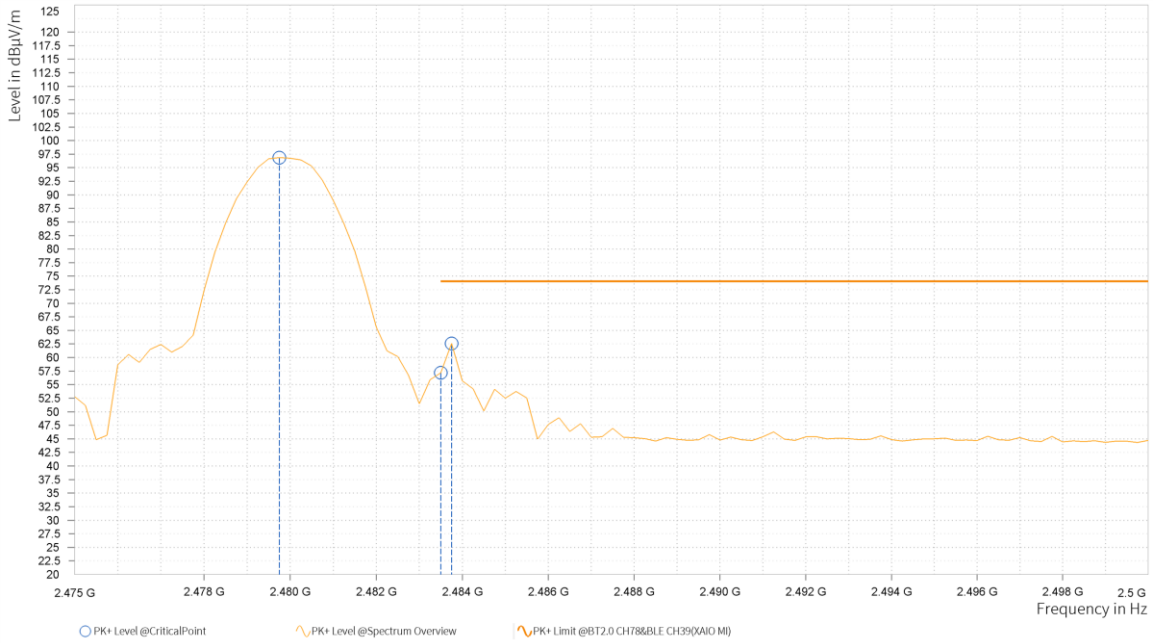
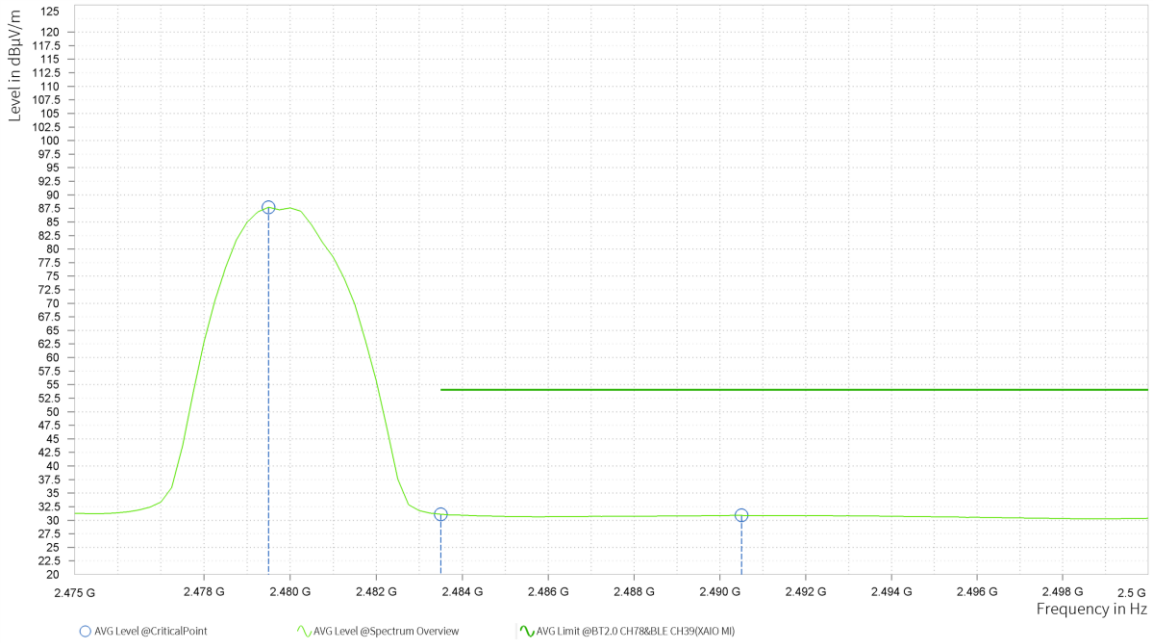
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.750	96.86			5.89	V	285.4	2.0
6	2,483.500	57.19	74.0	16.81	5.91	V	359.0	1.0
6	2,483.750	62.6	74.0	11.4	5.92	V	285.4	2.0



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,479.500	87.71			5.89	V	284.2	2.0
6	2,483.500	31.1	54.0	22.9	5.91	V	237.1	1.0
6	2,490.500	30.89	54.0	23.11	5.96	V	124.1	2.0



REMARKS:

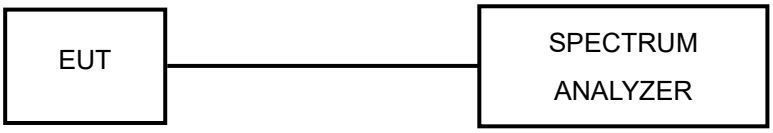
1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Limit value – Emission level.
2. 2480MHz: Fundamental frequency.

3.3 NUMBER OF HOPPING FREQUENCY USED

3.3.1 LIMIT OF HOPPING FREQUENCY USED

At least 15 channels frequencies, and should be equally spaced.

3.3.2 TEST SETUP



3.3.3 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	R&S	ESW 44	101973	Mar.28,24	Mar.27,26
Open Switch and Control Unit	R&S	OSP-B157W8	100836	N/A	N/A
Vector Signal Generator	R&S	SMBV100B	102176	Mar.29,24	Mar.28,26
Signal Generator	R&S	SMB100A03	182185	Mar.29,24	Mar.28,26
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Hygrothermograph	DELI	20210528	SZ015	Sep.06,22	Sep.05,24
Hygrothermograph	DELI	20210528	SZ015	Sep.05,24	Sep.04,26
PC	LENOVO	E14	HRSW0024	N/A	N/A
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.27,24	Apr.26,25
Test Software	EMC32	EMC32	N/A	N/A	N/A
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26
Power Meter	R&S	NRX	102380	Mar.28,24	Mar.27,26
Power Meter probe	R&S	NRP6A	102942	Mar.28,24	Mar.27,26

NOTE:

1. The calibration interval of the above test instruments is 12 /24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.

3.3.4 TEST PROCEDURES

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.

c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.

d. Set the SA on View mode and then plot the result on SA screen.

e. Repeat above procedures until all frequencies measured were completed.

3.3.5 DEVIATION FROM TEST STANDARD

No deviation.

3.3.6 TEST RESULTS

There are 79 hopping frequencies in the hopping mode. Please refer to next two pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.

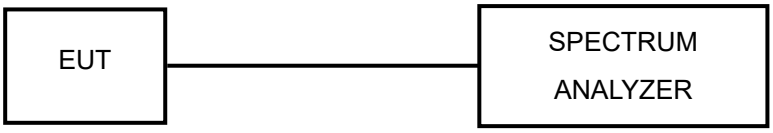
Please Refer to Appendix Of this test report.

3.4 DWELL TIME ON EACH CHANNEL

3.4.1 LIMIT OF DWELL TIME USED

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.

3.4.2 TEST SETUP



3.4.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.4.4 TEST PROCEDURES

a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.

c. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.

d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.

e. Repeat above procedures until all different time-slot modes have been completed.

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 TEST RESULTS

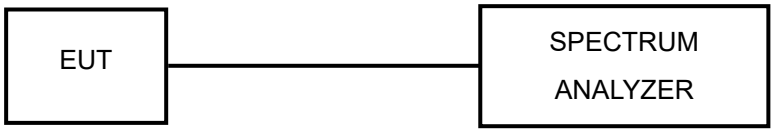
Please Refer to Appendix Of this test report

3.5 CHANNEL BANDWIDTH

3.5.1 LIMITS OF CHANNEL BANDWIDTH

For frequency hopping system operating in the 2400-2483.5MHz, If the 20dB bandwidth of hopping channel is greater than 25kHz, two-thirds 20dBbandwidth of hopping channel shell be a minimum limit for the hopping channel separation.

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.5.4 TEST PROCEDURE

a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.

d. Repeat above procedures until all frequencies measured were complete.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.

3.5.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.5.7 TEST RESULTS

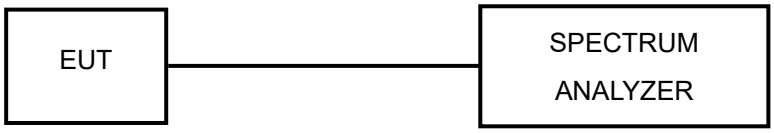
Please Refer to Appendix Of this test report.

3.6 HOPPING CHANNEL SEPARATION

3.6.1 LIMIT OF HOPPING CHANNEL SEPARATION

At least 25kHz or two-third of 20dB hopping channel bandwidth (whichever is greater).

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.6.4 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the MaxHold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

3.6.5 DEVIATION FROM TEST STANDARD

No deviation.

3.6.6 TEST RESULTS

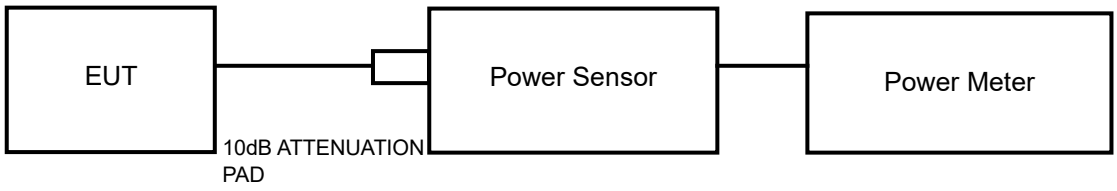
Please Refer to Appendix Of this test report.

3.7 MAXIMUM OUTPUT POWER

3.7.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

The Maximum Output Power Measurement is 125mW.

3.7.2 TEST SETUP



3.7.3 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.7.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

3.7.5 DEVIATION FROM TEST STANDARD

No deviation.

3.7.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.7.7 TEST RESULTS

3.7.7.1 MAXIMUM PEAK OUTPUT POWER

Please Refer to Appendix Of this test report.

3.7.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

Please Refer to Appendix Of this test report.

3.8 OUT OF BAND MEASUREMENT

3.8.1 LIMITS OF OUT OF BAND MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100KHz RBW).

3.8.2 TEST INSTRUMENTS

Refer to section 3.3.3 to get information of above instrument.

3.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Spectrum Analyzer was set RBW to 100 kHz and VBW to 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. Detector = PEAK and Trace mode = Max Hold. The band edges was measured and recorded.

3.8.4 DEVIATION FROM TEST STANDARD

No deviation.

3.8.5 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.8.6 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.

Please Refer to Appendix Of this test report.

4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

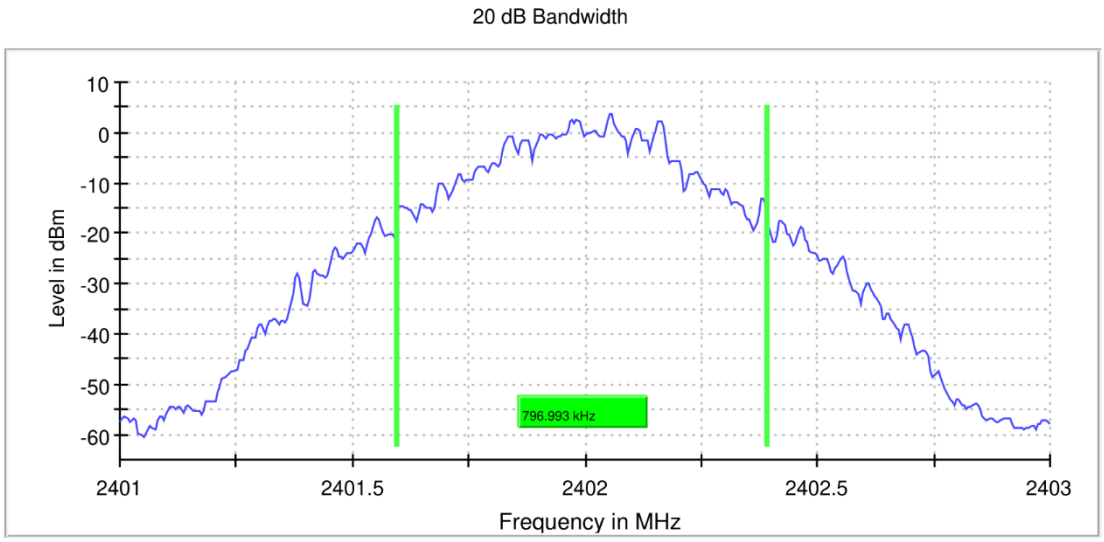
6 Appendix

20DB EMISSION BANDWIDTH

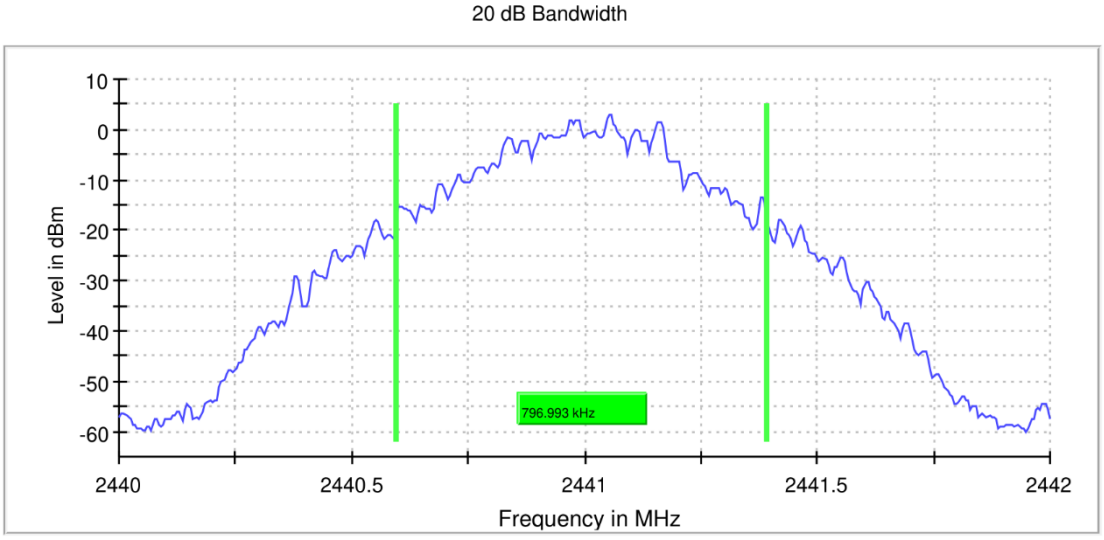
TEST RESULT

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	ANT4	2402	0.797	2401.596	2402.393	---	PASS
		2441	0.797	2440.596	2441.393	---	PASS
		2480	0.797	2479.596	2480.393	---	PASS
2DH5	ANT4	2402	1.208	2401.391	2402.599	---	PASS
		2441	1.208	2440.391	2441.599	---	PASS
		2480	1.208	2479.391	2480.599	---	PASS
3DH5	ANT4	2402	1.253	2401.366	2402.619	---	PASS
		2441	1.253	2440.366	2441.619	---	PASS
		2480	1.253	2479.366	2480.619	---	PASS

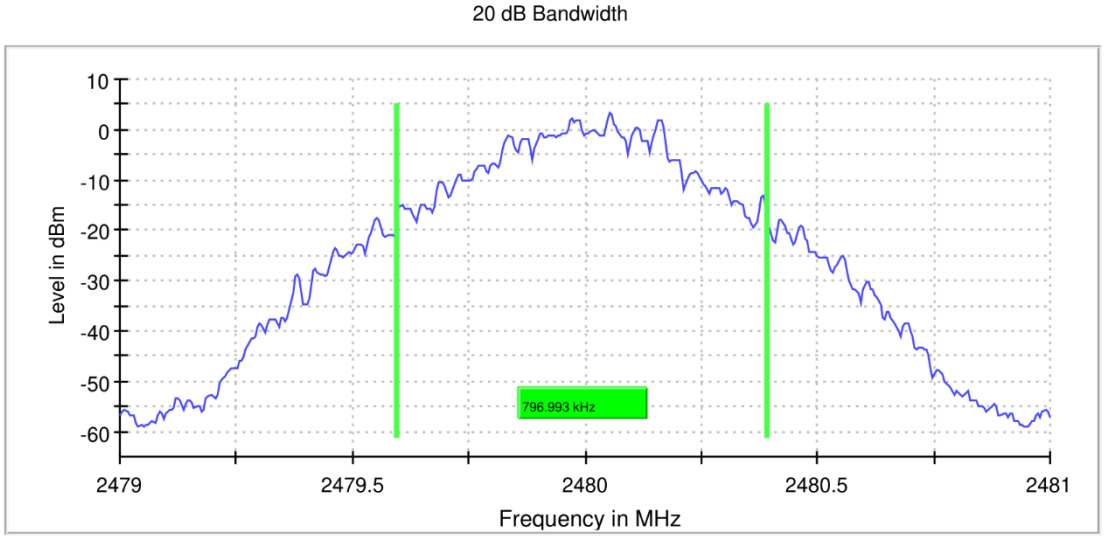
TEST GRAPHS



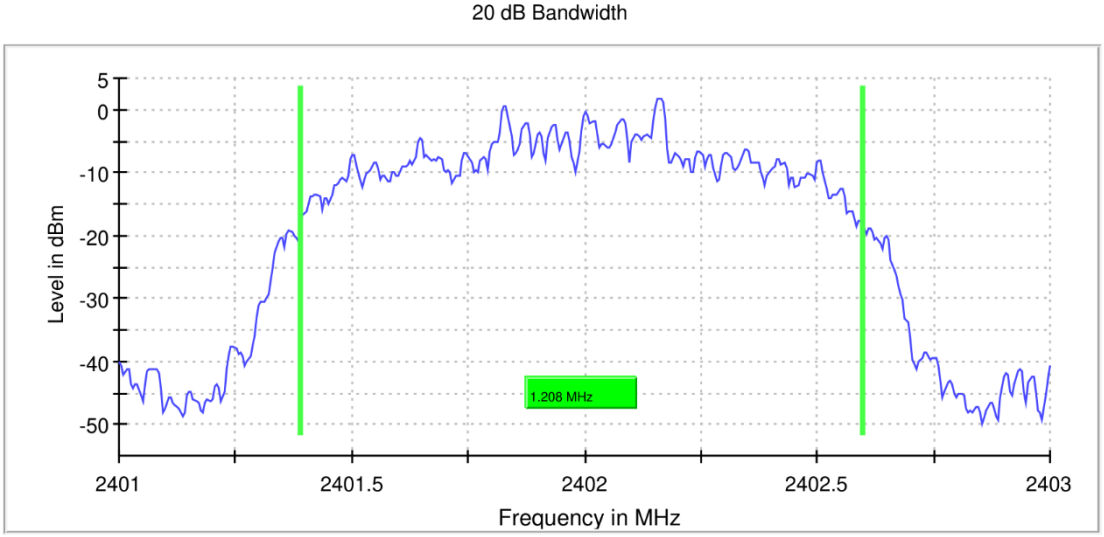
DH5_ANT4_2402



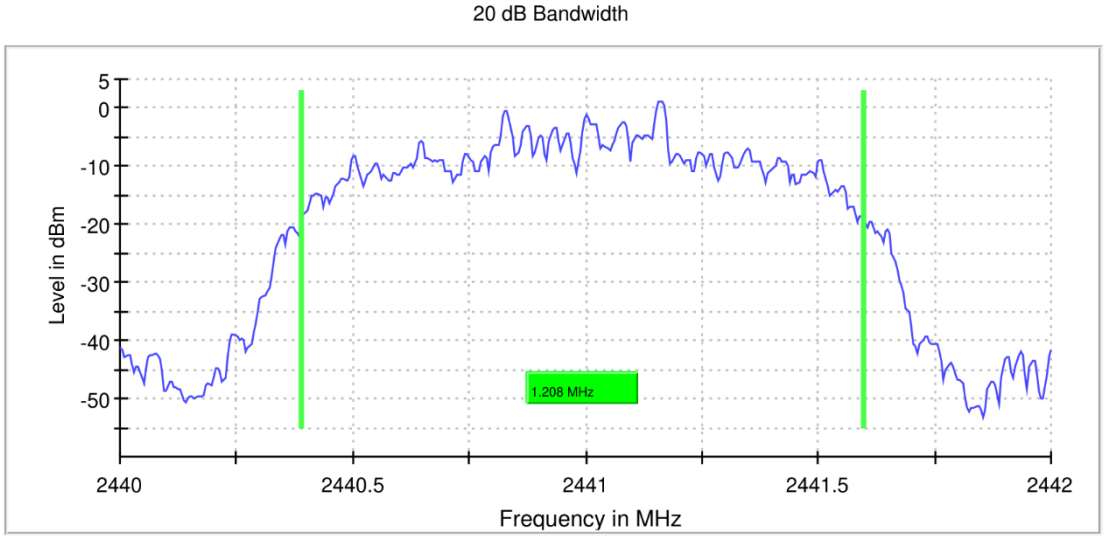
DH5_ANT4_2441



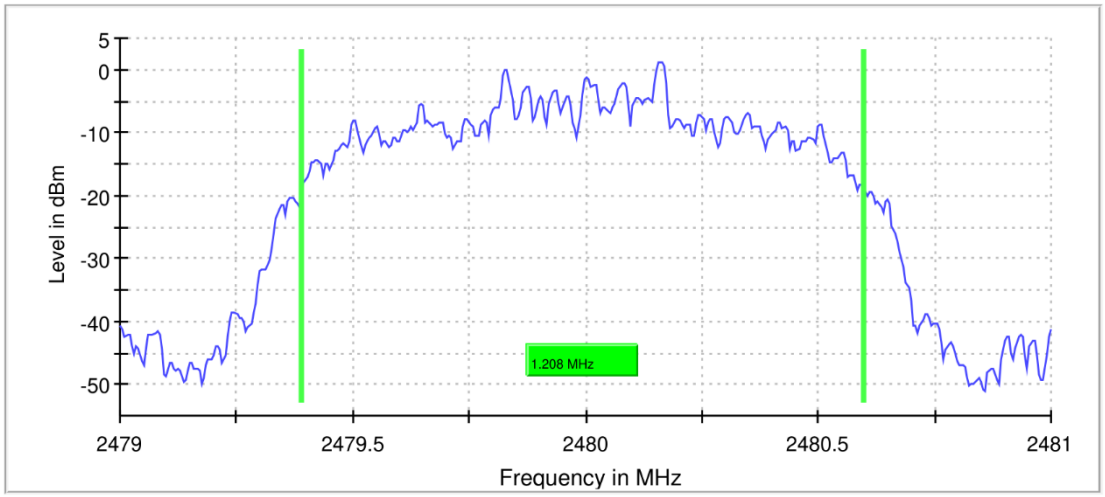
DH5_ANT4_2480



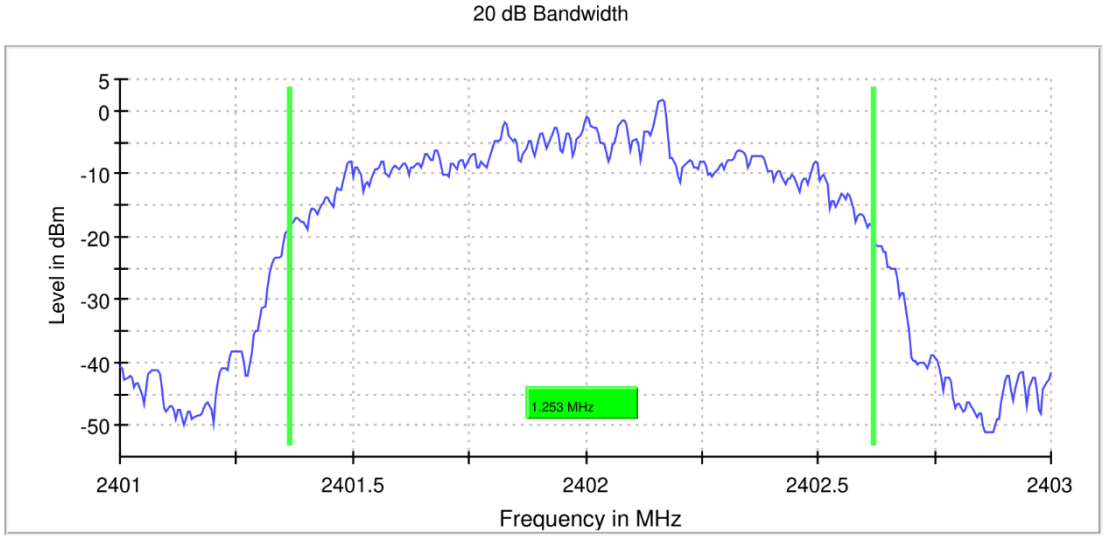
2DH5_ANT4_2402



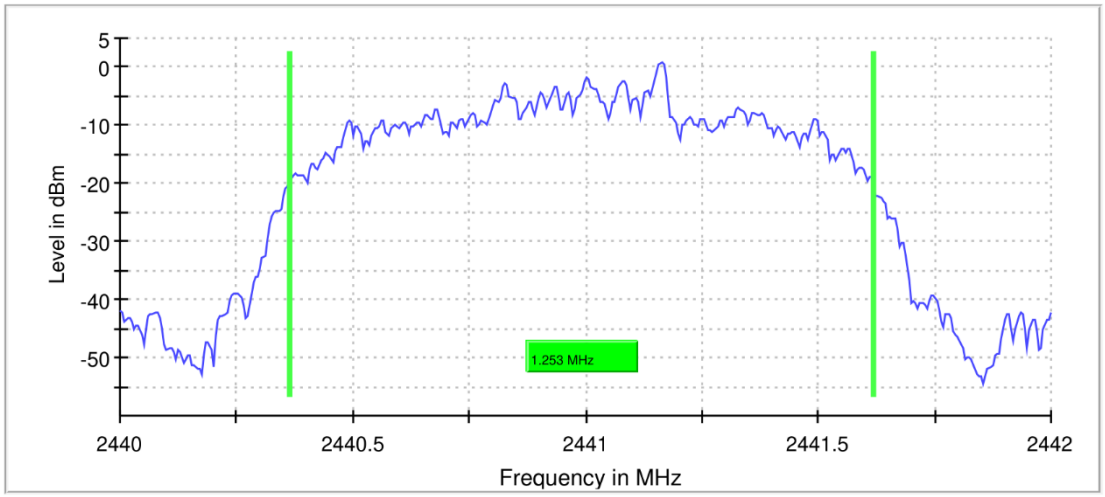
2DH5_ANT4_2441



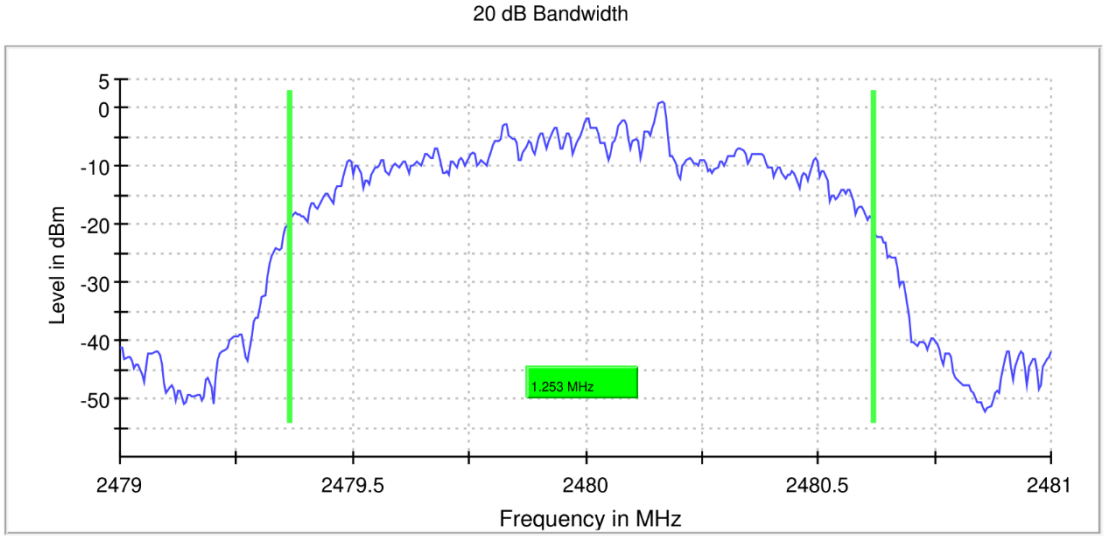
2DH5_ANT4_2480



3DH5_ANT4_2402



3DH5_ANT4_2441



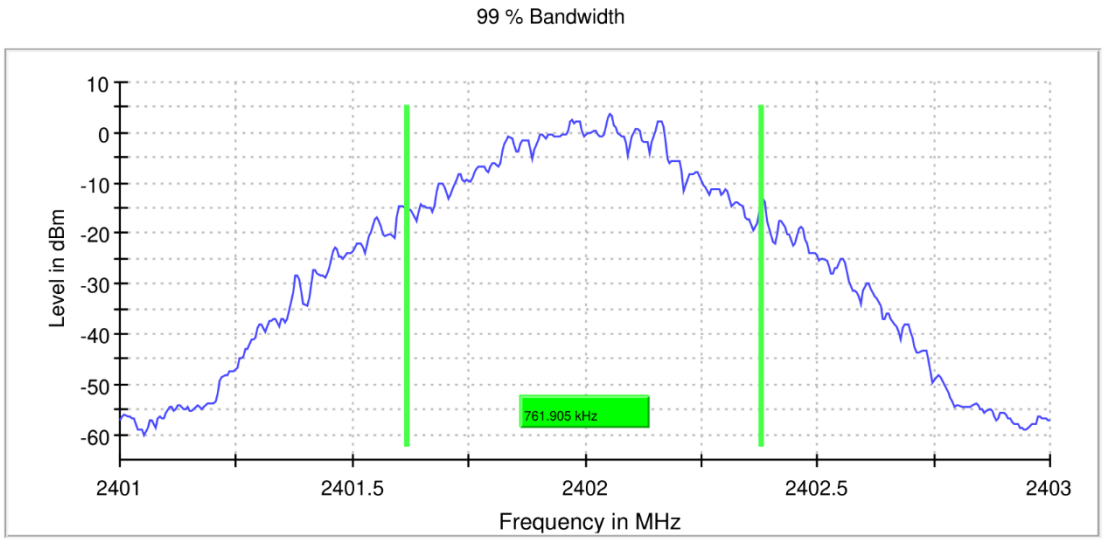
3DH5_ANT4_2480
RBW 10.000 kHz VBW 30.000 kHz

OCCUPIED CHANNEL BANDWIDTH

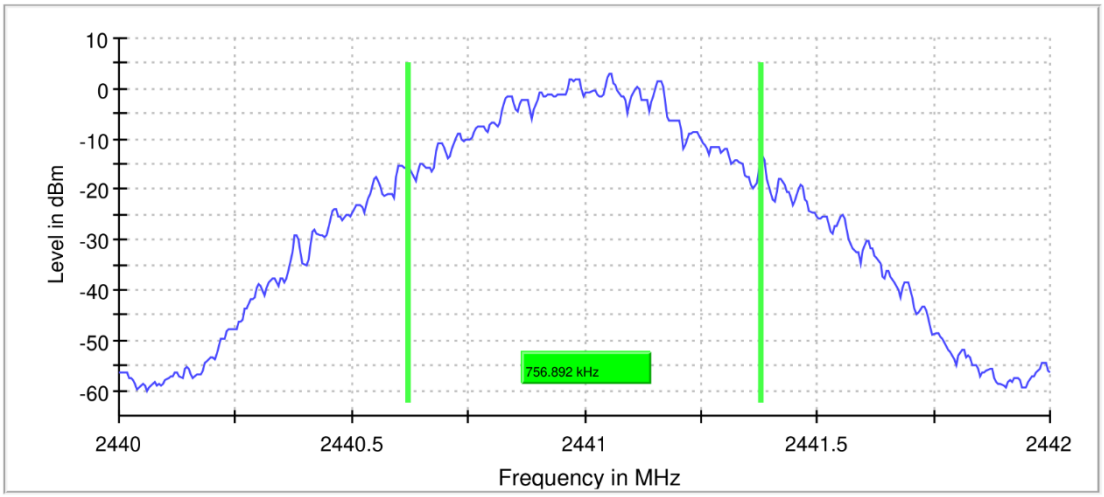
TEST RESULT

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	ANT4	2402	0.762	2401.617	2402.379	---	PASS
		2441	0.757	2440.622	2441.379	---	PASS
		2480	0.762	2479.617	2480.379	---	PASS
2DH5	ANT4	2402	1.143	2401.416	2402.559	---	PASS
		2441	1.138	2440.421	2441.559	---	PASS
		2480	1.143	2479.421	2480.564	---	PASS
3DH5	ANT4	2402	1.153	2401.416	2402.569	---	PASS
		2441	1.148	2440.421	2441.569	---	PASS
		2480	1.153	2479.416	2480.569	---	PASS

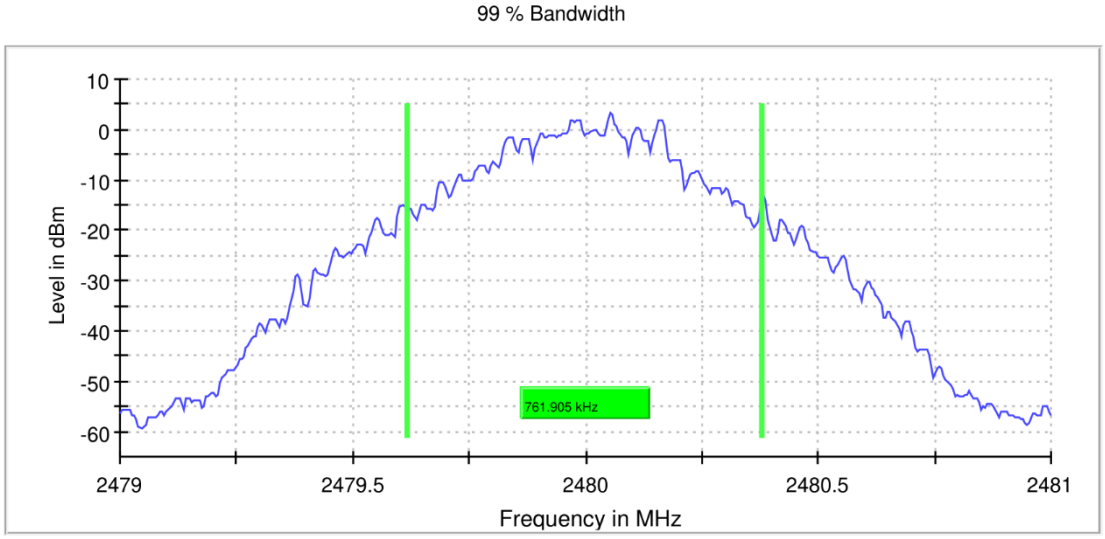
TEST GRAPHS



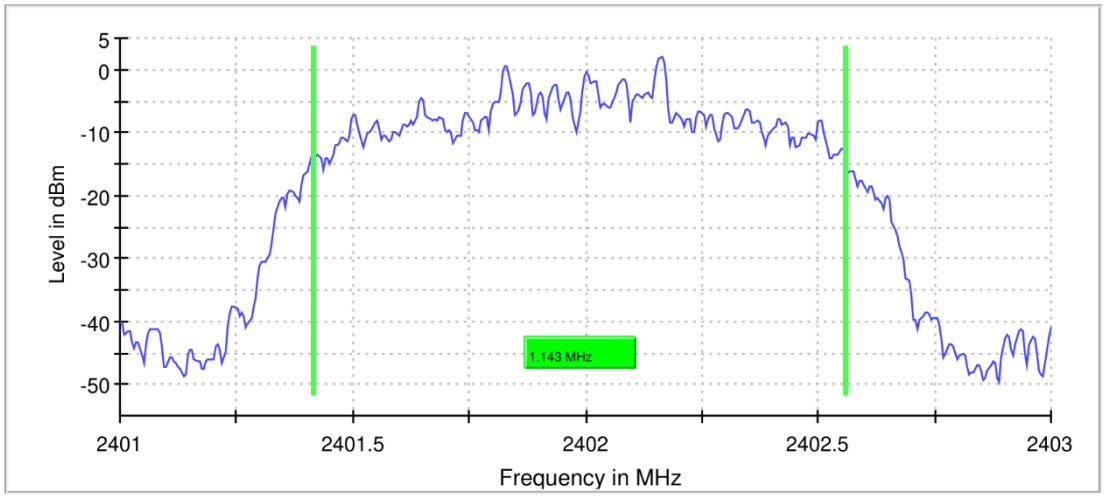
DH5_ANT4_2402



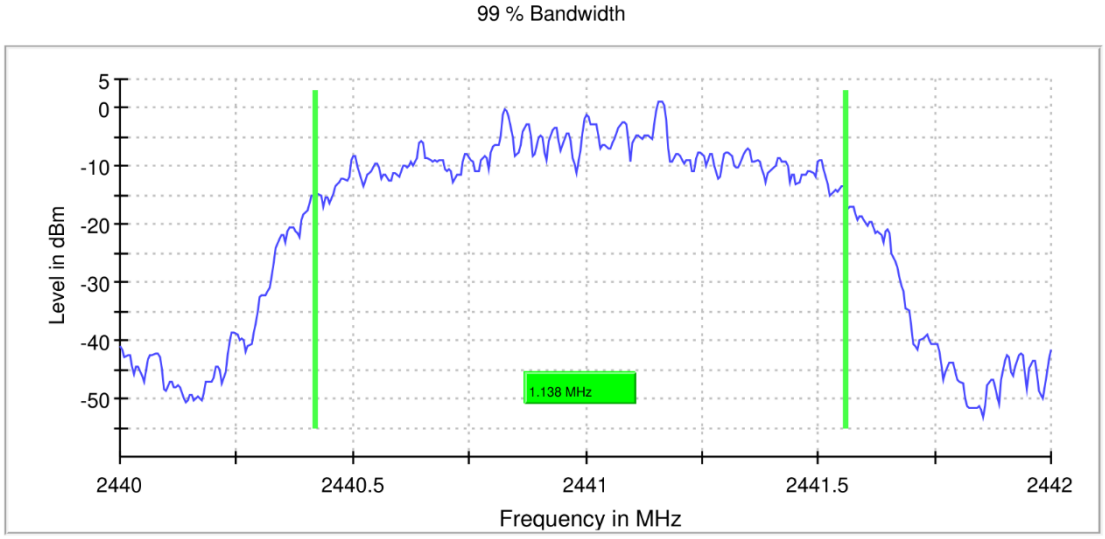
DH5_ANT4_2441



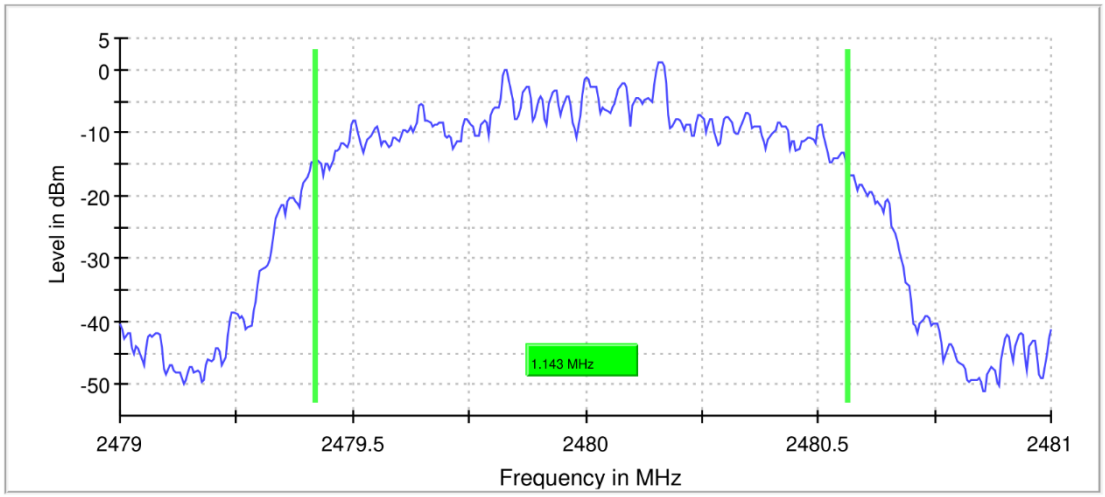
DH5_ANT4_2480



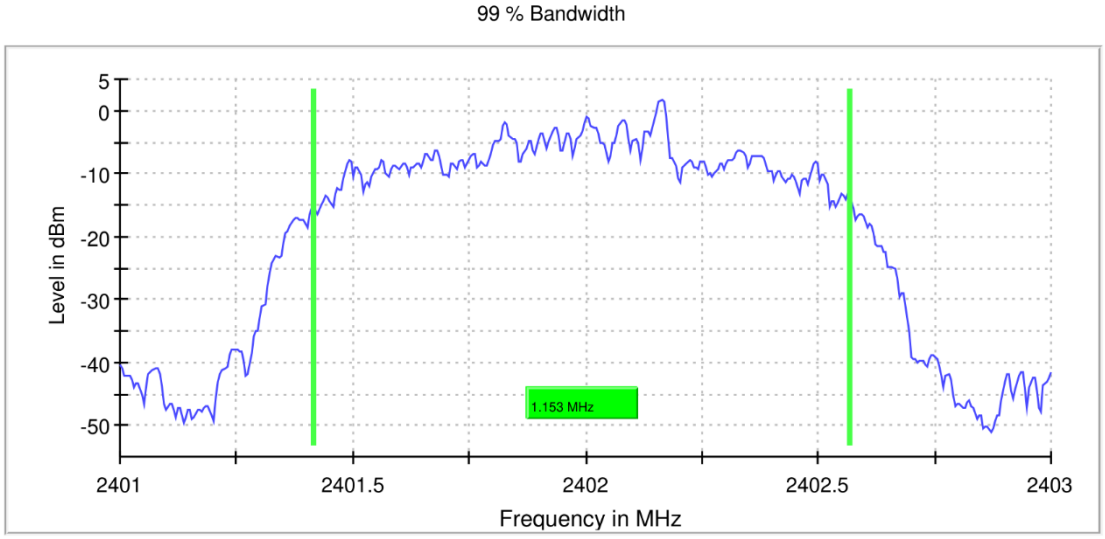
2DH5_ANT4_2402



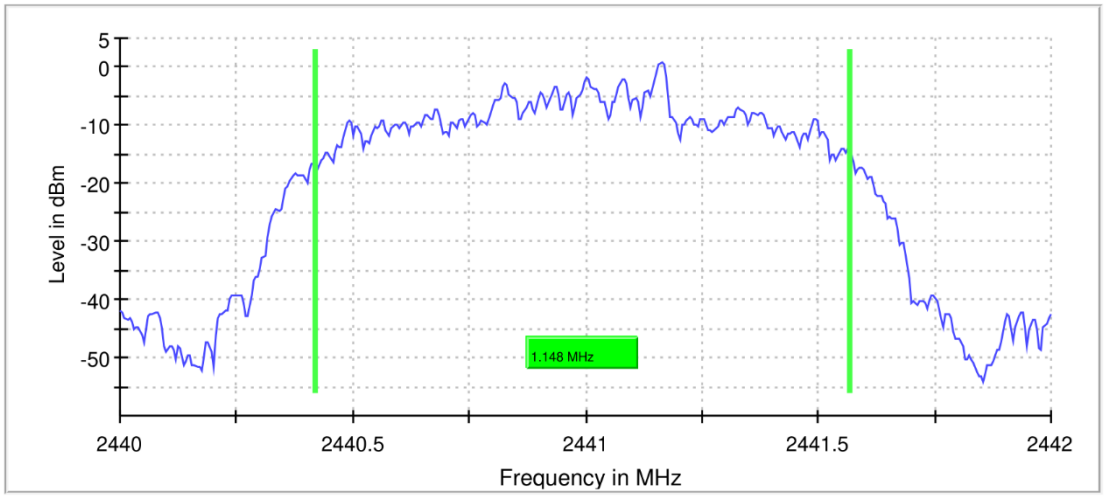
2DH5_ANT4_2441



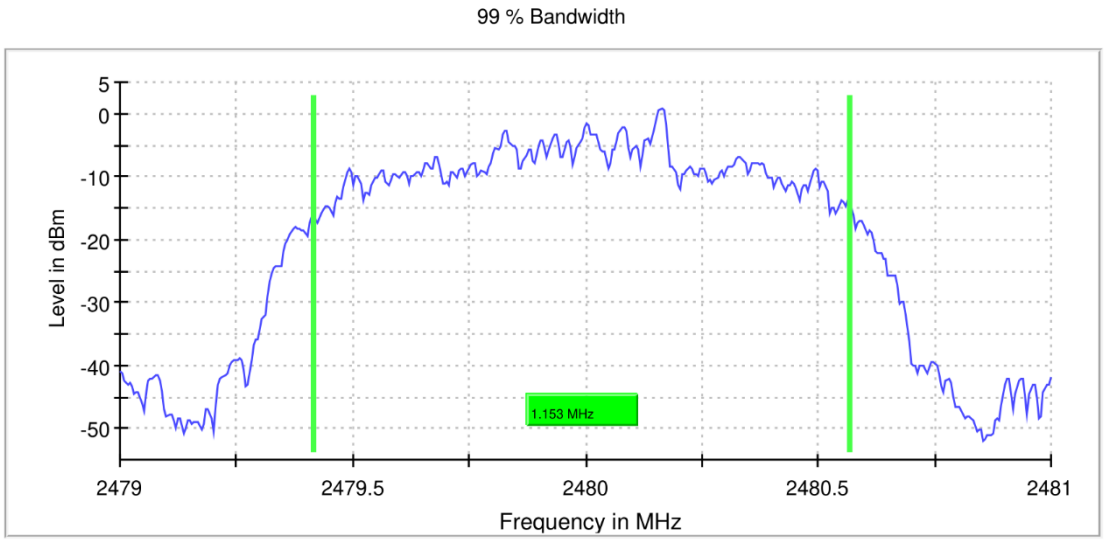
2DH5_ANT4_2480



3DH5_ANT4_2402



3DH5_ANT4_2441



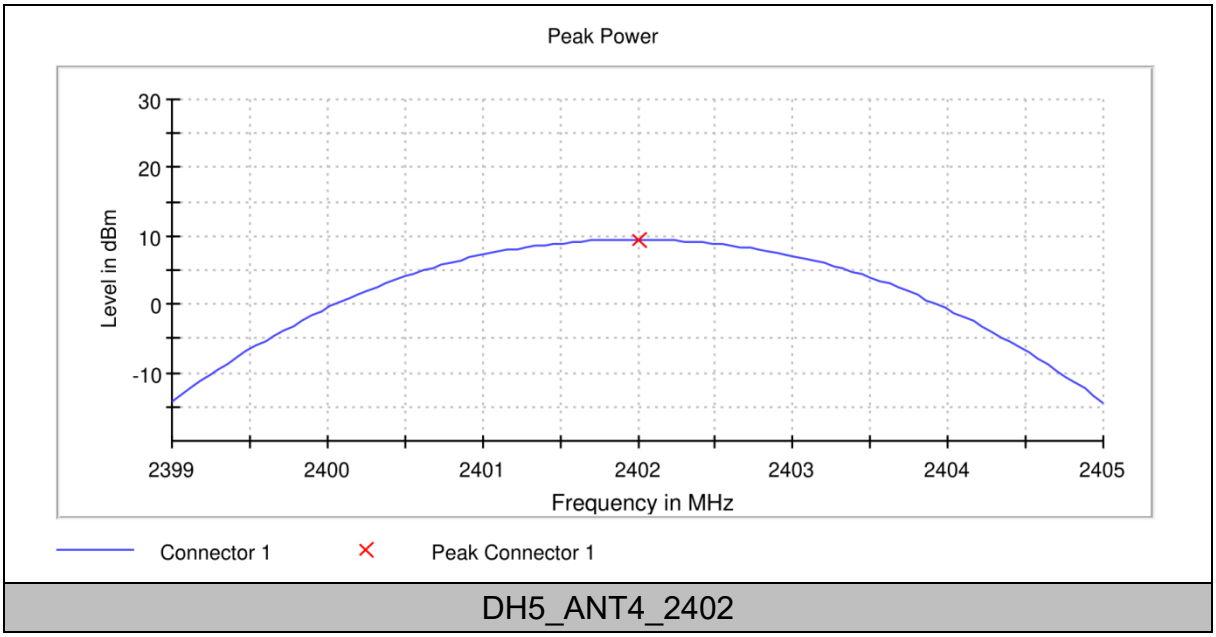
3DH5_ANT4_2480
RBW 10.000 kHz VBW 30.000 kHz

MAXIMUM CONDUCTED OUTPUT POWER

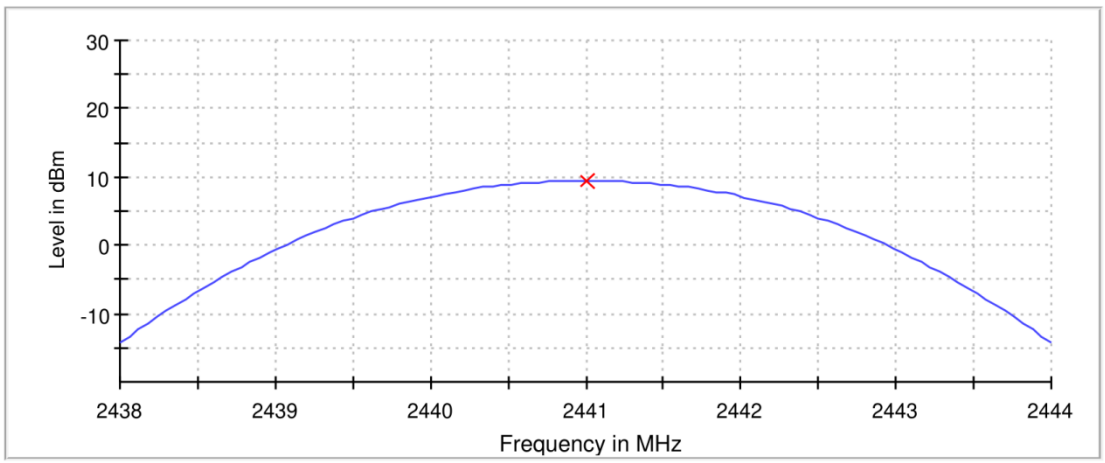
TEST RESULT

TestMode	Antenna	Frequency [MHz]	Average power [dBm]	Peak Power [dBm]	Peak Power [mw]	Conducted Limit [dBm]	Verdict
DH5	Ant1	2402	9.05	9.60	9.12	≤30.00	PASS
		2441	9.08	9.44	8.80	≤30.00	PASS
		2480	9.09	9.53	8.98	≤30.00	PASS
2DH5	Ant1	2402	6.53	9.47	8.86	≤30.00	PASS
		2441	5.86	8.72	7.45	≤30.00	PASS
		2480	6.35	9.21	8.34	≤30.00	PASS
3DH5	Ant1	2402	6.44	9.38	8.67	≤30.00	PASS
		2441	5.87	8.53	7.13	≤30.00	PASS
		2480	6.33	9.15	8.22	≤30.00	PASS

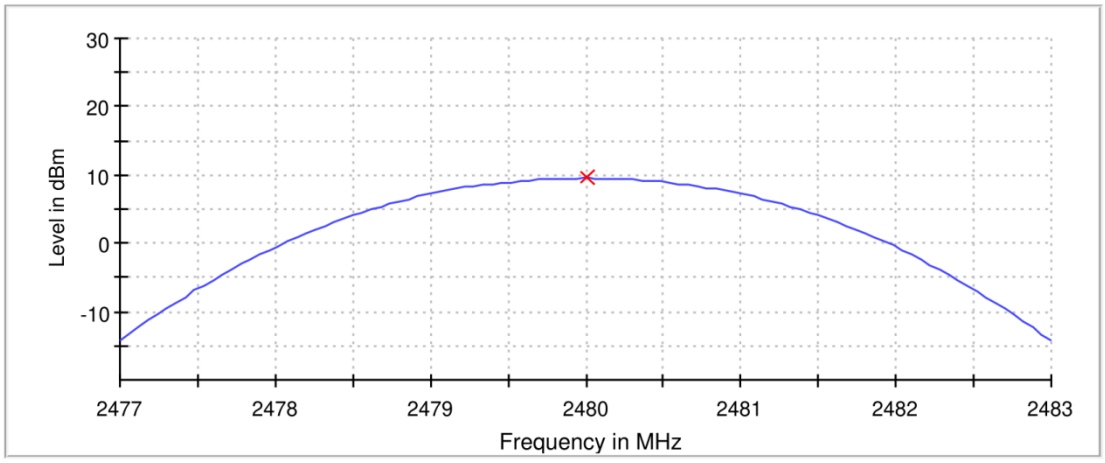
TEST GRAPHS



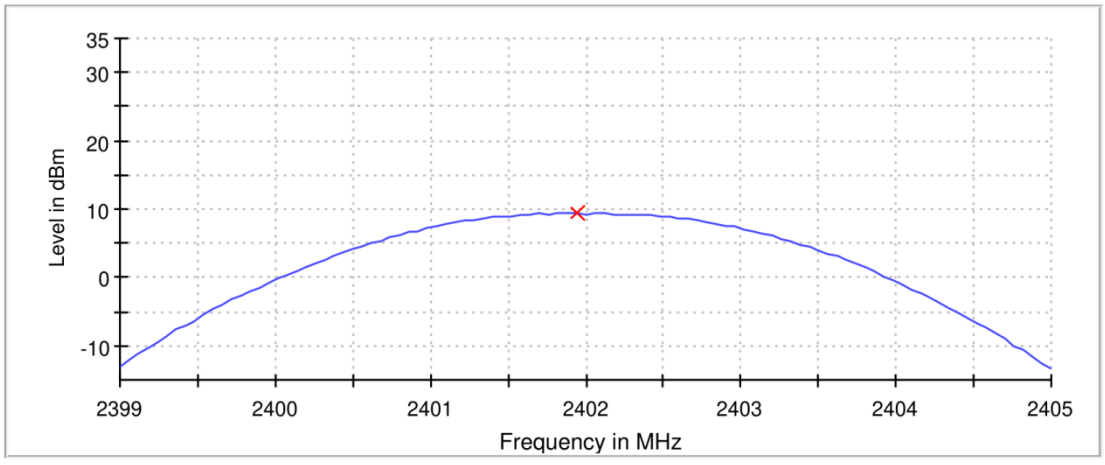
DH5_ANT4_2402



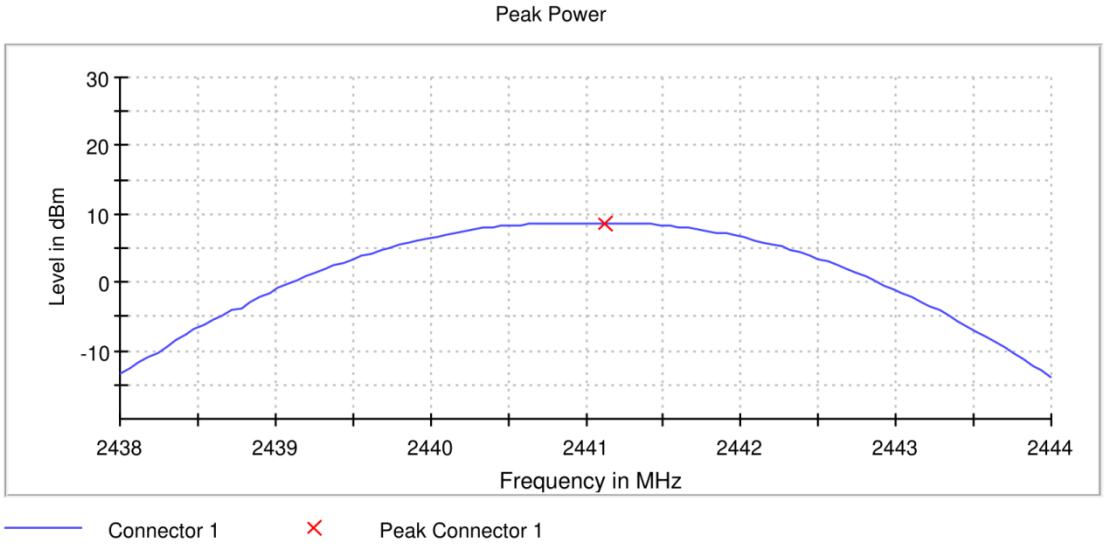
DH5_ANT4_2441



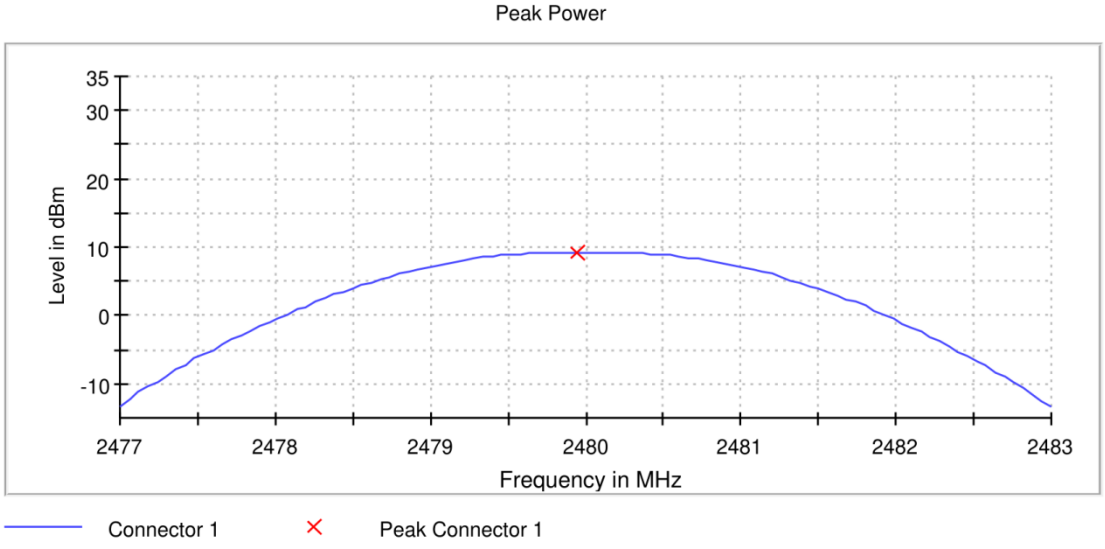
DH5_ANT4_2480



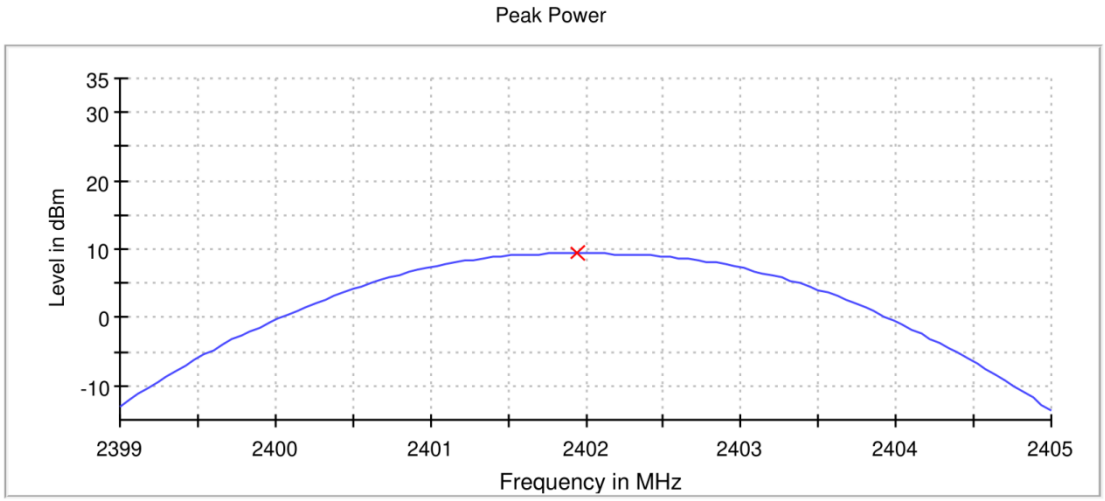
2DH5_ANT4_2402



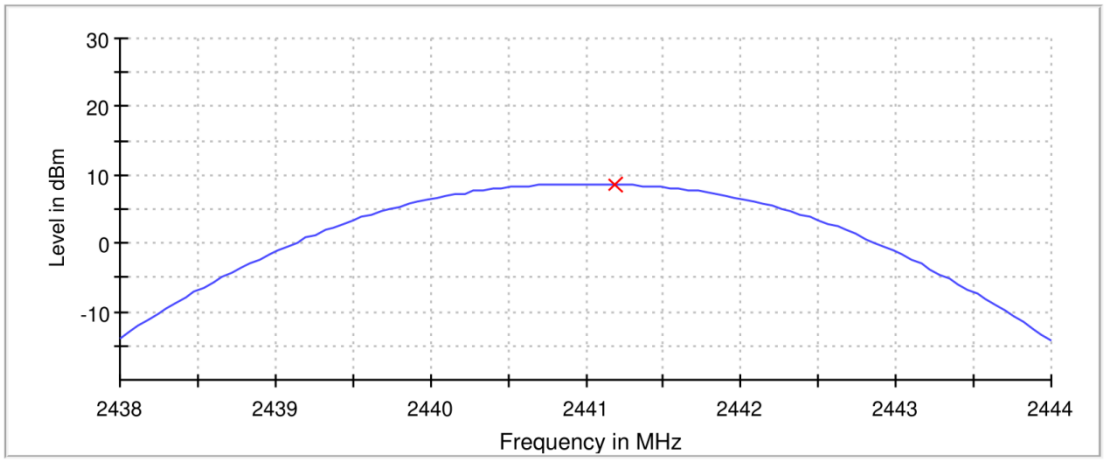
2DH5_ANT4_2441



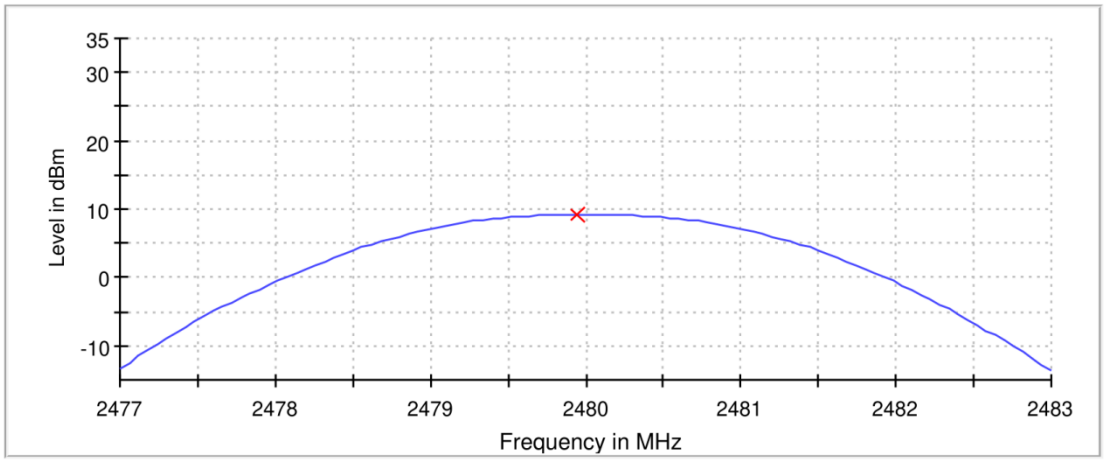
2DH5_ANT4_2480



3DH5_ANT4_2402



3DH5_ANT4_2441



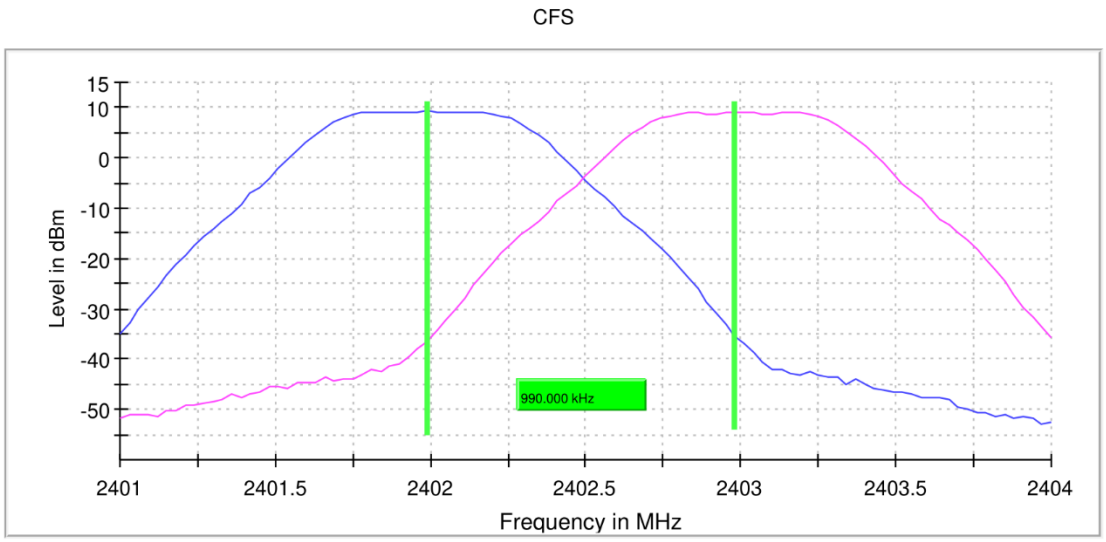
3DH5_ANT4_2480
RBW 100.000 kHz VBW 300.000 kHz

CARRIER FREQUENCY SEPARATION

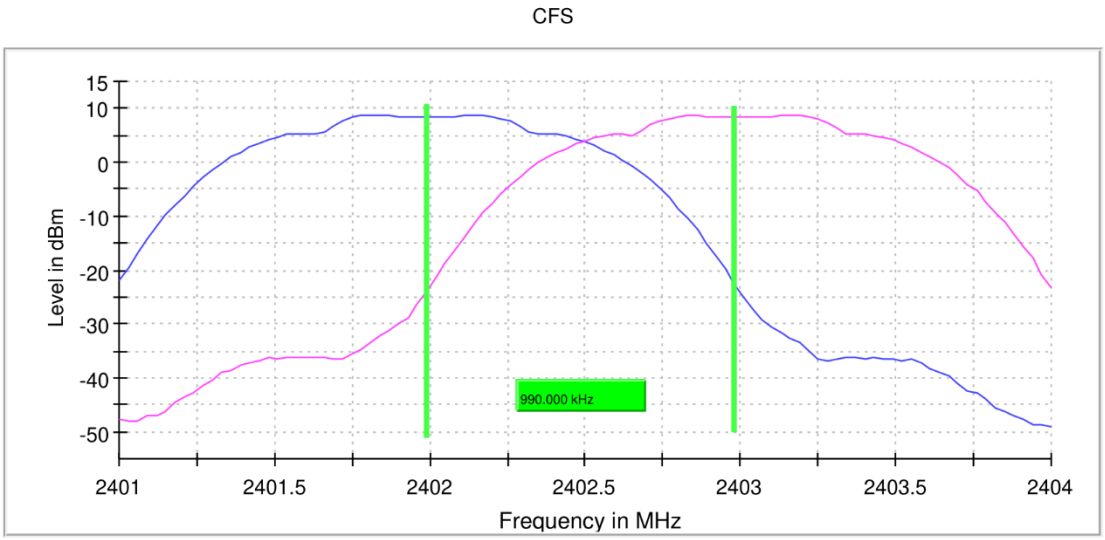
TEST RESULT

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	ANT4	Hop	0.990	≥0.5313	PASS
2DH5	ANT4	Hop	0.990	≥0.8053	PASS
3DH5	ANT4	Hop	0.990	≥0.8353	PASS

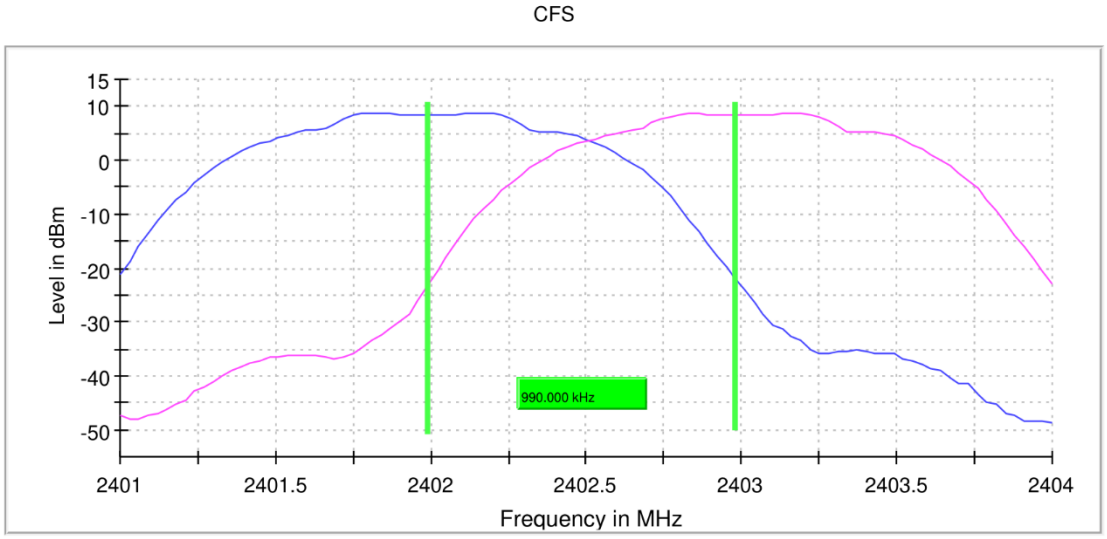
TEST GRAPHS



DH5_ANT4_Hop



2DH5_ANT4_Hop



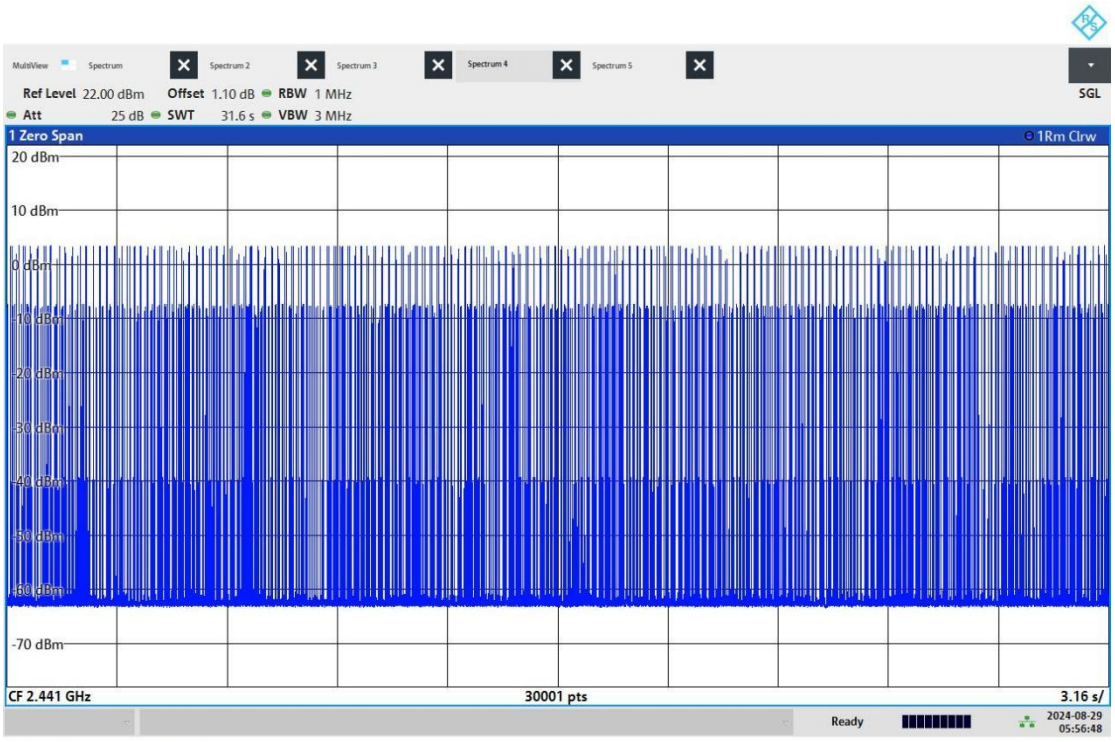
3DH5_ANT4_Hop
RBW 300.000 kHz
VBW 300.000 kHz

TIME OF OCCUPANCY

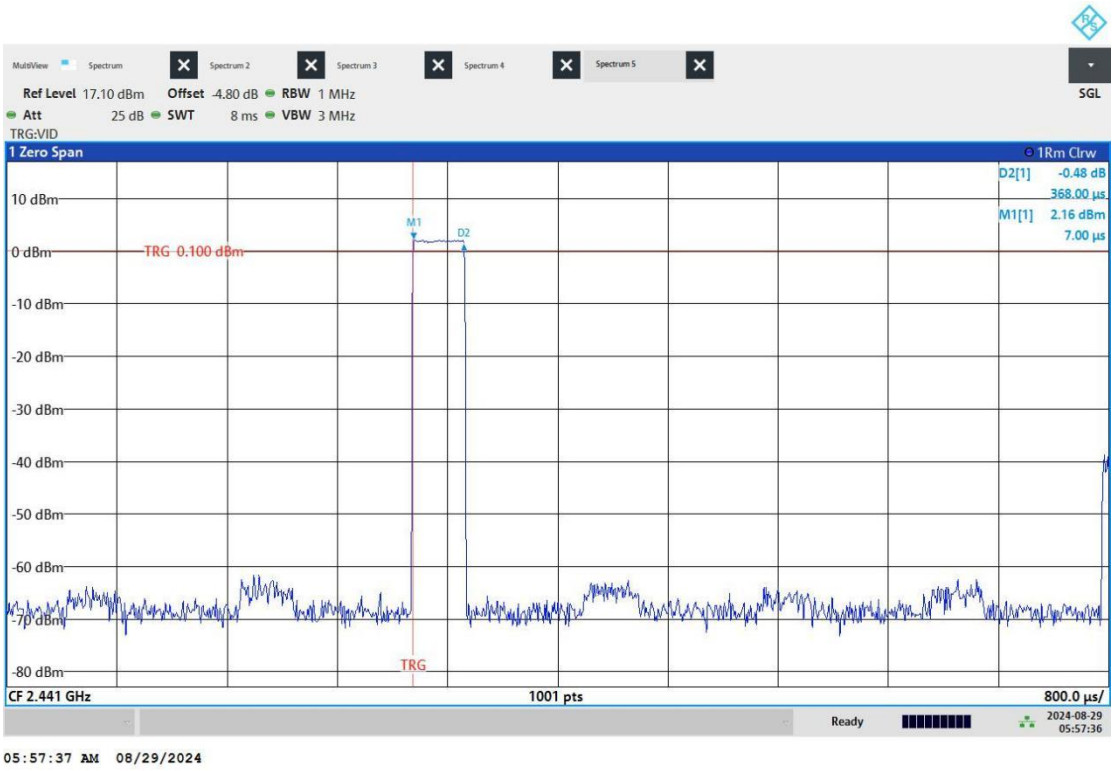
TEST RESULT

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	ANT4	Hop	0.368	213	78.384	≤0.4	PASS
DH3	ANT4	Hop	1.616	131	211.696	≤0.4	PASS
DH5	ANT4	Hop	2.872	106	304.432	≤0.4	PASS
2DH1	ANT4	Hop	0.376	224	84.224	≤0.4	PASS
2DH3	ANT4	Hop	1.624	147	238.728	≤0.4	PASS
2DH5	ANT4	Hop	2.880	103	296.640	≤0.4	PASS
3DH1	ANT4	Hop	0.376	216	81.216	≤0.4	PASS
3DH3	ANT4	Hop	1.624	152	246.848	≤0.4	PASS
3DH5	ANT4	Hop	2.880	110	316.800	≤0.4	PASS

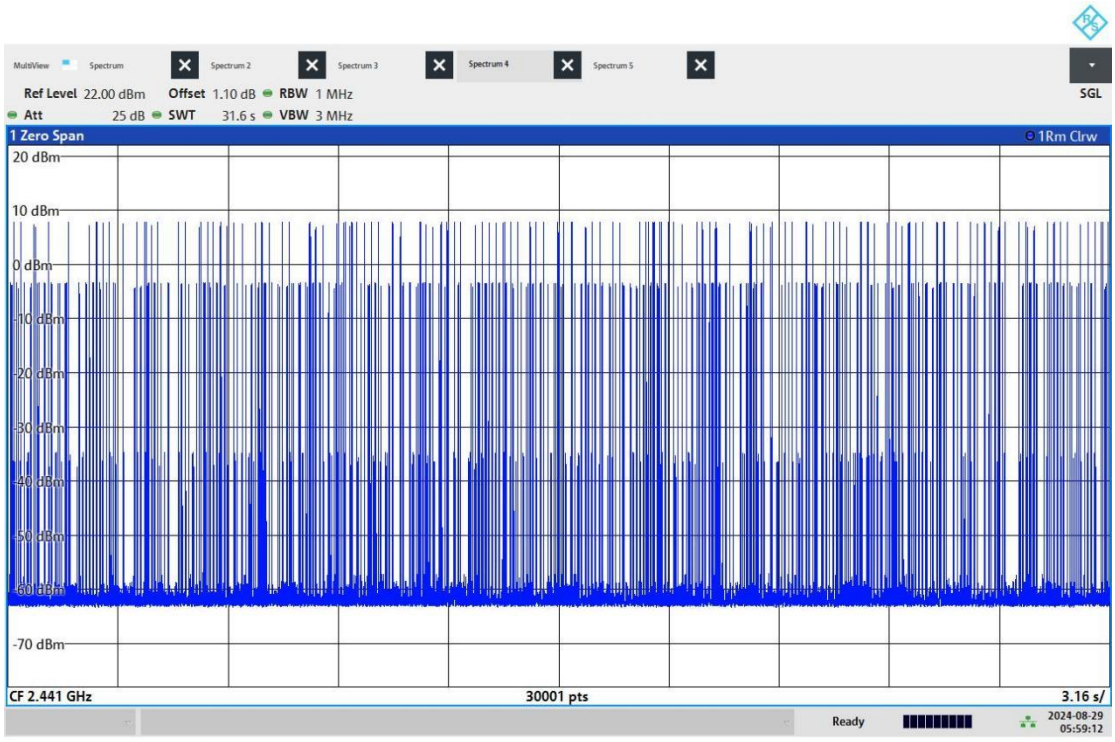
TEST GRAPHS



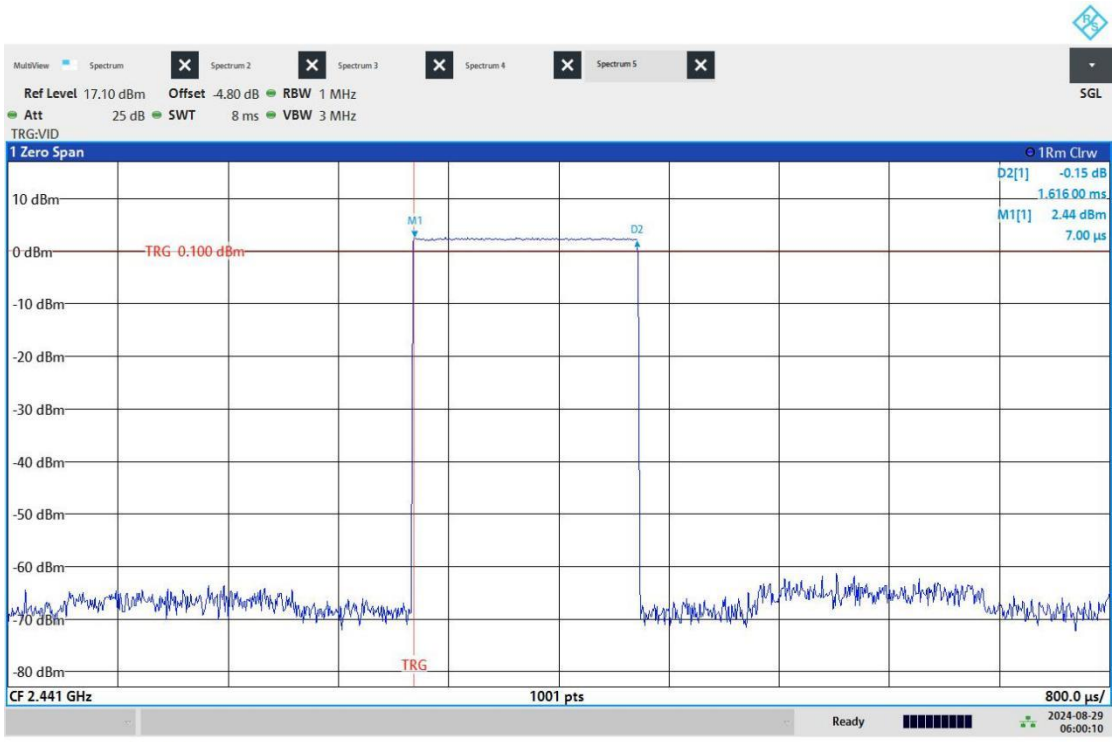
DH1_ANT4_Hop



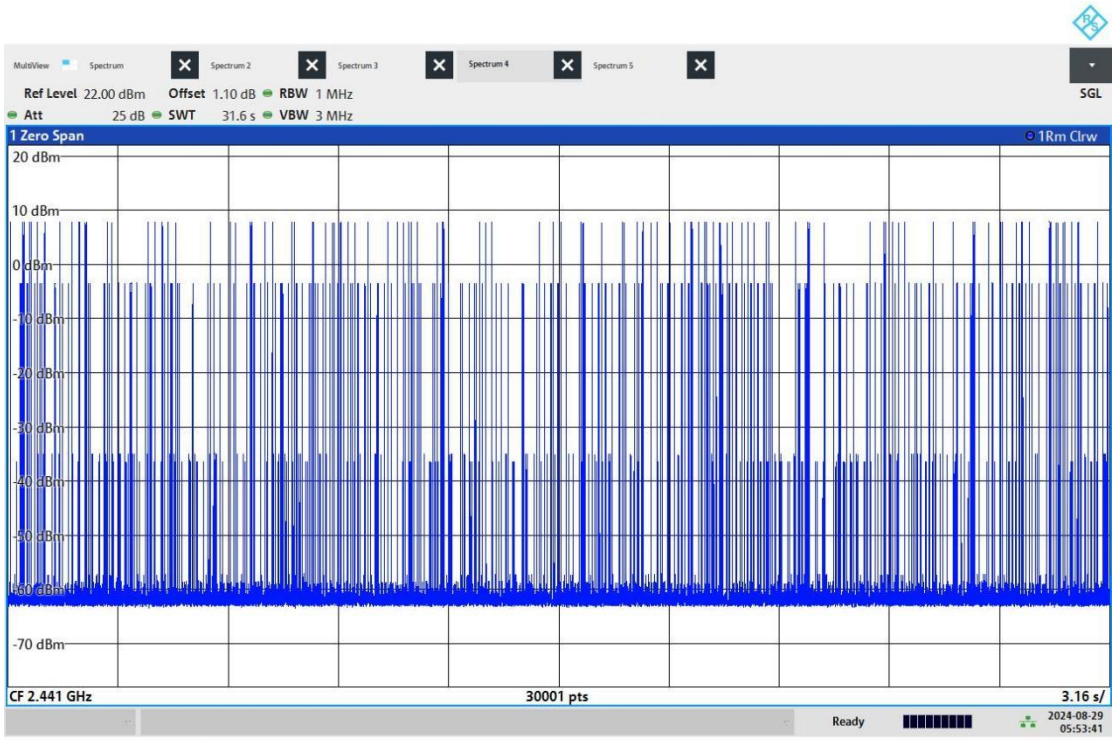
DH1_ANT4_Hop



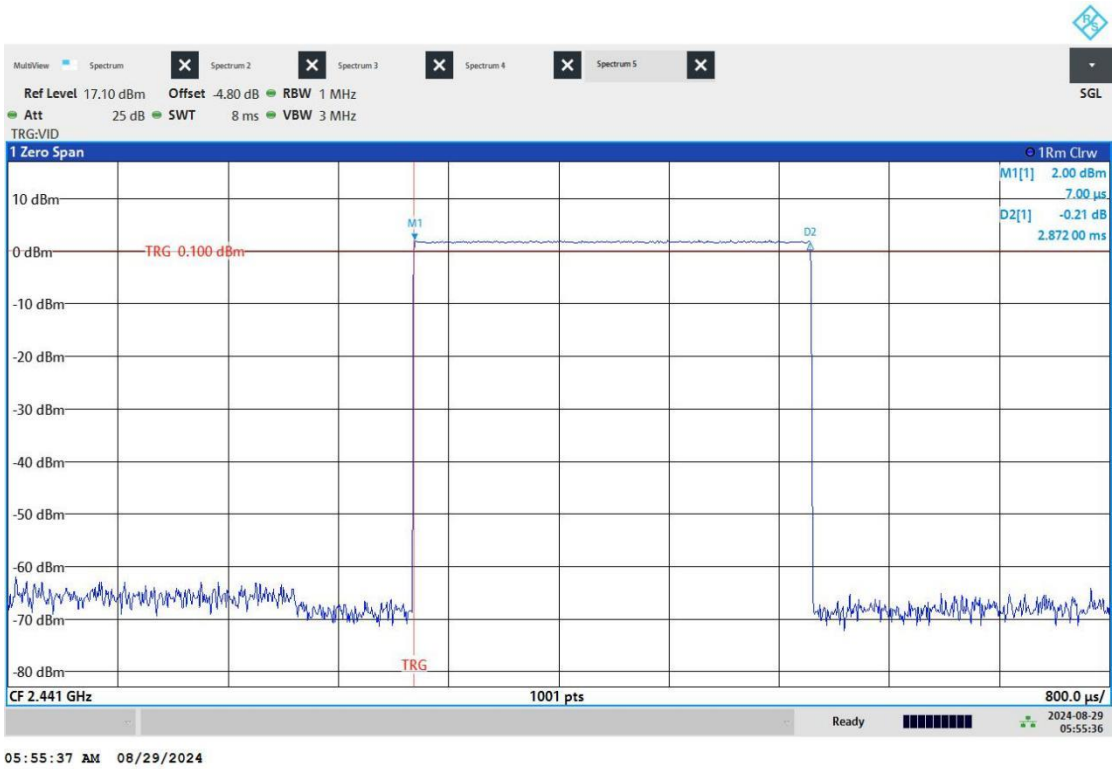
DH3_ANT4_Hop



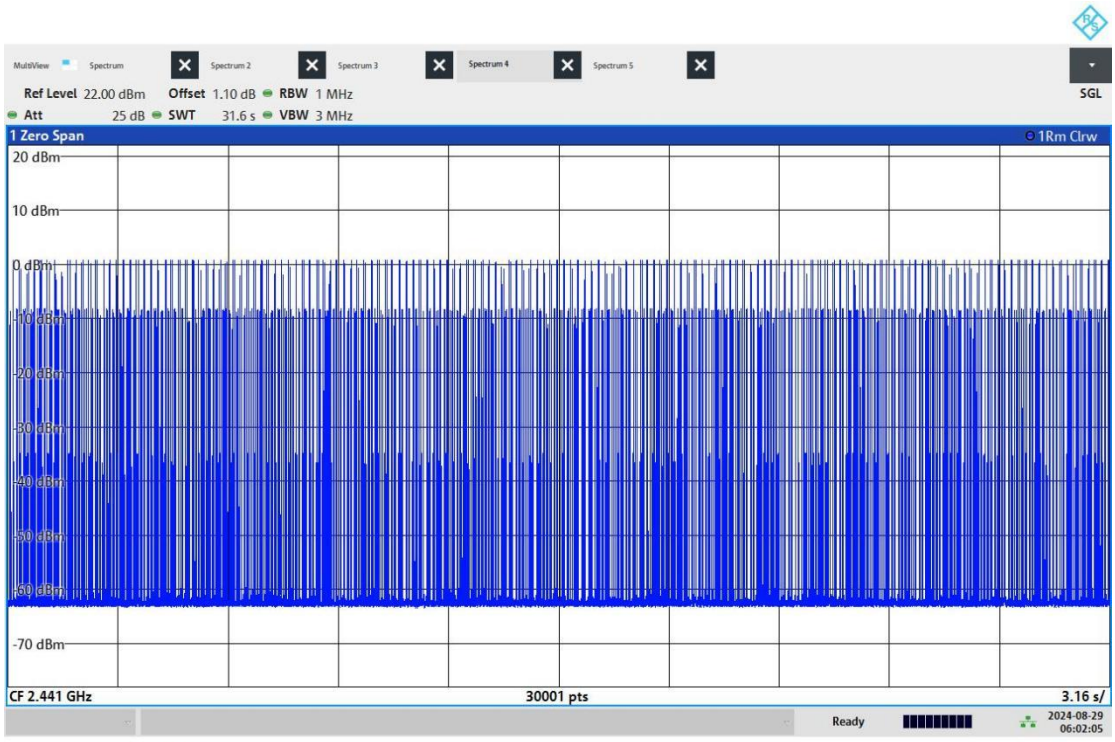
DH3_ANT4_Hop



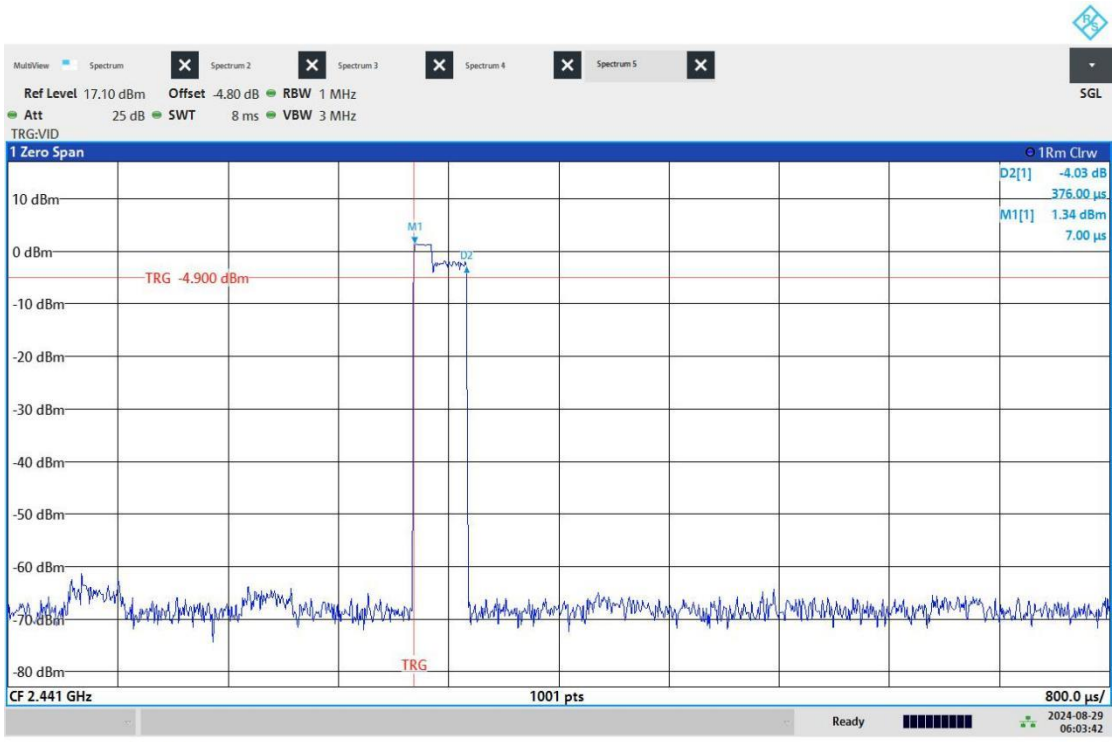
DH5_ANT4_Hop



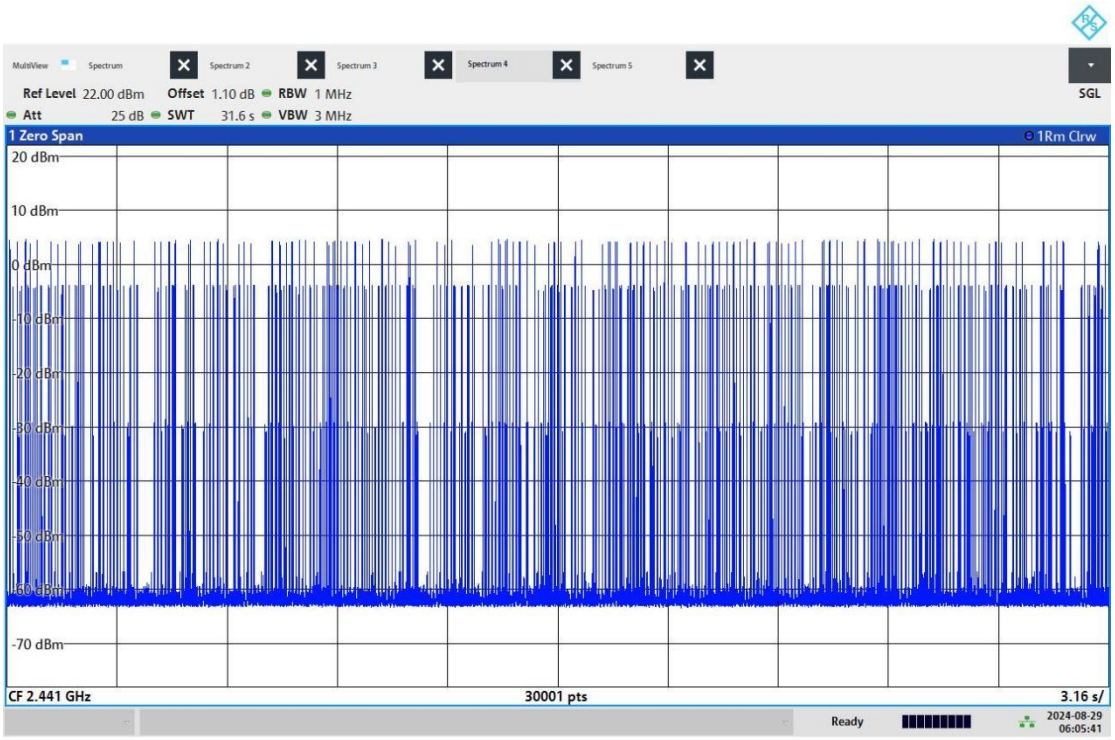
DH5_ANT4_Hop



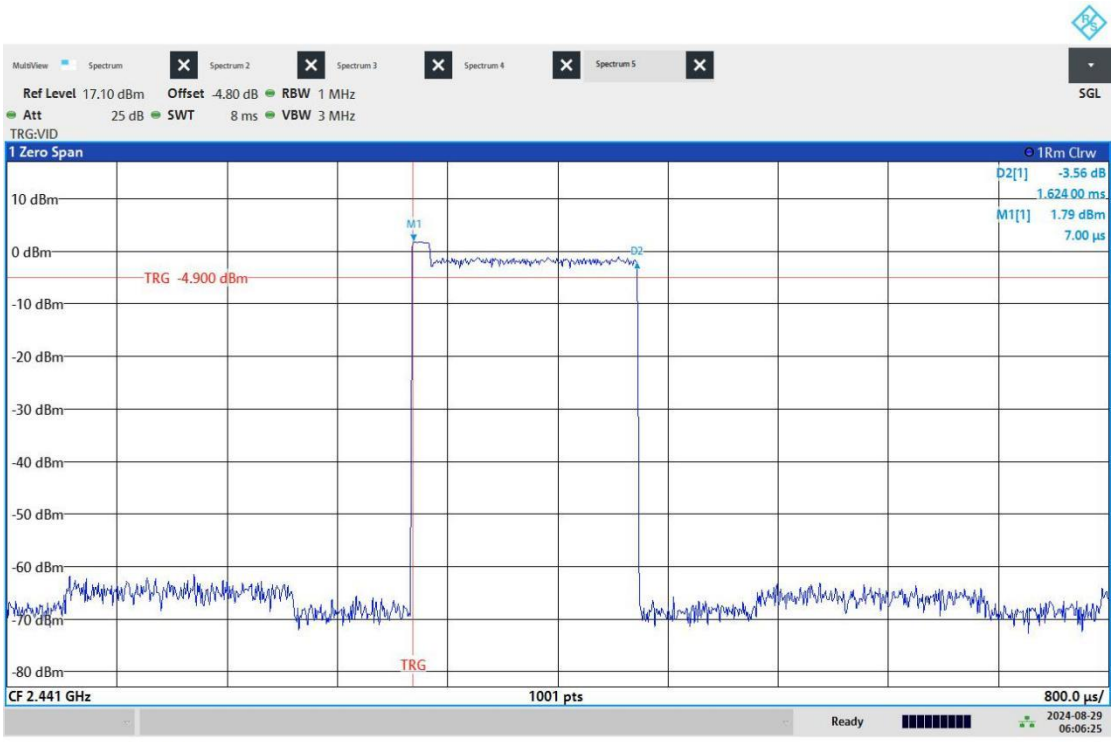
2DH1_ANT4_Hop



2DH1_ANT4_Hop



2DH3_ANT4_Hop



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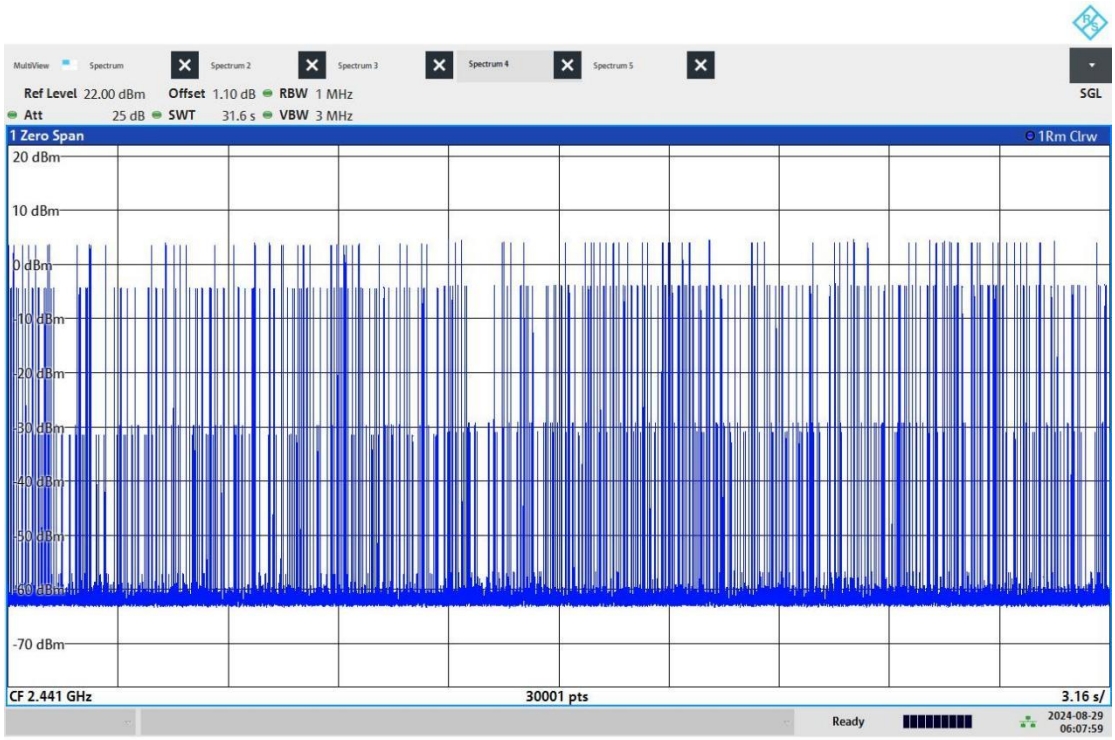

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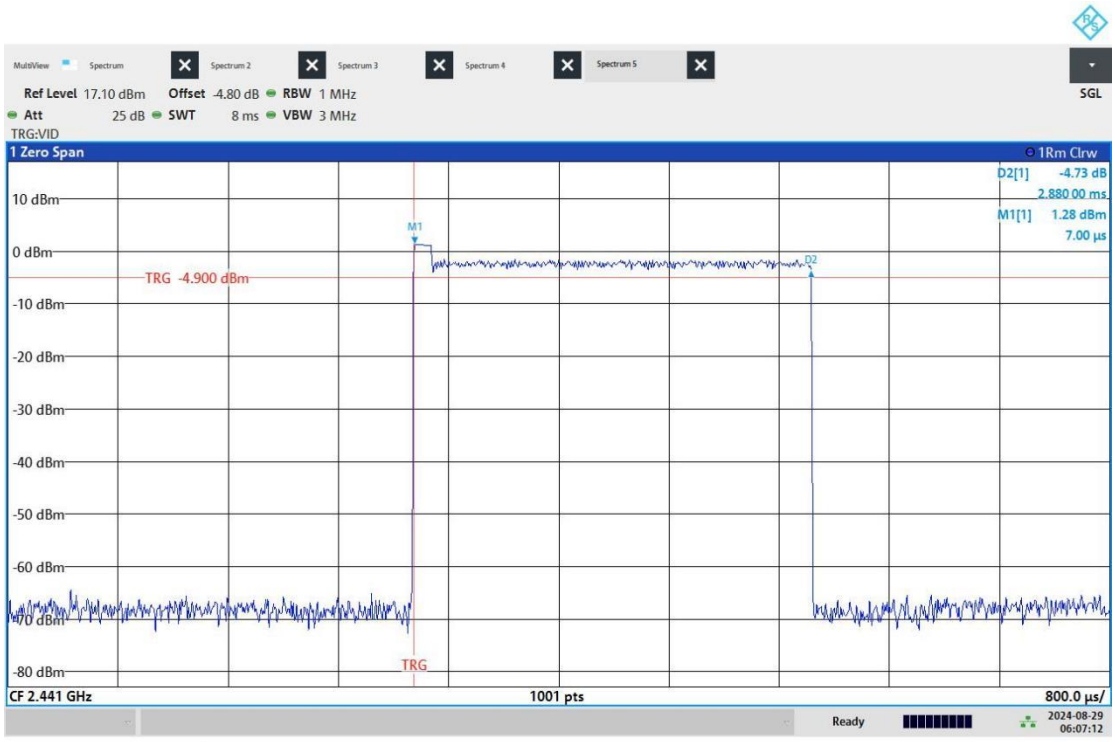
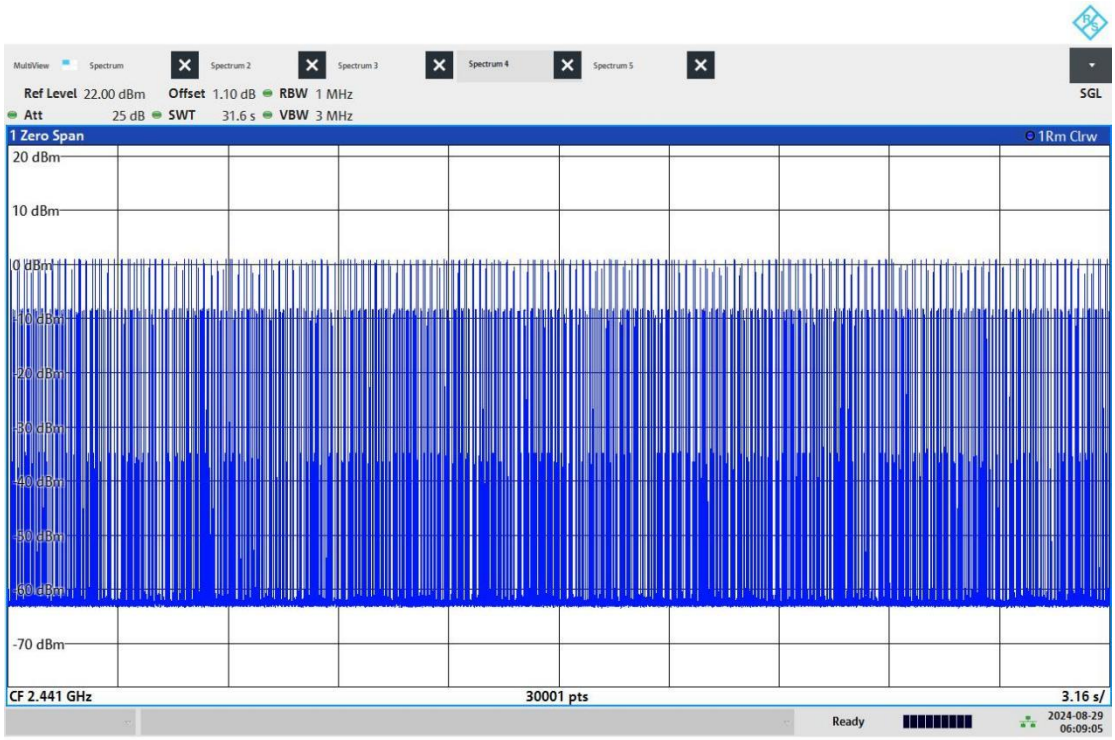
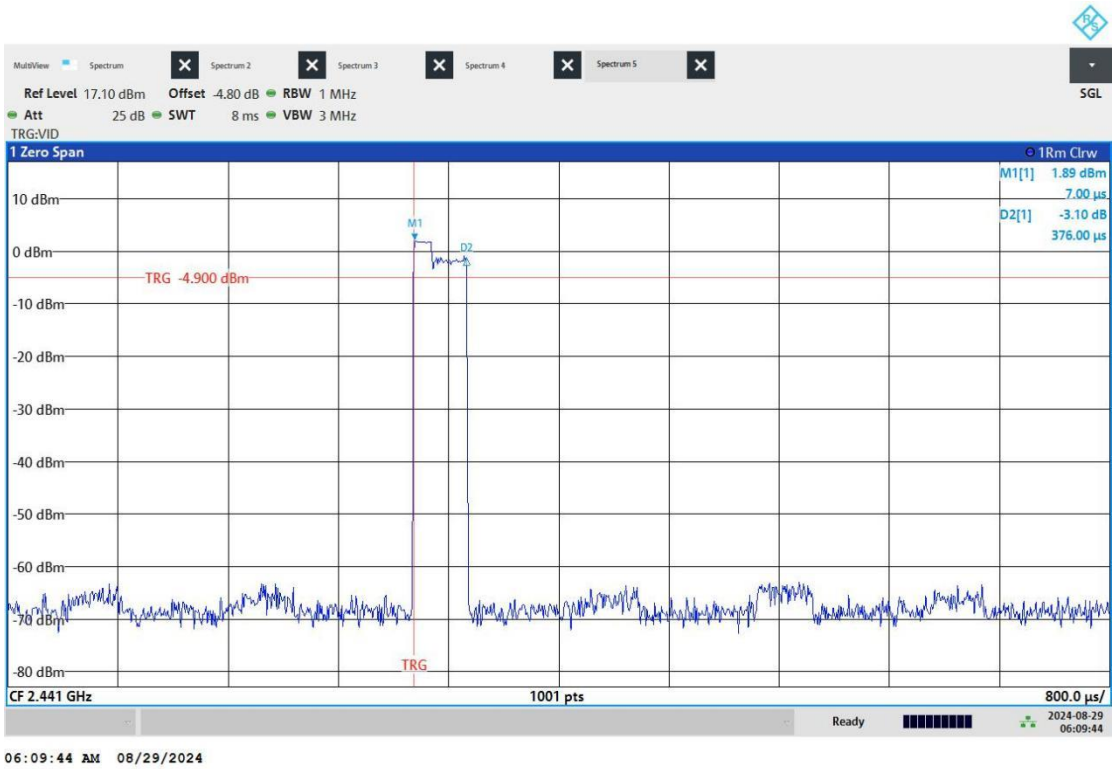


2DH5_ANT4_Hop



3DH1_ANT4_Hop



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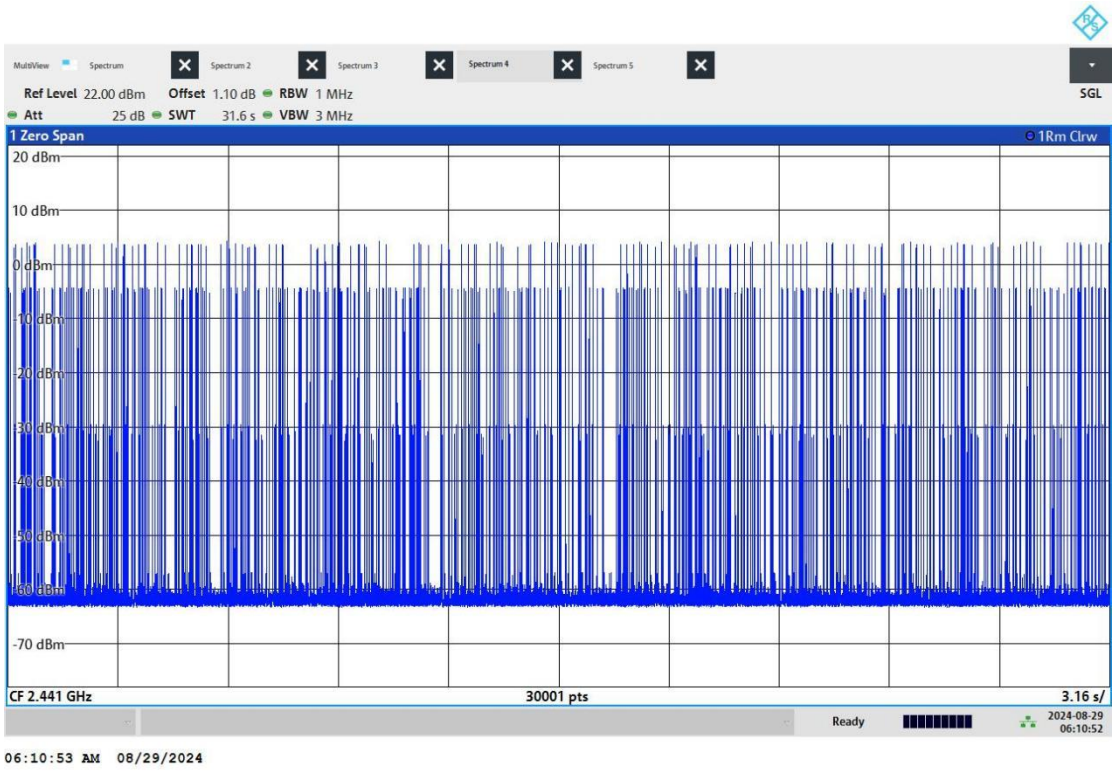

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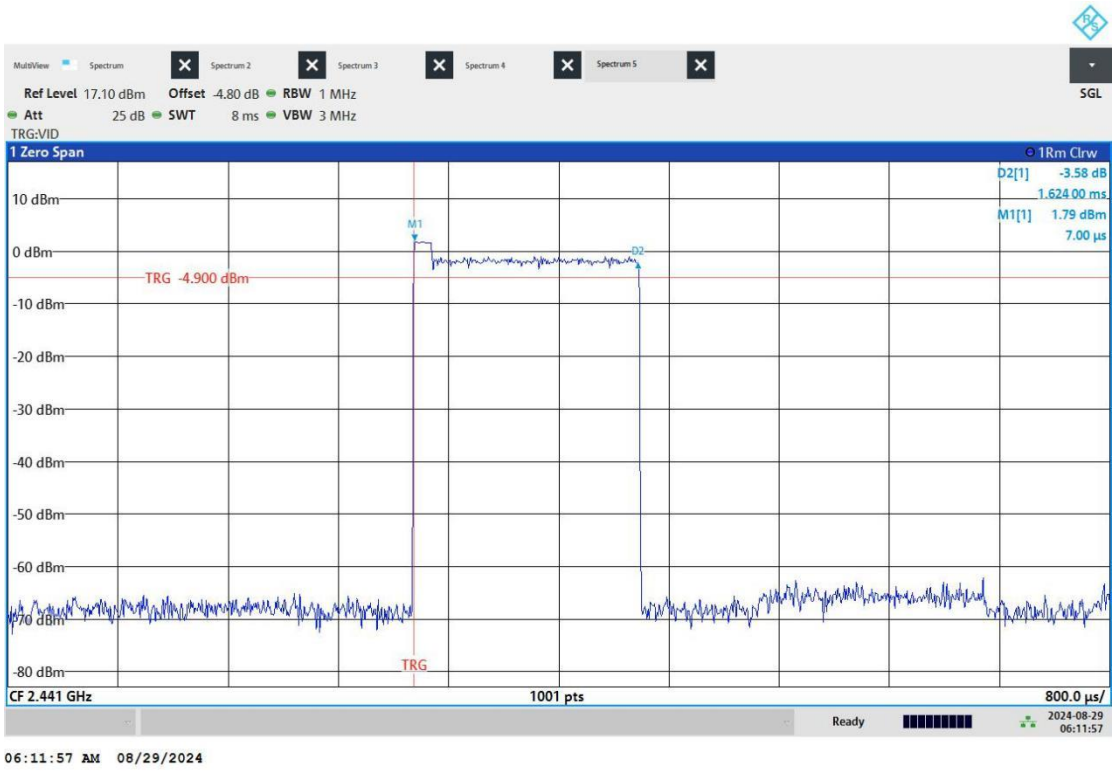

3DH3_ANT4_Hop