

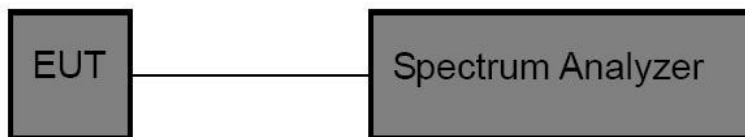


9 20DB Occupy Bandwidth Test

9.1 Test Standard

Test Standard	FCC Part15 C Section 15.247 (a)(1)
---------------	------------------------------------

9.2 Test Setup



9.3 Test Procedure

Using the following spectrum analyzer settings:

1. Span= approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel.
2. Set the RBW = 30 kHz.
3. Set the VBW = 100 kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

9.4 Test Data

Test Item	:	20dB BW	Test Mode	:	CH Low ~ CH High
Test Voltage	:	3.7V	Temperature	:	24.5°C
Test Result	:	PASS	Humidity	:	55%RH



L:

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.966	2401.514	2402.480	---	---
DH5	Ant1	2441	0.960	2440.514	2441.474	---	---
DH5	Ant1	2480	0.951	2479.514	2480.465	---	---
2DH5	Ant1	2402	1.359	2401.301	2402.660	---	---
2DH5	Ant1	2441	1.278	2440.358	2441.636	---	---
2DH5	Ant1	2480	1.281	2479.349	2480.630	---	---
3DH5	Ant1	2402	1.296	2401.334	2402.630	---	---
3DH5	Ant1	2441	1.284	2440.334	2441.618	---	---
3DH5	Ant1	2480	1.314	2479.325	2480.639	---	---

R:

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.942	2401.517	2402.459	---	---
DH5	Ant1	2441	0.954	2440.511	2441.465	---	---
DH5	Ant1	2480	0.957	2479.514	2480.471	---	---
2DH5	Ant1	2402	1.284	2401.349	2402.633	---	---
2DH5	Ant1	2441	1.284	2440.352	2441.636	---	---
2DH5	Ant1	2480	1.326	2479.316	2480.642	---	---
3DH5	Ant1	2402	1.287	2401.334	2402.621	---	---
3DH5	Ant1	2441	1.272	2440.337	2441.609	---	---
3DH5	Ant1	2480	1.299	2479.331	2480.630	---	---

Test Graphs:

L:





2DH5-Ant1-2402



2DH5-Ant1-2441



2DH5-Ant1-2480



3DH5-Ant1-2402



3DH5-Ant1-2441



3DH5-Ant1-2480



R:

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



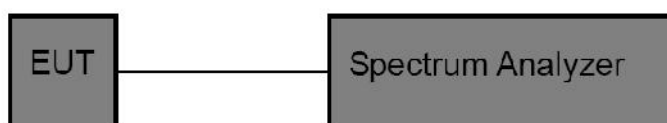


10 Carrier Frequency Separation Test

10.1 Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	>25KHz or >two-thirds of the 20 dB bandwidth

10.2 Test Setup



10.3 Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer settings:

1. Span= Wide enough to capture the peaks of two adjacent channels
2. Set the RBW = 300 kHz.
3. Set the VBW = 300 kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

10.4 Test Data

Test Item	:	Frequency Separation	Test Mode	:	CH Low ~ CH High
Test Voltage	:	3.7V	Temperature	:	24.5°C
Test Result	:	PASS	Humidity	:	55%RH



L:

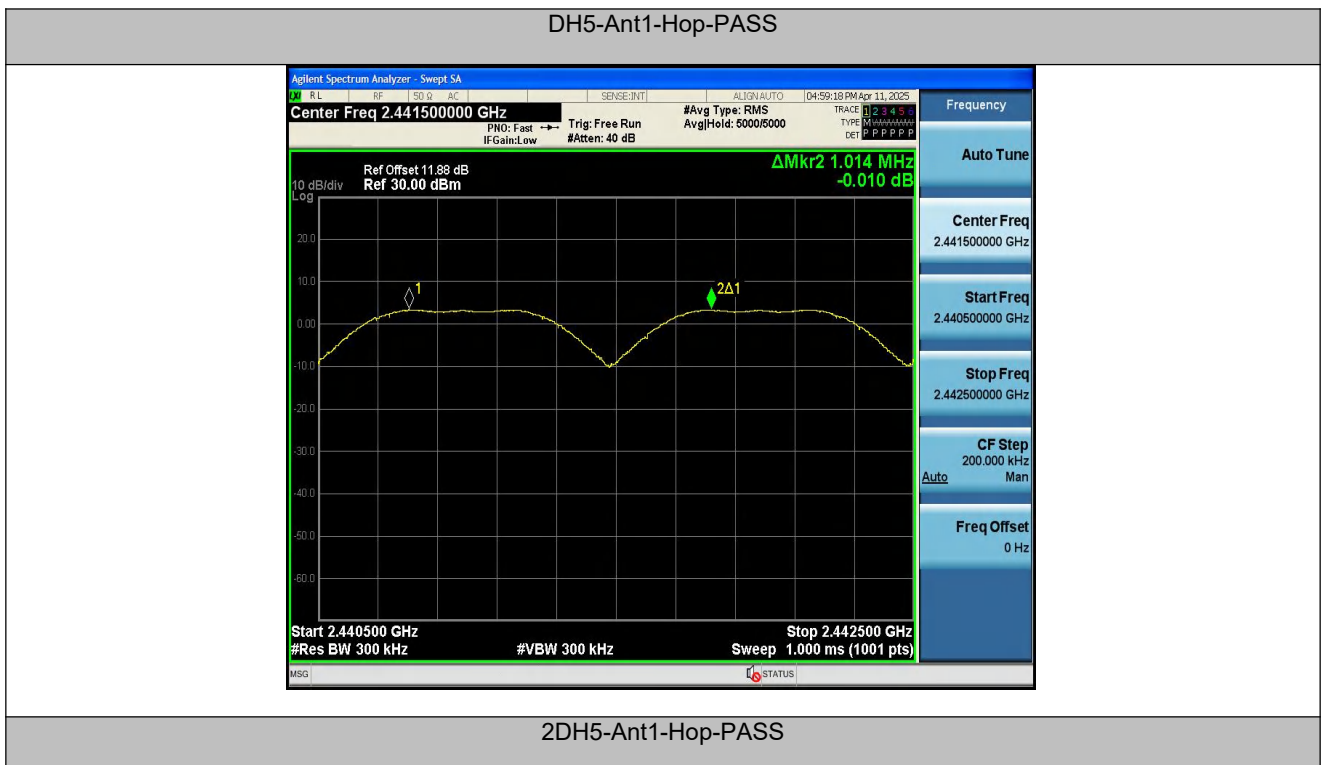
TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.014	≥ 0.644	PASS
2DH5	Ant1	Hop	0.992	≥ 0.906	PASS
3DH5	Ant1	Hop	1.334	≥ 0.876	PASS

R:

TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.994	≥ 0.638	PASS
2DH5	Ant1	Hop	1.004	≥ 0.884	PASS
3DH5	Ant1	Hop	1.332	≥ 0.886	PASS

Test Graphs:

L:





3DH5-Ant1-Hop-PASS





R:

DH5-Ant1-Hop-PASS



2DH5-Ant1-Hop-PASS



3DH5-Ant1-Hop-PASS



Report No.: PTC25032714605E-FC01



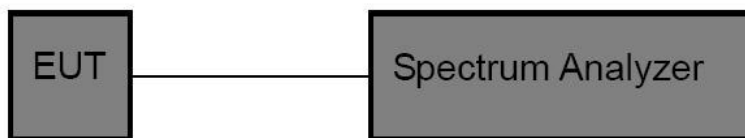


11 Number of Hopping Channel Test

11.1 Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	>15 channels

11.2 Test Setup



11.3 Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer setting:

1. Span= the frequency band of operation
2. Set the RBW = 300kHz.
3. Set the VBW = 300kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.



11.4 Test Data

Test Item	: Number of Hopping Frequency	Test Mode	: CH Low ~ CH High
Test Voltage	: 3.7V	Temperature	: 24.5°C
Test Result	: PASS	Humidity	: 55%RH

L:

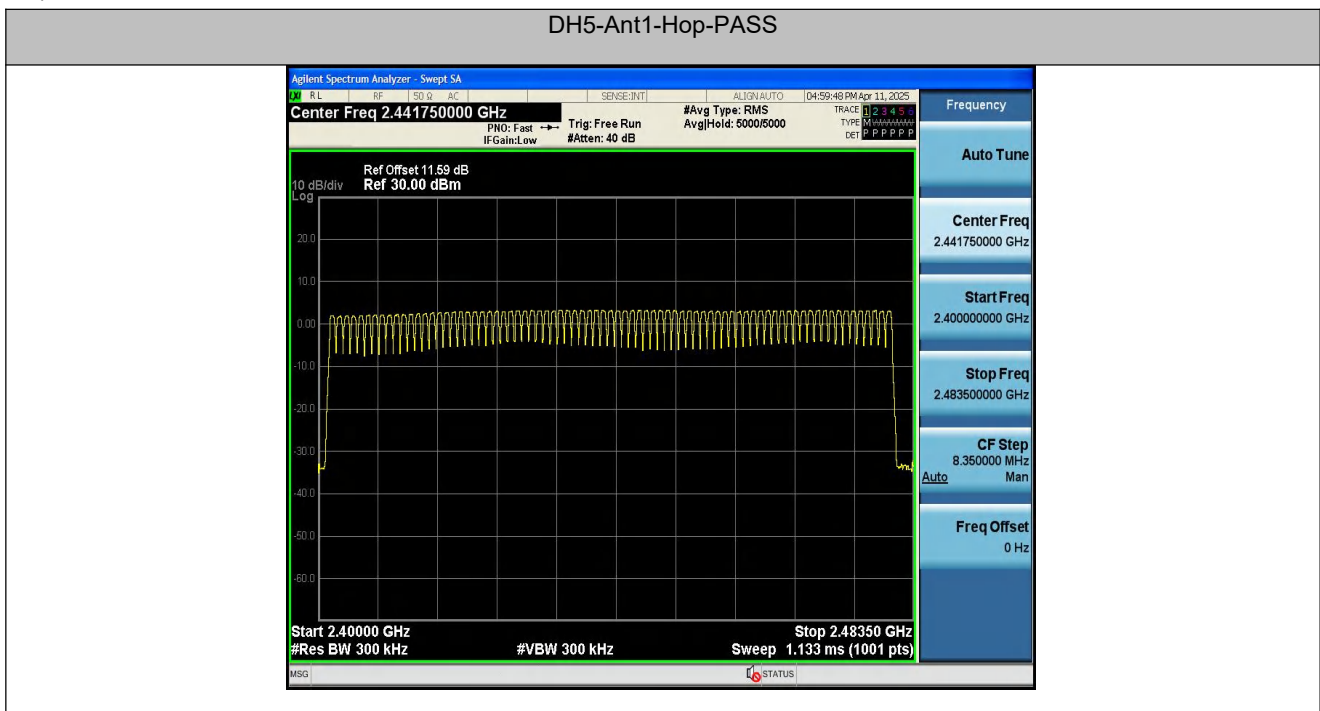
TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

R:

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

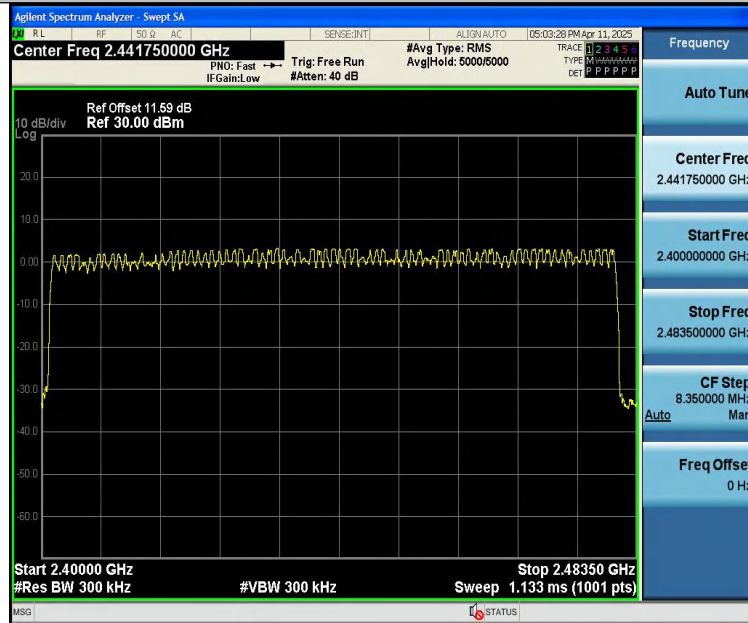
Test Graphs:

L:

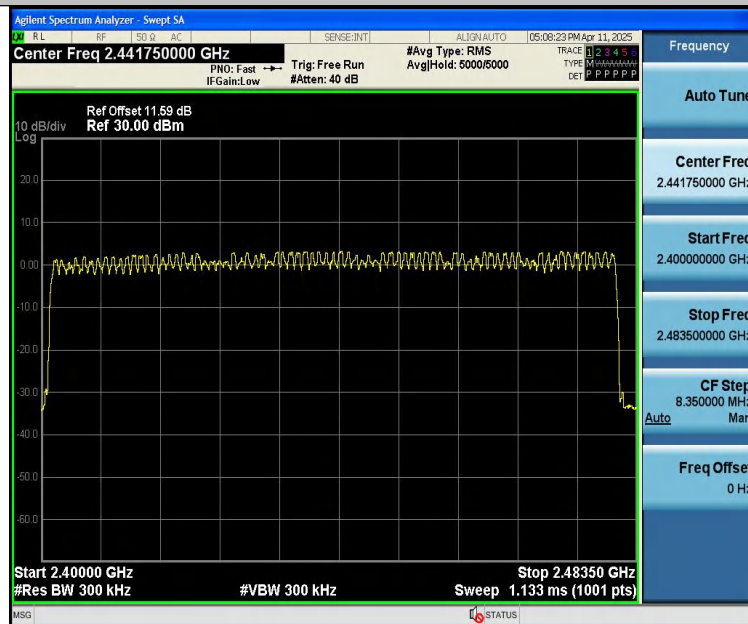




2DH5-Ant1-Hop-PASS



3DH5-Ant1-Hop-PASS

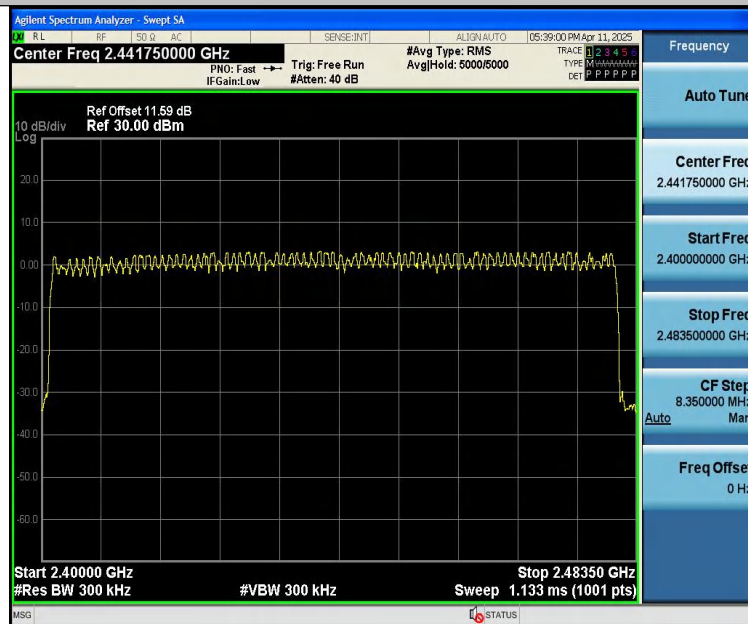


R:

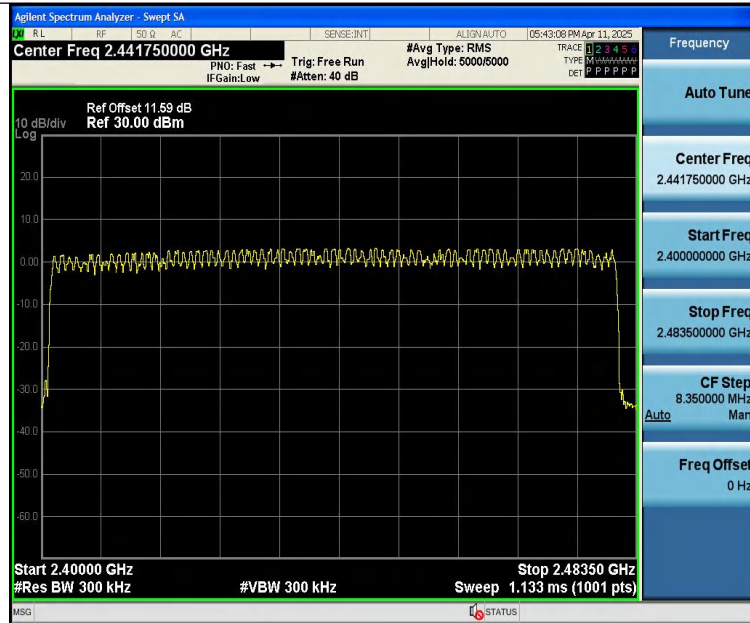
DH5-Ant1-Hop-PASS



2DH5-Ant1-Hop-PASS



3DH5-Ant1-Hop-PASS



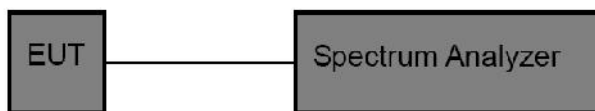


12 Dwell Time Test

12.1 Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	0.4 sec

12.2 Test Setup



12.3 Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span= zero span, centered on a hopping channel
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Sweep time = as necessary to capture the entire dwell time per hopping channel.
5. Detector function = peak.
6. Trace mode = clear write.
7. Allow trace to fully stabilize.



12.4 Test Data

Test Item : Time of Occupancy
Test Voltage : 3.7V
Test Result : PASS

Test Mode : CH Low ~ CH High
Temperature : 24.5°C
Humidity : 55%RH

L:

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.908	106.67	0.31	≤0.4	PASS
2DH5	Ant1	Hop	2.913	106.67	0.311	≤0.4	PASS
3DH5	Ant1	Hop	2.917	106.67	0.311	≤0.4	PASS
DH1	Ant1	Hop	0.403	320	0.129	≤0.4	PASS
2DH1	Ant1	Hop	0.413	320	0.132	≤0.4	PASS
3DH1	Ant1	Hop	0.414	320	0.132	≤0.4	PASS
DH3	Ant1	Hop	1.661	160	0.266	≤0.4	PASS
2DH3	Ant1	Hop	1.666	160	0.267	≤0.4	PASS
3DH3	Ant1	Hop	1.666	160	0.267	≤0.4	PASS

R:

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.908	106.67	0.31	≤0.4	PASS
2DH5	Ant1	Hop	2.912	106.67	0.311	≤0.4	PASS
3DH5	Ant1	Hop	2.916	106.67	0.311	≤0.4	PASS
DH1	Ant1	Hop	0.404	320	0.129	≤0.4	PASS
2DH1	Ant1	Hop	0.413	320	0.132	≤0.4	PASS
3DH1	Ant1	Hop	0.414	320	0.132	≤0.4	PASS
DH3	Ant1	Hop	1.659	160	0.265	≤0.4	PASS
2DH3	Ant1	Hop	1.664	160	0.266	≤0.4	PASS
3DH3	Ant1	Hop	1.664	160	0.266	≤0.4	PASS

Note:

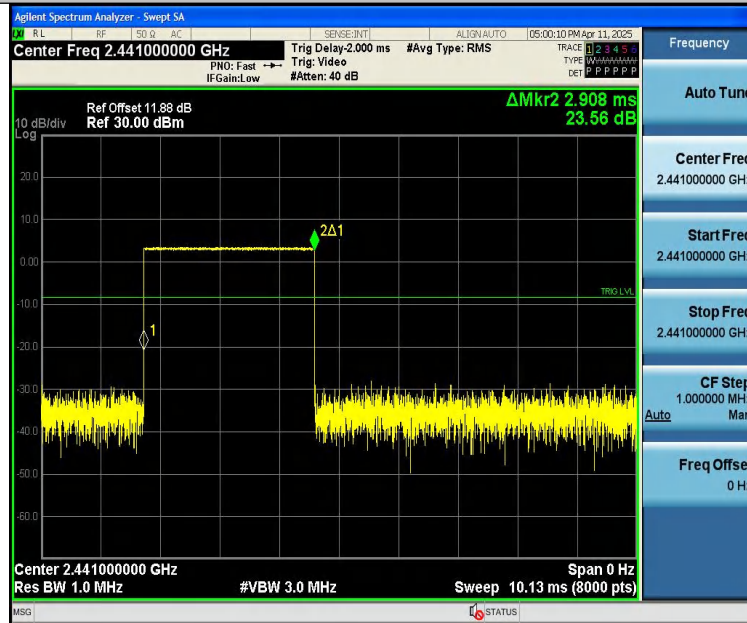
- 1.DH1/2DH1/3DH1 Dwell Time: Reading * (1600/2)*31.6/(channel number).
- 2.DH3/2DH3/3DH3 Dwell Time: Reading * (1600/4)*31.6/(channel number).
- 3.DH5/2DH5/3DH5 Dwell Time: Reading * (1600/6)*31.6/(channel number).



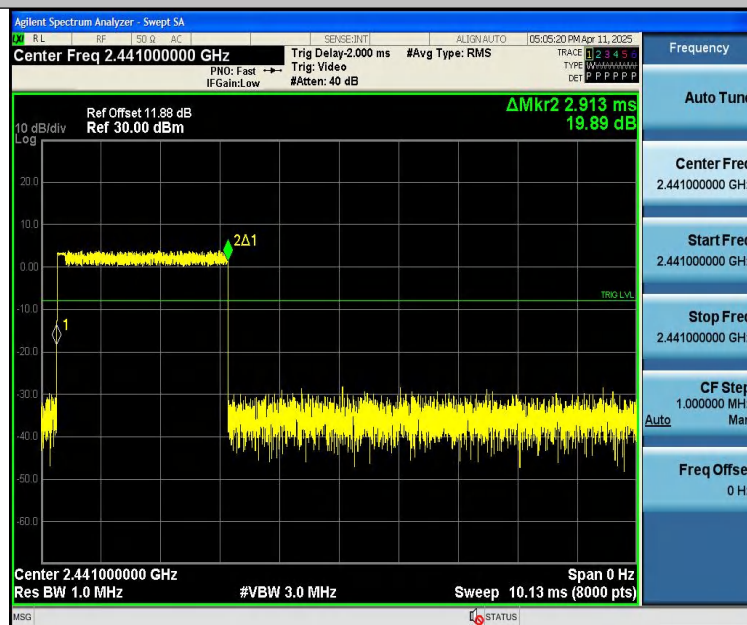
Test Graphs:

L:

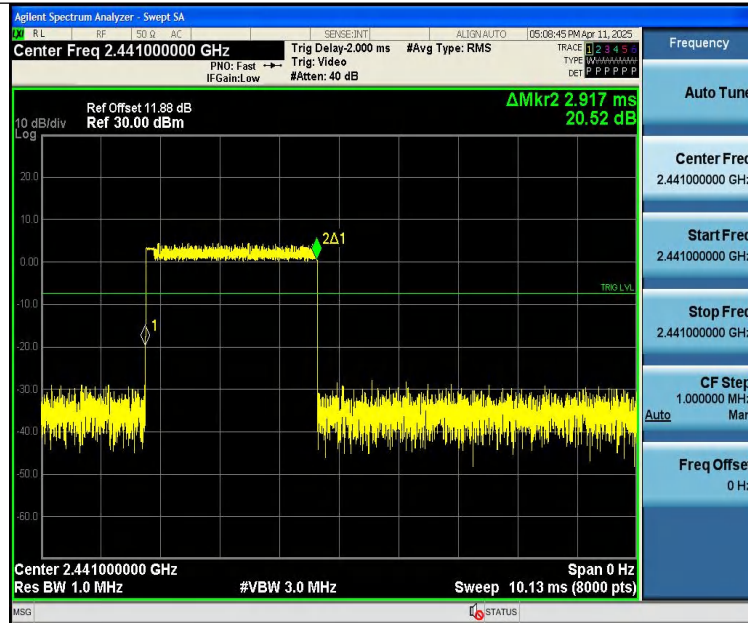
DH5-Ant1-Hop-PASS



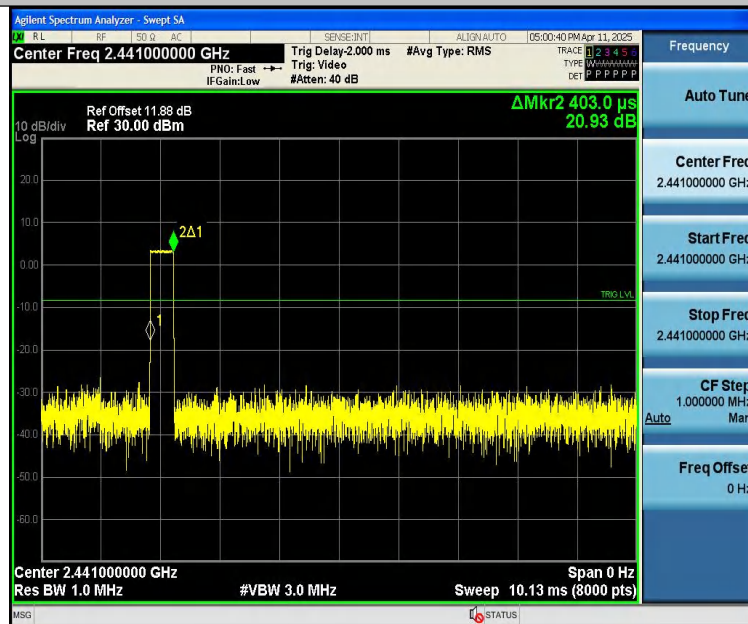
2DH5-Ant1-Hop-PASS



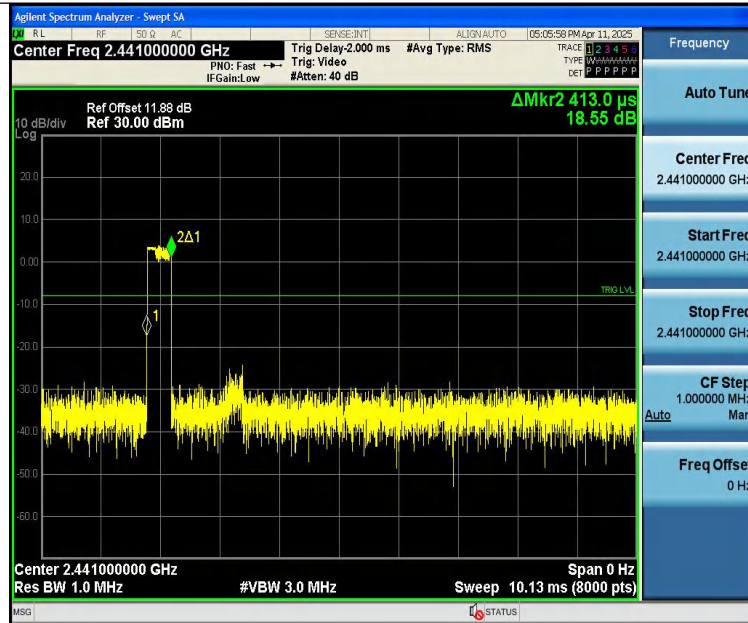
3DH5-Ant1-Hop-PASS



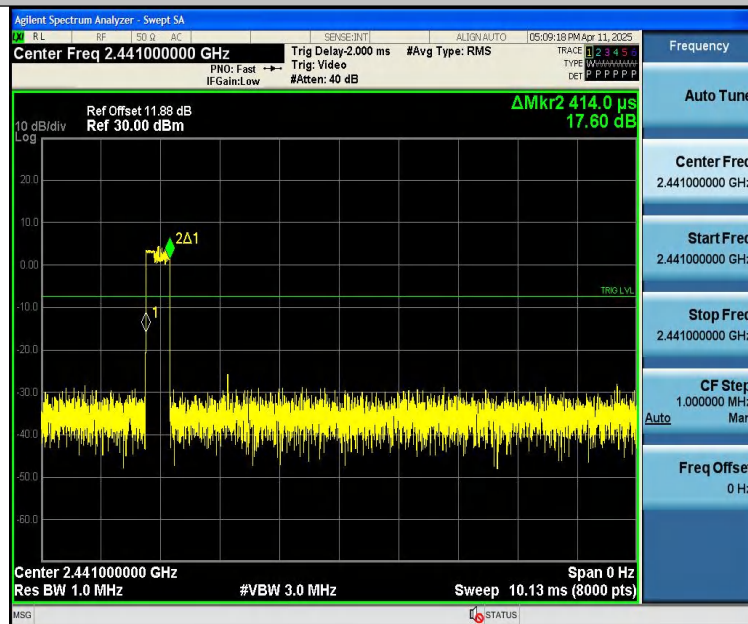
DH1-Ant1-Hop-PASS



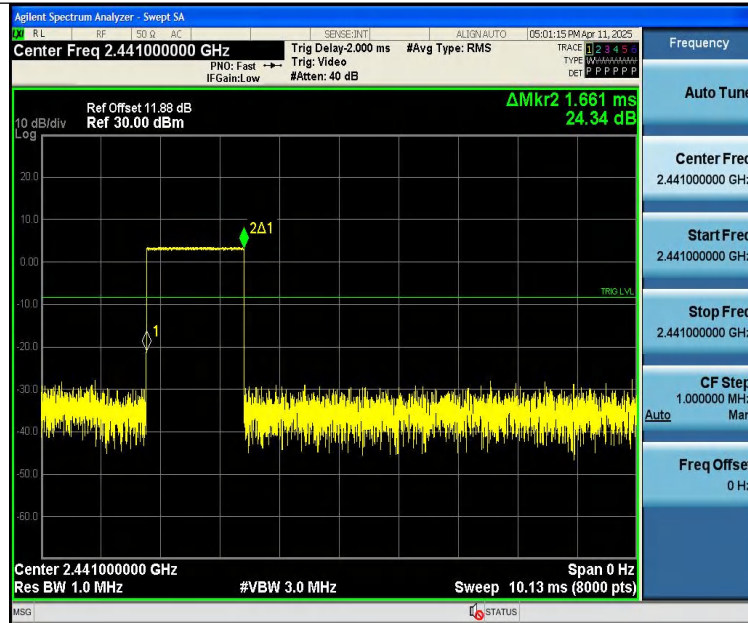
2DH1-Ant1-Hop-PASS



3DH1-Ant1-Hop-PASS



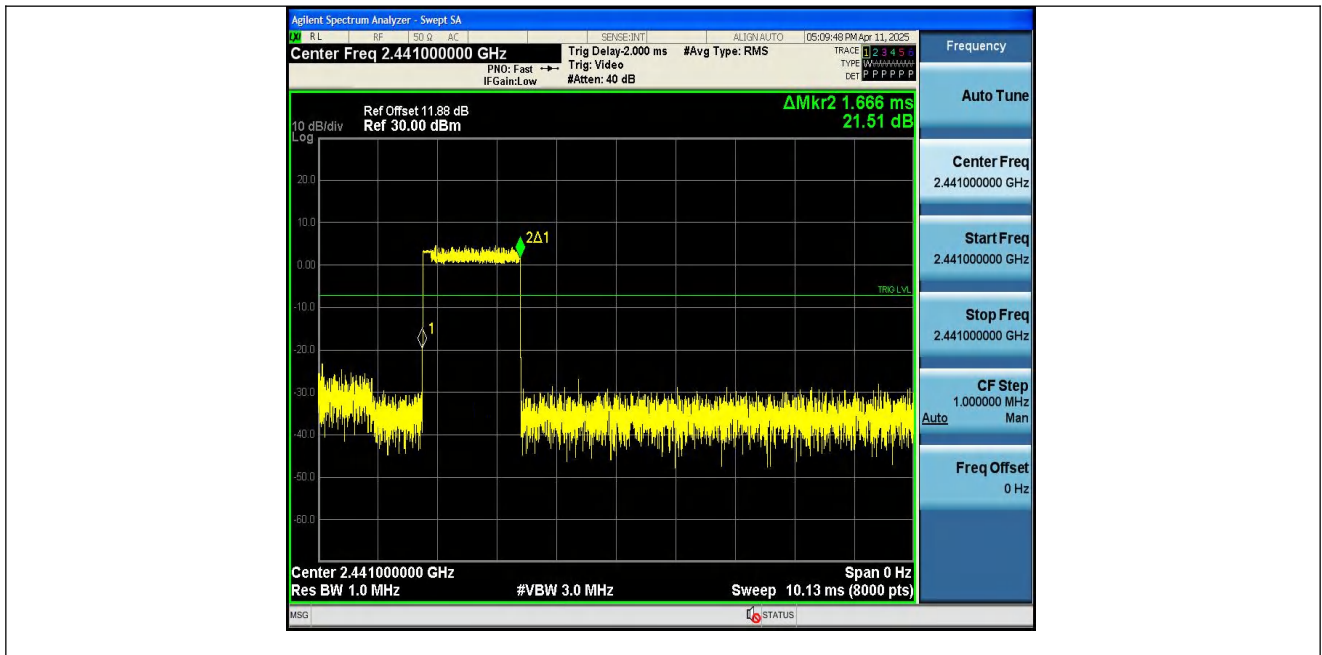
DH3-Ant1-Hop-PASS



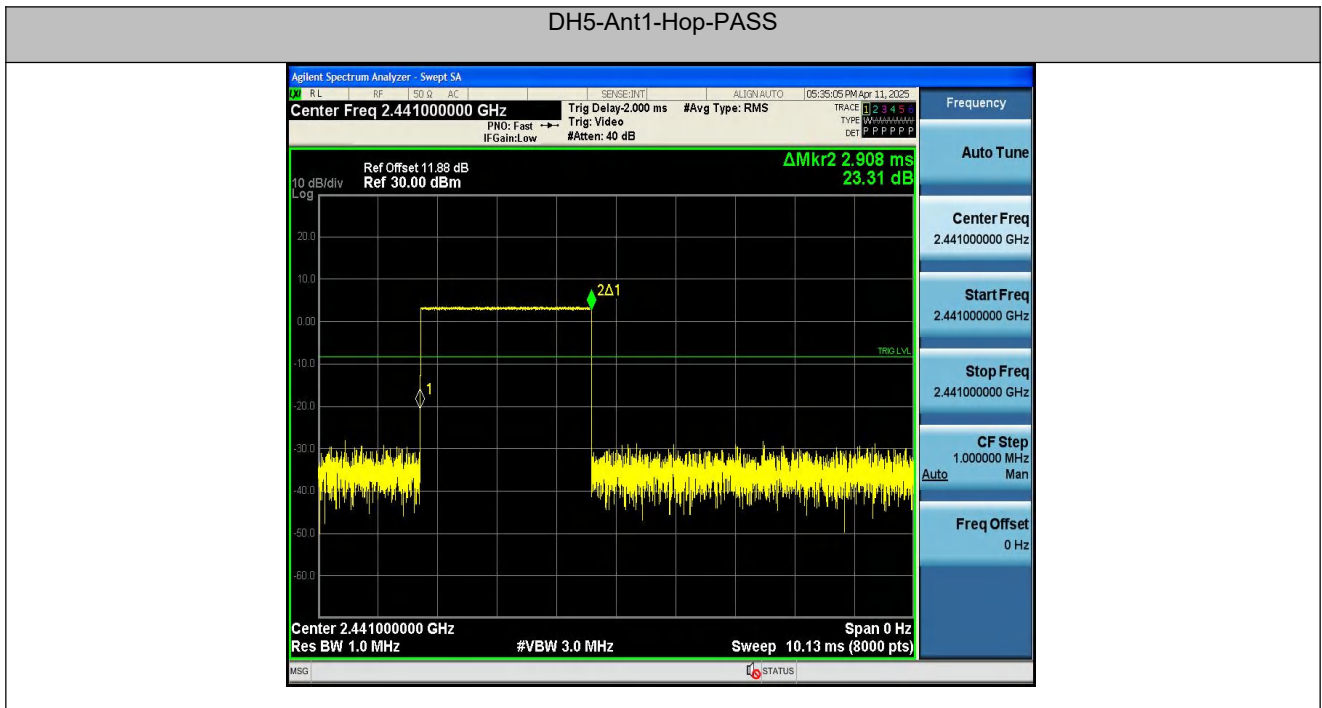
2DH3-Ant1-Hop-PASS



3DH3-Ant1-Hop-PASS

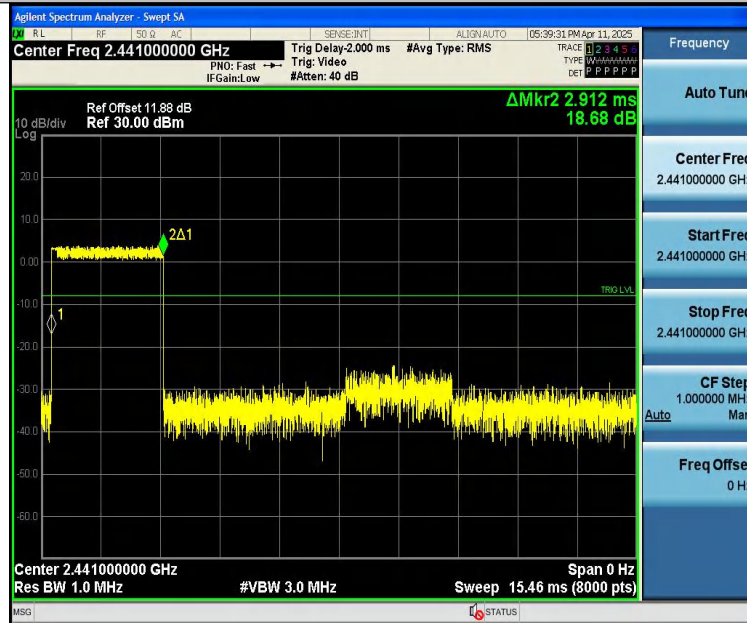


R:

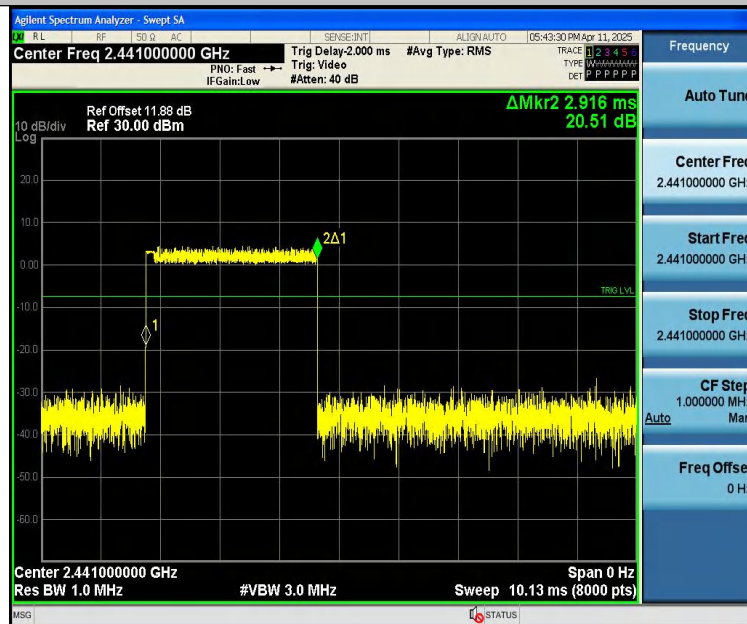




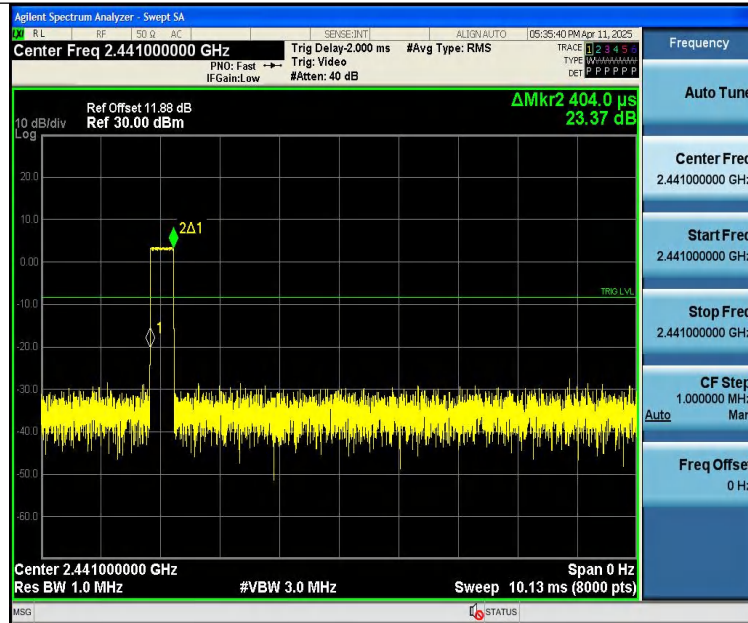
2DH5-Ant1-Hop-PASS



3DH5-Ant1-Hop-PASS



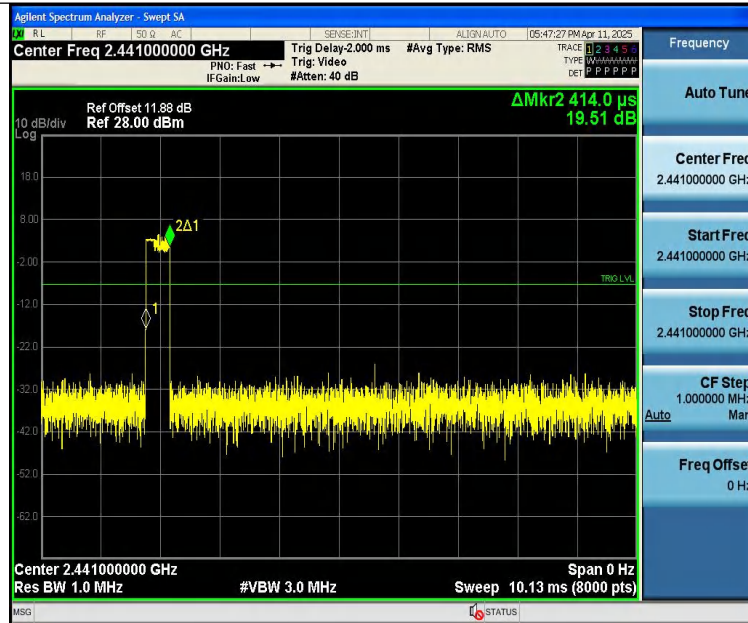
DH1-Ant1-Hop-PASS



2DH1-Ant1-Hop-PASS



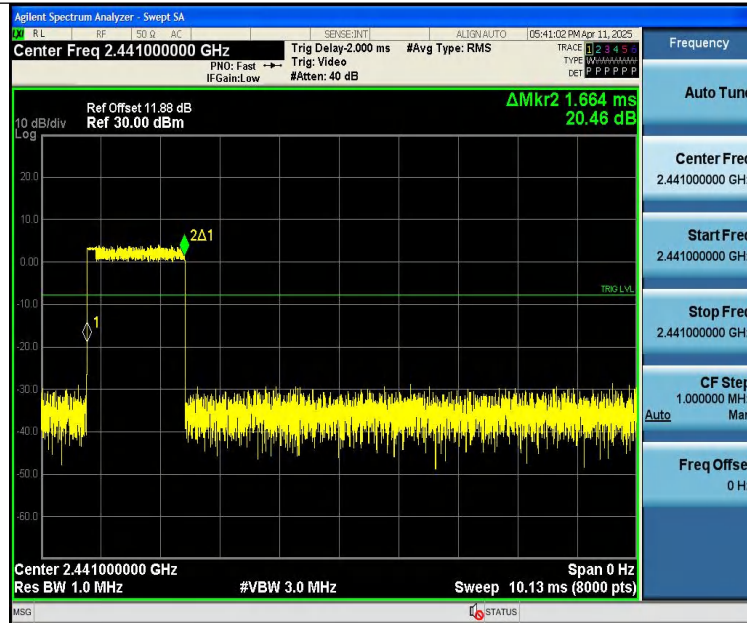
3DH1-Ant1-Hop-PASS



DH3-Ant1-Hop-PASS



2DH3-Ant1-Hop-PASS



3DH3-Ant1-Hop-PASS

