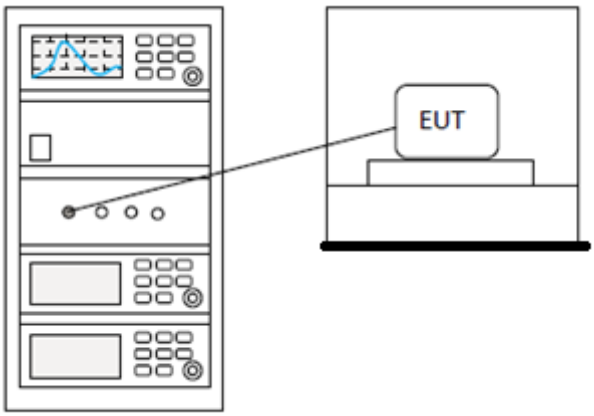
7 CONDUCTED BAND EDGES MEASUREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.6
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Ben
Temperature	25℃
Humidity	55%

7.1 LIMITS

Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

7.2 BLOCK DIAGRAM OF TEST SETUP



7.3 TEST DATA

Pass: Please Refer To Appendix: For Details

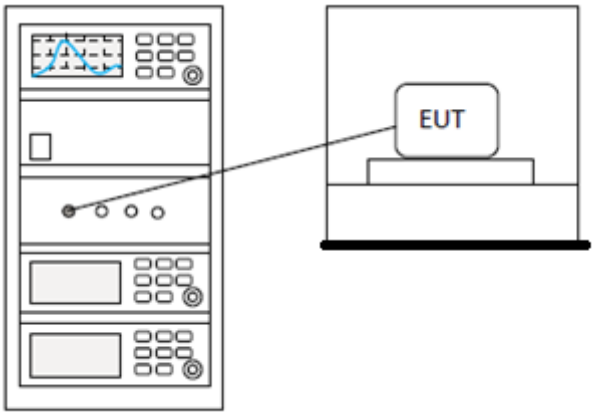
8 DWELL TIME

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.4
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Ben
Temperature	25℃
Humidity	55%

8.1 LIMITS

Frequency(MHz)	Limit
902-928	0.4S within a 20S period(20dB bandwidth<250kHz)
	0.4S within a 10S period(20dB bandwidth≥250kHz)
2400-2483.5	0.4S within a period of 0.4Smultiplied by the number of hopping channels
5725-5850	0.4S within a 30S period

8.2 BLOCK DIAGRAM OF TEST SETUP



8.3 TEST DATA

Pass: Please Refer To Appendix: For Details

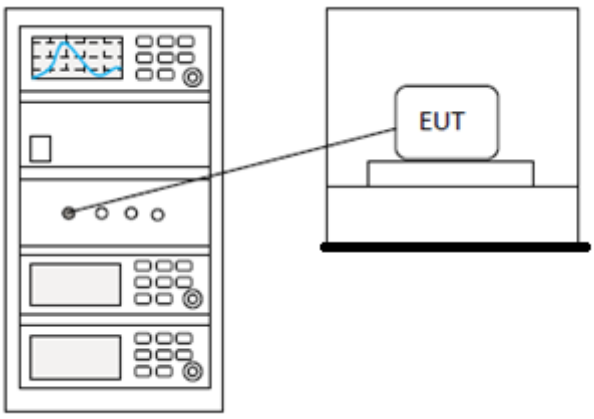
9 HOPPING CHANNEL NUMBER

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.3
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Ben
Temperature	25℃
Humidity	55%

9.1 LIMITS

Frequency range(MHz)	Number of hopping channels (minimum)
902-928	50 for 20dB bandwidth <250kHz
	25 for 20dB bandwidth ≥250kHz
2400-2483.5	15
5725-5850	75

9.2 BLOCK DIAGRAM OF TEST SETUP



9.3 TEST DATA

Pass: Please Refer To Appendix: For Details

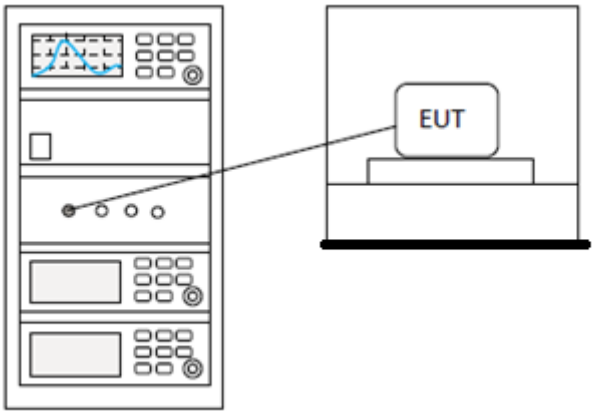
10 CARRIER FREQUENCIES SEPARATION

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Ben
Temperature	25℃
Humidity	55%

10.1 LIMITS

Limit:	2/3 of the 20dB bandwidth base on the transmission power is less than 0.125W

10.2 BLOCK DIAGRAM OF TEST SETUP



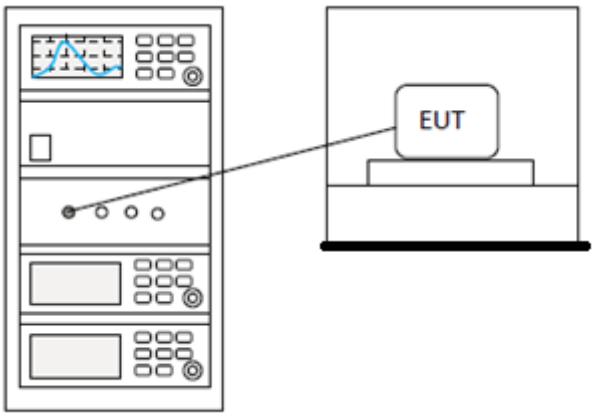
10.3 TEST DATA

Pass: Please Refer To Appendix: For Details

11 20DB BANDWIDTH

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.9
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Ben
Temperature	25℃
Humidity	55%

11.1 BLOCK DIAGRAM OF TEST SETUP



11.2 TEST DATA

Pass: Please Refer To Appendix: For Details

12 APPENDIX

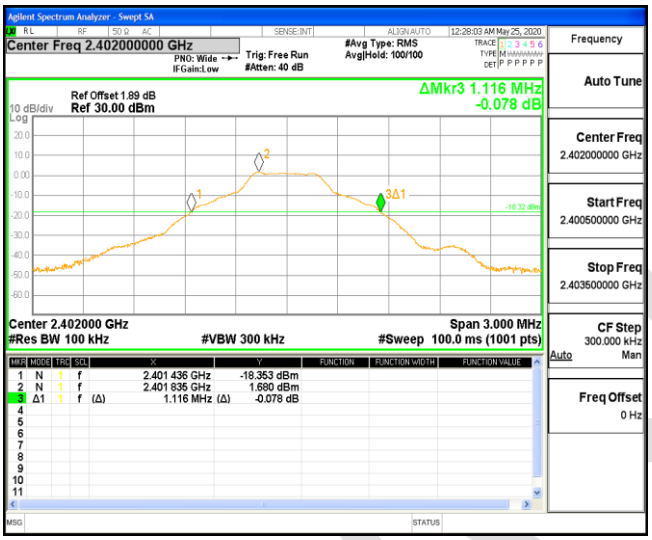
12.1 APPENDIX: 20DB EMISSION BANDWIDTH

Test Result

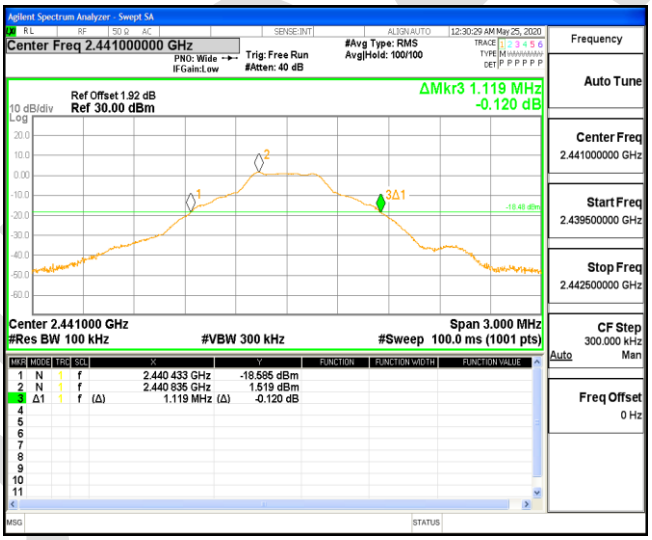
TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	1.116	2401.436	2402.552	---	PASS
		2441	1.119	2440.433	2441.552	---	PASS
		2480	1.116	2479.436	2480.552	---	PASS
2DH1	Ant1	2402	1.389	2401.301	2402.690	---	PASS
		2441	1.380	2440.301	2441.681	---	PASS
		2480	1.377	2479.304	2480.681	---	PASS
3DH1	Ant1	2402	1.386	2401.301	2402.687	---	PASS
		2441	1.386	2440.304	2441.690	---	PASS
		2480	1.386	2479.301	2480.687	---	PASS

Test Graphs

DH1_Ant1_2402

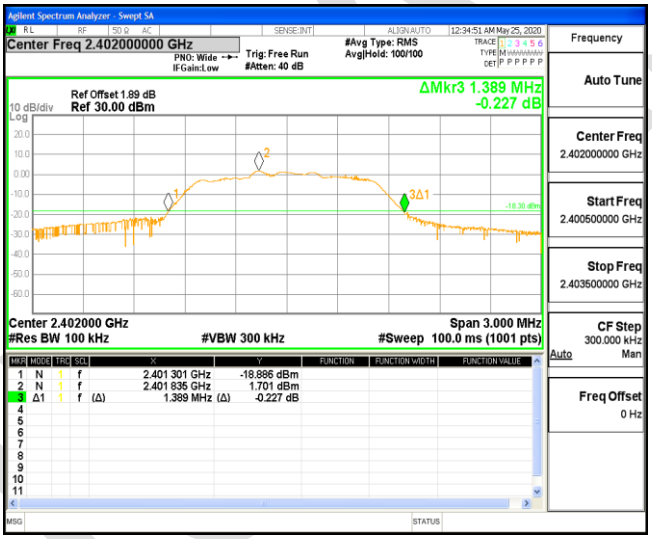


DH1_Ant1_2441



DH1_Ant1_2480

2DH1_Ant1_2402



2DH1_Ant1_2441

2DH1_Ant1_2480

3DH1_Ant1_2402

3DH1_Ant1_2441

3DH1_Ant1_2480

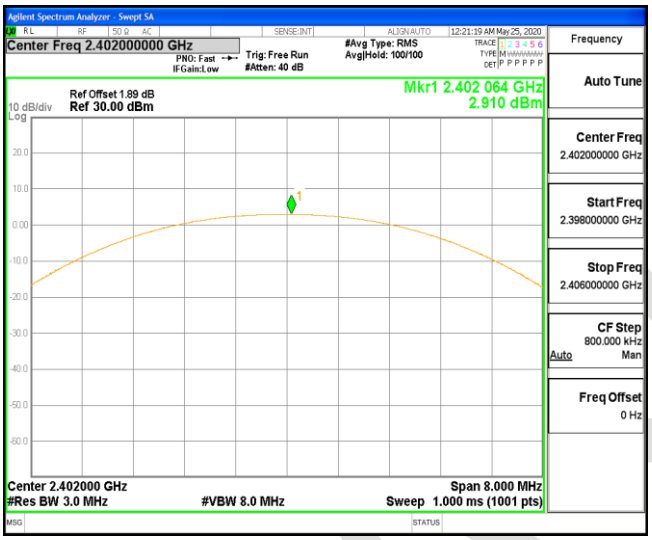
12.2 APPENDIX: MAXIMUM CONDUCTED OUTPUT POWER

Test Result

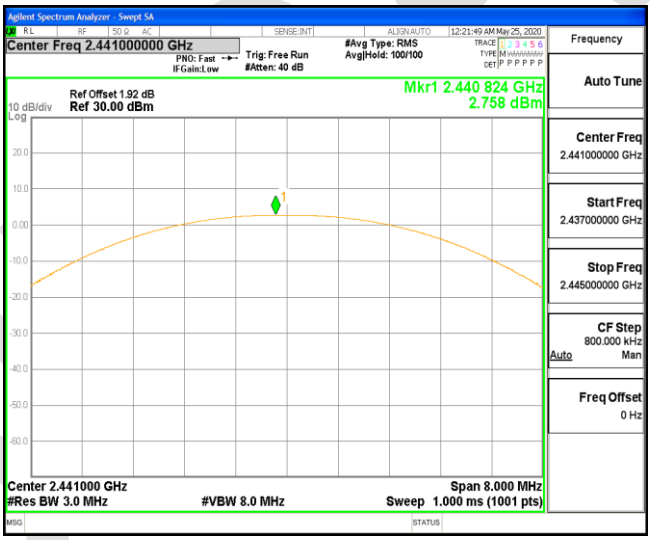
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH1	Ant1	2402	2.91	<=30	PASS
		2441	2.76	<=30	PASS
		2480	2.95	<=30	PASS
2DH1	Ant1	2402	4.21	<=30	PASS
		2441	3.97	<=30	PASS
		2480	4.18	<=30	PASS
3DH1	Ant1	2402	4.73	<=30	PASS
		2441	4.53	<=30	PASS
		2480	4.72	<=30	PASS

Test Graphs

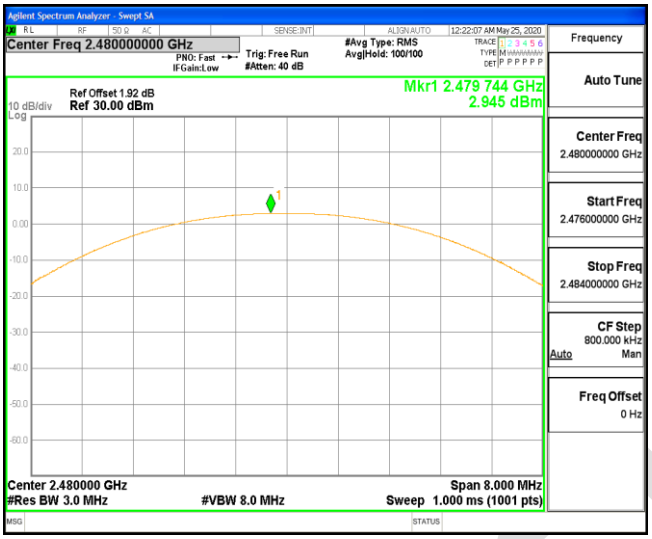
DH1_Ant1_2402



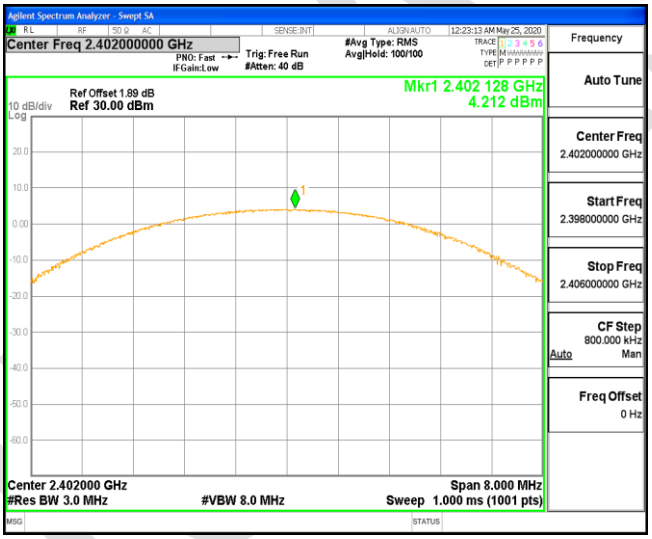
DH1_Ant1_2441



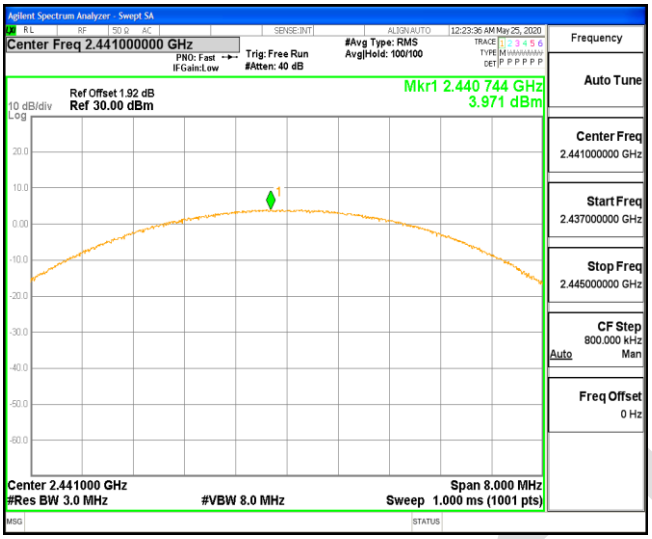
DH1_Ant1_2480



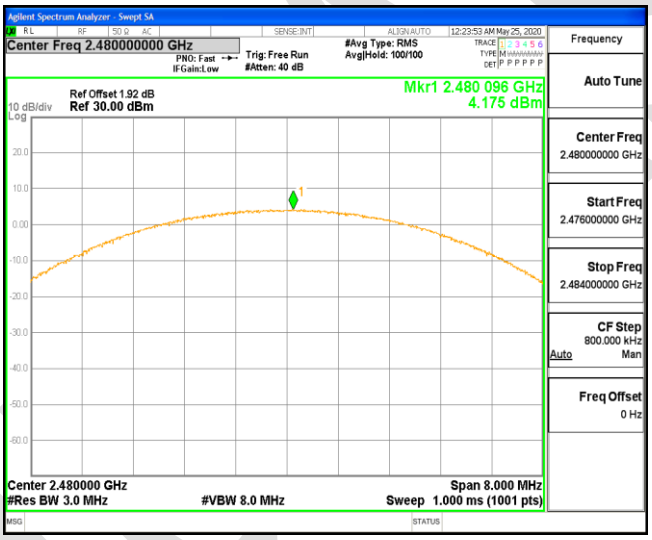
2DH1_Ant1_2402

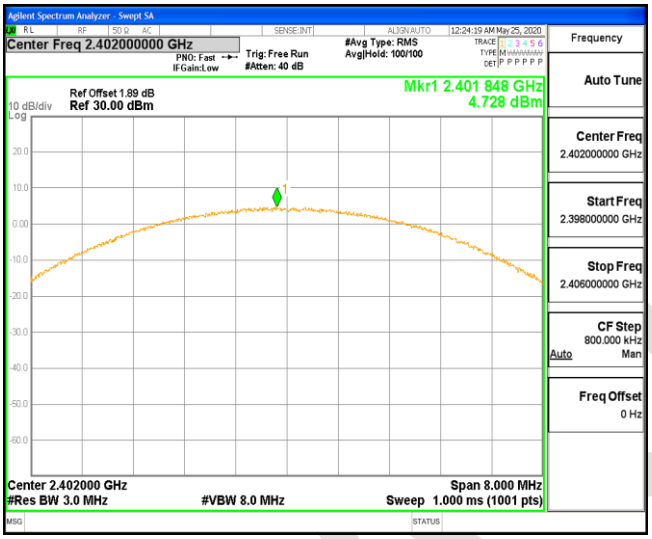
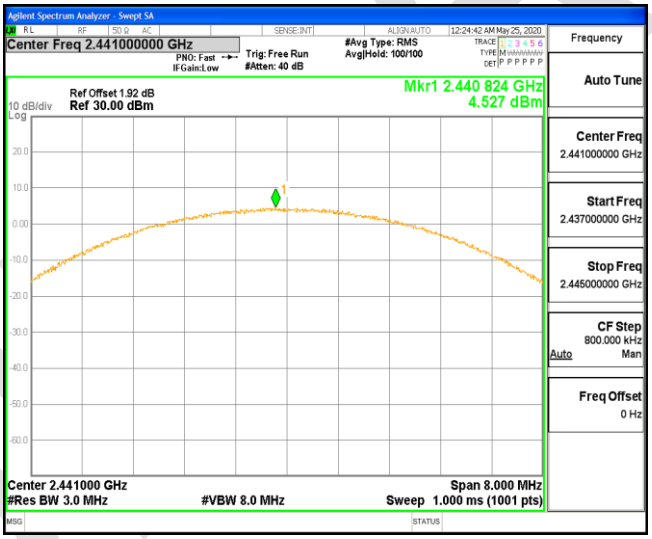


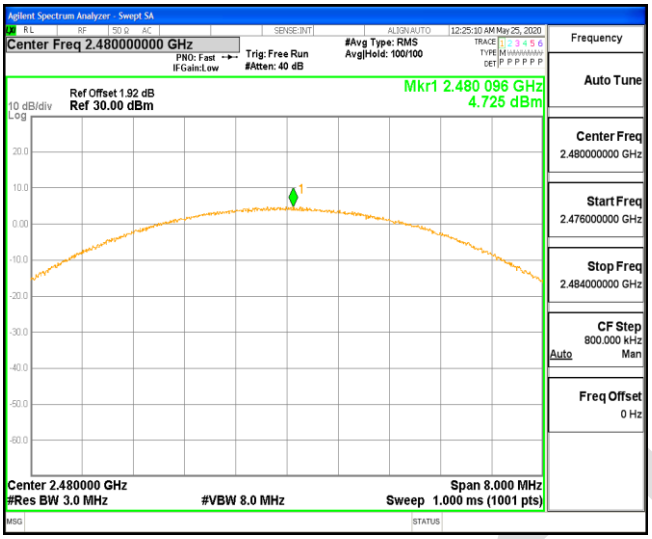
2DH1_Ant1_2441



2DH1_Ant1_2480



3DH1_Ant1_2402

3DH1_Ant1_2441

3DH1_Ant1_2480



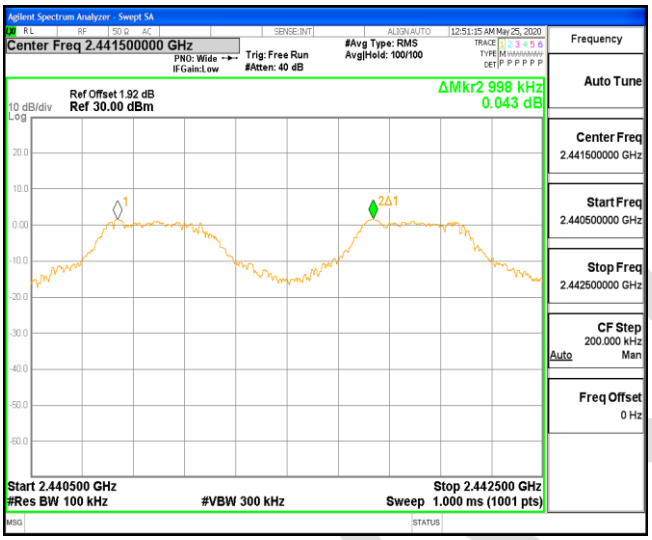
12.3 APPENDIX: CARRIER FREQUENCY SEPARATION

Test Result

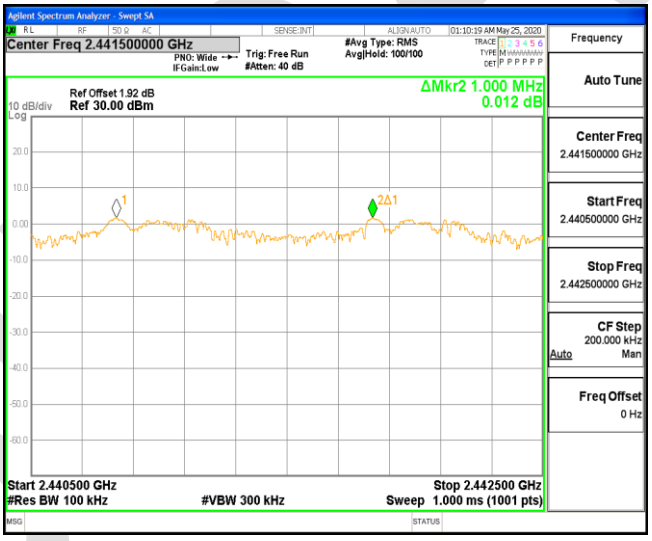
TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop	0.998	>=0.746	PASS
2DH1	Ant1	Hop	1.000	>=0.926	PASS
3DH1	Ant1	Hop	0.996	>=0.924	PASS

Test Graphs

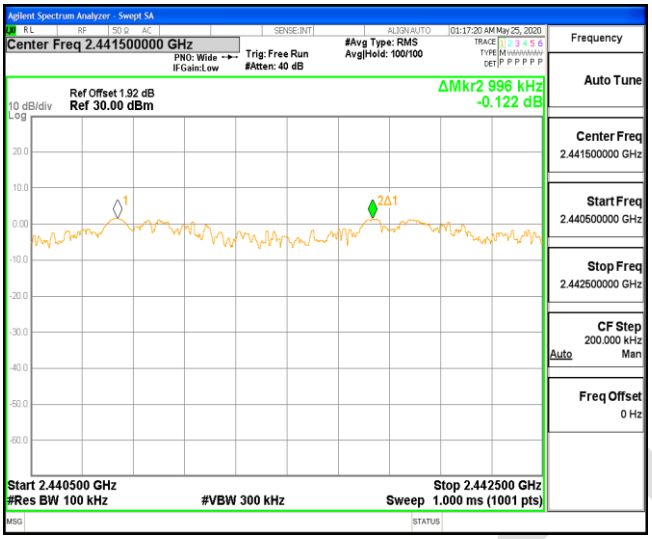
DH1_Ant1_Hop



2DH1_Ant1_Hop



3DH1_Ant1_Hop



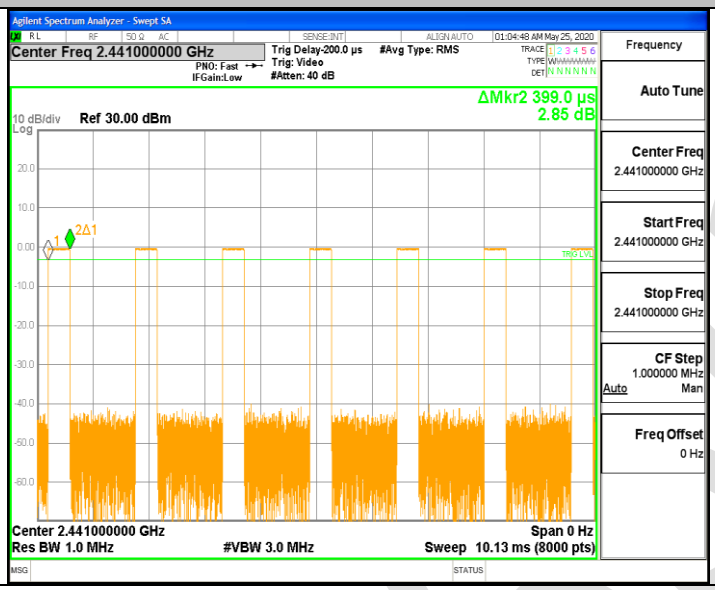
12.4 APPENDIX: TIME OF OCCUPANCY

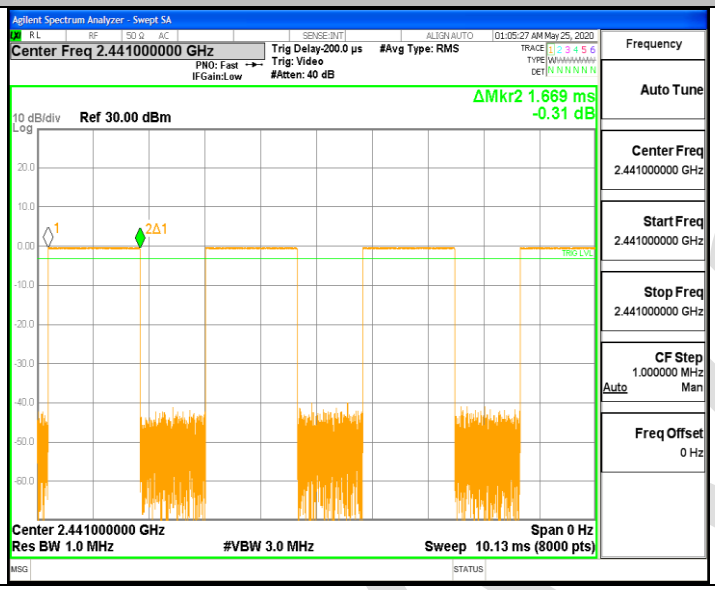
Test Result

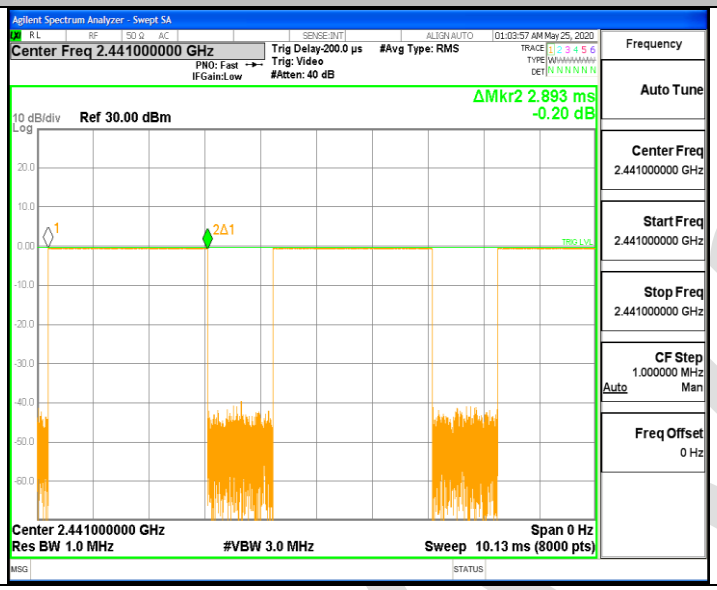
TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.40	320	0.128	<=0.4	PASS
DH3	Ant1	Hop	1.67	160	0.267	<=0.4	PASS
DH5	Ant1	Hop	2.89	106.67	0.308	<=0.4	PASS

NOTE:
DwellTime(DH1)= Pluse width*(1600/2/79)*31.6
DwellTime(DH3)= Pluse width*(1600/4/79)*31.6
DwellTime(DH5)= Pluse width*(1600/6/79)*31.6

Test Graphs

DH1_Ant1_Hop


DH3_Ant1_Hop


DH5_Ant1_Hop


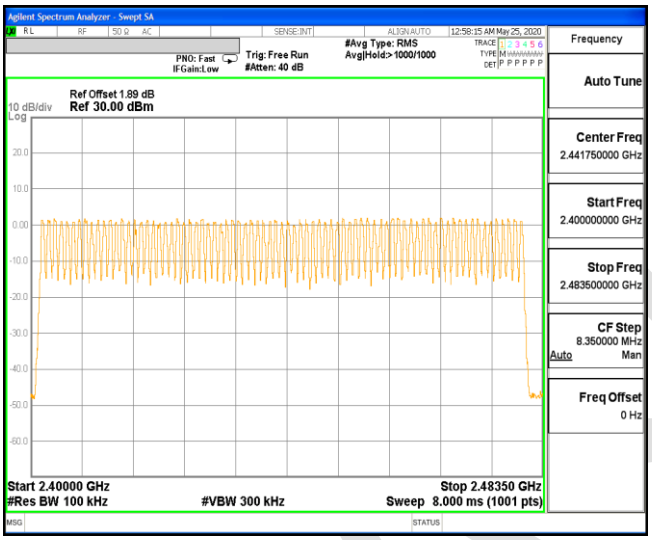
12.5 APPENDIX: NUMBER OF HOPPING CHANNELS

Test Result

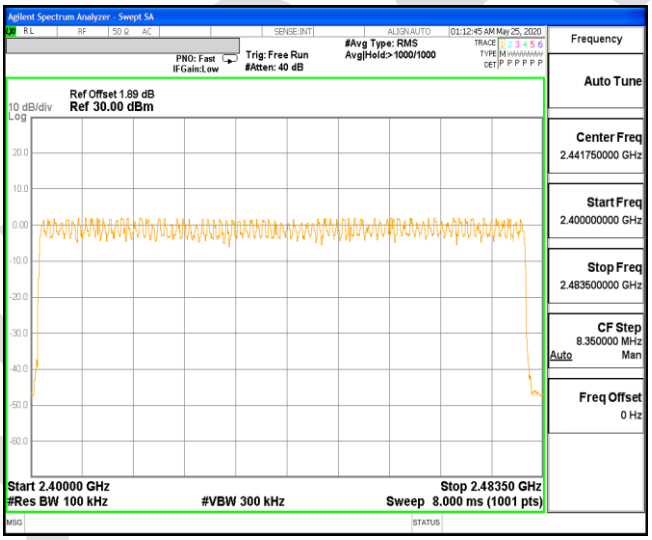
TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH1	Ant1	Hop	79	>=15	PASS
2DH1	Ant1	Hop	79	>=15	PASS
3DH1	Ant1	Hop	79	>=15	PASS

Test Graphs

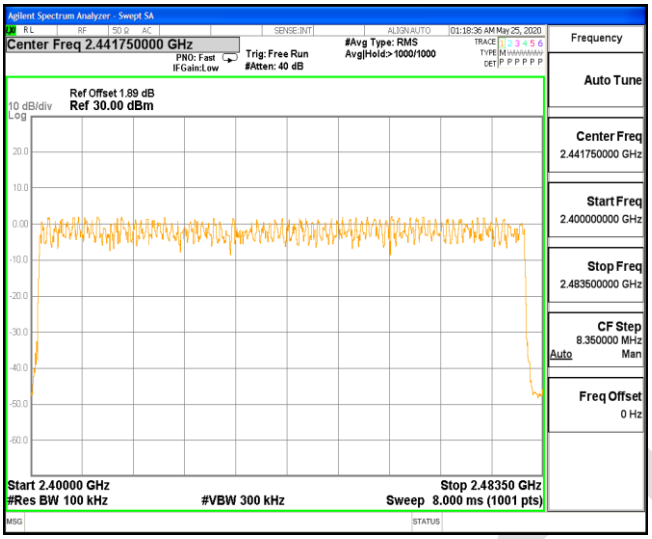
DH1_Ant1_Hop



2DH1_Ant1_Hop



3DH1_Ant1_Hop



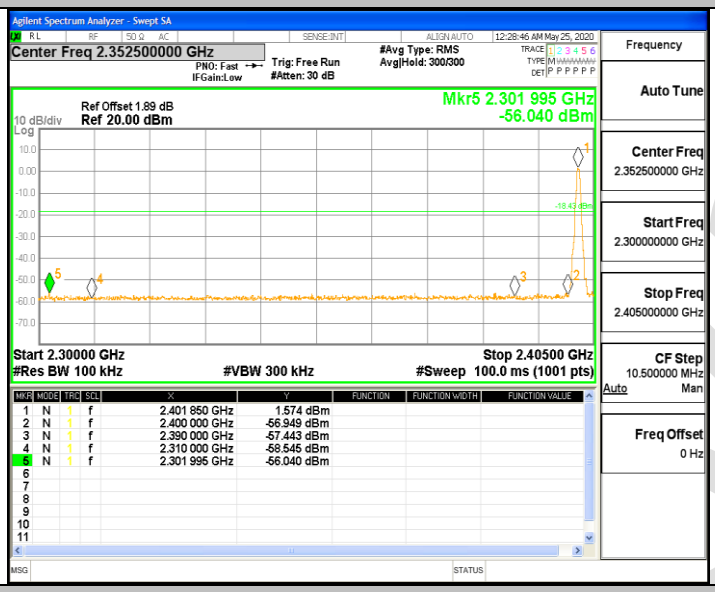
12.6 APPENDIX:BAND EDGE MEASUREMENTS

Test Result

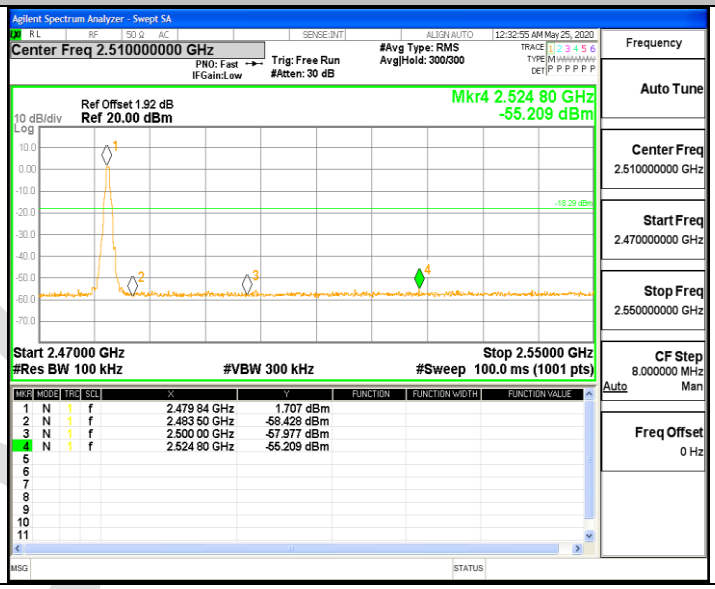
TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	Low	2402	1.57	-56.04	<=-18.43	PASS
		High	2480	1.71	-55.21	<=-18.29	PASS
		Low	Hop_2402	1.17	-42.48	-18.83	PASS
		High	Hop_2480	1.25	-55.7	-18.76	PASS
2DH1	Ant1	Low	2402	1.45	-46.64	<=-18.55	PASS
		High	2480	1.74	-53.86	<=-18.26	PASS
		Low	Hop_2402	0.38	-55.58	-19.62	PASS
		High	Hop_2480	1.76	-55.03	-18.24	PASS
3DH1	Ant1	Low	2402	1.62	-54.88	<=-18.38	PASS
		High	2480	1.74	-53.31	<=-18.26	PASS
		Low	Hop_2402	-2.00	-55.34	-22	PASS
		High	Hop_2480	1.08	-55.06	-18.92	PASS

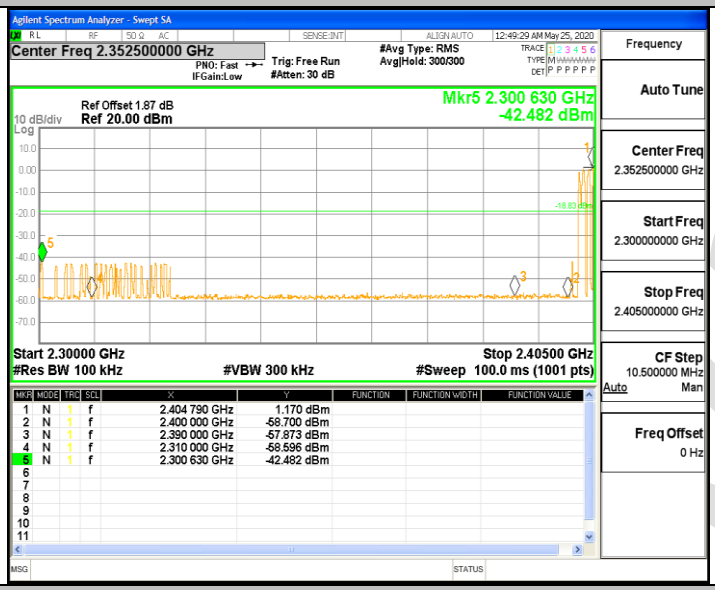
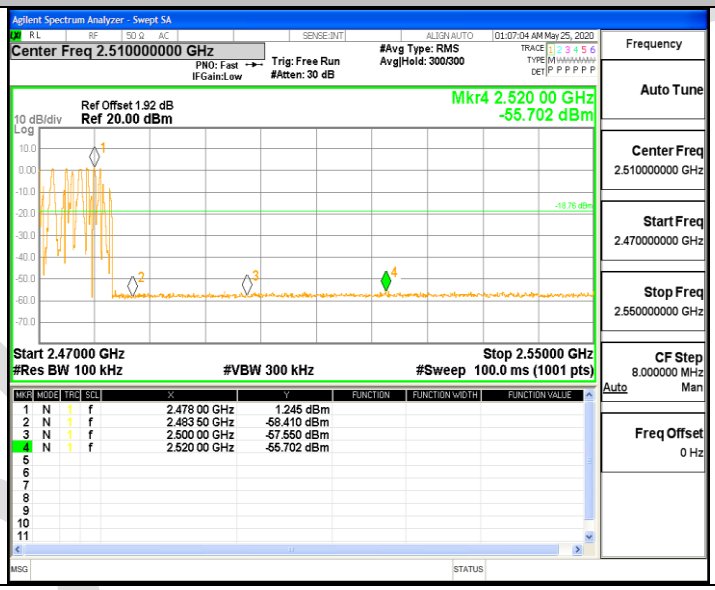
Test Graphs

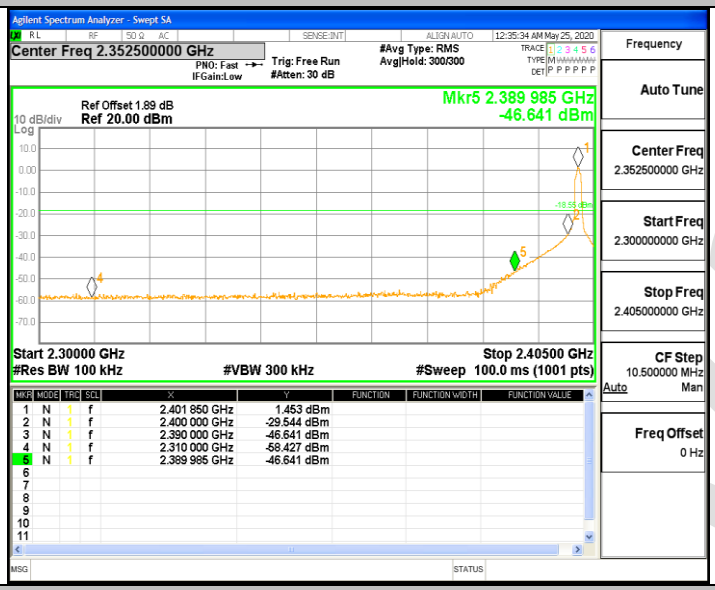
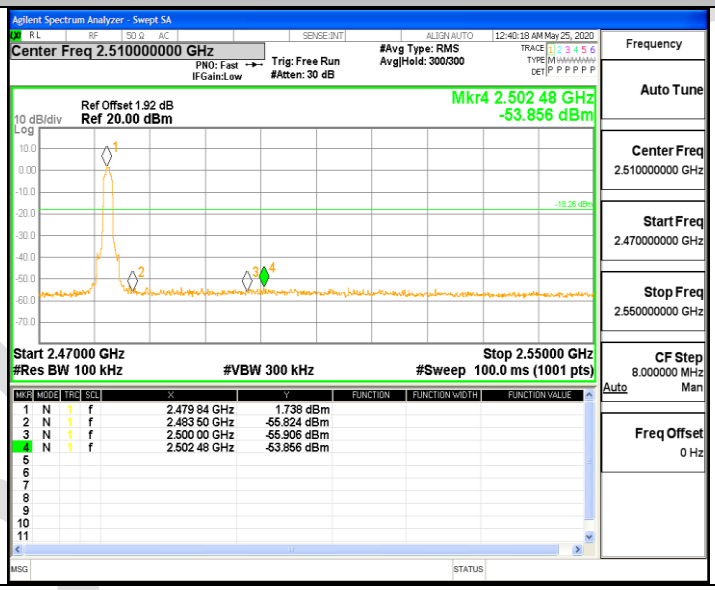
DH1_Ant1_Low_2402

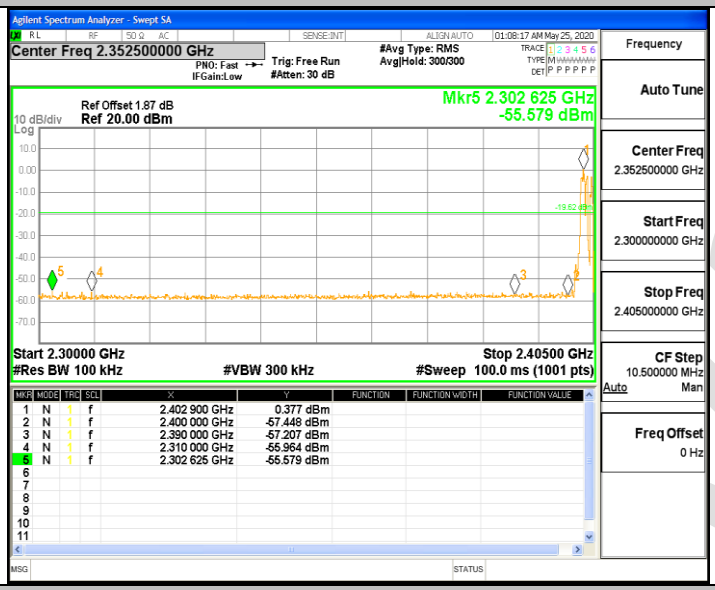


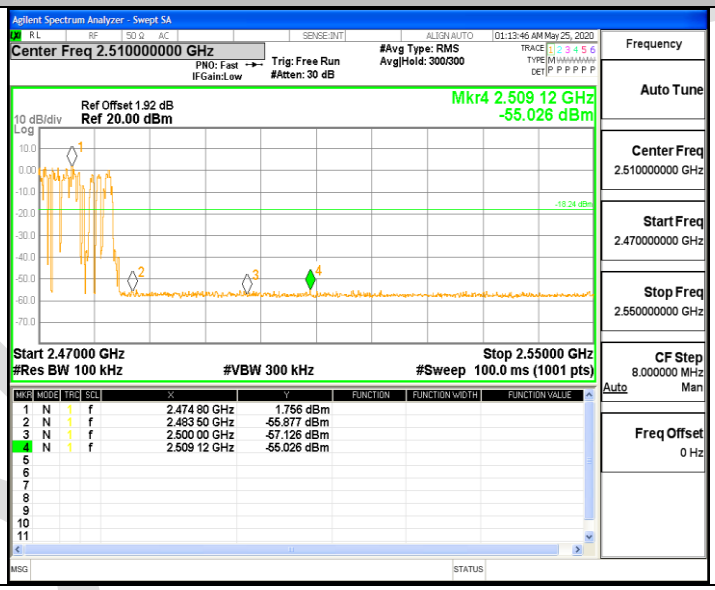
DH1_Ant1_High_2480

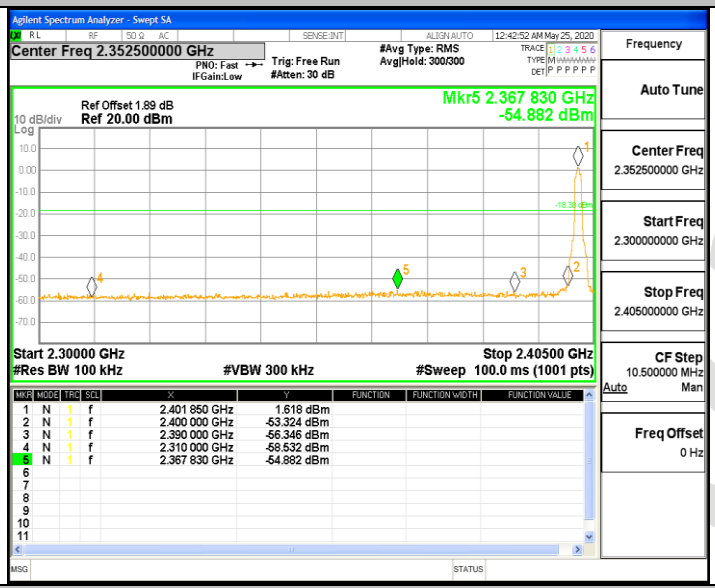
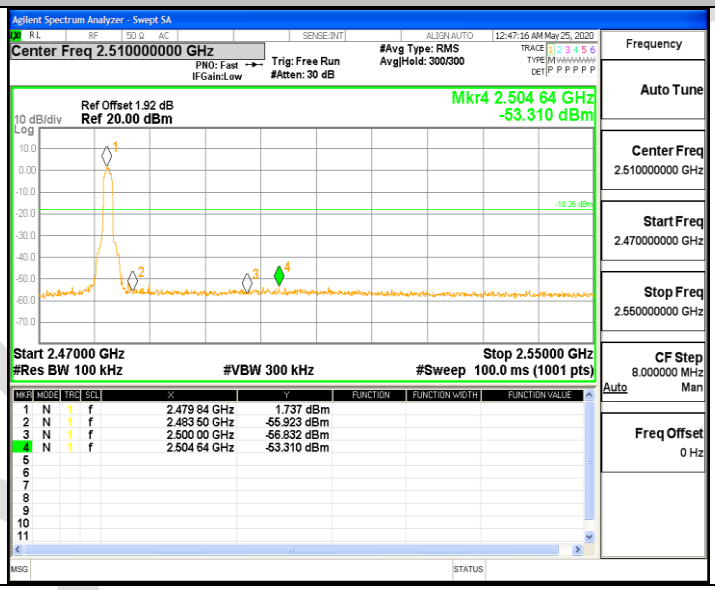


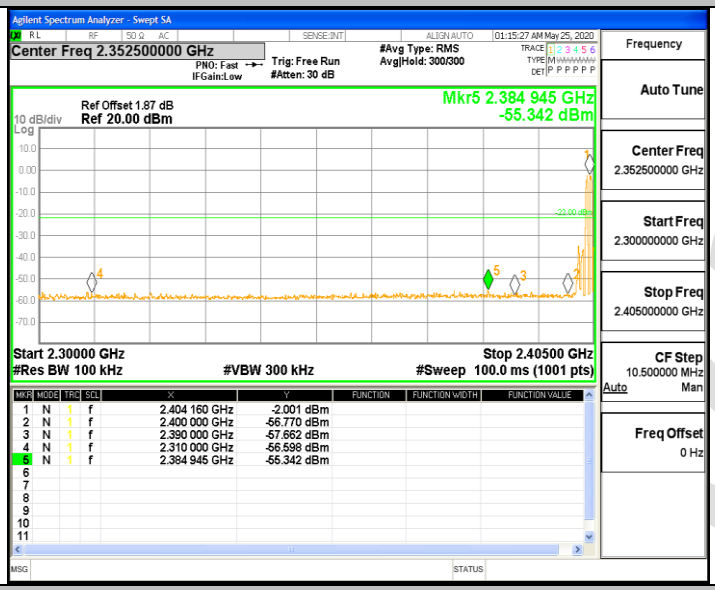
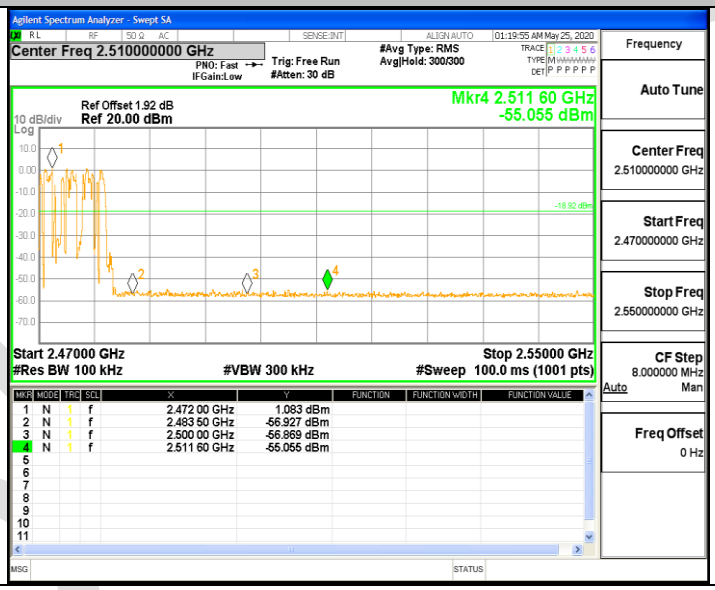
DH1_Ant1_Low_Hop_2402

DH1_Ant1_High_Hop_2480


2DH1_Ant1_Low_2402

2DH1_Ant1_High_2480


2DH1_Ant1_Low_Hop_2402


2DH1_Ant1_High_Hop_2480


3DH1_Ant1_Low_2402

3DH1_Ant1_High_2480


3DH1_Ant1_Low_Hop_2402

3DH1_Ant1_High_Hop_2480


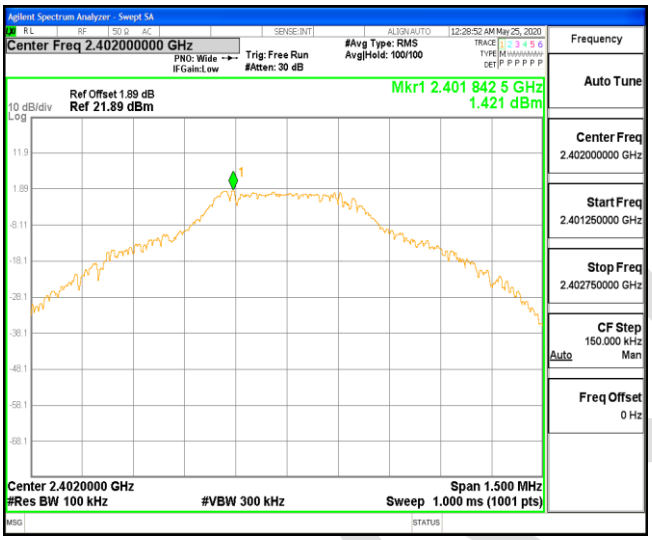
12.7 APPENDIXH:CONDUCTED SPURIOUSEMISSION

Test Result

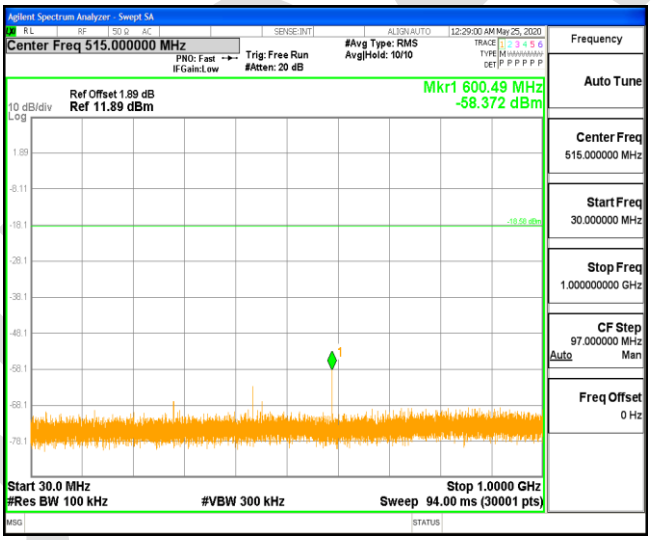
TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH1	Ant1	2402	Reference	1.42	1.42	---	PASS
			30~1000	30~1000	-58.372	<=-18.579	PASS
			1000~26500	1000~26500	-41.123	<=-18.579	PASS
		2441	Reference	1.38	1.38	---	PASS
			30~1000	30~1000	-58.05	<=-18.618	PASS
			1000~26500	1000~26500	-42.14	<=-18.618	PASS
		2480	Reference	1.66	1.66	---	PASS
			30~1000	30~1000	-57.481	<=-18.338	PASS
			1000~26500	1000~26500	-42.896	<=-18.338	PASS
2DH1	Ant1	2402	Reference	1.63	1.63	---	PASS
			30~1000	30~1000	-63.299	<=-18.366	PASS
			1000~26500	1000~26500	-42.882	<=-18.366	PASS
		2441	Reference	1.48	1.48	---	PASS
			30~1000	30~1000	-62.523	<=-18.524	PASS
			1000~26500	1000~26500	-44.761	<=-18.524	PASS
		2480	Reference	1.70	1.70	---	PASS
			30~1000	30~1000	-61.489	<=-18.303	PASS
			1000~26500	1000~26500	-47.376	<=-18.303	PASS
3DH1	Ant1	2402	Reference	1.58	1.58	---	PASS
			30~1000	30~1000	-63.922	<=-18.424	PASS
			1000~26500	1000~26500	-45.005	<=-18.424	PASS
		2441	Reference	1.29	1.29	---	PASS
			30~1000	30~1000	-62.715	<=-18.706	PASS
			1000~26500	1000~26500	-29.047	<=-18.706	PASS
		2480	Reference	1.72	1.72	---	PASS
			30~1000	30~1000	-67.37	<=-18.278	PASS
			1000~26500	1000~26500	-42.148	<=-18.278	PASS

Test Graphs

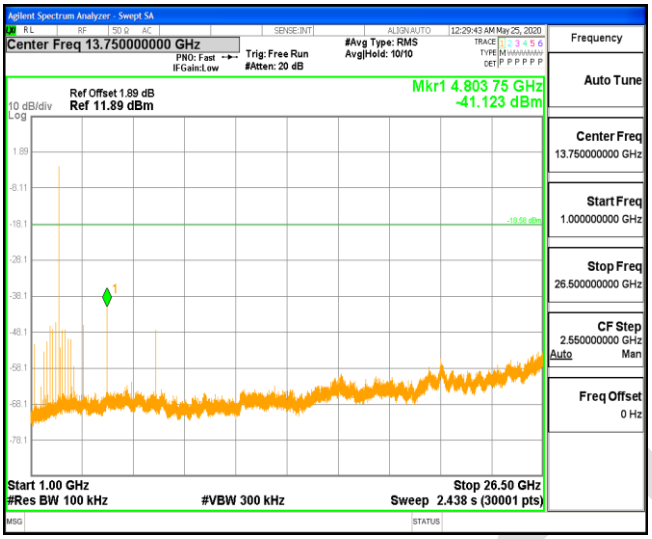
DH1_Ant1_2402_0~Reference



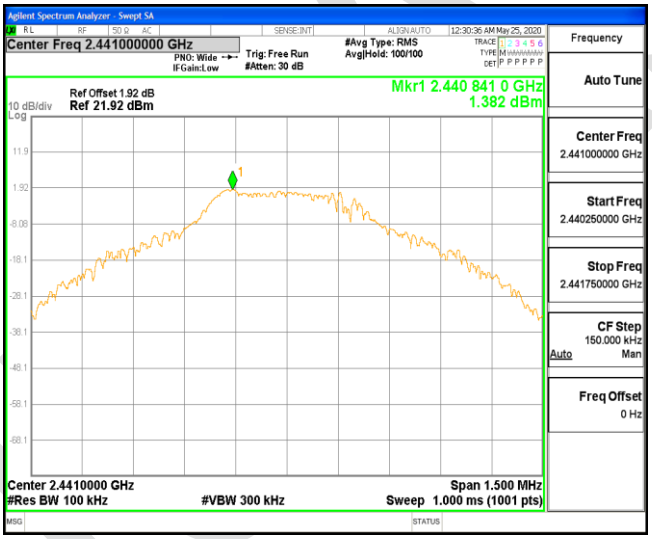
DH1_Ant1_2402_30~1000



DH1_Ant1_2402_1000~26500



DH1_Ant1_2441_0~Reference



DH1_Ant1_2441_30~1000