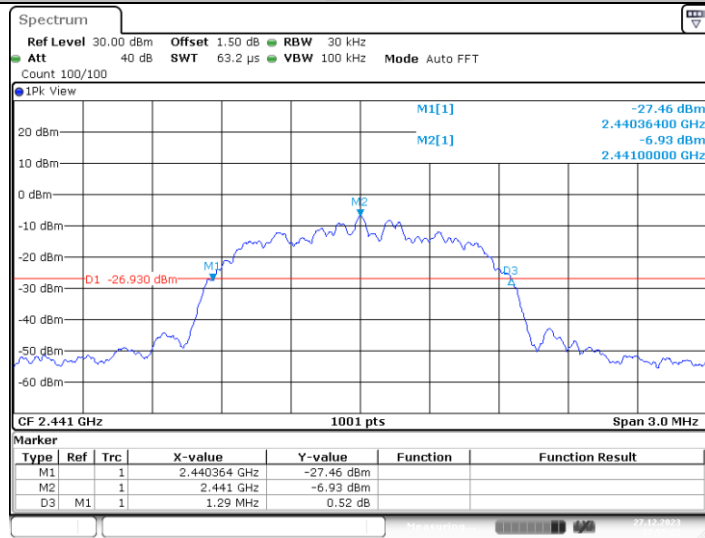


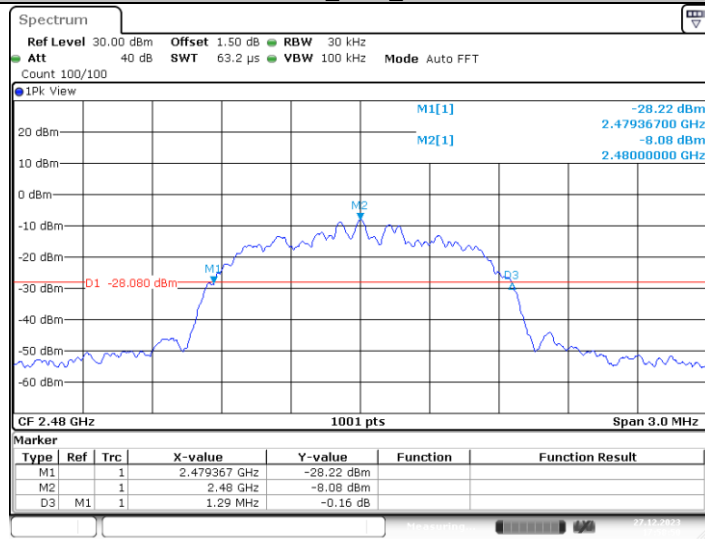
Date: 27.DEC.2023 17:41:03

2DH5_Ant1_2402



Date: 27.DEC.2023 17:55:23

2DH5_Ant1_2441



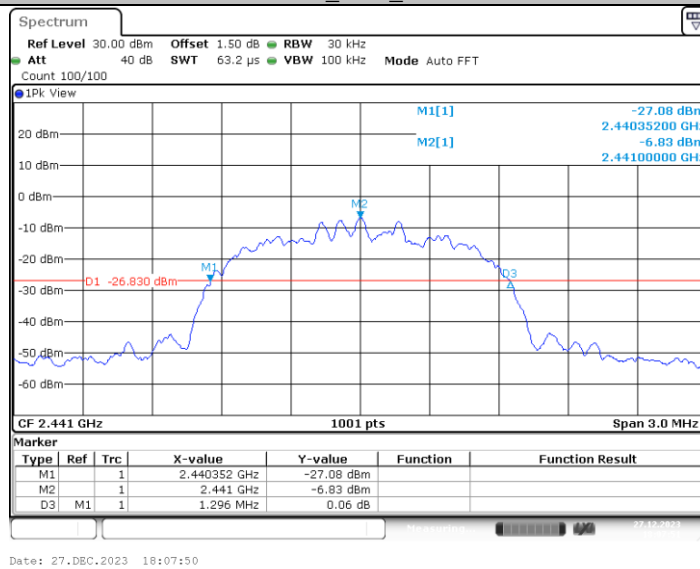
Date: 27.DEC.2023 17:58:49

2DH5_Ant1_2480

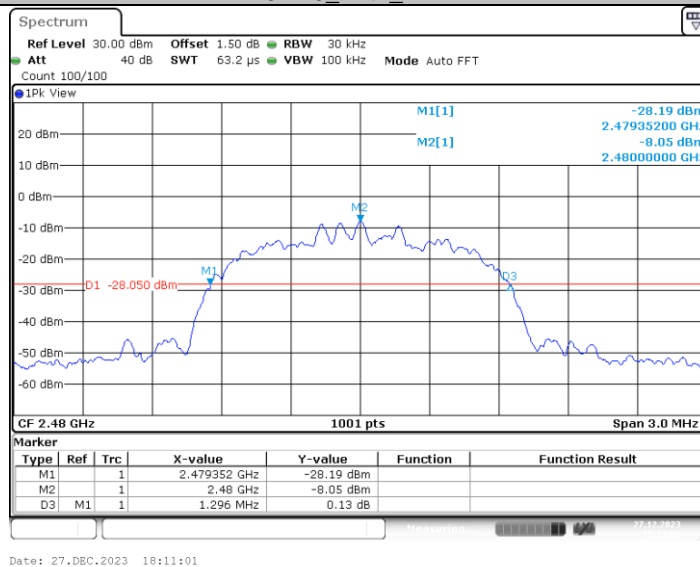




3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480





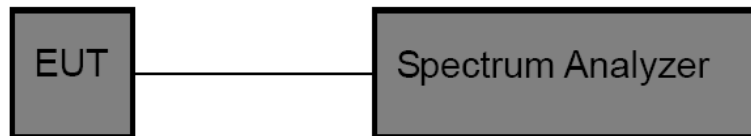
3.6. Channel Separation

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1)

| Test Item | Limit | Frequency Range (MHz) |
|--------------------|---|-----------------------|
| Channel Separation | >25kHz or >two-thirds of the 20 dB bandwidth Which is greater | 2400~2483.5 |

Test Configuration



Test Procedure

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- Spectrum Setting:
 - Set RBW = 100 kHz.
 - Set the video bandwidth (VBW) ≥ 3 RBW.
 - Detector = Peak.
 - Trace mode = Max hold.
 - Sweep = Auto couple.

Test Mode

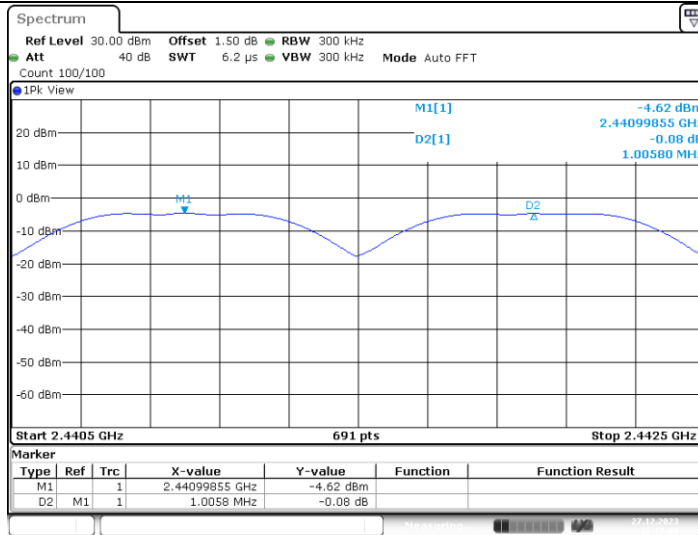
Please refer to the clause 2.4.

Test Result

| Test Mode | Frequency (MHz) | Carrier Frequencies Separation (MHz) | Limit (MHz) | Verdict |
|----------------|-----------------|--------------------------------------|-------------|---------|
| GFSK | Hop_2441 | 1.006 | >0.633 | Pass |
| $\pi/4$ -DQPSK | Hop_2441 | 0.91 | >0.860 | Pass |
| 8-DPSK | Hop_2441 | 1.029 | >0.867 | Pass |

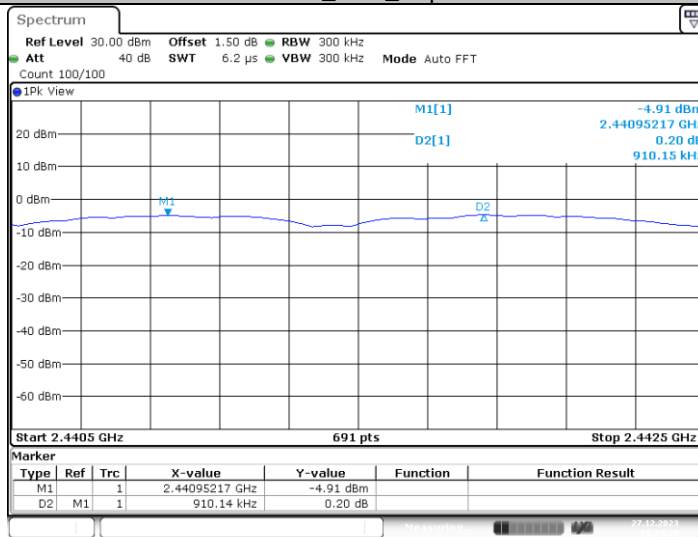


Test plot as follows:



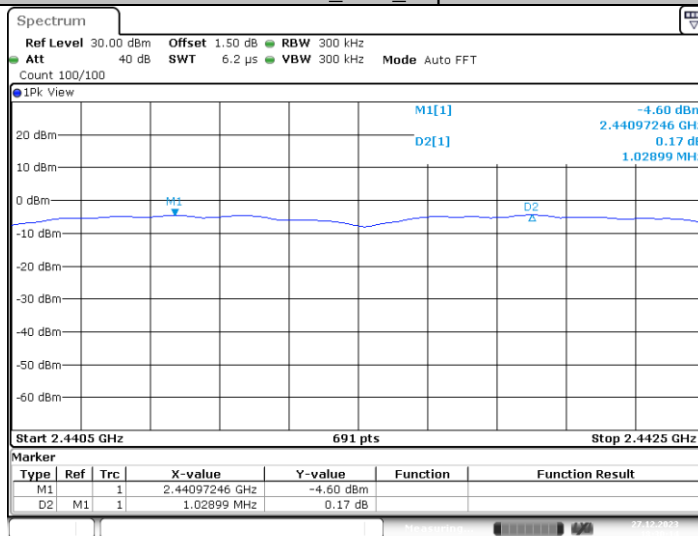
Date: 27.DEC.2023 18:17:00

DH5_Ant1_Hop



Date: 27.DEC.2023 18:34:34

2DH5_Ant1_Hop



Date: 27.DEC.2023 18:30:14

3DH5_Ant1_Hop





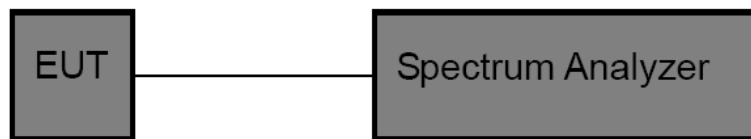
3.7. Number of Hopping Channel

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(iii)

| Section | Test Item | Limit |
|----------------------------------|---------------------------|-----------|
| 15.247 (a)(iii) RSS-247 5.1 d | Number of Hopping Channel | ≥ 15 |

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Peak Detector: RBW=100 kHz, VBW \geq RBW, Sweep time= Auto.

Test Mode

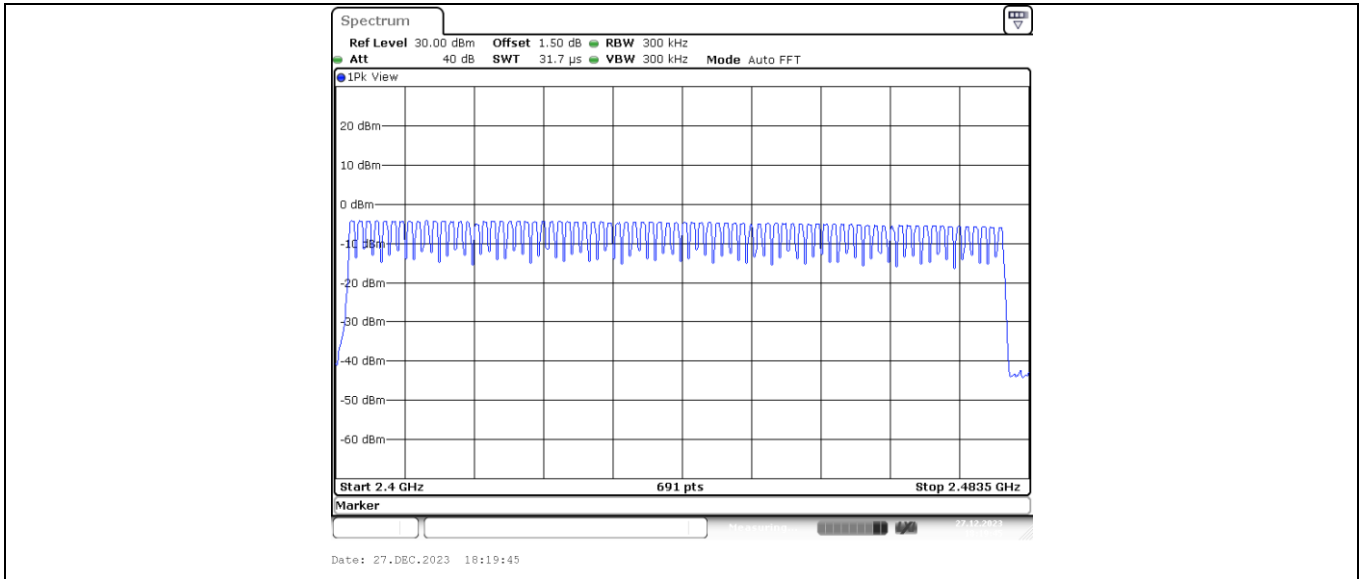
Please refer to the clause 2.4.

Test Result

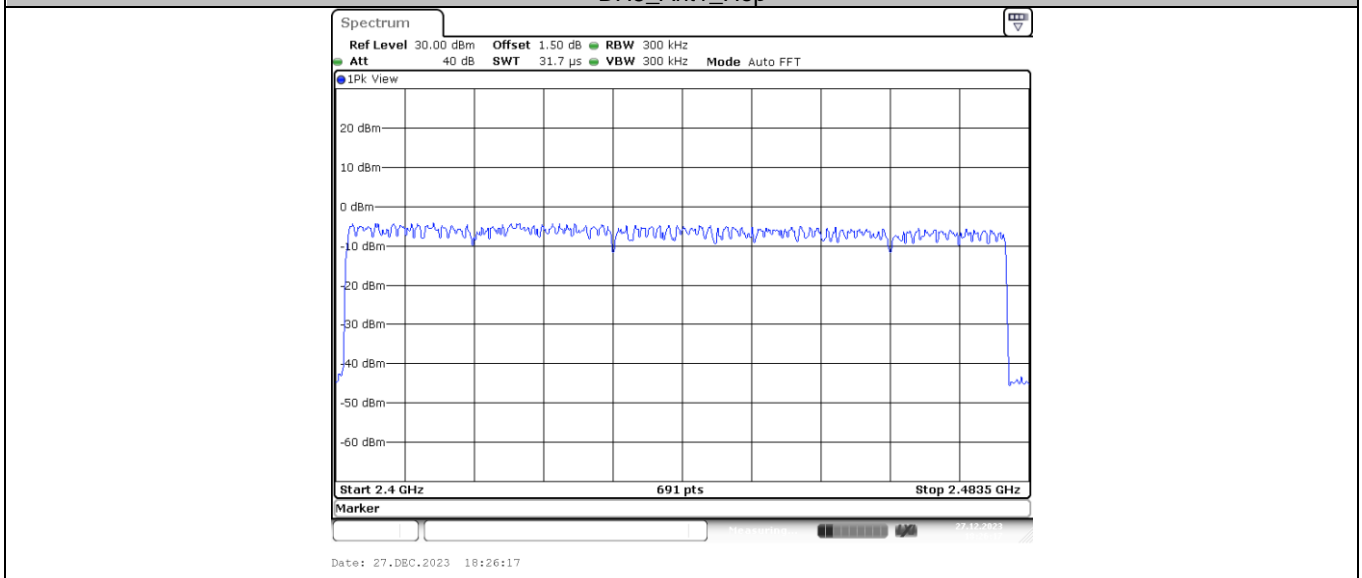
| Test Mode | Channel Number | Limit | Verdict |
|----------------|----------------|-----------|---------|
| GFSK | 79 | ≥ 15 | Pass |
| $\pi/4$ -DQPSK | 79 | ≥ 15 | Pass |
| 8-DPSK | 79 | ≥ 15 | Pass |



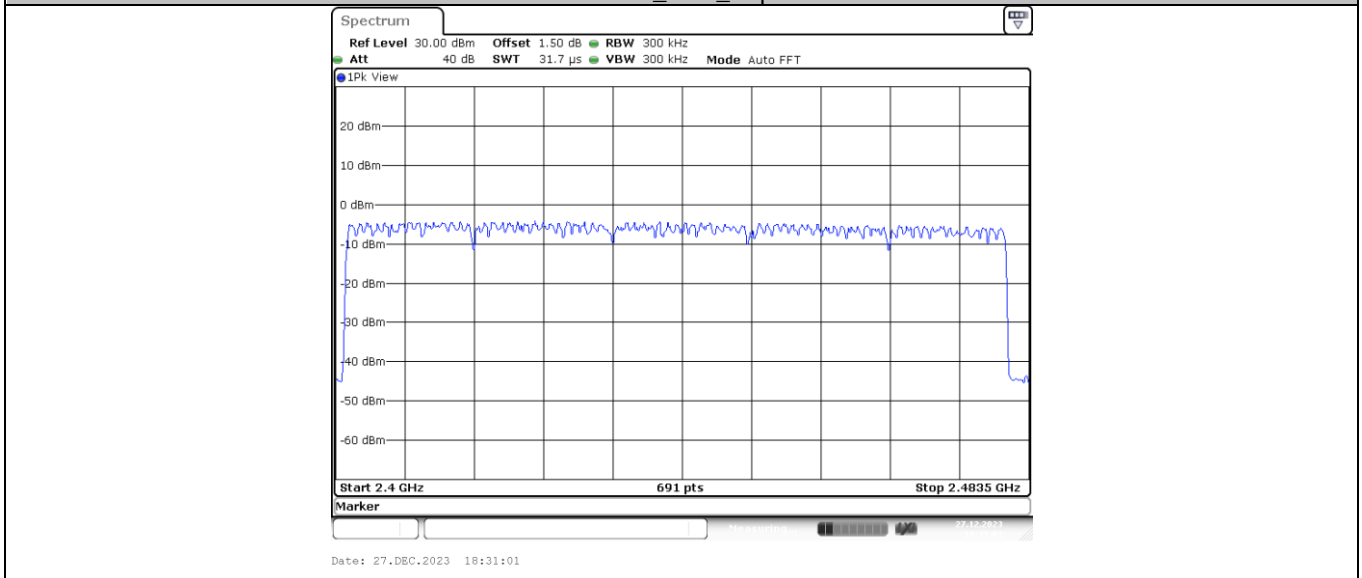
Test plot as follows:



DH5_Ant1_Hop



2DH5_Ant1_Hop



3DH5_Ant1_Hop



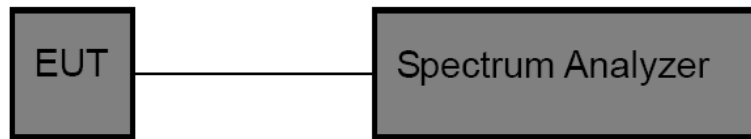
3.8. Dwell Time

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(iii)

| Section | Test Item | Limit |
|----------------------------------|---------------------------|---------|
| 15.247 (a)(iii) RSS-247 5.1 d | Average Time of Occupancy | 0.4 sec |

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Spectrum Setting: RBW=1MHz, VBW \geq RBW.
 - (2) Use video trigger with the trigger level set to enable triggering only on full pulses.
 - (3) Sweep Time is more than once pulse time.
 - (4) Set the center frequency on any frequency would be measure and set the frequency span to zero.
 - (5) Measure the maximum time duration of one single pulse.
 - (6) Set the EUT for packet transmitting.

Test Mode

Please refer to the clause 2.4.

**Test Result**

| Test Mode | Channel | Frequency (MHz) | Pulse Time (ms) | TotalHops [Num] | Total of Dwell (ms) | Period Time (ms) | Limit (second) | Verdict |
|------------|---------|-----------------|-----------------|-----------------|---------------------|------------------|----------------|---------|
| GFSK | DH1 | 2441 | 0.401 | 320 | 128.3 | 31.60 | ≤0.40 | Pass |
| | DH3 | 2441 | 1.658 | 180 | 265.3 | 31.60 | | |
| | DH5 | 2441 | 2.905 | 90 | 309.9 | 31.60 | | |
| π /4-DQPSK | 2DH1 | 2441 | 0.411 | 320 | 131.5 | 31.60 | ≤0.40 | Pass |
| | 2DH3 | 2441 | 1.663 | 150 | 266.1 | 31.60 | | |
| | 2DH5 | 2441 | 2.912 | 130 | 310.6 | 31.60 | | |
| 8-DPSK | 3DH1 | 2441 | 0.411 | 330 | 131.5 | 31.60 | ≤0.40 | Pass |
| | 3DH3 | 2441 | 1.661 | 180 | 265.8 | 31.60 | | |
| | 3DH5 | 2441 | 2.913 | 130 | 310.7 | 31.60 | | |

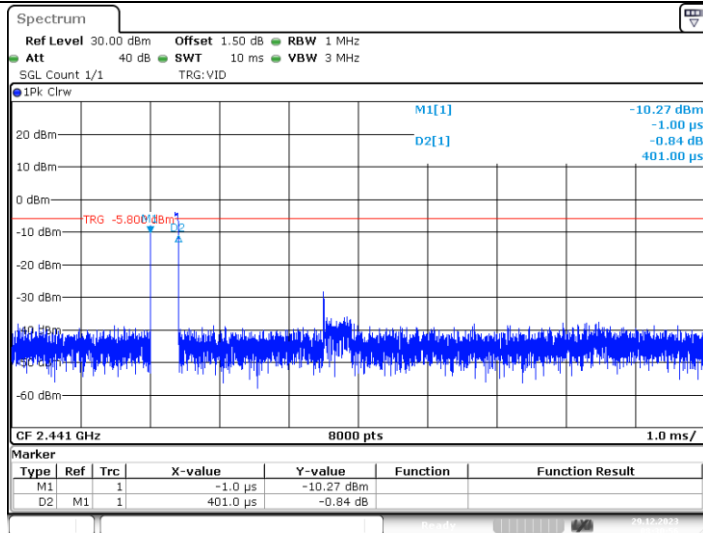
Note: 1DH1/2DH1/3DH1 Total of Dwell = Pulse Time*(1600/2)*31.6/79

1DH3/2DH3/3DH3 Total of Dwell = Pulse Time*(1600/4)*31.6/79

1DH5/2DH5/3DH5 Total of Dwell = Pulse Time*(1600/6)*31.6/79

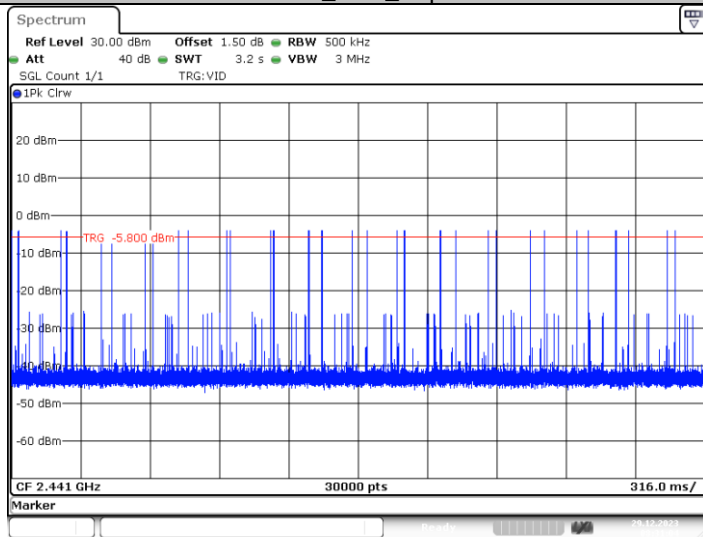


Test plot as follows:



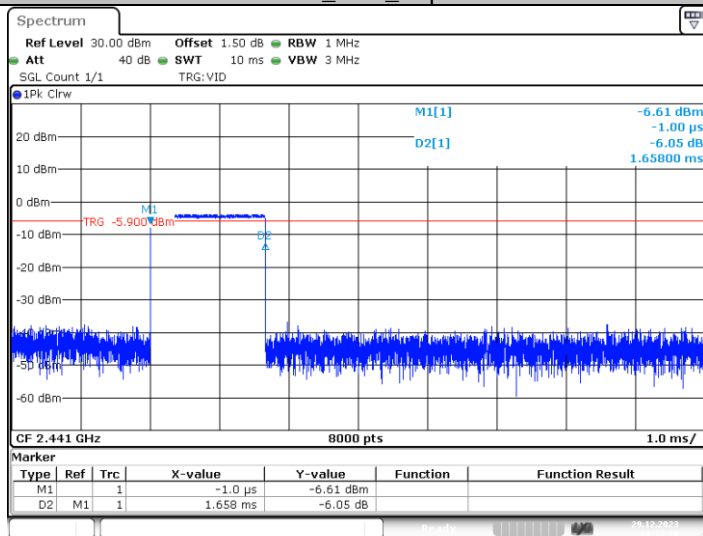
Date: 29.DEC.2023 08:30:56

DH1_Ant1_Hop



Date: 29.DEC.2023 08:31:04

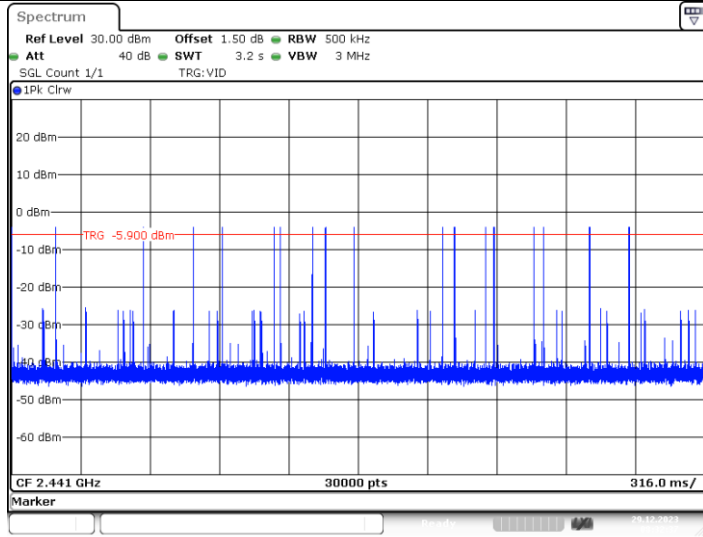
DH1_Ant1_Hop



Date: 29.DEC.2023 08:32:29

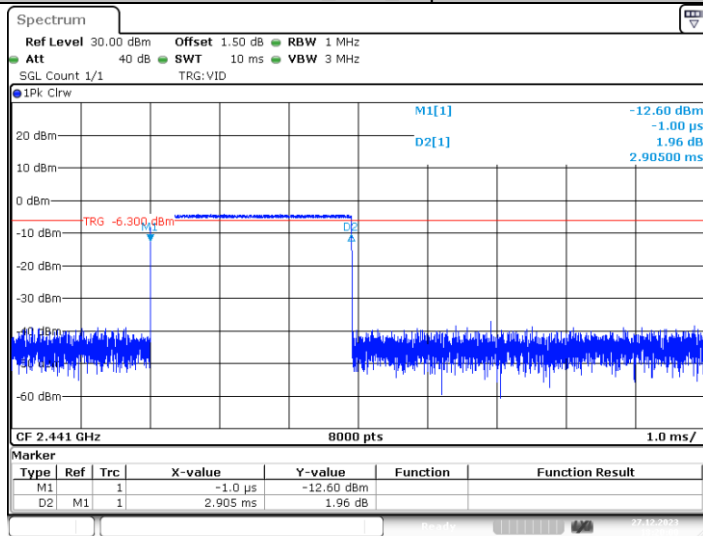
DH3_Ant1_Hop





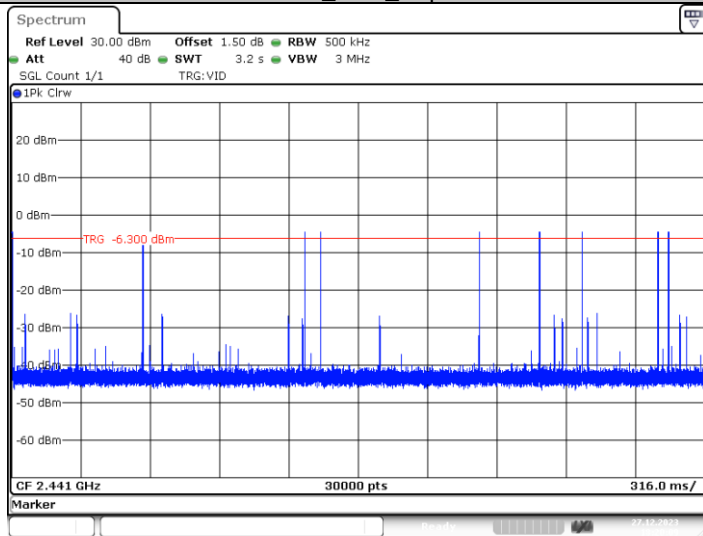
Date: 29.DEC.2023 08:32:37

DH3_Ant1_Hop



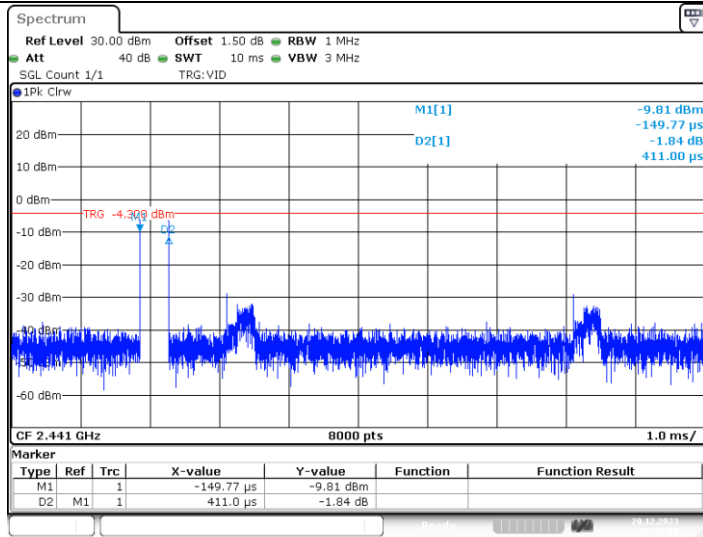
Date: 27.DEC.2023 18:20:00

DH5_Ant1_Hop



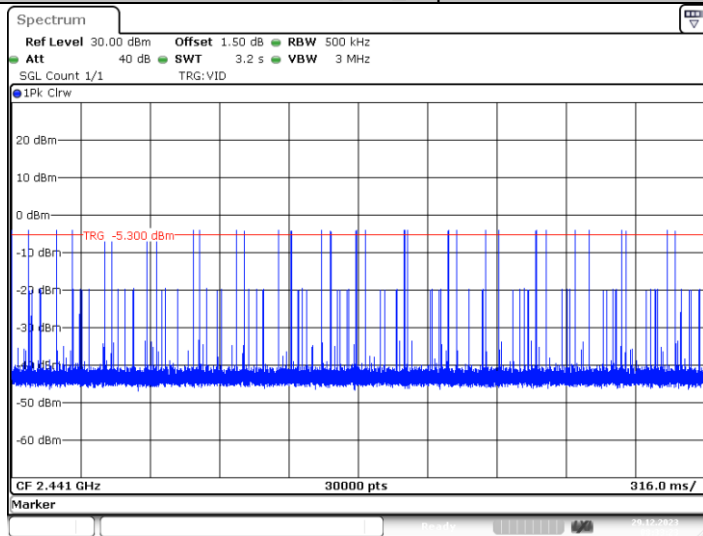
Date: 27.DEC.2023 18:20:09

DH5_Ant1_Hop



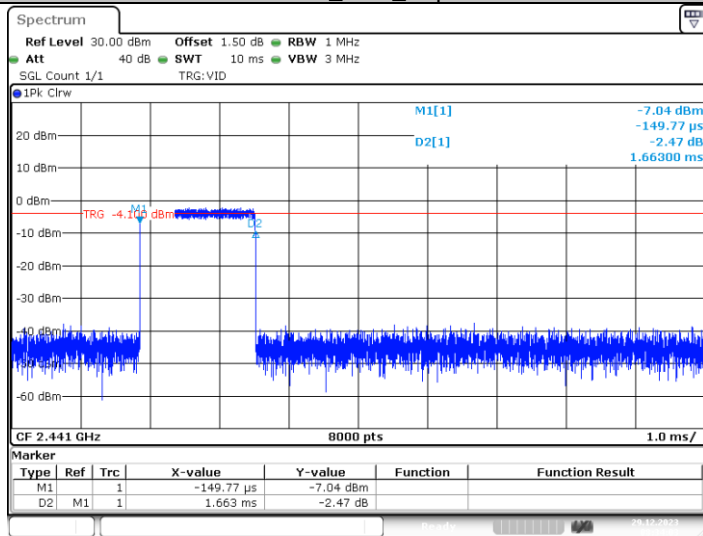
Date: 29.DEC.2023 08:33:08

2DH1_Ant1_Hop



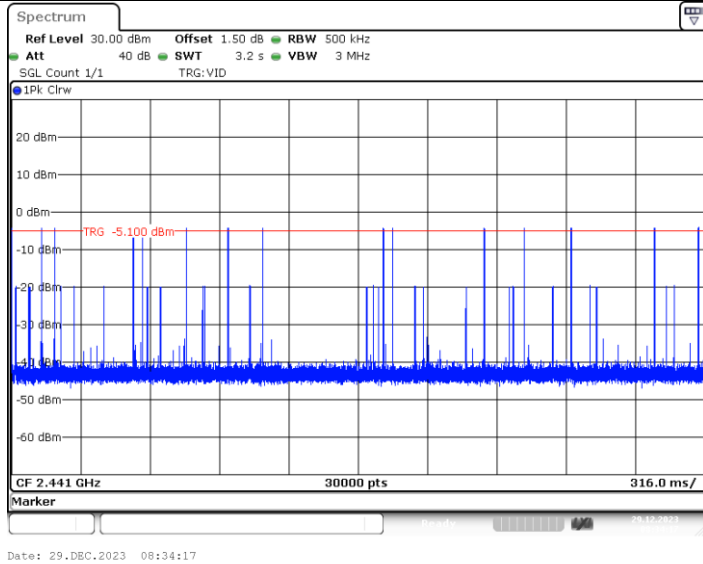
Date: 29.DEC.2023 08:33:22

2DH1_Ant1_Hop



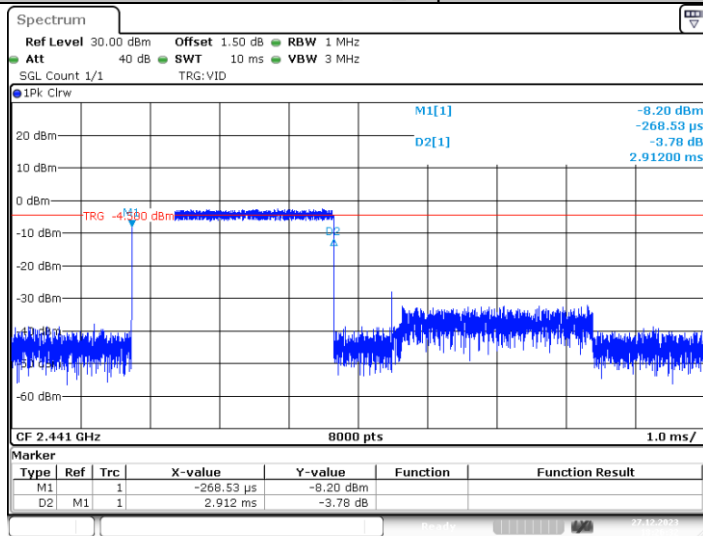
Date: 29.DEC.2023 08:34:02

2DH3_Ant1_Hop



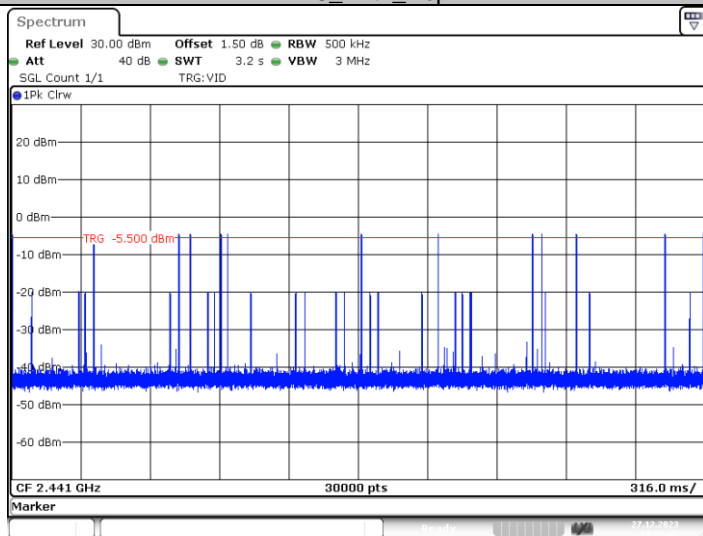
Date: 29.DEC.2023 08:34:17

2DH3_Ant1_Hop



Date: 27.DEC.2023 18:26:33

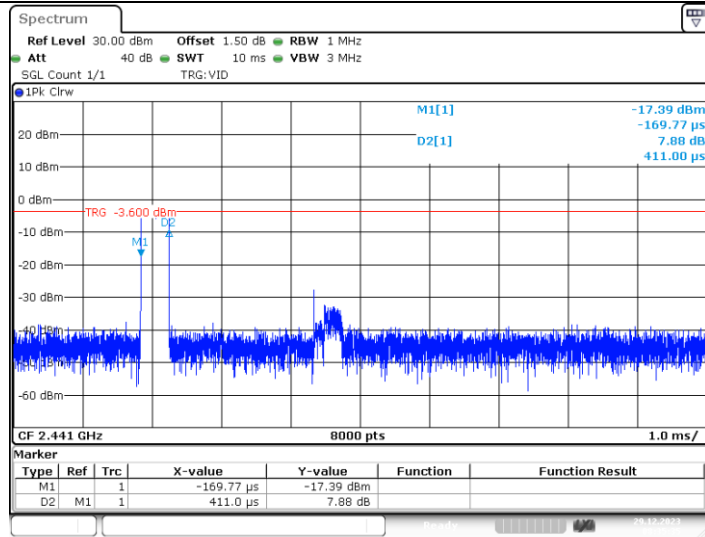
2DH5_Ant1_Hop



Date: 27.DEC.2023 18:26:48

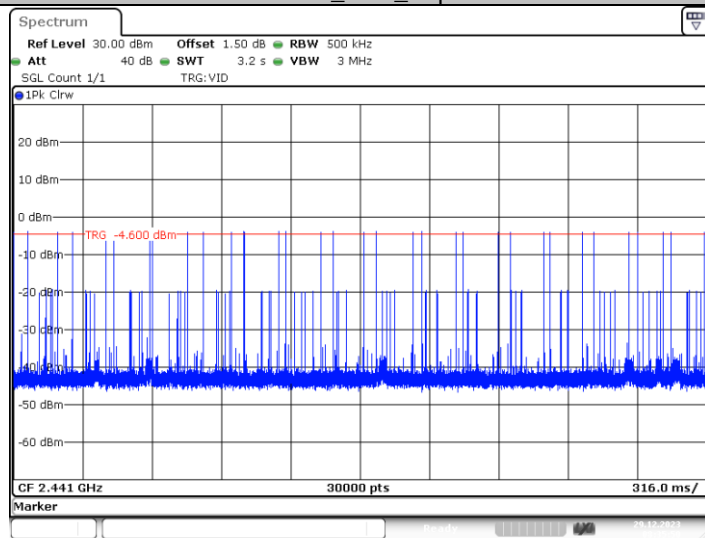
2DH5_Ant1_Hop





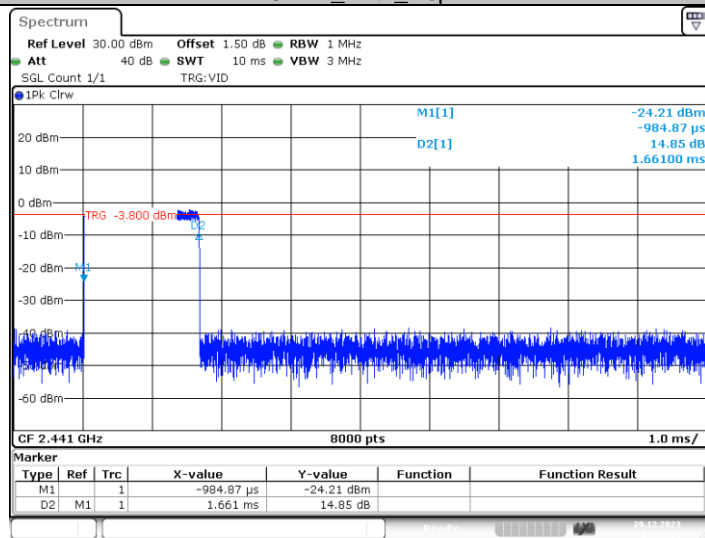
Date: 29.DEC.2023 08:35:35

3DH1_Ant1_Hop



Date: 29.DEC.2023 08:35:50

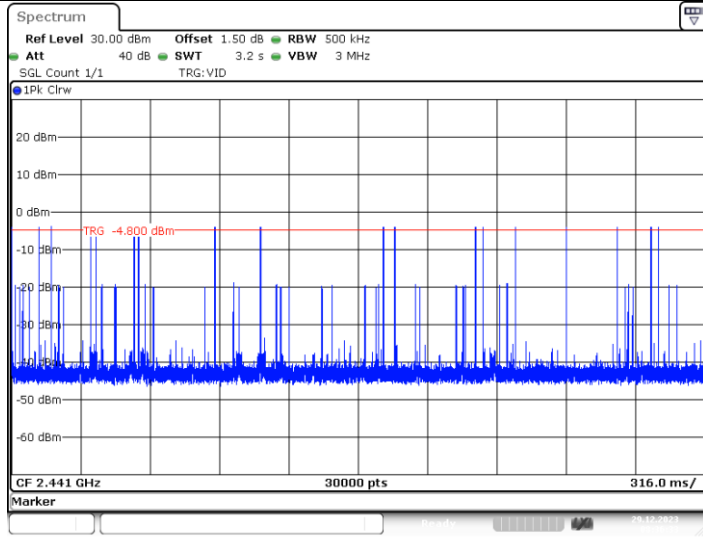
3DH1_Ant1_Hop



Date: 29.DEC.2023 08:36:19

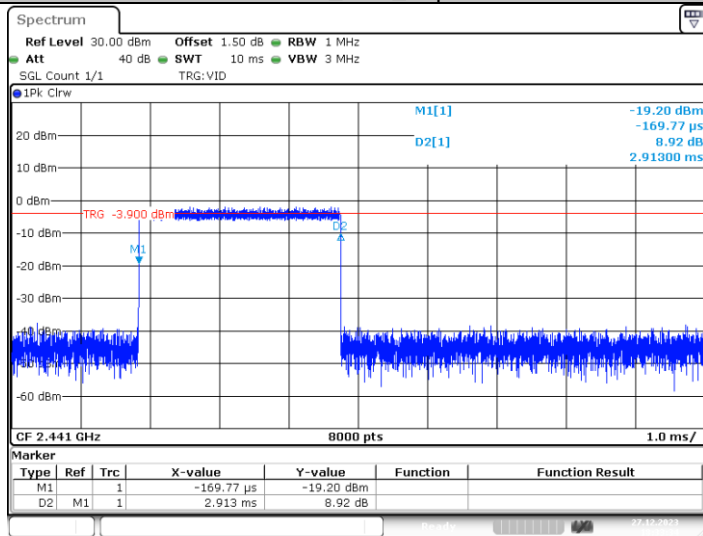
3DH3_Ant1_Hop





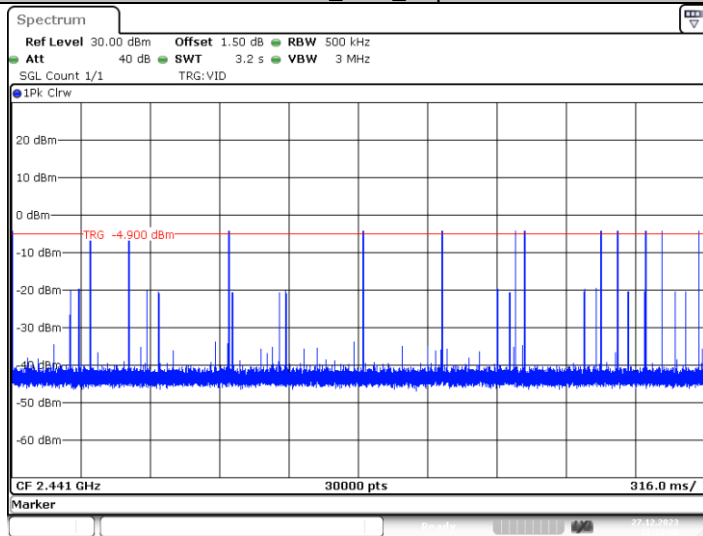
Date: 29.DEC.2023 08:36:33

3DH3_Ant1_Hop



Date: 27.DEC.2023 18:33:35

3DH5_Ant1_Hop



Date: 27.DEC.2023 18:33:49

3DH5_Ant1_Hop





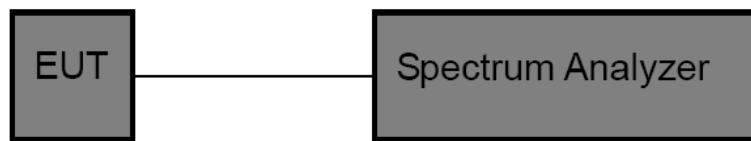
3.9. Peak Output Power

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(1)

| Section | Test Item | Limit | Frequency Range (MHz) |
|-------------------------------|--------------------------------|--|-----------------------|
| FCC CFR 47 Part 15.247 (b)(1) | Maximum Conducted Output Power | Hopping Channels ≥ 75 , Power $< 1\text{W}(30\text{dBm})$; Others $< 125\text{mW}(21\text{dBm})$ | 2400~2483.5 |

Test Configuration



Test Procedure

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- Spectrum Setting:
 - Set RBW $> 20\text{dB}$ Bandwidth.
 - Set VBW \geq RBW.
 - Detector = Peak.
 - Trace mode = Max hold.
 - Sweep = Auto couple.
 - Span = Approximately five times the 20dB bandwidth, centered on a hopping channel.

Test Mode

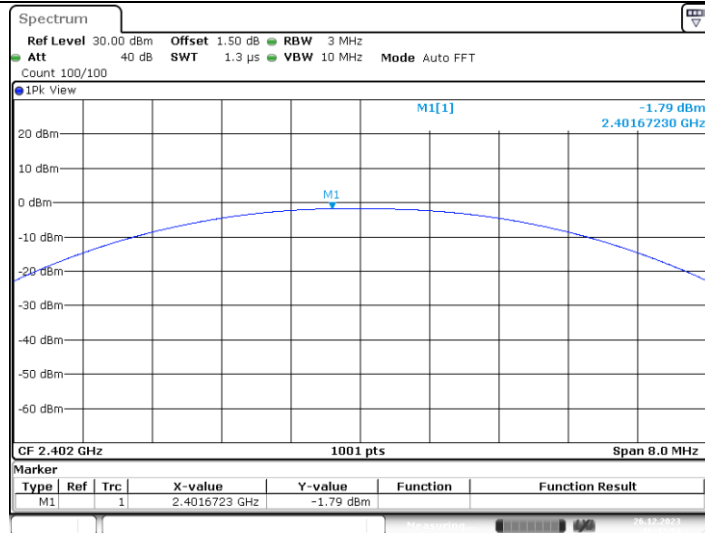
Please refer to the clause 2.4.

Test Result

| Test Mode | Frequency (MHz) | Conducted Output Power (dBm) | FCC Limit (dBm) | Verdict |
|----------------|-----------------|------------------------------|-----------------|---------|
| GFSK | 2402 | -1.79 | ≤ 30 | Pass |
| | 2441 | 0.98 | ≤ 30 | Pass |
| | 2480 | -6.32 | ≤ 30 | Pass |
| $\pi/4$ -DQPSK | 2402 | -2.52 | ≤ 30 | Pass |
| | 2441 | -2.56 | ≤ 30 | Pass |
| | 2480 | -3.67 | ≤ 30 | Pass |
| 8-DPSK | 2402 | -1.35 | ≤ 30 | Pass |
| | 2441 | -2.08 | ≤ 30 | Pass |
| | 2480 | -3.18 | ≤ 30 | Pass |

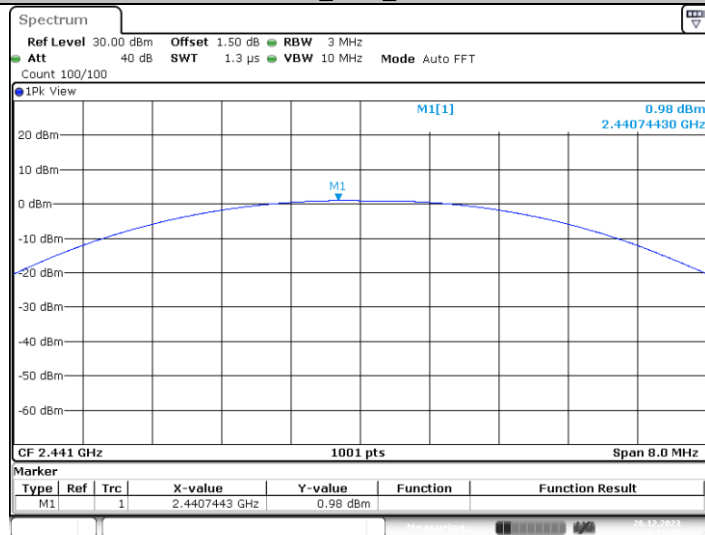


Test plot as follows:



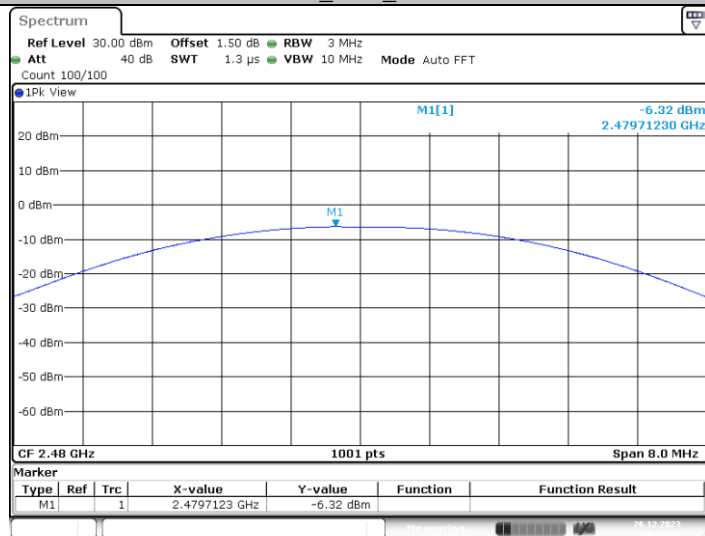
Date: 26.DEC.2023 16:42:54

DH5_Ant1_2402



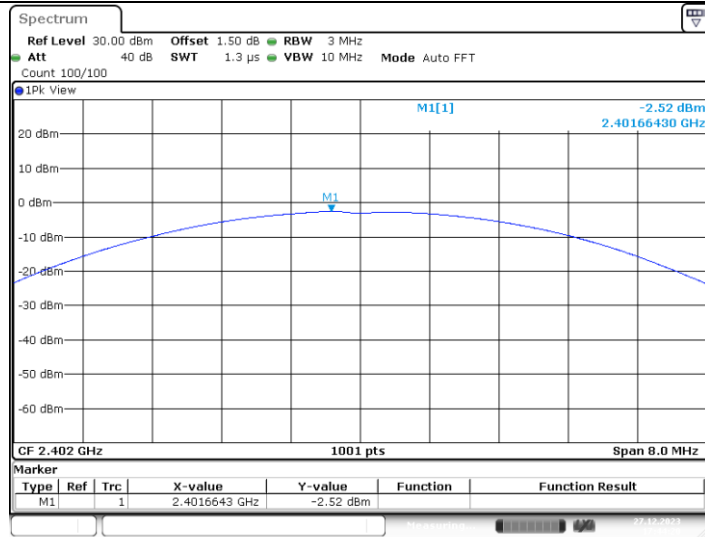
Date: 26.DEC.2023 16:17:17

DH5_Ant1_2441



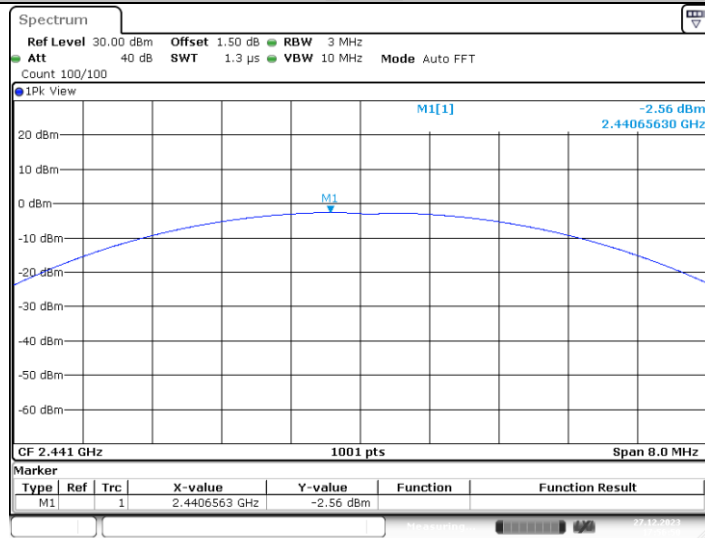
Date: 26.DEC.2023 16:07:35

DH5_Ant1_2480



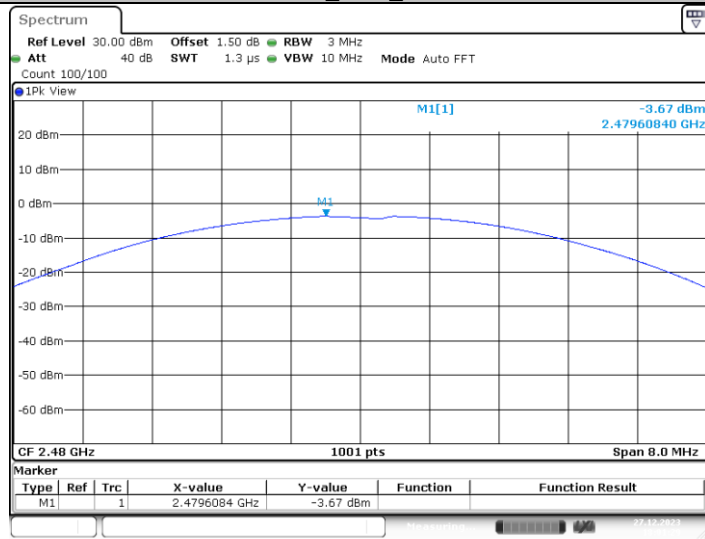
Date: 27.DEC.2023 17:44:21

2DH5_Ant1_2402



Date: 27.DEC.2023 17:56:50

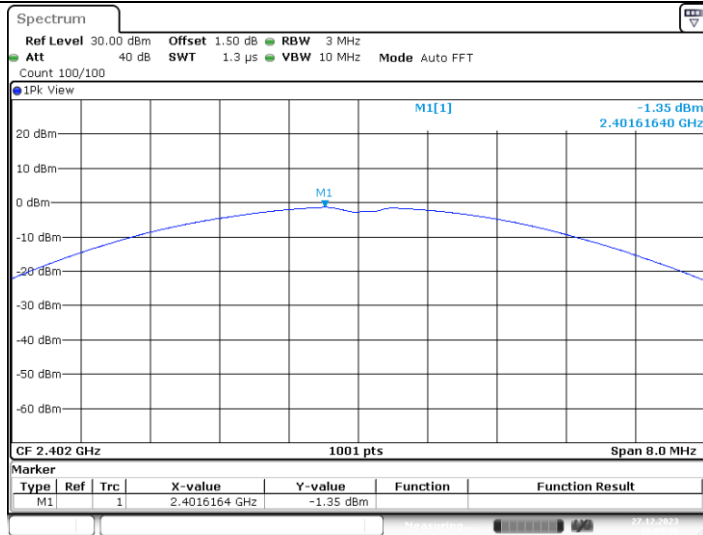
2DH5_Ant1_2441



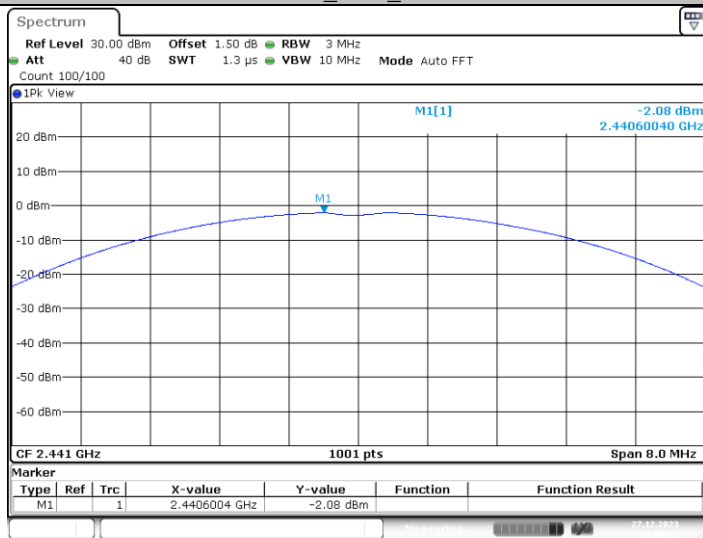
Date: 27.DEC.2023 18:01:29

2DH5_Ant1_2480

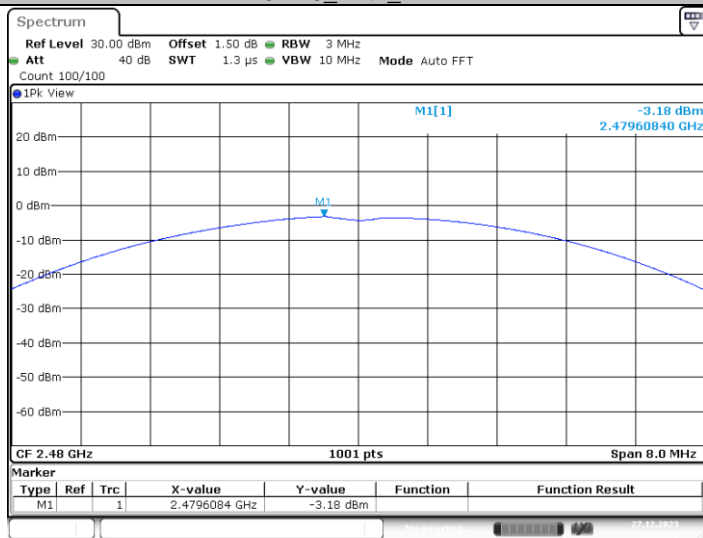




3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480

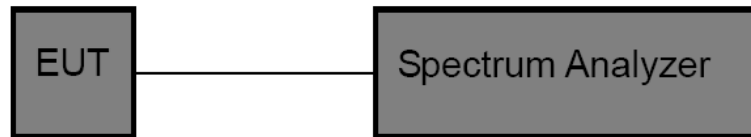


3.10. Duty Cycle

Limit

None, for report purposes only.

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:
Set analyzer center frequency to test channel center frequency.
Set the span to 0Hz.
Set the RBW to 10MHz.
Set the VBW to 10MHz.
Detector: Peak.
Sweep time: Auto.
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

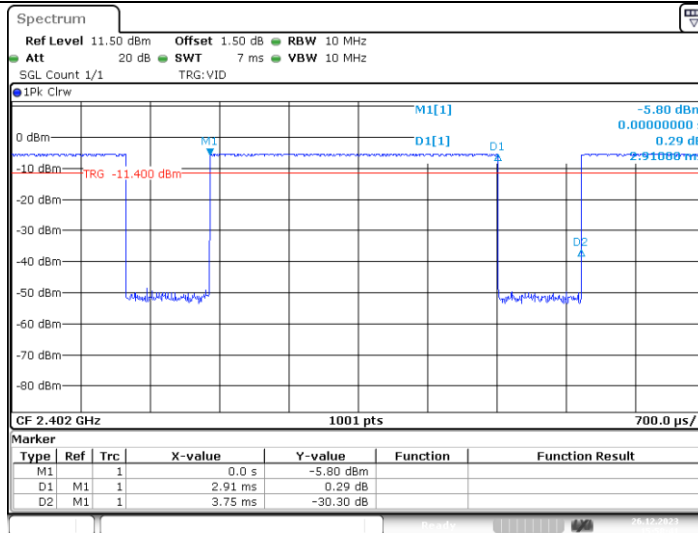
Please refer to the clause 2.4.

Test Result

| Test Mode | Frequency (MHz) | Transmission Duration (ms) | Transmission Period (ms) | Duty Cycle (%) | 1/T Minimum VBW (kHz) | Final Setting for VBW (kHz) |
|----------------|-----------------|----------------------------|--------------------------|----------------|-----------------------|-----------------------------|
| GFSK | 2402 | 2.91 | 3.75 | 77.60 | 0.34 | 1 |
| | 2441 | 2.91 | 3.75 | 77.60 | 0.34 | 1 |
| | 2480 | 2.91 | 3.76 | 77.39 | 0.34 | 1 |
| $\pi/4$ -DQPSK | 2402 | 2.92 | 3.75 | 77.87 | 0.34 | 1 |
| | 2441 | 2.92 | 3.76 | 77.66 | 0.34 | 1 |
| | 2480 | 2.92 | 3.76 | 77.66 | 0.34 | 1 |
| 8-DPSK | 2402 | 2.92 | 3.76 | 77.66 | 0.34 | 1 |
| | 2441 | 2.92 | 3.75 | 77.87 | 0.34 | 1 |
| | 2480 | 2.92 | 3.76 | 77.66 | 0.34 | 1 |

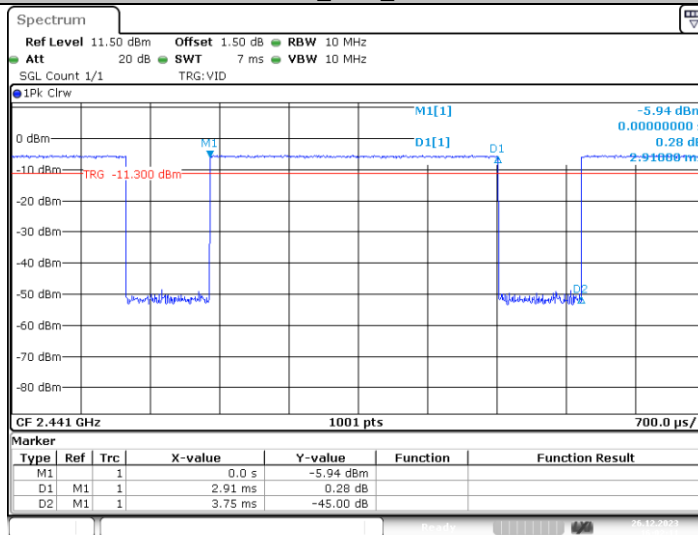


Test plot as follows:



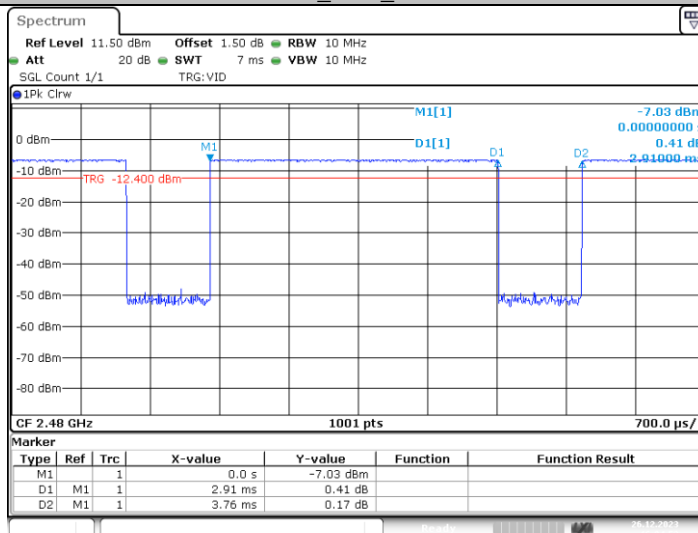
Date: 26.DEC.2023 15:58:41

DH5_Ant1_2402



Date: 26.DEC.2023 16:02:11

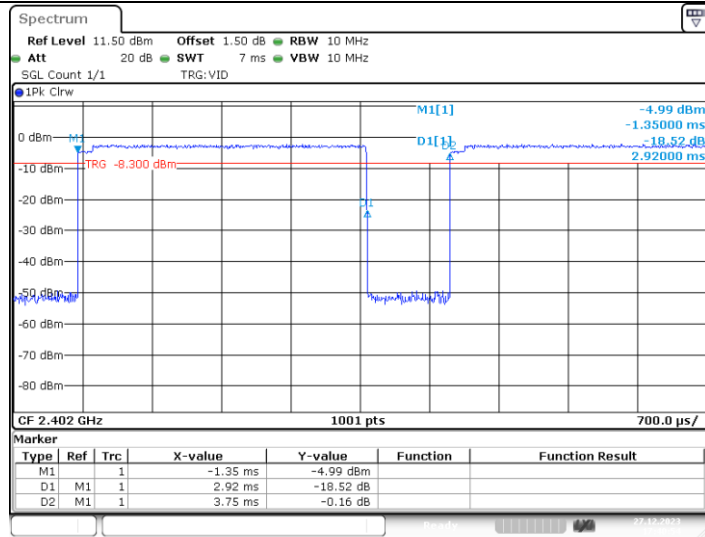
DH5_Ant1_2441



Date: 26.DEC.2023 16:04:52

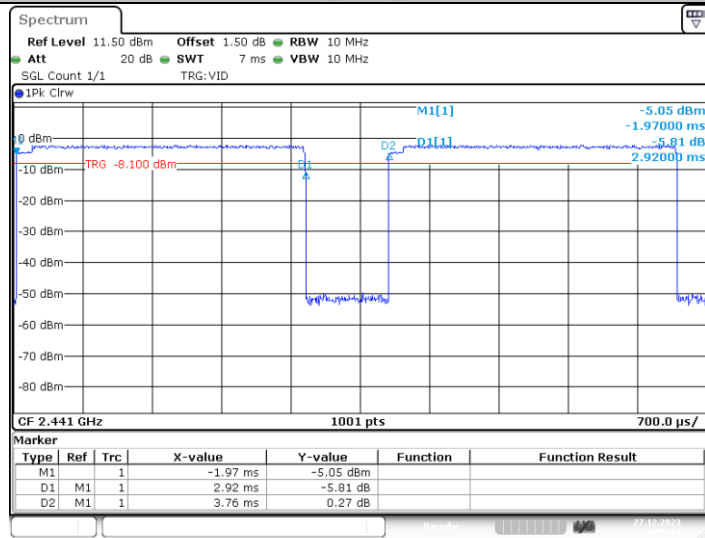
DH5_Ant1_2480





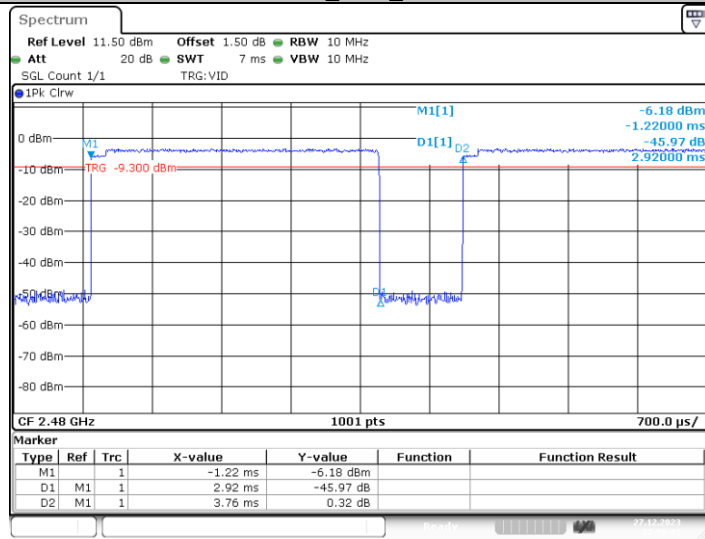
Date: 27.DEC.2023 17:40:54

2DH5_Ant1_2402



Date: 27.DEC.2023 17:55:14

2DH5_Ant1_2441



Date: 27.DEC.2023 17:58:40

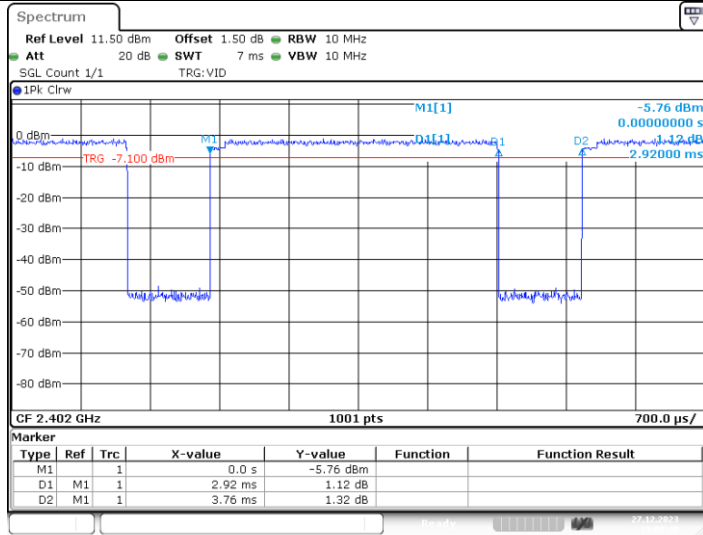
2DH5_Ant1_2480

CTC Laboratories, Inc.

2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China
Tel.: (86)755-27521059 Fax: (86)755-27521011 Http://www.sz-ctc.org.cn

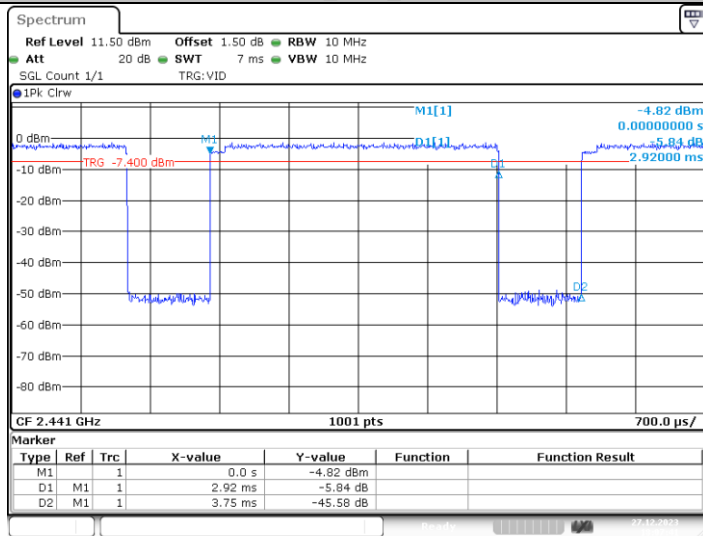


For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : <http://yz.cnca.cn>



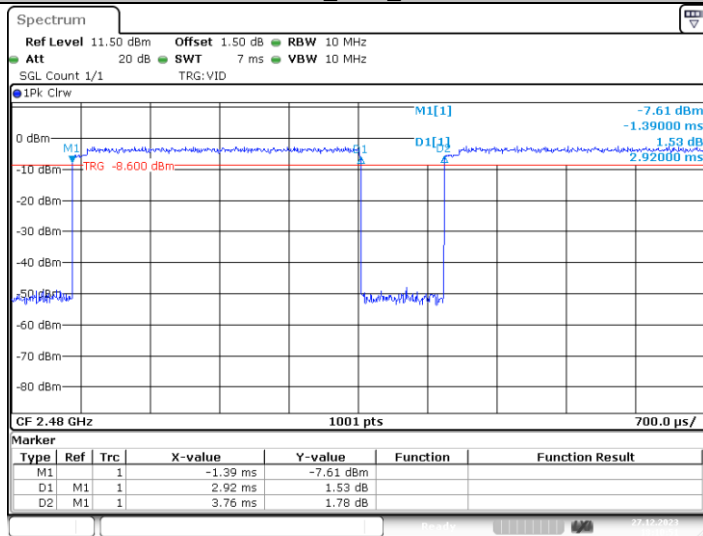
Date: 27.DEC.2023 18:02:48

3DH5_Ant1_2402



Date: 27.DEC.2023 18:07:41

3DH5_Ant1_2441



Date: 27.DEC.2023 18:10:52

3DH5_Ant1_2480





3.11. Antenna Requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i)

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result

The directional gain of the antenna is less than 6dBi, please refer to the EUT internal photographs antenna photo.

*****THE END*****