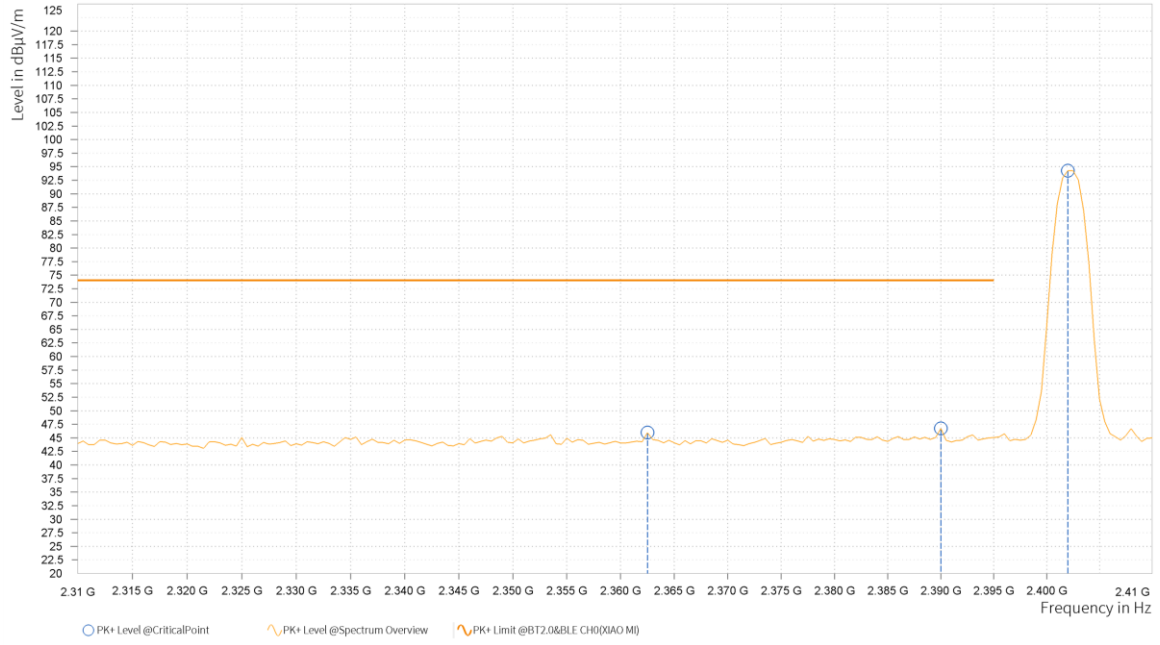
BT_8DPSK

CHANNEL	TX Channel 0	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

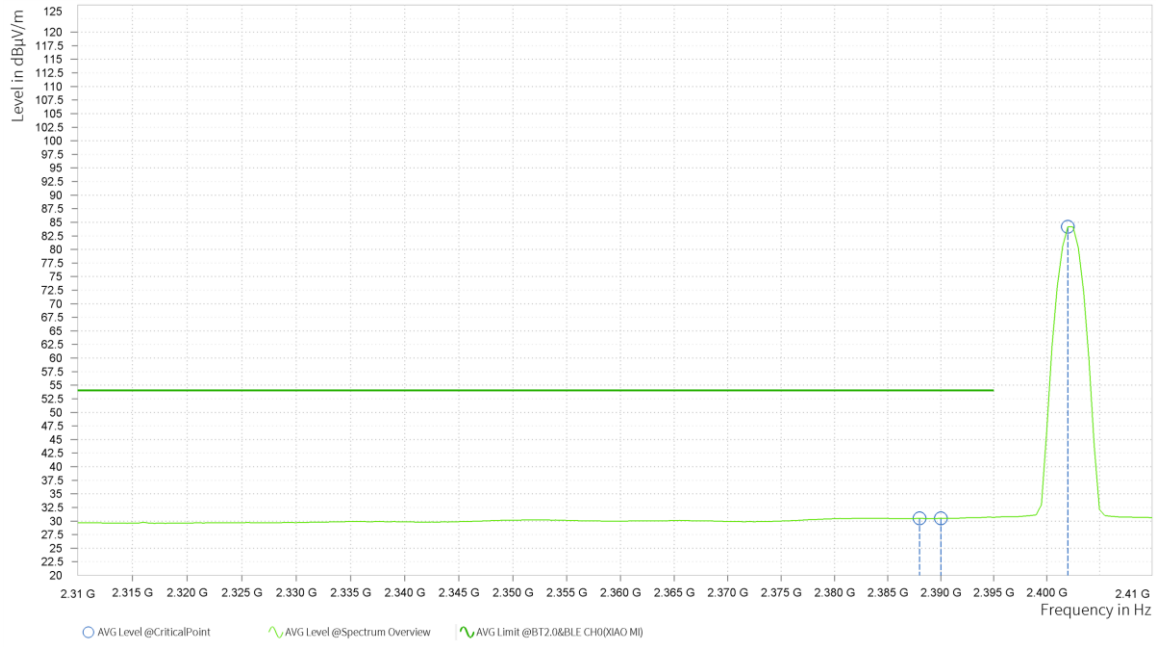
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,362.500	45.97	74.0	28.03	5.62	H	1.0	2.0
5	2,390.000	46.74	74.0	27.26	5.77	H	9.4	2.0
5	2,402.000	94.29			5.85	H	1.0	2.0



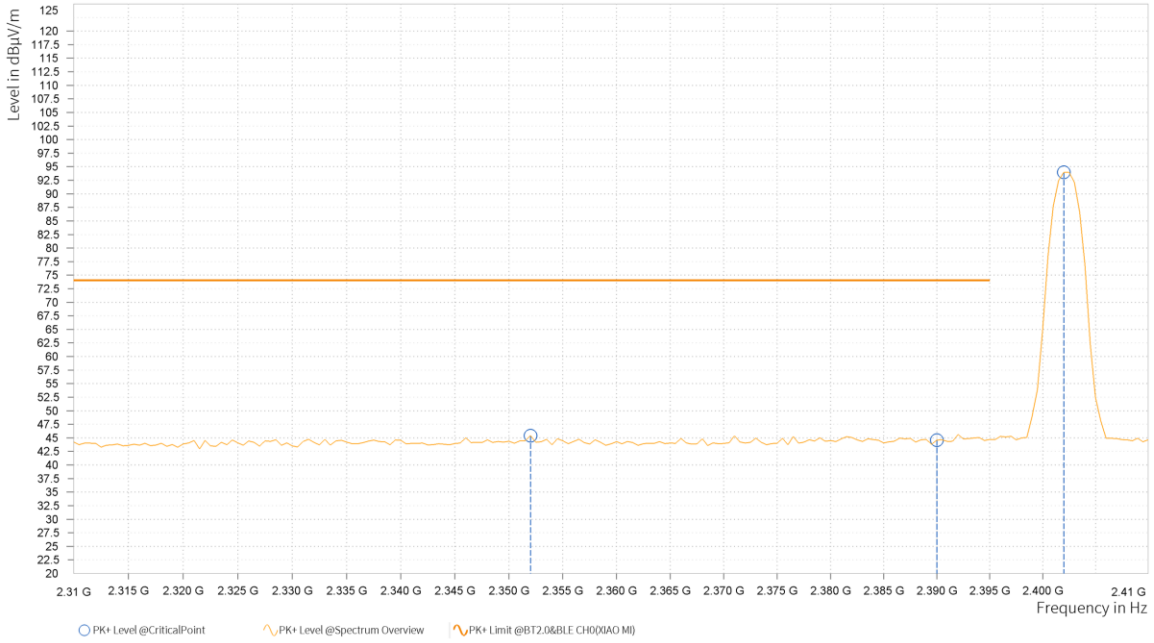
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
5	2,388.000	30.5	54.0	23.5	5.76	H	1.0	2.0
5	2,390.000	30.49	54.0	23.51	5.77	H	24.8	2.0
5	2,402.000	84.18			5.85	H	1.0	2.0



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]
5	2,352.000	45.42	74.0	28.58	5.59	V	273.1	1.0
5	2,390.000	44.6	74.0	29.4	5.77	V	305.7	2.0
5	2,402.000	93.98			5.85	V	359.0	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]
5	2,339.000	31.53	54.0	22.47	5.56	V	170.2	1.0
5	2,390.000	30.49	54.0	23.51	5.77	V	358.3	1.0
5	2,402.000	84.39			5.85	V	359.0	2.0

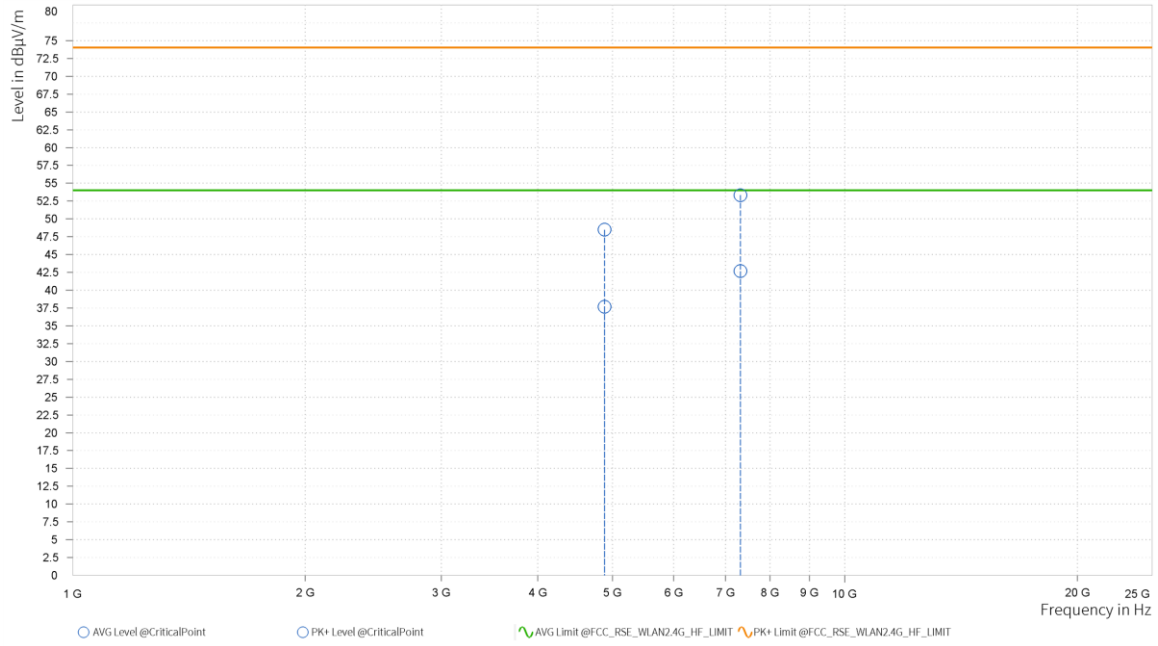
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Limit value – Emission level.
2. 2402MHz: Fundamental frequency.

CHANNEL	TX Channel 39	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

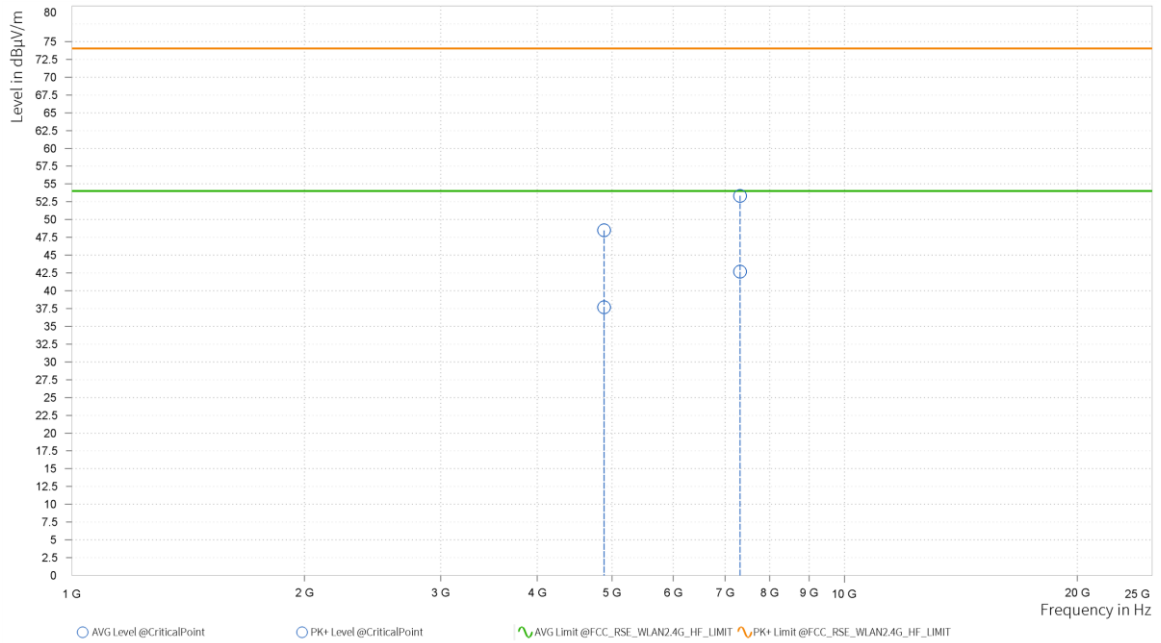
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,882.000	48.48	74.0	25.52	37.66	54.0	16.34	13.54	V	358.6	1.0
2	7,323.000	53.33	74.0	20.67	42.68	54.0	11.32	18.91	V	359.0	1.0



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	4,882.000	48.48	74.0	25.52	37.66	54.0	16.34	13.54	V	358.6	1.0
2	7,323.000	53.33	74.0	20.67	42.68	54.0	11.32	18.91	V	359.0	1.0



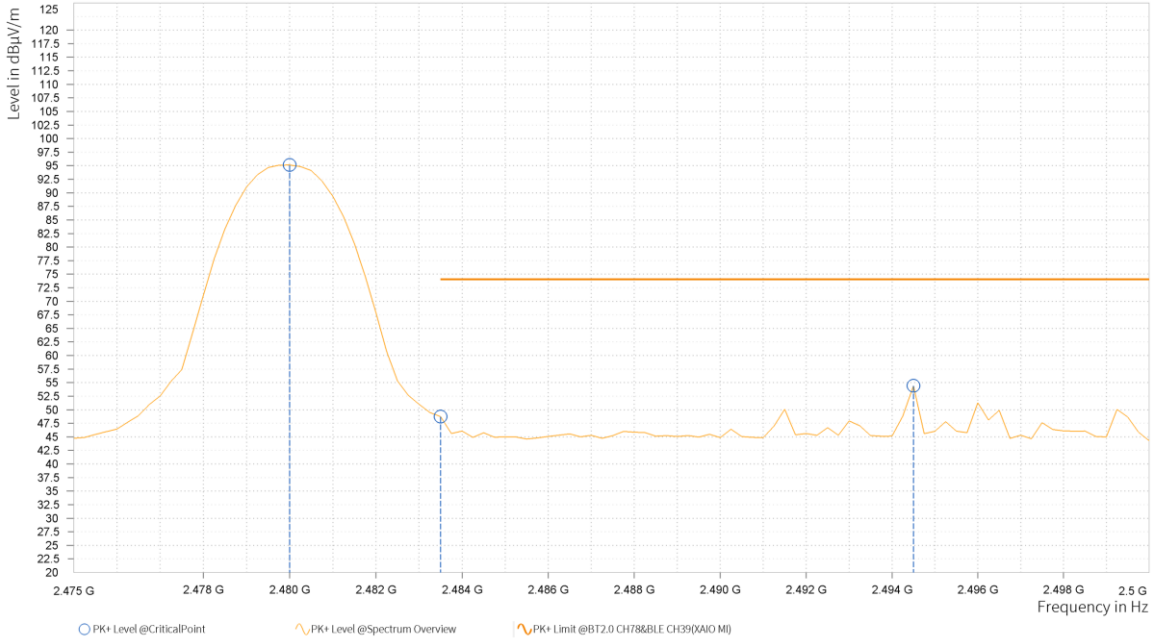
REMARKS:

1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Limit value – Emission level.
2. 2441MHz: Fundamental frequency.

CHANNEL	TX Channel 78	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

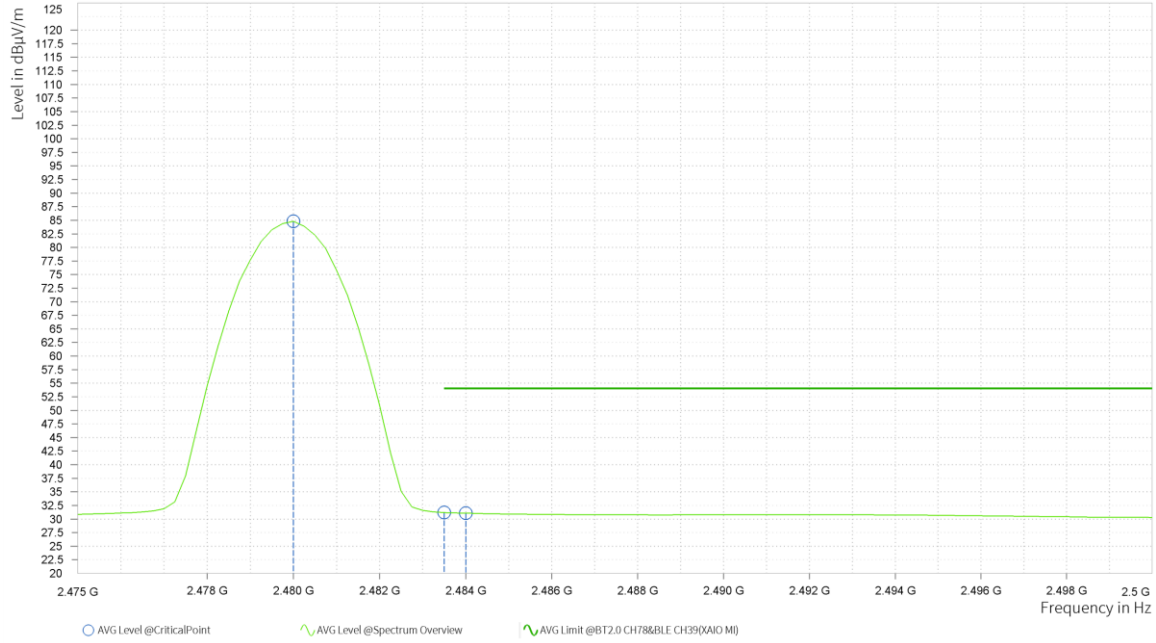
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,480.000	95.13			5.89	H	359.0	2.0
6	2,483.500	48.74	74.0	25.26	5.91	H	1.0	2.0
6	2,494.500	54.43	74.0	19.57	5.98	H	165.4	1.0



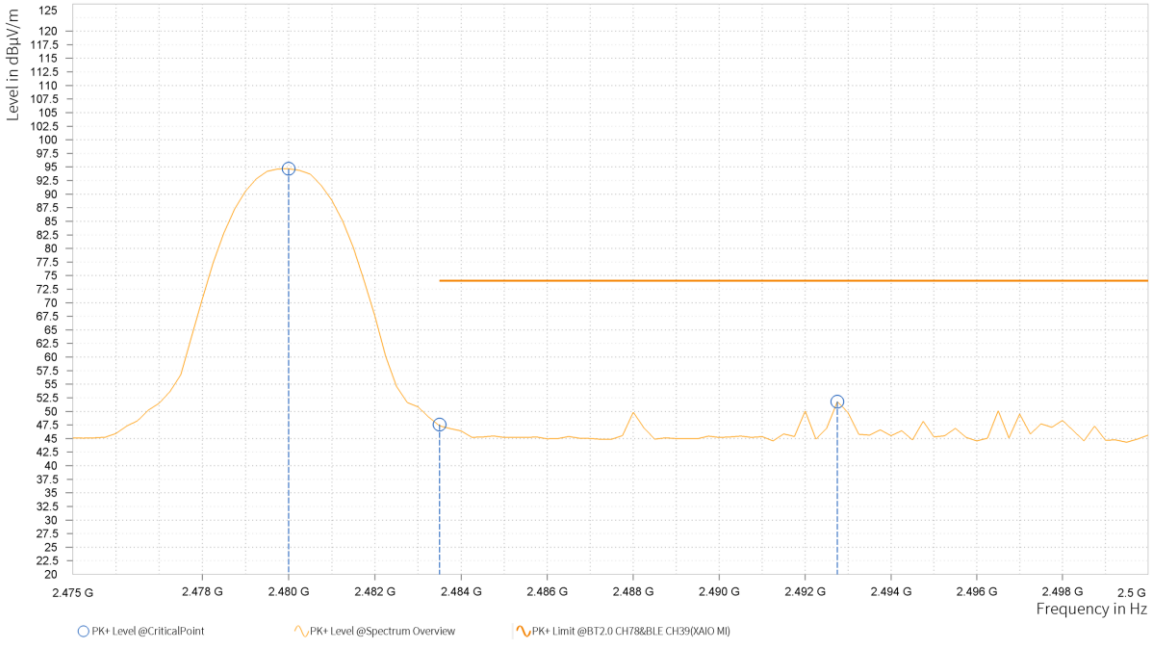
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,480.000	84.81			5.89	H	359.0	2.0
6	2,483.500	31.18	54.0	22.82	5.91	H	0.9	2.0
6	2,484.000	31.08	54.0	22.92	5.92	H	359.0	2.0



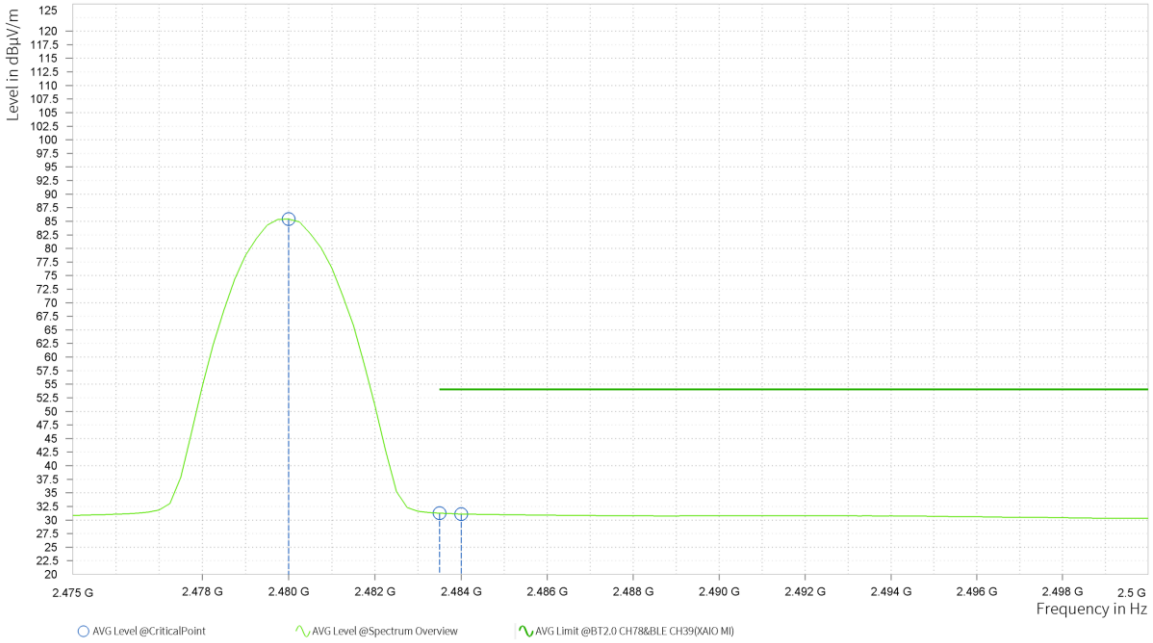
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
6	2,480.000	94.67			5.89	V	359.0	2.0
6	2,483.500	47.58	74.0	26.42	5.91	V	0.9	2.0
6	2,492.750	51.81	74.0	22.19	5.97	V	105.7	1.0



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	2,480.000	85.4			5.89	V	251.9	2.0
6	2,483.500	31.26	54.0	22.74	5.91	V	251.9	2.0
6	2,484.000	31.09	54.0	22.91	5.92	V	251.9	2.0



REMARKS:

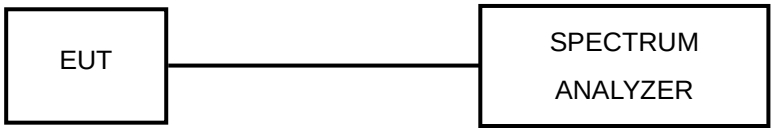
1. Emission Level = Read Level+ Antenna Factor + Cable Loss- Preamp Factor
   Margin value = Limit value – Emission level.
2. 2480MHz: Fundamental frequency.

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	585660781000050	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.

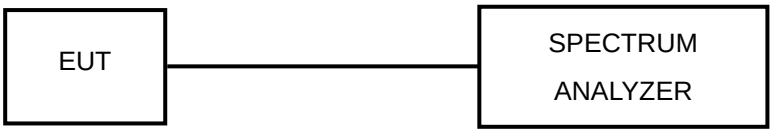
Please Refer to Appendix Of this test report.

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

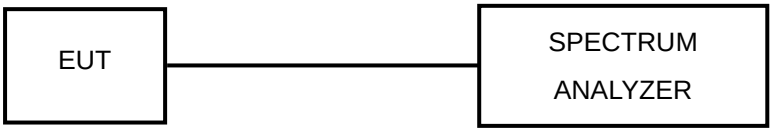
Please Refer to Appendix Of this test report

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

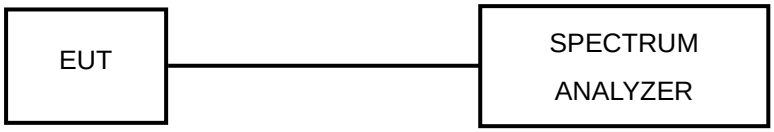
Please Refer to Appendix Of this test report.

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

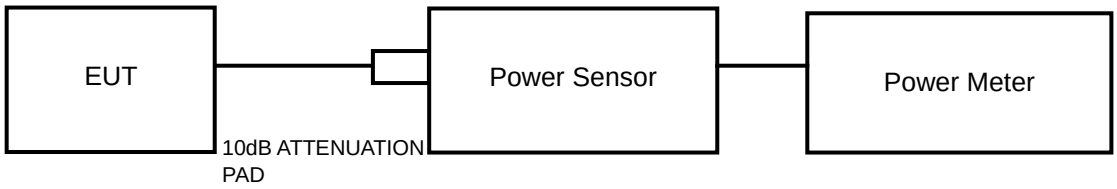
Please Refer to Appendix Of this test report.

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	ANT0	2402	0.889	2401.529	2402.418	---	PASS
		2441	0.847	2440.580	2441.427	---	PASS
		2480	0.893	2479.531	2480.424	---	PASS
2DH5	ANT0	2402	1.350	2401.321	2402.671	---	PASS
		2441	1.300	2440.349	2441.649	---	PASS
		2480	1.350	2479.319	2480.669	---	PASS
3DH5	ANT0	2402	1.310	2401.341	2402.651	---	PASS
		2441	1.330	2440.333	2441.663	---	PASS
		2480	1.340	2479.317	2480.657	---	PASS

TEST GRAPHS

DH5_ANT0_2402

DH5_ANT0_2441

DH5_ANT0_2480

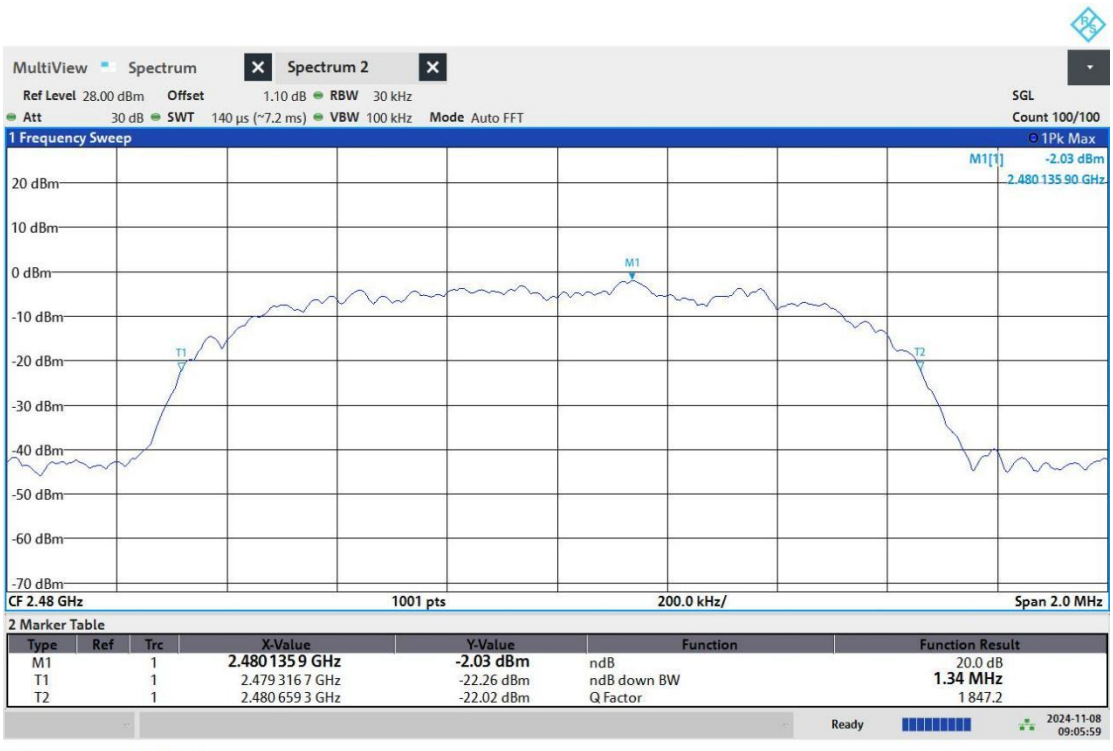
2DH5_ANT0_2402

2DH5_ANT0_2441

2DH5_ANT0_2480

3DH5_ANT0_2402

3DH5_ANT0_2441



3DH5_ANT0_2480

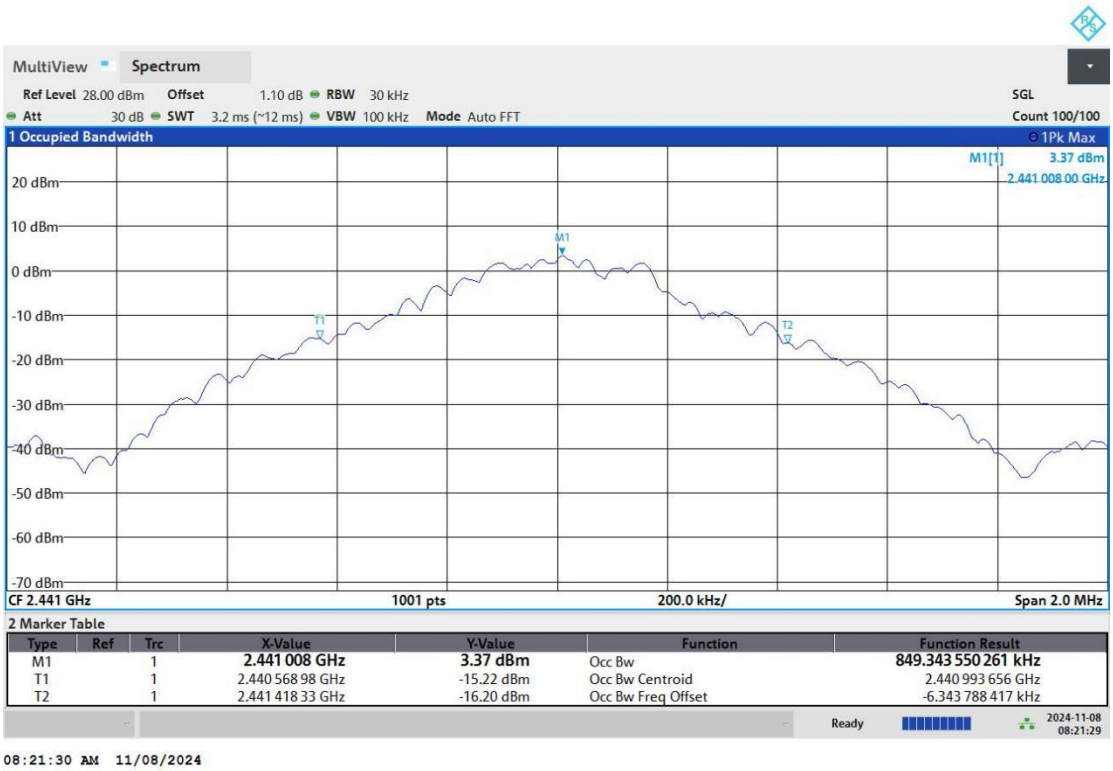
OCCUPIED CHANNEL BANDWIDTH

TEST RESULT

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	ANT0	2402	0.851	2401.569	2402.420	---	PASS
		2441	0.849	2440.569	2441.418	---	PASS
		2480	0.850	2479.568	2480.418	---	PASS
2DH5	ANT0	2402	1.171	2401.409	2402.580	---	PASS
		2441	1.171	2440.410	2441.581	---	PASS
		2480	1.171	2479.408	2480.579	---	PASS
3DH5	ANT0	2402	1.172	2401.412	2402.584	---	PASS
		2441	1.172	2440.412	2441.584	---	PASS
		2480	1.174	2479.410	2480.584	---	PASS

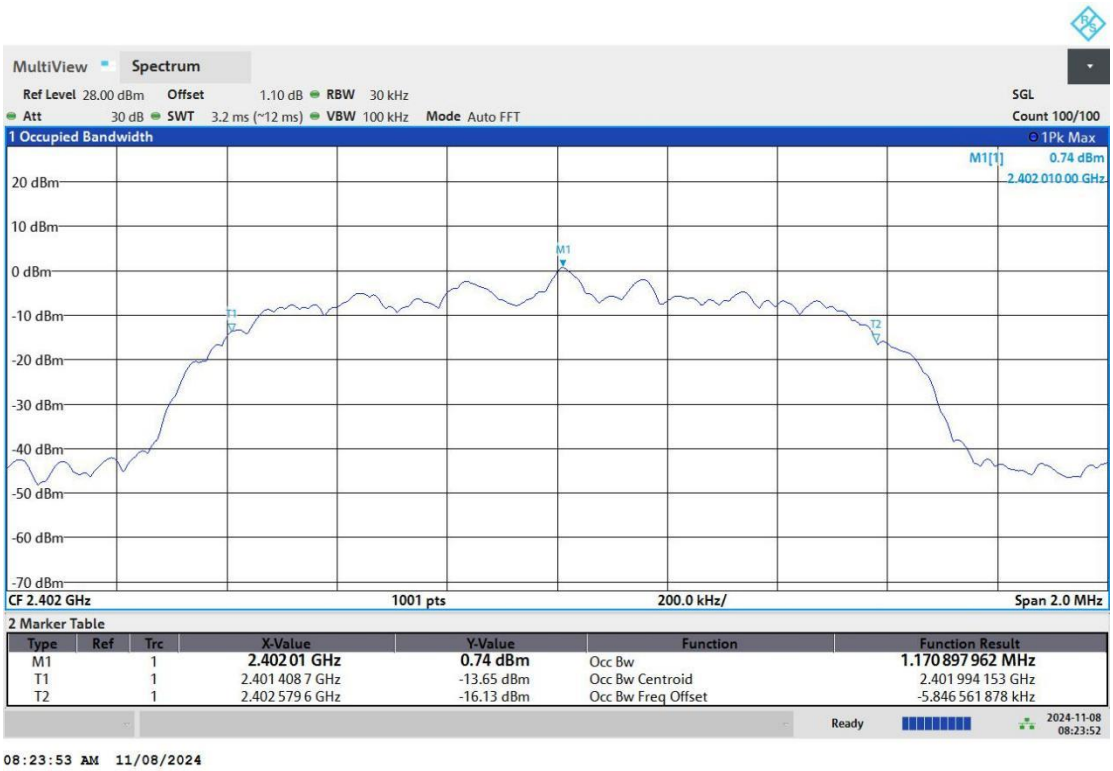
TEST GRAPHS

DH5_ANT0_2402

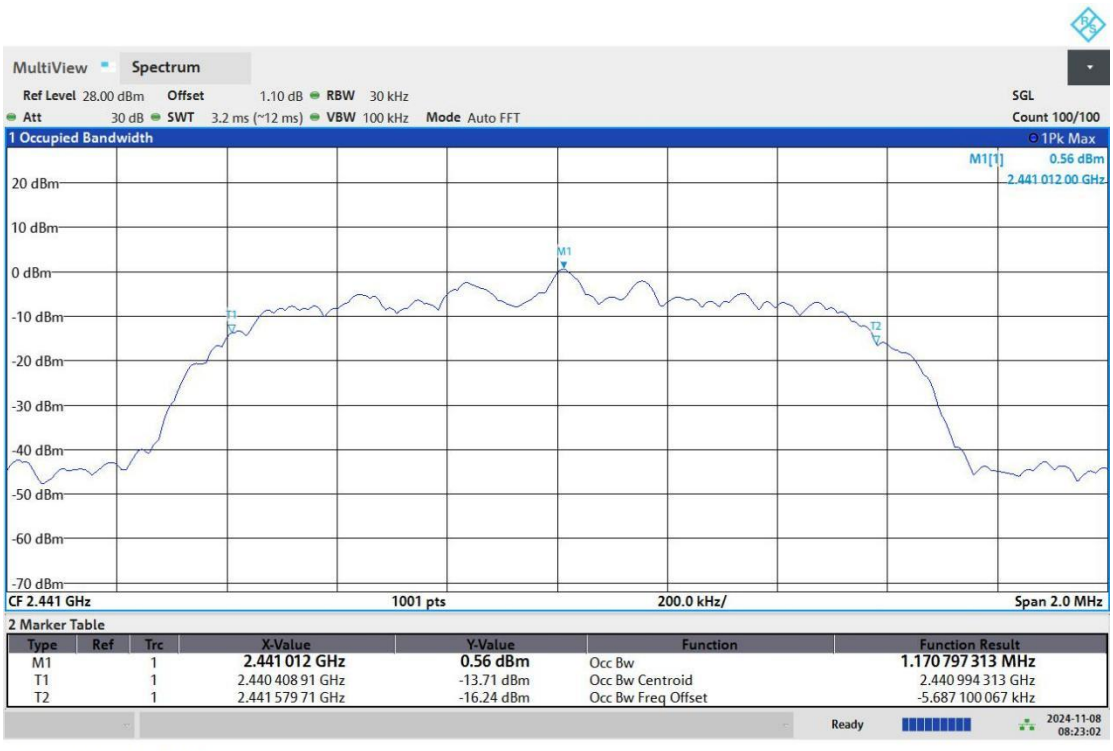


DH5_ANT0_2441

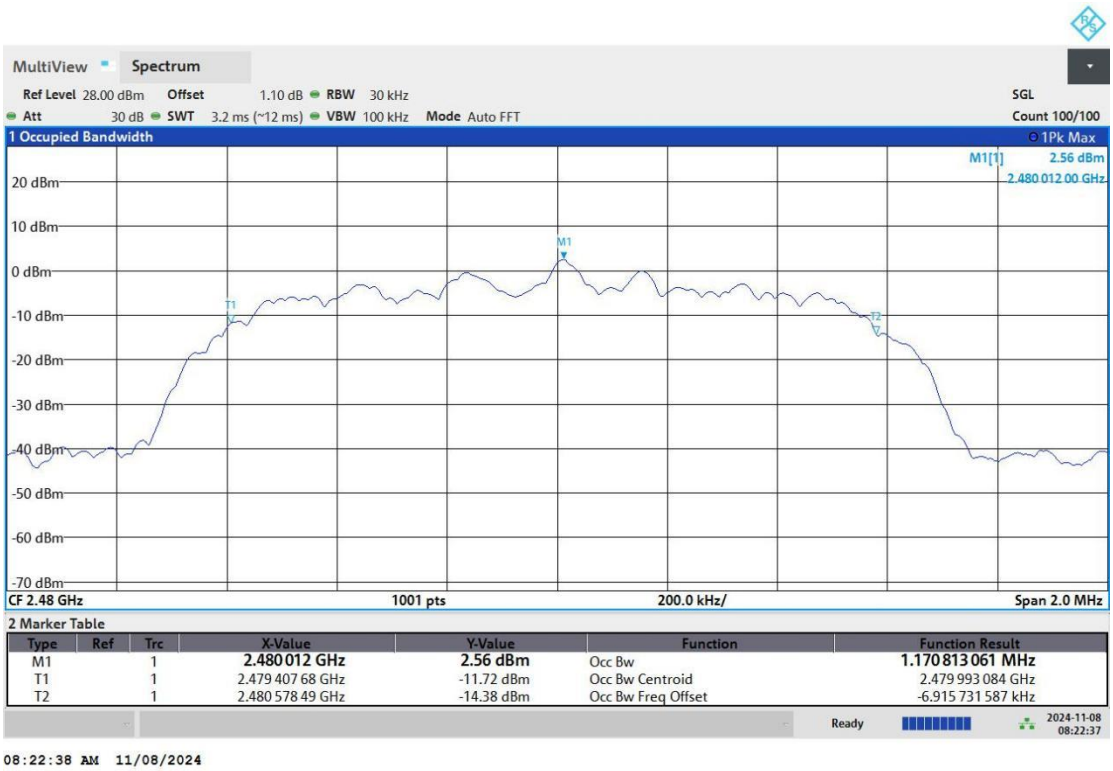
DH5_ANT0_2480



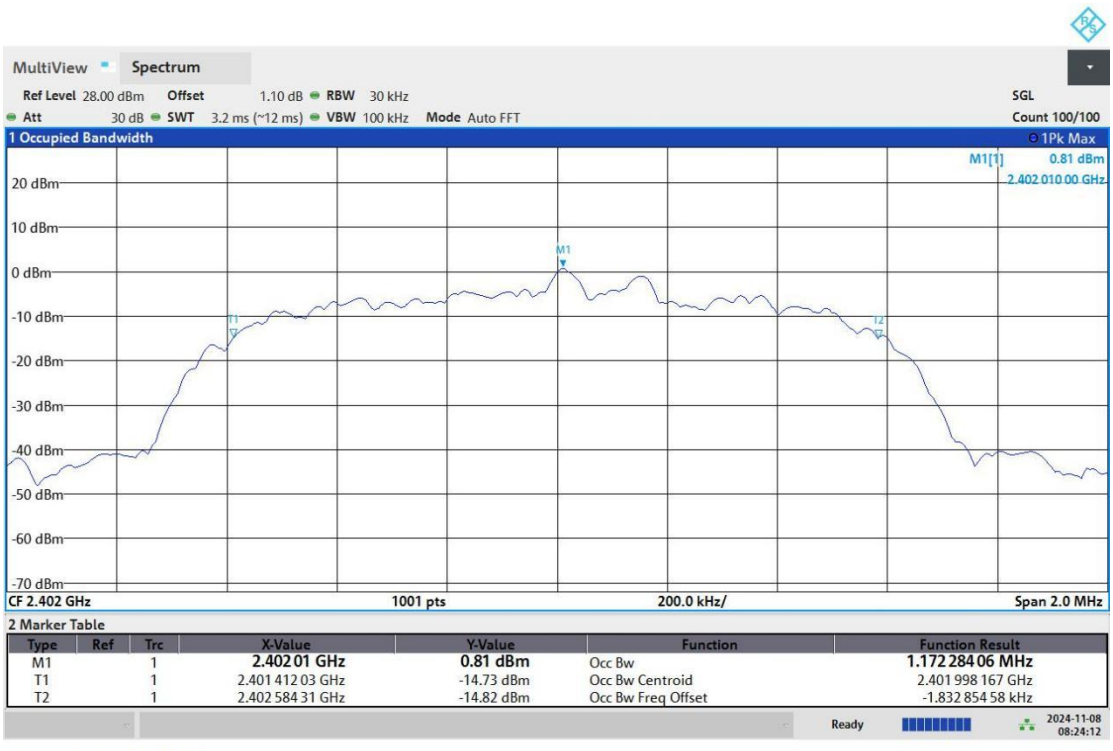
2DH5_ANT0_2402



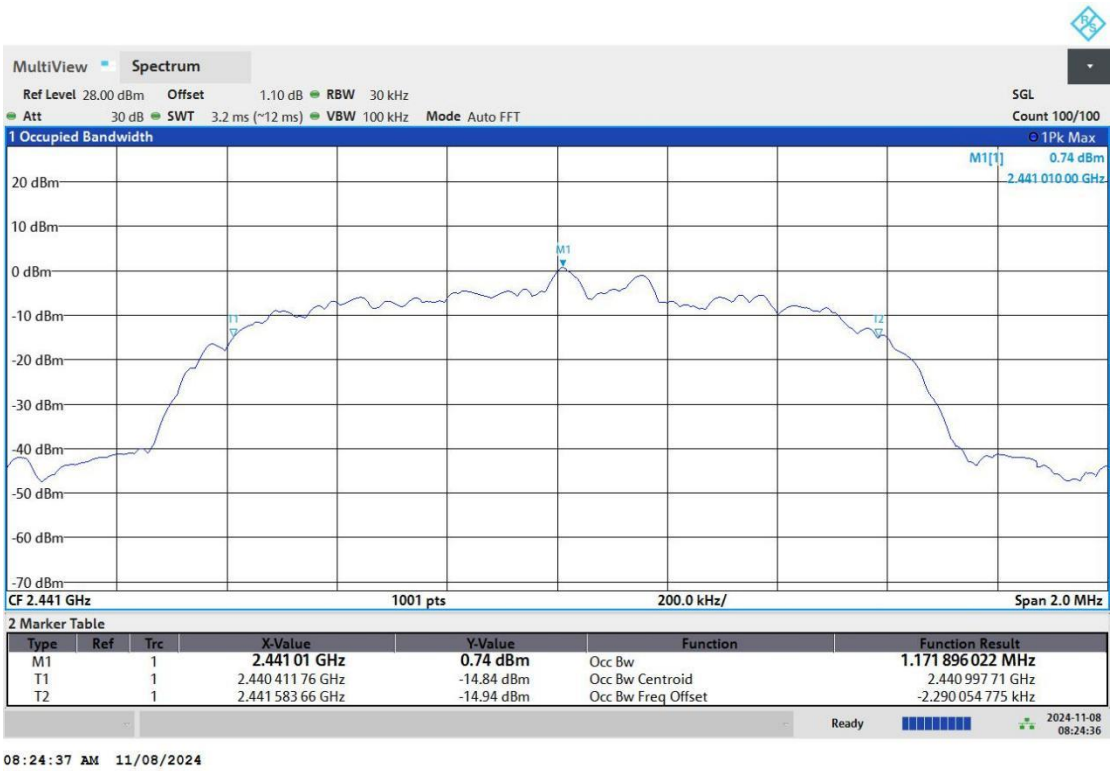
2DH5_ANT0_2441



2DH5_ANT0_2480



3DH5_ANT0_2402



3DH5_ANT0_2441

3DH5_ANT0_2480

MAXIMUM CONDUCTED OUTPUT POWER

TEST RESULT

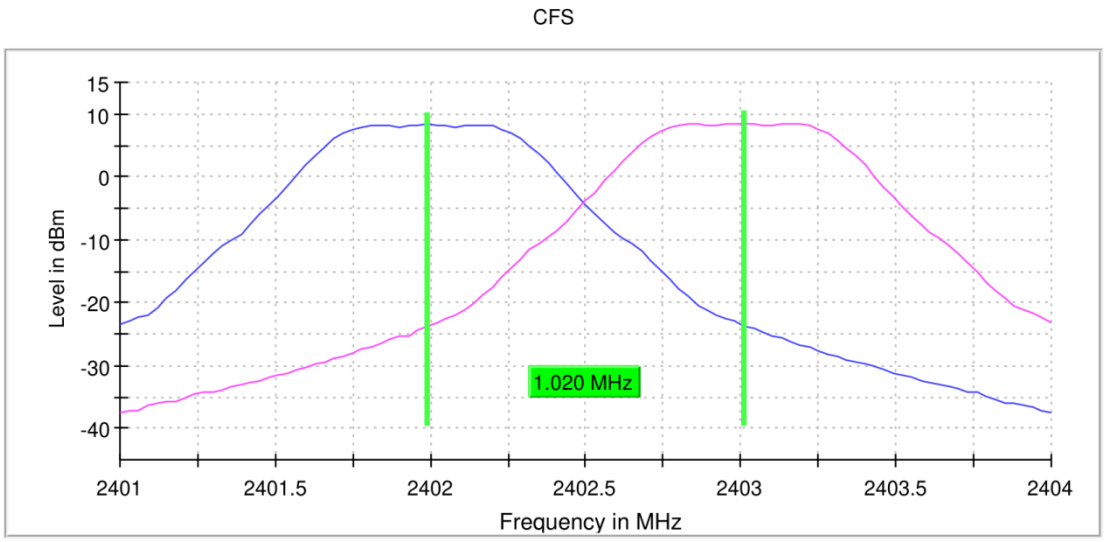
TestMode	Antenna	Frequency [MHz]	Average power [dBm]	Peak Power [dBm]	Peak Powert [mw]	Conducted Limit [dBm]	Verdict
DH5	ANT0	2402	8.16	8.69	7.40	≤30	PASS
		2441	7.66	8.12	6.49	≤30	PASS
		2480	8.60	9.07	8.08	≤30	PASS
2DH5	ANT0	2402	5.03	7.86	6.10	≤30	PASS
		2441	4.38	7.13	5.16	≤30	PASS
		2480	5.58	8.16	6.54	≤30	PASS
3DH5	ANT0	2402	5.10	8.04	6.37	≤30	PASS
		2441	4.42	7.56	5.70	≤30	PASS
		2480	5.61	8.43	6.97	≤30	PASS

CARRIER FREQUENCY SEPARATION

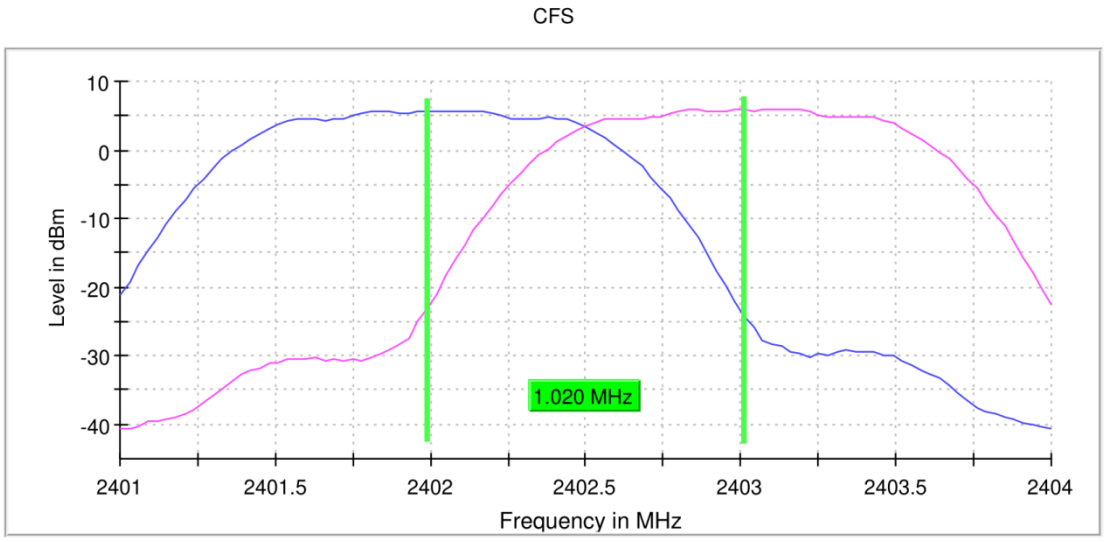
TEST RESULT

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	ANT0	Hop	1.020	≥0.6180	PASS
2DH5	ANT0	Hop	1.020	≥0.8187	PASS
3DH5	ANT0	Hop	1.020	≥0.8387	PASS

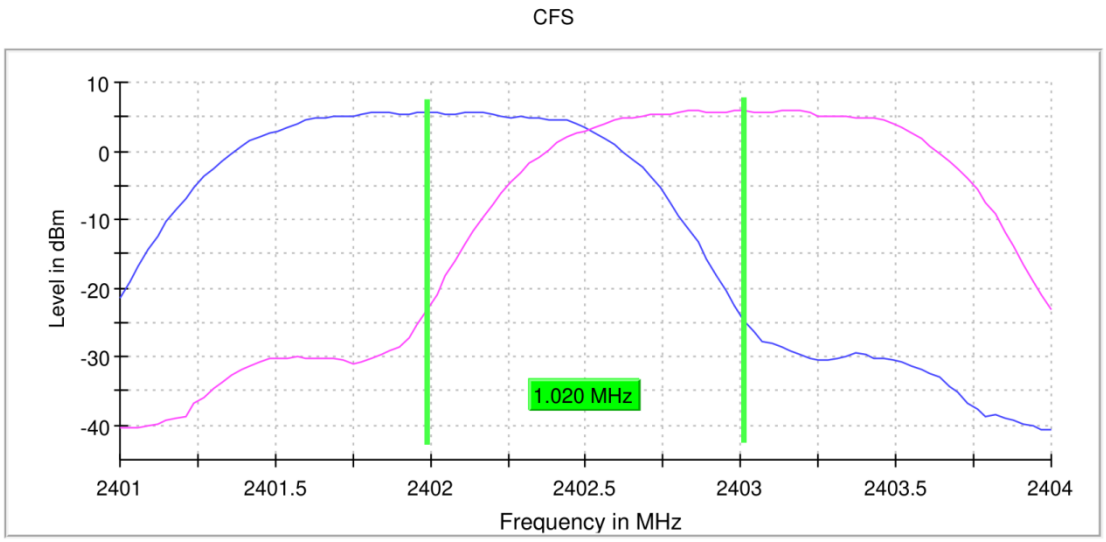
TEST GRAPHS



DH5_ANT0_Hop



2DH5_ANT0_Hop



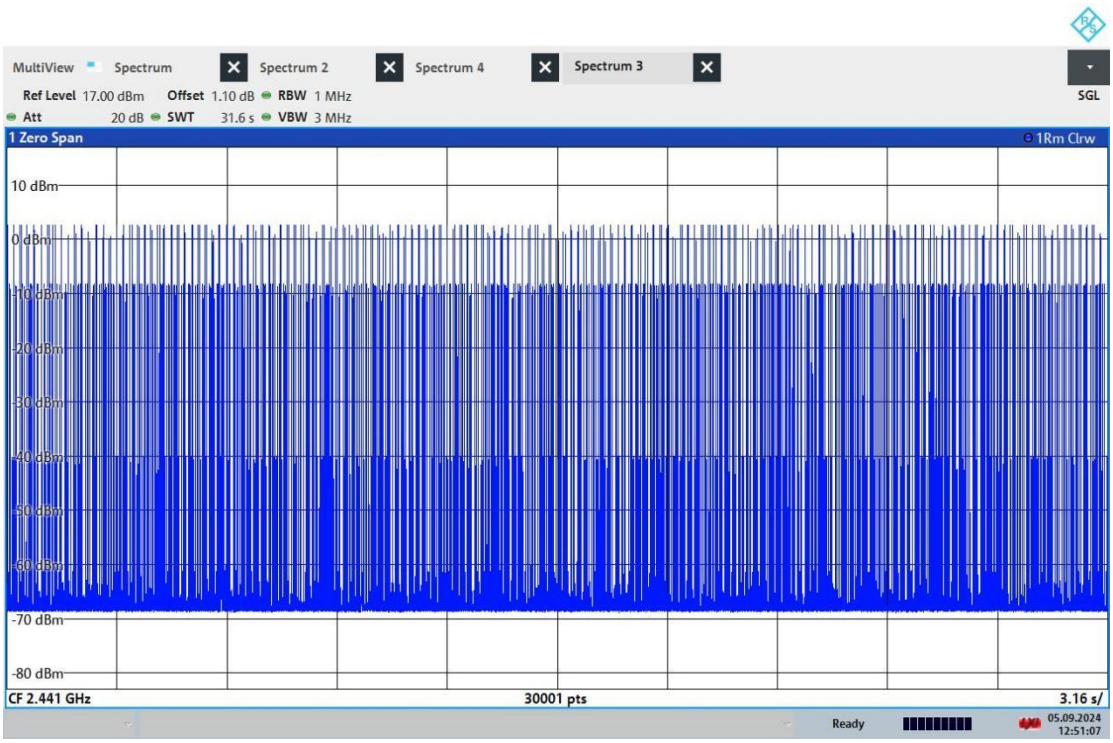
3DH5_ANT0_Hop
RBW 300.000 kHz VBW 300.000 kHz

TIME OF OCCUPANCY

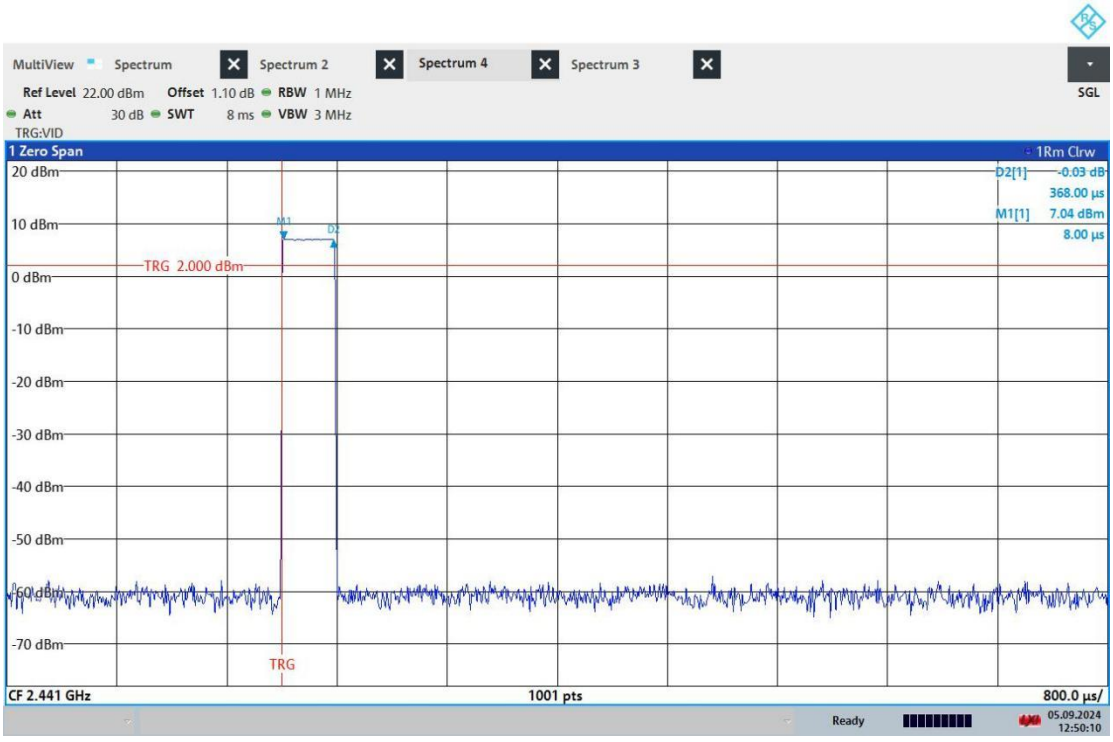
TEST RESULT

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	ANT0	Hop	0.368	203	0.075	≤0.4	PASS
DH3	ANT0	Hop	1.624	147	0.239	≤0.4	PASS
DH5	ANT0	Hop	2.872	103	0.296	≤0.4	PASS
2DH1	ANT0	Hop	0.368	210	0.077	≤0.4	PASS
2DH3	ANT0	Hop	1.624	138	0.224	≤0.4	PASS
2DH5	ANT0	Hop	2.872	115	0.330	≤0.4	PASS
3DH1	ANT0	Hop	0.376	227	0.085	≤0.4	PASS
3DH3	ANT0	Hop	1.632	137	0.224	≤0.4	PASS
3DH5	ANT0	Hop	2.880	108	0.311	≤0.4	PASS

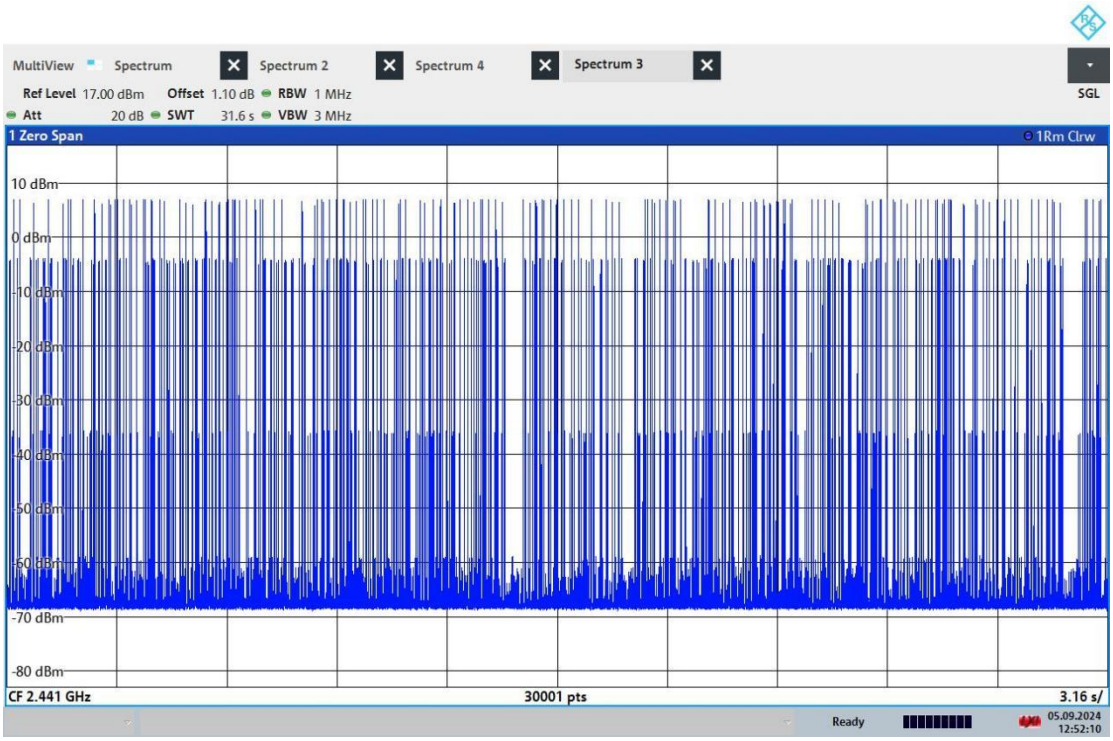
TEST GRAPHS



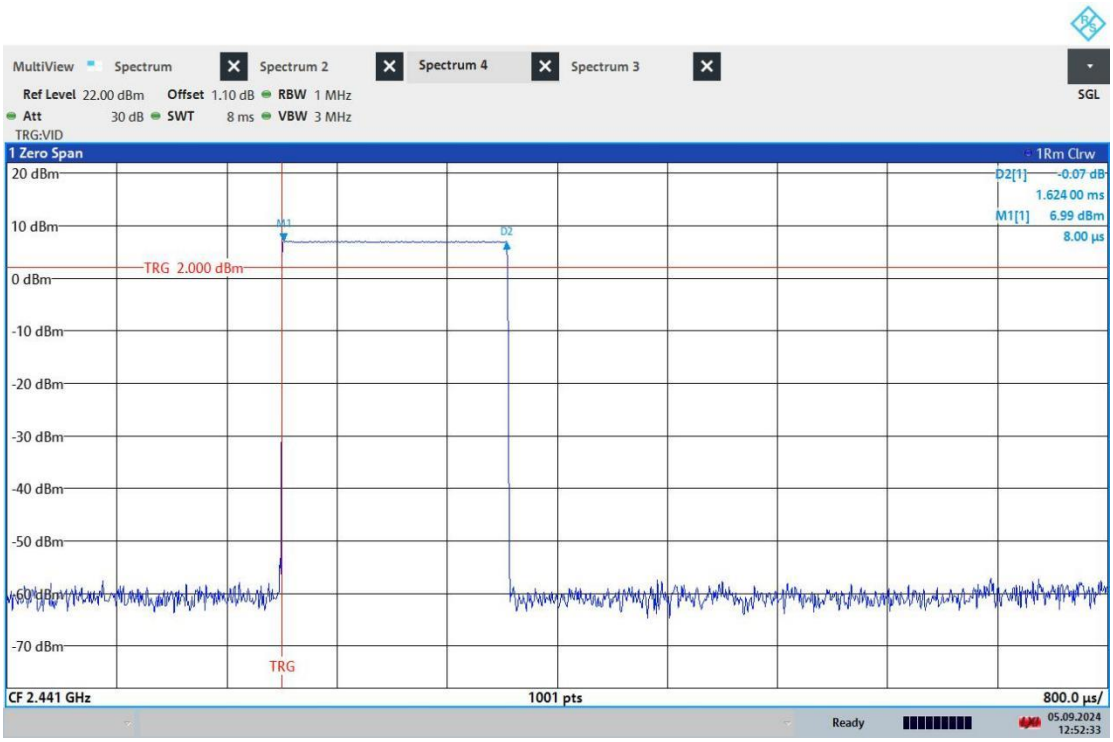
DH1_ANT0_Hop



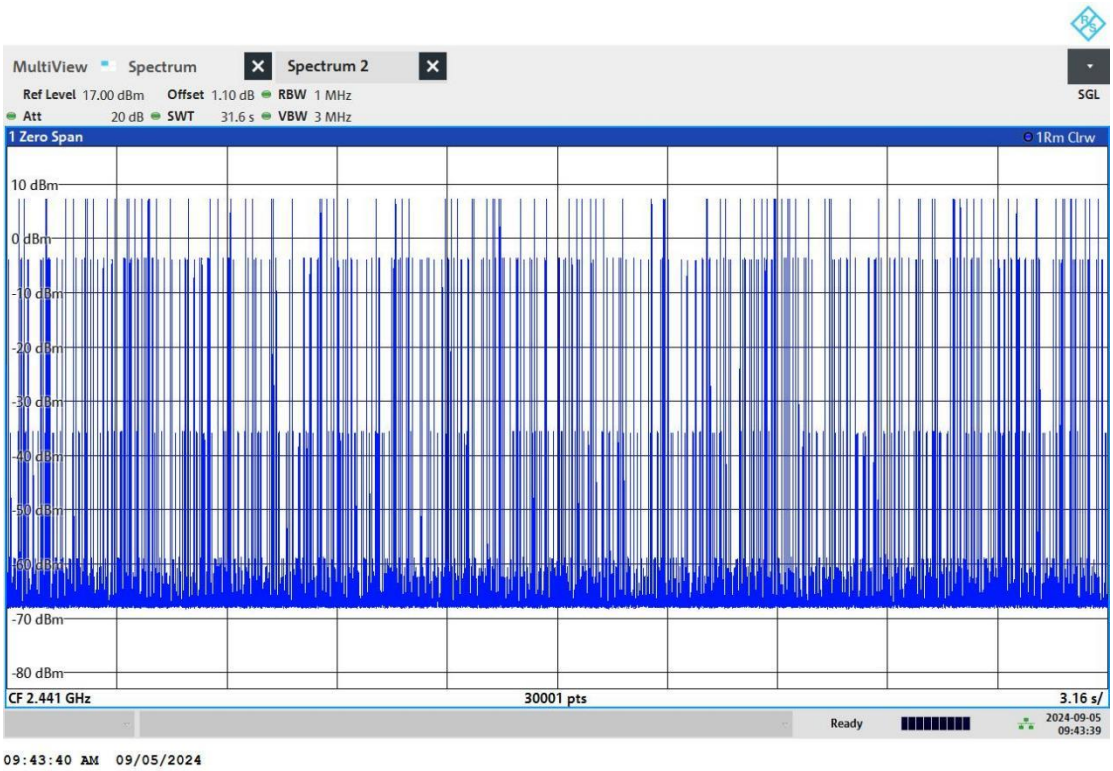
DH1_ANT0_Hop



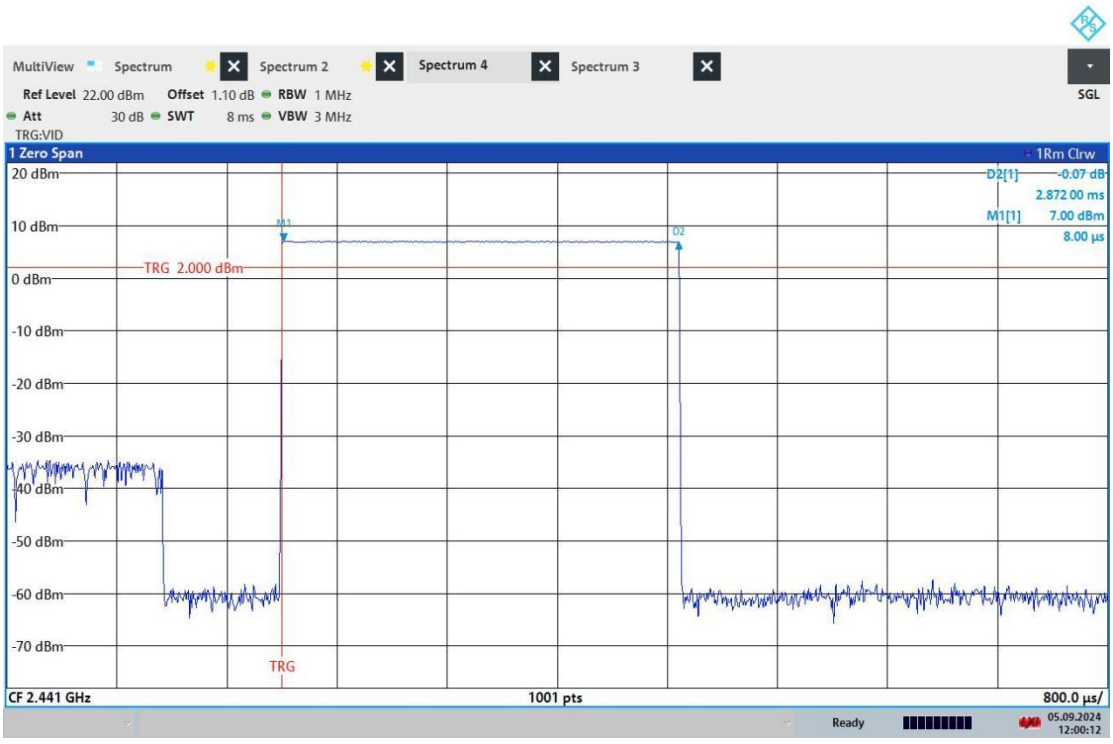
DH3_ANT0_Hop



DH3_ANT0_Hop



DH5_ANT0_Hop



DH5_ANT0_Hop