

TEST REPORT

FCC Sub6 n66 Test for SM-X528U
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2502-FC020

DATE OF ISSUE
February 10, 2025

Tested by
Jung Ki Lim



Technical Manager
Jong Seok Lee



HCT CO., LTD.
Bongjai Huh
BongJai Huh / CEO

**HCT CO.,LTD.**

2-6, 73, 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea
Tel. +82 31 645 6300 Fax. +82 31 645 6401

TEST REPORT

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Applicant

SAMSUNG Electronics Co., Ltd.

129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Product Name

Tablet

Model Name

SM-X528U

Date of Test

December 23, 2024 ~ February 07, 2025

FCC ID

A3LSMX528U

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: § 27

Test Results

PASS

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	February 10, 2025	Initial Release

Notice

Content

The measurements shown in this report were made in accordance with the procedures specified in CFR47 section § 2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

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

The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

CONTENTS

1. GENERAL INFORMATION	5
1.1 MAXIMUM OUTPUT POWER	6
2. INTRODUCTION	7
2.1 DESCRIPTION OF EUT	7
2.2 MEASURING INSTRUMENT CALIBRATION	7
2.3 TEST FACILITY	7
3. DESCRIPTION OF TESTS	8
3.1 TEST PROCEDURE	8
3.2 RADIATED POWER	9
3.3 RADIATED SPURIOUS EMISSIONS	10
3.4 PEAK- TO- AVERAGE RATIO	11
3.5 OCCUPIED BANDWIDTH	13
3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL	14
3.7 BAND EDGE	15
3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE	17
3.9 WORST CASE(RADIATED TEST)	18
3.10 WORST CASE(CONDUCTED TEST)	19
4. LIST OF TEST EQUIPMENT	20
5. MEASUREMENT UNCERTAINTY	21
6. SUMMARY OF TEST RESULTS	22
7. SAMPLE CALCULATION	23
8. TEST DATA	25
8.1 EQUIVALENT ISOTROPIC RADIATED POWER	25
8.2 RADIATED SPURIOUS EMISSIONS	32
8.3 PEAK-TO-AVERAGE RATIO	33
8.4 OCCUPIED BANDWIDTH	34
8.5 CONDUCTED SPURIOUS EMISSIONS	35
8.6 BAND EDGE	35
8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE	36
9. TEST PLOTS	43
10. ANNEX A_ TEST SETUP PHOTO	198

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMX528U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§ 27
EUT Type:	Tablet
Model(s):	SM-X528U
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:	1712.5 MHz – 1777.5 MHz (Sub6 n66(5 MHz)) 1715.0 MHz – 1775.0 MHz (Sub6 n66(10 MHz)) 1717.5 MHz – 1772.5 MHz (Sub6 n66(15 MHz)) 1720.0 MHz – 1770.0 MHz (Sub6 n66(20 MHz)) 1722.5 MHz – 1767.5 MHz (Sub6 n66(25 MHz)) 1725.0 MHz – 1765.0 MHz (Sub6 n66(30 MHz)) 1730.0 MHz – 1760.0 MHz (Sub6 n66(40 MHz))
Date(s) of Tests:	December 23, 2024 ~ February 07, 2025
Serial number:	Radiated : R32XC00A63Z Conducted : B32XC00A2XL

1.1 MAXIMUM OUTPUT POWER

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
Sub6 n66 (5)	1712.5 – 1777.5	4M51G7D	PI/2 BPSK	0.383	25.83
		4M51G7D	QPSK	0.372	25.70
		4M52W7D	16QAM	0.299	24.75
		4M51W7D	64QAM	0.206	23.13
		4M51W7D	256QAM	0.132	21.21
Sub6 n66 (10)	1715.0 – 1775.0	9M00G7D	PI/2 BPSK	0.394	25.96
		9M01G7D	QPSK	0.383	25.83
		8M99W7D	16QAM	0.310	24.91
		9M00W7D	64QAM	0.217	23.37
		8M98W7D	256QAM	0.136	21.32
Sub6 n66 (15)	1717.5 – 1772.5	13M4G7D	PI/2 BPSK	0.387	25.88
		13M5G7D	QPSK	0.382	25.82
		13M5W7D	16QAM	0.310	24.92
		13M5W7D	64QAM	0.219	23.41
		13M4W7D	256QAM	0.136	21.34
Sub6 n66 (20)	1720.0 – 1770.0	17M9G7D	PI/2 BPSK	0.400	26.02
		18M0G7D	QPSK	0.391	25.92
		18M0W7D	16QAM	0.310	24.91
		18M0W7D	64QAM	0.216	23.35
		17M9W7D	256QAM	0.135	21.31
Sub6 n66 (25)	1722.5 – 1767.5	23M0G7D	PI/2 BPSK	0.375	25.74
		23M0G7D	QPSK	0.372	25.71
		23M0W7D	16QAM	0.294	24.69
		23M0W7D	64QAM	0.207	23.16
		22M9W7D	256QAM	0.132	21.22
Sub6 n66 (30)	1725.0 – 1765.0	28M8G7D	PI/2 BPSK	0.384	25.84
		28M8G7D	QPSK	0.381	25.81
		28M7W7D	16QAM	0.316	25.00
		28M7W7D	64QAM	0.216	23.34
		28M7W7D	256QAM	0.128	21.06
Sub6 n66 (40)	1730.0 – 1760.0	38M8G7D	PI/2 BPSK	0.365	25.62
		38M7G7D	QPSK	0.358	25.54
		38M7W7D	16QAM	0.288	24.60
		38M9W7D	64QAM	0.209	23.20
		38M7W7D	256QAM	0.125	20.97

2. INTRODUCTION

2.1 DESCRIPTION OF EUT

Please refer to the [3G] Test Report.

2.2 MEASURING INSTRUMENT CALIBRATION

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

2.3 TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - 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 \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 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 10th 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;

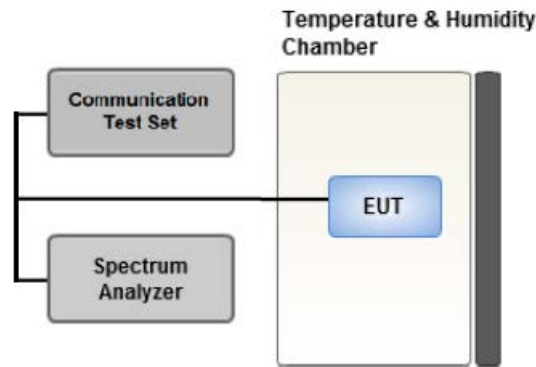
$$\text{Result}_{(\text{dBm})} = P_{\text{g}}_{(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

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)

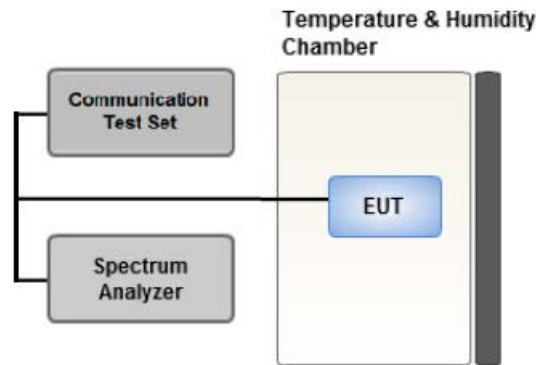
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW $\geq 3 \times$ RBW.

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 $[10 \log (1/0.25)] = 6 \text{ dB}$ 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.

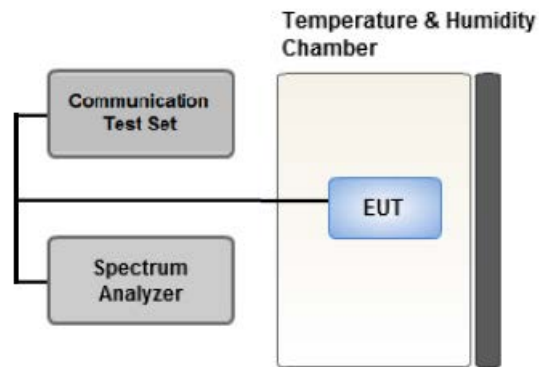
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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 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

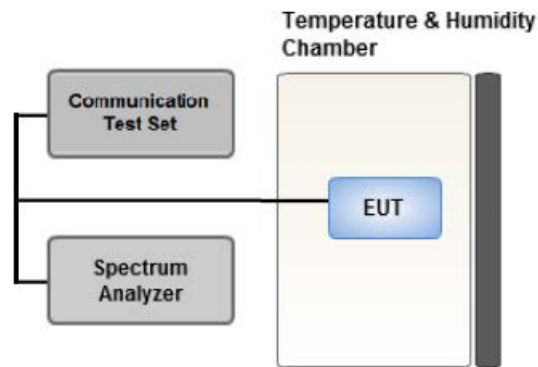
Test Overview

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 \geq 3 MHz
3. Detector = Peak
4. Trace Mode = Max Hold
5. Sweep time = auto
6. Number of points in sweep \geq 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 $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Notes

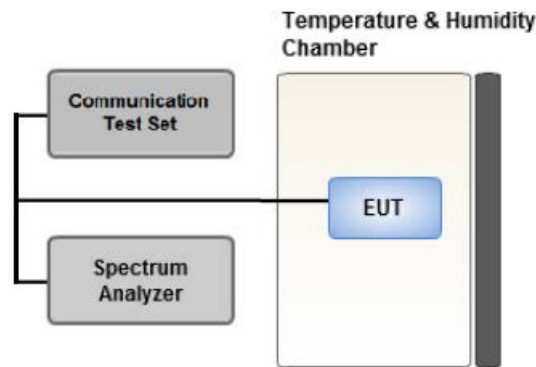
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block 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)

- Waveform : All Waveform of operation were investigated and the worst case configuration results are reported.
(Worst case: DFT-S-OFDM)
- 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, NSA
Worst case: SA
Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc)
Worst case : Stand alone
- 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.
- Radiated Spurious emissions are measured while operating in EN-DC mode with Sub 6 NR carrier as well as an LTE carrier (anchor).
All EN-DC mode of operation (=anchor) were investigated and the test results were measured No Peak Found.
The test results which are attenuated more than 20 dB below the permissible value, so it was not reported.
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
Please refer to the table below.
- In the case of radiated spurious emissions, all bandwidth of operation was investigated and the worst case bandwidth results are reported. (Worst case : 20 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		X
Radiated Spurious and Harmonic Emissions	PI/2 BPSK	See Section 8.2		X

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, NSA
Worst case: SA
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
Please refer to the table below.

[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
Precision Dipole Antenna	UHAP	Schwarzbeck	01273	03/10/2026	Biennial
Precision Dipole Antenna	UHAP	Schwarzbeck	01274	03/10/2026	Biennial
Horn Antenna(1~18 GHz)	BBHA 9120D	Schwarzbeck	02289	02/14/2026	Biennial
Horn Antenna(1~18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1299	04/27/2025	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
Loop Antenna(9 kHz~30 MHz)	FMZB1513	Rohde & Schwarz	1513-175	01/06/2027	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	895	08/28/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	1135	08/19/2026	Biennial
RF Switching System	FBSR-06B (1G HPF + LNA)	T&M SYSTEM	F3L1	05/14/2025	Annual
RF Switching System	FBSR-06B (3G HPF + LNA)	T&M SYSTEM	F3L2	05/14/2025	Annual
RF Switching System	FBSR-06B (6G HPF + LNA)	T&M SYSTEM	F3L3	05/14/2025	Annual
RF Switching System	FBSR-06B (LNA)	T&M SYSTEM	F3L4	05/14/2025	Annual
Power Amplifier	CBL18265035	CERNEX	22966	11/07/2025	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/26/2025	Annual
DC Power Supply	E3632A	Hewlett Packard	MY40004427	08/22/2025	Annual
Power Splitter(DC~26.5 GHz)	11667B	Hewlett Packard	11275	02/04/2026	Annual
Chamber	SU-642	ESPEC	93008124	02/19/2025	Annual
Signal Analyzer(10 Hz~26.5 GHz)	N9020A	Agilent	MY51110063	04/04/2025	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/17/2025	Annual
Spectrum Analyzer (10 Hz~40 GHz)	FSV40	REOHDE & SCHWARZ	101436	02/04/2026	Annual
Signal & Spectrum Analyzer (2 Hz~67 GHz)	FSW67	REOHDE & SCHWARZ	101736	05/23/2025	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/05/2025	Annual
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262287701	05/16/2025	Annual
Wideband Radio Communication Tester	MT8000A	Anritsu Corp.	6262302511	05/14/2025	Annual
Signal Analyzer(5 Hz~40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/17/2025	Annual
4-Way Divider	ZC4PD-K1844+	Mini-Circuits	942907	09/10/2025	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/26/2025	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_{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

6.1 Test Condition: Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§ 2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§ 2.1051, § 27.53(h)	< 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	§ 27.50(d)(5)	< 13 dB	PASS
Frequency stability / variation of ambient temperature	§ 2.1055, § 27.54	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	§ 27.50(d)(4)	< 1 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 27.53(h)	< 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 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

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

- 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 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

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

- 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 (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
1712.5	Sub6 n66/ 5 MHz [15 kHz]	PI/2 BPSK	-16.34	16.74	10.12	2.06	H	< 1.00	0.302	24.80	1	12
		QPSK	-16.38	16.70	10.12	2.06	H		0.300	24.76		
		16-QAM	-17.39	15.69	10.12	2.06	H		0.237	23.75		
		64-QAM	-18.96	14.12	10.12	2.06	H		0.165	22.18		
		256-QAM	-20.84	12.24	10.12	2.06	H		0.107	20.30		
1745.0		PI/2 BPSK	-15.90	17.47	10.43	2.07	H		0.383	25.83	1	23
		QPSK	-16.03	17.34	10.43	2.07	H		0.372	25.70		
		16-QAM	-16.98	16.39	10.43	2.07	H		0.299	24.75		
		64-QAM	-18.60	14.77	10.43	2.07	H		0.206	23.13		
		256-QAM	-20.52	12.85	10.43	2.07	H		0.132	21.21		
1777.5		PI/2 BPSK	-16.11	17.25	10.50	2.09	H		0.368	25.66	1	12
		QPSK	-16.13	17.23	10.50	2.09	H		0.367	25.64		
		16-QAM	-17.20	16.16	10.50	2.09	H		0.286	24.57		
		64-QAM	-18.66	14.70	10.50	2.09	H		0.205	23.11		
		256-QAM	-20.63	12.73	10.50	2.09	H		0.130	21.14		

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
1715.0	Sub6 n66/ 10 MHz [15 kHz]	Pl/2 BPSK	-16.34	16.74	10.12	2.06	H	< 1.00	0.302	24.80	1	50
		QPSK	-16.38	16.70	10.12	2.06	H		0.299	24.76		
		16-QAM	-17.28	15.80	10.12	2.06	H		0.243	23.86		
		64-QAM	-18.91	14.17	10.12	2.06	H		0.167	22.23		
		256-QAM	-20.90	12.18	10.12	2.06	H		0.106	20.24		
1745.0		Pl/2 BPSK	-15.88	17.49	10.43	2.07	H		0.385	25.85	1	50
		QPSK	-15.99	17.38	10.43	2.07	H		0.375	25.74		
		16-QAM	-16.88	16.49	10.43	2.07	H		0.305	24.85		
		64-QAM	-18.45	14.92	10.43	2.07	H		0.213	23.28		
		256-QAM	-20.41	12.96	10.43	2.07	H		0.136	21.32		
1775.0		Pl/2 BPSK	-15.84	17.56	10.49	2.09	H	0.394	25.96	1	1	
		QPSK	-15.97	17.43	10.49	2.09	H	0.383	25.83			
		16-QAM	-16.89	16.51	10.49	2.09	H	0.310	24.91			
		64-QAM	-18.43	14.97	10.49	2.09	H	0.217	23.37			
		256-QAM	-20.52	12.88	10.49	2.09	H	0.134	21.28			

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
1717.5	Sub6 n66/ 15 MHz [15 kHz]	PI/2 BPSK	-16.25	16.91	10.18	2.06	H	< 1.00	0.318	25.03	1	77
		QPSK	-16.44	16.72	10.18	2.06	H		0.305	24.84		
		16-QAM	-17.35	15.81	10.18	2.06	H		0.247	23.93		
		64-QAM	-18.92	14.24	10.18	2.06	H		0.172	22.36		
		256-QAM	-20.85	12.31	10.18	2.06	H		0.110	20.43		
1745.0		PI/2 BPSK	-15.90	17.47	10.43	2.07	H		0.383	25.83	1	39
		QPSK	-16.04	17.33	10.43	2.07	H		0.371	25.69		
		16-QAM	-16.92	16.45	10.43	2.07	H		0.303	24.81		
		64-QAM	-18.51	14.86	10.43	2.07	H		0.210	23.22		
		256-QAM	-20.42	12.95	10.43	2.07	H		0.135	21.31		
1772.5		PI/2 BPSK	-15.92	17.48	10.49	2.09	H		0.387	25.88	1	39
		QPSK	-15.98	17.42	10.49	2.09	H		0.382	25.82		
		16-QAM	-16.88	16.52	10.49	2.09	H		0.310	24.92		
		64-QAM	-18.39	15.01	10.49	2.09	H		0.219	23.41		
		256-QAM	-20.46	12.94	10.49	2.09	H		0.136	21.34		

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
1720.0		PI/2 BPSK	-16.26	16.90	10.18	2.06	H	< 1.00	0.318	25.02	1	104
		QPSK	-16.29	16.87	10.18	2.06	H		0.316	24.99		
		16-QAM	-17.21	15.95	10.18	2.06	H		0.255	24.07		
		64-QAM	-18.86	14.30	10.18	2.06	H		0.175	22.42		
		256-QAM	-20.91	12.25	10.18	2.06	H		0.109	20.37		
1745.0	Sub6 n66/ 20 MHz [15 kHz]	PI/2 BPSK	-16.04	17.33	10.43	2.07	H	< 1.00	0.370	25.69	1	53
		QPSK	-16.10	17.27	10.43	2.07	H		0.366	25.63		
		16-QAM	-17.02	16.35	10.43	2.07	H		0.296	24.71		
		64-QAM	-18.51	14.86	10.43	2.07	H		0.210	23.22		
		256-QAM	-20.48	12.89	10.43	2.07	H		0.133	21.25		
1770.0		PI/2 BPSK	-15.80	17.62	10.49	2.09	H	< 1.00	0.400	26.02	1	53
		QPSK	-15.90	17.52	10.49	2.09	H		0.391	25.92		
		16-QAM	-16.91	16.51	10.49	2.09	H		0.310	24.91		
		64-QAM	-18.47	14.95	10.49	2.09	H		0.216	23.35		
		256-QAM	-20.51	12.91	10.49	2.09	H		0.135	21.31		

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
1722.5		PI/2 BPSK	-16.05	17.23	10.23	2.07	H	< 1.00	0.346	25.39	1	131
		QPSK	-16.13	17.15	10.23	2.07	H		0.340	25.31		
		16-QAM	-17.05	16.23	10.23	2.07	H		0.275	24.39		
		64-QAM	-18.67	14.61	10.23	2.07	H		0.189	22.77		
		256-QAM	-20.56	12.72	10.23	2.07	H		0.122	20.88		
1745.0	Sub6 n66/ 25 MHz [15 kHz]	PI/2 BPSK	-15.99	17.38	10.43	2.07	H	< 1.00	0.375	25.74	1	66
		QPSK	-16.02	17.35	10.43	2.07	H		0.372	25.71		
		16-QAM	-17.04	16.33	10.43	2.07	H		0.294	24.69		
		64-QAM	-18.57	14.80	10.43	2.07	H		0.207	23.16		
		256-QAM	-20.51	12.86	10.43	2.07	H		0.132	21.22		
1767.5		PI/2 BPSK	-16.16	17.26	10.49	2.09	H	< 1.00	0.368	25.66	1	131
		QPSK	-16.25	17.17	10.49	2.09	H		0.361	25.57		
		16-QAM	-17.28	16.14	10.49	2.09	H		0.284	24.54		
		64-QAM	-18.82	14.60	10.49	2.09	H		0.200	23.00		
		256-QAM	-20.66	12.76	10.49	2.09	H		0.131	21.16		

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
1725.0		PI/2 BPSK	-16.10	17.18	10.23	2.07	H	< 1.00	0.342	25.34	1	158
		QPSK	-16.12	17.16	10.23	2.07	H		0.340	25.32		
		16-QAM	-17.06	16.22	10.23	2.07	H		0.274	24.38		
		64-QAM	-18.66	14.62	10.23	2.07	H		0.190	22.78		
		256-QAM	-20.54	12.74	10.23	2.07	H		0.123	20.90		
1745.0	Sub6 n66/ 30 MHz [15 kHz]	PI/2 BPSK	-15.89	17.48	10.43	2.07	H	< 1.00	0.384	25.84	1	80
		QPSK	-15.92	17.45	10.43	2.07	H		0.382	25.81		
		16-QAM	-17.03	16.34	10.43	2.07	H		0.295	24.70		
		64-QAM	-18.51	14.86	10.43	2.07	H		0.210	23.22		
		256-QAM	-20.67	12.70	10.43	2.07	H		0.128	21.06		
1765.0		PI/2 BPSK	-15.92	17.41	10.48	2.09	H	< 1.00	0.380	25.80	1	80
		QPSK	-16.04	17.29	10.48	2.09	H		0.370	25.68		
		16-QAM	-16.72	16.61	10.48	2.09	H		0.316	25.00		
		64-QAM	-18.38	14.95	10.48	2.09	H		0.216	23.34		
		256-QAM	-20.69	12.64	10.48	2.09	H		0.127	21.03		

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
1730.0	Sub6 n66/ 40 MHz [15 kHz]	PI/2 BPSK	-16.05	17.35	10.29	2.08	H	< 1.00	0.360	25.56	1	214
		QPSK	-16.07	17.33	10.29	2.08	H		0.358	25.54		
		16-QAM	-17.15	16.25	10.29	2.08	H		0.280	24.46		
		64-QAM	-18.68	14.72	10.29	2.08	H		0.196	22.93		
		256-QAM	-20.64	12.76	10.29	2.08	H		0.125	20.97		
1745.0		PI/2 BPSK	-16.11	17.26	10.43	2.07	H		0.365	25.62	1	108
		QPSK	-16.22	17.15	10.43	2.07	H		0.356	25.51		
		16-QAM	-17.13	16.24	10.43	2.07	H		0.288	24.60		
		64-QAM	-18.53	14.84	10.43	2.07	H		0.209	23.20		
		256-QAM	-20.77	12.60	10.43	2.07	H		0.125	20.96		
1760.0		PI/2 BPSK	-16.04	17.18	10.48	2.09	H	0.361	25.57	1	1	
		QPSK	-16.09	17.13	10.48	2.09	H	0.357	25.52			
		16-QAM	-17.19	16.03	10.48	2.09	H	0.277	24.42			
		64-QAM	-18.65	14.57	10.48	2.09	H	0.198	22.96			
		256-QAM	-20.65	12.57	10.48	2.09	H	0.125	20.96			

8.2 RADIATED SPURIOUS EMISSIONS

NR Band:	<u>N66</u>
Bandwidth:	<u>20 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
344000 (1720.0)	3 440.00	-60.22	11.86	-60.95	3.04	H	-52.13	-13.00	1	104
	5 160.00	-56.02	11.52	-50.27	3.76	H	-42.51	-13.00		
	6 880.00	-64.68	11.11	-52.78	4.44	H	-46.11	-13.00		
349000 (1745.0)	3 490.00	-61.40	12.04	-62.14	3.04	H	-53.14	-13.00	1	53
	5 235.00	-62.44	11.76	-57.11	3.78	H	-49.13	-13.00		
	6 980.00	-65.64	11.16	-52.86	4.48	H	-46.18	-13.00		
354000 (1770.0)	3 540.00	-59.52	12.04	-60.86	3.06	H	-51.88	-13.00	1	53
	5 310.00	-56.30	11.91	-50.41	3.82	H	-42.32	-13.00		
	7 080.00	-62.93	10.89	-48.70	4.49	H	-42.30	-13.00		

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Sub6 n66	5 MHz	1745.0	BPSK	25	0	4.33
			QPSK			5.57
			16-QAM			6.22
			64-QAM			6.48
			256-QAM			6.29
	10 MHz		BPSK	50		4.40
			QPSK			5.58
			16-QAM			6.34
			64-QAM			6.45
			256-QAM			6.61
	15 MHz		BPSK	75		4.23
			QPSK			5.53
			16-QAM			6.24
			64-QAM			6.37
			256-QAM			6.39
	20 MHz		BPSK	100		4.81
			QPSK			5.57
			16-QAM			6.25
			64-QAM			6.45
			256-QAM			6.37
	25 MHz		BPSK	128		4.72
			QPSK			5.68
			16-QAM			6.28
			64-QAM			6.39
			256-QAM			6.46
	30 MHz		BPSK	160		4.42
			QPSK			5.64
			16-QAM			6.32
			64-QAM			6.43
			256-QAM			6.45
	40 MHz		BPSK	216		4.44
			QPSK			5.65
			16-QAM			6.28
			64-QAM			6.39
			256-QAM			6.49

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 44 ~ 78.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Sub6 n66	5 MHz	1745.0	BPSK	25	0	4.5143
			QPSK			4.5139
			16-QAM			4.5226
			64-QAM			4.5077
			256-QAM			4.5083
	10 MHz		BPSK	50		9.0022
			QPSK			9.0084
			16-QAM			8.9871
			64-QAM			8.9997
			256-QAM			8.9745
	15 MHz		BPSK	75		13.433
			QPSK			13.476
			16-QAM			13.468
			64-QAM			13.469
			256-QAM			13.438
	20 MHz		BPSK	100		17.919
			QPSK			17.963
			16-QAM			17.950
			64-QAM			17.971
			256-QAM			17.910
	25 MHz		BPSK	128		22.974
			QPSK			23.024
			16-QAM			22.983
			64-QAM			23.008
			256-QAM			22.893
	30 MHz		BPSK	160		28.766
			QPSK			28.779
			16-QAM			28.703
			64-QAM			28.741
			256-QAM			28.717
	40 MHz		BPSK	216		38.798
			QPSK			38.726
			16-QAM			38.704
			64-QAM			38.901
			256-QAM			38.727

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 79 ~ 113.

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 n66	5	1712.5	8.2752	30.815	-61.665	-30.850	-13.00
		1745.0	4.0180	30.200	-62.774	-32.574	
		1777.5	8.8834	30.815	-61.825	-31.010	
	10	1715.0	3.5993	30.200	-63.630	-33.430	
		1745.0	9.4217	30.815	-62.895	-32.080	
		1775.0	9.7109	30.815	-63.231	-32.416	
	15	1717.5	8.5643	30.815	-62.972	-32.157	
		1745.0	9.7109	30.815	-63.338	-32.523	
		1772.5	8.0060	30.815	-63.500	-32.685	
	20	1720.0	9.4816	30.815	-62.072	-31.257	
		1745.0	5.1147	30.815	-62.944	-32.129	
		1770.0	6.0319	30.815	-63.622	-32.807	
	25	1722.5	6.3111	30.815	-63.584	-32.769	
		1745.0	5.9921	30.815	-62.485	-31.670	
		1767.5	4.0579	30.200	-61.880	-31.680	
	30	1725.0	8.6341	30.815	-62.434	-31.619	
		1745.0	8.2553	30.815	-62.654	-31.839	
		1765.0	8.8535	30.815	-63.259	-32.444	
	40	1730.0	9.2323	30.815	-61.220	-30.405	
		1745.0	3.8685	30.815	-62.932	-32.117	
		1760.0	3.7787	30.815	-61.717	-30.902	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 114 ~ 155.
2. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
3. Factor(dB) = Cable Loss + Ext. Attenuator + Power Splitter

Frequency Range (GHz)	Factor [dB]
0.03 – 1	27.494
1 – 5	30.200
5 – 10	30.815
10 – 15	31.340
15 – 20	31.713
Above 20	32.355

8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 156 ~ 197.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

- ▣ BandWidth: 5 MHz
- ▣ Voltage(100 %): 3.860 VDC
- ▣ Batt. Endpoint: 3.400 VDC
- ▣ LIMIT: Emission must remain in band

Test. Frequency	Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	Error (Hz)	(%)	
1712.5	100 %	+20(Ref)	1712 500 001	0.0	0.000 000	0.000
	100 %	-30	1712 500 001	-0.4	0.000 000	0.000
	100 %	-20	1712 500 000	-0.8	0.000 000	0.000
	100 %	-10	1712 500 003	1.8	0.000 000	0.001
	100 %	0	1712 500 002	0.7	0.000 000	0.000
	100 %	+10	1712 500 001	-0.5	0.000 000	0.000
	100 %	+30	1712 500 002	0.8	0.000 000	0.000
	100 %	+40	1712 500 003	1.7	0.000 000	0.001
	100 %	+50	1712 500 000	-0.7	0.000 000	0.000
	Batt. Endpoint	+20	1712 500 000	-0.8	0.000 000	0.000
1777.5	100 %	+20(Ref)	1777 499 999	0.0	0.000 000	0.000
	100 %	-30	1777 499 999	-0.3	0.000 000	0.000
	100 %	-20	1777 499 996	-2.7	0.000 000	-0.002
	100 %	-10	1777 499 997	-2.3	0.000 000	-0.001
	100 %	0	1777 499 999	-0.5	0.000 000	0.000
	100 %	+10	1777 499 998	-0.8	0.000 000	0.000
	100 %	+30	1777 499 997	-2.1	0.000 000	-0.001
	100 %	+40	1777 499 998	-0.7	0.000 000	0.000
	100 %	+50	1777 499 997	-1.9	0.000 000	-0.001
	Batt. Endpoint	+20	1777 499 997	-2.1	0.000 000	-0.001

- ▣ BandWidth: 10 MHz
- ▣ Voltage(100 %): 3.860 VDC
- ▣ Batt. Endpoint: 3.400 VDC
- ▣ LIMIT: Emission must remain in band

Test. Frequency	Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	Error (Hz)	(%)	
1715.0	100 %	+20(Ref)	1715 000 000	0.0	0.000 000	0.000
	100 %	-30	1715 000 000	-0.4	0.000 000	0.000
	100 %	-20	1714 999 999	-0.8	0.000 000	0.000
	100 %	-10	1714 999 998	-1.5	0.000 000	-0.001
	100 %	0	1715 000 000	-0.1	0.000 000	0.000
	100 %	+10	1715 000 001	0.6	0.000 000	0.000
	100 %	+30	1715 000 000	0.5	0.000 000	0.000
	100 %	+40	1715 000 001	1.1	0.000 000	0.001
	100 %	+50	1714 999 998	-1.8	0.000 000	-0.001
	Batt. Endpoint	+20	1714 999 998	-2.1	0.000 000	-0.001
1775.0	100 %	+20(Ref)	1775 000 001	0.0	0.000 000	0.000
	100 %	-30	1775 000 003	2.1	0.000 000	0.001
	100 %	-20	1775 000 001	0.3	0.000 000	0.000
	100 %	-10	1774 999 997	-3.7	0.000 000	-0.002
	100 %	0	1774 999 998	-3.4	0.000 000	-0.002
	100 %	+10	1775 000 004	2.9	0.000 000	0.002
	100 %	+30	1775 000 002	0.4	0.000 000	0.000
	100 %	+40	1774 999 999	-2.1	0.000 000	-0.001
	100 %	+50	1775 000 003	1.4	0.000 000	0.001
	Batt. Endpoint	+20	1775 000 001	0.2	0.000 000	0.000

- ▣ BandWidth: 15 MHz
- ▣ Voltage(100 %): 3.860 VDC
- ▣ Batt. Endpoint: 3.400 VDC
- ▣ LIMIT: Emission must remain in band

Test. Frequency	Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	Error (Hz)	(%)	
1717.5	100 %	+20(Ref)	1717 499 999	0.0	0.000 000	0.000
	100 %	-30	1717 499 999	-0.9	0.000 000	-0.001
	100 %	-20	1717 499 998	-1.2	0.000 000	-0.001
	100 %	-10	1717 499 997	-2.3	0.000 000	-0.001
	100 %	0	1717 500 001	1.1	0.000 000	0.001
	100 %	+10	1717 499 997	-2.5	0.000 000	-0.001
	100 %	+30	1717 499 997	-2.0	0.000 000	-0.001
	100 %	+40	1717 500 000	0.9	0.000 000	0.001
	100 %	+50	1717 499 997	-2.4	0.000 000	-0.001
	Batt. Endpoint	+20	1717 499 998	-1.9	0.000 000	-0.001
1772.5	100 %	+20(Ref)	1772 499 999	0.0	0.000 000	0.000
	100 %	-30	1772 500 000	1.0	0.000 000	0.001
	100 %	-20	1772 500 000	0.6	0.000 000	0.000
	100 %	-10	1772 499 999	0.0	0.000 000	0.000
	100 %	0	1772 499 999	0.3	0.000 000	0.000
	100 %	+10	1772 499 996	-2.6	0.000 000	-0.001
	100 %	+30	1772 500 001	2.3	0.000 000	0.001
	100 %	+40	1772 499 998	-1.1	0.000 000	-0.001
	100 %	+50	1772 500 002	2.6	0.000 000	0.001
	Batt. Endpoint	+20	1772 499 999	-0.1	0.000 000	0.000

- ▣ BandWidth: 20 MHz
- ▣ Voltage(100 %): 3.860 VDC
- ▣ Batt. Endpoint: 3.400 VDC
- ▣ LIMIT: Emission must remain in band

Test. Frequency	Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	Error (Hz)	(%)	
1720.0	100 %	+20(Ref)	1719 999 998	0.0	0.000 000	0.000
	100 %	-30	1719 999 999	0.7	0.000 000	0.000
	100 %	-20	1719 999 997	-1.1	0.000 000	-0.001
	100 %	-10	1719 999 998	-0.2	0.000 000	0.000
	100 %	0	1720 000 001	2.3	0.000 000	0.001
	100 %	+10	1719 999 998	-0.4	0.000 000	0.000
	100 %	+30	1719 999 999	0.6	0.000 000	0.000
	100 %	+40	1720 000 001	2.1	0.000 000	0.001
	100 %	+50	1719 999 996	-1.9	0.000 000	-0.001
	Batt. Endpoint	+20	1719 999 999	0.7	0.000 000	0.000
1770.0	100 %	+20(Ref)	1770 000 000	0.0	0.000 000	0.000
	100 %	-30	1769 999 997	-3.6	0.000 000	-0.002
	100 %	-20	1769 999 992	-7.9	0.000 000	-0.004
	100 %	-10	1770 000 008	7.8	0.000 000	0.004
	100 %	0	1770 000 001	1.0	0.000 000	0.001
	100 %	+10	1769 999 995	-5.5	0.000 000	-0.003
	100 %	+30	1770 000 000	-0.5	0.000 000	0.000
	100 %	+40	1770 000 001	1.1	0.000 000	0.001
	100 %	+50	1770 000 000	-0.2	0.000 000	0.000
	Batt. Endpoint	+20	1770 000 002	1.4	0.000 000	0.001

- ▣ BandWidth: 25 MHz
- ▣ Voltage(100 %): 3.860 VDC
- ▣ Batt. Endpoint: 3.400 VDC
- ▣ LIMIT: Emission must remain in band

Test. Frequency	Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	Error (Hz)	(%)	
1722.5	100 %	+20(Ref)	1722 500 000	0.0	0.000 000	0.000
	100 %	-30	1722 500 001	0.6	0.000 000	0.000
	100 %	-20	1722 500 001	0.7	0.000 000	0.000
	100 %	-10	1722 499 997	-3.0	0.000 000	-0.002
	100 %	0	1722 500 000	-0.4	0.000 000	0.000
	100 %	+10	1722 499 999	-0.8	0.000 000	0.000
	100 %	+30	1722 499 999	-0.8	0.000 000	0.000
	100 %	+40	1722 500 002	2.1	0.000 000	0.001
	100 %	+50	1722 499 998	-1.9	0.000 000	-0.001
	Batt. Endpoint	+20	1722 499 999	-0.5	0.000 000	0.000
1767.5	100 %	+20(Ref)	1767 500 002	0.0	0.000 000	0.000
	100 %	-30	1767 500 002	-0.4	0.000 000	0.000
	100 %	-20	1767 500 003	0.5	0.000 000	0.000
	100 %	-10	1767 500 002	0.0	0.000 000	0.000
	100 %	0	1767 500 002	0.1	0.000 000	0.000
	100 %	+10	1767 500 002	-0.2	0.000 000	0.000
	100 %	+30	1767 500 005	2.8	0.000 000	0.002
	100 %	+40	1767 500 004	1.6	0.000 000	0.001
	100 %	+50	1767 500 001	-1.0	0.000 000	-0.001
	Batt. Endpoint	+20	1767 500 005	2.4	0.000 000	0.001

- ▣ BandWidth: 30 MHz
- ▣ Voltage(100 %): 3.860 VDC
- ▣ Batt. Endpoint: 3.400 VDC
- ▣ LIMIT: Emission must remain in band

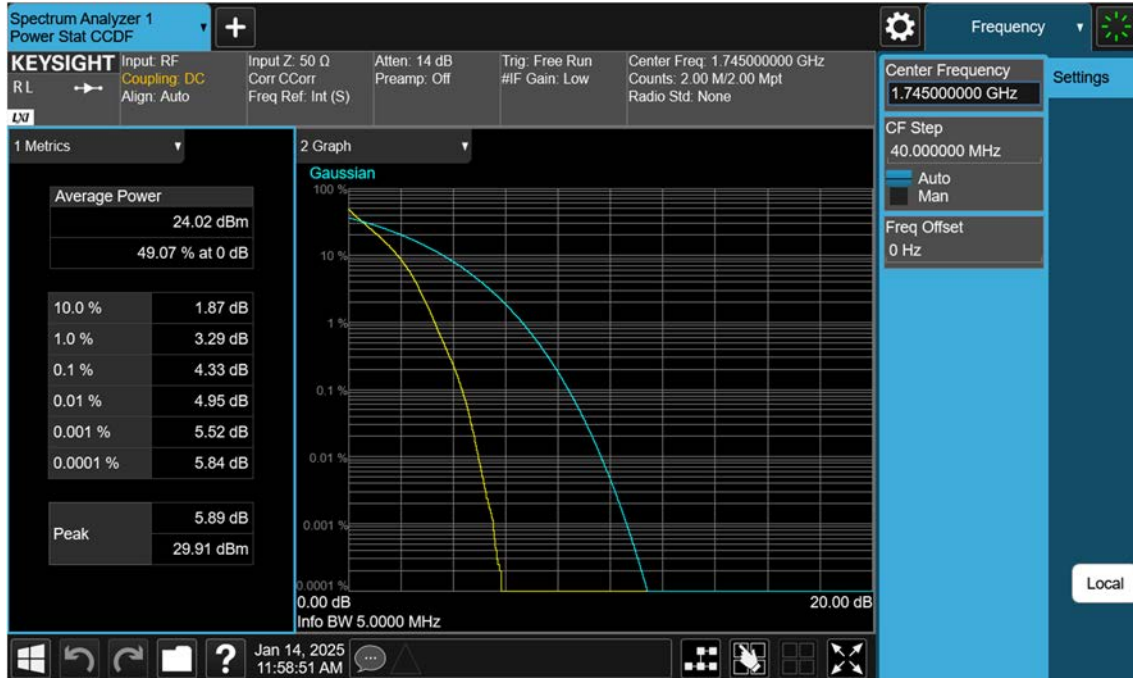
Test. Frequency	Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	Error (Hz)	(%)	
1725.0	100 %	+20(Ref)	1725 000 000	0.0	0.000 000	0.000
	100 %	-30	1724 999 999	-1.2	0.000 000	-0.001
	100 %	-20	1725 000 000	-0.4	0.000 000	0.000
	100 %	-10	1725 000 000	-0.4	0.000 000	0.000
	100 %	0	1725 000 000	-0.2	0.000 000	0.000
	100 %	+10	1725 000 000	-0.8	0.000 000	0.000
	100 %	+30	1725 000 000	-0.3	0.000 000	0.000
	100 %	+40	1724 999 999	-1.6	0.000 000	-0.001
	100 %	+50	1725 000 000	0.0	0.000 000	0.000
	Batt. Endpoint	+20	1725 000 001	0.2	0.000 000	0.000
1765.0	100 %	+20(Ref)	1765 000 000	0.0	0.000 000	0.000
	100 %	-30	1764 999 999	-1.2	0.000 000	-0.001
	100 %	-20	1765 000 002	1.1	0.000 000	0.001
	100 %	-10	1765 000 002	2.0	0.000 000	0.001
	100 %	0	1764 999 997	-3.0	0.000 000	-0.002
	100 %	+10	1765 000 000	-0.3	0.000 000	0.000
	100 %	+30	1765 000 001	0.3	0.000 000	0.000
	100 %	+40	1764 999 999	-1.8	0.000 000	-0.001
	100 %	+50	1765 000 001	0.2	0.000 000	0.000
	Batt. Endpoint	+20	1765 000 000	-0.6	0.000 000	0.000

- ▣ BandWidth: 40 MHz
- ▣ Voltage(100 %): 3.860 VDC
- ▣ Batt. Endpoint: 3.400 VDC
- ▣ LIMIT: Emission must remain in band

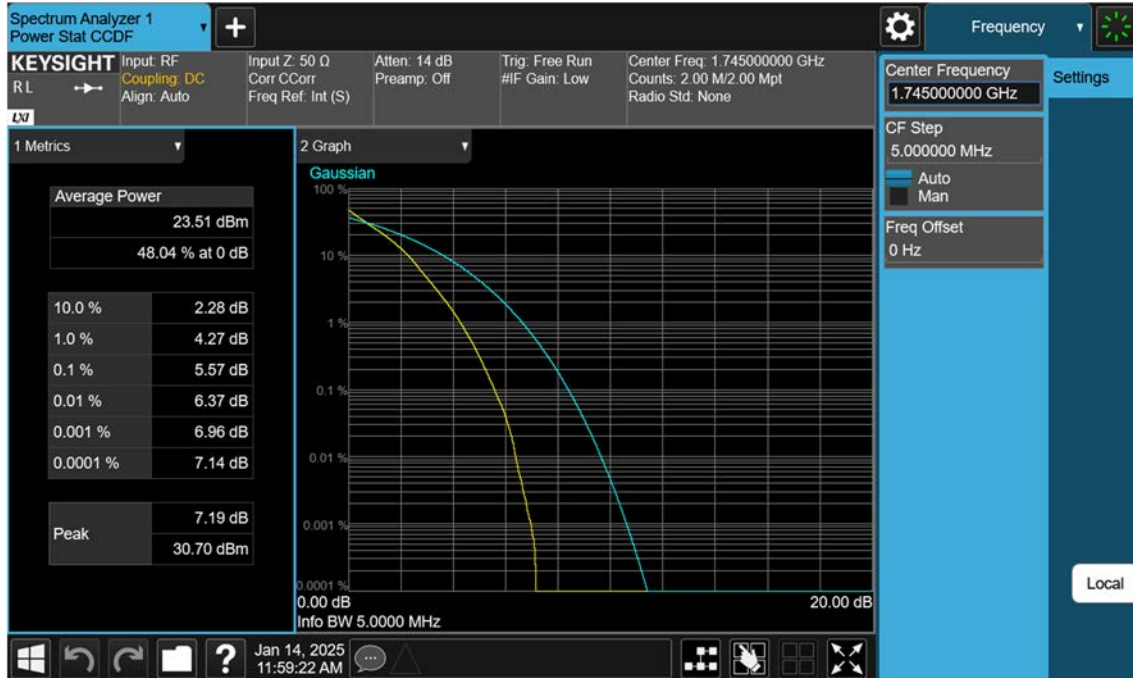
Test. Frequency	Voltage	Temp.	Frequency	Frequency	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	Error (Hz)	(%)	
1730.0	100 %	+20(Ref)	1730 000 000	0.0	0.000 000	0.000
	100 %	-30	1730 000 001	0.4	0.000 000	0.000
	100 %	-20	1730 000 003	2.4	0.000 000	0.001
	100 %	-10	1730 000 004	3.7	0.000 000	0.002
	100 %	0	1730 000 001	0.6	0.000 000	0.000
	100 %	+10	1730 000 001	0.8	0.000 000	0.000
	100 %	+30	1730 000 002	1.9	0.000 000	0.001
	100 %	+40	1730 000 003	3.1	0.000 000	0.002
	100 %	+50	1730 000 002	1.9	0.000 000	0.001
	Batt. Endpoint	+20	1730 000 001	0.7	0.000 000	0.000
1760.0	100 %	+20(Ref)	1760 000 000	0.0	0.000 000	0.000
	100 %	-30	1760 000 000	-0.3	0.000 000	0.000
	100 %	-20	1759 999 998	-2.0	0.000 000	-0.001
	100 %	-10	1760 000 002	2.2	0.000 000	0.001
	100 %	0	1760 000 000	0.2	0.000 000	0.000
	100 %	+10	1759 999 999	-0.8	0.000 000	0.000
	100 %	+30	1760 000 002	2.0	0.000 000	0.001
	100 %	+40	1759 999 999	-1.4	0.000 000	-0.001
	100 %	+50	1760 000 002	2.3	0.000 000	0.001
	Batt. Endpoint	+20	1760 000 002	1.7	0.000 000	0.001

9. TEST PLOTS

NR66_5 M_PAR_Mid_BPSK_FullIRB



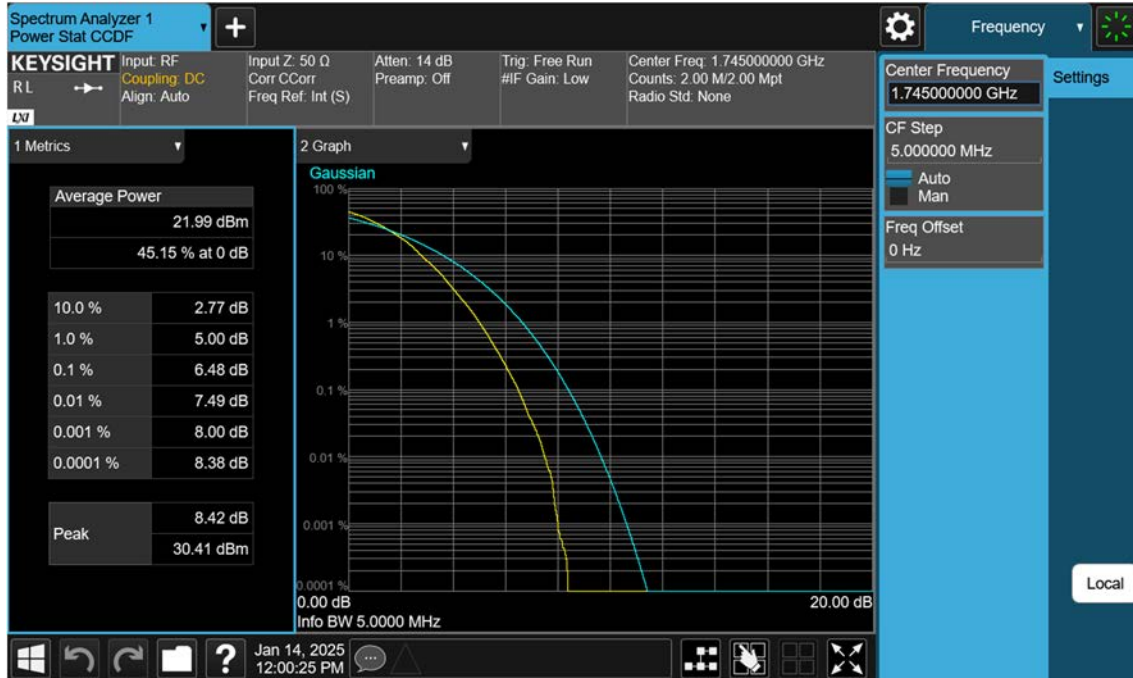
NR66_5 M_PAR_Mid_QPSK_FullIRB



NR66_5 M_PAR_Mid_16QAM_FullRB



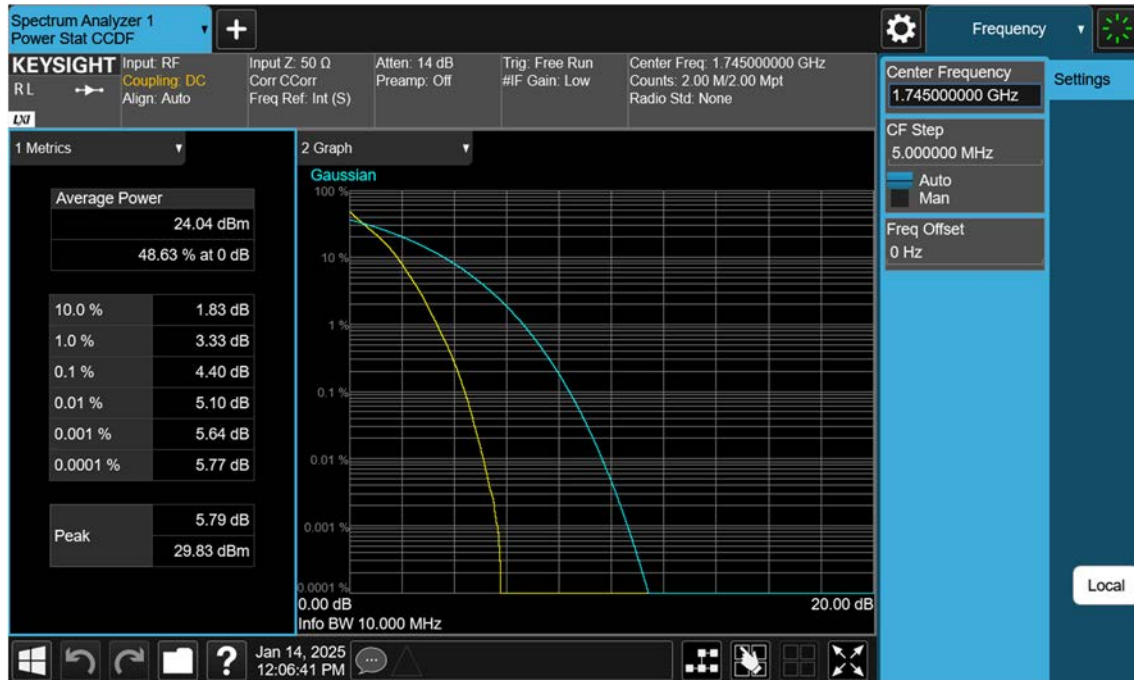
NR66_5 M_PAR_Mid_64QAM_FullRB



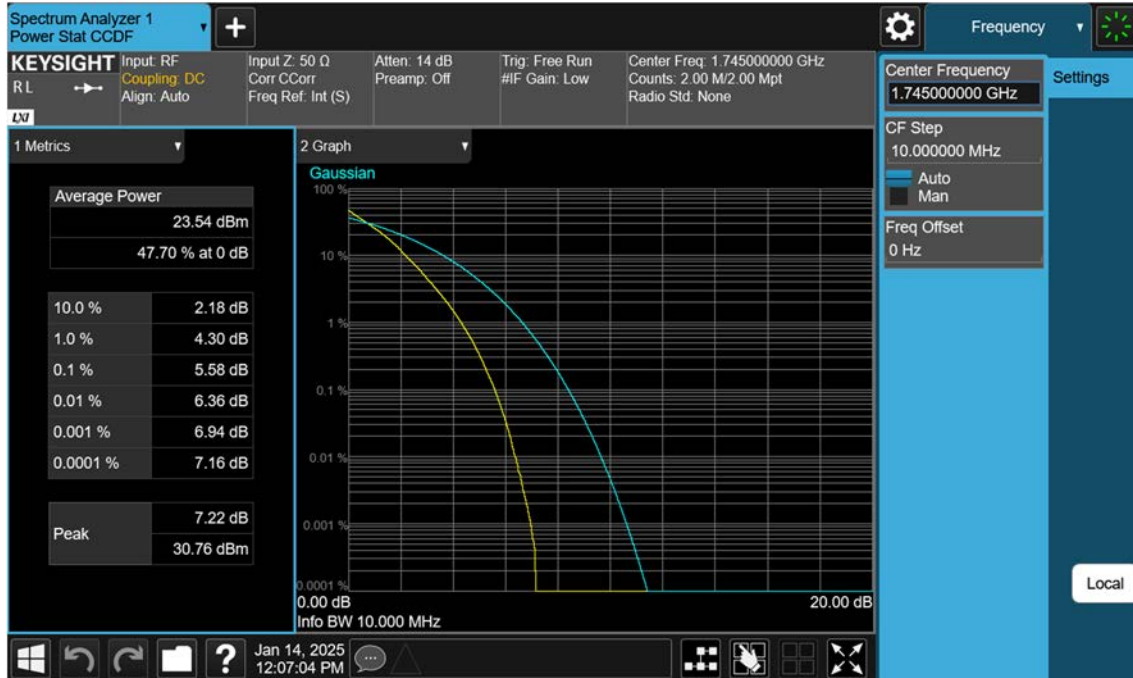
NR66_5 M_PAR_Mid_256QAM_FullRB



NR66_10 M_PAR_Mid_BPSK_FullRB



NR66_10 M_PAR_Mid_QPSK_FullRB



NR66_10 M_PAR_Mid_16QAM_FullRB



NR66_10 M_PAR_Mid_64QAM_FullRB



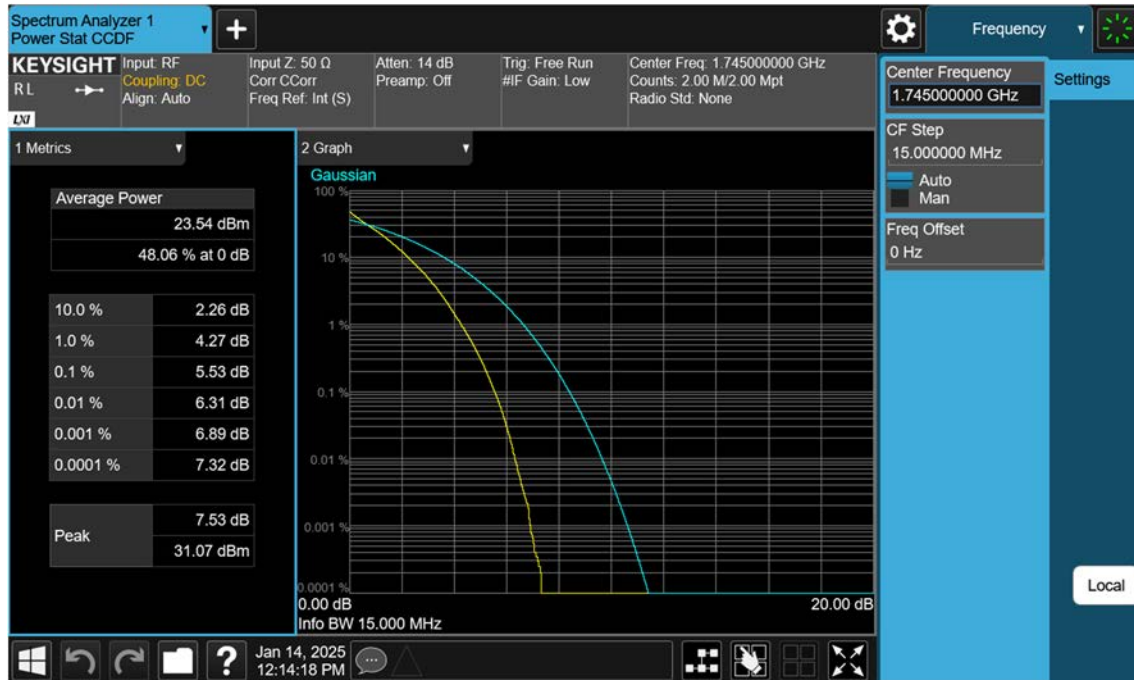
NR66_10 M_PAR_Mid_256QAM_FullRB



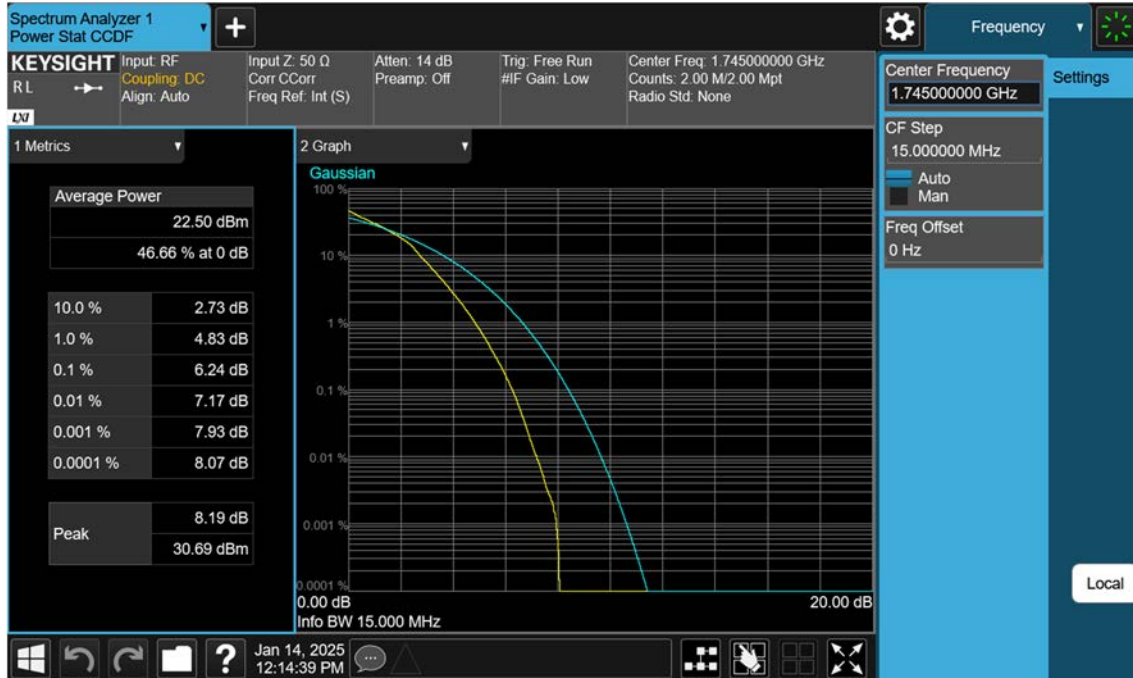
NR66_15 M_PAR_Mid_BPSK_FullRB



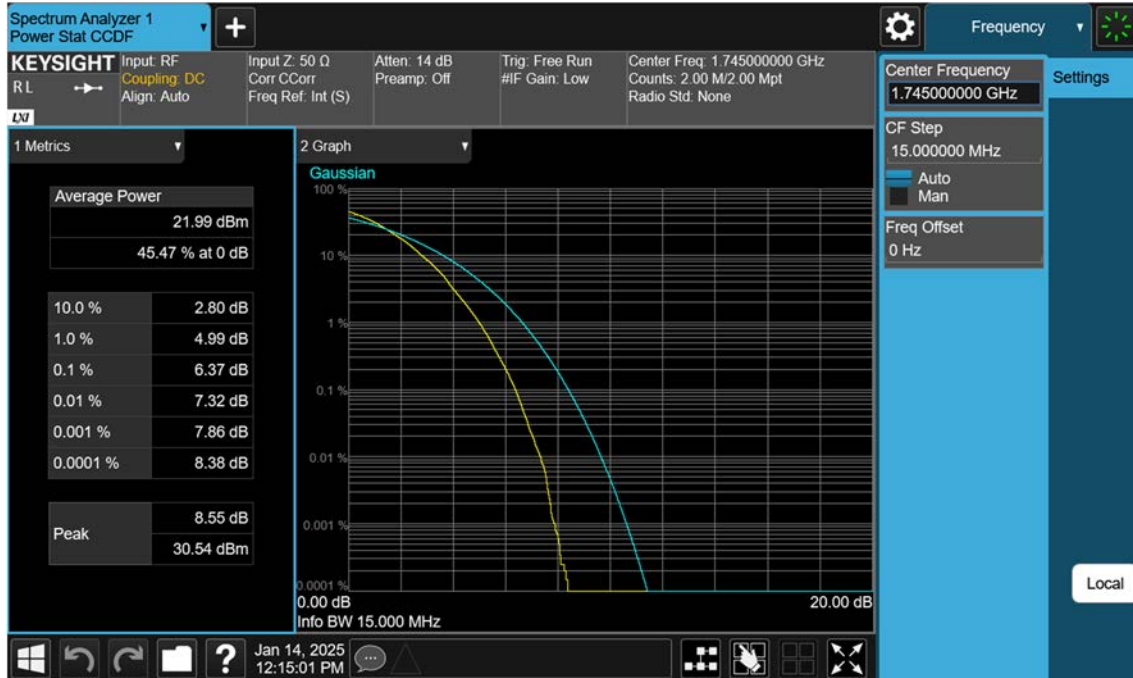
NR66_15 M_PAR_Mid_QPSK_FullRB



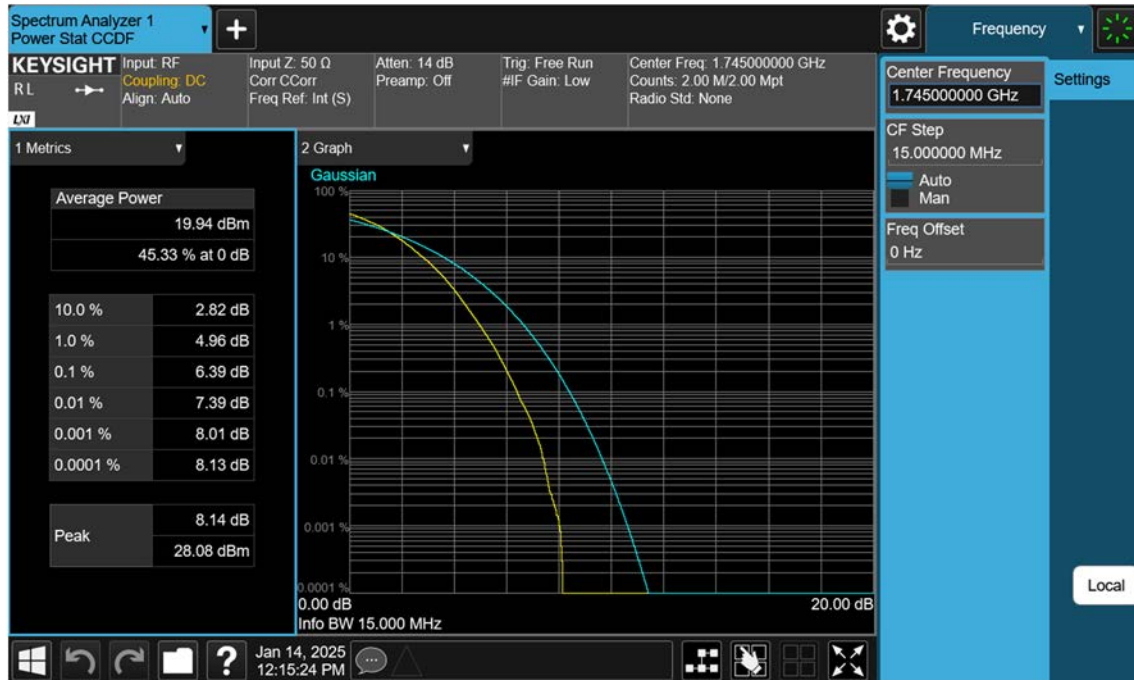
NR66_15 M_PAR_Mid_16QAM_FullRB



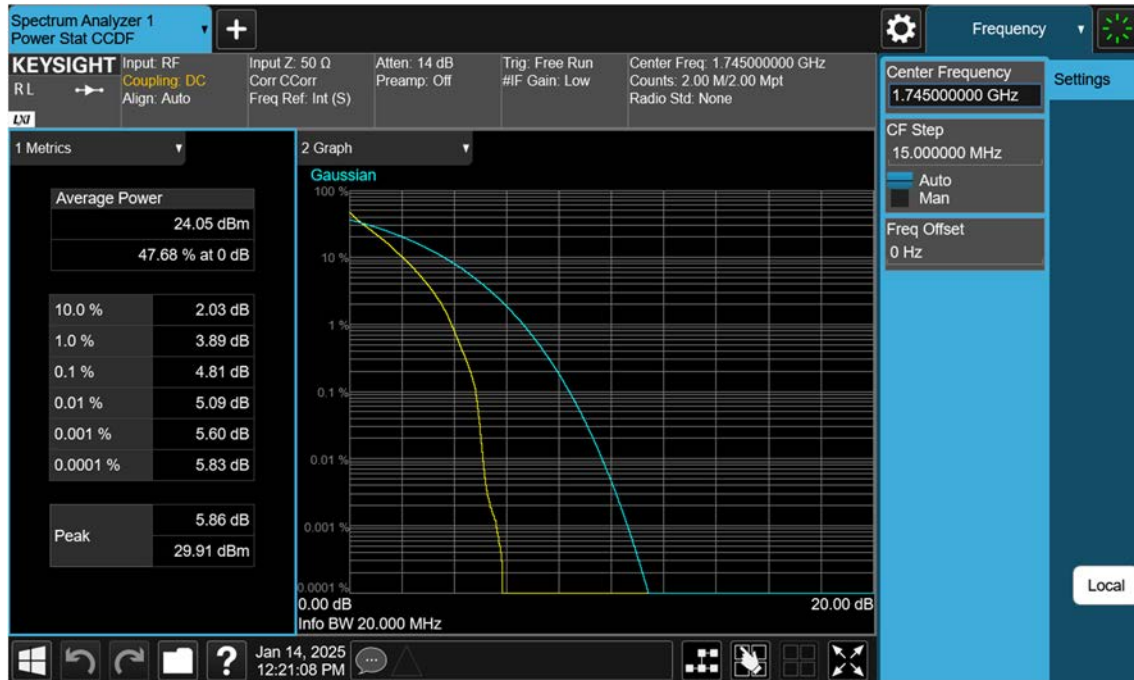
NR66_15 M_PAR_Mid_64QAM_FullRB



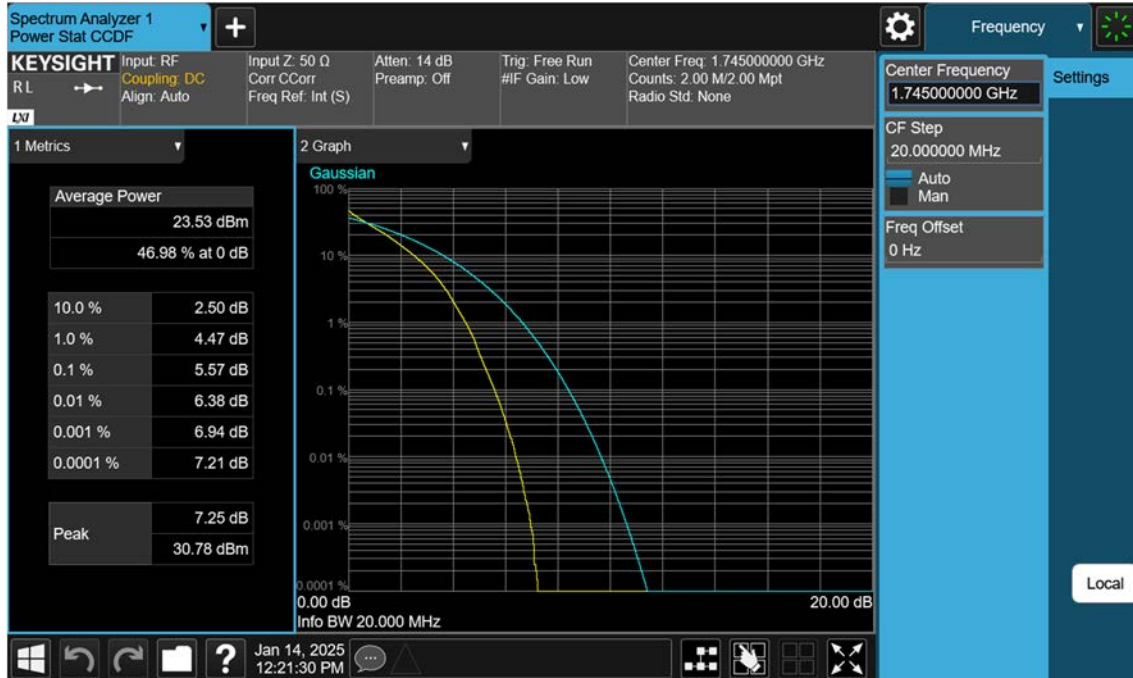
NR66_15 M_PAR_Mid_256QAM_FullRB



NR66_20 M_PAR_Mid_BPSK_FullRB



NR66_20 M_PAR_Mid_QPSK_FullRB



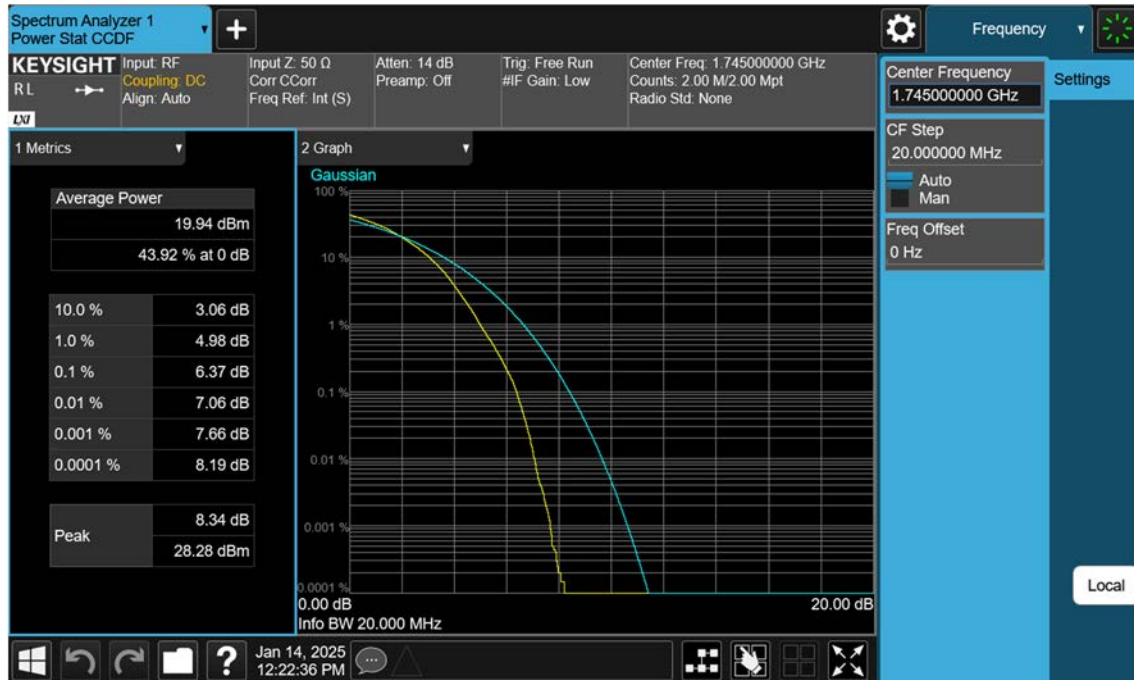
NR66_20 M_PAR_Mid_16QAM_FullRB



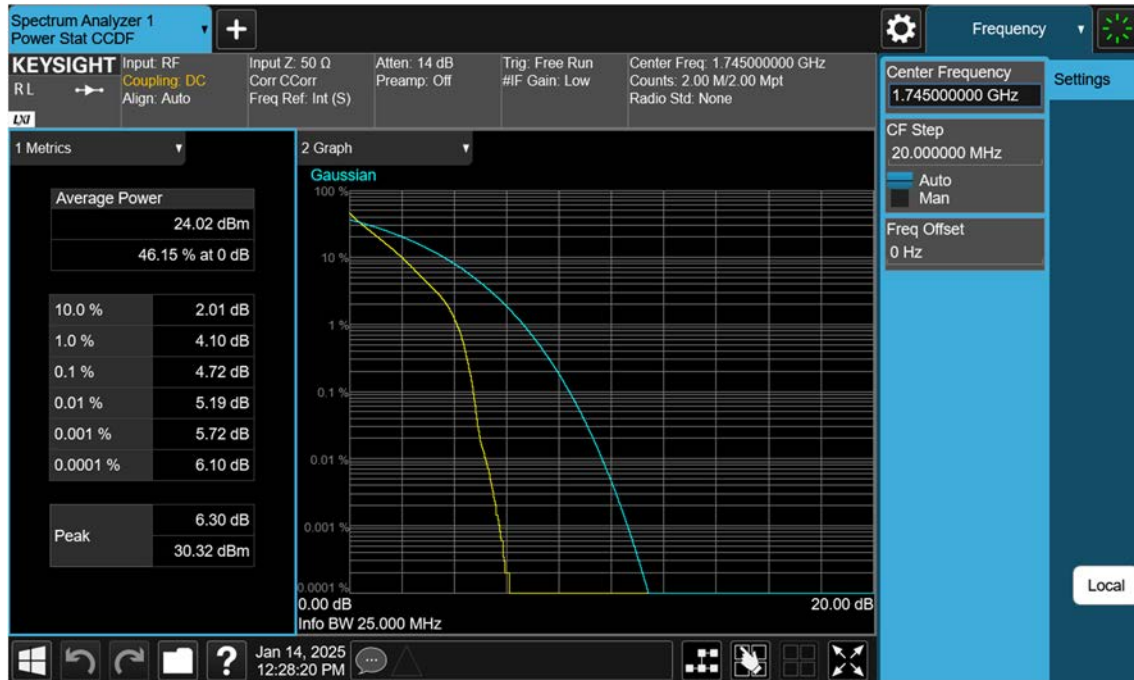
NR66_20 M_PAR_Mid_64QAM_FullRB



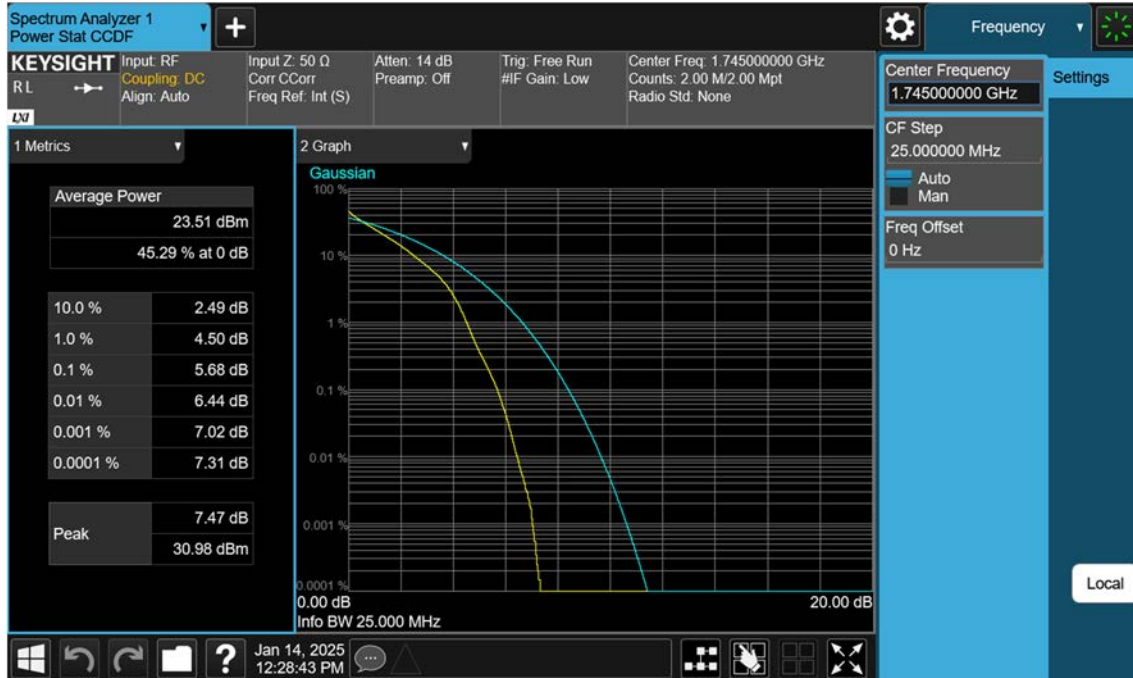
NR66_20 M_PAR_Mid_256QAM_FullRB



NR66_25 M_PAR_Mid_BPSK_FullRB



NR66_25 M_PAR_Mid_QPSK_FullRB



NR66_25 M_PAR_Mid_16QAM_FullRB



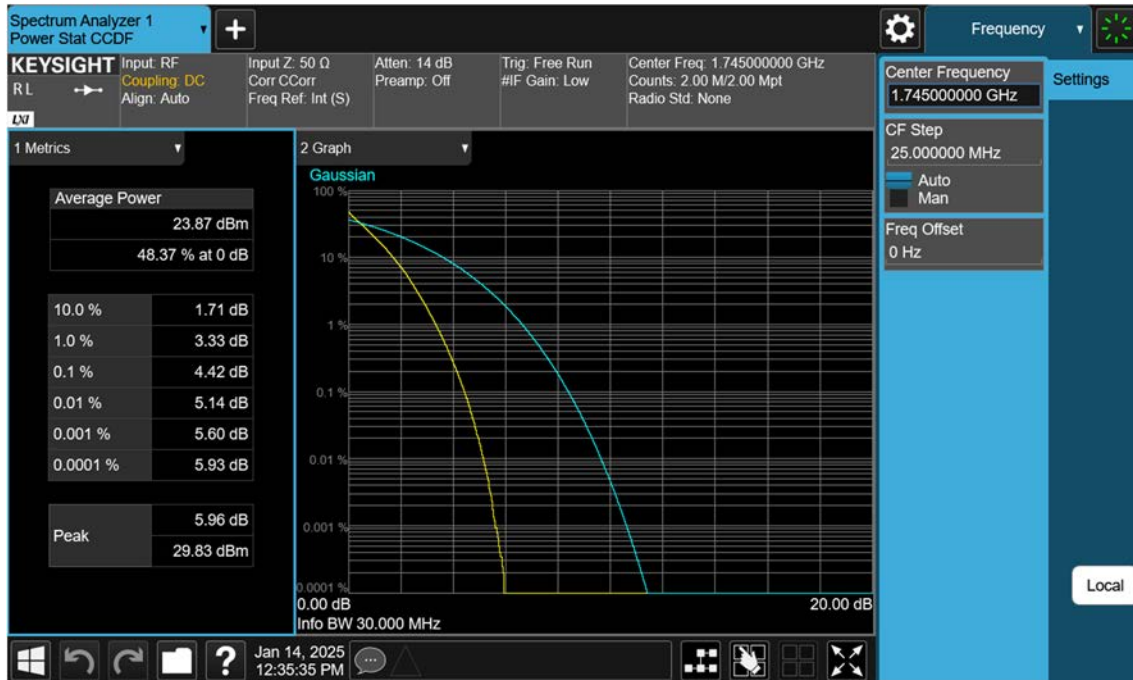
NR66_25 M_PAR_Mid_64QAM_FullRB



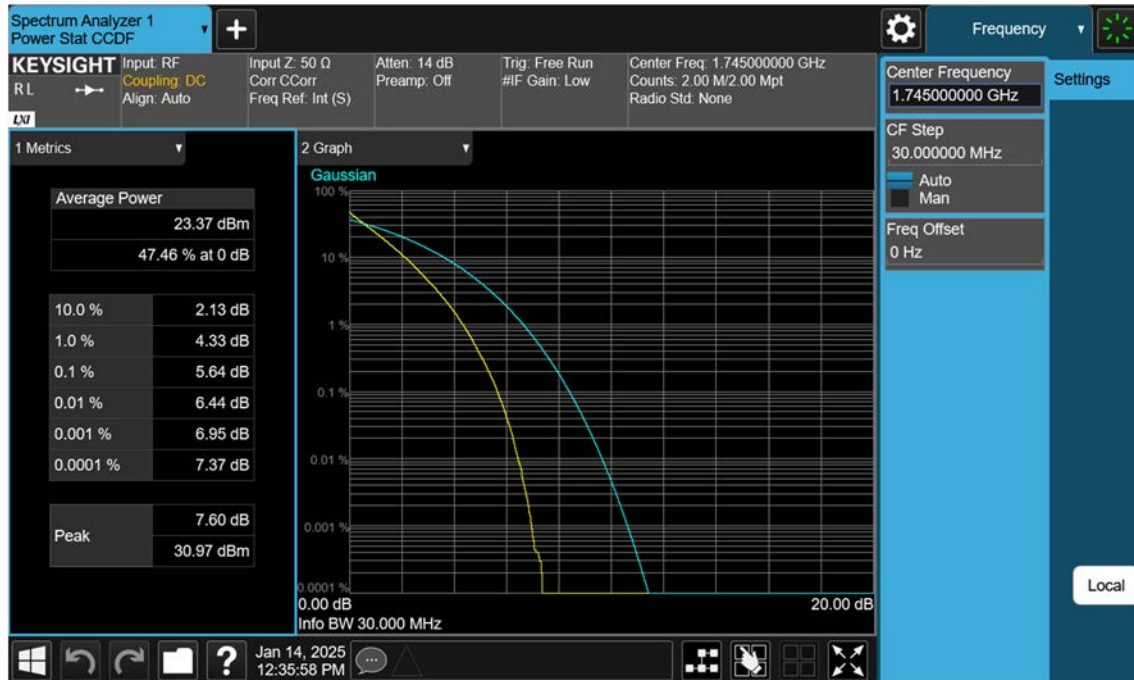
NR66_25 M_PAR_Mid_256QAM_FullRB



NR66_30 M_PAR_Mid_BPSK_FullRB



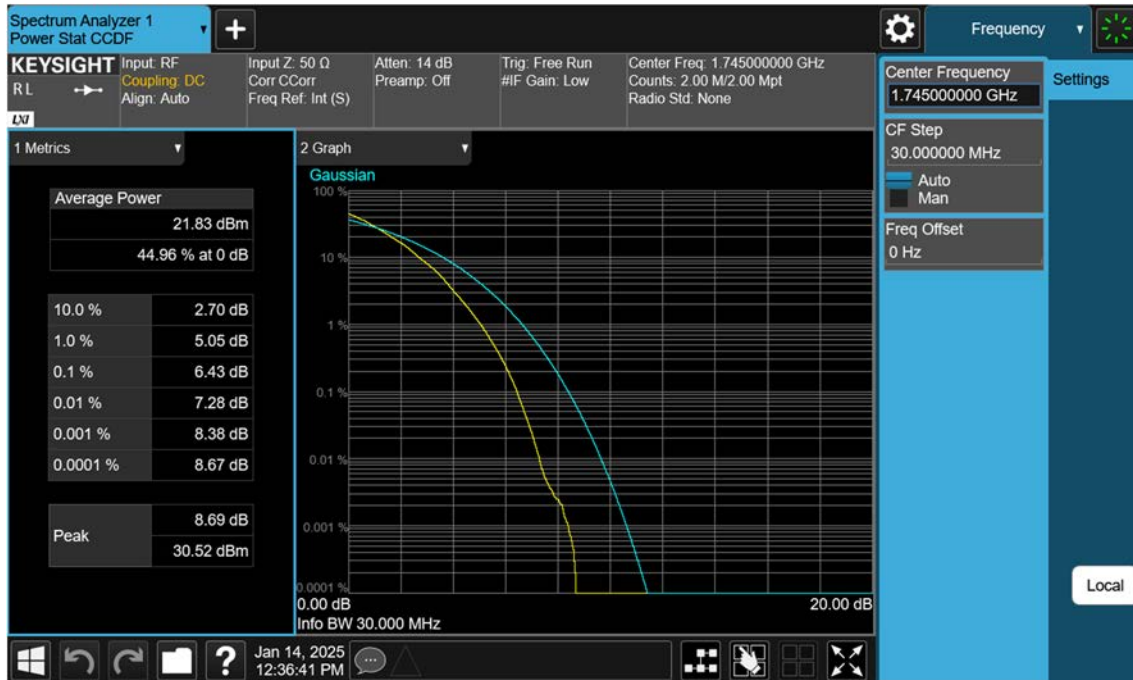
NR66_30 M_PAR_Mid_QPSK_FullRB



NR66_30 M_PAR_Mid_16QAM_FullRB



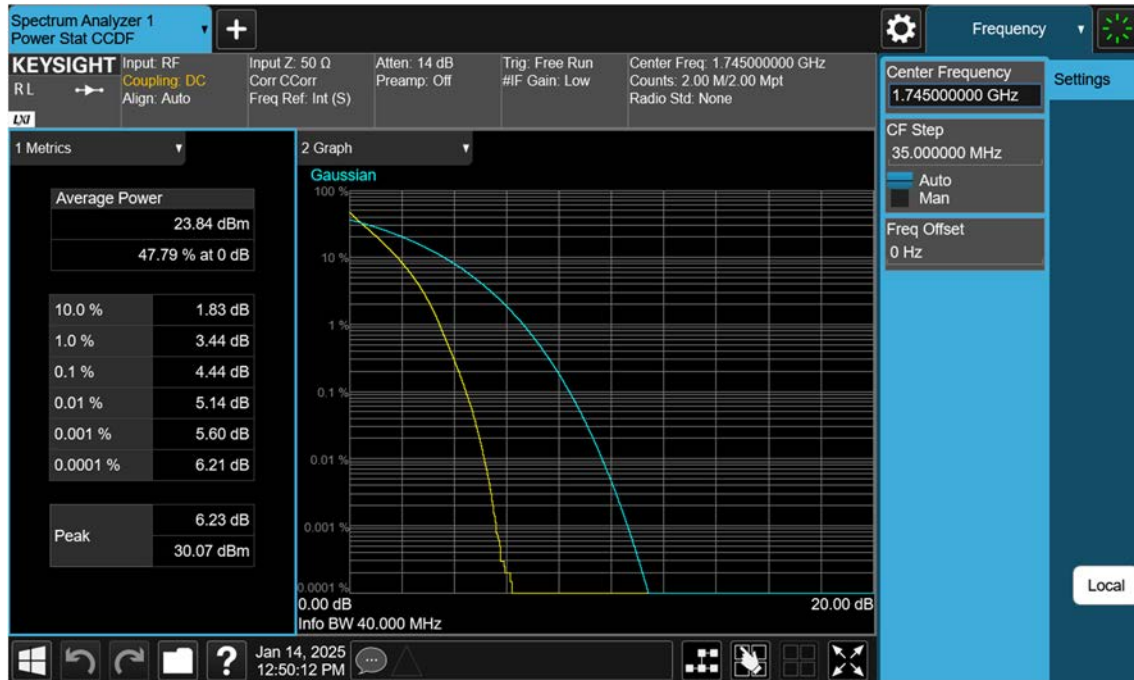
NR66_30 M_PAR_Mid_64QAM_FullRB



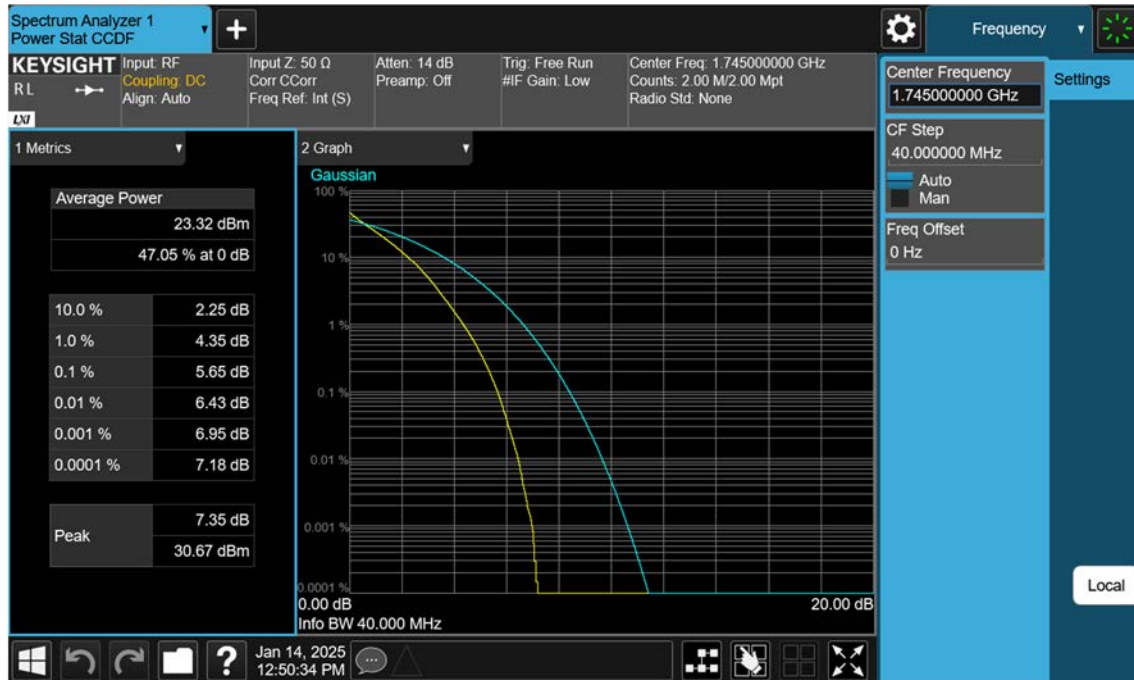
NR66_30 M_PAR_Mid_256QAM_FullRB



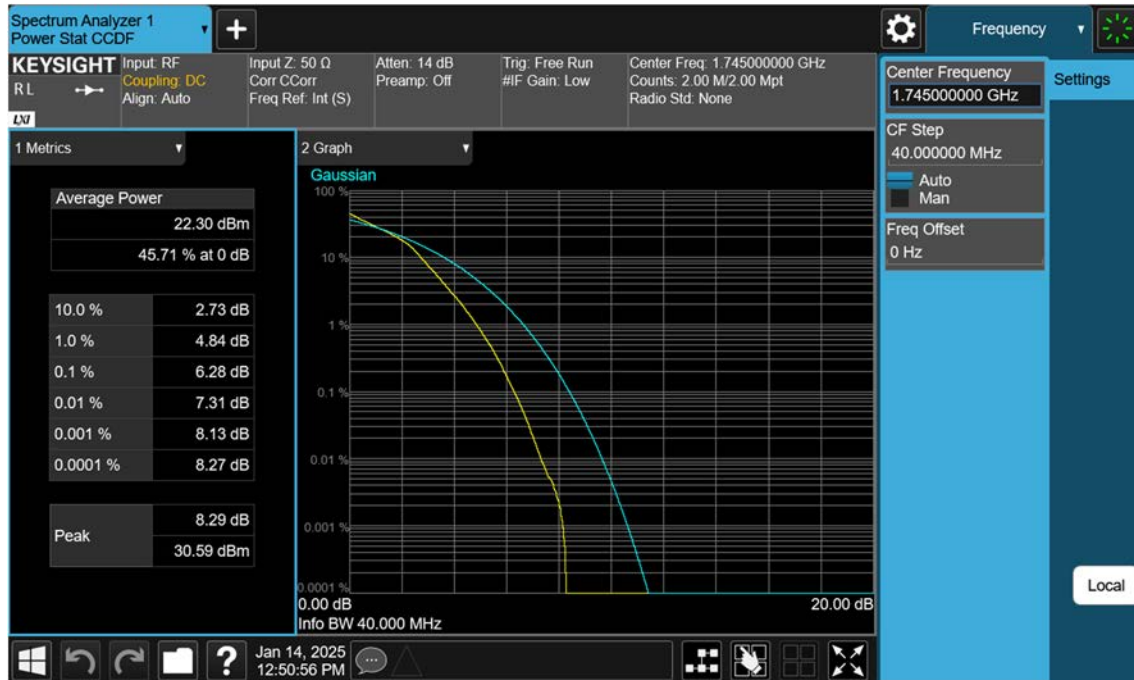
NR66_40 M_PAR_Mid_BPSK_FullRB



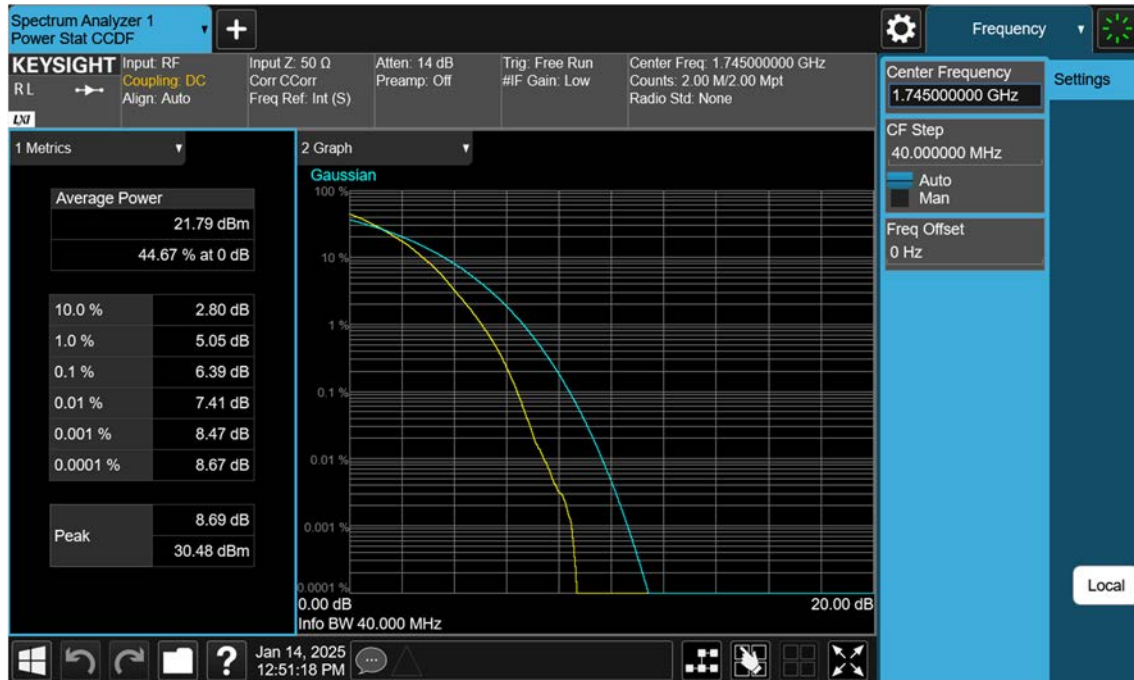
NR66_40 M_PAR_Mid_QPSK_FullRB



NR66_40 M_PAR_Mid_16QAM_FullRB



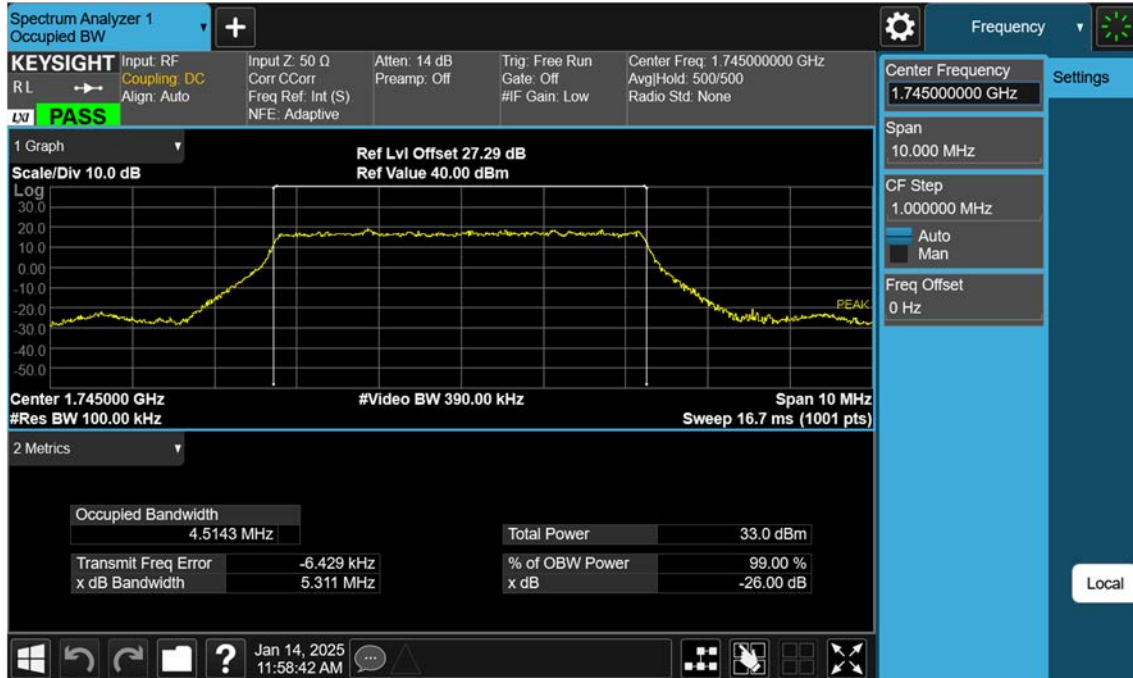
NR66_40 M_PAR_Mid_64QAM_FullRB



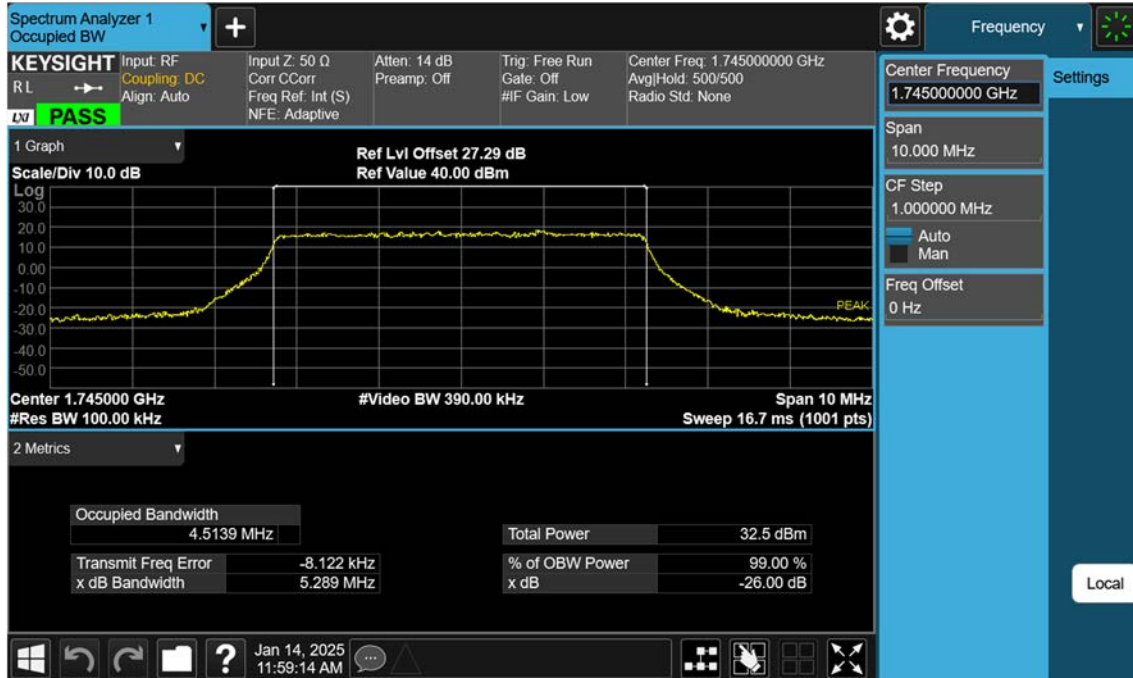
NR66_40 M_PAR_Mid_256QAM_FullRB



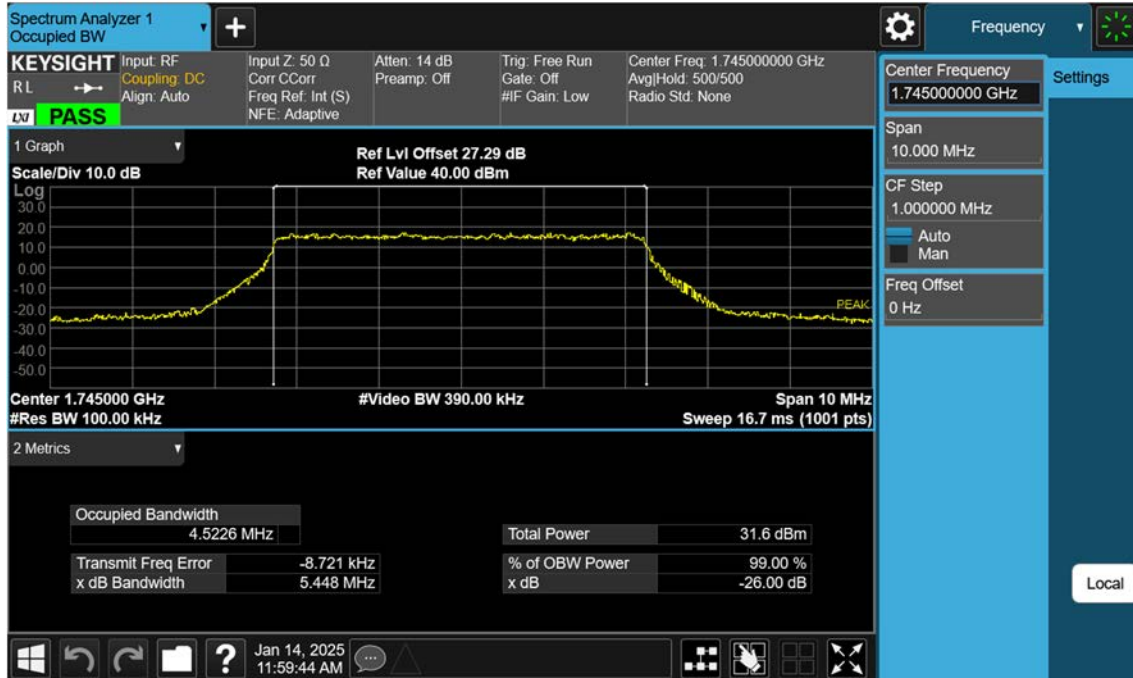
NR66_5 M_OBW_Mid_BPSK_FullRB



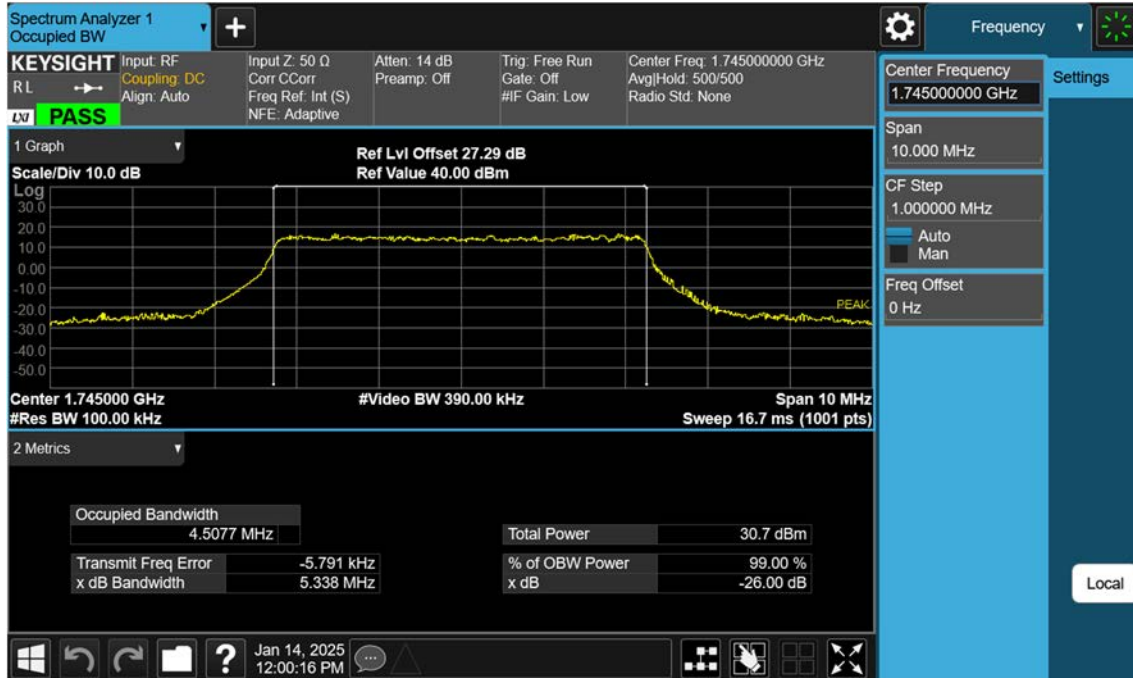
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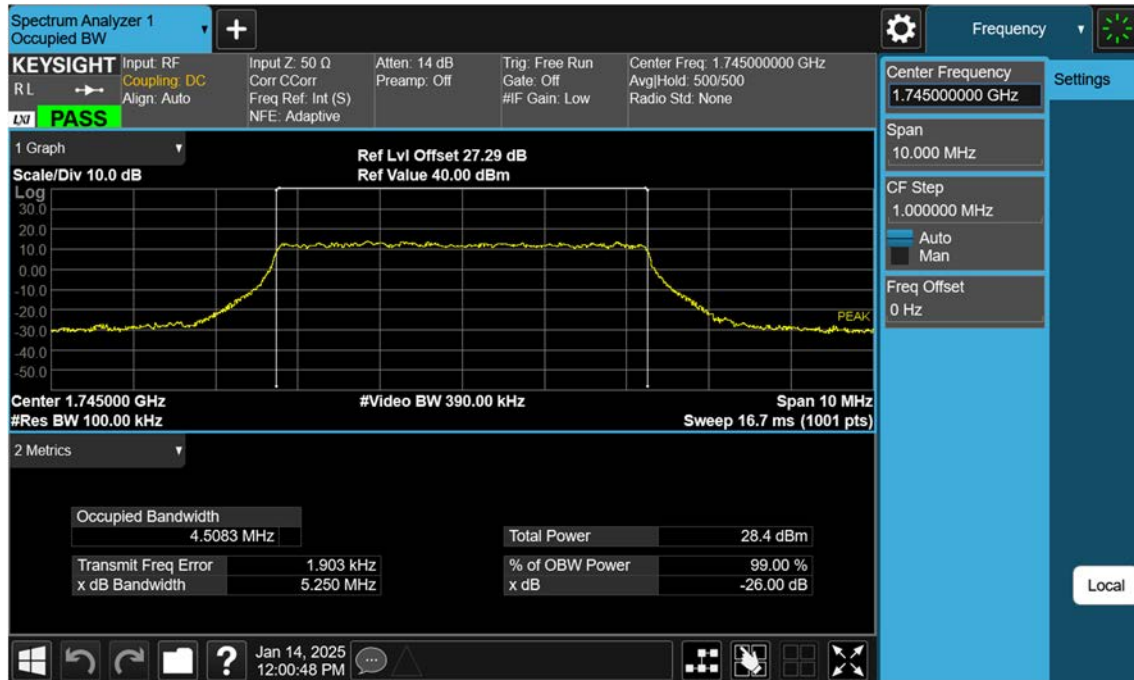
NR66_5 M_OBW_Mid_16QAM_FullRB



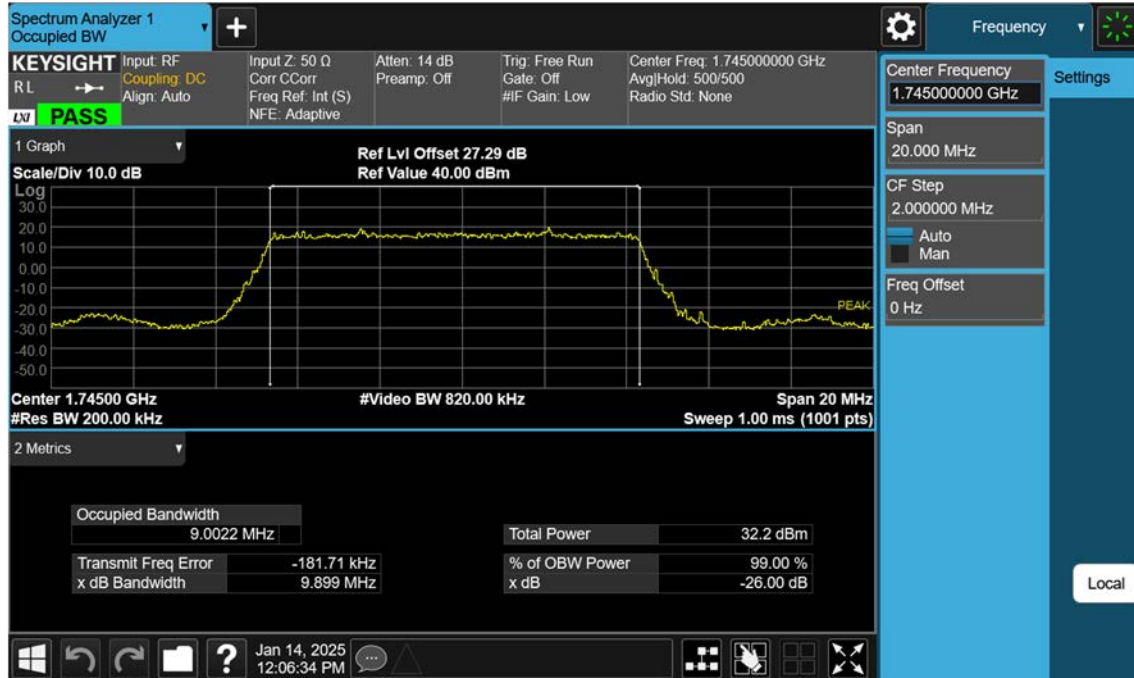
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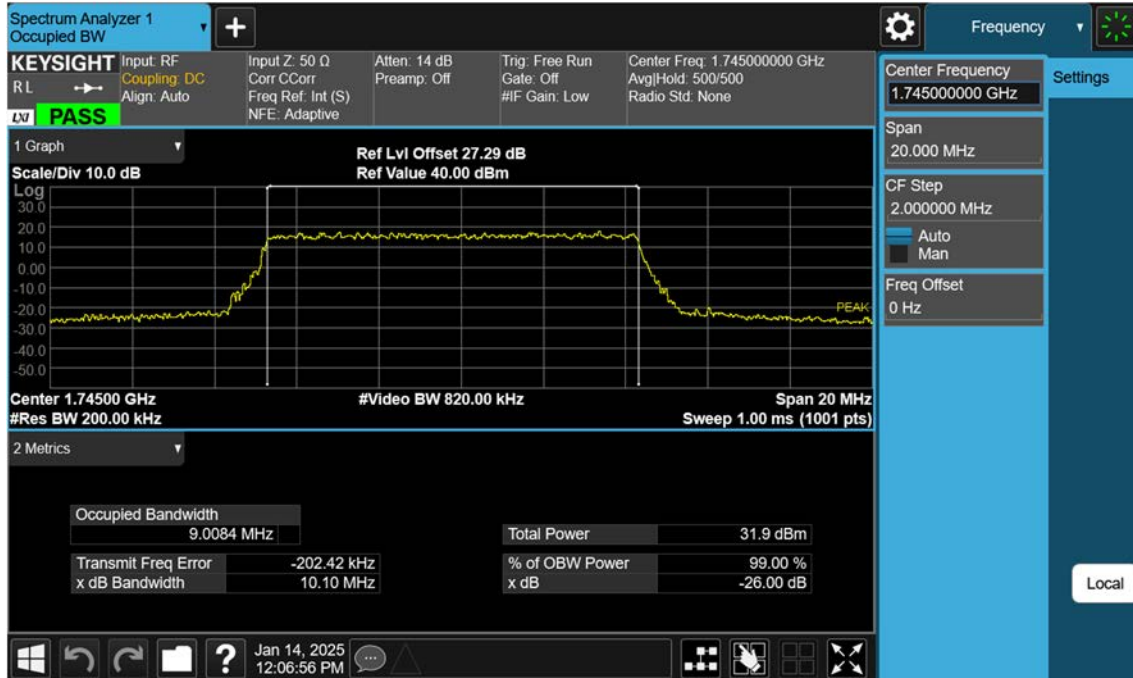
NR66_5 M_OBW_Mid_256QAM_FullRB



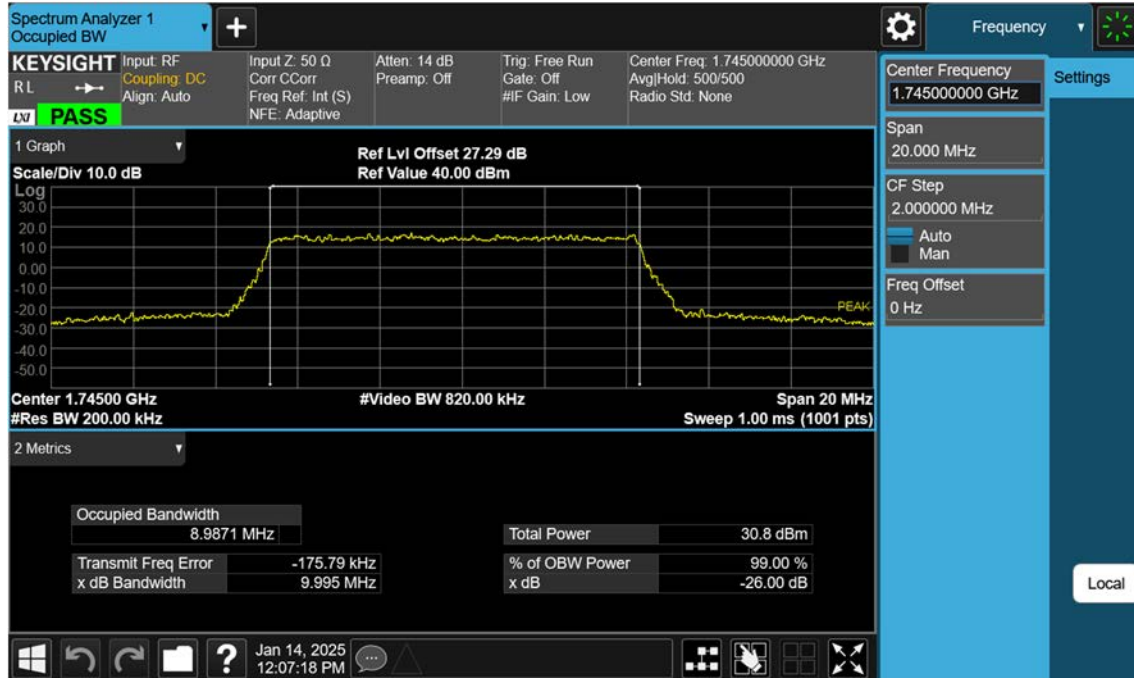
NR66_10 M_OBW_Mid_BPSK_FullRB



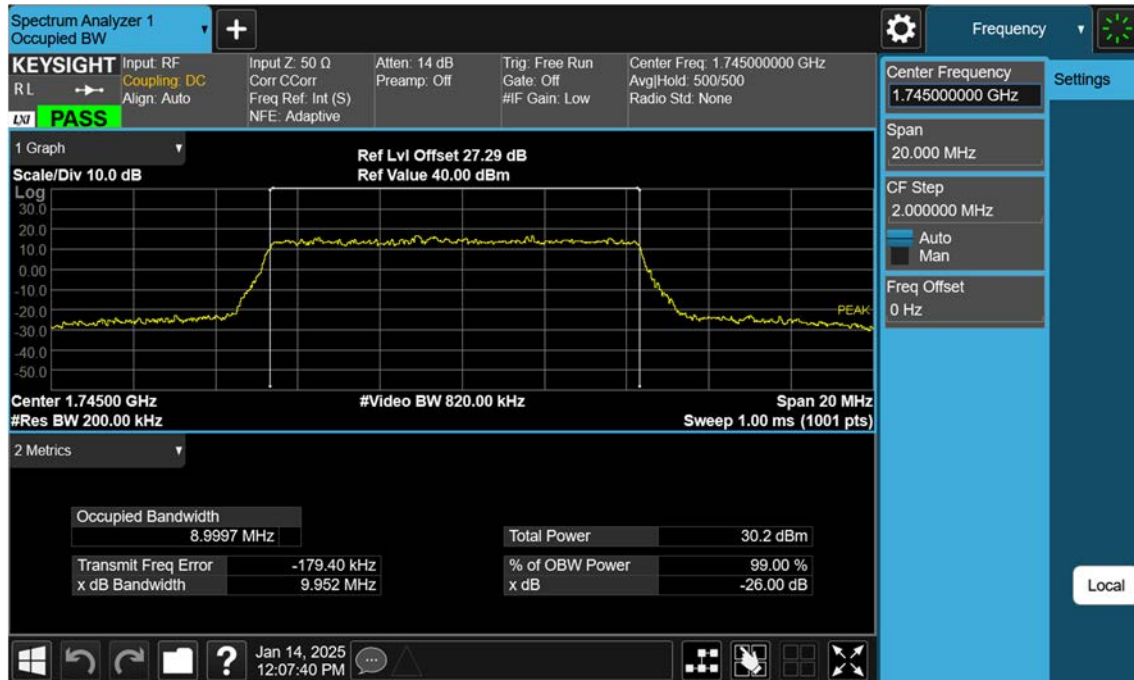
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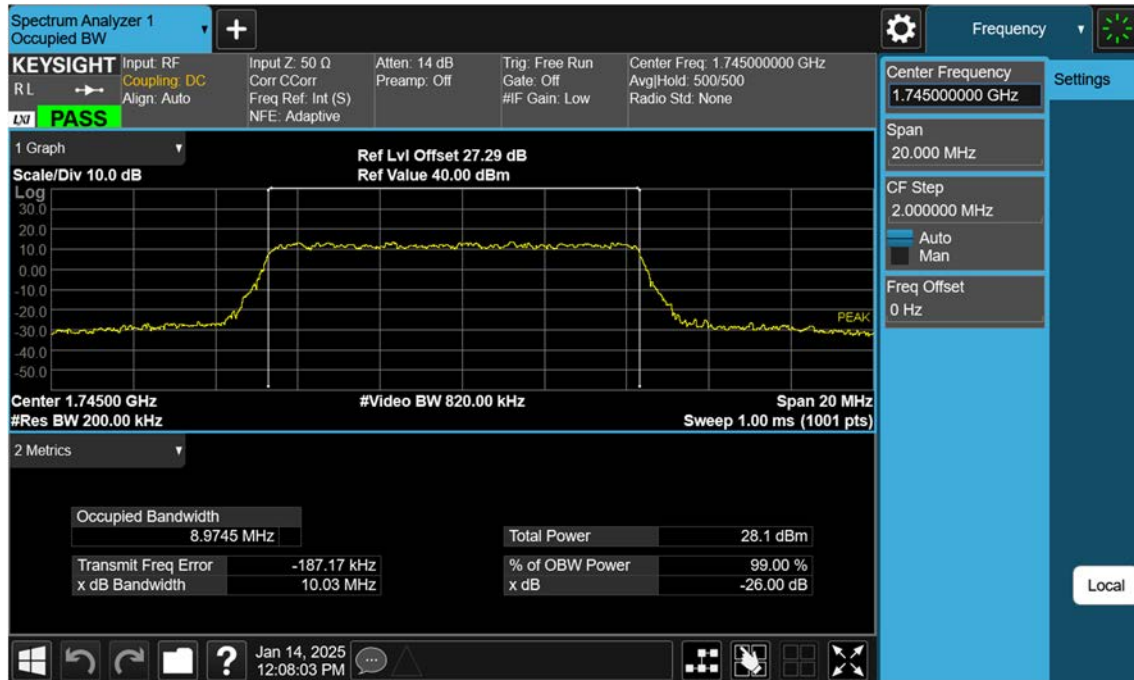
NR66_10 M_OBW_Mid_16QAM_FullRB



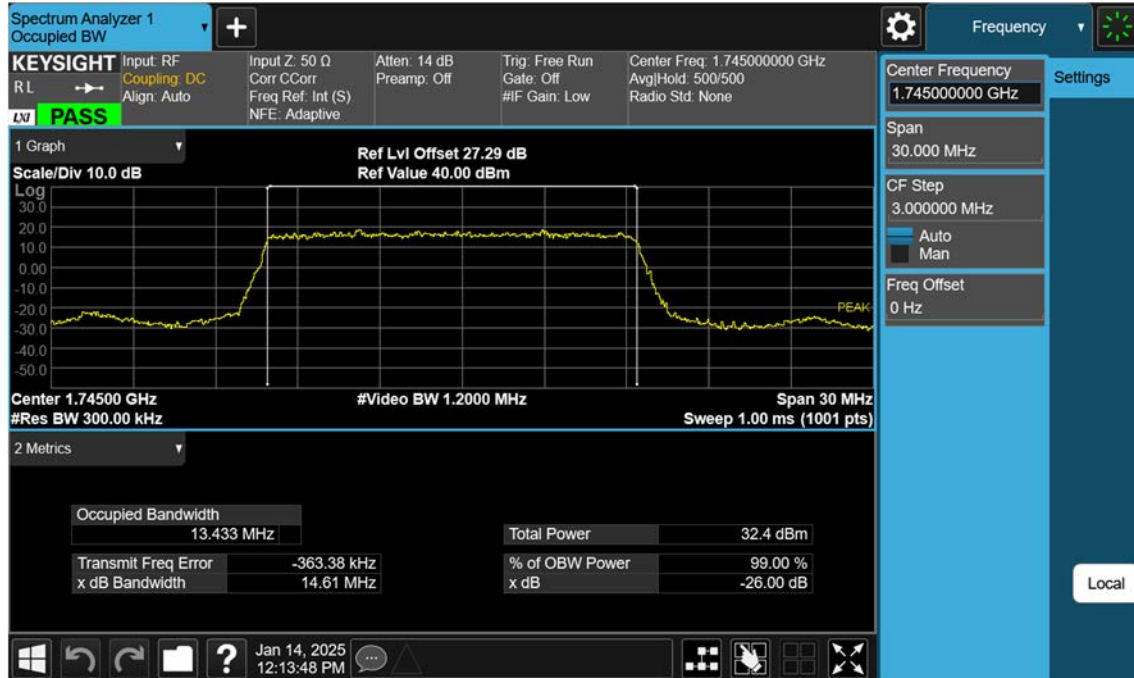
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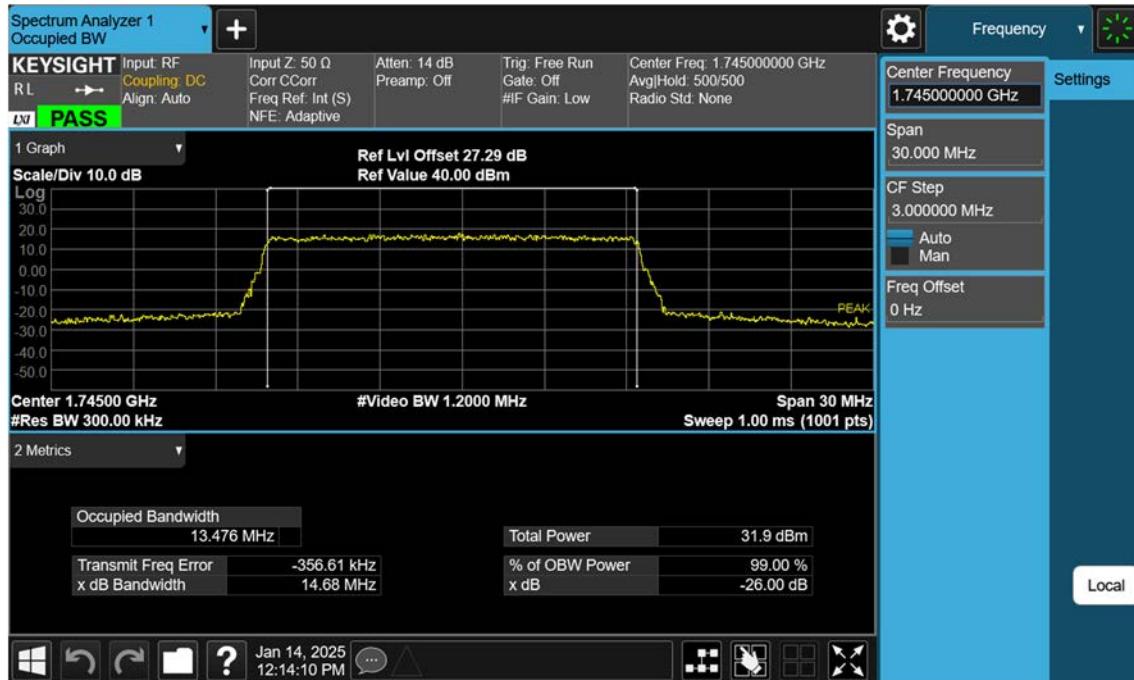
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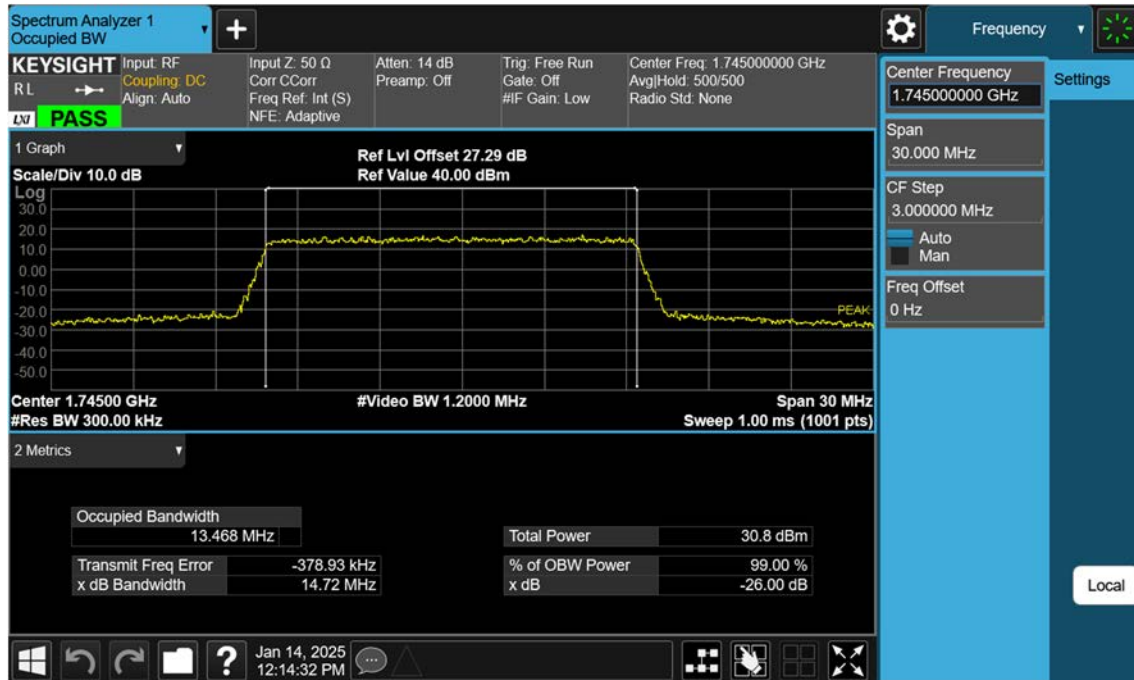
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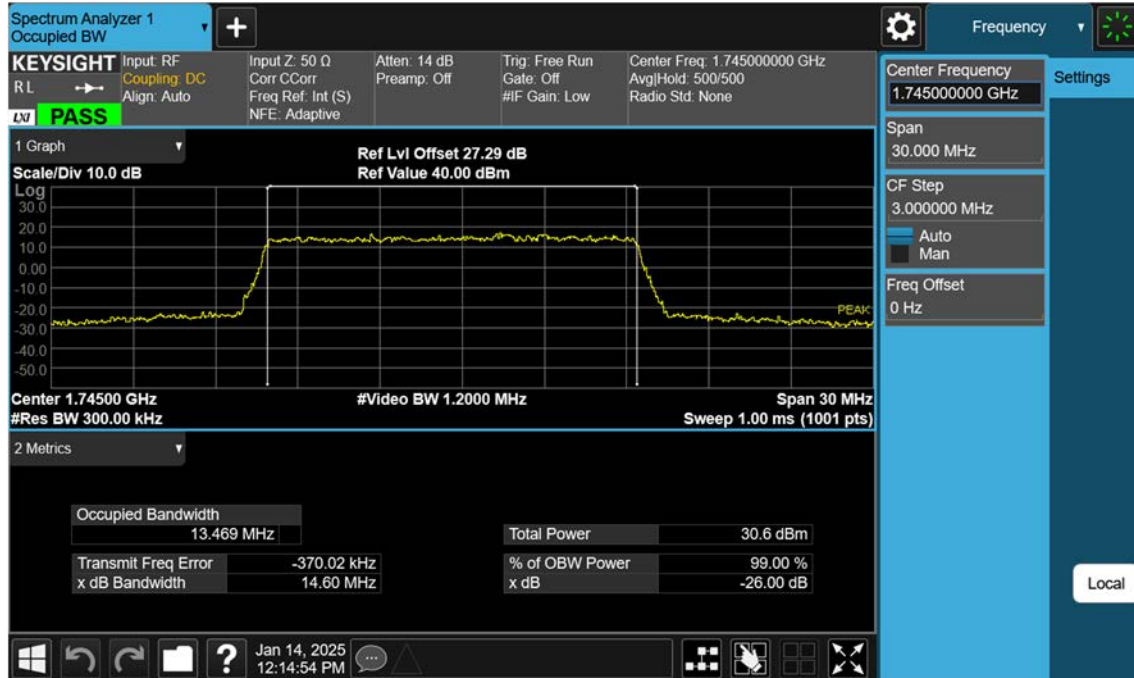
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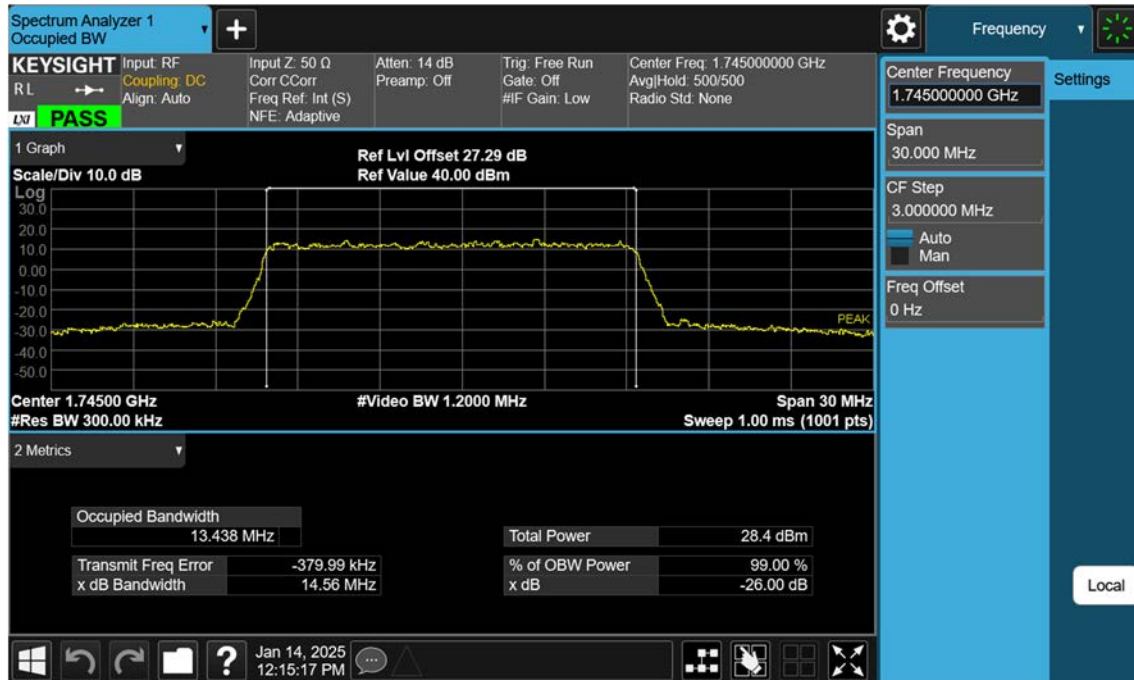
NR66_15 M_OBW_Mid_16QAM_FullRB



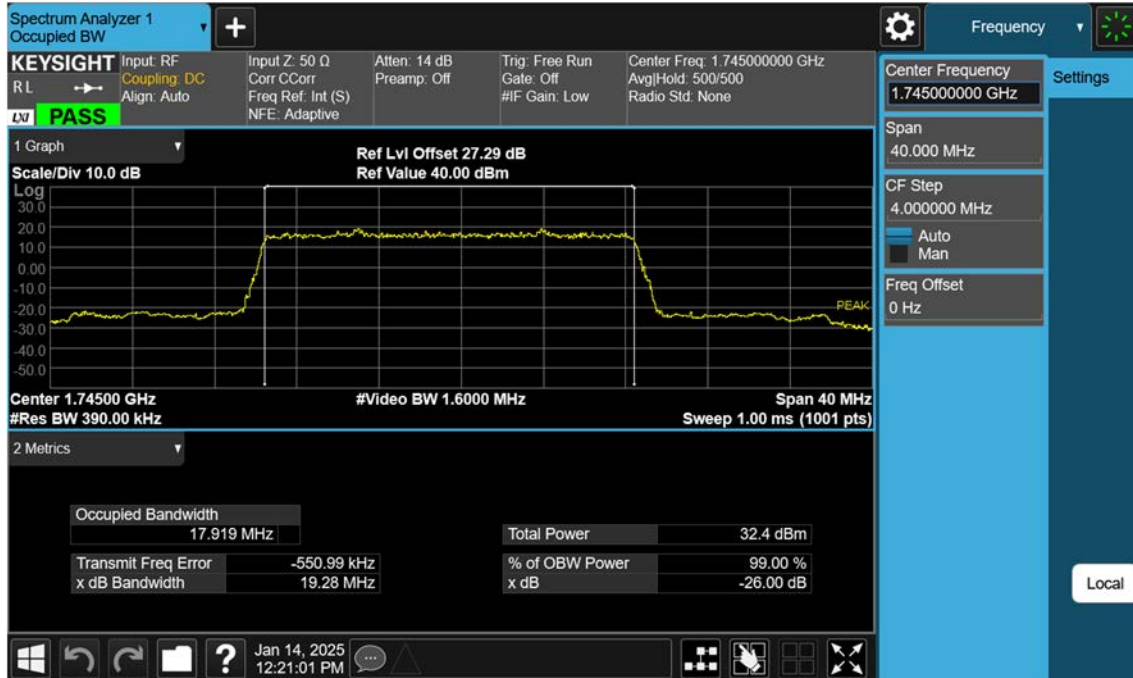
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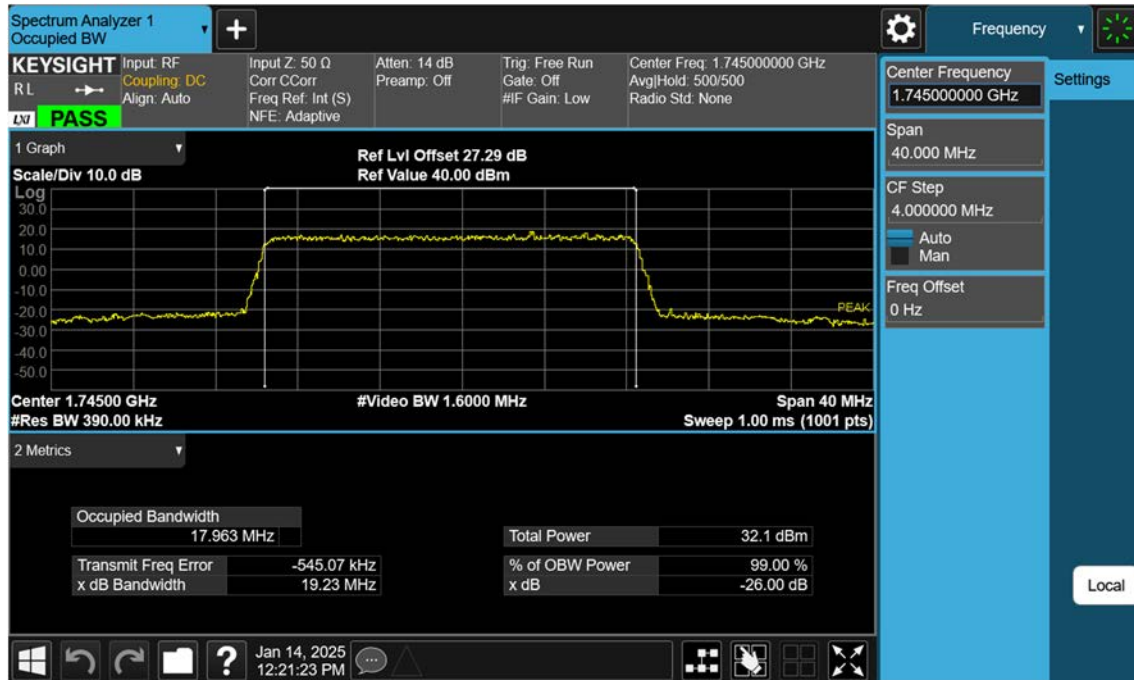
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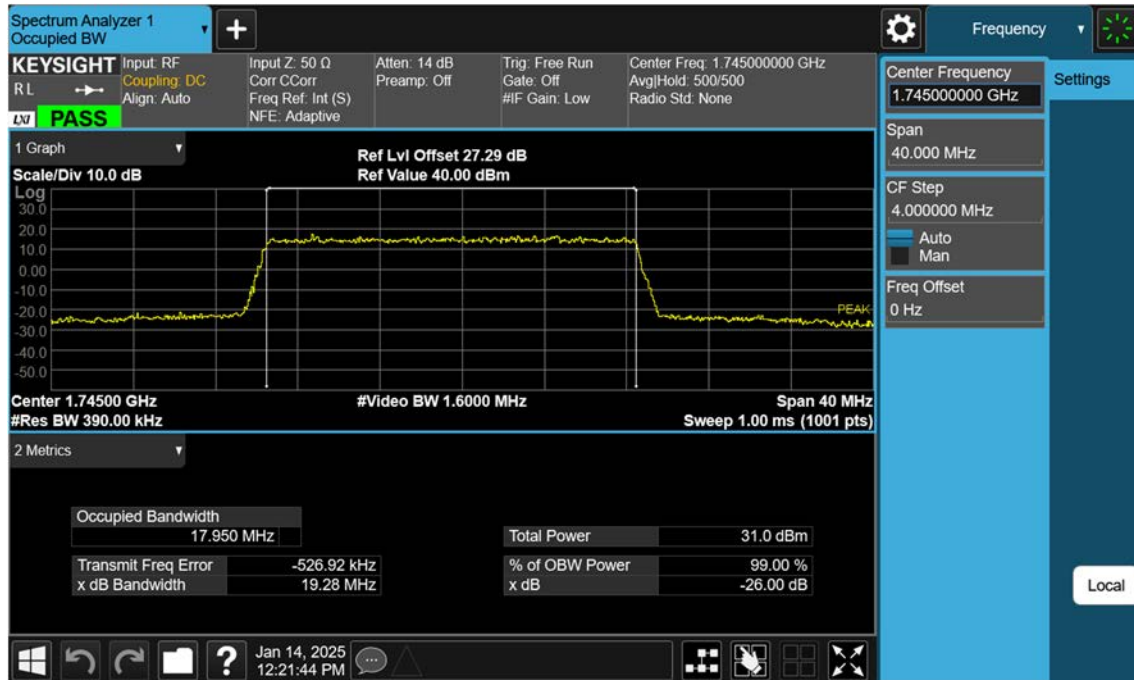
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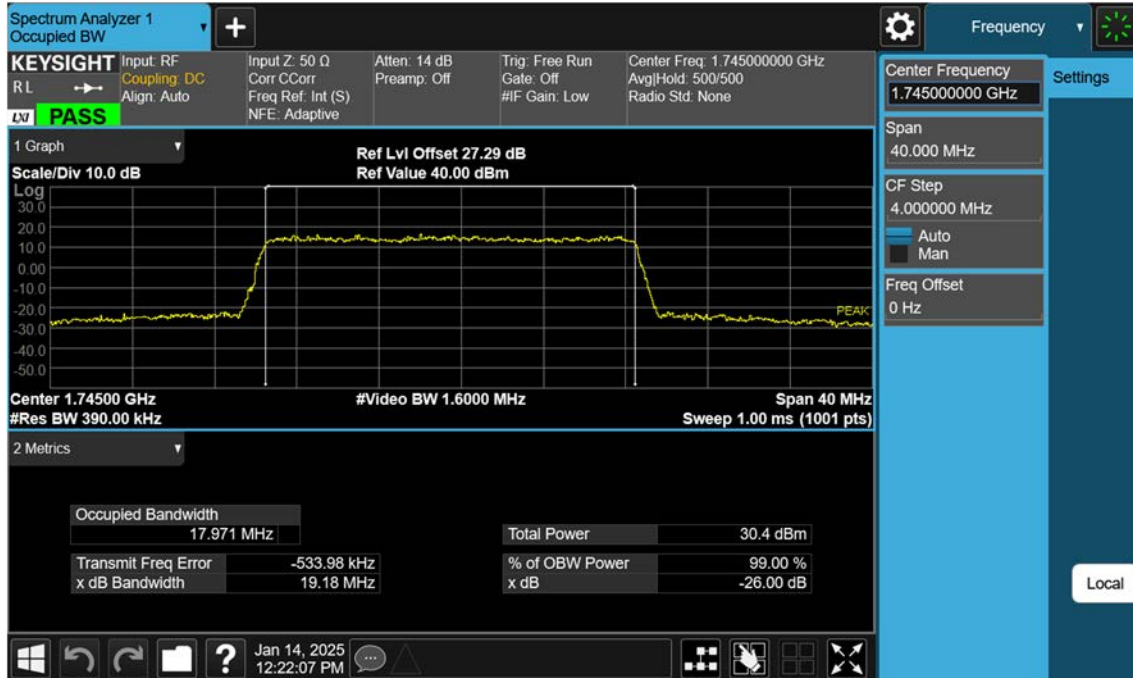
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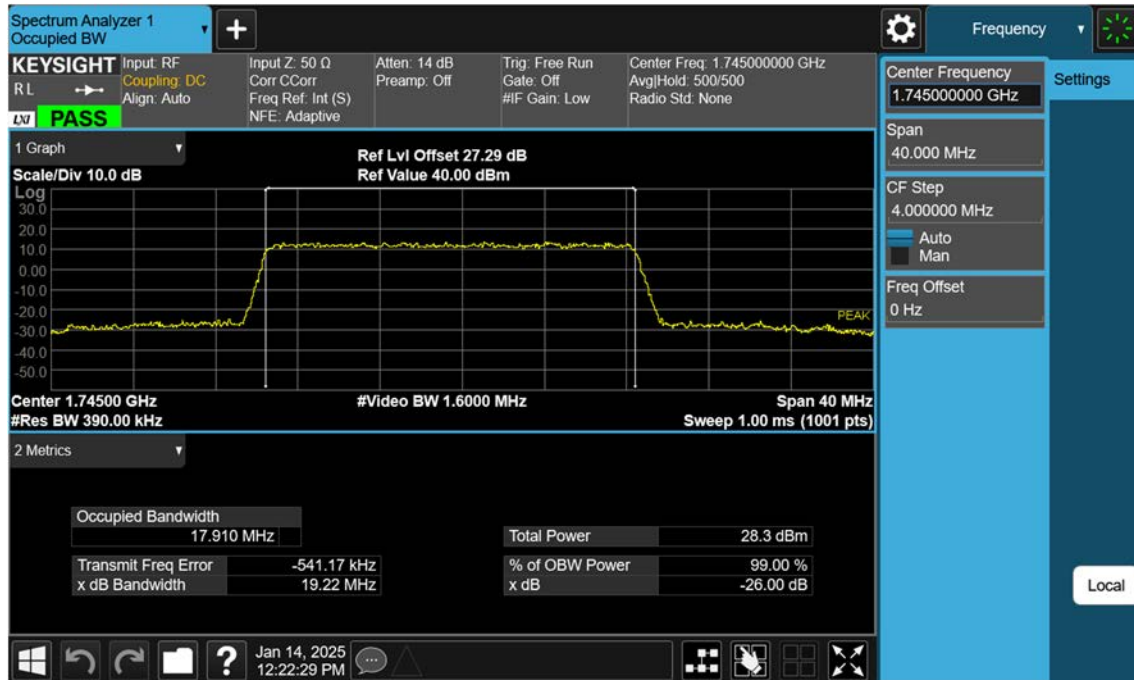
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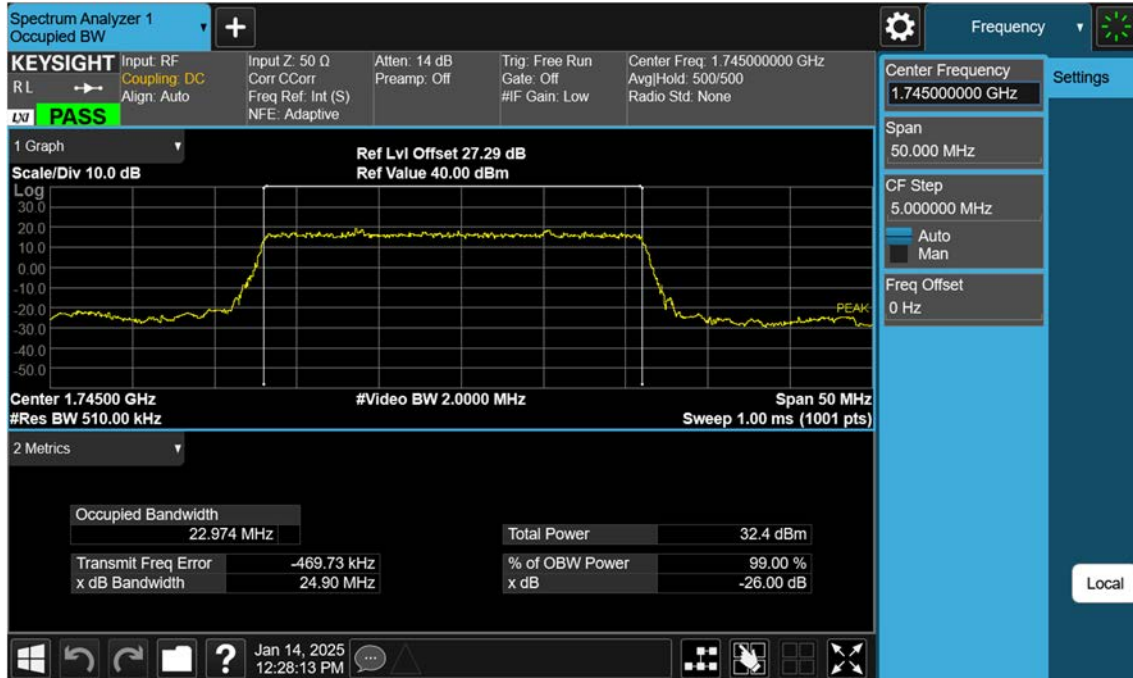
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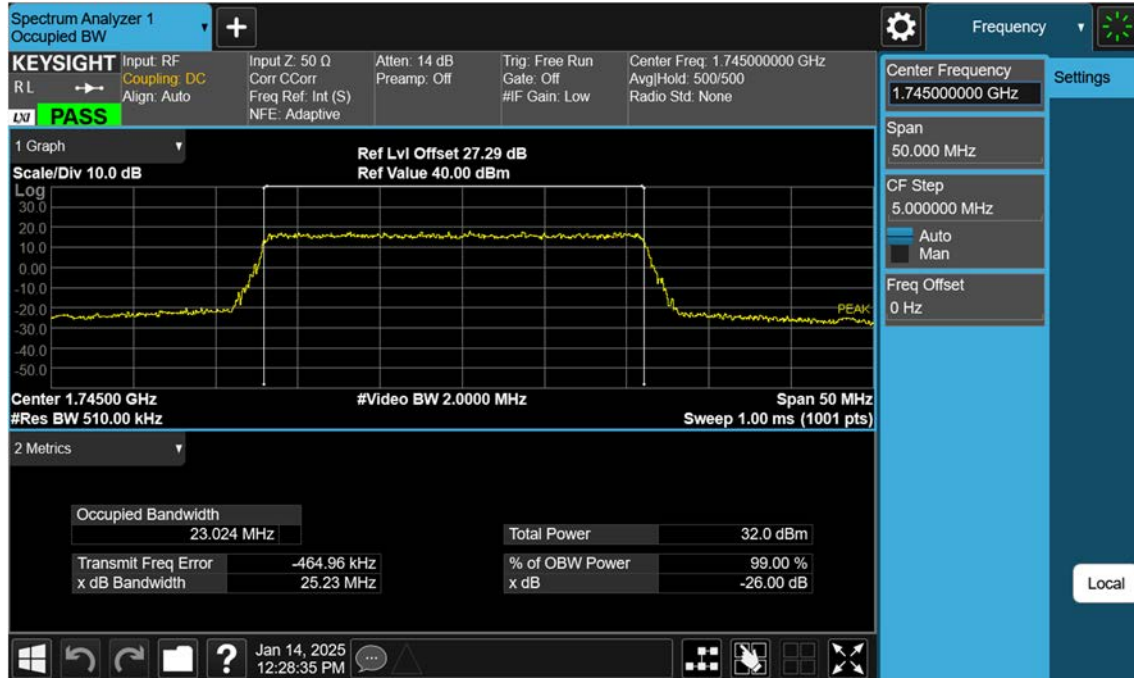
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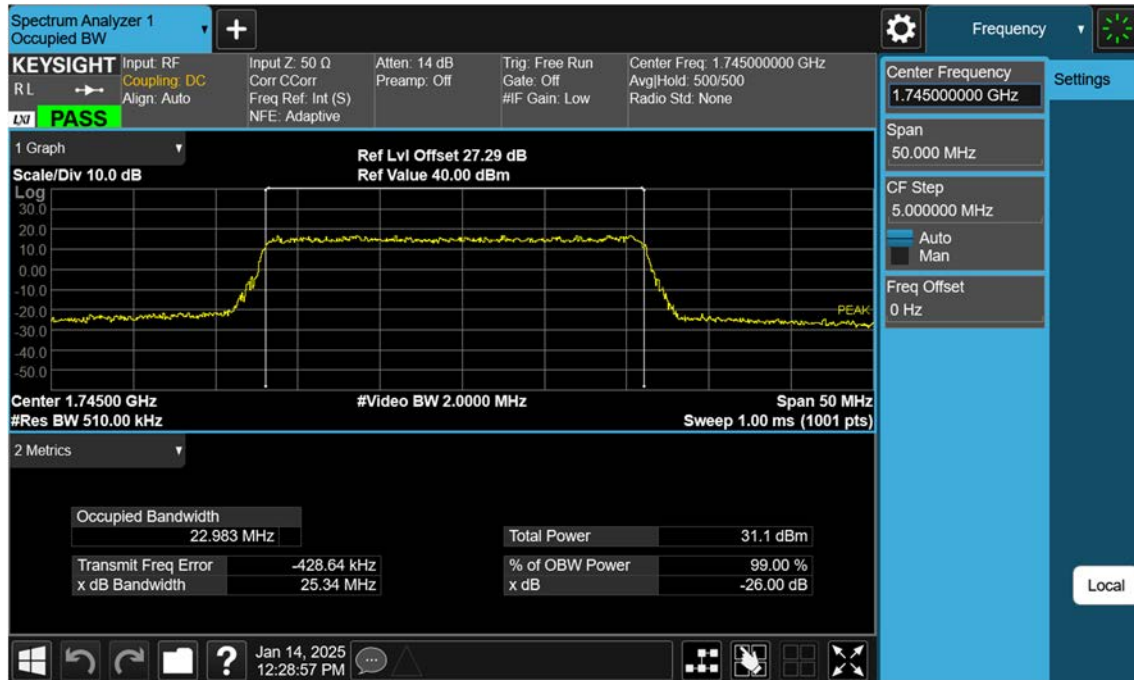
NR66_25 M_OBW_Mid_BPSK_FullRB



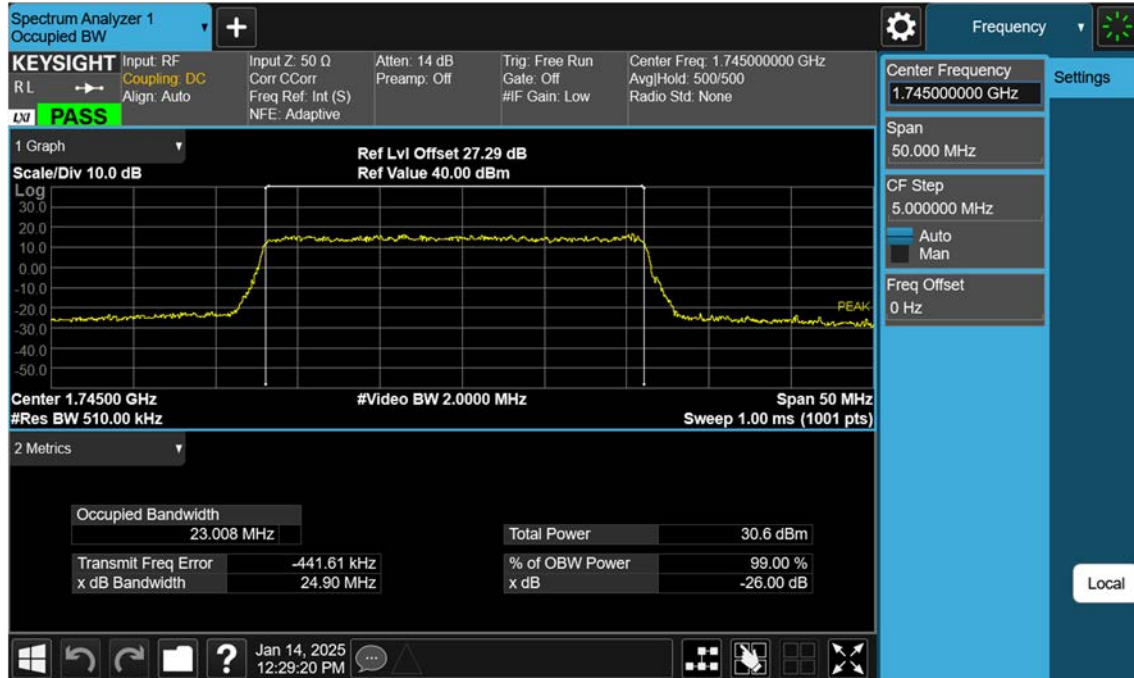
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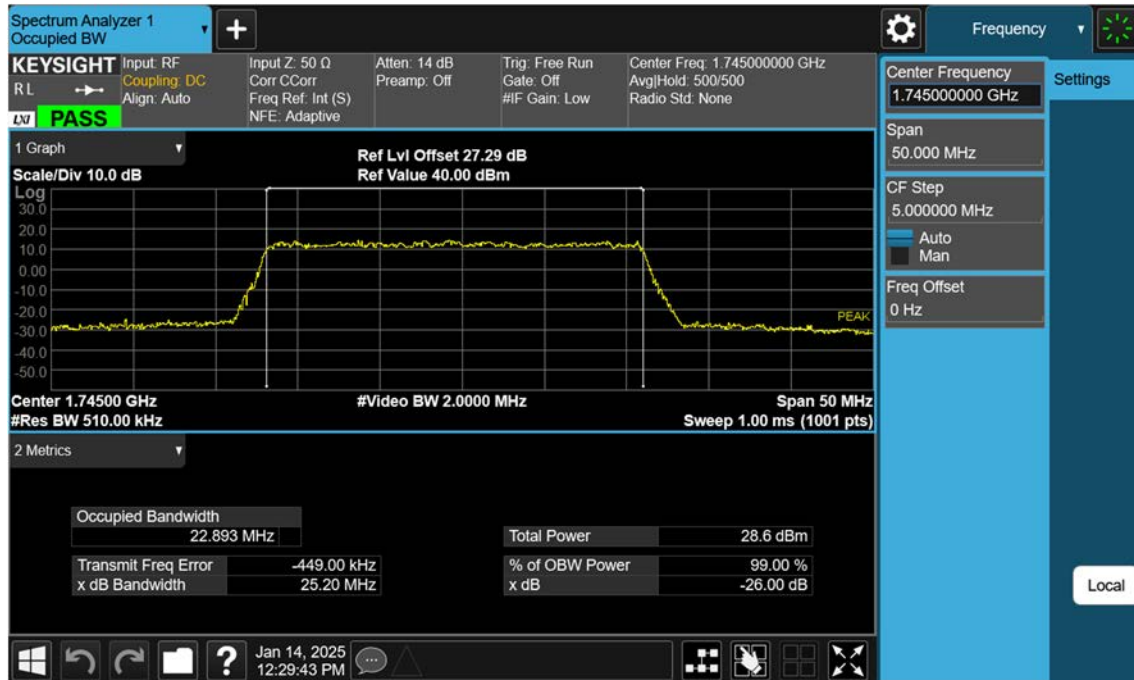
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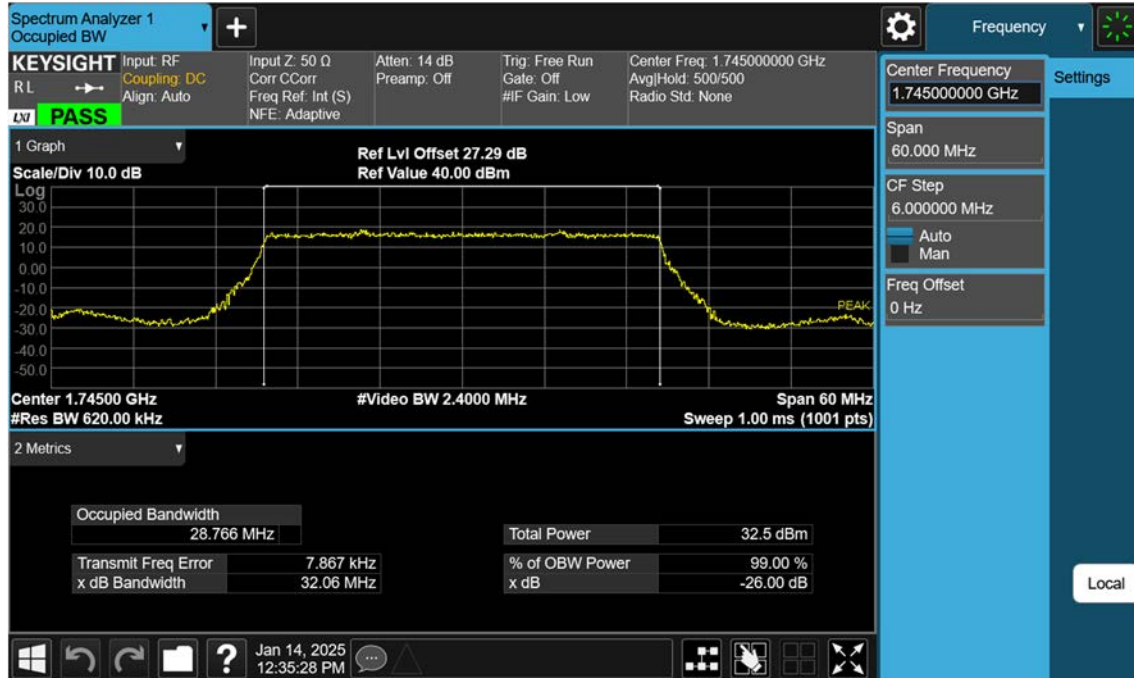
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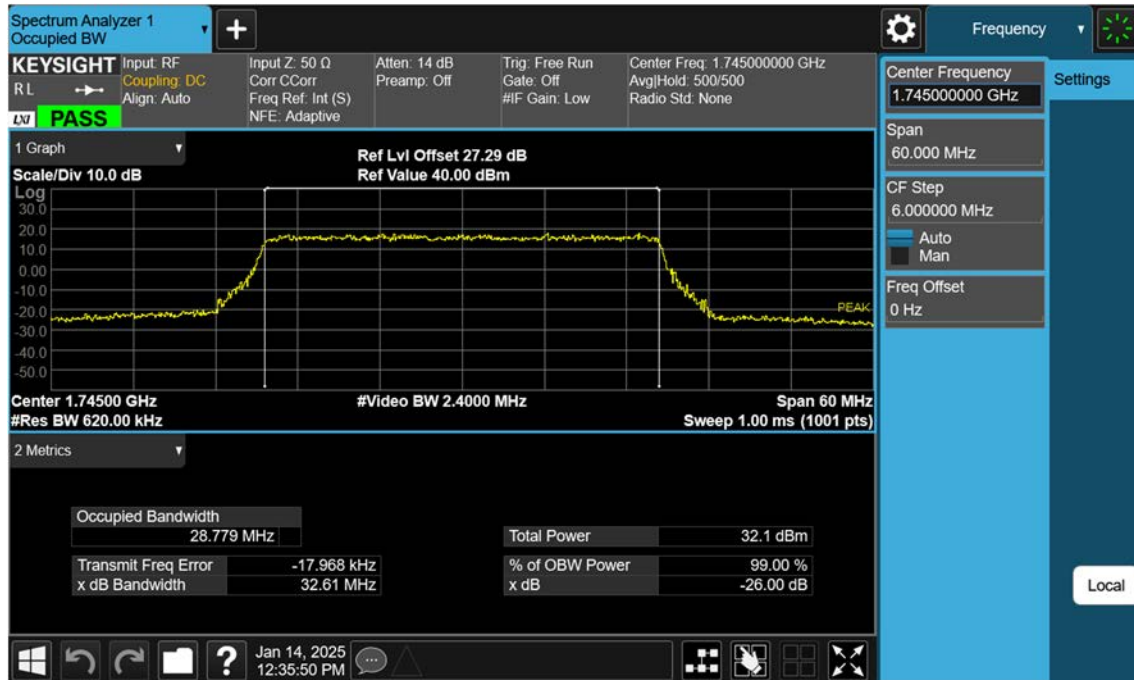
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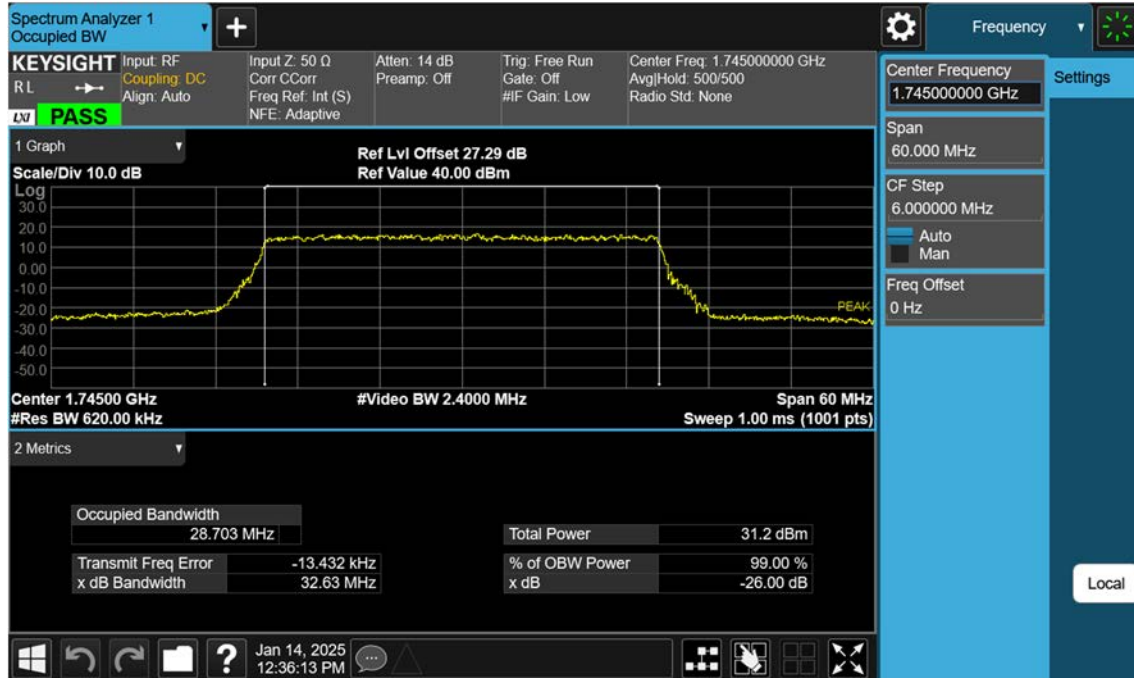
NR66_30 M_OBW_Mid_BPSK_FullRB



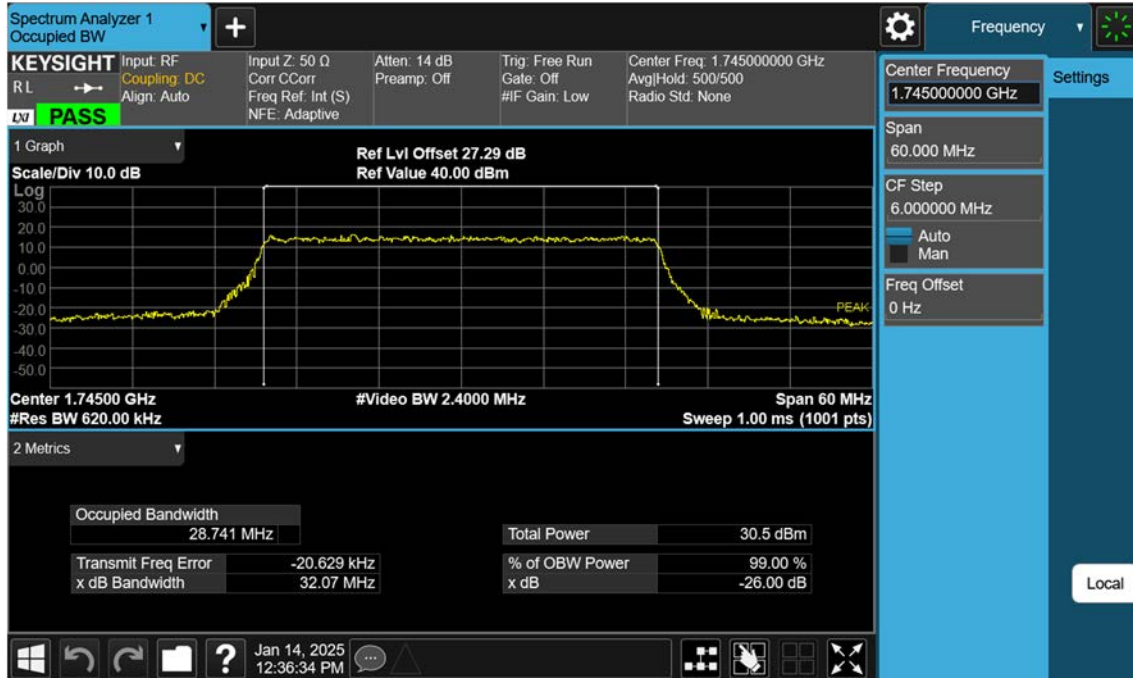
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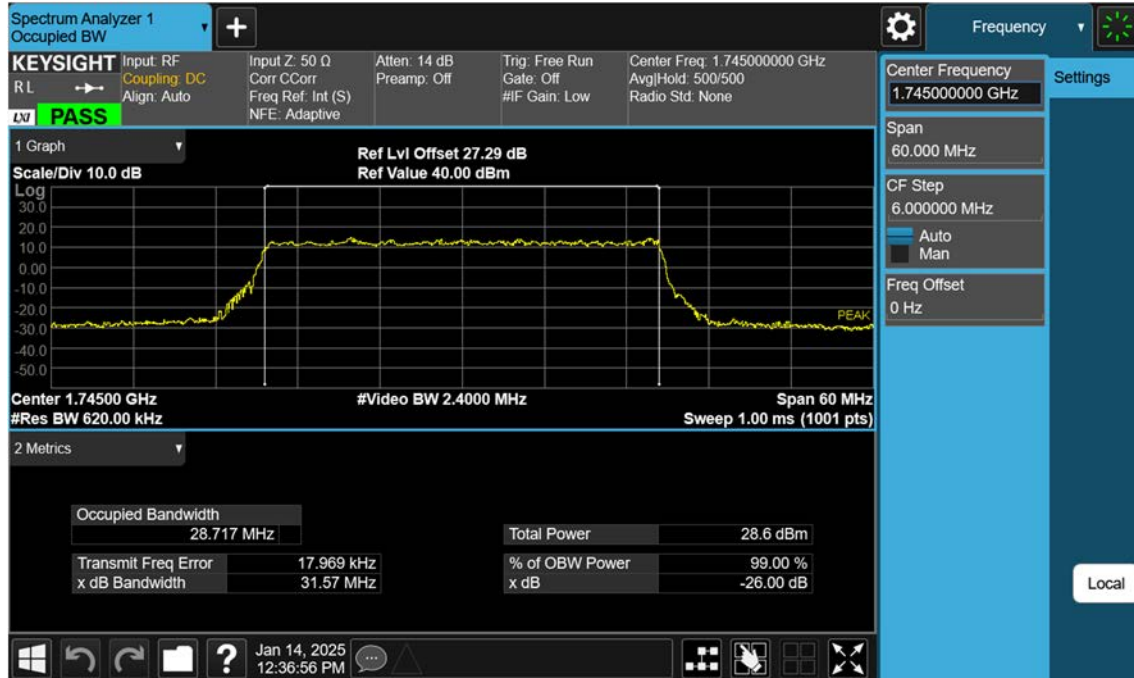
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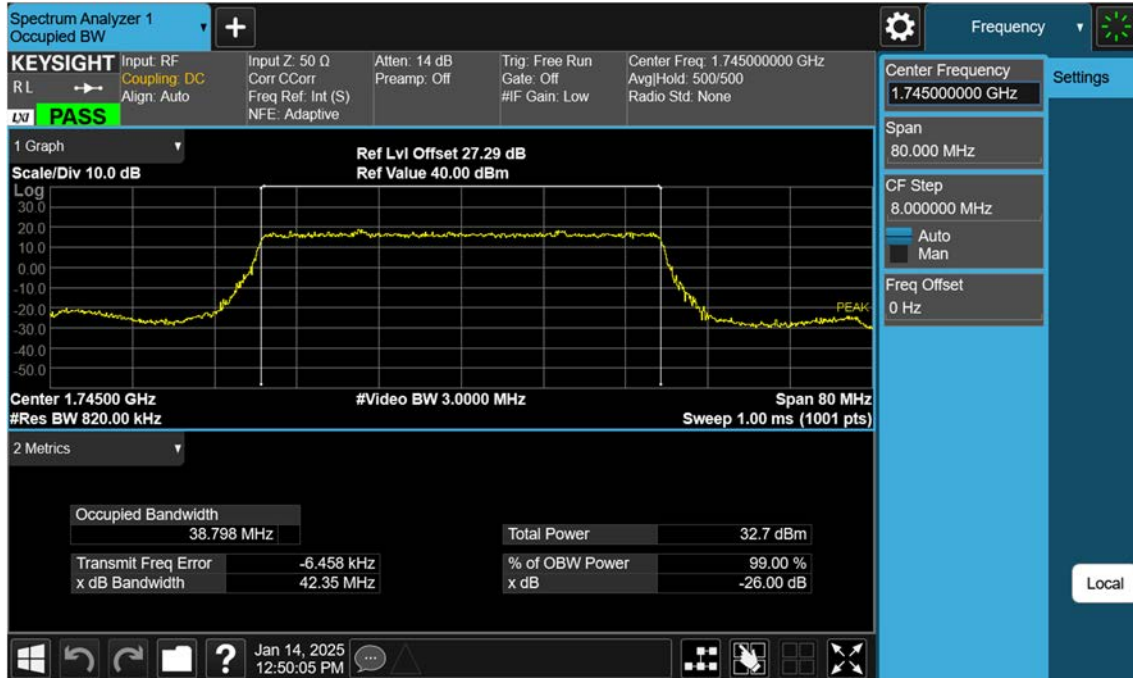
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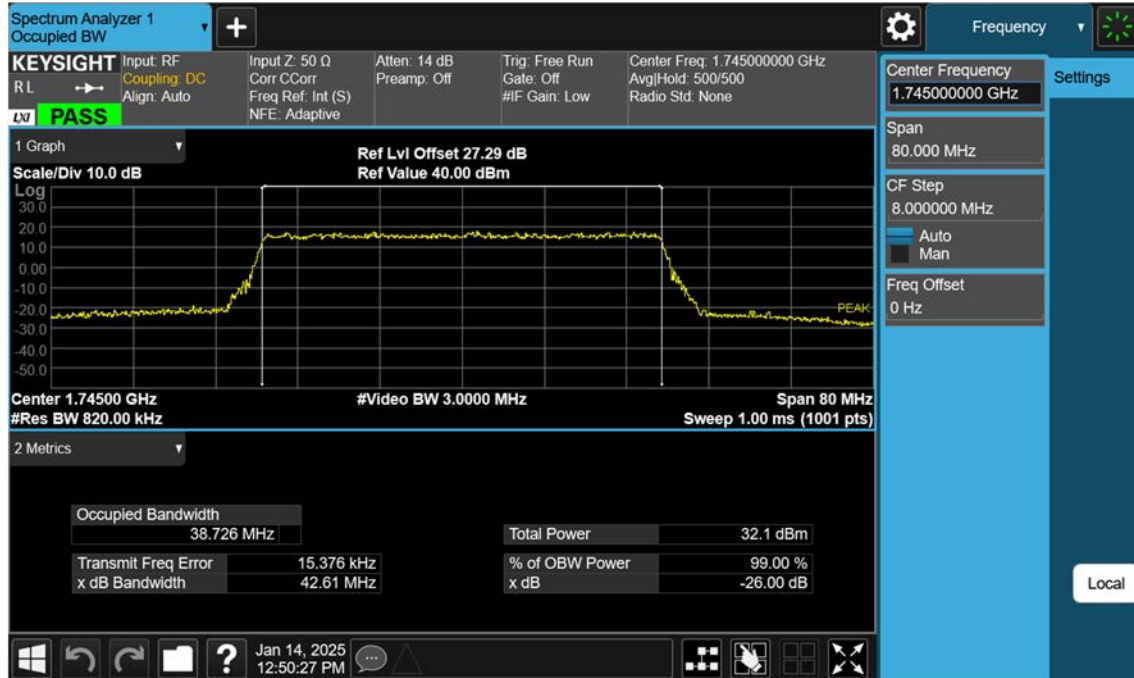
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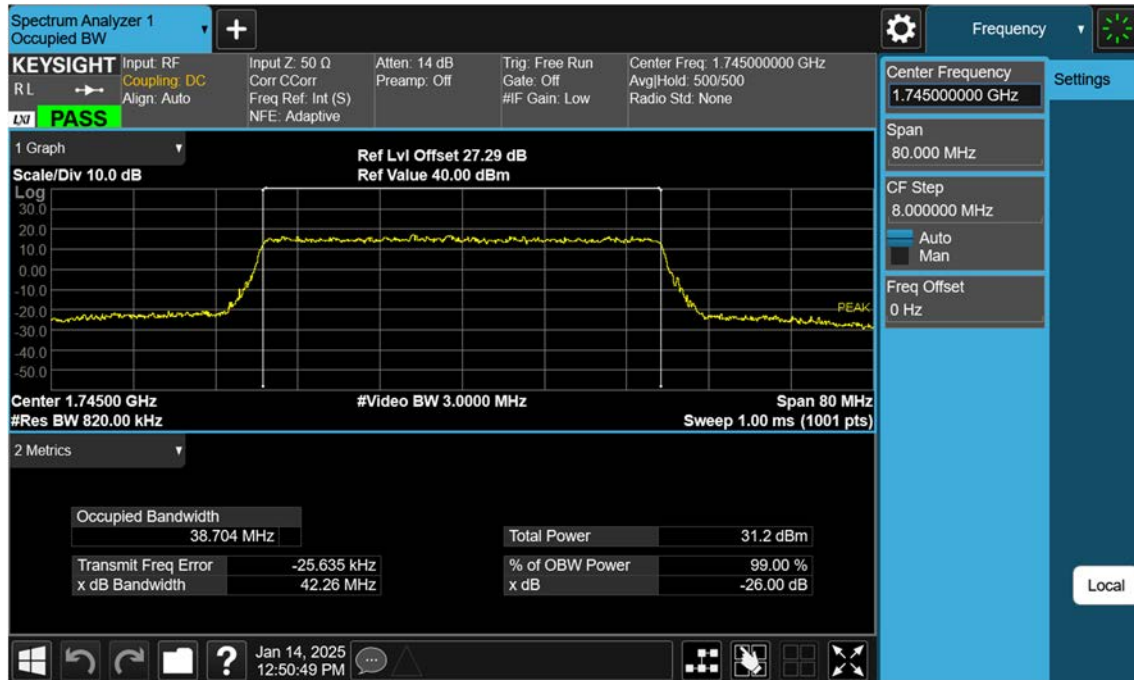
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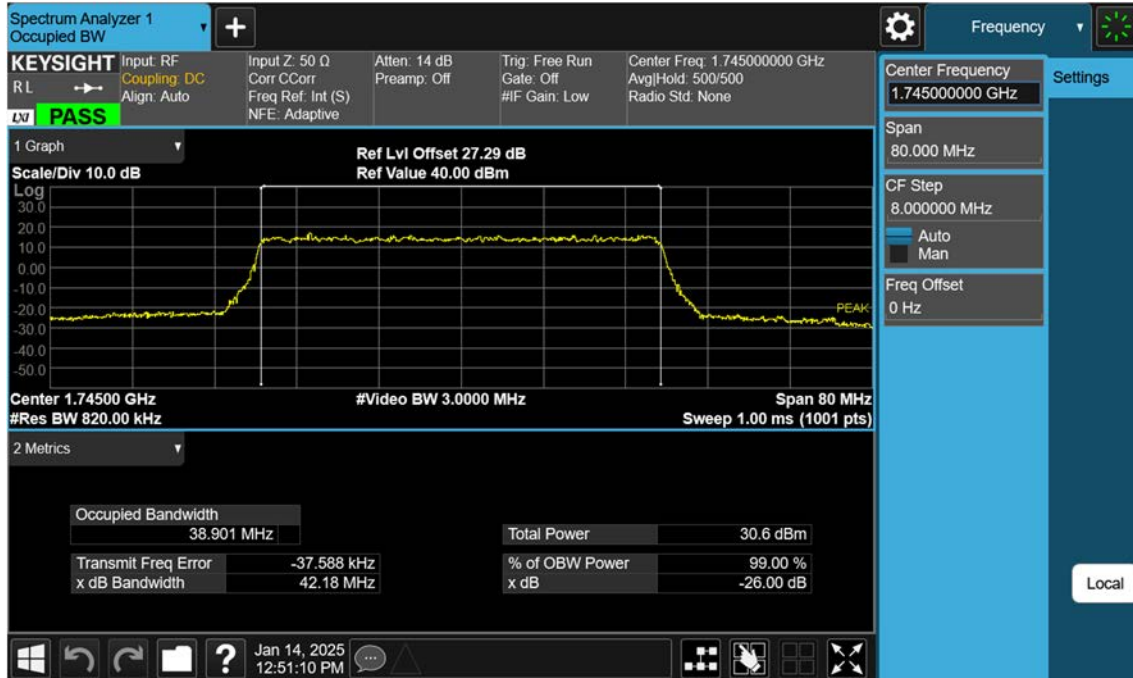
NR66_40 M_OBW_Mid_QPSK_FullRB



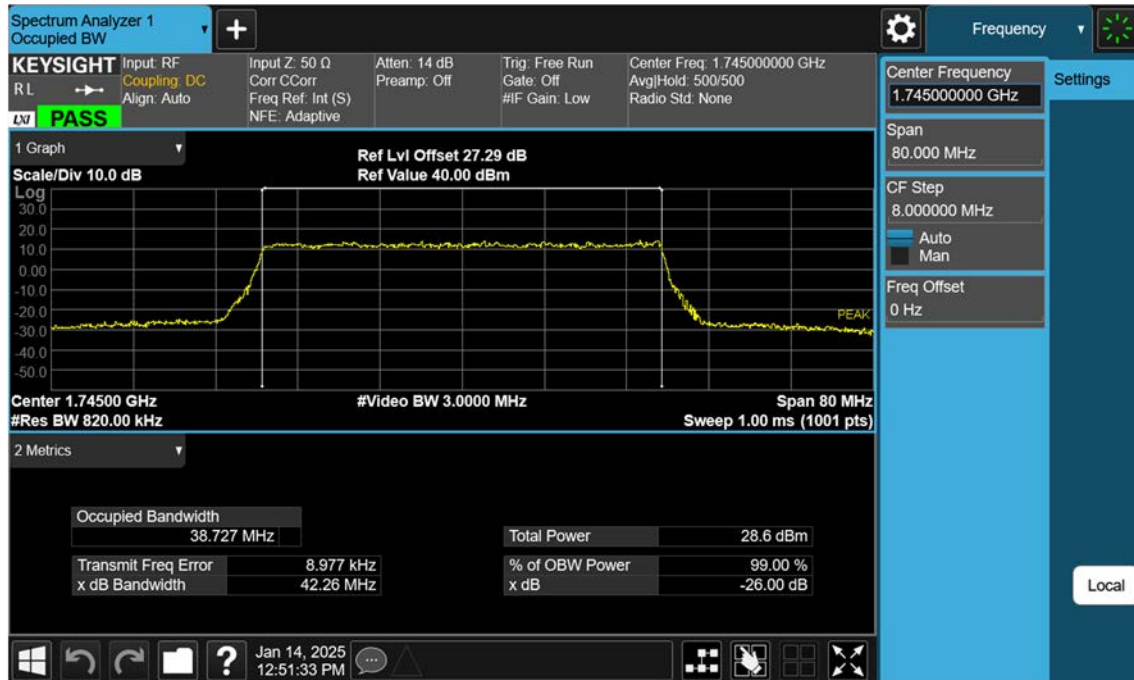
NR66_40 M_OBW_Mid_16QAM_FullRB



NR66_40 M_OBW_Mid_64QAM_FullRB



NR66_40 M_OBW_Mid_256QAM_FullRB



NR66_5 M_Conducted Spurious(30 M-10 G)_Low_BPSK_1RB

