# FCC RF Test Report

| | | |
|---|---|---|
| APPLICANT | : | Casa Systems, Inc. |
| EQUIPMENT | : | 5G Enterprise Small Cell |
| BRAND NAME | : | Casa Systems |
| MODEL NAME | : | 5G2105-48 |
| FCC ID | : | 2AO385G2105-48 |
| STANDARD | : | 47 CFR Part 2, 27 Subpart O (3700-3980MHz) |
| CLASSIFICATION | : | Licensed Non-Broadcast Station Transmitter (TNB) |
| TEST DATE(S) | : | Jan. 25, 2024 ~ Jan 29, 2024 |

**We, Sporton International Inc. (KunShan), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.**

**The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (KunShan), the test report shall not be reproduced except in full.**

Jason Jia

**Approved by: Jason Jia**

ACCREDITED Cert #5145.02

***Sporton International Inc. (Kunshan)***
***No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300***
***People's Republic of China***

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# REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| FG410208B | Rev. 01 | Initial issue of report | Feb. 22, 2024 |
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# SUMMARY OF TEST RESULT

| Report Section | FCC Rule | Description | Limit | Result | Remark |
|---|---|---|---|---|---|
| 3.4 | §2.1046 | Conducted Output Power | Reporting Only | PASS | - |
| | §27.50(j)(2) | Equivalent Isotropic Radiated Power | EIRP < 1640Watt | | |
| 3.5 | §27.50(j)(4) | Peak-to-Average Ratio | <13 dB | PASS | - |
| 3.6 | §2.1049 | Occupied Bandwidth | Reporting Only | PASS | - |
| 3.7 | §2.1051<br>§27.53(l)(1) | Conducted Band Edge Measurement | < 43+10log10(P[Watts]) | PASS | - |
| 3.8 | §2.1051<br>§27.53(l)(1) | Conducted Spurious Emission | < 43+10log10(P[Watts]) | PASS | - |
| 3.9 | §27.54 | Frequency Stability<br>Temperature & Voltage | Within Authorized Band | PASS | - |
| 4.4 | §2.1053<br>§27.53(l)(1) | Radiated Spurious Emission | < $43+10\log_{10}$(P[Watts]) | PASS | Under limit 15.97 dB at 7679.000 MHz |

**Conformity Assessment Condition:**

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”

**Disclaimer:**

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

# 1 General Description

## 1.1 Applicant

**Casa Systems, Inc**.
100 Old River Road Andover MA 01810 USA

## 1.2 Manufacturer

**Casa Systems, Inc.**
100 Old River Road Andover MA 01810 USA

## 1.3 Product Feature of Equipment Under Test

| Product Feature | |
|---|---|
| **Equipment** | 5G Enterprise Small Cell |
| **Brand Name** | Casa Systems |
| **Model Name** | 5G2105-48 |
| **FCC ID** | 2AO385G2105-48 |
| **HW Version** | V03 |
| **SW Version** | FR4.7 |
| **EUT Stage** | Production Unit |

## 1.4 Product Specification of Equipment Under Test

| Standards-related Product Specification | |
|---|---|
| **Tx/Rx Frequency** | 5G NR n77: 3700 MHz ~ 3980 MHz |
| **SCS** | 30kHz |
| **Bandwidth** | n77: 40 / 60 / 80 / 100MHz |
| **EN-DC** | 4A_n77A, 66A_n77A |
| **Maximum Output Power** | MIMO <Internal Ant.3+4>: 29.89 dBm<br>MIMO <External Ant.3+4>: 30.02 dBm |
| **Antenna Gain** | **External Ant. 3:**<br>n77 : 8.0 dBi<br>**External Ant. 4:**<br>n77 : 8.0 dBi<br>**Internal Ant. 3:**<br>n77 : 6.18 dBi<br>**Internal Ant. 4:**<br>n77 : 6.22 dBi |
| **Type of Modulation** | CP-OFDM: QPSK / 16QAM / 64QAM / 256QAM |

**Remark:**

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The maximum EIRP is calculated from max output power and max antenna gain, only the maximum EIRP is shown in the report, 5G NR n77 for External Antenna is shown on the report for MIMO

mode.

3. 5GNR Tx is non-signaling mode (Control tool ”QRCT”).
4. The base station only support 5GNR full RB.
5. For SISO & MIMO mode, the testing has assessed only MIMO mode by referring to the higher output power. The MIMO mode is completely uncorrelated, so the directional gain is selected the maximum gain among all antennas.
6. For Internal & External Antenna, they are the same transmitter, thus Conducted items only test External antenna port by referring to higher output power, and RSE test both Internal & External Antenna.
7. The Internal Antenna and External Antenna support manual switch, the Internal & External antenna can’t work at the same time, thus MIMO mode only support MIMO <Internal Ant.3+4> or MIMO <External Ant.3+4>, not support MIMO <Internal Ant.3/4 + External Ant.3/4>.
8. The EUT supports SA and NSA, RSE execution FTM Mode.
9. The device supports Power class 3 and HPUE (power class 2) under SISO mode and HPUE (power class 1.5) under UL MIMO mode for 5G NR n77, so HPUE (power class 1.5) has been performed according to the maximum power.

## 1.5 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.6 Maximum EIRP and Emission Designator

| 5G NR n77 UL MIMO for SCS 30kHz | | QPSK | | 16QAM / 64QAM / 256QAM | |
|---|---|---|---|---|---|
| **BW (MHz)** | **Frequency Range (MHz)** | **Maximum EIRP(W)** | **Emission Designator (99%OBW)** | **Maximum EIRP(W)** | **Emission Designator (99%OBW)** |
| **40** | 3720.00 ~ 3960.00 | 5.8028 | 38M2G7D | 6.3368 | 38M2W7D |
| **60** | 3730.02 ~ 3949.98 | 5.4886 | 58M5G7D | 5.5770 | 59M1W7D |
| **80** | 3740.01 ~ 3939.99 | 5.6478 | 78M2G7D | 5.5295 | 78M5W7D |
| **100** | 3750.00 ~ 3930.00 | 5.5827 | 98M1G7D | 5.8422 | 97M9W7D |

Note: All modulations have been tested, and only the worst test results of PSK & QAM are shown in the report.

## 1.7 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

| | | | |
|---|---|---|---|
| **Test Firm** | Sporton International Inc. (Kunshan) | | |
| **Test Site Location** | No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China<br>TEL : +86-512-57900158 | | |
| **Test Site No.** | **Sporton Site No.** | **FCC Designation No.** | **FCC Test Firm Registration No.** |
| | 03CH04-KS<br>TH01-KS | CN1257 | 314309 |

## 1.8 Test Software

| Item | Site | Manufacture | Name | Version |
|---|---|---|---|---|
| 1. | TH01-KS | SPORTON | FCC LTE_Ver2.0 Auto_china_210503 | 2.0 |
| 2. | 03CH04-KS | AUDIX | E3 | 210616 |

## 1.9 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2, 27
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.

# 2 Test Configuration of Equipment Under Test

## 2.1 Test Mode

Antenna port conducted and radiated test items are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

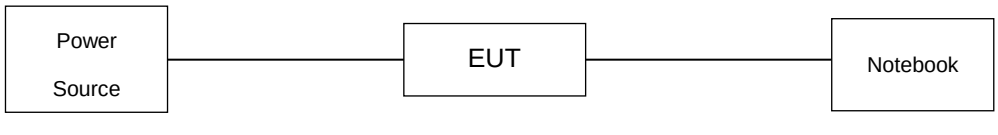
For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.

| | X Plane | Y Plane | Z Plane |
|---|---|---|---|
| Orthogonal Planes of EUT |  |  |  |

| Test Items | 5G NR | Bandwidth (MHz) | | | | Modulation | | | | | RB # | | | Test Channel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 40 | 60 | 80 | 100 | PI/2 BPSK | QPSK | 16QAM | 64QAM | 256 QAM | 1 | Partial | Full | L | M | H |
| Max. Output Power | n77 | v | v | v | v | - | v | v | v | v | - | - | v | v | v | v |
| Peak-to-Average Ratio | n77 | v | | | | - | v | v | | | - | - | v | | v | |
| 26dB and 99% Bandwidth | n77 | v | v | v | v | - | v | v | v | v | - | - | v | v | v | v |
| Conducted Band Edge | n77 | v | v | v | v | - | v | v | v | v | - | - | v | v | | v |
| Conducted Spurious Emission | n77 | v | v | v | v | - | v | v | v | v | - | - | | v | v | v |
| Frequency Stability | n77 | v | | | | - | v | | | | - | - | v | | v | |
| E.I.R.P | n77 | v | v | v | v | - | v | v | v | v | - | - | v | v | v | v |
| Radiated Spurious Emission | n77 | Worst Case | | | | | | | | | | | | | v | |
| Note | 1. The mark "**v** " means that this configuration is chosen for testing<br>2. The mark "-" means that this bandwidth is not supported.<br>3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.<br>4. Frequency Stability : Normal Voltage = 12V; Low Voltage =11.4V; High Voltage =12.6V. | | | | | | | | | | | | | | | |

## 2.2 Connection Diagram of Test System




This example is connection diagram of EUT test configurations.

. For detail, please refer to test mode configuration and setup photographs for each test item.

## 2.3 Support Unit used in test configuration and system

| Item | Equipment | Trade Name | Model No. | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|
| 1. | Power Supply | GWINSTEK | PSS-2002 | N/A | N/A | Unshielded, 1.8 m |
| 2. | Notebook | Lenovo | G480 | QDS-BRCM1050I | N/A | Unshielded AC I/P cable 1.8m |
| 3. | POE Adapter | N/A | N/A | N/A | N/A | N/A |

## 2.4 Measurement Results Explanation Example

**For all conducted test items:**

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 6.2 dB and 10dB attenuator.

Example :

*Offset(dB) = RF cable loss(dB) + attenuator factor(dB).*

= 6.2 + 10 = 16.2 (dB)

## 2.5 Frequency List of Low/Middle/High Channels

| 5G n77 (30kHz) Channel and Frequency List | | | | |
|---|---|---|---|---|
| **BW [MHz]** | **Channel/Frequency(MHz)** | **Lowest** | **Middle** | **Highest** |
| 100 | Channel | 650000 | 656000 | 662000 |
| | Frequency | 3750 | 3840 | 3930 |
| 80 | Channel | 649334 | 656000 | 662666 |
| | Frequency | 3740.01 | 3840 | 3939.99 |
| 60 | Channel | 648668 | 656000 | 663332 |
| | Frequency | 3730.02 | 3840 | 3949.98 |
| 40 | Channel | 648000 | 656000 | 664000 |
| | Frequency | 3720 | 3840 | 3960 |

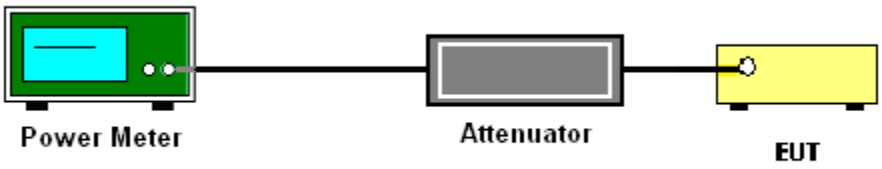
# 3 Conducted Test Items

## 3.1 Measuring Instruments

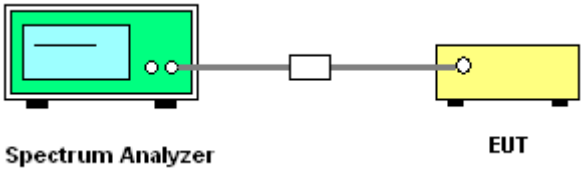
See list of measuring instruments of this test report.

## 3.2 Test Setup

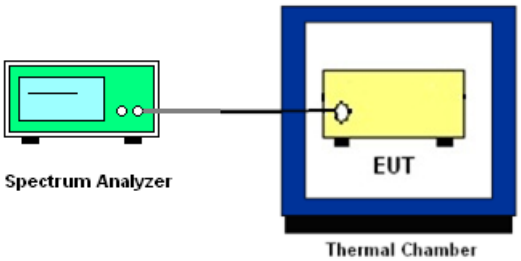
### 3.2.1 Conducted Output Power




### 3.2.2 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge and Conducted Spurious Emission




### 3.2.3 Frequency Stability




## 3.3 Test Result of Conducted Test

Please refer to Appendix A.

## 3.4 Conducted Output Power and EIRP

### 3.4.1 Description of the Conducted Output Power Measurement and EIRP Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The power of each fixed or base station transmitting in the 3700–3980 MHz band and situated in any geographic location is limited to an EIRP of 1640 Watts/MHz.

According to KDB 412172 D01 Power Approach,

EIRP = $P_T + G_T – L_C$, ERP = EIRP -2.15, where

$P_T$ = transmitter output power in dBm

$G_T$ = gain of the transmitting antenna in dBi

$L_C$ = signal attenuation in the connecting cable between the transmitter and antenna in dB

### 3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the power meter.
3. Set EUT at maximum power.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the power meter.

## 3.5 Peak-to-Average Ratio

### 3.5.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 3.5.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2.6 (PAPR).
2. The EUT was connected to spectrum analyzer.
3. Set EUT in maximum power output.
4. Set the RBW = 1MHz, VBW = 3MHz, Detector = Peak, Trace mode = max hold, Set span ≥ 2 × OBW in spectrum analyzer.
5. Set the RBW = 1MHz, VBW = 3MHz, Detector = power averaging, Trace mode = max hold, Set span ≥ 2 × OBW in spectrum analyzer.
6. Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission.
7. PAPR (dB) = $P_{Pk}$ (dBm) − $P_{Avg}$ (dBm)

   where

   PAPR peak-to-average power ratio, in dB

   $P_{Pk}$ measured peak power level, in dBm

   $P_{Avg}$ measured average power level, in dBm
8. Record the deviation as Peak to Average Ratio.

# 3.6 Occupied Bandwidth

## 3.6.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

## 3.6.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.4
2. The EUT was connected to spectrum analyzer.
3. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
4. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
5. Set the detection mode to peak, and the trace mode to max hold.
6. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace. (this is the reference value)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “–X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

# 3.7 Conducted Band Edge

## 3.7.1 Description of Conducted Band Edge Measurement

27.53(l)(1)

For base station operations in the 3700–3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz. Compliance with this paragraph is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

## 3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used or a narrower RBW was used (generally limited to no less than 1% of the OBW) and the measured power was integrated over the full required measurement bandwidth.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.
   Example:
   The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
   = P(W)- [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB) = -13dBm.
9. When using the integration method, the starting frequency of the integration shall be centered at one-half of the RBW away from the band edge.

# 3.8 Conducted Spurious Emission

## 3.8.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10$^{th}$ harmonic.

## 3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

# 3.9 Frequency Stability

## 3.9.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block.

## 3.9.2 Test Procedures for Temperature Variation

1. The testing follows ANSI C63.26 section 5.6.4
2. The EUT was set up in the thermal chamber and connected with the spectrum analyzer.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

## 3.9.3 Test Procedures for Voltage Variation

1. The testing follows ANSI C63.26 section 5.6.5
2. The EUT was placed in a temperature chamber at 20±5°C and connected with the spectrum analyzer.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value for other than hand carried battery equipment.
4. For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.
5. The variation in frequency was measured for the worst case.

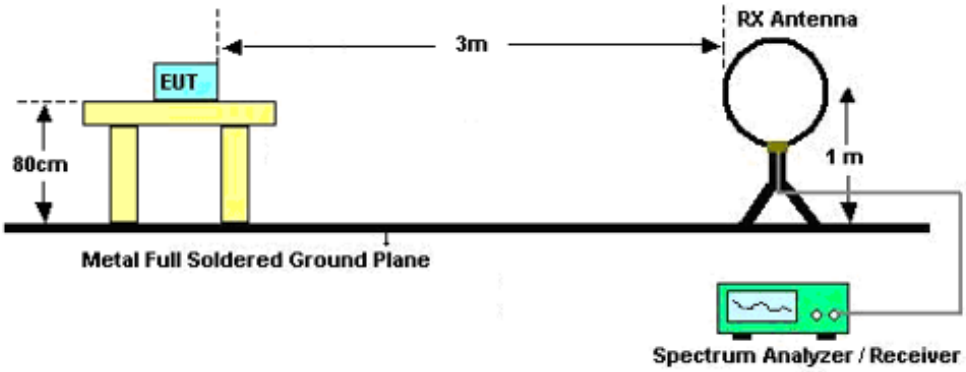
# 4 Radiated Test Items

## 4.1 Measuring Instruments

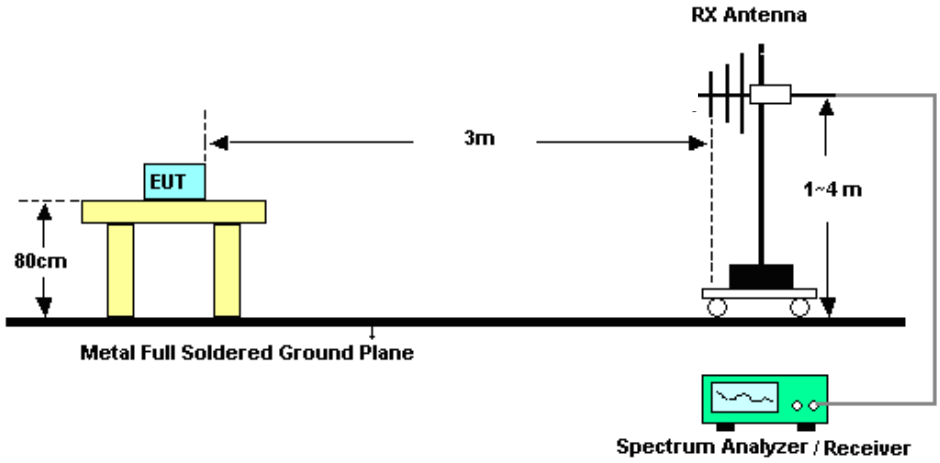
See list of measuring instruments of this test report.

## 4.2 Test Setup

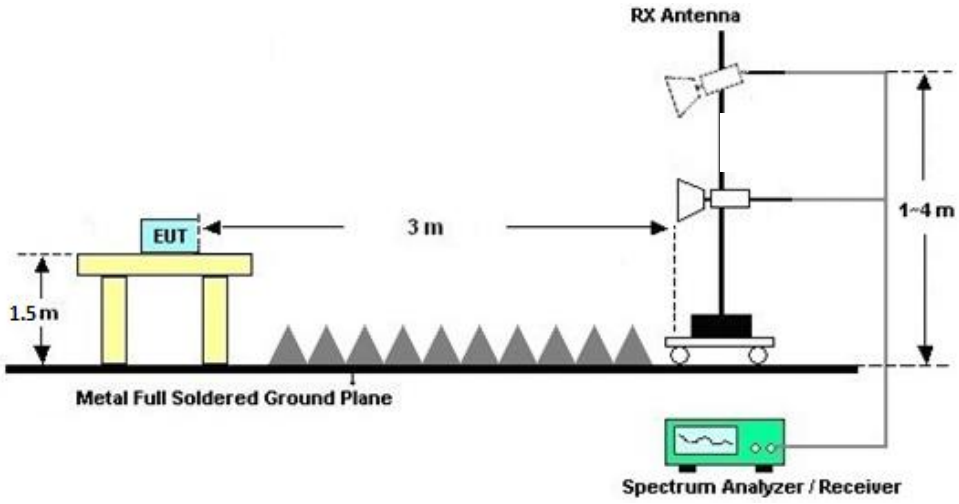
### 4.2.1 For radiated test below 30MHz




### 4.2.2 For radiated test from 30MHz to 1GHz



### 4.2.3 For radiated test above 1GHz




## 4.3 Test Result of Radiated Test

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

Please refer to Appendix B.

# 4.4 Radiated Spurious Emission

## 4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

## 4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
11. ERP (dBm) = EIRP - 2.15
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
    = P(W)- [43 + 10log(P)] (dB)
    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
    = -13dBm.

# 5 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Spectrum Analyzer | R&S | FSV40 | 101040 | 10Hz~40GHz | Oct. 11, 2023 | Jan. 25, 2024~ Jan. 29, 2024 | Oct. 10, 2024 | Conducted (TH01-KS) |
| Power Meter | Anritsu | ML2495A | 1435004 | 50MHz Bandwidth | Jan. 02, 2024 | Jan. 25, 2024~ Jan. 29, 2024 | Jan. 01, 2025 | Conducted (TH01-KS) |
| Temperature &humidity chamber | Hongzhan | LP-150U | H2014011440 | -40~+150°C 20%~95%RH | Jul. 06, 2023 | Jan. 25, 2024~ Jan. 29, 2024 | Jul. 05, 2024 | Conducted (TH01-KS) |
| EXA Spectrum Analyzer | Keysight | N9010B | MY57471079 | 10Hz-44G,MAX 30dB | Oct. 10, 2023 | Jan. 26, 2024 | Oct. 09, 2024 | Radiation (03CH04-KS) |
| Loop Antenna | R&S | HFH2-Z2E | 101125 | 9kHz~30MHz | Sep. 11 2023 | Jan. 26, 2024 | Sep. 10, 2024 | Radiation (03CH04-KS) |
| Bilog Antenna | TeseQ | CBL6111D | 49922 | 30MHz-1GHz | Apr. 09, 2023 | Jan. 26, 2024 | Apr. 08, 2024 | Radiation (03CH04-KS) |
| Horn Antenna | Schwarzbeck | BBHA9120D | 1284 | 1GHz~18GHz | Oct. 10, 2023 | Jan. 26, 2024 | Oct. 09, 2024 | Radiation (03CH04-KS) |
| SHF-EHF Horn | Com-power | AH-840 | 101070 | 18GHz~40GHz | Jan. 05, 2024 | Jan. 26, 2024 | Jan. 04, 2025 | Radiation (03CH04-KS) |
| Amplifier | SONOMA | 310N | 380827 | 9KHz-1GHz | Jul 06, 2023 | Jan. 26, 2024 | Jul 05, 2024 | Radiation (03CH04-KS) |
| Amplifier | MITEQ | EM18G40GGA | 060728 | 18~40GHz | Jan. 05, 2024 | Jan. 26, 2024 | Jan. 04, 2025 | Radiation (03CH04-KS) |
| high gain Amplifier | EM | EM01G18GA | 060840 | 1Ghz-18Ghz | Oct. 10, 2023 | Jan. 26, 2024 | Oct. 09, 2024 | Radiation (03CH04-KS) |
| Amplifier | Agilent | 8449B | 3008A02370 | 1Ghz-18Ghz | Oct. 10, 2023 | Jan. 26, 2024 | Oct. 09, 2024 | Radiation (03CH04-KS) |
| AC Power Source | Chroma | 61601 | F104090004 | N/A | NCR | Jan. 26, 2024 | NCR | Radiation (03CH04-KS) |
| Turn Table | ChamPro | EM 1000-T | 060762-T | 0~360 degree | NCR | Jan. 26, 2024 | NCR | Radiation (03CH04-KS) |
| Antenna Mast | ChamPro | EM 1000-A | 060762-A | 1 m~4 m | NCR | Jan. 26, 2024 | NCR | Radiation (03CH04-KS) |

NCR: No Calibration Required

# 6 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

**Uncertainty of Conducted Measurement**

| | |
|---|---|
| **Conducted Spurious Emission & Bandedge** | **±2.26 dB** |
| **Occupied Channel Bandwidth** | **±0.1%** |
| **Conducted Power** | **±0.46 dB** |
| **Peak to Average Ratio** | **±0.46 dB** |
| **Frequency Stability** | **±0.4 Hz** |

**Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **3.82dB** |

**Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **3.56dB** |

**Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **3.54dB** |

**---------- THE END ----------**

# Appendix A. Test Results of Conducted Test

| Test Engineer : | Simle Wang | Temperature : | 22~23℃ |
|---|---|---|---|
| | | Relative Humidity : | 40~42% |

## Conducted Output Power(Average power) and EIRP

**MIMO External Antenna <Ant 3+4>:**

| 5G NR n77 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ant. | BW | Type of Modulation | Channel | Frequency MHz | Power (dBm) | Gain (dB) | EIRP (W) |
| 3+4 | 40M | QPSK | 648000 | 3720 | 29.58 | 8 | 5.7262 |
| | | QPSK | 656000 | 3840 | 29.22 | 8 | 5.2762 |
| | | QPSK | 664000 | 3960 | 29.64 | 8 | 5.8028 |
| | 60M | QPSK | 648668 | 3730.02 | 29.39 | 8 | 5.4886 |
| | | QPSK | 656000 | 3840 | 29.06 | 8 | 5.0779 |
| | | QPSK | 663332 | 3949.98 | 29.33 | 8 | 5.4083 |
| | 80M | QPSK | 649334 | 3740.01 | 29.23 | 8 | 5.2898 |
| | | QPSK | 656000 | 3840 | 29.03 | 8 | 5.0458 |
| | | QPSK | 662666 | 3939.99 | 29.52 | 8 | 5.6478 |
| | 100M | QPSK | 650000 | 3750 | 29.18 | 8 | 5.2263 |
| | | QPSK | 656000 | 3840 | 29.13 | 8 | 5.1696 |
| | | QPSK | 662000 | 3930 | 29.47 | 8 | 5.5827 |
| | 40M | 16QAM | 648000 | 3720 | 29.39 | 8 | 5.4770 |
| | | 16QAM | 656000 | 3840 | 29.55 | 8 | 5.6837 |
| | | 16QAM | 664000 | 3960 | 30.02 | 8 | 6.3368 |
| | 60M | 16QAM | 648668 | 3730.02 | 28.99 | 8 | 4.9995 |
| | | 16QAM | 656000 | 3840 | 29.22 | 8 | 5.2747 |
| | | 16QAM | 663332 | 3949.98 | 29.46 | 8 | 5.5770 |
| | 80M | 16QAM | 649334 | 3740.01 | 29.24 | 8 | 5.2936 |
| | | 16QAM | 656000 | 3840 | 29.07 | 8 | 5.0937 |
| | | 16QAM | 662666 | 3939.99 | 29.41 | 8 | 5.5066 |
| | 100M | 16QAM | 650000 | 3750 | 29.32 | 8 | 5.3893 |
| | | 16QAM | 656000 | 3840 | 29.31 | 8 | 5.3788 |
| | | 16QAM | 662000 | 3930 | 29.48 | 8 | 5.6039 |
| | 40M | 64QAM | 648000 | 3720 | 29.52 | 8 | 5.6507 |
| | | 64QAM | 656000 | 3840 | 29.49 | 8 | 5.6067 |
| | | 64QAM | 664000 | 3960 | 29.94 | 8 | 6.2168 |
| | 60M | 64QAM | 648668 | 3730.02 | 29.02 | 8 | 5.0297 |
| | | 64QAM | 656000 | 3840 | 29.06 | 8 | 5.0762 |
| | | 64QAM | 663332 | 3949.98 | 29.45 | 8 | 5.5531 |
| | 80M | 64QAM | 649334 | 3740.01 | 29.27 | 8 | 5.3294 |
| | | 64QAM | 656000 | 3840 | 29.17 | 8 | 5.2124 |

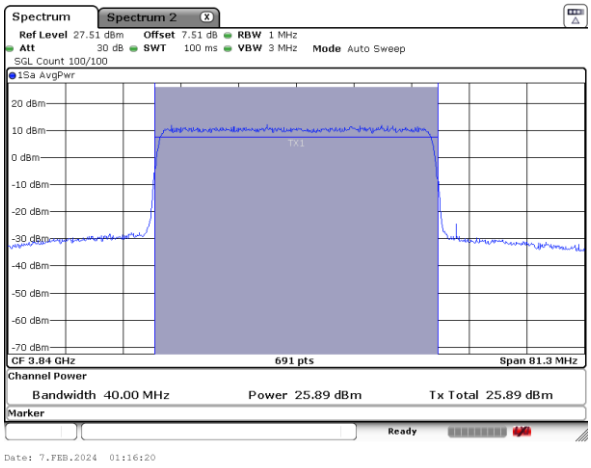
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 64QAM | 662666 | 3939.99 | 29.43 | 8 | 5.5295 |
| | 100M | 64QAM | 650000 | 3750 | 29.35 | 8 | 5.4327 |
| | | 64QAM | 656000 | 3840 | 29.24 | 8 | 5.2977 |
| | | 64QAM | 662000 | 3930 | 29.67 | 8 | 5.8422 |
| | 40M | 256QAM | 648000 | 3720 | 29.55 | 8 | 5.6911 |
| | | 256QAM | 656000 | 3840 | 29.47 | 8 | 5.5863 |
| | | 256QAM | 664000 | 3960 | 29.75 | 8 | 5.9622 |
| | 60M | 256QAM | 648668 | 3730.02 | 28.96 | 8 | 4.9606 |
| | | 256QAM | 656000 | 3840 | 29.16 | 8 | 5.2017 |
| | | 256QAM | 663332 | 3949.98 | 29.37 | 8 | 5.4533 |
| | 80M | 256QAM | 649334 | 3740.01 | 29.10 | 8 | 5.1263 |
| | | 256QAM | 656000 | 3840 | 29.13 | 8 | 5.1672 |
| | | 256QAM | 662666 | 3939.99 | 29.28 | 8 | 5.3464 |
| | 100M | 256QAM | 650000 | 3750 | 29.39 | 8 | 5.4869 |
| | | 256QAM | 656000 | 3840 | 29.36 | 8 | 5.4458 |
| | | 256QAM | 662000 | 3930 | 29.26 | 8 | 5.3251 |

# FR1 n77 External Antenna

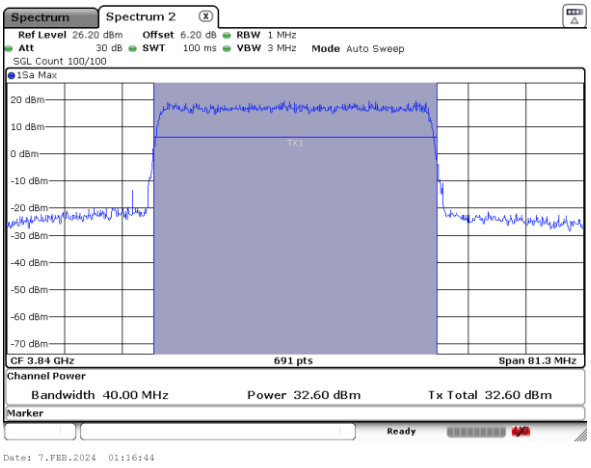
## Peak-to-Average Ratio

| Mode | FR1 n77 / 40MHz / CP OFDM/ANT3 | | |
|---|---|---|---|
| Mod. | 40M | | Limit: 13dB |
| RB Size | QPSK | 16QAM | Result |
| Middle CH | 6.71 | 6.78 | PASS |
| Mode | FR1 n77 / 40MHz / CP OFDM/ANT4 | | |
| Mod. | 40M | | Limit: 13dB |
| RB Size | QPSK | 16QAM | Result |
| Middle CH | 6.91 | 6.61 | PASS |

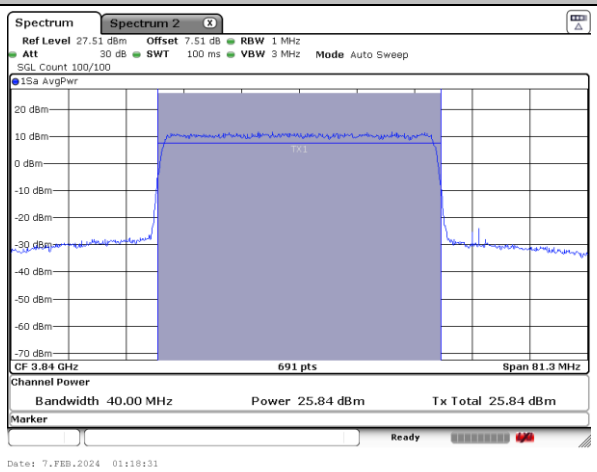
**QPSK-A/ANT3**



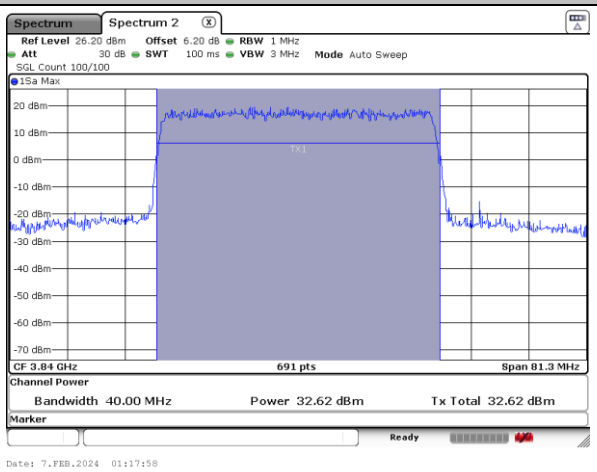

**QPSK-P/ANT3**

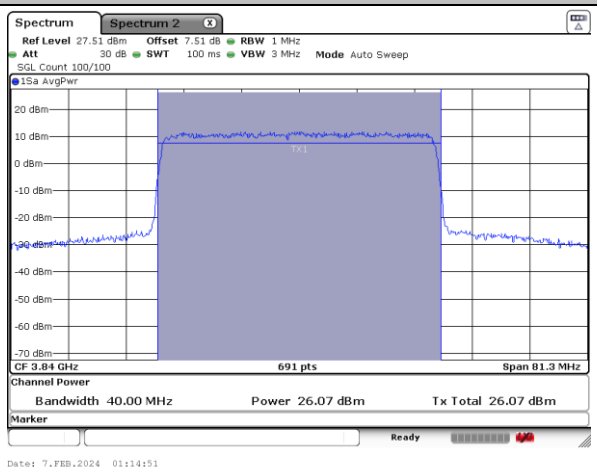
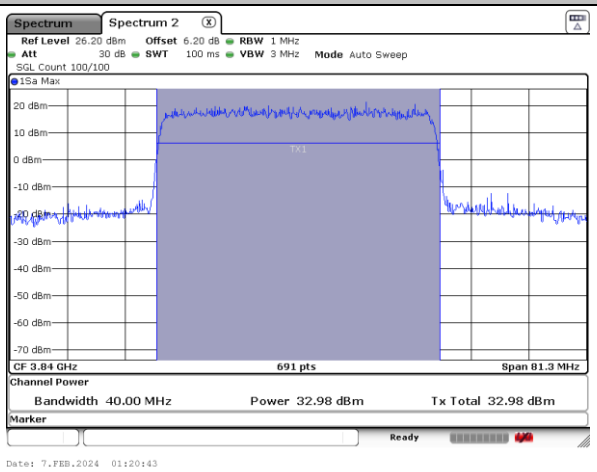
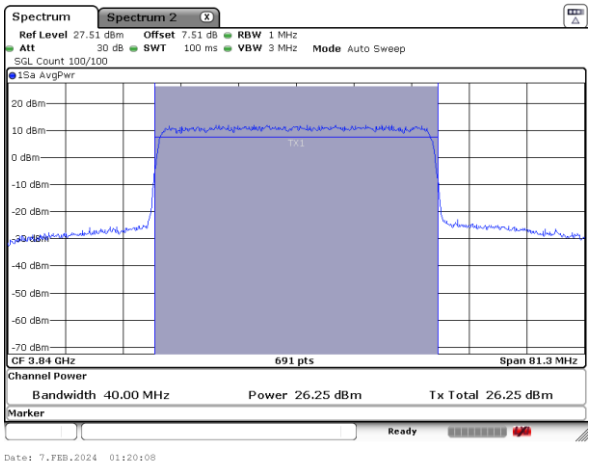
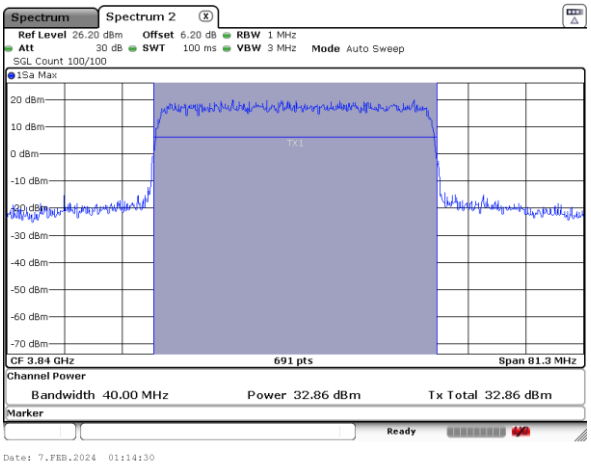



**16QAM-A/ANT3**




**16QAM-P/ANT3**



| QPSK-A/ANT4 | QPSK-P/ANT4 |
|---|---|
|  |  |
| **16QAM-A/ANT4** | **16QAM-P/ANT4** |
|  |  |

# 26DB Bandwidth

| Mode | FR1 n77 : 26dB BW(MHz) / CP | | | |
|---|---|---|---|---|
| ANT. | Ant3 | | | |
| BW | 40MHz | 40MHz | 40MHz | 40MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 40.36 | 40.60 | 40.60 | 40.20 |
| Middle CH | 40.28 | 40.20 | 40.36 | 40.36 |
| Highest CH | 40.52 | 40.36 | 40.36 | 40.52 |

| Mode | FR1 n77 : 26dB BW(MHz) / CP | | | |
|---|---|---|---|---|
| ANT. | Ant4 | | | |
| BW | 40MHz | 40MHz | 40MHz | 40MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 40.52 | 40.36 | 40.28 | 40.36 |
| Middle CH | 40.36 | 40.2 | 40.28 | 40.36 |
| Highest CH | 40.52 | 40.36 | 40.28 | 40.36 |

| Mode | FR1 n77 : 26dB BW(MHz) / CP | | | |
|---|---|---|---|---|
| ANT. | Ant3 | | | |
| BW | 60MHz | 60MHz | 60MHz | 60MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 62.46 | 62.46 | 62.46 | 62.58 |
| Middle CH | 62.34 | 62.82 | 62.7 | 62.7 |
| Highest CH | 62.46 | 62.7 | 62.82 | 62.22 |

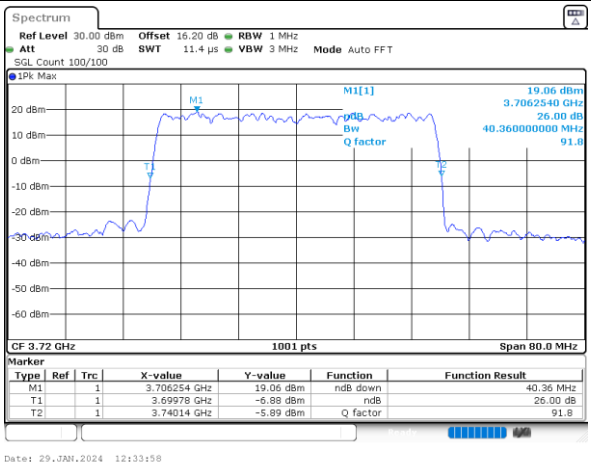
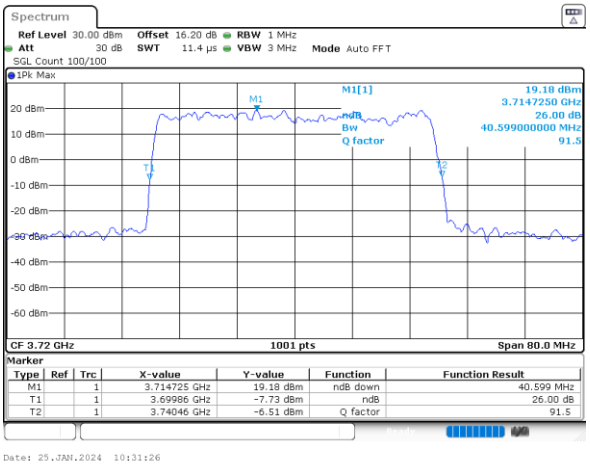
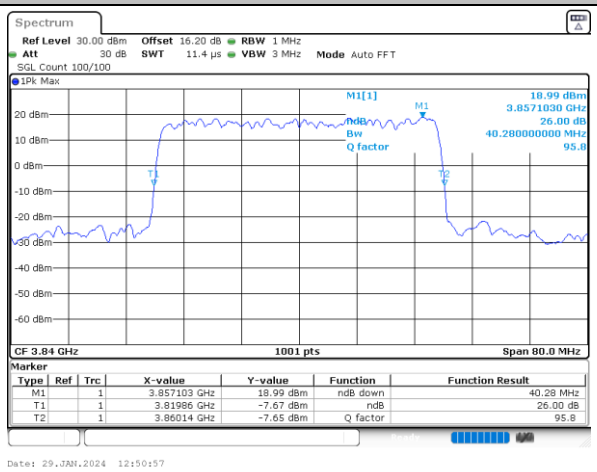
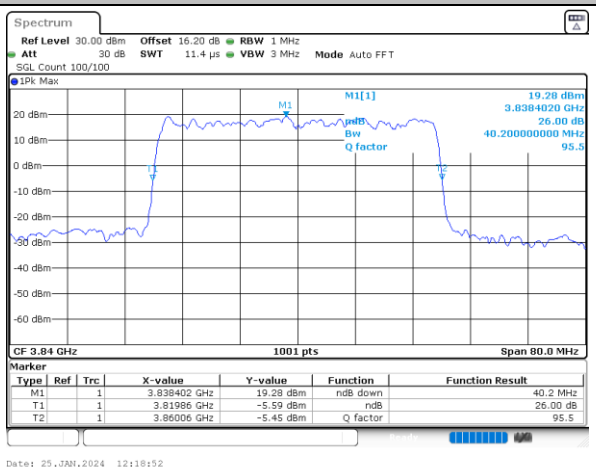
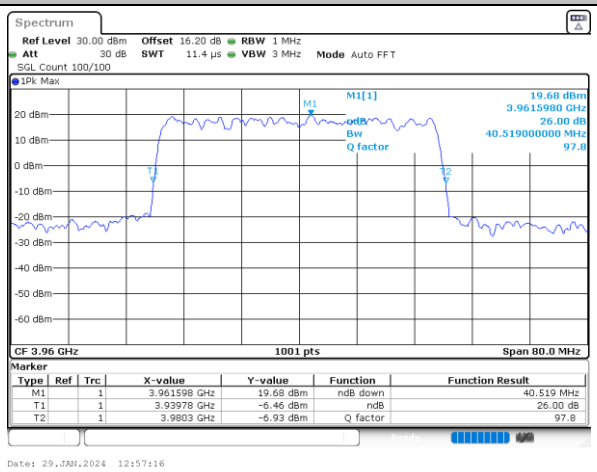
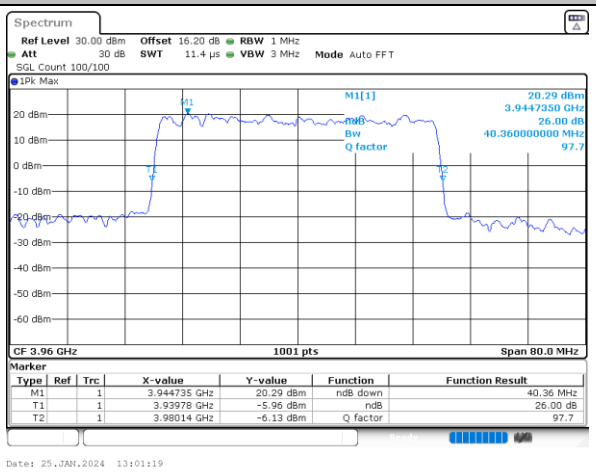
| Mode | FR1 n77 : 26dB BW(MHz) / CP | | | |
|---|---|---|---|---|
| ANT. | Ant4 | | | |
| BW | 60MHz | 60MHz | 60MHz | 60MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 62.46 | 62.58 | 62.58 | 62.7 |
| Middle CH | 62.58 | 62.7 | 62.58 | 62.82 |
| Highest CH | 62.58 | 62.7 | 62.58 | 62.7 |

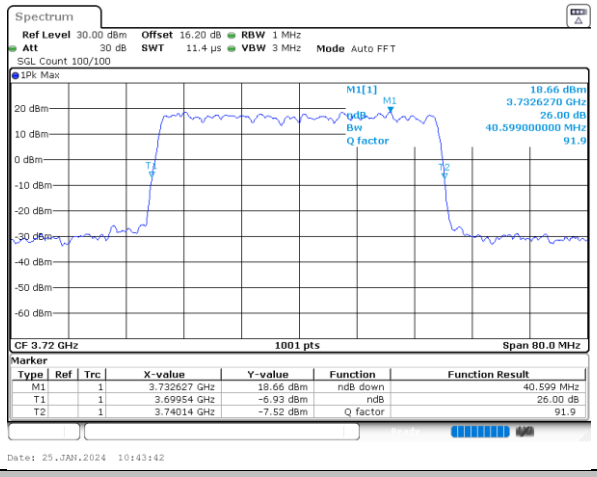
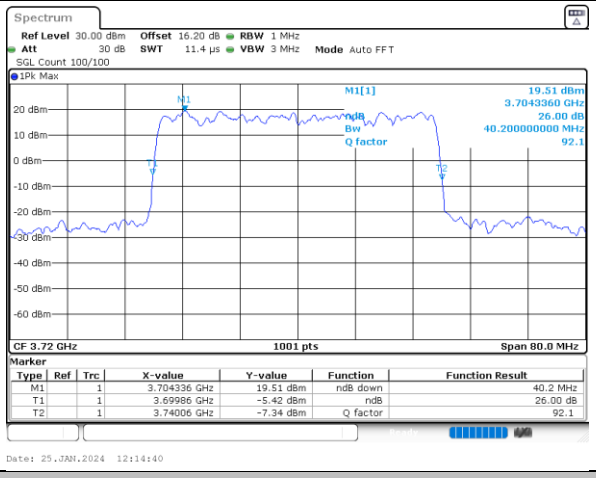
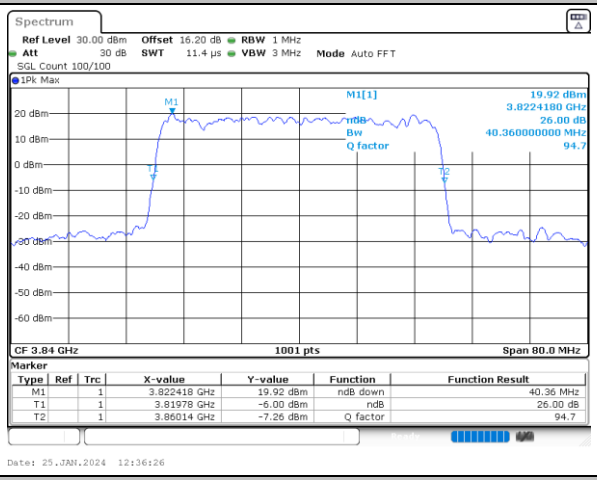
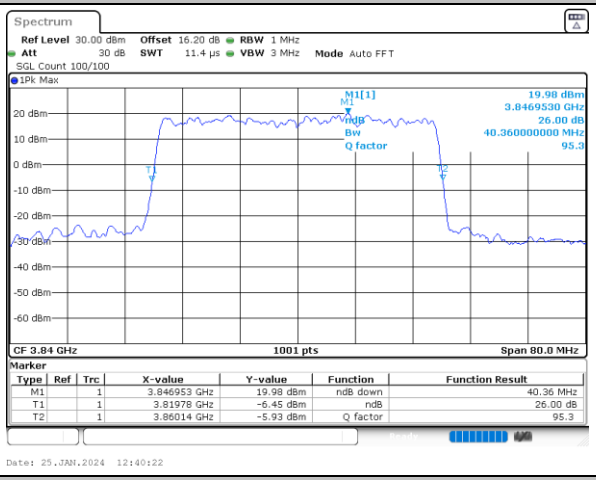
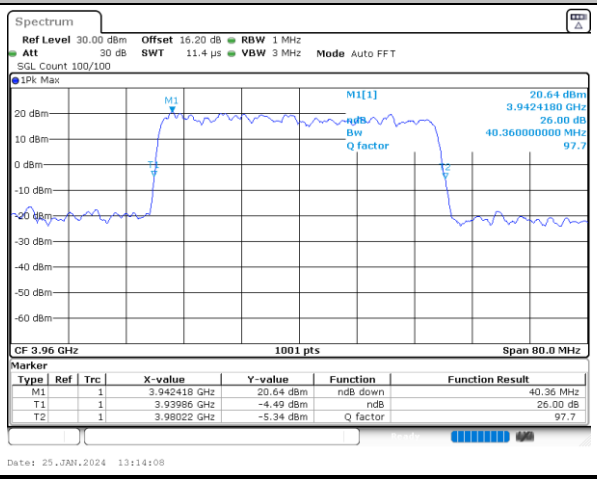
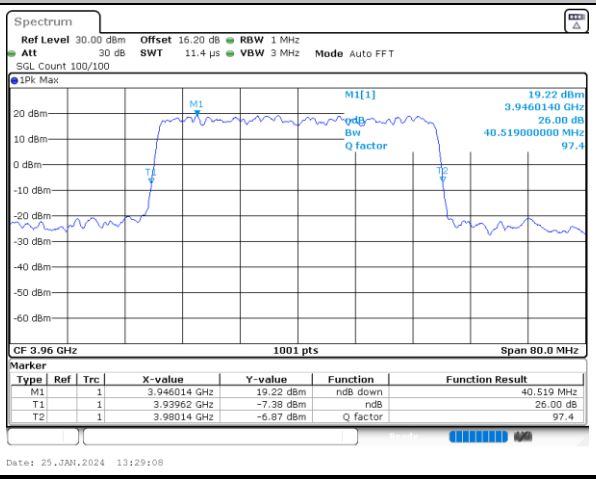
| Mode | FR1 n77 : 26dB BW(MHz) / CP | | | |
|---|---|---|---|---|
| ANT. | Ant3 | | | |
| BW | 80MHz | 80MHz | 80MHz | 80MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 82.32 | 82.32 | 82.48 | 82.48 |
| Middle CH | 82.32 | 82.32 | 82.32 | 82.32 |
| Highest CH | 82.48 | 82.48 | 82.16 | 82.32 |

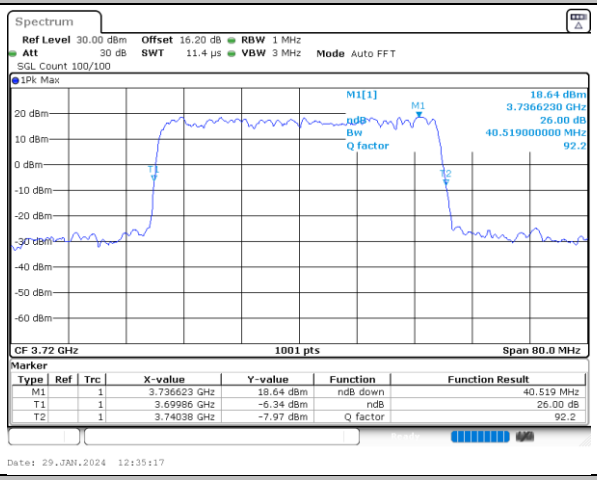
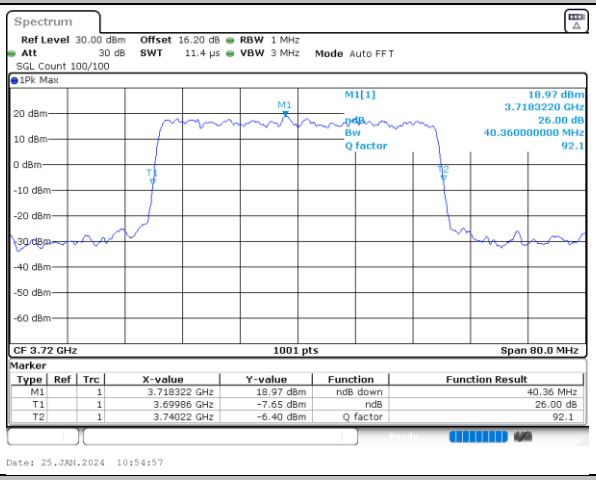
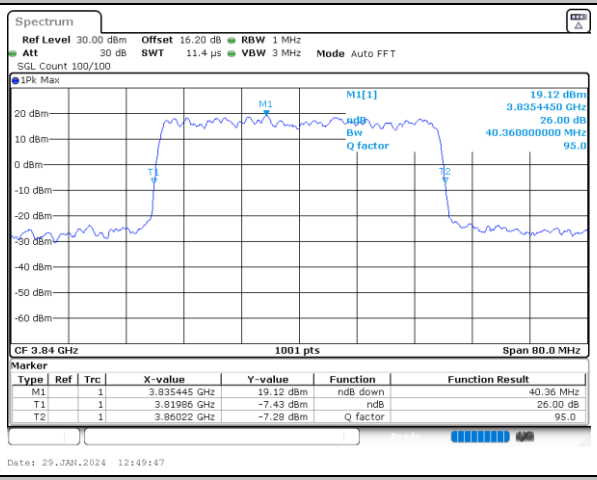
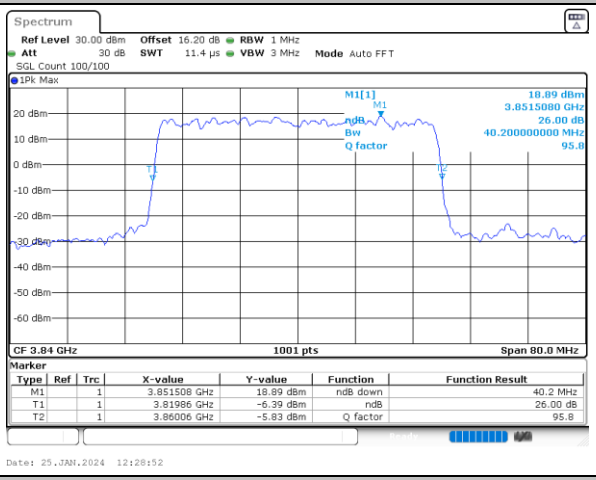
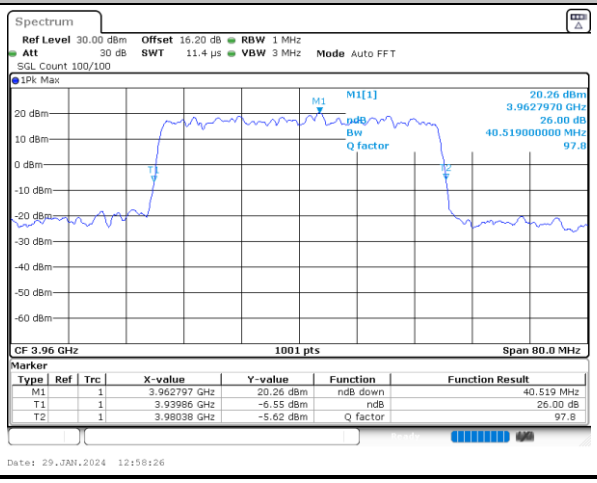
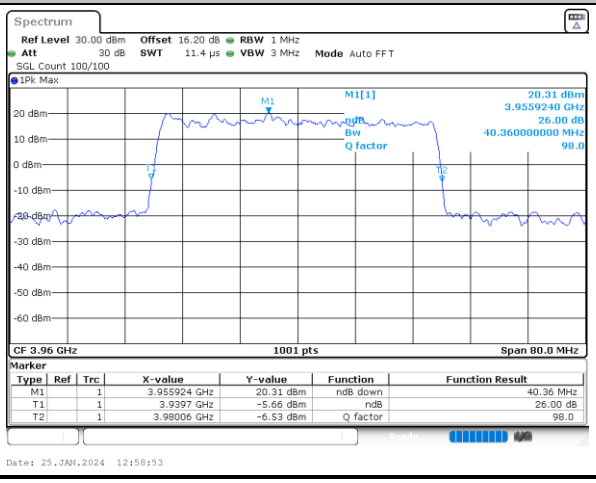
| Mode | FR1 n77 : 26dB BW(MHz) / CP | | | |
|---|---|---|---|---|
| ANT. | Ant4 | | | |
| BW | 80MHz | 80MHz | 80MHz | 80MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 82.64 | 82.16 | 82.48 | 82.48 |
| Middle CH | 82.32 | 82.32 | 82.48 | 82.32 |
| Highest CH | 82.32 | 82.32 | 82.48 | 82.32 |

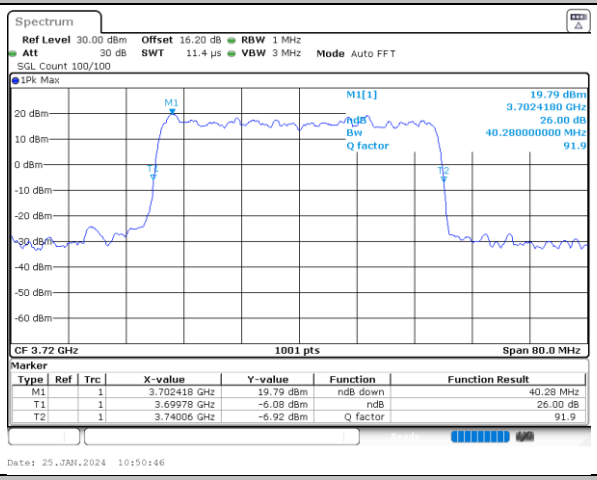
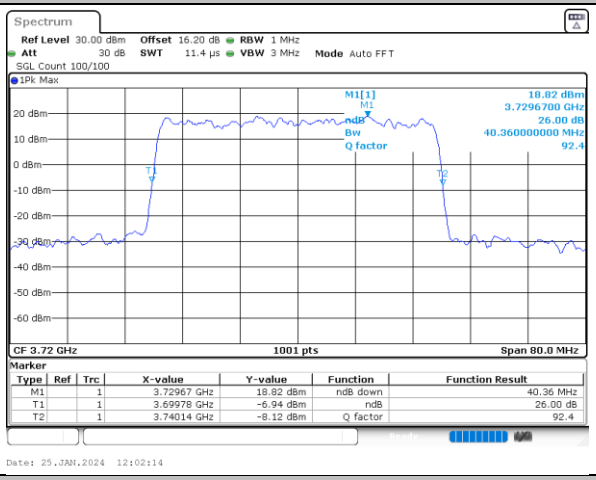
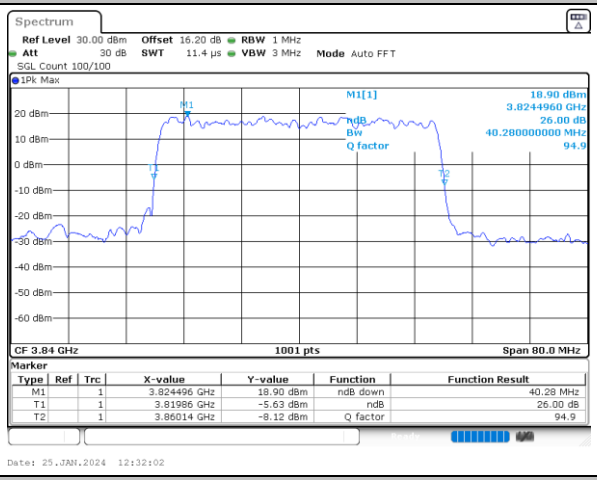
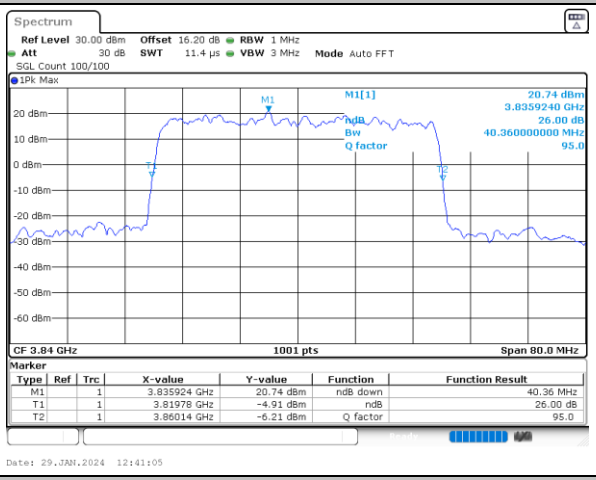
| Mode | FR1 n77 : 26dB BW(MHz) / CP | | | |
|---|---|---|---|---|
| ANT. | Ant3 | | | |
| BW | 100MHz | 100MHz | 100MHz | 100MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 102.5 | 102.7 | 102.7 | 102.5 |
| Middle CH | 102.3 | 102.5 | 102.7 | 102.7 |
| Highest CH | 102.5 | 102.3 | 102.7 | 102.3 |

| Mode | FR1 n77 : 26dB BW(MHz) / CP | | | |
|---|---|---|---|---|
| ANT. | Ant4 | | | |
| BW | 100MHz | 100MHz | 100MHz | 100MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 102.3 | 102.3 | 102.9 | 102.5 |
| Middle CH | 102.5 | 102.3 | 102.7 | 102.7 |
| Highest CH | 102.5 | 102.7 | 102.5 | 102.3 |

| FR1 n77 / 40MHz Ant3 / CP | |
|---|---|
| **QPSK** | **16QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

| FR1 n77 / 40MHz Ant3 / CP | |
|---|---|
| **64QAM** | **256QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

| FR1 n77 / 40MHz Ant4 / CP | |
|---|---|
| **QPSK** | **16QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

| FR1 n77 / 40MHz Ant4 / CP | |
|---|---|
| **64QAM** | **256QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
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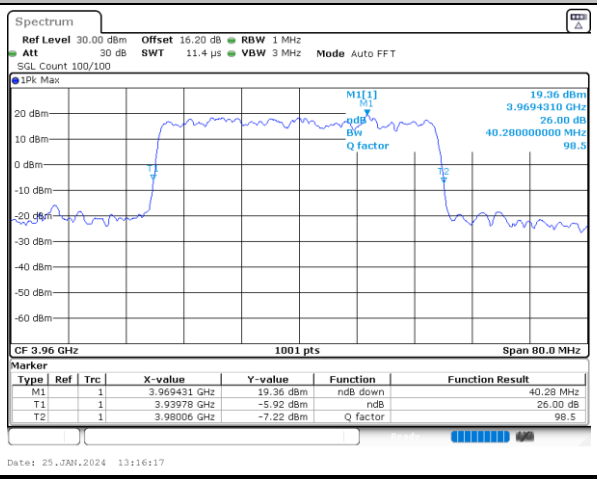
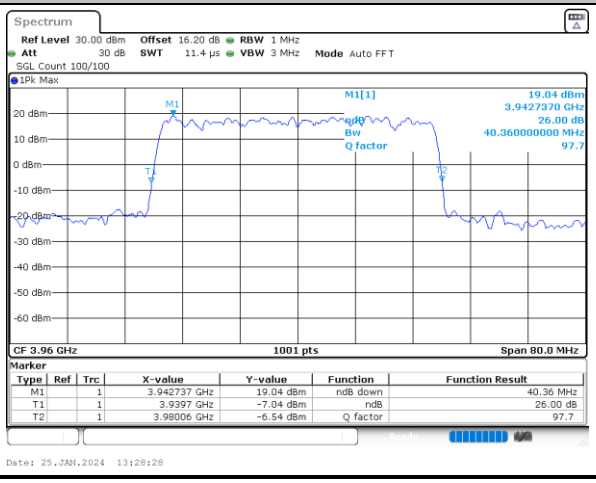
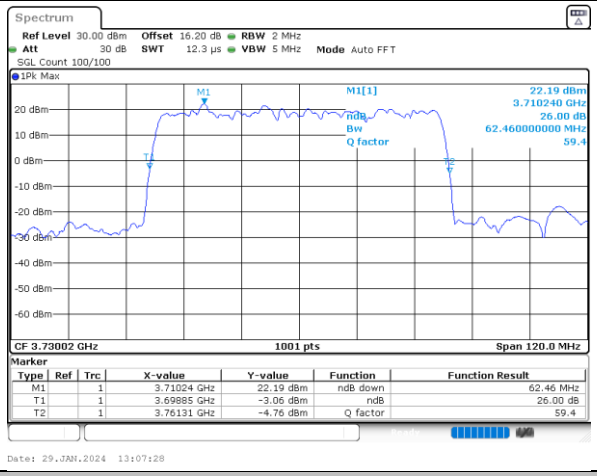
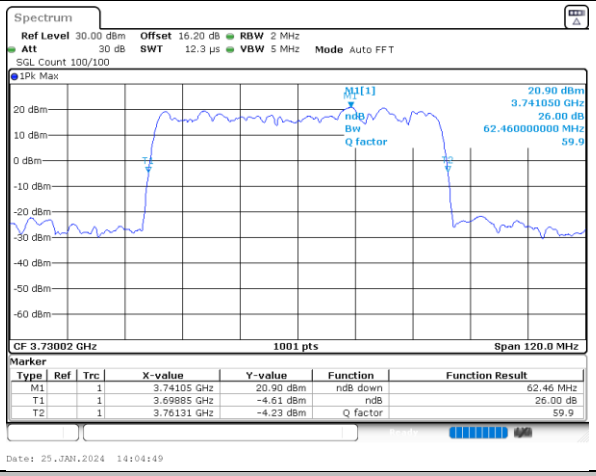
|  |  |

| FR1 n77 / 60MHz Ant3 / CP | |
|---|---|
| **QPSK** | **16QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
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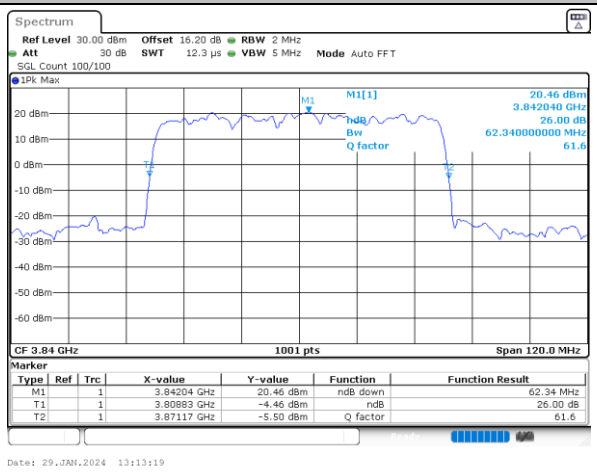
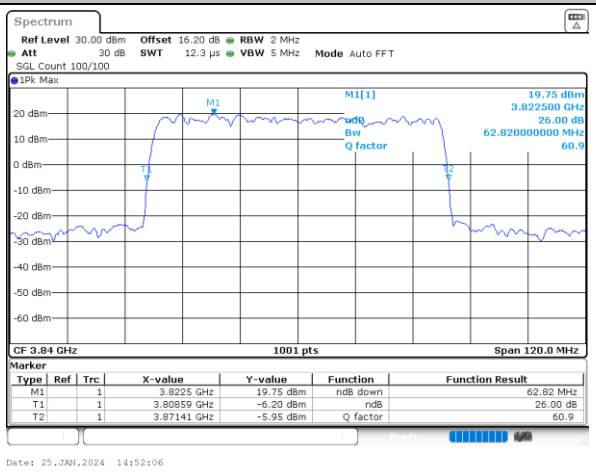
|  |  |
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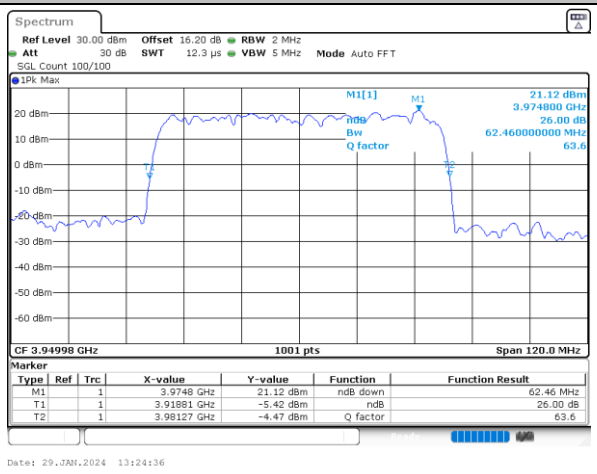
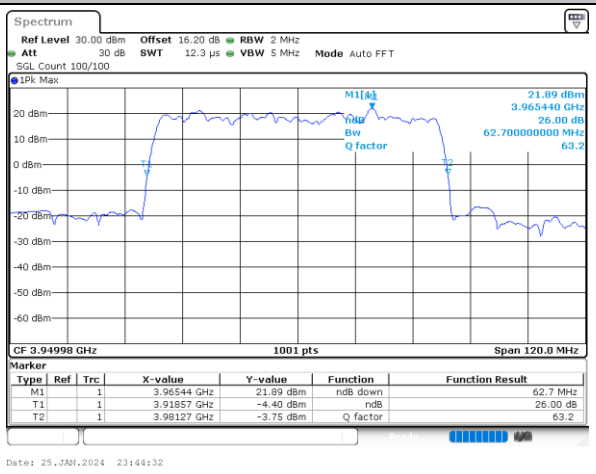
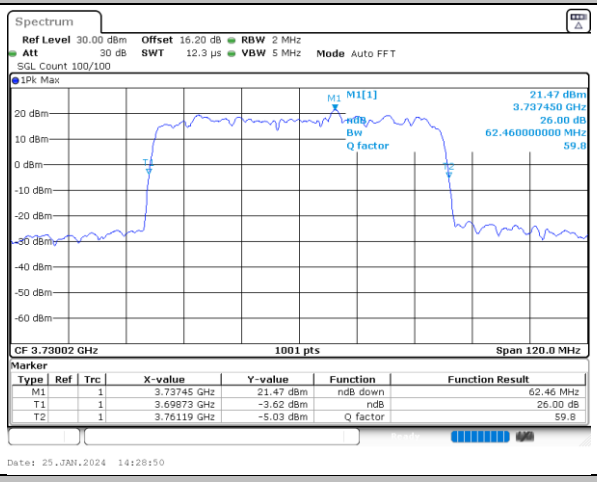
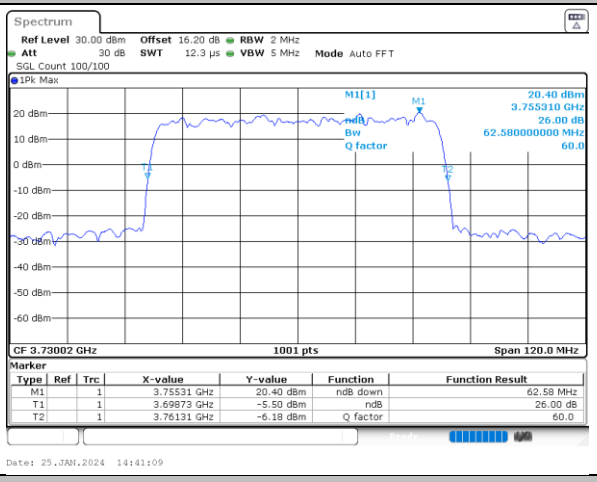
|  |  |

| FR1 n77 / 60MHz Ant3 / CP | |
|---|---|
| **64QAM** | **256QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
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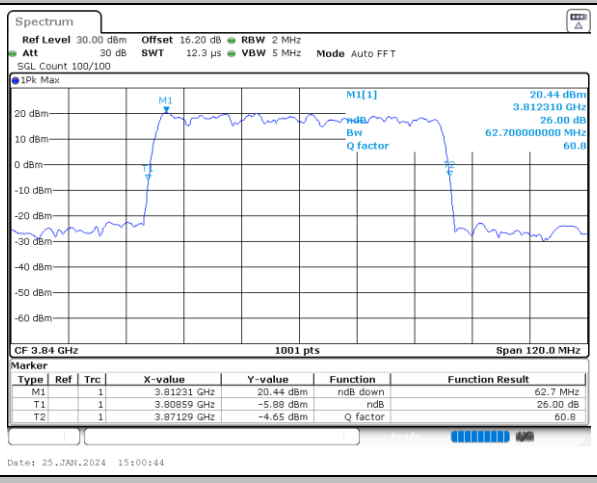
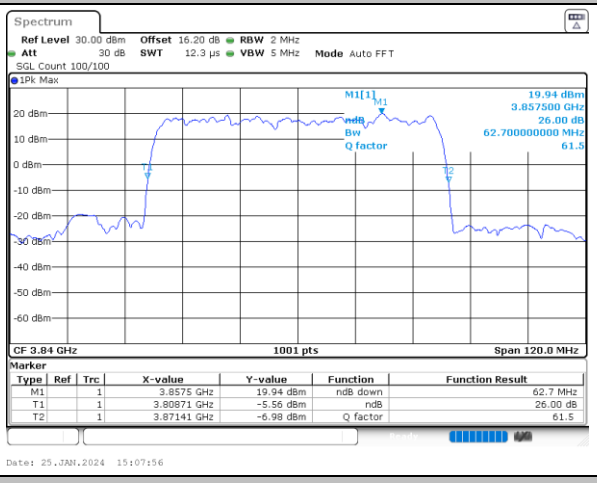
|  |  |
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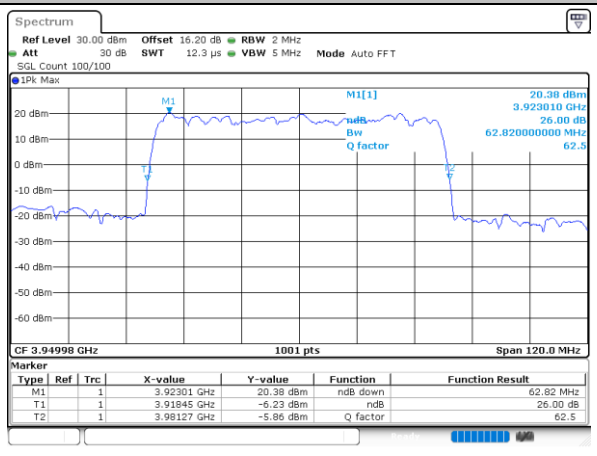
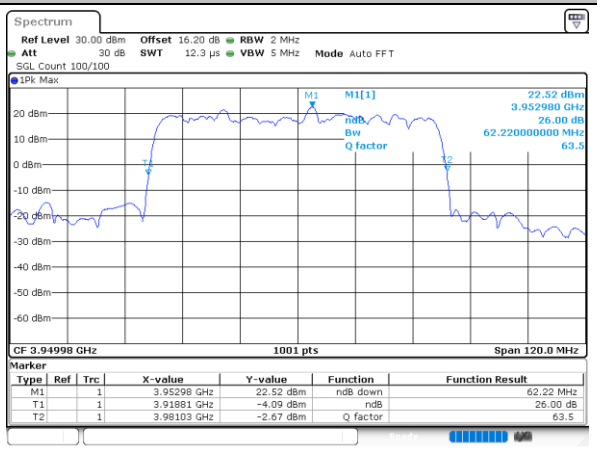
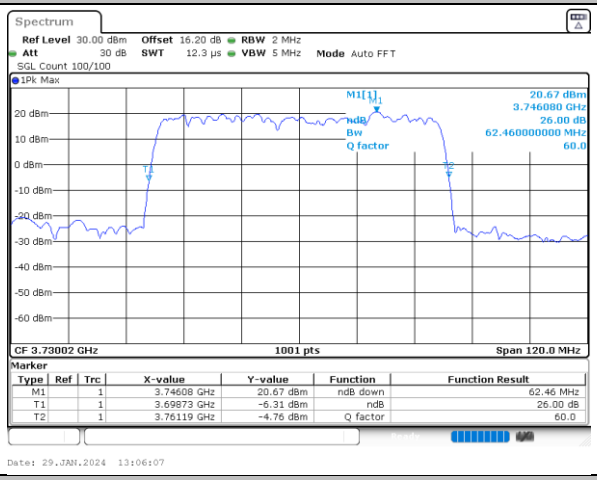
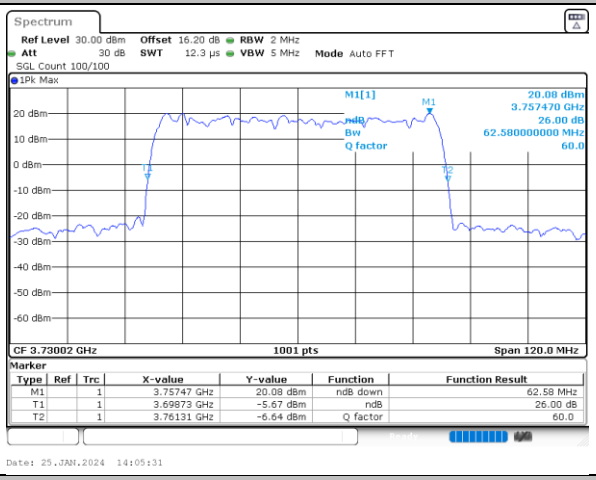
|  |  |

| FR1 n77 / 60MHz Ant4 / CP | |
|---|---|
| **QPSK** | **16QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
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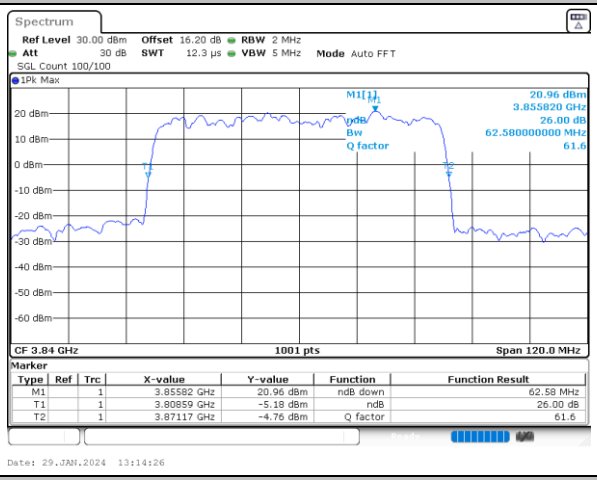
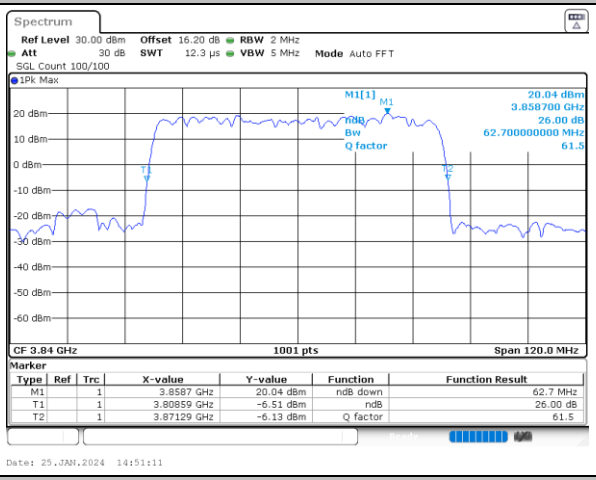
|  |  |
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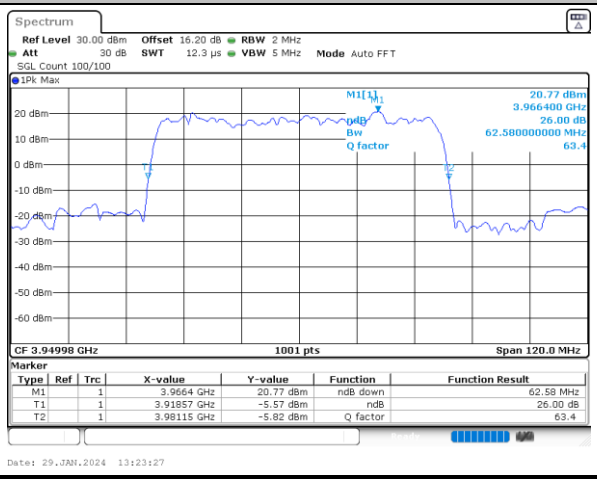
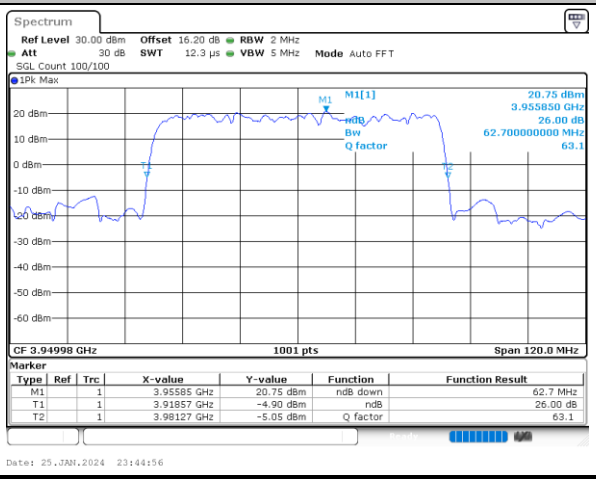
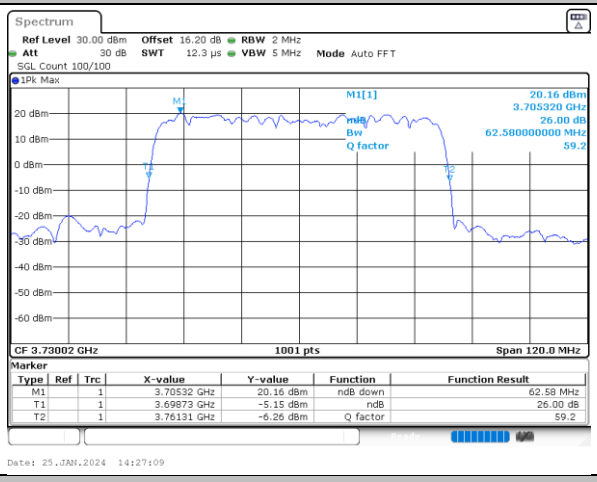
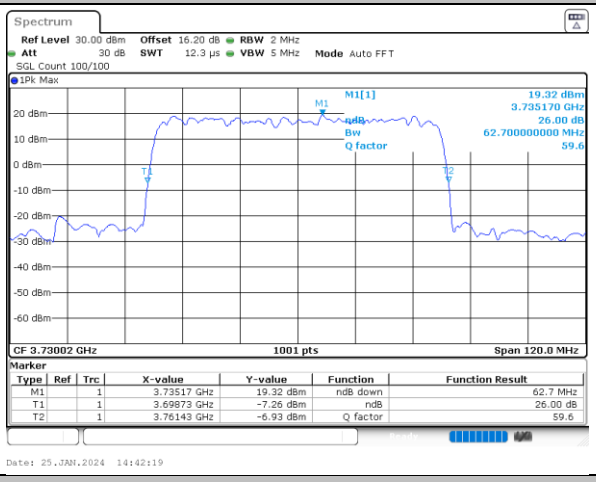
|  |  |

| FR1 n77 / 60MHz Ant4 / CP | |
|---|---|
| **64QAM** | **256QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
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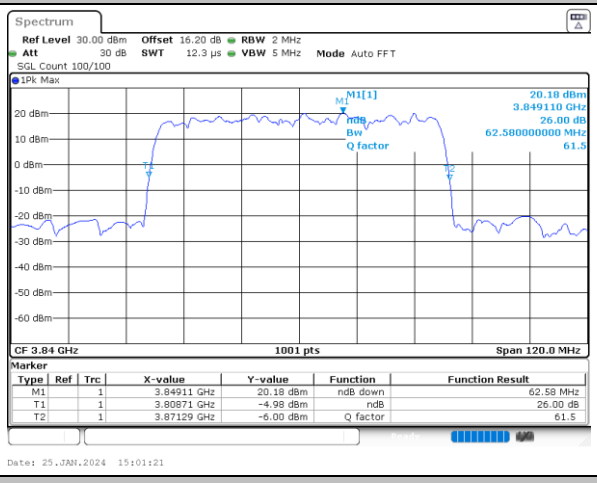
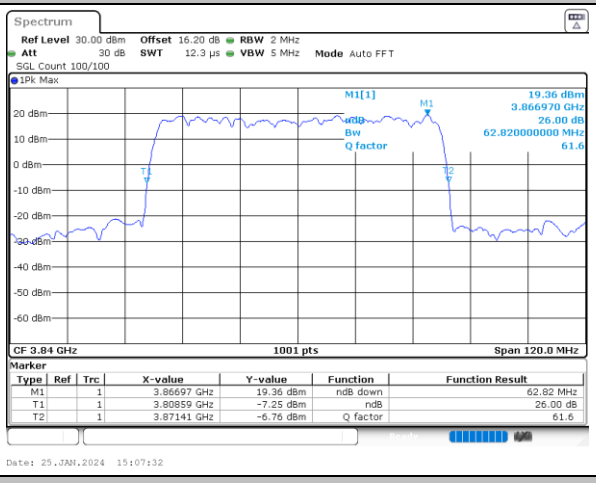
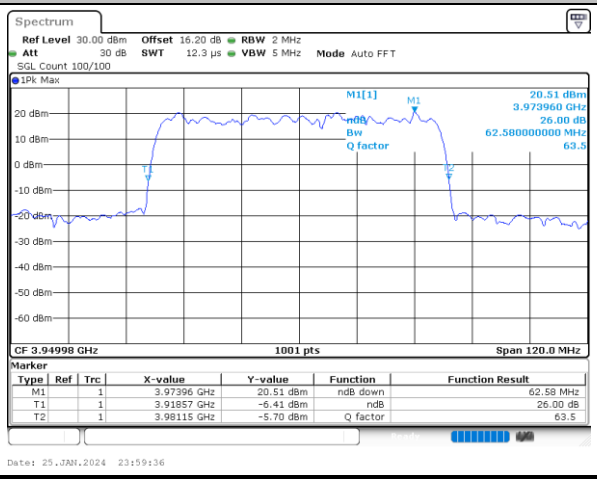
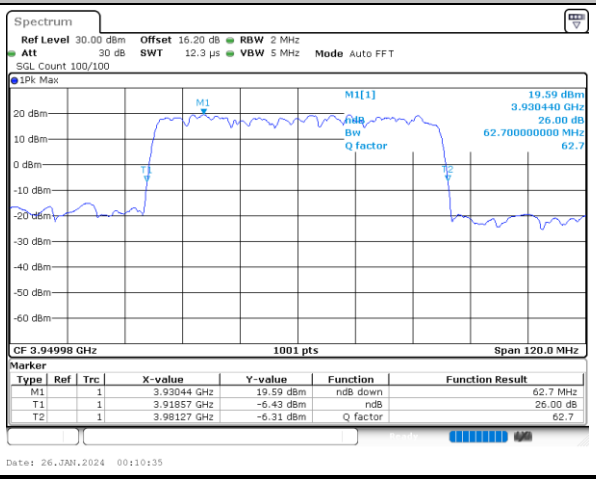
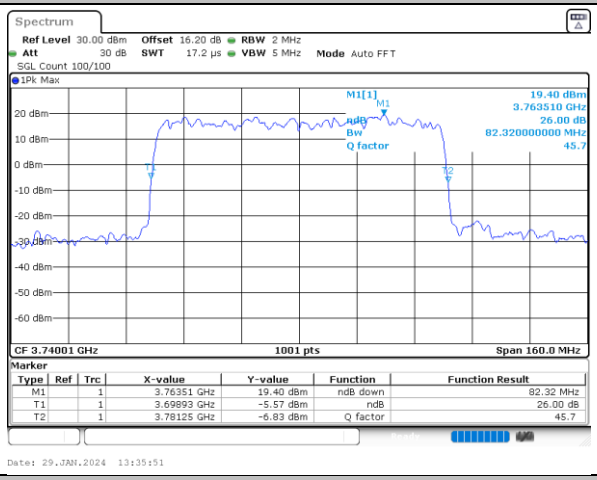
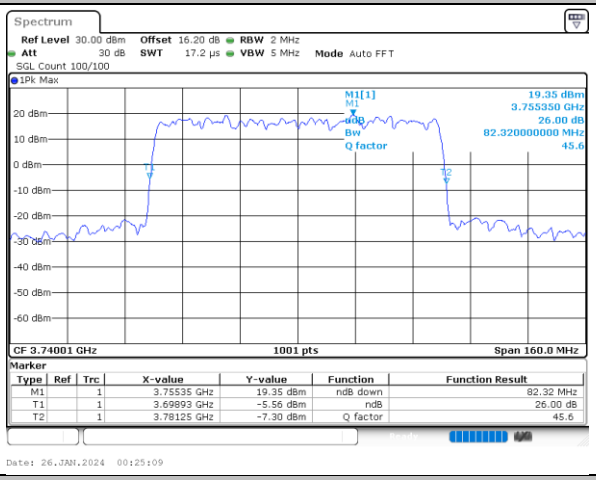
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

| FR1 n77 / 80MHz Ant3 / CP | |
|---|---|
| **QPSK** | **16QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
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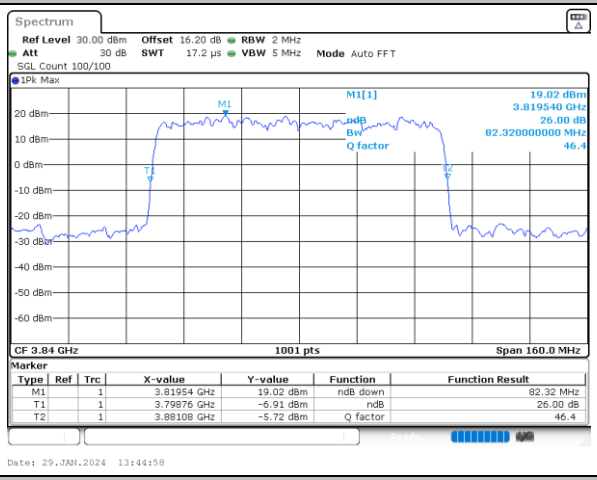
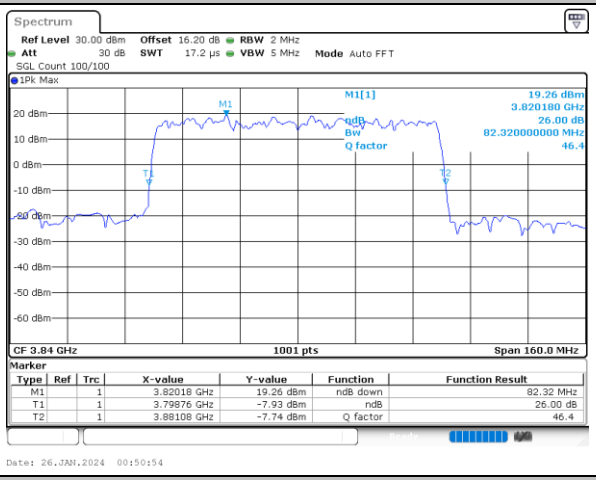
|  |  |
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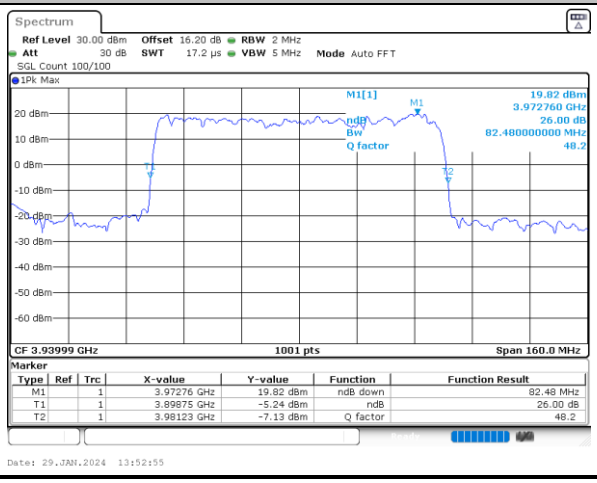
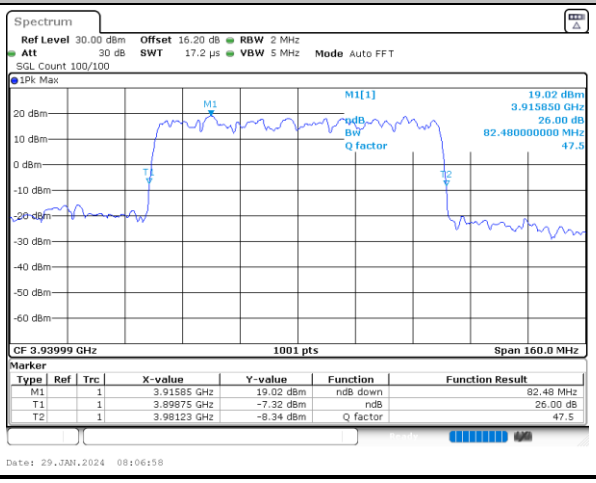
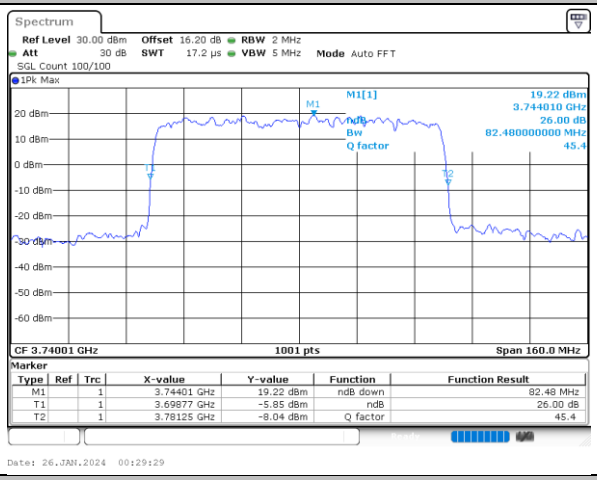
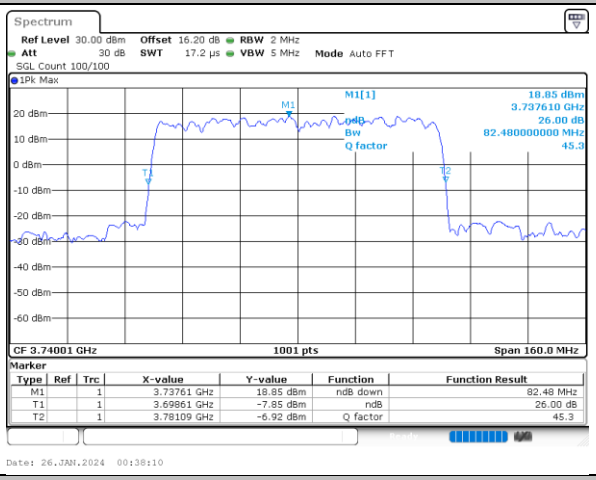
|  |  |

| FR1 n77 / 80MHz Ant3 / CP | |
|---|---|
| **64QAM** | **256QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
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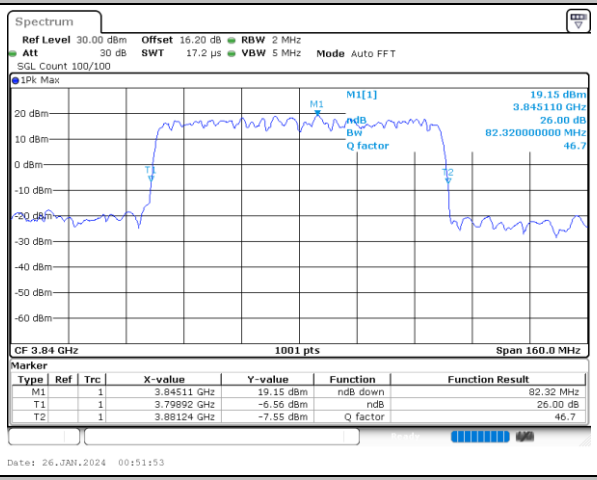
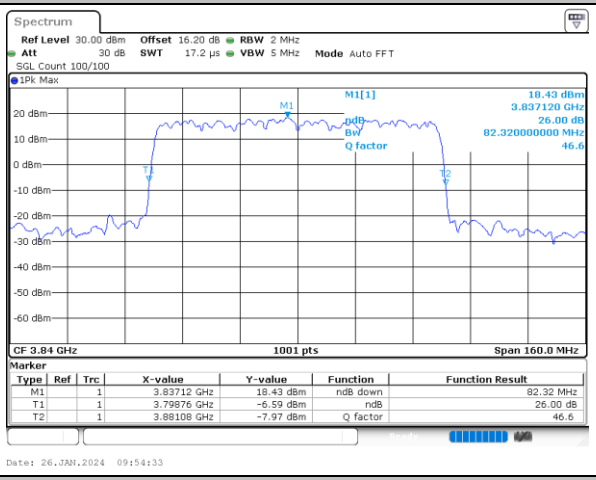
|  |  |
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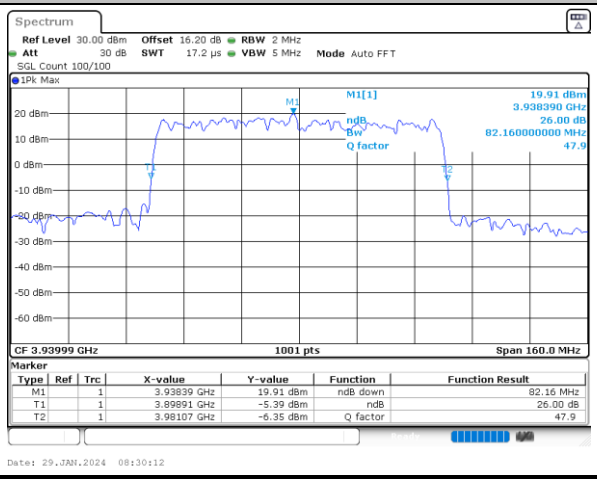
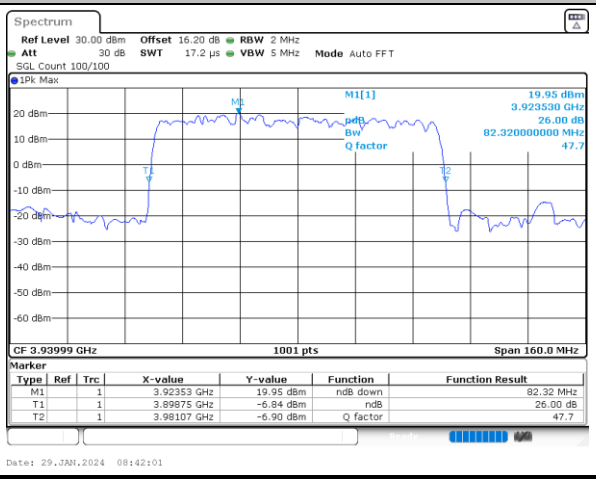
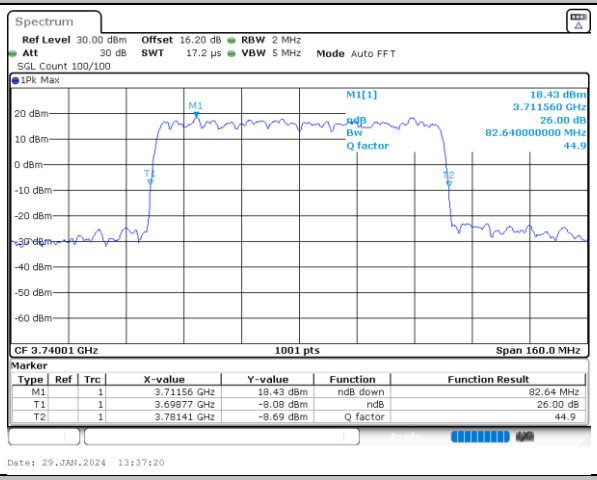
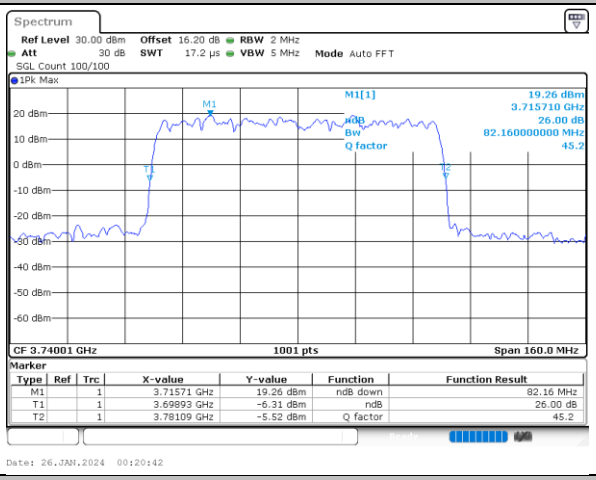
|  |  |

| FR1 n77 / 80MHz Ant4 / CP | |
|---|---|
| **QPSK** | **16QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
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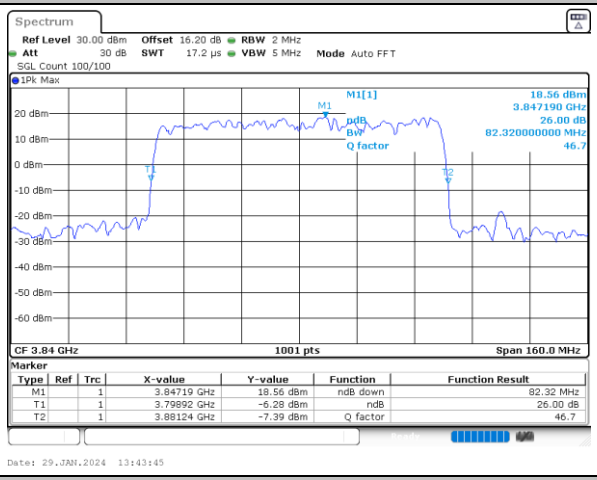
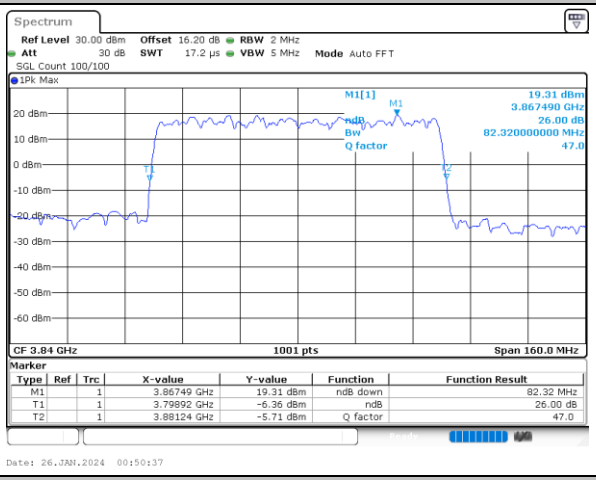
|  |  |
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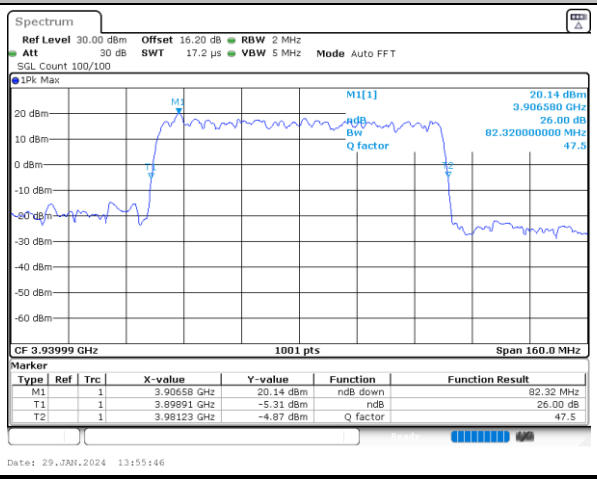
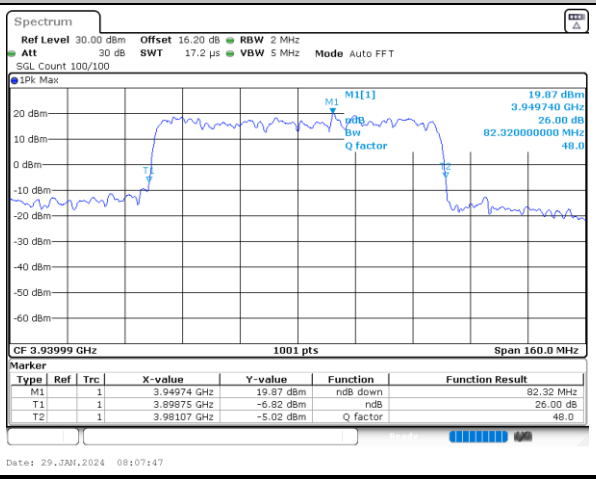
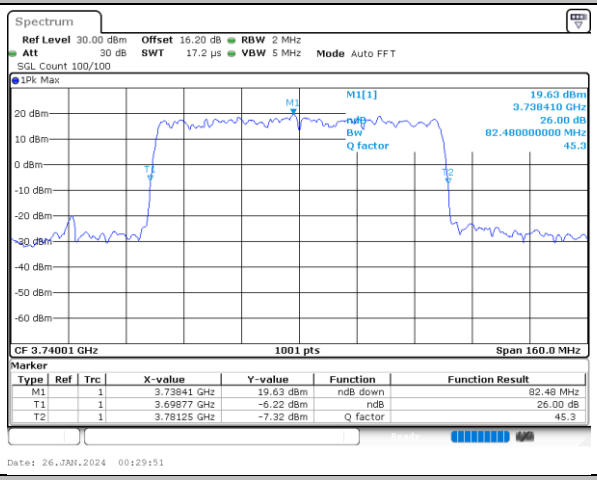
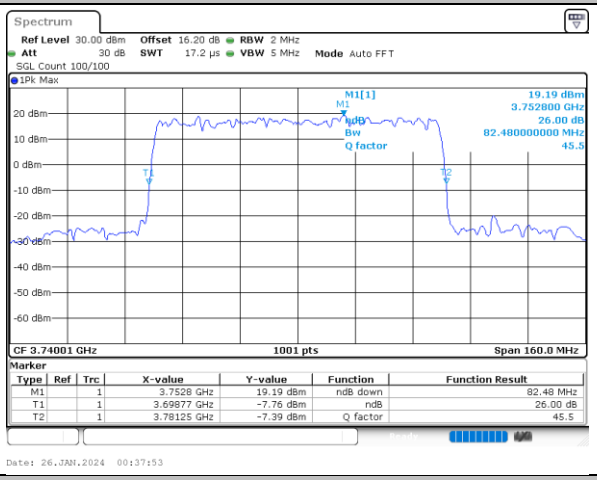
|  |  |

| FR1 n77 / 80MHz Ant4 / CP | |
|---|---|
| **64QAM** | **256QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
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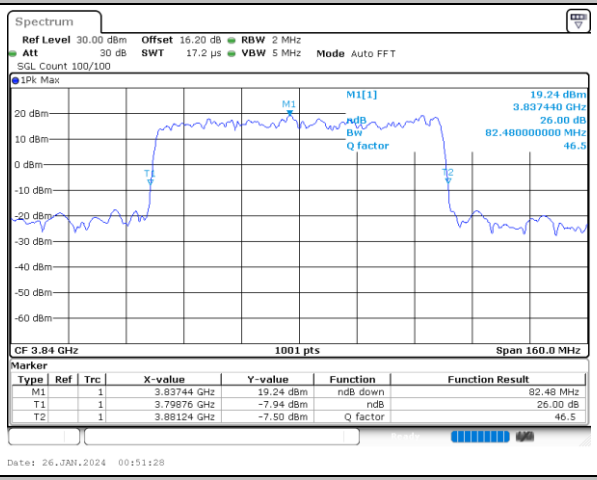
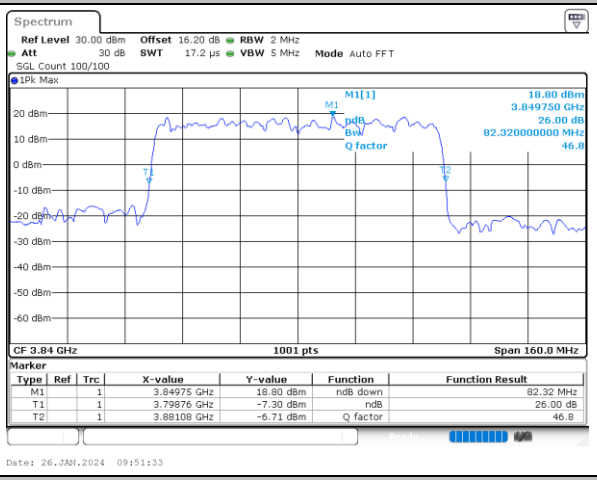
|  |  |
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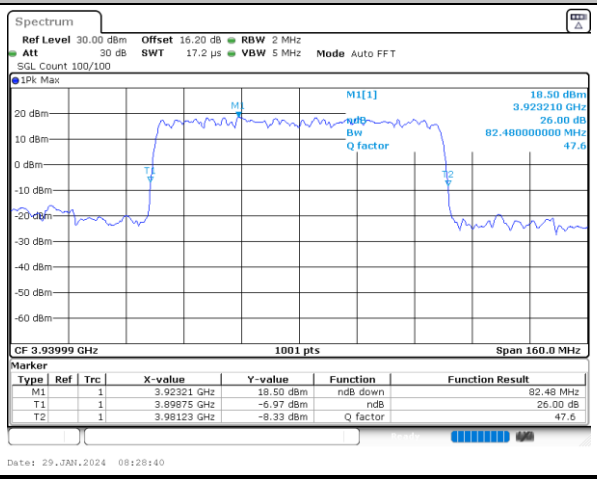
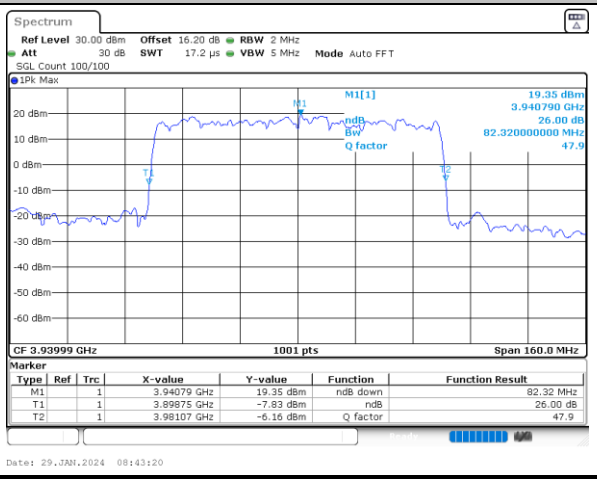
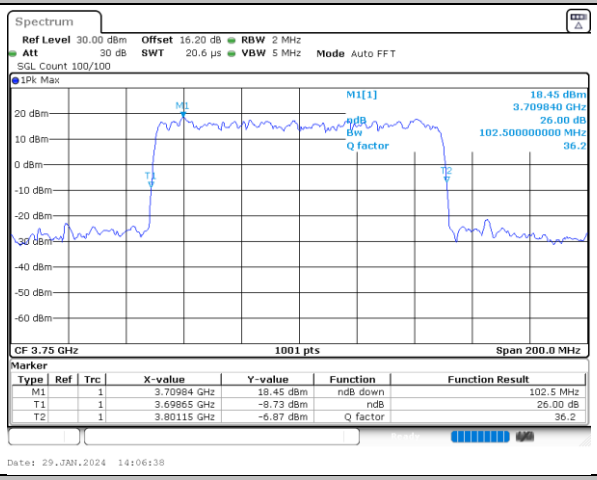
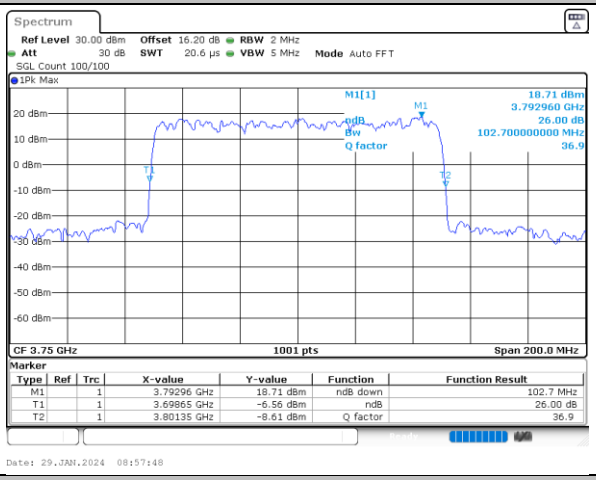
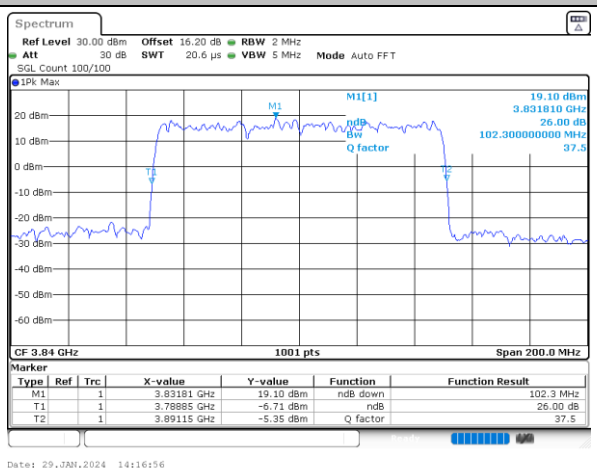
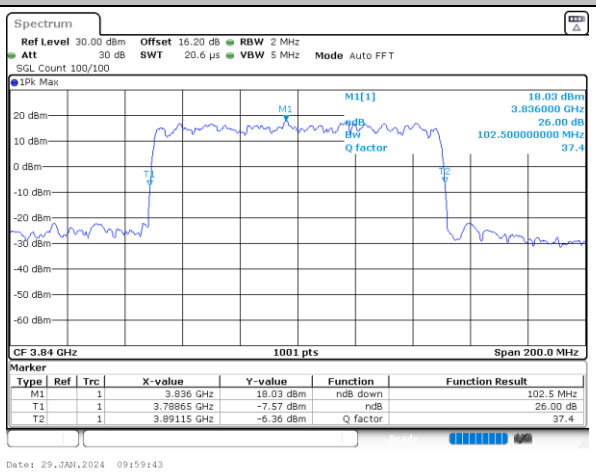
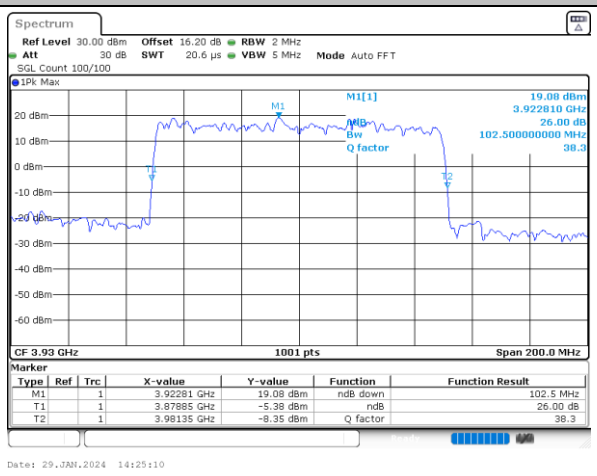
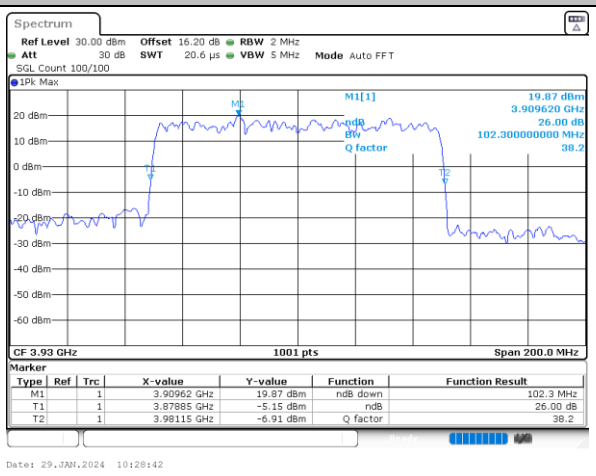
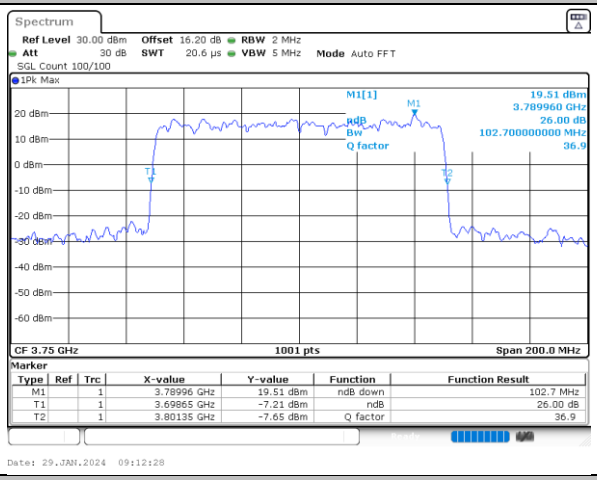
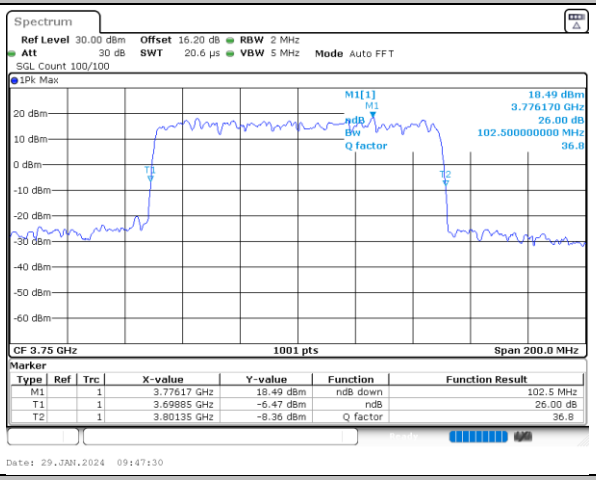
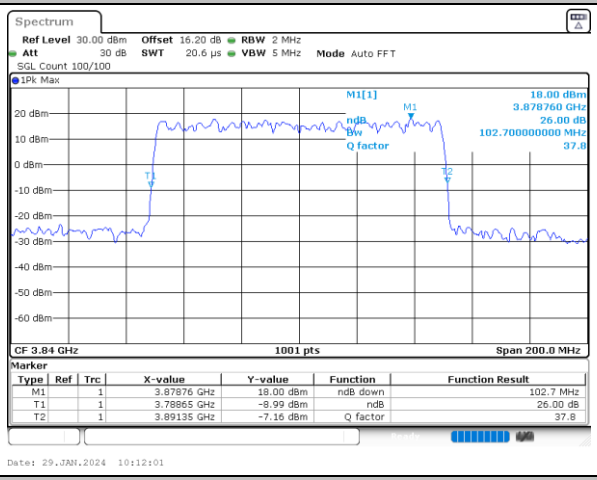
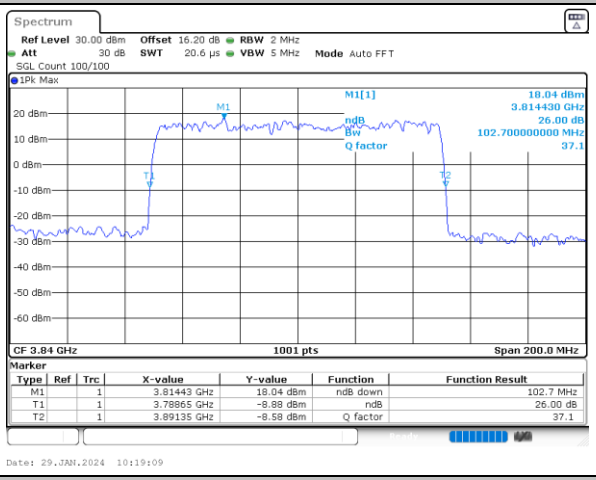
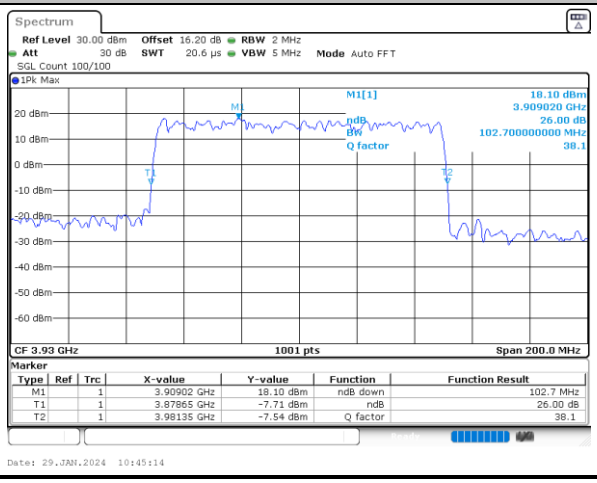
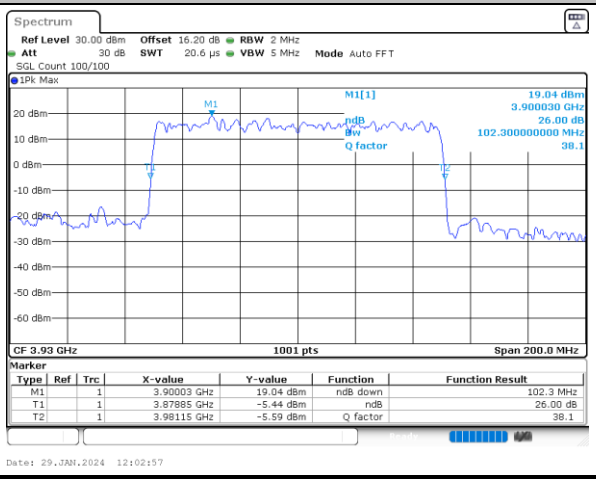
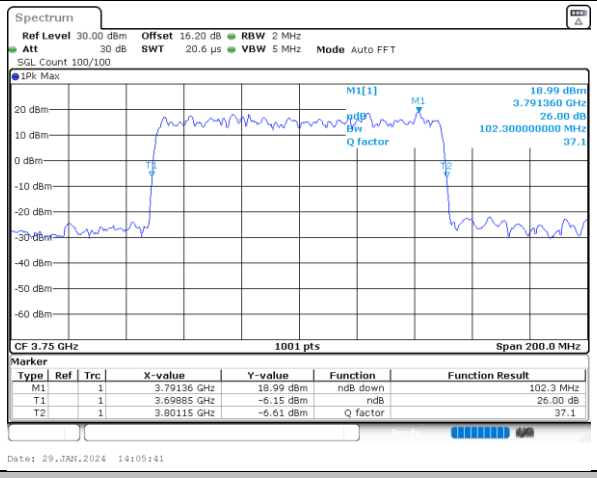
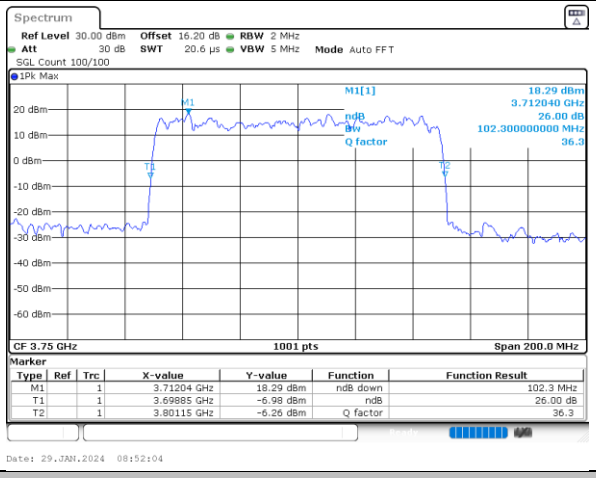
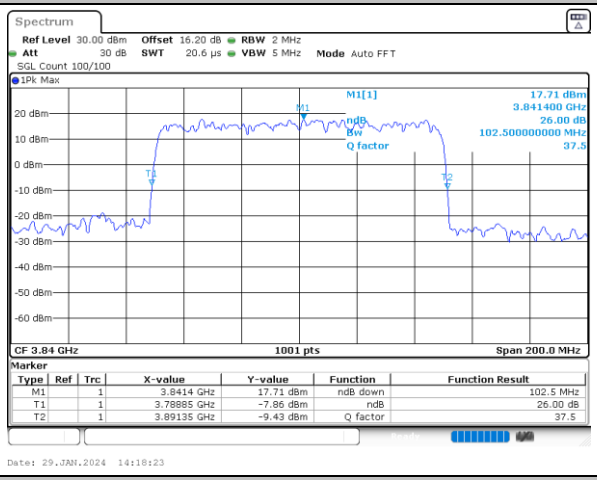
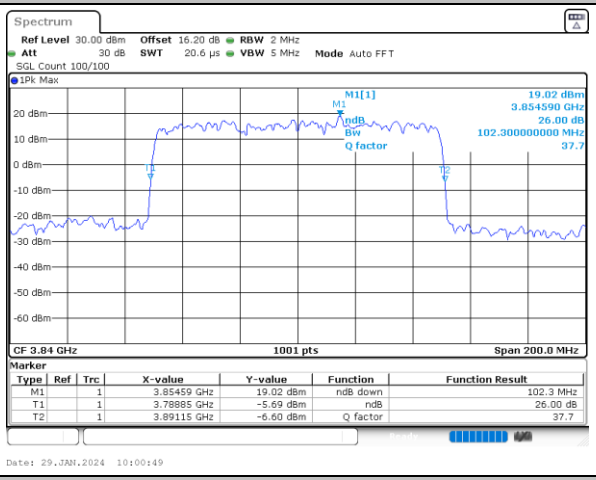
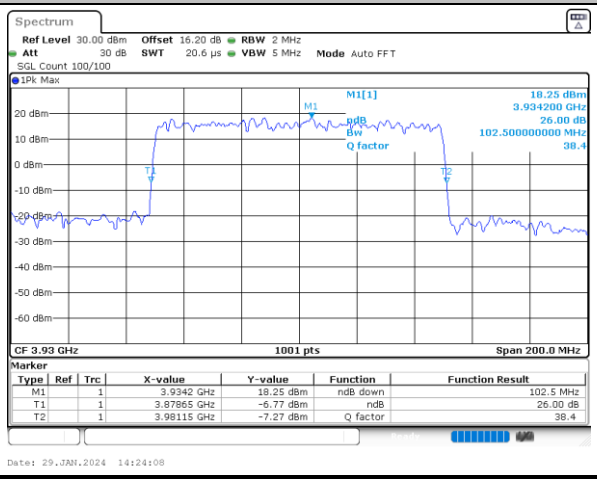
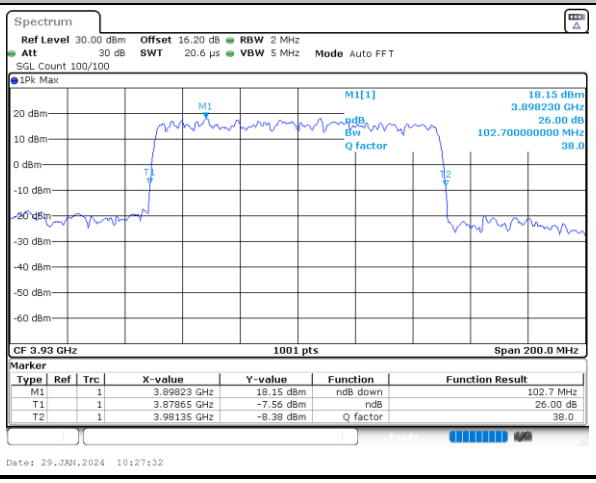
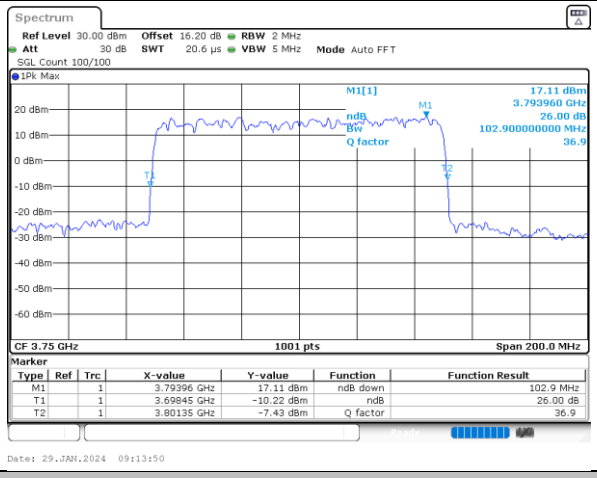
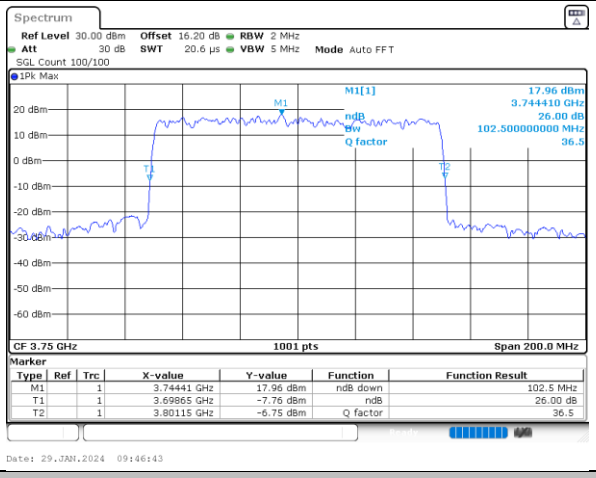
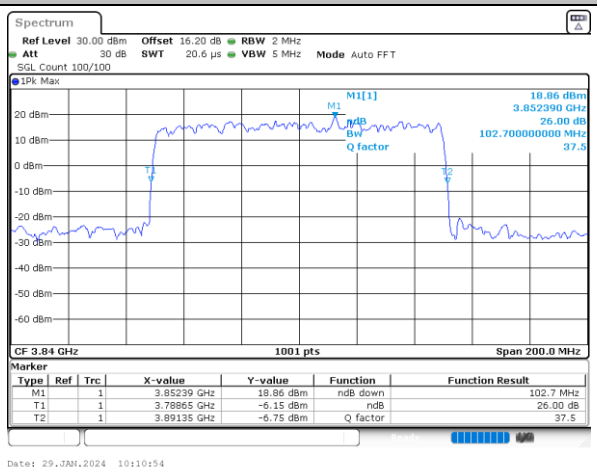
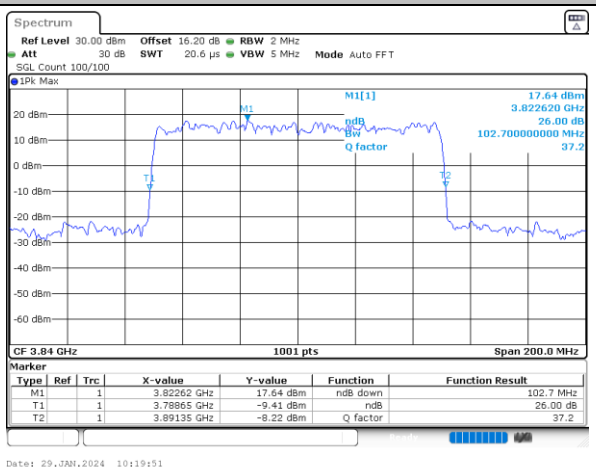
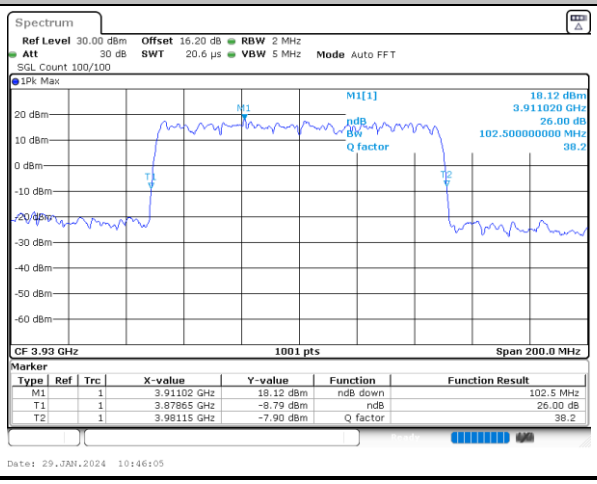
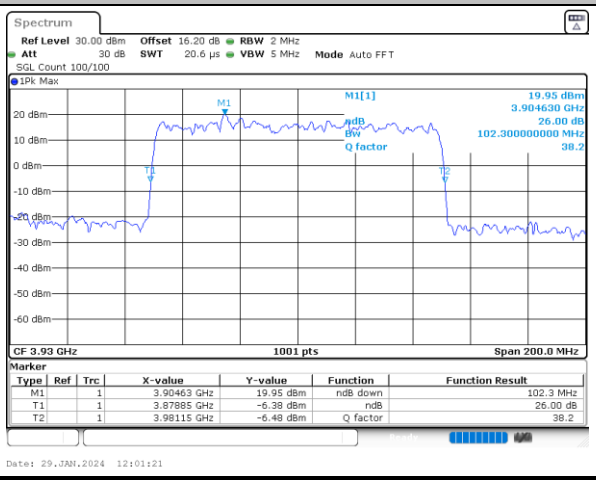
|  |  |

| FR1 n77 / 100MHz Ant3 / CP | |
|---|---|
| **QPSK** | **16QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

| FR1 n77 / 100MHz Ant3 / CP | |
|---|---|
| **64QAM** | **256QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

| FR1 n77 / 100MHz Ant4 / CP | |
|---|---|
| **QPSK** | **16QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

| FR1 n77 / 100MHz Ant4 / CP | |
|---|---|
| **64QAM** | **256QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

# Occupied Bandwidth

| Mode | FR1 n77 : OB / CP | | | |
|---|---|---|---|---|
| ANT. | Ant3 | | | |
| BW | 40MHz | 40MHz | 40MHz | 40MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 38.12 | 37.96 | 38.04 | 38.12 |
| Middle CH | 37.96 | 38.20 | 37.96 | 38.12 |
| Highest CH | 38.20 | 37.96 | 38.04 | 37.96 |

| Mode | FR1 n77 : OB / CP | | | |
|---|---|---|---|---|
| ANT. | Ant4 | | | |
| BW | 40MHz | 40MHz | 40MHz | 40MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 38.20 | 38.12 | 38.12 | 38.12 |
| Middle CH | 38.12 | 38.12 | 38.12 | 37.88 |
| Highest CH | 37.96 | 38.04 | 37.96 | 38.04 |

| Mode | FR1 n77 : OB / CP | | | |
|---|---|---|---|---|
| ANT. | Ant3 | | | |
| BW | 60MHz | 60MHz | 60MHz | 60MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 57.90 | 58.50 | 58.50 | 58.62 |
| Middle CH | 58.26 | 58.74 | 58.62 | 58.98 |
| Highest CH | 58.50 | 59.10 | 58.38 | 58.14 |

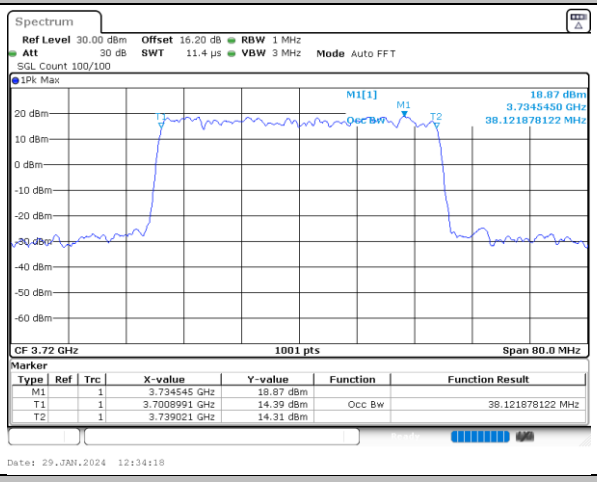
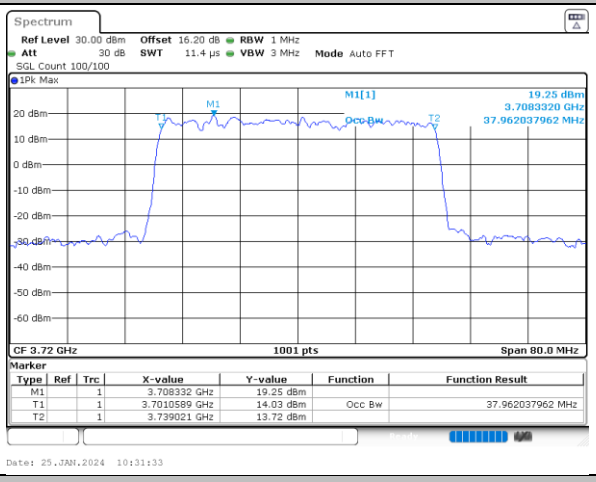
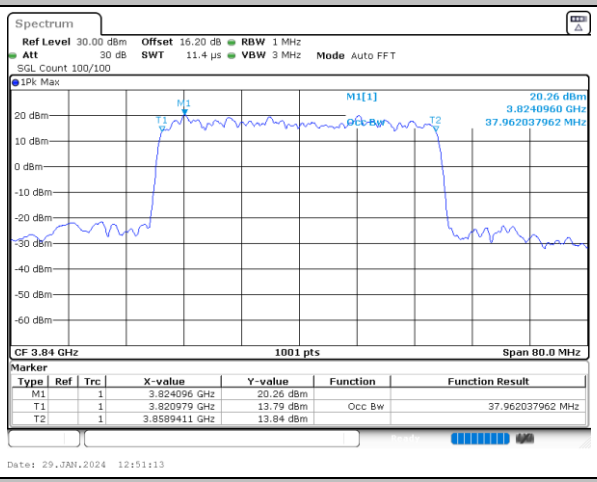
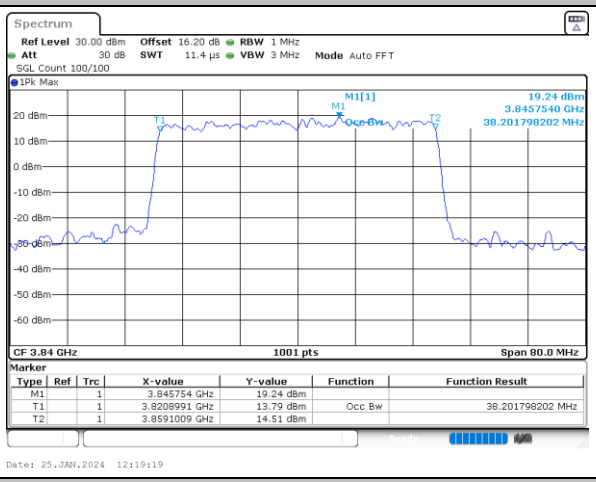
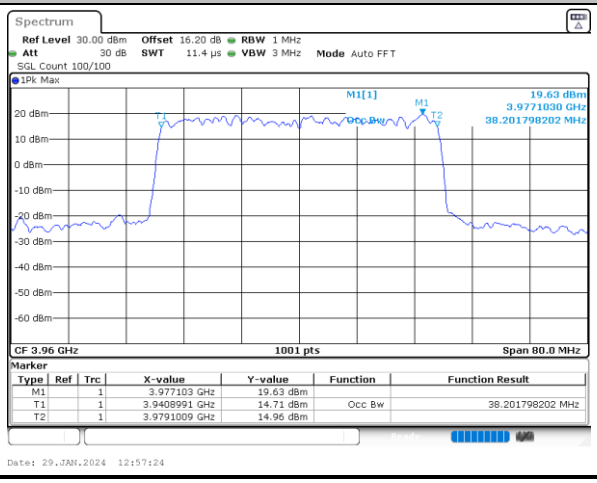
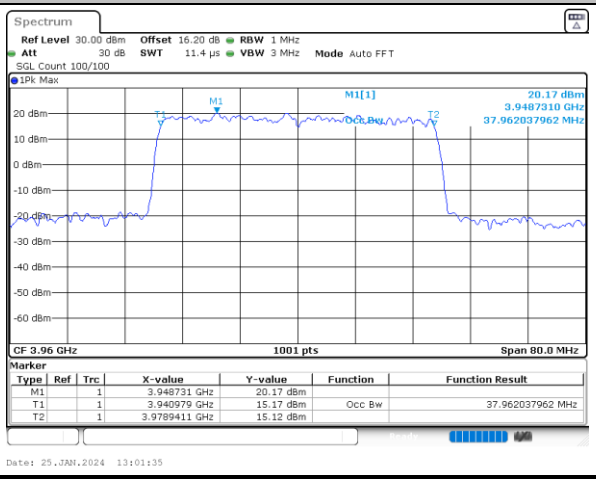
| Mode | FR1 n77 : OB / CP | | | |
|---|---|---|---|---|
| ANT. | Ant4 | | | |
| BW | 60MHz | 60MHz | 60MHz | 60MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 58.38 | 58.62 | 58.50 | 58.38 |
| Middle CH | 58.38 | 58.86 | 58.50 | 58.50 |
| Highest CH | 58.50 | 58.38 | 58.50 | 58.62 |

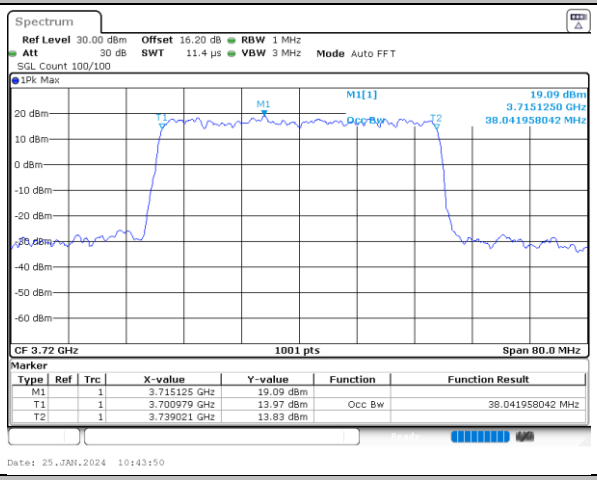
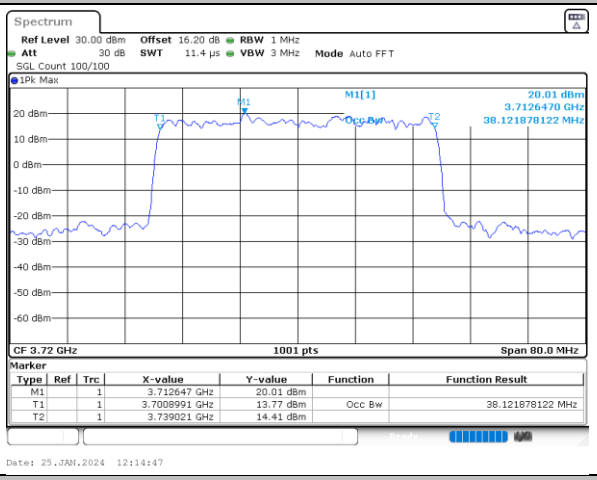
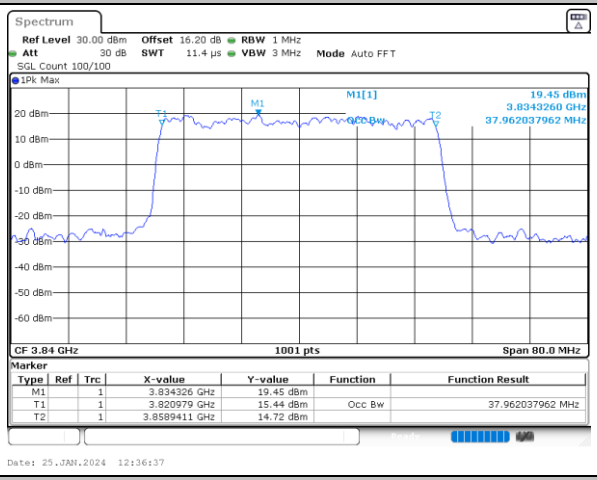
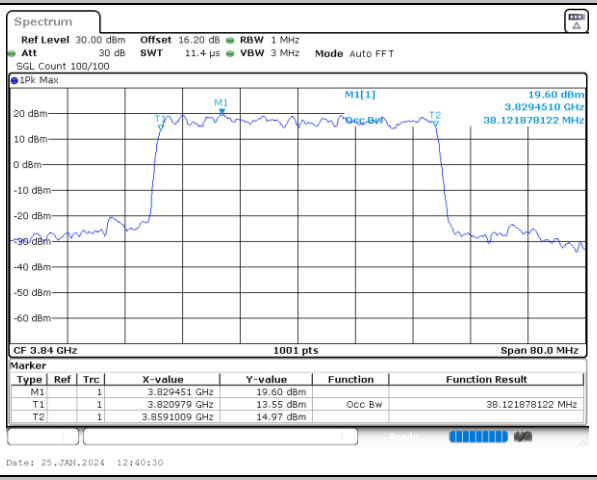
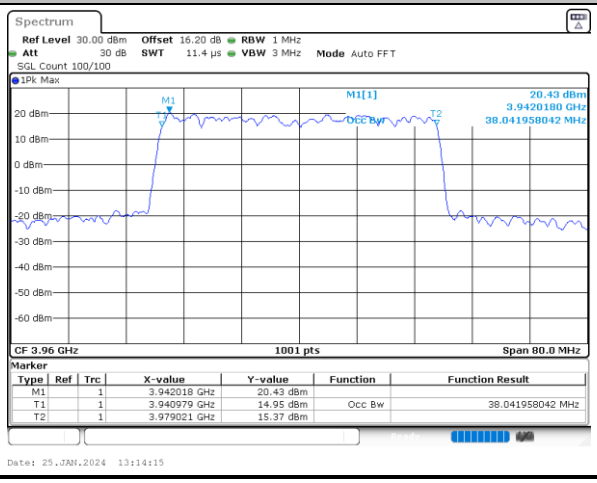
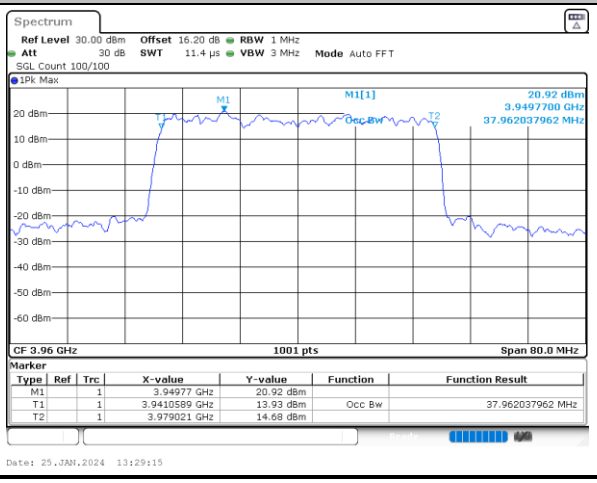
| Mode | FR1 n77 : OB / CP | | | |
|---|---|---|---|---|
| ANT. | Ant3 | | | |
| BW | 80MHz | 80MHz | 80MHz | 80MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 78.16 | 77.84 | 78.32 | 78.00 |
| Middle CH | 77.84 | 78.48 | 77.84 | 78.00 |
| Highest CH | 77.68 | 78.32 | 78.32 | 77.84 |

| Mode | FR1 n77 : OB / CP | | | |
|---|---|---|---|---|
| ANT. | Ant4 | | | |
| BW | 80MHz | 80MHz | 80MHz | 80MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 78.16 | 77.84 | 77.84 | 78.32 |
| Middle CH | 77.52 | 78.16 | 77.84 | 77.52 |
| Highest CH | 77.84 | 78.16 | 77.84 | 78.32 |

| Mode | FR1 n77 : OB / CP | | | |
|---|---|---|---|---|
| ANT. | Ant3 | | | |
| BW | 100MHz | 100MHz | 100MHz | 100MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 97.70 | 97.30 | 97.90 | 97.90 |
| Middle CH | 97.70 | 97.70 | 97.90 | 97.90 |
| Highest CH | 98.10 | 97.70 | 97.50 | 97.50 |

| Mode | FR1 n77 : OB / CP | | | |
|---|---|---|---|---|
| ANT. | Ant4 | | | |
| BW | 100MHz | 100MHz | 100MHz | 100MHz |
| Mod. | QPSK | 16QAM | 64QAM | 256QAM |
| Lowest CH | 97.90 | 97.70 | 97.70 | 97.50 |
| Middle CH | 97.90 | 97.90 | 97.70 | 97.30 |
| Highest CH | 97.50 | 97.70 | 97.30 | 97.90 |

| FR1 n77 / 40MHz Ant3 / CP | |
|---|---|
| **QPSK** | **16QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

| FR1 n77 / 40MHz Ant3 / CP | |
|---|---|
| **64QAM** | **256QAM** |
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |