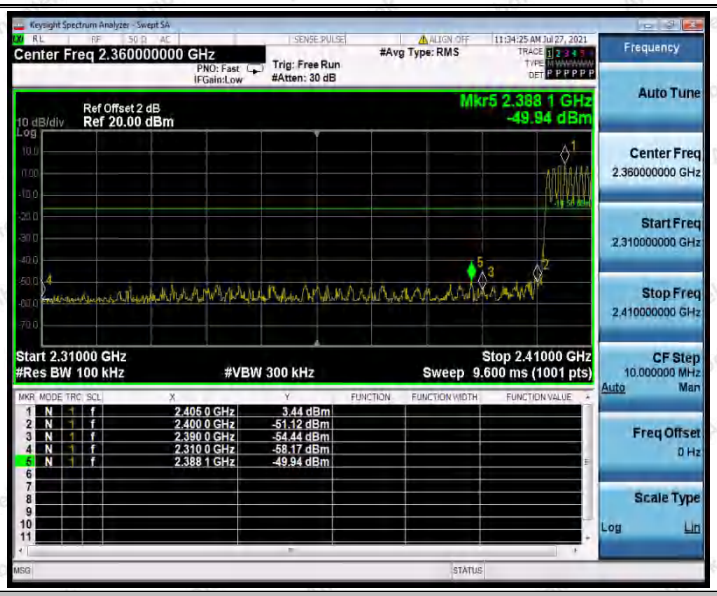
Test Graphs

DH5_Ant1_Low_2402

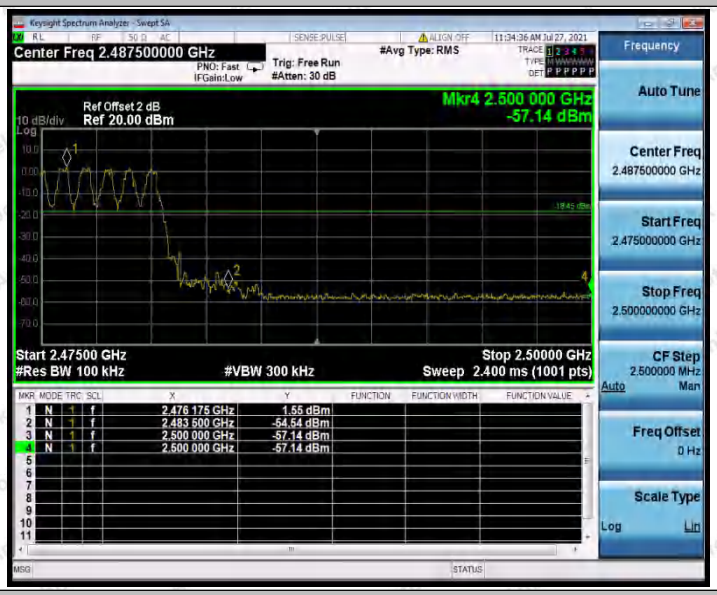


DH5_Ant1_High_2480

DH5_Ant1_Low_Hop

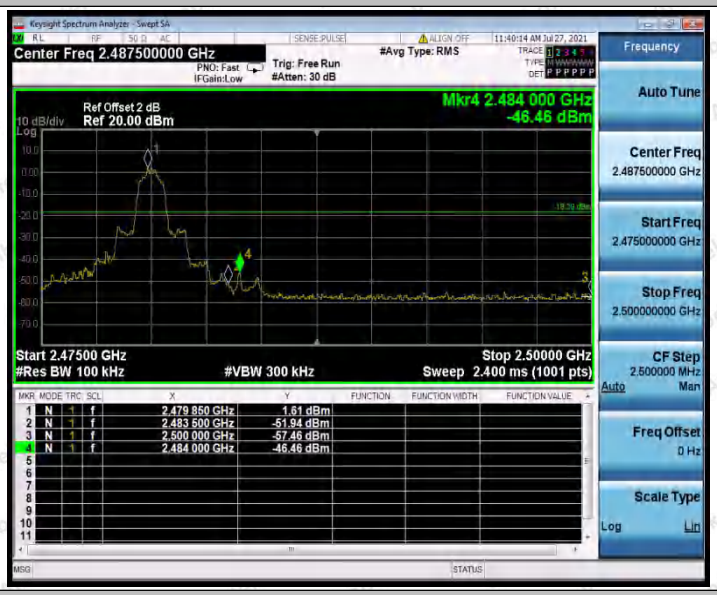


DH5_Ant1_High_Hop

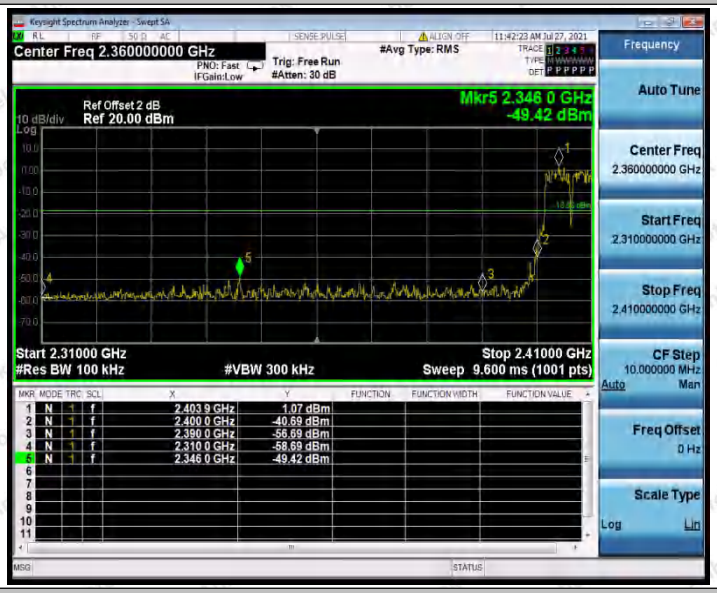


2DH5_Ant1_Low_2402

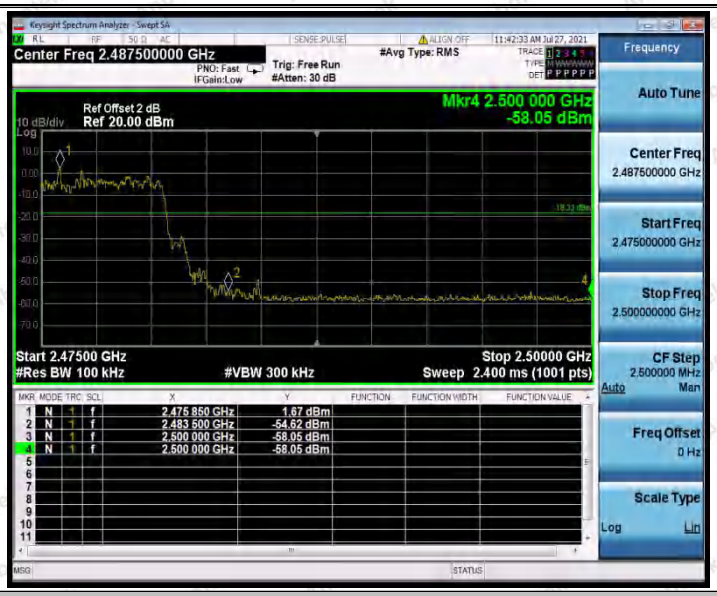
2DH5_Ant1_High_2480



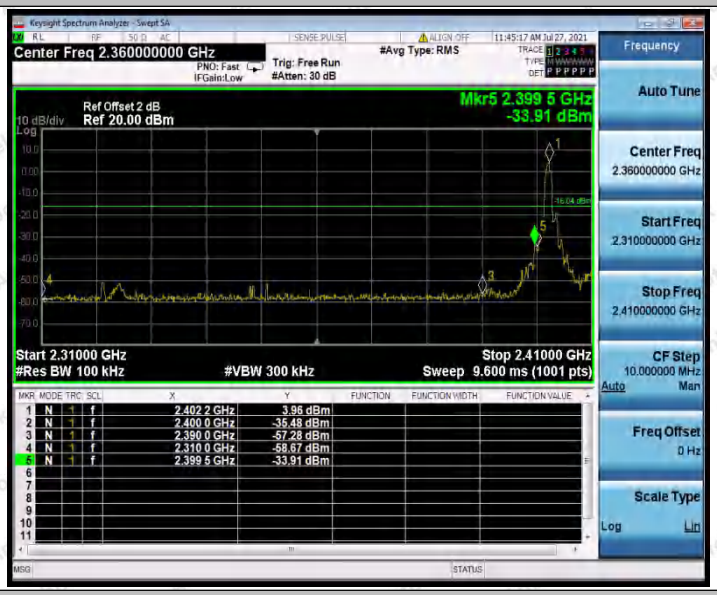
2DH5_Ant1_Low_Hop



2DH5_Ant1_High_Hop

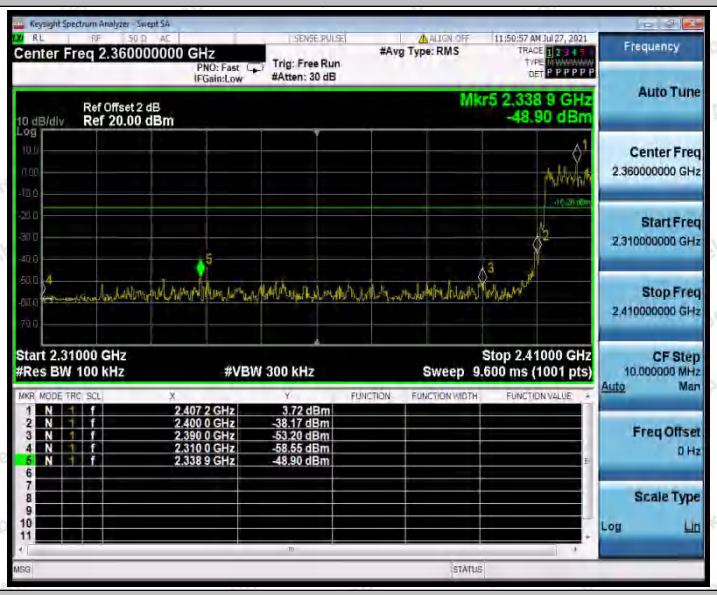


3DH5_Ant1_Low_2402



3DH5_Ant1_High_2480

3DH5_Ant1_Low_Hop



3DH5_Ant1_High_Hop

Appendix H: Conducted Spurious Emission

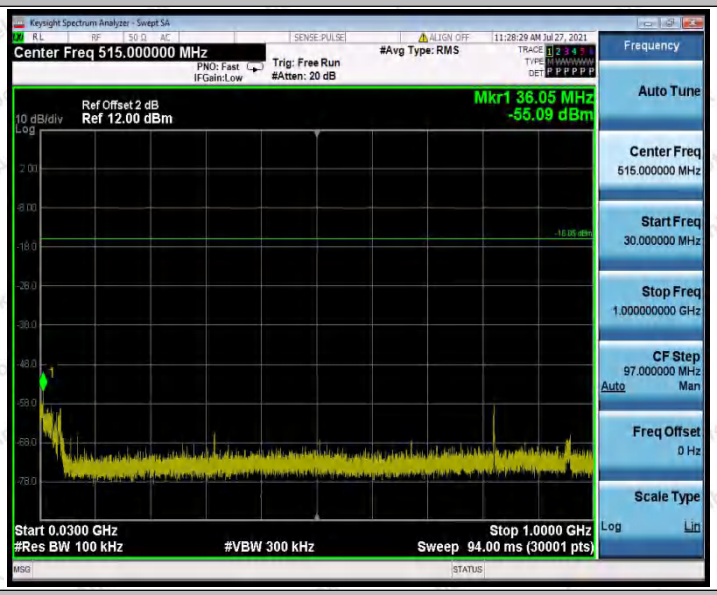
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	3.95	3.95	---	PASS
			30~1000	3.95	-55.09	<=-16.05	PASS
			1000~26500	3.95	-39.58	<=-16.05	PASS
		2441	Reference	3.13	3.13	---	PASS
			30~1000	3.13	-32.24	<=-16.87	PASS
			1000~26500	3.13	-34.39	<=-16.87	PASS
		2480	Reference	1.51	1.51	---	PASS
			30~1000	1.51	-46.53	<=-18.49	PASS
			1000~26500	1.51	-40.76	<=-18.49	PASS
2DH5	Ant1	2402	Reference	3.88	3.88	---	PASS
			30~1000	3.88	-53.04	<=-16.12	PASS
			1000~26500	3.88	-39.24	<=-16.12	PASS
		2441	Reference	3.16	3.16	---	PASS
			30~1000	3.16	-51	<=-16.84	PASS
			1000~26500	3.16	-42.93	<=-16.84	PASS
		2480	Reference	1.57	1.57	---	PASS
			30~1000	1.57	-53.49	<=-18.43	PASS
			1000~26500	1.57	-44	<=-18.43	PASS
3DH5	Ant1	2402	Reference	3.77	3.77	---	PASS
			30~1000	3.77	-52.95	<=-16.23	PASS
			1000~26500	3.77	-40	<=-16.23	PASS
		2441	Reference	3.13	3.13	---	PASS
			30~1000	3.13	-53.8	<=-16.87	PASS
			1000~26500	3.13	-41.31	<=-16.87	PASS
		2480	Reference	1.50	1.50	---	PASS
			30~1000	1.50	-52.6	<=-18.5	PASS
			1000~26500	1.50	-45.26	<=-18.5	PASS

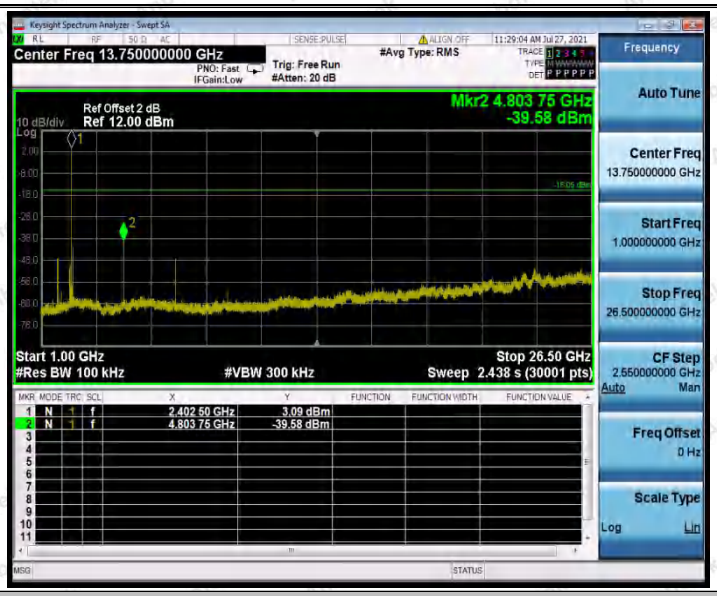
Test Graphs

DH5_Ant1_2402_0~Reference

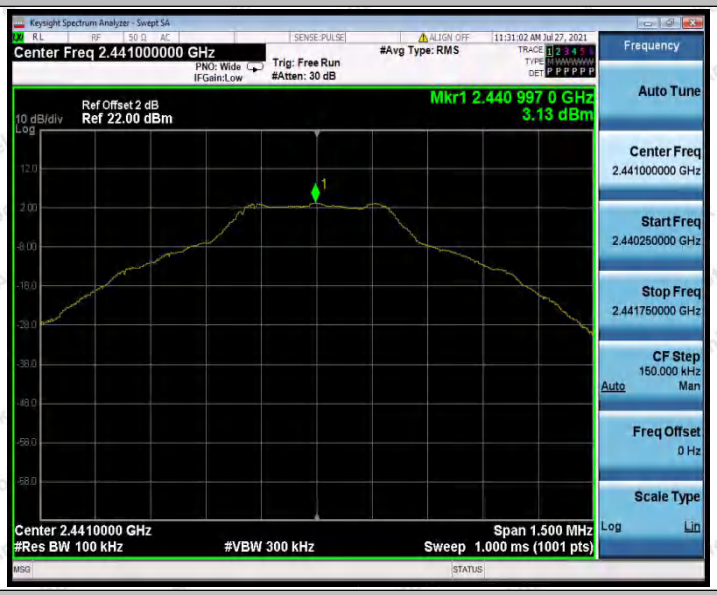
DH5_Ant1_2402_30~1000



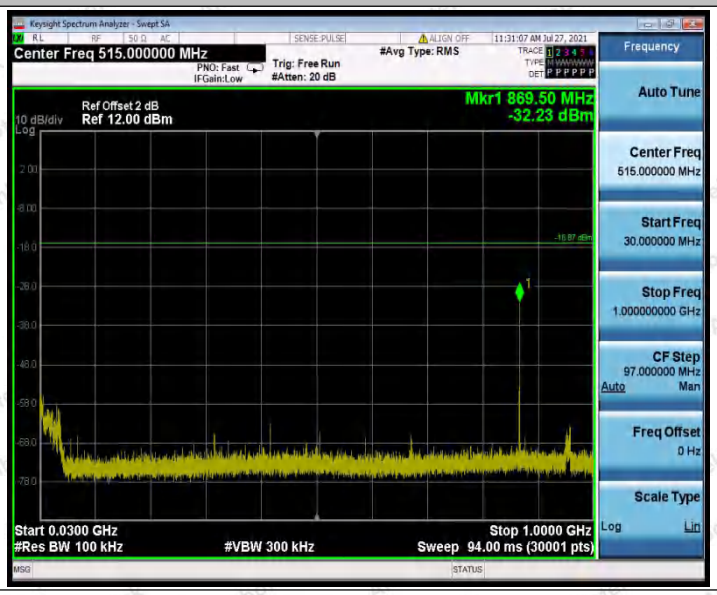
DH5_Ant1_2402_1000~26500



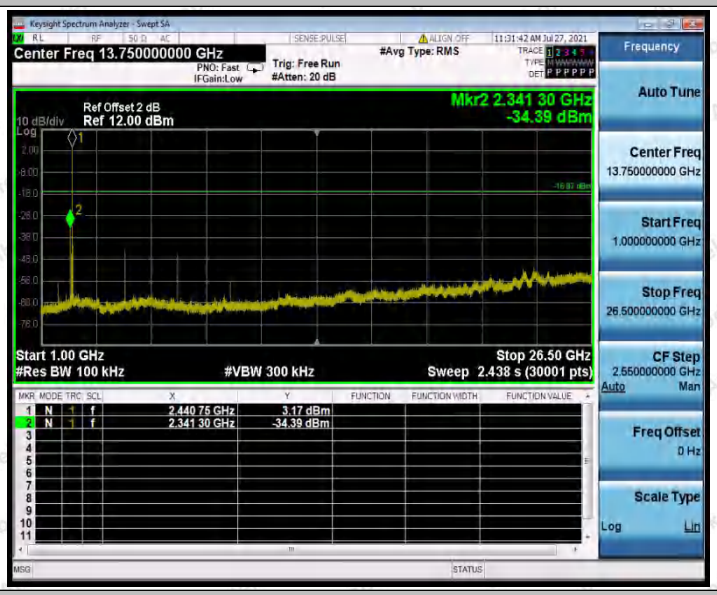
DH5_Ant1_2441_0~Reference



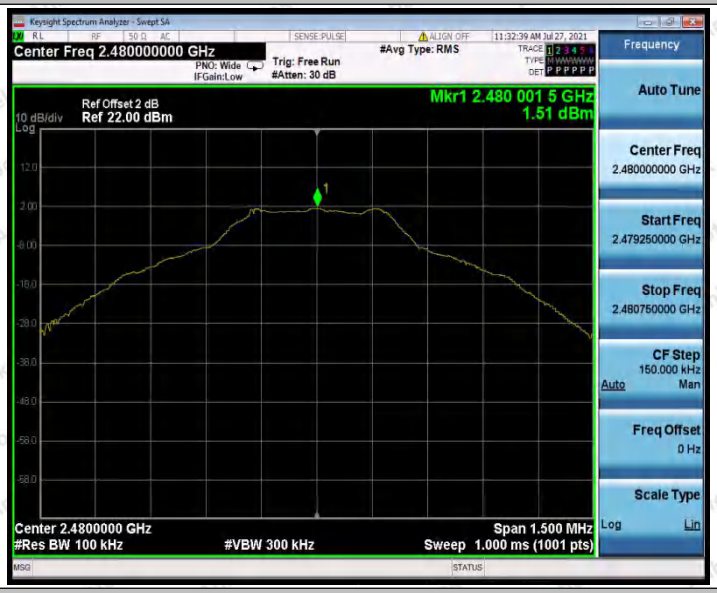
DH5_Ant1_2441_30~1000



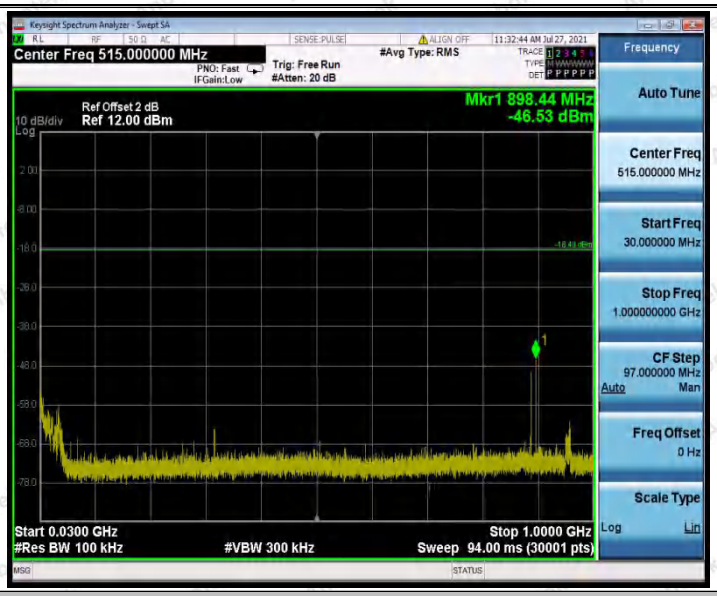
DH5_Ant1_2441_1000~26500



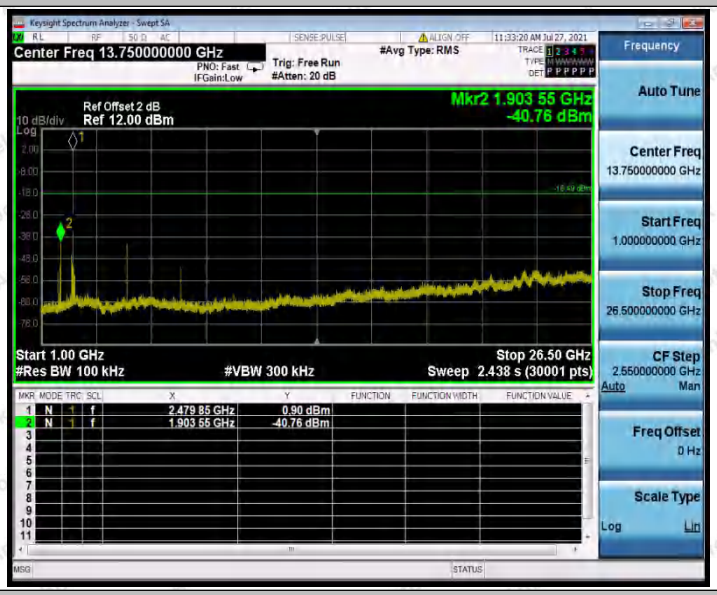
DH5_Ant1_2480_0~Reference



DH5_Ant1_2480_30~1000

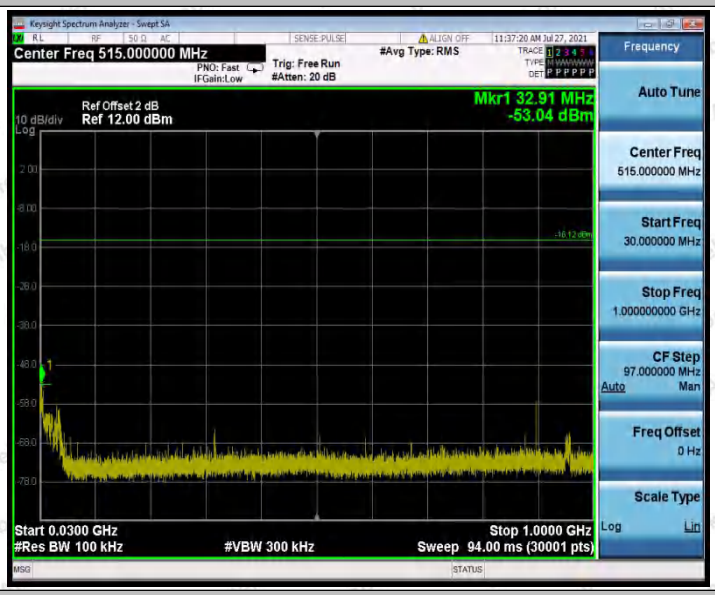


DH5_Ant1_2480_1000~26500

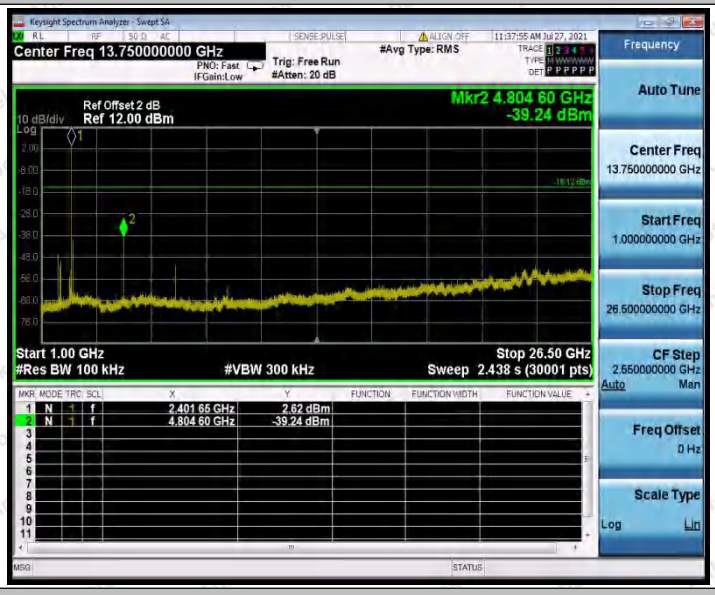


2DH5_Ant1_2402_0~Reference

2DH5_Ant1_2402_30~1000

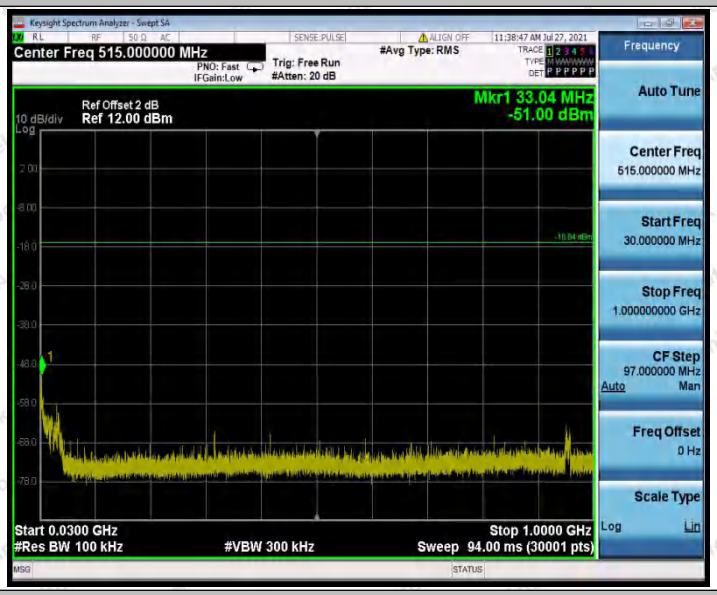


2DH5_Ant1_2402_1000~26500

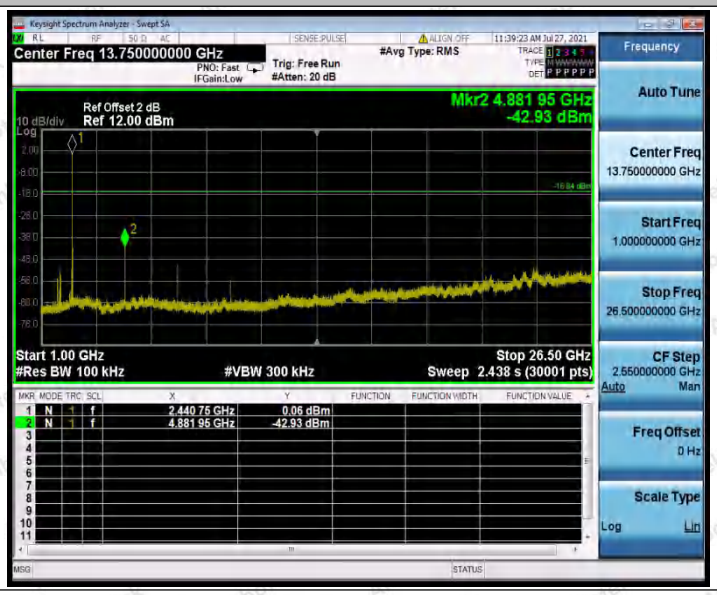


2DH5_Ant1_2441_0~Reference

2DH5_Ant1_2441_30~1000

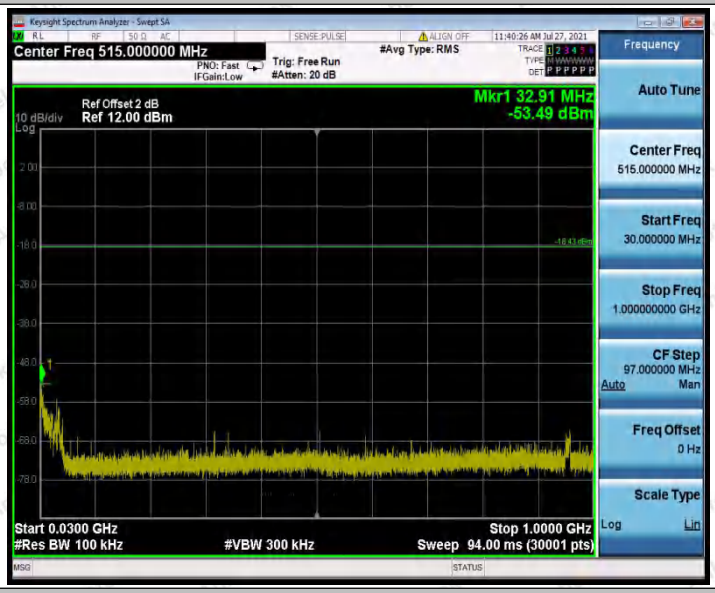


2DH5_Ant1_2441_1000~26500

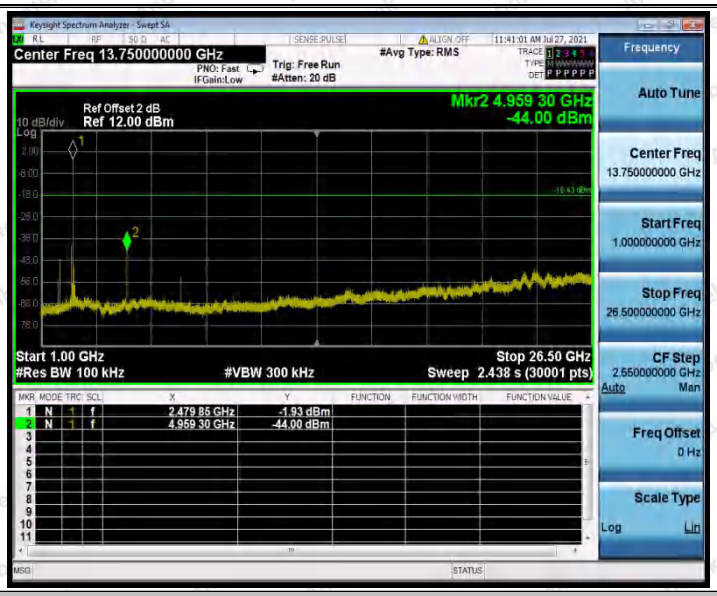


2DH5_Ant1_2480_0~Reference

2DH5_Ant1_2480_30~1000

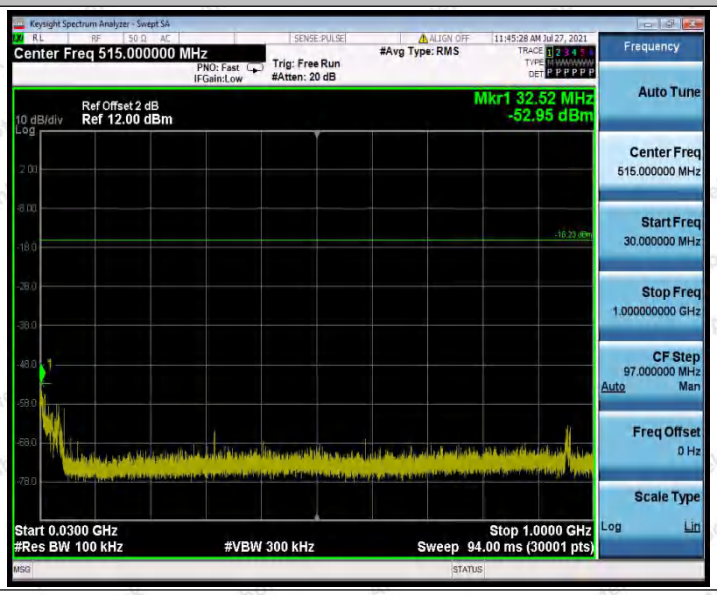


2DH5_Ant1_2480_1000~26500

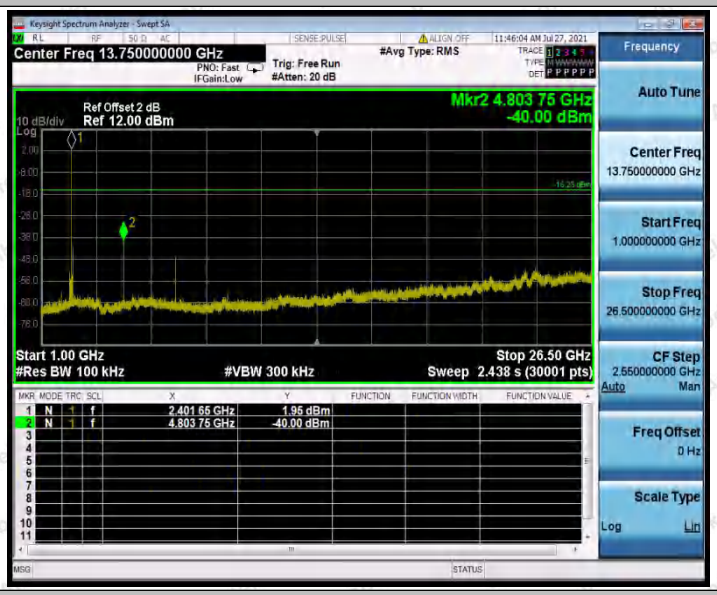


3DH5_Ant1_2402_0~Reference

3DH5_Ant1_2402_30~1000

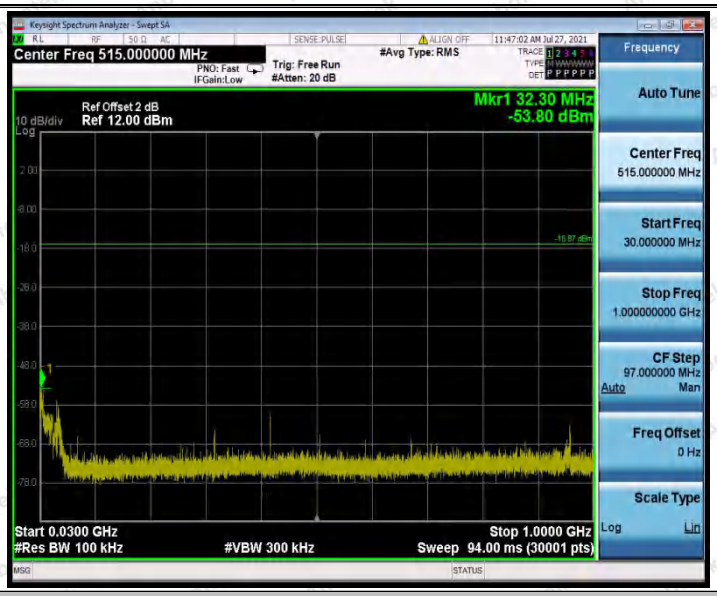


3DH5_Ant1_2402_1000~26500

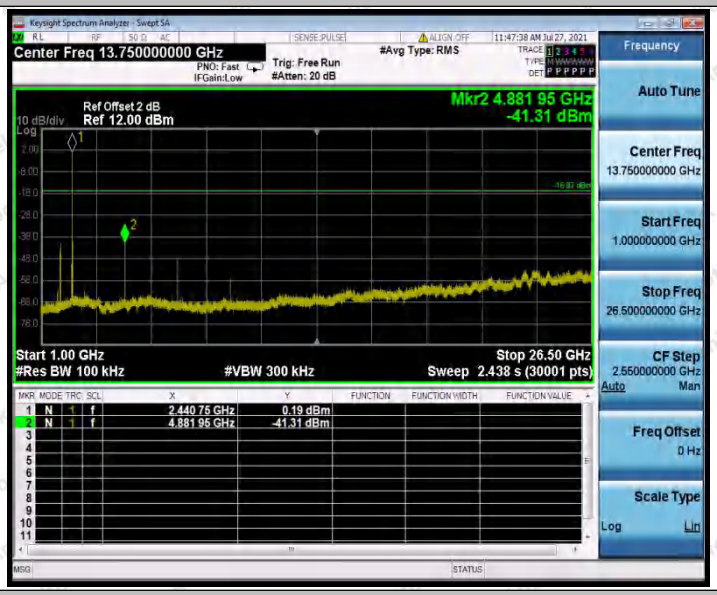


3DH5_Ant1_2441_0~Reference

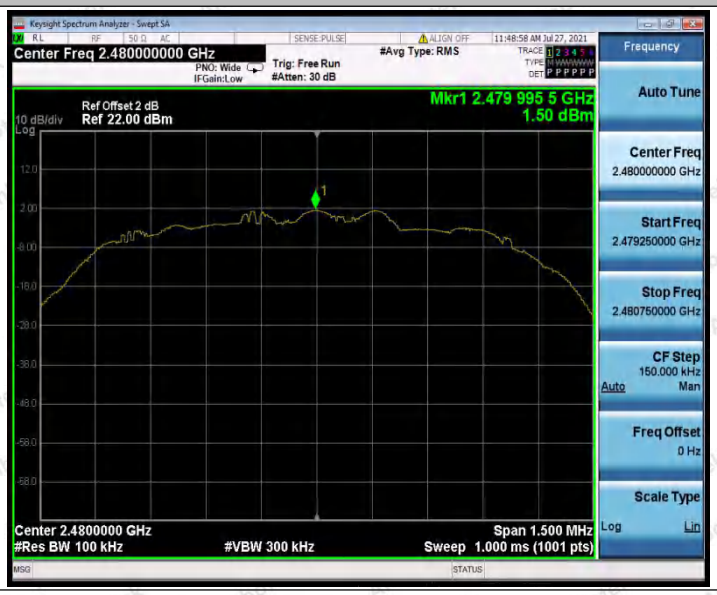
3DH5_Ant1_2441_30~1000



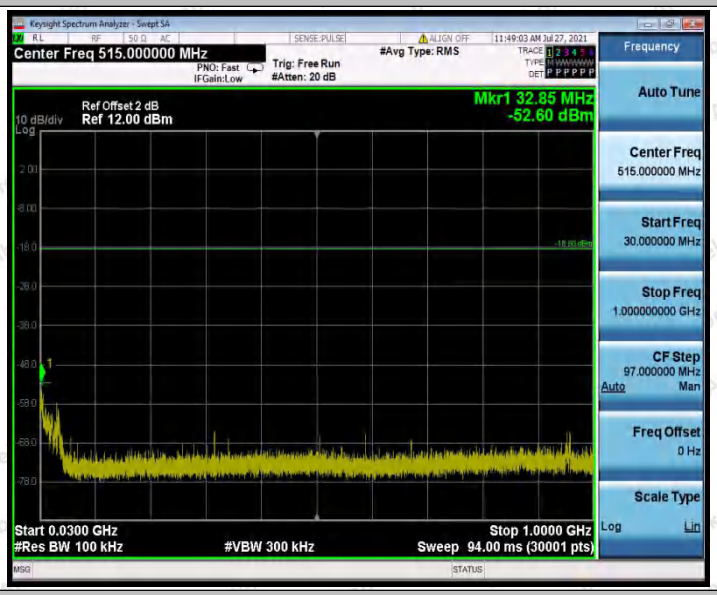
3DH5_Ant1_2441_1000~26500



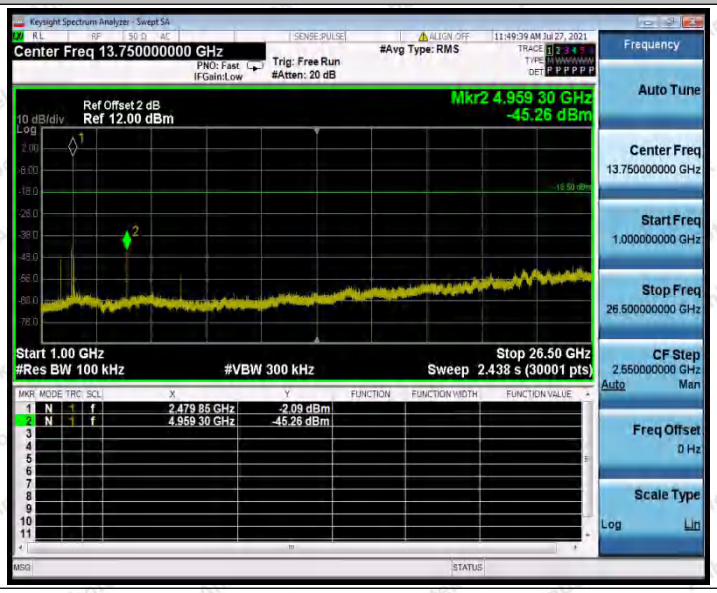
3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



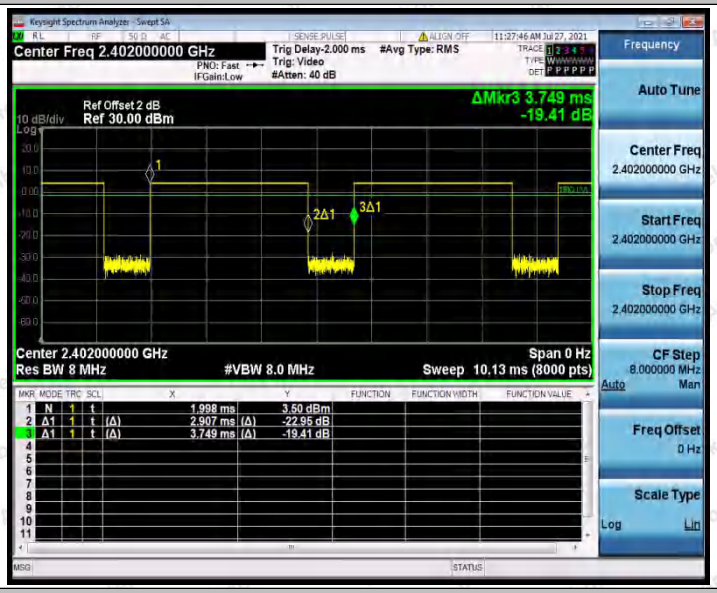
Appendix I: Duty Cycle

Test Result

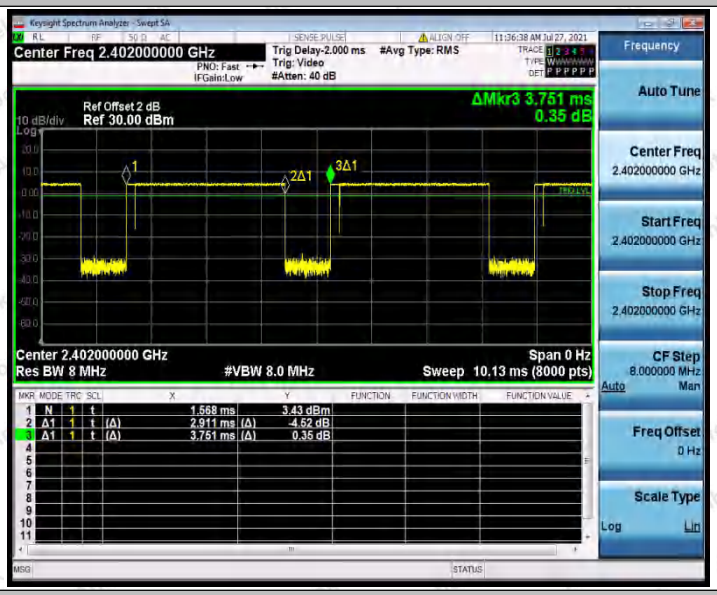
TestMode	Antenna	Channel	ON Time [ms]	Period [ms]	X	DC [%]	xFactor	Limit	Verdict
DH5	Ant1	2402	2.91	3.75	0.7760	77.60	1.10	---	PASS
2DH5	Ant1	2402	2.91	3.75	0.7760	77.60	1.10	---	PASS
3DH5	Ant1	2402	2.91	3.75	0.7760	77.60	1.10	---	PASS

Test Graphs

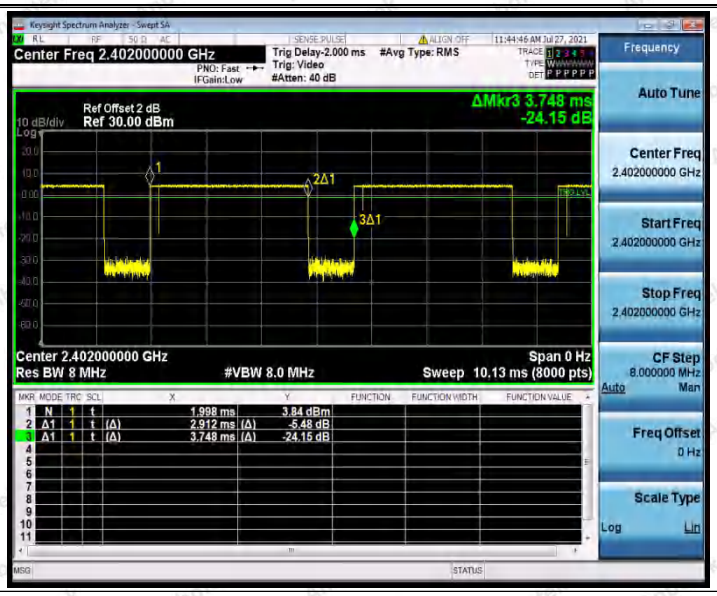
DH5_Ant1_2402



2DH5_Ant1_2402



3DH5_Ant1_2402


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.402000000 GHz
Trig Delay-2.000 ms
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
Ref Offset 2 dB
10 dB/div Ref 30.00 dBm
ΔMkr3 3.748 ms
-24.15 dB
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 1.998 ms 3.84 dBm
2 Δ1 1 t (Δ) 2.912 ms (Δ) -5.48 dB
3 Δ1 1 t (Δ) 3.748 ms (Δ) -24.15 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
Scale Type
Log Lin

----End----