HCT CO.,LTD.
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEL: +82-31-645-6300 FAX: +82-31-645-6401

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:
July 21, 2020

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

Report No.: HCT-RF-2007-FC037

FCC ID:	**A3LSMT878U**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s):	SM-T878U
EUT Type:	Tablet
FCC Classification:	PCS Licensed Transmitter (PCB)
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	0.211	23.24
		17M9G7D	QPSK	0.209	23.20
		17M9W7D	16QAM	0.177	22.49
		17M9W7D	64QAM	0.137	21.37
		17M9W7D	256QAM	0.074	18.71
Sub6 n41 (40)	2516.010 – 2670.000	35M8G7D	PI/2 BPSK	0.235	23.72
		35M7G7D	QPSK	0.233	23.68
		35M8W7D	16QAM	0.190	22.78
		35M7W7D	64QAM	0.153	21.86
		35M8W7D	256QAM	0.084	19.24
Sub6 n41 (50)	2521.020 – 2664.990	45M8G7D	PI/2 BPSK	0.215	23.32
		46M0G7D	QPSK	0.213	23.28
		46M0W7D	16QAM	0.181	22.58
		45M8W7D	64QAM	0.137	21.38
		45M8W7D	256QAM	0.074	18.72
Sub6 n41 (60)	2526.000 – 2659.980	57M9G7D	PI/2 BPSK	0.232	23.66
		57M8G7D	QPSK	0.230	23.62
		57M8W7D	16QAM	0.193	22.86
		57M8W7D	64QAM	0.148	21.70
		57M8W7D	256QAM	0.080	19.03
Sub6 n41 (80)	2536.020 – 2649.990	77M3G7D	PI/2 BPSK	0.242	23.84
		77M3G7D	QPSK	0.240	23.80
		77M3W7D	16QAM	0.196	22.93
		77M3W7D	64QAM	0.153	21.86
		77M2W7D	256QAM	0.083	19.21
Sub6 n41 (90)	2541.000 – 2644.980	87M3G7D	PI/2 BPSK	0.257	24.10
		86M8G7D	QPSK	0.254	24.05
		87M0W7D	16QAM	0.215	23.33
		86M9W7D	64QAM	0.170	22.30
		86M5W7D	256QAM	0.090	19.52
Sub6 n41 (100)	2546.010 – 2640.000	96M8G7D	PI/2 BPSK	0.249	23.97
		96M5G7D	QPSK	0.244	23.87
		96M5W7D	16QAM	0.208	23.18
		96M2W7D	64QAM	0.166	22.19
		96M5W7D	256QAM	0.088	19.45

REVIEWED BY

Report prepared by : Kwon Jeong
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 KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2007-FC037	July 21, 2020	- 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:	A3LSMT878U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§27, §2
EUT Type:	Tablet
Model(s):	SM-T878U
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:	June 07, 2020 ~ July 17, 2020

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Tablet with UMTS and LTE, Sub6.

It also supports IEEE 802.11 a/b/g/n/ac/ax (HT20/40/80), Bluetooth, BT LE, 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;

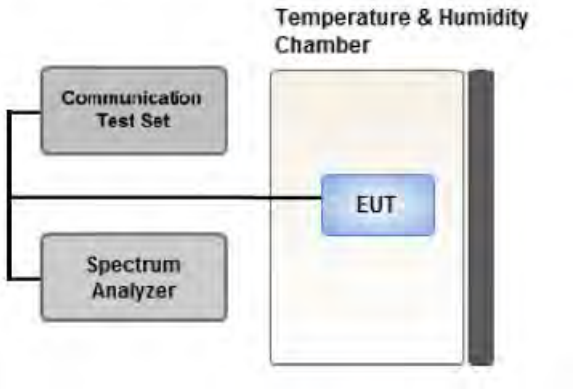
$$Result_{(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

   If the fundalmatal 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.

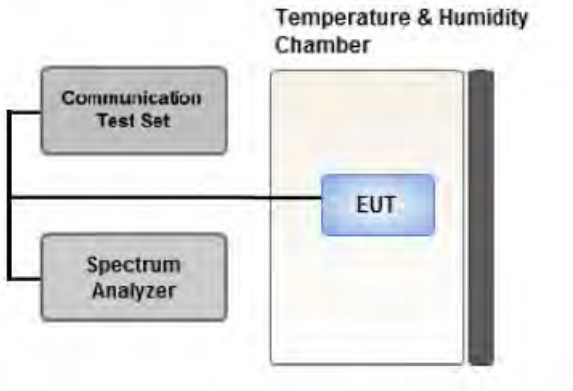
1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

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.

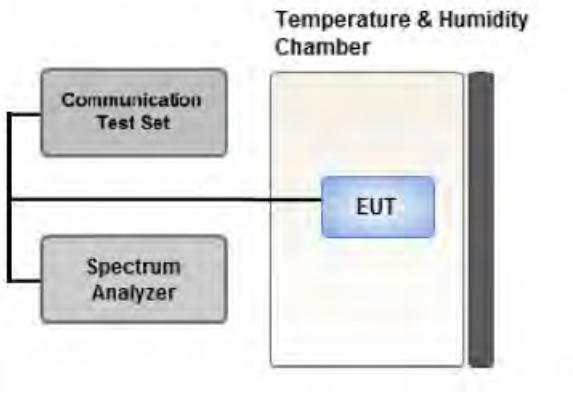
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

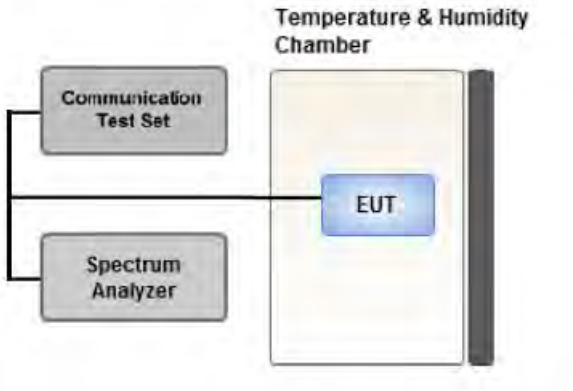
Test Overview

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 = Peak
4. Trace Mode = max hold
5. Sweep time = auto
6. Number of points in sweep ≥ 2 x Span / RBW

3.7 CHANNEL EDGE



Test setup

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

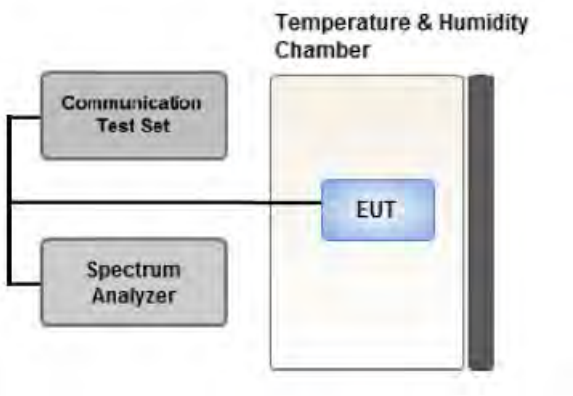
Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. 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.
- Radiated Spurious emissions are measured while operating in EN-DC mode with Sub 6 NR carrier as well as an LTE carrier (anchor).
  All EN-DC mode of operation were investigated and the worst case configuration results are reported.
  (Worst case: 2A-n41A)
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.

[Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1	1	Z
Radiated Spurious and Harmonic Emissions	PI/2 BPSK	1	1	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 RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	20, 40, 50, 60, 80, 90 ,100	Mid	Full RB	0
Peak-To-Average Radio	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
T&M SYSTEM	FBSR-02B(WHK1.2/15G-10EF)/H.P.F	-	03/09/2020	Annual	03/09/2021
T&M SYSTEM	FBSR-02B(WHK3.3/18G-10EF)/H.P.F	-	03/09/2020	Annual	03/09/2021
WAINWRIGHT INSTRUMENT	WHNX6.0/26.5G-6SS/H.P.F	1	03/19/2020	Annual	03/19/2021
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	04/27/2020	Annual	04/27/2021
Hewlett Packard	E3632A/DC Power Supply	MY4004427	09/27/2019	Annual	09/27/2020
Schwarzbeck	UHAP/ Dipole Antenna	557	03/29/2019	Biennial	03/29/2021
Schwarzbeck	UHAP/ Dipole Antenna	558	03/29/2019	Biennial	03/29/2021
ESPEC	SU-642 / Chamber	93000717	08/14/2019	Annual	08/14/2020
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	08/29/2019	Biennial	08/29/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1298	09/25/2019	Biennial	09/25/2021
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)	100931	10/14/2019	Annual	10/14/2020
Agilent	8960 (E5515C)/ Base Station	MY48360800	08/27/2019	Annual	08/27/2020
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	04/26/2019	Biennial	04/26/2021
Schwarzbeck	VULB9160/ Bilog Antenna	9160-3368	08/09/2018	Biennial	08/09/2020
Schwarzbeck	VULB9160/ Hybrid Antenna	760	03/22/2019	Biennial	03/22/2021
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6201502997	08/09/2019	Annual	08/09/2020
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/22/2020	Annual	01/22/2021
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/13/2020	Annual	07/13/2021
KEYSIGHT	E7515B / 5G Wireless Tester	MY58300756	01/07/2020	Annual	01/07/2021
KEYSIGHT	N9030B / Signal Analyzer(5Hz~40.0GHz)	MY55480167	06/04/2020	Annual	06/04/2021
Mini-Circuits	ZC4PD-K1844+ / 4-Way Divider	942907	09/05/2019	Annual	09/05/2020
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).
3. Model : SMB100A (S/N: 177633)
   - Use date of Equipment : June 07, 2020 ~ July 12, 2020/ July 14, 2020 ~ July 17, 2020

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. The same samples were used for SAR and EMC

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

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

16QAM Modulation

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

64QAM 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	-22.80	13.87	10.73	2.32	V	< 2.00	0.169	22.28
		QPSK	-22.88	13.79	10.73	2.32	V		0.166	22.20
		16-QAM	-23.63	13.04	10.73	2.32	V		0.140	21.45
		64-QAM	-24.79	11.88	10.73	2.32	V		0.107	20.29
		256-QAM	-27.44	9.23	10.73	2.32	V		0.058	17.64
2592.990		PI/2 BPSK	-22.20	14.59	10.98	2.35	V		0.210	23.22
		QPSK	-22.28	14.51	10.98	2.35	V		0.206	23.14
		16-QAM	-22.93	13.86	10.98	2.35	V		0.177	22.49
		64-QAM	-24.16	12.63	10.98	2.35	V		0.134	21.26
		256-QAM	-26.90	9.89	10.98	2.35	V		0.071	18.52
2679.990		PI/2 BPSK	-22.46	14.52	11.10	2.38	V		0.211	23.24
		QPSK	-22.50	14.48	11.10	2.38	V		0.209	23.20
		16-QAM	-23.23	13.75	11.10	2.38	V		0.177	22.47
		64-QAM	-24.33	12.65	11.10	2.38	V		0.137	21.37
		256-QAM	-26.99	9.99	11.10	2.38	V		0.074	18.71

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	-21.99	14.66	10.78	2.32	V	< 2.00	0.205	23.12
		QPSK	-22.01	14.64	10.78	2.32	V		0.204	23.10
		16-QAM	-22.84	13.81	10.78	2.32	V		0.169	22.27
		64-QAM	-23.72	12.93	10.78	2.32	V		0.138	21.39
		256-QAM	-26.50	10.15	10.78	2.32	V		0.073	18.61
2592.990		PI/2 BPSK	-21.90	14.89	10.98	2.35	V		0.225	23.52
		QPSK	-21.95	14.84	10.98	2.35	V		0.222	23.47
		16-QAM	-22.71	14.08	10.98	2.35	V		0.187	22.71
		64-QAM	-23.86	12.93	10.98	2.35	V		0.143	21.56
		256-QAM	-26.48	10.31	10.98	2.35	V		0.078	18.94
2670.000		PI/2 BPSK	-21.98	15.01	11.10	2.39	V		0.235	23.72
		QPSK	-22.02	14.97	11.10	2.39	V		0.233	23.68
		16-QAM	-22.92	14.07	11.10	2.39	V		0.190	22.78
		64-QAM	-23.84	13.15	11.10	2.39	V		0.153	21.86
		256-QAM	-26.46	10.53	11.10	2.39	V		0.084	19.24

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	-22.36	14.35	10.80	2.32	V	< 2.00	0.192	22.83
		QPSK	-22.40	14.31	10.80	2.32	V		0.190	22.79
		16-QAM	-23.22	13.49	10.80	2.32	V		0.158	21.97
		64-QAM	-24.31	12.40	10.80	2.32	V		0.123	20.88
		256-QAM	-26.92	9.79	10.80	2.32	V		0.067	18.27
2592.990		PI/2 BPSK	-22.37	14.42	10.98	2.35	V		0.202	23.05
		QPSK	-22.45	14.34	10.98	2.35	V		0.198	22.97
		16-QAM	-23.06	13.73	10.98	2.35	V		0.172	22.36
		64-QAM	-24.28	12.51	10.98	2.35	V		0.130	21.14
		256-QAM	-26.97	9.82	10.98	2.35	V		0.070	18.45
2664.990		PI/2 BPSK	-22.51	14.61	11.10	2.39	V		0.215	23.32
		QPSK	-22.55	14.57	11.10	2.39	V		0.213	23.28
		16-QAM	-23.25	13.87	11.10	2.39	V		0.181	22.58
		64-QAM	-24.45	12.67	11.10	2.39	V		0.137	21.38
		256-QAM	-27.11	10.01	11.10	2.39	V		0.074	18.72

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	-22.37	14.39	10.80	2.33	V	< 2.00	0.194	22.87
		QPSK	-22.44	14.32	10.80	2.33	V		0.190	22.80
		16-QAM	-23.21	13.55	10.80	2.33	V		0.160	22.03
		64-QAM	-24.23	12.53	10.80	2.33	V		0.126	21.01
		256-QAM	-26.98	9.78	10.80	2.33	V		0.067	18.26
2592.990		PI/2 BPSK	-22.80	13.99	10.98	2.35	V		0.183	22.62
		QPSK	-22.84	13.95	10.98	2.35	V		0.181	22.58
		16-QAM	-23.50	13.29	10.98	2.35	V		0.156	21.92
		64-QAM	-24.73	12.06	10.98	2.35	V		0.117	20.69
		256-QAM	-27.38	9.41	10.98	2.35	V		0.064	18.04
2659.980		PI/2 BPSK	-22.30	14.95	11.10	2.39	V		0.232	23.66
		QPSK	-22.34	14.91	11.10	2.39	V		0.230	23.62
		16-QAM	-23.10	14.15	11.10	2.39	V		0.193	22.86
		64-QAM	-24.26	12.99	11.10	2.39	V		0.148	21.70
		256-QAM	-26.93	10.32	11.10	2.39	V		0.080	19.03

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	-22.34	14.46	10.83	2.33	V	< 2.00	0.198	22.96
		QPSK	-22.38	14.42	10.83	2.33	V		0.196	22.92
		16-QAM	-23.08	13.72	10.83	2.33	V		0.167	22.22
		64-QAM	-24.22	12.58	10.83	2.33	V		0.128	21.08
		256-QAM	-26.90	9.90	10.83	2.33	V		0.069	18.40
2592.990		PI/2 BPSK	-22.13	14.66	10.98	2.35	V		0.213	23.29
		QPSK	-22.24	14.55	10.98	2.35	V		0.208	23.18
		16-QAM	-22.82	13.97	10.98	2.35	V		0.182	22.60
		64-QAM	-24.07	12.72	10.98	2.35	V		0.136	21.35
		256-QAM	-26.72	10.07	10.98	2.35	V		0.074	18.70
2649.990		PI/2 BPSK	-21.89	15.12	11.10	2.38	V		0.242	23.84
		QPSK	-21.93	15.08	11.10	2.38	V		0.240	23.80
		16-QAM	-22.80	14.21	11.10	2.38	V		0.196	22.93
		64-QAM	-23.87	13.14	11.10	2.38	V		0.153	21.86
		256-QAM	-26.52	10.49	11.10	2.38	V		0.083	19.21

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	-22.32	14.46	10.85	2.32	V	< 2.00	0.199	22.99
		QPSK	-22.37	14.41	10.85	2.32	V		0.197	22.94
		16-QAM	-23.01	13.77	10.85	2.32	V		0.170	22.30
		64-QAM	-24.07	12.71	10.85	2.32	V		0.133	21.24
		256-QAM	-26.86	9.92	10.85	2.32	V		0.070	18.45
2592.990		PI/2 BPSK	-21.62	15.17	10.98	2.35	V		0.240	23.80
		QPSK	-21.74	15.05	10.98	2.35	V		0.233	23.68
		16-QAM	-22.44	14.35	10.98	2.35	V		0.199	22.98
		64-QAM	-23.55	13.24	10.98	2.35	V		0.154	21.87
		256-QAM	-26.26	10.53	10.98	2.35	V		0.082	19.16
2644.980		PI/2 BPSK	-21.68	15.40	11.09	2.39	V		0.257	24.10
		QPSK	-21.73	15.35	11.09	2.39	V		0.254	24.05
		16-QAM	-22.45	14.63	11.09	2.39	V		0.215	23.33
		64-QAM	-23.48	13.60	11.09	2.39	V		0.170	22.30
		256-QAM	-26.26	10.82	11.09	2.39	V		0.090	19.52

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	-22.28	14.64	10.88	2.32	V	< 2.00	0.209	23.19
		QPSK	-22.39	14.53	10.88	2.32	V		0.203	23.08
		16-QAM	-22.97	13.95	10.88	2.32	V		0.178	22.50
		64-QAM	-24.10	12.82	10.88	2.32	V		0.137	21.37
		256-QAM	-26.87	10.05	10.88	2.32	V		0.073	18.60
2592.990		PI/2 BPSK	-21.76	15.03	10.98	2.35	V		0.232	23.66
		QPSK	-21.82	14.97	10.98	2.35	V		0.229	23.60
		16-QAM	-22.49	14.30	10.98	2.35	V		0.196	22.93
		64-QAM	-23.55	13.24	10.98	2.35	V		0.154	21.87
		256-QAM	-26.16	10.63	10.98	2.35	V		0.084	19.26
2640.000		PI/2 BPSK	-21.87	15.28	11.08	2.39	V		0.249	23.97
		QPSK	-21.97	15.18	11.08	2.39	V		0.244	23.87
		16-QAM	-22.66	14.49	11.08	2.39	V		0.208	23.18
		64-QAM	-23.65	13.50	11.08	2.39	V		0.166	22.19
		256-QAM	-26.39	10.76	11.08	2.39	V		0.088	19.45

8.2 RADIATED SPURIOUS EMISSIONS

▣ NR Band: N41

▣ LTE Band(Anchor): B2

▣ Bandwidth: 20 MHz

▣ Modulation: PI/2 BPSK

▣ Distance: 3 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	-36.48	12.65	-47.53	3.35	H	-38.23	-25.00
	7,518.06	-38.71	11.30	-40.70	4.30	H	-33.70	-25.00
	10,024.08	-47.63	11.05	-44.77	5.02	V	-38.74	-25.00
	12,530.10	-55.67	13.90	-53.11	5.67	V	-44.88	-25.00
518598 (2592.990)	5,185.98	-37.29	12.75	-49.06	3.44	H	-39.75	-25.00
	7,778.97	-45.27	11.65	-47.91	4.36	H	-40.62	-25.00
	10,371.96	-52.73	10.75	-49.47	5.16	V	-43.88	-25.00
535998 (2679.990)	5,359.98	-28.68	13.28	-39.80	3.51	H	-30.03	-25.00
	8,039.97	-47.65	10.93	-48.30	4.48	H	-41.85	-25.00
	10,719.96	-55.03	10.90	-52.24	5.24	V	-46.58	-25.00

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
18650 (1855.0)	3,710.00	-49.89	12.43	-54.88	2.86	V	-45.31	-25.00
	5,565.00	-56.08	13.18	-54.41	3.59	H	-44.82	-25.00
	7,420.00	-56.88	11.15	-47.12	4.24	V	-40.21	-25.00

▣ NR Band: N41

▣ LTE Band(Anchor): B2

▣ Bandwidth: 40 MHz

▣ Modulation: PI/2 BPSK

▣ Distance: 3 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	-35.00	12.60	-45.24	3.37	H	-36.01	-25.00
	7,548.03	-37.79	11.40	-41.31	4.28	H	-34.19	-25.00
	10,064.04	-52.06	11.17	-50.44	5.12	V	-44.39	-25.00
	12,580.05	-55.37	13.85	-52.17	5.77	V	-44.09	-25.00
518598 (2592.990)	5,185.98	-36.17	12.75	-47.94	3.44	H	-38.63	-25.00
	7,778.97	-42.31	11.65	-44.95	4.36	V	-37.66	-25.00
	10,371.96	-50.30	10.75	-47.04	5.16	V	-41.45	-25.00
534000 (2670.000)	5,340.00	-30.97	13.33	-41.85	3.49	H	-32.01	-25.00
	8,010.00	-45.06	10.98	-45.54	4.43	V	-38.99	-25.00
	10,680.00	-55.41	10.90	-53.40	5.21	V	-47.71	-25.00

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
18650 (1855.0)	3,710.00	-49.49	12.43	-54.48	2.86	V	-44.91	-25.00
	5,565.00	-55.84	13.18	-54.17	3.59	V	-44.58	-25.00
	7,420.00	-56.31	11.15	-46.55	4.24	V	-39.64	-25.00

▣ NR Band: N41

▣ LTE Band(Anchor): B2

▣ Bandwidth: 50 MHz

▣ Modulation: PI/2 BPSK

▣ Distance: 3 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	-38.30	12.55	-48.45	3.39	H	-39.29	-25.00
	7,563.06	-40.22	11.43	-43.90	4.29	V	-36.76	-25.00
	10,084.08	-50.69	11.14	-48.87	5.06	V	-42.79	-25.00
518598 (2592.990)	5,185.98	-38.66	12.75	-50.43	3.44	H	-41.12	-25.00
	7,778.97	-41.35	11.65	-43.99	4.36	H	-36.70	-25.00
	10,371.96	-53.71	10.75	-50.45	5.16	V	-44.86	-25.00
532998 (2664.990)	5,329.98	-27.57	13.35	-38.74	3.48	H	-28.87	-25.00
	7,994.97	-43.83	11.03	-44.50	4.42	V	-37.89	-25.00
	10,659.96	-54.54	10.90	-51.78	5.35	V	-46.23	-25.00

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
18650 (1855.0)	3,710.00	-50.31	12.43	-55.30	2.86	V	-45.73	-25.00
	5,565.00	-56.02	13.18	-54.35	3.59	V	-44.76	-25.00
	7,420.00	-56.53	11.15	-46.77	4.24	V	-39.86	-25.00

▣ NR Band: N41

▣ LTE Band(Anchor): B2

▣ Bandwidth: 60 MHz

▣ Modulation: PI/2 BPSK

▣ Distance: 3 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	-42.23	12.50	-52.66	3.39	H	-43.55	-25.00
	7,578.00	-40.45	11.45	-43.22	4.30	H	-36.07	-25.00
	10,104.00	-52.25	11.12	-49.81	5.04	V	-43.73	-25.00
	12,630.00	-56.52	13.70	-52.64	5.77	V	-44.71	-25.00
518598 (2592.990)	5,185.98	-37.42	12.75	-49.19	3.44	H	-39.88	-25.00
	7,778.97	-41.81	11.65	-44.45	4.36	H	-37.16	-25.00
	10,371.96	-53.18	10.75	-49.92	5.16	V	-44.33	-25.00
531996 (2659.980)	5,319.96	-30.85	13.35	-42.37	3.47	H	-32.49	-25.00
	7,979.94	-44.44	11.10	-45.36	4.43	H	-38.69	-25.00
	10,639.92	-54.80	10.90	-51.89	5.29	H	-46.28	-25.00

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
18650 (1855.0)	3,710.00	-49.62	12.43	-54.61	2.86	V	-45.04	-25.00
	5,565.00	-56.19	13.18	-54.52	3.59	V	-44.93	-25.00
	7,420.00	-56.58	11.15	-46.82	4.24	V	-39.91	-25.00

▣ NR Band: N41

▣ LTE Band(Anchor): B2

▣ Bandwidth: 80 MHz

▣ Modulation: PI/2 BPSK

▣ Distance: 3 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	-40.53	12.40	-51.56	3.39	H	-42.55	-25.00
	7,608.06	-38.81	11.55	-40.97	4.32	H	-33.74	-25.00
	10,144.08	-51.88	11.19	-49.57	5.13	V	-43.51	-25.00
518598 (2592.990)	5,185.98	-40.69	12.75	-52.46	3.44	V	-43.15	-25.00
	7,778.97	-40.26	11.65	-42.90	4.36	H	-35.61	-25.00
	10,371.96	-53.28	10.75	-50.02	5.16	H	-44.43	-25.00
529998 (2649.990)	5,299.98	-34.58	13.40	-46.60	3.47	H	-36.67	-25.00
	7,949.97	-45.69	11.20	-47.27	4.40	H	-40.47	-25.00
	10,599.96	-54.95	10.90	-51.74	5.16	H	-46.00	-25.00

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
18650 (1855.0)	3,710.00	-50.19	12.43	-55.18	2.86	V	-45.61	-25.00
	5,565.00	-55.86	13.18	-54.19	3.59	V	-44.60	-25.00
	7,420.00	-56.44	11.15	-46.68	4.24	V	-39.77	-25.00

▣ NR Band: N41

▣ LTE Band(Anchor): B2

▣ Bandwidth: 90 MHz

▣ Modulation: PI/2 BPSK

▣ Distance: 3 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	-41.33	12.40	-52.25	3.39	H	-43.24	-25.00
	7,623.00	-36.29	11.60	-38.56	4.34	H	-31.30	-25.00
	10,164.00	-48.96	11.13	-47.21	5.12	V	-41.21	-25.00
518598 (2592.990)	5,185.98	-41.21	12.75	-52.98	3.44	H	-43.67	-25.00
	7,778.97	-44.94	11.65	-47.58	4.36	H	-40.29	-25.00
	10,371.96	-54.36	10.75	-51.10	5.16	V	-45.51	-25.00
528996 (2644.980)	5,289.96	-37.96	13.35	-50.21	3.48	H	-40.34	-25.00
	7,934.94	-48.75	11.24	-50.17	4.41	H	-43.34	-25.00
	10,579.92	-56.63	10.85	-53.52	5.21	V	-47.88	-25.00

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
18650 (1855.0)	3,710.00	-50.30	12.43	-55.29	2.86	V	-45.72	-25.00
	5,565.00	-56.09	13.18	-54.42	3.59	V	-44.83	-25.00
	7,420.00	-56.83	11.15	-47.07	4.24	V	-40.16	-25.00

▣ NR Band: N41

▣ LTE Band(Anchor): B2

▣ Bandwidth: 100 MHz

▣ Modulation: PI/2 BPSK

▣ Distance: 3 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	-38.60	12.35	-49.27	3.41	H	-40.33	-25.00
	7,638.03	-36.12	11.65	-39.41	4.34	H	-32.10	-25.00
	10,184.04	-50.02	11.08	-48.06	5.08	V	-42.06	-25.00
518598 (2592.990)	5,185.98	-40.35	12.75	-52.12	3.44	H	-42.81	-25.00
	7,778.97	-40.71	11.65	-43.35	4.36	H	-36.06	-25.00
	10,371.96	-54.35	10.75	-51.09	5.16	V	-45.50	-25.00
528000 (2640.000)	5,280.00	-40.75	13.30	-53.11	3.48	H	-43.29	-25.00
	7,920.00	-50.07	11.25	-51.09	4.42	H	-44.26	-25.00
	10,560.00	-57.03	10.83	-53.38	5.25	H	-47.80	-25.00

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
18650 (1855.0)	3,710.00	-49.76	12.43	-54.75	2.86	V	-45.18	-25.00
	5,565.00	-55.69	13.18	-54.02	3.59	V	-44.43	-25.00
	7,420.00	-56.61	11.15	-46.85	4.24	V	-39.94	-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	50	0	4.46
			QPSK	50	0	5.66
			16-QAM	50	0	6.54
			64-QAM	50	0	6.60
			256-QAM	50	0	6.53
	40 MHz		BPSK	100	0	4.51
			QPSK	100	0	5.54
			16-QAM	100	0	6.46
			64-QAM	100	0	6.47
			256-QAM	100	0	6.64
	50 MHz		BPSK	128	0	4.83
			QPSK	128	0	5.73
			16-QAM	128	0	6.62
			64-QAM	128	0	6.63
			256-QAM	128	0	6.65
	60 MHz		BPSK	162	0	4.46
			QPSK	162	0	5.70
			16-QAM	162	0	6.37
			64-QAM	162	0	6.64
			256-QAM	162	0	6.60
	80 MHz		BPSK	216	0	5.14
			QPSK	216	0	5.73
			16-QAM	216	0	6.48
			64-QAM	216	0	6.67
			256-QAM	216	0	6.50
	90 MHz		BPSK	243	0	4.56
			QPSK	243	0	5.72
			16-QAM	243	0	6.49
			64-QAM	243	0	6.62
			256-QAM	243	0	6.54
	100 MHz		BPSK	270	0	4.91
			QPSK	270	0	5.70
			16-QAM	270	0	6.36
			64-QAM	270	0	6.54
			256-QAM	270	0	6.67

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 89 ~ 123.

8.4 OCCUPIED BANDWIDTH

SCS 30kHz

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Sub6 n41	20 MHz	2592.990	BPSK	50	0	17.931
			QPSK	50	0	17.933
			16-QAM	50	0	17.931
			64-QAM	50	0	17.935
			256-QAM	50	0	17.941
	40 MHz		BPSK	100	0	35.755
			QPSK	100	0	35.706
			16-QAM	100	0	35.778
			64-QAM	100	0	35.698
			256-QAM	100	0	35.814
	50 MHz		BPSK	128	0	45.839
			QPSK	128	0	45.996
			16-QAM	128	0	45.985
			64-QAM	128	0	45.844
			256-QAM	128	0	45.802
	60 MHz		BPSK	162	0	57.860
			QPSK	162	0	57.946
			16-QAM	162	0	57.776
			64-QAM	162	0	57.838
			256-QAM	162	0	57.800
	80 MHz		BPSK	216	0	77.285
			QPSK	216	0	77.326
			16-QAM	216	0	77.330
			64-QAM	216	0	77.298
			256-QAM	216	0	77.241
	90 MHz		BPSK	243	0	87.263
			QPSK	243	0	86.827
			16-QAM	243	0	87.006
			64-QAM	243	0	86.941
			256-QAM	243	0	86.503
	100 MHz		BPSK	270	0	96.802
			QPSK	270	0	96.497
			16-QAM	270	0	96.502
			64-QAM	270	0	96.237
			256-QAM	270	0	96.456

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 54 ~ 88.

8.5 CONDUCTED SPURIOUS EMISSIONS

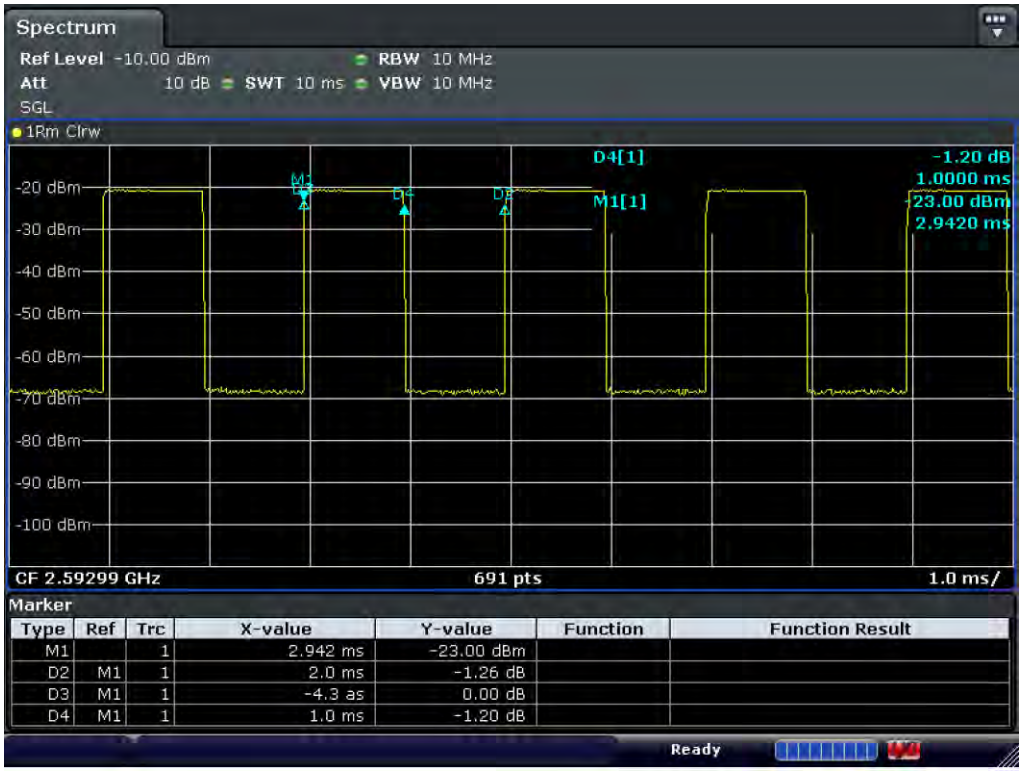
Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
Sub6 n41	20	2506.020	4.0290	33.288	-72.614	-39.326	-25.00
		2592.990	7.9626	34.401	-72.442	-38.041	
		2679.990	3.2942	33.288	-72.092	-38.804	
	40	2516.010	7.1875	34.401	-72.381	-37.980	
		2592.990	4.0404	33.288	-72.543	-39.255	
		2670.000	6.0474	34.401	-71.744	-37.343	
	50	2521.020	5.2338	34.401	-72.764	-38.363	
		2592.990	4.9527	33.288	-72.235	-38.947	
		2664.990	5.7747	34.401	-72.471	-38.070	
	60	2526.000	9.1172	34.401	-72.627	-38.226	
		2592.990	8.0239	34.401	-71.969	-37.568	
		2659.980	4.0514	33.288	-71.835	-38.547	
	80	2536.020	8.0259	34.401	-72.435	-38.034	
		2592.990	8.8495	34.401	-71.564	-37.163	
		2649.990	9.4651	34.401	-72.097	-37.696	
	90	2541.000	8.0085	34.401	-72.036	-37.635	
		2592.990	3.7339	33.288	-72.772	-39.484	
		2644.980	7.1665	34.401	-72.194	-37.793	
	100	2546.010	6.0708	34.401	-72.653	-38.252	
		2592.990	7.9985	34.401	-72.147	-37.746	
		2640.000	9.4272	34.401	-72.146	-37.745	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 173 ~ 214.

2. Duty Cycle

SCS (kHz)	Mod	T on (ms)	T total (ms)	Duty Cycle Factor (dB)	Duty Cycle (%)
30	DFT-s	1.00	2.00	3.01	50.00



3. Duty Cycle factor already applied on the factor.

- Duty Cycle Factor(dB) = 3.01
- Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator + Power Splitter
- Result(dBm) = Reading + Factor

Frequency Range (GHz)	Factor [dB]
0.03 – 1	31.701
1 – 5	33.288
5 – 10	34.401
10 – 15	34.726
15 – 20	35.563
Above 20(26.5)	36.994

8.6 CHANNEL EDGE

Band Width	Frequency (MHz)	Modulation	RB (Size/ Offset)	2 495 MHz ~ 2 496 MHz	C.E ~ (C.E +Normal Hz)	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 MHz	2506.020	BPSK	Full RB	-30.15	-36.78	-32.62	-34.95	-32.38	-35.26	-39.08
40 MHz	2516.010	BPSK	Full RB	-24.60	-27.61	-25.29	-29.21	-28.38	-28.38	-33.86
50 MHz	2521.020	BPSK	Full RB	-28.33	-32.15	-29.62	-30.74	-29.14	-32.75	-38.25
60 MHz	2526.000	BPSK	Full RB	-19.24	-21.75	-27.38	-28.94	-26.25	-26.15	-35.22
80 MHz	2536.020	BPSK	Full RB	-27.00	-30.00	-29.85	-29.85	-30.42	-28.32	-33.33
90 MHz	2541.000	BPSK	Full RB	-24.38	-27.79	-26.81	-27.24	-28.45	-26.01	-34.97
100 MHz	2546.010	BPSK	Full RB	-23.66	-28.68	-26.72	-27.54	-29.20	-28.76	-35.84
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 ± NormalHz)		(C.E ± 1 MHz) ~ (C.E ± 5 MHz)	
					Lower	Upper	Lower	Upper
20 MHz	2592.990	BPSK	Full RB	0	-30.04	-38.68	-35.09	-36.90
	2679.990	BPSK	Full RB	0	-29.52	-36.72	-35.13	-34.81
40 MHz	2592.990	BPSK	Full RB	0	-31.87	-35.75	-34.90	-37.31
	2670.000	BPSK	Full RB	0	-29.87	-34.67	-37.17	-35.94
50 MHz	2592.990	BPSK	Full RB	0	-29.81	-38.88	-35.68	-36.92
	2664.990	BPSK	Full RB	0	-30.19	-34.24	-36.47	-35.09
60 MHz	2592.990	BPSK	Full RB	0	-19.76	-22.58	-32.53	-41.41
	2659.980	BPSK	Full RB	0	-20.58	-22.22	-31.01	-37.66
80 MHz	2592.990	BPSK	Full RB	0	-26.81	-34.48	-33.81	-35.66
	2649.990	BPSK	Full RB	0	-27.30	-34.08	-32.88	-34.22
90 MHz	2592.990	BPSK	Full RB	0	-24.73	-33.16	-33.06	-33.18
	2644.980	BPSK	Full RB	0	-23.97	-27.91	-26.32	-28.11
100 MHz	2592.990	BPSK	Full RB	0	-22.27	-32.50	-29.13	-31.96
	2640.000	BPSK	Full RB	0	-22.25	-25.20	-26.03	-27.39
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	-36.42	-35.01	-39.66	-40.42
	2679.990	BPSK	Full RB	0	-37.49	-33.20	-40.62	-40.73
40 MHz	2592.990	BPSK	Full RB	0	-33.42	-33.61	-41.77	-43.52
	2670.000	BPSK	Full RB	0	-34.42	-34.23	-42.83	-51.96
50 MHz	2592.990	BPSK	Full RB	0	-35.89	-34.79	-43.44	-40.49
	2664.990	BPSK	Full RB	0	-31.34	-31.73	-44.58	-54.99
60 MHz	2592.990	BPSK	Full RB	0	-36.43	-41.22	-47.24	-42.08
	2659.980	BPSK	Full RB	0	-34.06	-37.87	-46.32	-63.02
80 MHz	2592.990	BPSK	Full RB	0	-30.90	-32.75	-63.26	-40.71
	2649.990	BPSK	Full RB	0	-26.05	-28.93	-35.63	-63.02
90 MHz	2592.990	BPSK	Full RB	0	-29.88	-30.48	-63.81	-40.32
	2644.980	BPSK	Full RB	0	-28.40	-28.03	-37.63	-62.98
100 MHz	2592.990	BPSK	Full RB	0	-28.16	-28.92	-63.46	-49.86
	2640.000	BPSK	Full RB	0	-27.54	-29.02	-38.69	-62.93
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. X = 6MHz(5MHz Bandwidth), 10MHz(10MHz Bandwidth), 15MHz(15MHz Bandwidth), 20MHz(20MHz Bandwidth)
4. Plots of the EUT's Channel Edge are shown Page 124 ~ 172. (1RB & Full RB)

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ BandWidth: 20 MHz

▣ Voltage(100%): 3.850 VDC

▣ Batt. Endpoint: 3.550 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 020 013	0.0	0.000 000	0.000
	100%	-30	2506 020 018	4.9	0.000 000	0.002
	100%	-20	2506 020 016	3.3	0.000 000	0.001
	100%	-10	2506 020 019	6.4	0.000 000	0.003
	100%	0	2506 020 018	5.2	0.000 000	0.002
	100%	+10	2506 020 023	10.4	0.000 000	0.004
	100%	+30	2506 020 023	10.2	0.000 000	0.004
	100%	+40	2506 020 016	3.7	0.000 000	0.001
	100%	+50	2506 020 023	10.3	0.000 000	0.004
	Batt. Endpoint	+20	2506 020 021	8.8	0.000 000	0.003
2679.990	100%	+20(Ref)	2679 990 004	0.0	0.000 000	0.000
	100%	-30	2679 990 014	9.7	0.000 000	0.004
	100%	-20	2679 990 012	8.3	0.000 000	0.003
	100%	-10	2679 990 012	8.0	0.000 000	0.003
	100%	0	2679 990 011	7.7	0.000 000	0.003
	100%	+10	2679 990 011	6.9	0.000 000	0.003
	100%	+30	2679 990 011	7.2	0.000 000	0.003
	100%	+40	2679 990 009	5.5	0.000 000	0.002
	100%	+50	2679 990 007	3.2	0.000 000	0.001
	Batt. Endpoint	+20	2679 990 013	8.8	0.000 000	0.003

▣ BandWidth: 40 MHz

▣ Voltage(100%): 3.850 VDC

▣ Batt. Endpoint: 3.550 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 010 005	0.0	0.000 000	0.000
	100%	-30	2516 010 011	5.9	0.000 000	0.002
	100%	-20	2516 010 007	2.2	0.000 000	0.001
	100%	-10	2516 010 009	3.3	0.000 000	0.001
	100%	0	2516 010 015	10.1	0.000 000	0.004
	100%	+10	2516 010 017	11.4	0.000 000	0.005
	100%	+30	2516 010 013	8.0	0.000 000	0.003
	100%	+40	2516 010 013	7.3	0.000 000	0.003
	100%	+50	2516 010 014	8.8	0.000 000	0.004
	Batt. Endpoint	+20	2516 010 007	2.2	0.000 000	0.001
2670.000	100%	+20(Ref)	2670 000 005	0.0	0.000 000	0.000
	100%	-30	2670 000 014	8.3	0.000 000	0.003
	100%	-20	2670 000 014	8.3	0.000 000	0.003
	100%	-10	2670 000 009	3.8	0.000 000	0.001
	100%	0	2670 000 013	7.7	0.000 000	0.003
	100%	+10	2670 000 017	11.5	0.000 000	0.004
	100%	+30	2670 000 016	11.0	0.000 000	0.004
	100%	+40	2670 000 016	11.0	0.000 000	0.004
	100%	+50	2670 000 019	13.5	0.000 001	0.005
	Batt. Endpoint	+20	2670 000 008	3.0	0.000 000	0.001

▣ BandWidth: 50 MHz

▣ Voltage(100%): 3.850 VDC

▣ Batt. Endpoint: 3.550 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 020 012	0.0	0.000 000	0.000
	100%	-30	2521 020 025	13.1	0.000 001	0.005
	100%	-20	2521 020 020	8.3	0.000 000	0.003
	100%	-10	2521 020 025	13.3	0.000 001	0.005
	100%	0	2521 020 014	2.6	0.000 000	0.001
	100%	+10	2521 020 014	1.8	0.000 000	0.001
	100%	+30	2521 020 015	3.4	0.000 000	0.001
	100%	+40	2521 020 016	4.0	0.000 000	0.002
	100%	+50	2521 020 022	10.5	0.000 000	0.004
	Batt. Endpoint	+20	2521 020 018	6.2	0.000 000	0.002
2664.990	100%	+20(Ref)	2664 990 007	0.0	0.000 000	0.000
	100%	-30	2664 990 019	12.2	0.000 000	0.005
	100%	-20	2664 990 018	10.5	0.000 000	0.004
	100%	-10	2664 990 010	2.7	0.000 000	0.001
	100%	0	2664 990 011	4.2	0.000 000	0.002
	100%	+10	2664 990 010	3.0	0.000 000	0.001
	100%	+30	2664 990 014	7.0	0.000 000	0.003
	100%	+40	2664 990 012	5.0	0.000 000	0.002
	100%	+50	2664 990 015	7.8	0.000 000	0.003
	Batt. Endpoint	+20	2664 990 012	4.8	0.000 000	0.002

▣ BandWidth: 60 MHz

▣ Voltage(100%): 3.850 VDC

▣ Batt. Endpoint: 3.550 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 000 007	0.0	0.000 000	0.000
	100%	-30	2526 000 018	10.7	0.000 000	0.004
	100%	-20	2526 000 018	10.8	0.000 000	0.004
	100%	-10	2526 000 020	12.8	0.000 001	0.005
	100%	0	2526 000 011	4.2	0.000 000	0.002
	100%	+10	2526 000 019	11.7	0.000 000	0.005
	100%	+30	2526 000 010	3.5	0.000 000	0.001
	100%	+40	2526 000 010	3.1	0.000 000	0.001
	100%	+50	2526 000 010	3.2	0.000 000	0.001
	Batt. Endpoint	+20	2526 000 017	10.0	0.000 000	0.004
2659.980	100%	+20(Ref)	2659 980 012	0.0	0.000 000	0.000
	100%	-30	2659 980 019	7.5	0.000 000	0.003
	100%	-20	2659 980 024	12.5	0.000 000	0.005
	100%	-10	2659 980 022	10.0	0.000 000	0.004
	100%	0	2659 980 015	3.3	0.000 000	0.001
	100%	+10	2659 980 020	8.3	0.000 000	0.003
	100%	+30	2659 980 021	9.6	0.000 000	0.004
	100%	+40	2659 980 014	2.4	0.000 000	0.001
	100%	+50	2659 980 021	9.8	0.000 000	0.004
	Batt. Endpoint	+20	2659 980 016	4.8	0.000 000	0.002

▣ BandWidth: 80 MHz

▣ Voltage(100%): 3.850 VDC

▣ Batt. Endpoint: 3.550 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 020 004	0.0	0.000 000	0.000
	100%	-30	2536 020 015	10.5	0.000 000	0.004
	100%	-20	2536 020 012	7.1	0.000 000	0.003
	100%	-10	2536 020 008	3.9	0.000 000	0.002
	100%	0	2536 020 006	1.9	0.000 000	0.001
	100%	+10	2536 020 015	10.2	0.000 000	0.004
	100%	+30	2536 020 016	11.2	0.000 000	0.004
	100%	+40	2536 020 016	11.8	0.000 000	0.005
	100%	+50	2536 020 017	12.6	0.000 000	0.005
	Batt. Endpoint	+20	2536 020 012	7.1	0.000 000	0.003
2649.990	100%	+20(Ref)	2649 990 005	0.0	0.000 000	0.000
	100%	-30	2649 990 015	10.5	0.000 000	0.004
	100%	-20	2649 990 011	6.0	0.000 000	0.002
	100%	-10	2649 990 017	11.9	0.000 000	0.005
	100%	0	2649 990 011	6.3	0.000 000	0.002
	100%	+10	2649 990 016	11.1	0.000 000	0.004
	100%	+30	2649 990 014	9.0	0.000 000	0.003
	100%	+40	2649 990 011	6.3	0.000 000	0.002
	100%	+50	2649 990 007	2.9	0.000 000	0.001
	Batt. Endpoint	+20	2649 990 012	7.6	0.000 000	0.003

▣ BandWidth: 90 MHz

▣ Voltage(100%): 3.850 VDC

▣ Batt. Endpoint: 3.550 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 000 023	10.7	0.000 000	0.004
	100%	-20	2541 000 019	6.7	0.000 000	0.003
	100%	-10	2541 000 021	9.0	0.000 000	0.004
	100%	0	2541 000 020	7.5	0.000 000	0.003
	100%	+10	2541 000 023	11.1	0.000 000	0.004
	100%	+30	2541 000 024	11.5	0.000 000	0.005
	100%	+40	2541 000 021	8.5	0.000 000	0.003
	100%	+50	2541 000 016	3.9	0.000 000	0.002
	Batt. Endpoint	+20	2541 000 017	5.1	0.000 000	0.002
2644.980	100%	+20(Ref)	2644 980 008	0.0	0.000 000	0.000
	100%	-30	2644 980 016	7.2	0.000 000	0.003
	100%	-20	2644 980 012	3.9	0.000 000	0.001
	100%	-10	2644 980 021	12.8	0.000 000	0.005
	100%	0	2644 980 021	12.3	0.000 000	0.005
	100%	+10	2644 980 018	9.3	0.000 000	0.004
	100%	+30	2644 980 013	4.4	0.000 000	0.002
	100%	+40	2644 980 021	12.7	0.000 000	0.005
	100%	+50	2644 980 014	5.7	0.000 000	0.002
	Batt. Endpoint	+20	2644 980 012	3.7	0.000 000	0.001

▣ BandWidth: 100 MHz

▣ Voltage(100%): 3.850 VDC

▣ Batt. Endpoint: 3.550 VDC

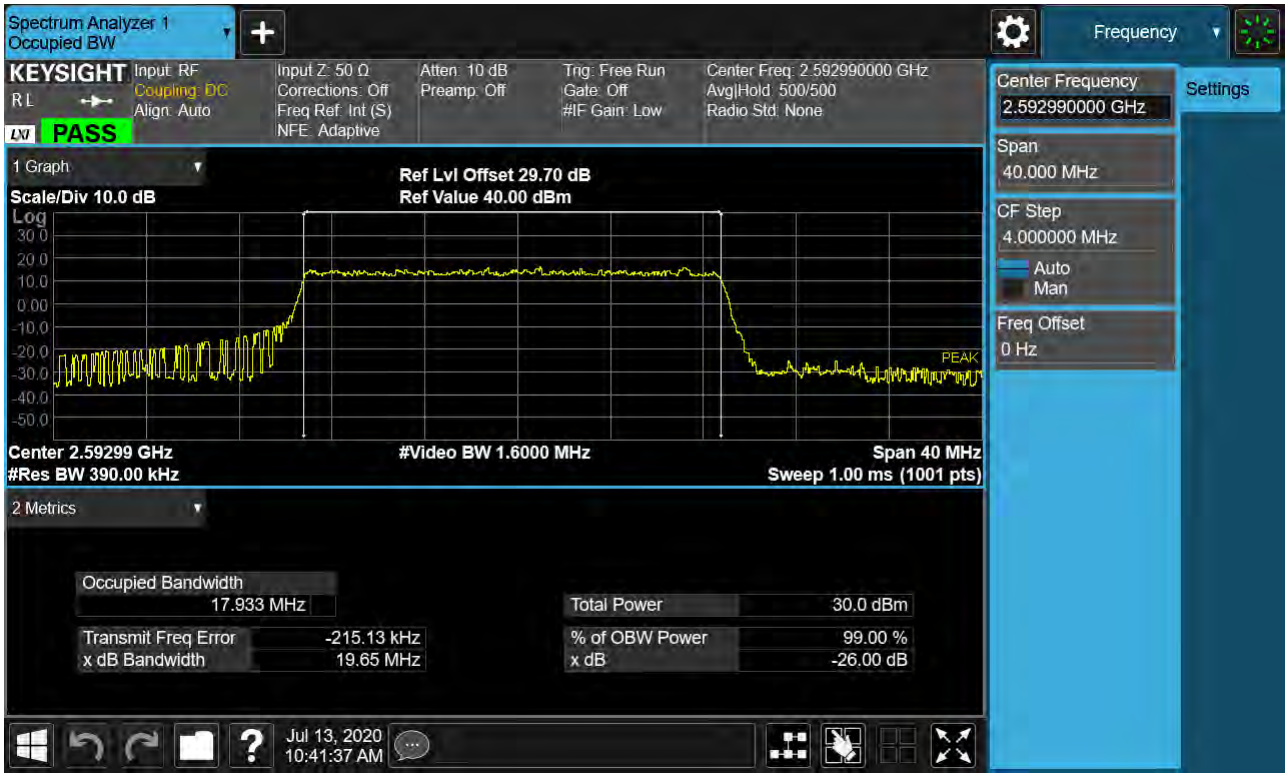
▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
2546.010	100%	+20(Ref)	2546 010 004	0.0	0.000 000	0.000
	100%	-30	2546 010 008	4.3	0.000 000	0.002
	100%	-20	2546 010 012	7.6	0.000 000	0.003
	100%	-10	2546 010 012	7.4	0.000 000	0.003
	100%	0	2546 010 010	6.2	0.000 000	0.002
	100%	+10	2546 010 007	3.3	0.000 000	0.001
	100%	+30	2546 010 015	10.9	0.000 000	0.004
	100%	+40	2546 010 007	2.5	0.000 000	0.001
	100%	+50	2546 010 010	6.2	0.000 000	0.002
	Batt. Endpoint	+20	2546 010 009	5.0	0.000 000	0.002
2640.000	100%	+20(Ref)	2640 000 009	0.0	0.000 000	0.000
	100%	-30	2640 000 013	3.9	0.000 000	0.001
	100%	-20	2640 000 015	6.1	0.000 000	0.002
	100%	-10	2640 000 015	6.0	0.000 000	0.002
	100%	0	2640 000 020	11.1	0.000 000	0.004
	100%	+10	2640 000 022	13.3	0.000 001	0.005
	100%	+30	2640 000 021	12.2	0.000 000	0.005
	100%	+40	2640 000 013	3.6	0.000 000	0.001
	100%	+50	2640 000 013	3.8	0.000 000	0.001
	Batt. Endpoint	+20	2640 000 017	8.0	0.000 000	0.003

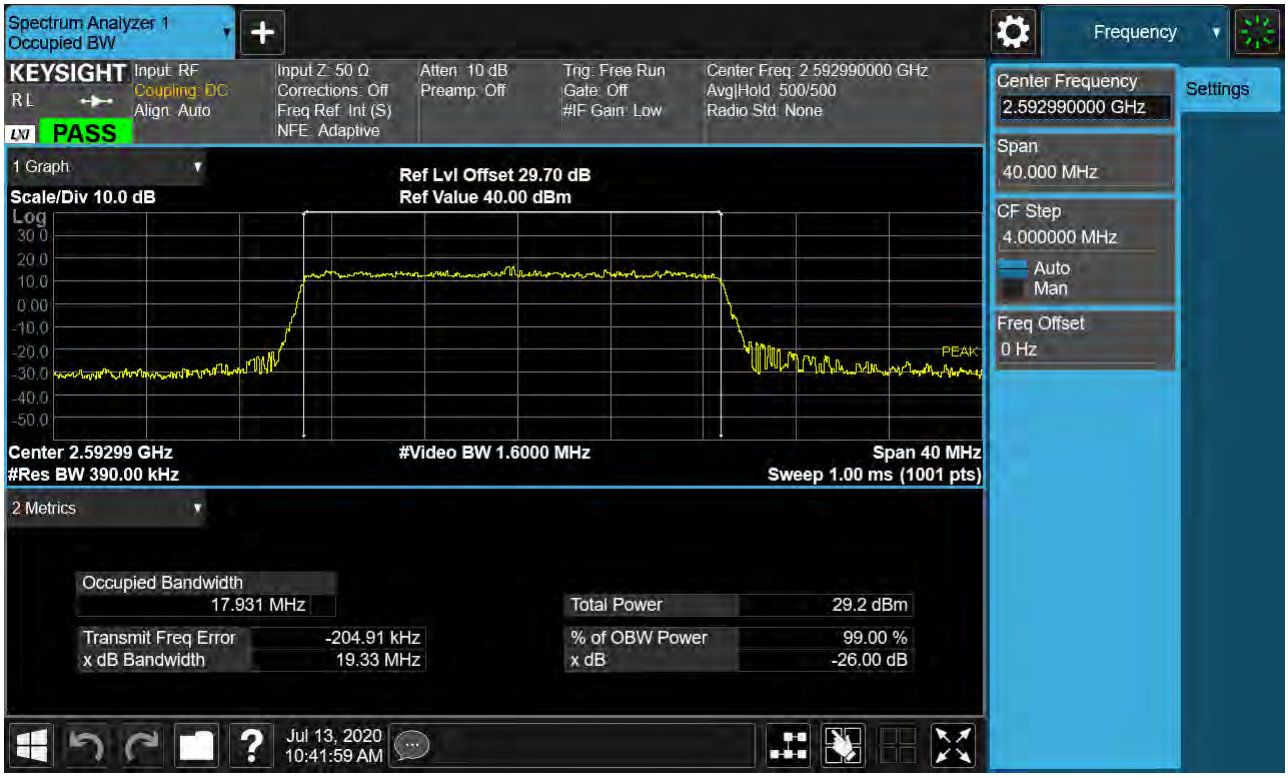
9. TEST PLOTS

Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 BPSK RB 25)_SCS 30 kHz

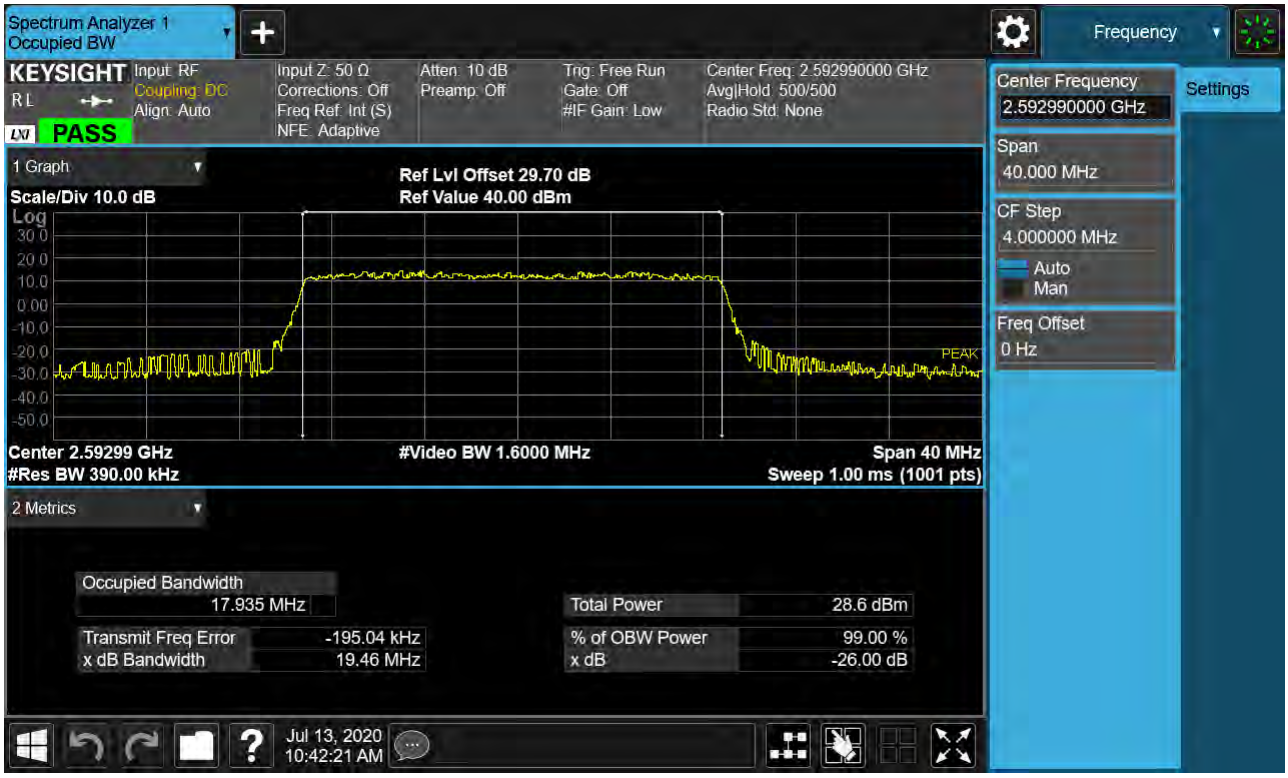
Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 QPSK RB 25) _SCS 30 kHz



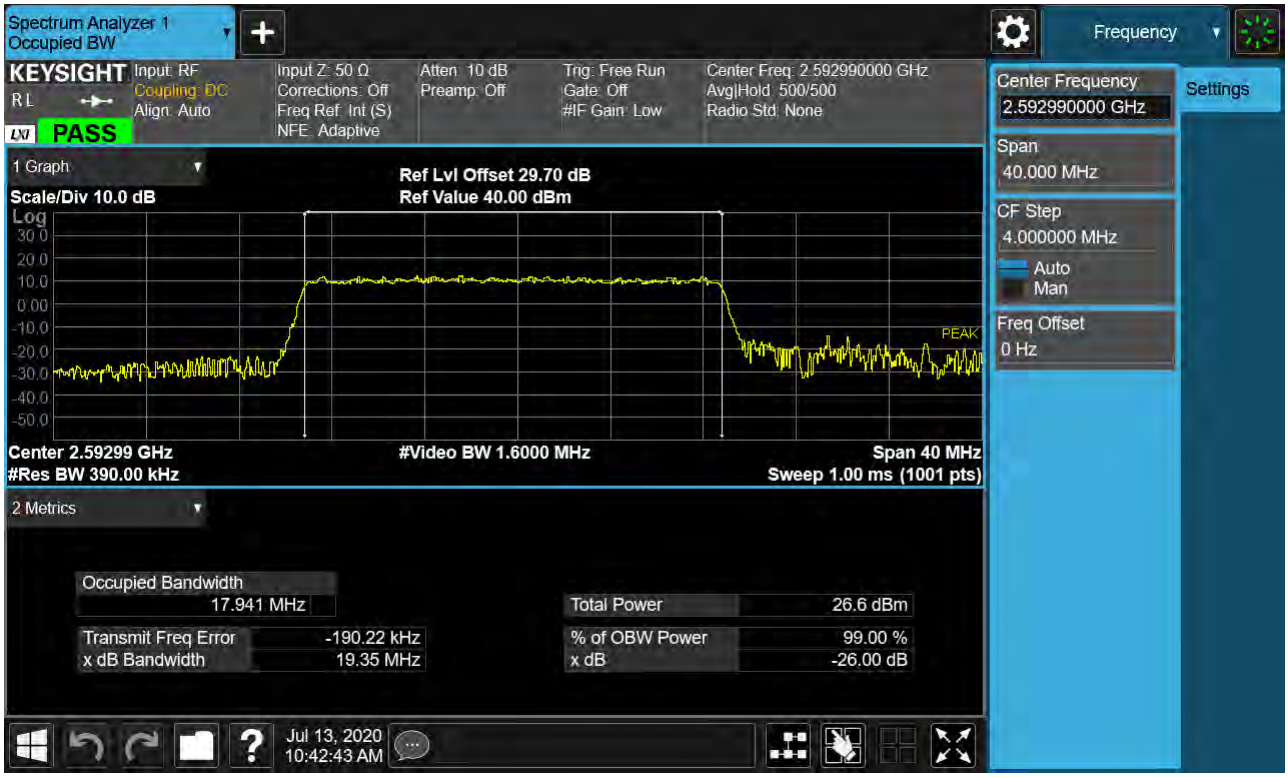
Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 16-QAM RB 25) _SCS 30 kHz



Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 64-QAM RB 25) _SCS 30 kHz

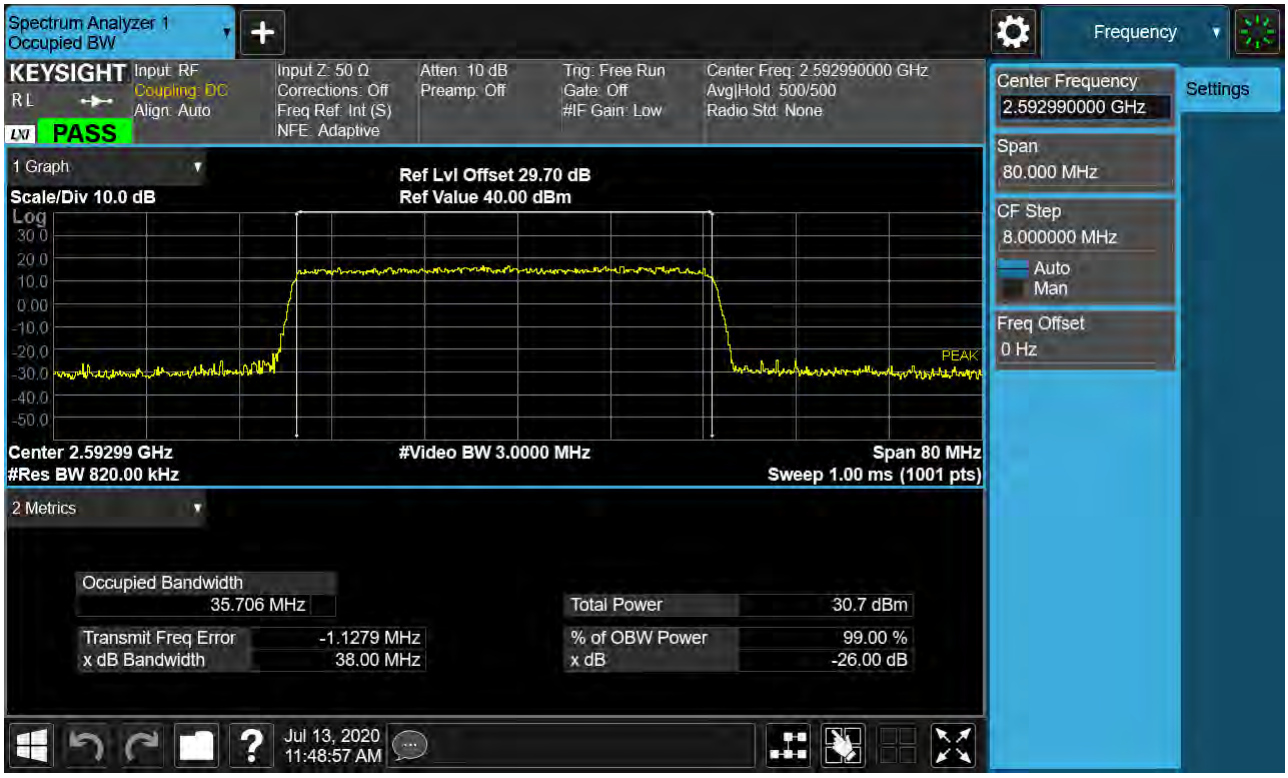


Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 256-QAM RB 25) _SCS 30 kHz

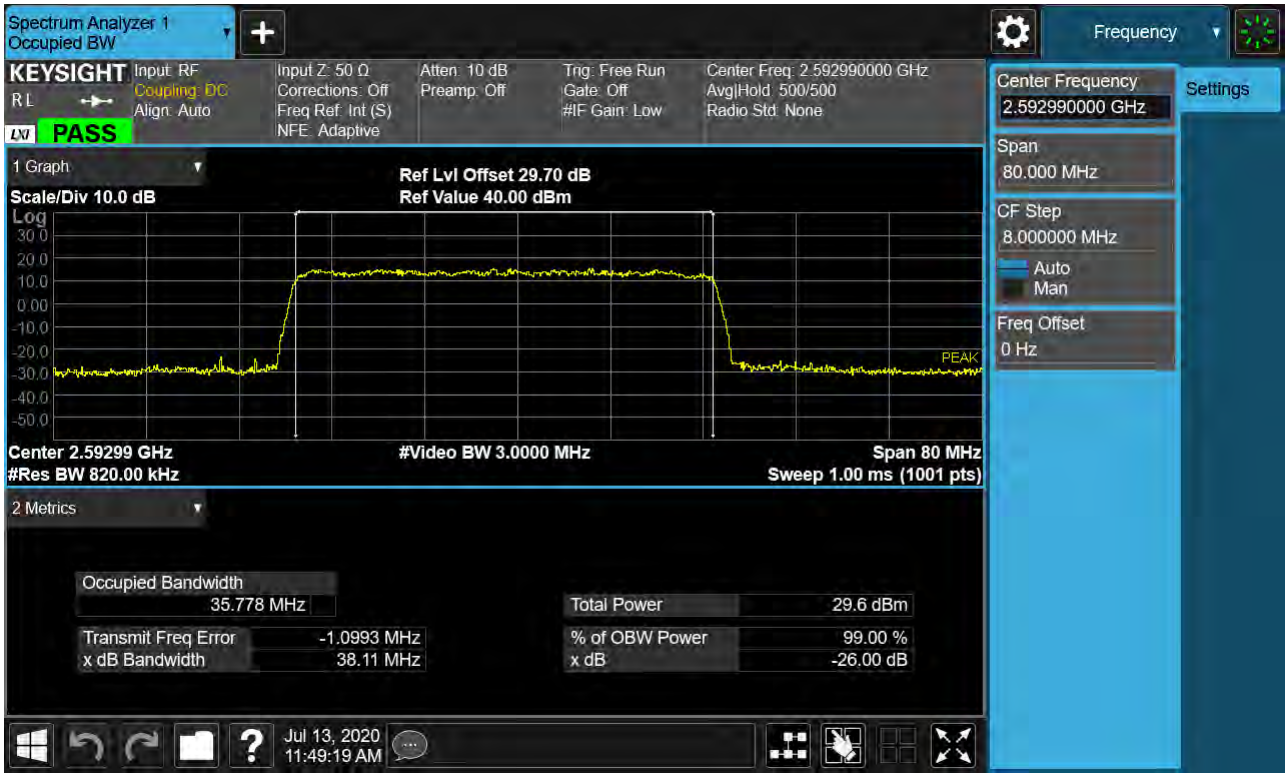


Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 BPSK RB 25) _SCS 30 kHz

Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 QPSK RB 25) _SCS 30 kHz

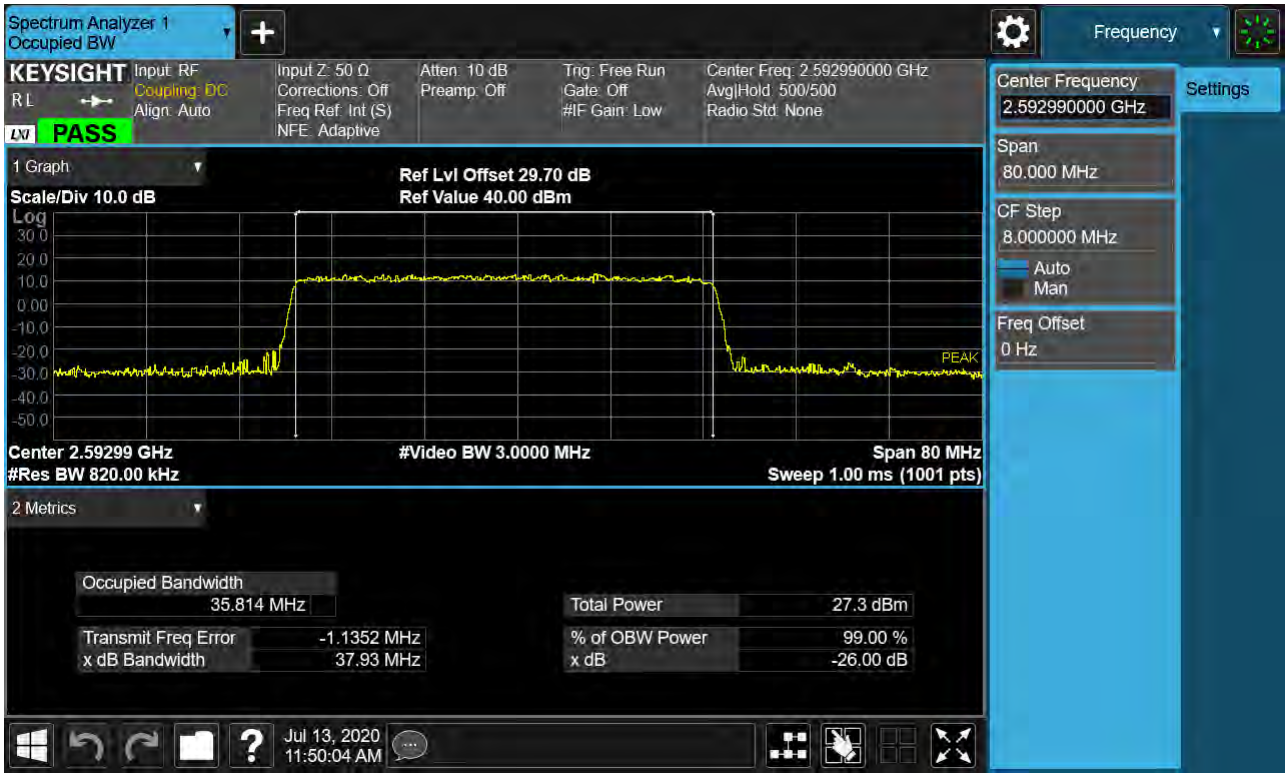


Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 16-QAM RB 25) _SCS 30 kHz

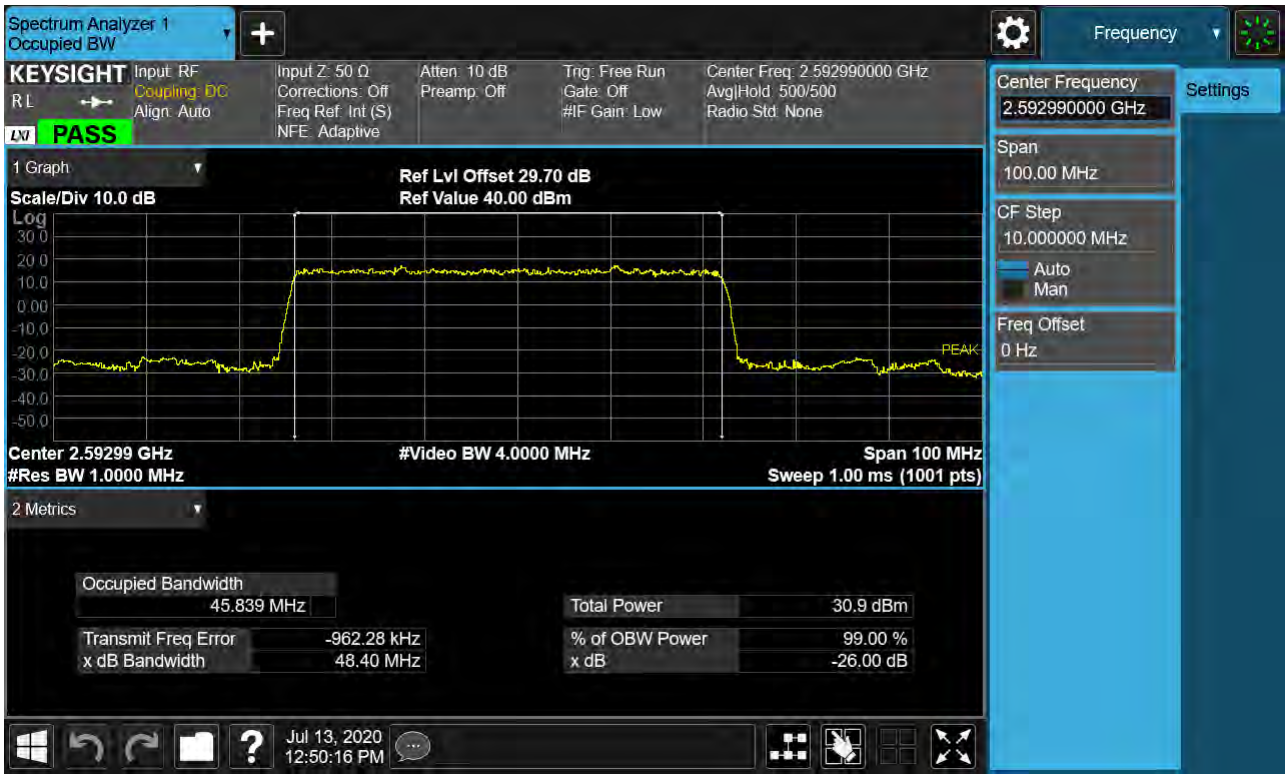


Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 64-QAM RB 25) _SCS 30 kHz

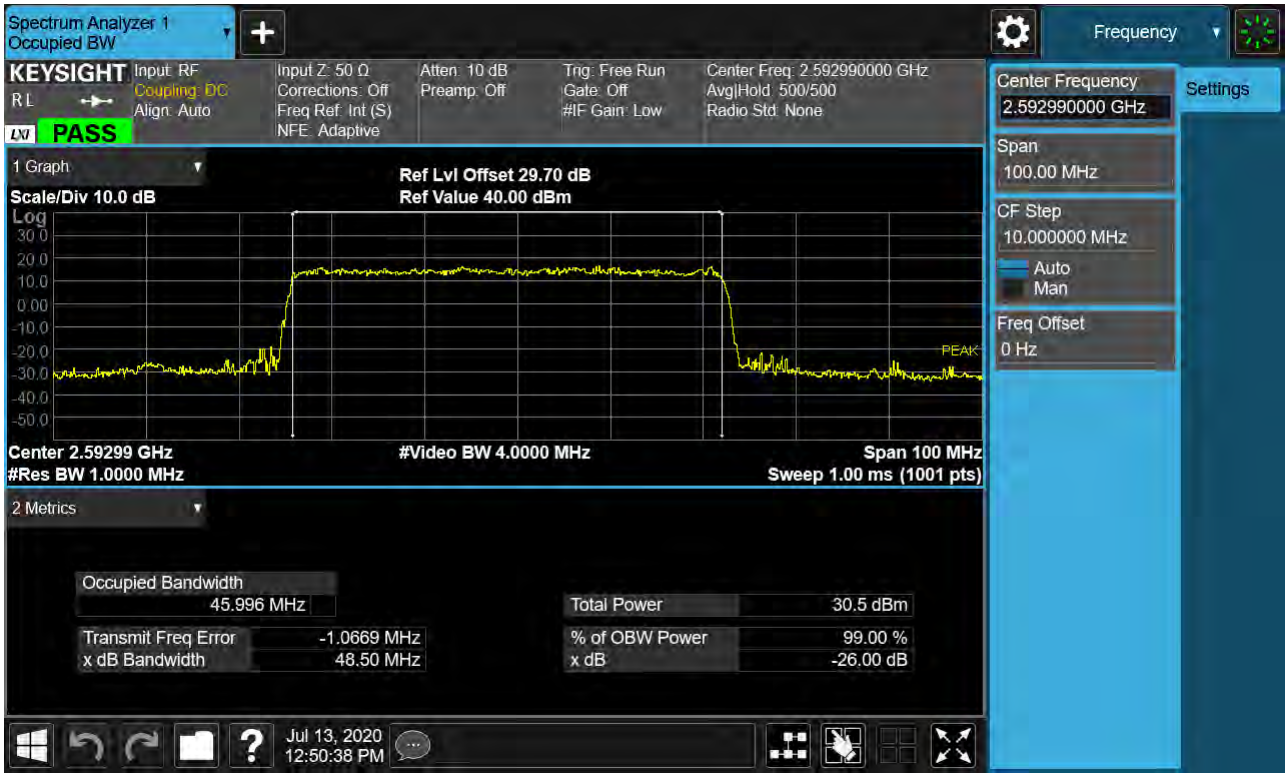
Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 256-QAM RB 25) _SCS 30 kHz



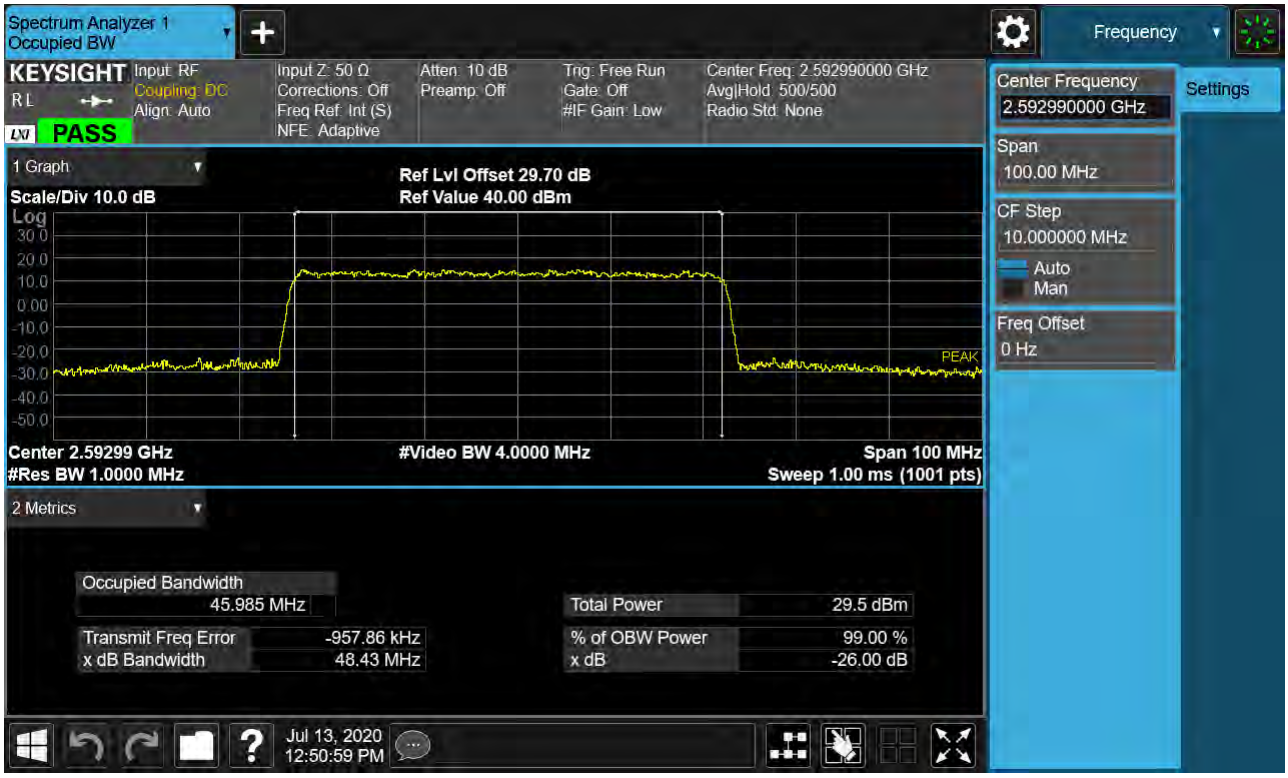
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 BPSK RB 25) _SCS 30 kHz



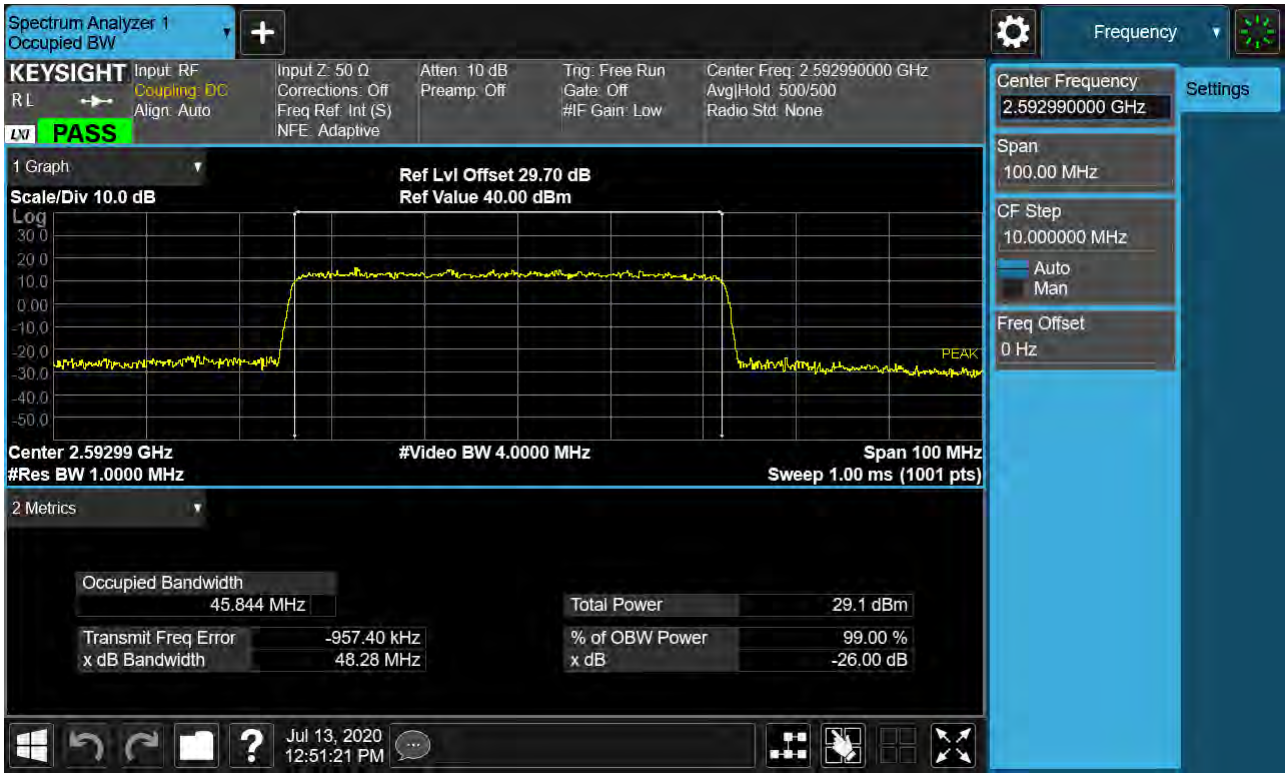
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 QPSK RB 25) _SCS 30 kHz



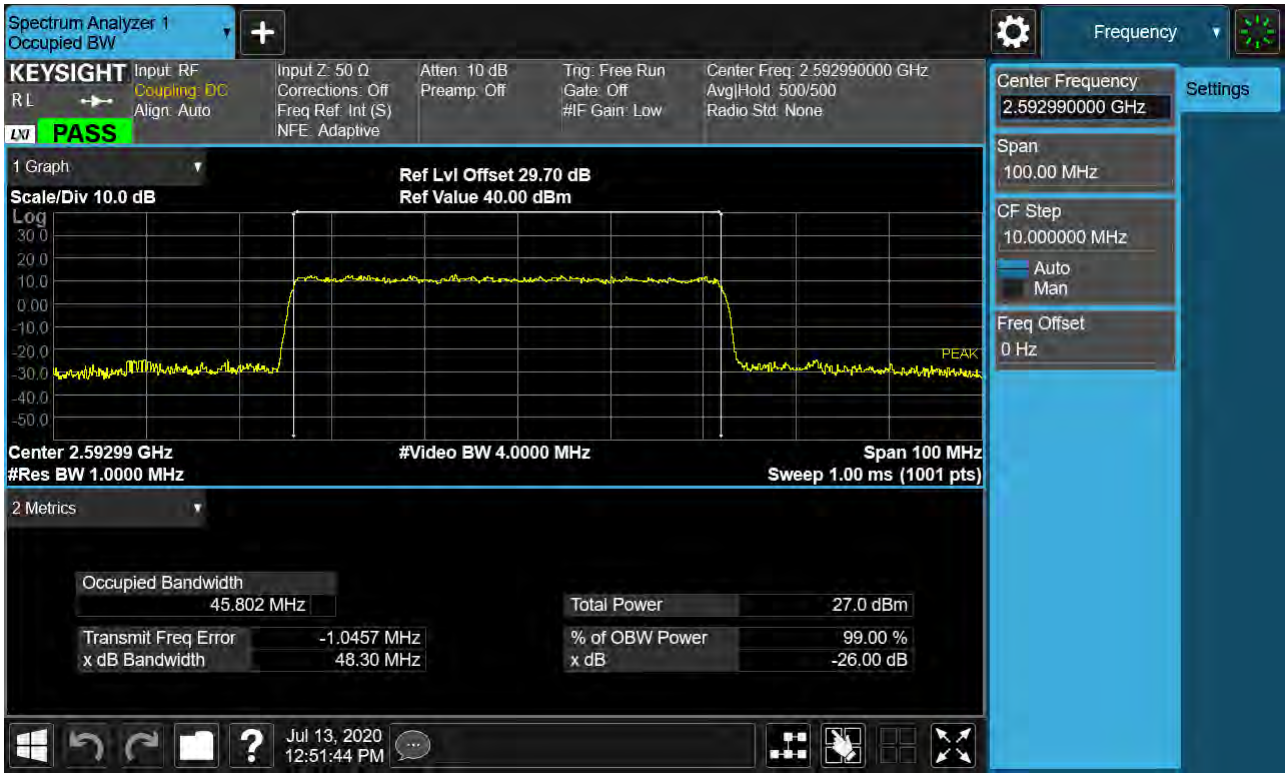
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 16-QAM RB 25) _SCS 30 kHz



Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 64-QAM RB 25) _SCS 30 kHz



Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 256-QAM RB 25) _SCS 30 kHz

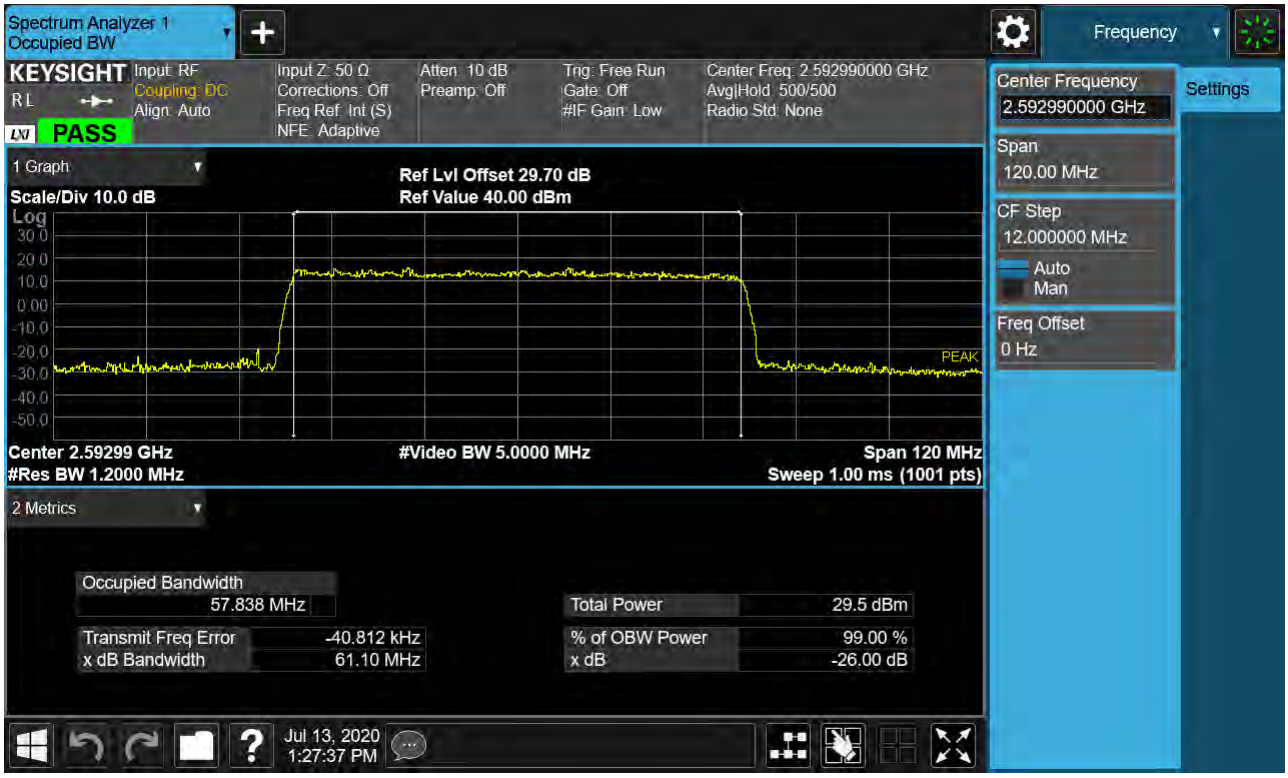


Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 BPSK RB 25) _SCS 30 kHz

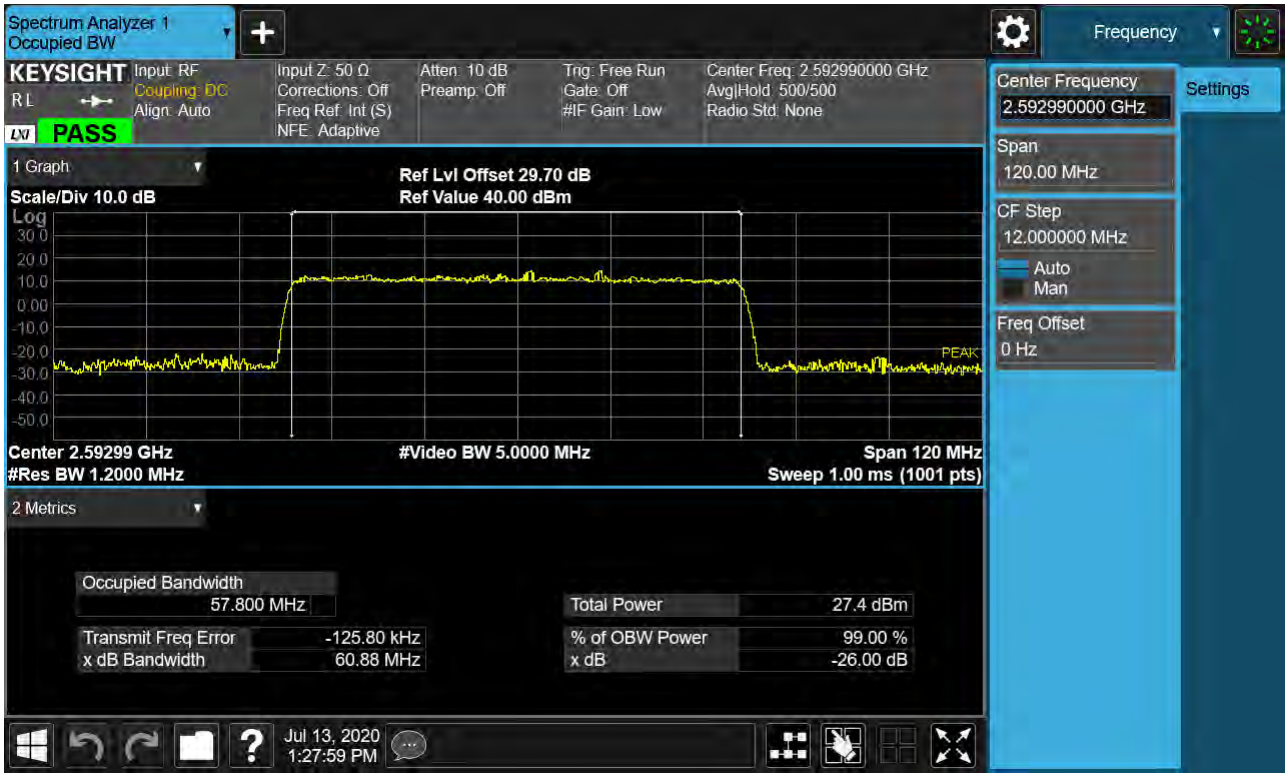
Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 QPSK RB 25) _SCS 30 kHz

Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 16-QAM RB 25) _SCS 30 kHz

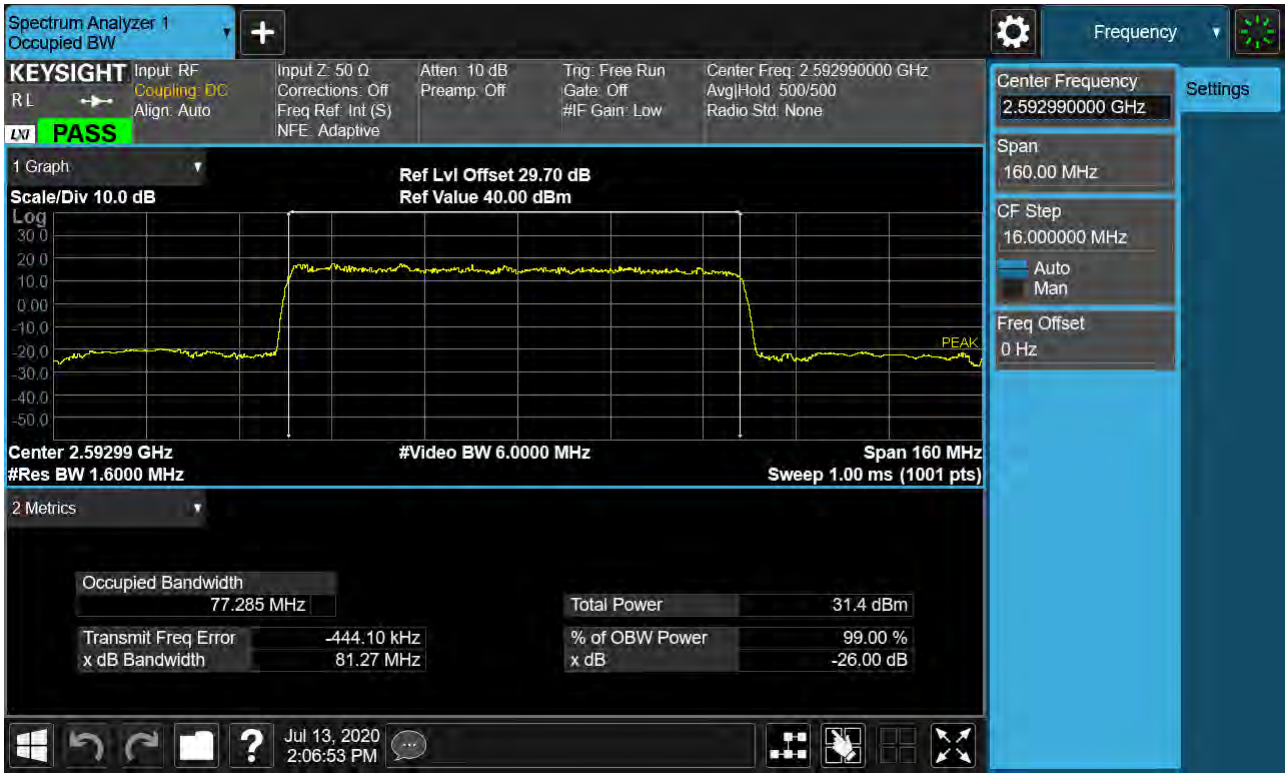
Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 64-QAM RB 25) _SCS 30 kHz



Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 256-QAM RB 25) _SCS 30 kHz



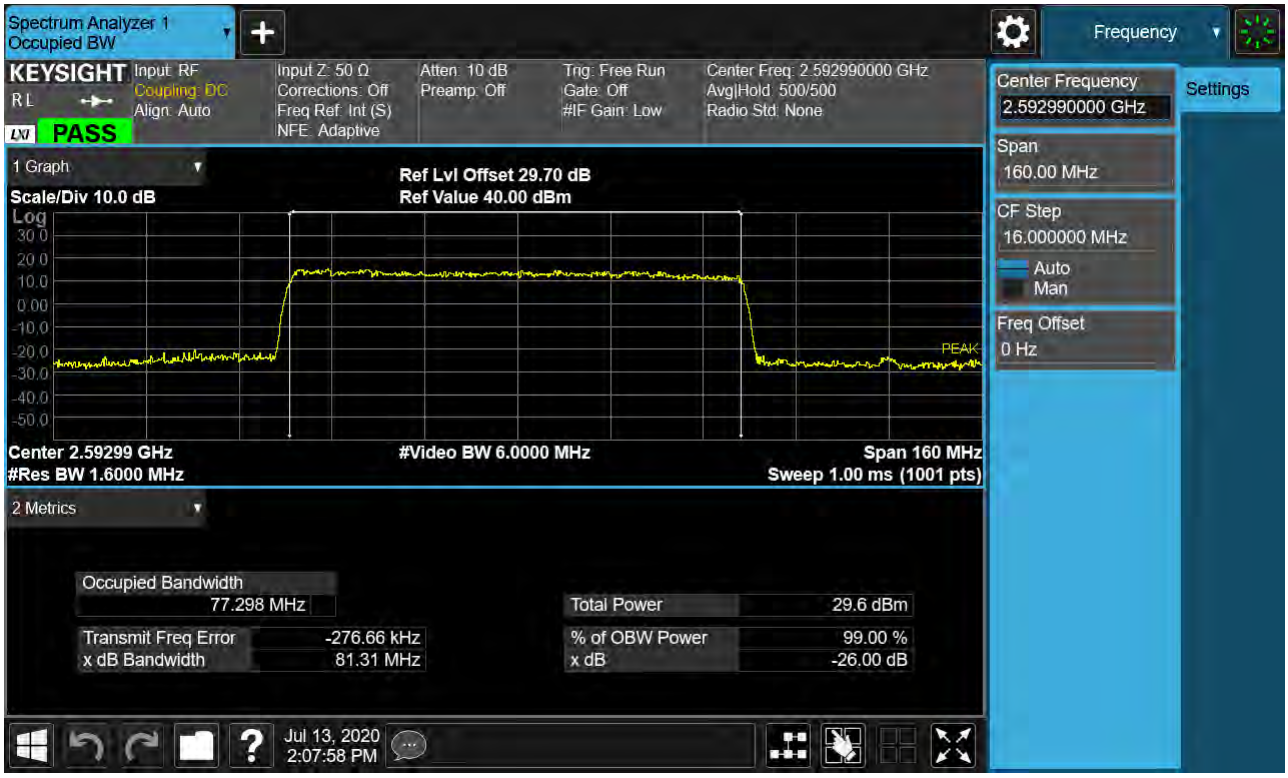
Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 BPSK RB 25) _SCS 30 kHz



Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 QPSK RB 25) _SCS 30 kHz

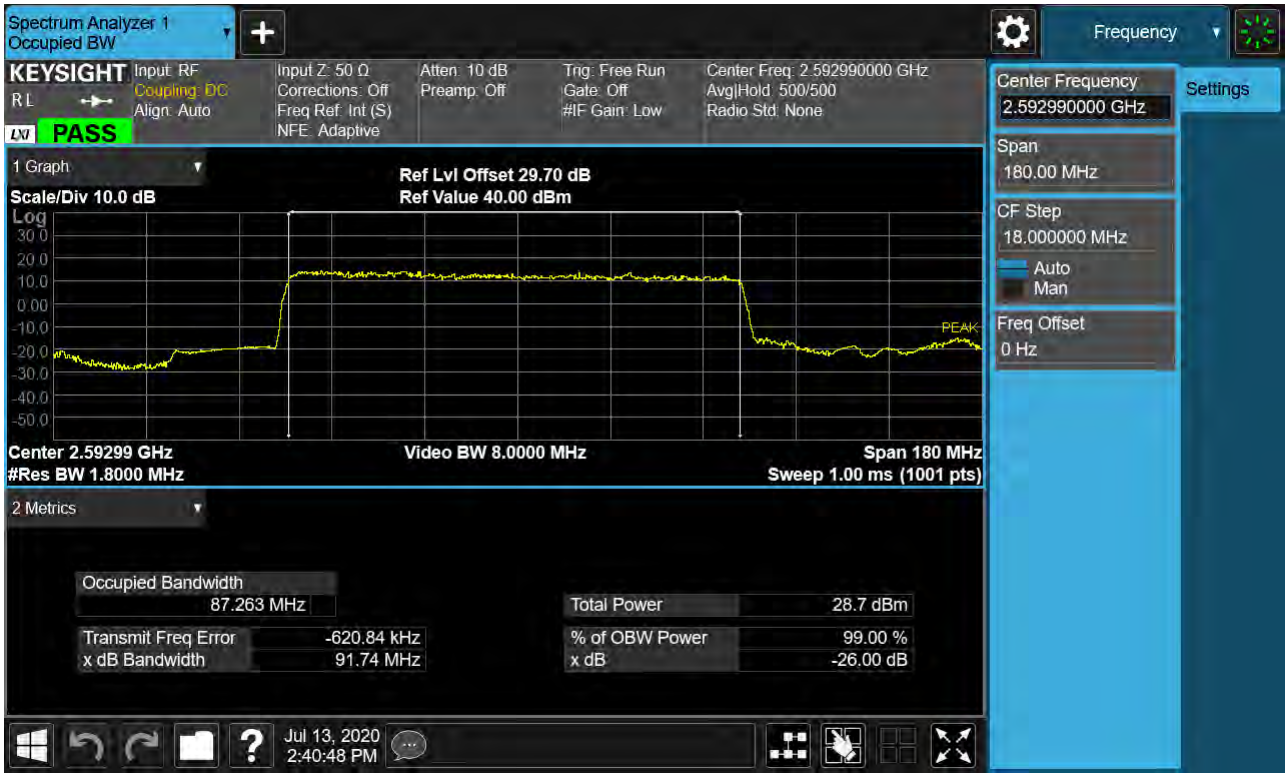
Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 16-QAM RB 25) _SCS 30 kHz

Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 64-QAM RB 25) _SCS 30 kHz

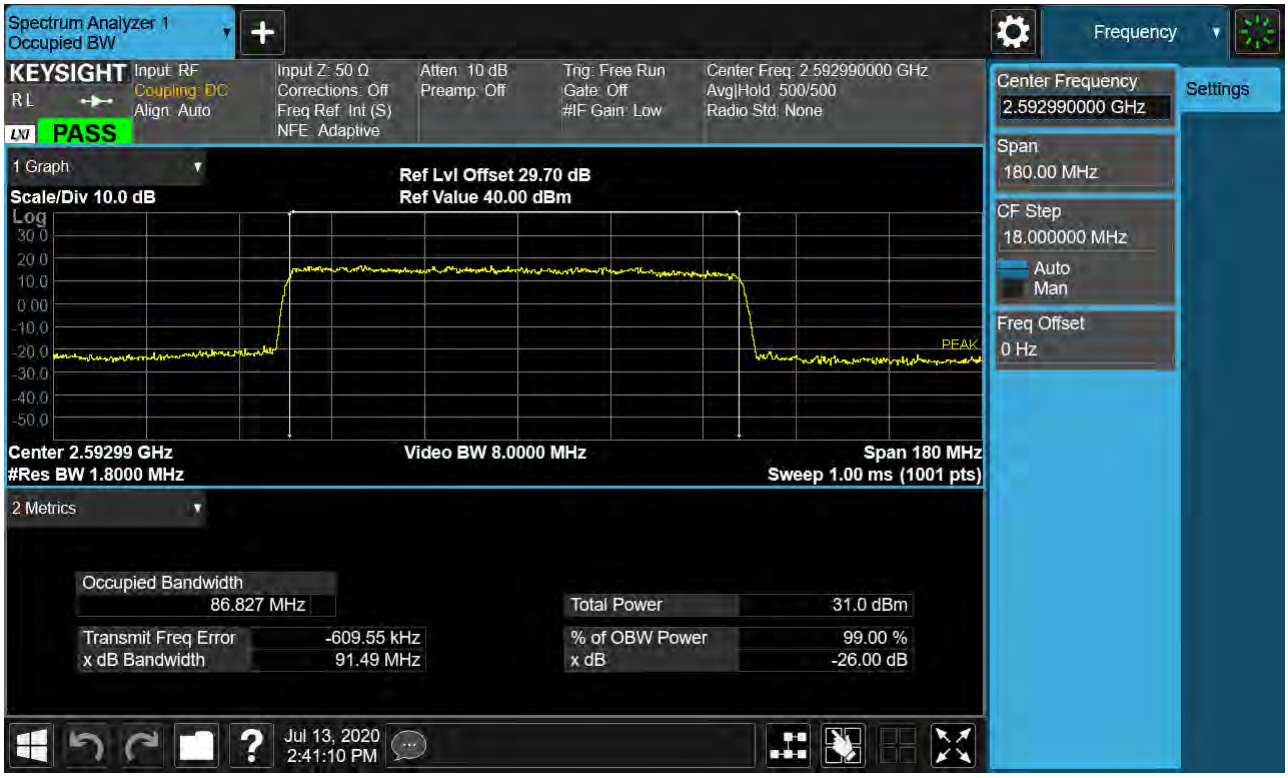


Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 256-QAM RB 25) _SCS 30 kHz

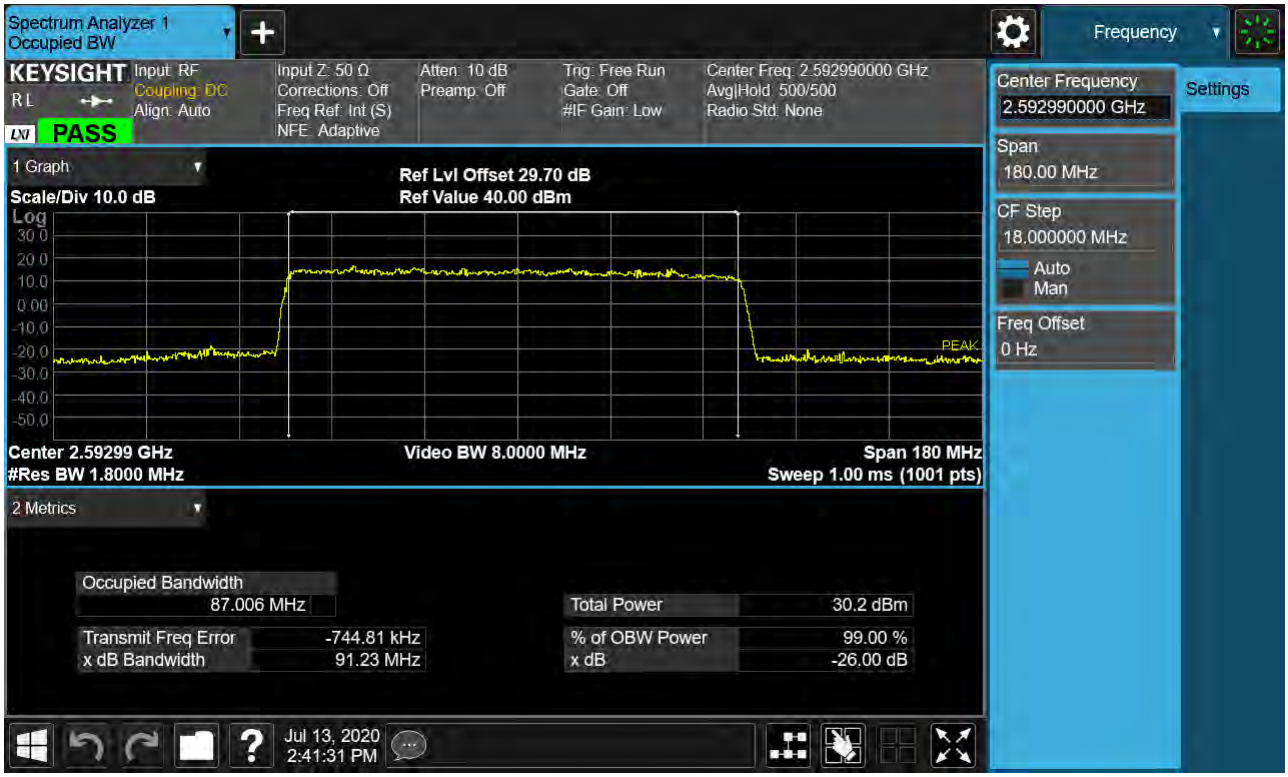
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 BPSK RB 25) _SCS 30 kHz



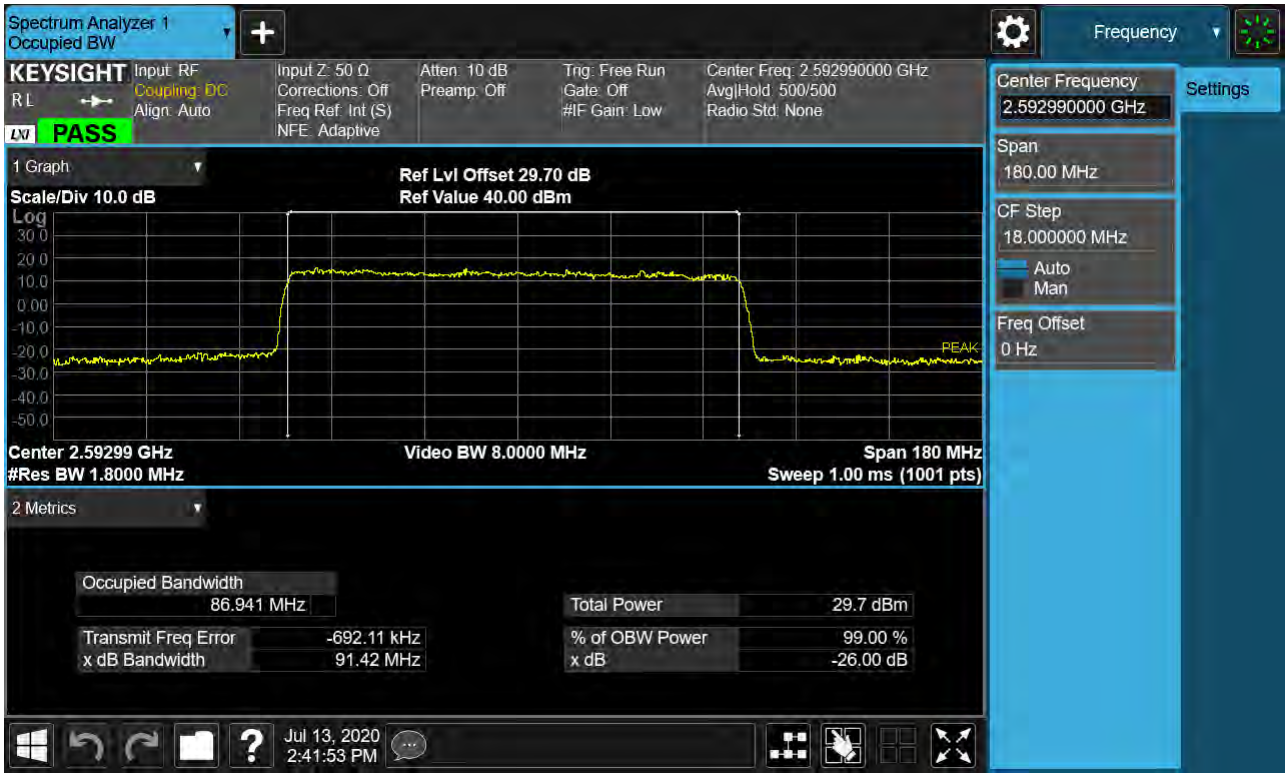
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 QPSK RB 25) _SCS 30 kHz



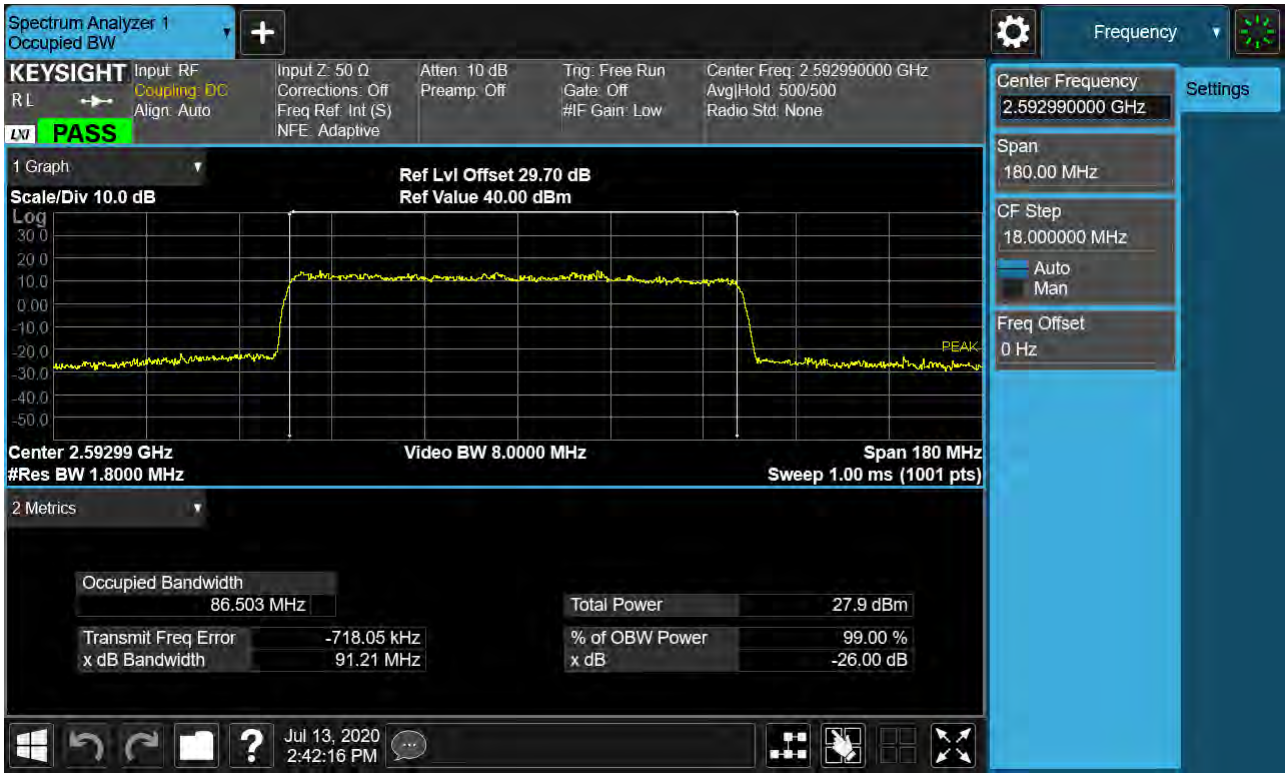
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 16-QAM RB 25) _SCS 30 kHz



Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 64-QAM RB 25) _SCS 30 kHz



Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 256-QAM RB 25) _SCS 30 kHz

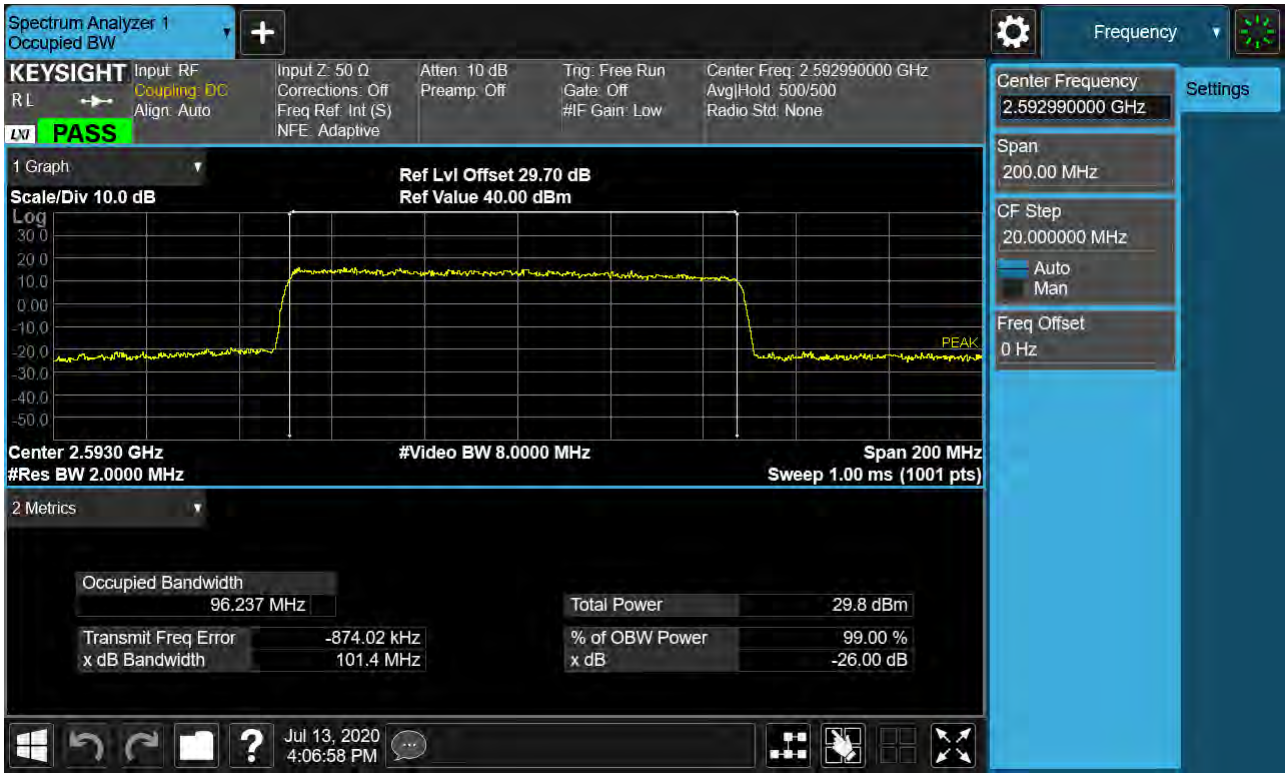


Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 BPSK RB 25) _SCS 30 kHz

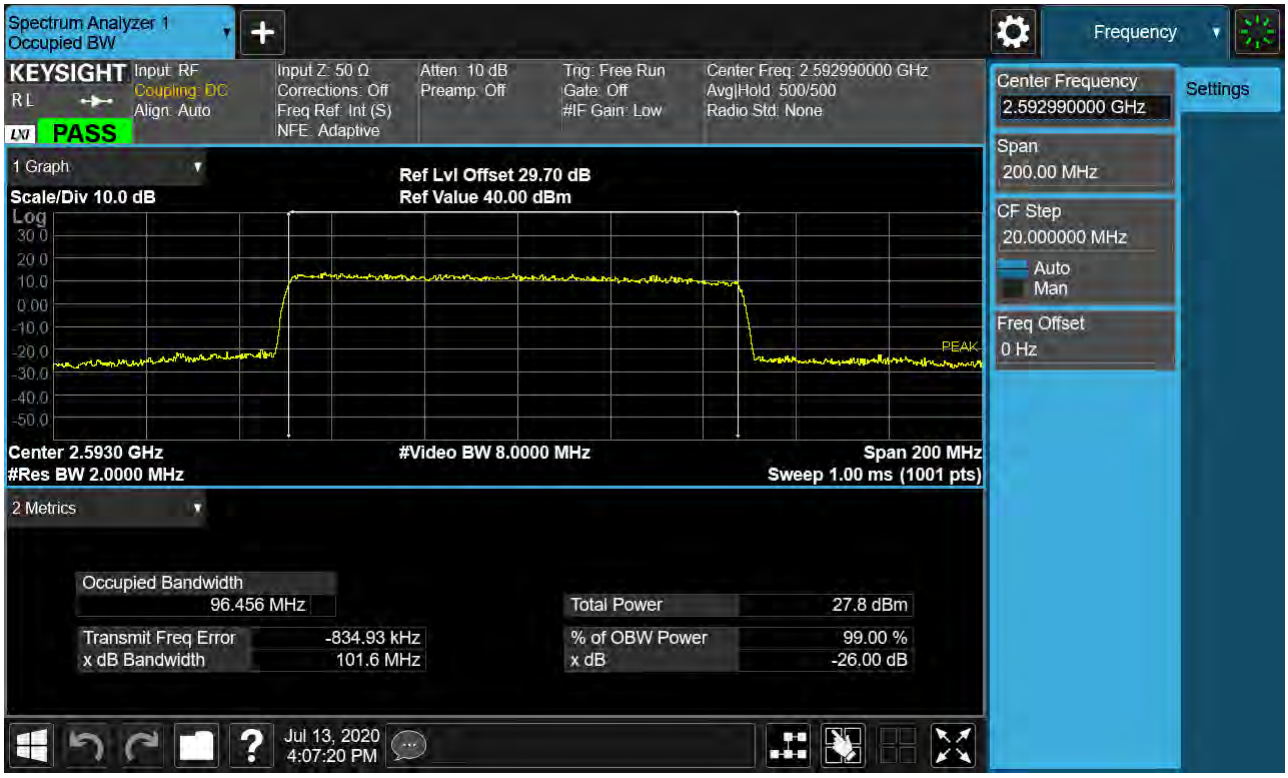
Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 QPSK RB 25) _SCS 30 kHz

Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 16-QAM RB 25) _SCS 30 kHz

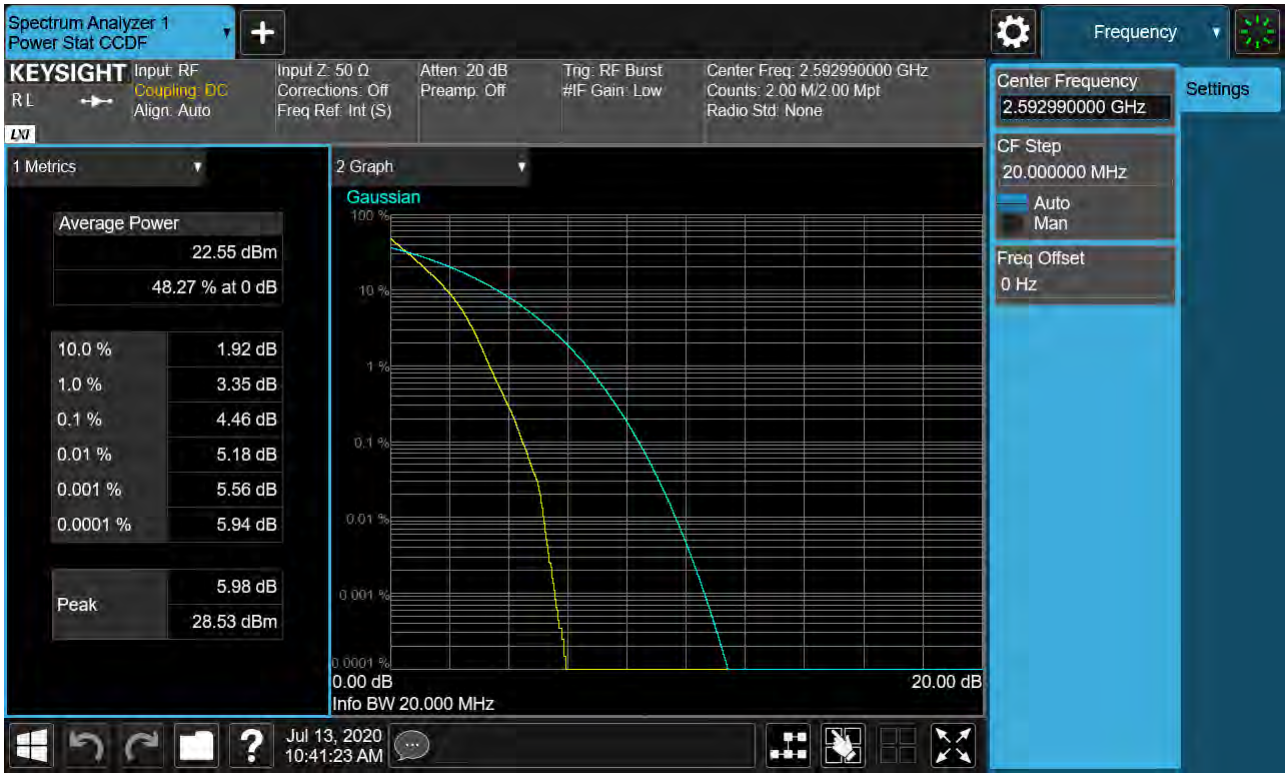
Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 64-QAM RB 25) _SCS 30 kHz



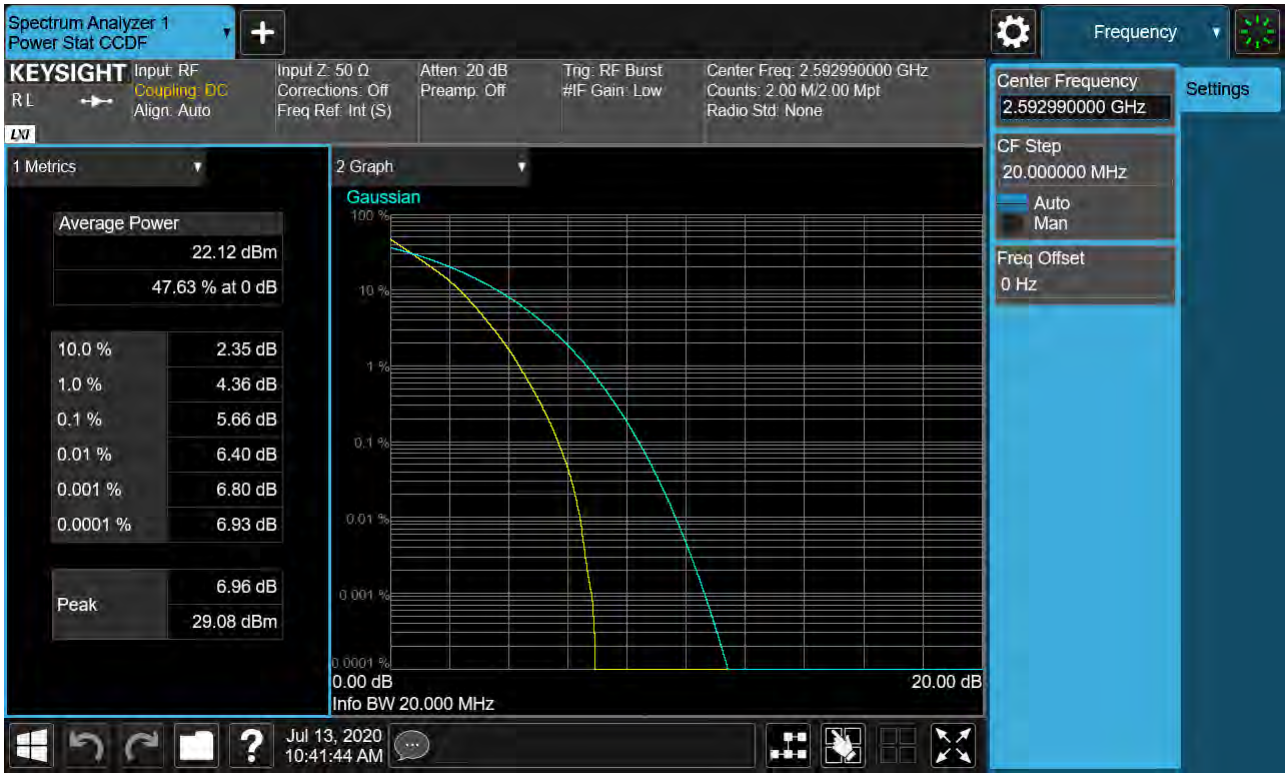
Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 256-QAM RB 25) _SCS 30 kHz



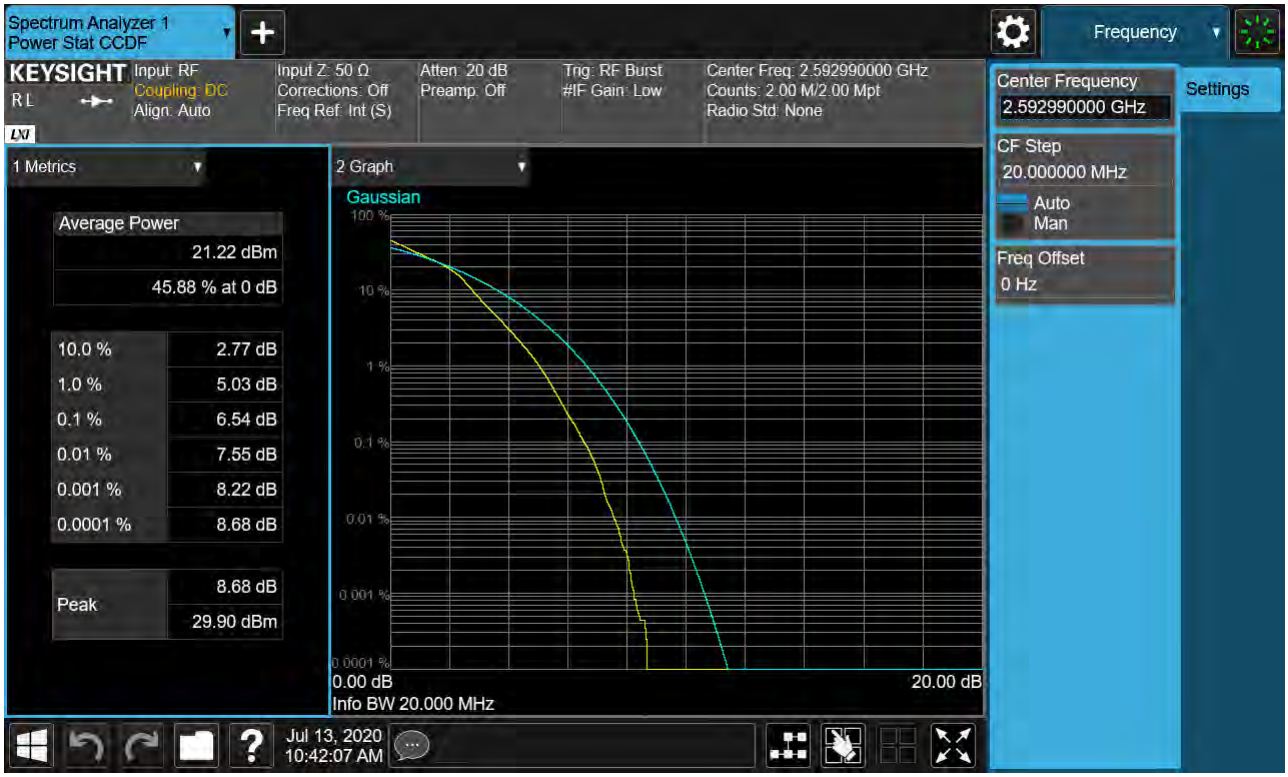
Sub6 n41. PAR Plot (20M BW_Ch.518598_BPSK_RB25_0)



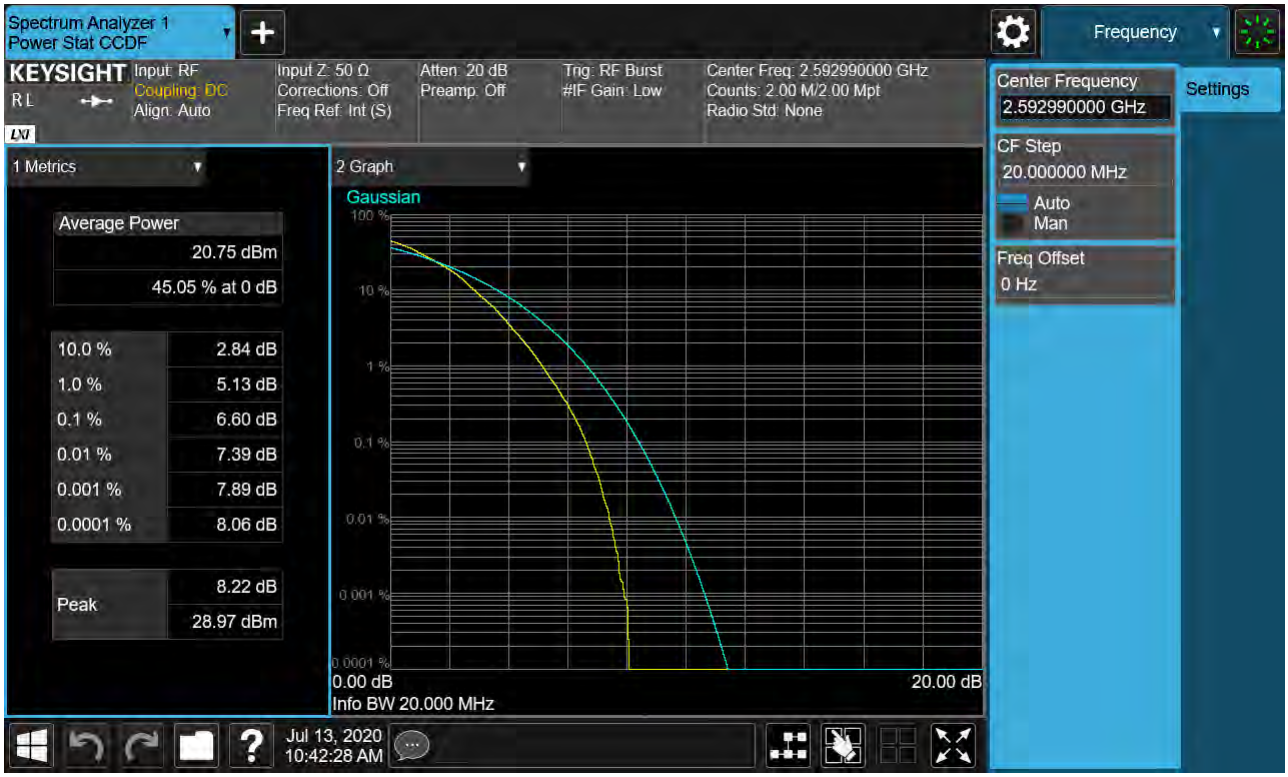
Sub6 n41. PAR Plot (20M BW_Ch.518598_QPSK_RB25_0)



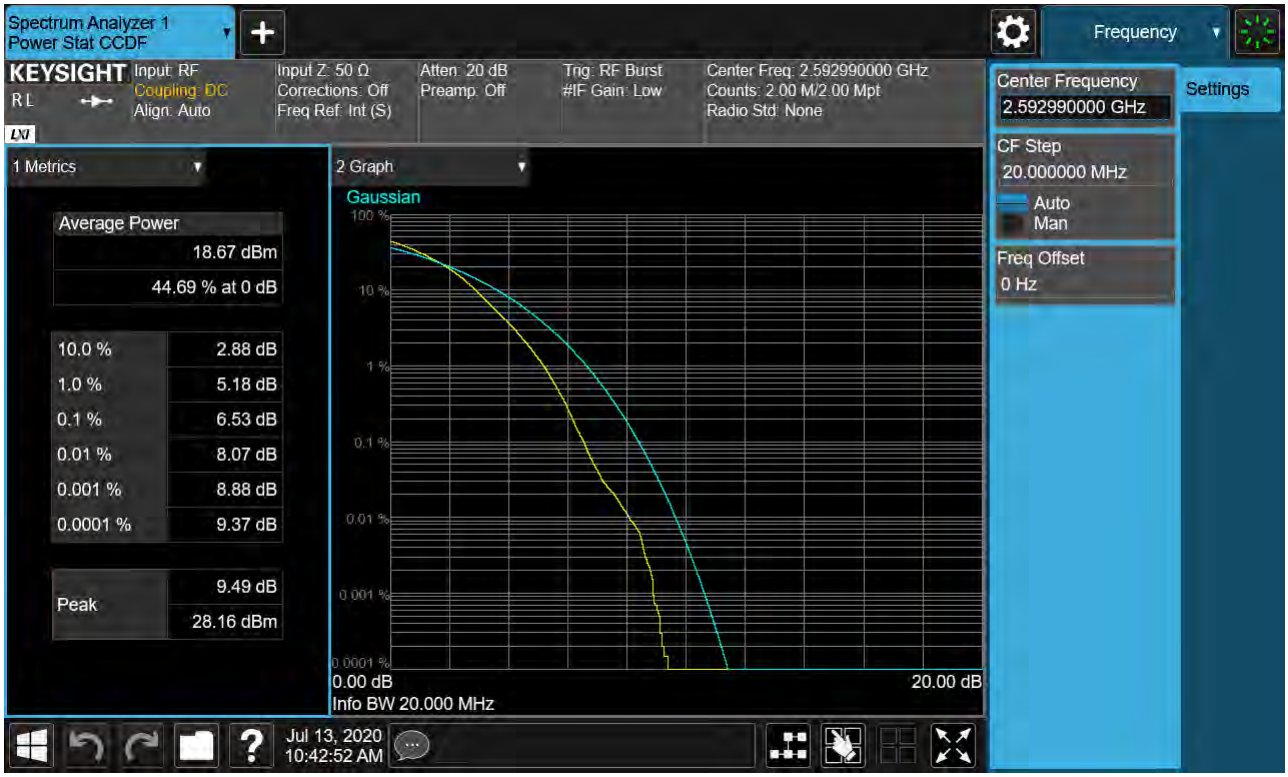
Sub6 n41. PAR Plot (20M BW_Ch.518598_16QAM_RB25_0)



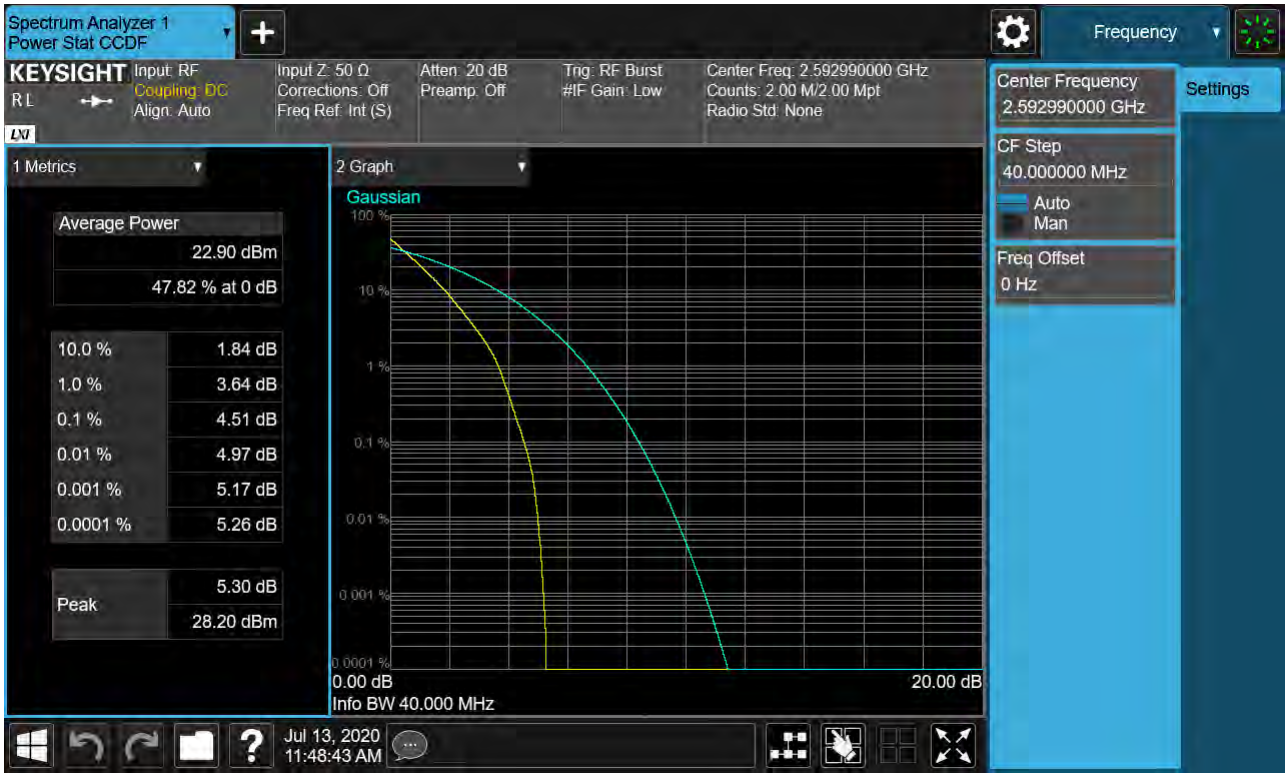
Sub6 n41. PAR Plot (20M BW_Ch.518598_64QAM_RB25_0)



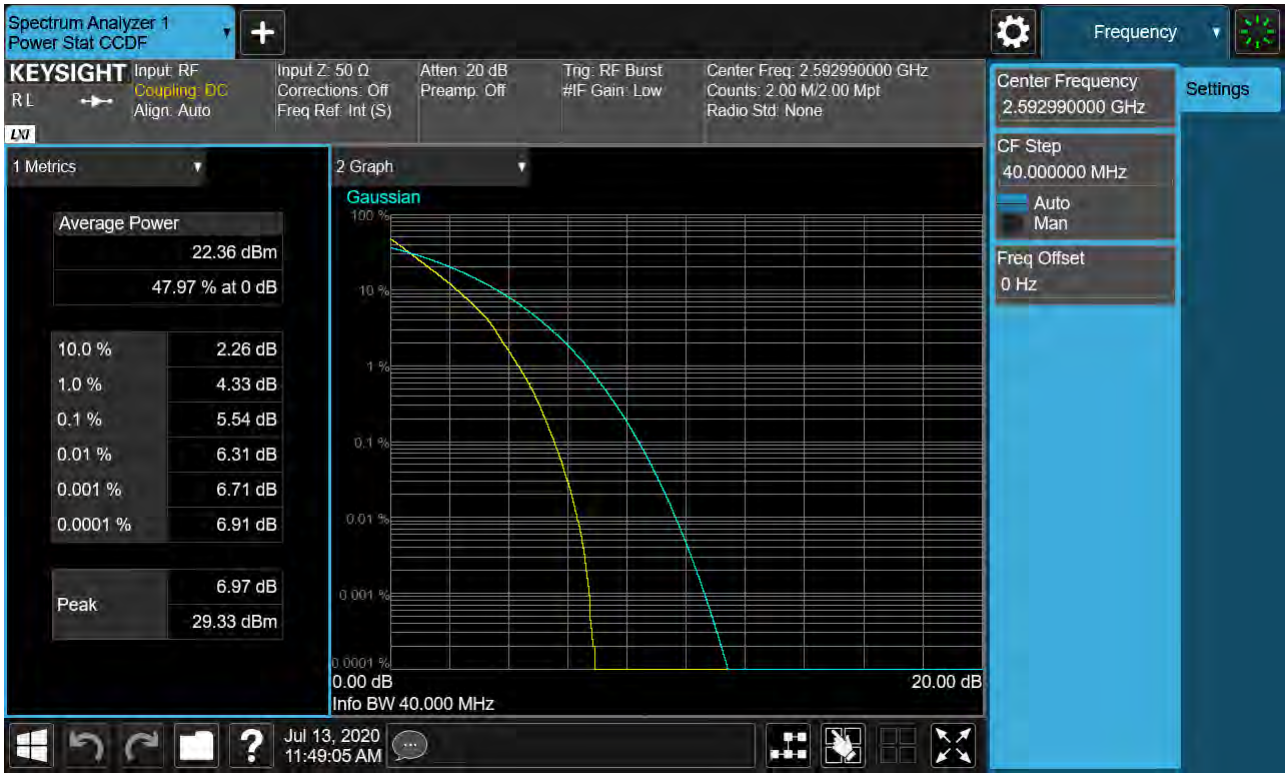
Sub6 n41. PAR Plot (20M BW_Ch.518598_256QAM_RB25_0)



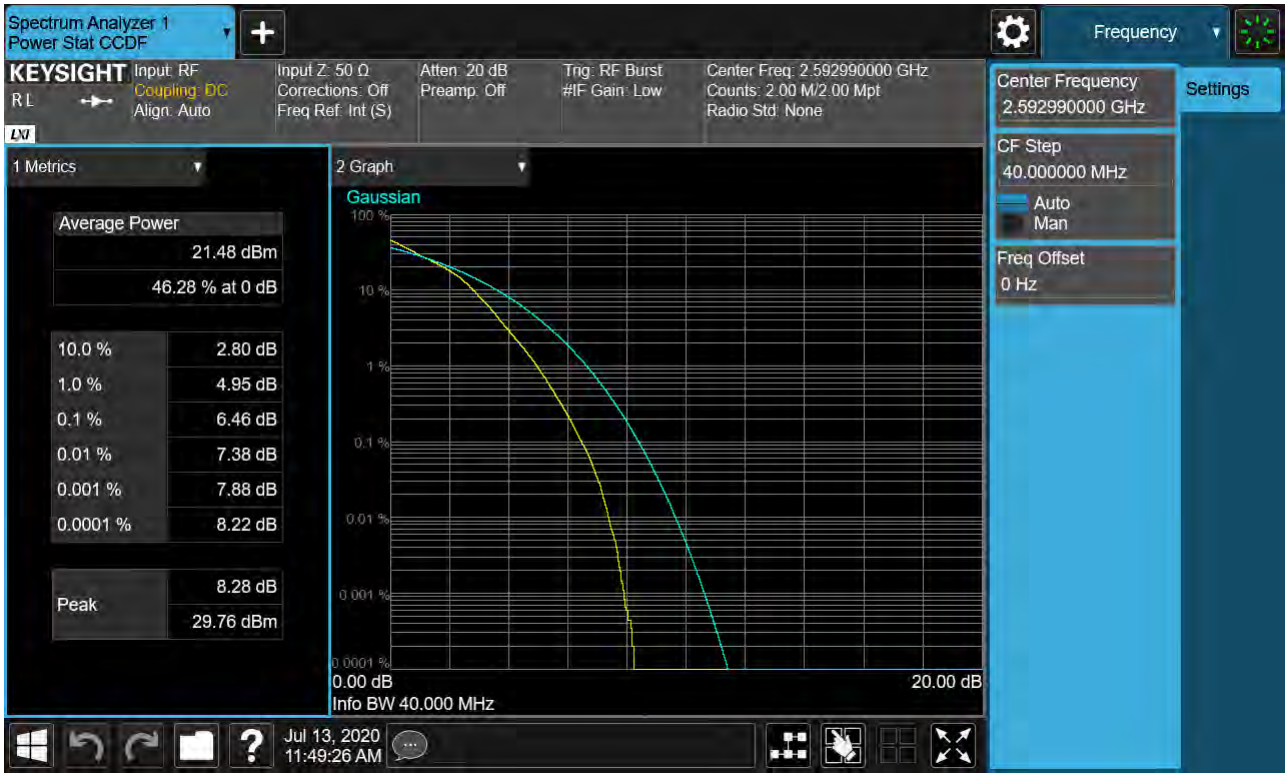
Sub6 n41. PAR Plot (40M BW_Ch.518598_BPSK_RB25_0)



Sub6 n41. PAR Plot (40M BW_Ch.518598_QPSK_RB25_0)



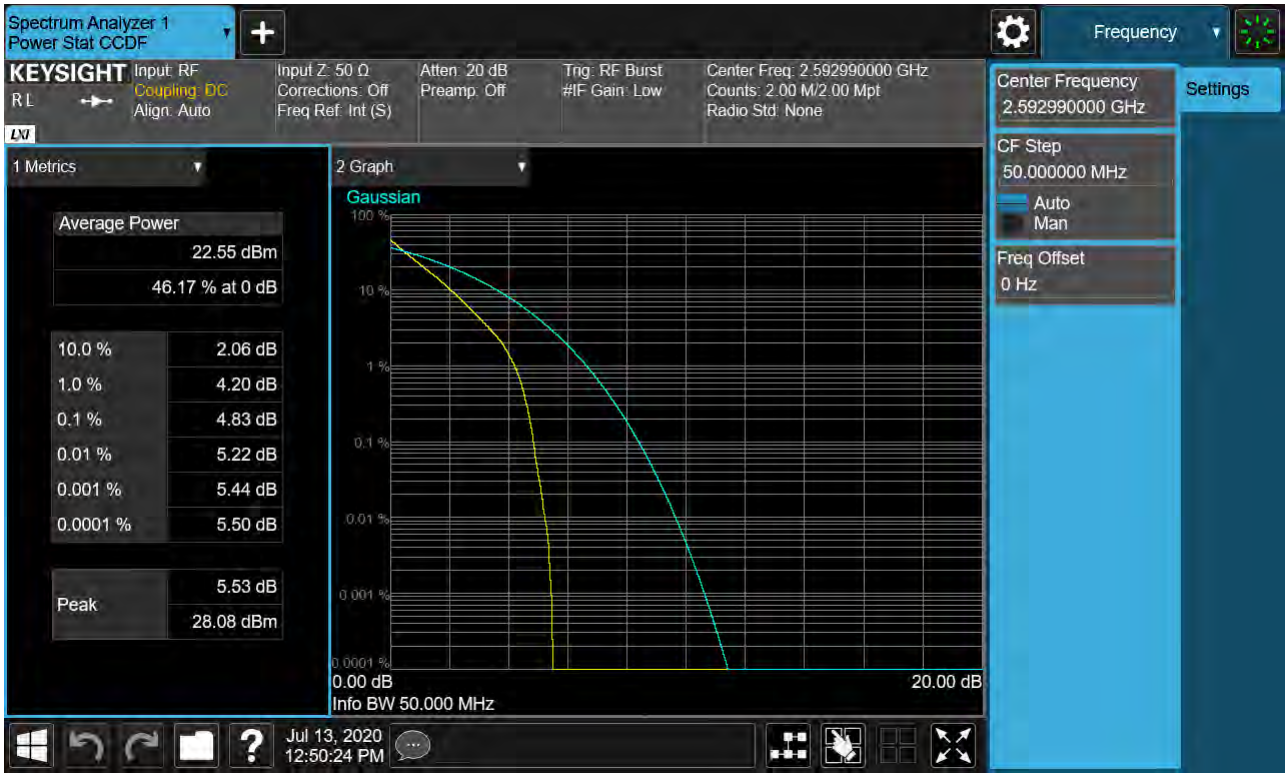
Sub6 n41. PAR Plot (40M BW_Ch.518598_16QAM_RB25_0)



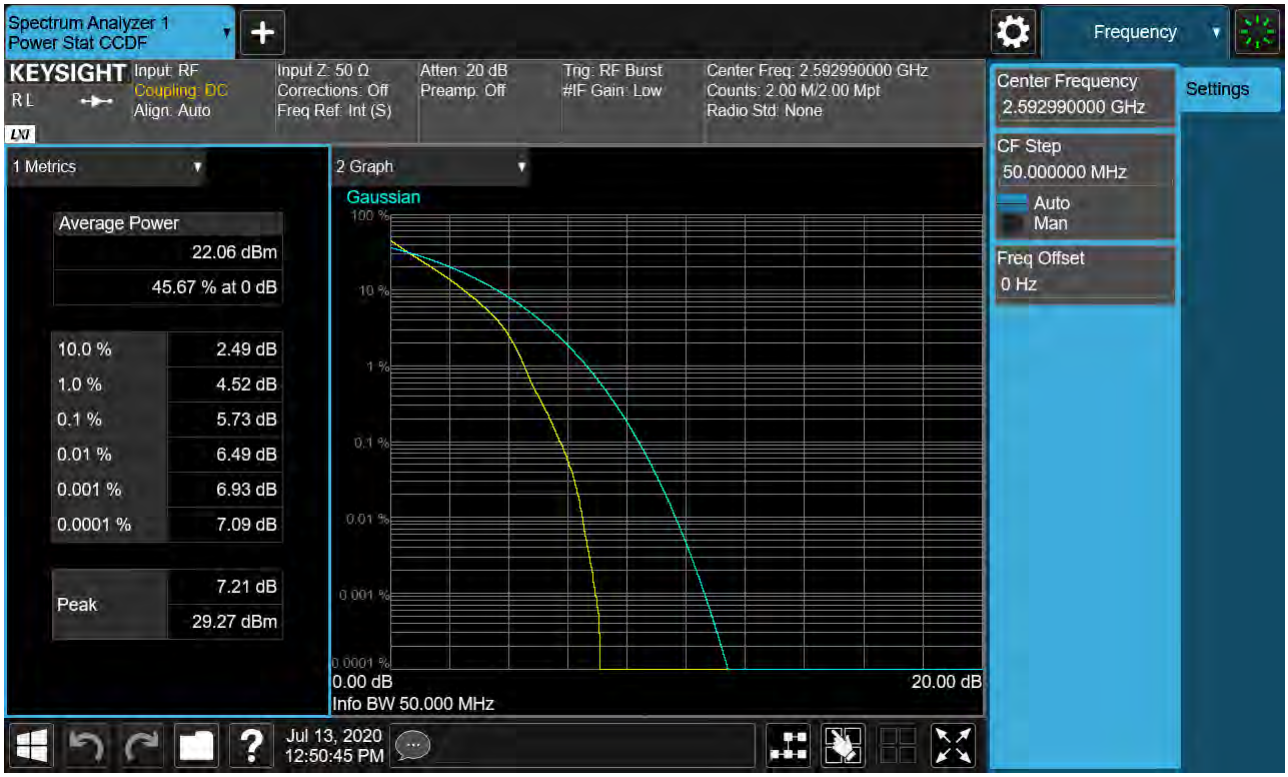
Sub6 n41. PAR Plot (40M BW_Ch.518598_64QAM_RB25_0)

Sub6 n41. PAR Plot (40M BW_Ch.518598_256QAM_RB25_0)

Sub6 n41. PAR Plot (50M BW_Ch.518598_BPSK_RB25_0)



Sub6 n41. PAR Plot (50M BW_Ch.518598_QPSK_RB25_0)

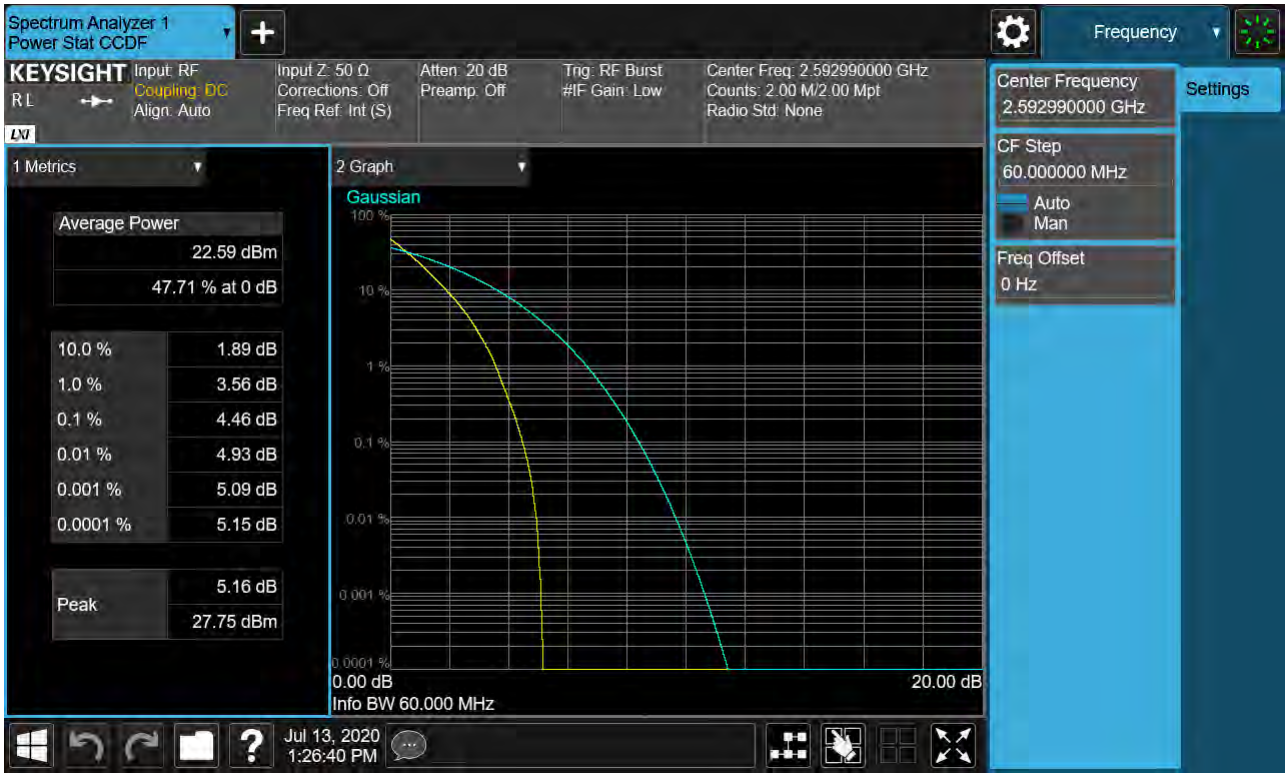


Sub6 n41. PAR Plot (50M BW_Ch.518598_16QAM_RB25_0)

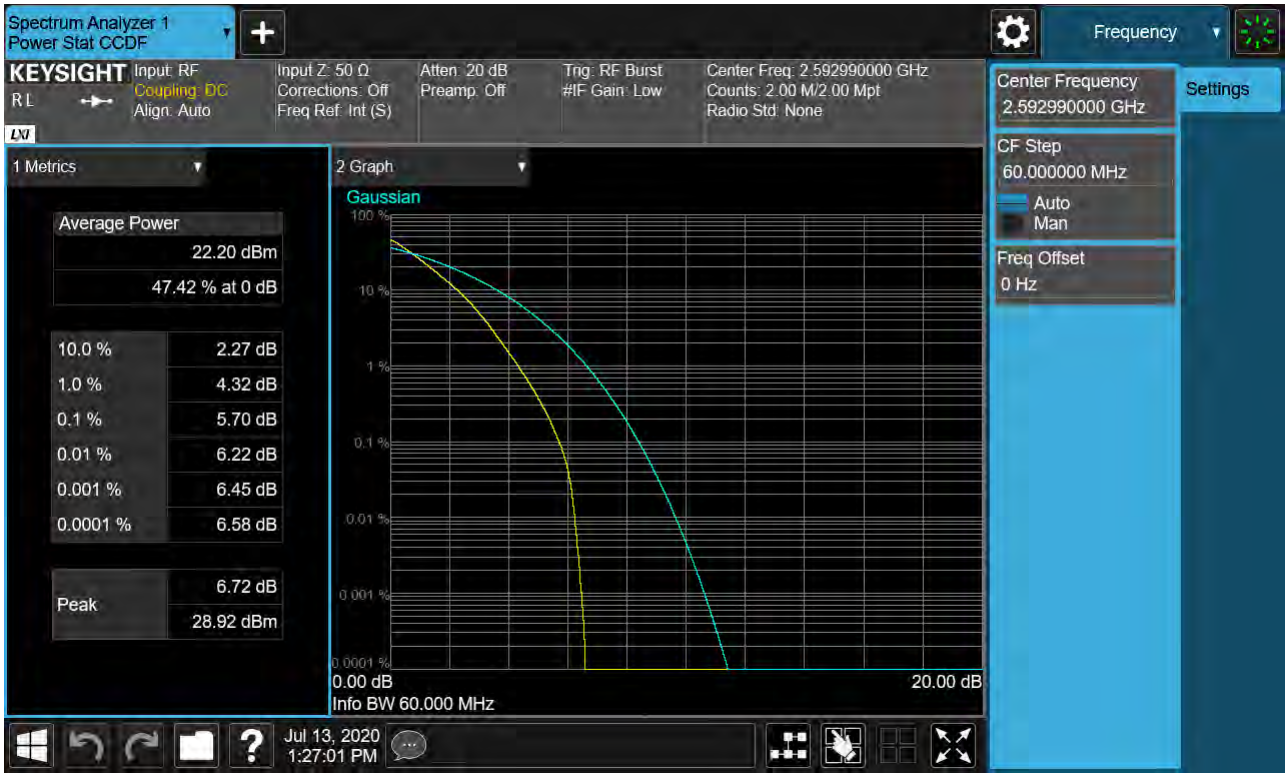
Sub6 n41. PAR Plot (50M BW_Ch.518598_64QAM_RB25_0)

Sub6 n41. PAR Plot (50M BW_Ch.518598_256QAM_RB25_0)

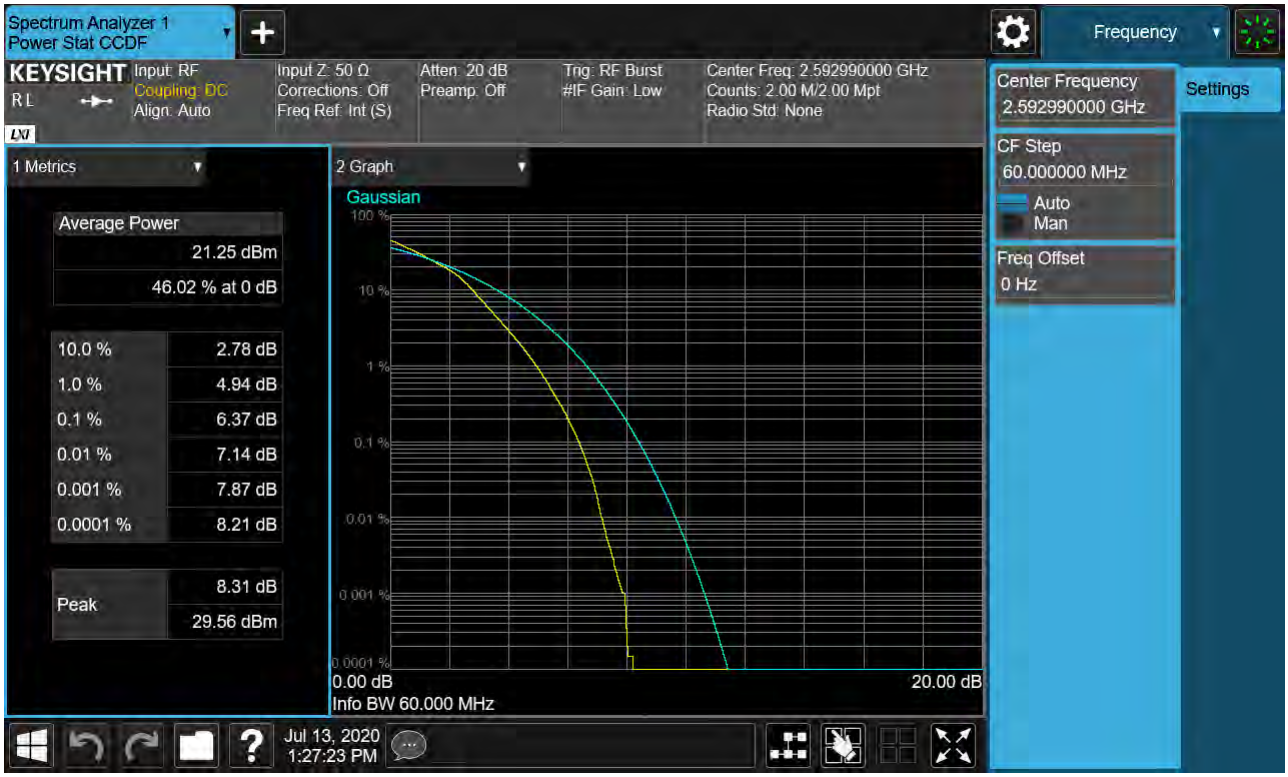
Sub6 n41. PAR Plot (60M BW_Ch.518598_BPSK_RB25_0)



Sub6 n41. PAR Plot (60M BW_Ch.518598_QPSK_RB25_0)



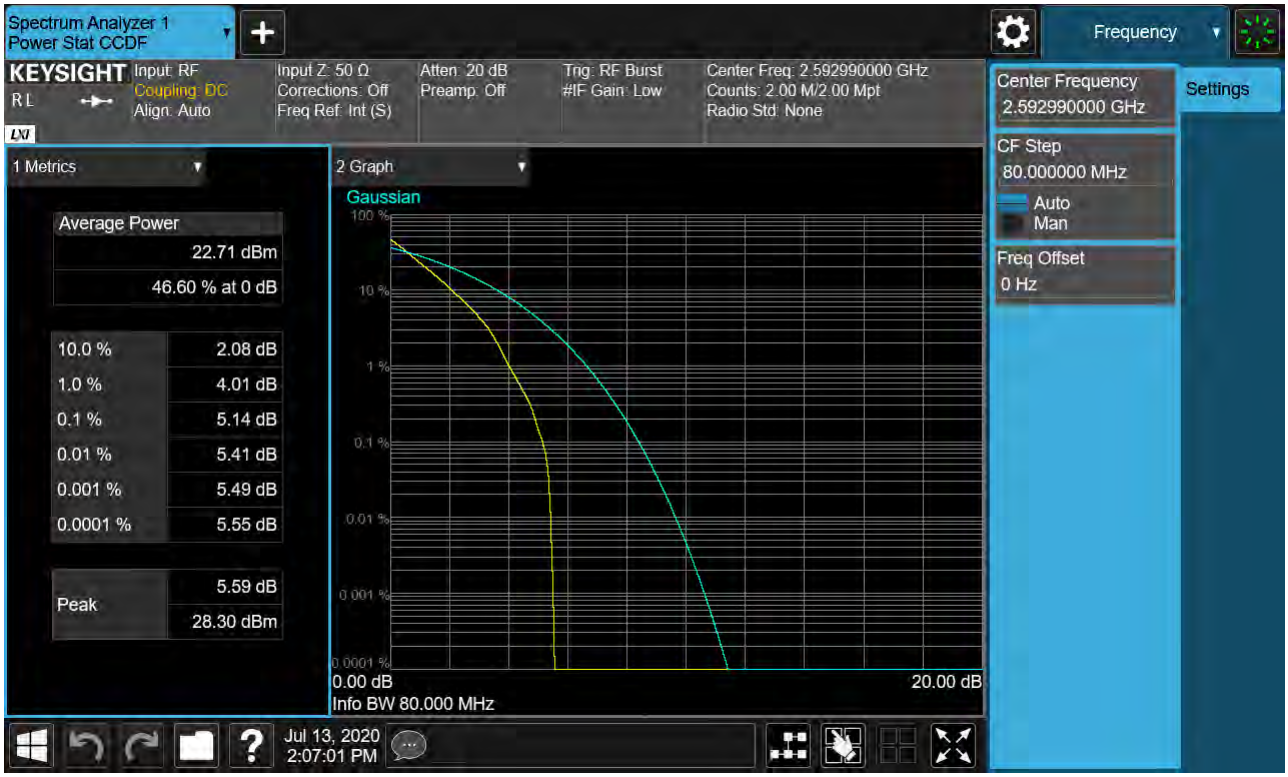
Sub6 n41. PAR Plot (60M BW_Ch.518598_16QAM_RB25_0)



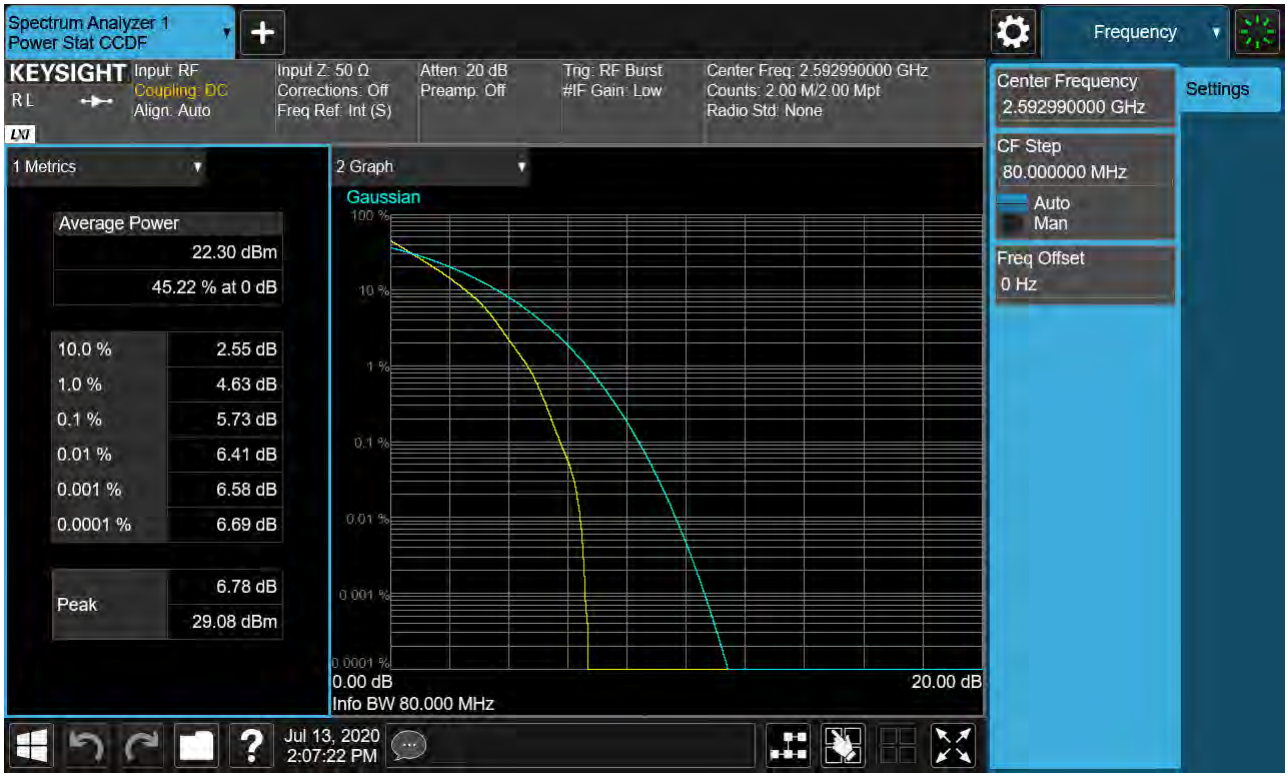
Sub6 n41. PAR Plot (60M BW_Ch.518598_64QAM_RB25_0)

Sub6 n41. PAR Plot (60M BW_Ch.518598_256QAM_RB25_0)

Sub6 n41. PAR Plot (80M BW_Ch.518598_BPSK_RB25_0)



Sub6 n41. PAR Plot (80M BW_Ch.518598_QPSK_RB25_0)

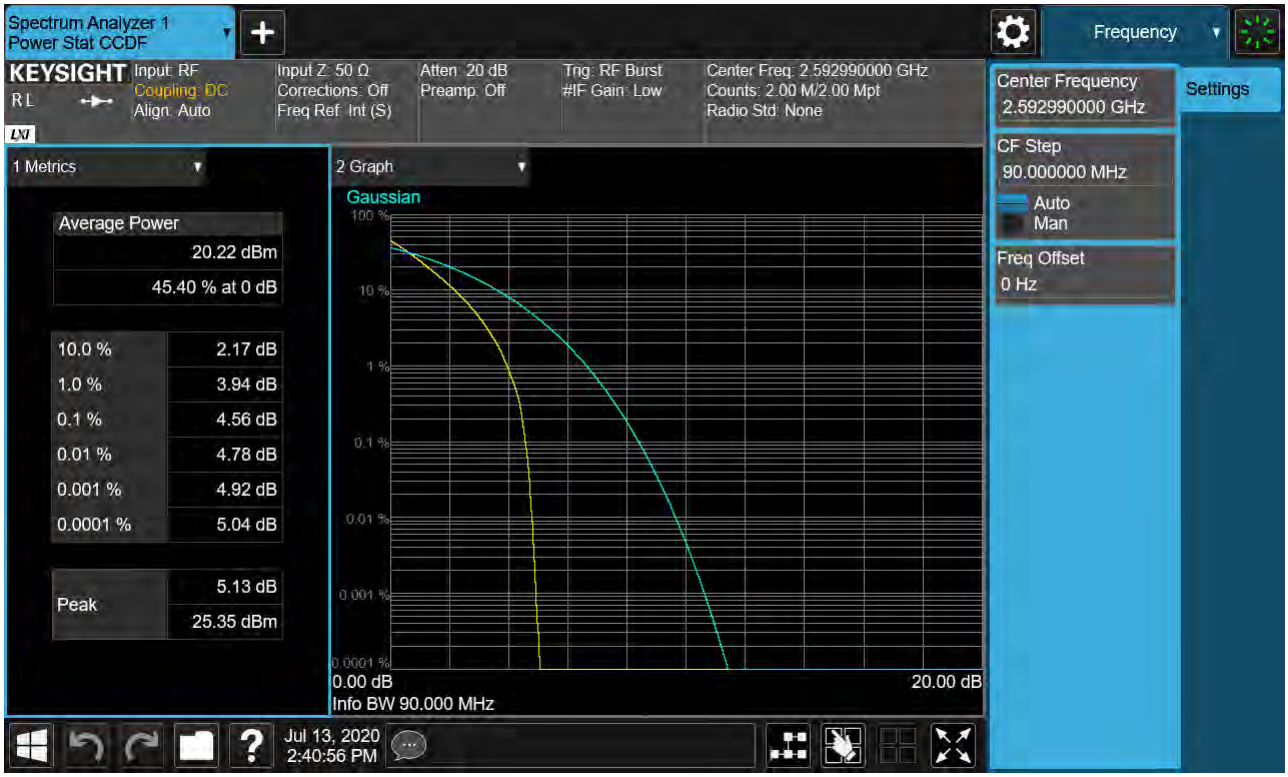


Sub6 n41. PAR Plot (80M BW_Ch.518598_16QAM_RB25_0)

Sub6 n41. PAR Plot (80M BW_Ch.518598_64QAM_RB25_0)

Sub6 n41. PAR Plot (80M BW_Ch.518598_256QAM_RB25_0)

Sub6 n41. PAR Plot (90M BW_Ch.518598_BPSK_RB25_0)



Sub6 n41. PAR Plot (90M BW_Ch.518598_QPSK_RB25_0)