

## TEST REPORT

Test report no.: 1-0619-25-01-02\_TR1-R01



Deutsche  
Akkreditierungsstelle  
D-PL-12047-01-00

### Testing laboratory

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#### **Accredited Testing Laboratory:**

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2018-03) by the Deutsche Akkreditierungsstelle GmbH (DAkkS).

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number:

D-PL-12047-01-00.

ISED Testing Laboratory Recognized Listing Number: DE0001

FCC designation number: DE0002

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### Test standard/s

FCC - Title 47 CFR Part 15

FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices

RSS - 247 Issue 4

Digital Transmission Systems, Frequency Hopping Systems and Licence-Exempt Local Area Network Devices in 902-928 MHz, 2400-2483.5 MHz, 5150-5350 MHz, and 5470-5895 MHz bands

RSS - Gen Issue 5 incl.  
Amendment 1 & 2

Spectrum Management and Telecommunications Radio Standards Specification  
- General Requirements for Compliance of Radio Apparatus

For further applied test standards please refer to section 3 of this test report.

### Test Item

**Kind of test item:** RFID evaluation unit UHF

**Model name:** DTP505, DTE505 (TR29)

**FCC ID:** UN6-DTP505

**ISED certification number:** 6799A-DTP505

**Frequency:** 902 MHz to 928 MHz

**Technology tested:** RFID

**Antenna:** 4 external antenna ports

**Power supply:** 18 V to 30 V DC, or PoE / Type 3

**Temperature range:** -20°C to +60°C

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

### Test report authorized:

on behalf of

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## 2 General information

### 2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. cetecom advanced GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

### 2.2 Application details

|                                    |            |
|------------------------------------|------------|
| Date of receipt of order:          | 2025-06-12 |
| Date of receipt of test item:      | 2025-07-16 |
| Start of test:*                    | 2025-07-28 |
| End of test:*                      | 2026-02-02 |
| Person(s) present during the test: | -/-        |

\*Date of each measurement, if not shown in the plot, can be requested. Dates are stored in the measurement software.

### 2.3 Test laboratories sub-contracted

None

### 3 Test standard/s, references and accreditations

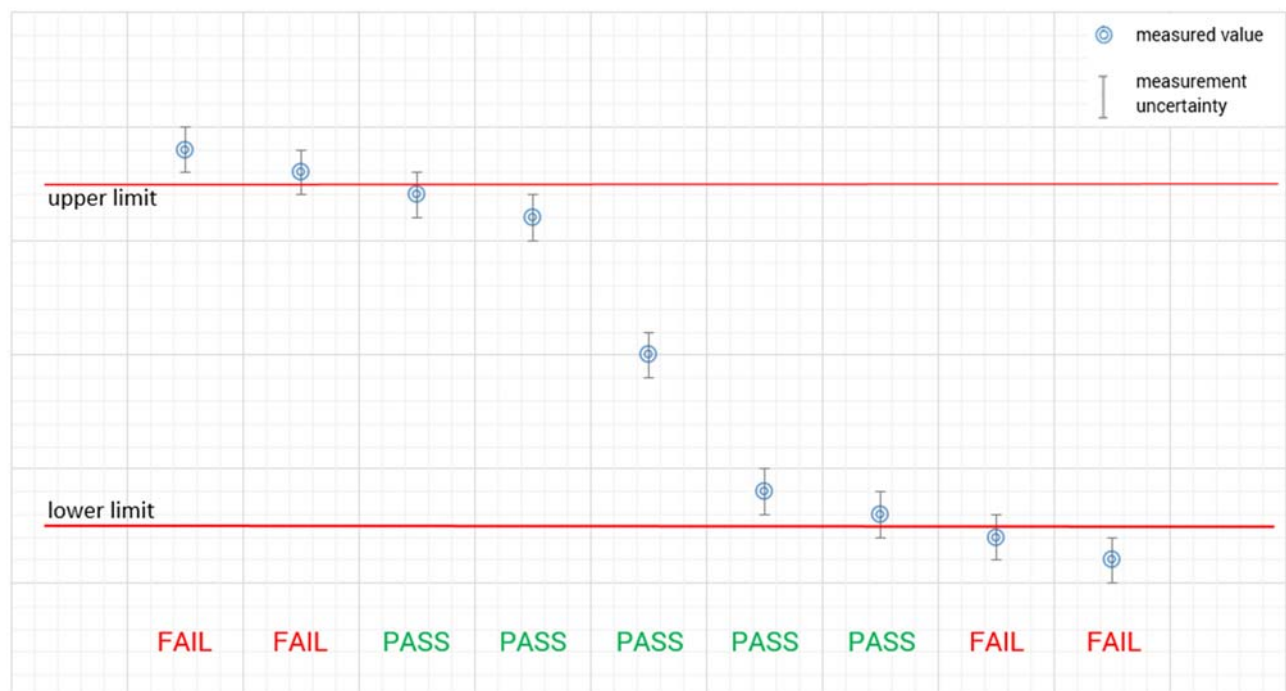
| Test standard                           | Date          | Description                                                                                                                                                                                                                                                                                             |
|-----------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FCC - Title 47 CFR Part 15              |               | FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices                                                                                                                                                                                                         |
| RSS - 247 Issue 4                       | july 2025     | Digital Transmission Systems, Frequency Hopping Systems and Licence-Exempt Local Area Network Devices in 902-928 MHz, 2400-2483.5 MHz, 5150-5350 MHz, and 5470-5895 MHz bands                                                                                                                           |
| RSS - Gen Issue 5 incl. Amendment 1 & 2 | February 2021 | Spectrum Management and Telecommunications Radio Standards Specification<br>- General Requirements for Compliance of Radio Apparatus                                                                                                                                                                    |
| Guidance                                | Version       | Description                                                                                                                                                                                                                                                                                             |
| KDB 174176 D01                          | V01r02        | AC POWER LINE CONDUCTED EMISSIONS<br>FREQUENTLY ASKED QUESTIONS                                                                                                                                                                                                                                         |
| ANSI C63.4a-2017                        | -/-           | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz                                                                                                                                     |
| ANSI C63.10-2020                        | 2020          | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices Including<br>- ANSI/USEMCSC C63.10-2020/Cor 1-2023<br>- ANSI/USEMCSC C63.10a-2024<br>- ANSI/USEMCSC C63.10a-2024 Amendment 1 / 2024-08-08<br>- ANSI/USEMCSC C63.10a-2024 Amendment 1 Errata / 2024-11-18 |

#### 4 Reporting statements of conformity – decision rule

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3.

The measurement uncertainty is mentioned in this test report, see chapter 9, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong."

measured value, measurement uncertainty, verdict



## 5 Test environment

|                             |                                     |                                                                                                                                                                                  |
|-----------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature :               | $T_{nom}$<br>$T_{max}$<br>$T_{min}$ | +22 °C during room temperature tests<br>+60 °C during high temperature tests<br>-20 °C during low temperature tests<br>tests under extreme environmental conditions not required |
| Relative humidity content : |                                     | 55 %                                                                                                                                                                             |
| Barometric pressure :       |                                     | 1021 hpa                                                                                                                                                                         |
| Power supply :              | $V_{nom}$<br>$V_{max}$<br>$V_{min}$ | 24 V DC, or PoE / Type 3<br>30 V DC<br>18 V DC<br>tests under extreme environmental conditions not required                                                                      |

## 6 Test item

### 6.1 General description

|                              |                                  |
|------------------------------|----------------------------------|
| Kind of test item :          | RFID evaluation unit UHF         |
| Model name :                 | DTP505, DTE505 (TR29)            |
| HMN :                        | N/A                              |
| PMN :                        | RFID evaluation unit UHF         |
| HVIN :                       | DTP505<br>DTE505                 |
| FVIN :                       | N/A                              |
| S/N serial number :          | 100010441615                     |
| Hardware status :            | AA from 14.04.2025               |
| S/N serial number :          | 100015262370                     |
| Hardware status :            | AA from 07.10.2025               |
| S/N serial number :          | 100010441692                     |
| Hardware status :            | AA from 14.04.2025               |
| Software status :            | V1.0.0                           |
| Firmware status :            | N/A                              |
| Frequency band :             | 902 MHz to 928 MHz               |
| Type of radio transmission : | modulated carrier                |
| Use of frequency spectrum :  |                                  |
| Type of modulation :         | PR-ASK and DSB-ASK               |
| Number of channels :         | 50                               |
| Antenna :                    | 4 external antenna ports         |
| Power supply :               | 18 V to 30 V DC, or PoE / Type 3 |
| Temperature range :          | -20°C to +60°C                   |

## 6.2 Additional information

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup and EUT photos are included in test report:

1-0619-25-01-01\_TR1-A101-R03  
1-0619-25-01-01\_TR1-A102-R02  
1-0619-25-01-01\_TR1-A103-R03

## 7 Description of the test setup

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, RF generating and signaling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

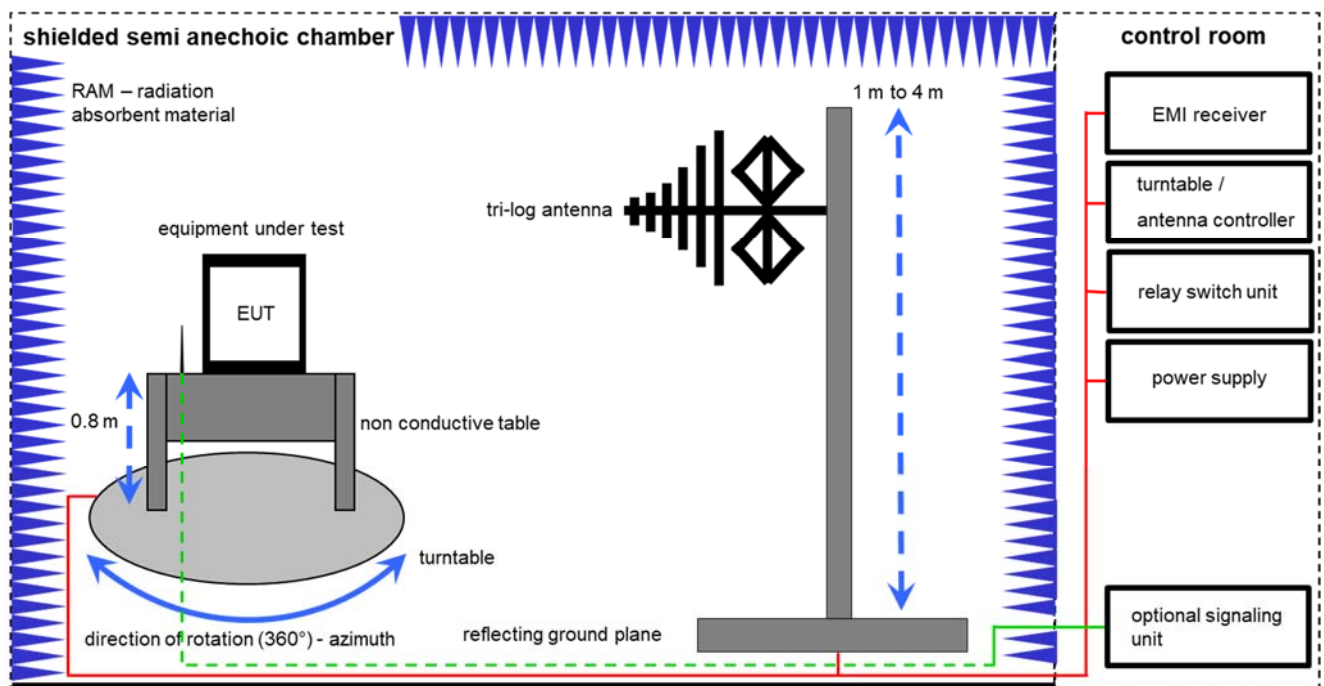
Each block diagram listed can contain several test setup configurations. All devices belonging to a test setup are identified with the same letter syntax. For example: Column Setup and all devices with an A.

### **Agenda:** Kind of Calibration

|        |                                            |     |                                                      |
|--------|--------------------------------------------|-----|------------------------------------------------------|
| k/cal  | calibration / calibrated                   | EK  | limited calibration                                  |
| Ne/cnn | not required (k, ev, izw, zw not required) | zw  | cyclical maintenance (external cyclical maintenance) |
| ev/chk | periodic self verification                 | izw | internal cyclical maintenance                        |
| Ve     | long-term stability recognized             | g   | blocked for accredited testing                       |
| v/k!   | Attention: extended calibration interval   |     |                                                      |
| NK!    | Attention: not calibrated                  | *)  | next calibration ordered / currently in progress     |
| cpu    | check prior usage                          |     |                                                      |

## 7.1 Shielded semi anechoic chamber

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 30 MHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are conform to specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Measurement distance: tri-log antenna 10 meter

EMC32 software version: 10.59.00

FS = UR + CL + AF

(FS-field strength; UR-voltage at the receiver; CL-loss of the cable; AF-antenna factor)

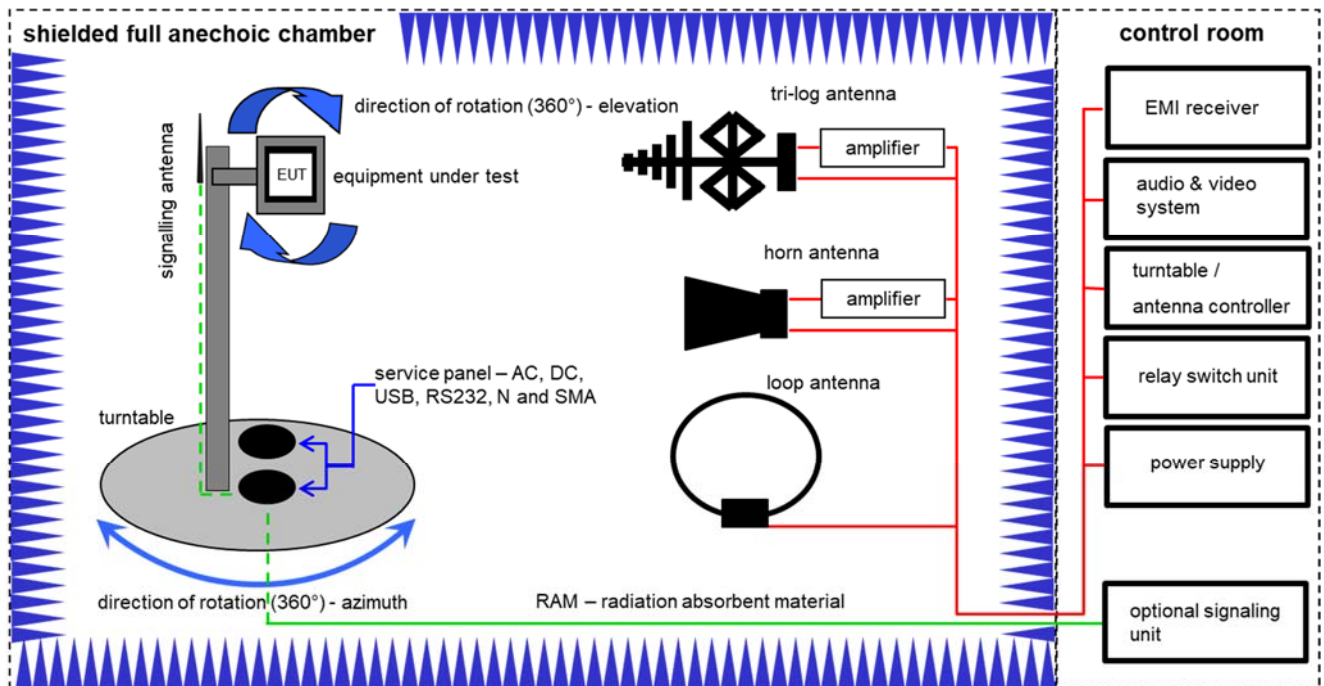
Example calculation:

FS [dBμV/m] = 12.35 [dBμV] + 1.90 [dB] + 16.80 [dB/m] = 31.05 [dBμV/m] (35.69 μV/m) @ distance

**Equipment table:**

| No. | Setup | Equipment                           | Type                               | Manufacturer                                    | Serial No.       | INV. No.       | Kind of Calibration | Last Calibration | Next Calibration |
|-----|-------|-------------------------------------|------------------------------------|-------------------------------------------------|------------------|----------------|---------------------|------------------|------------------|
| 1   | A     | Semi anechoic chamber               | Semi anechoic chamber 3000023      | MEC Import: MWB AG                              |                  | 300000551-0000 | cnn                 | -/-              | -/-              |
| 2   | A     | TRILOG Broadband Antenna            | TRILOG Broadband Antenna VULB9163  | Schwarzbeck Mess-Elektronik OHG / Schöna        | 371              | 300003854-0000 | cal                 | 11.07.2024       | 11.07.2026       |
| 3   | A     | Turntable                           | Turntable 2089-4.0                 | EMCO Elektronik GmbH / Gilching                 |                  | 300004394-0000 | cnn                 | -/-              | -/-              |
| 4   | A     | Analyzer-Impedence-System           | Analyzer-Impedence-System AIS16/1  | MEC Import: Spitzenberger + Spies GmbH & Co. KG | UO2076 07/0 1023 | 400001751-0000 | cal                 | 09.10.2025       | 31.12.2026       |
| 5   | A     | Switch-Unit                         | Switch-Unit 3488A                  | Hewlett Packard                                 | 2719A14505       | 300000368      | cpu                 | -/-              | -/-              |
| 6   | A     | TRILOG Broadband Antenna            | TRILOG Broadband Antenna VULB9163  | Schwarzbeck Mess-Elektronik OHG / Schöna        | 216              | 300003288      | cal                 | 05.09.2025       | 30.09.2027       |
| 7   | A     | Antenna Tower                       | Antenna Tower 2175                 | ETS-Lindgren GmbH / Taufkirchen                 | 64762            | 300003745      | cnn                 | -/-              | -/-              |
| 8   | A     | Positioning Controller              | Positioning Controller 2090        | ETS-Lindgren GmbH / Taufkirchen                 | 64672            | 300003746      | cnn                 | -/-              | -/-              |
| 9   | A     | EMI Test Receiver                   | EMI Test Receiver ESR3 9kHz-3.6GHz | Rohde & Schwarz Messgerätebau GmbH / Memmingen  | 102587           | 300005771      | cal                 | 08.12.2025       | 31.12.2026       |
| 10  | A     | DC power supply, 60Vdc, 50A, 1200 W | 6032A                              | HP                                              | 2920A04466       | 300000580      | ne                  | -/-              | -/-              |

## 7.2 Shielded fully anechoic chamber



Measurement distance: tri-log antenna and horn antenna 3 meter; loop antenna 3 meter

$$OP = AV + D - G + CA$$

(OP-radiated output power; AV-analyzer value; D-free field attenuation of measurement distance; G-antenna gain+amplifier gain; CA-loss signal path)

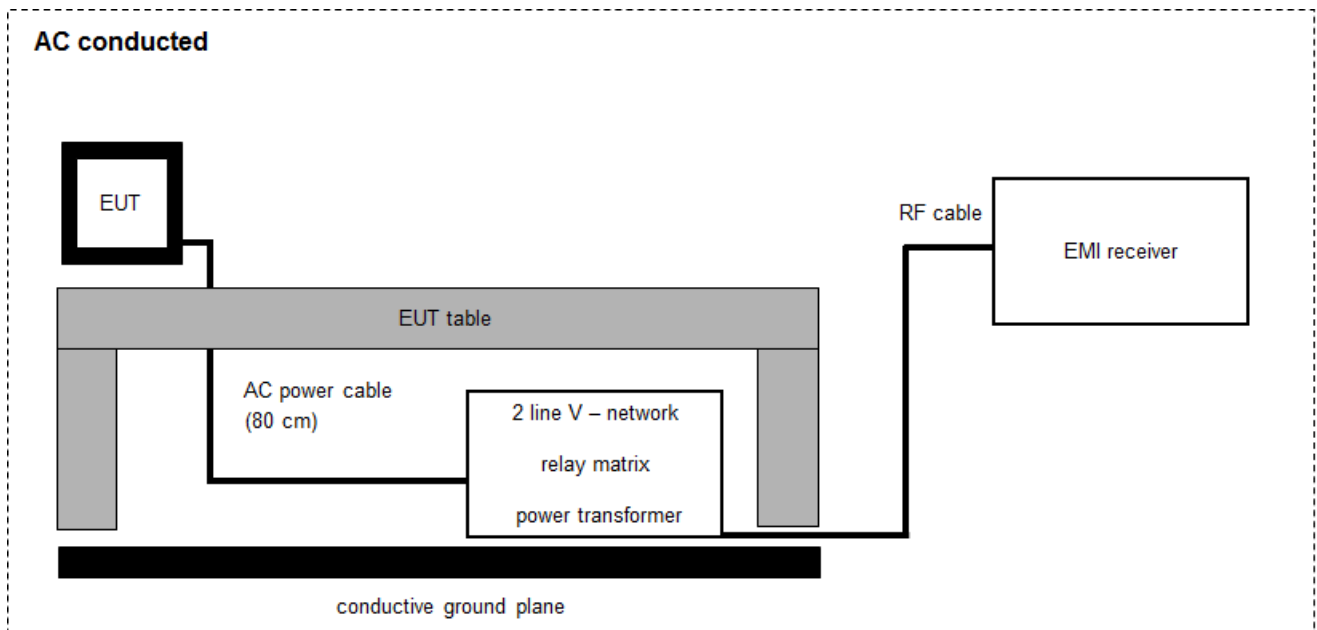
### Example calculation:

$$OP \text{ [dBm]} = -65.0 \text{ [dBm]} + 50 \text{ [dB]} - 20 \text{ [dBi]} + 5 \text{ [dB]} = -30 \text{ [dBm]} \text{ (1 } \mu\text{W)}$$

**Equipment table:**

| No. | Setup | Equipment                            | Type                                       | Manufacturer                                      | Serial No. | INV. No.       | Kind of Calibration | Last Calibration | Next Calibration |
|-----|-------|--------------------------------------|--------------------------------------------|---------------------------------------------------|------------|----------------|---------------------|------------------|------------------|
| 1   | A,B,C | EMI Test Receiver                    | EMI Test Receiver ESR26                    | Rohde & Schwarz Messgerätebau GmbH / Memmingen    | 101376     | 300005063-0000 | cal                 | 08.12.2025       | 31.12.2026       |
| 2   | A,B,C | 4U RF Switch Platform                | 4U RF Switch Platform L4491A               | Agilent Technologies Deutschland GmbH / Böblingen | MY50000032 | 300004510-0000 | cnn                 | -/-              | -/-              |
| 3   | A,B,C | NEXIO EMV-Software                   | NEXIO EMV-Software BAT EMC V2022.0.32.0    | MEC Import: Nexio                                 |            | 300004682-0000 | cnn                 | -/-              | -/-              |
| 4   | A,B,C | Anechoic chamber                     | Anechoic chamber                           | MEC Import: TDK                                   |            | 300003726-0000 | cnn                 | -/-              | -/-              |
| 5   | A,B,C | Power Supply                         | Power Supply HMP2020                       | Rohde & Schwarz Messgerätebau GmbH / Memmingen    | 120626     | 300006408-0000 | cal                 | 02.05.2023       | 31.05.2026       |
| 6   | C     | Double-Ridged Waveguide Horn Antenna | Double-Ridged Waveguide Horn Antenna 3115  | EMCO Elektronik GmbH / Gilching                   | 8812-3089  | 300000307      | cal                 | 09.07.2024       | 09.07.2026       |
| 7   | C     | Highpass Filter                      | Highpass Filter WHK1.1/15G-10SS            | Wainwright Instruments GmbH / Andechs             | 37         | 40362          | cnn                 | -/-              | -/-              |
| 8   | C     | Broadband Amplifier 0.5-18 GHz       | Broadband Amplifier 0.5-18 GHz CBLU5184540 | CERNEX                                            | 22050      | 40374          | cpu                 | -/-              | -/-              |
| 9   | B     | TRILOG Broadband Antenna             | TRILOG Broadband Antenna VULB9163          | Schwarzbeck Mess-Elektronik OHG / Schönau         | 318        | 50284          | cal                 | 31.01.2024       | 31.01.2026       |
| 10  | A     | Active Loop Antenna                  | Active Loop Antenna 6502                   | EMCO Elektronik GmbH / Gilching                   | 2210       | 300001015      | cal                 | 07.07.2025       | 07.07.2027       |

### 7.3 AC conducted



$$FS = UR + CF + VC$$

(FS-field strength; UR-voltage at the receiver; CR-loss of the cable and filter; VC-correction factor of the ISN)

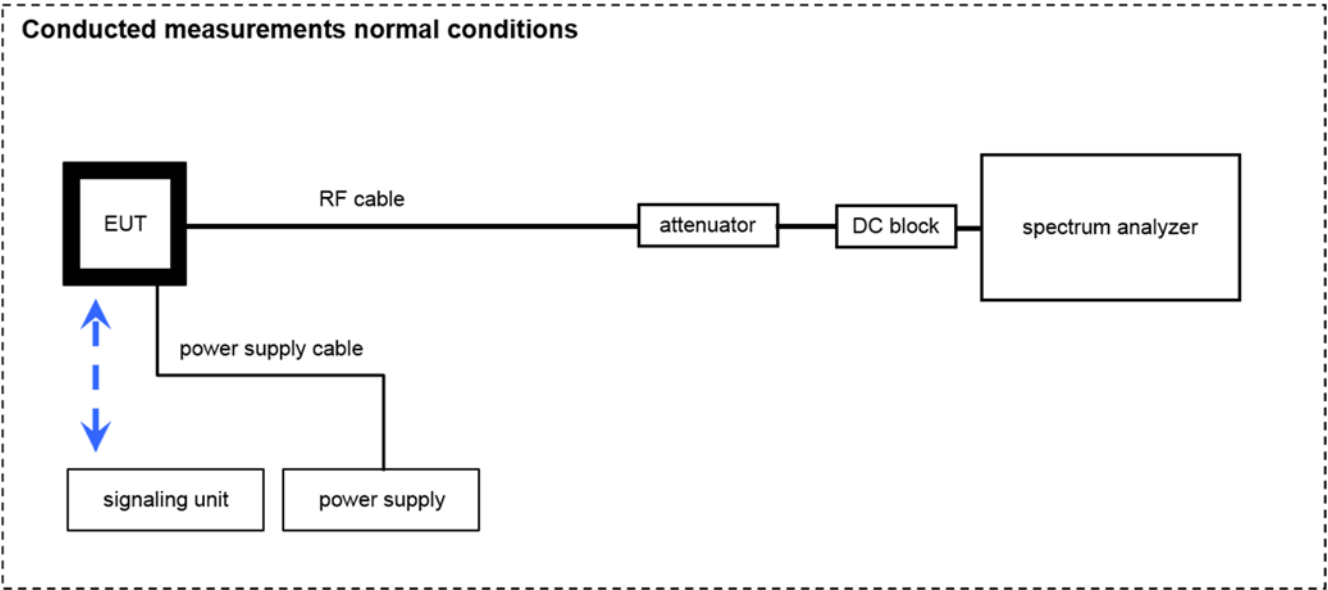
Example calculation:

$$FS [dB\mu V/m] = 37.62 [dB\mu V] + 9.90 [dB] + 0.23 [dB] = 47.75 [dB\mu V/m] \quad (244.06 \mu V/m) @ \text{distance}$$

**Equipment table:**

| No. | Setup | Equipment                                 | Type    | Manufacturer                        | Serial No.       | INV. No.  | Kind of Calibration | Last Calibration | Next Calibration |
|-----|-------|-------------------------------------------|---------|-------------------------------------|------------------|-----------|---------------------|------------------|------------------|
| 1   | A     | Two-line V-Network (LISN) 9 kHz to 30 MHz | ESH3-Z5 | Rohde & Schwarz                     | 892475/017       | 300002209 | vIKI!               | 09.12.2025       | 31.12.2027       |
| 2   | A     | RF-Filter-section                         | 85420E  | HP                                  | 3427A00162       | 300002214 | NK!                 | -/-              | -/-              |
| 3   | A     | Hochpass 150 kHz                          | EZ-25   | R&S                                 | 100010           | 300003798 | ev                  | -/-              | -/-              |
| 4   | A     | PC                                        | TecLine | F+W                                 | -/-              | 300003532 | ne                  | -/-              | -/-              |
| 5   | A     | Analyzer-Impedance-System                 | AIS16/1 | Spitzenberger + Spies GmbH & Co. KG | U02076 07/0 1023 | 400001751 | k                   | 09.12.2025       | 31.12.2026       |
| 6   | A     | EMI Test Receiver 3.6 GHz                 | ESR3    | Rohde & Schwarz                     | 102981           | 300006318 | k                   | 05.12.2025       | 31.12.2026       |

7.4 Conducted measurements



OP = AV + CA  
(OP-output power; AV-analyzer value; CA-loss signal path)

Example calculation:  
OP [dBm] = 6.0 [dBm] + 11.7 [dB] = 17.7 [dBm] (58.88 mW)

**Equipment table:**

| No. | Setup | Equipment       | Type                  | Manufacturer                                   | Serial No. | INV. No.       | Kind of Calibration | Last Calibration | Next Calibration |
|-----|-------|-----------------|-----------------------|------------------------------------------------|------------|----------------|---------------------|------------------|------------------|
| 1   | A     | Signal analyzer | Signal analyzer FSW26 | Rohde & Schwarz Messgerätebau GmbH / Memmingen | 101455     | 300004528-0000 | cal                 | 08.12.2025       | 31.12.2026       |
| 2   | A     | Power Supply    | Power Supply HMP2020  | Rohde & Schwarz Messgerätebau GmbH / Memmingen | 101961     | 300006102-0000 | cal                 | 05.12.2024       | 05.12.2026       |

## 8 Sequence of testing

### 8.1 Sequence of testing radiated spurious 9 kHz to 30 MHz

#### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, it is placed on a table with 0.8 m height.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

#### Premeasurement\*

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1 m.
- At each turntable position the analyzer sweeps with positive-peak detector to find the maximum of all emissions.

#### Final measurement

- Identified emissions during the pre-measurement are maximized by the software by rotating the turntable from 0° to 360°.
- Loop antenna is rotated about its vertical axis for maximum response at each azimuth about the EUT. (For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT)
- The final measurement is done in the position (turntable and elevation) causing the highest emissions with quasi-peak (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. A plot with the graph of the premeasurement and the limit is stored.

\*)Note: The sequence will be repeated three times with different EUT orientations.

## 8.2 Sequence of testing radiated spurious 30 MHz to 1 GHz

### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 10 m or 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

### Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 m to 3 m.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

### Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximize the peaks by changing turntable position  $\pm 45^\circ$  and antenna height between 1 and 4 m.
- The final measurement is done with quasi-peak detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

### 8.3 Sequence of testing radiated spurious 1 GHz to 12.75 GHz

#### Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a 2-axis positioner with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) – see test details.
- EUT is set into operation.

#### Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 m.
- At each turntable position and antenna polarization the analyzer sweeps with positive peak detector to find the maximum of all emissions.

#### Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximizes the peaks by rotating the turntable from 0° to 360°. This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps) and for both antenna polarizations.
- The final measurement is done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

## 9 Measurement uncertainty

| Measurement uncertainty                               |                                                  |
|-------------------------------------------------------|--------------------------------------------------|
| Test case                                             | Uncertainty                                      |
| Antenna gain                                          | $\pm 3$ dB                                       |
| Carrier frequency separation                          | $\pm 21.5$ kHz                                   |
| Number of hopping channels                            | -/-                                              |
| Spectrum bandwidth                                    | $\pm 21.5$ kHz absolute; $\pm 15.0$ kHz relative |
| Maximum output power                                  | $\pm 1$ dB                                       |
| Detailed conducted spurious emissions @ the band edge | $\pm 1$ dB                                       |
| Band edge compliance radiated                         | $\pm 3$ dB                                       |
| Spurious emissions conducted                          | $\pm 3$ dB                                       |
| Spurious emissions radiated below 30 MHz              | $\pm 3$ dB                                       |
| Spurious emissions radiated 30 MHz to 1 GHz           | $\pm 4.1$ dB                                     |
| Spurious emissions radiated 1 GHz to 12.75 GHz        | $\pm 3.7$ dB                                     |

## 10 Summary of measurement results

|                                     |                                                                                                                       |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | No deviations from the technical specifications were ascertained                                                      |
| <input type="checkbox"/>            | There were deviations from the technical specifications ascertained                                                   |
| <input type="checkbox"/>            | This test report is only a partial test report. The content and verdict of the performed test cases are listed below. |

| TC Identifier | Description                                                                                 | Verdict | Date       | Remark |
|---------------|---------------------------------------------------------------------------------------------|---------|------------|--------|
| RF-Testing    | CFR Part 15<br>RSS - 247, Issue 4<br>ANSI C63.10<br>RSS - Gen Issue 5 incl. Amendment 1 & 2 | Passed  | 2026-04-07 | -/-    |

| Test specification clause                                           | Test case                                               | Temperature conditions | Power source voltages | Mode               | C                                   | NC                       | NA                       | NP                       | Remark |
|---------------------------------------------------------------------|---------------------------------------------------------|------------------------|-----------------------|--------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------|
| §15.247(b)(4)<br>RSS - 247 / 5.4 (d)                                | Antenna gain                                            | Nominal                | Nominal               | CW                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.247(a)(1)<br>RSS - 247 / 5.1 (b)                                | Carrier frequency separation                            | Nominal                | Nominal               | DSB-ASK            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.247(a)(1)<br>RSS - 247 / 5.1 (d)                                | Number of hopping channels                              | Nominal                | Nominal               | DSB-ASK            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.247(a)(1) (i)<br>RSS - 247 / 5.1 (d)                            | Time of occupancy (dwell time)                          | Nominal                | Nominal               | DSB-ASK            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.247(a)(1)<br>RSS - 247 / 5<br>ANSI C 63.10                      | Spectrum bandwidth of a FHSS system bandwidth           | Nominal                | Nominal               | DSB-ASK/<br>PR-ASK | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.247(b)(2)<br>RSS - 247 / 5<br>ANSI C 63.10                      | Maximum output power                                    | Nominal                | Nominal               | DSB-ASK/<br>PR-ASK | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.247(d)<br>RSS - 247 / 5<br>ANSI C 63.10                         | Detailed spurious emissions @ the band edge - conducted | Nominal                | Nominal               | DSB-ASK/<br>PR-ASK | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.205<br>RSS - 247 / 5<br>ANSI C 63.10<br>RSS - Gen               | Band edge compliance radiated                           | Nominal                | Nominal               | DSB-ASK/<br>PR-ASK | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.247(d)<br>RSS - 247 / 5<br>ANSI C 63.10                         | Spurious emissions conducted                            | Nominal                | Nominal               | DSB-ASK/<br>PR-ASK | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.209(a)<br>RSS - Gen<br>ANSI C 63.10                             | Spurious emissions radiated below 30 MHz                | Nominal                | Nominal               | DSB-ASK            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.247(d)<br>RSS - 247 / 5<br>ANSI C 63.10<br>§15.109<br>RSS - Gen | Spurious emissions radiated 30 MHz to 1 GHz             | Nominal                | Nominal               | DSB-ASK            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.247(d)<br>RSS - 247 / 5<br>ANSI C 63.10<br>§15.109<br>RSS - Gen | Spurious emissions radiated above 1 GHz                 | Nominal                | Nominal               | DSB-ASK            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |
| §15.107(a)<br>§15.207                                               | Conducted emissions below 30 MHz (AC conducted)         | Nominal                | Nominal               | DSB-ASK            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | -/-    |

**Note:** C = Compliant; NC = Not compliant; NA = Not applicable; NP = Not performed

## 11 RF measurements

### 11.1 Additional comments

Reference documents: None

Special test descriptions: the conducted output power was evaluated on all four ports and the highest power was measured on port 3, which 3 has been used for conducted and radiated measurements

Configuration descriptions: Instructional\_manual\_to\_control\_DTE40x\_DTE40x  
all tests (except otherwise stated) have been performed in PoE mode

output power setting in control software 30 dBm

Additional tests (spurious emissions and conducted output power) have been performed with Hardware AA from 07.10.2025

| RF mode        | software setting | Modulation |
|----------------|------------------|------------|
| FM0 (103)      | 103              | DSB-ASK    |
| Miller 2 (123) | 123              | PR-ASK     |
| Miller 4 (141) | 141              | PR-ASK     |
| Miller 8 (185) | 185              | PR-ASK     |

Test frequencies: 902.75 MHz, 915.25 MHz, 927.25 MHz

Test mode: ☒ Special test commands were used to enable the different modulation and power levels.

supported channels overview:

| Ch. | frequency   |
|-----|-------------|
| 1   | 902.750 MHz |
| 2   | 903.250 MHz |
| 3   | 903.750 MHz |
| 4   | 904.250 MHz |
| 5   | 904.750 MHz |
| 6   | 905.250 MHz |
| 7   | 905.750 MHz |
| 8   | 906.250 MHz |
| 9   | 906.750 MHz |
| 10  | 907.250 MHz |
| 11  | 907.750 MHz |
| 12  | 908.250 MHz |
| 13  | 908.750 MHz |
| 14  | 909.250 MHz |
| 15  | 909.750 MHz |
| 16  | 910.250 MHz |
| 17  | 910.750 MHz |
| 18  | 911.250 MHz |
| 19  | 911.750 MHz |
| 20  | 912.250 MHz |
| 21  | 912.750 MHz |
| 22  | 913.250 MHz |
| 23  | 913.750 MHz |
| 24  | 914.250 MHz |
| 25  | 914.750 MHz |
| 26  | 915.250 MHz |
| 27  | 915.750 MHz |
| 28  | 916.250 MHz |
| 29  | 916.750 MHz |
| 30  | 917.250 MHz |
| 31  | 917.750 MHz |
| 32  | 918.250 MHz |
| 33  | 918.750 MHz |
| 34  | 919.250 MHz |
| 35  | 919.750 MHz |
| 36  | 920.250 MHz |
| 37  | 920.750 MHz |
| 38  | 921.250 MHz |
| 39  | 921.750 MHz |
| 40  | 922.250 MHz |
| 41  | 922.750 MHz |
| 42  | 923.250 MHz |
| 43  | 923.750 MHz |
| 44  | 924.250 MHz |
| 45  | 924.750 MHz |
| 46  | 925.250 MHz |
| 47  | 925.750 MHz |
| 48  | 926.250 MHz |
| 49  | 926.750 MHz |
| 50  | 927.250 MHz |

## 11.2 EUT setup

| EUT no. *)   | Product                                    | Model           |
|--------------|--------------------------------------------|-----------------|
| <b>EUT A</b> | RFID evaluation unit UHF, SN: 100010441615 | DTP505 HW14.04  |
| <b>EUT B</b> | Antenna                                    | ANT805          |
| <b>EUT C</b> | Antenna                                    | ANT815          |
| <b>EUT D</b> | Antenna                                    | ANT920          |
| <b>EUT E</b> | Antenna                                    | ANT950          |
| <b>EUT F</b> | Antenna                                    | ANT960          |
| <b>EUT G</b> | Antenna                                    | ANT970          |
| <b>EUT H</b> | RFID evaluation unit UHF, SN: 100015262370 | DTP505 HW07.10. |
| <b>EUT I</b> | RFID evaluation unit UHF, SN: 100010441692 | DTE505 HW14.04  |

\*) EUT short description is used to simplify the identification of the EUT in this test report.

## Auxiliary equipment

| AE *)       | Auxiliary equipment | Type             |
|-------------|---------------------|------------------|
| <b>AE 1</b> | PoE injektor        | Phoenix INJ 1000 |
| <b>AE 2</b> | Power supply        | ifm DN4011       |

\*) AE short description is used to simplify the identification of the auxiliary equipment in this test report.

| EUT set-up no. *) | Combination of EUT and AE         |
|-------------------|-----------------------------------|
| <b>set. 1</b>     | EUT A + EUT B + AE 1              |
| <b>set. 2</b>     | EUT A + EUT C + AE 1              |
| <b>set. 3</b>     | EUT A + EUT D + AE 1              |
| <b>set. 4</b>     | EUT A + EUT E + AE 1              |
| <b>set. 5</b>     | EUT A + EUT F + AE 1              |
| <b>set. 6</b>     | EUT A + EUT G + AE 1              |
| <b>set. 7</b>     | EUT A + EUT E (DC powered) + AE 2 |
| <b>set. 8</b>     | EUT A + AE 2 (DC powered)         |
| <b>set. 9</b>     | EUT A + AE 1 (PoE powered)        |
| <b>set. 10</b>    | EUT H + EUT F + AE 1              |
| <b>set. 11</b>    | EUT I + EUT E + AE2               |

\*) EUT set-up no. is used to simplify the identification of the EUT set-up in this test report.

## 12 Measurement results

### 12.1 Antenna gain

#### Description:

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

| Measurement parameters  |                                                                    |
|-------------------------|--------------------------------------------------------------------|
| Detector                | Peak                                                               |
| Sweep time              | Auto                                                               |
| Resolution bandwidth    | 1 MHz                                                              |
| Video bandwidth         | 3 MHz                                                              |
| Span                    | 5 MHz                                                              |
| Trace mode              | Max hold                                                           |
| Test setup              | See sub clause 7.2 B (radiated)<br>See sub clause 7.4 A(conducted) |
| Measurement uncertainty | See sub clause 9                                                   |

#### Limits:

| FCC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ISED |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Antenna gain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |
| The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi. |      |

**Results:**

- **cable length: 3m**
- **PoE powered**
- **power setting in Software: 30 dBm**

| Test Conditions                                     |                           | antenna gain |            |            |
|-----------------------------------------------------|---------------------------|--------------|------------|------------|
|                                                     |                           | 902.75 MHz   | 915.25 MHz | 927.25 MHz |
| conducted power (FM0 (103) modulation)              |                           | 29.65 dBm    | 29.69 dBm  | 29.69 dBm  |
| <b>set.1</b><br><b>(DTP505 +</b><br><b>ANT805)</b>  | radiated power (e.i.r.p.) | 0.1 dBm      | -0.28 dBm  | -1.1 dBm   |
|                                                     | antenna gain              | -29.55 dBi   | -29.41 dBi | -30.79 dBi |
| <b>set.2</b><br><b>(DTP505 +</b><br><b>ANT815)</b>  | radiated power (e.i.r.p.) | 17.66 dBm    | 17.96 dBm  | 17.40 dBm  |
|                                                     | antenna gain              | -11.99 dBi   | -11.73 dBi | -12.29 dBi |
| <b>set.3</b><br><b>(DTP505 +</b><br><b>ANT920)</b>  | radiated power (e.i.r.p.) | 29.86 dBm    | 29.24 dBm  | 29.41 dBm  |
|                                                     | antenna gain              | 0.21 dBi     | -0.45 dBi  | -0.28 dBi  |
| <b>set.4</b><br><b>(DTP505 +</b><br><b>ANT950)</b>  | radiated power (e.i.r.p.) | 34.67 dBm    | 34.65 dBm  | 34.05 dBm  |
|                                                     | antenna gain              | 5.02 dBi     | 4.96 dBi   | 4.36 dBi   |
| <b>set. 5</b><br><b>(DTP505 +</b><br><b>ANT960)</b> | radiated power (e.i.r.p.) | 35.0 dBm     | 34.08 dBm  | 33.96 dBm  |
|                                                     | antenna gain              | 5.35 dBi     | 4.39 dBi   | 4.27 dBi   |
| <b>set. 6</b><br><b>(DTP505 +</b><br><b>ANT970)</b> | radiated power (e.i.r.p.) | 28.68 dBm    | 30.65 dBm  | 29.00 dBm  |
|                                                     | antenna gain              | -0.97 dBi    | 0.96 dBi   | -0.69 dBi  |

- **cable length: 3m**
- **DC powered**
- **power setting in Software: 30 dBm**

| Test Conditions                                      |                           | antenna gain |            |            |
|------------------------------------------------------|---------------------------|--------------|------------|------------|
|                                                      |                           | 902.75 MHz   | 915.25 MHz | 927.25 MHz |
| conducted power (FM0 (103) modulation)               |                           | 29.87 dBm    | 29.93 dBm  | 29.82 dBm  |
| <b>set. 11</b><br><b>(DTE505 +</b><br><b>ANT950)</b> | radiated power (e.i.r.p.) | 34.45 dBm    | 34.96 dBm  | 34.64 dBm  |
|                                                      | antenna gain              | 4.58 dBi     | 5.03 dBi   | 4.82 dBi   |

## 12.2 Carrier Frequency Separation

### **Description:**

Measurement of the carrier frequency separation of a hopping system. The carrier frequency separation is constant for all modulation-modes. We use DBPSK-modulation to show compliance. EUT in hopping mode.

| Measurement parameters  |                      |
|-------------------------|----------------------|
| Detector                | Peak                 |
| Sweep time              | Auto                 |
| Resolution bandwidth    | 10 kHz               |
| Video bandwidth         | 30 kHz               |
| Span                    | See plots            |
| Trace mode              | Max hold             |
| Test setup              | See sub clause 7.4 A |
| Measurement uncertainty | See sub clause 9     |

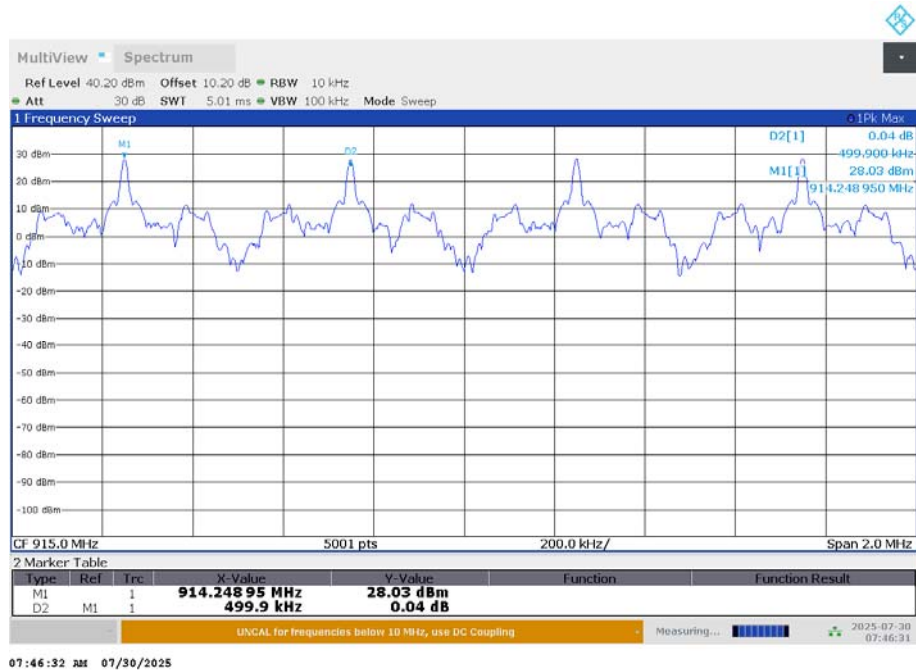
### **Limits:**

| FCC                                                                                             | ISED |
|-------------------------------------------------------------------------------------------------|------|
| Carrier frequency separation                                                                    |      |
| Minimum 25 kHz or two-thirds of the 20 dB bandwidth of the hopping system whichever is greater. |      |

**Result:** The channel separation is 500 kHz

Plots:

Plot 1: Frequency separation



## 12.3 Number of Hopping Channels

### **Description:**

Measurement of the total number of used hopping channels. The number of hopping channels is constant for all modulation-modes. We use DBPSK -modulation to show compliance. EUT in hopping mode.

| Measurement parameters  |                      |
|-------------------------|----------------------|
| Detector                | Peak                 |
| Sweep time              | Auto                 |
| Resolution bandwidth    | See plots            |
| Video bandwidth         | See plots            |
| Span                    | See plots            |
| Trace mode              | Max hold             |
| Test setup              | See sub clause 7.4 A |
| Measurement uncertainty | See sub clause 9     |

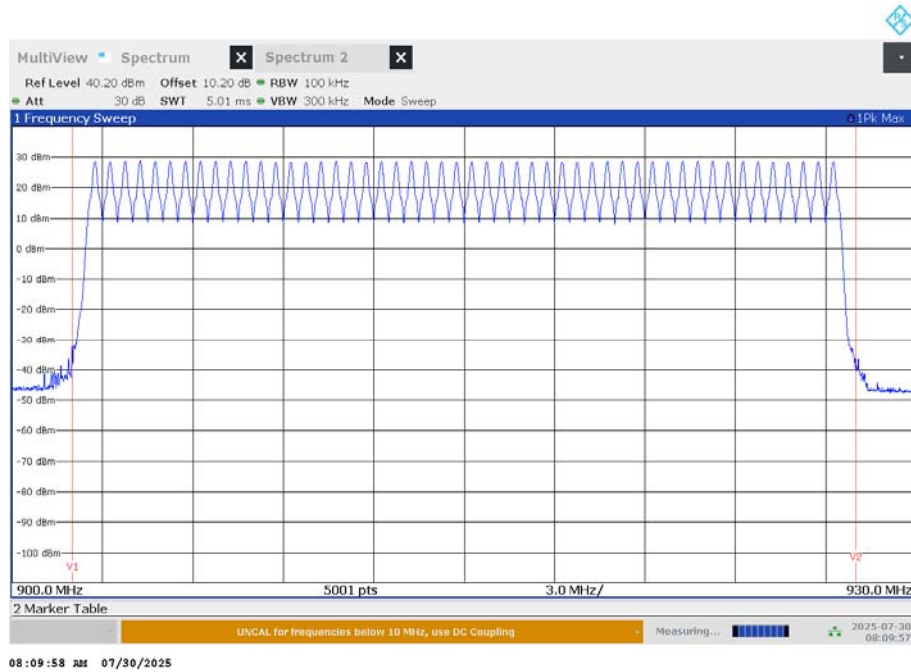
### **Limits:**

| FCC                                                                                                                                                                  | ISED |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Number of hopping channels                                                                                                                                           |      |
| At least 25 non overlapping hopping channels. If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping channels. |      |

**Result:** in summary the EUT uses 50 channels.

## Plots:

Plot 1: Number of channels



## 12.4 Average Time of Occupancy (dwell time)

### Description:

The measurement is performed in zero span mode to show that none of the 50 used channels is allocated more than 0.4 seconds within a 20 seconds interval (50 channels times 0.4s).

### Limits:

| FCC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ISED |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| <b>Average time of occupancy</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |
| For frequency hopping systems operating in the 902-928 MHz band: If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within 10 second period. |      |

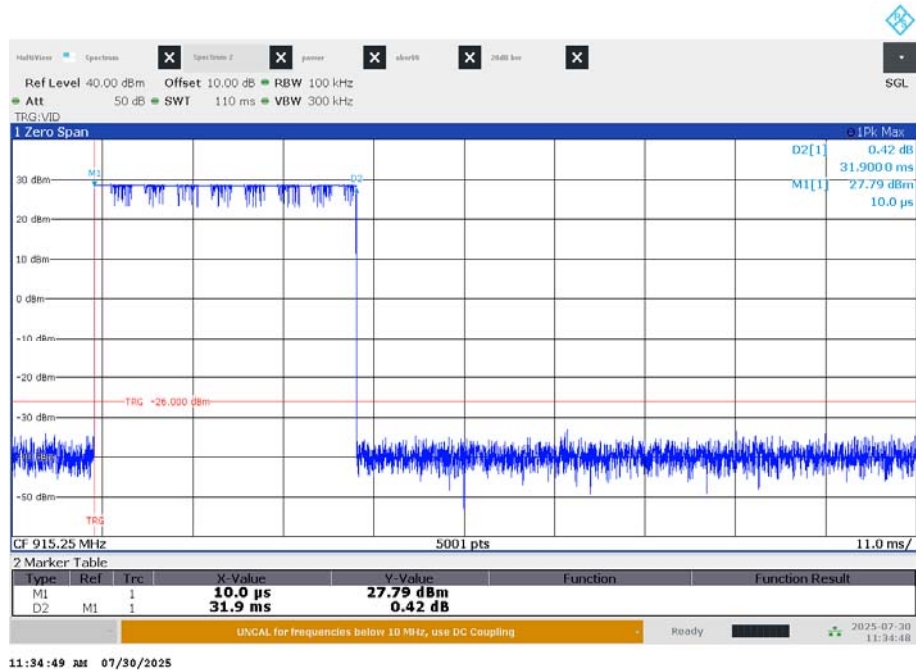
**Result:**      The time slot length is = 31.9 ms  
Number of hops / channel @ 20s = 7

Within 20 s period, the average time of occupancy in 20 s: 223.3 ms

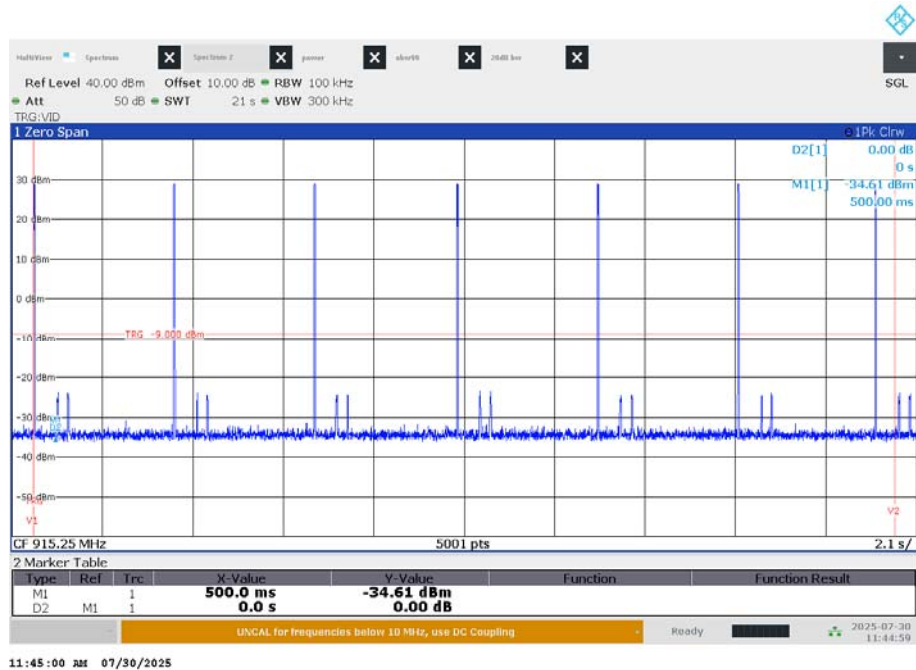
→ The average time of occupancy = 223.3 ms

**Plots:**

Plot 1: Time slot length = 31.9 ms



Plot 2: hops / channel @ 20s = 7



## 12.5 Spectrum bandwidth of a FHSS system

### Description:

Measurement of the 20dB bandwidth and 99% bandwidth of the modulated signal. The measurement is performed according to the "Measurement Guidelines" (DA 00-705, March 30, 2000). EUT in single channel mode.

| Measurement parameters  |                      |
|-------------------------|----------------------|
| Detector                | Peak                 |
| Sweep time              | Auto                 |
| Resolution bandwidth    | see plots            |
| Video bandwidth         | see plots            |
| Span                    | see plots            |
| Trace mode              | Max hold             |
| Test setup              | See sub clause 7.4 A |
| Measurement uncertainty | See sub clause 9     |

### Limits:

| FCC                                 | ISED |
|-------------------------------------|------|
| Spectrum bandwidth of a FHSS system |      |
| DBPSK < 500 kHz                     |      |

### Result:

| Test Conditions                      |                           | 20dB BANDWIDTH |            |            |
|--------------------------------------|---------------------------|----------------|------------|------------|
|                                      |                           | 902.75 MHz     | 915.25 MHz | 927.25 MHz |
| T <sub>nom</sub><br>V <sub>nom</sub> | FM0 (103) modulation      | 41.99 kHz      | 41.74 kHz  | 42.01 kHz  |
|                                      | Miller 2 (123) modulation | 65.54 kHz      | 65.23 kHz  | 65.16 kHz  |
|                                      | Miller 4 (141) modulation | 65.73 kHz      | 65.76 kHz  | 65.79 kHz  |
|                                      | Miller 8 (185) modulation | 62.21 kHz      | 61.83 kHz  | 62.51 kHz  |

| Test Conditions                      |                           | 99% BANDWIDTH |            |            |
|--------------------------------------|---------------------------|---------------|------------|------------|
|                                      |                           | 902.75 MHz    | 915.25 MHz | 927.25 MHz |
| T <sub>nom</sub><br>V <sub>nom</sub> | FM0 (103) modulation      | 373.10 kHz    | 371.93 kHz | 372.60 kHz |
|                                      | Miller 2 (123) modulation | 70.45 kHz     | 70.36 kHz  | 70.12 kHz  |
|                                      | Miller 4 (141) modulation | 69.24 kHz     | 69.04 kHz  | 69.05 kHz  |
|                                      | Miller 8 (185) modulation | 70.43 kHz     | 71.24 kHz  | 71.08 kHz  |

12.5.1 Plots FM0 (103) modulation:

Plot 1: tx 902.75 MHz – 20 dB bandwidth



Plot 2: tx 902.75 MHz – 99% bandwidth



Plot 3: tx 915.25 MHz – 20 dB bandwidth



Plot 4: tx 915.25 MHz – 99% bandwidth



Plot 5: tx 927.25 MHz – 20 dB bandwidth



Plot 6: tx 927.25 MHz – 99% bandwidth

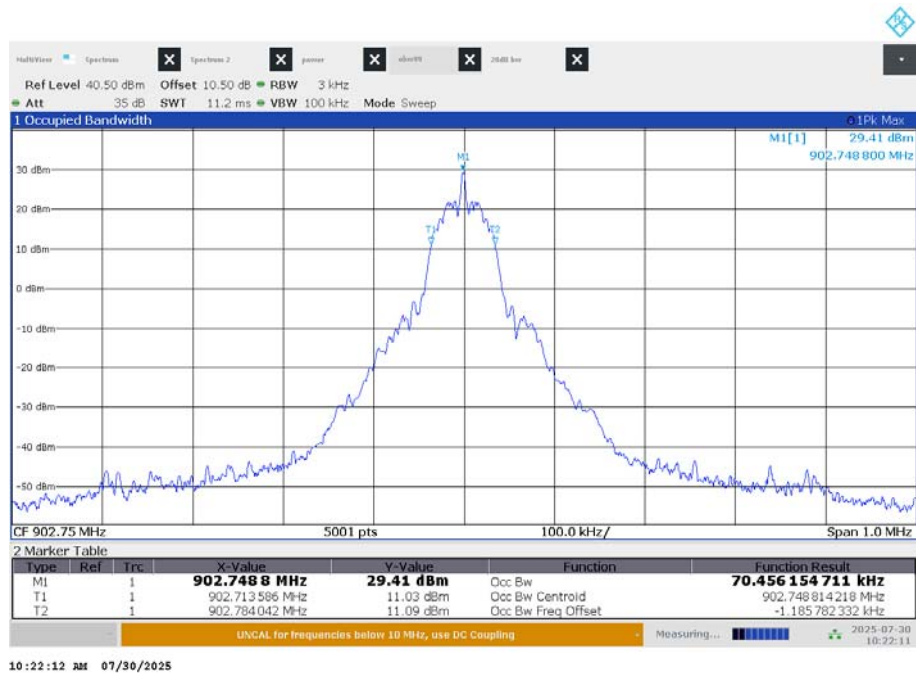


12.5.2 Plots Miller 2 (123) modulation:

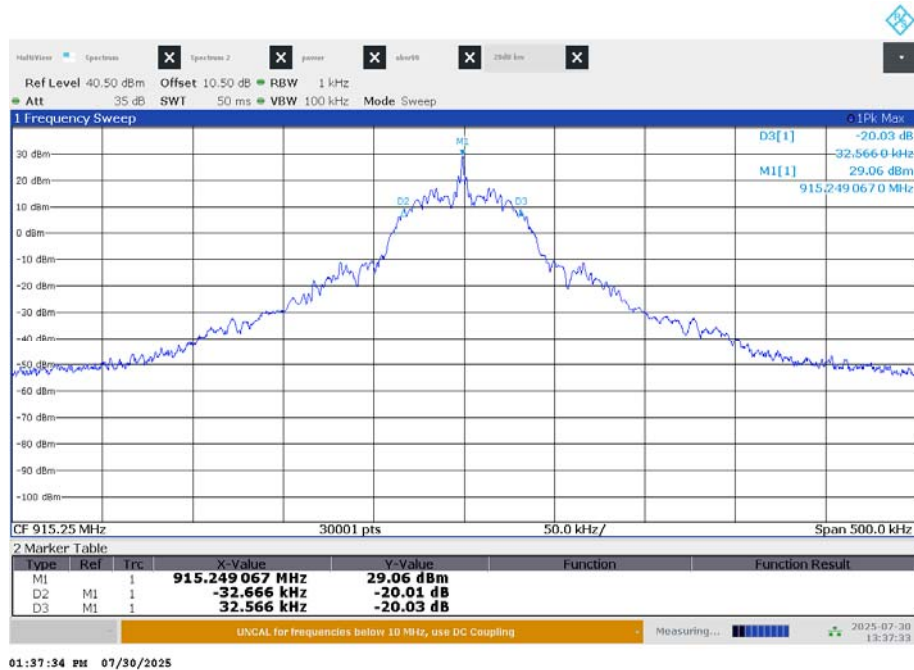
Plot 1: tx 902.75 MHz – 20 dB bandwidth



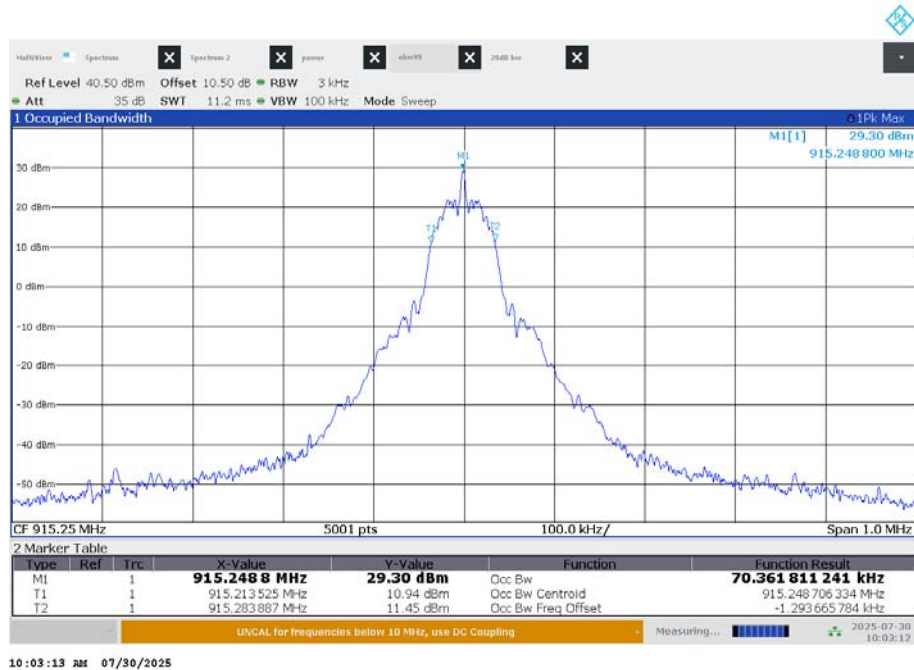
Plot 2: tx 902.75 MHz – 99% bandwidth



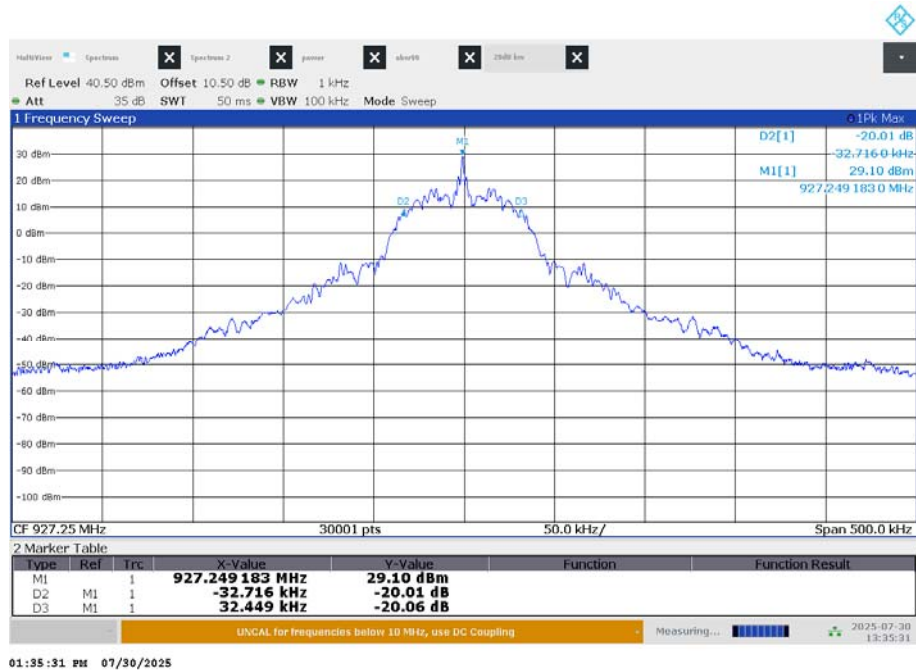
Plot 3: tx 915.25 MHz – 20 dB bandwidth



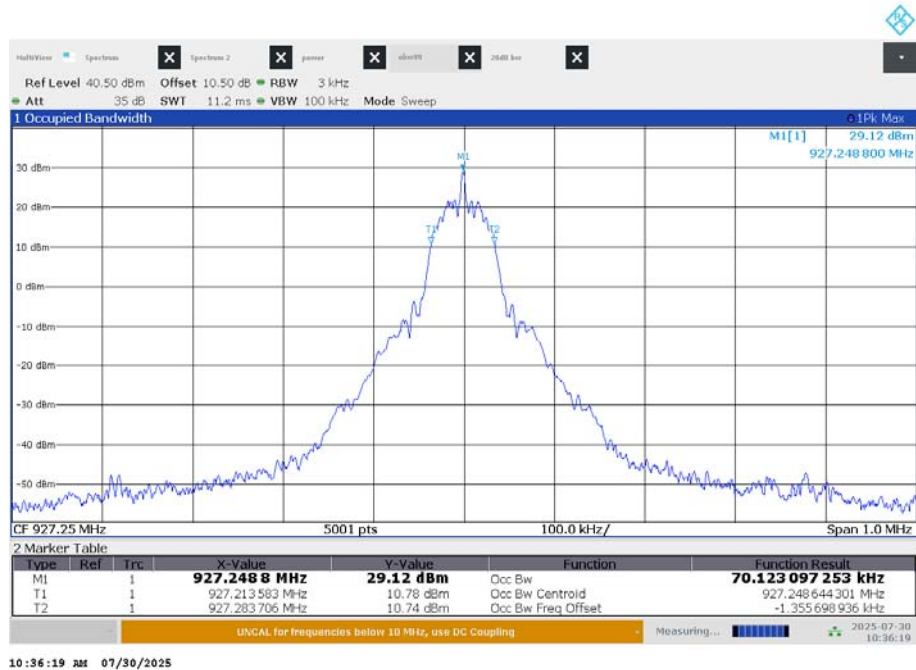
Plot 4: tx 915.25 MHz – 99% bandwidth



Plot 5: tx 927.25 MHz – 20 dB bandwidth

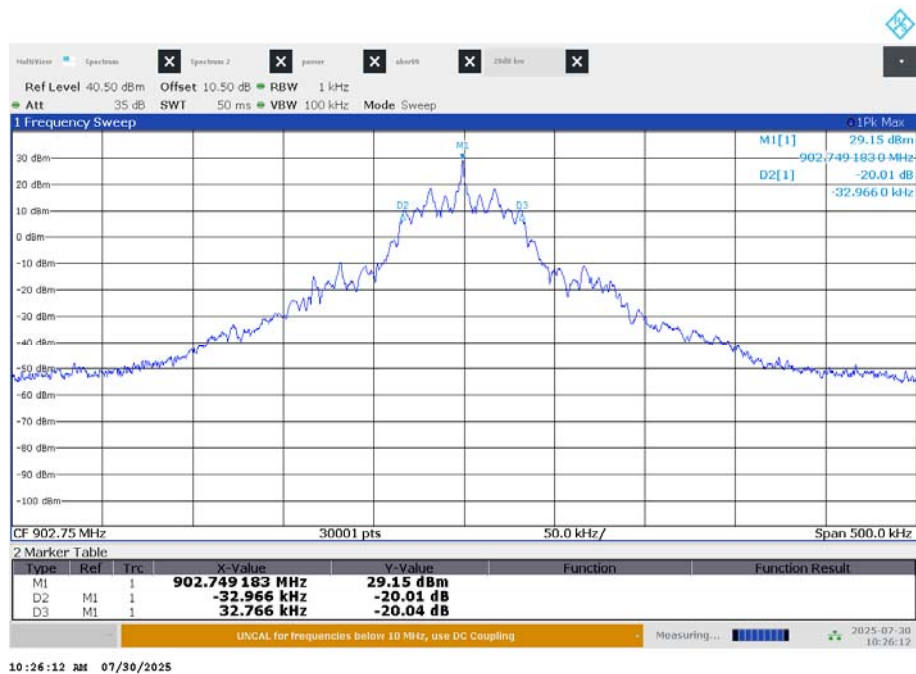


Plot 6: tx 927.25 MHz – 99% bandwidth

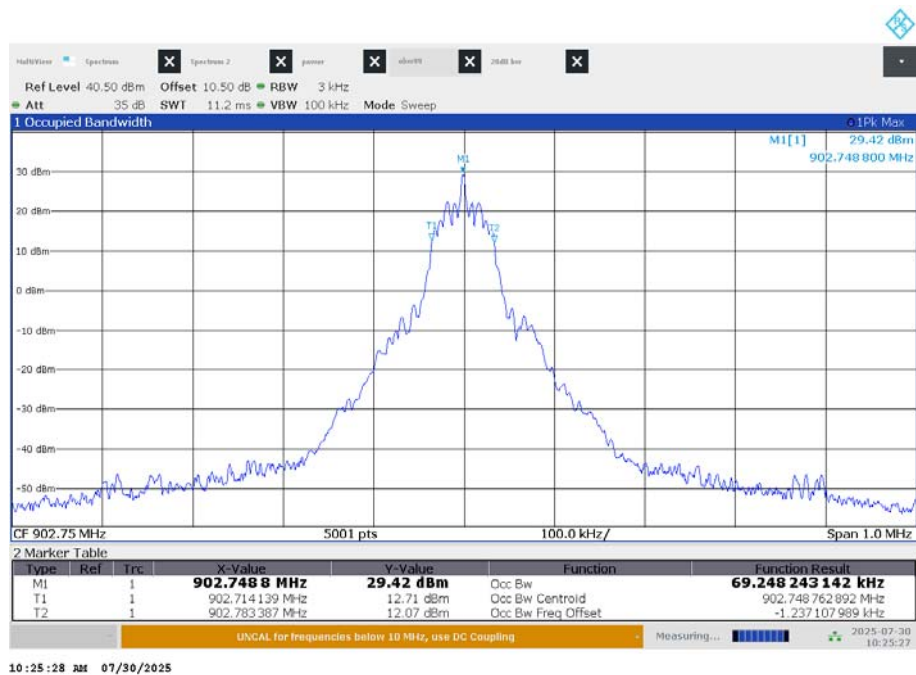


**12.5.3 Plots Miller 4 (141) modulation**

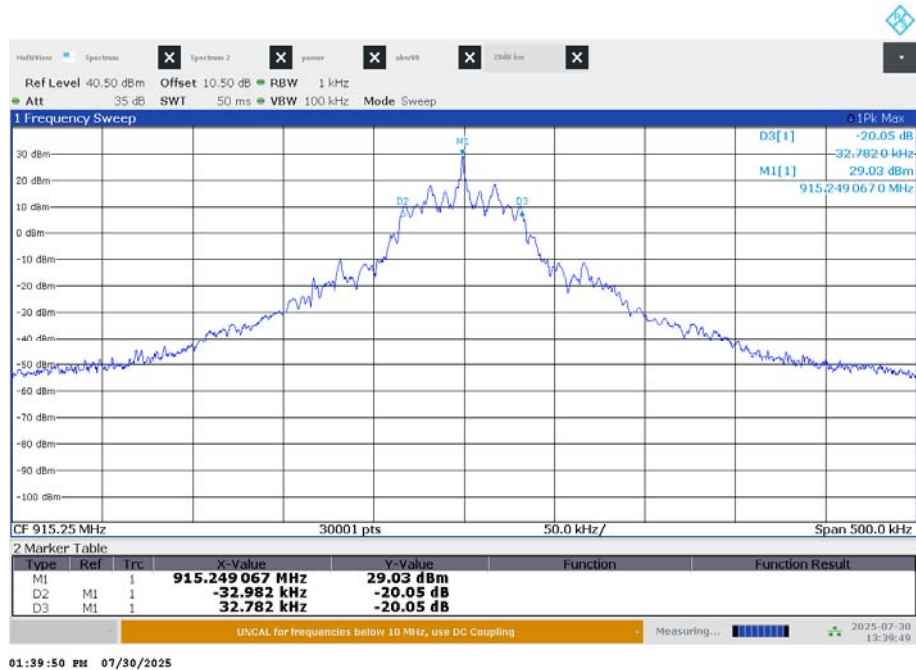
Plot 1: tx 902.75 MHz – 20 dB bandwidth



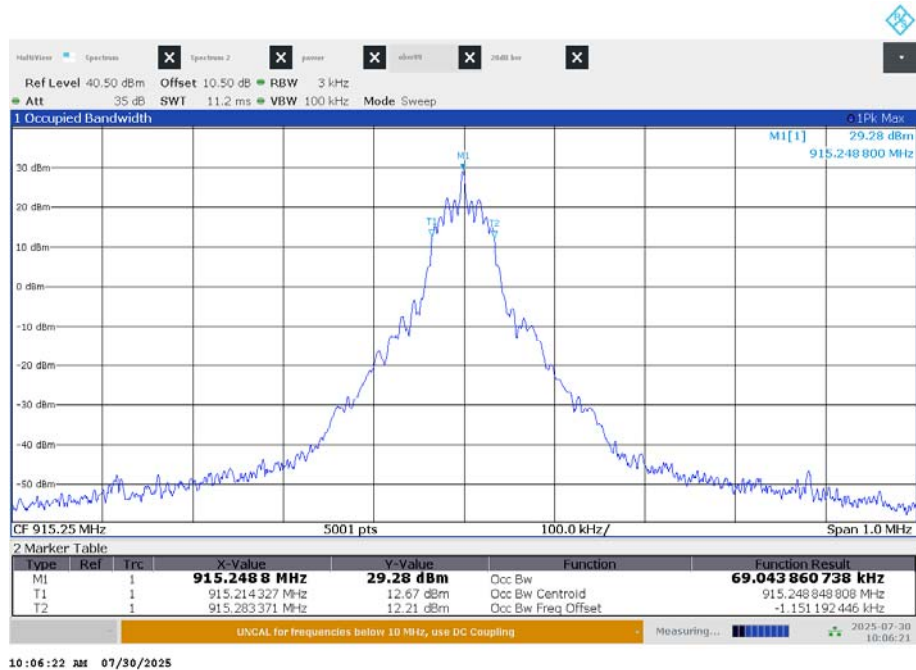
Plot 2: tx 902.75 MHz – 99% bandwidth



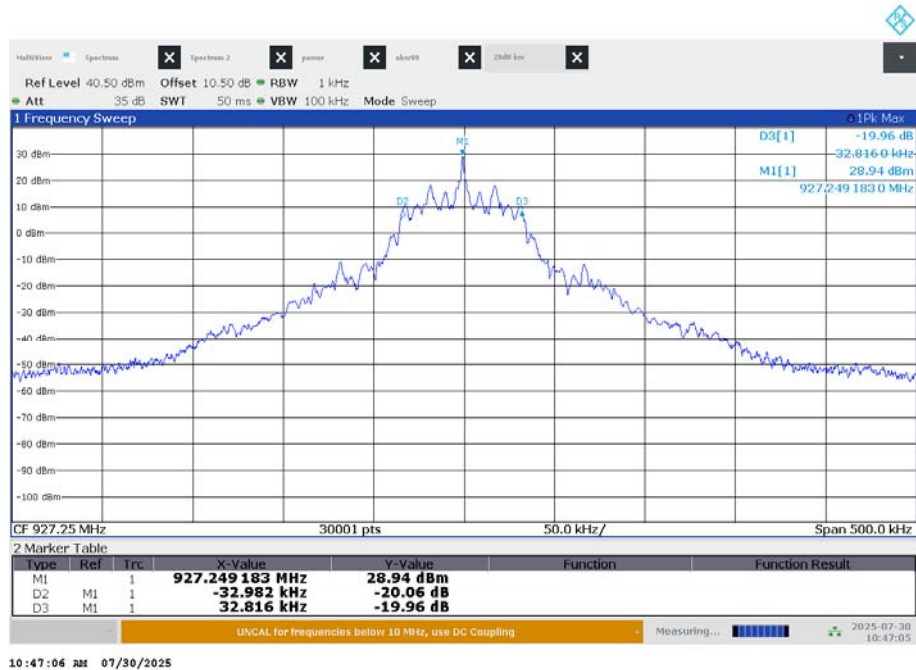
Plot 3: tx 915.25 MHz – 20 dB bandwidth



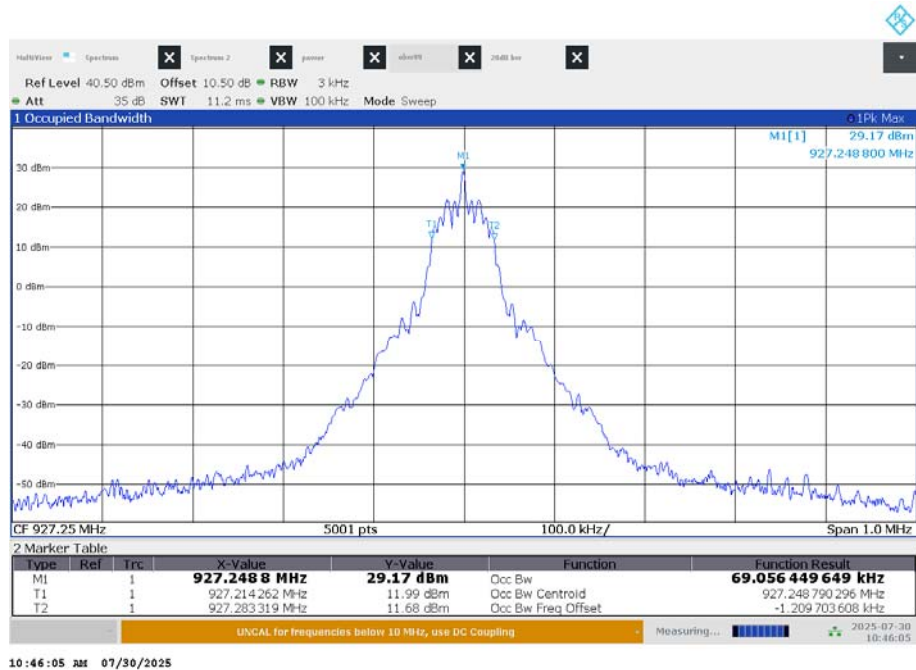
Plot 4: tx 915.25 MHz – 99% bandwidth



Plot 5: tx 927.25 MHz – 20 dB bandwidth



Plot 6: tx 927.25 MHz – 99% bandwidth

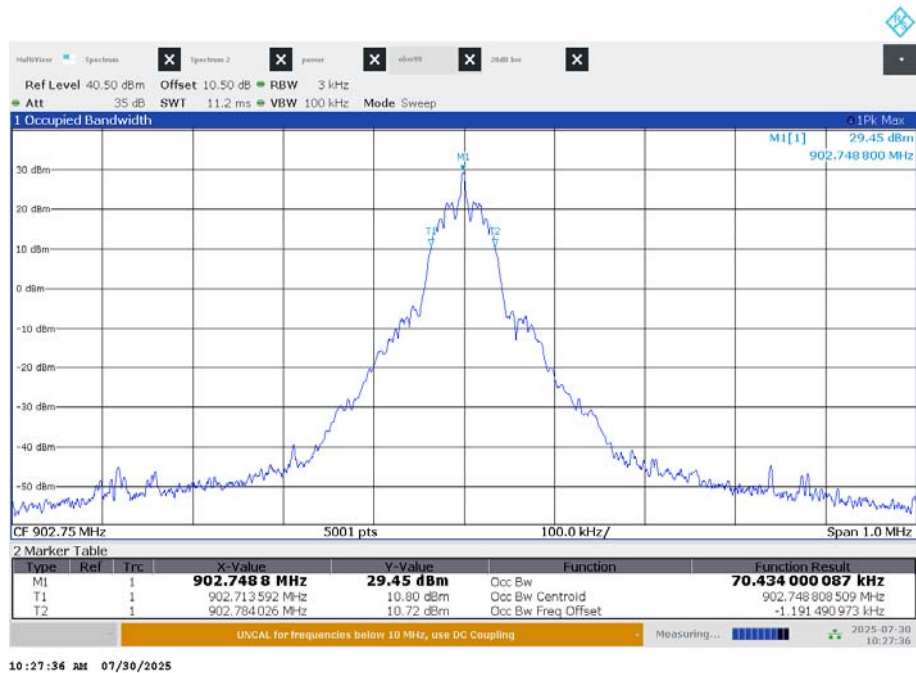


**12.5.4 Plots Miller 8 (185) modulation:**

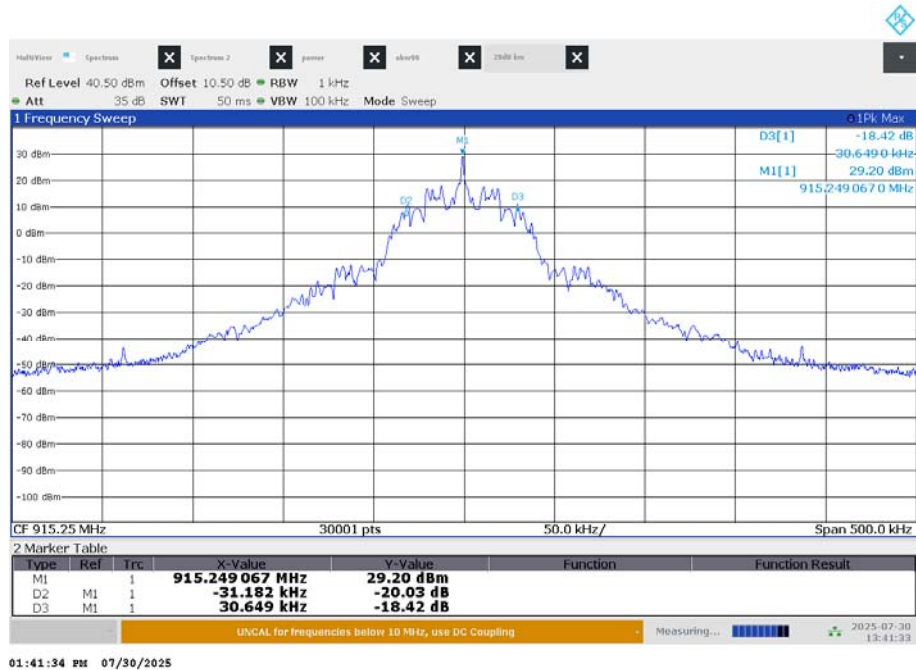
Plot 1: tx 902.75 MHz – 20 dB bandwidth



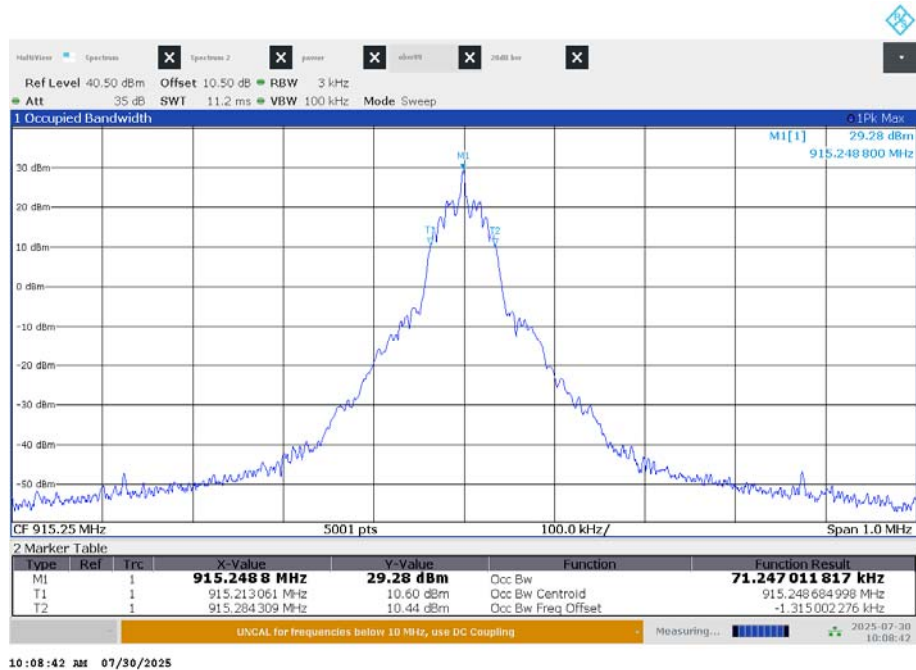
Plot 2: tx 902.75 MHz – 99% bandwidth



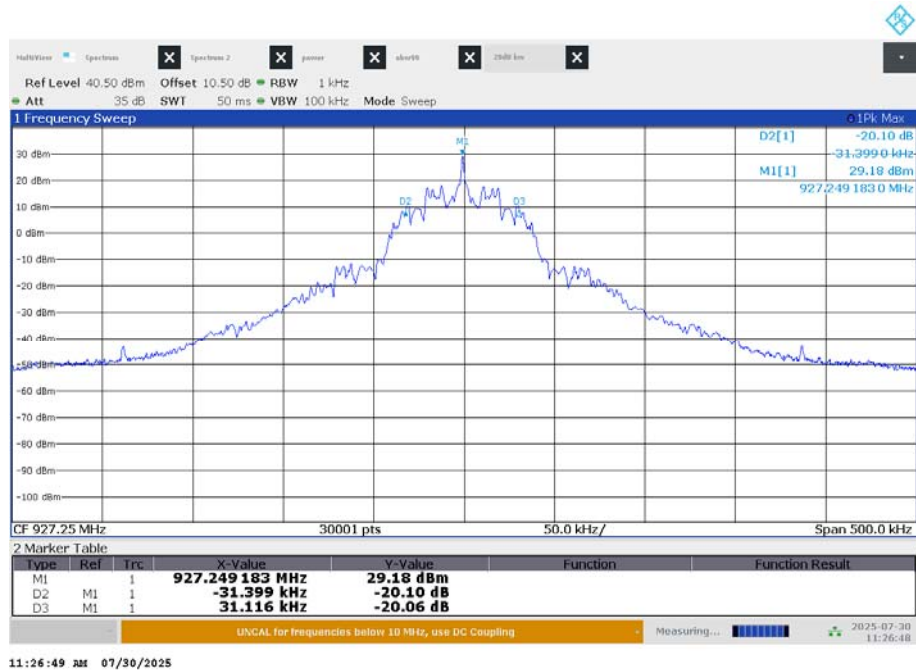
Plot 3: tx 915.25 MHz – 20 dB bandwidth



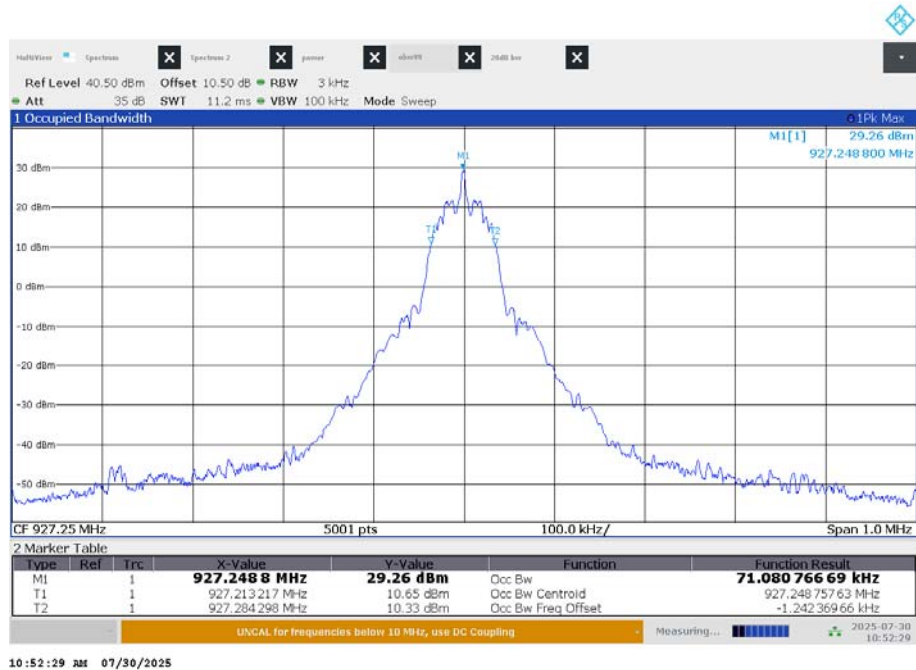
Plot 4: tx 915.25 MHz – 99% bandwidth



Plot 5: tx 927.25 MHz – 20 dB bandwidth



Plot 6: tx 927.25 MHz – 99% bandwidth



## 12.6 Maximum Output Power

### Measurement:

| Measurement parameter    |                   |
|--------------------------|-------------------|
| Detector:                | Peak              |
| Sweep time:              | Auto              |
| Resolution bandwidth:    | 1 MHz             |
| Video bandwidth:         | 3 MHz             |
| Span:                    | 5 MHz             |
| Trace-Mode:              | Max Hold          |
| Used equipment:          | See chapter 7.4 A |
| Measurement uncertainty: | See chapter 9     |

### Limits:

| FCC                                                                                                                                                                                                                                                                                                          | ISED |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Maximum Output Power Conducted                                                                                                                                                                                                                                                                               |      |
| For frequency hopping systems operating in the 902–928 MHz band: 1 watt (30 dBm) for systems employing at least 50 hopping channels; and, 0.25 watts (24 dBm) for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section. |      |

**Result EUT A:**

| Test Conditions   |                           | Maximum Output Power Conducted |            |            |
|-------------------|---------------------------|--------------------------------|------------|------------|
|                   |                           | 902.75 MHz                     | 915.25 MHz | 927.25 MHz |
| $T_{nom} V_{nom}$ | FM0 (103) modulation      | 29.65 dBm                      | 29.69 dBm  | 29.69 dBm  |
|                   | Miller 2 (123) modulation | 29.73 dBm                      | 29.51 dBm  | 29.49 dBm  |
|                   | Miller 4 (141) modulation | 29.66 dBm                      | 29.44 dBm  | 29.45 dBm  |
|                   | Miller 8 (185) modulation | 29.52 dBm                      | 29.47 dBm  | 29.45 dBm  |

**Result EUT A:**

| Test Conditions – FM0 (103) modulation |                | maximum output power radiated (ERP) |            |            |
|----------------------------------------|----------------|-------------------------------------|------------|------------|
|                                        |                | 902.75 MHz                          | 915.25 MHz | 927.25 MHz |
| ANT805                                 | radiated power | -2.05 dBm                           | -2.43 dBm  | -3.25 dBm  |
| ANT815                                 | radiated power | 15.51 dBm                           | 15.81 dBm  | 15.25 dBm  |
| ANT920                                 | radiated power | 27.71 dBm                           | 27.09 dBm  | 27.26 dBm  |
| ANT950                                 | radiated power | 32.52 dBm                           | 32.50 dBm  | 31.90 dBm  |
| ANT960                                 | radiated power | 32.85 dBm                           | 31.93 dBm  | 31.81 dBm  |
| ANT970                                 | radiated power | 26.53 dBm                           | 28.50 dBm  | 26.85 dBm  |

**Result EUT H:**

| Test Conditions   |                           | Maximum Output Power Conducted |            |            |
|-------------------|---------------------------|--------------------------------|------------|------------|
|                   |                           | 902.75 MHz                     | 915.25 MHz | 927.25 MHz |
| $T_{nom} V_{nom}$ | FM0 (103) modulation      | 29.53                          | 29.60      | 29.24      |
|                   | Miller 2 (123) modulation | 29.43                          | 29.37      | 29.21      |
|                   | Miller 4 (141) modulation | 29.40                          | 29.40      | 29.21      |
|                   | Miller 8 (185) modulation | 29.42                          | 29.35      | 29.25      |

**Result EUT I:**

| Test Conditions  |                  | Maximum Output Power Conducted |            |            |
|------------------|------------------|--------------------------------|------------|------------|
|                  |                  | 902.75 MHz                     | 915.25 MHz | 927.25 MHz |
| $T_{\text{nom}}$ | $V_{\text{nom}}$ | 29.87                          | 29.93      | 29.82      |

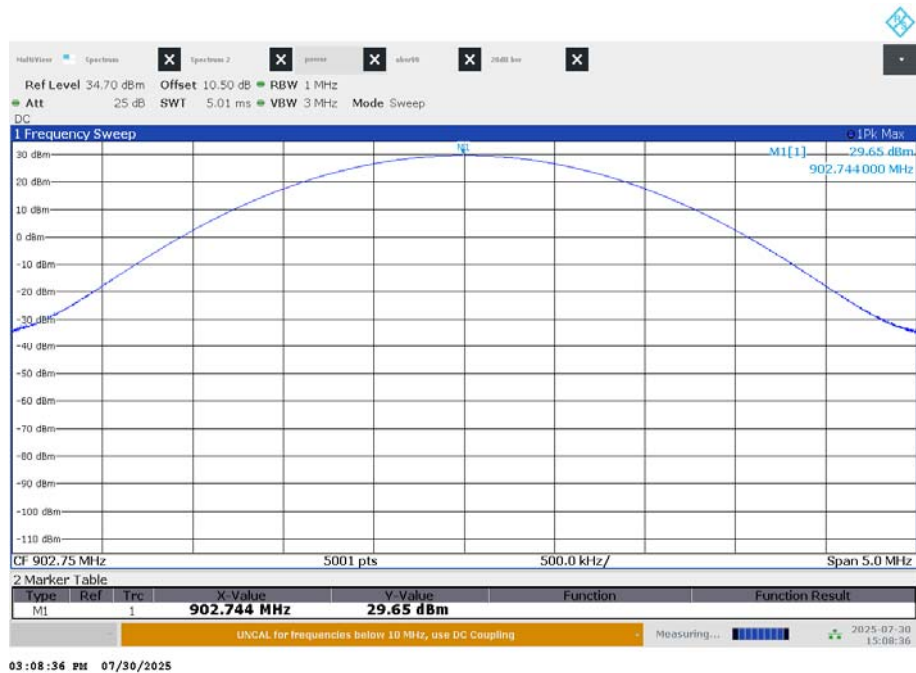
**Result set. 11**

| Test Conditions  |                  | Maximum Output Power radiated (ERP) |            |            |
|------------------|------------------|-------------------------------------|------------|------------|
|                  |                  | 902.75 MHz                          | 915.25 MHz | 927.25 MHz |
| $T_{\text{nom}}$ | $V_{\text{nom}}$ | 32.30                               | 32.81      | 32.49      |

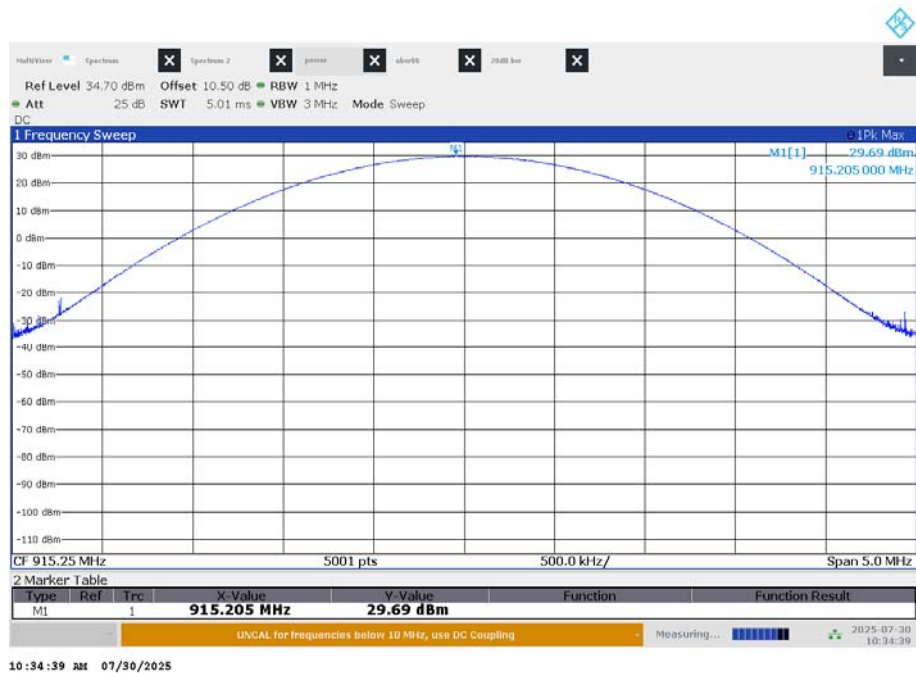
12.6.1 Plots EUT A

12.6.1.1 Plots FM0 (103) modulation:

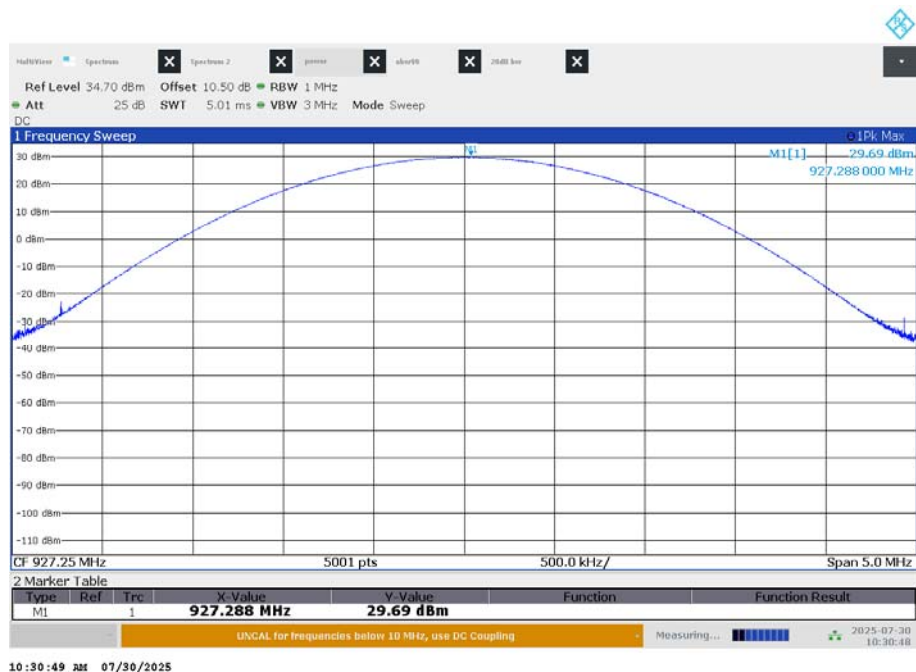
Plot 1: 902.75 MHz



Plot 2: 915.25 MHz

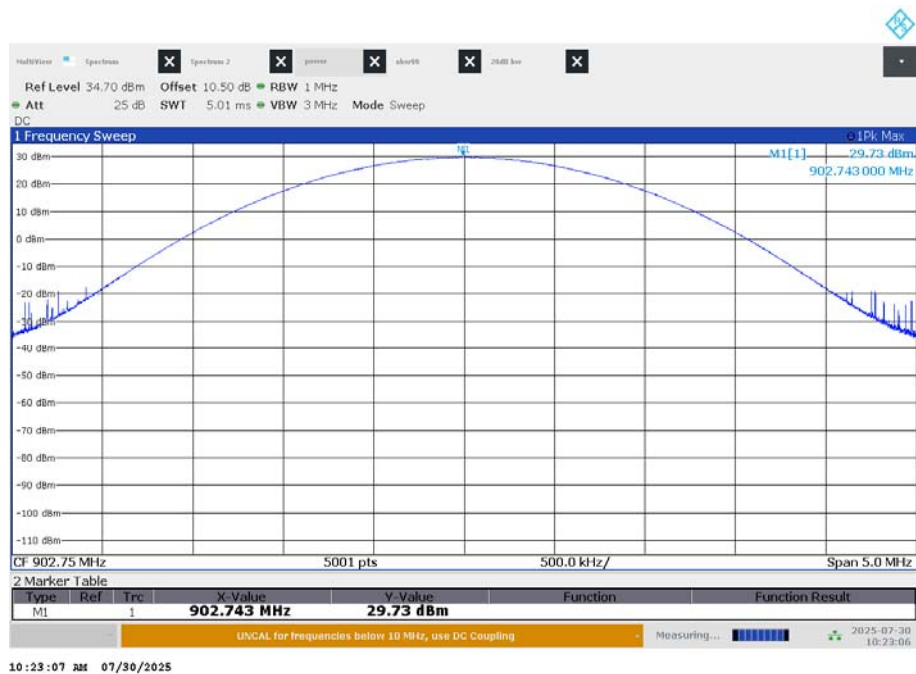


Plot 3: 927.25 MHz

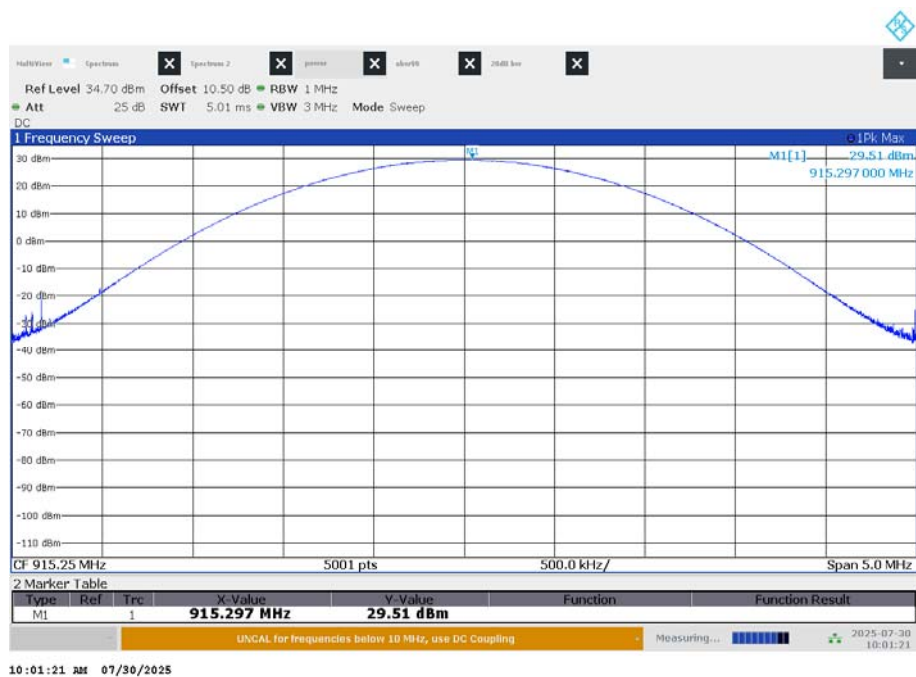


12.6.1.2 Plots Miller 2 (123) modulation:

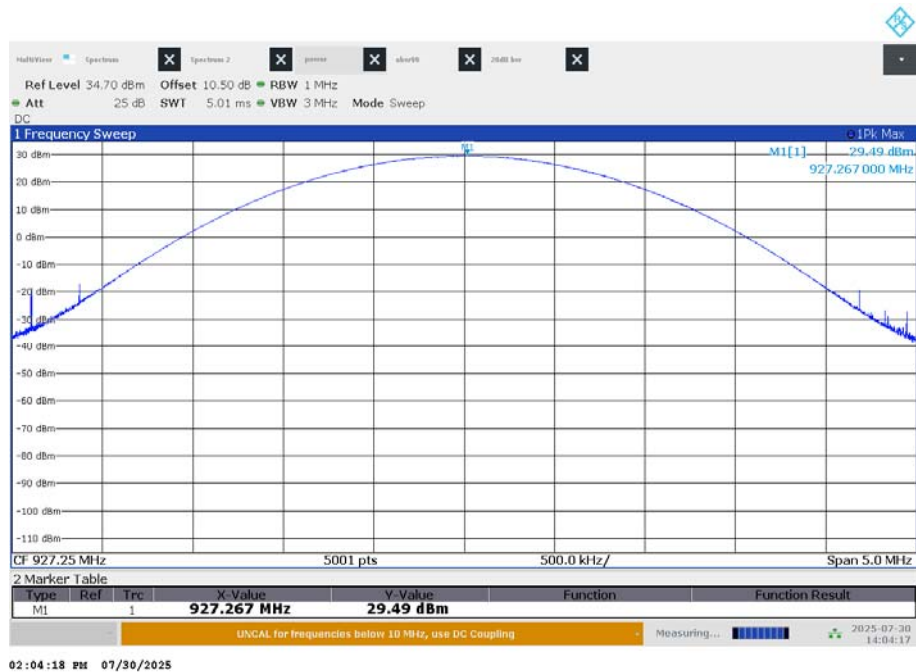
Plot 1: 902.75 MHz



Plot 2: 915.25 MHz

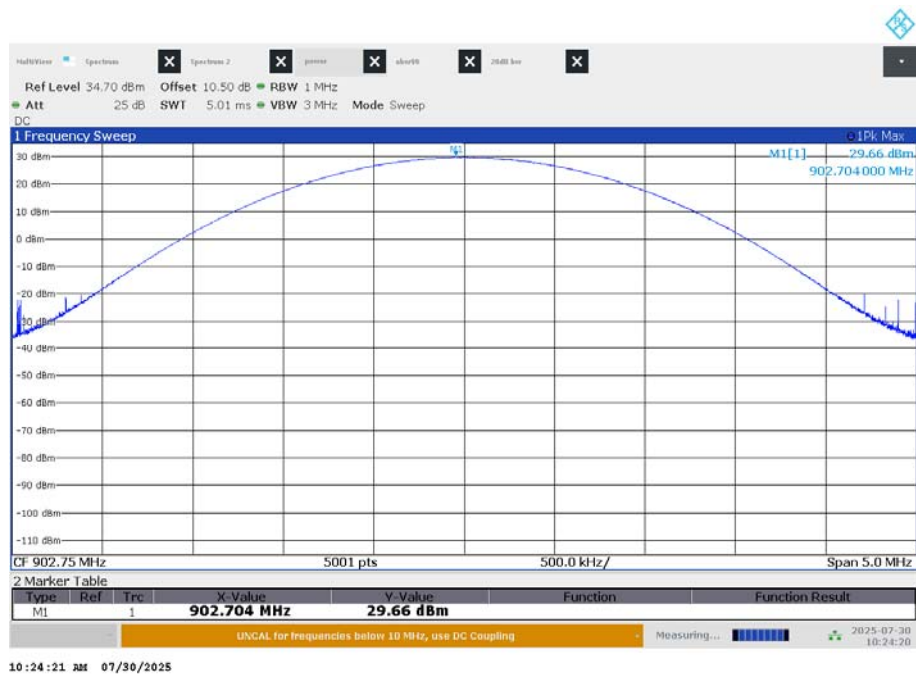


Plot 3: 927.25 MHz

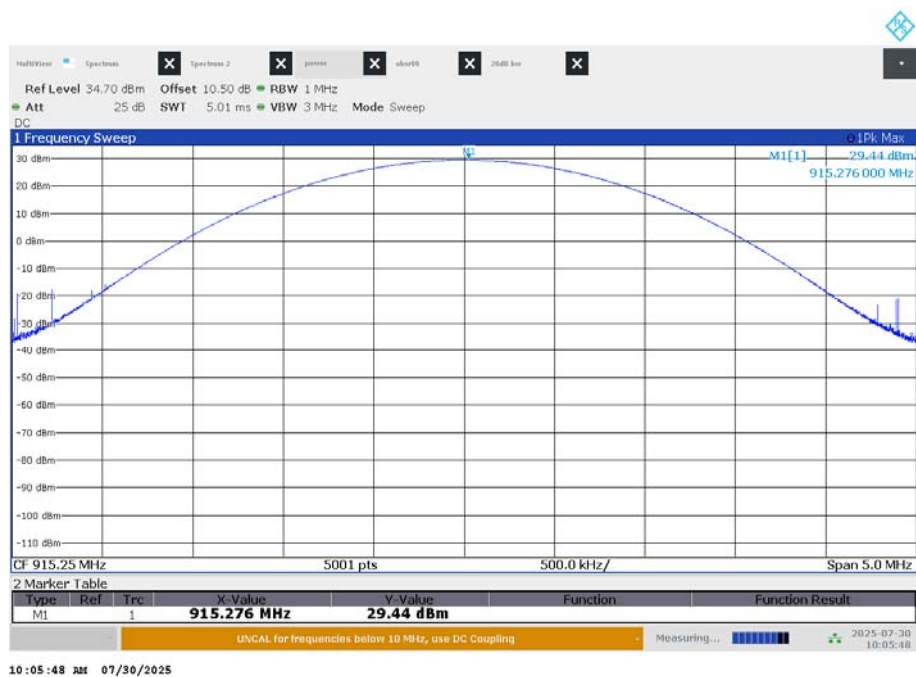


12.6.1.3 Plots Miller 4 (141) modulation:

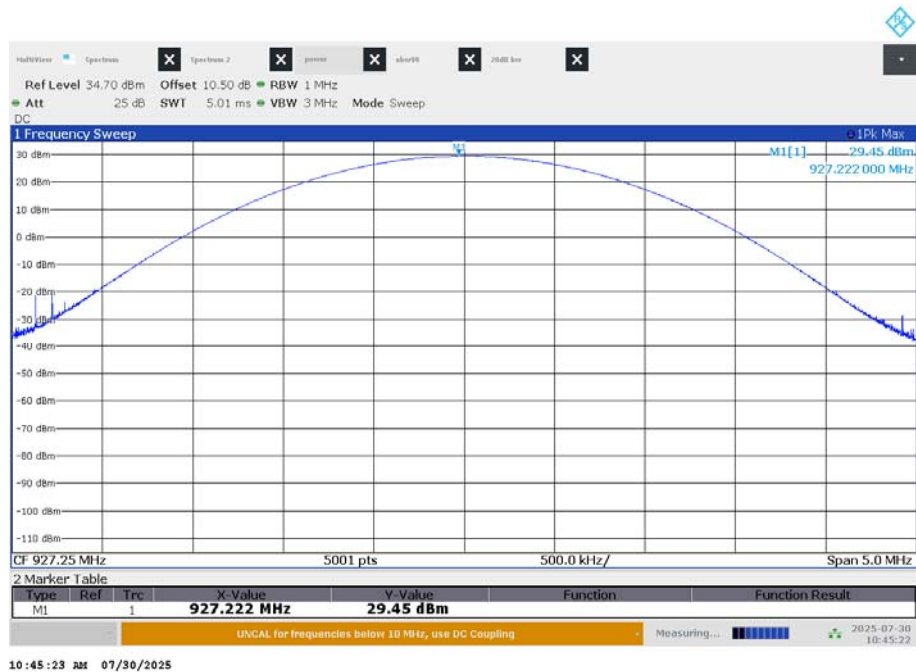
Plot 1: 902.75 MHz



Plot 2: 915.25 MHz

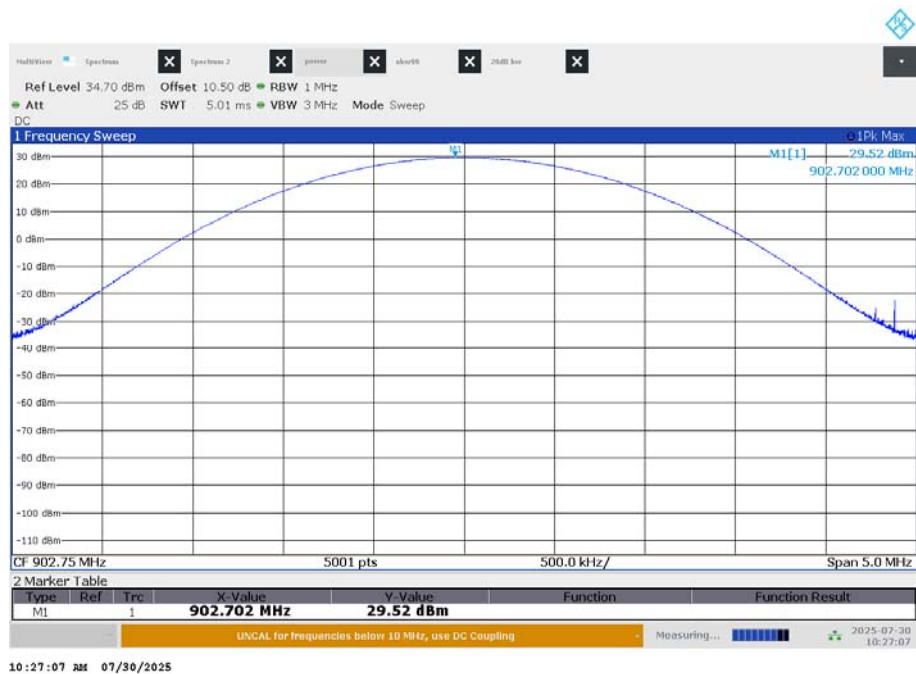


Plot 3: 927.25 MHz

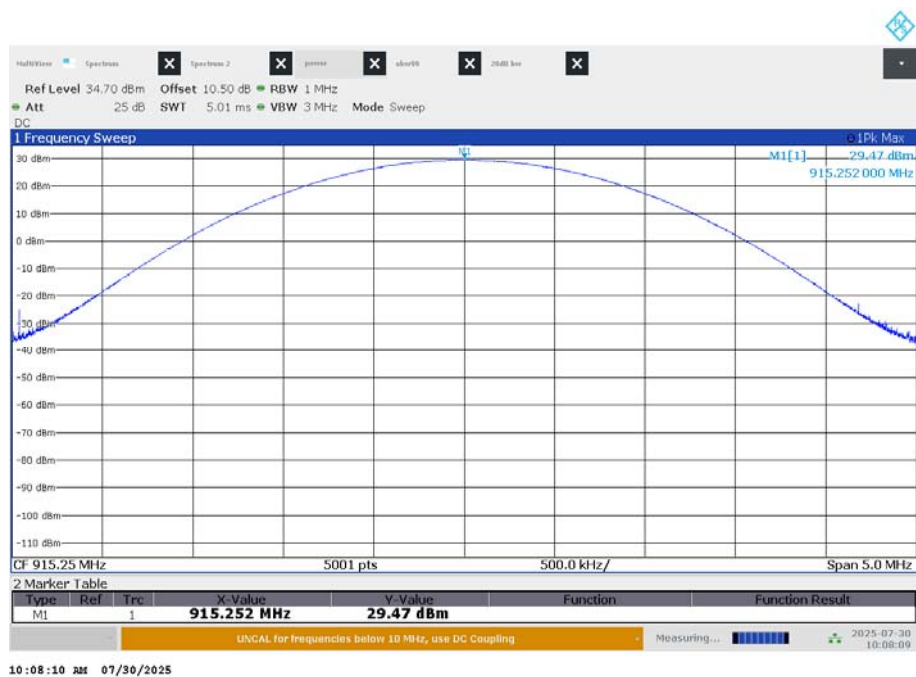


12.6.1.4 Plots Miller 8 (185) modulation:

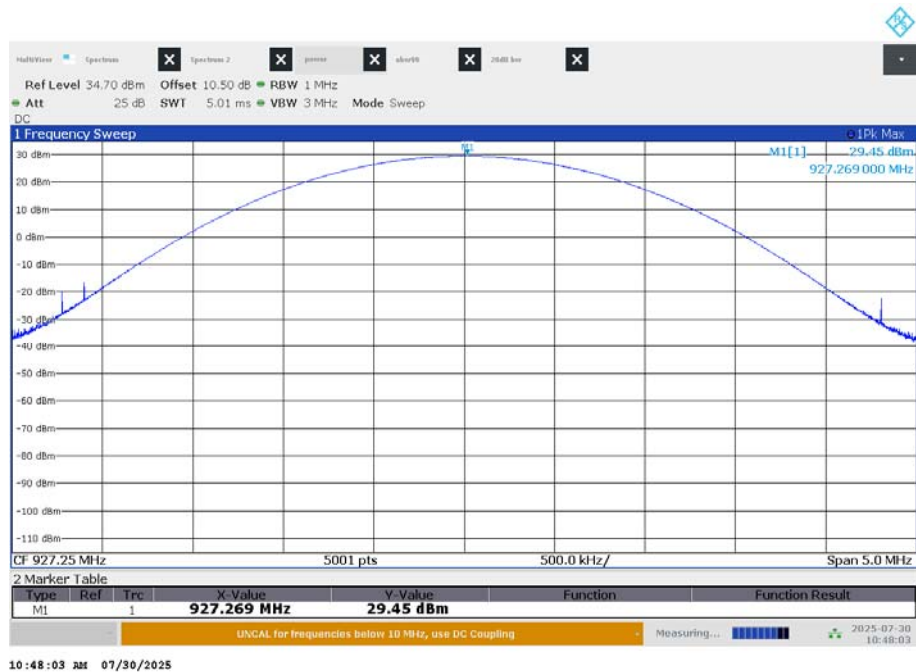
Plot 1: 902.75 MHz



Plot 2: 915.25 MHz



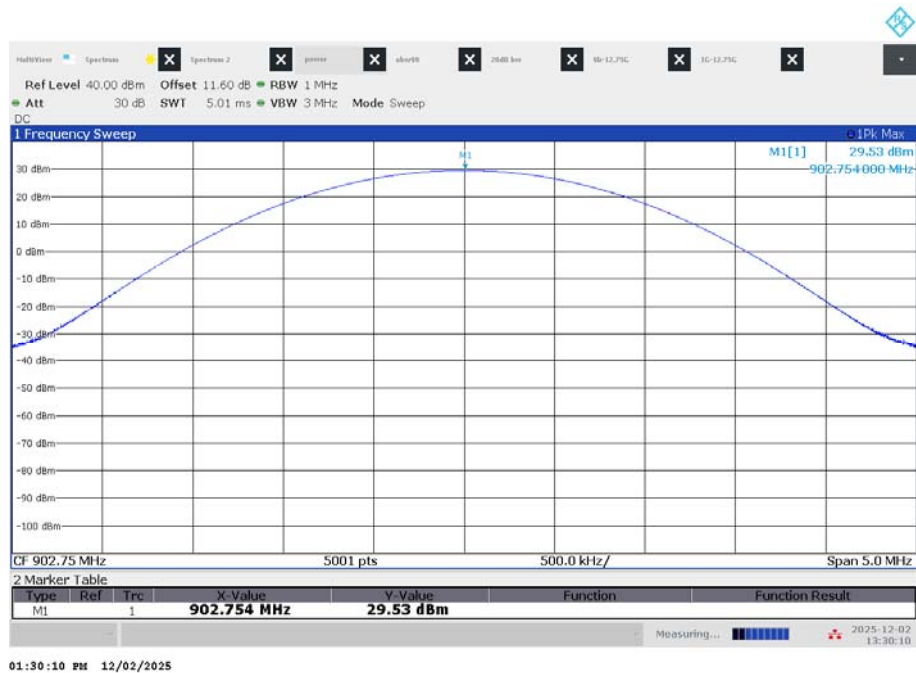
Plot 3: 927.25 MHz



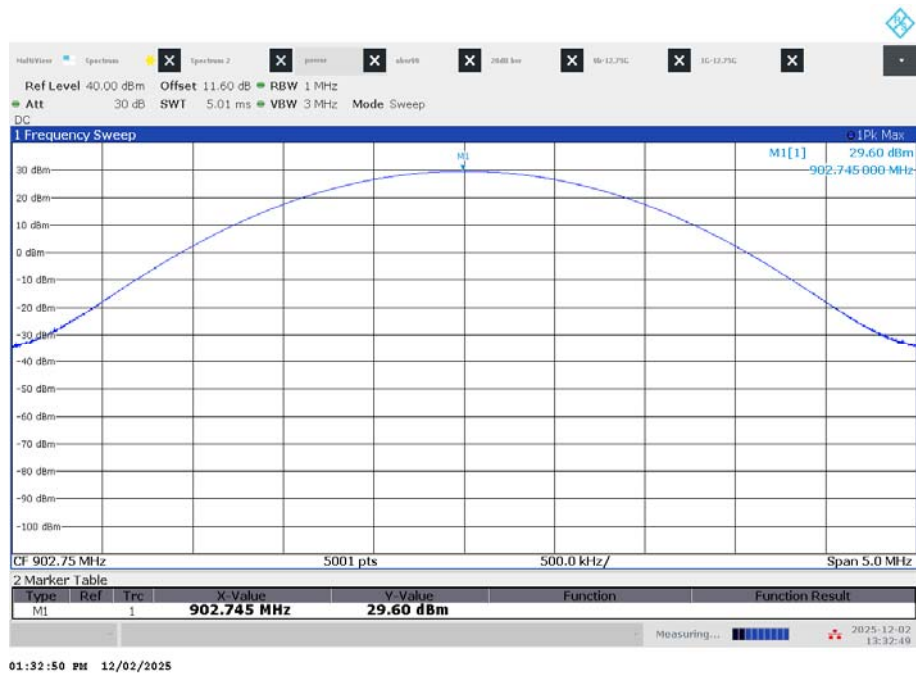
12.6.2 Plots EUT H

12.6.2.1 Plots FM0 (103) modulation:

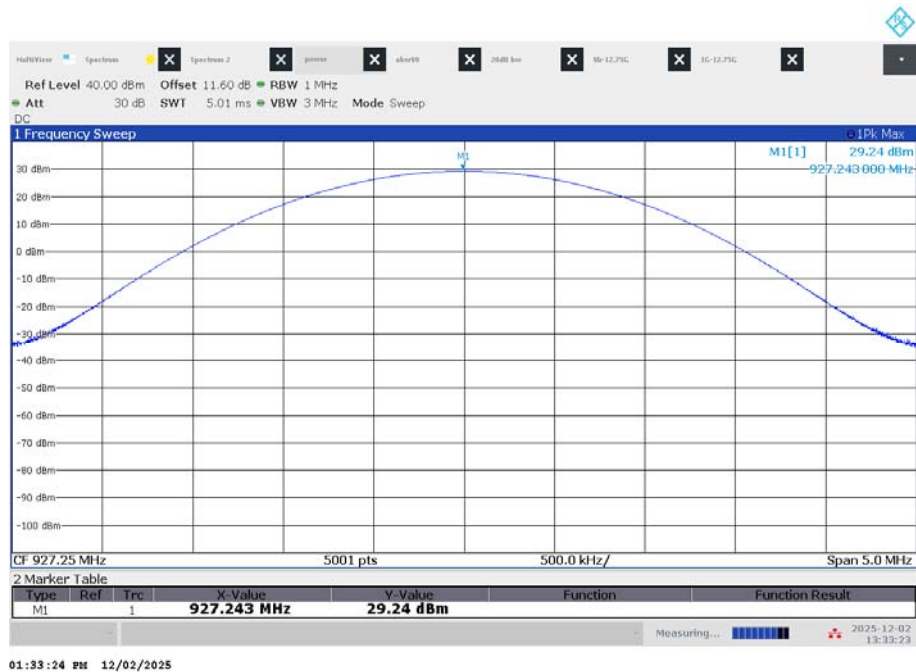
Plot 1: 902.75 MHz



Plot 2: 915.25 MHz

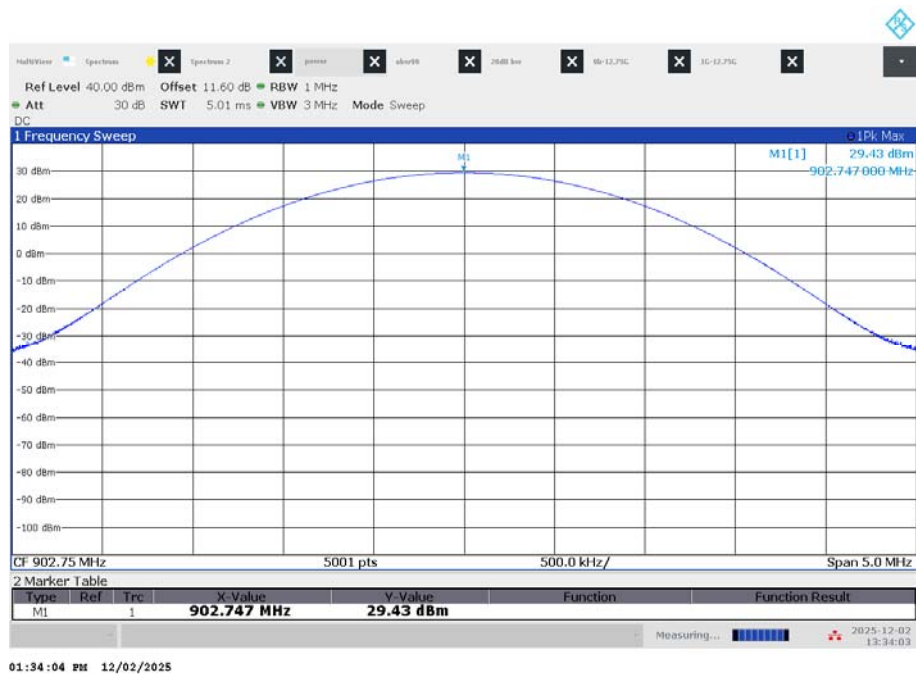


Plot 3: 927.25 MHz

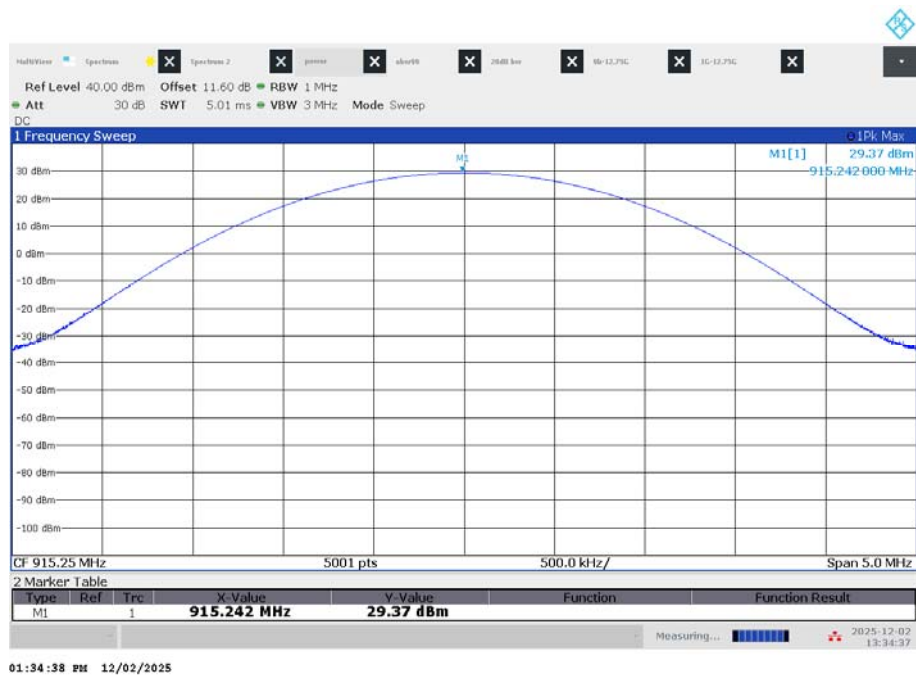


12.6.2.2 Plots Miller 2 (123) modulation:

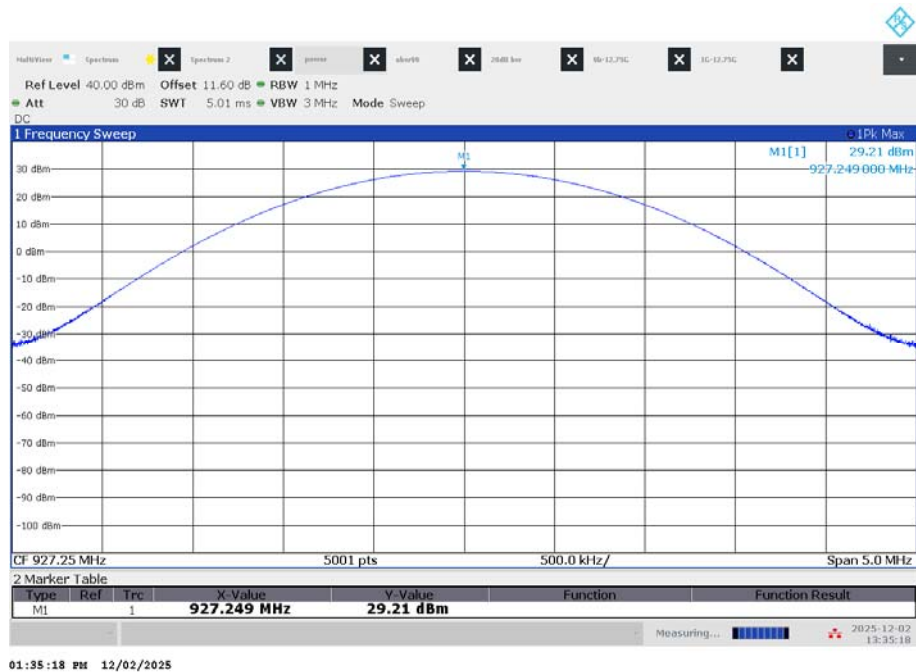
Plot 1: 902.75 MHz



Plot 2: 915.25 MHz

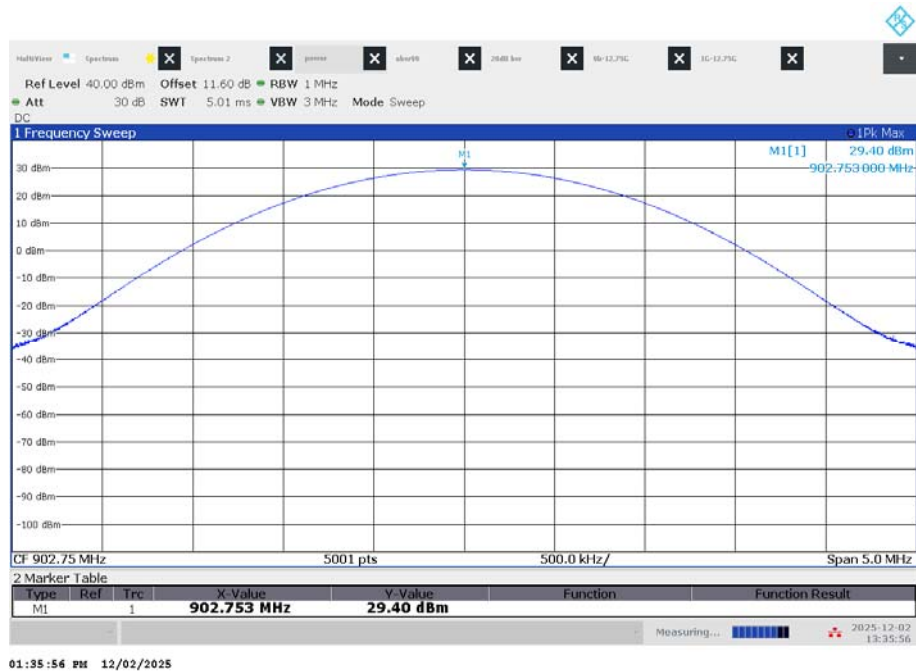


Plot 3: 927.25 MHz

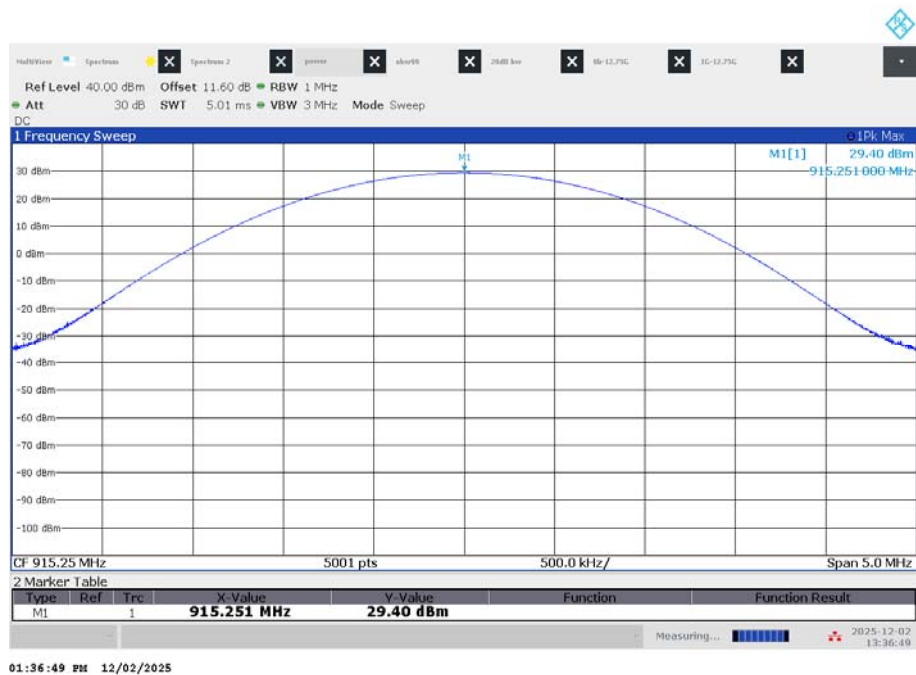


12.6.2.3 Plots Miller 4 (141) modulation:

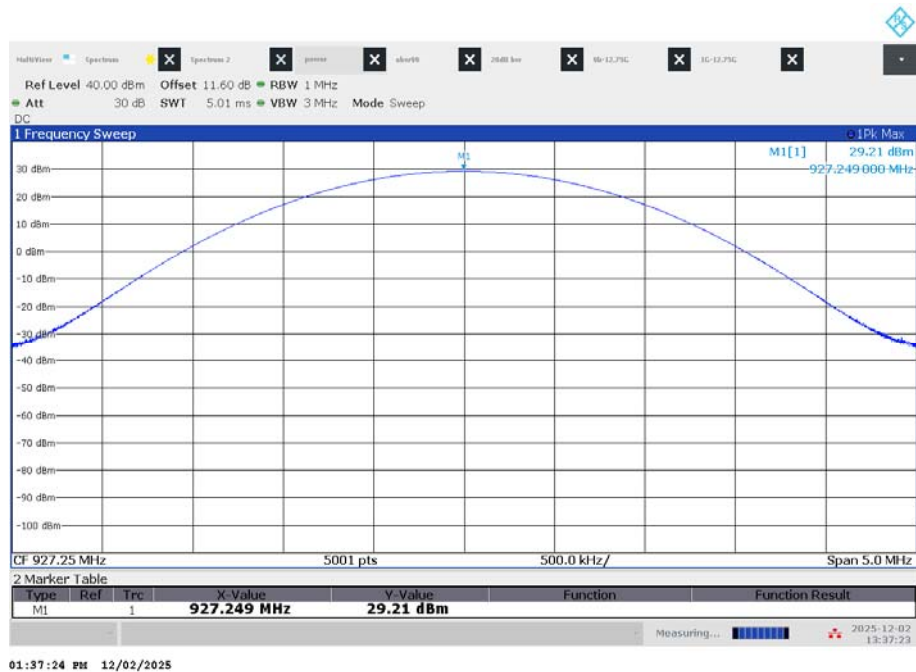
Plot 1: 902.75 MHz



Plot 2: 915.25 MHz

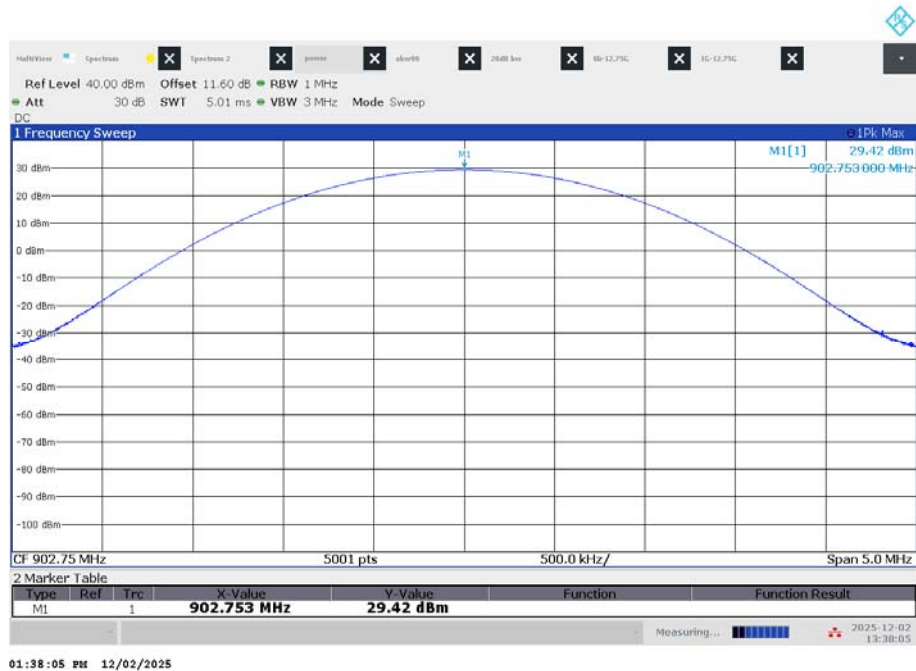


Plot 3: 927.25 MHz

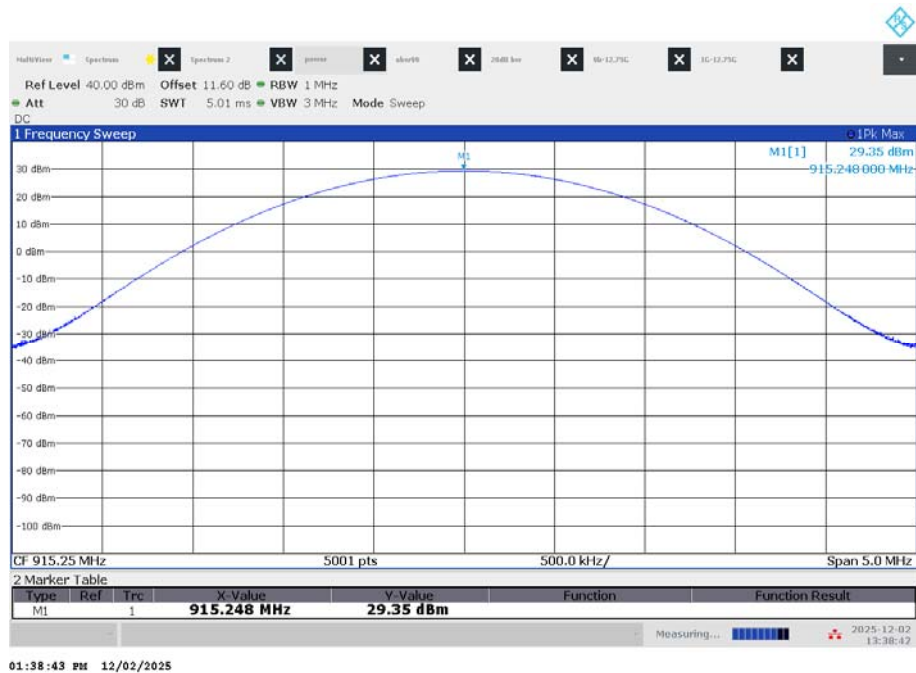


12.6.2.4 Plots Miller 8 (185) modulation:

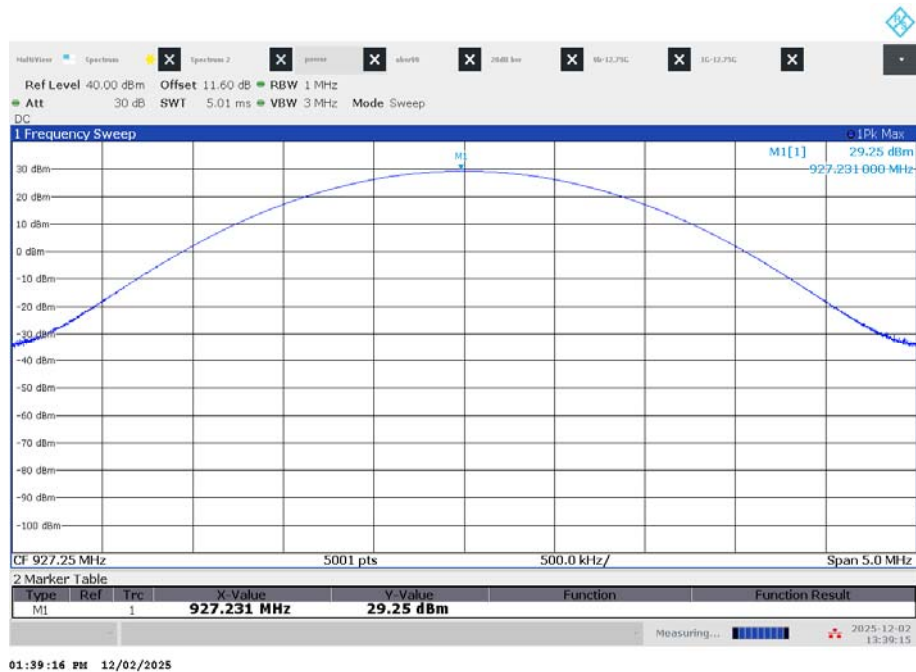
Plot 1: 902.75 MHz



Plot 2: 915.25 MHz



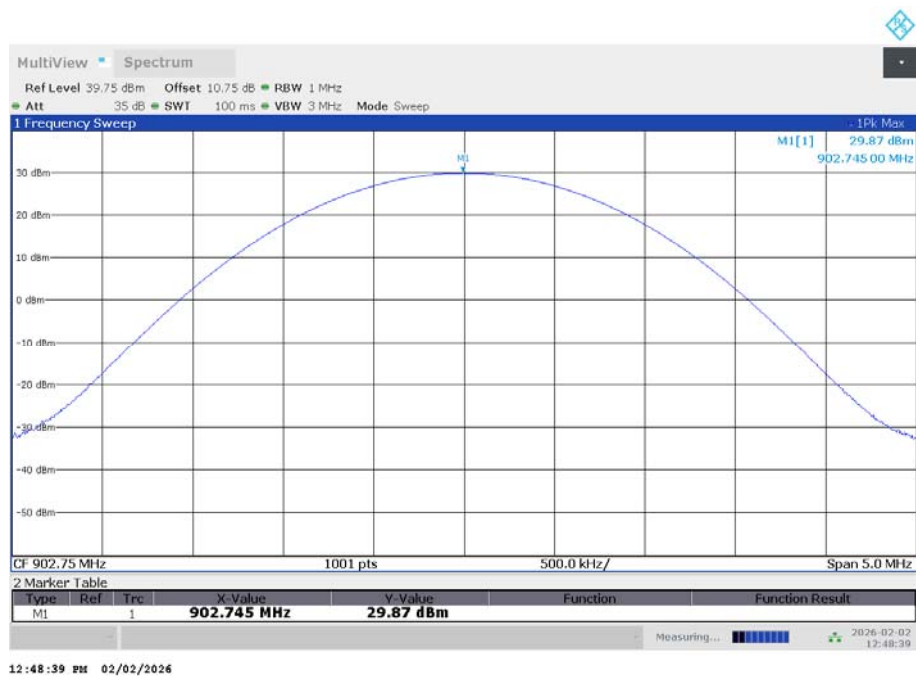
Plot 3: 927.25 MHz



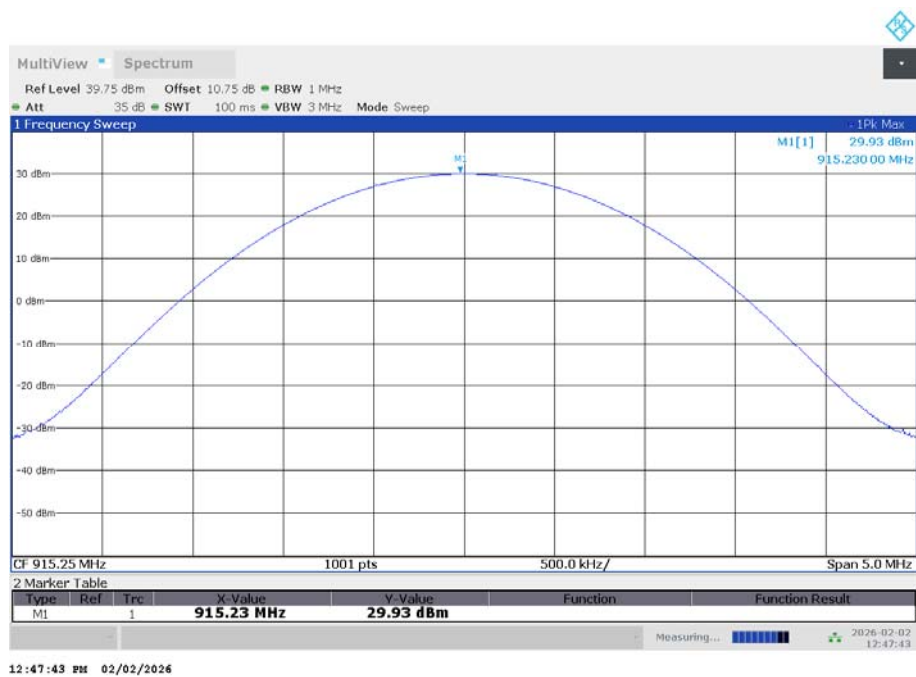
12.6.3 Plots EUT I

12.6.3.1 Plots FM0 (103) modulation:

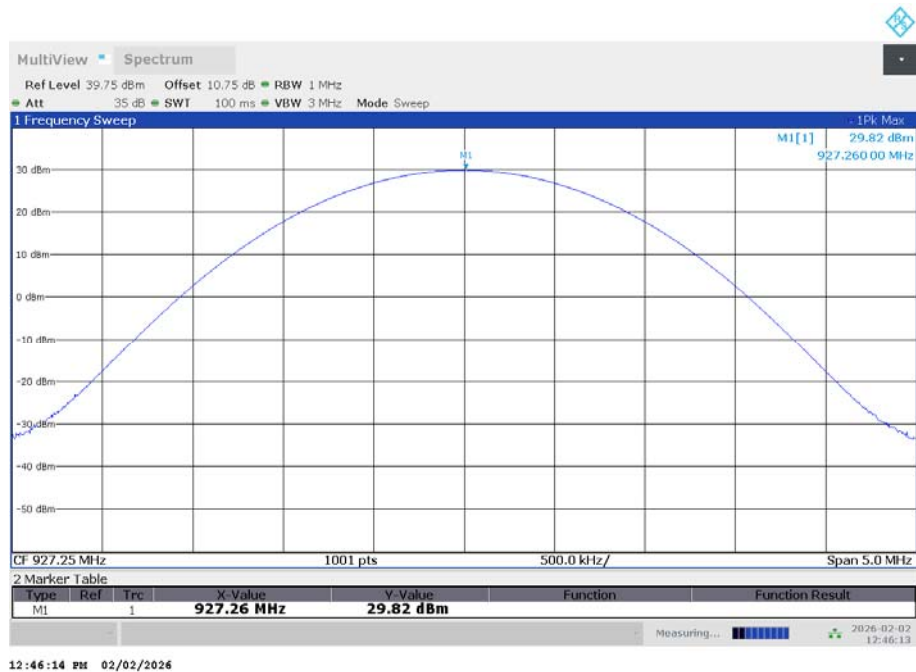
Plot 1: 902.75 MHz



Plot 2: 915.25 MHz



Plot 3: 927.25 MHz



## 12.7 Detailed spurious emissions @ the band edge – conducted and radiated

### Description:

Measurement of the conducted band edge compliance. EUT is measured at the lower and upper band edge in single channel and hopping mode. The measurement is repeated for all modulations.

| Measurement parameters  |                                                      |
|-------------------------|------------------------------------------------------|
| Detector                | Peak                                                 |
| Sweep time              | Auto                                                 |
| Resolution bandwidth    | 100 kHz                                              |
| Video bandwidth         | 300 kHz / 500 kHz                                    |
| Span                    | Lower Band Edge: 902 MHz<br>Upper Band Edge: 928 MHz |
| Trace mode              | Max hold                                             |
| Test setup              | See sub clause 7.3 A                                 |
| Measurement uncertainty | See sub clause 9                                     |

### Limits:

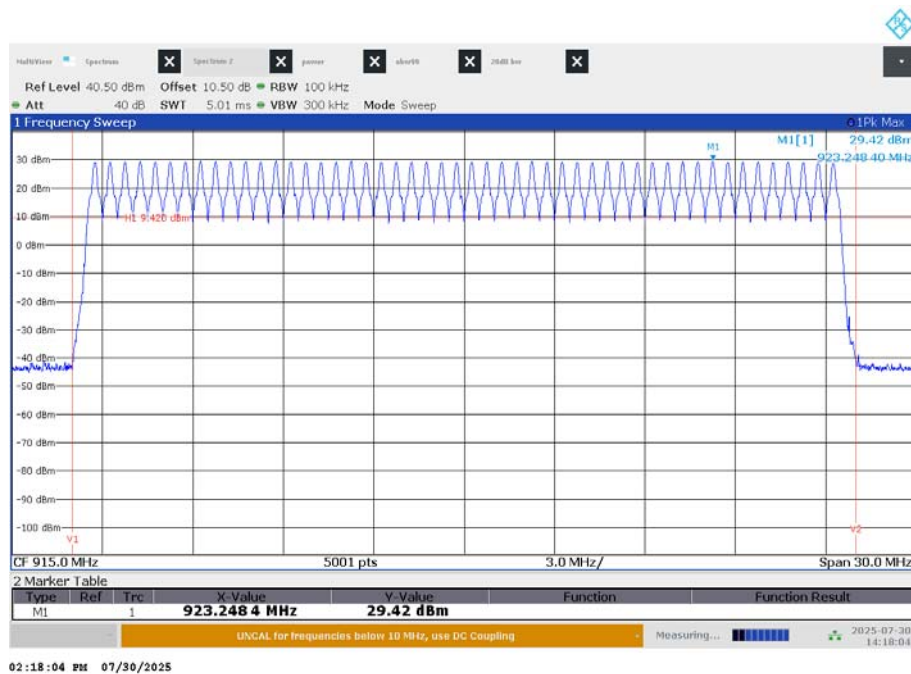
| FCC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | IC |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 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. Attenuation below the general limits specified in Section 15.209(a) is not required. |    |

### Results conducted (EUT A):

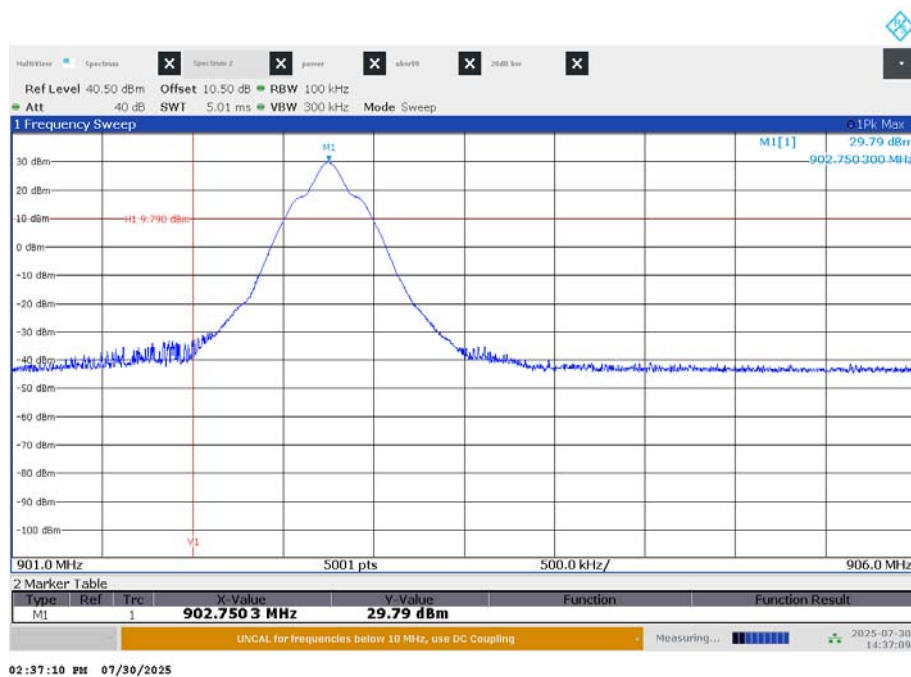
| Scenario                     |                          | Spurious band edge conducted |            |
|------------------------------|--------------------------|------------------------------|------------|
| Modulation                   |                          | 902.75 MHz                   | 927.25 MHz |
| Lower band edge – hopping on | FM0 (103) modulation     | > 20 dB                      | > 20 dB    |
|                              | Miller2 (123) modulation | > 20 dB                      | > 20 dB    |
|                              | Miller4 (141) modulation | > 20 dB                      | > 20 dB    |
|                              | Miller8 (185) modulation | > 20 dB                      | > 20 dB    |
| Upper band edge – hopping on | FM0 (103) modulation     | > 20 dB                      | > 20 dB    |
|                              | Miller2 (123) modulation | > 20 dB                      | > 20 dB    |
|                              | Miller4 (141) modulation | > 20 dB                      | > 20 dB    |
|                              | Miller8 (185) modulation | > 20 dB                      | > 20 dB    |

### 12.7.1 Plots FM0 (103) modulation:

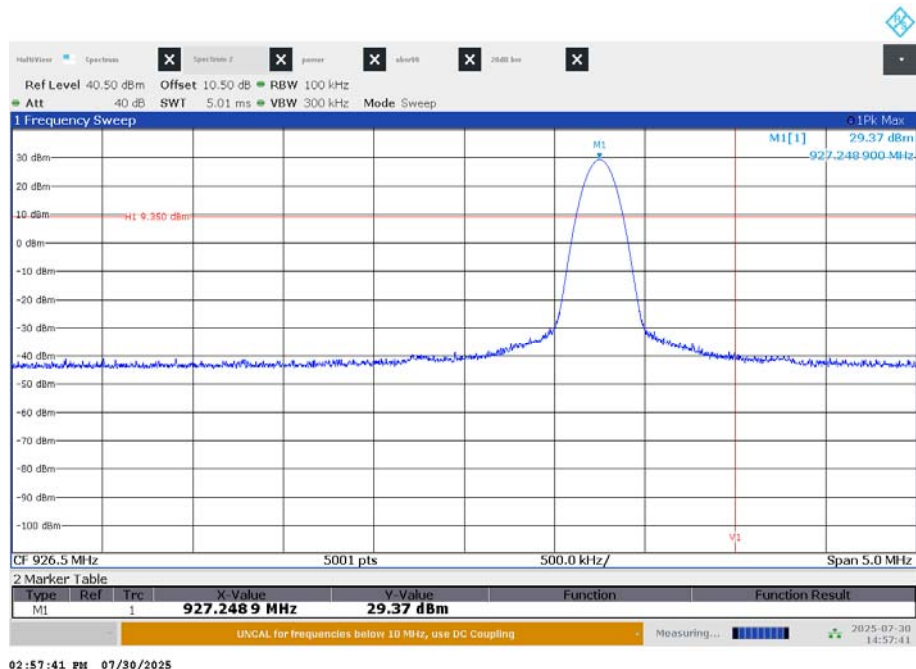
**Plot 1:** 20 dB – hopping on FM0 (103) modulation



**Plot 2:** 20 dB – hopping off, lower band edge, FM0 (103) modulation



**Plot 3:** 20 dB – hopping off, upper band edge, FM0 (103) modulation

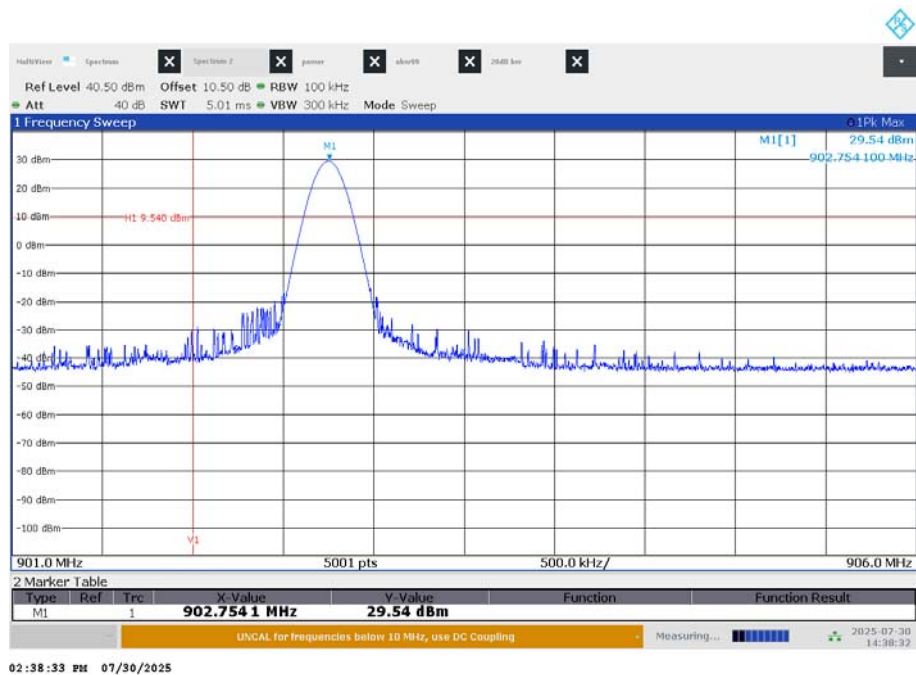


12.7.2 Plots Miller 2 (123) modulation:

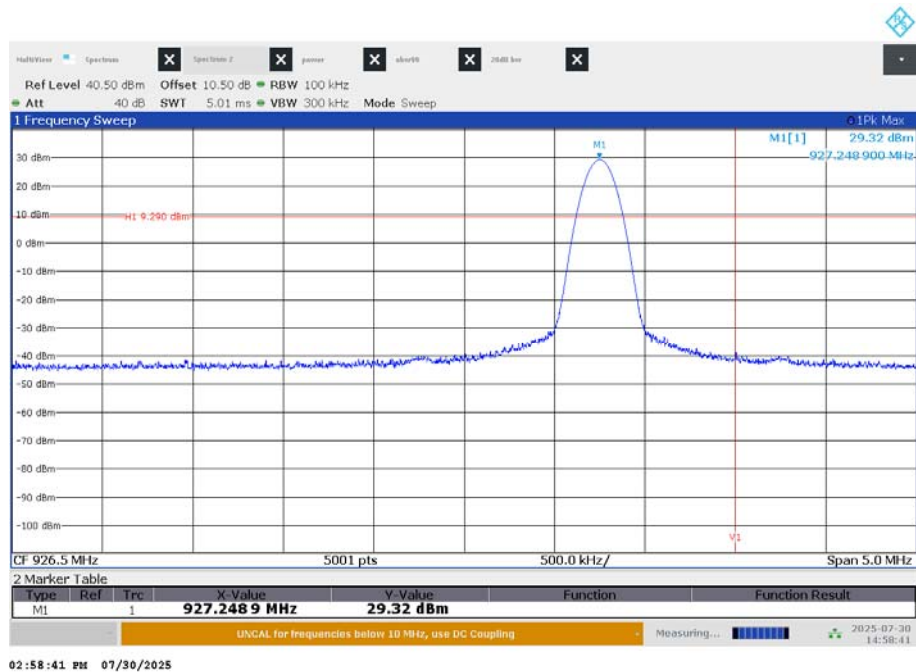
Plot 1: 20 dB – hopping on, Miller 2 (123) modulation



Plot 2: 20 dB – hopping off, lower band edge, Miller 2 (123) modulation



**Plot 3:** 20 dB – hopping off, upper band edge, Miller 2 (123) modulation

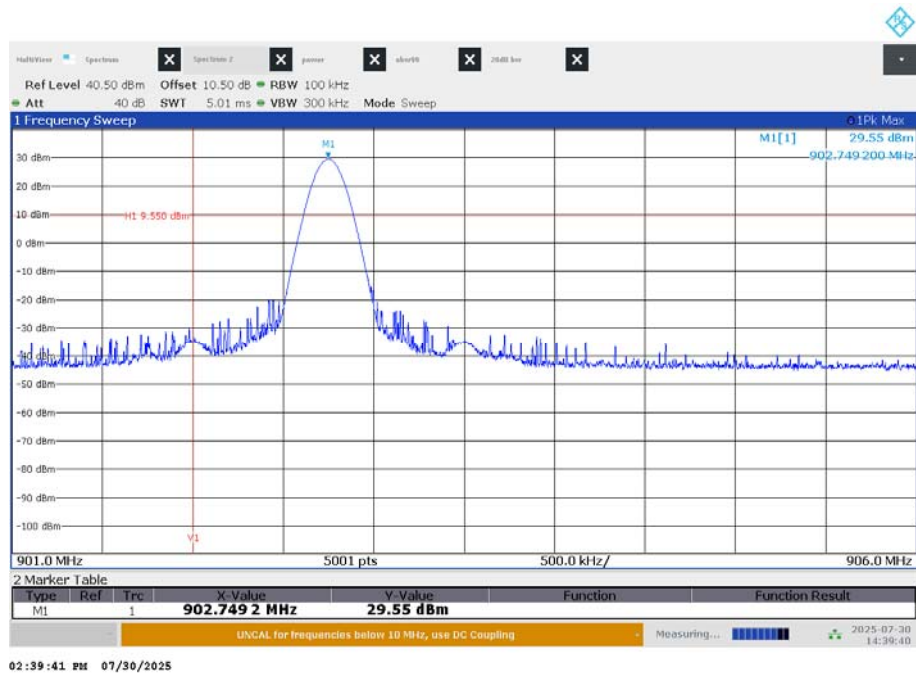


12.7.3 Plots Miller 4 (141) modulation:

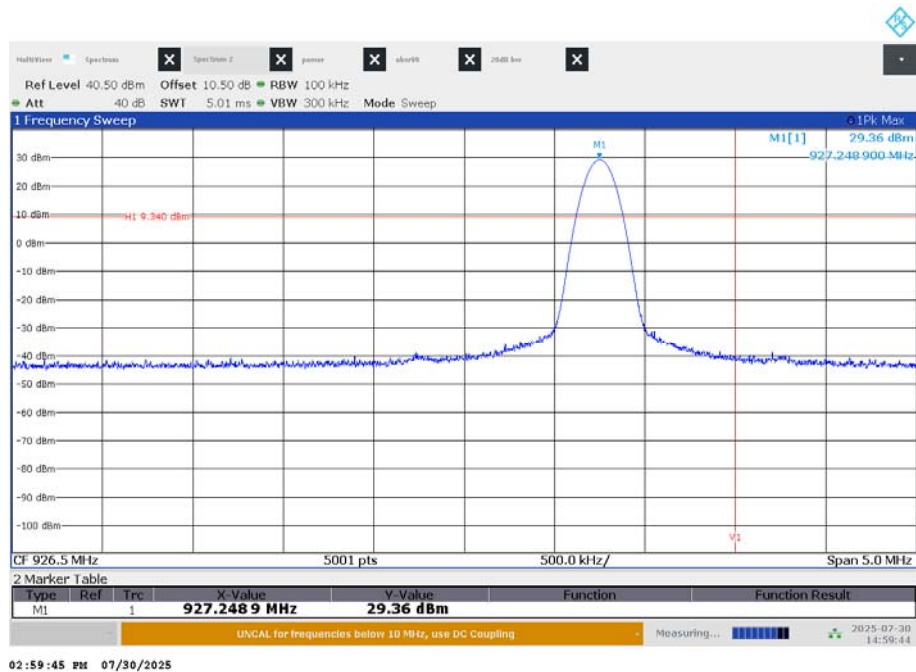
Plot 1: 20 dB – hopping on, Miller 4 (141) modulation



Plot 2: 20 dB – hopping off, lower band edge, Miller 4 (141) modulation



**Plot 3:** 20 dB – hopping off, upper band edge, Miller 4 (141) modulation

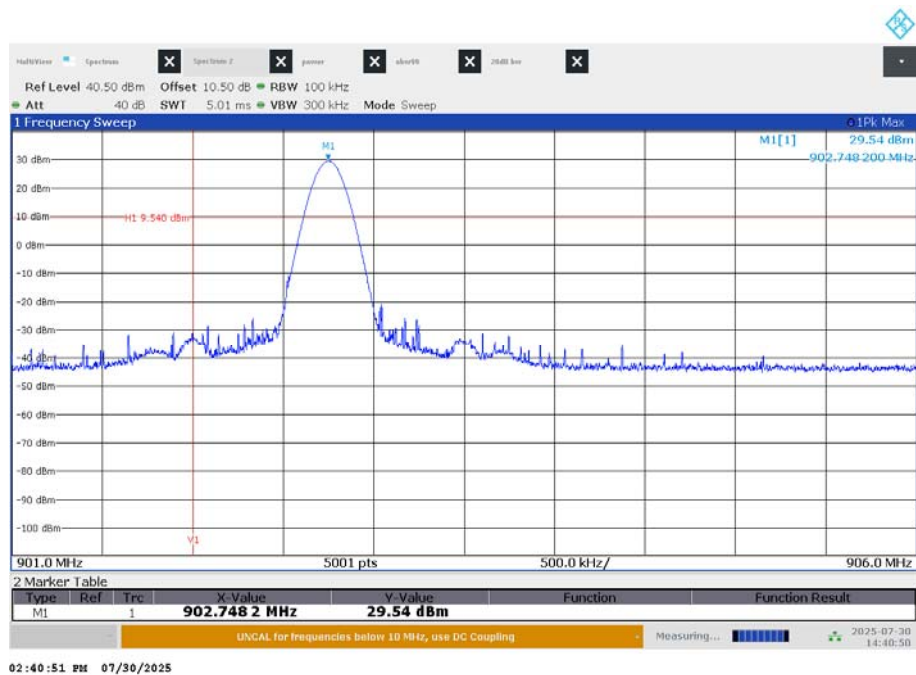


12.7.4 Plots Miller 8 (185) modulation:

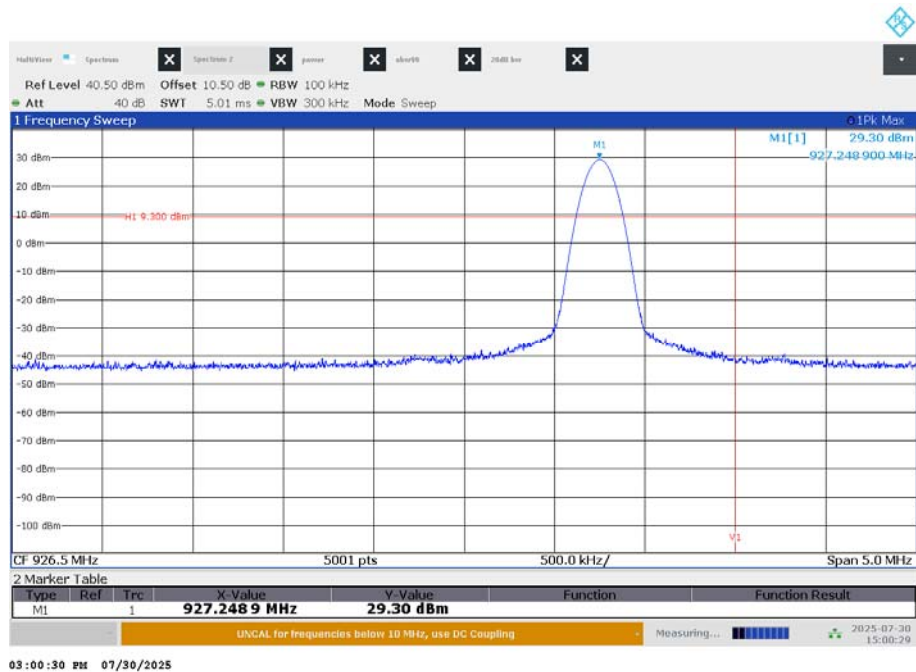
Plot 1: 20 dB – hopping on, Miller 8 (185) modulation



Plot 2: 20 dB – hopping off, lower band edge, Miller 8 (185) modulation



**Plot 3:** 20 dB – hopping off, upper band edge, Miller 8 (185) modulation



## 12.8 Spurious Emissions Conducted

### Description:

Measurement of the conducted spurious emissions in transmit mode. The EUT is set to single channel mode. The measurement is repeated for low, mid and high channel.

### Measurement:

| Measurement parameter    |                                          |
|--------------------------|------------------------------------------|
| Detector:                | Peak                                     |
| Sweep time:              | Auto                                     |
| Video bandwidth:         | F < 1 GHz: 1 MHz<br>F > 1 GHz: 1 MHz     |
| Resolution bandwidth:    | F < 1 GHz: 100 kHz<br>F > 1 GHz: 100 kHz |
| Span:                    | 9 kHz to 12.75 GHz                       |
| Trace-Mode:              | Max Hold                                 |
| Used equipment:          | See chapter 7.4A                         |
| Measurement uncertainty: | See chapter 9                            |

### Limits:

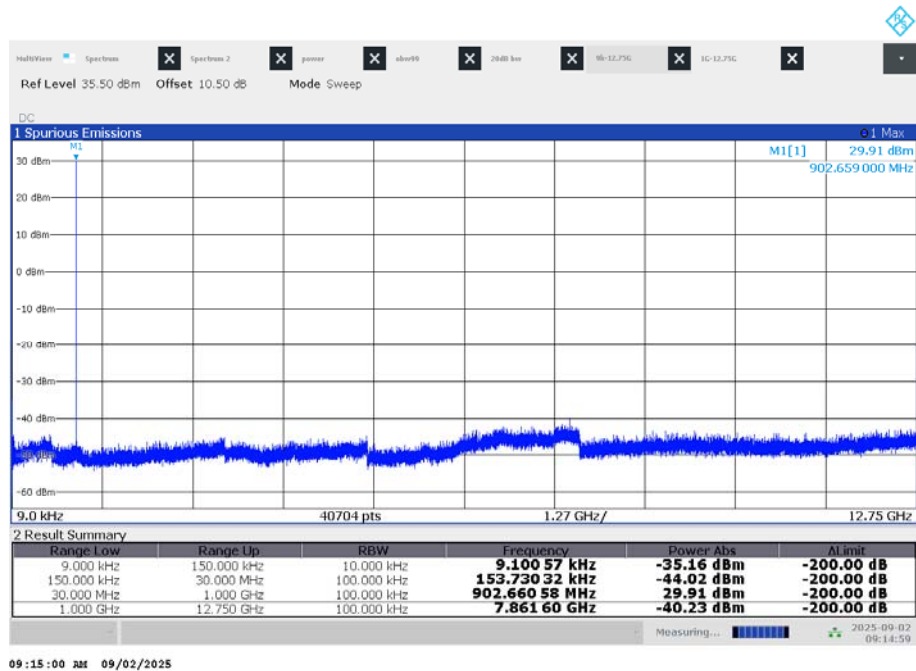
| FCC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ISED |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| TX spurious emissions conducted                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| 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. Attenuation below the general limits specified in Section 15.209(a) is not required |      |

### Result (EUT A):

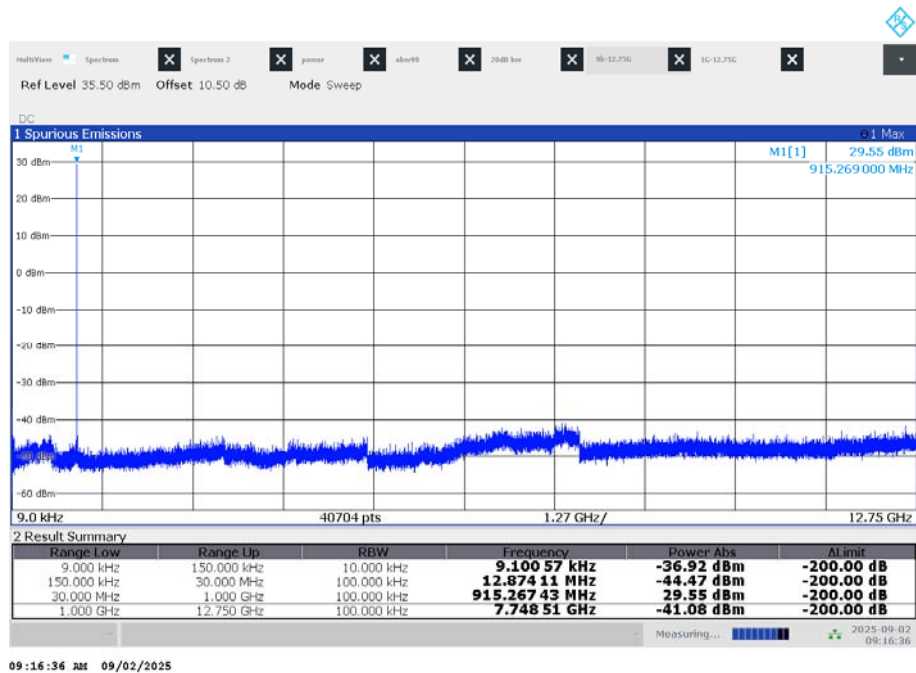
| Emission Limitation    |  |                             |                                   |                                                      |                     |
|------------------------|--|-----------------------------|-----------------------------------|------------------------------------------------------|---------------------|
| Frequency [MHz]        |  | Amplitude of emission [dBm] | Limit max. allowed emission power | actual attenuation below frequency of operation [dB] | Results             |
| 902.75                 |  |                             | 30 dBm                            |                                                      | Operating frequency |
| No emissions detected! |  |                             | -20 dBc                           |                                                      |                     |
| 915.25                 |  |                             | 30 dBm                            |                                                      | Operating frequency |
| No emissions detected! |  |                             | -20 dBc                           |                                                      |                     |
| 927.25                 |  |                             | 30 dBm                            |                                                      | Operating frequency |
| No emissions detected! |  |                             | -20 dBc                           |                                                      |                     |

**12.8.1 Plots FM0 (103) modulation:**

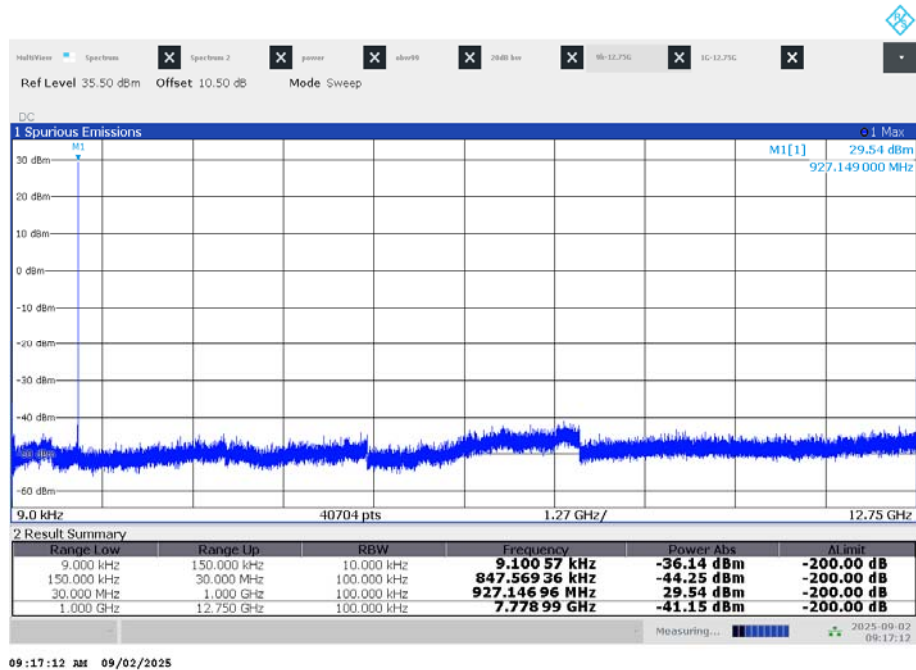
Plot 1: 902.75 MHz, 9 kHz – 12.75 GHz



Plot 2: 915.25 MHz, 9 kHz – 12.75 GHz

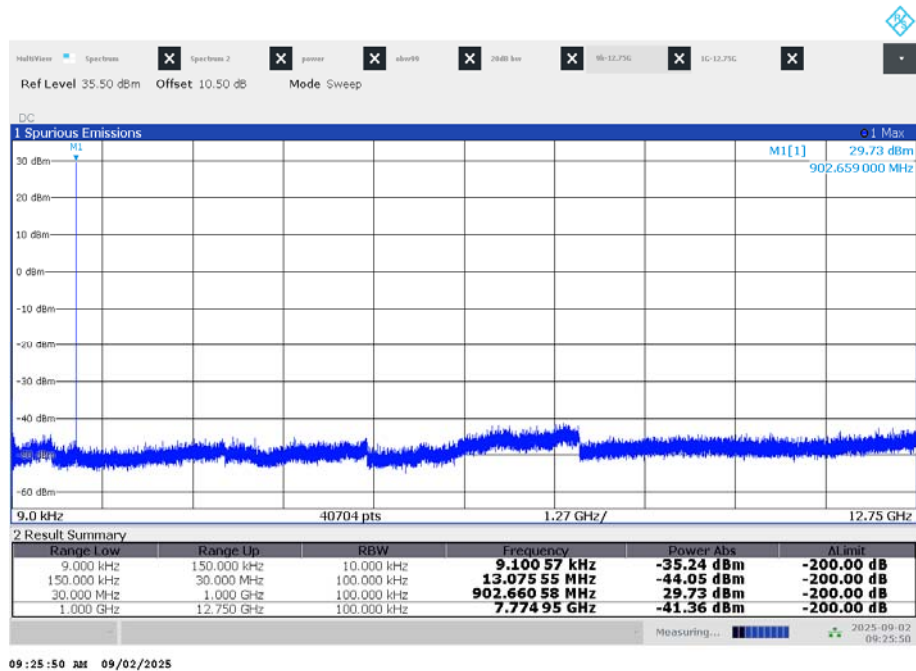


Plot 3: 927.25 MHz, 9 kHz – 12.75 GHz

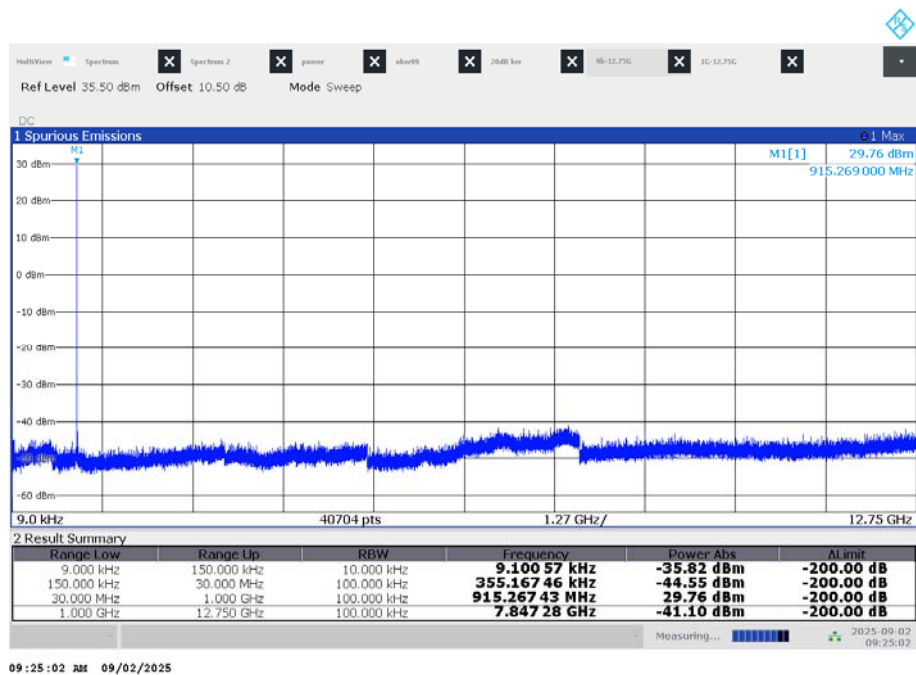


**12.8.2 Plots Miller 2 (123) modulation:**

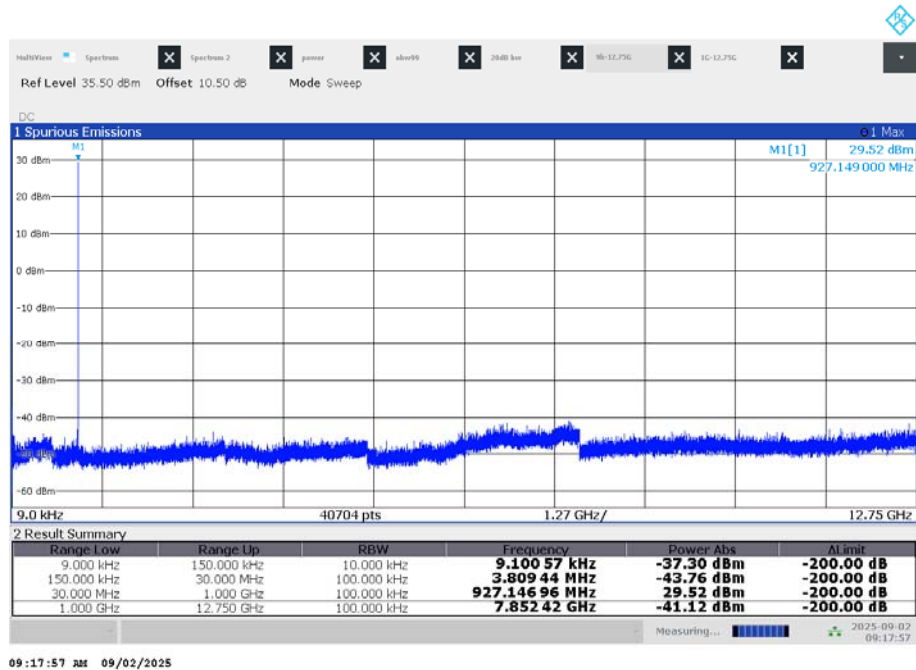
Plot 1: 902.75 MHz, 9 kHz – 12.75 GHz



Plot 2: 915.25 MHz, 9 kHz – 12.75 GHz

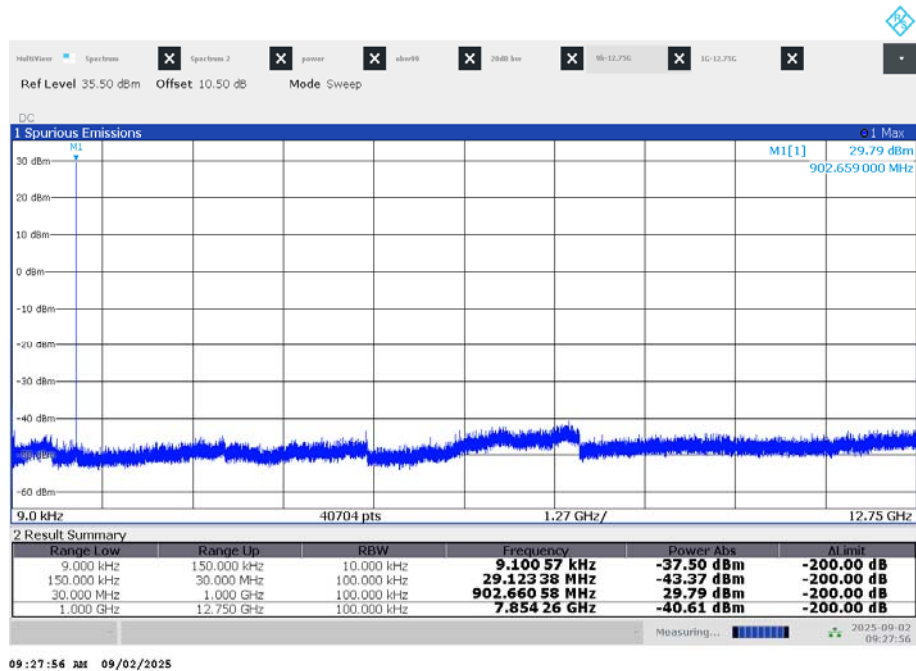


Plot 3: 927.25 MHz, 9 kHz – 12.75 GHz

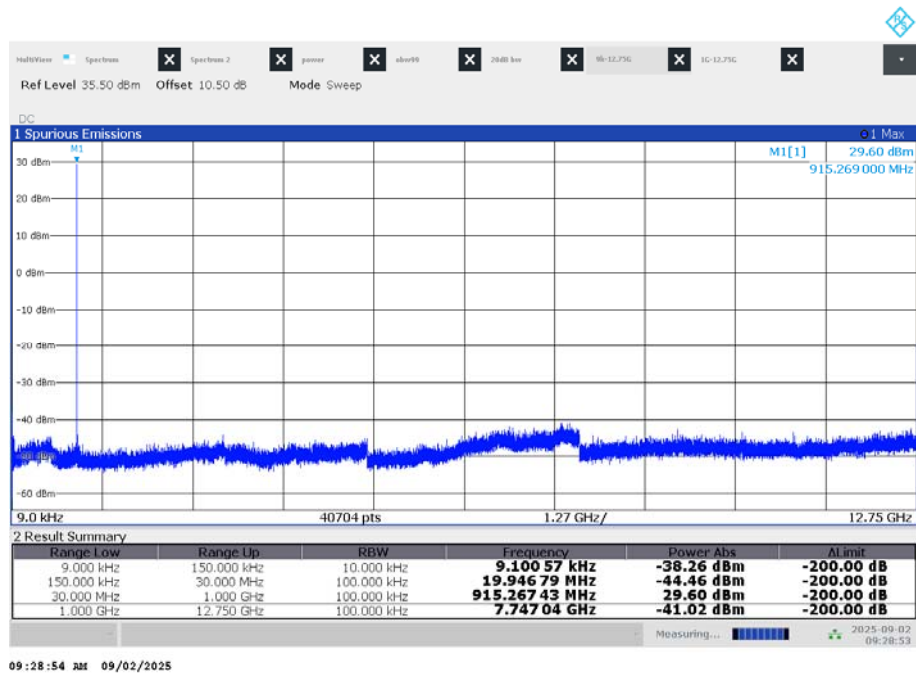


**12.8.3 Plots Miller 4 (141) modulation:**

Plot 1: 902.75 MHz, 9 kHz – 12.75 GHz



Plot 2: 915.25 MHz, 9 kHz – 12.75 GHz



Plot 3: 927.25 MHz, 9 kHz – 12.75 GHz

