

# TEST REPORT

FCC Sub6 n25(2) Test for TM15FNEUJL0  
Certification

**APPLICANT**  
LG Electronics Inc.

**REPORT NO.**  
HCT-RF-2502-FC084-R1

**DATE OF ISSUE**  
April 8, 2025

**Tested by**  
Beom Jin Cho



**Technical Manager**  
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Accredited by KOLAS, Republic of KOREA

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# TEST REPORT

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**Applicant**

**LG Electronics Inc.**

128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea

**Product Name**

Telematics

**Model Name**

TM15FNEUJL0

**Date of Test**

December 9, 2024 ~ February 24, 2025

**FCC ID**

BEJTM15FNEUJL0

**Location of Test**

☒ Permanent Testing Lab ☐ On Site Testing

(Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea)

**FCC Classification**

PCS Licensed Transmitter (PCB)

**Test Standard Used**

FCC Rule Part : § 24

**Test Results**

PASS

## REVISION HISTORY

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

| Revision No. | Date of Issue     | Description               |
|--------------|-------------------|---------------------------|
| 0            | February 24, 2025 | Initial Release           |
| 1            | April 08, 2025    | Revised the Product Name. |

## 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.

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)

The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.

The test results have only been applied with the test methods required by the standard(s).

The laboratory is not accredited for the test results marked \*.

Information provided by the applicant is marked \*\*.

Test results provided by external providers are marked \*\*\*.

When confirmation of authenticity of this test report is required, please contact [www.hct.co.kr](http://www.hct.co.kr)

This test report provides test result(s) under the scope accredited by the Korea Laboratory Accreditation Scheme (KOLAS), which signed the ILAC-MRA.  
(KOLAS (KS Q ISO/IEC 17025) Accreditation No. KT197)

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## MEASUREMENT REPORT

### 1. GENERAL INFORMATION

|                            |                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Applicant Name:</b>     | LG Electronics Inc.                                                                                                                                                                                                                                                                                                                              |
| <b>Address:</b>            | 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea                                                                                                                                                                                                                                                                                      |
| <b>FCC ID:</b>             | BEJTM15FNEUJL0                                                                                                                                                                                                                                                                                                                                   |
| <b>Application Type:</b>   | Certification                                                                                                                                                                                                                                                                                                                                    |
| <b>FCC Classification</b>  | PCS Licensed Transmitter (PCB)                                                                                                                                                                                                                                                                                                                   |
| <b>FCC Rule Part(s):</b>   | § 24                                                                                                                                                                                                                                                                                                                                             |
| <b>EUT Type:</b>           | Telematics                                                                                                                                                                                                                                                                                                                                       |
| <b>Model(s):</b>           | TM15FNEUJL0                                                                                                                                                                                                                                                                                                                                      |
| <b>SCS(kHz):</b>           | 15                                                                                                                                                                                                                                                                                                                                               |
| <b>Bandwidth(MHz):</b>     | 5, 10, 15, 20, 25, 30, 40                                                                                                                                                                                                                                                                                                                        |
| <b>Waveform:</b>           | CP-OFDM, DFT-S-OFDM                                                                                                                                                                                                                                                                                                                              |
| <b>Modulation:</b>         | DFT-S-OFDM: PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM<br>CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM                                                                                                                                                                                                                                                         |
| <b>Tx Frequency:</b>       | 1852.5 MHz – 1912.5 MHz (Sub6 n25(2) (5 MHz))<br>1855.0 MHz – 1910.0 MHz (Sub6 n25(2) (10 MHz))<br>1857.5 MHz – 1907.5 MHz (Sub6 n25(2) (15 MHz))<br>1860.0 MHz – 1905.0 MHz (Sub6 n25(2) (20 MHz))<br>1862.5 MHz – 1902.5 MHz (Sub6 n25 (25 MHz))<br>1865.0 MHz – 1900.0 MHz (Sub6 n25 (30 MHz))<br>1870.0 MHz – 1895.0 MHz (Sub6 n25 (40 MHz)) |
| <b>Date(s) of Tests:</b>   | December 9, 2024 ~ February 24, 2025                                                                                                                                                                                                                                                                                                             |
| <b>Serial number:</b>      | Radiated : 410VIXV000304(NAD)<br>Conducted : 410VIXV000305(NAD)                                                                                                                                                                                                                                                                                  |
| <b>Antenna Information</b> | Please refer to the Antenna Specification document.                                                                                                                                                                                                                                                                                              |

### 1.1. MAXIMUM OUTPUT POWER

| Mode<br>(MHz)     | Tx Frequency<br>(MHz) | Emission<br>Designator | Modulation | Conducted Output Power |                        |
|-------------------|-----------------------|------------------------|------------|------------------------|------------------------|
|                   |                       |                        |            | Max. Power<br>(W)      | Max.<br>Power<br>(dBm) |
| Sub6 n25(2) (5)   | 1852.5 - 1912.5       | 4M51G7D                | PI/2 BPSK  | 0.237                  | 23.75                  |
|                   |                       | 4M51G7D                | QPSK       | 0.237                  | 23.75                  |
|                   |                       | 4M50W7D                | 16QAM      | 0.183                  | 22.63                  |
|                   |                       | 4M50W7D                | 64QAM      | 0.131                  | 21.18                  |
|                   |                       | 4M51W7D                | 256QAM     | 0.082                  | 19.13                  |
| Sub6 n25(2) (10)  | 1855.0 - 1910.0       | 8M98G7D                | PI/2 BPSK  | 0.236                  | 23.73                  |
|                   |                       | 8M97G7D                | QPSK       | 0.236                  | 23.72                  |
|                   |                       | 8M95W7D                | 16QAM      | 0.186                  | 22.70                  |
|                   |                       | 8M97W7D                | 64QAM      | 0.133                  | 21.23                  |
|                   |                       | 8M97W7D                | 256QAM     | 0.083                  | 19.20                  |
| Sub6 n25(2) (15)  | 1857.5 - 1907.5       | 13M5G7D                | PI/2 BPSK  | 0.244                  | 23.88                  |
|                   |                       | 13M4G7D                | QPSK       | 0.242                  | 23.83                  |
|                   |                       | 13M5W7D                | 16QAM      | 0.187                  | 22.72                  |
|                   |                       | 13M5W7D                | 64QAM      | 0.132                  | 21.21                  |
|                   |                       | 13M5W7D                | 256QAM     | 0.084                  | 19.25                  |
| Sub6 n25 (2) (20) | 1860.0 - 1905.0       | 17M9G7D                | PI/2 BPSK  | 0.243                  | 23.85                  |
|                   |                       | 18M0G7D                | QPSK       | 0.241                  | 23.82                  |
|                   |                       | 17M9W7D                | 16QAM      | 0.191                  | 22.82                  |
|                   |                       | 17M9W7D                | 64QAM      | 0.136                  | 21.35                  |
|                   |                       | 17M9W7D                | 256QAM     | 0.086                  | 19.34                  |
| Sub6 n25 (25)     | 1862.5 - 1902.5       | 23M0G7D                | PI/2 BPSK  | 0.254                  | 24.05                  |
|                   |                       | 22M9G7D                | QPSK       | 0.254                  | 24.05                  |
|                   |                       | 22M9W7D                | 16QAM      | 0.199                  | 22.98                  |
|                   |                       | 22M9W7D                | 64QAM      | 0.142                  | 21.53                  |
|                   |                       | 22M9W7D                | 256QAM     | 0.090                  | 19.55                  |
| Sub6 n25 (30)     | 1865.0 - 1900.0       | 28M7G7D                | PI/2 BPSK  | 0.254                  | 24.05                  |
|                   |                       | 28M6G7D                | QPSK       | 0.252                  | 24.01                  |
|                   |                       | 28M6W7D                | 16QAM      | 0.200                  | 23.00                  |
|                   |                       | 28M6W7D                | 64QAM      | 0.141                  | 21.48                  |
|                   |                       | 28M7W7D                | 256QAM     | 0.089                  | 19.48                  |
| Sub6 n25 (40)     | 1870.0 - 1895.0       | 38M6G7D                | PI/2 BPSK  | 0.252                  | 24.01                  |
|                   |                       | 38M6G7D                | QPSK       | 0.251                  | 24.00                  |
|                   |                       | 38M6W7D                | 16QAM      | 0.199                  | 22.98                  |
|                   |                       | 38M6W7D                | 64QAM      | 0.140                  | 21.45                  |
|                   |                       | 38M5W7D                | 256QAM     | 0.087                  | 19.41                  |

## 2. INTRODUCTION

### 2.1. DESCRIPTION OF EUT

Please refer to the [2G3G] 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 Fully-anechoic chamber.

The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna.

#### 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  $\geq$  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 turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
2. A half wave dipole is then substituted in place of the EUT. For 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 power is calculated by the following formula;

$$P_d \text{ (dBm)} = P_g \text{ (dBm)} - \text{cable loss (dB)} + \text{antenna gain (dB)}$$

Where:  $P_d$  is the dipole equivalent power and  $P_g$  is the generator output power into the substitution antenna.

3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value.  
These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration
4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
5. 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.

### 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  $\geq 3 \times$  RBW
3. Span = 1.5 times the OBW
4. No. of sweep points  $> 2 \times$  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<sup>th</sup> 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;

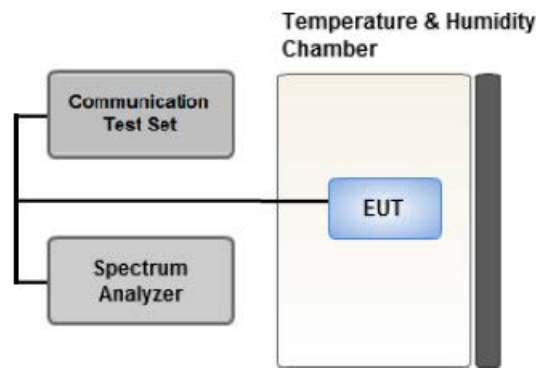
$$\text{Result}_{(\text{dBm})} = P_g_{(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

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.

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

## 3.4 PEAK- TO- AVERAGE RATIO



Test setup

### ① CCDF Procedure for PAPR

#### Test Settings

1. Set resolution/measurement bandwidth  $\geq$  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 %.

### ② Alternate Procedure for PAPR

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as  $P_{Pk}$ .

Use one of the applicable procedures presented 5.2(ANSI C63.26-2015) to measure the total average power and record as  $P_{Avg}$ . Determine the P.A.R. from:

$$P.A.R. (dB) = P_{Pk} (dBm) - P_{Avg} (dBm) \quad (P_{Avg} = \text{Average Power} + \text{Duty cycle Factor})$$

#### Test Settings(Peak Power)

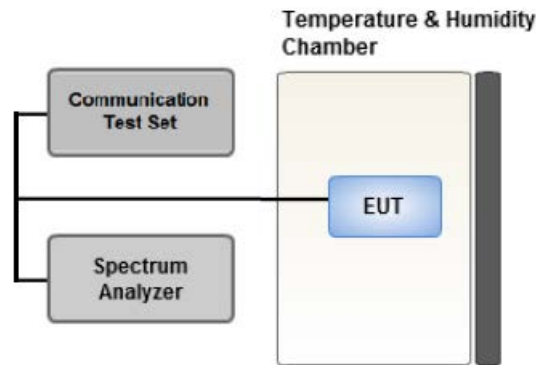
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW  $\geq 3 \times$  RBW.

1. Set the RBW  $\geq$  OBW.
2. Set VBW  $\geq 3 \times$  RBW.
3. Set span  $\geq 2 \times$  OBW.
4. Sweep time  $\geq 10 \times$  (number of points in sweep)  $\times$  (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

#### **Test Settings(Average Power)**

1. Set span to  $2 \times$  to  $3 \times$  the OBW.
2. Set RBW  $\geq$  OBW.
3. Set VBW  $\geq 3 \times$  RBW.
4. Set number of measurement points in sweep  $\geq 2 \times$  span / RBW.
5. Sweep time:  
Set  $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission period})]$  for single sweep (automation-compatible) measurement. The transmission period is the (on + off) time.
6. Detector = power averaging (rms).
7. Set sweep trigger to "free run."
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
9. Use the peak marker function to determine the maximum amplitude level.
10. Add  $[10 \log (1/\text{duty cycle})]$  to the measured maximum power level to compute the average power during continuous transmission. For example, add  $[10 \log (1/0.25)] = 6$  dB if the duty cycle is a constant 25 %.

### 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.

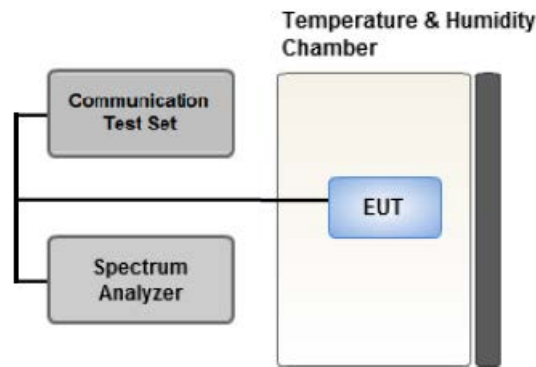
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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  $\geq 3 \times$  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

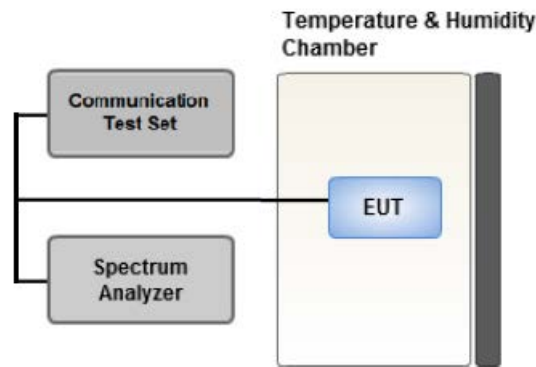
#### Test Overview

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  $\geq$  3 MHz
3. Detector = Peak
4. Trace Mode = Max Hold
5. Sweep time = auto
6. Number of points in sweep  $\geq 2 \times \text{Span} / \text{RBW}$

### 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  $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

**Test Notes**

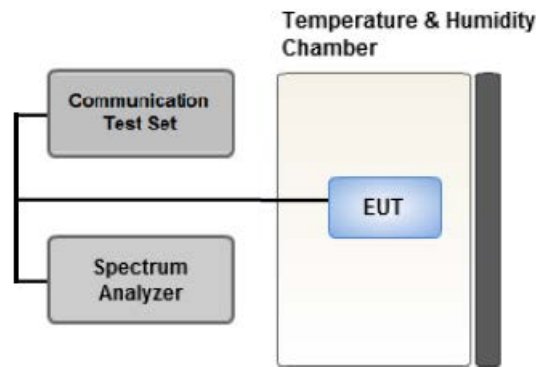
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. In the 1 MHz bands immediately outside and adjacent to the frequency block 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  $\text{Margin} < 1$  dB the emission level is either corrected by  $10 \log(1 \text{ MHz} / \text{RB})$  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.
- All modes of operation were investigated and the worst case configuration results are reported.  
Mode: SA Only
- JIG was used to test the EUT. (EUT + JIG)
- All simultaneous transmission scenarios of operation were investigated, and the test results showed no additional significant emissions relative to the least restrictive limit were observed.  
Therefore, only the worst case(stand-alone) results were reported.
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.  
Please refer to the table below.
- Sub6 n25 (1850 – 1915 MHz, 5/10/15/20/25/30/40 MHz bandwidth) overlaps the entire frequency range of Sub6 n2 (1850 - 1910 MHz, 5/10/15/20 MHz bandwidth) and they have the same Tune-up power.  
Therefore, test data provided in this report covers Sub6 n25 as well as Sub6 n2.
- In the case of radiated spurious emissions, all bandwidth of operation was investigated and the worst case bandwidth results are reported. (Worst case : 40 MHz)

[ Worst case ]

| Test Description                         | Modulation                                        | RB size         | RB offset | Axis |
|------------------------------------------|---------------------------------------------------|-----------------|-----------|------|
| Equivalent Isotropic Radiated Power      | PI/2 BPSK,<br>QPSK,<br>16QAM,<br>64QAM,<br>256QAM | See Section 8.1 |           | Y    |
| 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: SA Only
- JIG was used to test the EUT. (EUT + JIG)
- Sub6 n25 (1850 – 1915 MHz, 5/10/15/20/25/30/40 MHz bandwidth) overlaps the entire frequency range of Sub6 n2 (1850 - 1910 MHz, 5/10/15/20 MHz bandwidth) and they have the same Tune-up power.  
Therefore, test data provided in this report covers Sub6 n25 as well as Sub6 n2.
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.  
Please refer to the table below.

| [ Worst case ]                                      |                                       |                          |                |         |           |
|-----------------------------------------------------|---------------------------------------|--------------------------|----------------|---------|-----------|
| Test Description                                    | Modulation                            | Bandwidth (MHz)          | Frequency      | RB size | RB offset |
| Occupied Bandwidth, Peak-To-Average Ratio           | PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM | 5, 10, 15, 20, 25, 30,40 | 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       |
|                                                     |                                       | 25                       | Low            | 1       | 0         |
|                                                     |                                       |                          | High           | 1       | 132       |
|                                                     |                                       | 30                       | Low            | 1       | 0         |
|                                                     |                                       |                          | High           | 1       | 159       |
|                                                     |                                       | 40                       | Low            | 1       | 0         |
|                                                     |                                       |                          | High           | 1       | 215       |
|                                                     |                                       | 5, 10, 15, 20, 25, 30,40 | Low, High      | Full RB | 0         |
| Spurious and Harmonic Emissions at Antenna Terminal | PI/2 BPSK                             | 5, 10, 15, 20, 25, 30,40 | Low, Mid, High | 1       | 1         |

#### 4. LIST OF TEST EQUIPMENT

| Equipment                                            | Model                   | Manufacture      | Serial No.  | Due to Calibration | Calibration Interval |
|------------------------------------------------------|-------------------------|------------------|-------------|--------------------|----------------------|
| 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               |
| Power Amplifier                                      | CBL18265035             | CERNEX           | 22966       | 11/07/2025         | Annual               |
| Power Amplifier                                      | CBL26405040             | CERNEX           | 25956       | 02/26/2025         | Annual               |
| Power Splitter(DC ~ 26.5 GHz)                        | 11667B                  | Hewlett Packard  | 5001        | 04/17/2025         | 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             |
| Chamber                                              | SU-642                  | ESPEC            | 93022487    | 06/27/2025         | Annual               |
| 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(15 ~ 40 GHz)                            | BBHA 9170               | Schwarzbeck      | BBHA9170342 | 09/20/2026         | Biennial             |
| Horn Antenna(15 ~ 40 GHz)                            | BBHA 9170               | Schwarzbeck      | BBHA9170124 | 03/28/2025         | Biennial             |
| Signal Analyzer(10 Hz ~ 26.5 GHz)                    | N9020A                  | Agilent          | MY52090906  | 04/19/2025         | Annual               |
| ATTENUATOR(20 dB)                                    | 8493C                   | Hewlett Packard  | 17280       | 04/17/2025         | Annual               |
| Spectrum Analyzer(10 Hz ~ 40 GHz)                    | FSV40                   | ROHDE & SCHWARZ  | 101733      | 09/19/2025         | 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                             | VULB9168                | Schwarzbeck      | 895         | 08/28/2026         | Biennial             |
| Trilog Broadband Antenna                             | VULB9168                | Schwarzbeck      | 1135        | 08/19/2026         | Biennial             |
| Radio Communication Test Station                     | MT8000A                 | Anritsu Corp.    | 6272613402  | 08/28/2025         | Annual               |
| SIGNAL GENERATOR<br>(100 kHz ~ 40 GHz)               | SMB100A                 | REOHDE & SCHWARZ | 177633      | 07/26/2025         | Annual               |
| Signal Analyzer(5 Hz ~ 40.0 GHz)                     | N9030B                  | KEYSIGHT         | MY55480167  | 05/17/2025         | Annual               |
| Signal & Spectrum Analyzer (2 Hz~67 GHz)             | FSW67                   | REOHDE & SCHWARZ | 101736      | 05/23/2025         | Annual               |
| FCC LTE Mobile Conducted RF Automation Test Software | -                       | HCT CO., LTD.,   | -           | -                  | -                    |

**Note:**

- Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
- 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  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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

| Parameter                              | Expanded Uncertainty ( $\pm$ 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)  | 5.70 (Confidence level about 95 %, $k=2$ ) |
| Radiated Disturbance (1 GHz ~ 18 GHz)  | 5.52 (Confidence level about 95 %, $k=2$ ) |
| Radiated Disturbance (18 GHz ~ 40 GHz) | 5.66 (Confidence level about 95 %, $k=2$ ) |
| Radiated Disturbance (Above 40 GHz)    | 5.58 (Confidence level about 95 %, $k=2$ ) |

## 6. SUMMARY OF TEST RESULTS

Note. 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,<br>§ 24.238(a) | < 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions | PASS             |
| Conducted Output Power                                           | § 2.1046                 | N/A                                                                      | <u>See Note1</u> |
| Peak- to- Average Ratio                                          | § 24.232(d)              | < 13 dB                                                                  | PASS             |
| Frequency stability / variation of ambient temperature           | § 24.235                 | Emission must remain in band                                             | PASS             |

#### Note:

1. See SAR Report
2. All conducted tests were tested using 5G Wireless Tester.

### 6.2 Test Condition: Radiated Test

| Test Description                         | FCC Part Section(s)      | Test Limit                                              | Test Result |
|------------------------------------------|--------------------------|---------------------------------------------------------|-------------|
| Equivalent Isotropic Radiated Power      | § 24.232(c)              | < 2 Watts max. EIRP                                     | PASS        |
| Radiated Spurious and Harmonic Emissions | § 2.1053,<br>§ 24.238(a) | < 43 + 10log10 (P[Watts]) for all out-of band emissions | PASS        |

#### Note:

1. Radiated tests were tested using 5G Wireless Tester

## 7. SAMPLE CALCULATION

### 7.1 ERP Sample Calculation

| Ch./ Freq. |            | Measured<br>Level<br>(dBm) | Substitute<br>Level (dBm) | Ant. Gain<br>(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 |

$$\text{ERP} = \text{Substitute LEVEL(dBm)} + \text{Ant. Gain} - \text{CL(Cable Loss)}$$

- 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<br>Level<br>(dBm) | Substitute<br>Level (dBm) | Ant. Gain<br>(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 |

$$\text{EIRP} = \text{Substitute LEVEL(dBm)} + \text{Ant. Gain} - \text{CL(Cable Loss)}$$

- 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 EQUIVALENT ISOTROPIC RADIATED POWER

| Freq<br>(MHz) | Mod/<br>Bandwidth<br>[SCS (kHz)]  | Modulation | Measured<br>Level<br>(dBm) | Substitute<br>Level<br>(dBm) | Ant. Gain<br>(dBi) | C.L  | Pol | Limit  | EIRP  |       | RB   |        |
|---------------|-----------------------------------|------------|----------------------------|------------------------------|--------------------|------|-----|--------|-------|-------|------|--------|
|               |                                   |            |                            |                              |                    |      |     | W      | W     | dBm   | Size | Offset |
| 1852.5        | Sub6 n25(2)/<br>5 MHz<br>[15 kHz] | PI/2 BPSK  | -15.16                     | 19.84                        | 10.15              | 2.08 | H   | < 2.00 | 0.617 | 27.91 | 1    | 23     |
|               |                                   | QPSK       | -15.20                     | 19.80                        | 10.15              | 2.08 | H   |        | 0.612 | 27.87 |      |        |
|               |                                   | 16-QAM     | -16.24                     | 18.76                        | 10.15              | 2.08 | H   |        | 0.482 | 26.83 |      |        |
|               |                                   | 64-QAM     | -17.78                     | 17.22                        | 10.15              | 2.08 | H   |        | 0.338 | 25.29 |      |        |
|               |                                   | 256-QAM    | -19.81                     | 15.19                        | 10.15              | 2.08 | H   |        | 0.212 | 23.26 |      |        |
| 1882.5        |                                   | PI/2 BPSK  | -15.38                     | 20.02                        | 10.11              | 2.21 | H   |        | 0.619 | 27.92 | 1    | 23     |
|               |                                   | QPSK       | -15.52                     | 19.88                        | 10.11              | 2.21 | H   |        | 0.599 | 27.78 |      |        |
|               |                                   | 16-QAM     | -16.52                     | 18.88                        | 10.11              | 2.21 | H   |        | 0.476 | 26.78 |      |        |
|               |                                   | 64-QAM     | -17.92                     | 17.48                        | 10.11              | 2.21 | H   |        | 0.345 | 25.38 |      |        |
|               |                                   | 256-QAM    | -19.89                     | 15.51                        | 10.11              | 2.21 | H   |        | 0.219 | 23.41 |      |        |
| 1912.5        |                                   | PI/2 BPSK  | -15.82                     | 19.68                        | 10.00              | 2.17 | H   |        | 0.564 | 27.51 | 1    | 23     |
|               |                                   | QPSK       | -15.98                     | 19.52                        | 10.00              | 2.17 | H   |        | 0.543 | 27.35 |      |        |
|               |                                   | 16-QAM     | -17.02                     | 18.48                        | 10.00              | 2.17 | H   |        | 0.428 | 26.31 |      |        |
|               |                                   | 64-QAM     | -18.51                     | 16.99                        | 10.00              | 2.17 | H   |        | 0.304 | 24.82 |      |        |
|               |                                   | 256-QAM    | -20.45                     | 15.05                        | 10.00              | 2.17 | H   |        | 0.194 | 22.88 |      |        |

| Freq<br>(MHz) | Mod/<br>Bandwidth<br>[SCS (kHz)]   | Modulation | Measured<br>Level<br>(dBm) | Substitute<br>Level<br>(dBm) | Ant. Gain<br>(dBi) | C.L  | Pol | Limit  | EIRP  |       | RB   |        |
|---------------|------------------------------------|------------|----------------------------|------------------------------|--------------------|------|-----|--------|-------|-------|------|--------|
|               |                                    |            |                            |                              |                    |      |     | W      | W     | dBm   | Size | Offset |
| 1855.0        |                                    | PI/2 BPSK  | -15.42                     | 19.58                        | 10.15              | 2.08 | H   | < 2.00 | 0.583 | 27.65 | 1    | 26     |
|               |                                    | QPSK       | -15.52                     | 19.48                        | 10.15              | 2.08 | H   |        | 0.569 | 27.55 |      |        |
|               |                                    | 16-QAM     | -16.41                     | 18.59                        | 10.15              | 2.08 | H   |        | 0.463 | 26.66 |      |        |
|               |                                    | 64-QAM     | -17.92                     | 17.08                        | 10.15              | 2.08 | H   |        | 0.327 | 25.15 |      |        |
|               |                                    | 256-QAM    | -19.96                     | 15.04                        | 10.15              | 2.08 | H   |        | 0.205 | 23.11 |      |        |
| 1882.5        | Sub6 n25(2)/<br>10 MHz<br>[15 kHz] | PI/2 BPSK  | -15.84                     | 19.56                        | 10.11              | 2.21 | H   | < 2.00 | 0.557 | 27.46 | 1    | 26     |
|               |                                    | QPSK       | -15.94                     | 19.46                        | 10.11              | 2.21 | H   |        | 0.544 | 27.36 |      |        |
|               |                                    | 16-QAM     | -16.93                     | 18.47                        | 10.11              | 2.21 | H   |        | 0.433 | 26.37 |      |        |
|               |                                    | 64-QAM     | -18.38                     | 17.02                        | 10.11              | 2.21 | H   |        | 0.310 | 24.92 |      |        |
|               |                                    | 256-QAM    | -20.35                     | 15.05                        | 10.11              | 2.21 | H   |        | 0.197 | 22.95 |      |        |
| 1910.0        |                                    | PI/2 BPSK  | -15.37                     | 20.11                        | 10.03              | 2.17 | H   | < 2.00 | 0.627 | 27.97 | 1    | 1      |
|               |                                    | QPSK       | -15.69                     | 19.79                        | 10.03              | 2.17 | H   |        | 0.582 | 27.65 |      |        |
|               |                                    | 16-QAM     | -16.70                     | 18.78                        | 10.03              | 2.17 | H   |        | 0.462 | 26.64 |      |        |
|               |                                    | 64-QAM     | -18.11                     | 17.37                        | 10.03              | 2.17 | H   |        | 0.333 | 25.23 |      |        |
|               |                                    | 256-QAM    | -20.15                     | 15.33                        | 10.03              | 2.17 | H   |        | 0.208 | 23.19 |      |        |

| Freq<br>(MHz) | Mod/<br>Bandwidth<br>[SCS (kHz)]   | Modulation | Measured<br>Level<br>(dBm) | Substitute<br>Level<br>(dBm) | Ant. Gain<br>(dBi) | C.L  | Pol | Limit  | EIRP  |       | RB   |        |
|---------------|------------------------------------|------------|----------------------------|------------------------------|--------------------|------|-----|--------|-------|-------|------|--------|
|               |                                    |            |                            |                              |                    |      |     | W      | W     | dBm   | Size | Offset |
| 1857.5        |                                    | PI/2 BPSK  | -15.34                     | 19.78                        | 10.14              | 2.10 | H   | < 2.00 | 0.605 | 27.82 | 1    | 77     |
|               |                                    | QPSK       | -15.39                     | 19.73                        | 10.14              | 2.10 | H   |        | 0.598 | 27.77 |      |        |
|               |                                    | 16-QAM     | -16.27                     | 18.85                        | 10.14              | 2.10 | H   |        | 0.489 | 26.89 |      |        |
|               |                                    | 64-QAM     | -17.95                     | 17.17                        | 10.14              | 2.10 | H   |        | 0.332 | 25.21 |      |        |
|               |                                    | 256-QAM    | -19.88                     | 15.24                        | 10.14              | 2.10 | H   |        | 0.213 | 23.28 |      |        |
| 1882.5        | Sub6 n25(2)/<br>15 MHz<br>[15 kHz] | PI/2 BPSK  | -15.49                     | 19.91                        | 10.11              | 2.21 | H   | < 2.00 | 0.603 | 27.81 | 1    | 1      |
|               |                                    | QPSK       | -15.55                     | 19.85                        | 10.11              | 2.21 | H   |        | 0.596 | 27.75 |      |        |
|               |                                    | 16-QAM     | -16.45                     | 18.95                        | 10.11              | 2.21 | H   |        | 0.484 | 26.85 |      |        |
|               |                                    | 64-QAM     | -18.00                     | 17.40                        | 10.11              | 2.21 | H   |        | 0.339 | 25.30 |      |        |
|               |                                    | 256-QAM    | -19.98                     | 15.42                        | 10.11              | 2.21 | H   |        | 0.215 | 23.32 |      |        |
| 1907.5        |                                    | PI/2 BPSK  | -15.67                     | 19.81                        | 10.03              | 2.17 | H   | < 2.00 | 0.584 | 27.67 | 1    | 1      |
|               |                                    | QPSK       | -15.71                     | 19.77                        | 10.03              | 2.17 | H   |        | 0.580 | 27.63 |      |        |
|               |                                    | 16-QAM     | -16.75                     | 18.73                        | 10.03              | 2.17 | H   |        | 0.456 | 26.59 |      |        |
|               |                                    | 64-QAM     | -18.26                     | 17.22                        | 10.03              | 2.17 | H   |        | 0.322 | 25.08 |      |        |
|               |                                    | 256-QAM    | -20.21                     | 15.27                        | 10.03              | 2.17 | H   |        | 0.206 | 23.13 |      |        |

| Freq<br>(MHz) | Mod/<br>Bandwidth<br>[SCS (kHz)]   | Modulation | Measured<br>Level<br>(dBm) | Substitute<br>Level<br>(dBm) | Ant. Gain<br>(dBi) | C.L  | Pol | Limit  | EIRP  |       | RB   |        |
|---------------|------------------------------------|------------|----------------------------|------------------------------|--------------------|------|-----|--------|-------|-------|------|--------|
|               |                                    |            |                            |                              |                    |      |     | W      | W     | dBm   | Size | Offset |
| 1860.0        | Sub6 n25(2)/<br>20 MHz<br>[15 kHz] | PI/2 BPSK  | -15.34                     | 19.78                        | 10.14              | 2.10 | H   | < 2.00 | 0.605 | 27.82 | 1    | 1      |
|               |                                    | QPSK       | -15.35                     | 19.77                        | 10.14              | 2.10 | H   |        | 0.603 | 27.80 |      |        |
|               |                                    | 16-QAM     | -16.50                     | 18.62                        | 10.14              | 2.10 | H   |        | 0.464 | 26.66 |      |        |
|               |                                    | 64-QAM     | -17.93                     | 17.19                        | 10.14              | 2.10 | H   |        | 0.333 | 25.23 |      |        |
|               |                                    | 256-QAM    | -19.95                     | 15.17                        | 10.14              | 2.10 | H   |        | 0.209 | 23.21 |      |        |
| 1882.5        |                                    | PI/2 BPSK  | -15.60                     | 19.80                        | 10.11              | 2.21 | H   |        | 0.589 | 27.70 | 1    | 1      |
|               |                                    | QPSK       | -15.63                     | 19.77                        | 10.11              | 2.21 | H   |        | 0.585 | 27.67 |      |        |
|               |                                    | 16-QAM     | -16.58                     | 18.82                        | 10.11              | 2.21 | H   |        | 0.470 | 26.72 |      |        |
|               |                                    | 64-QAM     | -18.06                     | 17.34                        | 10.11              | 2.21 | H   |        | 0.334 | 25.24 |      |        |
|               |                                    | 256-QAM    | -20.05                     | 15.35                        | 10.11              | 2.21 | H   |        | 0.211 | 23.25 |      |        |
| 1905.0        |                                    | PI/2 BPSK  | -15.60                     | 19.90                        | 10.05              | 2.19 | H   |        | 0.597 | 27.76 | 1    | 1      |
|               |                                    | QPSK       | -15.66                     | 19.84                        | 10.05              | 2.19 | H   |        | 0.589 | 27.70 |      |        |
|               |                                    | 16-QAM     | -16.67                     | 18.83                        | 10.05              | 2.19 | H   |        | 0.467 | 26.69 |      |        |
|               |                                    | 64-QAM     | -18.15                     | 17.35                        | 10.05              | 2.19 | H   |        | 0.332 | 25.21 |      |        |
|               |                                    | 256-QAM    | -20.06                     | 15.44                        | 10.05              | 2.19 | H   |        | 0.214 | 23.30 |      |        |

| Freq<br>(MHz) | Mod/<br>Bandwidth<br>[SCS (kHz)] | Modulation | Measured<br>Level<br>(dBm) | Substitute<br>Level<br>(dBm) | Ant. Gain<br>(dBi) | C.L  | Pol | Limit  | EIRP  |       | RB   |        |
|---------------|----------------------------------|------------|----------------------------|------------------------------|--------------------|------|-----|--------|-------|-------|------|--------|
|               |                                  |            |                            |                              |                    |      |     | W      | W     | dBm   | Size | Offset |
| 1862.5        | Sub6 n25/<br>25 MHz<br>[15 kHz]  | PI/2 BPSK  | -15.25                     | 19.96                        | 10.13              | 2.13 | H   | < 2.00 | 0.625 | 27.96 | 1    | 1      |
|               |                                  | QPSK       | -15.33                     | 19.88                        | 10.13              | 2.13 | H   |        | 0.614 | 27.88 |      |        |
|               |                                  | 16-QAM     | -16.33                     | 18.88                        | 10.13              | 2.13 | H   |        | 0.488 | 26.88 |      |        |
|               |                                  | 64-QAM     | -17.74                     | 17.47                        | 10.13              | 2.13 | H   |        | 0.352 | 25.47 |      |        |
|               |                                  | 256-QAM    | -19.99                     | 15.22                        | 10.13              | 2.13 | H   |        | 0.210 | 23.22 |      |        |
| 1882.5        |                                  | PI/2 BPSK  | -15.49                     | 19.91                        | 10.11              | 2.21 | H   |        | 0.603 | 27.81 | 1    | 1      |
|               |                                  | QPSK       | -15.50                     | 19.90                        | 10.11              | 2.21 | H   |        | 0.603 | 27.80 |      |        |
|               |                                  | 16-QAM     | -16.55                     | 18.85                        | 10.11              | 2.21 | H   |        | 0.473 | 26.75 |      |        |
|               |                                  | 64-QAM     | -17.94                     | 17.46                        | 10.11              | 2.21 | H   |        | 0.344 | 25.36 |      |        |
|               |                                  | 256-QAM    | -20.01                     | 15.39                        | 10.11              | 2.21 | H   |        | 0.213 | 23.29 |      |        |
| 1902.5        |                                  | PI/2 BPSK  | -15.52                     | 19.98                        | 10.05              | 2.19 | H   |        | 0.609 | 27.84 | 1    | 1      |
|               |                                  | QPSK       | -15.66                     | 19.84                        | 10.05              | 2.19 | H   |        | 0.589 | 27.70 |      |        |
|               |                                  | 16-QAM     | -16.52                     | 18.98                        | 10.05              | 2.19 | H   |        | 0.483 | 26.84 |      |        |
|               |                                  | 64-QAM     | -17.92                     | 17.58                        | 10.05              | 2.19 | H   |        | 0.350 | 25.44 |      |        |
|               |                                  | 256-QAM    | -20.06                     | 15.44                        | 10.05              | 2.19 | H   |        | 0.214 | 23.30 |      |        |

| Freq<br>(MHz) | Mod/<br>Bandwidth<br>[SCS (kHz)] | Modulation | Measured<br>Level<br>(dBm) | Substitute<br>Level<br>(dBm) | Ant. Gain<br>(dBi) | C.L  | Pol | Limit  | EIRP  |       | RB   |        |
|---------------|----------------------------------|------------|----------------------------|------------------------------|--------------------|------|-----|--------|-------|-------|------|--------|
|               |                                  |            |                            |                              |                    |      |     | W      | W     | dBm   | Size | Offset |
| 1865.0        | Sub6 n25/<br>30 MHz<br>[15 kHz]  | PI/2 BPSK  | -15.39                     | 19.82                        | 10.13              | 2.13 | H   | < 2.00 | 0.605 | 27.82 | 1    | 1      |
|               |                                  | QPSK       | -15.36                     | 19.85                        | 10.13              | 2.13 | H   |        | 0.610 | 27.85 |      |        |
|               |                                  | 16-QAM     | -16.29                     | 18.92                        | 10.13              | 2.13 | H   |        | 0.492 | 26.92 |      |        |
|               |                                  | 64-QAM     | -17.81                     | 17.40                        | 10.13              | 2.13 | H   |        | 0.347 | 25.40 |      |        |
|               |                                  | 256-QAM    | -19.74                     | 15.47                        | 10.13              | 2.13 | H   |        | 0.222 | 23.47 |      |        |
| 1882.5        |                                  | PI/2 BPSK  | -15.57                     | 19.83                        | 10.11              | 2.21 | H   |        | 0.593 | 27.73 | 1    | 1      |
|               |                                  | QPSK       | -15.65                     | 19.75                        | 10.11              | 2.21 | H   |        | 0.582 | 27.65 |      |        |
|               |                                  | 16-QAM     | -16.57                     | 18.83                        | 10.11              | 2.21 | H   |        | 0.471 | 26.73 |      |        |
|               |                                  | 64-QAM     | -18.06                     | 17.34                        | 10.11              | 2.21 | H   |        | 0.334 | 25.24 |      |        |
|               |                                  | 256-QAM    | -20.17                     | 15.23                        | 10.11              | 2.21 | H   |        | 0.206 | 23.13 |      |        |
| 1900.0        |                                  | PI/2 BPSK  | -15.60                     | 19.89                        | 10.08              | 2.20 | H   |        | 0.598 | 27.77 | 1    | 1      |
|               |                                  | QPSK       | -15.62                     | 19.87                        | 10.08              | 2.20 | H   |        | 0.596 | 27.75 |      |        |
|               |                                  | 16-QAM     | -16.58                     | 18.91                        | 10.08              | 2.20 | H   |        | 0.478 | 26.79 |      |        |
|               |                                  | 64-QAM     | -18.13                     | 17.36                        | 10.08              | 2.20 | H   |        | 0.335 | 25.24 |      |        |
|               |                                  | 256-QAM    | -20.14                     | 15.35                        | 10.08              | 2.20 | H   |        | 0.210 | 23.23 |      |        |

| Freq<br>(MHz) | Mod/<br>Bandwidth<br>[SCS (kHz)] | Modulation | Measured<br>Level<br>(dBm) | Substitute<br>Level<br>(dBm) | Ant. Gain<br>(dBi) | C.L  | Pol | Limit  | EIRP  |       | RB   |        |
|---------------|----------------------------------|------------|----------------------------|------------------------------|--------------------|------|-----|--------|-------|-------|------|--------|
|               |                                  |            |                            |                              |                    |      |     | W      | W     | dBm   | Size | Offset |
| 1870.0        | Sub6 n25/<br>40 MHz<br>[15 kHz]  | PI/2 BPSK  | -15.19                     | 20.09                        | 10.13              | 2.16 | H   | < 2.00 | 0.641 | 28.07 | 1    | 1      |
|               |                                  | QPSK       | -15.35                     | 19.94                        | 10.13              | 2.16 | H   |        | 0.618 | 27.91 |      |        |
|               |                                  | 16-QAM     | -16.31                     | 18.98                        | 10.13              | 2.16 | H   |        | 0.495 | 26.95 |      |        |
|               |                                  | 64-QAM     | -17.75                     | 17.54                        | 10.13              | 2.16 | H   |        | 0.356 | 25.51 |      |        |
|               |                                  | 256-QAM    | -19.77                     | 15.52                        | 10.13              | 2.16 | H   |        | 0.223 | 23.49 |      |        |
| 1882.5        |                                  | PI/2 BPSK  | -15.53                     | 19.87                        | 10.11              | 2.21 | H   |        | 0.599 | 27.77 | 1    | 214    |
|               |                                  | QPSK       | -15.57                     | 19.83                        | 10.11              | 2.21 | H   |        | 0.593 | 27.73 |      |        |
|               |                                  | 16-QAM     | -16.58                     | 18.82                        | 10.11              | 2.21 | H   |        | 0.470 | 26.72 |      |        |
|               |                                  | 64-QAM     | -18.10                     | 17.30                        | 10.11              | 2.21 | H   |        | 0.332 | 25.20 |      |        |
|               |                                  | 256-QAM    | -20.12                     | 15.28                        | 10.11              | 2.21 | H   |        | 0.208 | 23.18 |      |        |
| 1895.0        |                                  | PI/2 BPSK  | -15.30                     | 20.16                        | 10.09              | 2.20 | H   |        | 0.639 | 28.05 | 1    | 1      |
|               |                                  | QPSK       | -15.33                     | 20.13                        | 10.09              | 2.20 | H   |        | 0.634 | 28.02 |      |        |
|               |                                  | 16-QAM     | -16.48                     | 18.98                        | 10.09              | 2.20 | H   |        | 0.487 | 26.87 |      |        |
|               |                                  | 64-QAM     | -17.74                     | 17.72                        | 10.09              | 2.20 | H   |        | 0.364 | 25.61 |      |        |
|               |                                  | 256-QAM    | -19.86                     | 15.60                        | 10.09              | 2.20 | H   |        | 0.223 | 23.49 |      |        |

## 8.2 RADIATED SPURIOUS EMISSIONS

|               |                  |
|---------------|------------------|
| ■ NR Band:    | <u>N25</u>       |
| ■ Bandwidth:  | <u>40 MHz</u>    |
| ■ Modulation: | <u>PI/2 BPSK</u> |
| ■ Distance:   | <u>3 meters</u>  |
| ■ SCS:        | <u>15 kHz</u>    |

| Ch                 | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L  | Pol | Result (dBm) | Limit (dBm) | RB   |        |
|--------------------|------------|----------------------|-----------------|------------------------|------|-----|--------------|-------------|------|--------|
|                    |            |                      |                 |                        |      |     |              |             | Size | Offset |
| 374000<br>(1870.0) | 3 740.00   | -54.76               | 11.70           | -61.55                 | 3.19 | H   | -53.04       | -13.00      | 1    | 1      |
|                    | 5 610.00   | -55.80               | 12.06           | -57.04                 | 3.92 | H   | -48.90       | -13.00      |      |        |
|                    | 7 480.00   | -56.10               | 11.38           | -52.19                 | 4.62 | H   | -45.43       | -13.00      |      |        |
|                    | 9 350.00   | -55.40               | 11.27           | -45.38                 | 5.26 | H   | -39.37       | -13.00      |      |        |
|                    | 11 220.00  | -54.52               | 12.32           | -47.85                 | 5.80 | H   | -41.33       | -13.00      |      |        |
| 376500<br>(1882.5) | 3 765.00   | -53.13               | 11.59           | -59.60                 | 3.11 | H   | -51.12       | -13.00      | 1    | 214    |
|                    | 5 647.50   | -55.28               | 12.01           | -56.48                 | 3.96 | H   | -48.43       | -13.00      |      |        |
|                    | 7 530.00   | -55.28               | 11.50           | -51.54                 | 4.60 | H   | -44.64       | -13.00      |      |        |
|                    | 9 412.50   | -56.31               | 11.28           | -46.52                 | 5.25 | H   | -40.49       | -13.00      |      |        |
|                    | 11 295.00  | -54.75               | 12.26           | -47.48                 | 5.83 | H   | -41.05       | -13.00      |      |        |
| 379000<br>(1895.0) | 3 790.00   | -54.40               | 11.45           | -60.83                 | 3.19 | H   | -52.57       | -13.00      | 1    | 1      |
|                    | 5 685.00   | -54.63               | 11.95           | -55.80                 | 4.01 | H   | -47.86       | -13.00      |      |        |
|                    | 7 580.00   | -55.16               | 11.55           | -51.40                 | 4.65 | H   | -44.50       | -13.00      |      |        |
|                    | 9 475.00   | -55.43               | 11.27           | -46.14                 | 5.28 | H   | -40.15       | -13.00      |      |        |
|                    | 11 370.00  | -55.76               | 12.23           | -48.40                 | 5.89 | H   | -42.06       | -13.00      |      |        |

### 8.3 PEAK-TO-AVERAGE RATIO

| Band           | Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resource Block Offset | Data (dB ) |
|----------------|------------|-----------------|------------|---------------------|-----------------------|------------|
| Sub6<br>n25(2) | 5 MHz      | 1882.5          | BPSK       | 25                  | 0                     | 4.05       |
|                |            |                 | QPSK       |                     |                       | 4.70       |
|                |            |                 | 16-QAM     |                     |                       | 5.89       |
|                |            |                 | 64-QAM     |                     |                       | 6.21       |
|                |            |                 | 256-QAM    |                     |                       | 6.95       |
|                | 10 MHz     |                 | BPSK       | 50                  |                       | 4.04       |
|                |            |                 | QPSK       |                     |                       | 4.58       |
|                |            |                 | 16-QAM     |                     |                       | 5.59       |
|                |            |                 | 64-QAM     |                     |                       | 6.08       |
|                |            |                 | 256-QAM    |                     |                       | 6.73       |
|                | 15 MHz     |                 | BPSK       | 75                  |                       | 3.98       |
|                |            |                 | QPSK       |                     |                       | 4.51       |
|                |            |                 | 16-QAM     |                     |                       | 5.48       |
|                |            |                 | 64-QAM     |                     |                       | 5.98       |
|                |            |                 | 256-QAM    |                     |                       | 6.68       |
|                | 20 MHz     |                 | BPSK       | 100                 |                       | 3.92       |
|                |            |                 | QPSK       |                     |                       | 4.50       |
|                |            |                 | 16-QAM     |                     |                       | 5.52       |
|                |            |                 | 64-QAM     |                     |                       | 5.99       |
|                |            |                 | 256-QAM    |                     |                       | 6.62       |

|             |        |        |         |     |   |      |
|-------------|--------|--------|---------|-----|---|------|
| Sub6<br>n25 | 25 MHz | 1882.5 | BPSK    | 128 | 0 | 3.90 |
|             |        |        | QPSK    |     |   | 4.52 |
|             |        |        | 16-QAM  |     |   | 5.48 |
|             |        |        | 64-QAM  |     |   | 6.03 |
|             |        |        | 256-QAM |     |   | 6.60 |
|             | 30 MHz |        | BPSK    | 160 |   | 3.80 |
|             |        |        | QPSK    |     |   | 4.49 |
|             |        |        | 16-QAM  |     |   | 5.53 |
|             |        |        | 64-QAM  |     |   | 6.03 |
|             |        |        | 256-QAM |     |   | 6.59 |
|             | 40 MHz |        | BPSK    | 216 |   | 3.75 |
|             |        |        | QPSK    |     |   | 4.58 |
|             |        |        | 16-QAM  |     |   | 5.57 |
|             |        |        | 64-QAM  |     |   | 5.97 |
|             |        |        | 256-QAM |     |   | 6.55 |

**Note:**

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 46 ~ 80.

#### 8.4 OCCUPIED BANDWIDTH

| Band           | Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resource Block Offset | Data ( MHz ) |
|----------------|------------|-----------------|------------|---------------------|-----------------------|--------------|
| Sub6<br>n25(2) | 5 MHz      | 1882.5          | BPSK       | 25                  | 0                     | 4.5061       |
|                |            |                 | QPSK       |                     |                       | 4.5079       |
|                |            |                 | 16-QAM     |                     |                       | 4.5039       |
|                |            |                 | 64-QAM     |                     |                       | 4.4985       |
|                |            |                 | 256-QAM    |                     |                       | 4.5047       |
|                | 10 MHz     |                 | BPSK       | 50                  |                       | 8.9786       |
|                |            |                 | QPSK       |                     |                       | 8.9739       |
|                |            |                 | 16-QAM     |                     |                       | 8.9534       |
|                |            |                 | 64-QAM     |                     |                       | 8.9720       |
|                |            |                 | 256-QAM    |                     |                       | 8.9707       |
|                | 15 MHz     |                 | BPSK       | 75                  |                       | 13.478       |
|                |            |                 | QPSK       |                     |                       | 13.441       |
|                |            |                 | 16-QAM     |                     |                       | 13.459       |
|                |            |                 | 64-QAM     |                     |                       | 13.445       |
|                |            |                 | 256-QAM    |                     |                       | 13.451       |
|                | 20 MHz     |                 | BPSK       | 100                 |                       | 17.920       |
|                |            |                 | QPSK       |                     |                       | 17.946       |
|                |            |                 | 16-QAM     |                     |                       | 17.925       |
|                |            |                 | 64-QAM     |                     |                       | 17.891       |
|                |            |                 | 256-QAM    |                     |                       | 17.848       |

|             |        |        |         |     |   |        |
|-------------|--------|--------|---------|-----|---|--------|
| Sub6<br>n25 | 25 MHz | 1882.5 | BPSK    | 128 | 0 | 22.946 |
|             |        |        | QPSK    |     |   | 22.915 |
|             |        |        | 16-QAM  |     |   | 22.888 |
|             |        |        | 64-QAM  |     |   | 22.899 |
|             |        |        | 256-QAM |     |   | 22.918 |
|             | 30 MHz |        | BPSK    | 160 |   | 28.682 |
|             |        |        | QPSK    |     |   | 28.603 |
|             |        |        | 16-QAM  |     |   | 28.621 |
|             |        |        | 64-QAM  |     |   | 28.582 |
|             |        |        | 256-QAM |     |   | 28.645 |
|             | 40 MHz |        | BPSK    | 216 |   | 38.612 |
|             |        |        | QPSK    |     |   | 38.608 |
|             |        |        | 16-QAM  |     |   | 38.595 |
|             |        |        | 64-QAM  |     |   | 38.582 |
|             |        |        | 256-QAM |     |   | 38.534 |

**Note:**

1. Plots of the EUT's Occupied Bandwidth are shown Page 81~ 115.

## 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<br>n25(2) | 5                | 1852.5          | 3.8585                              | 30.200      | -60.789                        | -30.589      | -13.00      |
|                |                  | 1882.5          | 8.3250                              | 30.815      | -61.599                        | -30.784      |             |
|                |                  | 1912.5          | 7.1885                              | 30.815      | -62.144                        | -31.329      |             |
|                | 10               | 1855.0          | 3.9183                              | 30.200      | -61.591                        | -31.391      |             |
|                |                  | 1882.5          | 3.7688                              | 30.200      | -61.291                        | -31.091      |             |
|                |                  | 1910.0          | 5.0050                              | 30.815      | -61.912                        | -31.097      |             |
|                | 15               | 1857.5          | 9.4018                              | 30.815      | -61.980                        | -31.165      |             |
|                |                  | 1882.5          | 5.1945                              | 30.815      | -61.246                        | -30.431      |             |
|                |                  | 1907.5          | 3.8385                              | 30.200      | -61.047                        | -30.847      |             |
|                | 20               | 1860.0          | 6.0220                              | 30.815      | -61.756                        | -30.941      |             |
|                |                  | 1882.5          | 4.8954                              | 30.200      | -61.528                        | -31.328      |             |
|                |                  | 1905.0          | 5.2543                              | 30.815      | -61.416                        | -30.601      |             |
| Sub6<br>n25    | 25               | 1862.5          | 6.0120                              | 27.520      | -61.245                        | -33.725      |             |
|                |                  | 1882.5          | 9.5214                              | 27.520      | -61.642                        | -34.122      |             |
|                |                  | 1902.5          | 7.1685                              | 27.520      | -61.686                        | -34.166      |             |
|                | 30               | 1865.0          | 3.7987                              | 26.600      | -61.587                        | -34.987      |             |
|                |                  | 1882.5          | 3.8385                              | 26.600      | -61.529                        | -34.929      |             |
|                |                  | 1900.0          | 7.4277                              | 27.520      | -62.057                        | -34.537      |             |
|                | 40               | 1870.0          | 8.0658                              | 27.520      | -62.118                        | -34.598      |             |
|                |                  | 1882.5          | 3.7887                              | 26.600      | -60.614                        | -34.014      |             |
|                |                  | 1895.0          | 4.0080                              | 26.600      | -61.383                        | -34.783      |             |

### Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 116 ~ 157.
2. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
3. Factor(dB) = Cable Loss + Attenuator + Power Splitter

| Frequency Range (GHz) | Factor [dB] |
|-----------------------|-------------|
| 0.03 – 1              | 26.080      |
| 1 – 5                 | 26.600      |
| 5 – 10                | 27.520      |
| 10 – 15               | 29.120      |
| 15 – 20               | 31.710      |
| Above 20              | 32.350      |

## 8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 158 ~ 199.

## 8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

- ☐ BandWidth: 5 MHz  
☐ Voltage(100 %): 12.000 VDC  
☐ LIMIT: Emission must remain in band

| Test.<br>Frequency | Voltage | Temp.    | Frequency    | Frequency<br>Error | Deviation  | ppm    |
|--------------------|---------|----------|--------------|--------------------|------------|--------|
| (MHz)              | (%)     | (°C)     | (Hz)         | (Hz)               | (%)        |        |
| 1852.5             | 100 %   | +20(Ref) | 1852 499 987 | 0.0                | 0.000 000  | 0.000  |
|                    | 100 %   | -30      | 1852 499 988 | 0.3                | 0.000 000  | 0.000  |
|                    | 100 %   | -20      | 1852 499 983 | -4.6               | 0.000 000  | -0.002 |
|                    | 100 %   | -10      | 1852 499 978 | -9.2               | 0.000 000  | -0.005 |
|                    | 100 %   | 0        | 1852 499 992 | 5.1                | 0.000 000  | 0.003  |
|                    | 100 %   | +10      | 1852 499 986 | -1.4               | 0.000 000  | -0.001 |
|                    | 100 %   | +30      | 1852 499 981 | -6.2               | 0.000 000  | -0.003 |
|                    | 100 %   | +40      | 1852 499 977 | -10.7              | -0.000 001 | -0.006 |
|                    | 100 %   | +50      | 1852 499 987 | -0.2               | 0.000 000  | 0.000  |
|                    | 85 %    | +20      | 1852 499 984 | -3.5               | 0.000 000  | -0.002 |
|                    | 115 %   | +20      | 1852 499 979 | -8.7               | 0.000 000  | -0.005 |
| 1912.5             | 100 %   | +20(Ref) | 1912 500 001 | 0.0                | 0.000 000  | 0.000  |
|                    | 100 %   | -30      | 1912 499 999 | -1.8               | 0.000 000  | -0.001 |
|                    | 100 %   | -20      | 1912 499 997 | -3.3               | 0.000 000  | -0.002 |
|                    | 100 %   | -10      | 1912 499 995 | -5.2               | 0.000 000  | -0.003 |
|                    | 100 %   | 0        | 1912 499 994 | -6.7               | 0.000 000  | -0.004 |
|                    | 100 %   | +10      | 1912 499 992 | -8.2               | 0.000 000  | -0.004 |
|                    | 100 %   | +30      | 1912 499 990 | -10.5              | -0.000 001 | -0.005 |
|                    | 100 %   | +40      | 1912 499 989 | -11.5              | -0.000 001 | -0.006 |
|                    | 100 %   | +50      | 1912 499 987 | -13.2              | -0.000 001 | -0.007 |
|                    | 85 %    | +20      | 1912 499 994 | -6.5               | 0.000 000  | -0.003 |
|                    | 115 %   | +20      | 1912 499 989 | -11.1              | -0.000 001 | -0.006 |

☐ BandWidth: 10 MHz  
☐ Voltage(100 %): 12.000 VDC  
☐ LIMIT: Emission must remain in band

| Test.<br>Frequency | Voltage | Temp.    | Frequency    | Frequency<br>Error | Deviation  | ppm    |
|--------------------|---------|----------|--------------|--------------------|------------|--------|
| (MHz)              | (%)     | (°C)     | (Hz)         | (Hz)               | (%)        |        |
| 1855.0             | 100 %   | +20(Ref) | 1854 999 999 | 0.0                | 0.000 000  | 0.000  |
|                    | 100 %   | -30      | 1854 999 996 | -3.6               | 0.000 000  | -0.002 |
|                    | 100 %   | -20      | 1854 999 993 | -5.9               | 0.000 000  | -0.003 |
|                    | 100 %   | -10      | 1854 999 991 | -8.0               | 0.000 000  | -0.004 |
|                    | 100 %   | 0        | 1854 999 988 | -11.5              | -0.000 001 | -0.006 |
|                    | 100 %   | +10      | 1855 000 003 | 3.9                | 0.000 000  | 0.002  |
|                    | 100 %   | +30      | 1855 000 001 | 2.0                | 0.000 000  | 0.001  |
|                    | 100 %   | +40      | 1854 999 999 | -0.2               | 0.000 000  | 0.000  |
|                    | 100 %   | +50      | 1854 999 996 | -3.0               | 0.000 000  | -0.002 |
|                    | 85 %    | +20      | 1854 999 998 | -1.5               | 0.000 000  | -0.001 |
|                    | 115 %   | +20      | 1854 999 990 | -9.2               | 0.000 000  | -0.005 |
| 1910.0             | 100 %   | +20(Ref) | 1910 000 008 | 0.0                | 0.000 000  | 0.000  |
|                    | 100 %   | -30      | 1910 000 017 | 8.2                | 0.000 000  | 0.004  |
|                    | 100 %   | -20      | 1910 000 015 | 7.1                | 0.000 000  | 0.004  |
|                    | 100 %   | -10      | 1910 000 016 | 7.3                | 0.000 000  | 0.004  |
|                    | 100 %   | 0        | 1910 000 015 | 6.2                | 0.000 000  | 0.003  |
|                    | 100 %   | +10      | 1910 000 014 | 5.6                | 0.000 000  | 0.003  |
|                    | 100 %   | +30      | 1910 000 013 | 4.8                | 0.000 000  | 0.003  |
|                    | 100 %   | +40      | 1910 000 013 | 4.5                | 0.000 000  | 0.002  |
|                    | 100 %   | +50      | 1910 000 011 | 2.9                | 0.000 000  | 0.002  |
|                    | 85 %    | +20      | 1910 000 010 | 2.1                | 0.000 000  | 0.001  |
|                    | 115 %   | +20      | 1910 000 009 | 0.6                | 0.000 000  | 0.000  |

■ BandWidth: 15 MHz  
 ■ Voltage(100 %): 12.000 VDC  
 ■ LIMIT: Emission must remain in band

| Test.<br>Frequency | Voltage | Temp.    | Frequency    | Frequency<br>Error | Deviation | ppm    |
|--------------------|---------|----------|--------------|--------------------|-----------|--------|
| (MHz)              | (%)     | (°C)     | (Hz)         | (Hz)               | (%)       |        |
| 1857.5             | 100 %   | +20(Ref) | 1857 500 013 | 0.0                | 0.000 000 | 0.000  |
|                    | 100 %   | -30      | 1857 500 026 | 12.5               | 0.000 001 | 0.007  |
|                    | 100 %   | -20      | 1857 500 024 | 11.2               | 0.000 001 | 0.006  |
|                    | 100 %   | -10      | 1857 500 023 | 9.9                | 0.000 001 | 0.005  |
|                    | 100 %   | 0        | 1857 500 021 | 7.3                | 0.000 000 | 0.004  |
|                    | 100 %   | +10      | 1857 500 019 | 5.9                | 0.000 000 | 0.003  |
|                    | 100 %   | +30      | 1857 500 018 | 5.0                | 0.000 000 | 0.003  |
|                    | 100 %   | +40      | 1857 500 017 | 3.7                | 0.000 000 | 0.002  |
|                    | 100 %   | +50      | 1857 500 016 | 2.7                | 0.000 000 | 0.001  |
|                    | 85 %    | +20      | 1857 500 022 | 8.9                | 0.000 000 | 0.005  |
|                    | 115 %   | +20      | 1857 500 025 | 11.8               | 0.000 001 | 0.006  |
| 1907.5             | 100 %   | +20(Ref) | 1907 499 997 | 0.0                | 0.000 000 | 0.000  |
|                    | 100 %   | -30      | 1907 499 993 | -3.9               | 0.000 000 | -0.002 |
|                    | 100 %   | -20      | 1907 499 993 | -3.8               | 0.000 000 | -0.002 |
|                    | 100 %   | -10      | 1907 499 992 | -4.4               | 0.000 000 | -0.002 |
|                    | 100 %   | 0        | 1907 499 991 | -5.3               | 0.000 000 | -0.003 |
|                    | 100 %   | +10      | 1907 499 991 | -5.8               | 0.000 000 | -0.003 |
|                    | 100 %   | +30      | 1907 499 990 | -6.3               | 0.000 000 | -0.003 |
|                    | 100 %   | +40      | 1907 499 990 | -6.5               | 0.000 000 | -0.003 |
|                    | 100 %   | +50      | 1907 499 990 | -6.5               | 0.000 000 | -0.003 |
|                    | 85 %    | +20      | 1907 499 996 | -1.2               | 0.000 000 | -0.001 |
|                    | 115 %   | +20      | 1907 499 993 | -3.9               | 0.000 000 | -0.002 |

☐ BandWidth: 20 MHz  
☐ Voltage(100 %): 12.000 VDC  
☐ LIMIT: Emission must remain in band

| Test.<br>Frequency | Voltage | Temp.    | Frequency    | Frequency<br>Error | Deviation  | ppm    |
|--------------------|---------|----------|--------------|--------------------|------------|--------|
| (MHz)              | (%)     | (°C)     | (Hz)         | (Hz)               | (%)        |        |
| 1860.0             | 100 %   | +20(Ref) | 1859 999 990 | 0.0                | 0.000 000  | 0.000  |
|                    | 100 %   | -30      | 1859 999 978 | -11.5              | -0.000 001 | -0.006 |
|                    | 100 %   | -20      | 1859 999 978 | -11.6              | -0.000 001 | -0.006 |
|                    | 100 %   | -10      | 1859 999 977 | -12.5              | -0.000 001 | -0.007 |
|                    | 100 %   | 0        | 1859 999 990 | 0.3                | 0.000 000  | 0.000  |
|                    | 100 %   | +10      | 1859 999 975 | -14.7              | -0.000 001 | -0.008 |
|                    | 100 %   | +30      | 1859 999 992 | 2.1                | 0.000 000  | 0.001  |
|                    | 100 %   | +40      | 1859 999 992 | 1.8                | 0.000 000  | 0.001  |
|                    | 100 %   | +50      | 1859 999 990 | 0.6                | 0.000 000  | 0.000  |
|                    | 85 %    | +20      | 1859 999 989 | -1.0               | 0.000 000  | -0.001 |
|                    | 115 %   | +20      | 1859 999 994 | 4.4                | 0.000 000  | 0.002  |
| 1905.0             | 100 %   | +20(Ref) | 1904 999 998 | 0.0                | 0.000 000  | 0.000  |
|                    | 100 %   | -30      | 1904 999 995 | -2.8               | 0.000 000  | -0.001 |
|                    | 100 %   | -20      | 1904 999 995 | -3.4               | 0.000 000  | -0.002 |
|                    | 100 %   | -10      | 1904 999 994 | -3.7               | 0.000 000  | -0.002 |
|                    | 100 %   | 0        | 1904 999 995 | -3.4               | 0.000 000  | -0.002 |
|                    | 100 %   | +10      | 1904 999 994 | -3.7               | 0.000 000  | -0.002 |
|                    | 100 %   | +30      | 1904 999 994 | -3.7               | 0.000 000  | -0.002 |
|                    | 100 %   | +40      | 1904 999 994 | -4.3               | 0.000 000  | -0.002 |
|                    | 100 %   | +50      | 1904 999 994 | -4.4               | 0.000 000  | -0.002 |
|                    | 85 %    | +20      | 1904 999 990 | -8.5               | 0.000 000  | -0.004 |
|                    | 115 %   | +20      | 1904 999 992 | -6.2               | 0.000 000  | -0.003 |

☐ BandWidth: 25 MHz  
☐ Voltage(100 %): 12.000 VDC  
☐ LIMIT: Emission must remain in band

| Test.<br>Frequency | Voltage | Temp.    | Frequency    | Frequency<br>Error | Deviation | ppm    |
|--------------------|---------|----------|--------------|--------------------|-----------|--------|
| (MHz)              | (%)     | (°C)     | (Hz)         | (Hz)               | (%)       |        |
| 1862.5             | 100 %   | +20(Ref) | 1862 499 990 | 0.0                | 0.000 000 | 0.000  |
|                    | 100 %   | -30      | 1862 499 983 | -7.5               | 0.000 000 | -0.004 |
|                    | 100 %   | -20      | 1862 499 997 | 6.7                | 0.000 000 | 0.004  |
|                    | 100 %   | -10      | 1862 499 996 | 5.8                | 0.000 000 | 0.003  |
|                    | 100 %   | 0        | 1862 499 994 | 4.3                | 0.000 000 | 0.002  |
|                    | 100 %   | +10      | 1862 499 993 | 3.0                | 0.000 000 | 0.002  |
|                    | 100 %   | +30      | 1862 499 992 | 2.1                | 0.000 000 | 0.001  |
|                    | 100 %   | +40      | 1862 499 991 | 1.3                | 0.000 000 | 0.001  |
|                    | 100 %   | +50      | 1862 499 990 | 0.4                | 0.000 000 | 0.000  |
|                    | 85 %    | +20      | 1862 499 992 | 2.0                | 0.000 000 | 0.001  |
|                    | 115 %   | +20      | 1862 499 988 | -1.8               | 0.000 000 | -0.001 |
| 1902.5             | 100 %   | +20(Ref) | 1902 500 003 | 0.0                | 0.000 000 | 0.000  |
|                    | 100 %   | -30      | 1902 500 006 | 3.0                | 0.000 000 | 0.002  |
|                    | 100 %   | -20      | 1902 500 007 | 3.6                | 0.000 000 | 0.002  |
|                    | 100 %   | -10      | 1902 500 007 | 3.6                | 0.000 000 | 0.002  |
|                    | 100 %   | 0        | 1902 500 007 | 3.3                | 0.000 000 | 0.002  |
|                    | 100 %   | +10      | 1902 500 007 | 3.4                | 0.000 000 | 0.002  |
|                    | 100 %   | +30      | 1902 500 006 | 2.8                | 0.000 000 | 0.001  |
|                    | 100 %   | +40      | 1902 500 006 | 2.4                | 0.000 000 | 0.001  |
|                    | 100 %   | +50      | 1902 500 006 | 2.7                | 0.000 000 | 0.001  |
|                    | 85 %    | +20      | 1902 500 007 | 3.3                | 0.000 000 | 0.002  |
|                    | 115 %   | +20      | 1902 500 006 | 2.2                | 0.000 000 | 0.001  |

☐ BandWidth: 30 MHz  
☐ Voltage(100 %): 12.000 VDC  
☐ LIMIT: Emission must remain in band

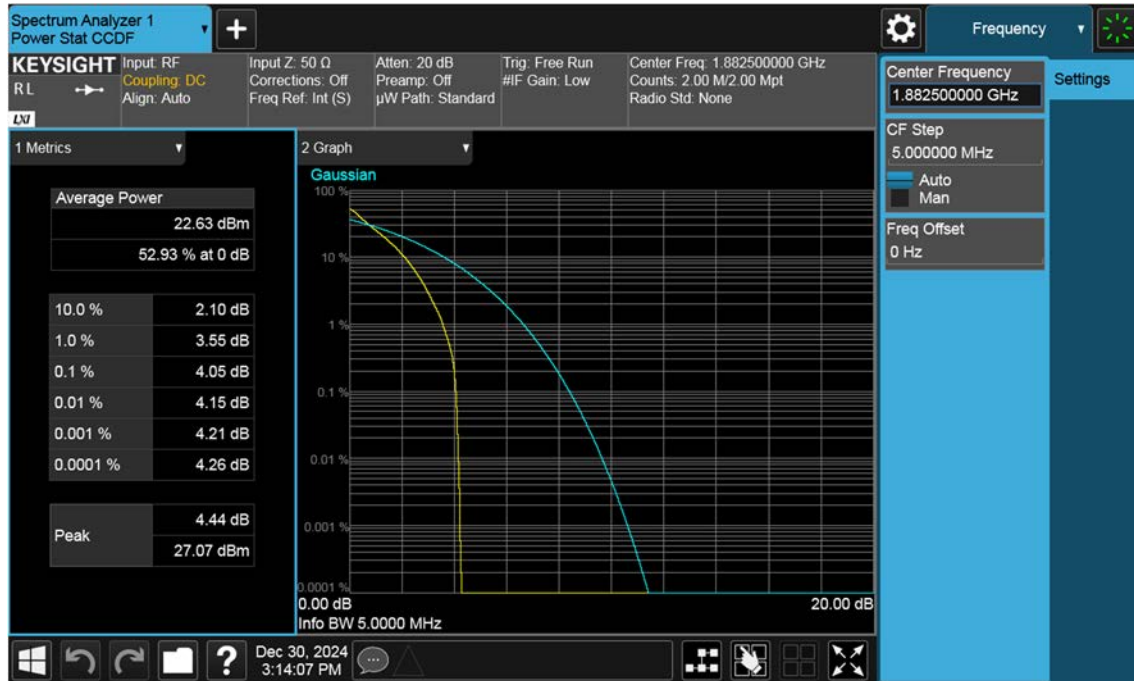
| Test.<br>Frequency | Voltage | Temp.    | Frequency    | Frequency<br>Error | Deviation | ppm    |
|--------------------|---------|----------|--------------|--------------------|-----------|--------|
| (MHz)              | (%)     | (°C)     | (Hz)         | (Hz)               | (%)       |        |
| 1865.0             | 100 %   | +20(Ref) | 1865 000 003 | 0.0                | 0.000 000 | 0.000  |
|                    | 100 %   | -30      | 1865 000 005 | 2.2                | 0.000 000 | 0.001  |
|                    | 100 %   | -20      | 1865 000 005 | 1.3                | 0.000 000 | 0.001  |
|                    | 100 %   | -10      | 1865 000 003 | -0.2               | 0.000 000 | 0.000  |
|                    | 100 %   | 0        | 1865 000 004 | 1.0                | 0.000 000 | 0.001  |
|                    | 100 %   | +10      | 1865 000 020 | 17.0               | 0.000 001 | 0.009  |
|                    | 100 %   | +30      | 1865 000 001 | -2.7               | 0.000 000 | -0.001 |
|                    | 100 %   | +40      | 1865 000 019 | 15.6               | 0.000 001 | 0.008  |
|                    | 100 %   | +50      | 1865 000 021 | 17.5               | 0.000 001 | 0.009  |
|                    | 85 %    | +20      | 1865 000 010 | 7.2                | 0.000 000 | 0.004  |
|                    | 115 %   | +20      | 1865 000 014 | 10.3               | 0.000 001 | 0.006  |
| 1900.0             | 100 %   | +20(Ref) | 1899 999 988 | 0.0                | 0.000 000 | 0.000  |
|                    | 100 %   | -30      | 1899 999 995 | 6.4                | 0.000 000 | 0.003  |
|                    | 100 %   | -20      | 1899 999 994 | 6.3                | 0.000 000 | 0.003  |
|                    | 100 %   | -10      | 1899 999 994 | 5.8                | 0.000 000 | 0.003  |
|                    | 100 %   | 0        | 1899 999 994 | 5.5                | 0.000 000 | 0.003  |
|                    | 100 %   | +10      | 1899 999 994 | 5.7                | 0.000 000 | 0.003  |
|                    | 100 %   | +30      | 1899 999 993 | 5.0                | 0.000 000 | 0.003  |
|                    | 100 %   | +40      | 1899 999 993 | 5.2                | 0.000 000 | 0.003  |
|                    | 100 %   | +50      | 1899 999 993 | 4.8                | 0.000 000 | 0.003  |
|                    | 85 %    | +20      | 1899 999 992 | 4.1                | 0.000 000 | 0.002  |
|                    | 115 %   | +20      | 1899 999 995 | 6.9                | 0.000 000 | 0.004  |

☐ BandWidth: 40 MHz  
☐ Voltage(100 %): 12.000 VDC  
☐ LIMIT: Emission must remain in band

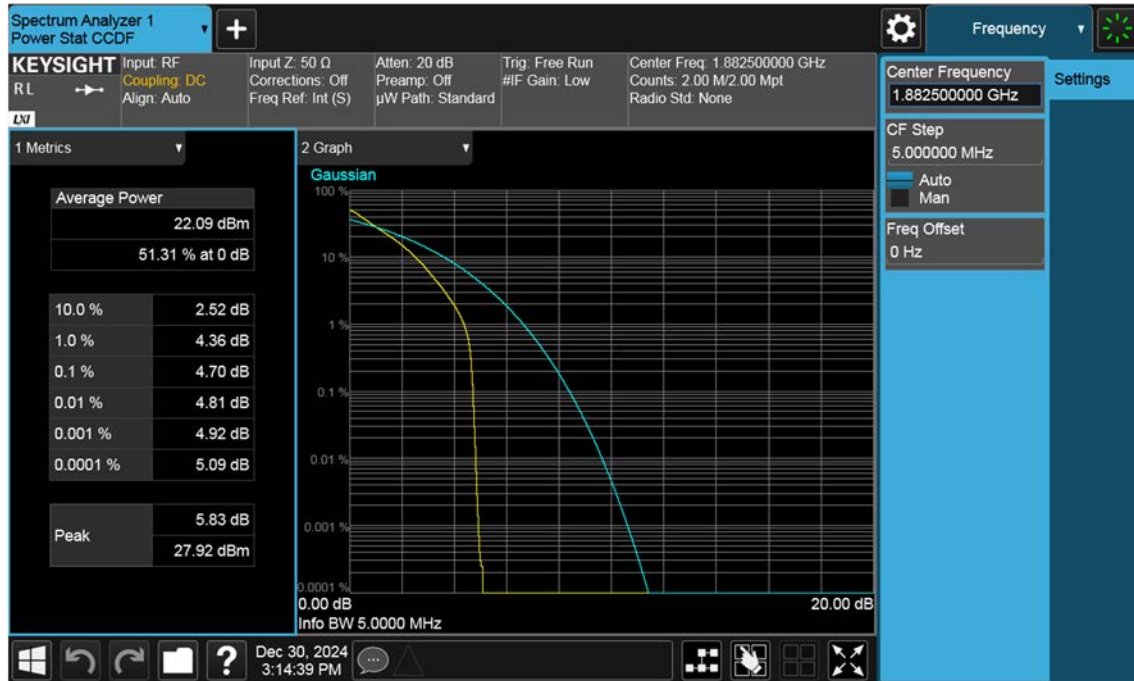
| Test.<br>Frequency | Voltage | Temp.    | Frequency    | Frequency<br>Error | Deviation  | ppm    |
|--------------------|---------|----------|--------------|--------------------|------------|--------|
| (MHz)              | (%)     | (°C)     | (Hz)         | (Hz)               | (%)        |        |
| 1870.0             | 100 %   | +20(Ref) | 1870 000 005 | 0.0                | 0.000 000  | 0.000  |
|                    | 100 %   | -30      | 1870 000 009 | 3.6                | 0.000 000  | 0.002  |
|                    | 100 %   | -20      | 1870 000 006 | 1.2                | 0.000 000  | 0.001  |
|                    | 100 %   | -10      | 1870 000 005 | -0.6               | 0.000 000  | 0.000  |
|                    | 100 %   | 0        | 1870 000 004 | -1.5               | 0.000 000  | -0.001 |
|                    | 100 %   | +10      | 1870 000 001 | -3.7               | 0.000 000  | -0.002 |
|                    | 100 %   | +30      | 1870 000 000 | -5.0               | 0.000 000  | -0.003 |
|                    | 100 %   | +40      | 1869 999 998 | -7.1               | 0.000 000  | -0.004 |
|                    | 100 %   | +50      | 1869 999 996 | -9.5               | -0.000 001 | -0.005 |
|                    | 85 %    | +20      | 1870 000 008 | 2.6                | 0.000 000  | 0.001  |
|                    | 115 %   | +20      | 1870 000 010 | 5.2                | 0.000 000  | 0.003  |
| 1895.0             | 100 %   | +20(Ref) | 1895 000 016 | 0.0                | 0.000 000  | 0.000  |
|                    | 100 %   | -30      | 1895 000 032 | 15.9               | 0.000 001  | 0.008  |
|                    | 100 %   | -20      | 1895 000 031 | 14.9               | 0.000 001  | 0.008  |
|                    | 100 %   | -10      | 1895 000 030 | 13.7               | 0.000 001  | 0.007  |
|                    | 100 %   | 0        | 1895 000 029 | 12.9               | 0.000 001  | 0.007  |
|                    | 100 %   | +10      | 1895 000 027 | 10.9               | 0.000 001  | 0.006  |
|                    | 100 %   | +30      | 1895 000 027 | 10.2               | 0.000 001  | 0.005  |
|                    | 100 %   | +40      | 1895 000 026 | 10.0               | 0.000 001  | 0.005  |
|                    | 100 %   | +50      | 1895 000 025 | 8.6                | 0.000 000  | 0.005  |
|                    | 85 %    | +20      | 1895 000 021 | 4.4                | 0.000 000  | 0.002  |
|                    | 115 %   | +20      | 1895 000 025 | 8.9                | 0.000 000  | 0.005  |

## 9. TEST PLOTS

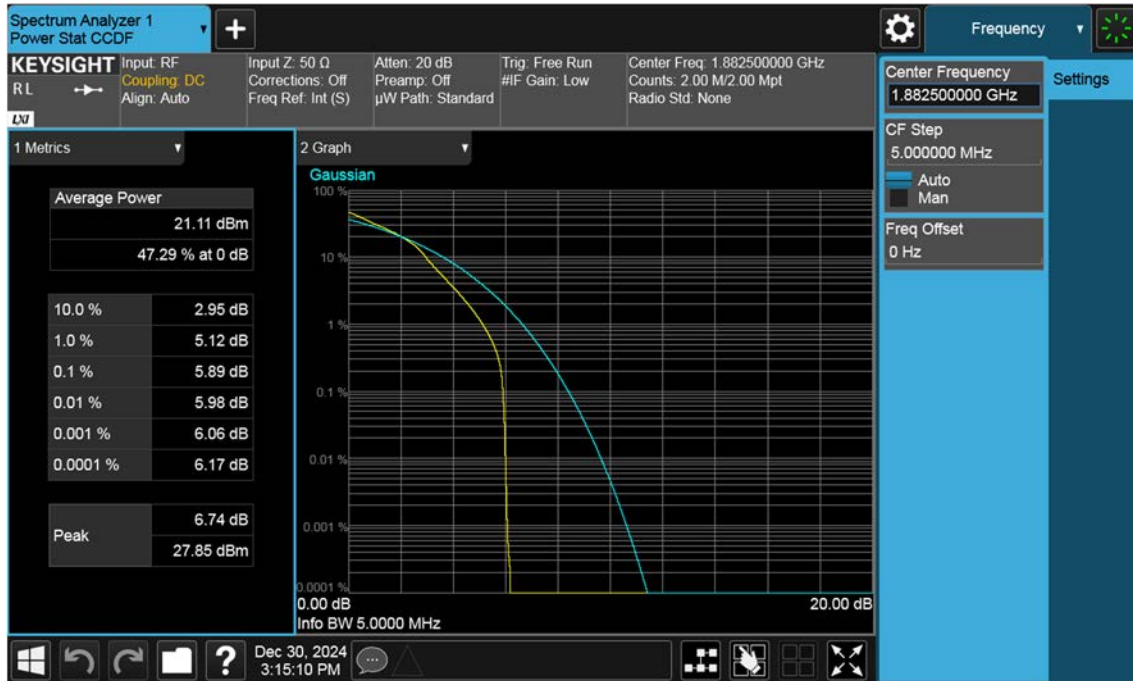
## NR25\_5 M\_PAR\_Mid\_BPSK\_FullRB



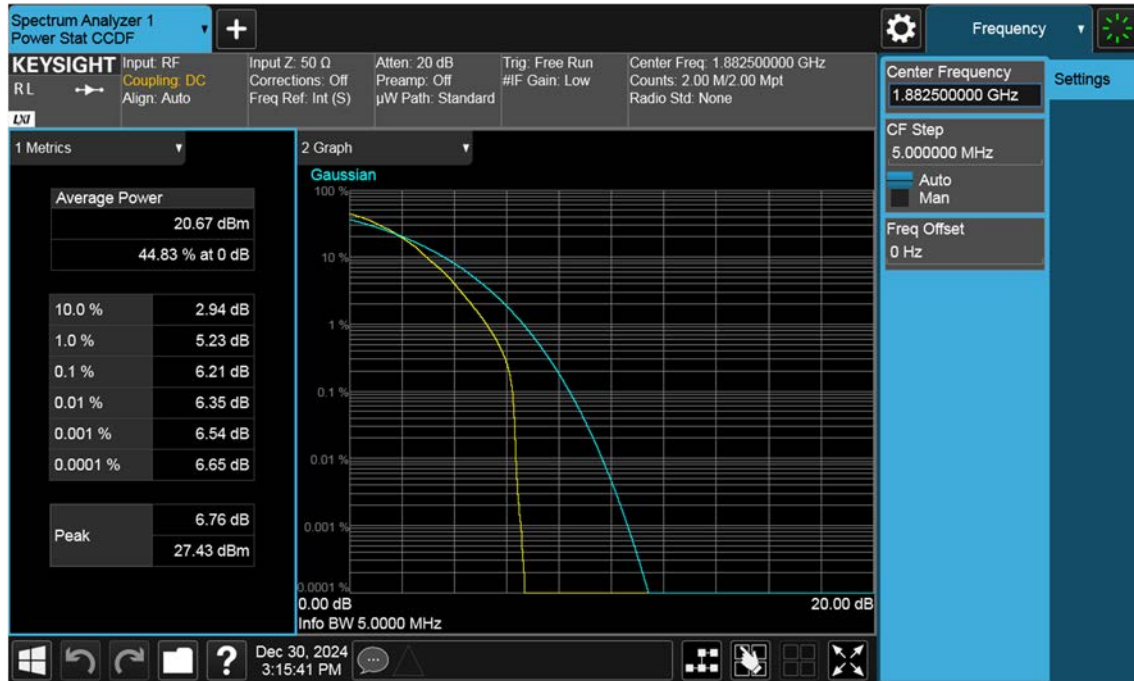
## NR25\_5 M\_PAR\_Mid\_QPSK\_FullRB



NR25\_5 M\_PAR\_Mid\_16QAM\_FullRB



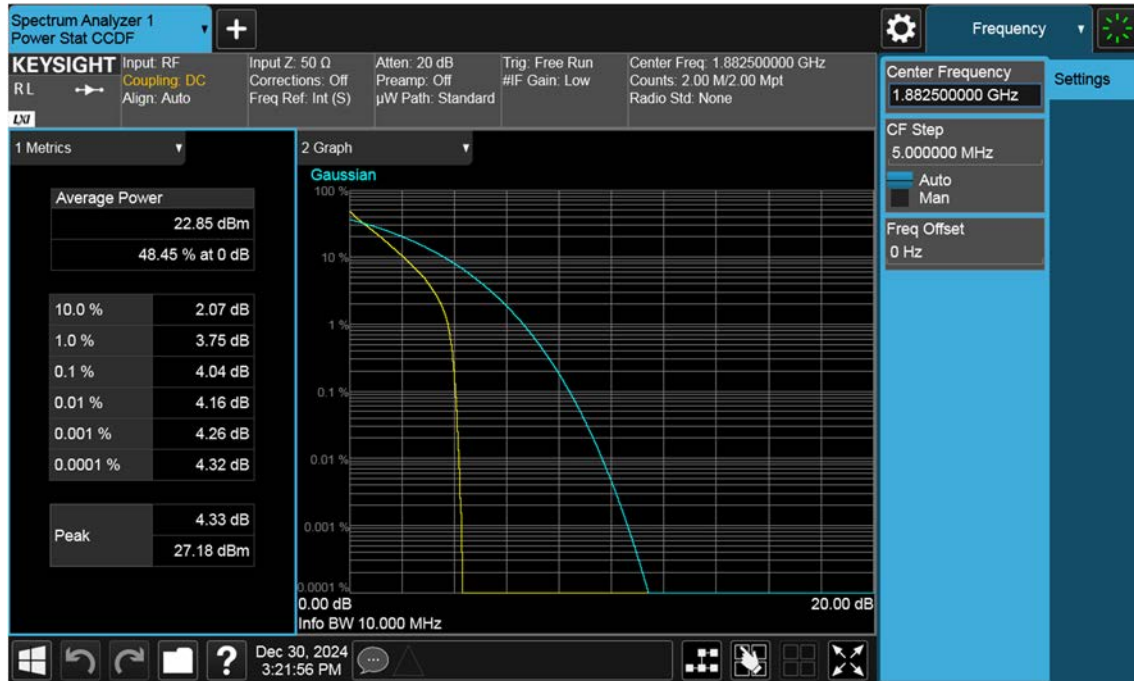
NR25\_5 M\_PAR\_Mid\_64QAM\_FullRB



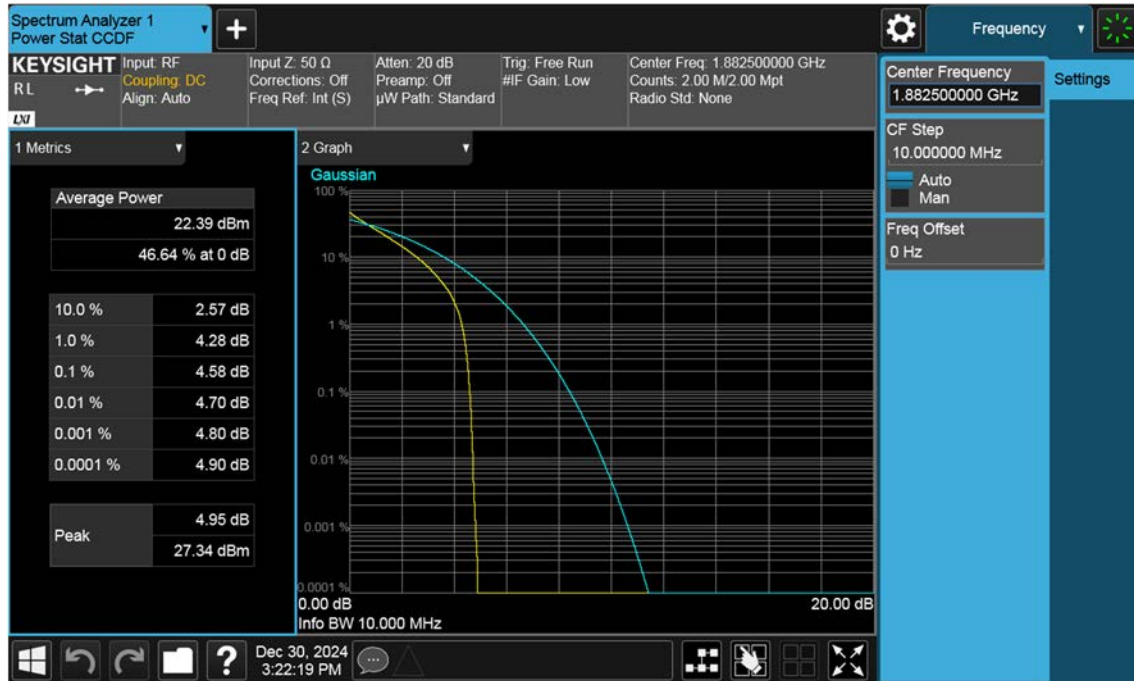
## NR25\_5 M\_PAR\_Mid\_256QAM\_FullRB



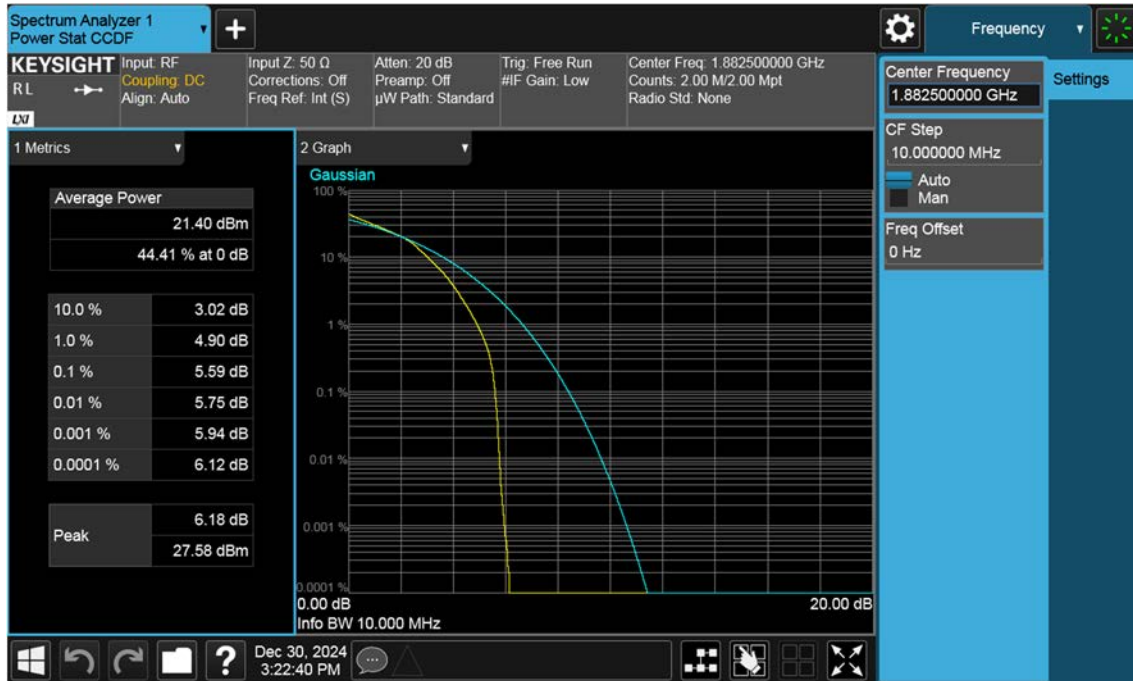
NR25\_10 M\_PAR\_Mid\_BPSK\_FullIRB



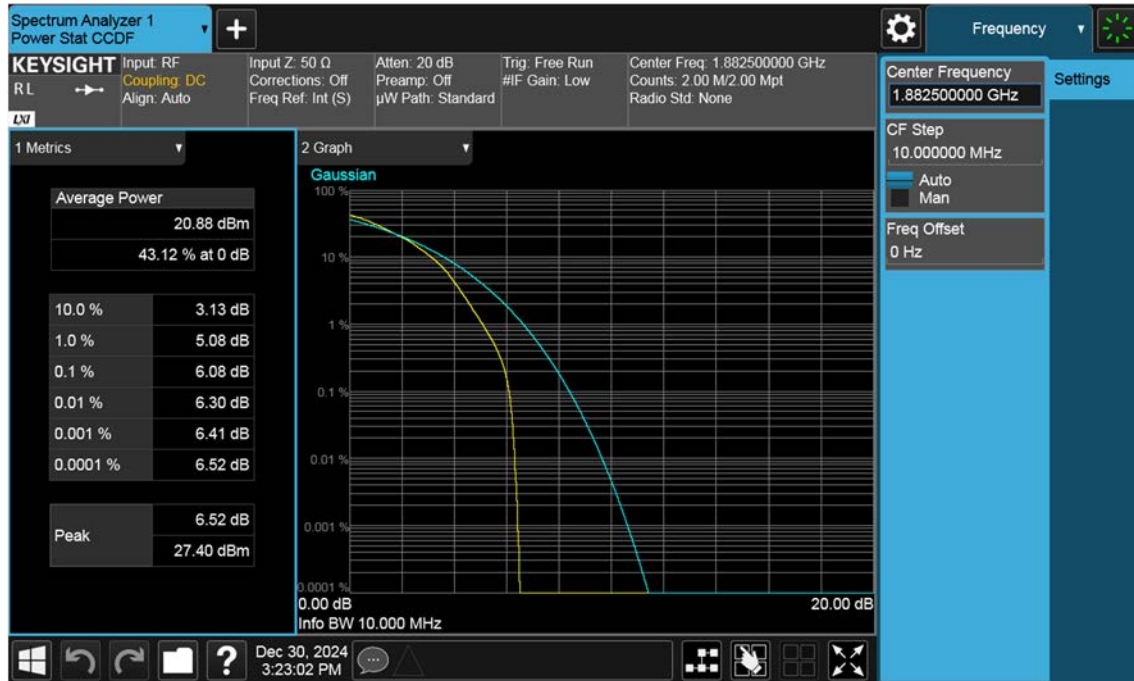
## NR25\_10 M\_PAR\_Mid\_QPSK\_FullRB



NR25\_10 M\_PAR\_Mid\_16QAM\_FullRB



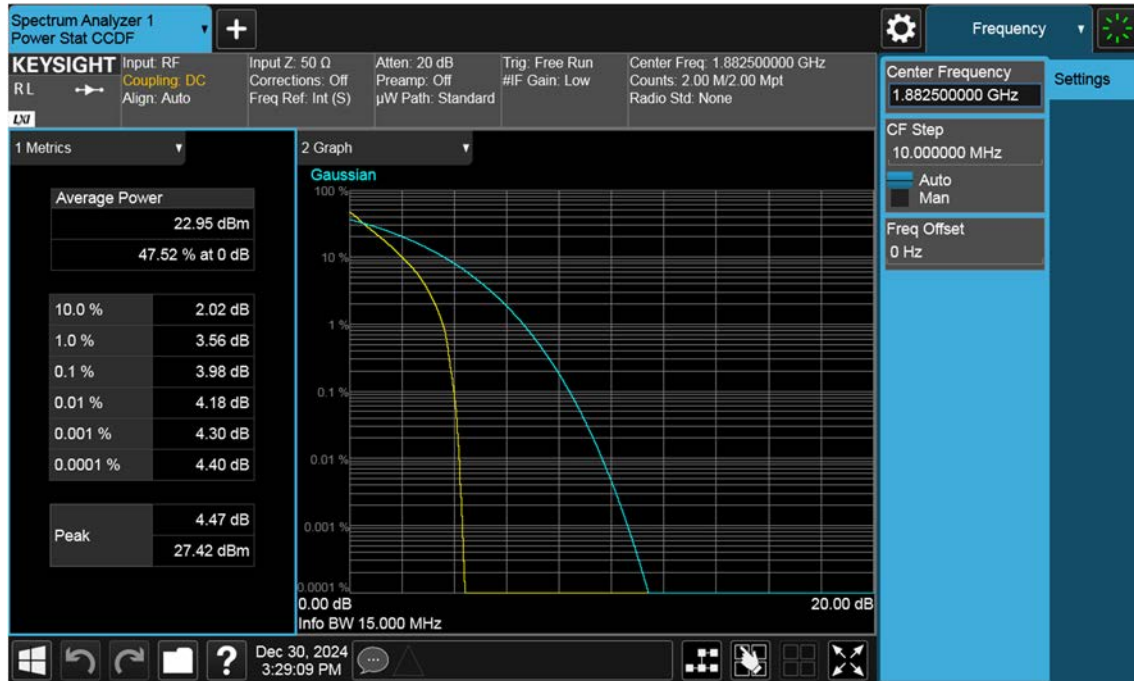
NR25\_10 M\_PAR\_Mid\_64QAM\_FullRB



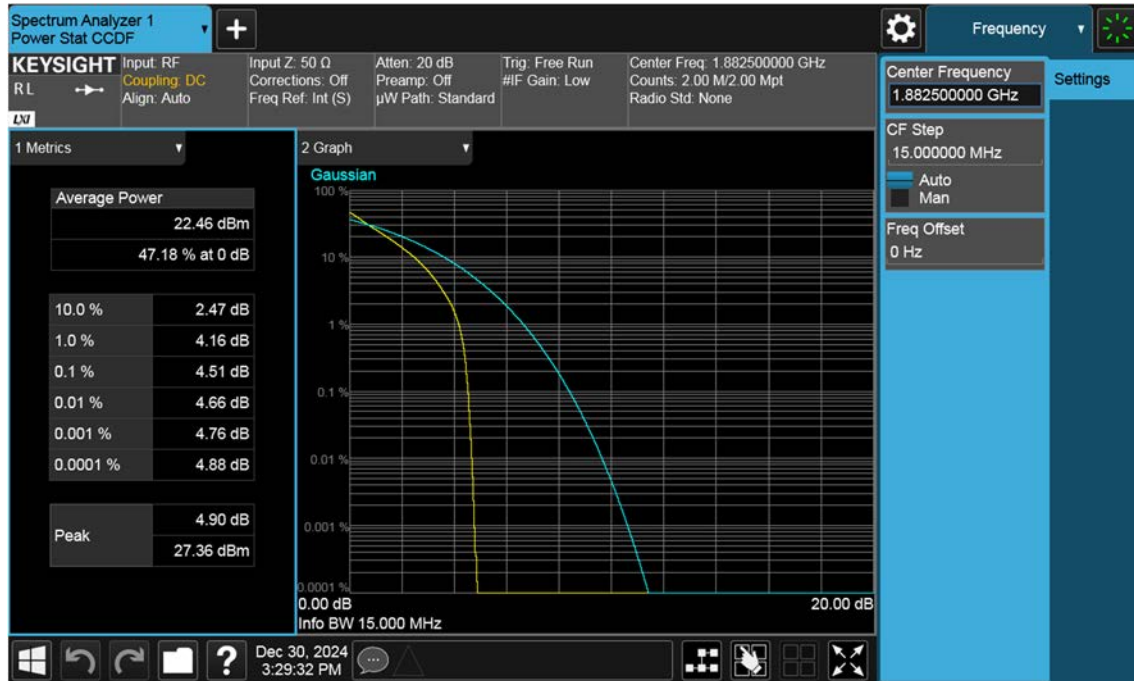
NR25\_10 M\_PAR\_Mid\_256QAM\_FullRB



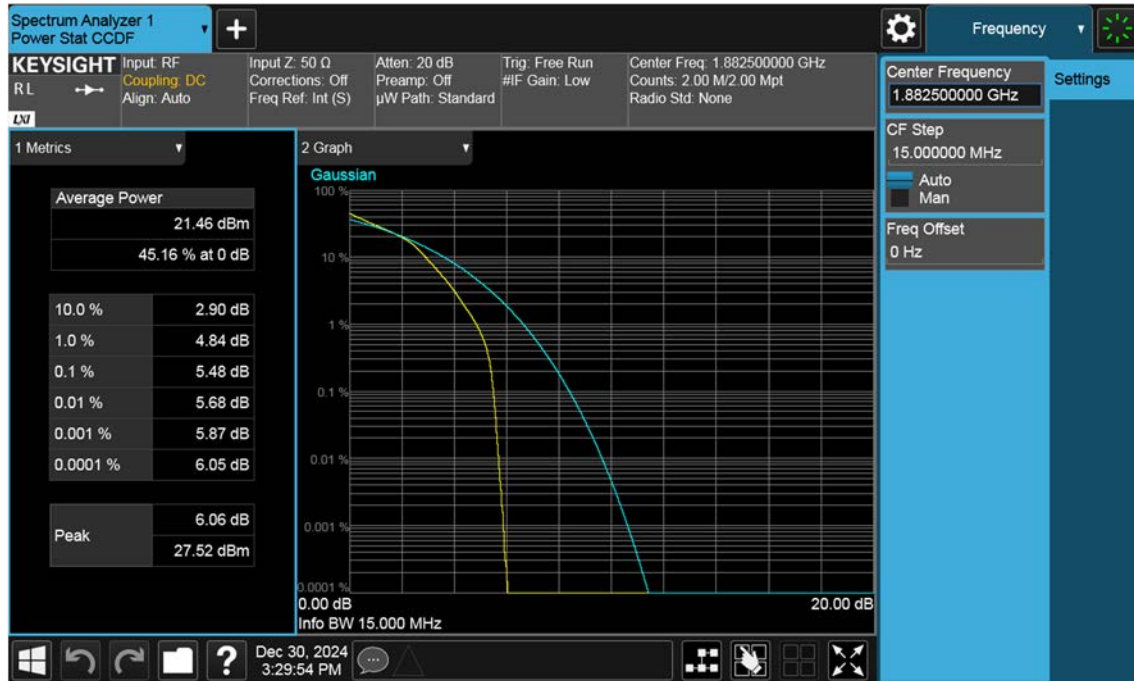
## NR25\_15 M\_PAR\_Mid\_BPSK\_FullIRB



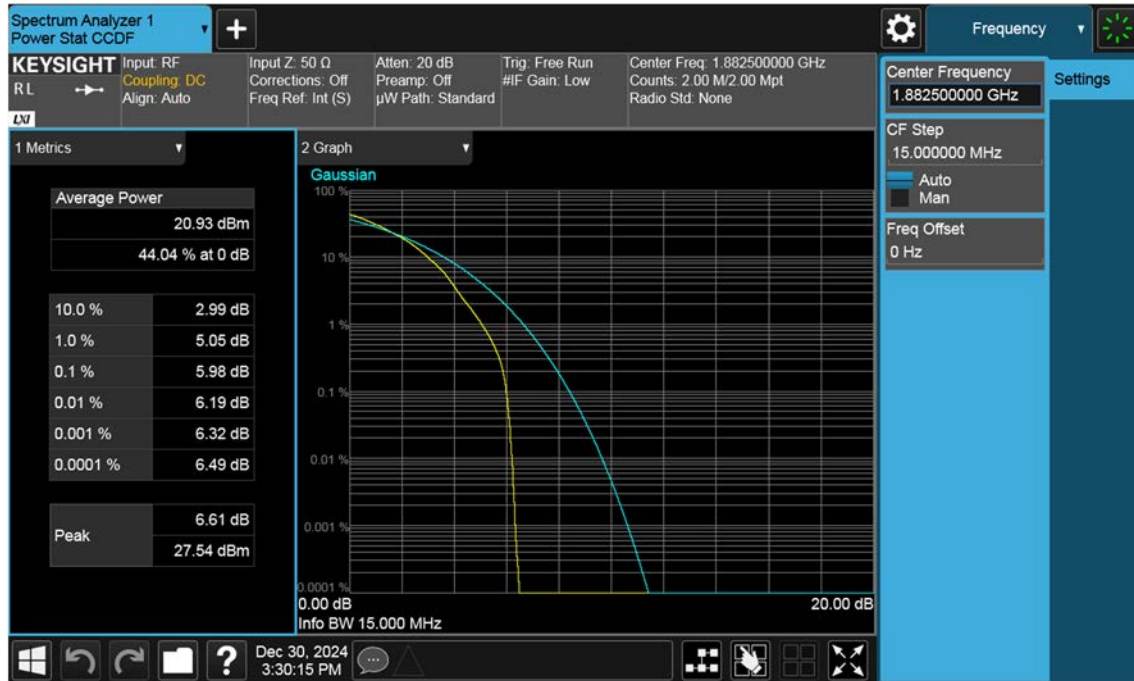
NR25\_15 M\_PAR\_Mid\_QPSK\_FullRB



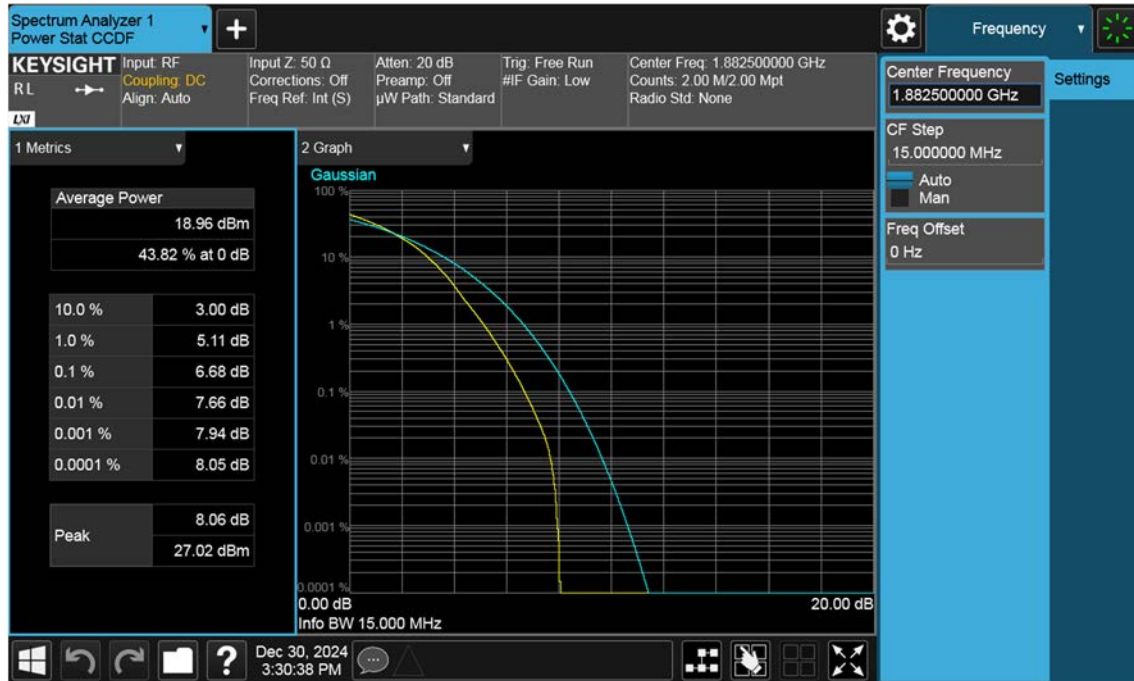
NR25\_15 M\_PAR\_Mid\_16QAM\_FullRB



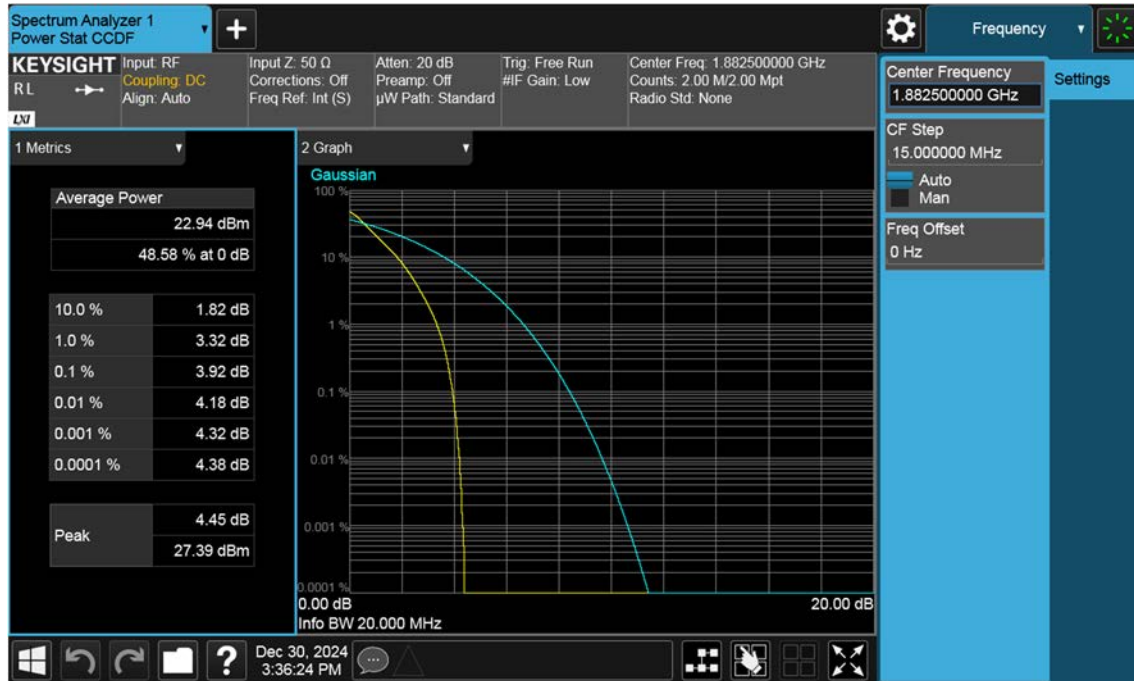
NR25\_15 M\_PAR\_Mid\_64QAM\_FullRB



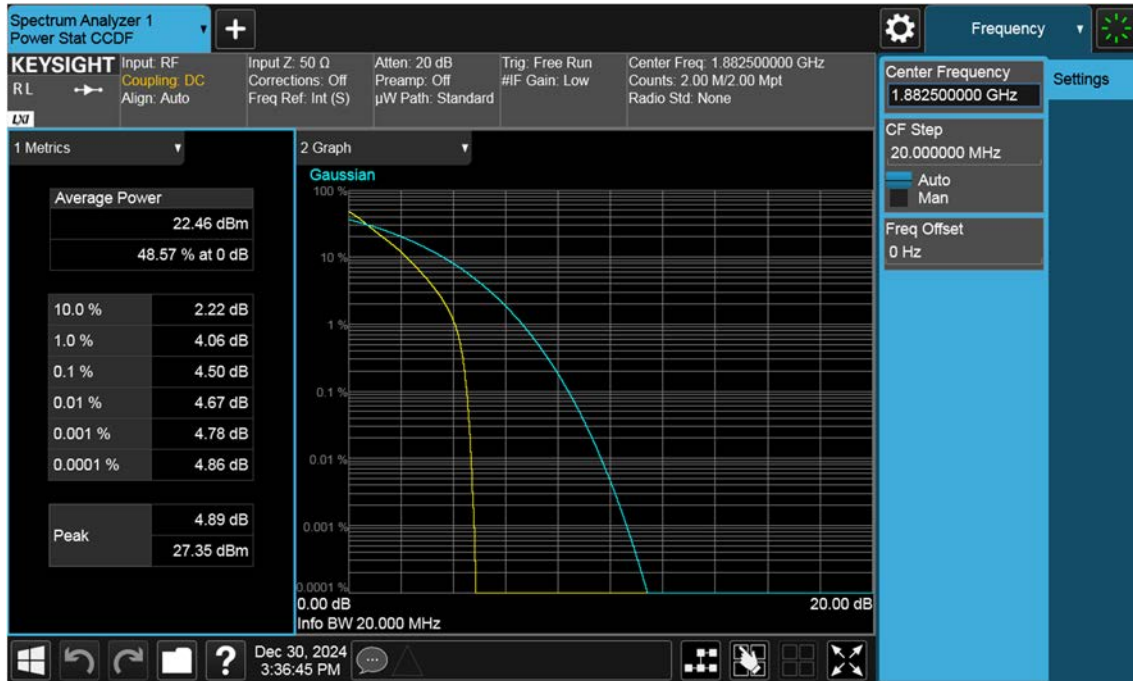
## NR25\_15 M\_PAR\_Mid\_256QAM\_FullRB



## NR25\_20 M\_PAR\_Mid\_BPSK\_FullIRB



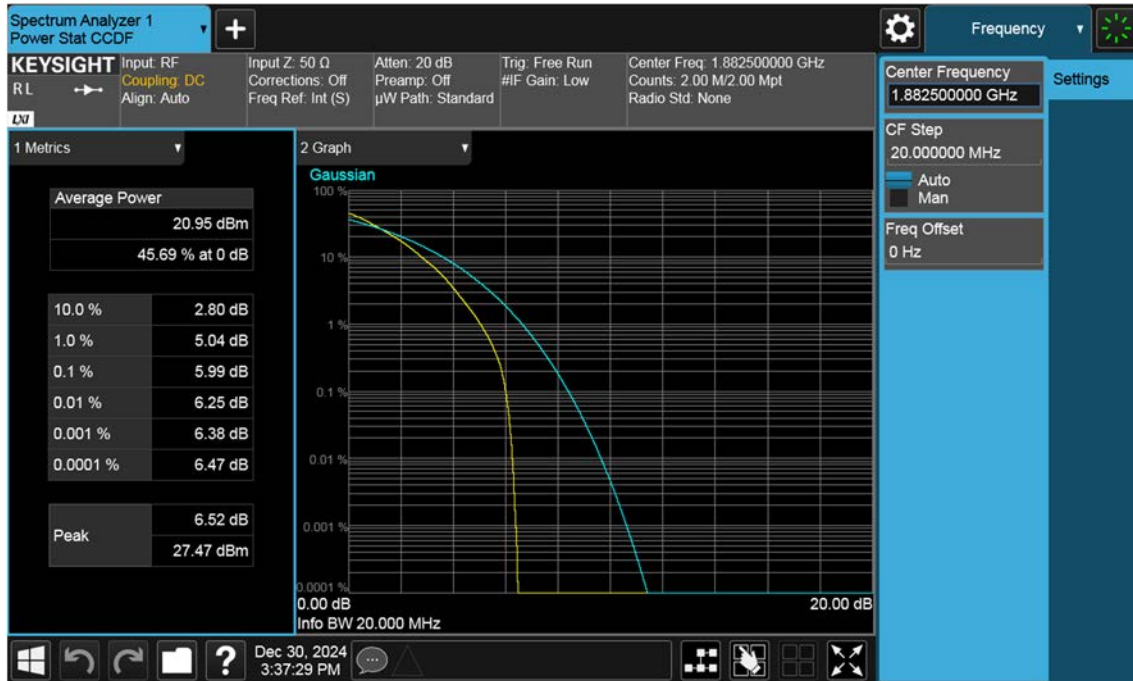
NR25\_20 M\_PAR\_Mid\_QPSK\_FullRB



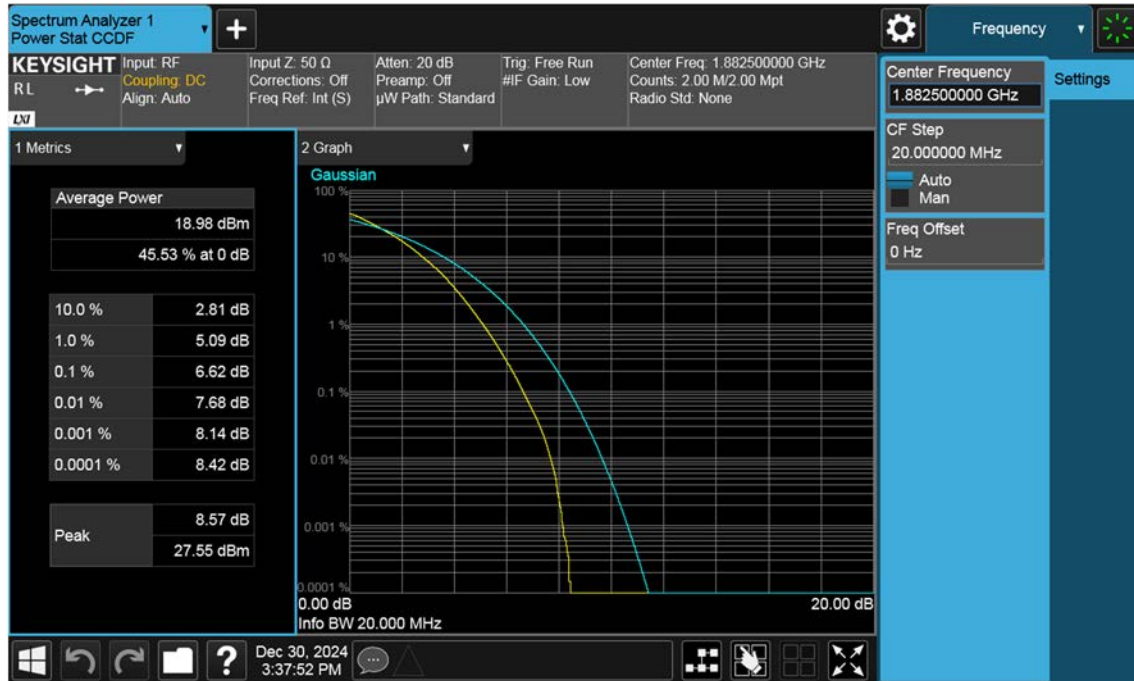
NR25\_20 M\_PAR\_Mid\_16QAM\_FullRB



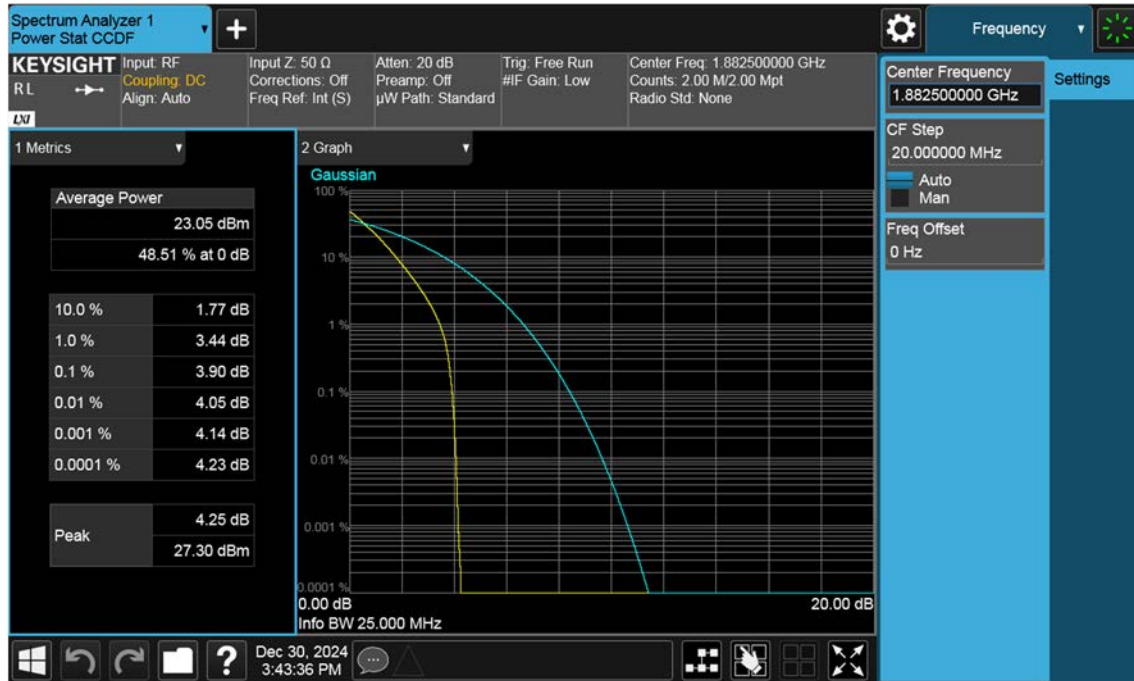
NR25\_20 M\_PAR\_Mid\_64QAM\_FullRB



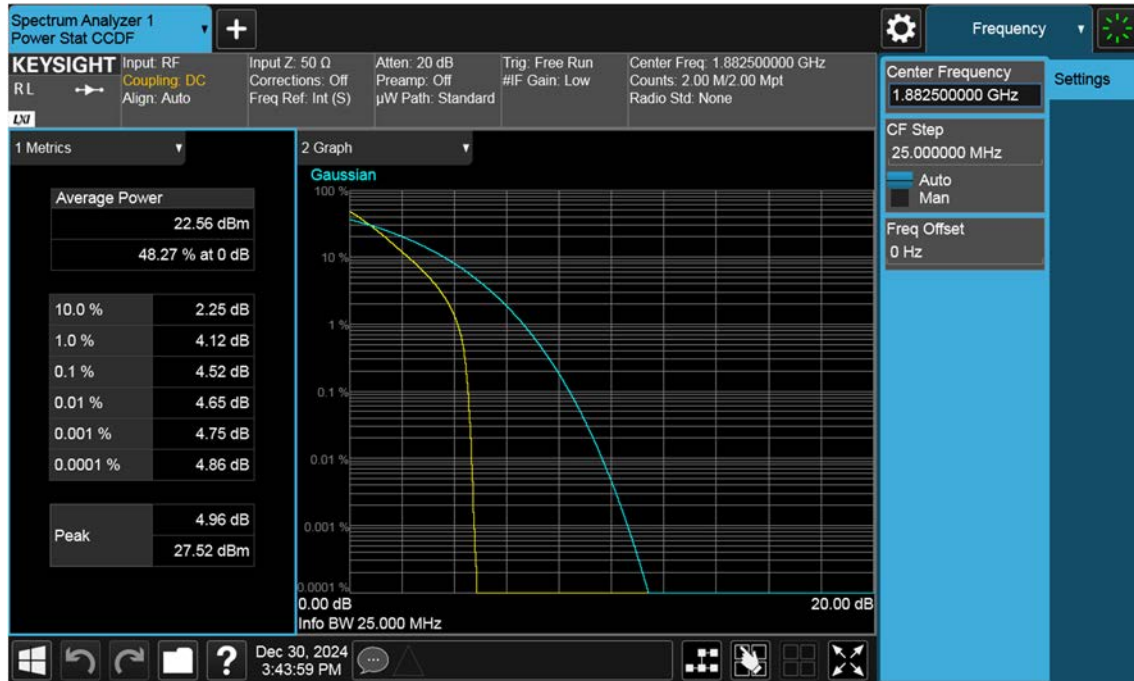
## NR25\_20 M\_PAR\_Mid\_256QAM\_FullRB



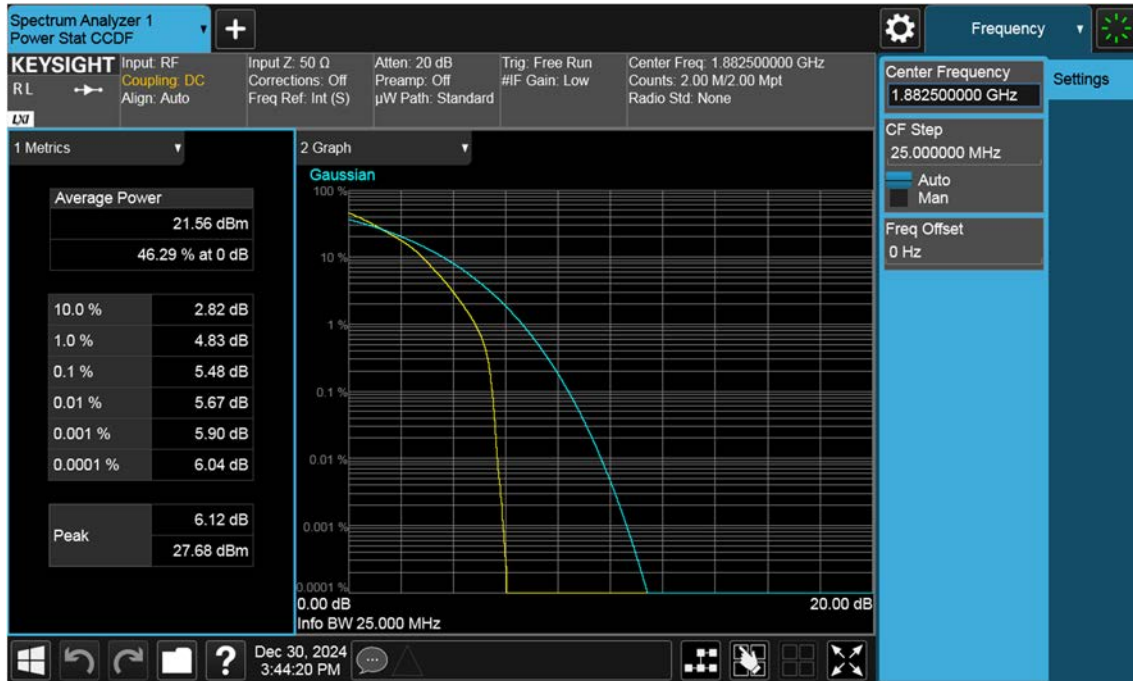
## NR25\_25 M\_PAR\_Mid\_BPSK\_FullIRB



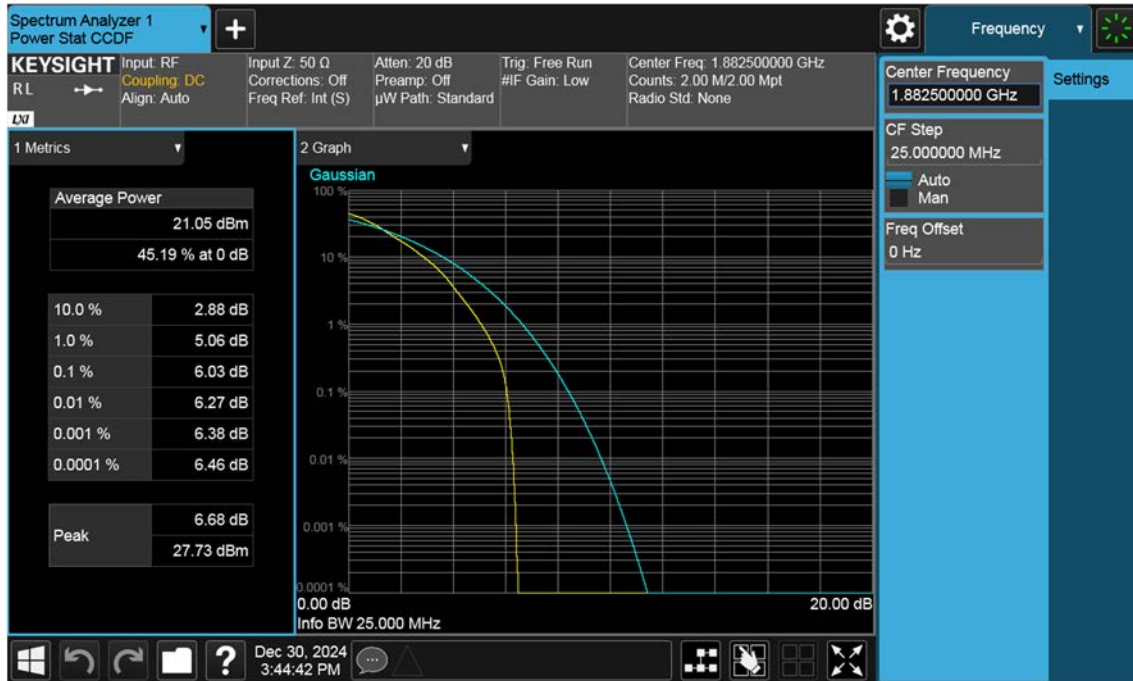
## NR25\_25 M\_PAR\_Mid\_QPSK\_FullRB



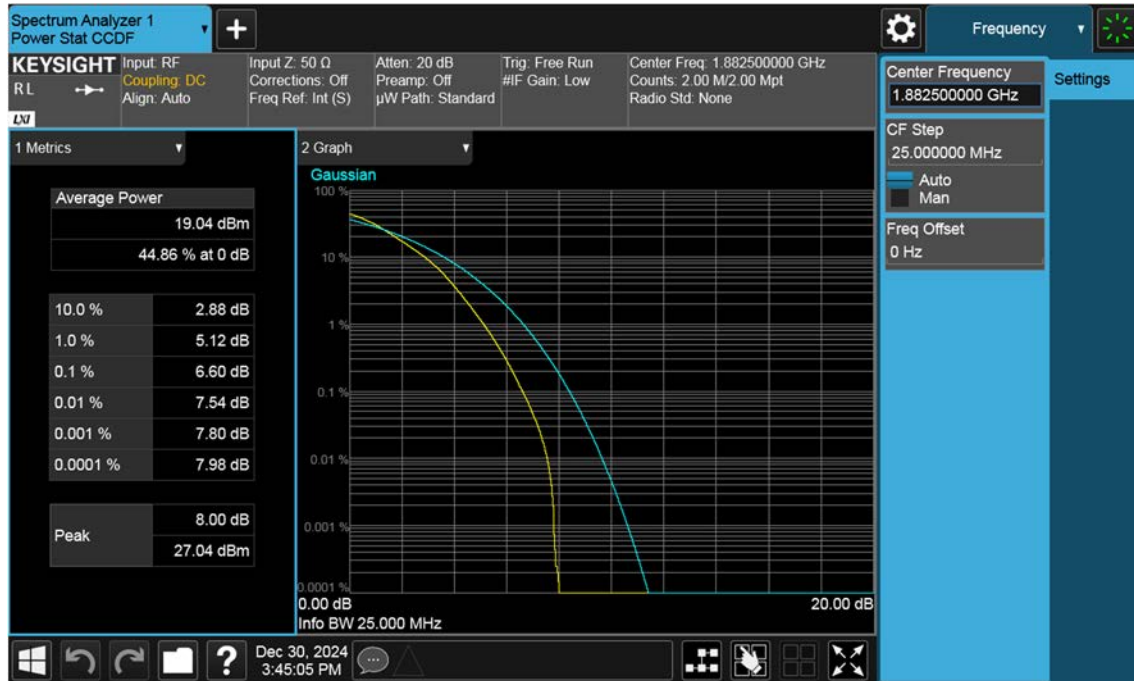
NR25\_25 M\_PAR\_Mid\_16QAM\_FullRB



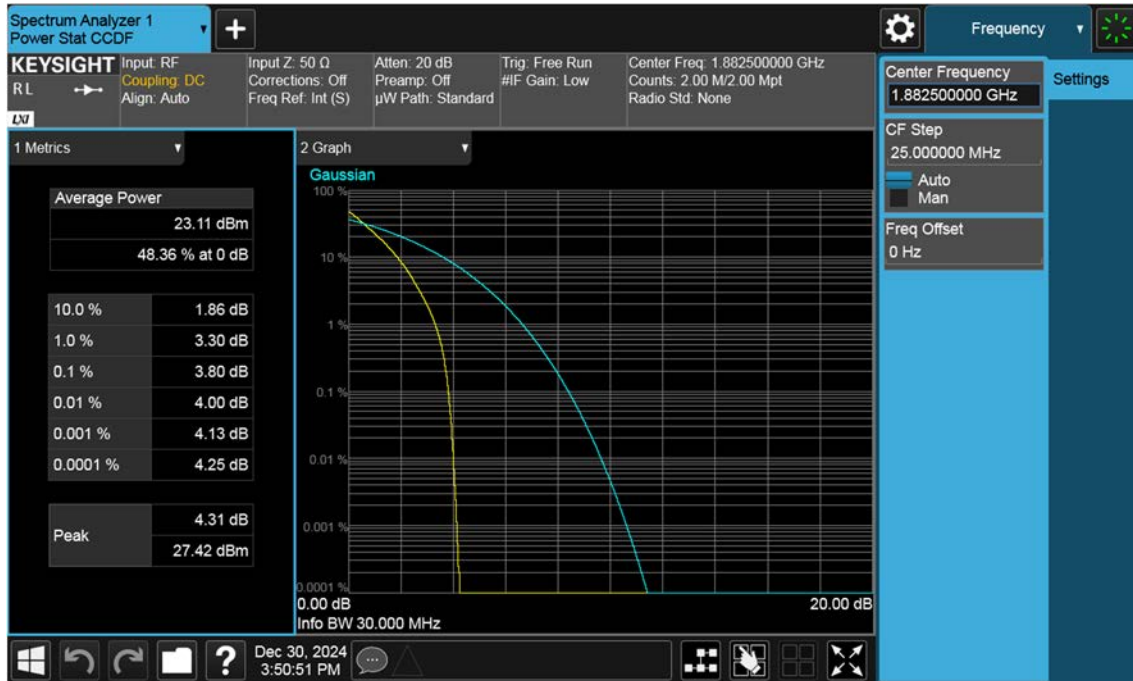
## NR25\_25 M\_PAR\_Mid\_64QAM\_FullRB



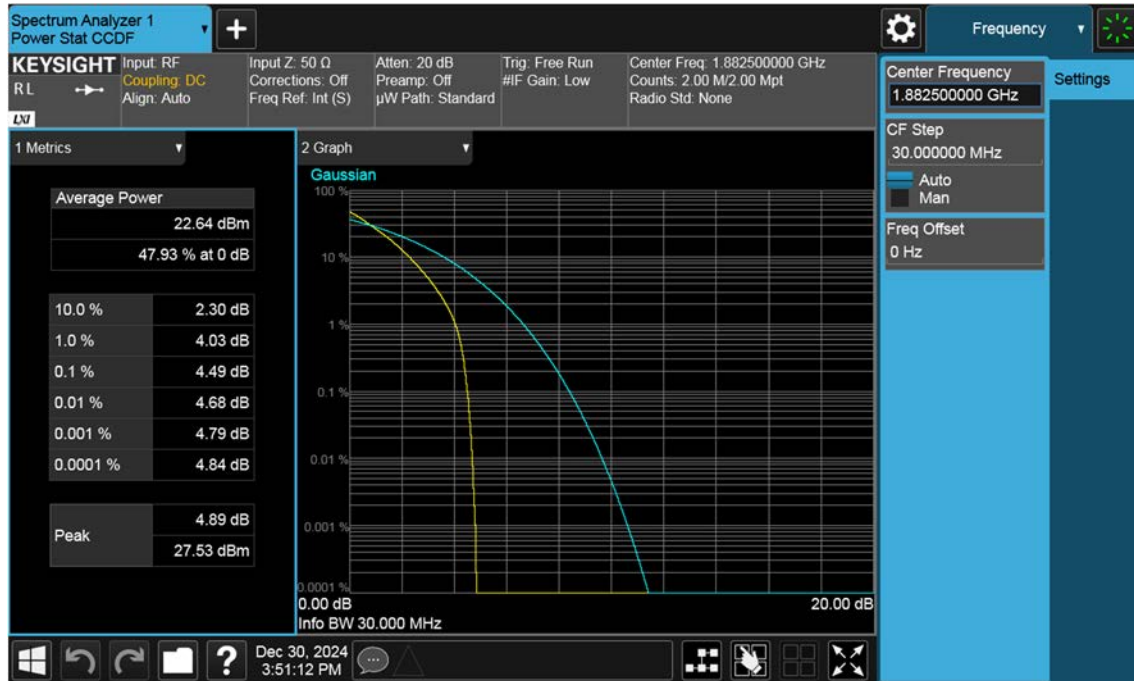
## NR25\_25 M\_PAR\_Mid\_256QAM\_FullRB



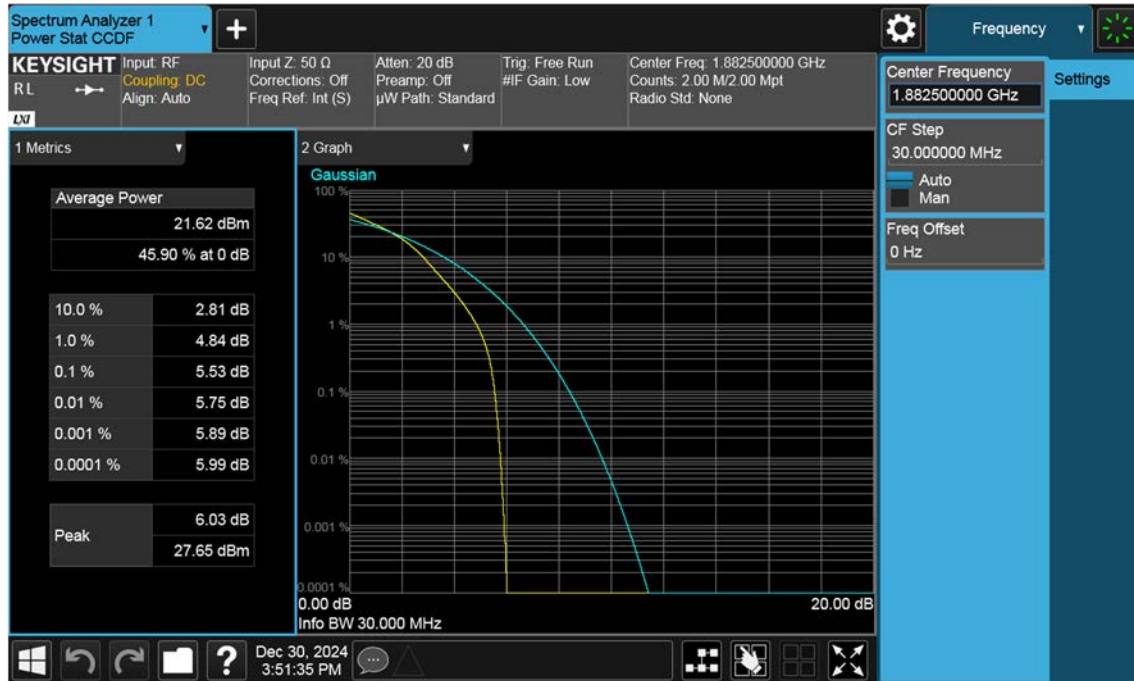
## NR25\_30 M\_PAR\_Mid\_BPSK\_FullIRB



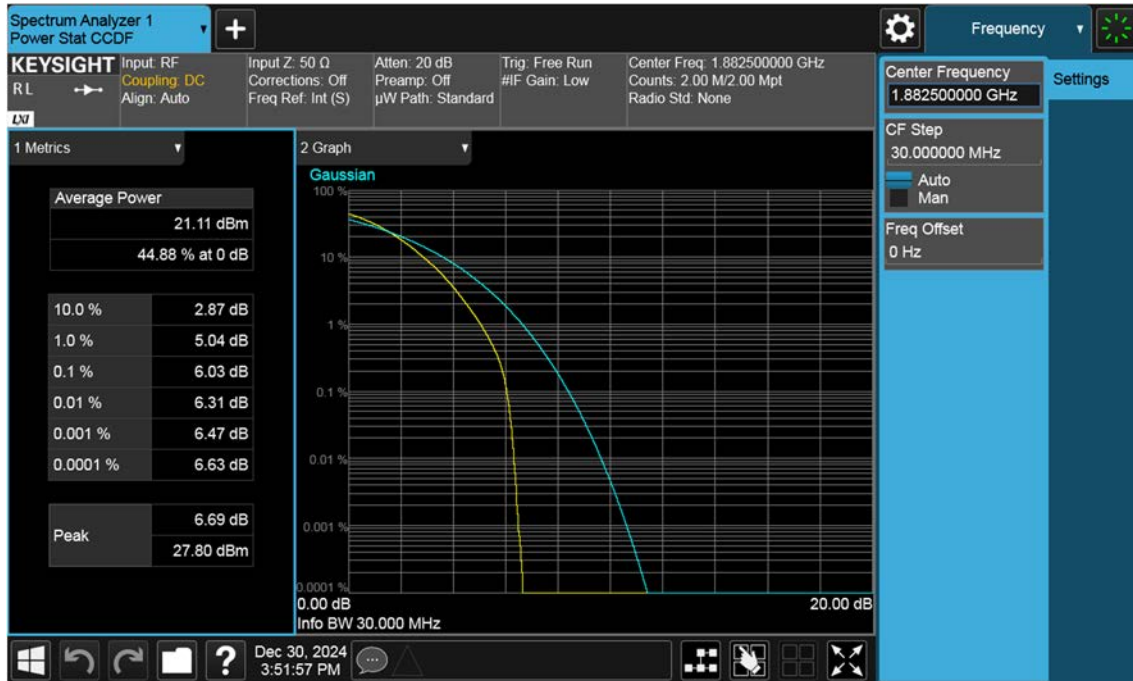
## NR25\_30 M\_PAR\_Mid\_QPSK\_FullRB



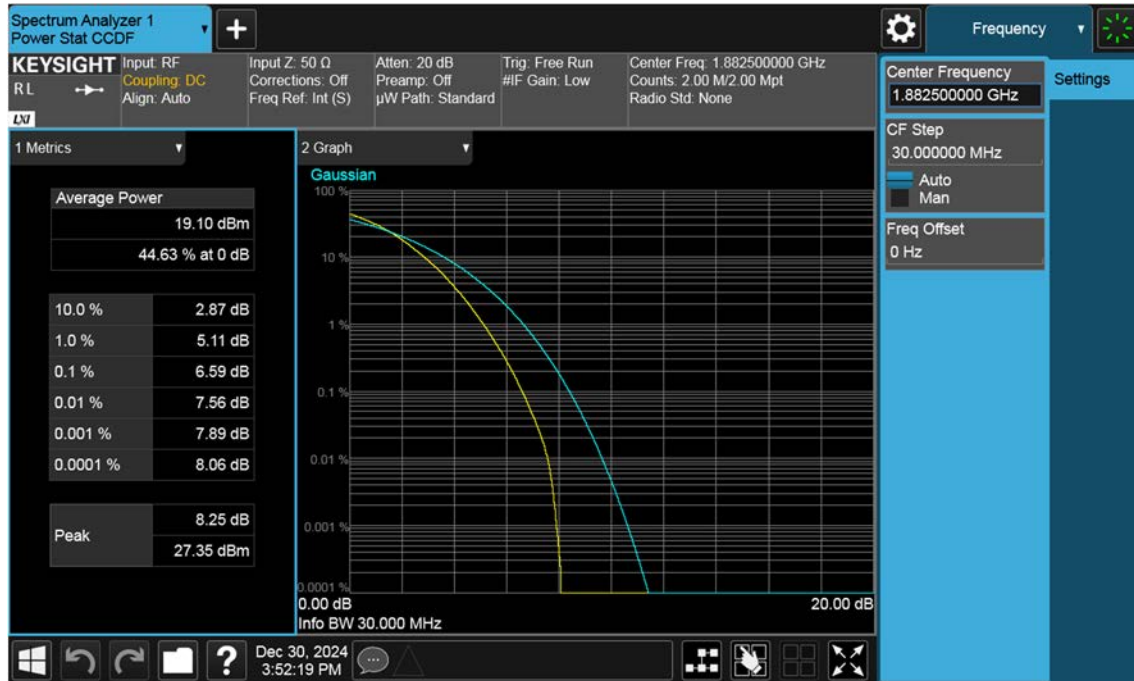
NR25\_30 M\_PAR\_Mid\_16QAM\_FullRB



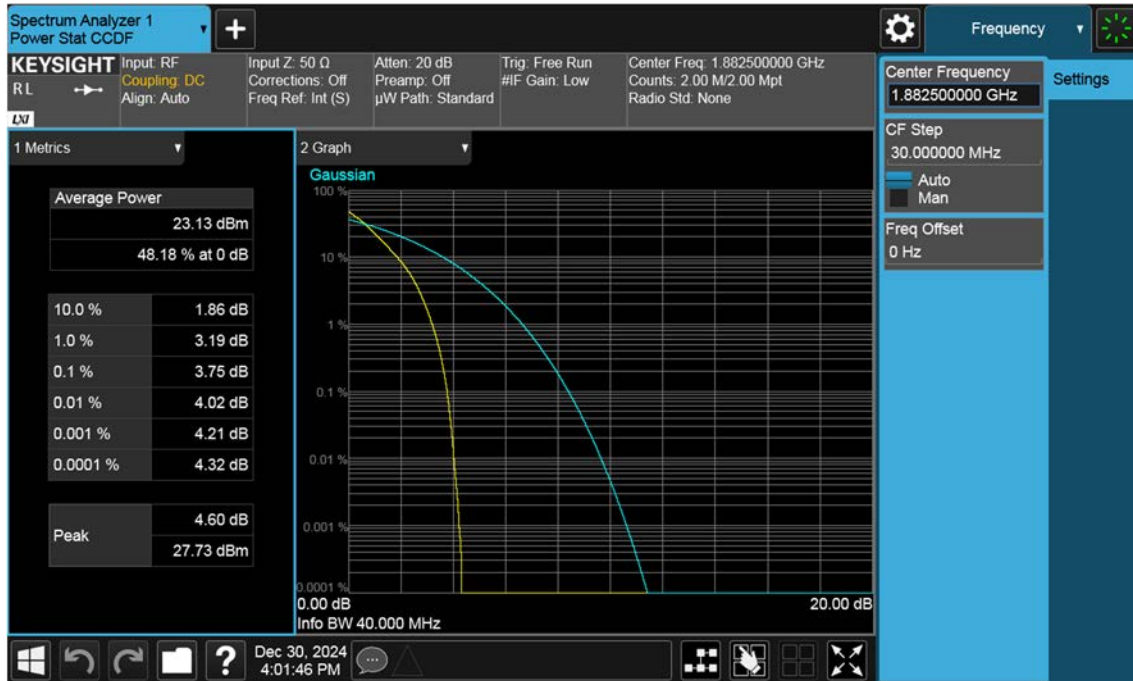
NR25\_30 M\_PAR\_Mid\_64QAM\_FullRB



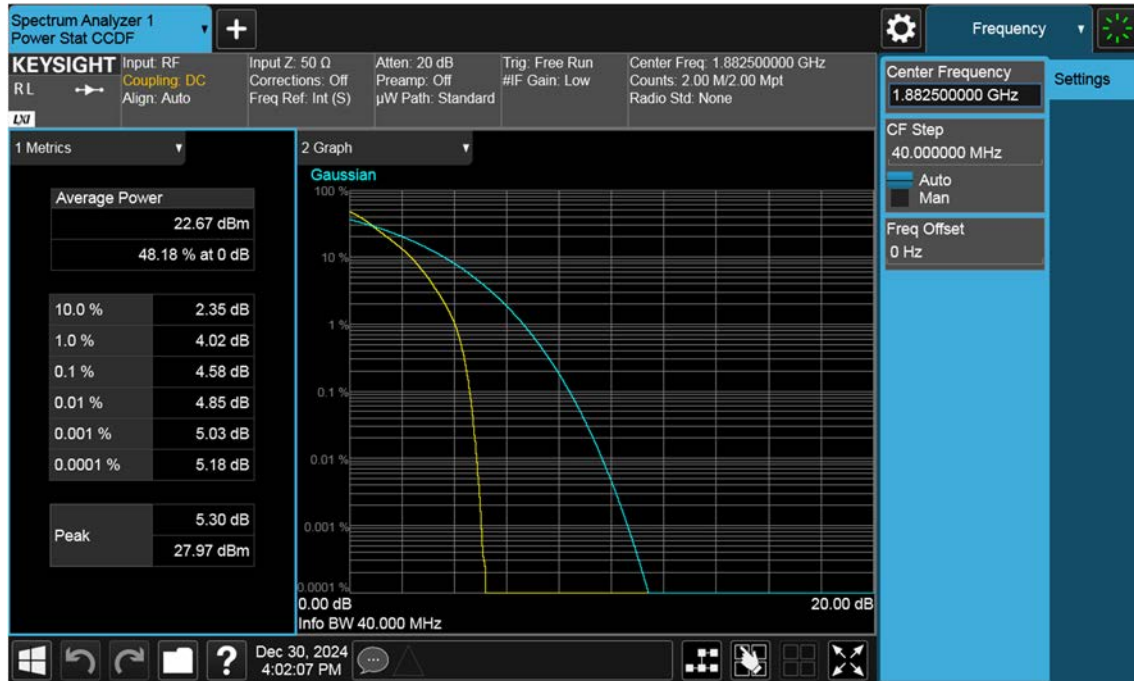
## NR25\_30 M\_PAR\_Mid\_256QAM\_FullRB



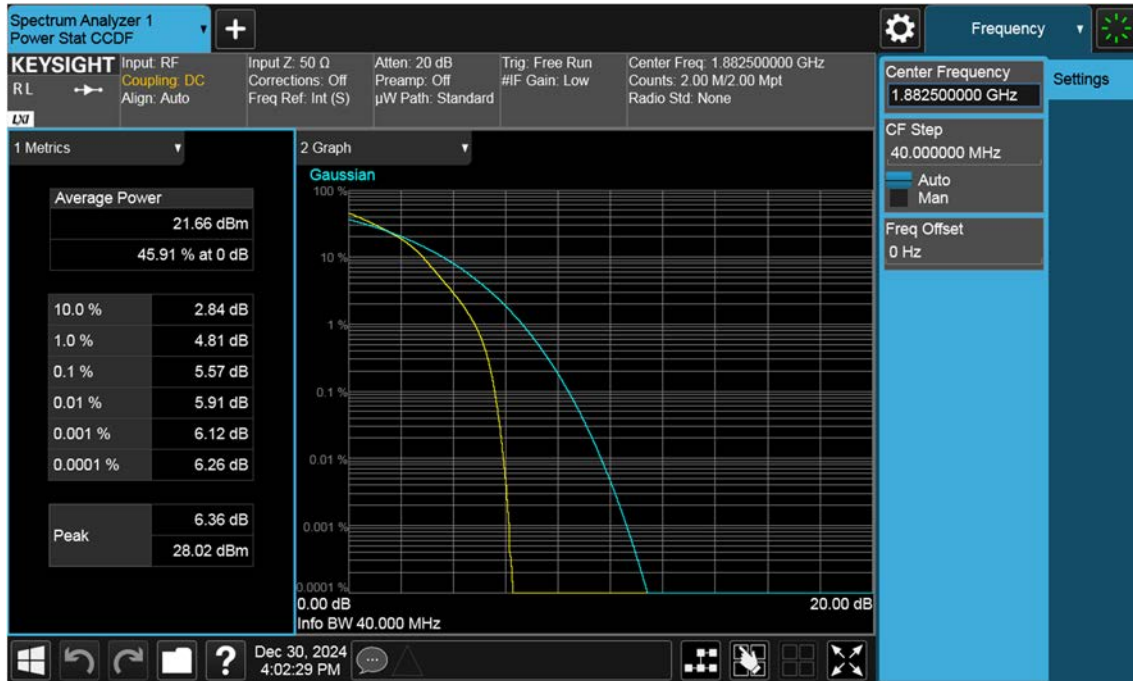
NR25\_40 M\_PAR\_Mid\_BPSK\_FullIRB



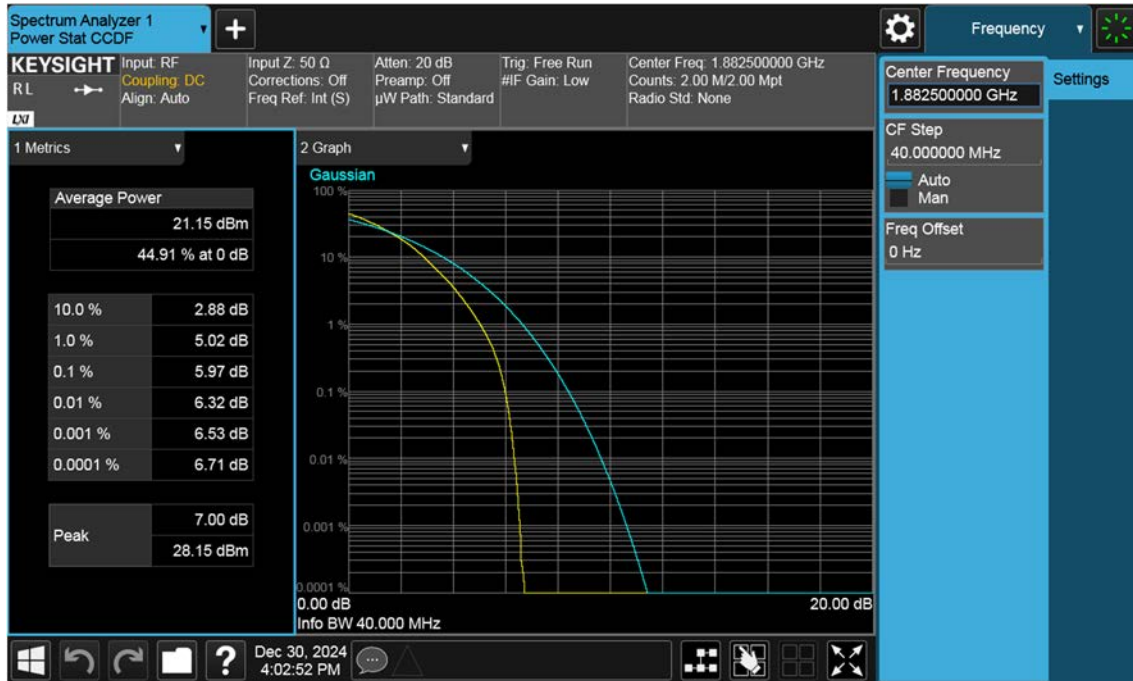
NR25\_40 M\_PAR\_Mid\_QPSK\_FullRB



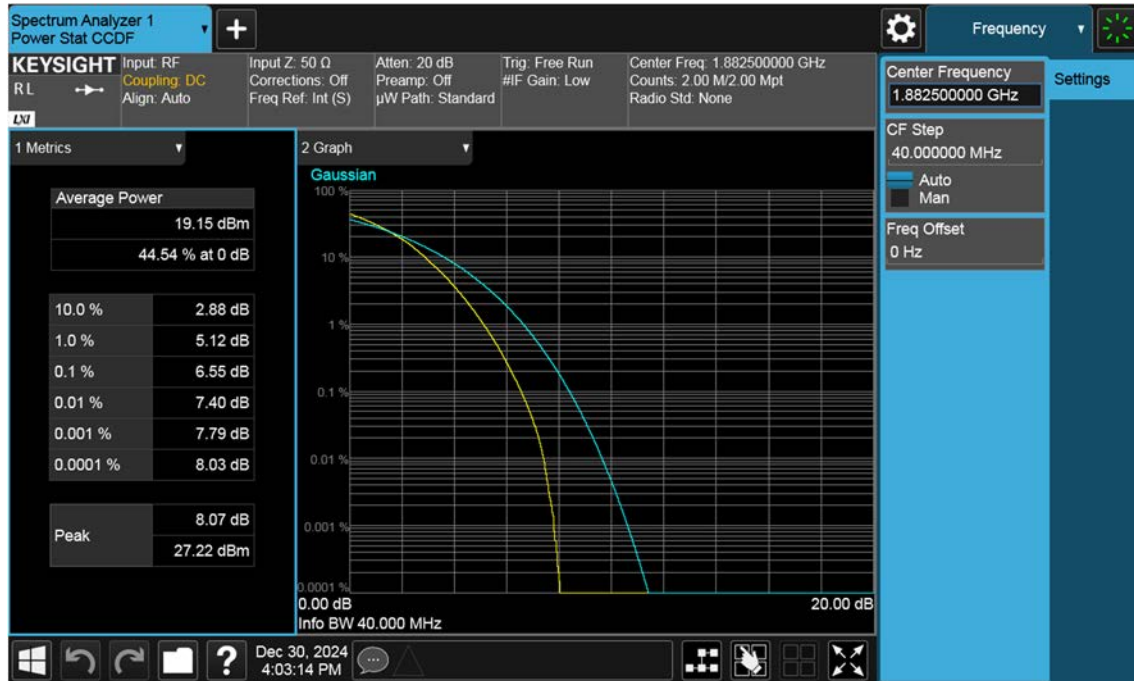
NR25\_40 M\_PAR\_Mid\_16QAM\_FullRB



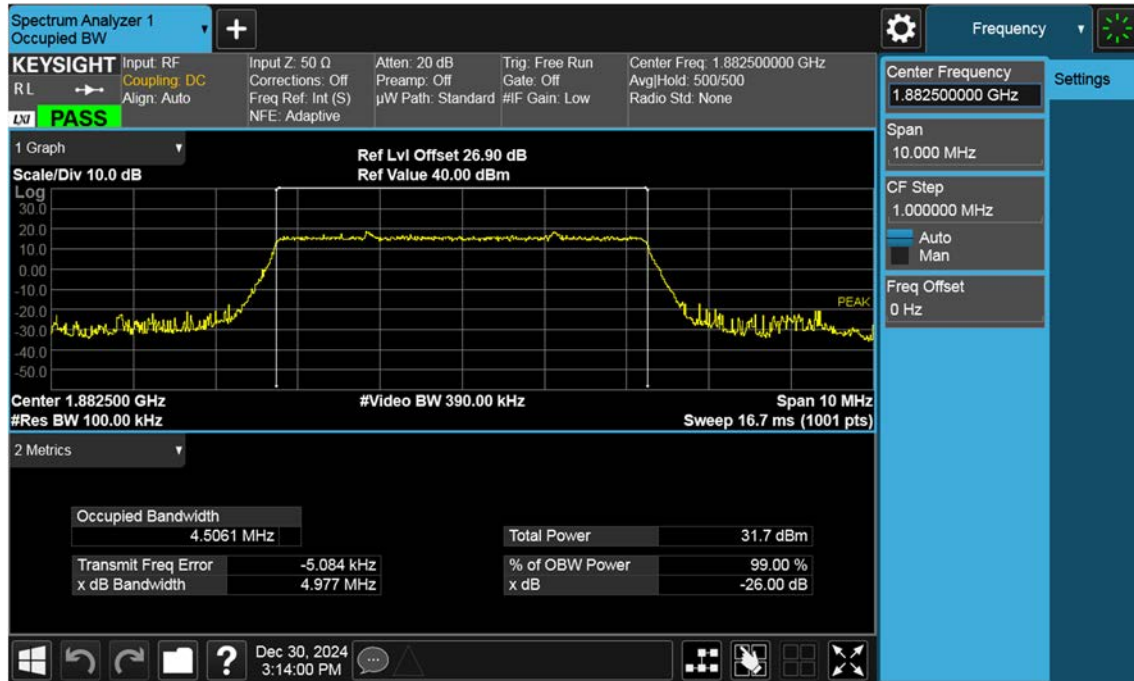
NR25\_40 M\_PAR\_Mid\_64QAM\_FullRB



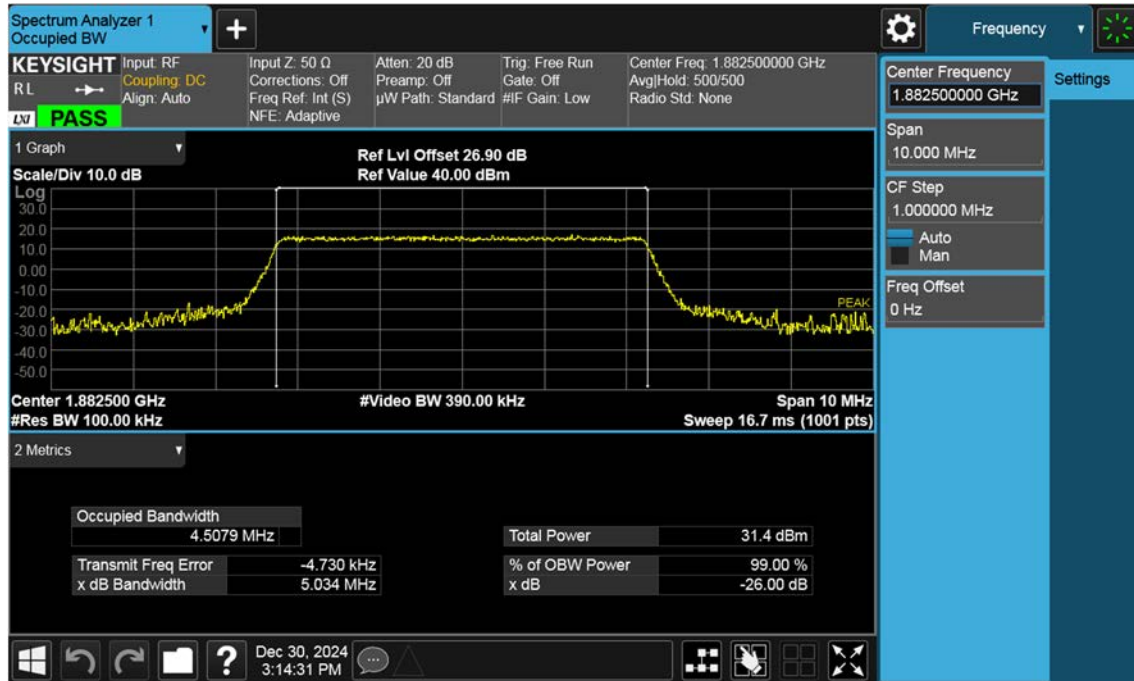
## NR25\_40 M\_PAR\_Mid\_256QAM\_FullRB



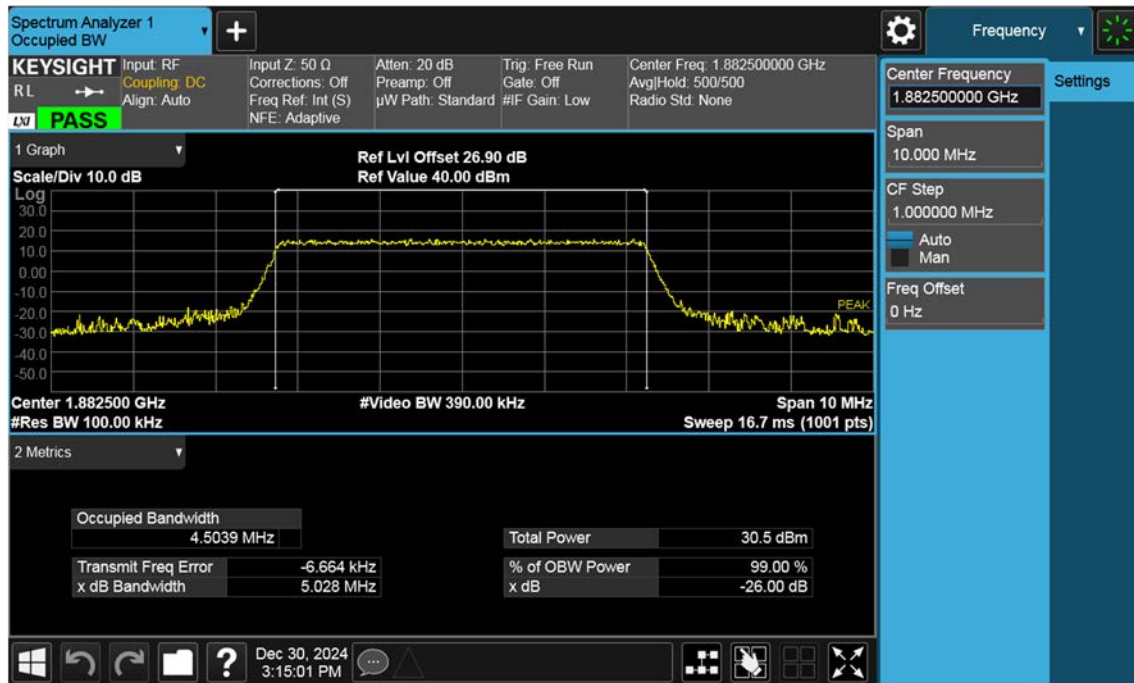
## NR25\_5 M\_OBW\_Mid\_BPSK\_FullIRB



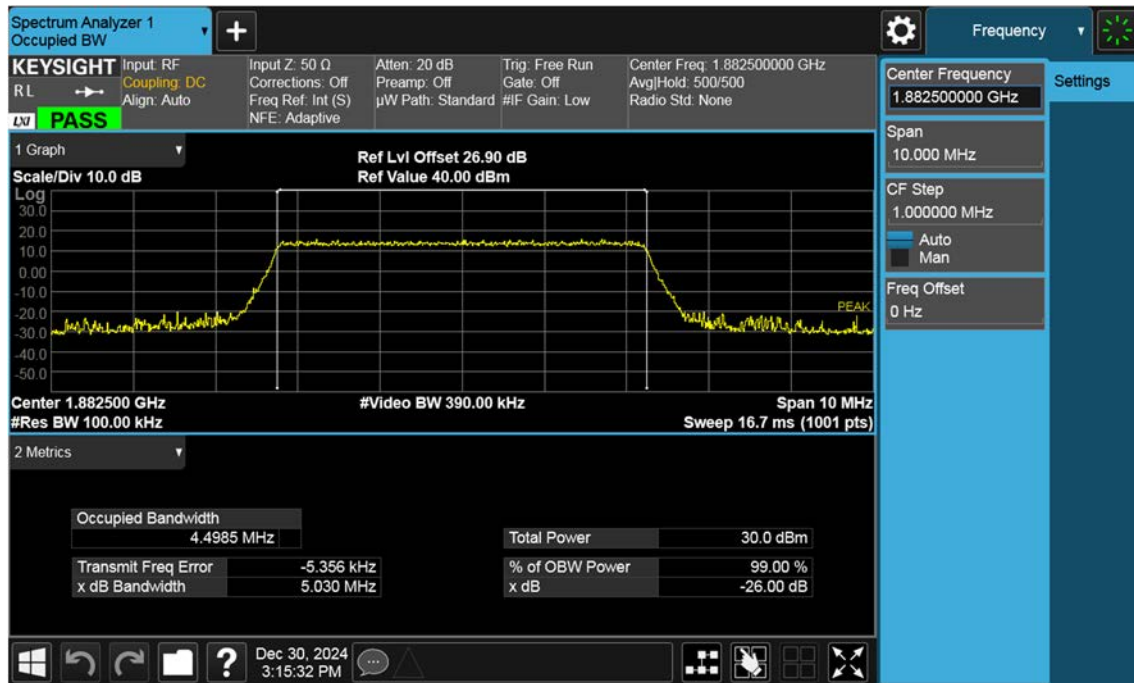
## NR25\_5 M\_OBW\_Mid\_QPSK\_FullRB



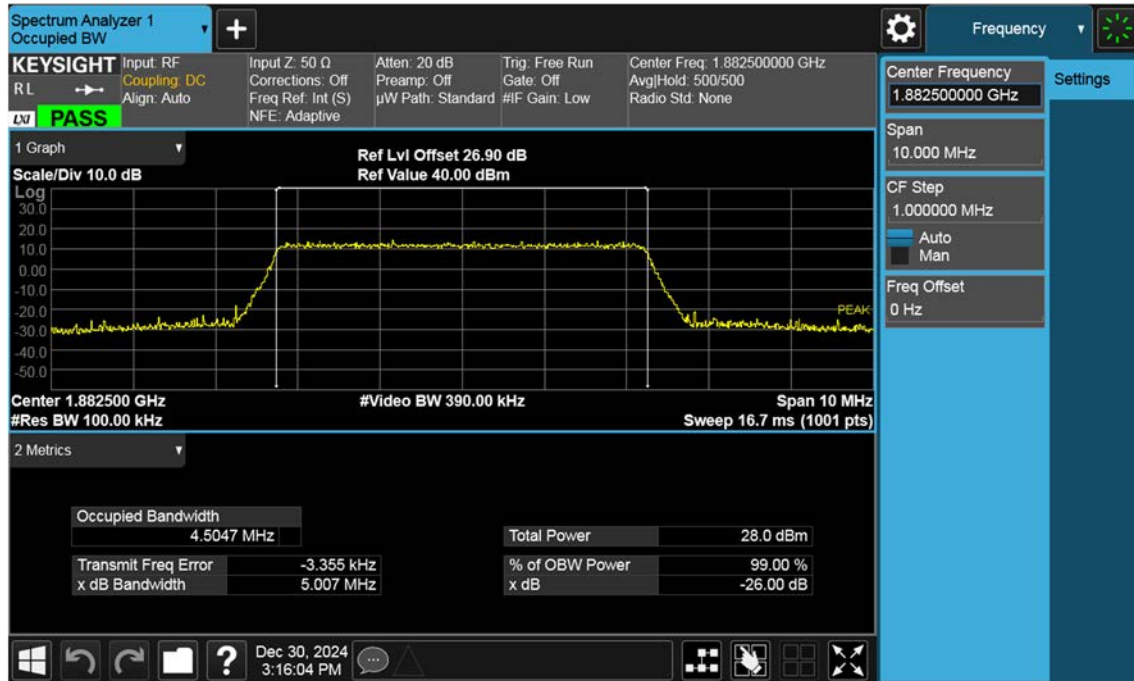
## NR25\_5 M\_OBW\_Mid\_16QAM\_FullRB



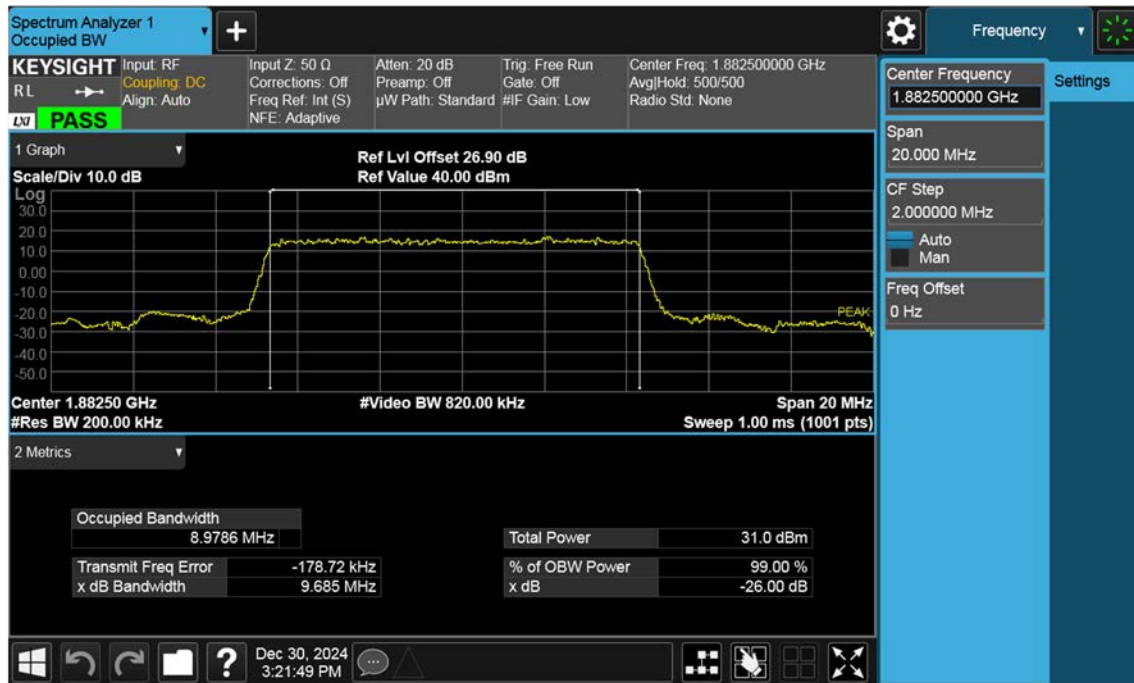
## NR25\_5 M\_OBW\_Mid\_64QAM\_FullRB



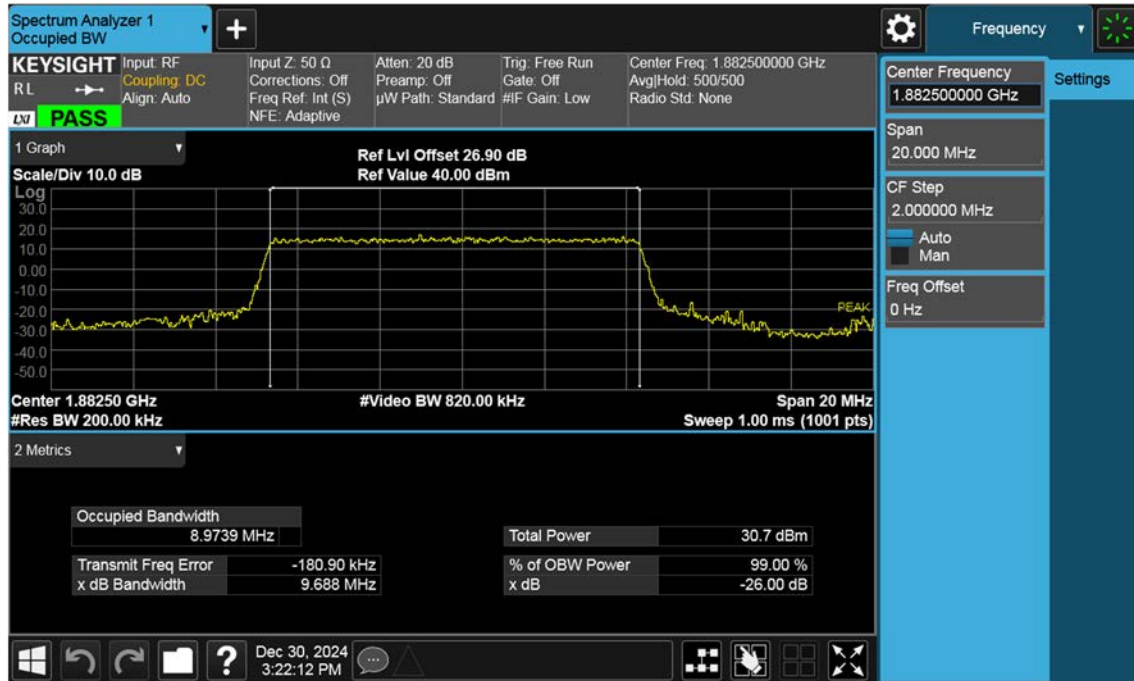
## NR25\_5 M\_OBW\_Mid\_256QAM\_FullRB



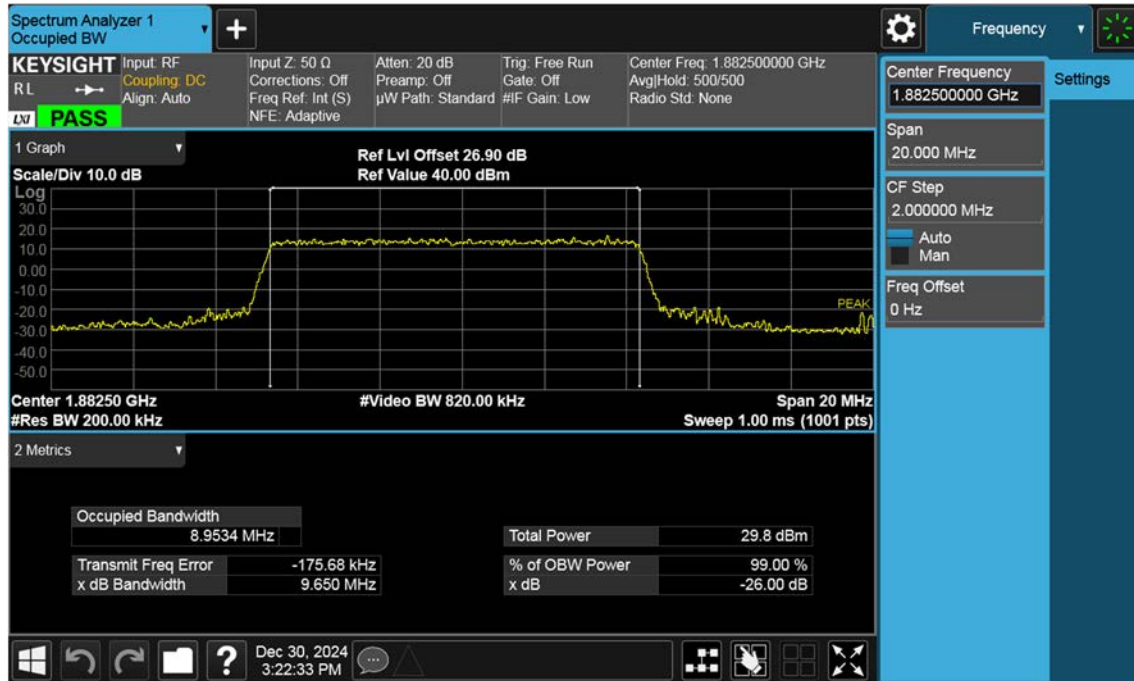
## NR25\_10 M\_OBW\_Mid\_BPSK\_FullRB



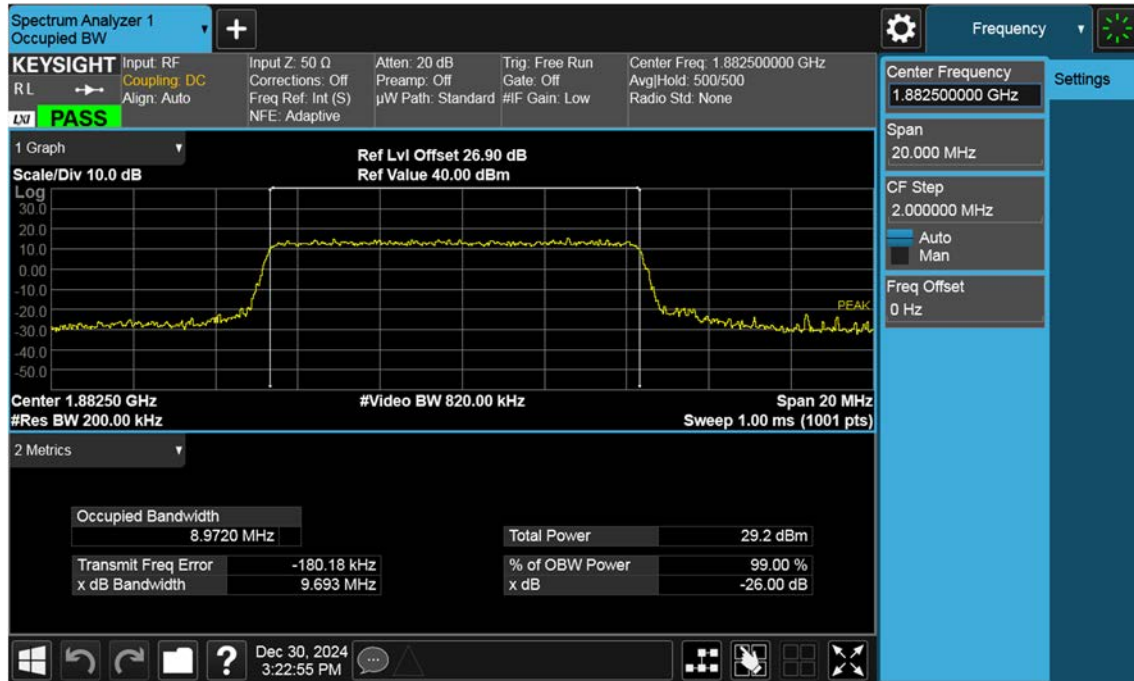
## NR25\_10 M\_OBW\_Mid\_QPSK\_FullIRB



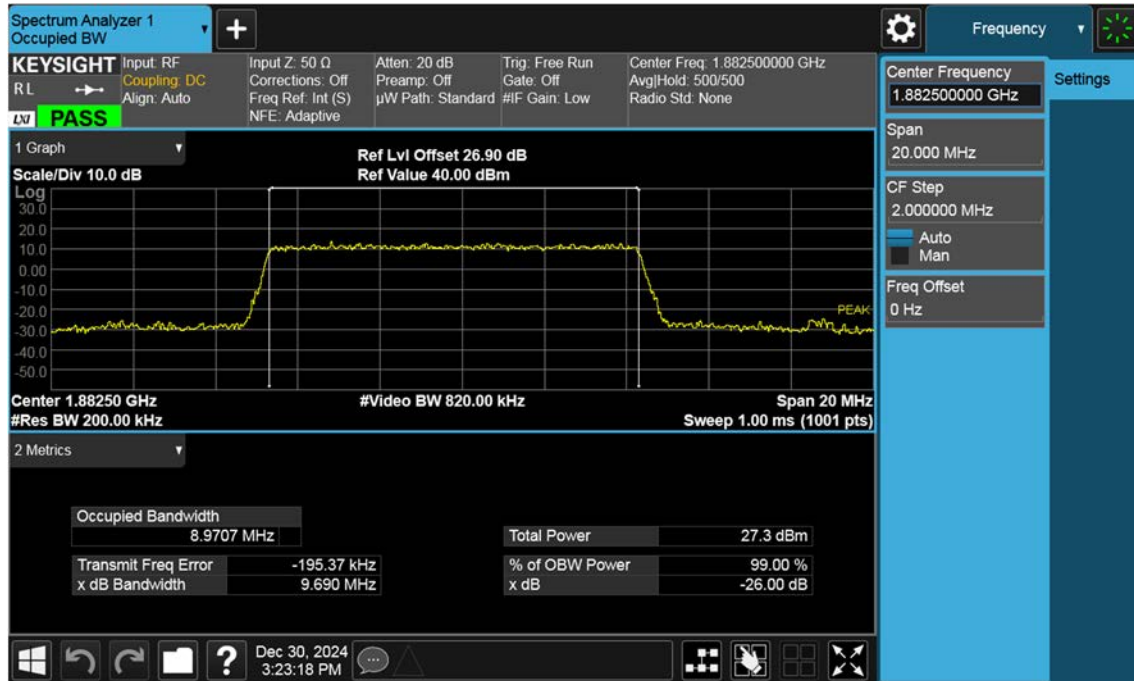
## NR25\_10 M\_OBW\_Mid\_16QAM\_FullRB



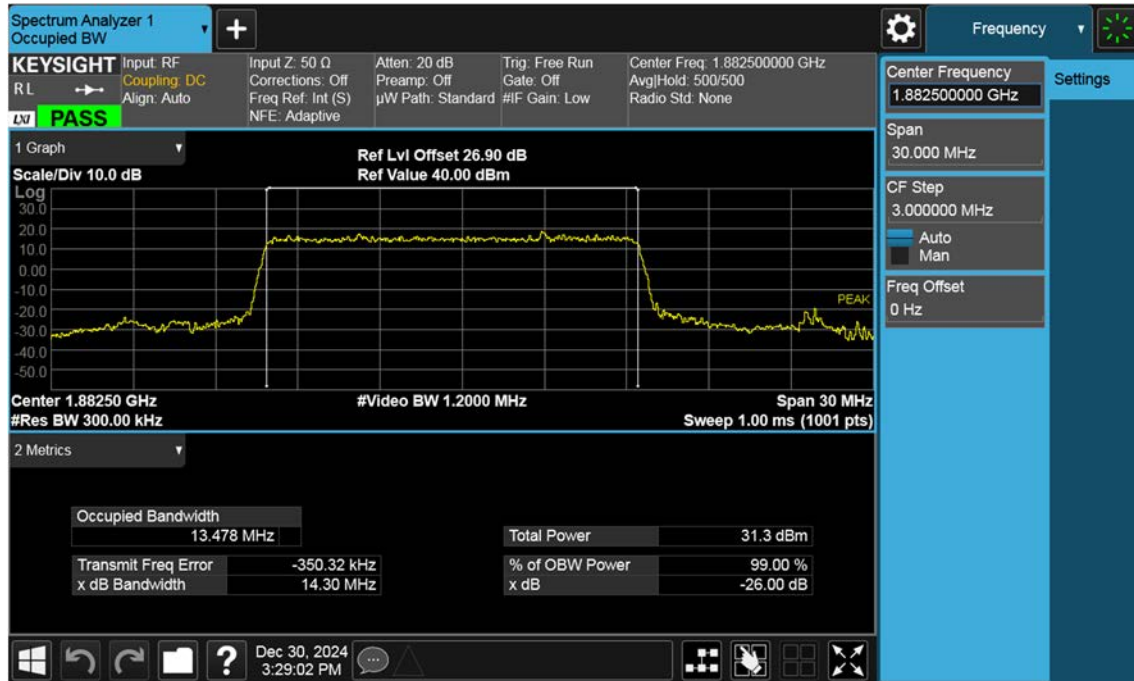
## NR25\_10 M\_OBW\_Mid\_64QAM\_FullRB



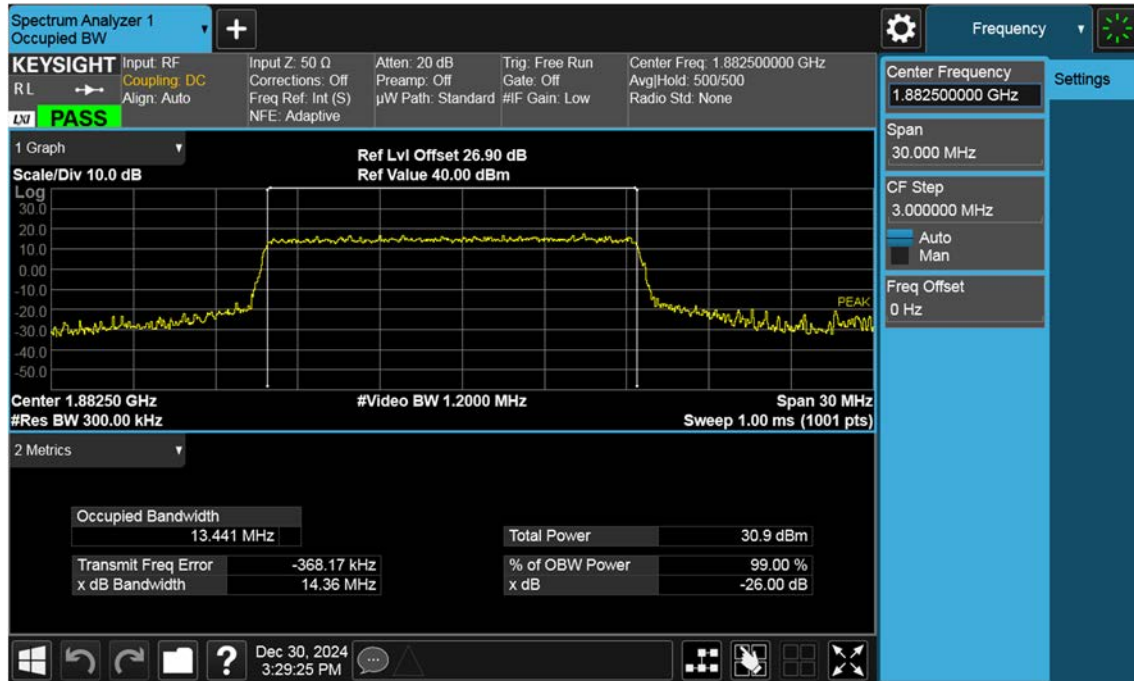
## NR25\_10 M\_OBW\_Mid\_256QAM\_FullRB



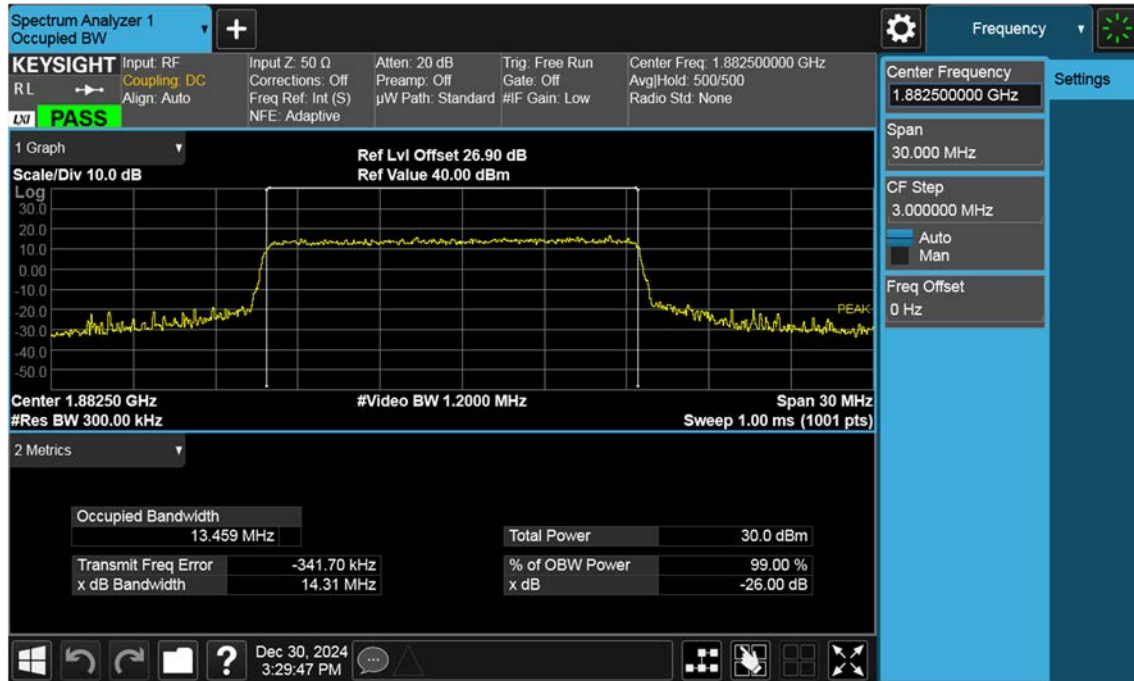
## NR25\_15 M\_OBW\_Mid\_BPSK\_FullRB



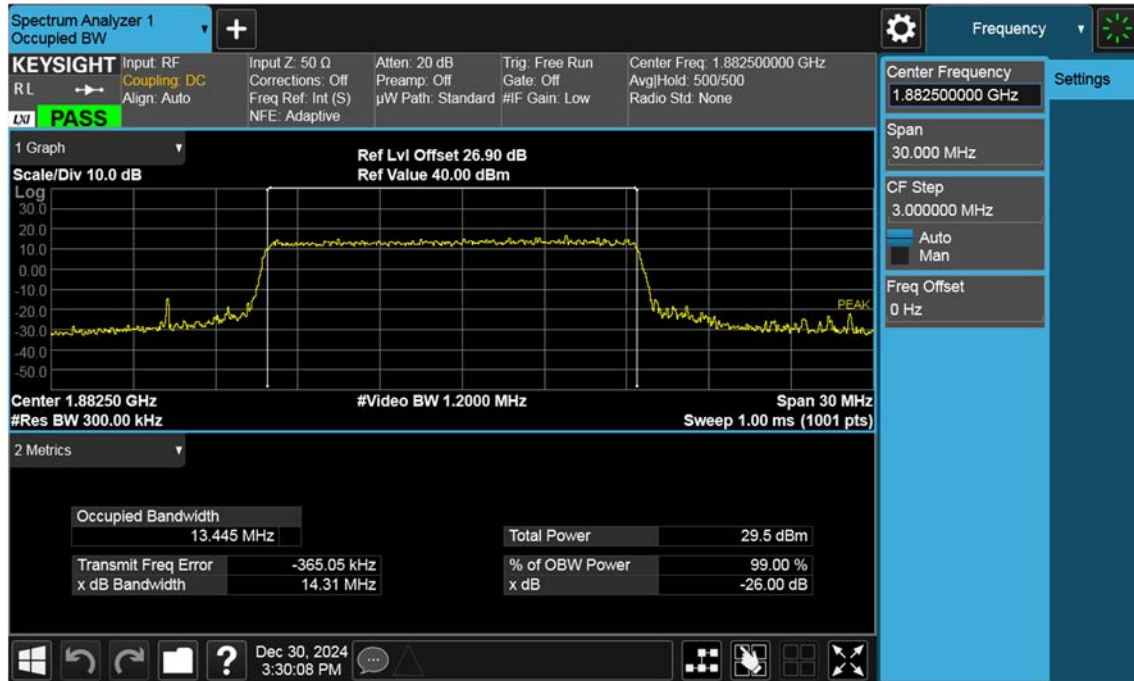
## NR25\_15 M\_OBW\_Mid\_QPSK\_FullIRB



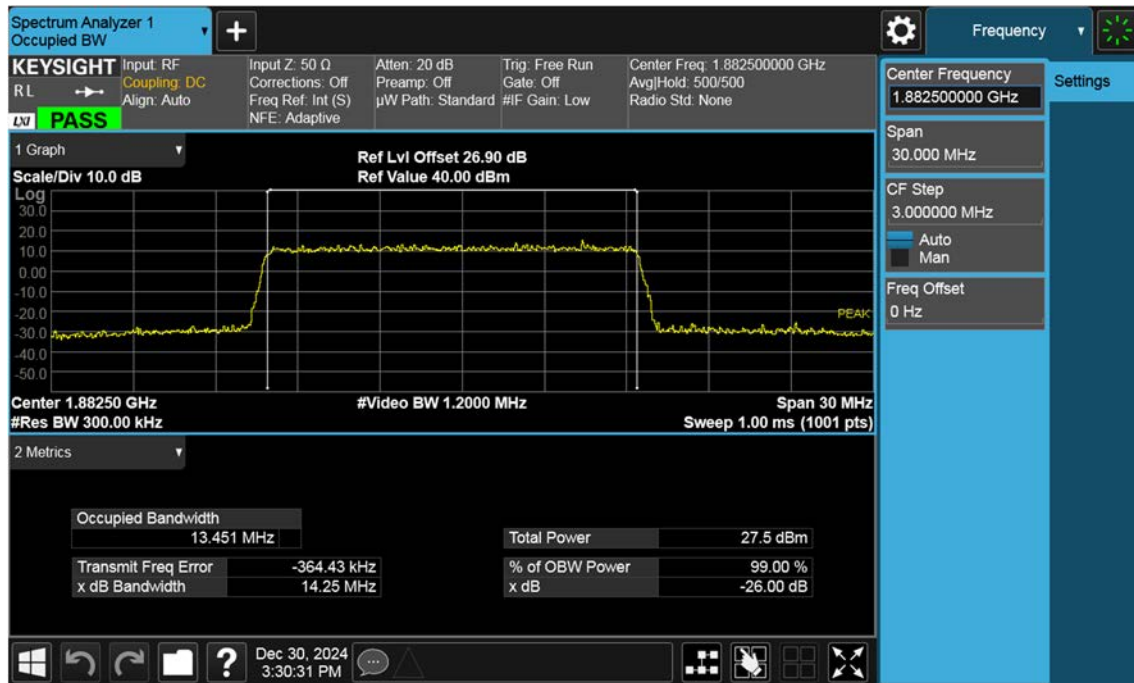
## NR25\_15 M\_OBW\_Mid\_16QAM\_FullRB



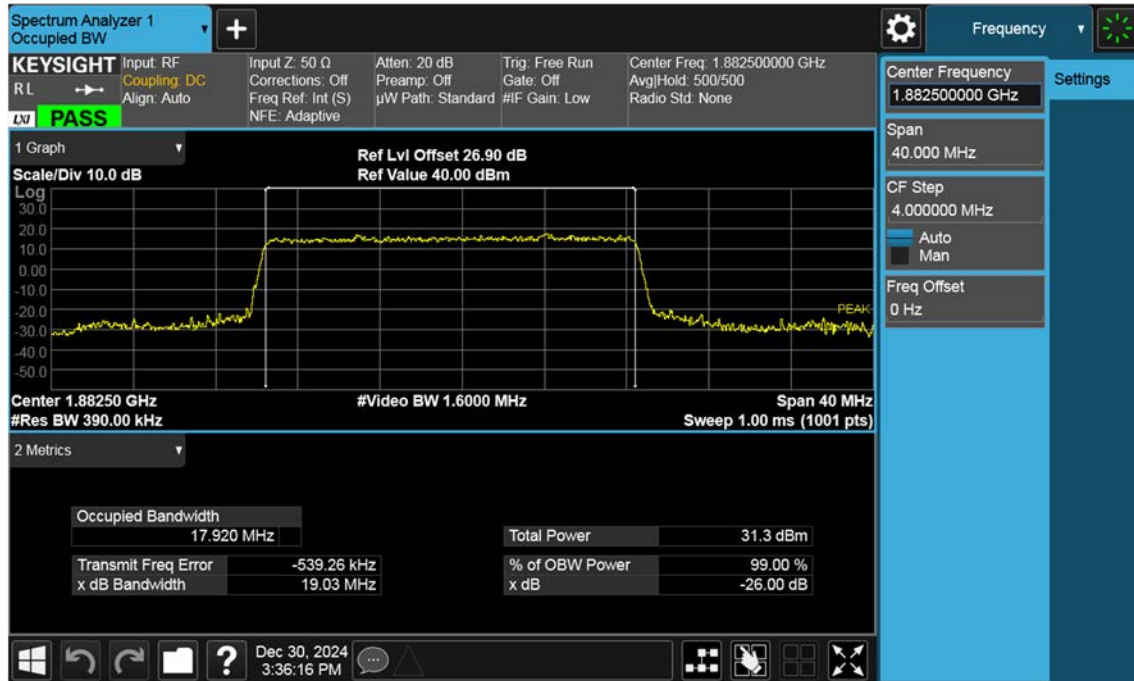
## NR25\_15 M\_OBW\_Mid\_64QAM\_FullRB



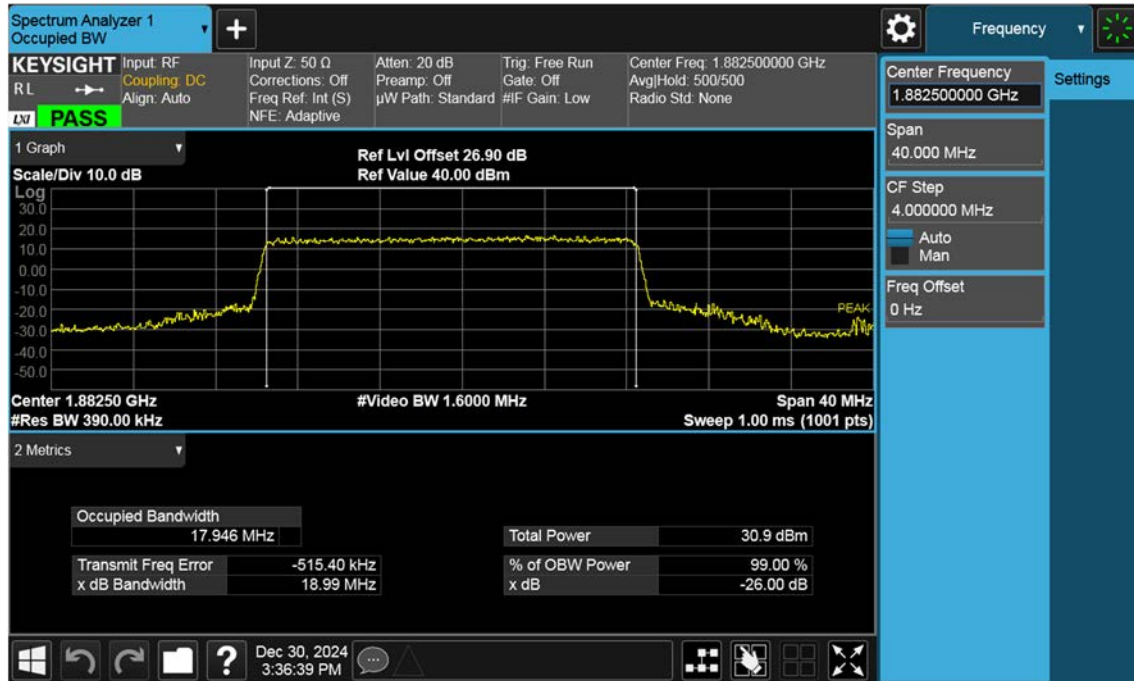
## NR25\_15 M\_OBW\_Mid\_256QAM\_FullRB



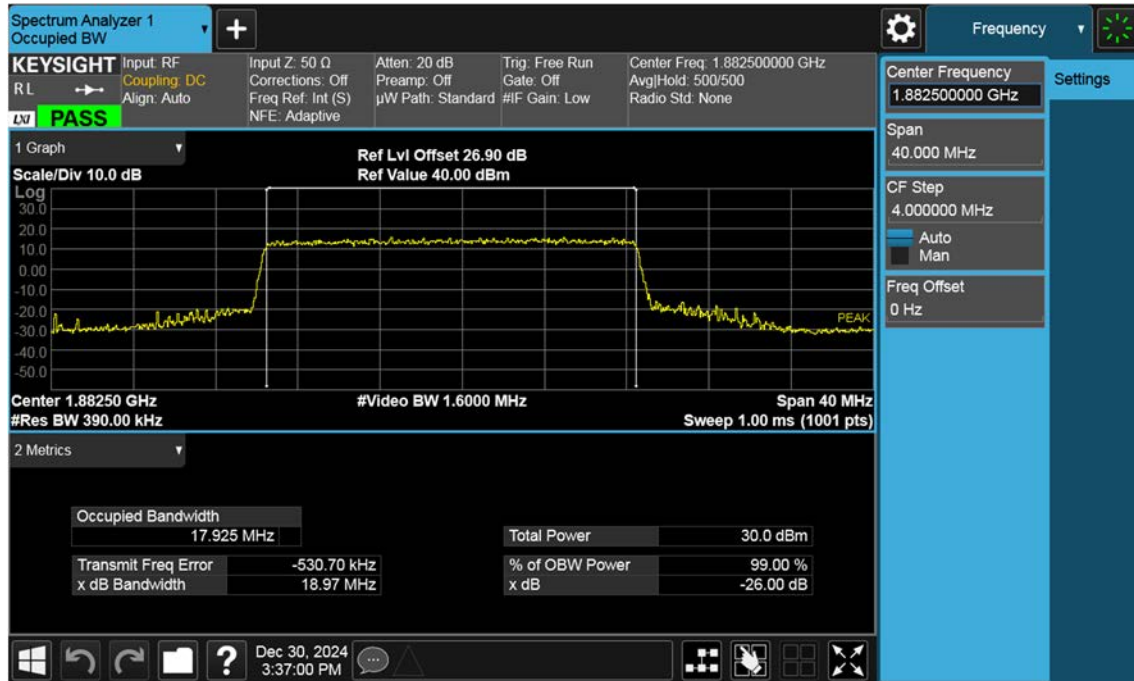
## NR25\_20 M\_OBW\_Mid\_BPSK\_FullRB



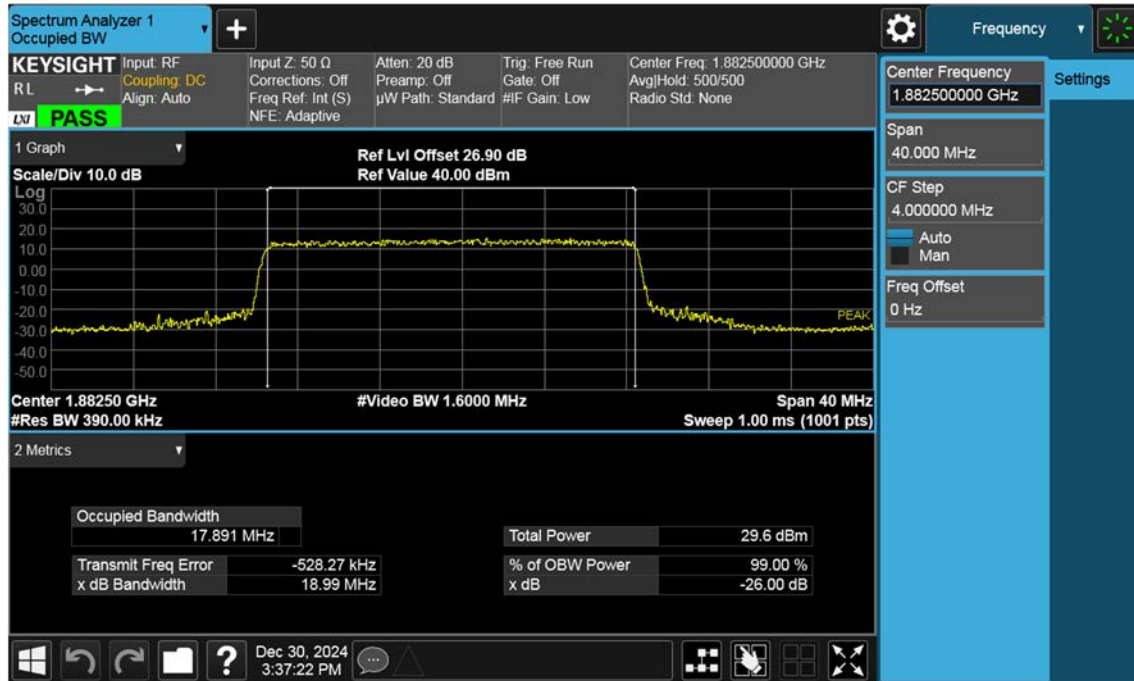
## NR25\_20 M\_OBW\_Mid\_QPSK\_FullIRB



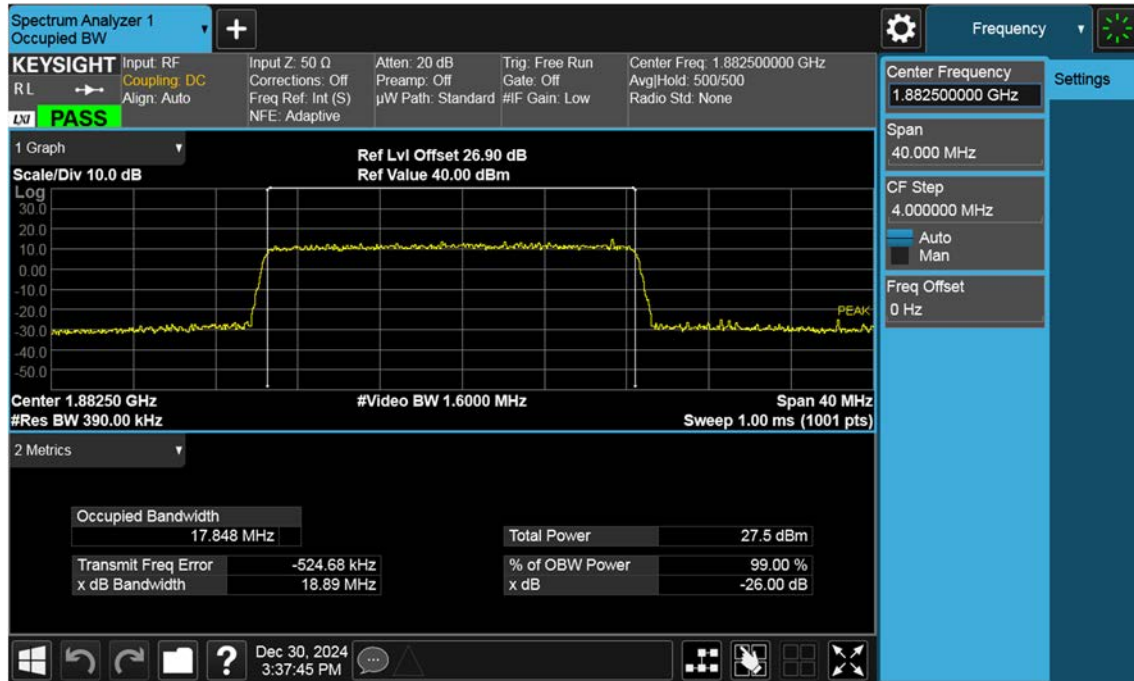
## NR25\_20 M\_OBW\_Mid\_16QAM\_FullRB



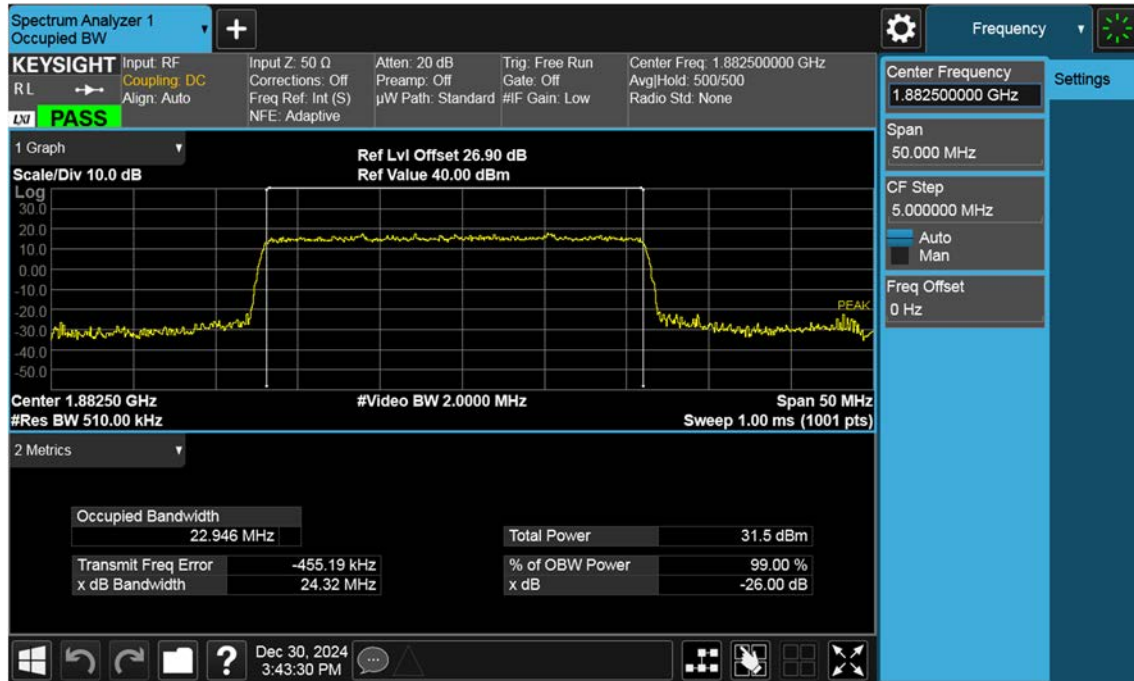
## NR25\_20 M\_OBW\_Mid\_64QAM\_FullRB



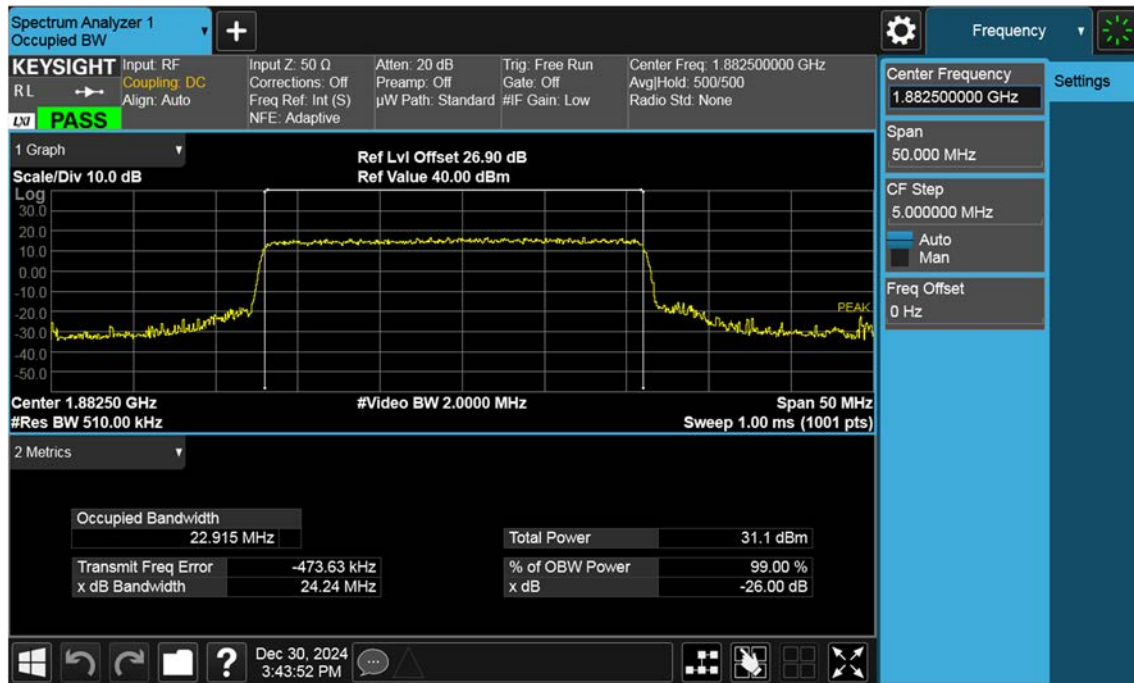
## NR25\_20 M\_OBW\_Mid\_256QAM\_FullRB



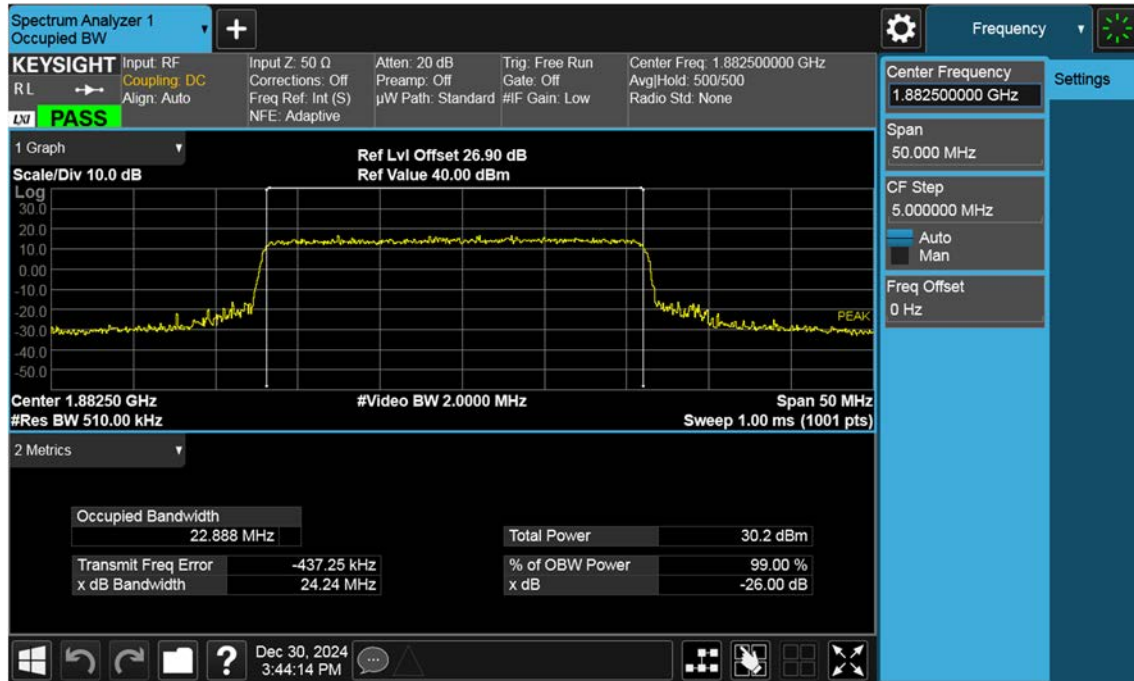
## NR25\_25 M\_OBW\_Mid\_BPSK\_FullRB



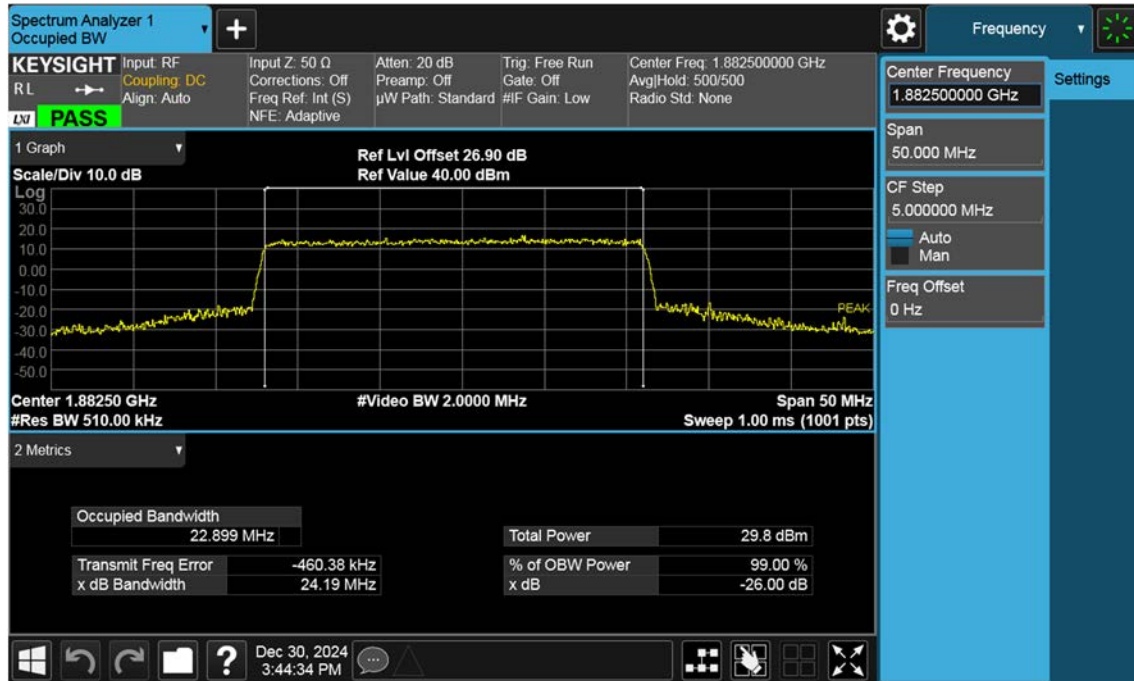
## NR25\_25 M\_OBW\_Mid\_QPSK\_FullIRB



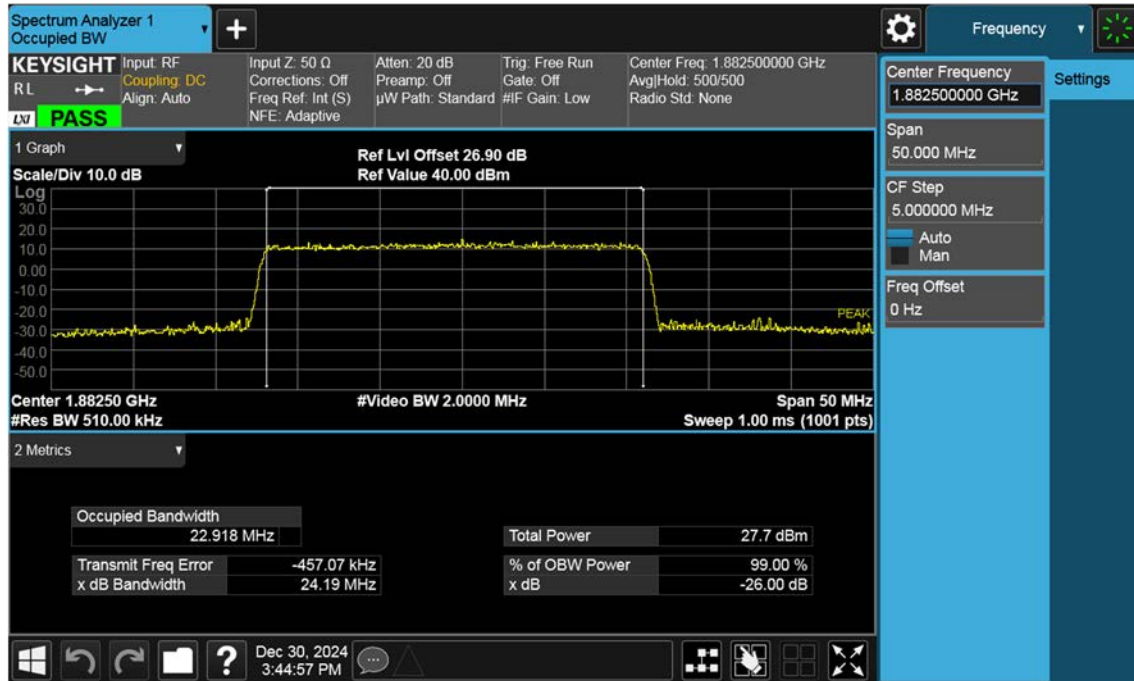
## NR25\_25 M\_OBW\_Mid\_16QAM\_FullRB



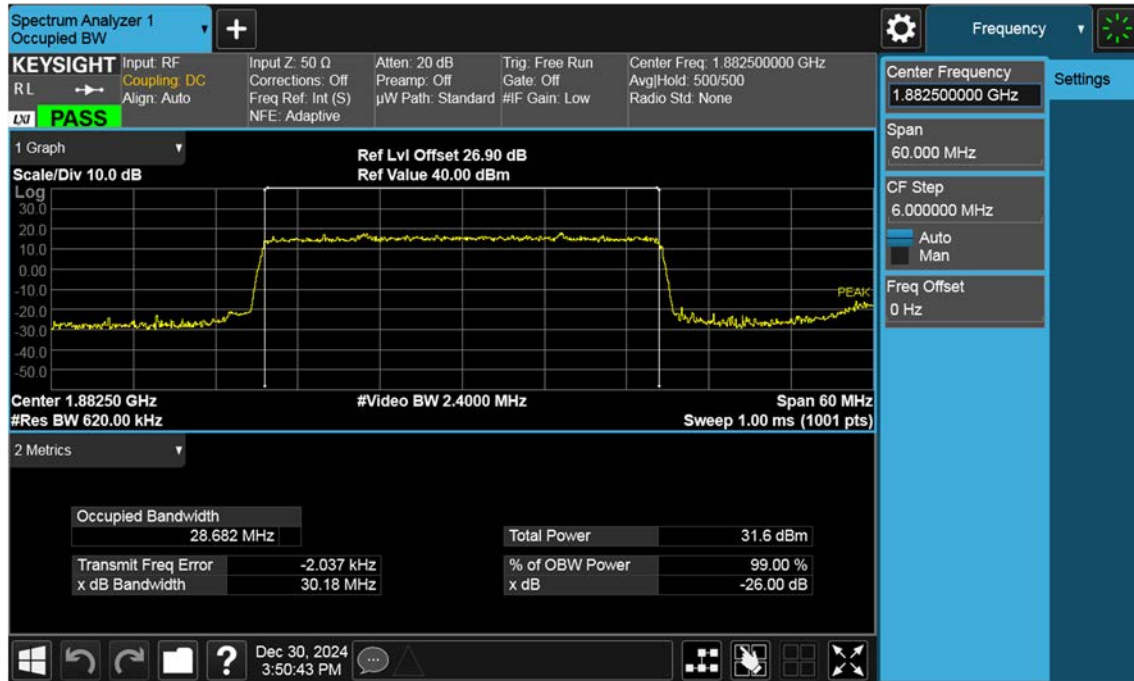
## NR25\_25 M\_OBW\_Mid\_64QAM\_FullRB



## NR25\_25 M\_OBW\_Mid\_256QAM\_FullRB



## NR25\_30 M\_OBW\_Mid\_BPSK\_FullRB



## NR25\_30 M\_OBW\_Mid\_QPSK\_FullIRB

