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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-FC009-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 n41 (20)	2506.020 – 2679.990	17M9G7D	PI/2 BPSK	0.208	23.19
		17M9G7D	QPSK	0.195	22.91
		17M9W7D	16QAM	0.164	22.14
		17M9W7D	64QAM	0.097	19.86
		18M0W7D	256QAM	0.073	18.64
Sub6 n41 (40)	2516.010 – 2670.000	35M8G7D	PI/2 BPSK	0.208	23.18
		35M8G7D	QPSK	0.202	23.06
		35M8W7D	16QAM	0.168	22.26
		35M8W7D	64QAM	0.102	20.09
		35M8W7D	256QAM	0.070	18.48
Sub6 n41 (50)	2521.020 – 2664.990	45M9G7D	PI/2 BPSK	0.221	23.44
		45M8G7D	QPSK	0.217	23.37
		46M0W7D	16QAM	0.178	22.51
		45M9W7D	64QAM	0.111	20.46
		45M7W7D	256QAM	0.075	18.73
Sub6 n41 (60)	2526.000 – 2659.980	57M9G7D	PI/2 BPSK	0.217	23.37
		57M9G7D	QPSK	0.208	23.19
		58M0W7D	16QAM	0.180	22.55
		57M8W7D	64QAM	0.109	20.37
		57M9W7D	256QAM	0.076	18.81
Sub6 n41 (80)	2536.020 – 2649.990	77M2G7D	PI/2 BPSK	0.222	23.47
		77M1G7D	QPSK	0.214	23.30
		77M4W7D	16QAM	0.175	22.42
		77M0W7D	64QAM	0.108	20.33
		77M2W7D	256QAM	0.077	18.86
Sub6 n41 (90)	2541.000 – 2644.980	86M8G7D	PI/2 BPSK	0.217	23.37
		86M9G7D	QPSK	0.214	23.31
		86M8W7D	16QAM	0.176	22.46
		86M8W7D	64QAM	0.110	20.43
		86M9W7D	256QAM	0.075	18.76
Sub6 n41 (100)	2546.010 – 2640.000	96M7G7D	PI/2 BPSK	0.232	23.66
		96M5G7D	QPSK	0.223	23.48
		96M6W7D	16QAM	0.181	22.58
		96M3W7D	64QAM	0.113	20.53
		96M3W7D	256QAM	0.079	18.96

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-FC009	May 26, 2021	- First Approval Report
HCT-RF-2105-FC009-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, 40, 50, 60, 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(SCS 30kHz):	2506.020 – 2679.990 : 20 MHz 2516.010 – 2670.000 : 40 MHz 2521.020 – 2664.990 : 50 MHz 2526.000 – 2659.980 : 60 MHz 2536.020 – 2649.990 : 80 MHz 2541.000 – 2644.980 : 90 MHz 2546.010 – 2640.000 : 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
Channel Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- 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 NormalHz
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 NormalHz 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;

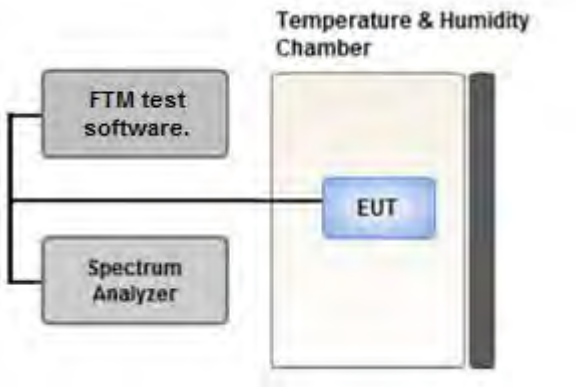
$$Result_{(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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:

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

Test Settings(Peak Power)

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

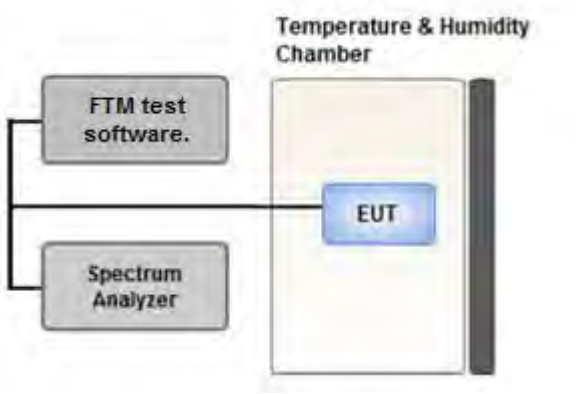
1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

Test Settings(Average Power)

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

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

3.5 OCCUPIED BANDWIDTH.



Test setup

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

The EUT makes a call to the communication simulator.

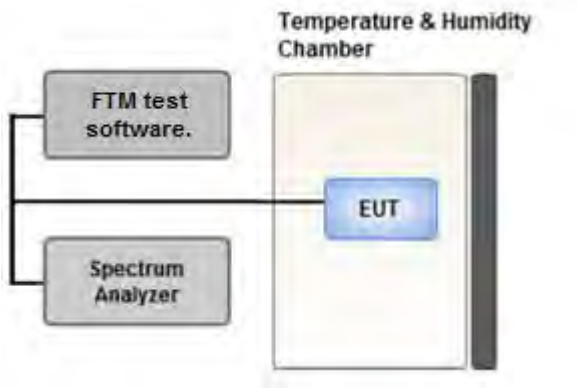
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

Test Settings

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

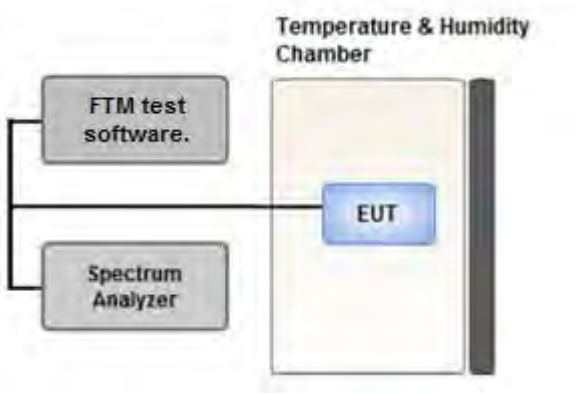
Test Overview

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 CHANNEL EDGE



Test setup

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum 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.

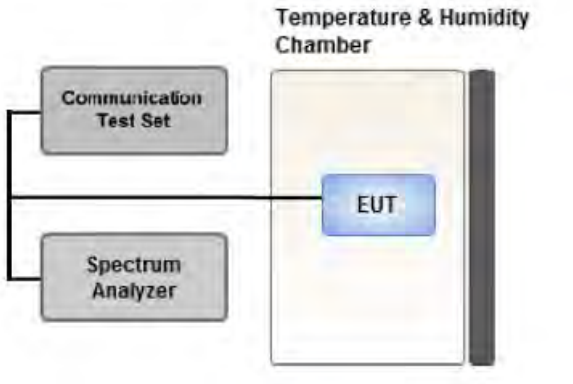
Test Settings

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. Within 1MHz of the channel edge the RBW should be 2% of EBW, then 1 MHz after that.
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

1. The attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge,
2. 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge.
3. 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge.
4. The attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz.
5. 55 + 10 log (P) dB at or below 2490.5 MHz.
6. X is the greater of 6MHz or the actual emission bandwidth
7. 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: Power Class 2(SA), Power Class 3(SA/ NSA)
  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	RB size	RB offset	Axis
Effective Isotropic Radiated Power	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1	1	X
Radiated Spurious and Harmonic Emissions	PI/2 BPSK	1	1	Z

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), Power Class 3(SA/ NSA)
  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, Peak-To-Average Ratio	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	20, 40, 50, 60, 80, 90, 100	Mid	Full RB	0
Channel Edge	PI/2 BPSK	20	Low	1	0
			High	1	50
		40	Low	1	0
			High	1	105
		50	Low	1	0
			High	1	132
		60	Low	1	0
			High	1	161
		80	Low	1	0
			High	1	216
		90	Low	1	0
			High	1	244
		100	Low	1	0
			High	1	272
		20, 40, 50, 60, 80, 90, 100	Low, Mid High	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	PI/2 BPSK	20, 40, 50, 60, 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(m)(4)	■ < 40 + 10log10 (P[Watts]) at Channel edges ■ < 43 + 10log10 (P[Watts]) between 5 and X MHz from Channel edges ■ < 55 + 10log10 (P[Watts]) beyond X MHz beyond from Channel edges ■ < 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz	PASS
Conducted Output Power	§2.1046	N/A	See Note1
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(h)(2)	< 2 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(m)(4)	< 55 + 10log10 (P[Watts])	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
518598	2593.0	-15.75	18.45	9.90	1.76	H	0.456	26.59

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

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.

2) During the test , the turn table is rotated until the maximum signal is found.

3) Record the field strength meter's level.

4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.

5) Increase the signal generator output till the field strength meter's level is equal to the item (3).

6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.

7.3. Emission Designator

GSM Emission Designator

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

EDGE Emission Designator

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

WCDMA Emission Designator

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

QPSK Modulation

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

QAM Modulation

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

8. TEST DATA

8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2506.020	Sub6 41/ 20 MHz [30 kHz]	PI/2 BPSK	-20.36	14.66	10.24	2.30	H	< 2.00	0.182	22.60
		QPSK	-20.43	14.59	10.24	2.30	H		0.179	22.53
		16-QAM	-21.20	13.82	10.24	2.30	H		0.150	21.76
		64-QAM	-23.18	11.84	10.24	2.30	H		0.095	19.78
		256-QAM	-24.79	10.23	10.24	2.30	H		0.066	18.17
2592.990		PI/2 BPSK	-20.24	15.10	10.42	2.33	H		0.208	23.19
		QPSK	-20.52	14.82	10.42	2.33	H		0.195	22.91
		16-QAM	-21.29	14.05	10.42	2.33	H		0.164	22.14
		64-QAM	-23.57	11.77	10.42	2.33	H		0.097	19.86
		256-QAM	-24.79	10.55	10.42	2.33	H		0.073	18.64
2679.990		PI/2 BPSK	-22.35	12.88	10.34	2.40	H		0.121	20.82
		QPSK	-22.52	12.71	10.34	2.40	H		0.116	20.65
		16-QAM	-23.30	11.93	10.34	2.40	H		0.097	19.87
		64-QAM	-25.41	9.82	10.34	2.40	H		0.060	17.76
		256-QAM	-26.99	8.24	10.34	2.40	H		0.042	16.18

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2516.010	Sub6 41/ 40 MHz [30 kHz]	PI/2 BPSK	-20.25	14.77	10.32	2.30	H	< 2.00	0.190	22.79
		QPSK	-20.29	14.73	10.32	2.30	H		0.188	22.75
		16-QAM	-21.22	13.80	10.32	2.30	H		0.152	21.82
		64-QAM	-23.30	11.72	10.32	2.30	H		0.094	19.74
		256-QAM	-25.00	10.02	10.32	2.30	H		0.064	18.04
2592.990		PI/2 BPSK	-20.25	15.09	10.42	2.33	H		0.208	23.18
		QPSK	-20.37	14.97	10.42	2.33	H		0.202	23.06
		16-QAM	-21.17	14.17	10.42	2.33	H		0.168	22.26
		64-QAM	-23.34	12.00	10.42	2.33	H		0.102	20.09
		256-QAM	-24.95	10.39	10.42	2.33	H		0.070	18.48
2670.000		PI/2 BPSK	-22.03	13.37	10.26	2.37	H		0.134	21.26
		QPSK	-22.07	13.33	10.26	2.37	H		0.132	21.22
		16-QAM	-23.19	12.21	10.26	2.37	H		0.102	20.10
		64-QAM	-25.18	10.22	10.26	2.37	H		0.065	18.11
		256-QAM	-26.76	8.64	10.26	2.37	H		0.045	16.53

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2521.020	Sub6 41/ 50 MHz [30 kHz]	PI/2 BPSK	-20.30	14.73	10.36	2.30	H	< 2.00	0.190	22.79
		QPSK	-20.42	14.61	10.36	2.30	H		0.185	22.67
		16-QAM	-21.32	13.71	10.36	2.30	H		0.150	21.77
		64-QAM	-23.27	11.76	10.36	2.30	H		0.096	19.82
		256-QAM	-24.85	10.18	10.36	2.30	H		0.067	18.24
2592.990		PI/2 BPSK	-19.99	15.35	10.42	2.33	H		0.221	23.44
		QPSK	-20.06	15.28	10.42	2.33	H		0.217	23.37
		16-QAM	-20.92	14.42	10.42	2.33	H		0.178	22.51
		64-QAM	-22.97	12.37	10.42	2.33	H		0.111	20.46
		256-QAM	-24.70	10.64	10.42	2.33	H		0.075	18.73
2664.990		PI/2 BPSK	-22.22	13.20	10.22	2.37	H		0.127	21.05
		QPSK	-22.37	13.05	10.22	2.37	H		0.123	20.90
		16-QAM	-23.25	12.17	10.22	2.37	H		0.100	20.02
		64-QAM	-25.33	10.09	10.22	2.37	H		0.062	17.94
		256-QAM	-26.81	8.61	10.22	2.37	H		0.044	16.46

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2526.000	Sub6 41/ 60 MHz [30 kHz]	PI/2 BPSK	-20.45	14.54	10.40	2.30	H	< 2.00	0.184	22.64
		QPSK	-20.49	14.50	10.40	2.30	H		0.182	22.60
		16-QAM	-21.40	13.59	10.40	2.30	H		0.148	21.69
		64-QAM	-23.51	11.48	10.40	2.30	H		0.091	19.58
		256-QAM	-24.92	10.07	10.40	2.30	H		0.066	18.17
2592.990		PI/2 BPSK	-20.06	15.28	10.42	2.33	H		0.217	23.37
		QPSK	-20.24	15.10	10.42	2.33	H		0.208	23.19
		16-QAM	-20.88	14.46	10.42	2.33	H		0.180	22.55
		64-QAM	-23.06	12.28	10.42	2.33	H		0.109	20.37
		256-QAM	-24.62	10.72	10.42	2.33	H		0.076	18.81
2659.980		PI/2 BPSK	-21.54	13.89	10.18	2.37	H		0.148	21.70
		QPSK	-21.74	13.69	10.18	2.37	H		0.141	21.50
		16-QAM	-22.70	12.73	10.18	2.37	H		0.113	20.54
		64-QAM	-24.56	10.87	10.18	2.37	H		0.074	18.68
		256-QAM	-26.13	9.30	10.18	2.37	H		0.051	17.11

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2536.020	Sub6 41/ 80 MHz [30 kHz]	PI/2 BPSK	-19.77	15.17	10.48	2.31	H	< 2.00	0.216	23.34
		QPSK	-19.87	15.07	10.48	2.31	H		0.211	23.24
		16-QAM	-20.76	14.18	10.48	2.31	H		0.172	22.35
		64-QAM	-22.78	12.16	10.48	2.31	H		0.108	20.33
		256-QAM	-24.53	10.41	10.48	2.31	H		0.072	18.58
2592.990		PI/2 BPSK	-19.96	15.38	10.42	2.33	H		0.222	23.47
		QPSK	-20.13	15.21	10.42	2.33	H		0.214	23.30
		16-QAM	-21.01	14.33	10.42	2.33	H		0.175	22.42
		64-QAM	-23.12	12.22	10.42	2.33	H		0.107	20.31
		256-QAM	-24.57	10.77	10.42	2.33	H		0.077	18.86
2649.990		PI/2 BPSK	-21.27	14.07	10.10	2.34	H		0.152	21.83
		QPSK	-21.29	14.05	10.10	2.34	H		0.152	21.81
		16-QAM	-22.21	13.13	10.10	2.34	H		0.123	20.89
		64-QAM	-24.17	11.17	10.10	2.34	H		0.078	18.93
		256-QAM	-25.94	9.40	10.10	2.34	H		0.052	17.16

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2541.000	Sub6 41/ 90 MHz [30 kHz]	PI/2 BPSK	-19.90	15.00	10.52	2.31	H	< 2.00	0.209	23.21
		QPSK	-20.01	14.89	10.52	2.31	H		0.204	23.10
		16-QAM	-20.97	13.93	10.52	2.31	H		0.163	22.14
		64-QAM	-22.90	12.00	10.52	2.31	H		0.105	20.21
		256-QAM	-24.67	10.23	10.52	2.31	H		0.070	18.44
2592.990		PI/2 BPSK	-20.06	15.28	10.42	2.33	H		0.217	23.37
		QPSK	-20.12	15.22	10.42	2.33	H		0.214	23.31
		16-QAM	-20.97	14.37	10.42	2.33	H		0.176	22.46
		64-QAM	-23.00	12.34	10.42	2.33	H		0.110	20.43
		256-QAM	-24.67	10.67	10.42	2.33	H		0.075	18.76
2644.980		PI/2 BPSK	-20.72	14.67	10.13	2.33	H		0.177	22.47
		QPSK	-20.85	14.54	10.13	2.33	H		0.171	22.34
		16-QAM	-21.52	13.87	10.13	2.33	H		0.147	21.67
		64-QAM	-23.66	11.73	10.13	2.33	H		0.090	19.53
		256-QAM	-25.19	10.20	10.13	2.33	H		0.063	18.00

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2546.010	Sub6 41/ 100 MHz [30 kHz]	PI/2 BPSK	-19.91	15.06	10.56	2.31	H	< 2.00	0.214	23.31
		QPSK	-19.97	15.00	10.56	2.31	H		0.211	23.25
		16-QAM	-20.93	14.04	10.56	2.31	H		0.169	22.29
		64-QAM	-22.93	12.04	10.56	2.31	H		0.107	20.29
		256-QAM	-24.59	10.38	10.56	2.31	H		0.073	18.63
2592.990		PI/2 BPSK	-19.77	15.57	10.42	2.33	H		0.232	23.66
		QPSK	-19.95	15.39	10.42	2.33	H		0.223	23.48
		16-QAM	-20.85	14.49	10.42	2.33	H		0.181	22.58
		64-QAM	-22.90	12.44	10.42	2.33	H		0.113	20.53
		256-QAM	-24.47	10.87	10.42	2.33	H		0.079	18.96
2640.000		PI/2 BPSK	-20.48	14.99	10.16	2.33	H		0.191	22.82
		QPSK	-20.53	14.94	10.16	2.33	H		0.189	22.77
		16-QAM	-21.40	14.07	10.16	2.33	H		0.155	21.90
		64-QAM	-23.43	12.04	10.16	2.33	H		0.097	19.87
		256-QAM	-25.07	10.40	10.16	2.33	H		0.066	18.23

8.2 RADIATED SPURIOUS EMISSIONS

▣ NR Band: N41

▣ Bandwidth: 20 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)
501204 (2506.020)	5 012.04	-55.91	10.92	-58.84	3.28	H	-51.20	-25.00
	7 518.06	-60.30	11.54	-53.35	4.12	H	-45.93	-25.00
	10 024.08	-52.26	11.75	-43.66	4.78	H	-36.69	-25.00
	12 530.10	-59.26	12.94	-49.77	5.23	V	-42.06	-25.00
	15 036.12	-48.14	14.54	-41.88	5.98	H	-33.32	-25.00
518598 (2592.990)	5 185.98	-56.68	11.47	-58.76	3.39	V	-50.68	-25.00
	7 778.97	-57.37	11.28	-50.37	4.21	H	-43.30	-25.00
	10 371.96	-55.33	11.80	-45.50	4.95	V	-38.65	-25.00
	12 964.95	-63.01	12.70	-52.97	5.41	V	-45.68	-25.00
	15 557.94	-53.68	16.22	-47.68	6.12	H	-37.58	-25.00
535998 (2679.990)	5 359.98	-56.34	11.82	-58.80	3.45	H	-50.43	-25.00
	8 039.97	-56.54	11.28	-49.34	4.31	H	-42.37	-25.00
	10 719.96	-50.77	11.70	-39.83	4.91	H	-33.04	-25.00
	13 399.95	-52.00	12.50	-41.82	5.67	H	-34.99	-25.00
	16 079.94	-50.81	16.50	-43.03	6.31	V	-32.84	-25.00

▣ NR Band: N41

▣ Bandwidth: 40 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)
503202 (2516.010)	5 032.02	-58.62	10.96	-60.73	3.33	V	-53.10	-25.00
	7 548.03	-62.77	11.58	-55.70	4.17	V	-48.29	-25.00
	10 064.04	-45.52	11.67	-37.29	4.89	V	-30.51	-25.00
	12 580.05	-60.37	12.90	-51.11	5.49	V	-43.70	-25.00
	15 096.06	-43.72	14.78	-36.96	6.06	H	-28.24	-25.00
518598 (2592.990)	5 185.98	-58.83	11.47	-60.91	3.39	V	-52.83	-25.00
	7 778.97	-57.09	11.28	-50.09	4.21	V	-43.02	-25.00
	10 371.96	-55.19	11.80	-45.36	4.95	V	-38.51	-25.00
	12 964.95	-59.57	12.70	-49.53	5.41	V	-42.24	-25.00
	15 557.94	-49.93	16.22	-43.93	6.12	H	-33.83	-25.00
534000 (2670.000)	5 340.00	-58.64	11.78	-61.09	3.43	V	-52.74	-25.00
	8 010.00	-59.16	11.22	-51.97	4.26	V	-45.01	-25.00
	10 680.00	-50.67	11.70	-39.94	5.02	H	-33.26	-25.00
	13 350.00	-61.66	12.70	-51.10	5.52	V	-43.92	-25.00
	16 020.00	-49.44	16.50	-42.13	6.28	V	-31.91	-25.00

▣ NR Band: N41

▣ Bandwidth: 50 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)
504204 (2521.020)	5 042.04	-57.73	10.98	-59.73	3.34	V	-52.09	-25.00
	7 563.06	-61.16	11.60	-54.54	4.16	V	-47.10	-25.00
	10 084.08	-46.81	11.63	-38.48	4.83	V	-31.68	-25.00
	12 605.10	-61.86	12.90	-52.23	5.50	V	-44.83	-25.00
	15 126.12	-42.77	14.85	-36.76	6.10	H	-28.01	-25.00
518598 (2592.990)	5 185.98	-57.98	11.47	-60.06	3.39	V	-51.98	-25.00
	7 778.97	-56.90	11.28	-49.90	4.21	V	-42.83	-25.00
	10 371.96	-55.28	11.80	-45.45	4.95	V	-38.60	-25.00
	12 964.95	-60.23	12.70	-50.19	5.41	V	-42.90	-25.00
	15 557.94	-48.27	16.22	-42.27	6.12	H	-32.17	-25.00
532998 (2664.990)	5 329.98	-53.77	11.76	-56.15	3.42	V	-47.81	-25.00
	7 994.97	-61.92	11.19	-54.76	4.23	V	-47.80	-25.00
	10 659.96	-51.89	11.70	-41.36	5.04	V	-34.70	-25.00
	13 324.95	-59.84	12.75	-49.71	5.59	V	-42.55	-25.00
	15 989.94	-49.35	16.50	-42.24	6.23	V	-31.97	-25.00

▣ NR Band: N41

▣ Bandwidth: 60 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)
505200 (2526.000)	5 052.00	-58.19	11.00	-60.35	3.34	V	-52.69	-25.00
	7 578.00	-61.59	11.60	-55.09	4.13	V	-47.62	-25.00
	10 104.00	-51.40	11.60	-42.57	4.79	V	-35.76	-25.00
	12 630.00	-63.54	12.90	-54.40	5.44	V	-46.94	-25.00
	15 156.00	-43.55	14.91	-37.08	6.03	H	-28.20	-25.00
518598 (2592.990)	5 185.98	-57.67	11.47	-59.75	3.39	V	-51.67	-25.00
	7 778.97	-57.35	11.28	-50.35	4.21	V	-43.28	-25.00
	10 371.96	-55.82	11.80	-45.99	4.95	V	-39.14	-25.00
	12 964.95	-60.10	12.70	-50.06	5.41	V	-42.77	-25.00
	15 557.94	-47.65	16.22	-41.65	6.12	H	-31.55	-25.00
531996 (2659.980)	5 319.96	-58.43	11.74	-61.32	3.41	V	-52.99	-25.00
	7 979.94	-58.38	11.16	-50.99	4.23	V	-44.06	-25.00
	10 639.92	-49.79	11.70	-39.37	4.96	V	-32.63	-25.00
	13 299.90	-61.81	12.80	-51.85	5.66	V	-44.71	-25.00
	15 959.88	-47.99	16.50	-40.90	6.22	H	-30.62	-25.00

▣ NR Band: N41

▣ Bandwidth: 80 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)
507204 (2536.020)	5 072.04	-57.77	11.08	-60.04	3.34	V	-52.30	-25.00
	7 608.06	-62.35	11.60	-55.39	4.14	V	-47.93	-25.00
	10 144.08	-48.15	11.60	-39.35	4.85	V	-32.60	-25.00
	12 680.10	-61.37	12.78	-51.25	5.43	V	-43.90	-25.00
	15 216.12	-44.10	15.03	-37.83	6.12	H	-28.92	-25.00
518598 (2592.990)	5 185.98	-57.10	11.47	-59.18	3.39	V	-51.10	-25.00
	7 778.97	-60.85	11.28	-53.85	4.21	V	-46.78	-25.00
	10 371.96	-53.32	11.80	-43.49	4.95	V	-36.64	-25.00
	12 964.95	-62.48	12.70	-52.44	5.41	V	-45.15	-25.00
	15 557.94	-47.04	16.22	-41.04	6.12	V	-30.94	-25.00
529998 (2649.990)	5 299.98	-59.43	11.70	-62.31	3.41	V	-54.02	-25.00
	7 949.97	-61.79	11.10	-54.95	4.29	V	-48.14	-25.00
	10 599.96	-51.16	11.70	-40.30	4.89	H	-33.49	-25.00
	13 249.95	-59.37	12.90	-49.23	5.53	V	-41.86	-25.00
	15 899.94	-51.19	16.40	-43.53	6.25	H	-33.38	-25.00

▣ NR Band: N41

▣ Bandwidth: 90 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)
508200 (2541.000)	5 082.00	-59.65	11.12	-61.94	3.34	V	-54.16	-25.00
	7 623.00	-61.13	11.60	-54.44	4.16	V	-47.00	-25.00
	10 164.00	-52.52	11.60	-43.73	4.91	V	-37.04	-25.00
	12 705.00	-61.72	12.69	-51.94	5.46	V	-44.71	-25.00
	15 246.00	-44.33	15.09	-38.54	6.10	H	-29.55	-25.00
518598 (2592.990)	5 185.98	-59.89	11.47	-61.97	3.39	V	-53.89	-25.00
	7 778.97	-61.56	11.28	-54.56	4.21	V	-47.49	-25.00
	10 371.96	-52.31	11.80	-42.48	4.95	V	-35.63	-25.00
	12 964.95	-60.39	12.70	-50.35	5.41	V	-43.06	-25.00
	15 557.94	-46.69	16.22	-40.69	6.12	H	-30.59	-25.00
528996 (2644.980)	5 289.96	-59.77	11.68	-62.29	3.40	V	-54.01	-25.00
	7 934.94	-61.42	11.07	-54.28	4.27	V	-47.48	-25.00
	10 579.92	-51.61	11.70	-41.24	4.98	V	-34.52	-25.00
	13 224.90	-62.39	12.90	-51.81	5.54	V	-44.45	-25.00
	15 869.88	-51.94	16.40	-45.10	6.18	H	-34.88	-25.00

▣ NR Band: N41

▣ Bandwidth: 100 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)
509202 (2546.010)	5 092.02	-59.98	11.16	-62.13	3.33	V	-54.30	-25.00
	7 638.03	-61.14	11.60	-54.69	4.19	V	-47.28	-25.00
	10 184.04	-50.74	11.60	-41.87	4.86	V	-35.13	-25.00
	12 730.05	-61.16	12.64	-50.97	5.36	V	-43.69	-25.00
	15 276.06	-44.49	15.20	-38.47	6.03	H	-29.30	-25.00
518598 (2592.990)	5 185.98	-59.10	11.47	-61.18	3.39	V	-53.10	-25.00
	7 778.97	-61.22	11.28	-54.22	4.21	V	-47.15	-25.00
	10 371.96	-48.75	11.80	-38.92	4.95	V	-32.07	-25.00
	12 964.95	-62.69	12.70	-52.65	5.41	V	-45.36	-25.00
	15 557.94	-45.62	16.22	-39.62	6.12	H	-29.52	-25.00
528000 (2640.000)	5 280.00	-58.95	11.66	-61.62	3.41	V	-53.37	-25.00
	7 920.00	-62.19	11.04	-54.68	4.26	V	-47.90	-25.00
	10 560.00	-55.40	11.70	-45.02	5.00	H	-38.32	-25.00
	13 200.00	-58.78	12.90	-48.54	5.60	V	-41.24	-25.00
	15 840.00	-56.04	16.40	-48.71	6.23	H	-38.54	-25.00

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

(Worst case: 2A-n41A(50MHz))

▣ NR Band: N41

▣ LTE Band(Anchor): B2

▣ Bandwidth: 50 MHz

▣ Modulation: PI/2 BPSK

▣ Distance: 1 meters

▣ SCS: 30 kHz

ENDC-Mode: 2A – n41A

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	-59.17	11.64	-62.16	2.85	V	-53.37	-13.00
	5 640.00	-60.47	12.00	-57.25	3.54	V	-48.79	-13.00
	7 520.00	-62.71	11.54	-50.36	4.12	H	-42.94	-13.00

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Sub6 n41	20 MHz	2592.990	BPSK	50	0	3.77
			QPSK			5.05
			16-QAM			6.08
			64-QAM			6.33
			256-QAM			6.73
	40 MHz		BPSK	100		3.94
			QPSK			5.15
			16-QAM			6.01
			64-QAM			6.31
			256-QAM			6.61
	50 MHz		BPSK	128		4.08
			QPSK			5.22
			16-QAM			6.09
			64-QAM			6.30
			256-QAM			6.63
	60 MHz		BPSK	162		3.82
			QPSK			5.11
			16-QAM			5.97
			64-QAM			6.25
			256-QAM			6.64
	80 MHz		BPSK	216		4.00
			QPSK			5.19
			16-QAM			5.98
			64-QAM			6.28
			256-QAM			6.54
	90 MHz		BPSK	243		3.86
			QPSK			5.05
			16-QAM			5.95
			64-QAM			6.27
			256-QAM			6.68
	100 MHz		BPSK	270		4.33
			QPSK			5.25
			16-QAM			6.03
			64-QAM			6.25
			256-QAM			6.61

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 90 ~ 124.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Sub6 n41	20 MHz	2592.990	BPSK	50	0	17.919
			QPSK			17.925
			16-QAM			17.943
			64-QAM			17.915
			256-QAM			17.973
	40 MHz		BPSK	100		35.762
			QPSK			35.790
			16-QAM			35.775
			64-QAM			35.780
			256-QAM			35.843
	50 MHz		BPSK	128		45.880
			QPSK			45.761
			16-QAM			46.004
			64-QAM			45.847
			256-QAM			45.744
	60 MHz		BPSK	162		57.938
			QPSK			57.937
			16-QAM			57.959
			64-QAM			57.841
			256-QAM			57.942
	80 MHz		BPSK	216		77.188
			QPSK			77.072
			16-QAM			77.413
			64-QAM			76.958
			256-QAM			77.168
	90 MHz		BPSK	243		86.770
			QPSK			86.933
			16-QAM			86.818
			64-QAM			86.812
			256-QAM			86.936
	100 MHz		BPSK	270		96.651
			QPSK			96.473
			16-QAM			96.594
			64-QAM			96.296
			256-QAM			96.311

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 55 ~ 89.

8.5 CONDUCTED SPURIOUS EMISSIONS

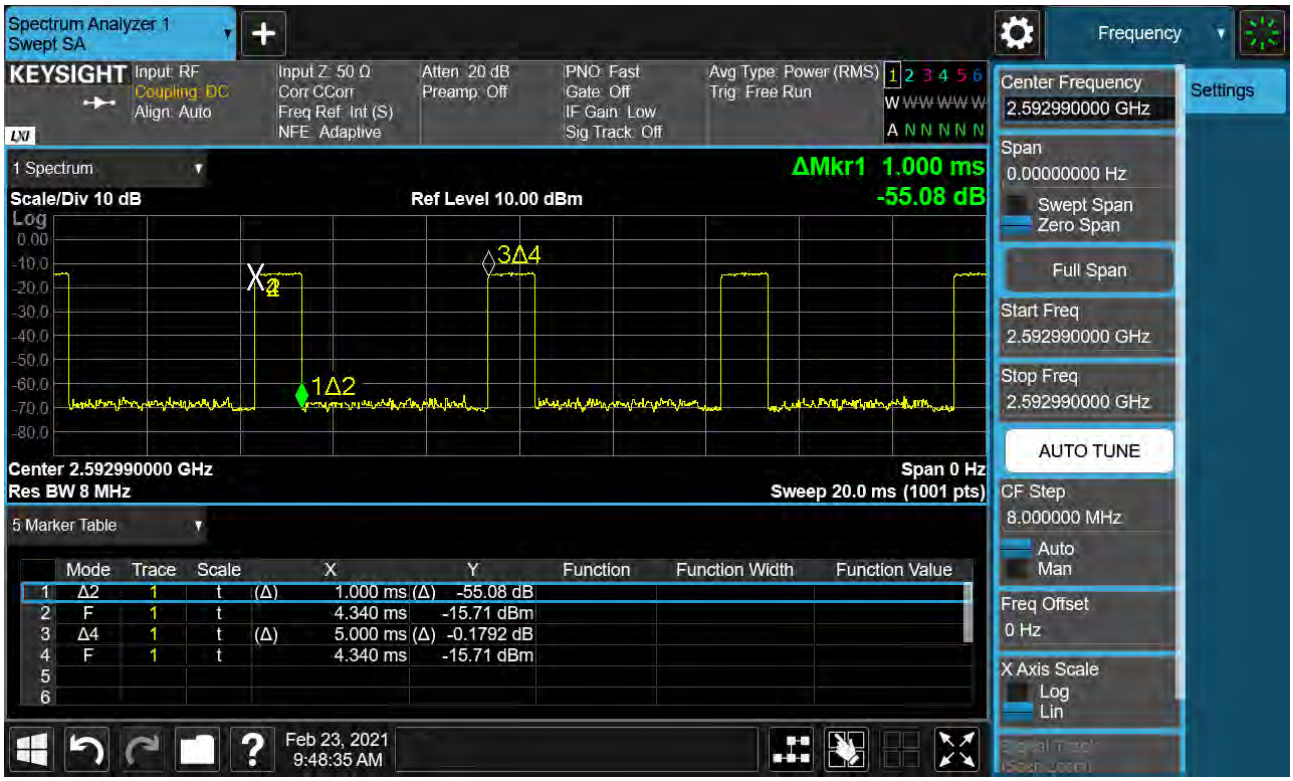
Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
Sub6 n41	20	2506.020	9.1371	35.581	-71.234	-35.653	-25.00
		2592.990	6.0459	35.581	-71.067	-35.486	
		2679.990	8.0065	35.581	-71.683	-36.102	
	40	2516.010	7.1939	35.581	-71.607	-36.026	
		2592.990	4.0683	34.966	-72.012	-37.046	
		2670.000	8.0125	35.581	-70.920	-35.339	
	50	2521.020	7.9990	35.581	-71.330	-35.749	
		2592.990	3.2448	34.966	-71.879	-36.913	
		2664.990	3.7668	34.966	-71.483	-36.517	
	60	2526.000	8.0075	35.581	-72.348	-36.767	
		2592.990	8.0244	35.581	-72.460	-36.879	
		2659.980	7.9811	35.581	-71.435	-35.854	
	80	2536.020	7.9915	35.581	-71.855	-36.274	
		2592.990	7.9980	35.581	-72.231	-36.650	
		2649.990	3.7717	34.966	-72.298	-37.332	
	90	2541.000	8.0080	35.581	-71.121	-35.540	
		2592.990	8.0025	35.581	-71.907	-36.326	
		2644.980	7.9836	35.581	-71.624	-36.043	
	100	2546.010	6.8759	35.581	-71.840	-36.259	
		2592.990	8.0598	35.581	-72.092	-36.511	
		2640.000	9.7458	35.581	-72.230	-36.649	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 174 ~ 215.

2. Duty Cycle factor already applied on the factor.

- Duty Cycle Factor(dB) = 6.990



- Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator

- Result(dBm) = Reading + Factor

3. Factor(dB)

Frequency Range (GHz)	Factor [dB]
0.03 – 1	32.260
1 – 5	34.966
5 – 10	35.581
10 – 15	36.106
15 – 20	36.479
Above 20	37.121

8.6 CHANNEL EDGE

BW (MHz)	Frequency (MHz)	Mod	RB (Size/ Offset)	2 495 MHz ~ 2 496 MHz	C.E ~ (C.E +1MHz)	2 490.5 MHz ~ 2 495 MHz	(C.E + 1 MHz) ~ (C.E + 5 MHz)	Below 2 490.5 MHz	(C.E + 5 MHz) ~ (C.E + X MHz)	Above (C.E + X MHz)
				Lower	Upper	Lower	Upper	Lower	Upper	Upper
20	2506.020	BPSK	Full RB	-27.35	-28.46	-27.27	-26.69	-29.11	-27.85	-35.83
40	2520.000	BPSK	Full RB	-28.07	-31.36	-31.28	-30.26	-30.14	-28.87	-39.86
50	2525.010	BPSK	Full RB	-28.12	-27.81	-32.06	-25.67	-29.80	-25.09	-36.76
60	2530.020	BPSK	Full RB	-19.07	-20.10	-32.50	-32.12	-33.63	-28.91	-39.98
80	2540.010	BPSK	Full RB	-25.82	-31.17	-31.37	-32.45	-33.01	-31.80	-39.97
90	2545.020	BPSK	Full RB	-23.72	-32.30	-30.90	-32.73	-31.69	-29.21	-41.90
100	2550.000	BPSK	Full RB	-23.25	-30.45	-30.52	-29.99	-29.88	-29.87	-40.55
Limit				-13.0	-10.0	-13.0	-10.0	-25.0	-13.0	-25.0

Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resoure Block Offset	C.E ~ (C.E ± 1 MHz)		(C.E ± 1 MHz) ~ (C.E ± 5 MHz)	
					Lower	Upper	Lower	Upper
20 MHz	2592.990	BPSK	Full RB	0	-24.36	-26.33	-24.30	-24.74
	2679.990	BPSK	Full RB	0	-24.44	-28.28	-24.14	-26.93
40 MHz	2592.990	BPSK	Full RB	0	-24.29	-29.20	-26.73	-29.60
	2670.000	BPSK	Full RB	0	-26.39	-31.86	-27.17	-32.22
50 MHz	2592.990	BPSK	Full RB	0	-24.78	-28.63	-27.55	-29.20
	2664.990	BPSK	Full RB	0	-25.20	-30.31	-28.22	-26.78
60 MHz	2592.990	BPSK	Full RB	0	-17.60	-20.24	-27.39	-28.17
	2659.980	BPSK	Full RB	0	-17.77	-20.96	-28.96	-32.53
80 MHz	2592.990	BPSK	Full RB	0	-24.13	-29.42	-30.34	-30.63
	2649.990	BPSK	Full RB	0	-24.88	-31.82	-30.58	-32.81
90 MHz	2592.990	BPSK	Full RB	0	-23.87	-31.19	-30.36	-31.49
	2644.980	BPSK	Full RB	0	-23.61	-34.28	-30.88	-34.61
100 MHz	2592.990	BPSK	Full RB	0	-21.38	-28.96	-30.62	-30.92
	2640.000	BPSK	Full RB	0	-21.22	-31.54	-30.65	-30.82
Limit					-10.0		-10.0	

Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resoure Block Offset	(C.E ± 5 MHz) ~ (C.E ± X MHz)		Above (C.E ± X MHz)	
					Lower	Upper	Lower	Upper
20 MHz	2592.990	BPSK	Full RB	0	-24.36	-24.66	-38.38	-37.15
	2679.990	BPSK	Full RB	0	-24.35	-27.07	-37.09	-38.00
40 MHz	2592.990	BPSK	Full RB	0	-28.86	-28.78	-42.14	-40.32
	2670.000	BPSK	Full RB	0	-28.41	-30.72	-41.21	-45.99
50 MHz	2592.990	BPSK	Full RB	0	-27.48	-28.20	-40.89	-37.96
	2664.990	BPSK	Full RB	0	-25.87	-26.32	-39.37	-47.53
60 MHz	2592.990	BPSK	Full RB	0	-29.25	-29.98	-44.32	-41.83
	2659.980	BPSK	Full RB	0	-28.68	-30.67	-43.17	-47.80
80 MHz	2592.990	BPSK	Full RB	0	-31.11	-31.17	-46.84	-41.49
	2649.990	BPSK	Full RB	0	-30.08	-31.69	-39.53	-48.07
90 MHz	2592.990	BPSK	Full RB	0	-30.96	-32.02	-48.25	-46.58
	2644.980	BPSK	Full RB	0	-30.47	-34.75	-44.68	-47.93
100 MHz	2592.990	BPSK	Full RB	0	-29.86	-31.01	-48.64	-48.12
	2640.000	BPSK	Full RB	0	-29.37	-31.04	-45.19	-48.12
Limit					-13.0		-25.0	

Note:

1. C.E = Channel Edge
2. X = X is the greater of 6MHz or the actual emission bandwidth
3. 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
4. Plots of the EUT's Channel Edge are shown Page 125 ~ 173. (1RB & Full RB)

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
2506.020	100%	+20(Ref)	2506 020 015	0.0	0.000 000	0.000
	100%	-30	2506 020 019	4.0	0.000 000	0.002
	100%	-20	2506 020 021	6.3	0.000 000	0.003
	100%	-10	2506 020 020	4.9	0.000 000	0.002
	100%	0	2506 020 028	13.0	0.000 001	0.005
	100%	+10	2506 020 023	7.3	0.000 000	0.003
	100%	+30	2506 020 026	10.6	0.000 000	0.004
	100%	+40	2506 020 021	5.9	0.000 000	0.002
	100%	+50	2506 020 024	8.6	0.000 000	0.003
	Batt. Endpoint	+20	2506 020 031	16.1	0.000 001	0.006
2679.990	100%	+20(Ref)	2679 990 009	0.0	0.000 000	0.000
	100%	-30	2679 990 012	3.2	0.000 000	0.001
	100%	-20	2679 990 024	15.2	0.000 001	0.006
	100%	-10	2679 990 020	11.5	0.000 000	0.004
	100%	0	2679 990 024	15.4	0.000 001	0.006
	100%	+10	2679 990 024	15.1	0.000 001	0.006
	100%	+30	2679 990 015	6.4	0.000 000	0.002
	100%	+40	2679 990 016	7.3	0.000 000	0.003
	100%	+50	2679 990 020	11.1	0.000 000	0.004
	Batt. Endpoint	+20	2679 990 021	12.7	0.000 000	0.005

▣ 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
2516.010	100%	+20(Ref)	2516 010 016	0.0	0.000 000	0.000
	100%	-30	2516 010 031	15.1	0.000 001	0.006
	100%	-20	2516 010 024	8.4	0.000 000	0.003
	100%	-10	2516 010 030	14.3	0.000 001	0.006
	100%	0	2516 010 019	3.5	0.000 000	0.001
	100%	+10	2516 010 033	16.9	0.000 001	0.007
	100%	+30	2516 010 024	8.3	0.000 000	0.003
	100%	+40	2516 010 025	9.1	0.000 000	0.004
	100%	+50	2516 010 021	5.0	0.000 000	0.002
	Batt. Endpoint	+20	2516 010 023	7.3	0.000 000	0.003
2670.000	100%	+20(Ref)	2670 000 014	0.0	0.000 000	0.000
	100%	-30	2670 000 025	10.8	0.000 000	0.004
	100%	-20	2670 000 030	16.0	0.000 001	0.006
	100%	-10	2670 000 023	9.5	0.000 000	0.004
	100%	0	2670 000 030	15.9	0.000 001	0.006
	100%	+10	2670 000 026	12.5	0.000 000	0.005
	100%	+30	2670 000 025	11.3	0.000 000	0.004
	100%	+40	2670 000 020	5.8	0.000 000	0.002
	100%	+50	2670 000 020	6.5	0.000 000	0.002
	Batt. Endpoint	+20	2670 000 019	4.9	0.000 000	0.002

▣ 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
2521.020	100%	+20(Ref)	2521 020 015	0.0	0.000 000	0.000
	100%	-30	2521 020 025	9.3	0.000 000	0.004
	100%	-20	2521 020 029	14.2	0.000 001	0.006
	100%	-10	2521 020 028	13.1	0.000 001	0.005
	100%	0	2521 020 020	4.4	0.000 000	0.002
	100%	+10	2521 020 030	14.3	0.000 001	0.006
	100%	+30	2521 020 028	12.9	0.000 001	0.005
	100%	+40	2521 020 028	13.2	0.000 001	0.005
	100%	+50	2521 020 029	14.2	0.000 001	0.006
	Batt. Endpoint	+20	2521 020 031	15.4	0.000 001	0.006
2664.990	100%	+20(Ref)	2664 990 004	0.0	0.000 000	0.000
	100%	-30	2664 990 016	12.6	0.000 000	0.005
	100%	-20	2664 990 013	9.5	0.000 000	0.004
	100%	-10	2664 990 013	9.0	0.000 000	0.003
	100%	0	2664 990 012	8.0	0.000 000	0.003
	100%	+10	2664 990 013	8.9	0.000 000	0.003
	100%	+30	2664 990 010	6.1	0.000 000	0.002
	100%	+40	2664 990 018	13.7	0.000 001	0.005
	100%	+50	2664 990 008	3.7	0.000 000	0.001
	Batt. Endpoint	+20	2664 990 017	13.2	0.000 000	0.005

▣ 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
2526.000	100%	+20(Ref)	2526 000 013	0.0	0.000 000	0.000
	100%	-30	2526 000 023	9.9	0.000 000	0.004
	100%	-20	2526 000 021	8.2	0.000 000	0.003
	100%	-10	2526 000 020	7.5	0.000 000	0.003
	100%	0	2526 000 016	3.2	0.000 000	0.001
	100%	+10	2526 000 028	15.6	0.000 001	0.006
	100%	+30	2526 000 029	16.3	0.000 001	0.006
	100%	+40	2526 000 020	7.6	0.000 000	0.003
	100%	+50	2526 000 019	6.3	0.000 000	0.003
	Batt. Endpoint	+20	2526 000 017	4.0	0.000 000	0.002
2659.980	100%	+20(Ref)	2659 980 008	0.0	0.000 000	0.000
	100%	-30	2659 980 011	3.0	0.000 000	0.001
	100%	-20	2659 980 012	3.3	0.000 000	0.001
	100%	-10	2659 980 013	5.0	0.000 000	0.002
	100%	0	2659 980 015	6.6	0.000 000	0.002
	100%	+10	2659 980 024	16.0	0.000 001	0.006
	100%	+30	2659 980 025	16.8	0.000 001	0.006
	100%	+40	2659 980 022	13.3	0.000 000	0.005
	100%	+50	2659 980 024	15.3	0.000 001	0.006
	Batt. Endpoint	+20	2659 980 016	8.0	0.000 000	0.003

▣ 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
2536.020	100%	+20(Ref)	2536 020 010	0.0	0.000 000	0.000
	100%	-30	2536 020 026	15.9	0.000 001	0.006
	100%	-20	2536 020 014	4.2	0.000 000	0.002
	100%	-10	2536 020 027	16.8	0.000 001	0.007
	100%	0	2536 020 016	6.0	0.000 000	0.002
	100%	+10	2536 020 024	14.4	0.000 001	0.006
	100%	+30	2536 020 019	9.5	0.000 000	0.004
	100%	+40	2536 020 024	14.4	0.000 001	0.006
	100%	+50	2536 020 019	9.4	0.000 000	0.004
	Batt. Endpoint	+20	2536 020 015	5.4	0.000 000	0.002
2649.990	100%	+20(Ref)	2649 990 008	0.0	0.000 000	0.000
	100%	-30	2649 990 016	8.0	0.000 000	0.003
	100%	-20	2649 990 016	7.9	0.000 000	0.003
	100%	-10	2649 990 011	3.2	0.000 000	0.001
	100%	0	2649 990 025	16.8	0.000 001	0.006
	100%	+10	2649 990 024	15.7	0.000 001	0.006
	100%	+30	2649 990 025	16.8	0.000 001	0.006
	100%	+40	2649 990 021	12.6	0.000 000	0.005
	100%	+50	2649 990 024	16.2	0.000 001	0.006
	Batt. Endpoint	+20	2649 990 012	3.9	0.000 000	0.001

▣ 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
2541.000	100%	+20(Ref)	2541 000 012	0.0	0.000 000	0.000
	100%	-30	2541 000 021	8.7	0.000 000	0.003
	100%	-20	2541 000 024	11.1	0.000 000	0.004
	100%	-10	2541 000 019	6.6	0.000 000	0.003
	100%	0	2541 000 019	6.7	0.000 000	0.003
	100%	+10	2541 000 026	13.2	0.000 001	0.005
	100%	+30	2541 000 022	10.0	0.000 000	0.004
	100%	+40	2541 000 022	9.7	0.000 000	0.004
	100%	+50	2541 000 027	14.6	0.000 001	0.006
	Batt. Endpoint	+20	2541 000 027	14.4	0.000 001	0.006
2644.980	100%	+20(Ref)	2644 980 010	0.0	0.000 000	0.000
	100%	-30	2644 980 026	16.0	0.000 001	0.006
	100%	-20	2644 980 021	10.9	0.000 000	0.004
	100%	-10	2644 980 015	5.1	0.000 000	0.002
	100%	0	2644 980 018	8.4	0.000 000	0.003
	100%	+10	2644 980 025	14.7	0.000 001	0.006
	100%	+30	2644 980 017	6.6	0.000 000	0.003
	100%	+40	2644 980 020	10.4	0.000 000	0.004
	100%	+50	2644 980 026	15.9	0.000 001	0.006
	Batt. Endpoint	+20	2644 980 014	4.5	0.000 000	0.002

▣ BandWidth: 100 MHz

▣ Voltage(100%): 3.880 VDC

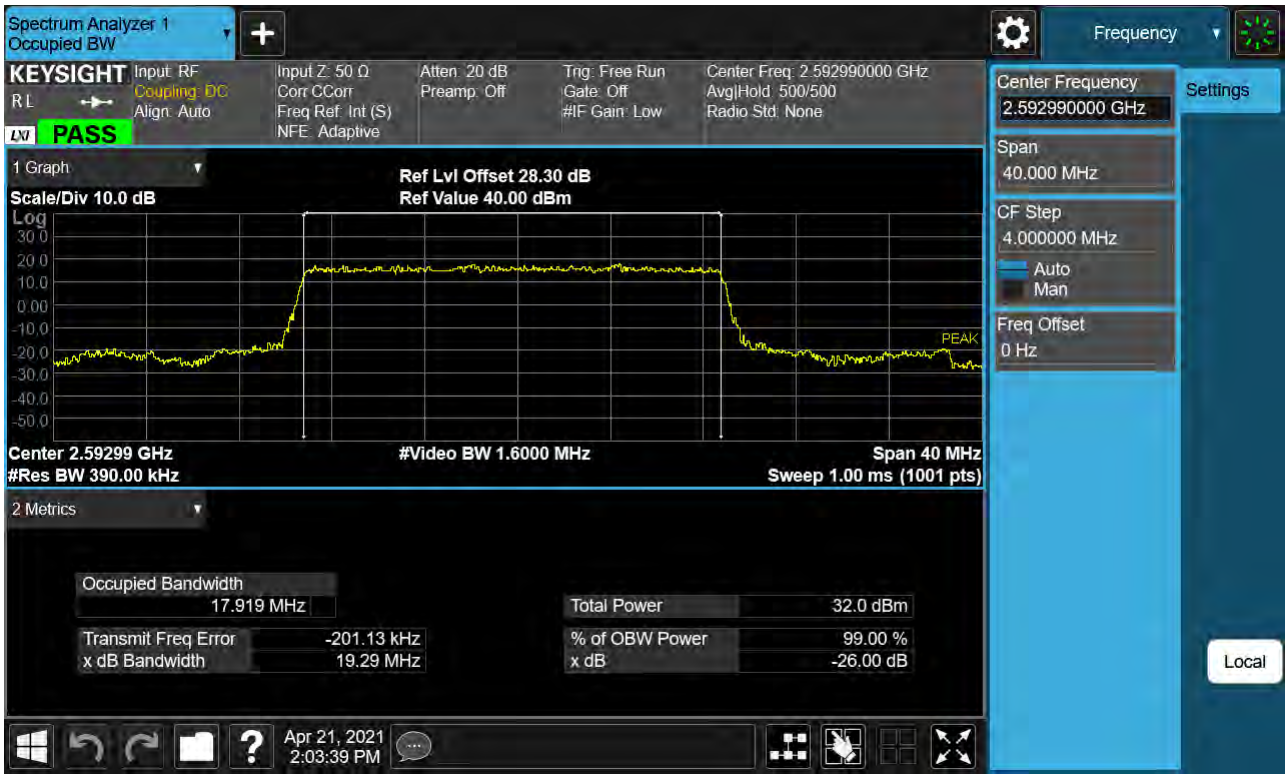
▣ Batt. Endpoint: 3.650 VDC

▣ LIMIT: Emission must remain in band

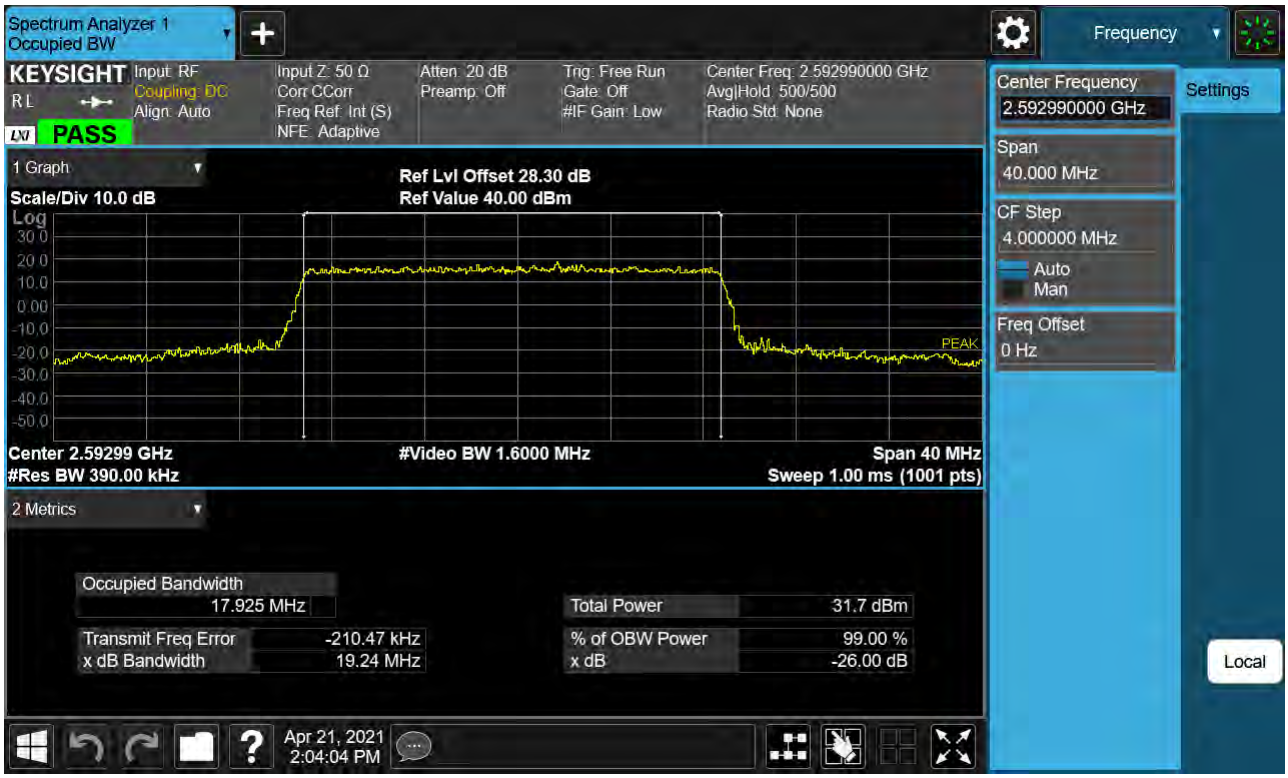
Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
2546.010	100%	+20(Ref)	2546 010 005	0.0	0.000 000	0.000
	100%	-30	2546 010 019	14.3	0.000 001	0.006
	100%	-20	2546 010 013	7.6	0.000 000	0.003
	100%	-10	2546 010 009	4.5	0.000 000	0.002
	100%	0	2546 010 015	10.0	0.000 000	0.004
	100%	+10	2546 010 015	9.6	0.000 000	0.004
	100%	+30	2546 010 016	11.2	0.000 000	0.004
	100%	+40	2546 010 011	5.8	0.000 000	0.002
	100%	+50	2546 010 021	15.7	0.000 001	0.006
	Batt. Endpoint	+20	2546 010 013	8.1	0.000 000	0.003
2640.000	100%	+20(Ref)	2640 000 003	0.0	0.000 000	0.000
	100%	-30	2640 000 011	7.6	0.000 000	0.003
	100%	-20	2640 000 011	7.8	0.000 000	0.003
	100%	-10	2640 000 015	12.2	0.000 000	0.005
	100%	0	2640 000 010	6.9	0.000 000	0.003
	100%	+10	2640 000 011	7.6	0.000 000	0.003
	100%	+30	2640 000 008	4.4	0.000 000	0.002
	100%	+40	2640 000 013	9.4	0.000 000	0.004
	100%	+50	2640 000 013	9.7	0.000 000	0.004
	Batt. Endpoint	+20	2640 000 009	6.0	0.000 000	0.002

9. TEST PLOTS

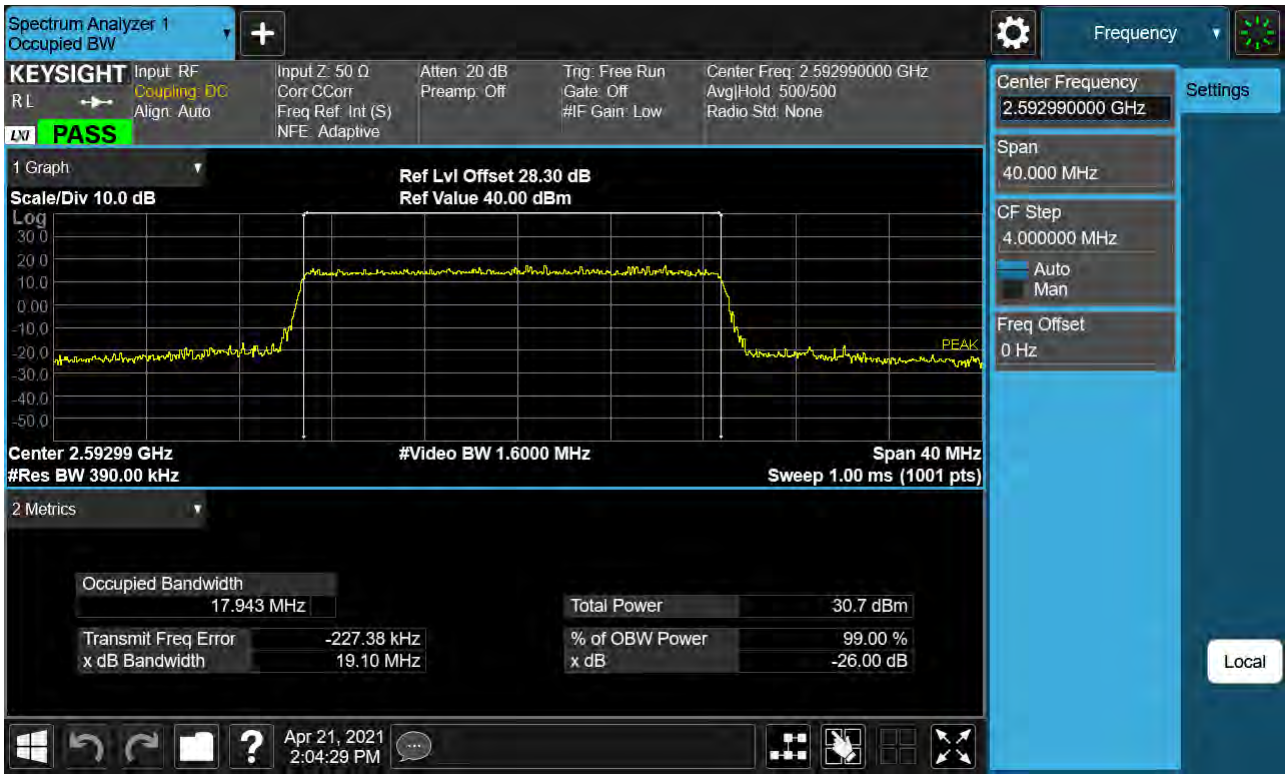
Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 BPSK)



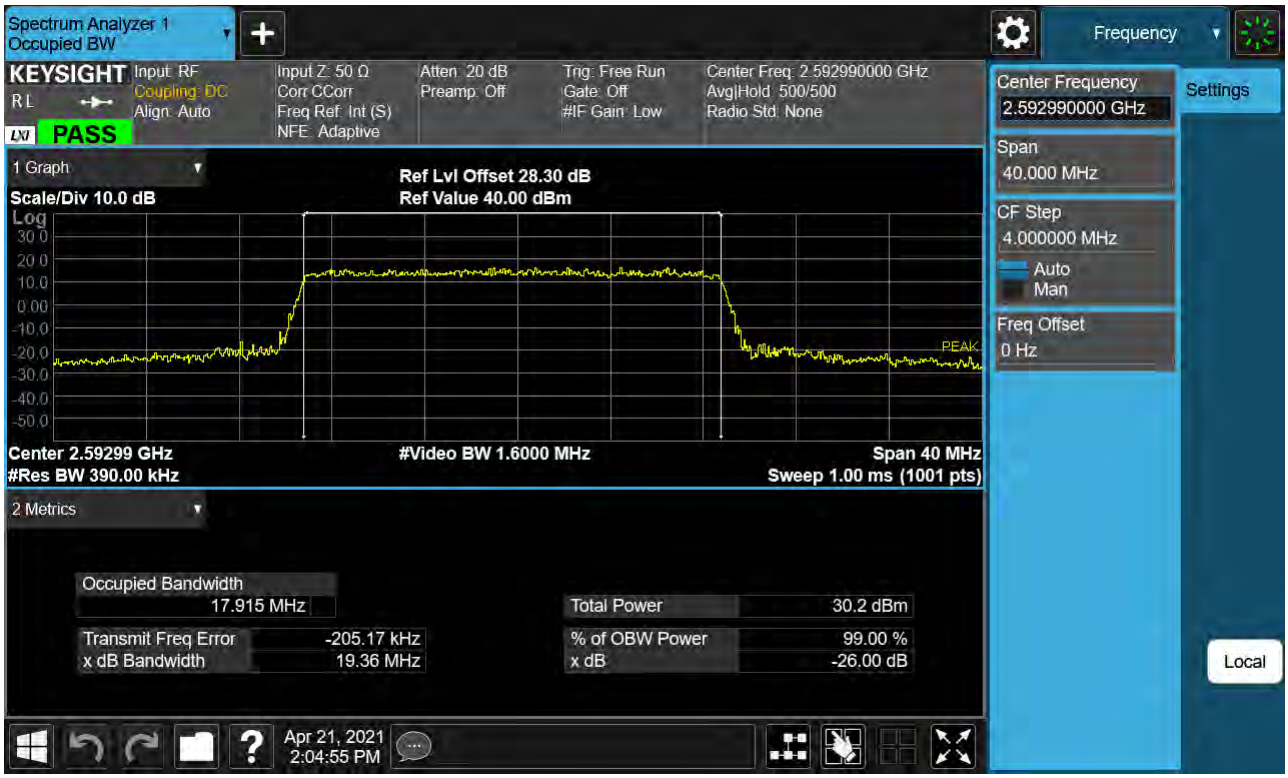
Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 QPSK)



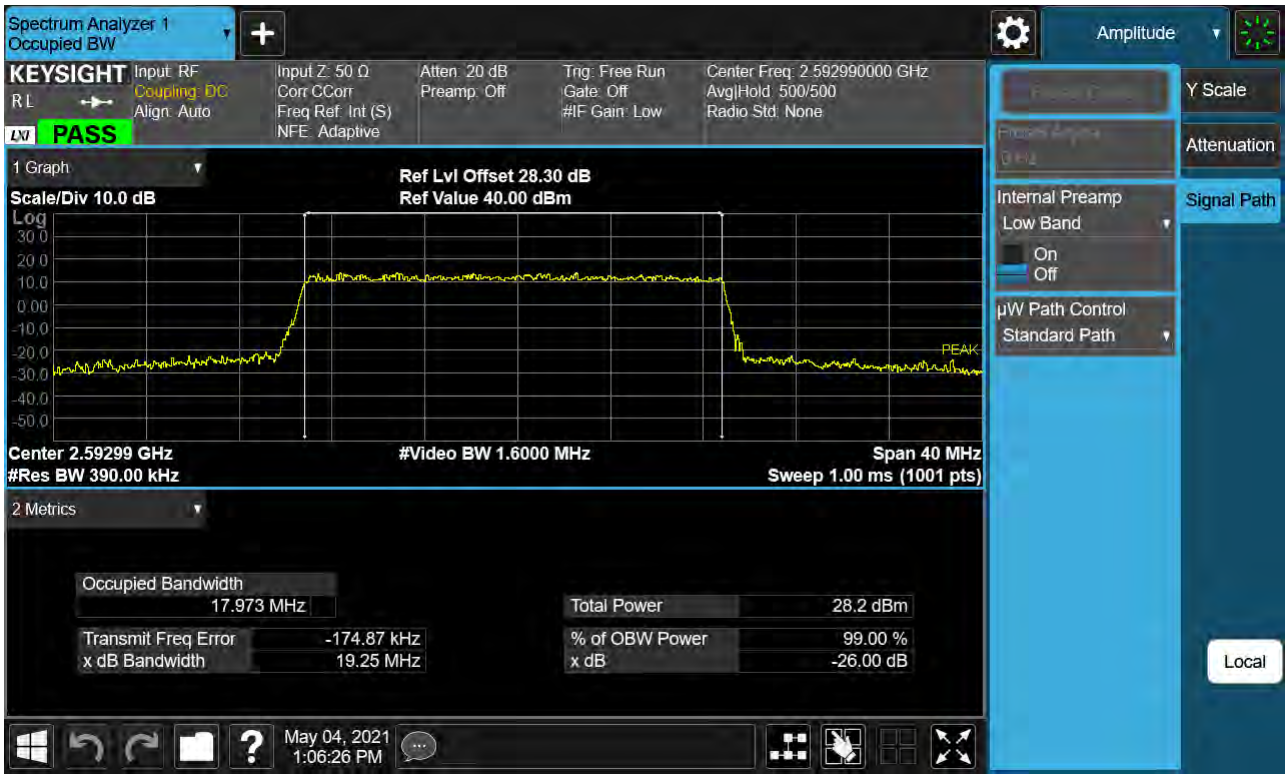
Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 16-QAM)



Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 64-QAM)



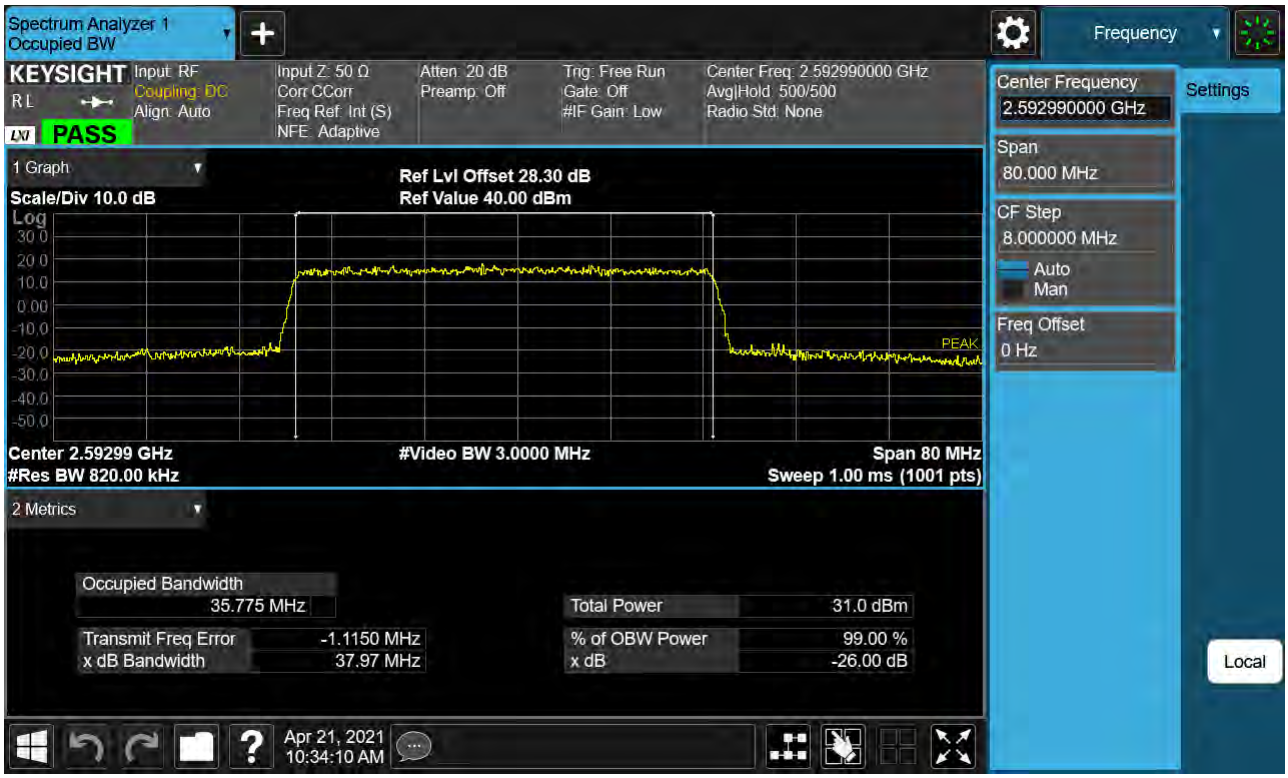
Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 256-QAM)



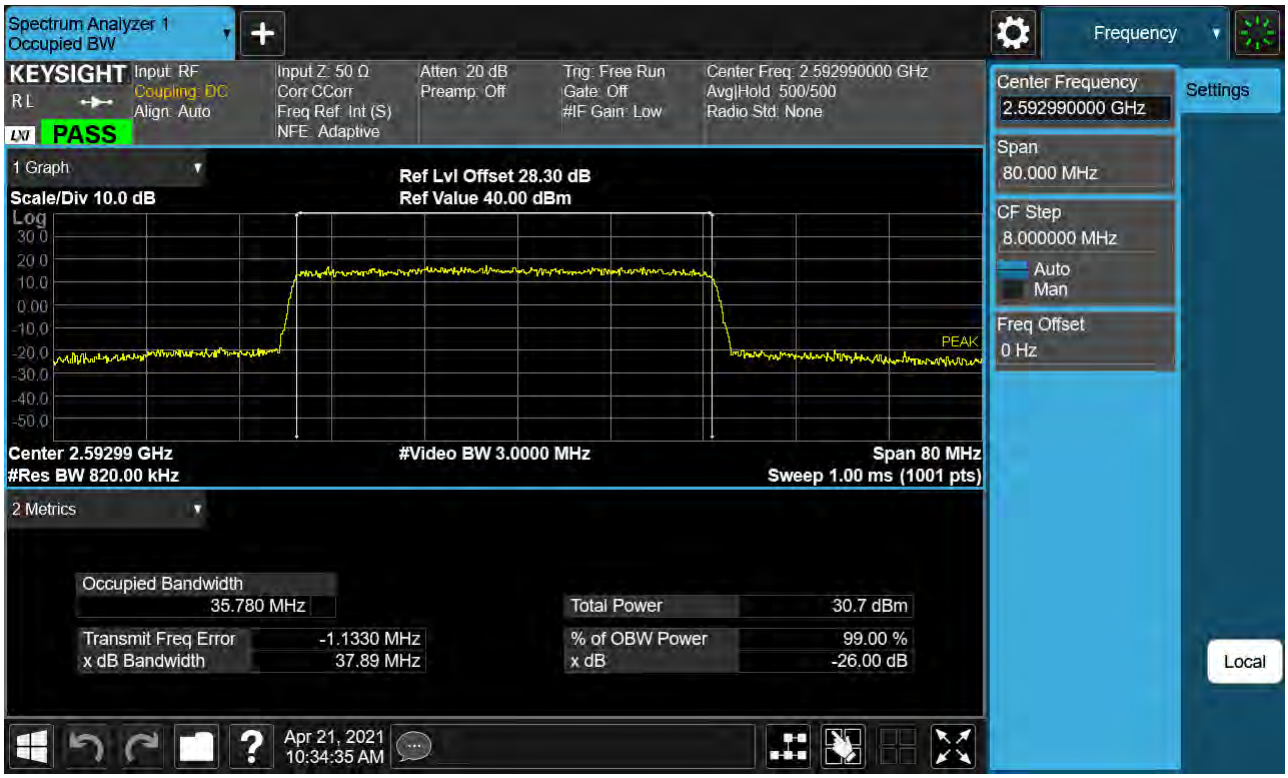
Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 BPSK)

Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 QPSK)

Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 16-QAM)

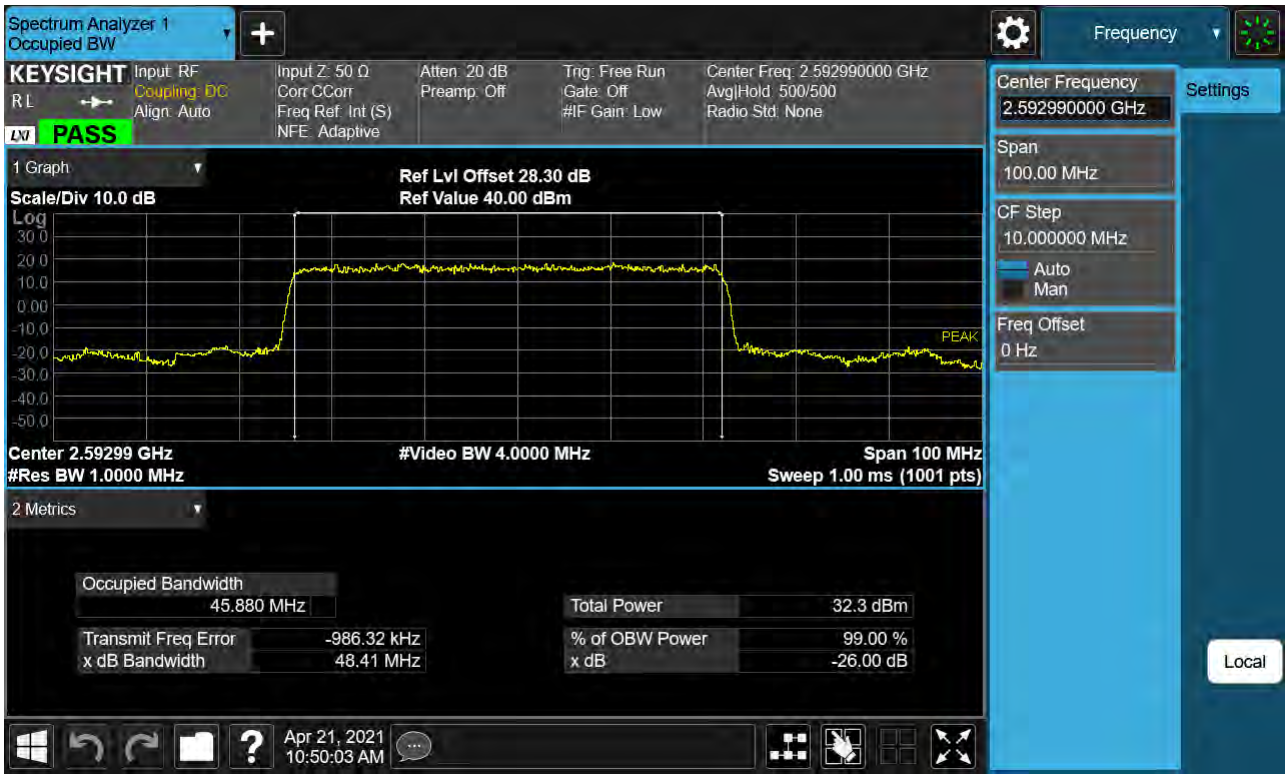


Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 64-QAM)

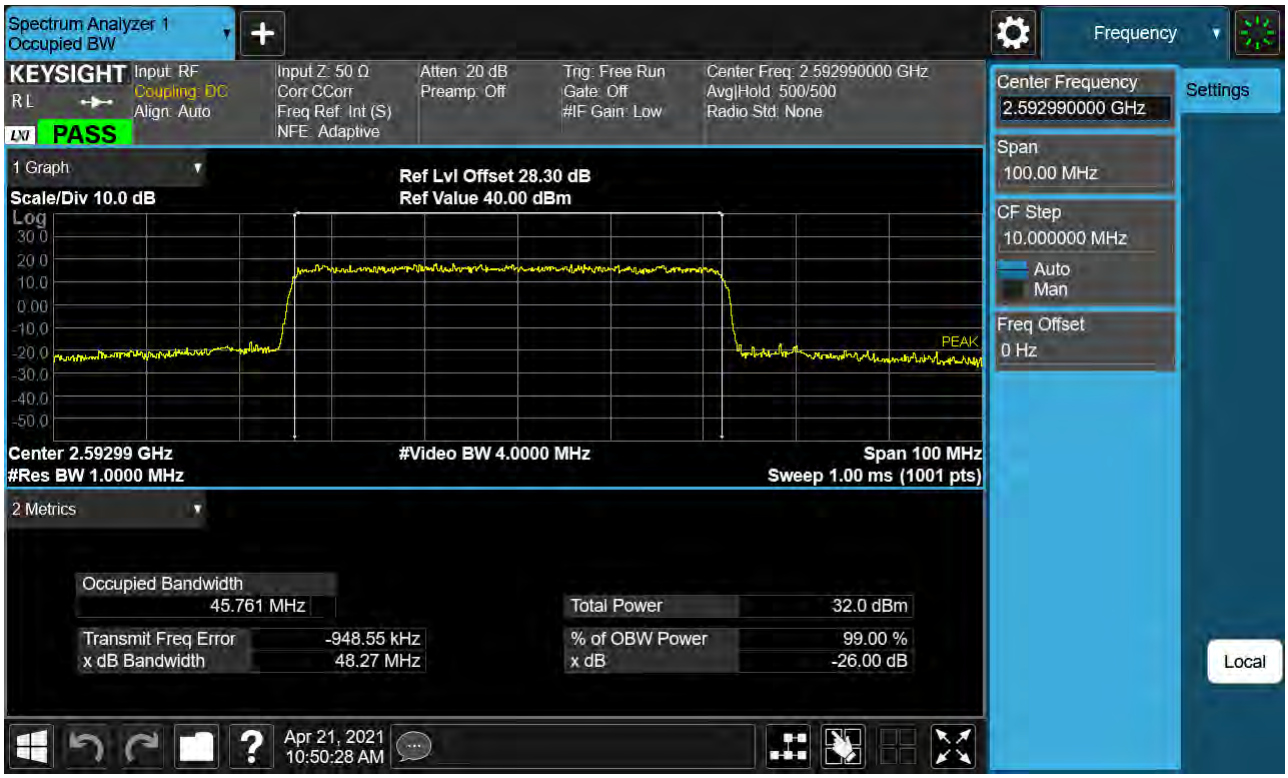


Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 256-QAM)

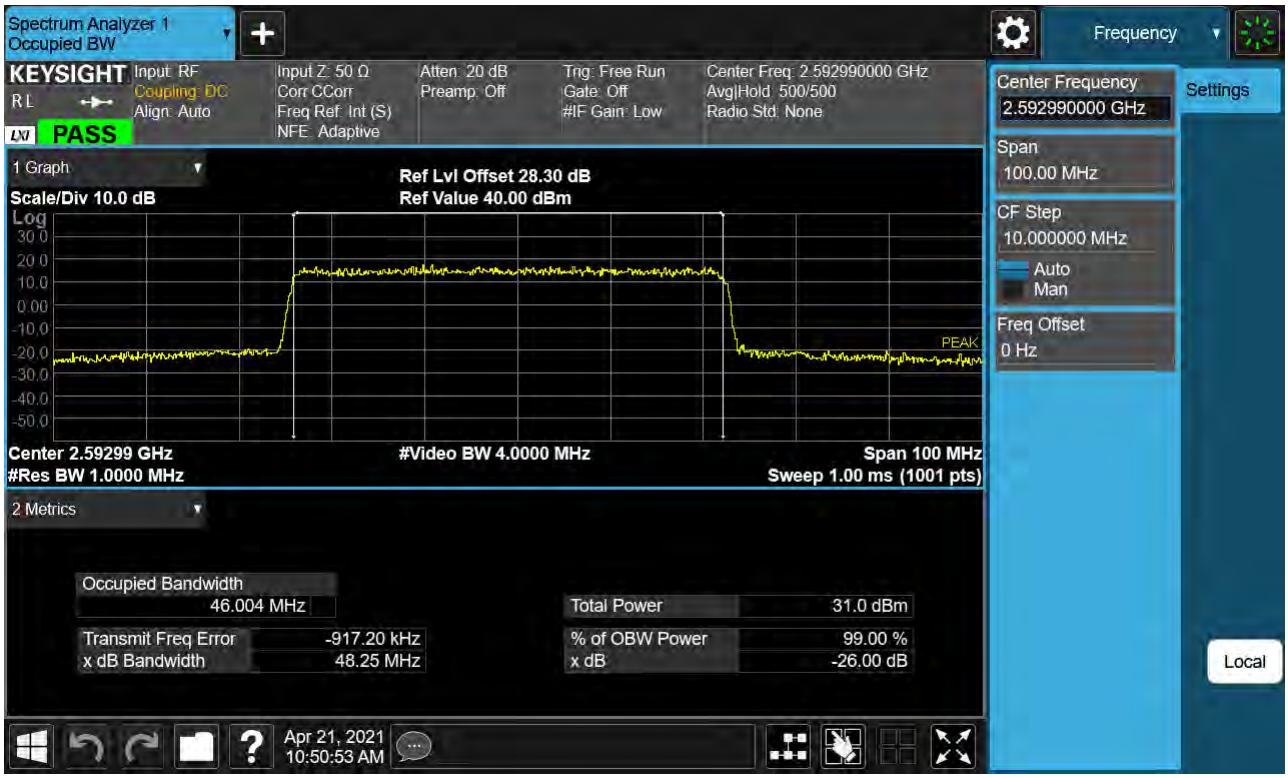
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 BPSK)



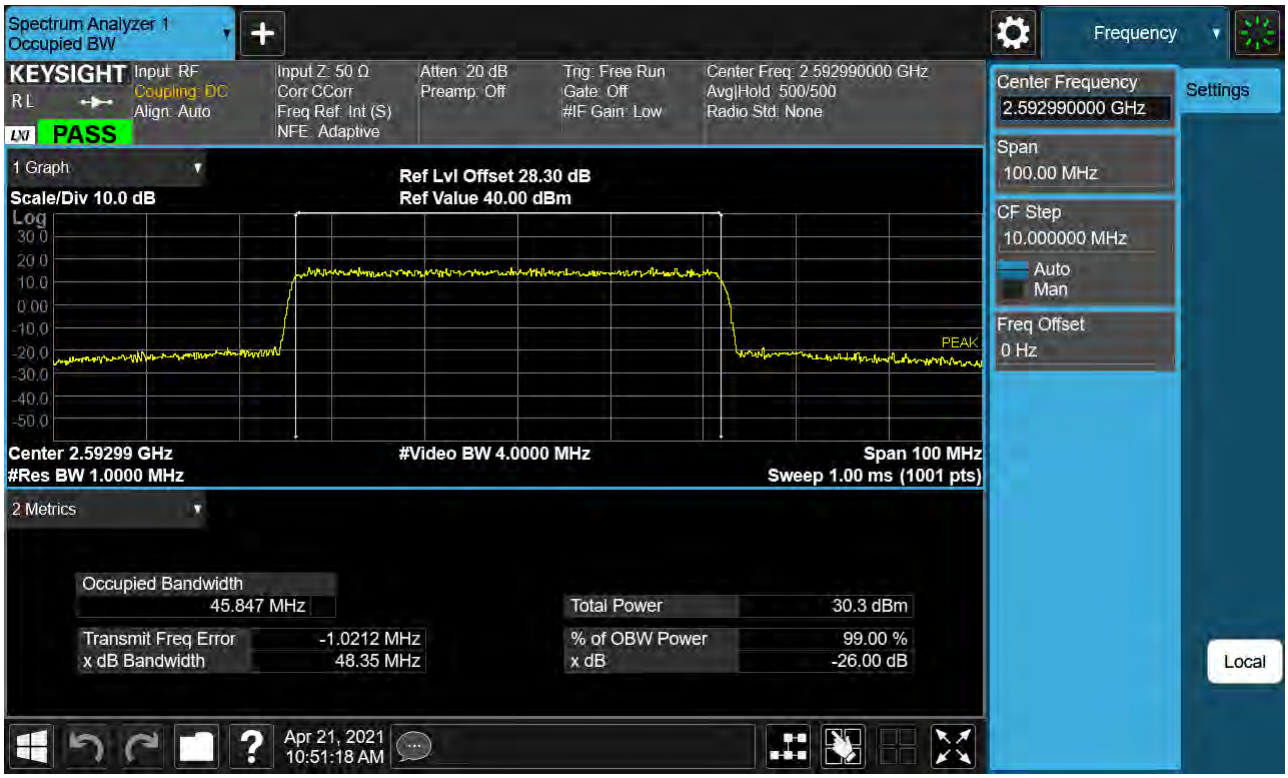
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 QPSK)



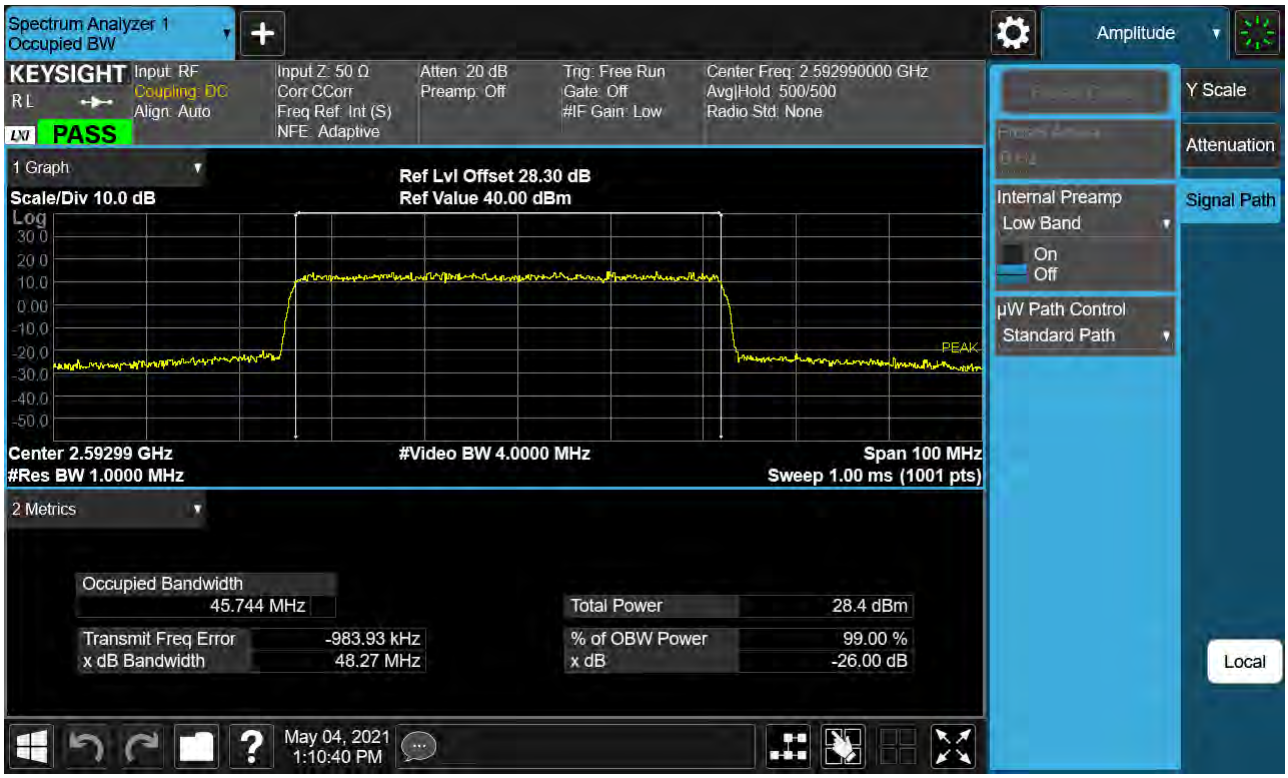
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 16-QAM)



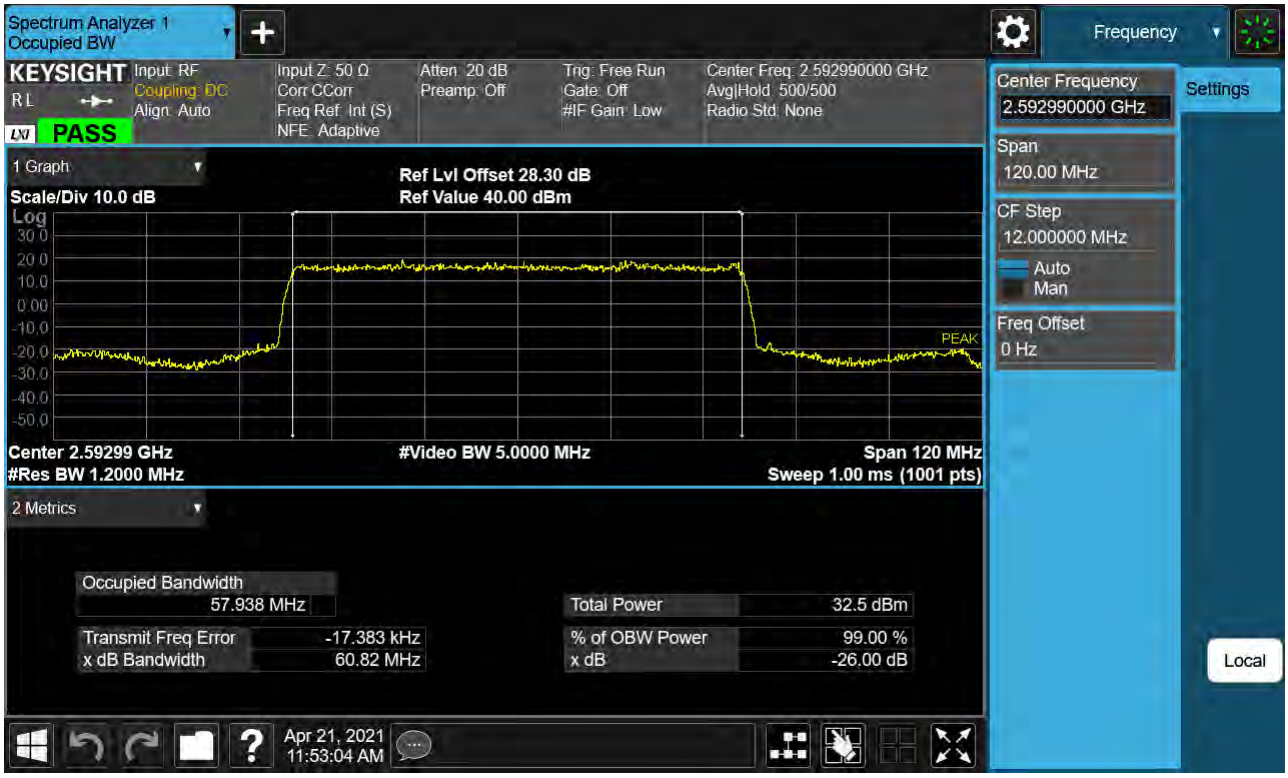
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 64-QAM)



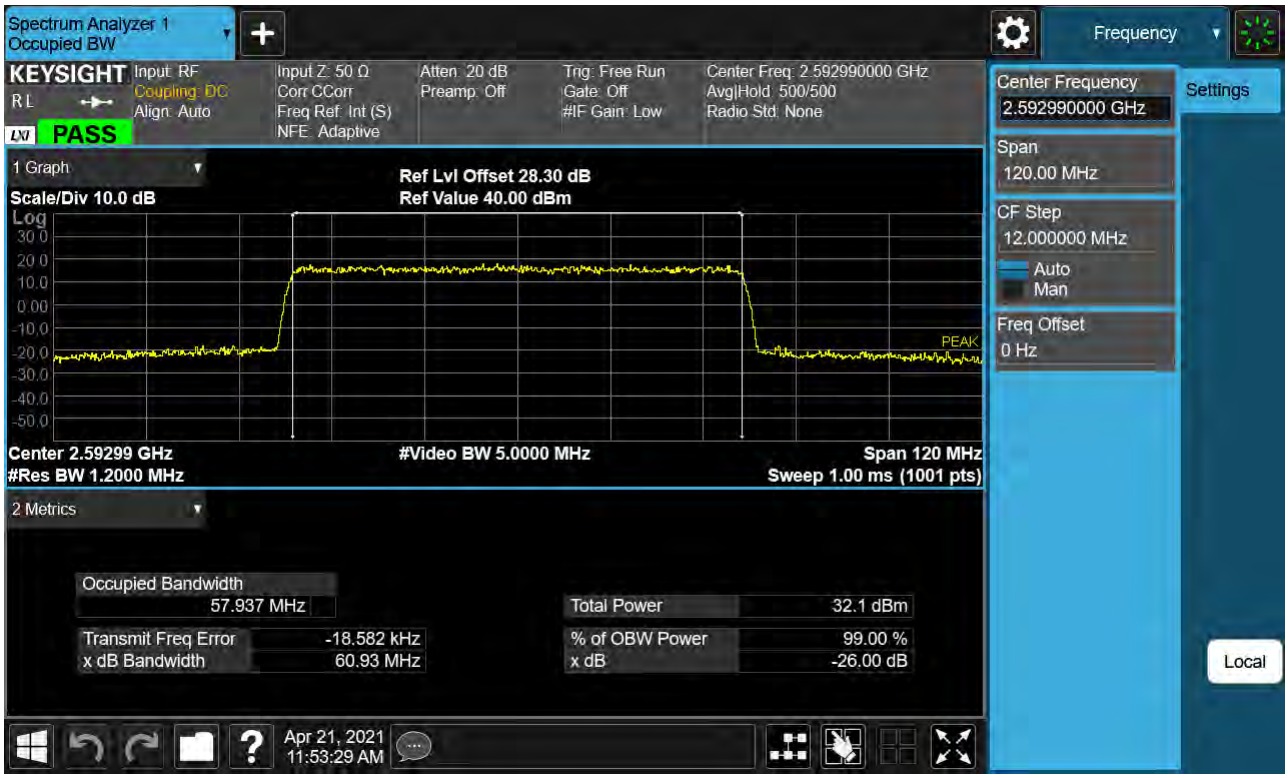
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 256-QAM)



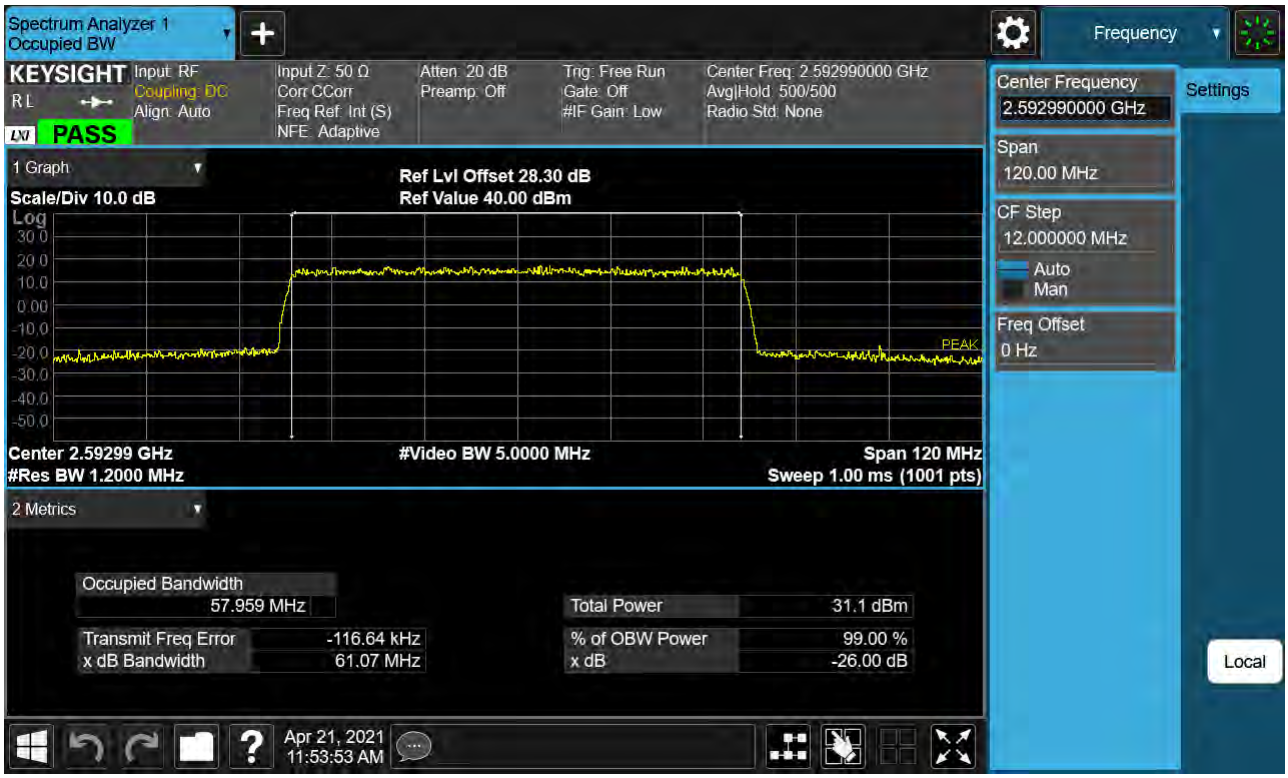
Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 BPSK)



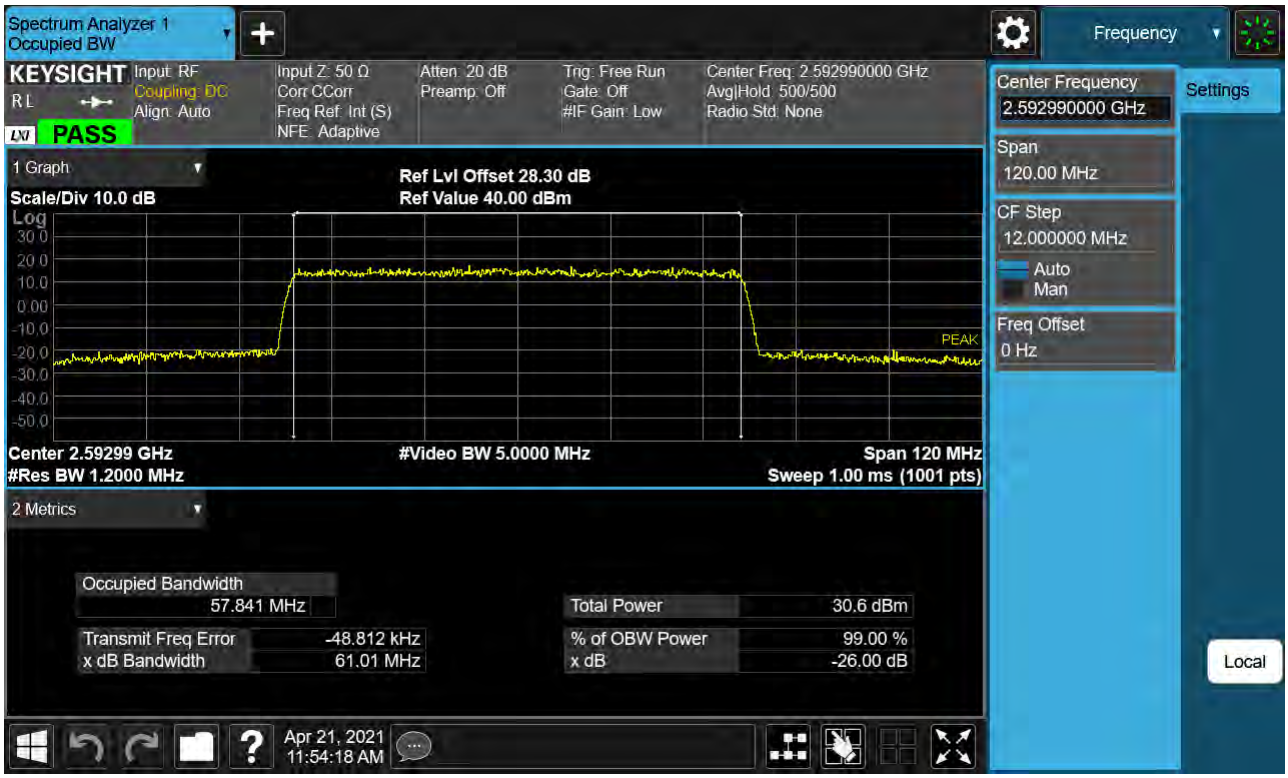
Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 QPSK)



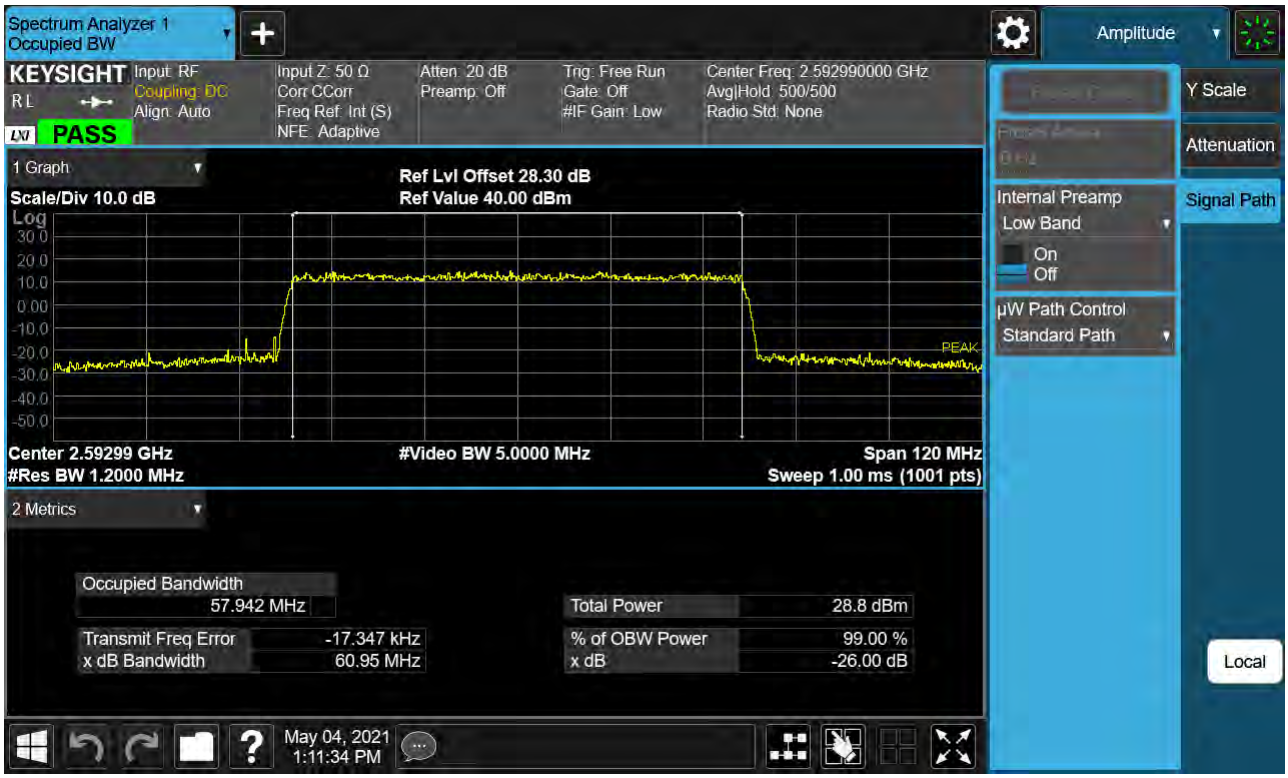
Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 16-QAM)



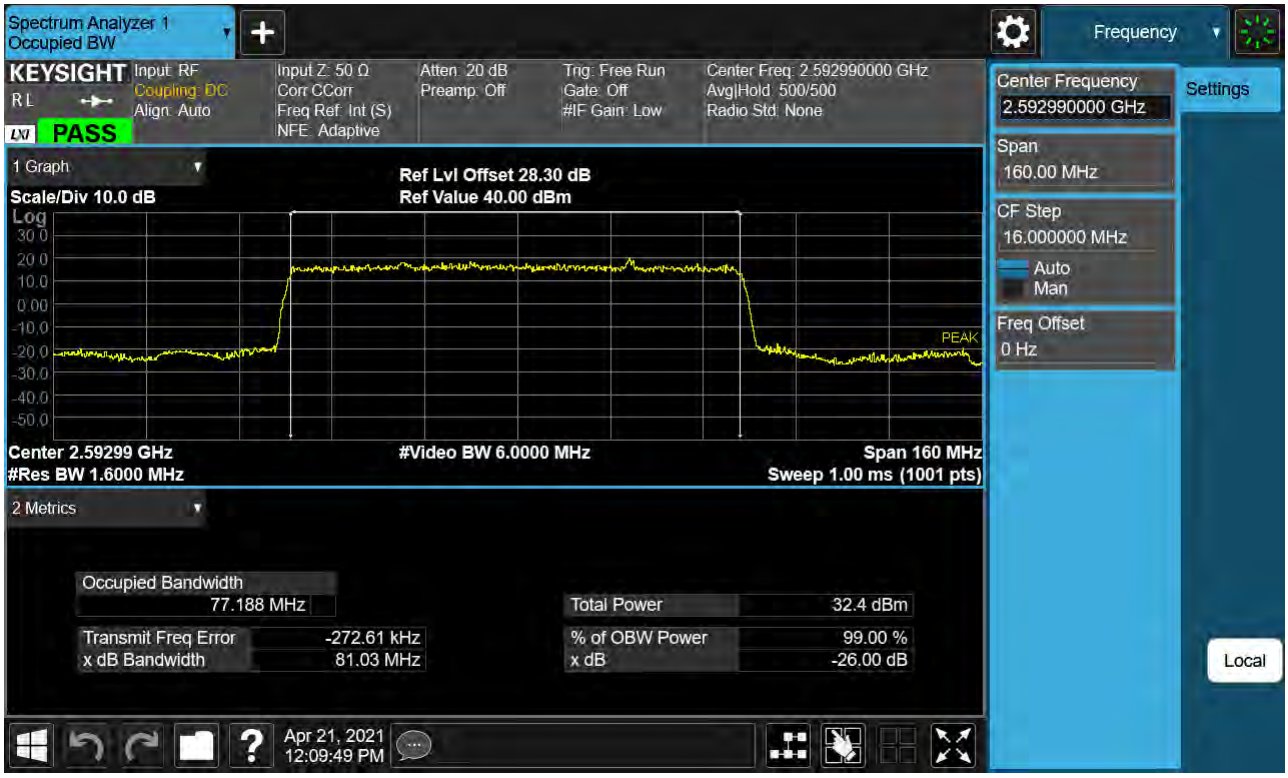
Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 64-QAM)



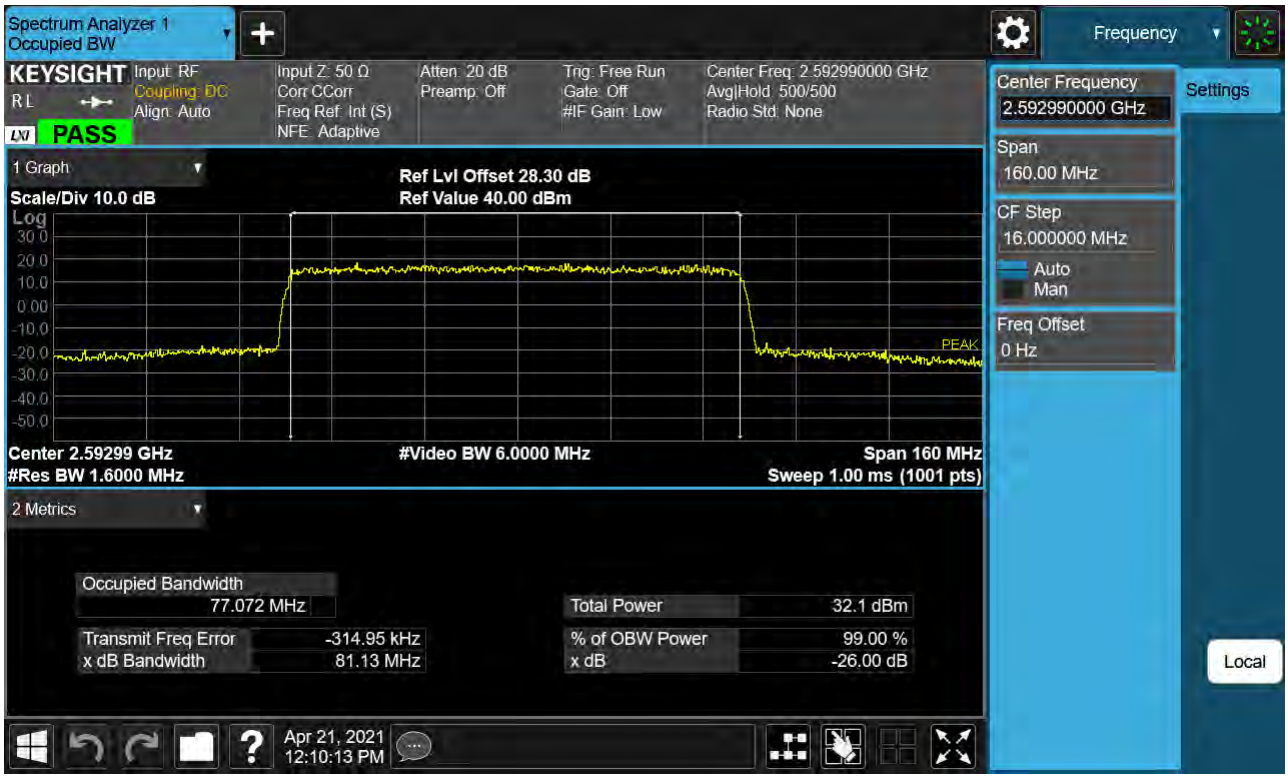
Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 256-QAM)



Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 BPSK)



Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 QPSK)

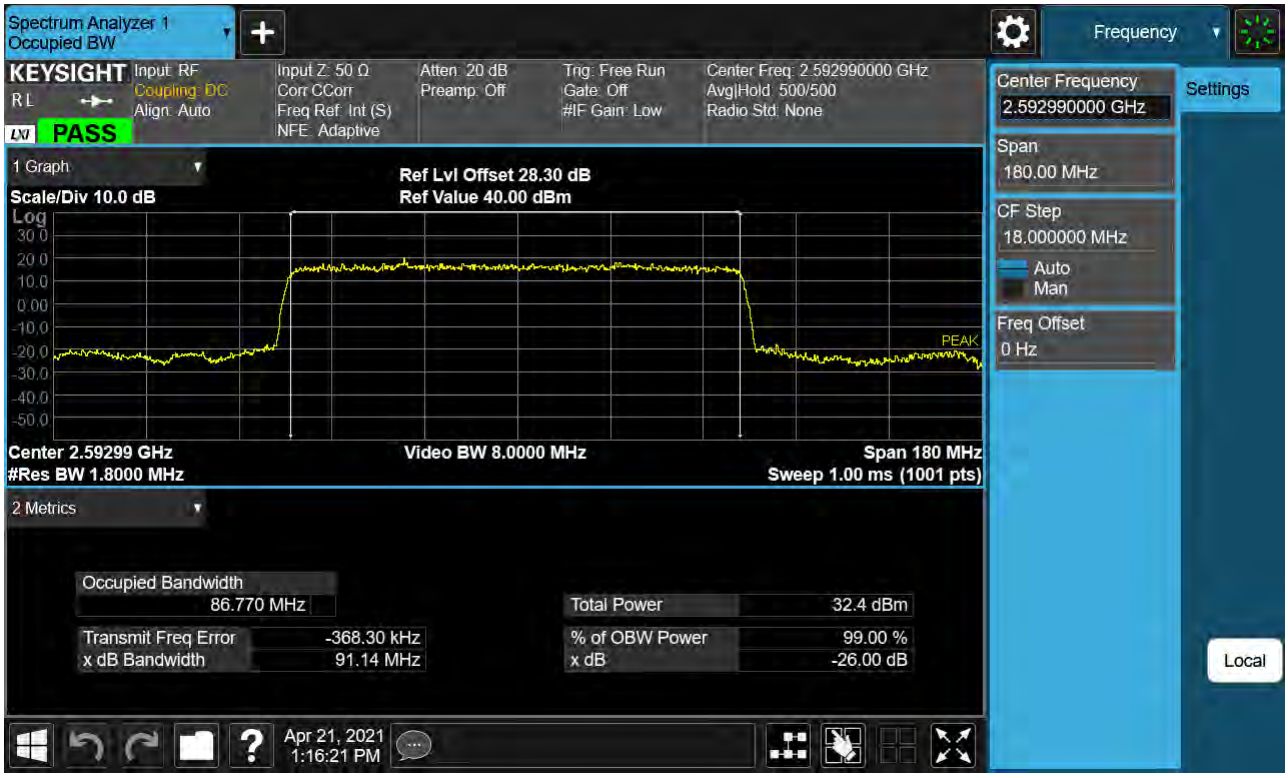


Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 16-QAM)

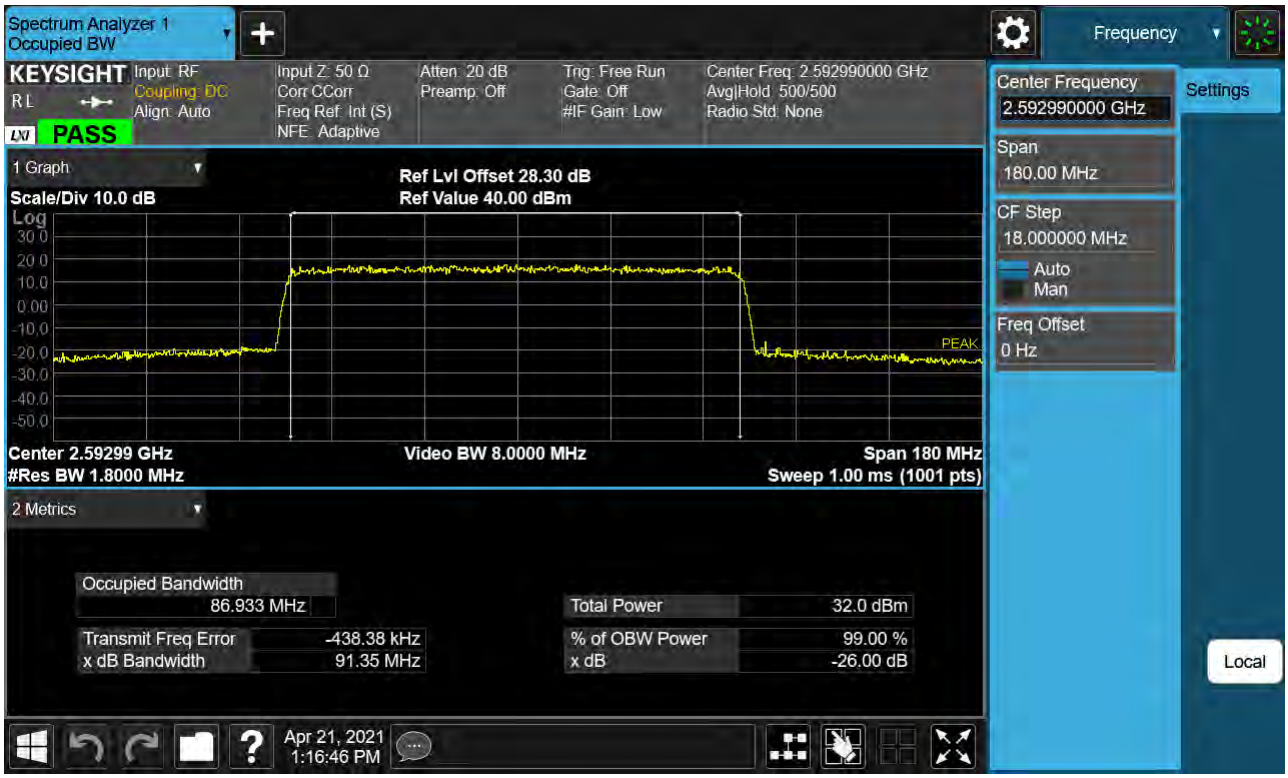
Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 64-QAM)

Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 256-QAM)

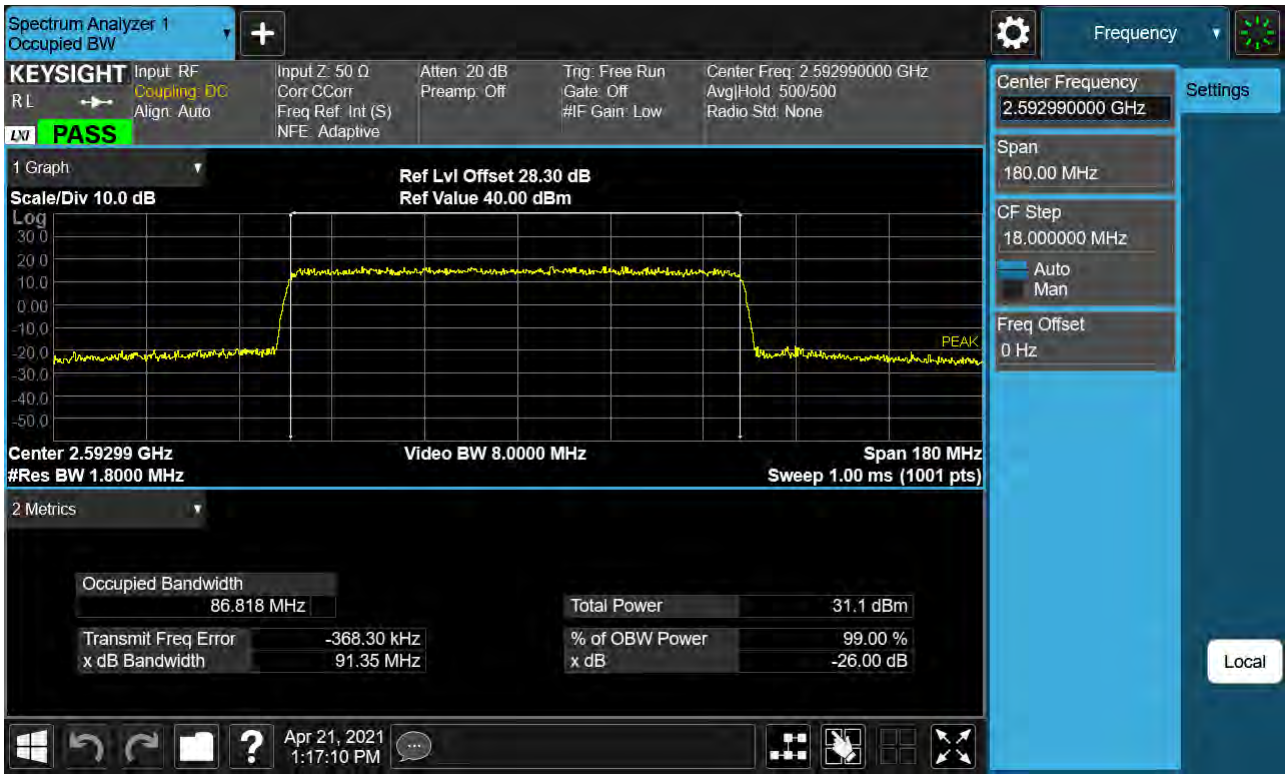
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 BPSK)



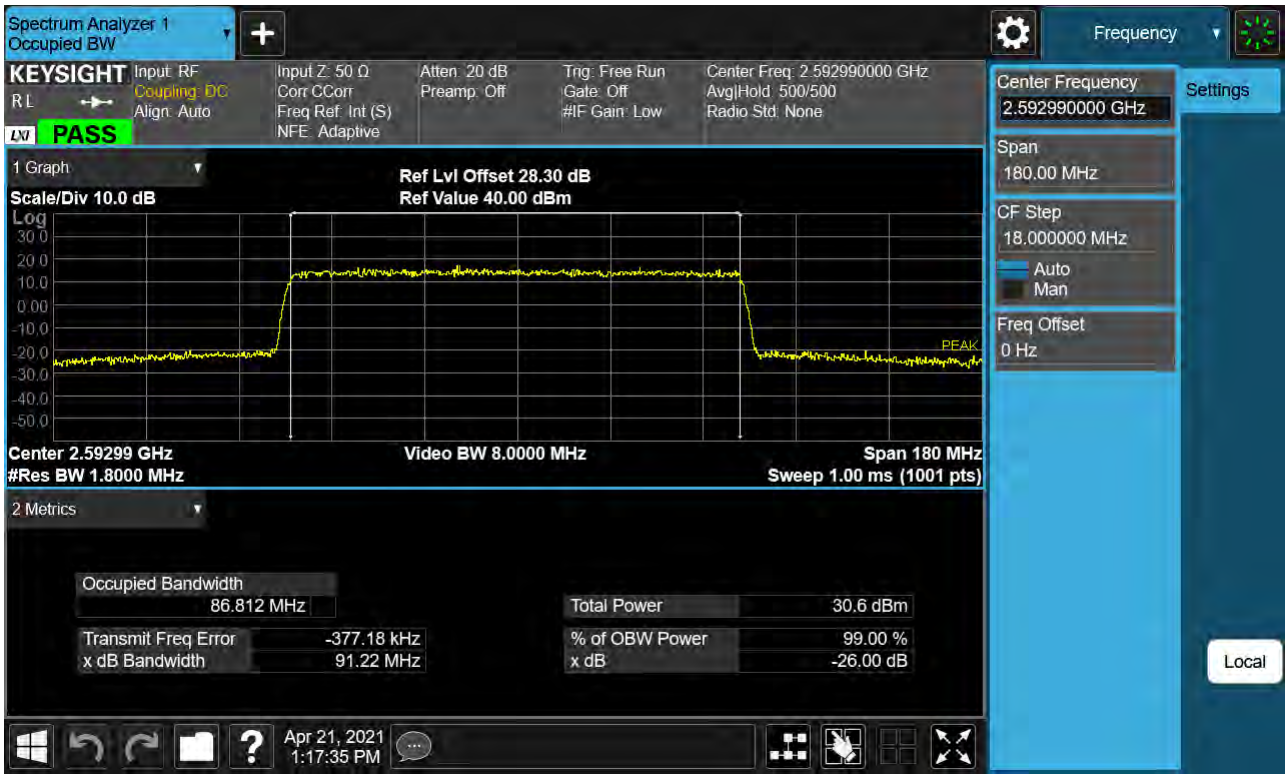
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 QPSK)



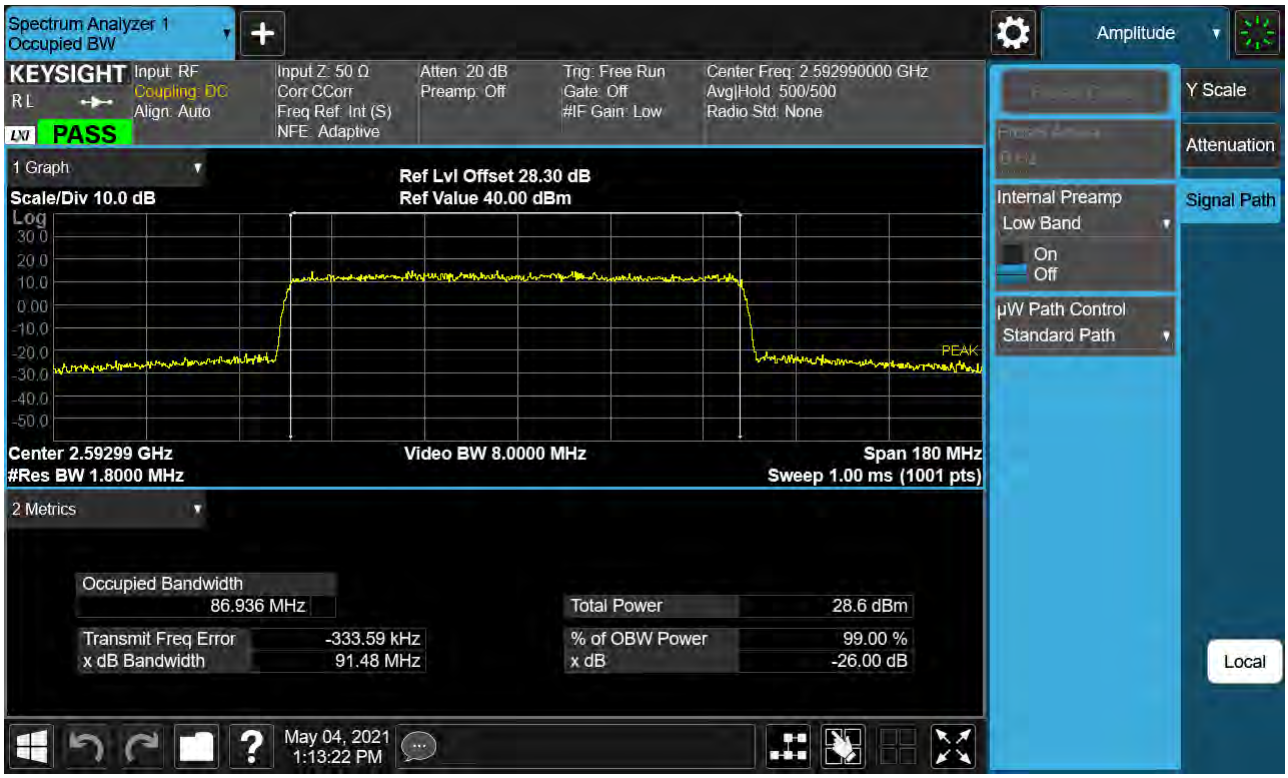
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 16-QAM)



Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 64-QAM)

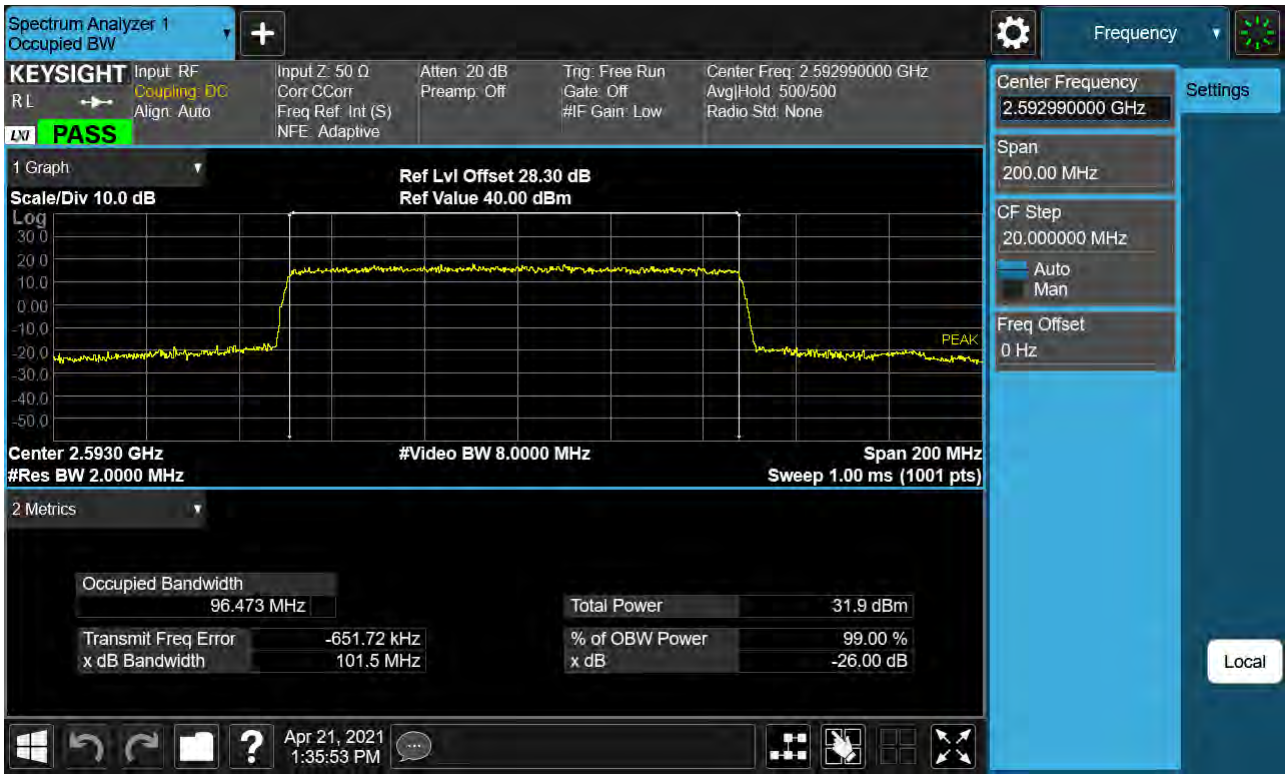


Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 256-QAM)

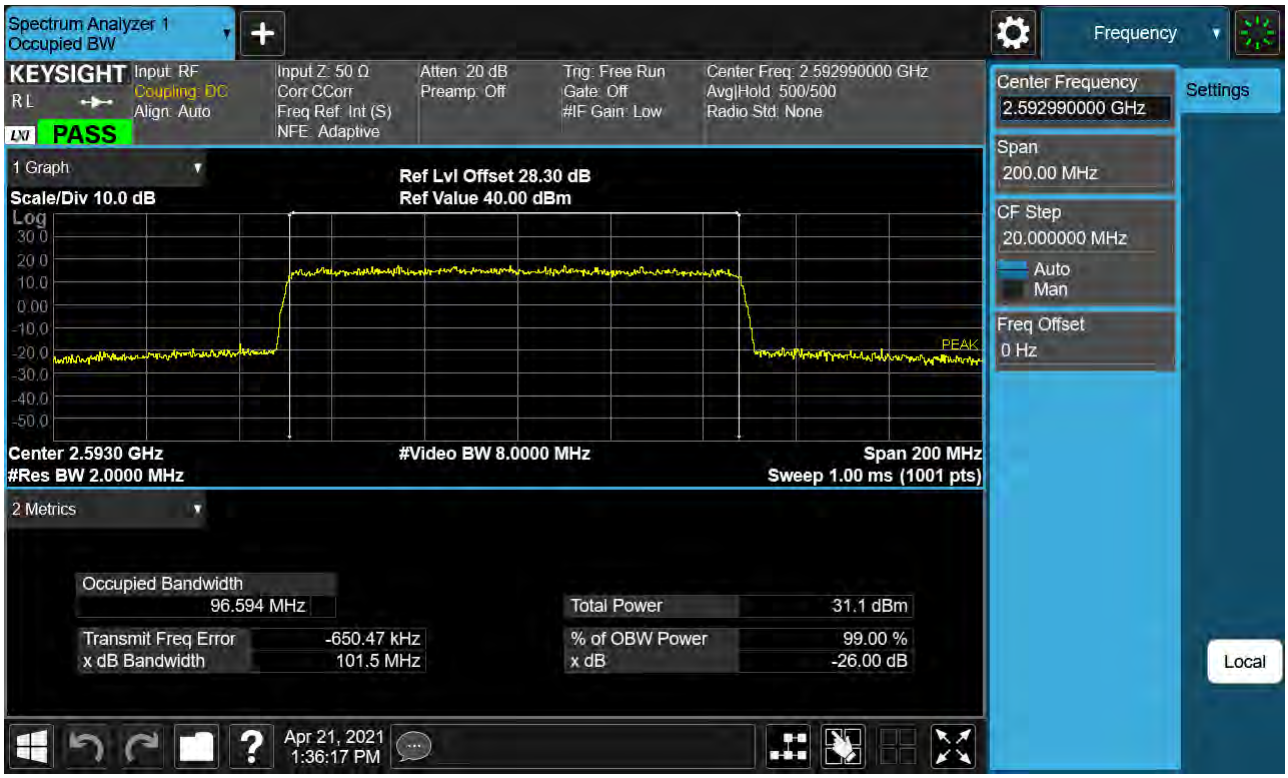


Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 BPSK)

Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 QPSK)



Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 16-QAM)



Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 64-QAM)

Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 256-QAM)

Sub6 n41. PAR Plot (20M BW_Ch.518598_BPSK)

Sub6 n41. PAR Plot (20M BW_Ch.518598_QPSK)

Sub6 n41. PAR Plot (20M BW_Ch.518598_16QAM)

Sub6 n41. PAR Plot (20M BW_Ch.518598_64QAM)

Sub6 n41. PAR Plot (20M BW_Ch.518598_256QAM)

Sub6 n41. PAR Plot (40M BW_Ch.518598_BPSK)

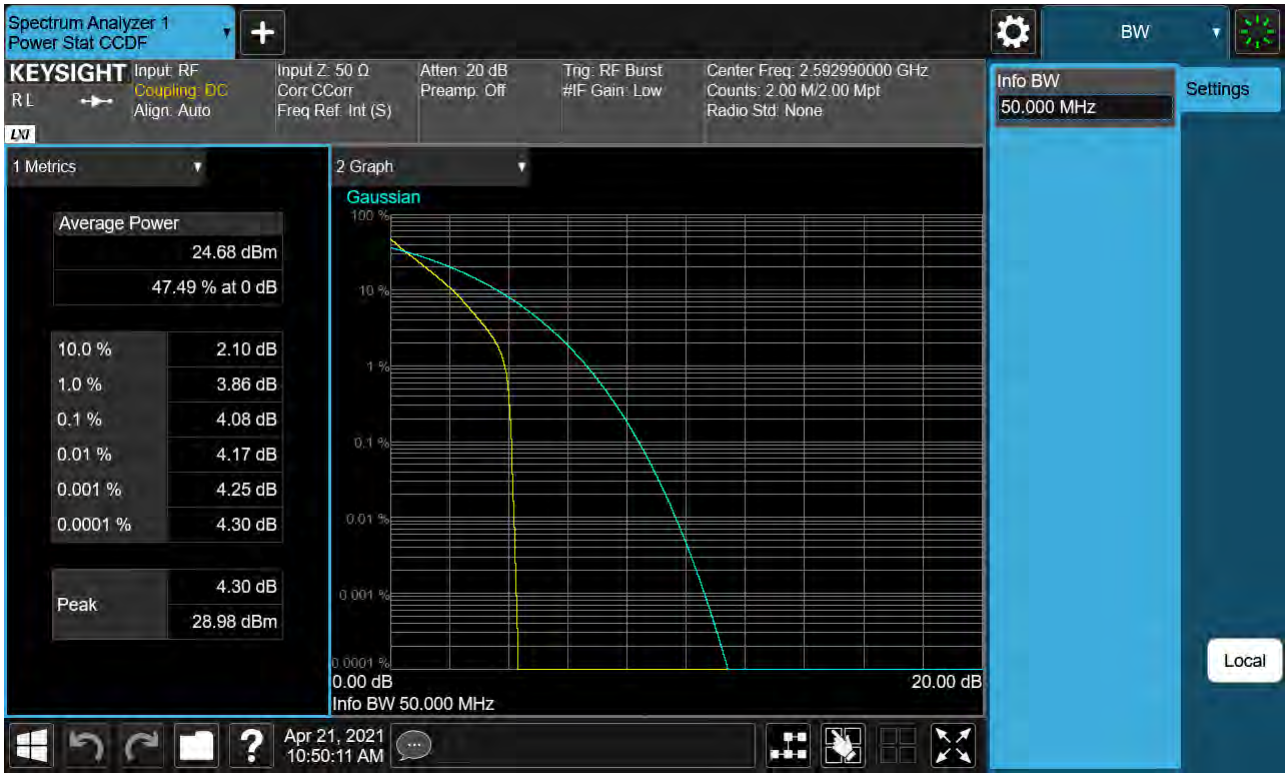
Sub6 n41. PAR Plot (40M BW_Ch.518598_QPSK)

Sub6 n41. PAR Plot (40M BW_Ch.518598_16QAM)

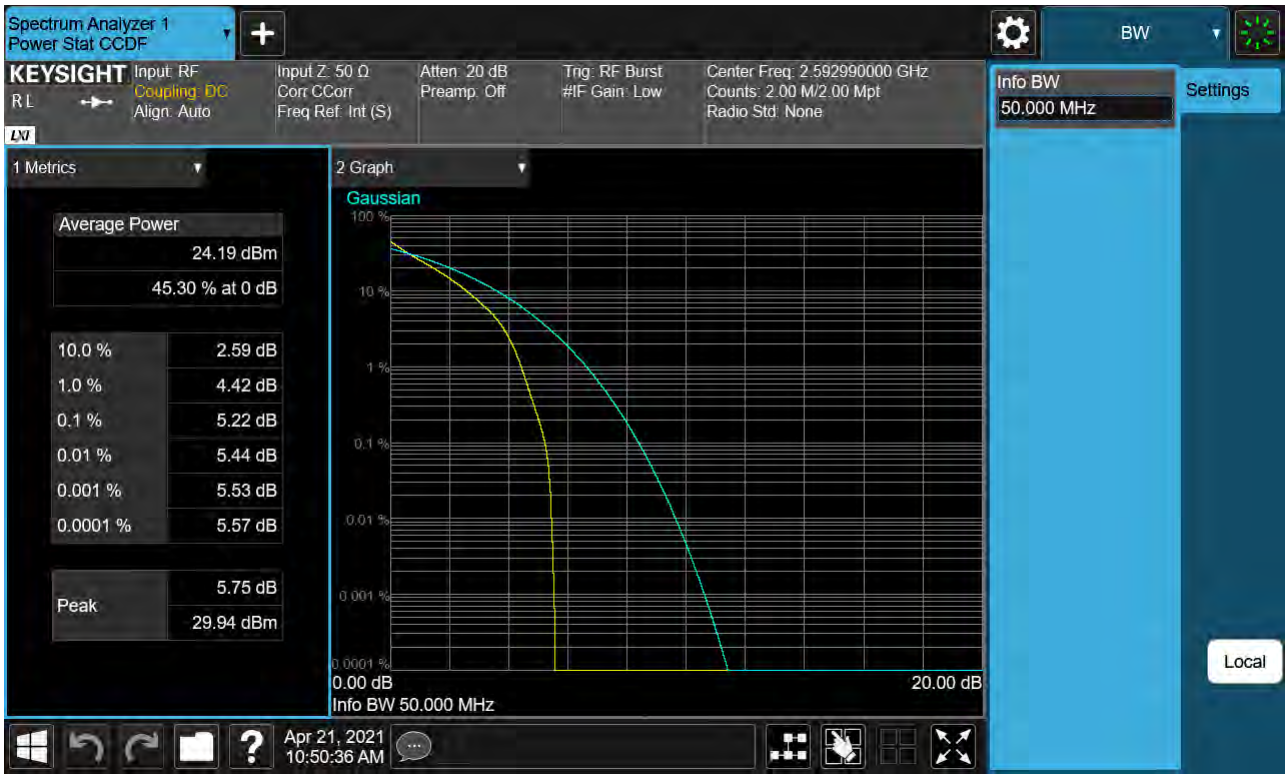
Sub6 n41. PAR Plot (40M BW_Ch.518598_64QAM)

Sub6 n41. PAR Plot (40M BW_Ch.518598_256QAM)

Sub6 n41. PAR Plot (50M BW_Ch.518598_BPSK)



Sub6 n41. PAR Plot (50M BW_Ch.518598_QPSK)



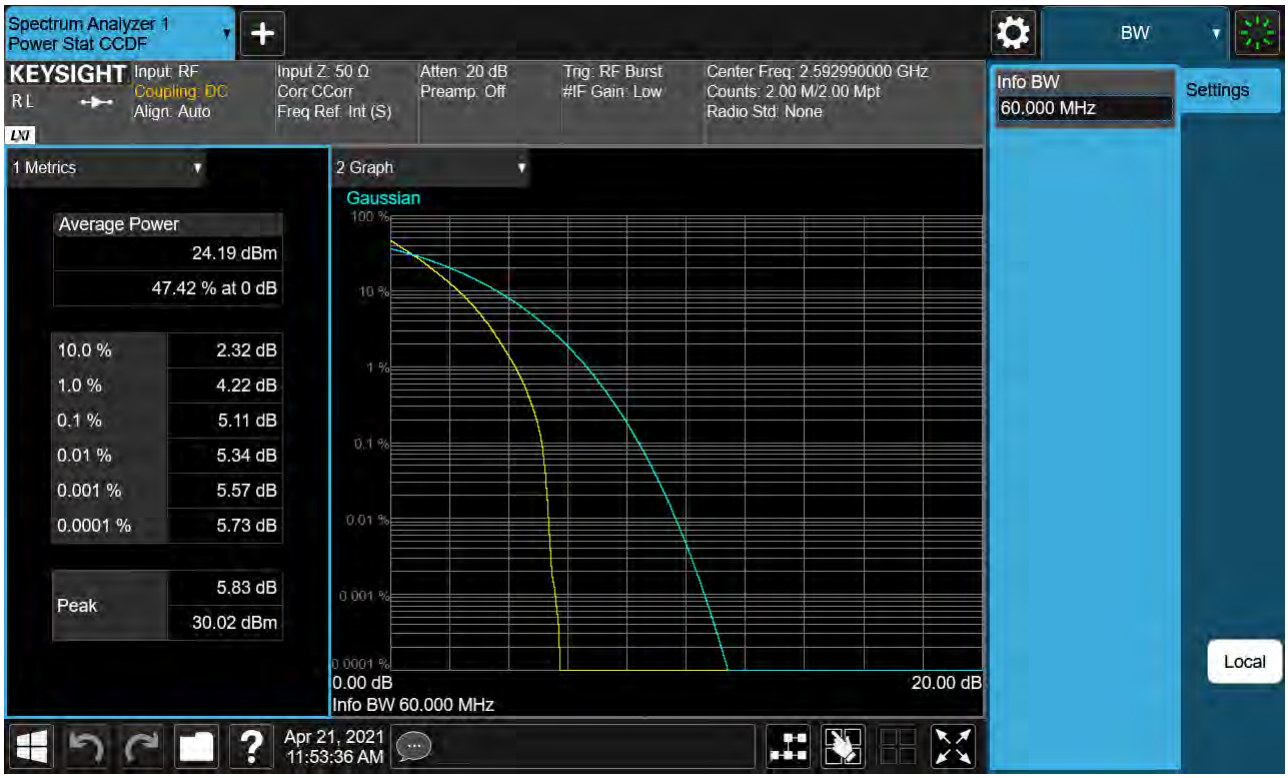
Sub6 n41. PAR Plot (50M BW_Ch.518598_16QAM)

Sub6 n41. PAR Plot (50M BW_Ch.518598_64QAM)

Sub6 n41. PAR Plot (50M BW_Ch.518598_256QAM)

Sub6 n41. PAR Plot (60M BW_Ch.518598_BPSK)

Sub6 n41. PAR Plot (60M BW_Ch.518598_QPSK)

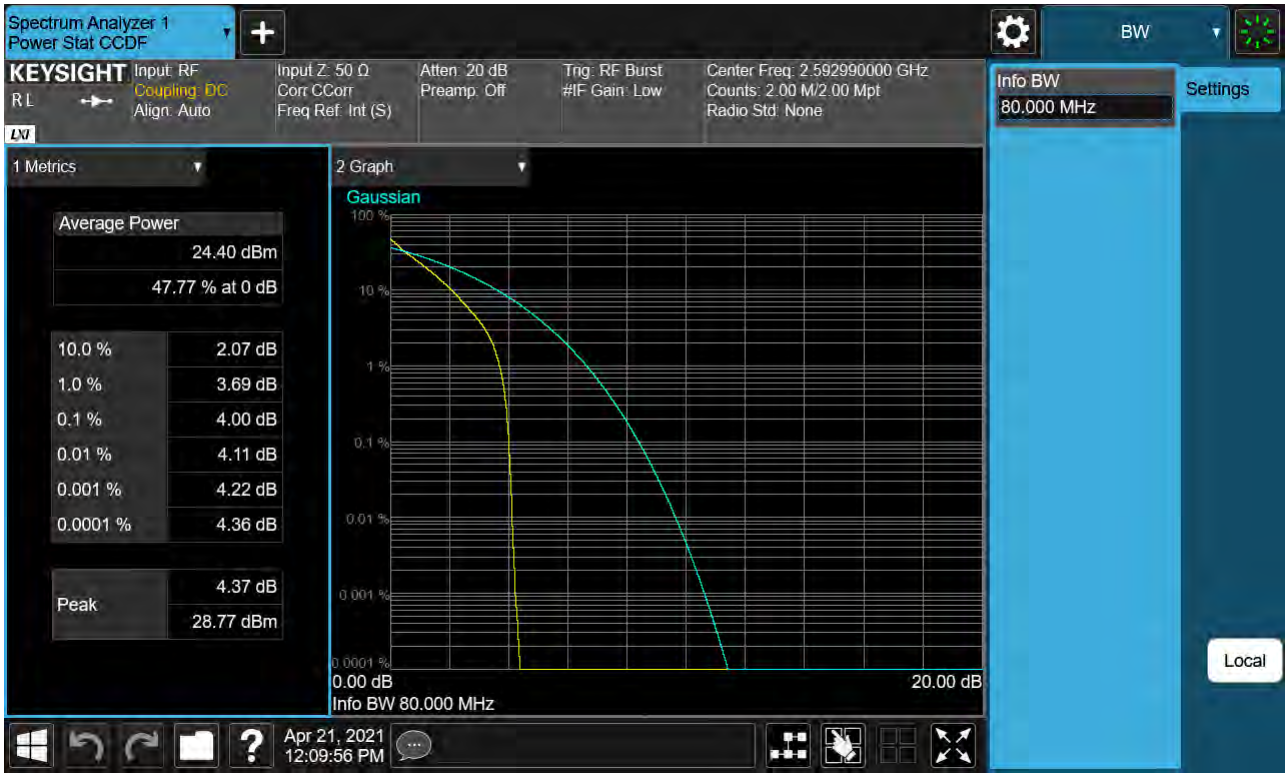


Sub6 n41. PAR Plot (60M BW_Ch.518598_16QAM)

Sub6 n41. PAR Plot (60M BW_Ch.518598_64QAM)

Sub6 n41. PAR Plot (60M BW_Ch.518598_256QAM)

Sub6 n41. PAR Plot (80M BW_Ch.518598_BPSK)



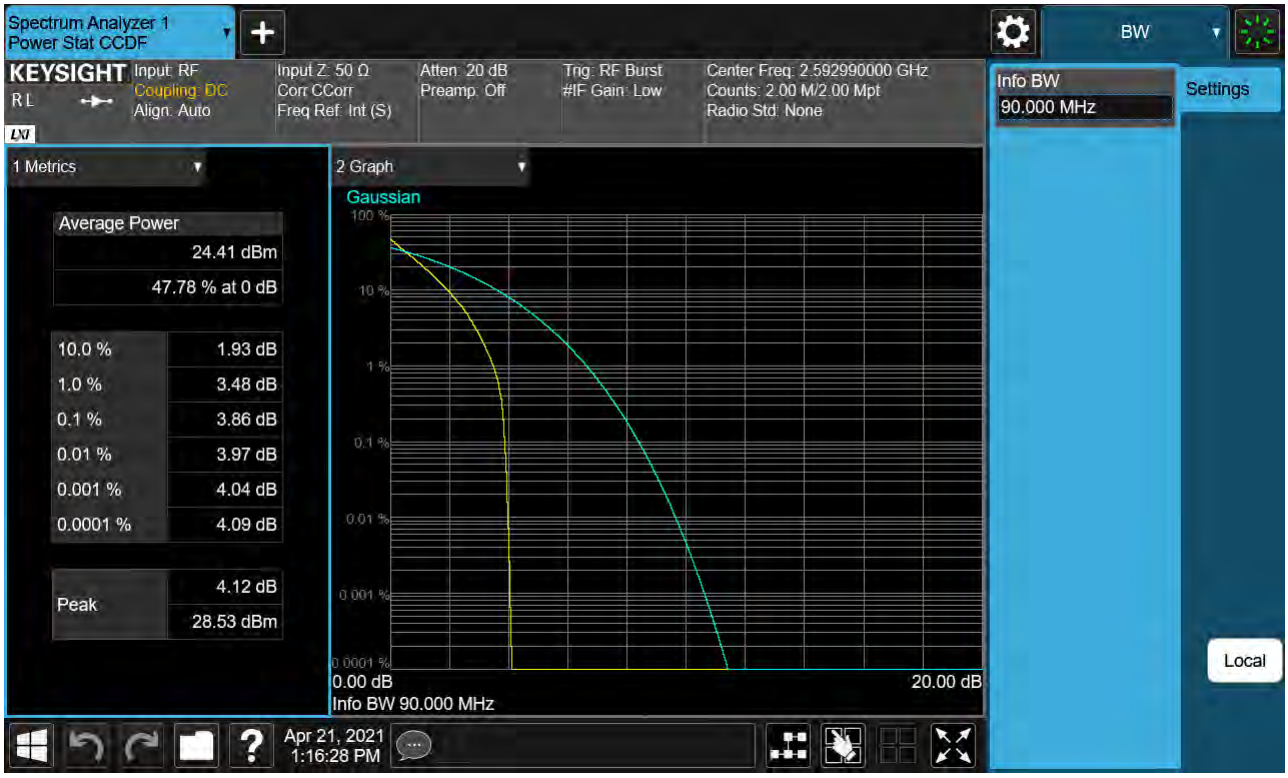
Sub6 n41. PAR Plot (80M BW_Ch.518598_QPSK)

Sub6 n41. PAR Plot (80M BW_Ch.518598_16QAM)

Sub6 n41. PAR Plot (80M BW_Ch.518598_64QAM)

Sub6 n41. PAR Plot (80M BW_Ch.518598_256QAM)

Sub6 n41. PAR Plot (90M BW_Ch.518598_BPSK)



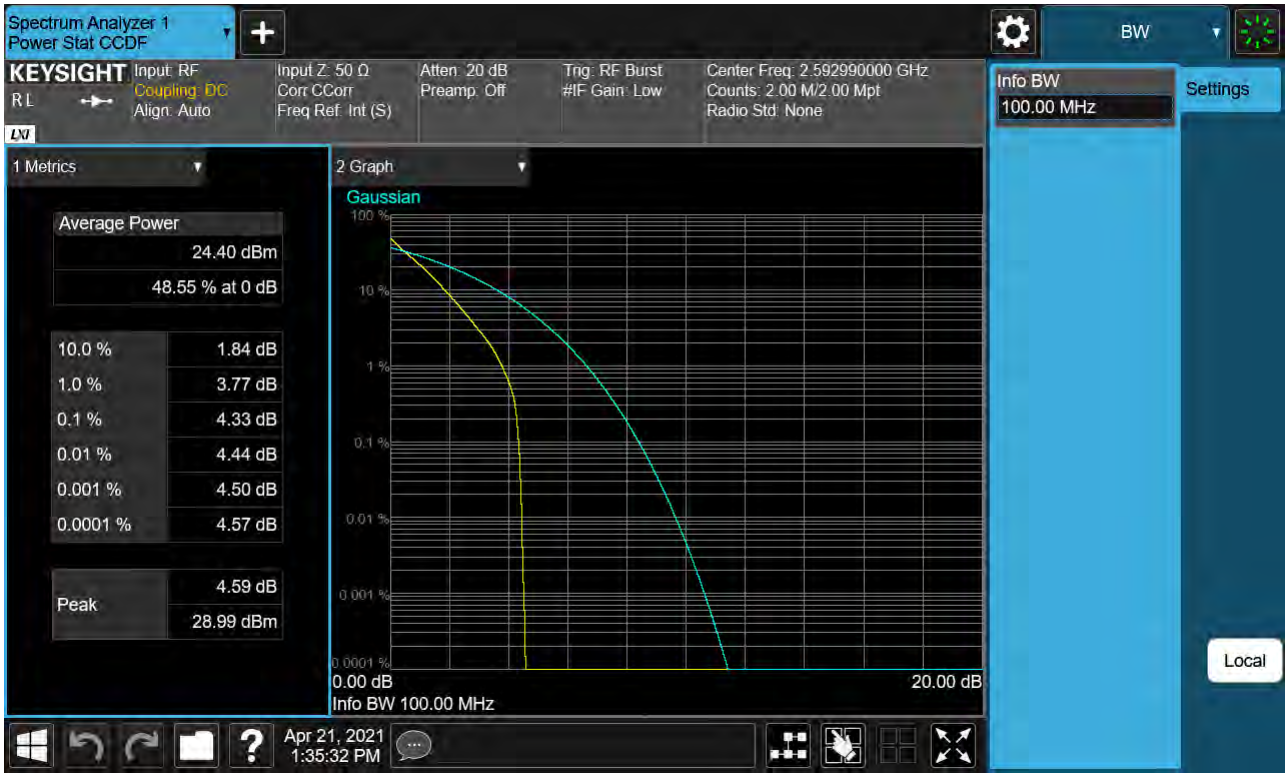
Sub6 n41. PAR Plot (90M BW_Ch.518598_QPSK)

Sub6 n41. PAR Plot (90M BW_Ch.518598_16QAM)

Sub6 n41. PAR Plot (90M BW_Ch.518598_64QAM)

Sub6 n41. PAR Plot (90M BW_Ch.518598_256QAM)

Sub6 n41. PAR Plot (100M BW_Ch.518598_BPSK)



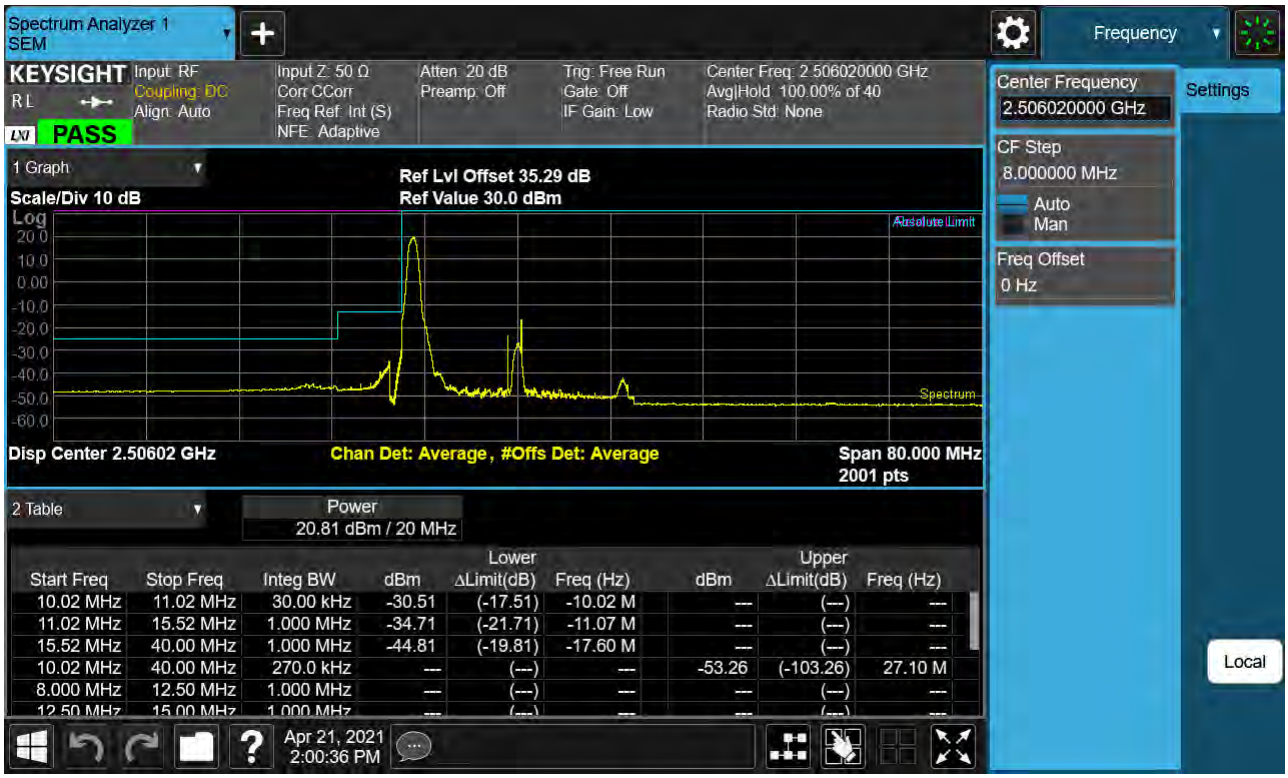
Sub6 n41. PAR Plot (100M BW_Ch.518598_QPSK)

Sub6 n41. PAR Plot (100M BW_Ch.518598_16QAM)

Sub6 n41. PAR Plot (100M BW_Ch.518598_64QAM)

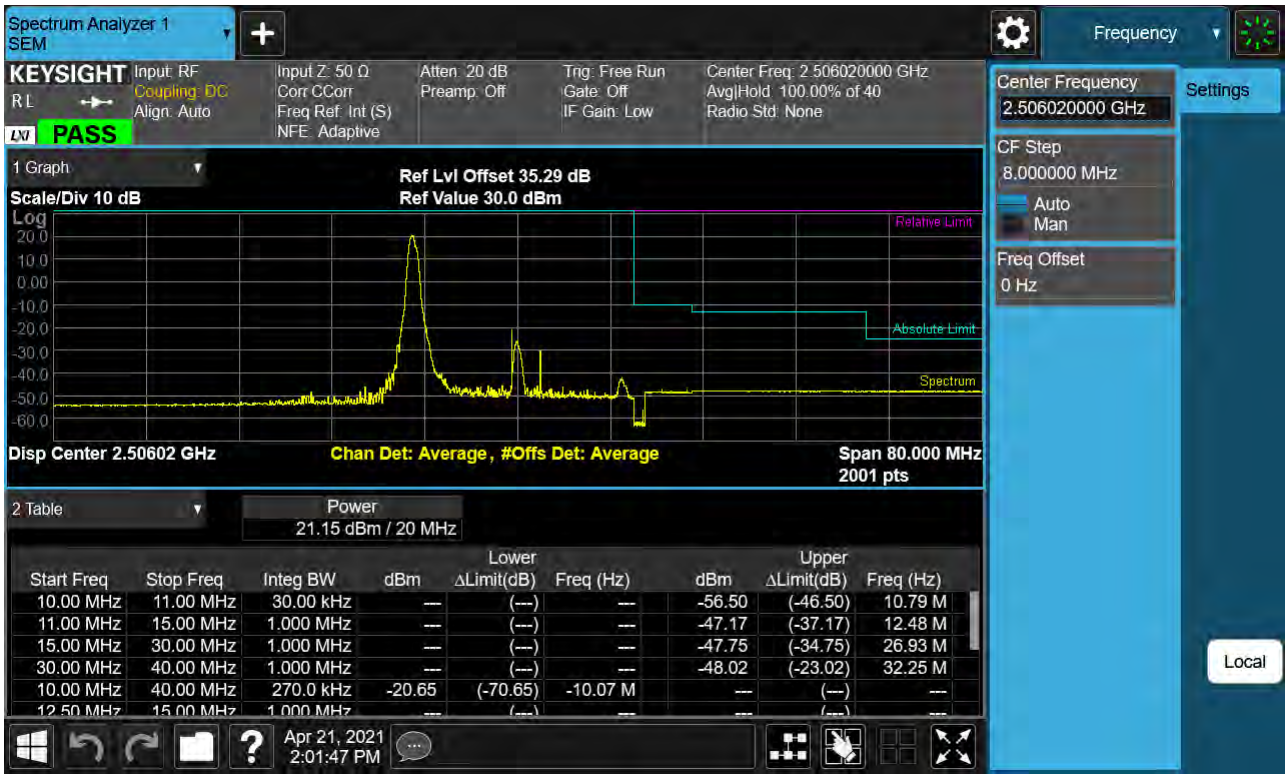
Sub6 n41. PAR Plot (100M BW_Ch.518598_256QAM)

Sub6 n41. Low Channel Edge Plot (20 MHz Ch.501204 BPSK RB 1)-1



Sub6 n41. Low Channel Edge Plot (20 MHz Ch.501204 BPSK)-1

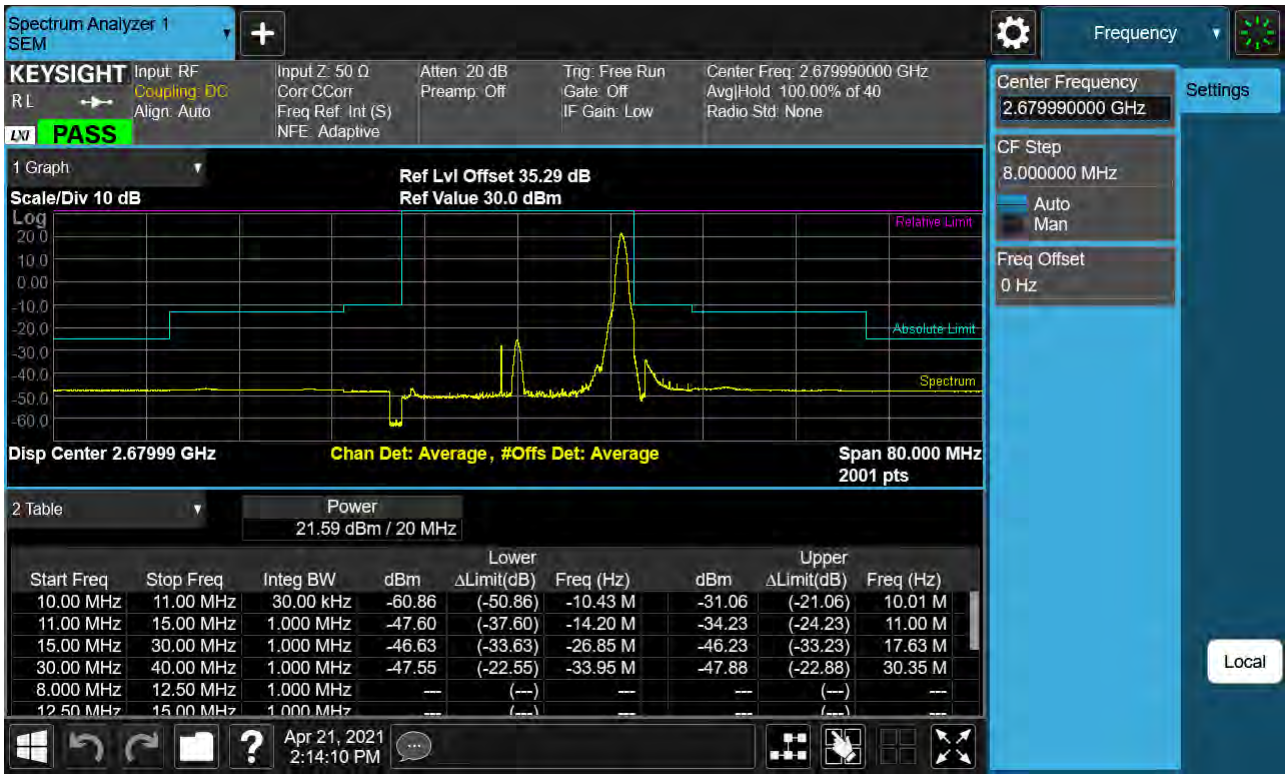
Sub6 n41. Low Channel Edge Plot (20 MHz Ch.501204 BPSK_RB1)-2



Sub6 n41. Low Channel Edge Plot (20 MHz Ch.501204 BPSK)-2

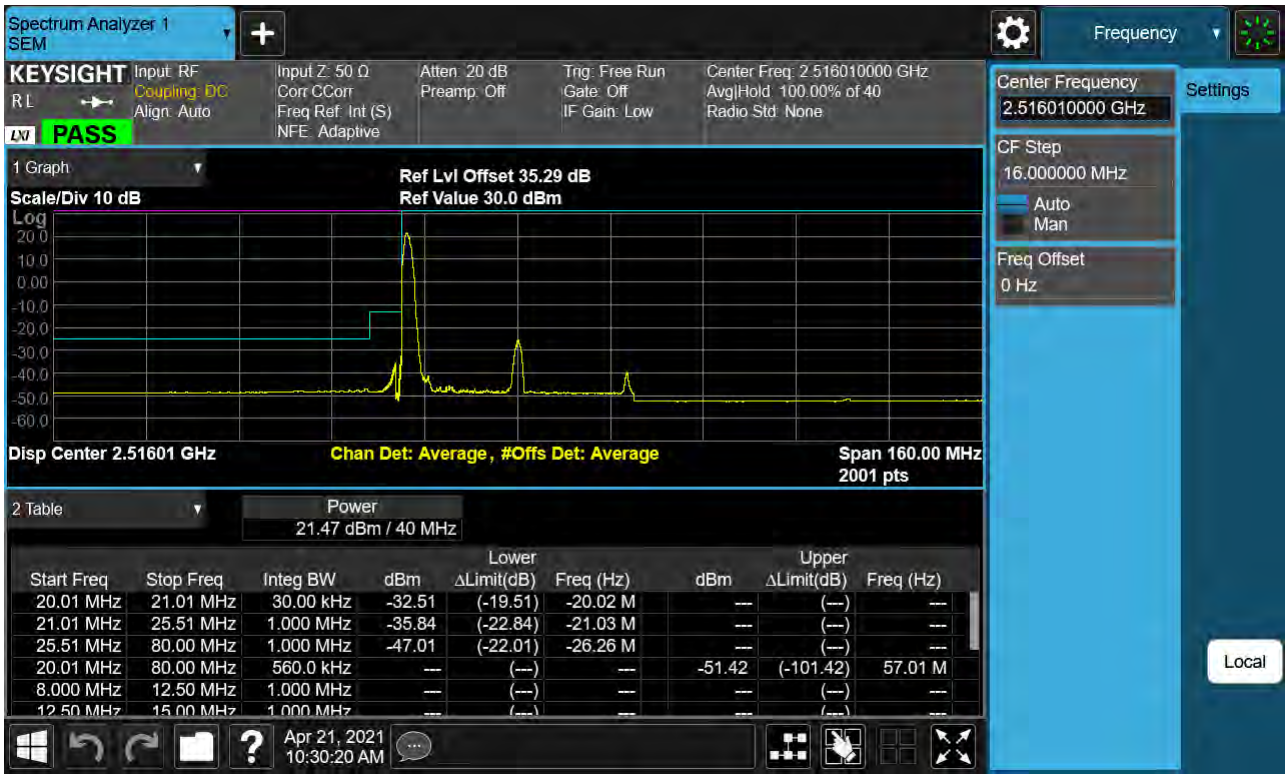
Sub6 n41. Mid Channel Edge Plot (20 MHz Ch.518598 BPSK)

Sub6 n41. High Channel Edge Plot (20 MHz Ch.535998 BPSK RB 1)



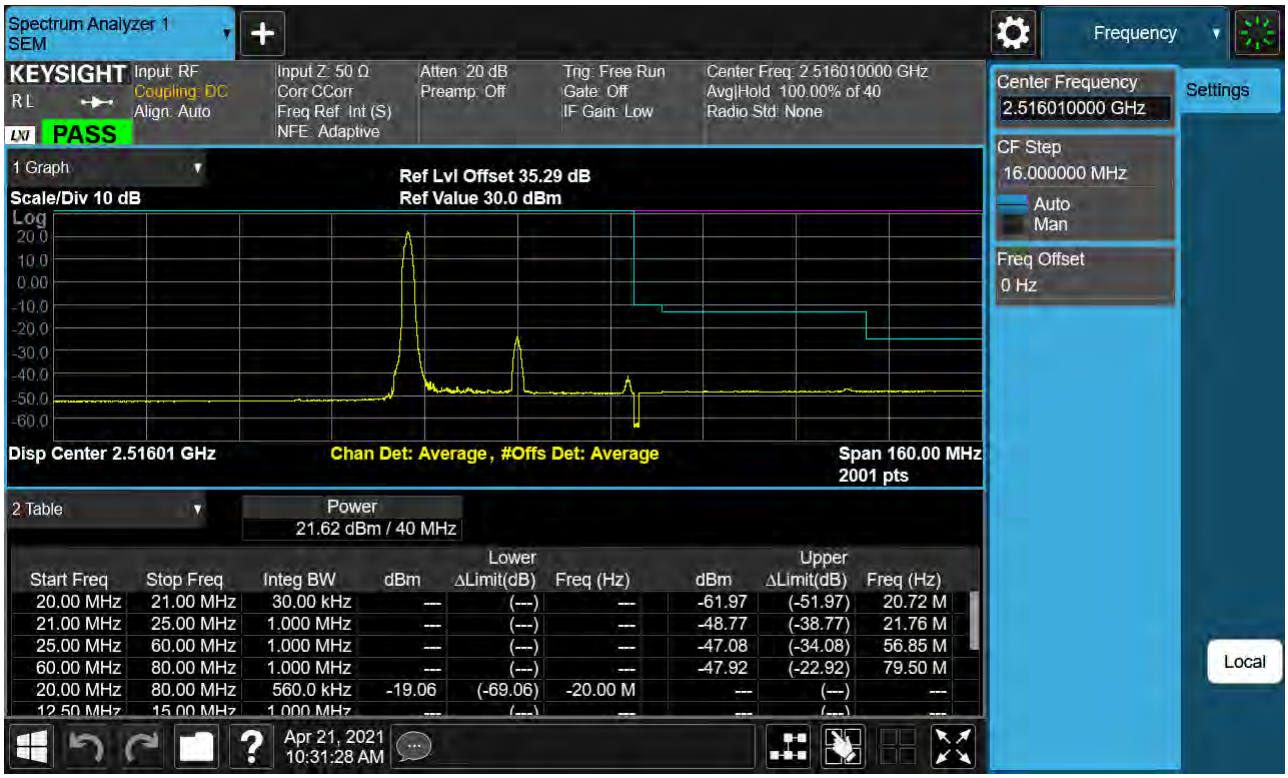
Sub6 n41. High Channel Edge Plot (20 MHz Ch.535998 BPSK)

Sub6 n41. Low Channel Edge Plot (40 MHz Ch.503202 BPSK RB 1)-1



Sub6 n41. Low Channel Edge Plot (40 MHz Ch.503202 BPSK)-1

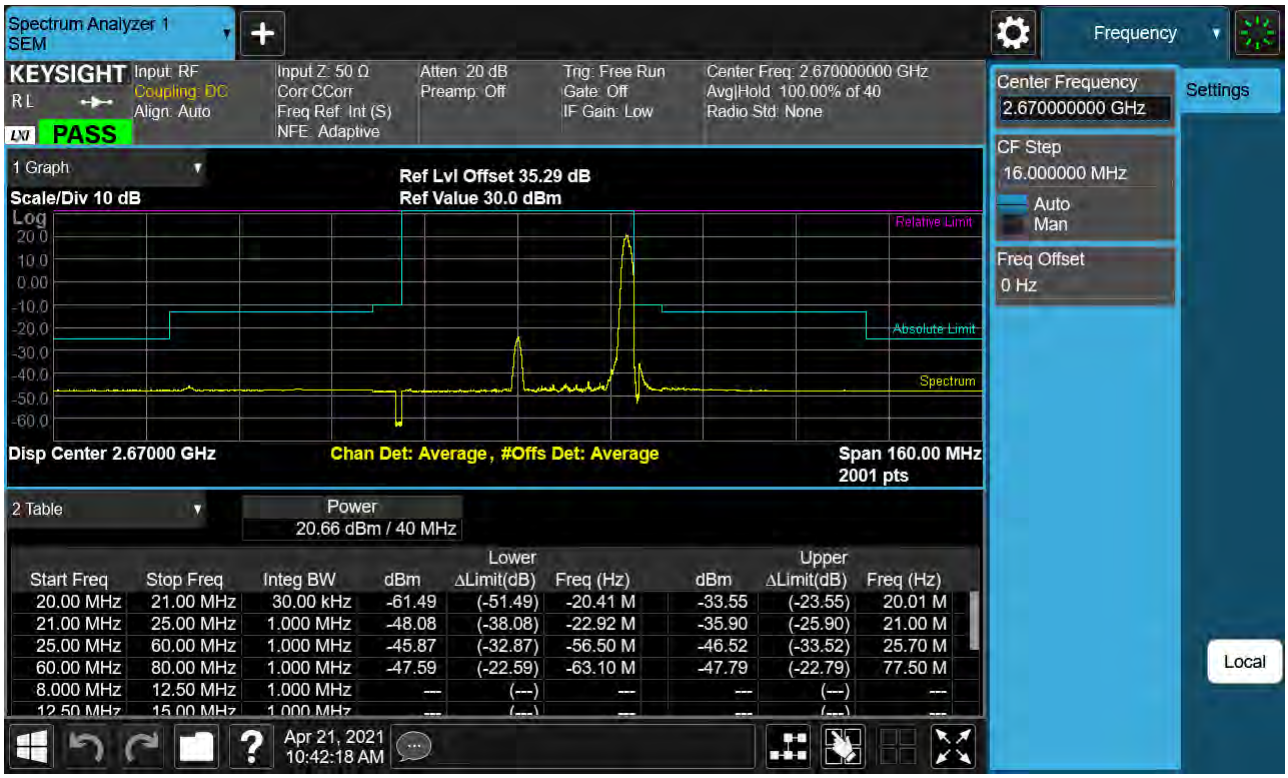
Sub6 n41. Low Channel Edge Plot (40 MHz Ch.503202 BPSK_RB1)-2



Sub6 n41. Low Channel Edge Plot (40 MHz Ch.503202 BPSK)-2

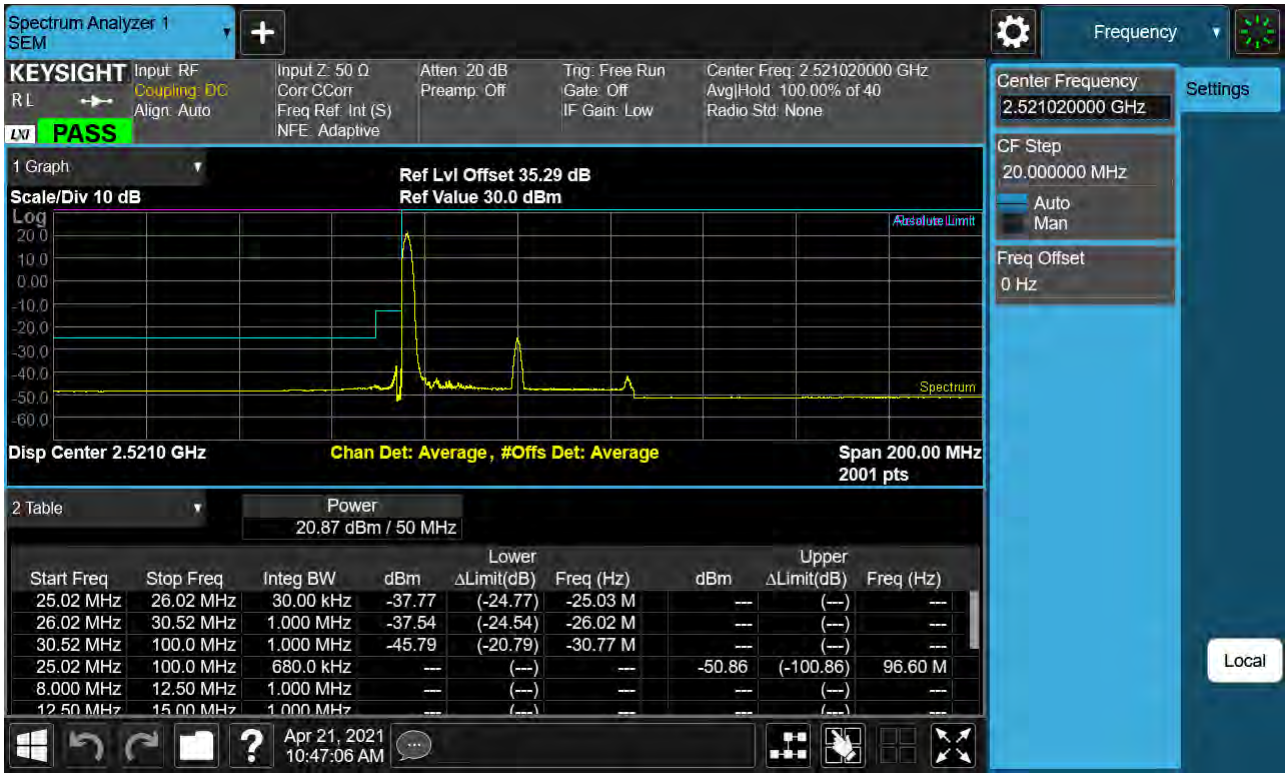
Sub6 n41. Mid Channel Edge Plot (40 MHz Ch.518598 BPSK)

Sub6 n41. High Channel Edge Plot (40 MHz Ch.534000 BPSK RB 1)



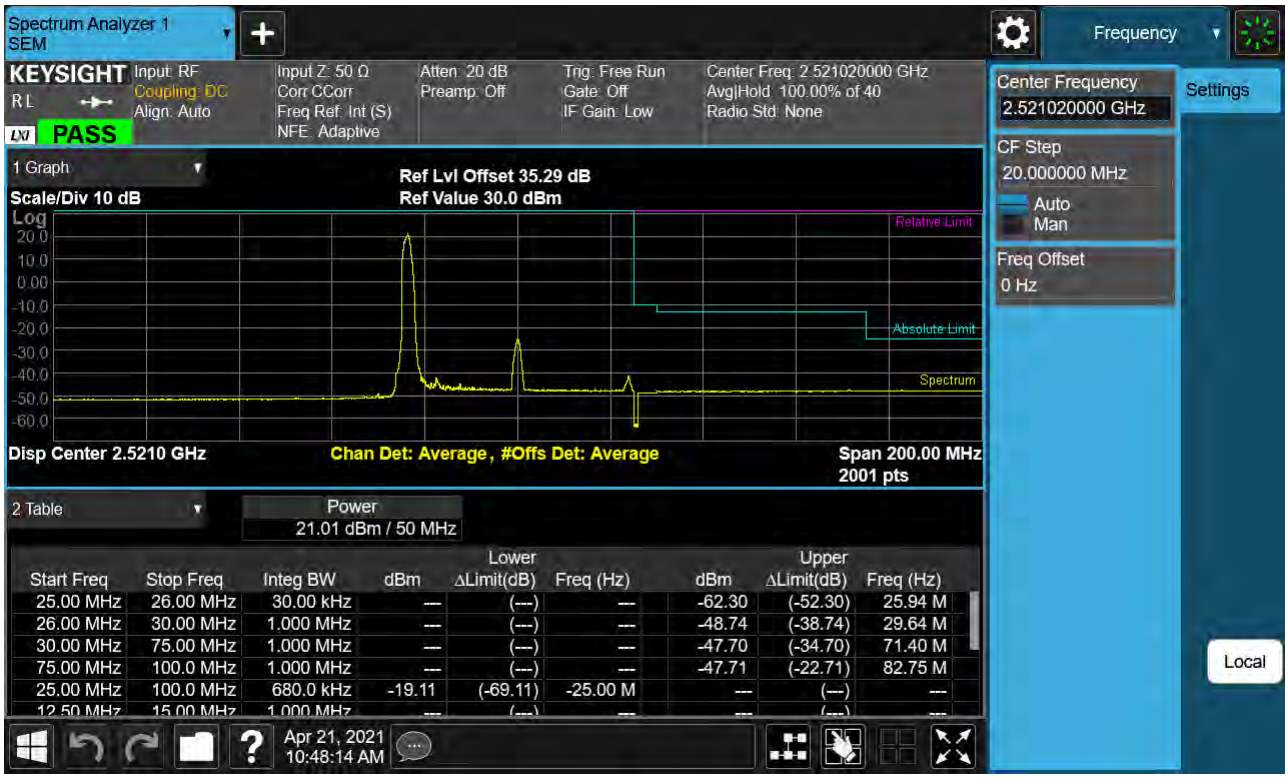
Sub6 n41. High Channel Edge Plot (40 MHz Ch.534000 BPSK)

Sub6 n41. Low Channel Edge Plot (50 MHz Ch.504204 BPSK RB 1)-1



Sub6 n41. Low Channel Edge Plot (50 MHz Ch.504204 BPSK)-1

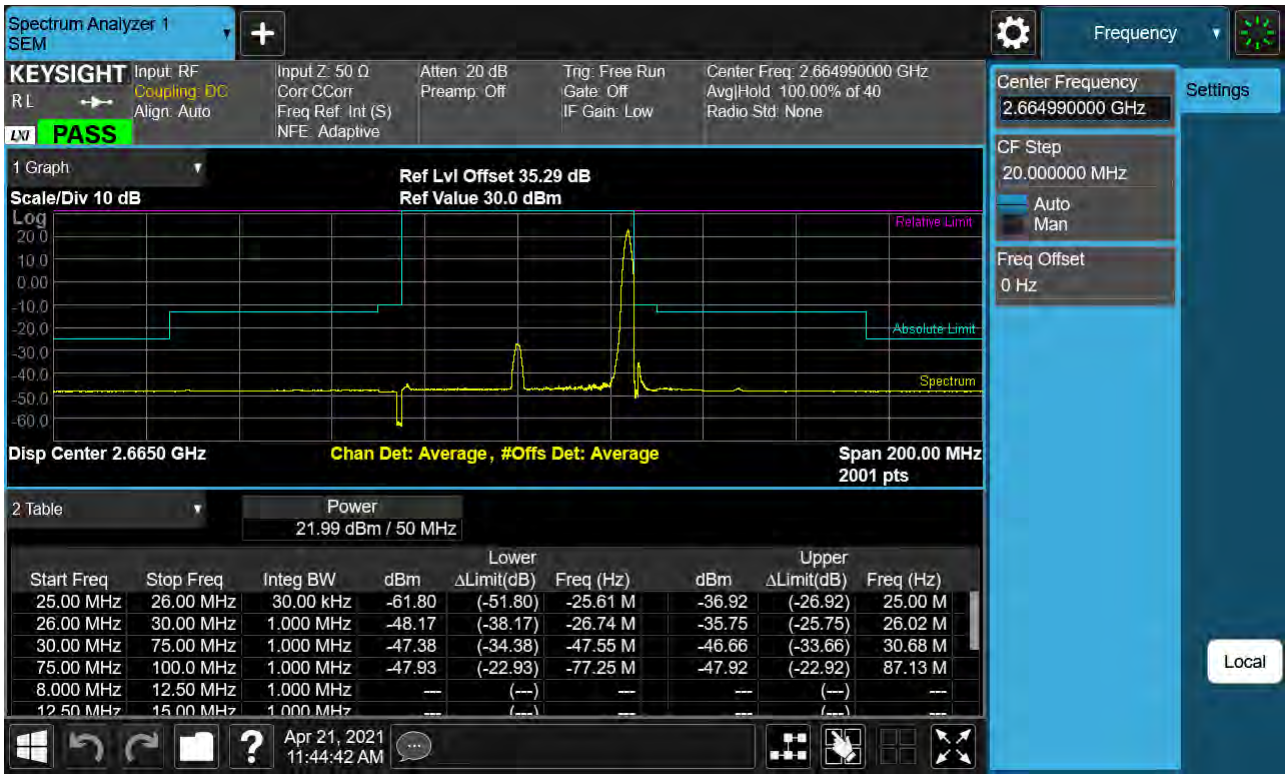
Sub6 n41. Low Channel Edge Plot (50 MHz Ch.504204 BPSK_RB 1)-2



Sub6 n41. Low Channel Edge Plot (50 MHz Ch.504204 BPSK)-2

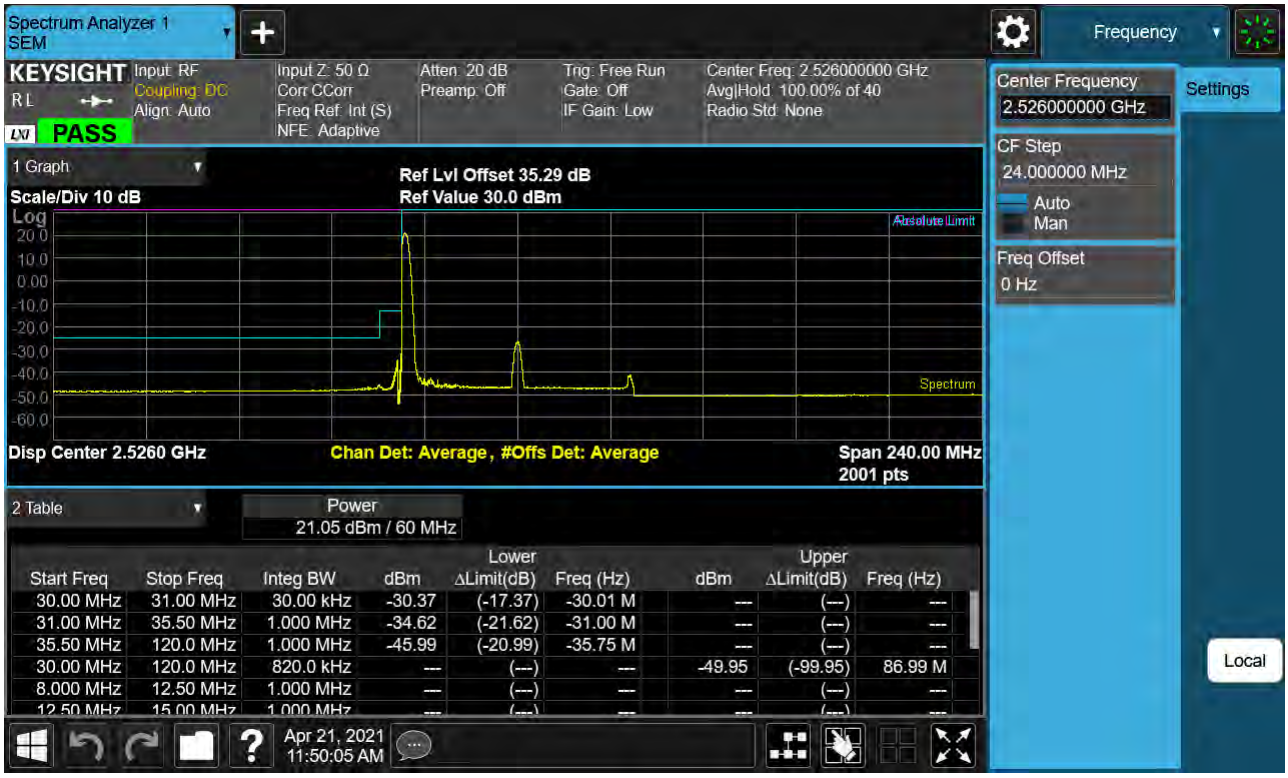
Sub6 n41. Mid Channel Edge Plot (50 MHz Ch.518598 BPSK)

Sub6 n41. High Channel Edge Plot (50 MHz Ch.532998 BPSK RB 1)



Sub6 n41. High Channel Edge Plot (50 MHz Ch.532998 BPSK)

Sub6 n41. Low Channel Edge Plot (60 MHz Ch.505200 BPSK RB 1)-1



Sub6 n41. Low Channel Edge Plot (60 MHz Ch.505200 BPSK)-1