

Applicant: <u>Shenzhen Vnvtent Co., Ltd.</u>	
Case No. : <u>18220WC20227001</u>	
EUT: <u>Auto diagnostic tool</u>	
M/N: <u>ELM327</u>	
Standard: <u>FCC Part15 Subpart C, Section 15.247</u>	
Test Power Supply: <u>NA</u>	
Ambient Condition: <u>28</u> °C, <u>44</u> %RH, <u>101.325</u> kPa	
Test Date: <u>2022.9.23</u>	Test Engineer: <u>Blue</u>

Appendix A: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Channel	20db EBW[MHz]
DH5	Ant1	2402	1.011
		2441	1.029
		2480	1.005
2DH5	Ant1	2402	1.323
		2441	1.365
		2480	1.305
3DH5	Ant1	2402	1.323
		2441	1.326
		2480	1.353

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	Channel	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	-0.38	≤20.97	PASS
		2441	-0.24	≤20.97	PASS
		2480	-0.61	≤20.97	PASS
2DH5	Ant1	2402	1.02	≤20.97	PASS
		2441	1.22	≤20.97	PASS
		2480	0.92	≤20.97	PASS
3DH5	Ant1	2402	1.44	≤20.97	PASS
		2441	1.53	≤20.97	PASS
		2480	1.17	≤20.97	PASS

Test Graphs

DH5_Ant1_2402



DH5_Ant1_2441



DH5_Ant1_2480



2DHS_Ant1_2402



2DHS_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	1.002	≥ 1	PASS
2DH5	Ant1	Hop	1.002	≥ 1	PASS
3DH5	Ant1	Hop	1.002	≥ 1	PASS

Test Graphs

DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop



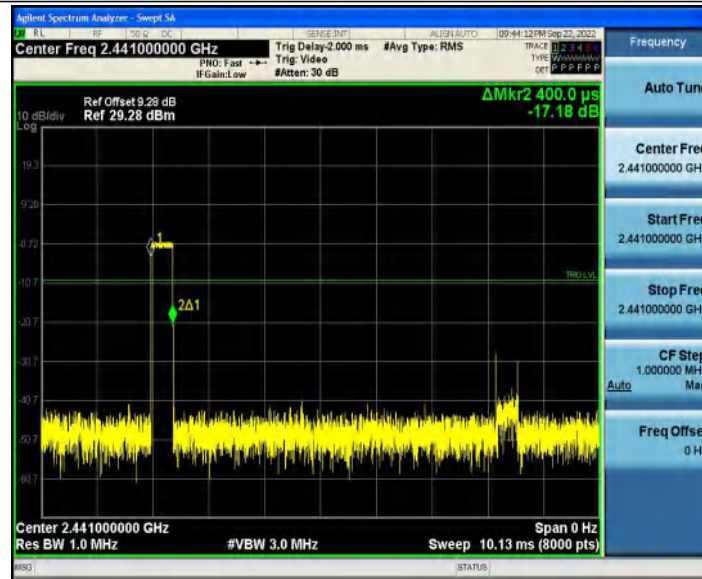
Appendix E: Time of occupancy

Test Result

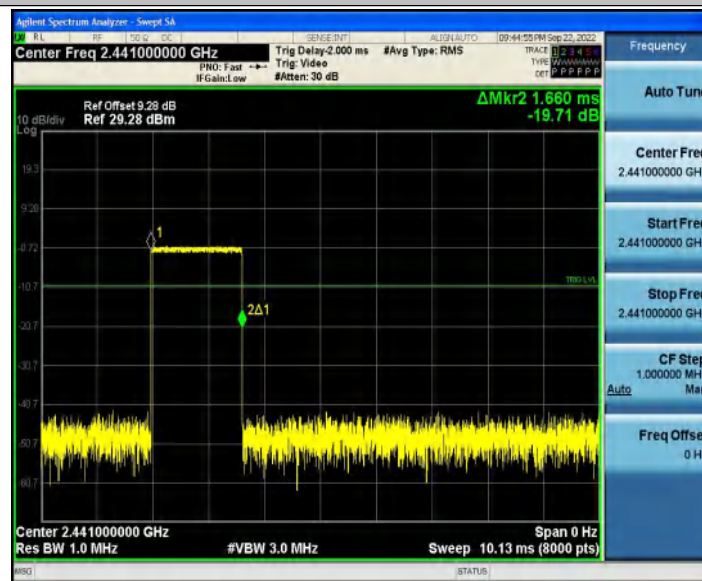
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.40	320	0.128	≤0.4	PASS
DH3	Ant1	Hop	1.66	160	0.266	≤0.4	PASS
DH5	Ant1	Hop	3.00	106.67	0.32	≤0.4	PASS
2DH1	Ant1	Hop	0.41	320	0.131	≤0.4	PASS
2DH3	Ant1	Hop	1.66	160	0.266	≤0.4	PASS
2DH5	Ant1	Hop	2.91	106.67	0.31	≤0.4	PASS
3DH1	Ant1	Hop	0.41	320	0.131	≤0.4	PASS
3DH3	Ant1	Hop	1.66	160	0.266	≤0.4	PASS
3DH5	Ant1	Hop	2.91	106.67	0.31	≤0.4	PASS

Test Graphs

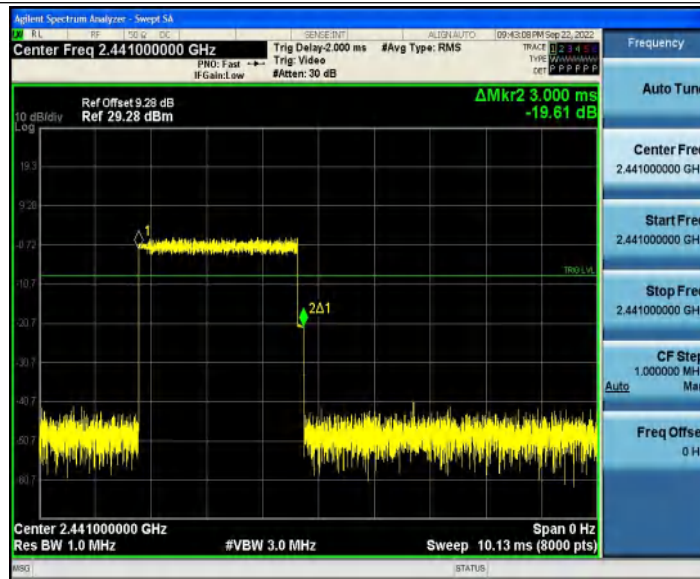
DH1_Ant1_Hop



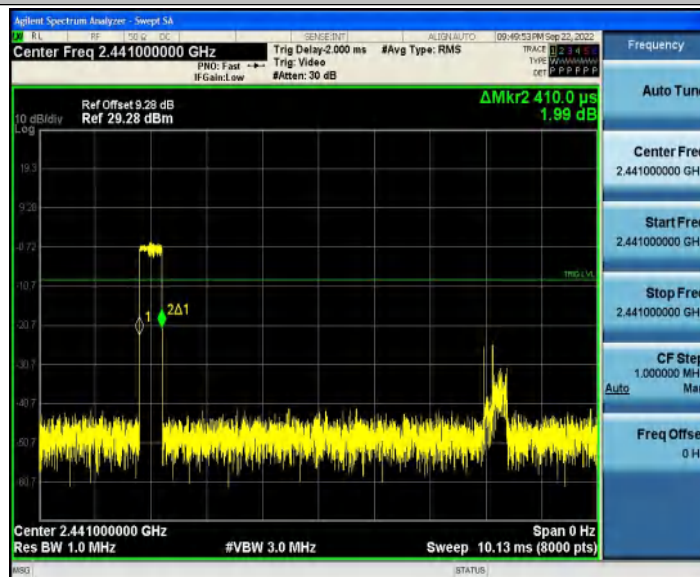
DH3_Ant1_Hop



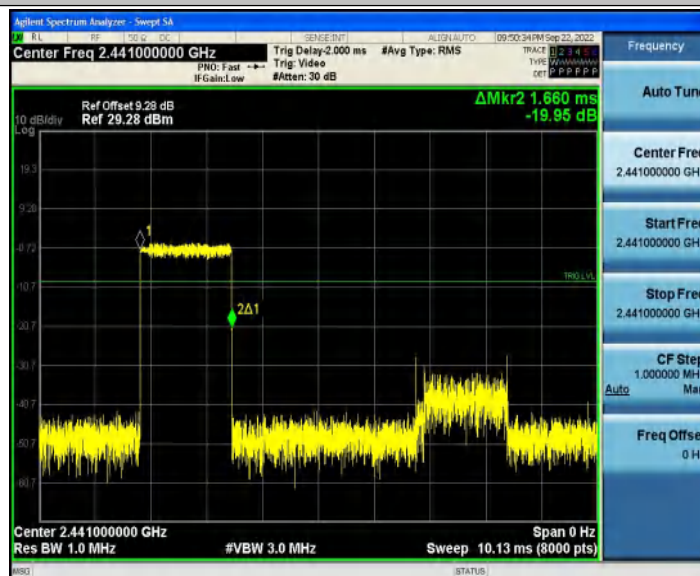
DH5_Ant1_Hop



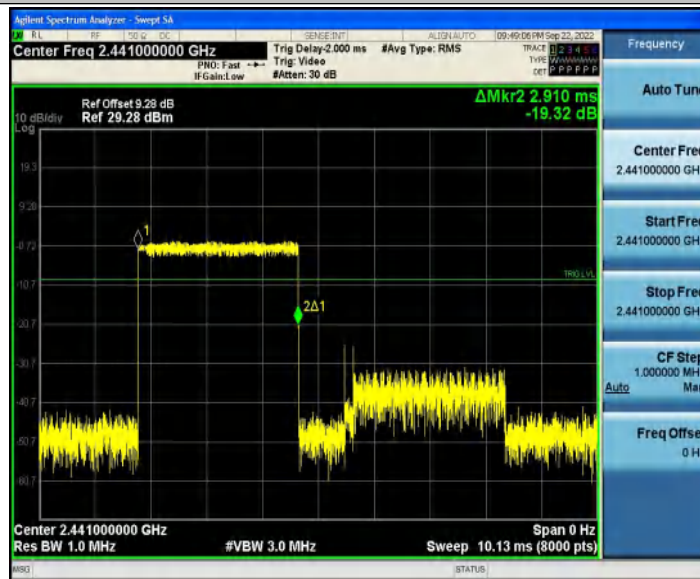
2DH1_Ant1_Hop



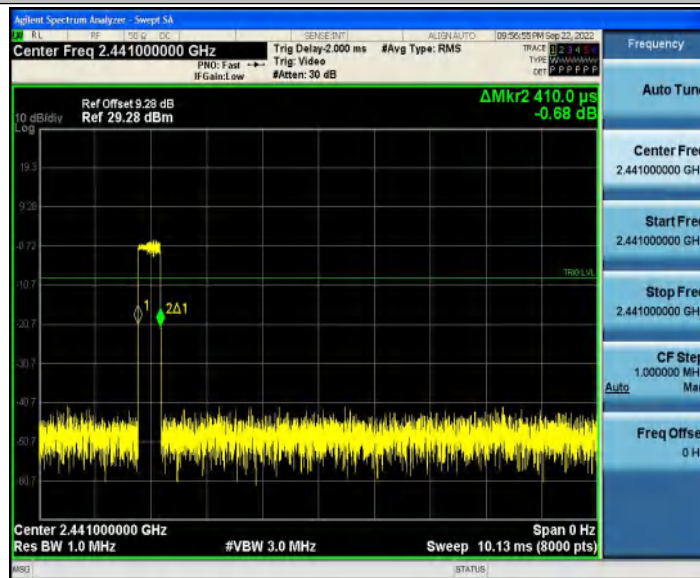
2DH3_Ant1_Hop



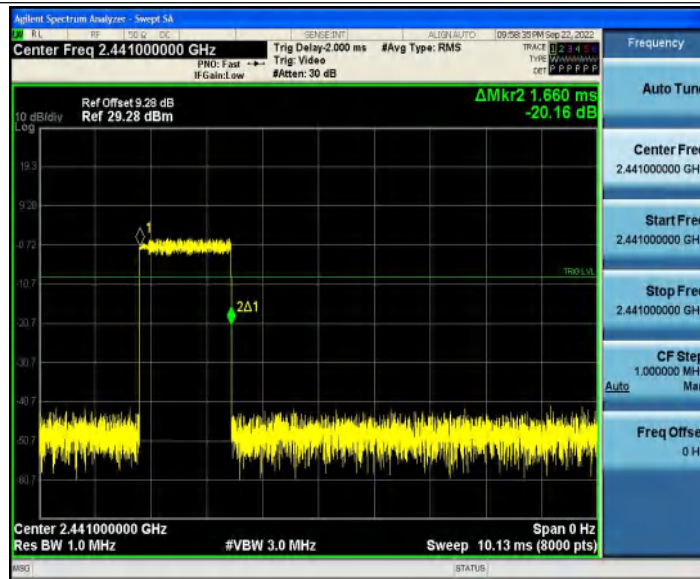
2DH5_Ant1_Hop



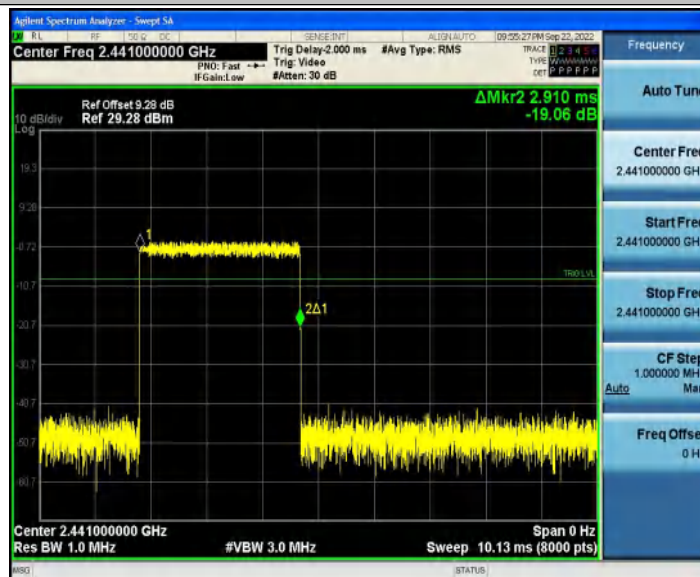
3DH1_Ant1_Hop



3DH3_Ant1_Hop



3DH5_Ant1_Hop



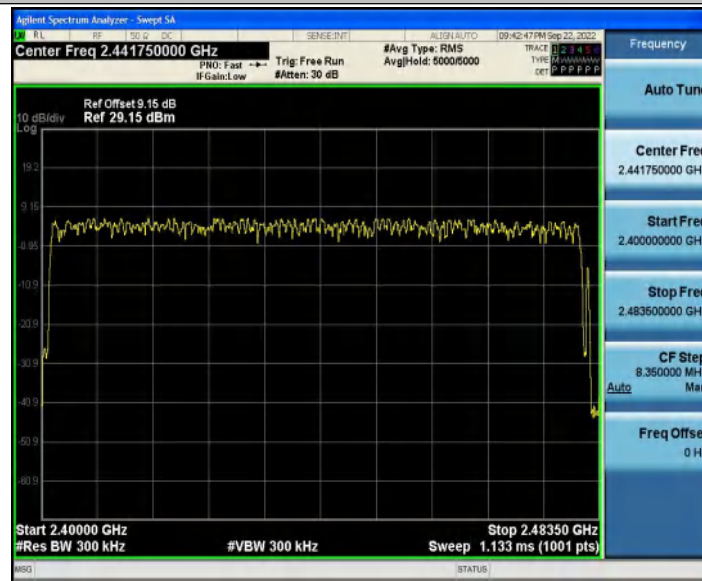
Appendix F: Number of hopping channels

Test Result

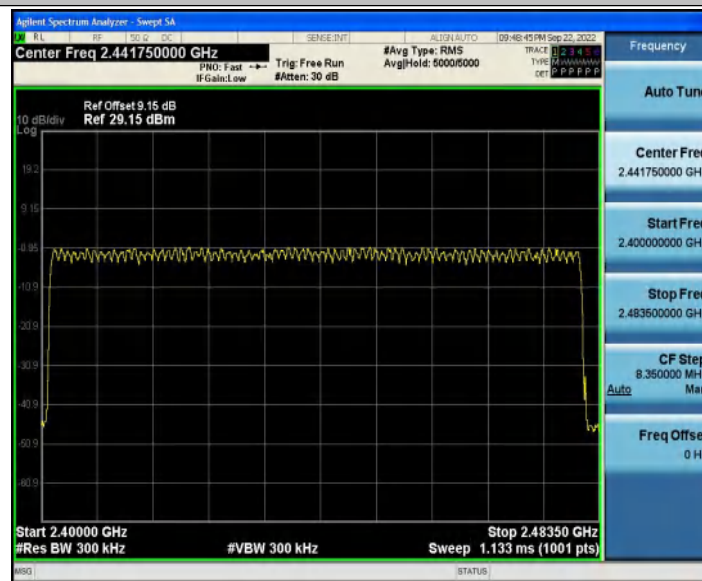
TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs

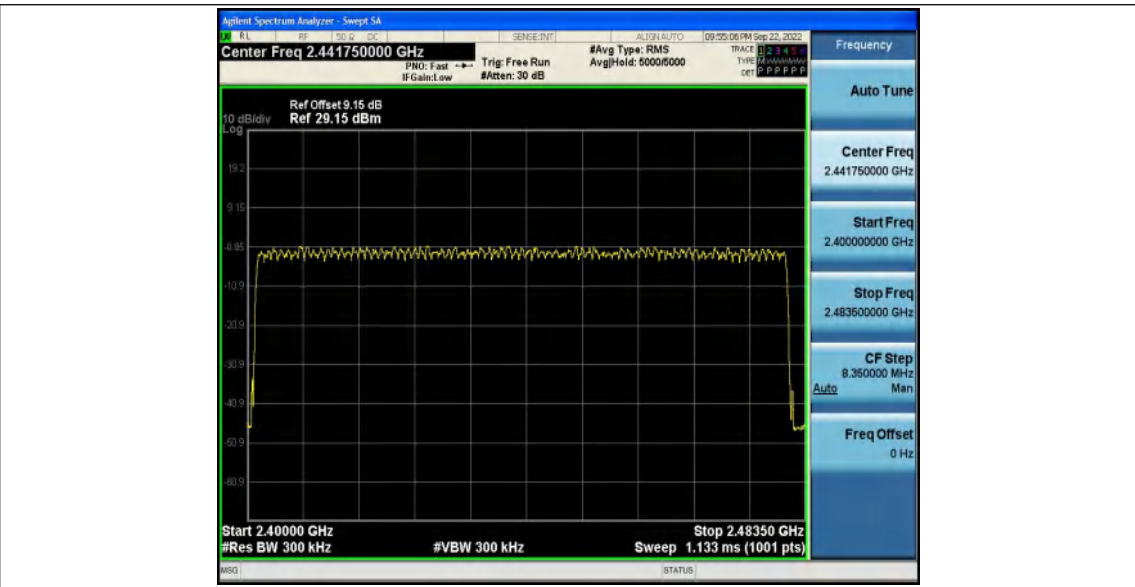
DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop



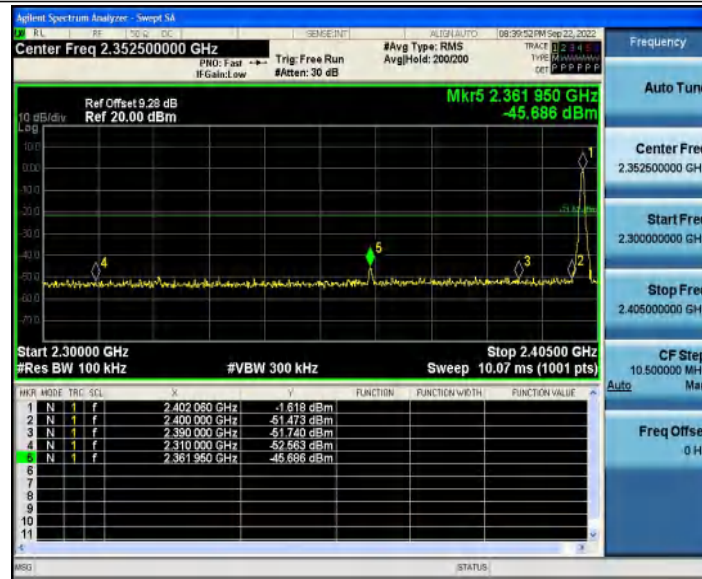
Appendix G: Band edge measurements

Test Result

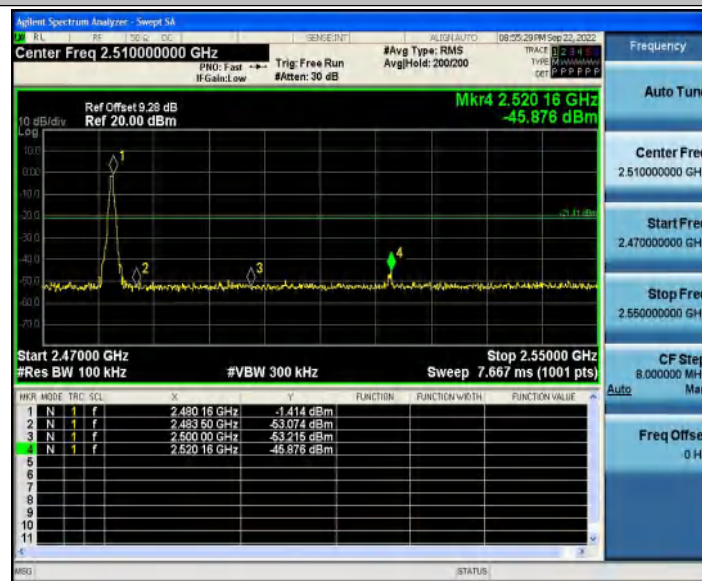
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	-1.62	-45.69	≤ -21.62	PASS
		High	2480	-1.41	-45.88	≤ -21.41	PASS
		Low	Hop_2402	5.21	-41.07	≤ -14.8	PASS
		High	Hop_2480	4.79	-41.64	≤ -15.21	PASS
2DH5	Ant1	Low	2402	-4.86	-49.14	≤ -24.86	PASS
		High	2480	-2.03	-48.24	≤ -22.03	PASS
		Low	Hop_2402	2.55	-41.56	≤ -17.45	PASS
		High	Hop_2480	5.33	-44.94	≤ -14.68	PASS
3DH5	Ant1	Low	2402	-1.39	-47.12	≤ -21.39	PASS
		High	2480	-1.54	-48.32	≤ -21.54	PASS
		Low	Hop_2402	1.59	-41.97	≤ -18.41	PASS
		High	Hop_2480	5.45	-44.97	≤ -14.55	PASS

Test Graphs

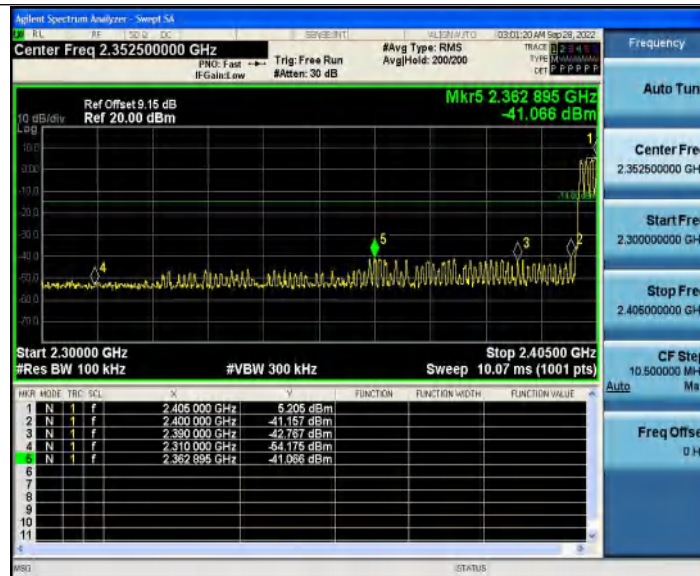
DH5_Ant1_Low_2402



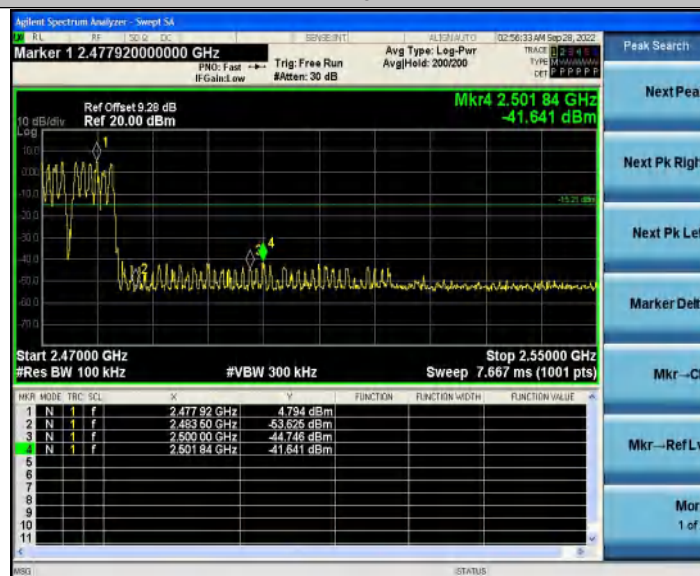
DH5_Ant1_High_2480



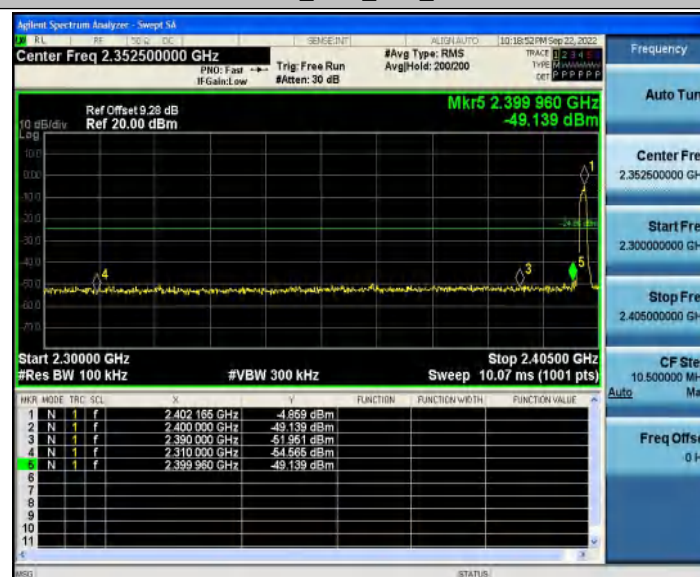
DH5_Ant1_Low_Hop_2402



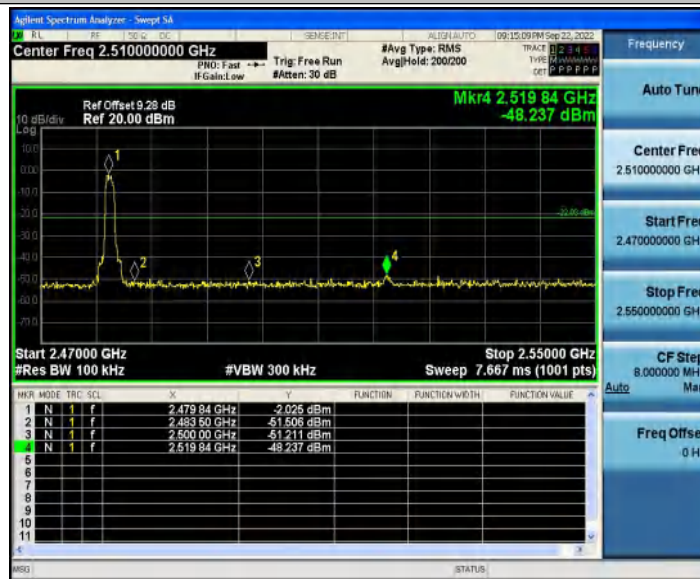
DH5_Ant1_High_Hop_2480



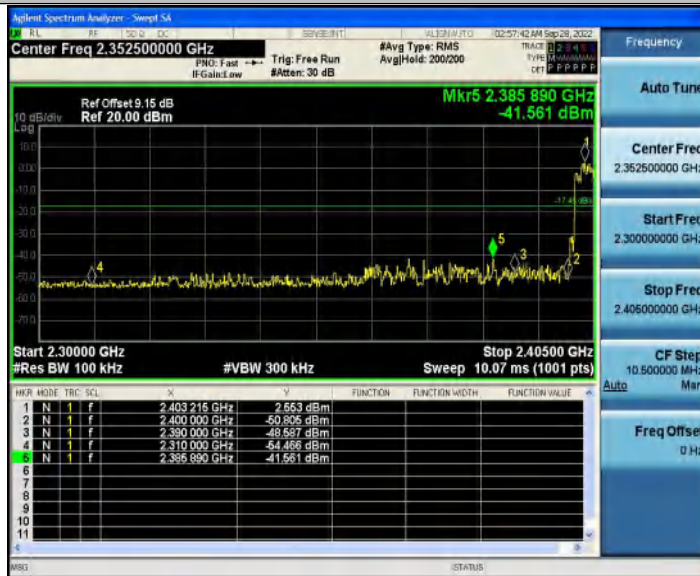
2DH5_Ant1_Low_2402



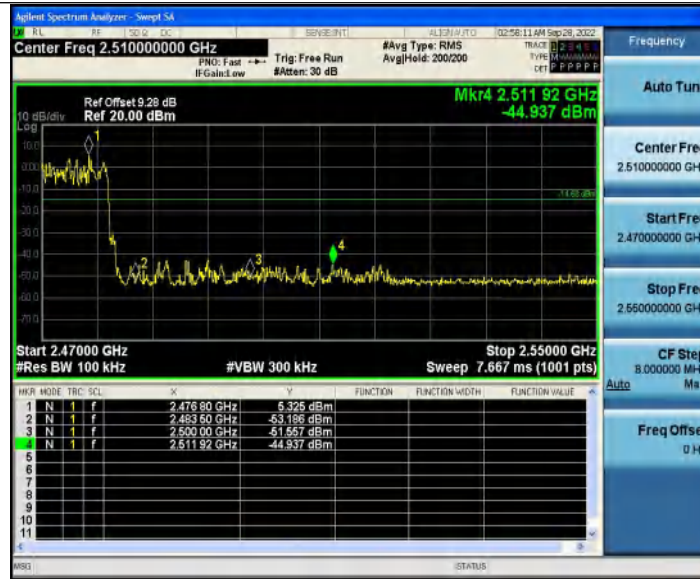
2DH5_Ant1_High_2480



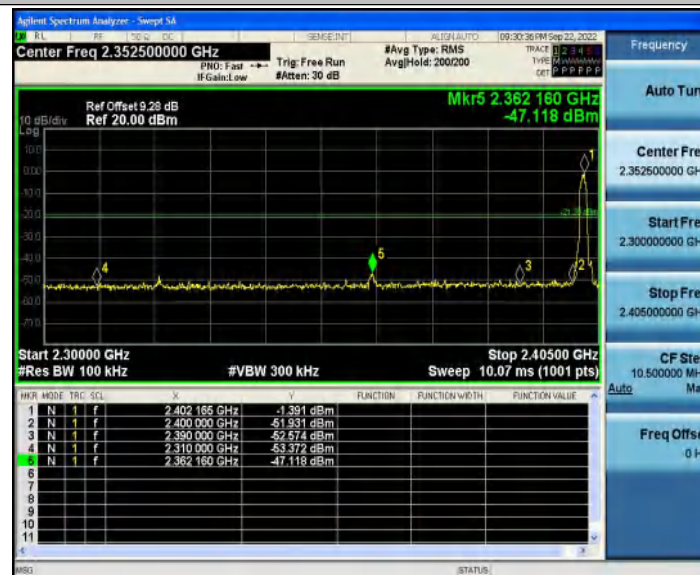
2DH5_Ant1_Low_Hop_2402



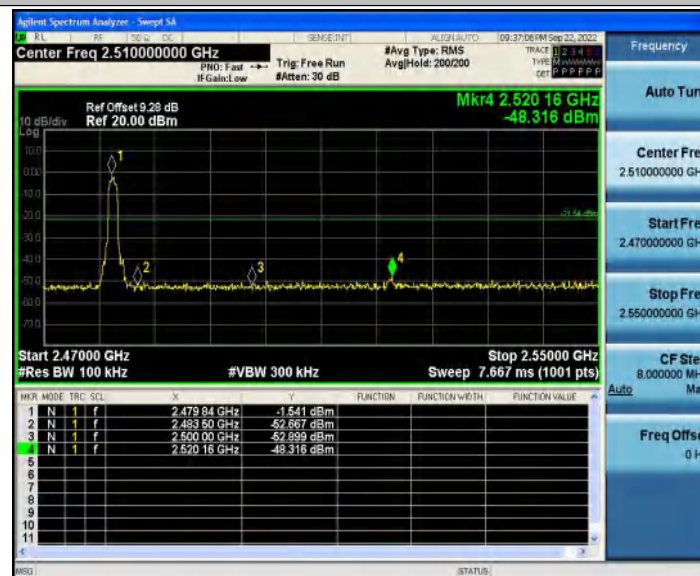
2DH5_Ant1_High_Hop_2480



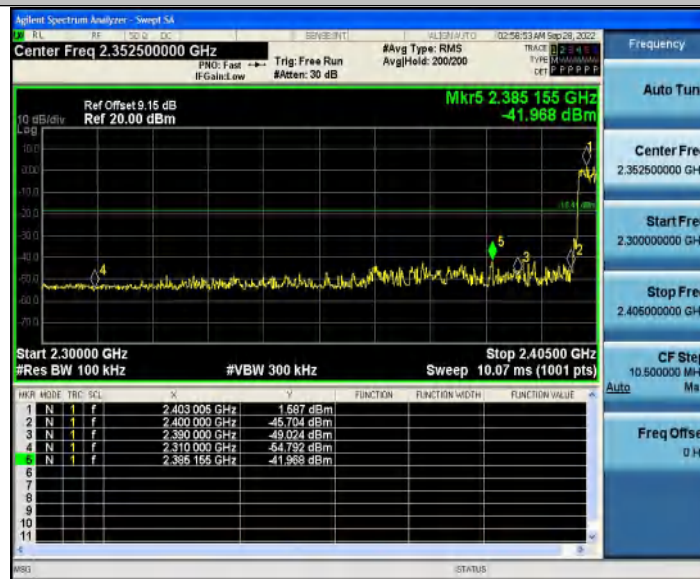
3DH5_Ant1_Low_2402



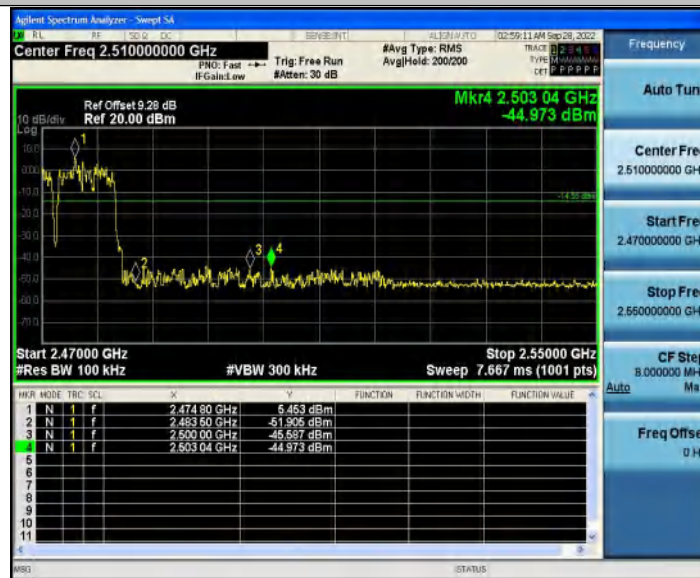
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



3DH5_Ant1_High_Hop_2480



Appendix H: Conducted Spurious Emission

Test Result

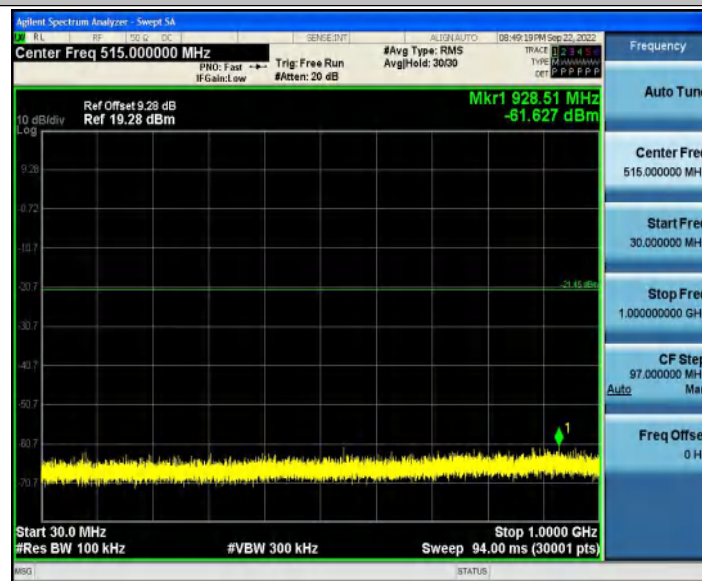
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	-1.45	-1.45	---	PASS
			30~1000	-1.45	-61.63	≤-21.45	PASS
			1000~26500	-1.45	-46.64	≤-21.45	PASS
		2441	Reference	-1.66	-1.66	---	PASS
			30~1000	-1.66	-61.48	≤-21.66	PASS
			1000~26500	-1.66	-49.18	≤-21.66	PASS
		2480	Reference	-1.83	-1.83	---	PASS
			30~1000	-1.83	-61.53	≤-21.83	PASS
			1000~26500	-1.83	-47.63	≤-21.83	PASS
2DH5	Ant1	2402	Reference	-5.26	-5.26	---	PASS
			30~1000	-5.26	-61.2	≤-25.26	PASS
			1000~26500	-5.26	-50.61	≤-25.26	PASS
		2441	Reference	-7.89	-7.89	---	PASS
			30~1000	-7.89	-61.66	≤-27.89	PASS
			1000~26500	-7.89	-51.06	≤-27.89	PASS
		2480	Reference	-5.36	-5.36	---	PASS
			30~1000	-5.36	-61.77	≤-25.36	PASS
			1000~26500	-5.36	-51.2	≤-25.36	PASS
3DH5	Ant1	2402	Reference	-1.34	-1.34	---	PASS
			30~1000	-1.34	-61.53	≤-21.34	PASS
			1000~26500	-1.34	-49.47	≤-21.34	PASS
		2441	Reference	-3.66	-3.66	---	PASS
			30~1000	-3.66	-61.78	≤-23.66	PASS
			1000~26500	-3.66	-49.58	≤-23.66	PASS
		2480	Reference	-3.42	-3.42	---	PASS
			30~1000	-3.42	-61.64	≤-23.42	PASS
			1000~26500	-3.42	-49.2	≤-23.42	PASS

Test Graphs

DH5_Ant1_2402_0~Reference



DH5_Ant1_2402_30~1000



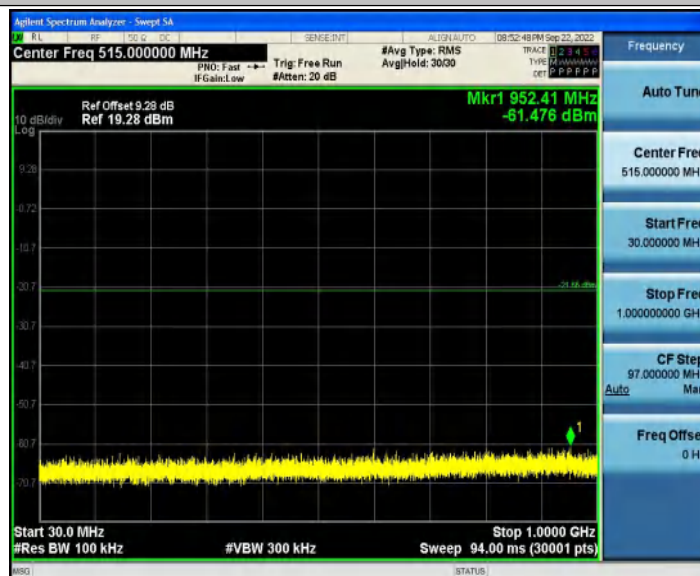
DH5_Ant1_2402_1000~26500



DH5_Ant1_2441_0~Reference



DH5_Ant1_2441_30~1000



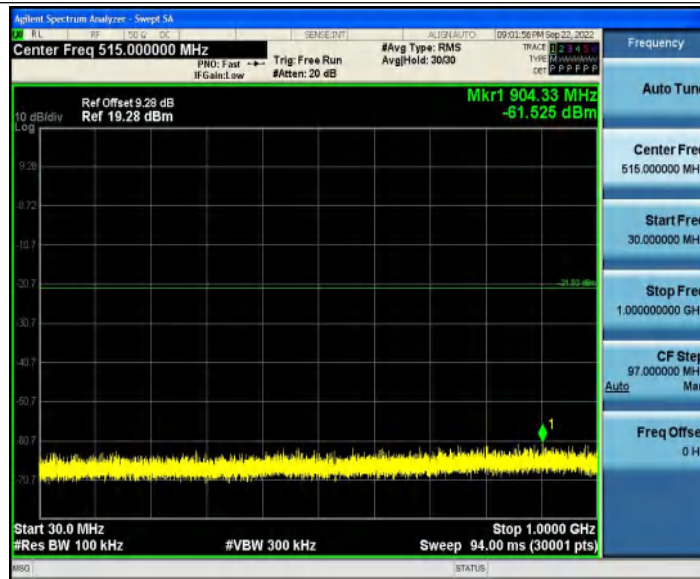
DH5_Ant1_2441_1000~26500



DH5_Ant1_2480_0~Reference



DH5_Ant1_2480_30~1000



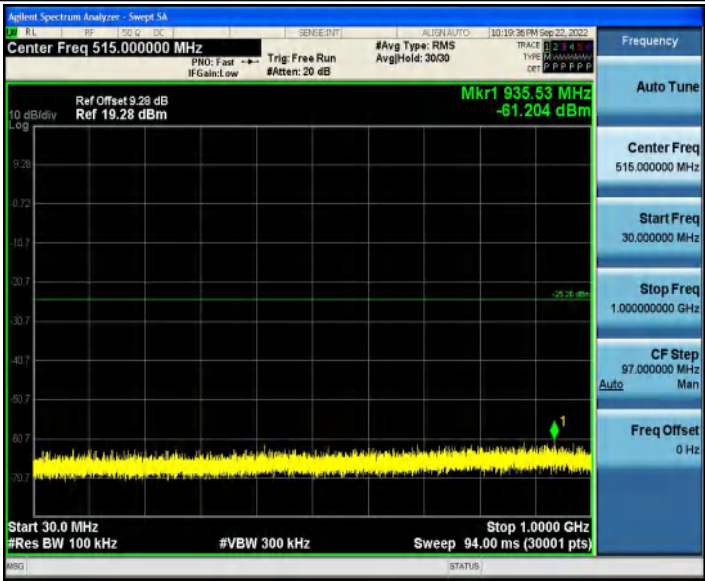
DH5_Ant1_2480_1000~26500



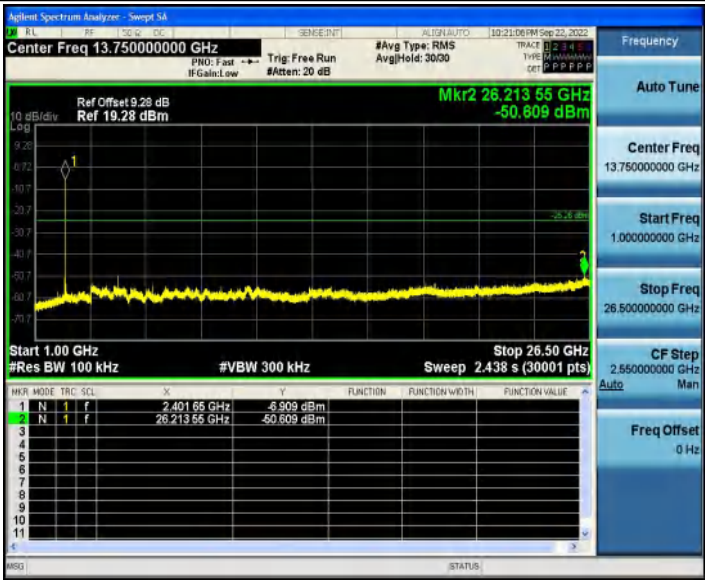
2DH5_Ant1_2402_0~Reference



2DH5_Ant1_2402_30~1000



2DH5_Ant1_2402_1000~26500



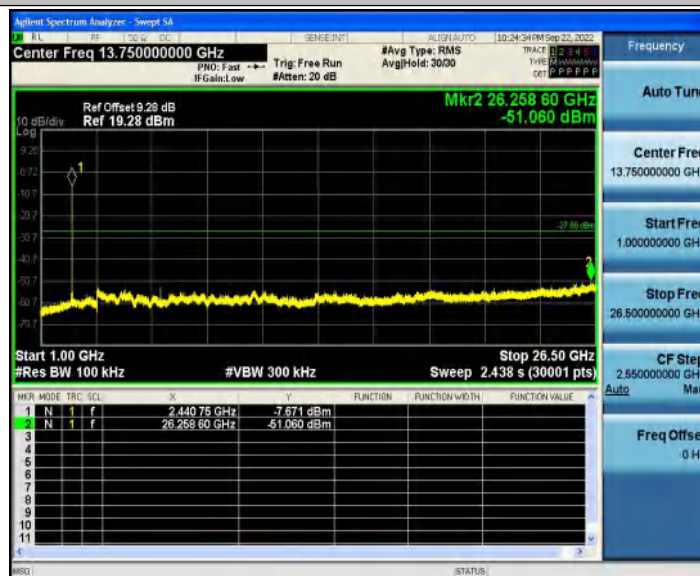
2DH5_Ant1_2441_0~Reference



2DH5_Ant1_2441_30~1000



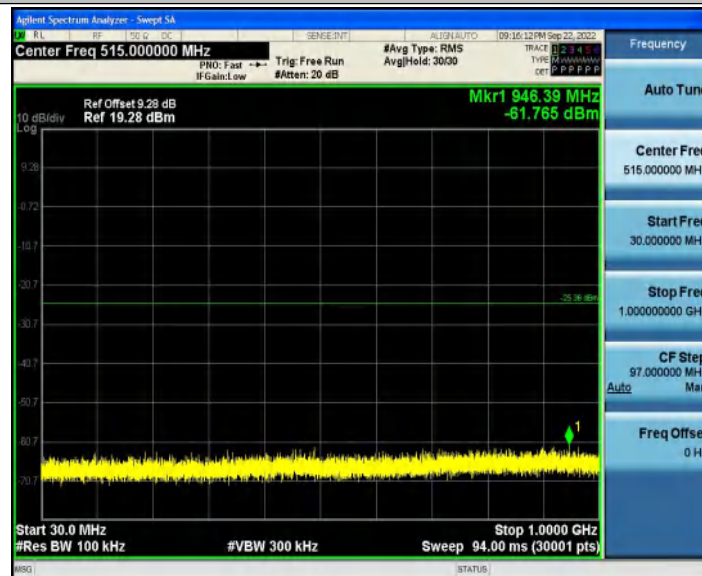
2DH5_Ant1_2441_1000~26500



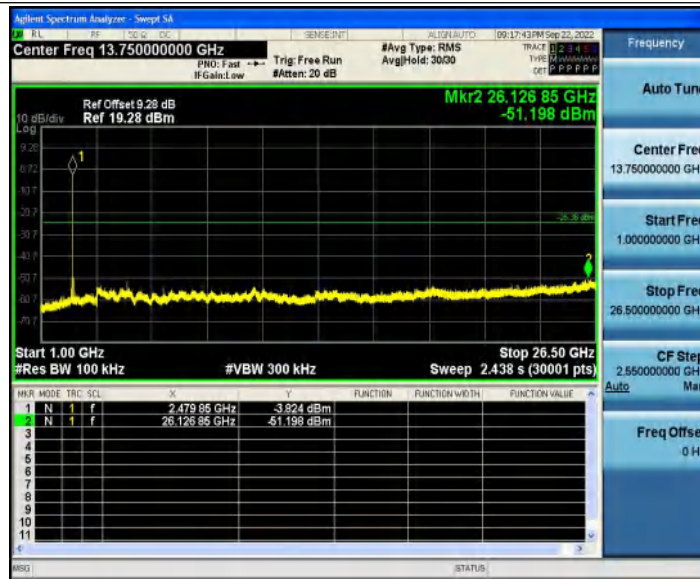
2DH5_Ant1_2480_0~Reference



2DH5_Ant1_2480_30~1000



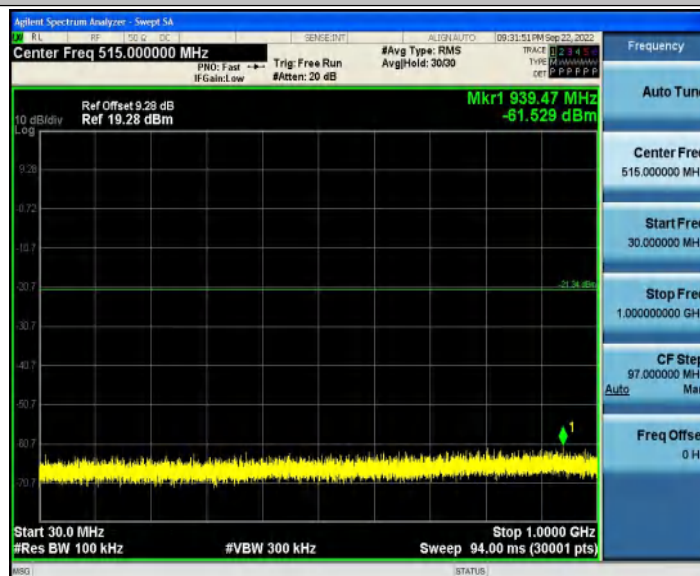
2DH5_Ant1_2480_1000~26500



3DH5_Ant1_2402_0~Reference



3DH5_Ant1_2402_30~1000



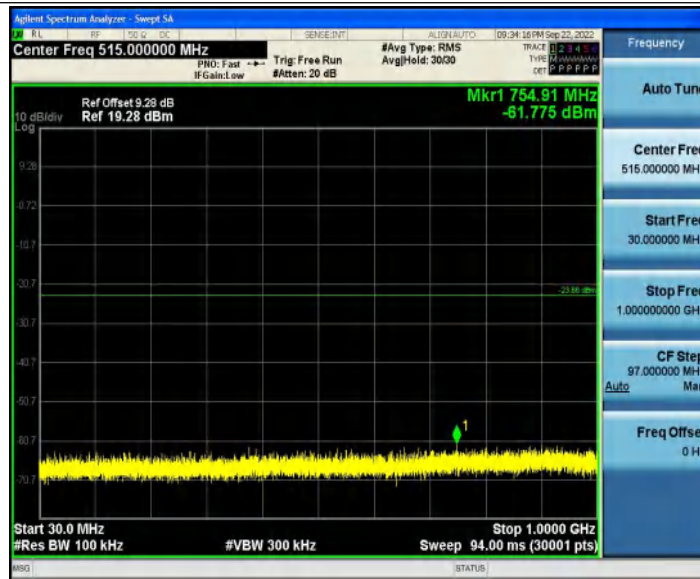
3DH5_Ant1_2402_1000~26500



3DH5_Ant1_2441_0~Reference



3DH5_Ant1_2441_30~1000



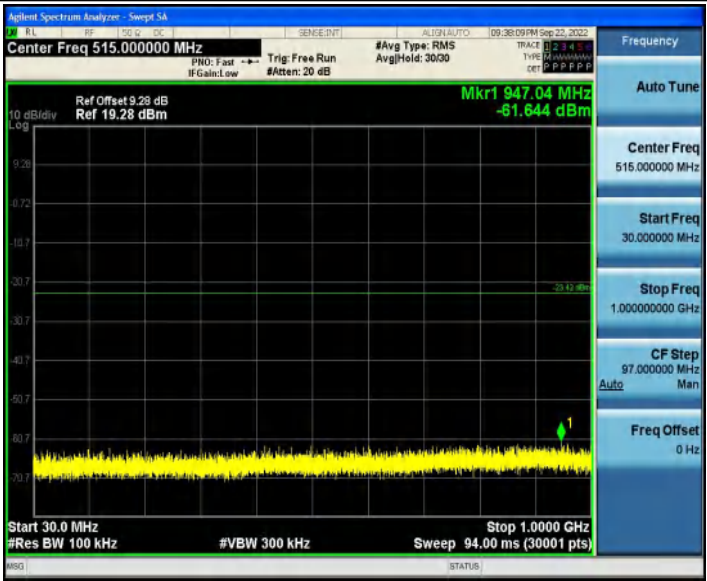
3DH5_Ant1_2441_1000~26500



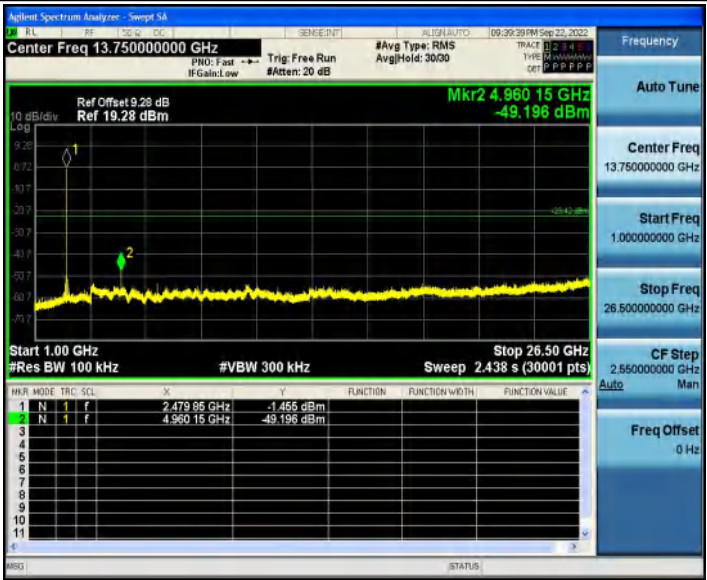
3DH5_Ant1_2480_0~Reference



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	2.87	3.77	0.7613	76.13	1.18	---	---
		2441	2.87	3.77	0.7613	76.13	1.18	---	---
		2480	2.87	3.77	0.7613	76.13	1.18	---	---
2DH5	Ant1	2402	2.88	3.78	0.7619	76.19	1.18	---	---
		2441	2.88	3.79	0.7599	75.99	1.19	---	---
		2480	2.88	3.78	0.7619	76.19	1.18	---	---
3DH5	Ant1	2402	2.88	3.79	0.7599	75.99	1.19	---	---
		2441	2.88	3.79	0.7599	75.99	1.19	---	---
		2480	2.90	3.79	0.7652	76.52	1.16	---	---

Test Graphs

DH5_Ant1_2402



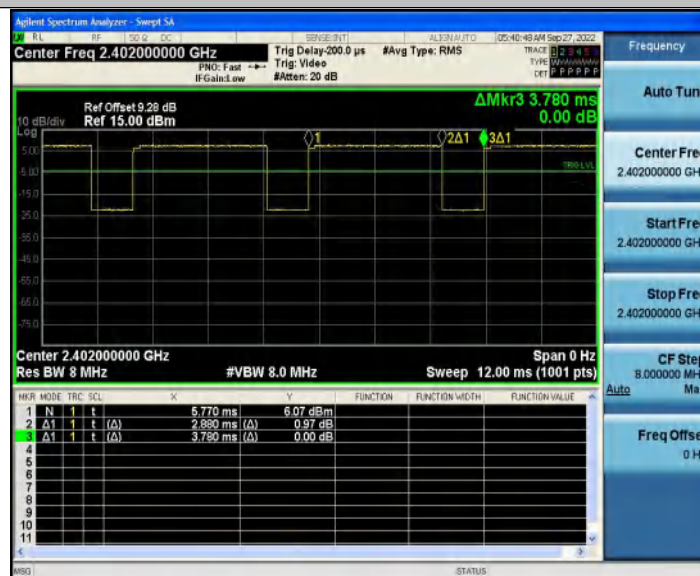
DH5_Ant1_2441



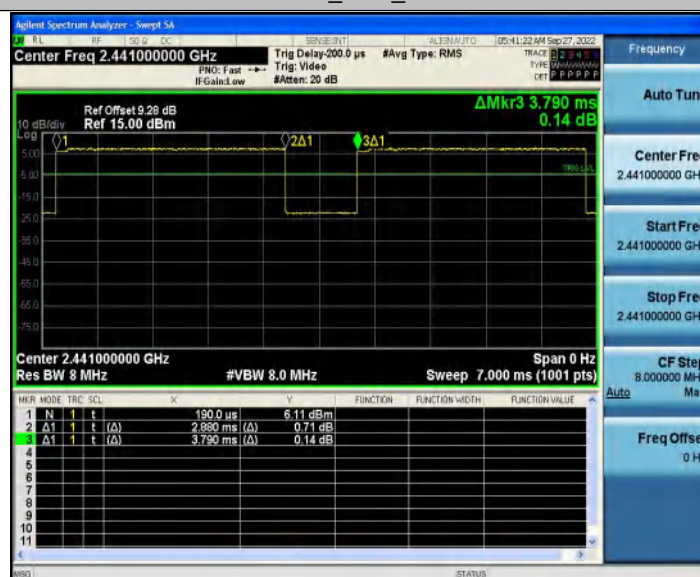
DH5_Ant1_2480



2DH5_Ant1_2402



2DH5_Ant1_2441



2DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



Appendix J: Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Channel	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
DH5	Ant1	Low	2402	Peak	2310.000	-43.44	≤-21.20	51.76	≤74	PASS
				Peak	2362.055	-38.01	≤-21.20	57.19	≤74	PASS
				Peak	2390.000	-39.68	≤-21.20	55.52	≤74	PASS
		High	2480	AV	2483.500	-46.89	≤-41.20	48.31	≤54	PASS
				AV	2483.520	-46.89	≤-41.20	48.31	≤54	PASS
				AV	2500.000	-48.74	≤-41.20	46.46	≤54	PASS
				Peak	2483.500	-42.11	≤-21.20	53.09	≤74	PASS
				Peak	2492.400	-38.95	≤-21.20	56.25	≤74	PASS
				Peak	2500.000	-40.63	≤-21.20	54.57	≤74	PASS
		Low	Hop_240 2	Peak	2310.000	-42.8	≤-21.20	52.40	≤74	PASS
				Peak	2362.895	-34.8	≤-21.20	60.40	≤74	PASS
				Peak	2390.000	-39.22	≤-21.20	55.98	≤74	PASS
		High	Hop_248 0	Peak	2483.500	-38.42	≤-21.20	56.78	≤74	PASS
				Peak	2494.720	-35.46	≤-21.20	59.74	≤74	PASS
				Peak	2500.000	-39.78	≤-21.20	55.42	≤74	PASS
2DH5	Ant1	Low	2402	AV	2310.000	-48.81	≤-41.20	46.39	≤54	PASS
				AV	2362.055	-46.98	≤-41.20	48.22	≤54	PASS
				AV	2390.000	-47.83	≤-41.20	47.37	≤54	PASS
				Peak	2310.000	-42.23	≤-21.20	52.97	≤74	PASS
				Peak	2388.200	-38.3	≤-21.20	56.90	≤74	PASS
				Peak	2390.000	-38.6	≤-21.20	56.60	≤74	PASS
		High	2480	AV	2483.500	-48.38	≤-41.20	46.82	≤54	PASS
				AV	2483.520	-48.38	≤-41.20	46.82	≤54	PASS
				AV	2500.000	-48.6	≤-41.20	46.60	≤54	PASS
				Peak	2483.500	-42.11	≤-21.20	53.09	≤74	PASS
				Peak	2490.960	-38.91	≤-21.20	56.29	≤74	PASS
				Peak	2500.000	-41.61	≤-21.20	53.59	≤74	PASS
		Low	Hop_240 2	Peak	2310.000	-42.23	≤-21.20	52.97	≤74	PASS
				Peak	2376.125	-35.17	≤-21.20	60.03	≤74	PASS
				Peak	2390.000	-39.42	≤-21.20	55.78	≤74	PASS
		High	Hop_248 0	Peak	2483.500	-38.46	≤-21.20	56.74	≤74	PASS
				Peak	2494.400	-34.66	≤-21.20	60.54	≤74	PASS
				Peak	2500.000	-40.31	≤-21.20	54.89	≤74	PASS
3DH5	Ant1	Low	2402	AV	2310.000	-49.26	≤-41.20	45.94	≤54	PASS
				AV	2362.055	-44.97	≤-41.20	50.23	≤54	PASS
				AV	2390.000	-48.2	≤-41.20	47.00	≤54	PASS
				Peak	2310.000	-42.42	≤-21.20	52.78	≤74	PASS

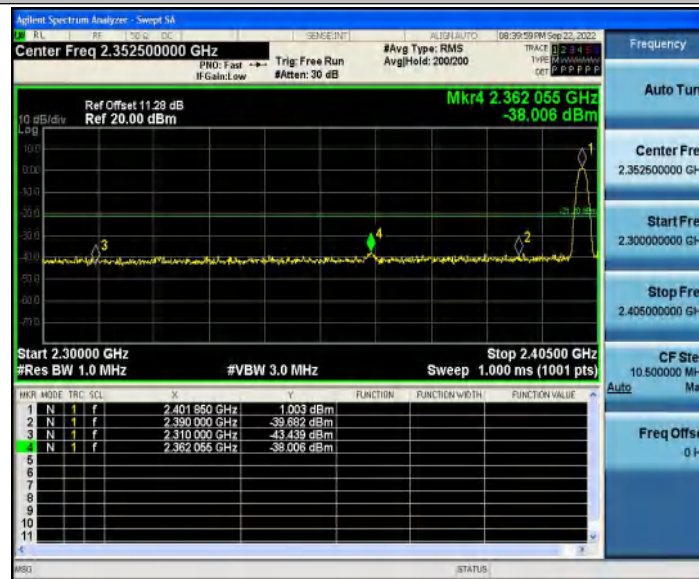
				Peak	2362.370	-37.66	≤-21.20	57.54	≤74	PASS
				Peak	2390.000	-40.3	≤-21.20	54.90	≤74	PASS
		High	2480	AV	2483.500	-48.36	≤-41.20	46.84	≤54	PASS
				AV	2483.520	-48.36	≤-41.20	46.84	≤54	PASS
				AV	2500.000	-48.63	≤-41.20	46.57	≤54	PASS
				Peak	2483.500	-41.07	≤-21.20	54.13	≤74	PASS
				Peak	2485.040	-39.17	≤-21.20	56.03	≤74	PASS
				Peak	2500.000	-40.64	≤-21.20	54.56	≤74	PASS
		Low	Hop_240 2	Peak	2310.000	-41.6	≤-21.20	53.60	≤74	PASS
				Peak	2370.035	-35.15	≤-21.20	60.05	≤74	PASS
				Peak	2390.000	-39.63	≤-21.20	55.57	≤74	PASS
		High	Hop_248 0	Peak	2483.500	-39.48	≤-21.20	55.72	≤74	PASS
				Peak	2489.200	-35.61	≤-21.20	59.59	≤74	PASS
				Peak	2500.000	-37.27	≤-21.20	57.93	≤74	PASS

Note:

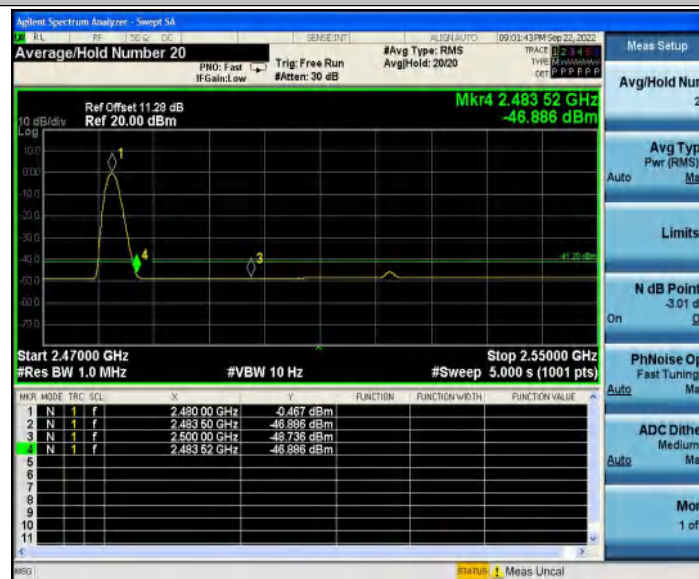
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

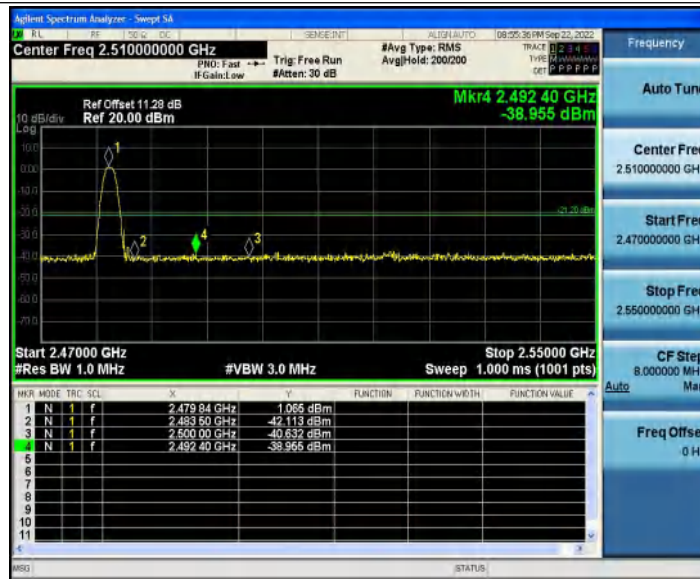
DH5_Ant1_Low_2402_Peak



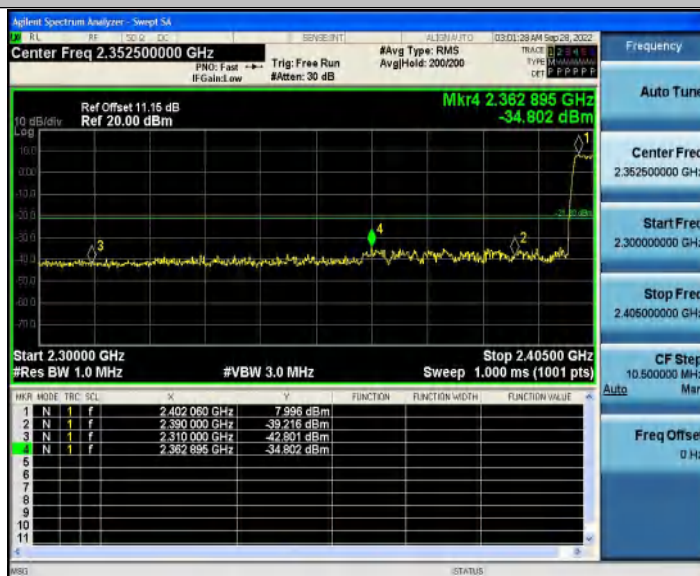
DH5_Ant1_High_2480_AV



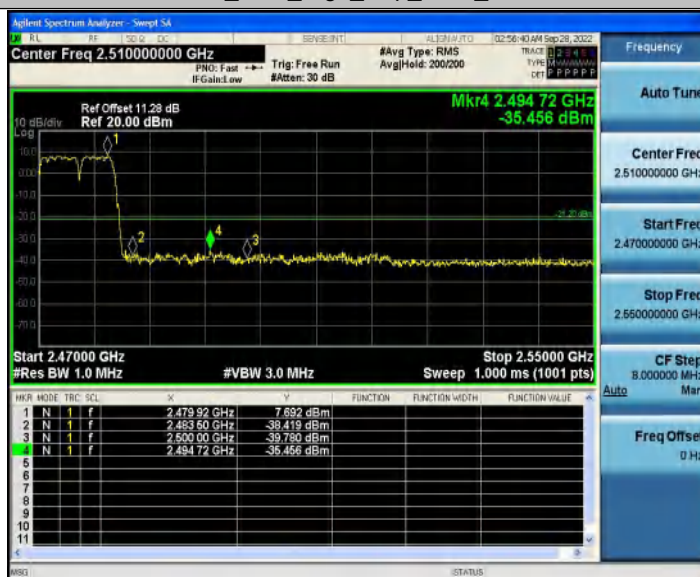
DH5_Ant1_High_2480_Peak



DH5_Ant1_Low_Hop_2402_Peak



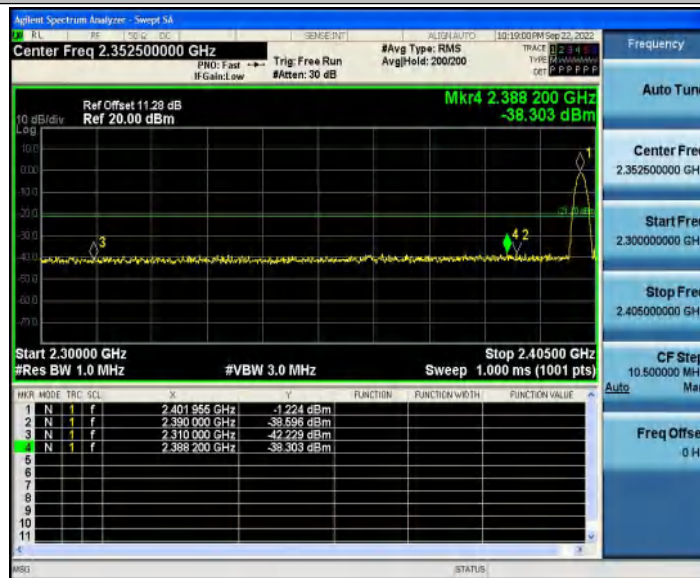
DH5_Ant1_High_Hop_2480_Peak



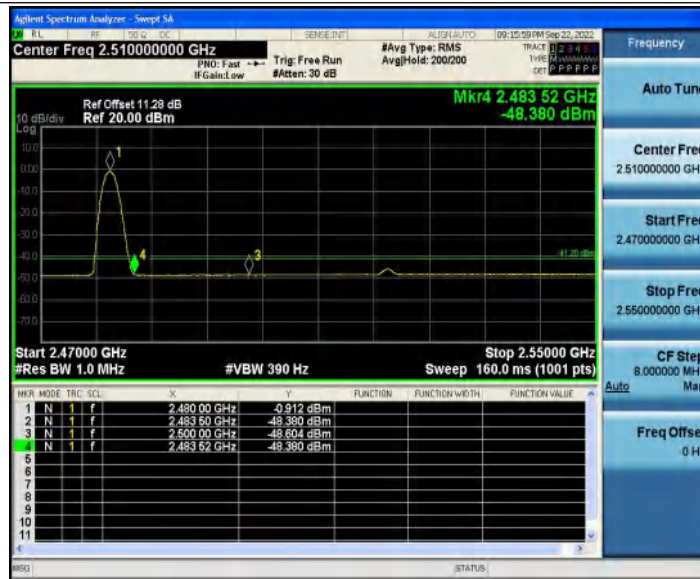
2DH5_Ant1_Low_2402_AV



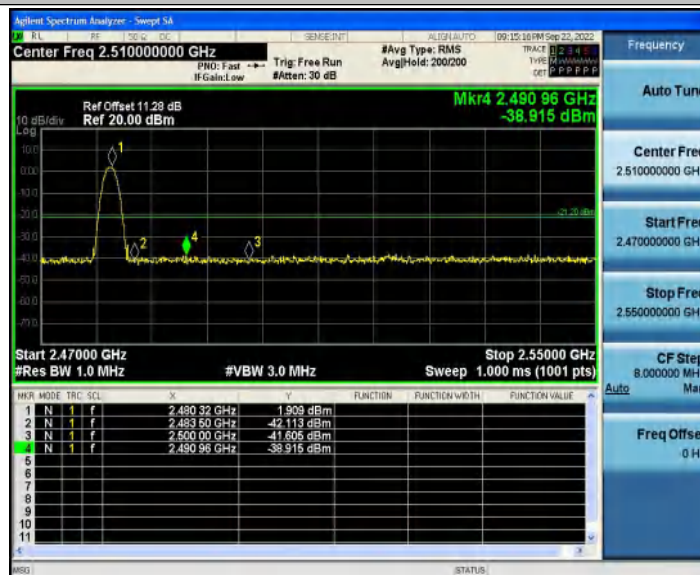
2DH5_Ant1_Low_2402_Peak



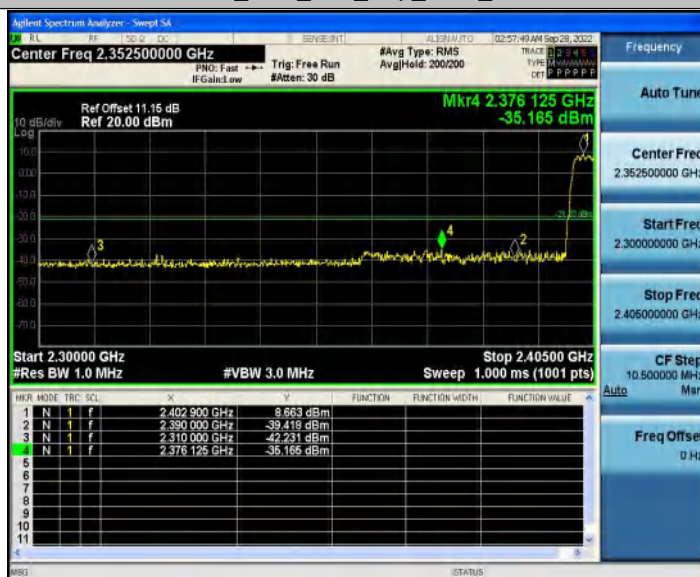
2DH5_Ant1_High_2480_AV



2DH5_Ant1_High_2480_Peak



2DH5_Ant1_Low_Hop_2402_Peak



2DH5_Ant1_High_Hop_2480_Peak



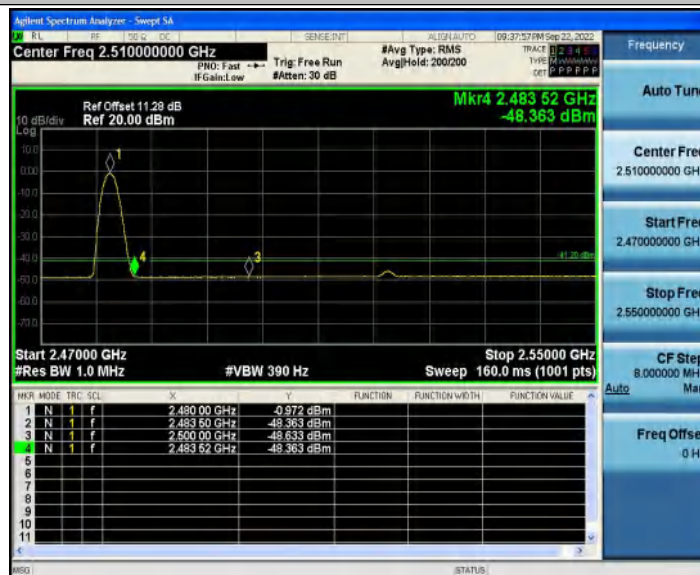
3DH5_Ant1_Low_2402_AV



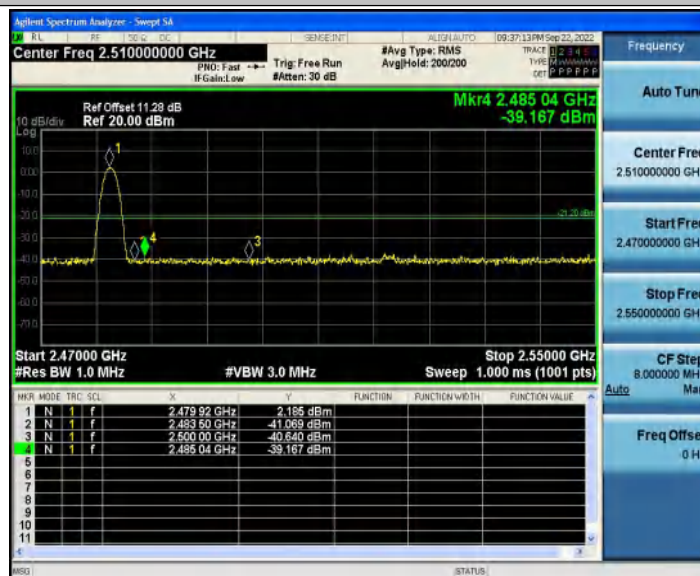
3DH5_Ant1_Low_2402_Peak



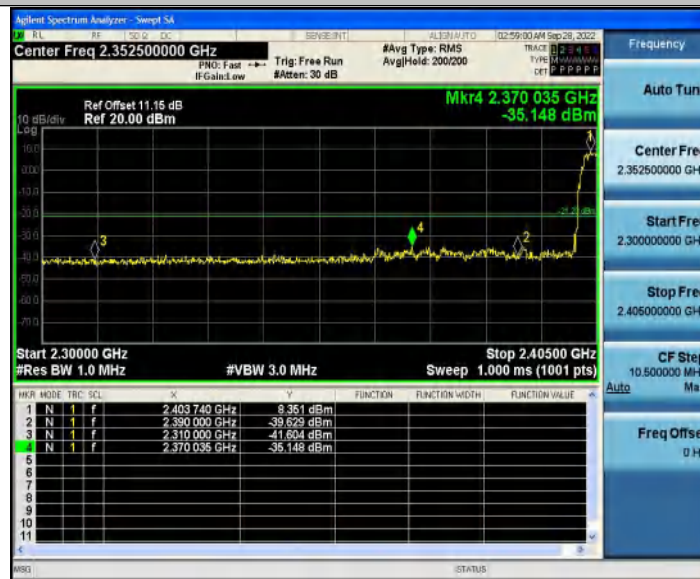
3DH5_Ant1_High_2480_AV



3DH5_Ant1_High_2480_Peak



3DH5_Ant1_Low_Hop_2402_Peak



3DH5_Ant1_High_Hop_2480_Peak

