

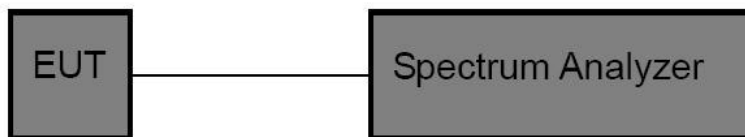


9 20DB Occupy Bandwidth Test

9.1 Test Standard

Test Standard	FCC Part15 C Section 15.247 (a)(1)
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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	0.915	2401.511	2402.426	---	---
DH5	Ant1	2441	0.954	2440.505	2441.459	---	---
DH5	Ant1	2480	0.960	2479.505	2480.465	---	---
2DH5	Ant1	2402	1.269	2401.337	2402.606	---	---
2DH5	Ant1	2441	1.320	2440.307	2441.627	---	---
2DH5	Ant1	2480	1.254	2479.343	2480.597	---	---
3DH5	Ant1	2402	1.320	2401.307	2402.627	---	---
3DH5	Ant1	2441	1.257	2440.331	2441.588	---	---
3DH5	Ant1	2480	1.242	2479.334	2480.576	---	---

R:

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.936	2401.514	2402.450	---	---
DH5	Ant1	2441	0.960	2440.505	2441.465	---	---
DH5	Ant1	2480	0.939	2479.514	2480.453	---	---
2DH5	Ant1	2402	1.317	2401.310	2402.627	---	---
2DH5	Ant1	2441	1.230	2440.346	2441.576	---	---
2DH5	Ant1	2480	1.317	2479.307	2480.624	---	---
3DH5	Ant1	2402	1.251	2401.346	2402.597	---	---
3DH5	Ant1	2441	1.320	2440.310	2441.630	---	---
3DH5	Ant1	2480	1.257	2479.340	2480.597	---	---

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



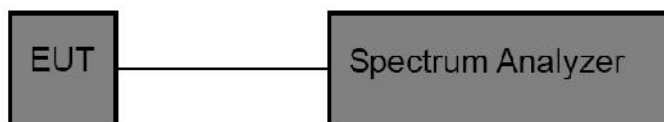


10 Carrier Frequency Separation Test

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:

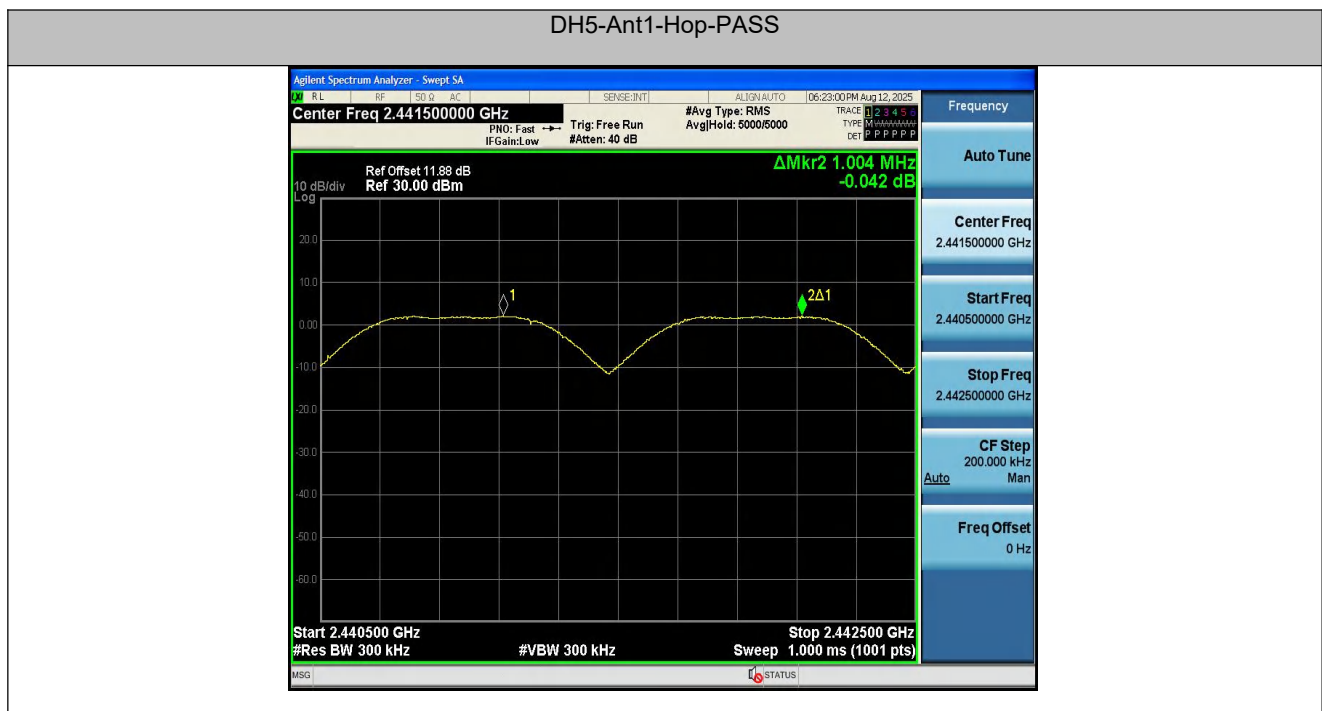
TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.004	≥ 0.640	PASS
2DH5	Ant1	Hop	0.684	≥ 0.880	PASS
3DH5	Ant1	Hop	0.992	≥ 0.880	PASS

R:

TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.324	≥ 0.640	PASS
2DH5	Ant1	Hop	1.038	≥ 0.878	PASS
3DH5	Ant1	Hop	1.298	≥ 0.880	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



Report No.: PTC25080514502E-FC01



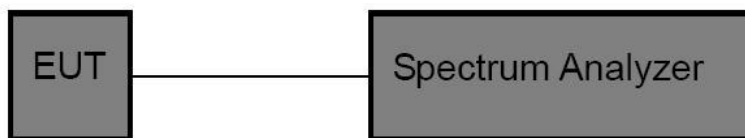


11 Number of Hopping Channel Test

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:

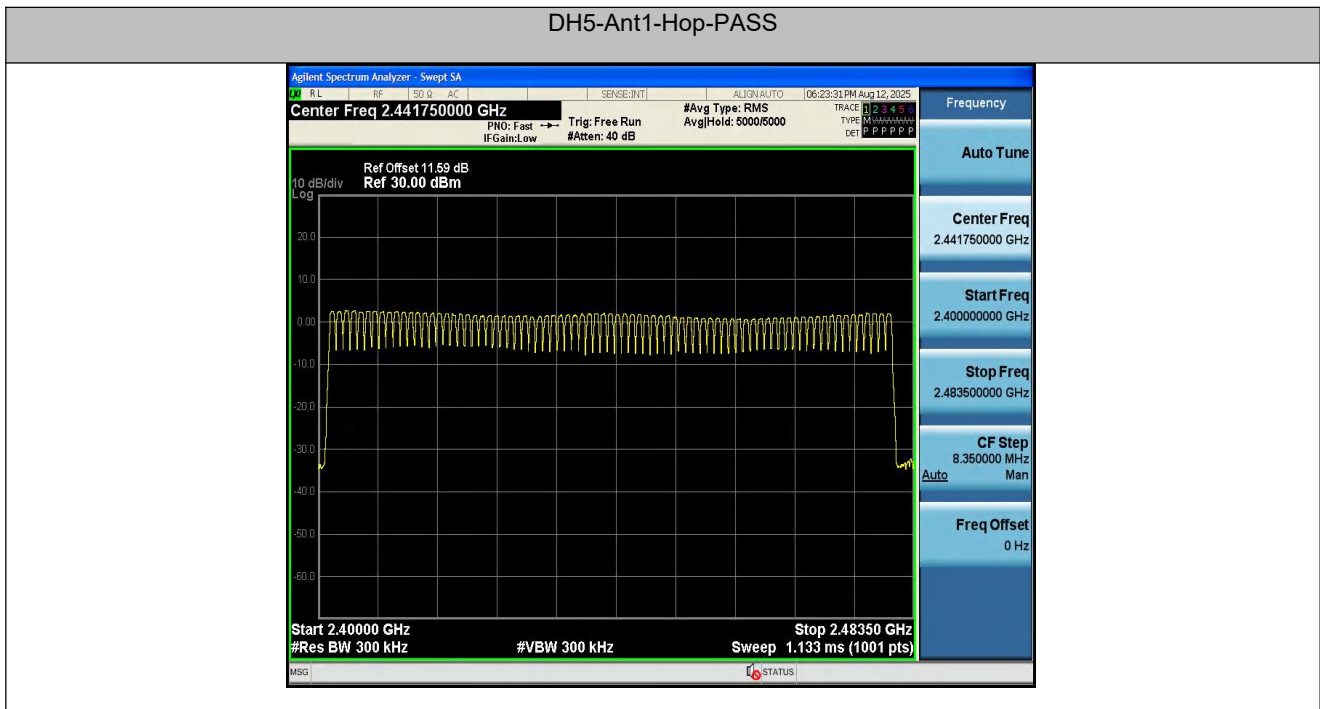
TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

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

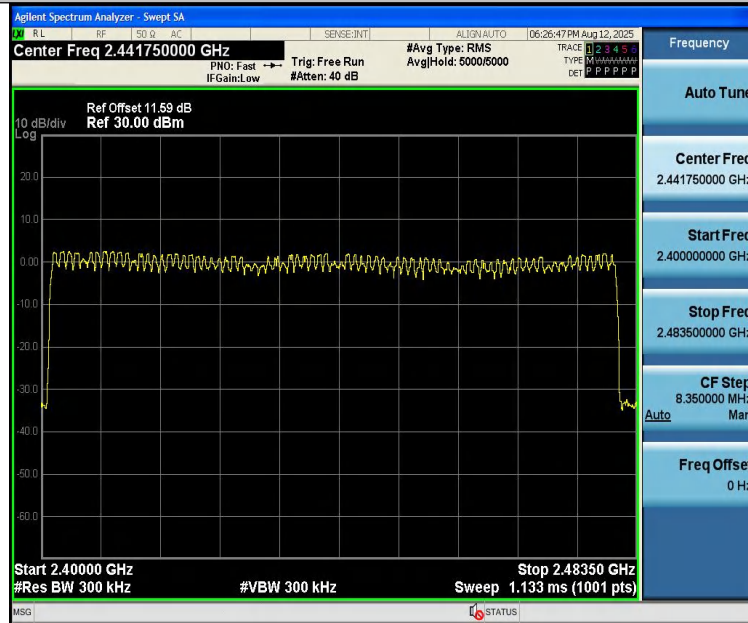
Test Graphs:

L:





2DH5-Ant1-Hop-PASS



3DH5-Ant1-Hop-PASS



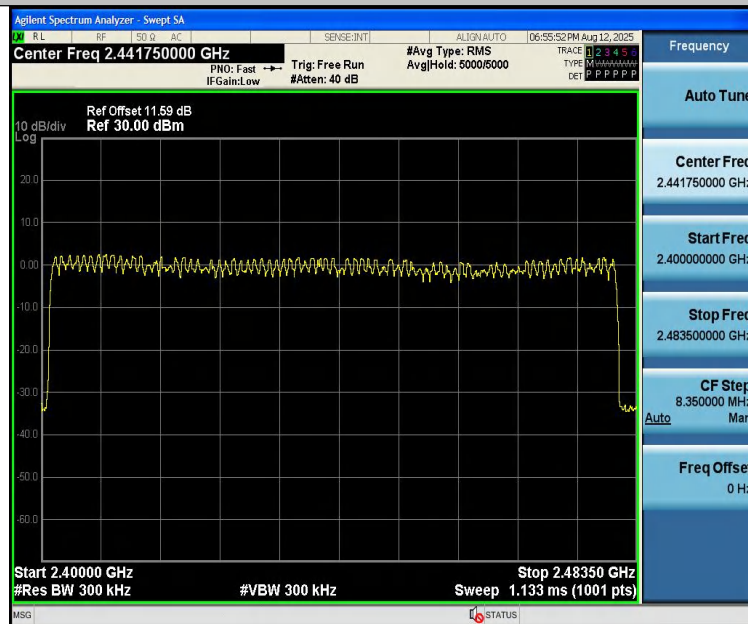


R:

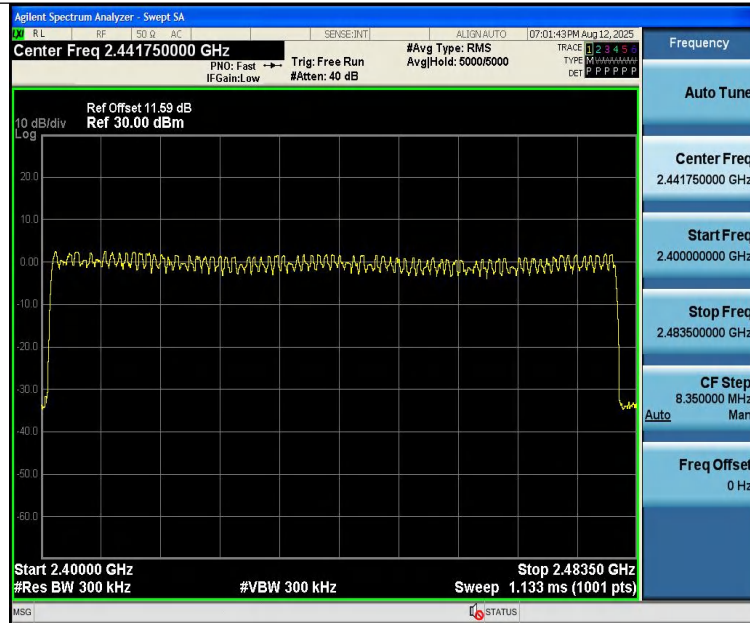
DH5-Ant1-Hop-PASS



2DH5-Ant1-Hop-PASS



3DH5-Ant1-Hop-PASS



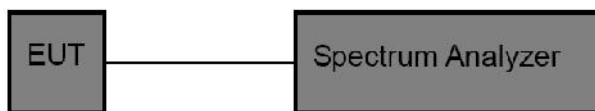


12 Dwell Time Test

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	0.310	≤0.4	PASS
2DH5	Ant1	Hop	2.911	106.67	0.311	≤0.4	PASS
3DH5	Ant1	Hop	2.917	106.67	0.311	≤0.4	PASS
DH1	Ant1	Hop	0.405	320	0.130	≤0.4	PASS
2DH1	Ant1	Hop	0.414	320	0.132	≤0.4	PASS
3DH1	Ant1	Hop	0.417	320	0.133	≤0.4	PASS
DH3	Ant1	Hop	1.661	160	0.266	≤0.4	PASS
2DH3	Ant1	Hop	1.667	160	0.267	≤0.4	PASS
3DH3	Ant1	Hop	1.667	160	0.267	≤0.4	PASS

R:

TestMode	Antenna	Frequency[MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH5	Ant1	Hop	2.910	106.67	0.310	≤0.4	PASS
2DH5	Ant1	Hop	2.914	106.67	0.311	≤0.4	PASS
3DH5	Ant1	Hop	2.917	106.67	0.311	≤0.4	PASS
DH1	Ant1	Hop	0.405	320	0.130	≤0.4	PASS
2DH1	Ant1	Hop	0.415	320	0.133	≤0.4	PASS
3DH1	Ant1	Hop	0.417	320	0.133	≤0.4	PASS
DH3	Ant1	Hop	1.661	160	0.266	≤0.4	PASS
2DH3	Ant1	Hop	1.667	160	0.267	≤0.4	PASS
3DH3	Ant1	Hop	1.667	160	0.267	≤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



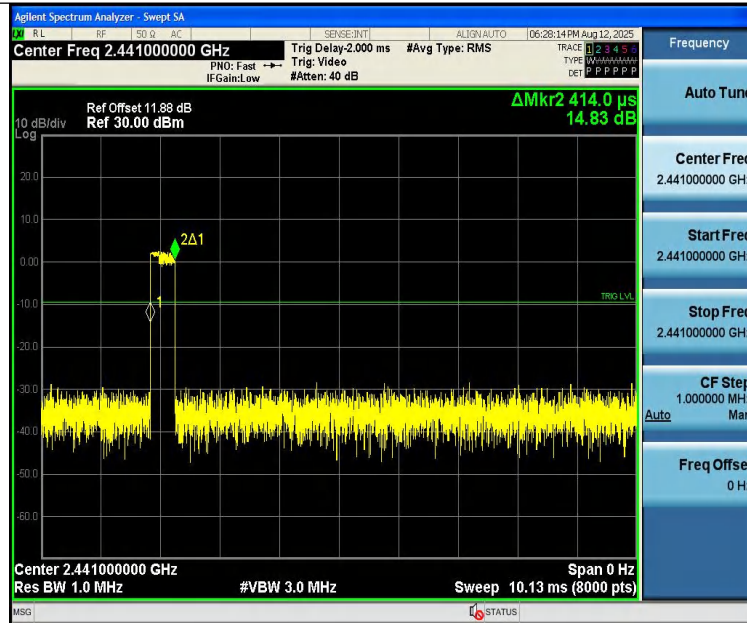
3DH5-Ant1-Hop-PASS



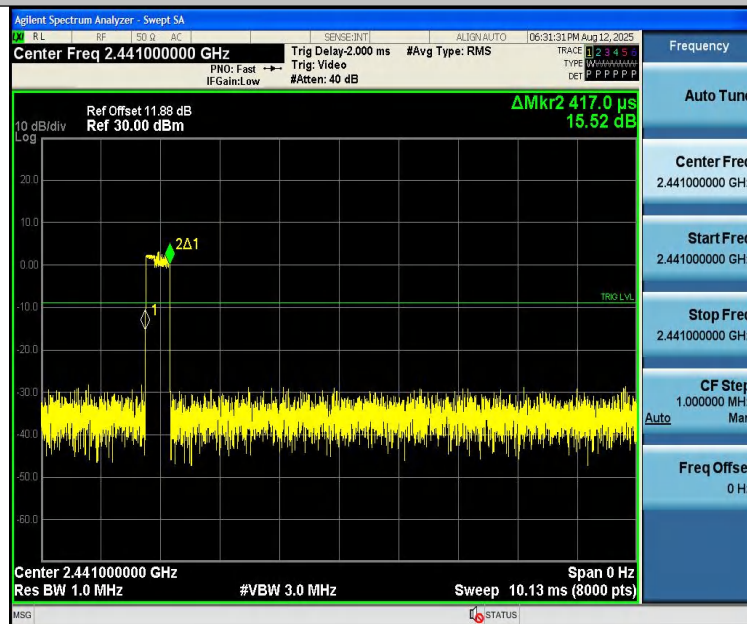
DH1-Ant1-Hop-PASS



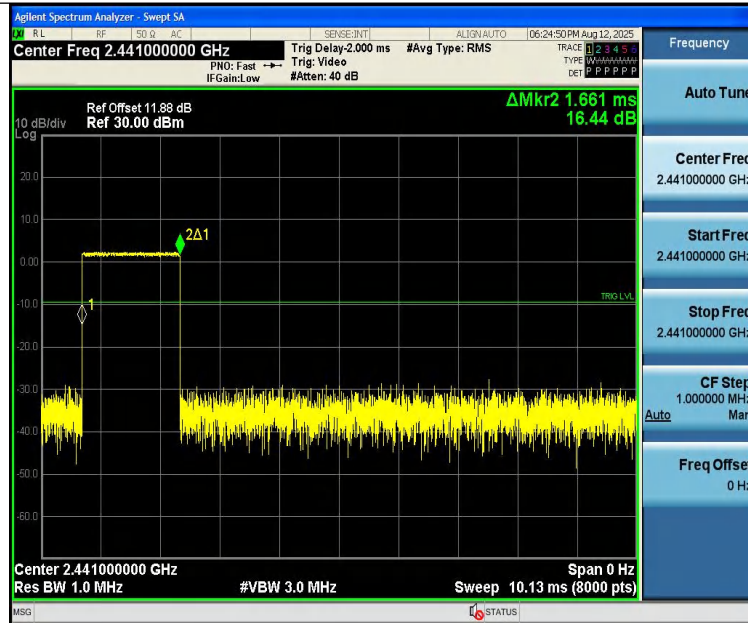
2DH1-Ant1-Hop-PASS



3DH1-Ant1-Hop-PASS



DH3-Ant1-Hop-PASS



2DH3-Ant1-Hop-PASS



3DH3-Ant1-Hop-PASS