HCT CO.,LTD.
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
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FCC Sub6 REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

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

Date of Issue:
June 15, 2021

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

Report No.: HCT-RF-2105-FC012-R1

FCC ID:	**A3LSMG990U**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s):	SM-G990U
Additional Model(s):	SM-G990U1/DS, SM-G990U1
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 n77 (20)	3710.01 – 3969.99	17M8G7D	PI/2 BPSK	0.311	24.93
		17M9G7D	QPSK	0.304	24.83
		17M8W7D	16QAM	0.265	24.23
		18M0W7D	64QAM	0.159	22.03
		17M9W7D	256QAM	0.115	20.62
Sub6 n77 (30)	3715.02 – 3964.98	26M8G7D	PI/2 BPSK	0.388	25.89
		26M9G7D	QPSK	0.369	25.67
		26M9W7D	16QAM	0.322	25.08
		27M0W7D	64QAM	0.204	23.09
		26M9W7D	256QAM	0.141	21.50
Sub6 n77 (40)	3720.00 – 3960.00	35M7G7D	PI/2 BPSK	0.341	25.33
		36M0G7D	QPSK	0.333	25.22
		36M0W7D	16QAM	0.279	24.45
		35M9W7D	64QAM	0.172	22.36
		35M8W7D	256QAM	0.122	20.88
Sub6 n77 (50)	3725.01 – 3954.99	45M9G7D	PI/2 BPSK	0.318	25.03
		45M7G7D	QPSK	0.314	24.97
		46M0W7D	16QAM	0.265	24.24
		45M6W7D	64QAM	0.158	21.99
		45M8W7D	256QAM	0.114	20.57
Sub6 n77 (60)	3730.01 – 3950.00	57M9G7D	PI/2 BPSK	0.299	24.75
		57M9G7D	QPSK	0.297	24.73
		57M7W7D	16QAM	0.249	23.96
		57M8W7D	64QAM	0.148	21.69
		58M1W7D	256QAM	0.105	20.21
Sub6 n77 (70)	3735.00 – 3945.00	64M4G7D	PI/2 BPSK	0.344	25.37
		64M6G7D	QPSK	0.337	25.28
		64M4W7D	16QAM	0.314	24.97
		64M6W7D	64QAM	0.194	22.87
		64M4W7D	256QAM	0.130	21.15

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
Sub6 n77 (80)	3740.01 – 3939.99	77M6G7D	PI/2 BPSK	0.309	24.90
		77M0G7D	QPSK	0.307	24.88
		77M6W7D	16QAM	0.252	24.02
		77M1W7D	64QAM	0.153	21.85
		77M2W7D	256QAM	0.109	20.38
Sub6 n77 (90)	3745.02 – 3934.98	87M1G7D	PI/2 BPSK	0.305	24.85
		86M8G7D	QPSK	0.303	24.82
		86M6W7D	16QAM	0.248	23.95
		86M6W7D	64QAM	0.157	21.97
		86M8W7D	256QAM	0.110	20.42
Sub6 n77 (100)	3750.00 – 3930.00	96M2G7D	PI/2 BPSK	0.309	24.90
		96M5G7D	QPSK	0.307	24.87
		96M5W7D	16QAM	0.250	23.97
		96M6W7D	64QAM	0.157	21.96
		96M4W7D	256QAM	0.109	20.37

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)

REVIEWED BY

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

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2105-FC012	May 26, 2021	- First Approval Report
HCT-RF-2105-FC012-R1	June 15, 2021	- Revised the Additional model(s). (SM-G990U1 added)

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

Table of 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:	A3LSMG990U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§27, §2
EUT Type:	Mobile Phone
Model(s):	SM-G990U
Additional Model(s):	SM-G990U1/DS, SM-G990U1
SCS(kHz):	30
Bandwidth(MHz):	20, 30, 40, 50, 60, 70, 80, 90, 100
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:	3710.01 MHz – 3969.99 MHz (Sub6 n77(20 MHz)) 3715.02 MHz – 3964.98 MHz (Sub6 n77(30 MHz)) 3720.00 MHz – 3960.00 MHz (Sub6 n77(40 MHz)) 3725.01 MHz – 3954.99 MHz (Sub6 n77(50 MHz)) 3730.01 MHz – 3950.00 MHz (Sub6 n77(60 MHz)) 3735.00 MHz – 3945.00 MHz (Sub6 n77(70 MHz)) 3740.01 MHz – 3939.99 MHz (Sub6 n77(80 MHz)) 3745.02 MHz – 3934.98 MHz (Sub6 n77(90 MHz)) 3750.00 MHz – 3930.00 MHz (Sub6 n77(100 MHz))
Date(s) of Tests:	April 13, 2021 ~ May 25, 2021
Serial number:	Radiated: R3CR315YMXB Conducted: R3CR3117FEE

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS, CDMA(BC0, 1, 10) and LTE, Sub6.

It also supports IEEE 802.11 a/b/g/n/ac/ax (HT20/40/80), Bluetooth, BT LE, NFC, WPT, mmWave(n260/261).

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 1MHz
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 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

   The power is calculated by the following formula;

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

   Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.
3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration
4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

3.3 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

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

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
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 1GHz, 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;

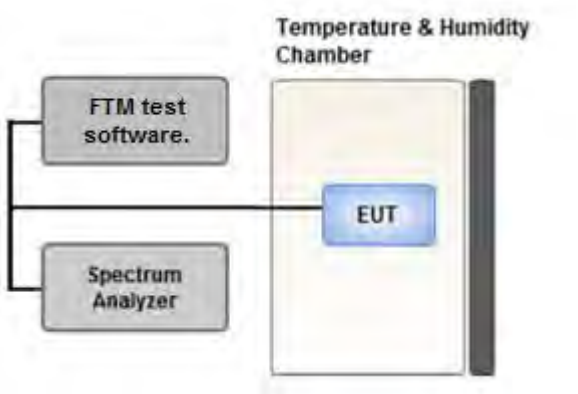
$$Result_{(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

$$EIRP_{(dBm)} = ERP_{(dBm)} + 2.15$$

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Set the measurement interval as follows:

.- for continuous transmissions, set to 1 ms,

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

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

② **Alternate Procedure for PAPR**

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

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

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

Test Settings(Peak Power)

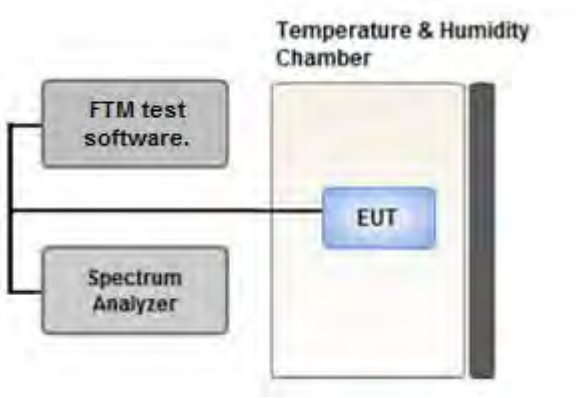
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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

Test Settings(Average Power)

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

3.5 OCCUPIED BANDWIDTH.



Test setup

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

The EUT makes a call to the communication simulator.

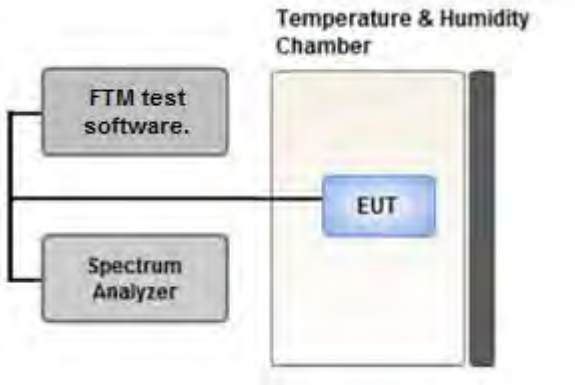
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB 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.

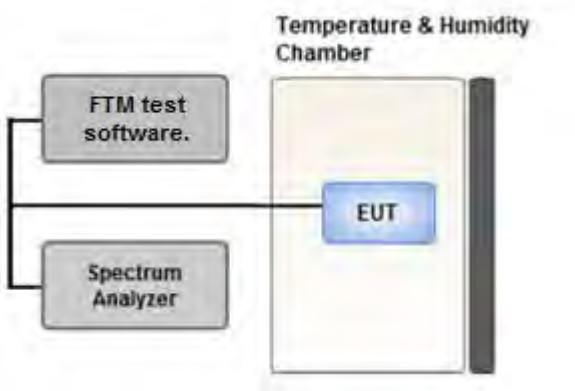
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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 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 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 : Please check the test notes below
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 mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz.

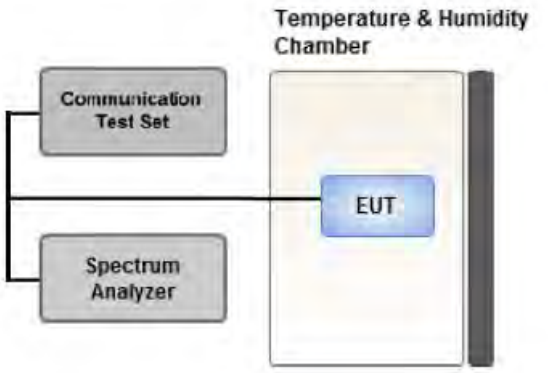
Measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater.

However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz.

In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz.

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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: Power Class 2(SA/ NSA), Power Class 3(SA/ NSA), SRS
  Worst case: Power Class 2(SA)
-All radiated spurious emissions were investigated and the worst case bandwidth results are reported.
- Radiated Spurious emissions are measured while operating in EN-DC mode with Sub 6 NR carrier as well as an LTE carrier (anchor).
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-G990U & additional models were tested and the worst case results are reported.
  (Worst case : SM-G990U)

[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	PI/2 BPSK	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: Power Class 2(SA/ NSA), Power Class 3(SA/ NSA), SRS
  Worst case: Power Class 2(SA)
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-G990U & additional models were tested and the worst case results are reported.
  (Worst case : SM-G990U)

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth,	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	20, 30, 40, 50, 60, 70, 80, 90, 100	Mid	Full RB	0
Peak-To-Average Ratio	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	20, 30, 40, 50, 60, 70, 80, 90, 100	Mid	Full RB	0
Band Edge	PI/2 BPSK	20	Low	1	0
			High	1	50
		30	Low	1	0
			High	1	77
		40	Low	1	0
			High	1	105
		50	Low	1	0
			High	1	132
		60	Low	1	0
			High	1	161
		70	Low	1	0
			High	1	188
		80	Low	1	0
			High	1	216
		90	Low	1	0
			High	1	244
		100	Low	1	0
			High	1	272
		20, 30, 40, 50, 60, 70, 80, 90, 100	Low, High	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	PI/2 BPSK	20, 30, 40, 50, 60, 70, 80, 90, 100	Low, Mid, High	1	1

4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
Schwarzbeck	UHAP / Precision Dipole Antenna	01273	05/30/2020	Biennial	05/30/2022
Schwarzbeck	UHAP / Precision Dipole Antenna	01274	05/30/2020	Biennial	05/30/2022
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	02289	05/08/2020	Biennial	05/08/2022
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1299	05/04/2020	Biennial	05/04/2022
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	10/13/2020	Biennial	10/13/2022
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	02/11/2020	Biennial	02/11/2022
Rohde & Schwarz	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	05/18/2020	Biennial	05/18/2022
Schwarzbeck	VULB9160/ Bilog Antenna	3150	03/03/2021	Biennial	03/03/2023
Schwarzbeck	VULB9160/ Hybrid Antenna	760	02/22/2021	Biennial	02/22/2023
ESPEC	SU-642 / Chamber	93008124	03/15/2021	Annual	03/15/2022
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY50200093	11/17/2020	Annual	11/17/2021
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/04/2020	Annual	06/04/2021
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	101436	03/02/2021	Annual	03/02/2022
Agilent	8960 (E5515C)/ Base Station	MY48360800	08/26/2020	Annual	08/26/2021
Wainwright Instruments	WHKX10-900-1000-15000-40SS/ High Pass Filter	5	07/13/2020	Annual	07/13/2021
Wainwright Instruments	WHKX10-2700-3000-18000-40SS/ High Pass Filter	145	09/03/2020	Annual	09/03/2021
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	04/07/2021	Annual	04/07/2022
CERNEX	LOW NOISE AMP (100MHz ~ 18GHz)	26822	06/04/2020	Annual	06/04/2021
CERNEX	CBL18265035 / Power Amplifier	22966	12/04/2020	Annual	12/04/2021
CERNEX	CBL26405040 / Power Amplifier	25956	03/23/2021	Annual	03/23/2022
Hewlett Packard	E3632A/DC Power Supply	MY40004427	09/16/2020	Annual	09/16/2021
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6262116770	07/22/2020	Annual	07/22/2021
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/07/2021	Annual	01/07/2022
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/13/2020	Annual	07/13/2021
KEYSIGHT	N9030B / Signal Analyzer(5Hz~40.0GHz)	MY55480167	06/04/2020	Annual	06/04/2021
HCT CO., LTD.,	FCC LTE Mobile Conducted RF Automation Test Software	-	-	-	-

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)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

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(i)(2)	< -13 dBm	PASS
Conducted Output Power	§2.1046	N/A	**See Note1**
Peak- to- Average Ratio	§27.50(j)(4)	< 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(j)(3)	< 1 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(i)(2)	< -13 dBm	PASS

Note:

1. Radiateded 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
3710.01	Sub6 n77/ 20 MHz [30 kHz]	PI/2 BPSK	-20.82	16.04	11.70	2.81	H	< 1.00	0.311	24.93
		QPSK	-20.92	15.94	11.70	2.81	H		0.304	24.83
		16-QAM	-21.52	15.34	11.70	2.81	H		0.265	24.23
		64-QAM	-23.72	13.14	11.70	2.81	H		0.159	22.03
		256-QAM	-25.13	11.73	11.70	2.81	H		0.115	20.62
3840.00		PI/2 BPSK	-23.29	13.94	11.24	2.86	H		0.171	22.32
		QPSK	-23.31	13.92	11.24	2.86	H		0.170	22.30
		16-QAM	-24.22	13.01	11.24	2.86	H		0.138	21.39
		64-QAM	-26.02	11.21	11.24	2.86	H		0.091	19.59
		256-QAM	-27.52	9.71	11.24	2.86	H		0.064	18.09
3969.99		PI/2 BPSK	-23.30	14.63	11.18	2.92	H		0.194	22.89
		QPSK	-23.50	14.43	11.18	2.92	H		0.186	22.69
		16-QAM	-24.52	13.41	11.18	2.92	H		0.147	21.67
		64-QAM	-26.47	11.46	11.18	2.92	H		0.094	19.72
		256-QAM	-27.83	10.10	11.18	2.92	H		0.068	18.36

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
3715.02	Sub6 n77/ 30 MHz [30 kHz]	PI/2 BPSK	-19.83	17.01	11.70	2.82	H	< 1.00	0.388	25.89
		QPSK	-20.05	16.79	11.70	2.82	H		0.369	25.67
		16-QAM	-20.64	16.20	11.70	2.82	H		0.322	25.08
		64-QAM	-22.63	14.21	11.70	2.82	H		0.204	23.09
		256-QAM	-24.22	12.62	11.70	2.82	H		0.141	21.50
3840.00		PI/2 BPSK	-22.73	14.50	11.24	2.86	H		0.194	22.88
		QPSK	-22.76	14.47	11.24	2.86	H		0.193	22.85
		16-QAM	-23.60	13.63	11.24	2.86	H		0.159	22.01
		64-QAM	-25.48	11.75	11.24	2.86	H		0.103	20.13
		256-QAM	-27.08	10.15	11.24	2.86	H		0.071	18.53
3964.98		PI/2 BPSK	-22.63	15.32	11.16	2.92	H		0.227	23.56
		QPSK	-22.64	15.31	11.16	2.92	H		0.226	23.55
		16-QAM	-23.63	14.32	11.16	2.92	H		0.180	22.56
		64-QAM	-25.73	12.22	11.16	2.92	H		0.111	20.46
		256-QAM	-27.29	10.66	11.16	2.92	H		0.078	18.90

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
3720.00	Sub6 n77/ 40 MHz [30 kHz]	PI/2 BPSK	-20.37	16.45	11.70	2.82	H	< 1.00	0.341	25.33
		QPSK	-20.48	16.34	11.70	2.82	H		0.333	25.22
		16-QAM	-21.25	15.57	11.70	2.82	H		0.279	24.45
		64-QAM	-23.34	13.48	11.70	2.82	H		0.172	22.36
		256-QAM	-24.82	12.00	11.70	2.82	H		0.122	20.88
3840.00		PI/2 BPSK	-22.92	14.31	11.24	2.86	H		0.186	22.69
		QPSK	-22.93	14.30	11.24	2.86	H		0.185	22.68
		16-QAM	-23.90	13.33	11.24	2.86	H		0.148	21.71
		64-QAM	-25.73	11.50	11.24	2.86	H		0.097	19.88
		256-QAM	-27.32	9.91	11.24	2.86	H		0.067	18.29
3960.00		PI/2 BPSK	-22.62	15.35	11.14	2.92	H		0.228	23.57
		QPSK	-22.65	15.32	11.14	2.92	H		0.226	23.54
		16-QAM	-23.56	14.41	11.14	2.92	H		0.183	22.63
		64-QAM	-25.52	12.45	11.14	2.92	H		0.117	20.67
		256-QAM	-27.07	10.90	11.14	2.92	H		0.082	19.12

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
3725.01	Sub6 n77/ 50 MHz [30 kHz]	PI/2 BPSK	-20.66	16.16	11.70	2.83	H	< 1.00	0.318	25.03
		QPSK	-20.72	16.10	11.70	2.83	H		0.314	24.97
		16-QAM	-21.45	15.37	11.70	2.83	H		0.265	24.24
		64-QAM	-23.70	13.12	11.70	2.83	H		0.158	21.99
		256-QAM	-25.12	11.70	11.70	2.83	H		0.114	20.57
3840.00		PI/2 BPSK	-23.01	14.22	11.24	2.86	H		0.182	22.60
		QPSK	-23.15	14.08	11.24	2.86	H		0.176	22.46
		16-QAM	-24.06	13.17	11.24	2.86	H		0.143	21.55
		64-QAM	-26.15	11.08	11.24	2.86	H		0.088	19.46
		256-QAM	-27.52	9.71	11.24	2.86	H		0.064	18.09
3954.99		PI/2 BPSK	-22.70	15.28	11.12	2.92	H		0.223	23.48
		QPSK	-22.88	15.10	11.12	2.92	H		0.214	23.30
		16-QAM	-23.75	14.23	11.12	2.92	H		0.175	22.43
		64-QAM	-25.82	12.16	11.12	2.92	H		0.109	20.36
		256-QAM	-27.24	10.74	11.12	2.92	H		0.078	18.94

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
3730.01	Sub6 n77/ 60 MHz [30 kHz]	PI/2 BPSK	-20.93	15.88	11.70	2.83	H	< 1.00	0.299	24.75
		QPSK	-20.95	15.86	11.70	2.83	H		0.297	24.73
		16-QAM	-21.72	15.09	11.70	2.83	H		0.249	23.96
		64-QAM	-23.99	12.82	11.70	2.83	H		0.148	21.69
		256-QAM	-25.47	11.34	11.70	2.83	H		0.105	20.21
3840.00		PI/2 BPSK	-22.93	14.30	11.24	2.86	H		0.185	22.68
		QPSK	-22.99	14.24	11.24	2.86	H		0.183	22.62
		16-QAM	-23.72	13.51	11.24	2.86	H		0.155	21.89
		64-QAM	-25.66	11.57	11.24	2.86	H		0.099	19.95
		256-QAM	-27.24	9.99	11.24	2.86	H		0.069	18.37
3950.00		PI/2 BPSK	-23.24	14.74	11.10	2.92	H		0.196	22.92
		QPSK	-23.33	14.65	11.10	2.92	H		0.192	22.83
		16-QAM	-24.27	13.71	11.10	2.92	H		0.155	21.89
		64-QAM	-26.25	11.73	11.10	2.92	H		0.098	19.91
		256-QAM	-27.79	10.19	11.10	2.92	H		0.069	18.37

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
3735.00	Sub6 n77/ 70 MHz [30 kHz]	PI/2 BPSK	-20.38	16.50	11.70	2.84	H	< 1.00	0.344	25.37
		QPSK	-20.47	16.41	11.70	2.84	H		0.337	25.28
		16-QAM	-20.78	16.10	11.70	2.84	H		0.314	24.97
		64-QAM	-22.88	14.00	11.70	2.84	H		0.194	22.87
		256-QAM	-24.60	12.28	11.70	2.84	H		0.130	21.15
3840.00		PI/2 BPSK	-22.57	14.66	11.24	2.86	H		0.201	23.04
		QPSK	-22.62	14.61	11.24	2.86	H		0.199	22.99
		16-QAM	-23.78	13.45	11.24	2.86	H		0.152	21.83
		64-QAM	-25.09	12.14	11.24	2.86	H		0.113	20.52
		256-QAM	-26.96	10.27	11.24	2.86	H		0.073	18.65
3945.00		PI/2 BPSK	-23.19	14.78	11.09	2.92	H		0.197	22.95
		QPSK	-23.34	14.63	11.09	2.92	H		0.191	22.80
		16-QAM	-24.36	13.61	11.09	2.92	H		0.151	21.78
		64-QAM	-25.80	12.17	11.09	2.92	H		0.108	20.34
		256-QAM	-27.70	10.27	11.09	2.92	H		0.070	18.44

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
3740.01	Sub6 n77/ 80 MHz [30 kHz]	PI/2 BPSK	-20.92	16.04	11.70	2.84	H	< 1.00	0.309	24.90
		QPSK	-20.94	16.02	11.70	2.84	H		0.307	24.88
		16-QAM	-21.80	15.16	11.70	2.84	H		0.252	24.02
		64-QAM	-23.97	12.99	11.70	2.84	H		0.153	21.85
		256-QAM	-25.44	11.52	11.70	2.84	H		0.109	20.38
3840.00		PI/2 BPSK	-22.37	14.86	11.24	2.86	H		0.211	23.24
		QPSK	-22.44	14.79	11.24	2.86	H		0.207	23.17
		16-QAM	-23.30	13.93	11.24	2.86	H		0.170	22.31
		64-QAM	-25.30	11.93	11.24	2.86	H		0.107	20.31
		256-QAM	-27.02	10.21	11.24	2.86	H		0.072	18.59
3939.99		PI/2 BPSK	-23.18	14.78	11.08	2.92	H		0.197	22.94
		QPSK	-23.30	14.66	11.08	2.92	H		0.191	22.82
		16-QAM	-24.16	13.80	11.08	2.92	H		0.157	21.96
		64-QAM	-26.22	11.74	11.08	2.92	H		0.098	19.90
		256-QAM	-27.68	10.28	11.08	2.92	H		0.070	18.44

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
3745.02	Sub6 n77/ 90 MHz [30 kHz]	PI/2 BPSK	-21.01	15.99	11.70	2.84	H	< 1.00	0.305	24.85
		QPSK	-21.04	15.96	11.70	2.84	H		0.303	24.82
		16-QAM	-21.91	15.09	11.70	2.84	H		0.248	23.95
		64-QAM	-23.89	13.11	11.70	2.84	H		0.157	21.97
		256-QAM	-25.44	11.56	11.70	2.84	H		0.110	20.42
3840.00		PI/2 BPSK	-22.02	15.21	11.24	2.86	H		0.229	23.59
		QPSK	-22.12	15.11	11.24	2.86	H		0.223	23.49
		16-QAM	-22.93	14.30	11.24	2.86	H		0.185	22.68
		64-QAM	-24.84	12.39	11.24	2.86	H		0.119	20.77
		256-QAM	-26.37	10.86	11.24	2.86	H		0.084	19.24
3934.98		PI/2 BPSK	-23.08	14.90	11.07	2.92	H		0.202	23.05
		QPSK	-23.16	14.82	11.07	2.92	H		0.198	22.97
		16-QAM	-24.01	13.97	11.07	2.92	H		0.163	22.12
		64-QAM	-26.07	11.91	11.07	2.92	H		0.101	20.06
		256-QAM	-27.62	10.36	11.07	2.92	H		0.071	18.51

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
3750.00	Sub6 n77/ 100 MHz [30 kHz]	PI/2 BPSK	-20.99	16.04	11.70	2.84	H	< 1.00	0.309	24.90
		QPSK	-21.02	16.01	11.70	2.84	H		0.307	24.87
		16-QAM	-21.92	15.11	11.70	2.84	H		0.250	23.97
		64-QAM	-23.93	13.10	11.70	2.84	H		0.157	21.96
		256-QAM	-25.52	11.51	11.70	2.84	H		0.109	20.37
3840.00		PI/2 BPSK	-22.22	15.01	11.24	2.86	H		0.218	23.39
		QPSK	-22.23	15.00	11.24	2.86	H		0.218	23.38
		16-QAM	-23.14	14.09	11.24	2.86	H		0.177	22.47
		64-QAM	-24.97	12.26	11.24	2.86	H		0.116	20.64
		256-QAM	-26.59	10.64	11.24	2.86	H		0.080	19.02
3930.00		PI/2 BPSK	-23.39	14.31	11.24	2.86	H		0.186	22.69
		QPSK	-23.45	14.25	11.24	2.86	H		0.183	22.63
		16-QAM	-24.22	13.48	11.24	2.86	H		0.153	21.86
		64-QAM	-26.36	11.34	11.24	2.86	H		0.094	19.72
		256-QAM	-27.87	9.83	11.24	2.86	H		0.066	18.21

8.2 RADIATED SPURIOUS EMISSIONS

▣ NR Band: N77(PC2)

▣ Bandwidth: 30 MHz

▣ Modulation: PI/2 BPSK

▣ Distance: 1 meters

▣ SCS: 30 kHz

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
647668 (3715.02)	7 430.04	-61.63	11.32	-54.36	4.12	V	-47.16	-13.00
	11 145.06	-61.53	12.30	-50.13	5.10	V	-42.93	-13.00
	14 860.08	-54.17	13.94	-48.35	5.97	H	-40.38	-13.00
656000 (3840.00)	7 680.00	-60.31	11.54	-53.42	4.18	V	-46.06	-13.00
	11 520.00	-61.05	12.44	-50.18	5.16	V	-42.90	-13.00
	15 360.00	-56.12	15.54	-51.04	6.07	V	-41.57	-13.00
664332 (3964.98)	7 929.96	-55.19	11.06	-47.78	4.27	H	-40.99	-13.00
	11 894.94	-55.41	12.80	-45.06	5.37	H	-37.63	-13.00
	15 859.92	-61.33	16.40	-54.46	6.20	H	-44.26	-13.00

ENDC-Mode: 2A-n77A(PC2)

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
18900 (1880.0)	3 760.00	-59.22	11.64	-62.21	2.85	V	-53.42	-13.00
	5 640.00	-60.86	12.00	-57.64	3.54	V	-49.18	-13.00
	7 520.00	-62.86	11.54	-50.51	4.12	V	-43.09	-13.00

Note : All EN-DC mode of operation were investigated and the worst case configuration results are reported.

(Worst case: 2A-n77A(BW 30MHz))

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Sub6 n77	20 MHz	3840.00	BPSK	50	0	4.26
			QPSK			5.09
			16-QAM			5.90
			64-QAM			6.37
			256-QAM			6.66
	30 MHz		BPSK	75		3.79
			QPSK			5.14
			16-QAM			6.02
			64-QAM			6.32
			256-QAM			6.58
	40 MHz		BPSK	100		4.09
			QPSK			4.97
			16-QAM			5.94
			64-QAM			6.29
			256-QAM			6.41
	50 MHz		BPSK	128		4.48
			QPSK			5.05
			16-QAM			5.94
			64-QAM			6.21
			256-QAM			6.48
	60 MHz		BPSK	162		4.18
			QPSK			5.41
			16-QAM			6.15
			64-QAM			6.34
			256-QAM			6.49

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Sub6 n77	70 MHz	3840.00	BPSK	180	0	4.37
			QPSK			5.49
			16-QAM			6.13
			64-QAM			6.49
			256-QAM			6.53
	80 MHz		BPSK	216		4.25
			QPSK			5.40
			16-QAM			6.09
			64-QAM			6.37
			256-QAM			6.39
	90 MHz		BPSK	243		3.92
			QPSK			5.24
			16-QAM			6.09
			64-QAM			6.28
			256-QAM			6.54
	100 MHz		BPSK	270		4.25
			QPSK			5.31
			16-QAM			6.11
			64-QAM			6.31
			256-QAM			6.51

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 98 ~ 142.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Sub6 n77	20 MHz	3840.00	BPSK	50	0	17.756
			QPSK			17.890
			16-QAM			17.811
			64-QAM			17.969
			256-QAM			17.859
	30 MHz		BPSK	75		26.754
			QPSK			26.868
			16-QAM			26.858
			64-QAM			27.000
			256-QAM			26.884
	40 MHz		BPSK	100		35.701
			QPSK			35.968
			16-QAM			35.963
			64-QAM			35.898
			256-QAM			35.939
	50 MHz		BPSK	128		45.889
			QPSK			45.646
			16-QAM			45.995
			64-QAM			45.551
			256-QAM			45.783
	60 MHz		BPSK	162		57.861
			QPSK			57.929
			16-QAM			57.668
			64-QAM			57.749
			256-QAM			58.112

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Sub6 n77	70 MHz	3840.00	BPSK	180	0	64.411
			QPSK			64.621
			16-QAM			64.403
			64-QAM			64.641
			256-QAM			64.367
	80 MHz		BPSK	216		77.552
			QPSK			77.003
			16-QAM			77.640
			64-QAM			77.144
			256-QAM			77.158
	90 MHz		BPSK	243		87.077
			QPSK			86.826
			16-QAM			86.607
			64-QAM			86.557
			256-QAM			86.775
	100 MHz		BPSK	270		96.224
			QPSK			96.521
			16-QAM			96.487
			64-QAM			96.620
			256-QAM			96.362

Note:

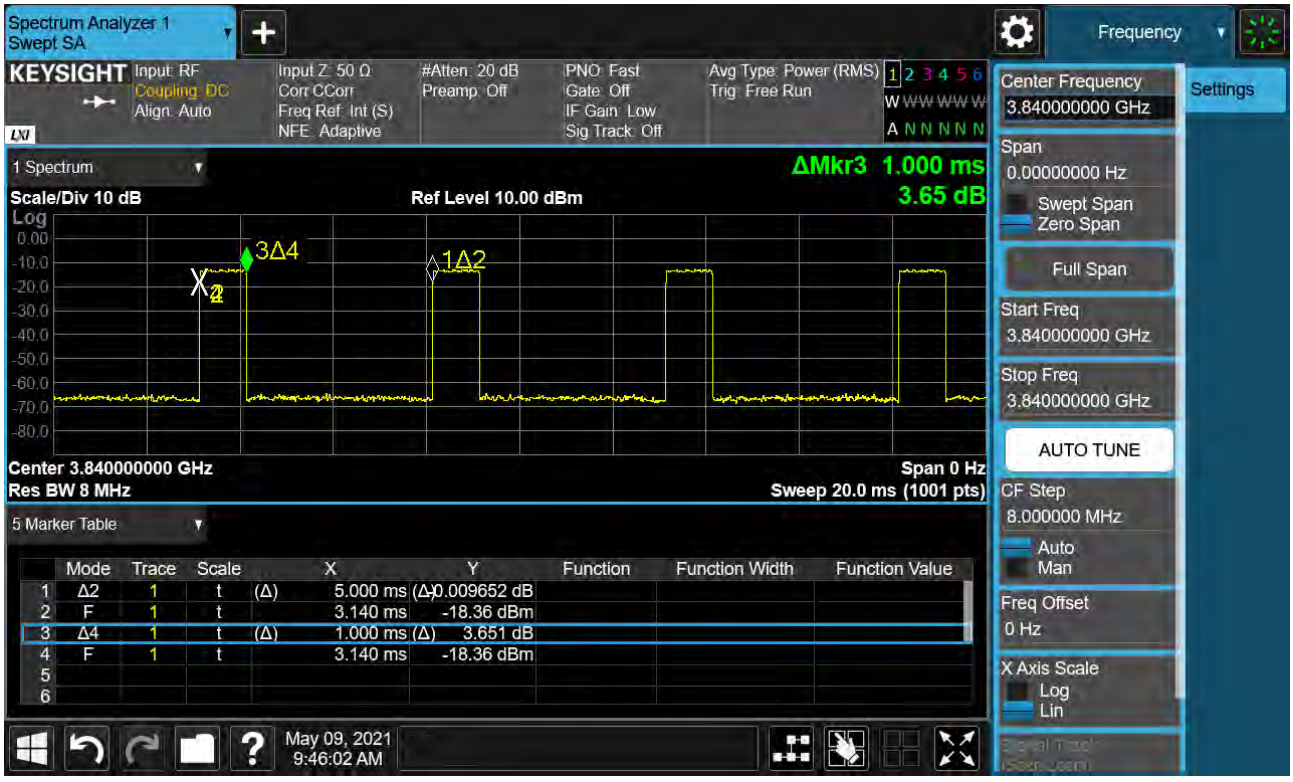
1. Plots of the EUT's Occupied Bandwidth are shown Page 53~ 97.

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 n77	20	3710.01	3.2802	38.093	-72.796	-34.703	-13.00
		3840.00	8.0100	38.705	-71.649	-32.944	
		3969.99	8.0210	38.705	-72.467	-33.762	
	30	3715.02	9.1167	0.000	-72.291	-72.291	
		3840.00	7.2268	0.000	-71.757	-71.757	
		3964.98	5.4487	0.000	-71.182	-71.182	
	40	3720.00	9.0723	38.705	-71.948	-33.243	
		3840.00	8.8559	38.705	-71.546	-32.841	
		3960.00	8.0045	38.705	-72.437	-33.732	
	50	3725.01	7.9681	38.705	-71.841	-33.136	
		3840.00	7.1481	38.705	-71.291	-32.586	
		3954.99	8.2792	38.705	-72.365	-33.660	
	60	3730.01	8.0195	38.705	-71.755	-33.050	
		3840.00	9.4108	38.705	-72.610	-33.905	
		3950.00	9.1456	38.705	-71.967	-33.262	
	70	3735.00	8.0055	38.705	-71.738	-33.033	
		3840.00	7.4262	38.705	-72.230	-33.525	
		3945.00	7.9905	38.705	-71.594	-32.889	
	80	3740.01	9.0967	38.705	-71.153	-32.448	
		3840.00	6.0384	38.705	-71.253	-32.548	
		3939.99	4.8988	38.093	-72.866	-34.773	
	90	3745.02	7.9751	38.705	-72.512	-33.807	
		3840.00	3.2897	38.093	-71.822	-33.729	
		3934.98	6.0364	38.705	-71.582	-32.877	
	100	3750.00	8.0324	38.705	-72.013	-33.308	
		3840.00	8.0459	38.705	-72.475	-33.770	
		3930.00	8.8559	38.705	-72.722	-34.017	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 251 ~ 304.
2. Duty Cycle factor already applied on the factor.
   - Duty Cycle Factor(dB) = 6.990



   - Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator + Power Divider
   - Result(dBm) = Reading + Factor

3. Factor(dB)

Frequency Range (GHz)	Factor [dB]
0.03 – 1	34.501
1 – 5	38.093
5 – 10	38.705
10 – 15	39.230
15 – 20	39.603
Above 20	40.245

8.6 BAND EDGE

1. Plots of the EUT's Band Edge are shown Page 143 ~ 250.
2. Duty Cycle factor already applied on the factor.
   - Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator + Power Divider
   - Result(dBm) = Reading + Factor
   - Duty Cycle Factor(dB) = 6.990

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ BandWidth: 20 MHz

▣ Voltage(100%): 3.880 VDC

▣ Batt. Endpoint: 3.650 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
3710.010	100%	+20(Ref)	3710 010 015	0.0	0.000 000	0.000
	100%	-30	3710 010 022	7.9	0.000 000	0.002
	100%	-20	3710 010 029	14.7	0.000 000	0.004
	100%	-10	3710 010 026	11.3	0.000 000	0.003
	100%	0	3710 010 030	15.1	0.000 000	0.004
	100%	+10	3710 010 021	6.3	0.000 000	0.002
	100%	+30	3710 010 027	12.8	0.000 000	0.003
	100%	+40	3710 010 028	13.8	0.000 000	0.004
	100%	+50	3710 010 018	3.2	0.000 000	0.001
	Batt. Endpoint	+20	3710 010 029	14.1	0.000 000	0.004
3969.990	100%	+20(Ref)	3969 990 013	0.0	0.000 000	0.000
	100%	-30	3969 990 020	6.8	0.000 000	0.002
	100%	-20	3969 990 026	13.2	0.000 000	0.003
	100%	-10	3969 990 019	6.1	0.000 000	0.002
	100%	0	3969 990 020	6.4	0.000 000	0.002
	100%	+10	3969 990 028	14.9	0.000 000	0.004
	100%	+30	3969 990 017	3.5	0.000 000	0.001
	100%	+40	3969 990 029	15.8	0.000 000	0.004
	100%	+50	3969 990 016	3.3	0.000 000	0.001
	Batt. Endpoint	+20	3969 990 028	14.6	0.000 000	0.004

▣ BandWidth: 30 MHz

▣ Voltage(100%): 3.880 VDC

▣ Batt. Endpoint: 3.650 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
3715.020	100%	+20(Ref)	3715 020 010	0.0	0.000 000	0.000
	100%	-30	3715 020 020	9.7	0.000 000	0.003
	100%	-20	3715 020 019	9.1	0.000 000	0.002
	100%	-10	3715 020 027	16.3	0.000 000	0.004
	100%	0	3715 020 014	3.6	0.000 000	0.001
	100%	+10	3715 020 013	3.0	0.000 000	0.001
	100%	+30	3715 020 019	8.9	0.000 000	0.002
	100%	+40	3715 020 023	13.3	0.000 000	0.004
	100%	+50	3715 020 017	6.4	0.000 000	0.002
	Batt. Endpoint	+20	3715 020 018	8.1	0.000 000	0.002
3964.980	100%	+20(Ref)	3964 980 010	0.0	0.000 000	0.000
	100%	-30	3964 980 023	13.6	0.000 000	0.003
	100%	-20	3964 980 016	6.3	0.000 000	0.002
	100%	-10	3964 980 026	16.5	0.000 000	0.004
	100%	0	3964 980 024	14.4	0.000 000	0.004
	100%	+10	3964 980 014	3.9	0.000 000	0.001
	100%	+30	3964 980 023	12.7	0.000 000	0.003
	100%	+40	3964 980 023	13.0	0.000 000	0.003
	100%	+50	3964 980 016	5.7	0.000 000	0.001
	Batt. Endpoint	+20	3964 980 027	16.6	0.000 000	0.004

▣ BandWidth: 40 MHz

▣ Voltage(100%): 3.880 VDC

▣ Batt. Endpoint: 3.650 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
3720.000	100%	+20(Ref)	3720 000 005	0.0	0.000 000	0.000
	100%	-30	3720 000 009	3.8	0.000 000	0.001
	100%	-20	3720 000 009	4.1	0.000 000	0.001
	100%	-10	3720 000 013	8.2	0.000 000	0.002
	100%	0	3720 000 012	6.7	0.000 000	0.002
	100%	+10	3720 000 012	6.5	0.000 000	0.002
	100%	+30	3720 000 020	14.5	0.000 000	0.004
	100%	+40	3720 000 015	9.4	0.000 000	0.003
	100%	+50	3720 000 010	4.6	0.000 000	0.001
	Batt. Endpoint	+20	3720 000 011	5.6	0.000 000	0.002
3960.000	100%	+20(Ref)	3960 000 005	0.0	0.000 000	0.000
	100%	-30	3960 000 011	6.3	0.000 000	0.002
	100%	-20	3960 000 009	3.9	0.000 000	0.001
	100%	-10	3960 000 020	14.8	0.000 000	0.004
	100%	0	3960 000 015	9.8	0.000 000	0.002
	100%	+10	3960 000 020	14.6	0.000 000	0.004
	100%	+30	3960 000 021	16.4	0.000 000	0.004
	100%	+40	3960 000 017	11.5	0.000 000	0.003
	100%	+50	3960 000 014	8.5	0.000 000	0.002
	Batt. Endpoint	+20	3960 000 019	14.4	0.000 000	0.004

▣ BandWidth: 50 MHz

▣ Voltage(100%): 3.880 VDC

▣ Batt. Endpoint: 3.650 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
3725.010	100%	+20(Ref)	3725 010 015	0.0	0.000 000	0.000
	100%	-30	3725 010 025	9.6	0.000 000	0.003
	100%	-20	3725 010 031	16.5	0.000 000	0.004
	100%	-10	3725 010 022	7.4	0.000 000	0.002
	100%	0	3725 010 026	11.4	0.000 000	0.003
	100%	+10	3725 010 027	12.0	0.000 000	0.003
	100%	+30	3725 010 028	12.9	0.000 000	0.003
	100%	+40	3725 010 029	14.5	0.000 000	0.004
	100%	+50	3725 010 022	7.4	0.000 000	0.002
	Batt. Endpoint	+20	3725 010 025	10.4	0.000 000	0.003
3954.990	100%	+20(Ref)	3954 990 012	0.0	0.000 000	0.000
	100%	-30	3954 990 017	4.8	0.000 000	0.001
	100%	-20	3954 990 021	8.9	0.000 000	0.002
	100%	-10	3954 990 015	3.5	0.000 000	0.001
	100%	0	3954 990 017	4.7	0.000 000	0.001
	100%	+10	3954 990 021	9.0	0.000 000	0.002
	100%	+30	3954 990 018	5.7	0.000 000	0.001
	100%	+40	3954 990 017	5.3	0.000 000	0.001
	100%	+50	3954 990 015	3.1	0.000 000	0.001
	Batt. Endpoint	+20	3954 990 029	17.0	0.000 000	0.004

▣ BandWidth: 60 MHz

▣ Voltage(100%): 3.880 VDC

▣ Batt. Endpoint: 3.650 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
3730.005	100%	+20(Ref)	3730 020 012	0.0	0.000 000	0.000
	100%	-30	3730 020 028	16.3	0.000 000	0.004
	100%	-20	3730 020 025	13.3	0.000 000	0.004
	100%	-10	3730 020 021	9.6	0.000 000	0.003
	100%	0	3730 020 022	10.3	0.000 000	0.003
	100%	+10	3730 020 022	10.0	0.000 000	0.003
	100%	+30	3730 020 015	3.2	0.000 000	0.001
	100%	+40	3730 020 016	4.5	0.000 000	0.001
	100%	+50	3730 020 021	9.3	0.000 000	0.002
	Batt. Endpoint	+20	3730 020 021	8.7	0.000 000	0.002
3949.995	100%	+20(Ref)	3949 995 010	0.0	0.000 000	0.000
	100%	-30	3949 995 015	4.6	0.000 000	0.001
	100%	-20	3949 995 024	13.9	0.000 000	0.004
	100%	-10	3949 995 016	5.8	0.000 000	0.001
	100%	0	3949 995 018	7.6	0.000 000	0.002
	100%	+10	3949 995 019	8.8	0.000 000	0.002
	100%	+30	3949 995 015	5.5	0.000 000	0.001
	100%	+40	3949 995 014	3.6	0.000 000	0.001
	100%	+50	3949 995 025	15.2	0.000 000	0.004
	Batt. Endpoint	+20	3949 995 025	14.7	0.000 000	0.004

▣ BandWidth: 70 MHz

▣ Voltage(100%): 3.880 VDC

▣ Batt. Endpoint: 3.650 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
3735.000	100%	+20(Ref)	3735 000 003	0.0	0.000 000	0.000
	100%	-30	3735 000 007	3.3	0.000 000	0.001
	100%	-20	3735 000 008	5.1	0.000 000	0.001
	100%	-10	3735 000 009	6.0	0.000 000	0.002
	100%	0	3735 000 015	11.8	0.000 000	0.003
	100%	+10	3735 000 009	6.0	0.000 000	0.002
	100%	+30	3735 000 013	9.9	0.000 000	0.003
	100%	+40	3735 000 014	10.9	0.000 000	0.003
	100%	+50	3735 000 007	3.7	0.000 000	0.001
	Batt. Endpoint	+20	3735 000 015	11.9	0.000 000	0.003
3945.000	100%	+20(Ref)	3945 000 014	0.0	0.000 000	0.000
	100%	-30	3945 000 029	14.4	0.000 000	0.004
	100%	-20	3945 000 029	15.0	0.000 000	0.004
	100%	-10	3945 000 021	6.8	0.000 000	0.002
	100%	0	3945 000 026	11.5	0.000 000	0.003
	100%	+10	3945 000 025	11.2	0.000 000	0.003
	100%	+30	3945 000 018	3.9	0.000 000	0.001
	100%	+40	3945 000 030	15.7	0.000 000	0.004
	100%	+50	3945 000 026	11.6	0.000 000	0.003
	Batt. Endpoint	+20	3945 000 017	3.1	0.000 000	0.001

▣ BandWidth: 80 MHz

▣ Voltage(100%): 3.880 VDC

▣ Batt. Endpoint: 3.650 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
3740.010	100%	+20(Ref)	3740 010 006	0.0	0.000 000	0.000
	100%	-30	3740 010 015	8.9	0.000 000	0.002
	100%	-20	3740 010 020	14.3	0.000 000	0.004
	100%	-10	3740 010 012	5.7	0.000 000	0.002
	100%	0	3740 010 011	5.4	0.000 000	0.001
	100%	+10	3740 010 011	5.2	0.000 000	0.001
	100%	+30	3740 010 010	4.4	0.000 000	0.001
	100%	+40	3740 010 009	3.5	0.000 000	0.001
	100%	+50	3740 010 022	16.1	0.000 000	0.004
	Batt. Endpoint	+20	3740 010 018	12.1	0.000 000	0.003
3939.990	100%	+20(Ref)	3939 990 006	0.0	0.000 000	0.000
	100%	-30	3939 990 022	16.1	0.000 000	0.004
	100%	-20	3939 990 015	9.0	0.000 000	0.002
	100%	-10	3939 990 020	14.4	0.000 000	0.004
	100%	0	3939 990 009	3.0	0.000 000	0.001
	100%	+10	3939 990 010	4.4	0.000 000	0.001
	100%	+30	3939 990 012	6.1	0.000 000	0.002
	100%	+40	3939 990 022	16.2	0.000 000	0.004
	100%	+50	3939 990 010	3.8	0.000 000	0.001
	Batt. Endpoint	+20	3939 990 021	14.8	0.000 000	0.004

▣ BandWidth: 90 MHz

▣ Voltage(100%): 3.880 VDC

▣ Batt. Endpoint: 3.650 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
3745.020	100%	+20(Ref)	3745 020 012	0.0	0.000 000	0.000
	100%	-30	3745 020 027	15.0	0.000 000	0.004
	100%	-20	3745 020 017	5.1	0.000 000	0.001
	100%	-10	3745 020 023	11.7	0.000 000	0.003
	100%	0	3745 020 021	9.2	0.000 000	0.002
	100%	+10	3745 020 028	16.4	0.000 000	0.004
	100%	+30	3745 020 028	16.7	0.000 000	0.004
	100%	+40	3745 020 017	5.0	0.000 000	0.001
	100%	+50	3745 020 023	11.5	0.000 000	0.003
	Batt. Endpoint	+20	3745 020 027	15.1	0.000 000	0.004
3934.980	100%	+20(Ref)	3934 980 004	0.0	0.000 000	0.000
	100%	-30	3934 980 008	3.2	0.000 000	0.001
	100%	-20	3934 980 009	4.2	0.000 000	0.001
	100%	-10	3934 980 020	15.8	0.000 000	0.004
	100%	0	3934 980 012	7.4	0.000 000	0.002
	100%	+10	3934 980 019	15.0	0.000 000	0.004
	100%	+30	3934 980 012	7.6	0.000 000	0.002
	100%	+40	3934 980 010	5.8	0.000 000	0.001
	100%	+50	3934 980 014	9.2	0.000 000	0.002
	Batt. Endpoint	+20	3934 980 014	9.3	0.000 000	0.002

▣ BandWidth: 100 MHz

▣ Voltage(100%): 3.880 VDC

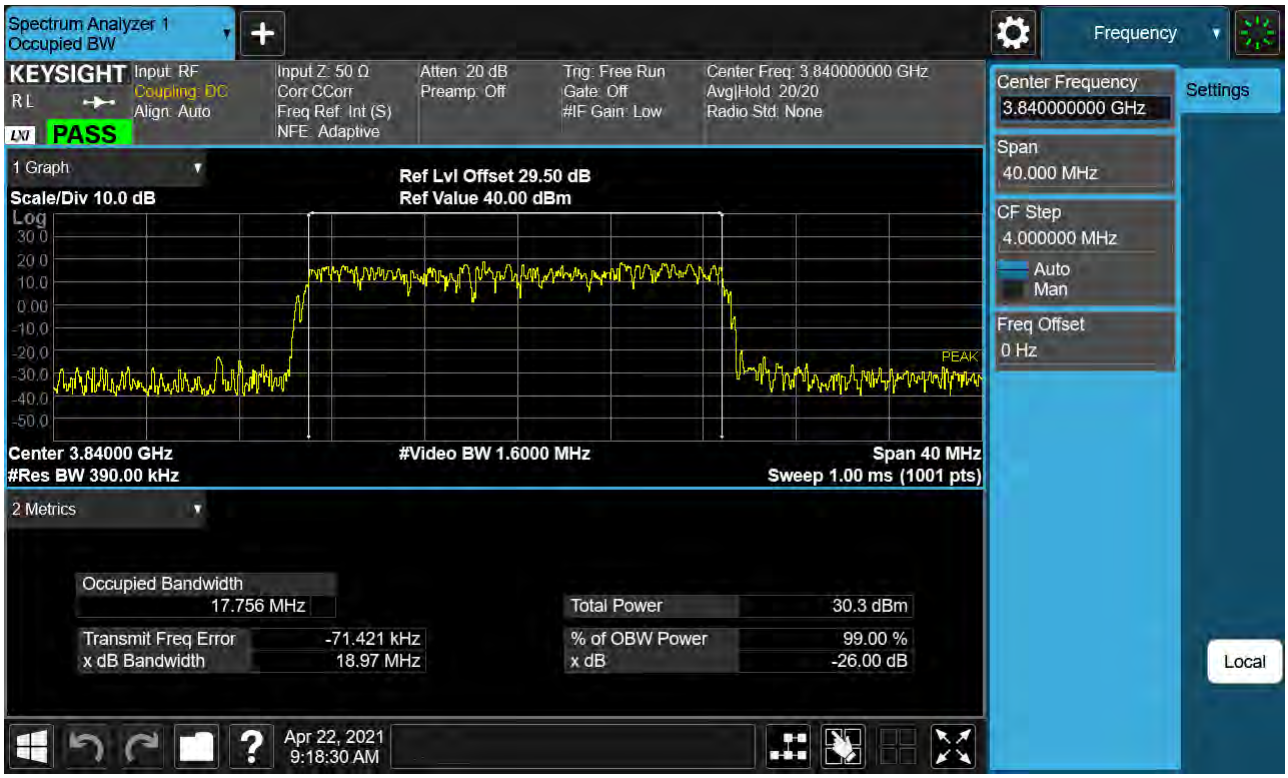
▣ Batt. Endpoint: 3.650 VDC

▣ LIMIT: Emission must remain in band

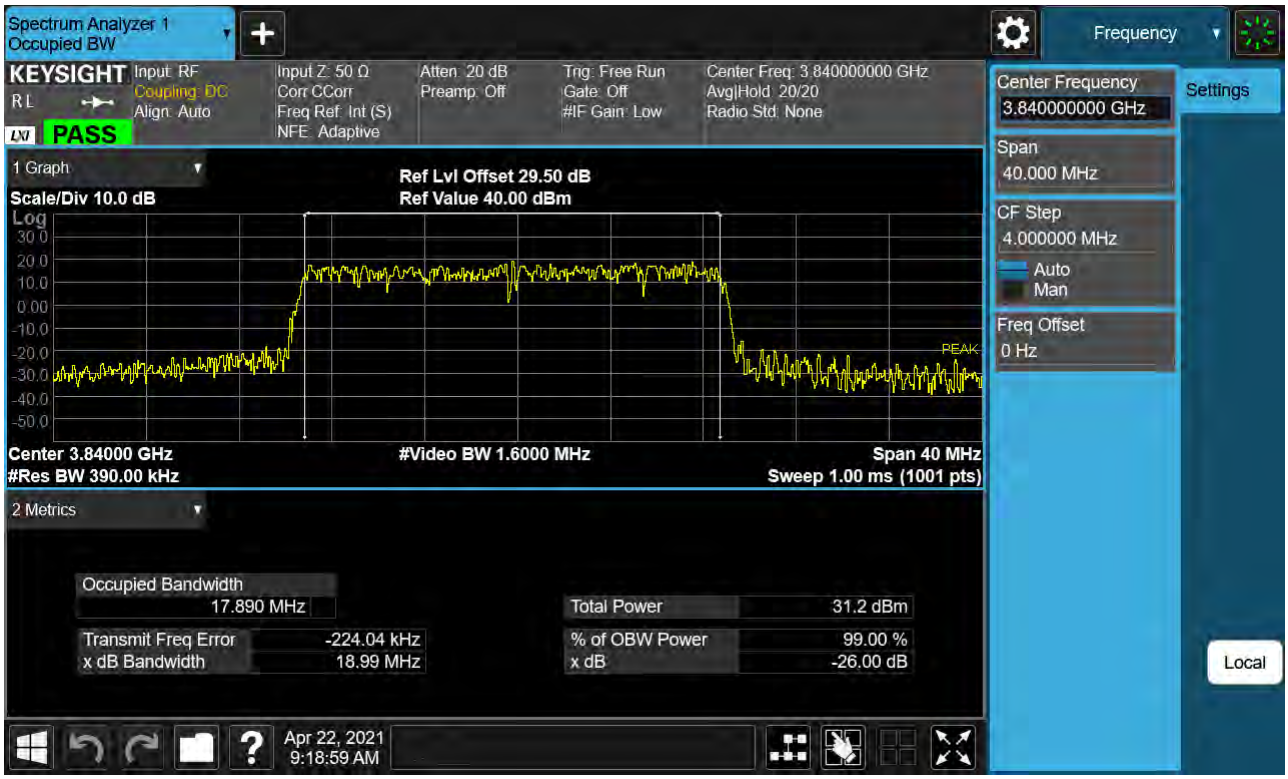
Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
3750.000	100%	+20(Ref)	3750 000 014	0.0	0.000 000	0.000
	100%	-30	3750 000 023	8.3	0.000 000	0.002
	100%	-20	3750 000 028	13.5	0.000 000	0.004
	100%	-10	3750 000 028	13.8	0.000 000	0.004
	100%	0	3750 000 028	13.2	0.000 000	0.004
	100%	+10	3750 000 031	16.6	0.000 000	0.004
	100%	+30	3750 000 030	16.0	0.000 000	0.004
	100%	+40	3750 000 024	10.1	0.000 000	0.003
	100%	+50	3750 000 023	8.8	0.000 000	0.002
	Batt. Endpoint	+20	3750 000 023	8.5	0.000 000	0.002
3930.000	100%	+20(Ref)	3930 000 016	0.0	0.000 000	0.000
	100%	-30	3930 000 030	14.8	0.000 000	0.004
	100%	-20	3930 000 028	12.7	0.000 000	0.003
	100%	-10	3930 000 024	8.1	0.000 000	0.002
	100%	0	3930 000 025	9.1	0.000 000	0.002
	100%	+10	3930 000 022	6.3	0.000 000	0.002
	100%	+30	3930 000 027	11.8	0.000 000	0.003
	100%	+40	3930 000 019	3.2	0.000 000	0.001
	100%	+50	3930 000 028	12.8	0.000 000	0.003
	Batt. Endpoint	+20	3930 000 031	15.5	0.000 000	0.004

9. TEST PLOTS

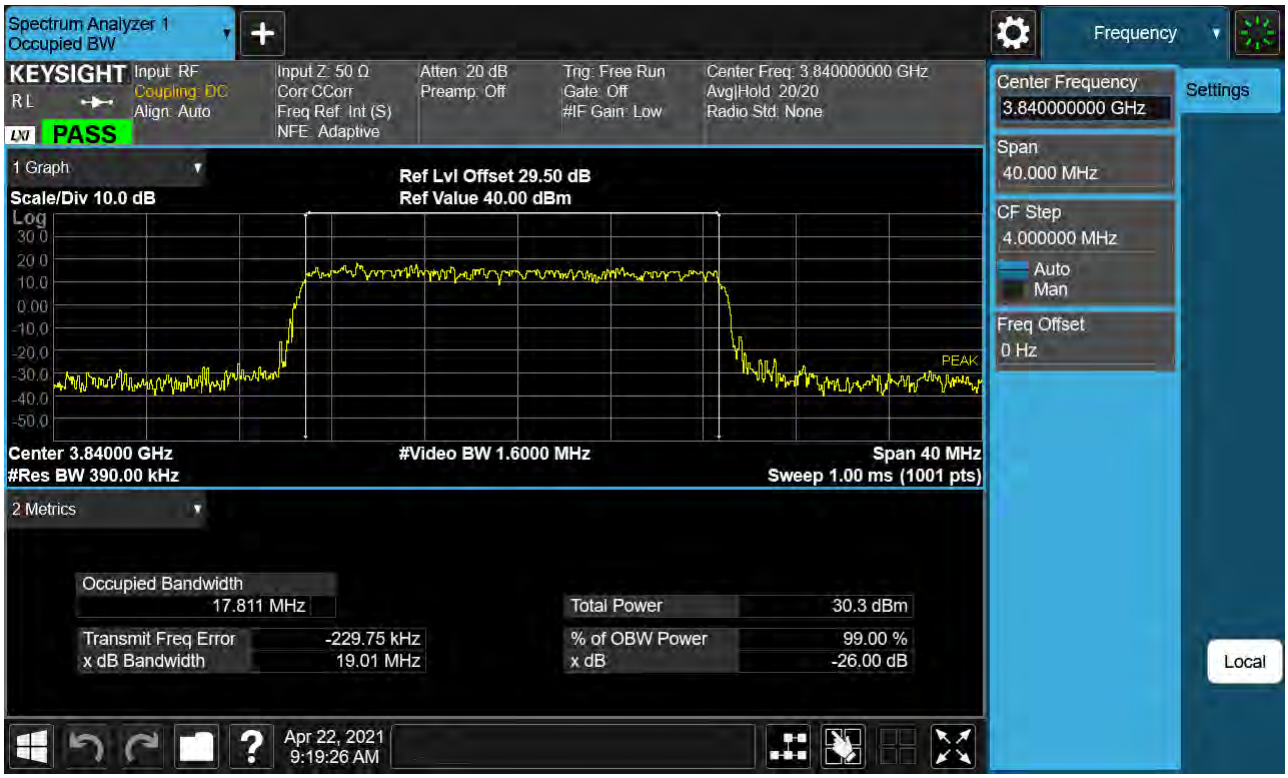
Sub6 n77. Occupied Bandwidth Plot (20M BW Ch.656000 BPSK)



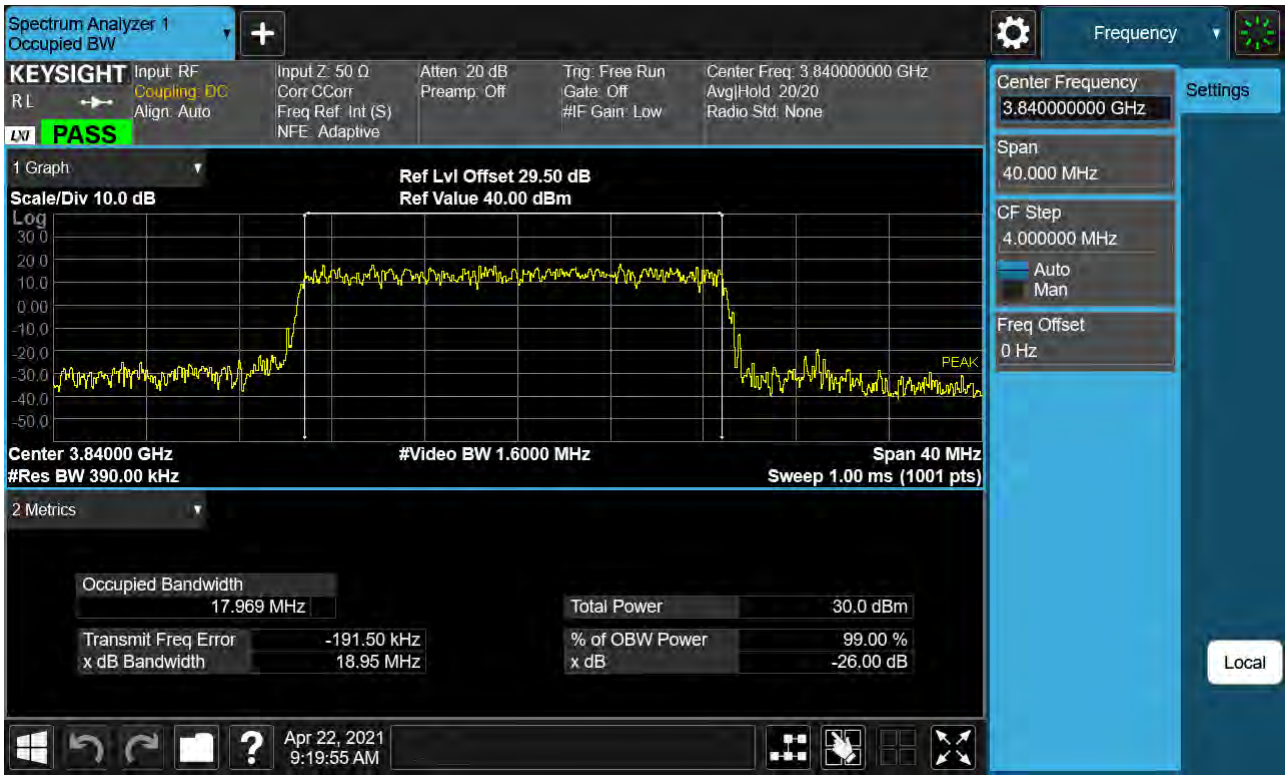
Sub6 n77. Occupied Bandwidth Plot (20M BW Ch.656000 QPSK)



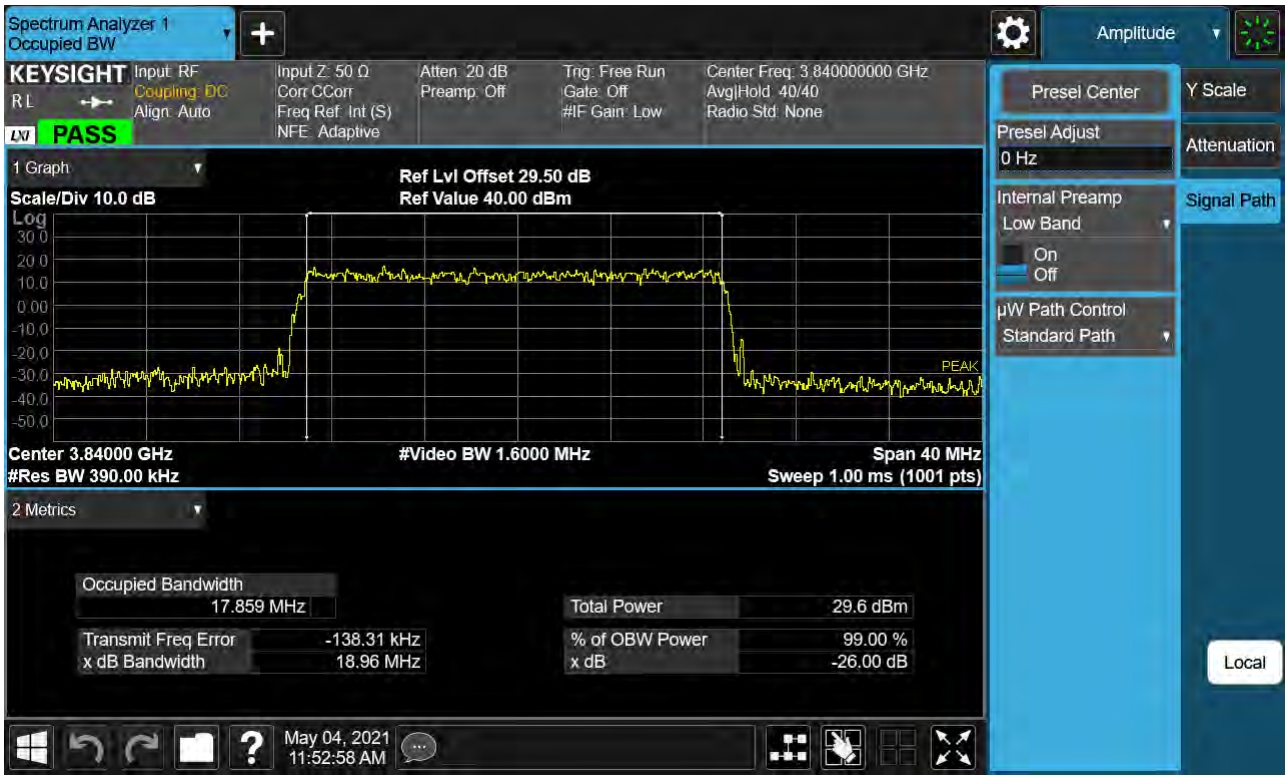
Sub6 n77. Occupied Bandwidth Plot (20M BW Ch.656000 16QAM)



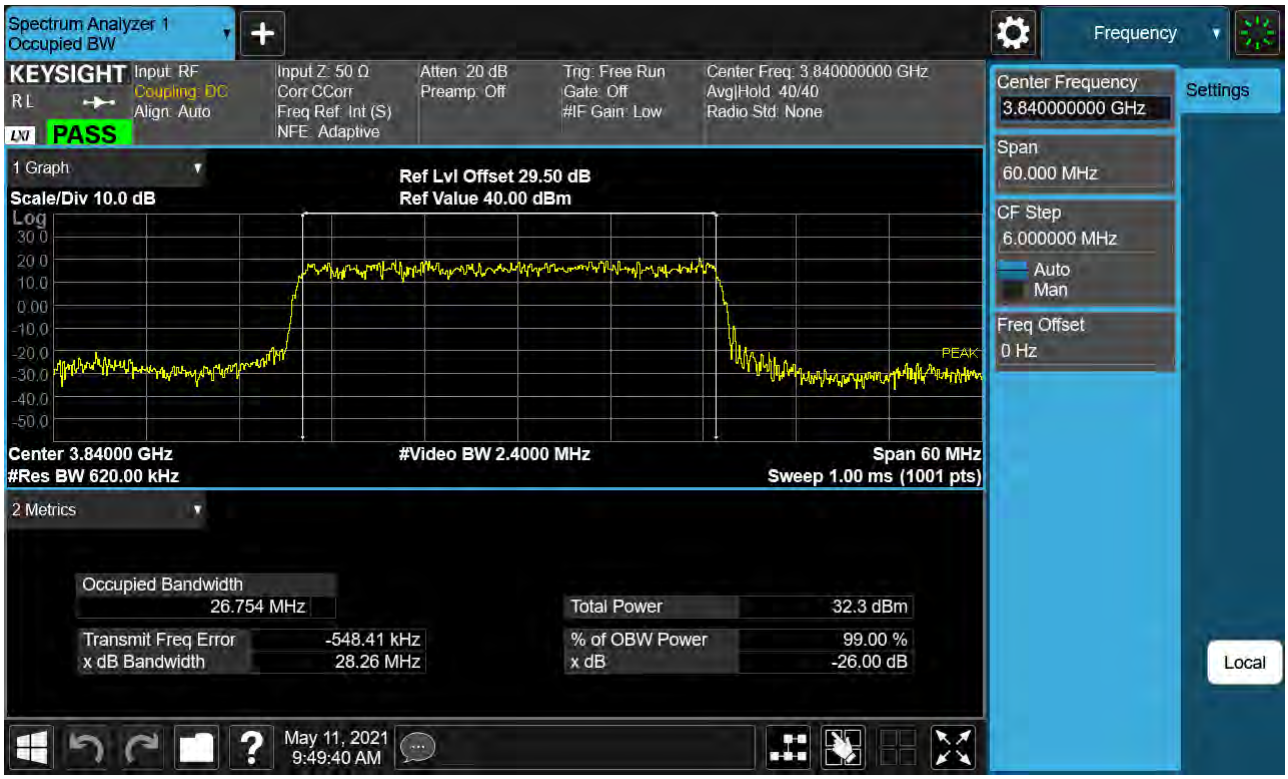
Sub6 n77. Occupied Bandwidth Plot (20M BW Ch.656000 64QAM)



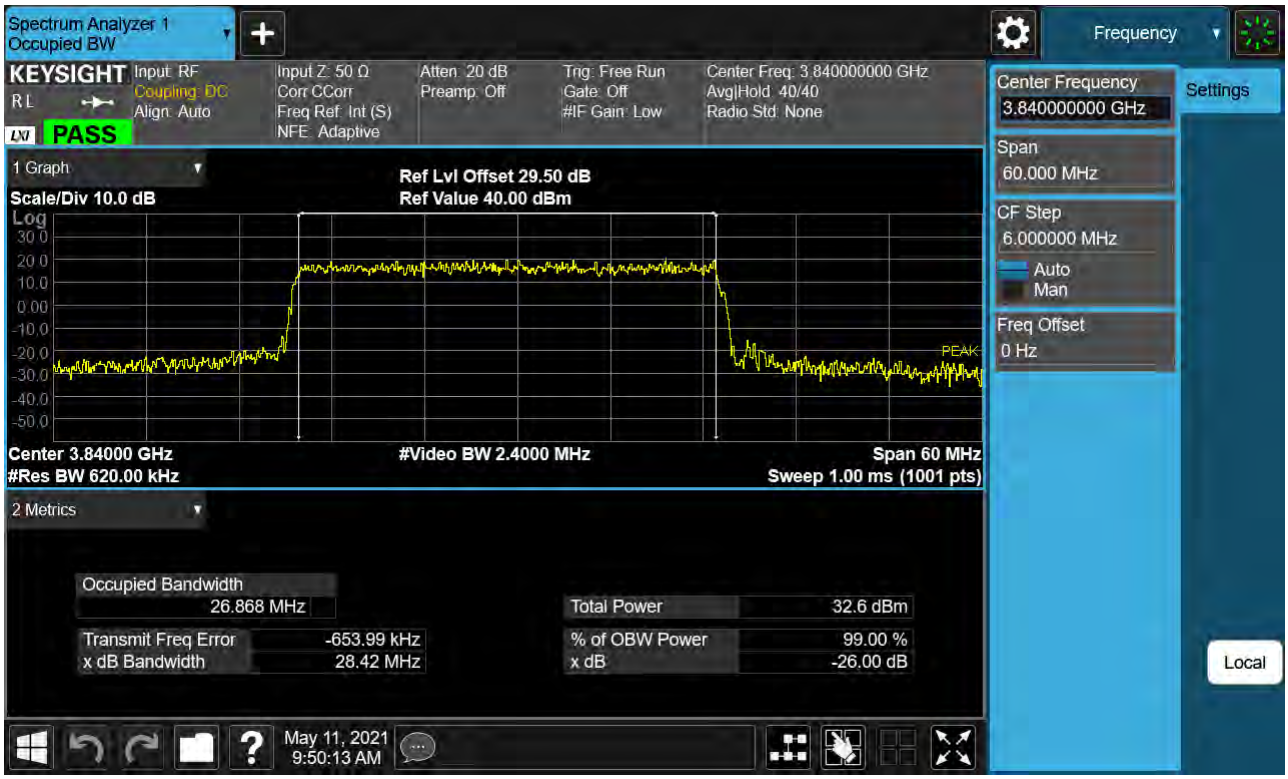
Sub6 n77. Occupied Bandwidth Plot (20M BW Ch.656000 256QAM)



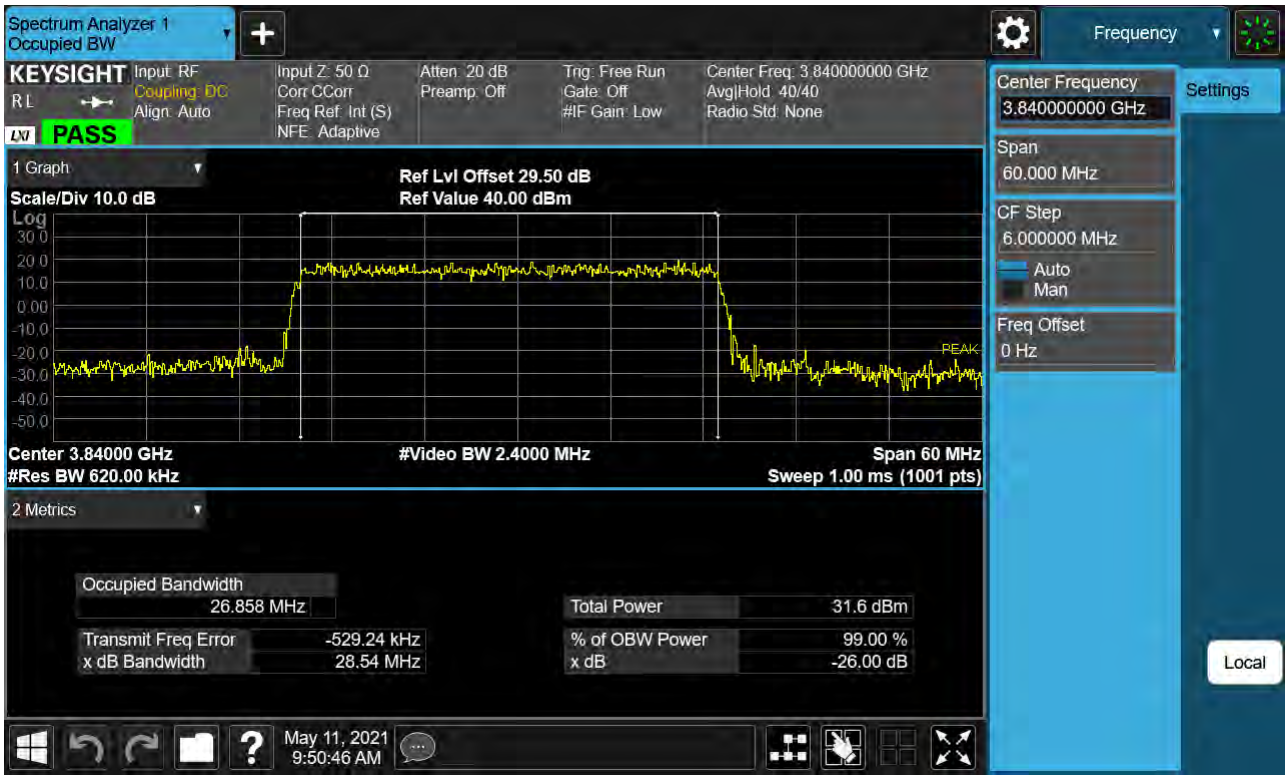
Sub6 n77. Occupied Bandwidth Plot (30M BW Ch.656000 BPSK)



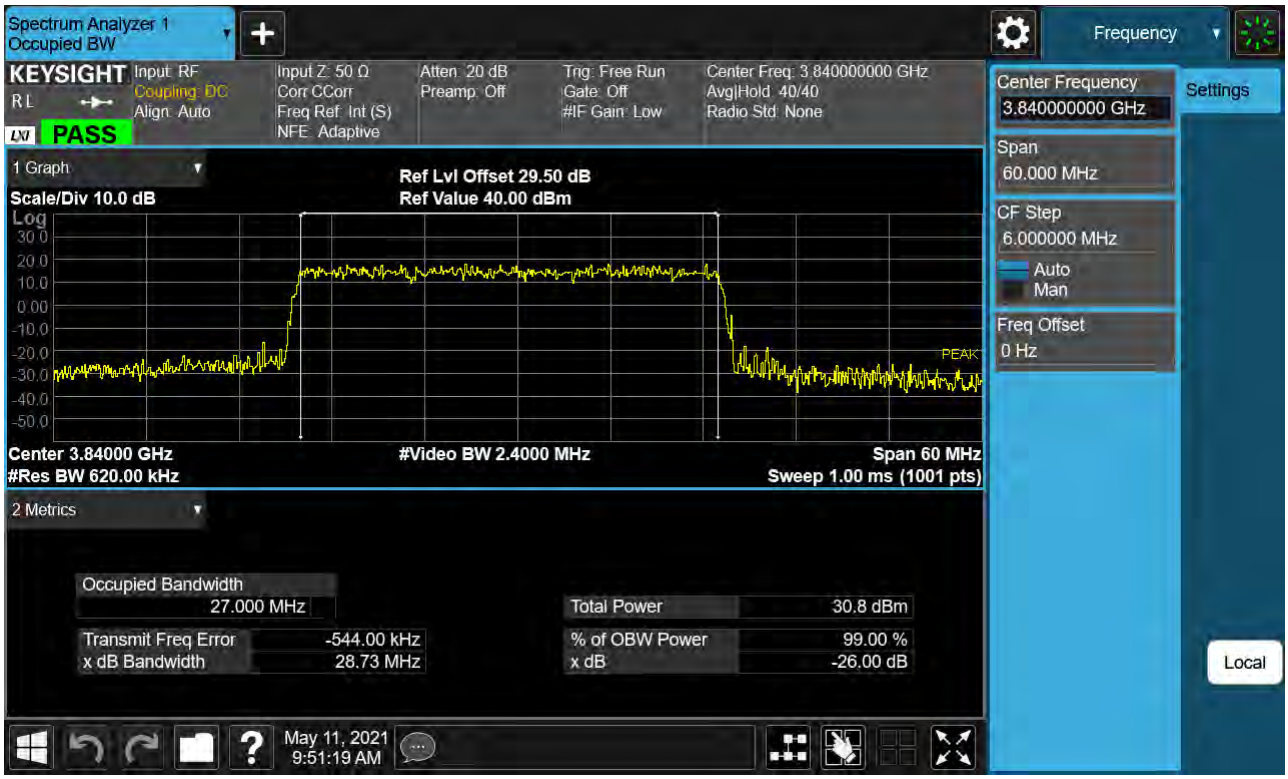
Sub6 n77. Occupied Bandwidth Plot (30M BW Ch.656000 QPSK)



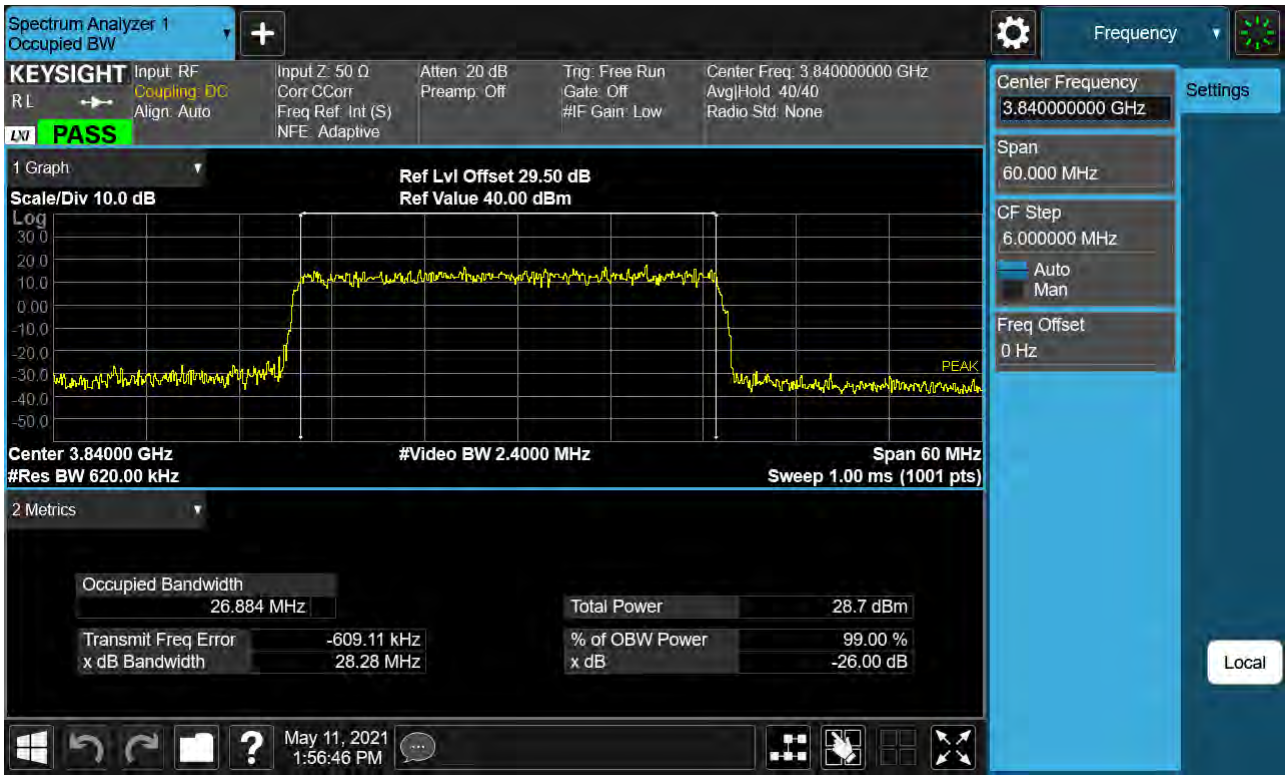
Sub6 n77. Occupied Bandwidth Plot (30M BW Ch.656000 16QAM)



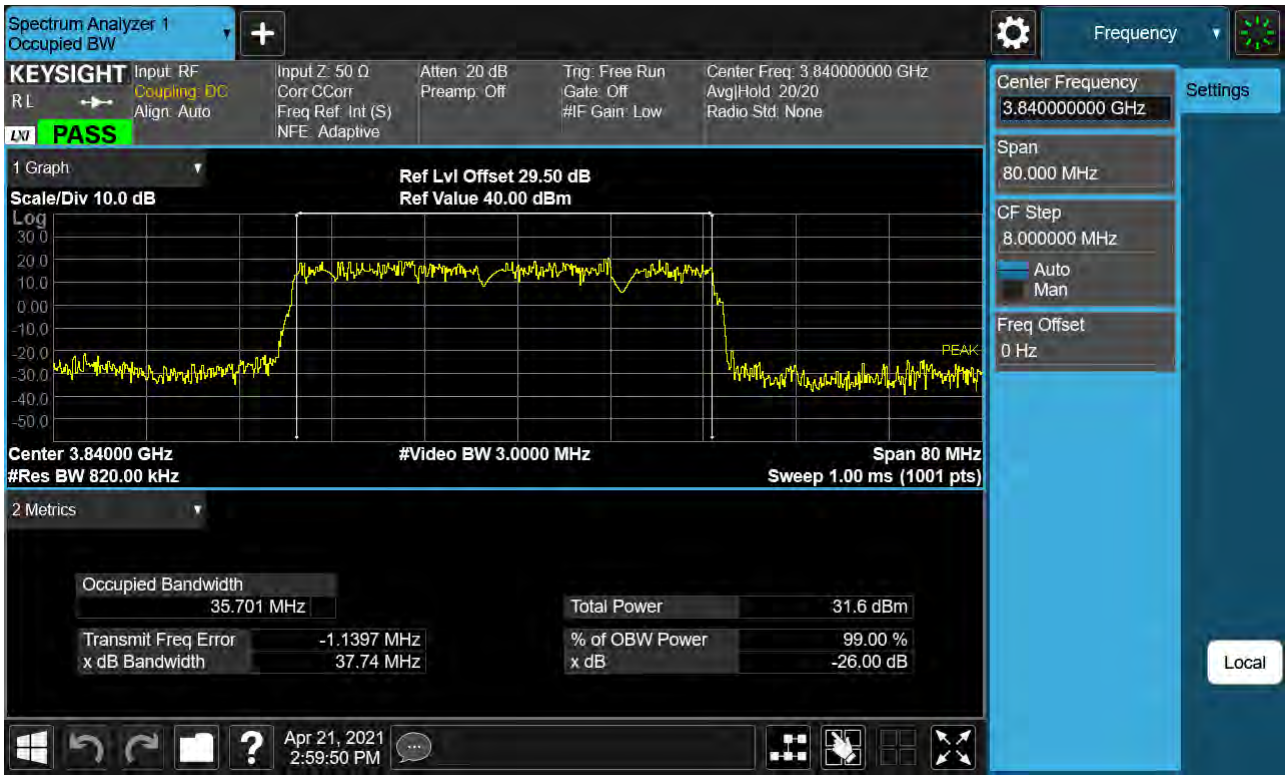
Sub6 n77. Occupied Bandwidth Plot (30M BW Ch.656000 64QAM)



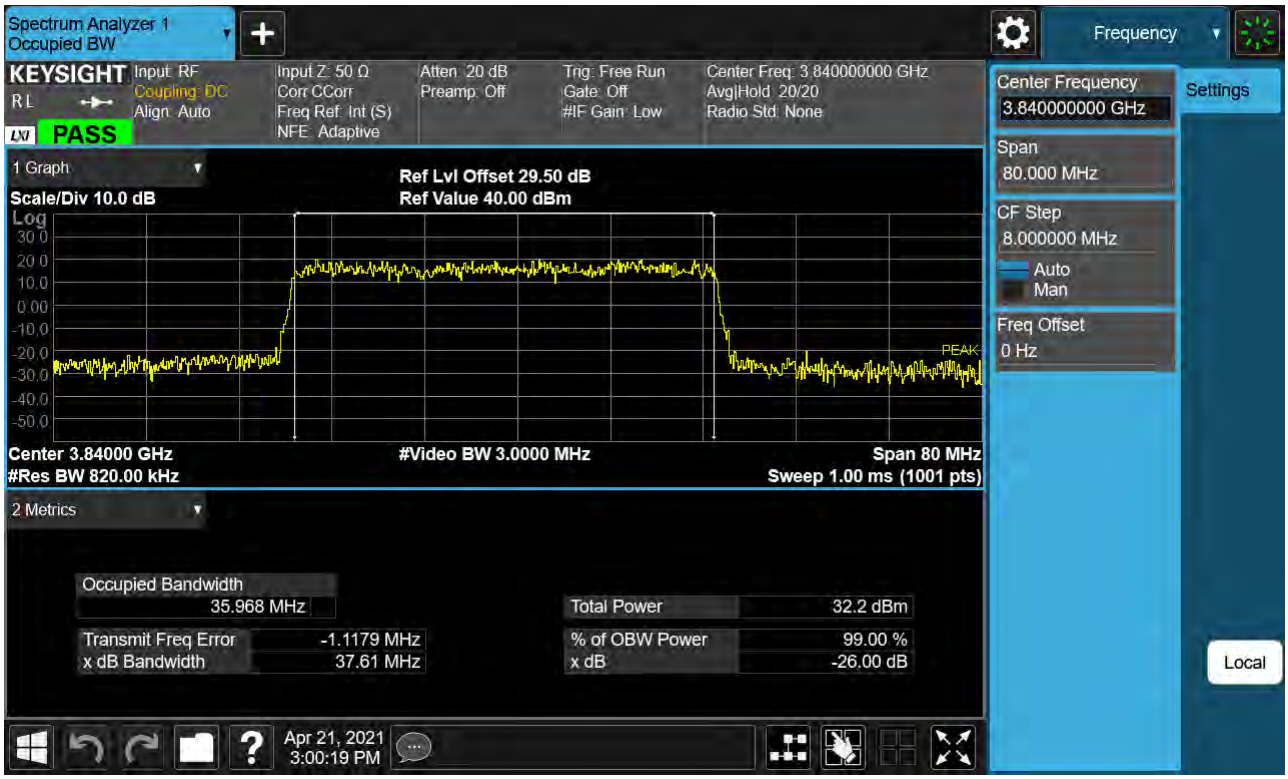
Sub6 n77. Occupied Bandwidth Plot (30M BW Ch.656000 256QAM)



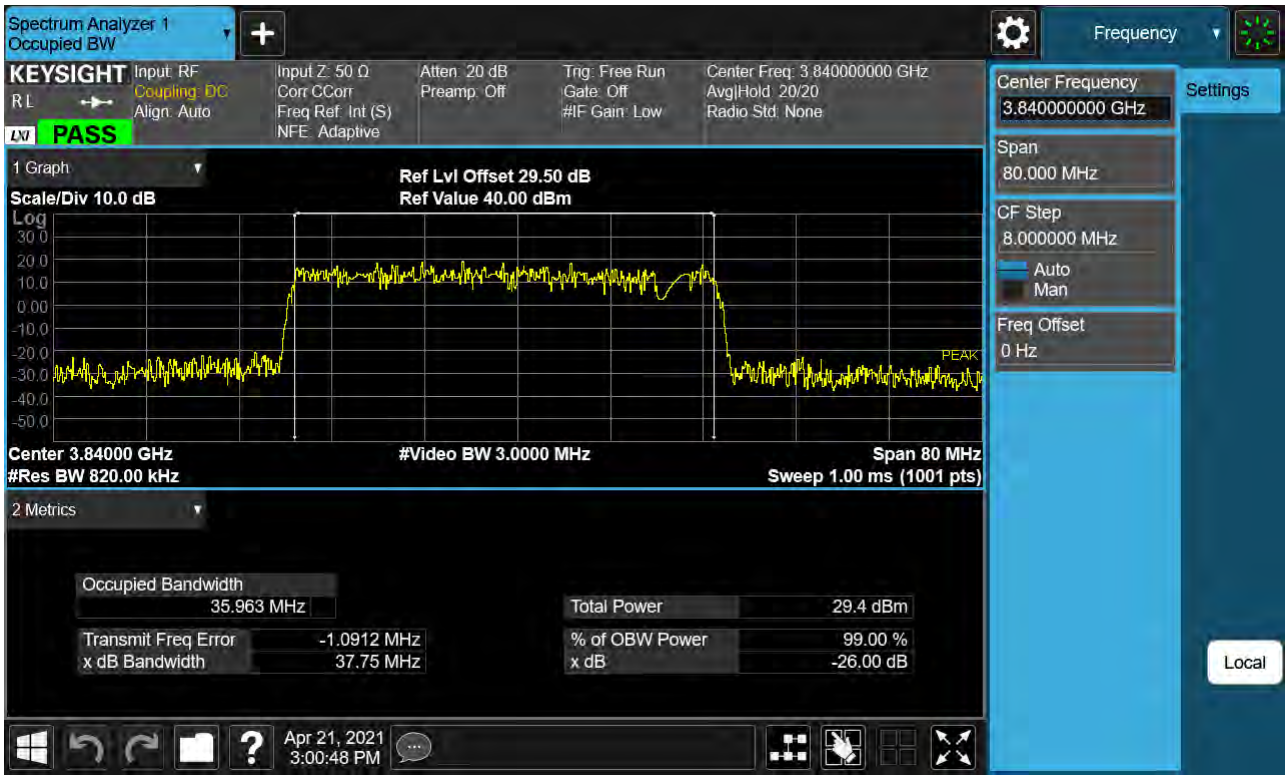
Sub6 n77. Occupied Bandwidth Plot (40M BW Ch.656000 BPSK)



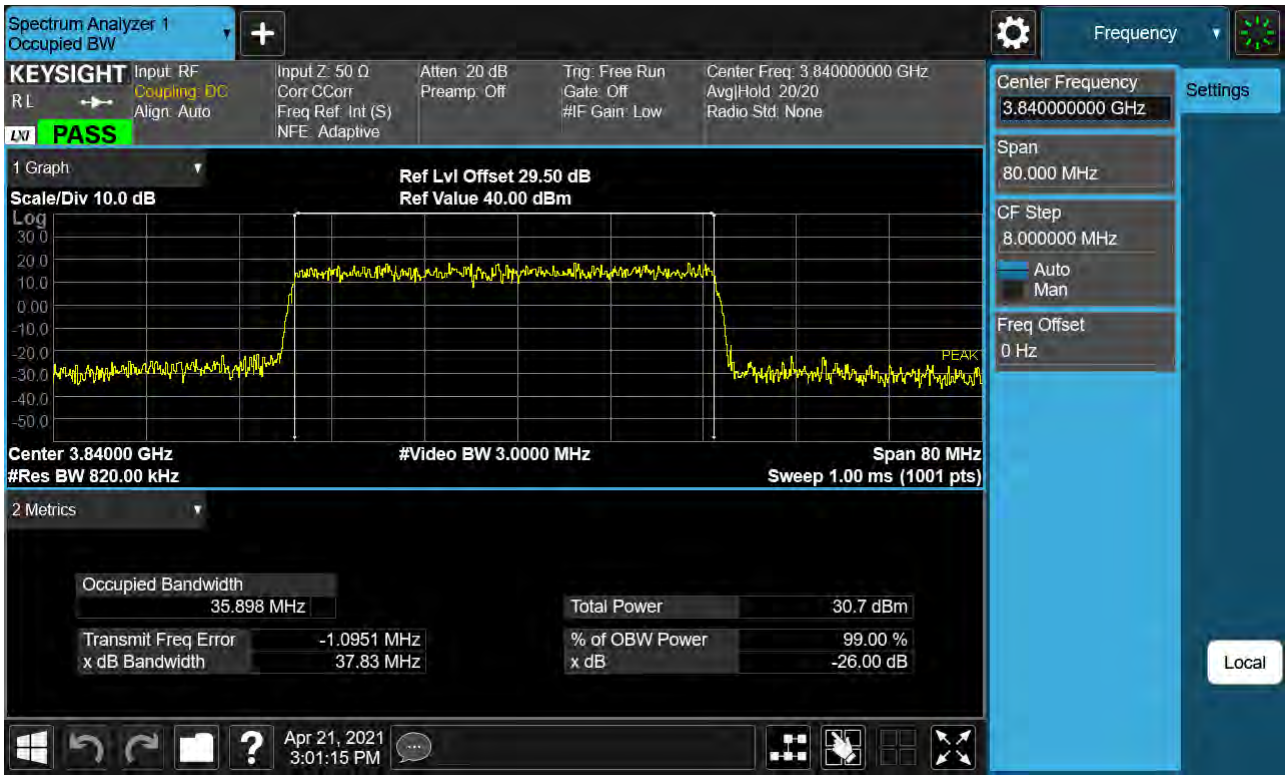
Sub6 n77. Occupied Bandwidth Plot (40M BW Ch.656000 QPSK)



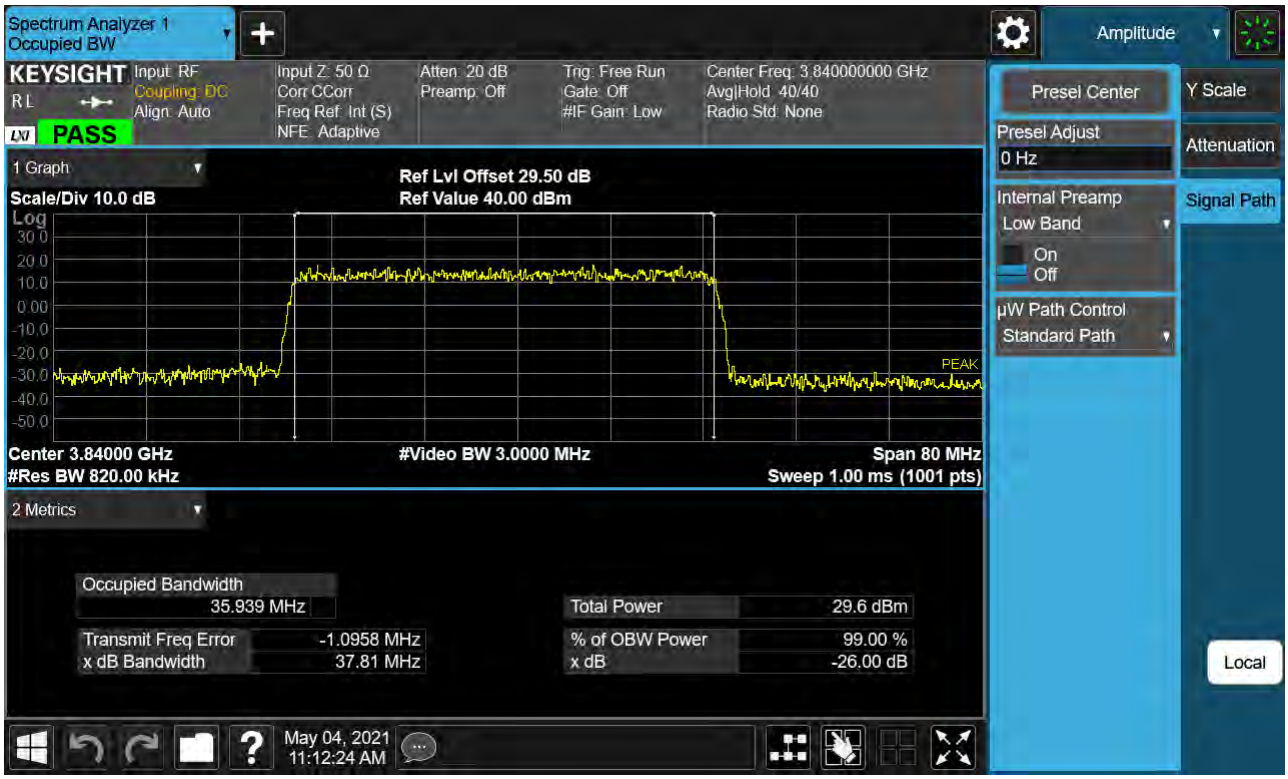
Sub6 n77. Occupied Bandwidth Plot (40M BW Ch.656000 16QAM)



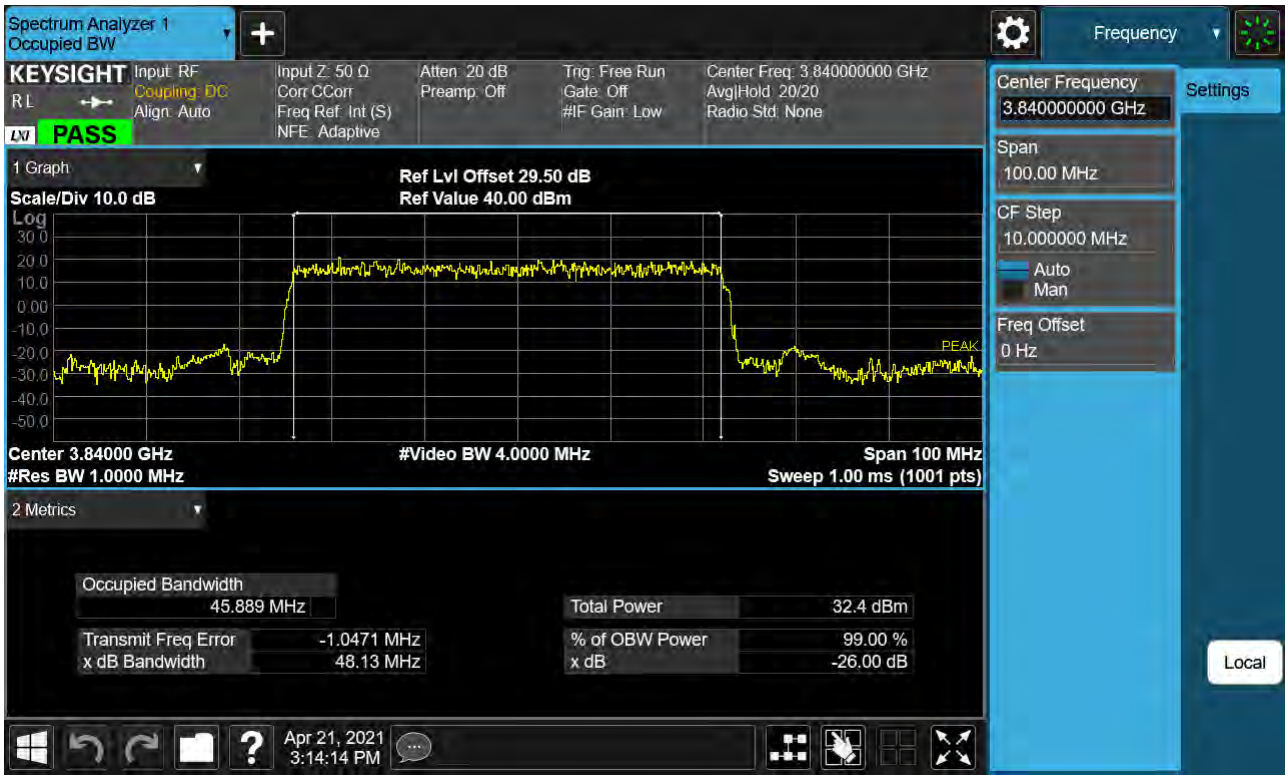
Sub6 n77. Occupied Bandwidth Plot (40M BW Ch.656000 64QAM)



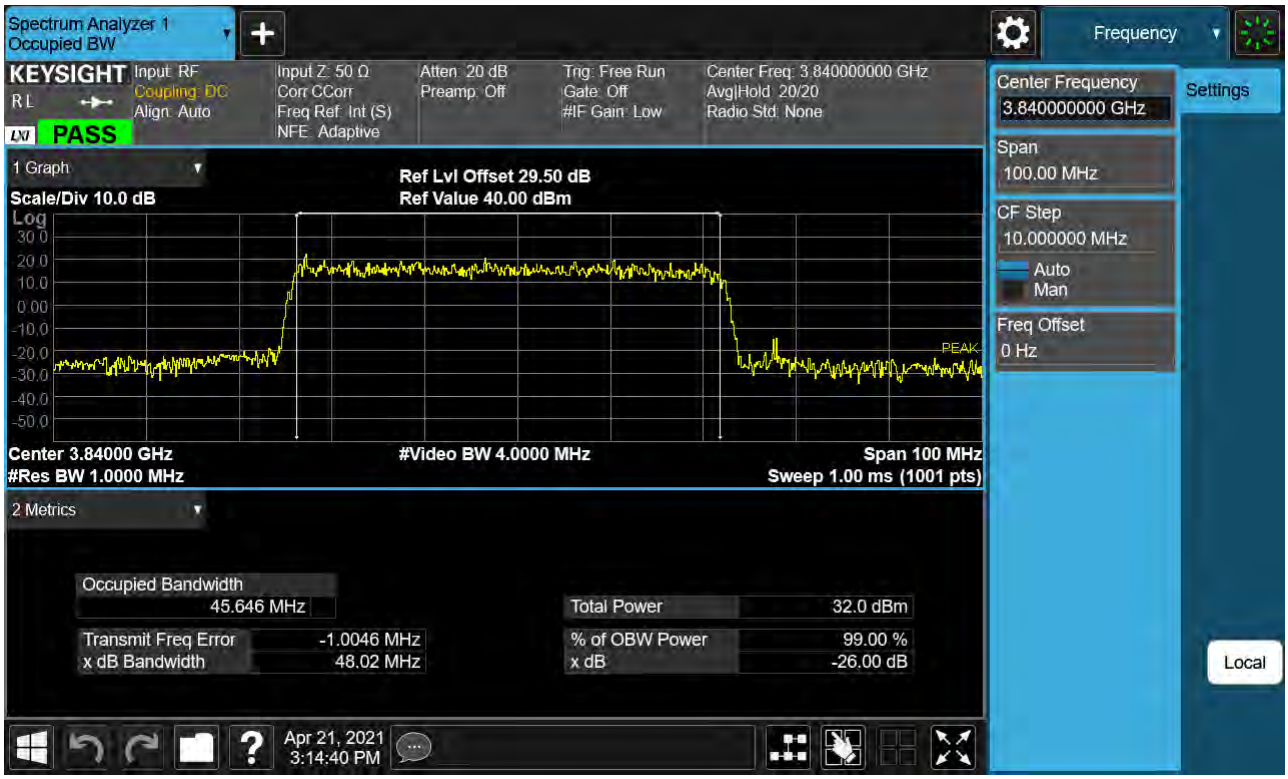
Sub6 n77. Occupied Bandwidth Plot (40M BW Ch.656000 256QAM)



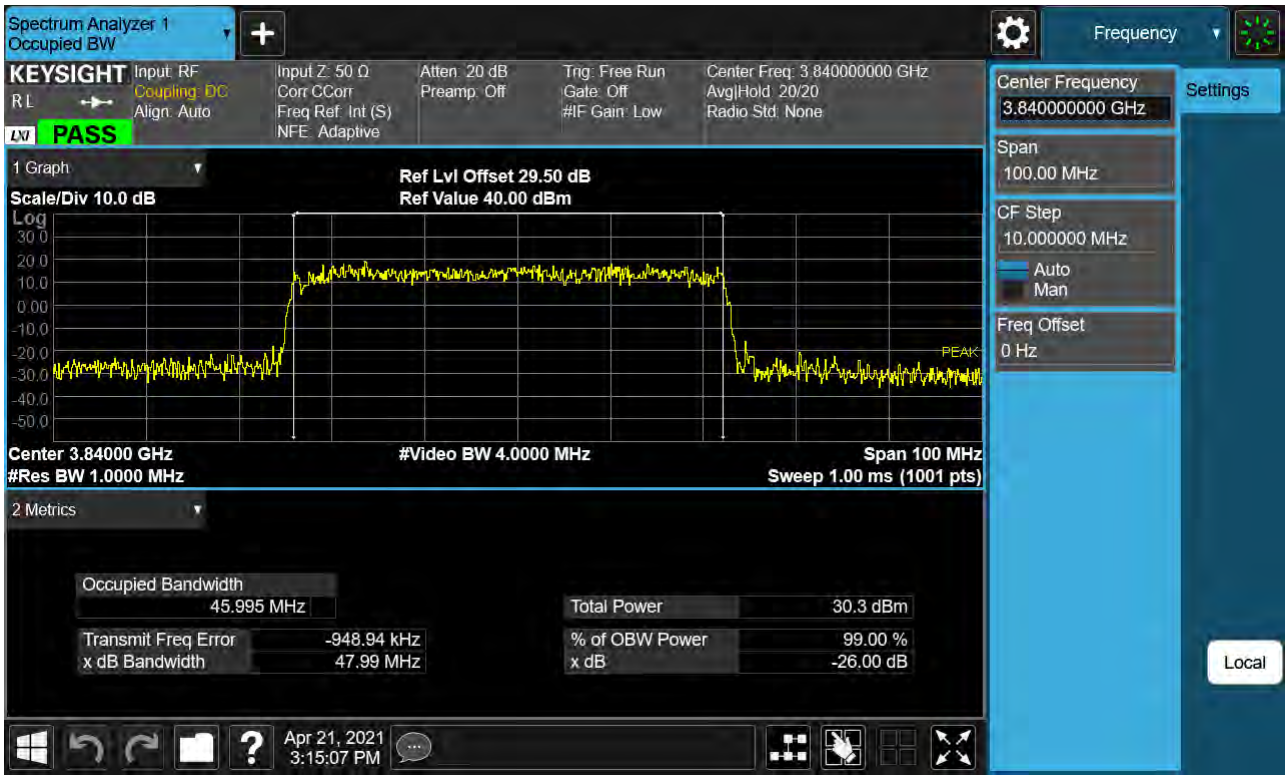
Sub6 n77. Occupied Bandwidth Plot (50M BW Ch.656000 BPSK)



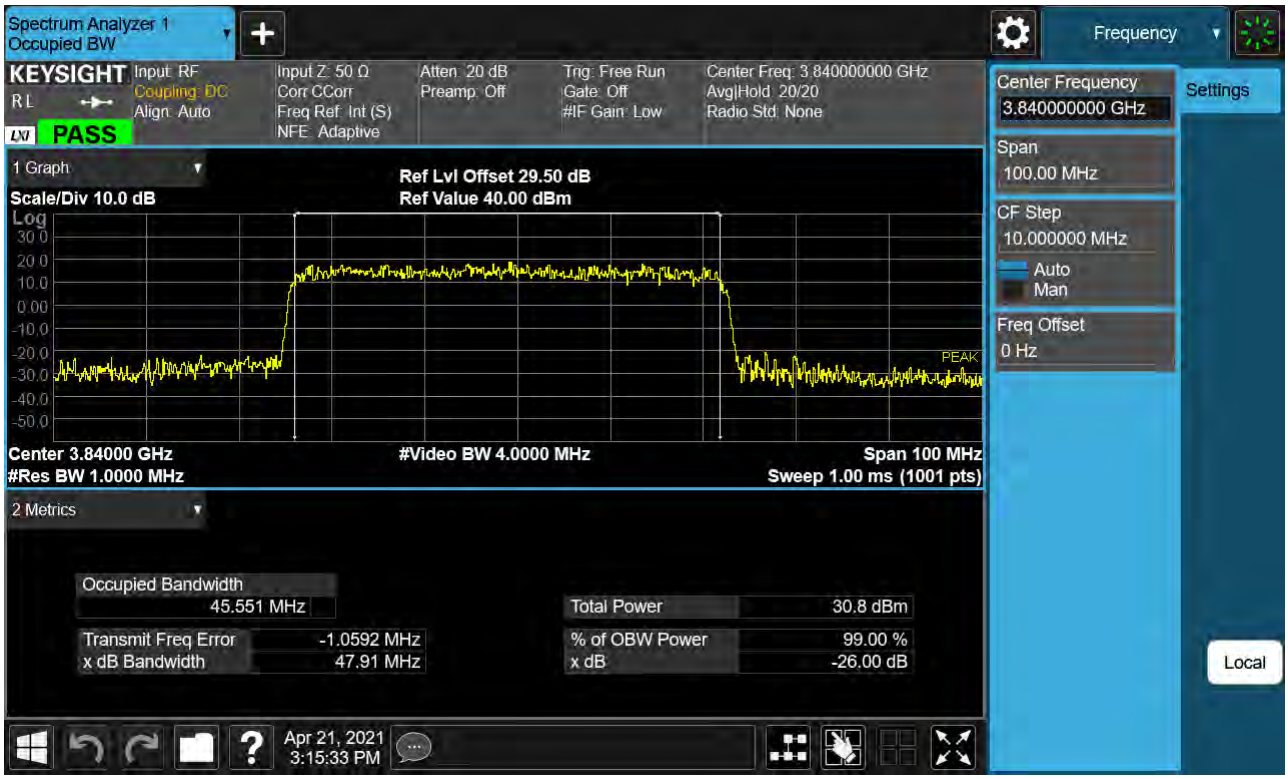
Sub6 n77. Occupied Bandwidth Plot (50M BW Ch.656000 QPSK)



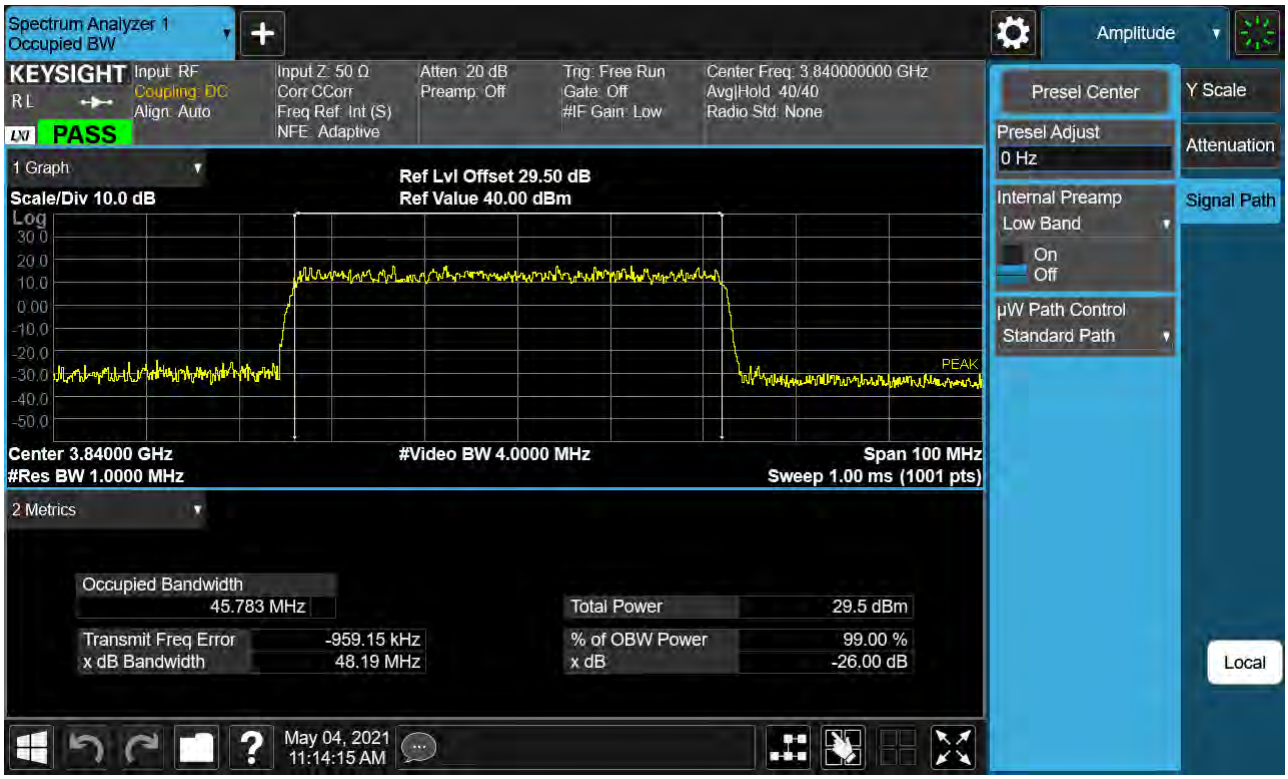
Sub6 n77. Occupied Bandwidth Plot (50M BW Ch.656000 16QAM)



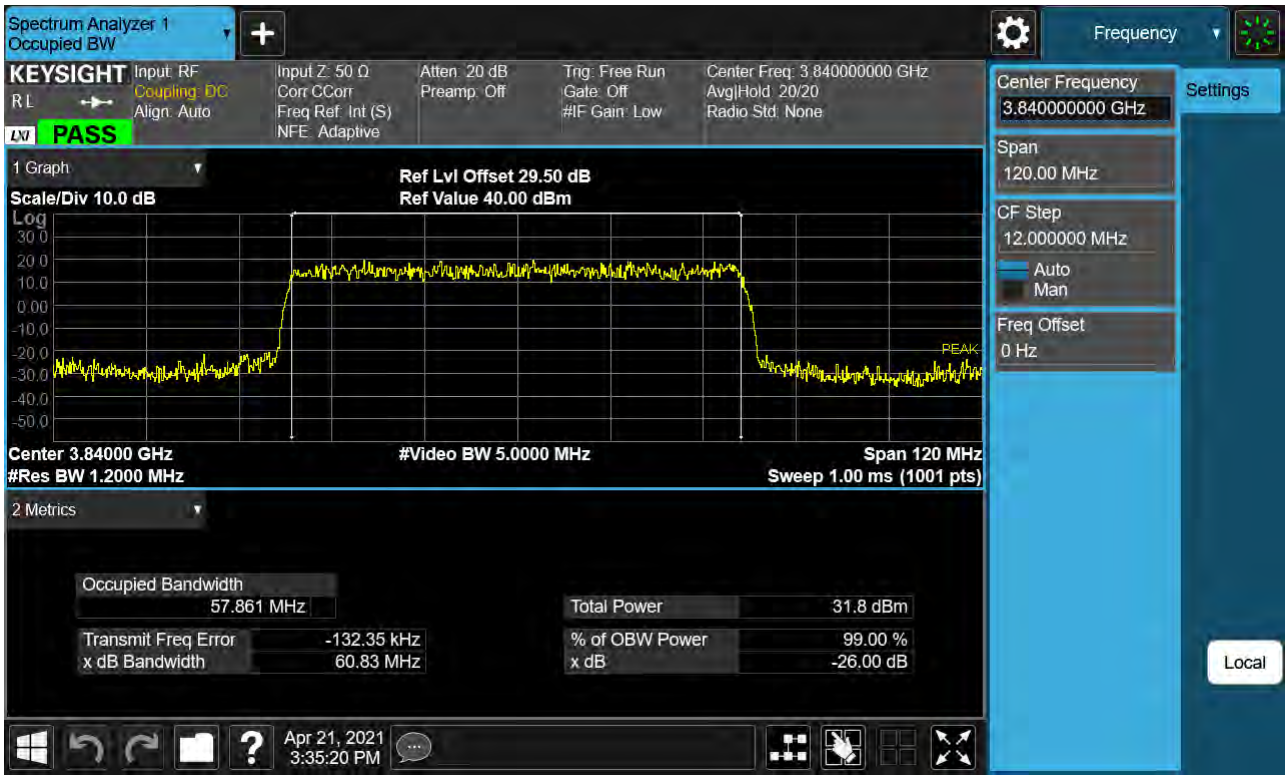
Sub6 n77. Occupied Bandwidth Plot (50M BW Ch.656000 64QAM)



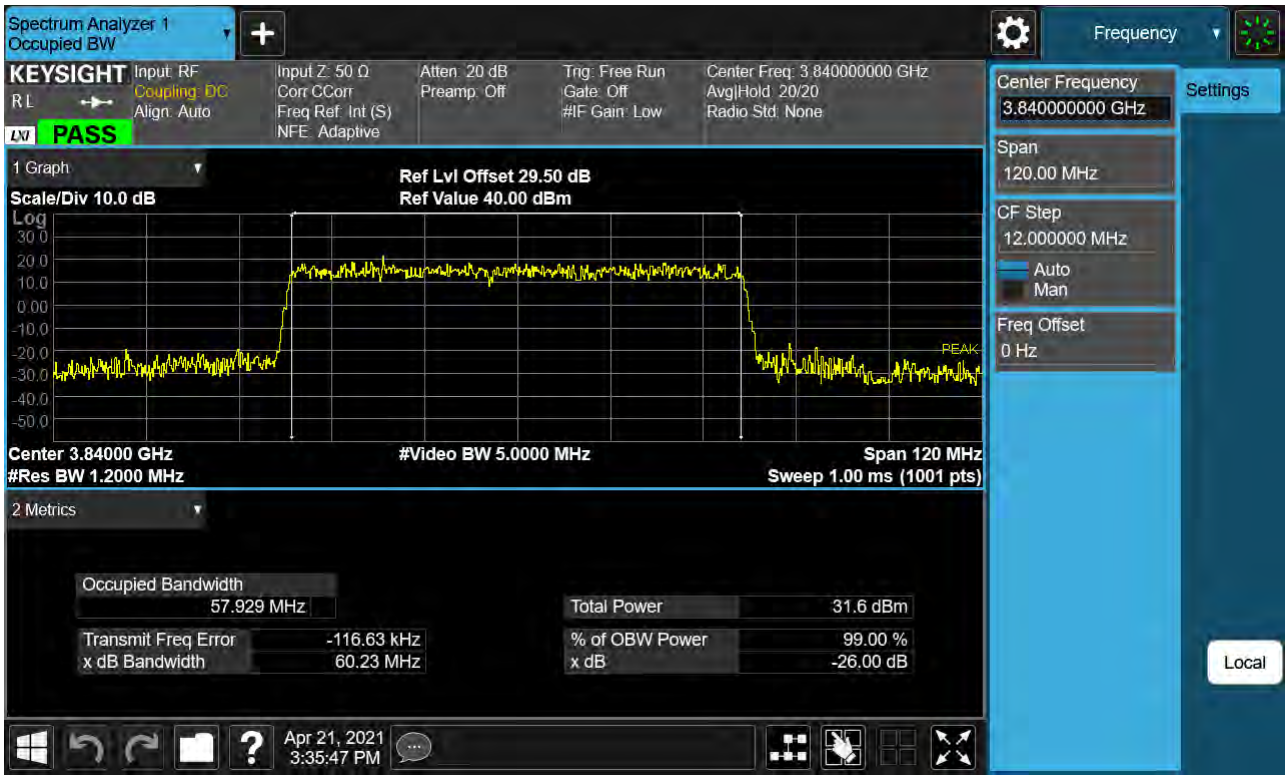
Sub6 n77. Occupied Bandwidth Plot (50M BW Ch.656000 256QAM)



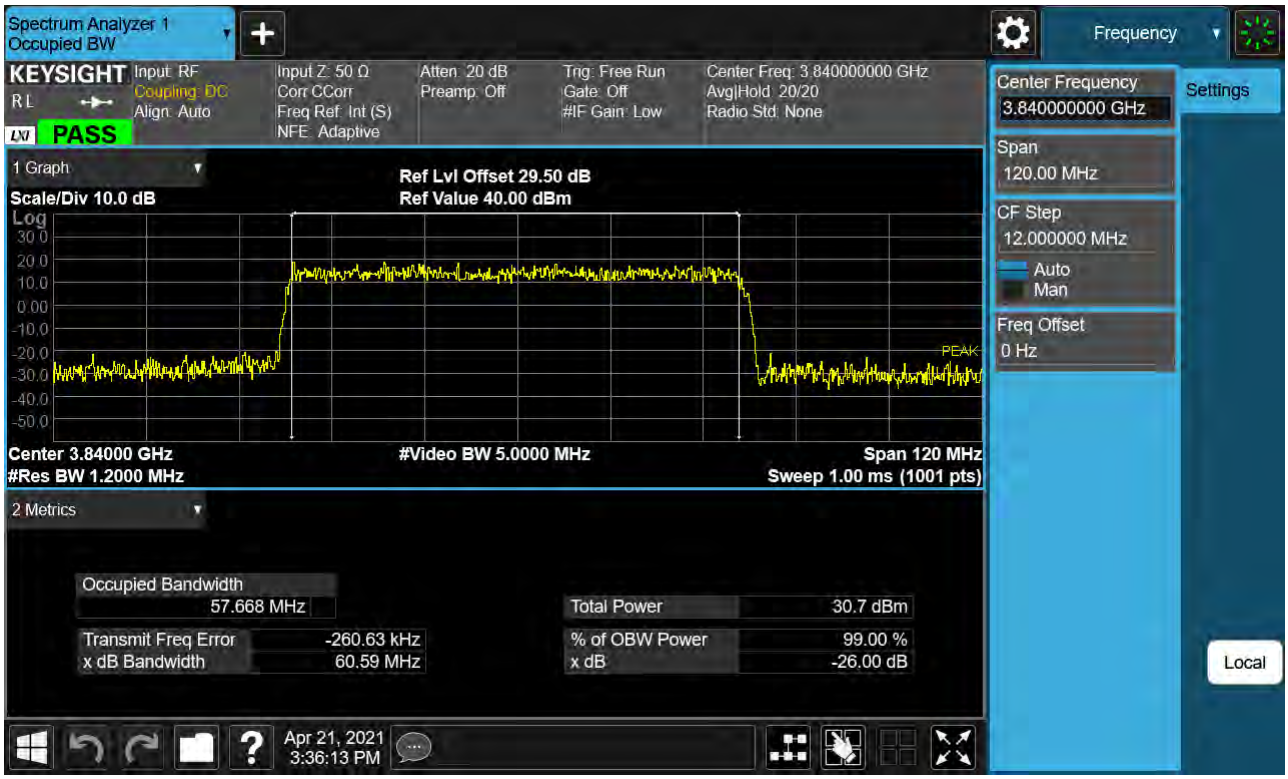
Sub6 n77. Occupied Bandwidth Plot (60M BW Ch.656000 BPSK)



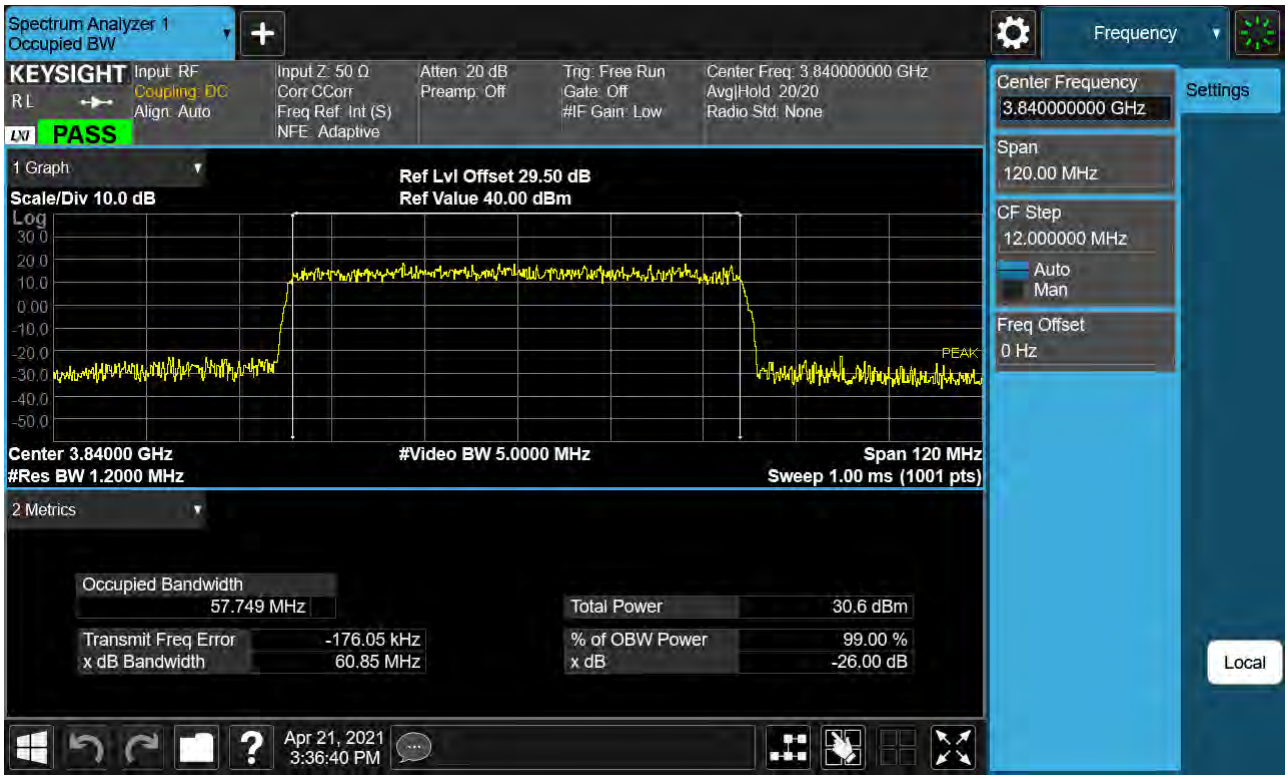
Sub6 n77. Occupied Bandwidth Plot (60M BW Ch.656000 QPSK)



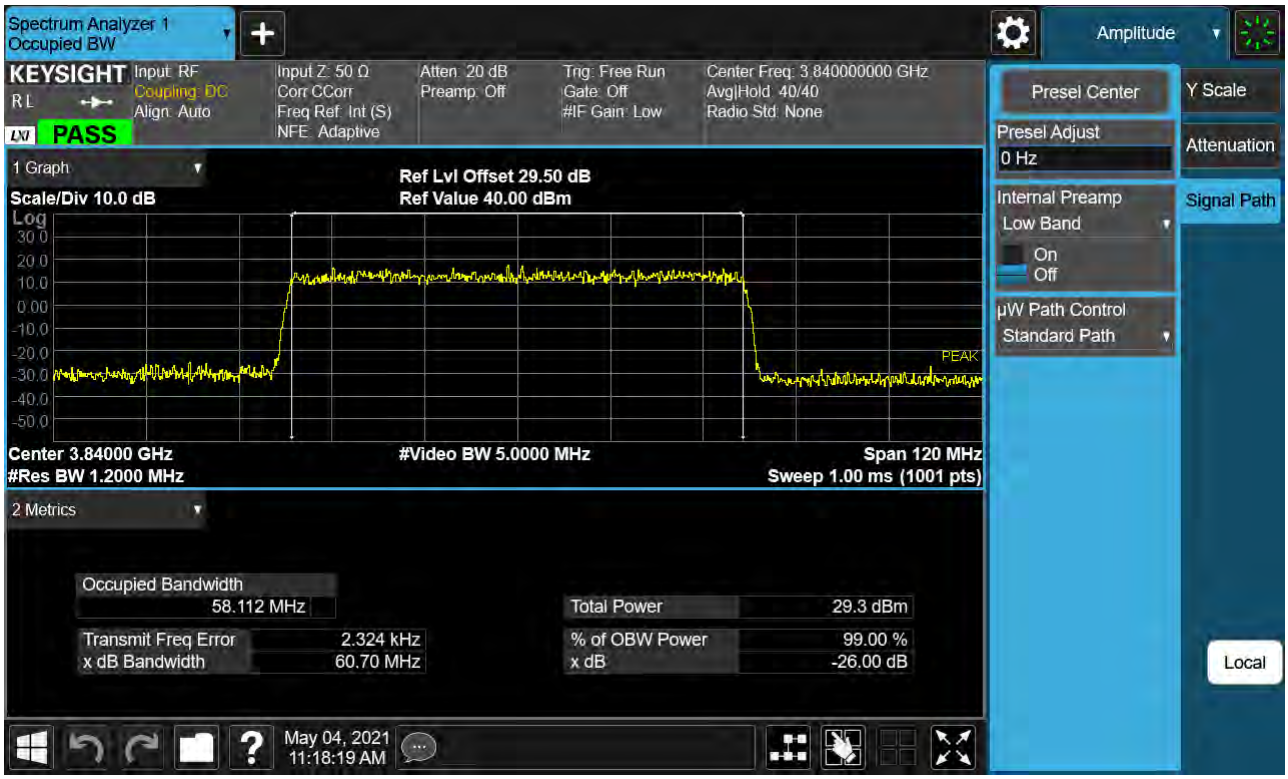
Sub6 n77. Occupied Bandwidth Plot (60M BW Ch.656000 16QAM)



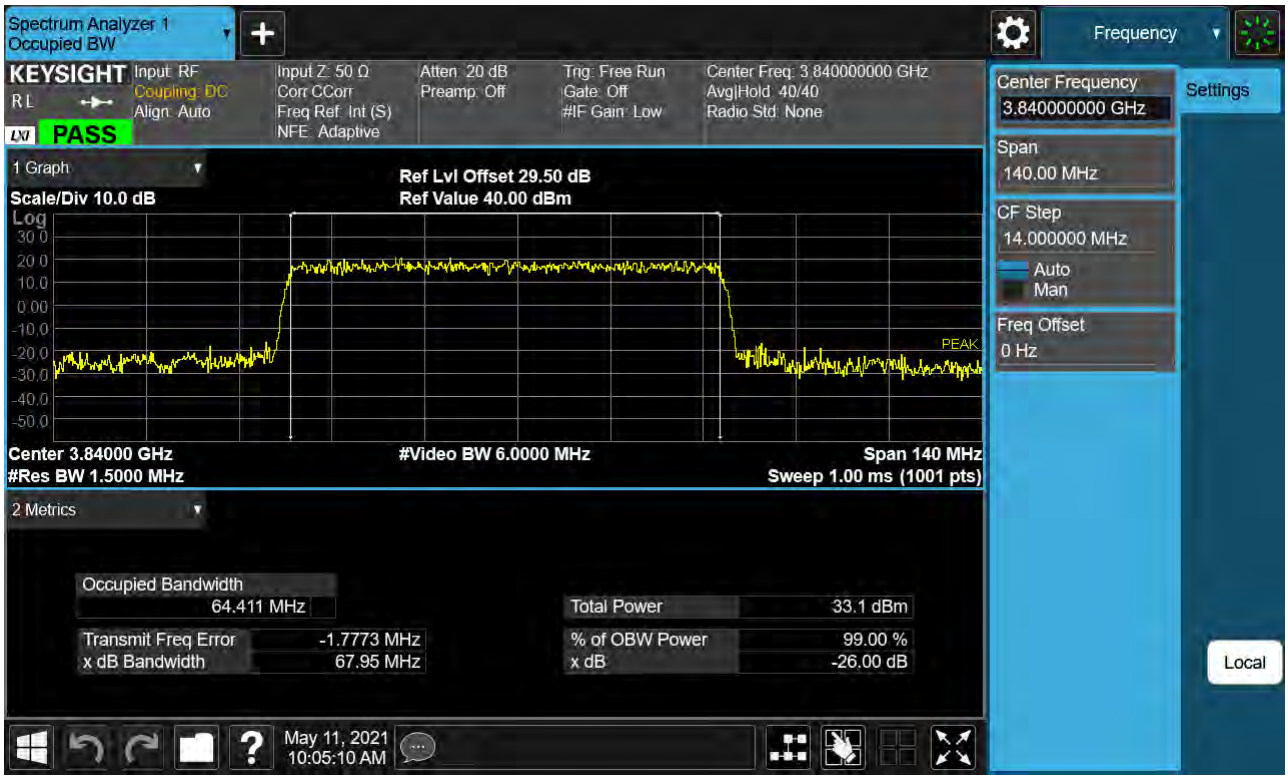
Sub6 n77. Occupied Bandwidth Plot (60M BW Ch.656000 64QAM)



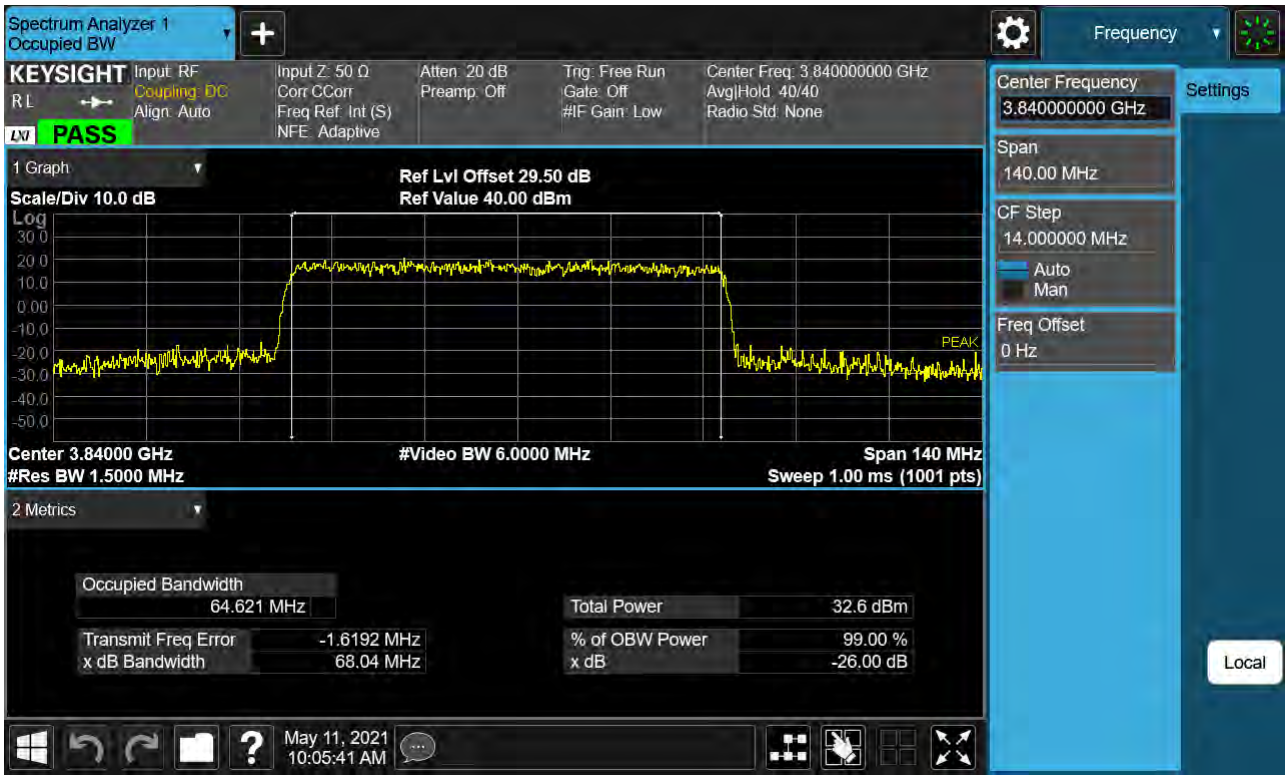
Sub6 n77. Occupied Bandwidth Plot (60M BW Ch.656000 256QAM)



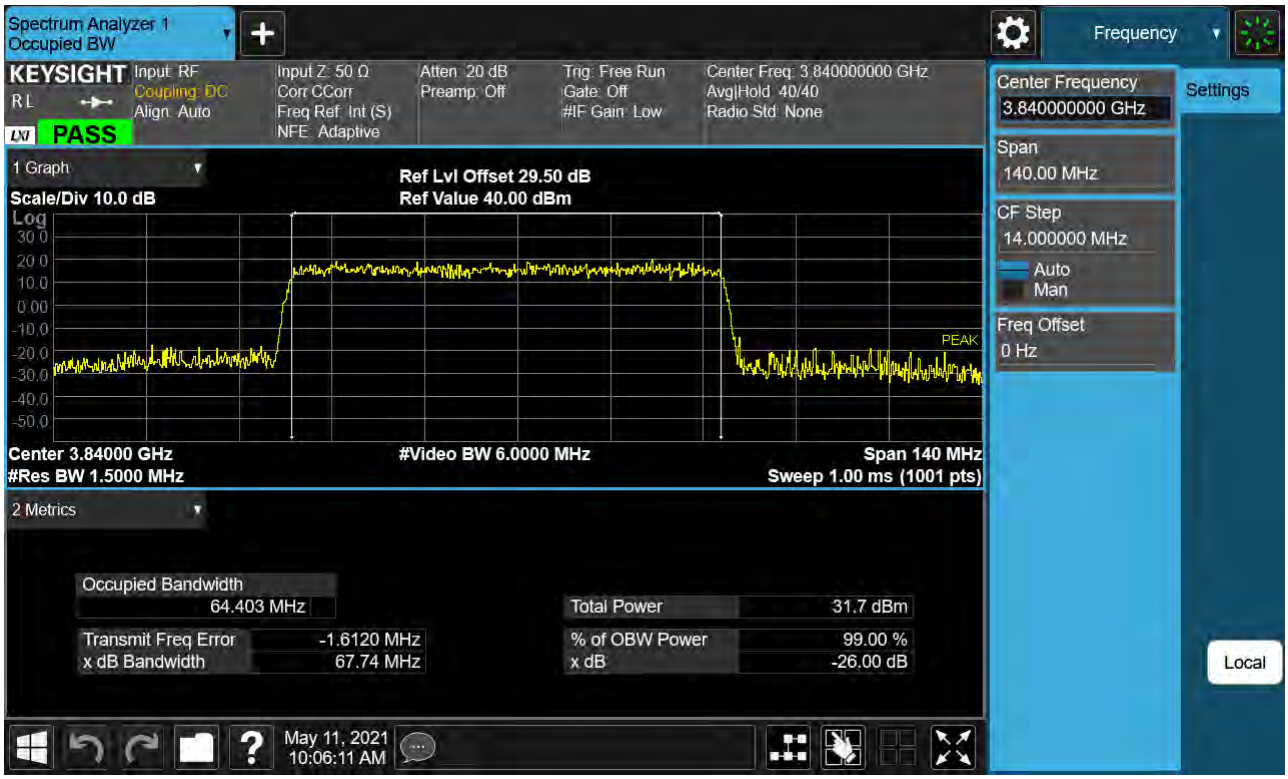
Sub6 n77. Occupied Bandwidth Plot (70M BW Ch.656000 BPSK)



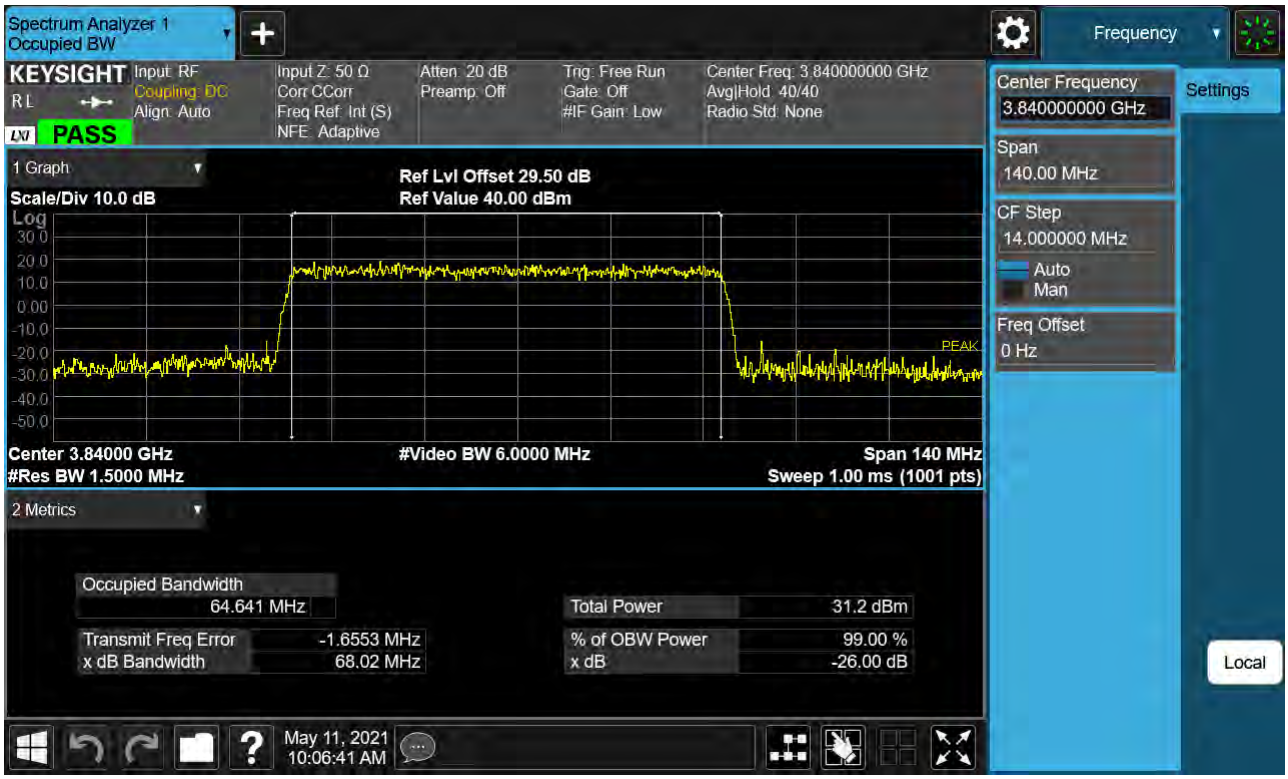
Sub6 n77. Occupied Bandwidth Plot (70M BW Ch.656000 QPSK)



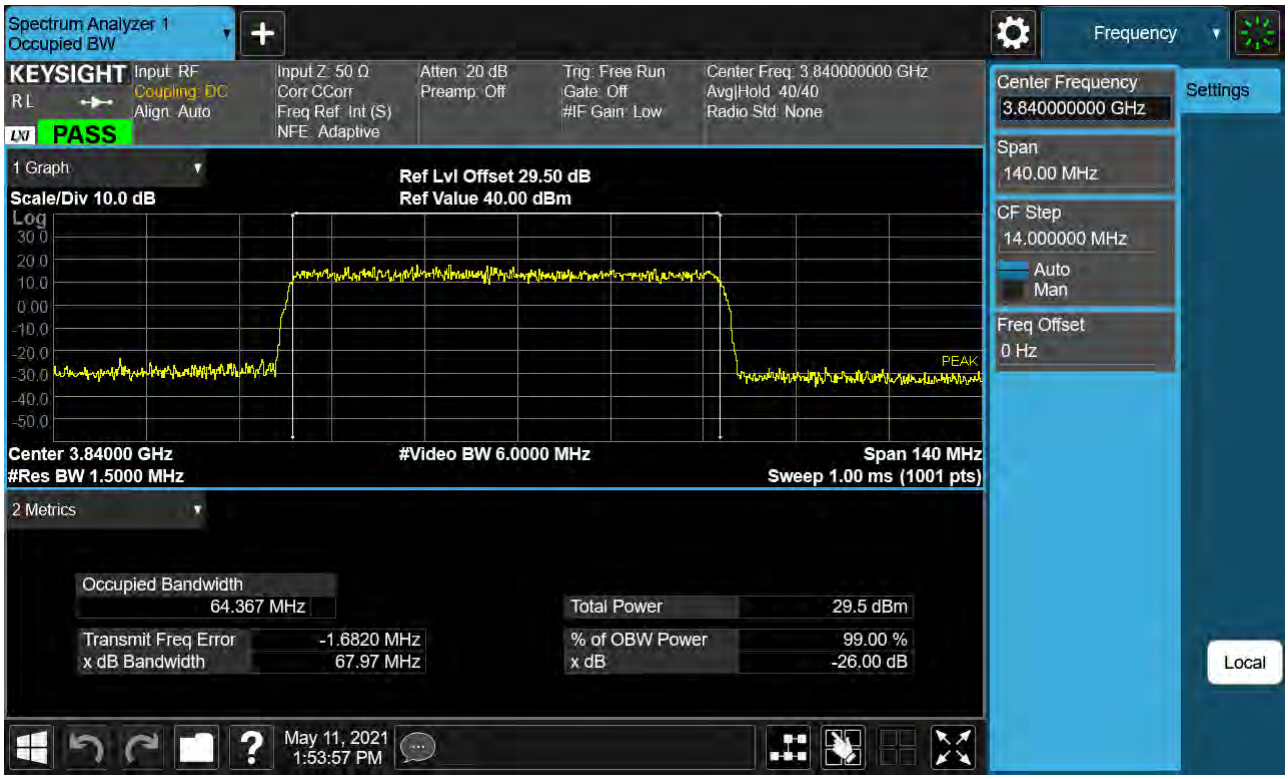
Sub6 n77. Occupied Bandwidth Plot (70M BW Ch.656000 16QAM)



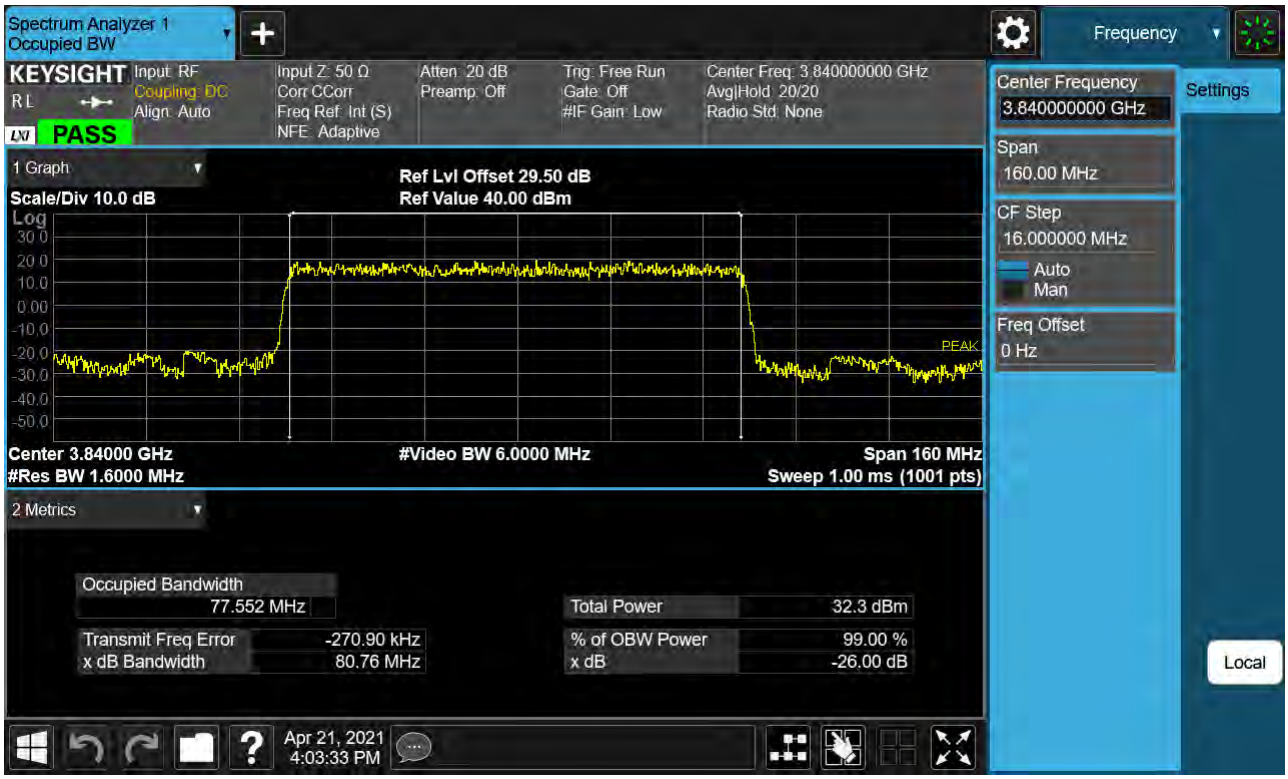
Sub6 n77. Occupied Bandwidth Plot (70M BW Ch.656000 64QAM)



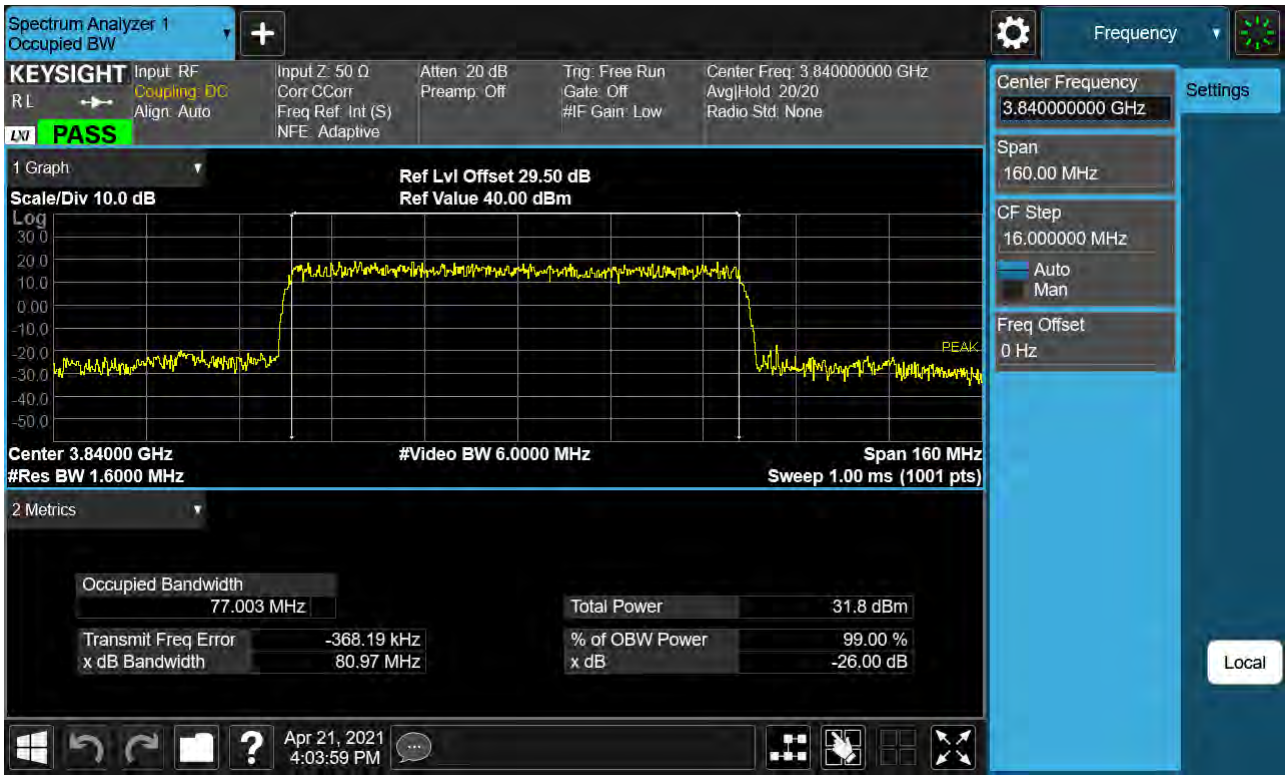
Sub6 n77. Occupied Bandwidth Plot (70M BW Ch.656000 256QAM)



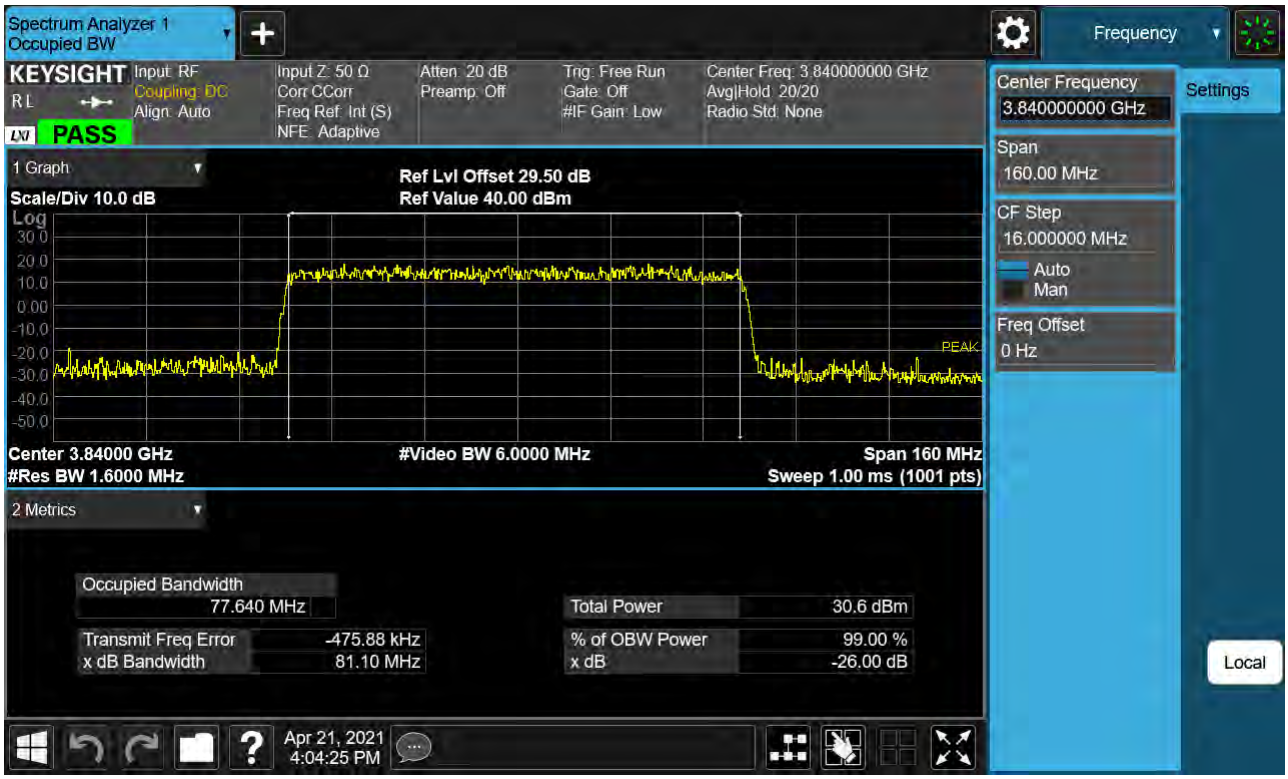
Sub6 n77. Occupied Bandwidth Plot (80M BW Ch.656000 BPSK)



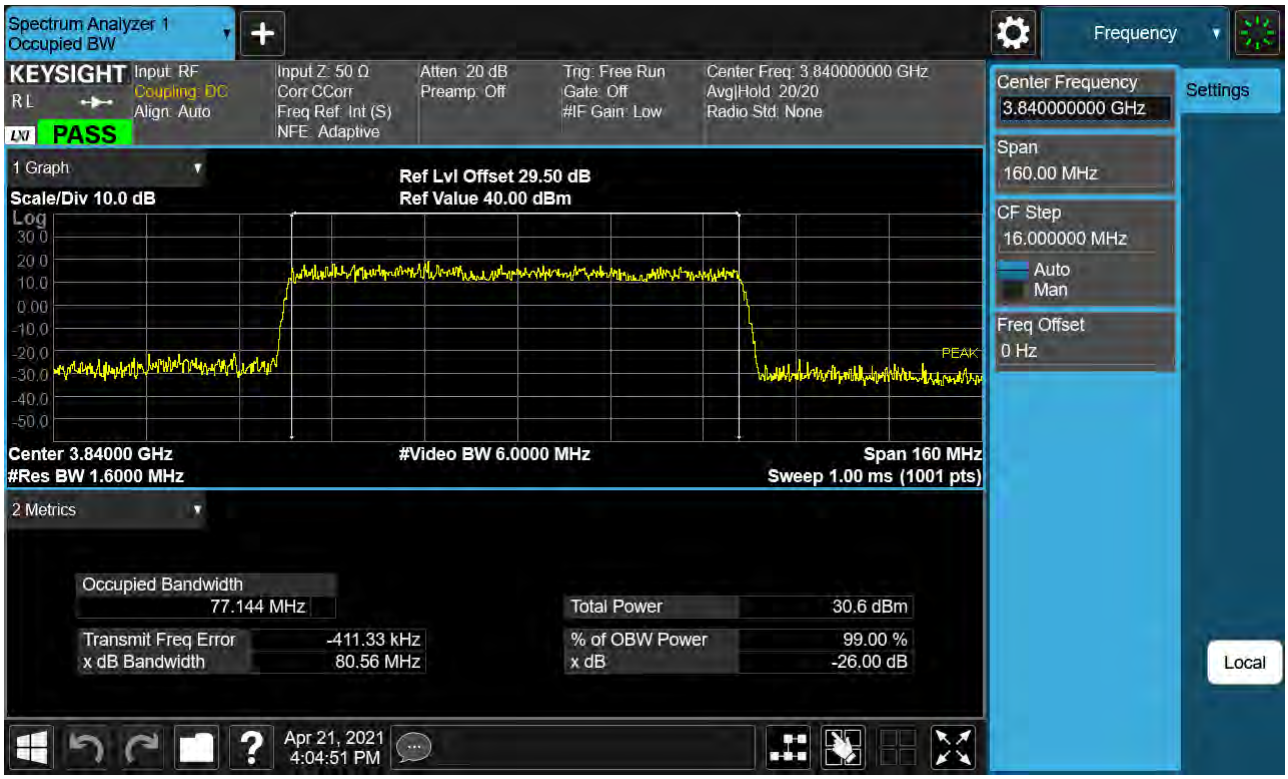
Sub6 n77. Occupied Bandwidth Plot (80M BW Ch.656000 QPSK)



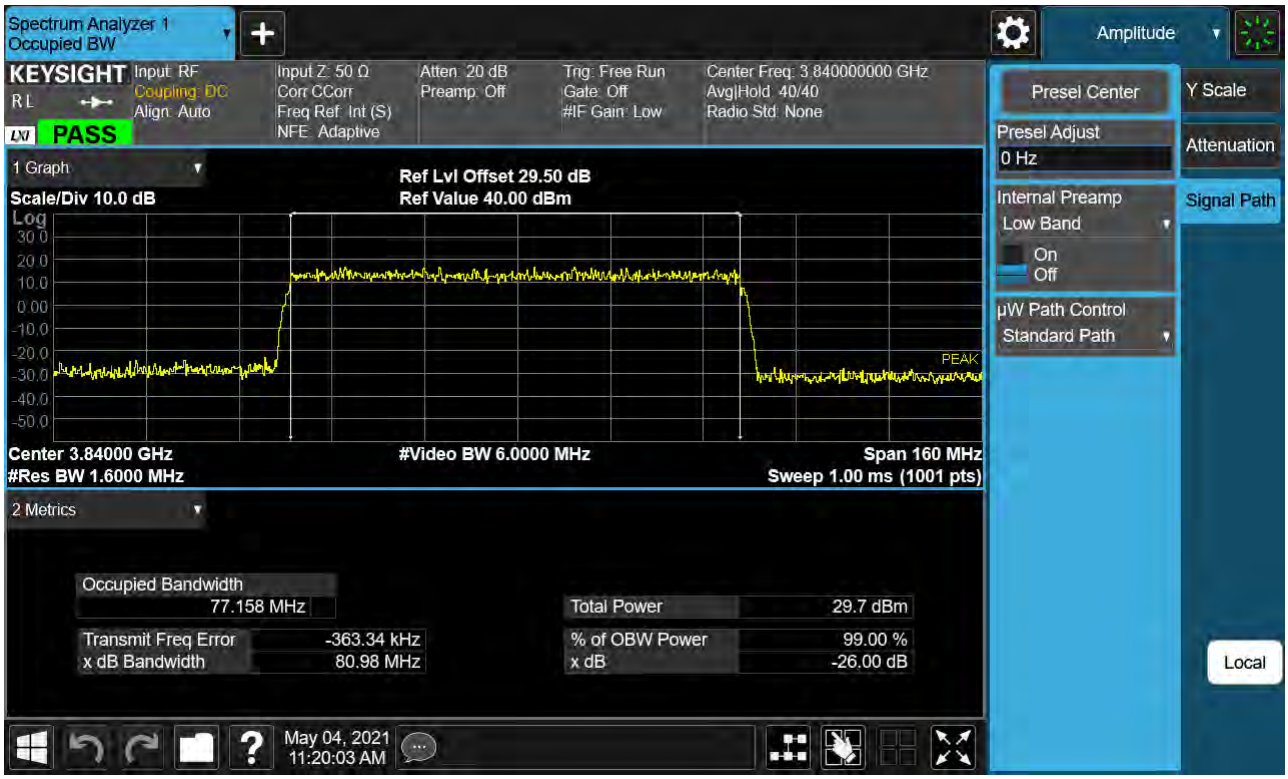
Sub6 n77. Occupied Bandwidth Plot (80M BW Ch.656000 16QAM)



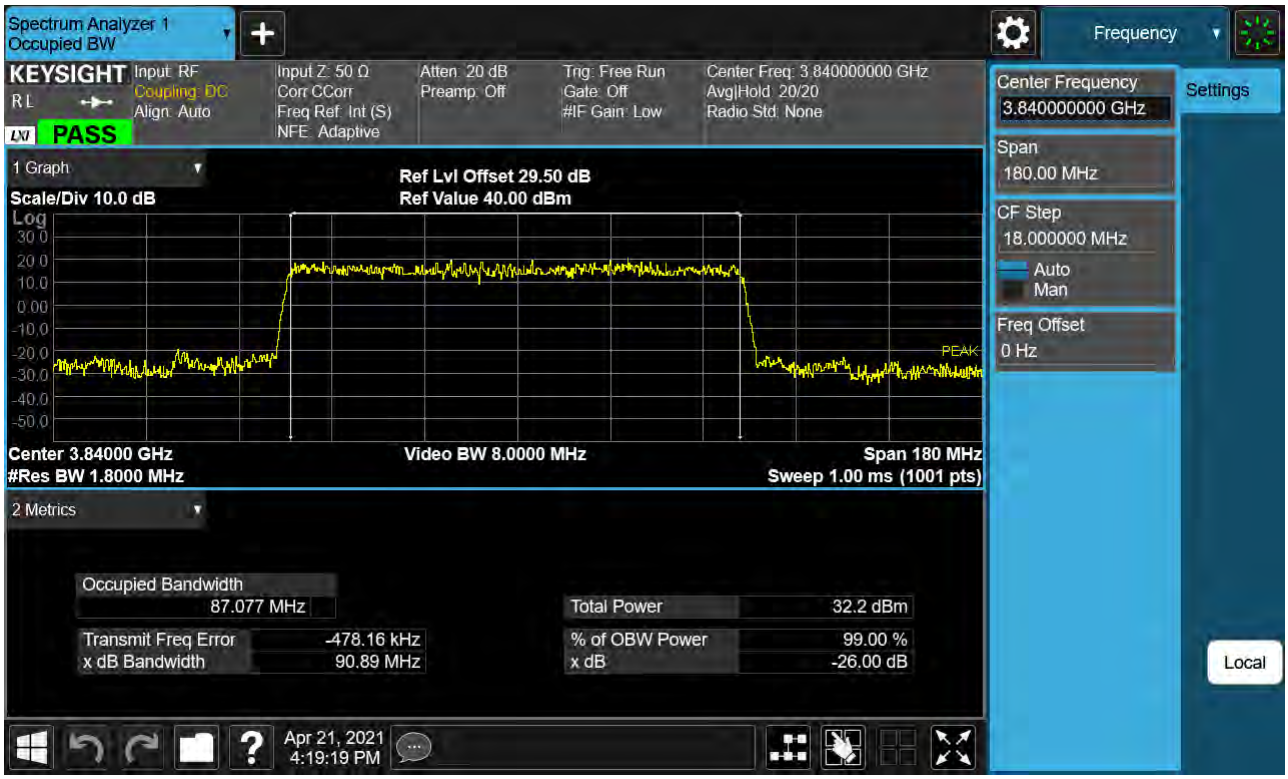
Sub6 n77. Occupied Bandwidth Plot (80M BW Ch.656000 64QAM)



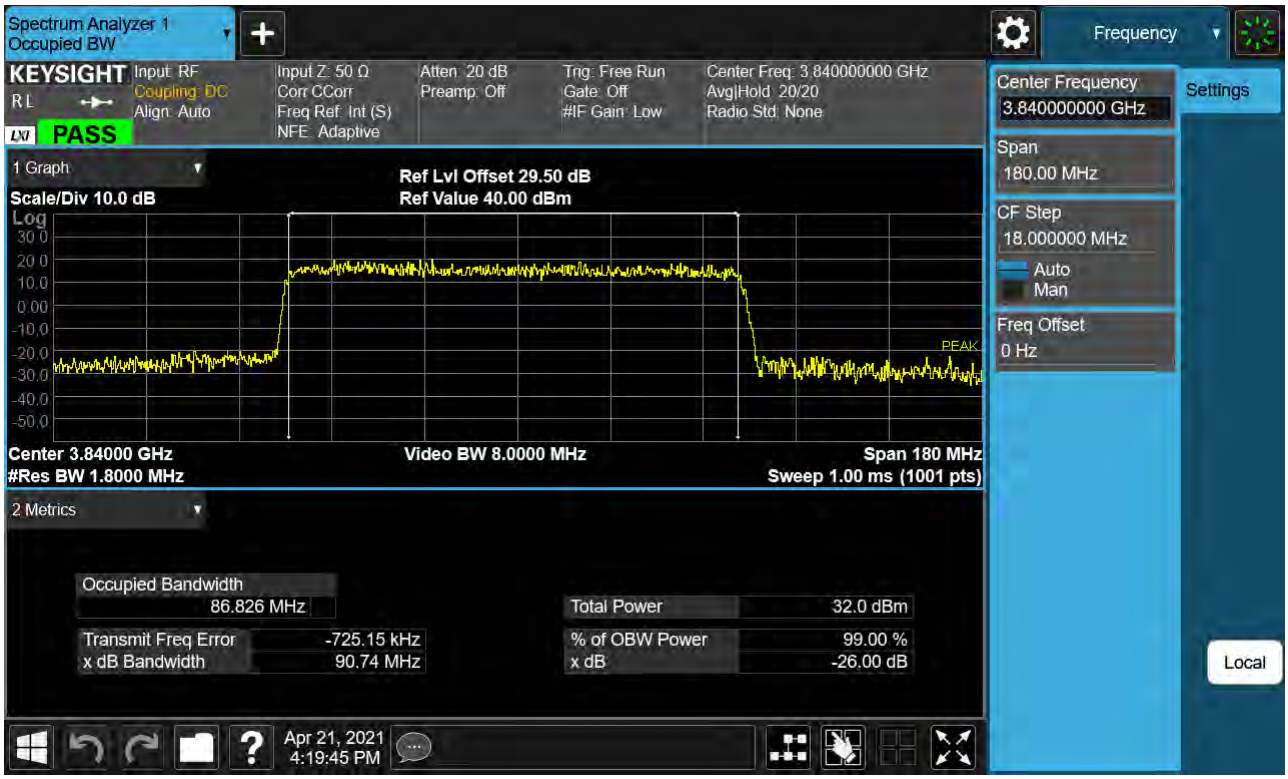
Sub6 n77. Occupied Bandwidth Plot (80M BW Ch.656000 256QAM)



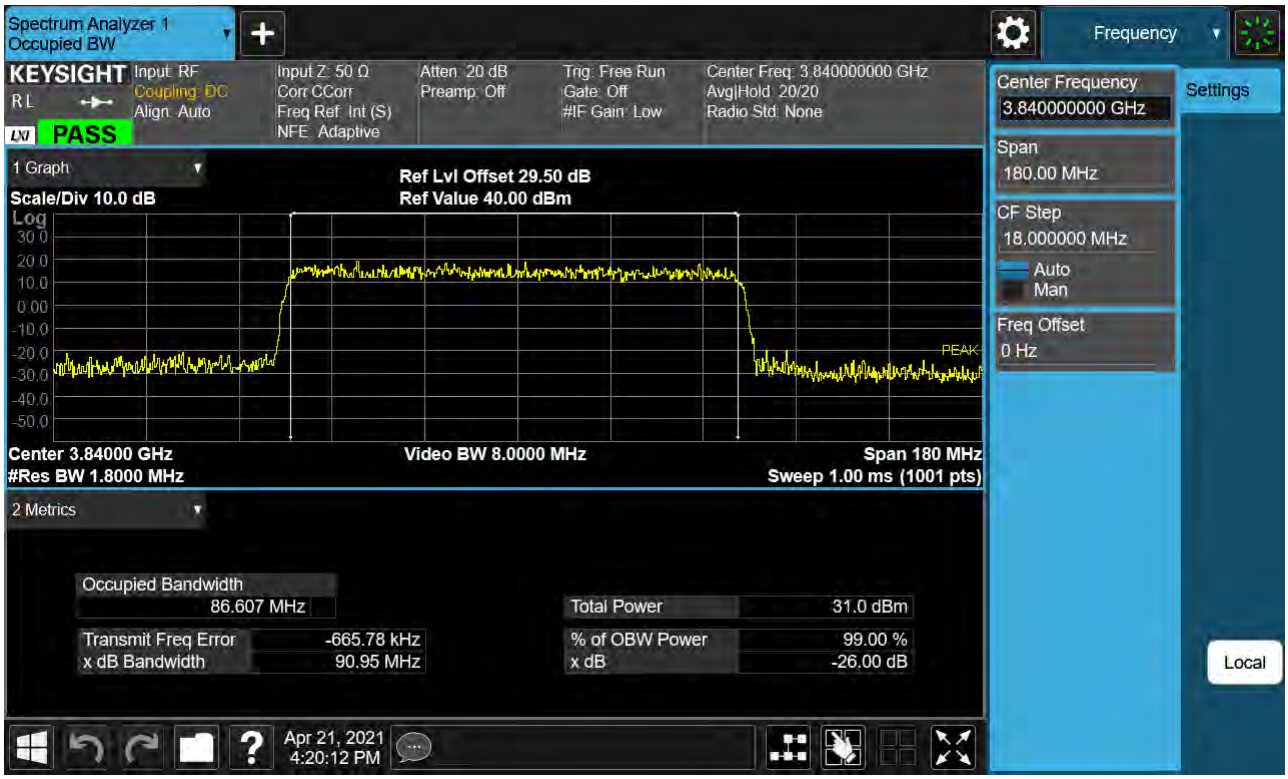
Sub6 n77. Occupied Bandwidth Plot (90M BW Ch.656000 BPSK)



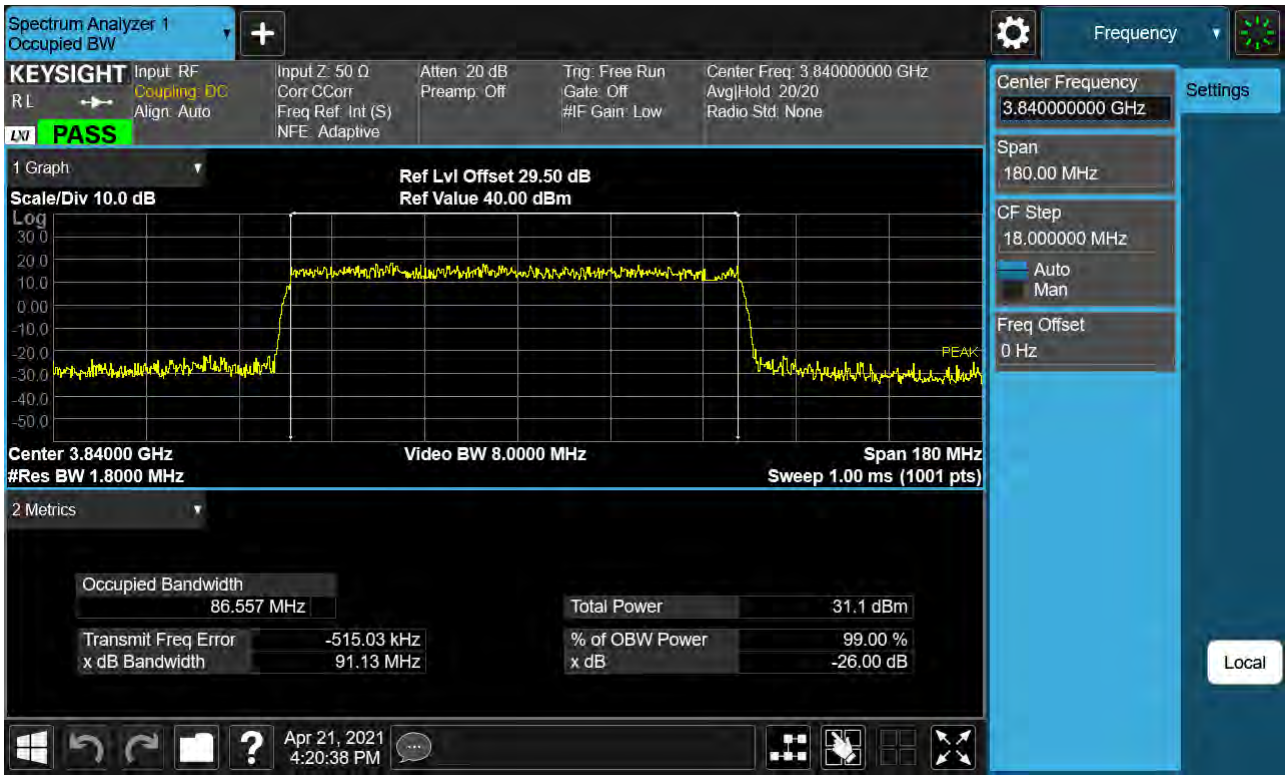
Sub6 n77. Occupied Bandwidth Plot (90M BW Ch.656000 QPSK)



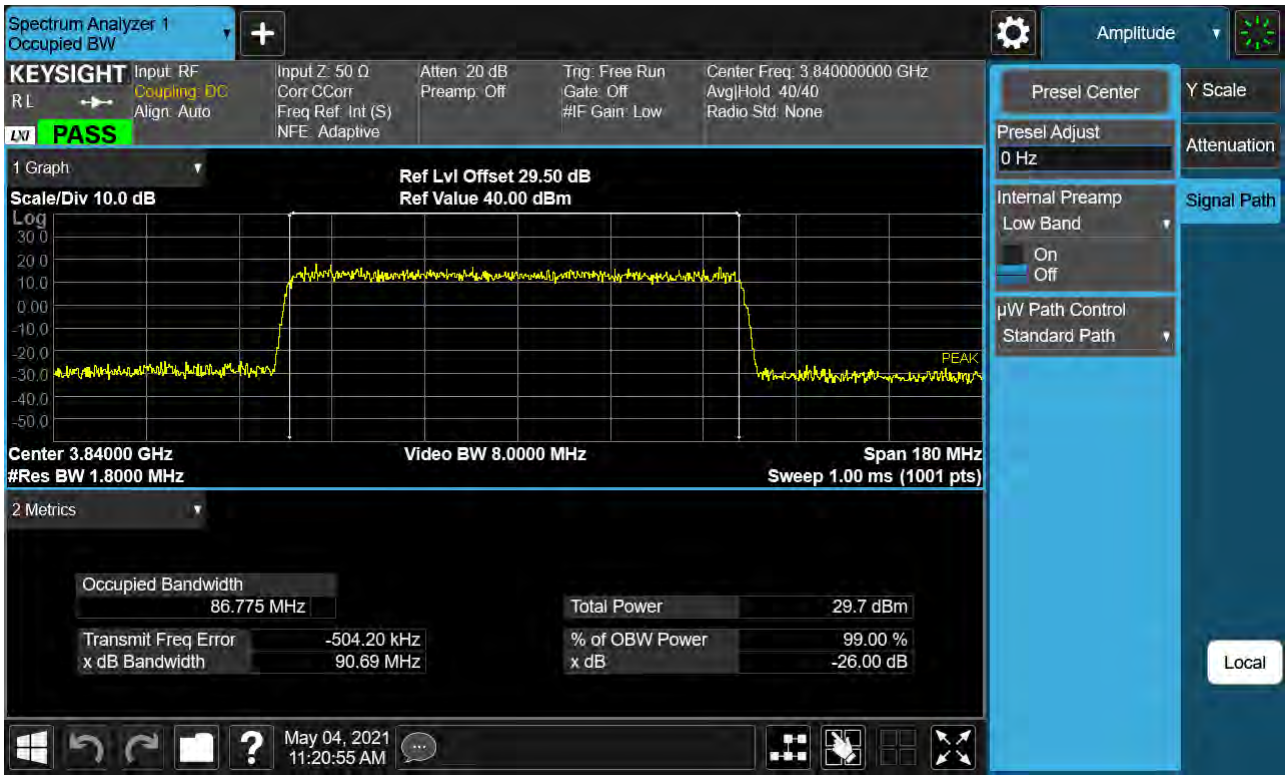
Sub6 n77. Occupied Bandwidth Plot (90M BW Ch.656000 16QAM)



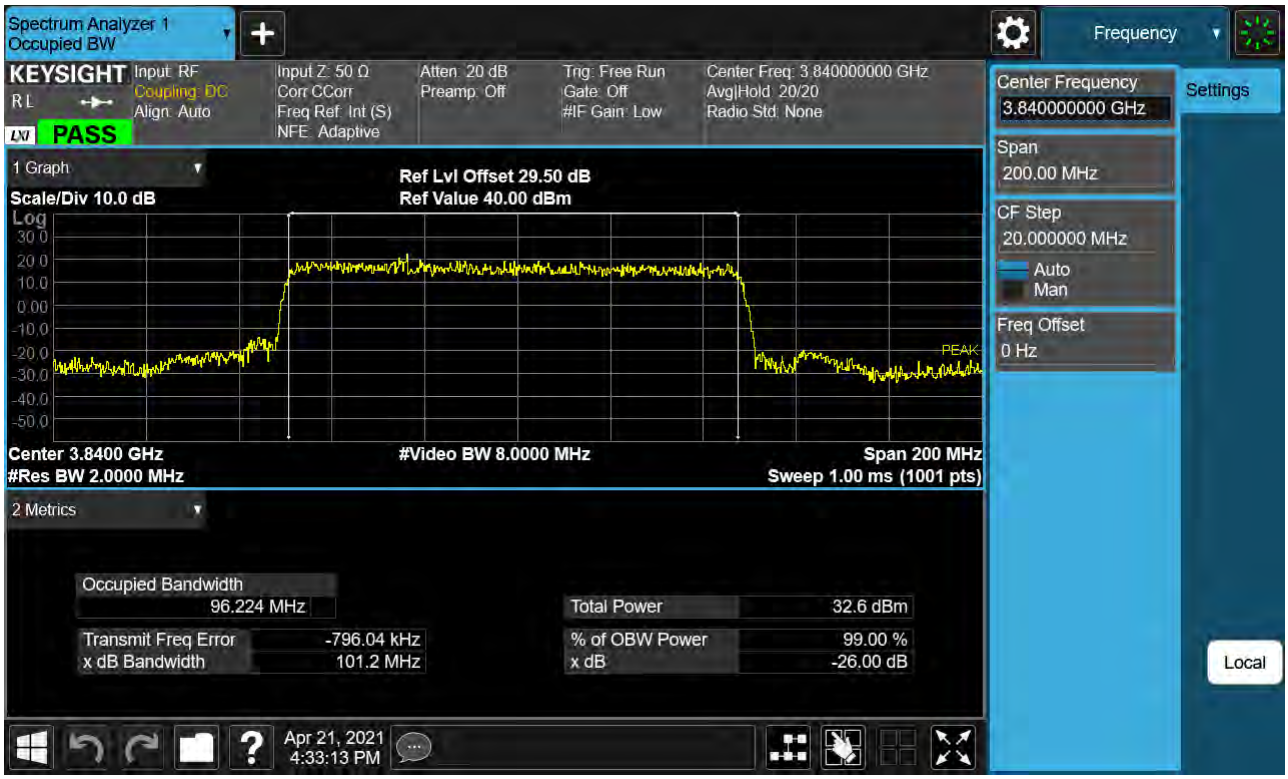
Sub6 n77. Occupied Bandwidth Plot (90M BW Ch.656000 64QAM)



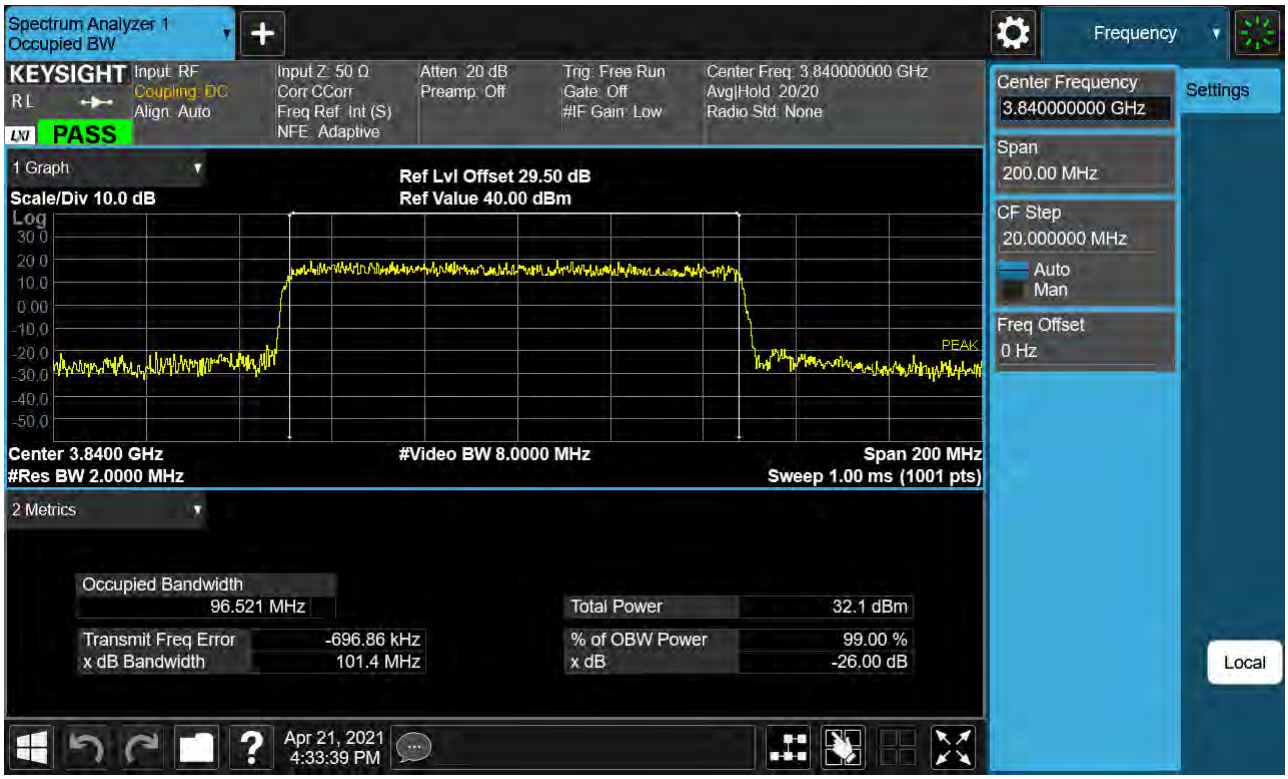
Sub6 n77. Occupied Bandwidth Plot (90M BW Ch.656000 256QAM)



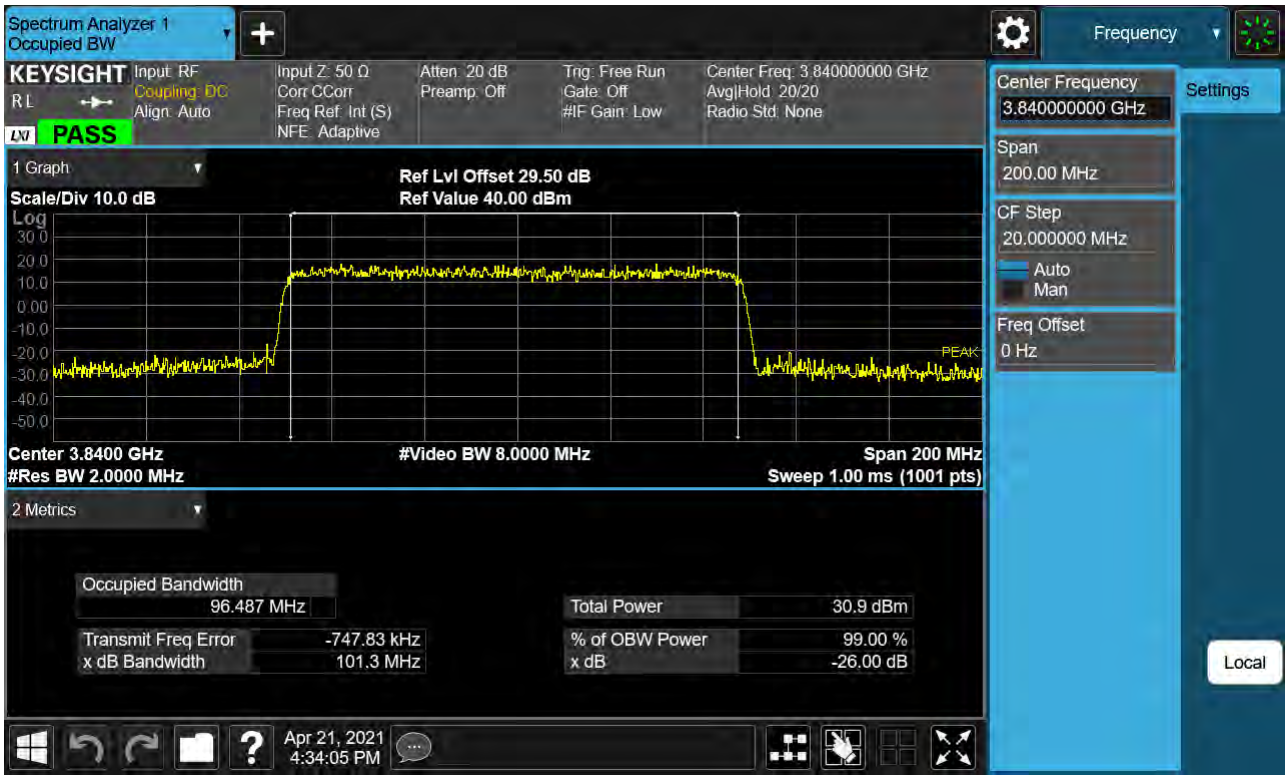
Sub6 n77. Occupied Bandwidth Plot (100M BW Ch.656000 BPSK)



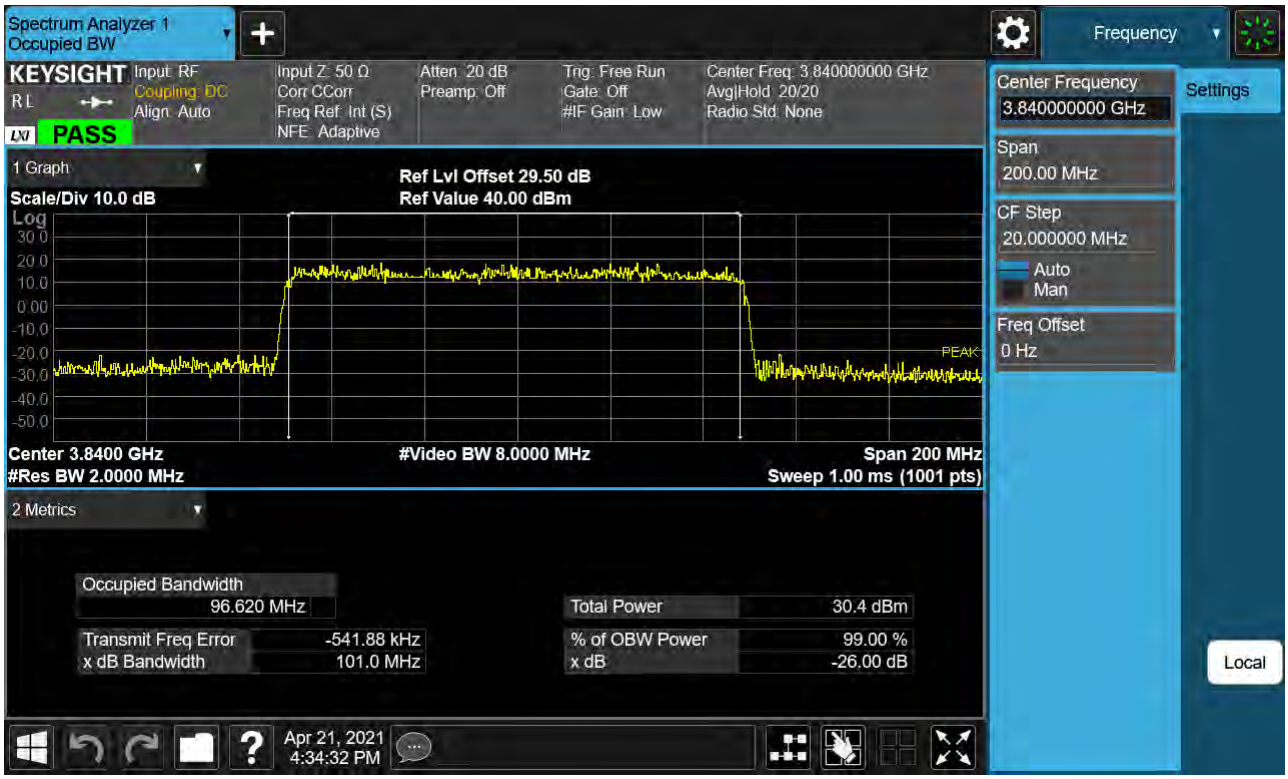
Sub6 n77. Occupied Bandwidth Plot (100M BW Ch.656000 QPSK)



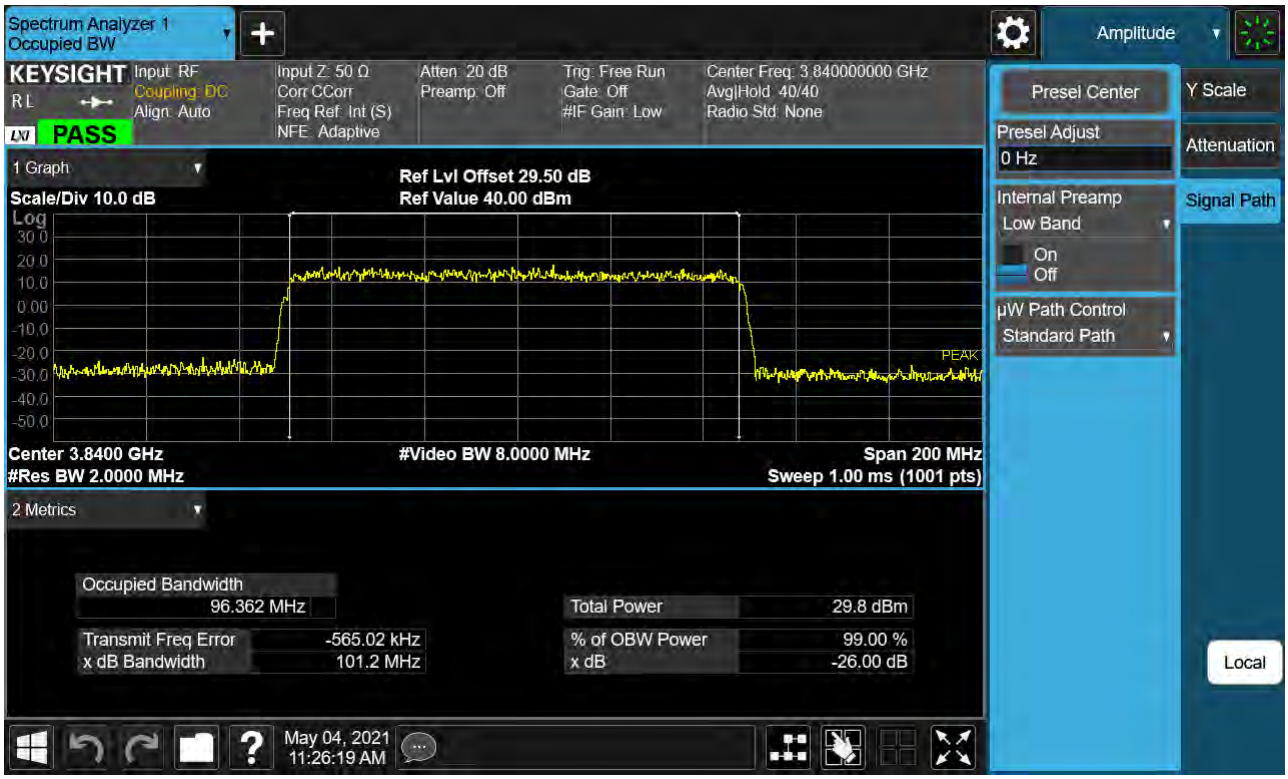
Sub6 n77. Occupied Bandwidth Plot (100M BW Ch.656000 16QAM)



Sub6 n77. Occupied Bandwidth Plot (100M BW Ch.656000 64QAM)



Sub6 n77. Occupied Bandwidth Plot (100M BW Ch.656000 256QAM)



Sub6 n77. PAR Plot (20M BW_Ch.656000_ BPSK)

Sub6 n77. PAR Plot (20M BW_Ch.656000_QPSK)

Sub6 n77. PAR Plot (20M BW_Ch.656000_16QAM)

Sub6 n77. PAR Plot (20M BW_Ch.656000_64QAM)

Sub6 n77. PAR Plot (20M BW_Ch.656000_256QAM)

Sub6 n77. PAR Plot (30M BW_Ch.656000_ BPSK)

Sub6 n77. PAR Plot (30M BW_Ch.656000_QPSK)

Sub6 n77. PAR Plot (30M BW_Ch.656000_16QAM)

Sub6 n77. PAR Plot (30M BW_Ch.656000_64QAM)

Sub6 n77. PAR Plot (30M BW_Ch.656000_256QAM)

Sub6 n77. PAR Plot (40M BW_Ch.656000_ BPSK)

Sub6 n77. PAR Plot (40M BW_Ch.656000_QPSK)

Sub6 n77. PAR Plot (40M BW_Ch.656000_16QAM)

Sub6 n77. PAR Plot (40M BW_Ch.656000_64QAM)

Sub6 n77. PAR Plot (40M BW_Ch.656000_256QAM)

Sub6 n77. PAR Plot (50M BW_Ch.656000_ BPSK)

Sub6 n77. PAR Plot (50M BW_Ch.656000_QPSK)

Sub6 n77. PAR Plot (50M BW_Ch.656000_16QAM)

Sub6 n77. PAR Plot (50M BW_Ch.656000_64QAM)

Sub6 n77. PAR Plot (50M BW_Ch.656000_256QAM)

Sub6 n77. PAR Plot (60M BW_Ch.656000_ BPSK)

Sub6 n77. PAR Plot (60M BW_Ch.656000_QPSK)

Sub6 n77. PAR Plot (60M BW_Ch.656000_16QAM)

Sub6 n77. PAR Plot (60M BW_Ch.656000_64QAM)

Sub6 n77. PAR Plot (60M BW_Ch.656000_256QAM)

Sub6 n77. PAR Plot (70M BW_Ch.656000_ BPSK)

Sub6 n77. PAR Plot (70M BW_Ch.656000_QPSK)

Sub6 n77. PAR Plot (70M BW_Ch.656000_16QAM)

Sub6 n77. PAR Plot (70M BW_Ch.656000_64QAM)

Sub6 n77. PAR Plot (70M BW_Ch.656000_256QAM)

Sub6 n77. PAR Plot (80M BW_Ch.656000_ BPSK)

Sub6 n77. PAR Plot (80M BW_Ch.656000_QPSK)

Sub6 n77. PAR Plot (80M BW_Ch.656000_16QAM)

Sub6 n77. PAR Plot (80M BW_Ch.656000_64QAM)

Sub6 n77. PAR Plot (80M BW_Ch.656000_256QAM)

Sub6 n77. PAR Plot (90M BW_Ch.656000_ BPSK)

Sub6 n77. PAR Plot (90M BW_Ch.656000_QPSK)

Sub6 n77. PAR Plot (90M BW_Ch.656000_16QAM)

Sub6 n77. PAR Plot (90M BW_Ch.656000_64QAM)

Sub6 n77. PAR Plot (90M BW_Ch.656000_256QAM)

Sub6 n77. PAR Plot (100M BW_Ch.656000_ BPSK)

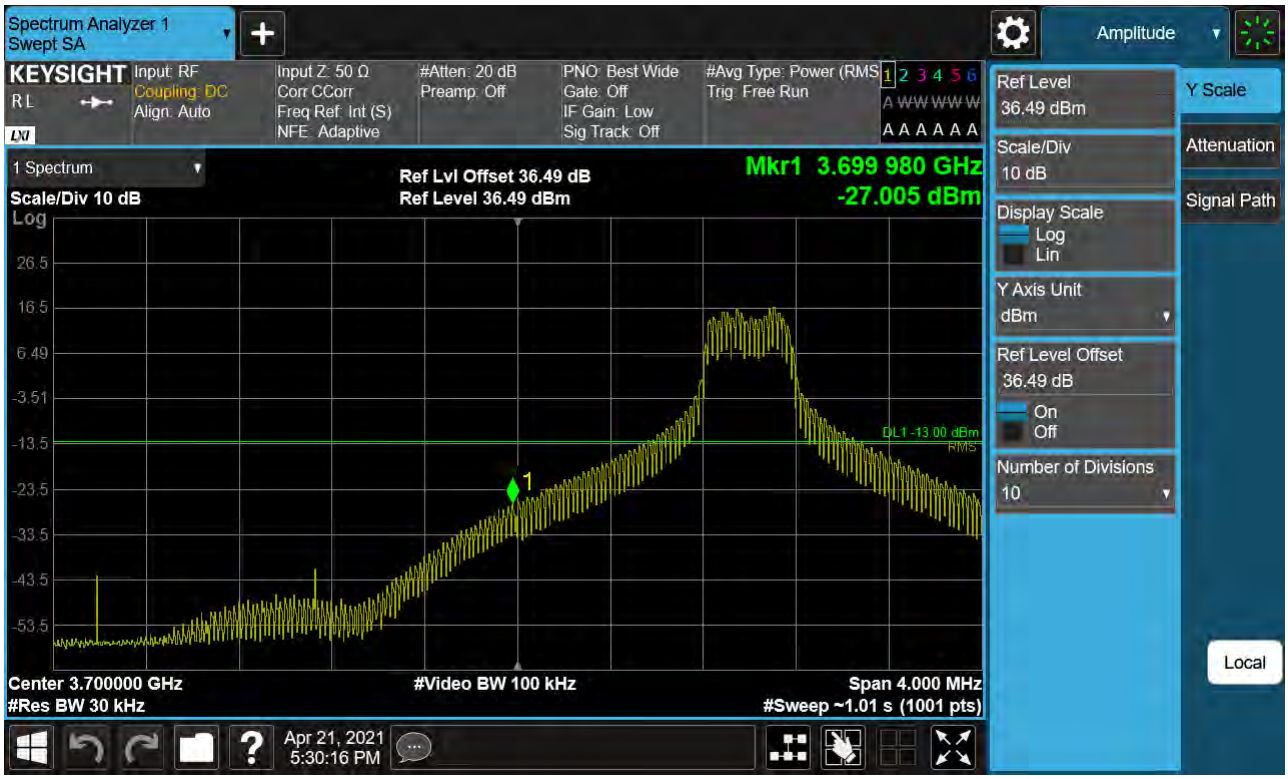
Sub6 n77. PAR Plot (100M BW_Ch.656000_QPSK)

Sub6 n77. PAR Plot (100M BW_Ch.656000_16QAM)

Sub6 n77. PAR Plot (100M BW_Ch.656000_64QAM)

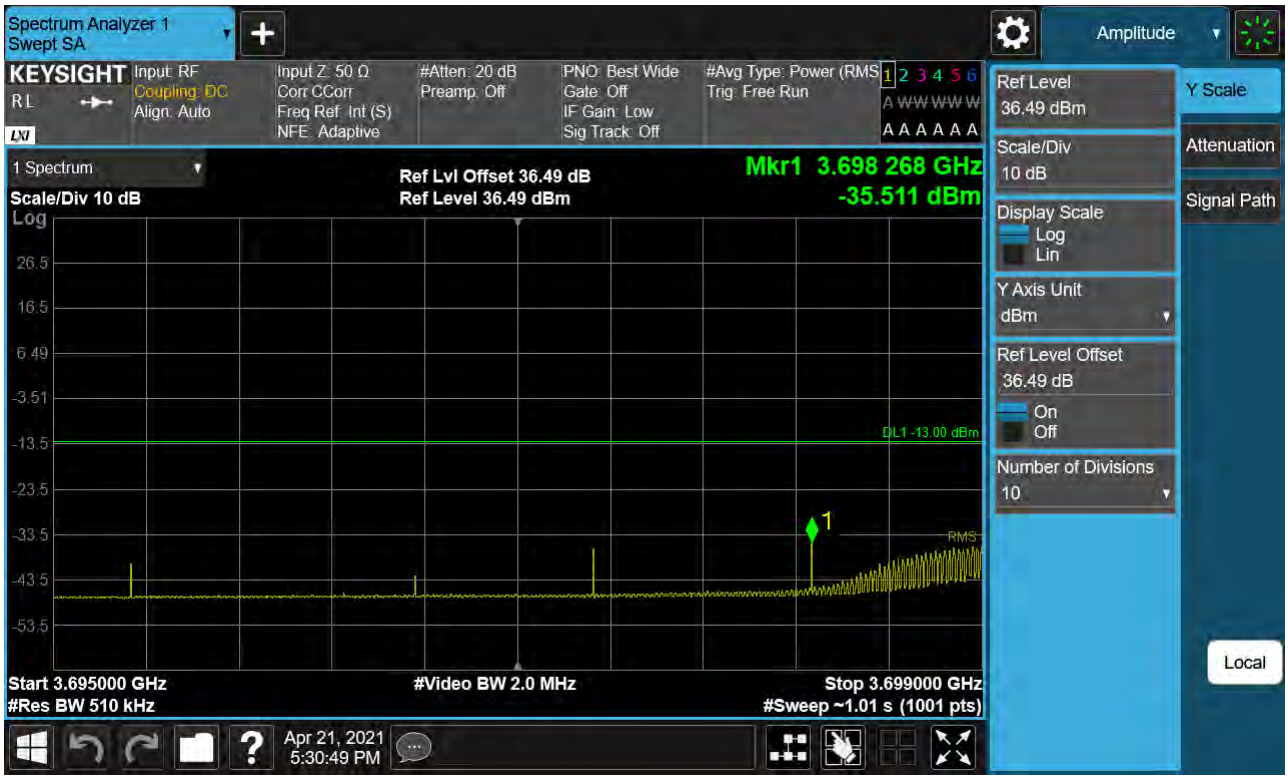
Sub6 n77. PAR Plot (100M BW_Ch.656000_256QAM)

Sub6 n77. Low Band Edge Plot (20M BW Ch.647334 BPSK 1RB)(1)



Sub6 n77. Low Band Edge Plot (20M BW Ch.647334 BPSK FullRB)(1)

Sub6 n77. Low Band Edge Plot (20M BW Ch.647334 BPSK 1RB)(2)



Sub6 n77. Low Band Edge Plot (20M BW Ch.647334 BPSK FullRB)(2)

Sub6 n77. Low Band Edge Plot (20M BW Ch.647334 BPSK 1RB)(3)

Sub6 n77. Low Band Edge Plot (20M BW Ch.647334 BPSK FullRB)(3)

Sub6 n77. High Band Edge Plot (20M BW Ch.664666 BPSK 1RB)(1)

Sub6 n77. High Band Edge Plot (20M BW Ch.664666 BPSK FullRB)(1)