# TEST REPORT

| | | |
|---|---|---|
| Applicant | : | Shenzhen Qixin Technology Co., Ltd. |
| Address | : | Room 2508, Baoshan Times Tower, Minqiang Community, Minzhi Street, Longhua District, Shenzhen, Guangdong Province, China |
| Manufacturer | : | Shenzhen Qixin Technology Co., Ltd. |
| Address | : | Room 2508, Baoshan Times Tower, Minqiang Community, Minzhi Street, Longhua District, Shenzhen, Guangdong Province, China |
| Product Name | : | DFirst Scanner |
| Model Number | : | DFirst Slink WiFi |
| Trademark | : | N/A |
| FCC ID | : | 2A3SM-WIFI |
| Test Date | : | Aug. 11, 2026 to Sep. 23, 2026 |
| Date of Report | : | Sep. 23, 2026 |
| Test Result | : | This device described above has been tested by NTT, and the test results show that the equipment under test (EUT) is in compliance with the Standard requirements. And it is applicable only to the tested sample identified in the report. |

Test Procedure Used:

| | | |
|---|---|---|
| Standards | : | FCC CFR Title 47 Part 15 Subpart C Section 15.247<br>ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a -2024<br>KDB 558074 D01 15.247 Meas Guidance v05r02 |

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Shenzhen NTT Testing Technology Co., Ltd.Special Seal for Inspection and Testing

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## Revision History of This Test Report

| Report Number | Description | Issued Date |
|---|---|---|
| SZNTT26038304E1-1 | Initial Issue | Sep. 23, 2026 |
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# 1. General Information

## 1.1.Description of Device (EUT)

| | | |
|---|---|---|
| EUT Name | : | DFirst Scanner |
| Model No. | : | DFirst Slink WiFi |
| Model Difference | : | N/A |
| Power supply | : | DC 12V power supply |
| Operation frequency | : | 2402-2480MHz |
| Modulation | : | GFSK |
| Antenna Type | : | Chip antenna, Maximum Gain is 2.12dBi |
| Intend use environment | : | Residential, commercial and light industrial environment |

## 1.2.Channel List

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 00 | **2402** | 14 | 2430 | 28 | 2458 |
| 01 | 2404 | 15 | 2432 | 29 | 2460 |
| 02 | 2406 | 16 | 2434 | 30 | 2462 |
| 03 | 2408 | 17 | 2436 | 31 | 2464 |
| 04 | 2410 | 18 | 2438 | 32 | 2466 |
| 05 | 2412 | **19** | **2440** | 33 | 2468 |
| 06 | 2414 | 20 | 2442 | 34 | 2470 |
| 07 | 2416 | 21 | 2444 | 35 | 2472 |
| 08 | 2418 | 22 | 2446 | 36 | 2474 |
| 09 | 2420 | 23 | 2448 | 37 | 2476 |
| 10 | 2422 | 24 | 2450 | 38 | 2478 |
| 11 | 2424 | 25 | 2452 | 39 | **2480** |
| 12 | 2426 | 26 | 2454 | | |
| 13 | 2428 | 27 | 2456 | | |

## 1.3.Summary of test result

| RF PART | | |
|---|---|---|
| **Test Items** | **Test Requirement** | **Result** |
| Antenna requirement | FCC part 15.203/15.247 (b)(4) | PASS |
| AC Power Line Conducted Emission | FCC part 15.207 | N/A |
| Conducted Peak Output Power | FCC part 15.247 (b)(3) | PASS |
| Channel Bandwidth | FCC part 15.247 (a)(2) | PASS |
| Power Spectral Density | FCC part 15.247 (e) | PASS |
| Band Edge | FCC part 15.247(d) | PASS |
| Spurious Emission | FCC part 15.205/15.209 | PASS |
| Remark:<br>N/A is an abbreviation for Not Applicable.<br>Measurement Uncertainty is not taken into account for conformity statement | | |

## 1.4.Special Accessories and Auxiliary Equipment

| Description | Manufacturer | Model No. | Hardware Version | Software Version |
|---|---|---|---|---|
| Adapter | JIYIN | JY-05100C | / | / |
| Laptop | DELL | Vostro 5490 | / | / |
| Cable | / | / | / | / |

## 1.5.Test mode

The special RF test software was used to control EUT work in Continuous BLE TX mode, and select test channel, wireless mode.

| Test mode | Low channel | Middle channel | High channel |
|---|---|---|---|
| GFSK | 2402MHz | 2440MHz | 2480MHz |
| Note：Only the worst Data Record in the report | | | |

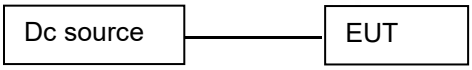
## 1.6. Test configuration

| | |
|---|---|
| Transmitting mode | Keep the EUT in continuously transmitting mode. |
| Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data. | |

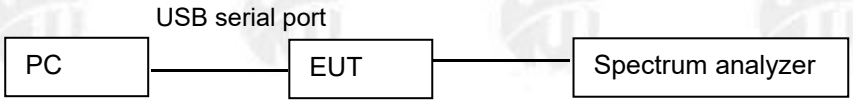
| | |
|---|---|
| Test Software | EspRFTestTool |
| Power level setup | Default |

## 1.7.Block Diagram

Radiated Emission




RF Conducted Test




## 1.8.Test Conditions

| Category | Normal Conditions | Extreme Conditions |
|---|---|---|
| Temperature range | 15-35℃ | N/A |
| Humidity range | 20-75% | N/A |
| Pressure range | 86-106kPa | N/A |
| Note: N/A is an abbreviation for Not Applicable. | | |

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

| **Parameter** | **Uncertainty** |
|---|---|
| RF output power, conducted | ±1.0dB |
| Power Spectral Density, conducted | ±2.2dB |
| Radio Frequency | ± 1 x 10-6 |
| Bandwidth | ± 1.5 x 10-6 |
| Time | ±2% |
| Duty Cycle | ±2% |
| Temperature | ±1°C |
| Humidity | ±5% |
| DC and low frequency voltages | ±3% |
| Conducted Emissions (150kHz~30MHz) | ±3.64dB |
| Radiated Emission(9KHz~30MHz) | ±4.51dB |
| Radiated Emission(30MHz~1GHz) | ±5.03dB |
| Radiated Emission(1GHz~25GHz) | ±4.74dB |
| Remark:When making a conformity declaration based on test results for regulations/standards or specifications,the default is to use Clause 4.2.1of ILAC-G8:09/2019 and the guidelines on decision rules and conformity declaration in IEC Guide 115:2023. | |

## 1.10.Test Facility

| Site Description | | |
|---|---|---|
| Name of Firm | : | Shenzhen NTT Testing Technology Co.,Ltd. |
| Site Location | : | 1B, Building 2, Factory Building & 103, Building 3, Factory Building, Dayang Industrial Park No.4, Industrial Avenue, Tangwei Community, Fuhai Sub-district, Bao 'an District, Shenzhen City, China |
| FCC Designation Number | : | CN3446 |
| FCC Test Firm Registration Number | : | 129414 |

## 1.11.Test Equipment

Radiated Test Site(Below 1G and Above 1G)&RF Test Site

| Name | Model No. | Serial No. | Manufacturer | Date of Cal. | Due Date |
|---|---|---|---|---|---|
| 966 Shielded Room | 966 Room | / | EMToni | 2025/07/24 | 2028/07/23 |
| EMI Test Receiver | ESPI | 101018 | ROHDE&SCHWARZ | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| Amplifi（30MHz-1GHz） | BBV 9745 | 00431 | SCHWARZBECK | 2025/09/08<br>2026/09/09 | 2026/09/07<br>2027/09/08 |
| Bilog Antenna（30MHz-1GHz） | VULB9168 | 1858 | SCHWARZBECK | 2025/09/09<br>2026/09/05 | 2026/09/08<br>2027/09/04 |
| Horn antenna（1GHz-18GHz） | BBHA 9120 D | 02622 | SCHWARZBECK | 2025/09/09<br>2026/09/05 | 2026/09/08<br>2027/09/04 |
| Pream plifier（1GHz-18GHz） | BBV 9718D | 0024 | SCHWARZBECK | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| Spectrum Analyze（10Hz-40GHz） | FSV 40 | 100952 | ROHDE&SCHWARZ | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| Pream plifier（18GHz-40GHz） | BBV 9721 | 0056 | SCHWARZBECK | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| Double Ridge Guide Horn Antenna（18GHz-40GHz） | SAS-574 | 588 | A.H.System | 2025/09/09<br>2026/09/05 | 2026/09/08<br>2027/09/04 |
| Loop Antenna (9KHz-30MHz) | FMZB 1513-60 | 00115 | SCHWARZBECK | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| MXG Signal Analyzer | N9020A | MY49100730 | Agilent | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| MXG Vector Signal Generator | N5182A | MY50144920 | Agilent | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| WIDEBAND RADIO COMMUNICATION TESTER | CMW500 | / | ROHDE&SCHWARZ | 2025/09/08<br>2026/09/07 | 2026/09/07<br>2027/09/06 |
| Power Sensor | MW100-RFCB-2 | MW260105NTT-64 | MWRFtest | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| RF Swith | MW100-RFCB-1 | MW260105NTT-64 | MWRFtest | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| Cable | RG223-3M | / | DA | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| Cable | RG223-12M | / | DA | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| Cable | SFT205-NMNMSW-2.5M | / | DA | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |
| Cable | SFT205-NMNM-12M | / | DA | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |

| | | | | | |
|---|---|---|---|---|---|
| Cable | UCA500-NJ<br>WSM-1.5M | 017 | MWRFtest | 2025/09/08<br>2026/09/04 | 2026/09/07<br>2027/09/03 |

Test software

| Item | Name | Manufacturer | Model | Software version |
|---|---|---|---|---|
| 1 | EMC Conduction Test System | FALA | EZ-EMC | Ver.EMC-CON 3A1.1+ |
| 2 | EMC radiation test system | FALA | EZ-EMC | Ver.FA-03A2 RE+ |
| 3 | RF test system | TACHOY | RFTest | V1.0.0 |
| 4 | RF communication test system | TACHOY | RFTest | V1.0.0 |

# 2. Conducted emission at the mains terminals test

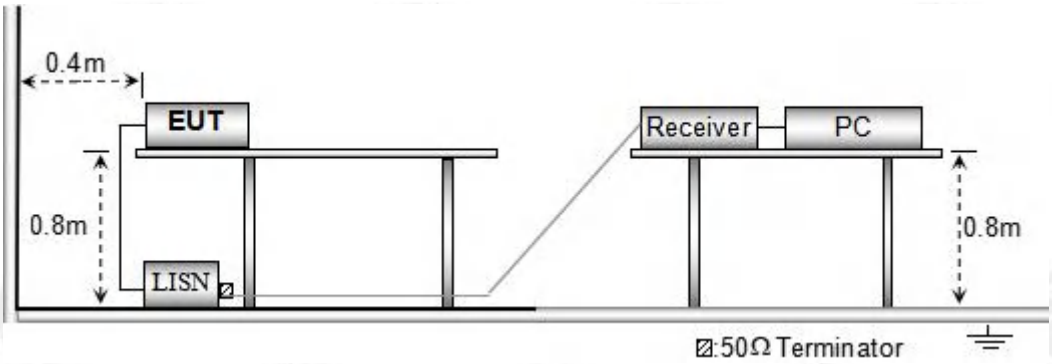
## 2.1.Limit

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.207 |
| Test Method: | ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 |
| Test Frequency Range: | 150KHz to 30MHz |
| Receiver setup: | RBW=9KHz, VBW=30KHz, Sweep time=auto |

| Frequency MHz | Limits dB(μV) | |
|---|---|---|
| | Quasi-peak Level | Average Level |
| 0.15 ~ 0.50 | 66 ~ 56* | 56 ~ 46* |
| 0.50 ~ 5.00 | 56 | 46 |
| 5.00 ~ 30.00 | 60 | 50 |

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

## 2.2.Test Setup




## 2.3.Test Procedure

1. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
2. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
3. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
4. LISN at least 80 cm from nearest part of EUT chassis.
5.For the actual test configuration, please refer to the related Item – EUT Test Photos.

## 2.4.Test Result

N/A

The EUT DC 12V DC power supply is not applicable to this item.

# 3. Radiated Spurious Emissions

## 3.1.Limit

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02April 2,2019; ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024

Test Result: PASS

Measurement Distance: 3m

| Frequency | Detector | RBW | VBW | Value |
|---|---|---|---|---|
| 9KHz-150KHz | Quasi-peak | 200Hz | 600Hz | Quasi-peak |
| 150KHz-30MHz | Quasi-peak | 9KHz | 30KHz | Quasi-peak |
| 30MHz-1GHz | Quasi-peak | 100KHz | 300KHz | Quasi-peak |
| Above 1GHz | Peak | 1MHz | 3MHz | Peak |
| | Peak | 1MHz | 10Hz | Average |

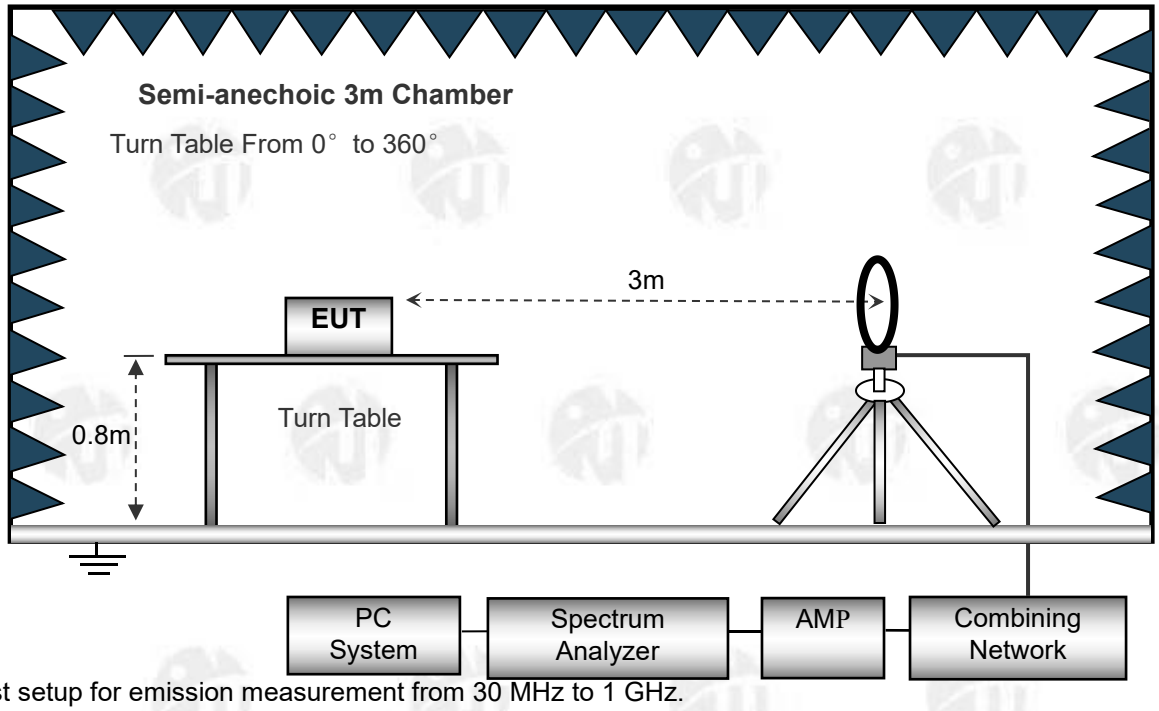
Limit:

| Frequency (MHz) | Field Strength | | Field Strength Limit at 3m Measurement Dist | |
|---|---|---|---|---|
| | uV/m | Distance (m) | uV/m | dBuV/m |
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 | 10000 * 2400/F(kHz) | 20log(2400/F(kHz)) + 80 |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 | 100 * 24000/F(kHz) | 20log(24000/F(kHz)) + 40 |
| 1.705 ~ 30 | 30 | 30 | 100 * 30 | 20log(30) + 40 |
| 30 ~ 88 | 100 | 3 | 100 | 20log(100) |
| 88 ~ 216 | 150 | 3 | 150 | 20log(150) |
| 216 ~ 960 | 200 | 3 | 200 | 20log(200) |
| Above 960 | 500 | 3 | 500 | 20log(500) |

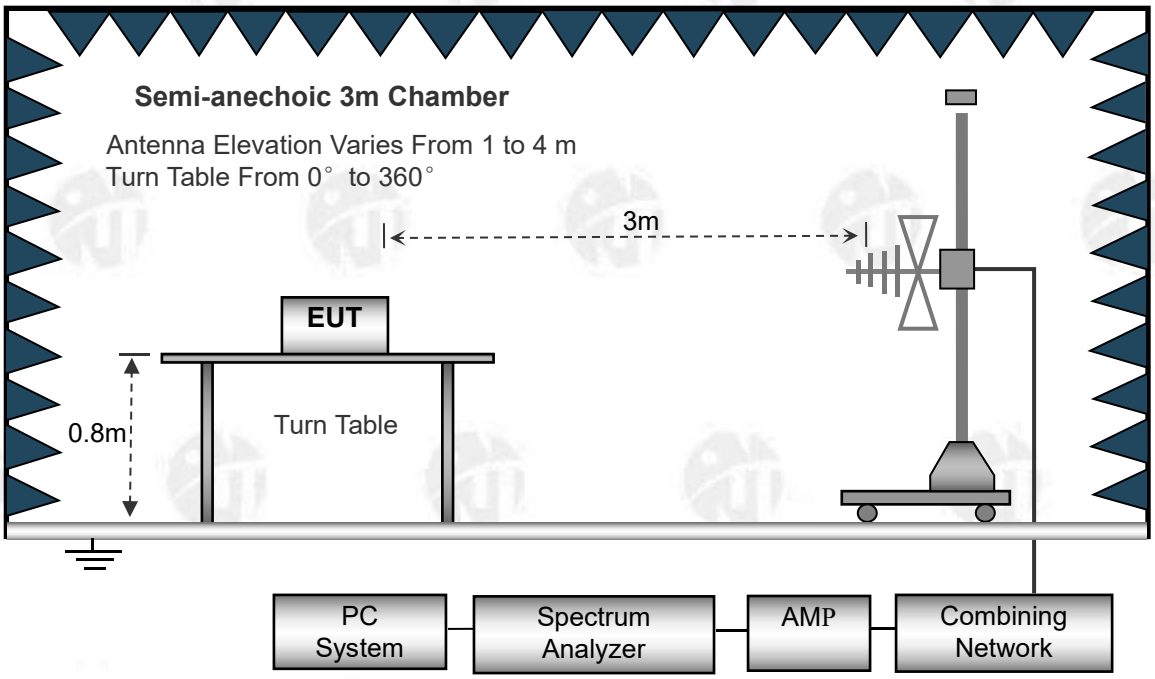
## 3.2.Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10.

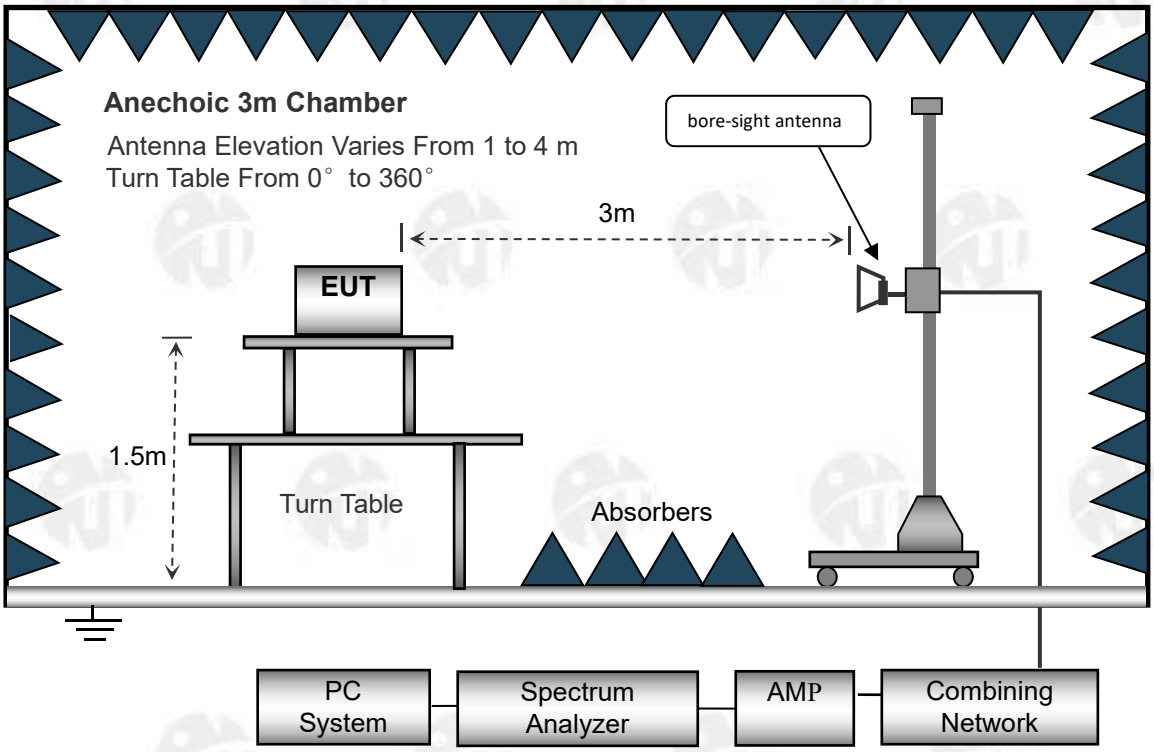
The test setup for emission measurement below 30MHz.

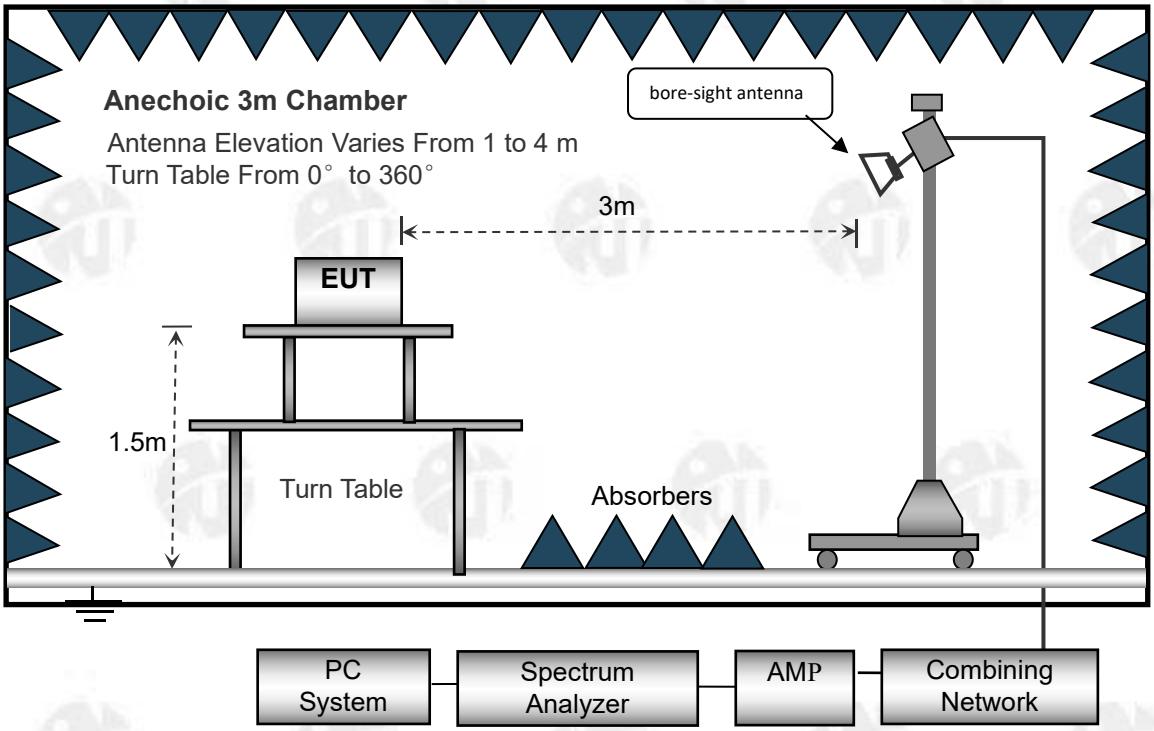



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



## 3.3.Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.

4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

6. Repeat above procedures until the measurements for all frequencies are complete.

7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in Z axis,so the worst data were shown as follow.

8. A 2.4GHz high - pass filter is used druing radiated emissions above 1GHz measurement.

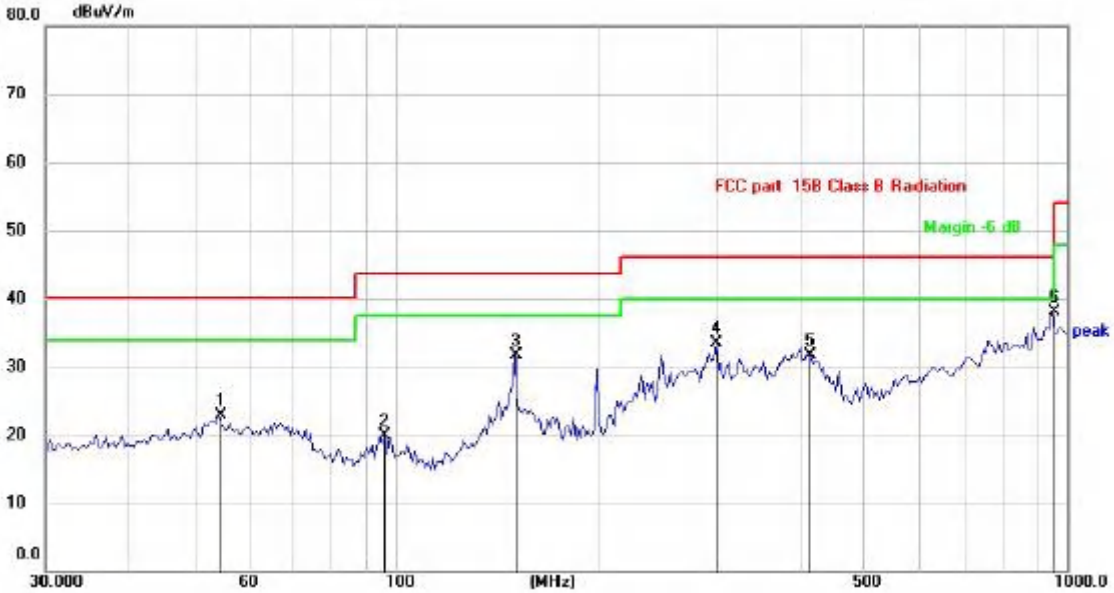
## 3.4.Test Result

Test Frequency: 9KHz~30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency : 30MHz ~ 1GHz

| Radiation Emission Test Data | | | |
|---|---|---|---|
| Temperature: | 25.1℃ | Relative Humidity: | 56% |
| Pressure: | 1008hPa | Phase : | Horizontal |
| Test Voltage : | DC 12V | Test Mode: | GFSK-1M (CH00) |




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | | 54.4516 | 27.92 | -4.99 | 22.93 | 40.00 | -17.07 | QP |
| 2 | | 96.2672 | 30.43 | -10.44 | 19.99 | 43.50 | -23.51 | QP |
| 3 | | 150.5378 | 36.23 | -4.53 | 31.70 | 43.50 | -11.80 | QP |
| 4 | | 300.8943 | 36.77 | -3.29 | 33.48 | 46.00 | -12.52 | QP |
| 5 | | 412.5467 | 33.46 | -1.73 | 31.73 | 46.00 | -14.27 | QP |
| 6 | * | 948.7610 | 29.29 | 8.80 | 38.09 | 46.00 | -7.91 | QP |

Note:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Reading + Factor
Margin=Emission Level-Limit
2. All the modes have tested and recorded the worst mode(GFSK) in the report

| Radiation Emission Test Data | | | |
|---|---|---|---|
| Temperature: | 25.1˚C | Relative Humidity: | 56% |
| Pressure: | 1008hPa | Phase : | Vertical |
| Test Voltage : | DC 12V | Test Mode: | GFSK-1M (CH00) |

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | | 54.4516 | 30.83 | -4.99 | 25.84 | 40.00 | -14.16 | QP |
| 2 | | 93.7685 | 31.08 | -10.47 | 20.61 | 43.50 | -22.89 | QP |
| 3 | | 150.5378 | 31.04 | -4.53 | 26.51 | 43.50 | -16.99 | QP |
| 4 | | 233.3487 | 33.14 | -6.79 | 26.35 | 46.00 | -19.65 | QP |
| 5 | | 401.8385 | 34.20 | -1.81 | 32.39 | 46.00 | -13.61 | QP |
| 6 | * | 789.2338 | 27.47 | 7.77 | 35.24 | 46.00 | -10.76 | QP |

Note:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Emission Level = Reading + Factor
Margin=Emission Level-Limit
2. All the modes have tested and recorded the worst mode(GFSK) in the report

1GHz~25GHz

| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| Low Channel:2402MHz | | | | | | | | | |
| V | 4804 | 52.94 | 34.12 | 5.03 | 32.39 | 56.24 | 74 | -17.76 | Pk |
| V | 4804 | 39.62 | 34.12 | 5.03 | 32.39 | 42.92 | 54 | -11.08 | AV |
| V | 7206 | 50.18 | 32.54 | 6.29 | 35.86 | 59.79 | 74 | -14.21 | Pk |
| V | 7206 | 35.23 | 32.54 | 6.29 | 35.86 | 44.84 | 54 | -9.16 | AV |
| V | 9608 | 47.50 | 32.98 | 7.55 | 38.4 | 60.47 | 74 | -13.53 | Pk |
| V | 9608 | 33.73 | 32.98 | 7.55 | 38.4 | 46.70 | 54 | -7.30 | AV |
| V | 12010 | 43.81 | 32.09 | 8.93 | 39 | 59.65 | 74 | -14.35 | Pk |
| V | 12010 | 29.06 | 32.09 | 8.93 | 39 | 44.90 | 54 | -9.10 | AV |
| H | 4804 | 49.55 | 34.12 | 5.03 | 32.39 | 52.85 | 74 | -21.15 | Pk |
| H | 4804 | 39.54 | 34.12 | 5.03 | 32.39 | 42.84 | 54 | -11.16 | AV |
| H | 7206 | 47.25 | 32.54 | 6.29 | 35.86 | 56.86 | 74 | -17.14 | Pk |
| H | 7206 | 32.90 | 32.54 | 6.29 | 35.86 | 42.51 | 54 | -11.49 | AV |
| H | 9608 | 48.42 | 32.98 | 7.55 | 38.4 | 61.39 | 74 | -12.61 | Pk |
| H | 9608 | 31.09 | 32.98 | 7.55 | 38.4 | 44.06 | 54 | -9.94 | AV |
| H | 12010 | 38.87 | 32.09 | 8.93 | 39 | 54.71 | 74 | -19.29 | Pk |
| H | 12010 | 26.35 | 32.09 | 8.93 | 39 | 42.19 | 54 | -11.81 | AV |

| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| Middle Channel:2440MHz | | | | | | | | | |
| V | 4880 | 49.80 | 34.07 | 5.09 | 32.59 | 53.41 | 74 | -20.59 | Pk |
| V | 4880 | 39.85 | 34.07 | 5.09 | 32.59 | 43.46 | 54 | -10.54 | AV |
| V | 7320 | 46.54 | 32.63 | 6.34 | 35.96 | 56.21 | 74 | -17.79 | Pk |
| V | 7320 | 37.30 | 32.63 | 6.34 | 35.96 | 46.97 | 54 | -7.03 | AV |
| V | 9760 | 44.17 | 32.92 | 7.59 | 38.4 | 57.24 | 74 | -16.76 | Pk |
| V | 9760 | 31.91 | 32.92 | 7.59 | 38.4 | 44.98 | 54 | -9.02 | AV |
| V | 12200 | 40.45 | 31.96 | 8.88 | 39.04 | 56.41 | 74 | -17.59 | Pk |
| V | 12200 | 29.30 | 31.96 | 8.88 | 39.04 | 45.26 | 54 | -8.74 | AV |
| H | 4880 | 49.34 | 34.07 | 5.09 | 32.59 | 52.95 | 74 | -21.05 | Pk |
| H | 4880 | 40.20 | 34.07 | 5.09 | 32.59 | 43.81 | 54 | -10.19 | AV |
| H | 7320 | 46.70 | 32.63 | 6.34 | 35.96 | 56.37 | 74 | -17.63 | Pk |
| H | 7320 | 34.65 | 32.63 | 6.34 | 35.96 | 44.32 | 54 | -9.68 | AV |
| H | 9760 | 42.01 | 32.92 | 7.59 | 38.4 | 55.08 | 74 | -18.92 | Pk |
| H | 9760 | 31.22 | 32.92 | 7.59 | 38.4 | 44.29 | 54 | -9.71 | AV |
| H | 12200 | 39.02 | 31.96 | 8.88 | 39.04 | 54.98 | 74 | -19.02 | Pk |
| H | 12200 | 29.63 | 31.96 | 8.88 | 39.04 | 45.59 | 54 | -8.41 | AV |

| Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|
| High Channel:2480MHz | | | | | | | | | |
| V | 4960 | 49.97 | 34.02 | 5.15 | 32.8 | 53.90 | 74 | -20.10 | Pk |
| V | 4960 | 36.82 | 34.02 | 5.15 | 32.8 | 40.75 | 54 | -13.25 | AV |
| V | 7440 | 45.66 | 32.71 | 6.4 | 36.05 | 55.40 | 74 | -18.60 | Pk |
| V | 7440 | 35.24 | 32.71 | 6.4 | 36.05 | 44.98 | 54 | -9.02 | AV |
| V | 9920 | 40.84 | 32.86 | 7.62 | 38.4 | 54.00 | 74 | -20.00 | Pk |
| V | 9920 | 30.87 | 32.86 | 7.62 | 38.4 | 44.03 | 54 | -9.97 | AV |
| V | 12400 | 39.09 | 31.82 | 8.84 | 39.08 | 55.19 | 74 | -18.81 | Pk |
| V | 12400 | 28.73 | 31.82 | 8.84 | 39.08 | 44.83 | 54 | -9.17 | AV |
| H | 4960 | 47.95 | 34.02 | 5.15 | 32.8 | 51.88 | 74 | -22.12 | Pk |
| H | 4960 | 38.82 | 34.02 | 5.15 | 32.8 | 42.75 | 54 | -11.25 | AV |
| H | 7440 | 45.84 | 32.71 | 6.4 | 36.05 | 55.58 | 74 | -18.42 | Pk |
| H | 7440 | 32.26 | 32.71 | 6.4 | 36.05 | 42.00 | 54 | -12.00 | AV |
| H | 9920 | 41.57 | 32.86 | 7.62 | 38.4 | 54.73 | 74 | -19.27 | Pk |
| H | 9920 | 27.10 | 32.86 | 7.62 | 38.4 | 40.26 | 54 | -13.74 | AV |
| H | 12400 | 40.46 | 31.82 | 8.84 | 39.08 | 56.56 | 74 | -17.44 | Pk |
| H | 12400 | 30.10 | 31.82 | 8.84 | 39.08 | 46.20 | 54 | -7.80 | AV |

Note: 1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
All the modes have tested and recorded the worst mode(GFSK) in the report.
The 1-25GHz range has been tested, and the report only records the worst performance of the 1-18G range.

Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

| | Polar (H/V) | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB/m) | Emission level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
|---|---|---|---|---|---|---|---|---|---|---|
| GFSK | Low Channel: 2402MHz | | | | | | | | | |
| | H | 2390 | 59.38 | 35.17 | 3.48 | 27.49 | 55.18 | 74 | -18.82 | PK |
| | H | 2390 | 50.36 | 35.17 | 3.48 | 27.49 | 46.16 | 54 | -7.84 | AV |
| | H | 2400 | 60.21 | 35.16 | 3.49 | 27.52 | 56.06 | 74 | -17.94 | PK |
| | H | 2400 | 50.06 | 35.16 | 3.49 | 27.52 | 45.91 | 54 | -8.09 | AV |
| | V | 2390 | 57.89 | 35.17 | 3.48 | 27.49 | 53.69 | 74 | -20.31 | PK |
| | V | 2390 | 51.91 | 35.17 | 3.48 | 27.49 | 47.71 | 54 | -6.29 | AV |
| | V | 2400 | 59.32 | 35.16 | 3.49 | 27.52 | 55.17 | 74 | -18.83 | PK |
| | V | 2400 | 50.85 | 35.16 | 3.49 | 27.52 | 46.70 | 54 | -7.30 | AV |
| | High Channel: 2480MHz | | | | | | | | | |
| | H | 2483.5 | 58.44 | 35.11 | 3.56 | 27.75 | 54.64 | 74 | -19.36 | PK |
| | H | 2483.5 | 48.88 | 35.11 | 3.56 | 27.75 | 45.08 | 54 | -8.92 | AV |
| | H | 2500 | 59.96 | 35.1 | 3.57 | 27.8 | 56.23 | 74 | -17.77 | PK |
| | H | 2500 | 51.28 | 35.1 | 3.57 | 27.8 | 47.55 | 54 | -6.45 | AV |
| | V | 2483.5 | 59.41 | 35.11 | 3.56 | 27.75 | 55.61 | 74 | -18.39 | PK |
| | V | 2483.5 | 51.57 | 35.11 | 3.56 | 27.75 | 47.77 | 54 | -6.23 | AV |
| | V | 2500 | 60.33 | 35.1 | 3.57 | 27.8 | 56.60 | 74 | -17.40 | PK |
| | V | 2500 | 50.10 | 35.1 | 3.57 | 27.8 | 46.37 | 54 | -7.63 | AV |

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss − Pre-amplifier, Margin= Emission Level - Limit

# 4. Conducted Spurious Emissions

## 4.1.Limit

Test Requirement: FCC CFR47 Part 15 Section 15.247
Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02April 2,2019; ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024
Test Result: PASS

Limit:
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

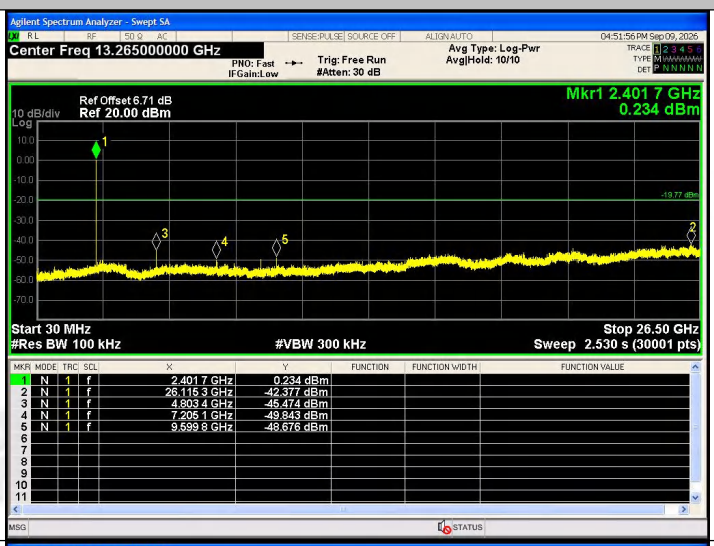
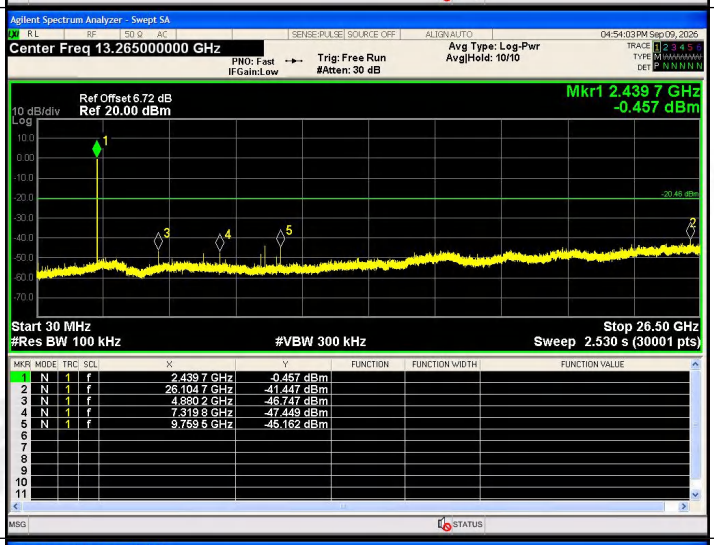
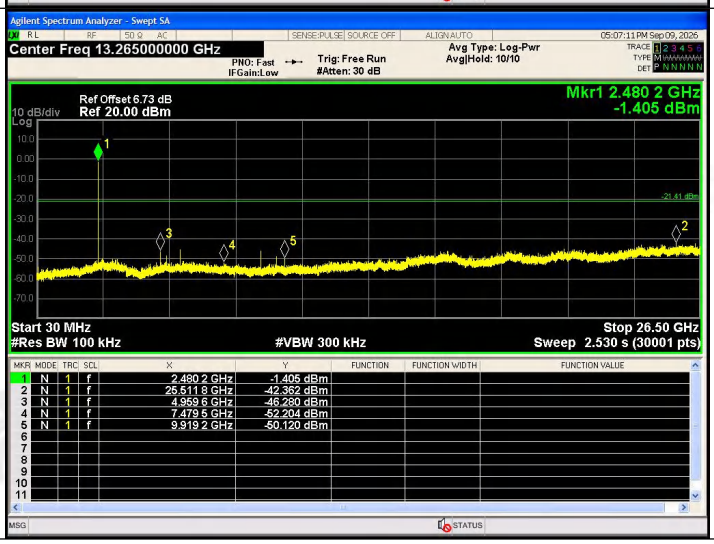
## 4.2.Test Setup

## 4.3.Test Procedure

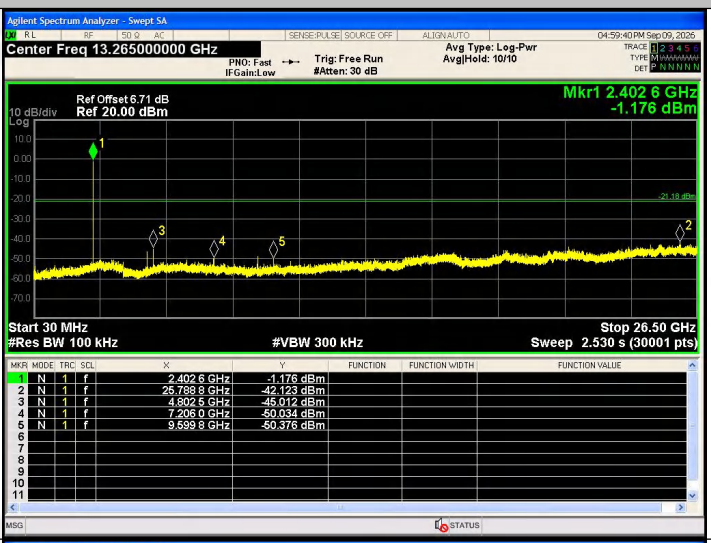
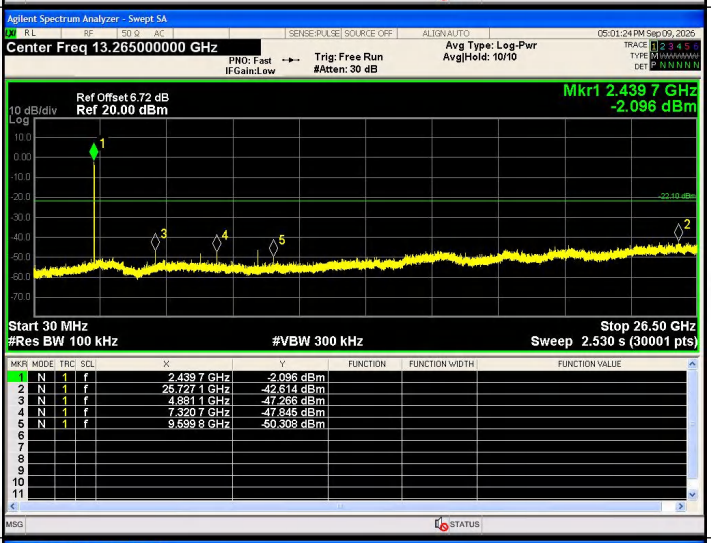
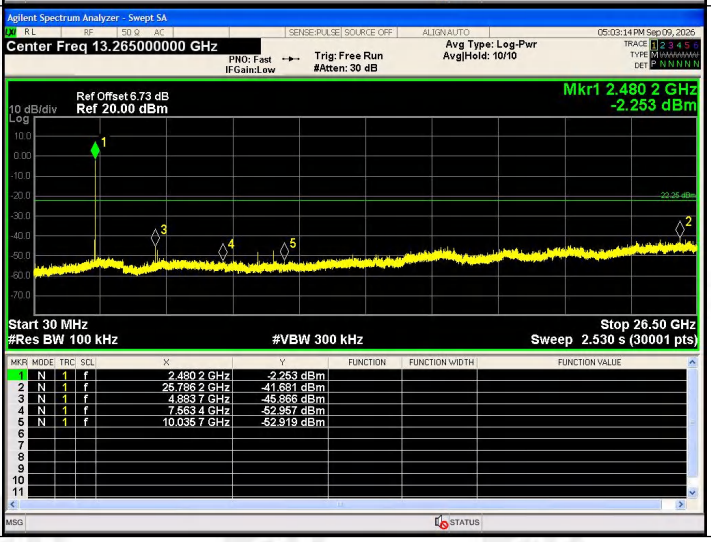
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer:
a) Set instrument center frequency to DTS channel center frequency.
b) Set the span to _ 1.5 times the DTS bandwidth.
c) Set the RBW = 100 kHz.
d) Set the VBW _ [3 × RBW].
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum PSD level.
Note that the channel found to contain the maximum PSD level can be used to establish the reference level.
Establish an emission level by using the following procedure:
a) Set the center frequency and span to encompass frequency range to be measured. Note that the frequency range might need to be divided into multiple frequency ranges to retain frequency resolution.
NOTE—the number of points can also be increased for large spans to retain frequency resolution
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ [3 × RBW].
d) Detector = peak.
e) Sweep time = No faster than coupled (auto) time.
f) Trace mode = max-hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in 11.1 a) or 11.1 b).
Report the three highest emissions relative to the limit.

## 4.4.Test Result

1M:

| RF Conducted Spurious Emissions Graphs | | | |
|---|---|---|---|
| GFSK/LCH | |  | |
| GFSK/MCH | |  | |
| GFSK/HCH | |  | |

2M:

| RF Conducted Spurious Emissions Graphs | | | |
|---|---|---|---|
| GFSK/LCH | |  | |
| GFSK/MCH | |  | |
| GFSK/HCH | |  | |

# 5. Band Edge Measurement

## 5.1.Limit

Test Requirement: FCC CFR47 Part 15 Section 15.247
Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02April 2,2019;
ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024
Test Limit: Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
Test Mode: Transmitting

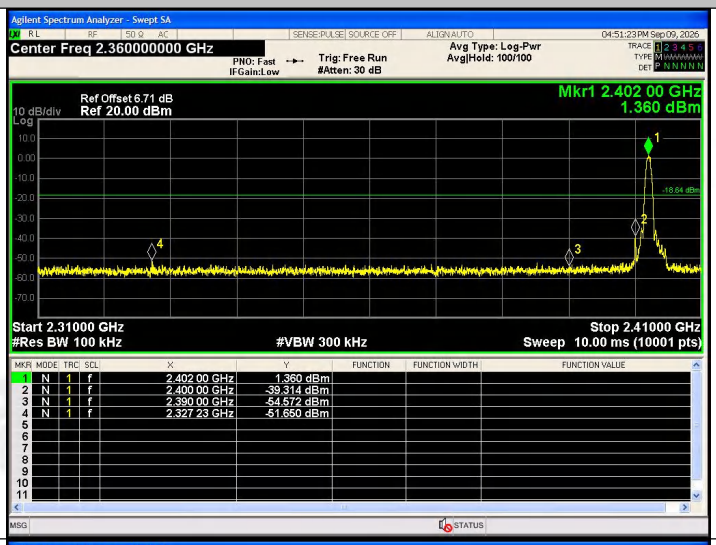
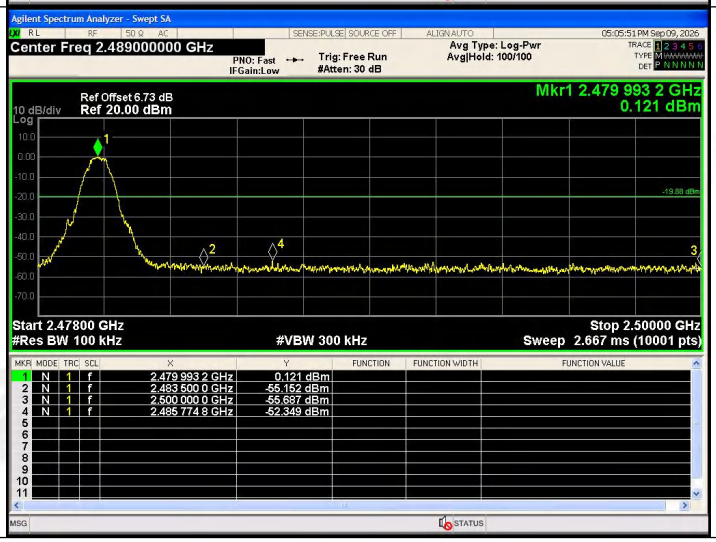
## 5.2.Test setup

## 5.3.Test Procedure

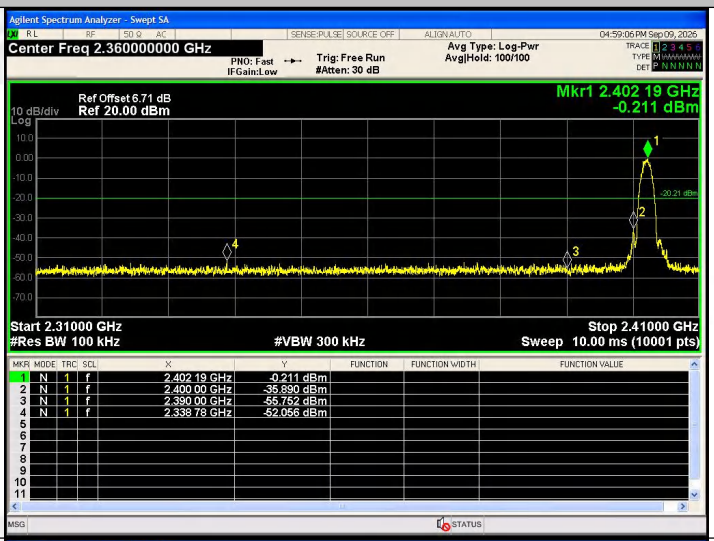
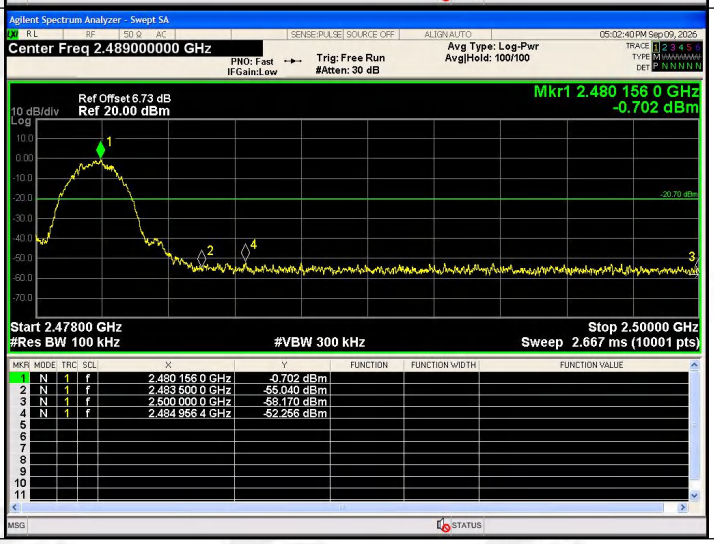
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

## 5.4.Test Result

1M:

| BAND EDGE Graphs | | | |
|---|---|---|---|
| GFSK/LCH | |  | |
| GFSK/HCH | |  | |

2M:

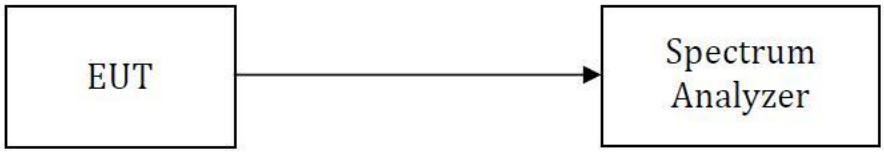
| BAND EDGE Graphs | | | |
|---|---|---|---|
| GFSK/LCH | |  | |
| GFSK/HCH | |  | |

# 6. -6 dB Bandwidth

## 6.1.Limit

Test Requirement: FCC CFR47 Part 15 Section 15.247
Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02April 2,2019; ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024

## 6.2.Test Setup




## 6.3.Test Procedure

**For 6dB Bandwidth Measurement**
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2.The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1(i.e, RBW= 100 kHz VBW>3 x RBW,and peak detector with maximum hold) is implemented by the instrumentation function.When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ⩾6 dB.
3. The steps for the first option are as follows:
a.Set RBW= shall be in the range of 1% to 5% of the OBW but not less than 100 kHz.
b.Set the VBW[3 x RBW].
c.Detector = peak
d.Trace mode = max-hold.
e.Sweep = No faster than coupled (auto) time.
f.Allow the trace to stabilize.
g.Measure the maximum width of the emission by placing two markers, one at the lowest frequencyand the other at the highest frequency of the envelope of the spectral display, such that each markeris at or slightly below the "-6 dB down amplitude". If a marker is below this "-6 dB down amplitude?' value, then it shalil be as close as possible to this value.
**For 99% Bandwidth Measurement**
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1%-5% OBW, VBW ⩾ 3RBW

## 6.4.Test Result

1M:

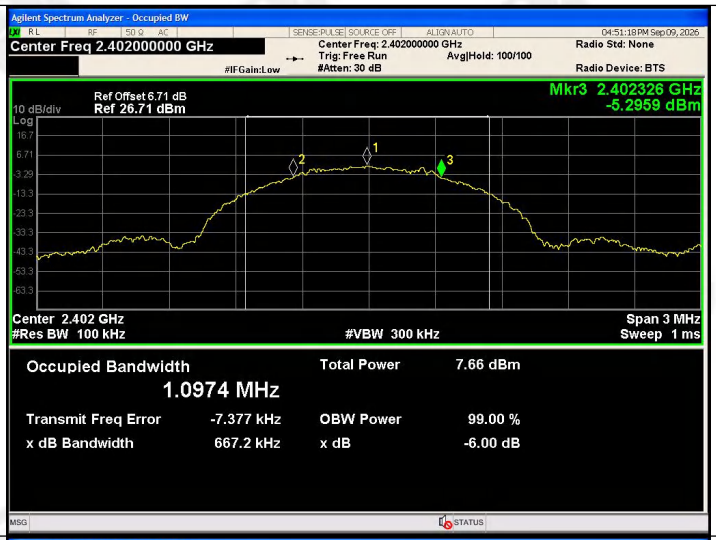
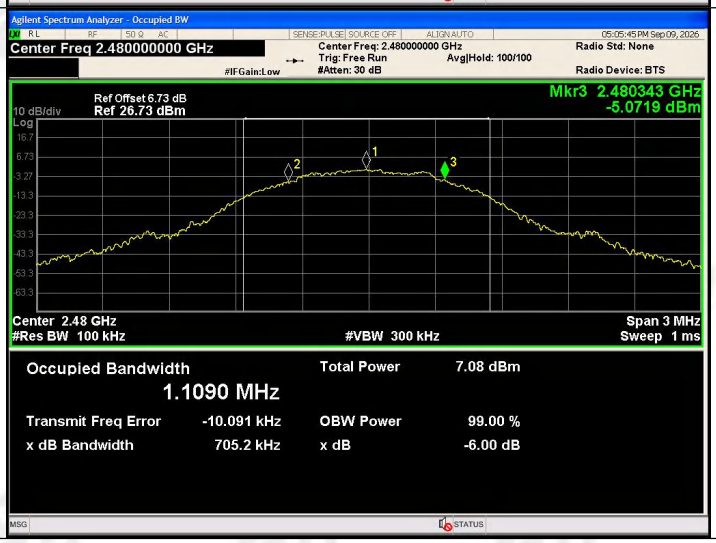
| Test Mode | Frequency | 6dB Bandwidth (MHz) | Limit (KHz) | Result |
|---|---|---|---|---|
| GFSK | Low channel | 0.667 | >= 500 | PASS |
| | Mid channel | 0.694 | >= 500 | PASS |
| | High channel | 0.705 | >= 500 | PASS |

2M:

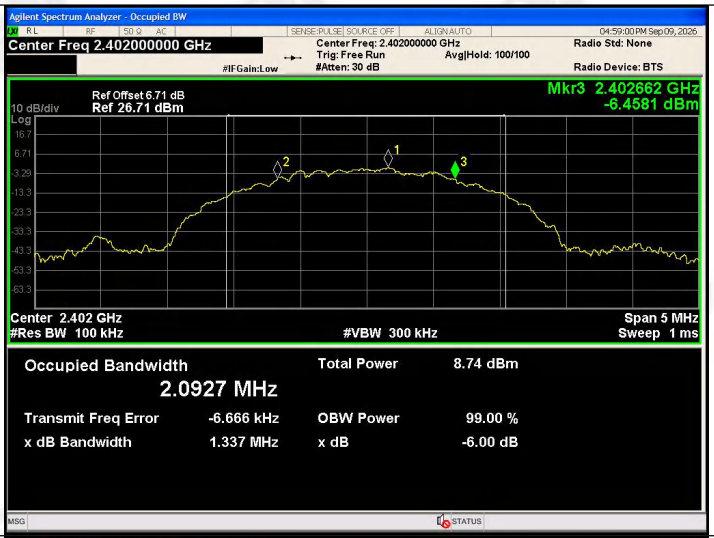
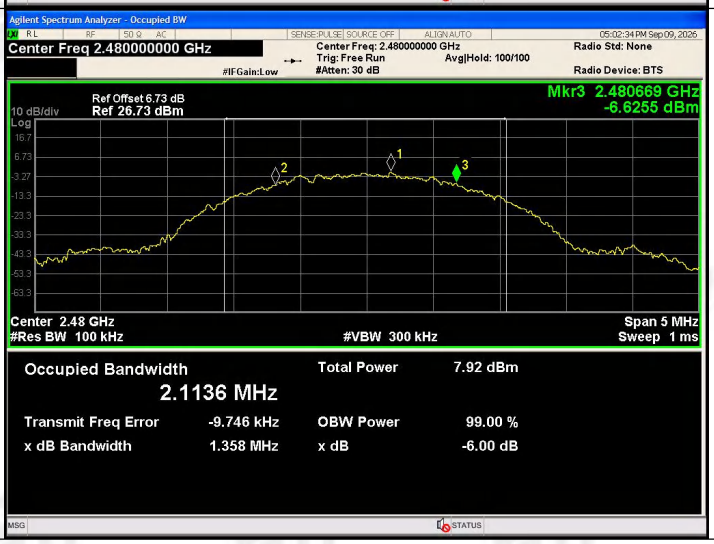
| Test Mode | Frequency | 6dB Bandwidth (MHz) | Limit (KHz) | Result |
|---|---|---|---|---|
| GFSK | Low channel | 1.337 | >= 500 | PASS |
| | Mid channel | 1.331 | >= 500 | PASS |
| | High channel | 1.358 | >= 500 | PASS |

Note: All modes of operation were Pre-scan and the worst-case emissions are reported.

1M:
6dB Bandwidth
Test Graph:

| | | | |
|---|---|---|---|
| GFSK<br>Low channel | |  | |
| GFSK<br>Mid channel | | | |
| GFSK<br>High channel | |  | |

2M:
6dB Bandwidth
Test Graph:

| | | | |
|---|---|---|---|
| GFSK<br>Low channel | |  | |
| GFSK<br>Mid channel | | | |
| GFSK<br>High channel | |  | |

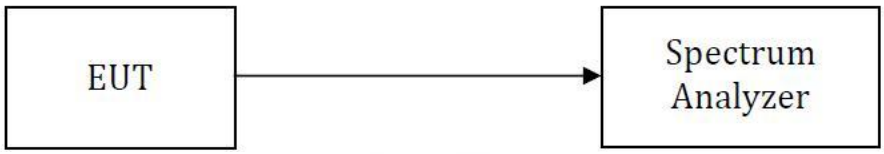
# 7. Maximum Peak Output Power

## 7.1.Limit

Test Requirement: FCC CFR47 Part 15 Section 15.247
Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02April 2,2019;
ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024

| FCC Part15 (15.247) , Subpart C | | | | |
|---|---|---|---|---|
| Section | Test Item | Limit | Frequency Range (MHz) | Result |
| 15.247(b)(3) | Peak Output Power | 1 watt or 30dBm | 2400-2483.5 | PASS |

## 7.2.Test Setup




## 7.3.Test Procedure

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.
a)Set the RBW ≥ DTS bandwidth.
b)Set VBW ≥ 3 x RBW.
c)Set span ≥ 3 x RBW
d)Sweep time = auto couple.
e)Detector = peak.
f)Trace mode = max hold.
g)Allow trace to fully stabilize.
h)Use peak marker function to determine the peak amplitude level.

## 7.4.Test Result

1M:

| Mode | Channel. | Maximum Output Power [dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|
| GFSK | LCH | 2.702 | 30 | PASS |
| | MCH | 2.414 | 30 | PASS |
| | HCH | 2.176 | 30 | PASS |

Duty Cycle

| Mode | Channel. | Duty Cycle(%) | Correction Factor (dB) |
|---|---|---|---|
| GFSK | LCH | 66.13 | 1.80 |
| | MCH | 66.13 | 1.80 |
| | HCH | 66.67 | 1.76 |

2M:

| Mode | Channel. | Maximum Output Power [dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|
| GFSK | LCH | 2.963 | 30 | PASS |
| | MCH | 2.576 | 30 | PASS |
| | HCH | 2.009 | 30 | PASS |

Duty Cycle

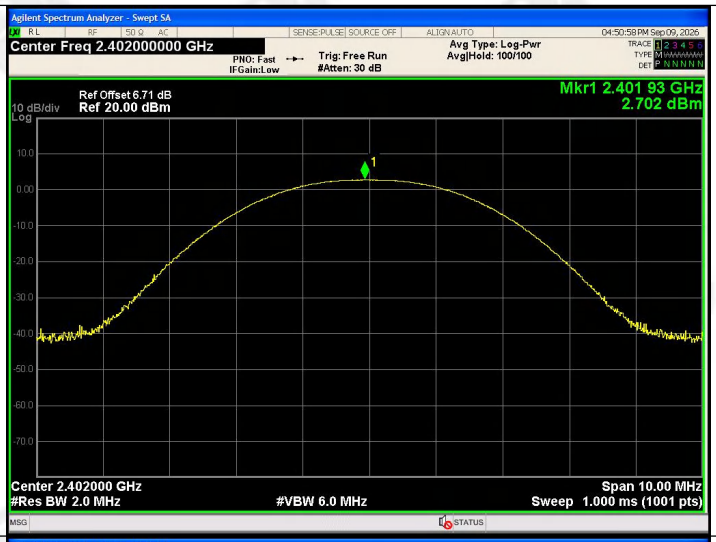
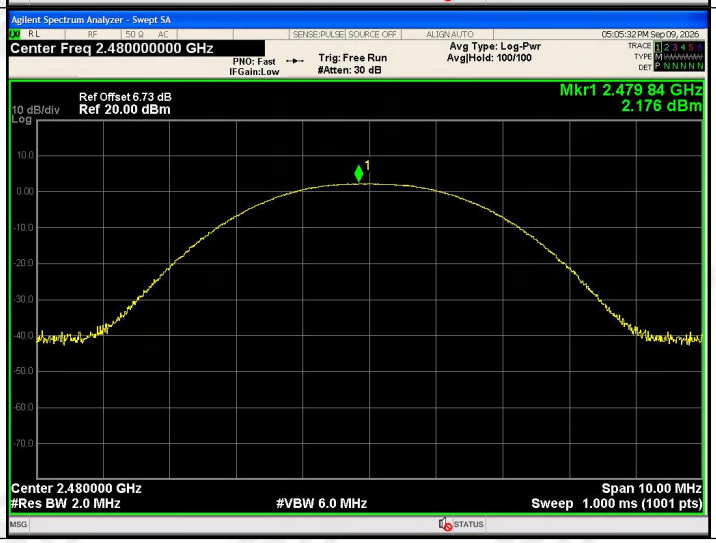
| Mode | Channel. | Duty Cycle(%) | Correction Factor (dB) |
|---|---|---|---|
| GFSK | LCH | 37.30 | 4.28 |
| | MCH | 36.51 | 4.38 |
| | HCH | 38.71 | 4.12 |

Note: Duty Cycle Factor= 10 log (1/x), x is Duty Cycle.

**Output Power**

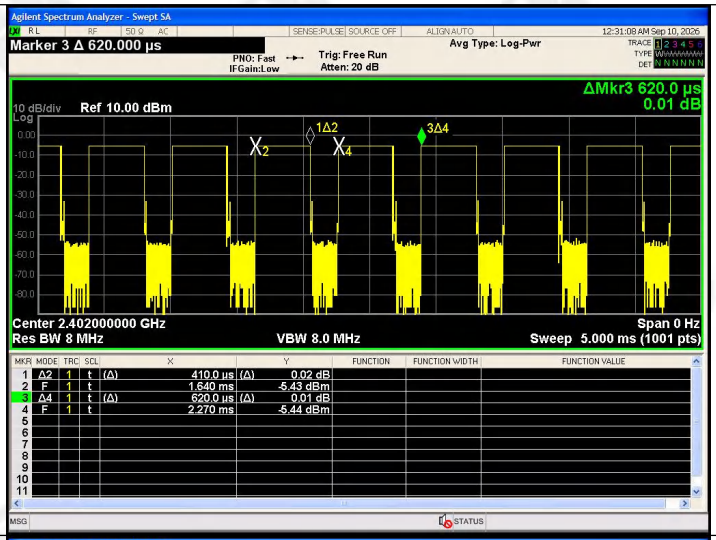
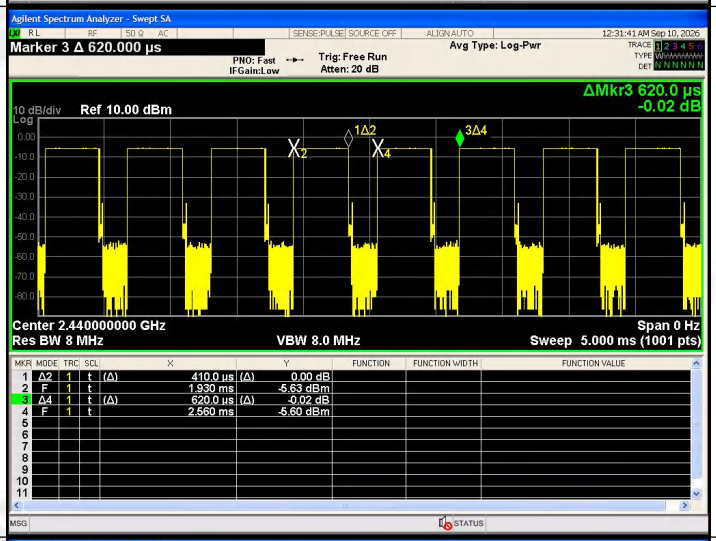
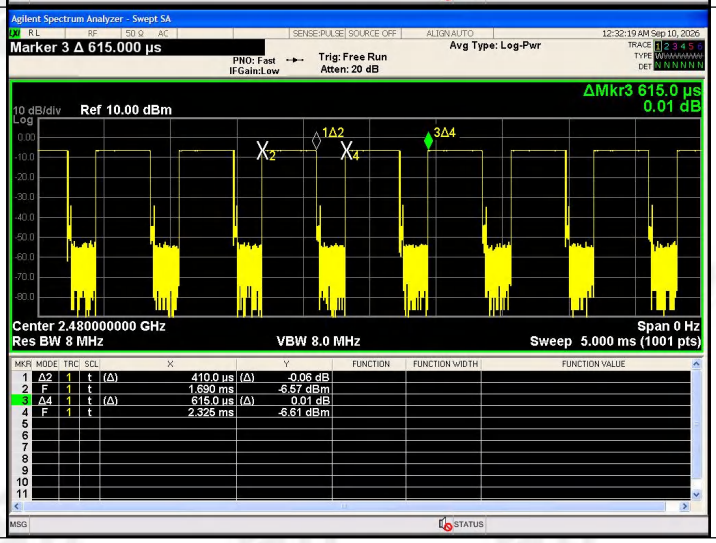
1M:

**Test Graph:**

| | | | |
|---|---|---|---|
| GFSK<br>Low channel | |  | |
| GFSK<br>Mid channel | | | |
| GFSK<br>High channel | |  | |

Duty Cycle
1M:

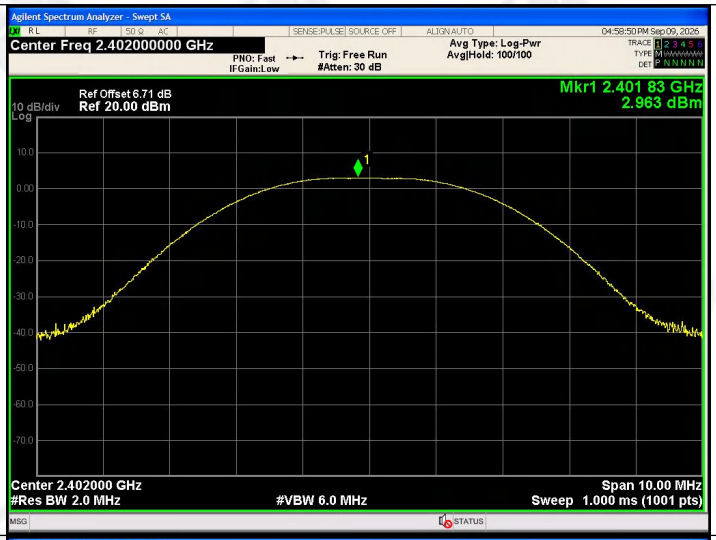
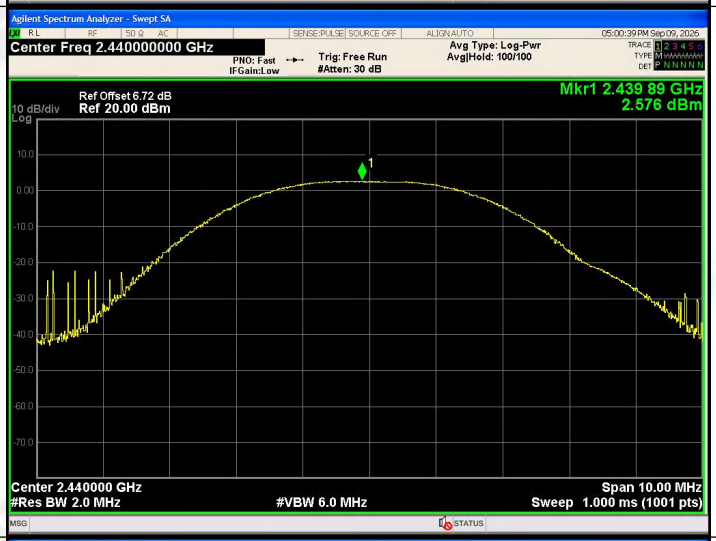
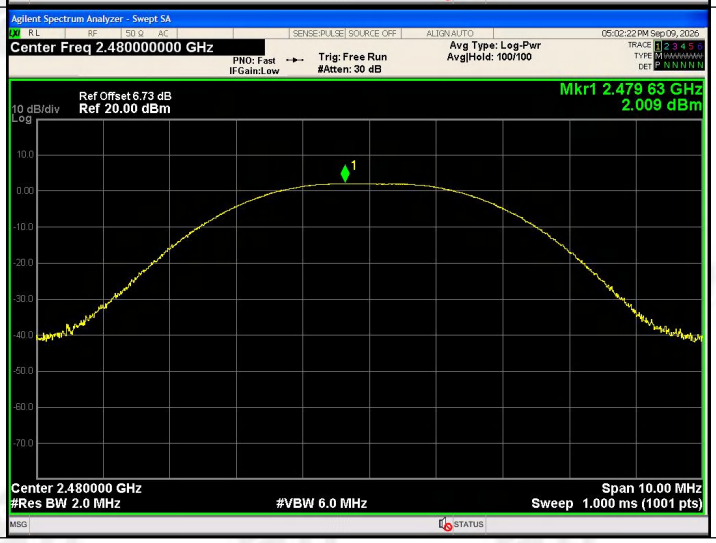
**Test Graph:**

| | | | |
|---|---|---|---|
| GFSK<br>Low channel | |  | |
| GFSK<br>Mid channel | |  | |
| GFSK<br>High channel | |  | |

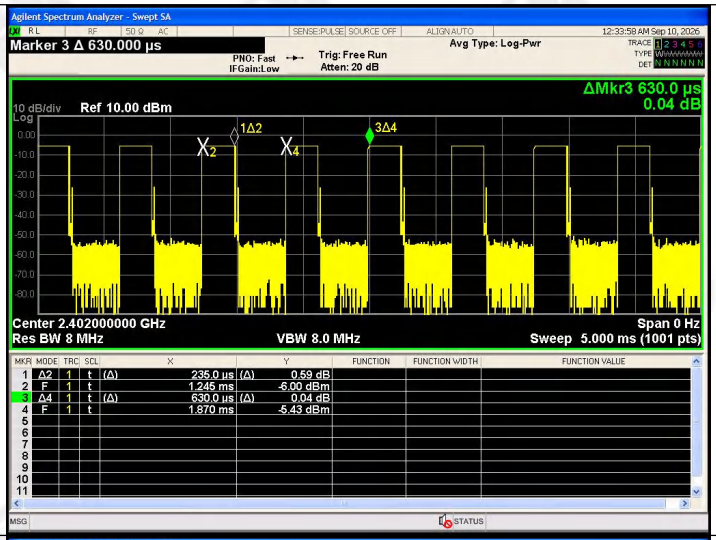
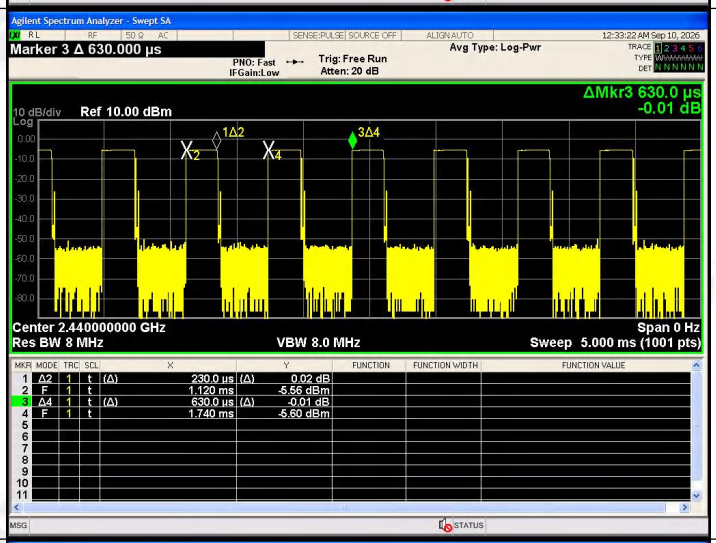
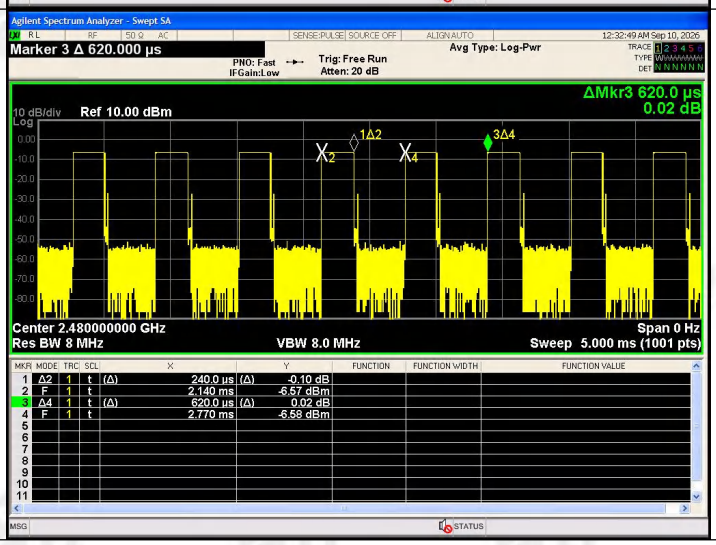
2M:

**Output Power**

**Test Graph:**

| | | | |
|---|---|---|---|
| GFSK<br>Low channel | |  | |
| GFSK<br>Mid channel | |  | |
| GFSK<br>High channel | |  | |

Duty Cycle
2M:
**Test Graph:**

| | | | |
|---|---|---|---|
| GFSK<br>Low channel | |  | |
| GFSK<br>Mid channel | |  | |
| GFSK<br>High channel | |  | |

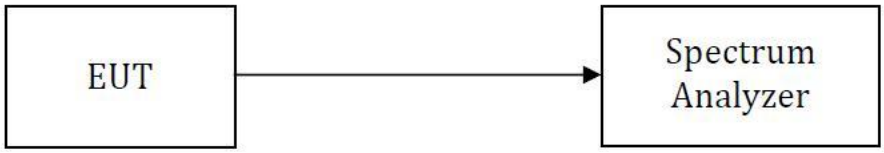
# 8. Power Spectral density

## 8.1.Limit

Test Requirement: FCC CFR47 Part 15 Section 15.247
Test Method: KDB 558074 D01 15.247 Meas Guidance v05r02April 2,2019; ANSI C63.10-2020 + Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024

| FCC Part15 (15.247) , Subpart C | | | | |
|---|---|---|---|---|
| Section | Test Item | Limit | Frequency Range (MHz) | Result |
| 15.247 | Power Spectral Density | 8dBm/3kHz | 2400-2483.5 | PASS |

## 8.2.Test Setup




## 8.3.Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

## 8.4.Test Result

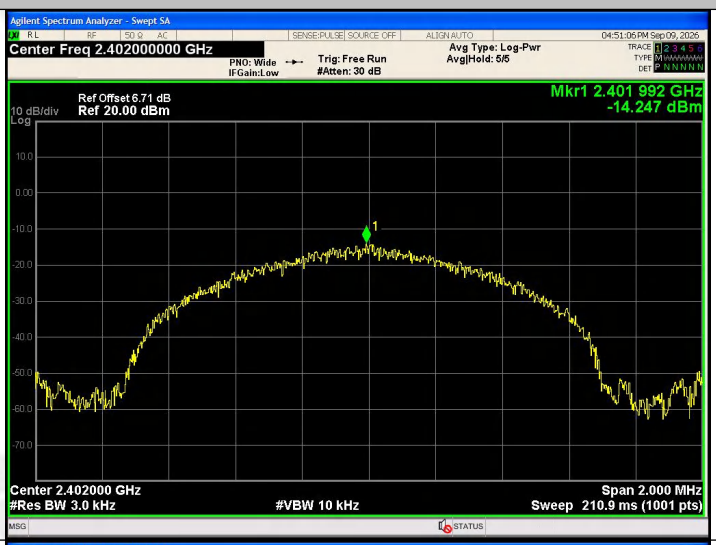
1M:

| Mode | Channel. | Power Spectral Density (dBm/3KHz) | Limit(dBm/3KHz) | Verdict |
|---|---|---|---|---|
| GFSK | LCH | -14.247 | 8 | PASS |
| GFSK | MCH | -9.641 | 8 | PASS |
| GFSK | HCH | -10.023 | 8 | PASS |

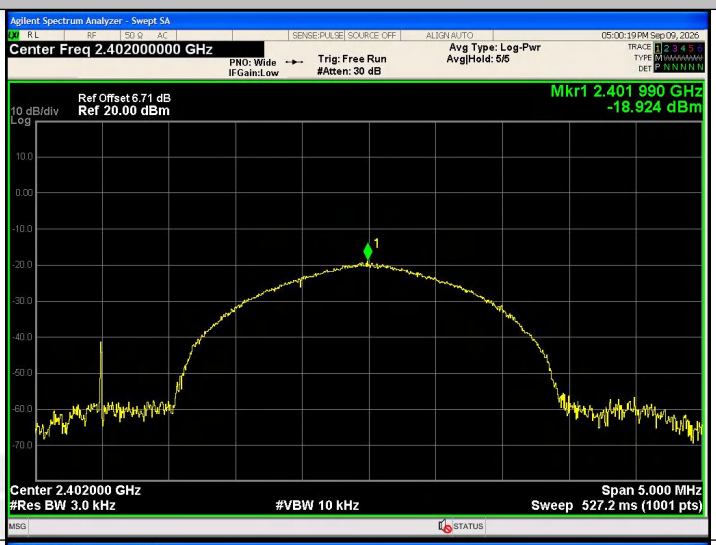
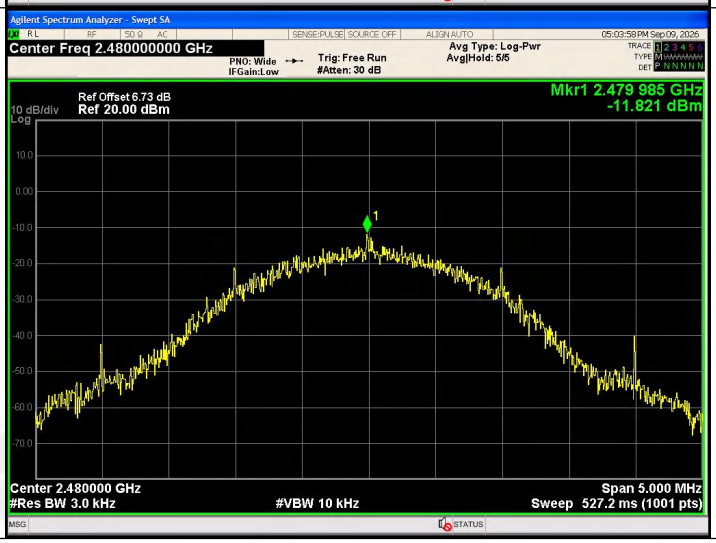
2M:

| Mode | Channel. | Power Spectral Density (dBm/3KHz) | Limit(dBm/3KHz) | Verdict |
|---|---|---|---|---|
| GFSK | LCH | -18.924 | 8 | PASS |
| GFSK | MCH | -14.825 | 8 | PASS |
| GFSK | HCH | -11.821 | 8 | PASS |

**1M:**
**Test Graph**

| Graphs | | | |
|---|---|---|---|
| GFSK/LCH | |  | |
| GFSK/MCH | | | |
| GFSK/HCH | | | |

**2M:**
**Test Graph**

| Graphs | | | |
|---|---|---|---|
| GFSK/LCH | |  | |
| GFSK/MCH | | | |
| GFSK/HCH | |  | |

# 9. Antenna Requirement

According to the FCC Part 15 Paragraph 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. This product has an integrated antenna fulfill the requirement of this section.

This product has an Chip antenna, and the maximum antenna gain is 2.12dBi, fulfill the requirement of this section.

# 10. TEST SETUP & EUT PHOTOGRAPH

Please see the attachment for details.

---------- End of Report ----------