# FCC Test Report

| | |
|---|---|
| **Application No.:** | DNT2506100222R6108-07072 |
| **Applicant:** | SHENZHEN LONFINE INNOVATION TECHNOLOGY CO., LTD. |
| **Address of Applicant:** | 1011, D Area, Building 7, Hengda Fashion Valley, Dalang Street, Longhua District,Shenzhen China |
| **EUT Description:** | TWS Bluetooth Earphones |
| **Model No.:** | TAT2420 |
| **FCC ID:** | 2BOYB-TAT2420 |
| **Power Supply (Charging Box):** | Input:DC 5V;<br>DC 3.7V From rechargeable lithium-ion battery |
| **Power Supply (Earphone ):** | DC 3.7V by rechargeable lithium-ion battery |
| **Trade Mark:** | PHILIPS |
| **Standards:** | 47 CFR FCC Part 2, Subpart J<br>47 CFR Part 15, Subpart C<br>ANSI C63.10: 2013 |
| **Date of Receipt:** | 2025/6/10 |
| **Date of Test:** | 2025/6/11 to 2025/6/18 |
| **Date of Issue:** | 2025/6/19 |
| **Test Result:** | **PASS** |

**Prepared By:** Wayne.Lin (Testing Engineer)

**Reviewed By:** Pencils.Chen (Project Engineer)

**Approved By:** Yeise Chen (Manager)

Note: If there is any objection to the results in this report, please submit a written inquiry to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp, and is issued by the company in accordance

**Dongguan DN Testing Co., Ltd.**

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with the requirements of the "Conditions of Issuance of Test Reports" printed in the attached page. Unless otherwise stated, the results presented in this report only apply to the samples tested this time. Partial reproduction of this report is not allowed unless approved by the company in writing.

**Report Revise Record**

| Report Version | Revise Time | Issued Date | Valid Version | Notes |
|---|---|---|---|---|
| V1.0 | / | June 19, 2025 | Valid | Original Report |

# 1 Test Summary

| Test Item | Test Requirement | Test Method | Test Result | Result |
|---|---|---|---|---|
| Antenna Requirement | 15.203/247(b) | -- | Clause 3.1 | PASS |
| 20dB Emission Bandwidth | 15.247 (a)(1) | ANSI C63.10: 2013 | Clause 3.2 | PASS |
| Conducted Peak Output Power | 15.247 (b)(1) | ANSI C63.10: 2013 | Clause 3.3 | PASS |
| Carrier Frequencies Separation | 15.247 (a)(1) | ANSI C63.10: 2013 | Clause 3.4 | PASS |
| Dwell Time | 15.247 (a)(1) | ANSI C63.10: 2013 | Clause 3.5 | PASS |
| Hopping Channel Number | 15.247 (a)(1) | ANSI C63.10: 2013 | Clause 3.6 | PASS |
| Band-edge for RF Conducted Emissions | 15.247(d) | ANSI C63.10: 2013 | Clause 3.7 | PASS |
| RF Conducted Spurious Emissions | 15.247(d) | ANSI C63.10: 2013 | Clause 3.8 | PASS |
| Radiated Spurious emissions | 15.247(d); 15.205/15.209 | ANSI C63.10: 2013 | Clause 3.9 | PASS |
| Restricted bands around fundamental frequency (Radiated Emission) | 15.247(d); 15.205/15.209 | ANSI C63.10: 2013 | Clause 3.10 | PASS |
| AC Power Line Conducted Emission | 15.207 | ANSI C63.10: 2013 | Clause 3.11 | PASS |

Note:
1. “N/A” denotes test is not applicable in this test report.

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# 2 General Information

## 2.1 Test Location

| | |
|---|---|
| Company: | Dongguan DN Testing Co., Ltd |
| Address: | No. 1, West Fourth Street, South Xinfa Road, Wusha Liwu, Chang ' an Town, Dongguan City, Guangdong P.R.China |
| Test engineer: | Wayne Lin |

## 2.2 General Description of EUT

| | |
|---|---|
| Manufacturer: | Guanjie Audiovisual Technology (Shenzhen) Co., Ltd |
| Address of Manufacturer: | 4201, Block A, Building 2, Shenzhen Bay Innovation Technology Center, No. 3156 Keyuan South Road, High tech Zone Community, Yuehai Street, Nanshan District, Shenzhen |
| Test EUT Description: | TWS Bluetooth Earphones |
| Model No.: | TAT2420 |
| Additional Model(s): | / |
| Chip Type: | BP2D116-73D4 |
| Serial number: | PR2506100222R6108 |
| Power Supply (Charging Box): | Input:DC 5V;<br>DC 3.7V From rechargeable lithium-ion battery |
| Power Supply (Earphone ): | DC 3.7V by rechargeable lithium-ion battery |
| Trade Mark: | PHILIPS |
| Hardware Version: | V1.0 |
| Software Version: | V1.0 |
| Operation Frequency: | 2402MHz to 2480MHz |
| Modulation Technique: | Frequency Hopping Spread Spectrum(FHSS) |
| Type of Modulation: | GFSK,π/4-DQPSK |
| Sample Type: | ☒ Portable Device, ☐ Module,☐ Mobile Device |
| Antenna Type: | ☐ External, ☒ Integrated |
| Antenna Ports: | ☒ Ant 1, ☐ Ant 2, ☐ Ant 3 |
| Antenna Gain*: | ☒ Provided by applicant |
| | 2.58dBi |
| RF Cable*: | ☒ Provided by applicant |
| | 0.5dB(0.6~1GHz); 0.8dB(1.4~2GHz); 1.0dB(2.1~2.7GHz); 1.5dB(3~4GHz); 1.8dB(4.4~6GHz); |

Remark:

*Since the above data and/or information is provided by the applicant relevant results or conclusions of this report are only made for these data and/or information , DNT is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

## 2.3 Channel List

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

Remark:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Channel | Frequency |
|---|---|
| The Lowest channel | 2402MHz |
| The Middle channel | 2441MHz |
| The Highest channel | 2480MHz |

## 2.4 5Test Environment and Mode

| **Operating Environment:** | |
|---|---|
| Temperature: | 20~25.0 ˚C |
| Humidity: | 45~56 % RH |
| Atmospheric Pressure: | 101.0~101.30 KPa |
| **Test mode:** | |
| Transmitting mode: | Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate. |

## 2.5 Power Setting of Test Software

| Software Name | FCC_assist_1.0.1.2 | | |
|---|---|---|---|
| Frequency(MHz) | 2402 | 2441 | 2480 |
| GFSK Setting | 8 | 8 | 8 |
| π/4-DQPSK Setting | 8 | 8 | 8 |
| 8DPSK | 8 | 8 | 8 |

## 2.6 Description of Support Units

The EUT has been tested independent unit.

## 2.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

**Lab A:**

**• FCC, USA**

Designation Number: CN1348

**• A2LA (Certificate No. 7050.01)**

DONGGUAN DN TESTING CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 7050.01.

**• Innovation, Science and Economic Development Canada**

DONGGUAN DN TESTING CO., LTD. EMC Laboratory has been recognized by ISED as an accredited testing laboratory. CAB identifier is CN0149.

IC#: 30755.

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## 2.8 Measurement Uncertainty (95% confidence levels, k=2)

| No. | Item | Measurement Uncertainty |
|---|---|---|
| 1 | 20dB Emission Bandwidth | ±0.0196% |
| 2 | Carrier Frequency Separation | ±1.9% |
| 3 | Number of Hopping Channel | ±1.9% |
| 4 | Time of Occupancy | ±0.028% |
| 5 | Max Peak Conducted Output Power | ±0.743 dB |
| 6 | Band-edge Spurious Emission | ±1.328 dB |
| 7 | Conducted RF Spurious Emission | 9KHz-1GHz:±0.746dB<br>1GHz-26GHz:±1.328dB |

| No. | Item | Measurement Uncertainty |
|---|---|---|
| 1 | Conduction Emission | ± 3.0dB (150kHz to 30MHz) |
| 2 | Radiated Emission | ± 4.8dB (Below 1GHz) |
| | | ± 4.8dB (1GHz to 6GHz) |
| | | ± 4.5dB (6GHz to 18GHz) |
| | | ± 5.02dB (Above 18GHz) |

## 2.9 Equipment List

| For Connect EUT Antenna Terminal Test | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Serial Number | Cal date | Due date |
| Signal Generator | Keysight | N5181A-6G | MY48180415 | 2024-10-23 | 2025-10-22 |
| Signal Generator | Keysight | N5182B | MY57300617 | 2024-10-23 | 2025-10-22 |
| Power supply | Keysight | E3640A | ZB2022656 | 2024-10-23 | 2025-10-22 |
| Radio Communication Tester | R&S | CMW500 | 105082 | 2024-10-23 | 2025-10-22 |
| Spectrum Analyzer | Aglient | N9010A | MY52220200 | 2024-10-23 | 2025-10-22 |
| BT/WIFI Test Software | Tonscend | JS1120 V3.1.83 | NA | NA | NA |
| RF Control Unit | Tonscend | JS0806-2 | 22F8060581 | NA | NA |
| Power Sensor | Anritsu | ML2495A | 2129005 | 2024-10-23 | 2025-10-22 |
| Pulse Power Sensor | Anritsu | MA2411B | 1911397 | 2024-10-23 | 2025-10-22 |
| temperature and humidity box | SCOTEK | SCD-C40-80PRO | 6866682020008 | 2024-10-23 | 2025-10-22 |
| RF Cable | ETS-LINDGREN | RFC-NMS-100-NMS-350-IN | NA | 2024-10-23 | 2025-10-22 |

| Test Equipment for Conducted Emission | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Serial Number | Cal Date | Due Date |
| Receiver | R&S | ESCI3 | 101152 | 2024-10-23 | 2025-10-22 |
| LISN | R&S | ENV216 | 102874 | 2024-10-23 | 2025-10-22 |
| ISN | R&S | ENY81-CA6 | 1309.8590.03 | 2024-10-23 | 2025-10-22 |
| RF Cable | ETS-LINDGREN | Cable-CE TS01 | / | 2024-10-23 | 2025-10-22 |

| Test Equipment for Radiated Emission(30MHz-1000MHz) | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Serial Number | Cal Date | Due Date |
| Receiver | R&S | ESR7 | 102497 | 2024-10-23 | 2025-10-22 |
| Test Software | ETS-LINDGREN | TiLE-FULL | NA | NA | NA |
| RF Cable | ETS-LINDGREN | RE Cable-TS01 | NA | 2024-10-23 | 2025-10-22 |
| Log periodic antenna | ETS-LINDGREN | VULB 9168 | 01475 | 2022-11-28 | 2025-11-27 |
| Pre-amplifier | Schwarzbeck | BBV9743B | 00423 | 2024-10-23 | 2025-10-22 |

| | | | | | |
|---|---|---|---|---|---|
| Attenuator 1 | Shanghai Huaxiang | TS2-6-18-A | 22061803 | 2025-5-6 | 2026-5-5 |
| Attenuator 2 | Shanghai Huaxiang | TS2-6-6-A | 230927163 | 2025-5-6 | 2026-5-5 |

| Test Equipment for Radiated Emission(Above 1000MHz) | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | Serial Number | Cal Date | Due Date |
| Frequency analyser | Keysight | N9010A | MY52221458 | 2024-10-23 | 2025-10-22 |
| RF Cable | ETS-LINDGREN | RE Cable-TS02 | NA | 2024-10-23 | 2025-10-22 |
| Horn Antenna | ETS-LINDGREN | 3117 | 00252567 | 2022-11-28 | 2025-11-27 |
| Double ridged waveguide antenna | ETS-LINDGREN | 3116C | 00251780 | 2022-11-28 | 2025-11-27 |
| Test Software | ETS-LINDGREN | TiLE-FULL | NA | NA | NA |
| Pre-amplifier | ETS-LINDGREN | 3117-PA | 252567 | 2024-10-23 | 2025-10-22 |
| Pre-amplifier | ETS-LINDGREN | 3116C-PA | 251780 | 2024-10-23 | 2025-10-22 |

## 2.10 Assistant equipment used for test

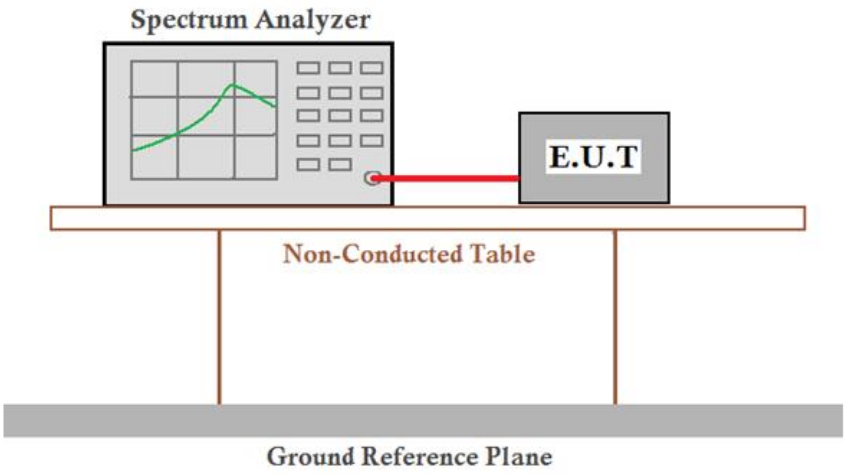
| Code | Equipment | Manufacturer | Model No. | Equipment No. |
|---|---|---|---|---|
| 1 | Computer | acer | N22C8 | EMC notebook01 |
| 2 | Adapter | HUAWEI | HW-100225C00 | NA |

# 3 Test results and Measurement Data

## 3.1 Antenna Requirement

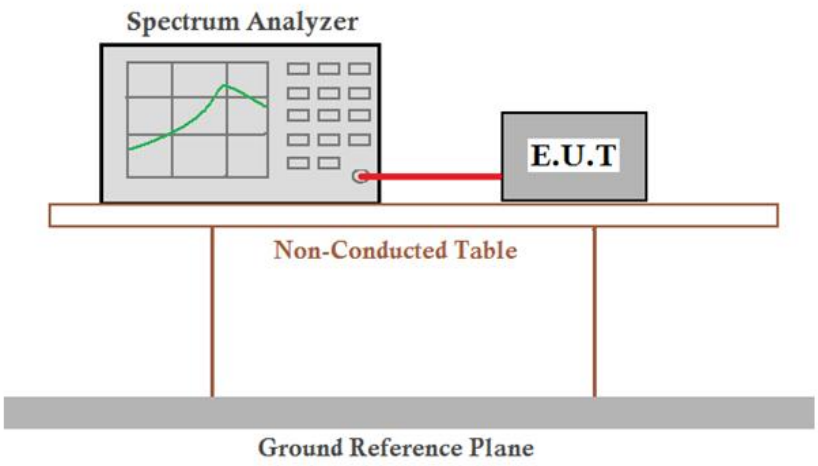
| **Standard requirement:** | 47 CFR Part 15C Section 15.203 /247(c) |
|---|---|
| 15.203 requirement:<br>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an 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.<br>15.247(b) (4) requirement:<br>The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi. | |
| The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.58dBi. | |

## 3.2 20dB Emission Bandwidth

| | |
|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.247 (a)(1) |
| Test Method: | ANSI C63.10: 2013 Section 7.8.7 |
| Test Setup: |  |
| Instruments Used: | Refer to section 2.9 for details |
| Exploratory Test Mode: | Non-hopping transmitting with all kind of modulation and all kind of data type. |
| Final Test Mode: | Through Pre-scan, find the worst case of all modulation type. |
| Limit: | NA |
| Test Results: | Pass |

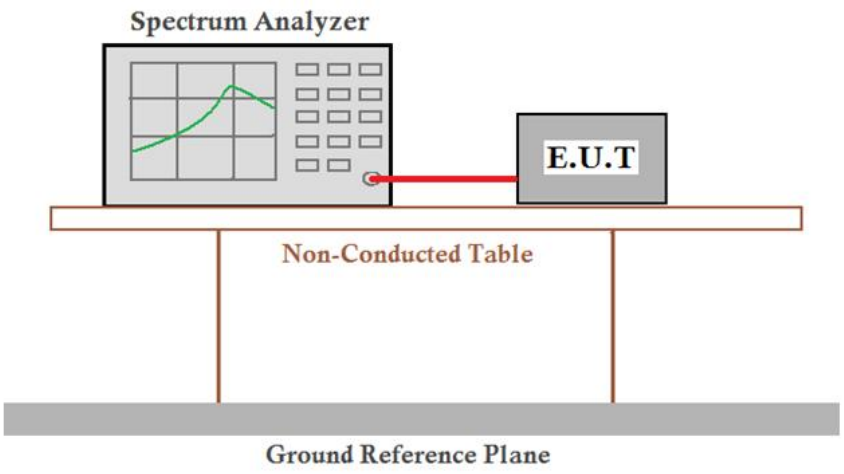
The detailed test data see: **Appendix A**

## 3.3 Conducted Output Power

| | |
|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.247 (b)(1) |
| Test Method: | ANSI C63.10: 2013 Section 7.8.5 |
| Test Setup: |  |
| Test Instruments: | Refer to section 2.9 for details |
| Exploratory Test Mode: | Non-hopping transmitting with all kind of modulation and all kind of data type. |
| Final Test Mode: | Through Pre-scan, find the worst case of all modulation type. |
| Limit: | (20.97dBm) 125mW |
| Test Results: | Pass |

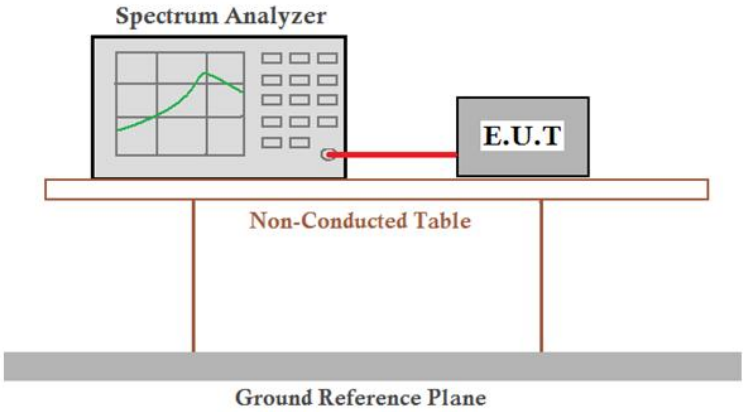
The detailed test data see: **Appendix B**

## 3.4 Carrier Frequencies Separationy

| | |
|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.247 (a)(1) |
| Test Method: | ANSI C63.10: 2013 Section 7.8.2 |
| Test Setup: |  |
| Test Instruments: | Refer to section 2.9 for details |
| Exploratory Test Mode: | Hopping transmitting with all kind of modulation and all kind of data type. |
| Final Test Mode: | Through Pre-scan, find the worst case of all modulation type. |
| Limit: | 2/3 of the 20dB bandwidth |
| | Remark: the transmission power is less than 0.125W. |
| Test Results: | Pass |

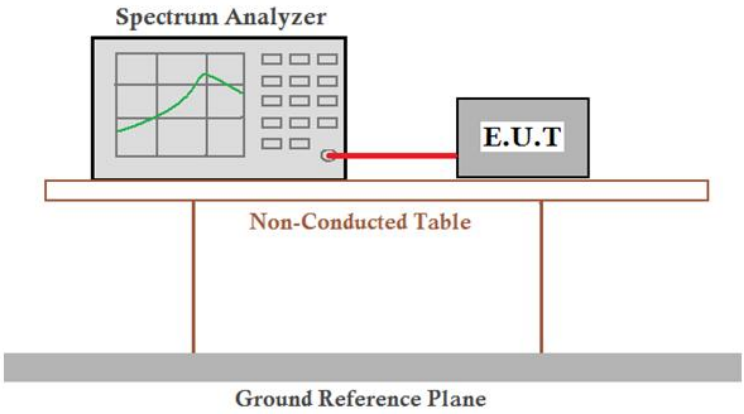
The detailed test data see: **Appendix C**

## 3.5 Dwell Time

| | |
|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.247 (a)(1) |
| Test Method: | ANSI C63.10: 2013 Section 7.8.4 |
| Test Setup: |  |
| Instruments Used: | Refer to section 2.9 for details |
| Test Mode: | Hopping transmitting with all kind of modulation and all kind of data type. |
| Limit: | 0.4 Second |
| Test Results: | Pass |

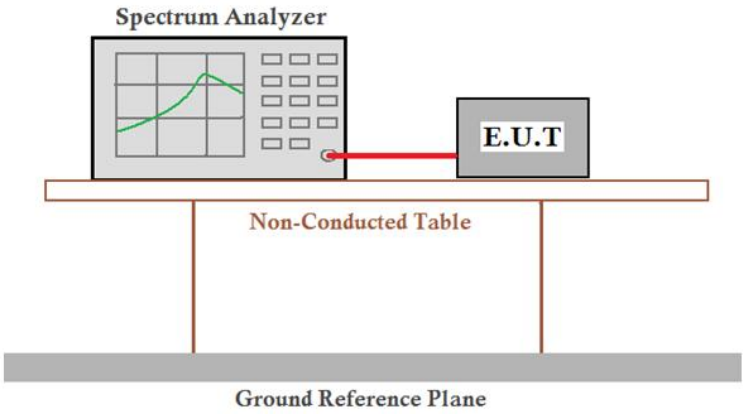
The detailed test data see: **Appendix D**

## 3.6 Hopping Channel Number

| | |
|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.247 (a)(1) |
| Test Method: | ANSI C63.10: 2013 Section 7.8.3 |
| Test Setup: |  |
| Instruments Used: | Refer to section 2.9 for details |
| Test Mode: | Hopping transmitting with all kind of modulation |
| Limit: | At least 15 channels |
| Test Results: | Pass |

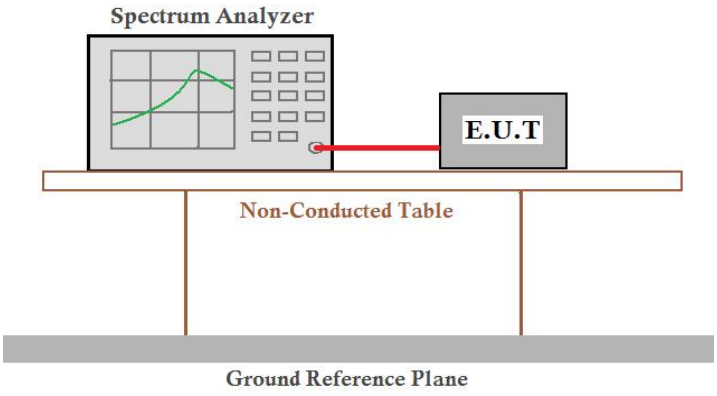
The detailed test data see: **Appendix E**

## 3.7 Band-edge for RF Conducted Emissions

| | |
|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.247 (d) |
| Test Method: | ANSI C63.10: 2013 Section 7.8.6 |
| Test Setup: |  |
| Instruments Used: | Refer to section 2.9 for details |
| Exploratory Test Mode: | Hopping and Non-hopping transmitting with all kind of modulation and all kind of data type. |
| Final Test Mode: | Through Pre-scan, find the worst case of all modulation type. |
| Limit: | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. |
| Test Results: | Pass |

The detailed test data see: **Appendix F**

## 3.8 RF Conducted Spurious Emissions

| | |
|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.247 (d) |
| Test Method: | ANSI C63.10: 2013 Section 11.11 |
| Test Setup: |  |
| Instruments Used: | Refer to section 2.9 for details |
| Exploratory Test Mode: | Transmitting with all kind of modulations, data rates |
| Final Test Mode: | Through Pre-scan, find the worst case of all modulation type. |
| Limit: | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. |
| Test Results: | Pass |

The detailed test data see: **Appendix G**

## 3.9 Radiated Spurious Emissions

| | | | | | |
|---|---|---|---|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.209 and 15.205 | | | | |
| Test Method: | ANSI C63.10: 2013 Section 11.12 | | | | |
| Test Site: | Measurement Distance: 3m or 10m (Semi-Anechoic Chamber) | | | | |
| Receiver Setup: | Frequency | Detector | RBW | VBW | Remark |
| | 0.009MHz-0.090MHz | Peak | 10kHz | 30kHz | Peak |
| | 0.009MHz-0.090MHz | Average | 10kHz | 30kHz | Average |
| | 0.090MHz-0.110MHz | Quasi-peak | 10kHz | 30kHz | Quasi-peak |
| | 0.110MHz-0.490MHz | Peak | 10kHz | 30kHz | Peak |
| | 0.110MHz-0.490MHz | Average | 10kHz | 30kHz | Average |
| | 0.490MHz -30MHz | Quasi-peak | 10kHz | 30kHz | Quasi-peak |
| | 30MHz-1GHz | Quasi-peak | 120kHz | 300kHz | Quasi-peak |
| | Above 1GHz | Peak | 1MHz | 3MHz | Peak |
| | | Peak | 1MHz | 10Hz (DC⩾0.98) ⩾1/T (DC<0.98) | Average |
| Limit: | Frequency | Field strength (microvolt/meter) | Limit (dBuV/m) | Remark | Measurement distance (m) |
| | 0.009MHz-0.490MHz | 2400/F(kHz) | - | - | 300 |
| | 0.490MHz-1.705MHz | 24000/F(kHz) | - | - | 30 |
| | 1.705MHz-30MHz | 30 | - | - | 30 |
| | 30MHz-88MHz | 100 | 40.0 | Quasi-peak | 3 |
| | 88MHz-216MHz | 150 | 43.5 | Quasi-peak | 3 |
| | 216MHz-960MHz | 200 | 46.0 | Quasi-peak | 3 |
| | 960MHz-1GHz | 500 | 54.0 | Quasi-peak | 3 |
| | Above 1GHz | 500 | 54.0 | Average | 3 |
| | Remark: 15.35(b),Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device. | | | | |

Test Setup:

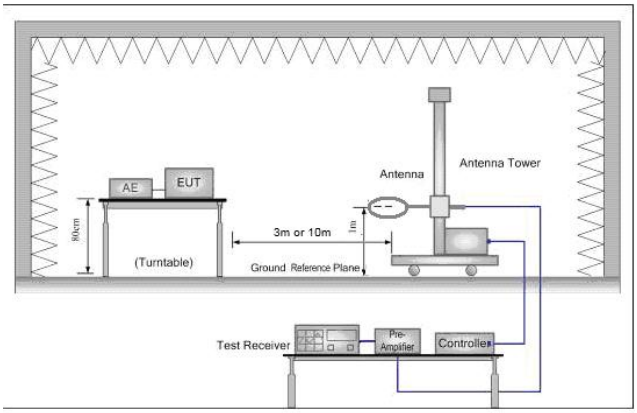



Figure 1. Below 30MHz

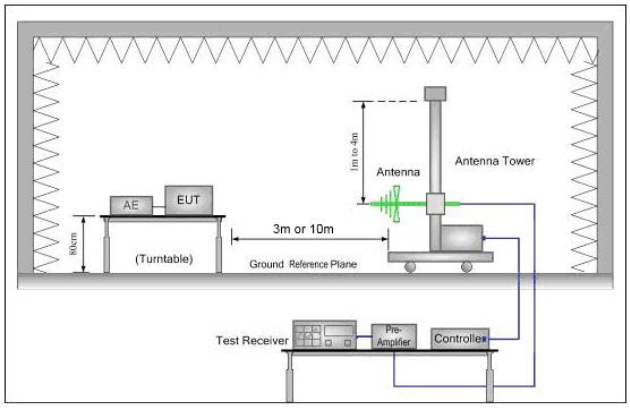



Figure 2. 30MHz to 1GHz

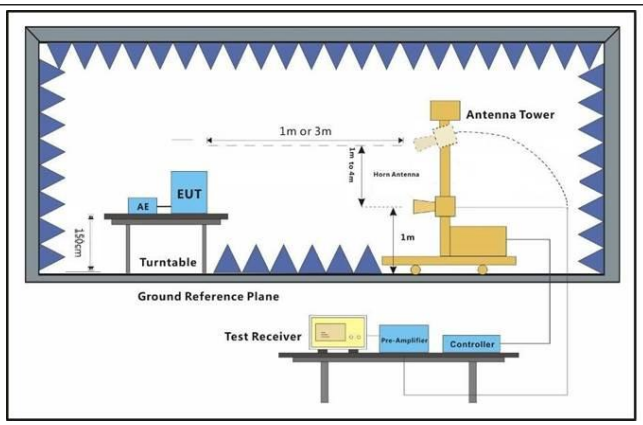



Figure 3. Above 1 GHz

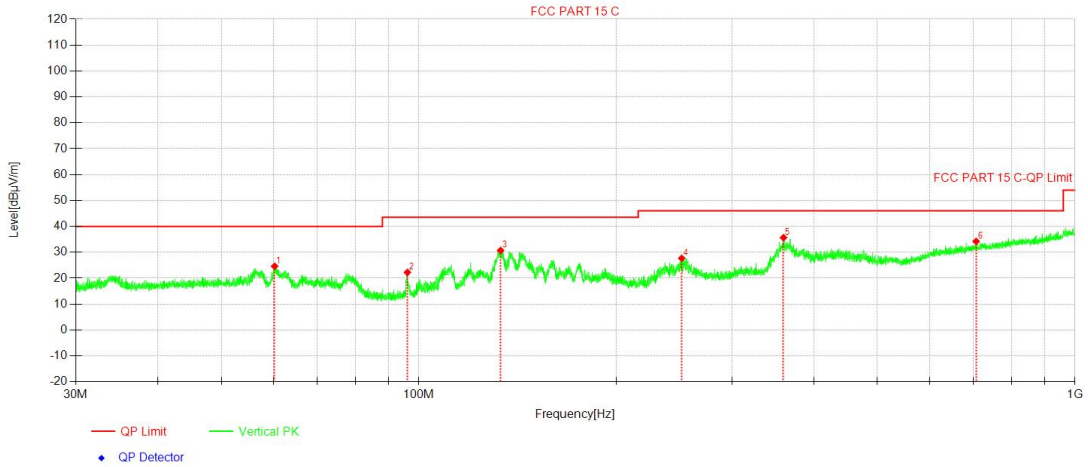
Test Procedure:

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation
c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
h. Test the EUT in the lowest channel, the middle channel ,the Highest channel.
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.
j. Repeat above procedures until all frequencies measured was complete.

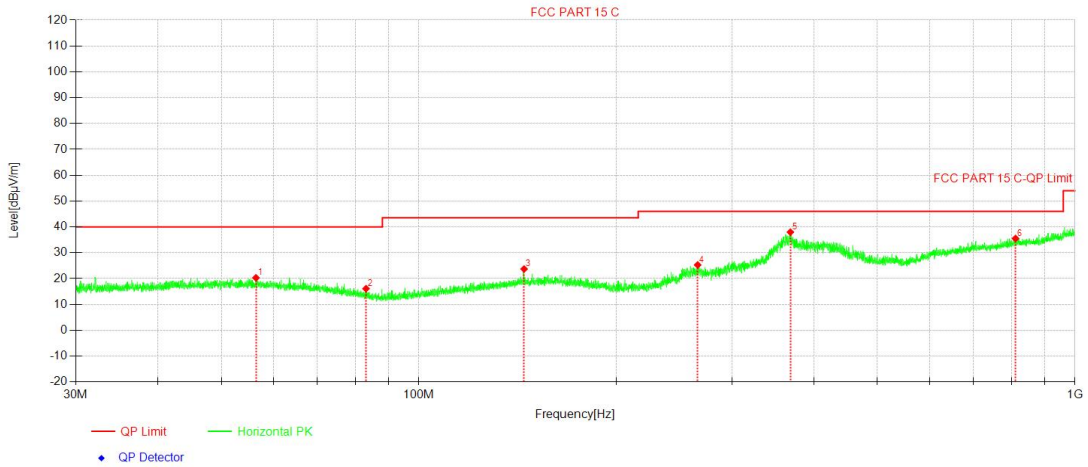
| | |
|---|---|
| Test Configuration: | Measurements Below 1000MHz<br>• RBW = 120 kHz<br>• VBW = 300 kHz<br>• Detector = Peak<br>• Trace mode = max hold<br>Peak Measurements Above 1000 MHz<br>• RBW = 1 MHz<br>• VBW ⩾ 3 MHz<br>• Detector = Peak<br>• Sweep time = auto<br>• Trace mode = max hold<br>Average Measurements Above 1000MHz<br>• RBW = 1 MHz<br>• VBW = 10 Hz, when duty cycle is no less than 98 percent.<br>• VBW ⩾ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. |
| Exploratory Test Mode: | Transmitting with all kind of modulations, data rates.<br>Charge+Transmitting mode. |
| Final Test Mode: | Pretest the EUT at Transmitting mode.<br>Through Pre-scan, find the DH5 of data type is the worst case of All modulation type. |
| Instruments Used: | Refer to section 2.9 for details |
| Test Results: | Pass |

**Test data**

**For 30-1000MHz**



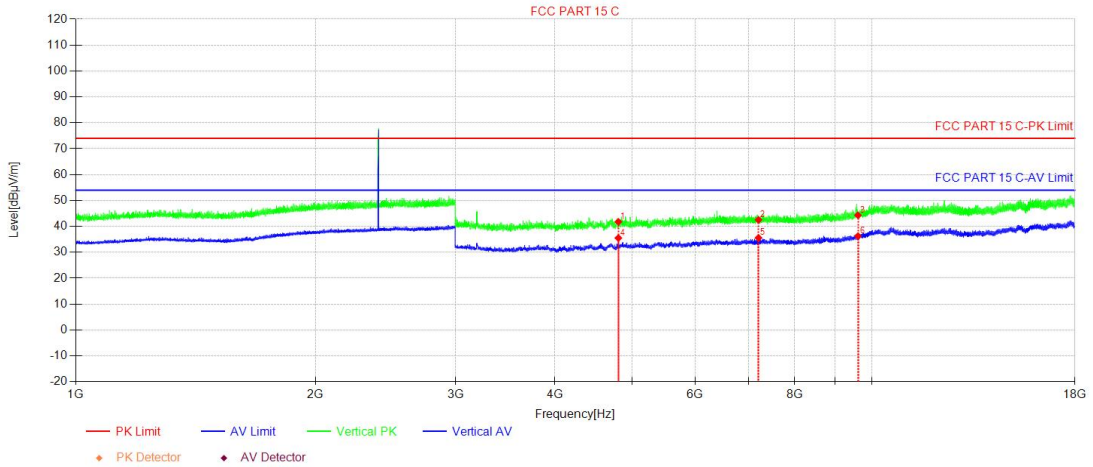

| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 60.28 | 33.39 | -8.79 | 24.60 | 40.00 | 15.40 | 100 | 268 | PK | Vertical |
| 2 | 96.06 | 35.45 | -13.21 | 22.24 | 43.50 | 21.26 | 100 | 303 | PK | Vertical |
| 3 | 133.24 | 39.84 | -9.13 | 30.71 | 43.50 | 12.79 | 100 | 292 | PK | Vertical |
| 4 | 251.53 | 36.59 | -8.90 | 27.69 | 46.00 | 18.31 | 100 | 81 | PK | Vertical |
| 5 | 359.56 | 41.21 | -5.55 | 35.66 | 46.00 | 10.34 | 100 | 183 | PK | Vertical |
| 6 | 706.95 | 31.76 | 2.46 | 34.22 | 46.00 | 11.78 | 100 | 162 | PK | Vertical |



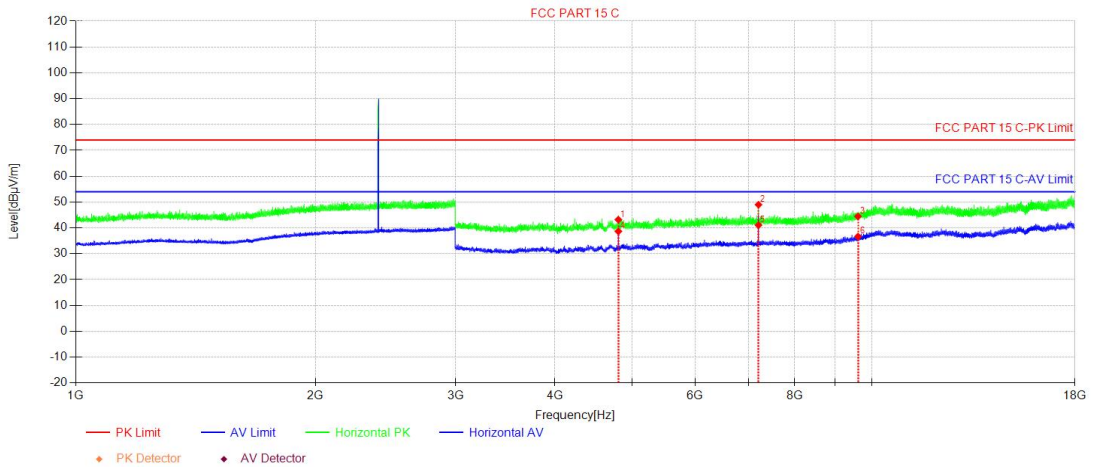

| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 56.45 | 28.69 | -8.40 | 20.29 | 40.00 | 19.71 | 100 | 256 | PK | Horizontal |
| 2 | 83.08 | 29.39 | -13.27 | 16.12 | 40.00 | 23.88 | 100 | 256 | PK | Horizontal |
| 3 | 144.69 | 31.90 | -8.19 | 23.71 | 43.50 | 19.79 | 100 | 189 | PK | Horizontal |
| 4 | 266.05 | 33.56 | -8.28 | 25.28 | 46.00 | 20.72 | 100 | 346 | PK | Horizontal |
| 5 | 368.37 | 43.21 | -5.23 | 37.98 | 46.00 | 8.02 | 100 | 33 | PK | Horizontal |
| 6 | 811.69 | 30.95 | 4.56 | 35.51 | 46.00 | 10.49 | 100 | 245 | PK | Horizontal |

**For above 1GHz**

**DH5 2402MHz**

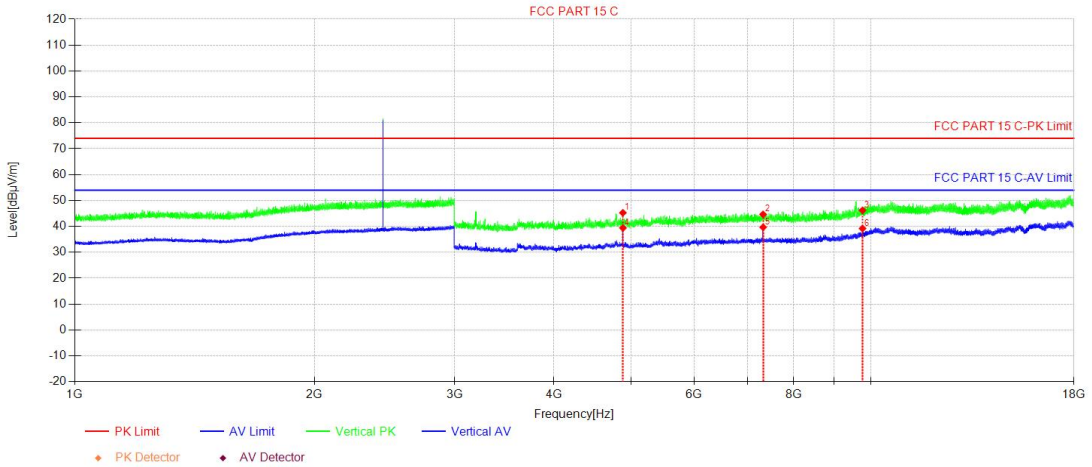



| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4804.59 | 46.37 | -4.61 | 41.76 | 74.00 | 32.24 | 150 | 18 | Peak | Vertical |
| 2 | 7206.21 | 44.27 | -1.76 | 42.51 | 74.00 | 31.49 | 150 | 173 | Peak | Vertical |
| 3 | 9608.58 | 43.42 | 0.88 | 44.30 | 74.00 | 29.70 | 150 | 324 | Peak | Vertical |
| 4 | 4804.59 | 40.12 | -4.61 | 35.51 | 54.00 | 18.49 | 150 | 204 | AV | Vertical |
| 5 | 7206.21 | 37.33 | -1.76 | 35.57 | 54.00 | 18.43 | 150 | 357 | AV | Vertical |
| 6 | 9608.58 | 35.38 | 0.88 | 36.26 | 54.00 | 17.74 | 150 | 153 | AV | Vertical |

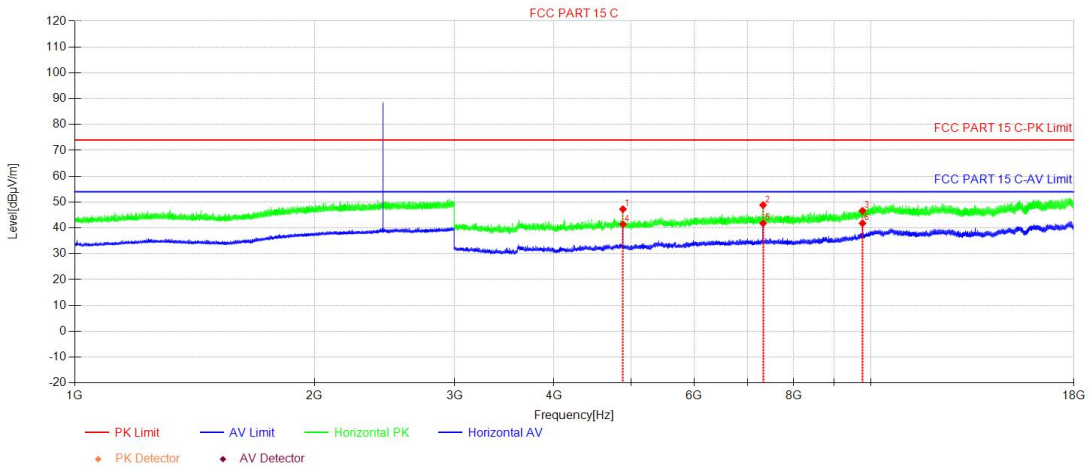



| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4804.59 | 47.79 | -4.61 | 43.18 | 74.00 | 30.82 | 150 | 64 | Peak | Horizon |
| 2 | 7206.21 | 50.74 | -1.76 | 48.98 | 74.00 | 25.02 | 150 | 282 | Peak | Horizon |
| 3 | 9608.58 | 43.57 | 0.88 | 44.45 | 74.00 | 29.55 | 150 | 64 | Peak | Horizon |
| 4 | 4804.59 | 43.29 | -4.61 | 38.68 | 54.00 | 15.32 | 150 | 232 | AV | Horizon |
| 5 | 7206.21 | 42.83 | -1.76 | 41.07 | 54.00 | 12.93 | 150 | 282 | AV | Horizon |
| 6 | 9608.58 | 35.79 | 0.88 | 36.67 | 54.00 | 17.33 | 150 | 282 | AV | Horizon |

**DH5 2441MHz**

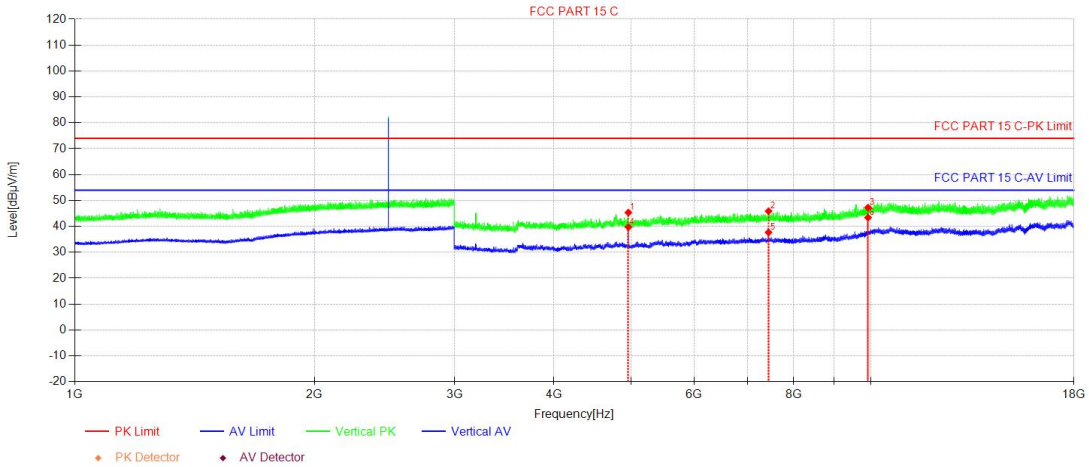



| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4881.84 | 49.98 | -4.72 | 45.26 | 74.00 | 28.74 | 150 | 129 | Peak | Vertical |
| 2 | 7323.22 | 46.12 | -1.49 | 44.63 | 74.00 | 29.37 | 150 | 76 | Peak | Vertical |
| 3 | 9764.59 | 44.54 | 1.64 | 46.18 | 74.00 | 27.82 | 150 | 217 | Peak | Vertical |
| 4 | 4882.59 | 44.13 | -4.72 | 39.41 | 54.00 | 14.59 | 150 | 76 | AV | Vertical |
| 5 | 7323.97 | 41.15 | -1.49 | 39.66 | 54.00 | 14.34 | 150 | 76 | AV | Vertical |
| 6 | 9764.59 | 37.55 | 1.64 | 39.19 | 54.00 | 14.81 | 150 | 76 | AV | Vertical |

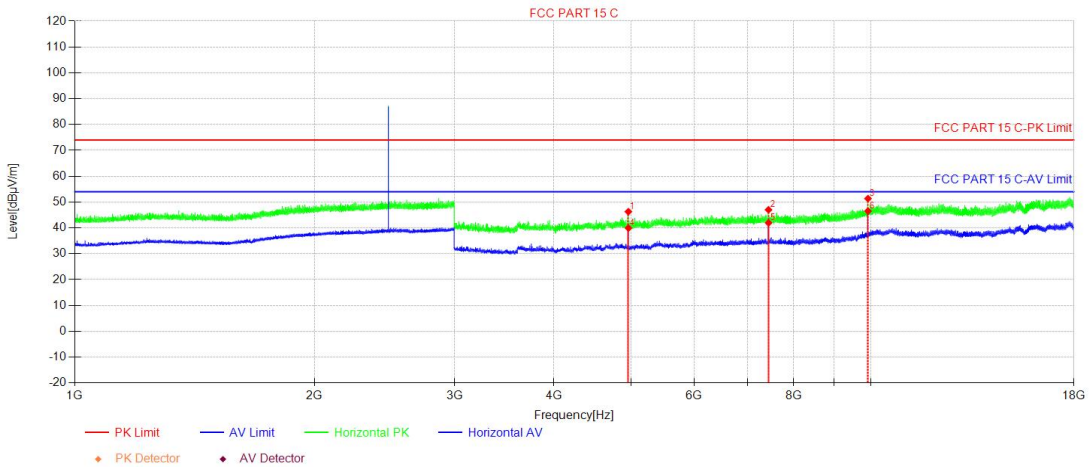



| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4882.59 | 51.97 | -4.72 | 47.25 | 74.00 | 26.75 | 150 | 55 | Peak | Horizon |
| 2 | 7323.22 | 50.33 | -1.49 | 48.84 | 74.00 | 25.16 | 150 | 72 | Peak | Horizon |
| 3 | 9764.59 | 45.00 | 1.64 | 46.64 | 74.00 | 27.36 | 150 | 38 | Peak | Horizon |
| 4 | 4882.59 | 46.10 | -4.72 | 41.38 | 54.00 | 12.62 | 150 | 215 | AV | Horizon |
| 5 | 7323.97 | 43.29 | -1.49 | 41.80 | 54.00 | 12.20 | 150 | 55 | AV | Horizon |
| 6 | 9764.59 | 40.15 | 1.64 | 41.79 | 54.00 | 12.21 | 150 | 19 | AV | Horizon |

**DH5 2480MHz**




| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4959.85 | 50.22 | -4.86 | 45.36 | 74.00 | 28.64 | 150 | 94 | Peak | Vertical |
| 2 | 7440.22 | 47.22 | -1.34 | 45.88 | 74.00 | 28.12 | 150 | 94 | Peak | Vertical |
| 3 | 9920.60 | 45.01 | 2.27 | 47.28 | 74.00 | 26.72 | 150 | 76 | Peak | Vertical |
| 4 | 4960.60 | 44.59 | -4.86 | 39.73 | 54.00 | 14.27 | 150 | 76 | AV | Vertical |
| 5 | 7440.22 | 39.02 | -1.34 | 37.68 | 54.00 | 16.32 | 150 | 76 | AV | Vertical |
| 6 | 9920.60 | 41.13 | 2.27 | 43.40 | 54.00 | 10.60 | 150 | 76 | AV | Vertical |




| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 4959.85 | 51.14 | -4.86 | 46.28 | 74.00 | 27.72 | 150 | 56 | Peak | Horizon |
| 2 | 7439.47 | 48.35 | -1.34 | 47.01 | 74.00 | 26.99 | 150 | 56 | Peak | Horizon |
| 3 | 9919.85 | 49.09 | 2.26 | 51.35 | 74.00 | 22.65 | 150 | 20 | Peak | Horizon |
| 4 | 4960.60 | 44.80 | -4.86 | 39.94 | 54.00 | 14.06 | 150 | 343 | AV | Horizon |
| 5 | 7440.97 | 43.29 | -1.34 | 41.95 | 54.00 | 12.05 | 150 | 56 | AV | Horizon |
| 6 | 9920.60 | 44.24 | 2.27 | 46.51 | 54.00 | 7.49 | 150 | 20 | AV | Horizon |

Note:

1. The Measurement (Result Level) is calculated by Reading Level adding the Correct Factor(maybe including Ant.Factor and the Cable Factor etc.), The basic equation is as follows:

   Result Level= Reading Level + Correct Factor(including Ant.Factor, Cable Factor etc. )

2. The amplitude of 9KHz to 30MHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

3. The amplitude of 18GHz to 25GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be report.

4. All channels had been pre-test,DH5 is the worst case, only the worst case was reported.

## 3.10 Restricted bands around fundamental frequency

| | | | |
|---|---|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.209 and 15.205 | | |
| Test Method: | ANSI C63.10: 2013 Section 11.12 | | |
| Test Site: | Measurement Distance: 3m or 10m (Semi-Anechoic Chamber) | | |
| Limit: | Frequency | Limit (dBuV/m) | Remark |
| | 30MHz-88MHz | 40.0 | Quasi-peak |
| | 88MHz-216MHz | 43.5 | Quasi-peak |
| | 216MHz-960MHz | 46.0 | Quasi-peak |
| | 960MHz-1GHz | 54.0 | Quasi-peak |
| | Above 1GHz | 54.0 | Average Value |
| | | 74.0 | Peak Value |
| Test Setup: | | | |

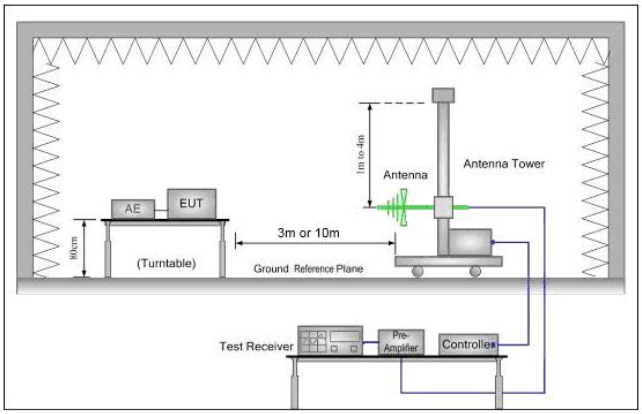



Figure 1. 30MHz to 1GHz

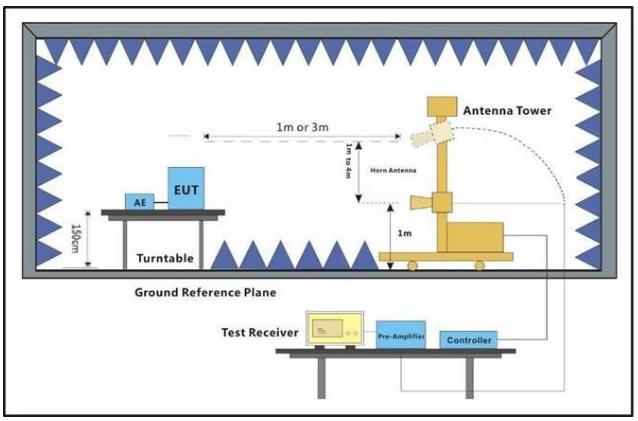


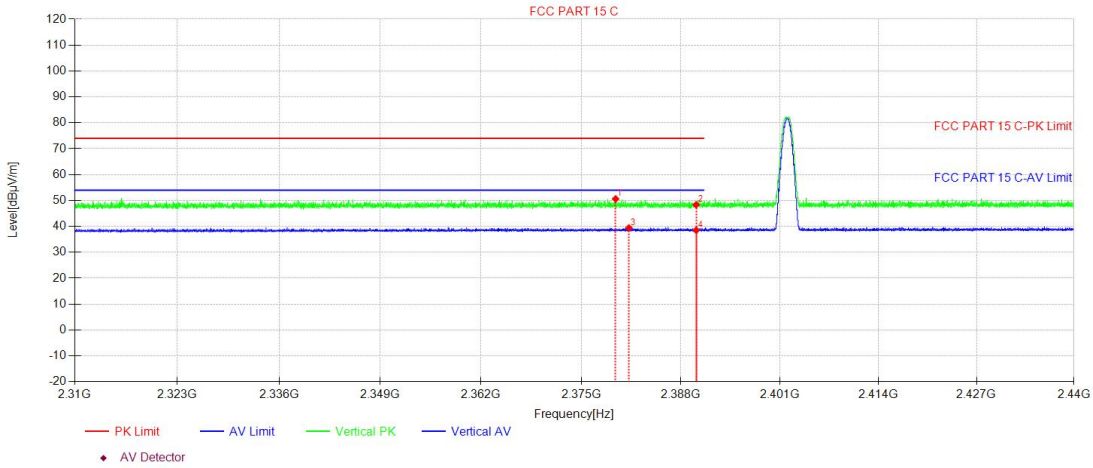

Figure 2. Above 1 GHz

| | |
|---|---|
| Test Procedure: | a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.<br>b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.<br>c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.<br>d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.<br>e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.<br>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.<br>g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel<br>h. Test the EUT in the lowest channel , the Highest channel<br>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.<br>j. Repeat above procedures until all frequencies measured was complete. |
| Test Configuration: | Measurements Below 1000MHz |

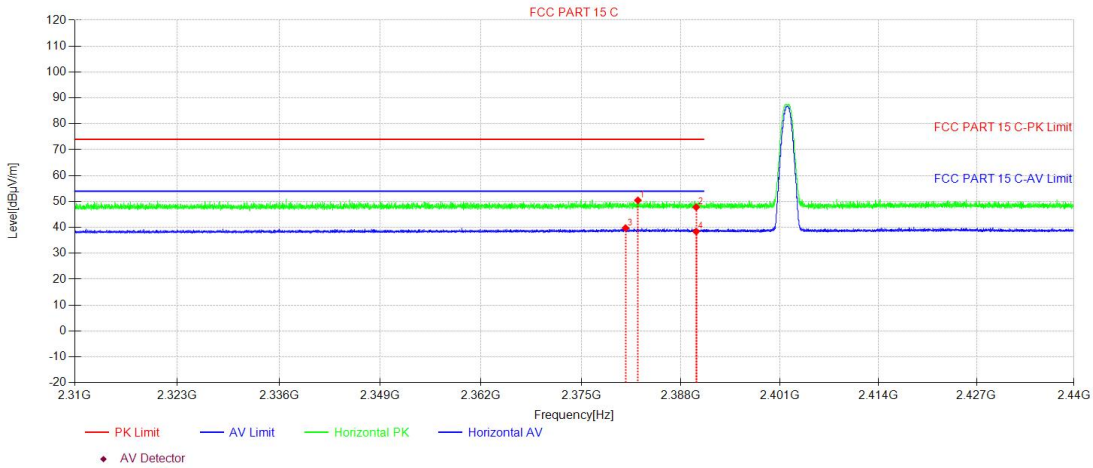
| | |
|---|---|
| | • RBW = 120 kHz<br>• VBW = 300 kHz<br>• Detector = Peak<br>• Trace mode = max hold<br>Peak Measurements Above 1000 MHz<br>• RBW = 1 MHz<br>• VBW ⩾ 3 MHz<br>• Detector = Peak<br>• Sweep time = auto<br>• Trace mode = max hold<br>Average Measurements Above 1000MHz<br>• RBW = 1 MHz<br>• VBW = 10 Hz, when duty cycle is no less than 98 percent.<br>• VBW ⩾ 1/T, when duty cycle is less than 98 percent where T is the minimum<br>transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. |
| Exploratory Test Mode: | Transmitting with all kind of modulations, data rates.<br>Transmitting mode. |
| Final Test Mode: | Pretest the EUT Transmitting mode.<br>Through Pre-scan, find the DH5 of data type is the worst case of all modulation type.<br>Only the worst case is recorded in the report. |
| Instruments Used: | Refer to section 2.9 for details |
| Test Results: | Pass |

**Test Date**

**DH5 2402MHz**

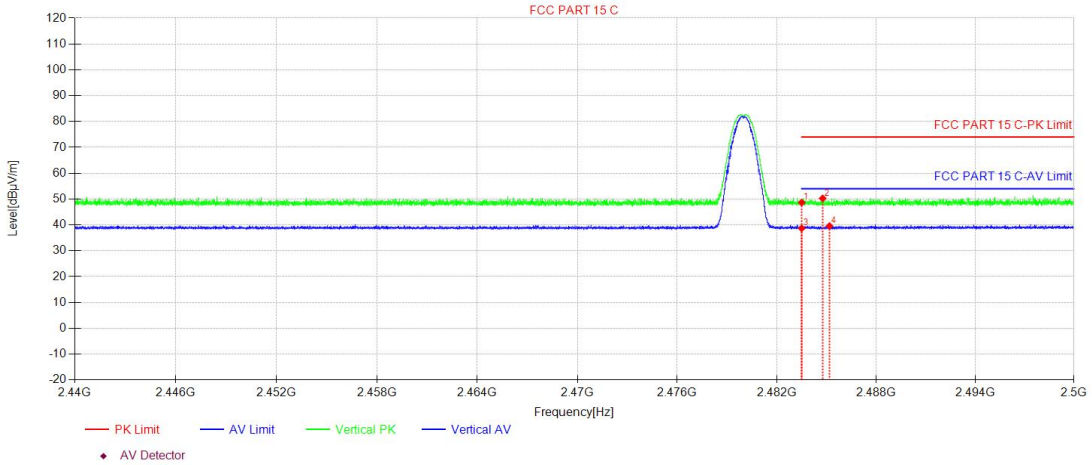



| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2379.48 | 51.46 | -0.84 | 50.62 | 74.00 | 23.38 | 150 | 199 | Peak | Vertical |
| 2 | 2390.01 | 49.15 | -0.80 | 48.35 | 74.00 | 25.65 | 150 | 326 | Peak | Vertical |
| 3 | 2381.22 | 40.23 | -0.83 | 39.40 | 54.00 | 14.60 | 150 | 243 | AV | Vertical |
| 4 | 2390.01 | 39.30 | -0.80 | 38.50 | 54.00 | 15.50 | 150 | 164 | AV | Vertical |

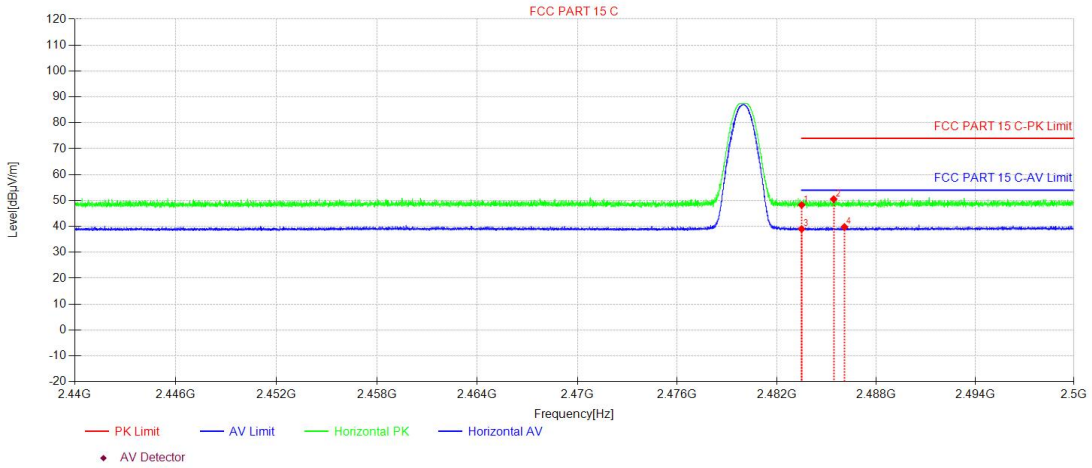



| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2382.39 | 51.29 | -0.83 | 50.46 | 74.00 | 23.54 | 150 | 356 | Peak | Horizon |
| 2 | 2390.01 | 48.60 | -0.80 | 47.80 | 74.00 | 26.20 | 150 | 195 | Peak | Horizon |
| 3 | 2380.78 | 40.58 | -0.83 | 39.75 | 54.00 | 14.25 | 150 | 59 | AV | Horizon |
| 4 | 2390.01 | 39.21 | -0.80 | 38.41 | 54.00 | 15.59 | 150 | 332 | AV | Horizon |

**DH5 2480MHz**




| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2483.50 | 48.93 | -0.29 | 48.64 | 74.00 | 25.36 | 150 | 226 | Peak | Vertical |
| 2 | 2484.78 | 50.54 | -0.27 | 50.27 | 74.00 | 23.73 | 150 | 172 | Peak | Vertical |
| 3 | 2483.50 | 38.98 | -0.29 | 38.69 | 54.00 | 15.31 | 150 | 192 | AV | Vertical |
| 4 | 2485.18 | 39.84 | -0.27 | 39.57 | 54.00 | 14.43 | 150 | 24 | AV | Vertical |




| NO. | Freq. [MHz] | Reading Level [dBμV] | Correct Factor [dB/m] | Result Level [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Remark | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2483.50 | 48.56 | -0.29 | 48.27 | 74.00 | 25.73 | 150 | 237 | Peak | Horizon |
| 2 | 2485.44 | 50.80 | -0.27 | 50.53 | 74.00 | 23.47 | 150 | 336 | Peak | Horizon |
| 3 | 2483.50 | 39.27 | -0.29 | 38.98 | 54.00 | 15.02 | 150 | 356 | AV | Horizon |
| 4 | 2486.09 | 40.05 | -0.27 | 39.78 | 54.00 | 14.22 | 150 | 57 | AV | Horizon |

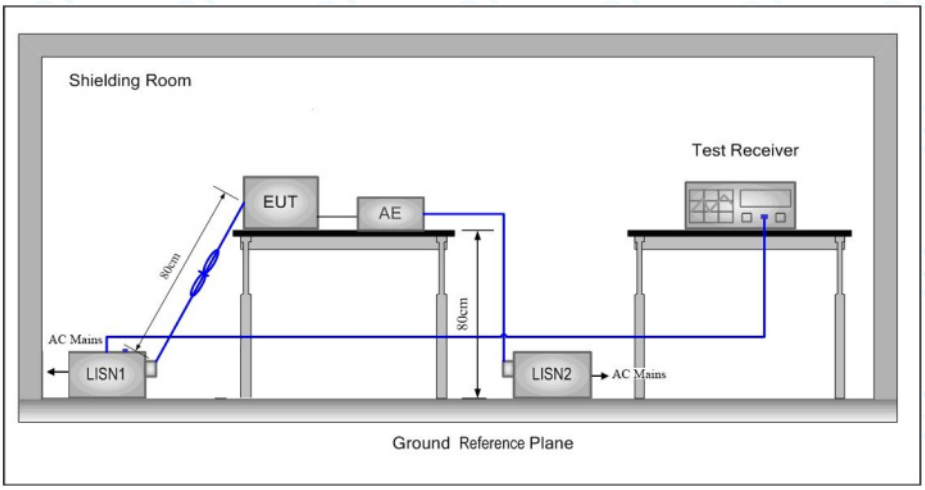
Note:

1. The Measurement (Result Level) is calculated by Reading Level adding the Correct Factor(maybe including Ant.Factor and the Cable Factor etc.), The basic equation is as follows:

Result Level= Reading Level + Correct Factor(including Ant.Factor ,Cable Factor etc.

2.All channels had been pre-test, DH5 is the worst case, only the worst case was reported.

## 3.11 AC Power Line Conducted Emissions

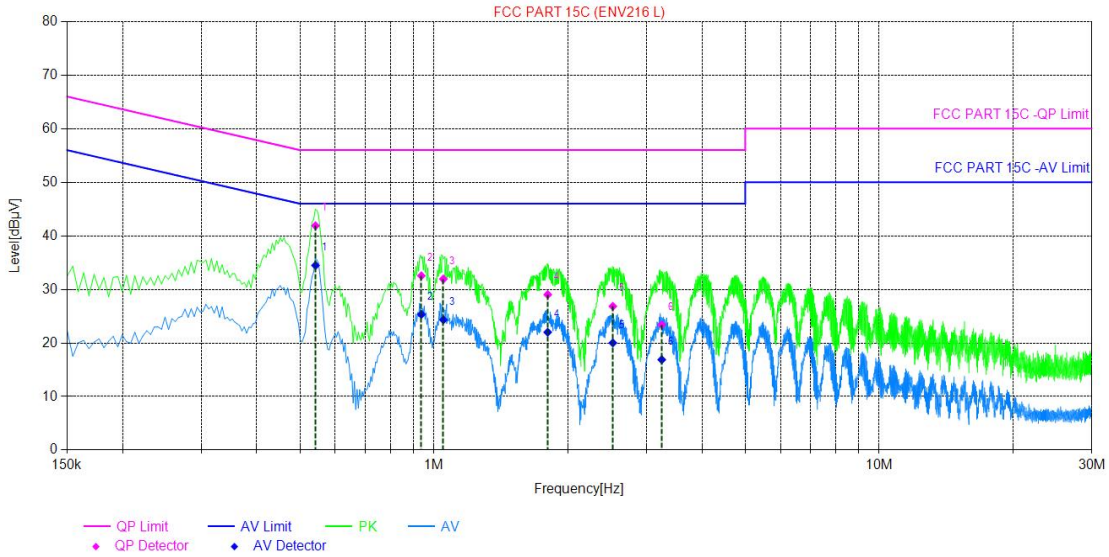
| | | | |
|---|---|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.207 | | |
| Test Method: | ANSI C63.10: 2013 | | |
| Test Frequency Range: | 150kHz to 30MHz | | |
| Limit: | Frequency range (MHz) | Limit (dBuV) | |
| | | Quasi-peak | Average |
| | 0.15-0.5 | 66 to 56* | 56 to 46* |
| | 0.5-5 | 56 | 46 |
| | 5-30 | 60 | 50 |
| | * Decreases with the logarithm of the frequency. | | |
| Test Procedure: | 1) The mains terminal disturbance voltage test was conducted in a shielded room.<br>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.<br>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,<br>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 2013 on conducted measurement. | | |
| Test Setup: |  | | |
| Exploratory Test Mode: | Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.<br>Charge + Transmitting mode. | | |

| | |
|---|---|
| Final Test Mode: | Through Pre-scan, find the the worst case. |
| Instruments Used: | Refer to section 2.9 for details |
| Test Results: | PASS |

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

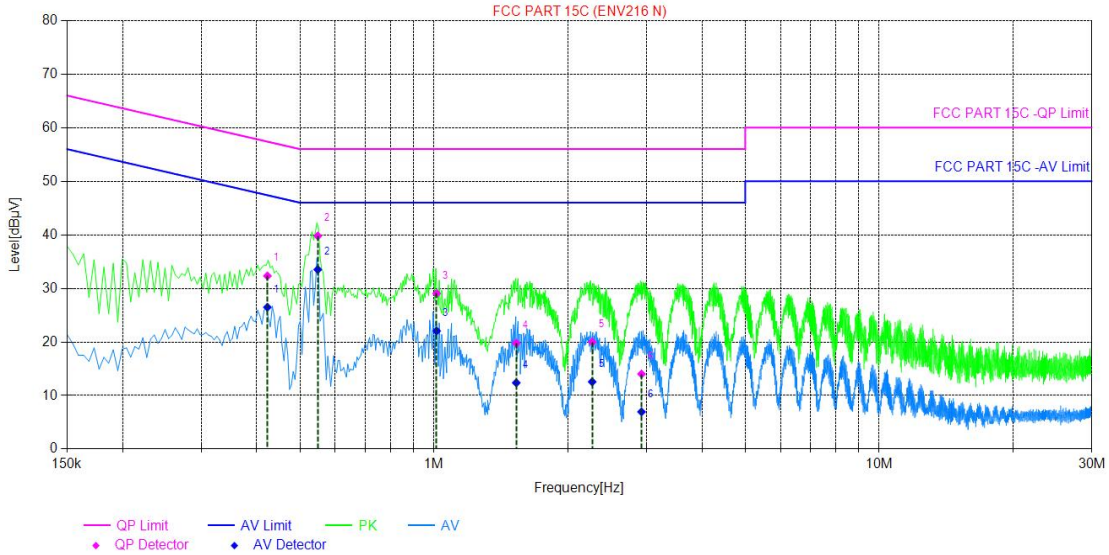
Live Line:




## Final Data List

| NO. | Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Verdict |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.5421 | 9.85 | 41.88 | 56.00 | 14.12 | 34.48 | 46.00 | 11.52 | PASS |
| 2 | 0.9371 | 9.73 | 32.54 | 56.00 | 23.46 | 25.33 | 46.00 | 20.67 | PASS |
| 3 | 1.0501 | 9.72 | 31.94 | 56.00 | 24.06 | 24.32 | 46.00 | 21.68 | PASS |
| 4 | 1.8011 | 9.73 | 29.02 | 56.00 | 26.98 | 22.01 | 46.00 | 23.99 | PASS |
| 5 | 2.5222 | 9.73 | 26.84 | 56.00 | 29.16 | 20.01 | 46.00 | 25.99 | PASS |
| 6 | 3.2480 | 9.74 | 23.38 | 56.00 | 32.62 | 16.88 | 46.00 | 29.12 | PASS |

Neutral Line:




## Final Data List

| NO. | Freq. [MHz] | Factor [dB] | QP Value [dBµV] | QP Limit [dBµV] | QP Margin [dB] | AV Value [dBµV] | AV Limit [dBµV] | AV Margin [dB] | Verdict |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.4227 | 9.84 | 32.32 | 57.39 | 25.07 | 26.48 | 47.39 | 20.91 | PASS |
| 2 | 0.5484 | 9.75 | 39.79 | 56.00 | 16.21 | 33.51 | 46.00 | 12.49 | PASS |
| 3 | 1.0142 | 9.68 | 29.05 | 56.00 | 26.95 | 22.06 | 46.00 | 23.94 | PASS |
| 4 | 1.5306 | 9.73 | 19.78 | 56.00 | 36.22 | 12.38 | 46.00 | 33.62 | PASS |
| 5 | 2.2669 | 9.80 | 19.99 | 56.00 | 36.01 | 12.56 | 46.00 | 33.44 | PASS |
| 6 | 2.9252 | 9.86 | 14.02 | 56.00 | 41.98 | 6.96 | 46.00 | 39.04 | PASS |

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. The Measurement (Result Level) is calculated by Reading Level adding the Correct Factor(maybe including LISN Factor and the Cable Factor etc.), The basic equation is as follows:

Result Level= Reading Level + Correct Factor(including LISN Factor, Cable Factor etc

# 4 Appendix

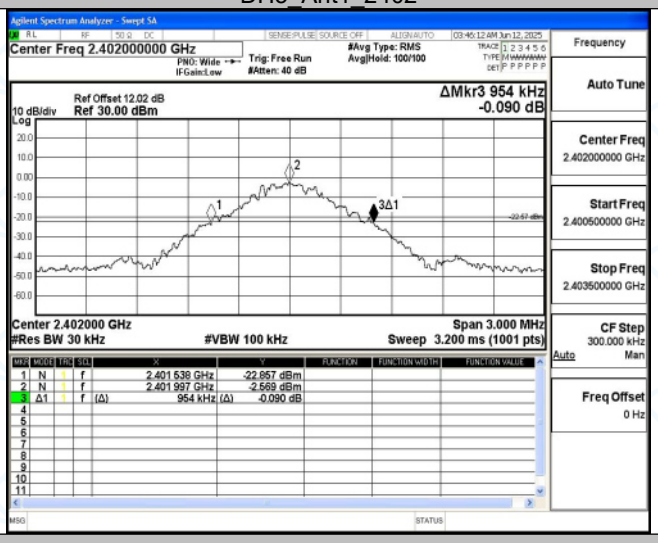
## Appendix A: 20dB Emission Bandwidth

**Test Result**

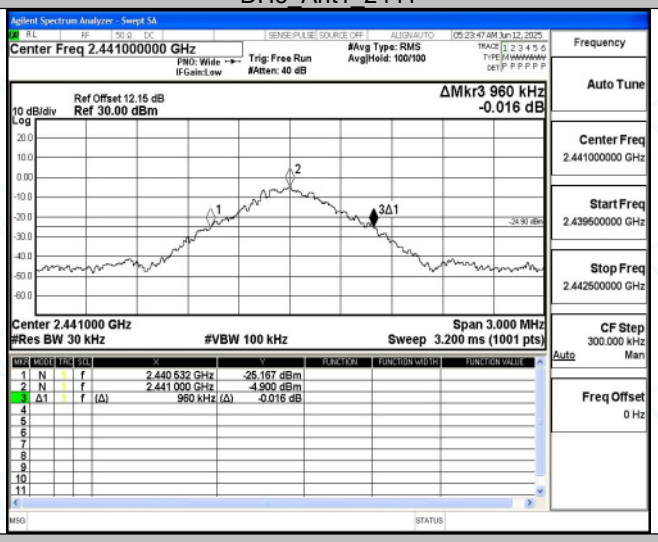
| TestMode | Antenna | Freq(MHz) | 20dB EBW[MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 0.954 | 2401.538 | 2402.492 | --- | --- |
| | | 2441 | 0.960 | 2440.532 | 2441.492 | --- | --- |
| | | 2480 | 0.999 | 2479.496 | 2480.495 | --- | --- |
| 2DH5 | Ant1 | 2402 | 1.290 | 2401.370 | 2402.660 | --- | --- |
| | | 2441 | 1.290 | 2440.370 | 2441.660 | --- | --- |
| | | 2480 | 1.329 | 2479.334 | 2480.663 | --- | --- |

**Test Graphs**

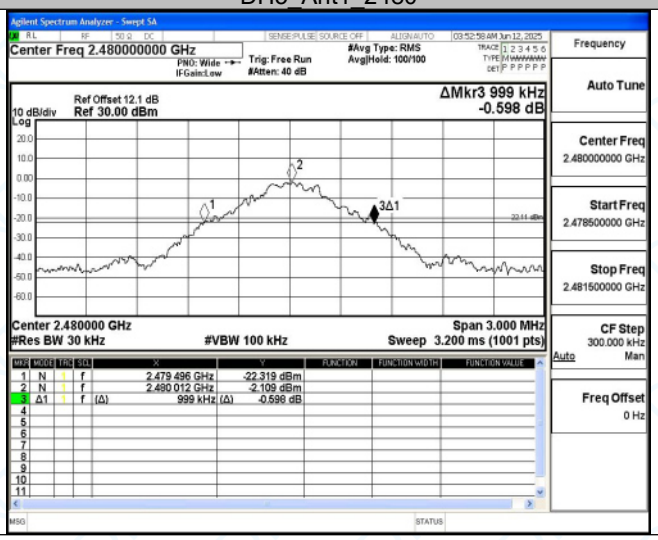
DH5_Ant1_2402



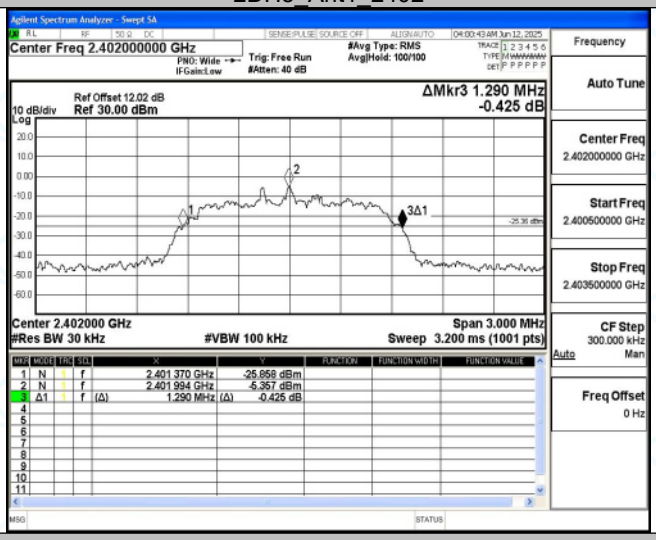

DH5_Ant1_2441



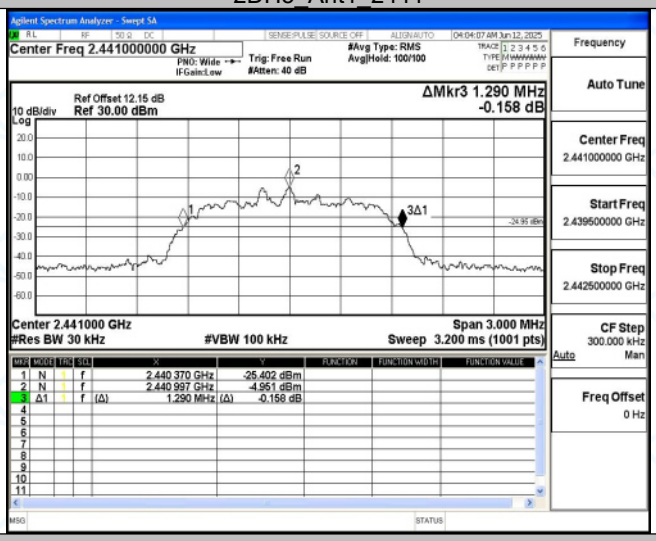

DH5_Ant1_2480



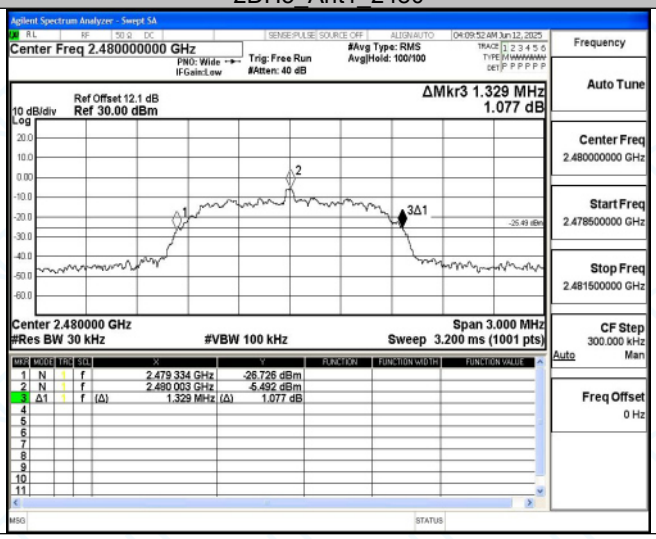
2DH5_Ant1_2402




2DH5_Ant1_2441




2DH5_Ant1_2480



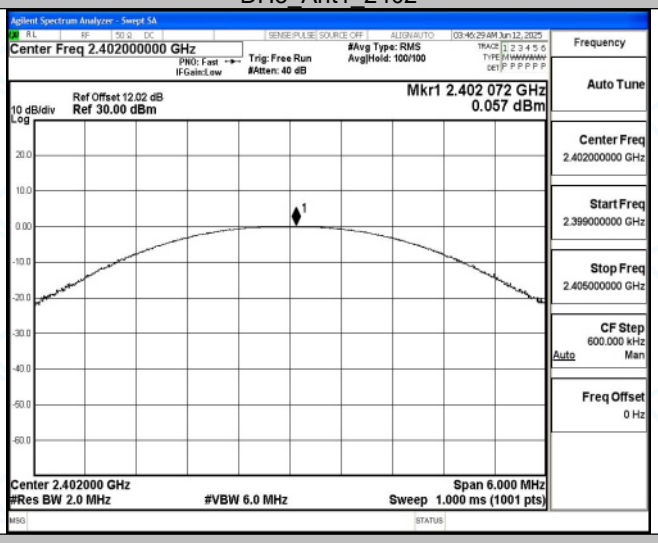
# Appendix B: Maximum conducted output power

Test Result

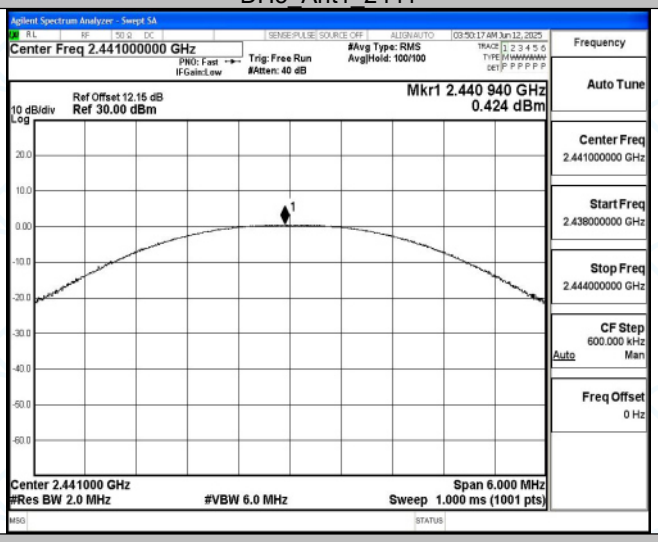
| Test Mode | Antenna | Freq(MHz) | Conducted Peak Powert[dBm] | Conducted Limit[dBm] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | 2402 | 0.06 | ≤20.97 | PASS |
| | | 2441 | 0.42 | ≤20.97 | PASS |
| | | 2480 | 0.69 | ≤20.97 | PASS |
| 2DH5 | Ant1 | 2402 | -2.21 | ≤20.97 | PASS |
| | | 2441 | -1.58 | ≤20.97 | PASS |
| | | 2480 | -1.56 | ≤20.97 | PASS |

**Test Graphs**

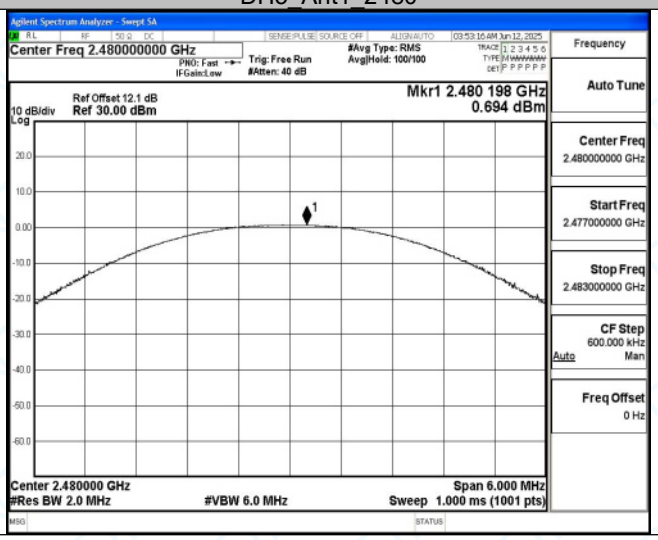
DH5_Ant1_2402



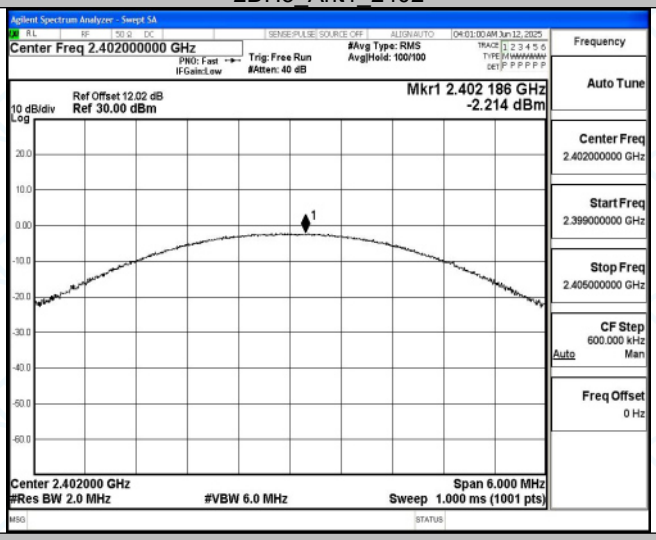

DH5_Ant1_2441



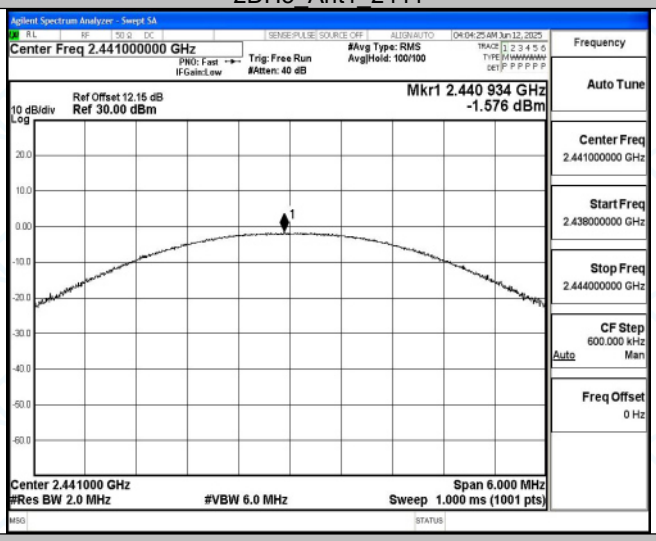

DH5_Ant1_2480



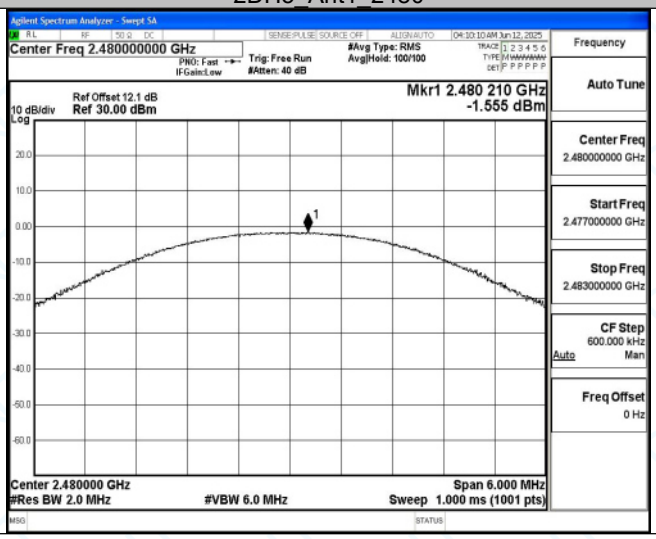
2DH5_Ant1_2402




2DH5_Ant1_2441




2DH5_Ant1_2480



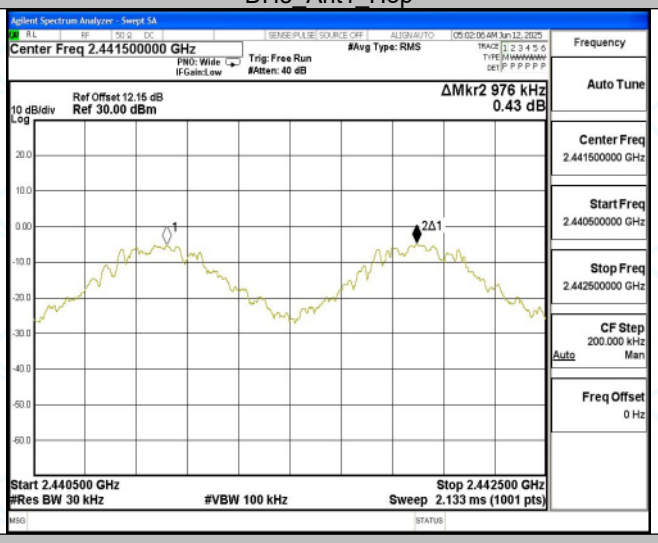
# Appendix C: Carrier frequency separation

**Test Result**

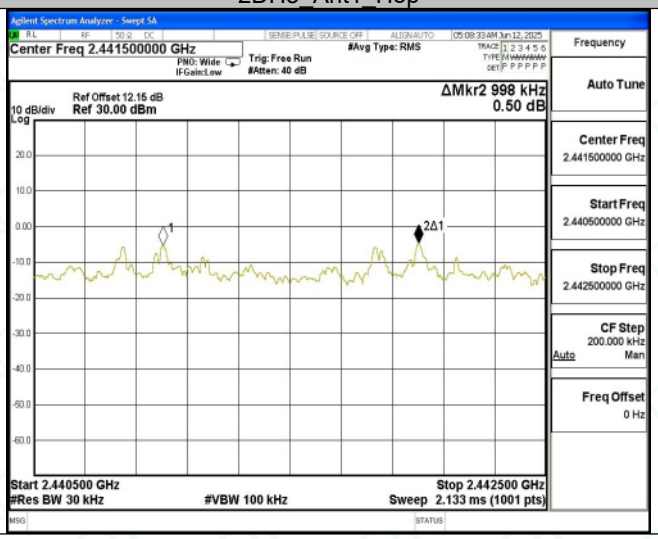
| TestMode | Antenna | Freq(MHz) | Result[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | Hop | 0.976 | ≥0.786 | PASS |
| 2DH5 | Ant1 | Hop | 0.998 | ≥0.886 | PASS |

**Test Graphs**

DH5_Ant1_Hop




2DH5_Ant1_Hop



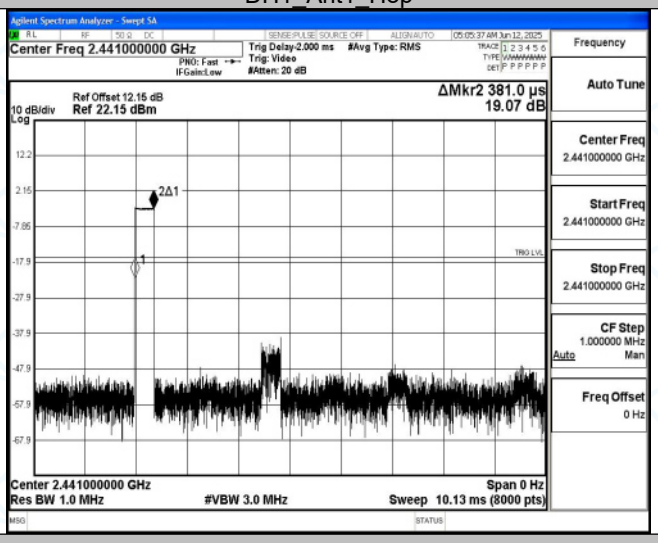
# Appendix D: Dwell Time

**Test Result**

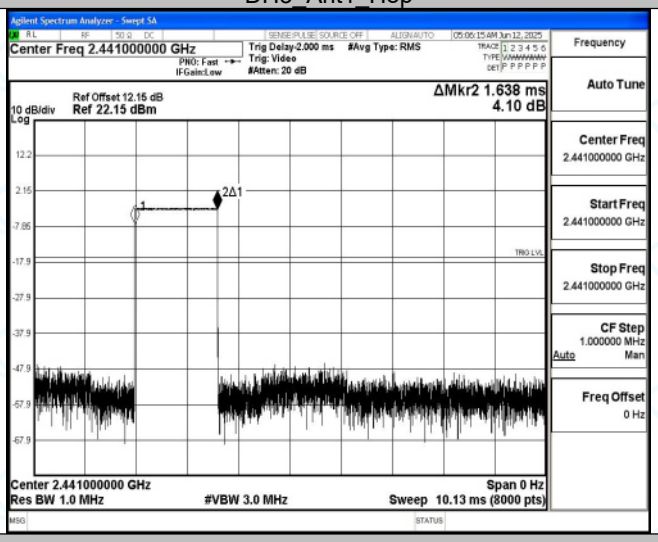
| TestMode | Antenna | Freq(MHz) | BurstWidth [ms] | TotalHops [Num] | Result[s] | Limit[s] | Verdict |
|---|---|---|---|---|---|---|---|
| DH1 | Ant1 | Hop | 0.381 | 320 | 0.122 | ≤0.4 | PASS |
| DH3 | Ant1 | Hop | 1.638 | 160 | 0.262 | ≤0.4 | PASS |
| DH5 | Ant1 | Hop | 2.885 | 106.67 | 0.308 | ≤0.4 | PASS |
| 2DH1 | Ant1 | Hop | 0.390 | 320 | 0.125 | ≤0.4 | PASS |
| 2DH3 | Ant1 | Hop | 1.643 | 160 | 0.263 | ≤0.4 | PASS |
| 2DH5 | Ant1 | Hop | 2.891 | 106.67 | 0.308 | ≤0.4 | PASS |

**Test Graphs**

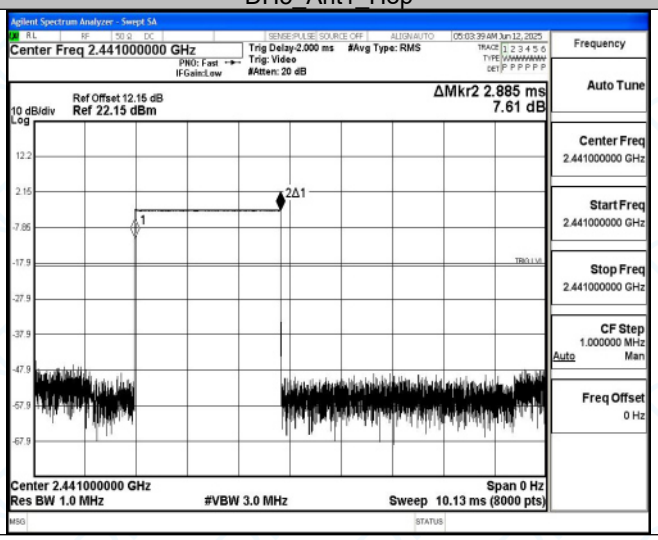
DH1_Ant1_Hop



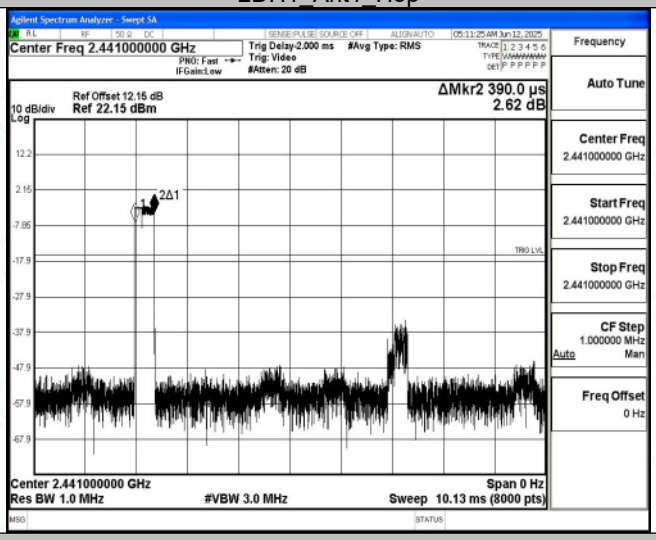

DH3_Ant1_Hop



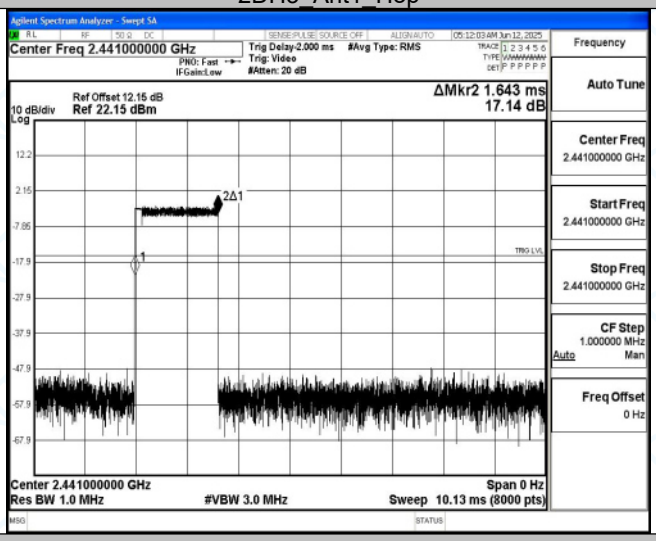

DH5_Ant1_Hop



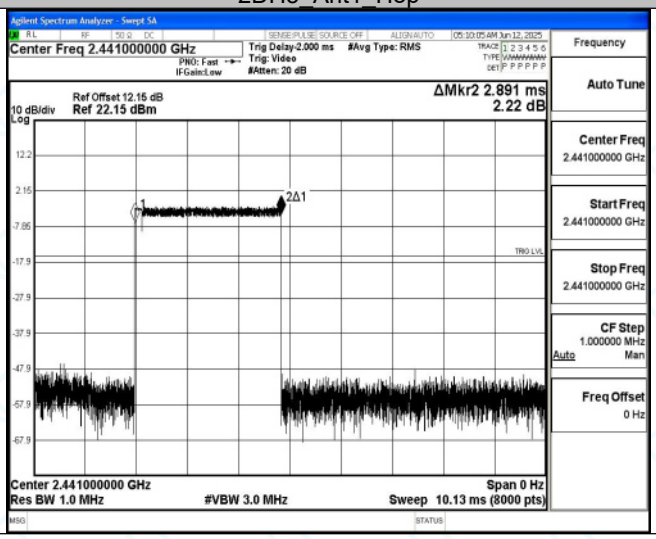
2DH1_Ant1_Hop




2DH3_Ant1_Hop




2DH5_Ant1_Hop



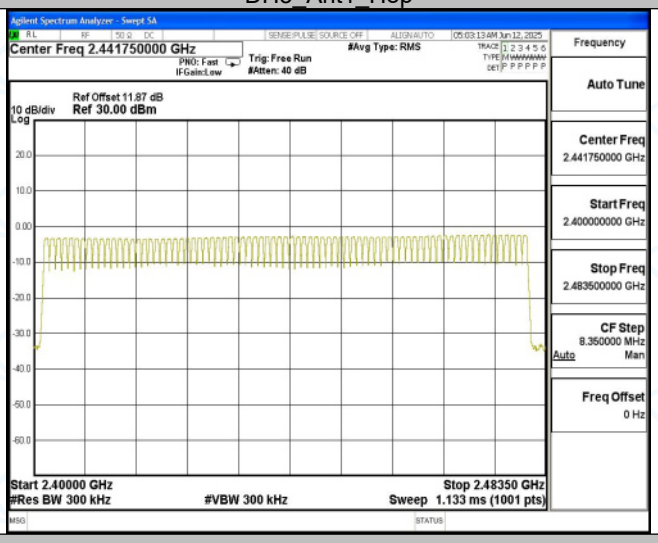
# Appendix E: Number of hopping channels

**Test Result**

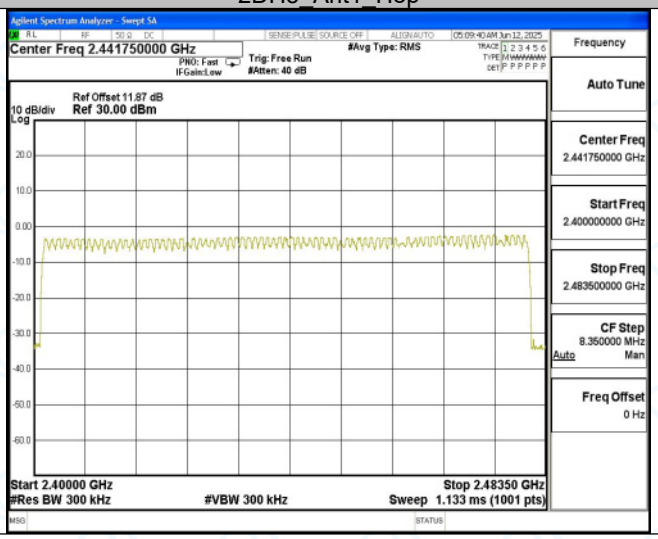
| TestMode | Antenna | Freq(MHz) | Result[Num] | Limit[Num] | Verdict |
|---|---|---|---|---|---|
| DH5 | Ant1 | Hop | 79 | ≥15 | PASS |
| 2DH5 | Ant1 | Hop | 79 | ≥15 | PASS |

**Test Graphs**

DH5_Ant1_Hop




2DH5_Ant1_Hop



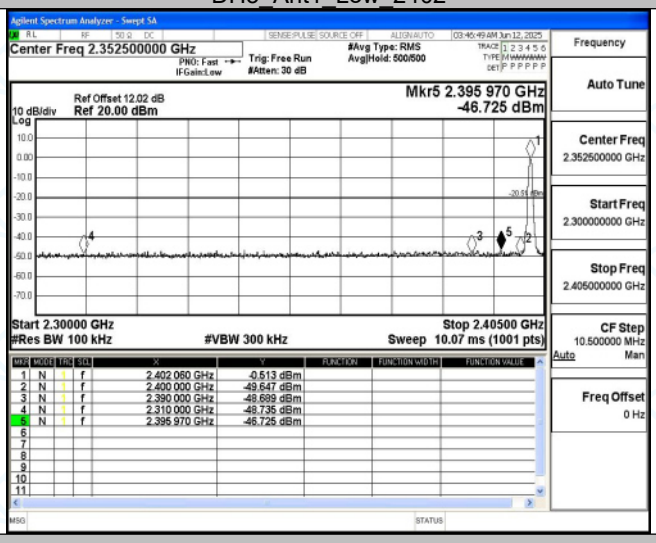
# Appendix F: Band edge measurements

**Test Result**

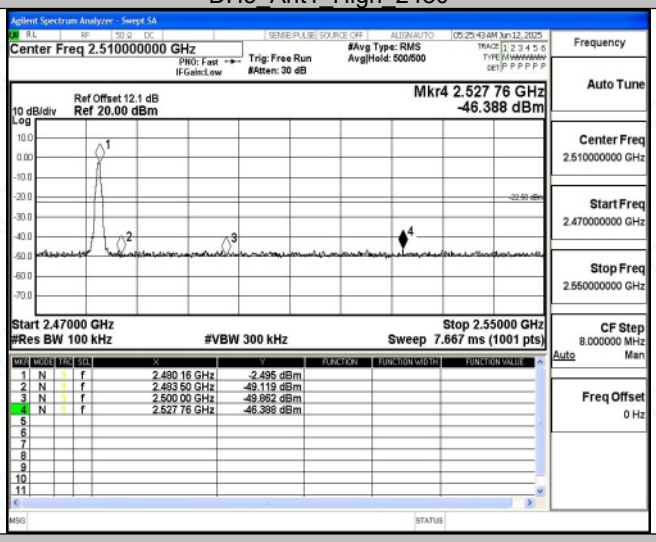
| TestMode | Antenna | ChName | Freq(MHz) | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| DH5 | Ant1 | Low | 2402 | -0.51 | -46.73 | ≤-20.51 | PASS |
| | | High | 2480 | -2.50 | -46.39 | ≤-22.5 | PASS |
| | | Low | Hop_2402 | -3.52 | -46.87 | ≤-23.52 | PASS |
| | | High | Hop_2480 | -2.61 | -46.52 | ≤-22.61 | PASS |
| 2DH5 | Ant1 | Low | 2402 | -3.49 | -46.05 | ≤-23.49 | PASS |
| | | High | 2480 | -2.78 | -46.77 | ≤-22.78 | PASS |
| | | Low | Hop_2402 | -3.53 | -45.87 | ≤-23.53 | PASS |
| | | High | Hop_2480 | -2.74 | -45.45 | ≤-22.74 | PASS |

**Test Graphs**

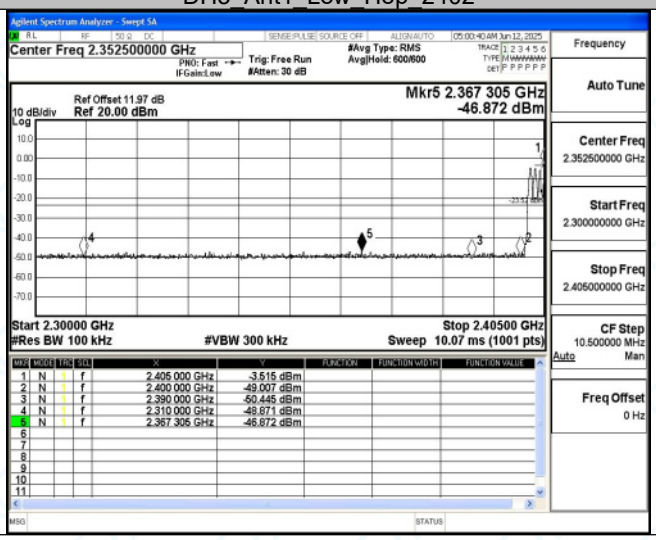
DH5_Ant1_Low_2402



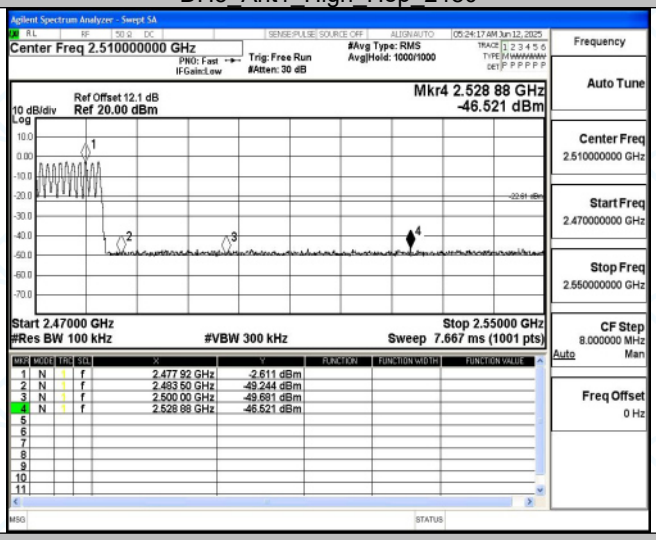

DH5_Ant1_High_2480



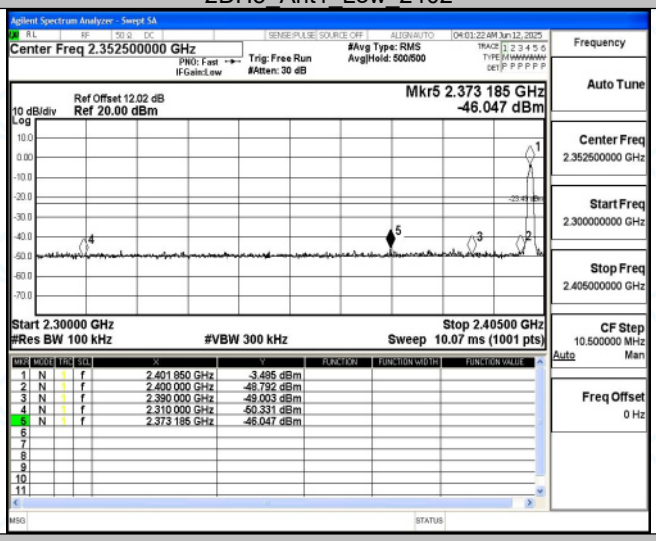

DH5_Ant1_Low_Hop_2402



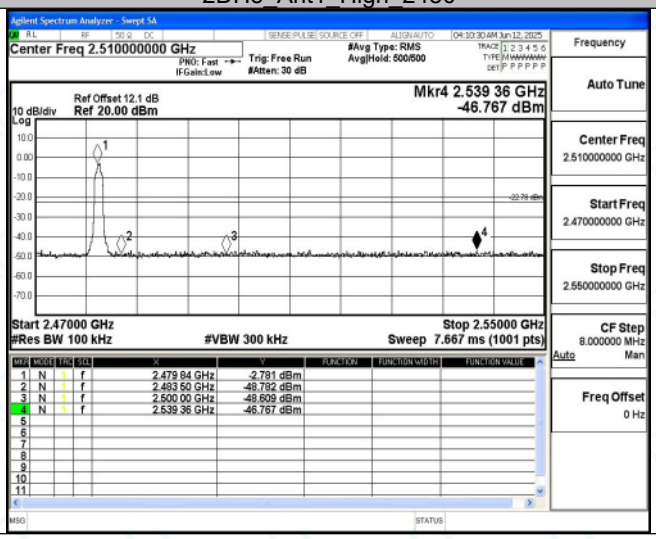
DH5_Ant1_High_Hop_2480



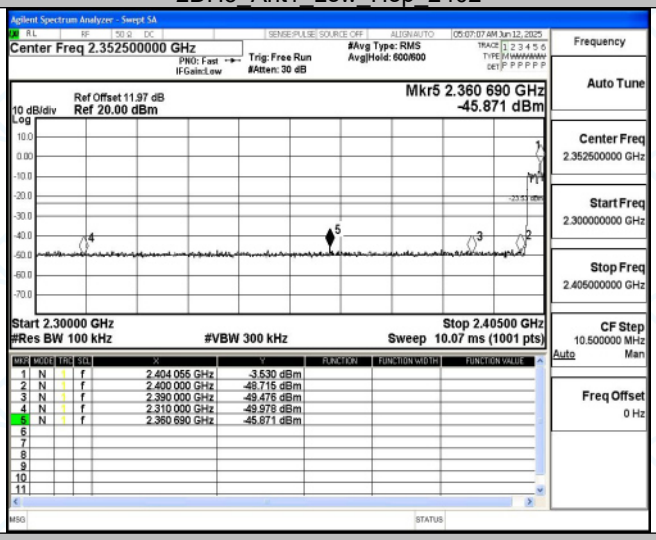

2DH5_Ant1_Low_2402

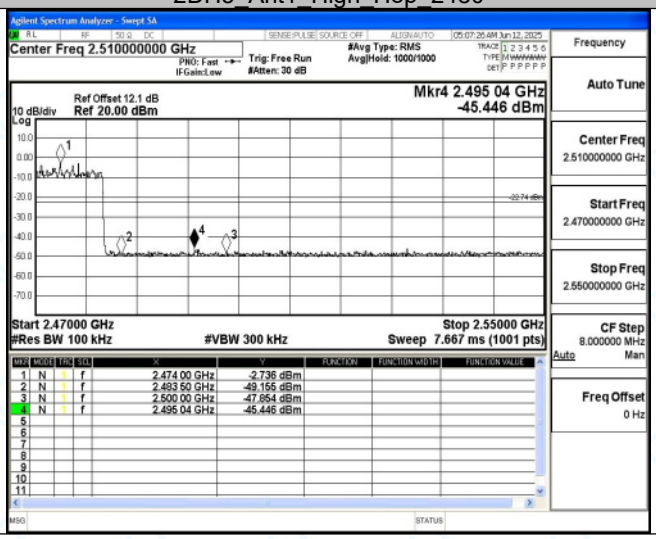



2DH5_Ant1_High_2480



2DH5_Ant1_Low_Hop_2402




2DH5_Ant1_High_Hop_2480