



## Test Report - FCC Part 15.247/ DTS

FCC ID: IPH-04937

Applicant: Garmin International Inc.

Signature:

A handwritten signature in black ink, appearing to read "Tim Royer", is written over a horizontal line.

Sr. EMC Engineer  
EMC-003838-NE



Name & Title:

Tim Royer, Lab Manager

Date of Signature

12/18/2025

Prepared By:

Mark Learner, Technical Writer

This test report relates only to the items tested as identified and is not valid for any subsequent changes or modifications made to the equipment under test.

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## 1. Applicant Information

Applicant: Garmin International Inc.  
Address: 1200 East 151st Street  
Olathe, KS 66062, USA

### 1.1 Test Result Summary

The following test procedure and guidance were used for measuring Digital Transmission System (DTS); FCC KDB 558074 D01 DTS Measurement Guidance and ANSI C63.10-2020. Full test results are available in this report.

No additions to the test methods were needed. There were no deviations, or exclusions from the test methods. No test results are from external providers or from the customer. The test results relate only to the items tested. IIA Lab Services LLC does not offer opinions and interpretations, only a pass/fail statement.

| Applicable Clauses from Part 2 or KDB |                                 |                           |
|---------------------------------------|---------------------------------|---------------------------|
| FCC Clauses                           | Description of the requirements | Result: (Pass, Fail, N/A) |
| KDB 558074 D01                        | Duty Cycle                      | Reported                  |
| KDB 558074 D01                        | 99 % Bandwidth                  | Reported                  |
| KDB 558074 D01                        | Band-edge measurements          | Pass                      |

| Applicable Clauses from Part 15.247 |                                                  |                           |
|-------------------------------------|--------------------------------------------------|---------------------------|
| FCC Clauses                         | Description of the requirements                  | Result: (Pass, Fail, N/A) |
| 15.247 (a) (1) – (1) (iii)          | FHSS hopping requirements (1, i,ii,iii)          | N/A                       |
| 15.247 (a) (1)                      | FHSS 20dB Bandwidth                              | N/A                       |
| 15.247 (a) (2)                      | DTS 6dB Bandwidth                                | Pass                      |
| 15.247 (b) (1) – (4)                | Conducted output power                           | Pass                      |
| 15.247 (c) (1) – (2)                | Operation with directional antenna gains > 6 dBi | N/A                       |
| 15.247 (d), 15.215 (b)              | Conducted Emissions in Non-restricted bands      | Pass                      |
| 15.247 (d), 15.215 (b)              | Conducted Emissions at the Band-edge             | Pass                      |
| 15.247 (e)                          | Power Spectral Density (PSD)                     | Pass                      |
| 15.247 (f)                          | Hybrid system hopping requirements               | N/A                       |
| 15.247 (f)                          | Hybrid system Power Spectral Density             | N/A                       |
| 15.247 (g)                          | FHSS System requirements                         | N/A                       |
| 15.247 (h)                          | FHSS spectrum sensing                            | N/A                       |

| Applicable Clauses from Part 2 and Part 15 Subpart C |                                        |                           |
|------------------------------------------------------|----------------------------------------|---------------------------|
| FCC Clauses                                          | Description of the requirements        | Result: (Pass, Fail, N/A) |
| 15.203                                               | Antenna requirements                   | Pass                      |
| 15.205                                               | Restricted bands of operation          | Pass                      |
| 15.207                                               | AC Power Conducted Emissions           | N/A                       |
| 15.209                                               | Radiated Emissions in Restricted bands | Pass                      |
| 15.211                                               | Tunnel Radio Systems                   | N/A                       |
| 15.212 (a)                                           | Single Modular Transmitter             | N/A                       |
| 15.212 (b)                                           | Limited Modular Transmitter            | N/A                       |
| 15.213                                               | Cable Locating Equipment               | N/A                       |

## 2. Location of Testing

### 2.1 Test Laboratory

IIA Lab Services LLC. is a subsidiary of Industrial Inspection & Analysis, Inc. ("IIA"). Testing was performed at IIA's permanent laboratory located at 13146 NW 86<sup>th</sup> Drive, Suite 400, Alachua, Florida 32615.

FCC test firm # 578780

FCC Designation # US1070

FCC site registration is under A2LA certificate # 0955.01

ISED Canada test site registration # 2056A

EU Notified Body # 1177

For all designations see A2LA scope # 0955.01

## 3. Test Sample(s) (EUT/DUT)

The test sample was received: 6/18/2025

Dates of Testing: 8/25/2025 – 12/05/2025

### 3.1 Description of the EUT

A description as well as unambiguous identification of the EUT(s) tested. Where more than one sample is required for technical reasons (such as the use of connected units for the purpose of conducted output power testing where the product units will have integral antennas), each specific test shall identify which unit was tested.

| Identification    |                              |
|-------------------|------------------------------|
| FCC ID:           | IPH-04937                    |
| Brief Description | Portable Digital Transceiver |
| Model(s) #        | A04937                       |
| Firmware version  | N/A                          |
| Software version  | 0.03.1849+1d08               |
| Serial Number     | EP2-4                        |

| Technical Characteristics    |                     |
|------------------------------|---------------------|
| Frequency Range              | 2402 – 2480 MHz     |
| RF O/P Power (Max.)          | 14.10 dBm (25.7 mW) |
| Modulation                   | GFSK                |
| Bandwidth & Emission Class   | 749.30 KHz          |
| Duty Cycle                   | 100%                |
| Antenna Connector            | N/A                 |
| Voltage Rating (AC or Batt.) | 12v DC              |

Note: Information such as antenna gain, firmware/software numbers are provided by manufacturer and cannot be validated by the test lab.

### 3.2 Configuration of EUT

| Band (MHz)  | Mode                     | Number of Ant. |
|-------------|--------------------------|----------------|
| 2400-2483.5 | Mode 1: Transmit – 1M    | 1              |
| 2400-2483.5 | Mode 2: Transmit – Coded | 1              |

#### Operating conditions during Testing:

No modifications of the device under test (including firmware, specific software settings, and input/output signal levels to the EUT).

#### Peripherals used during Testing:

No peripherals used.

### 3.3 Test Setup of EUT

Equipment, antenna, and cable arrangement. The setup of the equipment and cable or wire placement on the test site that produces the highest radiated and the highest ac power line conducted emissions shall be shown clearly and described. Information on the orientation of portable equipment during testing shall be included. Drawings or photographs may be used for this purpose.

Test Setups are included in the test report.

## 4. Test methods & Applicable Regulatory Limits

### 4.1 Test methods/Standards/Guidance:

Test procedures and guidance for measuring Digital Transmission System (DTS) are provided in the FCC KDB 558074 D01 DTS Measurement Guidance and in Clause 11 of ANSI C63.10-2020.

- 1) ANSI C63.10-2020
- 2) FCC KDB 558074 D01

### 4.2 Applied Limits and Regulatory Limits:

- 3) FCC CFR 47 Part 15.247 (2020)

## 5. Measurement Uncertainty

| Parameter                                                                                                                                                                   | Uncertainty (dB) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Conducted Emissions                                                                                                                                                         | $\pm 3.14$ dB    |
| Radiated Emissions (9kHz – 30 MHz)                                                                                                                                          | $\pm 3.08$ dB    |
| Radiated Emissions (30 – 200 MHz)                                                                                                                                           | $\pm 2.16$ dB    |
| Radiated Emissions (200 – 1000 MHz)                                                                                                                                         | $\pm 2.15$ dB    |
| Radiated Emissions (1 GHz – 18 GHz)                                                                                                                                         | $\pm 2.14$ dB    |
| Radiated Emissions (18 GHz – 40 GHz)                                                                                                                                        | $\pm 2.31$ dB    |
| <b>Note:</b> The uncertainties provided in this table represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of K=2. |                  |

## 6. Environmental Conditions

### 6.1 Temperature & Humidity

Measurements performed at the test site did not exceed the following:

|                                                                                                                                 |             |
|---------------------------------------------------------------------------------------------------------------------------------|-------------|
| Temperature                                                                                                                     | 23 C +/- 5% |
| Humidity                                                                                                                        | 55% +/- 5%  |
| Barometric pressure                                                                                                             | 30.05 inHg  |
| <b>Note:</b> Specific environmental conditions that are applicable to a specific test are available in the test result section. |             |

## 7. List of Test Equipment and Test Facility

The test equipment used identified by type, manufacturer, serial number, or other identification and the date on which the next calibration or service check is due.

Description of the firmware or software used to operate EUT for testing purposes.

A complete list of all test equipment used shall be included with the test report. The manufacturer's model and serial numbers, and date of last calibration, and calibration interval shall be included. Measurement cable loss, measuring instrument bandwidth and detector function, video bandwidth, if appropriate, and antenna factors shall also be included where applicable.

### 7.1 List of Test Equipment

| Test Equipment |                               |                 |             |          |             |            |
|----------------|-------------------------------|-----------------|-------------|----------|-------------|------------|
| Type           | Device                        | Manufacturer    | Model       | SN#      | Current Cal | Cal Due    |
| Antenna        | Double-Ridged Horn/ETS Horn 1 | ETS-Lindgren    | 3117        | 00035923 | 5/31/23     | 5/30/2026  |
| CHAMBER        | CHAMBER                       | Panashield      | 3M          | N/A      | 12/29/23    | 12/18/2025 |
| Pre-amp        | Pre-amp                       | RF-LAMBDA       | RLNA00M45GA | NA       | 9/3/25      | 9/2/2028   |
| Receiver       | EMI Test Receiver R&S ESW44   | Rohde & Schwarz | ESW44       | 103049   | 1/20/2025   | 1/20/2028  |
| Receiver       | EMI Test Receiver R&S ESU 40  | Rohde & Schwarz | ESU 40      | 100320   | 9/18/24     | 9/18/2027  |

| Software       |                 |                          |               |
|----------------|-----------------|--------------------------|---------------|
| Software       | Author          | Version                  | Validation on |
| ESU Firmware   | Rohde & Schwarz | 4.43 SP3; BIOS v5.1-24-3 | 2018          |
| RSCCommander   | Rohde & Schwarz | 1.6.4                    | 2014          |
| ScopeExplorer  | LeCroy          | v2.25.0.0                | 2009          |
| Field Strength | IIA             | v4.10.7.0                | 2016          |

## 8. Test Results

The results of the test are usually indicated in the form of tables, spectrum analyzer plots, charts, sample calculations, as appropriate for each test procedure.

A description and/or a block diagram of the test setup is usually provided.

The measurement results, along with the appropriate limits for comparison, may be presented in tabular or graphical form. In addition, any variation in the measurement environment may be reported if applicable (e.g., a significant change of temperature that could affect the cable loss and amplifier response).

Unless noted otherwise in the referenced standard, the measurements of **ac power-line conducted emissions and conducted power output** will be reported in units of dB $\mu$ V. Unless noted otherwise in the referenced standard, the measurements of **radiated emissions** will be reported in units of decibels, referenced to one microvolt per meter (dB $\mu$ V/m) for electric fields, or to one ampere per meter (dBA/m) for magnetic fields, at the distance specified in the appropriate standards or requirements. The measurements of antenna-conducted power for receivers may be reported in units of dB $\mu$ V if the impedance of the measuring instrument is also reported. Otherwise, antenna-conducted power will be reported in units of decibels referenced to one milliwatt (dBm). All formulas for data conversions and conversion factors, if used, will be included in this measurement report.

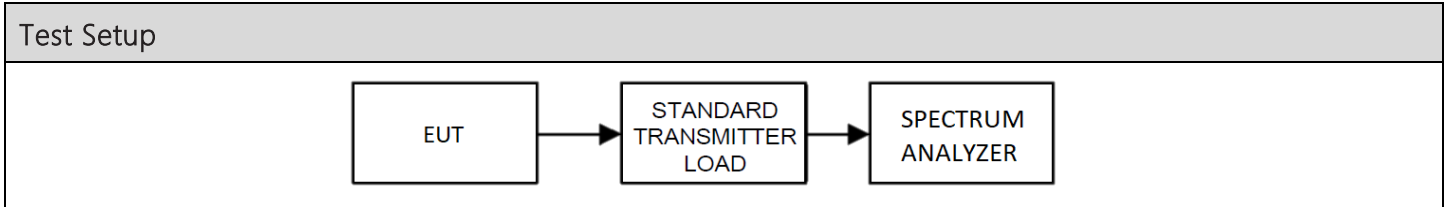
### Example:

|            |               |              |          |                          |
|------------|---------------|--------------|----------|--------------------------|
| Freq (MHz) | Meter Reading | + ACF        | +CL      | = FS                     |
| 33         | 20 dB $\mu$ V | + 10.36 dB/m | +0.40 dB | =30.36 dB $\mu$ V/m @ 3m |

$EIRP = P_{cond} \text{ (dBm)} + dBi$

## 8.1 DTS conducted output power – 1M

Limits from FCC Part 15.247 (b) (3) and test procedure from ANSI C63.10-2020 section 11.9

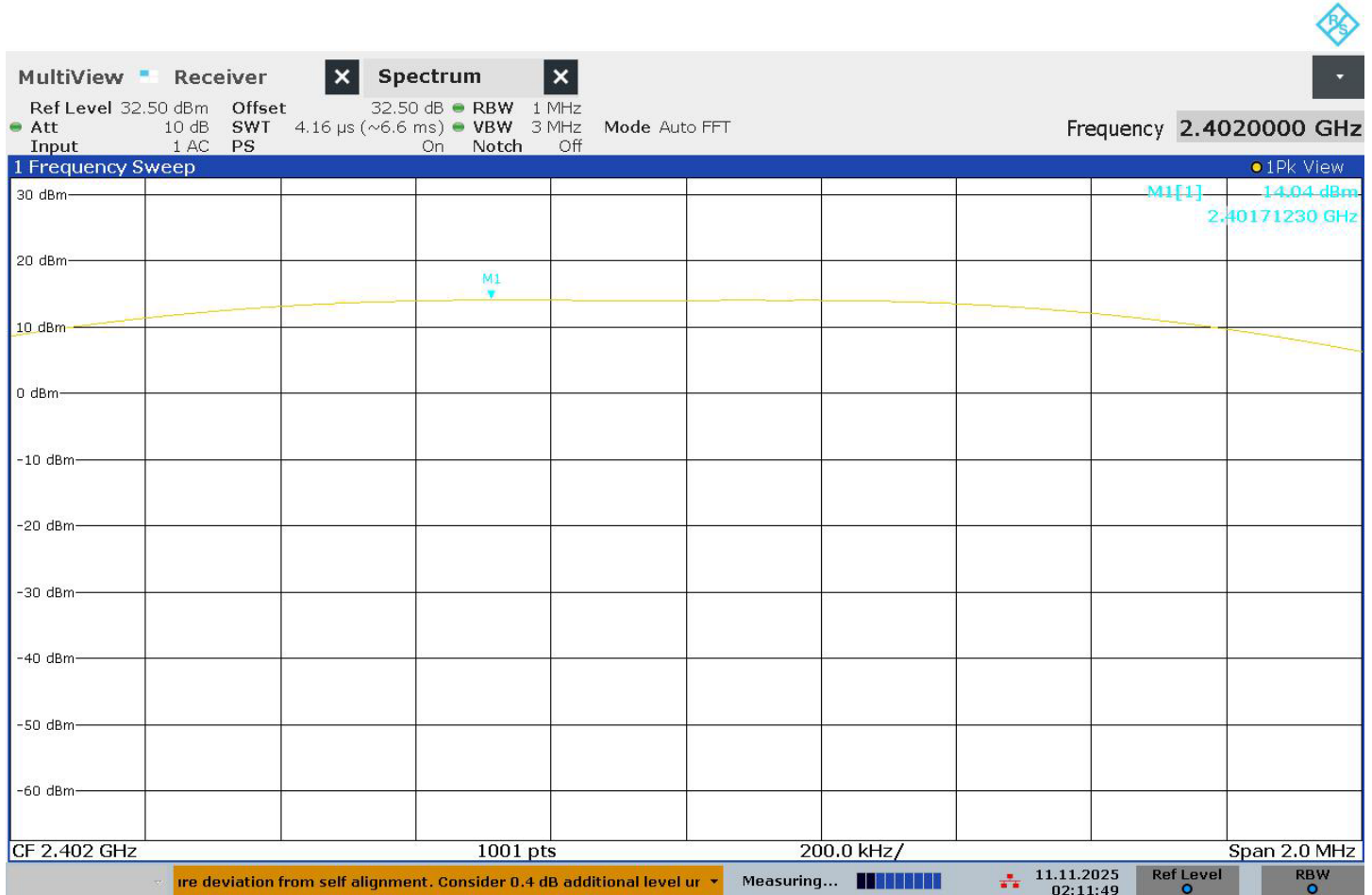


| Test Results, Mode 1 – 1M |                         |
|---------------------------|-------------------------|
| Tuned Frequency (MHz)     | Peak Power Output (dBm) |
| 2402                      | 14.04                   |
| 2442                      | <b>14.10</b>            |
| 2480                      | 13.87                   |

- MAXIMUM Conducted Output Power = 14.10 dBm

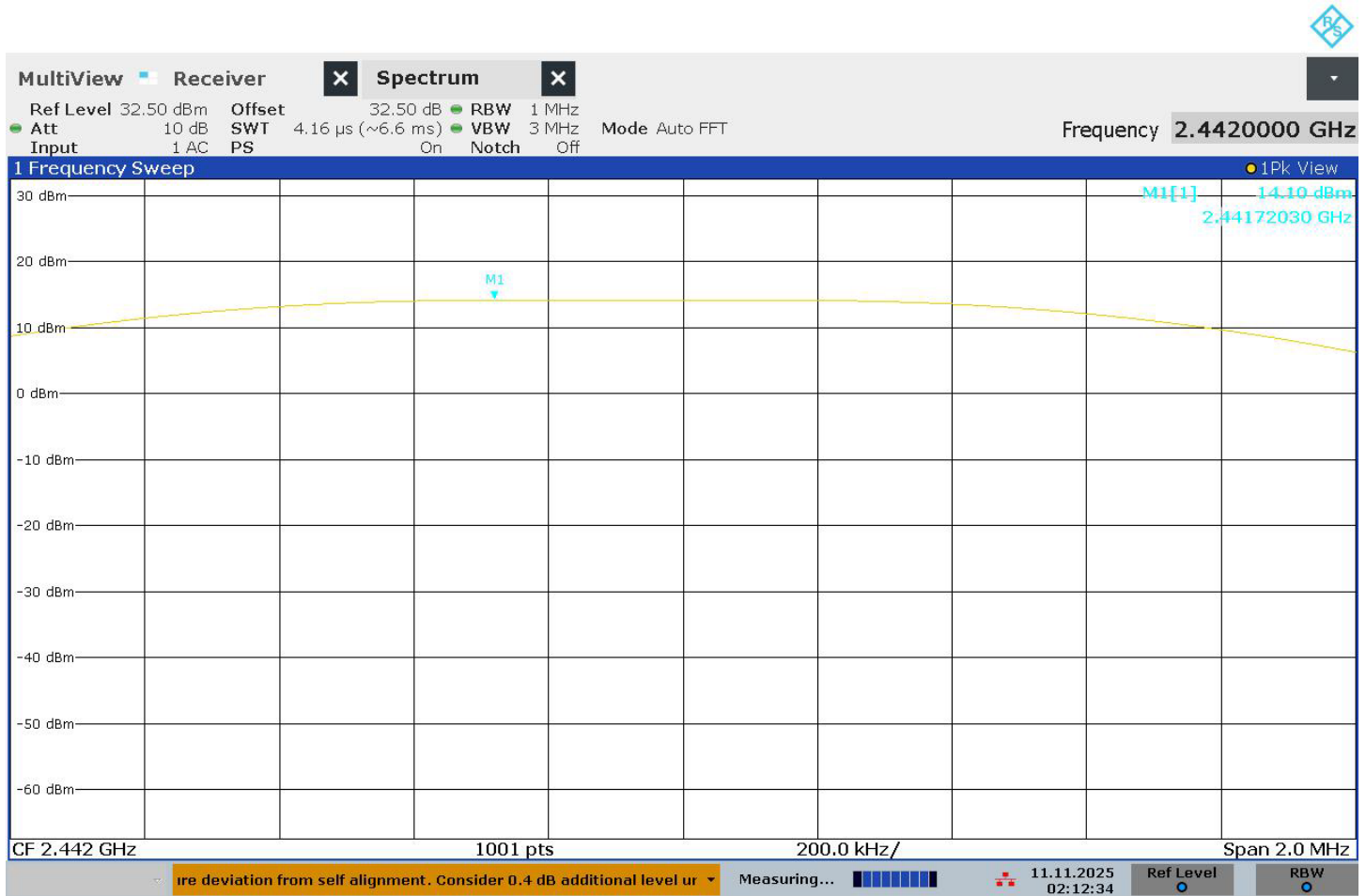
## Conducted Output Power, Spectrum Plots

### 8.1.1 Conducted Output Power, 2402 MHz



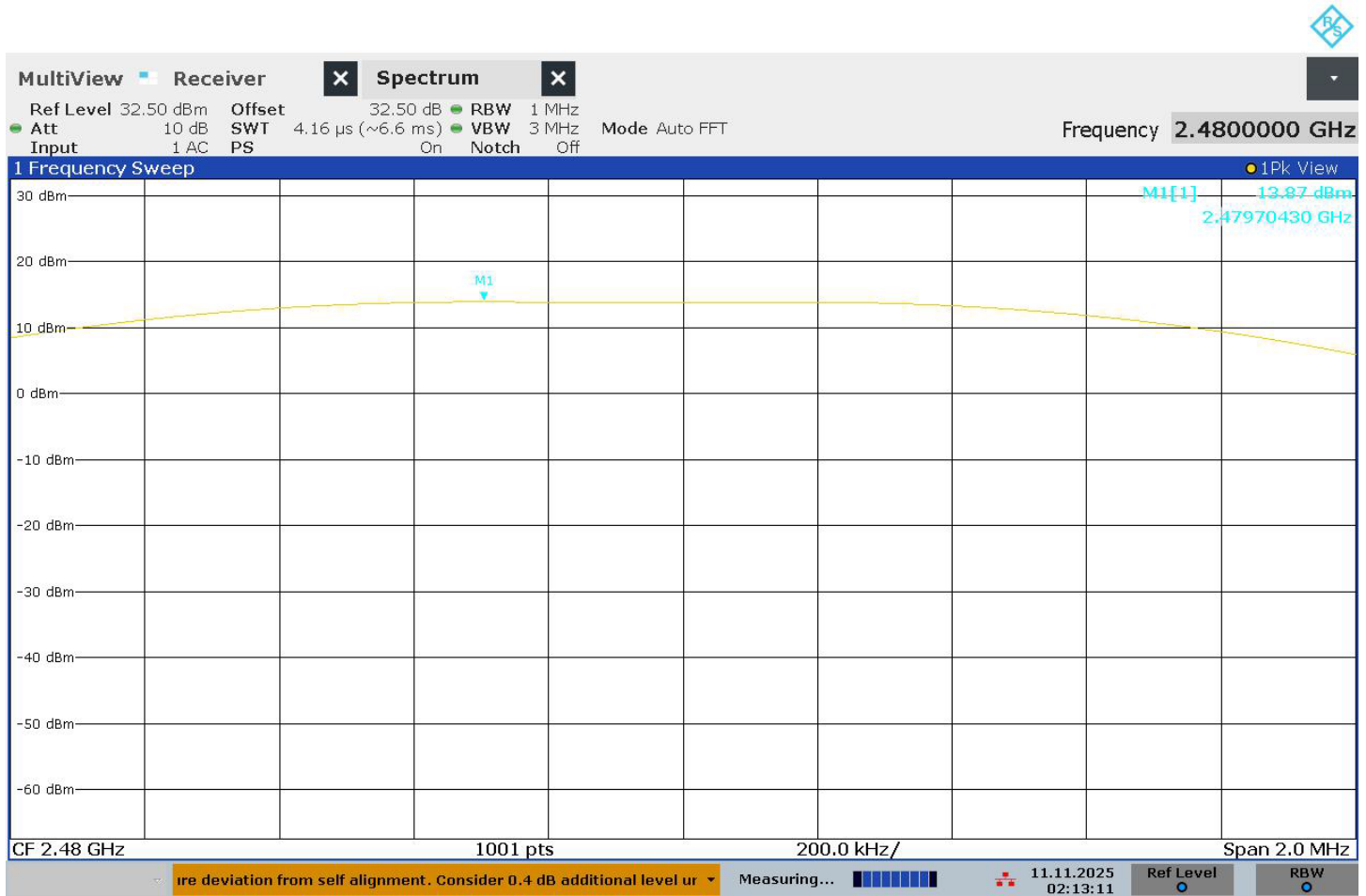
02:11:50 11.11.2025

## 8.1.2 Conducted Output Power, 2442 MHz



02:12:34 11.11.2025

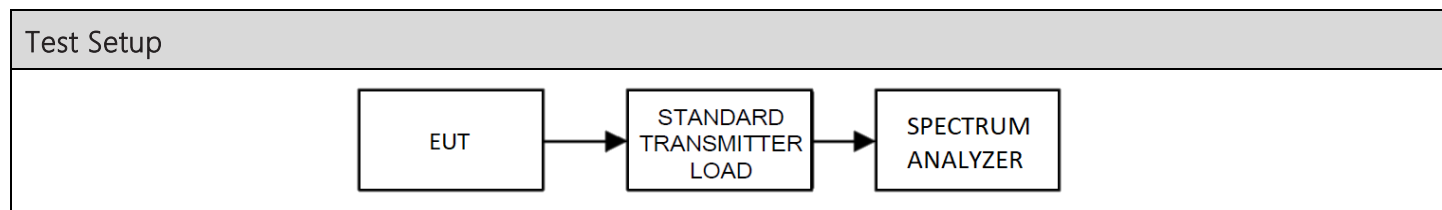
### 8.1.3 Conducted Output Power, 2480 MHz



02:13:11 11.11.2025

## 8.2 DTS conducted output power – Coded

Limits from FCC Part 15.247 (b) (3) and test procedure from ANSI C63.10-2020 section 11.9

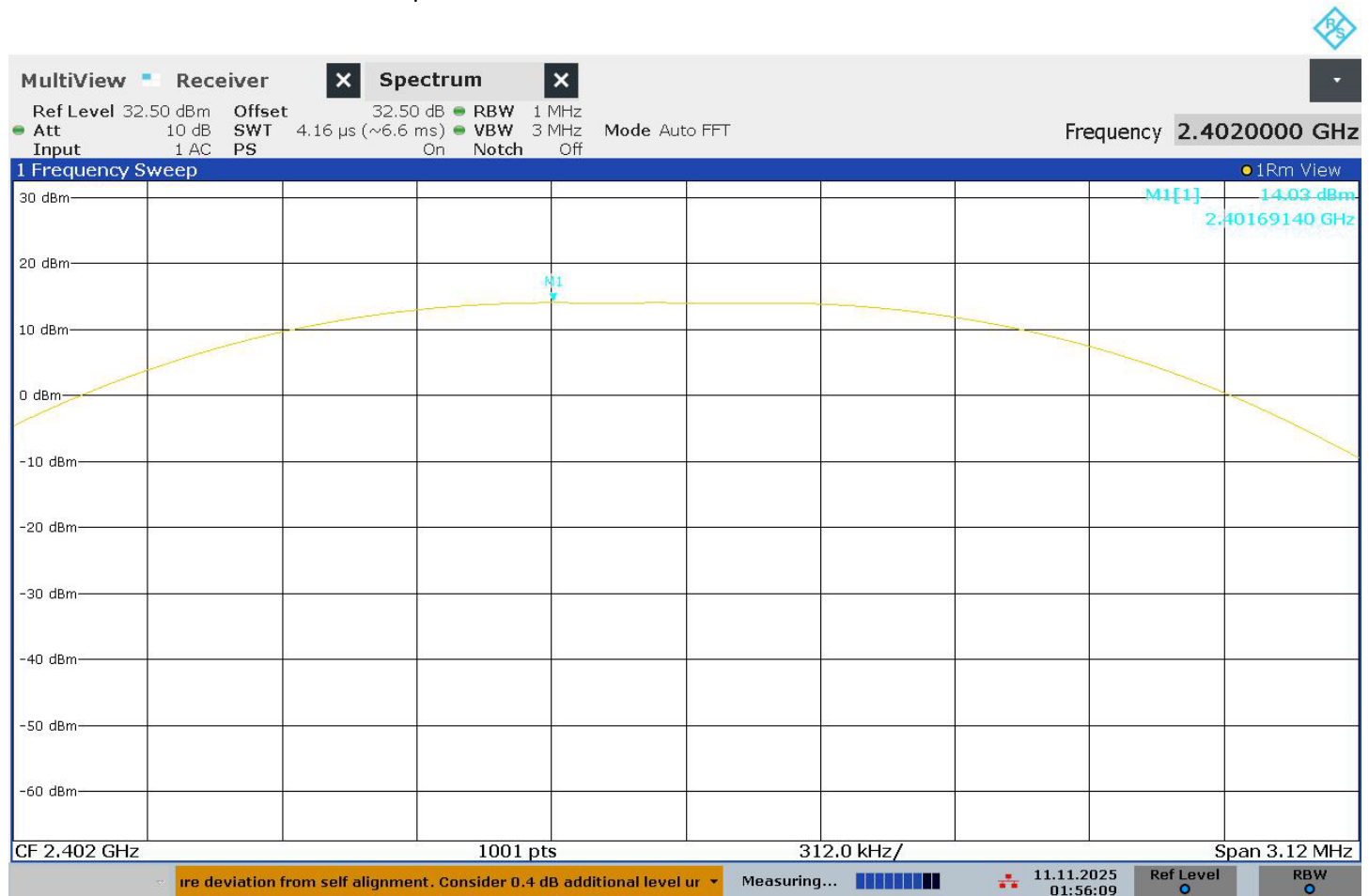


| Test Results, Mode 2 - Coded |                    |
|------------------------------|--------------------|
| Tuned Frequency (MHz)        | Power Output (dBm) |
| 2402                         | 14.03              |
| 2442                         | <b>14.12</b>       |
| 2480                         | 13.90              |

- MAXIMUM Conducted Output Power = 14.12 dBm

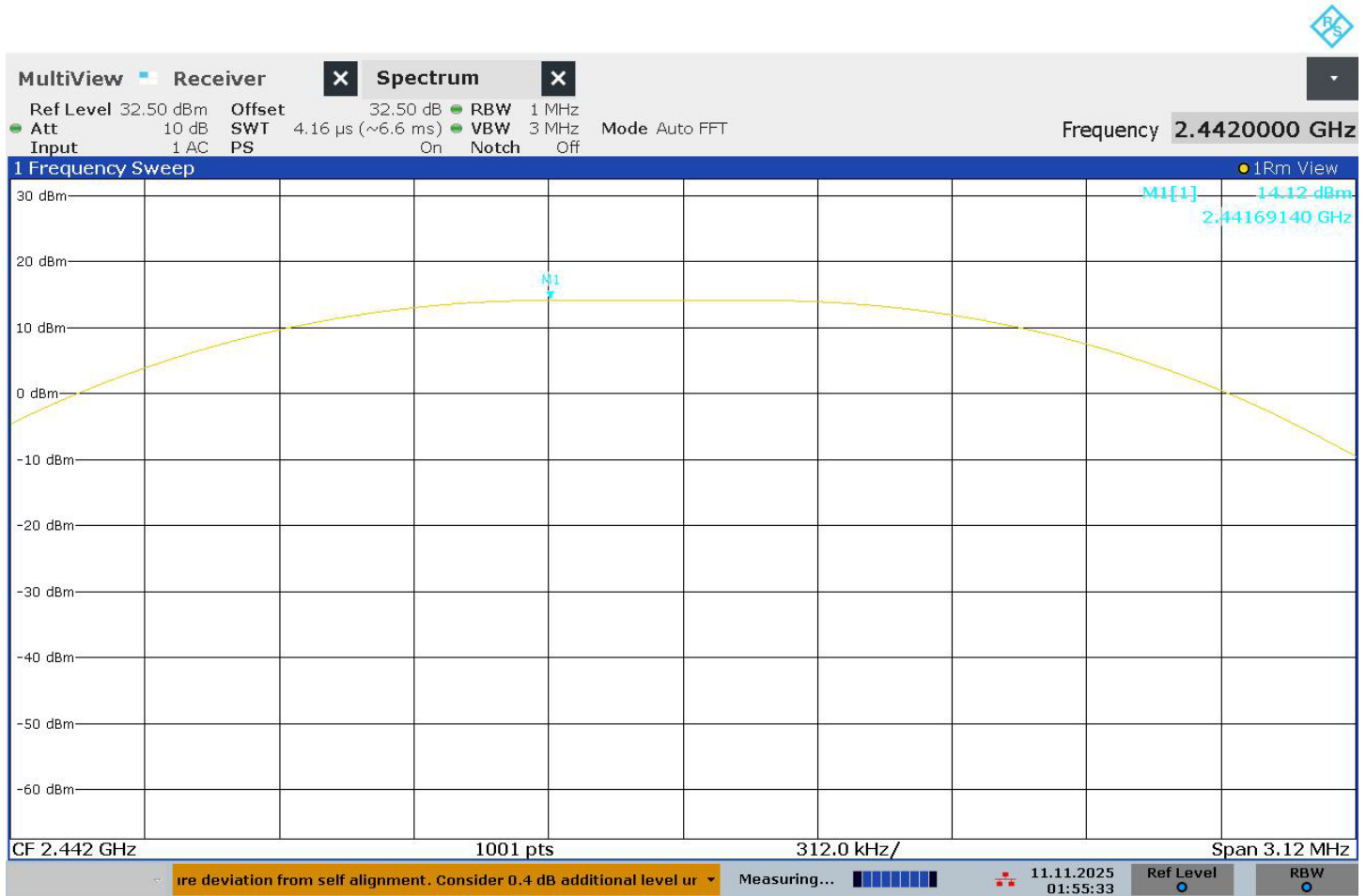
## Conducted Output Power, Spectrum Plots

### 8.2.1 Conducted Output Power, 2402 MHz



01:56:09 11.11.2025

## 8.2.2 Conducted Output Power, 2442 MHz



01:55:33 11.11.2025

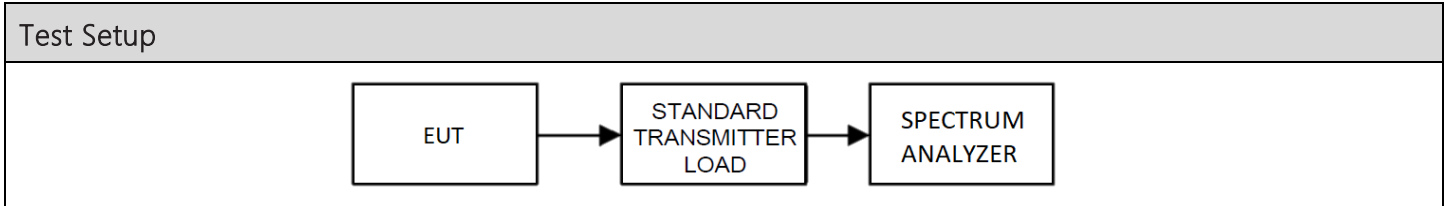
## 8.2.3 Conducted Output Power, 2480 MHz



01:54:59 11.11.2025

### 8.3 Occupied Bandwidth – 1M

Requirement from FCC KDB 558074 D01 and test procedure from ANSI C63.10-2020 section 6.9.3

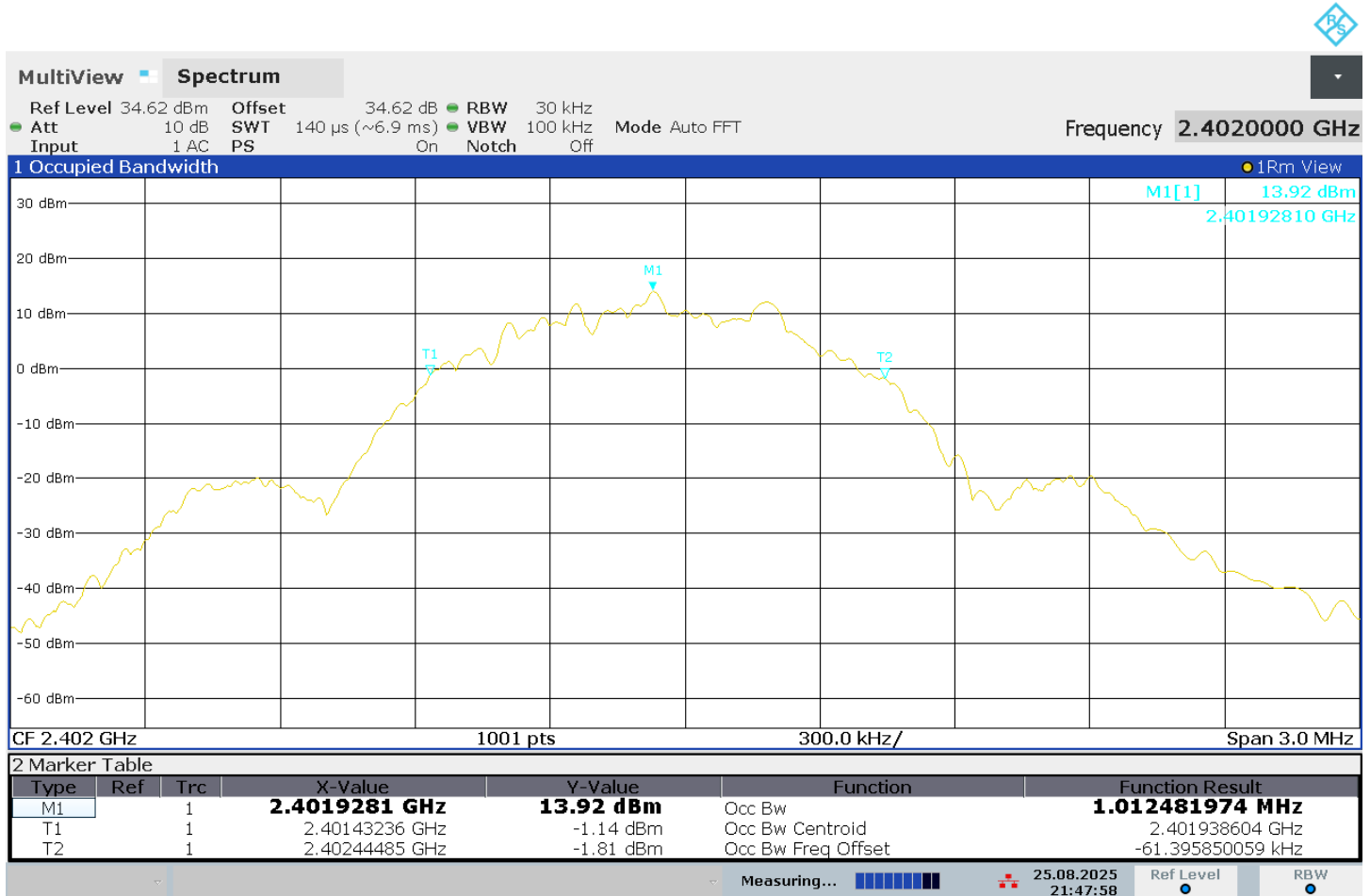


### 99% BW Test Results

| Tuned Frequency (MHz) | 99% BW (MHz) |
|-----------------------|--------------|
| 2402                  | 1.013        |
| 2442                  | 1.015        |
| 2480                  | 1.019        |

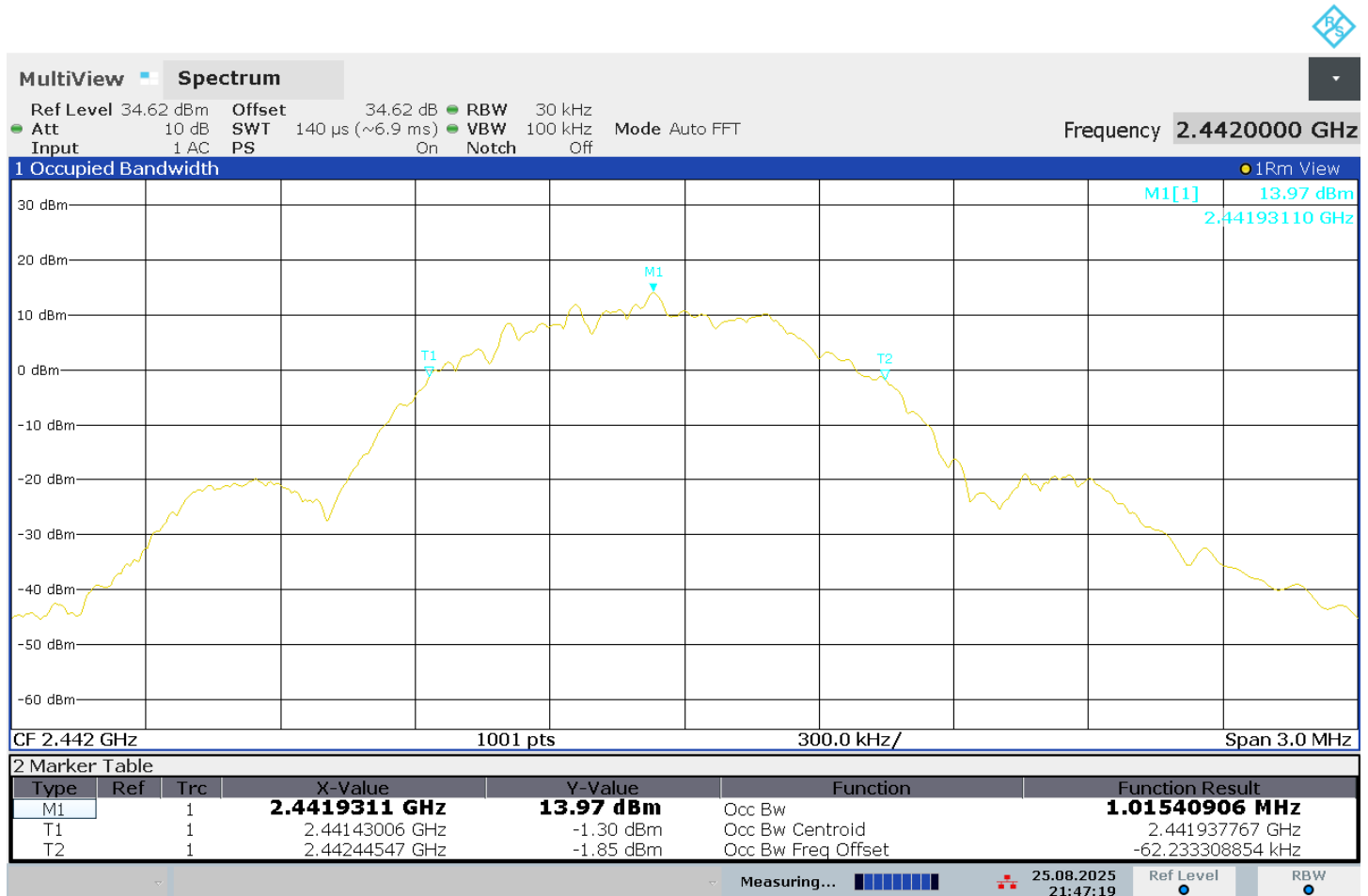
## 99% Occupied Bandwidth Test Data / Spectrum Plots

### 8.3.1 99% Bandwidth Plot, 2402 MHz



21:47:58 25.08.2025

### 8.3.2 99% Bandwidth Plot, 2442 MHz



21:47:19 25.08.2025

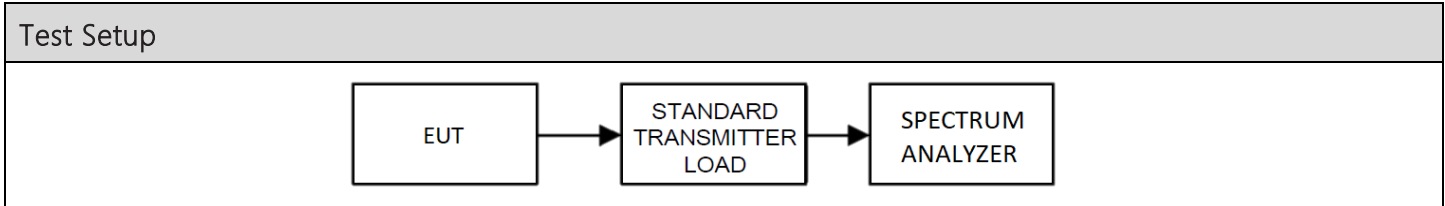
### 8.3.3 99% Bandwidth Plot, 2480 MHz



21:46:30 25.08.2025

## 8.4 Occupied Bandwidth – Coded

Requirement from FCC KDB 558074 D01 and test procedure from ANSI C63.10-2020 section 6.9.3



### 99% BW Test Results

| Tuned Frequency (MHz) | 99% BW (MHz) |
|-----------------------|--------------|
| 2402                  | 1.048        |
| 2442                  | 1.045        |
| 2480                  | 1.043        |

## 99% Occupied Bandwidth Test Data / Spectrum Plots

### 8.4.1 99% Bandwidth Plot, 2402 MHz



01:52:52 11.11.2025

## 8.4.2 99% Bandwidth Plot, 2442 MHz



01:53:27 11.11.2025

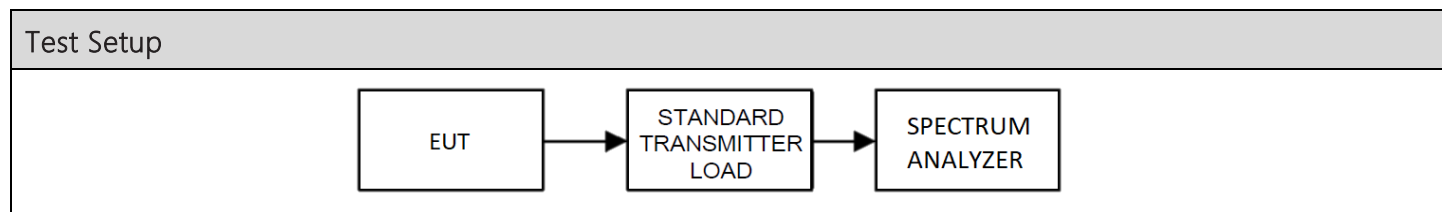
### 8.4.3 99% Bandwidth Plot, 2480 MHz



01:53:56 11.11.2025

## 8.5 6dB Bandwidth (DTS BW) – 1M

Limits from FCC Part 15.247 (a) (2) and test procedure from ANSI C63.10-2020 section 11.8



| Tuned Frequency (MHz) | 6dB Bandwidth (DTS BW) (kHz) |
|-----------------------|------------------------------|
| 2402                  | 749.30                       |
| 2442                  | 739.30                       |
| 2480                  | 744.30                       |

## 6dB BW Test Data / Spectrum Plots

### 8.5.1 6dB Bandwidth (DTS BW), 2402 MHz



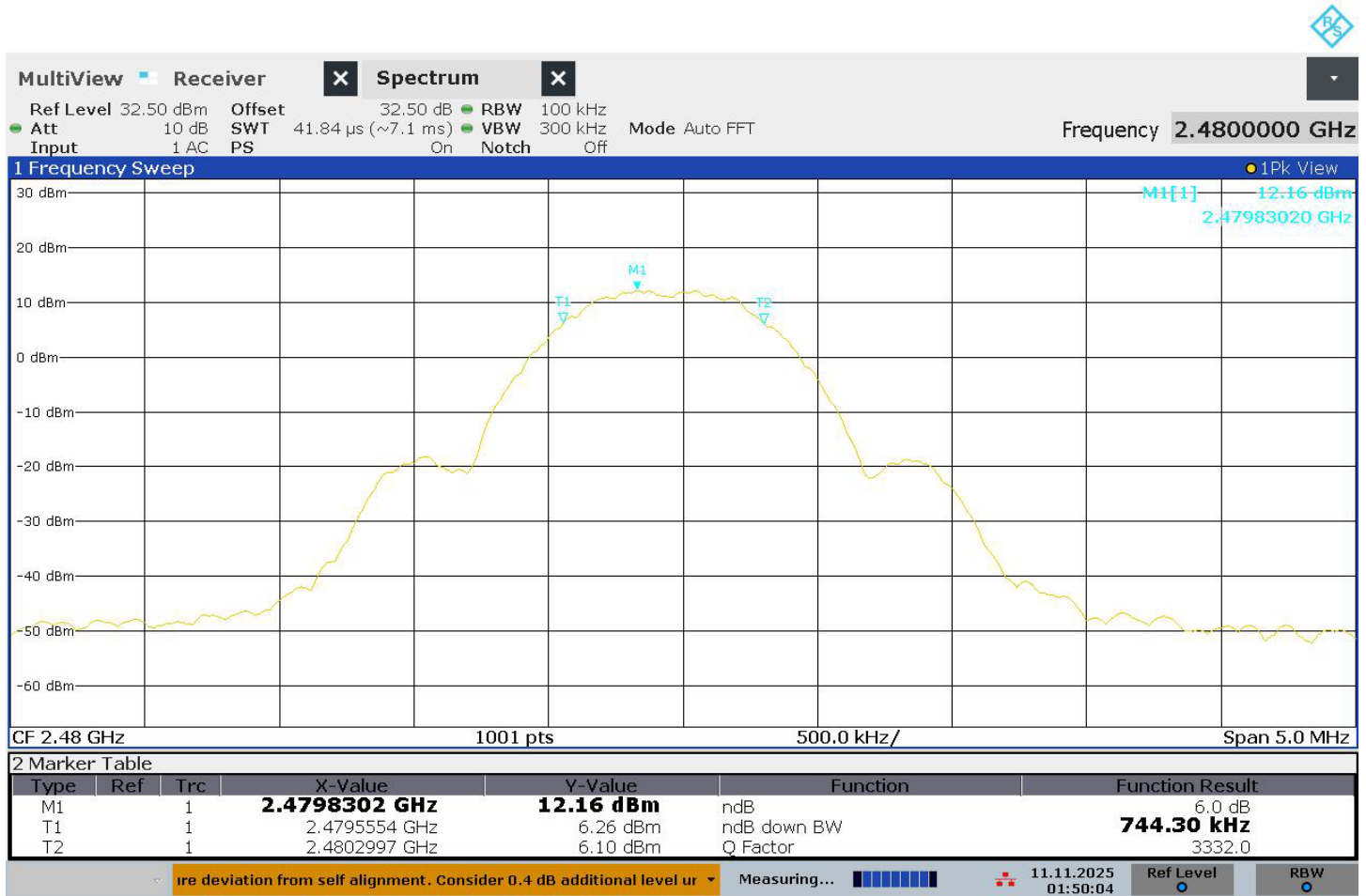
01:47:39 11.11.2025

## 8.5.2 6dB Bandwidth (DTS BW), 2442 MHz



01:48:35 11.11.2025

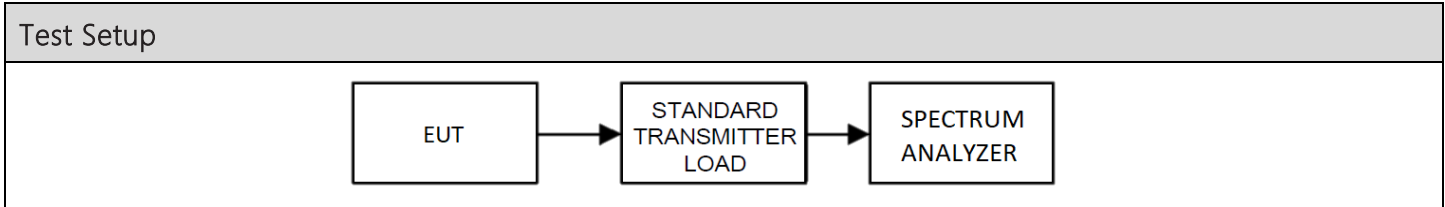
### 8.5.3 6dB Bandwidth (DTS BW), 2480 MHz



01:50:05 11.11.2025

## 8.6 6dB Bandwidth (DTS BW) – Coded

Limits from FCC Part 15.247 (a) (2) and test procedure from ANSI C63.10-2020 section 11.8



| Tuned Frequency (MHz) | 6dB Bandwidth (DTS BW) (kHz) |
|-----------------------|------------------------------|
| 2402                  | 689.30                       |
| 2442                  | 679.30                       |
| 2480                  | 679.30                       |

## 6dB BW Test Data / Spectrum Plots

### 8.6.1 6dB Bandwidth (DTS BW), 2402 MHz



01:51:58 11.11.2025