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:
February 25, 2021

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

Report No.: HCT-RF-2102-FC065

FCC ID:	**A3LSMA526U**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s):	SM-A526U
Additional Model(s):	SM-A526U1
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	18M0G7D	PI/2 BPSK	0.179	22.53
		17M9G7D	QPSK	0.178	22.49
		17M9W7D	16QAM	0.144	21.57
		18M0W7D	64QAM	0.089	19.49
		18M0W7D	256QAM	0.064	18.03
Sub6 n41 (30)	2511.000 – 2674.980	26M9G7D	PI/2 BPSK	0.182	22.61
		27M0G7D	QPSK	0.182	22.60
		26M9W7D	16QAM	0.145	21.61
		27M0W7D	64QAM	0.091	19.61
		26M9W7D	256QAM	0.064	18.04
Sub6 n41 (40)	2516.010 – 2670.000	35M8G7D	PI/2 BPSK	0.185	22.66
		35M9G7D	QPSK	0.182	22.61
		36M0W7D	16QAM	0.143	21.55
		35M9W7D	64QAM	0.093	19.67
		35M8W7D	256QAM	0.065	18.10
Sub6 n41 (50)	2521.020 – 2664.990	45M9G7D	PI/2 BPSK	0.177	22.48
		45M8G7D	QPSK	0.177	22.47
		46M0W7D	16QAM	0.141	21.49
		46M0W7D	64QAM	0.088	19.45
		45M8W7D	256QAM	0.061	17.82
Sub6 n41 (60)	2526.000 – 2659.980	58M0G7D	PI/2 BPSK	0.184	22.64
		57M9G7D	QPSK	0.183	22.63
		58M0W7D	16QAM	0.146	21.64
		58M0W7D	64QAM	0.091	19.58
		58M0W7D	256QAM	0.064	18.03
Sub6 n41 (80)	2536.020 – 2649.990	77M3G7D	PI/2 BPSK	0.204	23.09
		77M2G7D	QPSK	0.203	23.08
		77M4W7D	16QAM	0.165	22.17
		77M3W7D	64QAM	0.102	20.08

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
		77M3W7D	256QAM	0.071	18.54
Sub6 n41 (90)	2541.000 – 2644.980	86M9G7D	PI/2 BPSK	0.209	23.20
		86M9G7D	QPSK	0.207	23.17
		86M9W7D	16QAM	0.168	22.25
		87M1W7D	64QAM	0.103	20.14
		86M9W7D	256QAM	0.073	18.62
Sub6 n41 (100)	2546.010 – 2640.000	96M7G7D	PI/2 BPSK	0.212	23.27
		96M8G7D	QPSK	0.208	23.18
		96M7W7D	16QAM	0.169	22.27
		96M5W7D	64QAM	0.109	20.38
		96M5W7D	256QAM	0.072	18.57

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 : Jae Ryang Do
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-2102-FC065	February 25, 2021	- First Approval Report

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:	A3LSMA526U
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-A526U
Additional Model(s):	SM-A526U1
SCS(kHz):	30
Bandwidth(MHz):	20, 30, 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 2511.000 – 2674.980 : 30 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:	January 19, 2021 ~ February 25, 2021
Serial number:	Radiated: R3CR10D7D4B Conducted: R3CR10L8SPZ

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 (HT20/40/80), Bluetooth, BT LE, NFC.

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

The Fully-anechoic chamber and conducted measurement facility used to collect the radiated data are located at the **74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.**

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
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;

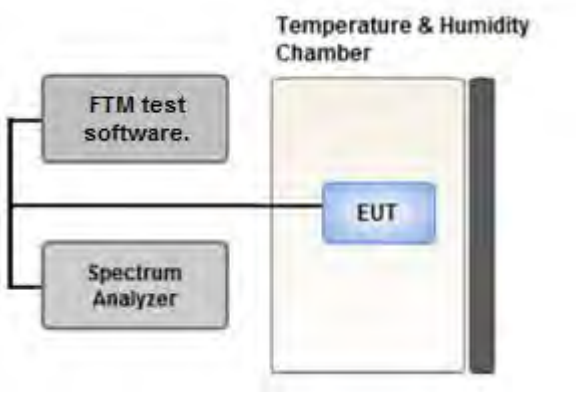
$$Result_{(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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.

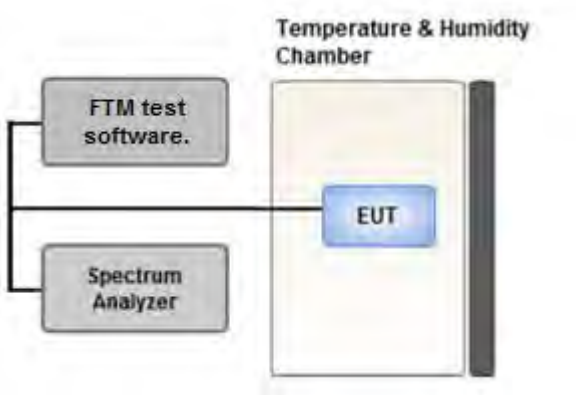
1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

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.

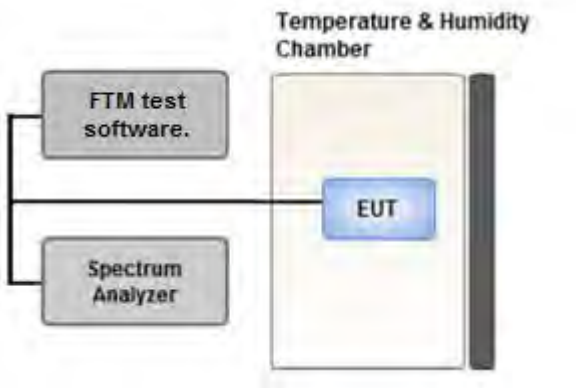
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

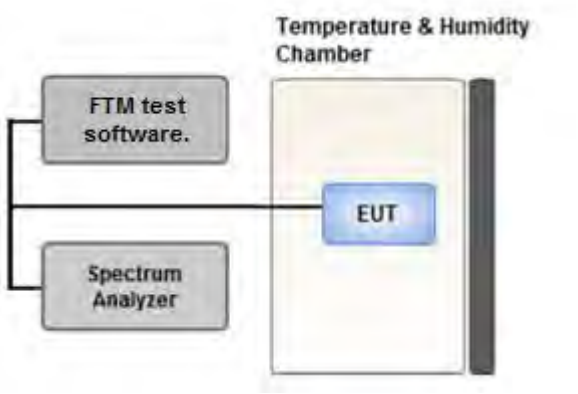
Test Overview

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.

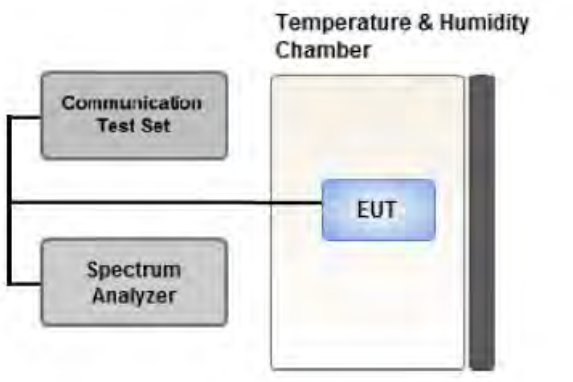
Test Settings

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.
- All power classes were tested, and the results were reported for the worst case PC2.
- All test are measured while operating in S.A mode.
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-A526U & additional models were tested and the worst case results are reported.

(Worst case : SM-A526U)

[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 power classes were tested, and the results were reported for the worst case PC2.
- All test are measured while operating in S.A mode.
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-A526U & additional models were tested and the worst case results are reported.
  (Worst case : SM-A526U)

[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, 30, 40, 50, 60, 80, 90, 100	Mid	Full RB	0
Channel 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
		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, 80, 90, 100	Low, Mid High	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	PI/2 BPSK	20, 30, 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
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
Wainwright Instruments	WHNX6-4740-6000-26500-40CC/ High Pass Filter	11	09/03/2020	Annual	09/03/2021
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	04/27/2020	Annual	04/27/2021
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	03/23/2020	Annual	03/23/2021
Hewlett Packard	E3632A/DC Power Supply	MY40004427	09/16/2020	Annual	09/16/2021
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
ESPEC	SU-642 / Chamber	93008124	03/18/2020	Annual	03/18/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	02289	05/08/2020	Biennial	05/08/2022
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1299	05/10/2019	Biennial	05/10/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/29/2019	Biennial	04/29/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	02/11/2020	Biennial	02/11/2022
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY51110063	04/27/2020	Annual	04/27/2021
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/04/2020	Annual	06/04/2021
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	101436	03/16/2020	Annual	03/16/2021
Rohde & Schwarz	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	05/18/2020	Biennial	05/18/2022
Schwarzbeck	VULB9160/ Bilog Antenna	3150	03/12/2019	Biennial	03/12/2021
Schwarzbeck	VULB9160/ Hybrid Antenna	760	03/22/2019	Biennial	03/22/2021
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6262116770	07/22/2020	Annual	07/22/2021
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
KEYSIGHT	E7515B / 5G Wireless Tester	MY60101126	05/28/2020	Annual	05/28/2021
Mini-Circuits	ZC4PD-K1844+ / 4-Way Divider	942907	09/14/2020	Annual	09/14/2021
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)

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
2506.020	Sub6 41/ 20 MHz [30 kHz]	PI/2 BPSK	-20.43	14.59	10.24	2.30	H	< 2.00	0.179	22.53
		QPSK	-20.47	14.55	10.24	2.30	H		0.178	22.49
		16-QAM	-21.39	13.63	10.24	2.30	H		0.144	21.57
		64-QAM	-23.47	11.55	10.24	2.30	H		0.089	19.49
		256-QAM	-24.93	10.09	10.24	2.30	H		0.064	18.03
2592.990		PI/2 BPSK	-21.13	14.21	10.42	2.33	H		0.170	22.30
		QPSK	-21.18	14.16	10.42	2.33	H		0.168	22.25
		16-QAM	-22.11	13.23	10.42	2.33	H		0.135	21.32
		64-QAM	-24.20	11.14	10.42	2.33	H		0.084	19.23
		256-QAM	-25.74	9.60	10.42	2.33	H		0.059	17.69
2679.990		PI/2 BPSK	-25.90	9.33	10.34	2.40	H		0.053	17.27
		QPSK	-26.00	9.23	10.34	2.40	H		0.052	17.17
		16-QAM	-26.81	8.42	10.34	2.40	H		0.043	16.36
		64-QAM	-29.04	6.19	10.34	2.40	H		0.026	14.13
		256-QAM	-30.55	4.68	10.34	2.40	H		0.018	12.62

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2511.000	Sub6 41/ 30 MHz [30 kHz]	PI/2 BPSK	-20.63	14.46	10.20	2.30	H	< 2.00	0.172	22.36
		QPSK	-20.66	14.43	10.20	2.30	H		0.171	22.33
		16-QAM	-21.69	13.40	10.20	2.30	H		0.135	21.30
		64-QAM	-23.61	11.48	10.20	2.30	H		0.087	19.38
		256-QAM	-25.21	9.88	10.20	2.30	H		0.060	17.78
2592.990		PI/2 BPSK	-20.82	14.52	10.42	2.33	H		0.182	22.61
		QPSK	-20.83	14.51	10.42	2.33	H		0.182	22.60
		16-QAM	-21.82	13.52	10.42	2.33	H		0.145	21.61
		64-QAM	-23.82	11.52	10.42	2.33	H		0.091	19.61
		256-QAM	-25.39	9.95	10.42	2.33	H		0.064	18.04
2674.980		PI/2 BPSK	-25.46	9.83	10.30	2.37	H		0.060	17.76
		QPSK	-25.47	9.82	10.30	2.37	H		0.060	17.75
		16-QAM	-26.31	8.98	10.30	2.37	H		0.049	16.91
		64-QAM	-28.46	6.83	10.30	2.37	H		0.030	14.76
		256-QAM	-30.04	5.25	10.30	2.37	H		0.021	13.18

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	-20.38	14.64	10.32	2.30	H	< 2.00	0.185	22.66
		QPSK	-20.43	14.59	10.32	2.30	H		0.182	22.61
		16-QAM	-21.50	13.52	10.32	2.30	H		0.143	21.54
		64-QAM	-23.37	11.65	10.32	2.30	H		0.093	19.67
		256-QAM	-24.94	10.08	10.32	2.30	H		0.065	18.10
2592.990		PI/2 BPSK	-20.93	14.41	10.42	2.33	H		0.178	22.50
		QPSK	-20.96	14.38	10.42	2.33	H		0.177	22.47
		16-QAM	-21.88	13.46	10.42	2.33	H		0.143	21.55
		64-QAM	-23.91	11.43	10.42	2.33	H		0.090	19.52
		256-QAM	-25.51	9.83	10.42	2.33	H		0.062	17.92
2670.000		PI/2 BPSK	-25.00	10.40	10.26	2.37	H		0.067	18.29
		QPSK	-25.07	10.33	10.26	2.37	H		0.066	18.22
		16-QAM	-25.95	9.45	10.26	2.37	H		0.054	17.34
		64-QAM	-28.12	7.28	10.26	2.37	H		0.033	15.17
		256-QAM	-29.65	5.75	10.26	2.37	H		0.023	13.64

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	-20.91	14.12	10.36	2.30	H	< 2.00	0.165	22.18
		QPSK	-20.92	14.11	10.36	2.30	H		0.165	22.17
		16-QAM	-21.81	13.22	10.36	2.30	H		0.134	21.28
		64-QAM	-23.83	11.20	10.36	2.30	H		0.084	19.26
		256-QAM	-25.43	9.60	10.36	2.30	H		0.058	17.66
2592.990		PI/2 BPSK	-20.95	14.39	10.42	2.33	H		0.177	22.48
		QPSK	-20.96	14.38	10.42	2.33	H		0.177	22.47
		16-QAM	-21.94	13.40	10.42	2.33	H		0.141	21.49
		64-QAM	-23.98	11.36	10.42	2.33	H		0.088	19.45
		256-QAM	-25.61	9.73	10.42	2.33	H		0.061	17.82
2664.990		PI/2 BPSK	-24.85	10.57	10.22	2.37	H		0.069	18.42
		QPSK	-24.89	10.53	10.22	2.37	H		0.069	18.38
		16-QAM	-25.86	9.56	10.22	2.37	H		0.055	17.41
		64-QAM	-27.94	7.48	10.22	2.37	H		0.034	15.33
		256-QAM	-29.41	6.01	10.22	2.37	H		0.024	13.86

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	-20.87	14.12	10.40	2.30	H	< 2.00	0.167	22.22
		QPSK	-20.90	14.09	10.40	2.30	H		0.166	22.19
		16-QAM	-21.93	13.06	10.40	2.30	H		0.131	21.16
		64-QAM	-23.96	11.03	10.40	2.30	H		0.082	19.13
		256-QAM	-25.41	9.58	10.40	2.30	H		0.059	17.68
2592.990		PI/2 BPSK	-20.79	14.55	10.42	2.33	H		0.184	22.64
		QPSK	-20.80	14.54	10.42	2.33	H		0.183	22.63
		16-QAM	-21.79	13.55	10.42	2.33	H		0.146	21.64
		64-QAM	-23.85	11.49	10.42	2.33	H		0.091	19.58
		256-QAM	-25.40	9.94	10.42	2.33	H		0.064	18.03
2659.980		PI/2 BPSK	-23.92	11.51	10.18	2.37	H		0.086	19.32
		QPSK	-23.93	11.50	10.18	2.37	H		0.085	19.31
		16-QAM	-24.80	10.63	10.18	2.37	H		0.070	18.44
		64-QAM	-26.94	8.49	10.18	2.37	H		0.043	16.30
		256-QAM	-28.45	6.98	10.18	2.37	H		0.030	14.79

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	-20.30	14.64	10.48	2.31	H	< 2.00	0.191	22.81
		QPSK	-20.32	14.62	10.48	2.31	H		0.190	22.79
		16-QAM	-21.28	13.66	10.48	2.31	H		0.152	21.83
		64-QAM	-23.30	11.64	10.48	2.31	H		0.096	19.81
		256-QAM	-24.92	10.02	10.48	2.31	H		0.066	18.19
2592.990		PI/2 BPSK	-20.34	15.00	10.42	2.33	H		0.204	23.09
		QPSK	-20.34	15.00	10.42	2.33	H		0.203	23.08
		16-QAM	-21.26	14.08	10.42	2.33	H		0.165	22.17
		64-QAM	-23.35	11.99	10.42	2.33	H		0.102	20.08
		256-QAM	-24.89	10.45	10.42	2.33	H		0.071	18.54
2649.990		PI/2 BPSK	-23.20	12.14	10.10	2.34	H		0.098	19.90
		QPSK	-23.23	12.11	10.10	2.34	H		0.097	19.87
		16-QAM	-24.17	11.17	10.10	2.34	H		0.078	18.93
		64-QAM	-26.20	9.14	10.10	2.34	H		0.049	16.90
		256-QAM	-27.74	7.60	10.10	2.34	H		0.034	15.36

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2541.000	Sub6 41/ 90 MHz [30 kHz]	PI/2 BPSK	-20.10	14.80	10.52	2.31	H	< 2.00	0.200	23.01
		QPSK	-20.23	14.67	10.52	2.31	H		0.194	22.88
		16-QAM	-21.30	13.60	10.52	2.31	H		0.152	21.81
		64-QAM	-23.28	11.62	10.52	2.31	H		0.096	19.83
		256-QAM	-24.82	10.08	10.52	2.31	H		0.067	18.29
2592.990		PI/2 BPSK	-20.23	15.11	10.42	2.33	H		0.209	23.20
		QPSK	-20.26	15.08	10.42	2.33	H		0.207	23.17
		16-QAM	-21.18	14.16	10.42	2.33	H		0.168	22.25
		64-QAM	-23.29	12.05	10.42	2.33	H		0.103	20.14
		256-QAM	-24.81	10.53	10.42	2.33	H		0.073	18.62
2644.980		PI/2 BPSK	-22.76	12.63	10.13	2.33	H		0.110	20.43
		QPSK	-22.84	12.55	10.13	2.33	H		0.108	20.35
		16-QAM	-23.72	11.67	10.13	2.33	H		0.089	19.47
		64-QAM	-25.80	9.59	10.13	2.33	H		0.055	17.39
		256-QAM	-27.30	8.09	10.13	2.33	H		0.039	15.89

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	-20.10	14.87	10.56	2.31	H	< 2.00	0.205	23.12
		QPSK	-20.19	14.78	10.56	2.31	H		0.201	23.03
		16-QAM	-21.24	13.73	10.56	2.31	H		0.158	21.98
		64-QAM	-23.29	11.68	10.56	2.31	H		0.098	19.93
		256-QAM	-24.75	10.22	10.56	2.31	H		0.070	18.47
2592.990		PI/2 BPSK	-20.16	15.18	10.42	2.33	H		0.212	23.27
		QPSK	-20.25	15.09	10.42	2.33	H		0.208	23.18
		16-QAM	-21.16	14.18	10.42	2.33	H		0.169	22.27
		64-QAM	-23.05	12.29	10.42	2.33	H		0.109	20.38
		256-QAM	-24.86	10.48	10.42	2.33	H		0.072	18.57
2640.000		PI/2 BPSK	-22.44	13.03	10.16	2.33	H		0.122	20.86
		QPSK	-22.45	13.02	10.16	2.33	H		0.121	20.85
		16-QAM	-23.31	12.16	10.16	2.33	H		0.100	19.99
		64-QAM	-25.49	9.98	10.16	2.33	H		0.060	17.81
		256-QAM	-27.08	8.39	10.16	2.33	H		0.042	16.22

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	-47.99	10.92	-50.92	3.28	H	-43.28	-25.00
	7 518.06	-58.61	11.54	-51.66	4.12	H	-44.24	-25.00
	10 024.08	-45.27	11.75	-36.67	4.78	H	-29.70	-25.00
	12 530.10	-58.45	12.94	-48.96	5.23	H	-41.25	-25.00
	15 036.12	-56.17	14.54	-49.91	5.98	H	-41.35	-25.00
518598 (2592.990)	5 185.98	-49.17	11.47	-51.25	3.39	H	-43.17	-25.00
	7 778.97	-53.97	11.28	-46.97	4.21	H	-39.90	-25.00
	10 371.96	-51.10	11.80	-41.27	4.95	H	-34.42	-25.00
	12 964.95	-57.39	12.70	-47.35	5.41	V	-40.06	-25.00
	15 557.94	-55.30	16.22	-49.30	6.12	H	-39.20	-25.00
535998 (2679.990)	5 359.98	-50.72	11.82	-53.18	3.45	H	-44.81	-25.00
	8 039.97	-48.13	11.28	-40.93	4.31	H	-33.96	-25.00
	10 719.96	-56.42	11.70	-45.48	4.91	H	-38.69	-25.00
	13 399.95	-62.82	12.50	-52.64	5.67	H	-45.81	-25.00
	16 079.94	-63.09	16.50	-55.31	6.31	H	-45.12	-25.00

▣ NR Band: N41

▣ 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)
502200 (2511.000)	5 022.00	-47.44	10.94	-49.71	3.29	H	-42.06	-25.00
	7 533.00	-57.46	11.56	-50.40	4.15	H	-42.99	-25.00
	10 044.00	-44.99	11.71	-36.28	4.87	H	-29.44	-25.00
	12 555.00	-57.88	12.90	-48.45	5.35	V	-40.90	-25.00
	15 066.00	-54.11	14.66	-48.26	5.95	H	-39.55	-25.00
518598 (2592.990)	5 185.98	-47.78	11.47	-49.86	3.39	H	-41.78	-25.00
	7 778.97	-55.62	11.28	-48.62	4.21	H	-41.55	-25.00
	10 371.96	-54.79	11.80	-44.96	4.95	H	-38.11	-25.00
	12 964.95	-59.88	12.70	-49.84	5.41	V	-42.55	-25.00
	15 557.94	-57.32	16.22	-51.32	6.12	H	-41.22	-25.00
534996 (2674.980)	5 349.96	-49.46	11.80	-51.75	3.44	H	-43.39	-25.00
	8 024.94	-50.39	11.25	-43.33	4.30	H	-36.37	-25.00
	10 699.92	-58.17	11.70	-47.09	4.98	H	-40.37	-25.00
	13 374.90	-61.11	12.60	-51.36	5.59	H	-44.35	-25.00
	16 049.88	-62.68	16.50	-55.07	6.29	V	-44.86	-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	-48.38	10.96	-50.49	3.33	H	-42.86	-25.00
	7 548.03	-57.92	11.58	-50.85	4.17	H	-43.44	-25.00
	10 064.04	-47.53	11.67	-39.30	4.89	V	-32.52	-25.00
	12 580.05	-58.63	12.90	-49.37	5.49	V	-41.96	-25.00
	15 096.06	-56.80	14.78	-50.04	6.06	V	-41.32	-25.00
518598 (2592.990)	5 185.98	-47.30	11.47	-49.38	3.39	H	-41.30	-25.00
	7 778.97	-53.80	11.28	-46.80	4.21	H	-39.73	-25.00
	10 371.96	-54.52	11.80	-44.69	4.95	H	-37.84	-25.00
	12 964.95	-61.11	12.70	-51.07	5.41	H	-43.78	-25.00
	15 557.94	-59.36	16.22	-53.36	6.12	H	-43.26	-25.00
534000 (2670.000)	5 340.00	-48.62	11.78	-51.07	3.43	H	-42.72	-25.00
	8 010.00	-51.84	11.22	-44.65	4.26	V	-37.69	-25.00
	10 680.00	-55.56	11.70	-44.83	5.02	H	-38.15	-25.00
	13 350.00	-61.50	12.70	-50.94	5.52	V	-43.76	-25.00
	16 020.00	-62.76	16.50	-55.45	6.28	V	-45.23	-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	-48.87	10.98	-50.87	3.34	H	-43.23	-25.00
	7 563.06	-57.90	11.60	-51.28	4.16	V	-43.84	-25.00
	10 084.08	-45.03	11.63	-36.70	4.83	H	-29.90	-25.00
	12 605.10	-59.72	12.90	-50.09	5.50	H	-42.69	-25.00
	15 126.12	-54.91	14.85	-48.90	6.10	H	-40.15	-25.00
518598 (2592.990)	5 185.98	-47.39	11.47	-49.47	3.39	H	-41.39	-25.00
	7 778.97	-57.88	11.28	-50.88	4.21	V	-43.81	-25.00
	10 371.96	-49.41	11.80	-39.58	4.95	H	-32.73	-25.00
	12 964.95	-60.48	12.70	-50.44	5.41	V	-43.15	-25.00
	15 557.94	-54.72	16.22	-48.72	6.12	H	-38.62	-25.00
532998 (2664.990)	5 329.98	-52.78	11.76	-55.16	3.42	H	-46.82	-25.00
	7 994.97	-54.38	11.19	-47.22	4.23	V	-40.26	-25.00
	10 659.96	-58.71	11.70	-48.18	5.04	V	-41.52	-25.00
	13 324.95	-61.64	12.75	-51.51	5.59	H	-44.35	-25.00
	15 989.94	-61.78	16.50	-54.67	6.23	H	-44.40	-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	-48.33	11.00	-50.49	3.34	H	-42.83	-25.00
	7 578.00	-58.41	11.60	-51.91	4.13	H	-44.44	-25.00
	10 104.00	-46.07	11.60	-37.24	4.79	H	-30.43	-25.00
	12 630.00	-58.57	12.90	-49.43	5.44	V	-41.97	-25.00
	15 156.00	-54.40	14.91	-47.93	6.03	H	-39.05	-25.00
518598 (2592.990)	5 185.98	-48.31	11.47	-50.39	3.39	H	-42.31	-25.00
	7 778.97	-55.12	11.28	-48.12	4.21	V	-41.05	-25.00
	10 371.96	-49.18	11.80	-39.35	4.95	H	-32.50	-25.00
	12 964.95	-59.59	12.70	-49.55	5.41	V	-42.26	-25.00
	15 557.94	-61.22	16.22	-55.22	6.12	V	-45.12	-25.00
531996 (2659.980)	5 319.96	-51.40	11.74	-54.29	3.41	H	-45.96	-25.00
	7 979.94	-55.70	11.16	-48.31	4.23	V	-41.38	-25.00
	10 639.92	-59.48	11.70	-49.06	4.96	H	-42.32	-25.00
	13 299.90	-61.04	12.80	-51.08	5.66	H	-43.94	-25.00
	15 959.88	-63.09	16.50	-56.00	6.22	H	-45.72	-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	-47.64	11.08	-49.91	3.34	H	-42.17	-25.00
	7 608.06	-57.99	11.60	-51.03	4.14	V	-43.57	-25.00
	10 144.08	-45.80	11.60	-37.00	4.85	H	-30.25	-25.00
	12 680.10	-59.39	12.78	-49.27	5.43	V	-41.92	-25.00
	15 216.12	-54.90	15.03	-48.63	6.12	H	-39.72	-25.00
518598 (2592.990)	5 185.98	-51.56	11.47	-53.64	3.39	H	-45.56	-25.00
	7 778.97	-54.81	11.28	-47.81	4.21	V	-40.74	-25.00
	10 371.96	-52.08	11.80	-42.25	4.95	H	-35.40	-25.00
	12 964.95	-62.45	12.70	-52.41	5.41	H	-45.12	-25.00
	15 557.94	-57.52	16.22	-51.52	6.12	V	-41.42	-25.00
529998 (2649.990)	5 299.98	-47.33	11.70	-50.21	3.41	H	-41.92	-25.00
	7 949.97	-54.59	11.10	-47.75	4.29	V	-40.94	-25.00
	10 599.96	-59.72	11.70	-48.86	4.89	V	-42.05	-25.00
	13 249.95	-61.07	12.90	-50.93	5.53	V	-43.56	-25.00
	15 899.94	-60.73	16.40	-53.07	6.25	H	-42.92	-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	-48.17	11.12	-50.46	3.34	H	-42.68	-25.00
	7 623.00	-57.90	11.60	-51.21	4.16	H	-43.77	-25.00
	10 164.00	-46.32	11.60	-37.53	4.91	H	-30.84	-25.00
	12 705.00	-59.08	12.69	-49.30	5.46	H	-42.07	-25.00
	15 246.00	-55.95	15.09	-50.16	6.10	H	-41.17	-25.00
518598 (2592.990)	5 185.98	-50.81	11.47	-52.89	3.39	H	-44.81	-25.00
	7 778.97	-54.90	11.28	-47.90	4.21	V	-40.83	-25.00
	10 371.96	-49.45	11.80	-39.62	4.95	H	-32.77	-25.00
	12 964.95	-62.61	12.70	-52.57	5.41	H	-45.28	-25.00
	15 557.94	-61.26	16.22	-55.26	6.12	V	-45.16	-25.00
528996 (2644.980)	5 289.96	-47.28	11.68	-49.80	3.40	H	-41.52	-25.00
	7 934.94	-55.63	11.07	-48.49	4.27	V	-41.69	-25.00
	10 579.92	-53.99	11.70	-43.62	4.98	H	-36.90	-25.00
	13 224.90	-57.61	12.90	-47.03	5.54	V	-39.67	-25.00
	15 869.88	-54.91	16.40	-48.07	6.18	H	-37.85	-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	-45.39	11.16	-47.54	3.33	H	-39.71	-25.00
	7 638.03	-55.32	11.60	-48.87	4.19	H	-41.46	-25.00
	10 184.04	-45.11	11.60	-36.24	4.86	H	-29.50	-25.00
	12 730.05	-55.46	12.64	-45.27	5.36	V	-37.99	-25.00
	15 276.06	-53.97	15.20	-47.95	6.03	V	-38.78	-25.00
518598 (2592.990)	5 185.98	-46.88	11.47	-48.96	3.39	H	-40.88	-25.00
	7 778.97	-53.52	11.28	-46.52	4.21	H	-39.45	-25.00
	10 371.96	-46.20	11.80	-36.37	4.95	H	-29.52	-25.00
	12 964.95	-56.52	12.70	-46.48	5.41	V	-39.19	-25.00
	15 557.94	-53.83	16.22	-47.83	6.12	H	-37.73	-25.00
528000 (2640.000)	5 280.00	-47.39	11.66	-50.06	3.41	V	-41.81	-25.00
	7 920.00	-56.36	11.04	-48.85	4.26	V	-42.07	-25.00
	10 560.00	-53.90	11.70	-43.52	5.00	H	-36.82	-25.00
	13 200.00	-56.91	12.90	-46.67	5.60	V	-39.37	-25.00
	15 840.00	-55.41	16.40	-48.08	6.23	V	-37.91	-25.00

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	51	0	4.22
			QPSK			4.85
			16-QAM			5.67
			64-QAM			6.15
			256-QAM			6.13
	30 MHz		BPSK	78		4.27
			QPSK			5.07
			16-QAM			5.92
			64-QAM			6.35
			256-QAM			6.15
	40 MHz		BPSK	106		3.97
			QPSK			5.06
			16-QAM			5.99
			64-QAM			6.36
			256-QAM			6.20
	50 MHz		BPSK	133		4.16
			QPSK			4.57
			16-QAM			5.79
			64-QAM			6.14
			256-QAM			6.17
	60 MHz		BPSK	162		4.09
			QPSK			4.55
			16-QAM			5.57
			64-QAM			6.04
			256-QAM			6.11
	80 MHz		BPSK	217		4.27
			QPSK			4.67
			16-QAM			5.65
			64-QAM			6.13
			256-QAM			6.12
	90 MHz		BPSK	245		4.26
			QPSK			4.65
			16-QAM			5.61
			64-QAM			6.05
			256-QAM			6.06
	100 MHz		BPSK	273		4.48
			QPSK			5.09
			16-QAM			5.54
			64-QAM			6.20
			256-QAM			6.15

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 98 ~ 137.

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	51	0	17.954
			QPSK			17.940
			16-QAM			17.930
			64-QAM			17.961
			256-QAM			17.950
	30 MHz		BPSK	78		26.920
			QPSK			27.017
			16-QAM			26.909
			64-QAM			26.945
			256-QAM			26.934
	40 MHz		BPSK	106		35.844
			QPSK			35.879
			16-QAM			35.958
			64-QAM			35.912
			256-QAM			35.830
	50 MHz		BPSK	133		45.903
			QPSK			45.785
			16-QAM			45.987
			64-QAM			45.946
			256-QAM			45.782
	60 MHz		BPSK	162		57.954
			QPSK			57.919
			16-QAM			57.961
			64-QAM			57.992
			256-QAM			57.975
	80 MHz		BPSK	217		77.319
			QPSK			77.173
			16-QAM			77.400
			64-QAM			77.323
			256-QAM			77.320
	90 MHz		BPSK	245		86.883
			QPSK			86.871
			16-QAM			86.941
			64-QAM			87.050
			256-QAM			86.871
	100 MHz		BPSK	273		96.743
			QPSK			96.806
			16-QAM			96.743
			64-QAM			96.537
			256-QAM			96.540

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 58 ~ 97.

8.5 CONDUCTED SPURIOUS EMISSIONS

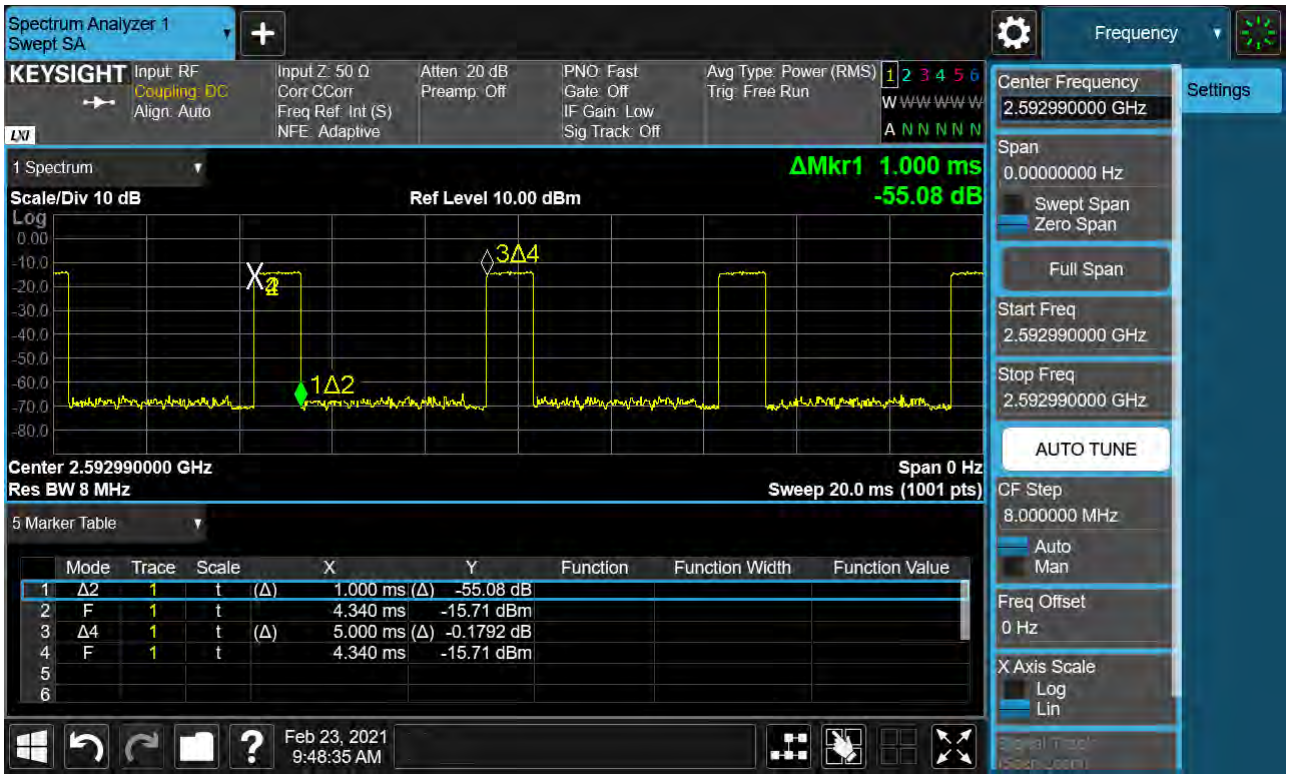
Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
Sub6 n41	20	2506.020	8.0075	36.701	-71.521	-34.820	-25.00
		2592.990	8.0329	36.701	-72.047	-35.346	
		2679.990	7.9985	36.701	-71.315	-34.614	
	30	2511.000	5.0095	36.701	-72.203	-35.502	
		2592.990	8.0100	36.701	-72.251	-35.550	
		2674.980	8.0140	36.701	-72.144	-35.443	
	40	2516.010	9.6979	36.701	-71.782	-35.081	
		2592.990	8.0160	36.701	-72.031	-35.330	
		2670.000	3.1601	36.091	-72.789	-36.698	
	50	2521.020	3.7842	36.091	-73.604	-37.513	
		2592.990	4.0738	36.091	-71.849	-35.758	
		2664.990	5.4412	36.701	-72.035	-35.334	
	60	2526.000	7.9910	36.701	-71.528	-34.827	
		2592.990	8.0040	36.701	-72.050	-35.349	
		2659.980	8.3076	36.701	-71.907	-35.206	
	80	2536.020	7.9925	36.701	-72.223	-35.522	
		2592.990	8.2622	36.701	-71.370	-34.669	
		2649.990	8.0200	36.701	-71.571	-34.870	
	90	2541.000	3.7478	36.091	-72.368	-36.277	
		2592.990	7.9930	36.701	-72.116	-35.415	
		2644.980	8.0399	36.701	-72.706	-36.005	
	100	2546.010	7.1765	36.701	-72.322	-35.621	
		2592.990	8.0225	36.701	-72.215	-35.514	
		2640.000	7.9915	36.701	-70.784	-34.083	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 194 ~ 241.

2. Duty Cycle factor already applied on the factor.

- Duty Cycle Factor(dB) = 6.99



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

- Result(dBm) = Reading + Factor

3. Factor(dB)

Frequency Range (GHz)	Factor [dB]
0.03 – 1	26.613
1 – 5	29.101
5 – 10	29.711
10 – 15	30.236
15 – 20	30.609
Above 20	31.251

8.6 CHANNEL EDGE

BW (MHz)	Frequency (MHz)	Mod	RB (Size/ Offset)	2 495 MHz ~ 2 496 MHz	C.E ~ (C.E +NormalHz)	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	-26.65	-29.58	-28.96	-28.68	-29.01	-29.38	-37.19
30	2511.000	BPSK	Full RB	-26.35	-29.68	-28.51	-28.77	-30.87	-29.92	-44.76
40	2520.000	BPSK	Full RB	-24.90	-30.03	-28.15	-28.21	-31.22	-30.34	-46.31
50	2525.010	BPSK	Full RB	-26.10	-27.39	-29.11	-27.83	-30.93	-28.00	-44.15
60	2530.020	BPSK	Full RB	-17.00	-18.35	-25.88	-25.09	-29.67	-28.18	-45.92
80	2540.010	BPSK	Full RB	-22.44	-24.39	-26.26	-24.65	-28.22	-26.63	-42.16
90	2545.020	BPSK	Full RB	-20.14	-30.11	-29.85	-29.79	-32.33	-32.76	-44.60
100	2550.000	BPSK	Full RB	-21.31	-29.84	-29.33	-29.33	-30.67	-31.29	-40.38
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	-25.15	-30.30	-27.33	-28.48
	2679.990	BPSK	Full RB	0	-24.55	-31.01	-25.41	-27.84
30 MHz	2592.990	BPSK	Full RB	0	-25.02	-29.23	-25.78	-29.88
	2679.990	BPSK	Full RB	0	-24.59	-29.37	-25.15	-28.13
40 MHz	2592.990	BPSK	Full RB	0	-24.19	-29.65	-25.50	-29.26
	2670.000	BPSK	Full RB	0	-24.43	-29.23	-26.45	-28.36
50 MHz	2592.990	BPSK	Full RB	0	-22.93	-26.61	-24.87	-27.03
	2664.990	BPSK	Full RB	0	-23.74	-27.09	-25.29	-25.77
60 MHz	2592.990	BPSK	Full RB	0	-15.45	-19.44	-25.23	-27.05
	2659.980	BPSK	Full RB	0	-15.79	-19.60	-24.33	-28.21
80 MHz	2592.990	BPSK	Full RB	0	-21.36	-24.45	-25.18	-26.92
	2649.990	BPSK	Full RB	0	-20.95	-27.16	-27.11	-29.14
90 MHz	2592.990	BPSK	Full RB	0	-21.53	-26.43	-26.87	-26.65
	2644.980	BPSK	Full RB	0	-22.37	-35.81	-32.17	-35.56
100 MHz	2592.990	BPSK	Full RB	0	-18.70	-24.69	-27.19	-27.53
	2640.000	BPSK	Full RB	0	-19.91	-28.92	-26.45	-27.23
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	-28.36	-31.60	-45.10	-44.91
	2679.990	BPSK	Full RB	0	-25.69	-30.57	-47.19	-43.12
30 MHz	2592.990	BPSK	Full RB	0	-27.23	-30.84	-47.49	-46.14
	2679.990	BPSK	Full RB	0	-26.38	-29.61	-47.25	-47.57
40 MHz	2592.990	BPSK	Full RB	0	-27.16	-30.81	-45.65	-44.22
	2670.000	BPSK	Full RB	0	-27.96	-30.68	-47.67	-48.26
50 MHz	2592.990	BPSK	Full RB	0	-26.45	-29.15	-44.41	-43.67
	2664.990	BPSK	Full RB	0	-25.69	-27.42	-45.04	-48.31
60 MHz	2592.990	BPSK	Full RB	0	-27.47	-29.49	-45.28	-42.26
	2659.980	BPSK	Full RB	0	-29.05	-28.84	-44.82	-48.50
80 MHz	2592.990	BPSK	Full RB	0	-26.65	-27.35	-48.82	-44.08
	2649.990	BPSK	Full RB	0	-28.23	-29.80	-46.68	-48.64
90 MHz	2592.990	BPSK	Full RB	0	-27.67	-27.35	-48.83	-47.66
	2644.980	BPSK	Full RB	0	-33.18	-33.77	-47.41	-48.72
100 MHz	2592.990	BPSK	Full RB	0	-27.02	-27.79	-48.83	-48.63
	2640.000	BPSK	Full RB	0	-26.96	-28.16	-44.24	-48.69
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 + Divider + Ext. Attenuator
   - Result(dBm) = Reading + Factor
   - Duty Cycle Factor(dB) = 6.99
4. Plots of the EUT's Channel Edge are shown Page 138 ~ 193. (1RB & Full RB)

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ BandWidth: 20 MHz

▣ Voltage(100%): 3.860 VDC

▣ Batt. Endpoint: 3.400 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 020 012	0.0	0.000 000	0.000
	100%	-30	2506 020 019	6.2	0.000 000	0.002
	100%	-20	2506 020 019	6.9	0.000 000	0.003
	100%	-10	2506 020 027	14.7	0.000 001	0.006
	100%	0	2506 020 027	14.9	0.000 001	0.006
	100%	+10	2506 020 027	14.2	0.000 001	0.006
	100%	+30	2506 020 022	9.3	0.000 000	0.004
	100%	+40	2506 020 018	5.3	0.000 000	0.002
	100%	+50	2506 020 029	16.9	0.000 001	0.007
	Batt. Endpoint	+20	2506 020 018	6.0	0.000 000	0.002
2679.990	100%	+20(Ref)	2679 990 004	0.0	0.000 000	0.000
	100%	-30	2679 990 015	11.6	0.000 000	0.004
	100%	-20	2679 990 012	8.5	0.000 000	0.003
	100%	-10	2679 990 007	3.7	0.000 000	0.001
	100%	0	2679 990 015	10.9	0.000 000	0.004
	100%	+10	2679 990 016	12.6	0.000 000	0.005
	100%	+30	2679 990 013	9.0	0.000 000	0.003
	100%	+40	2679 990 008	4.1	0.000 000	0.002
	100%	+50	2679 990 012	8.6	0.000 000	0.003
	Batt. Endpoint	+20	2679 990 013	8.8	0.000 000	0.003

▣ BandWidth: 30 MHz

▣ Voltage(100%): 3.860 VDC

▣ Batt. Endpoint: 3.400 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
2511.000	100%	+20(Ref)	2511 000 011	0.0	0.000 000	0.000
	100%	-30	2511 000 024	12.8	0.000 001	0.005
	100%	-20	2511 000 021	10.0	0.000 000	0.004
	100%	-10	2511 000 015	4.3	0.000 000	0.002
	100%	0	2511 000 015	3.8	0.000 000	0.002
	100%	+10	2511 000 016	5.4	0.000 000	0.002
	100%	+30	2511 000 020	9.4	0.000 000	0.004
	100%	+40	2511 000 017	6.4	0.000 000	0.003
	100%	+50	2511 000 028	16.9	0.000 001	0.007
	Batt. Endpoint	+20	2511 000 027	15.8	0.000 001	0.006
2674.980	100%	+20(Ref)	2674 980 011	0.0	0.000 000	0.000
	100%	-30	2674 980 025	13.1	0.000 000	0.005
	100%	-20	2674 980 025	13.2	0.000 000	0.005
	100%	-10	2674 980 021	9.6	0.000 000	0.004
	100%	0	2674 980 026	15.0	0.000 001	0.006
	100%	+10	2674 980 022	10.6	0.000 000	0.004
	100%	+30	2674 980 020	8.3	0.000 000	0.003
	100%	+40	2674 980 022	10.1	0.000 000	0.004
	100%	+50	2674 980 024	13.0	0.000 000	0.005
	Batt. Endpoint	+20	2674 980 019	7.4	0.000 000	0.003

▣ BandWidth: 40 MHz

▣ Voltage(100%): 3.860 VDC

▣ Batt. Endpoint: 3.400 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 010 009	0.0	0.000 000	0.000
	100%	-30	2516 010 018	9.0	0.000 000	0.004
	100%	-20	2516 010 014	5.6	0.000 000	0.002
	100%	-10	2516 010 022	13.5	0.000 001	0.005
	100%	0	2516 010 023	14.7	0.000 001	0.006
	100%	+10	2516 010 025	16.1	0.000 001	0.006
	100%	+30	2516 010 013	4.0	0.000 000	0.002
	100%	+40	2516 010 015	7.0	0.000 000	0.003
	100%	+50	2516 010 018	9.1	0.000 000	0.004
	Batt. Endpoint	+20	2516 010 014	5.4	0.000 000	0.002
2670.000	100%	+20(Ref)	2670 000 008	0.0	0.000 000	0.000
	100%	-30	2670 000 014	5.9	0.000 000	0.002
	100%	-20	2670 000 012	4.1	0.000 000	0.002
	100%	-10	2670 000 021	12.9	0.000 000	0.005
	100%	0	2670 000 013	4.8	0.000 000	0.002
	100%	+10	2670 000 015	7.4	0.000 000	0.003
	100%	+30	2670 000 021	13.3	0.000 000	0.005
	100%	+40	2670 000 013	4.5	0.000 000	0.002
	100%	+50	2670 000 023	14.5	0.000 001	0.005
	Batt. Endpoint	+20	2670 000 018	10.1	0.000 000	0.004

▣ BandWidth: 50 MHz

▣ Voltage(100%): 3.860 VDC

▣ Batt. Endpoint: 3.400 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 020 010	0.0	0.000 000	0.000
	100%	-30	2521 020 016	5.7	0.000 000	0.002
	100%	-20	2521 020 016	5.5	0.000 000	0.002
	100%	-10	2521 020 018	8.3	0.000 000	0.003
	100%	0	2521 020 024	13.5	0.000 001	0.005
	100%	+10	2521 020 025	15.5	0.000 001	0.006
	100%	+30	2521 020 023	12.6	0.000 001	0.005
	100%	+40	2521 020 015	5.2	0.000 000	0.002
	100%	+50	2521 020 015	4.8	0.000 000	0.002
	Batt. Endpoint	+20	2521 020 023	13.1	0.000 001	0.005
2664.990	100%	+20(Ref)	2664 990 016	0.0	0.000 000	0.000
	100%	-30	2664 990 020	4.2	0.000 000	0.002
	100%	-20	2664 990 024	7.9	0.000 000	0.003
	100%	-10	2664 990 030	13.6	0.000 001	0.005
	100%	0	2664 990 029	12.8	0.000 000	0.005
	100%	+10	2664 990 028	11.6	0.000 000	0.004
	100%	+30	2664 990 025	9.3	0.000 000	0.003
	100%	+40	2664 990 022	5.3	0.000 000	0.002
	100%	+50	2664 990 033	16.6	0.000 001	0.006
	Batt. Endpoint	+20	2664 990 025	9.2	0.000 000	0.003

▣ BandWidth: 60 MHz

▣ Voltage(100%): 3.860 VDC

▣ Batt. Endpoint: 3.400 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 000 011	0.0	0.000 000	0.000
	100%	-30	2526 000 018	6.1	0.000 000	0.002
	100%	-20	2526 000 016	4.1	0.000 000	0.002
	100%	-10	2526 000 025	13.9	0.000 001	0.006
	100%	0	2526 000 016	4.1	0.000 000	0.002
	100%	+10	2526 000 026	14.1	0.000 001	0.006
	100%	+30	2526 000 027	15.8	0.000 001	0.006
	100%	+40	2526 000 028	16.6	0.000 001	0.007
	100%	+50	2526 000 020	8.7	0.000 000	0.003
	Batt. Endpoint	+20	2526 000 017	5.8	0.000 000	0.002
2659.980	100%	+20(Ref)	2659 980 007	0.0	0.000 000	0.000
	100%	-30	2659 980 020	13.4	0.000 001	0.005
	100%	-20	2659 980 015	8.3	0.000 000	0.003
	100%	-10	2659 980 018	11.1	0.000 000	0.004
	100%	0	2659 980 020	13.2	0.000 000	0.005
	100%	+10	2659 980 013	5.8	0.000 000	0.002
	100%	+30	2659 980 024	17.0	0.000 001	0.006
	100%	+40	2659 980 016	9.4	0.000 000	0.004
	100%	+50	2659 980 018	11.3	0.000 000	0.004
	Batt. Endpoint	+20	2659 980 024	17.0	0.000 001	0.006

▣ BandWidth: 80 MHz

▣ Voltage(100%): 3.860 VDC

▣ Batt. Endpoint: 3.400 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 020 015	0.0	0.000 000	0.000
	100%	-30	2536 020 030	14.8	0.000 001	0.006
	100%	-20	2536 020 028	12.8	0.000 001	0.005
	100%	-10	2536 020 026	10.8	0.000 000	0.004
	100%	0	2536 020 023	8.0	0.000 000	0.003
	100%	+10	2536 020 025	9.2	0.000 000	0.004
	100%	+30	2536 020 026	11.1	0.000 000	0.004
	100%	+40	2536 020 019	3.1	0.000 000	0.001
	100%	+50	2536 020 027	11.8	0.000 000	0.005
	Batt. Endpoint	+20	2536 020 023	7.1	0.000 000	0.003
2649.990	100%	+20(Ref)	2649 990 008	0.0	0.000 000	0.000
	100%	-30	2649 990 019	11.1	0.000 000	0.004
	100%	-20	2649 990 017	8.9	0.000 000	0.003
	100%	-10	2649 990 018	10.1	0.000 000	0.004
	100%	0	2649 990 018	9.7	0.000 000	0.004
	100%	+10	2649 990 013	4.7	0.000 000	0.002
	100%	+30	2649 990 016	7.8	0.000 000	0.003
	100%	+40	2649 990 016	8.4	0.000 000	0.003
	100%	+50	2649 990 015	6.8	0.000 000	0.003
	Batt. Endpoint	+20	2649 990 019	10.8	0.000 000	0.004

▣ BandWidth: 90 MHz

▣ Voltage(100%): 3.860 VDC

▣ Batt. Endpoint: 3.400 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 000 007	0.0	0.000 000	0.000
	100%	-30	2541 000 017	10.1	0.000 000	0.004
	100%	-20	2541 000 016	9.2	0.000 000	0.004
	100%	-10	2541 000 023	15.4	0.000 001	0.006
	100%	0	2541 000 018	10.3	0.000 000	0.004
	100%	+10	2541 000 013	5.3	0.000 000	0.002
	100%	+30	2541 000 020	13.2	0.000 001	0.005
	100%	+40	2541 000 018	10.5	0.000 000	0.004
	100%	+50	2541 000 013	5.8	0.000 000	0.002
	Batt. Endpoint	+20	2541 000 021	13.5	0.000 001	0.005
2644.980	100%	+20(Ref)	2644 980 011	0.0	0.000 000	0.000
	100%	-30	2644 980 025	13.3	0.000 001	0.005
	100%	-20	2644 980 020	8.6	0.000 000	0.003
	100%	-10	2644 980 019	8.1	0.000 000	0.003
	100%	0	2644 980 018	6.6	0.000 000	0.003
	100%	+10	2644 980 024	12.3	0.000 000	0.005
	100%	+30	2644 980 020	8.2	0.000 000	0.003
	100%	+40	2644 980 019	7.8	0.000 000	0.003
	100%	+50	2644 980 015	3.4	0.000 000	0.001
	Batt. Endpoint	+20	2644 980 015	3.6	0.000 000	0.001

▣ BandWidth: 100 MHz

▣ Voltage(100%): 3.860 VDC

▣ Batt. Endpoint: 3.400 VDC

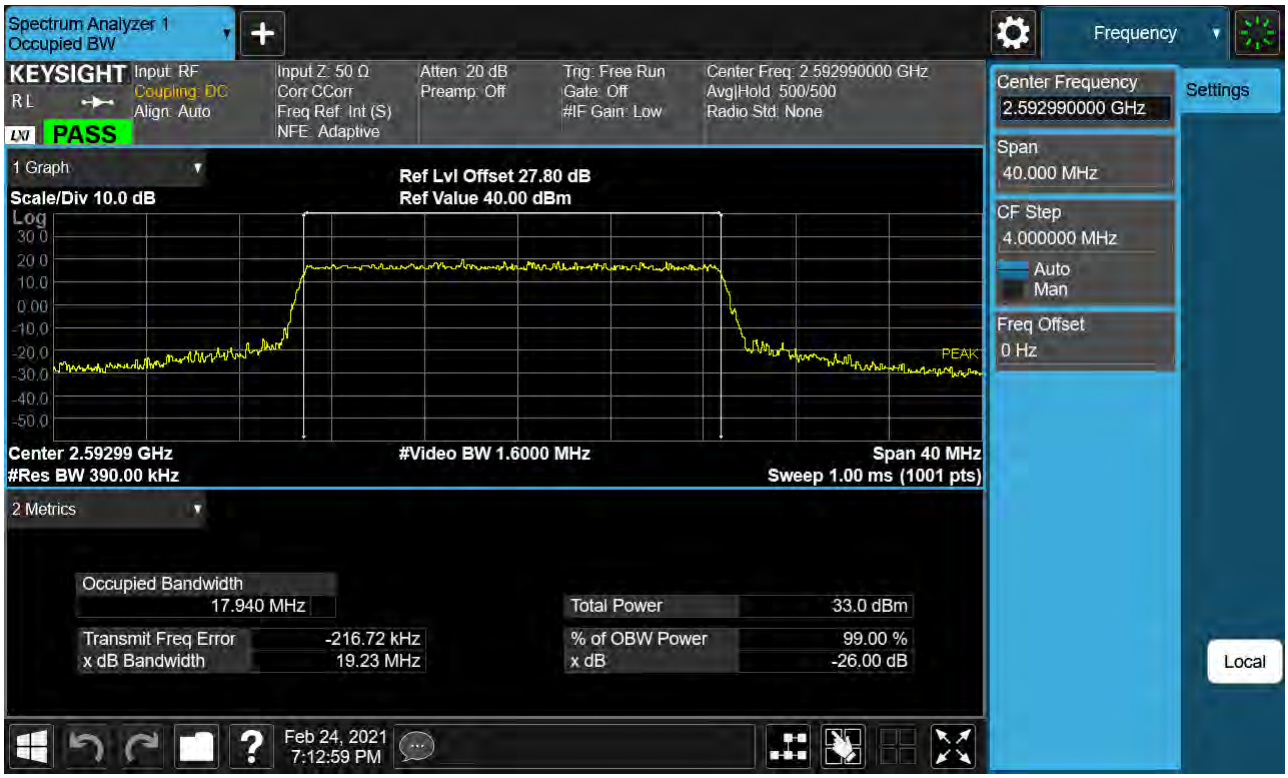
▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
2546.010	100%	+20(Ref)	2546 010 014	0.0	0.000 000	0.000
	100%	-30	2546 010 030	16.3	0.000 001	0.006
	100%	-20	2546 010 018	4.0	0.000 000	0.002
	100%	-10	2546 010 030	16.5	0.000 001	0.006
	100%	0	2546 010 029	15.1	0.000 001	0.006
	100%	+10	2546 010 029	15.7	0.000 001	0.006
	100%	+30	2546 010 026	12.8	0.000 001	0.005
	100%	+40	2546 010 025	10.9	0.000 000	0.004
	100%	+50	2546 010 025	11.4	0.000 000	0.004
	Batt. Endpoint	+20	2546 010 017	3.5	0.000 000	0.001
2640.000	100%	+20(Ref)	2640 000 008	0.0	0.000 000	0.000
	100%	-30	2640 000 017	9.1	0.000 000	0.003
	100%	-20	2640 000 012	4.7	0.000 000	0.002
	100%	-10	2640 000 020	12.5	0.000 000	0.005
	100%	0	2640 000 012	4.6	0.000 000	0.002
	100%	+10	2640 000 014	6.4	0.000 000	0.002
	100%	+30	2640 000 022	13.9	0.000 001	0.005
	100%	+40	2640 000 013	5.0	0.000 000	0.002
	100%	+50	2640 000 016	8.0	0.000 000	0.003
	Batt. Endpoint	+20	2640 000 019	10.9	0.000 000	0.004

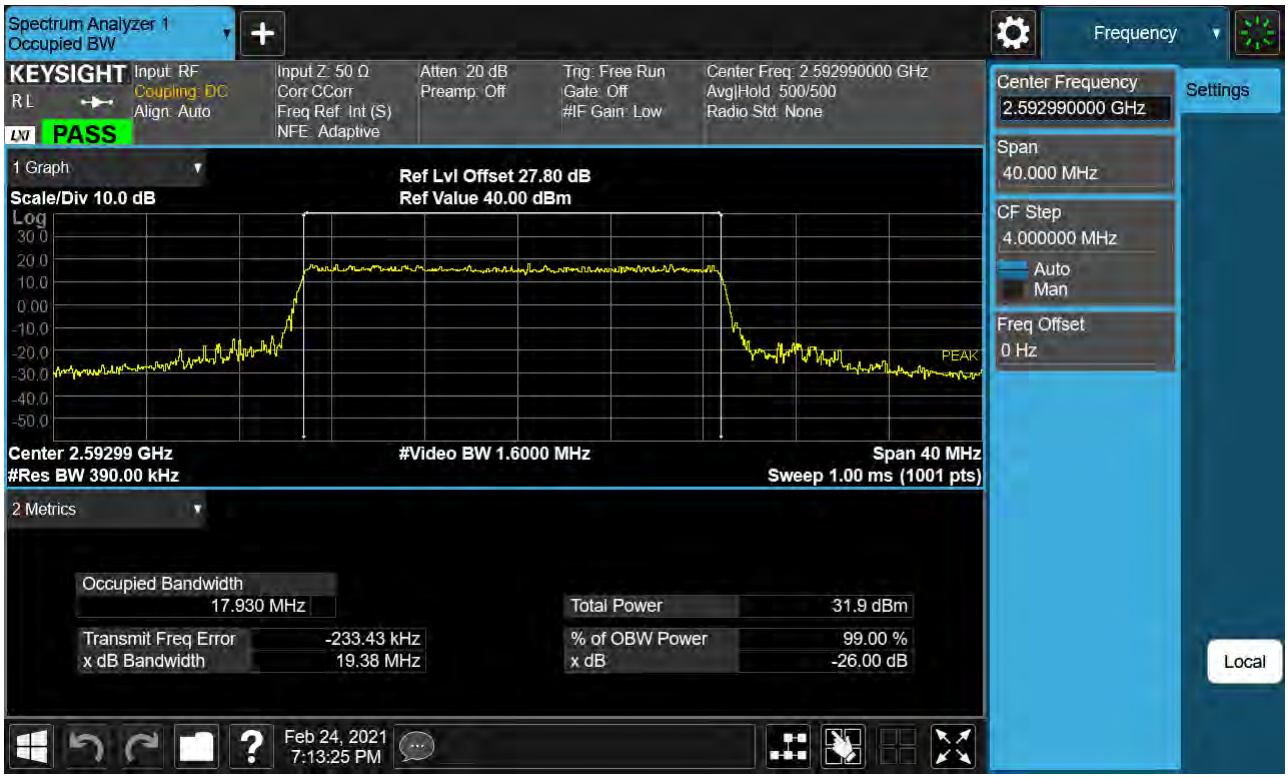
9. TEST PLOTS

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

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

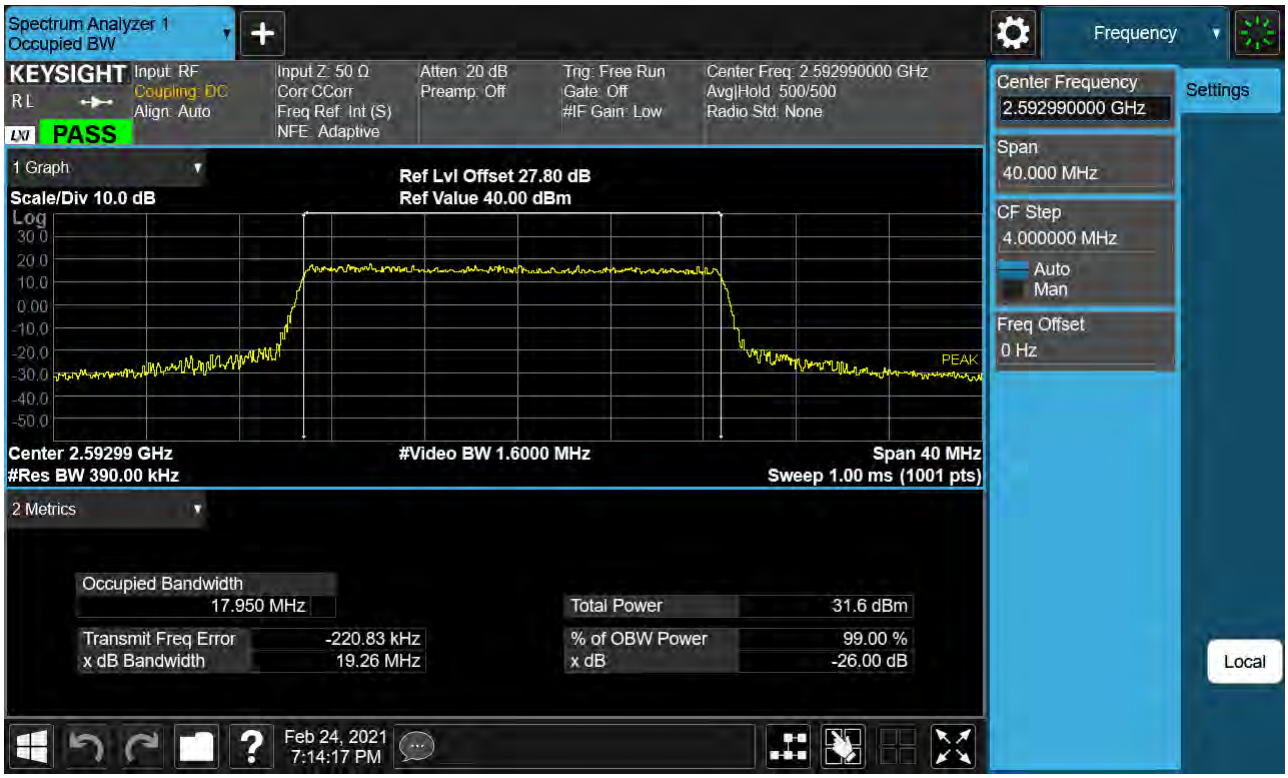


Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 16-QAM)

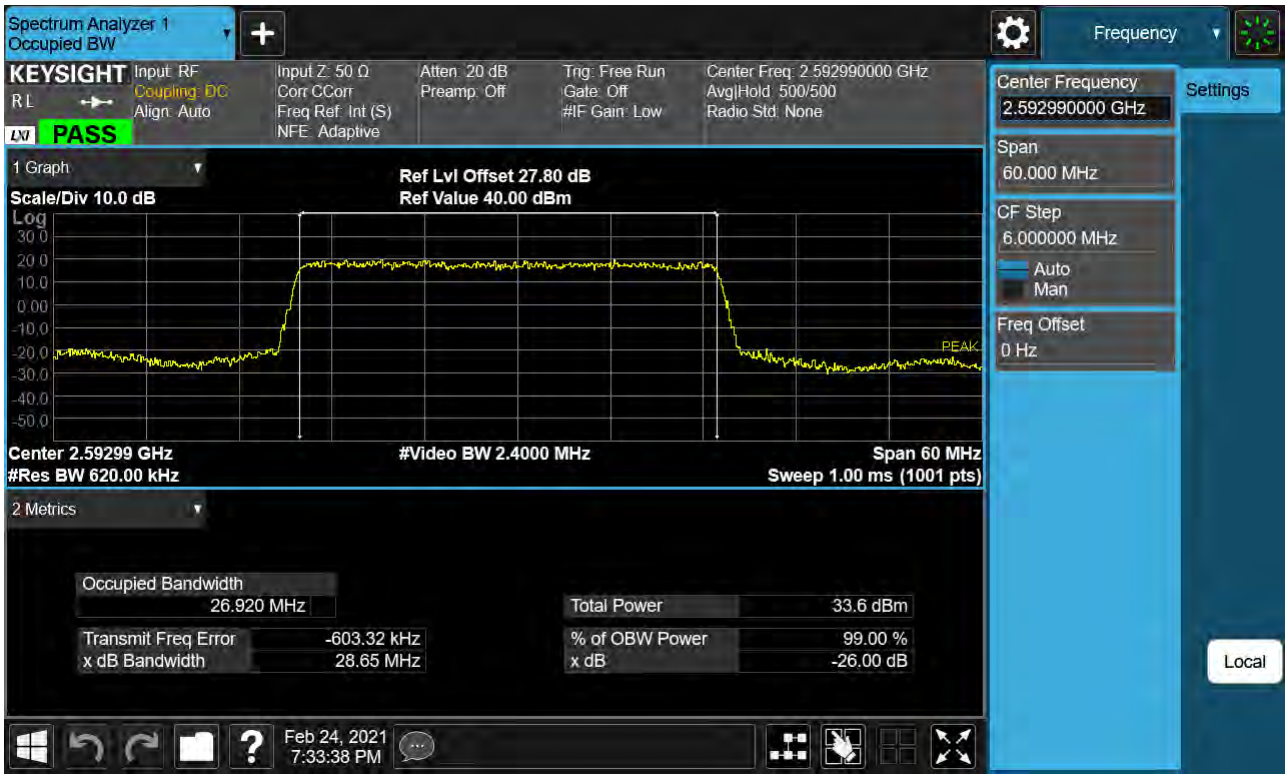


Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 64-QAM)

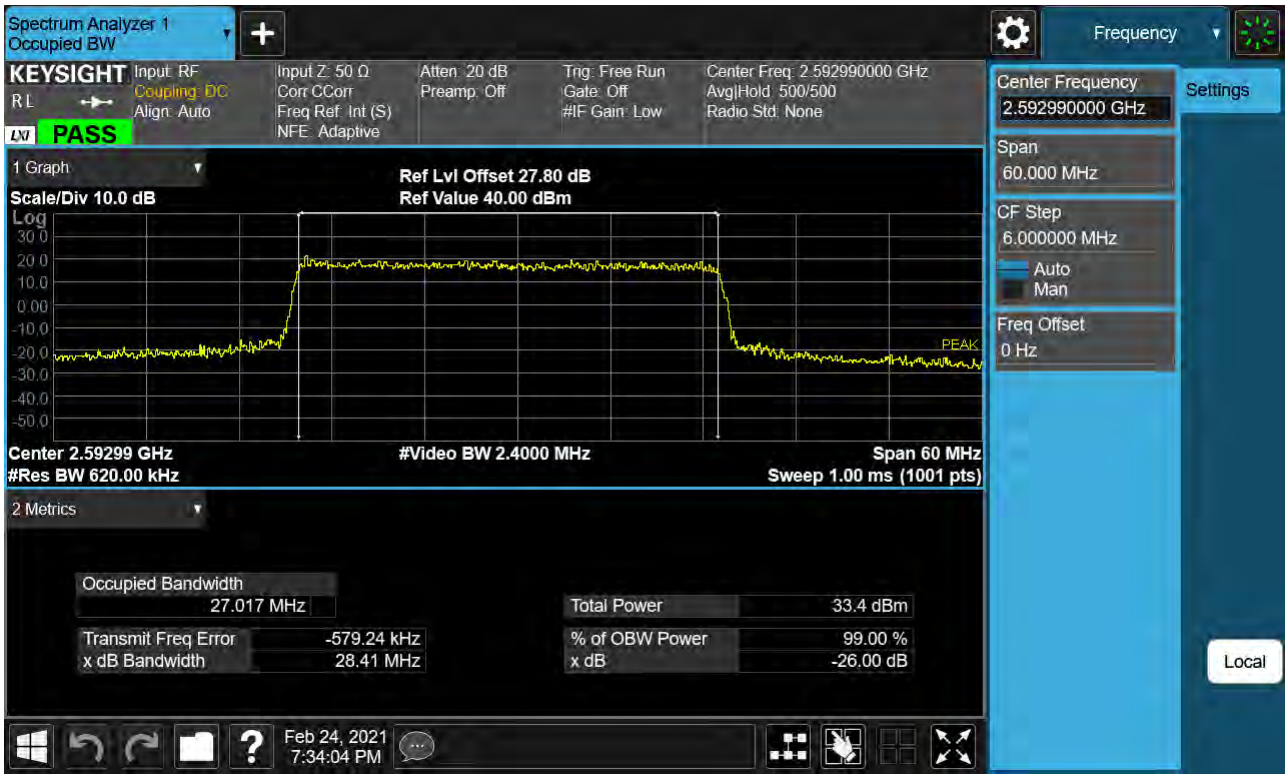
Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 256-QAM)



Sub6 n41. Occupied Bandwidth Plot (30 MHz Ch.518598 BPSK)

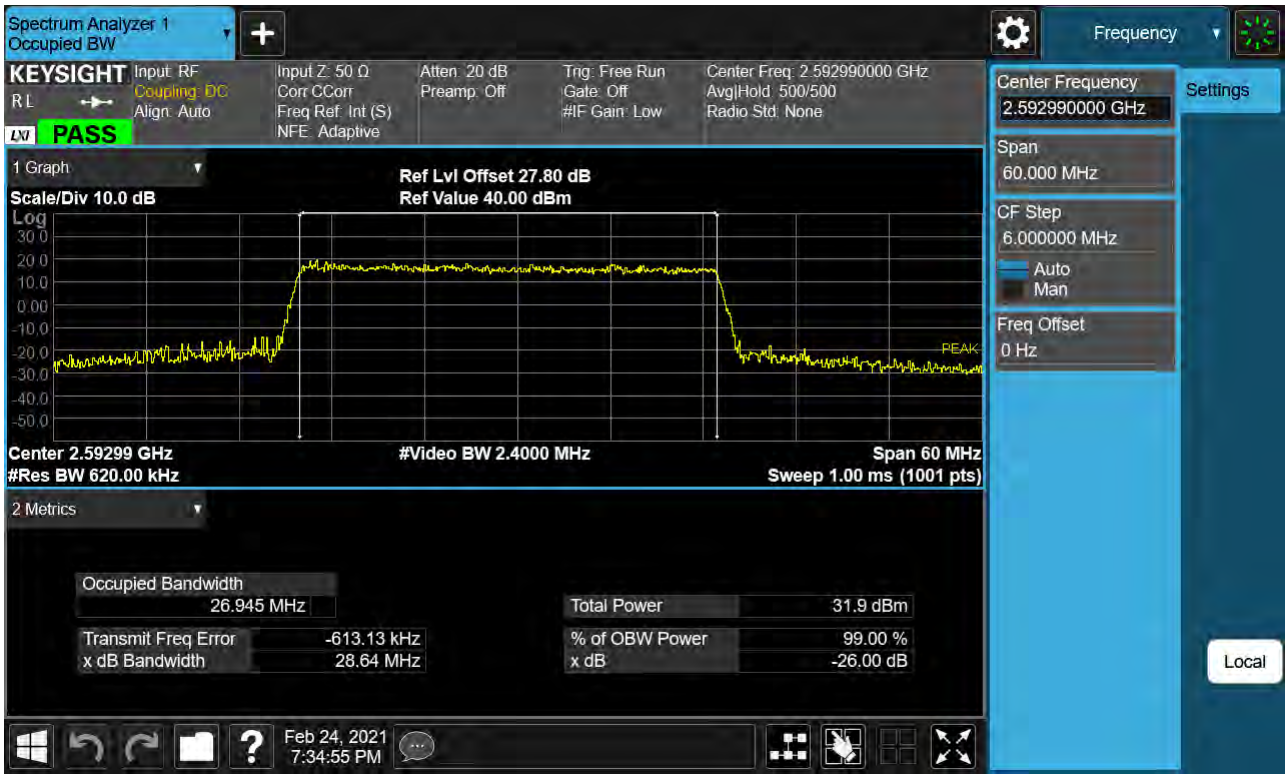


Sub6 n41. Occupied Bandwidth Plot (30 MHz Ch.518598 QPSK)

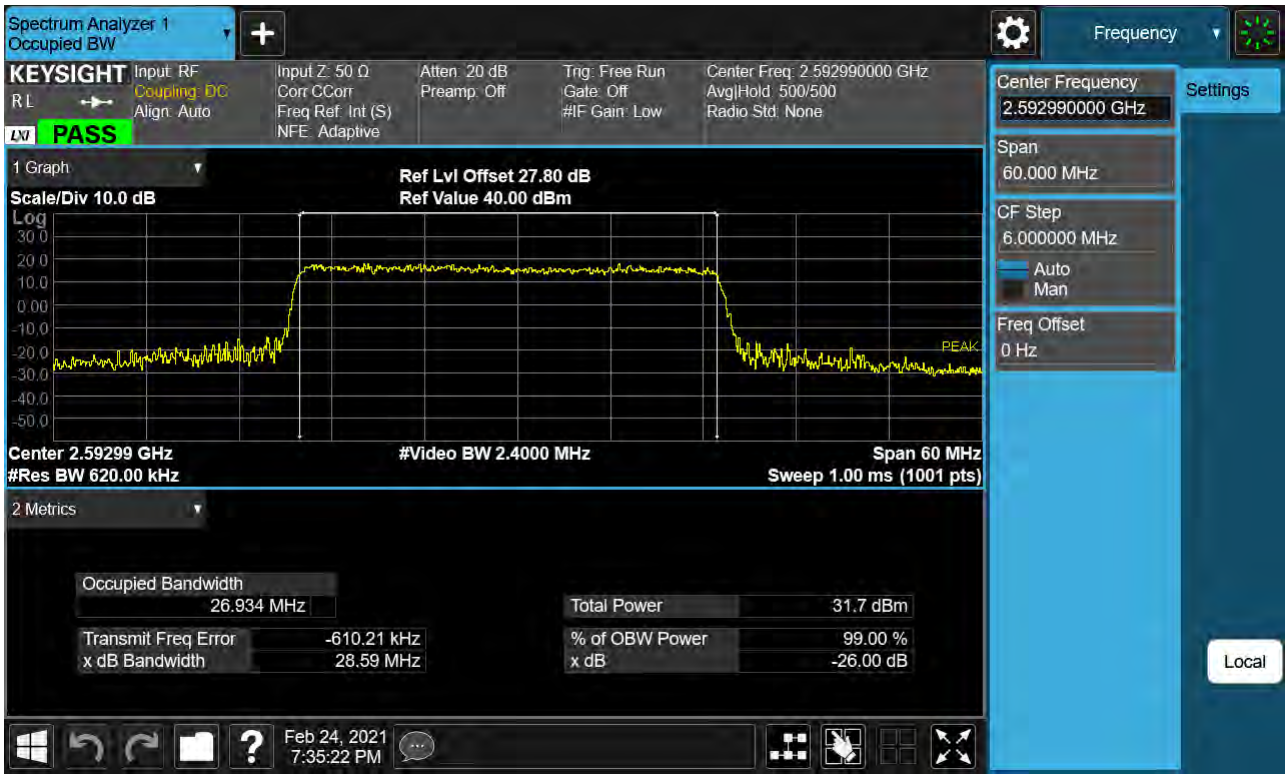


Sub6 n41. Occupied Bandwidth Plot (30 MHz Ch.518598 16-QAM)

Sub6 n41. Occupied Bandwidth Plot (30 MHz Ch.518598 64-QAM)

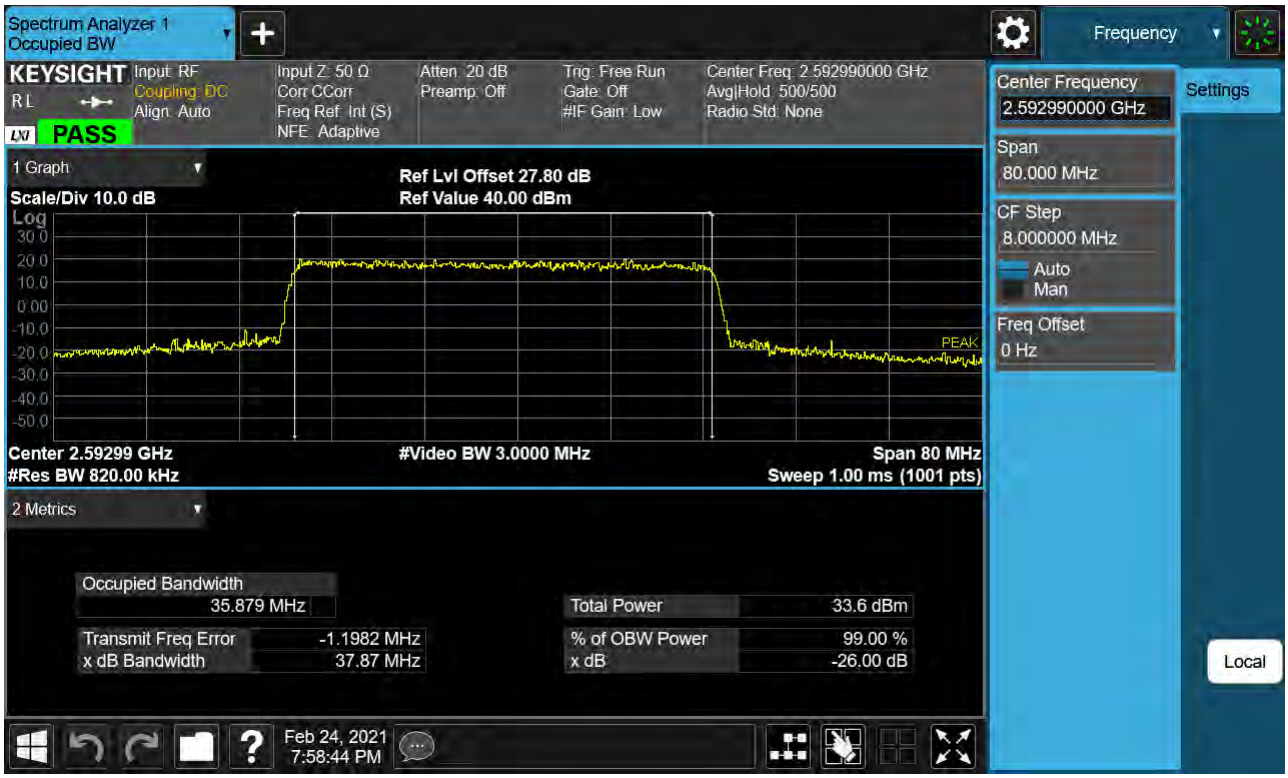


Sub6 n41. Occupied Bandwidth Plot (30 MHz Ch.518598 256-QAM)

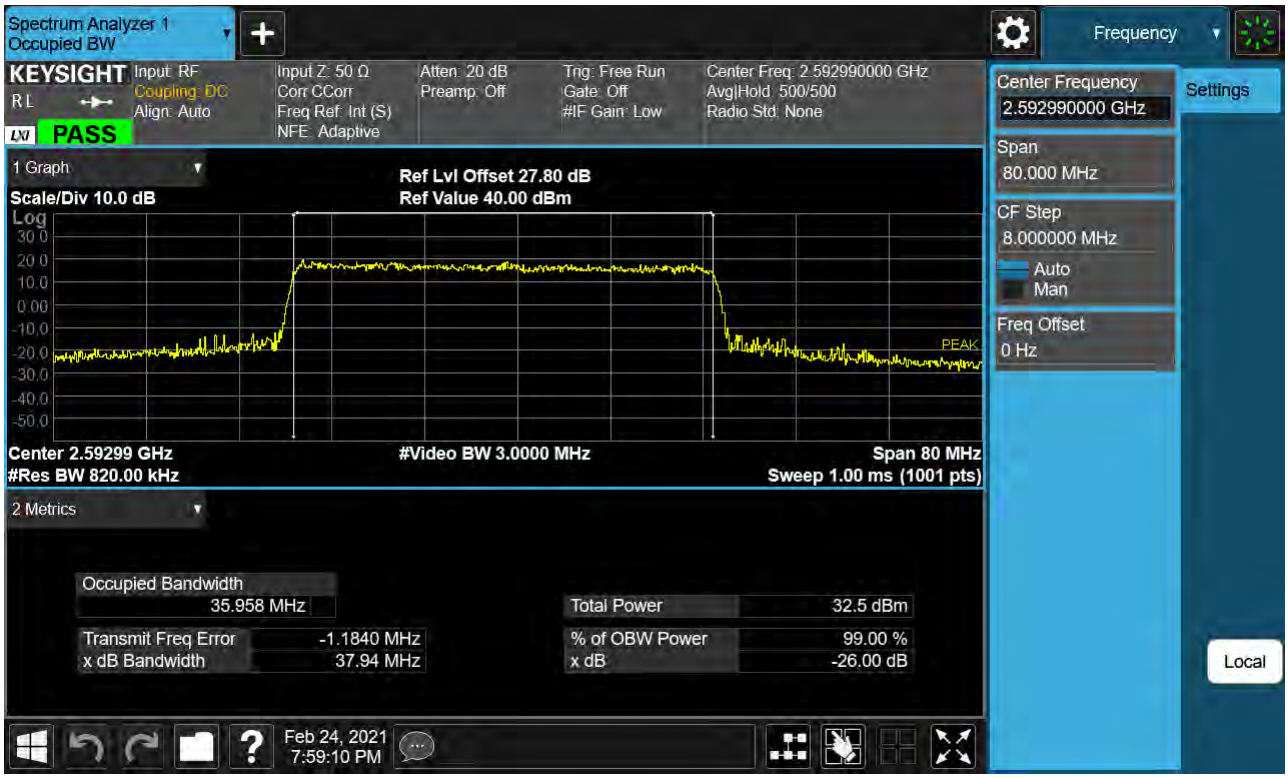


Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 BPSK)

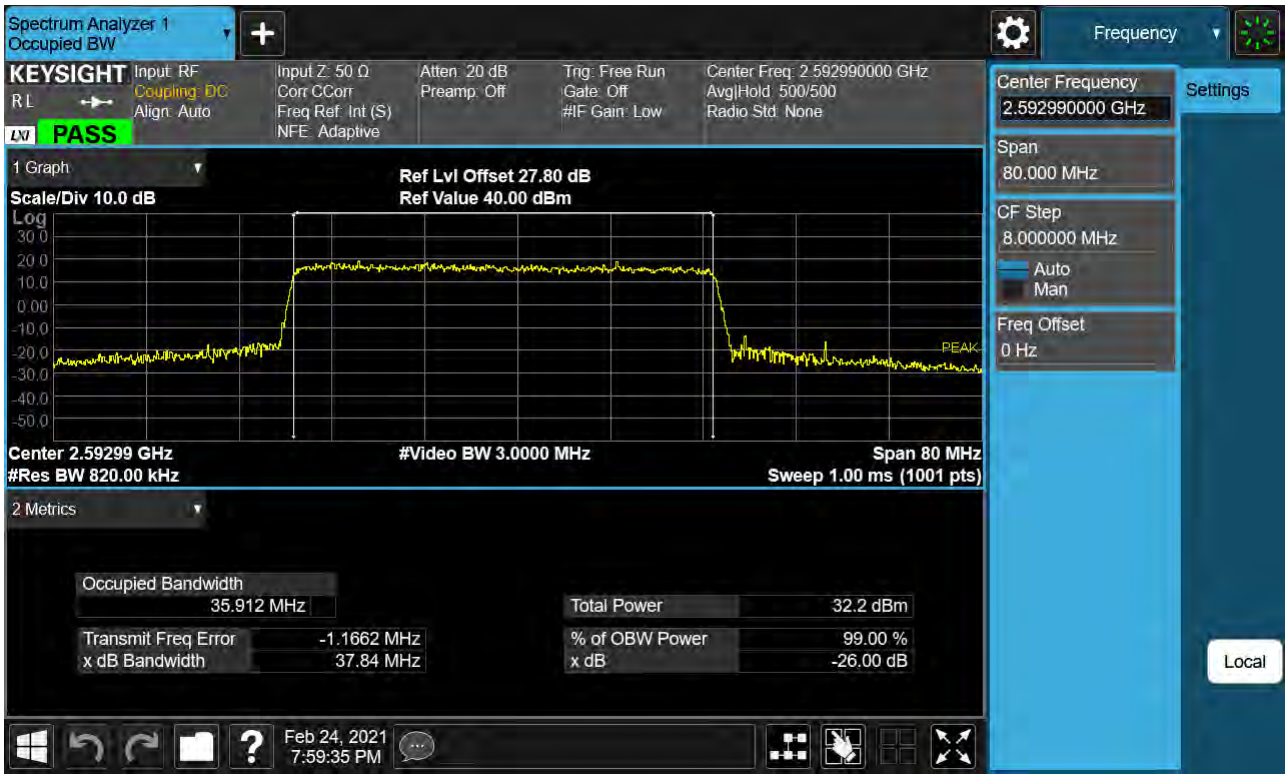
Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 QPSK)



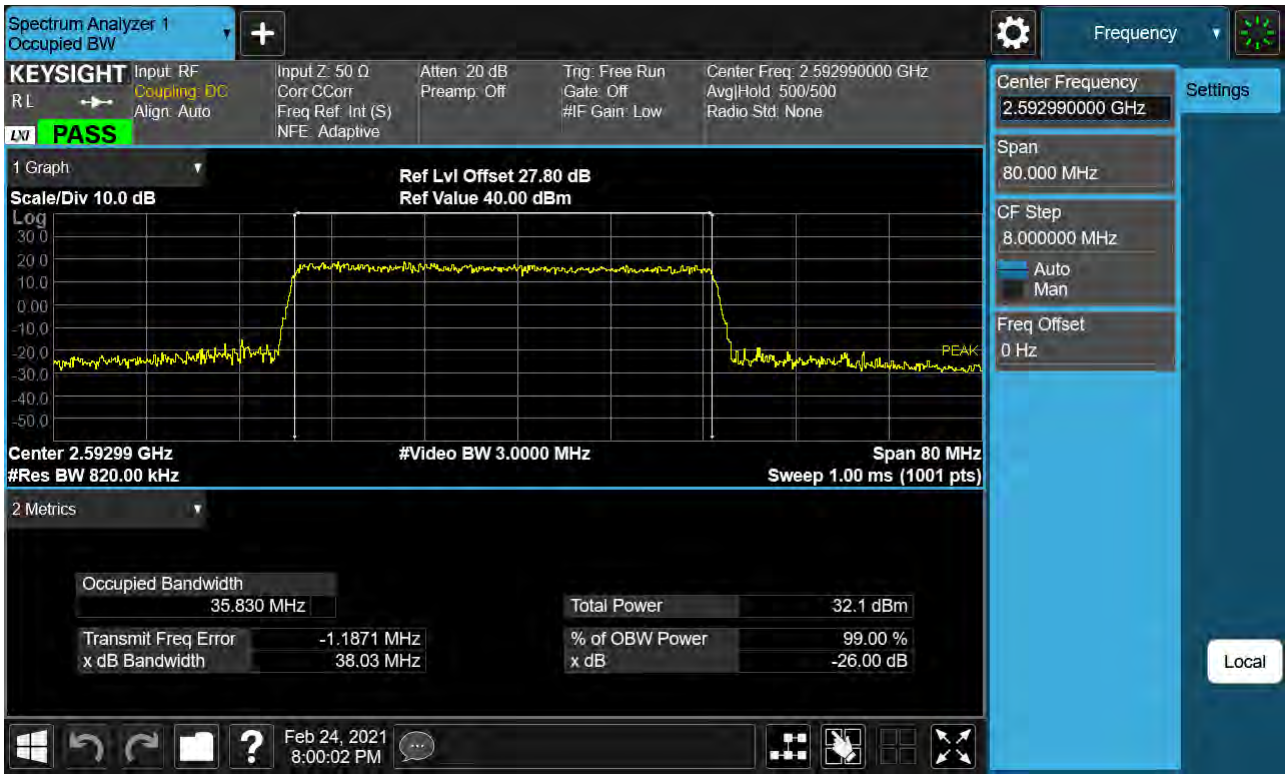
Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 16-QAM)



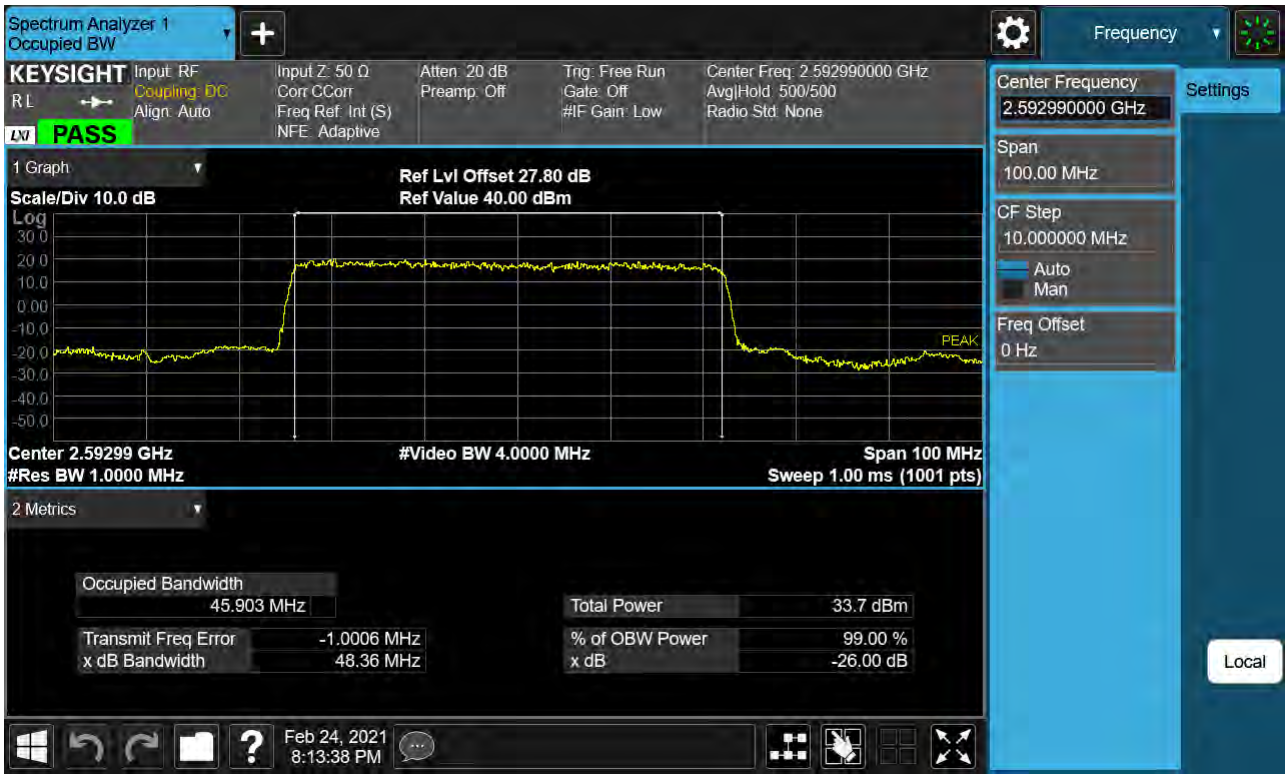
Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 64-QAM)



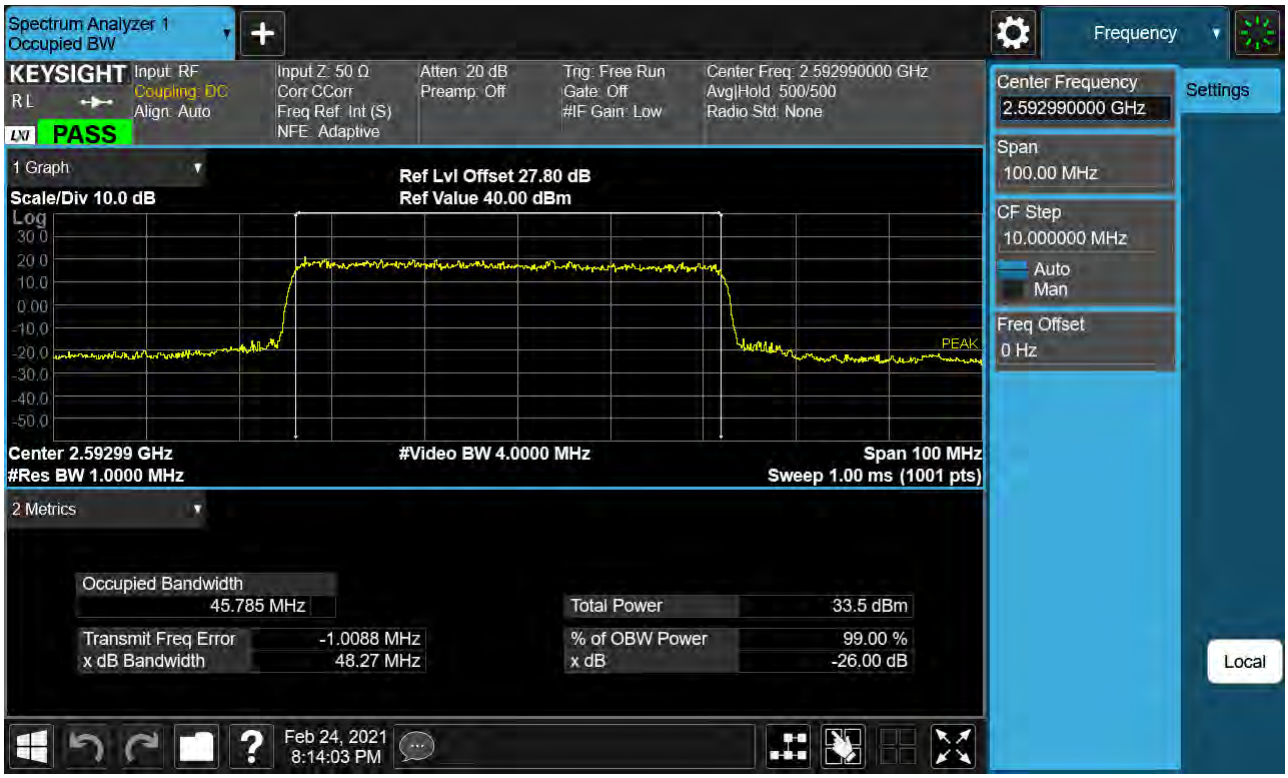
Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 256-QAM)



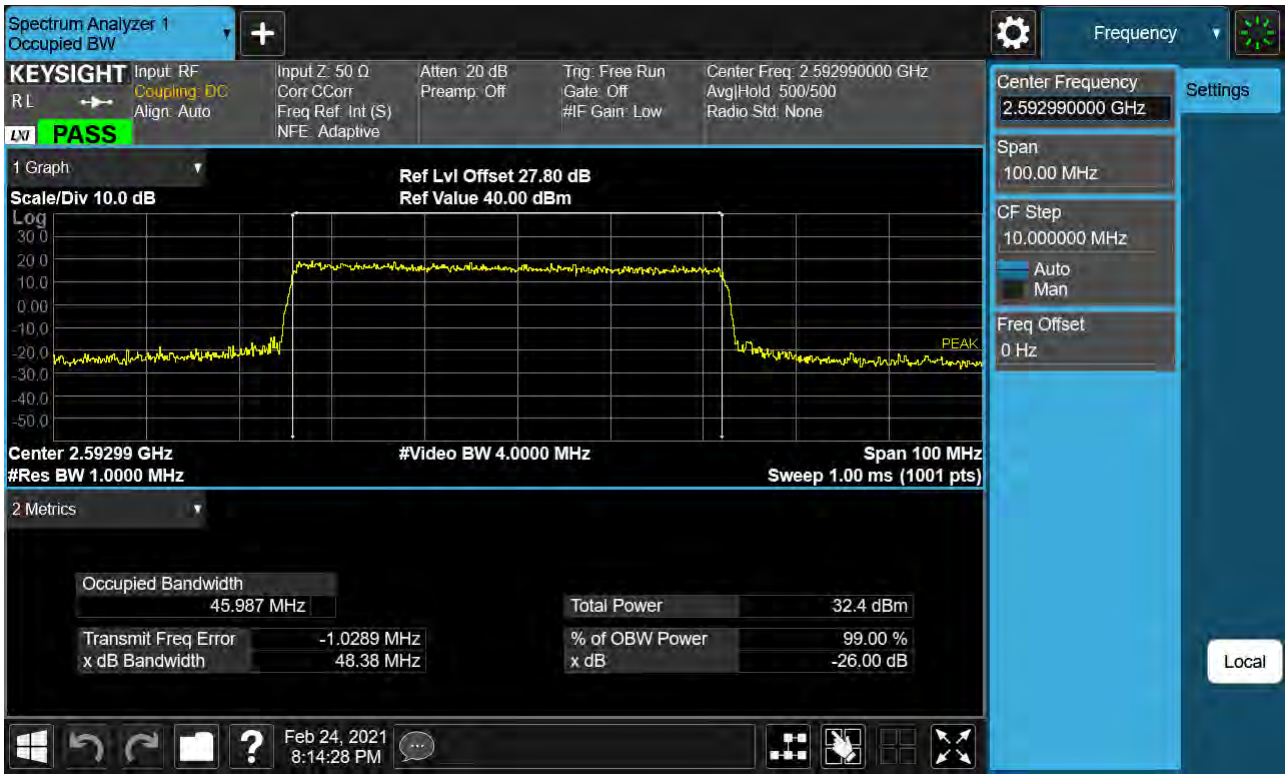
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 BPSK)



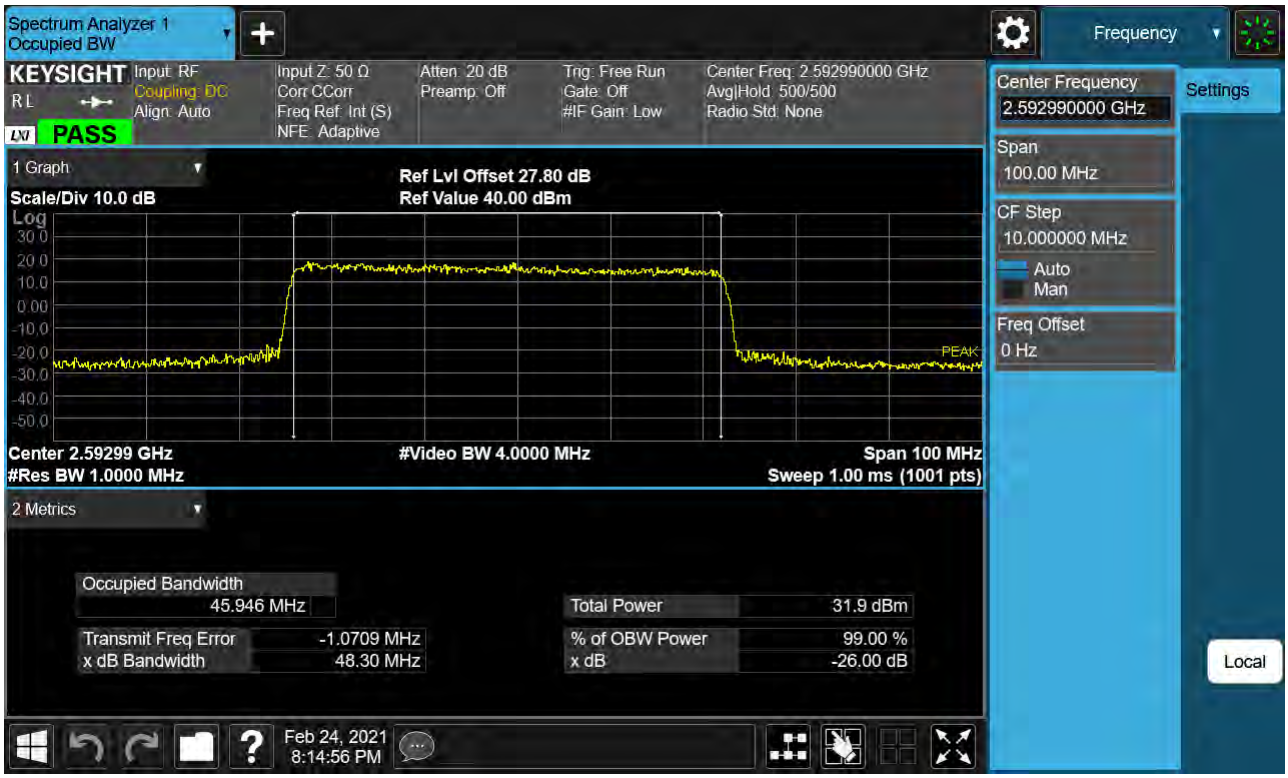
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 QPSK)



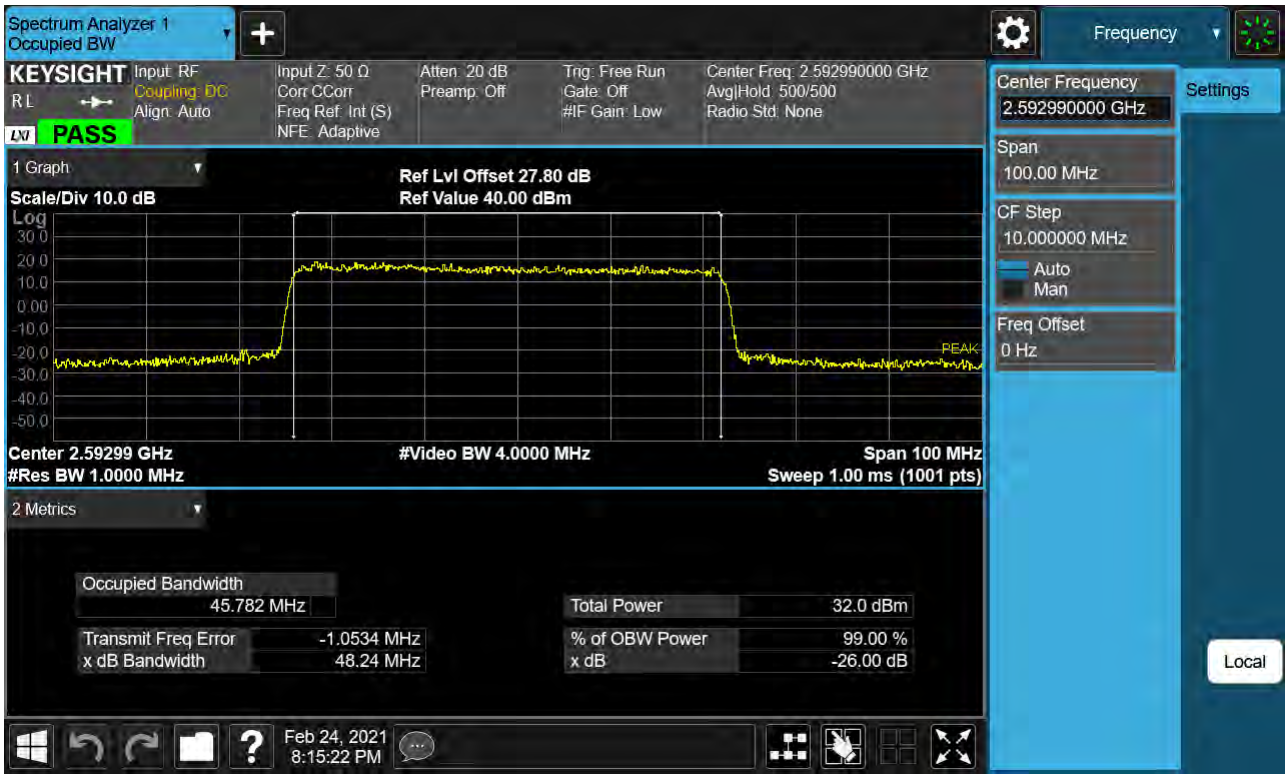
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 16-QAM)



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

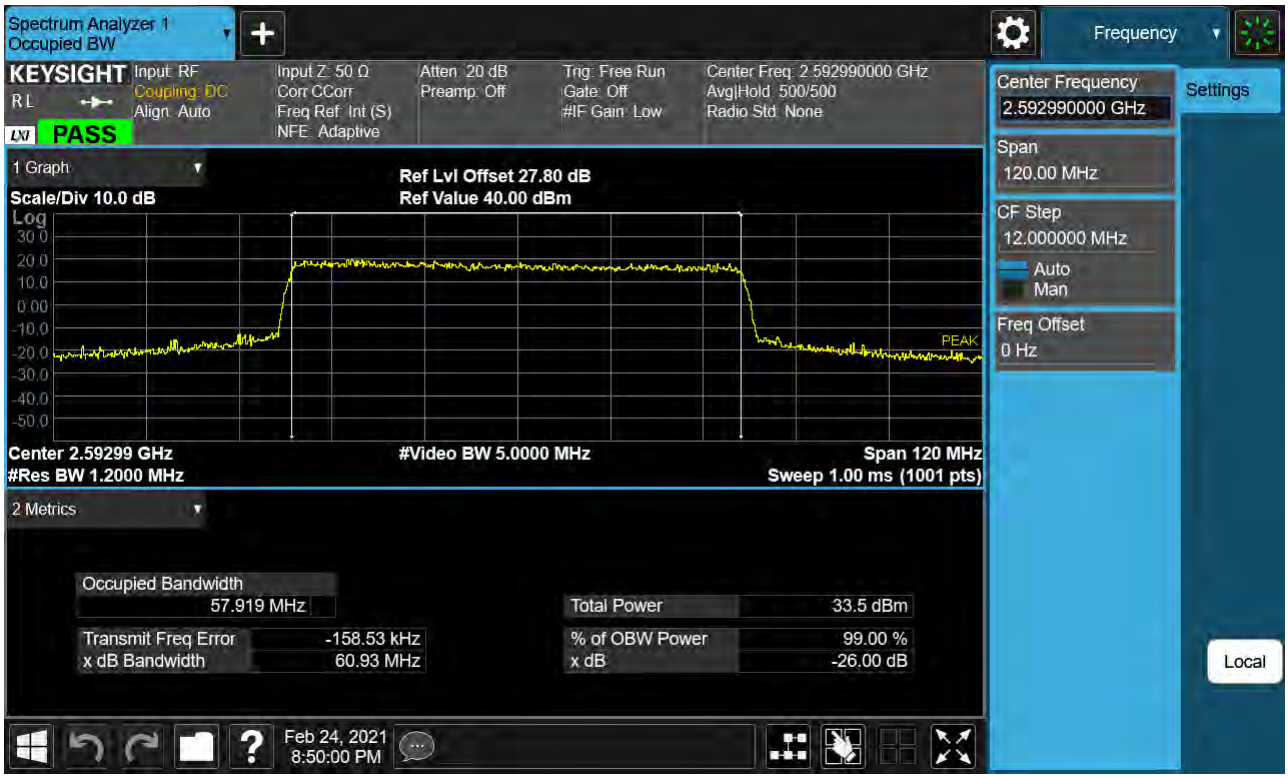


Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 256-QAM)

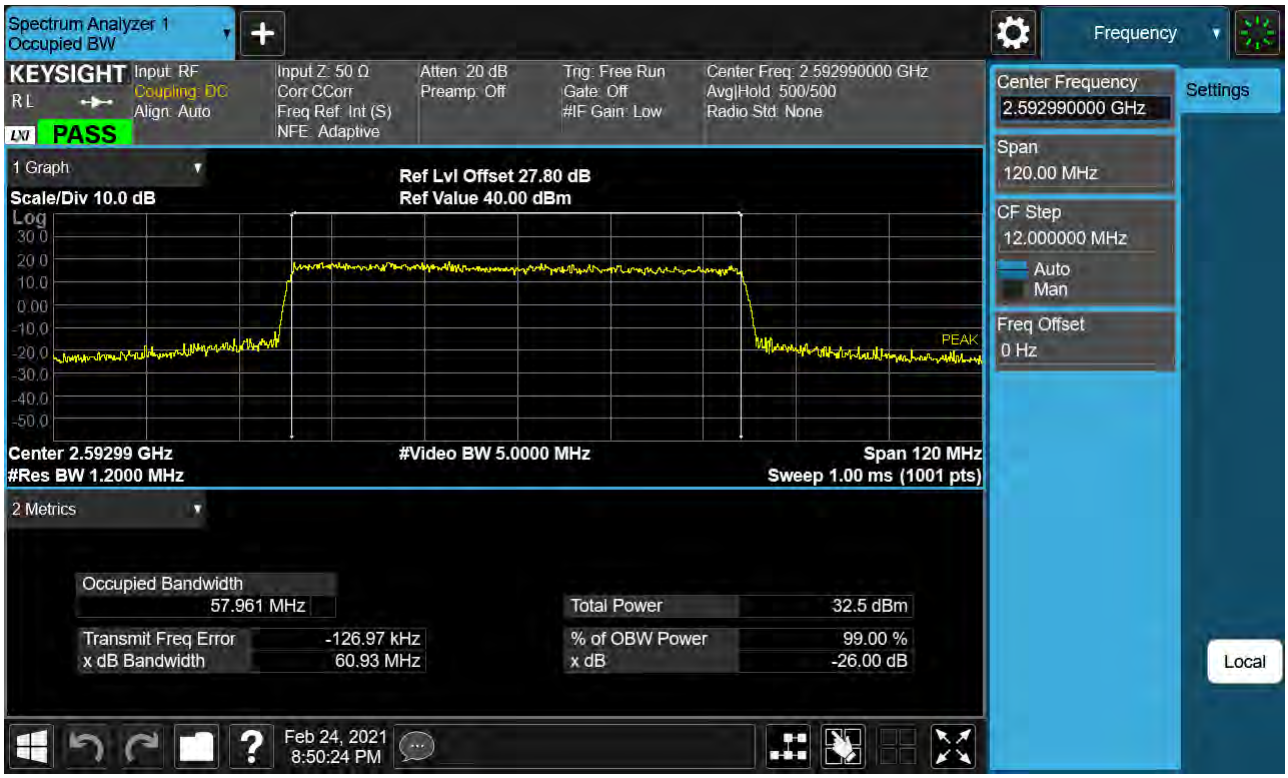


Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 BPSK)

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)

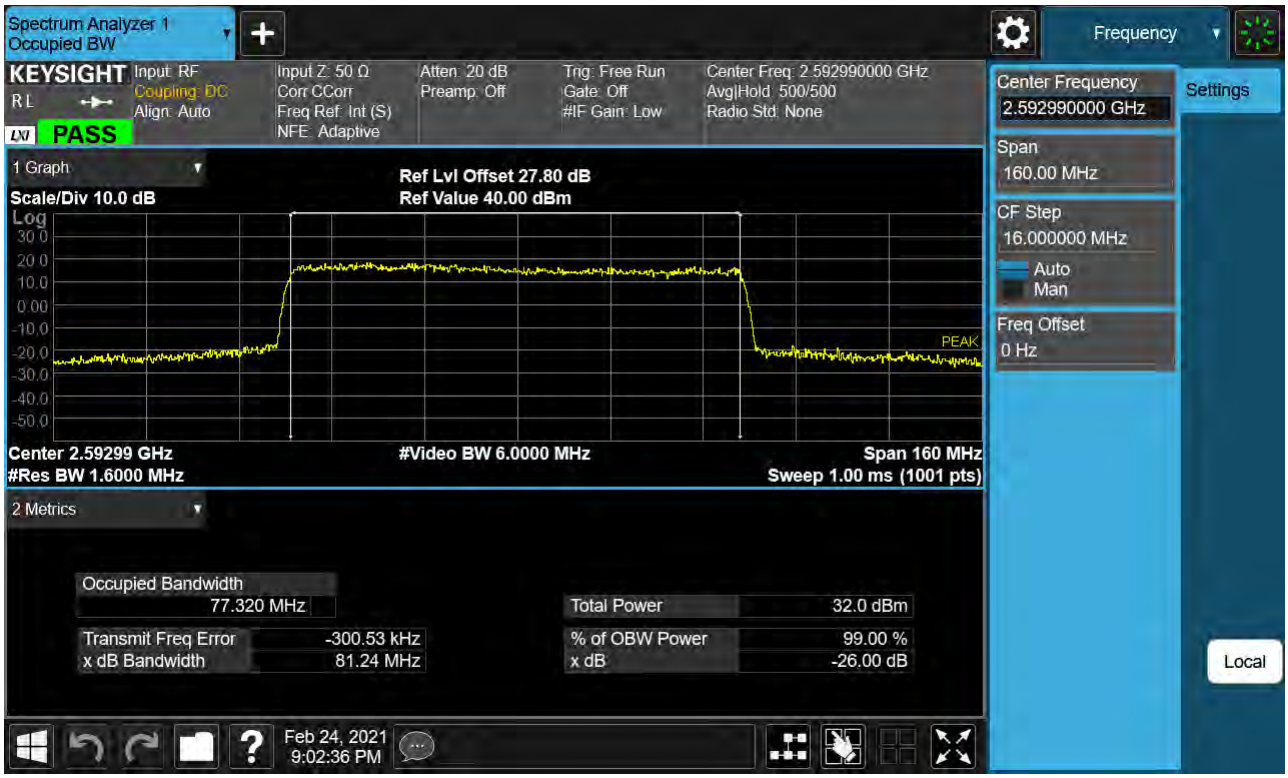
Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 BPSK)

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

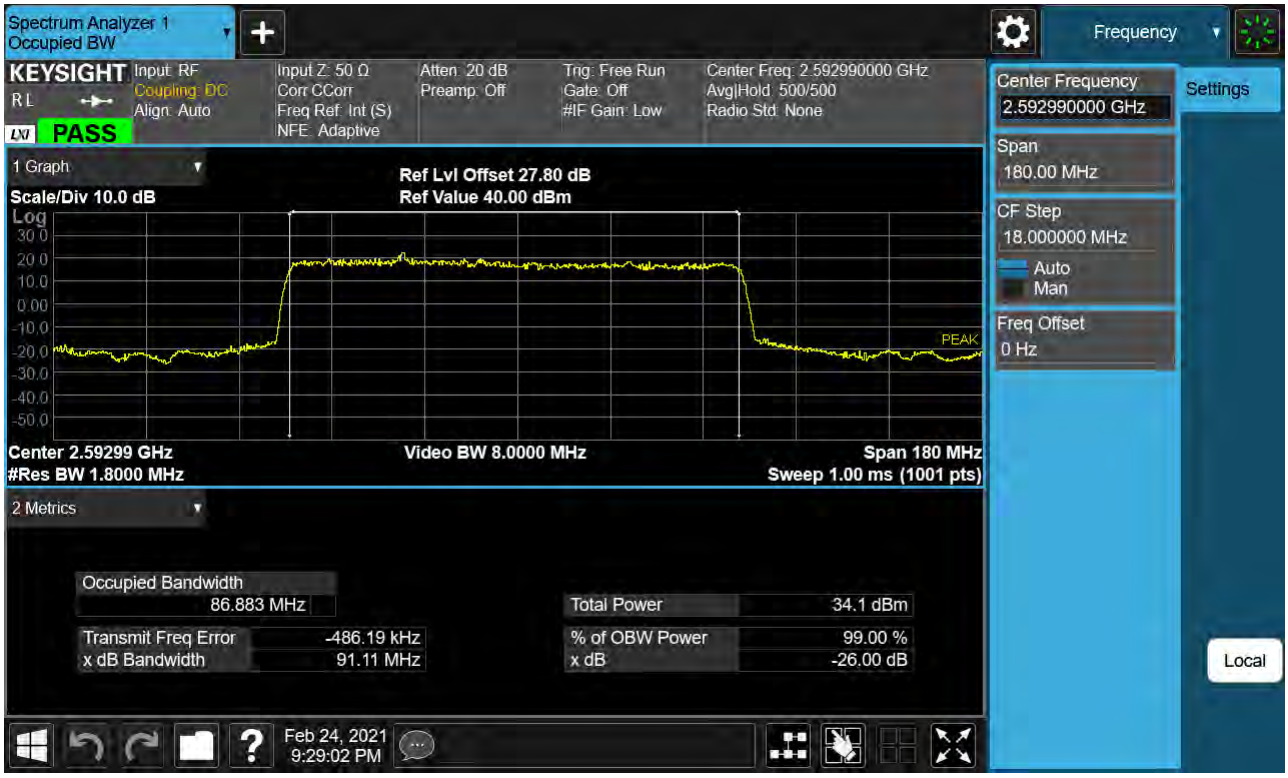
Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 16-QAM)

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

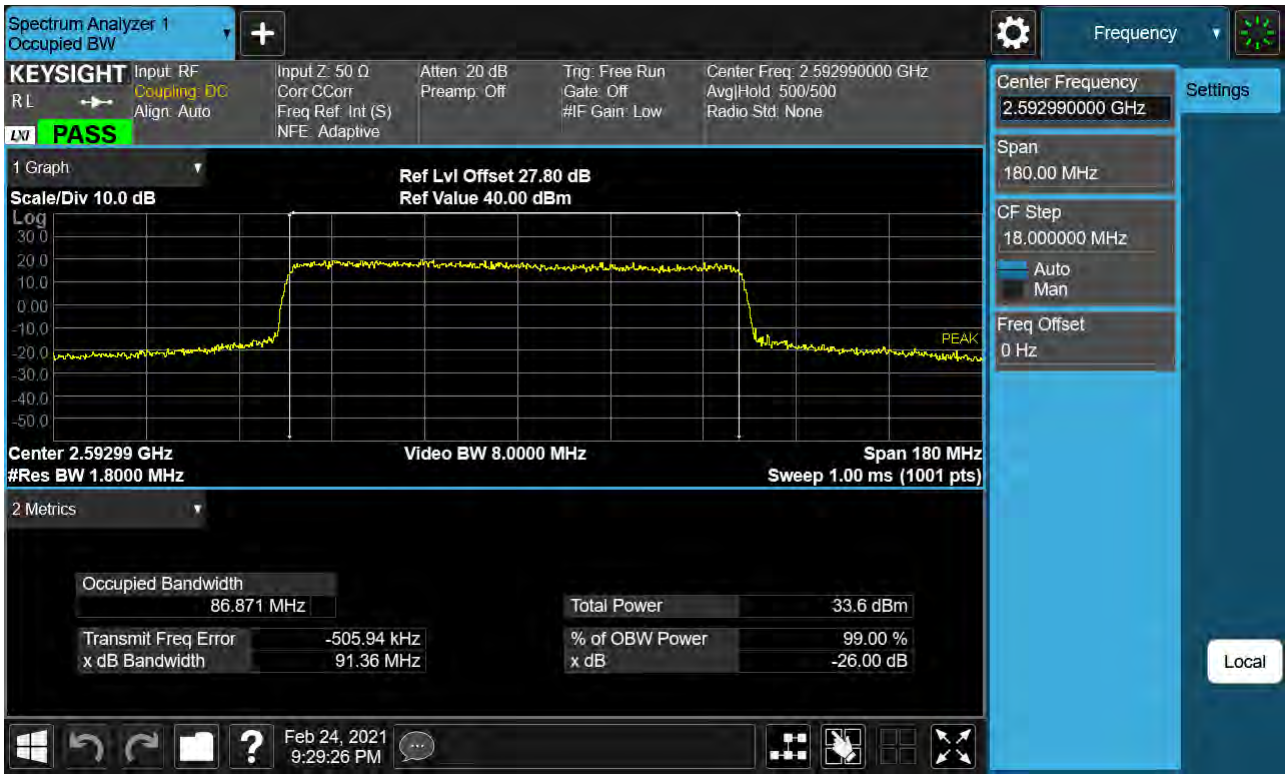
Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 256-QAM)



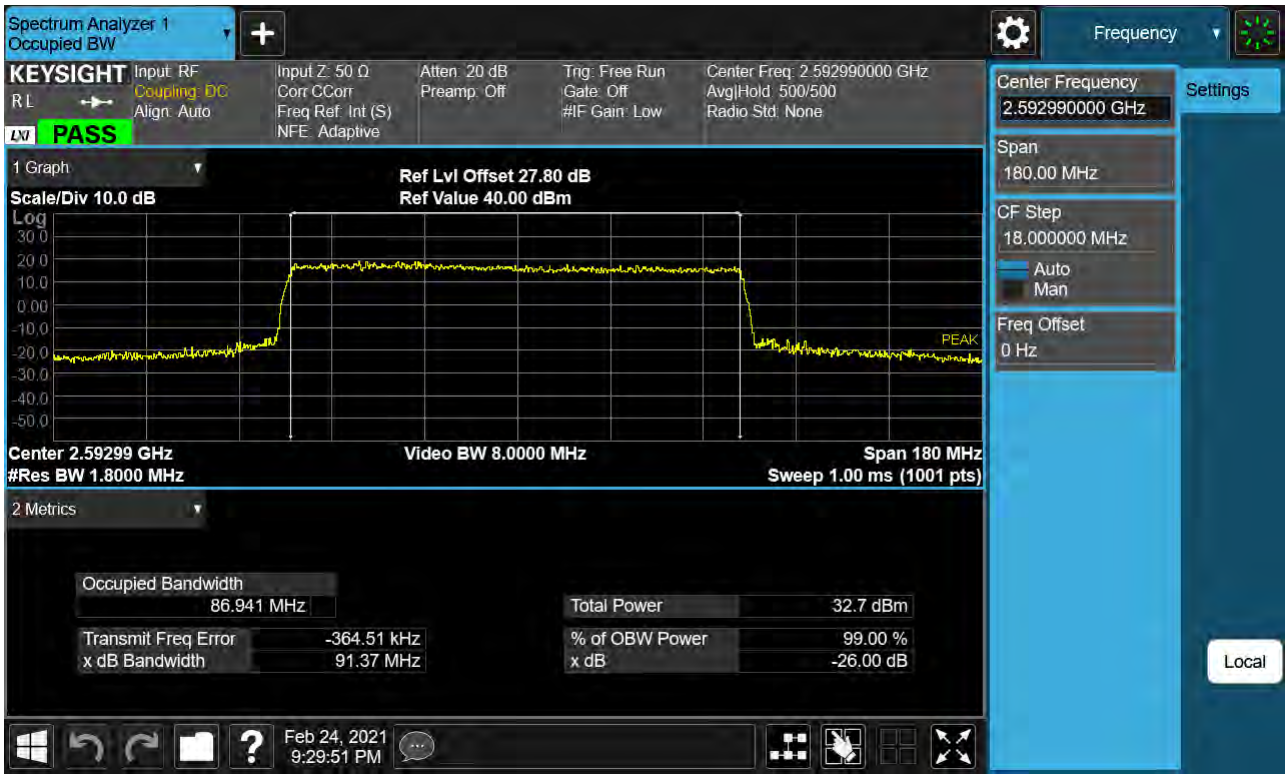
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 BPSK)



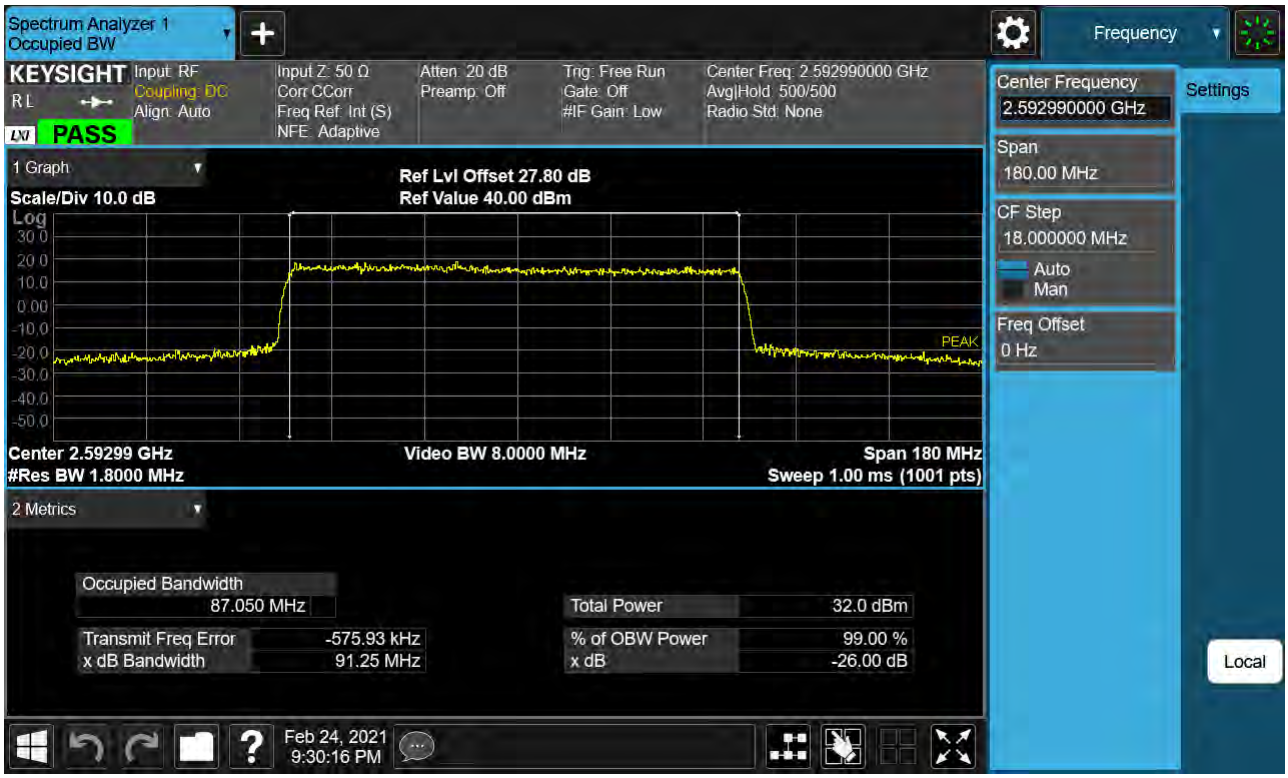
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 QPSK)



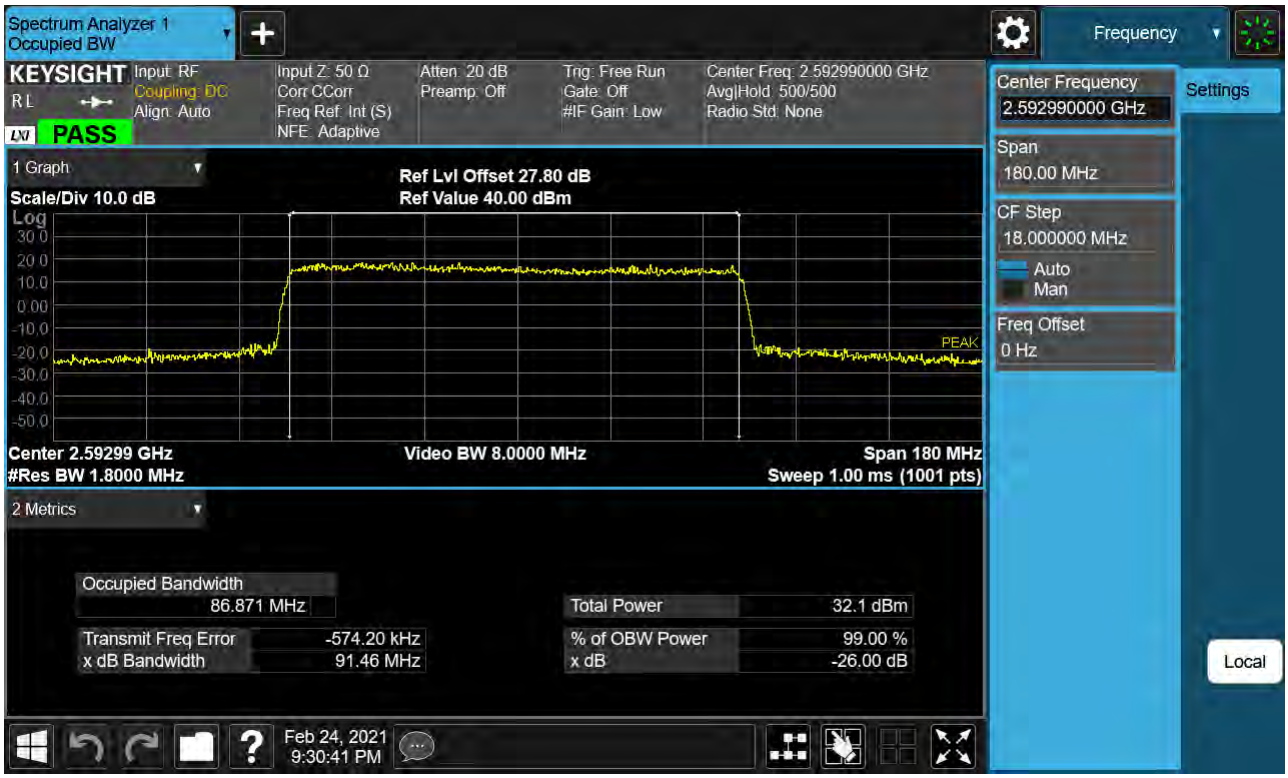
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 16-QAM)



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



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

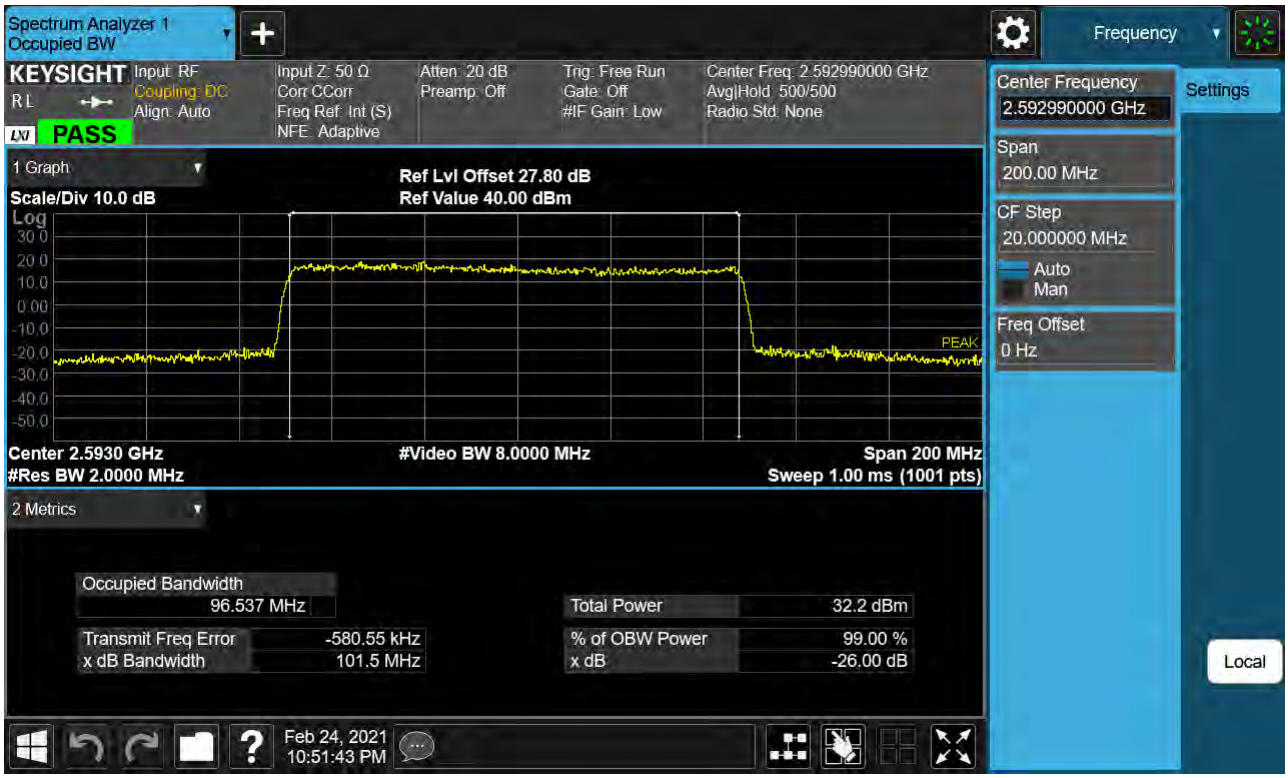


Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 BPSK)

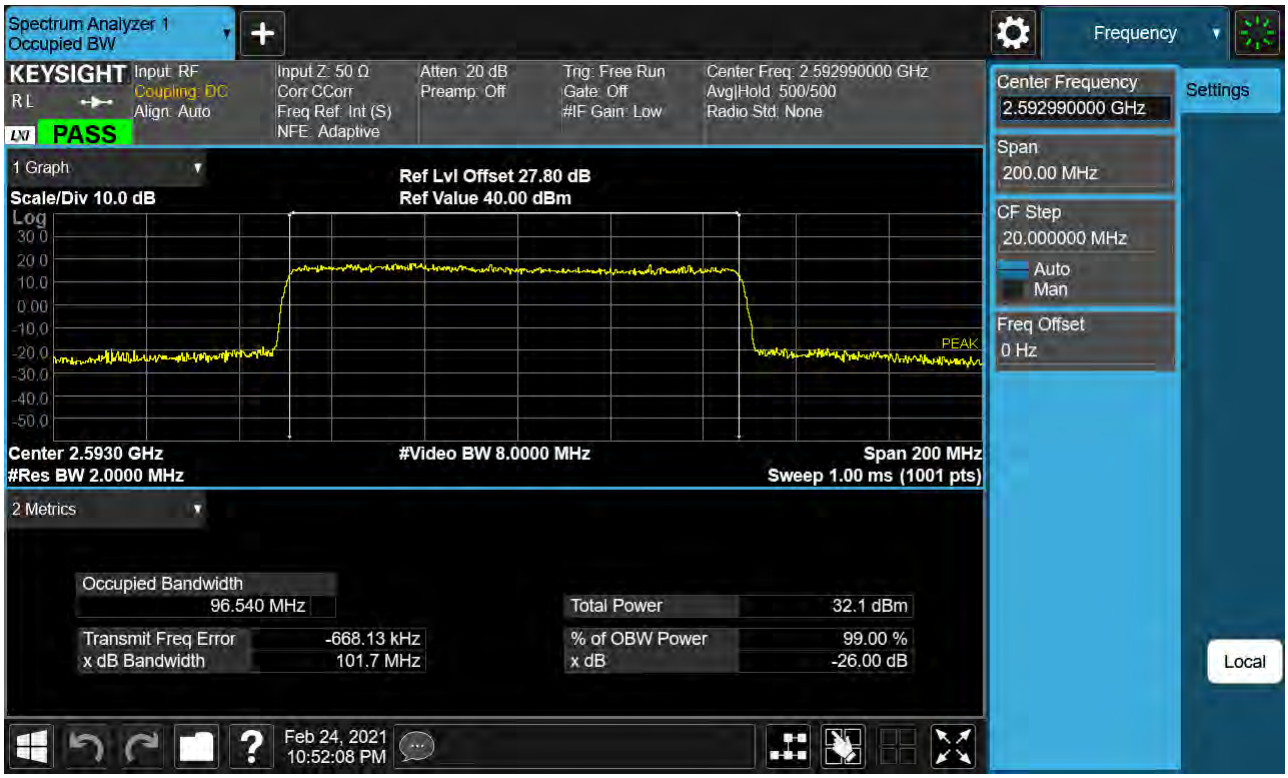
Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 QPSK)

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 (30M BW_Ch.518598_BPSK)

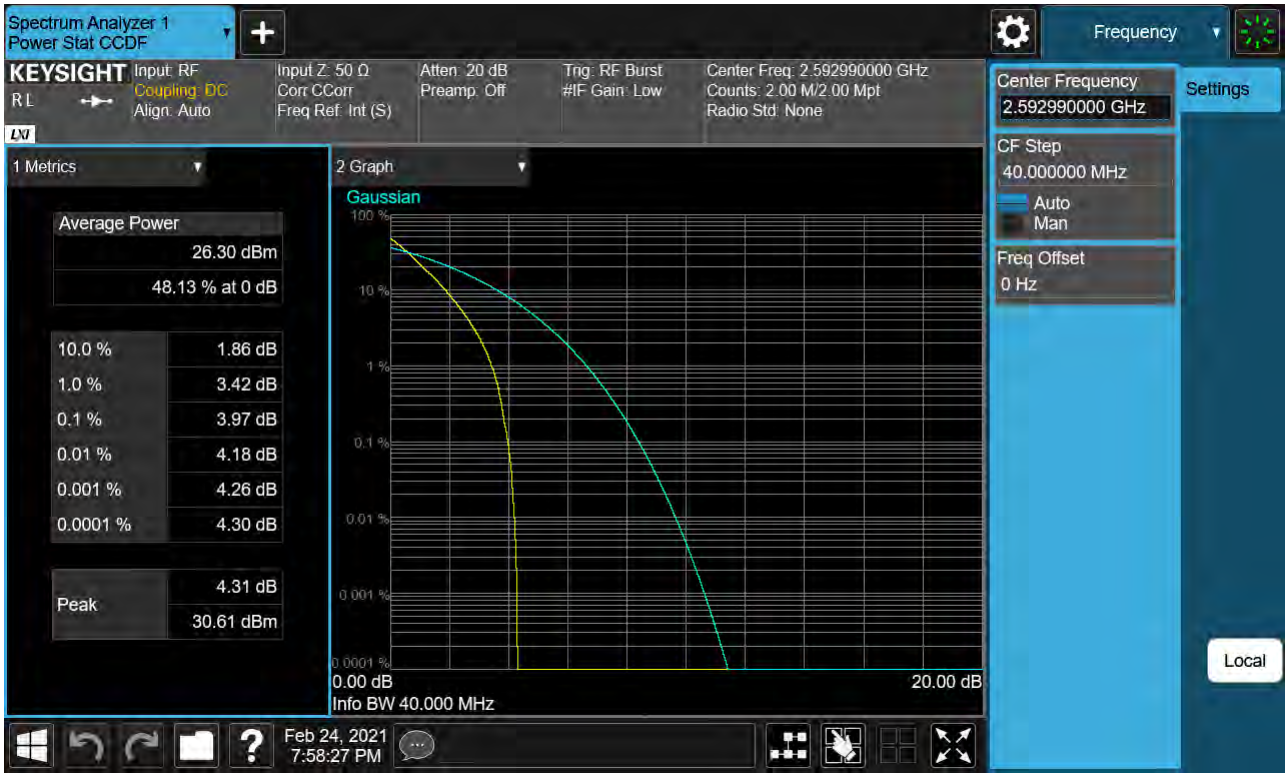
Sub6 n41. PAR Plot (30M BW_Ch.518598_QPSK)

Sub6 n41. PAR Plot (30M BW_Ch.518598_16QAM)

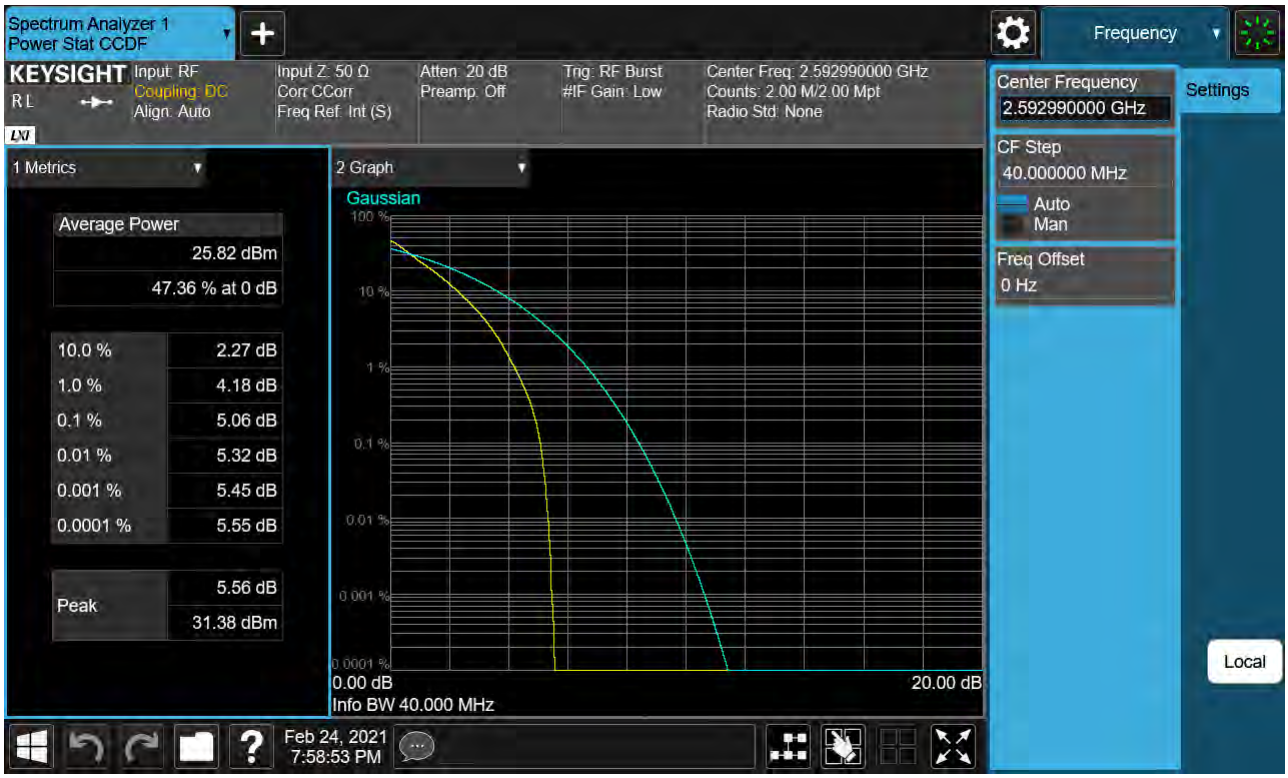
Sub6 n41. PAR Plot (30M BW_Ch.518598_64QAM)

Sub6 n41. PAR Plot (30M BW_Ch.518598_256QAM)

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



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

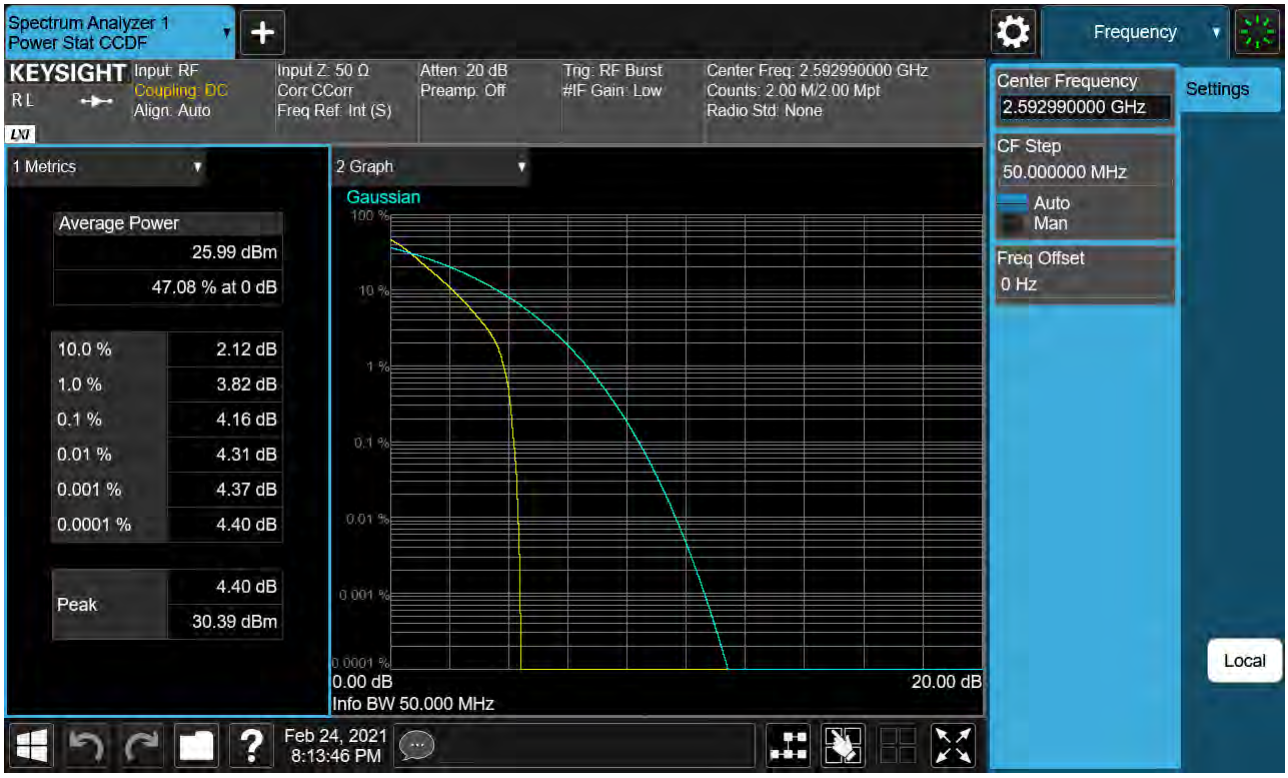


Sub6 n41. PAR Plot (40M BW_Ch.518598_16QAM)

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)

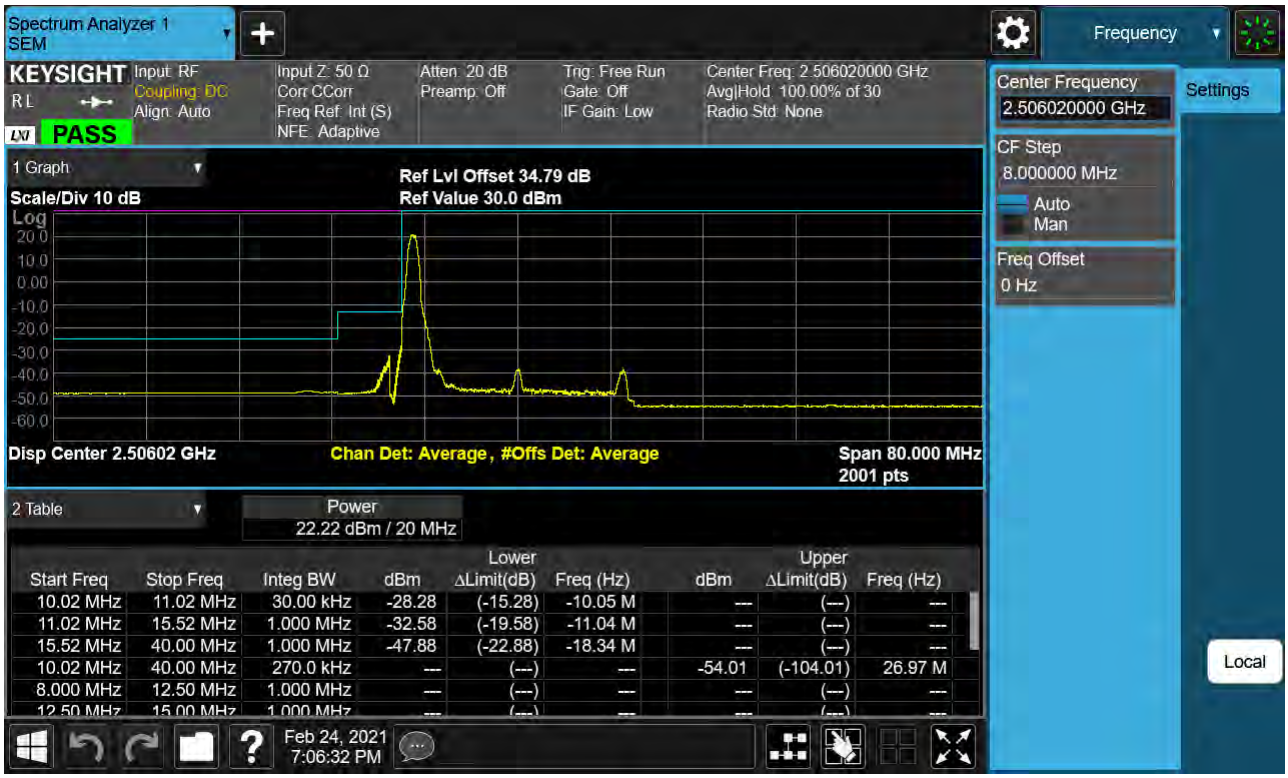
Sub6 n41. PAR Plot (100M BW_Ch.518598_QPSK)

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

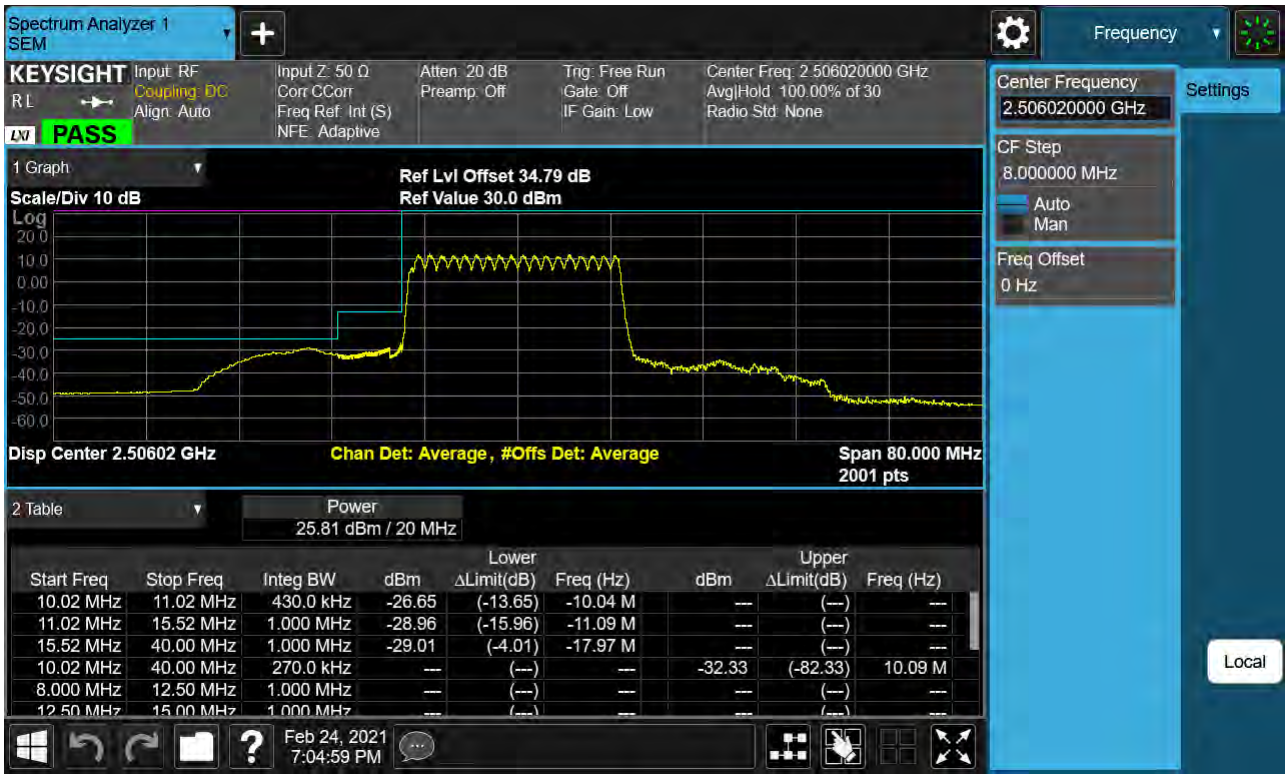
Sub6 n41. PAR Plot (100M BW_Ch.518598_64QAM)

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

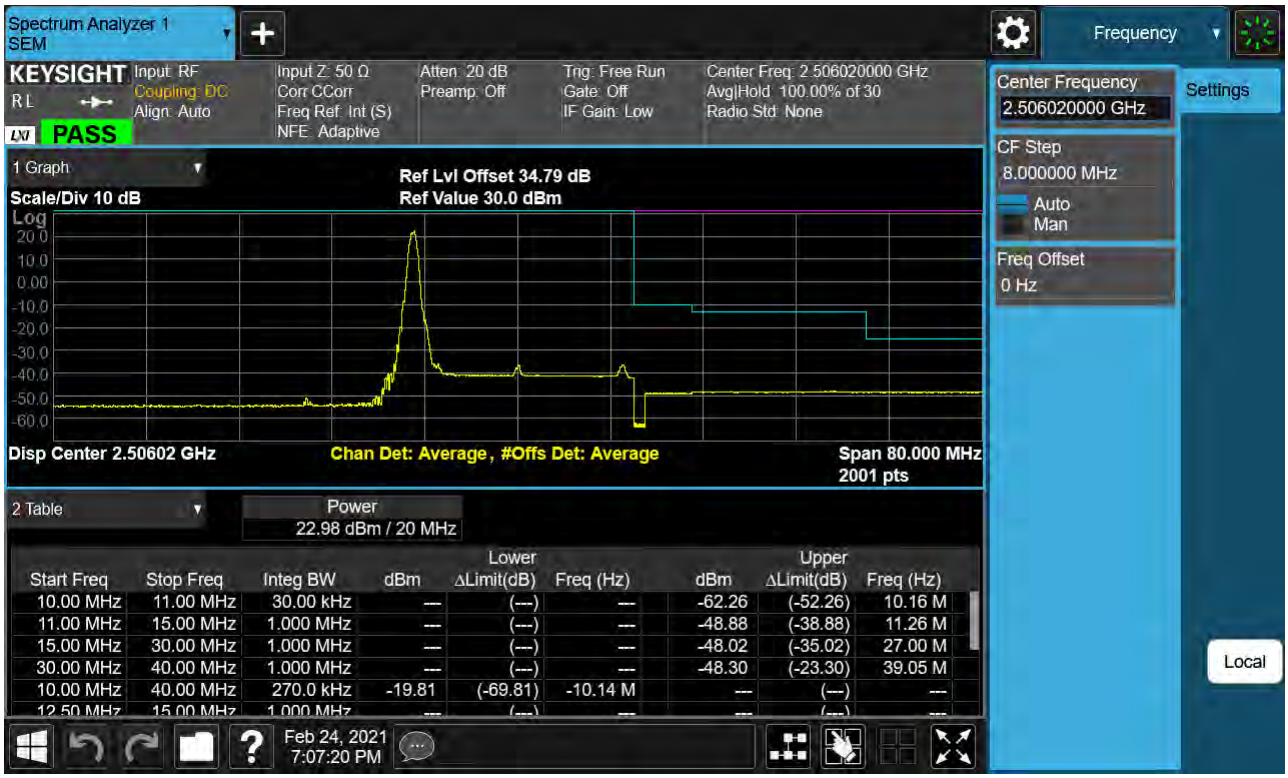
Sub6 n41. Low Channel Edge Plot (20 MHz Ch.501204 BPSK RB 1)-1



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



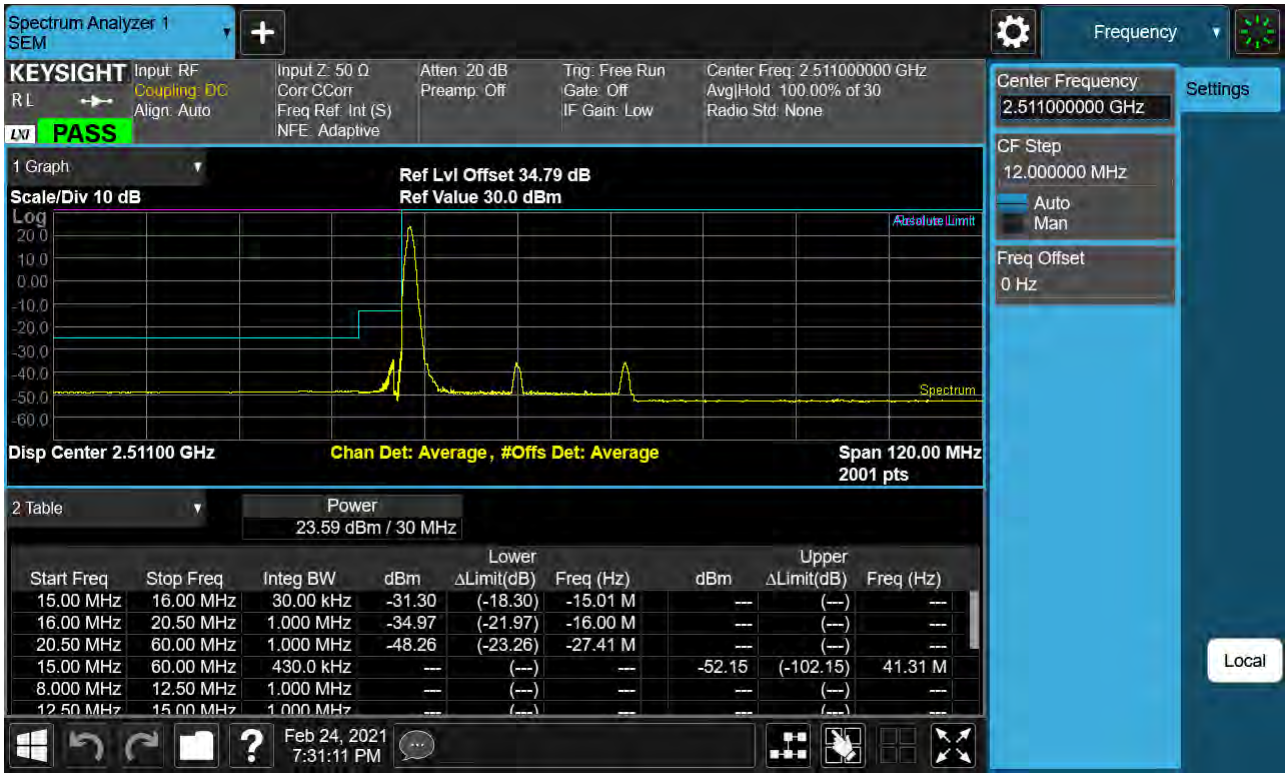
Sub6 n41. Low Channel Edge Plot (20 MHz Ch.501204 BPSK)-2

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

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

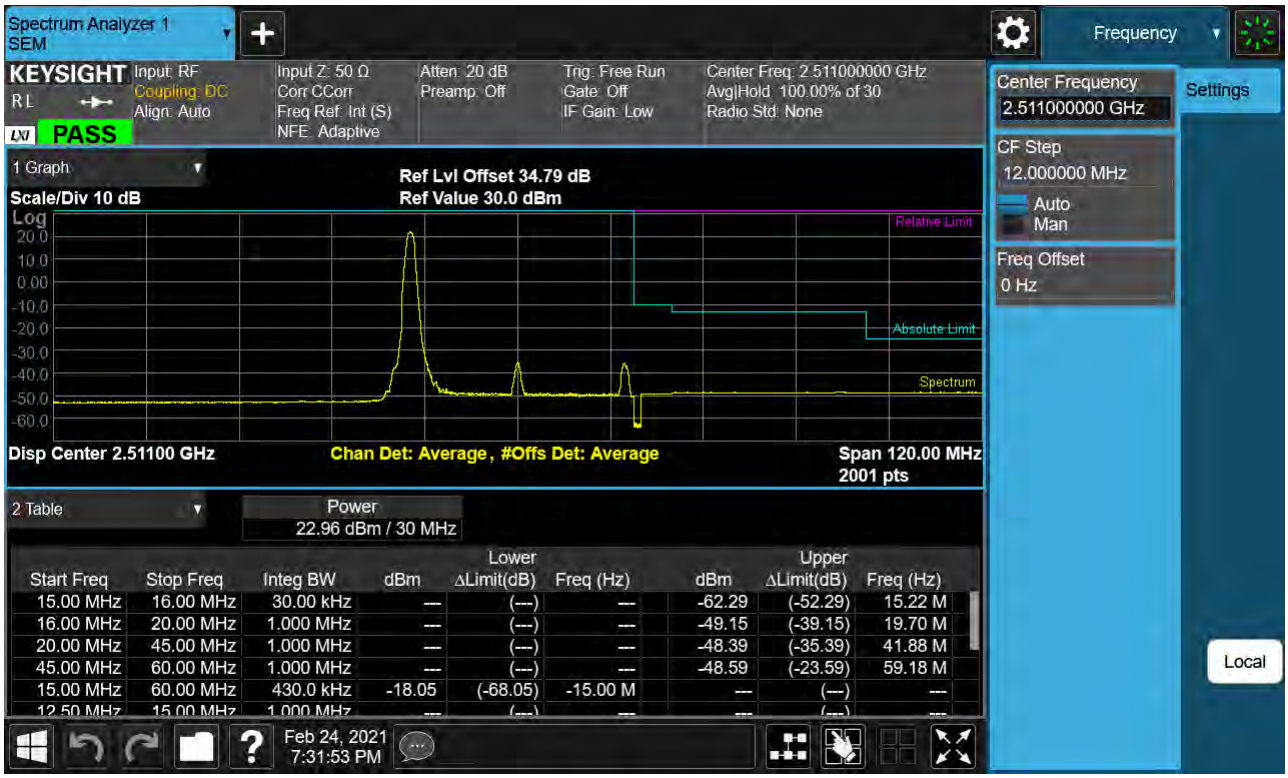
Sub6 n41. High Channel Edge Plot (20 MHz Ch.535998 BPSK)

Sub6 n41. Low Channel Edge Plot (30 MHz Ch.502200 BPSK RB 1)-1



Sub6 n41. Low Channel Edge Plot (30 MHz Ch.502200 BPSK)-1

Sub6 n41. Low Channel Edge Plot (30 MHz Ch.502200 BPSK_RB1)-2



Sub6 n41. Low Channel Edge Plot (30 MHz Ch.502200 BPSK)-2

Sub6 n41. Mid Channel Edge Plot (30 MHz Ch.518598 BPSK)

Sub6 n41. High Channel Edge Plot (30 MHz Ch.534996 BPSK RB 1)