# MEASUREMENT REPORT
## FCC PART 15.247 Zigbee

Report No.: S20250714488301E01
Issue Date: 08-12-2025

| | |
|---|---|
| **Applicant:** | Jiangsu Shushi Technology Co., Ltd. |
| **Address:** | NO.9 Nanxu Road,RunZhou District,Zhenjiang,Jiangsu,China |
| **FCC ID:** | 2BAGQ-3RSM0247Z |
| **Product:** | Smart Soil Moisture Sensor |
| **Model No.:** | 3RSM0147Z |
| **FCC Classification:** | Digital Transmission System (DTS) |
| **FCC Rule Part(s):** | Part 15 Subpart C (15.247) |
| **Test Procedure(s):** | ANSI C63.10-2013, KDB 558074 D01v05r02 |
| **Result:** | Pass |
| **Item Receipt Date:** | Jul. 15, 2025 |
| **Test Date:** | Jul. 16 ~ Jul. 31, 2025 |

Compiled By: Stone Zhang
(Stone Zhang)
Senior Test Engineer

Approved By: Line Chen
(Line Chen)
Engineer Manager

FANGGUANG INSPECTION & TESTING CO.,LTD. APPROVED(02)

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s)
The test report shall not be reproduced except in full without the written approval of Fangguang Inspection & Testing Co., Ltd. Wuxi Branch
The test report must not be used by the client to claim product certifications, approval, or endorsement by NVLAP, NIST or any agency of U.S. Government.

# Revision History

| Report No. | Version | Description | Issue Date |
|---|---|---|---|
| S20250714488301E01 | Rev. 01 | / | 08-12-2025 |

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## §2.1033 General Information

| | |
|---|---|
| **Applicant:** | Jiangsu Shushi Technology Co., Ltd. |
| **Applicant Address:** | NO.9 Nanxu Road,RunZhou District,Zhenjiang,Jiangsu,China |
| **Manufacturer:** | Jiangsu Shushi Technology Co., Ltd. |
| **Manufacturer Address:** | NO.9 Nanxu Road,RunZhou District,Zhenjiang,Jiangsu,China |
| **Factory:** | Jiangsu Shushi Technology Co., Ltd. |
| **Factory Address:** | NO.9 Nanxu Road,RunZhou District,Zhenjiang,Jiangsu,China |
| **Test Site:** | Fangguang Inspection & Testing Co., Ltd. |
| **LAB ID:** | CN5037 |
| **LAB registration number：** | 600222-0 |
| **Test Site Address:** | No.8 Ningyun Rd., Xinwu District Wuxi, Jiangsu 214000 China |
| **FCC Rule Part(s):** | Part 15 Subpart C (15.247) |
| **FCC ID:** | 2BAGQ-3RSM0247Z |
| **Test Device Serial No.:** | S/N.: /<br>☐ Production ☒ Pre-Production ☐ Engineering |
| **FCC Classification:** | Digital Transmission System (DTS) |

# 1. Introduction

## 1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

## 1.2. Fangguang Test Location

These measurement tests were performed at the Fangguang Inspection and testing Co.,LTD located at No.8 Ningyun Rd., Xinwu District Wuxi, Jiangsu 214000 China. The detailed description of the measurement facility was found to be in compliance with the requirements of ANSI C63.10-2013.

# 2. Product Information

## 2.1. Equipment Description

| | |
|---|---|
| Product Name: | Smart Soil Moisture Sensor |
| Test Model: | 3RSM0147Z |
| Trade Mark: | THIRDREALITY |
| Input Voltage Range: | DC1.5V(1*AA) |
| Software Version: | v1.00.47 |
| Hardware Version: | V1.7 |
| EUT sample number: | S20250714488301-1-1 (Conducted)<br>S20250714488301-1-2 (Radiated) |

Note: This information is provided by the Customer and its authenticity is the responsibility of the Customer.

## 2.2. Product Specification Subjective to this Report

| | |
|---|---|
| Operating Band | 2405~2480MHz |
| Number of Channels | 16 |
| Channel Spacing | 5 MHz |
| Type of modulation | O-QPSK |
| Antenna Type: | Single Ceramic Antenna |
| Antenna Gain: | 2.8dBi |

Note: The maximum Antenna Gain was declared by the manufacturer.

## 2.3. Operation Frequency / Channel List

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| 11 | 2405 MHz | 12 | 2410 MHz | 13 | 2415 MHz |
| 14 | 2420 MHz | 15 | 2425 MHz | 16 | 2430 MHz |
| 17 | 2435 MHz | 18 | 2440 MHz | 19 | 2445 MHz |
| 20 | 2450 MHz | 21 | 2455 MHz | 22 | 2460 MHz |
| 23 | 2465 MHz | 24 | 2470 MHz | 25 | 2475 MHz |
| 26 | 2480 MHz | -- | -- | -- | -- |

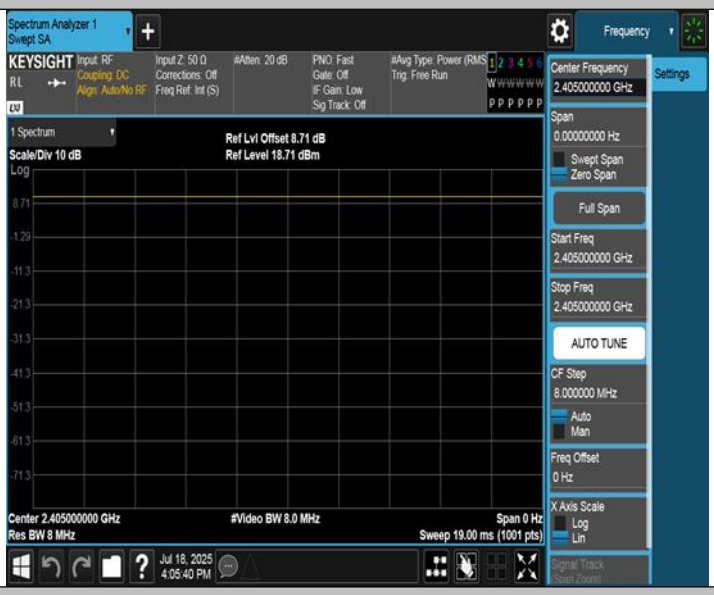
EUT was tested with Channel 11, 18, 25 and 26.

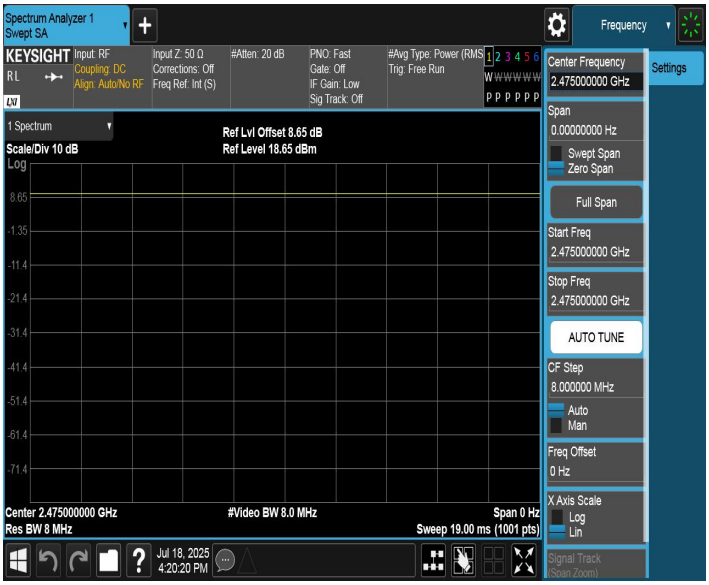
## 2.4. Device Capabilities

This device contains the following capabilities: Zigbee.

**Note:** The maximum achievable duty cycle was determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW =8MHz. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles of Zigbee are 100%.

| Test Mode | Antenna | Frequency (MHz) | Transmission Duration [ms] | Transmission Period [ms] | Duty Cycle [%] |
|---|---|---|---|---|---|
| Zigbee | Ant1 | 2405 | 0.00 | 0.00 | 100 |
| | | 2440 | 0.00 | 0.00 | 100 |
| | | 2475 | 0.00 | 0.00 | 100 |
| | | 2480 | 0.00 | 0.00 | 100 |

| Zigbee_Ant1_2405 |
| --- |
|  |
| Zigbee_Ant1_2440 |
|  |

| Zigbee_Ant1_2475 |
|---|
|  |
| Zigbee_Ant1_2480 |
|  |

## 2.5. Description of Test Software

The test utility software used during testing was “EMI_Test_Tool.exe”, Power Parameter Value:

| Test Mode | Channel | ANT1 |
|---|---|---|
| Zigbee | 2405 | 10.5dBm |
| | 2440 | 10.5dBm |
| | 2475 | 10.5dBm |
| | 2480 | 1.7dBm |

## 2.6. Test Mode

| Test Mode | Mode 1: Transmit by Zigbee |
|---|---|

## 2.7. Test Configuration

The EUT was tested per the guidance of KDB 558074 D01 v05r02. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

## 2.8. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

## 2.9. EUT Photo

The EUT external photo, internal photo and test setup photo, please refer to the plots in the S20250714488301-A1/A2/A3.

## 2.10. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

## 2.11. Calculation with all conversion and correction factors used

For AC Line Conducted Emissions Test:

Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

For Radiated Emissions Below 1GHz Test:

Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m).

For Radiated Emissions Above 1GHz Test:

Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB).

# 3. Description of Test

## 3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance provided in KDB 558074 D01 v05r02 were used in the measurement of the EUT.

**Deviation from measurement procedure…….....None**

## 3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.

### 3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. The turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-25GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

# 4. Antenna Requirements

**Excerpt from §15.203 of the FCC Rules/Regulations:**

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 shall be considered sufficient to comply with the provisions of this section.”

- Use a unique coupling to the intentional radiator**.**

# 5. Test Equipment Calibration Date

Conducted Emissions

| Instrument | Manufacturer | Type No. | Asset No. | Cali. Interval | Cali. Due Date |
|---|---|---|---|---|---|
| EMI Test Receiver | R&S | ESR3 | FWXGJC-2016-181 | 1 year | 2026/07/08 |
| Two-Line V-Network | R&S | ENV 216 | FWXGJC-2016-182 | 1 year | 2026/07/09 |
| Thermohygrometer | Yuhuaze | HTC-1 | FWXDA-2016-387 | 1 year | 2025/09/03 |

Radiated Emission

| Instrument | Manufacturer | Type No. | Asset No. | Cali. Interval | Cali. Due Date |
|---|---|---|---|---|---|
| Loop Antenna | Schwarzbeck | FMZB 1519B | FWXGJC-2018-015 | 1 year | 2026/06/21 |
| Bi-Log Antenna | R&S | VULB 9168 | FGZZ-2024-036 | 1 year | 2026/06/21 |
| Broadband Horn Antenna | R&S | HF907 | FWXGJC-2016-267-07 | 1 year | 2026/06/21 |
| Broadband Horn Antenna | Schwarzbeck | BBHA 9170 | FWXGJC-2018-016 | 1 year | 2026/06/21 |
| EMI Receiver | R&S | ESR26 | FWXGJC-2016-267-01 | 1 year | 2026/07/16 |
| EXA Signal Analyzer | Keysight | N9010B | FWXGJC-2018-010 | 1 year | 2026/07/16 |
| Pre-Amplifier | Tonscend | TAP0118048 | FWXGJC-2024-037 | 1 year | 2026/06/21 |
| Pre-Amplifier | Chengyi | EMC184055SE | FWXGJC-2018-018 | 1 year | 2026/06/21 |
| Thermohygrometer | Yuhuaze | HTC-1 | FWXDA-2016-385 | 1 year | 2025/09/03 |
| Anechoic Chamber | SAEMC | FSAC318 | FWXGJC-2024-035 | 3 year | 2027/06/02 |

Conducted Test Equipment

| Instrument | Manufacturer | Type No. | Asset No. | Cali. Interval | Cali. Due Date |
|---|---|---|---|---|---|
| EXA Signal Analyzer | Keysight | N9010B | FWXGJC-2018-010 | 1 year | 2026/07/16 |
| RF Control Unit | Toncend | JS0806-2 | FWXGJC-2018-013 | 1 year | 2026/07/25 |
| Thermohygrometer | Yuhuaze | HTC-1 | FWXDA-2016-386 | 1 year | 2025/09/03 |

| Test Software | Manufacturer | Version | Asset No. | Function |
|---|---|---|---|---|
| JS1120-3 Test System | tonscend | V3.3.10 | / | Conducted Test |
| JS32 | tonscend | V5.0.0 | / | Radiated Emission |
| EMI Test Software | R&S | 9.26.00 | / | Conducted Emission |

Auxiliary Equipment

| Instrument | Manufacturer | Type No. | Asset No. | Cali. Interval | Cali. Due Date |
|---|---|---|---|---|---|
| Filter | Tonscend | ZBSF6 | 07247867 | 1 year | 2026/07/16 |
| Filter | Tonscend | ZHPF6 | 07233297 | 1 year | 2026/07/16 |
| Attenuator | Tonscend | 10dB | / | 1 year | 2026/07/16 |
| RF Cable | Tonscend | T-1 | / | 1 year | 2026/07/16 |

## 6. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

| |
|---|
| AC Conducted Emission Measurement |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.68dB |
| Radiated Emission Measurement（9kHz - 30MHz） |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 3.06dB |
| Radiated Emission Measurement（30MHz -1GHz） |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 4.01dB |
| Radiated Emission Measurement（1-18GHz） |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 4.97dB |
| Radiated Emission Measurement（18-40GHz） |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 5.32dB |
| Spurious Emissions, Conducted |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 30MHz-1GHz: 1.00 dB 1GHz-12.75GHz: 1.30 dB |
| Output Power |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.60dB |
| Power Spectrum Density |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.80dB |
| Occupied Bandwidth |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.20MHz |
| Frequency Stability |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): $0.1 \times 10^{-6}$MHz |

# 7. Test Result

## 7.1. Summary

| FCC Part Section(s) | Test Description | Test Limit | Test Condition | Test Result | Reference |
|---|---|---|---|---|---|
| 15.247(a)(2) | 6dB Bandwidth | ≥ 500kHz | Conducted | Pass | Section 7.2 |
| 15.247(b)(3) | Output Power | ≤ 30dBm | | Pass | Section 7.3 |
| 15.247(e) | Power Spectral Density | ≤ 8dBm/3kHz | | Pass | Section 7.4 |
| 15.247(d) | Band Edge | ≥ 20dBc | | Pass | Section 7.5 |
| 15.247(d) | Out-of-Band Emissions | ≥ 20dBc | | Pass | Section 7.5 |
| 15.205<br>15.209 | General Field Strength Limits (Restricted Bands and Radiated Emission Limits) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 | Radiated | Pass | Section 7.6&7.7 |
| 15.207 | AC Conducted Emissions 150kHz - 30MHz | < FCC 15.207 limits | Line Conducted | NA | Section 7.8 |

**Notes:**

1) All modes of operation and data rates were investigated. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.
2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

## 7.2. 6dB Bandwidth Measurement

### 7.2.1. Test Limit

The minimum permissible 6dB bandwidth is 500 kHz.

### 7.2.2. Test Procedure used

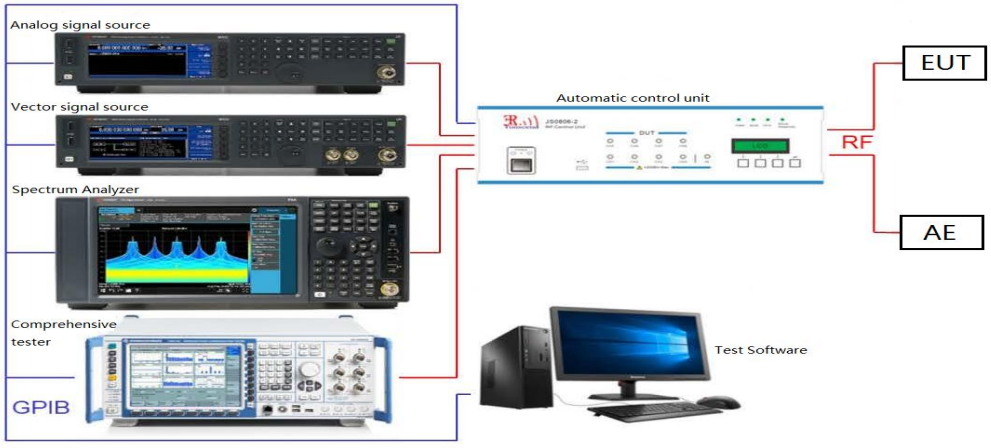
ANSI C63.10-2013 Section 11.8.2 Option 1

KDB 558074 D01 v05r02 – Section 8.2

### 7.2.3. Test Setting

1. Set RBW = 100 kHz
2. VBW ≥ 3 × RBW
3. Detector = peak
4. Trace mode = max hold
5. Sweep = auto couple
6. Allow the trace was allowed to stabilize
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### 7.2.4. Test Setup



### 7.2.5. Test Result

| | |
|---|---|
| Temperature: | 26.7 ~ 27.8°C |
| Relative Humidity: | 40 ~ 45 % |
| ATM Pressure: | 100.0 ~100.6 kPa |
| Test Data: | 2025-07-18 ~ 2025-07-19 |
| Test Engineer: | Stone Zhang |

| Test Mode | Antenna | Frequency (MHz) | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit [MHz] | 99% BW[MHz] | Verdict |
|---|---|---|---|---|---|---|---|---|
| ZIGB | Ant1 | 2405 | 1.540 | 2404.270 | 2405.810 | 0.5 | 2.3560 | PASS |
| | | 2440 | 1.540 | 2439.240 | 2440.780 | 0.5 | 2.3354 | PASS |
| | | 2475 | 1.460 | 2474.260 | 2475.720 | 0.5 | 2.3198 | PASS |
| | | 2480 | 1.650 | 2479.200 | 2480.850 | 0.5 | 2.3949 | PASS |

## Test Graphs

Zigbee_Ant1_2405

## Zigbee_Ant1_2440


## Zigbee_Ant1_2475


## Zigbee_Ant1_2480

## 7.3. Output Power Measurement

### 7.3.1. Test Limit

The maximum permissible conducted output power is 1 Watt (30dBm). And for antenna gain greater than 6dBi the limit shall reduce by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 7.3.2. Test Procedure Used

ANSI C63.10-2013 – Section 11.9.1.1

KDB 558074 D01 v05r02 – Section 8.3.1.2

### 7.3.3. Test Setting

1.Set the RBW ≥ DTS bandwidth.

2.Set the VBW ≥ [3 × RBW].

3.Set the span ≥ [3 × RBW].

4.Detector = peak.

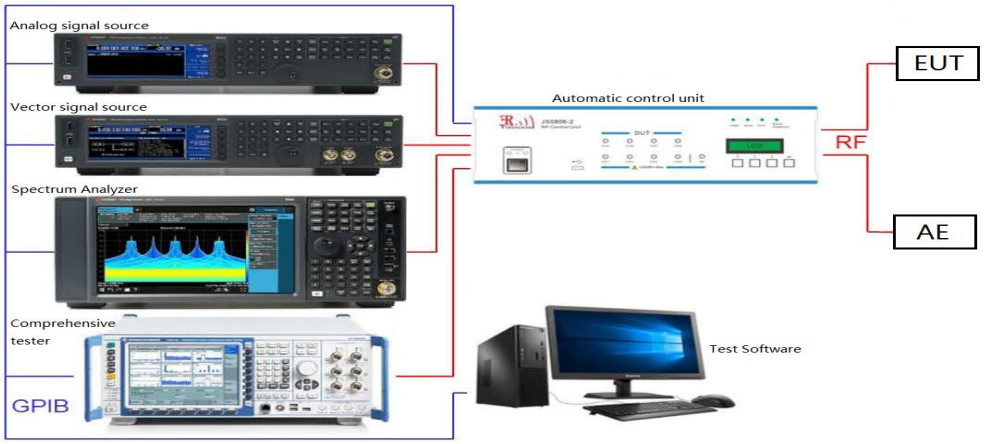
5.Sweep time = auto couple.

6.Trace mode = max hold.

7.Allow trace to fully stabilize.

8. Use peak marker function to determine the peak amplitude level.

### 7.3.4. Test Setup



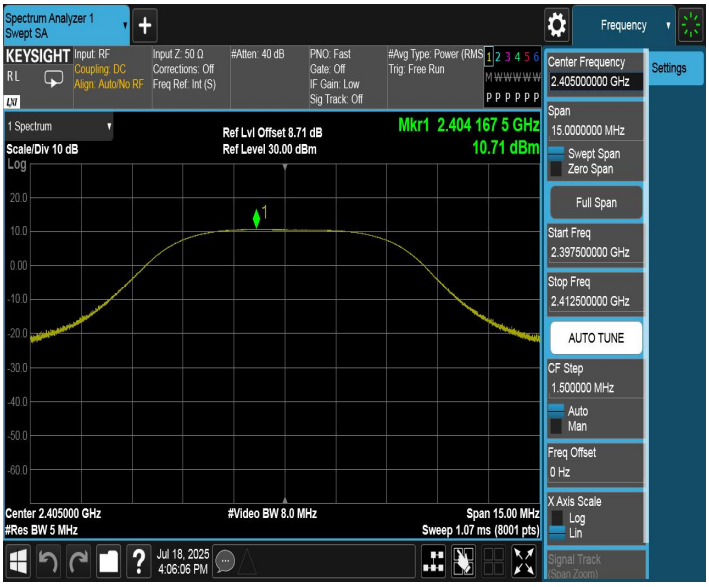

### 7.3.5. Test Result

| | |
|---|---|
| Temperature: | 26.7 ~ 27.8°C |
| Relative Humidity: | 40 ~ 45 % |
| ATM Pressure: | 100.0 ~100.6 kPa |
| Test Data: | 2025-07-18 ~ 2025-07-19 |
| Test Engineer: | Stone Zhang |

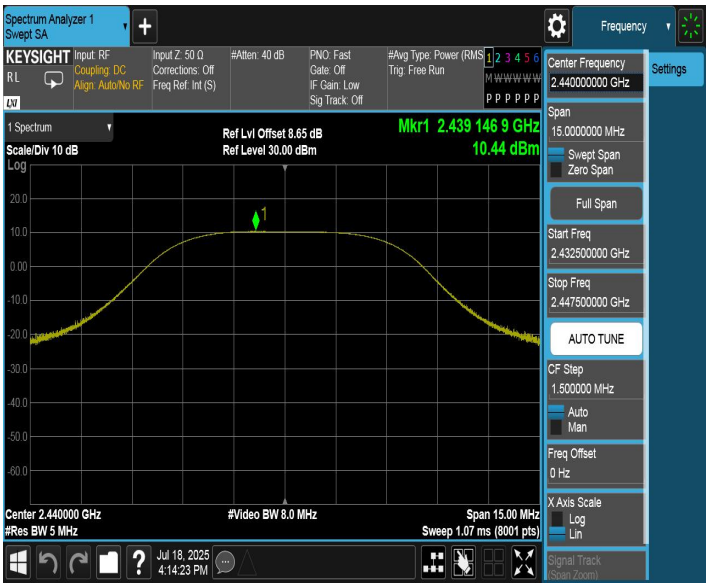
| Test Mode | Antenna | Frequency (MHz) | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|
| ZIGB | Ant1 | 2405 | 10.71 | ≤30 | PASS |
| | | 2440 | 10.44 | ≤30 | PASS |
| | | 2475 | 9.91 | ≤30 | PASS |
| | | 2480 | -0.04 | ≤30 | PASS |

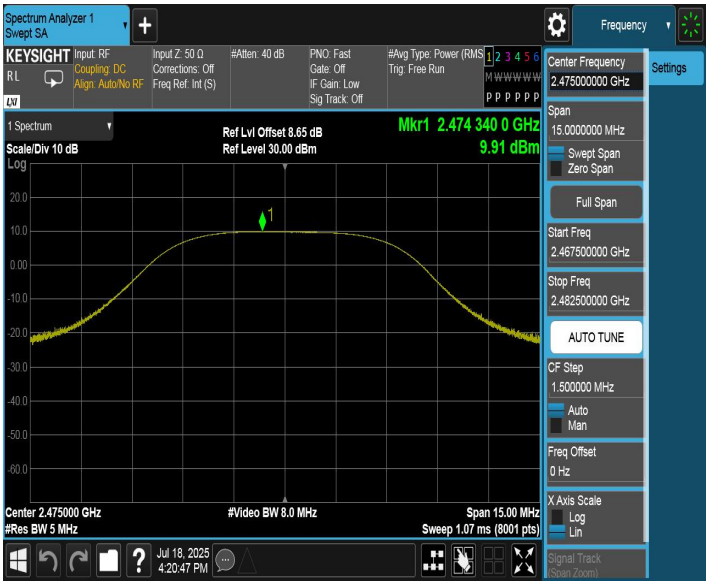
## Test Graphs

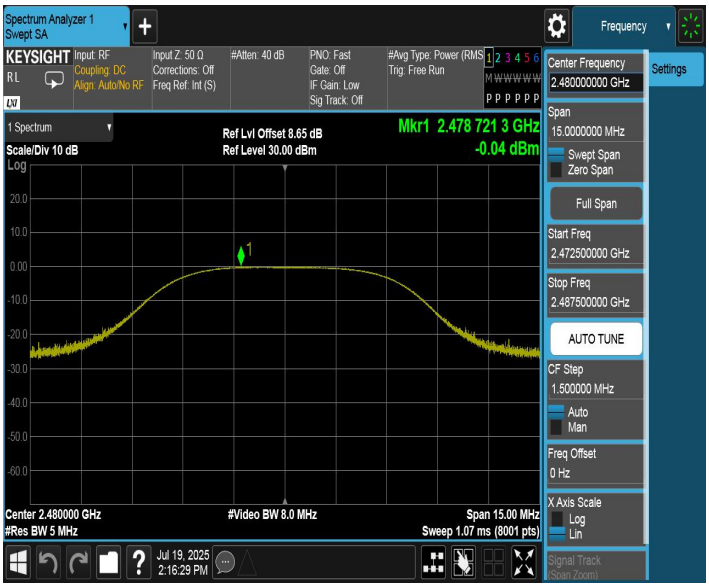
Zigbee_Ant1_2405




Zigbee_Ant1_2440



| Zigbee_Ant1_2475 |
| --- |
|  |

| Zigbee_Ant1_2480 |
| --- |
|  |

## 7.4. Power Spectral Density Measurement

### 7.4.1. Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band. And for antenna gain greater than 6dBi the limit shall reduce by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 7.4.2. Test Procedure Used

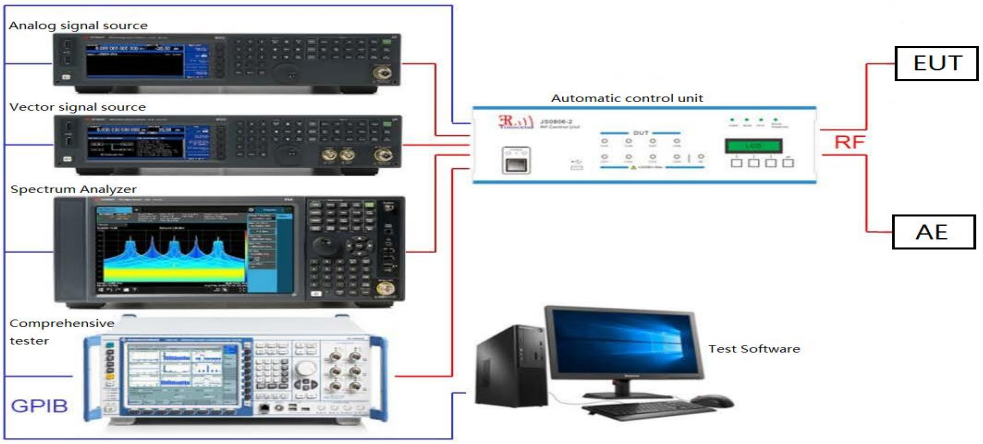
KDB 558074 D01 v05r02 - Section 8.4

ANSI C63.10 – Section 11.10.2

### 7.4.3. Test Setting

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ [3 × RBW].
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.

### 7.4.4. Test Setup

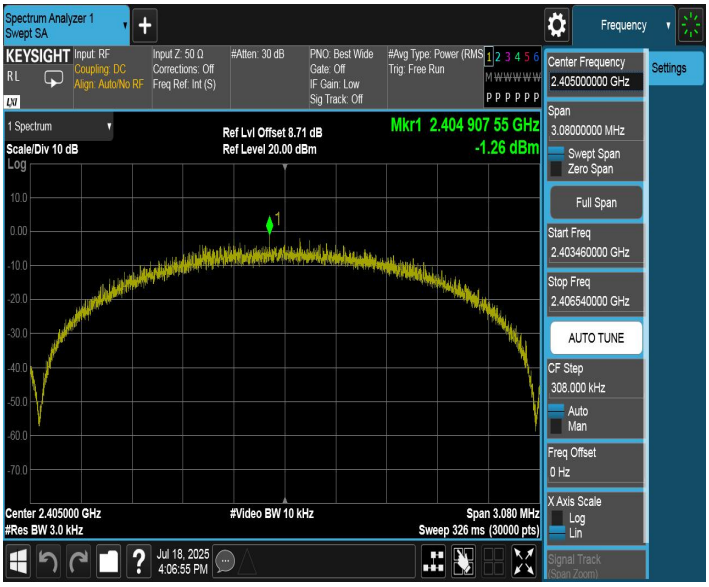
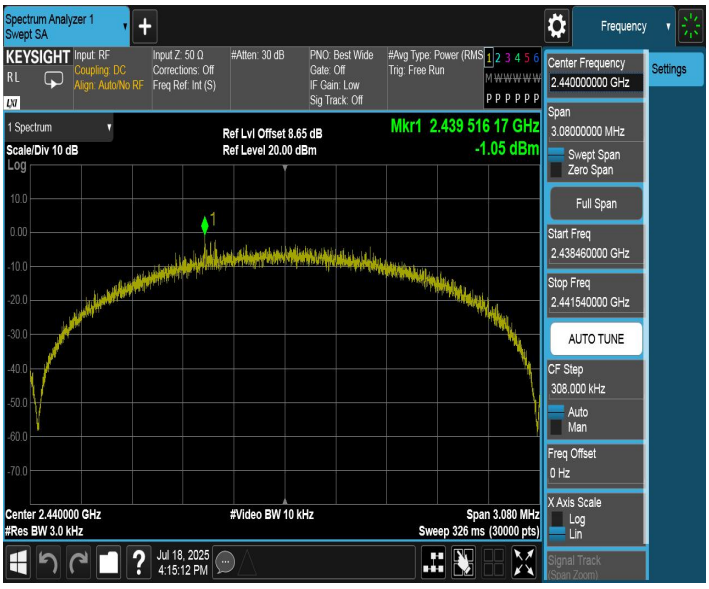


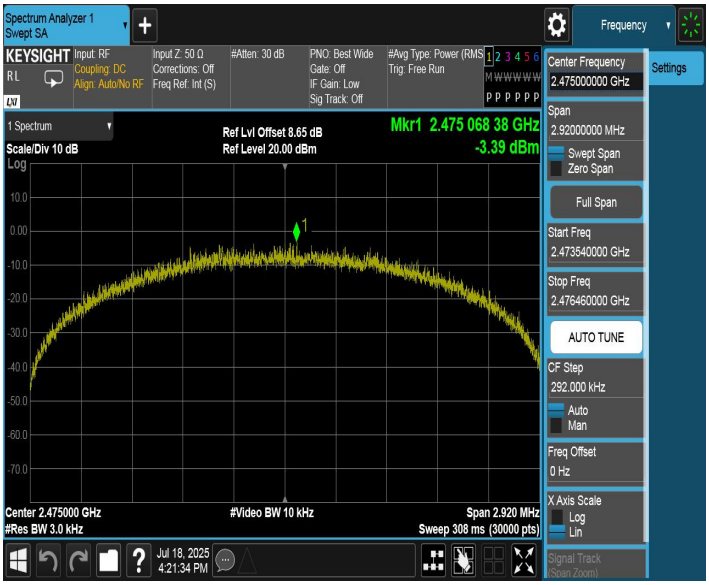
### 7.4.5. Test Result

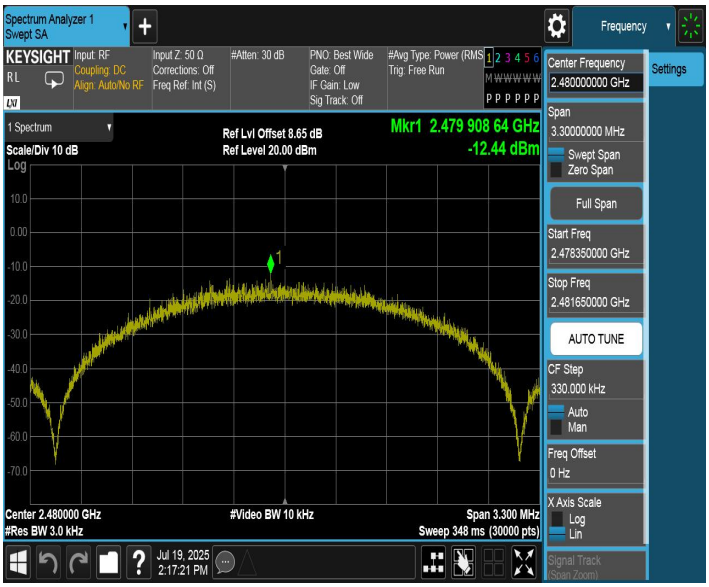
| | |
|---|---|
| Temperature: | 26.7 ~ 27.8°C |
| Relative Humidity: | 40 ~ 45 % |
| ATM Pressure: | 100.0 ~100.6 kPa |
| Test Data: | 2025-07-18 ~ 2025-07-19 |
| Test Engineer: | Stone Zhang |

| Test Mode | Antenna | Frequency (MHz) | Result [dBm/3-100kHz] | Limit[dBm/3kHz] | Verdict |
|---|---|---|---|---|---|
| ZIGB | Ant1 | 2405 | -1.26 | ≤8.00 | PASS |
| | | 2440 | -1.05 | ≤8.00 | PASS |
| | | 2475 | -3.39 | ≤8.00 | PASS |
| | | 2480 | -12.44 | ≤8.00 | PASS |

## Test Graphs

| Zigbee_Ant1_2405 |
| --- |
|  |
| Zigbee_Ant1_2440 |
|  |

| Zigbee_Ant1_2475 |
| --- |
|  |

| Zigbee_Ant1_2480 |
| --- |
|  |

## 7.5. Conducted Band Edge and Out-of-Band Emissions

### 7.5.1. Test Limit

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

### 7.5.2. Test Procedure Used

KDB 558074 D01 v05r02 - Section 8.5 & Section 8.6

ANSI C63.10 – Section 11.11&11.12

### 7.5.3. Test Setting

(a) Set the center frequency and span to encompass frequency range to be measured

(b) RBW = 100kHz

(c) VBW = 300kHz

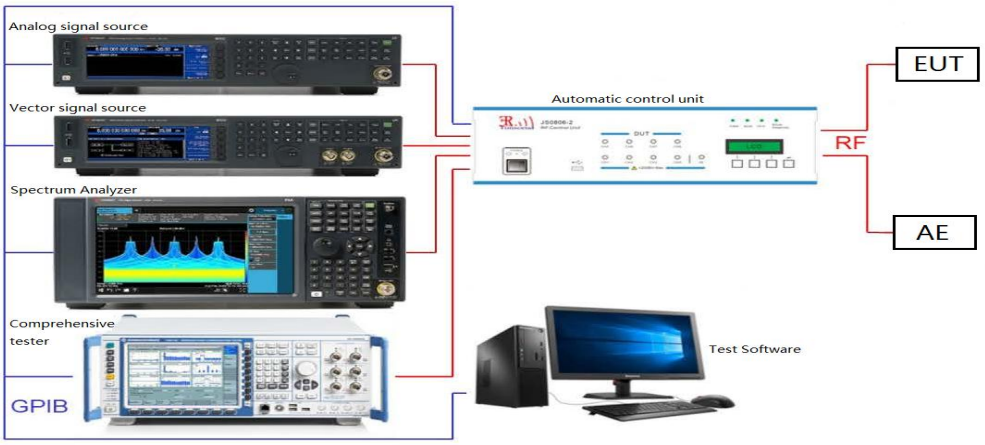
(d) Detector = Peak

(e) Trace mode = max hold

(f) Sweep time = auto couple

(g) The trace was allowed to stabilize

### 7.5.4. Test Setup



### 7.5.5. Test Result

| | |
|---|---|
| Temperature: | 26.7 ~ 27.8°C |
| Relative Humidity: | 40 ~ 45 % |
| ATM Pressure: | 100.0 ~100.6 kPa |
| Test Data: | 2025-07-18 ~ 2025-07-19 |
| Test Engineer: | Stone Zhang |

**Band edge**

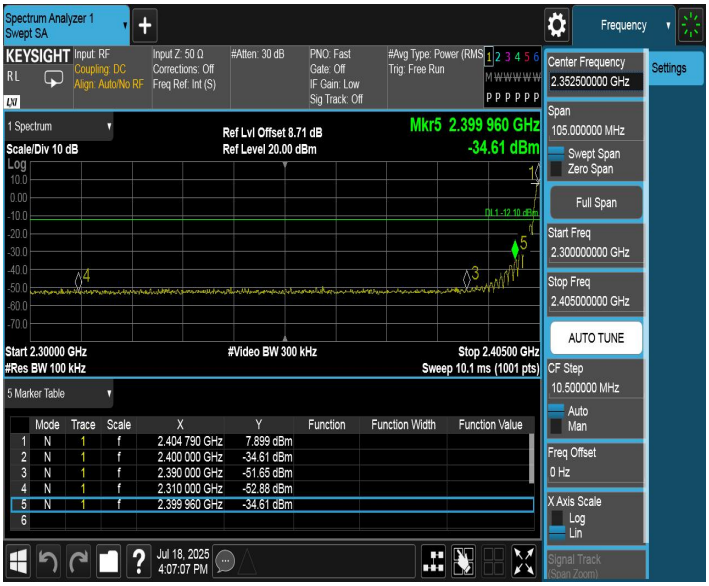
| Test Mode | Antenna | Channel Name | Channel | Ref Level [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| ZIGB | Ant1 | Low | 2405 | 7.90 | -34.61 | ≤-12.10 | PASS |
| | | High | 2475 | 7.41 | -46.21 | ≤-12.59 | PASS |
| | | | 2480 | -2.26 | -40.14 | ≤-22.26 | PASS |

**Conducted Spurious Emission**

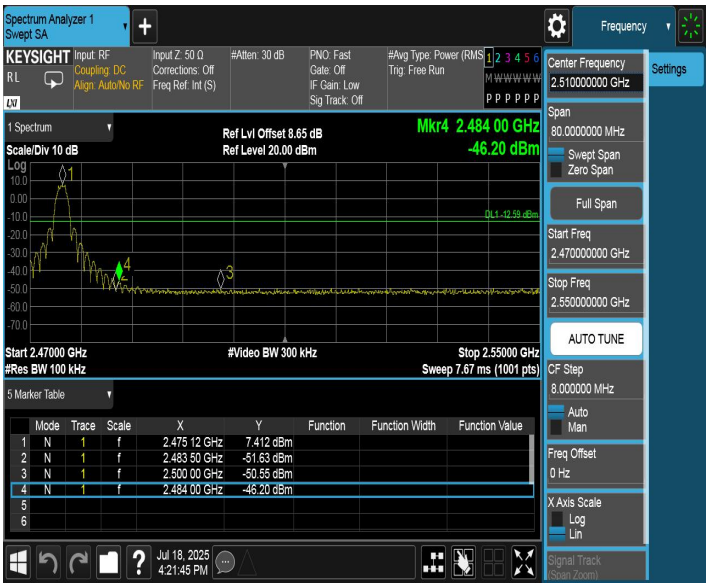
| Test Mode | Antenna | Frequency (MHz) | Frequency Range [MHz] | Ref Level [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| ZIGB | Ant1 | 2405 | Reference | 8.39 | 8.39 | --- | PASS |
| | | | 30~1000 | 8.39 | -40.79 | ≤-11.61 | PASS |
| | | | 1000~26500 | 8.39 | -28.41 | ≤-11.61 | PASS |
| | | 2440 | Reference | 8.29 | 8.29 | --- | PASS |
| | | | 30~1000 | 8.29 | -40.95 | ≤-11.71 | PASS |
| | | | 1000~26500 | 8.29 | -24.67 | ≤-11.71 | PASS |
| | | 2475 | Reference | 8.07 | 8.07 | --- | PASS |
| | | | 30~1000 | 8.07 | -41.22 | ≤-11.93 | PASS |
| | | | 1000~26500 | 8.07 | -32.31 | ≤-11.93 | PASS |
| | | 2480 | Reference | -2.59 | -2.59 | --- | PASS |
| | | | 30~1000 | -2.59 | -40.69 | ≤-22.59 | PASS |
| | | | 1000~26500 | -2.59 | -32.91 | ≤-22.59 | PASS |

## Test Graphs of Band Edge

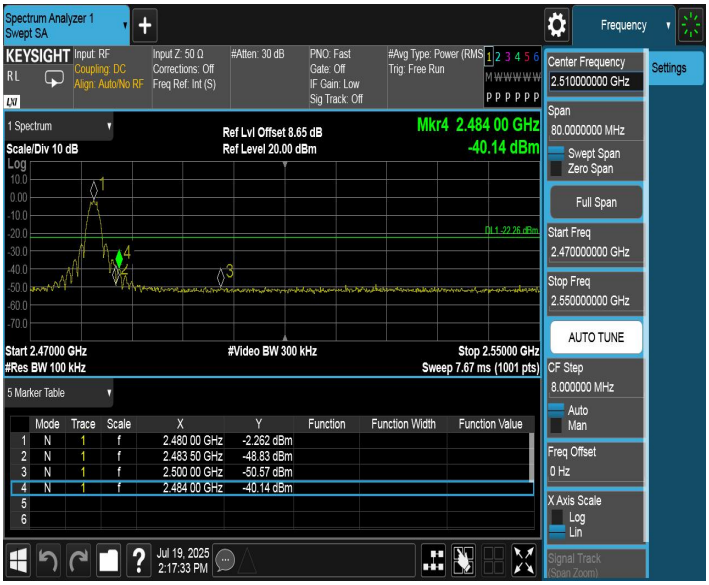
Zigbee_Ant1_Low_2405




Zigbee_Ant1_High_2475

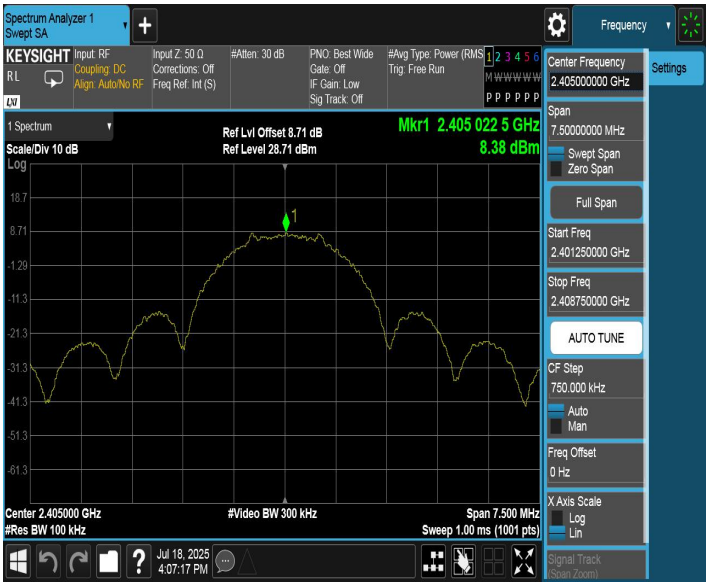


Zigbee_Ant1_High_2480

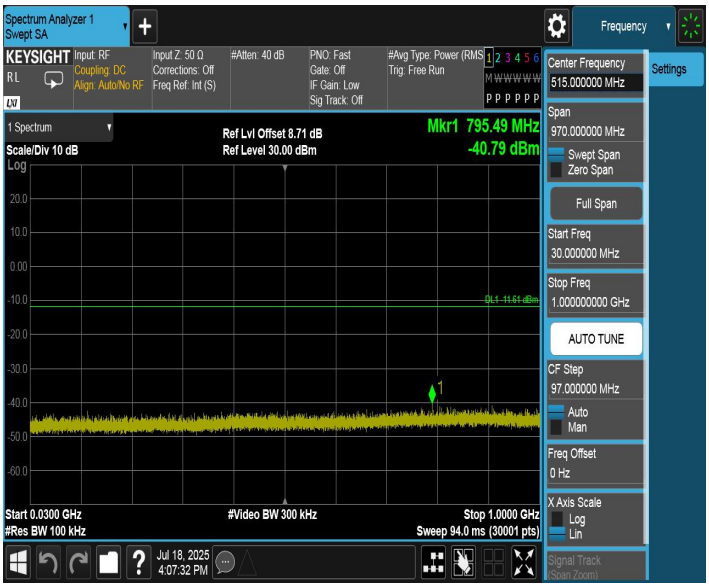


## Test Graphs of Out-of-Band Emissions

Zigbee_Ant1_2405_0~Reference

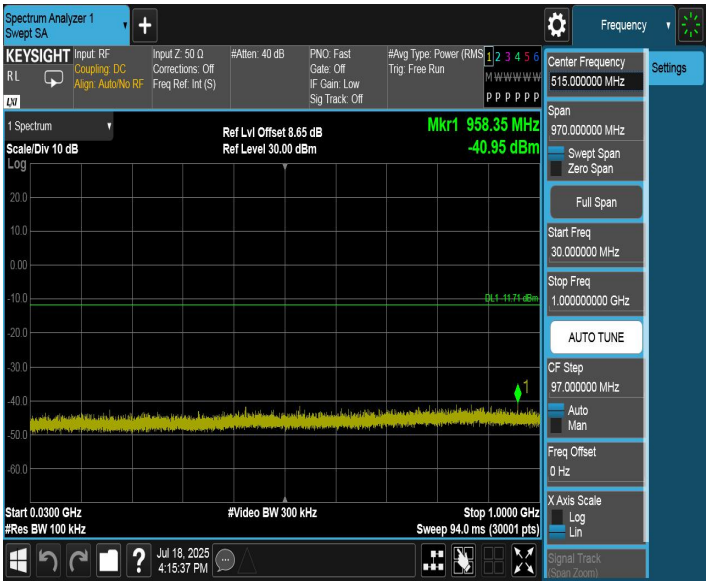



Zigbee_Ant1_2405_30~1000

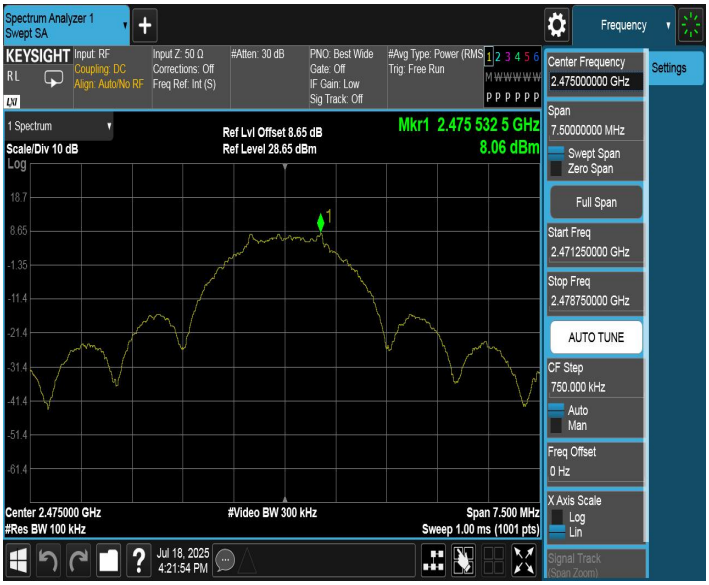


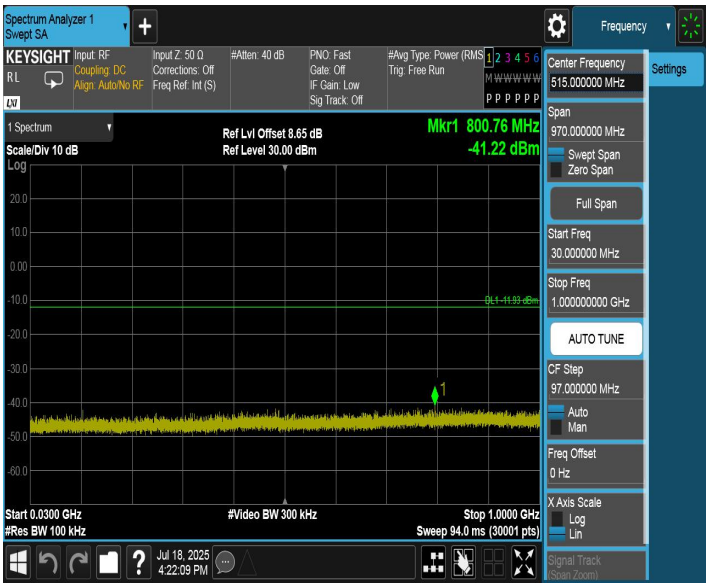
| Zigbee_Ant1_2405_1000~26500 |
| --- |
|  |

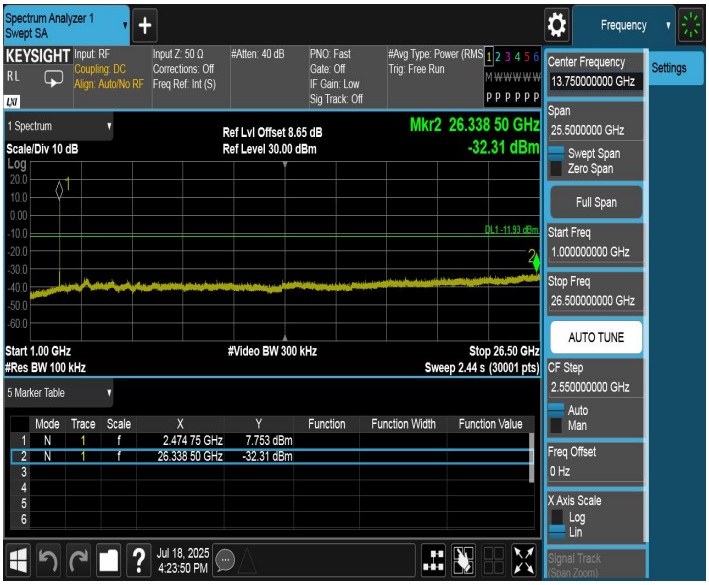
| Zigbee_Ant1_2440_0~Reference |
| --- |
|  |

| Zigbee_Ant1_2440_30~1000 |
| --- |
|  |

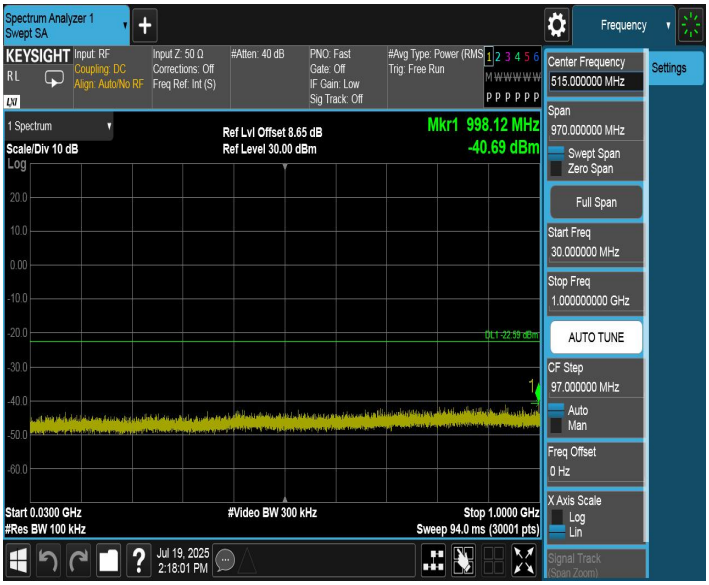
| Zigbee_Ant1_2440_1000~26500 |
| --- |
|  |

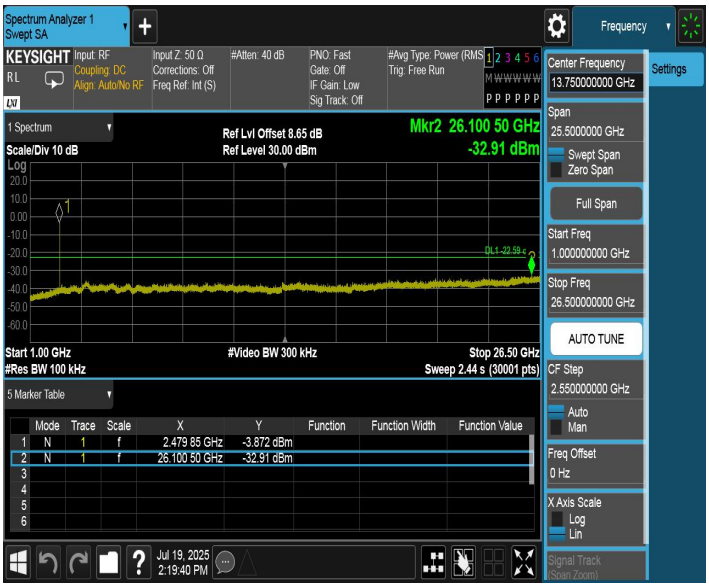
| Zigbee_Ant1_2475_0~Reference |
| --- |
|  |

| Zigbee_Ant1_2475_30~1000 |
| --- |
|  |

| Zigbee_Ant1_2475_1000~26500 |
| --- |
|  |

| Zigbee_Ant1_2480_0~Reference |
| --- |
|  |

| Zigbee_Ant1_2480_30~1000 |
| --- |
|  |

| Zigbee_Ant1_2480_1000~26500 |
| --- |
|  |