Appendix: Bluetooth Classic

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Appendix A: 20dBEmission Bandwidth

Test Result

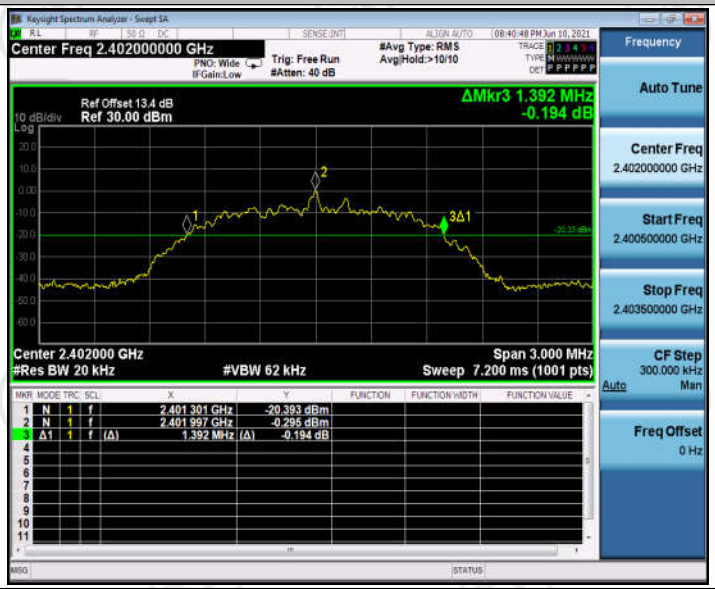
Test Mode	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	2402	0.858	2401.544	2402.402	---	PASS
	2441	0.861	2440.541	2441.402	---	PASS
	2480	0.864	2479.538	2480.402	---	PASS
2DH5	2402	1.392	2401.301	2402.693	---	PASS
	2441	1.392	2440.298	2441.690	---	PASS
	2480	1.395	2479.295	2480.690	---	PASS
3DH5	2402	1.401	2401.304	2402.705	---	PASS
	2441	1.404	2440.298	2441.702	---	PASS
	2480	1.404	2479.298	2480.702	---	PASS

Test Graphs

DH5 _2402

DH5 _2441

DH5 _2480



2DH5 _2402

2DH5 _2441

2DH5 _2480

3DH5 _2402

3DH5 _2441

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>10/10
Ref Offset 13.45 dB
10 dB/div
Ref 30.00 dBm
ΔMkr3 1.404 MHz
0.173 dB
Center 2.480000 GHz
#Res BW 20 kHz
#VBW 62 kHz
Span 3.000 MHz
Sweep 7.200 ms (1001 pts)
1 N 1 f 2.479 298 GHz -21.681 dBm
2 N 1 f 2.479 997 GHz -1.454 dBm
3 Δ1 1 f (Δ) 1.404 MHz (Δ) 0.173 dB
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.478500000 GHz
Stop Freq
2.481500000 GHz
CF Step
300.000 kHz
Auto Man
Freq Offset
0 Hz

3DH5 _2480

Appendix B: Occupied Channel Bandwidth

Test Result

Test Mode	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	2402	0.85652	2401.571	2402.427	---	PASS
	2441	0.85865	2440.564	2441.423	---	PASS
	2480	0.86561	2479.561	2480.427	---	PASS
2DH5	2402	1.3446	2401.327	2402.672	---	PASS
	2441	1.3472	2440.321	2441.669	---	PASS
	2480	1.3497	2479.319	2480.669	---	PASS
3DH5	2402	1.3480	2401.330	2402.678	---	PASS
	2441	1.3456	2440.326	2441.672	---	PASS
	2480	1.3485	2479.324	2480.673	---	PASS

Test Graphs

DH5 _2402

DH5 _2441

DH5 _2480

2DH5 _2402

2DH5 _2441

2DH5 _2480

3DH5 _2402

3DH5 _2441

Keysight Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 13.45 dB
10 dB/div
Ref 30.00 dBm
Mkr1 2.479997 GHz
-1.5013 dBm
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 20 kHz
#VBW 75 kHz
Span 3 MHz
Sweep 7.133 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
1.3484 MHz
Total Power
8.34 dBm
Transmit Freq Error
-1.262 kHz
OBW Power
99.00 %
x dB Bandwidth
1.581 MHz
x dB
-26.00 dB
Freq Offset
0 Hz

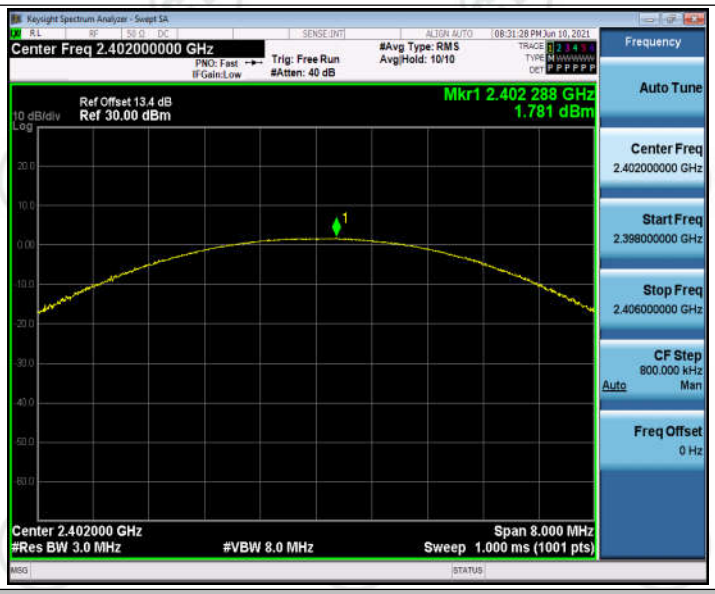
3DH5 _2480

Appendix C: Maximum conducted output power

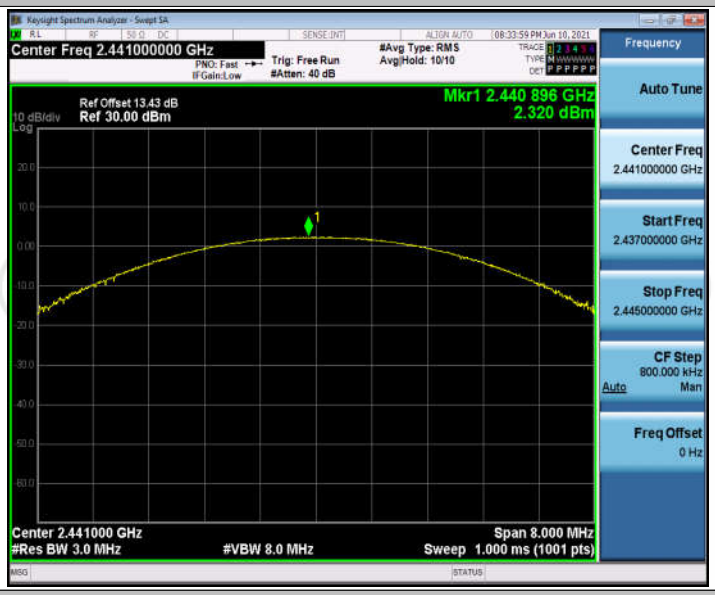
Test Result

Test Mode	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	2402	1.78	<=20.97	PASS
	2441	2.32	<=20.97	PASS
	2480	-0.94	<=20.97	PASS
2DH5	2402	3.61	<=20.97	PASS
	2441	4.33	<=20.97	PASS
	2480	3.51	<=20.97	PASS
3DH5	2402	3.01	<=20.97	PASS
	2441	3.75	<=20.97	PASS
	2480	2.77	<=20.97	PASS

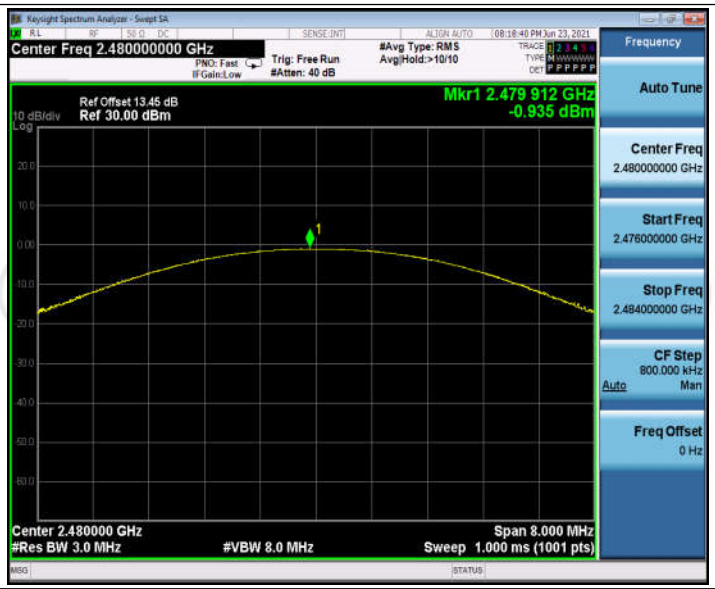
Test Graphs



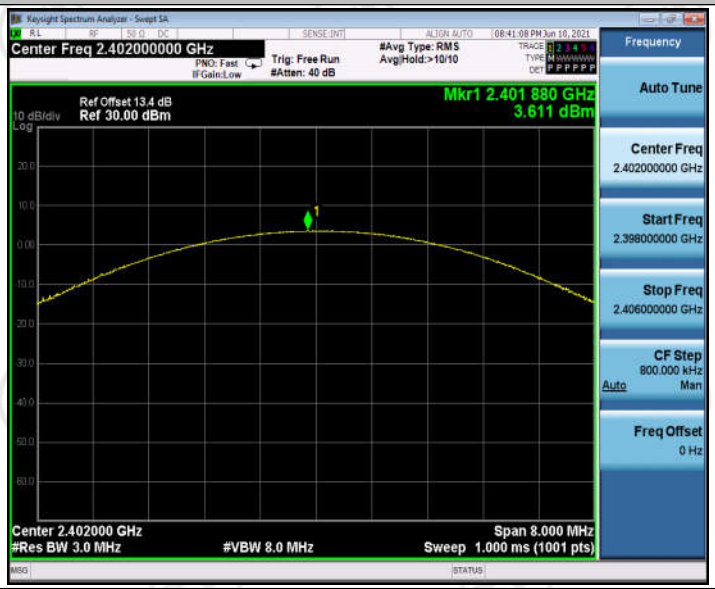
DH5 _2402



DH5 _2441

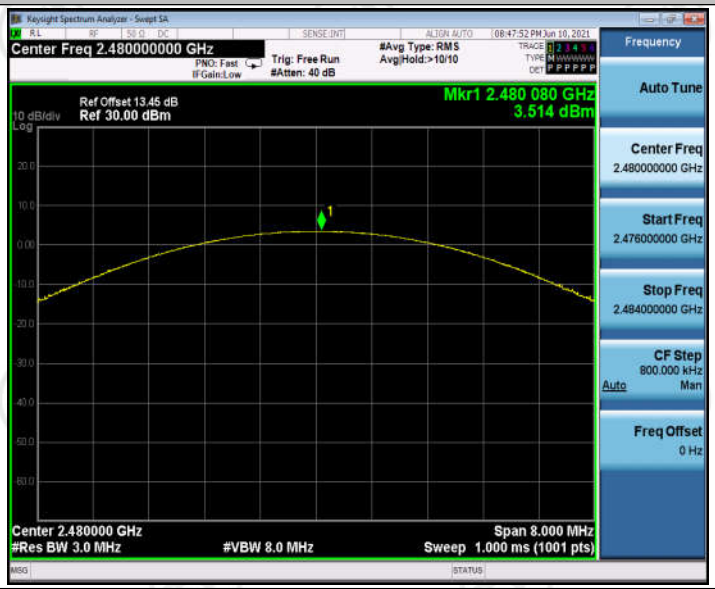


DH5 _2480

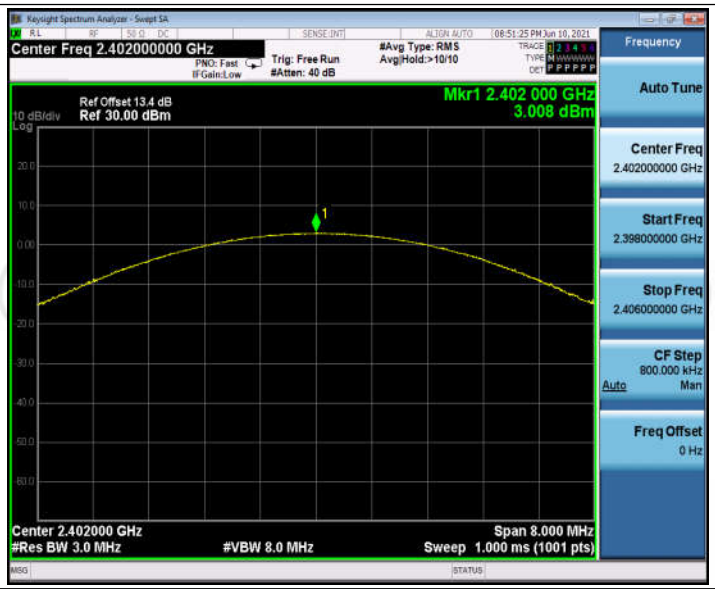


2DH5 _2402

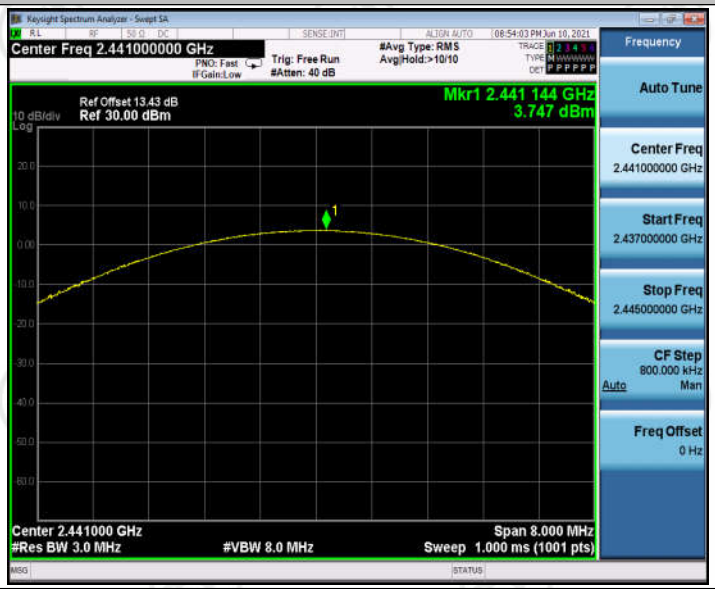
2DH5 _2441



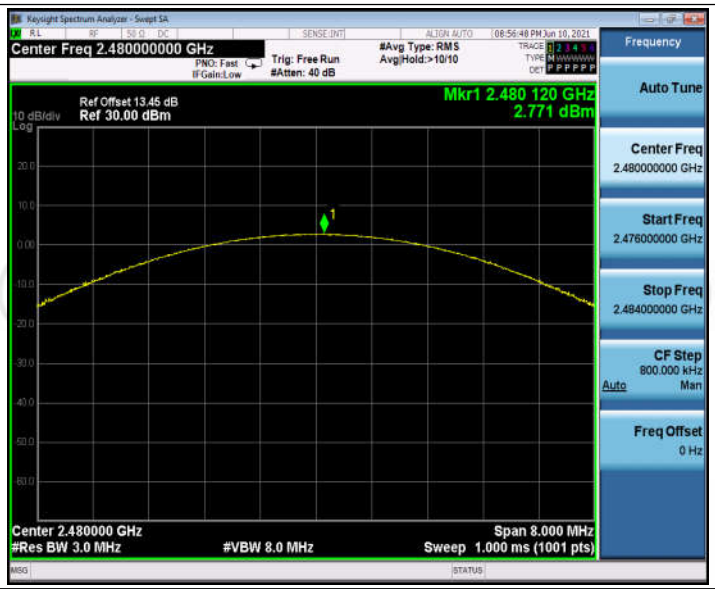
2DH5 _2480



3DH5 _2402



3DH5 _2441


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>10/10
Ref Offset 13.45 dB
10 dB/div Ref 30.00 dBm
Log
Mkr1 2.480 120 GHz
2.771 dBm
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 8.000 MHz
Sweep 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.476000000 GHz
Stop Freq
2.484000000 GHz
CF Step
800.000 kHz
Auto
Man
Freq Offset
0 Hz

3DH5 _2480

Appendix D: Carrier frequency separation

Test Result

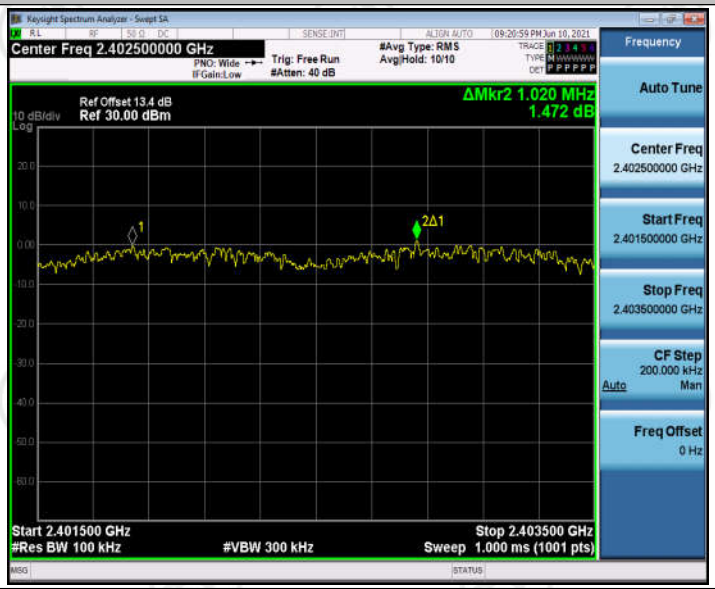
Test Mode	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Hop_2402	1.078	>=0.864	PASS
	Hop_2441	0.984	>=0.864	PASS
	Hop_2480	0.982	>=0.864	PASS
2DH5	Hop_2402	1.02	>=0.930	PASS
	Hop_2441	0.982	>=0.930	PASS
	Hop_2480	1	>=0.930	PASS
3DH5	Hop_2402	0.978	>=0.936	PASS
	Hop_2441	1.116	>=0.936	PASS
	Hop_2480	0.97	>=0.936	PASS

Test Graphs

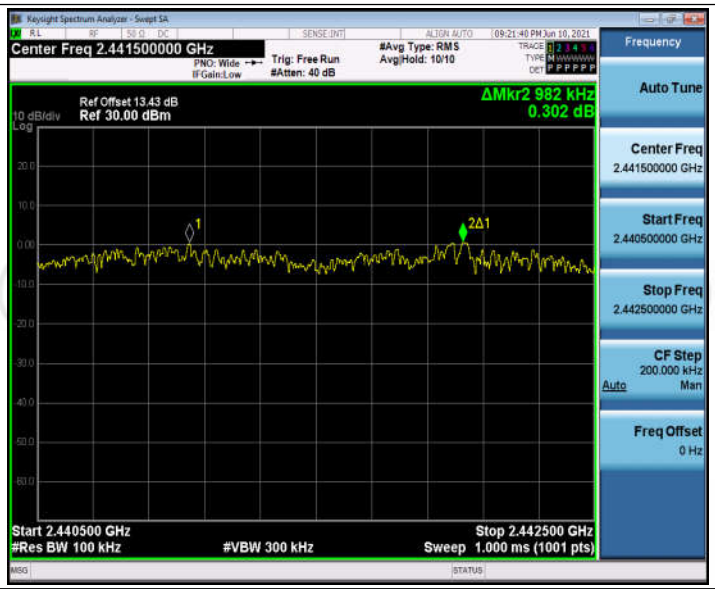
DH5 _Hop_2402

DH5 _Hop_2441

DH5 _Hop_2480

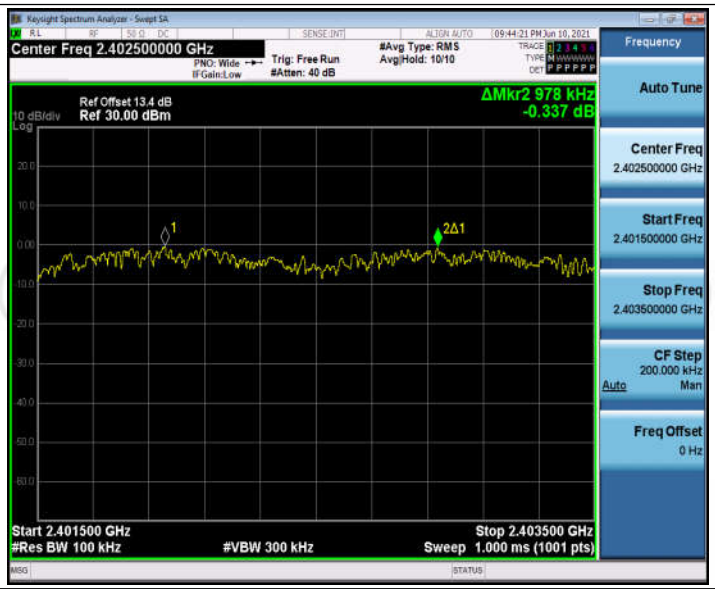


2DH5 _Hop_2402

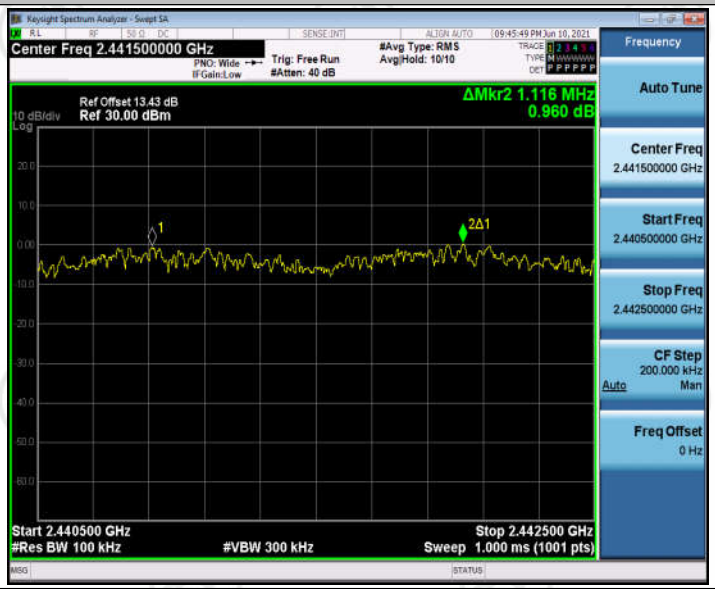


2DH5 _Hop_2441

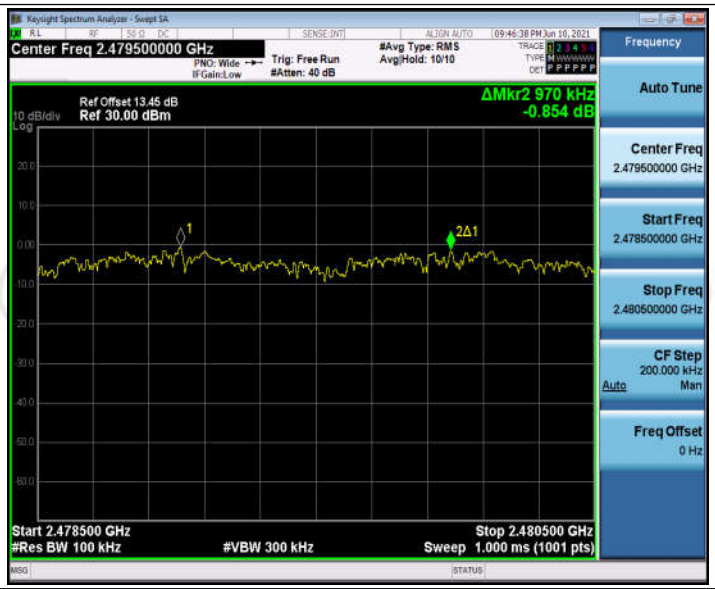
2DH5 _Hop_2480



3DH5 _Hop_2402



3DH5 _Hop_2441



3DH5 _Hop_2480

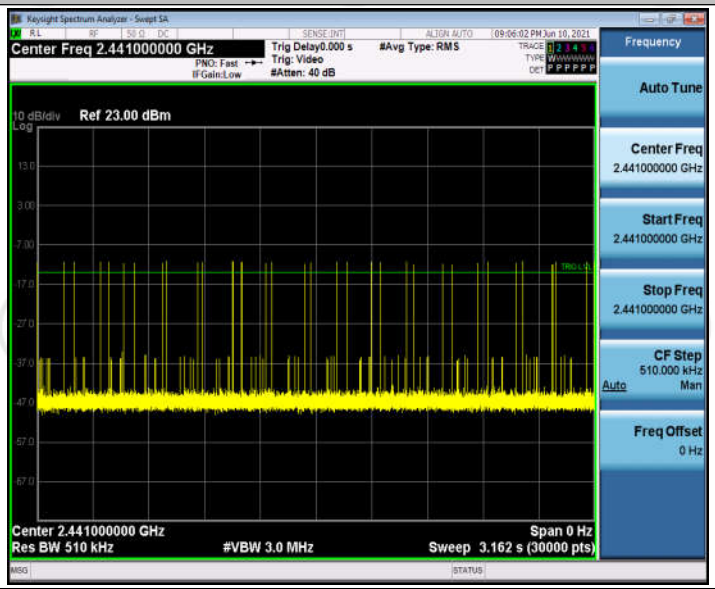
Appendix E: Time of occupancy

Test Result

Test Mode	Channel	Burst Width [ms]	Total Hops [Num]	Result[s]	Limit[s]	Verdict
DH1	Hop	0.38	330	0.125	<=0.4	PASS
DH3	Hop	1.64	160	0.262	<=0.4	PASS
DH5	Hop	2.88	100	0.288	<=0.4	PASS
2DH1	Hop	0.39	320	0.124	<=0.4	PASS
2DH3	Hop	1.64	130	0.213	<=0.4	PASS
2DH5	Hop	2.89	100	0.289	<=0.4	PASS
3DH1	Hop	0.39	330	0.128	<=0.4	PASS
3DH3	Hop	1.64	180	0.295	<=0.4	PASS
3DH5	Hop	2.89	110	0.318	<=0.4	PASS

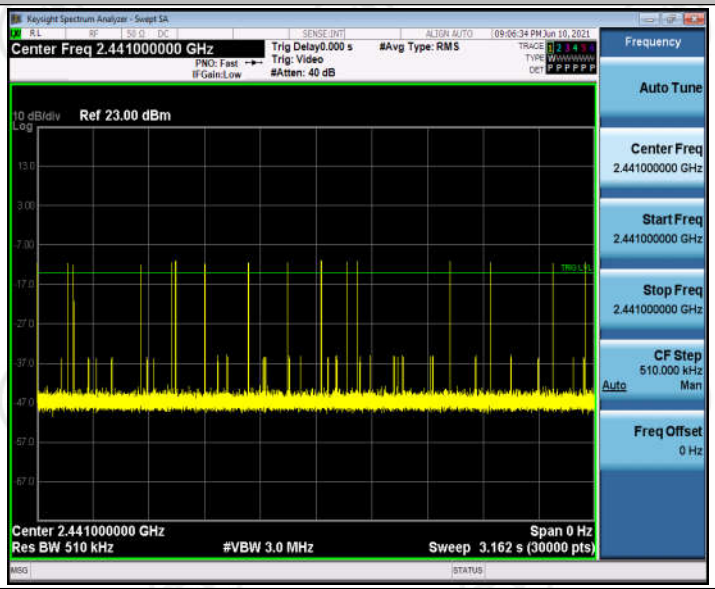
Test Graphs

DH1 _Hop

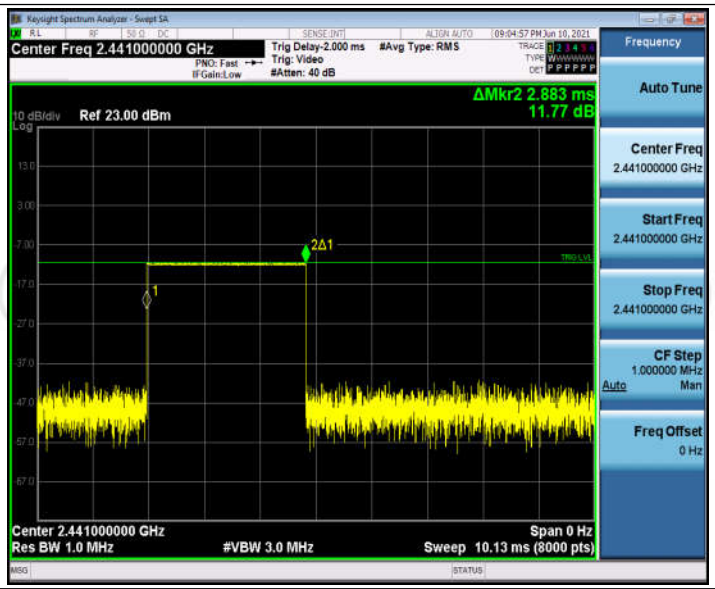


DH1 _Hop

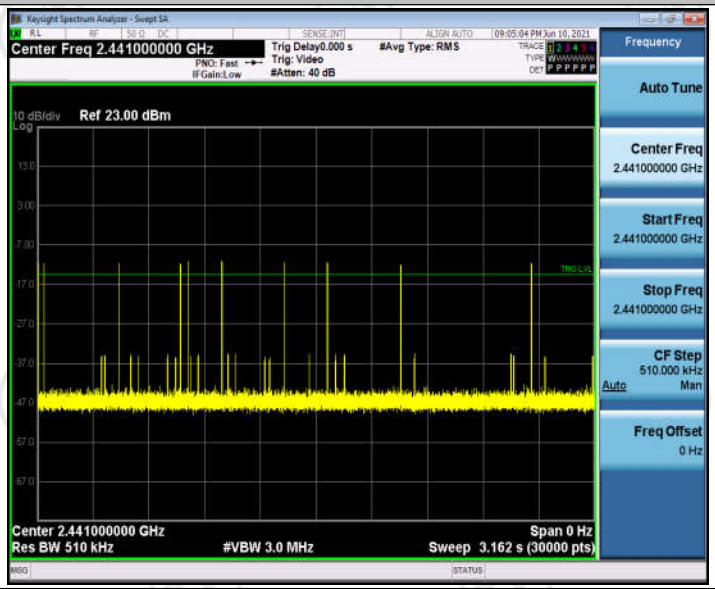
DH3 _Hop



DH3 _Hop

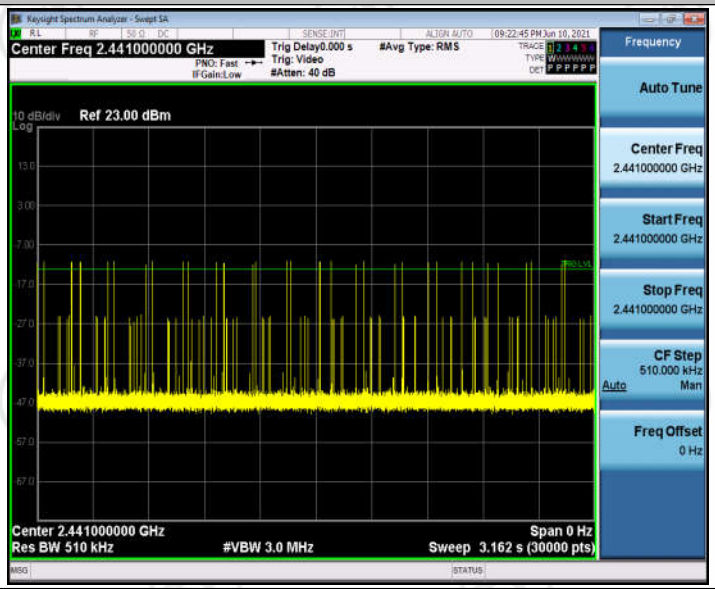


DH5 _Hop



DH5 _Hop

2DH1 _Hop



2DH1 _Hop

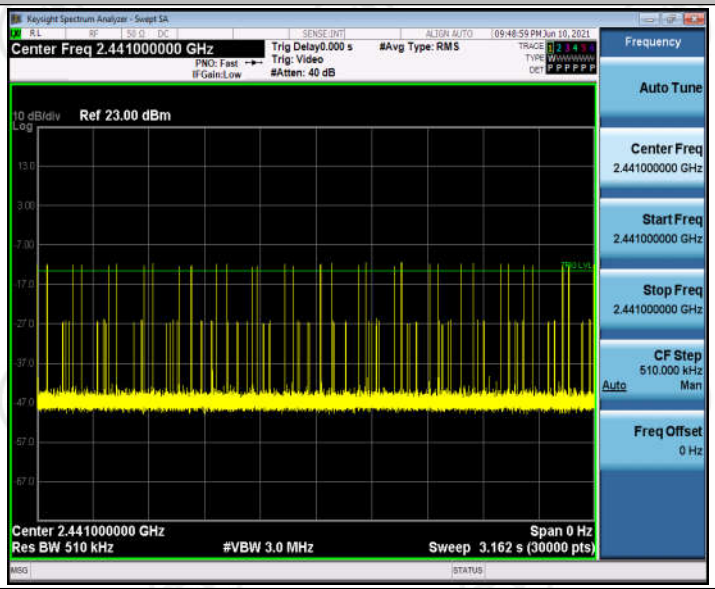
2DH3 _Hop

2DH3 _Hop

2DH5 _Hop

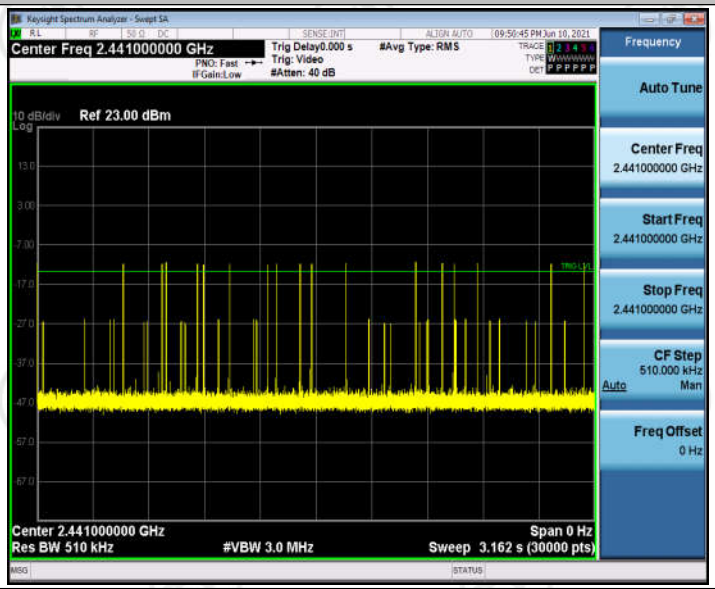
2DH5 _Hop

3DH1 _Hop

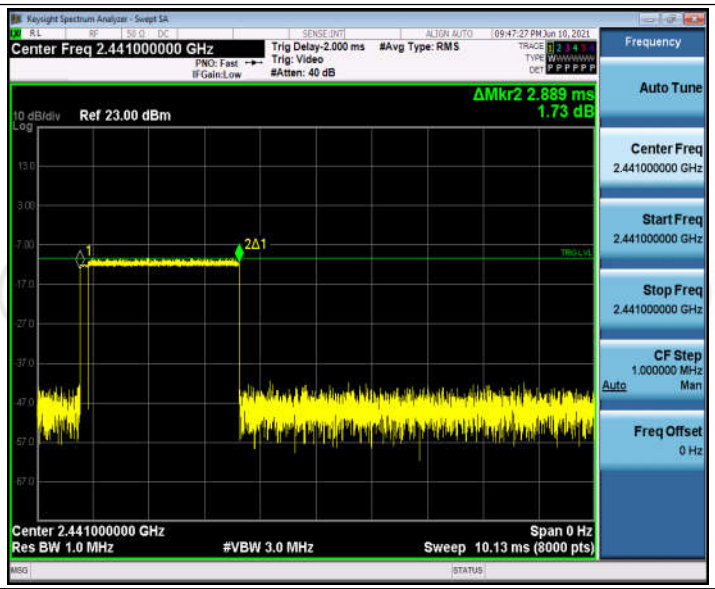


3DH1 _Hop

3DH3 _Hop



3DH3 _Hop



3DH5 _Hop

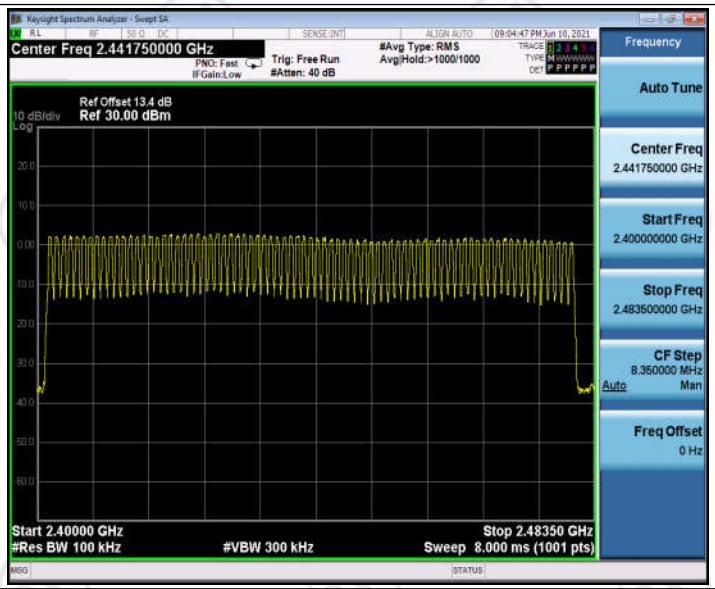
3DH5 _Hop

Appendix F: Number of hopping channels

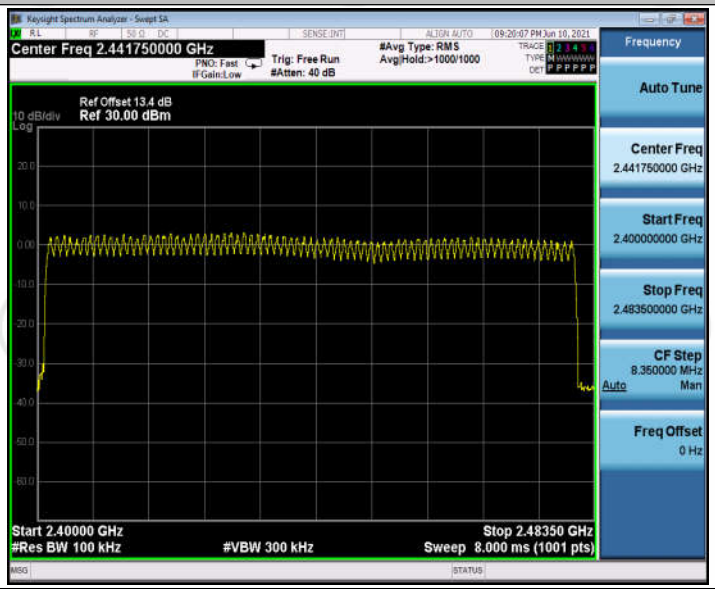
Test Result

Test Mode	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Hop	79	>=15	PASS
2DH5	Hop	79	>=15	PASS
3DH5	Hop	79	>=15	PASS

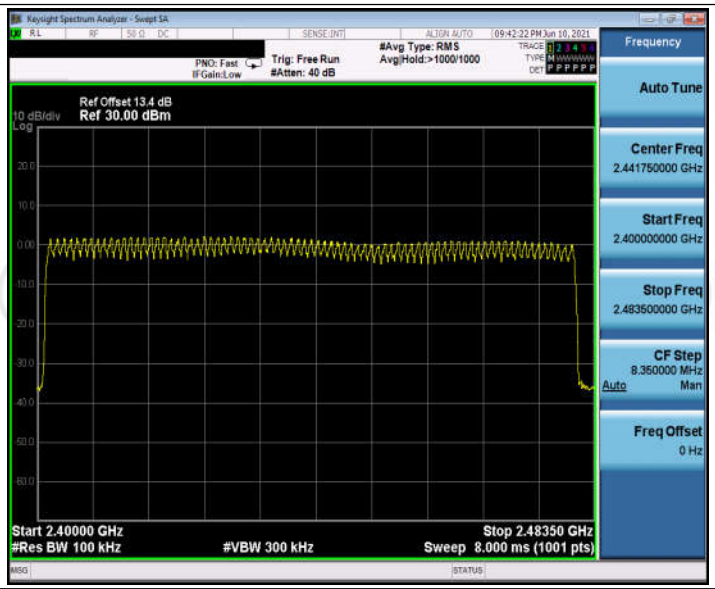
Test Graphs



DH5 _Hop



2DH5 _Hop


Keysight Spectrum Analyzer - Swept SA
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold:>1000/1000
Ref Offset 13.4 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

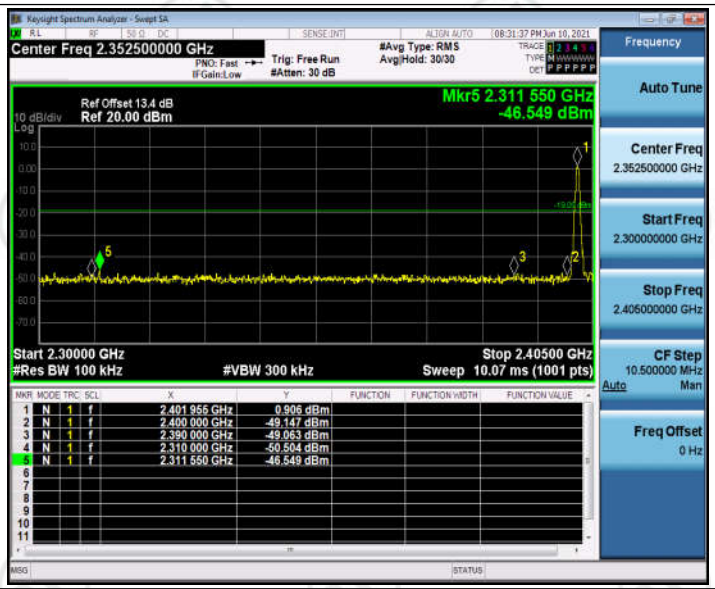
3DH5 _Hop

Appendix G:Band edge measurements

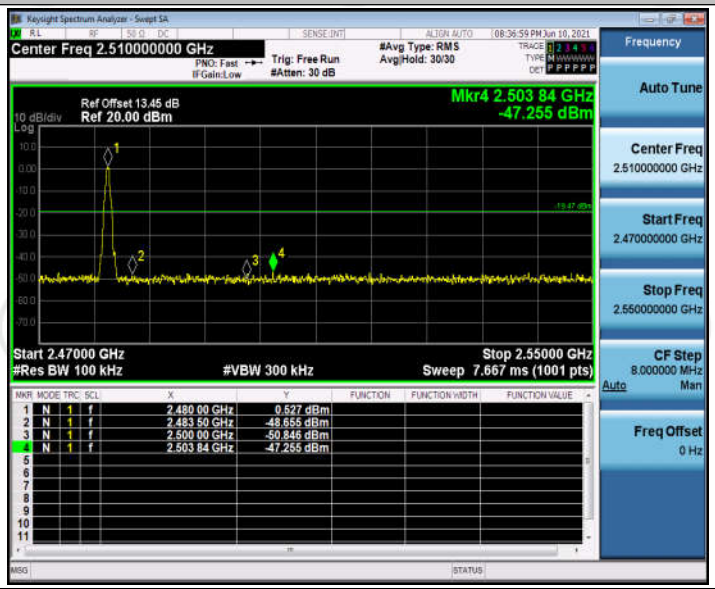
Test Result

Test Mode	Ch Name	Channel	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Low	2402	0.91	-46.55	<=-19.09	PASS
	High	2480	0.53	-47.26	<=-19.47	PASS
	Low	Hop_2402	1.95	-44.32	<=-18.05	PASS
	High	Hop_2480	1.45	-45.1	<=-18.55	PASS
2DH5	Low	2402	-0.06	-44.39	<=-20.06	PASS
	High	2480	0.28	-46.46	<=-19.72	PASS
	Low	Hop_2402	2.40	-45.49	<=-17.6	PASS
	High	Hop_2480	-1.02	-46.51	<=-21.02	PASS
3DH5	Low	2402	-1.56	-46.7	<=-21.56	PASS
	High	2480	-2.16	-46.54	<=-22.16	PASS
	Low	Hop_2402	1.31	-44.22	<=-18.69	PASS
	High	Hop_2480	0.87	-45.02	<=-19.13	PASS

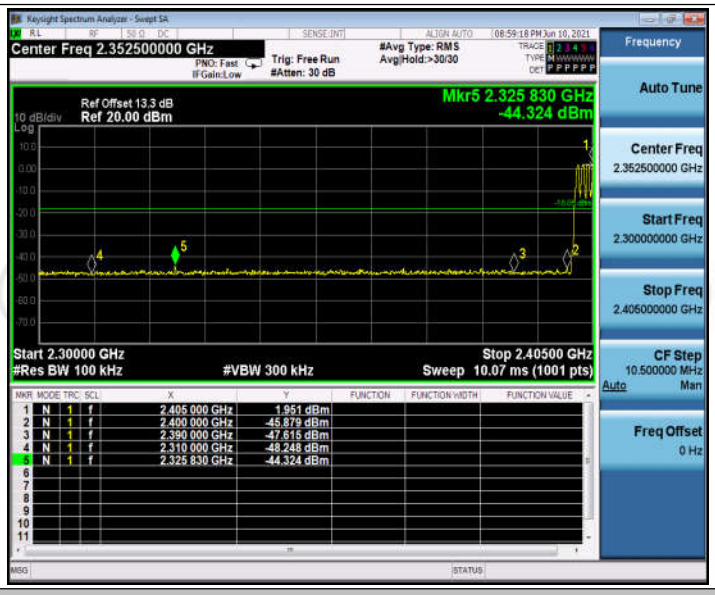
Test Graphs



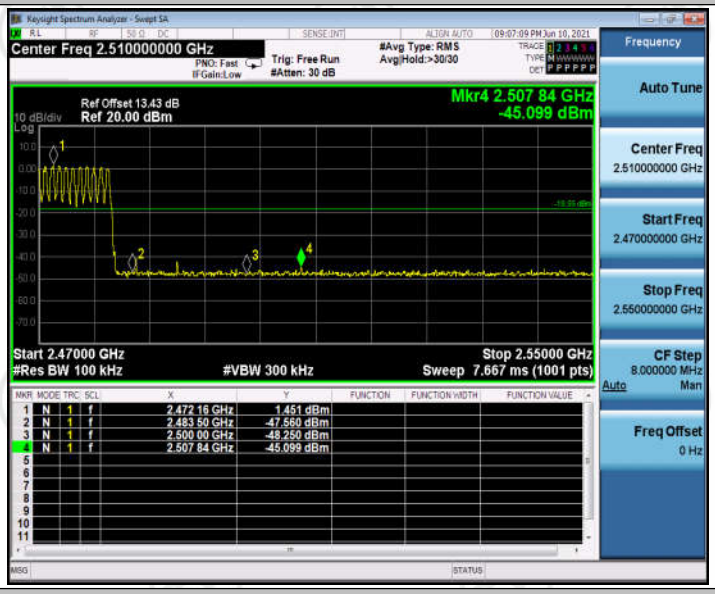
DH5 _Low_2402



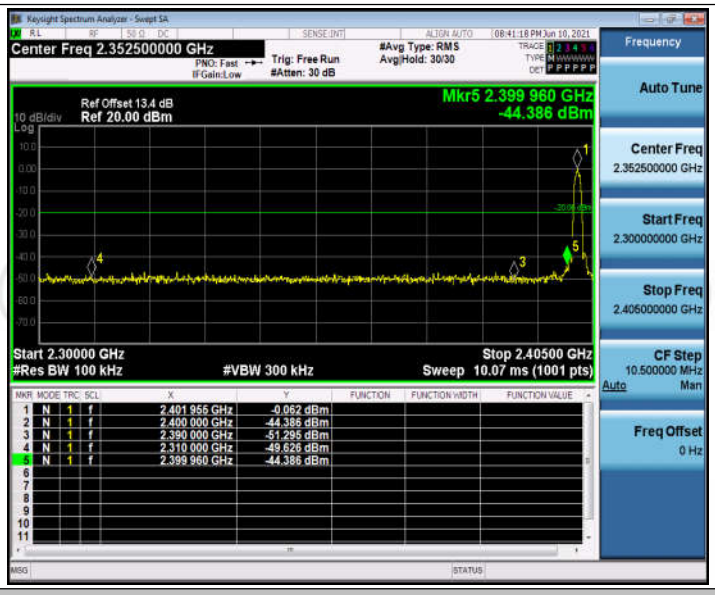
DH5 _High_2480



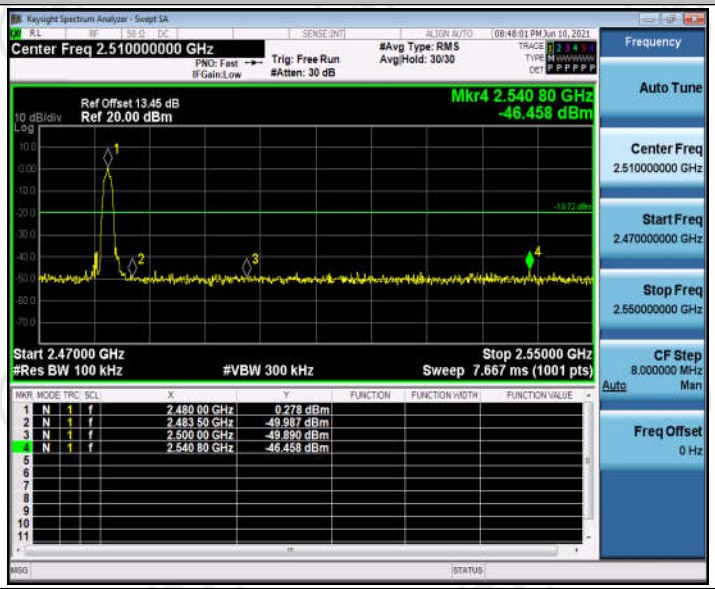
DH5 _Low_Hop_2402



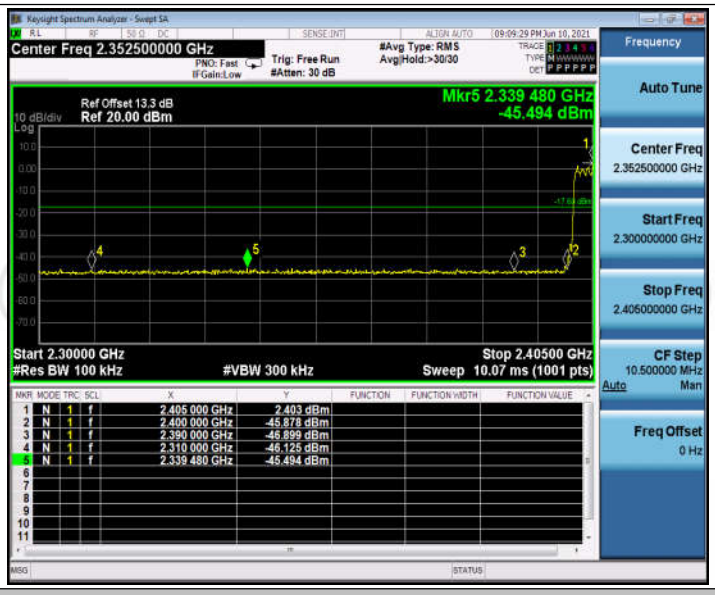
DH5 _High_Hop_2480



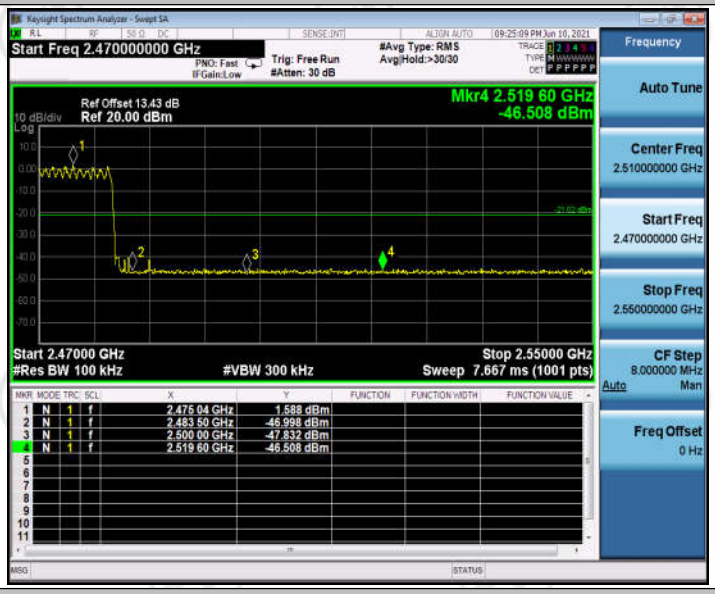
2DH5 _Low_2402



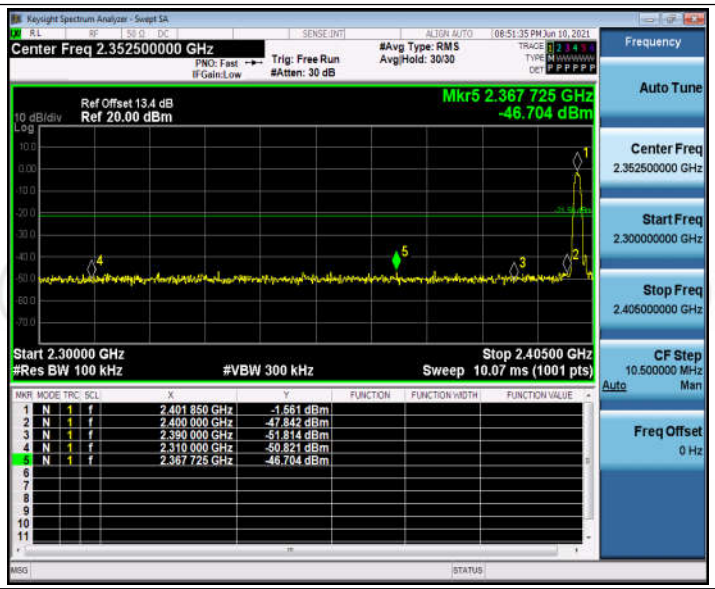
2DH5 _High_2480



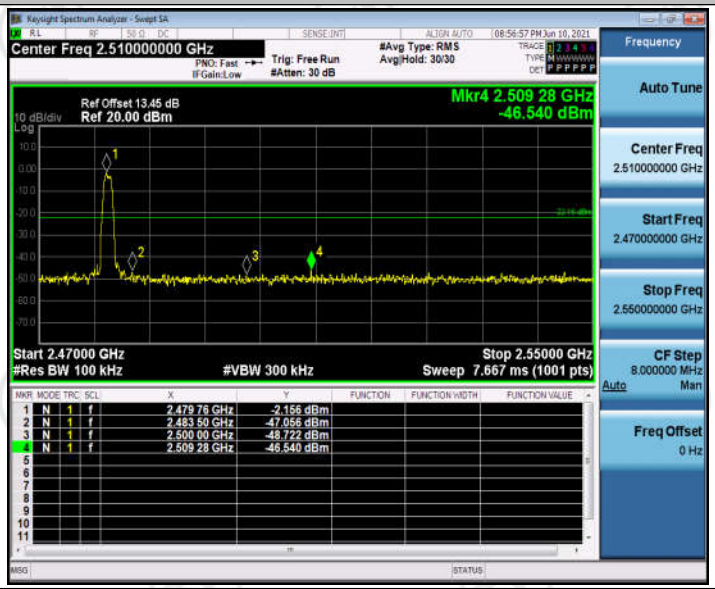
2DH5 _Low_Hop_2402



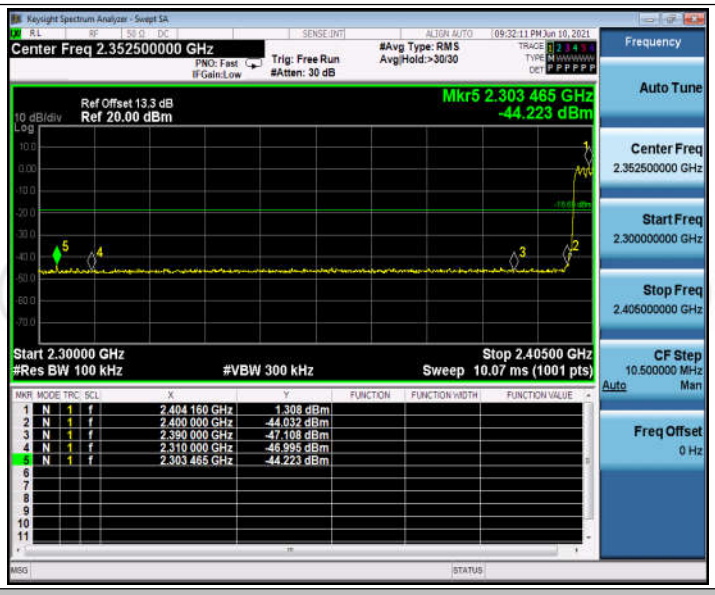
2DH5 _High_Hop_2480



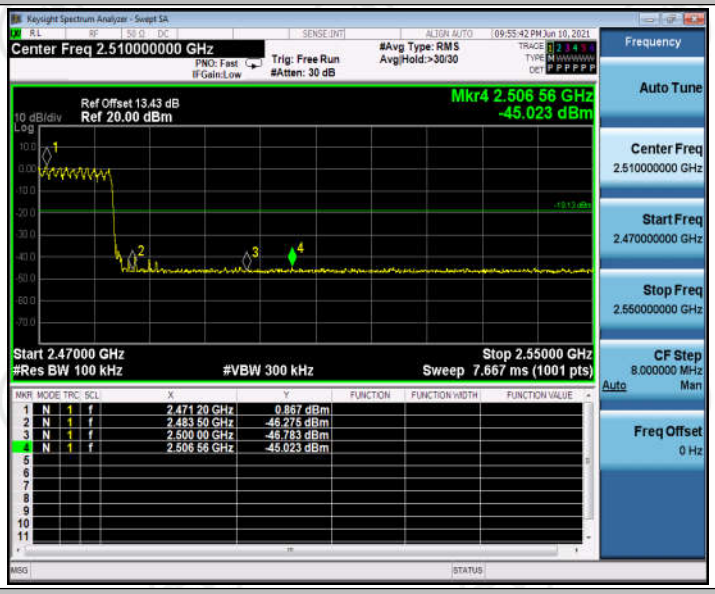
3DH5 _Low_2402



3DH5 _High_2480



3DH5 _Low_Hop_2402



3DH5 _High_Hop_2480

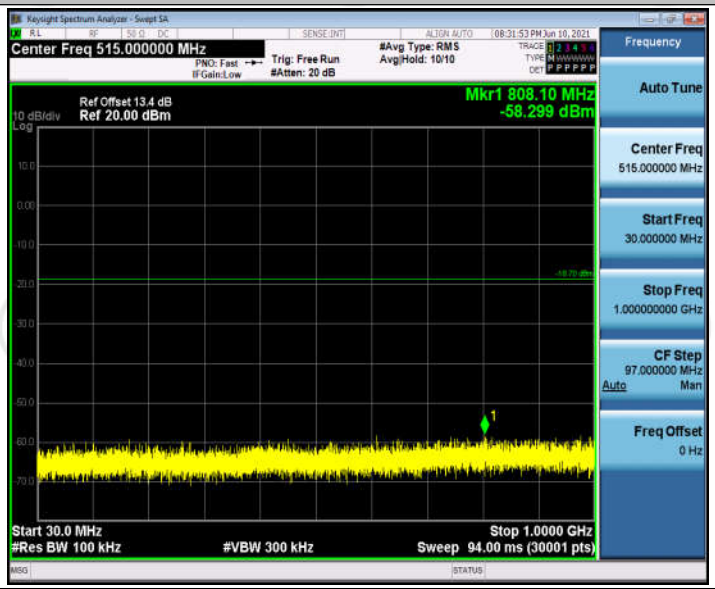
Appendix H:Conducted Spurious Emission

Test Result

Test Mode	Channel	Freq Range [MHz]	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	2402	Reference	1.30	1.30	---	PASS
		30~1000	30~1000	-58.299	<=-18.703	PASS
		1000~26500	1000~26500	-49.705	<=-18.703	PASS
	2441	Reference	1.72	1.72	---	PASS
		30~1000	30~1000	-57.756	<=-18.277	PASS
		1000~26500	1000~26500	-49.964	<=-18.277	PASS
	2480	Reference	0.34	0.34	---	PASS
		30~1000	30~1000	-57.491	<=-19.656	PASS
		1000~26500	1000~26500	-49.806	<=-19.656	PASS
2DH5	2402	Reference	1.22	1.22	---	PASS
		30~1000	30~1000	-57.828	<=-18.781	PASS
		1000~26500	1000~26500	-49.772	<=-18.781	PASS
	2441	Reference	1.08	1.08	---	PASS
		30~1000	30~1000	-58.016	<=-18.918	PASS
		1000~26500	1000~26500	-49.314	<=-18.918	PASS
	2480	Reference	0.52	0.52	---	PASS
		30~1000	30~1000	-58.139	<=-19.476	PASS
		1000~26500	1000~26500	-50.006	<=-19.476	PASS
3DH5	2402	Reference	-0.15	-0.15	---	PASS
		30~1000	30~1000	-56.946	<=-20.15	PASS
		1000~26500	1000~26500	-49.788	<=-20.15	PASS
	2441	Reference	1.05	1.05	---	PASS
		30~1000	30~1000	-56.292	<=-18.953	PASS
		1000~26500	1000~26500	-49.887	<=-18.953	PASS
	2480	Reference	0.03	0.03	---	PASS
		30~1000	30~1000	-58.178	<=-19.966	PASS
		1000~26500	1000~26500	-49.636	<=-19.966	PASS

Test Graphs

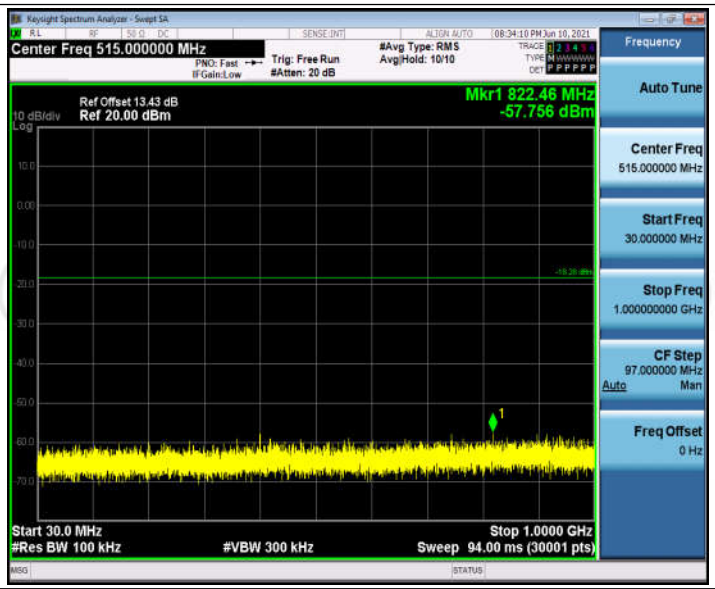
DH5 _2402_0~Reference



DH5 _2402_30~1000

DH5 _2402_1000~26500

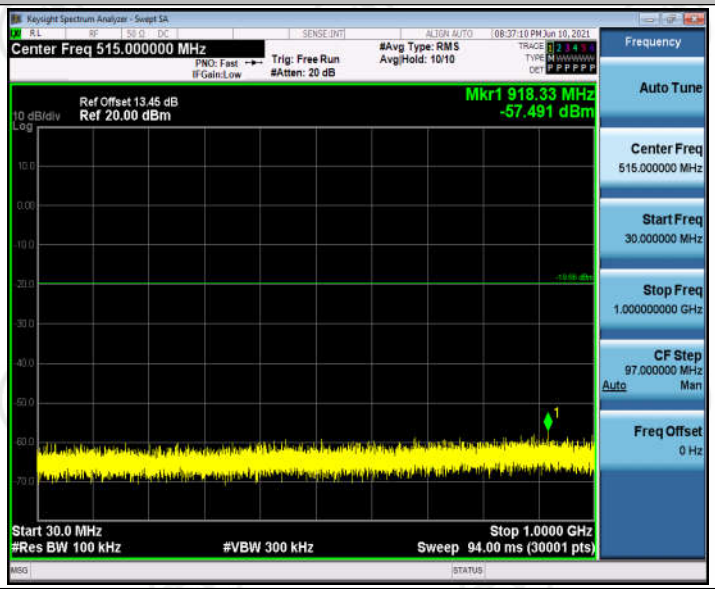
DH5 _2441_0~Reference



DH5 _2441_30~1000

DH5 _2441_1000~26500

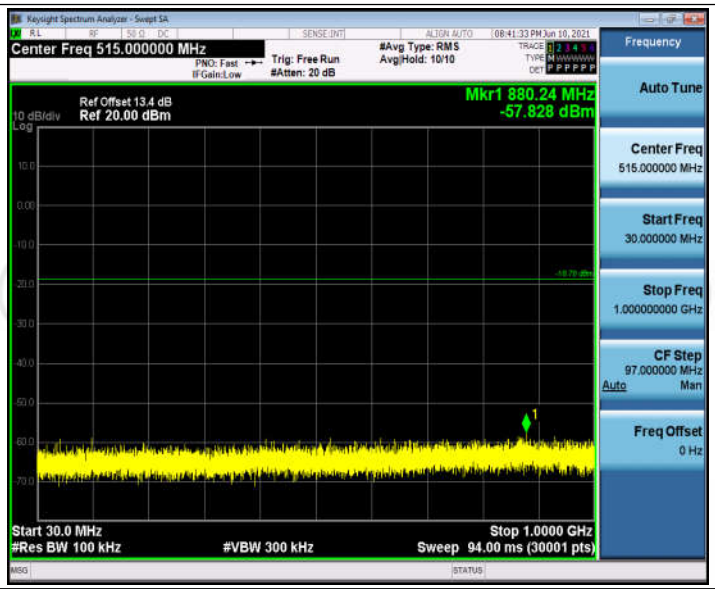
DH5 _2480_0~Reference



DH5 _2480_30~1000

DH5 _2480_1000~26500

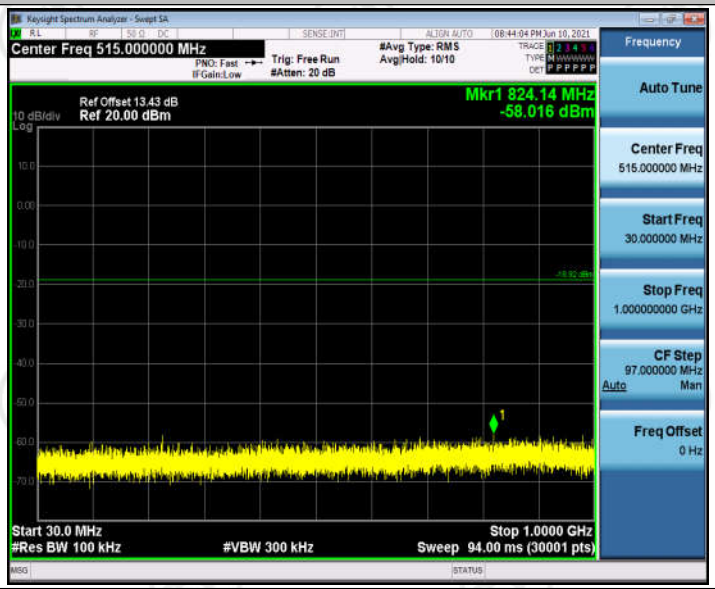
2DH5 _2402_0~Reference



2DH5 _2402_30~1000

2DH5 _2402_1000~26500

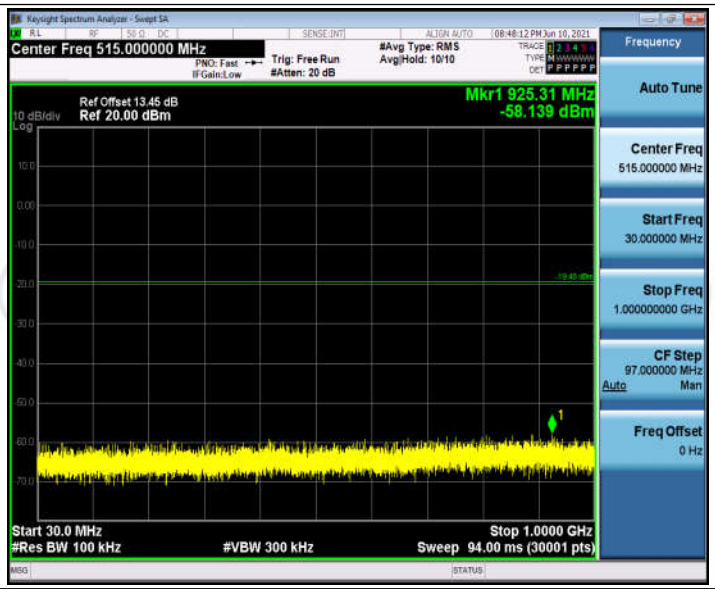
2DH5 _2441_0~Reference



2DH5 _2441_30~1000

2DH5 _2441_1000~26500

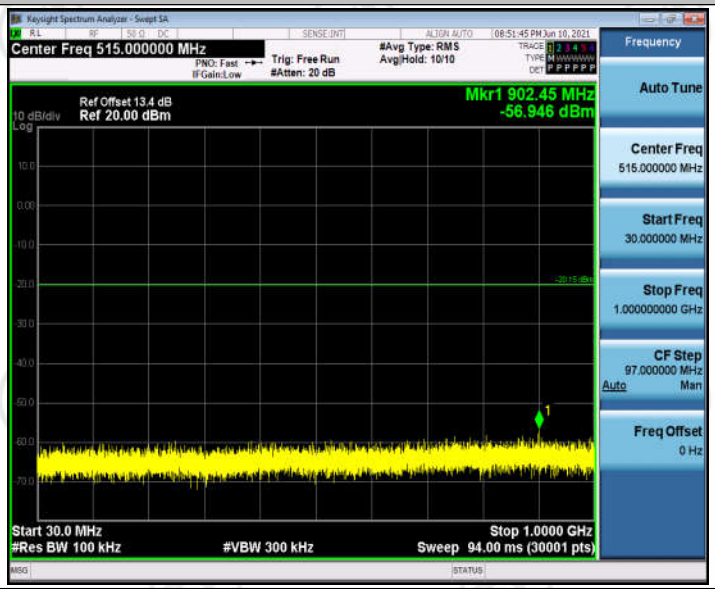
2DH5 _2480_0~Reference



2DH5 _2480_30~1000

2DH5 _2480_1000~26500

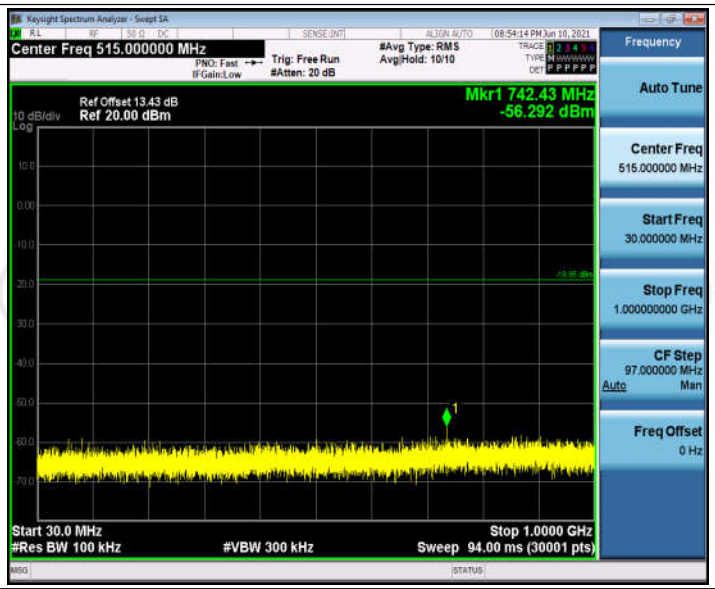
3DH5 _2402_0~Reference



3DH5 _2402_30~1000

3DH5 _2402_1000~26500

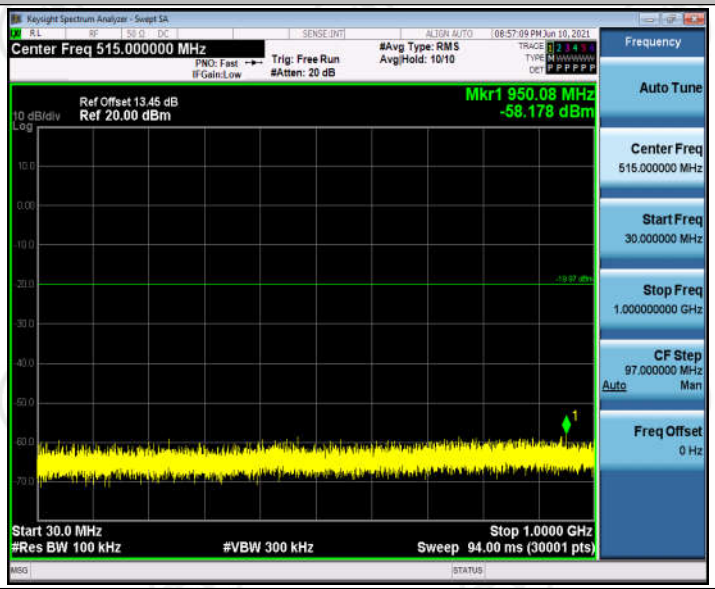
3DH5 _2441_0~Reference



3DH5 _2441_30~1000

3DH5 _2441_1000~26500

3DH5 _2480_0~Reference



3DH5 _2480_30~1000

3DH5 _2480_1000~26500

Appendix I: Duty Cycle

Test Result

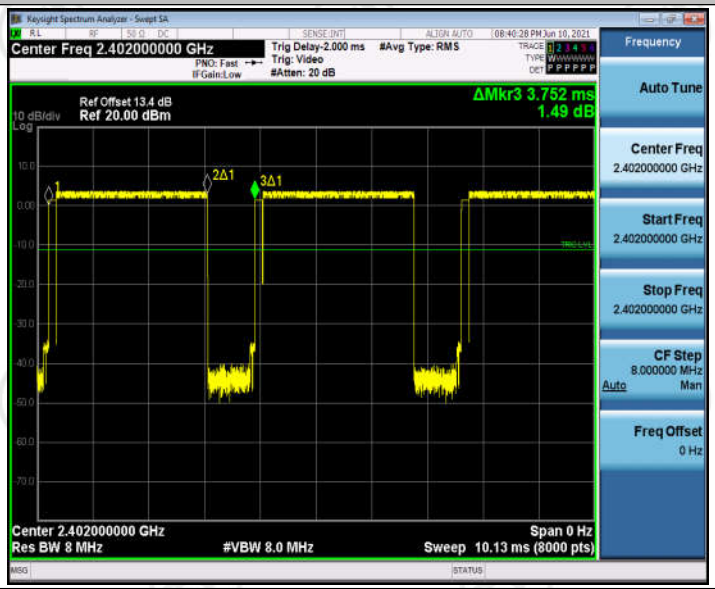
Test Mode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
DH5	Ant1	2402	2.88	3.75	76.89	---	PASS
		2441	2.88	3.75	76.87	---	PASS
		2480	2.88	3.75	76.87	---	PASS
2DH5	Ant1	2402	2.89	3.75	76.99	---	PASS
		2441	2.89	3.75	76.99	---	PASS
		2480	2.89	3.75	76.99	---	PASS
3DH5	Ant1	2402	2.89	3.75	77.06	---	PASS
		2441	2.89	3.75	77.06	---	PASS
		2480	2.89	3.75	77.06	---	PASS

Test Graphs

DH5 _2402

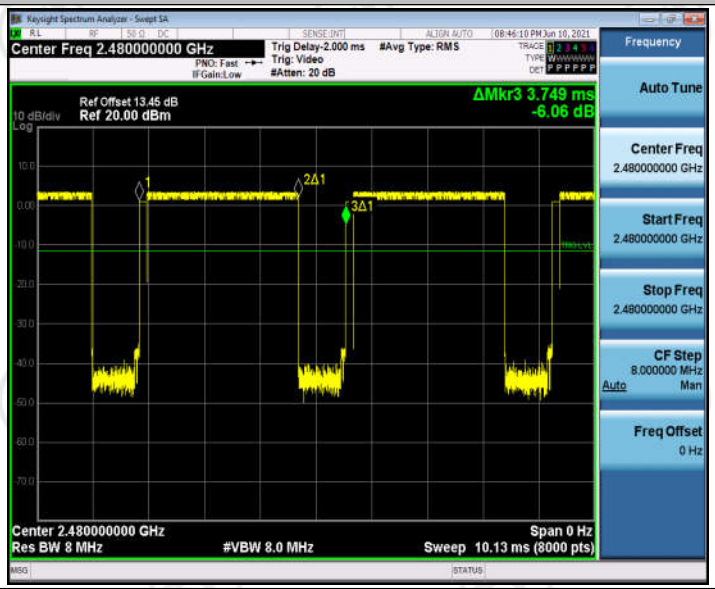
DH5 _2441

DH5 _2480

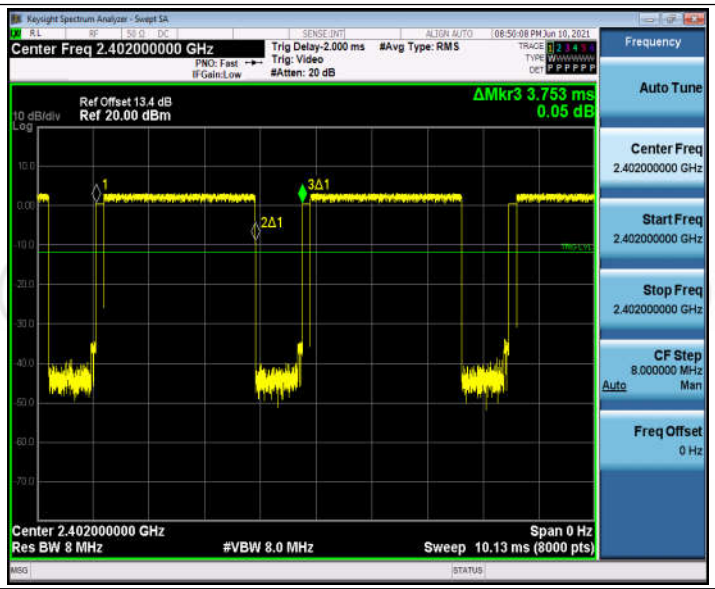


2DH5 _2402

2DH5 _2441



2DH5 _2480



3DH5 _2402

3DH5 _2441

3DH5 _2480

*** End of Report ***