Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: Lumicharge III

Test Model: LC3

Environmental Conditions

Temperature:	23.5 ° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	monkey.Li Monkey Li
Supervised by:	Lihn Li Huan

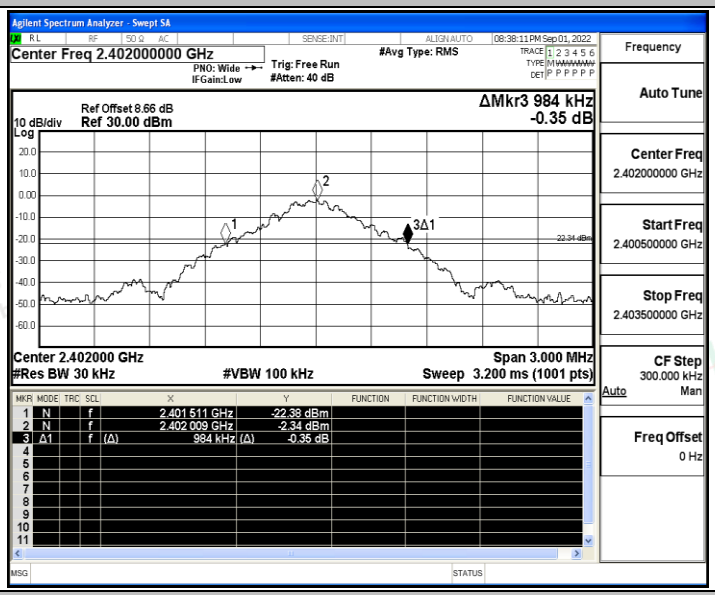
A.1 20dB Emission Bandwidth

Test Result

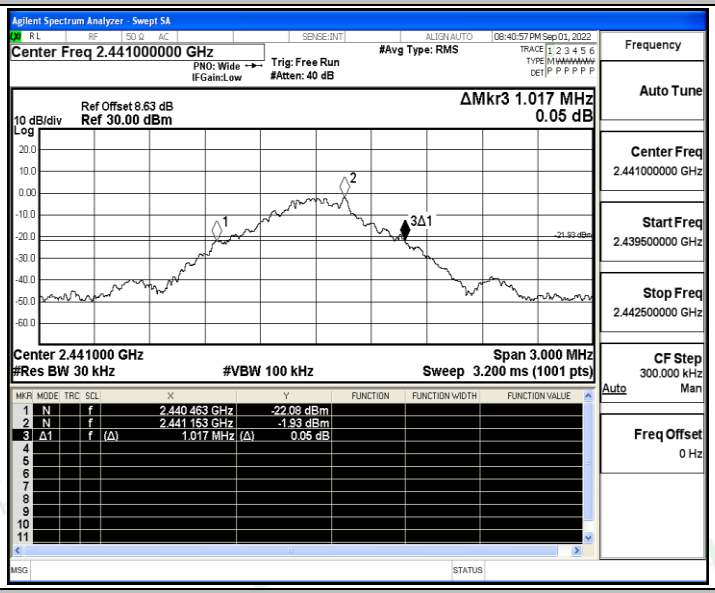
TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.984	2401.511	2402.495	---	PASS
		2441	1.017	2440.463	2441.480	---	PASS
		2480	0.969	2479.523	2480.492	---	PASS
2DH5	Ant1	2402	1.326	2401.328	2402.654	---	PASS
		2441	1.299	2440.352	2441.651	---	PASS
		2480	1.290	2479.355	2480.645	---	PASS
3DH5	Ant1	2402	1.344	2401.319	2402.663	---	PASS
		2441	1.290	2440.346	2441.636	---	PASS
		2480	1.305	2479.340	2480.645	---	PASS

Test Graphs

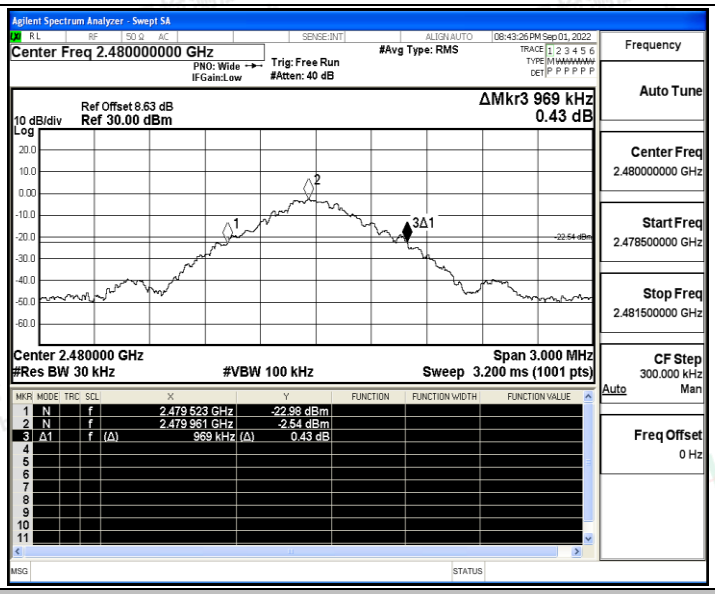
DH5_Ant1_2402



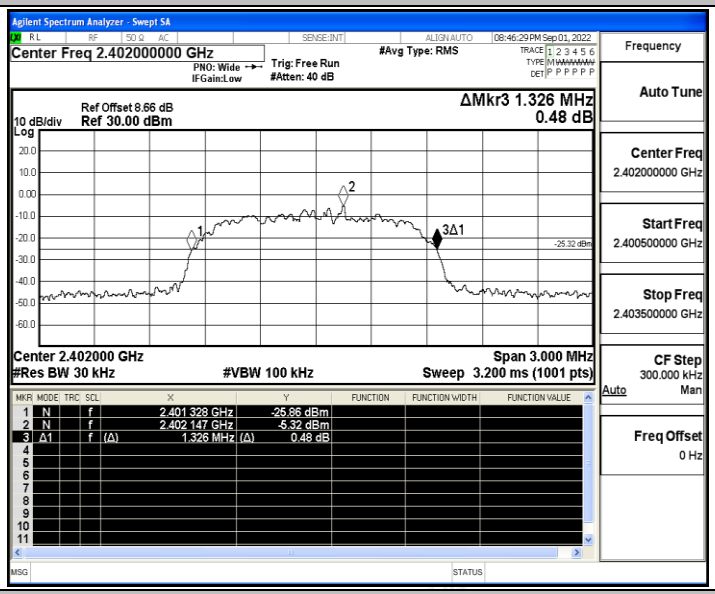
DH5_Ant1_2441



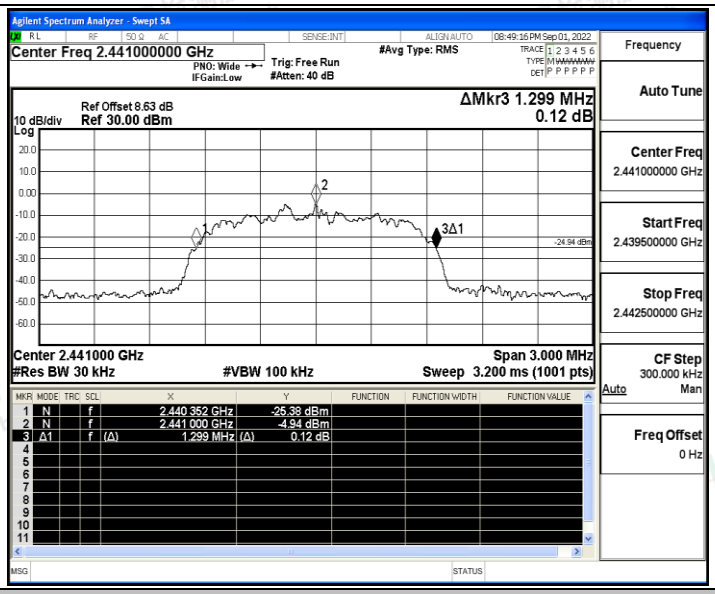
DH5_Ant1_2480



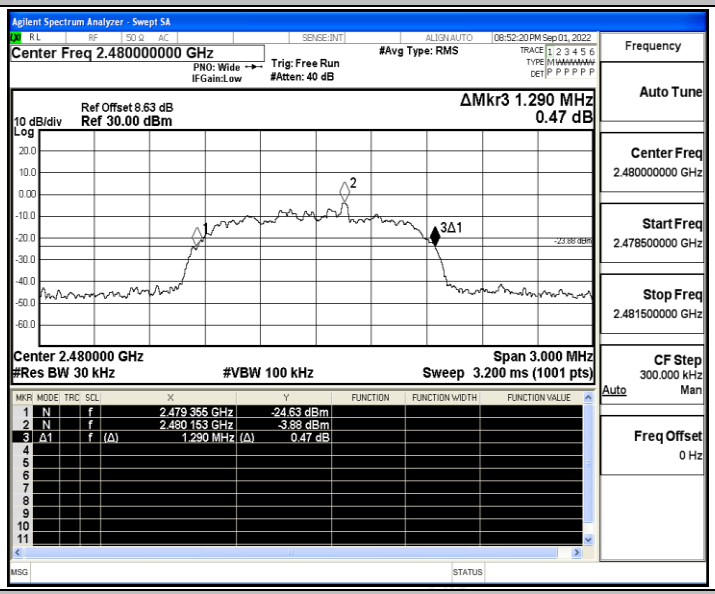
2DH5_Ant1_2402



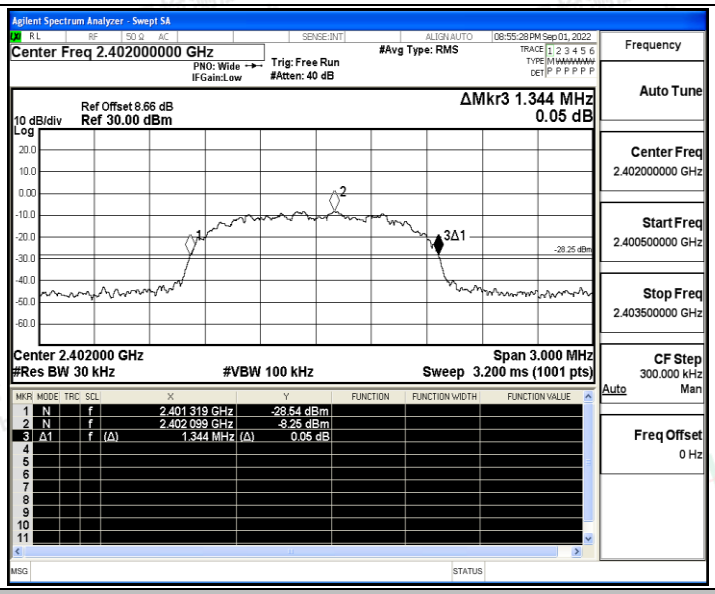
2DH5_Ant1_2441



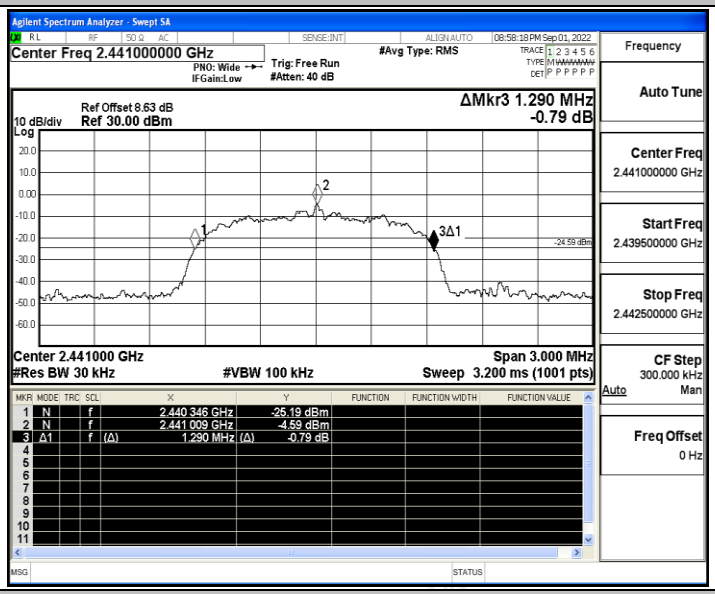
2DH5_Ant1_2480



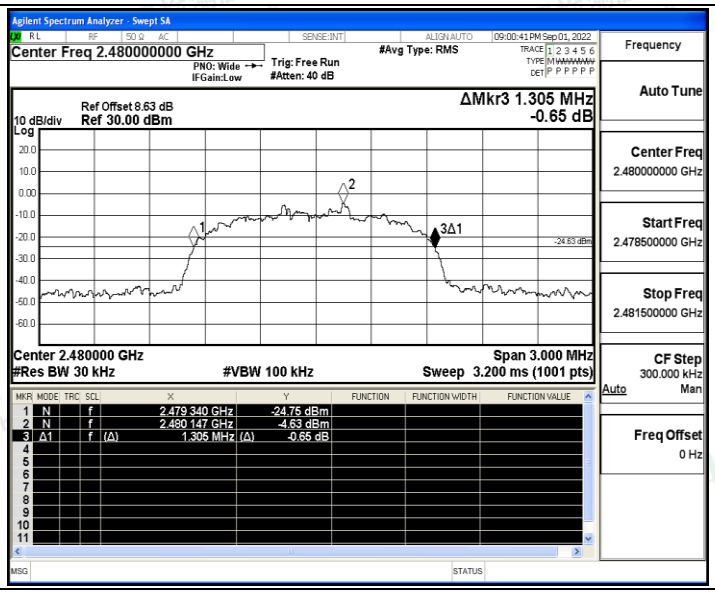
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
09:00:41 PM Sep 01, 2022
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
Ref Offset 8.63 dB
10 dB/div Ref 30.00 dBm
Log
ΔMkr3 1.305 MHz
-0.65 dB
-24.63 dBm
Center 2.480000 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3.000 MHz
Sweep 3.200 ms (1001 pts)
1 N f 2.479 340 GHz -24.75 dBm
2 N f 2.480 147 GHz -4.63 dBm
3 Δ1 f (Δ) 1.305 MHz (Δ) -0.65 dB
MSG
STATUS

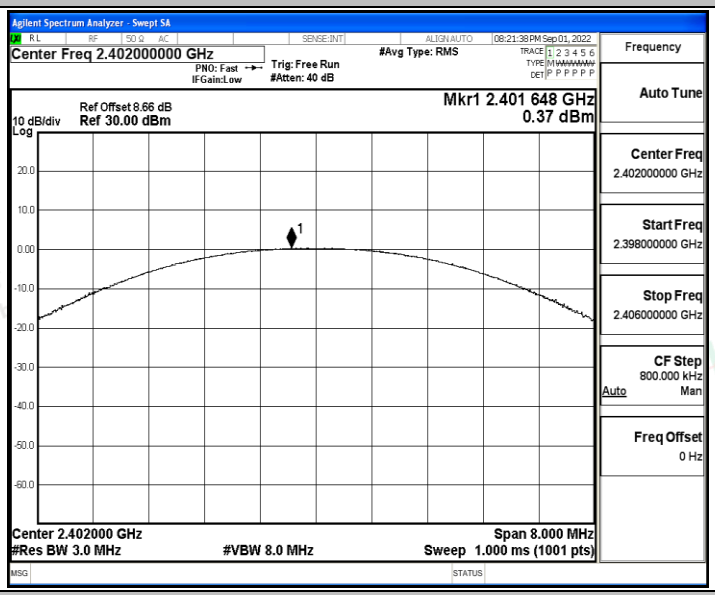
A.2 Maximum conducted output power

Test Result

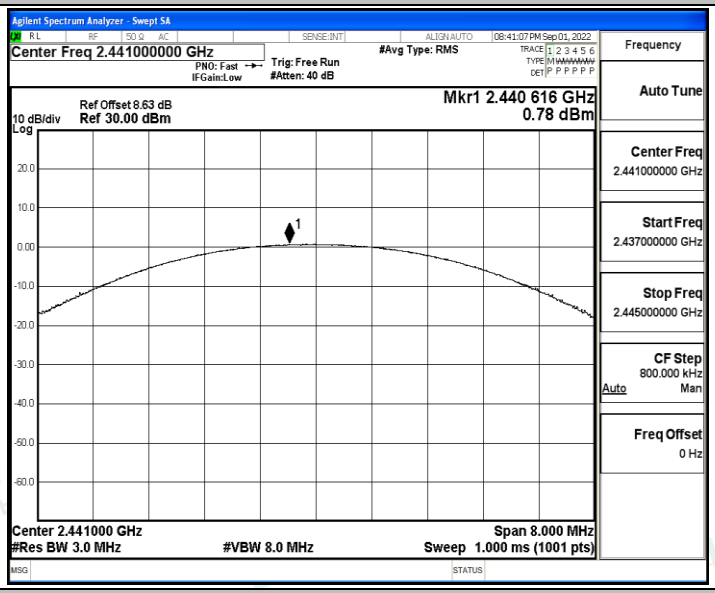
Test Mode	Antenna	Frequency[MHz]	Conducted Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	0.37	≤20.97	PASS
		2441	0.78	≤20.97	PASS
		2480	0.65	≤20.97	PASS
2DH5	Ant1	2402	0.43	≤20.97	PASS
		2441	0.35	≤20.97	PASS
		2480	0.41	≤20.97	PASS
3DH5	Ant1	2402	0.47	≤20.97	PASS
		2441	0.48	≤20.97	PASS
		2480	0.36	≤20.97	PASS

Test Graphs

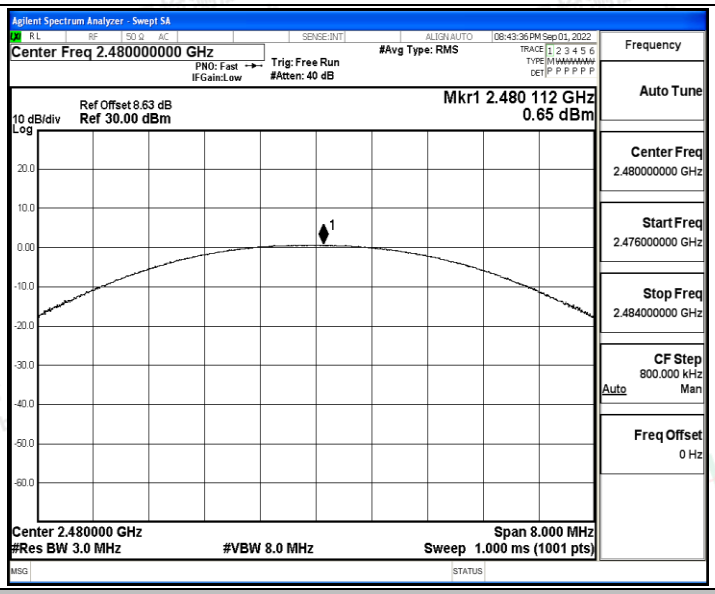
DH5_Ant1_2402



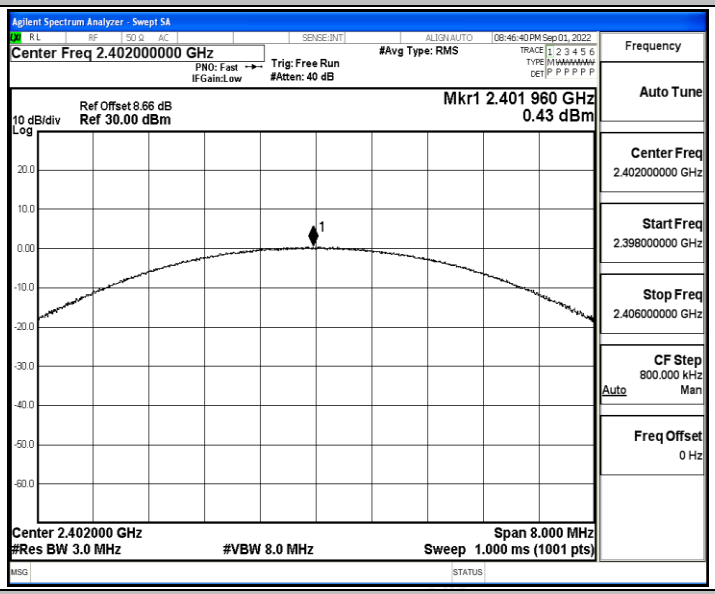
DH5_Ant1_2441



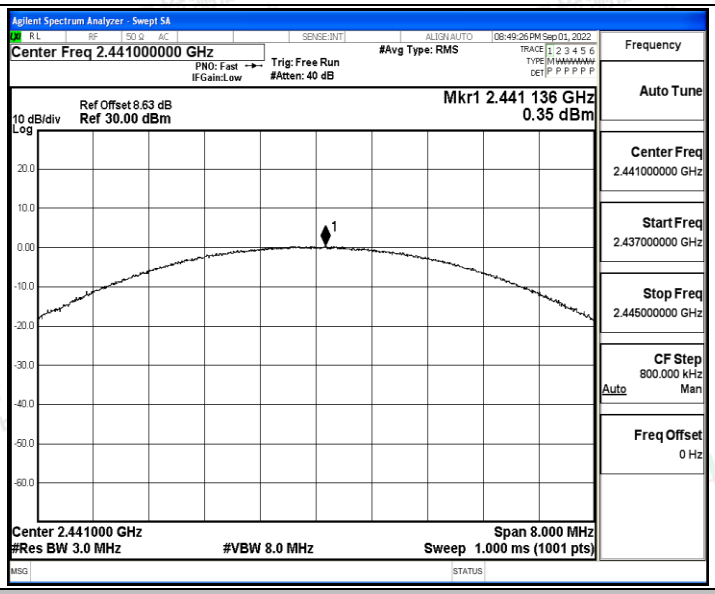
DH5_Ant1_2480



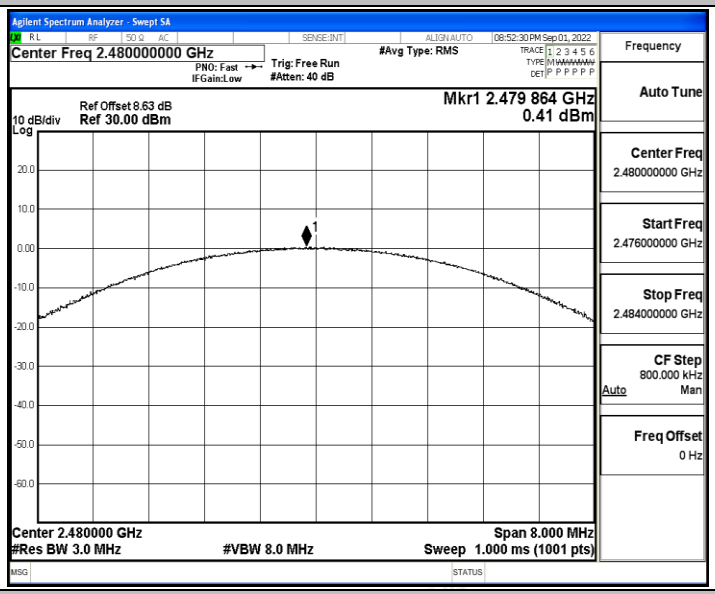
2DH5_Ant1_2402



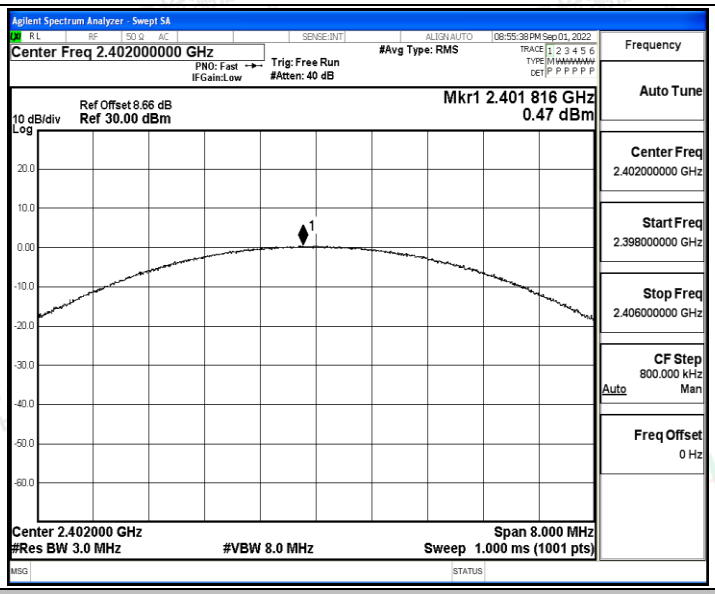
2DH5_Ant1_2441



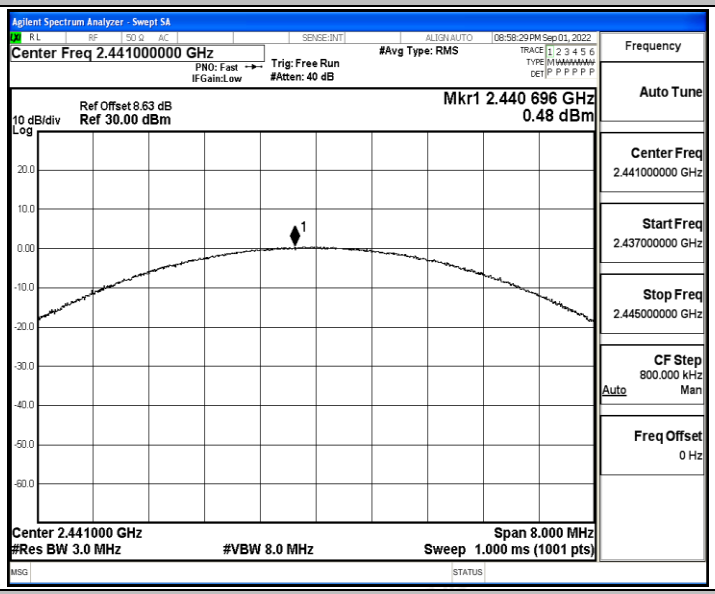
2DH5_Ant1_2480



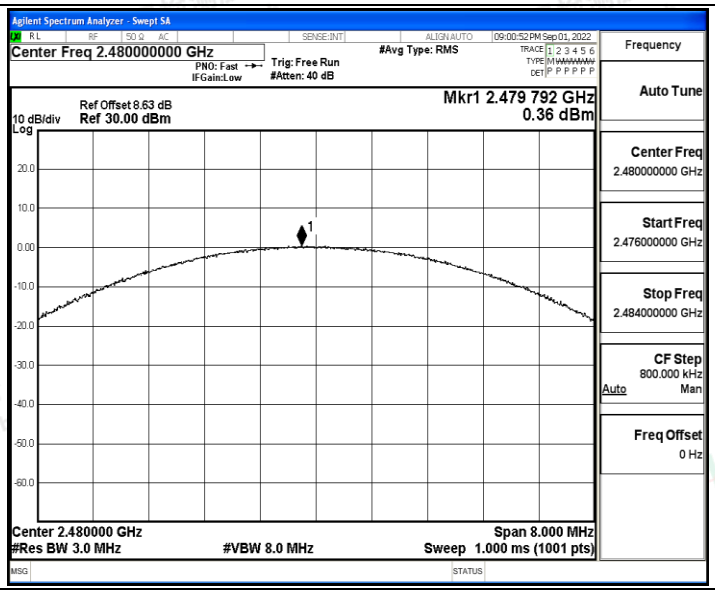
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
09:00:52 PM Sep 01, 2022
Ref Offset 8.63 dB
10 dB/div Ref 30.00 dBm
Log
Mkr1 2.479 792 GHz
0.36 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

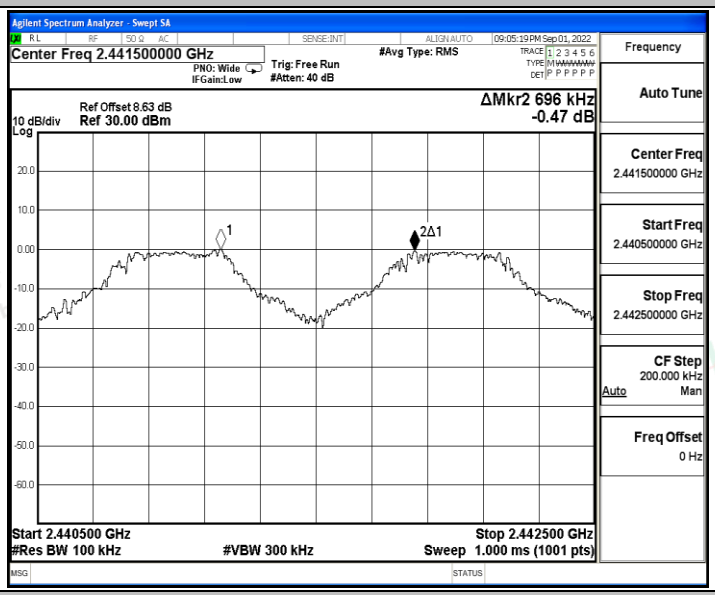
A.3 Carrier frequency separation

Test Result

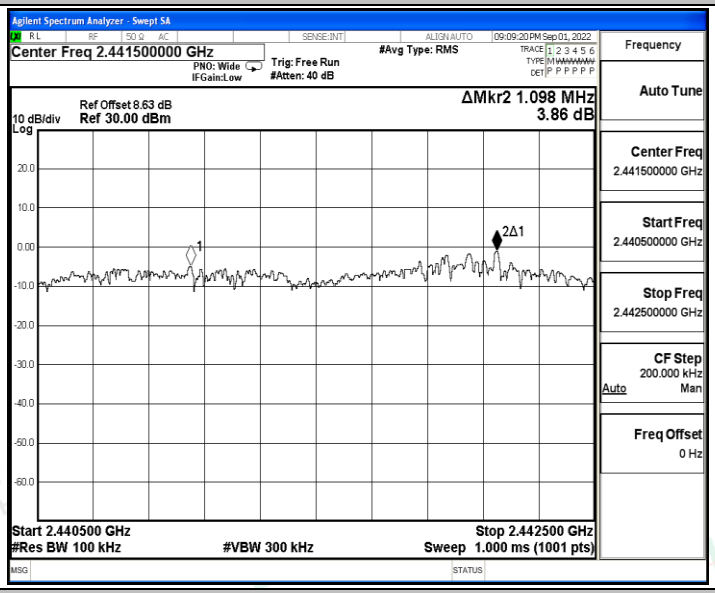
TestMode	Antenna	Frequency[MHz]	Result[dBm]	Limit[dBm]	Verdict
DH5	Ant1	Hop	0.696	≥0.678	PASS
2DH5	Ant1	Hop	1.098	≥0.884	PASS
3DH5	Ant1	Hop	0.954	≥0.896	PASS

Test Graphs

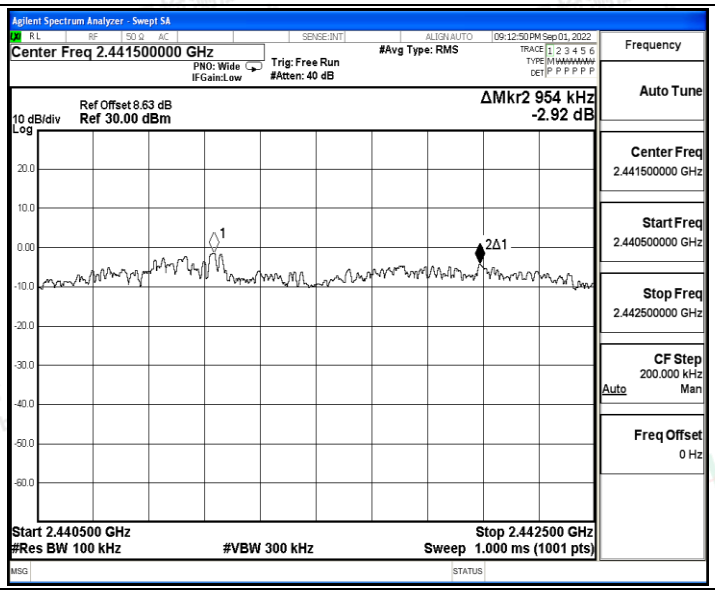
DH5_Ant1_Hop



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
09:12:50 PM Sep 01, 2022
Ref Offset 8.63 dB
10 dB/div Ref 30.00 dBm
Log
ΔMkr2 954 kHz
-2.92 dB
1
2Δ1
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

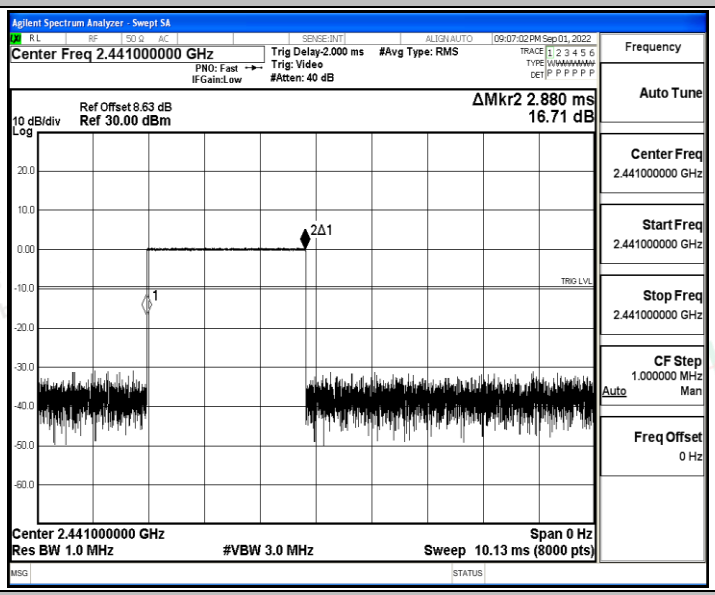
A.4 Time of occupancy

Test Result

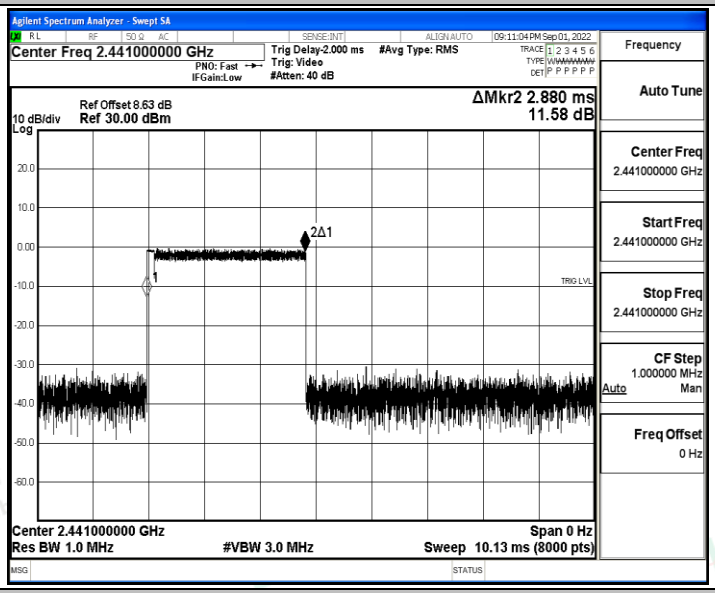
TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.88	106.67	0.307	≤0.4	PASS
2DH5	Ant1	Hop	2.88	106.67	0.307	≤0.4	PASS
3DH5	Ant1	Hop	2.89	106.67	0.308	≤0.4	PASS

Test Graphs

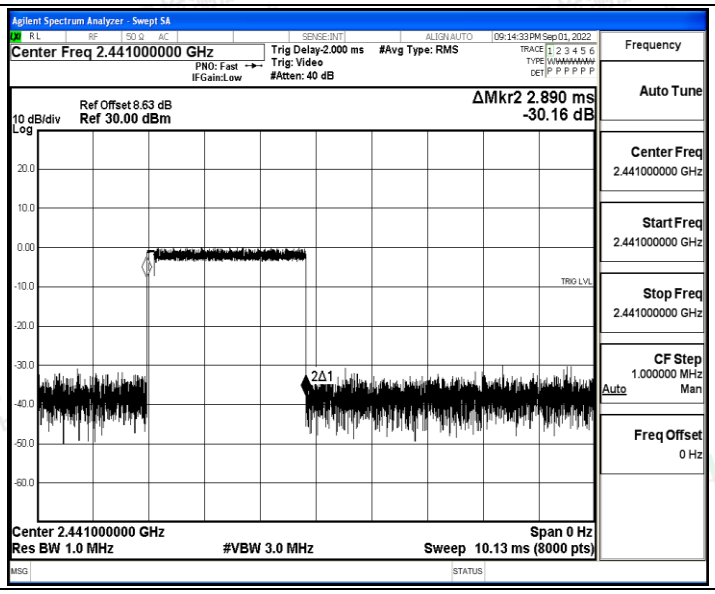
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441000000 GHz
Trig Delay-2.000 ms
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
09:14:33 PM Sep 01, 2022
Frequency
Auto Tune
Ref Offset 8.63 dB
10 dB/div Ref 30.00 dBm
Log
ΔMkr2 2.890 ms
-30.16 dB
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
2Δ1
Center 2.441000000 GHz
Span 0 Hz
Res BW 1.0 MHz
#VBW 3.0 MHz
Sweep 10.13 ms (8000 pts)

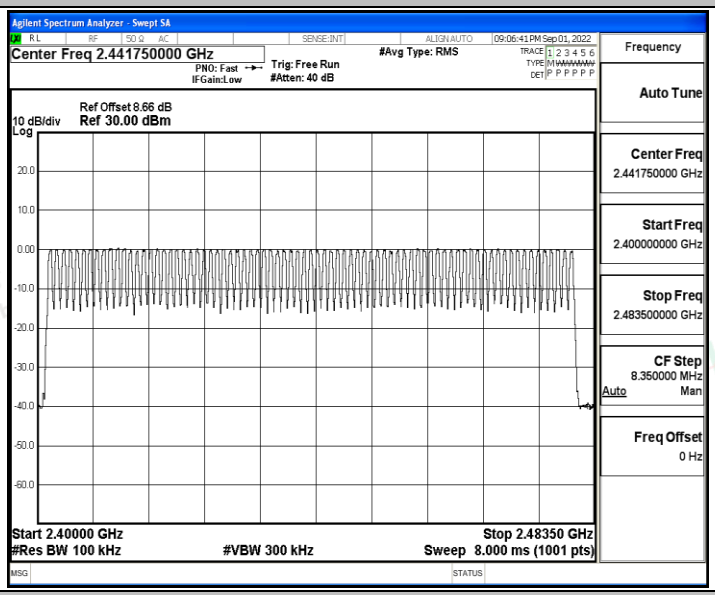
A.5 Number of hopping channels

Test Result

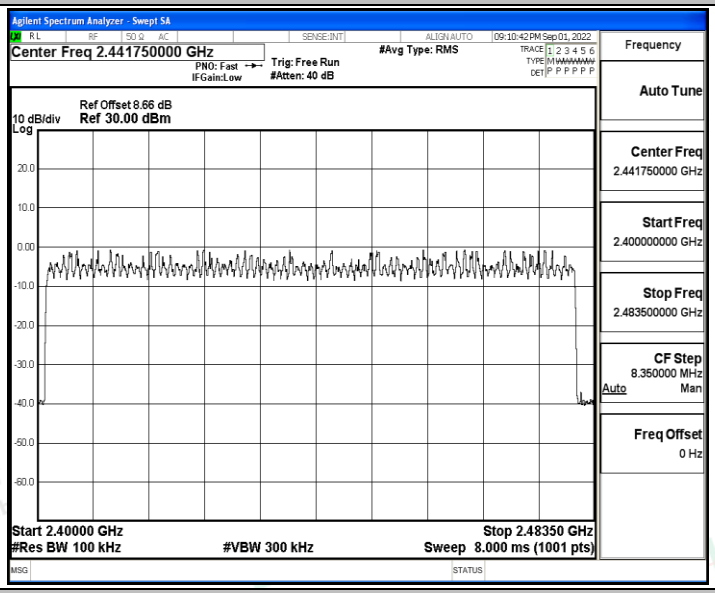
TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs

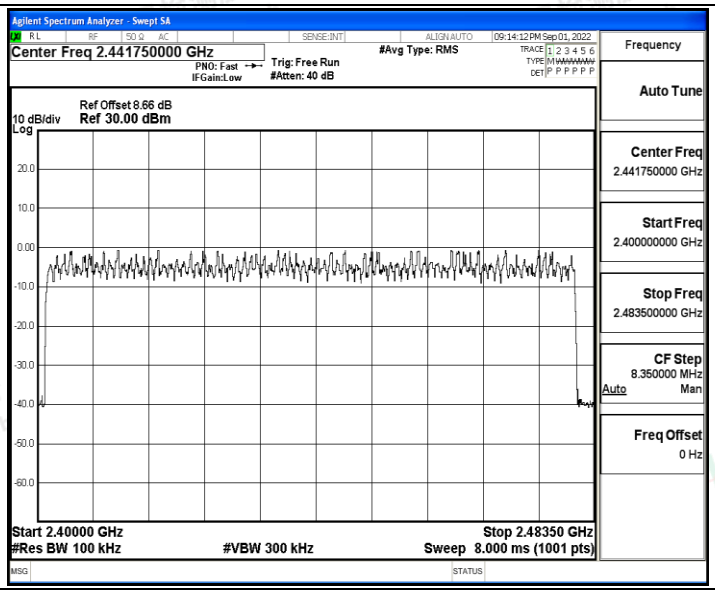
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.441750000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
09:14:12 PM Sep 01, 2022
Ref Offset 8.66 dB
10 dB/div
Ref 30.00 dBm
Log
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
Start 2.40000 GHz
Stop 2.48350 GHz
#Res BW 100 kHz
#VBW 300 kHz
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

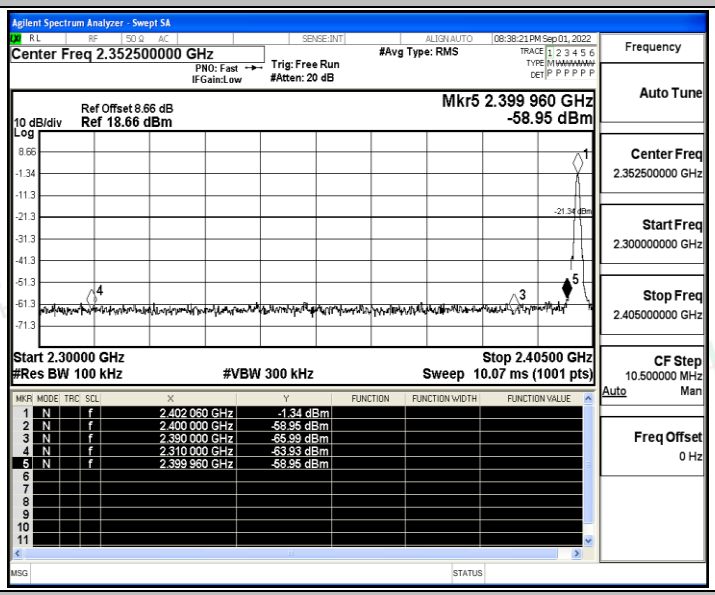
A.6 Band edge measurements

Test Result

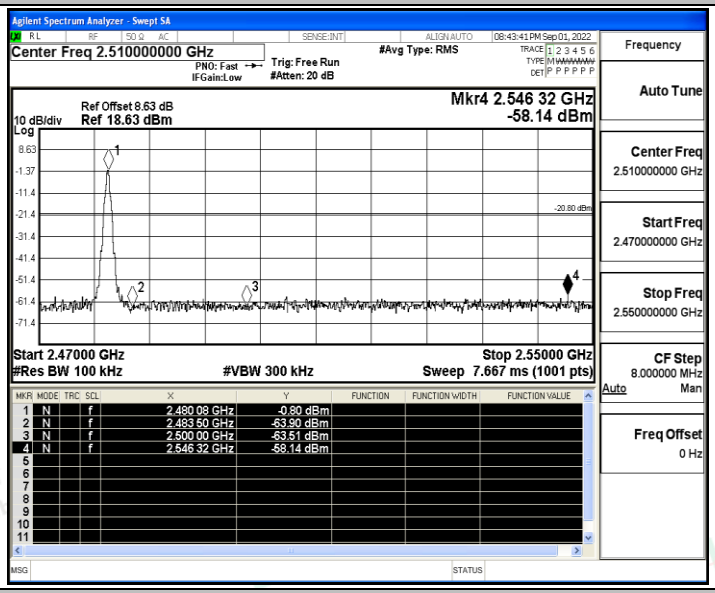
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-1.34	-58.95	≤-21.34	PASS
		High	2480	-0.80	-58.14	≤-20.8	PASS
		Low	Hop_2402	-1.25	-58.58	≤-21.25	PASS
		High	Hop_2480	-0.02	-58	≤-20.02	PASS
2DH5	Ant1	Low	2402	-4.98	-56.28	≤-24.98	PASS
		High	2480	-5.07	-59.43	≤-25.07	PASS
		Low	Hop_2402	-1.24	-58.37	≤-21.24	PASS
		High	Hop_2480	-1.36	-56.9	≤-21.36	PASS
3DH5	Ant1	Low	2402	-4.03	-58.64	≤-24.03	PASS
		High	2480	-5.88	-59.05	≤-25.88	PASS
		Low	Hop_2402	-2.83	-58.91	≤-22.83	PASS
		High	Hop_2480	-3.72	-56.86	≤-23.72	PASS

Test Graphs

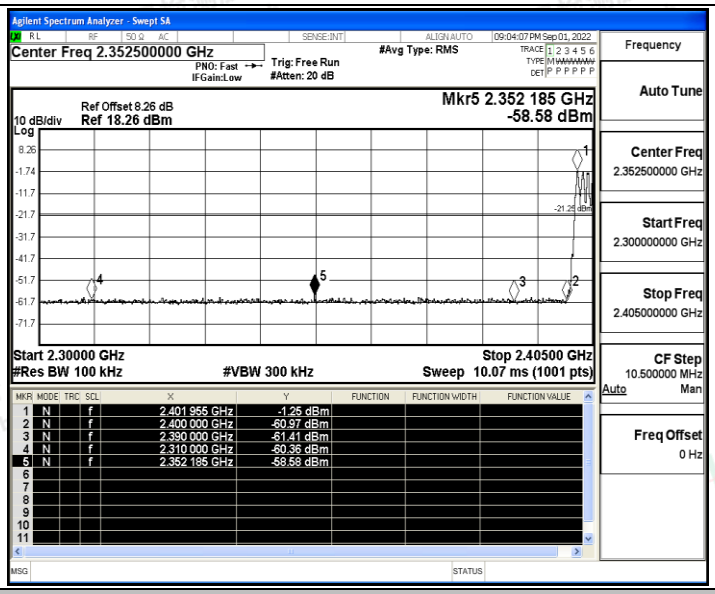
DH5_Ant1_Low_2402



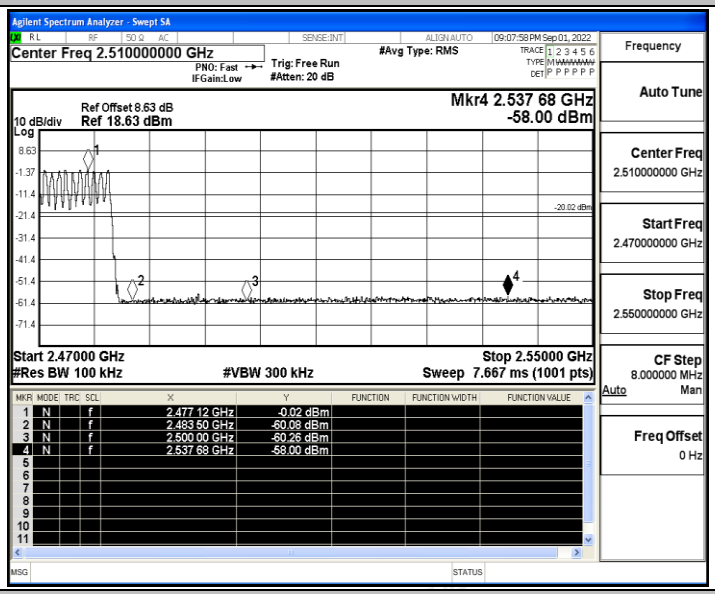
DH5_Ant1_High_2480



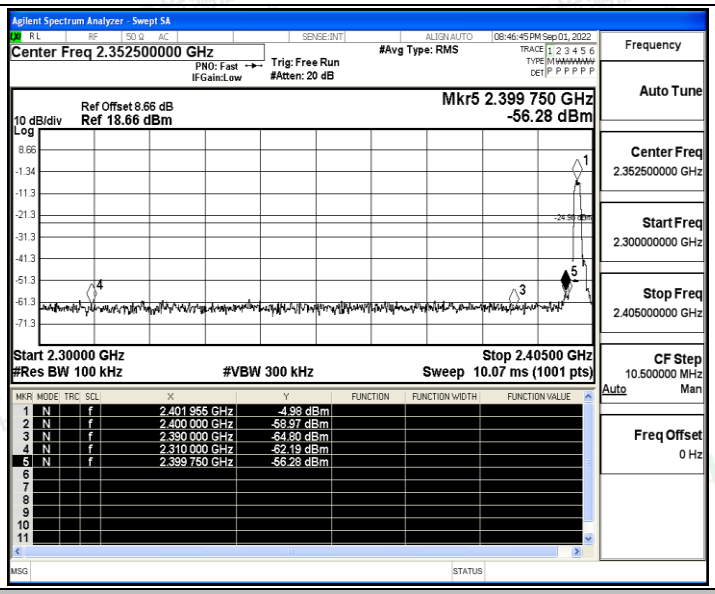
DH5_Ant1_Low_Hop_2402



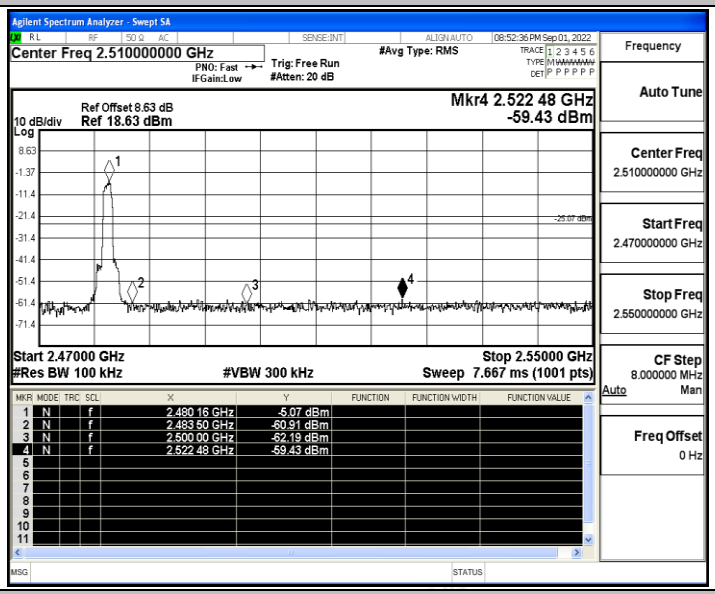
DH5_Ant1_High_Hop_2480



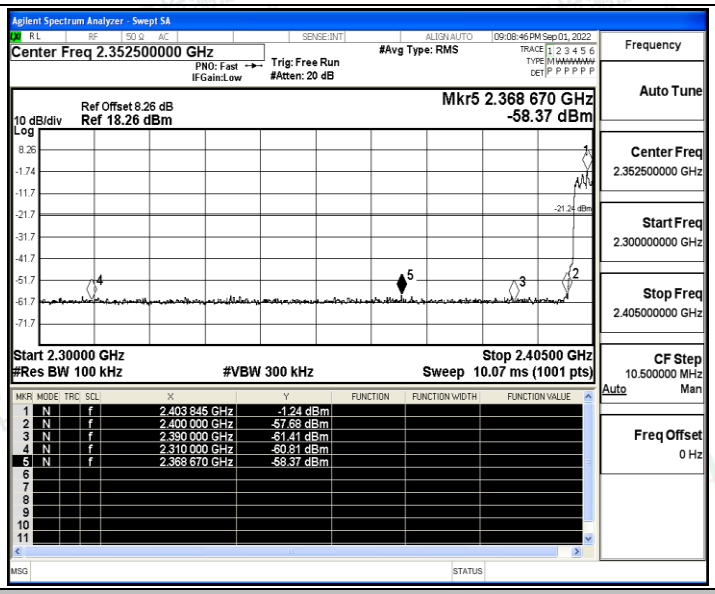
2DH5_Ant1_Low_2402



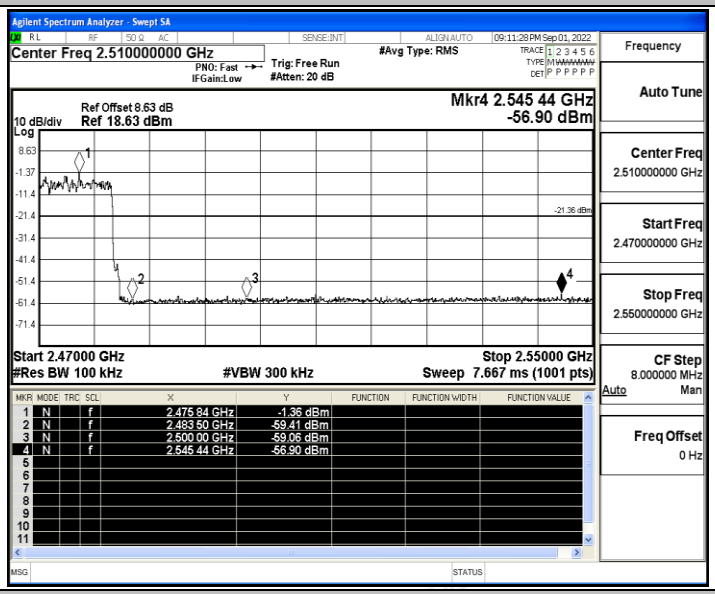
2DH5_Ant1_High_2480



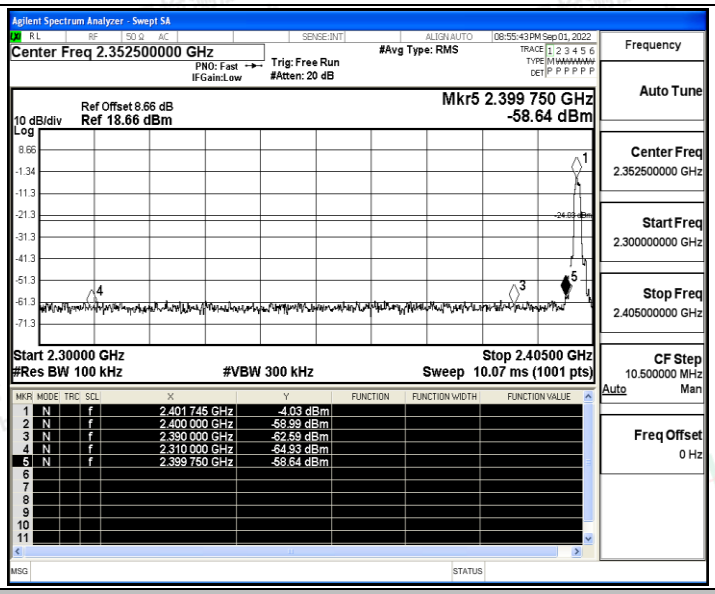
2DH5_Ant1_Low_Hop_2402



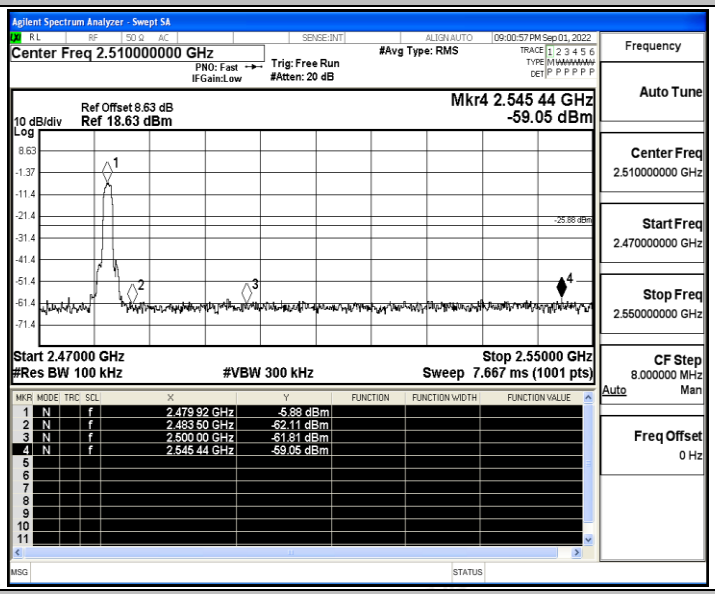
2DH5_Ant1_High_Hop_2480



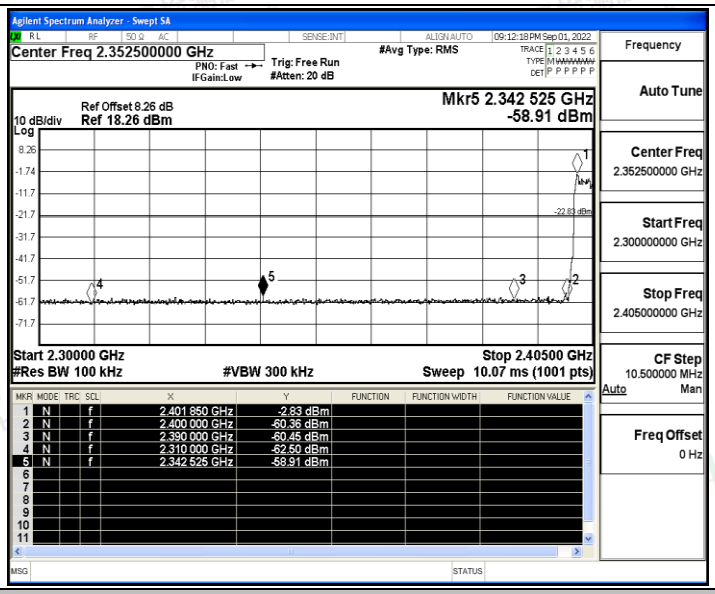
3DH5_Ant1_Low_2402



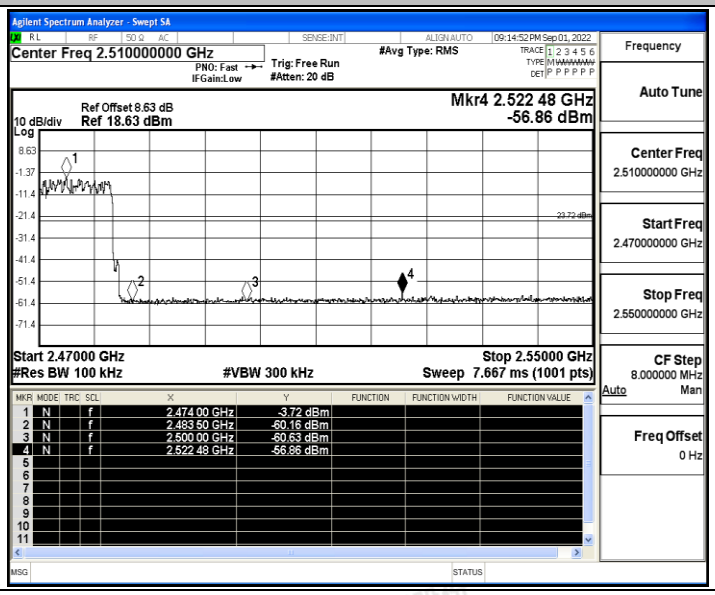
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



A.7 Conducted Spurious Emission

Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-0.92	-0.92	---	PASS
			30~1000	-0.92	-60.99	≤-20.92	PASS
			1000~26500	-0.92	-45.96	≤-20.92	PASS
		2441	Reference	-0.81	-0.81	---	PASS
			30~1000	-0.81	-60.8	≤-20.81	PASS
			1000~26500	-0.81	-46.19	≤-20.81	PASS
		2480	Reference	-0.78	-0.78	---	PASS
			30~1000	-0.78	-60.26	≤-20.78	PASS
			1000~26500	-0.78	-46.24	≤-20.78	PASS
2DH5	Ant1	2402	Reference	-5.14	-5.14	---	PASS
			30~1000	-5.14	-59.68	≤-25.14	PASS
			1000~26500	-5.14	-46.38	≤-25.14	PASS
		2441	Reference	-1.94	-1.94	---	PASS
			30~1000	-1.94	-61.22	≤-21.94	PASS
			1000~26500	-1.94	-45.98	≤-21.94	PASS
		2480	Reference	-1.31	-1.31	---	PASS
			30~1000	-1.31	-60.88	≤-21.31	PASS
			1000~26500	-1.31	-45.37	≤-21.31	PASS
3DH5	Ant1	2402	Reference	-1.17	-1.17	---	PASS
			30~1000	-1.17	-60.77	≤-21.17	PASS
			1000~26500	-1.17	-45.78	≤-21.17	PASS
		2441	Reference	-2.56	-2.56	---	PASS
			30~1000	-2.56	-60.88	≤-22.56	PASS
			1000~26500	-2.56	-46.52	≤-22.56	PASS
		2480	Reference	-2.47	-2.47	---	PASS
			30~1000	-2.47	-60.69	≤-22.47	PASS
			1000~26500	-2.47	-45.57	≤-22.47	PASS