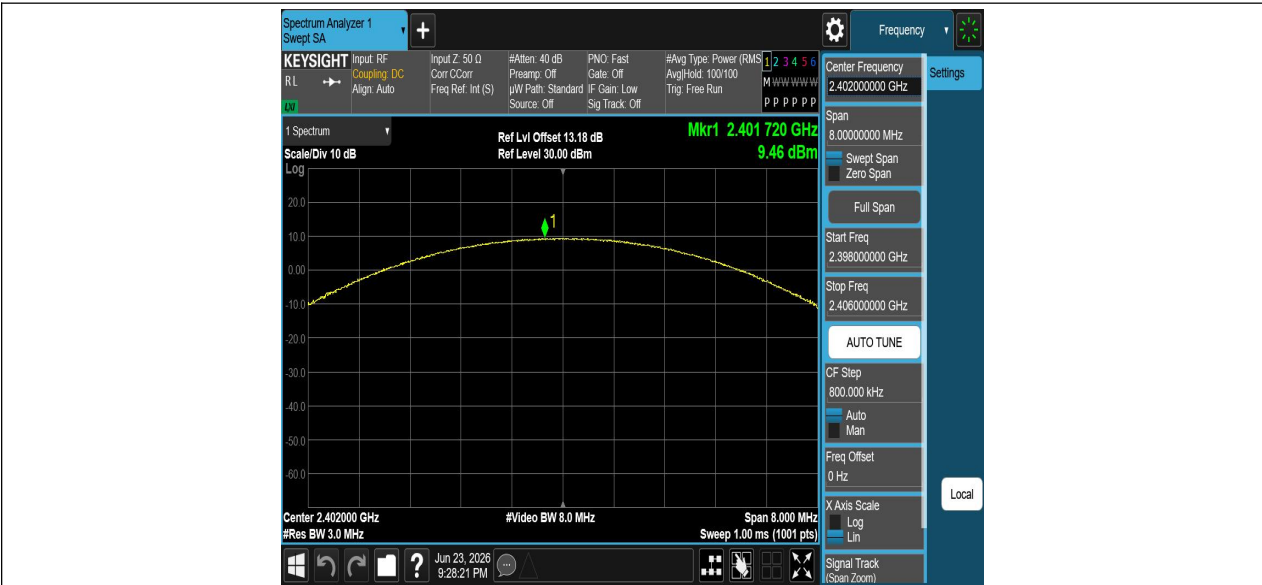
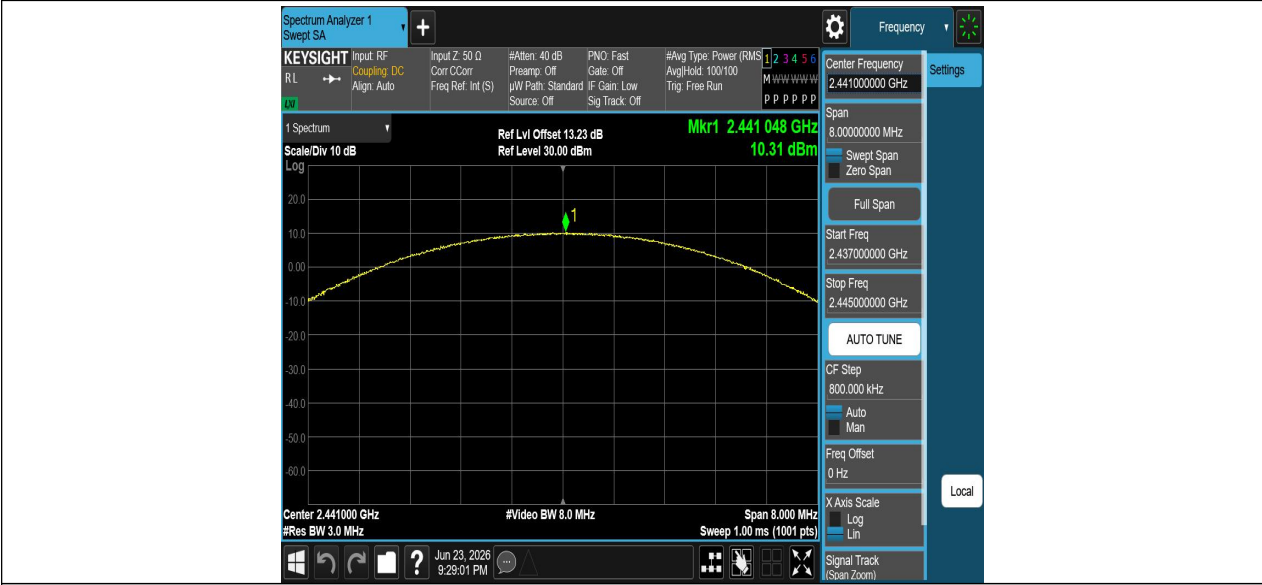




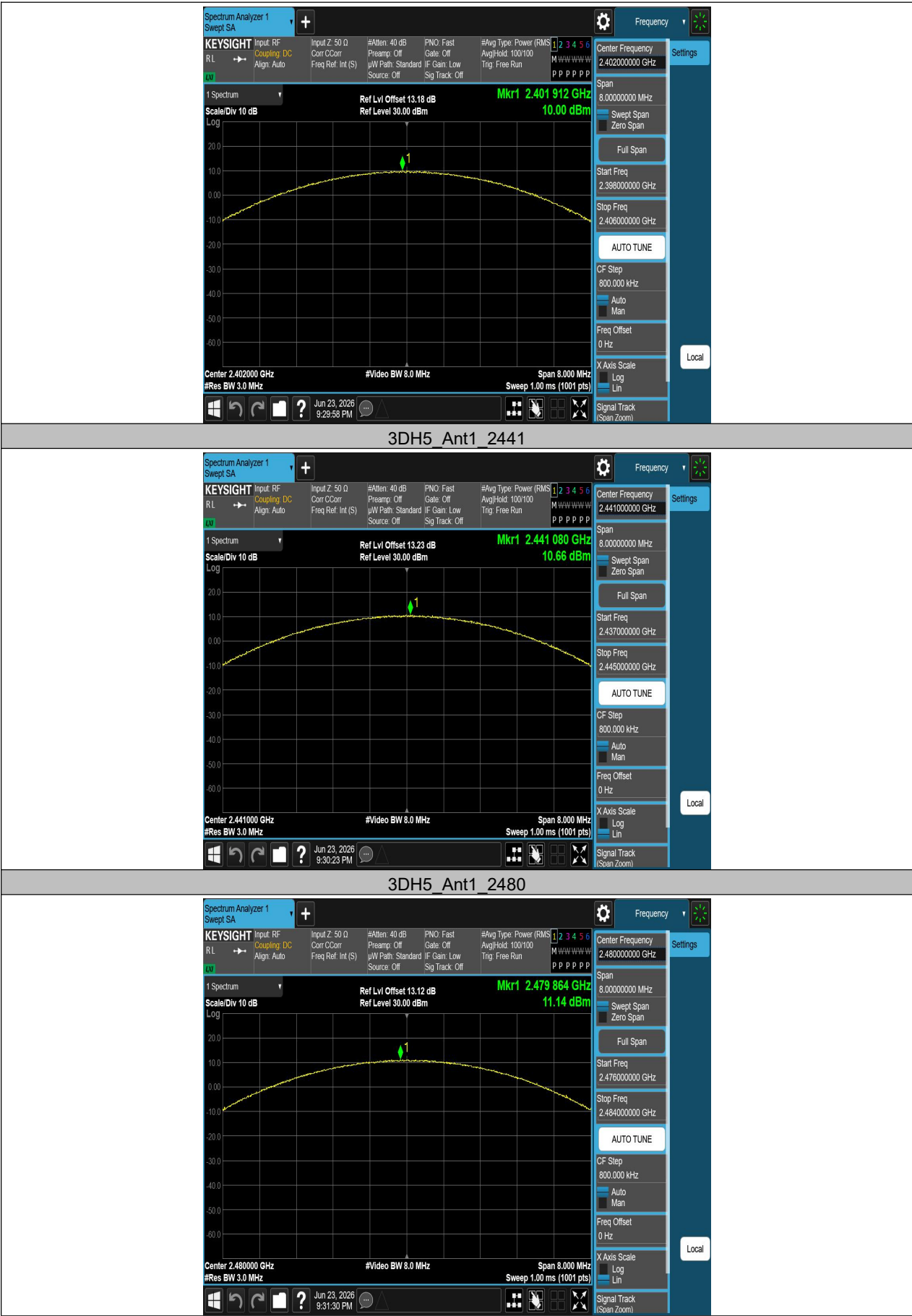
2DH5_Ant1_2441



2DH5_Ant1_2480



3DH5_Ant1_2402



11. Carrier Hopping Channel Separation

11.1. Block diagram of test setup

Same as section 8.1

11.2. Limits

CFR 47 FCC Part15 (15.247) , Subpart C ISED RSS-247 ISSUE 4			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247 (a) (1) ISED RSS-247 Clause 5.1 (b)	Carrier Hopping Channel Separation	Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel.	2400-2483.5

11.3. Test Procedure

Connect the UUT to the spectrum Analyzer and use the following settings:

Center Frequency	The center frequency of the channel under test
Span	wide enough to capture the peaks of two adjacent channels
Detector	Peak
RBW	Start with the RBW set to approximately 30 % of the channel spacing; adjust as necessary to best identify the center of each individual channel.
VBW	≥ RBW
Trace	Max hold
Sweep time	Auto couple

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

Compliance of an EUT with the appropriate regulatory limit shall be determined.

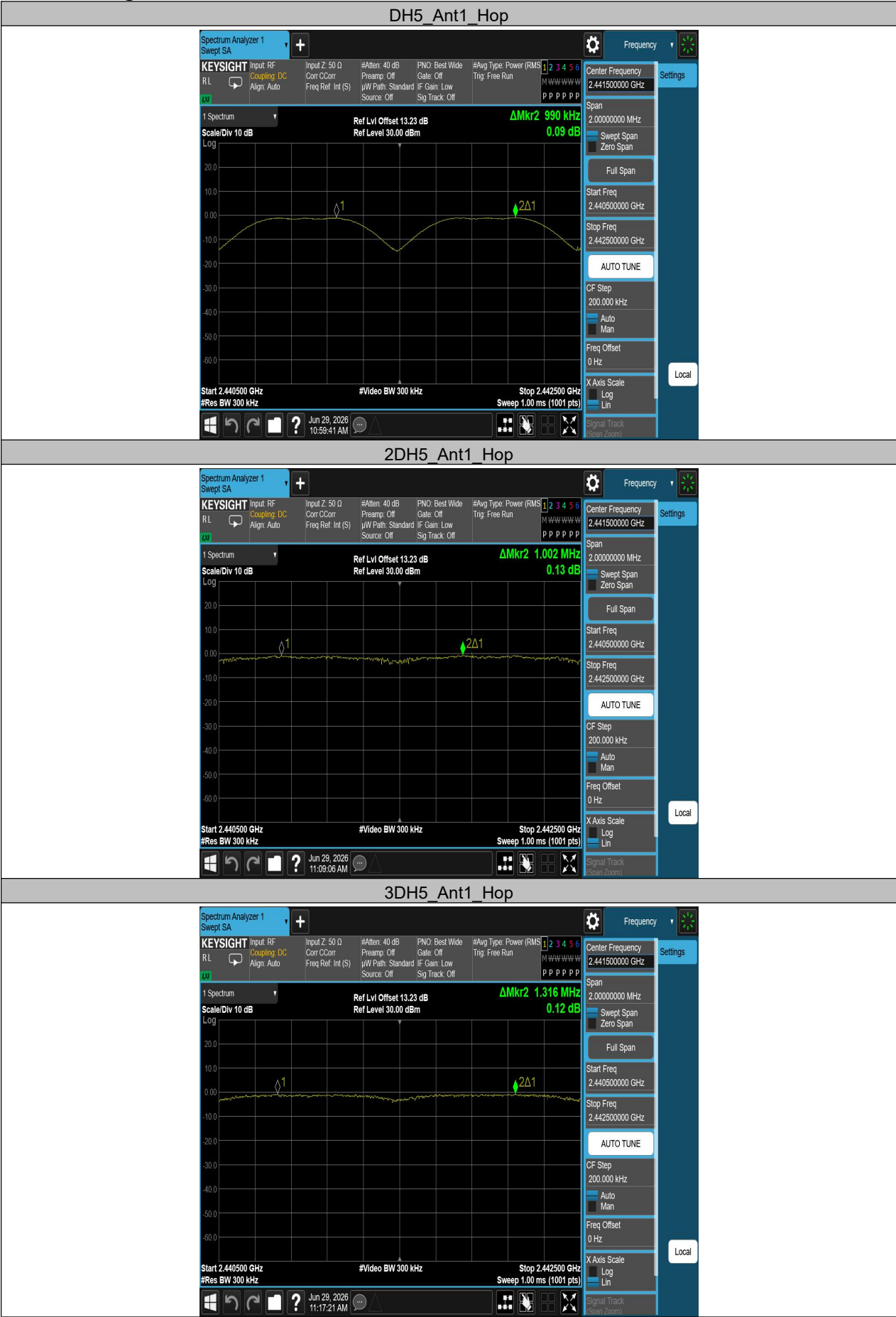
A plot of the data shall be included in the test report.

11.4. Results

Test Mode	Ant.	Freq. (MHz)	Result (MHz)	Limit (MHz)	Verdict
DH5	Ant1	Hop	0.99	≥0.668	PASS
2DH5	Ant1	Hop	1.002	≥0.888	PASS
3DH5	Ant1	Hop	1.316	≥0.888	PASS

Note: Offset=cable loss + Test system insertion loss

11.5. Original test data



12. Number of Hopping Frequency

12.1. Block diagram of test setup

Same as section 8.1

12.2. Limits

CFR 47 FCC Part15 (15.247), Subpart C ISED RSS-247 ISSUE 4		
Section	Test Item	Limit
CFR 47 15.247 (a) (1) III ISED RSS-247 Clause 5.1 (d)	Number of Hopping Frequency	at least 15 hopping channels

12.3. Test Procedure

Connect the EUT to the spectrum Analyzer and use the following settings:

Detector	Peak
RBW	To identify clearly the individual channels, set the RBW to less than 30 % of the channel spacing or the 20 dB bandwidth, whichever is smaller.
VBW	≥RBW
Span	The frequency band of operation
Trace	Max hold
Sweep time	Auto couple

Set EUT to transmit maximum output power and switch on frequency hopping function. then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer.

Count the quantity of peaks to get the number of hopping channels.

FHSS Mode: 79 Channels observed.

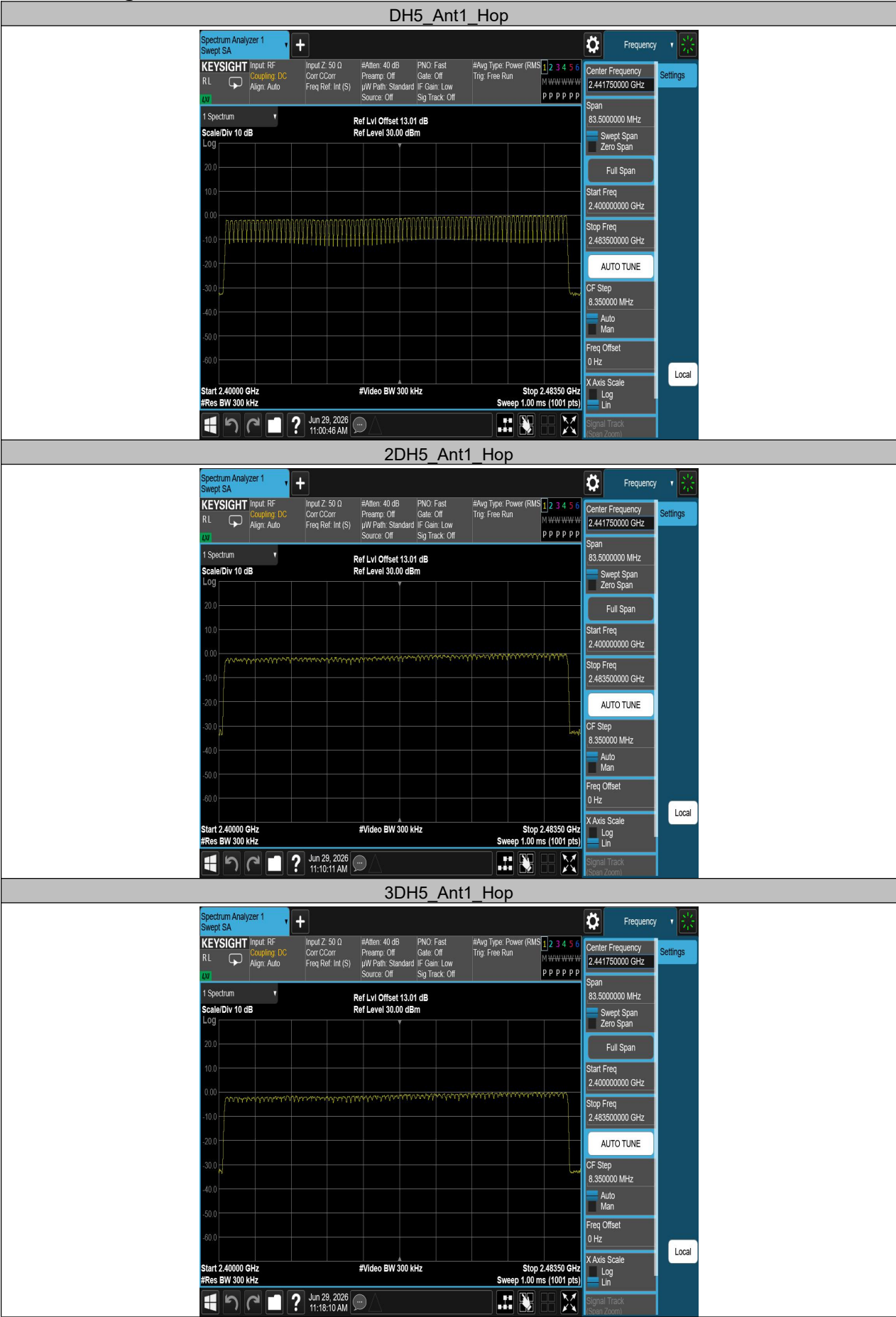
AFHSS Mode: 20 Channels declared.

12.4. Results

Test Mode	Ant.	Freq. (MHz)	Result (Num)	Limit (Num)	Verdict
DH5	Ant1	Hop	79	≥15	PASS
2DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Note: Offset=cable loss + Test system insertion loss

12.5. Original test data



2DH5_Ant1_Hop

Spectrum Analyzer 1
Sweep SA

KEYSIGHT
Input: RF
Coupling: DC
Align: Auto

Input Z: 50 Ω
Corr: CCorr
Freq Ref: Int (S)

#Atten: 40 dB
Preamp: Off
 μ W Path: Standard
Source: Off

PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off

#Avg Type: Power (RMS)
Trig: Free Run

1 2 3 4 5 6
M W W W W W
P P P P P P

Center Frequency
2.441750000 GHz

Span
83.5000000 MHz

Sweep Span
Zero Span

Full Span

Start Freq
2.400000000 GHz

Stop Freq
2.483500000 GHz

AUTO TUNE

CF Step
8.3500000 MHz

Auto
Man

Freq Offset
0 Hz

X Axis Scale
Log
Lin

Signal Track
(Span Zoom)

Local

1 Spectrum
Scale/Div 10 dB
LogRef Lvl Offset 13.01 dB
Ref Level 30.00 dBmStart 2.40000 GHz
#Res BW 300 kHz

#Video BW 300 kHz

Stop 2.48350 GHz
Sweep 1.00 ms (1001 pts)Jun 29, 2026
11:10:11 AM

3DH5_Ant1_Hop

Spectrum Analyzer 1
Sweep SA

KEYSIGHT
Input: RF
Coupling: DC
Align: Auto

Input Z: 50 Ω
Corr: CCorr
Freq Ref: Int (S)

#Atten: 40 dB
Preamp: Off
 μ W Path: Standard
Source: Off

PNO: Fast
Gate: Off
IF Gain: Low
Sig Track: Off

#Avg Type: Power (RMS)
Trig: Free Run

1 2 3 4 5 6
M W W W W W
P P P P P P

Center Frequency
2.441750000 GHz

Span
83.5000000 MHz

Sweep Span
Zero Span

Full Span

Start Freq
2.400000000 GHz

Stop Freq
2.483500000 GHz

AUTO TUNE

CF Step
8.3500000 MHz

Auto
Man

Freq Offset
0 Hz

X Axis Scale
Log
Lin

Signal Track
(Span Zoom)

Local

1 Spectrum
Scale/Div 10 dB
LogRef Lvl Offset 13.01 dB
Ref Level 30.00 dBmStart 2.40000 GHz
#Res BW 300 kHz

#Video BW 300 kHz

Stop 2.48350 GHz
Sweep 1.00 ms (1001 pts)Jun 29, 2026
11:18:10 AM

13. Time of Occupancy (Dwell Time)

13.1. Block diagram of test setup

Same as section 8.1

13.2. Limits

CFR 47 FCC Part15 (15.247), Subpart C ISED RSS-247 ISSUE 4		
Section	Test Item	Limit
CFR 47 15.247 (a) (1) III ISED RSS-247 Clause 5.1 (d)	Time of Occupancy (Dwell Time)	The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds, multiplied by the number of hopping channels employed.

13.3. Test Procedure

Connect the UUT to the spectrum analyzer and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Average
RBW	1 MHz
VBW	≥ RBW
Span	zero span
Trace	Clear Write
Sweep time	As necessary to capture the entire dwell time per hopping channel

Connect the UUT to the spectrum Analyzer and use the following settings:

- The transmitter output (antenna port) was connected to the spectrum analyzer
 - Set RBW of spectrum analyzer to 1 MHz and VBW to 3 MHz.
 - Use a video trigger with the trigger level set to enable triggering only on full pulses.
 - Sweep Time is more than once pulse time.
 - Set the center frequency on any frequency would be measure and set the frequency span to zero span.
 - Measure the maximum time duration of one single pulse.
 - Set the EUT for DH5, DH3 and DH1 packet transmitting.
 - Measure the maximum time duration of one single pulse.
- A Period Time = (channel number)*0.4
- For FHSS Mode (79 Channel):
- DH1 Time Slot: Reading * (1600/2)*31.6/(channel number)
- DH3 Time Slot: Reading * (1600/4)*31.6/(channel number)
- DH5 Time Slot: Reading * (1600/6)*31.6/(channel number)

13.4. Results

Test Mode	Ant.	Freq. (MHz)	Burst Width (ms)	Total Hops (Num)	Result (s)	Limit (s)	Verdict
DH1	Ant1	Hop	0.366	230	0.084	≤0.4	PASS
DH3	Ant1	Hop	1.623	130	0.211	≤0.4	PASS
DH5	Ant1	Hop	-0.020	110	-0.002	≤0.4	PASS
2DH1	Ant1	Hop	0.376	210	0.079	≤0.4	PASS
2DH3	Ant1	Hop	1.628	110	0.179	≤0.4	PASS
2DH5	Ant1	Hop	2.321	90	0.209	≤0.4	PASS
3DH1	Ant1	Hop	0.376	160	0.06	≤0.4	PASS
3DH3	Ant1	Hop	1.626	110	0.179	≤0.4	PASS

3DH5	Ant1	Hop	2.878	90	0.259	≤0.4	PASS
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Note: Offset=cable loss + Test system insertion loss

13.5. Original test data

