TEST REPORT

FCC Sub6 n26(Part90) Test for SM-S721U
Certification

APPLICANT
SAMSUNG Electronics Co., Ltd.

REPORT NO.
HCT-RF-2407-FC030

DATE OF ISSUE
July 19, 2024

Tested by
Jin Woo Yu

Technical Manager
Jong Seok Lee

HCT CO., LTD.
BongJai Huh / CEO

HCT CO., LTD. 2-6, 73, 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA Tel. +82 31 645 6300 Fax. +82 31 645 6401

HCT CO.,LTD.
2-6, 73, 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
Tel. +82 31 645 6300 Fax. +82 31 645 6401

TEST REPORT

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Additional Model
SM-S721U1

Applicant	**SAMSUNG Electronics Co., Ltd.** 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Product Name Model Name	Mobile Phone SM-S721U
Date of Test	May 21, 2024 ~ July 19, 2024
FCC ID	A3LSMS721U
Location of Test	■ Permanent Testing Lab ☐ On Site Testing (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 Republic of Korea)
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Test Standard Used	FCC Rule Part: § 90, § 22
Test Results	PASS

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	July 19, 2024	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

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:	A3LSMS721U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§ 90, § 22
EUT Type:	Mobile phone
Model(s):	SM-S721U
Additional Model(s)	SM-S721U1
SCS(kHz):	15
Bandwidth(MHz):	5, 10, 15, 20
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:	816.5 MHz – 824.0 MHz (Sub6 n26 (5 MHz)) 819.0 MHz – 824.0 MHz (Sub6 n26 (10 MHz)) 821.5 MHz – 824.0 MHz (Sub6 n26 (15 MHz)) 824.0 MHz (Sub6 n26 (20 MHz))
Date(s) of Tests:	May 21, 2024 ~ July 19, 2024
Serial number:	Radiated : 67d50ecc63197ece Conducted : R3CX40SV7PD

1.1. MAXIMUM OUTPUT POWER

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	Conducted Output Power	
				Max. Power (W)	Max. Power (dBm)
Sub6 n26 (5)	816.5 – 824.0	4M64G7D	PI/2 BPSK	0.351	25.45
		4M63G7D	QPSK	0.346	25.39
		4M65W7D	16QAM	0.280	24.47
		4M64W7D	64QAM	0.187	22.71
		4M68W7D	256QAM	0.126	21.01
Sub6 n26 (10)	819.0 – 824.0	9M06G7D	PI/2 BPSK	0.356	25.52
		9M01G7D	QPSK	0.356	25.51
		9M03W7D	16QAM	0.265	24.24
		8M97W7D	64QAM	0.200	23.02
		8M97W7D	256QAM	0.128	21.06
Sub6 n26 (15)	821.5 – 824.0	13M7G7D	PI/2 BPSK	0.344	25.36
		13M5G7D	QPSK	0.342	25.35
		13M5W7D	16QAM	0.260	24.16
		13M5W7D	64QAM	0.197	22.94
		13M4W7D	256QAM	0.126	21.00
Sub6 n26 (20)	824.0	18M2G7D	PI/2 BPSK	0.349	25.43
		18M3G7D	QPSK	0.348	25.42
		18M2W7D	16QAM	0.255	24.06
		17M9W7D	64QAM	0.201	23.04
		17M9W7D	256QAM	0.101	20.05

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS and LTE, Sub 6, mmWave.
It also supports IEEE 802.11 a/b/g/n/ac/ax (20/40/80/160 MHz), Bluetooth(iPA, ePA), BT LE(iPA, ePA), NFC, WPT, WIFI 6E.

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, 17383, Rep. 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
Channel 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	- KDB 971168 D01 v03r01 - Section 5.2.4 - ANSI C63.26-2015 - Section 5.2.1 & 5.2.4.2
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 CONDUCTED OUTPUT POWER

Test Overview

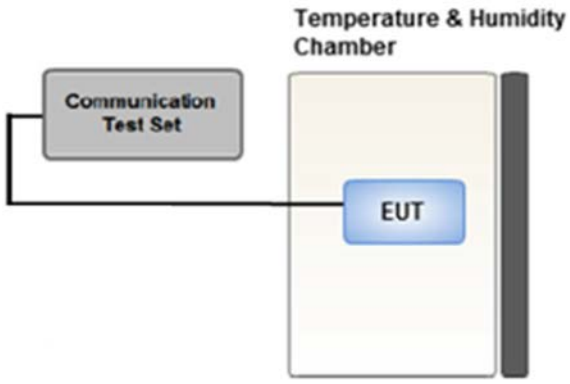
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base station emulator, communications test set, call box, or similar instrumentation that is capable of establishing a communications link with the EUT to enable control over variable parameters (e.g., output power, OBW, etc.).

In some cases, these instruments also include basic digital spectrum analyzer and/or power meter capabilities that can be utilized to measure the RF output power if the specified detectors and requirements can be realized and the measurement functions have been calibrated.

Test Procedure

1. The RF port of the EUT was connected to the Communication Tester via an RF cable.
2. Conducted average power was measured using a calibrated Radio Communication Tester.

Test setup



3.3 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 in accordance with ANSI/TIA-603-E-2016 Clause 2.2.17.

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.

3.4 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA-603-E-2016.

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;

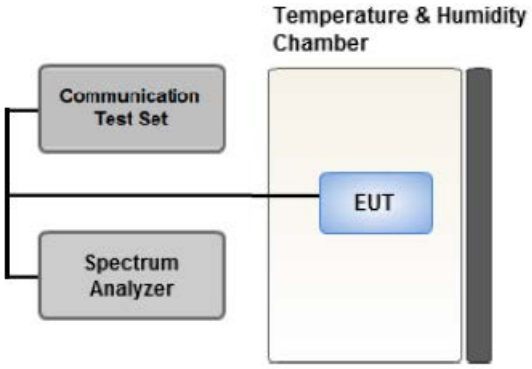
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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.

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

3.5 OCCUPIED BANDWIDTH.



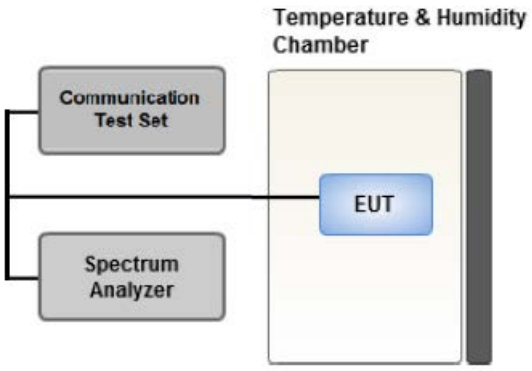
Test setup

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

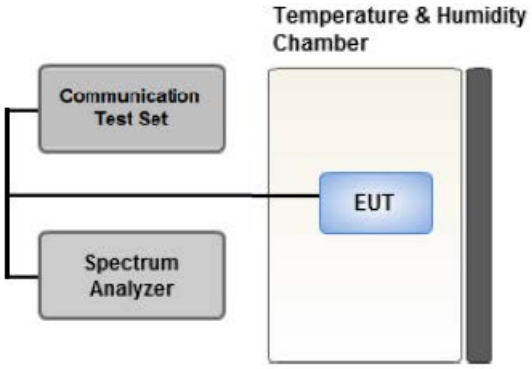
Test Overview

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 = RMS
4. Trace Mode = trace average
5. Sweep time = auto
6. Number of points in sweep ≥ 2 x Span / RBW

3.7 CHANNEL 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

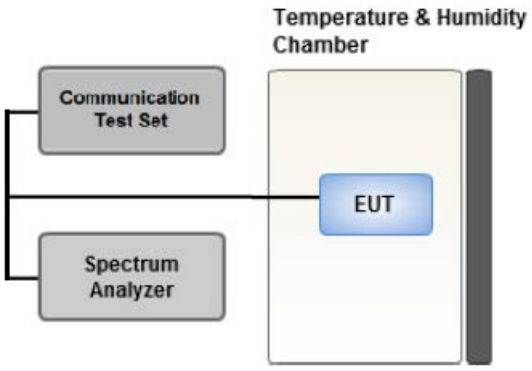
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW :
   .- EA licensee's frequency block by up to and including 37.5 kHz : 300 Hz
   .- EA licensee's frequency block greater than 37.5 kHz : 100 kHz
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

For 90.691(a), RBW=300 Hz for offset less than 37.5 kHz from channel edge and RBW=100 kHz for offsets greater than 37.5 kHz is allowed.

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)

- 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 Only
  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.
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- In the case of radiated spurious emissions, all bandwidth of operation was investigated and the worst case bandwidth results are reported. (Worst case : 5 MHz)
- SM-S721U & additional models were tested and the worst case results are reported.
  (Worst case : SM-S721U)

[Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Radiated Power	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	See Section 8.1		X
Radiated Spurious and Harmonic Emissions	PI/2 BPSK	See Section 8.1		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 Only.
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-S721U & additional models were tested and the worst case results are reported.
  (Worst case : SM-S721U)

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth	PI/2 BPSK QPSK, 16QAM, 64QAM, 256QAM	5	High	Full RB	0
	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	10, 15, 20	Mid	Full RB	0
Channel Edge	PI/2 BPSK,	5	Low	1	0
			High	1	24
		10	Mid	1	0
				1	51
		15	Mid	1	0
				1	78
		20	Mid	1	0
				1	105
		5	Low, High	Full RB	0
		10, 15, 20	Mid	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	PI/2 BPSK,	5	Low, High	1	1
		10, 15, 20	Mid	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	09/29/2024	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	01/16/2025	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/09/2025	Biennial
Hybrid Antenna	VULB9160	Schwarzbeck	760	02/24/2025	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	11/17/2024	Annual
Power Amplifier	CBL26405040	CERNEX	25956	02/26/2025	Annual
DC Power Supply	E3632A	Hewlett Packard	MY40004427	08/25/2024	Annual
Power Splitter(DC~26.5 GHz)	11667B	Hewlett Packard	11275	02/29/2025	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	02/13/2025	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/10/2024	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	09/19/2024	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 (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.98 (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
Channel Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§ 2.1051, § 90.691	< 50 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions within 37.5 kHz of Block Edge	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§ 2.1051, § 22.917(a)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§ 2.1046 § 90.635	< 100 Watts	PASS
Frequency stability / variation of ambient temperature	§ 2.1055, § 90.213 § 22.355	< 2.5 ppm	PASS

6.2 Test Condition: Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Effective Radiated Power	§ 22.913(a)(5)	< 7 Watts max. ERP (Only 15,20 MHz B.W & Straddle C.H)	PASS
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 90.691 § 22.917(a)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

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 CONDUCTED OUTPUT POWER

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)						Limit (W)
				816.5 MHz		821.5 MHz		824.0 MHz		
				dBm	W	dBm	W	dBm	W	
5	BPSK	1	1	25.36	0.344	25.45	0.351	25.40	0.347	100
		1	13	24.98	0.315	25.25	0.335	25.32	0.341	100
		1	23	25.12	0.325	25.39	0.346	25.35	0.343	100
		12	0	24.75	0.298	24.76	0.299	24.77	0.300	100
		12	7	25.23	0.334	25.32	0.341	25.35	0.343	100
		12	13	24.68	0.294	24.83	0.304	24.77	0.300	100
		25	0	24.79	0.301	24.78	0.300	24.87	0.307	100
	QPSK	1	1	25.33	0.341	25.37	0.344	25.39	0.346	100
		1	13	25.04	0.319	25.30	0.339	25.16	0.328	100
		1	23	25.34	0.342	25.33	0.341	25.33	0.341	100
		12	0	24.16	0.260	24.28	0.268	24.28	0.268	100
		12	7	25.18	0.329	25.31	0.340	25.31	0.340	100
		12	13	24.21	0.263	24.35	0.272	24.38	0.274	100
		25	0	24.24	0.265	24.30	0.269	24.38	0.274	100
	16QAM	1	1	23.91	0.246	24.47	0.280	24.28	0.268	100
	64QAM	1	1	22.71	0.187	22.26	0.168	22.53	0.179	100
	256QAM	1	1	20.85	0.122	21.01	0.126	20.98	0.125	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)				Limit (W)
				819.0 MHz		824.0 MHz		
				dBm	W	dBm	W	
10	BPSK	1	1	25.52	0.356	25.42	0.348	100
		1	26	25.46	0.352	25.40	0.346	100
		1	50	25.30	0.339	25.34	0.342	100
		25	0	24.68	0.294	24.80	0.302	100
		25	14	25.27	0.336	25.35	0.343	100
		25	27	24.73	0.297	24.91	0.310	100
		50	0	24.78	0.300	24.86	0.306	100
	QPSK	1	1	25.51	0.356	25.40	0.347	100
		1	26	25.50	0.355	25.39	0.346	100
		1	50	25.48	0.353	25.04	0.319	100
		25	0	24.26	0.267	24.32	0.270	100
		25	14	25.21	0.332	25.38	0.345	100
		25	27	24.33	0.271	24.32	0.270	100
		50	0	24.30	0.269	24.28	0.268	100
	16QAM	1	1	24.24	0.265	24.06	0.255	100
	64QAM	1	1	23.02	0.200	22.41	0.174	100
	256QAM	1	1	20.58	0.114	21.06	0.128	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)				Limit (W)
				821.5 MHz		824.0 MHz		
				dBm	W	dBm	W	
15	BPSK	1	1	25.32	0.341	25.36	0.344	100
		1	40	25.27	0.337	25.28	0.337	100
		1	77	25.31	0.340	25.33	0.341	100
		36	0	24.86	0.306	24.87	0.307	100
		36	22	25.29	0.338	25.35	0.343	100
		36	43	24.82	0.304	24.76	0.300	100
		75	0	24.86	0.306	24.87	0.307	100
	QPSK	1	1	25.31	0.340	25.35	0.342	100
		1	40	25.13	0.326	25.34	0.342	100
		1	77	25.31	0.340	25.31	0.339	100
		36	0	24.23	0.265	24.35	0.273	100
		36	22	25.24	0.334	25.27	0.336	100
		36	43	24.33	0.271	24.27	0.268	100
		75	0	24.36	0.273	24.26	0.267	100
	16QAM	1	1	23.82	0.241	24.16	0.260	100
	64QAM	1	1	22.92	0.196	22.94	0.197	100
	256QAM	1	1	20.76	0.119	21.00	0.126	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824.0 MHz		
				dBm	W	
20	BPSK	1	1	25.43	0.349	100
		1	53	25.25	0.335	100
		1	104	25.27	0.337	100
		50	0	24.80	0.302	100
		50	28	25.32	0.340	100
		50	56	24.78	0.301	100
		100	0	24.78	0.300	100
	QPSK	1	1	25.37	0.344	100
		1	53	25.41	0.348	100
		1	104	25.42	0.348	100
		50	0	24.33	0.271	100
		50	28	25.35	0.343	100
		50	56	24.39	0.275	100
		100	0	24.35	0.272	100
	16QAM	1	1	24.06	0.255	100
	64QAM	1	1	23.04	0.201	100
	256QAM	1	1	20.05	0.101	100

8.2 EFFECTIVE RADIATED POWER

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
816.5	Sub6 n26 5 MHz [15 kHz]	PI/2 BPSK	-30.47	30.27	-10.05	1.38	H	< 100	0.077	18.84	1	12
		QPSK	-30.61	30.13	-10.05	1.38	H		0.074	18.70		
		16-QAM	-31.65	29.09	-10.05	1.38	H		0.058	17.66		
		64-QAM	-33.07	27.67	-10.05	1.38	H		0.042	16.24		
		256-QAM	-35.09	25.65	-10.05	1.38	H		0.026	14.22		
821.5		PI/2 BPSK	-30.29	30.63	-10.05	1.38	H		0.083	19.20	1	12
		QPSK	-30.35	30.57	-10.05	1.38	H		0.082	19.14		
		16-QAM	-31.33	29.59	-10.05	1.38	H		0.065	18.16		
		64-QAM	-32.80	28.12	-10.05	1.38	H		0.047	16.69		
		256-QAM	-34.76	26.16	-10.05	1.38	H		0.030	14.73		
824.0		PI/2 BPSK	-30.11	30.79	-10.05	1.38	H	< 7.00	0.086	19.36	1	12
		QPSK	-30.25	30.65	-10.05	1.38	H		0.084	19.22		
		16-QAM	-31.25	29.65	-10.05	1.38	H		0.066	18.22		
		64-QAM	-32.72	28.18	-10.05	1.38	H		0.047	16.75		
		256-QAM	-34.69	26.21	-10.05	1.38	H		0.030	14.78		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
819.0	Sub6 n26 10 MHz [15 kHz]	PI/2 BPSK	-30.31	30.43	-10.05	1.38	H	< 100	0.080	19.00	1	12
		QPSK	-30.35	30.39	-10.05	1.38	H		0.079	18.96		
		16-QAM	-31.32	29.42	-10.05	1.38	H		0.063	17.99		
		64-QAM	-32.77	27.97	-10.05	1.38	H		0.045	16.54		
		256-QAM	-34.82	25.92	-10.05	1.38	H		0.028	14.49		
824.0		PI/2 BPSK	-30.19	30.71	-10.05	1.38	H	< 7.00	0.085	19.28	1	50
		QPSK	-30.30	30.60	-10.05	1.38	H		0.083	19.17		
		16-QAM	-31.22	29.68	-10.05	1.38	H		0.067	18.25		
		64-QAM	-32.67	28.23	-10.05	1.38	H		0.048	16.80		
		256-QAM	-34.61	26.29	-10.05	1.38	H		0.031	14.86		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
821.5	Sub6 n26 15 MHz [15 kHz]	PI/2 BPSK	-30.14	30.78	-10.05	1.38	H	< 7.00	0.086	19.35	1	77
		QPSK	-30.20	30.72	-10.05	1.38	H		0.085	19.29		
		16-QAM	-31.18	29.74	-10.05	1.38	H		0.068	18.31		
		64-QAM	-32.67	28.25	-10.05	1.38	H		0.048	16.82		
		256-QAM	-34.65	26.27	-10.05	1.38	H		0.030	14.84		
824.0		PI/2 BPSK	-30.14	30.76	-10.05	1.38	H		0.086	19.33	1	77
		QPSK	-30.16	30.74	-10.05	1.38	H		0.085	19.31		
		16-QAM	-31.08	29.82	-10.05	1.38	H		0.069	18.39		
		64-QAM	-32.61	28.29	-10.05	1.38	H		0.049	16.86		
		256-QAM	-34.66	26.24	-10.05	1.38	H		0.030	14.81		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP		RB	
								W	W	dBm	Size	Offset
824.0	Sub6 n26 20 MHz [15 kHz]	PI/2 BPSK	-30.14	30.76	-10.05	1.38	H	< 7.00	0.086	19.33	1	104
		QPSK	-30.16	30.74	-10.05	1.38	H		0.085	19.31		
		16-QAM	-31.20	29.70	-10.05	1.38	H		0.067	18.27		
		64-QAM	-32.60	28.30	-10.05	1.38	H		0.049	16.87		
		256-QAM	-34.48	26.42	-10.05	1.38	H		0.032	14.99		

8.3 RADIATED SPURIOUS EMISSIONS

▣ NR Band: N26

▣ Bandwidth: 5 MHz

▣ Modulation: PI/2 BPSK

▣ Distance: 3 meters

▣ SCS: 15 kHz

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)	RB	
									Size	Offset
163300 (816.5)	1 633.00	-57.52	9.20	-66.43	2.03	V	-59.26	-13.00	1	12
	2 449.50	-60.50	10.20	-63.75	2.45	V	-56.00	-13.00		
	3 266.00	-61.18	10.90	-63.22	2.92	V	-55.24	-13.00		
164300 (821.5)	1 643.00	-58.99	9.40	-67.61	2.00	V	-60.21	-13.00	1	12
	2 464.50	-60.48	10.30	-65.31	2.52	V	-57.53	-13.00		
	3 286.00	-60.91	11.00	-63.39	2.94	V	-55.33	-13.00		
164800 (824.0)	1 648.00	-58.03	9.20	-67.02	2.02	V	-59.84	-13.00	1	12
	2 472.00	-59.09	10.20	-63.23	2.49	V	-55.52	-13.00		
	3 296.00	-59.75	10.75	-62.10	2.91	V	-54.26	-13.00		

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Band 26	5 MHz	821.5	BPSK	25	0	4.6383
			QPSK			4.6341
			16QAM			4.6460
			64QAM			4.6377
			256QAM			4.6842
	10 MHz	819.0	BPSK	50		9.0644
			QPSK			9.0070
			16QAM			9.0258
			64QAM			8.9743
			256QAM			8.9678
	15 MHz	## 821.5	BPSK	75		13.645
			QPSK			13.482
			16QAM			13.461
			64QAM			13.475
			256QAM			13.435
	20 MHz	## 824.0	BPSK	100		18.178
			QPSK			18.267
			16QAM			18.222
			64QAM			17.926
			256QAM			17.892

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 41 ~ 60.
2. ##: Straddle Channel
3. Straddle channel does not exceed the Part22 and Part90 limits.

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)
26	5	816.5	8.3001	30.015	-74.257	-44.242	-13.00
		821.5	3.7922	29.400	-74.554	-45.154	
		## 824.0	4.9088	29.400	-74.016	-44.616	
	10	819.0	5.2019	30.015	-73.808	-43.793	
		## 824.0	3.7473	29.400	-73.334	-43.934	
	15	## 821.5	5.1820	30.015	-74.011	-43.996	
		## 824.0	6.0265	30.015	-74.776	-44.761	
	20	## 824.0	6.0409	30.015	-75.593	-45.578	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 87 ~ 94.
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	26.694
1 – 5	29.400
5 – 10	30.015
10 – 15	30.540
15 – 20	30.913
Above 20	31.555

5. ##: Straddle Channel
6. Straddle channel does not exceed the Part22 and Part90 limit

8.6 CHANNEL EDGE (Part90)

- Test Channel : 164800(824.0MHz)
- Plots of the EUT's Band Edge are shown Page 61 ~ 76.

8.7 BAND EDGE(Part22)

- Test Channel : 164800(824.0 MHz)
- Plots of the EUT's Band Edge are shown Page 77 ~ 86.

8.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ BandWidth: 5 MHz

▣ Voltage(100 %): 3.880 VDC

▣ Batt. Endpoint: 3.300 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)	
821.5	100 %	+20(Ref)	821 500 001	0.0	0.000 000	0.000
	100 %	-30	821 500 002	0.8	0.000 000	0.001
	100 %	-20	821 499 952	-48.4	-0.000 006	-0.059
	100 %	-10	821 500 002	0.7	0.000 000	0.001
	100 %	0	821 499 917	-83.4	-0.000 010	-0.102
	100 %	+10	821 500 001	0.2	0.000 000	0.000
	100 %	+30	821 500 001	0.4	0.000 000	0.000
	100 %	+40	821 500 001	0.4	0.000 000	0.000
	100 %	+50	821 499 927	-73.8	-0.000 009	-0.090
	Batt. Endpoint	+20	821 500 001	0.1	0.000 000	0.000

▣ BandWidth: 10 MHz

▣ Voltage(100 %): 3.880 VDC

▣ Batt. Endpoint: 3.300 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)	
819.0	100 %	+20(Ref)	818 999 999	0.0	0.000 000	0.000
	100 %	-30	818 999 998	-0.5	0.000 000	-0.001
	100 %	-20	818 999 998	-0.9	0.000 000	-0.001
	100 %	-10	818 999 998	-0.8	0.000 000	-0.001
	100 %	0	818 999 999	-0.4	0.000 000	0.000
	100 %	+10	818 999 999	-0.4	0.000 000	0.000
	100 %	+30	818 999 998	-0.7	0.000 000	-0.001
	100 %	+40	818 999 999	-0.4	0.000 000	-0.001
	100 %	+50	818 999 999	-0.4	0.000 000	-0.001
	Batt. Endpoint	+20	818 999 998	-0.7	0.000 000	-0.001

▣ BandWidth: 15 MHz

▣ Voltage(100 %): 3.880 VDC

▣ Batt. Endpoint: 3.300 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)	
## 821.5	100 %	+20(Ref)	821 500 000	0.0	0.000 000	0.000
	100 %	-30	821 500 001	0.2	0.000 000	0.000
	100 %	-20	821 500 000	-0.6	0.000 000	-0.001
	100 %	-10	821 500 000	-0.3	0.000 000	0.000
	100 %	0	821 500 000	-0.4	0.000 000	0.000
	100 %	+10	821 500 000	-0.5	0.000 000	-0.001
	100 %	+30	821 500 001	0.6	0.000 000	0.001
	100 %	+40	821 500 000	-0.2	0.000 000	0.000
	100 %	+50	821 500 000	-0.3	0.000 000	0.000
	Batt. Endpoint	+20	821 500 000	-0.4	0.000 000	0.000

Note:

1. ##: Straddle Channel

2. Straddle channel does not exceed the Part22 and Part90 limits.

▣ BandWidth: 20 MHz

▣ Voltage(100 %): 3.880 VDC

▣ Batt. Endpoint: 3.300 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy	Voltage	Temp.	Frequency	Frequency Error	Deviation	ppm
(MHz)	(%)	(°C)	(Hz)	(Hz)	(%)	
## 824.0	100 %	+20(Ref)	824 000 055	0.0	0.000 000	0.000
	100 %	-30	824 000 055	-0.3	0.000 000	0.000
	100 %	-20	824 000 055	-0.1	0.000 000	0.000
	100 %	-10	824 000 055	-0.4	0.000 000	-0.001
	100 %	0	824 000 055	-0.5	0.000 000	-0.001
	100 %	+10	824 000 055	-0.6	0.000 000	-0.001
	100 %	+30	824 000 055	-0.4	0.000 000	0.000
	100 %	+40	824 000 055	-0.5	0.000 000	-0.001
	100 %	+50	824 000 055	-0.3	0.000 000	0.000
	Batt. Endpoint	+20	824 000 055	-0.3	0.000 000	0.000

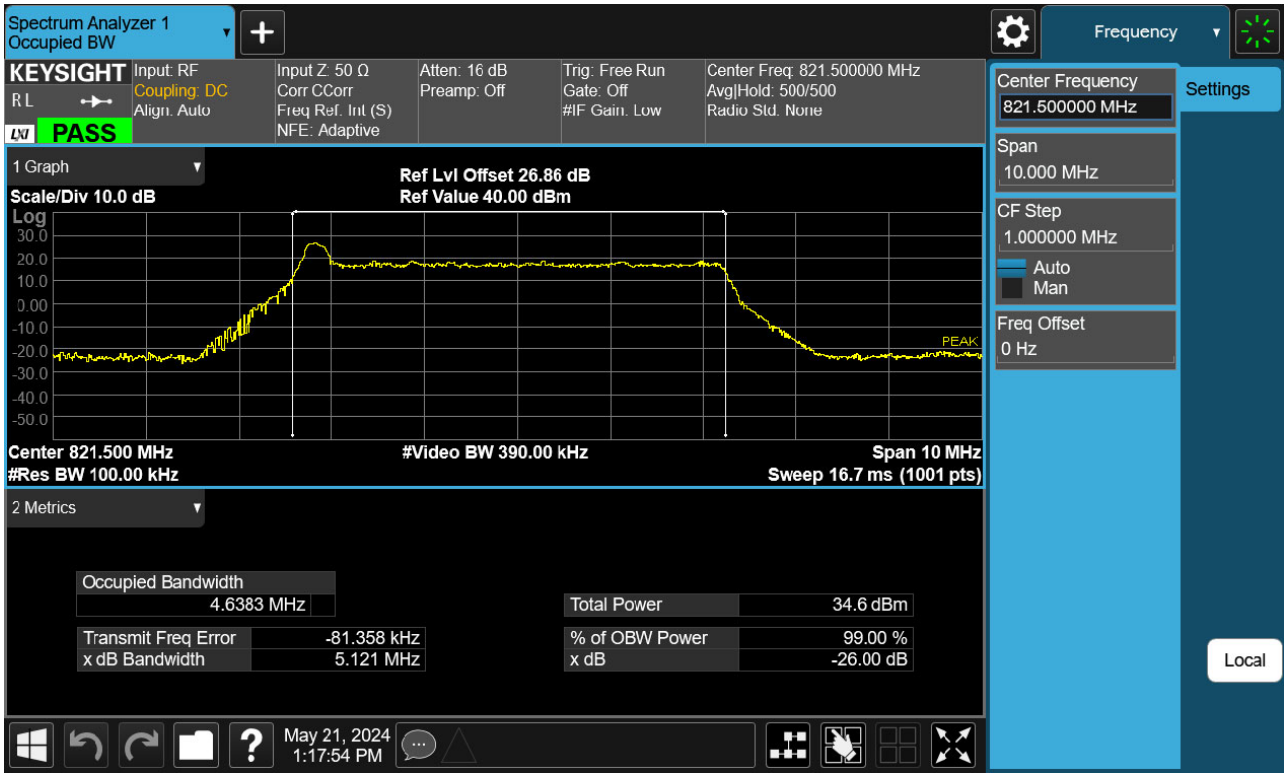
Note:

1. ##: Straddle Channel

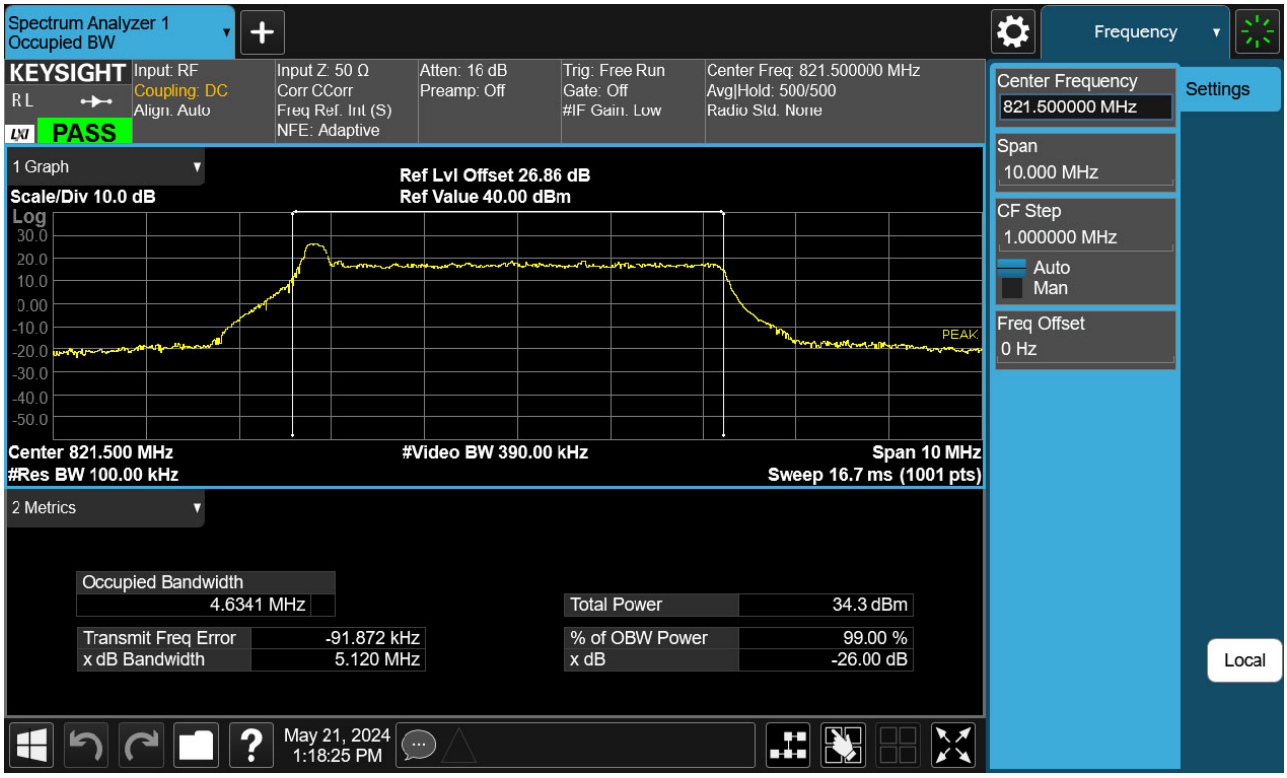
2. Straddle channel does not exceed the Part22 and Part90 limits.

9. TEST PLOTS

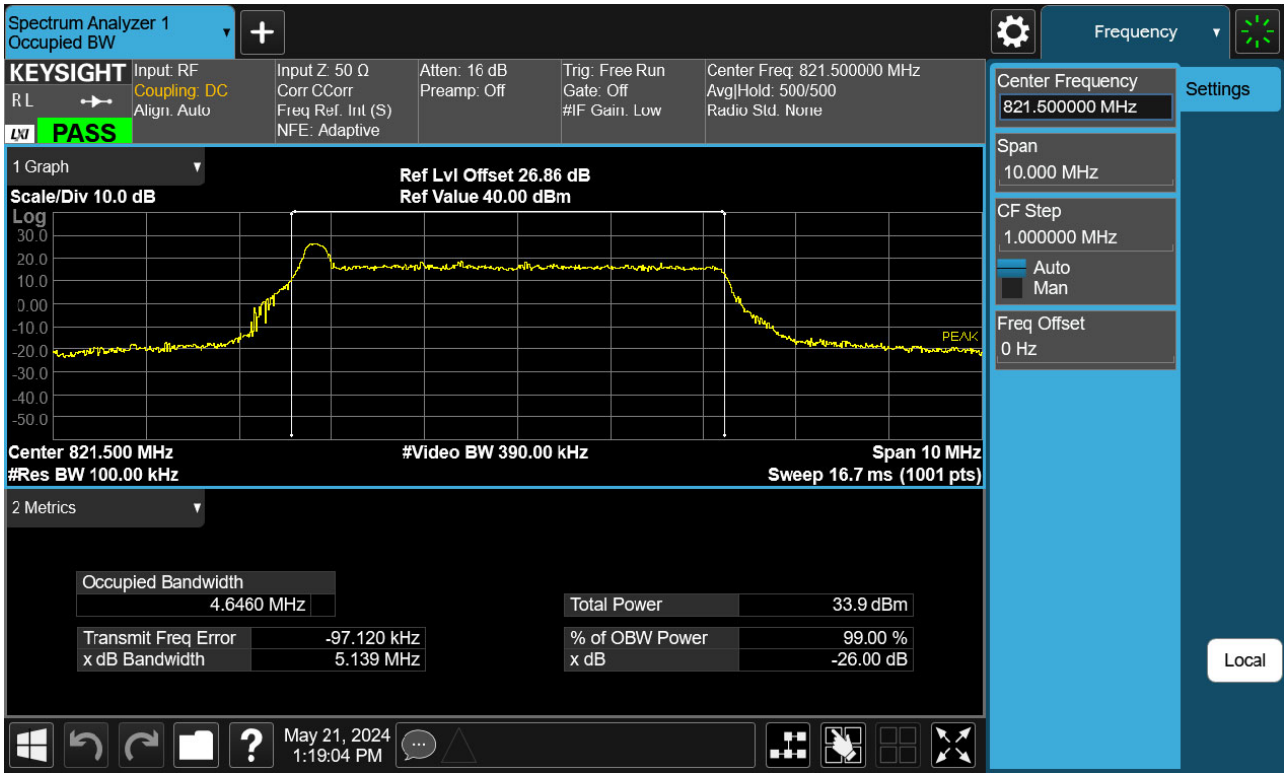
Sub6 n26. Occupied Bandwidth Plot (5 M BW Ch.164300 BPSK RB 25_0)



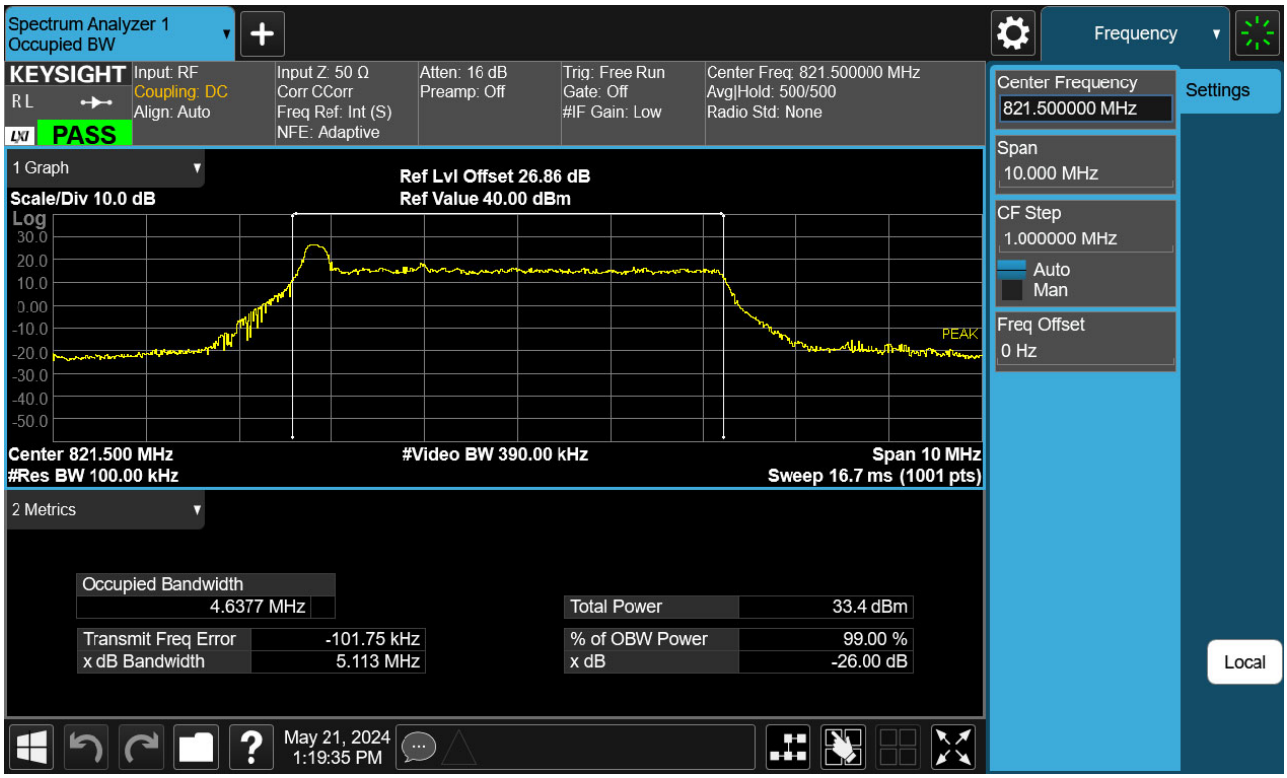
Sub6 n26. Occupied Bandwidth Plot (5 M BW Ch.164300 QPSK RB 25_0)



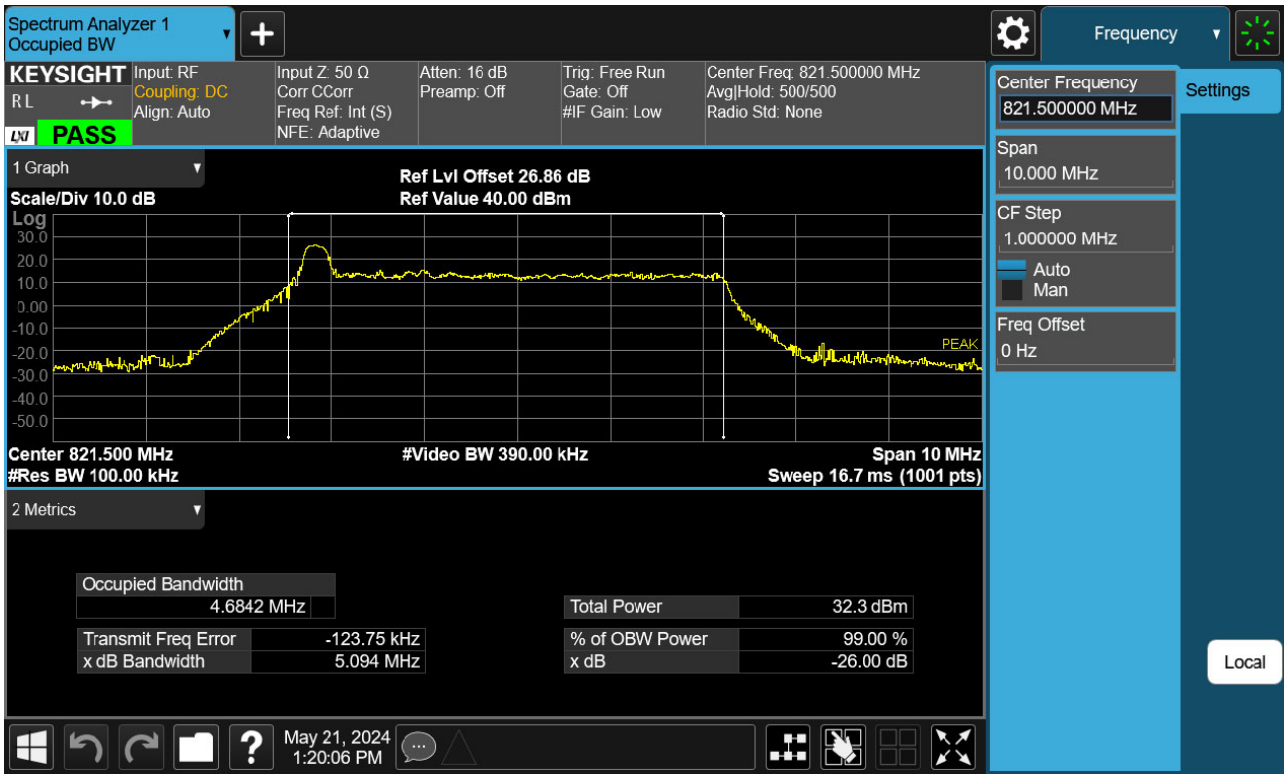
Sub6 n26. Occupied Bandwidth Plot (5 M BW Ch.164300 16QAM RB 25_0)



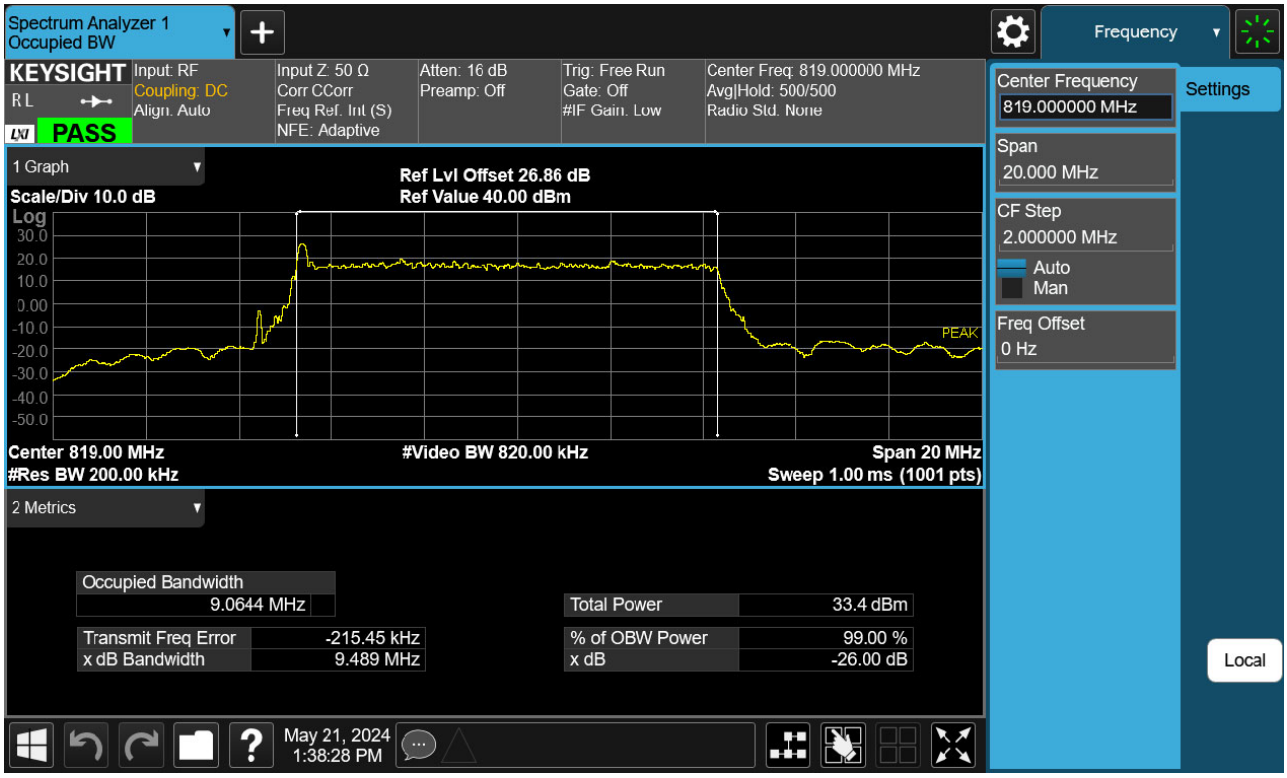
Sub6 n26. Occupied Bandwidth Plot (5 M BW Ch.164300 64QAM RB 25_0)



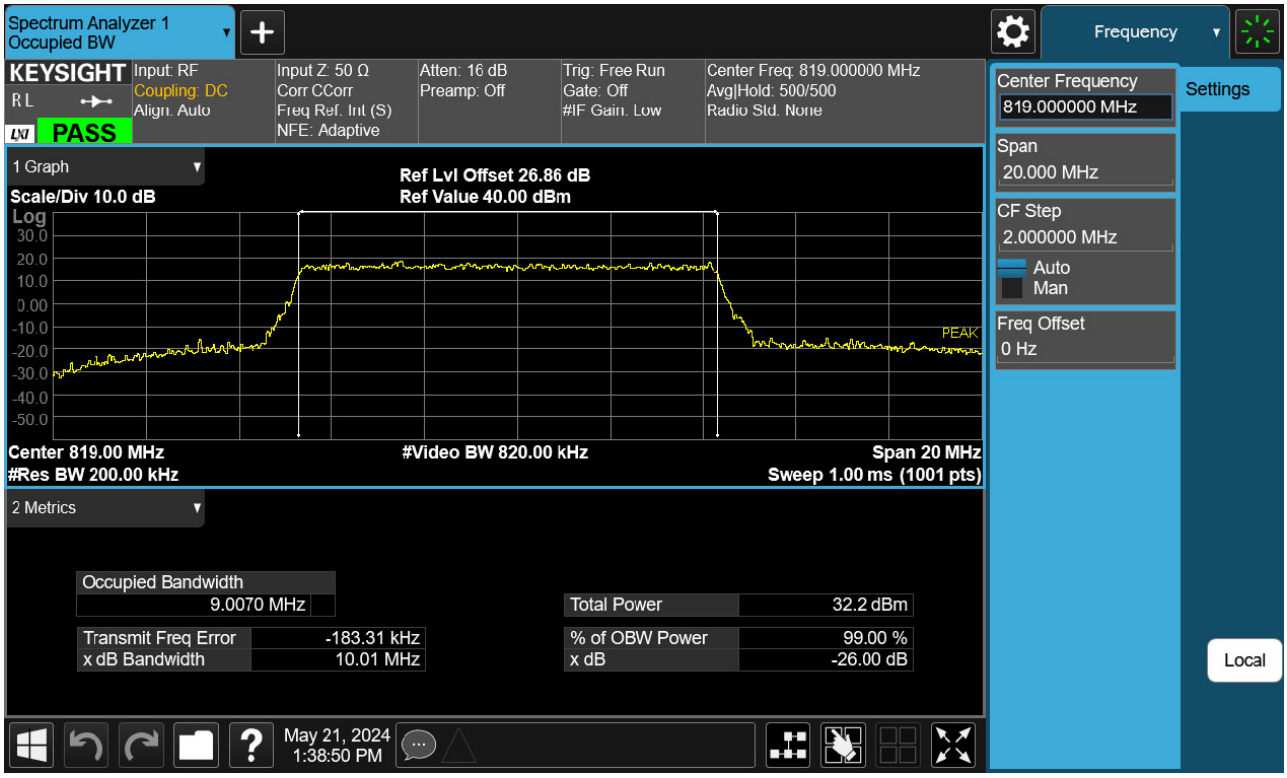
Sub6 n26. Occupied Bandwidth Plot (5 M BW Ch.164300 256QAM RB 25_0)



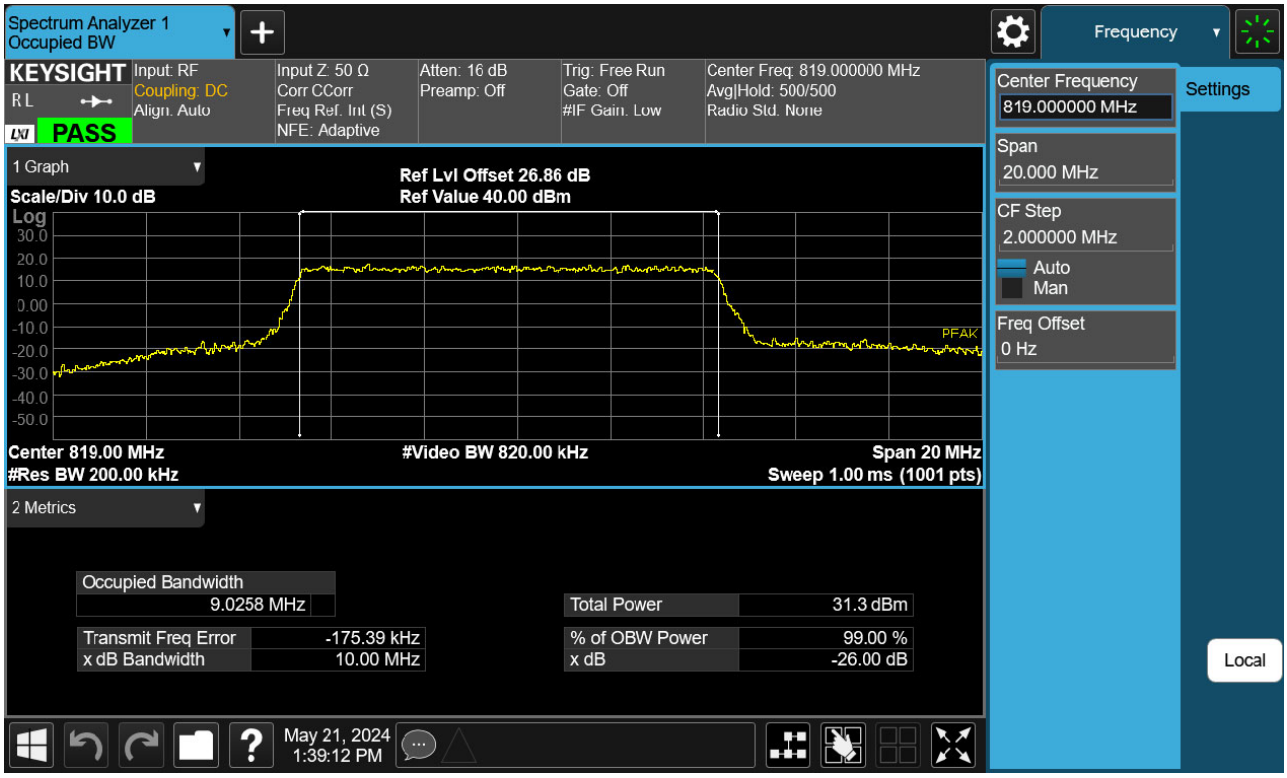
Sub6 n26. Occupied Bandwidth Plot (10 M BW Ch.163800 BPSK RB 50_0)



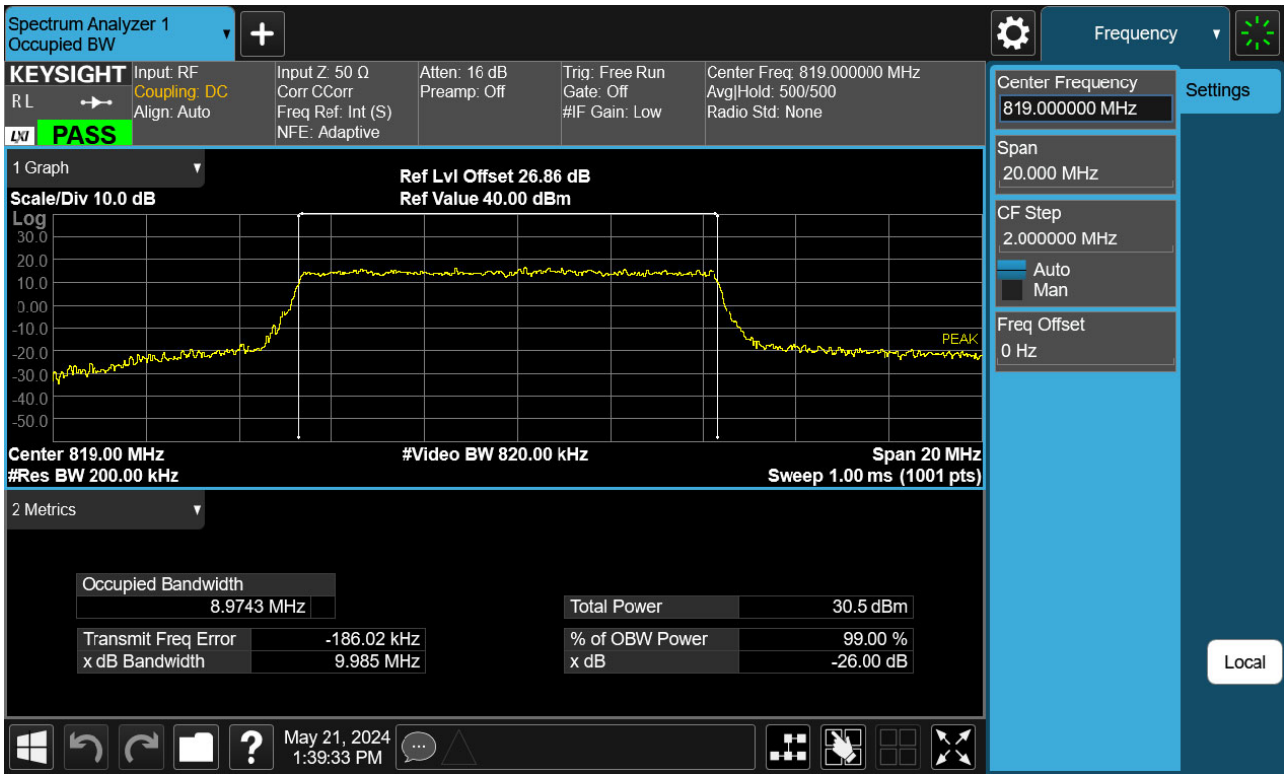
Sub6 n26. Occupied Bandwidth Plot (10 M BW Ch.163800 QPSK RB 50_0)



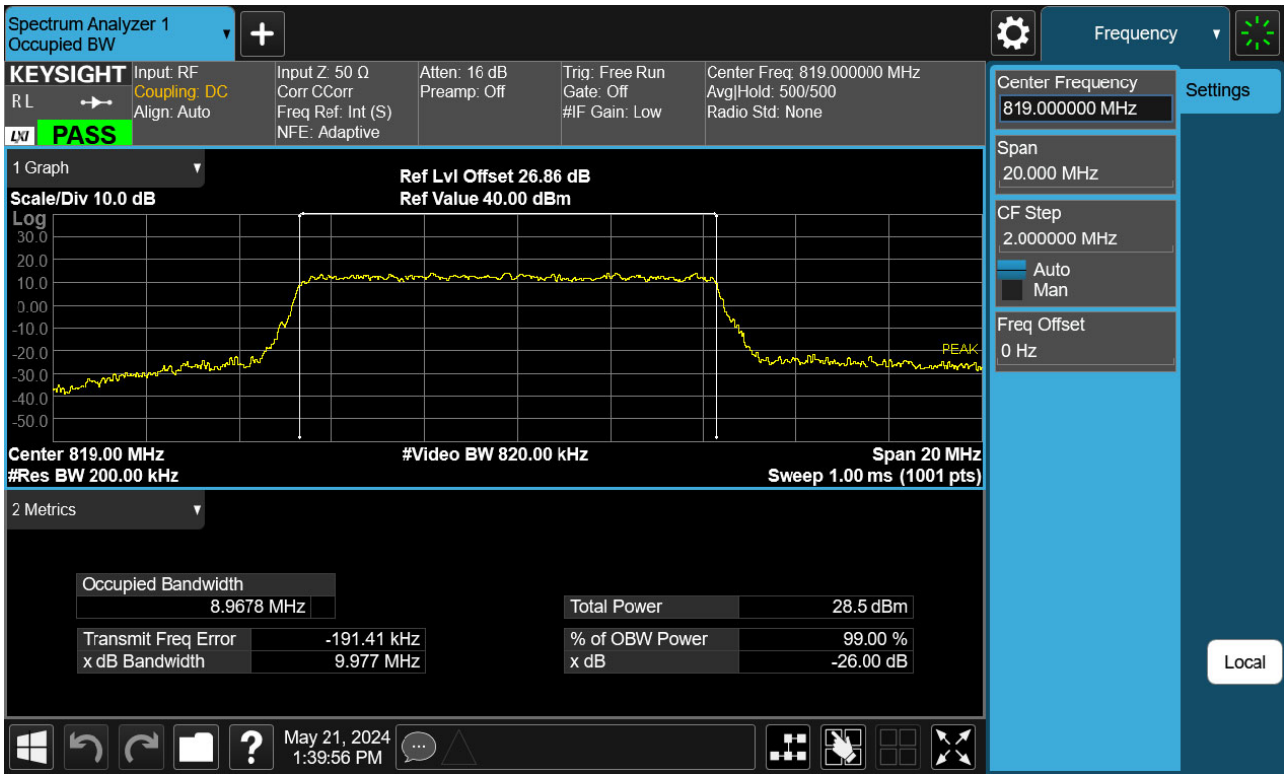
Sub6 n26. Occupied Bandwidth Plot (10 M BW Ch.163800 16QAM RB 50_0)



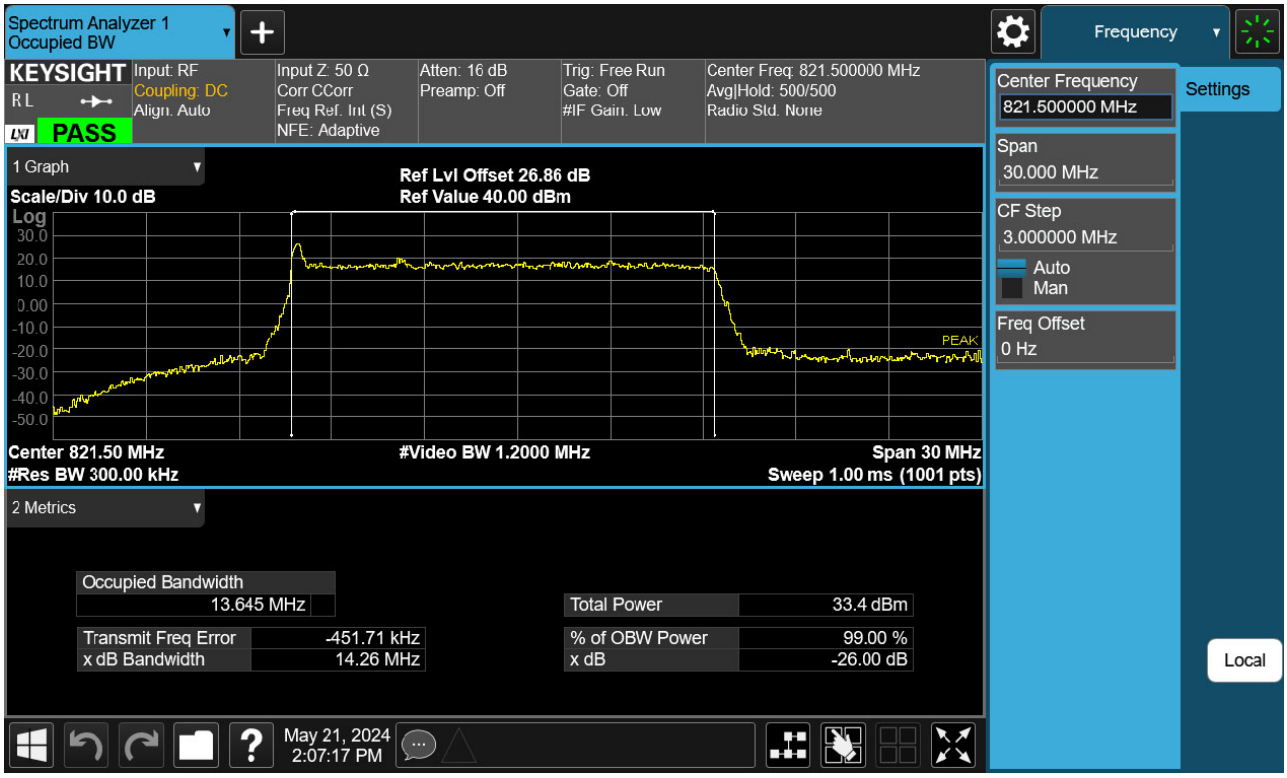
Sub6 n26. Occupied Bandwidth Plot (10 M BW Ch.163800 64QAM RB 50_0)



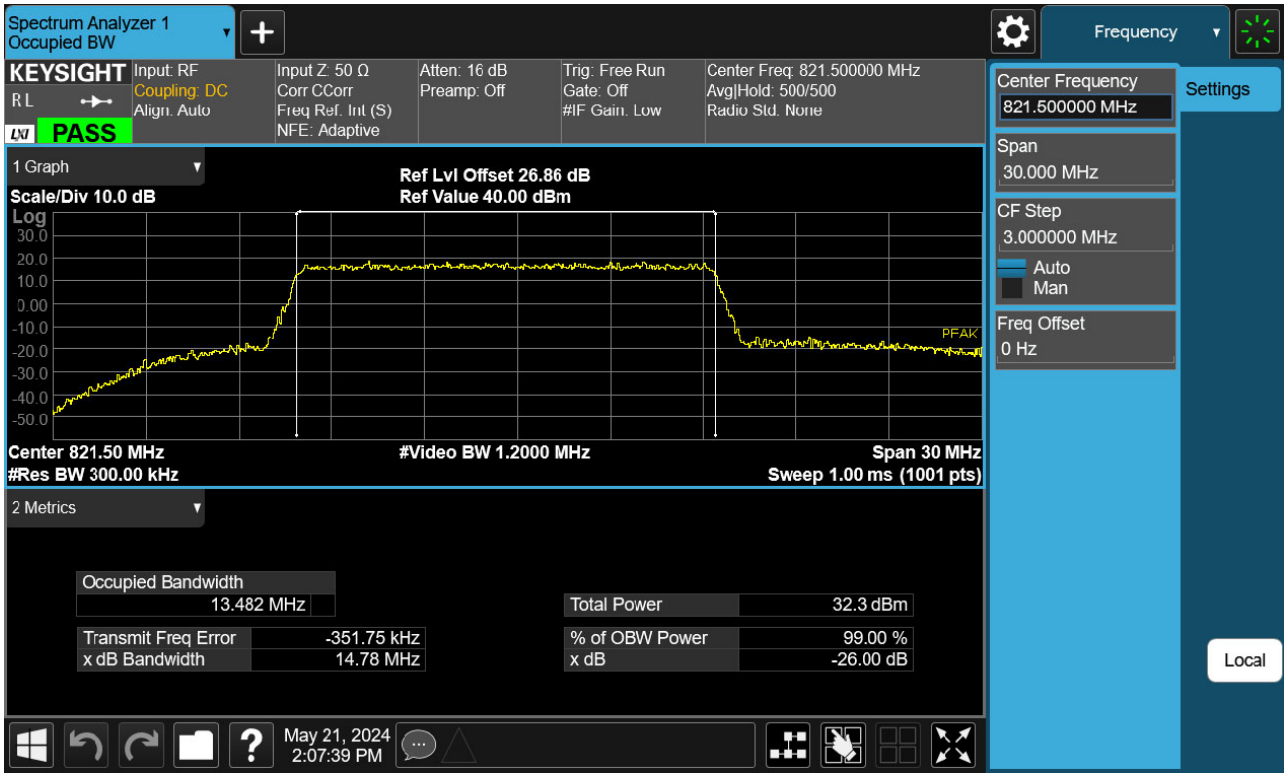
Sub6 n26. Occupied Bandwidth Plot (10 M BW Ch.163800 256QAM RB 50_0)



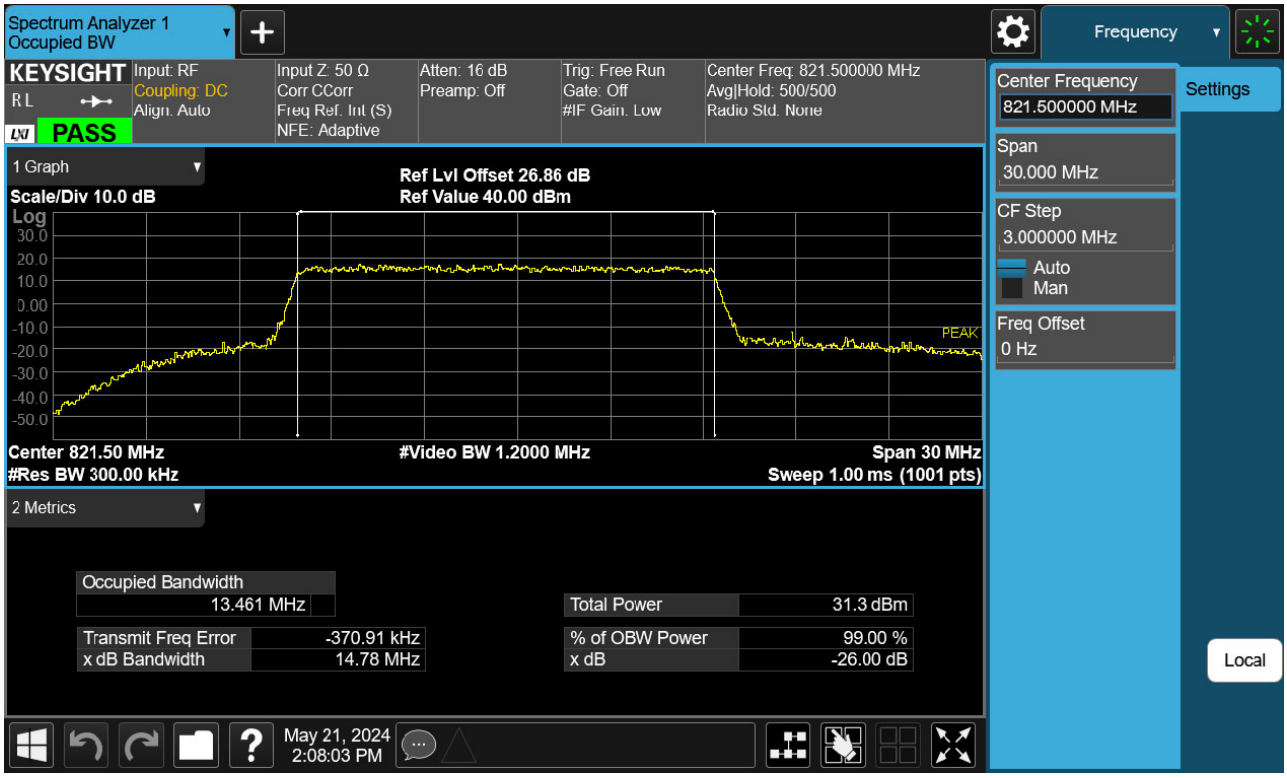
Sub6 n26. Occupied Bandwidth Plot (15 M BW Ch.164300 BPSK RB 75_0)



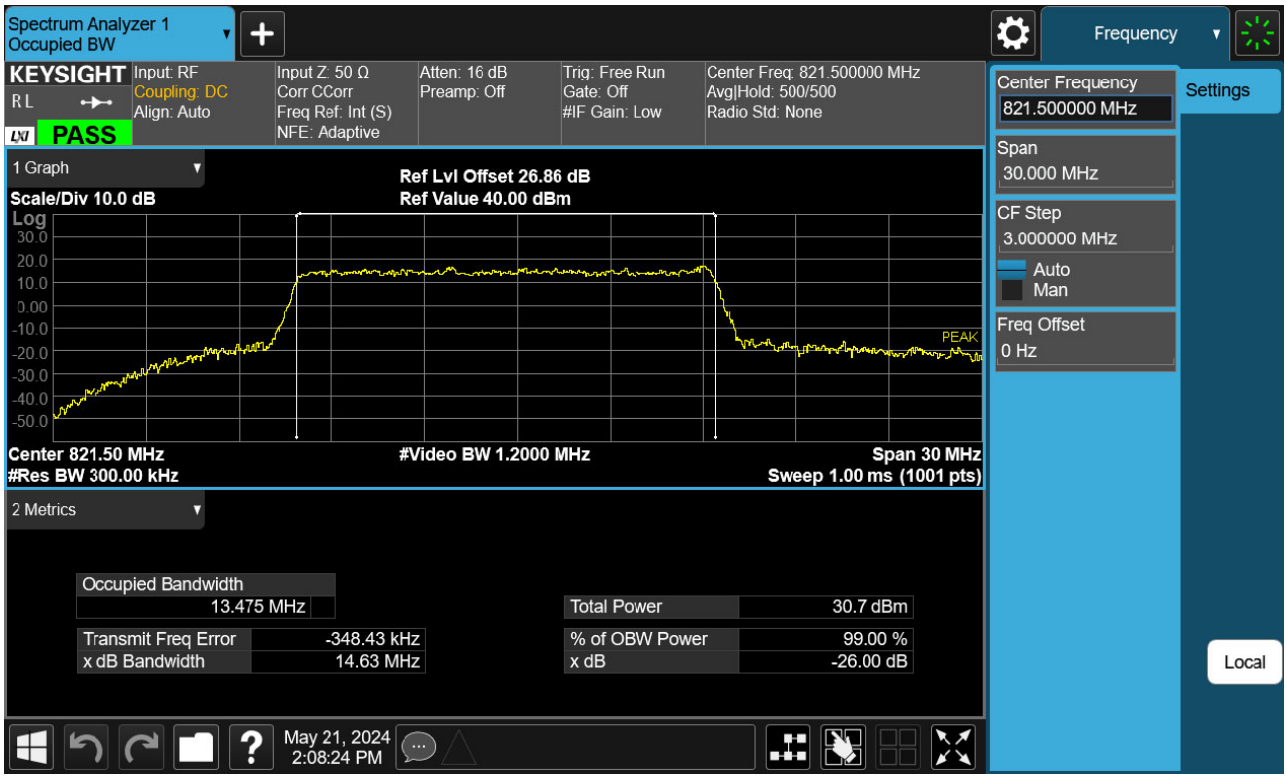
Sub6 n26. Occupied Bandwidth Plot (15 M BW Ch.164300 QPSK RB 75_0)



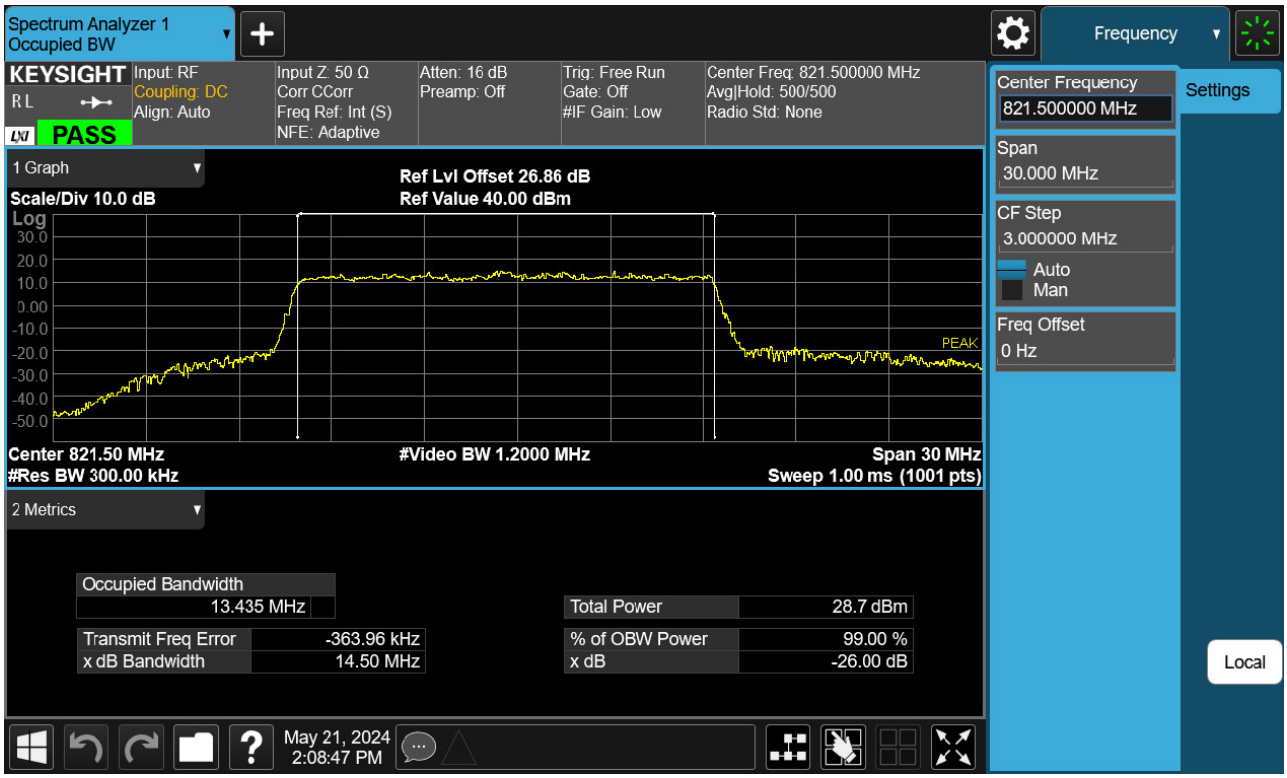
Sub6 n26. Occupied Bandwidth Plot (15 M BW Ch.164300 16QAM RB 75_0)



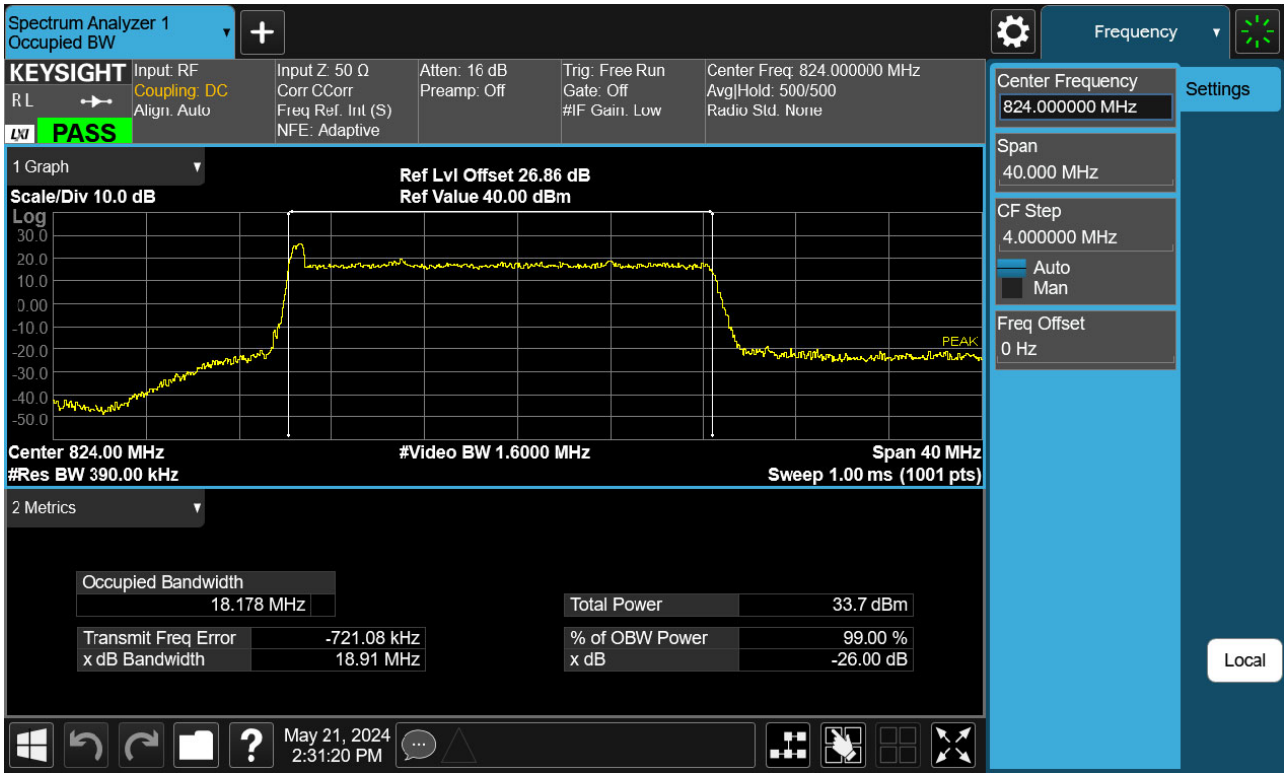
Sub6 n26. Occupied Bandwidth Plot (15 M BW Ch.164300 64QAM RB 75_0)



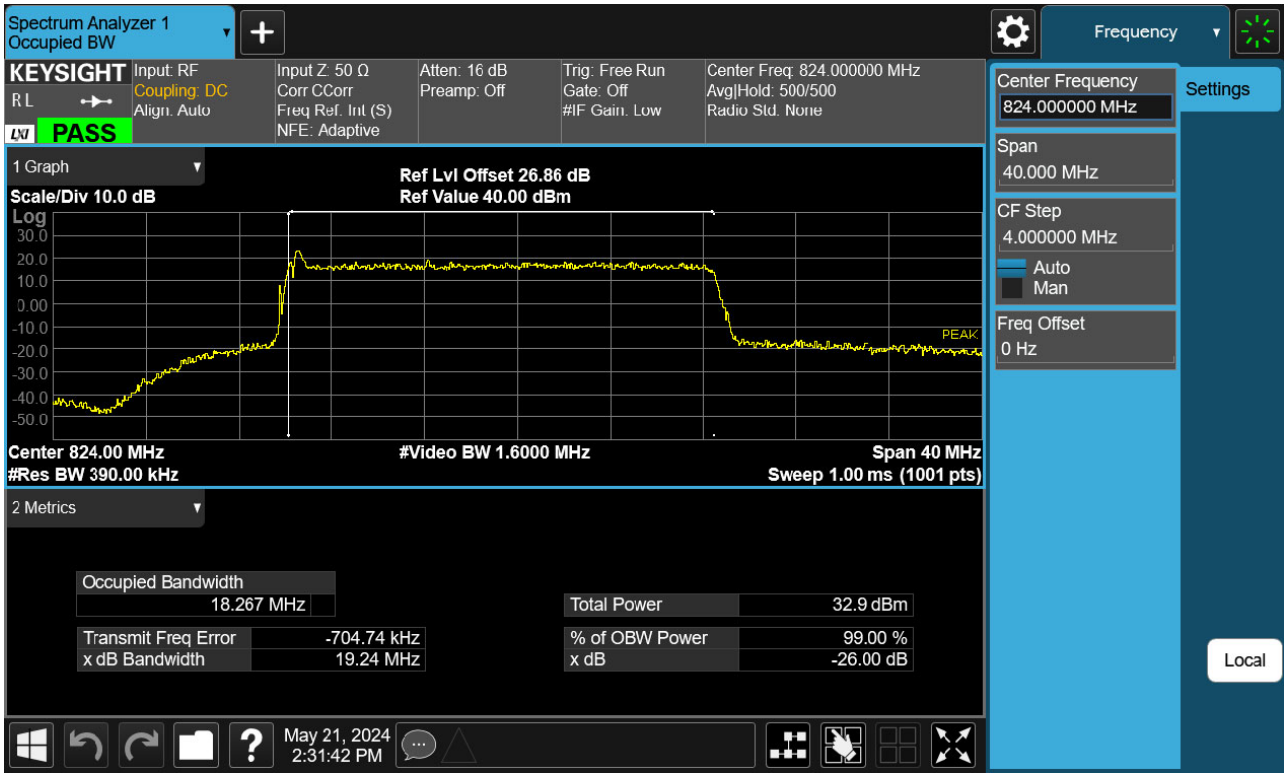
Sub6 n26. Occupied Bandwidth Plot (15 M BW Ch.164300 256QAM RB 100_0)



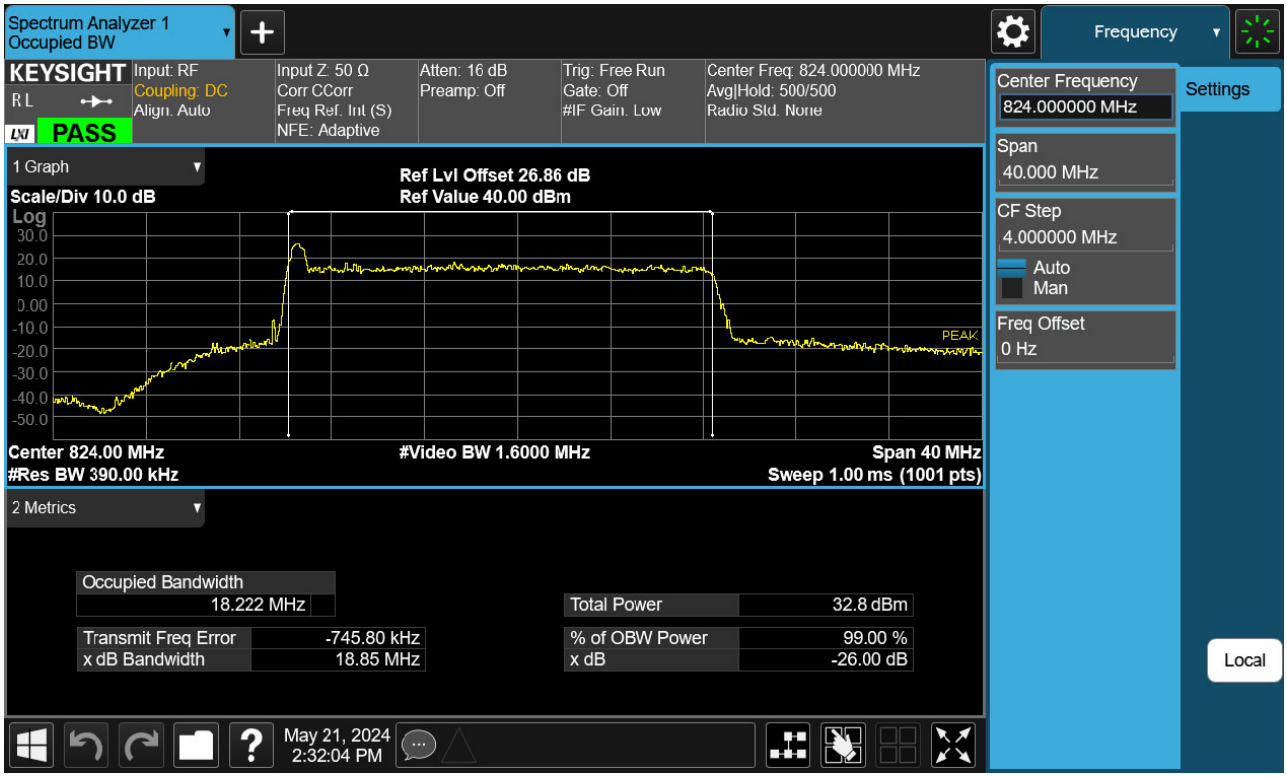
Sub6 n26. Occupied Bandwidth Plot (20 M BW Ch.164800 BPSK RB 100_0)



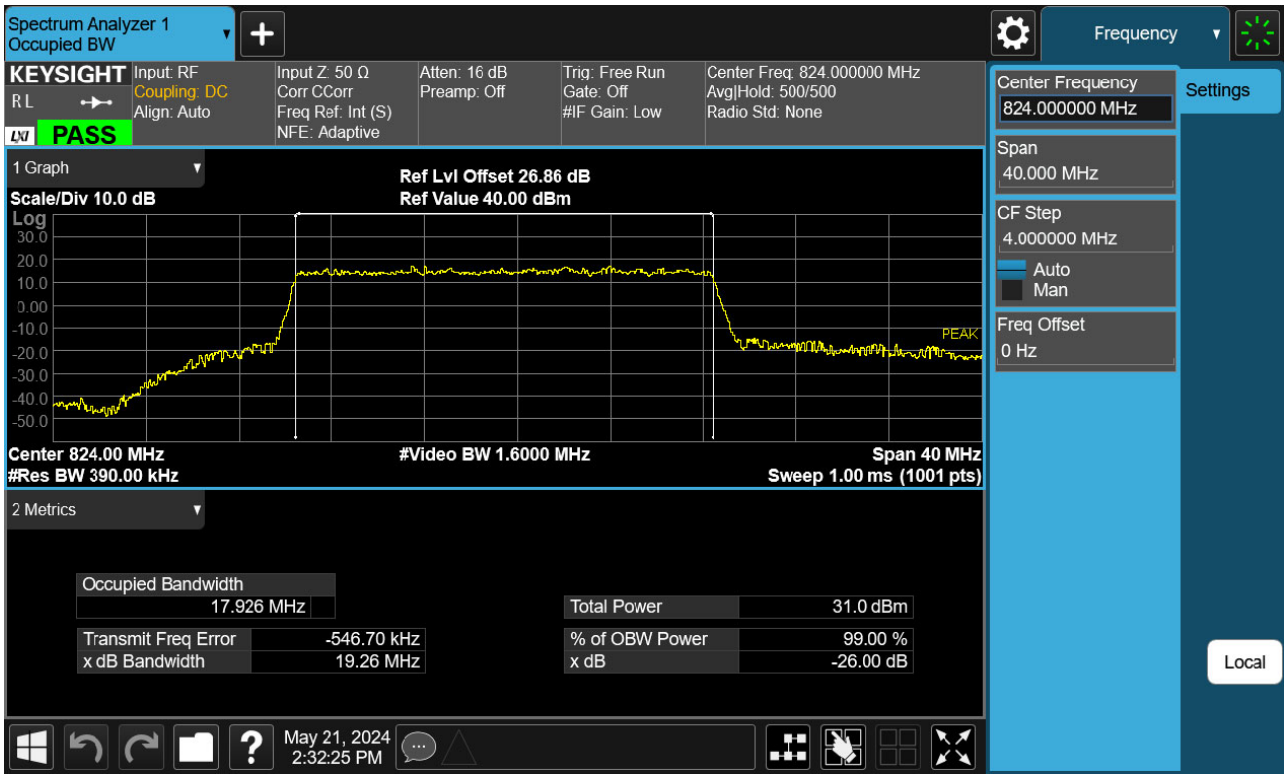
Sub6 n26. Occupied Bandwidth Plot (20 M BW Ch.164800 QPSK RB 100_0)



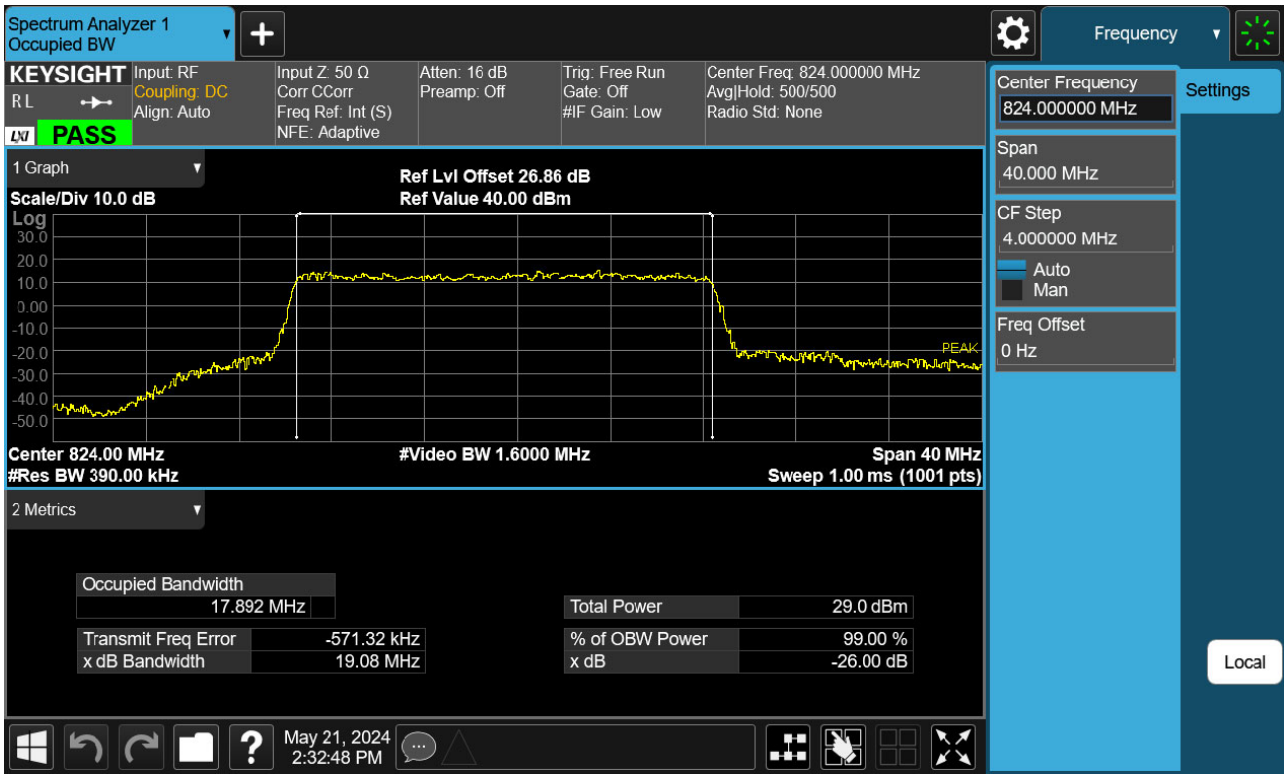
Sub6 n26. Occupied Bandwidth Plot (20 M BW Ch.164800 16QAM RB 100_0)



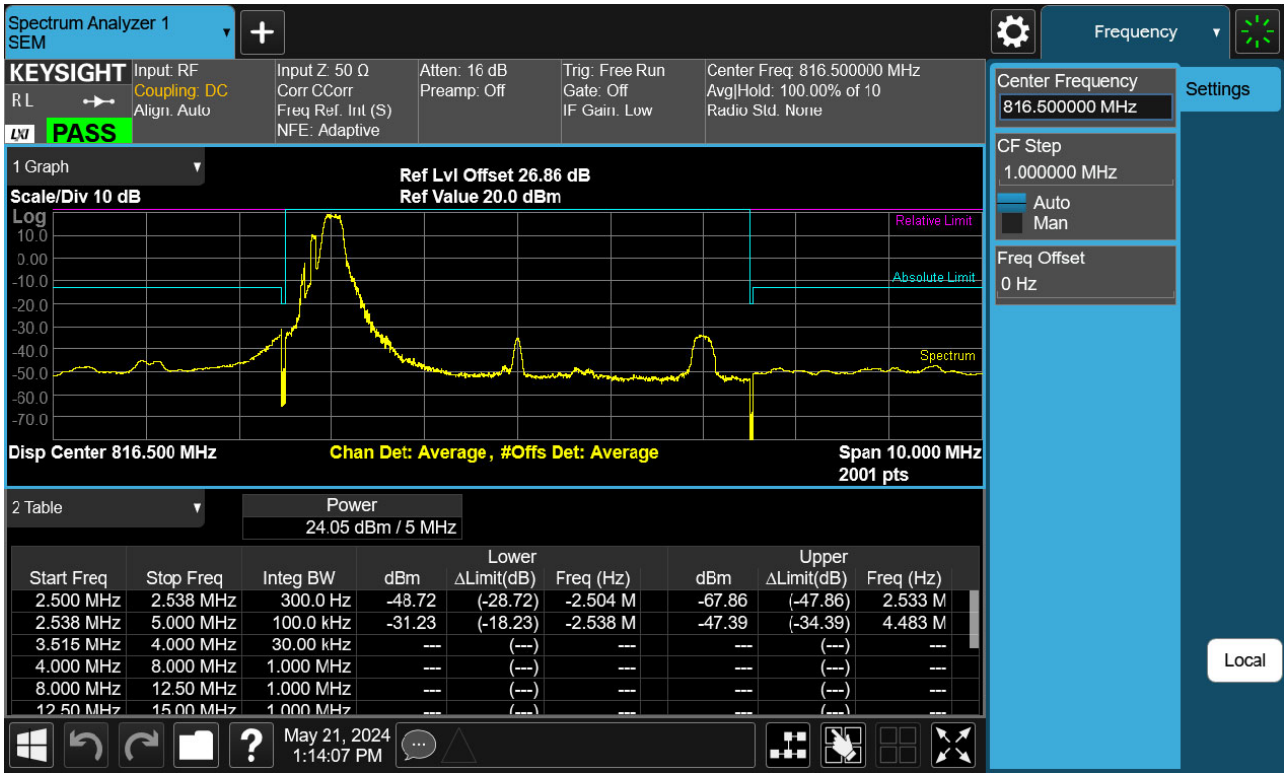
Sub6 n26. Occupied Bandwidth Plot (20 M BW Ch.164800 64QAM RB 100_0)



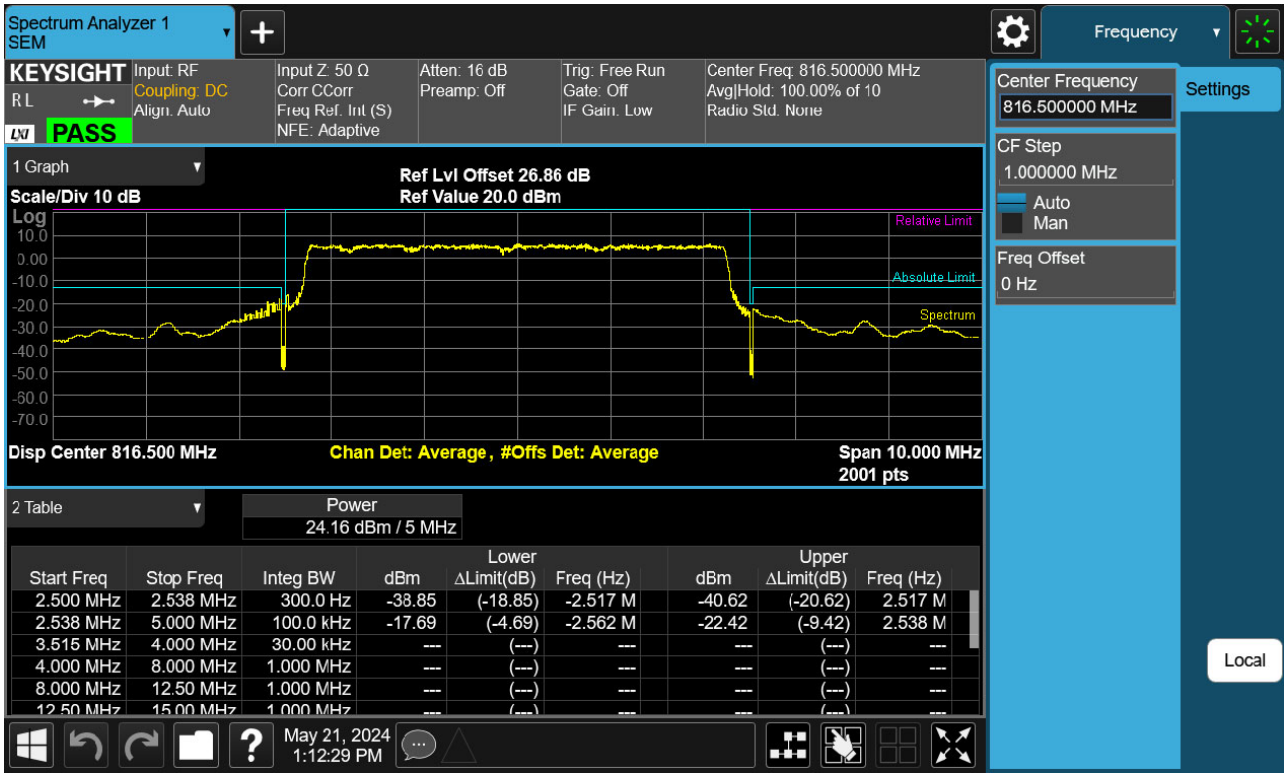
Sub6 n26. Occupied Bandwidth Plot (20 M BW Ch.164800 256QAM RB 100_0)



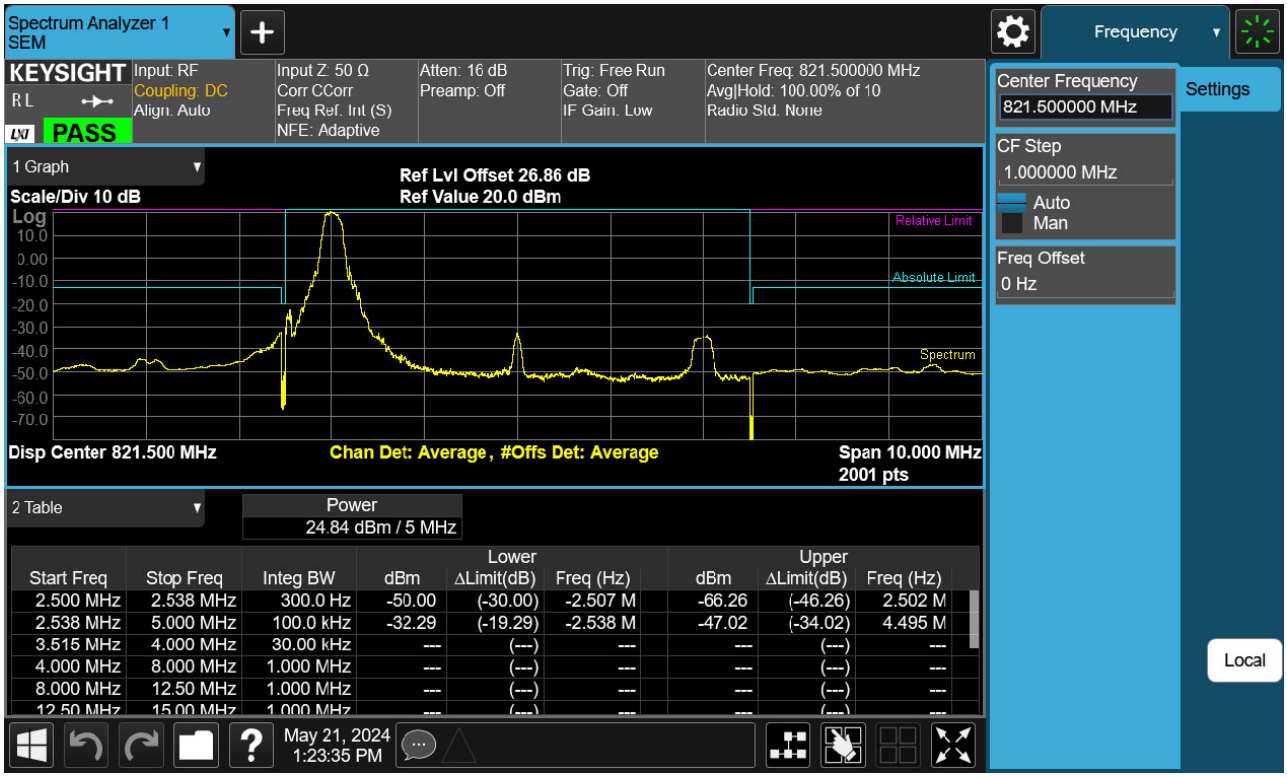
Sub6 n26. Lower Channel Edge Plot (5 M BW Ch.163300 BPSK RB 1, Offset 0)



Sub6 n26. Lower Channel Edge Plot (5 M BW Ch.163300 BPSK_RB25_Offset 0)



Sub6 n26. Mid Channel Edge Plot (5 M BW Ch.164300 BPSK_RB1_Offset 0)



Sub6 n26. Mid Channel Edge Plot (5 M BW Ch.164300 BPSK_ RB25_Offset 0)