Testing and Certification

TEST REPORT

FCC Sub6 n25(2) Test for TM15FNEUJL1
Certification

APPLICANT
LG Electronics Inc.

REPORT NO.
HCT-RF-2502-FC102-R1

DATE OF ISSUE
April 8, 2025

Tested by
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Accredited by KOLAS, Republic of KOREA

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TEST REPORT

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HCT-RF-2502-FC102-R1

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Applicant	**LG Electronics Inc.** 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea
Product Name Model Name	Telematics TM15FNEUJL1
Date of Test	December 9, 2024 ~ February 24, 2025
FCC ID	BEJTM15FNEUJL1
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 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)

CONTENTS

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	LG Electronics Inc.
Address:	128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea
FCC ID:	BEJTM15FNEUJL1
Application Type:	Certification
FCC Classification	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§ 24
EUT Type:	Telematics
Model(s):	TM15FNEUJL1
SCS(kHz):	15
Bandwidth(MHz):	5, 10, 15, 20, 25, 30, 40
Waveform:	CP-OFDM, DFT-S-OFDM
Modulation:	DFT-S-OFDM: PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM
Tx Frequency:	1852.5 MHz – 1912.5 MHz (Sub6 n25(2) (5 MHz)) 1855.0 MHz – 1910.0 MHz (Sub6 n25(2) (10 MHz)) 1857.5 MHz – 1907.5 MHz (Sub6 n25(2) (15 MHz)) 1860.0 MHz – 1905.0 MHz (Sub6 n25(2) (20 MHz)) 1862.5 MHz – 1902.5 MHz (Sub6 n25 (25 MHz)) 1865.0 MHz – 1900.0 MHz (Sub6 n25 (30 MHz)) 1870.0 MHz – 1895.0 MHz (Sub6 n25 (40 MHz))
Date(s) of Tests:	December 9, 2024 ~ February 24, 2025
Serial number:	Radiated : 410VIXV000304(NAD) Conducted : 410VIXV000305(NAD)
Antenna Information	Please refer to the Antenna Specification document.

1.1. MAXIMUM OUTPUT POWER

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	Conducted Output Power	
				Max. Power (W)	Max. Power (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 - ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - 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 - 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 - KDB 971168 D01 v03r01 – Section 5.8
Radiated Spurious and Harmonic Emissions	- ANSI C63.26-2015 – Section 5.5.3 - 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 ≥ 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;

$$P_{d\ (dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dB)}$$

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

Test Note

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

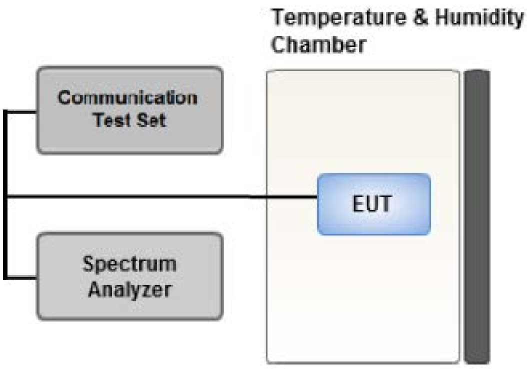
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

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

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

2. Set the number of counts to a value that stabilizes the measured CCDF curve;

3. Set the measurement interval as follows:

.- for continuous transmissions, set to 1 ms,

.- or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.

4. Record the maximum PAPR level associated with a probability of 0.1 %.

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:

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

Test Settings(Peak Power)

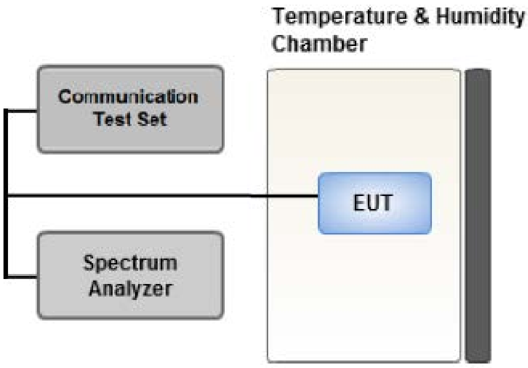
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (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 × to 3 × the OBW.
2. Set RBW ≥ OBW.
3. Set VBW ≥ 3 × RBW.
4. Set number of measurement points in sweep ≥ 2 × span / RBW.
5. Sweep time:
   Set ≥ [10 × (number of points in sweep) × (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/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.



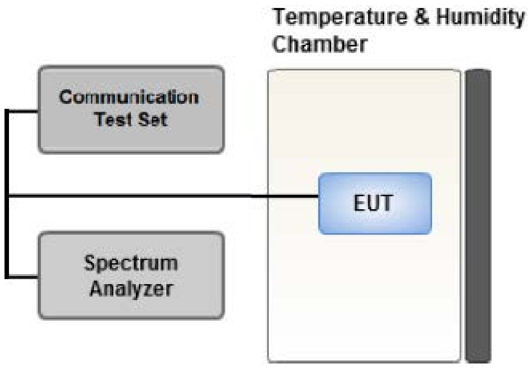
Test setup

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 ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5 % of the 99 % occupied bandwidth observed in Step 7

3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

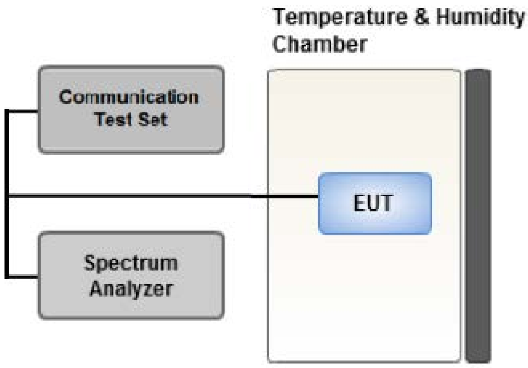
Test Overview

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

Test Settings

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

3.7 BAND EDGE



Test setup

Test Overview

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

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

Test Settings

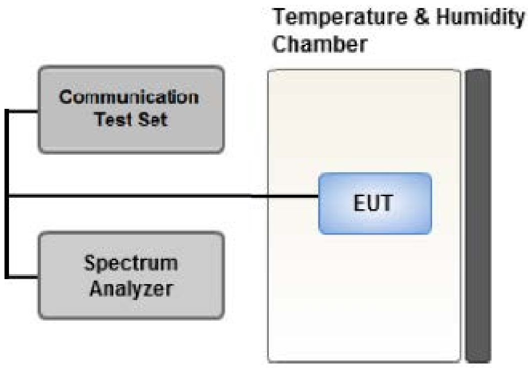
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1 % of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = 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 Margin < 1 dB the emission level is either corrected by 10 log(1 MHz/ RB) or the emission is integrated over a 1 MHz bandwidth to determine the final result. When using the integration method the integration window is either centered on the emission or, for emissions at the band edge, centered by an offset of 500 kHz from the block edge so that the integration window is the 1 MHz adjacent to the block edge.

3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015.

The frequency stability of the transmitter is measured by:

1. Temperature:

   The temperature is varied from -30 °C to +50 °C in 10 °C increments using an environmental chamber.

2. Primary Supply Voltage:

   .- Unless otherwise specified, vary primary supply voltage from 85 % to 115 % of the nominal value for other than hand carried battery equipment.

   .- For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

Test Settings

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

3.9 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- 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, QPSK, 16QAM, 64QAM, 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 (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:

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

5. MEASUREMENT UNCERTAINTY

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

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

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

Parameter	Expanded Uncertainty (±dB)
Block Edge	0.70 (Confidence level about 95 %, k=2)
Conducted Spurious Emissions	1.18 (Confidence level about 95 %, k=2)
Peak- to- Average Ratio	0.68 (Confidence level about 95 %, k=2)
Radiated Power	4.74 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.70 (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, § 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	See Note1
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, § 24.238(a)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

Note:

1. Radiated tests were tested using 5G Wireless Tester

6.3. Data Referencing

Rule Part	Test item	Data Referencing	Comments
§2.1049	Occupied Bandwidth	Y	-
§2.1051, §24.238(a)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	Y	-
§24.232(d)	Peak- to- Average Ratio	Y	-
§24.235	Frequency stability / variation of ambient temperature	Y	-
§24.232(c)	Effective Radiated Power Equivalent Isotropic Radiated Power	Y	Spot-check
§2.1053, §24.238(a)	Radiated Spurious and Harmonic Emissions	Y	Spot-check
§2.1046	Conducted Output Power	Y	-

Spot-Check Result

1. Data was leveraged from model TM15FNEUJL0 for the certification of TM15FNEUJL1.

2. Please refer to the [FCC Evaluation] Report

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

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

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

7.2 EIRP Sample Calculation

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

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

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

7.3. Emission Designator

GSM Emission Designator

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

EDGE Emission Designator

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

WCDMA Emission Designator

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

QPSK Modulation

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

QAM Modulation

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

8. TEST DATA

8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1852.5	Sub6 n25(2)/ 5 MHz [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 (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1855.0	Sub6 n25(2)/ 10 MHz [15 kHz]	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		PI/2 BPSK	-15.84	19.56	10.11	2.21	H		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		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 (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1857.5	Sub6 n25(2)/ 15 MHz [15 kHz]	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		PI/2 BPSK	-15.49	19.91	10.11	2.21	H		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		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 (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1860.0	Sub6 n25(2)/ 20 MHz [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 (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1862.5	Sub6 n25/ 25 MHz [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 (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1865.0	Sub6 n25/ 30 MHz [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 (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1870.0	Sub6 n25/ 40 MHz [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: N25
- Bandwidth: 40 MHz
- Modulation: PI/2 BPSK
- Distance: 3 meters
- SCS: 15 kHz

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)	RB	
									Size	Offset
374000 (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 (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 (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 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 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 47 ~ 81.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Sub6 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 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 82 ~ 116.

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 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 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 117 ~ 158.
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 159 ~ 200.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ BandWidth: 5 MHz

▣ Voltage(100 %): 12.000 VDC

▣ LIMIT: Emission must remain in band

Test. Frequency (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
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. Frequency (MHz)	Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
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. Frequency (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
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. Frequency (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
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. Frequency (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
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. Frequency (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
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

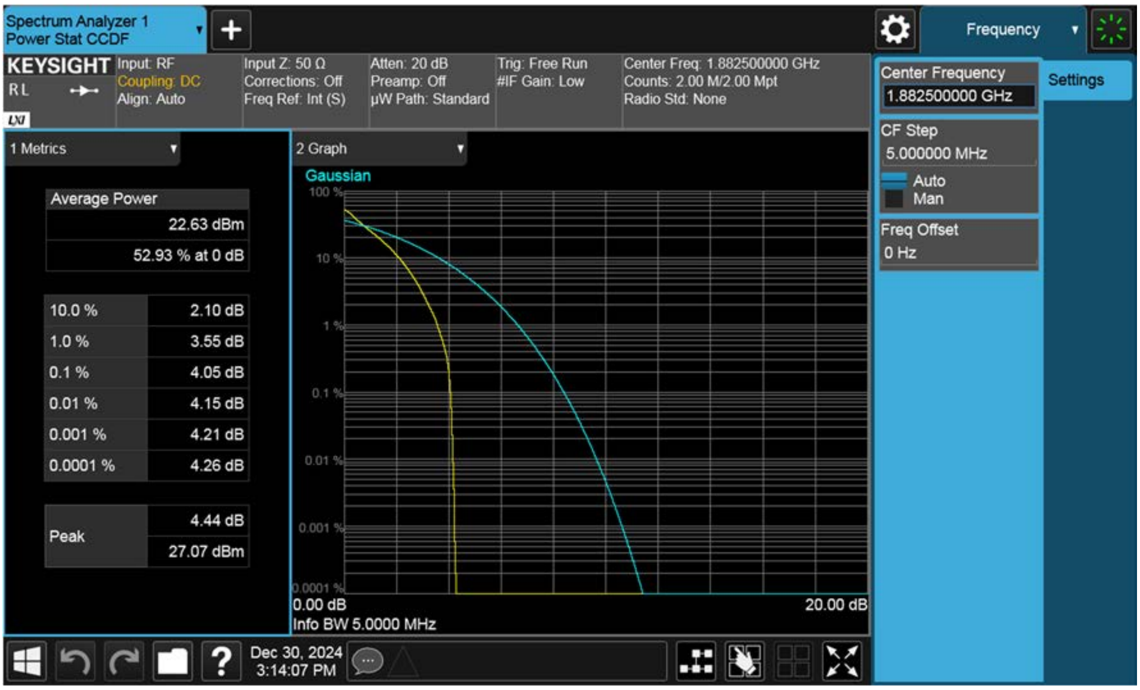
▣ Voltage(100 %): 12.000 VDC

▣ LIMIT: Emission must remain in band

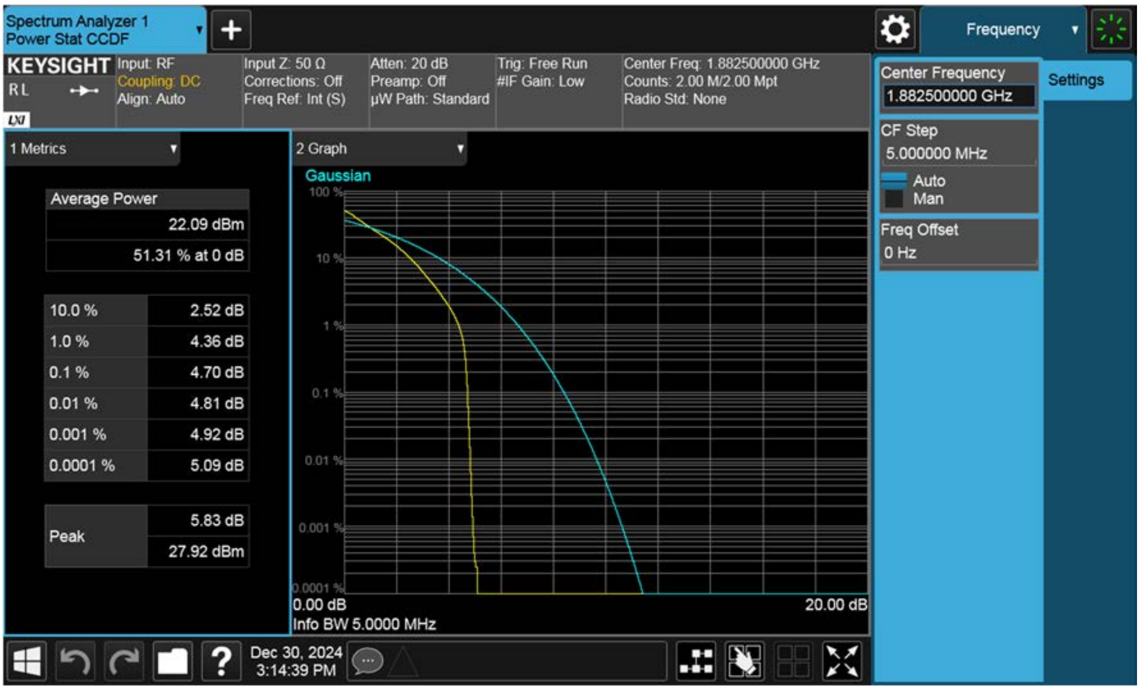
Test. Frequency (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
1870.0	100 %	+20(Ref)	1870 000 005	0.0	0.000 000	0.000
	100 %	-30	1870 000 009	3.6	0.000 000	0.002
	100 %	-20	1870 000 006	1.2	0.000 000	0.001
	100 %	-10	1870 000 005	-0.6	0.000 000	0.000
	100 %	0	1870 000 004	-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

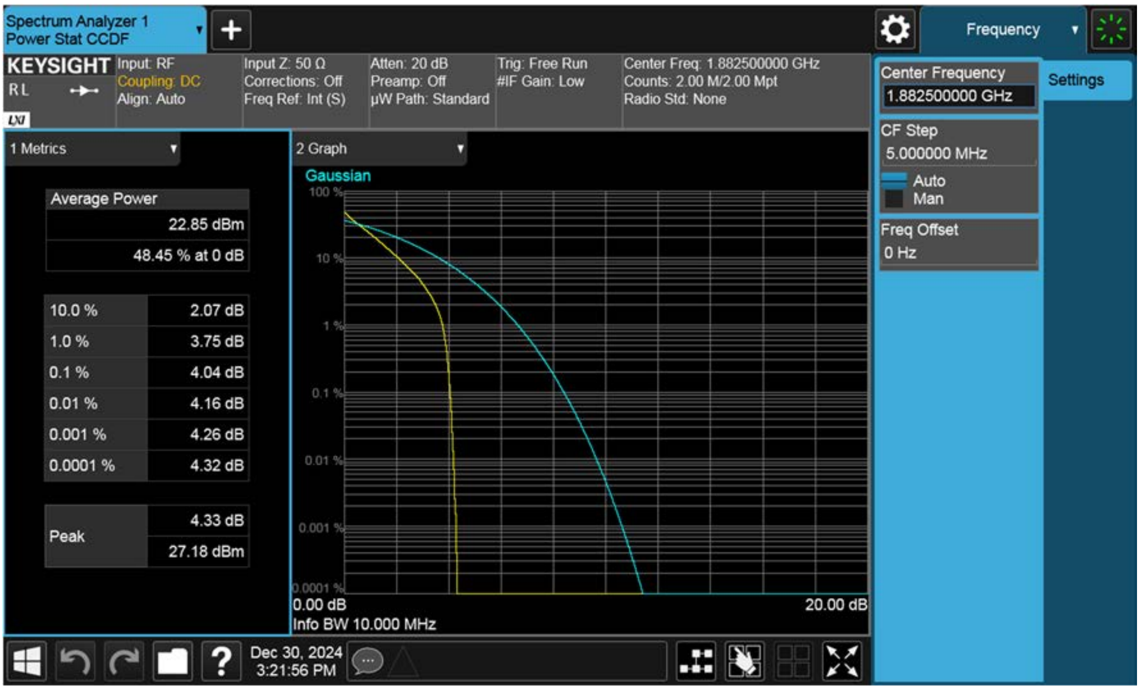


NR25_5 M_PAR_Mid_16QAM_FullRB

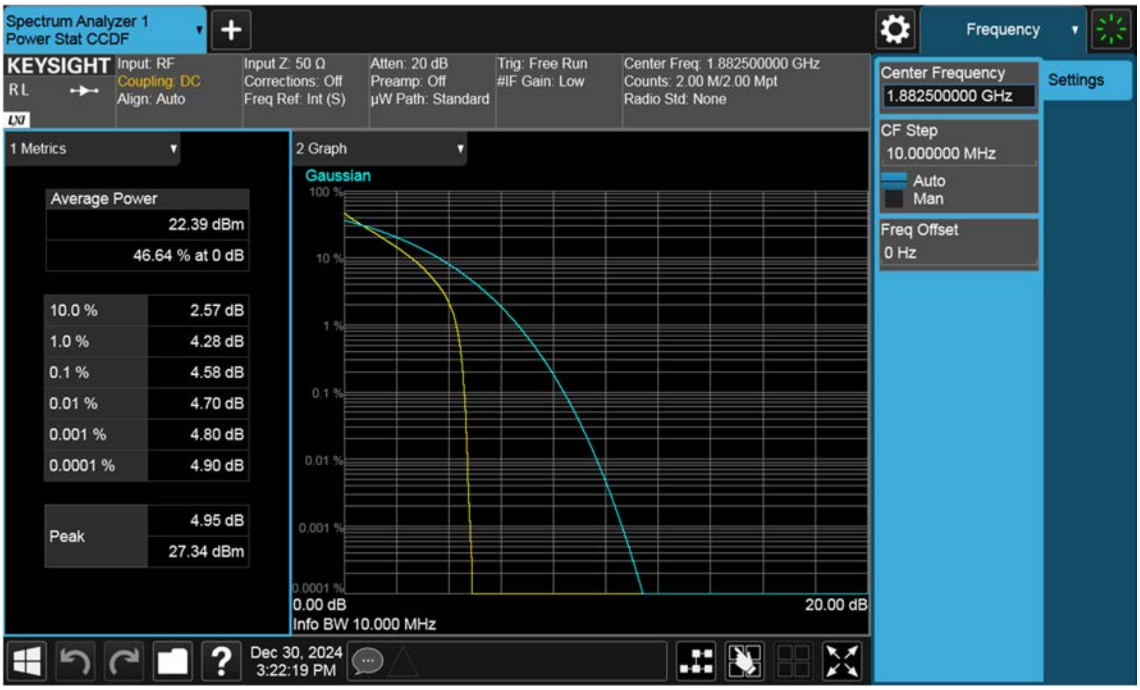
NR25_5 M_PAR_Mid_64QAM_FullRB

NR25_5 M_PAR_Mid_256QAM_FullRB

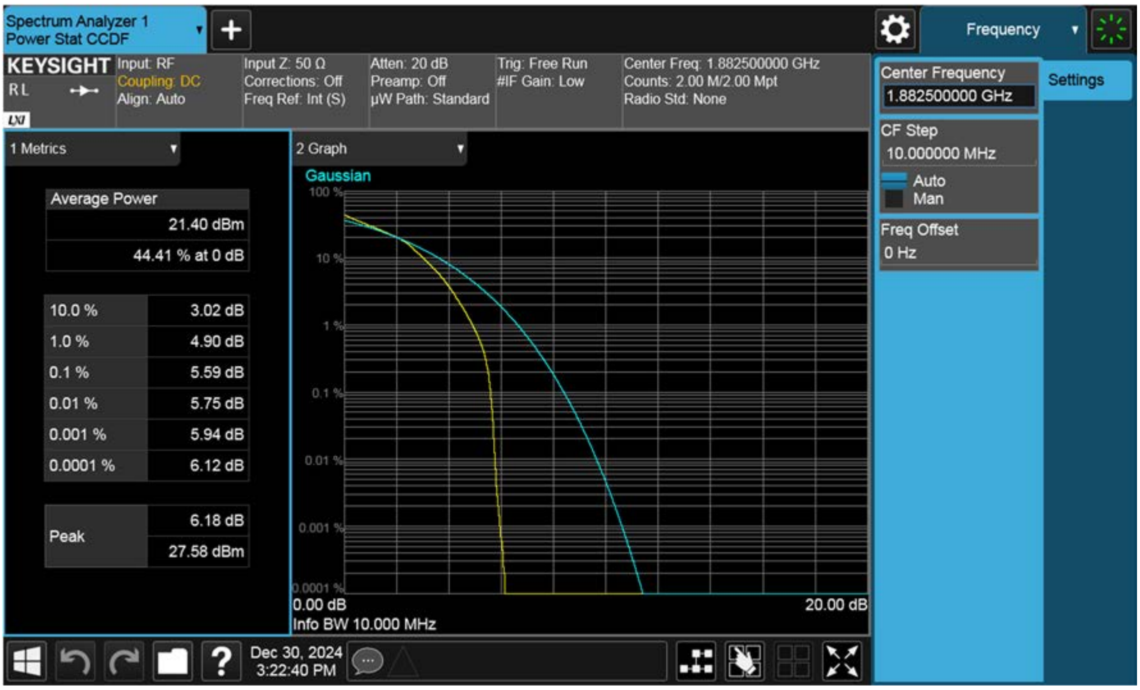
NR25_10 M_PAR_Mid_BPSK_FullRB



NR25_10 M_PAR_Mid_QPSK_FullRB

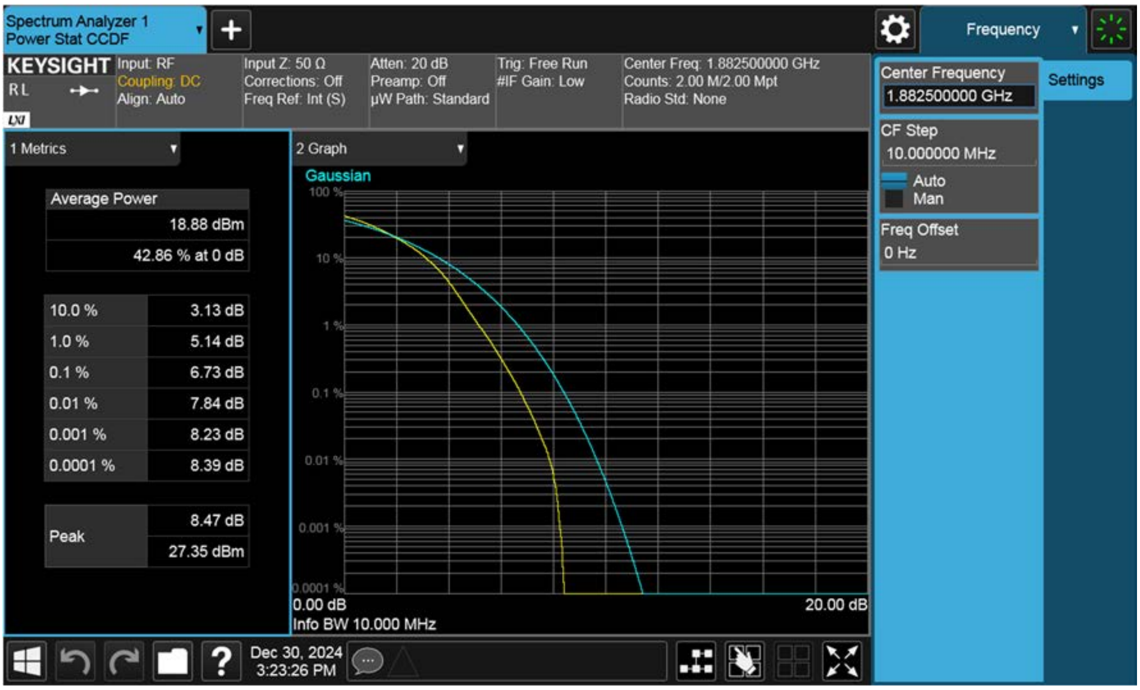


NR25_10 M_PAR_Mid_16QAM_FullRB

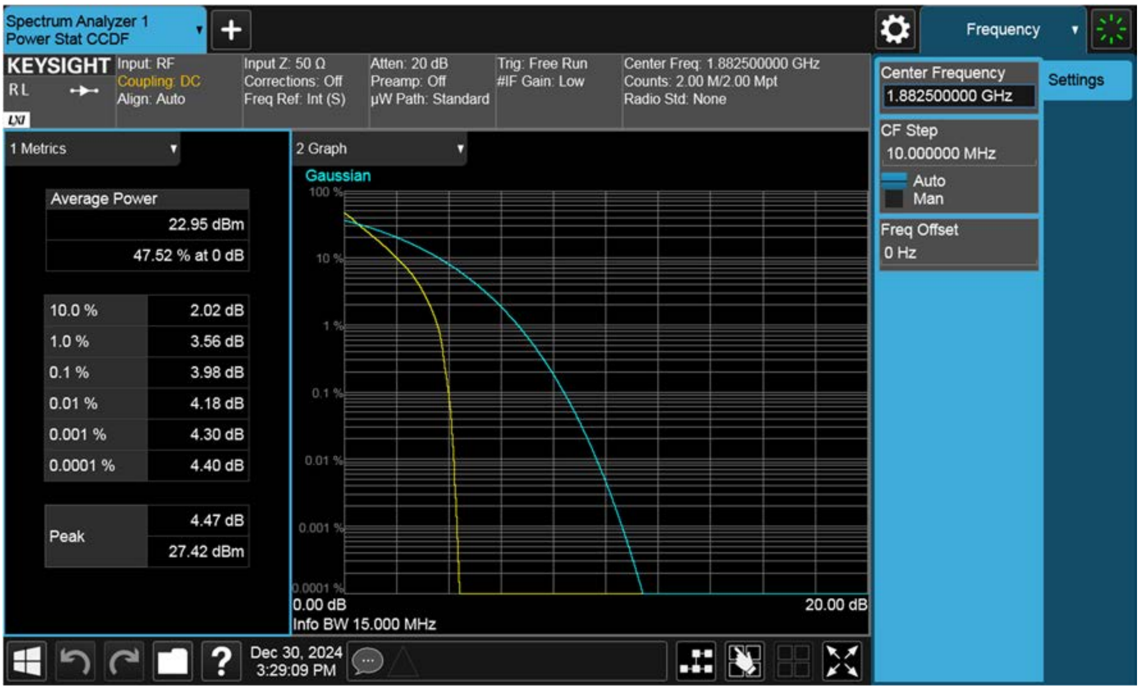


NR25_10 M_PAR_Mid_64QAM_FullRB

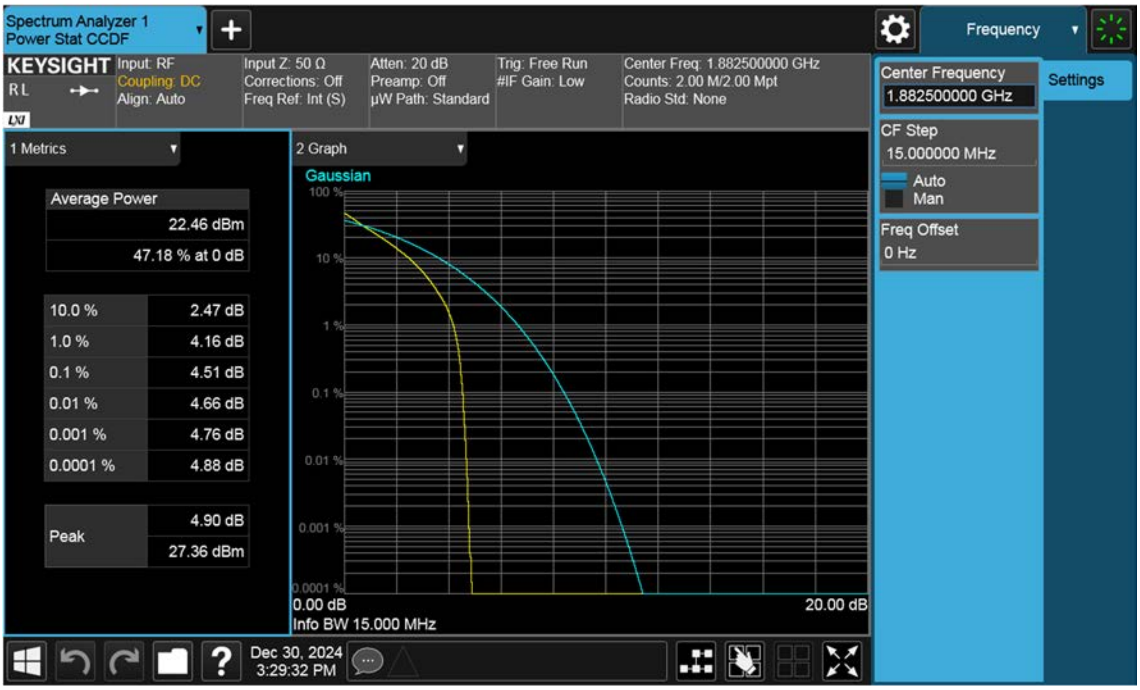
NR25_10 M_PAR_Mid_256QAM_FullRB



NR25_15 M_PAR_Mid_BPSK_FullRB



NR25_15 M_PAR_Mid_QPSK_FullRB

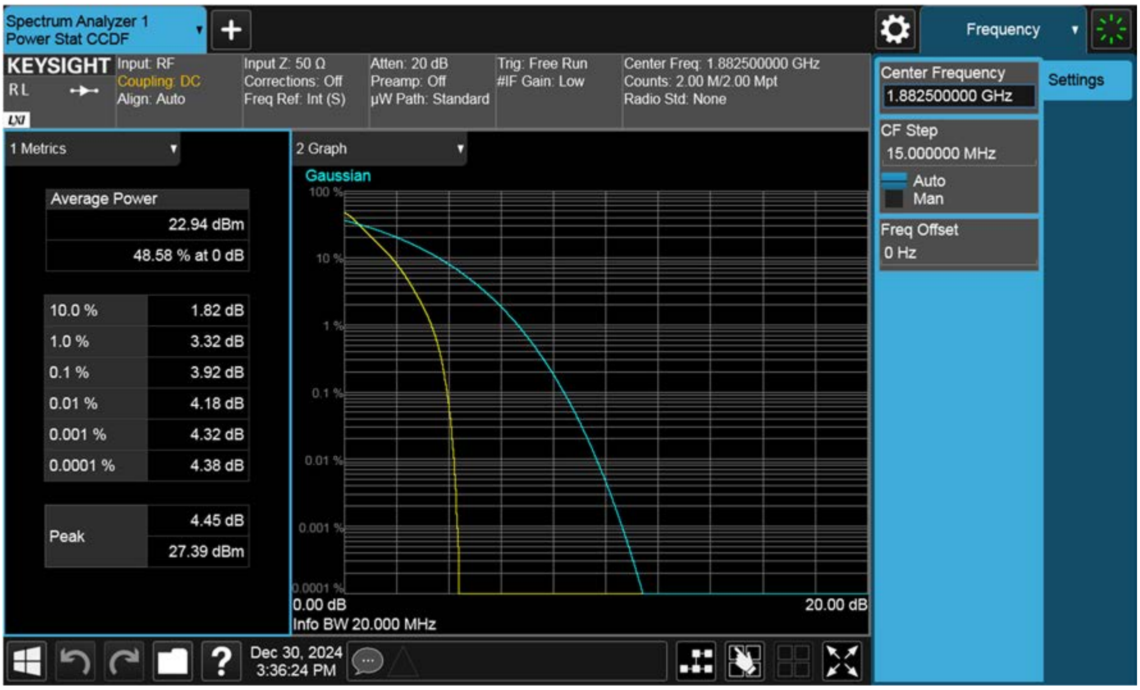


NR25_15 M_PAR_Mid_16QAM_FullRB

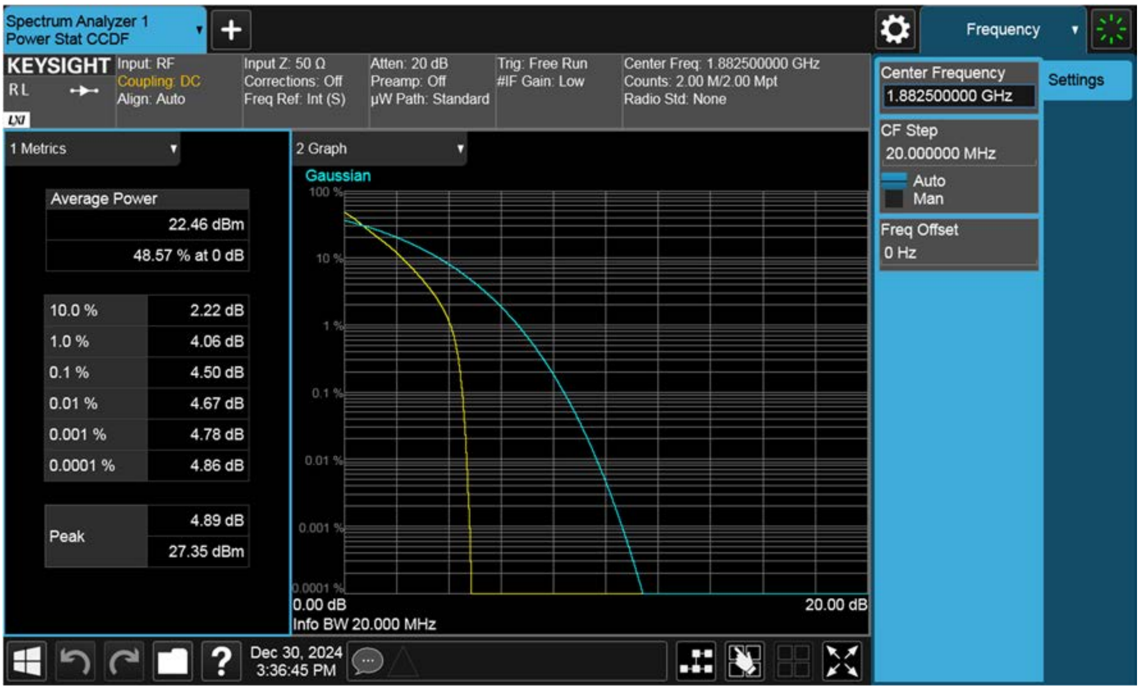
NR25_15 M_PAR_Mid_64QAM_FullRB

NR25_15 M_PAR_Mid_256QAM_FullRB

NR25_20 M_PAR_Mid_BPSK_FullRB



NR25_20 M_PAR_Mid_QPSK_FullRB



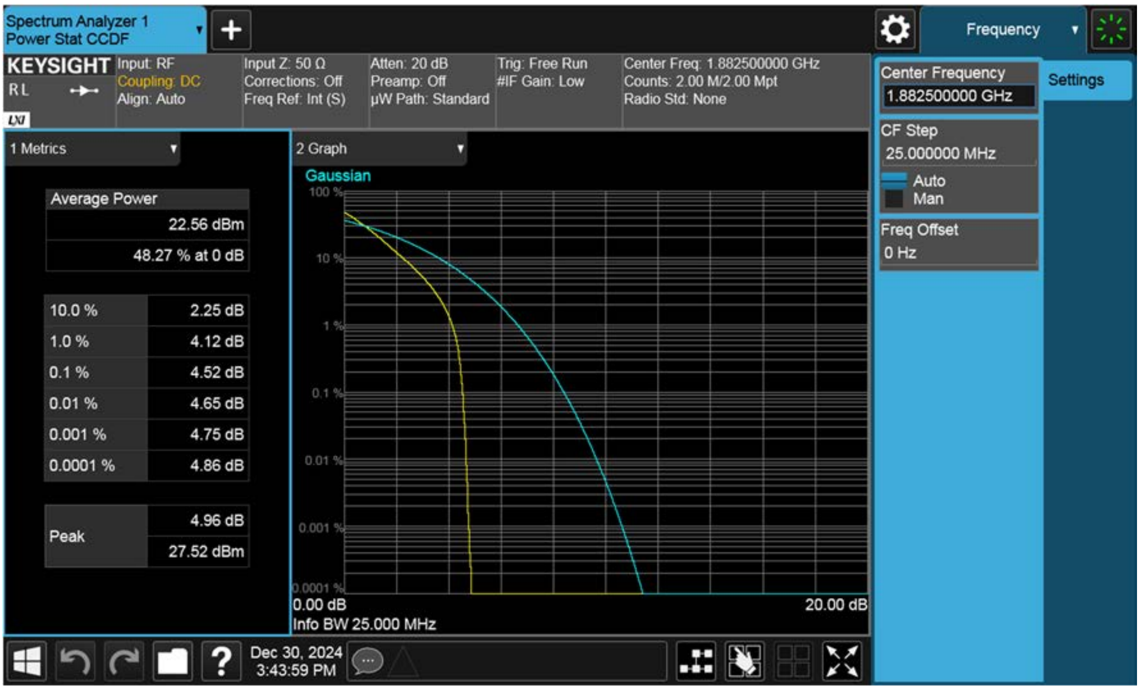
NR25_20 M_PAR_Mid_16QAM_FullRB

NR25_20 M_PAR_Mid_64QAM_FullRB

NR25_20 M_PAR_Mid_256QAM_FullRB

NR25_25 M_PAR_Mid_BPSK_FullRB

NR25_25 M_PAR_Mid_QPSK_FullRB



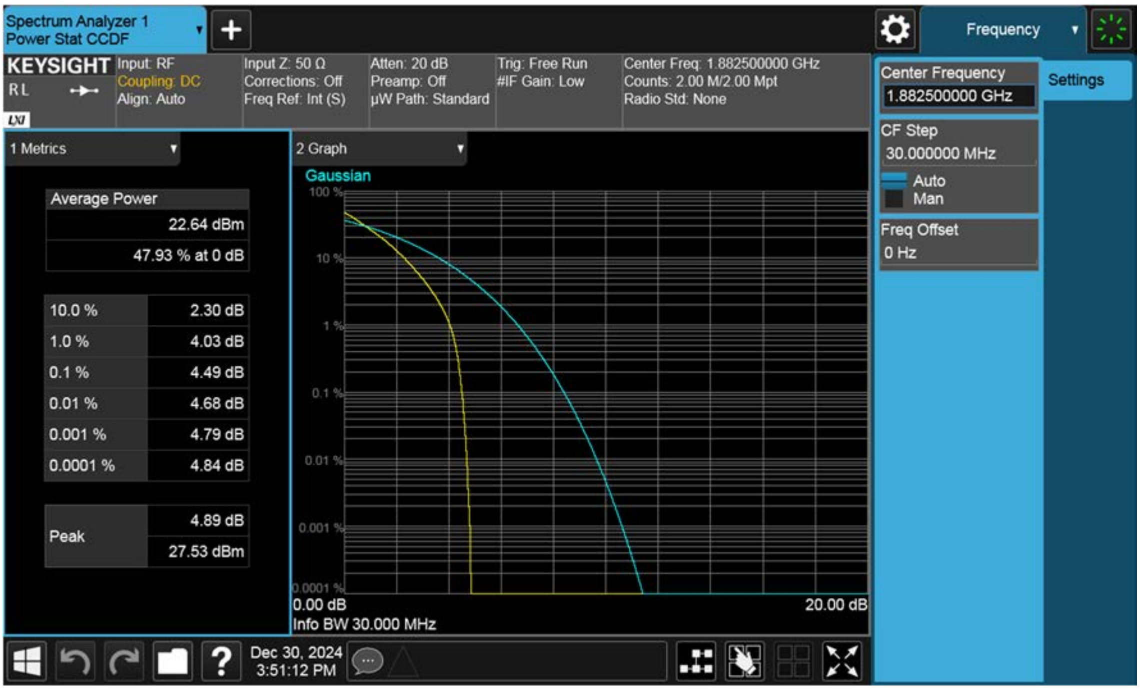
NR25_25 M_PAR_Mid_16QAM_FullRB

NR25_25 M_PAR_Mid_64QAM_FullRB

NR25_25 M_PAR_Mid_256QAM_FullRB

NR25_30 M_PAR_Mid_BPSK_FullRB

NR25_30 M_PAR_Mid_QPSK_FullRB

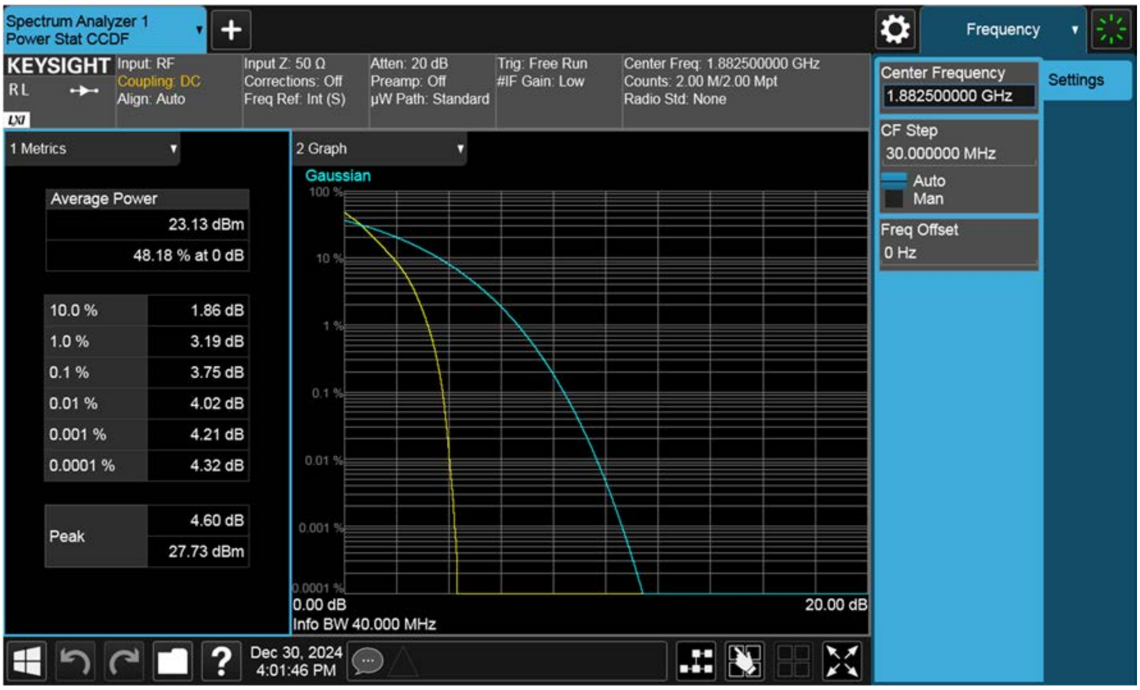


NR25_30 M_PAR_Mid_16QAM_FullRB

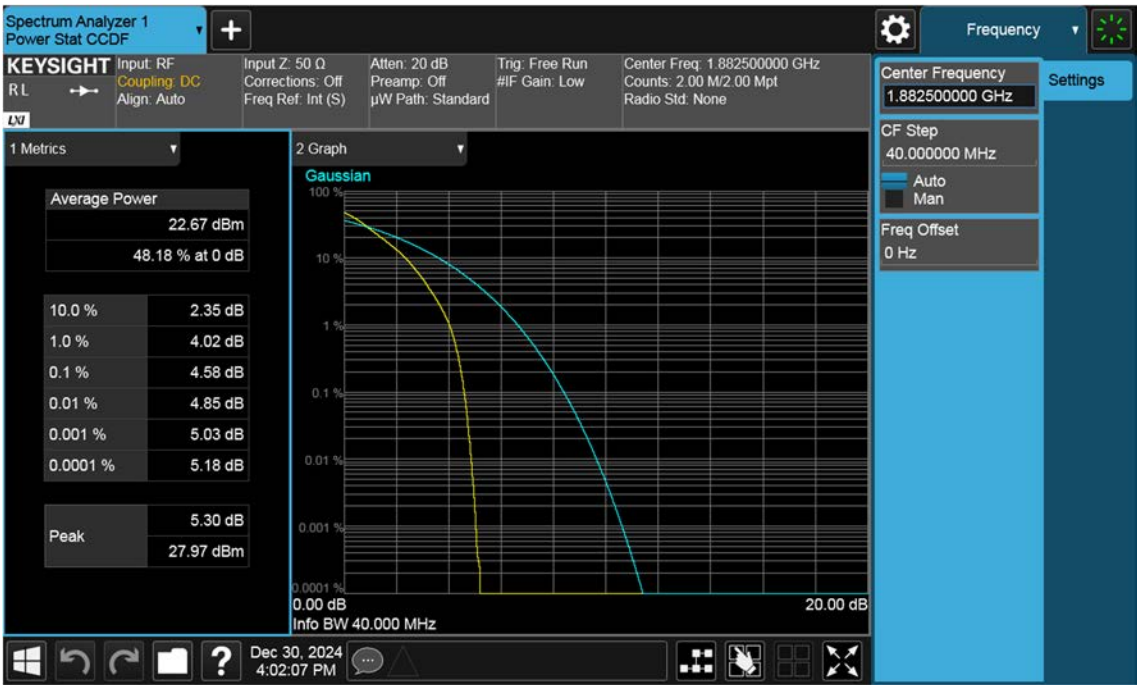
NR25_30 M_PAR_Mid_64QAM_FullRB

NR25_30 M_PAR_Mid_256QAM_FullRB

NR25_40 M_PAR_Mid_BPSK_FullRB



NR25_40 M_PAR_Mid_QPSK_FullRB

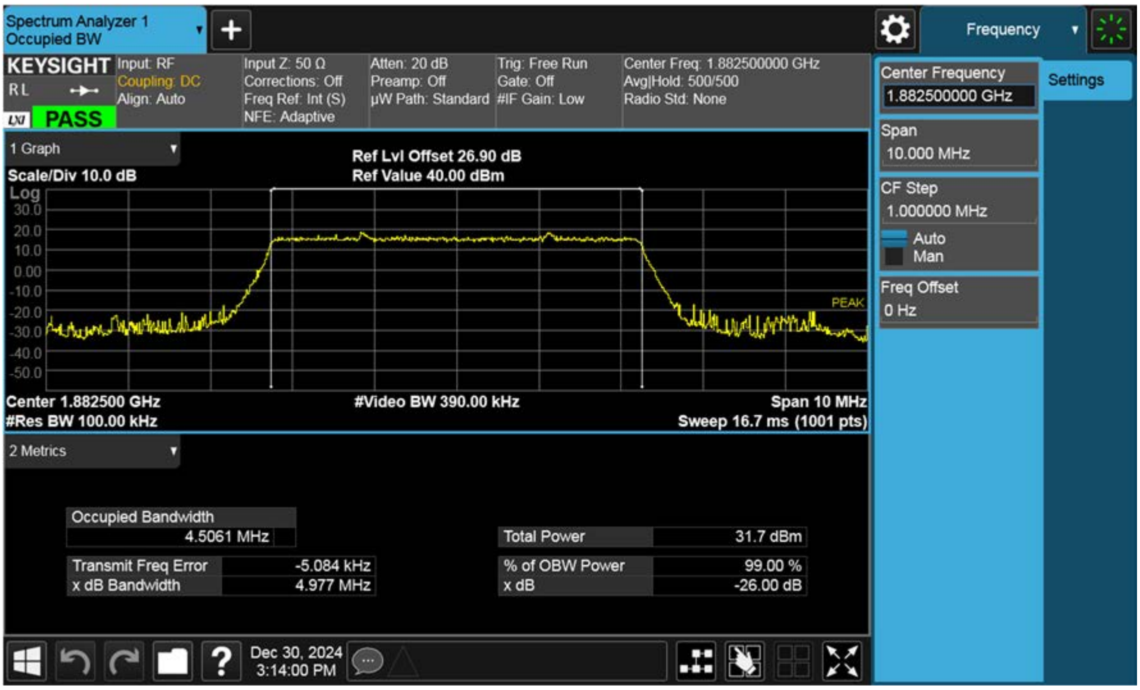


NR25_40 M_PAR_Mid_16QAM_FullRB

NR25_40 M_PAR_Mid_64QAM_FullRB

NR25_40 M_PAR_Mid_256QAM_FullRB

NR25_5 M_OBW_Mid_BPSK_FullRB



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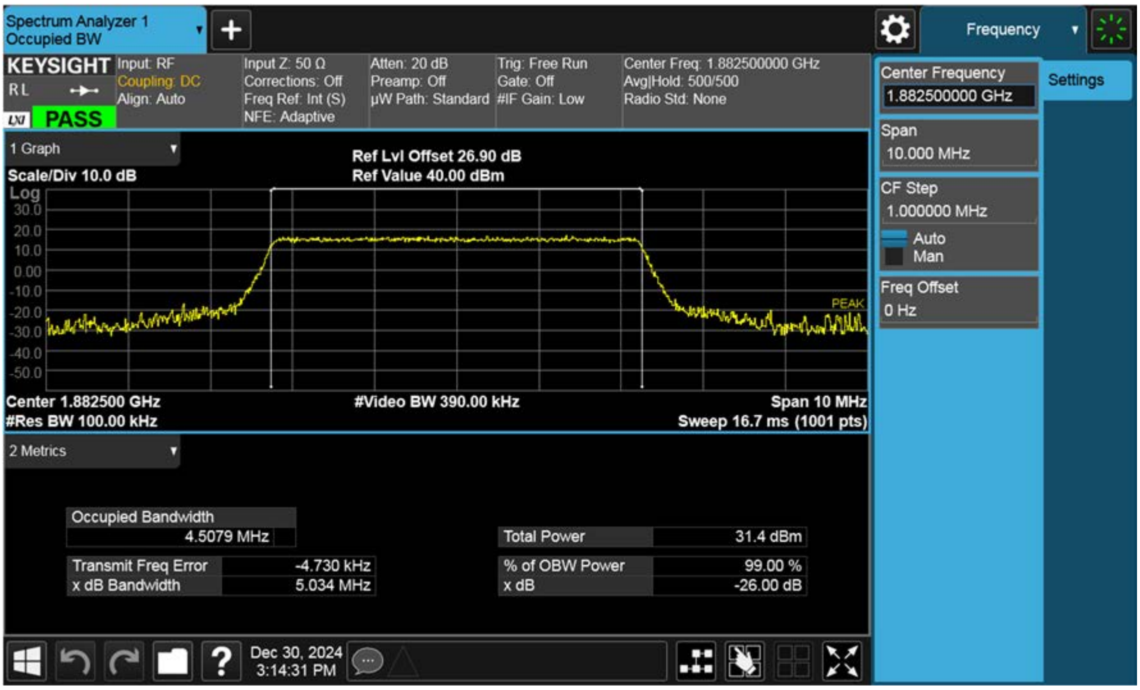
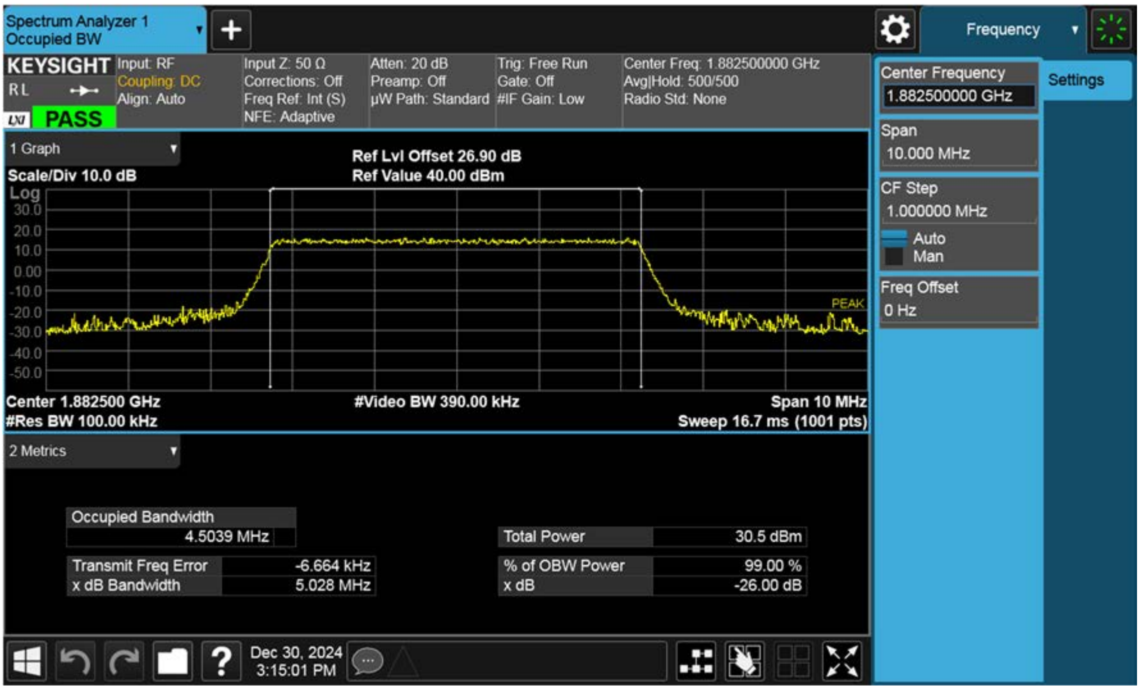
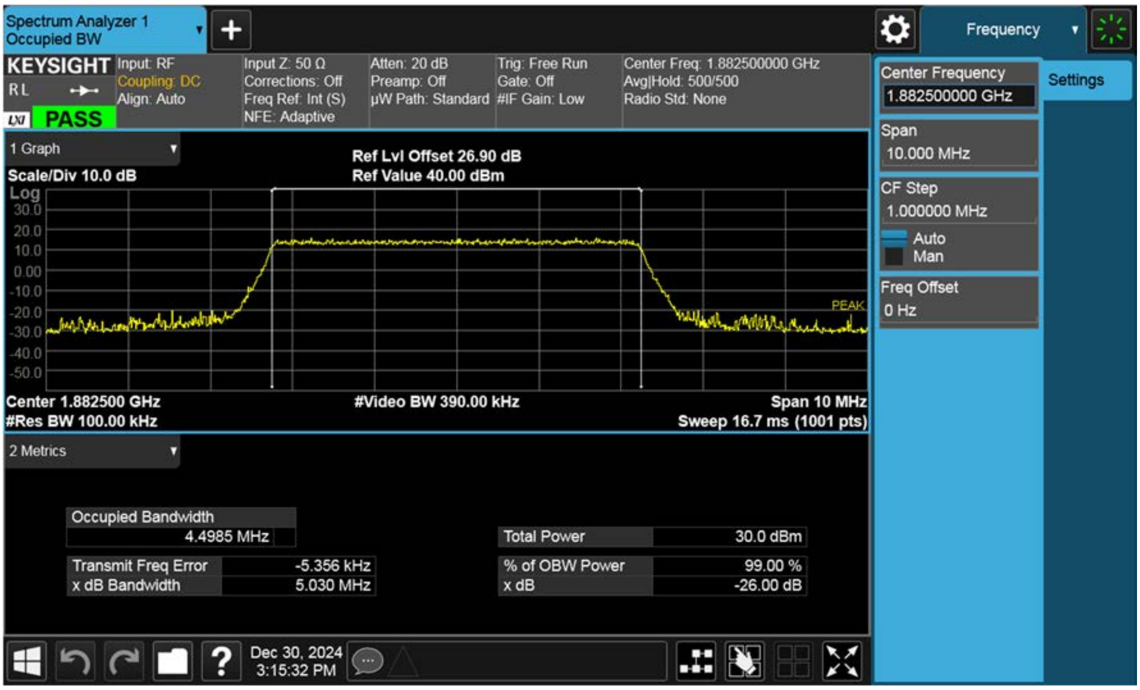


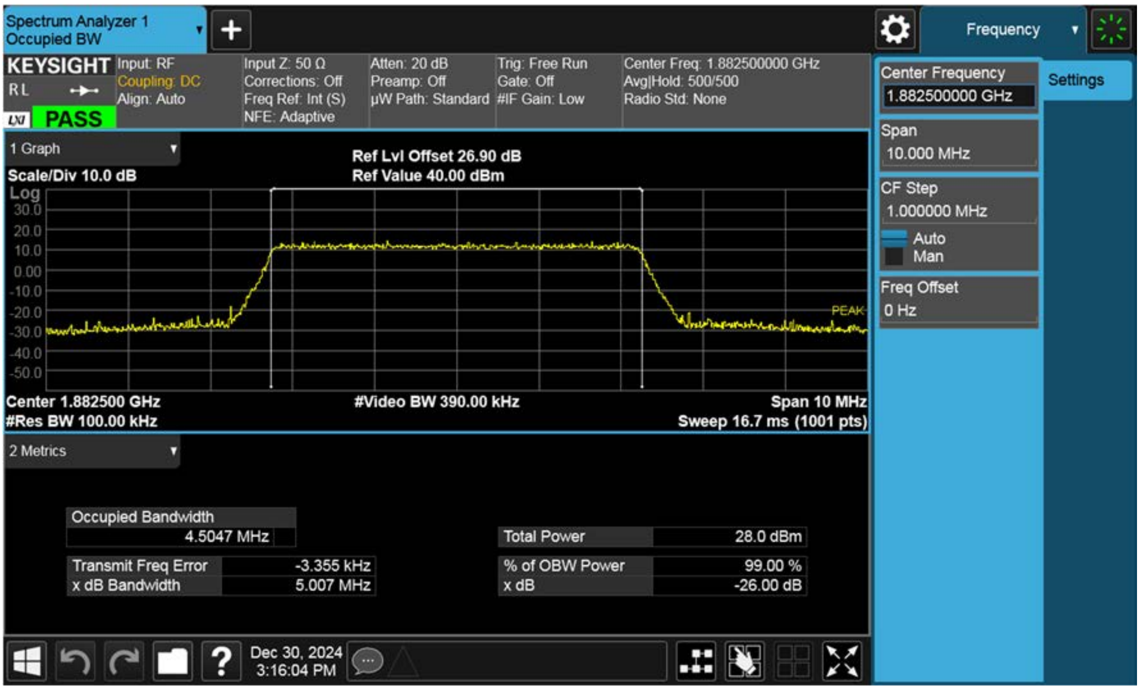
NR25_5 M_OBW_Mid_16QAM_FullRB



NR25_5 M_OBW_Mid_64QAM_FullRB

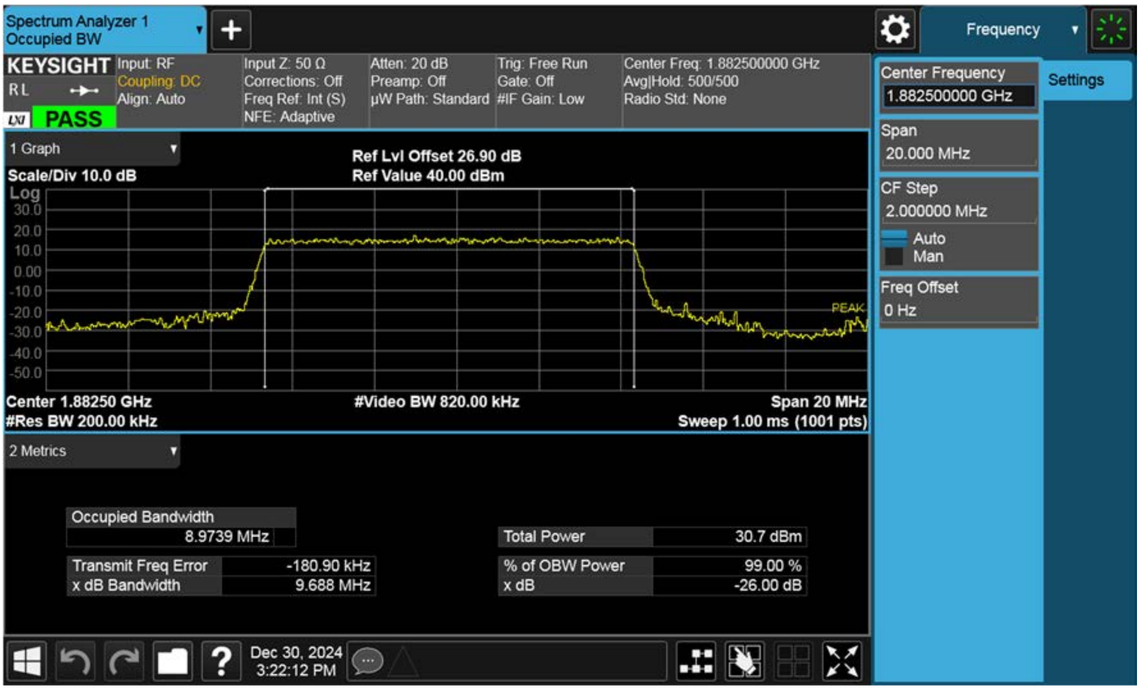


NR25_5 M_OBW_Mid_256QAM_FullRB

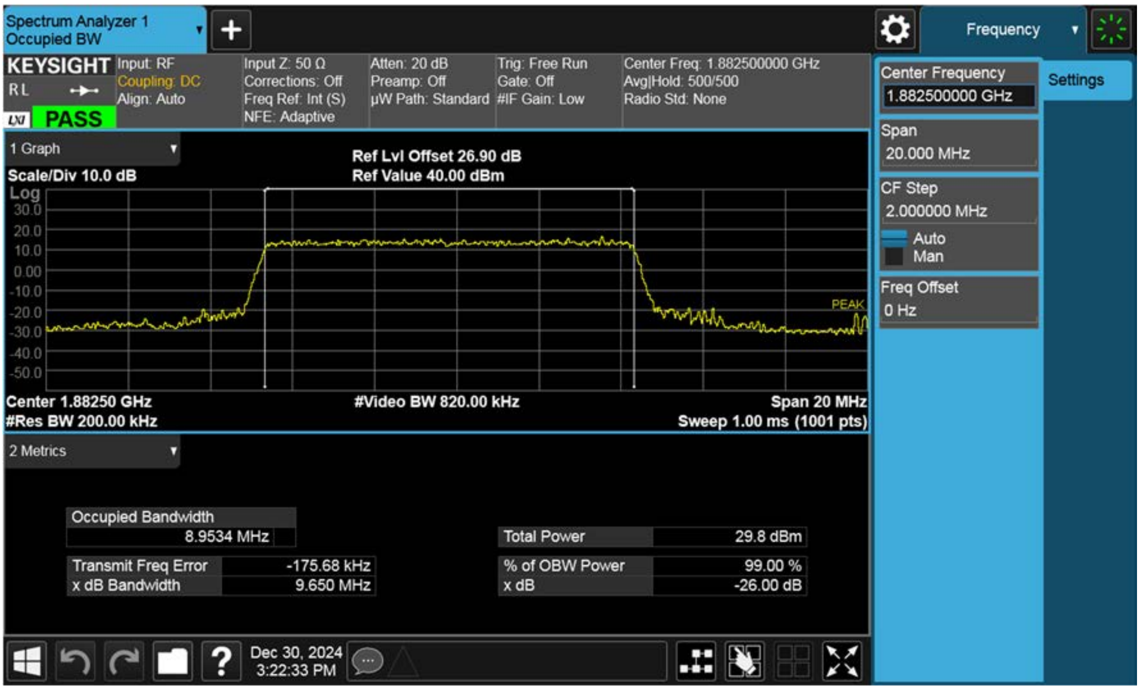


NR25_10 M_OBW_Mid_BPSK_FullRB

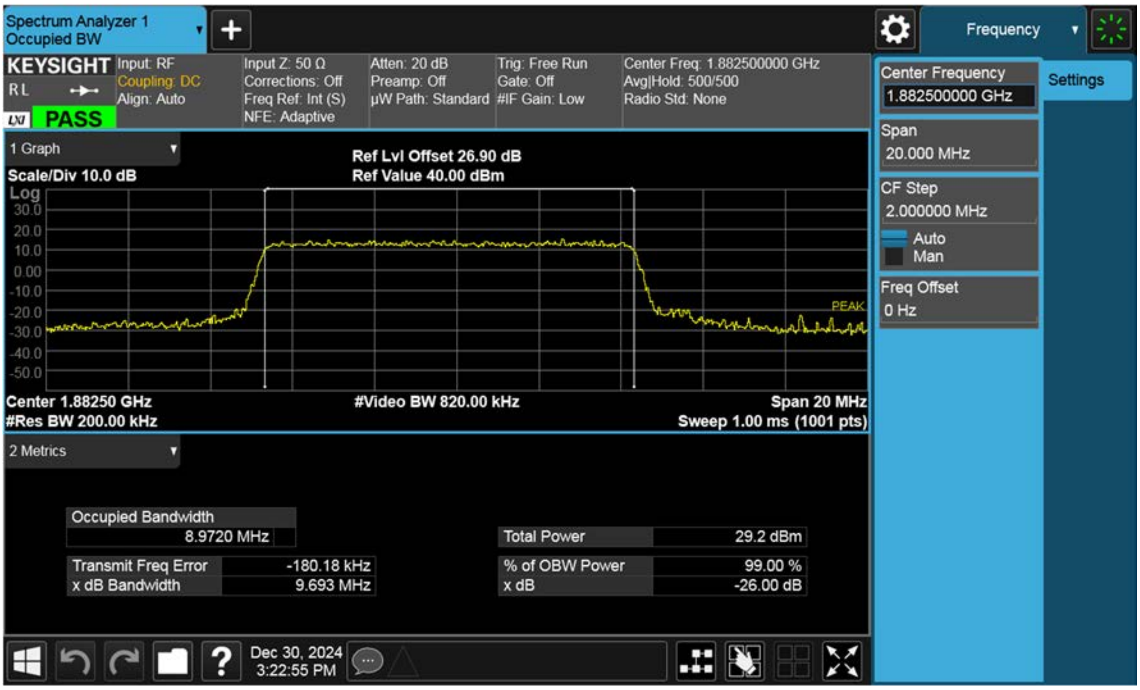
NR25_10 M_OBW_Mid_QPSK_FullRB



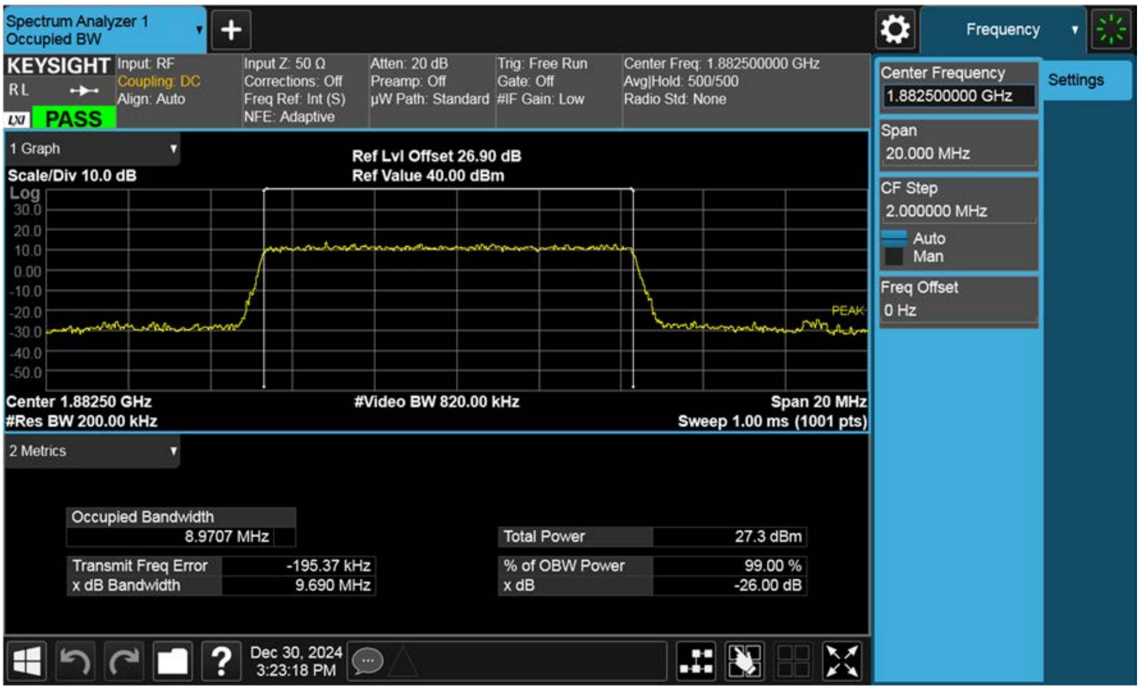
NR25_10 M_OBW_Mid_16QAM_FullRB



NR25_10 M_OBW_Mid_64QAM_FullRB



NR25_10 M_OBW_Mid_256QAM_FullRB

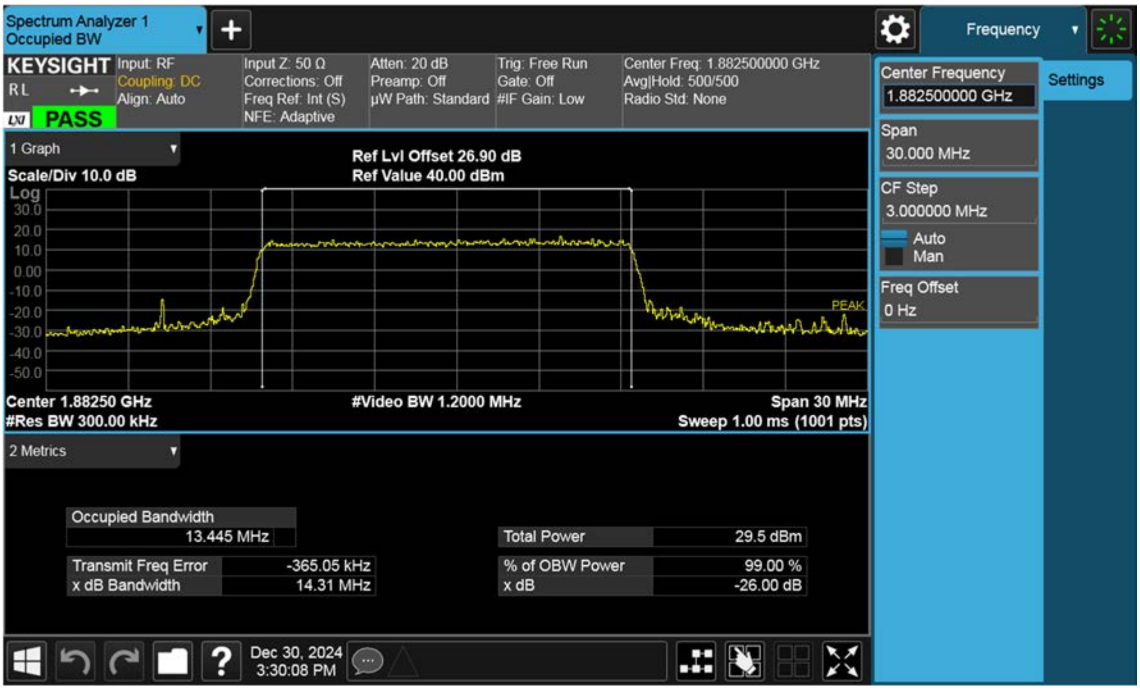


NR25_15 M_OBW_Mid_BPSK_FullRB

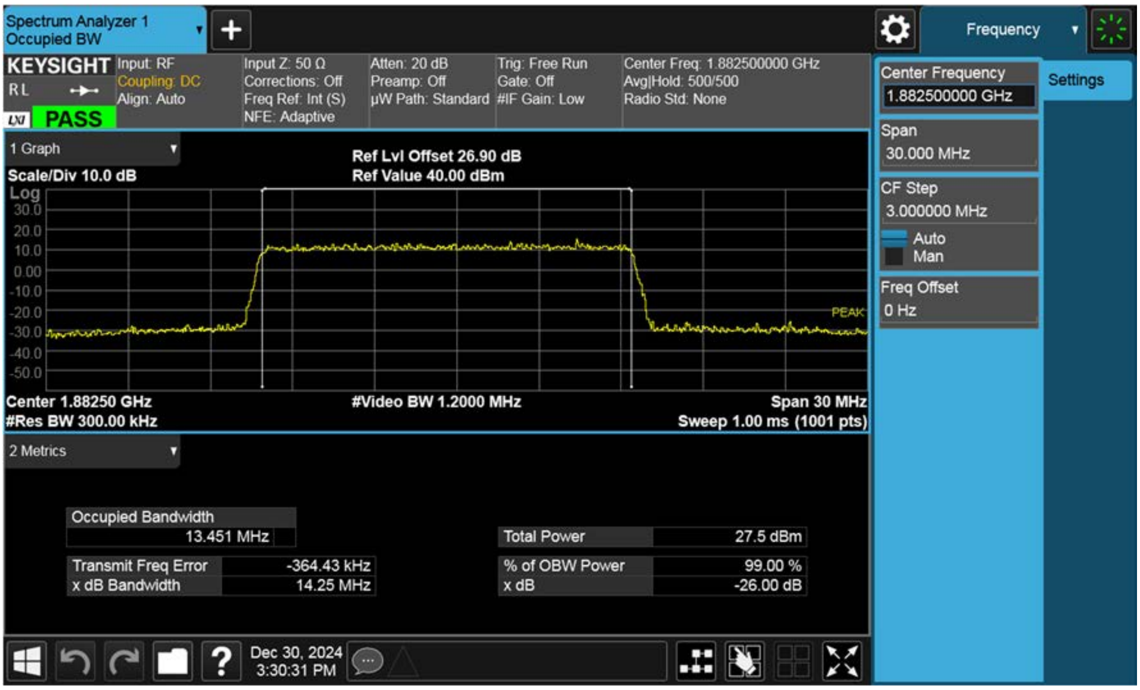
NR25_15 M_OBW_Mid_QPSK_FullRB

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_FullRB

NR25_20 M_OBW_Mid_16QAM_FullRB

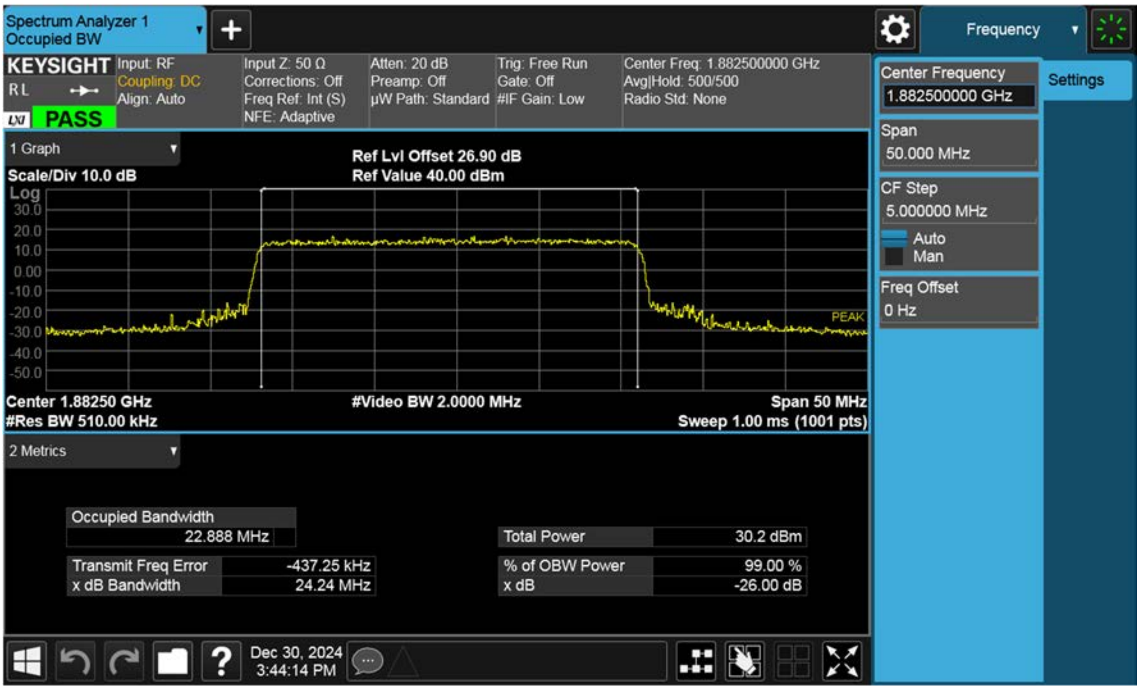
NR25_20 M_OBW_Mid_64QAM_FullRB

NR25_20 M_OBW_Mid_256QAM_FullRB

NR25_25 M_OBW_Mid_BPSK_FullRB

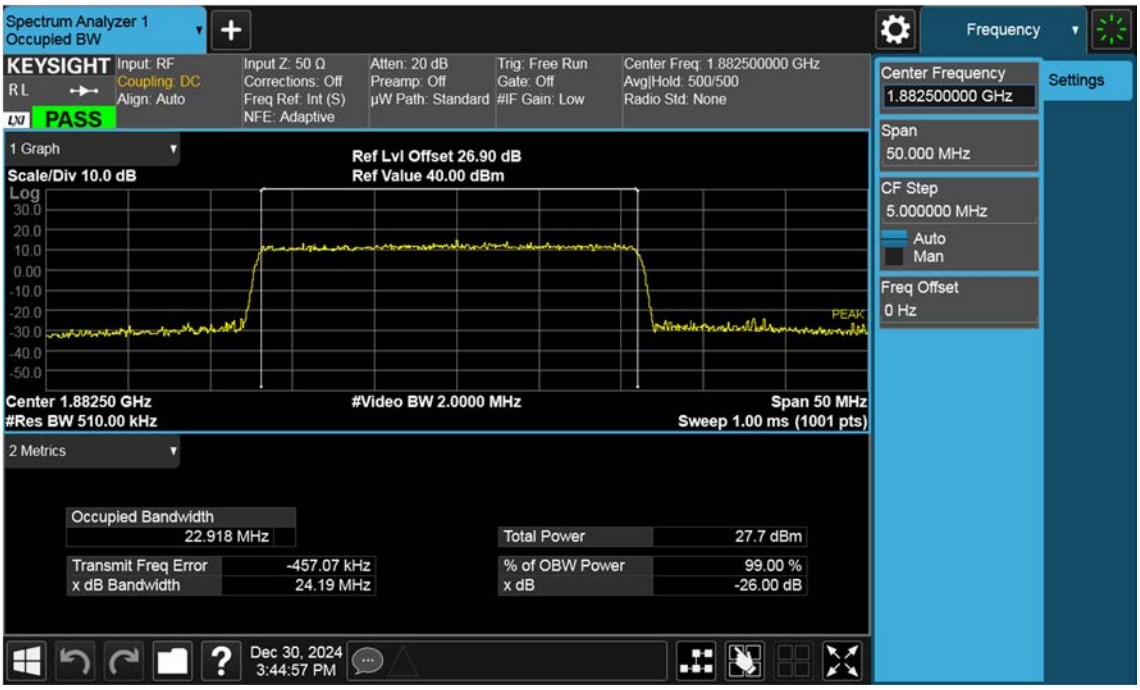
NR25_25 M_OBW_Mid_QPSK_FullRB

NR25_25 M_OBW_Mid_16QAM_FullRB



NR25_25 M_OBW_Mid_64QAM_FullRB

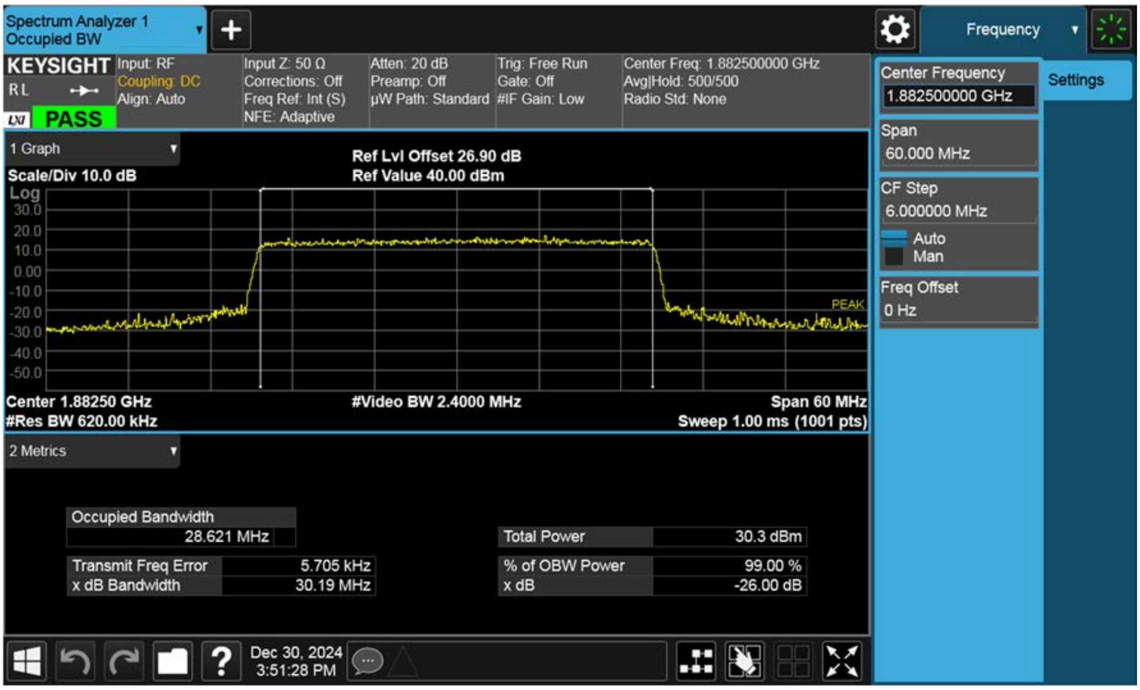
NR25_25 M_OBW_Mid_256QAM_FullRB



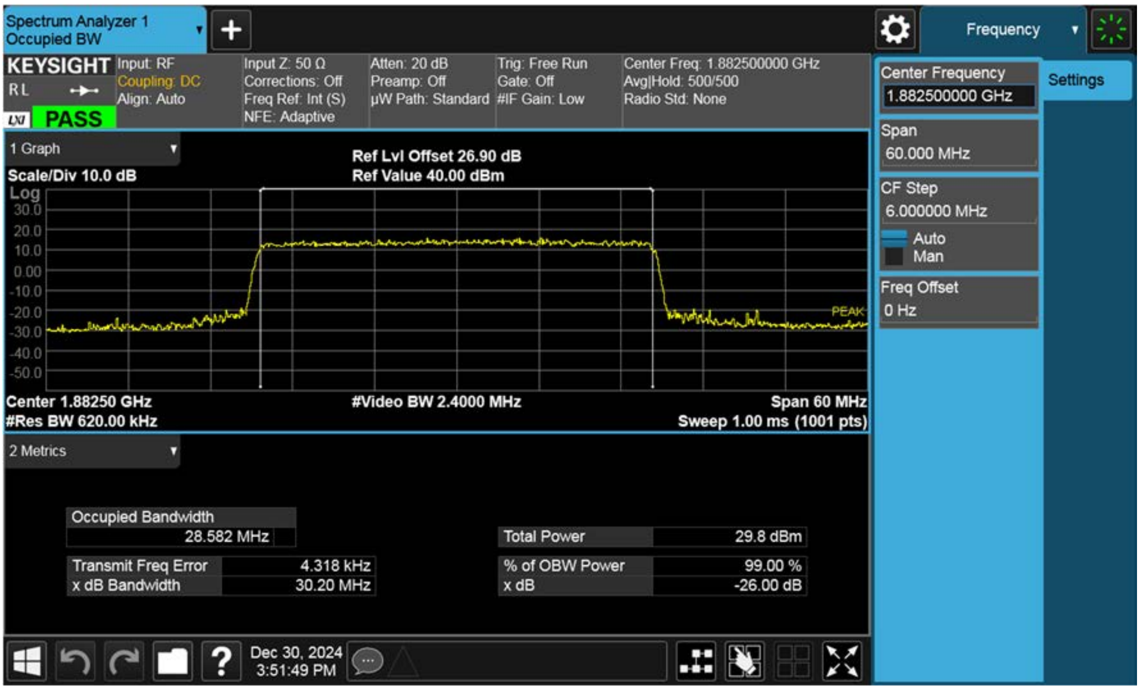
NR25_30 M_OBW_Mid_BPSK_FullRB

NR25_30 M_OBW_Mid_QPSK_FullRB

NR25_30 M_OBW_Mid_16QAM_FullRB



NR25_30 M_OBW_Mid_64QAM_FullRB



NR25_30 M_OBW_Mid_256QAM_FullRB

NR25_40 M_OBW_Mid_BPSK_FullRB

NR25_40 M_OBW_Mid_QPSK_FullRB

NR25_40 M_OBW_Mid_16QAM_FullRB

NR25_40 M_OBW_Mid_64QAM_FullRB