

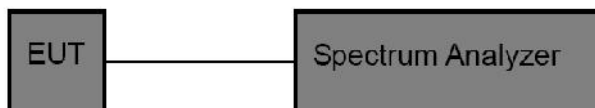


8 Maximum Peak Output Power Test

8.1 Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (b)(3)
Test Limit	125mW

8.2 Test Setup



8.3 Test Procedure

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 D01 15.247 Meas Guidance v05 section 8.3.1.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.



8.4 Test Data

Test Item	:	Max. peak output power	Test Mode	:	CH Low ~ CH High
Test Voltage	:	3.7V	Temperature	:	24.5°C
Test Result	:	PASS	Humidity	:	55%RH

L:

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	4.66	≤20.97	PASS
DH5	Ant1	2441	4.5	≤20.97	PASS
DH5	Ant1	2480	4.35	≤20.97	PASS
2DH5	Ant1	2402	5.39	≤20.97	PASS
2DH5	Ant1	2441	4.99	≤20.97	PASS
2DH5	Ant1	2480	5.07	≤20.97	PASS
3DH5	Ant1	2402	5.77	≤20.97	PASS
3DH5	Ant1	2441	5.41	≤20.97	PASS
3DH5	Ant1	2480	5.29	≤20.97	PASS

R:

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
DH5	Ant1	2402	3.74	≤20.97	PASS
DH5	Ant1	2441	3.7	≤20.97	PASS
DH5	Ant1	2480	3.78	≤20.97	PASS
2DH5	Ant1	2402	4.33	≤20.97	PASS
2DH5	Ant1	2441	4.17	≤20.97	PASS
2DH5	Ant1	2480	4.48	≤20.97	PASS
3DH5	Ant1	2402	4.8	≤20.97	PASS
3DH5	Ant1	2441	4.78	≤20.97	PASS
3DH5	Ant1	2480	4.99	≤20.97	PASS



Test Graphs:

L:

DH5-Ant1-2402-PASS



DH5-Ant1-2441-PASS





DH5-Ant1-2480-PASS



2DH5-Ant1-2402-PASS



2DH5-Ant1-2441-PASS



2DH5-Ant1-2480-PASS



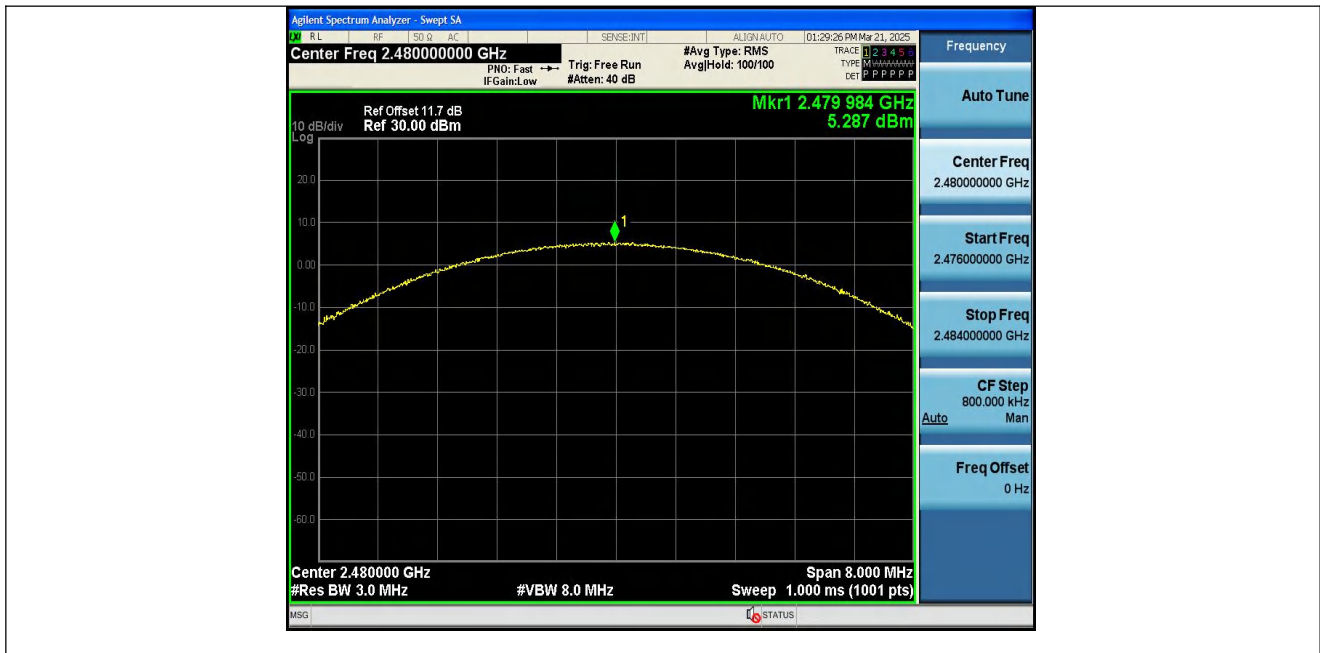
3DH5-Ant1-2402-PASS



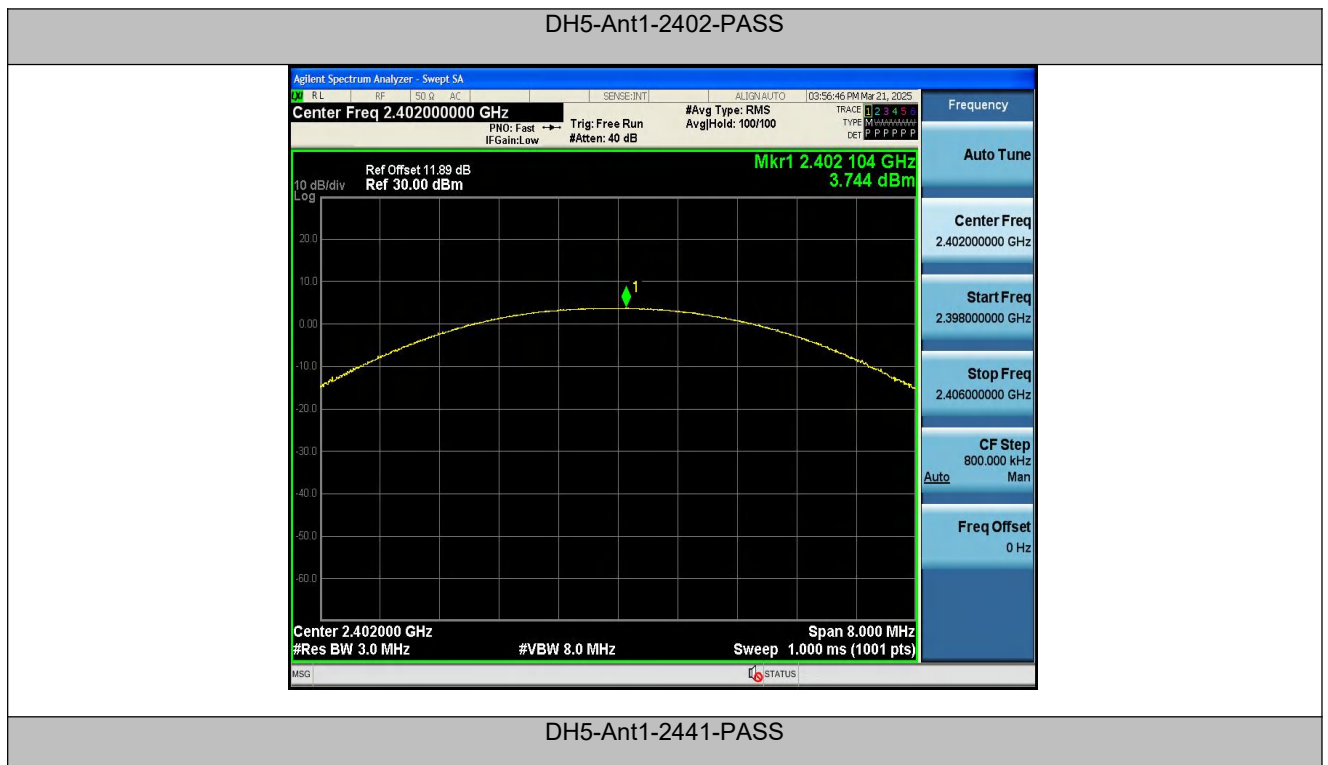
3DH5-Ant1-2441-PASS



3DH5-Ant1-2480-PASS



R:





DH5-Ant1-2480-PASS



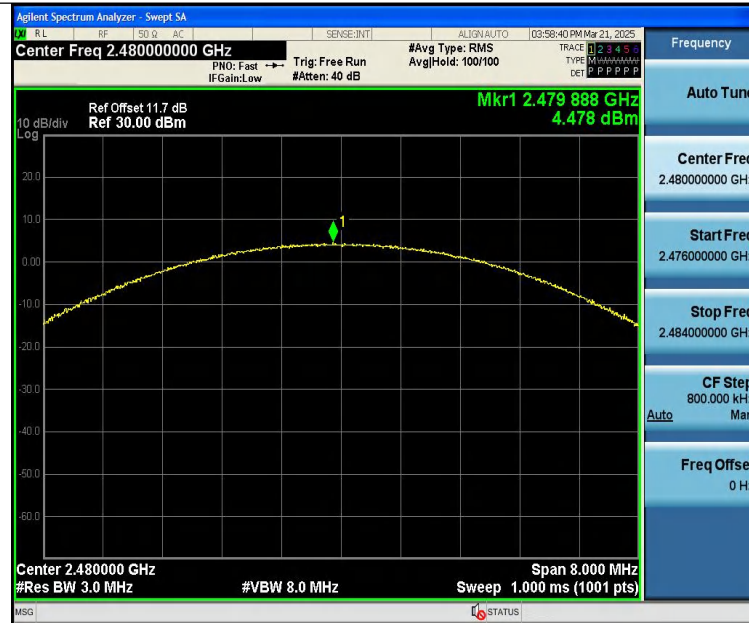
2DH5-Ant1-2402-PASS



2DH5-Ant1-2441-PASS



2DH5-Ant1-2480-PASS



3DH5-Ant1-2402-PASS



3DH5-Ant1-2441-PASS



3DH5-Ant1-2480-PASS



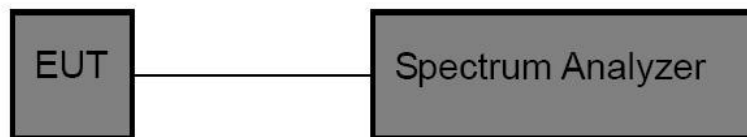


9 20DB Occupy Bandwidth Test

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

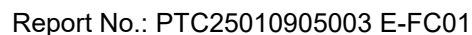


L:

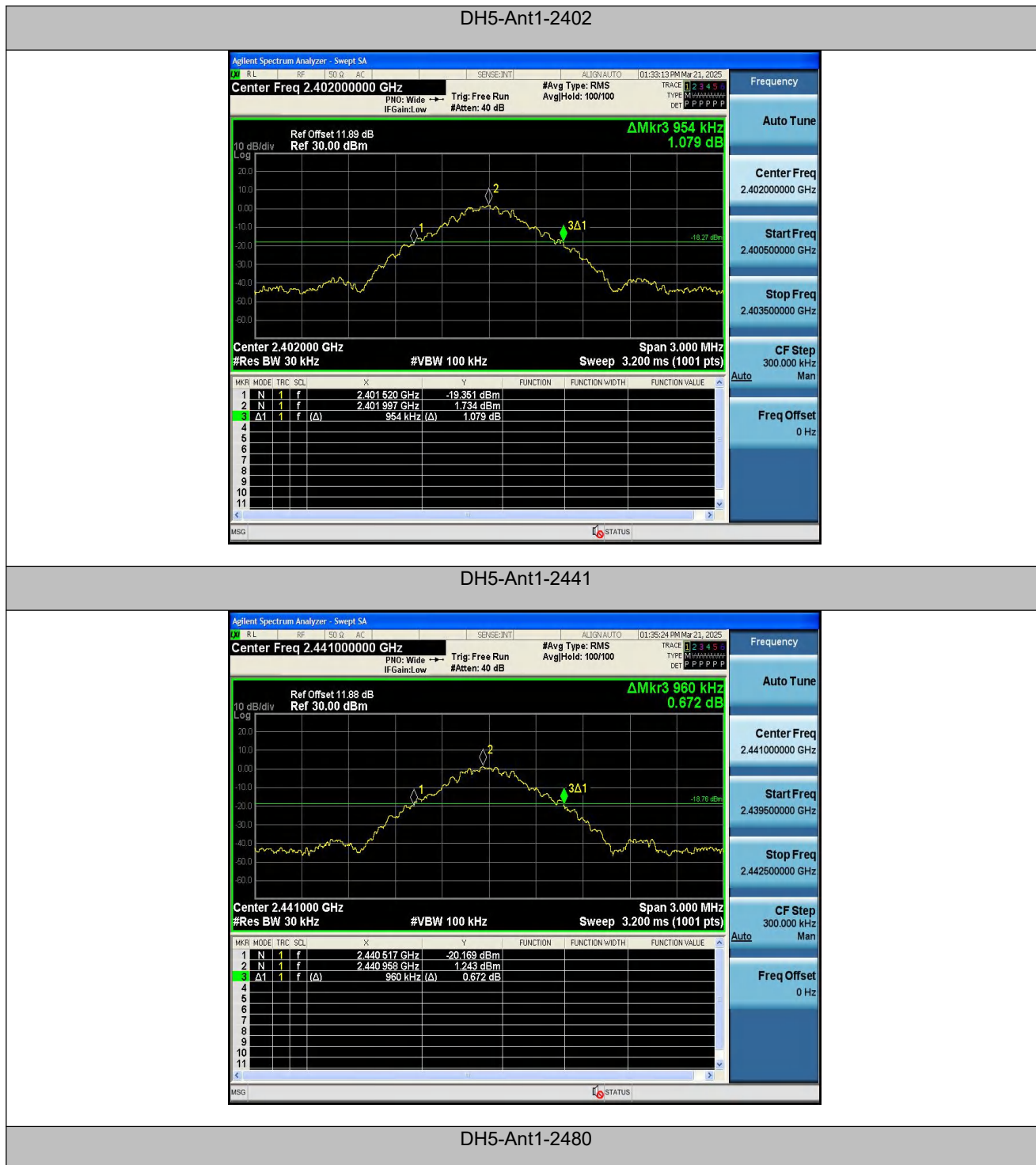
TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.954	2401.520	2402.474	---	---
DH5	Ant1	2441	0.960	2440.517	2441.477	---	---
DH5	Ant1	2480	0.957	2479.523	2480.480	---	---
2DH5	Ant1	2402	1.371	2401.301	2402.672	---	---
2DH5	Ant1	2441	1.323	2440.322	2441.645	---	---
2DH5	Ant1	2480	1.314	2479.328	2480.642	---	---
3DH5	Ant1	2402	1.299	2401.340	2402.639	---	---
3DH5	Ant1	2441	1.290	2440.337	2441.627	---	---
3DH5	Ant1	2480	1.287	2479.337	2480.624	---	---

R:

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.936	2401.529	2402.465	---	---
DH5	Ant1	2441	0.942	2440.520	2441.462	---	---
DH5	Ant1	2480	0.957	2479.514	2480.471	---	---
2DH5	Ant1	2402	1.365	2401.295	2402.660	---	---
2DH5	Ant1	2441	1.245	2440.364	2441.609	---	---
2DH5	Ant1	2480	1.323	2479.313	2480.636	---	---
3DH5	Ant1	2402	1.254	2401.358	2402.612	---	---
3DH5	Ant1	2441	1.281	2440.337	2441.618	---	---
3DH5	Ant1	2480	1.242	2479.358	2480.600	---	---



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



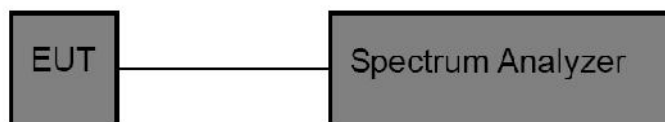


10 Carrier Frequency Separation Test

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:

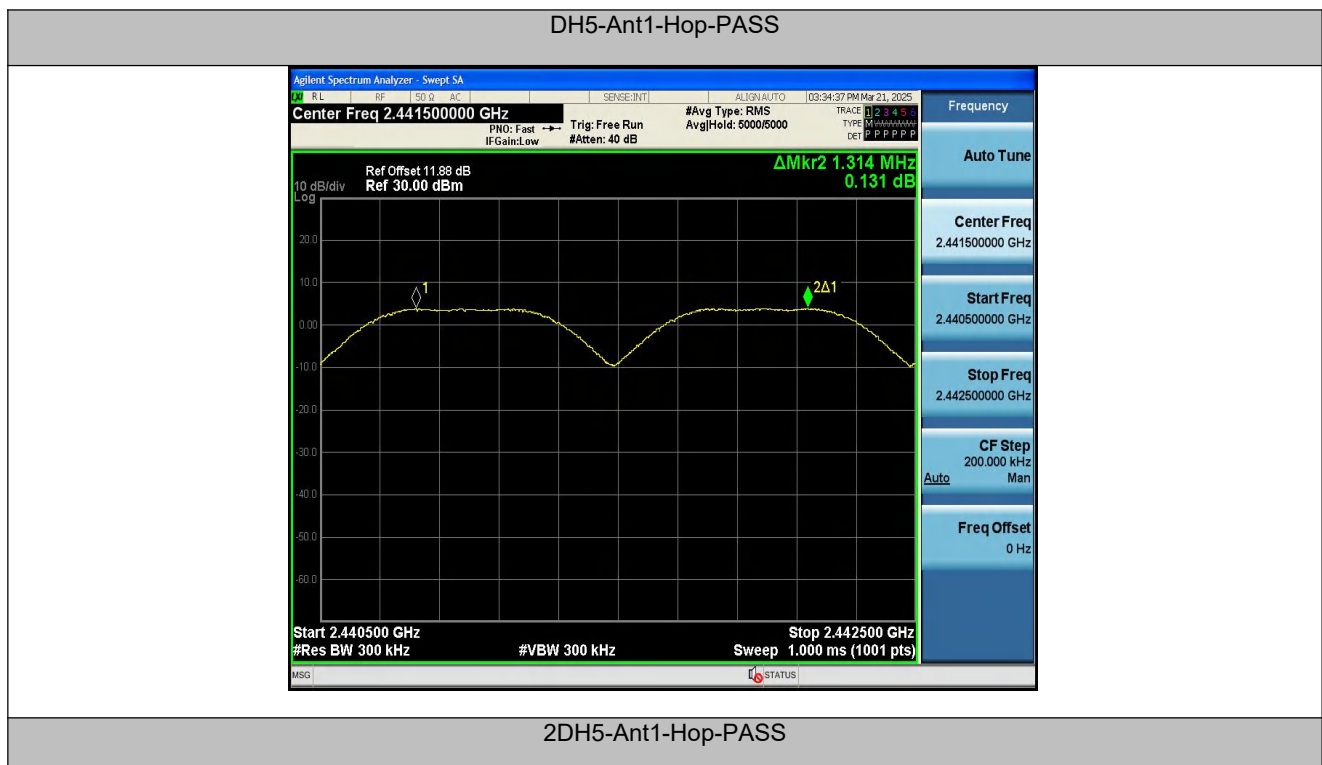
TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.314	≥ 0.640	PASS
2DH5	Ant1	Hop	1.284	≥ 0.914	PASS
3DH5	Ant1	Hop	1.246	≥ 0.866	PASS

R:

TestMode	Antenna	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.838	≥ 0.638	PASS
2DH5	Ant1	Hop	1.136	≥ 0.910	PASS
3DH5	Ant1	Hop	1.134	≥ 0.854	PASS

Test Graphs:

L:





3DH5-Ant1-Hop-PASS





R:

DH5-Ant1-Hop-PASS



2DH5-Ant1-Hop-PASS



3DH5-Ant1-Hop-PASS



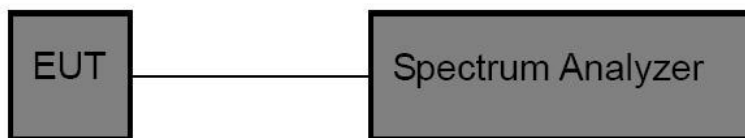


11 Number of Hopping Channel Test

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:

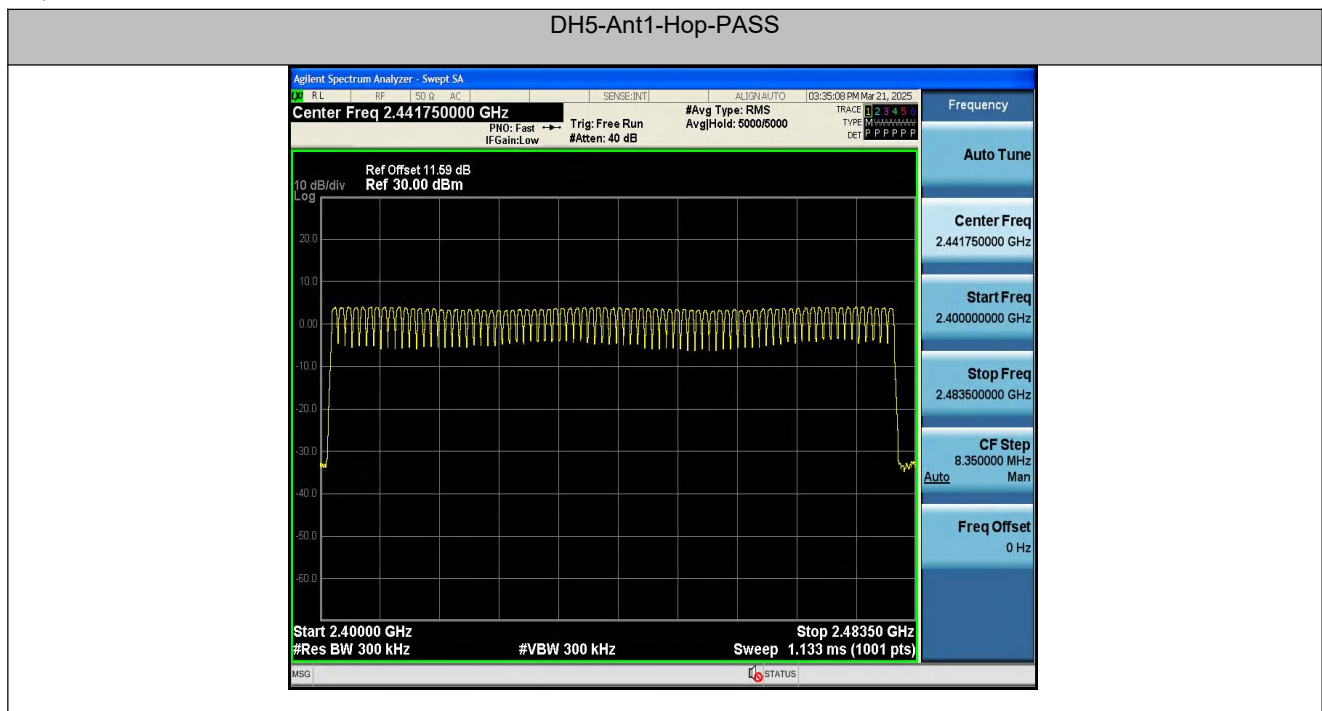
TestMode	Antenna	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

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

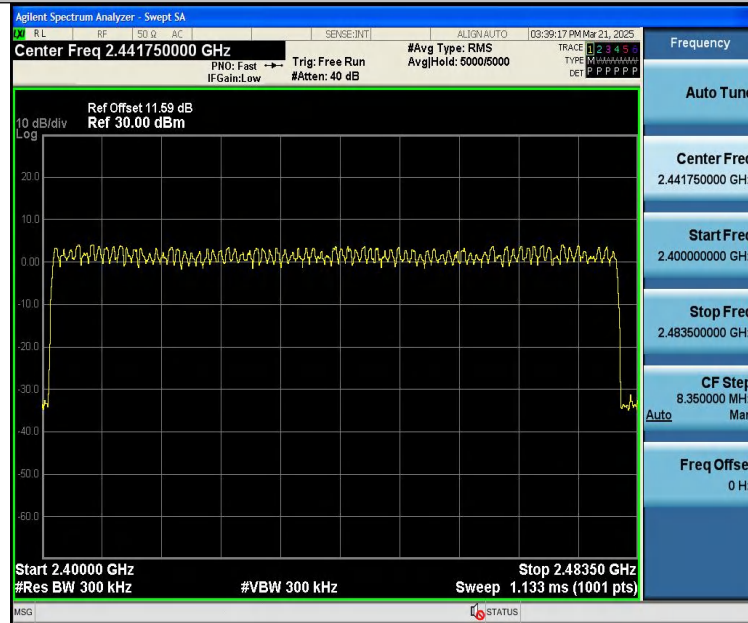
Test Graphs:

L:

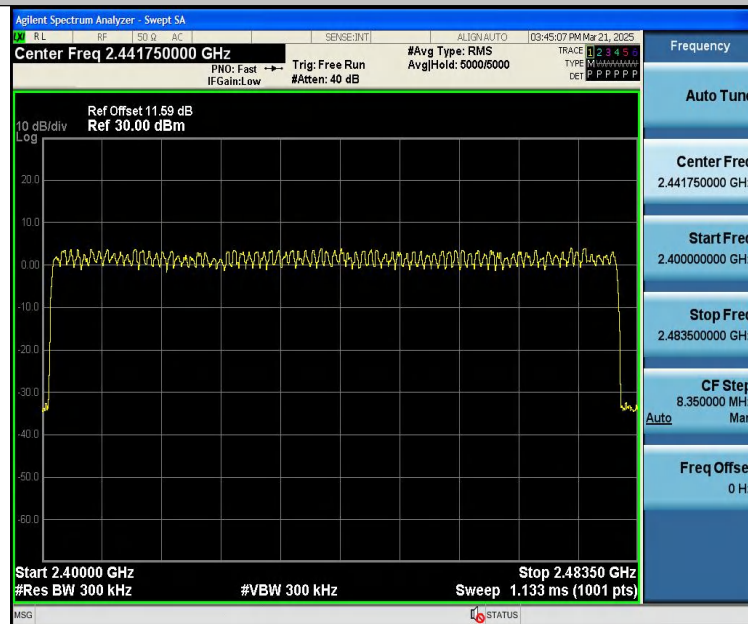




2DH5-Ant1-Hop-PASS



3DH5-Ant1-Hop-PASS



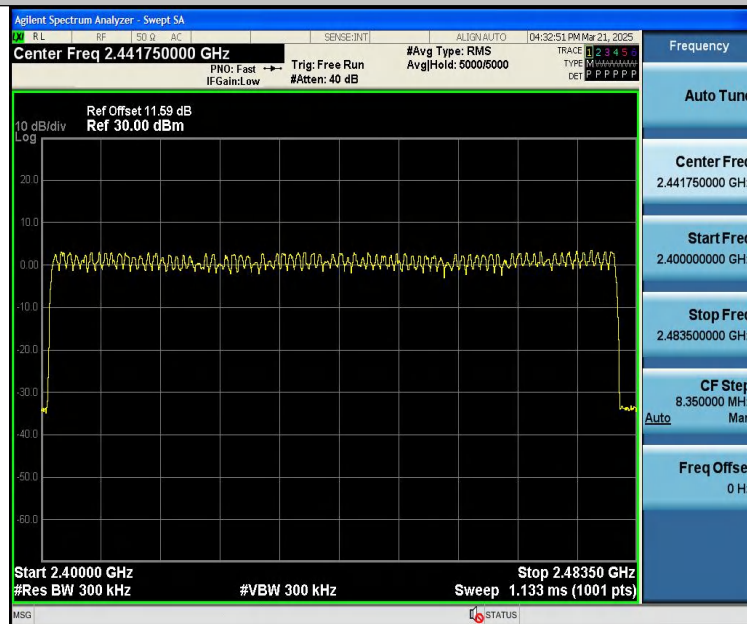


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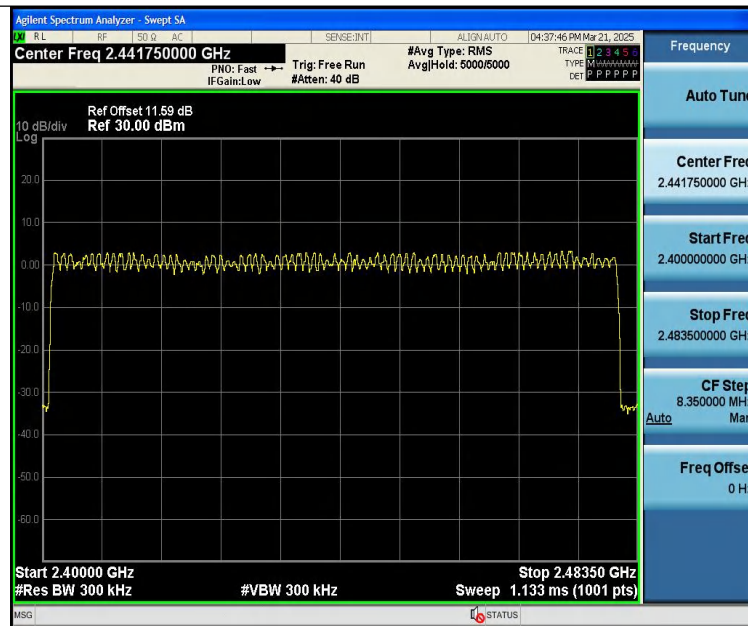
DH5-Ant1-Hop-PASS



2DH5-Ant1-Hop-PASS



3DH5-Ant1-Hop-PASS



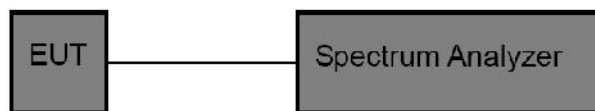


12 Dwell Time Test

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	2.911	106.67	0.311	≤0.4	PASS
2DH5	Ant1	Hop	2.917	106.67	0.311	≤0.4	PASS
3DH5	Ant1	Hop	2.921	106.67	0.312	≤0.4	PASS
DH1	Ant1	Hop	0.407	320	0.13	≤0.4	PASS
2DH1	Ant1	Hop	0.417	320	0.133	≤0.4	PASS
3DH1	Ant1	Hop	0.419	320	0.134	≤0.4	PASS
DH3	Ant1	Hop	1.663	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	2.911	106.67	0.311	≤0.4	PASS
2DH5	Ant1	Hop	2.910	106.67	0.31	≤0.4	PASS
3DH5	Ant1	Hop	2.920	106.67	0.311	≤0.4	PASS
DH1	Ant1	Hop	0.407	320	0.13	≤0.4	PASS
2DH1	Ant1	Hop	0.417	320	0.133	≤0.4	PASS
3DH1	Ant1	Hop	0.418	320	0.134	≤0.4	PASS
DH3	Ant1	Hop	1.662	160	0.266	≤0.4	PASS
2DH3	Ant1	Hop	1.669	160	0.267	≤0.4	PASS
3DH3	Ant1	Hop	1.669	160	0.267	≤0.4	PASS

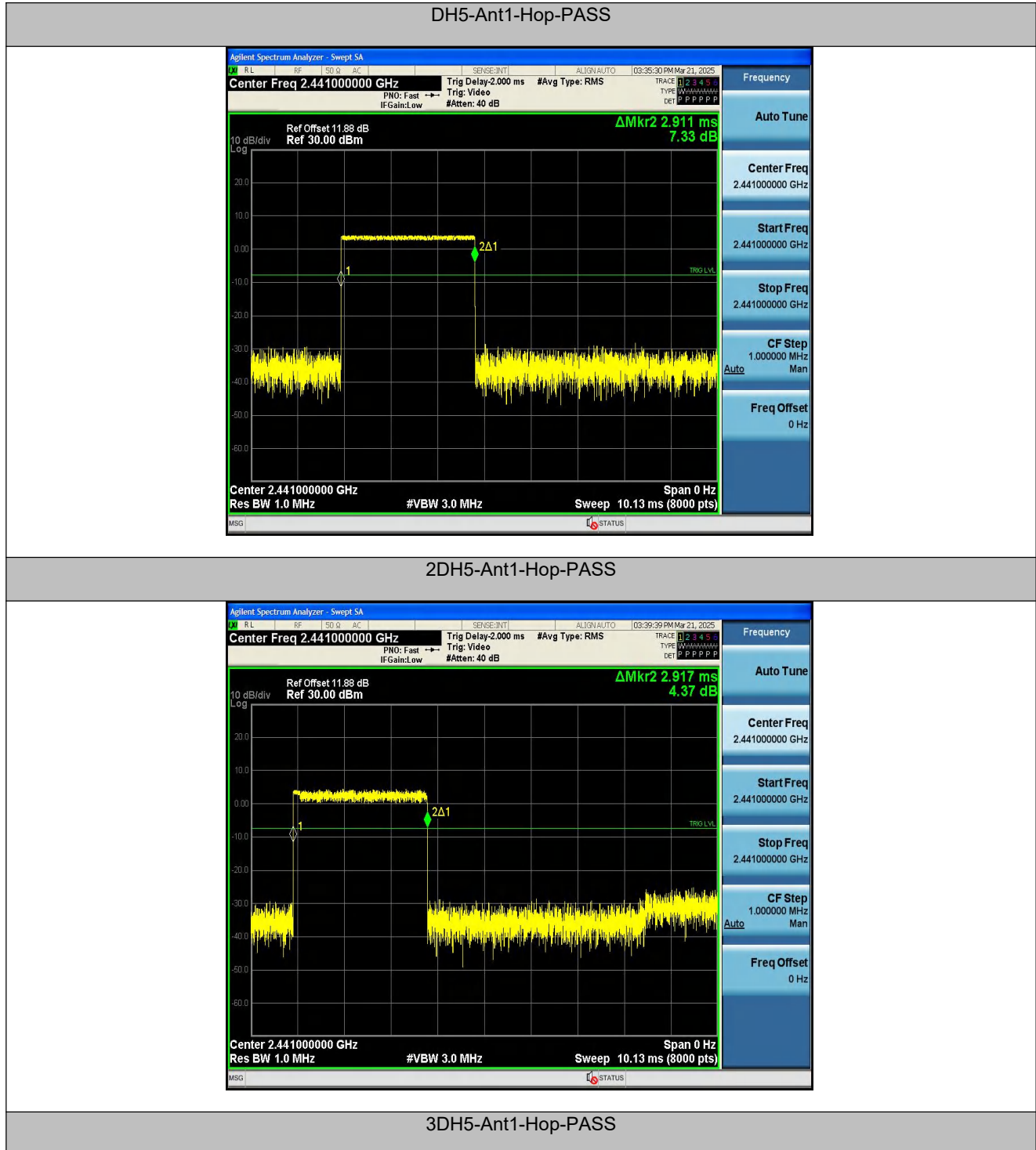
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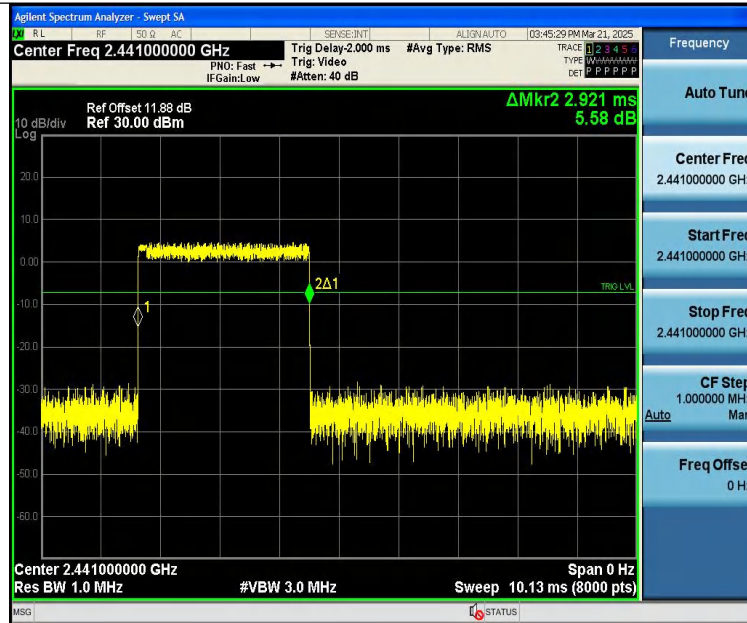
- 1.DH1/2DH1/3DH1 Dwell Time: Reading * (1600/2)*31.6/(channel number).
- 2.DH3/2DH3/3DH3 Dwell Time: Reading * (1600/4)*31.6/(channel number).
- 3.DH5/2DH5/3DH5 Dwell Time: Reading * (1600/6)*31.6/(channel number).



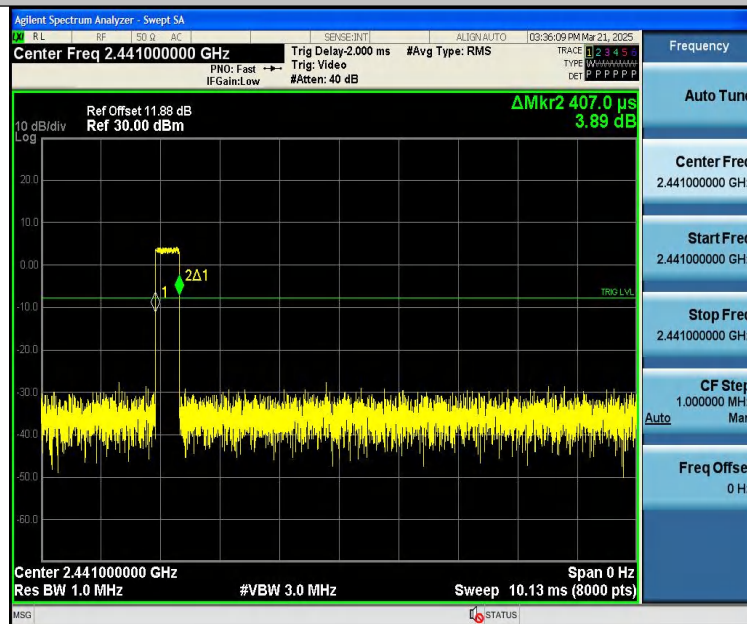
Test Graphs:

L:

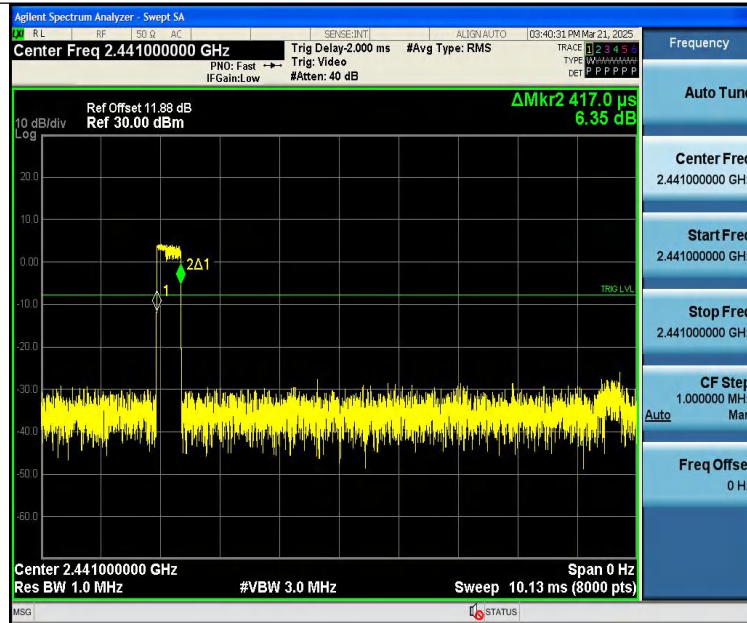




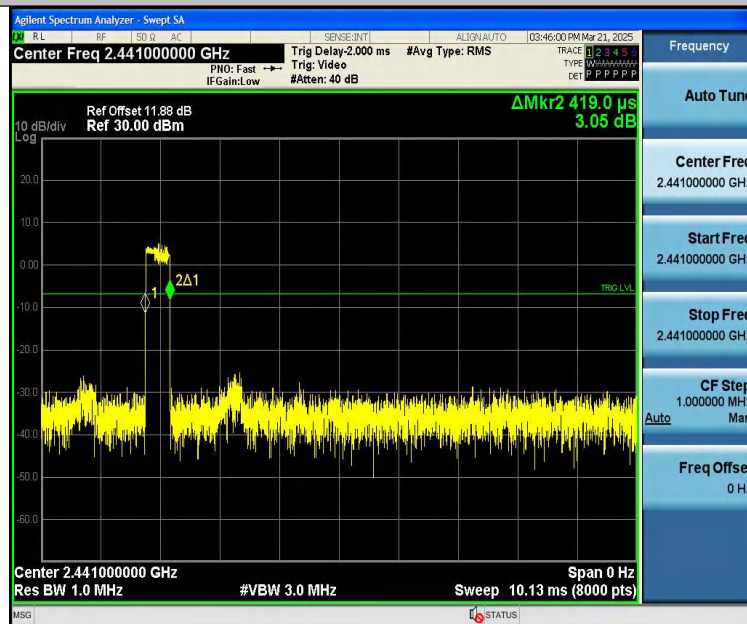
DH1-Ant1-Hop-PASS



2DH1-Ant1-Hop-PASS



3DH1-Ant1-Hop-PASS



DH3-Ant1-Hop-PASS