

# FCC Sub6 REPORT

## Certification

**Applicant Name:**  
SAMSUNG Electronics Co., Ltd.

**Date of Issue:**  
January 26, 2022

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

**Location:**  
HCT CO., LTD.,  
74, Seoicheon-ro 578beon-gil, Majang-myeon,  
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

**Report No.:** HCT-RF-2201-FC097

**FCC ID:** A3LSMM236B

**APPLICANT:** SAMSUNG Electronics Co., Ltd.

Model(s): SM-M236B/DS  
 EUT Type: Mobile Phone  
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)  
 FCC Rule Part(s): §27, §2

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	0.145	21.61
		4M51G7D	QPSK	0.144	21.59
		4M51W7D	16QAM	0.115	20.59
		4M51W7D	64QAM	0.081	19.07
		4M50W7D	256QAM	0.051	17.10
Sub6 n66 (10)	1715.0 – 1775.0	8M99G7D	PI/2 BPSK	0.146	21.63
		8M98G7D	QPSK	0.145	21.62
		8M97W7D	16QAM	0.116	20.63
		8M96W7D	64QAM	0.082	19.15
		8M97W7D	256QAM	0.051	17.10
Sub6 n66 (15)	1717.5 – 1772.5	13M4G7D	PI/2 BPSK	0.139	21.44
		13M5G7D	QPSK	0.139	21.43
		13M5W7D	16QAM	0.111	20.47
		13M4W7D	64QAM	0.079	18.97
		13M5W7D	256QAM	0.050	16.95
Sub6 n66 (20)	1720.0 – 1770.0	17M9G7D	PI/2 BPSK	0.133	21.23
		17M9G7D	QPSK	0.129	21.10
		17M8W7D	16QAM	0.103	20.13
		17M9W7D	64QAM	0.073	18.62
		17M9W7D	256QAM	0.047	16.73

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)

Report No.: HCT-RF-2201-FC097

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REVIEWED BY



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Report prepared by : Jung Ki Lim  
Engineer of Telecommunication Testing Center

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Report approved by : Jong Seok Lee  
Manager of Telecommunication Testing Center

This test results were applied only to the test methods required by the standard.

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

The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

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# Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2201-FC097	January 26, 2022	- First Approval Report

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

## Table of Contents

REVIEWED BY .....	2
1. GENERAL INFORMATION .....	5
2. INTRODUCTION .....	6
2.1. DESCRIPTION OF EUT.....	6
2.2. MEASURING INSTRUMENT CALIBRATION .....	6
2.3. TEST FACILITY .....	6
3. DESCRIPTION OF TESTS.....	7
3.1 TEST PROCEDURE .....	7
3.2 RADIATED POWER.....	8
3.3 RADIATED SPURIOUS EMISSIONS .....	9
3.4 PEAK- TO- AVERAGE RATIO.....	10
3.5 OCCUPIED BANDWIDTH. ....	12
3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL .....	13
3.7 BAND EDGE .....	14
3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE .....	16
3.9 WORST CASE(RADIATED TEST) .....	17
3.10 WORST CASE(CONDUCTED TEST) .....	18
4. LIST OF TEST EQUIPMENT .....	19
5. MEASUREMENT UNCERTAINTY .....	20
6. SUMMARY OF TEST RESULTS .....	21
7. SAMPLE CALCULATION .....	22
8. TEST DATA .....	24
8.1 EQUIVALENT ISOTROPIC RADIATED POWER.....	24
8.2 RADIATED SPURIOUS EMISSIONS .....	28
8.3 PEAK-TO-AVERAGE RATIO.....	29
8.4 OCCUPIED BANDWIDTH .....	30
8.5 CONDUCTED SPURIOUS EMISSIONS .....	31
8.6 BAND EDGE .....	31
8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE .....	32
9. TEST PLOTS.....	36
10. ANNEX A_ TEST SETUP PHOTO.....	125

# MEASUREMENT REPORT

## 1. GENERAL INFORMATION

<b>Applicant Name:</b>	SAMSUNG Electronics Co., Ltd.
<b>Address:</b>	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
<b>FCC ID:</b>	A3LSMM236B
<b>Application Type:</b>	Certification
<b>FCC Classification:</b>	PCS Licensed Transmitter Held to Ear (PCE)
<b>FCC Rule Part(s):</b>	§27, §2
<b>EUT Type:</b>	Mobile Phone
<b>Model(s):</b>	SM-M236B/DS
<b>SCS(kHz):</b>	15
<b>Bandwidth(MHz):</b>	5, 10, 15, 20
<b>Waveform:</b>	CP-OFDM, DFT-S-OFDM
<b>Modulation:</b>	DFT-S-OFDM: PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM
<b>Tx Frequency:</b>	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))
<b>Date(s) of Tests:</b>	December 23, 2021 ~ January 25, 2022
<b>Serial number:</b>	Radiated: R3CRB0HMTTM Conducted: R3CRB0HLZXE

## **2. INTRODUCTION**

### **2.1. DESCRIPTION OF EUT**

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS and LTE, Sub6.

It also supports IEEE 802.11 a/b/g/n/ac (20/40/80), Bluetooth, BT LE, NFC.

### **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
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 - ANSI C63.26-2015 – Section 5.2.6(only GSM)
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 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  $\geq$  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 according to ANSI/TIA-603-E-2016.

#### Test Settings

1. RBW = 100kHz 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 10<sup>th</sup> harmonics from 9 kHz.

#### Test Note

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

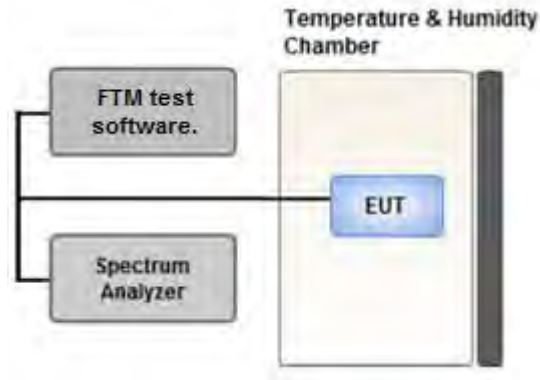
$$\text{Result}_{(dBm)} = P_g_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

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

### 3.4 PEAK- TO- AVERAGE RATIO



**Test setup**

#### ① CCDF Procedure for PAPR

##### **Test Settings**

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

**② Alternate Procedure for PAPR**

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

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

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

**Test Settings(Peak Power)**

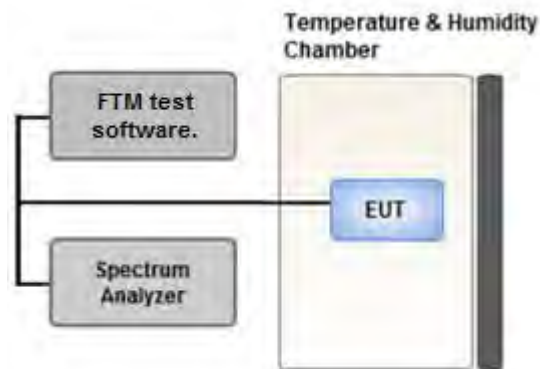
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW  $\geq 3 \times$  RBW.

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

**Test Settings(Average Power)**

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

### 3.5 OCCUPIED BANDWIDTH.



#### Test setup

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

The EUT makes a call to the communication simulator.

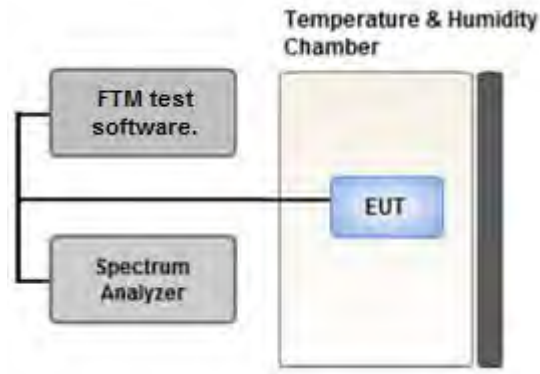
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

#### Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5 % of the expected OBW
3. VBW  $\geq$  3 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.

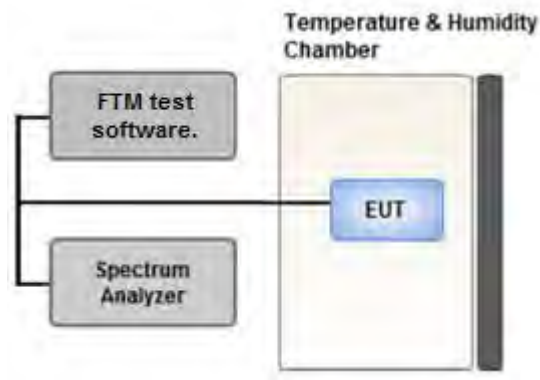
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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 = RMS
4. Trace Mode = trace average
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

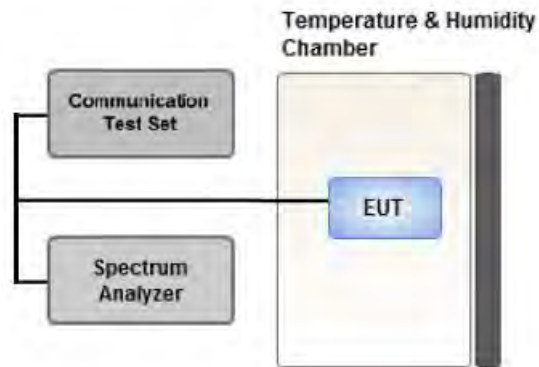
**Test Notes**

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.

### 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 : NSA

Worst case: NSA(5A-n66A)

Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc)

Worst case : Stand alone

- We were performed the RSE test in condition of co-location. There has no significant emission raised.

Mode : WWAN + WLAN 5 GHz + BT (Worst case : Stand alone)

- 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 were investigated and the worst case configuration results are reported.

(Worst case: 5A(10 MHz) - n66A)

- 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 were investigated and the worst case bandwidth results are reported.

(Worst case : 10 MHz)

[ Worst case ]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1	1	Z
Radiated Spurious and Harmonic Emissions	QPSK	1	1	Y

**3.10 WORST CASE(CONDUCTED TEST)**

- Waveform : All Waveform of operation were investigated and the worst case configuration results are reported.

(Worst case: DFT-S-OFDM)

- Modulation : All Modulation of operation were investigated and the worst case configuration results are reported.

(Worst case: PI/2 BPSK)

- All modes of operation were investigated and the worst case configuration results are reported.

Mode : NSA

Worst case: NSA(5A-n66A)

- 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	Mid	Full RB	0
Band Edge	PI/2 BPSK	5	Low	1	0
			High	1	24
		10	Low	1	0
			High	1	51
		15	Low	1	0
			High	1	78
		20	Low	1	0
High	1		105		
		5, 10, 15, 20	Low, High	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	PI/2 BPSK	5, 10, 15, 20	Low, Mid, High	1	1

#### 4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacture	Serial No.	Due to Calibration	Calibration Interval
Precision Dipole Antenna	UHAP	Schwarzbeck	01273	05/30/2022	Biennial
Precision Dipole Antenna	UHAP	Schwarzbeck	01274	05/30/2022	Biennial
Horn Antenna(1~18GHz)	BBHA 9120D	Schwarzbeck	02289	05/08/2022	Biennial
Horn Antenna(1~18GHz)	BBHA 9120D	Schwarzbeck	9120D-1299	05/04/2022	Biennial
Horn Antenna(15~40GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	10/13/2022	Biennial
Horn Antenna(15~40GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	02/11/2022	Biennial
Loop Antenna(9kHz~30 MHz)	FMZB1513	Rohde & Schwarz	1513-175	05/18/2022	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/03/2023	Biennial
Hybrid Antenna	VULB9160	Schwarzbeck	760	02/22/2023	Biennial
High Pass Filter	WHKX10-900-1000-15000-40SS	Wainwright Instruments	15	06/15/2022	Annual
High Pass Filter	WHKX10-2700-3000-18000-40SS	Wainwright Instruments	145	06/15/2022	Annual
High Pass Filter	WHNX6-4740-6000-26500-40CC	Wainwright Instruments	11	06/15/2022	Annual
LOW NOISE AMP (100 MHz ~ 18GHz)	CBLU1183540B-01	CERNEC	26822	06/15/2022	Annual
Power Amplifier	CBL18265035	CERNEC	22966	12/02/2022	Annual
Power Amplifier	CBL26405040	CERNEC	25956	03/23/2022	Annual
DC Power Supply	E3632A	Hewlett Packard	MY40004427	09/15/2022	Annual
Power Splitter(DC~26.5 GHz)	11667B	Hewlett Packard	11275	04/07/2022	Annual
Chamber	SU-642	ESPEC	93008124	03/15/2022	Annual
Signal Analyzer(10Hz~26.5GHz)	N9020A	Agilent	MY51110063	04/22/2022	Annual
ATTENUATOR(20dB)	8493C	Hewlett Packard	17280	06/01/2022	Annual
Spectrum Analyzer(10Hz~40GHz)	FSV40	REOHDE & SCHWARZ	101436	03/02/2022	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/18/2022	Annual
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262287700	05/25/2022	Annual
Wideband Radio Communication Tester	MT8000A	Anritsu Corp.	6262302511	05/26/2022	Annual
SIGNAL GENERATOR (100kHz~40GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2022	Annual
Signal Analyzer(5Hz~40.0GHz)	N9030B	KEYSIGHT	MY55480167	06/02/2022	Annual
4-Way Divider	ZC4PD-K1844+	Mini-Circuits	942907	09/27/2022	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  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty ( $\pm$ dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05 (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	<b>See Note1</b>
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

**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
349000	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)

#### PSK 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	
								W	W	dBm
1712.5	Sub6 n66/ 5 MHz [15 kHz]	PI/2 BPSK	-20.64	12.22	9.76	2.08	V	< 1.00	0.098	19.90
		QPSK	-21.45	11.41	9.76	2.08	V		0.081	19.09
		16-QAM	-22.31	10.55	9.76	2.08	V		0.067	18.23
		64-QAM	-23.68	9.18	9.76	2.08	V		0.049	16.86
		256-QAM	-25.20	7.66	9.76	2.08	V		0.034	15.34
1745.0		PI/2 BPSK	-19.50	13.63	9.97	1.99	V		0.145	21.61
		QPSK	-19.52	13.61	9.97	1.99	V		0.144	21.59
		16-QAM	-20.52	12.61	9.97	1.99	V		0.115	20.59
		64-QAM	-22.04	11.09	9.97	1.99	V		0.081	19.07
		256-QAM	-24.01	9.12	9.97	1.99	V		0.051	17.10
1777.5	PI/2 BPSK	-20.53	12.68	10.12	2.14	V	0.116	20.66		
	QPSK	-21.58	11.63	10.12	2.14	V	0.091	19.61		
	16-QAM	-22.40	10.81	10.12	2.14	V	0.076	18.79		
	64-QAM	-23.76	9.45	10.12	2.14	V	0.055	17.43		
	256-QAM	-25.09	8.12	10.12	2.14	V	0.041	16.10		



Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1715.0	Sub6 n66/ 10 MHz [15 kHz]	PI/2 BPSK	-20.53	12.49	9.79	2.07	V	< 1.00	0.105	20.21
		QPSK	-21.38	11.64	9.79	2.07	V		0.086	19.36
		16-QAM	-22.26	10.76	9.79	2.07	V		0.071	18.48
		64-QAM	-23.54	9.48	9.79	2.07	V		0.053	17.20
		256-QAM	-25.07	7.95	9.79	2.07	V		0.037	15.67
1745.0		PI/2 BPSK	-19.48	13.65	9.97	1.99	V		0.146	21.63
		QPSK	-19.49	13.64	9.97	1.99	V		0.145	21.62
		16-QAM	-20.48	12.65	9.97	1.99	V		0.116	20.63
		64-QAM	-21.96	11.17	9.97	1.99	V		0.082	19.15
		256-QAM	-24.01	9.12	9.97	1.99	V		0.051	17.10
1775.0	PI/2 BPSK	-19.77	13.46	10.10	2.14	V	0.139	21.42		
	QPSK	-19.79	13.44	10.10	2.14	V	0.138	21.40		
	16-QAM	-20.78	12.45	10.10	2.14	V	0.110	20.41		
	64-QAM	-22.28	10.95	10.10	2.14	V	0.078	18.91		
	256-QAM	-24.27	8.96	10.10	2.14	V	0.049	16.92		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
									W	W
1717.5	Sub6 n66/ 15 MHz [15 kHz]	PI/2 BPSK	-20.65	12.34	9.82	2.07	V	< 1.00	0.102	20.09
		QPSK	-21.63	11.36	9.82	2.07	V		0.082	19.11
		16-QAM	-22.48	10.51	9.82	2.07	V		0.067	18.26
		64-QAM	-23.91	9.08	9.82	2.07	V		0.048	16.83
		256-QAM	-25.30	7.69	9.82	2.07	V		0.035	15.44
1745.0		PI/2 BPSK	-19.77	13.36	9.97	1.99	V		0.136	21.34
		QPSK	-19.79	13.34	9.97	1.99	V		0.136	21.32
		16-QAM	-20.77	12.36	9.97	1.99	V		0.108	20.34
		64-QAM	-22.25	10.88	9.97	1.99	V		0.077	18.86
		256-QAM	-24.26	8.87	9.97	1.99	V		0.048	16.85
1772.5	PI/2 BPSK	-19.78	13.49	10.08	2.13	V	0.139	21.44		
	QPSK	-19.79	13.48	10.08	2.13	V	0.139	21.43		
	16-QAM	-20.75	12.52	10.08	2.13	V	0.111	20.47		
	64-QAM	-22.25	11.02	10.08	2.13	V	0.079	18.97		
	256-QAM	-24.27	9.00	10.08	2.13	V	0.050	16.95		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
									W	W
1720.0	Sub6 n66/ 20 MHz [15 kHz]	PI/2 BPSK	-20.62	12.55	9.82	2.05	V	< 1.00	0.108	20.32
		QPSK	-21.49	11.68	9.82	2.05	V		0.088	19.45
		16-QAM	-22.32	10.85	9.82	2.05	V		0.073	18.62
		64-QAM	-23.73	9.44	9.82	2.05	V		0.053	17.21
		256-QAM	-25.25	7.92	9.82	2.05	V		0.037	15.69
1745.0		PI/2 BPSK	-20.00	13.13	9.97	1.99	V		0.129	21.11
		QPSK	-20.01	13.12	9.97	1.99	V		0.129	21.10
		16-QAM	-20.98	12.15	9.97	1.99	V		0.103	20.13
		64-QAM	-22.49	10.64	9.97	1.99	V		0.073	18.62
		256-QAM	-24.42	8.71	9.97	1.99	V		0.047	16.69
1770.0	PI/2 BPSK	-20.04	13.28	10.08	2.13	V	0.133	21.23		
	QPSK	-20.47	12.85	10.08	2.13	V	0.120	20.80		
	16-QAM	-21.31	12.01	10.08	2.13	V	0.099	19.96		
	64-QAM	-22.69	10.63	10.08	2.13	V	0.072	18.58		
	256-QAM	-24.54	8.78	10.08	2.13	V	0.047	16.73		

### 8.2 RADIATED SPURIOUS EMISSIONS

- NR Band: N66
- LTE Band(Anchor): B5
- Bandwidth: 20 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)
344000 (1720.0)	3 430.00	-60.97	11.30	-61.69	3.04	V	-53.43	-13.00
	5 145.00	-61.06	11.38	-55.96	3.68	V	-48.26	-13.00
	6 860.00	-62.66	11.18	-51.87	4.48	v	-45.17	-13.00
	8 575.00	-63.60	10.95	-49.62	4.83	V	-43.50	-13.00
	10 290.00	-62.82	11.68	-44.86	5.40	H	-38.58	-13.00
349000 (1745.0)	3 490.00	-60.92	11.46	-62.23	3.05	V	-53.82	-13.00
	5 235.00	-62.19	11.57	-56.88	3.79	V	-49.10	-13.00
	6 980.00	-63.10	11.16	-50.87	4.51	V	-44.22	-13.00
	8 725.00	-63.16	11.10	-49.19	4.92	H	-43.01	-13.00
	10 470.00	-65.68	11.80	-48.30	5.45	H	-41.95	-13.00
354000 (1770.0)	3 550.00	-60.39	11.70	-61.90	3.09	H	-53.29	-13.00
	5 325.00	-60.68	11.75	-56.12	3.78	H	-48.15	-13.00
	7 100.00	-63.03	11.00	-48.58	4.42	V	-42.00	-13.00
	8 875.00	-62.94	11.05	-48.65	4.95	H	-42.54	-13.00
	10 650.00	-64.10	11.70	-44.89	5.47	V	-38.66	-13.00

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
20525 (836.5)	1673.00	-61.24	9.52	-70.89	2.03	V	-63.40	-13.00
	2509.50	-62.27	10.28	-67.25	2.51	V	-59.48	-13.00
	3346.00	-62.15	11.28	-64.93	2.99	H	-56.64	-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	3.93
			QPSK			5.24
			16-QAM			6.21
			64-QAM			6.54
			256-QAM			6.55
	10 MHz		BPSK	50		4.23
			QPSK			5.46
			16-QAM			6.28
			64-QAM			6.52
			256-QAM			6.54
	15 MHz		BPSK	75		4.10
			QPSK			5.34
			16-QAM			6.28
			64-QAM			6.51
			256-QAM			6.53
	20 MHz		BPSK	100		3.93
			QPSK			5.20
			16-QAM			6.22
			64-QAM			6.45
			256-QAM			6.50

**Note:**

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 57 ~ 76.

**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	4.5055
			QPSK			4.5112
			16-QAM			4.5068
			64-QAM			4.5092
			256-QAM			4.4971
	10 MHz		BPSK	50		8.9881
			QPSK			8.9830
			16-QAM			8.9714
			64-QAM			8.9601
			256-QAM			8.9668
	15 MHz		BPSK	75		13.426
			QPSK			13.451
			16-QAM			13.457
			64-QAM			13.426
			256-QAM			13.445
	20 MHz		BPSK	100		17.851
			QPSK			17.868
			16-QAM			17.832
			64-QAM			17.863
			256-QAM			17.873

**Note:**

1. Plots of the EUT's Occupied Bandwidth are shown Page 37 ~ 56.

**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	3.7767	30.200	-70.526	-40.326	-13.00
		1745.0	8.8390	30.815	-70.607	-39.792	
		1777.5	8.2468	30.815	-70.104	-39.289	
	10	1715.0	4.8979	30.200	-70.820	-40.620	
		1745.0	8.2283	30.815	-70.865	-40.050	
		1775.0	3.7972	30.200	-70.384	-40.184	
	15	1717.5	7.7024	30.815	-70.166	-39.351	
		1745.0	4.0893	30.200	-70.147	-39.947	
		1772.5	8.2572	30.815	-70.321	-39.506	
	20	1720.0	9.9546	30.815	-70.270	-39.455	
		1745.0	8.5932	30.815	-69.946	-39.131	
		1770.0	5.1885	30.815	-70.420	-39.605	

**Note:**

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 101 ~ 124.
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(26.5)	32.355

**8.6 BAND EDGE**

- Plots of the EUT's Band Edge are shown Page 77 ~ 100.

**8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE**

- ▣ BandWidth: 5 MHz
- ▣ Voltage(100 %): 3.860 VDC
- ▣ Batt. Endpoint: 3.650 VDC
- ▣ LIMIT: Emission must remain in band

Test. Frequency (MHz)	Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
1712.5	100 %	+20(Ref)	1712 500 007	0.0	0.000 000	0.000
	100 %	-30	1712 500 020	13.5	0.000 001	0.008
	100 %	-20	1712 500 020	13.4	0.000 001	0.008
	100 %	-10	1712 500 018	11.1	0.000 001	0.007
	100 %	0	1712 500 012	5.4	0.000 000	0.003
	100 %	+10	1712 500 023	15.8	0.000 001	0.009
	100 %	+30	1712 500 011	4.5	0.000 000	0.003
	100 %	+40	1712 500 022	15.5	0.000 001	0.009
	100 %	+50	1712 500 012	4.7	0.000 000	0.003
	Batt. Endpoint	+20	1712 500 013	5.9	0.000 000	0.003
1777.5	100 %	+20(Ref)	1777 500 010	0.0	0.000 000	0.000
	100 %	-30	1777 500 026	16.0	0.000 001	0.009
	100 %	-20	1777 500 022	11.8	0.000 001	0.007
	100 %	-10	1777 500 017	7.6	0.000 000	0.004
	100 %	0	1777 500 023	13.4	0.000 001	0.008
	100 %	+10	1777 500 023	12.8	0.000 001	0.007
	100 %	+30	1777 500 019	9.0	0.000 001	0.005
	100 %	+40	1777 500 016	6.4	0.000 000	0.004
	100 %	+50	1777 500 025	15.4	0.000 001	0.009
	Batt. Endpoint	+20	1777 500 026	16.6	0.000 001	0.009



- ▣ BandWidth: 10 MHz
- ▣ Voltage(100 %): 3.860 VDC
- ▣ Batt. Endpoint: 3.650 VDC
- ▣ LIMIT: Emission must remain in band

Test. Frequency (MHz)	Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
1715.0	100 %	+20(Ref)	1715 000 009	0.0	0.000 000	0.000
	100 %	-30	1715 000 018	9.2	0.000 001	0.005
	100 %	-20	1715 000 021	12.4	0.000 001	0.007
	100 %	-10	1715 000 016	7.7	0.000 000	0.005
	100 %	0	1715 000 020	11.3	0.000 001	0.007
	100 %	+10	1715 000 021	12.2	0.000 001	0.007
	100 %	+30	1715 000 023	14.0	0.000 001	0.008
	100 %	+40	1715 000 020	11.2	0.000 001	0.007
	100 %	+50	1715 000 021	12.2	0.000 001	0.007
	Batt. Endpoint	+20	1715 000 017	8.6	0.000 001	0.005
1775.0	100 %	+20(Ref)	1775 000 011	0.0	0.000 000	0.000
	100 %	-30	1775 000 018	6.6	0.000 000	0.004
	100 %	-20	1775 000 021	9.3	0.000 001	0.005
	100 %	-10	1775 000 017	5.7	0.000 000	0.003
	100 %	0	1775 000 028	16.6	0.000 001	0.009
	100 %	+10	1775 000 017	5.3	0.000 000	0.003
	100 %	+30	1775 000 027	15.4	0.000 001	0.009
	100 %	+40	1775 000 024	12.9	0.000 001	0.007
	100 %	+50	1775 000 015	3.6	0.000 000	0.002
	Batt. Endpoint	+20	1775 000 026	15.0	0.000 001	0.008

- ▣ BandWidth: 15 MHz
- ▣ Voltage(100 %): 3.860 VDC
- ▣ Batt. Endpoint: 3.650 VDC
- ▣ LIMIT: Emission must remain in band

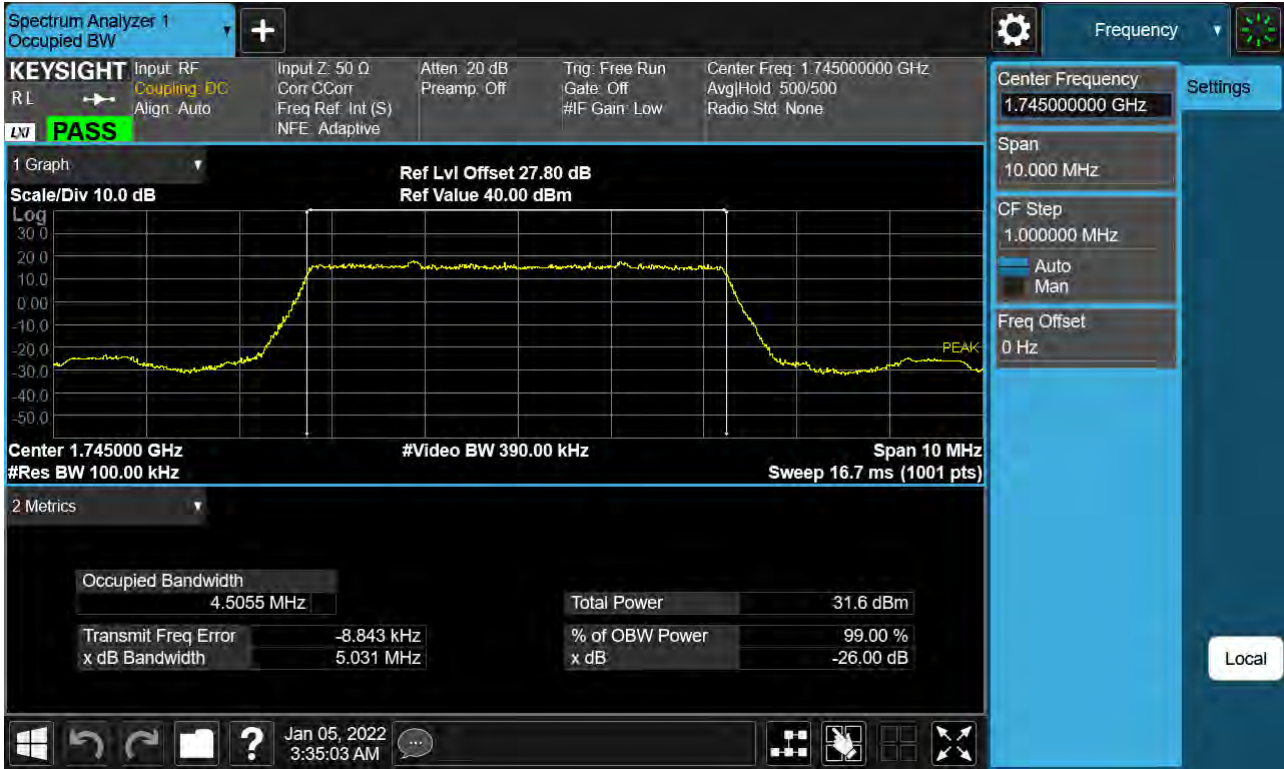
Test. Frequency (MHz)	Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
1717.5	100 %	+20(Ref)	1717 500 016	0.0	0.000 000	0.000
	100 %	-30	1717 500 030	14.5	0.000 001	0.008
	100 %	-20	1717 500 026	10.1	0.000 001	0.006
	100 %	-10	1717 500 028	12.5	0.000 001	0.007
	100 %	0	1717 500 029	13.0	0.000 001	0.008
	100 %	+10	1717 500 031	15.1	0.000 001	0.009
	100 %	+30	1717 500 023	7.7	0.000 000	0.004
	100 %	+40	1717 500 026	9.8	0.000 001	0.006
	100 %	+50	1717 500 032	15.9	0.000 001	0.009
	Batt. Endpoint	+20	1717 500 030	14.5	0.000 001	0.008
1772.5	100 %	+20(Ref)	1772 500 009	0.0	0.000 000	0.000
	100 %	-30	1772 500 021	12.0	0.000 001	0.007
	100 %	-20	1772 500 012	3.4	0.000 000	0.002
	100 %	-10	1772 500 025	16.6	0.000 001	0.009
	100 %	0	1772 500 025	16.8	0.000 001	0.009
	100 %	+10	1772 500 016	7.7	0.000 000	0.004
	100 %	+30	1772 500 022	13.5	0.000 001	0.008
	100 %	+40	1772 500 022	13.5	0.000 001	0.008
	100 %	+50	1772 500 021	12.2	0.000 001	0.007
	Batt. Endpoint	+20	1772 500 024	15.9	0.000 001	0.009

- ▣ BandWidth: 20 MHz
- ▣ Voltage(100 %): 3.860 VDC
- ▣ Batt. Endpoint: 3.650 VDC
- ▣ LIMIT: Emission must remain in band

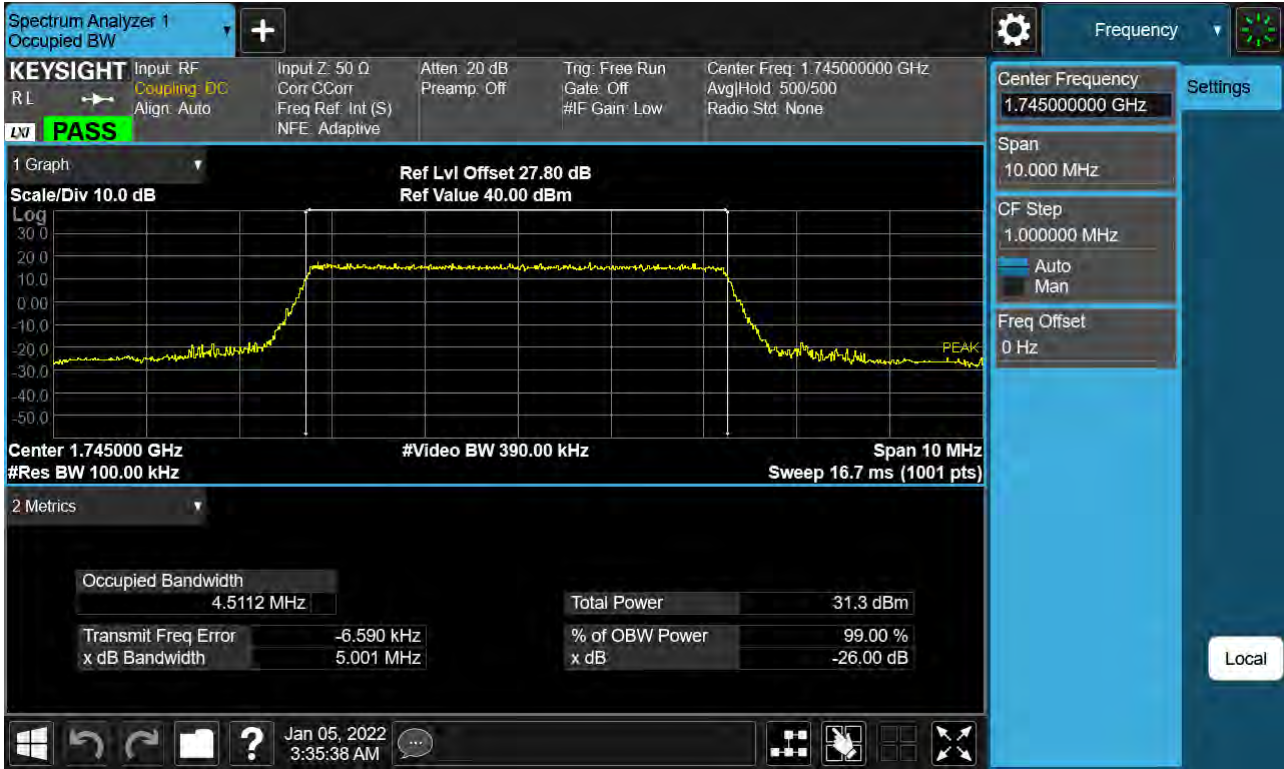
Test. Frequency (MHz)	Voltage (%)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
1720.0	100 %	+20(Ref)	1720 000 010	0.0	0.000 000	0.000
	100 %	-30	1720 000 014	4.3	0.000 000	0.003
	100 %	-20	1720 000 019	9.0	0.000 001	0.005
	100 %	-10	1720 000 016	5.8	0.000 000	0.003
	100 %	0	1720 000 024	13.8	0.000 001	0.008
	100 %	+10	1720 000 017	7.3	0.000 000	0.004
	100 %	+30	1720 000 023	13.3	0.000 001	0.008
	100 %	+40	1720 000 019	9.2	0.000 001	0.005
	100 %	+50	1720 000 020	10.5	0.000 001	0.006
	Batt. Endpoint	+20	1720 000 021	11.0	0.000 001	0.006
1770.0	100 %	+20(Ref)	1770 000 005	0.0	0.000 000	0.000
	100 %	-30	1770 000 009	4.3	0.000 000	0.002
	100 %	-20	1770 000 015	10.3	0.000 001	0.006
	100 %	-10	1770 000 009	4.3	0.000 000	0.002
	100 %	0	1770 000 013	7.5	0.000 000	0.004
	100 %	+10	1770 000 019	13.9	0.000 001	0.008
	100 %	+30	1770 000 015	9.6	0.000 001	0.005
	100 %	+40	1770 000 011	5.7	0.000 000	0.003
	100 %	+50	1770 000 010	5.2	0.000 000	0.003
	Batt. Endpoint	+20	1770 000 019	14.1	0.000 001	0.008

## 9. TEST PLOTS

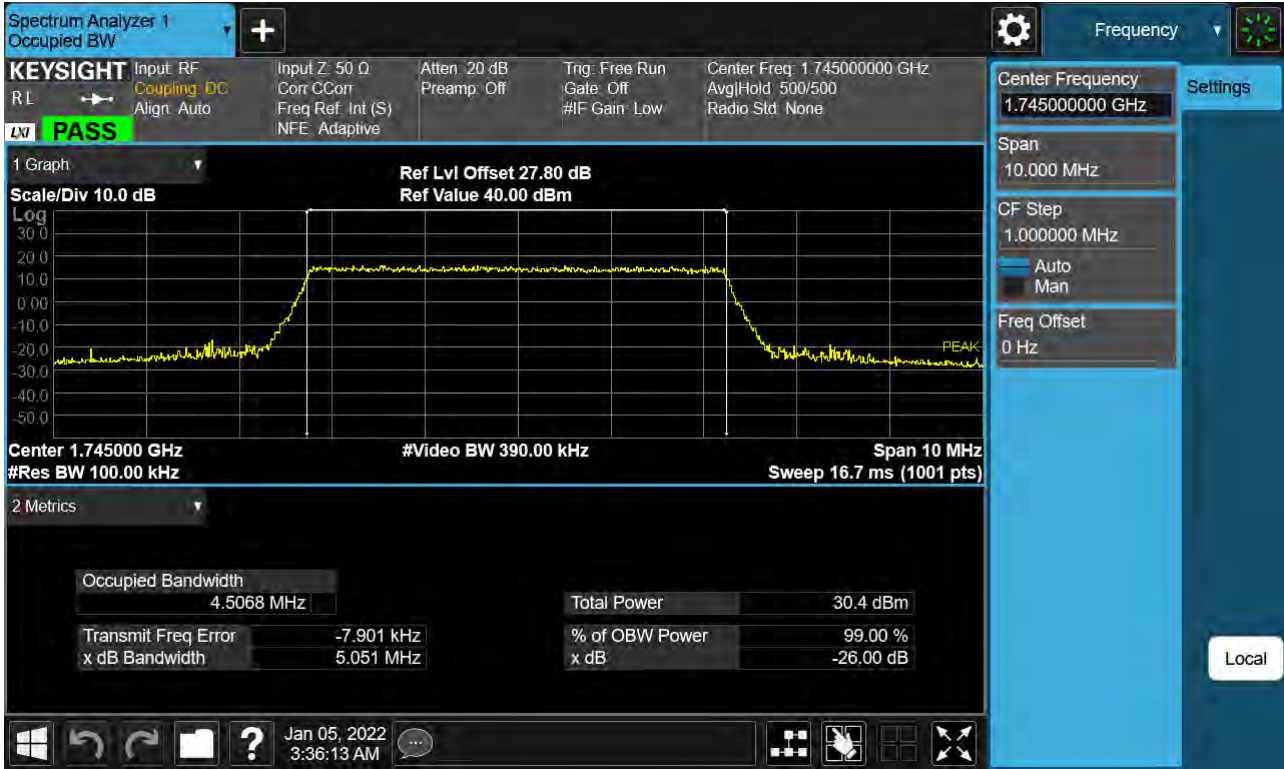
Sub6 n66. Occupied Bandwidth Plot (5 M BW Ch.349000 BPSK Full RB)



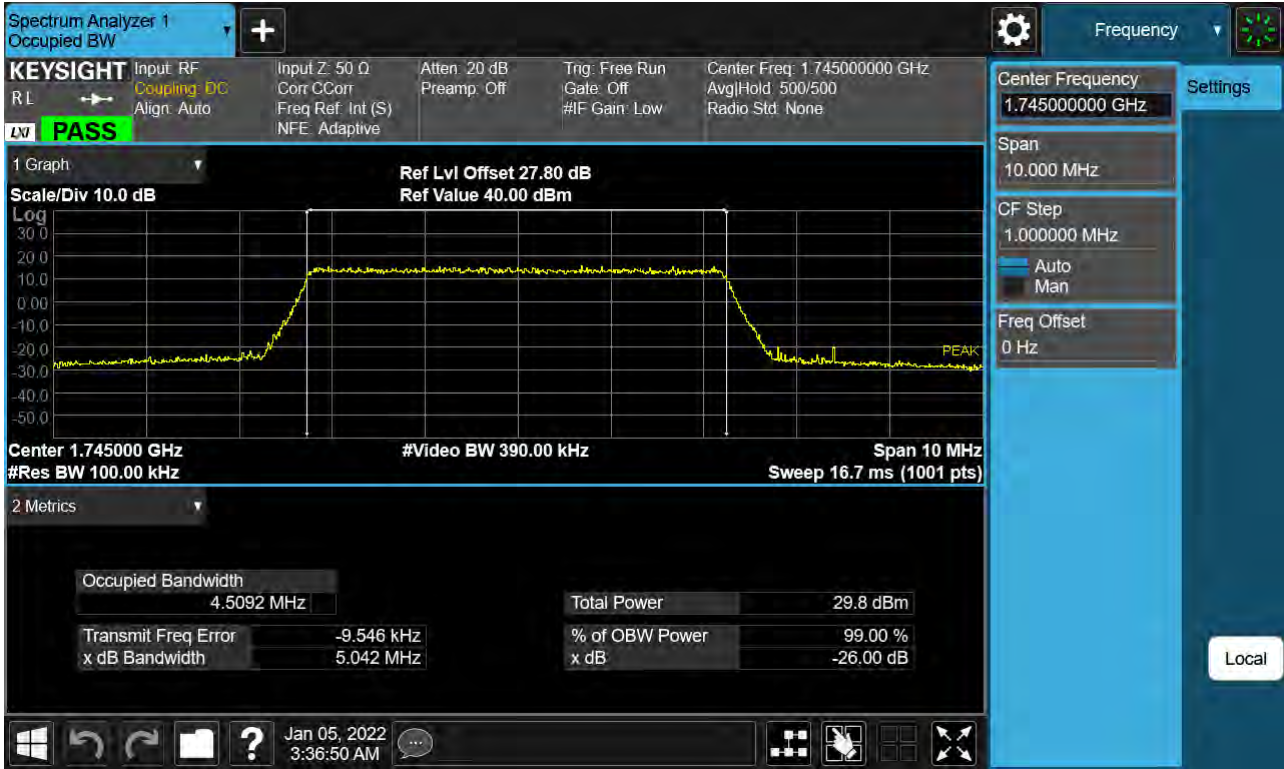
Sub6 n66. Occupied Bandwidth Plot (5 M BW Ch.349000 QPSK Full RB)



Sub6 n66. Occupied Bandwidth Plot (5 M BW Ch.349000 16QAM Full RB)

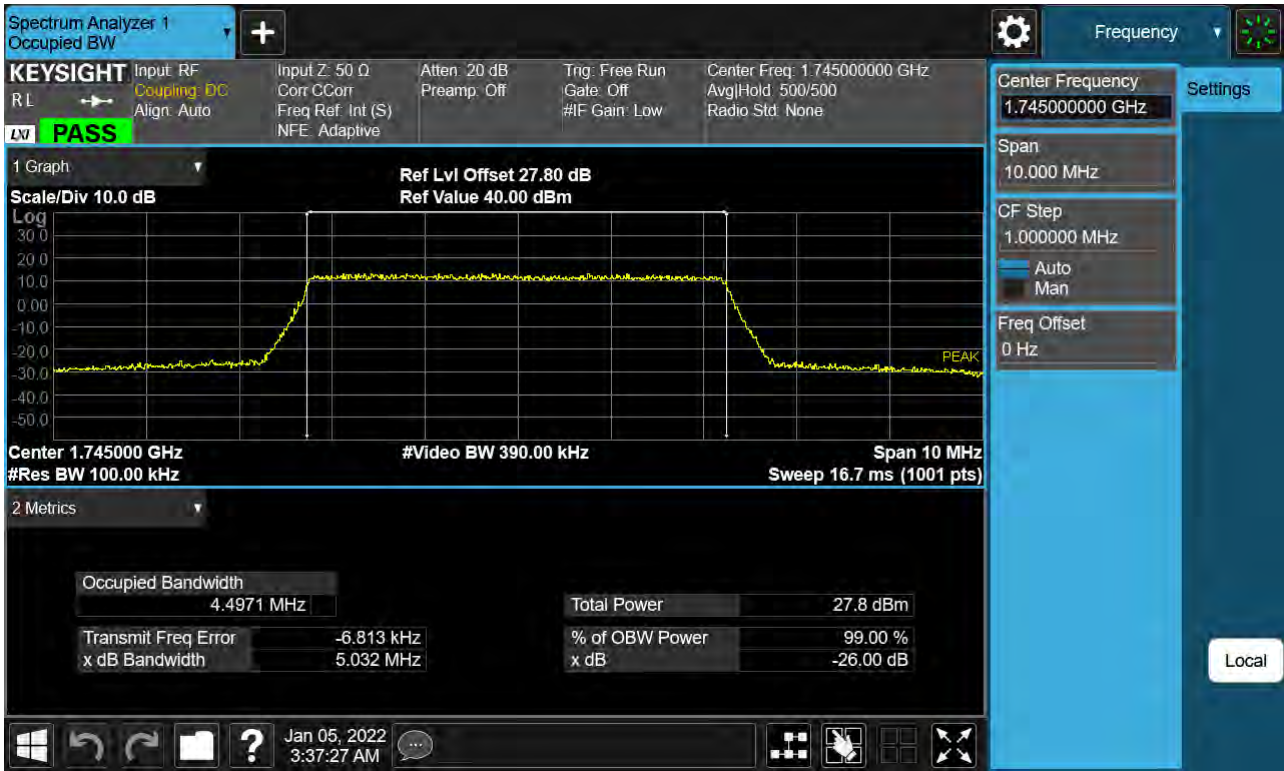


Sub6 n66. Occupied Bandwidth Plot (5 M BW Ch.349000 64QAM Full RB)

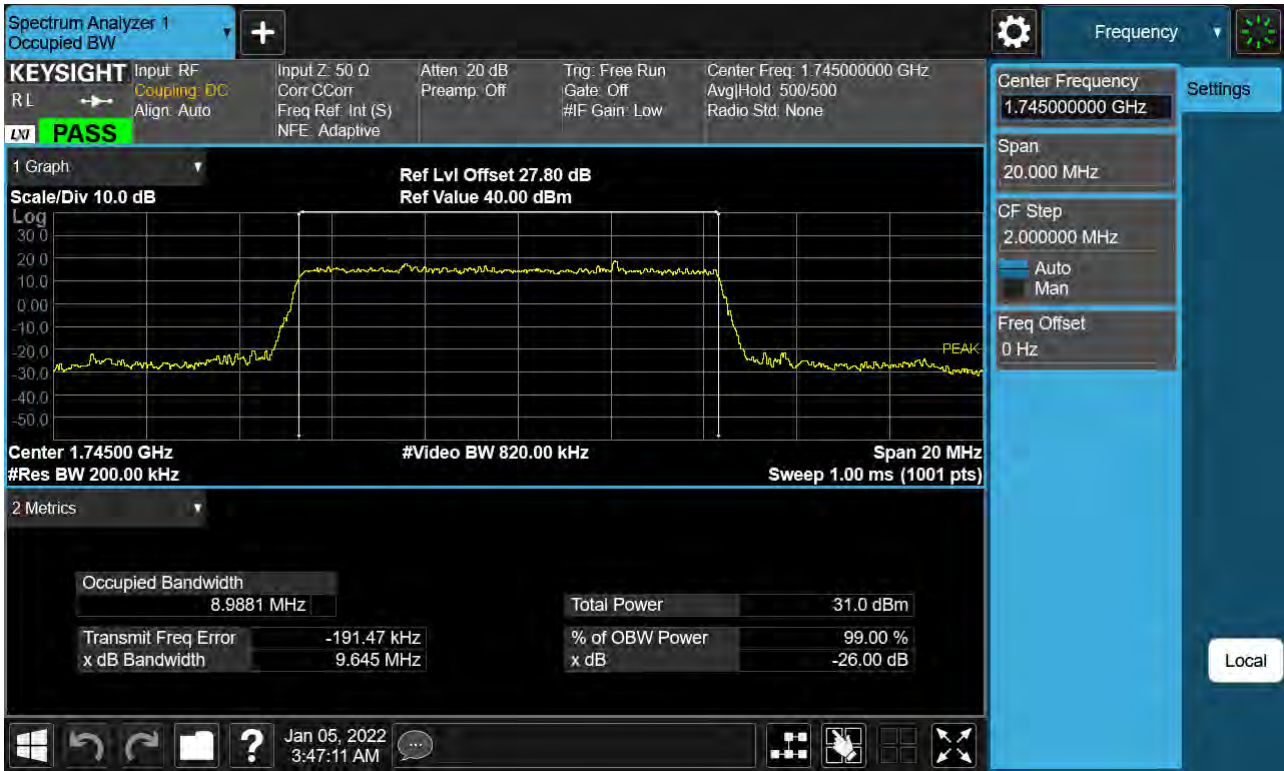




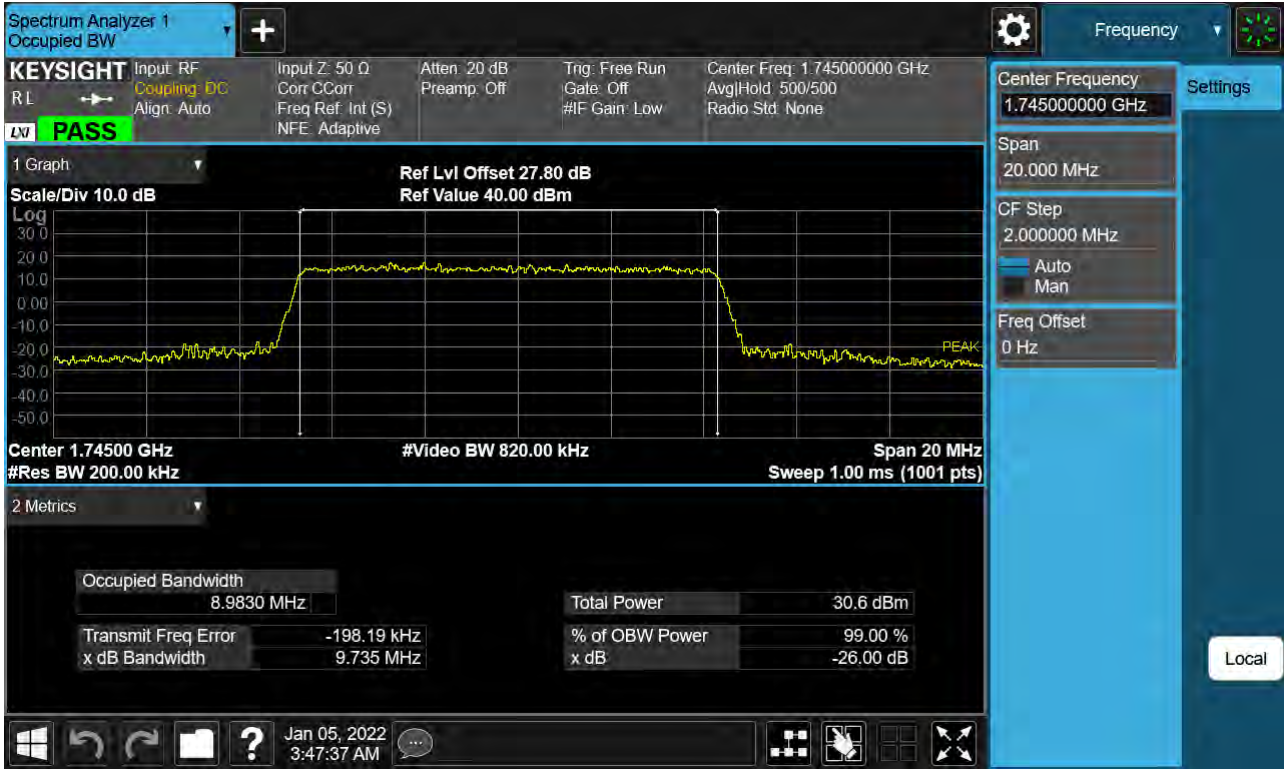
Sub6 n66. Occupied Bandwidth Plot (5 M BW Ch.349000 256QAM Full RB)



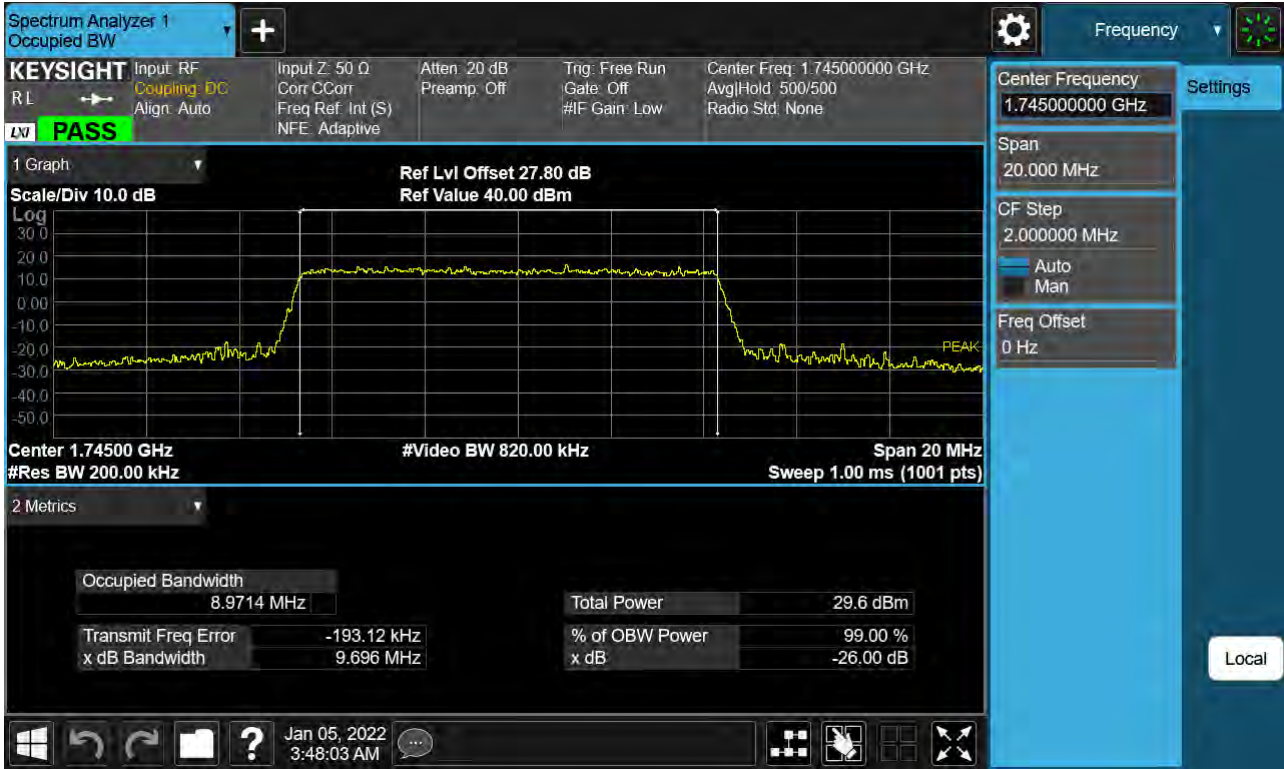
Sub6 n66. Occupied Bandwidth Plot (10 M BW Ch.349000 BPSK Full RB)



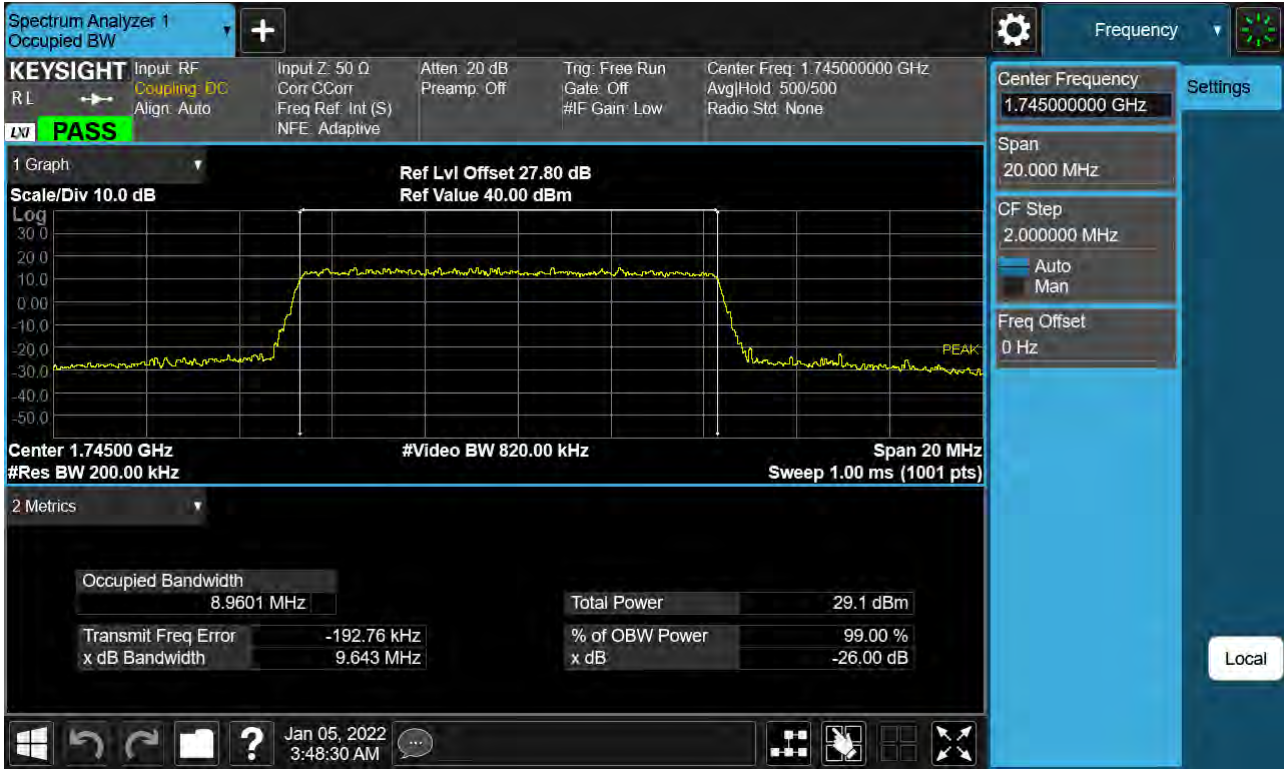
Sub6 n66. Occupied Bandwidth Plot (10 M BW Ch.349000 QPSK Full RB)



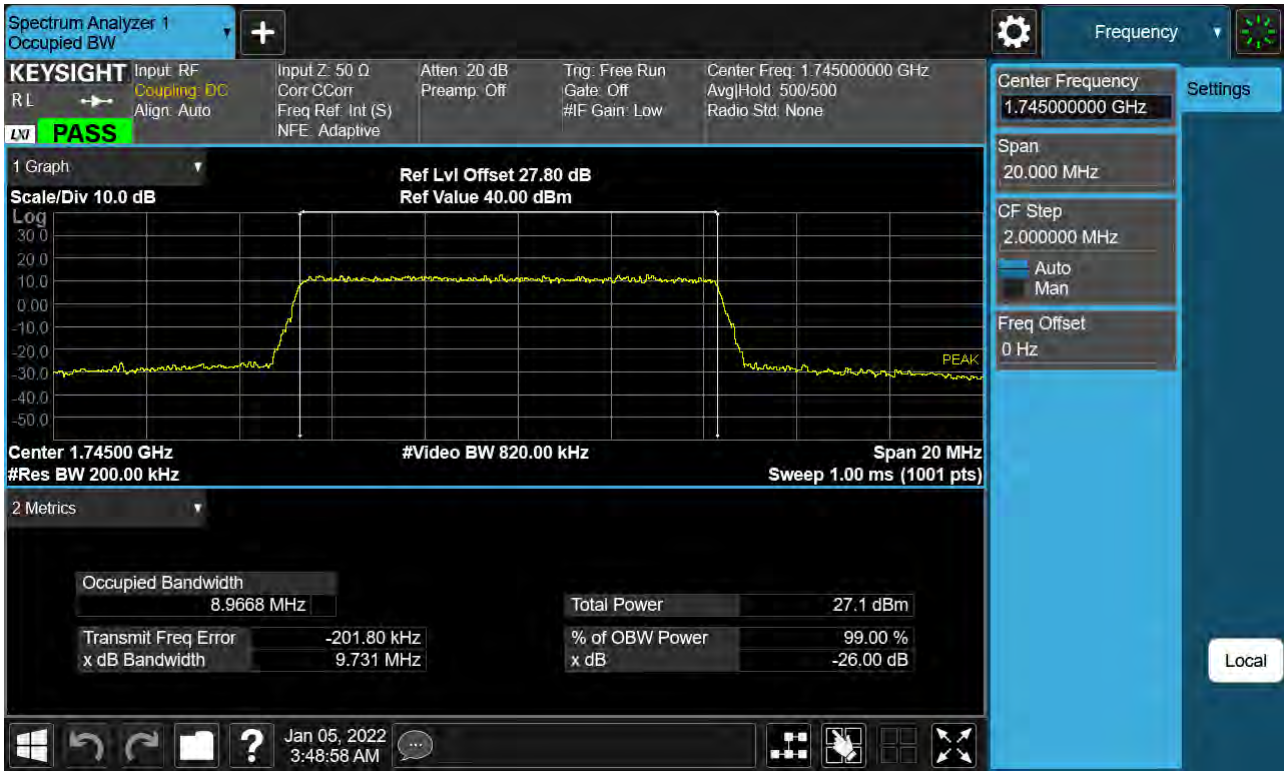
Sub6 n66. Occupied Bandwidth Plot (10 M BW Ch.349000 16QAM Full RB)



Sub6 n66. Occupied Bandwidth Plot (10 M BW Ch.349000 64QAM Full RB)



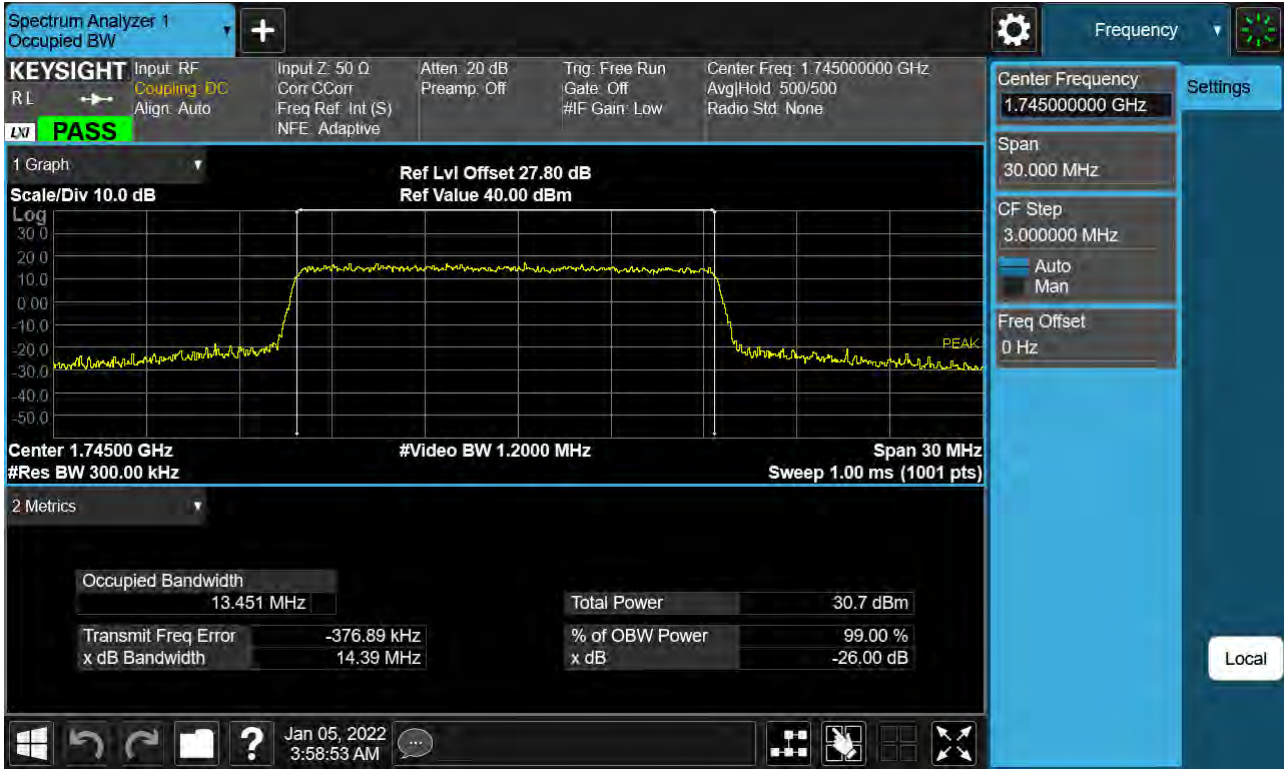
Sub6 n66. Occupied Bandwidth Plot (10 M BW Ch.349000 256QAM Full RB)



Sub6 n66. Occupied Bandwidth Plot (15 M BW Ch.349000 BPSK Full RB)

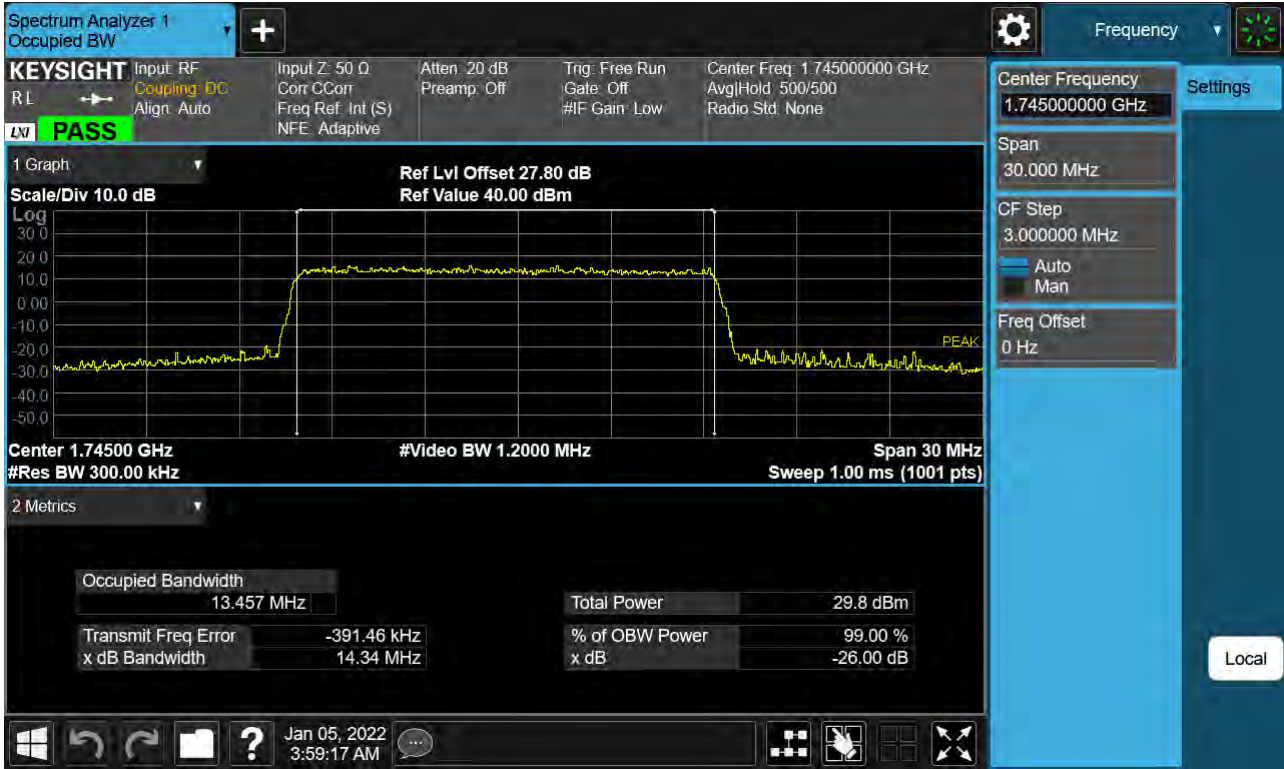


Sub6 n66. Occupied Bandwidth Plot (15 M BW Ch.349000 QPSK Full RB)

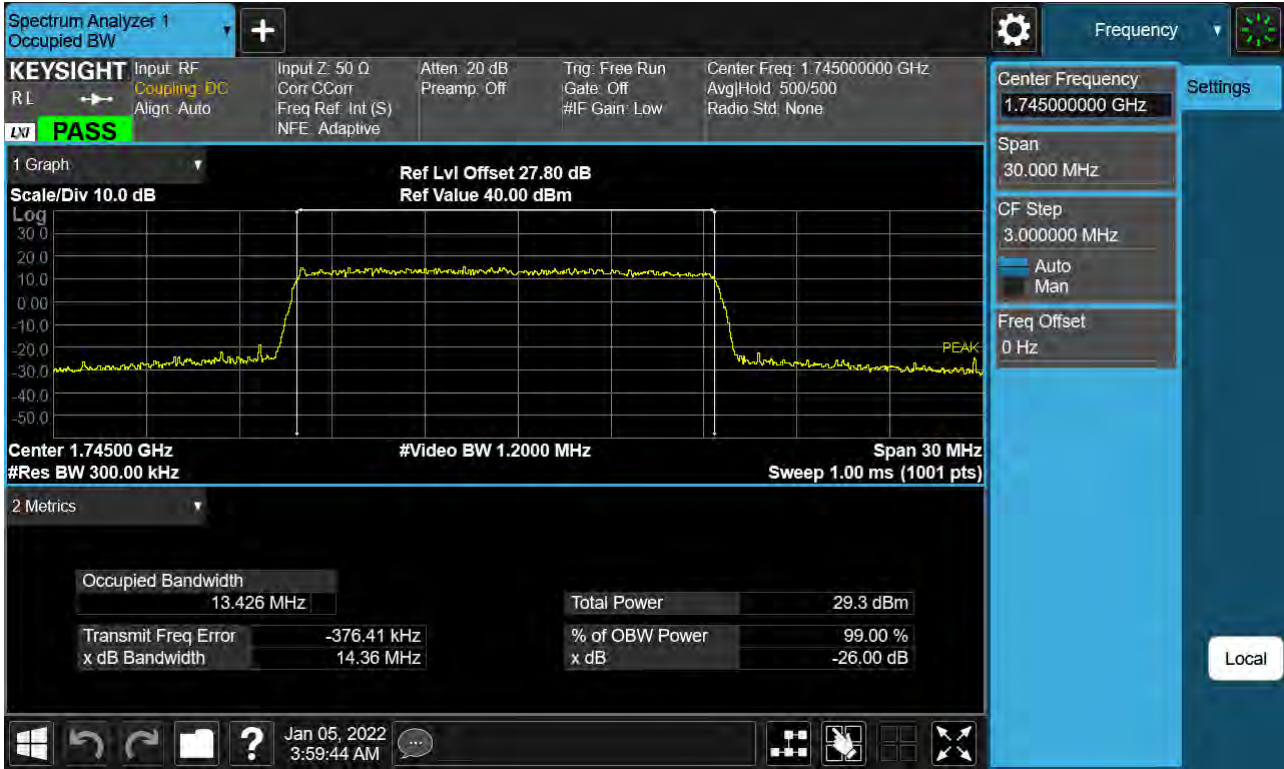




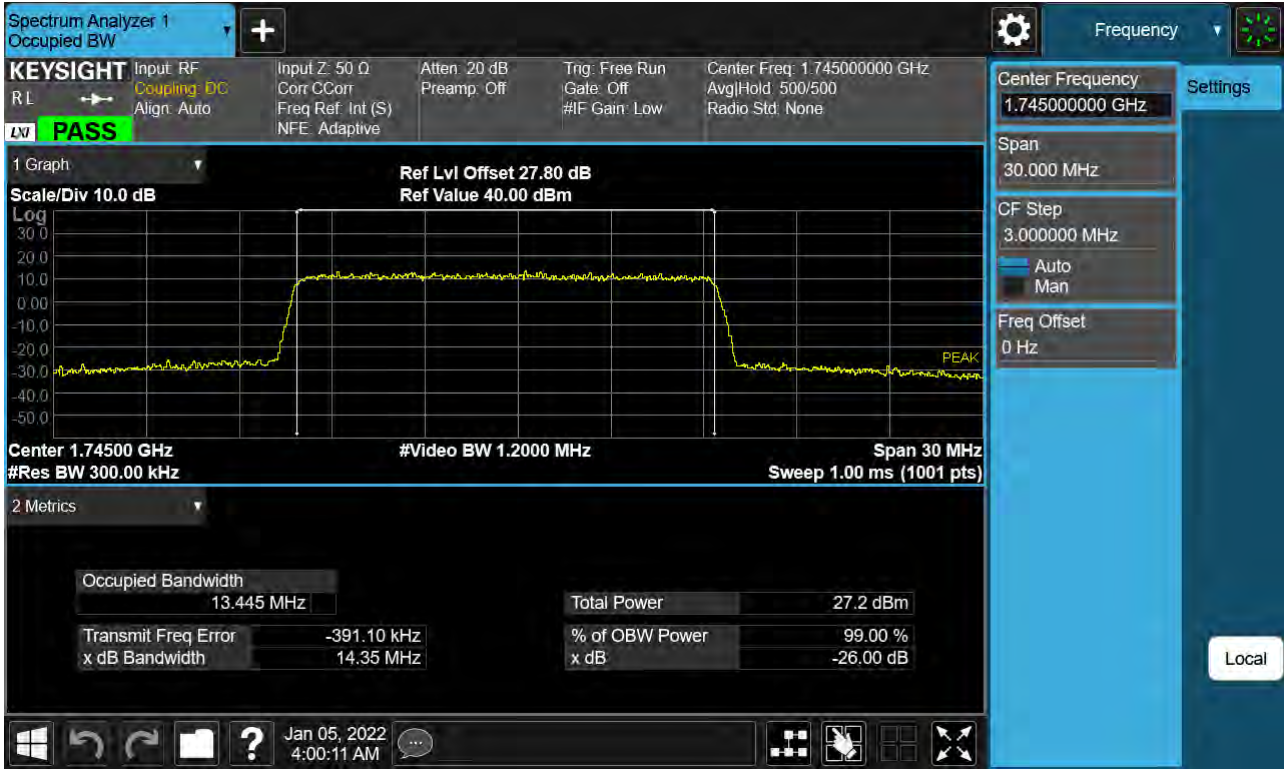
Sub6 n66. Occupied Bandwidth Plot (15 M BW Ch.349000 16QAM Full RB)



Sub6 n66. Occupied Bandwidth Plot (15 M BW Ch.349000 64QAM Full RB)



Sub6 n66. Occupied Bandwidth Plot (15 M BW Ch.349000 256QAM Full RB)



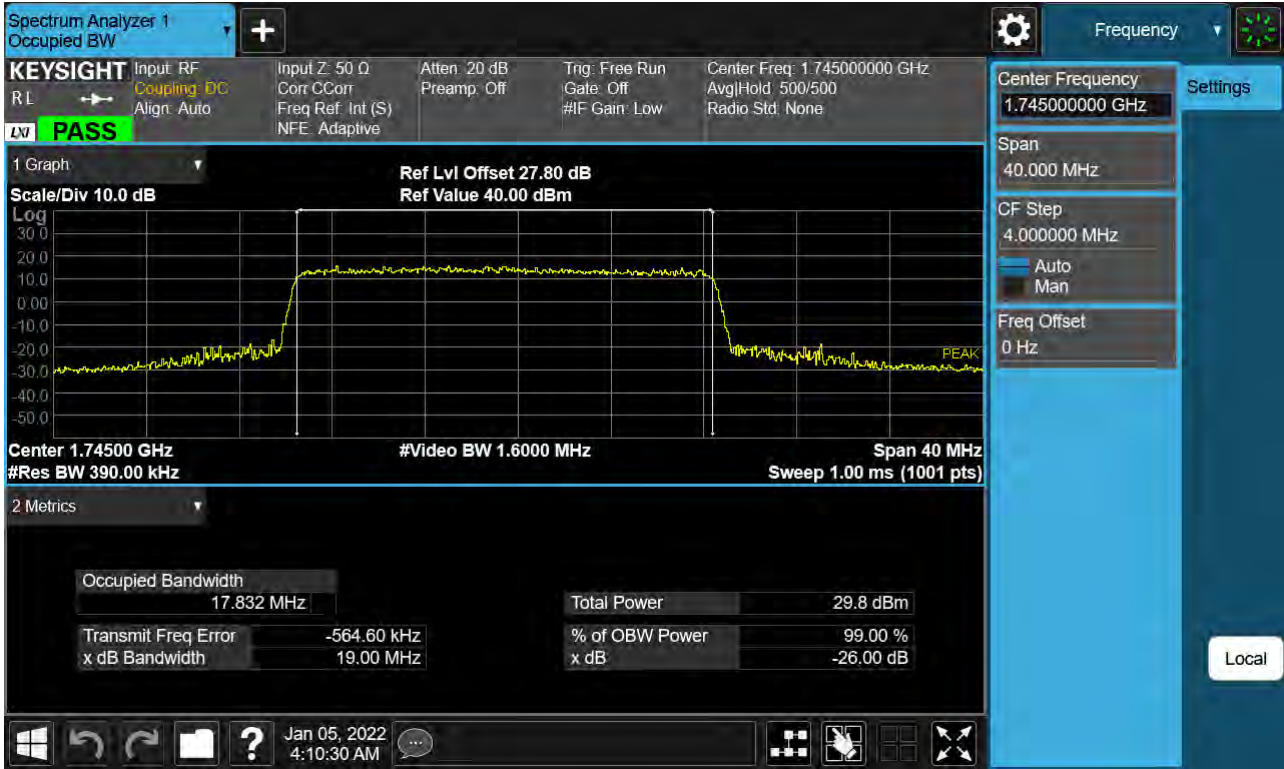
Sub6 n66. Occupied Bandwidth Plot (20 M BW Ch.349000 BPSK Full RB)



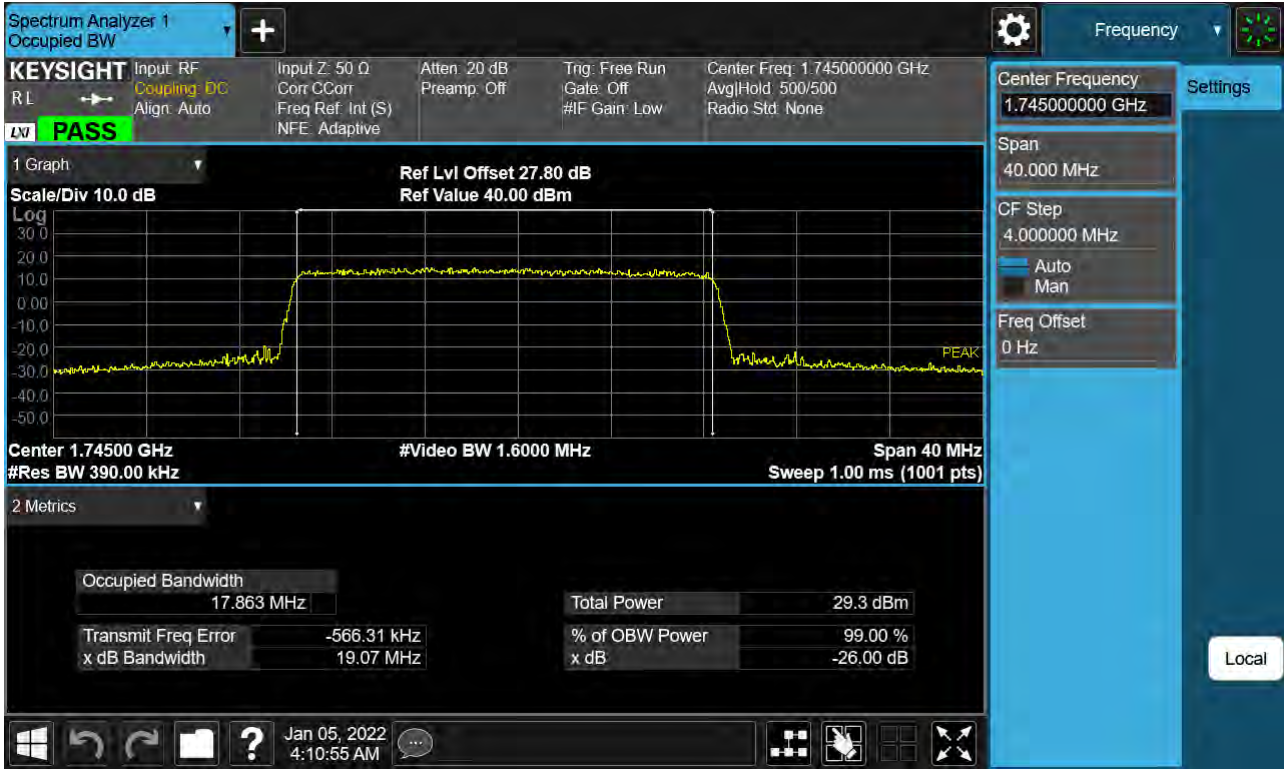
Sub6 n66. Occupied Bandwidth Plot (20 M BW Ch.349000 QPSK Full RB)



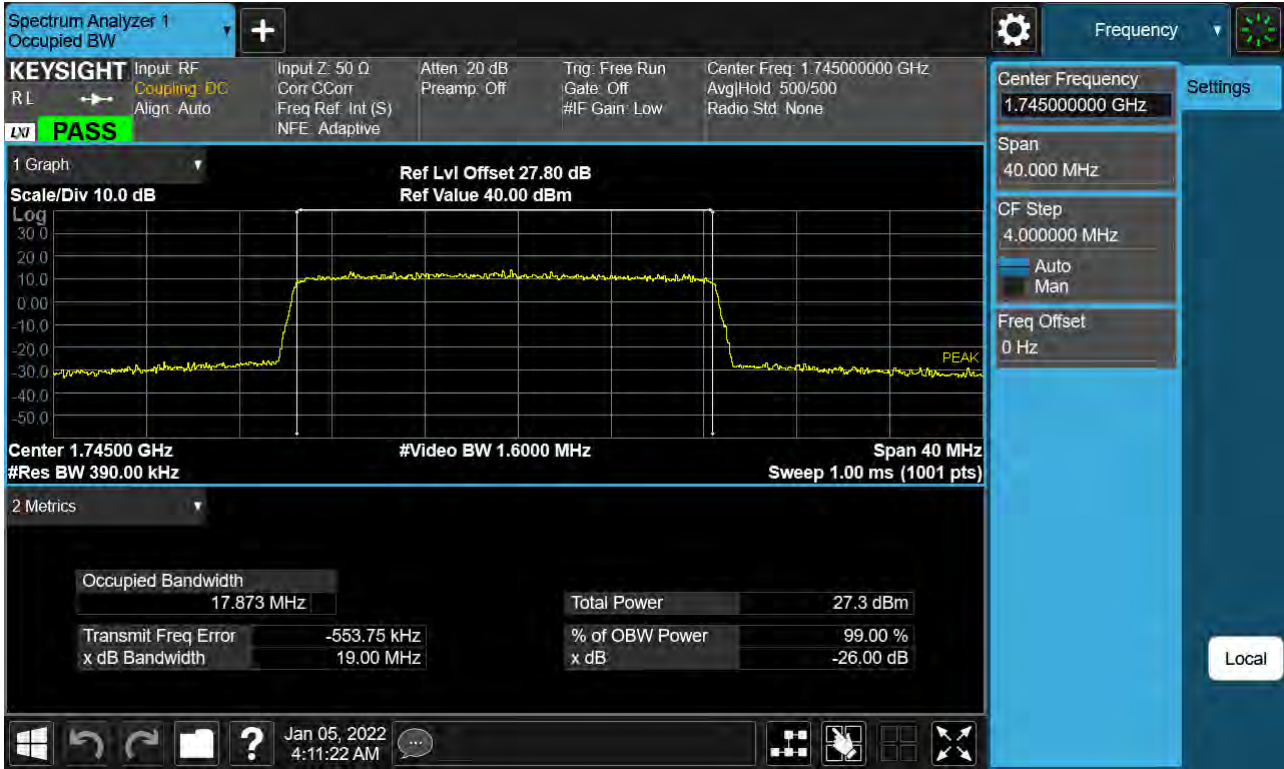
Sub6 n66. Occupied Bandwidth Plot (20 M BW Ch.349000 16QAM Full RB)



Sub6 n66. Occupied Bandwidth Plot (20 M BW Ch.349000 64QAM Full RB)

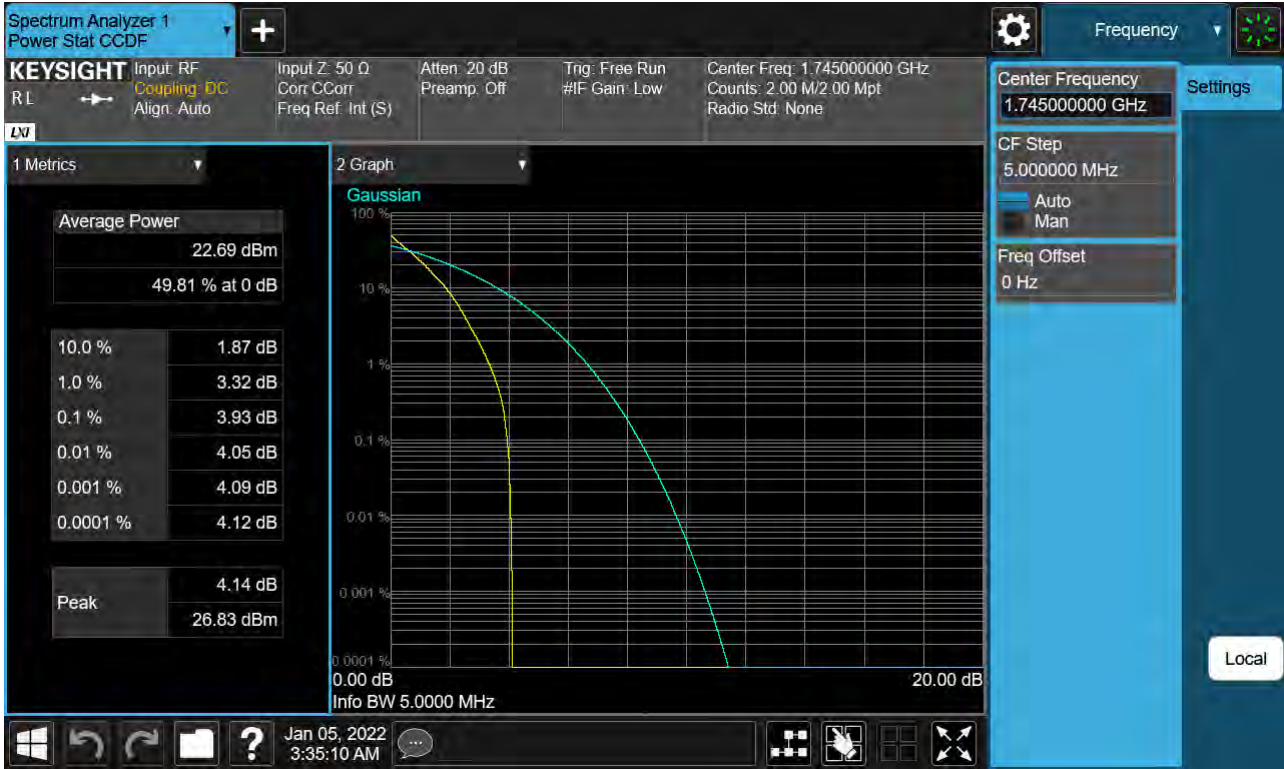


Sub6 n66. Occupied Bandwidth Plot (20 M BW Ch.349000 256QAM Full RB)





Sub6 n66. PAR Plot (5 M BW\_Ch.349000\_ BPSK\_ Full RB)



Sub6 n66. PAR Plot (5 M BW\_Ch.349000\_QPSK\_Full RB)



Sub6 n66. PAR Plot (5 M BW\_Ch.349000\_16QAM\_Full RB)



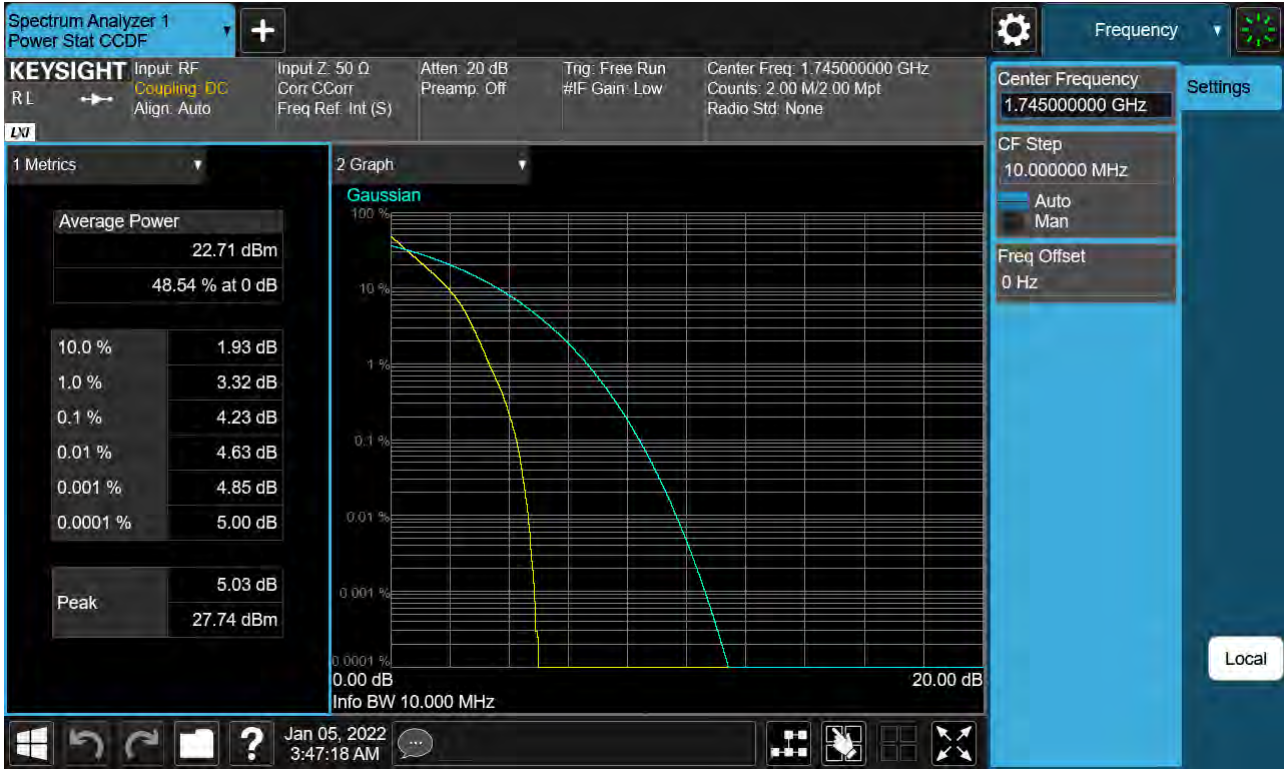
Sub6 n66. PAR Plot (5 M BW\_Ch.349000\_64QAM\_Full RB)



Sub6 n66. PAR Plot (5 M BW\_Ch.349000\_256QAM\_Full RB)



Sub6 n66. PAR Plot (10 M BW\_Ch.349000\_ BPSK\_ Full RB)



Sub6 n66. PAR Plot (10 M BW\_Ch.349000\_QPSK\_Full RB)



Sub6 n66. PAR Plot (10 M BW\_Ch.349000\_16QAM\_Full RB)





Sub6 n66. PAR Plot (10 M BW\_Ch.349000\_64QAM\_Full RB)



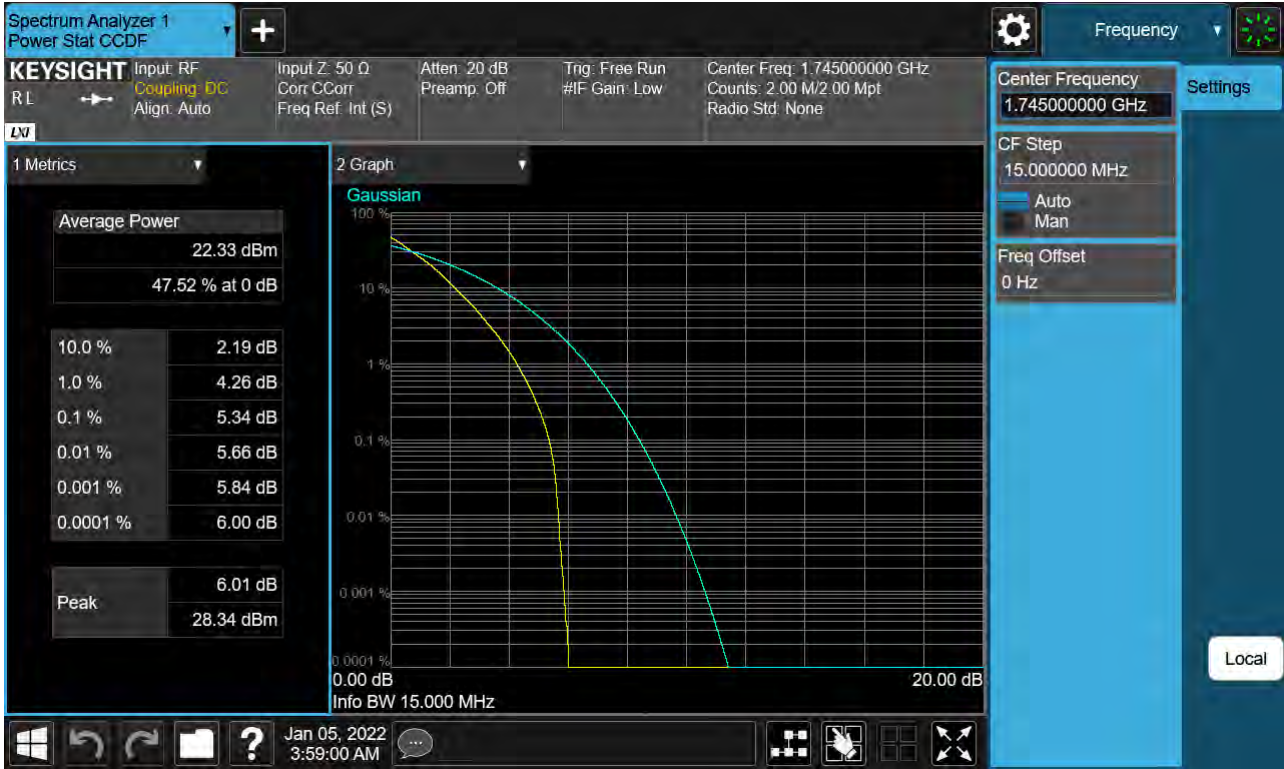
Sub6 n66. PAR Plot (10 M BW\_Ch.349000\_256QAM\_Full RB)



Sub6 n66. PAR Plot (15 M BW\_Ch.349000\_ BPSK\_ Full RB)



Sub6 n66. PAR Plot (15 M BW\_Ch.349000\_QPSK\_Full RB)



Sub6 n66. PAR Plot (15 M BW\_Ch.349000\_16QAM\_Full RB)



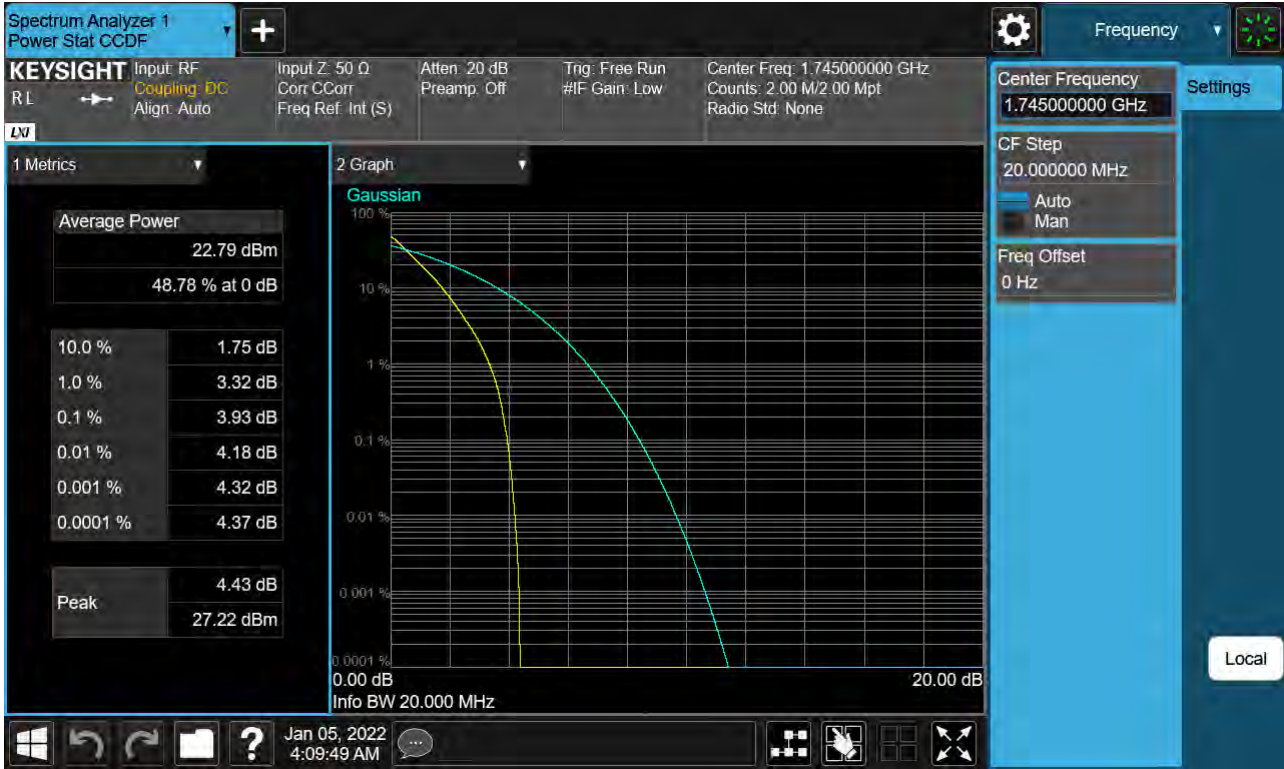
Sub6 n66. PAR Plot (15 M BW\_Ch.349000\_64QAM\_Full RB)



Sub6 n66. PAR Plot (15 M BW\_Ch.349000\_256QAM\_Full RB)

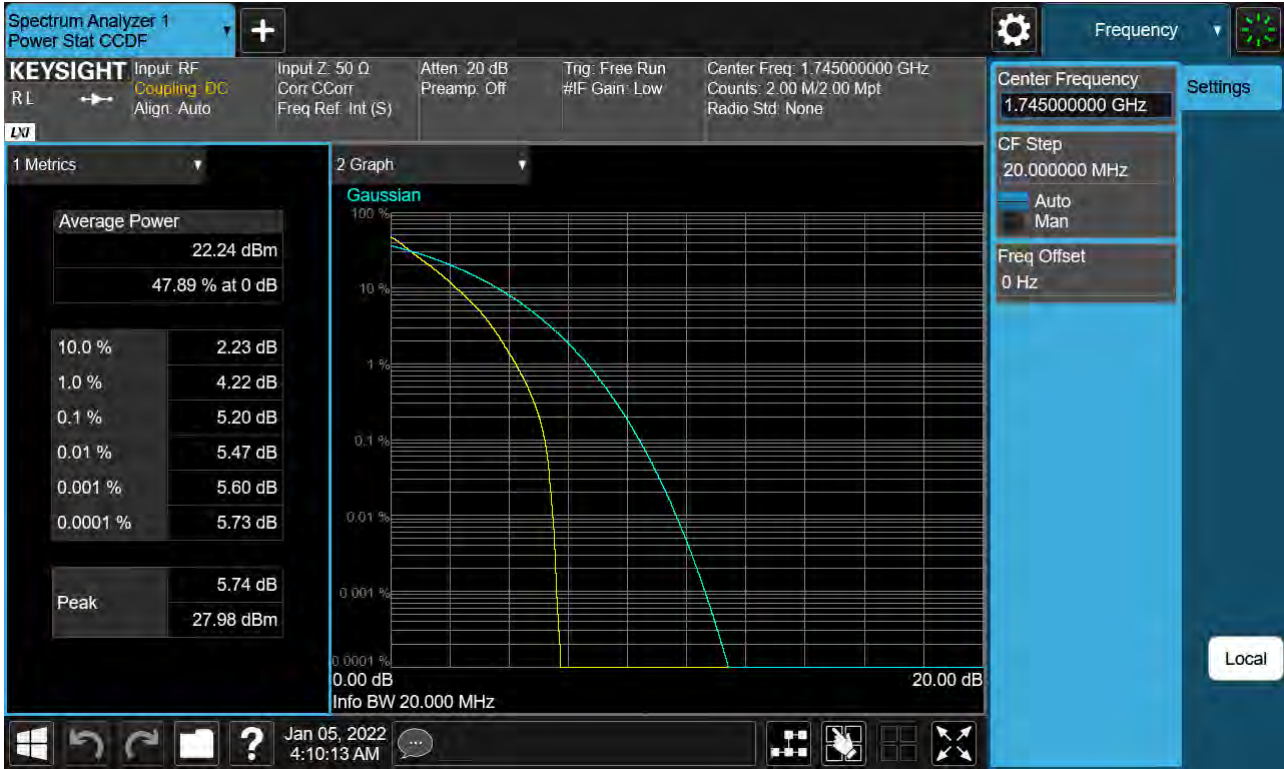


Sub6 n66. PAR Plot (20 M BW\_Ch.349000\_ BPSK\_ Full RB)

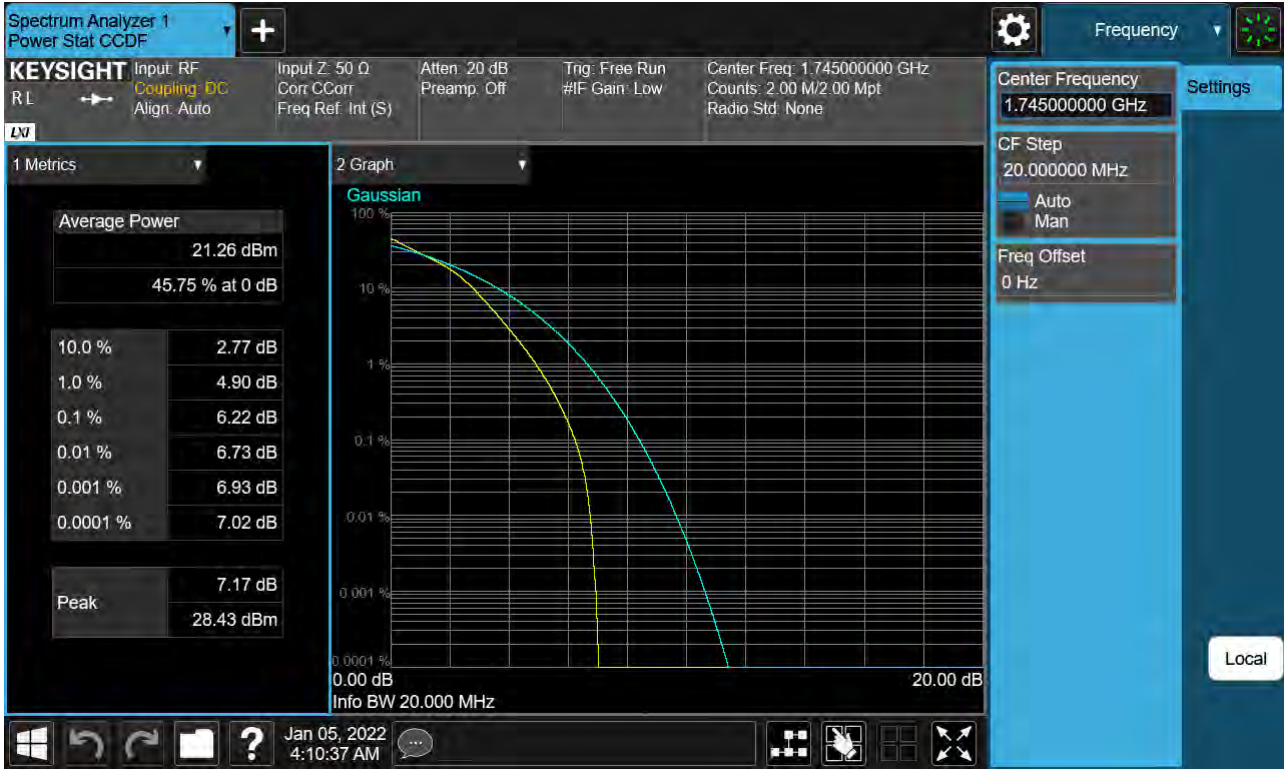




Sub6 n66. PAR Plot (20 M BW\_Ch.349000\_QPSK\_Full RB)



Sub6 n66. PAR Plot (20 M BW\_Ch.349000\_16QAM\_Full RB)



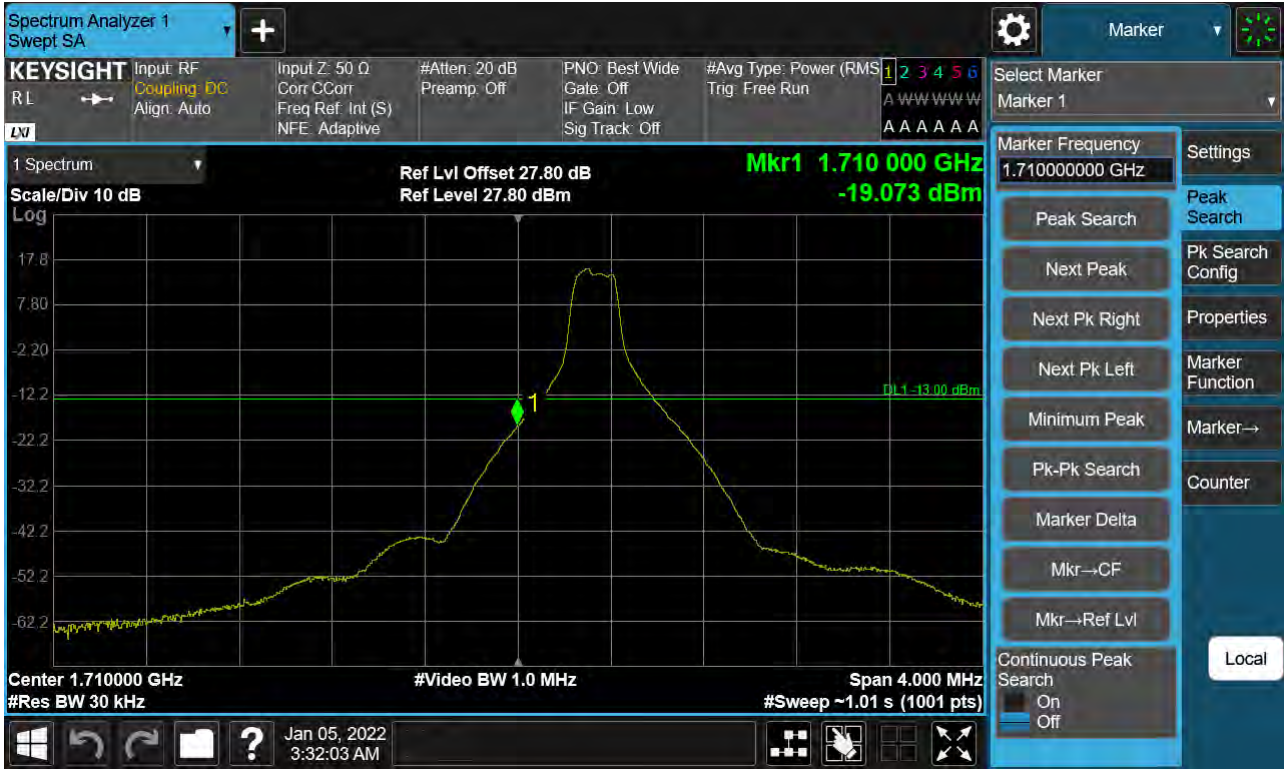
Sub6 n66. PAR Plot (20 M BW\_Ch.349000\_64QAM\_Full RB)



Sub6 n66. PAR Plot (20 M BW\_Ch.349000\_256QAM\_Full RB)



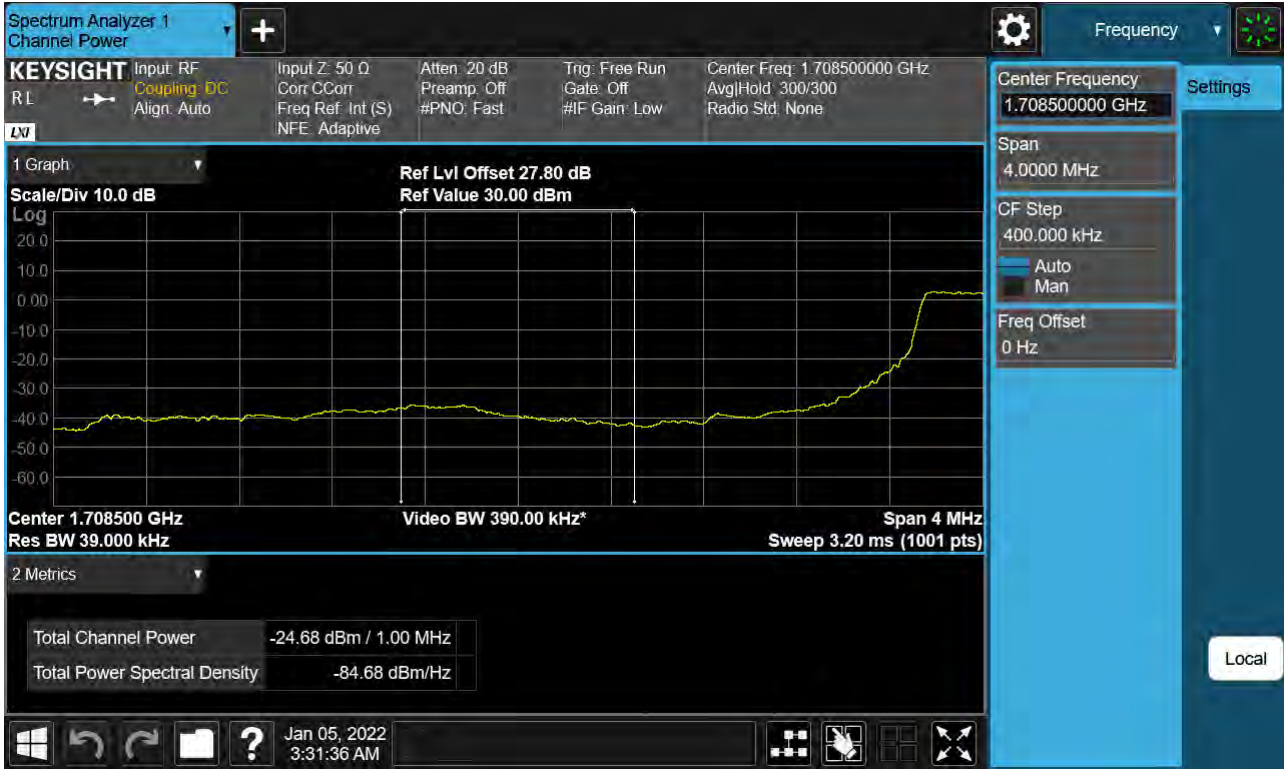
Sub6 n66. Lower Band Edge Plot (5 M BW Ch.342500 BPSK RB 1, Offset 0) -1



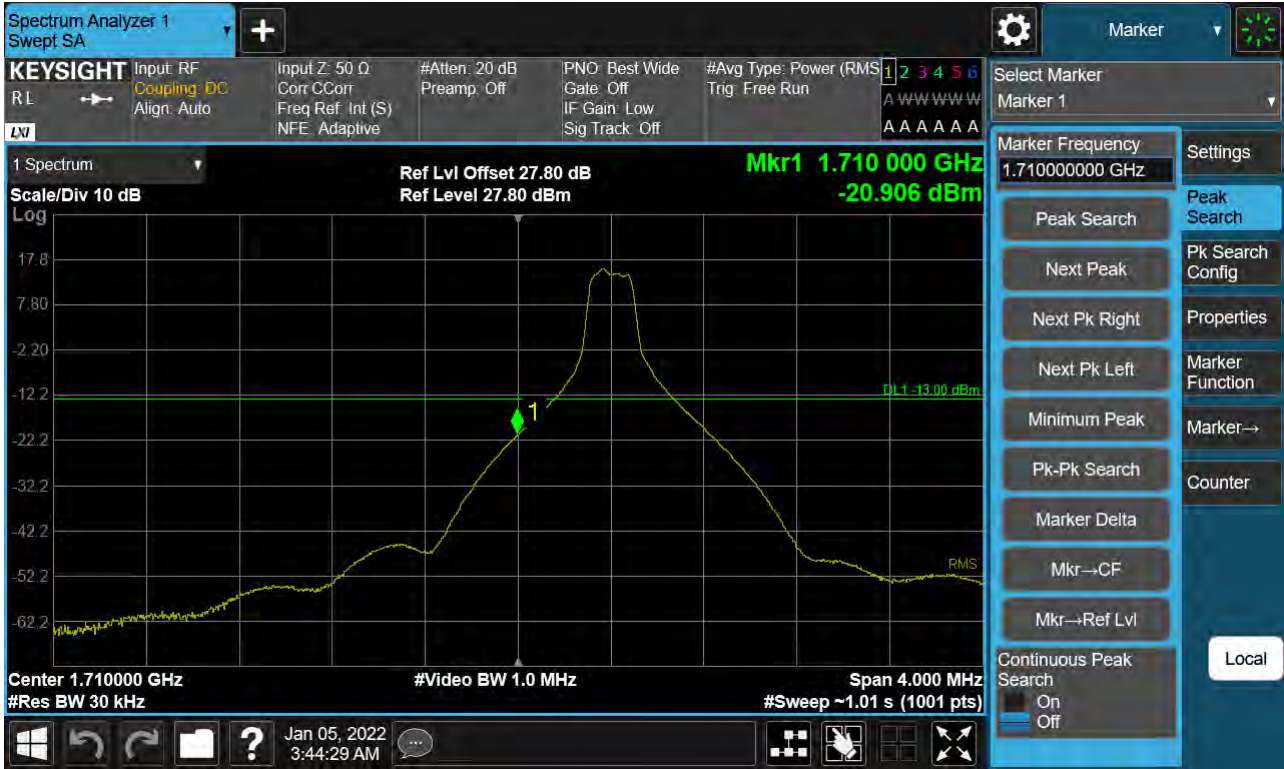
Sub6 n66. Lower Band Edge Plot (5 M BW Ch.342500 BPSK Full RB) -2



Sub6 n66. Lower Extended Band Edge Plot (5 M BW Ch.342500 BPSK\_ Full RB) -3



Sub6 n66. Lower Band Edge Plot (10 M BW Ch.343000 BPSK RB 1, Offset 0) -1

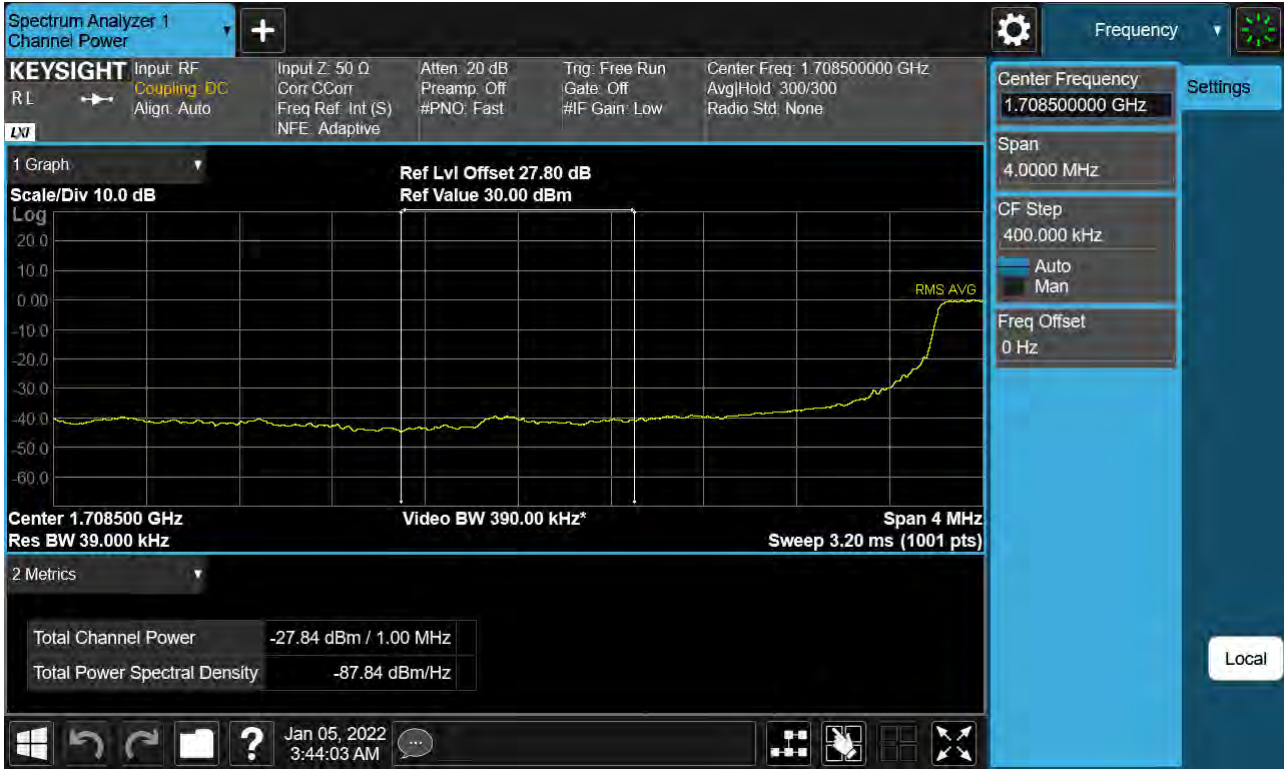




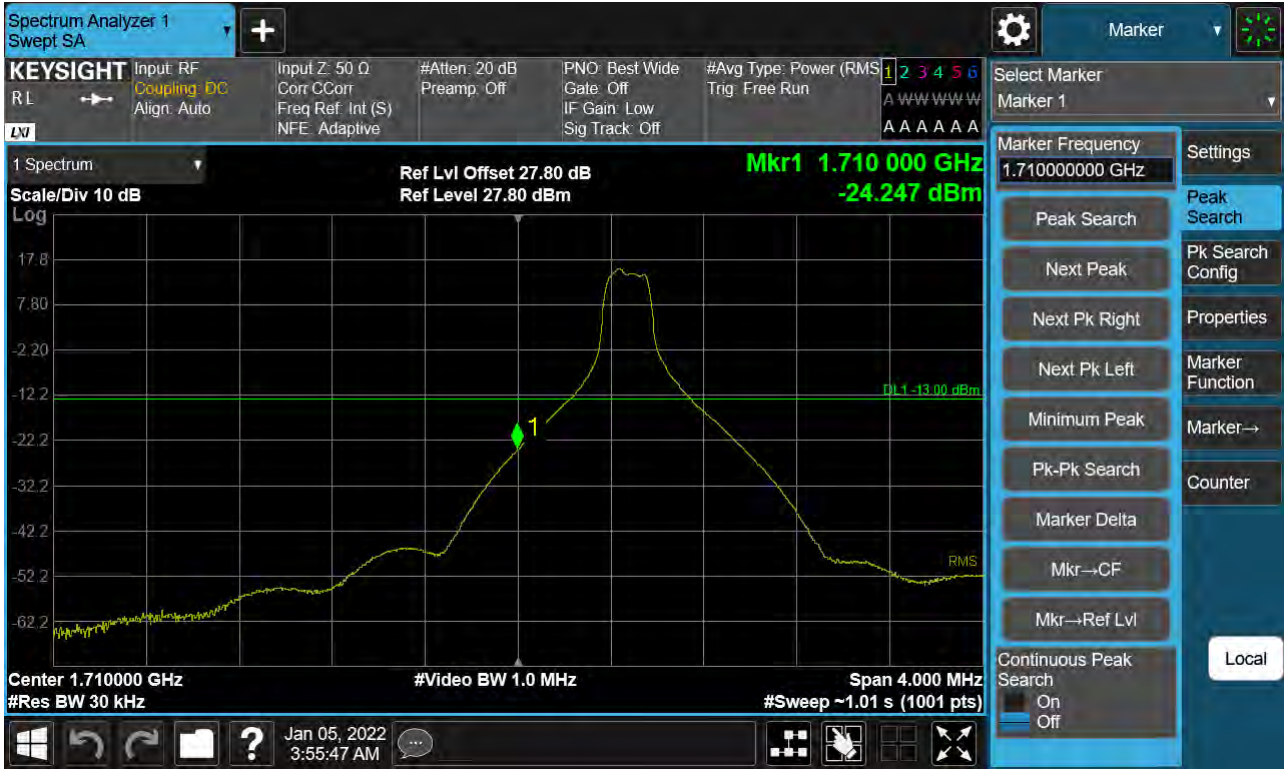
Sub6 n66. Lower Band Edge Plot (10 M BW Ch.343000 BPSK Full RB) -2



Sub6 n66. Lower Extended Band Edge Plot (10 M BW Ch.343000 BPSK\_ Full RB) -3



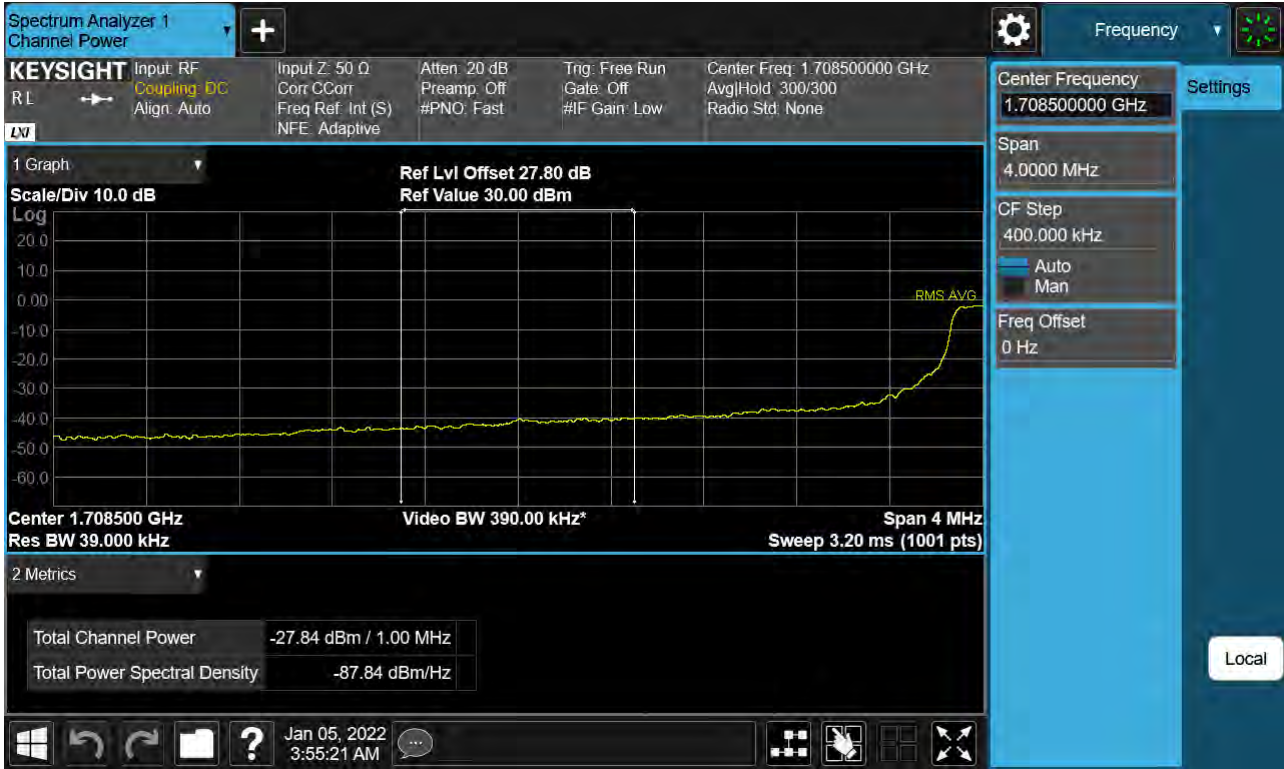
Sub6 n66. Lower Band Edge Plot (15 M BW Ch.343500 BPSK RB 1, Offset 0) -1



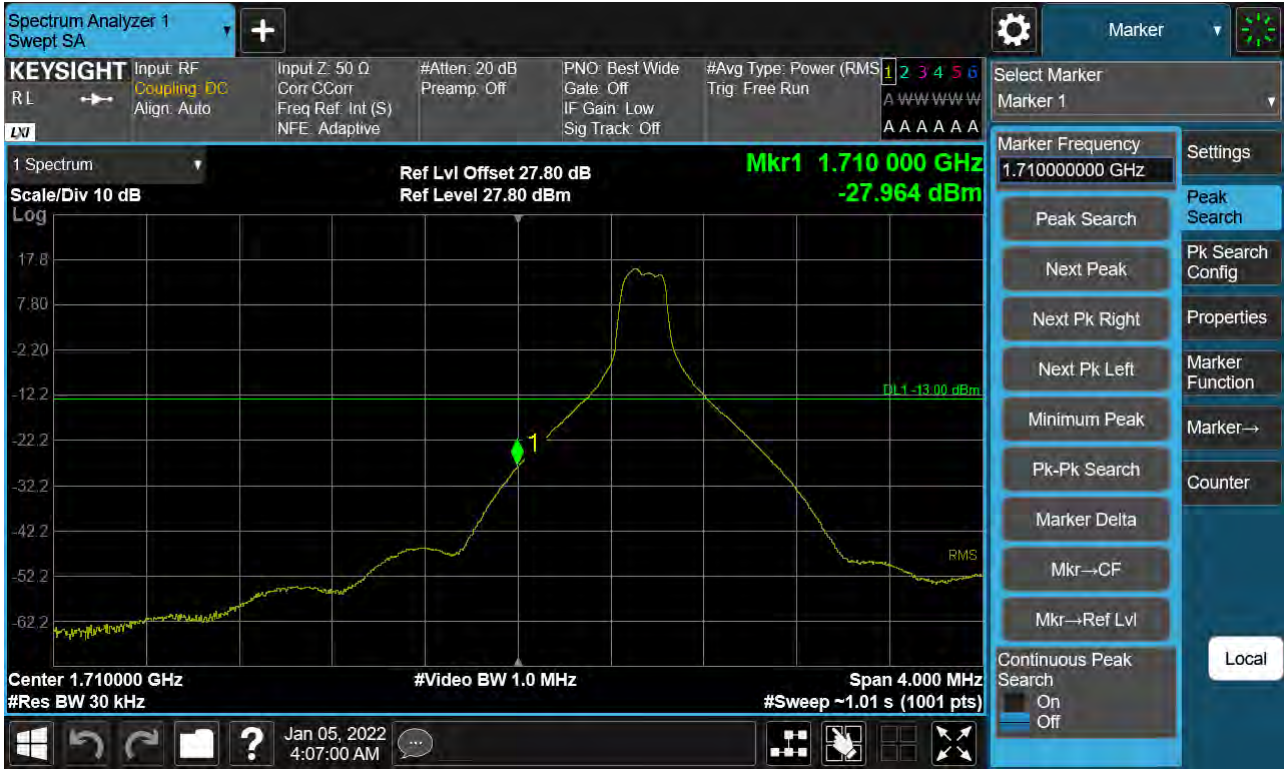
Sub6 n66. Lower Band Edge Plot (15 M BW Ch.343500 BPSK Full RB) -2



Sub6 n66. Lower Extended Band Edge Plot (15 M BW Ch.343500 BPSK\_ Full RB) -3



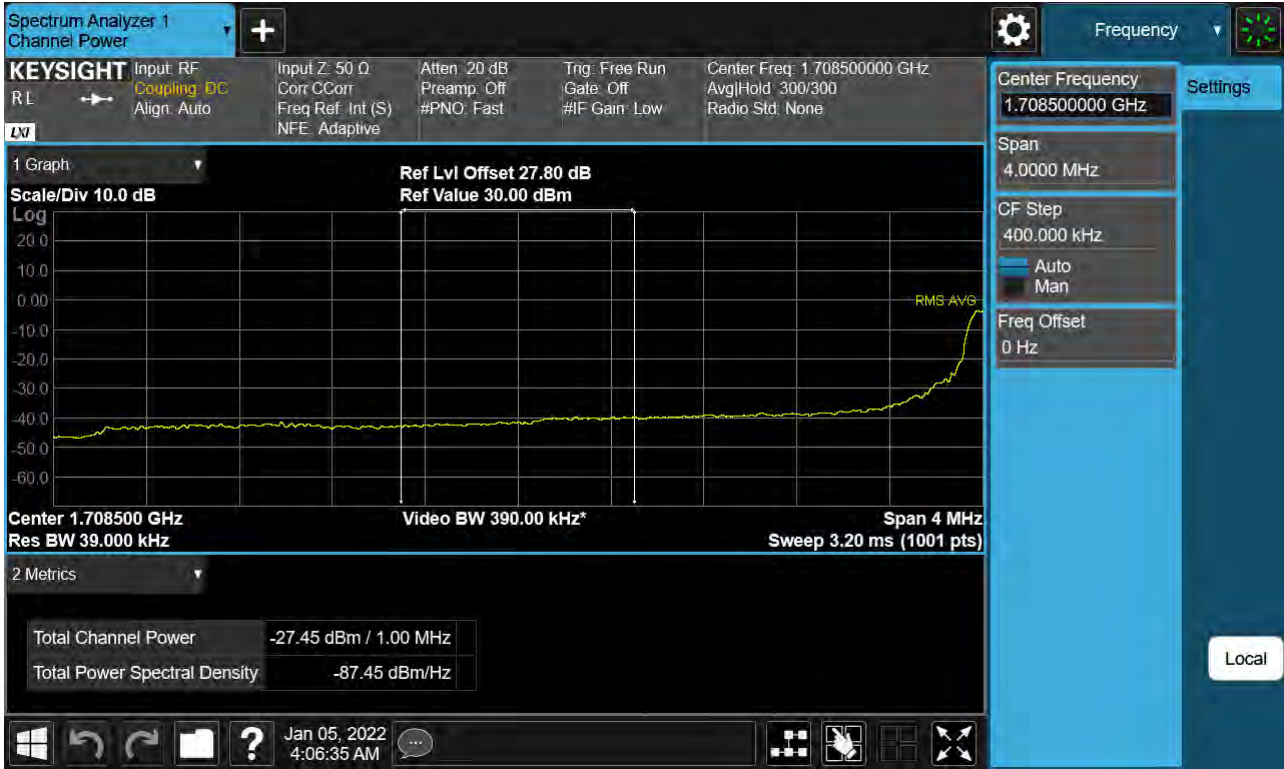
Sub6 n66. Lower Band Edge Plot (20 M BW Ch.344000 BPSK RB 1, Offset 0) -1



Sub6 n66. Lower Band Edge Plot (20 M BW Ch.344000 BPSK Full RB) -2



Sub6 n66. Lower Extended Band Edge Plot (20 M BW Ch.344000 BPSK\_ Full RB) -3





Sub6 n66. Upper Band Edge Plot (5 M BW Ch.355500 BPSK\_RB1\_Offset 24) -1



Sub6 n66. Upper Band Edge Plot (5 M BW Ch.355500 BPSK\_ Full RB) -2



Sub6 n66. Upper Extended Band Edge Plot (5 M BW Ch.355500 BPSK\_ Full RB) -3



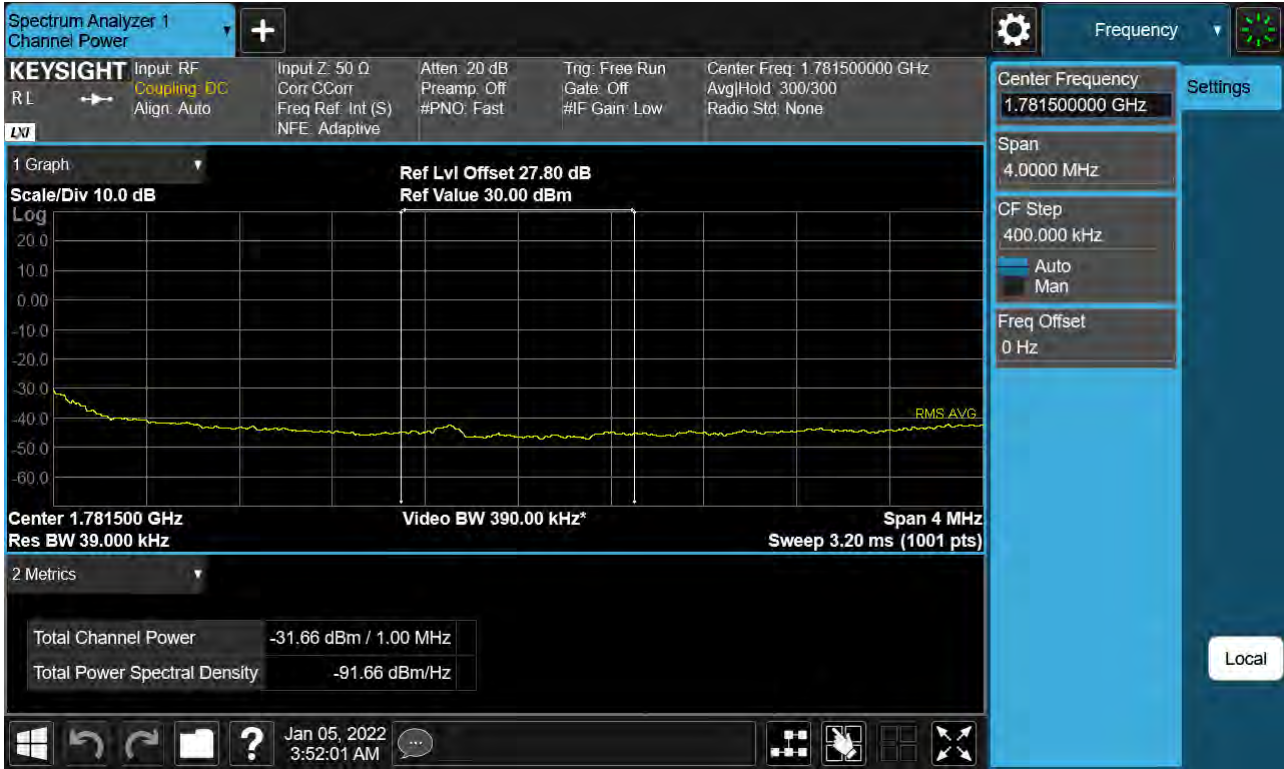
Sub6 n66. Upper Band Edge Plot (10 M BW Ch.355000 BPSK\_RB1\_Offset 51) -1



Sub6 n66. Upper Band Edge Plot (10 M BW Ch.355000 BPSK\_ Full RB) -2



Sub6 n66. Upper Extended Band Edge Plot (10 M BW Ch.355000 BPSK\_ Full RB) -3



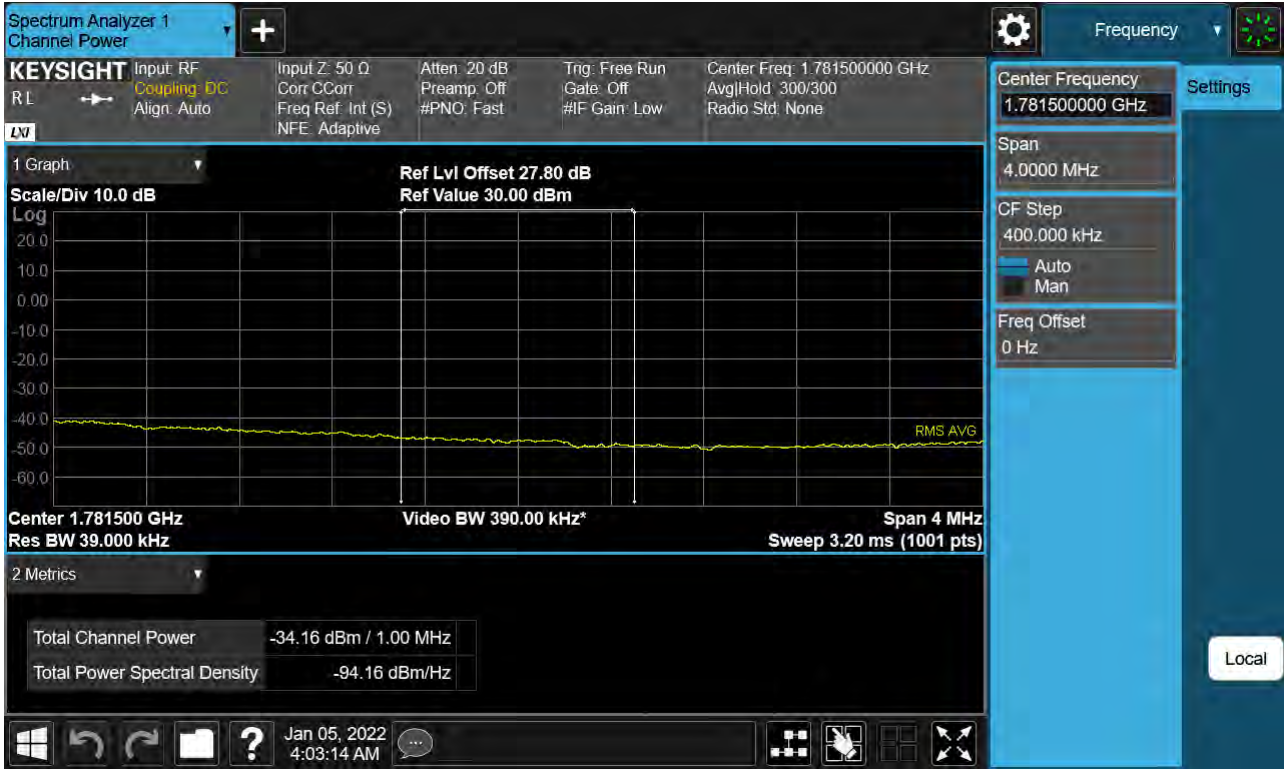


Sub6 n66. Upper Band Edge Plot (15 M BW Ch.354500 BPSK\_ Full RB) -2

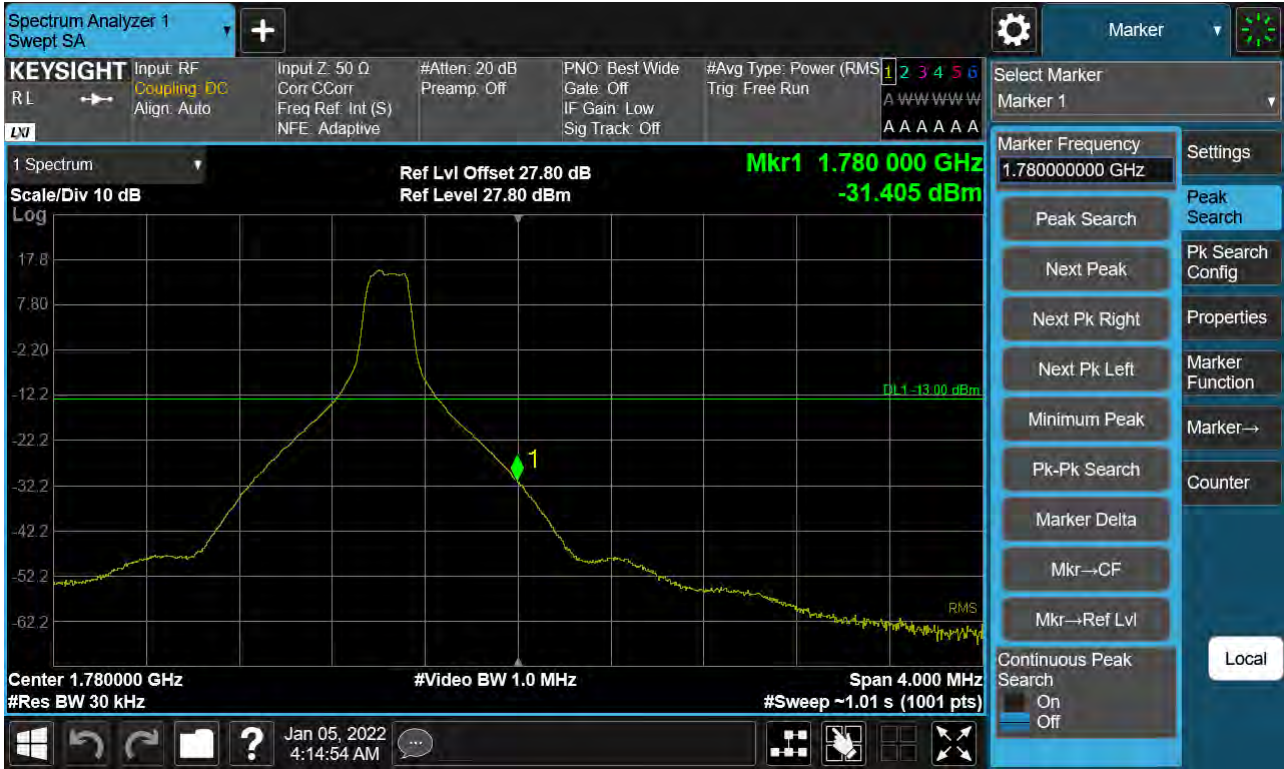




Sub6 n66. Upper Extended Band Edge Plot (15 M BW Ch.354500 BPSK\_ Full RB) -3



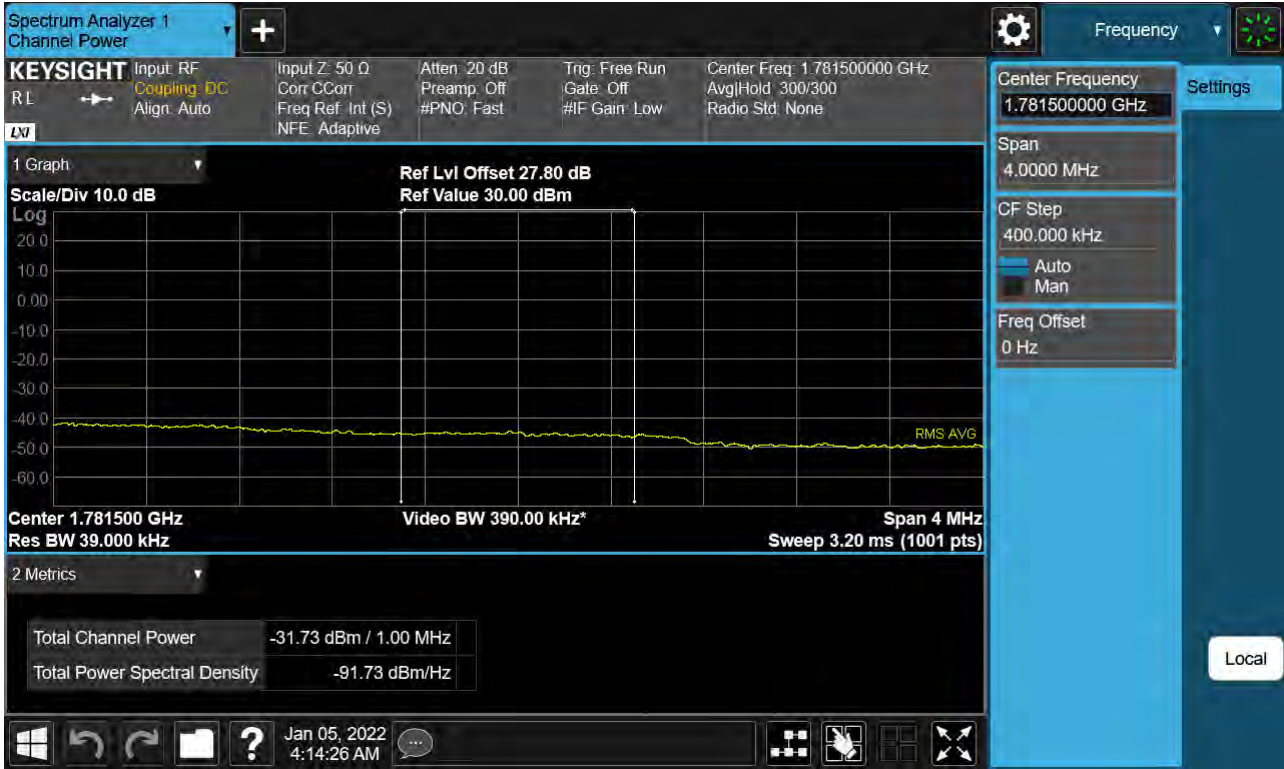
Sub6 n66. Upper Band Edge Plot (20 M BW Ch.354000 BPSK\_RB1\_Offset 105) -1



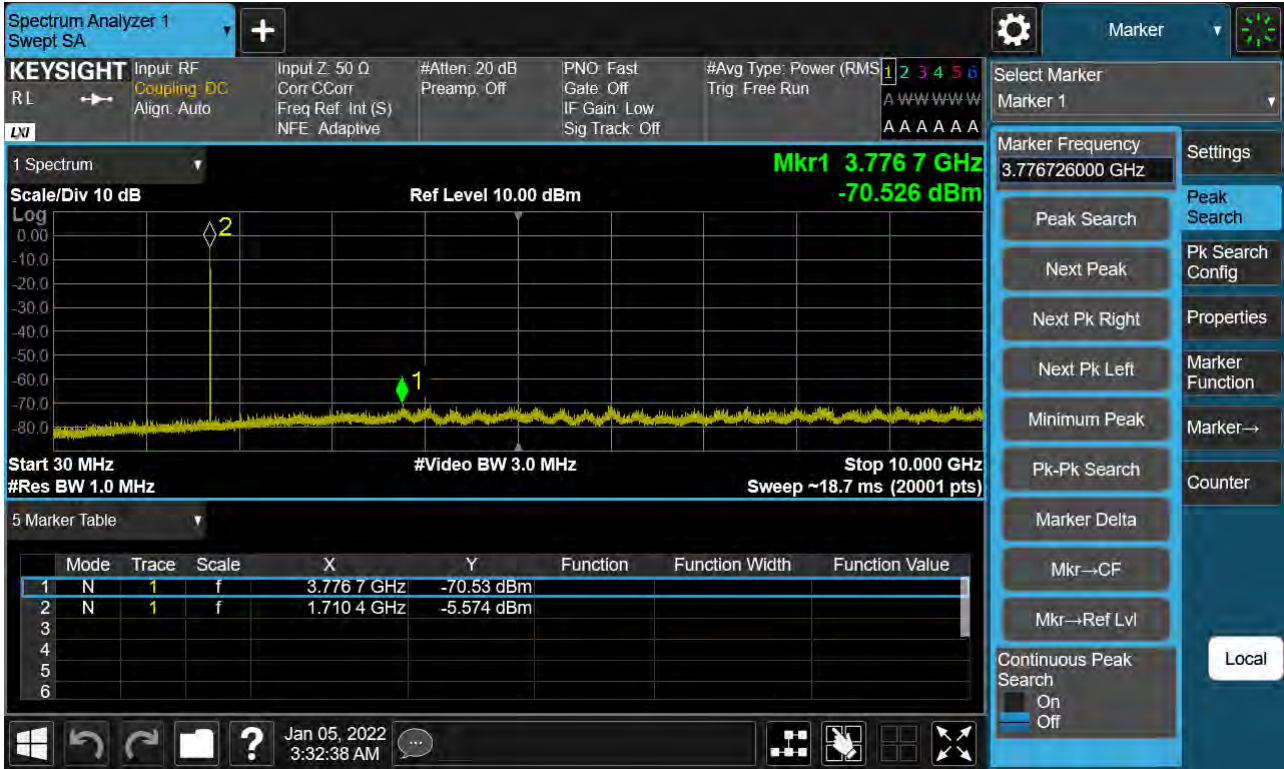
Sub6 n66. Upper Band Edge Plot (20 M BW Ch.354000 BPSK\_ Full RB) -2



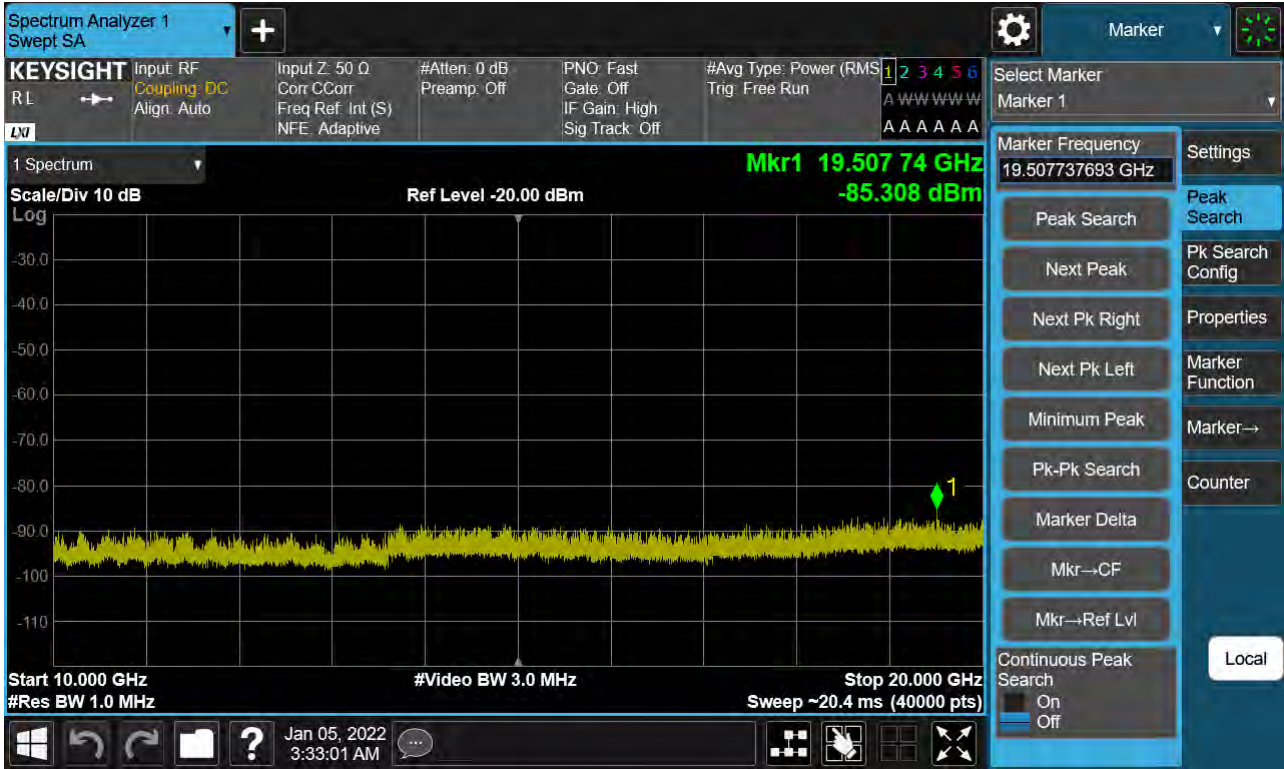
Sub6 n66. Upper Extended Band Edge Plot (20 M BW Ch.354000 BPSK\_ Full RB) -3



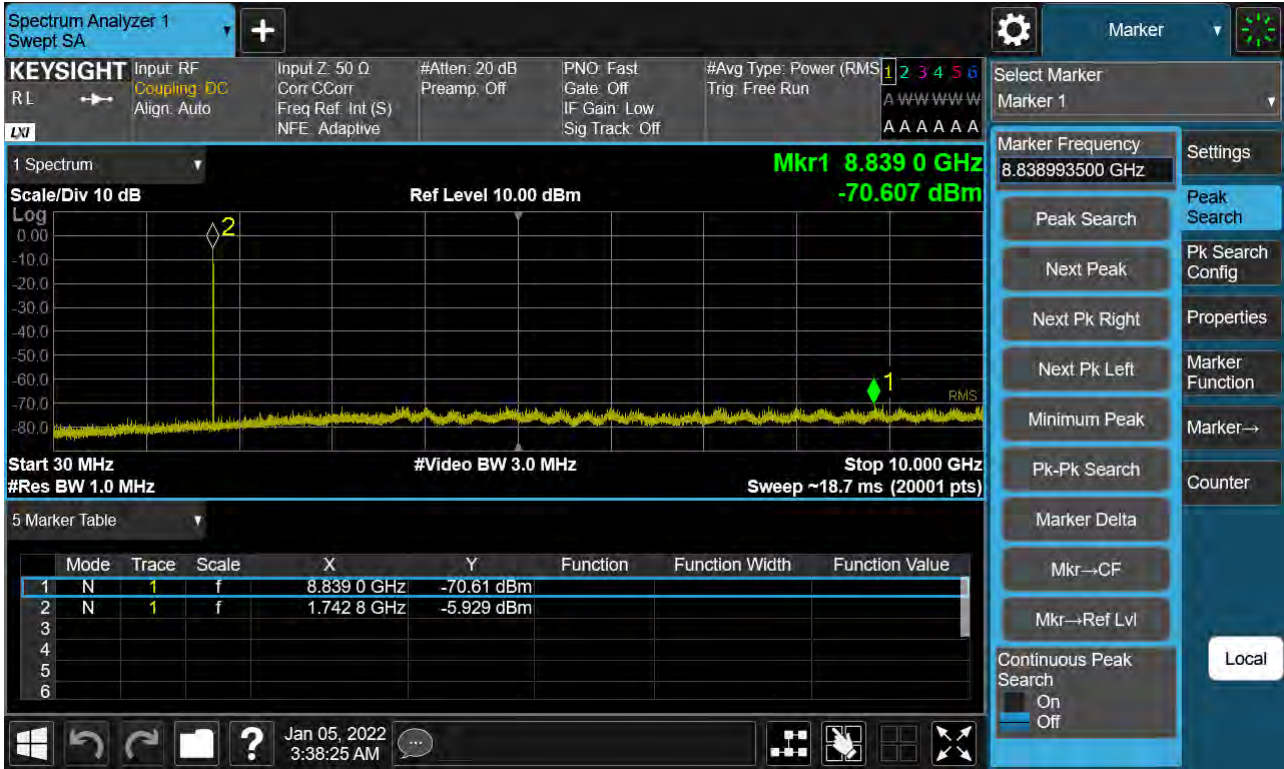
Sub6 n66. Conducted Spurious Plot\_1 (342500ch\_5 MHz\_BPSK\_RB 1\_1)



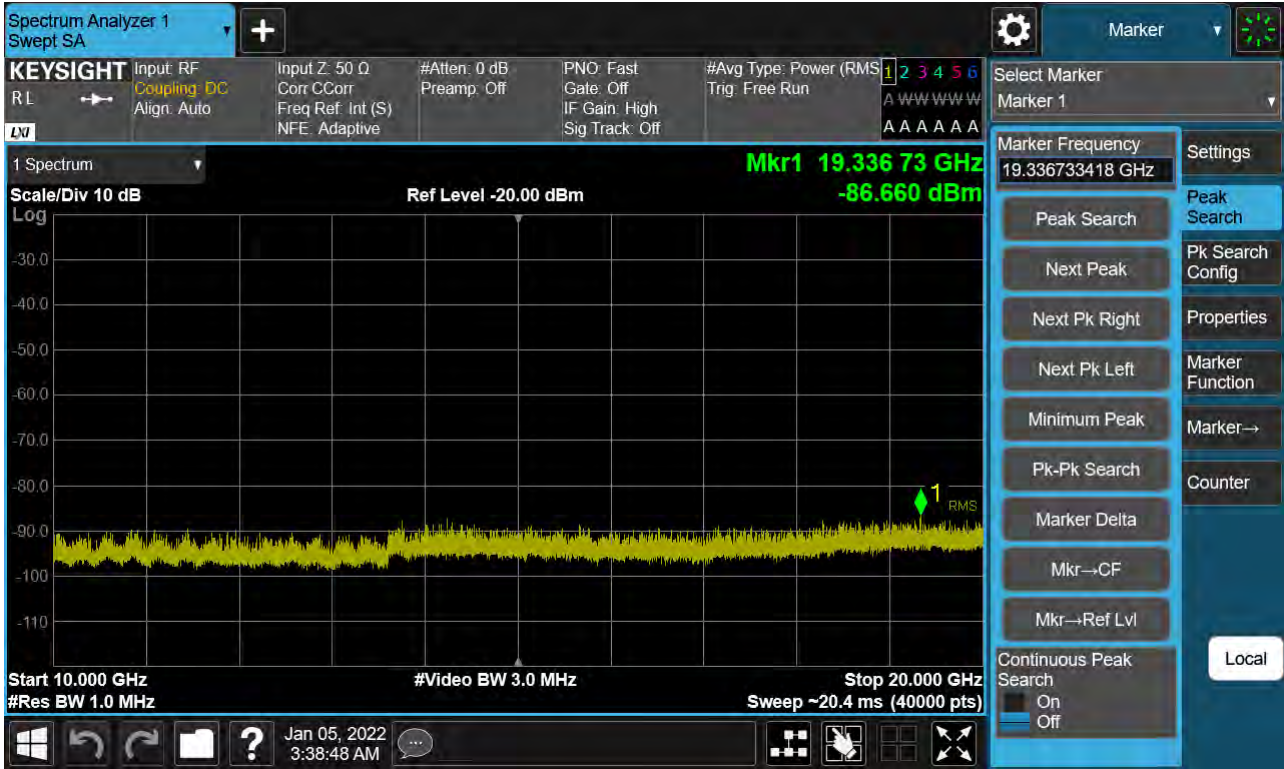
Sub6 n66. Conducted Spurious Plot\_2 (342500ch\_5 MHz\_BPSK\_RB 1\_1)



Sub6 n66. Conducted Spurious Plot\_1 (349000ch\_5 MHz\_BPSK\_RB 1\_1)

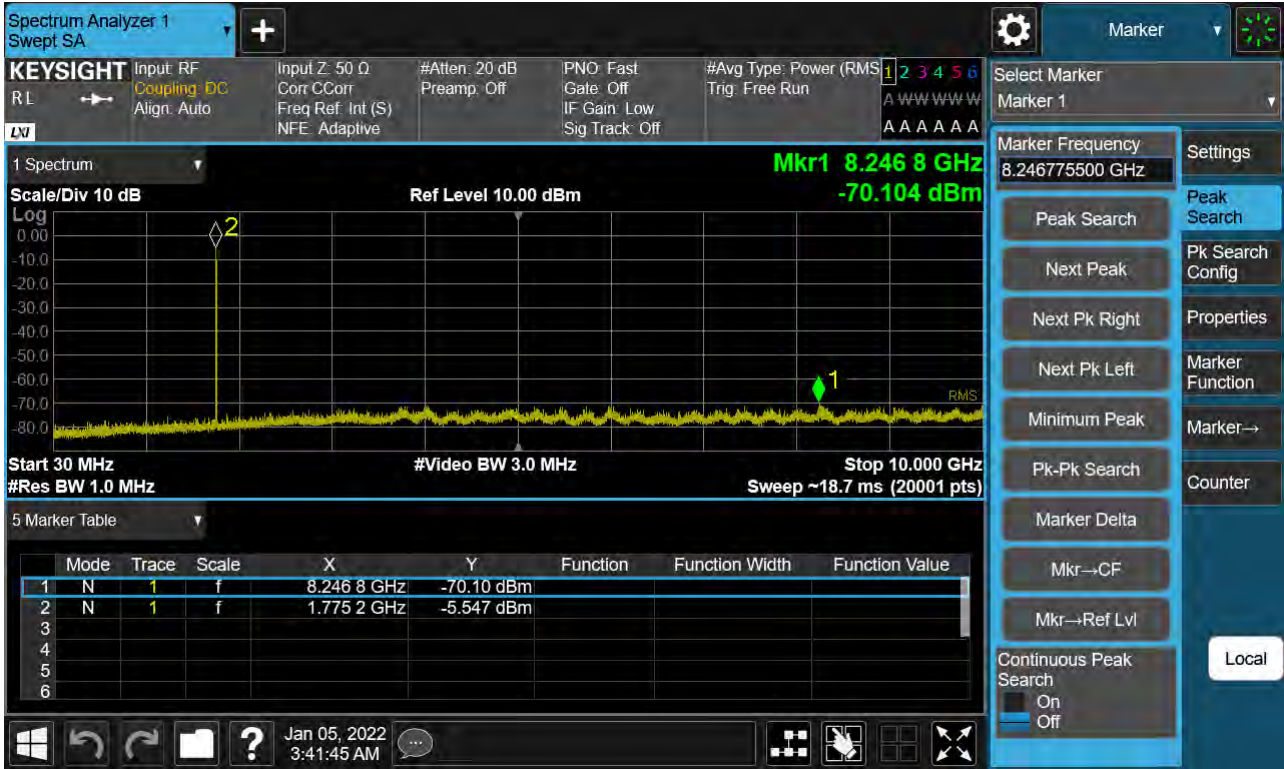


Sub6 n66. Conducted Spurious Plot\_2 (349000ch\_5 MHz\_BPSK\_RB 1\_1)





Sub6 n66. Conducted Spurious Plot\_1 (355500ch\_5 MHz\_BPSK\_RB 1\_1)



Sub6 n66. Conducted Spurious Plot\_2 (355500ch\_5 MHz\_BPSK\_RB 1\_1)

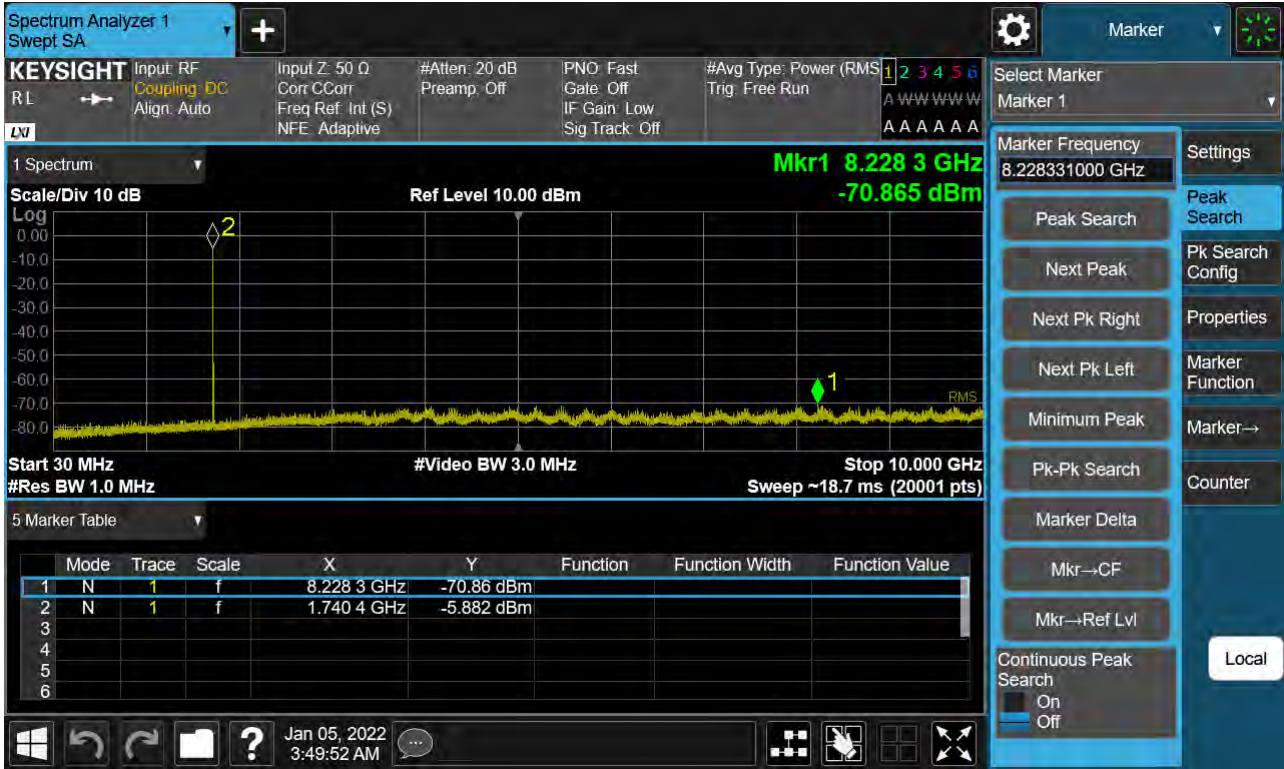


Sub6 n66. Conducted Spurious Plot\_1 (343000ch\_10 MHz\_BPSK\_RB 1\_1)





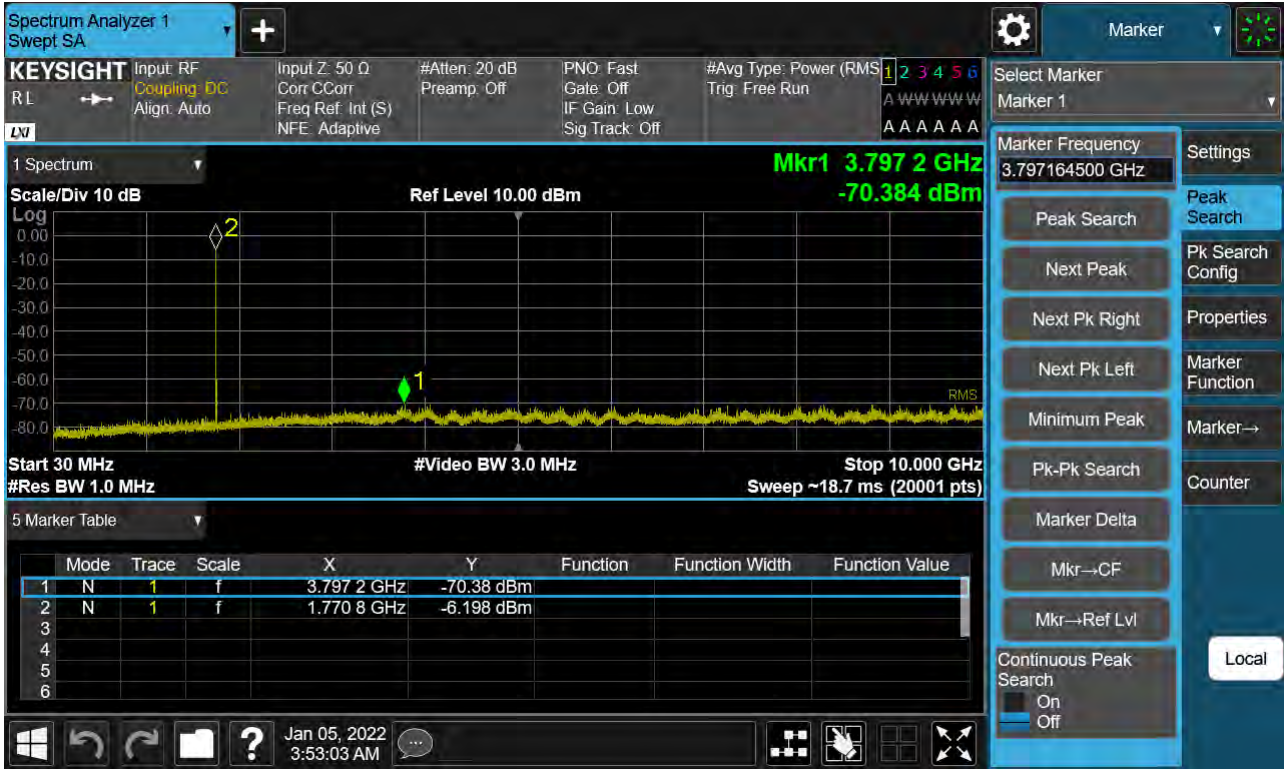
Sub6 n66. Conducted Spurious Plot\_1 (349000ch\_10 MHz\_BPSK\_RB 1\_1)



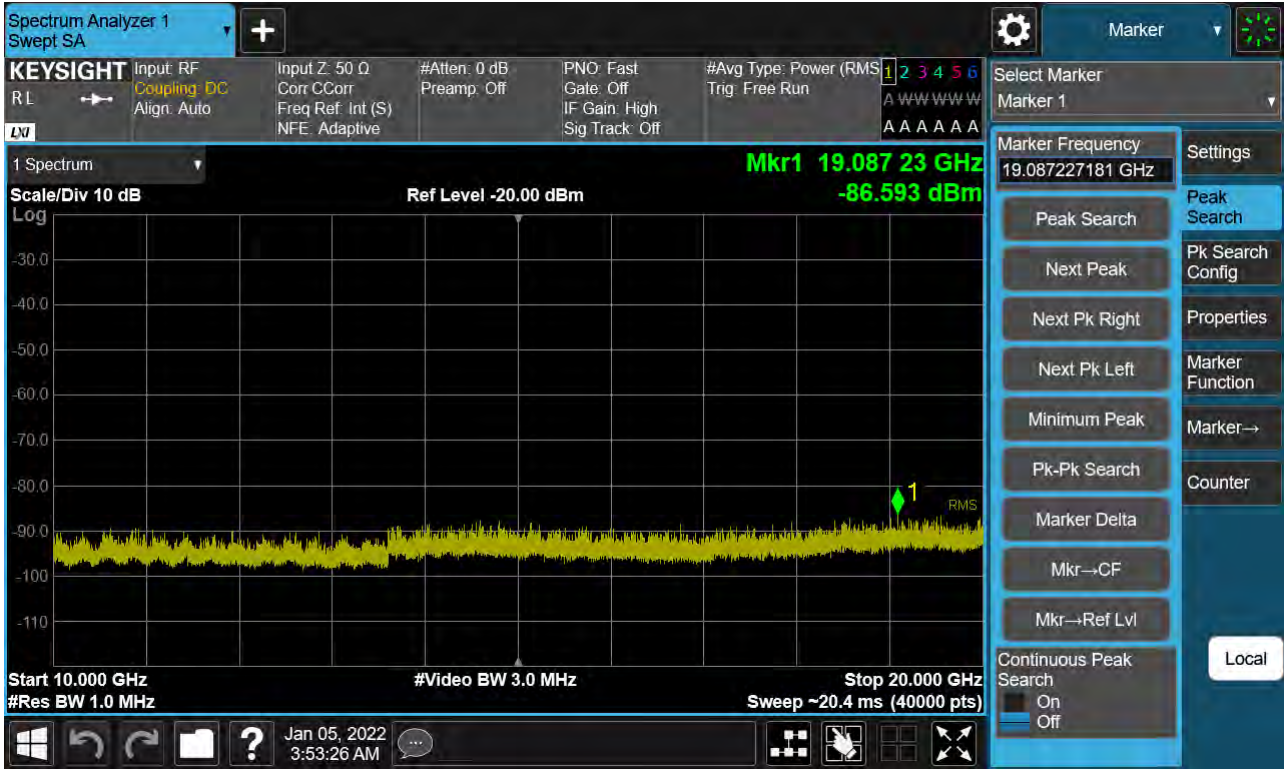
Sub6 n66. Conducted Spurious Plot\_2 (349000ch\_10 MHz\_BPSK\_RB 1\_1)



Sub6 n66. Conducted Spurious Plot\_1 (355000ch\_10 MHz\_BPSK\_RB 1\_1)

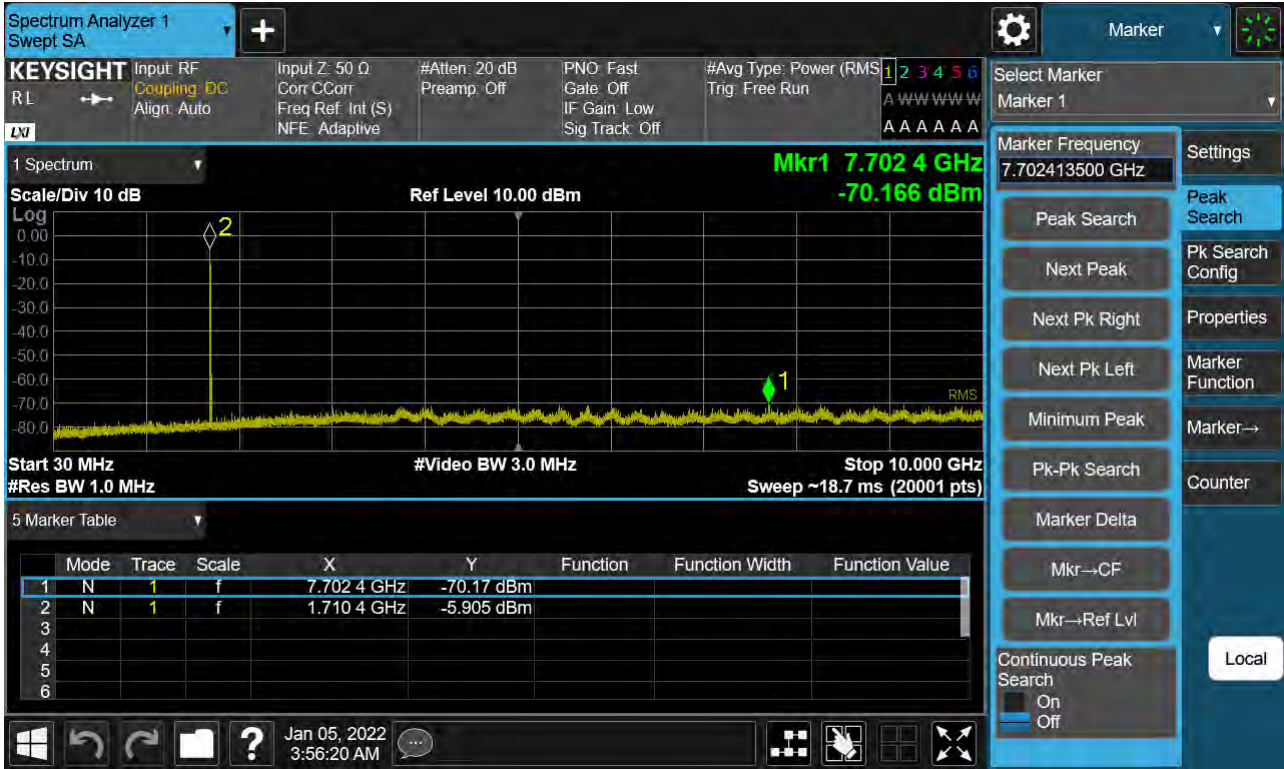


Sub6 n66. Conducted Spurious Plot\_2 (355000ch\_10 MHz\_BPSK\_RB 1\_1)

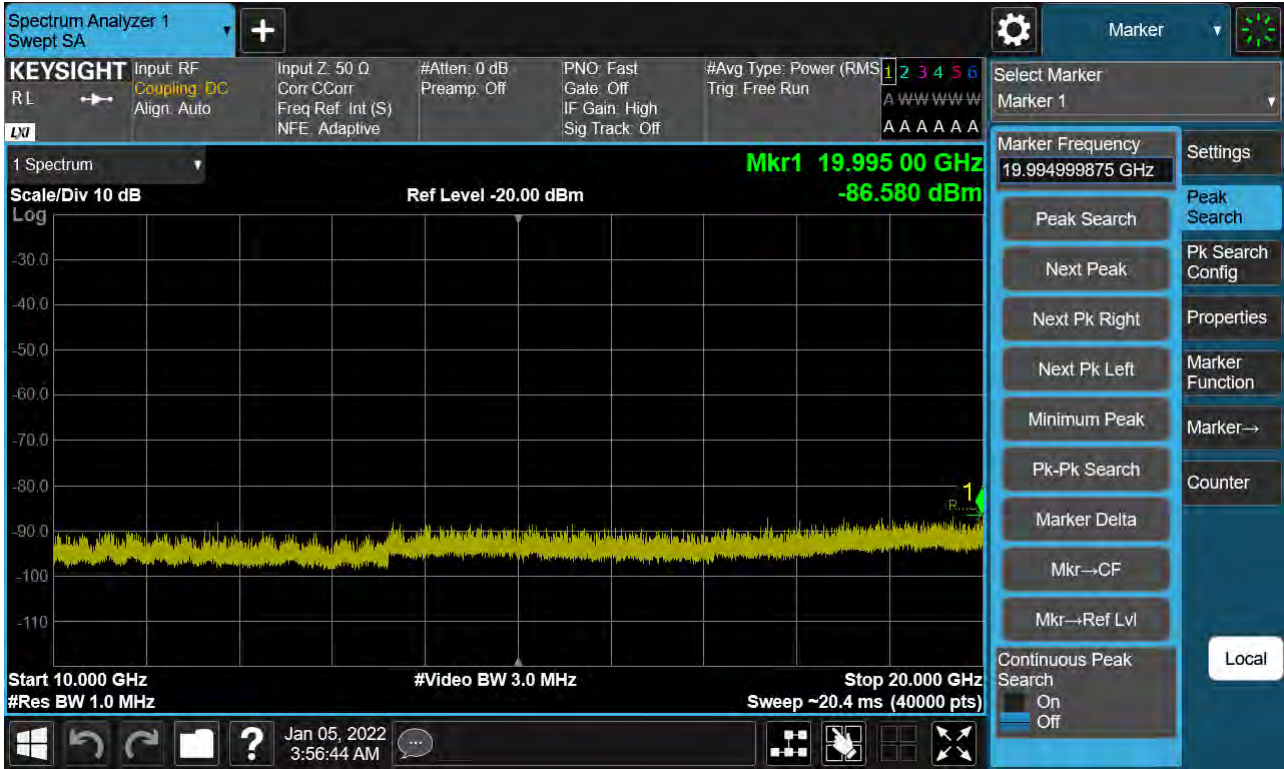




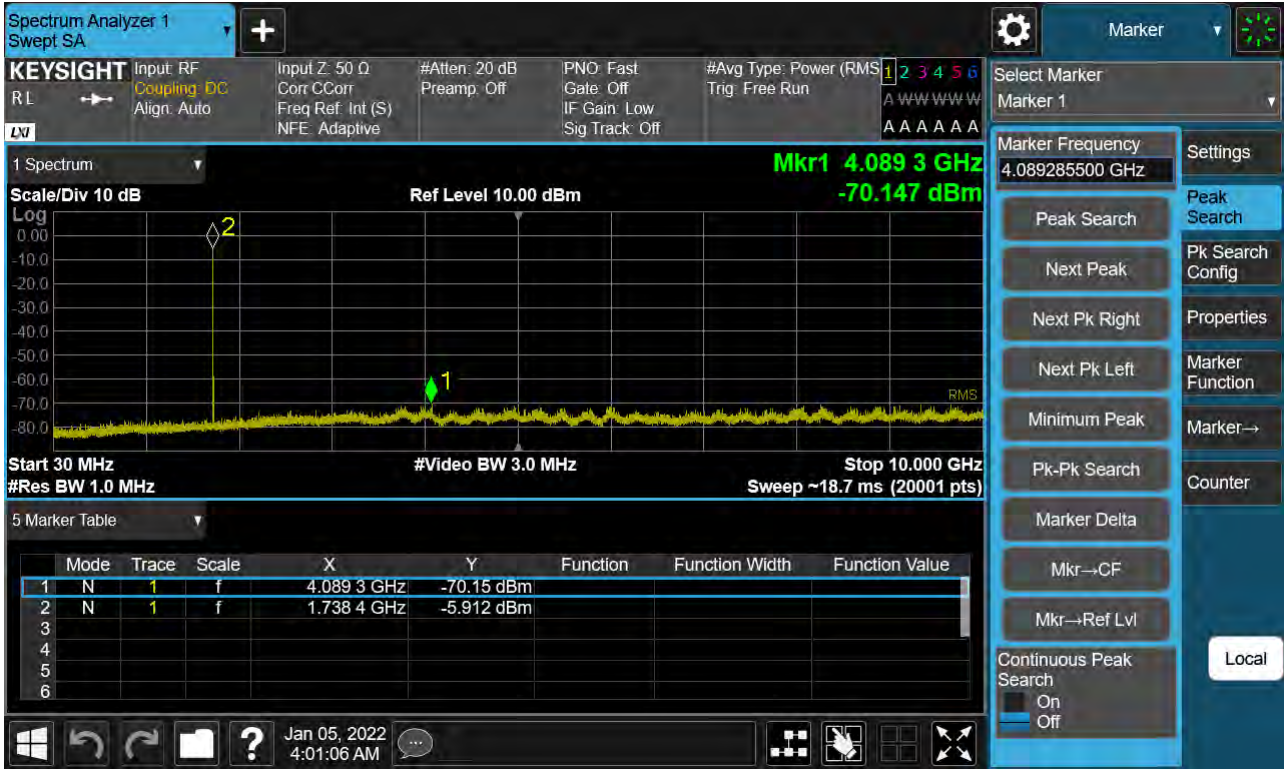
Sub6 n66. Conducted Spurious Plot\_1 (343500ch\_15 MHz\_BPSK\_RB 1\_1)



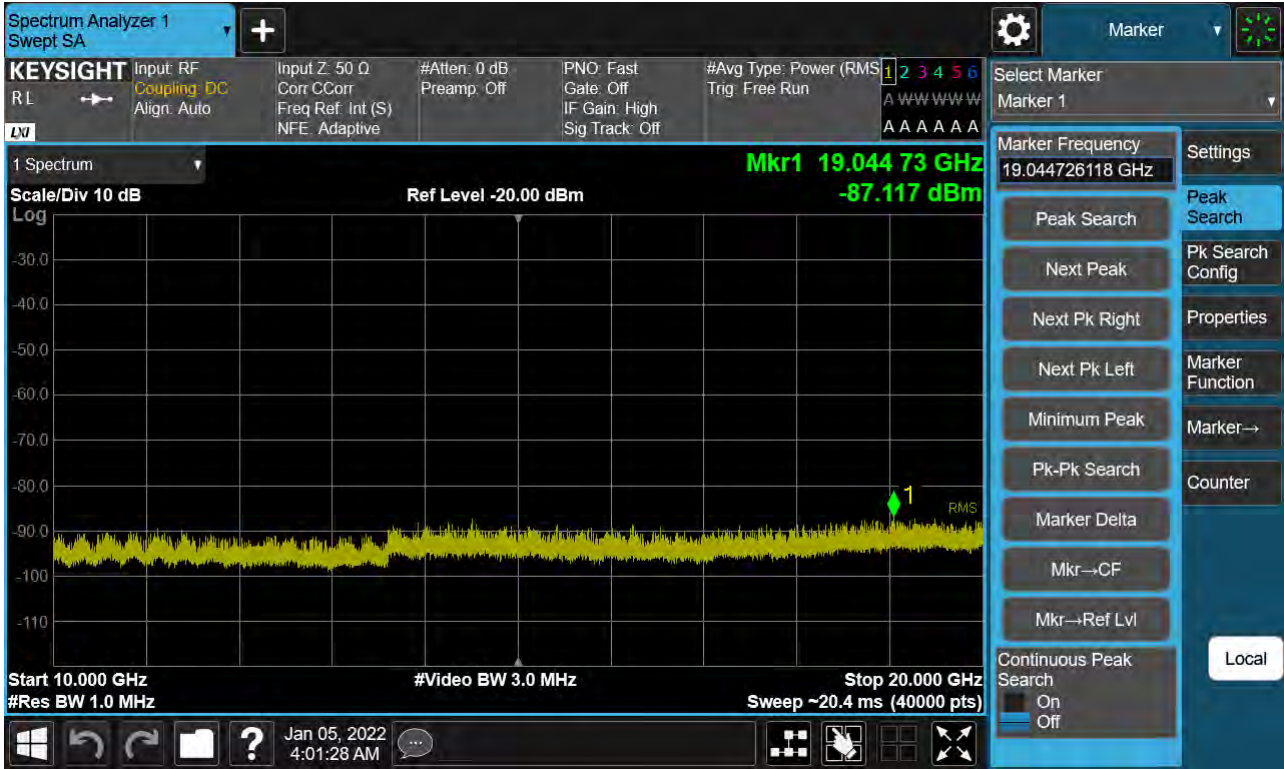
Sub6 n66. Conducted Spurious Plot\_2 (343500ch\_15 MHz\_BPSK\_RB 1\_1)



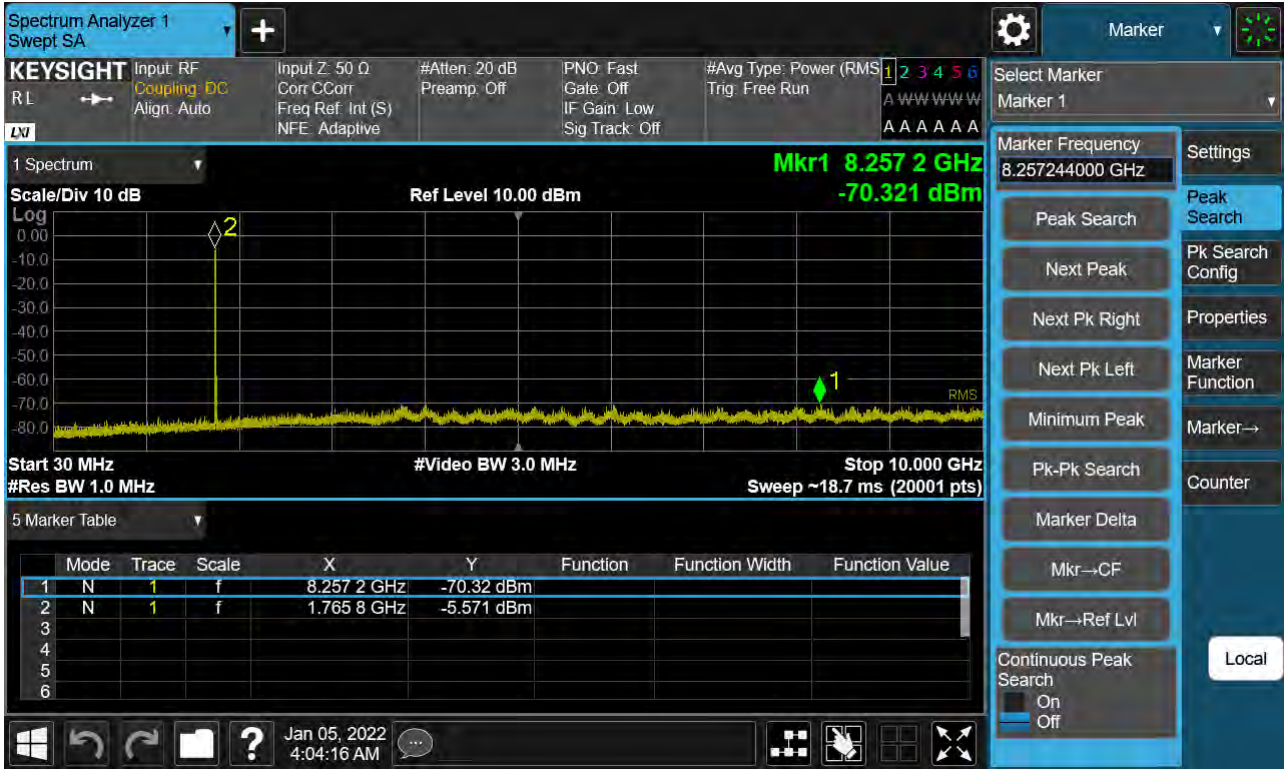
Sub6 n66. Conducted Spurious Plot\_1 (349000ch\_15 MHz\_BPSK\_RB 1\_1)



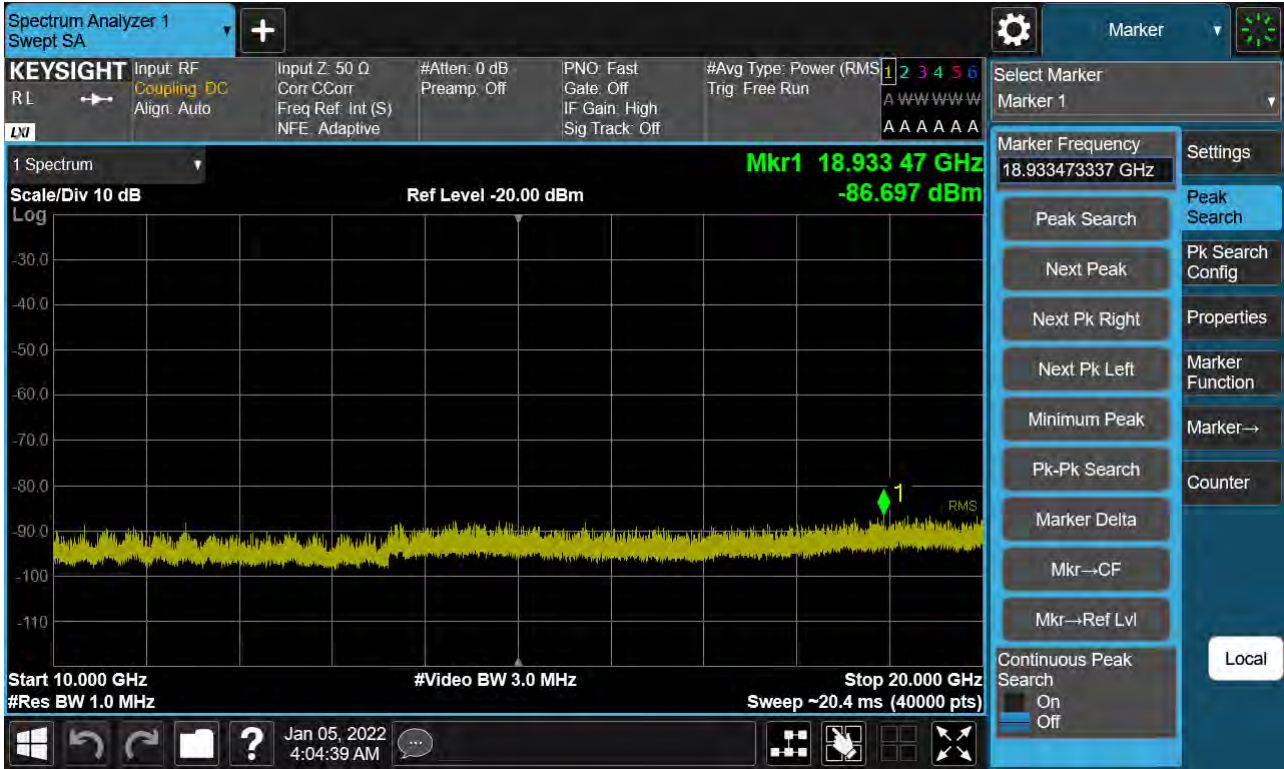
Sub6 n66. Conducted Spurious Plot\_2 (349000ch\_15 MHz\_BPSK\_RB 1\_1)



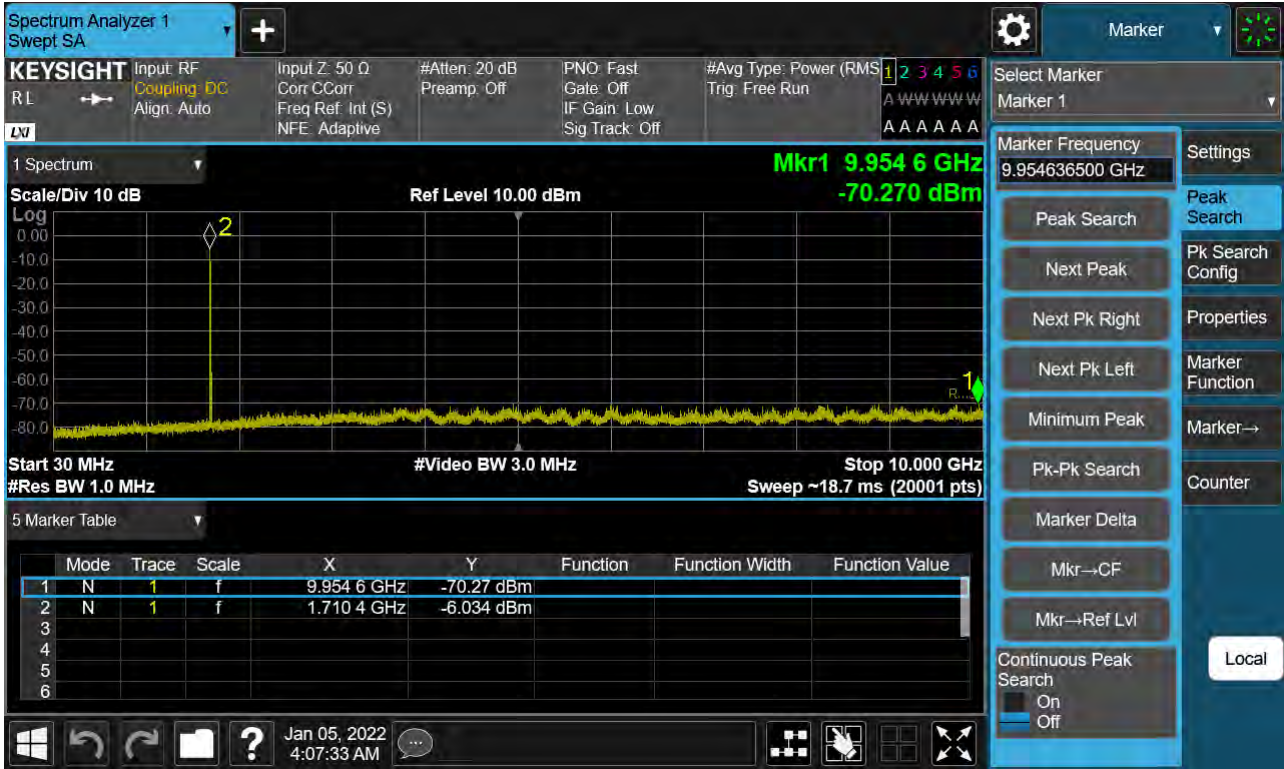
Sub6 n66. Conducted Spurious Plot\_1 (354500ch\_15 MHz\_BPSK\_RB 1\_1)



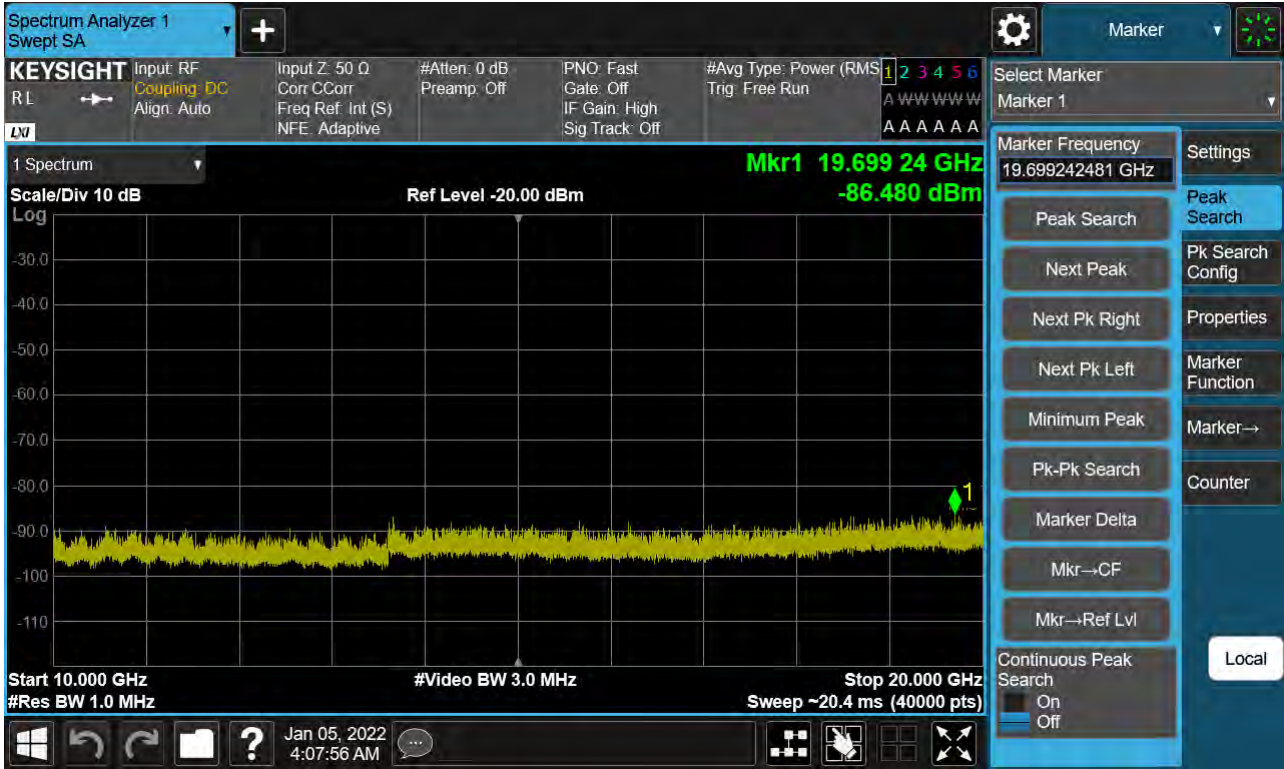
Sub6 n66. Conducted Spurious Plot\_2 (354500ch\_15 MHz\_BPSK\_RB 1\_1)



Sub6 n66. Conducted Spurious Plot\_1 (344000ch\_20 MHz\_BPSK\_RB 1\_1)



Sub6 n66. Conducted Spurious Plot\_2 (344000ch\_20 MHz\_BPSK\_RB 1\_1)

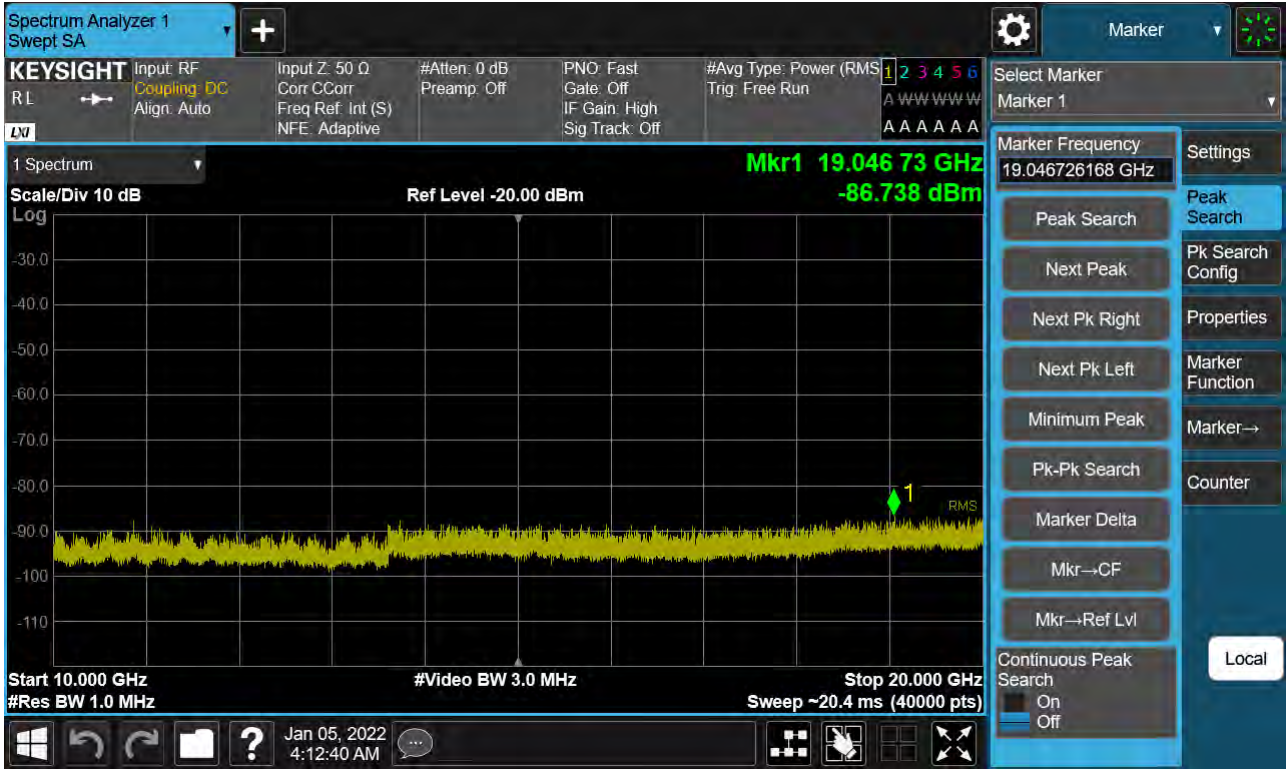




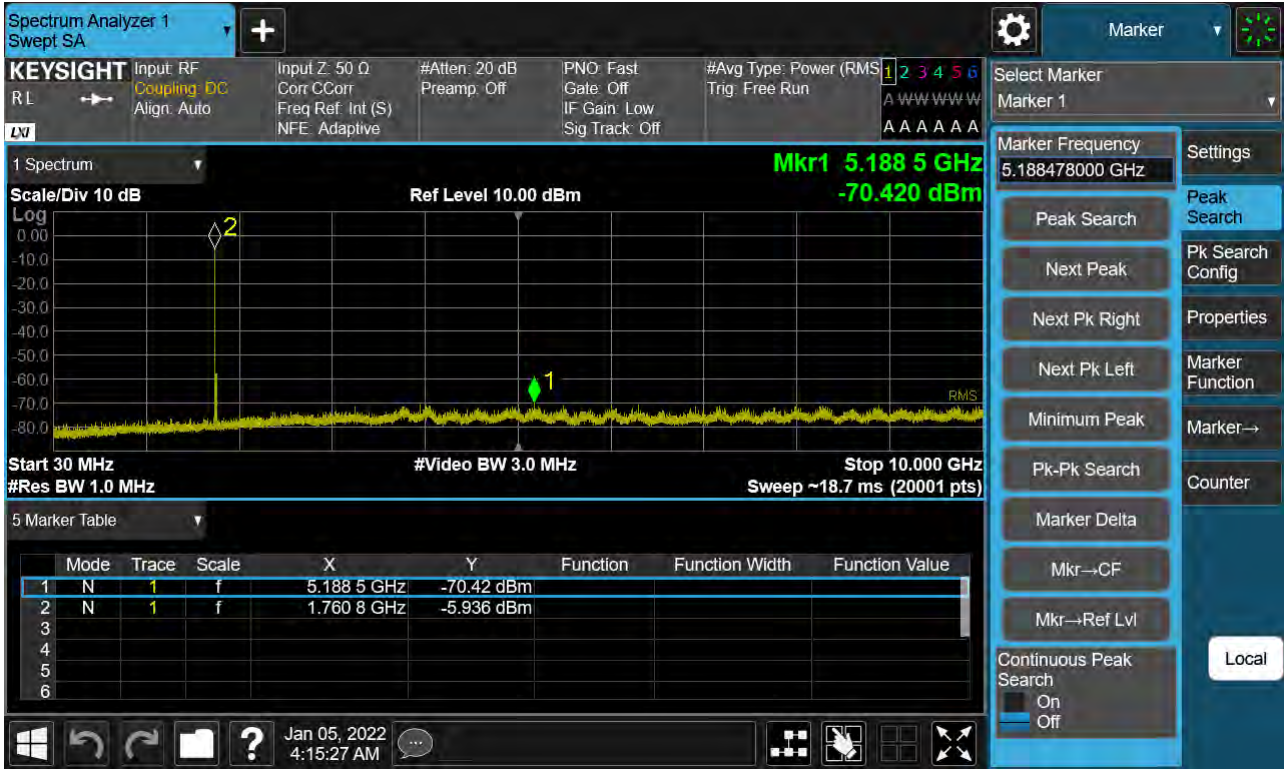
Sub6 n66. Conducted Spurious Plot\_1 (349000ch\_20 MHz\_BPSK\_ RB 1\_1)



Sub6 n66. Conducted Spurious Plot\_2 (349000ch\_20 MHz\_BPSK\_RB 1\_1)



Sub6 n66. Conducted Spurious Plot\_1 (354000ch\_20 MHz\_BPSK\_RB 1\_1)



Sub6 n66. Conducted Spurious Plot\_2 (354000ch\_20 MHz\_BPSK\_RB 1\_1)



**10. ANNEX A\_ TEST SETUP PHOTO**

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2201-FC097-P