Testing and Certification

# TEST REPORT

FCC Sub6 n71 Test for TM18FNNABM0
Certification

**APPLICANT**
LG Electronics Inc.

**REPORT NO.**
HCT-RF-2506-FC070

**DATE OF ISSUE**
June 17, 2025

**Tested by**
Jae Ryang Do

**Technical Manager**
Jong Seok Lee

Accredited by KOLAS, Republic of KOREA

HCT CO., LTD.
BongJai Huh / CEO



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REPORT NO.
HCT-RF-2506-FC070

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June 17, 2025

| | |
|---|---|
| Applicant | **LG Electronics Inc.**<br>128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea |
| Product Name<br>Model Name | Telematics<br>TM18FNNABM0 |
| Date of Test | February 08, 2025 ~ June 13, 2025 |
| Location of Test | ■ Permanent Testing Lab ☐ On Site Testing<br>(Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea) |
| FCC ID | 2BO3LTM18FNNABM0 |
| FCC Classification | PCS Licensed Transmitter (PCB) |
| Test Standard Used | FCC Rule Part(s) : § 27 |
| Test Results | PASS |

## REVISION HISTORY

The revision history for this test report is shown in table.

| Revision No. | Date of Issue | Description |
|---|---|---|
| 0 | June 17, 2025 | Initial Release |

## Notice

| Content |
|---|
| The measurements shown in this report were made in accordance with the procedures specified in CFR47 section § 2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.<br>HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)<br><br>The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.<br>The test results have only been applied with the test methods required by the standard(s).<br><br>The laboratory is not accredited for the test results marked *.<br>Information provided by the applicant is marked **.<br>Test results provided by external providers are marked ***.<br><br>When confirmation of authenticity of this test report is required, please contact www.hct.co.kr<br><br>This test report provides test result(s) under the scope accredited by the Korea Laboratory Accreditation Scheme (KOLAS), which signed the ILAC-MRA.<br>(KOLAS (KS Q ISO/IEC 17025) Accreditation No. KT197) |

## CONTENTS

**MEASUREMENT REPORT**

## 1. GENERAL INFORMATION

| | |
|---|---|
| Applicant Name: | LG Electronics Inc. |
| Address: | 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea |
| FCC ID: | 2BO3LTM18FNNABM0 |
| Application Type: | Certification |
| FCC Classification: | PCS Licensed Transmitter (PCB) |
| FCC Rule Part(s): | § 27 |
| EUT Type: | Telematics |
| Model(s): | TM18FNNABM0 |
| Voltage: | 4.2V |
| SCS(kHz): | 15 |
| Bandwidth(MHz): | 5, 10, 15, 20 |
| Waveform: | CP-OFDM, DFT-S-OFDM |
| Modulation: | DFT-S-OFDM: PI/2 BPSK, QPSK, 16 QAM, 64 QAM, 256 QAM<br>CP-OFDM: QPSK, 16 QAM, 64 QAM, 256 QAM |
| Tx Frequency: | 665.5 MHz – 695.5 MHz (Sub6 n71(5 MHz))<br>668.0 MHz – 693.0 MHz (Sub6 n71(10 MHz))<br>670.5 MHz – 690.5 MHz (Sub6 n71(15 MHz))<br>673.0 MHz – 688.0 MHz (Sub6 n71(20 MHz)) |
| Date(s) of Tests: | February 08, 2025 ~ June 13, 2025 |
| EUT Serial number: | Radiated : BMW ICON-25SF Radiated #1<br>Conducted : BMW ICON-25SF Conducted #3 |
| Antenna Information | Please refer to the Antenna Specification document. |

## 1.1. SUPPORTED BANDS PER ANTENNA PORT

| Antenna Port | Supported bands |
|---|---|
| MIMO 1 | - WCDMA: B2, 5<br>- LTE: B2, 4, 5, 7, 12, 13, 17, 25, 66, 26, 38, 42, 48, 71<br>- NR: n2, 5, 7, 12, 25, 41, 48, 66, 71, 77, 78 |
| MIMO 2 | - LTE: B42, 48<br>- NR: n48, 77, 78 |
| MIMO 3 | Only RX |
| MIMO 4 | Only RX |
| Int. BUA (Back Up Antenna) | - WCDMA: B2, 5<br>- LTE: B2, 4, 5, 7, 25, 26, 38, 66<br>- NR: n2, 5, 7, 25, 41, 66 |

Note:

1. Since the Int. BUA uses the same antenna port as MIMO1, only radiated testing was performed.

## 1.2. MAXIMUM OUTPUT POWER

| Mode (MHz) | Tx Frequency (MHz) | Emission Designator | Modulation | Conducted Output Power | |
|---|---|---|---|---|---|
| | | | | Max. Power (W) | Max. Power (dBm) |
| Sub6 n71 (5) | 665.5 - 695.5 | 4M49G7D | PI/2 BPSK | 0.206 | 23.14 |
| | | 4M52G7D | QPSK | 0.203 | 23.07 |
| | | 4M51W7D | 16 QAM | 0.169 | 22.28 |
| | | 4M48W7D | 64 QAM | 0.122 | 20.86 |
| | | 4M50W7D | 256 QAM | 0.078 | 18.90 |
| Sub6 n71 (10) | 668.0 - 693.0 | 8M96G7D | PI/2 BPSK | 0.206 | 23.13 |
| | | 8M96G7D | QPSK | 0.204 | 23.10 |
| | | 8M93W7D | 16 QAM | 0.171 | 22.33 |
| | | 8M97W7D | 64 QAM | 0.123 | 20.90 |
| | | 8M96W7D | 256 QAM | 0.077 | 18.87 |
| Sub6 n71 (15) | 670.5 - 690.5 | 13M5G7D | PI/2 BPSK | 0.201 | 23.04 |
| | | 13M4G7D | QPSK | 0.202 | 23.05 |
| | | 13M4W7D | 16 QAM | 0.167 | 22.22 |
| | | 13M4W7D | 64 QAM | 0.121 | 20.84 |
| | | 13M4W7D | 256 QAM | 0.075 | 18.76 |
| Sub6 n71 (20) | 673.0 - 688.0 | 18M0G7D | PI/2 BPSK | 0.203 | 23.07 |
| | | 17M9G7D | QPSK | 0.201 | 23.04 |
| | | 17M9W7D | 16 QAM | 0.168 | 22.25 |
| | | 17M9W7D | 64 QAM | 0.121 | 20.83 |
| | | 17M9W7D | 256 QAM | 0.075 | 18.73 |

# 2. INTRODUCTION

## 2.1. DESCRIPTION OF EUT

Please refer to the [3G] Test Report.

## 2.2. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

## 2.3. TEST FACILITY

The Fully-anechoic chamber and conducted measurement facility used to collect the radiated data are located at the **74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea**

# 3. DESCRIPTION OF TESTS

## 3.1 TEST PROCEDURE

| Test Description | Test Procedure Used |
|---|---|
| Occupied Bandwidth | - KDB 971168 D01 v03r01 – Section 4.3<br>- ANSI C63.26-2015 – Section 5.4.4 |
| Band Edge | - KDB 971168 D01 v03r01 – Section 6.0<br>- ANSI C63.26-2015 – Section 5.7 |
| Spurious and Harmonic Emissions at Antenna Terminal | - KDB 971168 D01 v03r01 – Section 6.0<br>- ANSI C63.26-2015 – Section 5.7 |
| Conducted Output Power | - N/A (See SAR Report) |
| Peak- to- Average Ratio | - KDB 971168 D01 v03r01 – Section 5.7<br>- ANSI C63.26-2015 – Section 5.2.3.4 |
| Frequency stability | - ANSI C63.26-2015 – Section 5.6 |
| Radiated Power | - ANSI C63.26-2015 – Section 5.2.4.4<br>- KDB 971168 D01 v03r01 – Section 5.8 |
| Radiated Spurious and Harmonic Emissions | - ANSI C63.26-2015 – Section 5.5.3<br>- KDB 971168 D01 v03r01 – Section 5.8 |

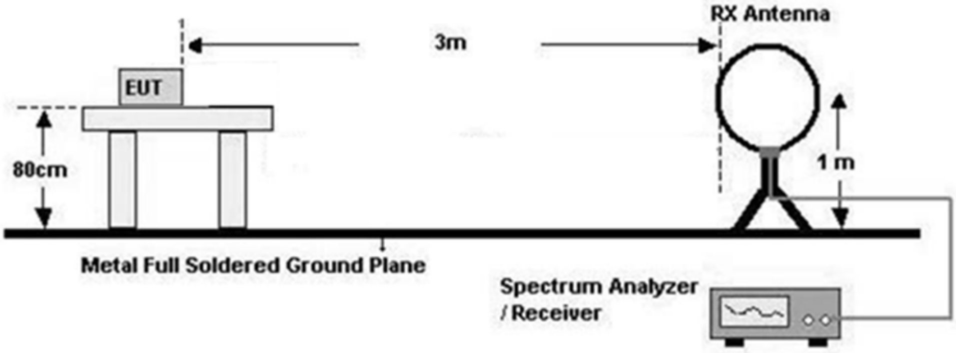
## 3.2 RADIATED POWER

Test Overview

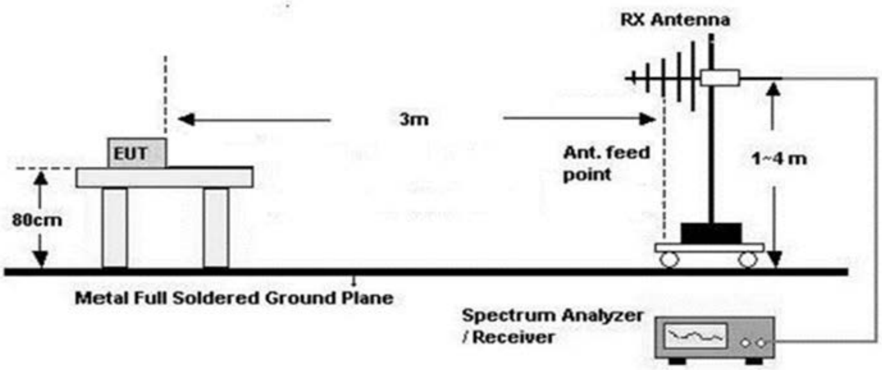
Radiated tests are performed in the semi-anechoic chamber. The equipment under test is placed on a non-conductive table on semi-anechoic chamber.

Test Configuration

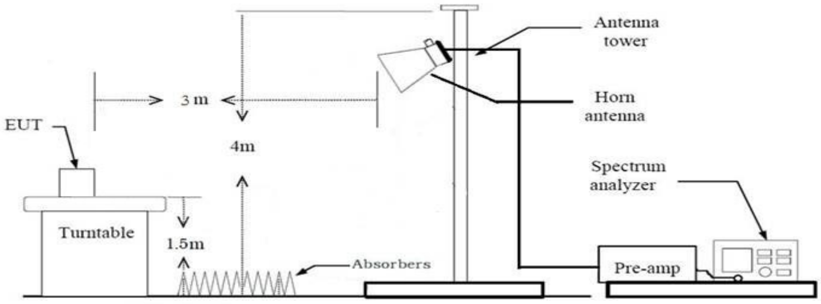
Below 30 MHz




30 MHz - 1 GHz




Above 1 GHz



Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5 % of the expected OBW, not to exceed 1 MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points > 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Note

1. The EUT is placed on a turntable, which is 0.8 m above ground plane. (Below 1 GHz)
2. The EUT is placed on a turntable, which is 1.5 m above ground plane. (Above 1 GHz)
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
6. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.
7. Total(dB V/m) = Measured Value(dB V) + Cable Loss(dB) + Antenna Factor(dB/m) + Distance Factor(D.F)
8. EIRP (dBm)
= Total (dB V/m) + 20 log D – 104.8 (where D is the measurement distance in meters. D=3)
= Total (dB V/m) - 95.2(dB)
9. ERP(dBm) = EIRP(dBm) - 2.15(dB)

### 3.3 RADIATED SPURIOUS EMISSIONS

**Test Overview**

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method.

**Test Settings**

1. RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points > 2 x span / RBW
5. Detector = Peak
6. Trace mode = Max Hold
7. The trace was allowed to stabilize
8. Test channel : Low/ Middle/ High
9. Frequency range : We are performed all frequency to $10^{th}$ harmonics from 9 kHz.

**Test Note**

1. Measurements value show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
2. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
   The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data
3. For spurious emissions above 1 GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
   The spurious emissions is calculated by the following formula;

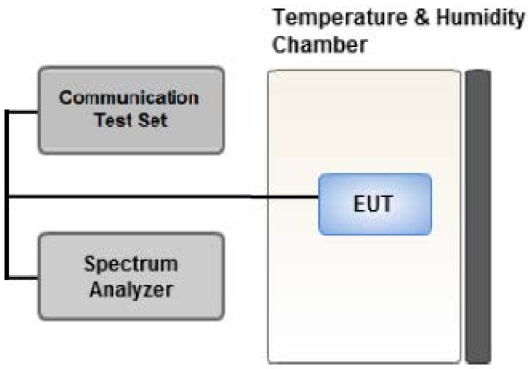
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   Where: $P_g$ is the generator output power into the substitution antenna.

   If the fundamental frequency is below 1 GHz, RF output power has been converted to EIRP.

$$\text{EIRP}_{(dBm)} = \text{ERP}_{(dBm)} + 2.15$$

### 3.4 PEAK- TO- AVERAGE RATIO



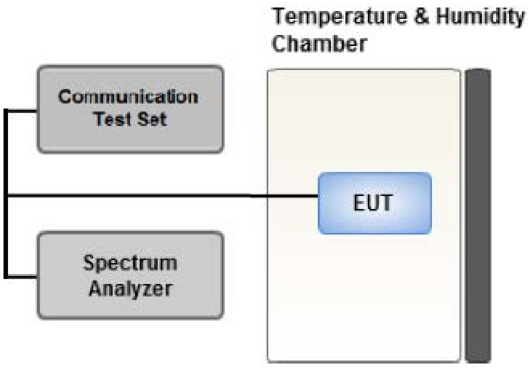

Test setup

CCDF Procedure for PAPR

Test Settings

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Set the measurement interval as follows:
   .- for continuous transmissions, set to 1 ms,
   .- or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
4. Record the maximum PAPR level associated with a probability of 0.1 %.

## 3.5 OCCUPIED BANDWIDTH.



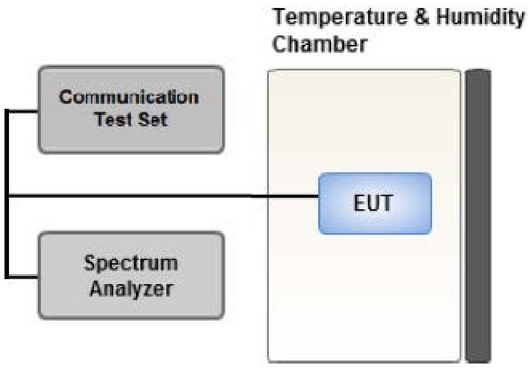

Test setup

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 power of a given emission.
The EUT makes a call to the communication simulator.
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5 % of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5 % of the 99 % occupied bandwidth observed in Step 7

## 3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL




Test setup

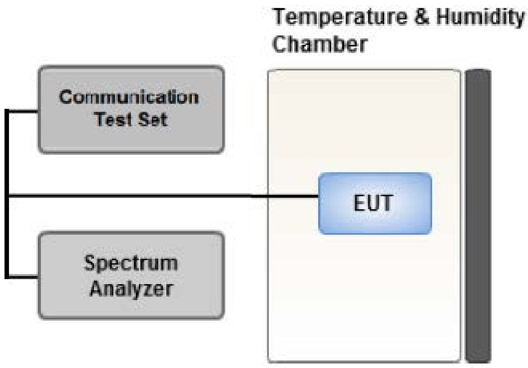
### Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

### Test Settings

1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = Peak
4. Trace Mode = Max Hold
5. Sweep time = auto
6. Number of points in sweep ≥ 2 x Span / RBW

## 3.7 BAND EDGE




Test setup

**Test Overview**

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of

operation were investigated and the worst case configuration results are reported in this section.

**Test Settings**

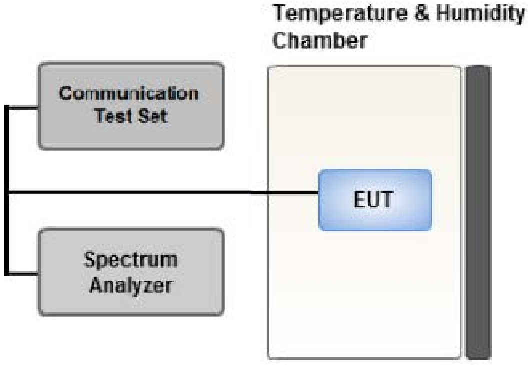
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1 % of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time > Number of points in sweep     Symbol period
9. The trace was allowed to stabilize

Test Notes

According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.
All measurements were done at 2 channels(low and high operational frequency range.)
The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

Where Margin < 1 dB the emission level is either corrected by 10 log(1 MHz/ RB) or the emission is integrated over a 1 MHz bandwidth to determine the final result. When using the integration method the integration window is either centered on the emission or, for emissions at the band edge, centered by an offset of 500 kHz from the block edge so that the integration window is the 1 MHz adjacent to the block edge.

## 3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE




Test setup

**Test Overview**

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015.
The frequency stability of the transmitter is measured by:

1. Temperature:
   The temperature is varied from -30 °C to +50 °C in 10 °C increments using an environmental chamber.
2. Primary Supply Voltage:
   .- Unless otherwise specified, vary primary supply voltage from 85 % to 115 % of the nominal value for other than hand carried battery equipment.
   .- 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.

**Test Settings**

1. The carrier frequency of the transmitter is measured at room temperature (20 °C to provide a reference).
2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter.
   Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10 °C intervals ranging from -30 °C to +50 °C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

### 3.9 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- All modes of operation were investigated and the worst case configuration results are reported.
  Mode: SA, NSA (Worst case: SA)
- Radiated Spurious emissions are measured while operating in EN-DC mode with Sub 6 NR carrier as well as an LTE carrier (anchor).
  All EN-DC mode of operation (=anchor) were investigated and the test results were measured No Peak Found.
  The test results which are attenuated more than 20 dB below the permissible value, so it was not reported.
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported. Please refer to the table below.
- In the case of radiated spurious emissions, all bandwidth of operation was investigated and the worst case bandwidth results are reported. (Worst case : 5 MHz)
- MIMO3 and MIMO4 have three types of Rx antennas. Operating modes were investigated for all Rx antennas, and the worst-case configuration results were reported.
  (Worst-case: HKL antenna(Maximum gain: 5dBi))

[ Worst case ]

| Test Description | Modulation | RB size | RB offset | Axis |
|---|---|---|---|---|
| Effective Radiated Power | PI/2 BPSK,<br>QPSK,<br>16 QAM,<br>64 QAM,<br>256 QAM | See Section 8.1 | | Z |
| Radiated Spurious and Harmonic Emissions | PI/2 BPSK | See Section 8.2 | | Y |

## 3.10 WORST CASE(CONDUCTED TEST)

- Waveform : All Waveform of operation were investigated and the worst case configuration results are reported.(Worst case: DFT-S-OFDM)
- Modulation : All Modulation of operation were investigated and the worst case configuration results are reported.(Worst case: PI/2 BPSK)
- All modes of operation were investigated and the worst case configuration results are reported. Mode: NSA, SA. (Worst case: SA)
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported. Please refer to the table below.
- Both 85% and 115% conditions were measured for the Frequency Stability test, and results for the worst-case configuration (85%) were reported.
- In accordance with the customer's specification of 3.7V as the lowest operating voltage, testing was performed at 3.7V instead of 85% (3.57V).

[ Worst case ]

| Test Description | Modulation | Bandwidth (MHz) | Frequency | RB size | RB offset |
|---|---|---|---|---|---|
| Occupied Bandwidth<br>Peak- to- Average Ratio | PI/2 BPSK, QPSK, 16 QAM, 64 QAM, 256 QAM | 5,10,15,20 | Mid | Full RB | 0 |
| Band Edge | PI/2 BPSK | 5 | Low | 1 | 0 |
| | | | High | 1 | 24 |
| | | 10 | Low | 1 | 0 |
| | | | High | 1 | 51 |
| | | 15 | Low | 1 | 0 |
| | | | High | 1 | 78 |
| | | 20 | Low | 1 | 0 |
| | | | High | 1 | 105 |
| | | 5,10,15,20 | Low, High | Full RB | 0 |
| Spurious and Harmonic Emissions at Antenna Terminal | PI/2 BPSK | 5,10,15,20 | Low, Mid, High | 1 | 1 |

## 4. LIST OF TEST EQUIPMENT

[Radiated]

| Equipment | Model | Manufacturer | Serial No. | Due to Calibration | Calibration Interval |
|---|---|---|---|---|---|
| RF Switch System | FBSR-04C(3G HPF+LNA) | TNM System | S4L1 | 03/12/2026 | Annual |
| RF Switch System | FBSR-04C(7G HPF+LNA) | TNM System | S4L5 | 03/12/2026 | Annual |
| RF Switch System | FBSR-04C(LNA) | TNM System | S4L4 | 03/12/2026 | Annual |
| RF Switch System | FBSR-04C(Thru) | TNM System | S4L6 | 03/12/2026 | Annual |
| Antenna Position Tower | MA4640 | Innco systems | S4AM | 08/07/2025 | Annual |
| Turn Table | DS2000-S | Innco systems | N/A | N/A | - |
| Controller (Antenna mast & Turn Table) | CO3000 | Innco systems | CO3000/1251/48920320/P | N/A | - |
| Amp & Filter Bank Switch Controller | FBSM-01B | TNM system | TM20090002 | N/A | - |
| RF Switching System | Switch box(1 G HPF+LNA) | HCT CO., LTD., | F2L2 | 12/12/2025 | Annual |
| RF Switching System | Switch box(3 G HPF+LNA) | HCT CO., LTD., | F2L3 | 12/12/2025 | Annual |
| RF Switching System | Switch box(LNA) | HCT CO., LTD., | F2L5 | 12/12/2025 | Annual |
| RF Switching System | Switch box(6 G HPF+LNA) | HCT CO., LTD., | F2L14 | 12/12/2025 | Annual |
| HIGHPASS FILTER | WHKX10-900-1000-15000-40SS | WAINWRIGHT INSTRUMENTS | 16 | 07/24/2025 | Annual |
| LOW NOISE AMPLIFIER | 310N | SONOMA Instrument | 186169 | 02/05/2026 | Annual |
| LOW NOISE AMPLIFIER | TK-PA1840H | TESTEK | 170011-L | 10/11/2025 | Annual |
| Power Amplifier | CBL18265035 | CERNEX | 22966 | 11/07/2025 | Annual |
| Power Amplifier | CBL26405040 | CERNEX | 25956 | 02/19/2026 | Annual |
| Power Splitter(DC ~ 26.5 GHz) | 11667B | Hewlett Packard | 5001 | 04/10/2026 | Annual |
| DC Power Supply | E3632A | Agilent | MY40010147 | 08/06/2025 | Annual |
| Dipole Antenna | UHAP | Schwarzbeck | 01274 | 03/10/2026 | Biennial |
| Dipole Antenna | UHAP | Schwarzbeck | 01288 | 08/07/2026 | Biennial |
| Horn Antenna(1 ~ 18 GHz) | BBHA 9120D | Schwarzbeck | 03197 | 11/28/2025 | Biennial |
| Horn Antenna(1 ~ 18 GHz) | BBHA 9120D | Schwarzbeck | 03201 | 11/28/2025 | Biennial |
| Horn Antenna(1 ~ 18 GHz) | BBHA 9120 | Schwarzbeck | 937 | 02/07/2027 | Biennial |
| Horn Antenna(15 ~ 40 GHz) | BBHA 9170 | Schwarzbeck | BBHA9170124 | 03/23/2027 | Biennial |
| Horn Antenna(15 ~ 40 GHz) | BBHA 9170 | Schwarzbeck | BBHA9170342 | 09/20/2026 | Biennial |

| Equipment | Model | Manufacturer | Serial No. | Due to Calibration | Calibration Interval |
|---|---|---|---|---|---|
| Spectrum Analyzer(10 Hz ~ 40 GHz) | FSV40 | ROHDE & SCHWARZ | 101733 | 09/19/2025 | Annual |
| Spectrum Analyzer(10 Hz ~ 40 GHz) | FSV40 | REOHDE & SCHWARZ | 101436 | 02/04/2026 | Annual |
| Signal & Spectrum Analyzer (2 Hz~67 GHz) | FSW67 | REOHDE & SCHWARZ | 101736 | 05/27/2026 | Annual |
| Base Station | 8960 (E5515C) | Agilent | MY48360800 | 08/05/2025 | Annual |
| Loop Antenna(9 kHz ~ 30 MHz) | FMZB1513 | Schwarzbeck | 1513-333 | 03/07/2026 | Biennial |
| Trilog Broadband Antenna | VULB 9168 | Schwarzbeck | 9168-0895 | 08/28/2026 | Biennial |
| Trilog Broadband Antenna | VULB9168 | Schwarzbeck | 895 | 08/28/2026 | Biennial |
| Trilog Broadband Antenna | VULB9168 | Schwarzbeck | 1135 | 08/19/2026 | Biennial |
| Wideband Radio Communication Tester | MT8821C | Anritsu Corp. | 6262287701 | 05/14/2026 | Annual |
| Wideband Radio Communication Tester | MT8000A | Anritsu Corp. | 6272613402 | 08/28/2025 | Annual |
| SIGNAL GENERATOR (100 kHz ~ 40 GHz) | SMB100A | REOHDE & SCHWARZ | 177633 | 07/26/2025 | Annual |
| Automation Software | FCC LTE Radiated | HCT CO., LTD | - | - | - |
| Automation Software | FCC NR Radiated | HCT CO., LTD | - | - | - |

[Conducted]

| Equipment | Model | Manufacturer | Serial No. | Due to Calibration | Calibration Interval |
|---|---|---|---|---|---|
| Power Splitter (DC ~ 26.5 GHz) | 11667B | Hewlett Packard | 5001 | 04/10/2026 | Annual |
| DC Power Supply | E3632A | Agilent | MY40010147 | 08/06/2025 | Annual |
| Chamber | SU-642 | ESPEC | 93008124 | 02/11/2026 | Annual |
| ATTENUATOR (20 dB) | 8493C | Hewlett Packard | 17280 | 04/10/2026 | Annual |
| Base Station | 8960 (E5515C) | Agilent | MY48360800 | 08/05/2025 | Annual |
| Wideband Radio Communication Tester | MT8821C | Anritsu Corp. | 6262094331 | 11/13/2025 | Annual |
| UXM 5G Wireless Test Platform | E7515B | KEYSIGHT | MY60101126 | 02/10/2026 | Annual |
| Signal Analyzer (2 Hz ~ 50.0 GHz) | N9030B | KEYSIGHT | MY56320554 | 02/03/2026 | Annual |
| FCC LTE Mobile Conducted RF Automation Test Software | - | HCT CO., LTD. | - | - | - |
| Automation Software | FCC 2G/3G/4G Conducted | HCT CO., LTD | – | – | – |
| Automation Software | FCC NR Conducted | HCT CO., LTD | – | – | – |

Note:

1. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
2. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

## 5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the $U_{CISPR}$ measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

| Parameter | Expanded Uncertainty (±kHz) |
|---|---|
| Occupied Bandwidth | 95 (Confidence level about 95 %, $k$=2) |
| Frequency stability | 28 (Confidence level about 95 %, $k$=2) |

| Parameter | Expanded Uncertainty (±dB) |
|---|---|
| Block Edge | 0.70 (Confidence level about 95 %, $k$=2) |
| Conducted Spurious Emissions | 1.18 (Confidence level about 95 %, $k$=2) |
| Peak- to- Average Ratio | 0.68 (Confidence level about 95 %, $k$=2) |
| Radiated Power | 4.74 (Confidence level about 95 %, $k$=2) |
| Radiated Disturbance (9 kHz ~ 30 MHz) | 4.36 (Confidence level about 95 %, $k$=2) |
| Radiated Disturbance (30 MHz ~ 1 GHz) | 5.68 (Confidence level about 95 %, $k$=2) |
| Radiated Disturbance (1 GHz ~ 18 GHz) | 5.75 (Confidence level about 95 %, $k$=2) |
| Radiated Disturbance (18 GHz ~ 40 GHz) | 5.82 (Confidence level about 95 %, $k$=2) |
| Radiated Disturbance (Above 40 GHz) | 5.58 (Confidence level about 95 %, $k$=2) |

## 6. SUMMARY OF TEST RESULTS

-. The decision rule applies ‘simple acceptance’

6.1 Test Condition: Conducted Test

| Test Description | FCC Part Section(s) | Test Limit | Test Result |
|---|---|---|---|
| Occupied Bandwidth | § 2.1049 | N/A | PASS |
| Band Edge / Spurious and Harmonic Emissions at Antenna Terminal. | § 2.1051, § 27.53(g) | < 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions | PASS |
| Conducted Output Power | § 2.1046 | N/A | Note[1] |
| Frequency stability / variation of ambient temperature | § 2.1055, § 27.54 | Emission must remain in band | PASS |

Note:

1. Refer to the SAR report.
2. Conducted tests were tested using 5G Wireless Tester.

6.2 Test Condition: Radiated Test

| Test Description | FCC Part Section(s) | Test Limit | Test Result |
|---|---|---|---|
| Effective Radiated Power | § 27.50(c)(10) | < 3 Watts max. ERP | PASS |
| Radiated Spurious and Harmonic Emissions | § 2.1053, § 27.53(g) | < 43 + 10log10 (P[Watts]) for all out-of band emissions | PASS |

Note:

1. Radiateded tests were tested using 5G Wireless Tester.

# 7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

| Ch./ Freq. | | Measured Level (dBm) | Substitute Level (dBm) | Ant. Gain (dBd) | C.L | Pol. | ERP | |
|---|---|---|---|---|---|---|---|---|
| channel | Freq.(MHz) | | | | | | W | dBm |
| 128 | 824.20 | -21.37 | 38.40 | -10.61 | 0.95 | H | 0.483 | 26.84 |

ERP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
2) During the test, the turn table is rotated until the maximum signal is found.
3) Record the field strength meter's level.
4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power.

7.2 EIRP Sample Calculation

| Ch./ Freq. | | Measured Level (dBm) | Substitute Level (dBm) | Ant. Gain (dBi) | C.L | Pol. | EIRP | |
|---|---|---|---|---|---|---|---|---|
| channel | Freq.(MHz) | | | | | | W | dBm |
| 20175 | 1,732.50 | -15.75 | 18.45 | 9.90 | 1.76 | H | 0.456 | 26.59 |

EIRP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
2) During the test, the turn table is rotated until the maximum signal is found.
3) Record the field strength meter's level.
4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.

## 7.3. Emission Designator

### GSM Emission Designator

Emission Designator = 249KGXW
GSM BW = 249 kHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

### EDGE Emission Designator

Emission Designator = 249KG7W
GSM BW = 249 kHz
G = Phase Modulation
7 = Quantized/Digital Info
W = Combination (Audio/Data)

### WCDMA Emission Designator

Emission Designator = 4M17F9W
WCDMA BW = 4.17 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data)

### QPSK Modulation

Emission Designator = 4M48G7D
LTE BW = 4.48 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

### QAM Modulation

Emission Designator = 4M48W7D
LTE BW = 4.48 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

# 8. TEST DATA

## 8.1 EFFECTIVE RADIATED POWER

| Freq (MHz) | Mod/ Bandwidth [SCS (kHz)] | Modulation | Measured (dBμV/m) | Ant. Factor + Dis. Factor(dB) | Cable loss(dB) | Total (dBμV/m) | Pol. | Limit | ERP | | RB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm | Size | Offset |
| 665.5 | Sub6 n71/ 5 MHz [15 kHz] | PI/2 BPSK | 91.33 | 28.14 | 2.34 | 121.81 | H | < 3.00 | 0.279 | 24.46 | 1 | 1 |
| | | QPSK | 91.33 | 28.14 | 2.34 | 121.81 | H | | 0.279 | 24.46 | | |
| | | 16-QAM | 90.17 | 28.14 | 2.34 | 120.65 | H | | 0.214 | 23.30 | | |
| | | 64-QAM | 89.41 | 28.14 | 2.34 | 119.89 | H | | 0.179 | 22.54 | | |
| | | 256-QAM | 87.43 | 28.14 | 2.34 | 117.91 | H | | 0.114 | 20.56 | | |
| 680.5 | | PI/2 BPSK | 92.02 | 28.24 | 2.37 | 122.62 | H | | 0.337 | 25.27 | 1 | 23 |
| | | QPSK | 91.95 | 28.24 | 2.37 | 122.56 | H | | 0.332 | 25.21 | | |
| | | 16-QAM | 91.19 | 28.24 | 2.37 | 121.80 | H | | 0.279 | 24.45 | | |
| | | 64-QAM | 90.43 | 28.24 | 2.37 | 121.04 | H | | 0.234 | 23.69 | | |
| | | 256-QAM | 88.45 | 28.24 | 2.37 | 119.06 | H | | 0.148 | 21.71 | | |
| 695.5 | | PI/2 BPSK | 92.76 | 28.44 | 2.39 | 123.59 | H | | 0.421 | 26.24 | 1 | 1 |
| | | QPSK | 92.59 | 28.44 | 2.39 | 123.42 | H | | 0.405 | 26.07 | | |
| | | 16-QAM | 92.00 | 28.44 | 2.39 | 122.83 | H | | 0.353 | 25.48 | | |
| | | 64-QAM | 91.24 | 28.44 | 2.39 | 122.07 | H | | 0.297 | 24.72 | | |
| | | 256-QAM | 89.26 | 28.44 | 2.39 | 120.09 | H | | 0.188 | 22.74 | | |

| Freq (MHz) | Mod/ Bandwidth [SCS (kHz)] | Modulation | Measured (dBµV/m) | Ant. Factor + Dis. Factor(dB) | Cable loss(dB) | Total (dBµV/m) | Pol. | Limit | ERP | | RB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm | Size | Offset |
| 668.0 | Sub6 n71/ 10 MHz [15 kHz] | PI/2 BPSK | 90.86 | 28.14 | 2.34 | 121.34 | H | < 3.00 | 0.251 | 23.99 | 1 | 1 |
| | | QPSK | 90.81 | 28.14 | 2.34 | 121.28 | H | | 0.247 | 23.93 | | |
| | | 16-QAM | 89.79 | 28.14 | 2.34 | 120.27 | H | | 0.196 | 22.92 | | |
| | | 64-QAM | 89.03 | 28.14 | 2.34 | 119.51 | H | | 0.164 | 22.16 | | |
| | | 256-QAM | 87.05 | 28.14 | 2.34 | 117.53 | H | | 0.104 | 20.18 | | |
| 680.5 | | PI/2 BPSK | 92.06 | 28.24 | 2.37 | 122.67 | H | | 0.340 | 25.32 | 1 | 50 |
| | | QPSK | 92.01 | 28.24 | 2.37 | 122.62 | H | | 0.336 | 25.27 | | |
| | | 16-QAM | 91.03 | 28.24 | 2.37 | 121.64 | H | | 0.269 | 24.29 | | |
| | | 64-QAM | 90.27 | 28.24 | 2.37 | 120.88 | H | | 0.225 | 23.53 | | |
| | | 256-QAM | 87.92 | 28.24 | 2.37 | 118.53 | H | | 0.131 | 21.18 | | |
| 693.0 | | PI/2 BPSK | 92.65 | 28.44 | 2.39 | 123.48 | H | | 0.410 | 26.13 | 1 | 26 |
| | | QPSK | 92.65 | 28.44 | 2.39 | 123.48 | H | | 0.410 | 26.13 | | |
| | | 16-QAM | 91.52 | 28.44 | 2.39 | 122.35 | H | | 0.316 | 25.00 | | |
| | | 64-QAM | 89.91 | 28.44 | 2.39 | 120.74 | H | | 0.218 | 23.39 | | |
| | | 256-QAM | 87.93 | 28.44 | 2.39 | 118.76 | H | | 0.138 | 21.41 | | |

| Freq (MHz) | Mod/ Bandwidth [SCS (kHz)] | Modulation | Measured (dBμV/m) | Ant. Factor + Dis. Factor(dB) | Cable loss(dB) | Total (dBμV/m) | Pol. | Limit | ERP | | RB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm | Size | Offset |
| 670.5 | Sub6 n71/ 15 MHz [15 kHz] | PI/2 BPSK | 90.91 | 28.14 | 2.34 | 121.38 | H | < 3.00 | 0.253 | 24.03 | 1 | 77 |
| | | QPSK | 90.76 | 28.14 | 2.34 | 121.23 | H | | 0.245 | 23.88 | | |
| | | 16-QAM | 90.15 | 28.14 | 2.34 | 120.62 | H | | 0.213 | 23.27 | | |
| | | 64-QAM | 89.39 | 28.14 | 2.34 | 119.86 | H | | 0.178 | 22.51 | | |
| | | 256-QAM | 87.41 | 28.14 | 2.34 | 117.88 | H | | 0.113 | 20.53 | | |
| 680.5 | | PI/2 BPSK | 92.11 | 28.24 | 2.37 | 122.72 | H | | 0.344 | 25.37 | 1 | 77 |
| | | QPSK | 91.90 | 28.24 | 2.37 | 122.50 | H | | 0.328 | 25.15 | | |
| | | 16-QAM | 90.89 | 28.24 | 2.37 | 121.50 | H | | 0.260 | 24.15 | | |
| | | 64-QAM | 89.40 | 28.24 | 2.37 | 120.01 | H | | 0.185 | 22.66 | | |
| | | 256-QAM | 87.42 | 28.24 | 2.37 | 118.03 | H | | 0.117 | 20.68 | | |
| 690.5 | | PI/2 BPSK | 92.31 | 28.44 | 2.39 | 123.14 | H | | 0.379 | 25.79 | 1 | 77 |
| | | QPSK | 92.28 | 28.44 | 2.39 | 123.11 | H | | 0.376 | 25.76 | | |
| | | 16-QAM | 91.33 | 28.44 | 2.39 | 122.16 | H | | 0.303 | 24.81 | | |
| | | 64-QAM | 89.79 | 28.44 | 2.39 | 120.62 | H | | 0.212 | 23.27 | | |
| | | 256-QAM | 87.81 | 28.44 | 2.39 | 118.64 | H | | 0.134 | 21.29 | | |

| Freq (MHz) | Mod/ Bandwidth [SCS (kHz)] | Modulation | Measured (dBμV/m) | Ant. Factor + Dis. Factor(dB) | Cable loss(dB) | Total (dBμV/m) | Pol. | Limit | ERP | | RB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm | Size | Offset |
| 673.0 | Sub6 n71/ 20 MHz [15 kHz] | PI/2 BPSK | 91.73 | 28.14 | 2.34 | 122.21 | H | < 3.00 | 0.306 | 24.86 | 1 | 104 |
| | | QPSK | 91.71 | 28.14 | 2.34 | 122.19 | H | | 0.305 | 24.84 | | |
| | | 16-QAM | 90.68 | 28.14 | 2.34 | 121.16 | H | | 0.241 | 23.81 | | |
| | | 64-QAM | 89.92 | 28.14 | 2.34 | 120.40 | H | | 0.202 | 23.05 | | |
| | | 256-QAM | 87.78 | 28.14 | 2.34 | 118.26 | H | | 0.123 | 20.91 | | |
| 680.5 | | PI/2 BPSK | 92.29 | 28.24 | 2.37 | 122.89 | H | | 0.358 | 25.54 | 1 | 104 |
| | | QPSK | 92.04 | 28.24 | 2.37 | 122.65 | H | | 0.339 | 25.30 | | |
| | | 16-QAM | 91.13 | 28.24 | 2.37 | 121.74 | H | | 0.275 | 24.39 | | |
| | | 64-QAM | 89.68 | 28.24 | 2.37 | 120.29 | H | | 0.197 | 22.94 | | |
| | | 256-QAM | 87.70 | 28.24 | 2.37 | 118.31 | H | | 0.125 | 20.96 | | |
| 688.0 | | PI/2 BPSK | 92.23 | 28.44 | 2.39 | 123.06 | H | | 0.372 | 25.71 | 1 | 53 |
| | | QPSK | 91.97 | 28.44 | 2.39 | 122.79 | H | | 0.350 | 25.44 | | |
| | | 16-QAM | 91.47 | 28.44 | 2.39 | 122.30 | H | | 0.313 | 24.95 | | |
| | | 64-QAM | 90.71 | 28.44 | 2.39 | 121.54 | H | | 0.262 | 24.19 | | |
| | | 256-QAM | 88.73 | 28.44 | 2.39 | 119.56 | H | | 0.166 | 22.21 | | |

## 8.2 RADIATED SPURIOUS EMISSIONS

- NR Band: N71
- Bandwidth: 5 MHz
- Modulation: PI/2 BPSK
- Distance: 3 meters
- SCS: 15 kHz

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L | Pol | Result (dBm) | Limit (dBm) | RB | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Size | Size |
| 133100 (665.5) | 1 331.00 | -38.85 | 7.01 | -50.58 | 1.78 | V | -45.35 | -13.00 | 1 | 1 |
| | 1 996.50 | -42.41 | 9.41 | -55.58 | 2.30 | H | -48.47 | -13.00 | | |
| | 2 662.00 | -52.26 | 10.51 | -62.98 | 2.67 | H | -55.14 | -13.00 | | |
| | 3 327.50 | -53.91 | 11.10 | -62.48 | 2.99 | H | -54.37 | -13.00 | | |
| | 3 993.00 | -52.33 | 11.35 | -58.95 | 3.24 | V | -50.84 | -13.00 | | |
| | 4 658.50 | -54.68 | 11.90 | -59.06 | 3.55 | V | -50.71 | -13.00 | | |
| 136100 (680.5) | 1 361.00 | -37.94 | 7.31 | -49.93 | 1.81 | H | -44.43 | -13.00 | 1 | 23 |
| | 2 041.50 | -16.78 | 9.46 | -28.71 | 2.25 | H | -21.50 | -13.00 | | |
| | 2 722.00 | -51.87 | 10.61 | -62.77 | 2.60 | V | -54.76 | -13.00 | | |
| | 3 402.50 | -41.43 | 11.23 | -50.28 | 2.97 | V | -42.02 | -13.00 | | |
| | 4 083.00 | -53.70 | 11.57 | -59.94 | 3.32 | H | -51.69 | -13.00 | | |
| | 4 763.50 | -54.18 | 11.62 | -57.62 | 3.63 | V | -49.63 | -13.00 | | |
| 139100 (695.5) | 1 391.00 | -38.62 | 7.65 | -51.45 | 1.87 | V | -45.67 | -13.00 | 1 | 1 |
| | 2 086.50 | -15.57 | 9.51 | -26.81 | 2.30 | H | -19.60 | -13.00 | | |
| | 2 782.00 | -52.38 | 10.60 | -63.09 | 2.64 | V | -55.13 | -13.00 | | |
| | 3 477.50 | -37.56 | 11.54 | -46.50 | 3.02 | V | -37.98 | -13.00 | | |
| | 4 173.00 | -53.62 | 11.72 | -59.40 | 3.39 | H | -51.07 | -13.00 | | |
| | 4 868.50 | -54.79 | 11.36 | -56.33 | 3.68 | V | -48.65 | -13.00 | | |

### 8.3 PEAK-TO-AVERAGE RATIO

| Band | Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resource Block Offset | Data (dB) |
|---|---|---|---|---|---|---|
| Sub6 n71 | 5 MHz | 680.5 | BPSK | 25 | 0 | 4.97 |
| | | | QPSK | | | 5.85 |
| | | | 16-QAM | | | 6.36 |
| | | | 64-QAM | | | 6.73 |
| | | | 256-QAM | | | 6.75 |
| | 10 MHz | | BPSK | 50 | | 4.73 |
| | | | QPSK | | | 5.58 |
| | | | 16-QAM | | | 6.27 |
| | | | 64-QAM | | | 6.64 |
| | | | 256-QAM | | | 6.74 |
| | 15 MHz | | BPSK | 75 | | 4.89 |
| | | | QPSK | | | 5.55 |
| | | | 16-QAM | | | 6.25 |
| | | | 64-QAM | | | 6.42 |
| | | | 256-QAM | | | 6.67 |
| | 20 MHz | | BPSK | 100 | | 4.34 |
| | | | QPSK | | | 5.48 |
| | | | 16-QAM | | | 6.25 |
| | | | 64-QAM | | | 6.35 |
| | | | 256-QAM | | | 6.58 |

**Note:**

1. Plots of the EUT’s Peak- to- Average Ratio are shown Page 41 ~ 60.

2. Peak- to- Average Ratio is not required. These values are reported for information only.

## 8.4 OCCUPIED BANDWIDTH

| Band | Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resource Block Offset | Data (MHz) |
|---|---|---|---|---|---|---|
| Sub6 n71 | 5 MHz | 680.5 | BPSK | 25 | 0 | 4.4891 |
| | | | QPSK | | | 4.5180 |
| | | | 16-QAM | | | 4.5059 |
| | | | 64-QAM | | | 4.4819 |
| | | | 256-QAM | | | 4.5005 |
| | 10 MHz | | BPSK | 50 | | 8.9550 |
| | | | QPSK | | | 8.9563 |
| | | | 16-QAM | | | 8.9297 |
| | | | 64-QAM | | | 8.9663 |
| | | | 256-QAM | | | 8.9546 |
| | 15 MHz | | BPSK | 75 | | 13.489 |
| | | | QPSK | | | 13.421 |
| | | | 16-QAM | | | 13.408 |
| | | | 64-QAM | | | 13.441 |
| | | | 256-QAM | | | 13.433 |
| | 20 MHz | | BPSK | 100 | | 17.968 |
| | | | QPSK | | | 17.875 |
| | | | 16-QAM | | | 17.877 |
| | | | 64-QAM | | | 17.896 |
| | | | 256-QAM | | | 17.858 |

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 61 ~ 80.

## 8.5 CONDUCTED SPURIOUS EMISSIONS

| Band | Band Width (MHz) | Frequency (MHz) | Frequency of Maximum Harmonic (GHz) | Factor (dB) | Measurement Maximum Data (dBm) | Result (dBm) | Limit (dBm) |
|---|---|---|---|---|---|---|---|
| Sub6 n71 | 5 | 665.5 | 3.7987 | 29.320 | -60.810 | -31.490 | -13.00 |
| | | 680.5 | 4.0180 | 29.320 | -61.309 | -31.989 | |
| | | 695.5 | 3.7887 | 29.320 | -61.175 | -31.855 | |
| | 10 | 668.0 | 5.2144 | 29.910 | -61.450 | -31.540 | |
| | | 680.5 | 3.7987 | 29.320 | -61.412 | -32.092 | |
| | | 693.0 | 3.7887 | 29.320 | -61.964 | -32.644 | |
| | 15 | 670.5 | 9.7807 | 29.910 | -61.804 | -31.894 | |
| | | 680.5 | 3.8186 | 29.320 | -61.500 | -32.180 | |
| | | 690.5 | 3.7488 | 29.320 | -61.999 | -32.679 | |
| | 20 | 673.0 | 6.0319 | 29.910 | -61.081 | -31.171 | |
| | | 680.5 | 4.9452 | 29.320 | -61.812 | -32.492 | |
| | | 688.0 | 3.9981 | 29.320 | -62.150 | -32.830 | |

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 81 ~ 92.
2. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
3. Factor(dB) = Cable Loss + Attenuator + Splitter

| Frequency Range (GHz) | Factor [dB] |
|---|---|
| 0.03 – 1 | 27.250 |
| 1 – 5 | 29.320 |
| 5 – 10 | 29.910 |
| 10 – 15 | 30.530 |
| 15 – 20 | 31.840 |
| Above 20(26.5) | 32.520 |

## 8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 93 ~ 124.

## 8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

- ▣ BandWidth: 5 MHz
- ▣ Voltage(100 %): 4.200 VDC
- ▣ Lowest voltage: 3.700 VDC
- ▣ LIMIT: Emission must remain in band

| Test. Frequncy (MHz) | Voltage (%) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 665.5 | 100 % | +20(Ref) | 665 499 997 | 0.0 | 0.000 000 | 0.000 |
| | 100 % | -30 | 665 499 993 | -3.9 | -0.000 001 | -0.006 |
| | 100 % | -20 | 665 499 994 | -2.6 | 0.000 000 | -0.004 |
| | 100 % | -10 | 665 499 997 | -0.2 | 0.000 000 | 0.000 |
| | 100 % | 0 | 665 499 995 | -2.4 | 0.000 000 | -0.004 |
| | 100 % | +10 | 665 499 993 | -4.0 | -0.000 001 | -0.006 |
| | 100 % | +30 | 665 499 993 | -4.3 | -0.000 001 | -0.006 |
| | 100 % | +40 | 665 499 992 | -4.8 | -0.000 001 | -0.007 |
| | 100 % | +50 | 665 499 993 | -3.8 | -0.000 001 | -0.006 |
| | Lowest voltage | +20 | 665 499 993 | -4.0 | -0.000 001 | -0.006 |
| 695.5 | 100 % | +20(Ref) | 695 500 000 | 0.0 | 0.000 000 | 0.000 |
| | 100 % | -30 | 695 500 001 | 0.7 | 0.000 000 | 0.001 |
| | 100 % | -20 | 695 500 000 | 0.2 | 0.000 000 | 0.000 |
| | 100 % | -10 | 695 500 000 | 0.2 | 0.000 000 | 0.000 |
| | 100 % | 0 | 695 500 002 | 1.8 | 0.000 000 | 0.003 |
| | 100 % | +10 | 695 500 000 | 0.0 | 0.000 000 | 0.000 |
| | 100 % | +30 | 695 499 998 | -1.8 | 0.000 000 | -0.003 |
| | 100 % | +40 | 695 500 001 | 1.3 | 0.000 000 | 0.002 |
| | 100 % | +50 | 695 500 001 | 1.0 | 0.000 000 | 0.001 |
| | Lowest voltage | +20 | 695 500 001 | 0.8 | 0.000 000 | 0.001 |

- BandWidth: 10 MHz
- Voltage(100 %): 4.200 VDC
- Lowest voltage: 3.700 VDC
- LIMIT: Emission must remain in band

| Test. Frequncy (MHz) | Voltage (%) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 668.0 | 100 % | +20(Ref) | 667 999 994 | 0.0 | 0.000 000 | 0.000 |
| | 100 % | -30 | 667 999 988 | -6.4 | -0.000 001 | -0.010 |
| | 100 % | -20 | 667 999 989 | -5.9 | -0.000 001 | -0.009 |
| | 100 % | -10 | 667 999 988 | -6.4 | -0.000 001 | -0.010 |
| | 100 % | 0 | 667 999 988 | -6.6 | -0.000 001 | -0.010 |
| | 100 % | +10 | 667 999 987 | -7.2 | -0.000 001 | -0.011 |
| | 100 % | +30 | 667 999 987 | -7.3 | -0.000 001 | -0.011 |
| | 100 % | +40 | 667 999 987 | -7.6 | -0.000 001 | -0.011 |
| | 100 % | +50 | 667 999 988 | -6.2 | -0.000 001 | -0.009 |
| | Lowest voltage | +20 | 667 999 988 | -6.4 | -0.000 001 | -0.010 |
| 693.0 | 100 % | +20(Ref) | 662 999 993 | 0.0 | 0.000 000 | 0.000 |
| | 100 % | -30 | 662 999 989 | -4.2 | -0.000 001 | -0.006 |
| | 100 % | -20 | 662 999 989 | -4.2 | -0.000 001 | -0.006 |
| | 100 % | -10 | 662 999 989 | -4.2 | -0.000 001 | -0.006 |
| | 100 % | 0 | 662 999 989 | -4.0 | -0.000 001 | -0.006 |
| | 100 % | +10 | 662 999 990 | -3.0 | 0.000 000 | -0.004 |
| | 100 % | +30 | 662 999 990 | -3.1 | 0.000 000 | -0.005 |
| | 100 % | +40 | 662 999 987 | -6.0 | -0.000 001 | -0.009 |
| | 100 % | +50 | 662 999 988 | -5.3 | -0.000 001 | -0.008 |
| | Lowest voltage | +20 | 662 999 988 | -4.9 | -0.000 001 | -0.007 |

▣ BandWidth: 15 MHz

▣ Voltage(100 %): 4.200 VDC

▣ Lowest voltage: 3.700 VDC

▣ LIMIT: Emission must remain in band

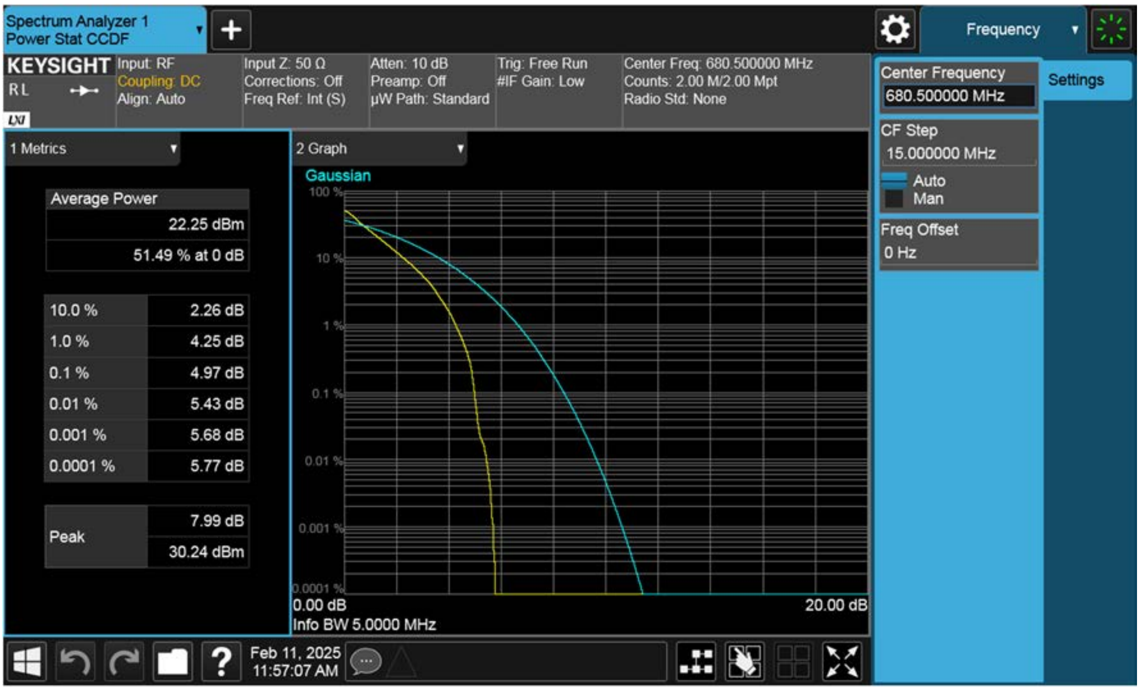
| Test. Frequncy (MHz) | Voltage (%) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 670.5 | 100 % | +20(Ref) | 670 499 991 | 0.0 | 0.000 000 | 0.000 |
| | 100 % | -30 | 670 499 983 | -8.5 | -0.000 001 | -0.013 |
| | 100 % | -20 | 670 499 981 | -9.8 | -0.000 001 | -0.015 |
| | 100 % | -10 | 670 499 981 | -10.5 | -0.000 002 | -0.016 |
| | 100 % | 0 | 670 499 981 | -10.3 | -0.000 002 | -0.015 |
| | 100 % | +10 | 670 499 980 | -11.0 | -0.000 002 | -0.016 |
| | 100 % | +30 | 670 499 980 | -11.2 | -0.000 002 | -0.017 |
| | 100 % | +40 | 670 499 982 | -8.9 | -0.000 001 | -0.013 |
| | 100 % | +50 | 670 499 983 | -7.8 | -0.000 001 | -0.012 |
| | Lowest voltage | +20 | 670 499 982 | -8.9 | -0.000 001 | -0.013 |
| 690.5 | 100 % | +20(Ref) | 690 499 993 | 0.0 | 0.000 000 | 0.000 |
| | 100 % | -30 | 690 499 985 | -7.7 | -0.000 001 | -0.011 |
| | 100 % | -20 | 690 499 987 | -5.8 | -0.000 001 | -0.008 |
| | 100 % | -10 | 690 499 988 | -4.8 | -0.000 001 | -0.007 |
| | 100 % | 0 | 690 499 988 | -5.0 | -0.000 001 | -0.007 |
| | 100 % | +10 | 690 499 988 | -4.8 | -0.000 001 | -0.007 |
| | 100 % | +30 | 690 499 988 | -5.4 | -0.000 001 | -0.008 |
| | 100 % | +40 | 690 499 986 | -6.9 | -0.000 001 | -0.010 |
| | 100 % | +50 | 690 499 987 | -6.2 | -0.000 001 | -0.009 |
| | Lowest voltage | +20 | 690 499 986 | -7.2 | -0.000 001 | -0.010 |

- BandWidth: 20 MHz
- Voltage(100 %): 4.200 VDC
- Lowest voltage: 3.700 VDC
- LIMIT: Emission must remain in band

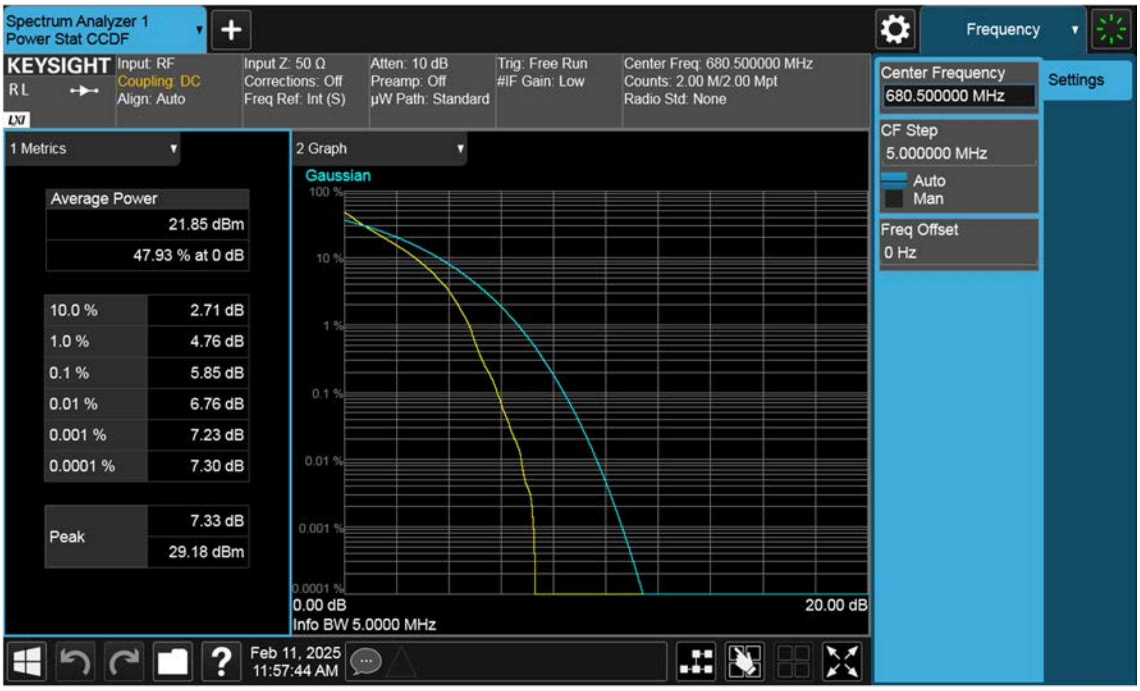
| Test. Frequncy (MHz) | Voltage (%) | Temp. (°C) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 673.0 | 100 % | +20(Ref) | 672 999 999 | 0.0 | 0.000 000 | 0.000 |
| | 100 % | -30 | 672 999 995 | -3.4 | -0.000 001 | -0.005 |
| | 100 % | -20 | 672 999 996 | -2.5 | 0.000 000 | -0.004 |
| | 100 % | -10 | 672 999 996 | -2.3 | 0.000 000 | -0.003 |
| | 100 % | 0 | 672 999 995 | -3.7 | -0.000 001 | -0.006 |
| | 100 % | +10 | 672 999 994 | -5.1 | -0.000 001 | -0.008 |
| | 100 % | +30 | 672 999 995 | -3.1 | 0.000 000 | -0.005 |
| | 100 % | +40 | 672 999 998 | -0.3 | 0.000 000 | -0.001 |
| | 100 % | +50 | 672 999 998 | -0.7 | 0.000 000 | -0.001 |
| | Lowest voltage | +20 | 672 999 996 | -2.2 | 0.000 000 | -0.003 |
| 688.0 | 100 % | +20(Ref) | 687 999 998 | 0.0 | 0.000 000 | 0.000 |
| | 100 % | -30 | 687 999 997 | -1.5 | 0.000 000 | -0.002 |
| | 100 % | -20 | 687 999 996 | -1.7 | 0.000 000 | -0.003 |
| | 100 % | -10 | 687 999 995 | -2.8 | 0.000 000 | -0.004 |
| | 100 % | 0 | 687 999 996 | -2.2 | 0.000 000 | -0.003 |
| | 100 % | +10 | 687 999 996 | -2.2 | 0.000 000 | -0.003 |
| | 100 % | +30 | 687 999 996 | -2.0 | 0.000 000 | -0.003 |
| | 100 % | +40 | 687 999 996 | -2.5 | 0.000 000 | -0.004 |
| | 100 % | +50 | 687 999 996 | -2.5 | 0.000 000 | -0.004 |
| | Lowest voltage | +20 | 687 999 995 | -3.1 | 0.000 000 | -0.004 |

# 9. TEST PLOTS

NR71_5 M_PAR_Mid_BPSK_FullRB



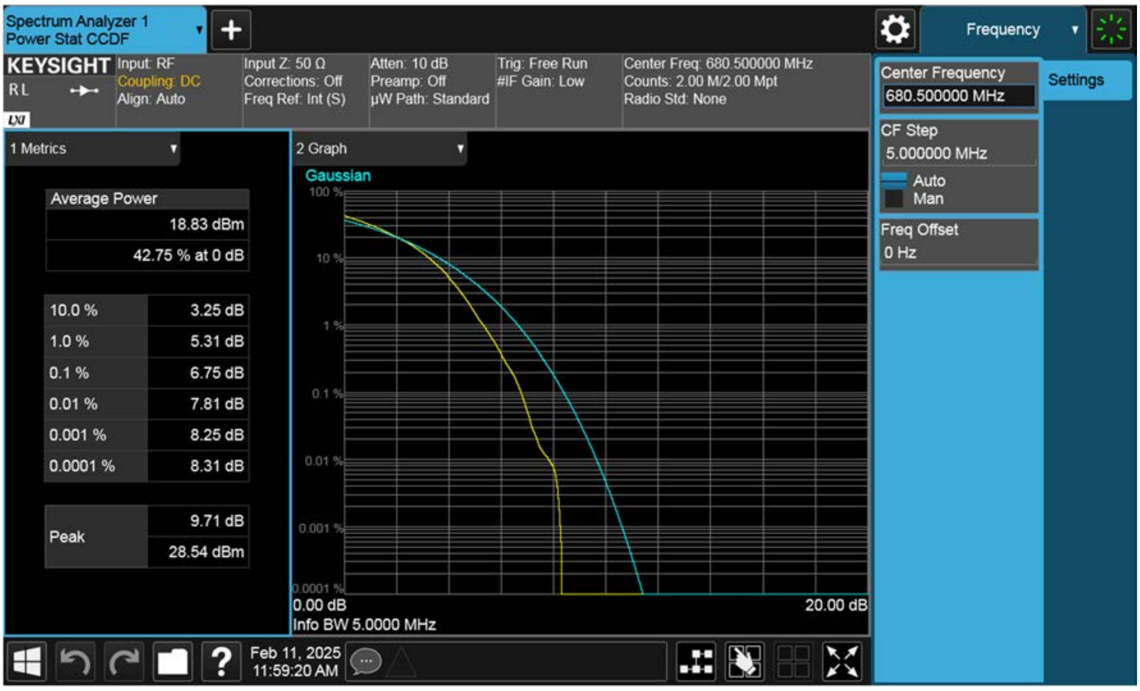
NR71_5 M_PAR_Mid_QPSK_FullRB



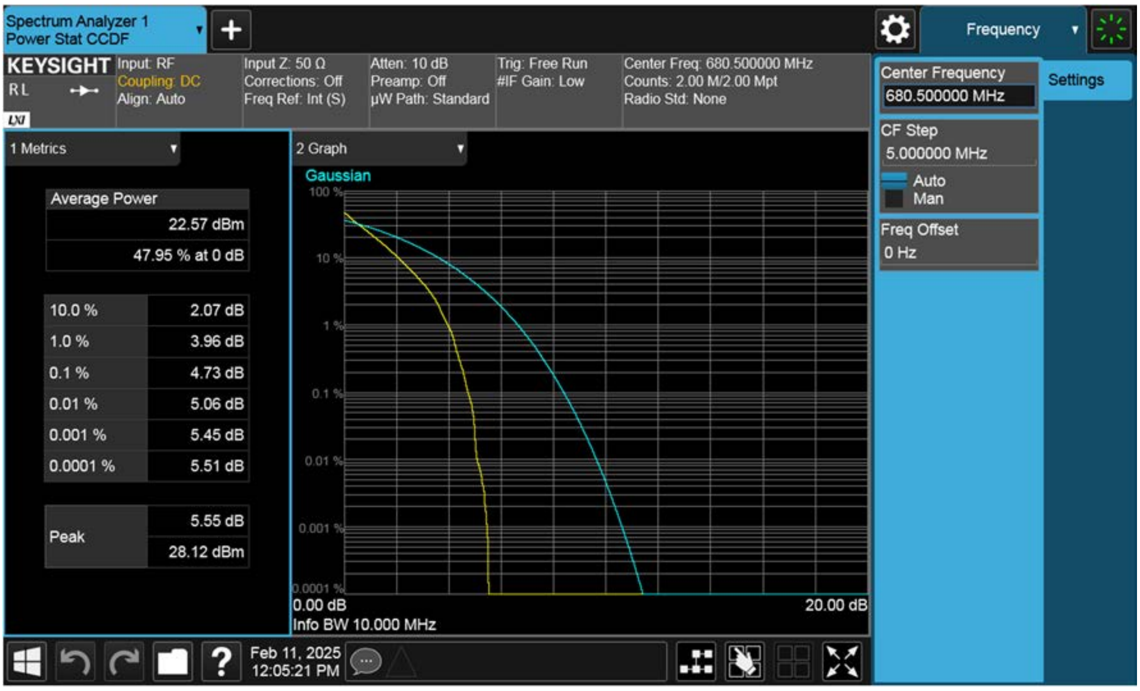
NR71_5 M_PAR_Mid_16QAM_FullRB

NR71_5 M_PAR_Mid_64QAM_FullRB

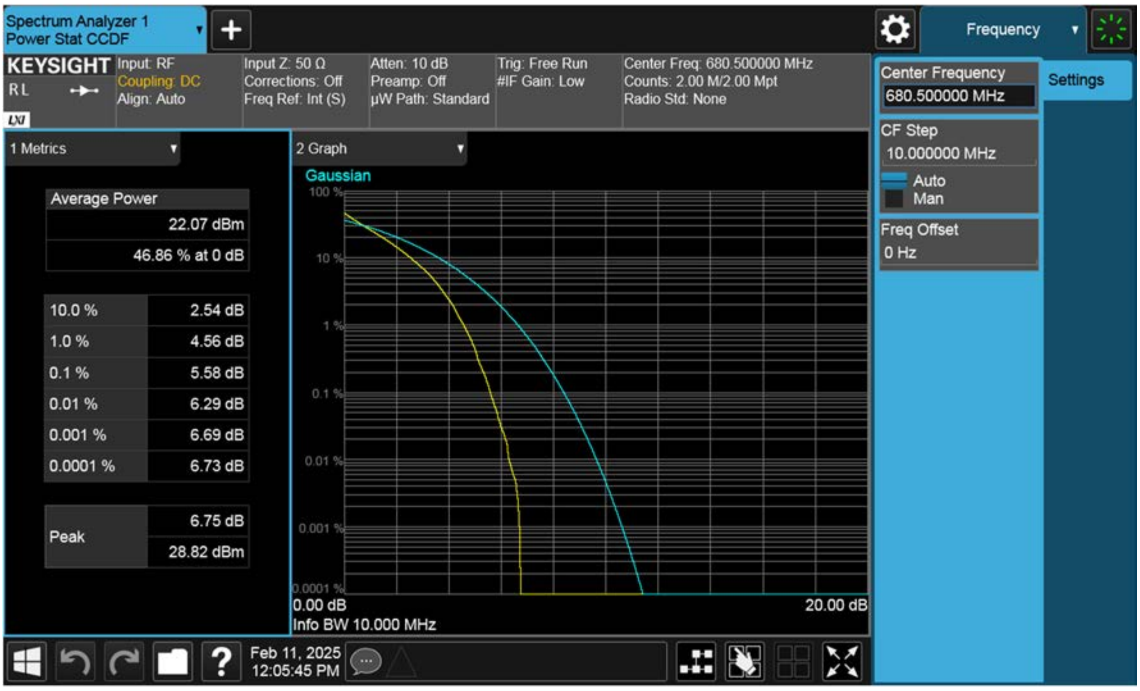
NR71_5 M_PAR_Mid_256QAM_FullRB



NR71_10 M_PAR_Mid_BPSK_FullRB



NR71_10 M_PAR_Mid_QPSK_FullRB

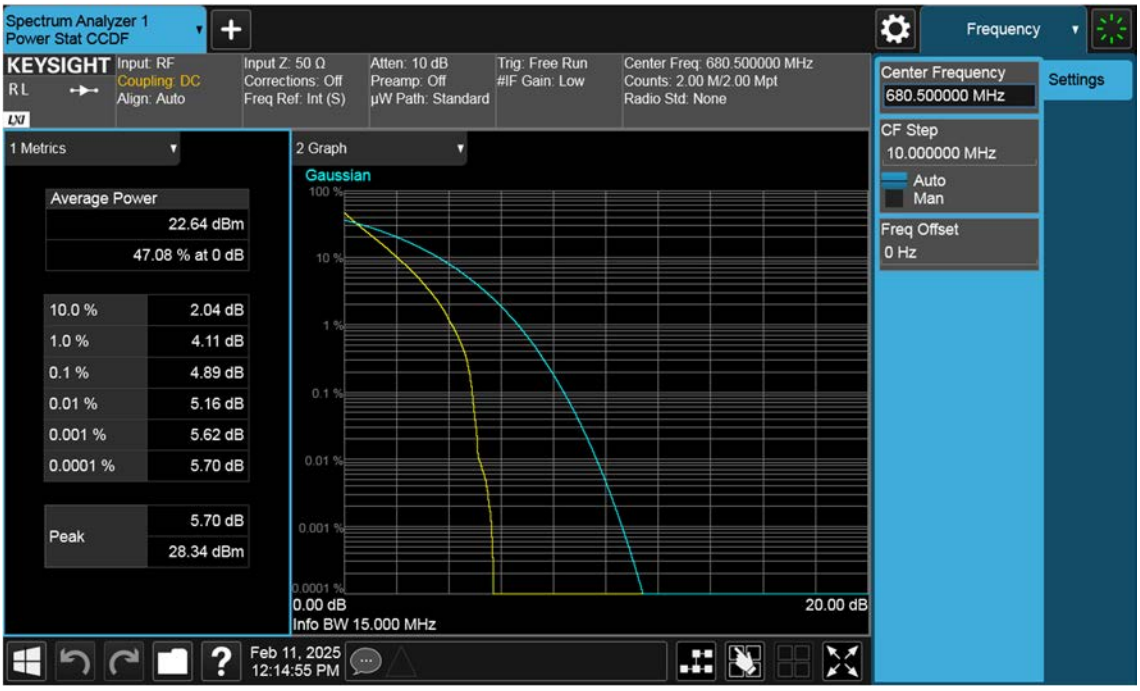


NR71_10 M_PAR_Mid_16QAM_FullRB

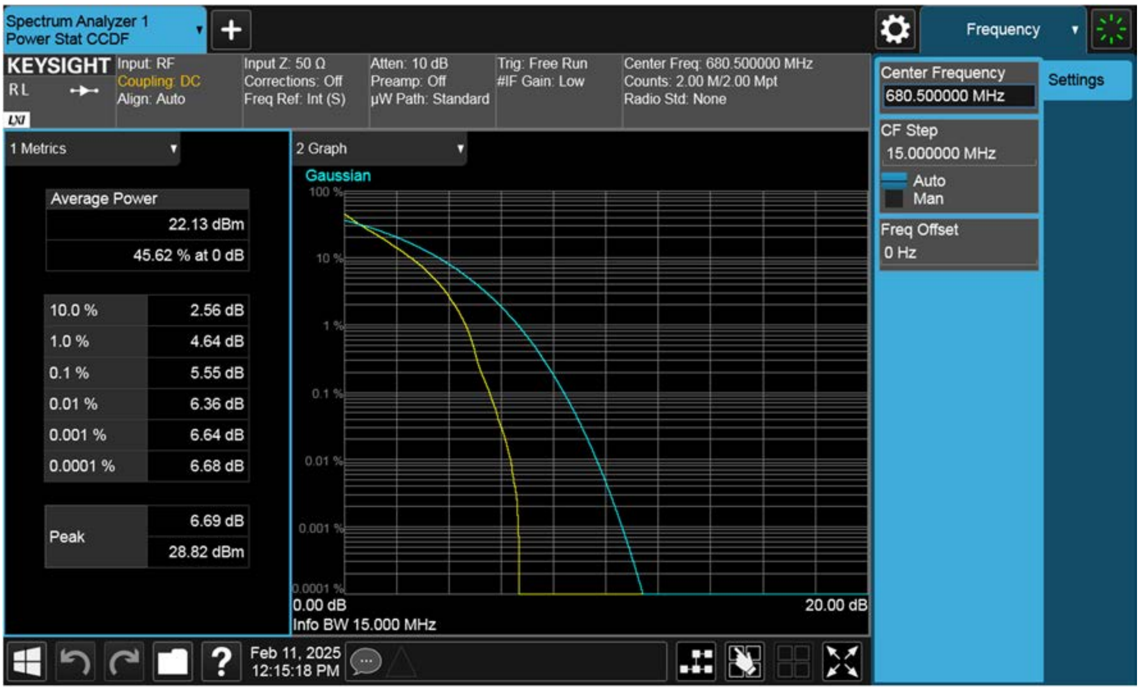
NR71_10 M_PAR_Mid_64QAM_FullRB

NR71_10 M_PAR_Mid_256QAM_FullRB

NR71_15 M_PAR_Mid_BPSK_FullRB



NR71_15 M_PAR_Mid_QPSK_FullRB

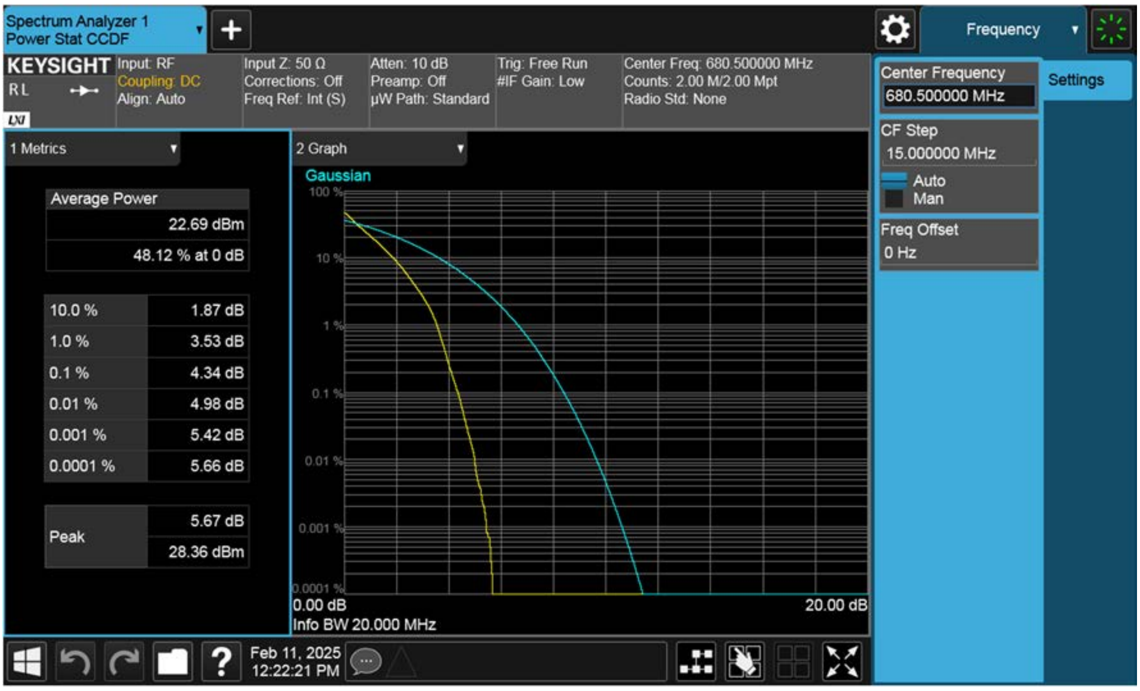


NR71_15 M_PAR_Mid_16QAM_FullRB

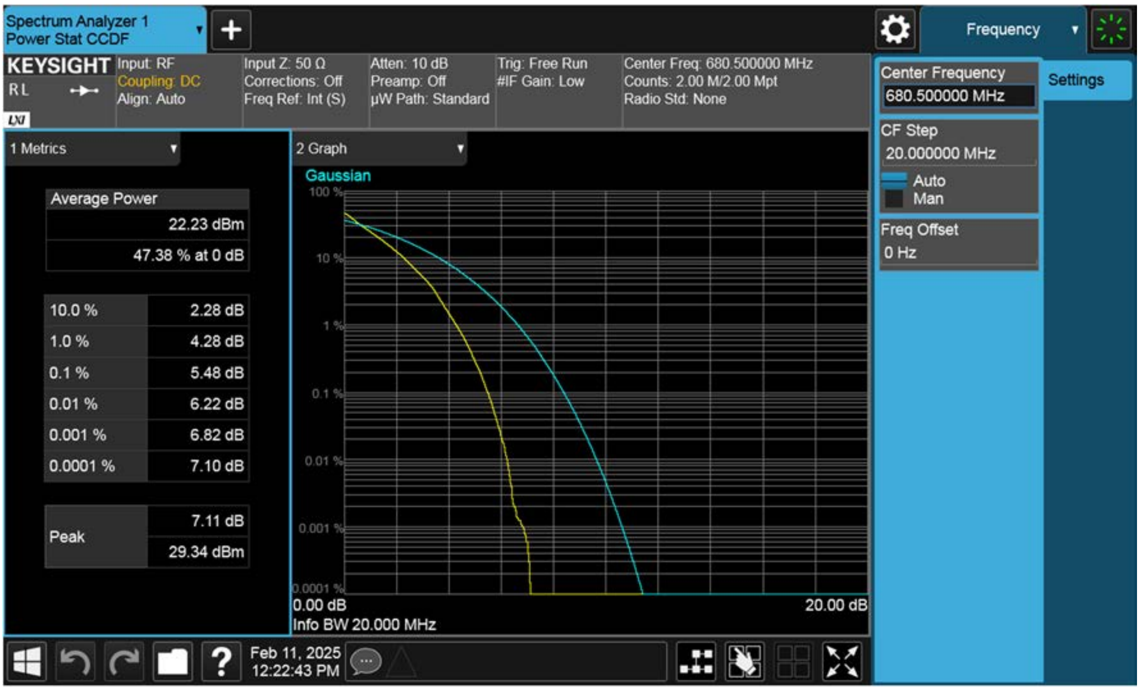
NR71_15 M_PAR_Mid_64QAM_FullRB

NR71_15 M_PAR_Mid_256QAM_FullRB

NR71_20 M_PAR_Mid_BPSK_FullRB



NR71_20 M_PAR_Mid_QPSK_FullRB



NR71_20 M_PAR_Mid_16QAM_FullRB

NR71_20 M_PAR_Mid_64QAM_FullRB

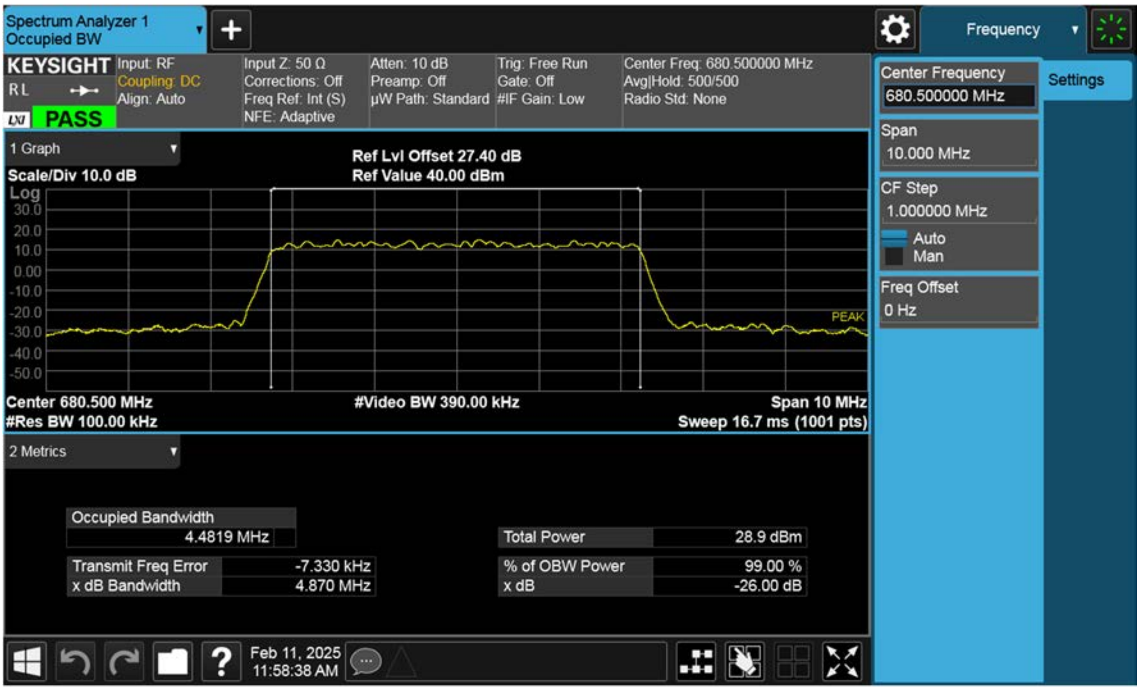
NR71_20 M_PAR_Mid_256QAM_FullRB

NR71_5 M_OBW_Mid_BPSK_FullRB

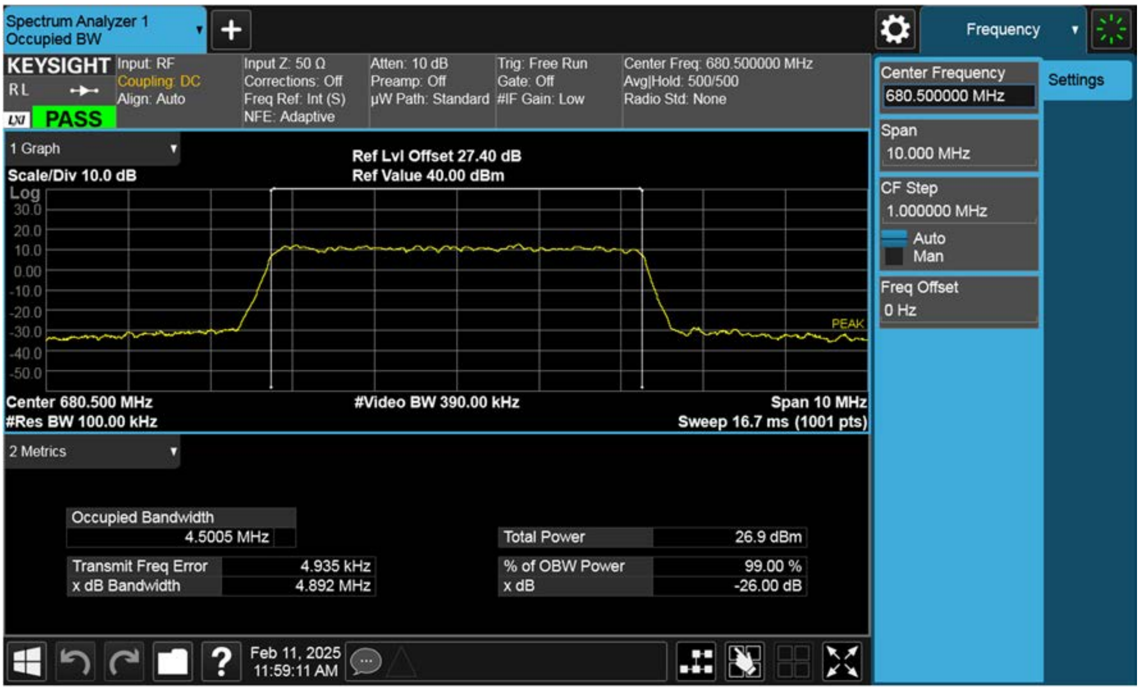
NR71_5 M_OBW_Mid_QPSK_FullRB

NR71_5 M_OBW_Mid_16QAM_FullRB

NR71_5 M_OBW_Mid_64QAM_FullRB



NR71_5 M_OBW_Mid_256QAM_FullRB



NR71_10 M_OBW_Mid_BPSK_FullRB

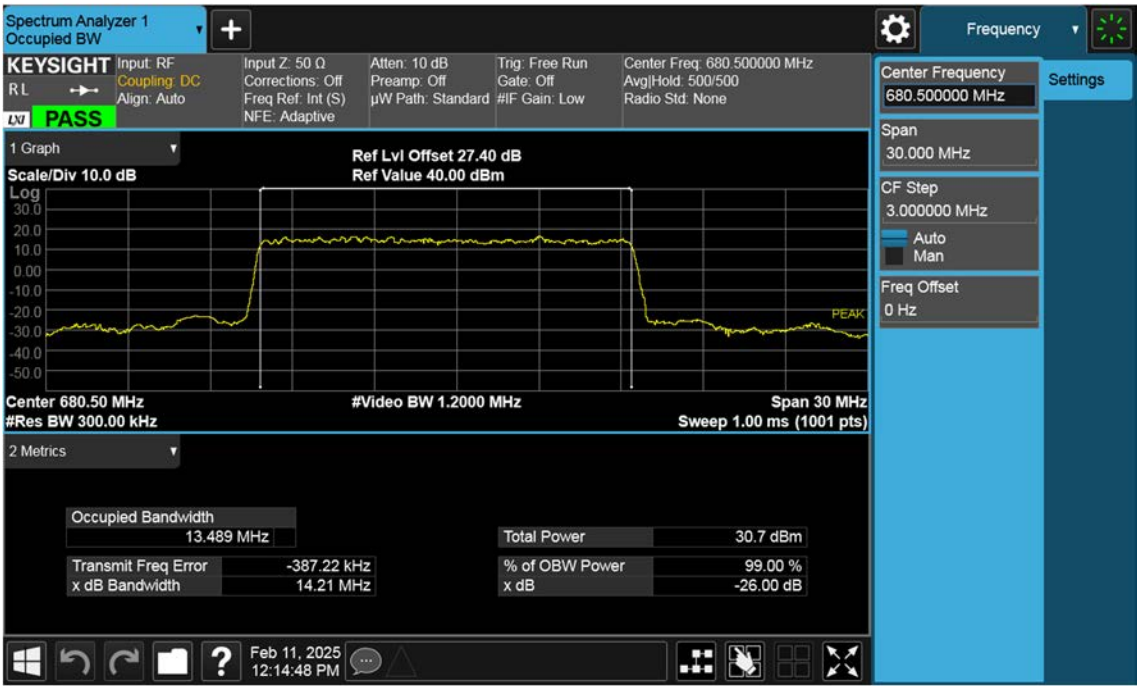
NR71_10 M_OBW_Mid_QPSK_FullRB

NR71_10 M_OBW_Mid_16QAM_FullRB

NR71_10 M_OBW_Mid_64QAM_FullRB

NR71_10 M_OBW_Mid_256QAM_FullRB

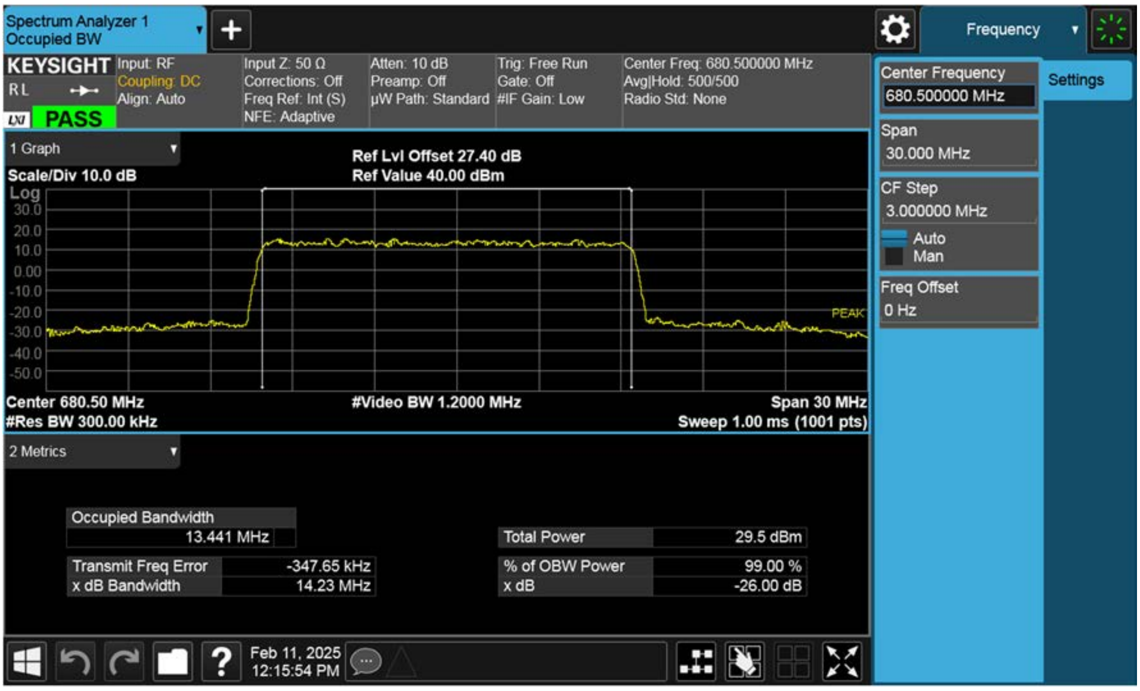
NR71_15 M_OBW_Mid_BPSK_FullRB



NR71_15 M_OBW_Mid_QPSK_FullRB

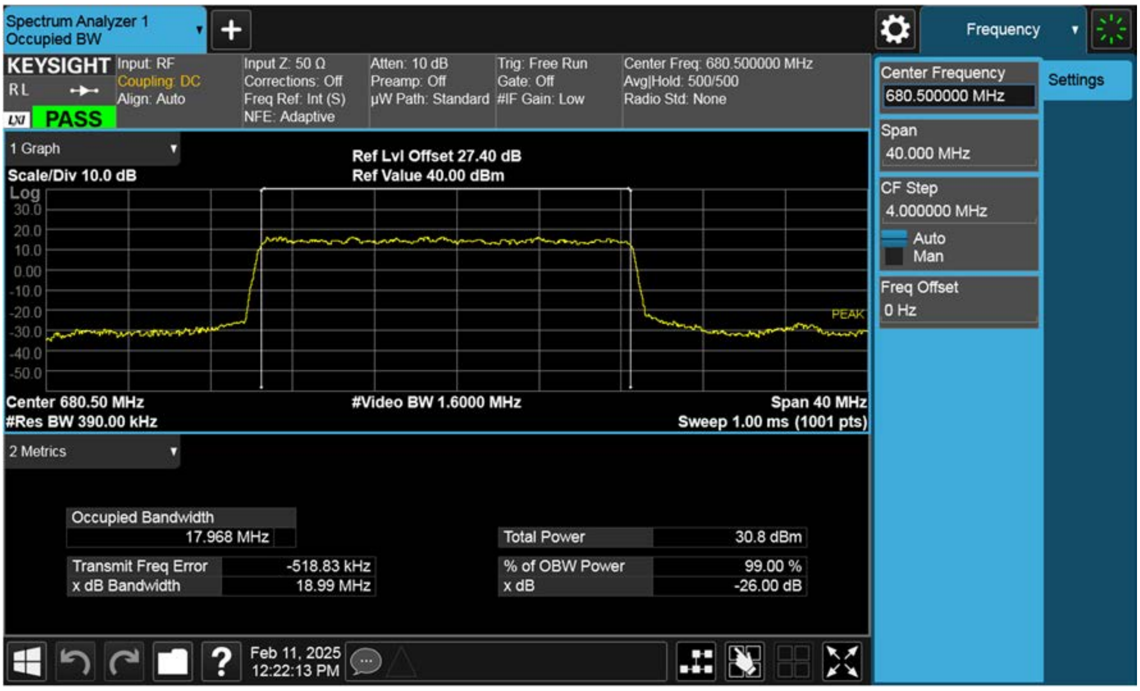
NR71_15 M_OBW_Mid_16QAM_FullRB

NR71_15 M_OBW_Mid_64QAM_FullRB



NR71_15 M_OBW_Mid_256QAM_FullRB

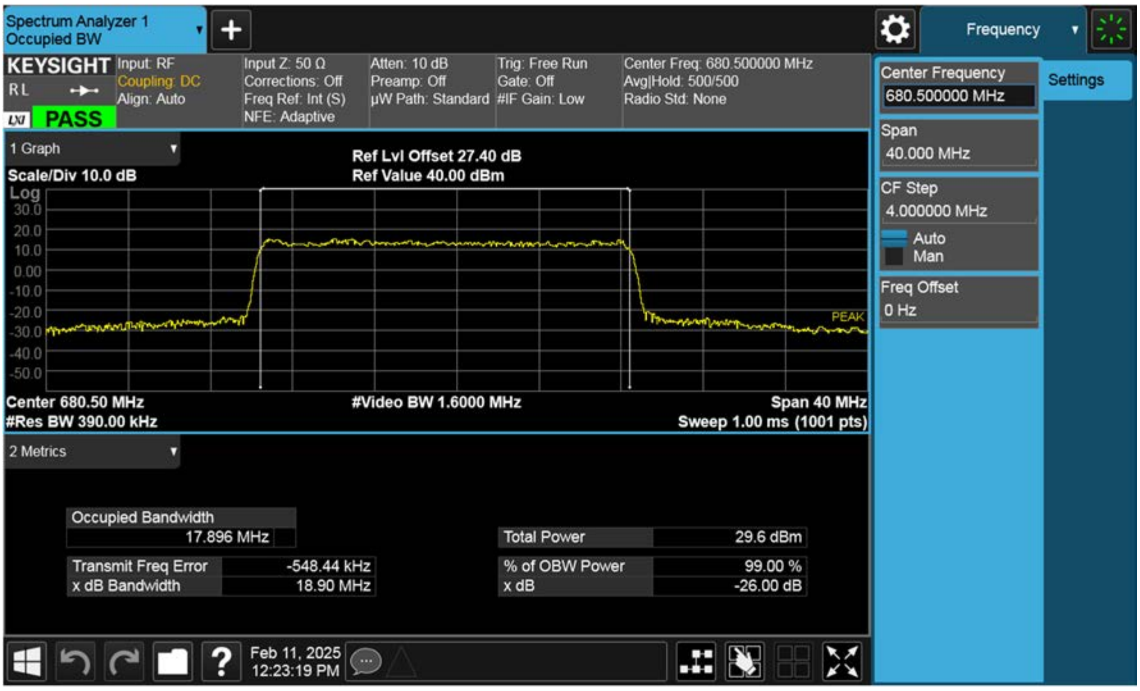
NR71_20 M_OBW_Mid_BPSK_FullRB



NR71_20 M_OBW_Mid_QPSK_FullRB

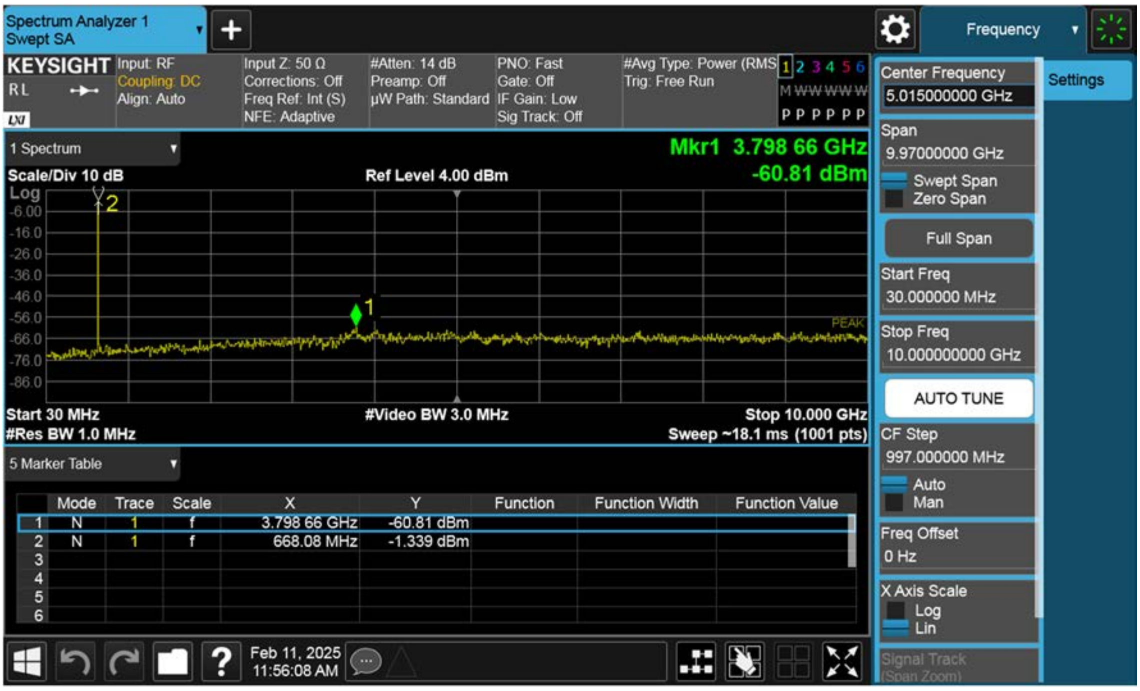
NR71_20 M_OBW_Mid_16QAM_FullRB

NR71_20 M_OBW_Mid_64QAM_FullRB

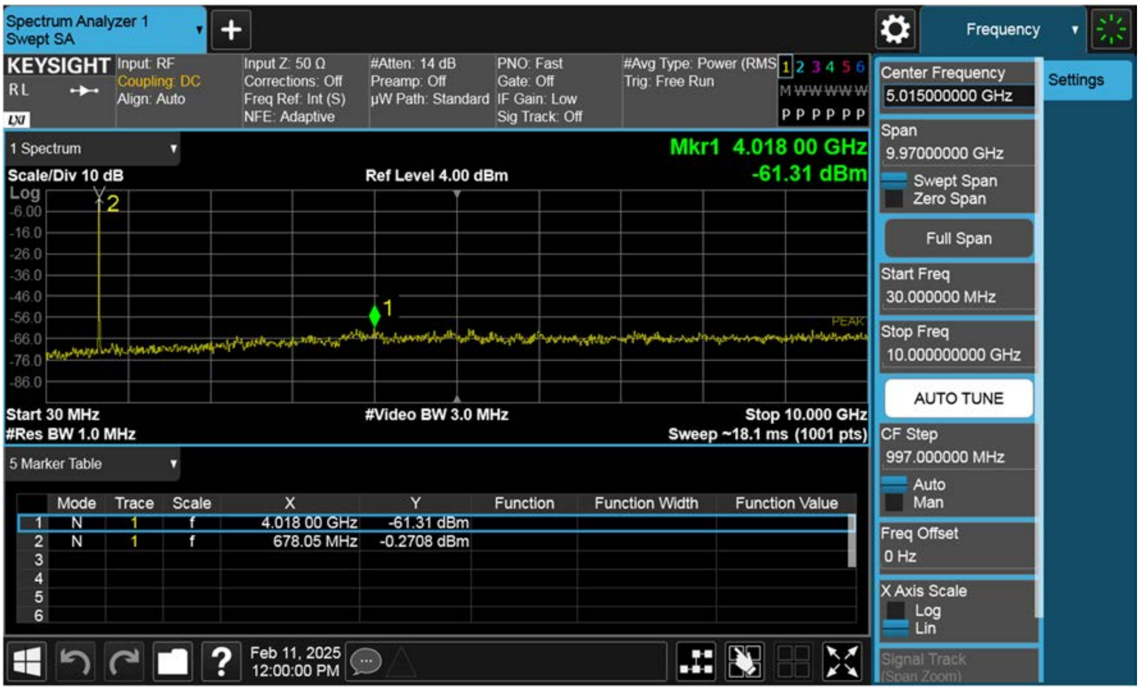


NR71_20 M_OBW_Mid_256QAM_FullRB

NR71_5 M_Conducted Spurious(30 M-10 G)_Low_BPSK_1RB

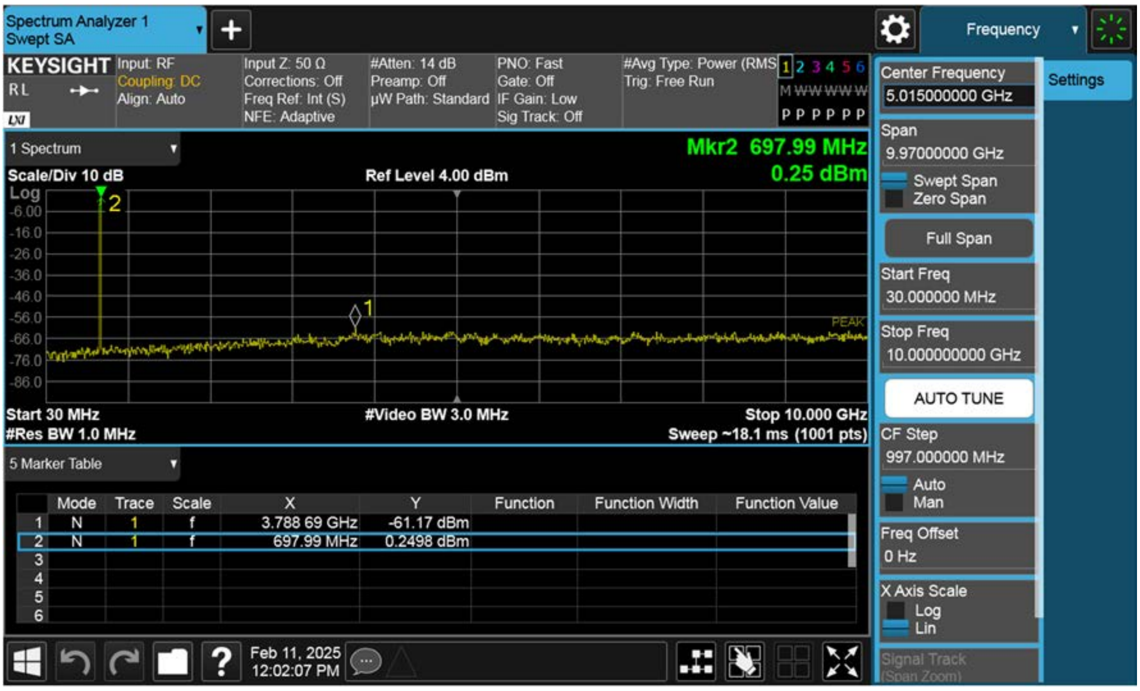


NR71_5 M_Conducted Spurious(30 M-10 G)_Mid_BPSK_1RB

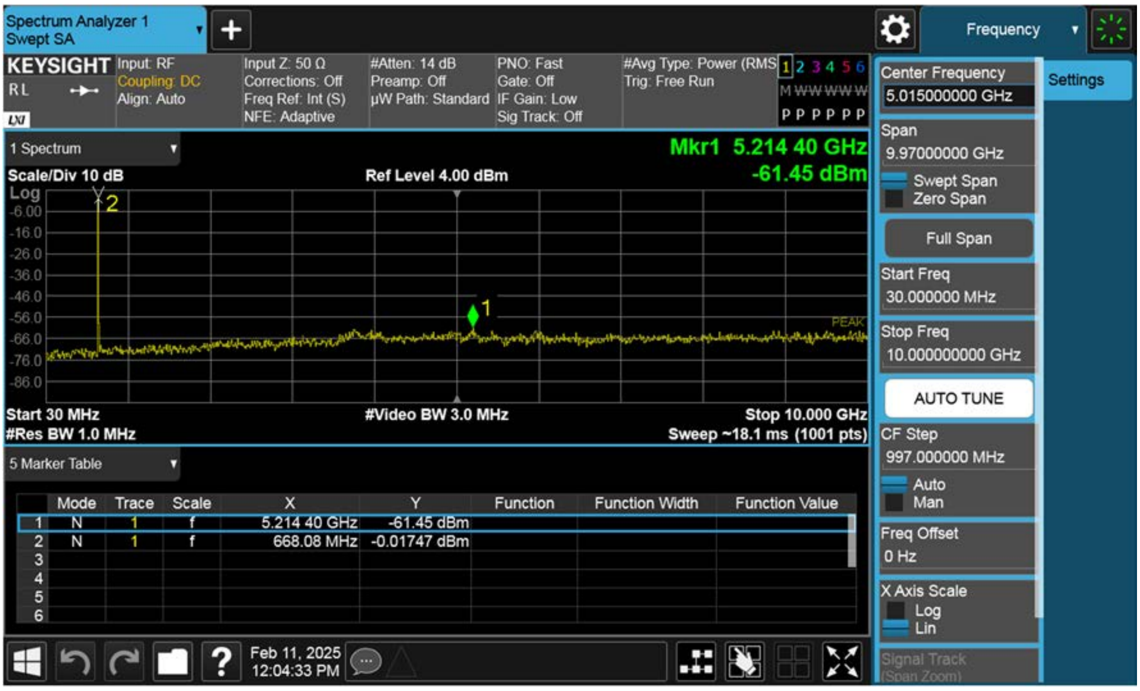



| | Mode | Trace | Scale | X | Y | Function | Function Width | Function Value |
|---|---|---|---|---|---|---|---|---|
| 1 | N | 1 | f | 4.018 00 GHz | -61.31 dBm | | | |
| 2 | N | 1 | f | 678.05 MHz | -0.2708 dBm | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |

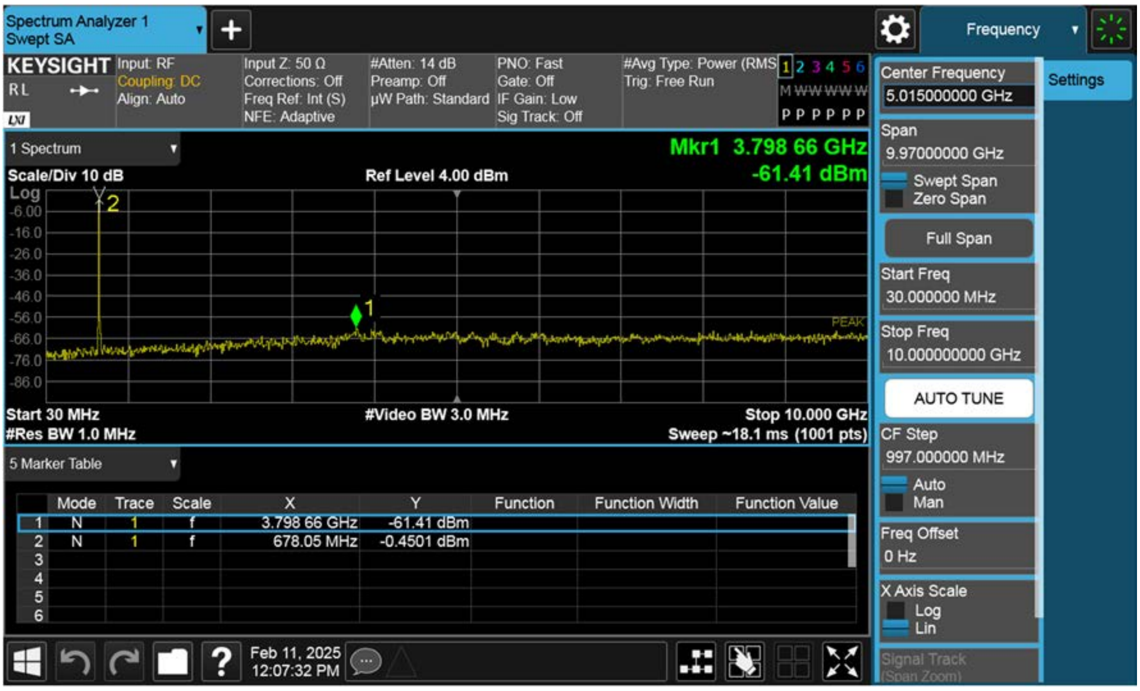
NR71_5 M_Conducted Spurious(30 M-10 G)_High_BPSK_1RB



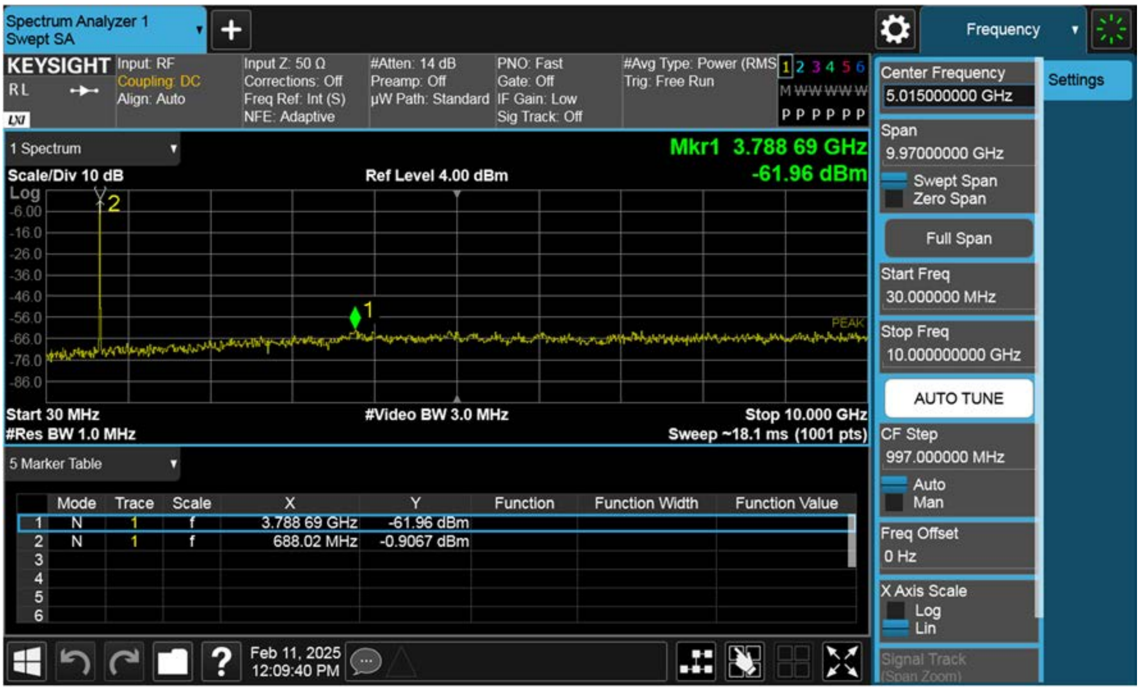
NR71_10 M_Conducted Spurious(30 M-10 G)_Low_BPSK_1RB



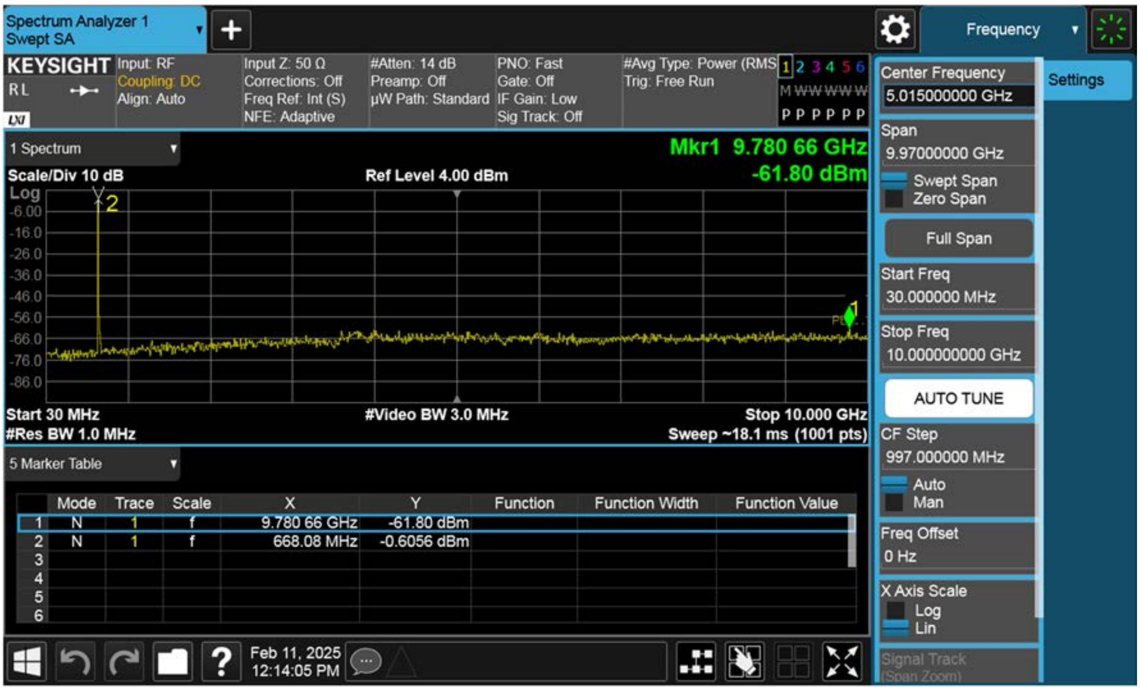
NR71_10 M_Conducted Spurious(30 M-10 G)_Mid_BPSK_1RB



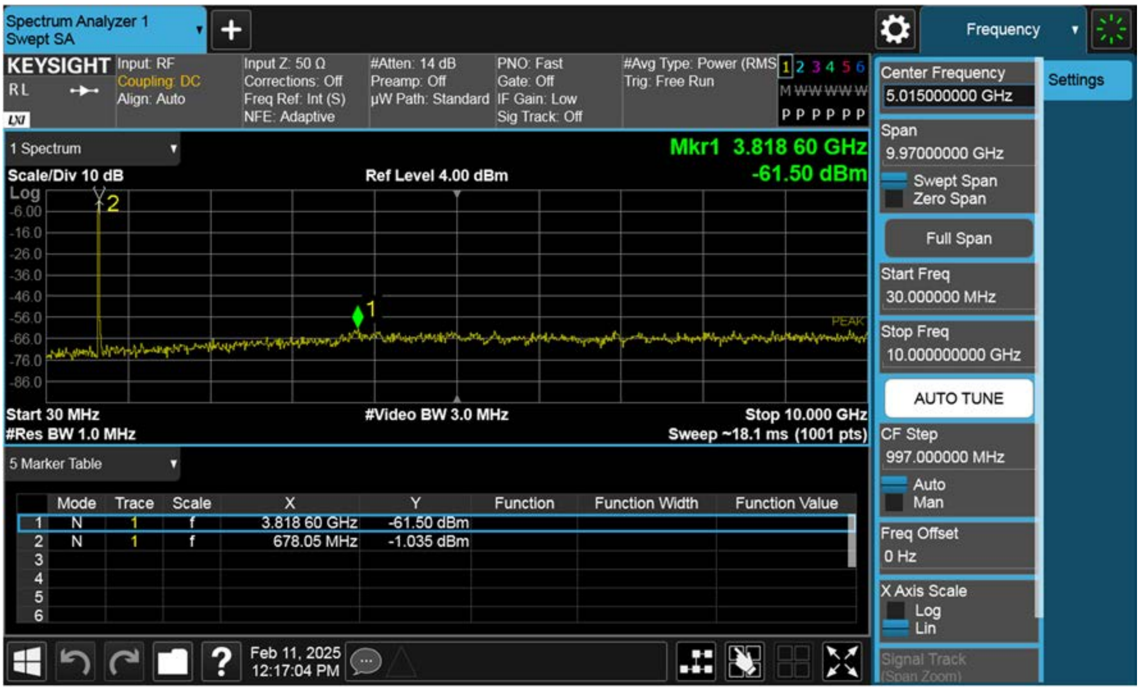
NR71_10 M_Conducted Spurious(30 M-10 G)_High_BPSK_1RB



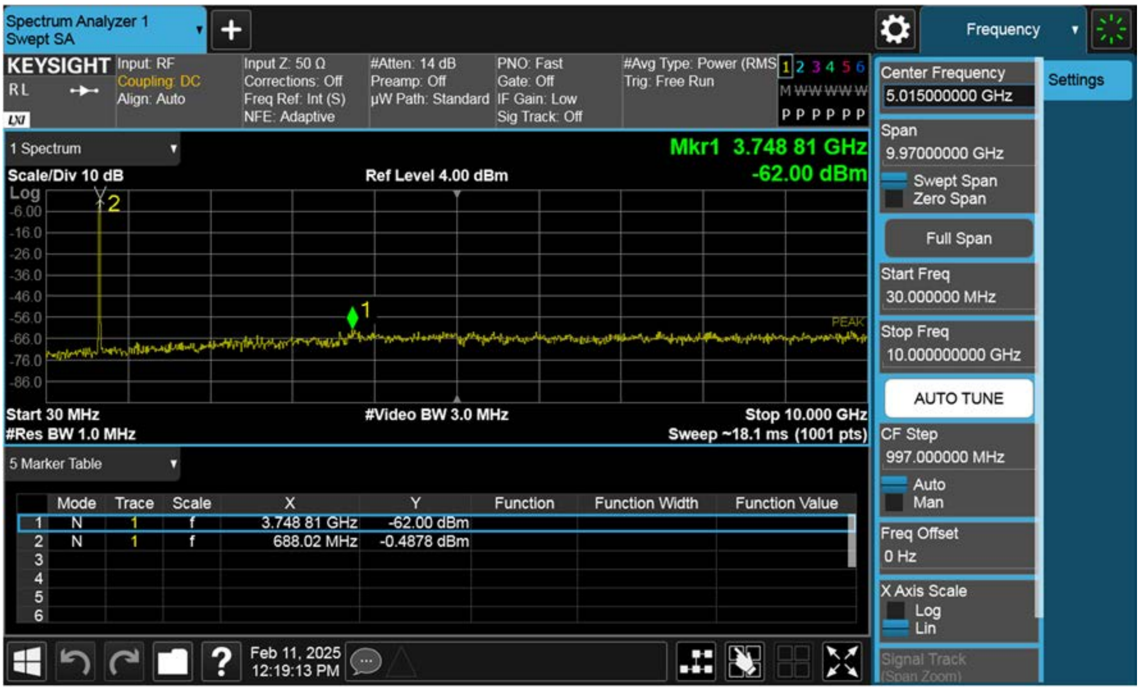
NR71_15 M_Conducted Spurious(30 M-10 G)_Low_BPSK_1RB



NR71_15 M_Conducted Spurious(30 M-10 G)_Mid_BPSK_1RB

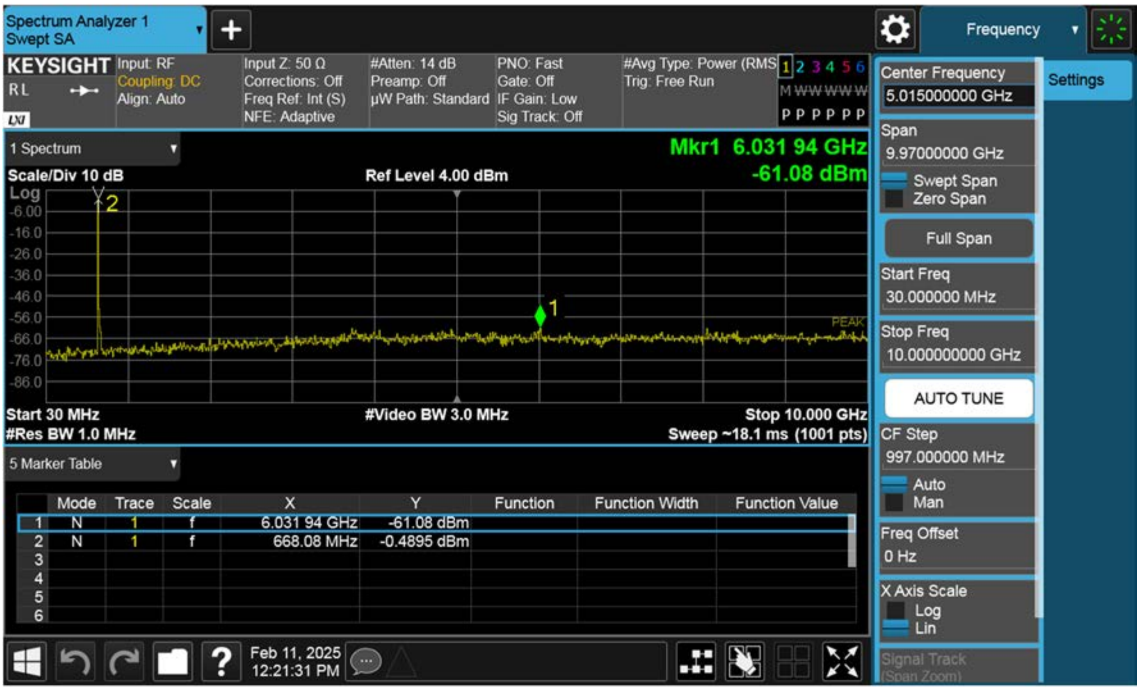


NR71_15 M_Conducted Spurious(30 M-10 G)_High_BPSK_1RB

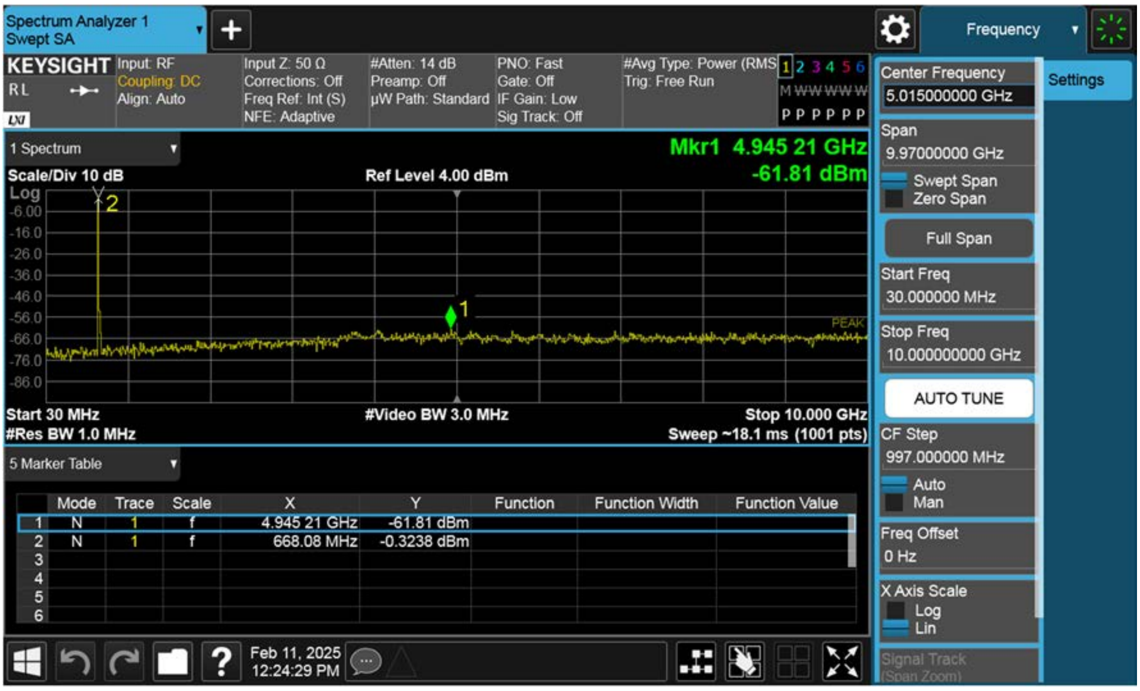



| | Mode | Trace | Scale | X | Y | Function | Function Width | Function Value |
|---|---|---|---|---|---|---|---|---|
| 1 | N | 1 | f | 3.748 81 GHz | -62.00 dBm | | | |
| 2 | N | 1 | f | 688.02 MHz | -0.4878 dBm | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |

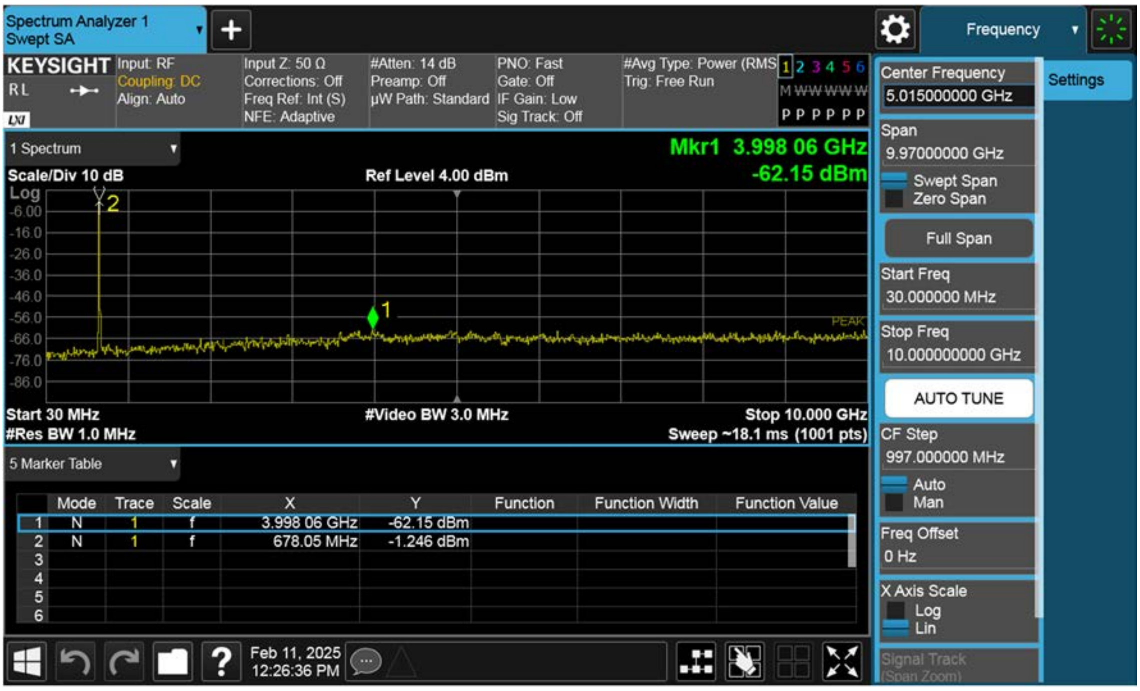
NR71_20 M_Conducted Spurious(30 M-10 G)_Low_BPSK_1RB



NR71_20 M_Conducted Spurious(30 M-10 G)_Mid_BPSK_1RB



NR71_20 M_Conducted Spurious(30 M-10 G)_High_BPSK_1RB



NR71_5 M_Band Edge_Low_BPSK_1RB(1)

NR71_5 M_Band Edge_Low_BPSK_1RB(2)

NR71_5 M_Band Edge_Low_BPSK_FullRB

NR71_5 M_Extended Band Edge_Low_BPSK_FullRB

NR71_5 M_Band Edge_High_BPSK_1RB(1)

NR71_5 M_Band Edge_High_BPSK_1RB(2)

NR71_5 M_Band Edge_High_BPSK_FullRB

NR71_5 M_Extended Band Edge_High_BPSK_FullRB

NR71_10 M_Band Edge_Low_BPSK_1RB(1)

NR71_10 M_Band Edge_Low_BPSK_1RB(2)

NR71_10 M_Band Edge_Low_BPSK_FullRB

NR71_10 M_Extended Band Edge_Low_BPSK_FullRB

NR71_10 M_Band Edge_High_BPSK_1RB(1)

NR71_10 M_Band Edge_High_BPSK_1RB(2)