



■ Report No.: DDT-R22083008-2E01

■ Issued Date: Oct. 11, 2022

FCC AND ISED CERTIFICATION TEST REPORT

FOR

| | | |
|-----------------------------|---|---|
| Applicant | : | Harman International Industries, Inc. |
| Address | : | 8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES |
| Equipment under Test | : | BLUETOOTH HEADSET |
| Model No. | : | TUNE520BT |
| Trade Mark | : | JBL |
| FCC ID | : | APITUNE520BT |
| IC | : | 6132A-TUNE520BT |
| Manufacturer | : | Harman International Industries, Inc. |
| Address | : | 8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES |

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park,
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REPORT

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Test Report Declare

| | | |
|-----------------------------|---|--|
| Applicant | : | Harman International Industries, Inc. |
| Address | : | 8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES |
| Equipment under Test | : | BLUETOOTH HEADSET |
| Model No. | : | TUNE520BT |
| Trade Mark | : | JBL |
| Manufacturer | : | Harman International Industries, Inc. |
| Address | : | 8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES |

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C, RSS-247 Issue 2 February 2017.

Test Procedure Used:

ANSI C63.10:2013, RSS-Gen Issue 5, Apr. 2018, Amendment 2 (February 2021)

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC&ISED standards.

| | | | |
|-------------------------|--------------------|----------------------|-------------------------------|
| Report No.: | DDT-R22083008-2E01 | | |
| Date of Receipt: | Sep. 19, 2022 | Date of Test: | Sep. 19, 2022 ~ Oct. 11, 2022 |

Prepared By:

Sanvin Zheng

Sanvin Zheng/Engineer

Approved By:



Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision History

| Rev. | Revisions | Issue Date | Revised By |
|------|---------------|---------------|------------|
| --- | Initial issue | Oct. 11, 2022 | |
| | | | |

1. Summary of Test Results

| Description of Test Item | Standard | Verdict |
|-----------------------------------|---|---------|
| Maximum Peak Output Power | FCC Part 15: 15.247(b)(1) ANSI C63.10:2013 RSS-247 Issue 2 | Pass |
| 20 dB Bandwidth and 99% Bandwidth | FCC Part 15: 15.215 ANSI C63.10:2013 RSS-247 Issue 2 | Pass |
| Carrier Frequency Separation | FCC Part 15: 15.247(a)(1) ANSI C63.10:2013 RSS-247 Issue 2 | Pass |
| Number of Hopping Channel | FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10:2013 RSS-247 Issue 2 | Pass |
| Dwell Time | FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10:2013 RSS-247 Issue 2 | Pass |
| Radiated Emission | FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.10:2013 RSS-247 Issue 2 RSS-Gen Issue 5 | Pass |
| Band Edge Compliance | FCC Part 15: 15.247(d) ANSI C63.10:2013 RSS-247 Issue 2 RSS-Gen Issue 5 | Pass |
| Power Line Conducted Emissions | FCC Part 15: 15.207 ANSI C63.10:2013 RSS-Gen Issue 5 | Pass |
| Antenna Requirement | FCC Part 15: 15.203 RSS-Gen Issue 5 | Pass |

2. General Test Information

2.1. Description of EUT

| | |
|--------------------------|---|
| EUT* Name | : BLUETOOTH HEADSET |
| Model Number | : TUNE520BT |
| EUT Function Description | : Please reference user manual of this device |
| Power Supply | : DC 5V from external USB DC 3.7V built-in battery |
| Radio Specification | : Bluetooth V5.3 |
| Operation Frequency | : 2402MHz-2480MHz |
| Modulation | : GFSK, $\pi/4$ -DQPSK, 8DPSK |
| Data Rate | : 1Mbps, 2Mbps, 3Mbps |
| Antenna Gain | : PCB Layout antenna, maximum PK gain: 1.99 dBi |
| Sample Number | : S22083008-26 for conductive S22083008-27 for radiation |

Note: EUT is the ab. of equipment under test.

| Channel information | | | | | |
|---------------------|-----------------|---------|-----------------|---------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 0 | 2402 | 27 | 2429 | 54 | 2456 |
| 1 | 2403 | 28 | 2430 | 55 | 2457 |
| 2 | 2404 | 29 | 2431 | 56 | 2458 |
| 3 | 2405 | 30 | 2432 | 57 | 2459 |
| 4 | 2406 | 31 | 2433 | 58 | 2460 |
| 5 | 2407 | 32 | 2434 | 59 | 2461 |
| 6 | 2408 | 33 | 2435 | 60 | 2462 |
| 7 | 2409 | 34 | 2436 | 61 | 2463 |
| 8 | 2410 | 35 | 2437 | 62 | 2464 |
| 9 | 2411 | 36 | 2438 | 63 | 2465 |
| 10 | 2412 | 37 | 2439 | 64 | 2466 |
| 11 | 2413 | 38 | 2440 | 65 | 2467 |
| 12 | 2414 | 39 | 2441 | 66 | 2468 |
| 13 | 2415 | 40 | 2442 | 67 | 2469 |
| 14 | 2416 | 41 | 2443 | 68 | 2470 |
| 15 | 2417 | 42 | 2444 | 69 | 2471 |
| 16 | 2418 | 43 | 2445 | 70 | 2472 |
| 17 | 2419 | 44 | 2446 | 71 | 2473 |
| 18 | 2420 | 45 | 2447 | 72 | 2474 |
| 19 | 2421 | 46 | 2448 | 73 | 2475 |
| 20 | 2422 | 47 | 2449 | 74 | 2476 |
| 21 | 2423 | 48 | 2450 | 75 | 2477 |
| 22 | 2424 | 49 | 2451 | 76 | 2478 |
| 23 | 2425 | 50 | 2452 | 77 | 2479 |
| 24 | 2426 | 51 | 2453 | 78 | 2480 |
| 25 | 2427 | 52 | 2454 | | |
| 26 | 2428 | 53 | 2455 | | |

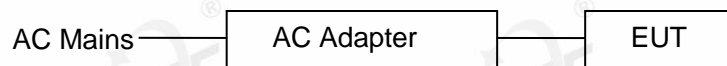
2.2. Accessories of EUT

| Description of Accessories | Manufacturer | Model number | Description | Remark |
|----------------------------|--------------|--------------|--------------|--------|
| USB cable | Harman | N/A | Length: 0.2m | N/A |

2.3. Assistant equipment used for test

| Assistant equipment | Manufacturer | Model number | EMC Compliance | SN |
|---------------------|--------------|--------------|----------------|-----|
| N/A | N/A | N/A | N/A | N/A |

2.4. Block diagram of EUT configuration for test



Test software: RTLBTAPP_V5.2.3.40.exe

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table.

The pathloss of external cable: 0.5dB (According to the manufacturer's claims)

| Tested mode, channel, information | | | |
|------------------------------------|------------------|-------------|-----------------|
| Mode | Setting Tx Power | Channel | Frequency (MHz) |
| GFSK hopping on Tx mode | / | CH0 to CH78 | 2402 to 2480 |
| $\pi/4$ -DQPSK hopping on Tx mode | / | CH0 to CH78 | 2402 to 2480 |
| 8DPSK hopping on Tx mode | / | CH0 to CH78 | 2402 to 2480 |
| GFSK hopping off Tx mode | / | CH0 | 2402 |
| | / | CH39 | 2441 |
| | / | CH78 | 2480 |
| $\pi/4$ -DQPSK hopping off Tx mode | / | CH0 | 2402 |
| | / | CH39 | 2441 |
| | / | CH78 | 2480 |
| 8DPSK hopping off Tx mode | / | CH0 | 2402 |
| | / | CH39 | 2441 |
| | / | CH78 | 2480 |

2.5. Deviations of test standard

No deviation.

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|--------------------|------------|
| Temperature range: | 21-25 °C |
| Humidity range: | 40-75% |
| Pressure range: | 86-106 kPa |

2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20155, G-20118

2.8. Measurement uncertainty

| Test Item | Uncertainty |
|--|--|
| Bandwidth | 1.1% |
| Peak Output Power (Conducted) (Spectrum analyzer) | 0.86 dB (10 MHz ≤ f < 3.6 GHz); |
| | 1.38 dB (3.6 GHz ≤ f < 8 GHz) |
| Peak Output Power (Conducted) (Power Sensor) | 0.74 dB |
| Power Spectral Density | 0.74 dB (10 MHz ≤ f < 3.6 GHz); |
| | 1.38 dB (3.6 GHz ≤ f < 8 GHz) |
| Frequencies Stability | 6.7 × 10 ⁻⁸ (Antenna couple method) |
| | 5.5 × 10 ⁻⁸ (Conducted method) |
| Conducted spurious emissions | 0.86 dB (10 MHz ≤ f < 3.6 GHz); |
| | 1.40 dB (3.6 GHz ≤ f < 8 GHz) |
| | 1.66 dB (8 GHz ≤ f < 22 GHz) |
| Uncertainty for radio frequency (RBW < 20 kHz) | 3×10 ⁻⁸ |
| Temperature | 0.4 °C |
| Humidity | 2 % |
| Uncertainty for Conduction emission test (9KHz-150KHz) | 3.72dB |
| Uncertainty for Radiation Emission test (30 MHz - 1 GHz) | 4.70 dB (Antenna Polarize: V) |
| | 4.84 dB (Antenna Polarize: H) |
| Uncertainty for Radiation Emission test (1 GHz - 40 GHz) | 4.10 dB (1 - 6 GHz) |
| | 4.40 dB (6 GHz - 18 GHz) |
| | 3.54 dB (18 GHz - 26 GHz) |
| | 4.30 dB (26 GHz - 40 GHz) |
| Uncertainty for Power line conduction emission test | 3.32 dB (150 kHz - 30 MHz) |

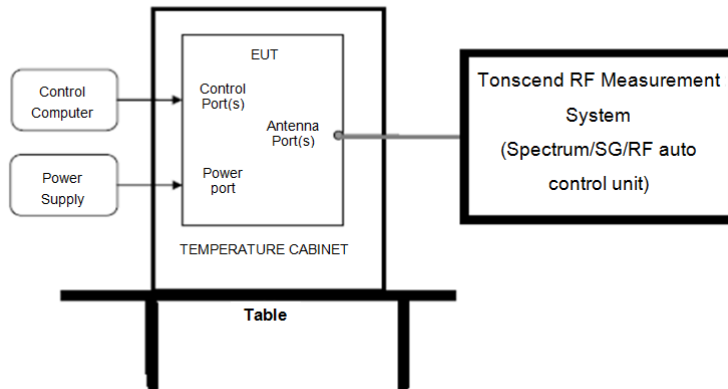
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Equipment Used During Test

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|-----------------|--|-----------------------|--------------------------------|---------------|
| ☑RF Connected Test (Tonscend RF Measurement System 4#) | | | | | |
| Signal &Spectrum analyzer | R&S | FSV3044 | 101173 | Apr. 13, 2022 | 1 Year |
| Wideband Radio Communication tester | R&S | CMW500 | 120259 | May 26, 2022 | 1 Year |
| EXG Analog Signal Generator | KEYSIGHT | N5173A | MY62152058 | May 26, 2022 | 1 Year |
| Vector Signal Generator | Agilent | E8267D | US49060192 | Oct. 15, 2021 | 1 Year |
| RF Control Unit | Tonsend | JS0806-2 | 2118060485 | May 28, 2022 | 1 Year |
| Temp&Humi Programmable | ZHIXIANG | ZXGDJS-150L | ZX170110-A | May 26, 2022 | 1 Year |
| Test Software | JS Tonscend | JS1120-3 | Ver.3.2.22 | N/A | N/A |
| ☑Radiation 3#chamber | | | | | |
| EMI Test Receiver | R&S | ESU26 | 100472 | May 19, 2022 | 1 Year |
| Spectrum analyzer | Agilent | E4447A | MY50180031 | May 17, 2022 | 1 Year |
| Active Loop antenna | Schwarzbeck | FMZB-1519 | 1519-038 | Sep. 19, 2021 Sep. 29, 2022 | 1 Year |
| Trilog Broadband Antenna | Schwarzbeck | VULB 9163 | 01429 | Jul. 22, 2022 | 1 Year |
| Double Ridged Horn Antenna | Schwarzbeck | BBHA9120D | 02468 | Nov. 29, 2021 | 1 Year |
| Broad Band Horn Antenna | Schwarzbeck | BBHA 9170 | 790 | May 06, 2022 | 1 Year |
| Pre-amplifier | COM-POWER | PAM-118A | 18040084 | Aug.17, 2022 | 1 Year |
| Pre-amplifier | COM-POWER | PAM-840A | 461369 | Apr. 11, 2022 | 1 Year |
| RE Cable | N/A | W23.02 CP1-X2 + W23.09 AP1-X8+ JCT26S-NJ- NJ-1.5M+ JCT26S-NJ- NJ-1.5M | 4.5M+8M+1.5M+ 1.5M | Aug.17, 2022 | 1 Year |
| RF Cable | Yuhu Technology | JCTB810-NJ -NJ-9M | 21123964 | May. 19,2022 | 1 Year |
| RF Cable | Yuhu Technology | ZT26S-SMA J-SMAJ-1M | 21073466 | Aug.17, 2022 | 1 Year |
| Test software | Audix | E3 | V 6.1.1.1 | N/A | N/A |
| ☑Power Line Conducted Emissions Test 1# | | | | | |
| Test Receiver | R&S | ESCI | 100551 | Aug. 26, 2022 | 1 Year |
| LISN 1 | R&S | ENV216 | 101109 | Aug. 26, 2022 | 1 Year |
| LISN 2 | R&S | ESH2-Z5 | 100309 | Aug. 26, 2022 | 1 Year |
| Pulse Limiter | R&S | ESH3-Z2 | 101242 | Aug. 26, 2022 | 1 Year |
| CE Cable 1 | HUBSER | N/A | W10.01 | Aug. 26, 2022 | 1 Year |
| Test software | Audix | E3 | V 6.11111b | N/A | N/A |
| Test Receiver | R&S | ESCI | 100551 | Aug. 26, 2022 | 1 Year |

4. Maximum Peak Output Power

4.1. Block diagram of test setup



4.2. Limits

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts, the e.i.r.p shall not exceed 4W.

4.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Measure the maximum conducted output power of EUT by spectrum analyzer with PK detector and RBW=3 MHz (above 20 dB bandwidth of measured signal), VBW=10 MHz

Note: The attenuator loss was inputted into spectrum analyzer as amplitude offset.

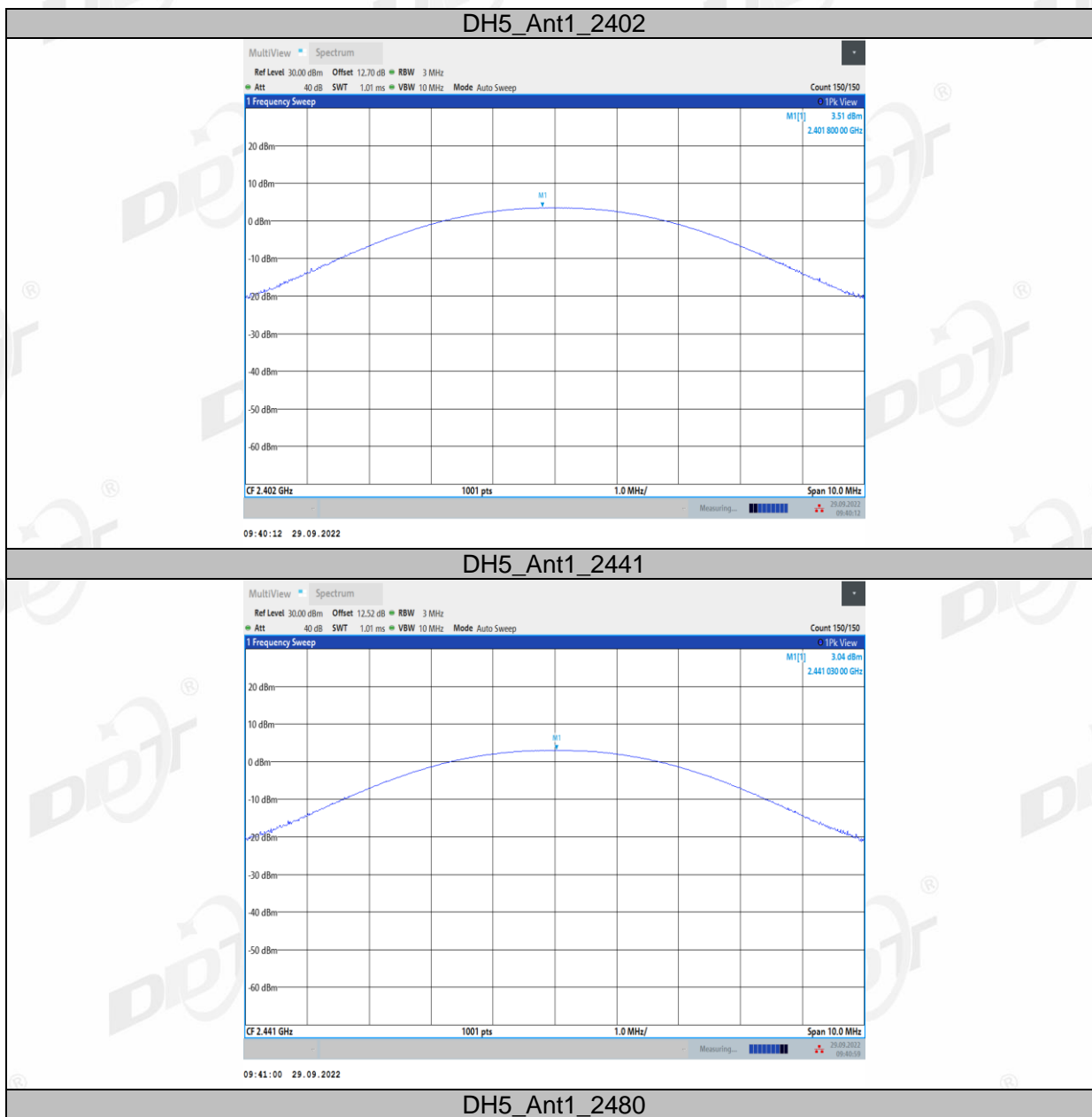
4.4. Test result

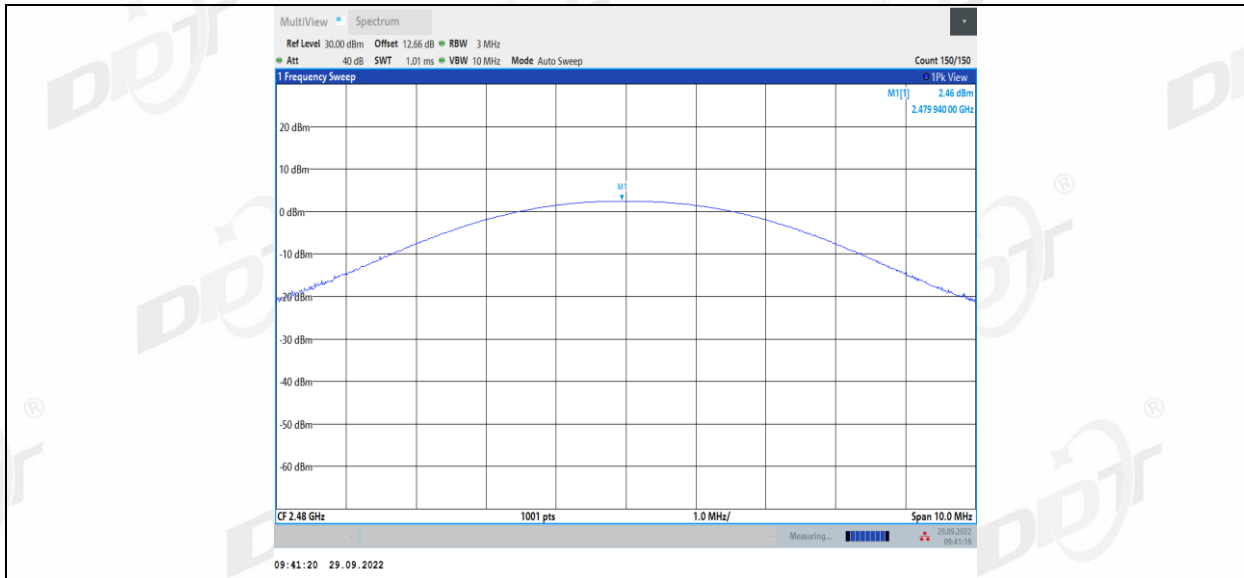
| Mode | Antenna | Freq. (MHz) | Conducted Output Power (dBm) | Limit (dBm) | Verdict |
|----------------|---------|-------------|------------------------------|-------------|---------|
| GFSK | ANT1 | 2402 | 3.51 | 21 | Pass |
| | ANT1 | 2441 | 3.04 | 21 | Pass |
| | ANT1 | 2480 | 2.46 | 21 | Pass |
| $\pi/4$ -DQPSK | ANT1 | 2402 | 5.62 | 21 | Pass |
| | ANT1 | 2441 | 5.26 | 21 | Pass |
| | ANT1 | 2480 | 4.69 | 21 | Pass |
| 8DPSK | ANT1 | 2402 | 6.07 | 21 | Pass |
| | ANT1 | 2441 | 5.73 | 21 | Pass |
| | ANT1 | 2480 | 5.26 | 21 | Pass |

| Mode | Antenna | Freq. (MHz) | EIRP (dBm) | Limit (dBm) | Verdict |
|----------------|---------|-------------|-------------|-------------|---------|
| GFSK | ANT1 | 2402 | 5.50 | 36 | Pass |
| | ANT1 | 2441 | 5.03 | 36 | Pass |
| | ANT1 | 2480 | 4.45 | 36 | Pass |
| $\pi/4$ -DQPSK | ANT1 | 2402 | 7.61 | 36 | Pass |
| | ANT1 | 2441 | 7.25 | 36 | Pass |
| | ANT1 | 2480 | 6.68 | 36 | Pass |
| 8DPSK | ANT1 | 2402 | 8.06 | 36 | Pass |
| | ANT1 | 2441 | 7.72 | 36 | Pass |
| | ANT1 | 2480 | 7.25 | 36 | Pass |

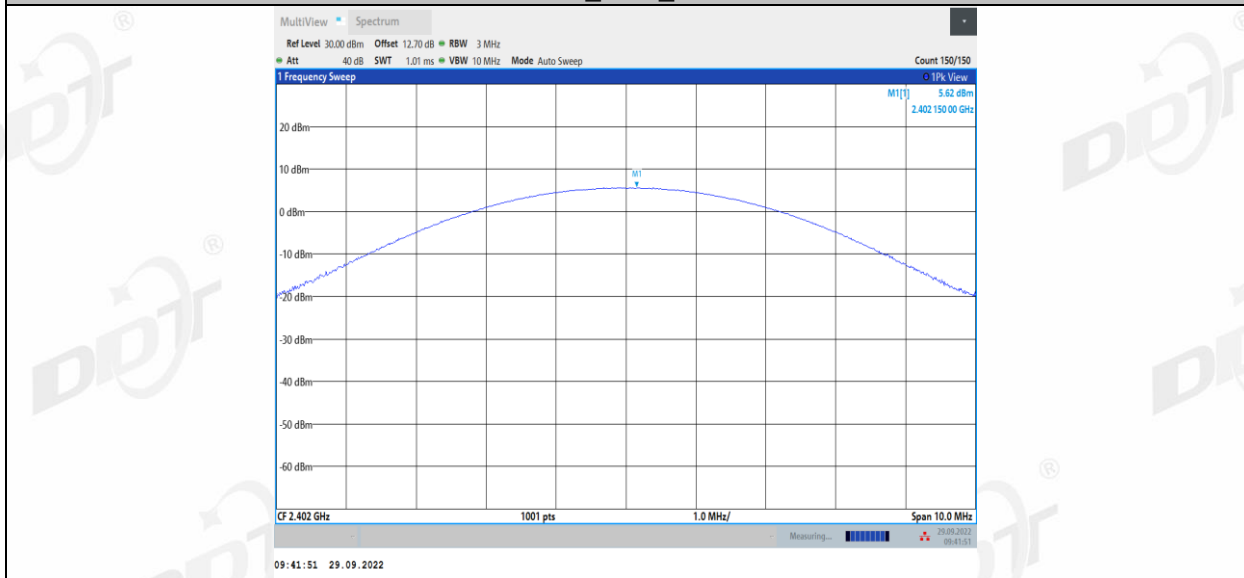
Note: EIRP (dBm)=Conducted Output Power (dBm)+ Antenna Gain (dBi)

4.5. Original test data

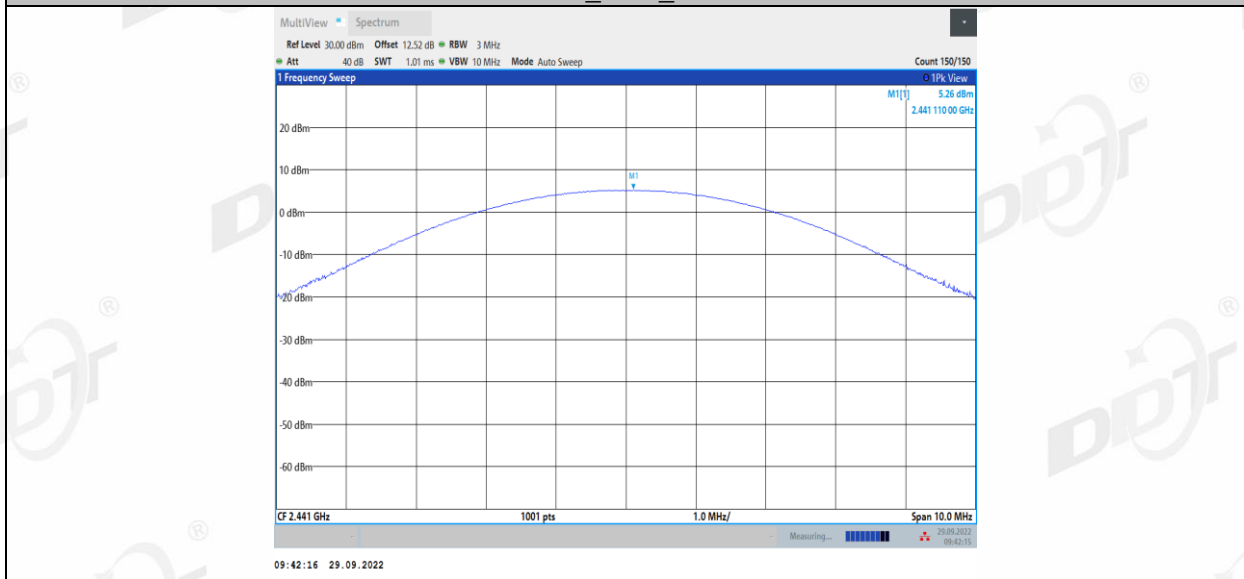




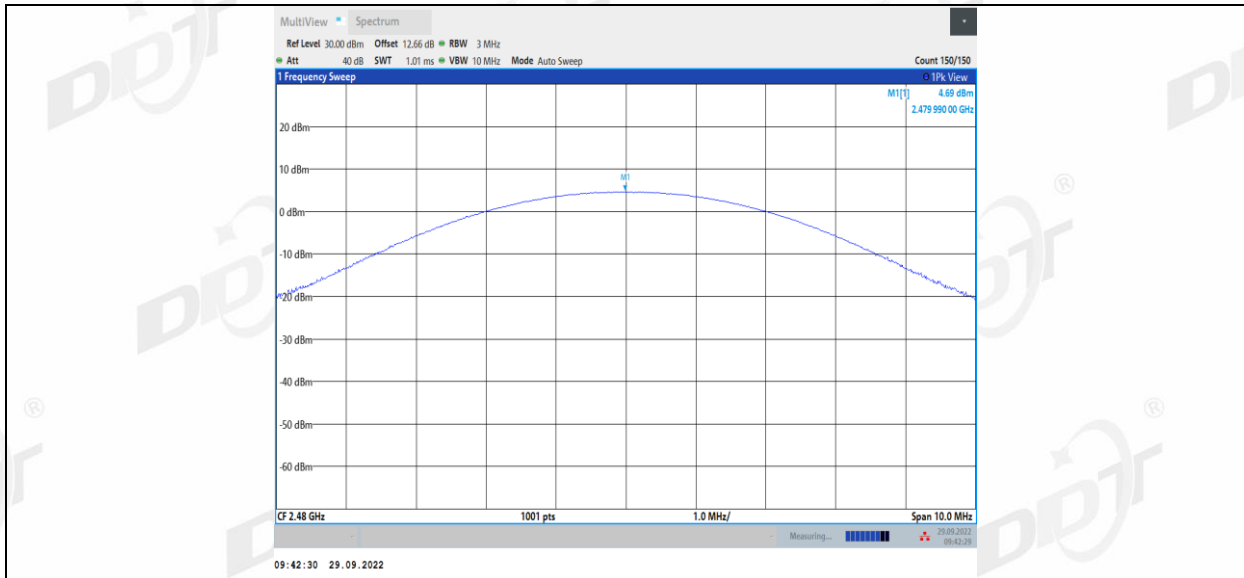
2DH5_Ant1_2402



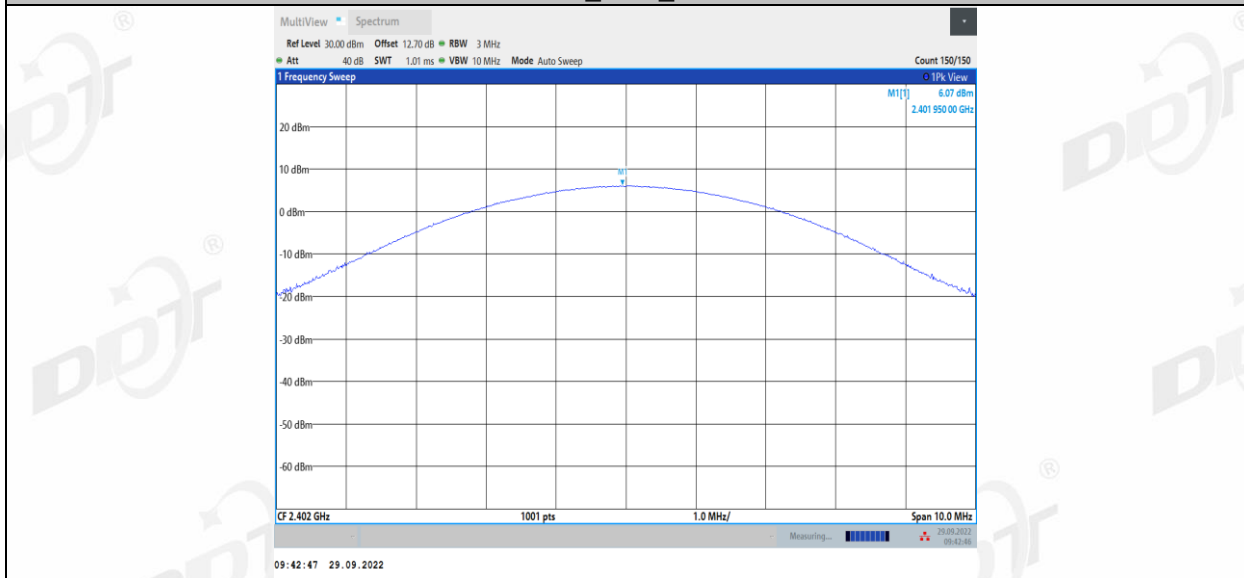
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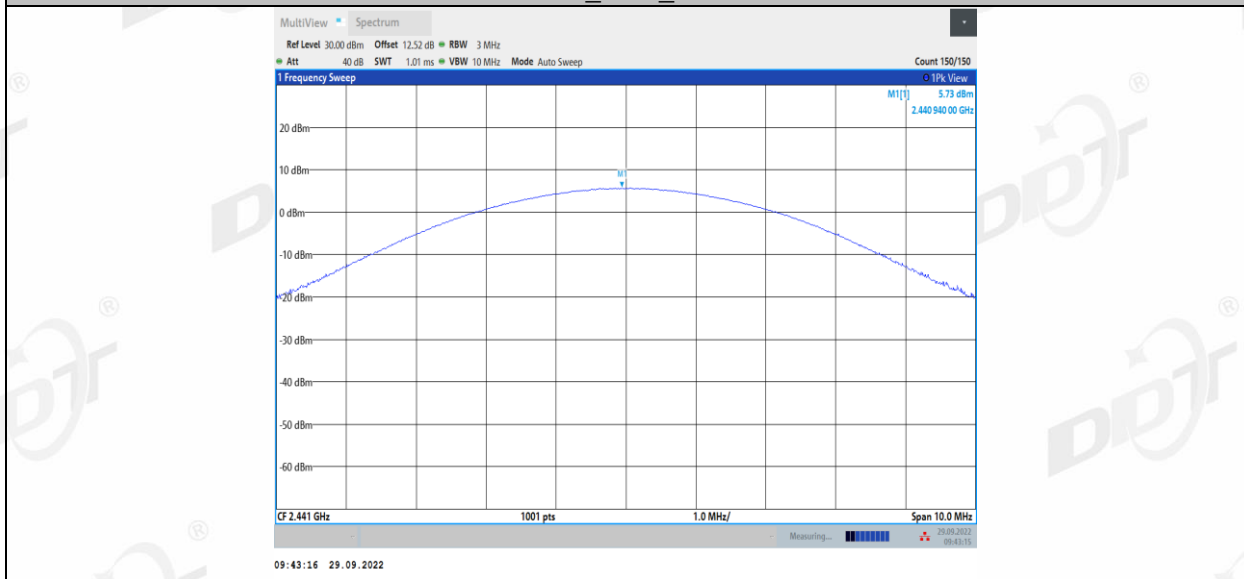
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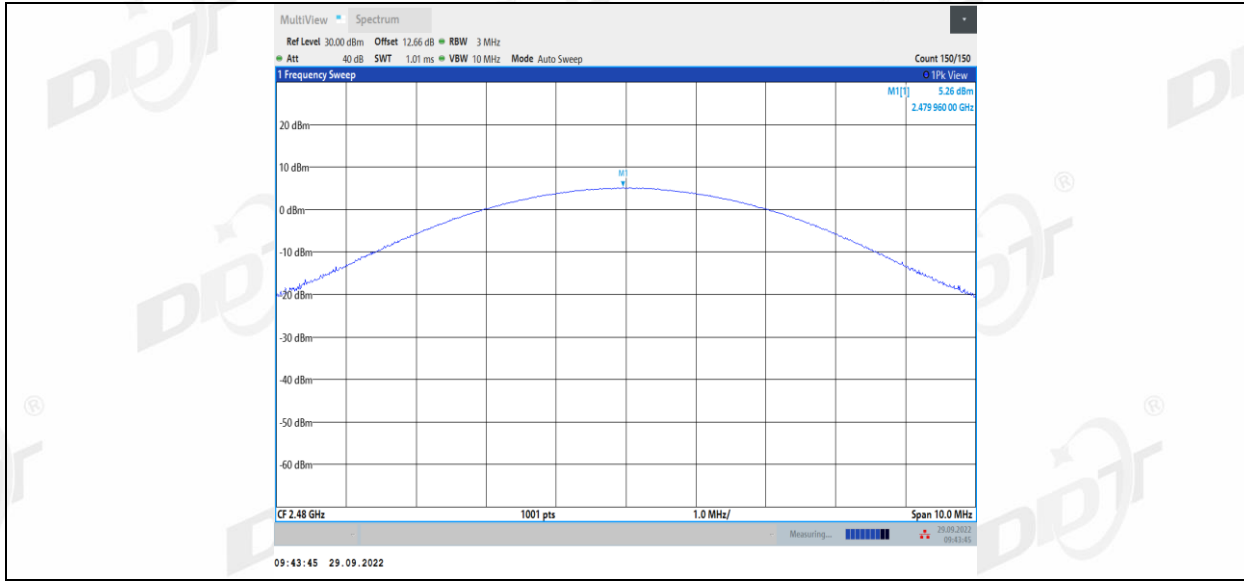
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



5. 20 dB Bandwidth and 99% Bandwidth

5.1. Block diagram of test setup

Same as section 4.1

5.2. Limits

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30 kHz RBW and 100 kHz VBW. The 20 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.

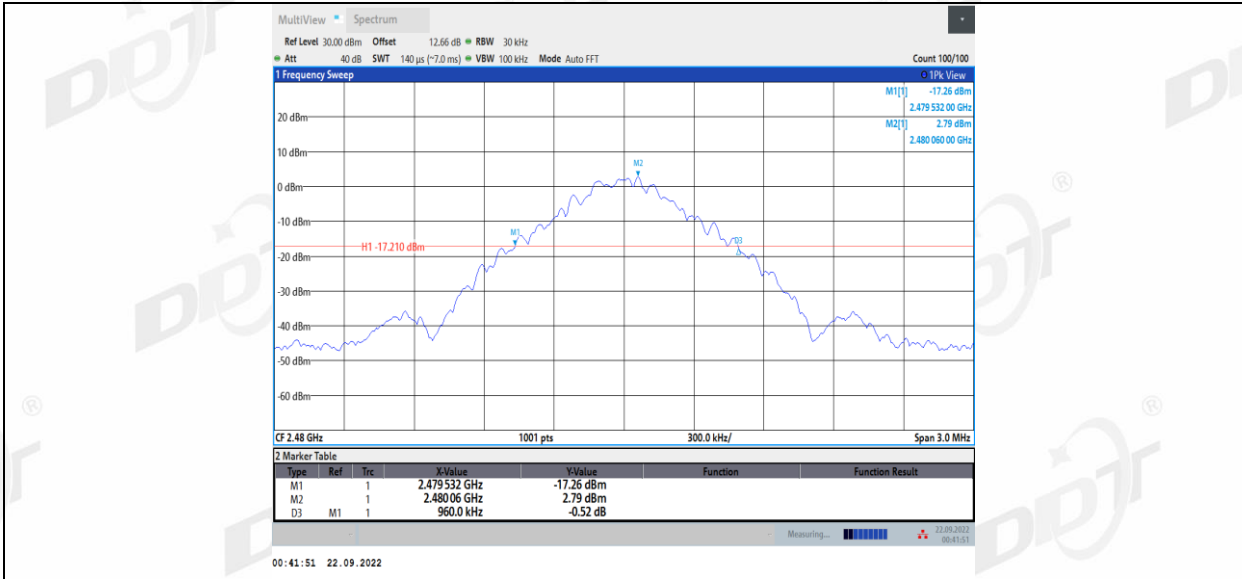
5.4. Test result

| Mode | Freq. (MHz) | 20 dB bandwidth Result (MHz) | 99% bandwidth Result (MHz) | Verdict |
|----------------|-------------|------------------------------|----------------------------|---------|
| GFSK | 2402 | 0.960 | 0.902 | Pass |
| | 2441 | 0.960 | 0.899 | Pass |
| | 2480 | 0.960 | 0.894 | Pass |
| $\pi/4$ -DQPSK | 2402 | 1.368 | 1.199 | Pass |
| | 2441 | 1.368 | 1.199 | Pass |
| | 2480 | 1.368 | 1.198 | Pass |
| 8DPSK | 2402 | 1.356 | 1.205 | Pass |
| | 2441 | 1.350 | 1.203 | Pass |
| | 2480 | 1.350 | 1.205 | Pass |

5.5. Original test data

20dB bandwidth:

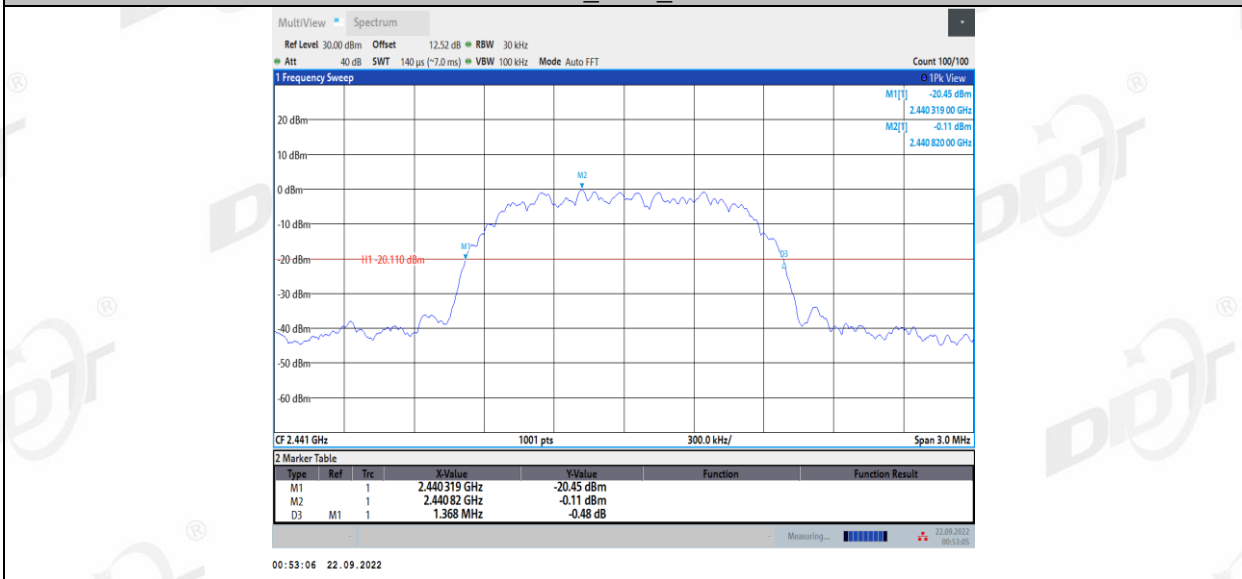




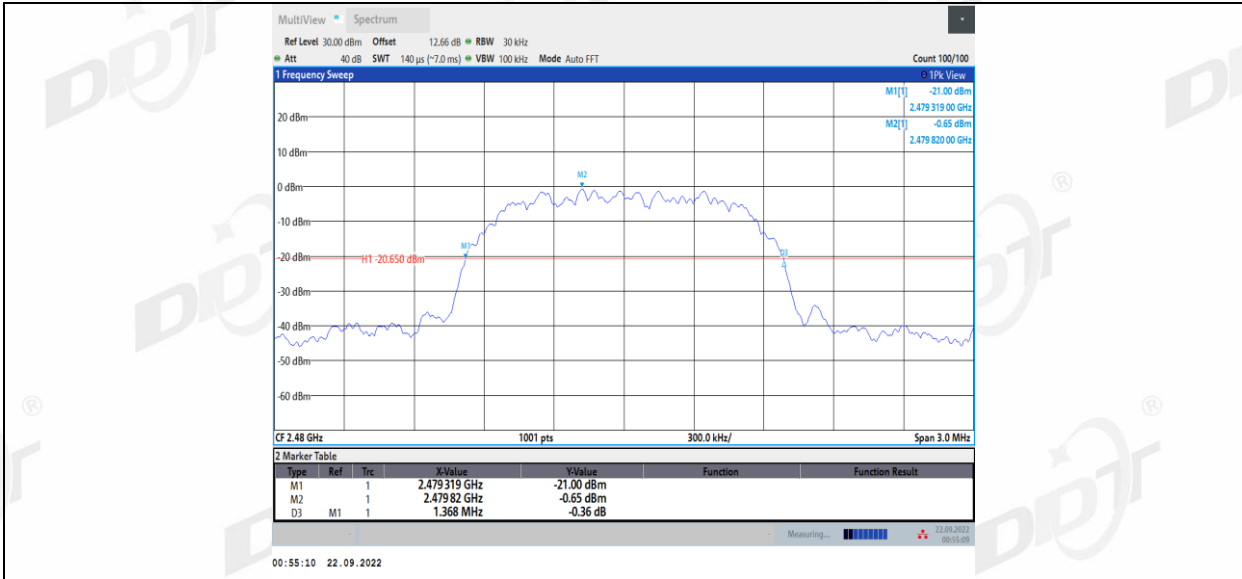
2DH5_Ant1_2402



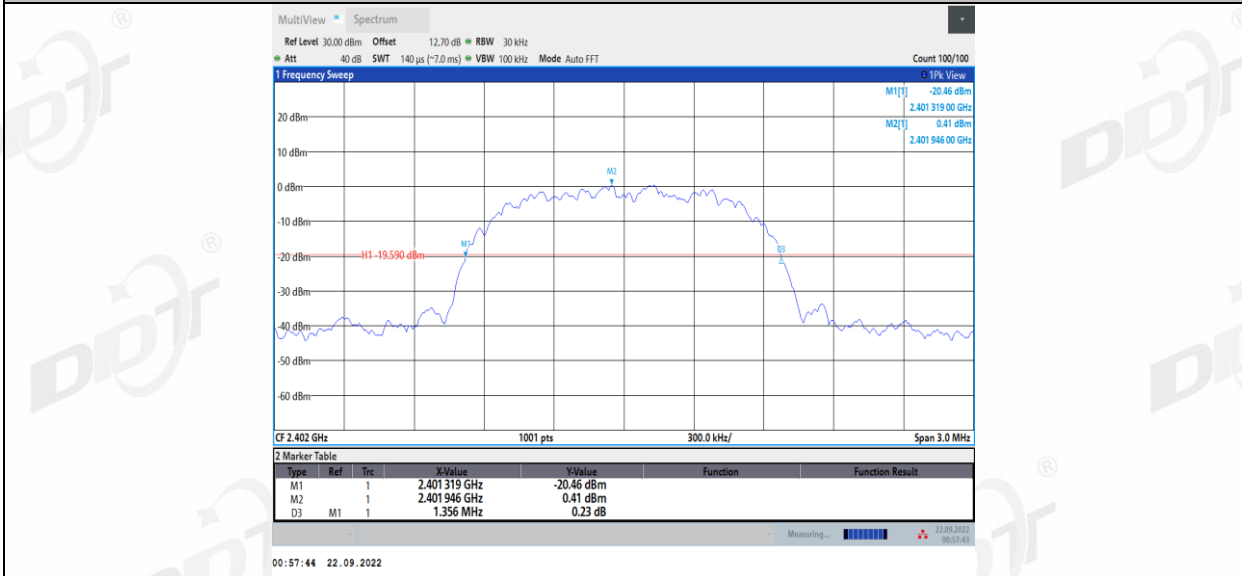
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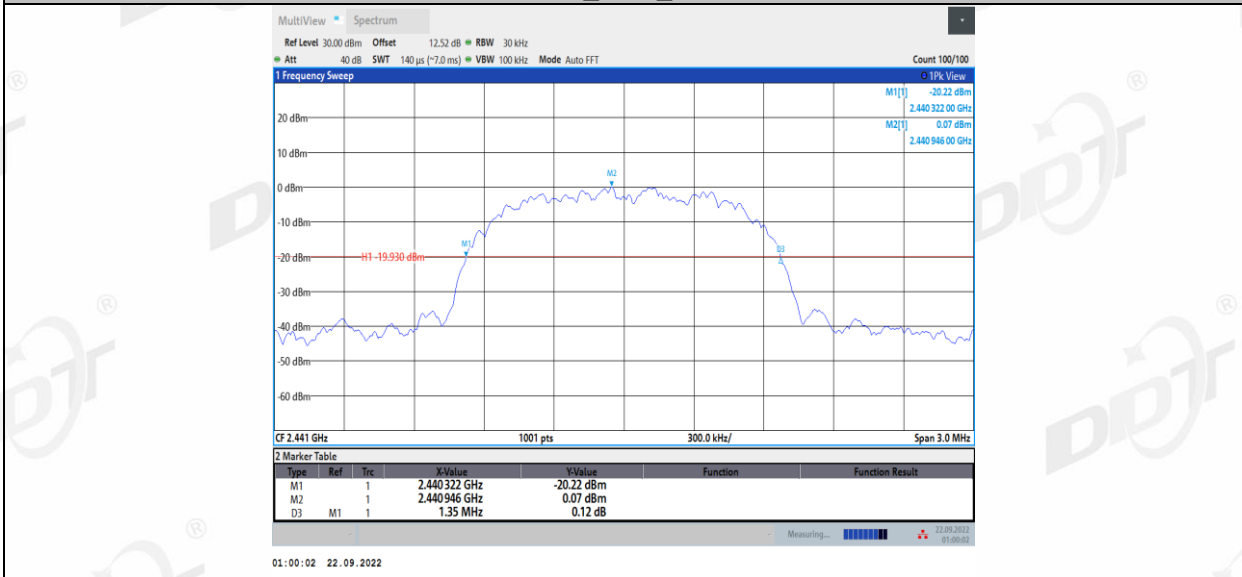
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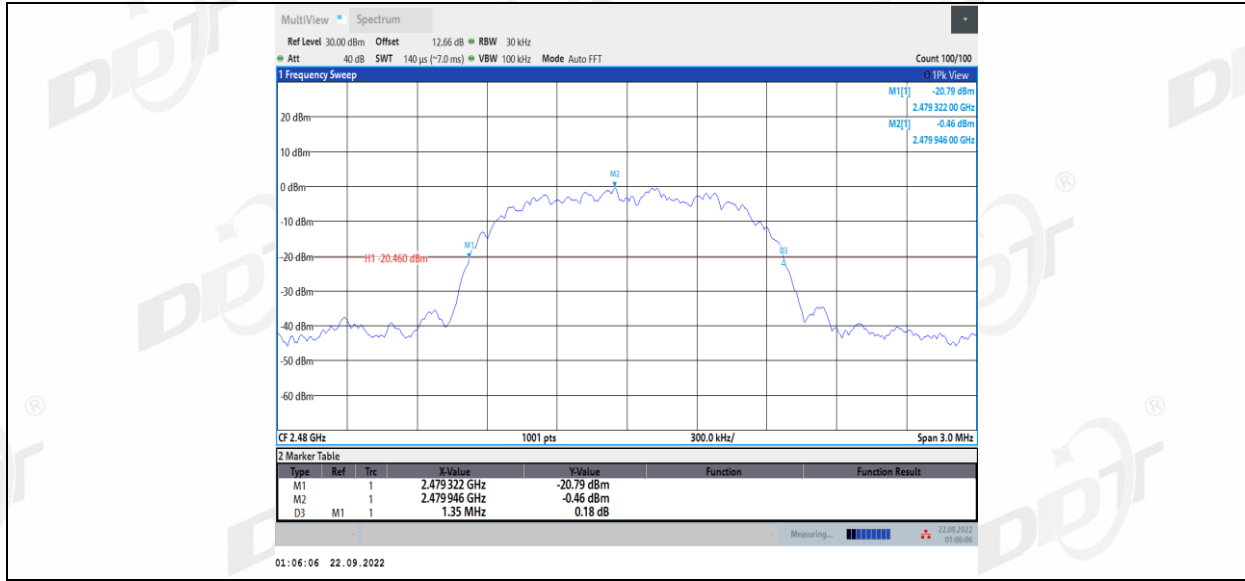
3DH5_Ant1_2402



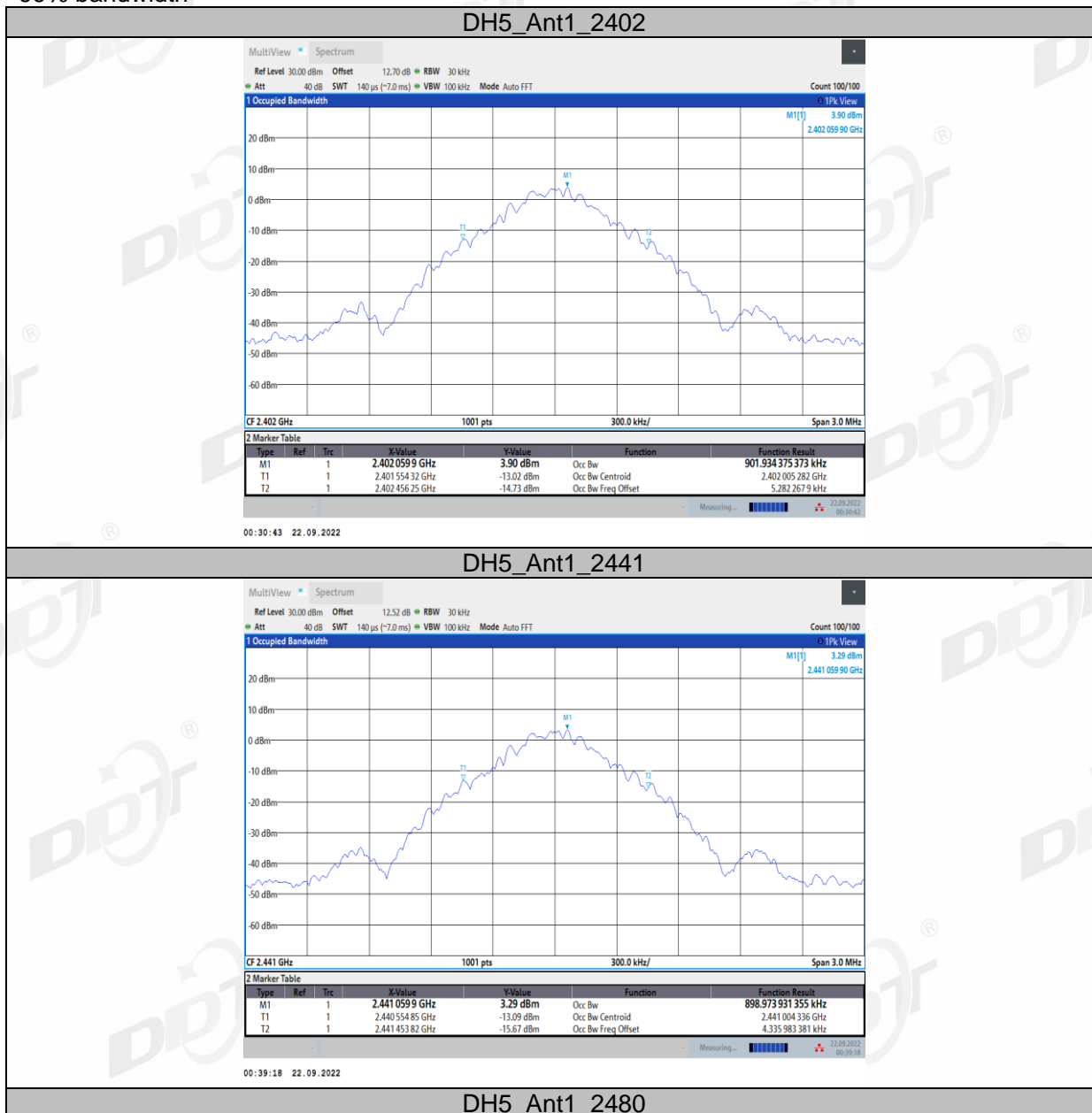
3DH5_Ant1_2441

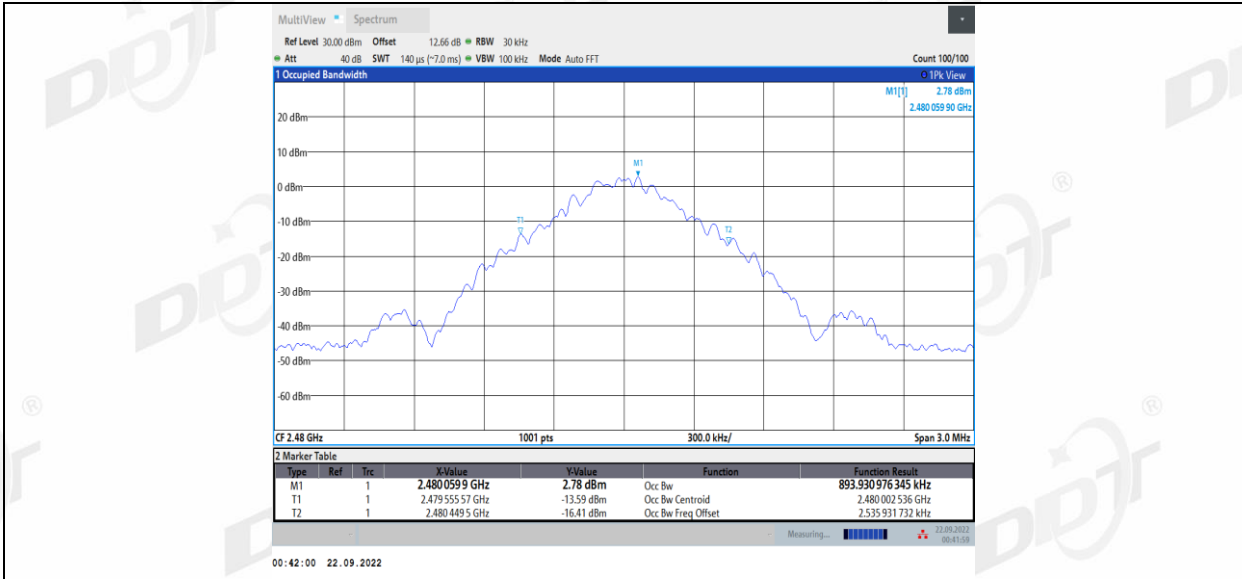


3DH5_Ant1_2480

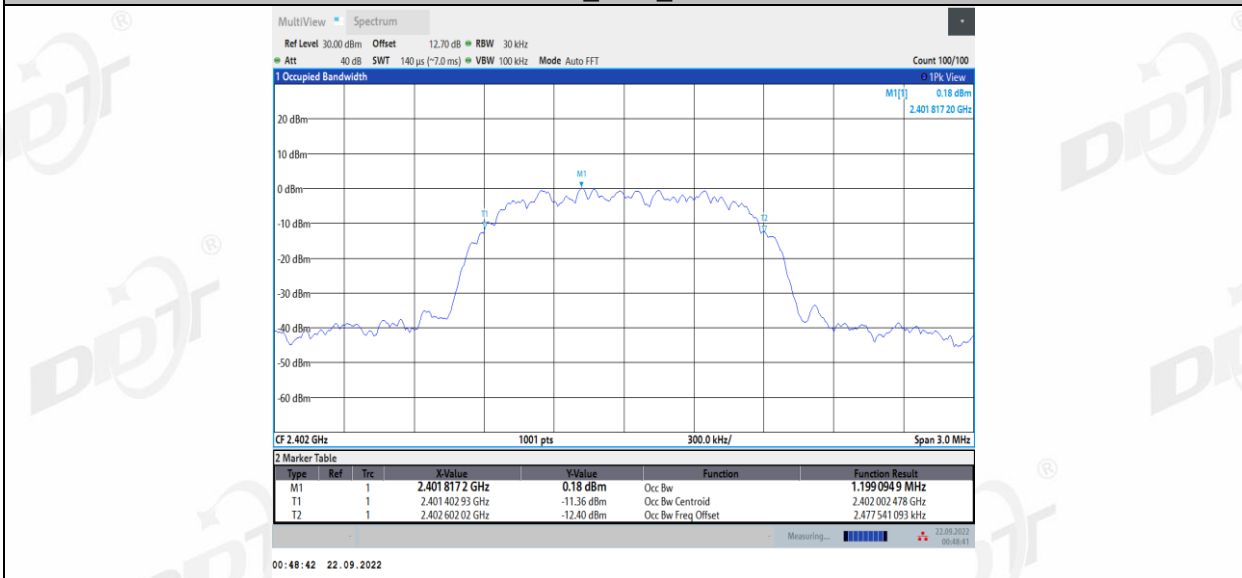


99% bandwidth

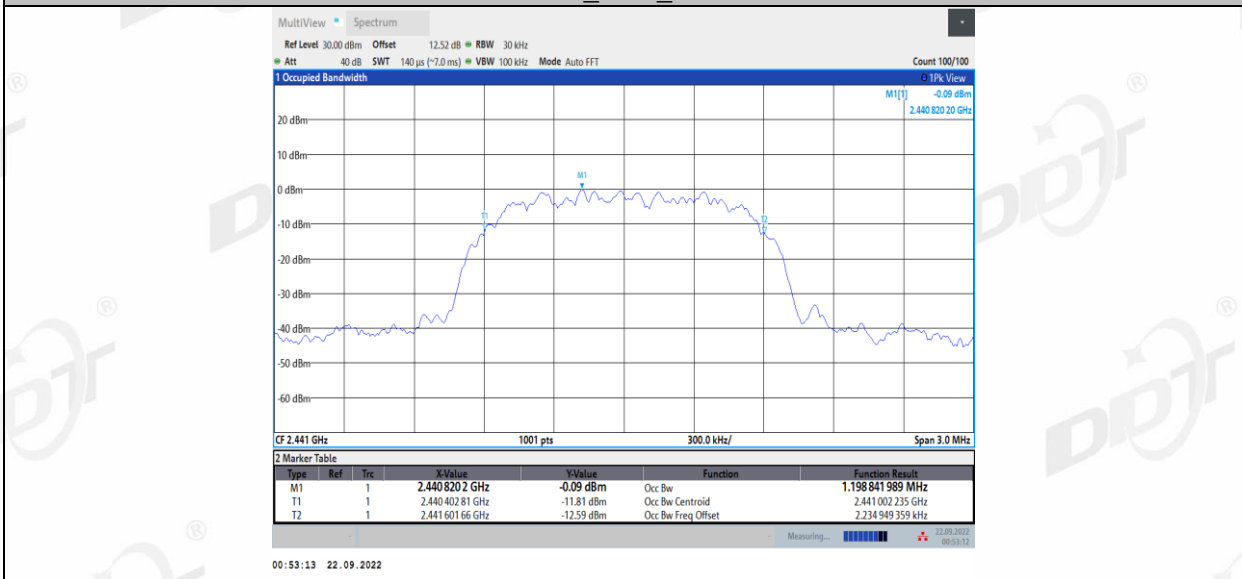




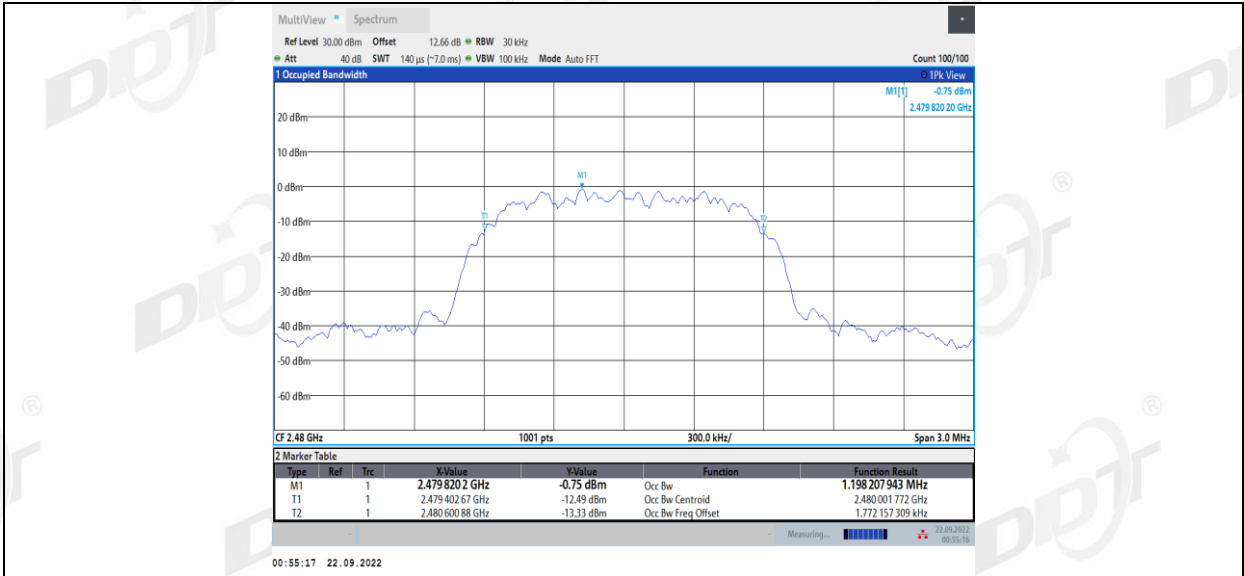
2DH5_Ant1_2402



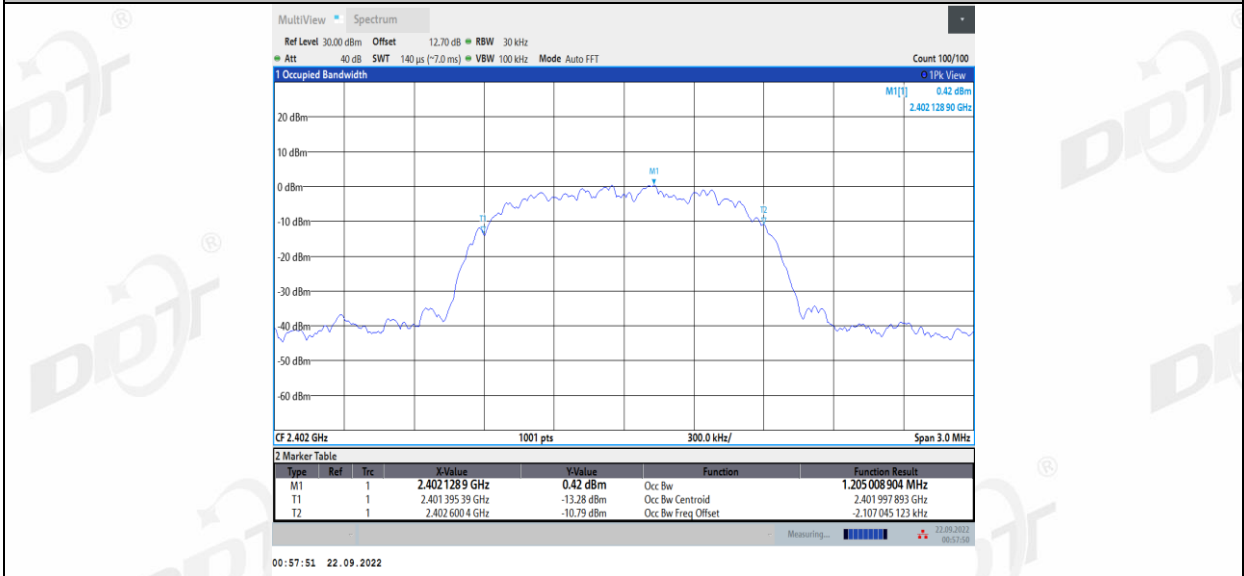
2DH5_Ant1_2441



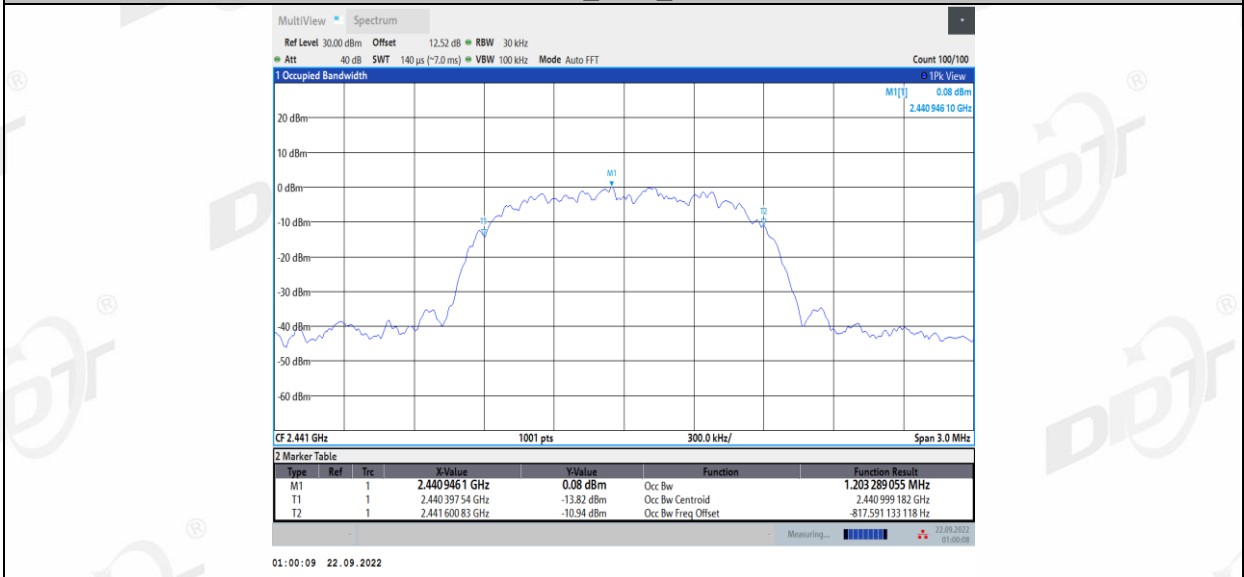
2DH5_Ant1_2480



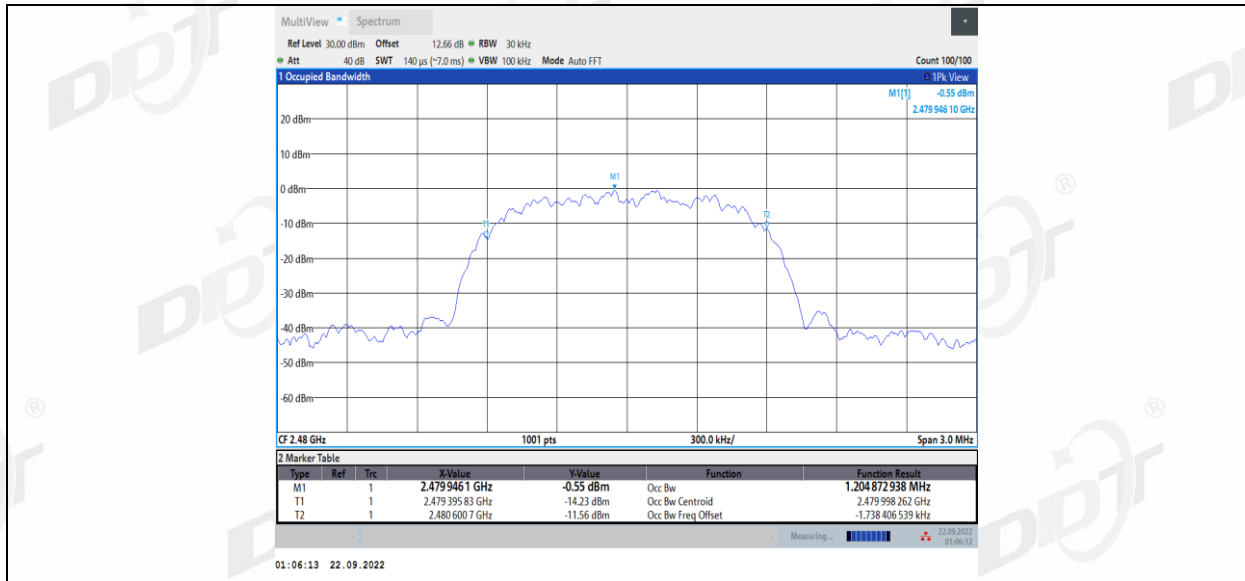
3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



6. Carrier Frequency Separation

6.1. Block diagram of test setup

Same as section 4.1

6.2. Limits

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, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

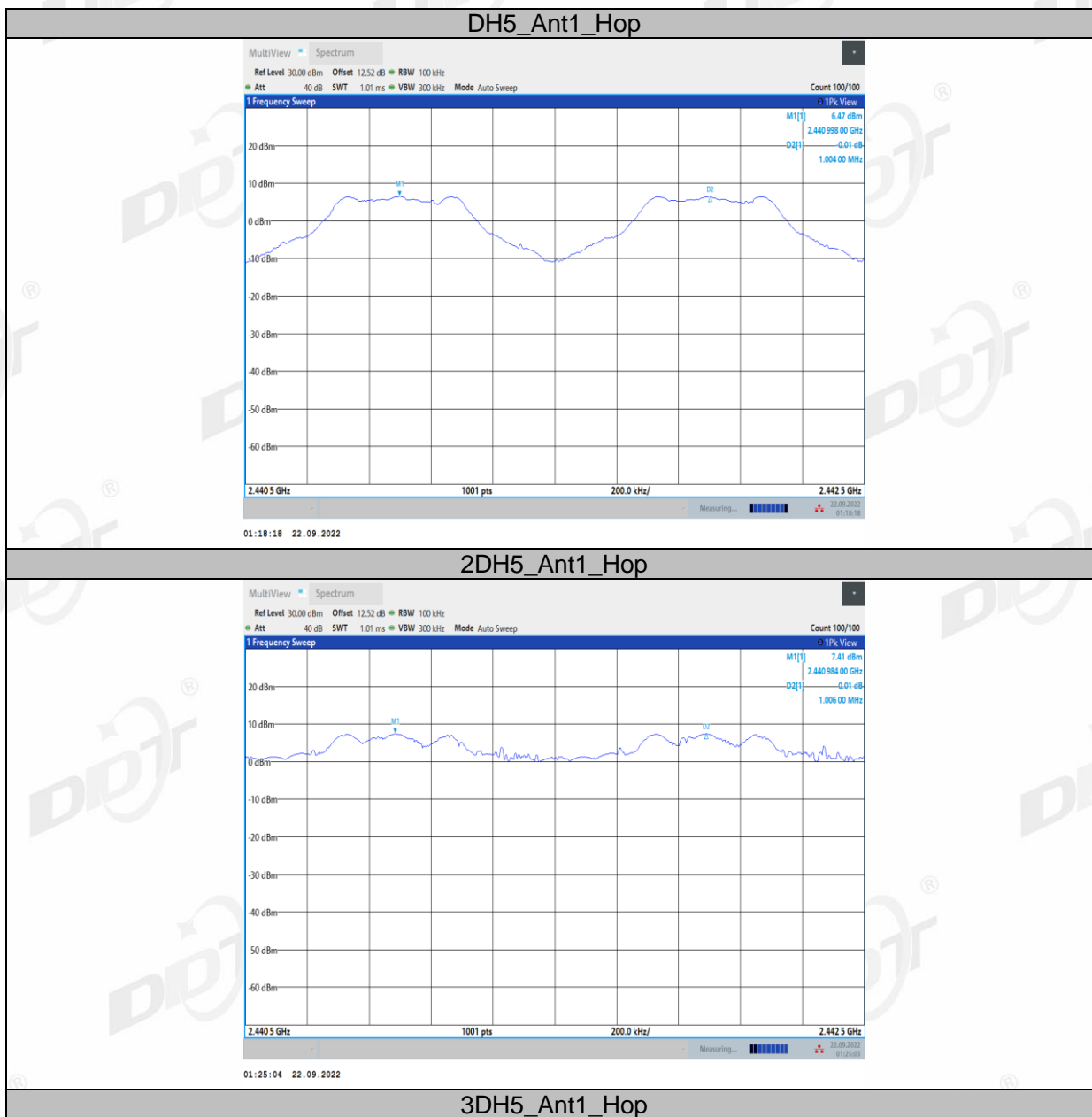
6.3. Test procedure

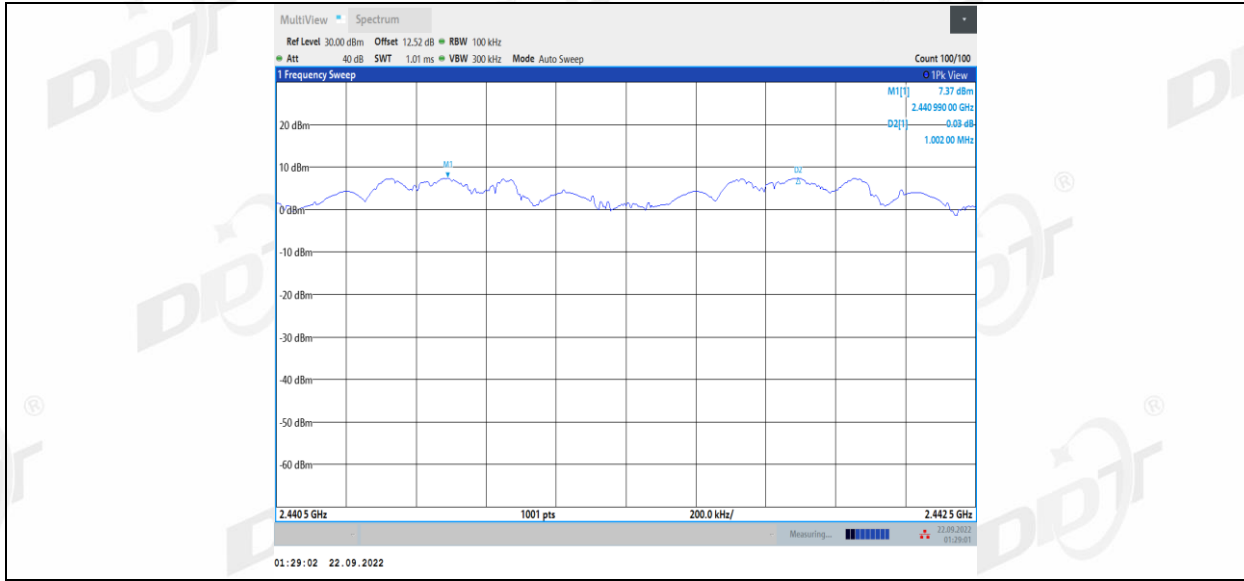
- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) The carrier frequency was measured by spectrum analyzer with 100 kHz RBW and 300 kHz VBW.

6.4. Test result

| Mode | Channel separation (MHz) | 20dB bandwidth (MHz) (worse case) | Limit (MHz) 2/3 of 20dB bandwidth | Verdict |
|----------------|--------------------------|--------------------------------------|---|---------|
| GFSK | 1.004 | 0.960 | ≥0.640 | Pass |
| $\pi/4$ -DQPSK | 1.006 | 1.368 | ≥0.912 | Pass |
| 8DPSK | 1.002 | 1.356 | ≥0.904 | Pass |

6.5. Original test data





7. Number of Hopping Channel

7.1. Block diagram of test setup

Same as section 4.1

7.2. Limits

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

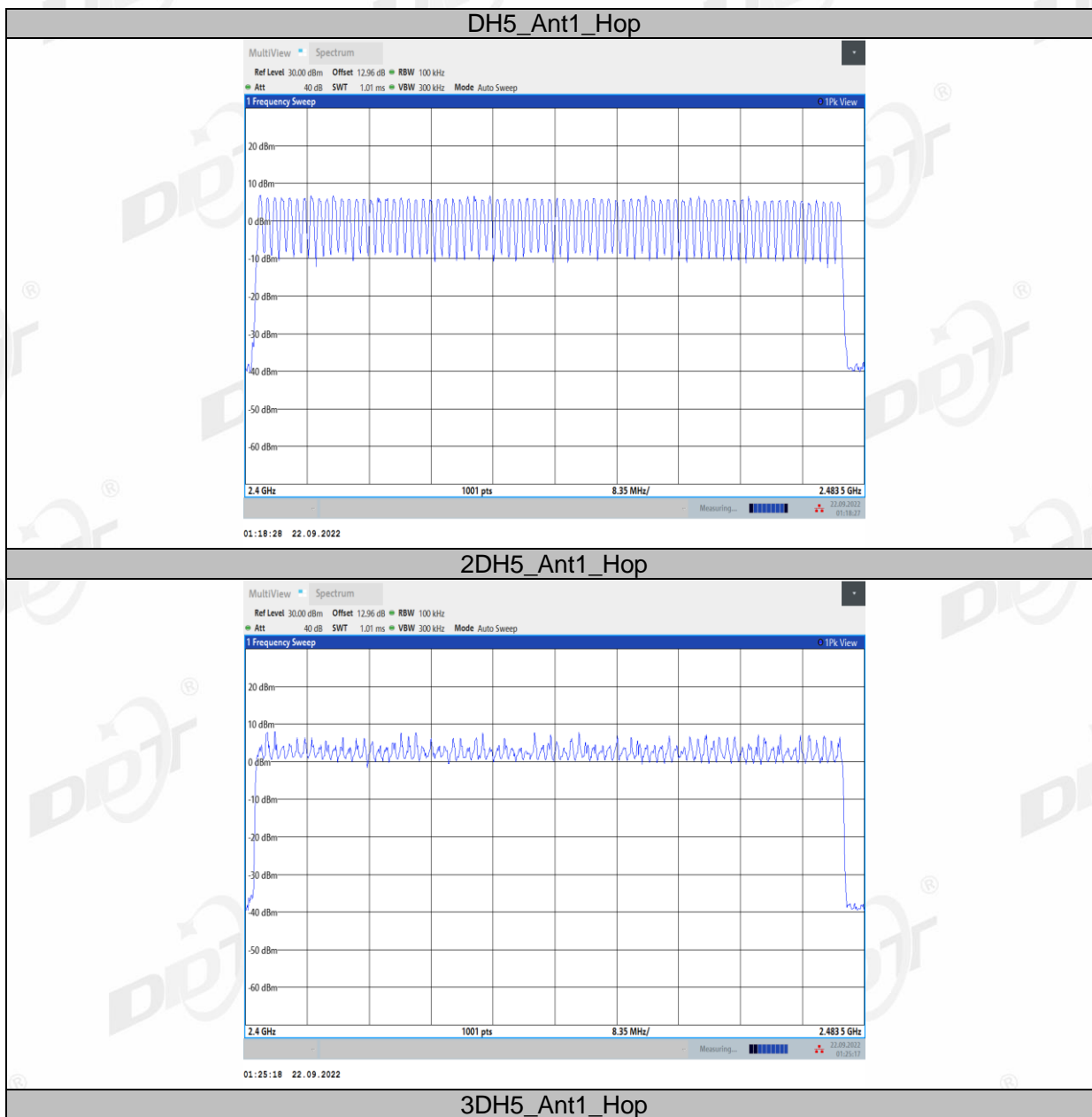
7.3. Test procedure

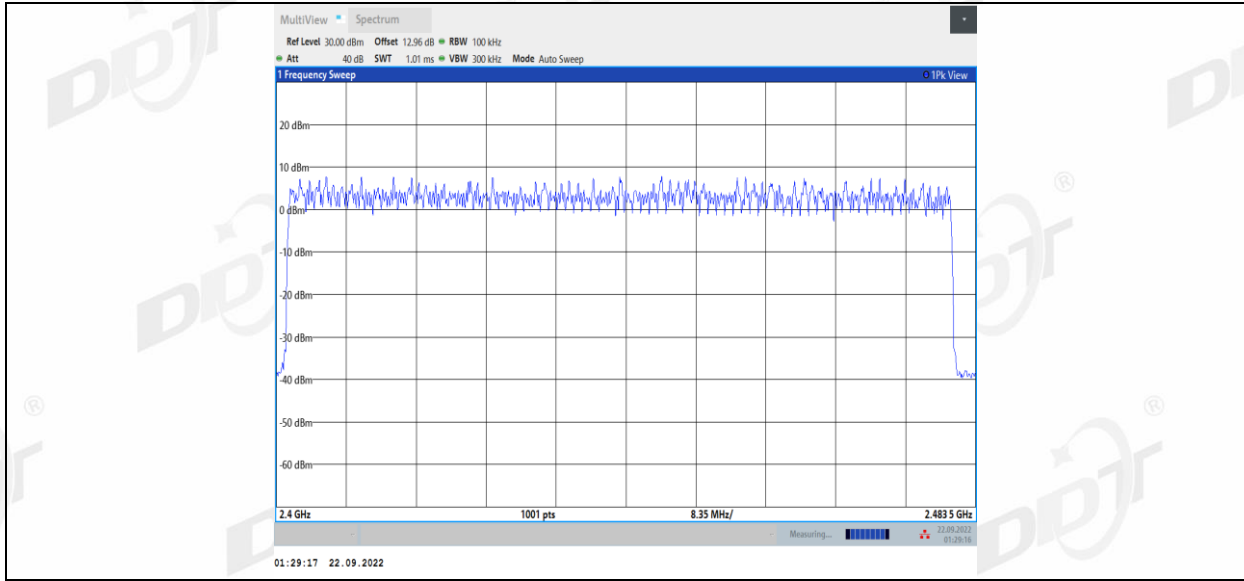
- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) The number of hopping channels was measured by spectrum analyzer with 100 kHz RBW and 300 kHz VBW.

7.4. Test result

| Mode | Number of hopping channels | Limit | Verdict |
|----------------|----------------------------|-------|---------|
| GFSK | 79 | >15 | Pass |
| $\pi/4$ -DQPSK | 79 | >15 | Pass |
| 8DPSK | 79 | >15 | Pass |

7.5. Original test data





8. Dwell Time

8.1. Block diagram of test setup

Same as section 4.1

8.2. Limits

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.

8.3. Test procedure

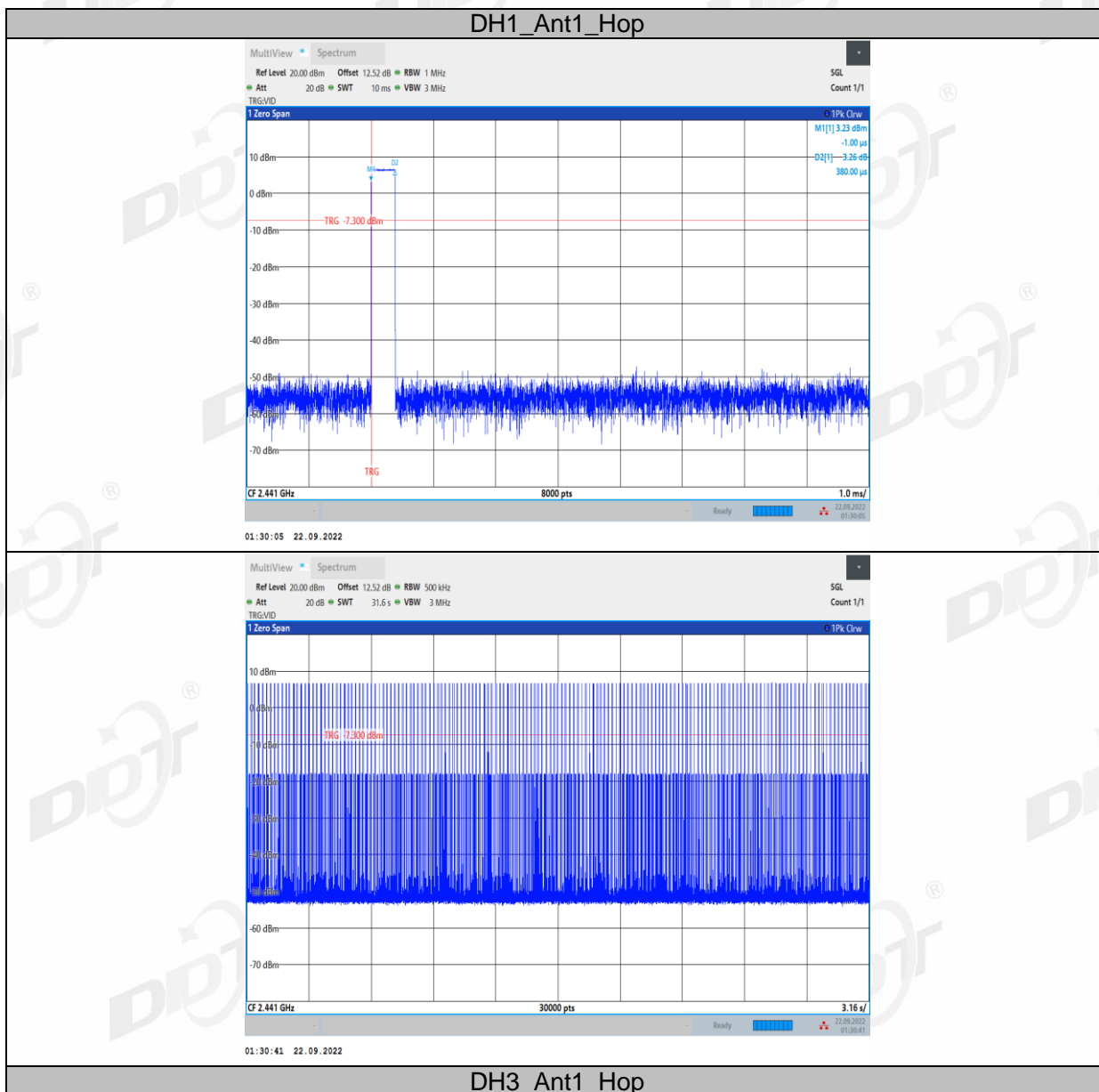
- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) The test period: $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$
- (3) Measure the hopping number and on time of each pulse with spectrum analyzer in zero span set, and calculate dwell time with formula $\text{Dwell time} = \text{total hops} \times \text{pulse's on time}$.

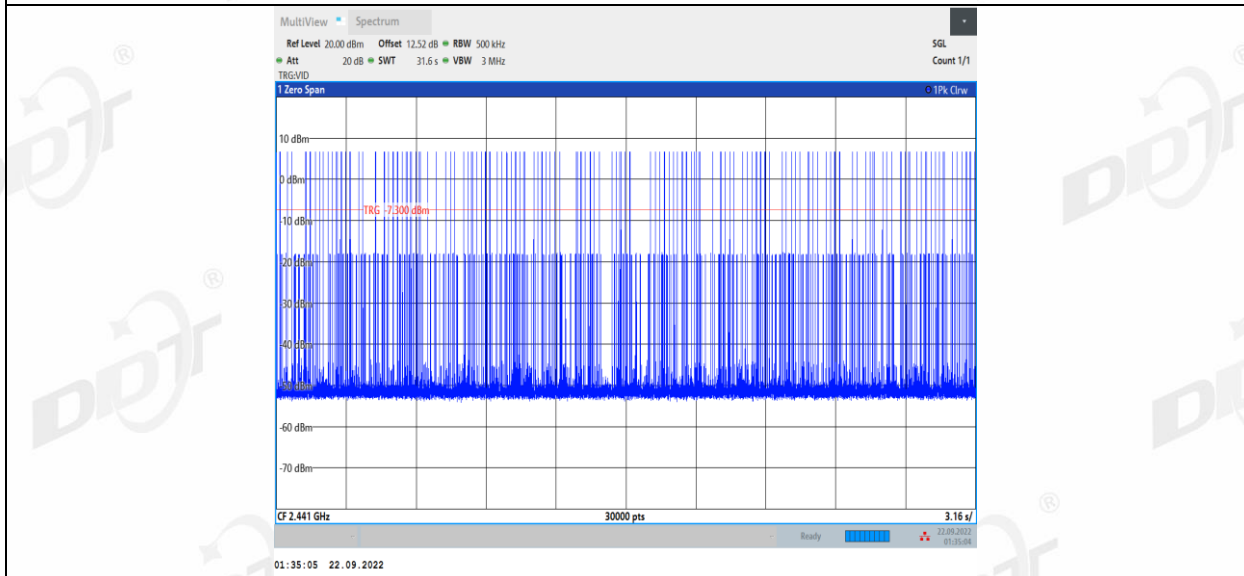
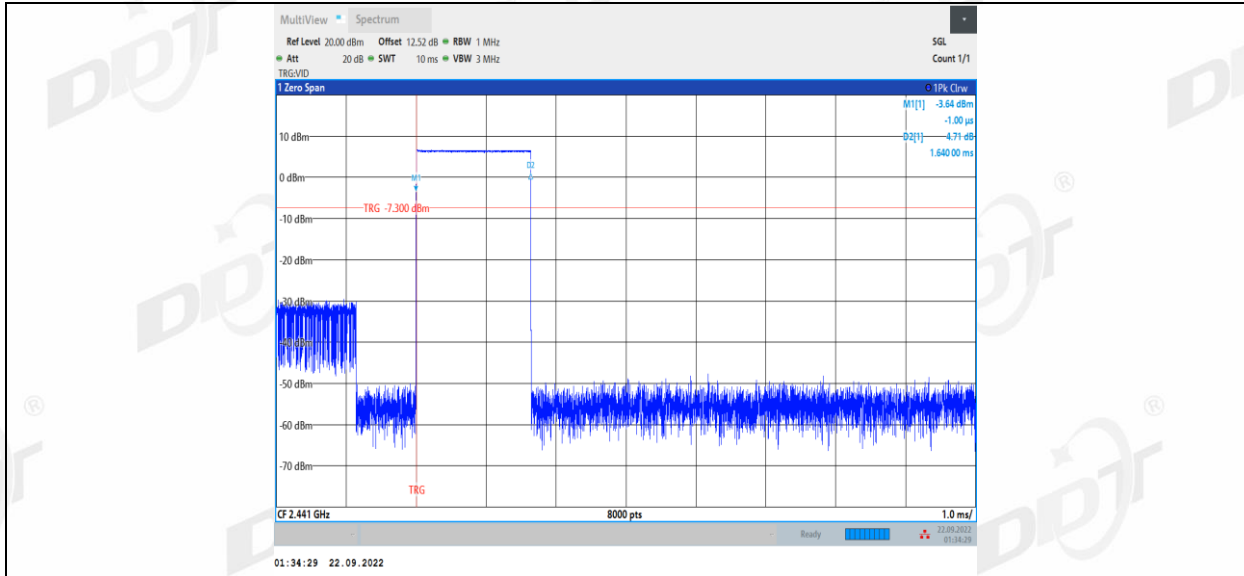
8.4. Test result

| Mode | Dwell time (s) | Pulse's on time (ms) | Total hops | Limit | Verdict |
|------|----------------|----------------------|------------|--------|---------|
| DH1 | 0.122 | 0.38 | 321 | <400ms | Pass |
| DH3 | 0.279 | 1.64 | 170 | <400ms | Pass |
| DH5 | 0.318 | 2.89 | 110 | <400ms | Pass |
| 2DH1 | 0.124 | 0.39 | 318 | <400ms | Pass |
| 2DH3 | 0.266 | 1.64 | 162 | <400ms | Pass |
| 2DH5 | 0.335 | 2.89 | 116 | <400ms | Pass |
| 3DH1 | 0.122 | 0.39 | 314 | <400ms | Pass |
| 3DH3 | 0.262 | 1.64 | 160 | <400ms | Pass |
| 3DH5 | 0.364 | 2.89 | 126 | <400ms | Pass |

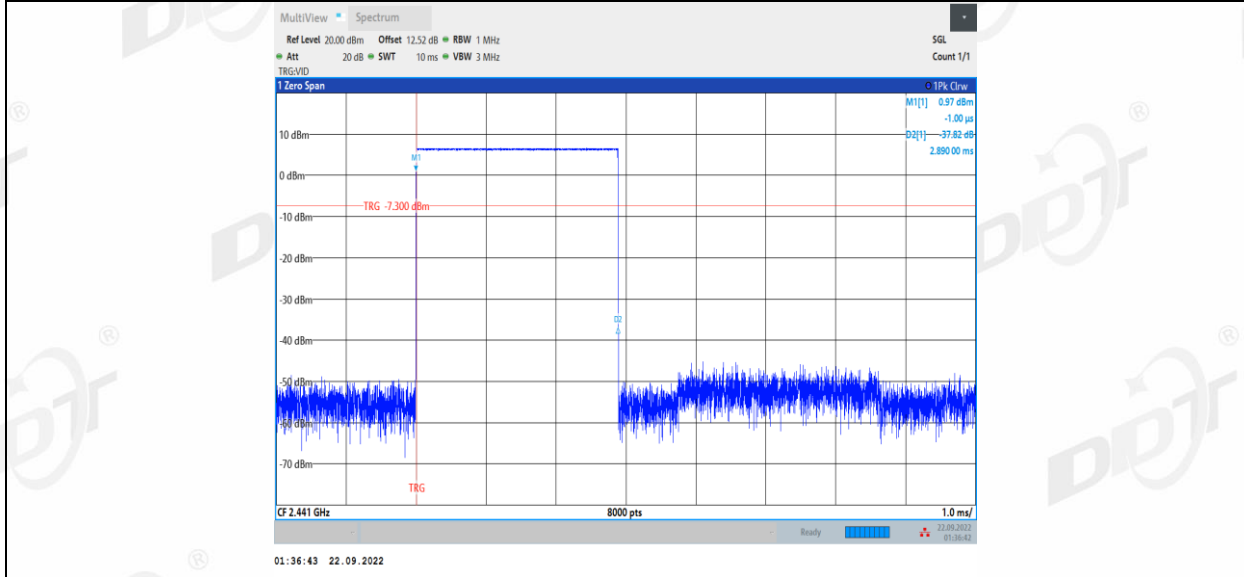
Note: $\text{Dwell time} = \text{total hops} \times \text{pulse's on time}$.

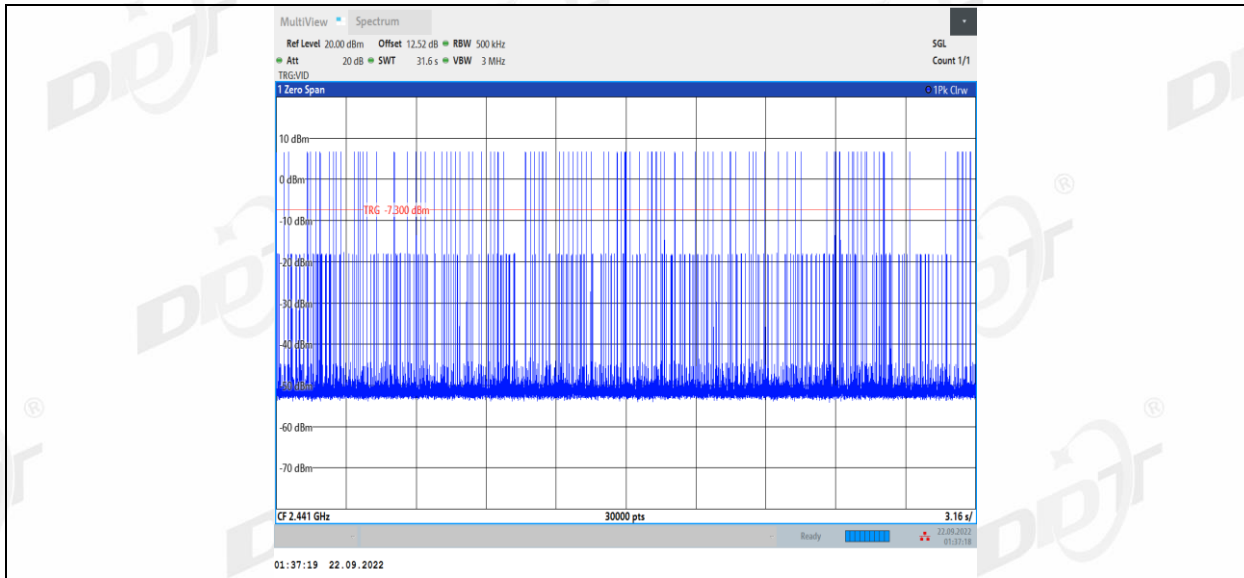
8.5. Original test data



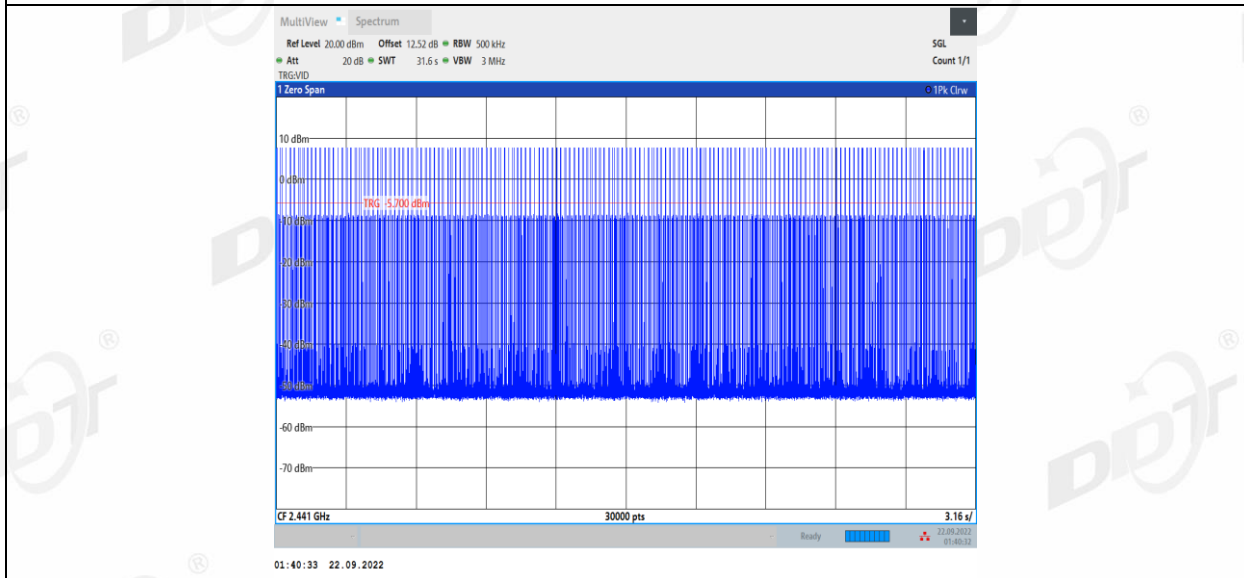
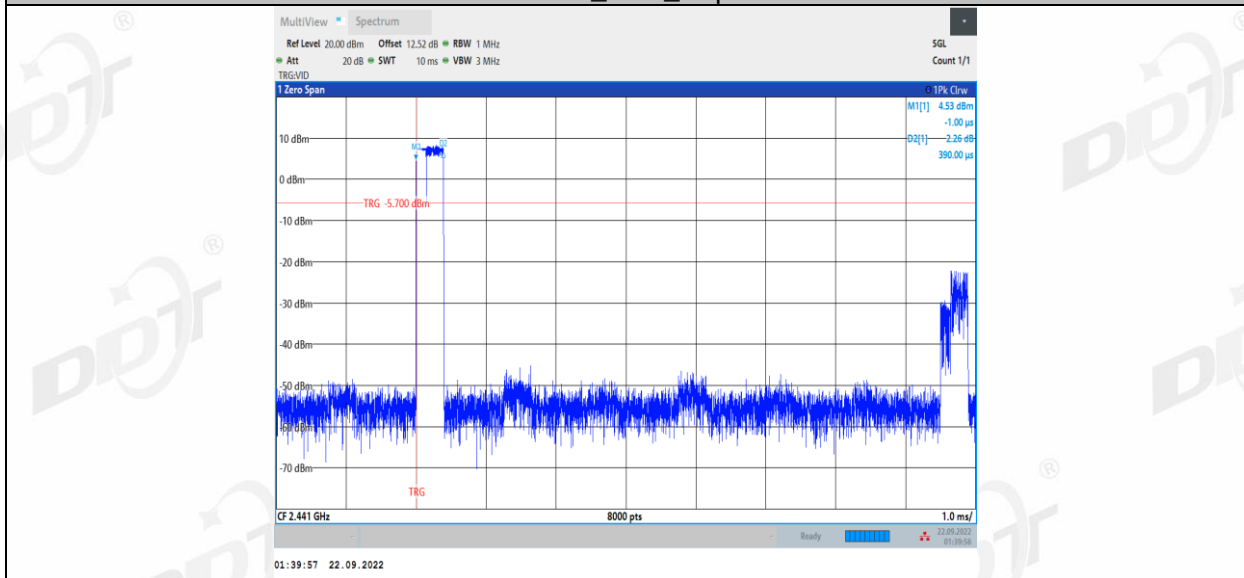


DH5_Ant1_Hop

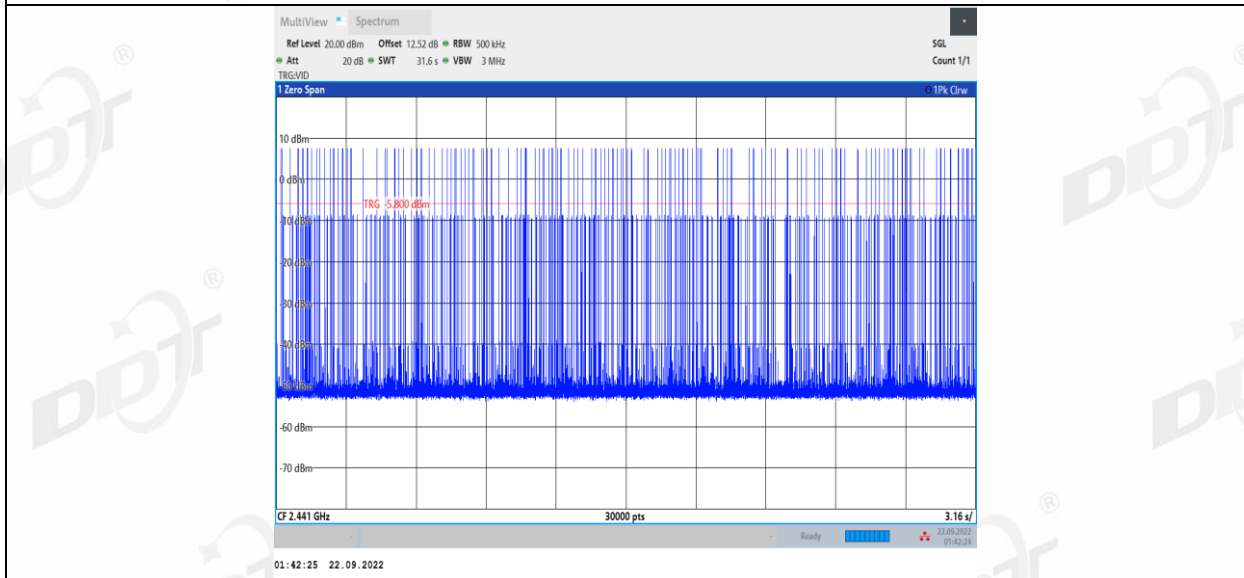
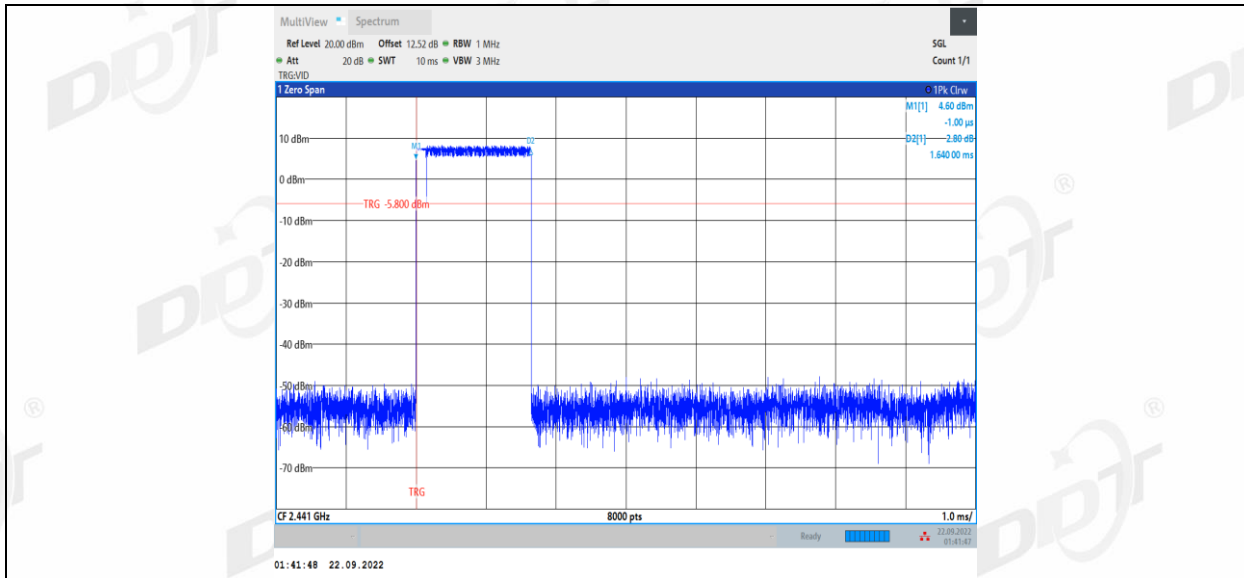




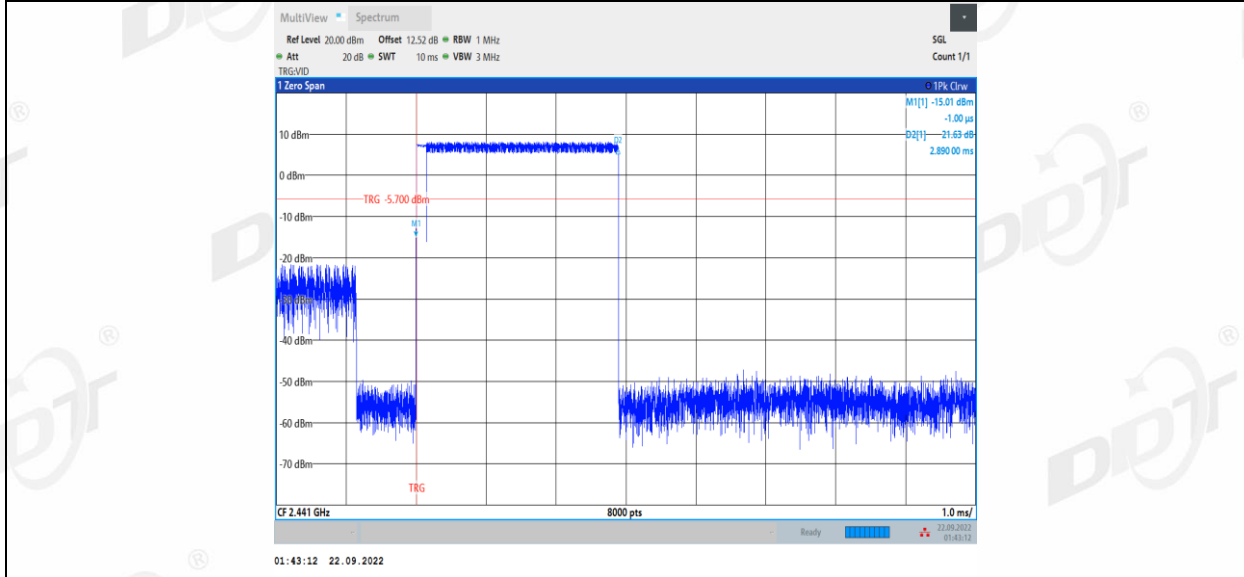
2DH1_Ant1_Hop

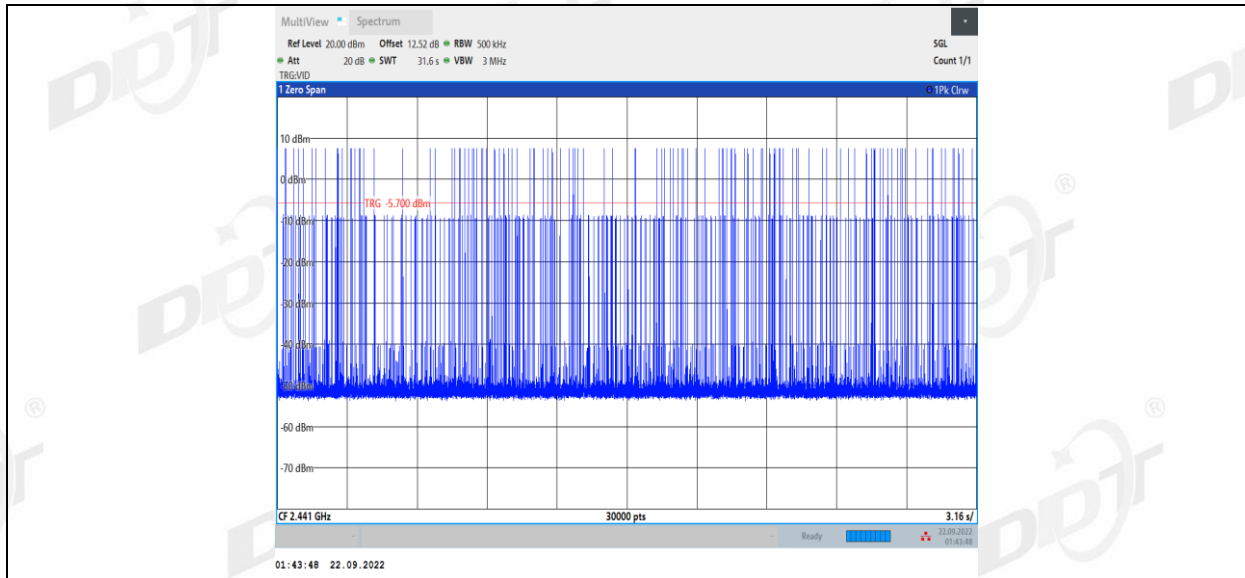


2DH3_Ant1_Hop

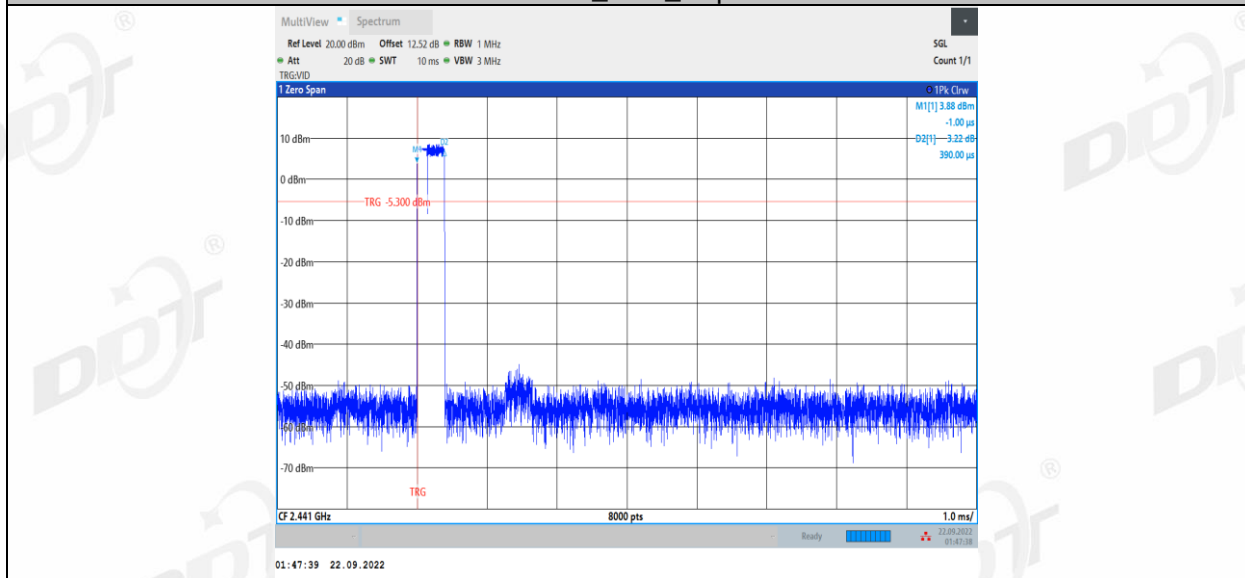


2DH5_Ant1_Hop

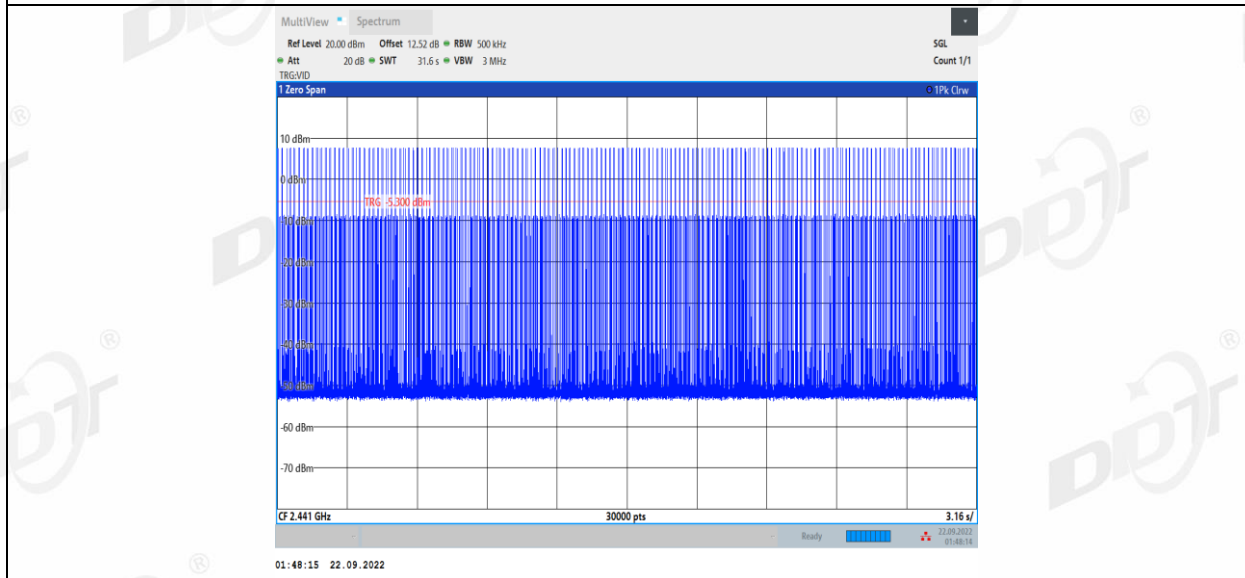


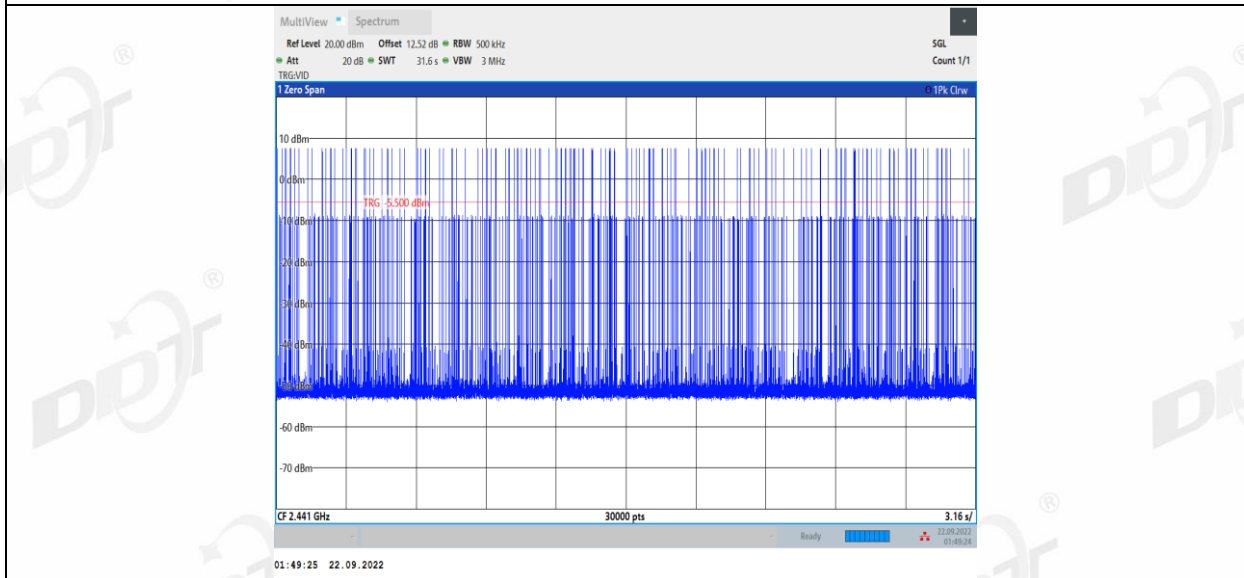
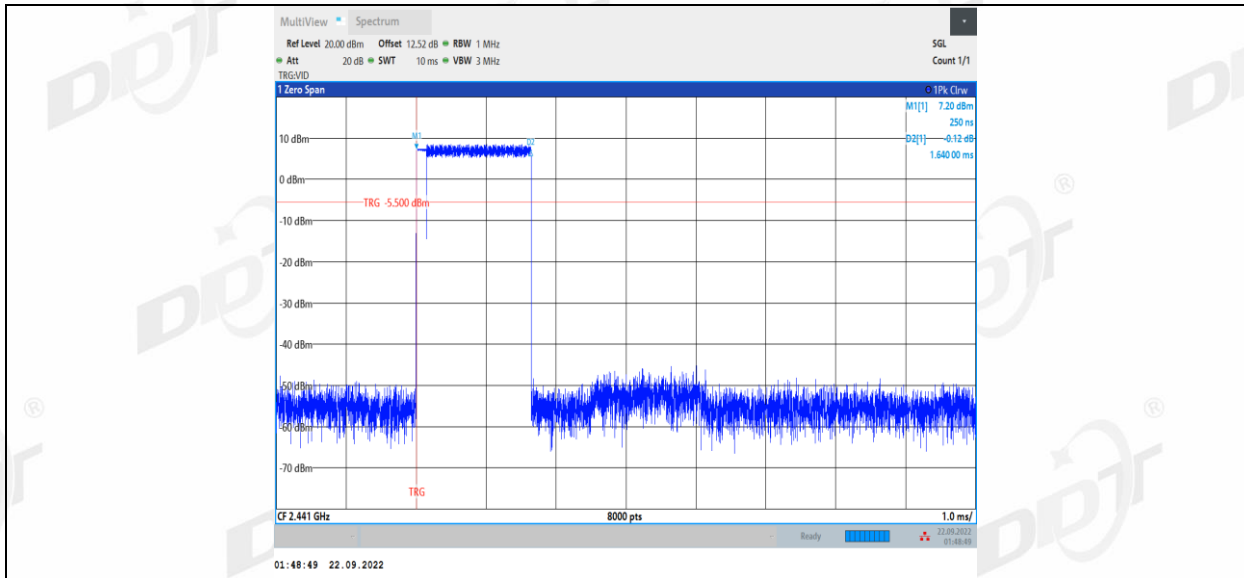


3DH1_Ant1_Hop

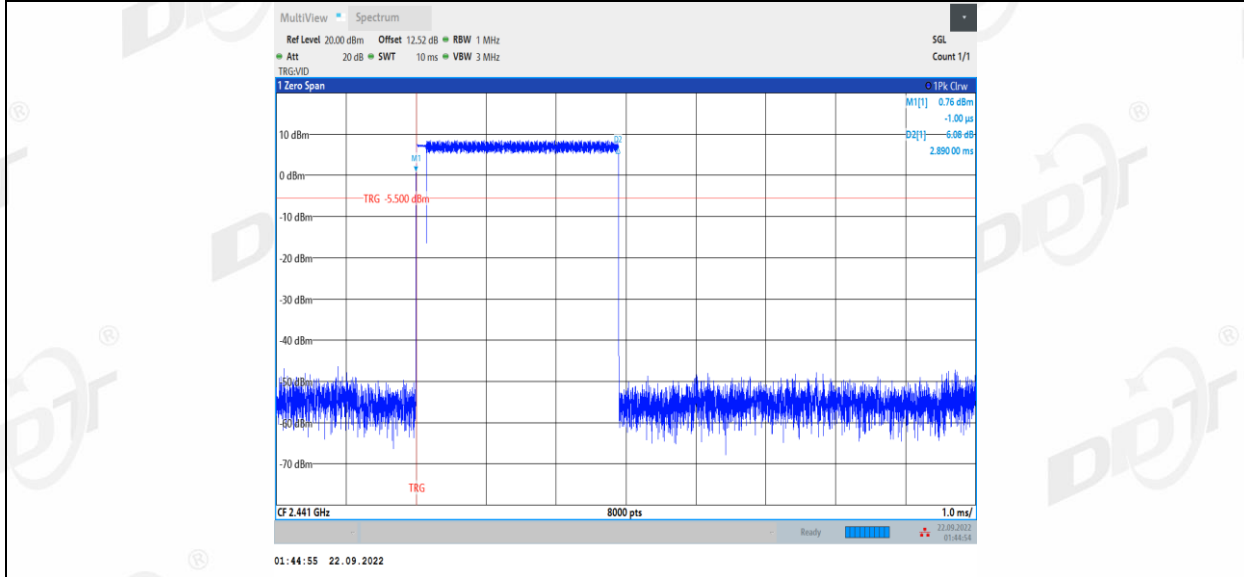


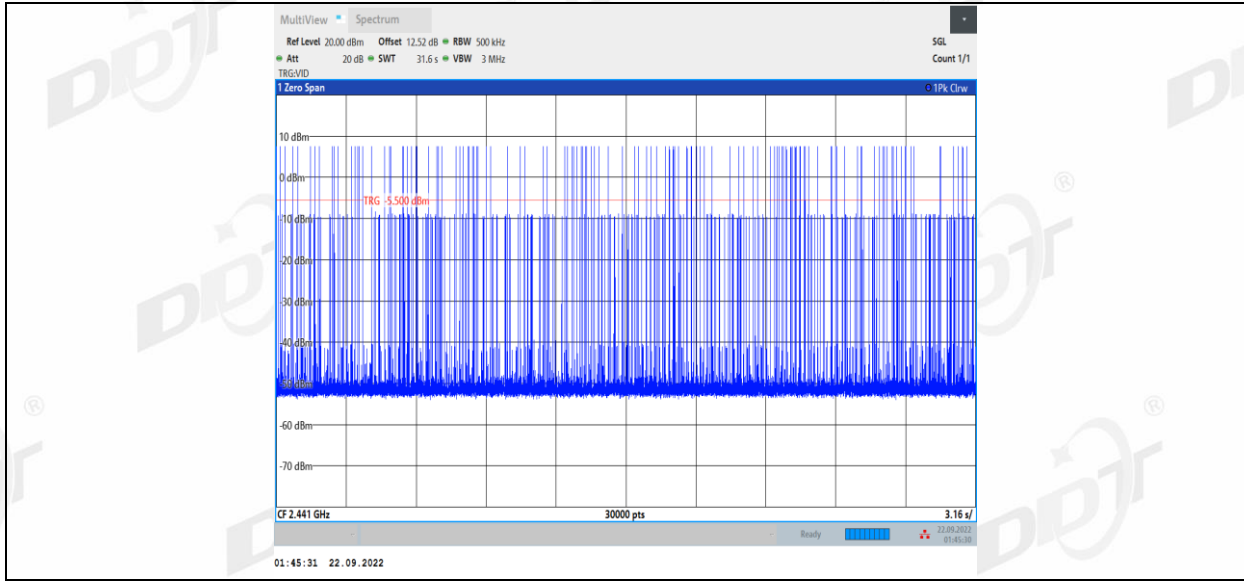
3DH3_Ant1_Hop





3DH5_Ant1_Hop





9. Band Edge Compliance (Conducted Method)

9.1. Block diagram of test setup

Same as section 4.1

9.2. Limit

All restriction band should comply with 15.209, other emission should be at least 20dB below the fundamental.

9.3. Test procedure

(1) Connect EUT's antenna output to spectrum analyzer by RF cable.

(2) Establish a reference level by using the following procedure:

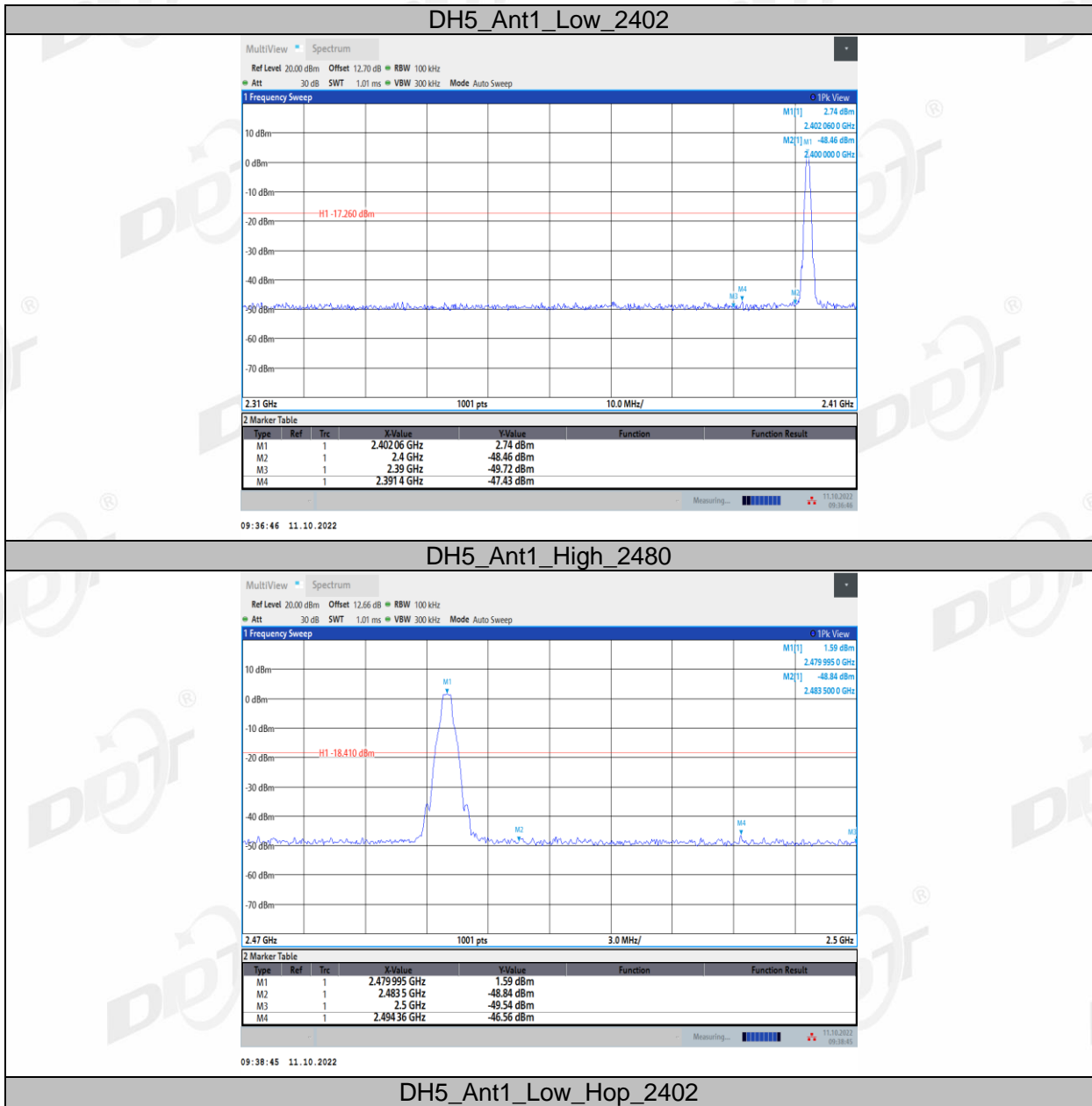
| | |
|----------------|--|
| RBW: | 100 kHz |
| VBW: | 300 kHz |
| Span | Encompass frequency range to be measured |
| Detector Mode: | Peak |
| Sweep time: | auto |
| Trace mode | Max hold |

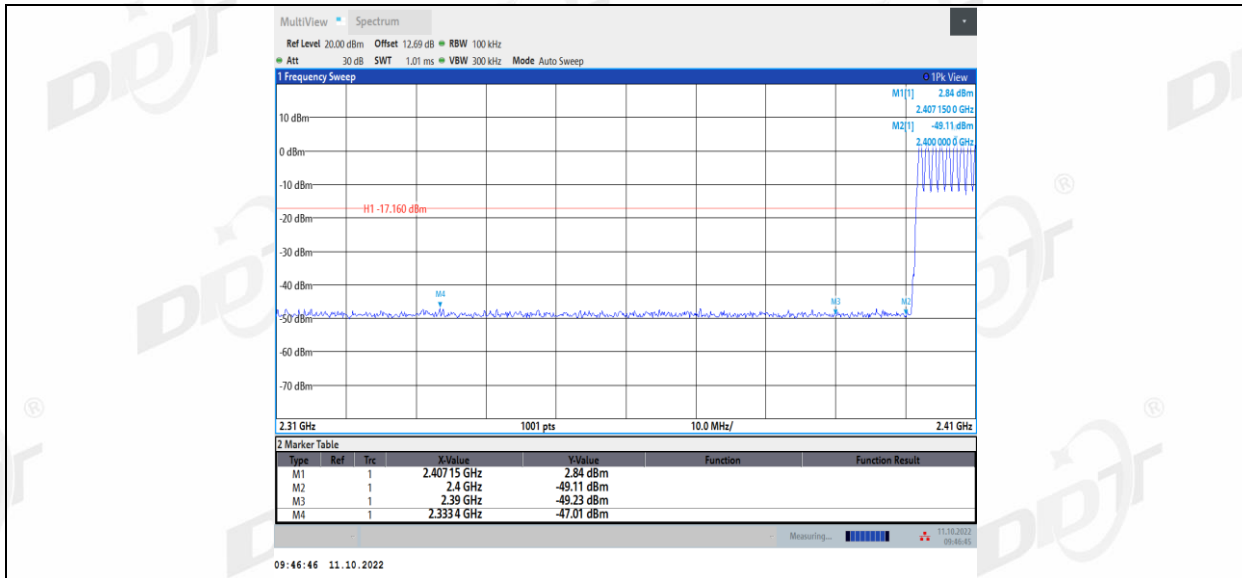
(3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

9.4. Test result

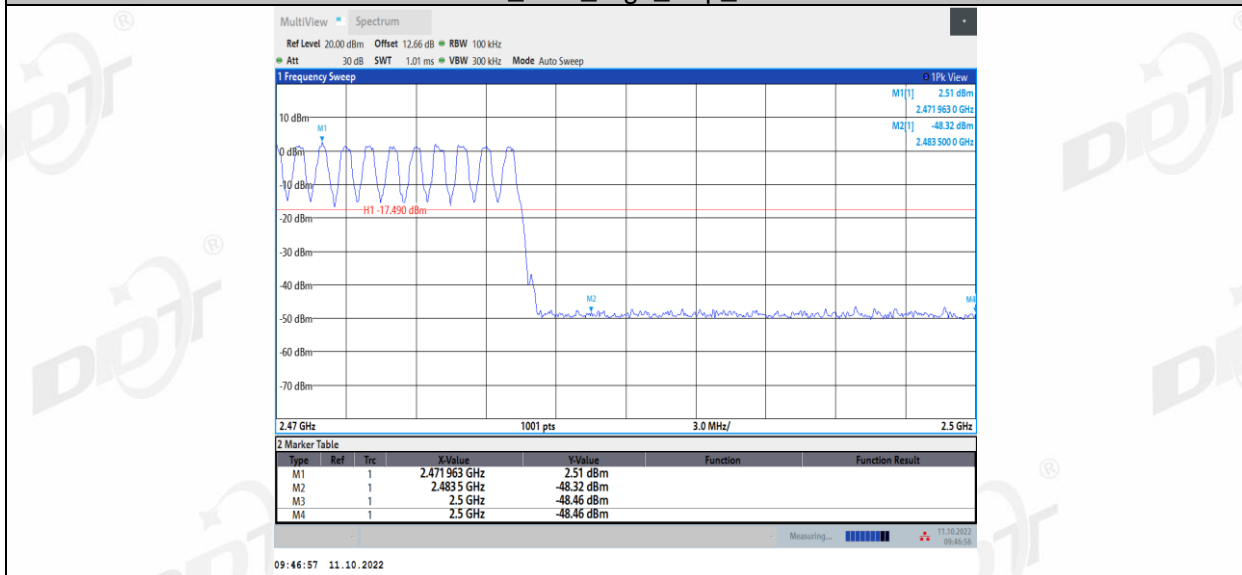
| Mode | Freq. (MHz) | Verdict |
|----------------|------------------|---------|
| GFSK | Hopping off 2402 | Pass |
| | Hopping off 2480 | Pass |
| | Hopping on | Pass |
| $\pi/4$ -DQPSK | Hopping off 2402 | Pass |
| | Hopping off 2480 | Pass |
| | Hopping on | Pass |
| 8DPSK | Hopping off 2402 | Pass |
| | Hopping off 2480 | Pass |
| | Hopping on | Pass |

9.5. Original test data

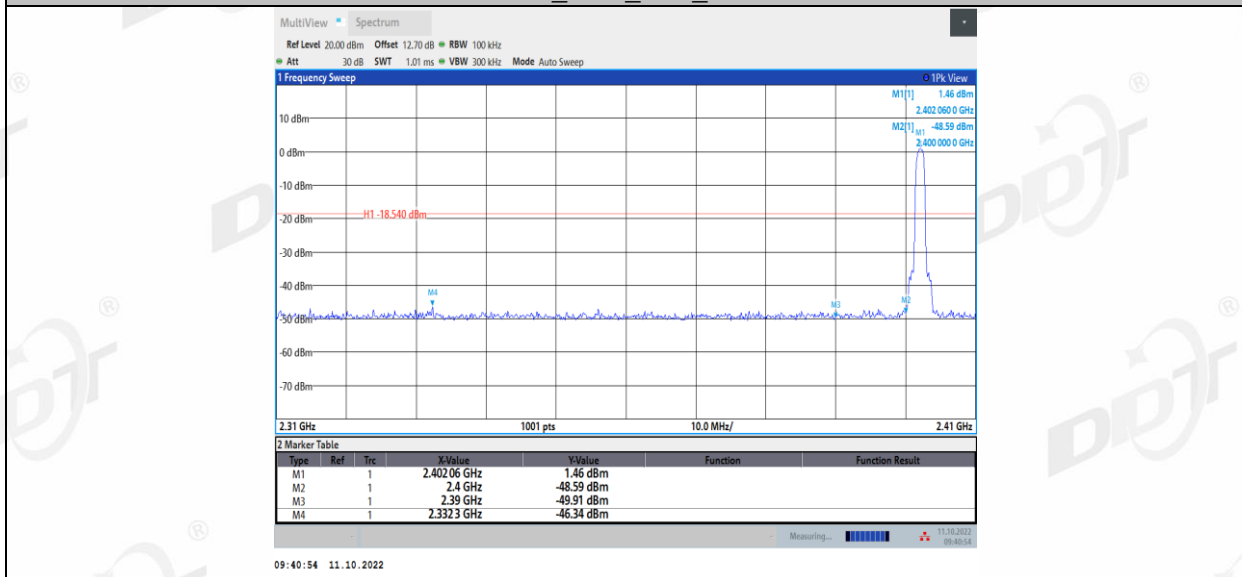




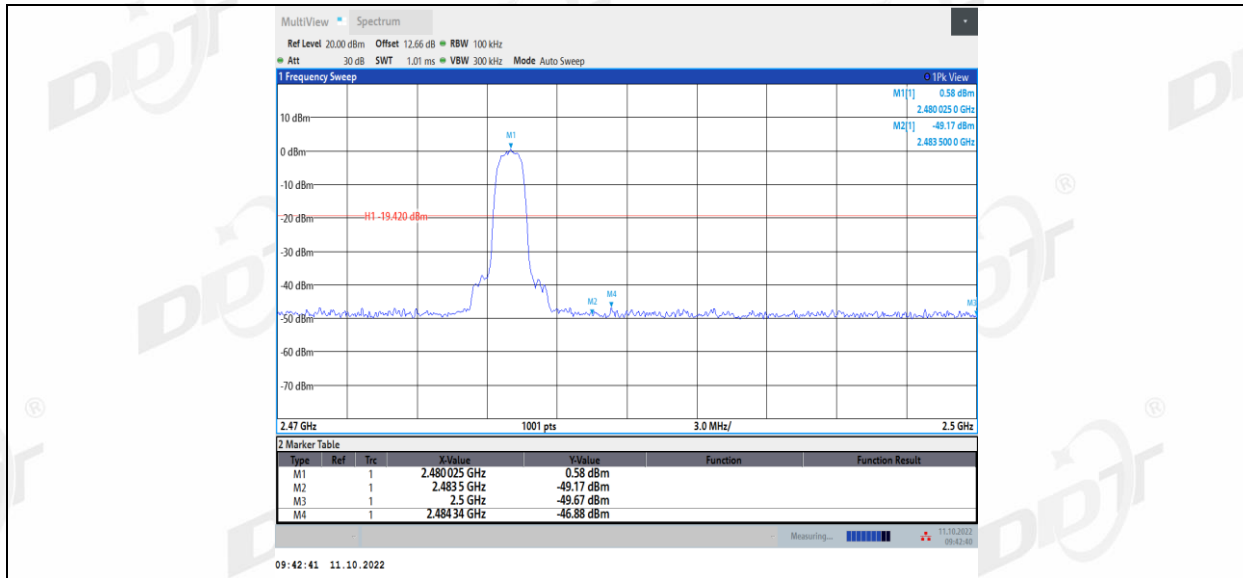
DH5_Ant1_High_Hop_2480



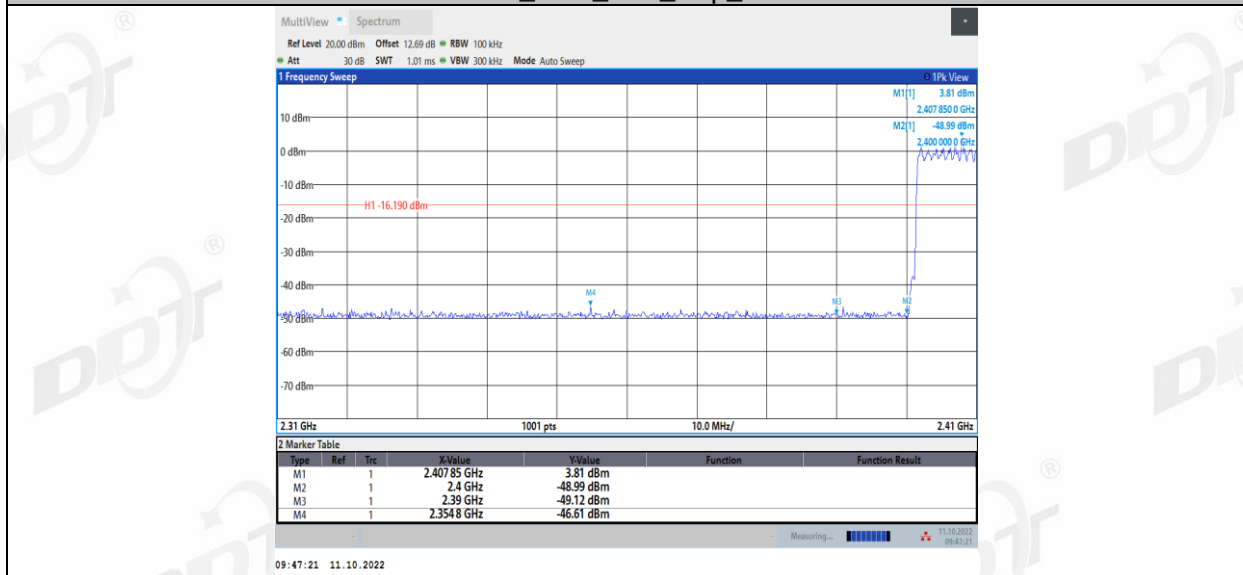
2DH5_Ant1_Low_2402



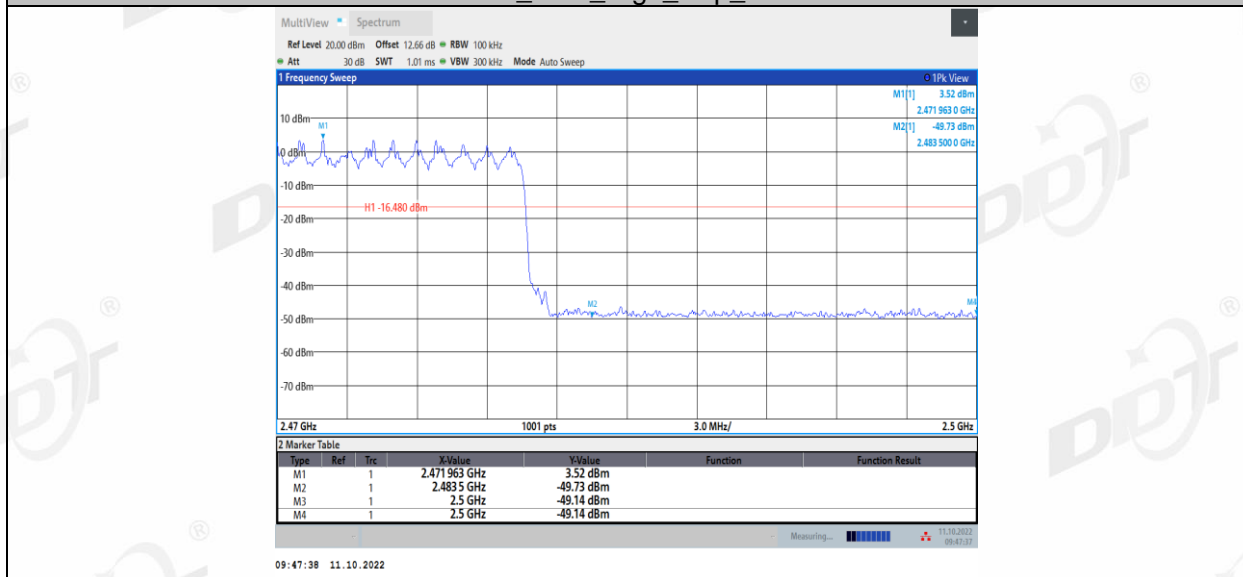
2DH5_Ant1_High_2480



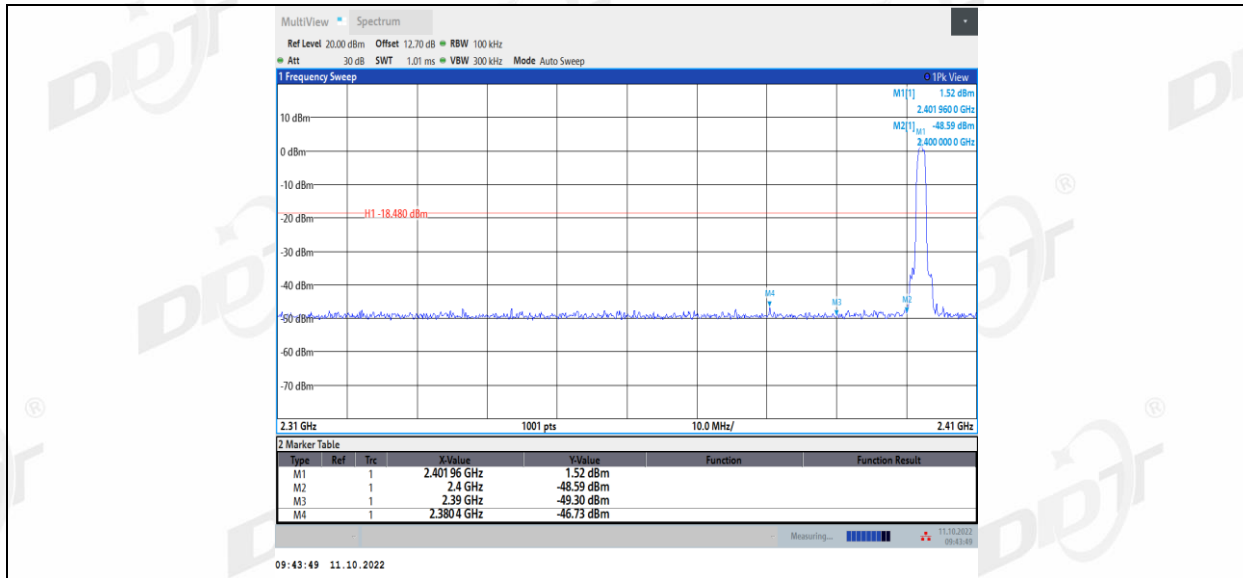
2DH5_Ant1_Low_Hop_2402



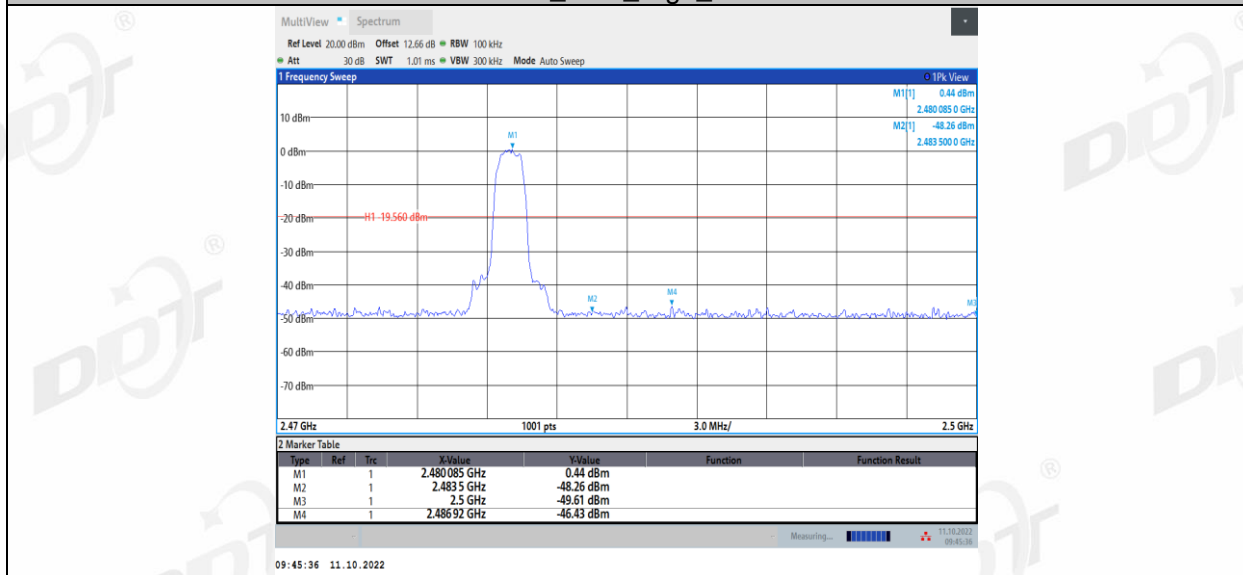
2DH5_Ant1_High_Hop_2480



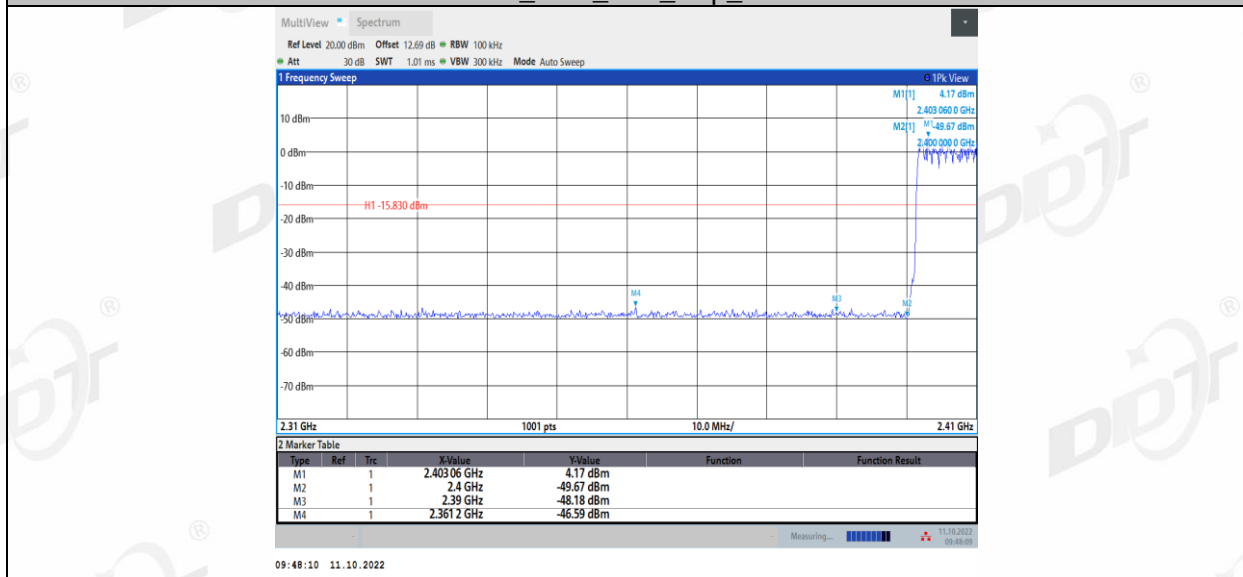
3DH5_Ant1_Low_2402



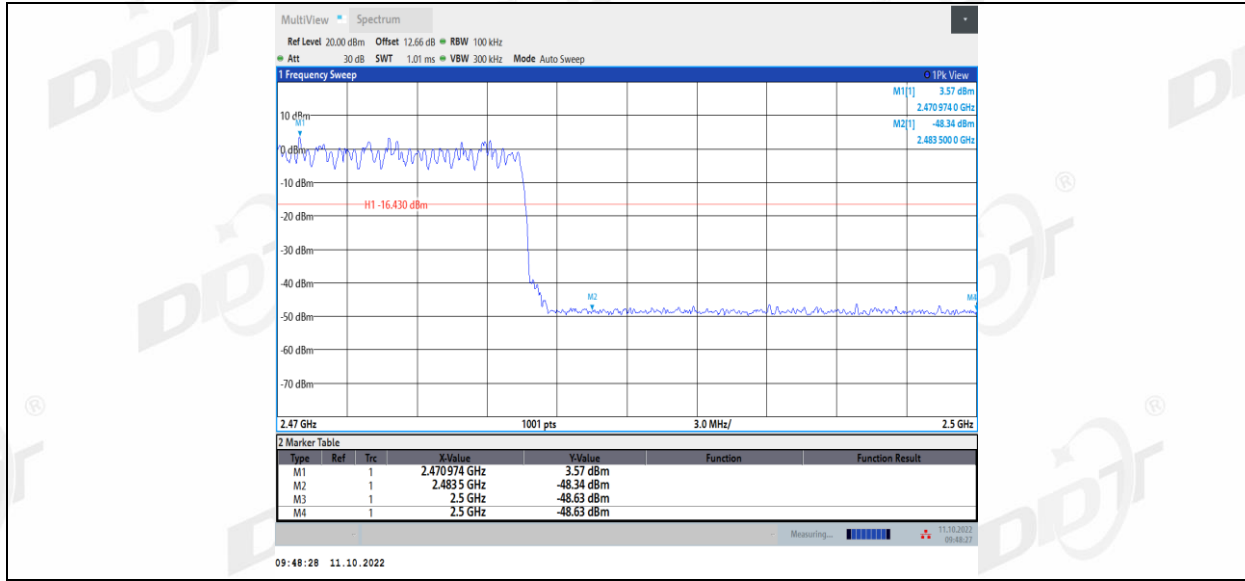
3DH5_Ant1_High_2480



3DH5_Ant1_Low_Hop_2402



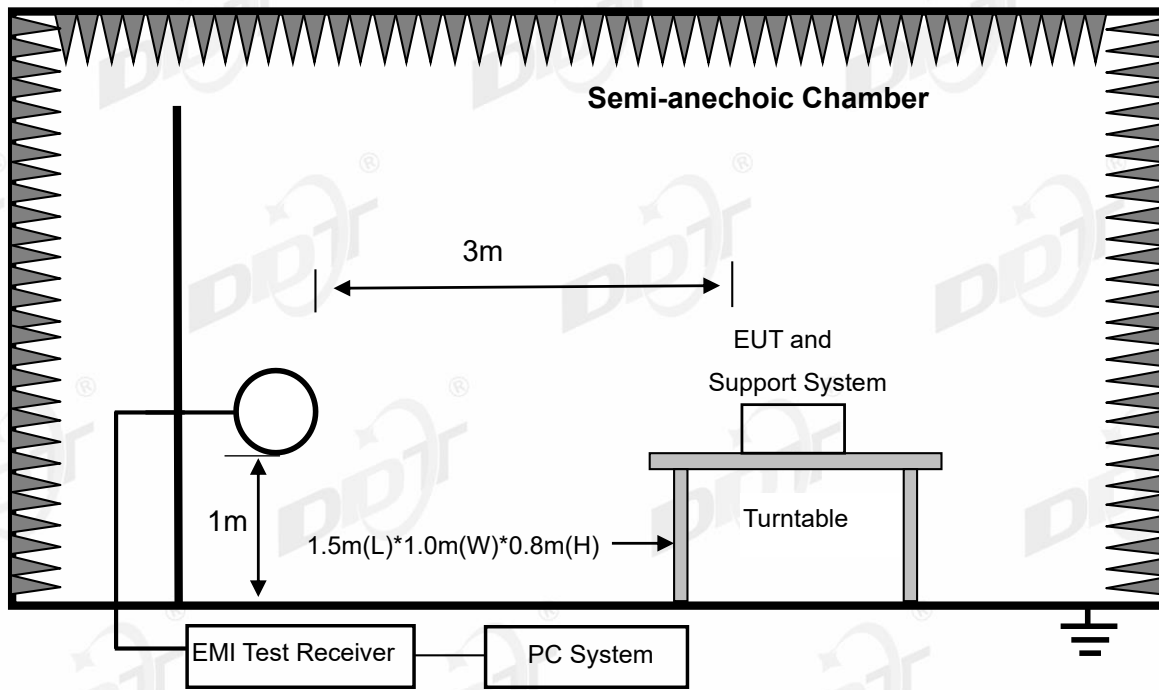
3DH5_Ant1_High_Hop_2480



10. Radiated Emission

10.1. Block diagram of test setup

In 3 m Anechoic Chamber, test setup diagram for 9 kHz - 30 MHz:



In 3 m Anechoic Chamber, test setup diagram for 30 MHz - 1 GHz:

