# ENGINEERING TEST REPORT

## ALTA® 900 MHz Rechargeable Water Detection Disc
## Model: MNS2-9-DSC-WS

**FCC ID: ZTL- G2WD**

*Applicant:*

**Monnit Corporation**
**3400 S West Temple**
**South Salt Lake, UT 84115**

***In Accordance With***

**Federal Communications Commission (FCC)**
**Part 15, Subpart C, Section 15.247 Frequency Hopping Spread Spectrum (FHSS)**

**UltraTech's File No.: 26MONN055_FCC15C247**

| | |
|---|---|
| This Test report is Issued under the Authority of<br>Tri M. Luu<br>Vice President of Engineering<br>UltraTech Group of Labs<br><br>Date: March 11, 2026 | |
| Report Prepared by: Santhosh Fernandez<br><br>Issued Date: March 11, 2026 | Tested by: Angus Au<br><br>Test Dates:<br>August 7 to 15, 2025 and March 11, 2026 |

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
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# EXHIBIT 1. INTRODUCTION

## 1.1. SCOPE

| | |
|---|---|
| **Reference:** | FCC Part 15, Subpart C, Section 15.247 |
| **Title:** | Code of Federal Regulations (CFR), Title 47 – Telecommunication, Part 15 |
| **Purpose of Test:** | Equipment Certification for Frequency Hopping Spread Spectrum (FHSS) Transmitter. |
| **Test Procedures:** | ▪ ANSI C63.4<br>▪ ANSI C63.10<br>▪ FCC Public Notice DA 00-705 |
| **Environmental Classification:** | [ x ] Commercial, industrial or business environment<br>[ x ] Residential environment |

## 1.2. Revision history

| Document | Issue Date | Description |
|---|---|---|
| 26MONN055_FCC15C247 | March 11, 2026 | Original report |
| | | |
| | | |

## 1.3. RELATED SUBMITTAL(S)/GRANT(S)

None

## 1.4. NORMATIVE REFERENCES

| Publication | Year | Title |
|---|---|---|
| 47 CFR Parts 0-19 | 2026 | Code of Federal Regulations (CFR), Title 47 – Telecommunication |
| ANSI C63.4 | 2014 | 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 | American National Standard for Testing Unlicensed Wireless Devices |

# EXHIBIT 2. PERFORMANCE ASSESSMENT

## 2.1. CLIENT INFORMATION

| APPLICANT | |
|---|---|
| **Name:** | Monnit Corporation |
| **Address:** | 3400 S West Temple<br>South Salt Lake<br>Utah, United States 84115 |
| **Contact Person:** | Kelly Lewis or Brad Walters<br>Phone #: 801-561-5555<br>Fax #: 801-561-5575<br>kellyl@monnit.com or bradw@monnit.com |

| MANUFACTURER | |
|---|---|
| **Name:** | Monnit Corporation |
| **Address:** | 3400 S West Temple<br>South Salt Lake<br>Utah, United States 84115 |
| **Contact Person:** | Kelly Lewis or Brad Walters<br>Phone #: 801-561-5555<br>Fax #: 801-561-5575<br>Email Address:<br>kellyl@monnit.com or bradw@monnit.com |

## 2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

| | |
|---|---|
| **Brand Name:** | Monnit Corporation |
| **Product Name:** | ALTA® 900 MHz Rechargeable Water Detection Disc |
| **Model Name or Number:** | MNS2-9-DSC-WS |
| **Serial Number:** | 1307979 &1307982 |
| **Type of Equipment:** | FHSS Transceiver |
| **Input Power Supply Type:** | Internal Battery:<br>Lithium Polymer, 2.8 – 4.2 VDC, 2400 mAh<br>30mA max for transmission.<br>External DC Power:<br>USB C port, 4.5 – 5.5 VDC<br>Battery charging up to 800mA if empty |
| **Primary User Functions of EUT:** | IoT Water sensors |
| **Firmware Version Identification Number (FVIN):** | V26.60 |

## 2.3. EUT'S TECHNICAL SPECIFICATIONS

| Transmitter | |
|---|---|
| **Equipment Type:** | ▪ Mobile |
| **Intended Operating Environment:** | ▪ Commercial, industrial or business environment<br>▪ Residential environment |
| **Power Supply Requirement:** | 4.5 – 5.5V USB, internal LIPO 2.8 – 4.2V |
| **RF Output Power Rating:** | +13.40dBm (Conducted) |
| **Operating Frequency Range:** | 902.2 - 927.8 MHz |
| **Channel Spacing:** | 50KHz, 500KHz |
| **RF Output Impedance:** | 50 Ω |
| **Modulation Type:** | GFSK +Digital DSSS |
| **Emission Designator(s)** | F7D |
| **Data Rates:** | ALTA (High Speed Mode) 400K Symbol Rate<br>ALTA LSM (Low Speed Mode) 10K symbol rate |
| **Oscillator Frequency(ies):** | XOSC_LF 0.32768 MHz<br>RCOSC_LF 0.32768 MHz<br>RCOSC_MF 2.000 MHz<br>RCOSC_HF 48.000 MHz<br>XOSC_HF 24.000 MHz |
| **Intermediate Frequency(ies):** | ALTA-LSM 900: 50kHz<br>ALTA-HSM 900: 500kHz |
| **Antenna Connector Type:** | Integral |

## 2.4. ASSOCIATED ANTENNA DESCRIPTIONS

| | |
|---|---|
| **Manufacturer:** | Monnit |
| **Type:** | Monopole Wire |
| **Model:** | ANT-0001-01 (Black) or ANT-0018-01 (White) |
| **Frequency Range:** | 902-928 MHz |
| **Gain (dBi):** | 2.15 dBi |

## 2.5. LIST OF EUT'S PORTS

| Port Number | EUT's Port Description | Number of Identical Ports | Connector Type | Cable Type (Specify minimum length and shielded/non-shielded) |
|---|---|---|---|---|
| 1 | USB Port (Charge Only) | 0 | USB C | N/A |
| 2 | Water Detection | 0 | Two 3mm stainless steel pins | N/A |

## 2.6. ANCILLARY EQUIPMENT:

None

# EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

## 3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

| | |
|---|---|
| **Temperature:** | 21 to 23 °C |
| **Humidity:** | 41 to 55% |
| **Pressure:** | 102 kPa |
| **Power Input Source:** | 4.0 Vdc Battery |

## 3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

| | |
|---|---|
| **Operating Modes:** | ▪ Each of lowest, middle and highest channel frequencies transmits continuously for emissions measurements.<br>▪ The EUT operates in normal Frequency Hopping mode for occupancy duration, and frequency separation. |
| **Special Test Software & Hardware:** | Special software provided by the Applicant is installed to allow the EUT to operate in hopping mode or at each channel frequency continuously. For example, the transmitter will be operated at each of lowest, middle and highest frequencies individually continuously during testing. |
| **Transmitter Test Antenna:** | The EUT is tested with integral antenna typical of normal intended use as described with the test results. |

| **Transmitter Test Signals** | |
|---|---|
| **Frequency Band(s):** | 902.2 - 927.8 MHz (ALTA LSM)<br>902.5 - 927.5 MHz(ALTA HSM) |
| **Frequency(ies) Tested:**<br>(Near lowest, near middle & near highest frequencies in the frequency range of operation.) | 902.2, 915.0, 927.8 MHz(ALTA LSM)<br>902.5, 915.0, 927.5 MHz(ALTA HSM) |
| **RF Power Output:**<br>(measured maximum output power at antenna terminals) | +13.40dBm (0.02188W) (Conducted) |
| **Normal Test Modulation:** | GFSK +Digital DSSS |
| **Modulating Signal Source:** | Internal |

# EXHIBIT 4. SUMMARY OF TEST RESULTS

## 4.1. TEST LAB AND LOCATION

| | | |
|---|---|---|
| **Company name:** | **Ultratech Engineering labs Inc.** | |
| **Address:** | 3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4<br>Tel.: (905) 829-1570 Fax.: (905) 829-8050<br>Website: www.ultratech-labs.com, | |
| **Test Site/Company Number:** | **FCC** | **ISED** |
| | MRA: APEC TEL<br>Designation no. CA0001 | Company No.2049A<br>CAB Identifier: CA0001 |

## 4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

| FCC Section(s) | Test Requirements | Compliance (Yes/No) |
|---|---|---|
| 15.203 | Antenna requirements | Yes |
| 15.207(a) | AC Power Line Conducted Emissions | Yes |
| 15.247(a)(1) & (1)(i) | Provisions for Frequency Hopping Systems | Yes* |
| 15.247(b)(2) | Peak Conducted Output Power | Yes |
| 15.247(c) | Operation with directional antenna gains greater than 6 dBi | N/A |
| 15.247(d) | Band-Edge and RF Conducted Spurious Emissions at the Transmitter Antenna Terminal | Yes |
| 15.247(d), 15.209 & 15.205 | Transmitter Spurious Radiated Emissions | Yes |
| 15.247 (g) & (h) | Requirements for FHSS | Yes* |
| 15.247(i), 1.1307, 1.1310, 2.1091 | RF Exposure | Yes |

* Refer to the Operational Description

## 4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None

# EXHIBIT 5. MEASUREMENTS, EXAMINATIONS & TEST DATA FOR EMC EMISSIONS

## 5.1. POWER LINE CONDUCTED EMISSIONS [§15.207(a)]

### 5.1.1. Limit(s)

The equipment shall meet the limits of the following table:

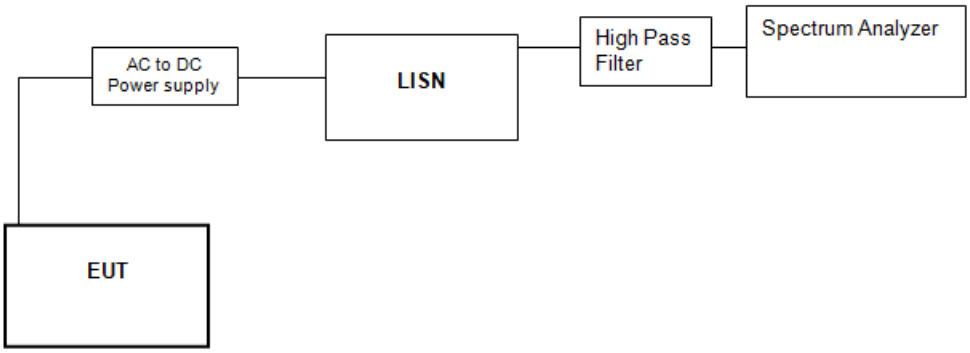
| Frequency of emission (MHz) | Conducted Limits (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15–0.5 .....…….. | 66 to 56* ..... | 56 to 46* |
| 0.5–5 .....…….. | 56 ..... | 46 |
| 5-30 …….. | 60 ...…….. | 50 |

*Decreases linearly with the logarithm of the frequency

### 5.1.2. Method of Measurements

ANSI C63.4-2009

### 5.1.3. Test Arrangement



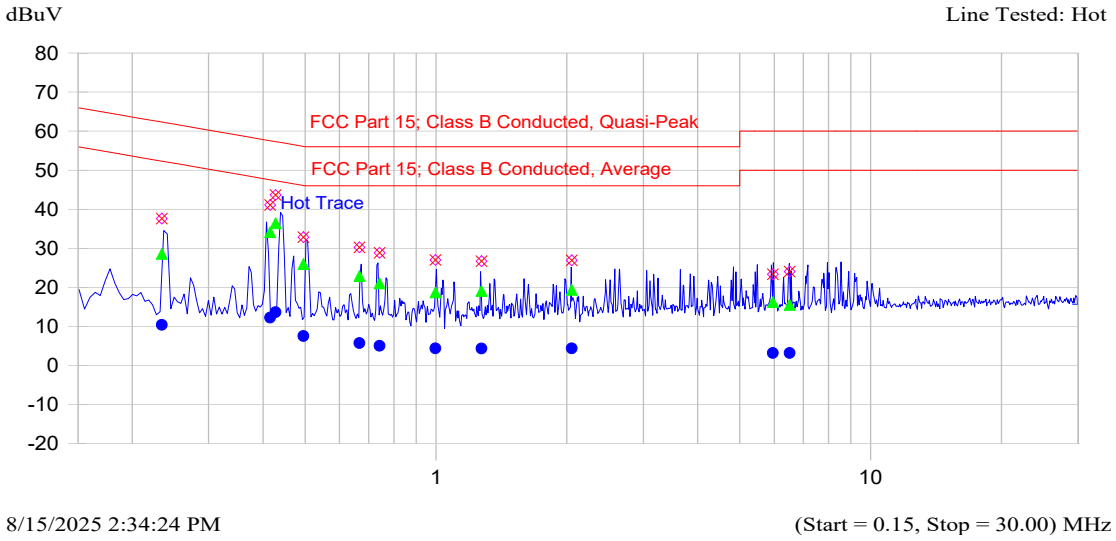

### 5.1.4. Test Equipment List

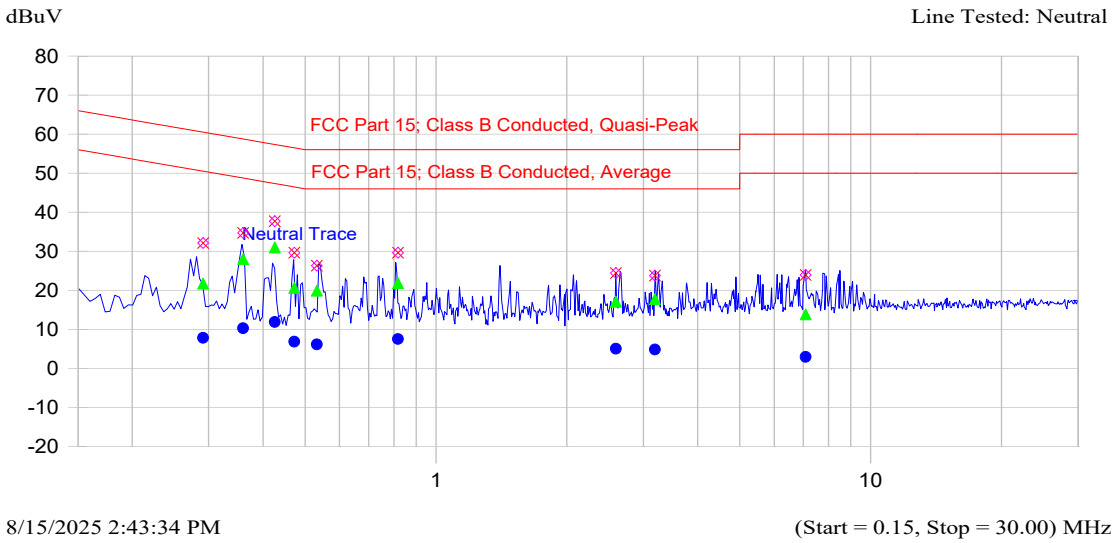
| Test Instruments | Manufacturer | Model No. | Serial No. | Frequency Range | Calibration Due Date |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E7401A | US40240432 | 9 kHz–1.5GHz | 19-Nov-2025 |
| High Pass filter | Rohde & Schwarz | EZ-25 | 830164/006 | Cut off 150kHz | 04-Sep-2025 |
| LISN | NSLK 8127 | NSLK 8127 | 8127276 | 9 kHz–30 MHz | 13-Dec-2025 |
| AC to DC Power supply | TOP Microsystems | SAW12-050-1000UB | - | 5Vdc | Output verified before use |

Test Date: August 15, 2025

## 5.1.5. Test Data

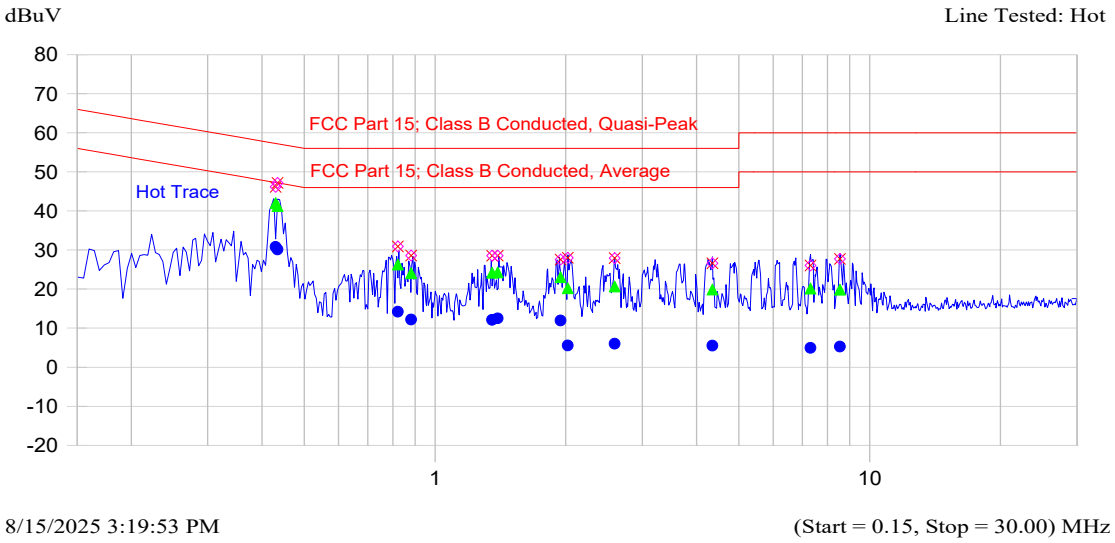
### 5.1.5.1. Charging Mode



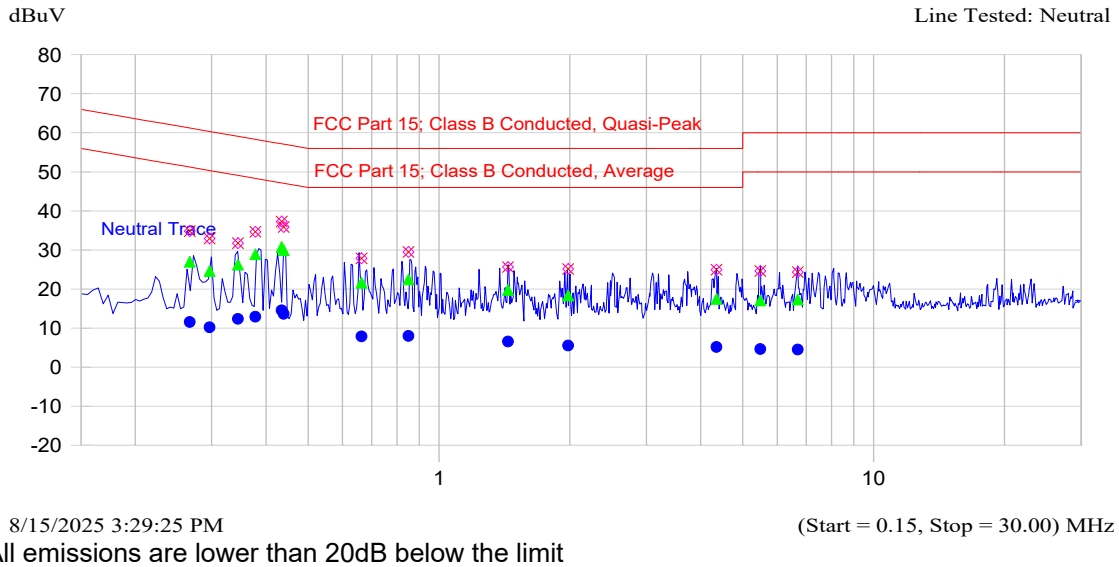




All emissions are lower than 20dB below the limit

### 5.1.5.2. Transmit Mode

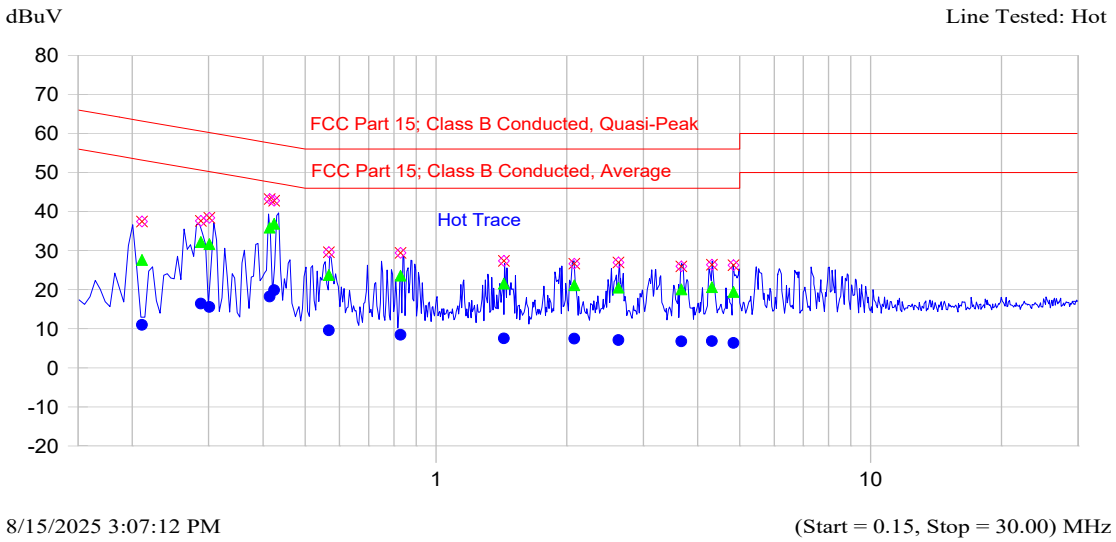


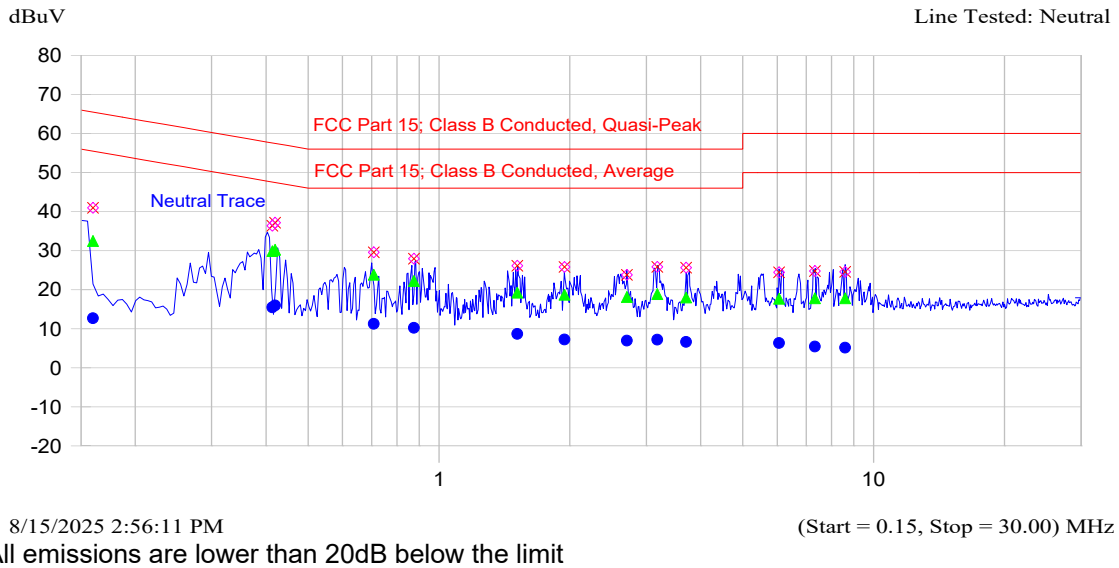

| Frequency MHz | Peak dBuV | QP dBuV | QP-QP Limit dB | Avg dBuV | Avg-Avg Limit dB | Trace Name |
|---|---|---|---|---|---|---|
| 0.434 | 47.2 | 41.2 | -15.9 | 30.1 | -17.1 | Hot Trace |
| 0.430 | 46.1 | 42.0 | -15.3 | 30.8 | -16.5 | Hot Trace |




All emissions are lower than 20dB below the limit

### 5.1.5.3. Receive Mode




All emissions are lower than 20dB below the limit

## 5.2. COMPLIANCE WITH FCC PART 15 – GENERAL TECHNICAL REQUIREMENTS

| FCC Section | FCC Rules | Manufacturer's Clarification |
|---|---|---|
| 15.203 | Described how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.<br><br>The exception is in those cases where EUT must be professionally installed. In order to demonstrate that professional installation is required, the following 3 points must be addressed:<br>➢ The application (or intended use) of the EUT<br>➢ The installation requirements of the EUT<br>➢ The method by which the EUT will be marketed | The antenna is permanently attached. |
| 15.204 | Provided the information for every antenna proposed for use with the EUT:<br>➢ type (e.g. Yagi, patch, grid, dish, etc…),<br>➢ manufacturer and model number<br>➢ gain with reference to an isotropic radiator | Uses Integral Antenna –refer to section 2.4 of this report and datasheet provided by the applicant . |
| 15.247(a) | Description of how the EUT meets the definition of a frequency hopping spread spectrum, found in Section 2.1. Based on the technical description. | See Operational Description |
| 15.247(a) | Pseudo Frequency Hopping Sequence: Describe how the hopping sequence is generated. Provide an example of the hopping sequence channels, in order to demonstrate that the sequence meets the requirements specified in the definition of a frequency hopping spread spectrum system, found in Section 2.1 | See Operational Description |

| FCC Section | FCC Rules | Manufacturer's Clarification |
|---|---|---|
| 15.247(a) | Equal Hopping Frequency Use:<br>Describe how each individual EUT meets the requirement that each of its hopping channels is used equally on average (e.g. that each new transmission event begins on the next channel in the hopping sequence after final channel used in the previous transmission events). | See Operational Description |
| 15.247(a) | System Receiver Input Bandwidth:<br>Describe how the associated receiver(s) complies with the requirement that its input bandwidth (either RF or IF) matches the bandwidth of the transmitted signal. | See Operational Description |
| 15.247(a) | System Receiver Hopping Capability:<br>Describe how the associated receiver(s) has the ability to shift frequencies in synchronization with the transmitted signals | See Operational Description |
| 15.247(g) | Describe how the EUT complies with the requirement that it be designed to be capable of operating as a true frequency hopping system | See Operational Description |
| 15.247(h) | Describe how the EUT complies with the requirement that it not have the ability to coordinated with other FHSS is an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitters | See Operational Description |

## 5.3. PROVISIONS FOR FREQUENCY HOPPING SYSTEMS [§ 15.247(a)(1)]

### 5.3.1. Limits

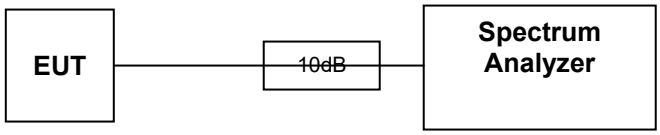
**§ 15.247(a)(1)**: Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

**§ 15.247(a)(1)(i)**: 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 a 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 a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

### 5.3.2. Method of Measurements

KDB 558074 D01 15.247 Meas Guidance V05r02, Section 8.2, ANSI C63.10

### 5.3.3. Test Arrangement




### 5.3.4. Test Equipment List

| Test Instruments | Manufacturer | Model No. | Serial No. | Frequency Range | Calibration Due Date |
|---|---|---|---|---|---|
| Spectrum Analyzer | Rohde & Schwarz | FSU26 | 100398 | 20Hz–26.5 GHz | 26-Sep-2027 |
| Attenuator | Pasternack | PE7024-10 | 3 | DC–26.5 GHz | Cal before use |

Test Dates: August 13, 14, 2025 and March 11, 2026

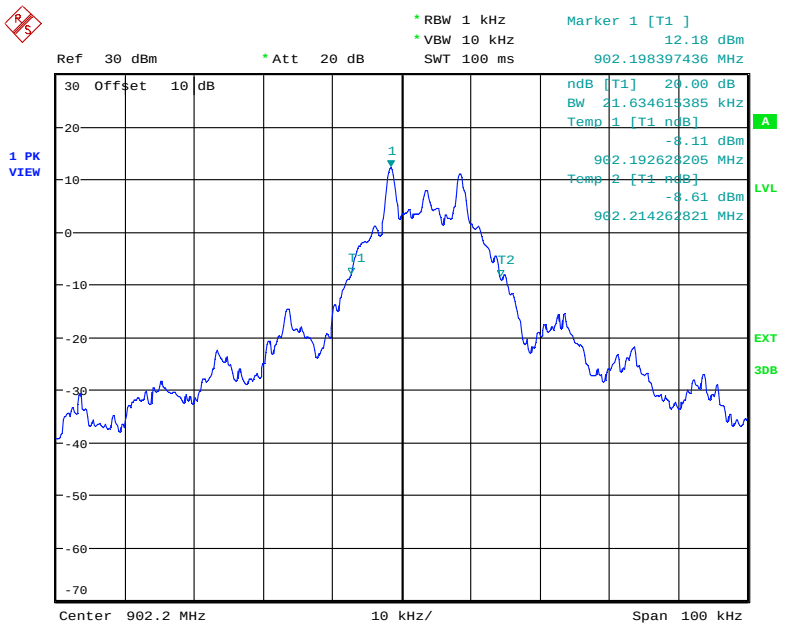
### 5.3.5. Test Data

| Test Description | FCC Specification | Measured Values | Comments |
|---|---|---|---|
| Frequency Hopping Systems Requirements | The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals. | -- | See Note 1 |
| 20 dB BW of the hopping channel | The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz | ALTA LSM: 23.08 kHz<br>ALTA HSM: 483.17 kHz | See Note 2 |
| Channel Hopping Frequency Separation | Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. | ALTA LSM: 50.48 kHz<br>ALTA HSM: 1001.60 kHz | See Note 2 |
| Number hopping frequencies | If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies.<br><br>If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies. | ALTA LSM: 513 Hopping Frequencies<br><br>ALTA HSM: 51 Hopping Frequencies | See Note 1 and 2 |
| Average Time of Occupancy | If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.<br><br>If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. | ALTA LSM:<br>67.30 ms <400 ms in 20s<br><br>ALTA HSM:<br>131.67ms <400 ms in 10s | See Note 2 |

**Note 1**: See operational description exhibit for details.

**Note 2**: See the following plots for details.

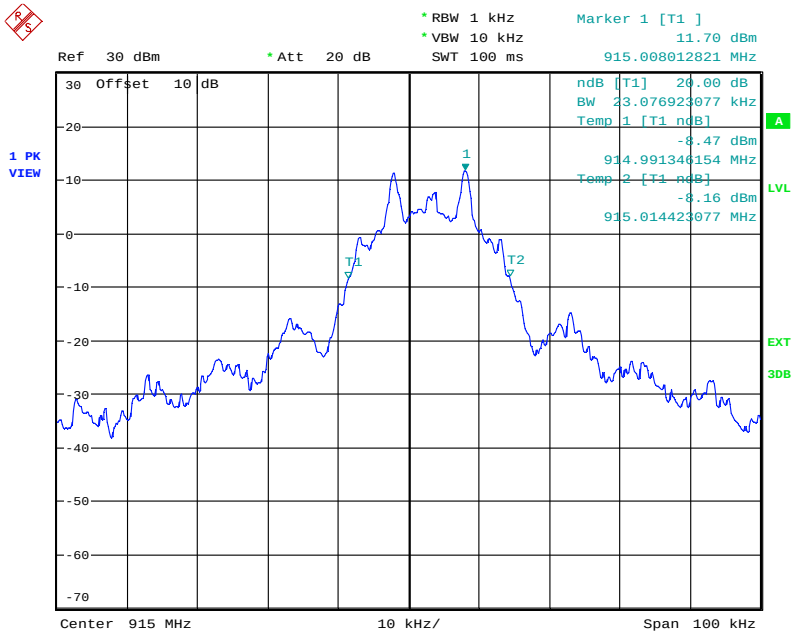
### 5.3.5.1. Configuration 20dB BW: ALTA-LSM; 902.2MHz




Date: 13.AUG.2025 18:48:07

BW=21.63 kHz

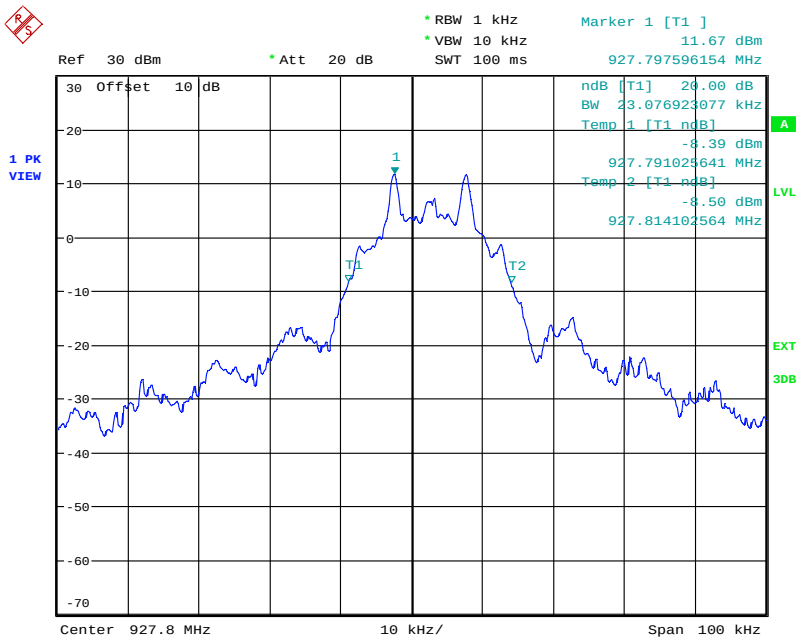
### 5.3.5.2. Configuration 20dB BW: ALTA-LSM; 915MHz




Date: 13.AUG.2025 18:49:19

BW=23.08 kHz

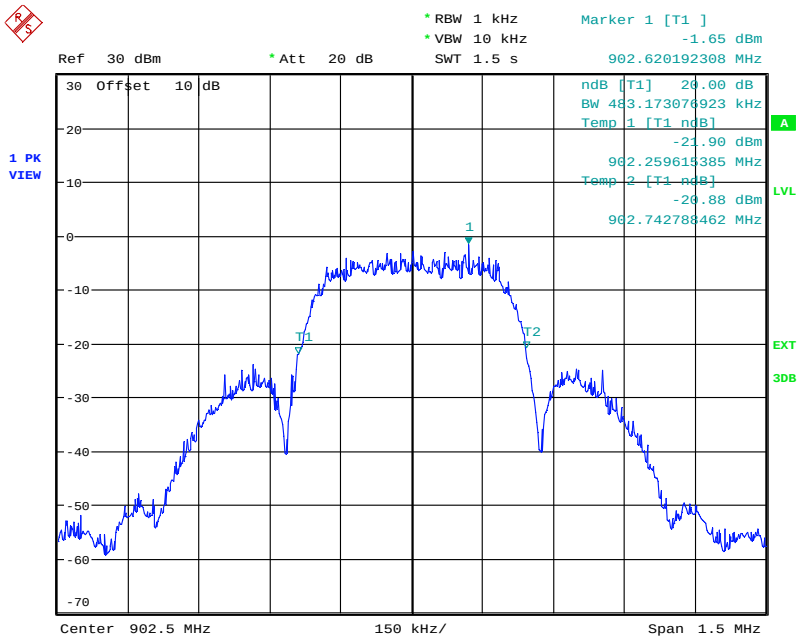
### 5.3.5.3. Configuration 20dB BW: ALTA-LSM; 927.8MHz




Date: 13.AUG.2025 18:50:56

BW=23.08 kHz

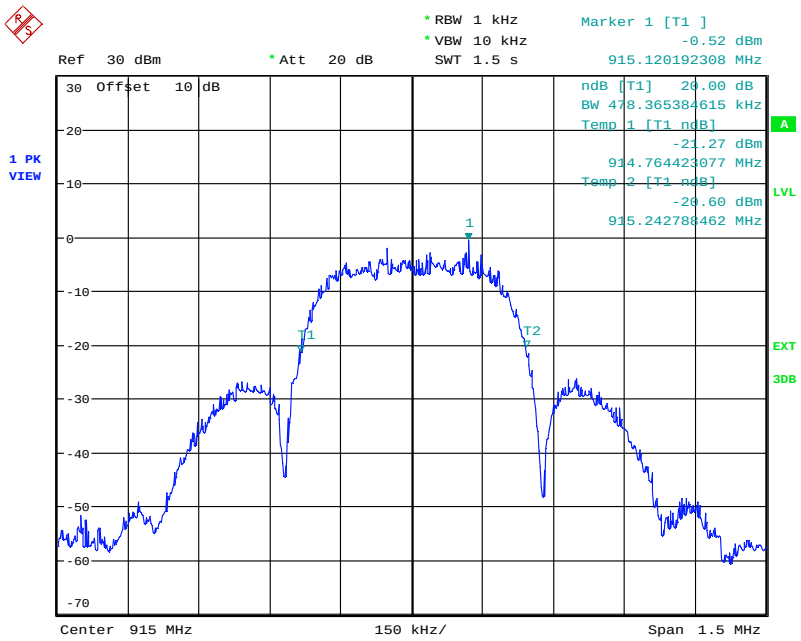
### 5.3.5.4. Configuration 20dB BW: ALTA-HSM 902.5MHz




Date: 13.AUG.2025 18:54:13

BW=483.17 kHz

### 5.3.5.5. Configuration 20dB BW: ALTA-HSM 915MHz

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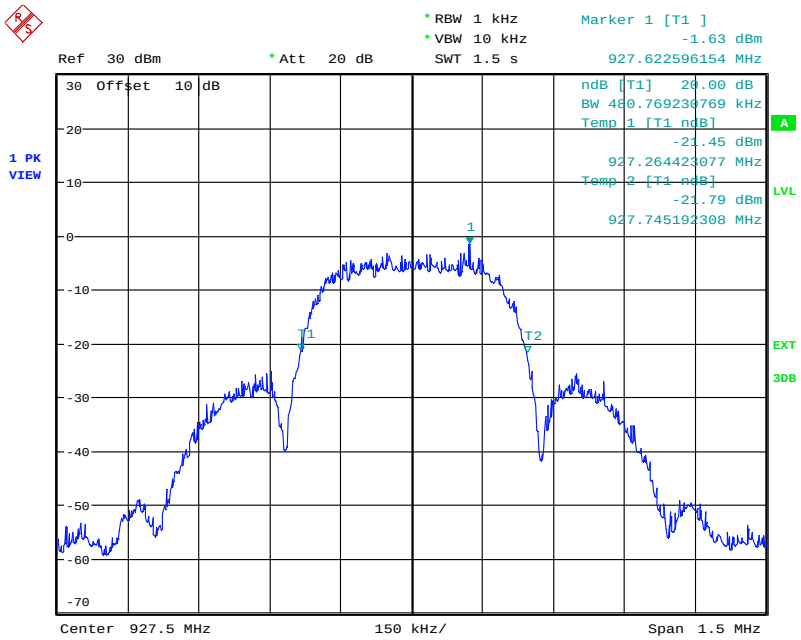
BW=478.37 kHz

### 5.3.5.6. Configuration 20dB BW: ALTA-HSM 927.5MHz

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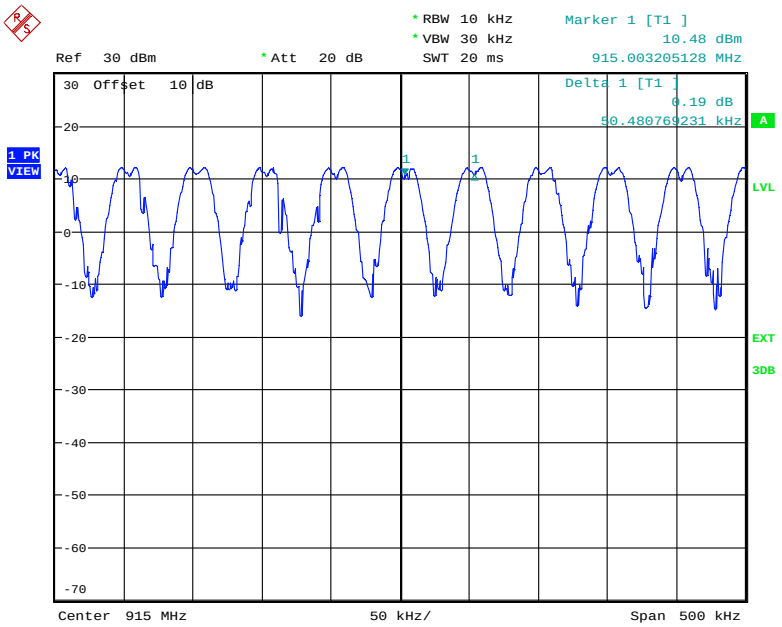
BW=480.77 kHz

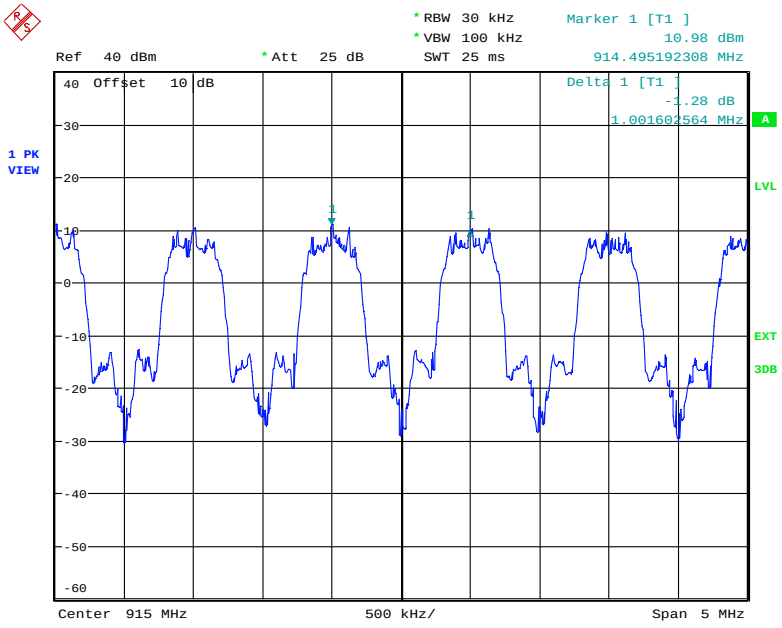
### 5.3.5.7. Carrier Frequency Separation ALTA LSM




Date: 14.AUG.2025 17:46:53

Separation=50.48 kHz

### 5.3.5.8. Carrier Frequency Separation ALTA HSM

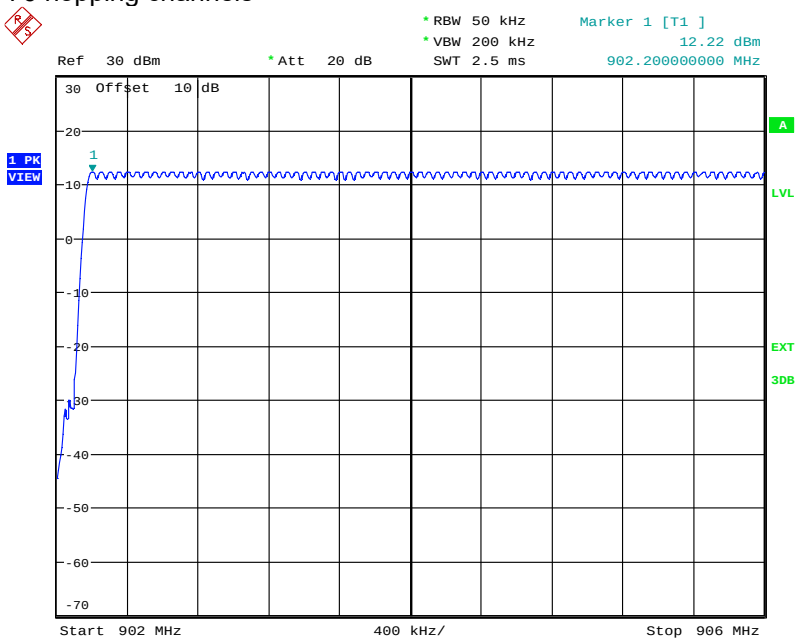



Date: 11.MAR.2026 19:08:41

Separation=1001.60 kHz

### 5.3.5.9. Number of Hopping Frequencies, ALTA-LSM

76 hopping channels

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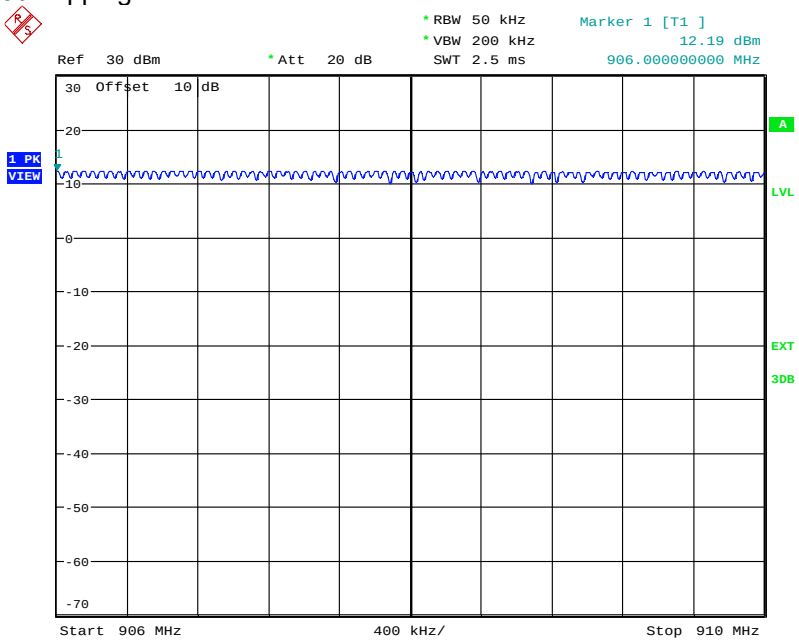
80 hopping channels

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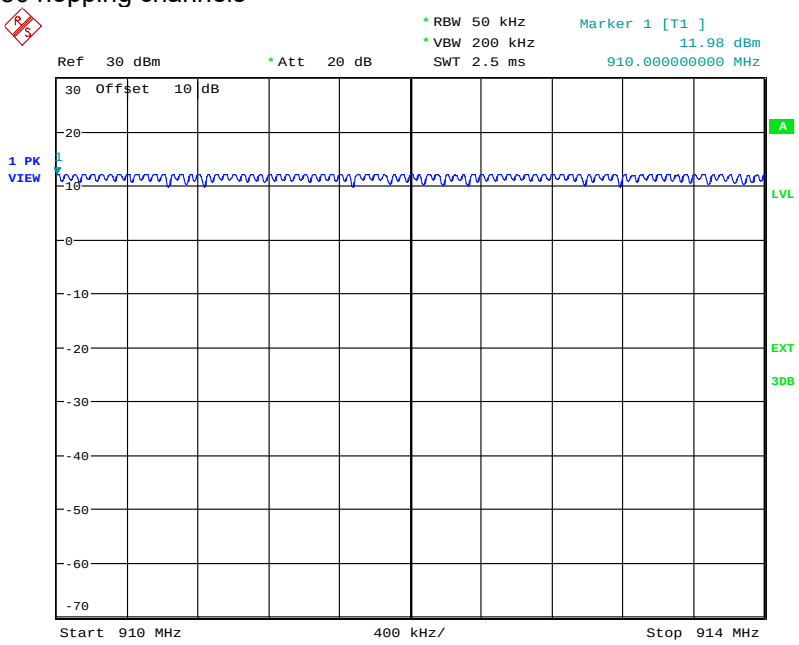
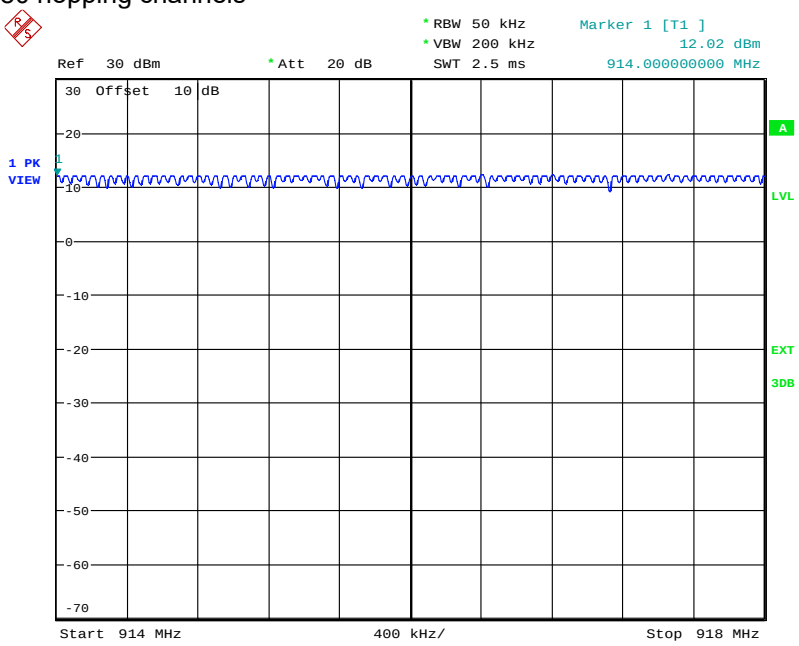
80 hopping channels



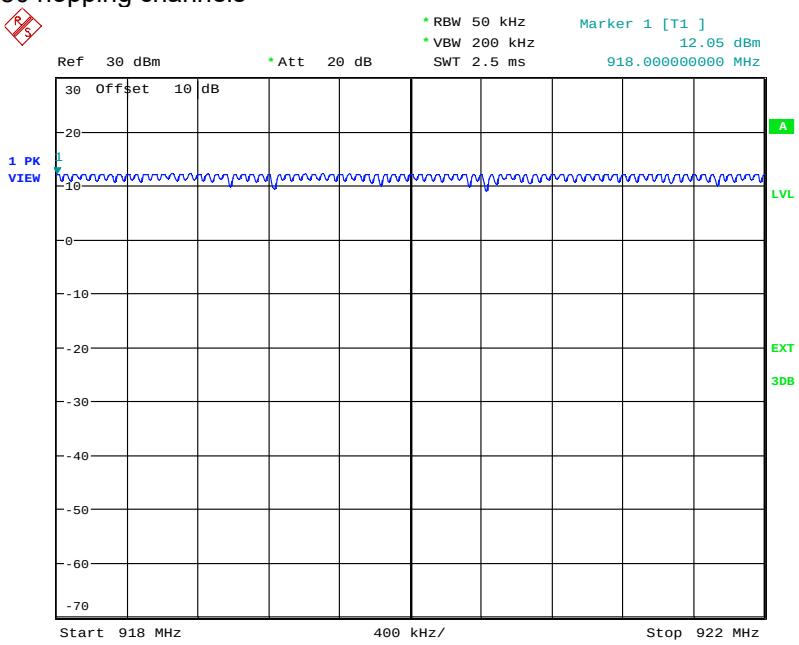

Date: 13.AUG.2025 19:41:04

80 hopping channels



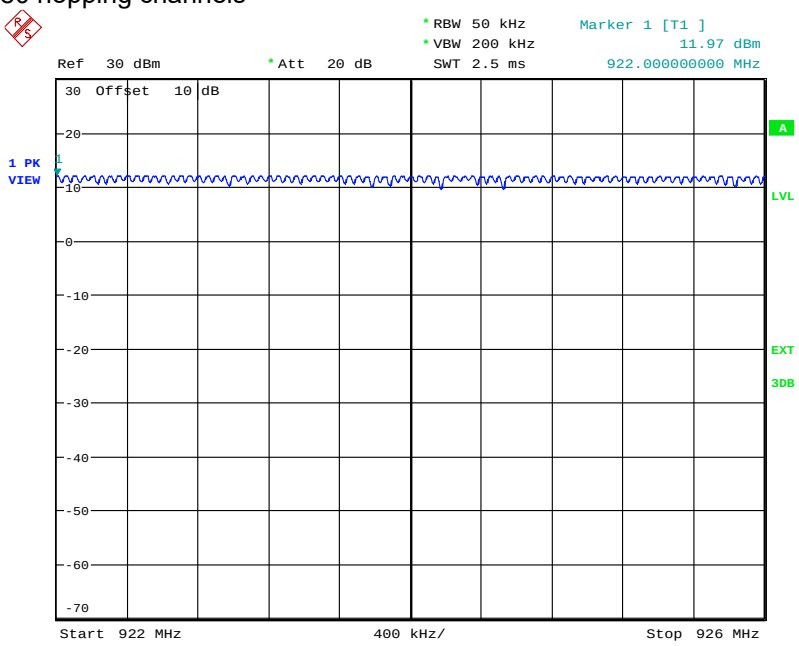

Date: 13.AUG.2025 19:44:29

80 hopping channels



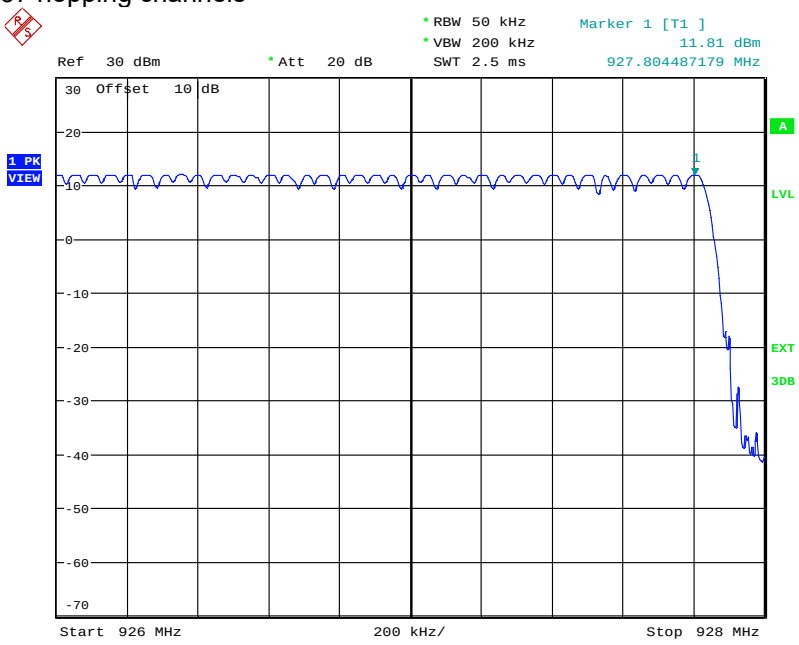

Date: 13.AUG.2025 19:46:38

80 hopping channels




Date: 13.AUG.2025 19:48:42

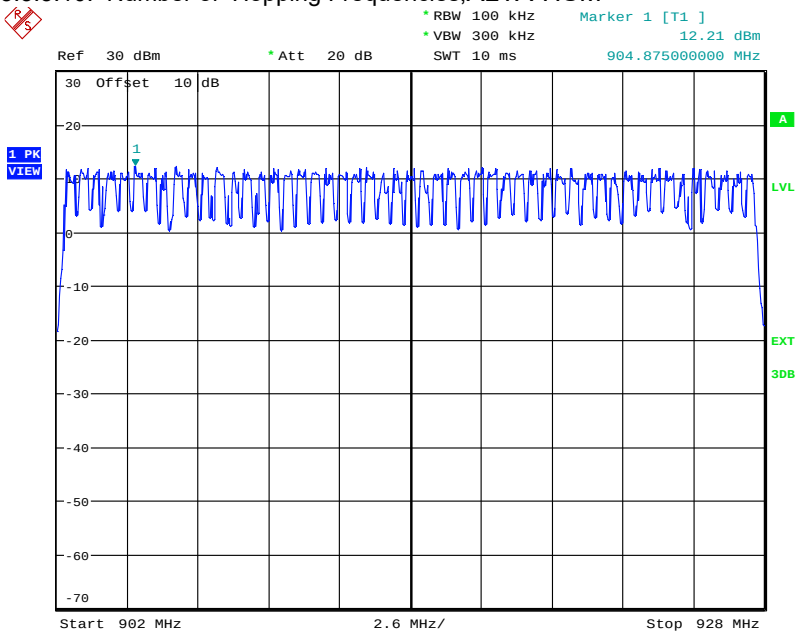
37 hopping channels




Date: 13.AUG.2025 19:51:13

Total number of hopping frequencies from 902 to 928 is 513 for ALTA-LSM

5.3.5.10. Number of Hopping Frequencies,ALTA-HSM

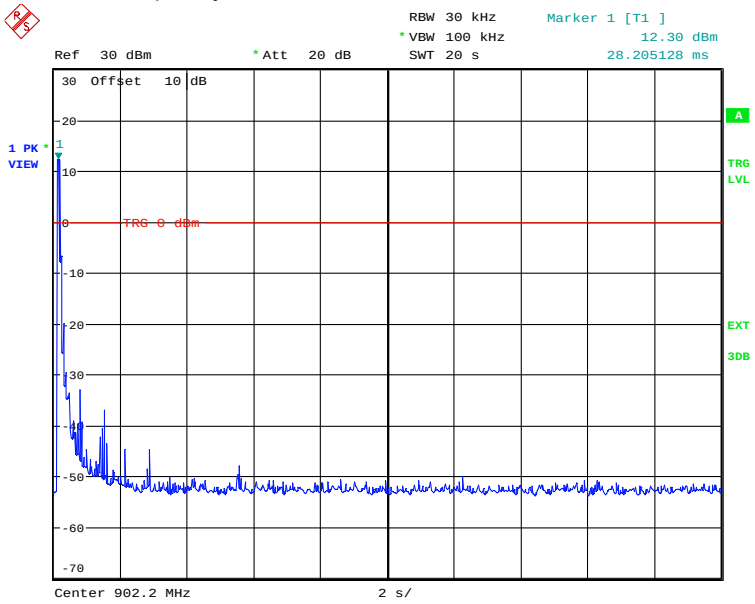



Date: 13.AUG.2025 20:02:24

Total number of hopping frequencies from 902 to 928 is 51 ALTA-HSM

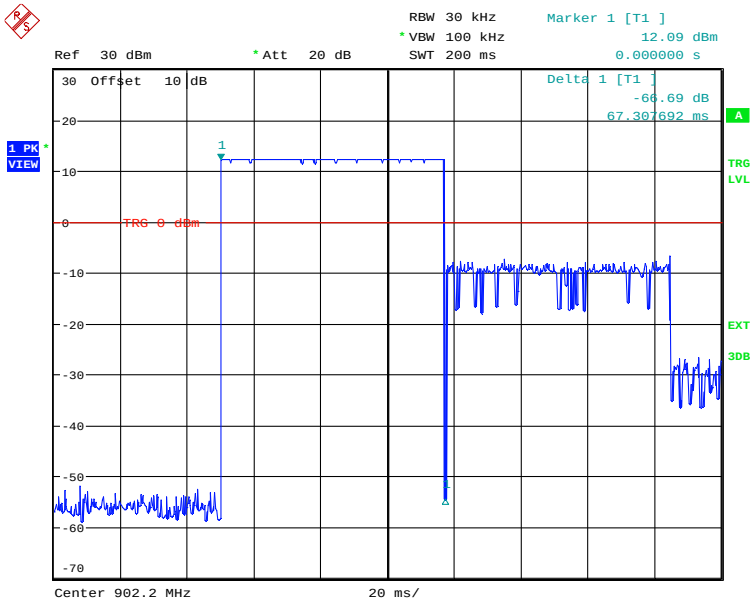
### 5.3.5.11. ALTA LSM; 902.2MHz

ttime of occupancy = 67.307692ms * 1 = 67.307692ms < 400ms in 20s period




Date: 14.AUG.2025 17:50:30

Pulse Width: 67.307692ms

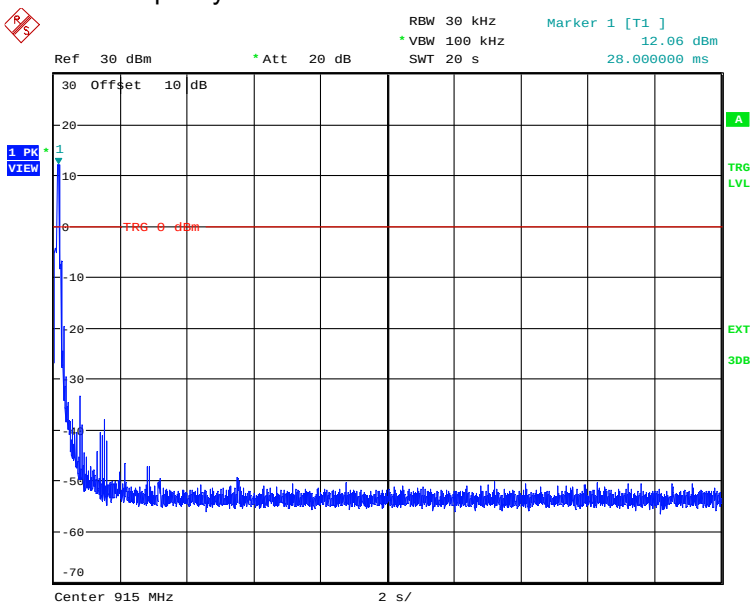



Date: 14.AUG.2025 17:53:35

### 5.3.5.12. 915MHz;

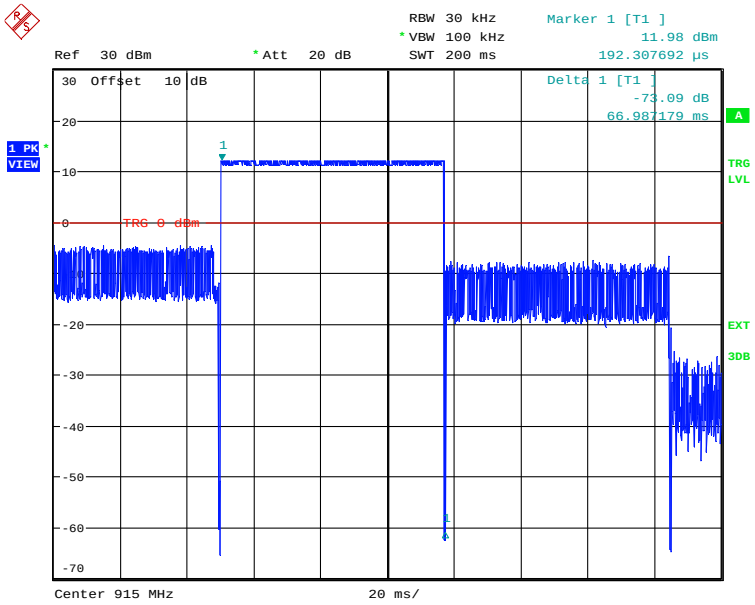
Note: lower signals are from adjacent channels

ttime of occupancy = 66.987179ms * 1 = 66.987179ms < 400ms in 20s period




Date: 14.AUG.2025 18:02:16

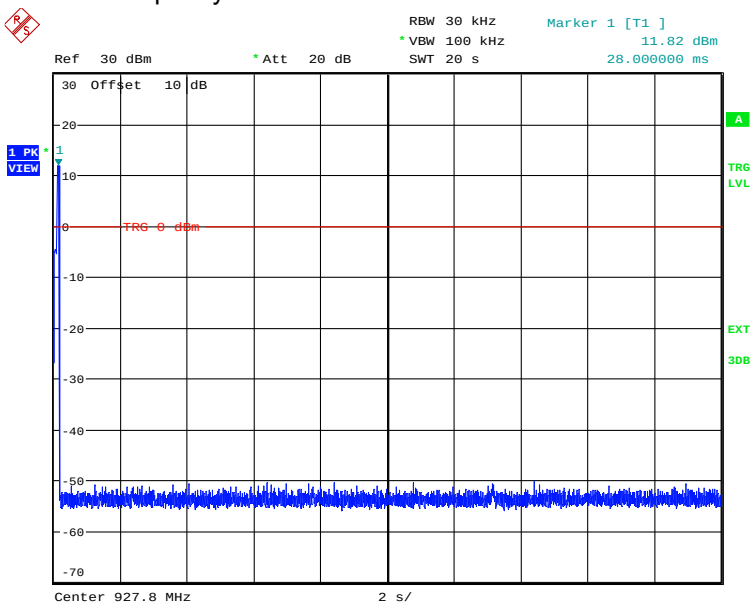
Pulse Width: 66.987179ms




Date: 14.AUG.2025 18:00:51

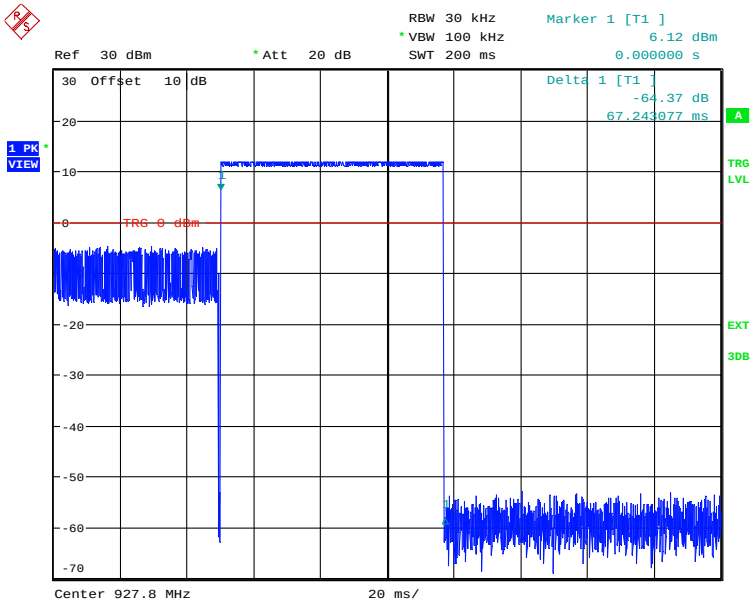
### 5.3.5.13. 927.8MHz

ttime of occupancy = 67.243077ms * 1 = 67.243077ms < 400ms in 20s period




Date: 14.AUG.2025 18:03:30

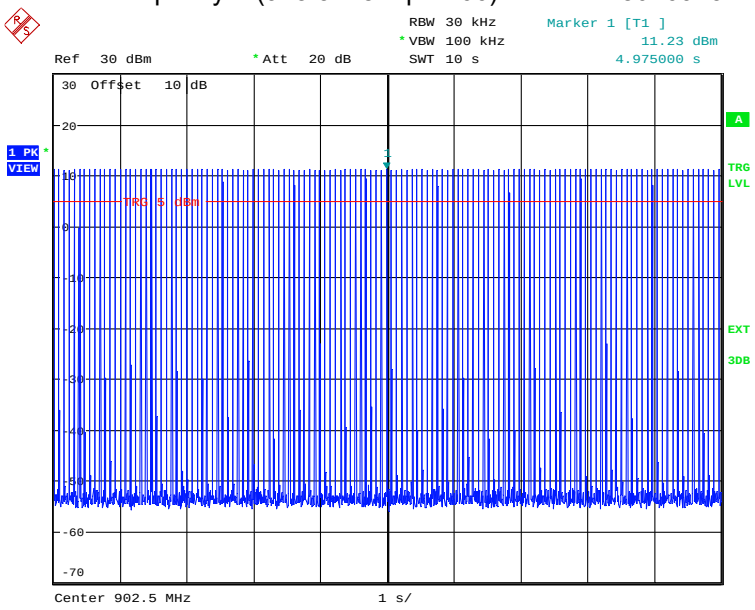
Pulse Width: 67.243077ms




Date: 14.AUG.2025 18:05:28

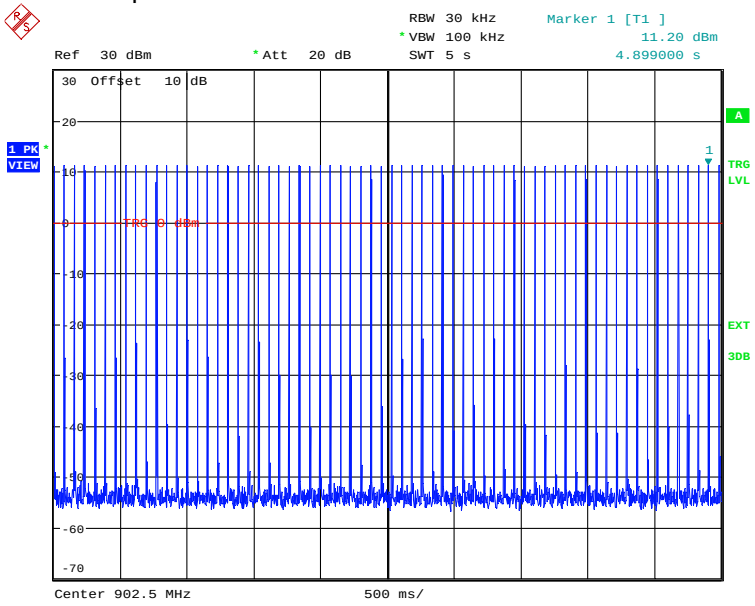
### 5.3.5.14. ALTA HSM 902.5MHz

ttime of occupancy = (945.512821µs * 66) * 2 = 124.80769237199ms < 400ms in 10s period



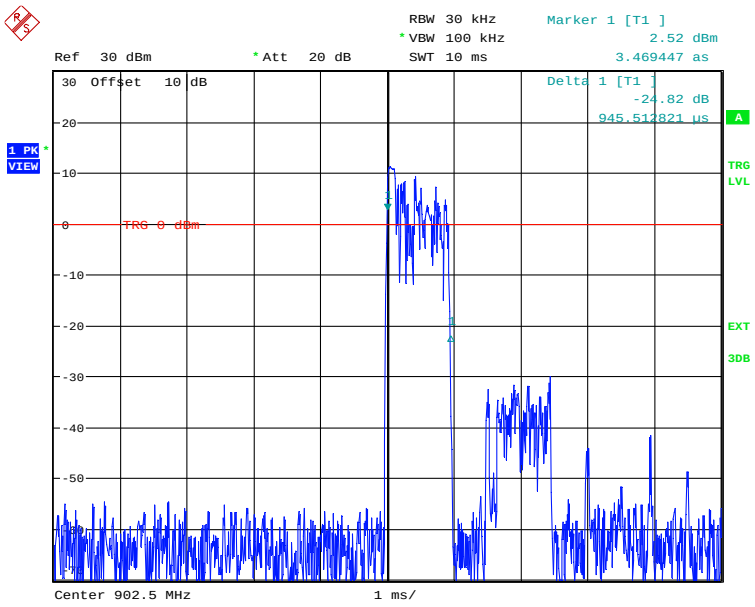

Date: 14.AUG.2025 18:24:26

Number of pulses: 66




Date: 14.AUG.2025 18:17:04

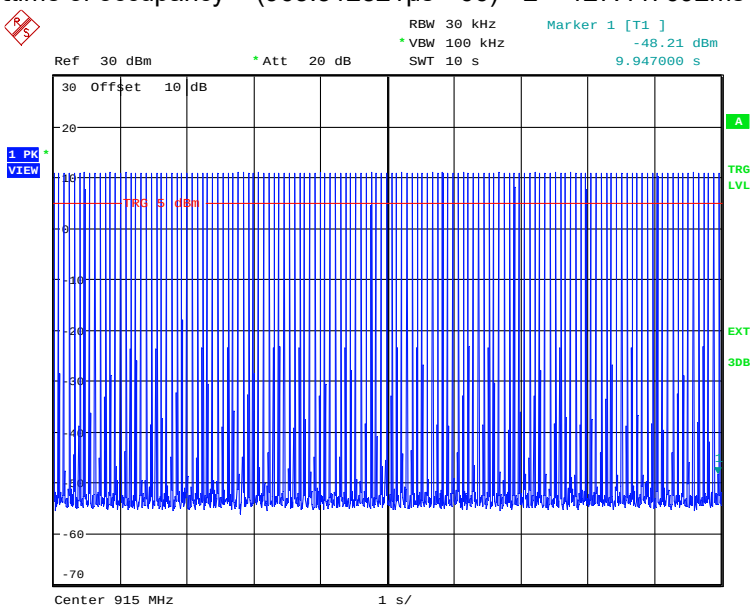
Pulse width: (945.512821µs * 67) * 2 = 126.698718014ms < 400ms in 10s period




Date: 14.AUG.2025 18:16:24

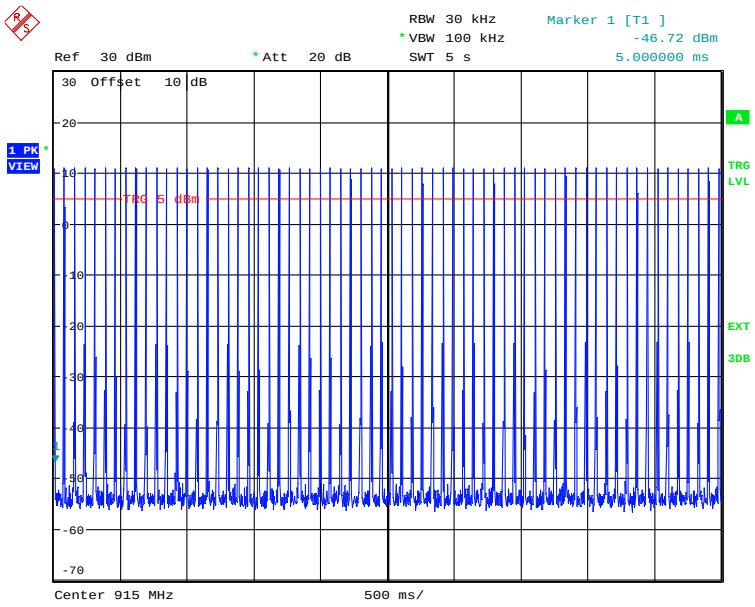
### 5.3.5.15. 915MHz

ttime of occupancy = (965.512821µs * 66) * 2 = 127.447692ms < 400ms in 10s period



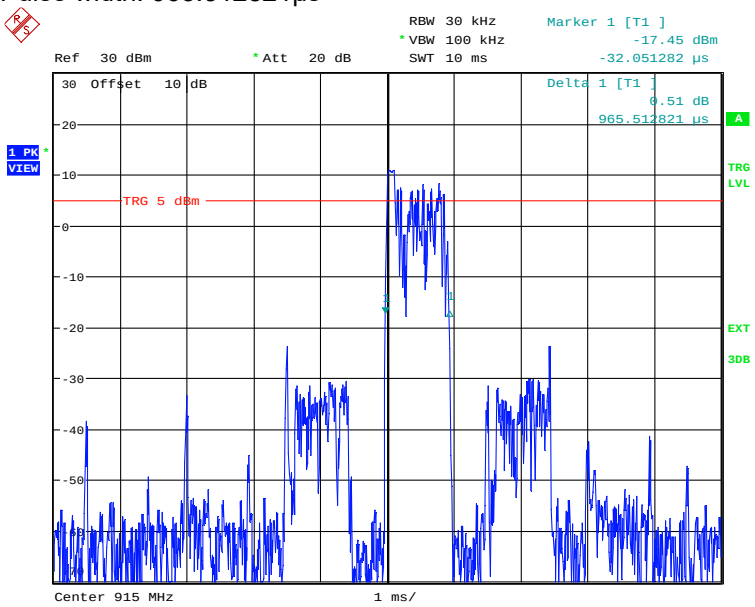

Date: 14.AUG.2025 19:08:55

Number of pulses: 66




Date: 14.AUG.2025 19:09:54

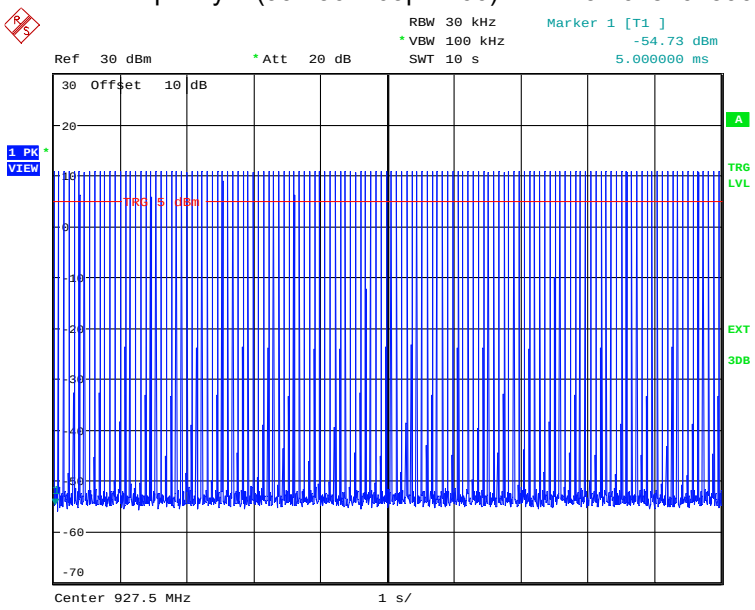
Pulse width: 965.512821µs




Date: 14.AUG.2025 19:12:45

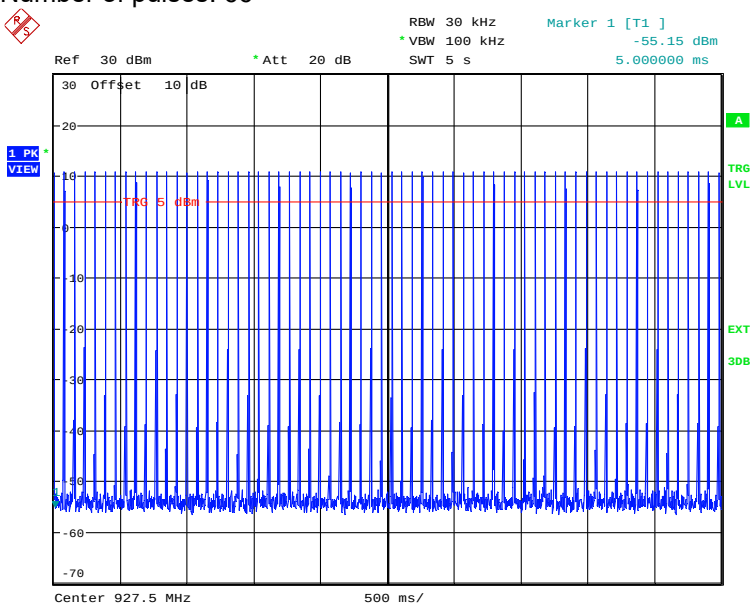
### 5.3.5.16. 927.5MHz

ttime of occupancy = (997.564103µs * 66) * 2 = 131.678461596ms < 400ms in 10s period



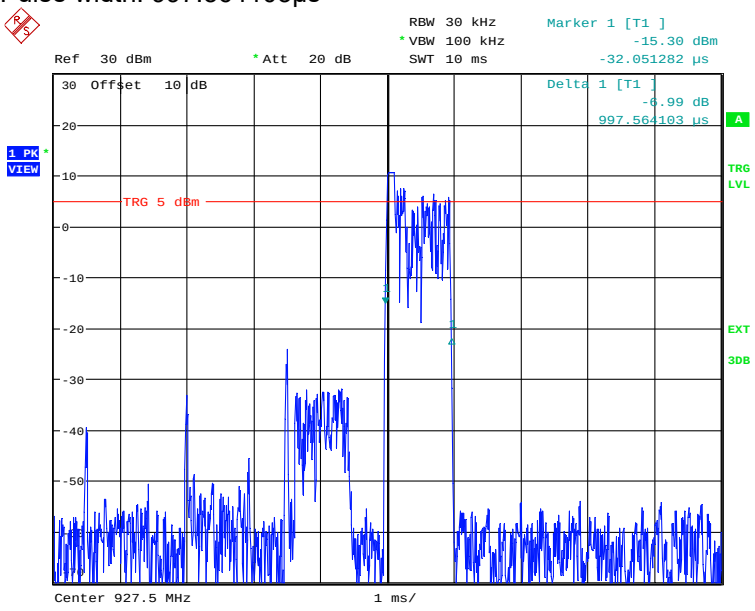

Date: 14.AUG.2025 19:11:10

Number of pulses: 66




Date: 14.AUG.2025 19:10:51

Pulse width: 997.564103µs




Date: 14.AUG.2025 19:12:08

## 5.4. PEAK CONDUCTED OUTPUT POWER [§ 15.247(b)(2)]

### 5.4.1. Limits

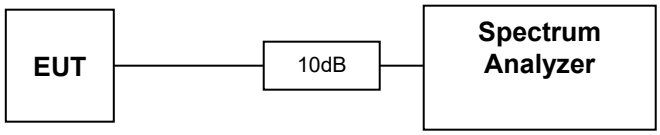
**§15.247(b)(2):** For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

**§15.247(b)**(3) For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
**§15.247(b)(4):** 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.

### 5.4.2. Method of Measurements

Test Procedure: KDB 558074 D01 15.247 Meas Guidance V05r02, Section 8.3.1.1 RBW ≥ DTS bandwidth and ANSI 63.10

### 5.4.3. Test Arrangement




### 5.4.4. Test Equipment List

| Test Instruments | Manufacturer | Model No. | Serial No. | Frequency Range | Calibration Due Date |
|---|---|---|---|---|---|
| Spectrum Analyzer | Rohde & Schwarz | FSU26 | 100398 | 20Hz–26.5 GHz | 21-Sep-2025 |
| Attenuator | Pasternack | PE7024-10 | 3 | DC–26.5 GHz | Cal before use |

Test Dates: August 7 and 12, 2025

### 5.4.5. Test Data

**(a) Peak Conducted Output (High Power)**

| Configuration Modulation | Frequency (MHz) | Peak Output Power at Antenna Terminal (dBm) | Peak Conducted Output Power Limit (dBm) |
|---|---|---|---|
| ALTA LSM | 902.2 | 13.39 | 30 |
| | 915.0 | 13.05 | 30 |
| | 927.8 | 12.87 | 30 |
| ALTA HSM | 902.5 | 13.40 | 30 |
| | 915.0 | 13.13 | 30 |
| | 927.5 | 12.89 | 30 |

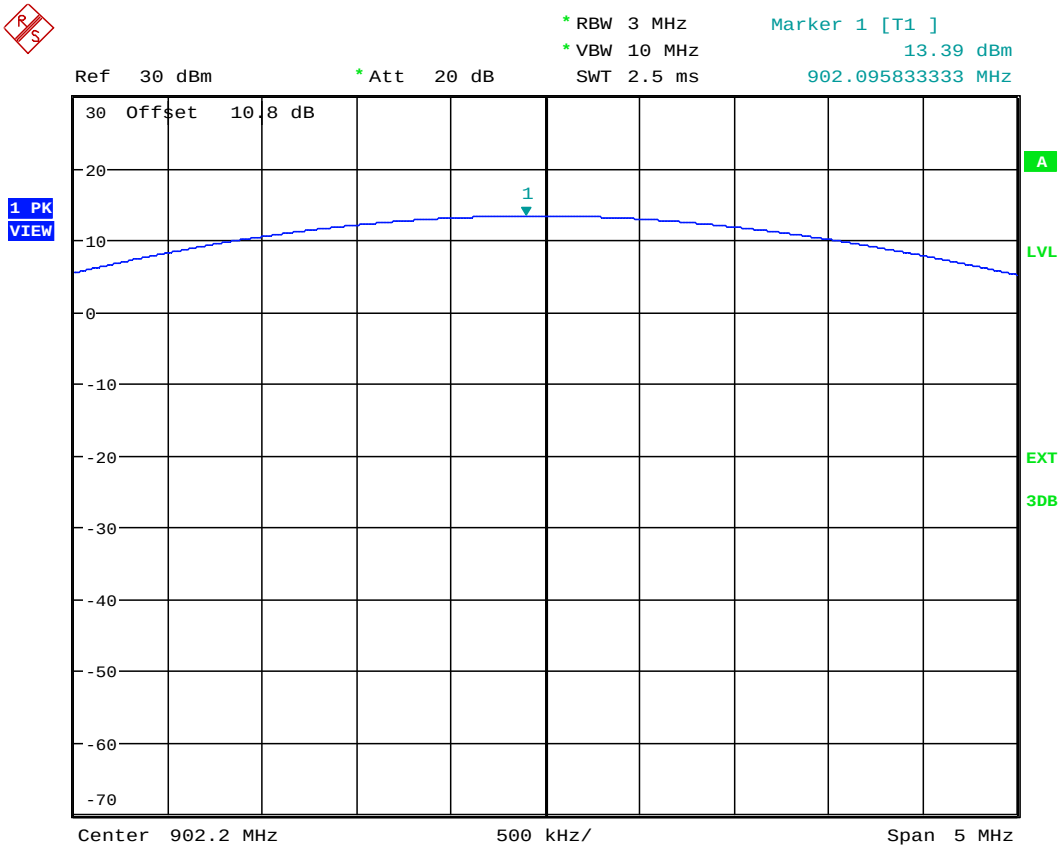
**(b) Peak Conducted Output (Low Power)**

| Configuration Modulation | Frequency (MHz) | Peak Output Power at Antenna Terminal (dBm) | Peak Conducted Output Power Limit (dBm) |
|---|---|---|---|
| ALTA LSM | 902.2 | -15.67 | 30 |
| | 915.0 | -16.39 | 30 |
| | 927.8 | -17.06 | 30 |
| ALTA HSM | 902.5 | -15.74 | 30 |
| | 915.0 | -16.50 | 30 |
| | 927.5 | -17.08 | 30 |

Maximum Antenna Gain is 2.15 dBi for the integrated Antenna of this device.
EIRP(Max)=13.40+2.15=15.55dBm < 36 dBm limit

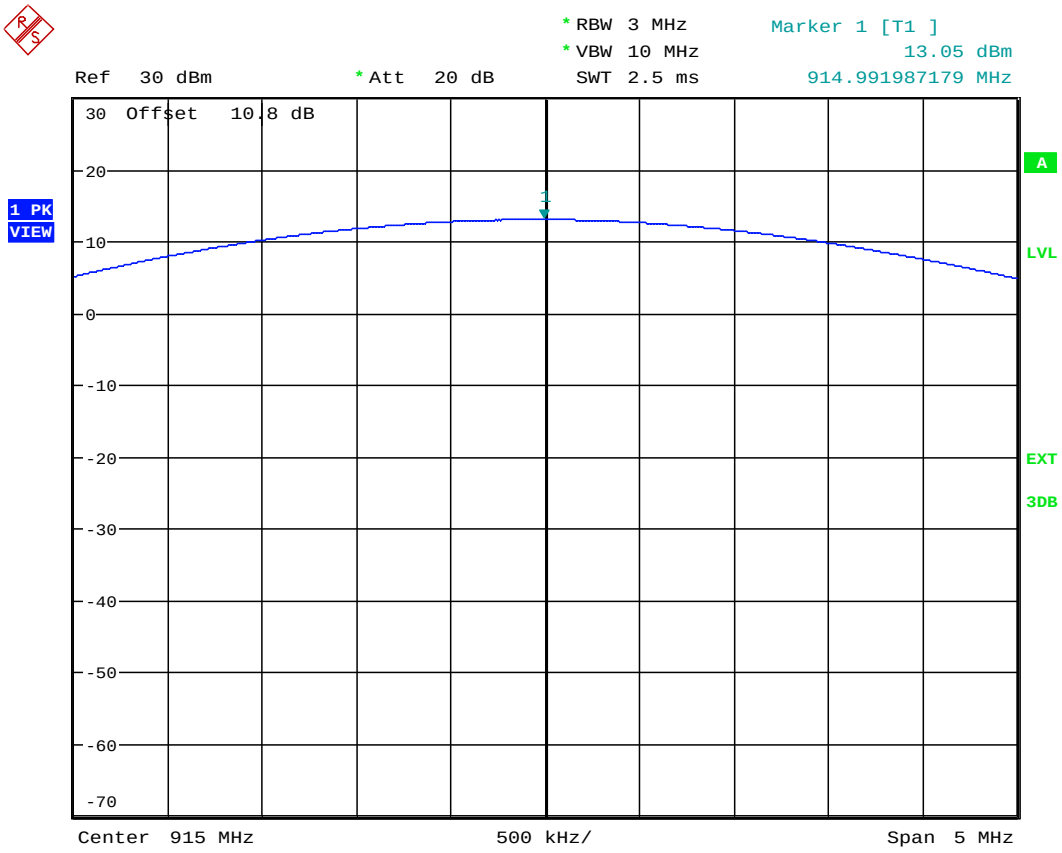
Note: The low power tests are for reference only, the final product is made for high power setting only.

Configuration: ALTA-LSM
902.2MHz



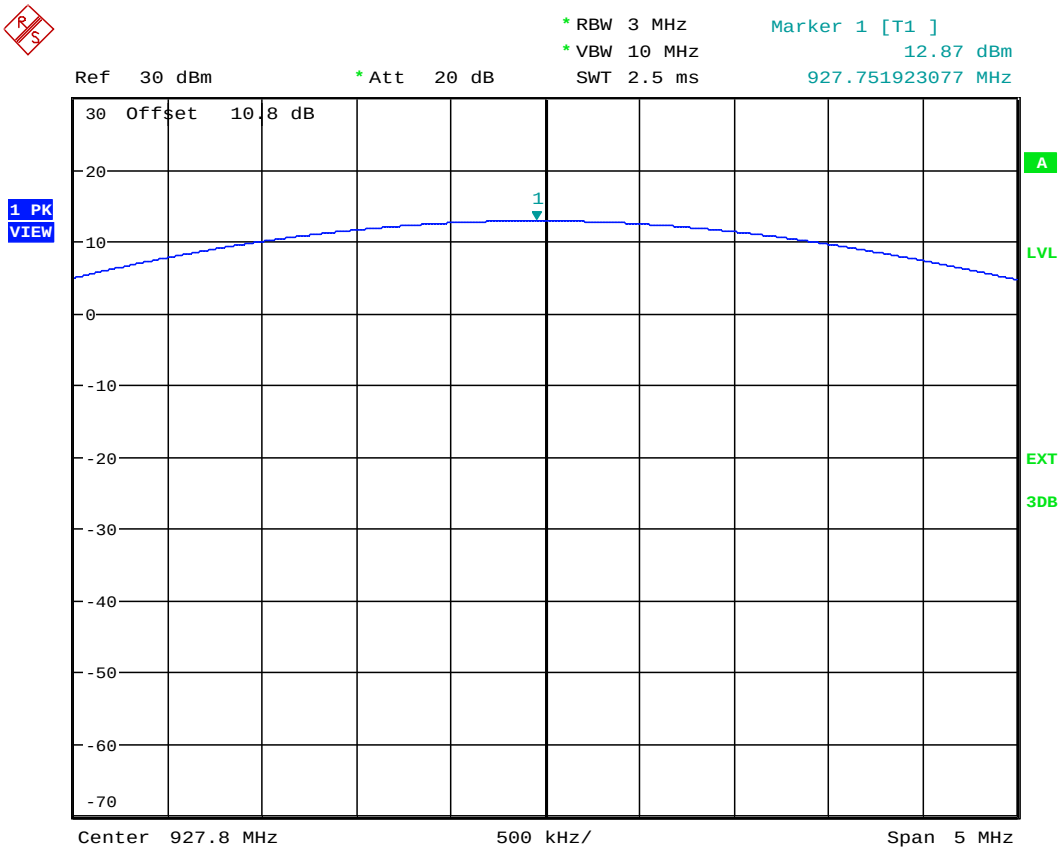

Date: 7.AUG.2025 20:49:38

915MHz




Date: 7.AUG.2025 20:51:56

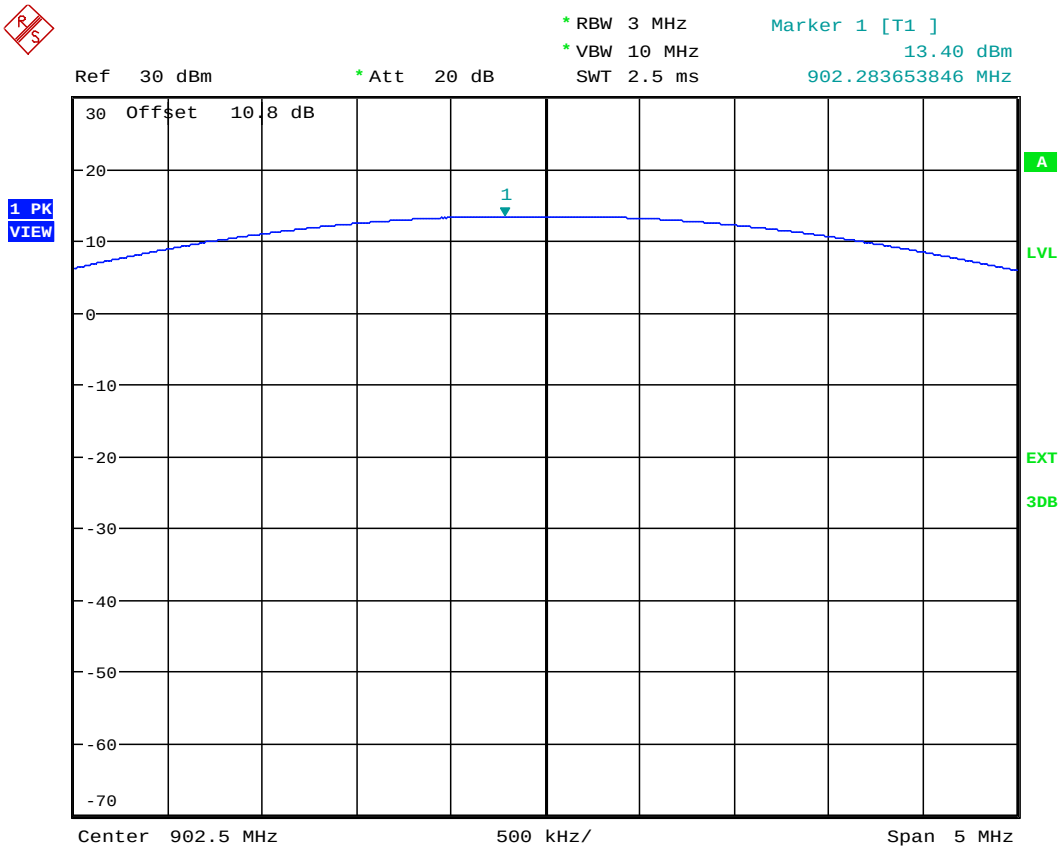
927.8MHz




Date: 7.AUG.2025 20:53:55

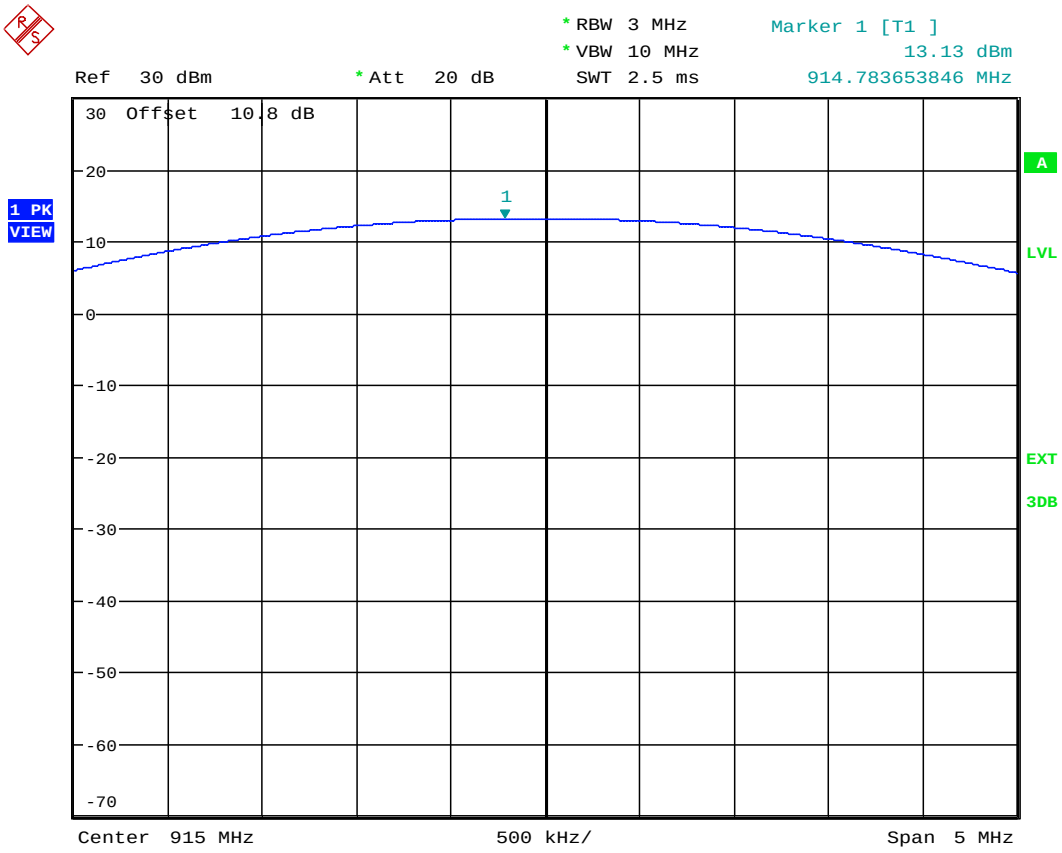
Configuration: ALTA-HSM

902.5MHz



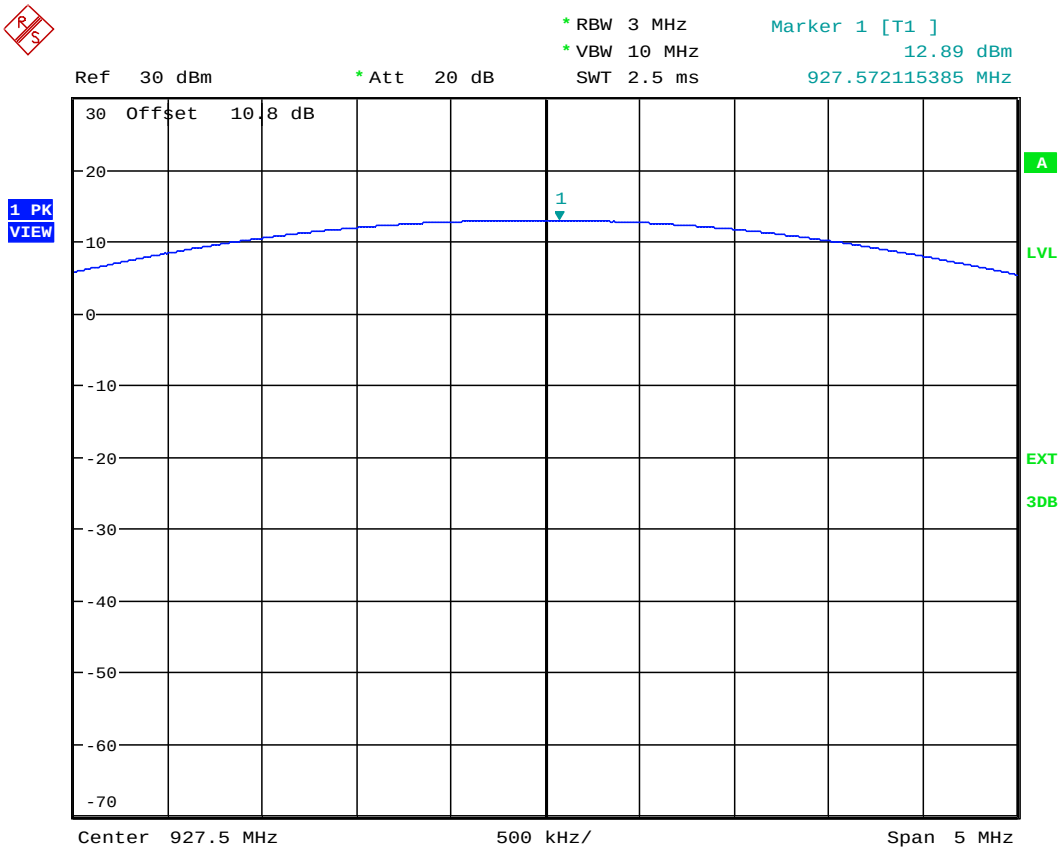

Date: 7.AUG.2025 20:55:21

915MHz




Date: 7.AUG.2025 20:56:07

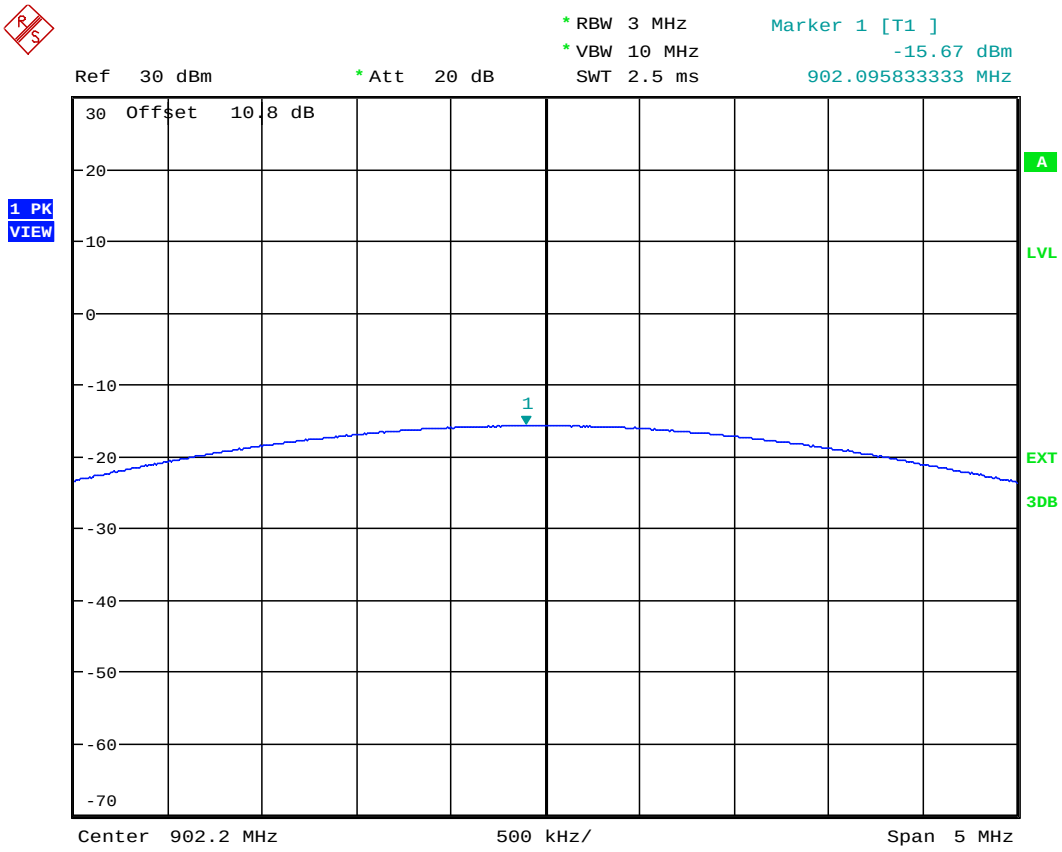
927.5MHz



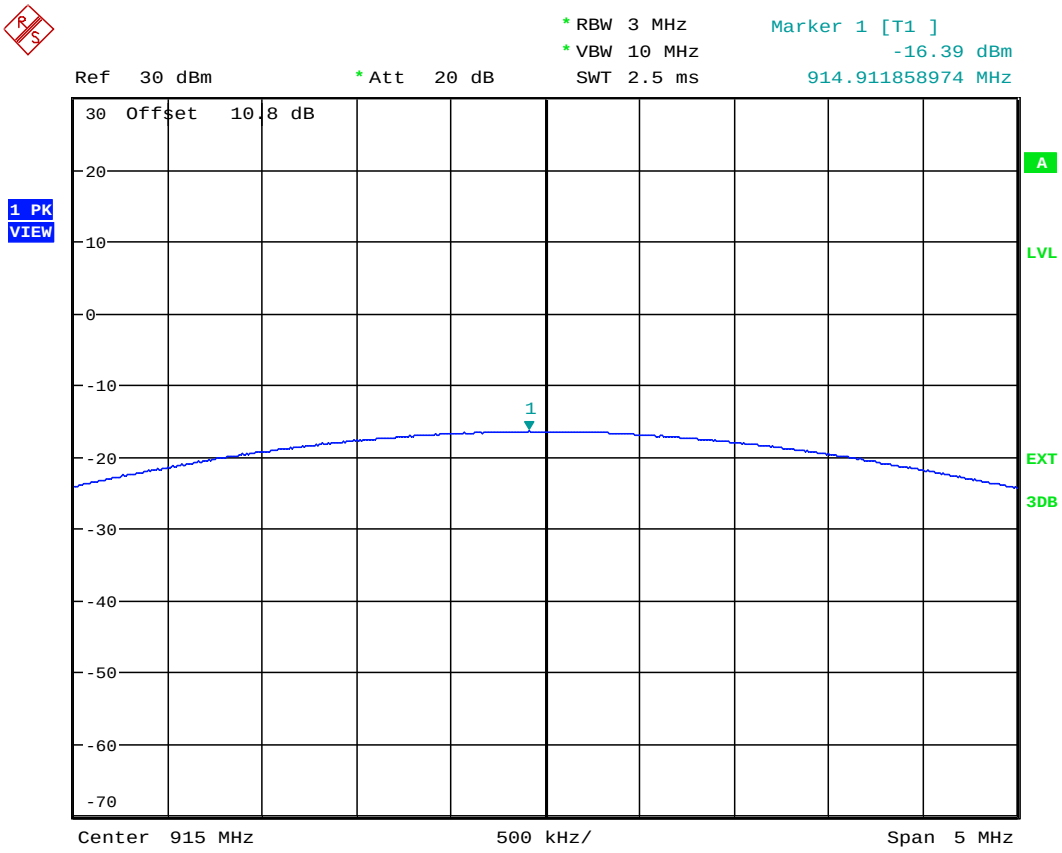

Date: 7.AUG.2025 20:56:57

## 5.5. Low power

Configuration: ALTA-LSM
902.2MHz

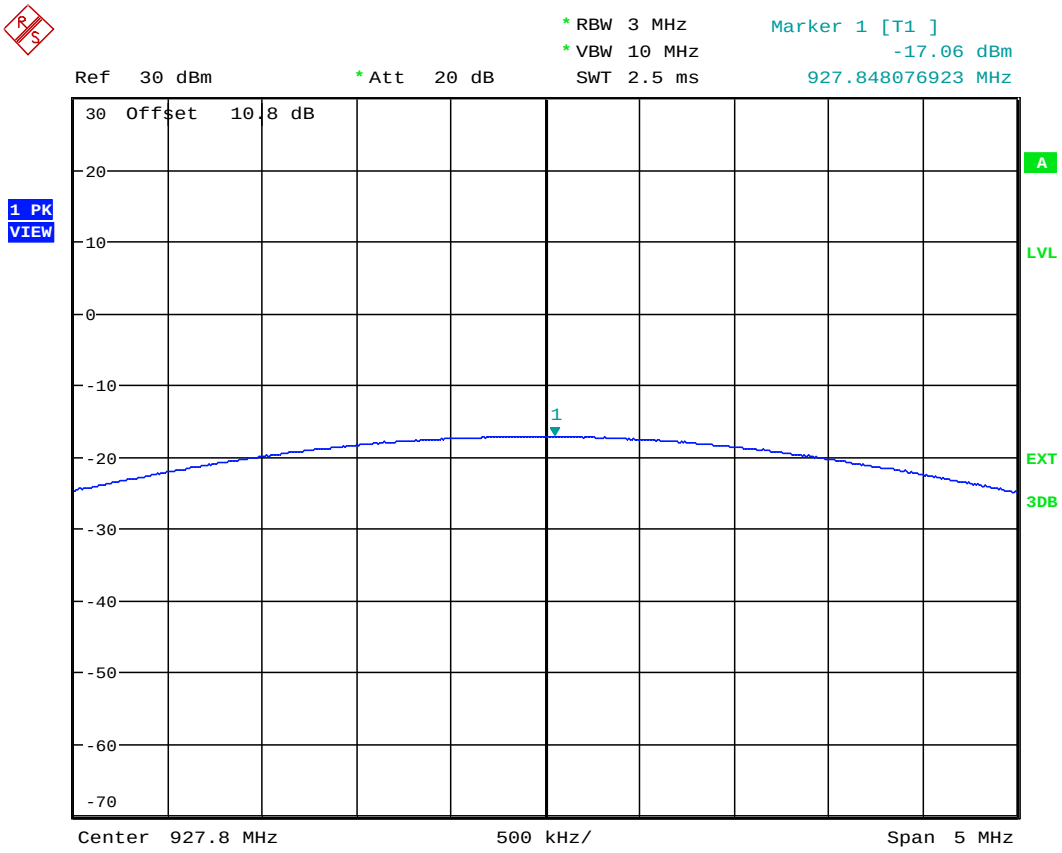


915MHz



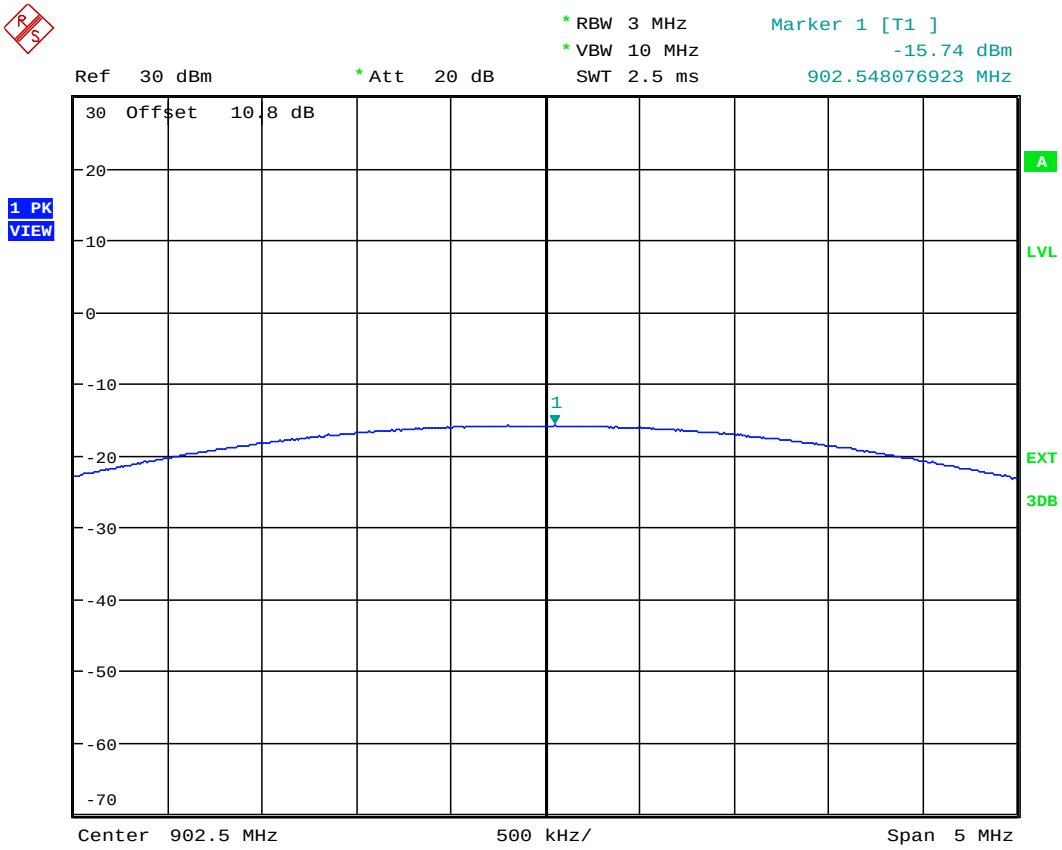

Date: 12.AUG.2025 15:25:18

927.8MHz



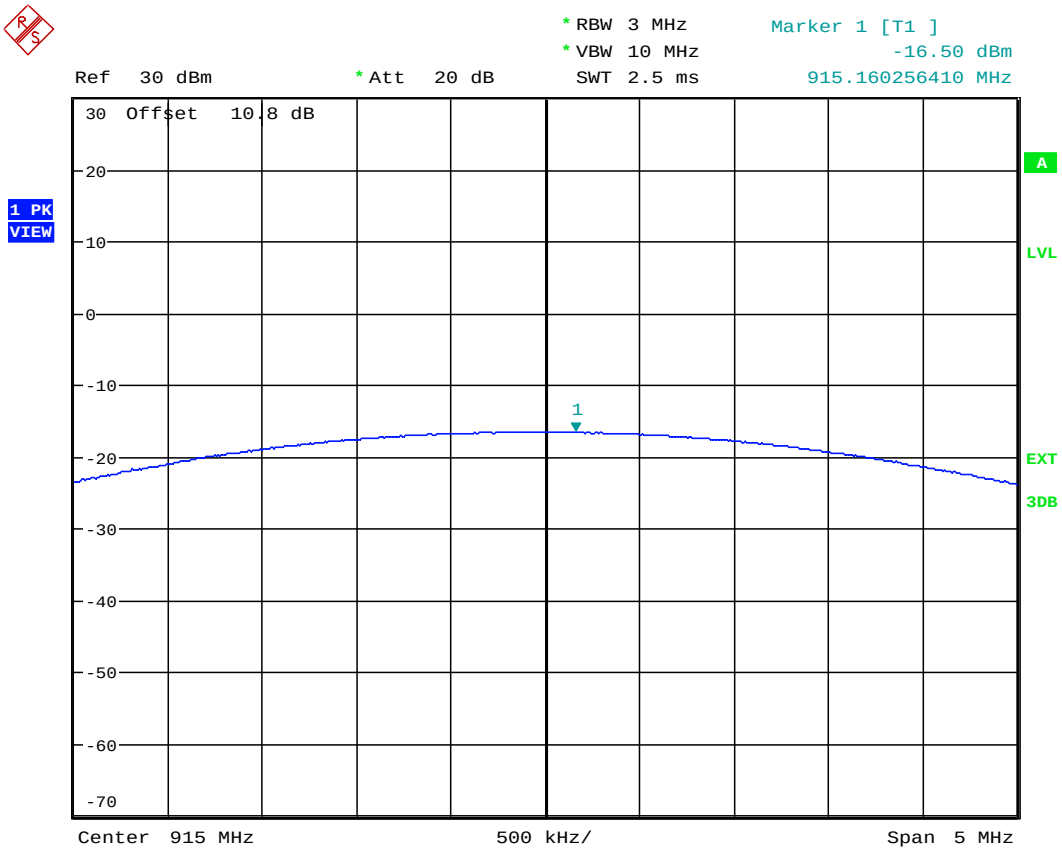

Date: 12.AUG.2025 15:26:19

Configuration: ALTA-HSM
902.5MHz



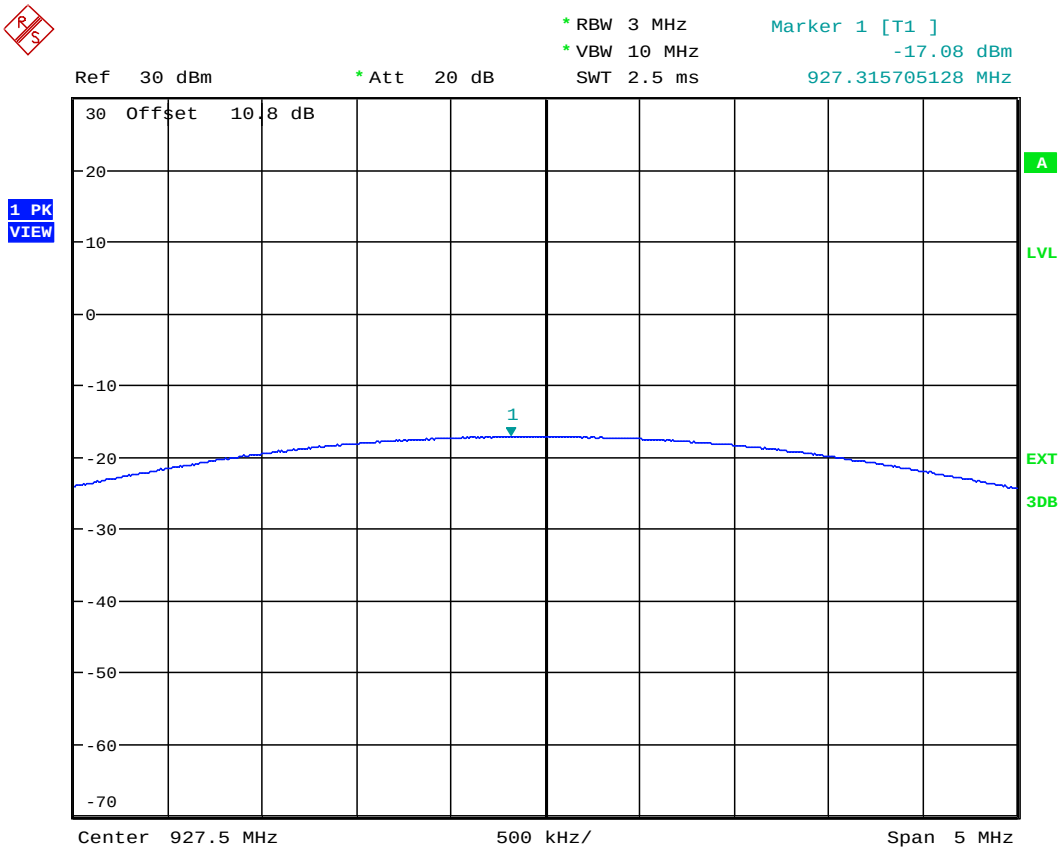

Date: 12.AUG.2025 15:27:31

915MHz




Date: 12.AUG.2025 15:31:34

927.5MHz




Date: 12.AUG.2025 15:32:39

## 5.6. TRANSMITTER SPURIOUS RADIATED EMISSIONS AT 3 METERS [§§ 15.247(d), 15.209 & 15.205]

### 5.6.1. Limit

**§ 15.247 (d)**: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

**Section 15.205(a) - Restricted Bands of Operation**

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090–0.110 | 16.42–16.423 | 399.9–410 | 4.5–5.15 |
| [1] 0.495–0.505 | 16.69475–16.69525 | 608–614 | 5.35–5.46 |
| 2.1735–2.1905 | 16.80425–16.80475 | 960–1240 | 7.25–7.75 |
| 4.125–4.128 | 25.5–25.67 | 1300–1427 | 8.025–8.5 |
| 4.17725–4.17775 | 37.5–38.25 | 1435–1626.5 | 9.0–9.2 |
| 4.20725–4.20775 | 73–74.6 | 1645.5–1646.5 | 9.3–9.5 |
| 6.215–6.218 | 74.8–75.2 | 1660–1710 | 10.6–12.7 |
| 6.26775–6.26825 | 108–121.94 | 1718.8–1722.2 | 13.25–13.4 |
| 6.31175–6.31225 | 123–138 | 2200–2300 | 14.47–14.5 |
| 8.291–8.294 | 149.9–150.05 | 2310–2390 | 15.35–16.2 |
| 8.362–8.366 | 156.52475–156.52525 | 2483.5–2500 | 17.7–21.4 |
| 8.37625–8.38675 | 156.7–156.9 | 2655–2900 | 22.01–23.12 |
| 8.41425–8.41475 | 162.0125–167.17 | 3260–3267 | 23.6–24.0 |
| 12.29–12.293 | 167.72–173.2 | 3332–3339 | 31.2–31.8 |
| 12.51975–12.52025 | 240–285 | 3345.8–3358 | 36.43–36.5 |
| 12.57675–12.57725 | 322–335.4 | 3600–4400 | ([2]) |
| 13.36–13.41. | | | |

[1] Until February 1, 1999, this restricted band shall be 0.490–0.510 MHz.
[2] Above 38.6

**Section 15.209(a) - Field Strength Limits within Restricted Frequency Bands**

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009 - 0.490 | 2,400 / F (kHz) | 300 |
| 0.490 - 1.705 | 24,000 / F (kHz) | 30 |
| 1.705 - 30.0 | 30 | 30 |
| 30 – 88 | 100 | 3 |
| 88 – 216 | 150 | 3 |
| 216 – 960 | 200 | 3 |
| Above 960 | 500 | 3 |

### 5.6.2. Method of Measurements

ANSI C63.10 and ANSI 63.4 procedures.

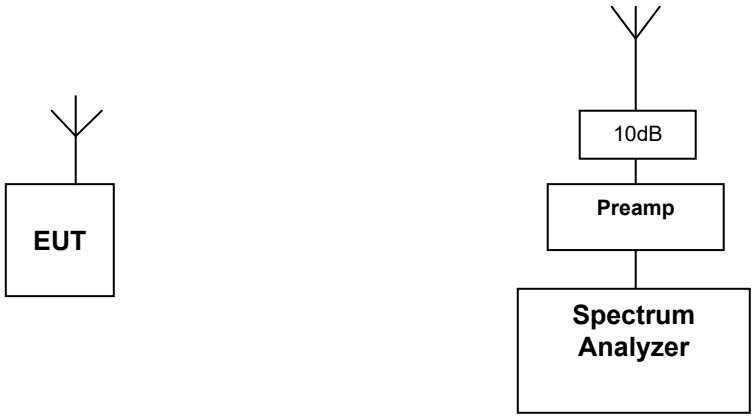
### 5.6.3. Test Data

#### 5.6.3.1. Spurious Radiated Emissions

**Remark(s):**

- All spurious emissions that are in excess of 20 dB below the specified limit shall be recorded.
- The following test results are the final worst-case measurements derived from above exploratory tests, performed with EUT.

##### 5.6.3.1.1. Test Arrangement




##### 5.6.3.1.2. Test Equipment List

| Test Instruments | Manufacturer | Model No. | Serial No. | Frequency Range | Calibration Due Date |
|---|---|---|---|---|---|
| Spectrum Analyzer | Rohde & Schwarz | FSU26 | 100398 | 20Hz–26.5 GHz | 21-Sep-2025 |
| Attenuator | Pasternack | PE7024-10 | 3 | DC–26.5 GHz | Cal before use |
| Preamp | Com-Power | PAM-103 | 18020181 | 1MHz-1GHz | 11-Mar-2026 |
| Log Periodic Antenna | ETS | 93148 | 1101 | 200MHz-2GHz | 29-Aug-2026 |

Test Dates: August 7- 13, 2025

### 5.6.3.1.3. EUT with 2.15 dBi Integral Antenna

Test Distance:3m
HSM

| | |
|---|---|
| Fundamental Frequency: | 902.5 MHz |
| Configuration: | ALTA HSM |
| Power Setting: | High |
| Frequency Test Range: | 30 MHz – 10 GHz |

| Frequency (MHz) | RF Peak Level (dBµV/m) | RF Avg Level (dBµV/m) | Antenna Plane (H/V) | Limit 15.209 (dBµV/m) | Limit 15.247 (dBµV/m) | Margin (dB) | Pass/ Fail |
|---|---|---|---|---|---|---|---|
| 902.5 | 114.41 | -- | V | -- | -- | -- | -- |
| 902.2 | 108.19 | -- | H | -- | -- | -- | -- |
| 2707.5 | 51.39 | 41.02 | V | 54.0 | 88.9 | -12.98 | Pass* |
| 2707.5 | 51.81 | 41.54 | H | 54.0 | 88.9 | -12.46 | Pass* |
| All other spurious emissions and harmonics are more than 20 dB below the applicable limit. | | | | | | | |

*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

| | |
|---|---|
| Fundamental Frequency: | 915.0 MHz |
| Configuration: | ALTA HSM |
| Power Setting: | High |
| Frequency Test Range: | 30 MHz – 10 GHz |

| Frequency (MHz) | RF Peak Level (dBµV/m) | RF Avg Level (dBµV/m) | Antenna Plane (H/V) | Limit 15.209 (dBµV/m) | Limit 15.247 (dBµV/m) | Margin (dB) | Pass/ Fail |
|---|---|---|---|---|---|---|---|
| 915.0 | 113.2 | -- | V | -- | -- | -- | -- |
| 915.0 | 108.43 | -- | H | -- | -- | -- | -- |
| 2745.0 | 51.51 | 41.11 | V | 54.0 | 88.4 | -12.89 | Pass* |
| 2745.0 | 52.63 | 42.97 | H | 54.0 | 88.4 | -11.03 | Pass* |
| All other spurious emissions and harmonics are more than 20 dB below the applicable limit. | | | | | | | |

*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

| | |
|---|---|
| Fundamental Frequency: | 927.5MHz |
| Configuration: | ALTA HSM |
| Power Setting: | High |
| Frequency Test Range: | 30 MHz – 10 GHz |

| Frequency (MHz) | RF Peak Level (dBµV/m) | RF Avg Level (dBµV/m) | Antenna Plane (H/V) | Limit 15.209 (dBµV/m) | Limit 15.247 (dBµV/m) | Margin (dB) | Pass/ Fail |
|---|---|---|---|---|---|---|---|
| 927.5 | 111.57 | -- | V | -- | -- | -- | -- |
| 927.5 | 109.22 | -- | H | -- | -- | -- | -- |
| 2782.5 | 52.27 | 43.24 | V | 54.0 | 89.2 | -10.76 | Pass* |
| 2782.5 | 51.90 | 42.67 | H | 54.0 | 89.2 | -11.33 | Pass* |

All other spurious emissions and harmonics are more than 20 dB below the applicable limit.

*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

LSM

| | |
|---|---|
| Fundamental Frequency: | 902.5 MHz |
| Configuration: | ALTA LSM |
| Power Setting: | High |
| Frequency Test Range: | 30 MHz – 10 GHz |

| Frequency (MHz) | RF Peak Level (dBµV/m) | RF Avg Level (dBµV/m) | Antenna Plane (H/V) | Limit 15.209 (dBµV/m) | Limit 15.247 (dBµV/m) | Margin (dB) | Pass/ Fail |
|---|---|---|---|---|---|---|---|
| 902.2 | 113.87 | -- | V | -- | -- | -- | -- |
| 902.2 | 109.58 | -- | H | -- | -- | -- | -- |
| 2706.6 | 51.78 | 44.32 | V | 54.0 | 88.5 | -9.68 | Pass* |
| 2706.6 | 52.10 | 44.64 | H | 54.0 | 88.5 | -9.36 | Pass* |
| 3608.8 | 51.23 | 38.07 | V | 54.0 | 88.5 | -15.93 | Pass* |
| 3608.8 | 51.57 | 38.29 | H | 54.0 | 88.5 | -15.71 | Pass* |

All other spurious emissions and harmonics are more than 20 dB below the applicable limit.

*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

| | |
|---|---|
| Fundamental Frequency: | 915.0 MHz |
| Configuration: | ALTA LSM |
| Power Setting: | High |
| Frequency Test Range: | 30 MHz – 10 GHz |

| Frequency (MHz) | RF Peak Level (dBµV/m) | RF Avg Level (dBµV/m) | Antenna Plane (H/V) | Limit 15.209 (dBµV/m) | Limit 15.247 (dBµV/m) | Margin (dB) | Pass/ Fail |
|---|---|---|---|---|---|---|---|
| 915.0 | 113.24 | -- | V | -- | -- | -- | -- |
| 915.0 | 109.67 | -- | H | -- | -- | -- | -- |
| 2745.0 | 51.34 | 42.85 | V | 54.0 | 89.67 | -11.15 | Pass* |
| 2745.0 | 52.64 | 45.90 | H | 54.0 | 89.67 | -8.10 | Pass* |

All other spurious emissions and harmonics are more than 20 dB below the applicable limit.

*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

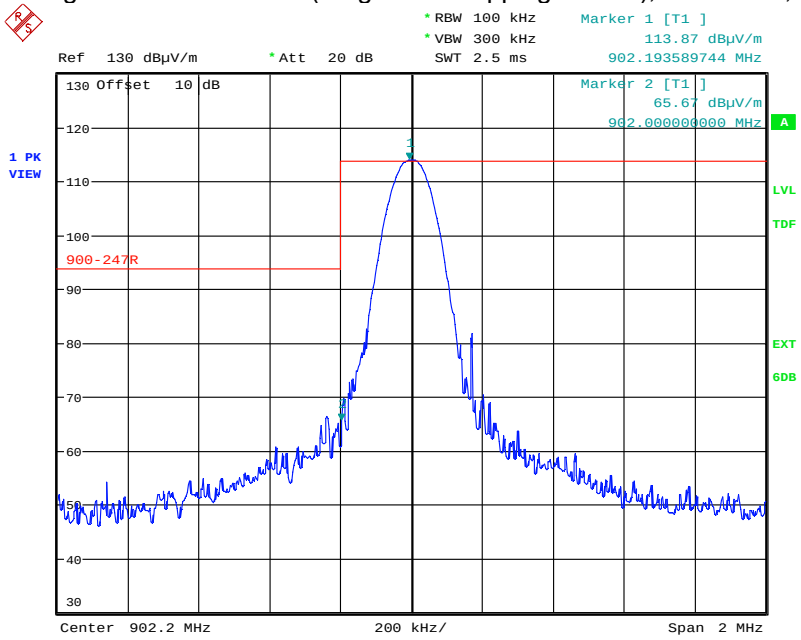
| | |
|---|---|
| Fundamental Frequency: | 927.5 MHz |
| Configuration: | ALTA LSM |
| Power Setting: | High |
| Frequency Test Range: | 30 MHz – 10 GHz |

| Frequency (MHz) | RF Peak Level (dBµV/m) | RF Avg Level (dBµV/m) | Antenna Plane (H/V) | Limit 15.209 (dBµV/m) | Limit 15.247 (dBµV/m) | Margin (dB) | Pass/ Fail |
|---|---|---|---|---|---|---|---|
| 927.8 | 112.07 | -- | V | -- | -- | -- | -- |
| 927.8 | 109.75 | -- | H | -- | -- | -- | -- |
| 2783.4 | 52.25 | 45.43 | V | 54.0 | 89.7 | -8.57 | Pass* |
| 2783.4 | 50.48 | 42.74 | H | 54.0 | 89.7 | -11.26 | Pass* |

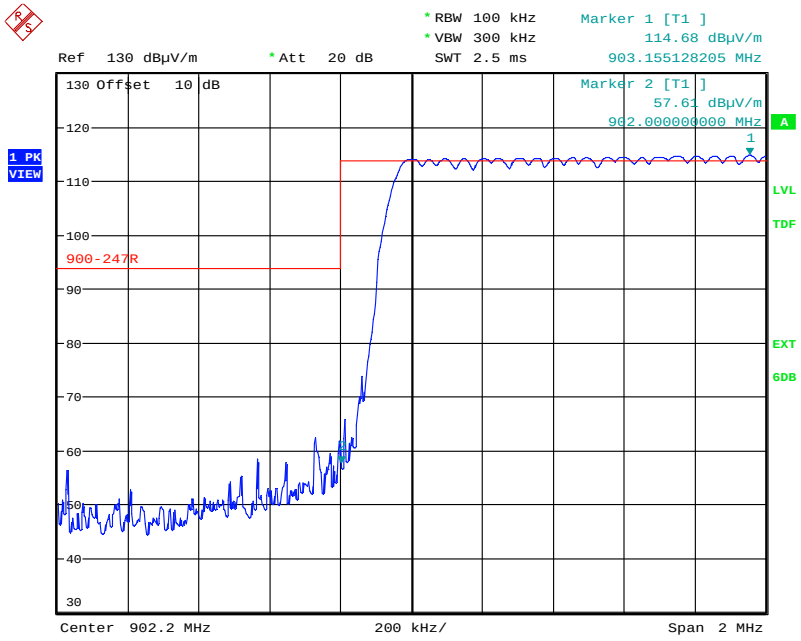
All other spurious emissions and harmonics are more than 20 dB below the applicable limit.

### 5.6.3.3. Band-Edge RF Radiated Emissions

Configuration: ALTA LSM (Single and Hopping Modes); 902.2MHz; Vertical

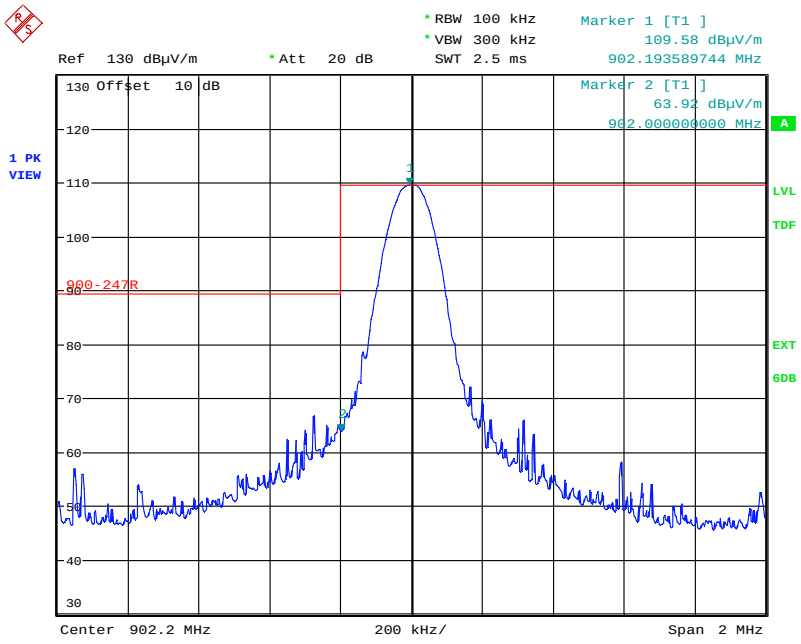



Date: 7.AUG.2025 20:00:53

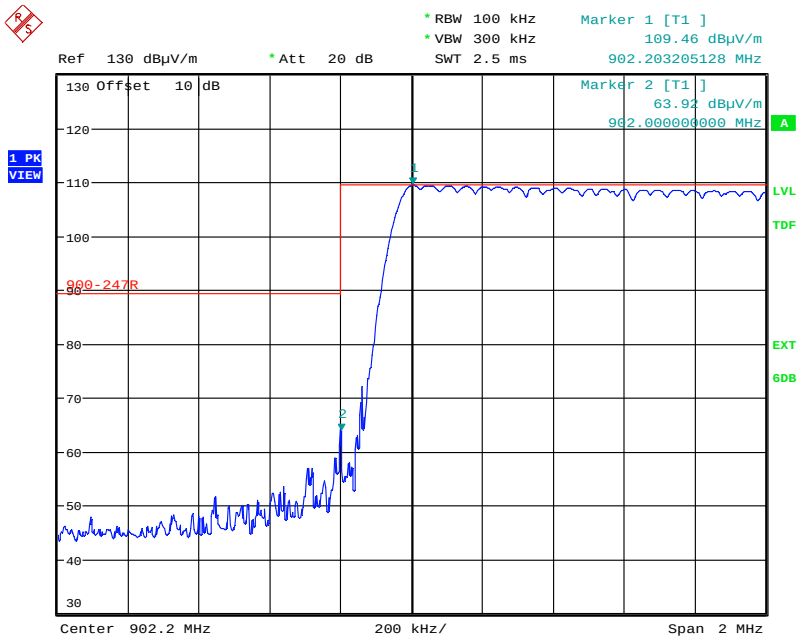



Date: 7.AUG.2025 20:04:11

## Horizontal

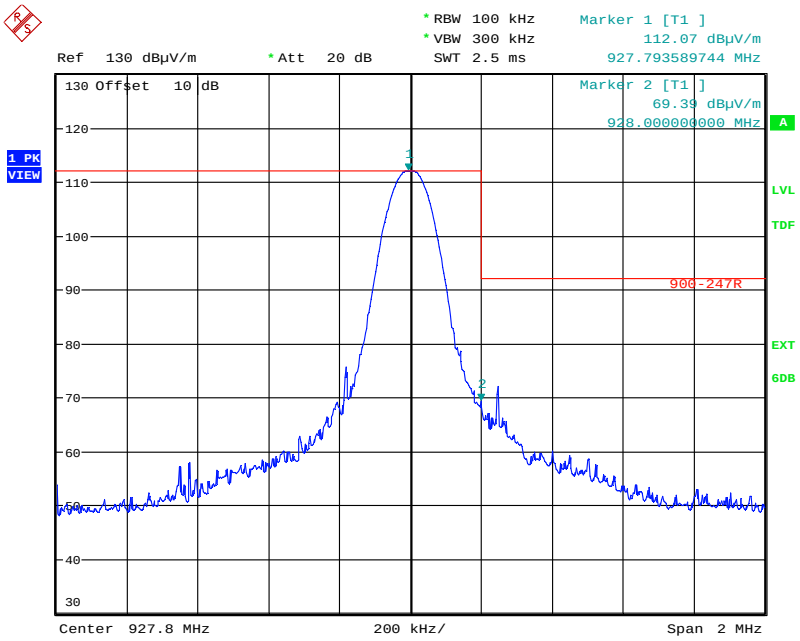



Date: 7.AUG.2025 20:08:17

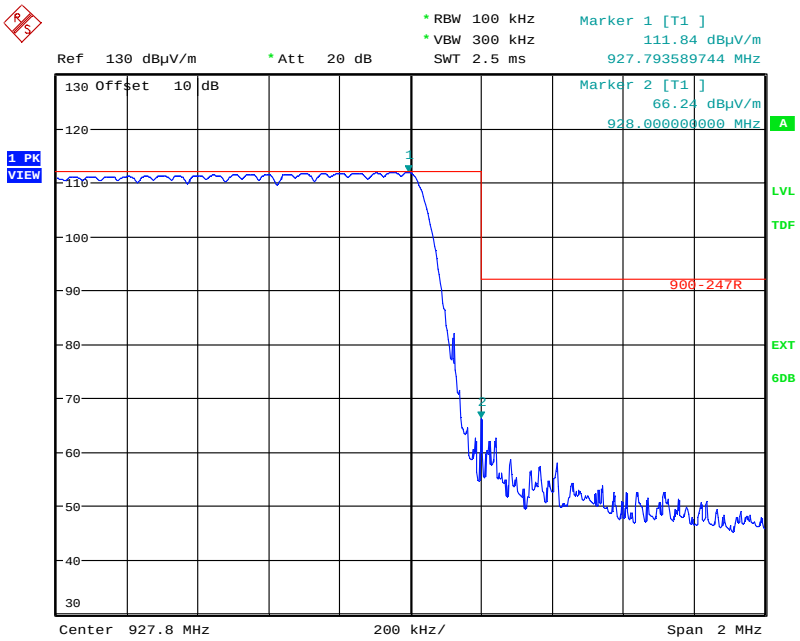



Date: 7.AUG.2025 20:11:46

927.8MHz
Vertical

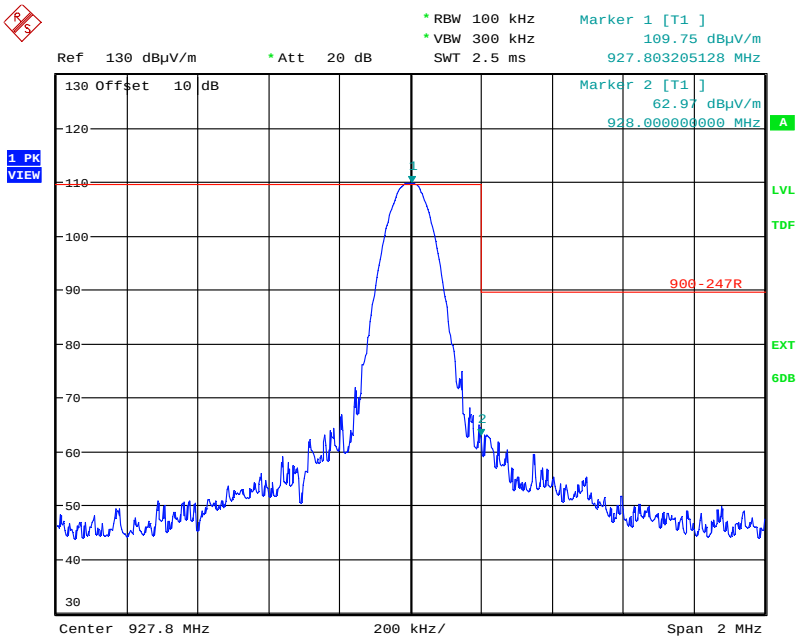



Date: 7.AUG.2025 20:19:07

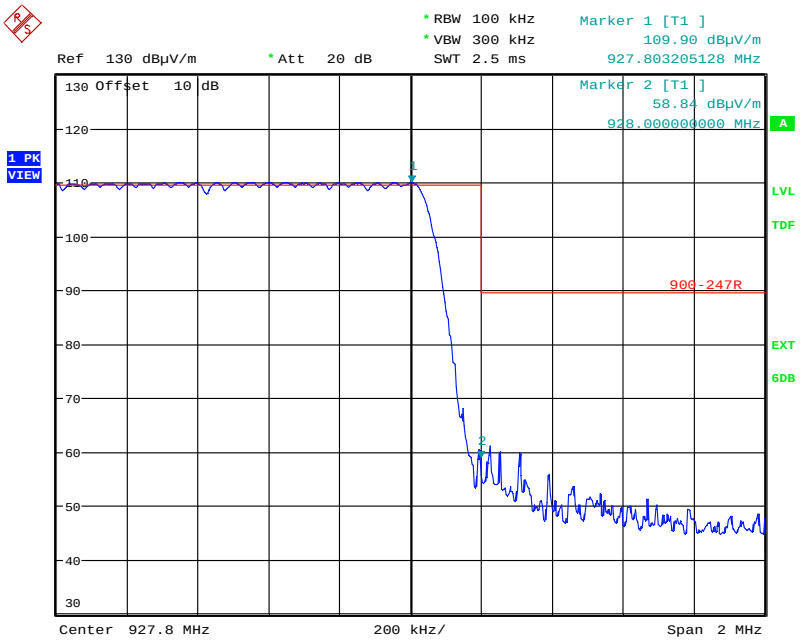



Date: 7.AUG.2025 20:20:41

## Horizontal

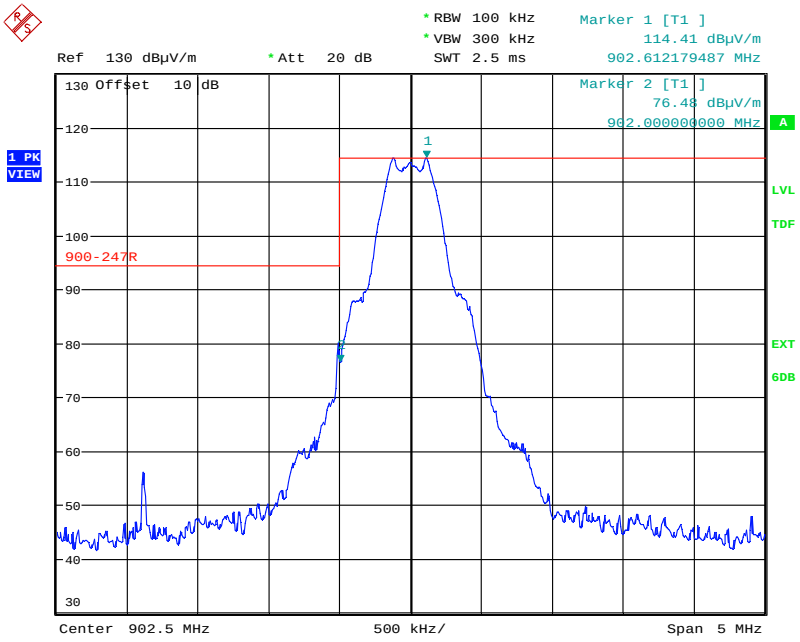



Date: 7.AUG.2025 20:14:46

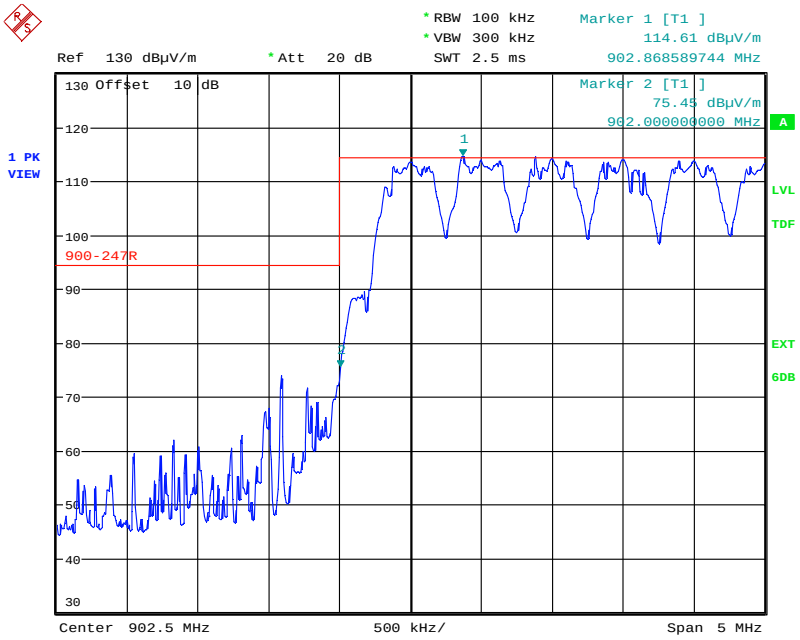



Date: 7.AUG.2025 20:16:27

Configuration: ALTA HSM (Single and Hopping Modes)
902.5MHz
Vertical

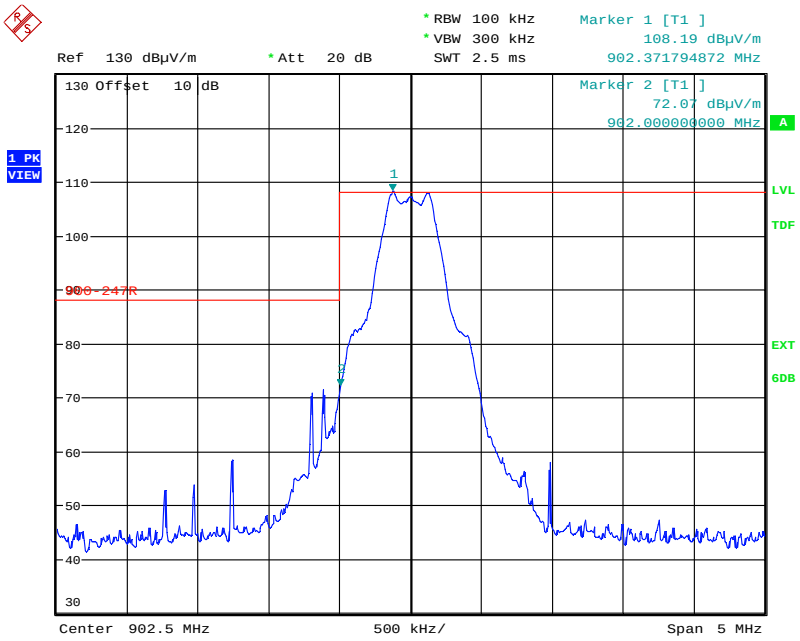



Date: 7.AUG.2025 20:23:48




Date: 7.AUG.2025 20:25:39

## Horizontal

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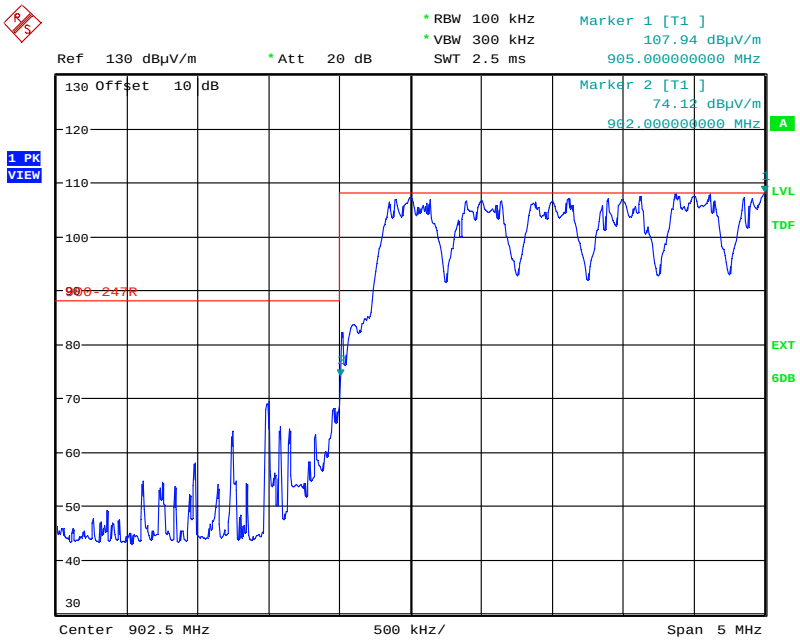
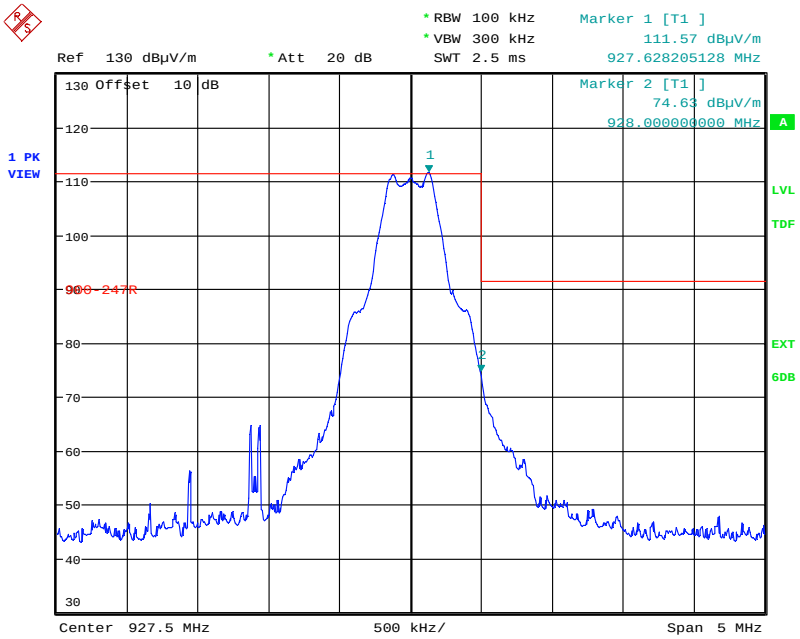
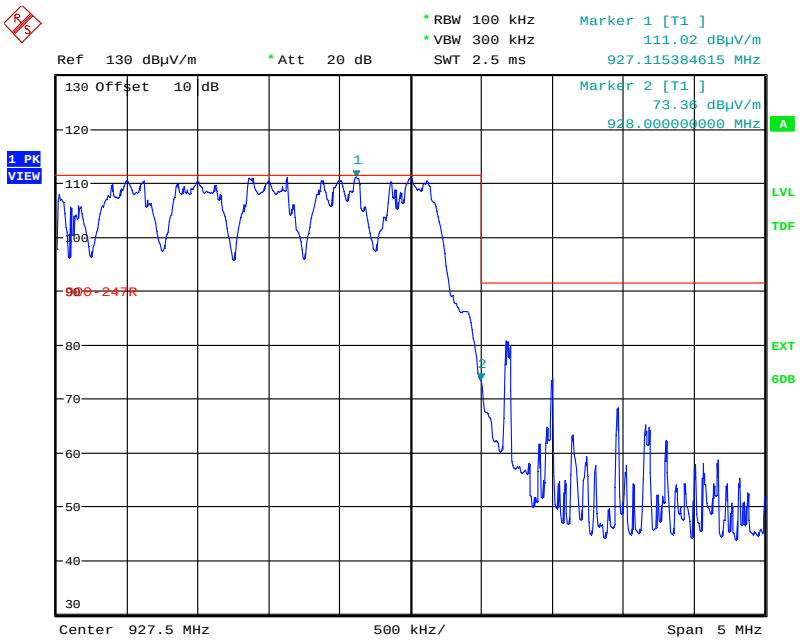



Date: 7.AUG.2025 20:30:55

927.5MHz
Vertical

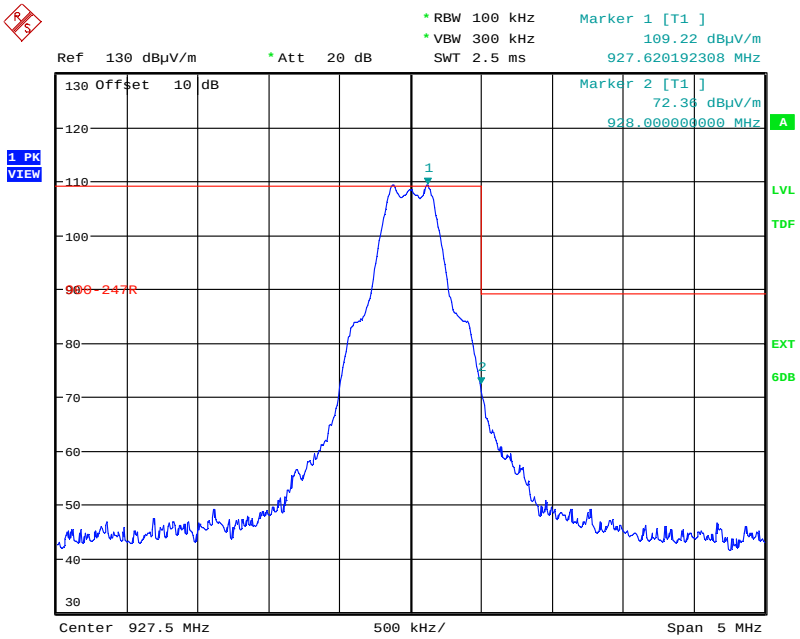



Date: 7.AUG.2025 20:39:16




Date: 7.AUG.2025 20:42:08

## Horizontal

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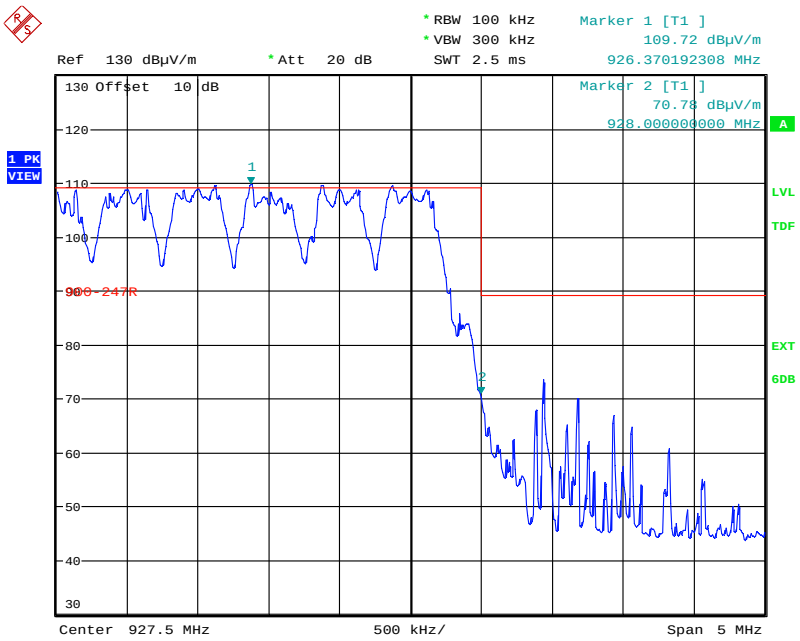


Date: 7.AUG.2025 20:36:17

## 5.7. RF EXPOSURE REQUIRMENTS [§§ 15.247(i), 1.1310 & 2.1091]

The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation.

**FCC 47 CFR § 1.1310:**

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density ($mW/cm^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| **(A) Limits for Occupational/Controlled Exposures** | | | | |
| 0.3–3.0 | 614 | 1.63 | *(100) | 6 |
| 3.0–30 | 1842/f | 4.89/f | *($900/f^2$) | 6 |
| 30–300 | 61.4 | 0.163 | 1.0 | 6 |
| 300–1500 | ..... | ..... | f/300 | 6 |
| 1500–100,000 | ..... | ..... | 5 | 6 |
| **(B) Limits for General Population/Uncontrolled Exposure** | | | | |
| 0.3–1.34 | 614 | 1.63 | *(100) | 30 |
| 1.34–30 | 824/f | 2.19/f | *($180/f^2$) | 30 |
| 30–300 | 27.5 | 0.073 | 0.2 | 30 |
| 300–1500 | ..... | ..... | f/1500 | 30 |
| 1500–100,000 | ..... | ..... | 1.0 | 30 |

f = frequency in MHz
* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

### 5.7.1. Method of Measurements

Refer to Sections 1.1310, 2.1091

In order to demonstrate compliance with MPE requirements (see Section 2.1091), the following information is typically needed:

(1) Calculation that estimates the minimum separation distance (20 cm or more) between an antenna and persons required to satisfy power density limits defined for free space.
(2) Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement
(3) Any caution statements and/or warning labels that are necessary in order to comply with the exposure limits
(4) Any other RF exposure related issues that may affect MPE compliance

**Calculation Method of RF Safety Distance**:

$$S = \frac{P \cdot G}{4 \cdot \pi \cdot r^2} = \frac{EIRP}{4 \cdot \pi \cdot r^2}$$

Where: P: power input to the antenna in mW
EIRP: Equivalent (effective) isotropic radiated power
S: power density mW/cm$^2$
G: numeric gain of antenna relative to isotropic radiator
r: distance to centre of radiation in cm

### 5.7.2. RF Evaluation

| Evaluation of RF Exposure Compliance Requirements | |
|---|---|
| **RF Exposure Requirements** | **Compliance with FCC Rules** |
| Minimum calculated separation distance between antenna and persons required: ***2.2 cm** | Manufacturer' instruction for separation distance between antenna and persons required**: 20 cm** |
| Caution statements and/or warning labels that are necessary in order to comply with the exposure limits | Refer to User's Manual for RF Exposure Information. |
| Any other RF exposure related issues that may affect MPE compliance | None. |

*The minimum separation distance between the antenna and bodies of users are calculated using the following formula:

**RF EXPOSURE DISTANCE LIMITS**

$$r = \sqrt{\frac{P \cdot G}{4 \cdot \pi \cdot S}} = \sqrt{\frac{EIRP}{4 \cdot \pi \cdot S}}$$

S = f/1500 = 902/1500 = 0.6 mW/cm$^2$
EIRP = 13.4+2.15=15.55 dBm = $10^{15.55/10}$ mW = 36mW (Worst Case)

**(Minimum Safe Distance, r)** = $\sqrt{\frac{EIRP}{4 \cdot \pi \cdot S}} = \sqrt{\frac{36}{4 \cdot \pi \cdot (0.6)}} \approx 2.2cm$

## EXHIBIT 6. MEASUREMENT UNCERTAINTY

| Test Description | Expanded Uncertainty, K=2 for 95% Confidence Level |
|---|---|
| Power Line Conducted Emissions | ± 2.62 dB |
| Occupied Bandwidth | ±0.20 Hz |
| Conducted Output Power | ±0.62 dB |
| Transmitter Spurious Radiated Emissions | ±4.20 dB (30 MHz – 1 GHz) |
| | ±2.70 dB (1 – 18 GHz) |
| Transmitter Radiated Band-edge Emissions | ±2.76dB |