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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 15, 2022

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

Report No.: HCT-RF-2202-FC015

FCC ID:	**A3LSMA736B**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s):	SM-A736B/DS
Additional Model(s):	SM-A736B
EUT Type:	Mobile phone
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§27, §2

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)

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	0.174	22.40
		17M9G7D	QPSK	0.154	21.87
		18M0W7D	16QAM	0.124	20.95
		18M0W7D	64QAM	0.100	19.99
		18M0W7D	256QAM	0.069	18.40
Sub6 n41 (30)	2511.000 – 2674.980	27M0G7D	PI/2 BPSK	0.188	22.74
		26M9G7D	QPSK	0.177	22.47
		26M8W7D	16QAM	0.137	21.36
		27M0W7D	64QAM	0.108	20.32
		27M0W7D	256QAM	0.073	18.64
Sub6 n41 (40)	2516.010 – 2670.000	35M9G7D	PI/2 BPSK	0.199	22.99
		35M8G7D	QPSK	0.197	22.94
		35M8W7D	16QAM	0.150	21.77
		35M8W7D	64QAM	0.101	20.03
		35M9W7D	256QAM	0.071	18.51
Sub6 n41 (50)	2521.020 – 2664.990	45M9G7D	PI/2 BPSK	0.186	22.70
		45M8G7D	QPSK	0.185	22.68
		45M8W7D	16QAM	0.146	21.64
		45M9W7D	64QAM	0.096	19.82
		45M9W7D	256QAM	0.067	18.29
Sub6 n41 (60)	2526.000 – 2659.980	58M1G7D	PI/2 BPSK	0.184	22.64
		58M0G7D	QPSK	0.183	22.62
		58M1W7D	16QAM	0.141	21.49
		58M0W7D	64QAM	0.094	19.71
		57M9W7D	256QAM	0.066	18.17
Sub6 n41 (80)	2536.020 – 2649.990	77M2G7D	PI/2 BPSK	0.192	22.83
		77M2G7D	QPSK	0.187	22.73
		77M0W7D	16QAM	0.151	21.78
		77M1W7D	64QAM	0.094	19.75
		77M1W7D	256QAM	0.066	18.18
Sub6 n41 (90)	2541.000 – 2644.980	86M8G7D	PI/2 BPSK	0.195	22.90
		86M9G7D	QPSK	0.194	22.87
		86M8W7D	16QAM	0.149	21.73
		86M7W7D	64QAM	0.096	19.83
		86M8W7D	256QAM	0.065	18.14
Sub6 n41 (100)	2546.010 – 2640.000	96M4G7D	PI/2 BPSK	0.190	22.79
		96M3G7D	QPSK	0.188	22.75
		96M5W7D	16QAM	0.144	21.57
		96M5W7D	64QAM	0.090	19.54
		96M3W7D	256QAM	0.062	17.95

REVIEWED BY

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

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

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

This laboratory is not accredited for the test results marked *.
The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2202-FC015	February 15, 2022	- 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:	A3LSMA736B
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-A736B/DS
Additional Model(s):	SM-A736B
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 07, 2022 ~ February 14, 2022
Serial number:	Radiated: R3CRB0BP4HX Conducted: 5a1ad468cf347ece

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

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

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

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
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 1 MHz
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 1 GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

   The power is calculated by the following formula;

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

   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 = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz
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 1 GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
   The spurious emissions is calculated by the following formula;

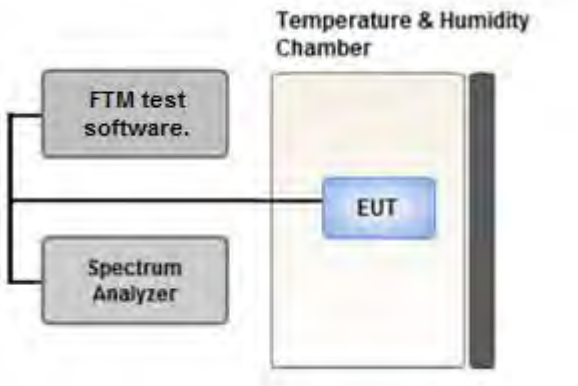
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

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

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

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

② Alternate Procedure for PAPR

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

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

Test Settings(Peak Power)

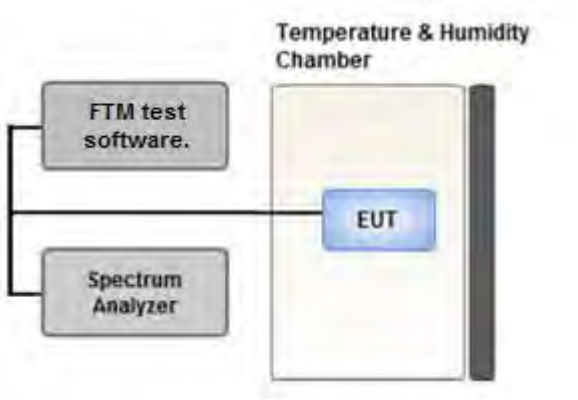
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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

Test Settings(Average Power)

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

3.5 OCCUPIED BANDWIDTH.



Test setup

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

The EUT makes a call to the communication simulator.

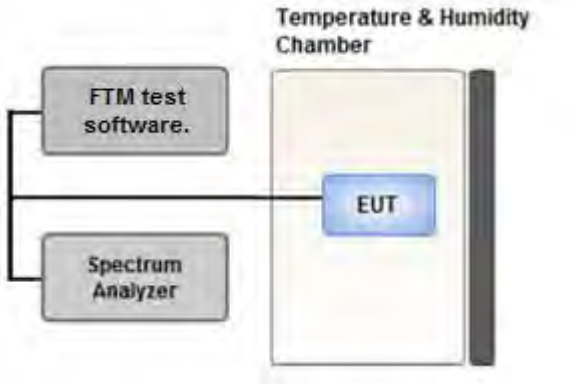
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

Test Settings

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

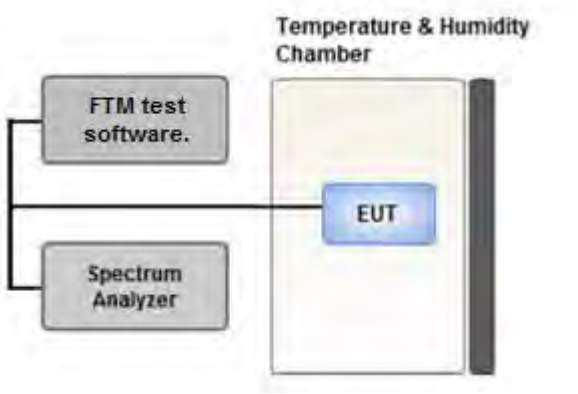
Test Overview

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.

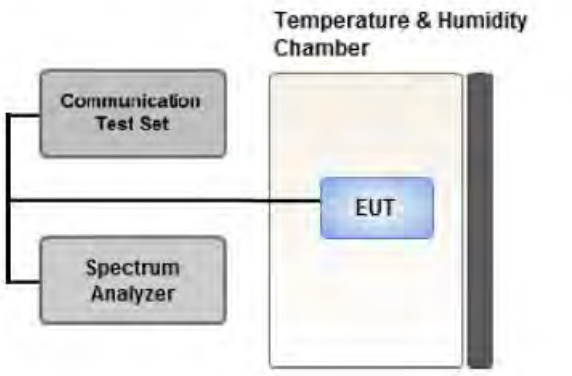
Test Settings

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 1 MHz of the channel edge the RBW should be 2 % of EBW, then 1 MHz after that.
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Notes

1. The attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge,
2. 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge.
3. 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge.
4. The attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz.
5. 55 + 10 log (P) dB at or below 2490.5 MHz.
6. X is the greater of 6MHz or the actual emission bandwidth
7. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer

3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015.

The frequency stability of the transmitter is measured by:

1. Temperature:

   The temperature is varied from -30 °C to +50 °C in 10 °C increments using an environmental chamber.

2. Primary Supply Voltage:

   .- Unless otherwise specified, vary primary supply voltage from 85 % to 115 % of the nominal value for other than hand carried battery equipment.

   .- For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20 °C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10 °C intervals ranging from -30 °C to +50 °C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

3.9 WORST CASE(RADIATED TEST)

- Waveform : All Waveform of operation were investigated and the worst case configuration results are reported.
  (Worst case: DFT-S-OFDM)
- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.
  Mode: Power Class 3 (SA/ NSA), SRS
  Worst case: Power Class 3 (NSA, 66A-n41A)
- Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc)
  Worst case : Stand alone
- We were performed the RSE test in condition of co-location. There has no significant emission raised.
- WWAN + WLAN 5 GHz + BT (Worst case : Stand alone)
- Radiated Spurious emissions are measured while operating in EN-DC mode with Sub 6 NR carrier as well as an LTE carrier (anchor).
  All EN-DC mode of operation were investigated and the worst case configuration results are reported.
  Worst case: 66A(10 MHz)-n41A(60 MHz)
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-A736B/DS & additional models were tested and the worst case results are reported.
  (Worst case : SM-A736B/DS)

[Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	See Section 8.1		Y,X
Radiated Spurious and Harmonic Emissions	PI/2 BPSK	See Section 8.2		Y

3.10 WORST CASE(CONDUCTED TEST)

- Waveform : All Waveform of operation were investigated and the worst case configuration results are reported.
  (Worst case: DFT-S-OFDM)
- Modulation : All Modulation of operation were investigated and the worst case configuration results are reported.
  (Worst case: PI/2 BPSK)
- All modes of operation were investigated and the worst case configuration results are reported.
  Mode: Power Class 3 (SA/ NSA), SRS
  Worst case: Power Class 3 (NSA, 66A-n41A)
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-A736B/DS & additional models were tested and the worst case results are reported.
  (Worst case : SM-A736B/DS)

[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

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

Note:

1. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
2. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{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 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05 (Confidence level about 95 %, k=2)

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §27.53(m)(4)	■ < 40 + 10log10 (P[Watts]) at Channel edges ■ < 43 + 10log10 (P[Watts]) between 5 and X MHz from Channel edges ■ < 55 + 10log10 (P[Watts]) beyond X MHz beyond from Channel edges ■ < 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz	PASS
Conducted Output Power	§2.1046	N/A	See Note1
Frequency stability / variation of ambient temperature	§2.1055, §27.54	Emission must remain in band	PASS

Note:

1. See SAR Report

2. All conducted tests were tested using 5G Wireless Tester.

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§27.50(h)(2)	< 2 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(m)(4)	< 55 + 10log10 (P[Watts])	PASS

Note:

1. Radiateded tests were tested using 5G Wireless Tester.

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

Ch./ Freq.		Measured Level(dBm)	Substitute Level(dBm)	Ant. Gain (dBd)	C.L	Pol.	ERP	
channel	Freq.(MHz)						W	dBm
128	824.20	-21.37	38.40	-10.61	0.95	H	0.483	26.84

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

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

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

3) Record the field strength meter's level.

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

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

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

7.2 EIRP Sample Calculation

Ch./ Freq.		Measured Level(dBm)	Substitute Level(dBm)	Ant. Gain (dBi)	C.L	Pol.	EIRP	
channel	Freq.(MHz)						W	dBm
518598	2593.0	-15.75	18.45	9.90	1.76	H	0.456	26.59

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

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

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

3) Record the field strength meter's level.

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

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

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

7.3. Emission Designator

GSM Emission Designator

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

EDGE Emission Designator

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

WCDMA Emission Designator

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

QPSK Modulation

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

QAM Modulation

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

8. TEST DATA

8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
2506.020	Sub6 41/ 20 MHz [30 kHz]	PI/2 BPSK	-21.89	14.66	10.24	2.50	H	< 2.00	0.174	22.40	1	50
		QPSK	-22.42	14.13	10.24	2.50	H		0.154	21.87		
		16-QAM	-23.34	13.21	10.24	2.50	H		0.124	20.95		
		64-QAM	-24.30	12.25	10.24	2.50	H		0.100	19.99		
		256-QAM	-25.89	10.66	10.24	2.50	H		0.069	18.40		
2592.990		PI/2 BPSK	-22.31	14.15	10.42	2.56	H		0.159	22.01	1	1
		QPSK	-22.45	14.01	10.42	2.56	H		0.154	21.87		
		16-QAM	-23.41	13.05	10.42	2.56	H		0.123	20.91		
		64-QAM	-25.28	11.18	10.42	2.56	H		0.080	19.04		
		256-QAM	-26.73	9.73	10.42	2.56	H		0.057	17.59		
2679.990		PI/2 BPSK	-24.91	12.87	10.34	2.63	H		0.114	20.58	1	25
		QPSK	-25.86	11.92	10.34	2.63	H		0.092	19.63		
		16-QAM	-26.61	11.17	10.34	2.63	H		0.077	18.88		
		64-QAM	-28.45	9.33	10.34	2.63	H		0.051	17.04		
		256-QAM	-29.41	8.37	10.34	2.63	H		0.041	16.08		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
2511.000	Sub6 41/ 30 MHz [30 kHz]	PI/2 BPSK	-21.64	15.05	10.20	2.51	H	< 2.00	0.188	22.74	1	77
		QPSK	-22.16	14.53	10.20	2.51	H		0.167	22.22		
		16-QAM	-23.16	13.53	10.20	2.51	H		0.133	21.22		
		64-QAM	-24.06	12.63	10.20	2.51	H		0.108	20.32		
		256-QAM	-25.74	10.95	10.20	2.51	H		0.073	18.64		
2592.990		PI/2 BPSK	-21.83	14.63	10.42	2.56	H		0.177	22.49	1	1
		QPSK	-21.85	14.61	10.42	2.56	H		0.177	22.47		
		16-QAM	-22.96	13.50	10.42	2.56	H		0.137	21.36		
		64-QAM	-24.70	11.76	10.42	2.56	H		0.092	19.62		
		256-QAM	-26.21	10.25	10.42	2.56	H		0.065	18.11		
2674.980		PI/2 BPSK	-25.06	12.27	10.30	2.62	H		0.099	19.95	1	39
		QPSK	-26.06	11.27	10.30	2.62	H		0.079	18.95		
		16-QAM	-26.94	10.39	10.30	2.62	H		0.064	18.07		
		64-QAM	-28.82	8.51	10.30	2.62	H		0.042	16.19		
		256-QAM	-29.89	7.44	10.30	2.62	H		0.033	15.12		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
2516.010	Sub6 41/ 40 MHz [30 kHz]	PI/2 BPSK	-21.38	15.20	10.32	2.53	H	< 2.00	0.199	22.99	1	53
		QPSK	-21.43	15.15	10.32	2.53	H		0.197	22.94		
		16-QAM	-22.60	13.98	10.32	2.53	H		0.150	21.77		
		64-QAM	-24.34	12.24	10.32	2.53	H		0.101	20.03		
		256-QAM	-25.86	10.72	10.32	2.53	H		0.071	18.51		
2592.990		PI/2 BPSK	-22.00	14.46	10.42	2.56	H		0.171	22.32	1	1
		QPSK	-22.01	14.45	10.42	2.56	H		0.170	22.31		
		16-QAM	-22.98	13.48	10.42	2.56	H		0.136	21.34		
		64-QAM	-24.94	11.52	10.42	2.56	H		0.087	19.38		
		256-QAM	-26.45	10.01	10.42	2.56	H		0.061	17.87		
2670.000		PI/2 BPSK	-25.21	11.66	10.26	2.60	H		0.085	19.32	1	105
		QPSK	-26.51	10.36	10.26	2.60	H		0.063	18.02		
		16-QAM	-27.41	9.46	10.26	2.60	H		0.052	17.12		
		64-QAM	-28.23	8.64	10.26	2.60	H		0.043	16.30		
		256-QAM	-29.21	7.66	10.26	2.60	H		0.034	15.32		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
2521.020	Sub6 41/ 50 MHz [30 kHz]	PI/2 BPSK	-21.65	14.89	10.36	2.55	H	< 2.00	0.186	22.70	1	66
		QPSK	-21.67	14.87	10.36	2.55	H		0.185	22.68		
		16-QAM	-22.71	13.83	10.36	2.55	H		0.146	21.64		
		64-QAM	-24.53	12.01	10.36	2.55	H		0.096	19.82		
		256-QAM	-26.06	10.48	10.36	2.55	H		0.067	18.29		
2592.990		PI/2 BPSK	-22.11	14.35	10.42	2.56	H		0.166	22.21	1	1
		QPSK	-22.16	14.30	10.42	2.56	H		0.164	22.16		
		16-QAM	-23.16	13.30	10.42	2.56	H		0.131	21.16		
		64-QAM	-25.12	11.34	10.42	2.56	H		0.083	19.20		
		256-QAM	-26.61	9.85	10.42	2.56	H		0.059	17.71		
2664.990		PI/2 BPSK	-25.16	11.68	10.22	2.60	H		0.085	19.30	1	132
		QPSK	-26.39	10.45	10.22	2.60	H		0.064	18.07		
		16-QAM	-27.22	9.62	10.22	2.60	H		0.053	17.24		
		64-QAM	-28.10	8.74	10.22	2.60	H		0.043	16.36		
		256-QAM	-29.01	7.83	10.22	2.60	H		0.035	15.45		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
2526.000	Sub6 41/ 60 MHz [30 kHz]	PI/2 BPSK	-21.56	14.80	10.40	2.56	H	< 2.00	0.184	22.64	1	81
		QPSK	-21.58	14.78	10.40	2.56	H		0.183	22.62		
		16-QAM	-22.71	13.65	10.40	2.56	H		0.141	21.49		
		64-QAM	-24.49	11.87	10.40	2.56	H		0.094	19.71		
		256-QAM	-26.03	10.33	10.40	2.56	H		0.066	18.17		
2592.990		PI/2 BPSK	-21.74	14.72	10.42	2.56	H		0.181	22.58	1	1
		QPSK	-21.76	14.70	10.42	2.56	H		0.180	22.56		
		16-QAM	-22.89	13.57	10.42	2.56	H		0.139	21.43		
		64-QAM	-24.80	11.66	10.42	2.56	H		0.090	19.52		
		256-QAM	-26.31	10.15	10.42	2.56	H		0.063	18.01		
2659.980		PI/2 BPSK	-24.96	11.85	10.18	2.60	H		0.088	19.43	1	1
		QPSK	-25.16	11.65	10.18	2.60	H		0.084	19.23		
		16-QAM	-26.23	10.58	10.18	2.60	H		0.066	18.16		
		64-QAM	-28.21	8.60	10.18	2.60	H		0.042	16.18		
		256-QAM	-29.66	7.15	10.18	2.60	H		0.030	14.73		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
2536.020	Sub6 41/ 80 MHz [30 kHz]	PI/2 BPSK	-21.51	14.86	10.52	2.55	H	< 2.00	0.192	22.83	1	108
		QPSK	-21.61	14.76	10.52	2.55	H		0.187	22.73		
		16-QAM	-22.56	13.81	10.52	2.55	H		0.151	21.78		
		64-QAM	-24.59	11.78	10.52	2.55	H		0.094	19.75		
		256-QAM	-26.16	10.21	10.52	2.55	H		0.066	18.18		
2592.990		PI/2 BPSK	-21.98	14.48	10.42	2.56	H		0.171	22.34	1	1
		QPSK	-22.03	14.43	10.42	2.56	H		0.169	22.29		
		16-QAM	-23.01	13.45	10.42	2.56	H		0.135	21.31		
		64-QAM	-25.16	11.30	10.42	2.56	H		0.082	19.16		
		256-QAM	-26.63	9.83	10.42	2.56	H		0.059	17.69		
2649.990		PI/2 BPSK	-23.83	12.80	10.13	2.62	H		0.107	20.31	1	1
		QPSK	-23.84	12.79	10.13	2.62	H		0.107	20.30		
		16-QAM	-24.90	11.73	10.13	2.62	H		0.084	19.24		
		64-QAM	-26.66	9.97	10.13	2.62	H		0.056	17.48		
		256-QAM	-28.23	8.40	10.13	2.62	H		0.039	15.91		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
2541.000	Sub6 41/ 90 MHz [30 kHz]	PI/2 BPSK	-21.48	14.90	10.56	2.56	H	< 2.00	0.195	22.90	1	122
		QPSK	-21.51	14.87	10.56	2.56	H		0.194	22.87		
		16-QAM	-22.65	13.73	10.56	2.56	H		0.149	21.73		
		64-QAM	-24.55	11.83	10.56	2.56	H		0.096	19.83		
		256-QAM	-26.24	10.14	10.56	2.56	H		0.065	18.14		
2592.990		PI/2 BPSK	-21.61	14.85	10.42	2.56	H		0.187	22.71	1	1
		QPSK	-21.62	14.84	10.42	2.56	H		0.186	22.70		
		16-QAM	-22.69	13.77	10.42	2.56	H		0.146	21.63		
		64-QAM	-24.61	11.85	10.42	2.56	H		0.094	19.71		
		256-QAM	-26.26	10.20	10.42	2.56	H		0.064	18.06		
2644.980		PI/2 BPSK	-23.32	13.57	10.16	2.63	H		0.129	21.10	1	1
		QPSK	-23.39	13.50	10.16	2.63	H		0.127	21.03		
		16-QAM	-24.36	12.53	10.16	2.63	H		0.101	20.06		
		64-QAM	-26.23	10.66	10.16	2.63	H		0.066	18.19		
		256-QAM	-27.62	9.27	10.16	2.63	H		0.048	16.80		

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
2546.010	Sub6 41/ 100 MHz [30 kHz]	PI/2 BPSK	-21.59	14.79	10.56	2.56	H	< 2.00	0.190	22.79	1	136
		QPSK	-21.63	14.75	10.56	2.56	H		0.188	22.75		
		16-QAM	-22.81	13.57	10.56	2.56	H		0.144	21.57		
		64-QAM	-24.84	11.54	10.56	2.56	H		0.090	19.54		
		256-QAM	-26.43	9.95	10.56	2.56	H		0.062	17.95		
2592.990		PI/2 BPSK	-21.75	14.71	10.42	2.56	H		0.181	22.57	1	1
		QPSK	-21.77	14.69	10.42	2.56	H		0.180	22.55		
		16-QAM	-23.03	13.43	10.42	2.56	H		0.135	21.29		
		64-QAM	-24.86	11.60	10.42	2.56	H		0.088	19.46		
		256-QAM	-26.56	9.90	10.42	2.56	H		0.060	17.76		
2640.000		PI/2 BPSK	-22.95	13.94	10.16	2.63	H		0.140	21.47	1	1
		QPSK	-23.03	13.86	10.16	2.63	H		0.138	21.39		
		16-QAM	-24.00	12.89	10.16	2.63	H		0.110	20.42		
		64-QAM	-25.66	11.23	10.16	2.63	H		0.075	18.76		
		256-QAM	-27.31	9.58	10.16	2.63	H		0.051	17.11		

8.2 RADIATED SPURIOUS EMISSIONS

▣ NR Band: N41

▣ LTE Band(Anchor): B66

▣ 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)	RB	
									Size	Offset
501204 (2506.020)	5 012.04	-61.02	10.92	-60.46	3.77	H	-53.31	-25.00	1	50
	7 518.06	-59.19	11.54	-49.83	4.51	H	-42.80	-25.00		
	10 024.08	-51.15	11.75	-40.36	5.30	H	-33.91	-25.00		
	12 530.10	-53.99	12.94	-42.34	6.10	H	-35.50	-25.00		
518598 (2592.990)	5 185.98	-60.63	11.47	-60.28	3.90	H	-52.70	-25.00	1	1
	7 778.97	-52.00	11.28	-42.58	4.66	H	-35.96	-25.00		
	10 371.96	-56.71	11.80	-44.01	5.41	H	-37.62	-25.00		
	12 964.95	-62.84	12.70	-50.56	6.26	H	-44.12	-25.00		
535998 (2679.990)	5 359.98	-61.43	11.82	-61.68	3.84	H	-53.70	-25.00	1	25
	8 039.97	-55.97	11.28	-46.73	4.71	H	-40.16	-25.00		
	10 719.96	-51.84	11.70	-37.84	5.48	H	-31.62	-25.00		
	13 399.95	-56.67	12.50	-43.23	6.33	H	-37.06	-25.00		

▣ NR Band: N41

▣ LTE Band(Anchor): B66

▣ 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)	RB	
									Size	Offset
502200 (2511.000)	5 022.00	-61.33	10.94	-61.17	3.72	H	-53.95	-25.00	1	77
	7 533.00	-59.30	11.56	-50.45	4.56	H	-43.44	-25.00		
	10 044.00	-51.50	11.71	-40.50	5.29	H	-34.08	-25.00		
	12 555.00	-54.14	12.90	-42.22	6.17	H	-35.49	-25.00		
518598 (2592.990)	5 185.98	-61.25	11.47	-60.90	3.90	H	-53.32	-25.00	1	1
	7 778.97	-59.28	11.28	-49.86	4.66	H	-43.24	-25.00		
	10 371.96	-51.75	11.80	-39.05	5.41	H	-32.66	-25.00		
	12 964.95	-64.61	12.70	-52.33	6.26	H	-45.89	-25.00		
534996 (2674.980)	5 349.96	-62.08	11.80	-62.07	3.79	H	-54.06	-25.00	1	39
	8 024.94	-55.04	11.25	-45.47	4.69	H	-38.91	-25.00		
	10 699.92	-54.13	11.70	-40.52	5.51	H	-34.33	-25.00		
	13 374.90	-57.00	12.60	-44.40	6.29	H	-38.09	-25.00		

▣ NR Band: N41

▣ LTE Band(Anchor): B66

▣ 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)	RB	
									Size	Offset
503202 (2516.010)	5 032.02	-60.61	10.96	-60.90	3.66	H	-53.60	-25.00	1	53
	7 548.03	-55.66	11.58	-46.56	4.63	H	-39.61	-25.00		
	10 064.04	-52.06	11.67	-41.21	5.31	H	-34.85	-25.00		
	12 580.05	-56.59	12.90	-45.40	6.12	H	-38.62	-25.00		
518598 (2592.990)	5 185.98	-59.97	11.47	-59.62	3.90	H	-52.04	-25.00	1	1
	7 778.97	-58.82	11.28	-49.40	4.66	H	-42.78	-25.00		
	10 371.96	-54.72	11.80	-42.02	5.41	H	-35.63	-25.00		
	12 964.95	-60.57	12.70	-48.29	6.26	H	-41.85	-25.00		
534000 (2670.000)	5 340.00	-61.36	11.78	-61.85	3.78	H	-53.85	-25.00	1	105
	8 010.00	-56.25	11.22	-46.49	4.66	H	-39.93	-25.00		
	10 680.00	-53.21	11.70	-38.95	5.56	H	-32.81	-25.00		
	13 350.00	-58.09	12.70	-44.74	6.30	H	-38.34	-25.00		

▣ NR Band: N41

▣ LTE Band(Anchor): B66

▣ 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)	RB	
									Size	Offset
504204 (2521.020)	5 042.04	-60.47	10.98	-61.23	3.65	H	-53.90	-25.00	1	66
	7 563.06	-58.87	11.60	-49.67	4.65	H	-42.71	-25.00		
	10 084.08	-56.32	11.63	-45.28	5.35	H	-38.99	-25.00		
	12 605.10	-58.06	12.90	-46.31	6.08	H	-39.49	-25.00		
518598 (2592.990)	5 185.98	-61.25	11.47	-60.90	3.90	H	-53.32	-25.00	1	1
	7 778.97	-59.07	11.28	-49.65	4.66	H	-43.03	-25.00		
	10 371.96	-53.18	11.80	-40.48	5.41	H	-34.09	-25.00		
	12 964.95	-62.18	12.70	-49.90	6.26	H	-43.46	-25.00		
532998 (2664.990)	5 329.98	-59.90	11.76	-60.29	3.76	H	-52.29	-25.00	1	132
	7 994.97	-55.49	11.19	-45.89	4.64	H	-39.33	-25.00		
	10 659.96	-55.05	11.70	-40.52	5.51	H	-34.33	-25.00		
	13 324.95	-57.75	12.75	-44.10	6.39	H	-37.73	-25.00		

▣ NR Band: N41

▣ LTE Band(Anchor): B66

▣ 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)	RB	
									Size	Offset
505200 (2526.000)	5 052.00	-58.39	11.00	-58.82	3.66	H	-51.48	-25.00	1	81
	7 578.00	-60.18	11.60	-51.33	4.60	H	-44.33	-25.00		
	10 104.00	-51.44	11.60	-40.35	5.34	H	-34.08	-25.00		
	12 630.00	-55.44	12.90	-44.33	6.19	H	-37.62	-25.00		
518598 (2592.990)	5 185.98	-60.92	11.47	-60.57	3.90	H	-52.99	-25.00	1	1
	7 778.97	-54.85	11.28	-45.43	4.66	H	-38.81	-25.00		
	10 371.96	-56.46	11.80	-43.76	5.41	H	-37.37	-25.00		
	12 964.95	-59.73	12.70	-47.45	6.26	H	-41.01	-25.00		
531996 (2659.980)	5 319.96	-59.71	11.74	-60.43	3.80	H	-52.49	-25.00	1	1
	7 979.94	-52.09	11.16	-42.71	4.66	H	-36.21	-25.00		
	10 639.92	-51.09	11.70	-37.24	5.44	H	-30.98	-25.00		
	13 299.90	-59.07	12.80	-45.99	6.31	H	-39.50	-25.00		

▣ NR Band: N41

▣ LTE Band(Anchor): B66

▣ 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)	RB	
									Size	Offset
507204 (2536.020)	5 072.04	-60.49	11.08	-60.10	3.73	H	-52.75	-25.00	1	108
	7 608.06	-60.09	11.60	-50.95	4.54	H	-43.89	-25.00		
	10 144.08	-53.30	11.60	-41.76	5.33	H	-35.48	-25.00		
	12 680.10	-58.04	12.78	-45.69	6.16	H	-39.07	-25.00		
518598 (2592.990)	5 185.98	-60.92	11.47	-60.57	3.90	H	-52.99	-25.00	1	1
	7 778.97	-56.69	11.28	-47.27	4.66	H	-40.65	-25.00		
	10 371.96	-54.25	11.80	-41.55	5.41	H	-35.16	-25.00		
	12 964.95	-60.87	12.70	-48.59	6.26	H	-42.15	-25.00		
529998 (2649.990)	5 299.98	-61.73	11.70	-61.89	3.91	H	-54.10	-25.00	1	1
	7 949.97	-60.97	11.10	-51.06	4.74	H	-44.70	-25.00		
	10 599.96	-58.08	11.70	-44.72	5.53	H	-38.55	-25.00		
	13 249.95	-60.98	12.90	-48.83	6.31	H	-42.24	-25.00		

▣ NR Band: N41

▣ LTE Band(Anchor): B66

▣ 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)	RB	
									Size	Offset
508200 (2541.000)	5 082.00	-58.83	11.12	-58.53	3.74	H	-51.15	-25.00	1	122
	7 623.00	-59.69	11.60	-50.24	4.55	H	-43.19	-25.00		
	10 164.00	-50.19	11.60	-38.45	5.35	H	-32.19	-25.00		
	12 705.00	-55.42	12.69	-42.16	6.17	H	-35.64	-25.00		
518598 (2592.990)	5 185.98	-58.52	11.47	-58.17	3.90	H	-50.59	-25.00	1	1
	7 778.97	-58.23	11.28	-48.81	4.66	H	-42.19	-25.00		
	10 371.96	-52.20	11.80	-39.50	5.41	H	-33.11	-25.00		
	12 964.95	-59.14	12.70	-46.86	6.26	H	-40.42	-25.00		
528996 (2644.980)	5 289.96	-61.58	11.68	-61.73	3.90	H	-53.95	-25.00	1	1
	7 934.94	-62.19	11.07	-52.98	4.69	H	-46.60	-25.00		
	10 579.92	-57.99	11.70	-45.19	5.51	H	-39.00	-25.00		
	13 224.90	-62.77	12.90	-49.55	6.32	H	-42.97	-25.00		

▣ NR Band: N41

▣ LTE Band(Anchor): B66

▣ 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)	RB	
									Size	Offset
509202 (2546.010)	5 092.02	-59.87	11.16	-59.96	3.79	H	-52.59	-25.00	1	136
	7 638.03	-59.09	11.60	-50.26	4.58	H	-43.24	-25.00		
	10 184.04	-51.00	11.60	-39.47	5.38	H	-33.24	-25.00		
	12 730.05	-58.53	12.64	-45.50	6.20	H	-39.06	-25.00		
518598 (2592.990)	5 185.98	-60.60	11.47	-60.25	3.90	H	-52.67	-25.00	1	1
	7 778.97	-59.22	11.28	-49.80	4.66	H	-43.18	-25.00		
	10 371.96	-51.52	11.80	-38.82	5.41	H	-32.43	-25.00		
	12 964.95	-60.17	12.70	-47.89	6.26	H	-41.45	-25.00		
528000 (2640.000)	5 280.00	-61.58	11.66	-62.28	3.84	H	-54.46	-25.00	1	1
	7 920.00	-59.55	11.04	-50.01	4.64	H	-43.61	-25.00		
	10 560.00	-58.40	11.70	-45.27	5.47	H	-39.04	-25.00		
	13 200.00	-62.46	12.90	-50.26	6.27	H	-43.63	-25.00		

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

(Worst case: 66A(10 MHz)-n41A(60 MHz))

▣ NR Band: N41
▣ LTE Band(Anchor): B66
▣ Bandwidth: 10 MHz
▣ Modulation: PI/2 BPSK
▣ Distance: 1 meters
▣ SCS: 30 kHz

ENDC-Mode: 12A – n41A (PC3)

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
132322 (1745.0)	3490.00	-61.20	11.46	-62.51	3.05	V	-54.10	-13.00
	5235.00	-61.58	11.57	-56.27	3.79	V	-48.49	-13.00
	6980.00	-62.00	11.16	-49.77	4.51	V	-43.12	-13.00

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Sub6 n41	20 MHz	2592.990	BPSK	50	0	4.41
			QPSK			5.46
			16-QAM			6.32
			64-QAM			6.63
			256-QAM			6.94
	30 MHz		BPSK	75		4.40
			QPSK			5.44
			16-QAM			6.20
			64-QAM			6.46
			256-QAM			6.90
	40 MHz		BPSK	100		4.39
			QPSK			5.40
			16-QAM			6.19
			64-QAM			6.52
			256-QAM			6.96
	50 MHz		BPSK	128		4.47
			QPSK			5.25
			16-QAM			6.19
			64-QAM			6.49
			256-QAM			6.86
	60 MHz		BPSK	162		4.56
			QPSK			5.15
			16-QAM			6.19
			64-QAM			6.44
			256-QAM			6.80
	80 MHz		BPSK	216		4.24
			QPSK			4.88
			16-QAM			6.00
			64-QAM			6.33
			256-QAM			6.72
	90 MHz		BPSK	243		4.08
			QPSK			4.65
			16-QAM			5.88
			64-QAM			6.30
			256-QAM			6.75
	100 MHz		BPSK	270		4.13
			QPSK			4.70
			16-QAM			5.89
			64-QAM			6.27
			256-QAM			6.60

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 99 ~ 138.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Sub6 n41	20 MHz	2592.990	BPSK	50	0	17.974
			QPSK			17.928
			16-QAM			17.950
			64-QAM			17.959
			256-QAM			17.973
	30 MHz		BPSK	75		26.960
			QPSK			26.931
			16-QAM			26.801
			64-QAM			26.987
			256-QAM			27.014
	40 MHz		BPSK	100		35.876
			QPSK			35.807
			16-QAM			35.786
			64-QAM			35.840
			256-QAM			35.855
	50 MHz		BPSK	128		45.854
			QPSK			45.786
			16-QAM			45.840
			64-QAM			45.851
			256-QAM			45.859
	60 MHz		BPSK	162		58.076
			QPSK			57.979
			16-QAM			58.089
			64-QAM			57.951
			256-QAM			57.847
	80 MHz		BPSK	216		77.156
			QPSK			77.157
			16-QAM			77.031
			64-QAM			77.081
			256-QAM			77.141
	90 MHz		BPSK	243		86.826
			QPSK			86.879
			16-QAM			86.801
			64-QAM			86.697
			256-QAM			86.757
	100 MHz		BPSK	270		96.427
			QPSK			96.306
			16-QAM			96.522
			64-QAM			96.488
			256-QAM			96.253

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 59 ~ 98.

8.5 CONDUCTED SPURIOUS EMISSIONS

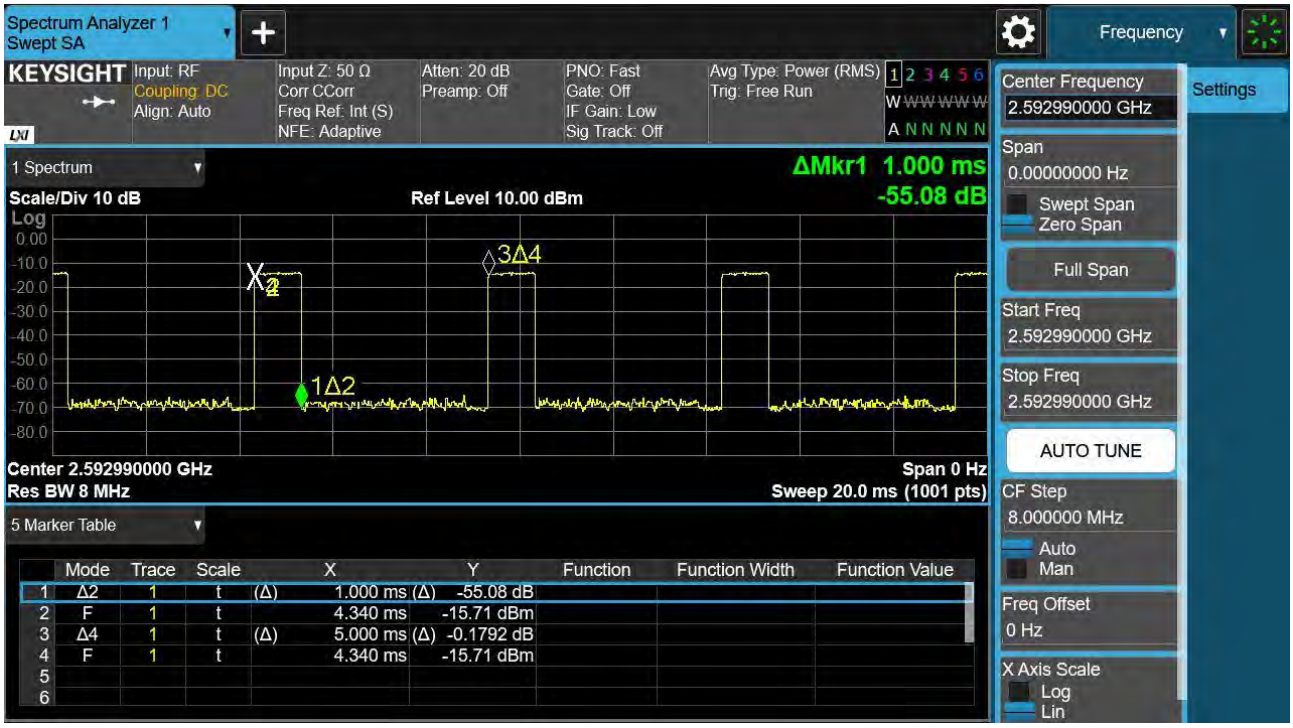
Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
Sub6 n41	20	2506.020	3.8086	37.190	-67.099	-29.909	-25.00
		2592.990	3.7902	37.190	-66.687	-29.497	
		2679.990	3.7528	37.190	-66.737	-29.547	
	30	2511.000	3.8086	37.190	-66.323	-29.133	
		2592.990	3.7837	37.190	-67.108	-29.918	
		2674.980	3.7638	37.190	-67.264	-30.074	
	40	2516.010	3.7683	37.190	-66.966	-29.776	
		2592.990	3.7812	37.190	-66.640	-29.450	
		2670.000	3.7712	37.190	-66.049	-28.859	
	50	2521.020	3.7877	37.190	-66.790	-29.600	
		2592.990	3.8196	37.190	-65.722	-28.532	
		2664.990	3.7498	37.190	-66.855	-29.665	
	60	2526.000	3.8066	37.190	-66.324	-29.134	
		2592.990	3.7707	37.190	-66.537	-29.347	
		2659.980	3.7658	37.190	-66.266	-29.076	
	80	2536.020	3.7892	37.190	-66.552	-29.362	
		2592.990	3.7628	37.190	-67.548	-30.358	
		2649.990	3.7842	37.190	-66.687	-29.497	
	90	2541.000	3.7872	37.190	-66.853	-29.663	
		2592.990	3.7663	37.190	-66.972	-29.782	
		2644.980	3.7792	37.190	-66.531	-29.341	
	100	2546.010	3.8041	37.190	-66.249	-29.059	
		2592.990	3.8046	37.190	-66.455	-29.265	
		2640.000	3.7633	37.190	-66.961	-29.771	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 195 ~ 242.

2. Duty Cycle factor already applied on the factor.

- Duty Cycle Factor(dB) = 6.99



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

- Result(dBm) = Reading + Factor

3. Factor(dB)

Frequency Range (GHz)	Factor [dB]
0.03 – 1	34.484
1 – 5	37.190
5 – 10	37.805
10 – 15	38.330
15 – 20	38.703
Above 20	39.345

8.6 CHANNEL EDGE

BW (MHz)	Frequency (MHz)	Mod	RB (Size/ Offset)	2 495 MHz ~ 2 496 MHz	C.E ~ (C.E +1MHz)	2 490.5 MHz ~ 2 495 MHz	(C.E + 1 MHz) ~ (C.E + 5 MHz)	Below 2 490.5 MHz	(C.E + 5 MHz) ~ (C.E + X MHz)	Above (C.E + X MHz)
				Lower	Upper	Lower	Upper	Lower	Upper	Upper
20	2506.020	BPSK	Full RB	-26.24	-27.74	-27.12	-26.22	-33.29	-28.73	-37.75
30	2511.000	BPSK	Full RB	-27.09	-29.78	-30.18	-30.47	-36.09	-30.44	-42.34
40	2520.000	BPSK	Full RB	-28.85	-31.51	-32.11	-31.58	-37.41	-31.37	-42.77
50	2525.010	BPSK	Full RB	-29.29	-30.94	-32.75	-31.23	-35.51	-29.87	-37.67
60	2530.020	BPSK	Full RB	-21.43	-21.25	-35.35	-34.29	-40.61	-33.95	-46.27
80	2540.010	BPSK	Full RB	-27.61	-31.80	-36.26	-34.15	-40.03	-33.74	-43.68
90	2545.020	BPSK	Full RB	-26.08	-35.53	-35.58	-36.35	-37.68	-35.44	-47.20
100	2550.000	BPSK	Full RB	-24.43	-31.89	-34.15	-31.50	-34.61	-32.95	-45.54
Limit				-13.0	-10.0	-13.0	-10.0	-25.0	-13.0	-25.0

Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resoure Block Offset	C.E ~ (C.E ± 1 MHz)		(C.E ± 1 MHz) ~ (C.E ± 5 MHz)	
					Lower	Upper	Lower	Upper
20 MHz	2592.990	BPSK	Full RB	0	-24.75	-31.72	-27.94	-30.59
	2679.990	BPSK	Full RB	0	-25.97	-30.26	-27.13	-29.51
30 MHz	2592.990	BPSK	Full RB	0	-27.31	-30.78	-28.35	-33.50
	2679.990	BPSK	Full RB	0	-26.88	-32.83	-27.56	-32.22
40 MHz	2592.990	BPSK	Full RB	0	-27.28	-33.03	-29.76	-35.65
	2670.000	BPSK	Full RB	0	-26.95	-33.81	-28.04	-34.91
50 MHz	2592.990	BPSK	Full RB	0	-25.52	-34.74	-29.39	-34.60
	2664.990	BPSK	Full RB	0	-25.03	-34.12	-27.91	-33.01
60 MHz	2592.990	BPSK	Full RB	0	-18.98	-21.71	-28.65	-33.10
	2659.980	BPSK	Full RB	0	-17.07	-22.31	-28.28	-33.88
80 MHz	2592.990	BPSK	Full RB	0	-24.57	-34.63	-31.62	-37.31
	2649.990	BPSK	Full RB	0	-25.20	-34.40	-30.00	-35.87
90 MHz	2592.990	BPSK	Full RB	0	-23.07	-35.32	-30.98	-37.59
	2644.980	BPSK	Full RB	0	-22.10	-35.94	-28.30	-36.83
100 MHz	2592.990	BPSK	Full RB	0	-21.23	-34.58	-30.72	-34.75
	2640.000	BPSK	Full RB	0	-20.23	-35.44	-29.00	-34.68
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	-27.17	-29.45	-38.25	-40.19
	2679.990	BPSK	Full RB	0	-26.29	-27.02	-35.41	-38.77
30 MHz	2592.990	BPSK	Full RB	0	-29.16	-32.75	-44.78	-43.61
	2679.990	BPSK	Full RB	0	-28.31	-31.83	-40.77	-43.83
40 MHz	2592.990	BPSK	Full RB	0	-30.05	-32.78	-45.88	-45.13
	2670.000	BPSK	Full RB	0	-28.07	-33.17	-41.12	-44.34
50 MHz	2592.990	BPSK	Full RB	0	-29.07	-34.00	-42.15	-40.17
	2664.990	BPSK	Full RB	0	-28.34	-32.97	-36.50	-40.09
60 MHz	2592.990	BPSK	Full RB	0	-31.97	-35.71	-46.78	-47.13
	2659.980	BPSK	Full RB	0	-29.32	-36.76	-43.30	-47.62
80 MHz	2592.990	BPSK	Full RB	0	-31.77	-37.00	-48.14	-45.06
	2649.990	BPSK	Full RB	0	-27.19	-37.27	-43.22	-48.14
90 MHz	2592.990	BPSK	Full RB	0	-29.63	-36.27	-48.20	-47.61
	2644.980	BPSK	Full RB	0	-27.29	-35.92	-46.93	-48.17
100 MHz	2592.990	BPSK	Full RB	0	-30.57	-34.94	-48.24	-46.09
	2640.000	BPSK	Full RB	0	-28.42	-36.31	-47.43	-48.19
Limit					-13.0		-25.0	

Note:

1. C.E = Channel Edge
2. X = X is the greater of 6 MHz or the actual emission bandwidth
3. Duty Cycle factor already applied on the factor.
   - Factor(dB) = Duty Cycle factor + Cable Loss + Ext. Attenuator + Power Splitter
   - Result(dBm) = Reading + Factor
   - Duty Cycle Factor(dB) = 6.99
4. Plots of the EUT's Channel Edge are shown Page 139 ~ 194. (1RB & Full RB)

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ BandWidth: 20 MHz

▣ Voltage(100 %): 3.860 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 020 015	0.0	0.000 000	0.000
	100 %	-30	2506 020 019	4.4	0.000 000	0.002
	100 %	-20	2506 020 031	16.5	0.000 001	0.007
	100 %	-10	2506 020 025	10.4	0.000 000	0.004
	100 %	0	2506 020 022	7.5	0.000 000	0.003
	100 %	+10	2506 020 019	4.2	0.000 000	0.002
	100 %	+30	2506 020 031	16.2	0.000 001	0.006
	100 %	+40	2506 020 027	12.9	0.000 001	0.005
	100 %	+50	2506 020 027	12.3	0.000 000	0.005
	Batt. Endpoint	+20	2506 020 029	13.9	0.000 001	0.006
2679.990	100 %	+20(Ref)	2679 990 012	0.0	0.000 000	0.000
	100 %	-30	2679 990 021	9.3	0.000 000	0.003
	100 %	-20	2679 990 023	10.9	0.000 000	0.004
	100 %	-10	2679 990 015	3.3	0.000 000	0.001
	100 %	0	2679 990 017	5.2	0.000 000	0.002
	100 %	+10	2679 990 015	3.2	0.000 000	0.001
	100 %	+30	2679 990 026	14.3	0.000 001	0.005
	100 %	+40	2679 990 018	6.4	0.000 000	0.002
	100 %	+50	2679 990 019	7.1	0.000 000	0.003
	Batt. Endpoint	+20	2679 990 019	6.8	0.000 000	0.003

▣ BandWidth: 30 MHz

▣ Voltage(100 %): 3.860 VDC

▣ Batt. Endpoint: 3.550 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 000 014	0.0	0.000 000	0.000
	100 %	-30	2511 000 027	12.3	0.000 000	0.005
	100 %	-20	2511 000 023	8.3	0.000 000	0.003
	100 %	-10	2511 000 028	13.5	0.000 001	0.005
	100 %	0	2511 000 028	13.7	0.000 001	0.005
	100 %	+10	2511 000 030	15.6	0.000 001	0.006
	100 %	+30	2511 000 029	14.2	0.000 001	0.006
	100 %	+40	2511 000 019	4.9	0.000 000	0.002
	100 %	+50	2511 000 026	11.2	0.000 000	0.004
	Batt. Endpoint	+20	2511 000 027	12.3	0.000 000	0.005
2674.980	100 %	+20(Ref)	2674 980 006	0.0	0.000 000	0.000
	100 %	-30	2674 980 015	8.2	0.000 000	0.003
	100 %	-20	2674 980 010	3.2	0.000 000	0.001
	100 %	-10	2674 980 019	12.2	0.000 000	0.005
	100 %	0	2674 980 015	8.9	0.000 000	0.003
	100 %	+10	2674 980 013	7.1	0.000 000	0.003
	100 %	+30	2674 980 023	16.6	0.000 001	0.006
	100 %	+40	2674 980 012	6.0	0.000 000	0.002
	100 %	+50	2674 980 017	10.6	0.000 000	0.004
	Batt. Endpoint	+20	2674 980 012	5.7	0.000 000	0.002

▣ BandWidth: 40 MHz

▣ Voltage(100 %): 3.860 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 010 008	0.0	0.000 000	0.000
	100 %	-30	2516 010 022	14.0	0.000 001	0.006
	100 %	-20	2516 010 014	5.7	0.000 000	0.002
	100 %	-10	2516 010 012	3.7	0.000 000	0.001
	100 %	0	2516 010 022	13.6	0.000 001	0.005
	100 %	+10	2516 010 024	15.8	0.000 001	0.006
	100 %	+30	2516 010 023	14.4	0.000 001	0.006
	100 %	+40	2516 010 023	14.3	0.000 001	0.006
	100 %	+50	2516 010 022	13.4	0.000 001	0.005
	Batt. Endpoint	+20	2516 010 021	12.7	0.000 001	0.005
2670.000	100 %	+20(Ref)	2670 000 012	0.0	0.000 000	0.000
	100 %	-30	2670 000 024	11.9	0.000 000	0.004
	100 %	-20	2670 000 026	14.1	0.000 001	0.005
	100 %	-10	2670 000 021	9.2	0.000 000	0.003
	100 %	0	2670 000 017	5.4	0.000 000	0.002
	100 %	+10	2670 000 020	7.8	0.000 000	0.003
	100 %	+30	2670 000 018	6.0	0.000 000	0.002
	100 %	+40	2670 000 023	10.6	0.000 000	0.004
	100 %	+50	2670 000 027	15.3	0.000 001	0.006
	Batt. Endpoint	+20	2670 000 028	16.3	0.000 001	0.006

▣ BandWidth: 50 MHz

▣ Voltage(100 %): 3.860 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 020 015	0.0	0.000 000	0.000
	100 %	-30	2521 020 020	5.0	0.000 000	0.002
	100 %	-20	2521 020 027	11.5	0.000 000	0.005
	100 %	-10	2521 020 027	12.2	0.000 000	0.005
	100 %	0	2521 020 026	11.2	0.000 000	0.004
	100 %	+10	2521 020 029	13.9	0.000 001	0.006
	100 %	+30	2521 020 018	3.3	0.000 000	0.001
	100 %	+40	2521 020 020	5.0	0.000 000	0.002
	100 %	+50	2521 020 029	14.3	0.000 001	0.006
	Batt. Endpoint	+20	2521 020 025	9.7	0.000 000	0.004
2664.990	100 %	+20(Ref)	2664 990 012	0.0	0.000 000	0.000
	100 %	-30	2664 990 021	8.6	0.000 000	0.003
	100 %	-20	2664 990 018	6.2	0.000 000	0.002
	100 %	-10	2664 990 023	10.3	0.000 000	0.004
	100 %	0	2664 990 016	4.2	0.000 000	0.002
	100 %	+10	2664 990 017	4.7	0.000 000	0.002
	100 %	+30	2664 990 017	5.0	0.000 000	0.002
	100 %	+40	2664 990 020	8.0	0.000 000	0.003
	100 %	+50	2664 990 021	9.2	0.000 000	0.003
	Batt. Endpoint	+20	2664 990 027	15.2	0.000 001	0.006

▣ BandWidth: 60 MHz

▣ Voltage(100 %): 3.860 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 000 022	14.5	0.000 001	0.006
	100 %	-20	2526 000 013	5.4	0.000 000	0.002
	100 %	-10	2526 000 023	15.3	0.000 001	0.006
	100 %	0	2526 000 024	16.1	0.000 001	0.006
	100 %	+10	2526 000 015	7.1	0.000 000	0.003
	100 %	+30	2526 000 011	3.2	0.000 000	0.001
	100 %	+40	2526 000 023	15.3	0.000 001	0.006
	100 %	+50	2526 000 017	9.7	0.000 000	0.004
	Batt. Endpoint	+20	2526 000 021	13.8	0.000 001	0.005
2659.980	100 %	+20(Ref)	2659 980 004	0.0	0.000 000	0.000
	100 %	-30	2659 980 017	13.4	0.000 001	0.005
	100 %	-20	2659 980 009	5.3	0.000 000	0.002
	100 %	-10	2659 980 015	10.6	0.000 000	0.004
	100 %	0	2659 980 010	5.6	0.000 000	0.002
	100 %	+10	2659 980 012	8.1	0.000 000	0.003
	100 %	+30	2659 980 018	13.7	0.000 001	0.005
	100 %	+40	2659 980 015	10.8	0.000 000	0.004
	100 %	+50	2659 980 010	6.1	0.000 000	0.002
	Batt. Endpoint	+20	2659 980 014	9.7	0.000 000	0.004

▣ BandWidth: 80 MHz

▣ Voltage(100 %): 3.860 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 020 008	0.0	0.000 000	0.000
	100 %	-30	2536 020 011	3.2	0.000 000	0.001
	100 %	-20	2536 020 020	12.2	0.000 000	0.005
	100 %	-10	2536 020 025	16.5	0.000 001	0.006
	100 %	0	2536 020 012	3.4	0.000 000	0.001
	100 %	+10	2536 020 016	7.6	0.000 000	0.003
	100 %	+30	2536 020 012	3.4	0.000 000	0.001
	100 %	+40	2536 020 015	6.6	0.000 000	0.003
	100 %	+50	2536 020 021	13.1	0.000 001	0.005
	Batt. Endpoint	+20	2536 020 012	4.2	0.000 000	0.002
2649.990	100 %	+20(Ref)	2649 990 011	0.0	0.000 000	0.000
	100 %	-30	2649 990 020	8.8	0.000 000	0.003
	100 %	-20	2649 990 023	12.5	0.000 000	0.005
	100 %	-10	2649 990 027	16.4	0.000 001	0.006
	100 %	0	2649 990 022	11.6	0.000 000	0.004
	100 %	+10	2649 990 021	10.3	0.000 000	0.004
	100 %	+30	2649 990 020	9.3	0.000 000	0.004
	100 %	+40	2649 990 018	7.7	0.000 000	0.003
	100 %	+50	2649 990 018	7.6	0.000 000	0.003
	Batt. Endpoint	+20	2649 990 026	15.2	0.000 001	0.006

▣ BandWidth: 90 MHz

▣ Voltage(100 %): 3.860 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 000 014	0.0	0.000 000	0.000
	100 %	-30	2541 000 026	12.4	0.000 000	0.005
	100 %	-20	2541 000 030	15.7	0.000 001	0.006
	100 %	-10	2541 000 027	13.2	0.000 001	0.005
	100 %	0	2541 000 026	12.4	0.000 000	0.005
	100 %	+10	2541 000 018	4.4	0.000 000	0.002
	100 %	+30	2541 000 018	3.5	0.000 000	0.001
	100 %	+40	2541 000 018	3.6	0.000 000	0.001
	100 %	+50	2541 000 026	11.5	0.000 000	0.005
	Batt. Endpoint	+20	2541 000 025	11.0	0.000 000	0.004
2644.980	100 %	+20(Ref)	2644 980 004	0.0	0.000 000	0.000
	100 %	-30	2644 980 020	15.9	0.000 001	0.006
	100 %	-20	2644 980 014	10.6	0.000 000	0.004
	100 %	-10	2644 980 019	15.7	0.000 001	0.006
	100 %	0	2644 980 021	16.8	0.000 001	0.006
	100 %	+10	2644 980 010	6.5	0.000 000	0.002
	100 %	+30	2644 980 013	8.9	0.000 000	0.003
	100 %	+40	2644 980 007	3.3	0.000 000	0.001
	100 %	+50	2644 980 011	7.7	0.000 000	0.003
	Batt. Endpoint	+20	2644 980 010	6.5	0.000 000	0.002

▣ BandWidth: 100 MHz

▣ Voltage(100 %): 3.860 VDC

▣ Batt. Endpoint: 3.550 VDC

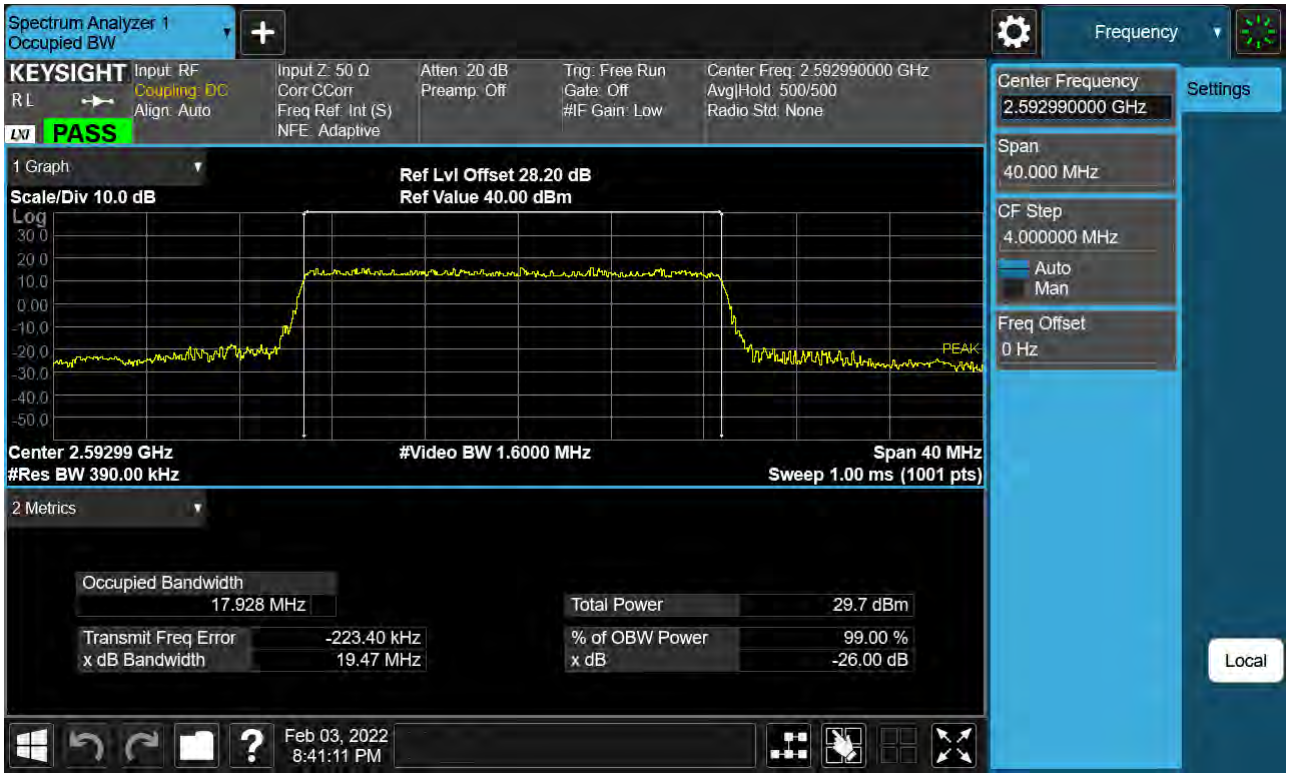
▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
2546.010	100 %	+20(Ref)	2546 010 015	0.0	0.000 000	0.000
	100 %	-30	2546 010 029	14.5	0.000 001	0.006
	100 %	-20	2546 010 028	13.6	0.000 001	0.005
	100 %	-10	2546 010 023	8.0	0.000 000	0.003
	100 %	0	2546 010 029	14.1	0.000 001	0.006
	100 %	+10	2546 010 031	15.8	0.000 001	0.006
	100 %	+30	2546 010 022	7.5	0.000 000	0.003
	100 %	+40	2546 010 022	7.1	0.000 000	0.003
	100 %	+50	2546 010 030	15.6	0.000 001	0.006
	Batt. Endpoint	+20	2546 010 027	12.2	0.000 000	0.005
2640.000	100 %	+20(Ref)	2640 000 012	0.0	0.000 000	0.000
	100 %	-30	2640 000 022	10.6	0.000 000	0.004
	100 %	-20	2640 000 018	5.8	0.000 000	0.002
	100 %	-10	2640 000 026	13.9	0.000 001	0.005
	100 %	0	2640 000 021	9.7	0.000 000	0.004
	100 %	+10	2640 000 019	7.2	0.000 000	0.003
	100 %	+30	2640 000 027	15.5	0.000 001	0.006
	100 %	+40	2640 000 015	3.0	0.000 000	0.001
	100 %	+50	2640 000 019	7.6	0.000 000	0.003
	Batt. Endpoint	+20	2640 000 028	16.7	0.000 001	0.006

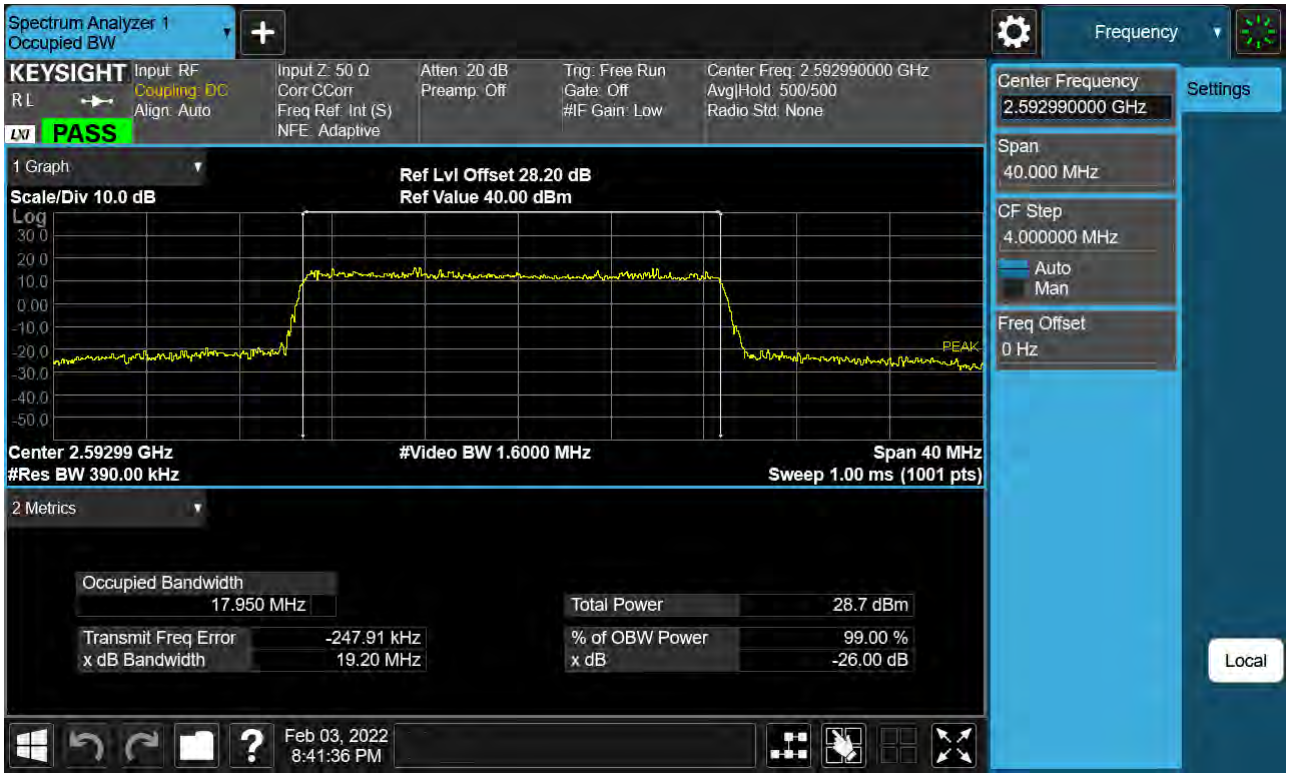
9. TEST PLOTS

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

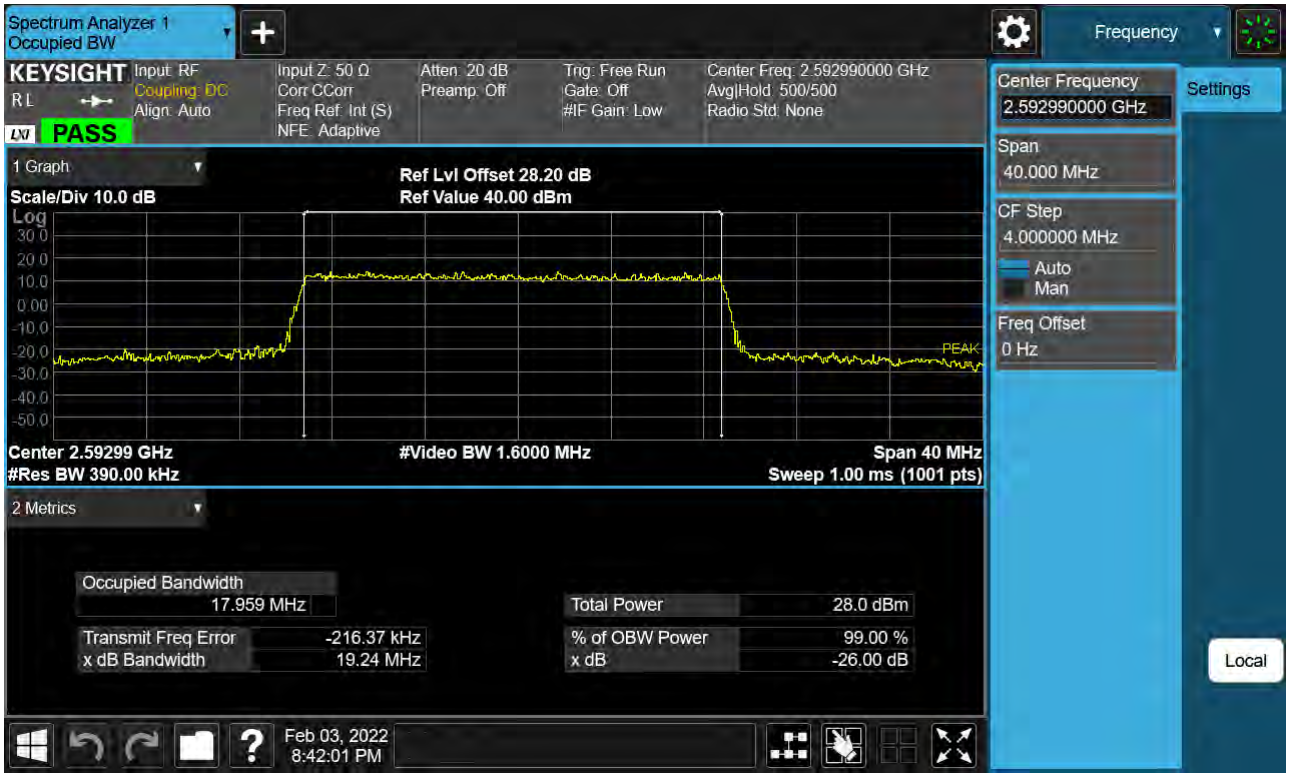
Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 QPSK)



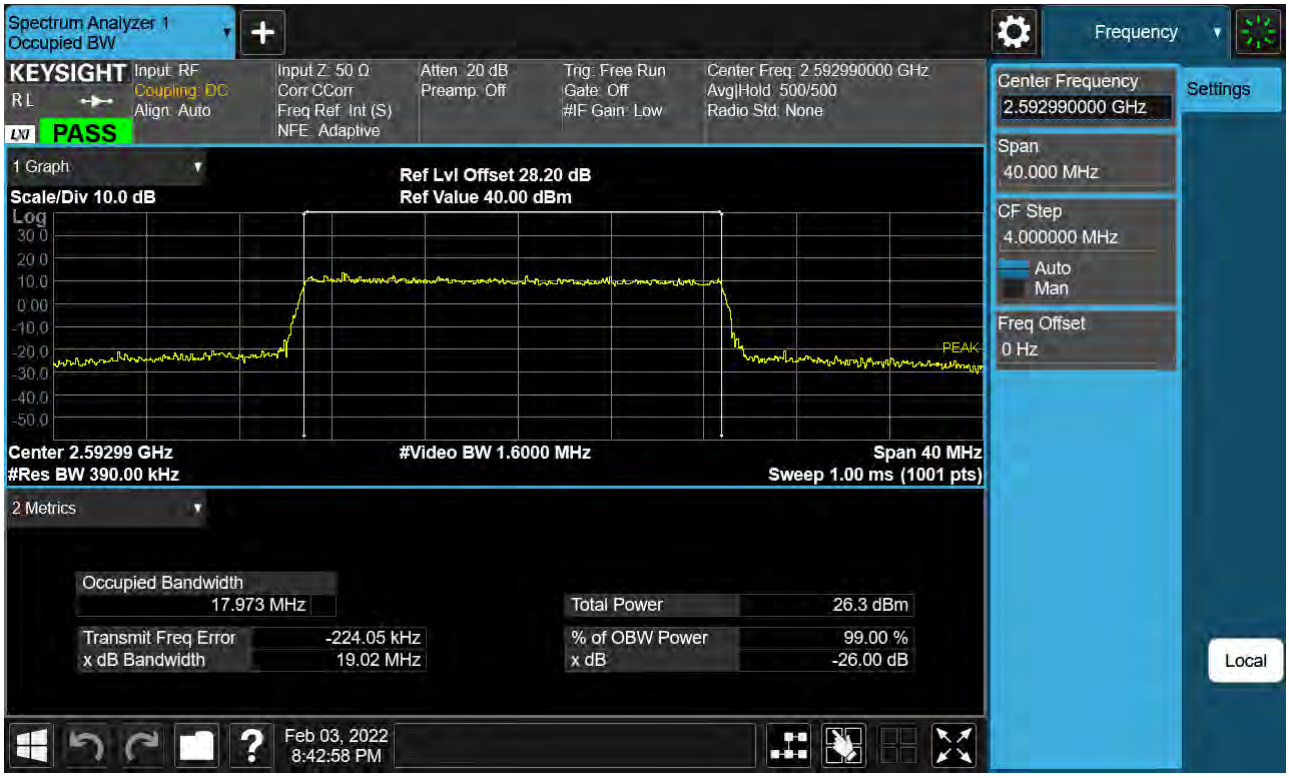
Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 16-QAM)



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



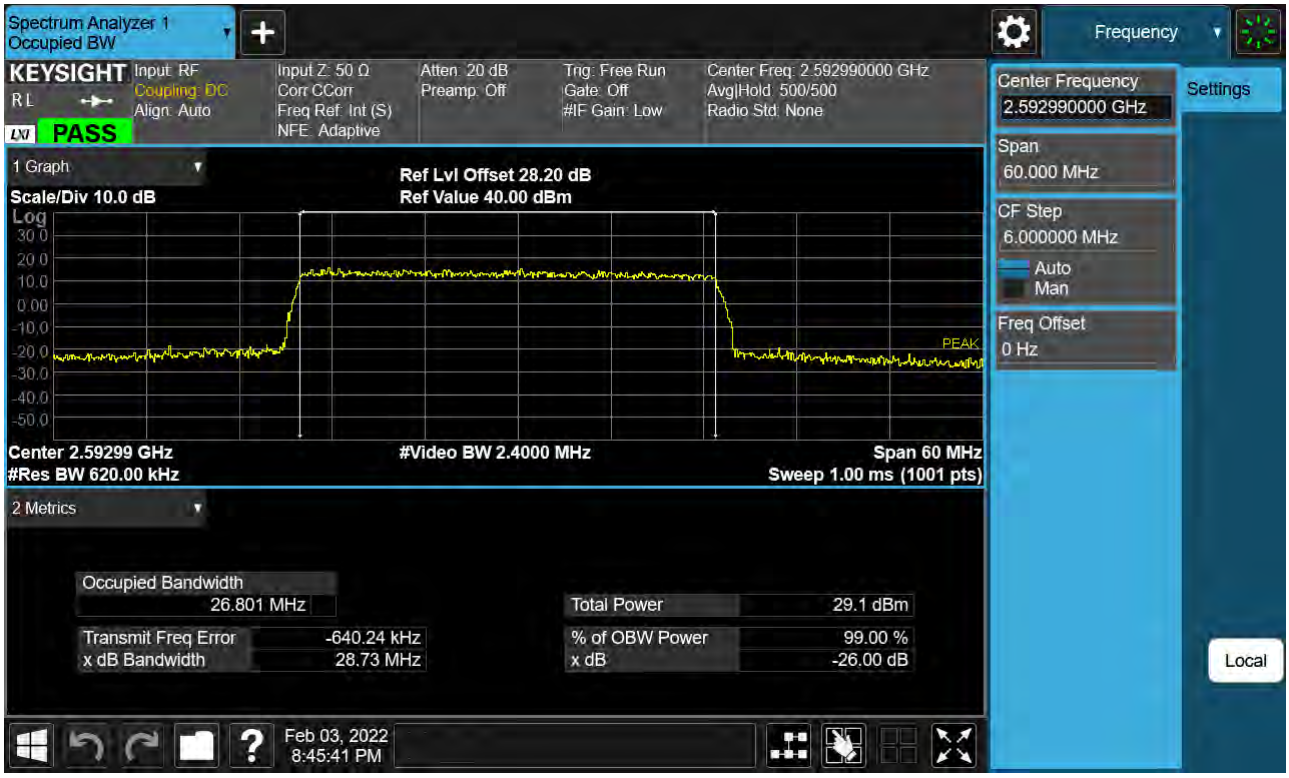
Sub6 n41. Occupied Bandwidth Plot (20 MHz Ch.518598 256-QAM)



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

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

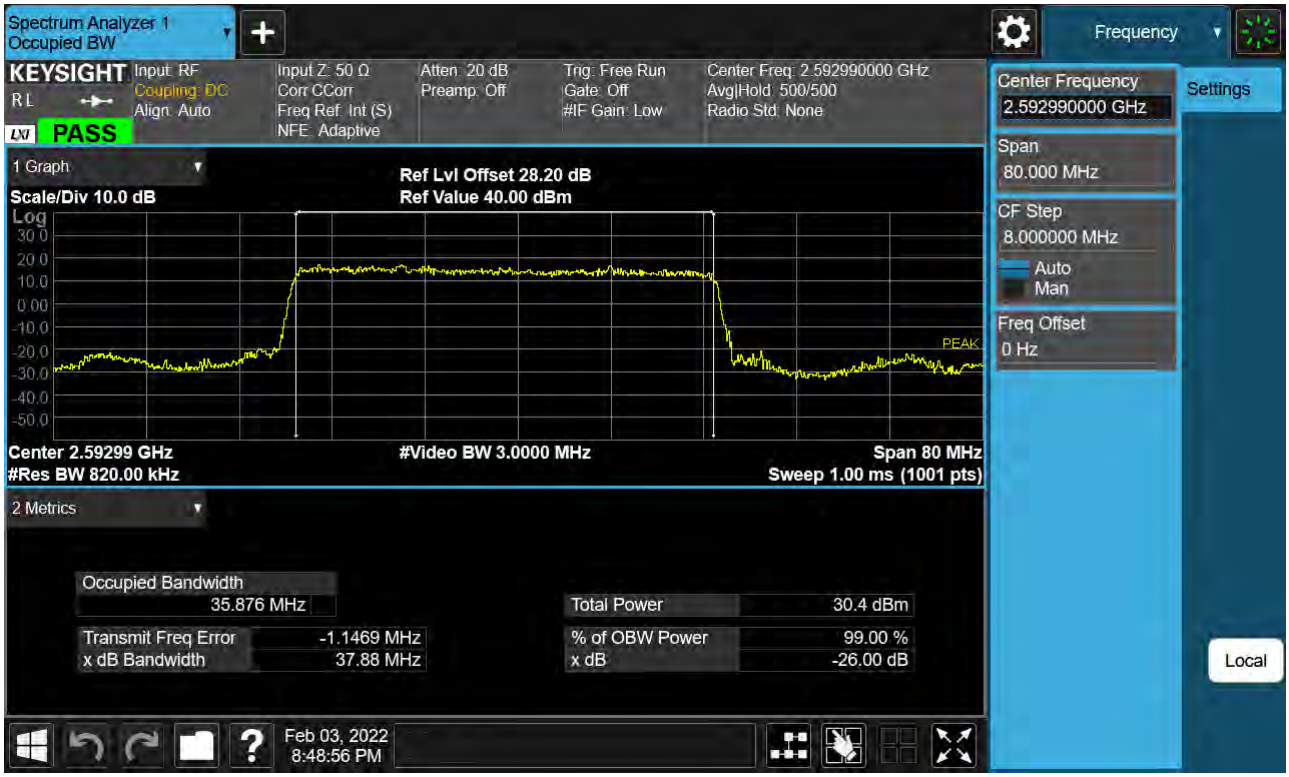
Sub6 n41. Occupied Bandwidth Plot (30 MHz Ch.518598 16-QAM)



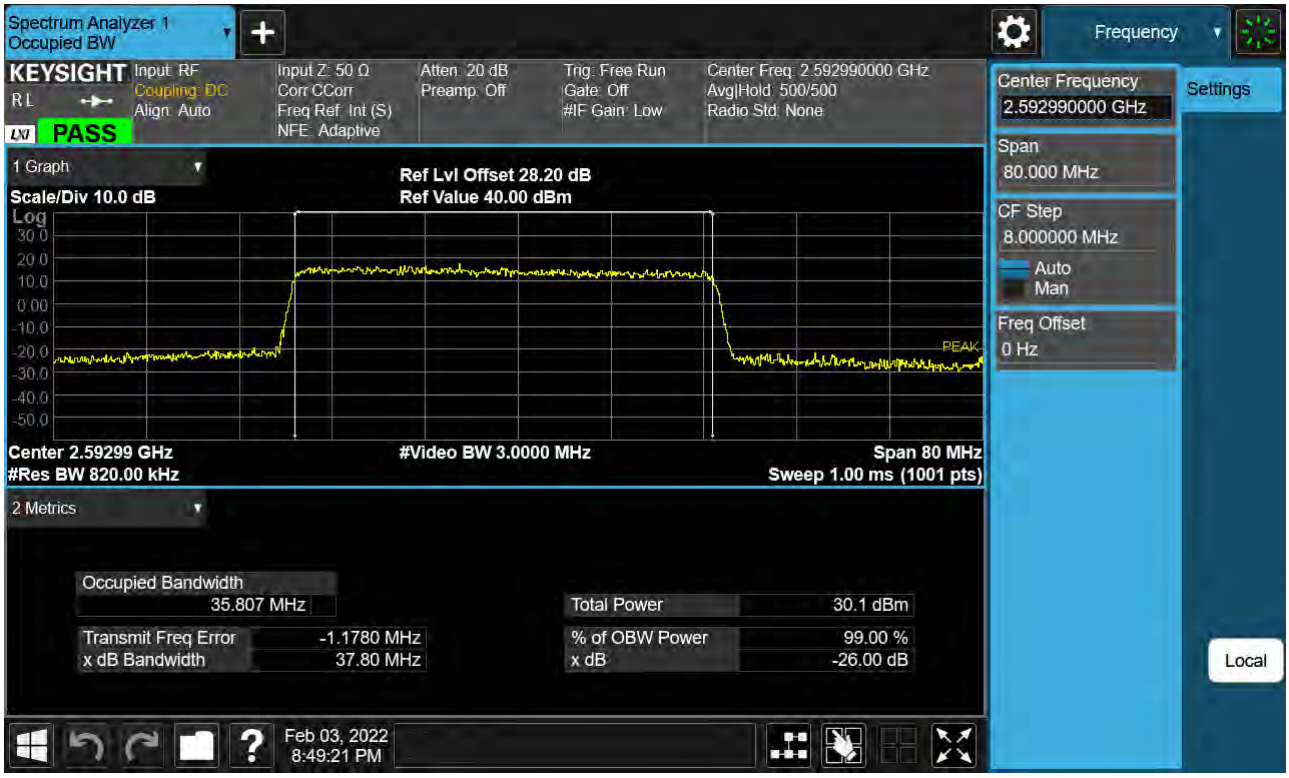
Sub6 n41. Occupied Bandwidth Plot (30 MHz Ch.518598 64-QAM)

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

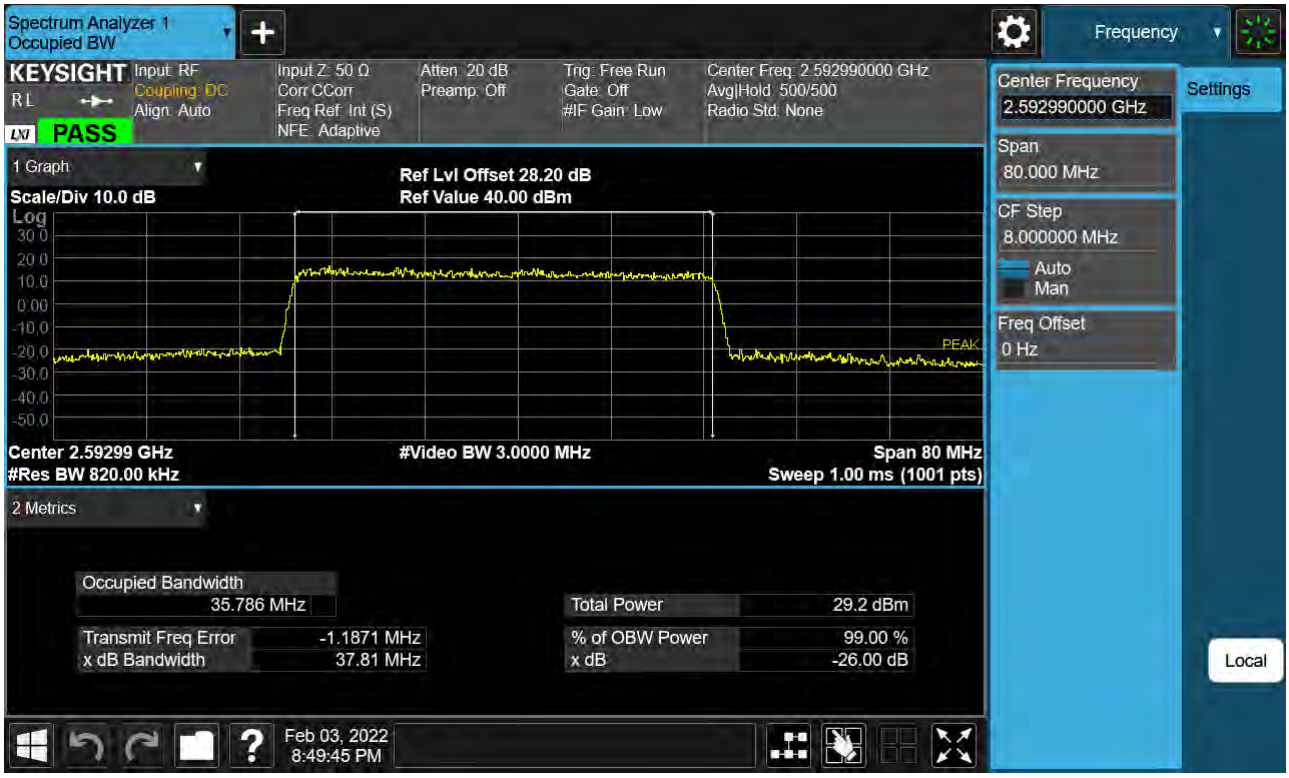
Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 BPSK)



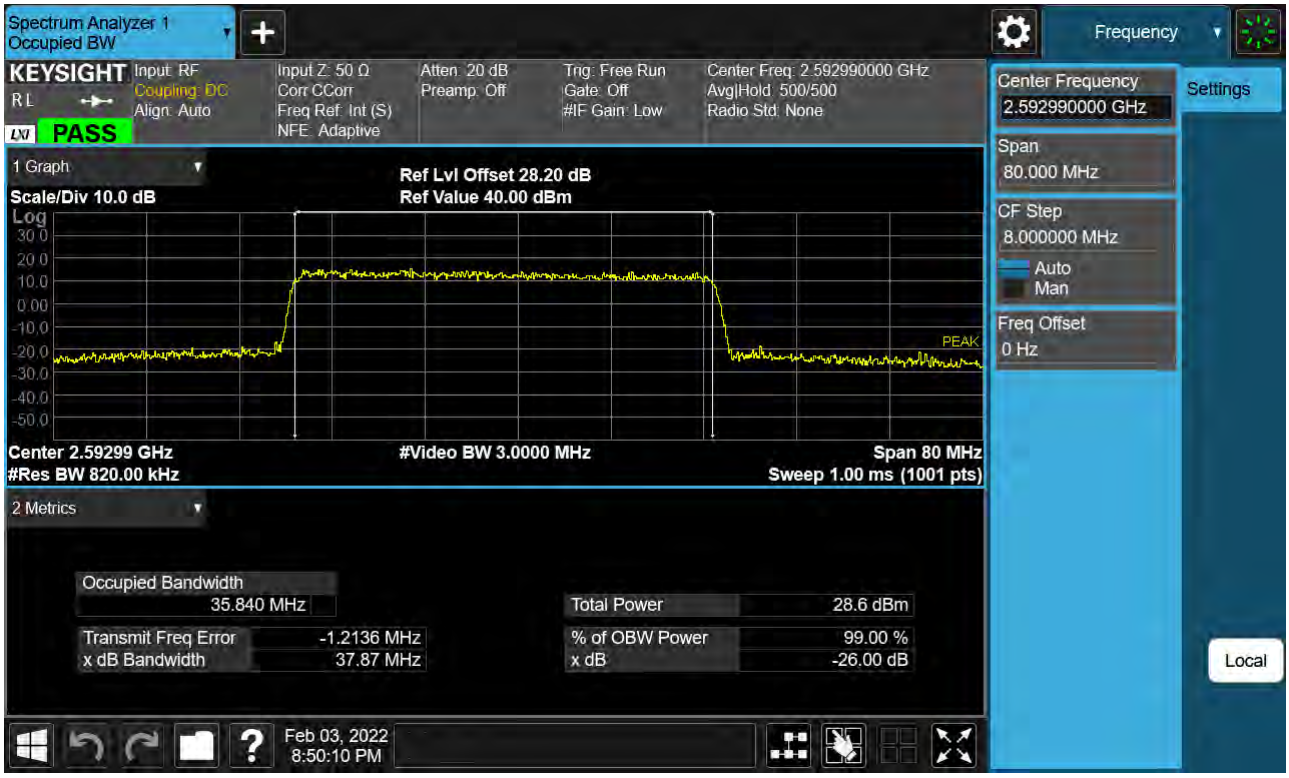
Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 QPSK)



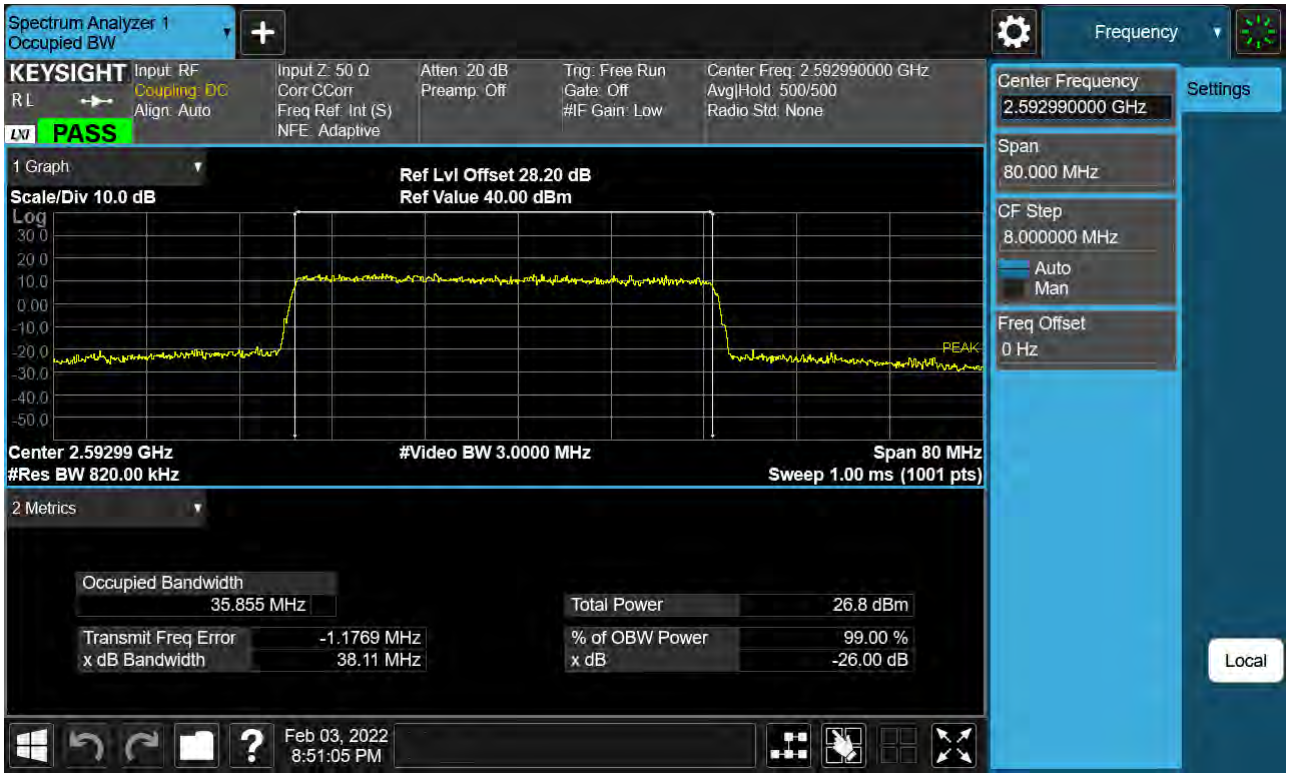
Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 16-QAM)



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

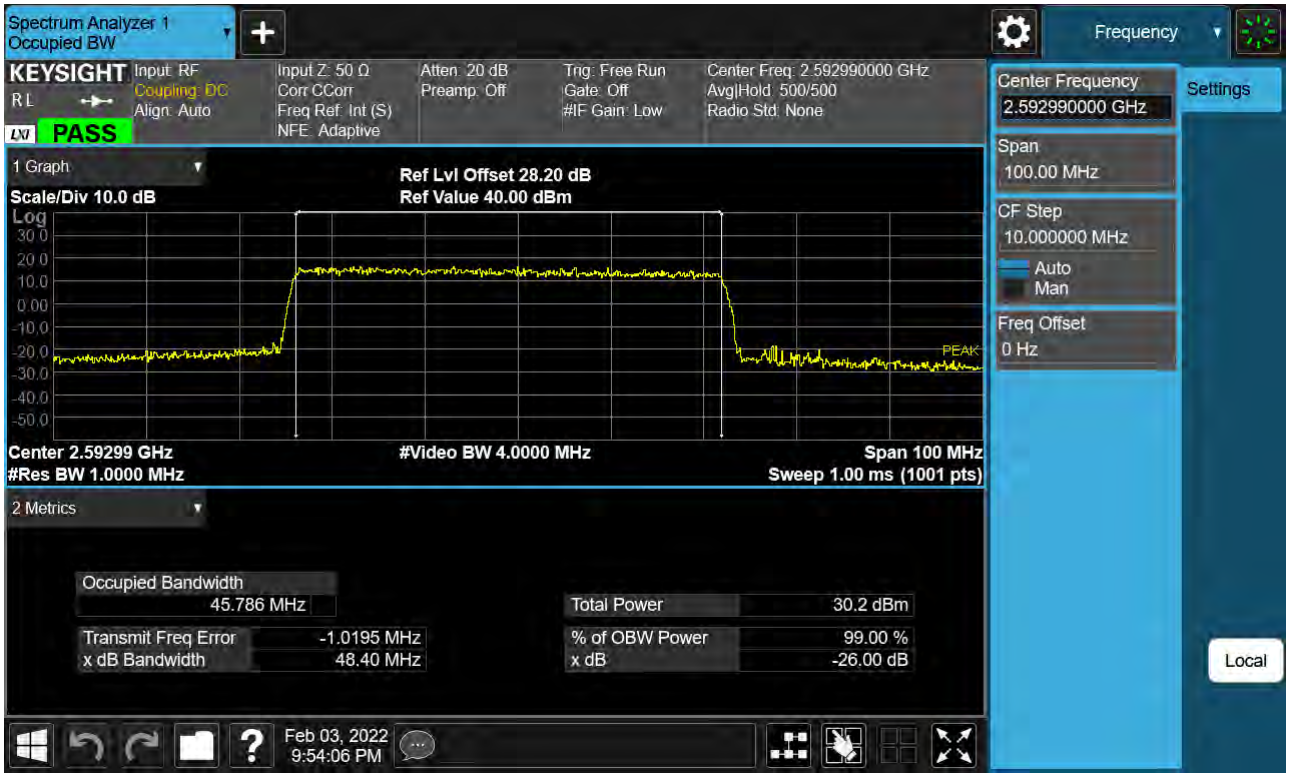


Sub6 n41. Occupied Bandwidth Plot (40 MHz Ch.518598 256-QAM)



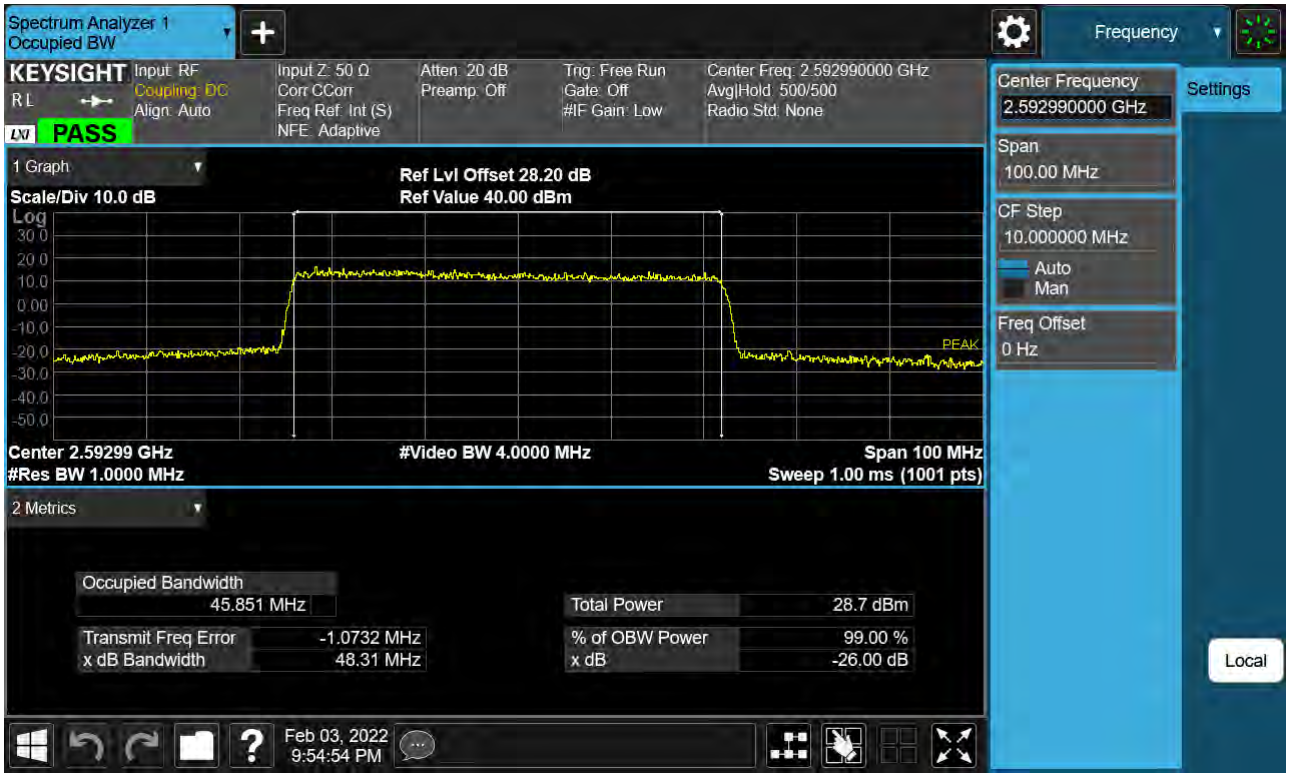
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 BPSK)

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

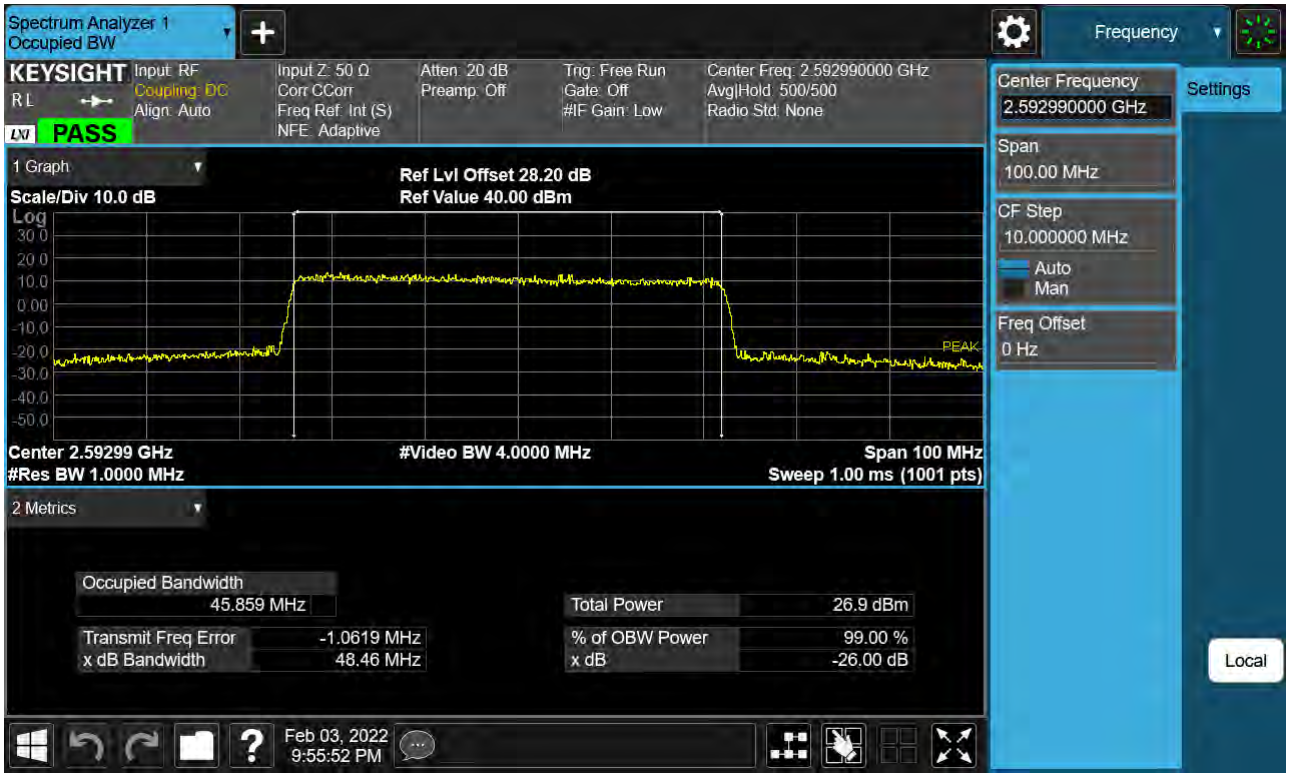


Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 16-QAM)

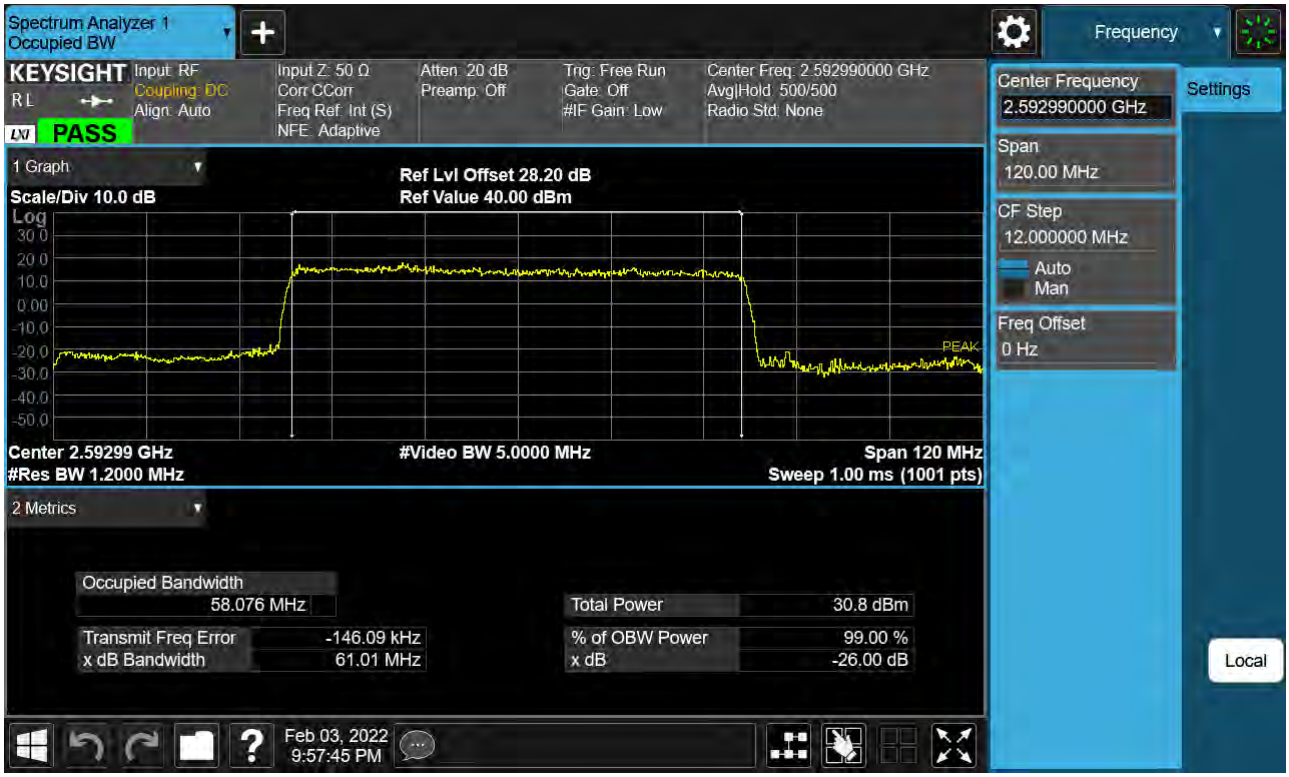
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 64-QAM)



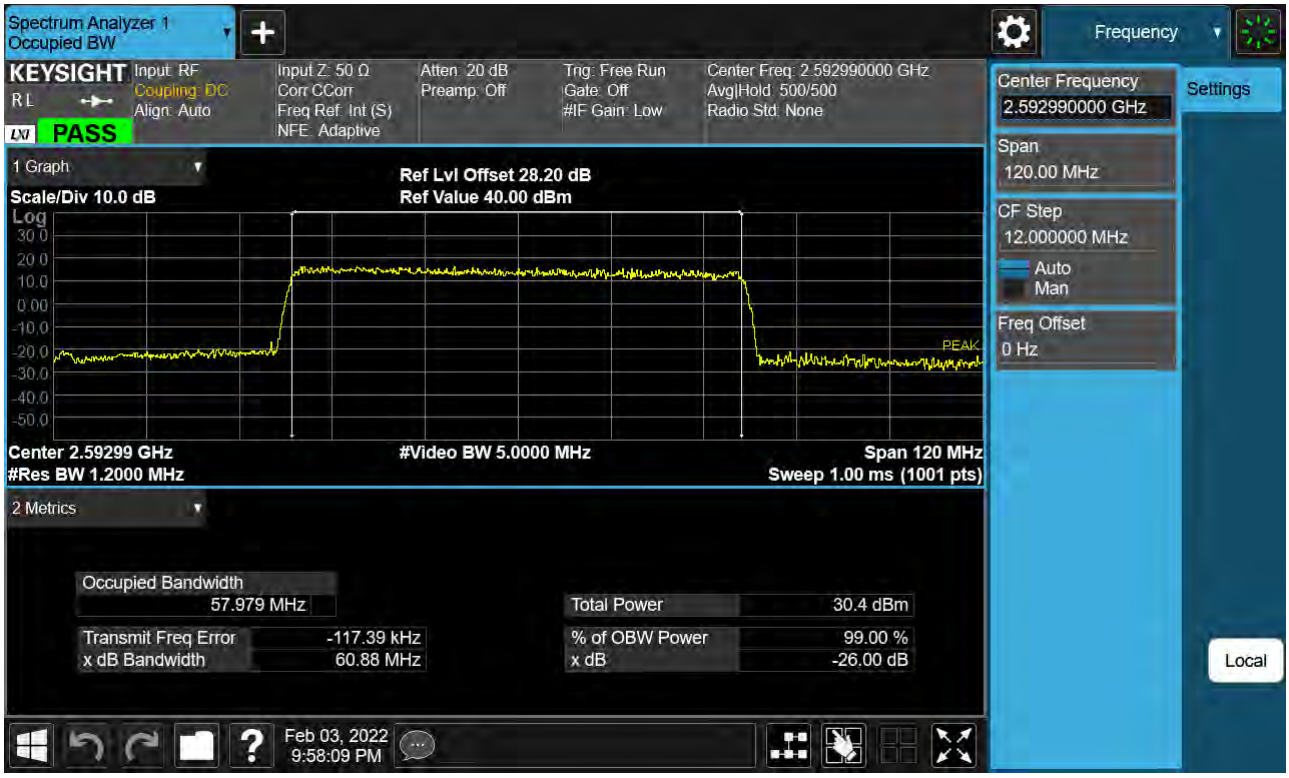
Sub6 n41. Occupied Bandwidth Plot (50 MHz Ch.518598 256-QAM)



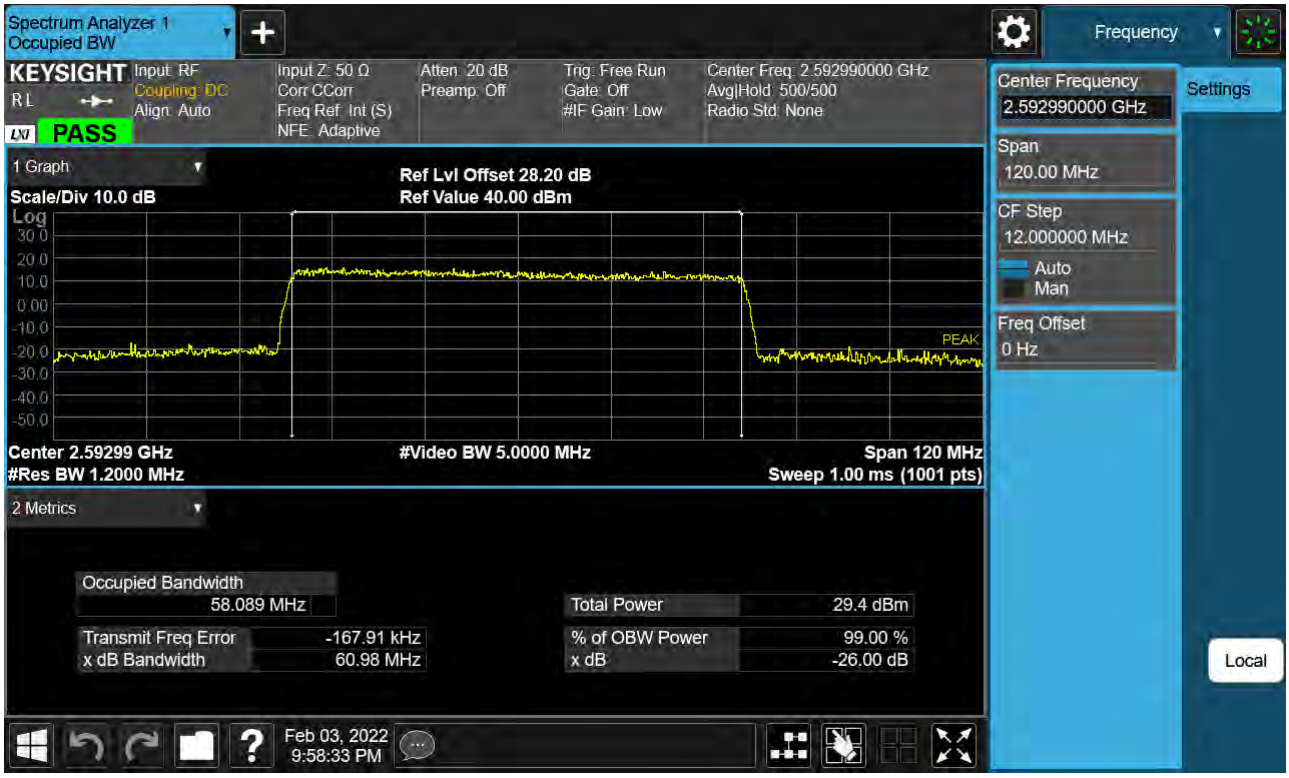
Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 BPSK)



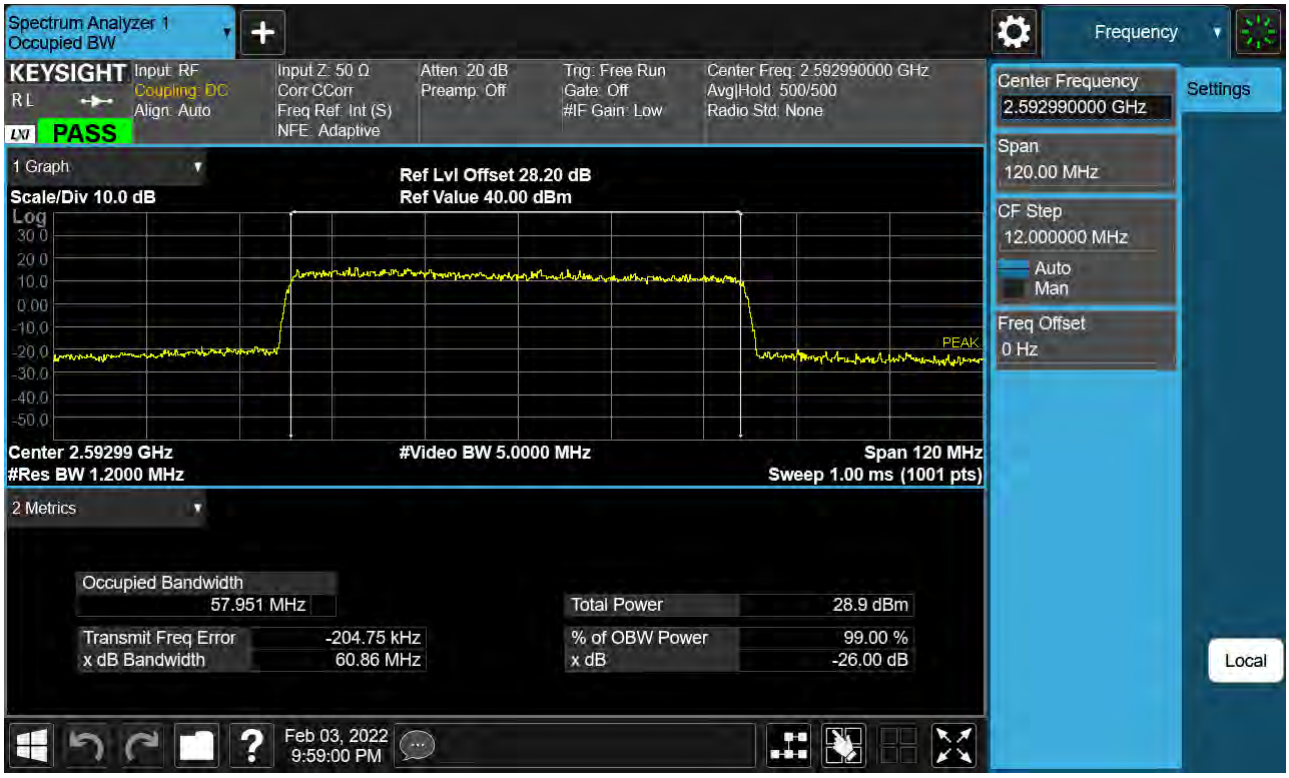
Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 QPSK)



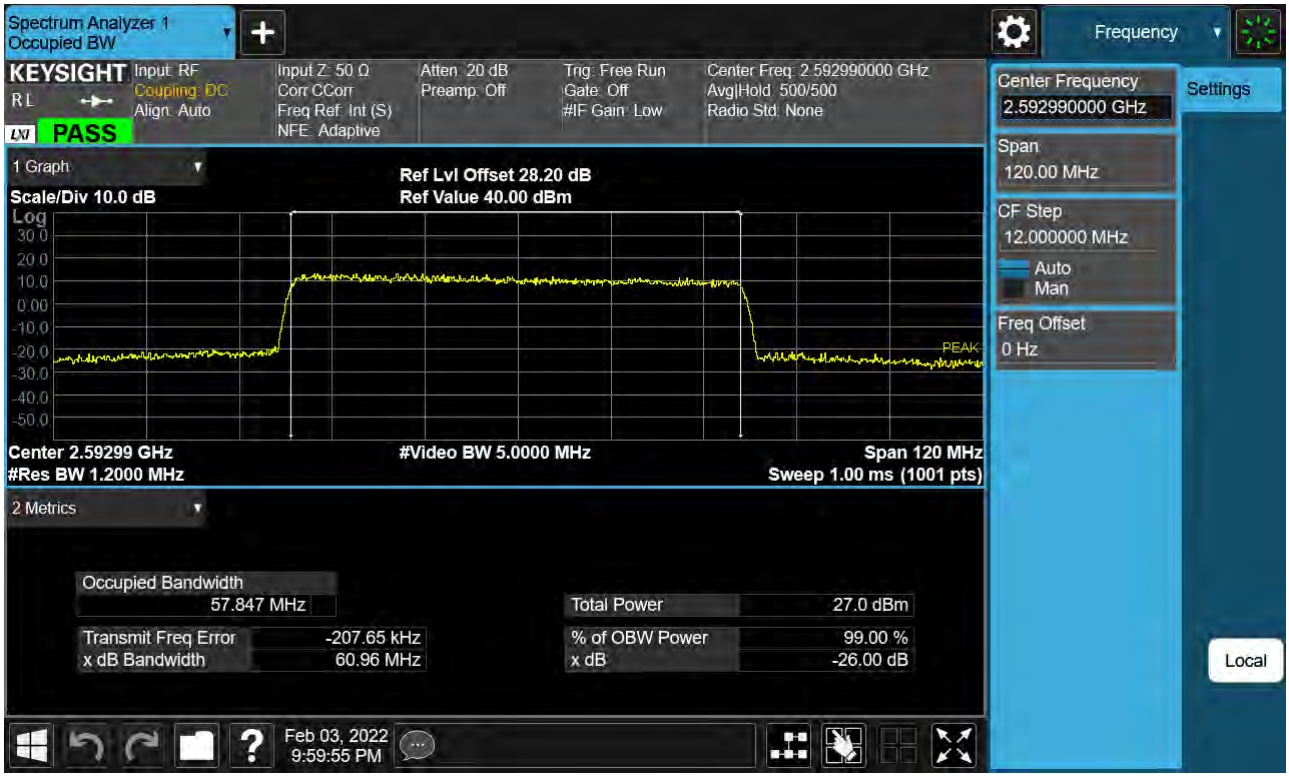
Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 16-QAM)



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

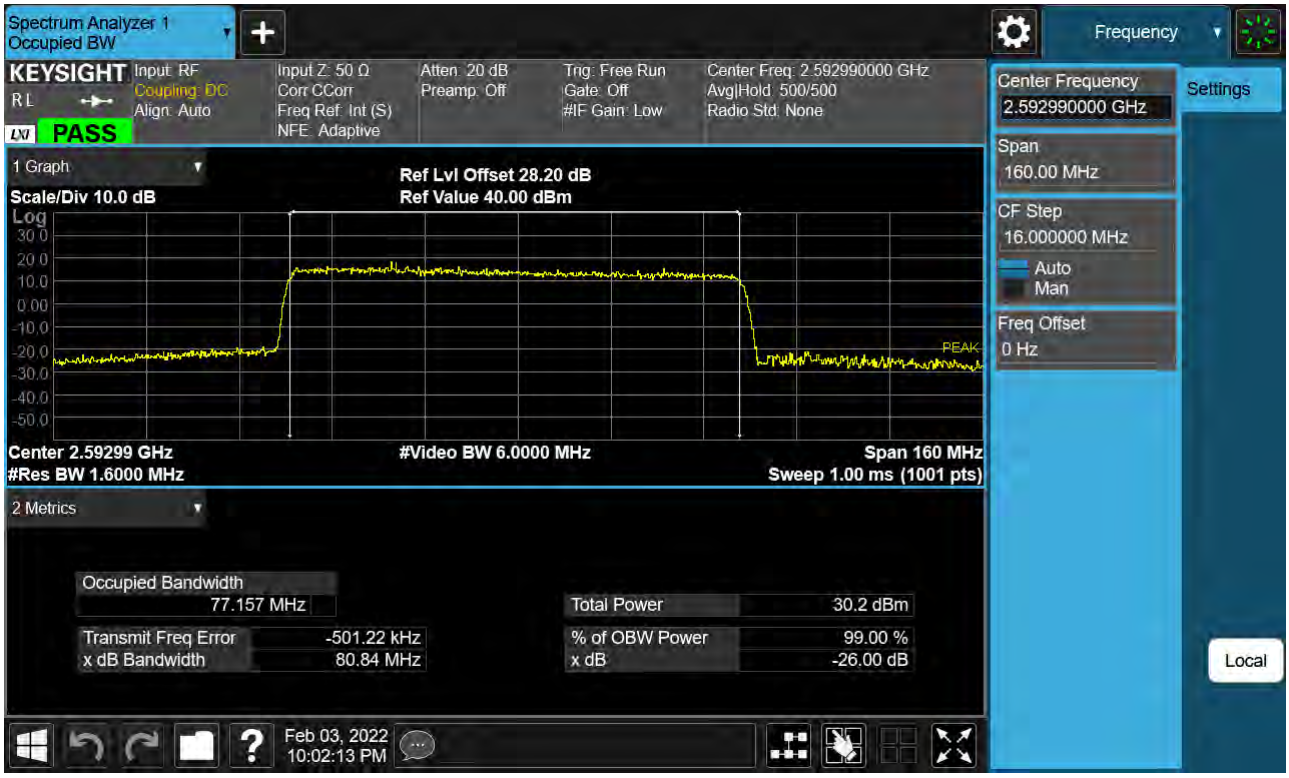


Sub6 n41. Occupied Bandwidth Plot (60 MHz Ch.518598 256-QAM)

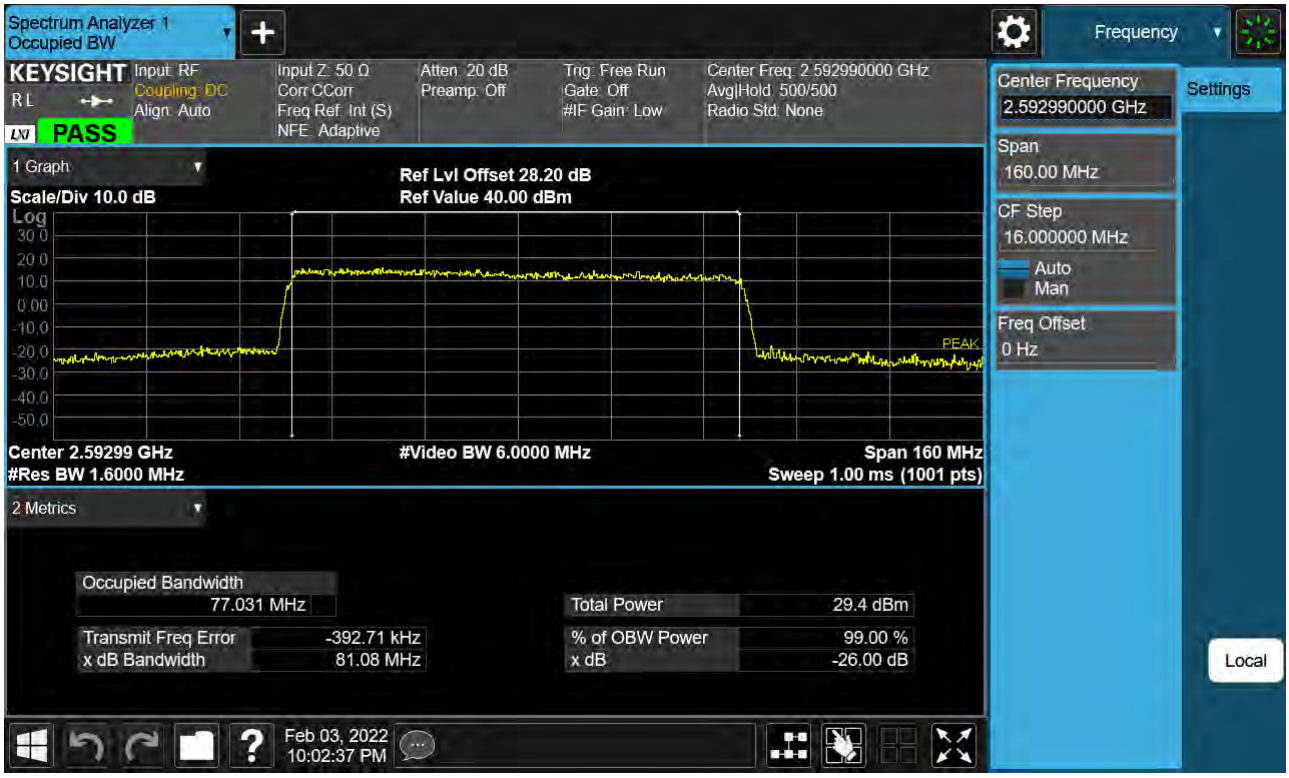


Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 BPSK)

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

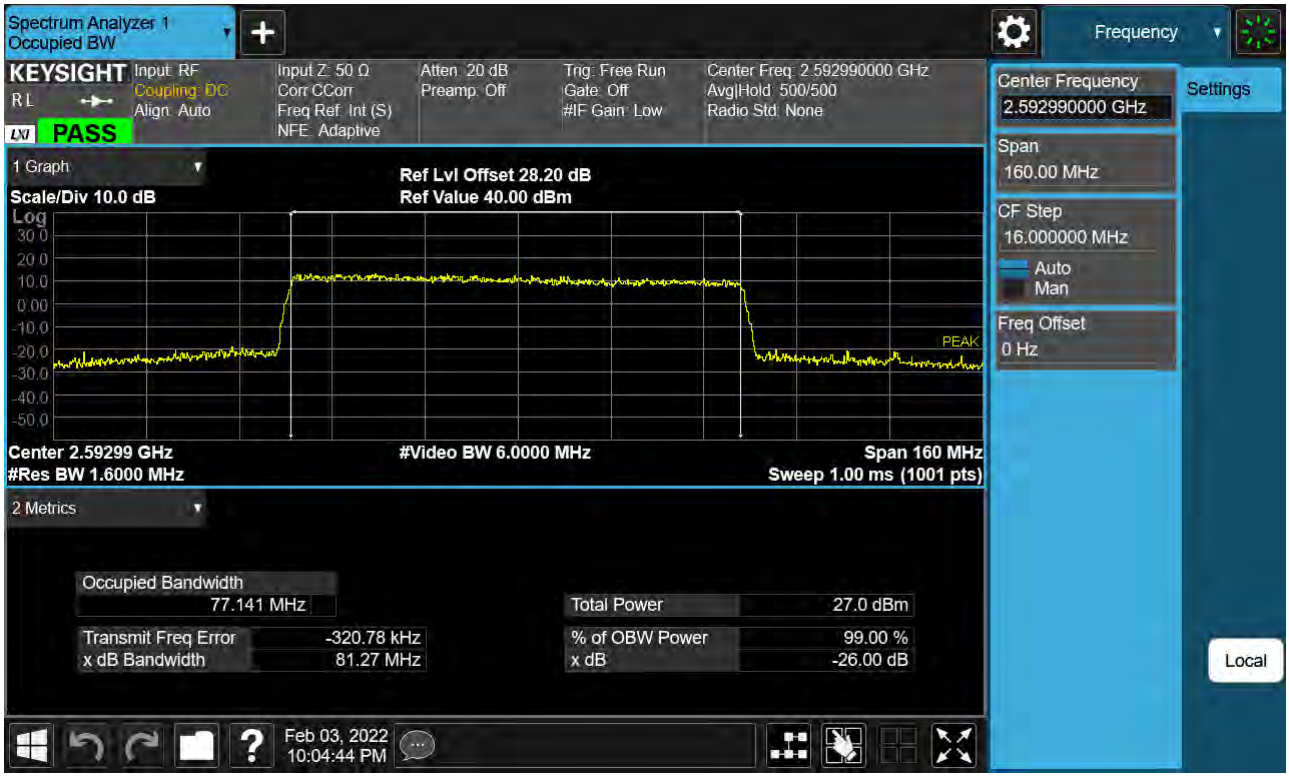


Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 16-QAM)

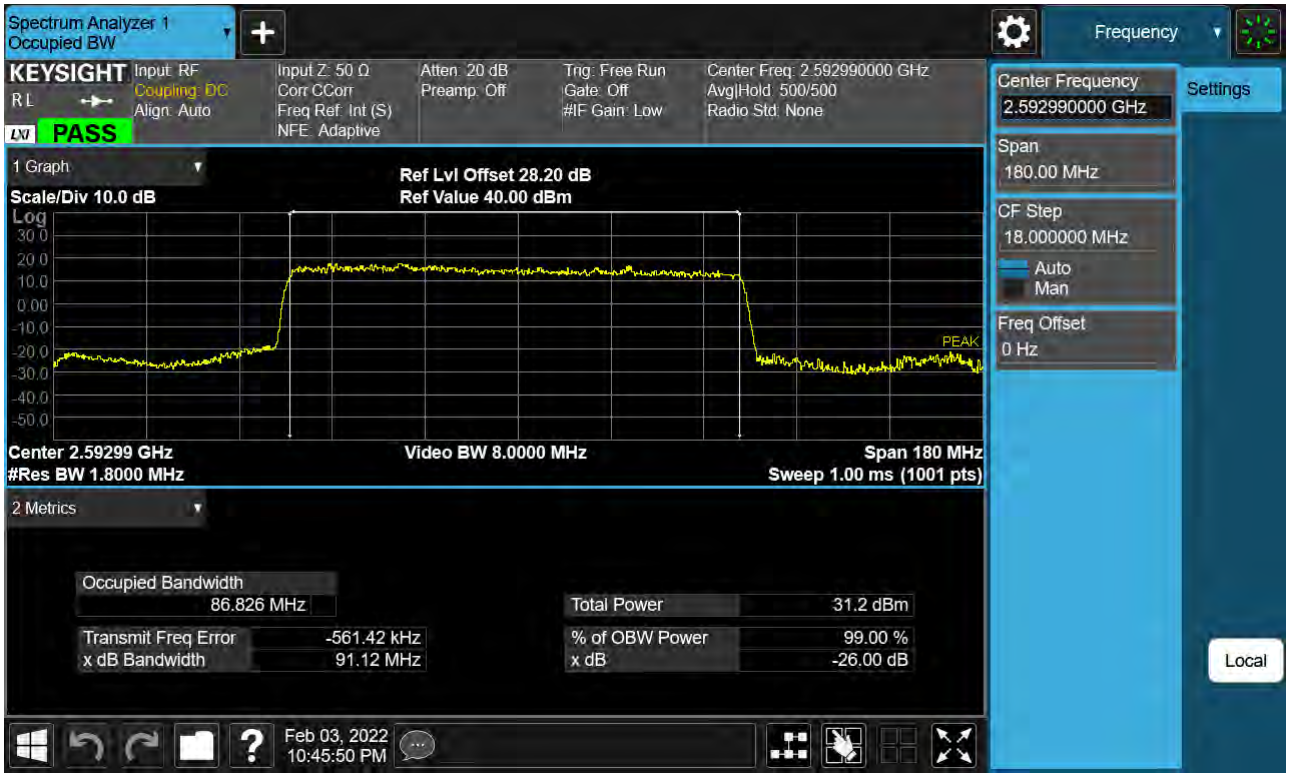


Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 64-QAM)

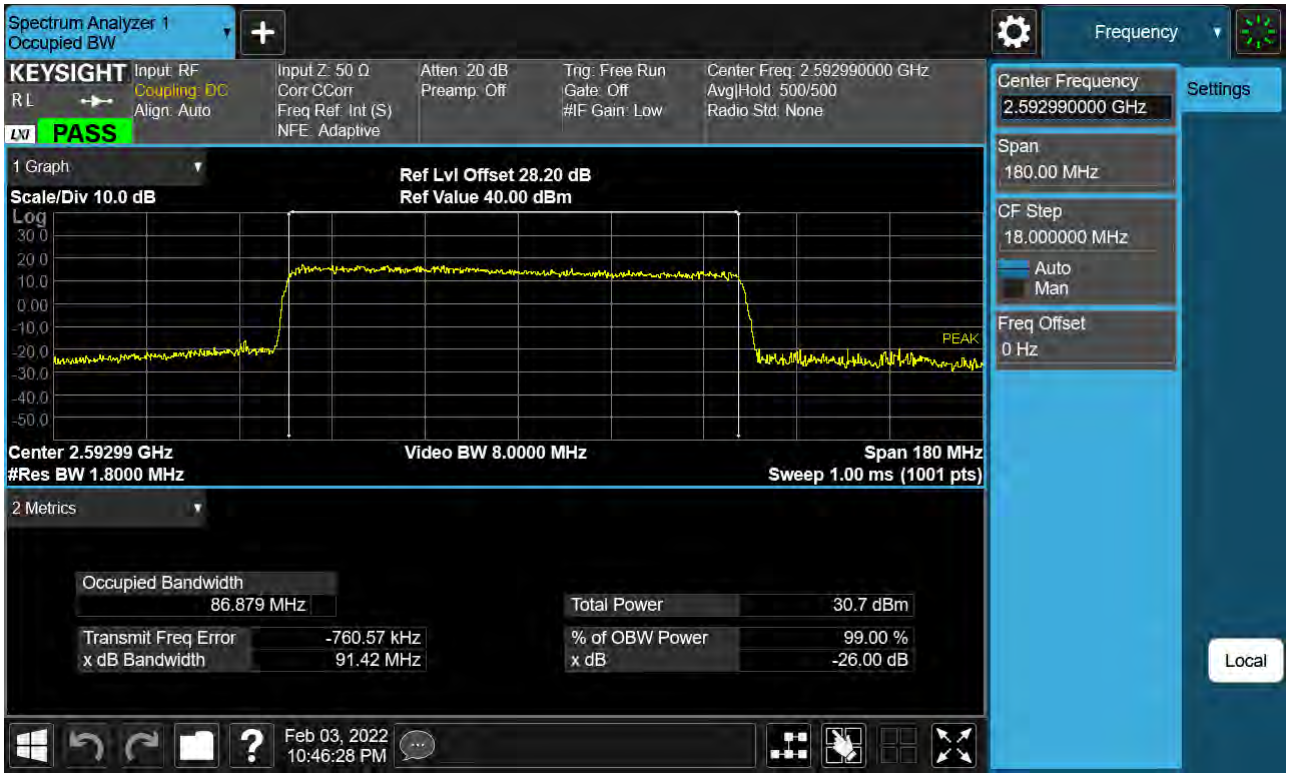
Sub6 n41. Occupied Bandwidth Plot (80 MHz Ch.518598 256-QAM)



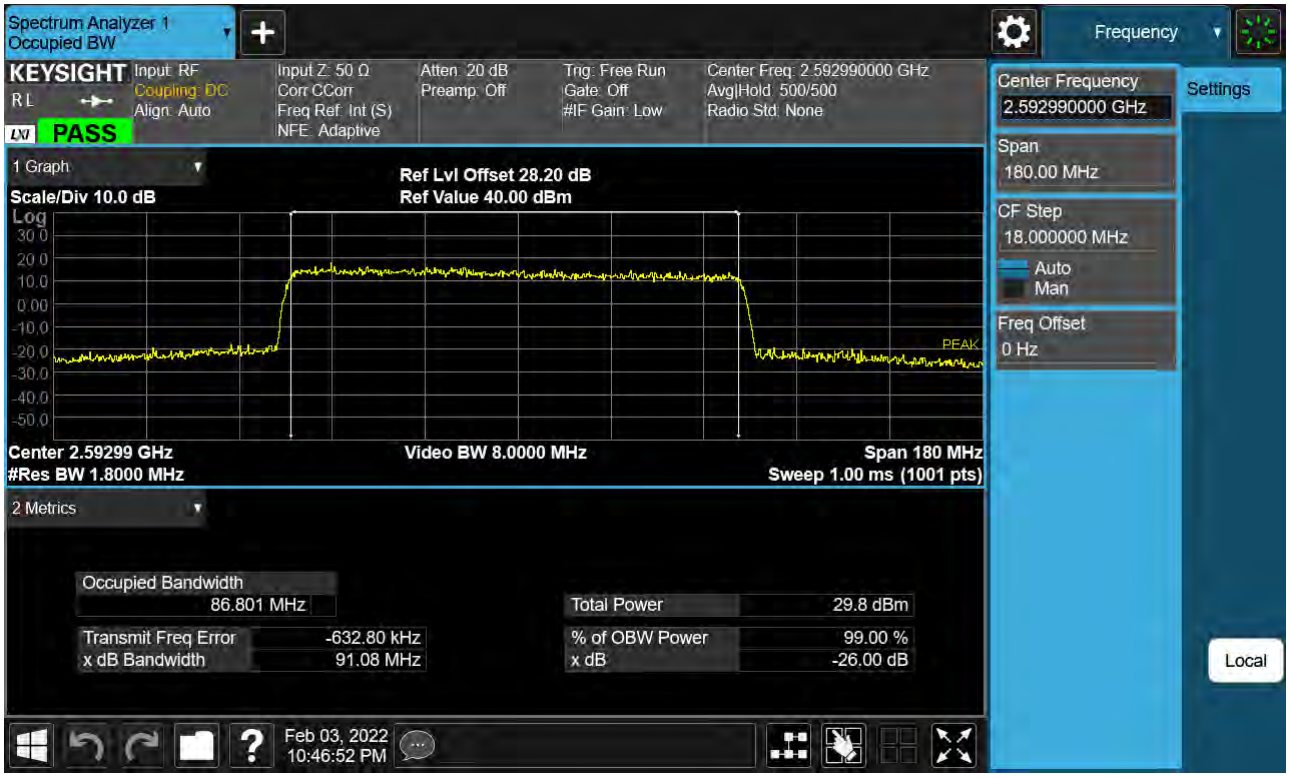
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 BPSK)



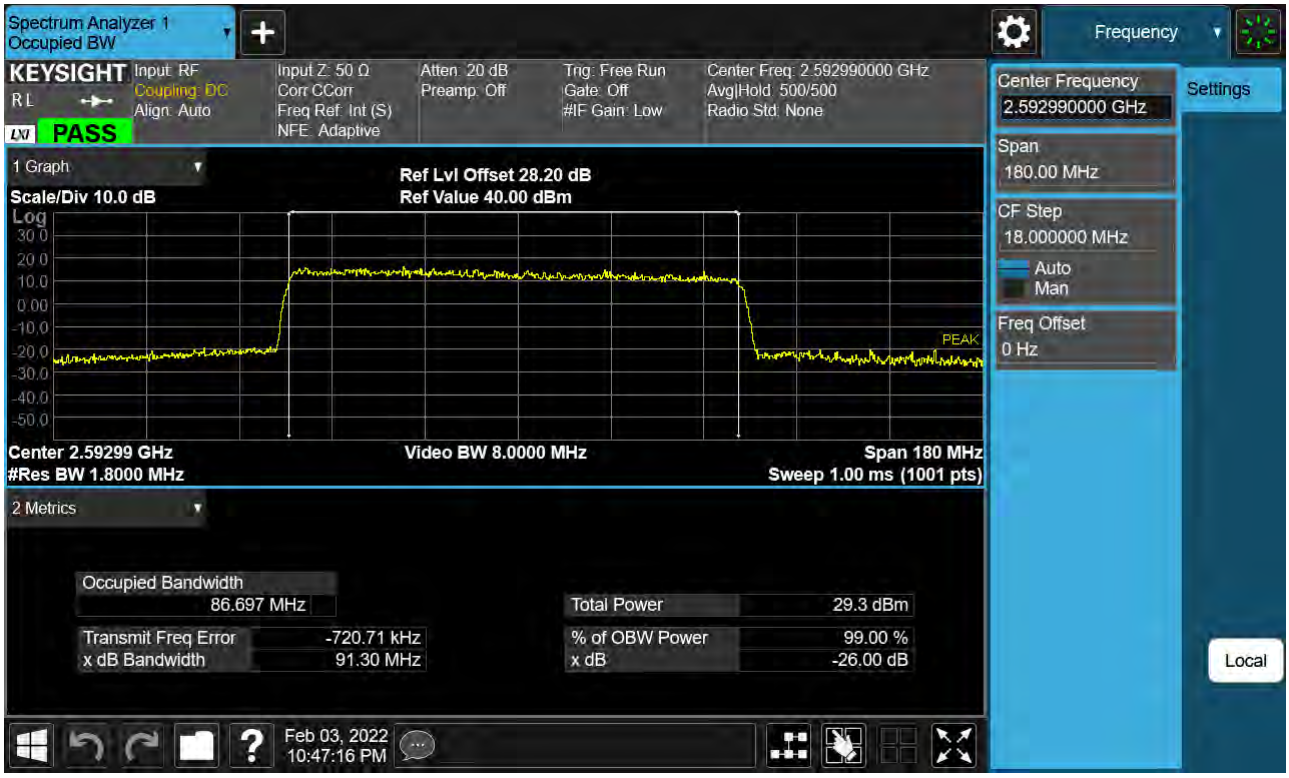
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 QPSK)



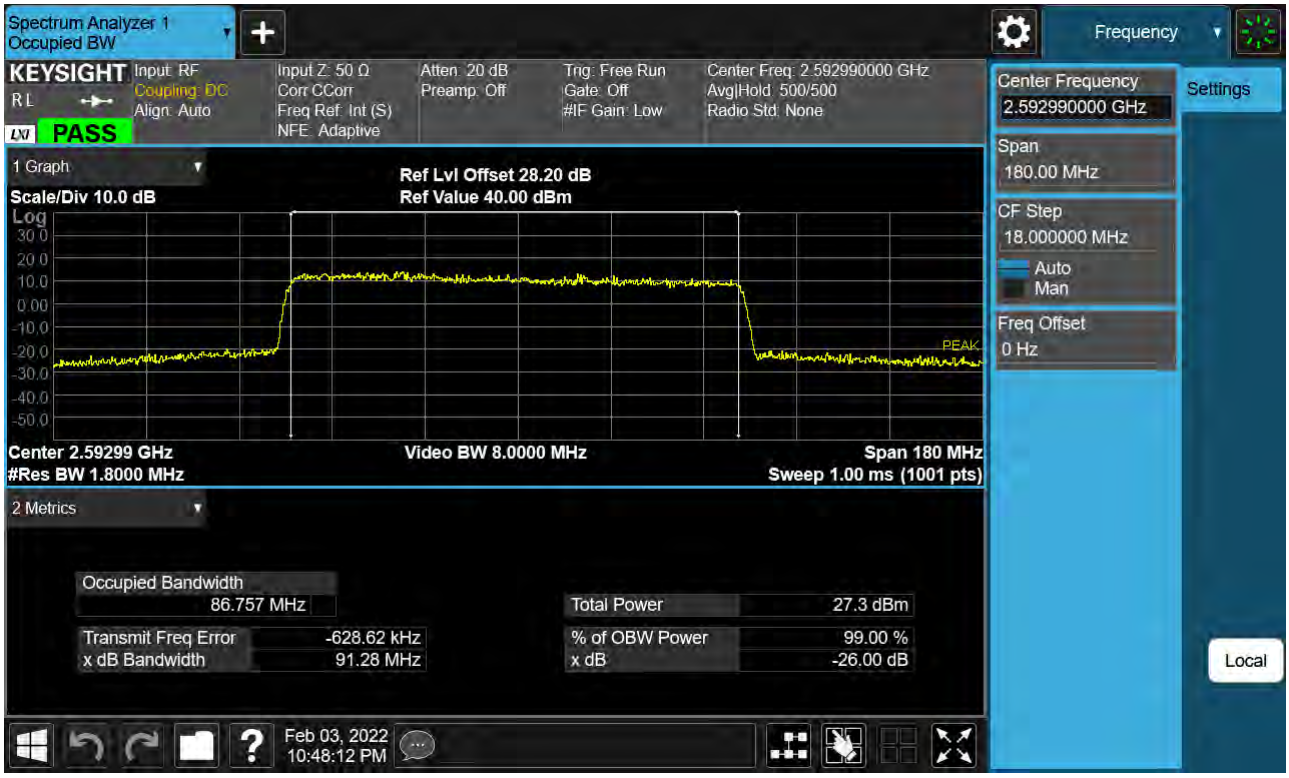
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 16-QAM)



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



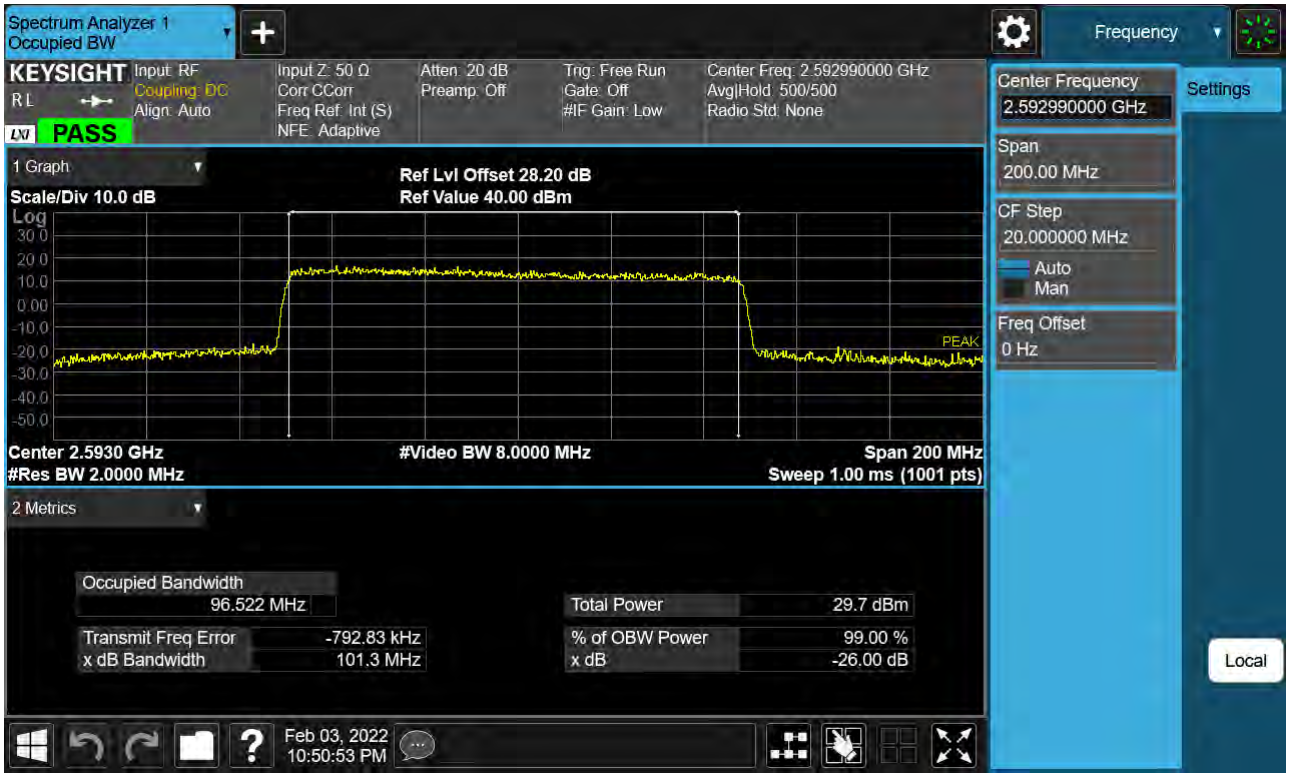
Sub6 n41. Occupied Bandwidth Plot (90 MHz Ch.518598 256-QAM)



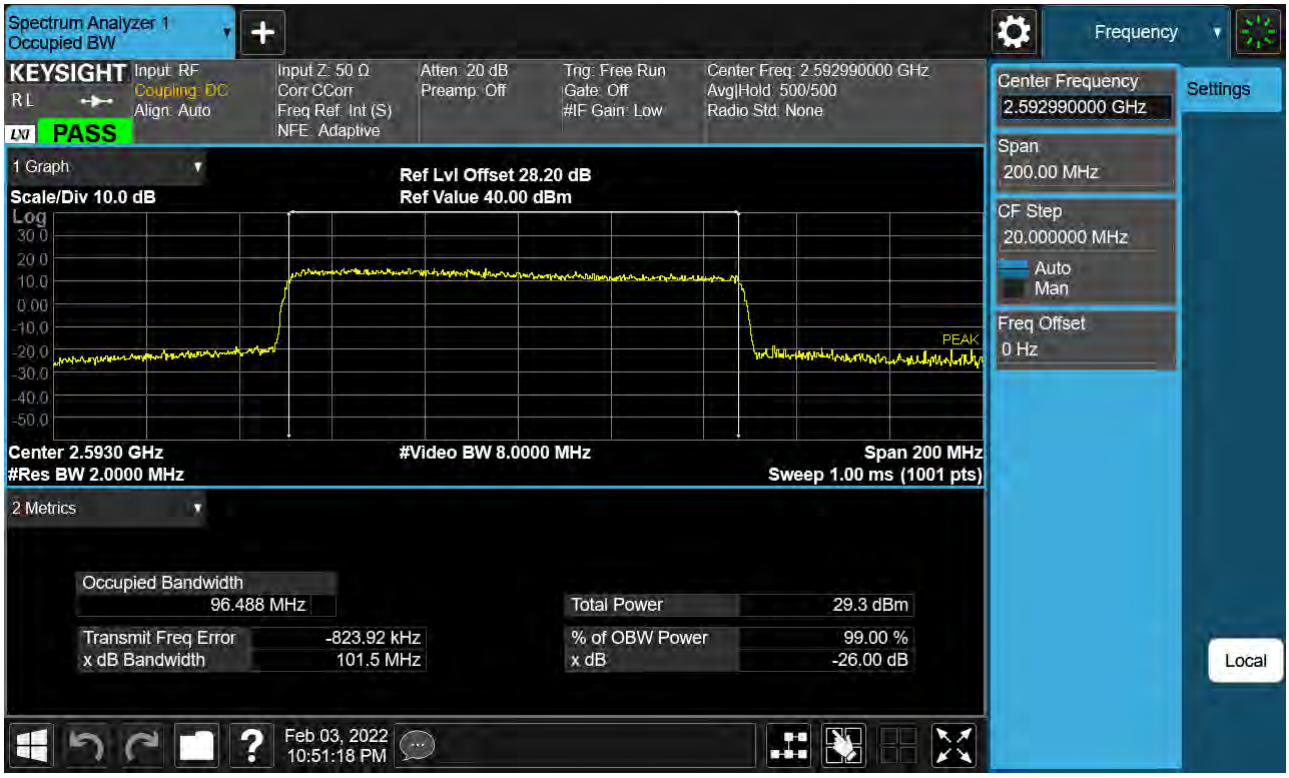
Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 BPSK)

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

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

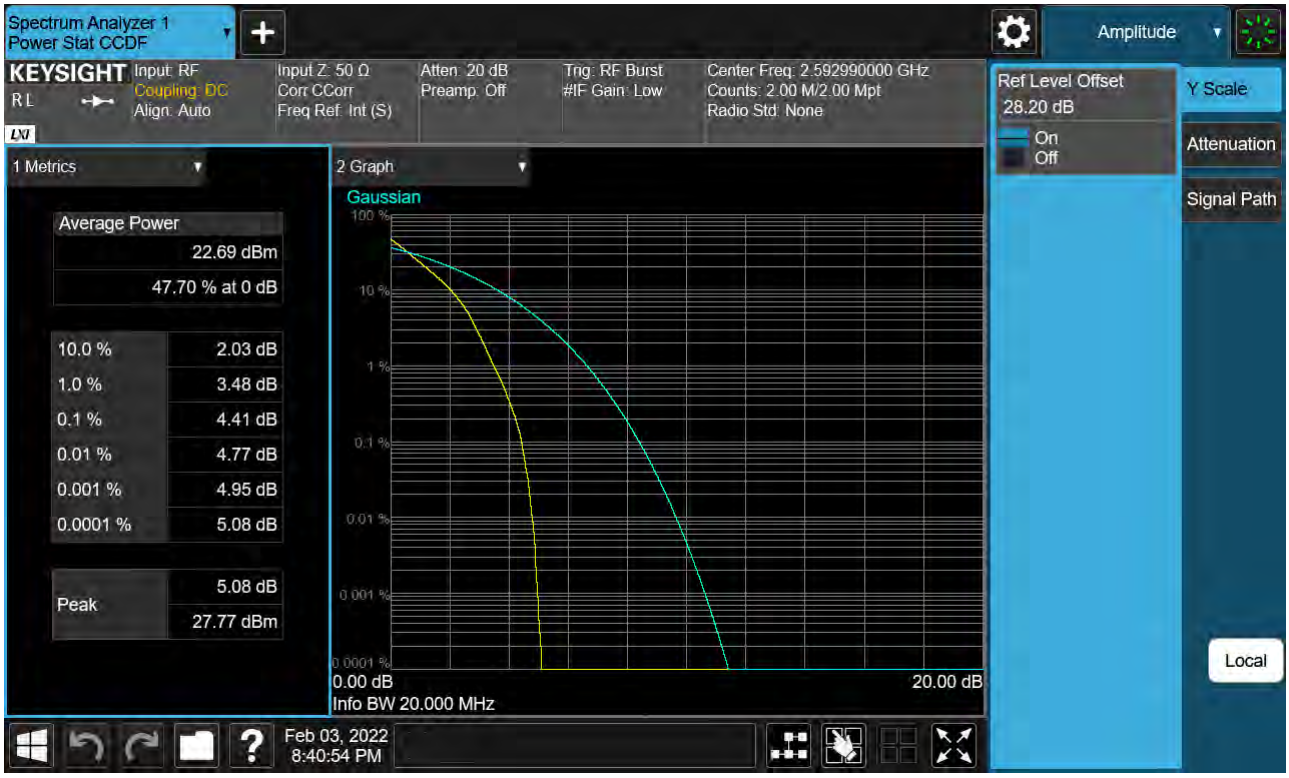


Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 64-QAM)

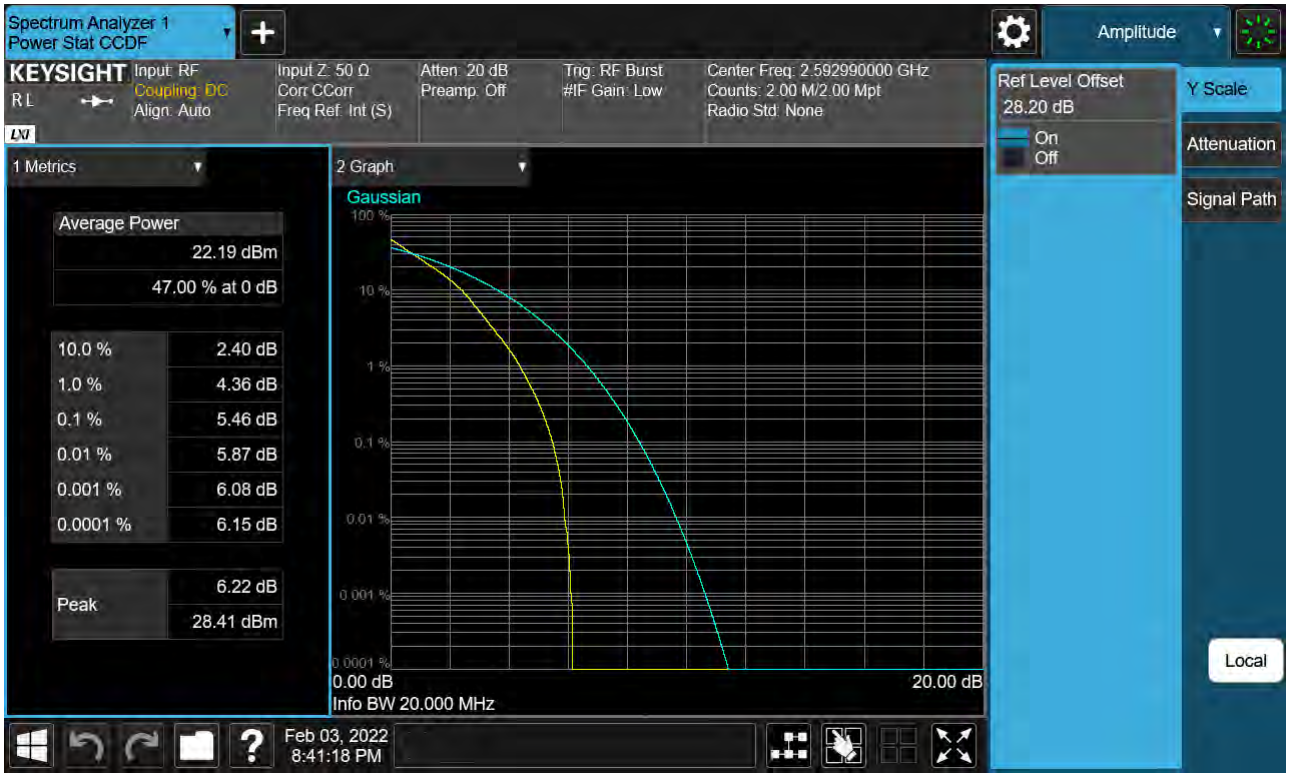


Sub6 n41. Occupied Bandwidth Plot (100 MHz Ch.518598 256-QAM)

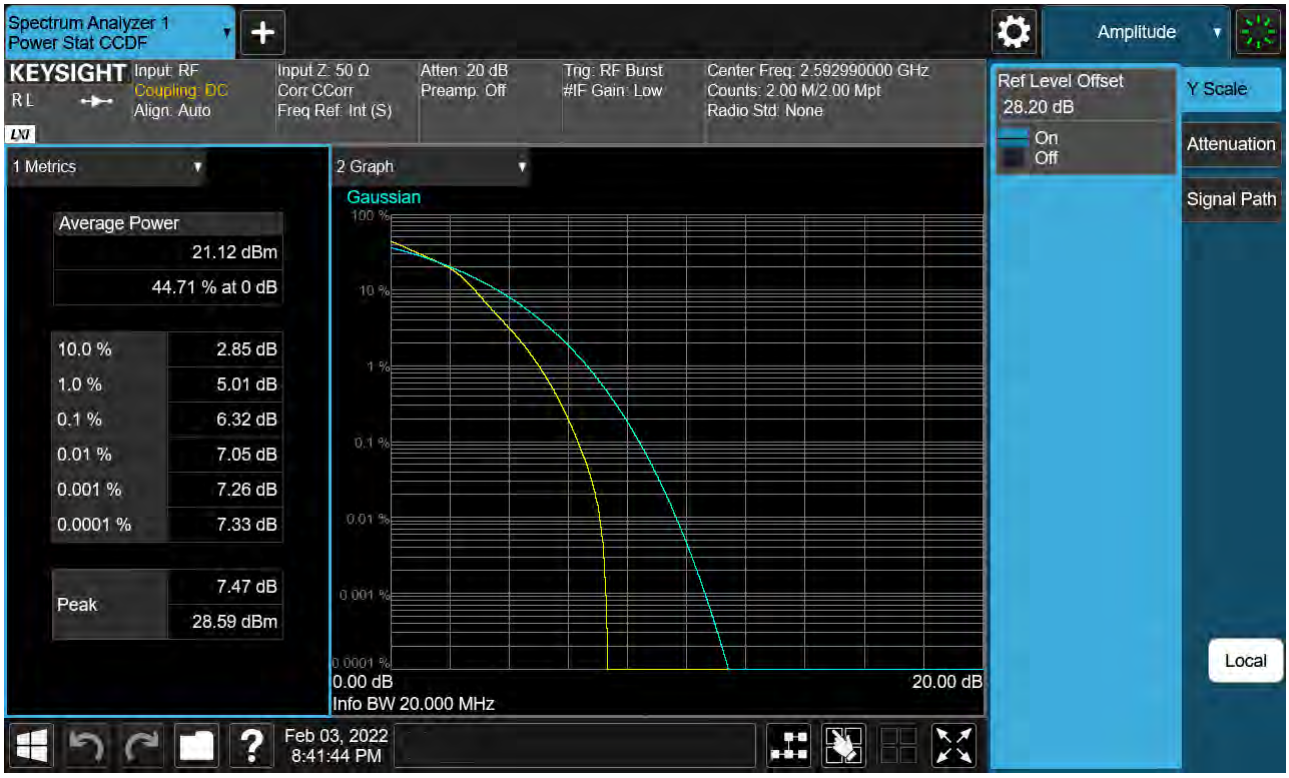
Sub6 n41. PAR Plot (20 M BW_Ch.518598_BPSK)



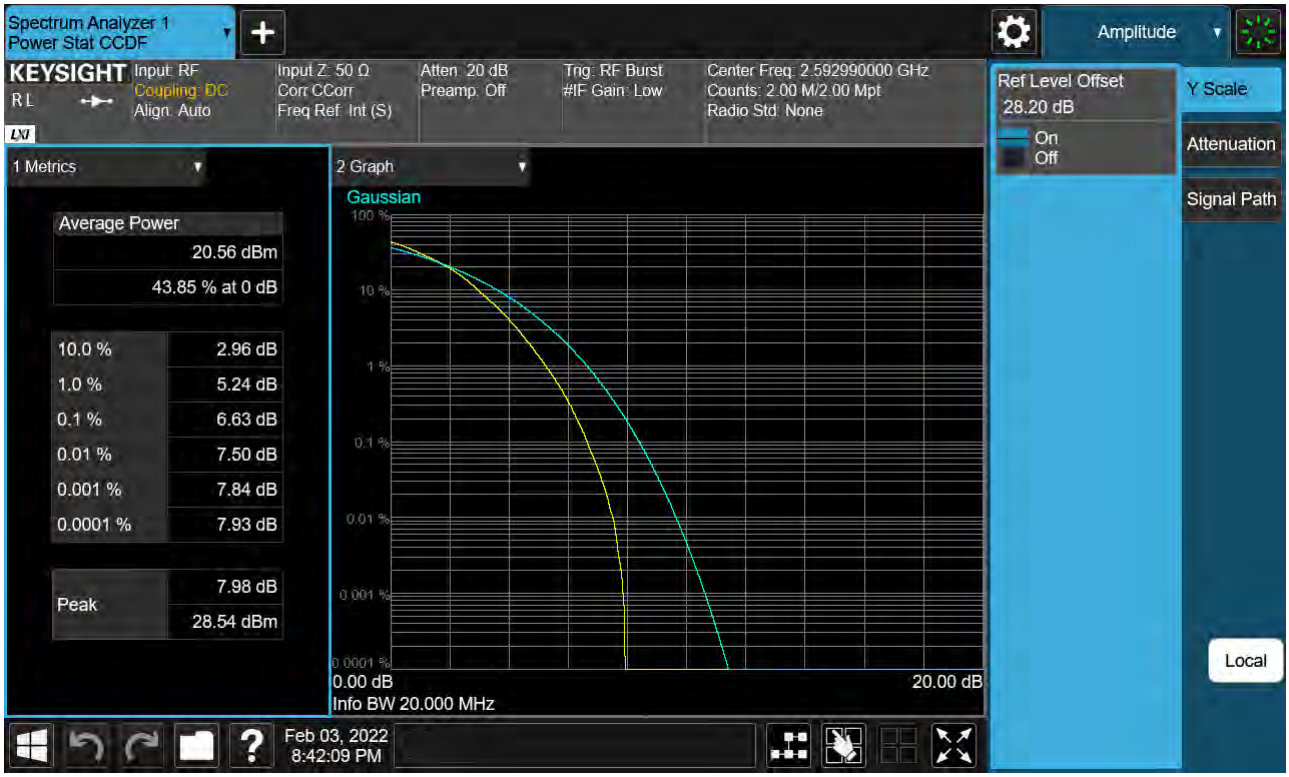
Sub6 n41. PAR Plot (20 M BW_Ch.518598_QPSK)



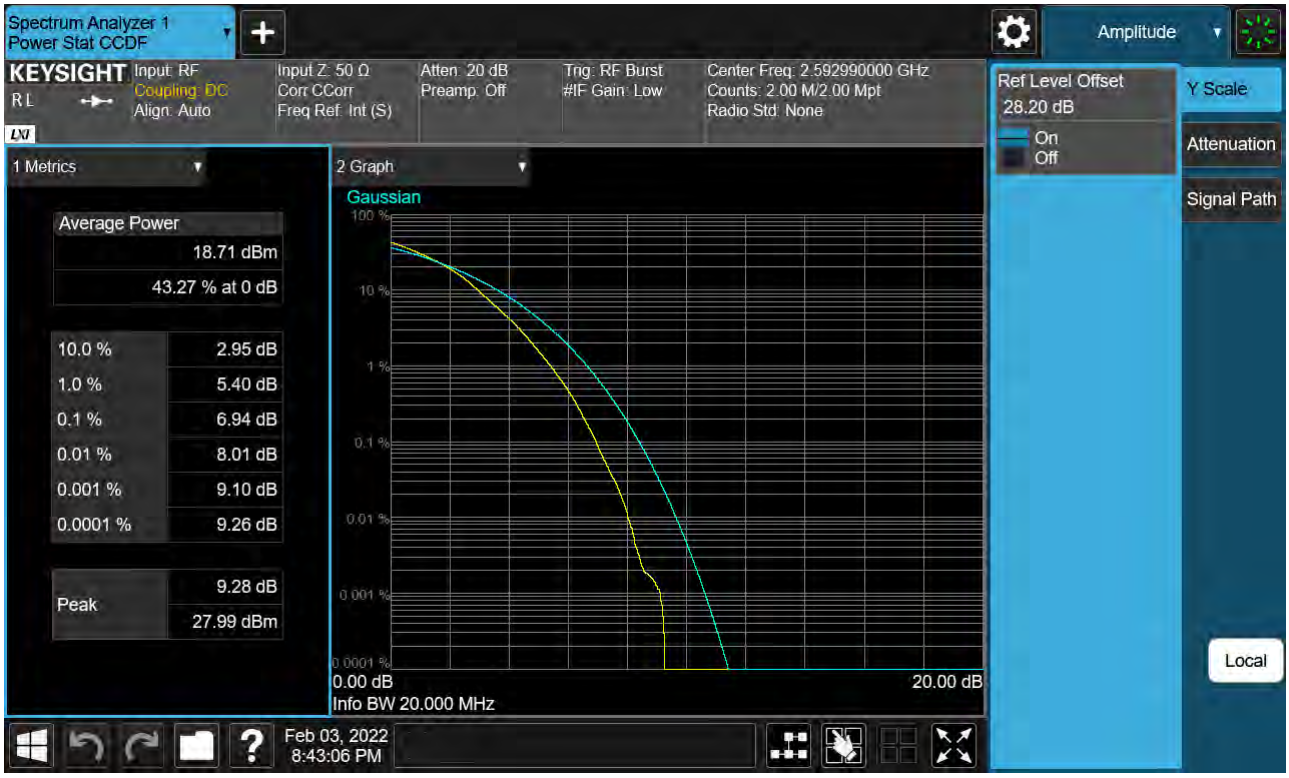
Sub6 n41. PAR Plot (20 M BW_Ch.518598_16QAM)



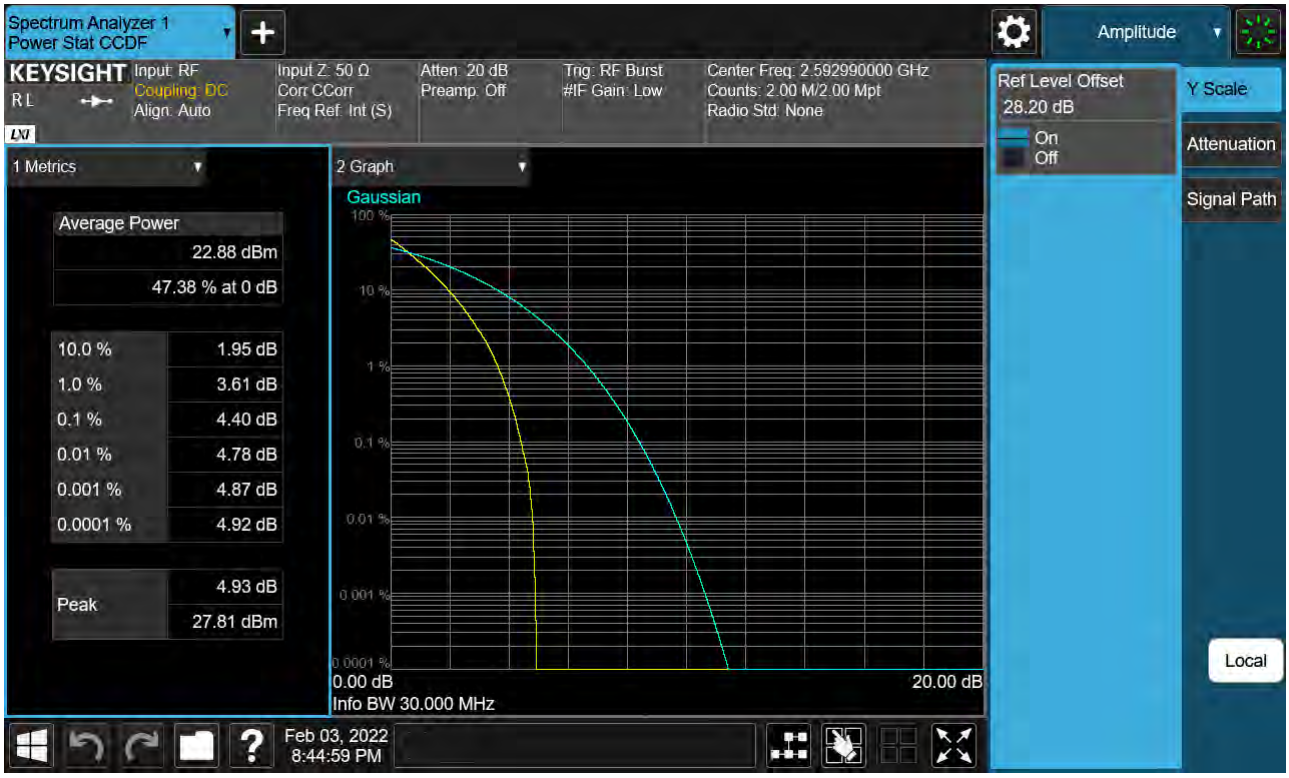
Sub6 n41. PAR Plot (20 M BW_Ch.518598_64QAM)



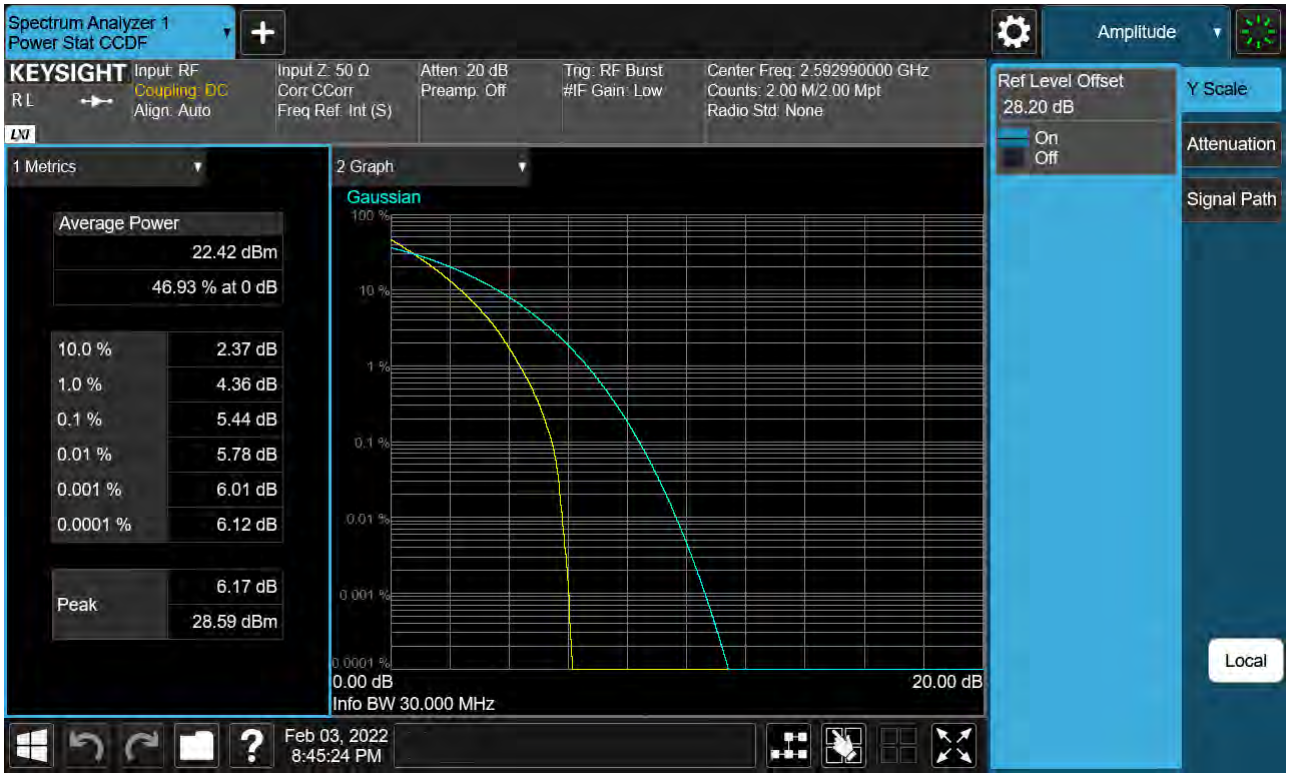
Sub6 n41. PAR Plot (20 M BW_Ch.518598_256QAM)



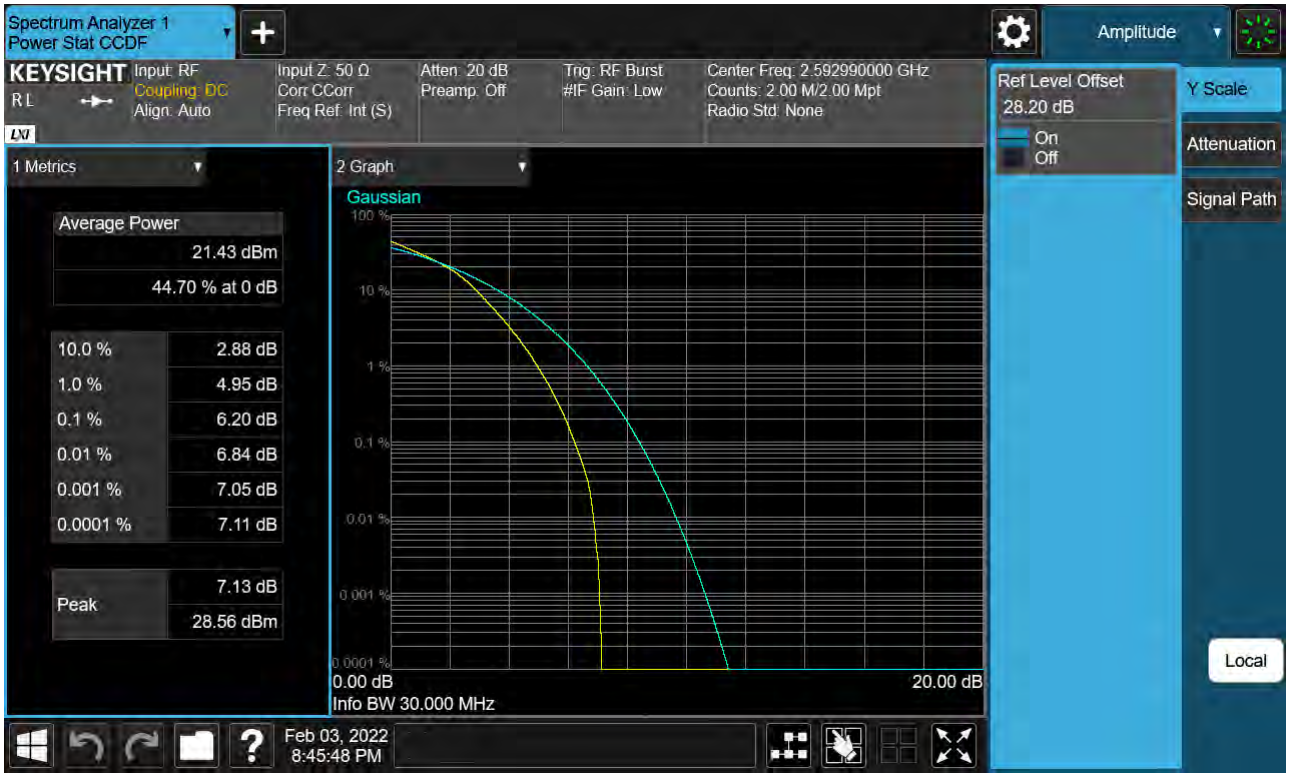
Sub6 n41. PAR Plot (30 M BW_Ch.518598_BPSK)



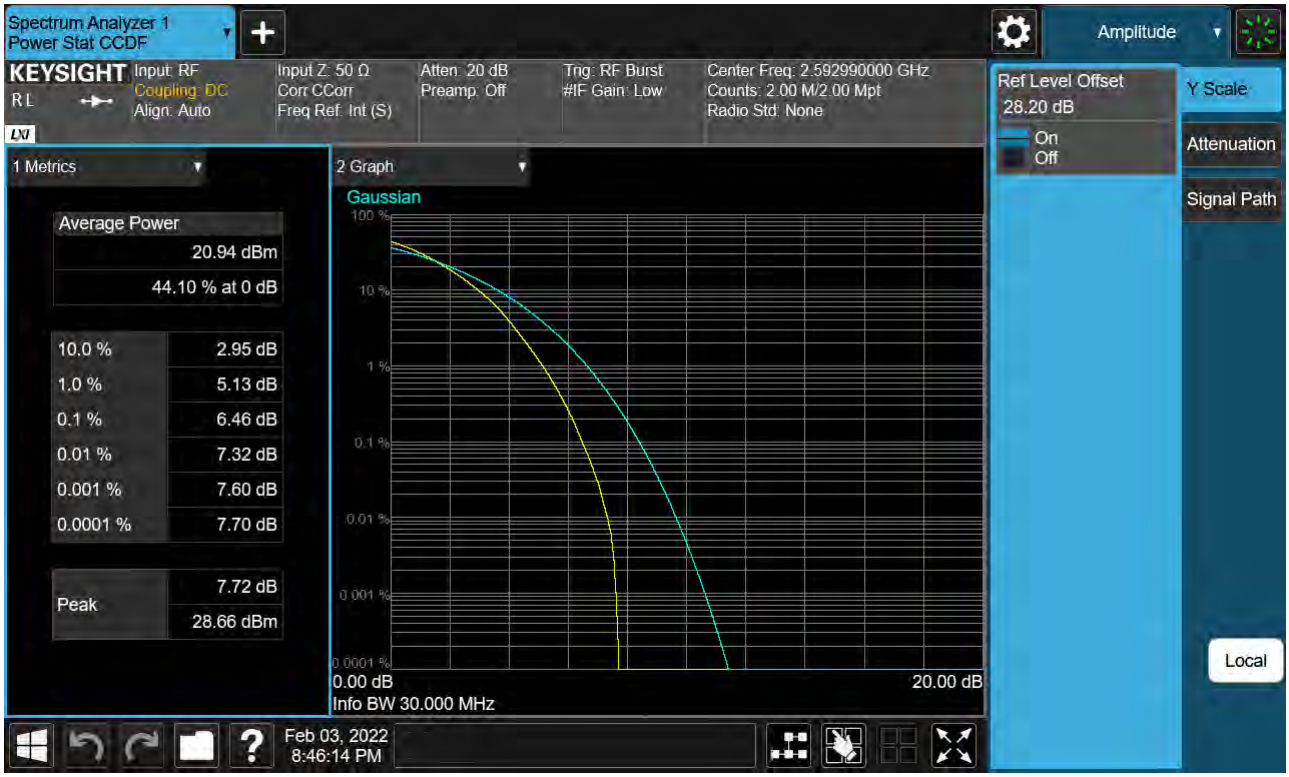
Sub6 n41. PAR Plot (30 M BW_Ch.518598_QPSK)



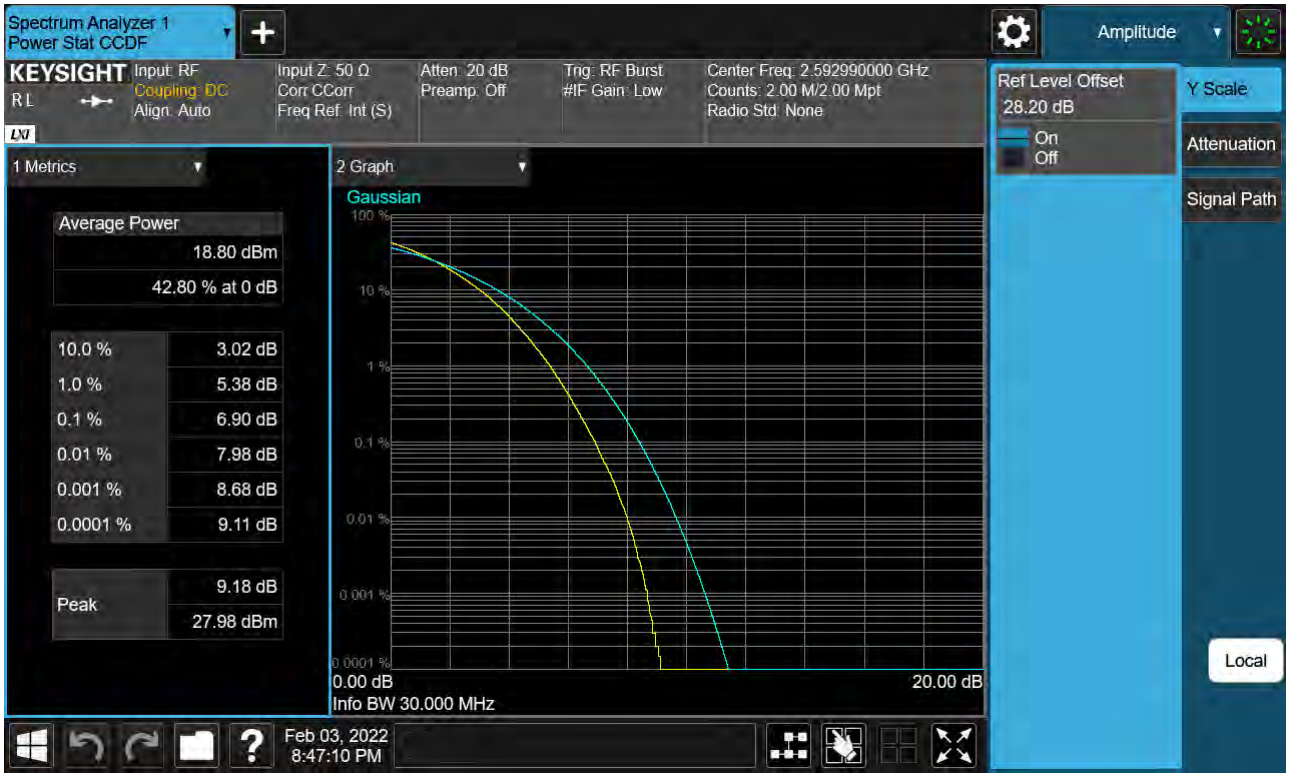
Sub6 n41. PAR Plot (30 M BW_Ch.518598_16QAM)



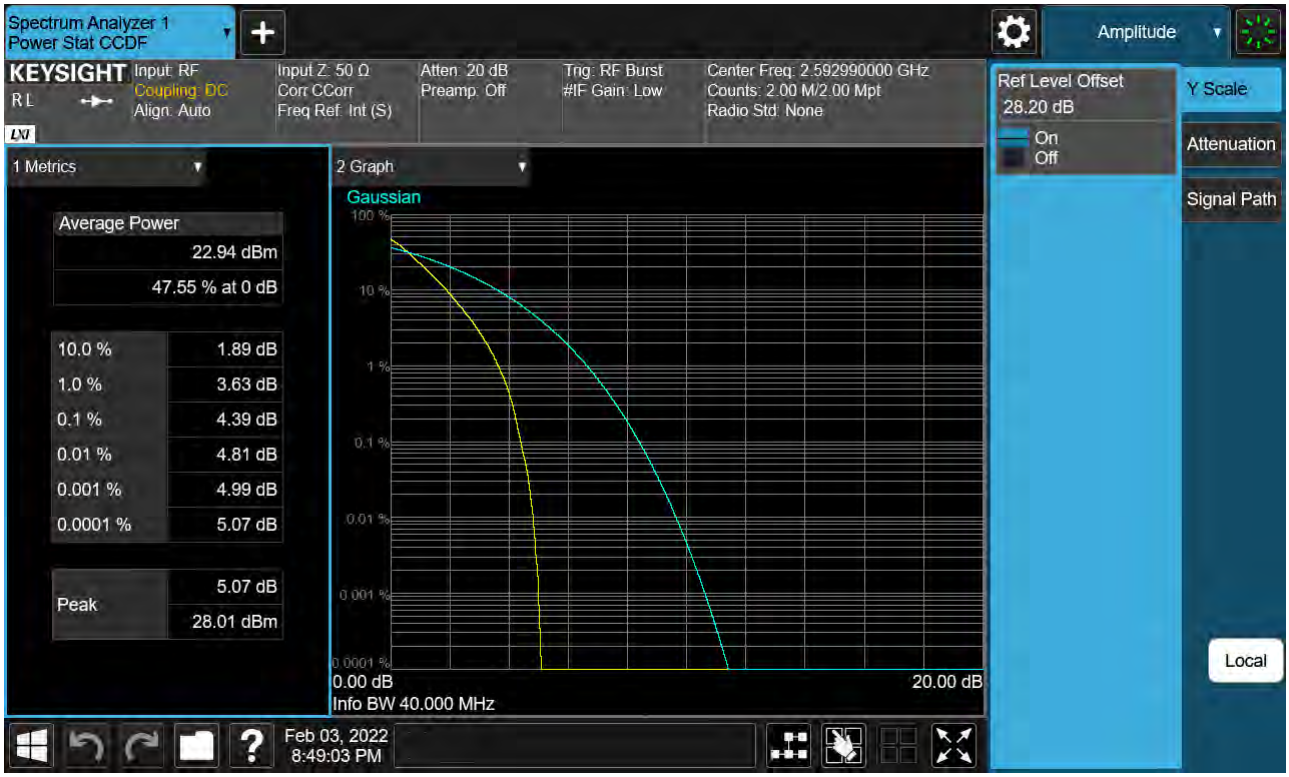
Sub6 n41. PAR Plot (30 M BW_Ch.518598_64QAM)



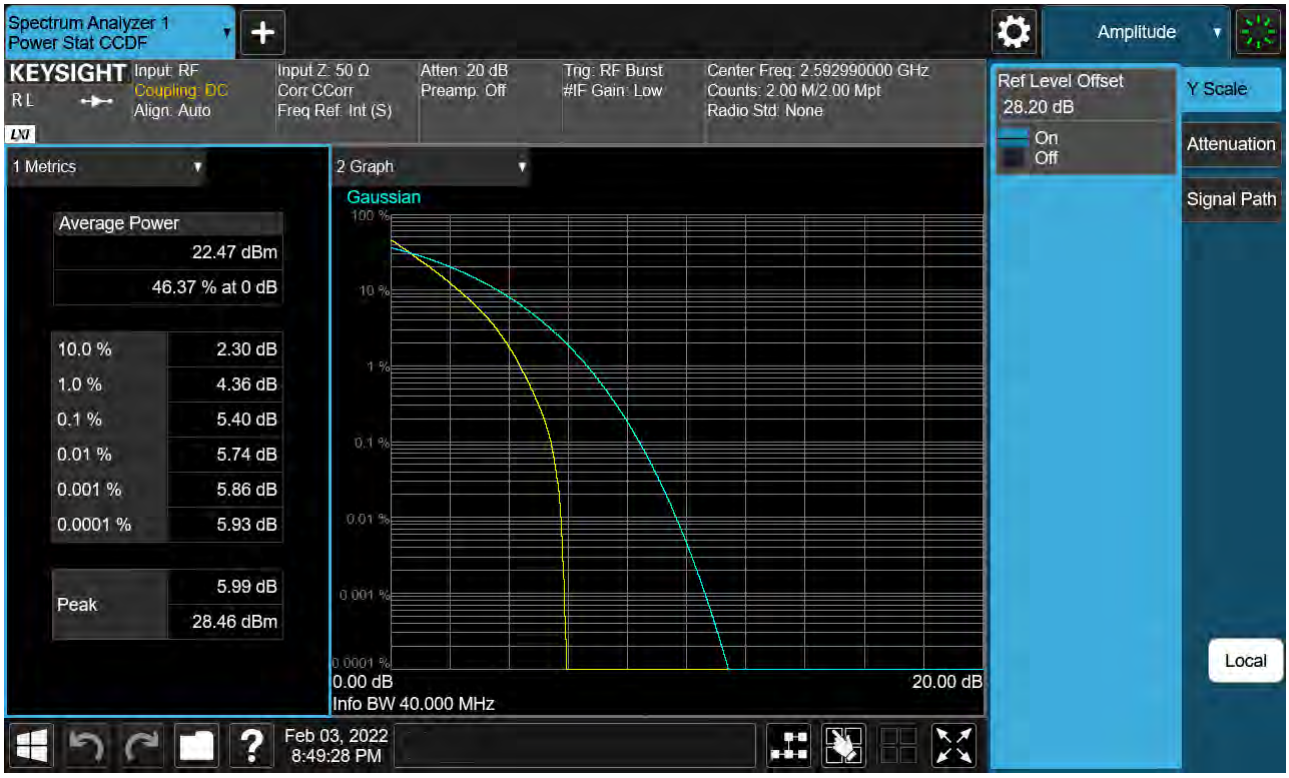
Sub6 n41. PAR Plot (30 M BW_Ch.518598_256QAM)



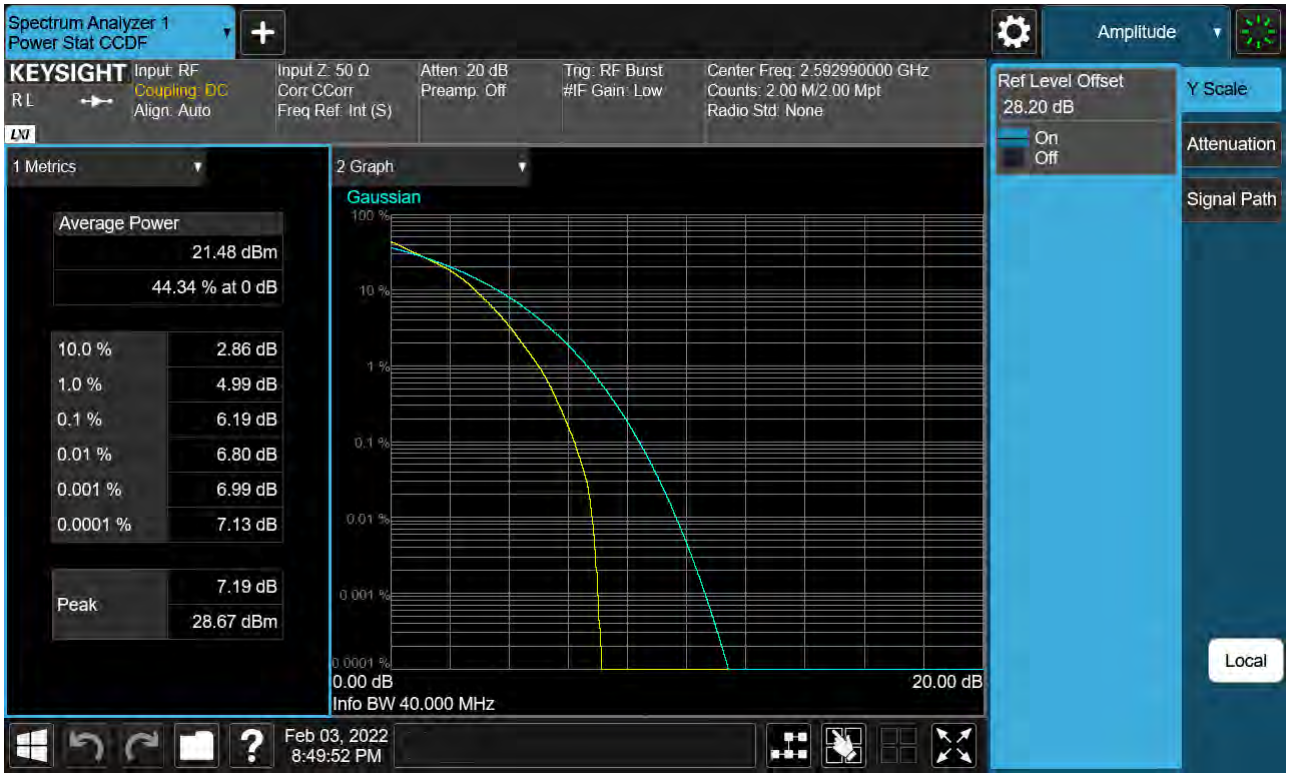
Sub6 n41. PAR Plot (40 M BW_Ch.518598_BPSK)



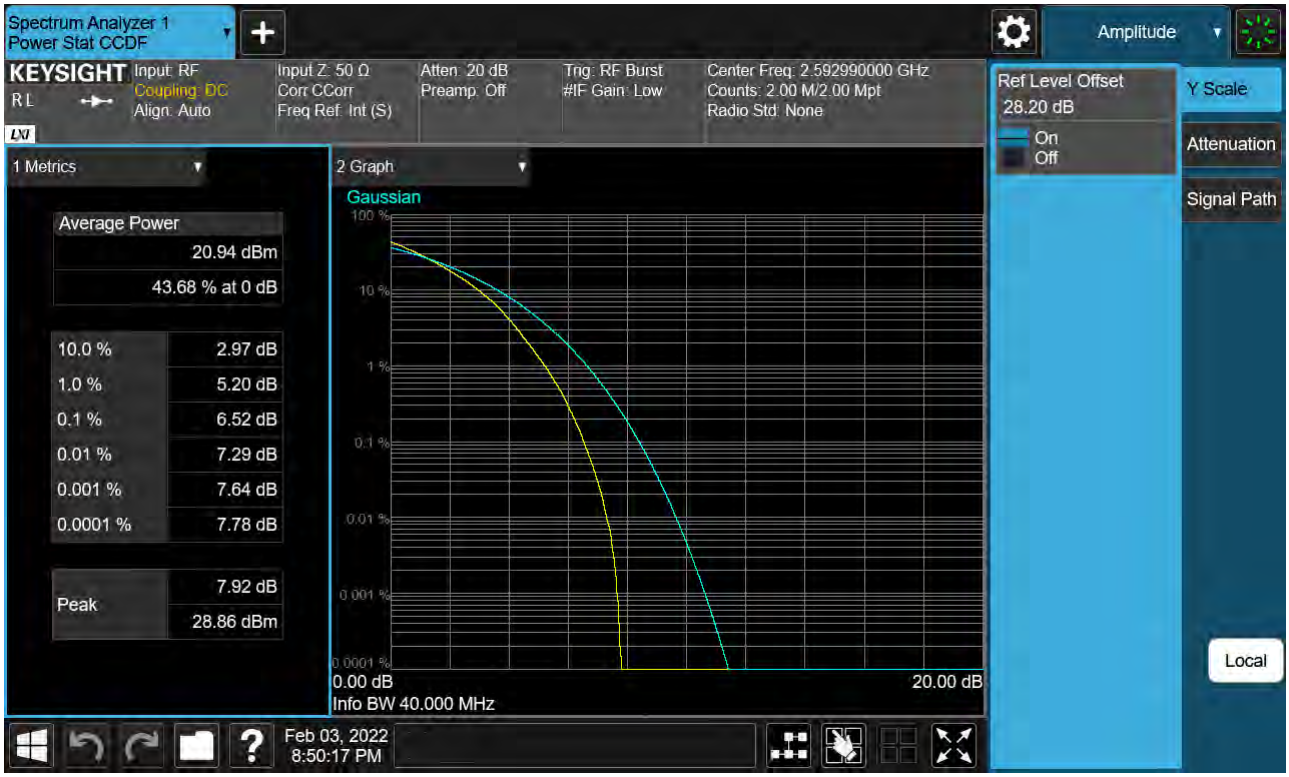
Sub6 n41. PAR Plot (40 M BW_Ch.518598_QPSK)



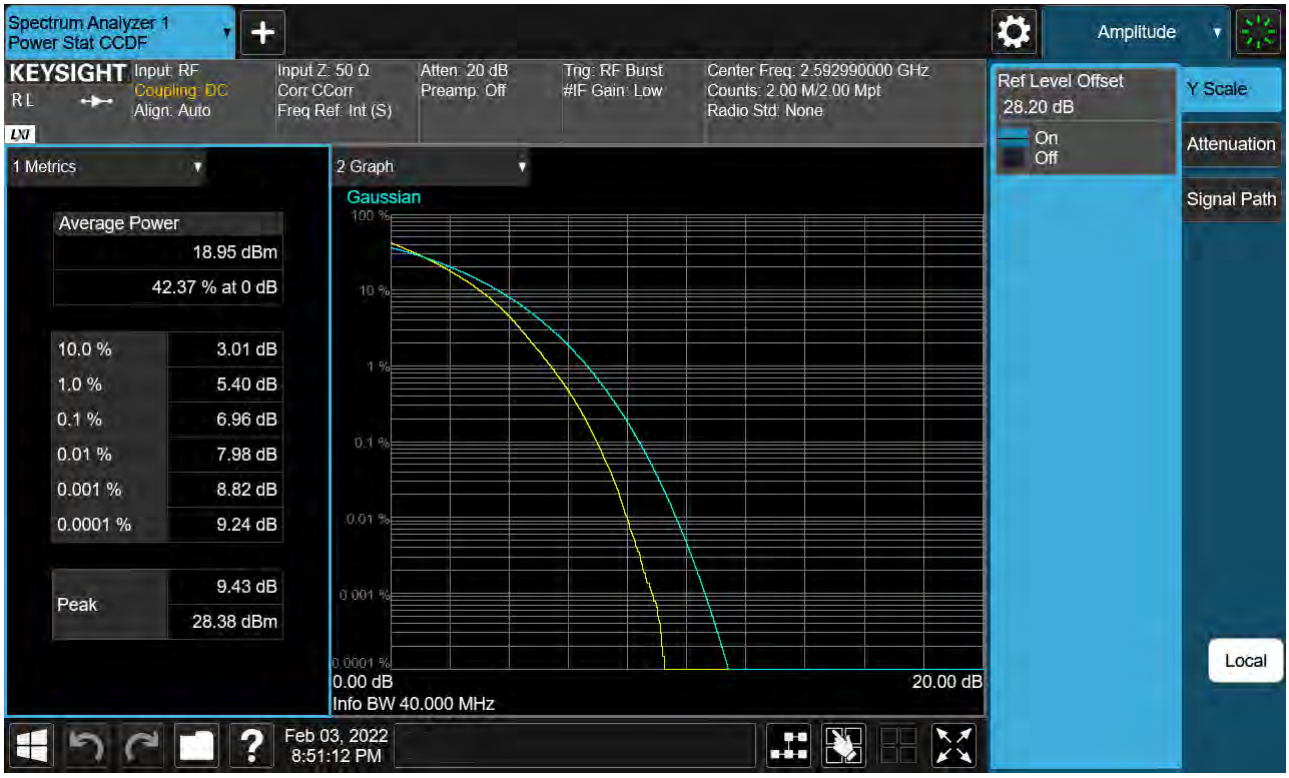
Sub6 n41. PAR Plot (40 M BW_Ch.518598_16QAM)



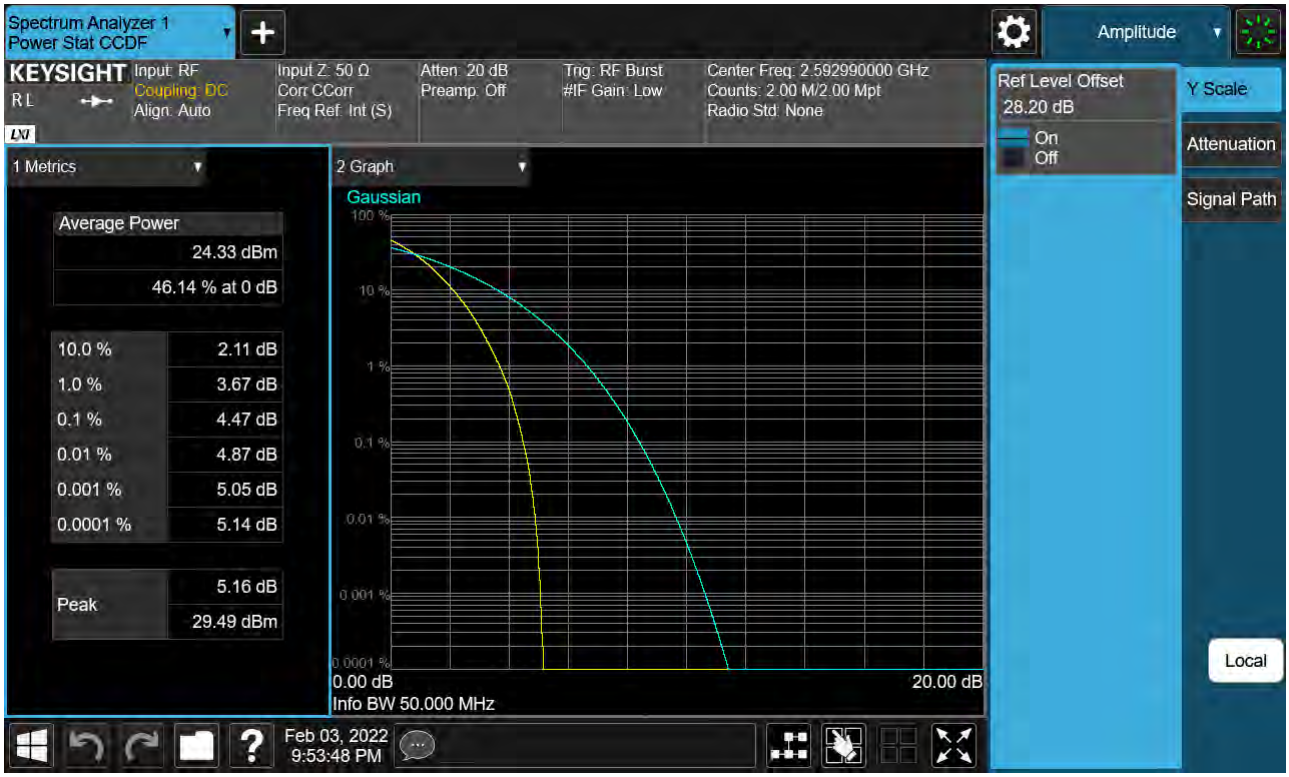
Sub6 n41. PAR Plot (40 M BW_Ch.518598_64QAM)



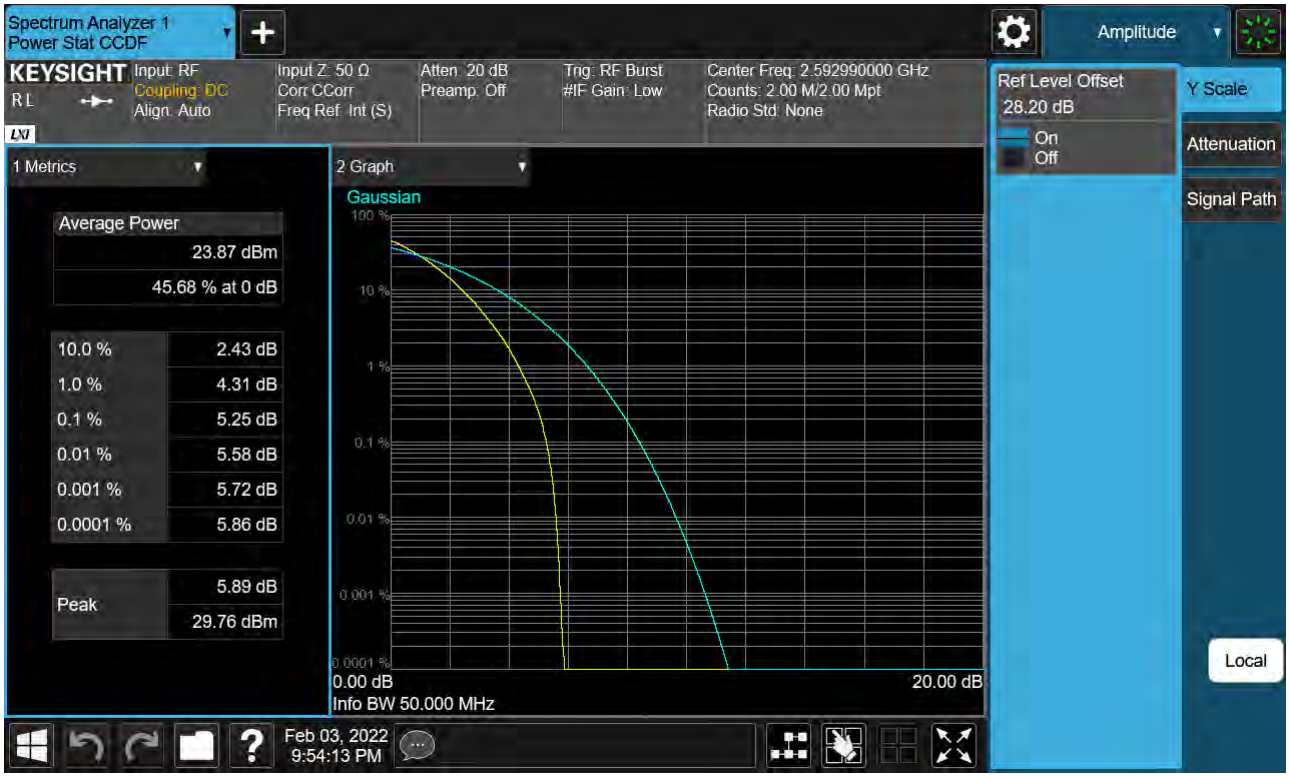
Sub6 n41. PAR Plot (40 M BW_Ch.518598_256QAM)



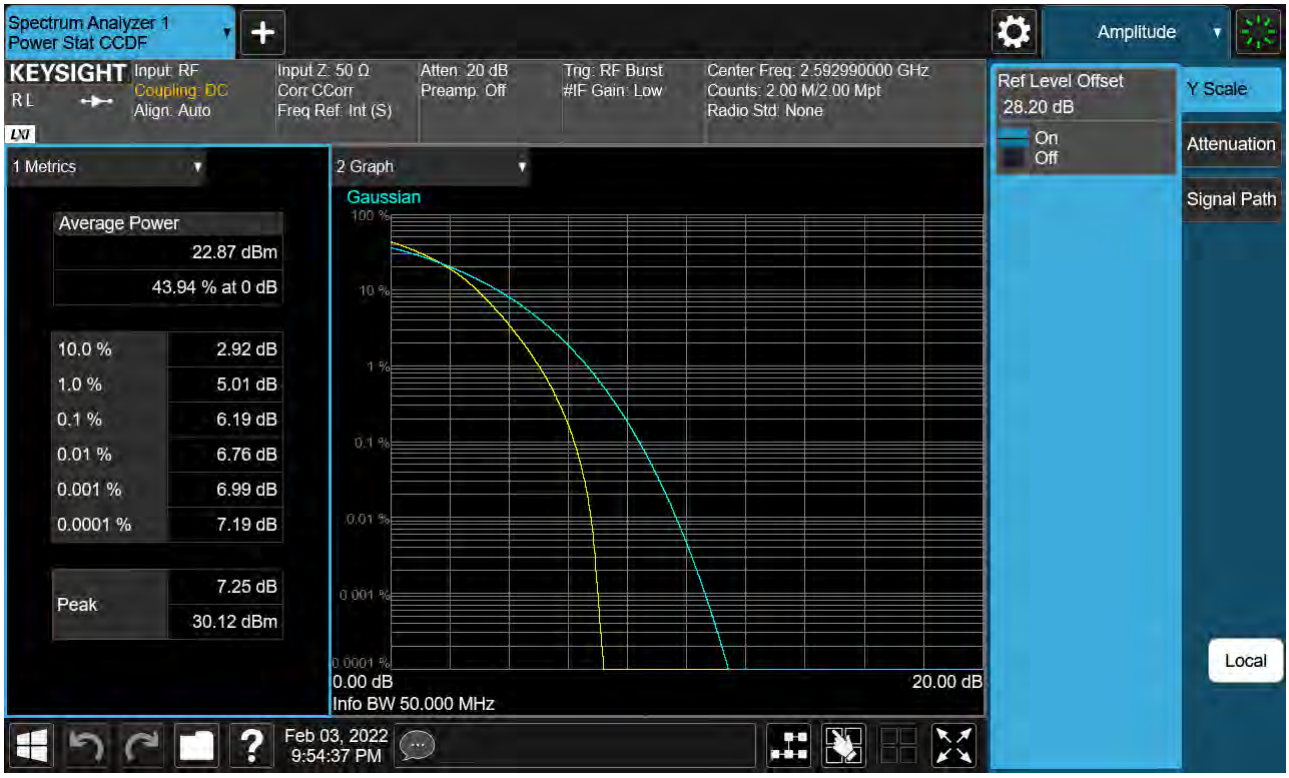
Sub6 n41. PAR Plot (50 M BW_Ch.518598_BPSK)



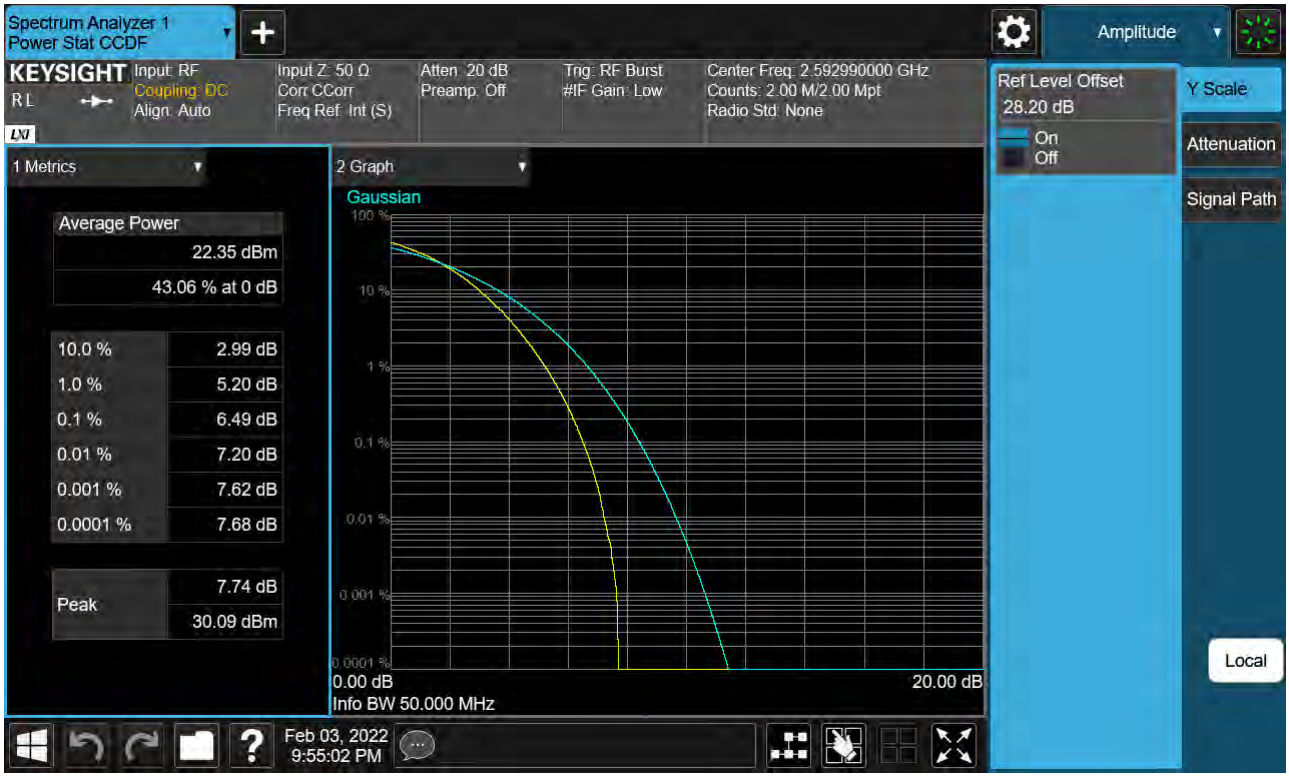
Sub6 n41. PAR Plot (50 M BW_Ch.518598_QPSK)



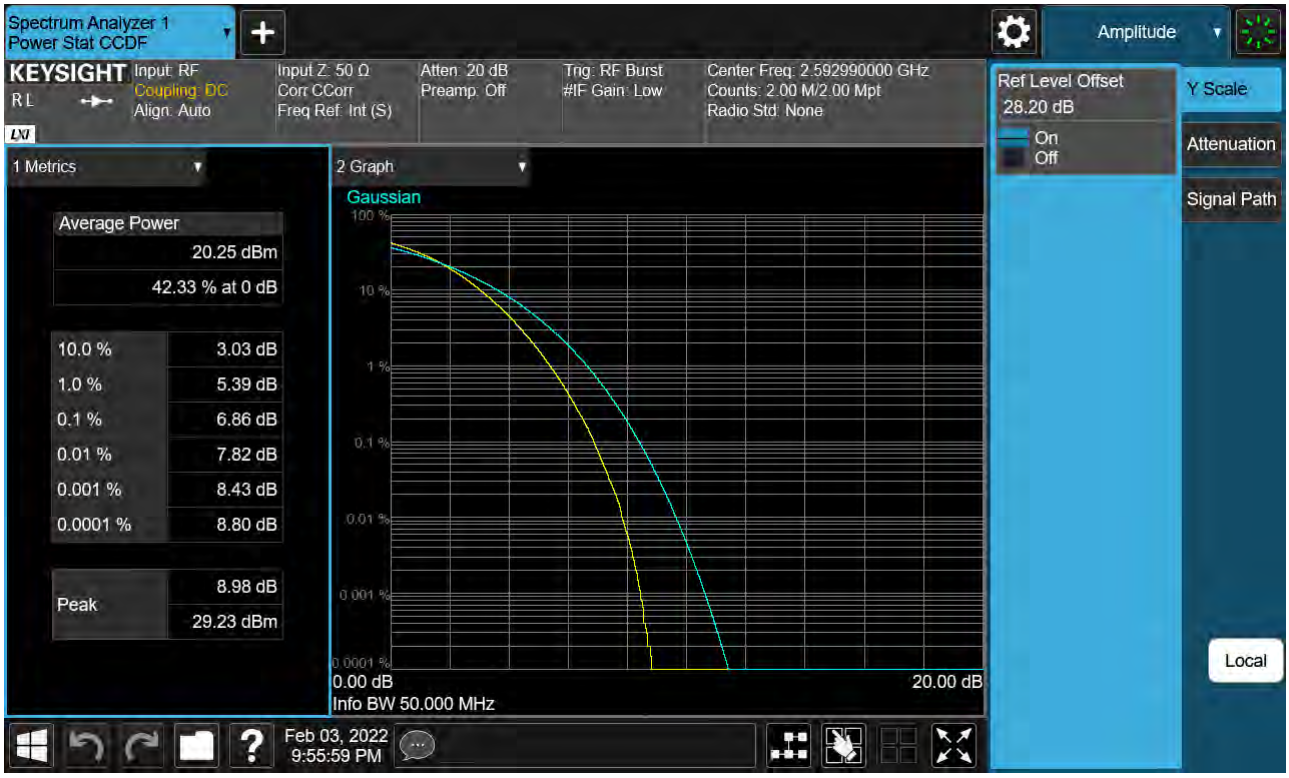
Sub6 n41. PAR Plot (50 M BW_Ch.518598_16QAM)



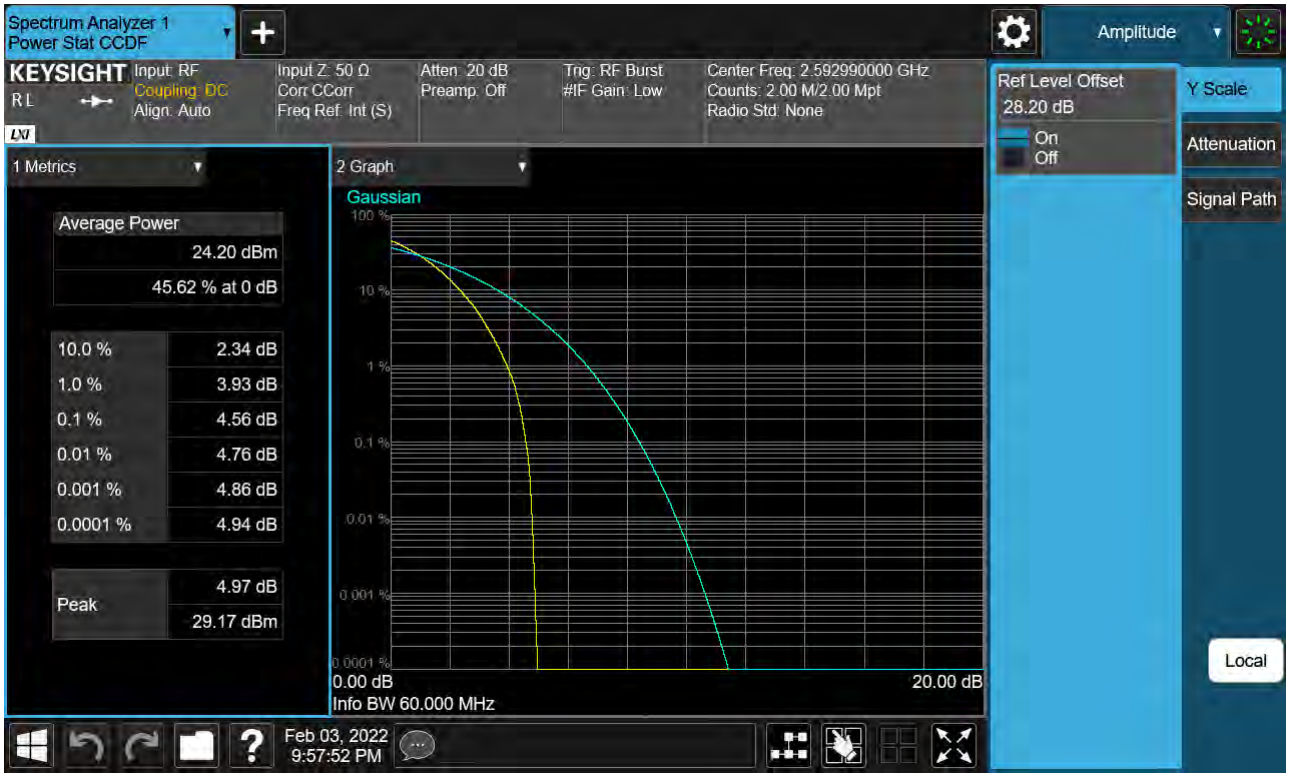
Sub6 n41. PAR Plot (50 M BW_Ch.518598_64QAM)



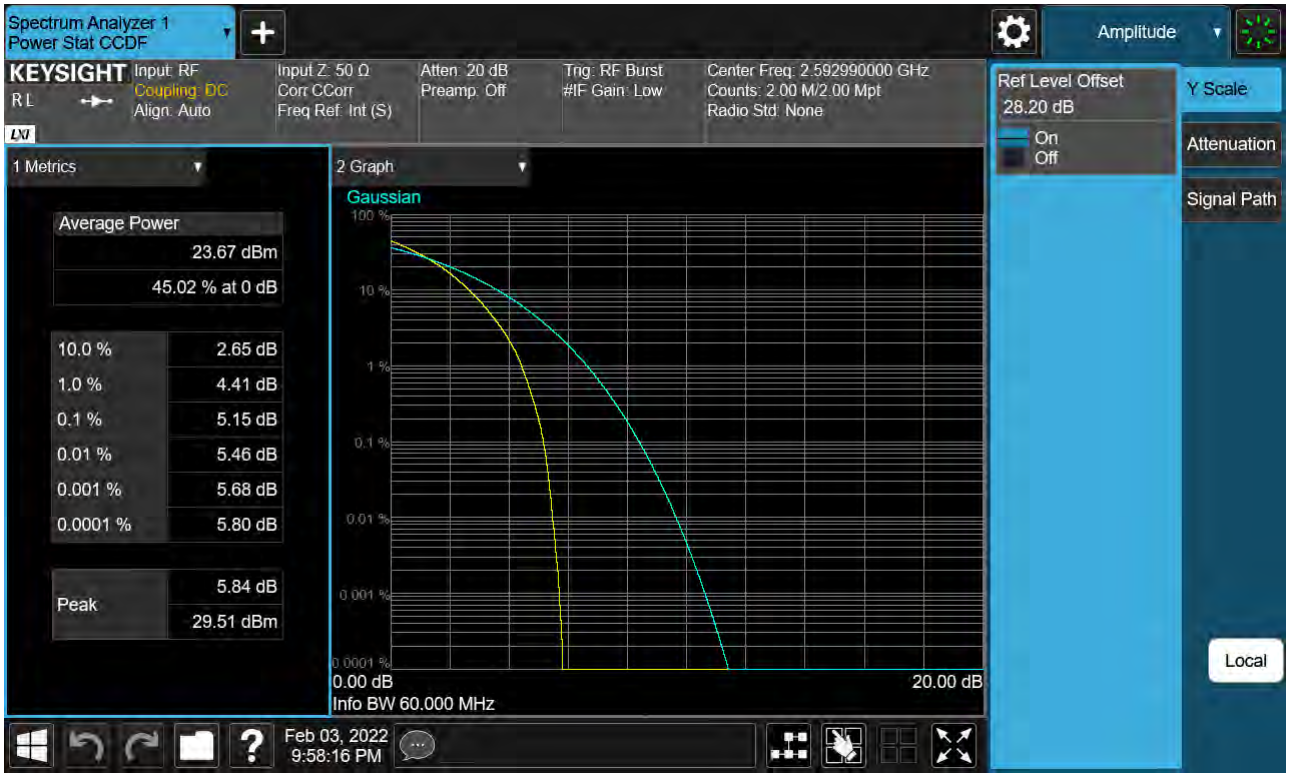
Sub6 n41. PAR Plot (50 M BW_Ch.518598_256QAM)



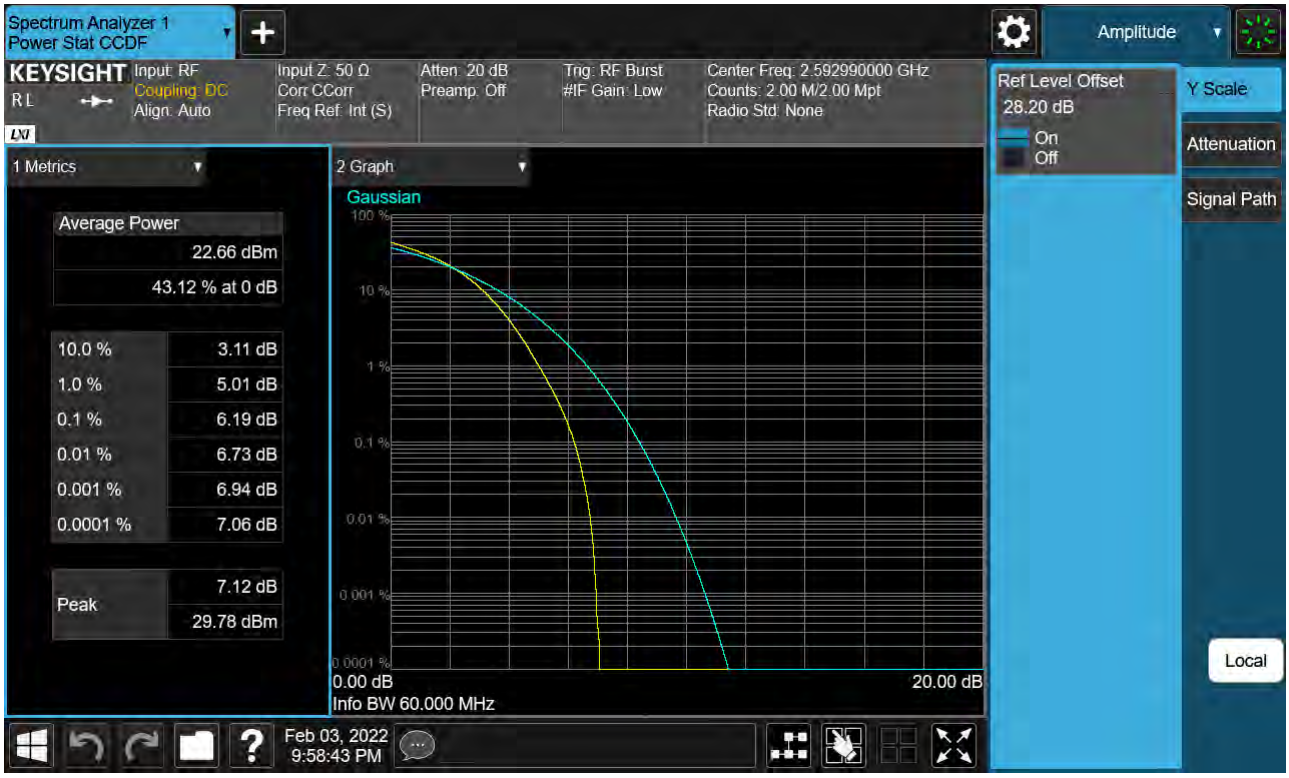
Sub6 n41. PAR Plot (60 M BW_Ch.518598_BPSK)



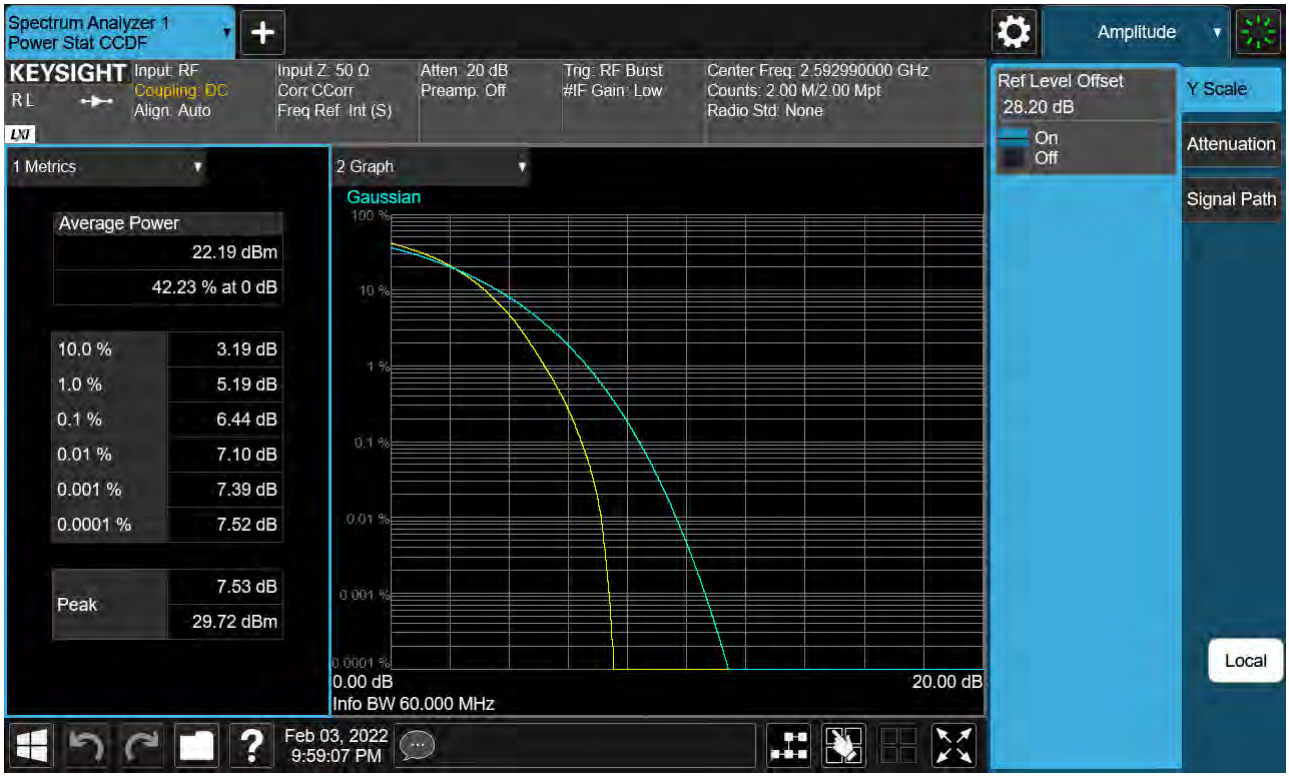
Sub6 n41. PAR Plot (60 M BW_Ch.518598_QPSK)



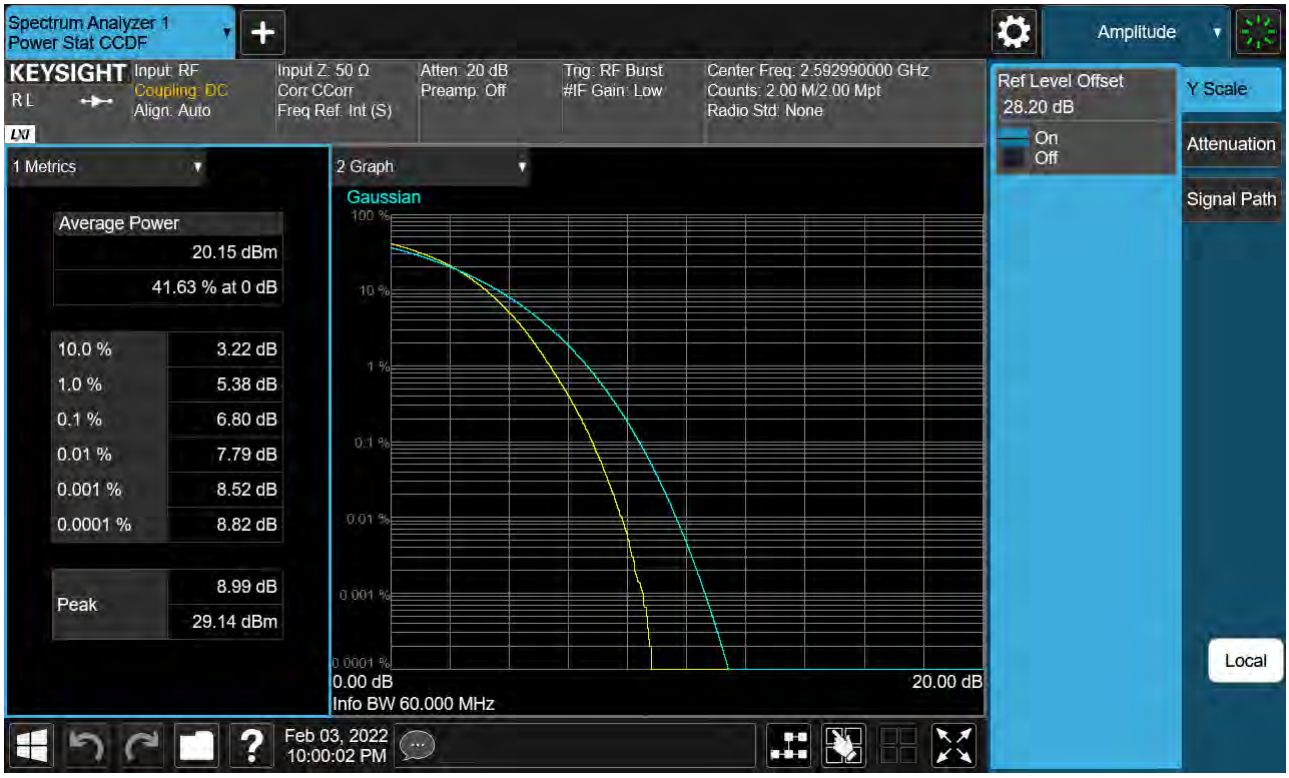
Sub6 n41. PAR Plot (60 M BW_Ch.518598_16QAM)



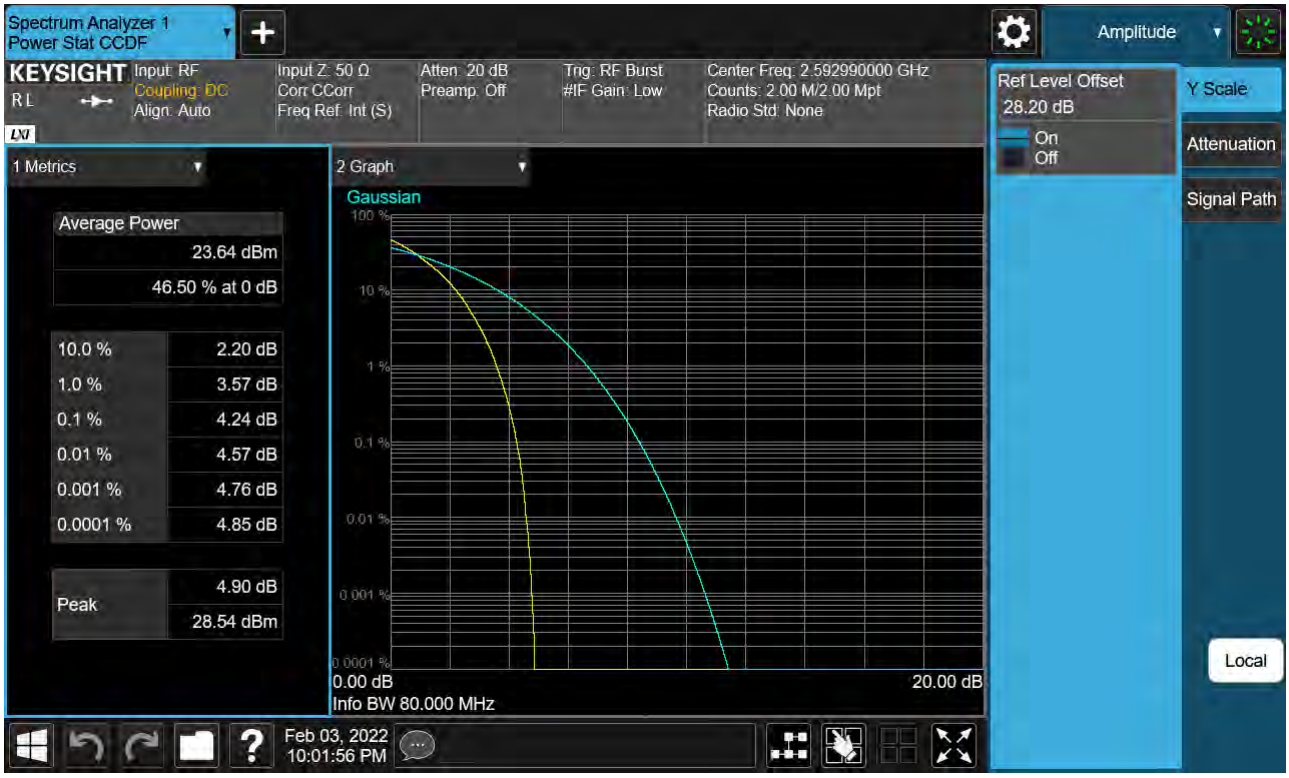
Sub6 n41. PAR Plot (60 M BW_Ch.518598_64QAM)



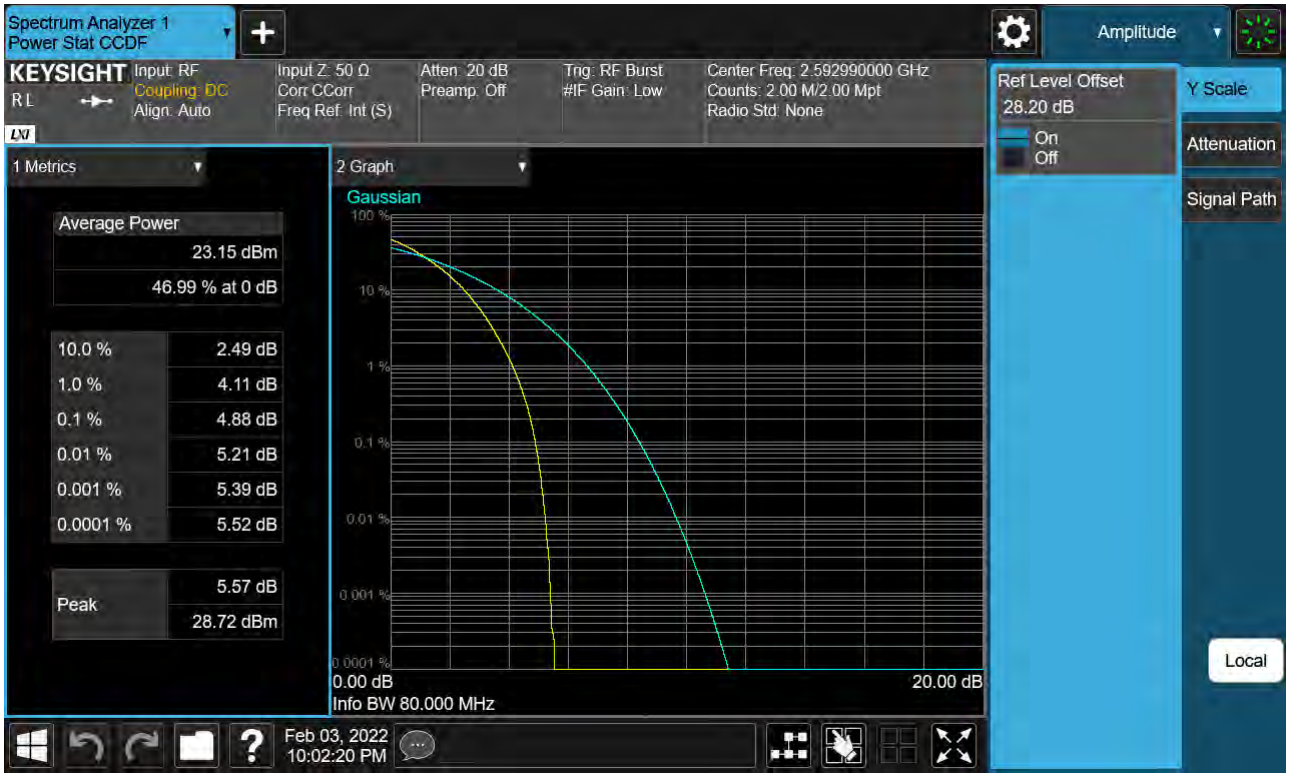
Sub6 n41. PAR Plot (60 M BW_Ch.518598_256QAM)



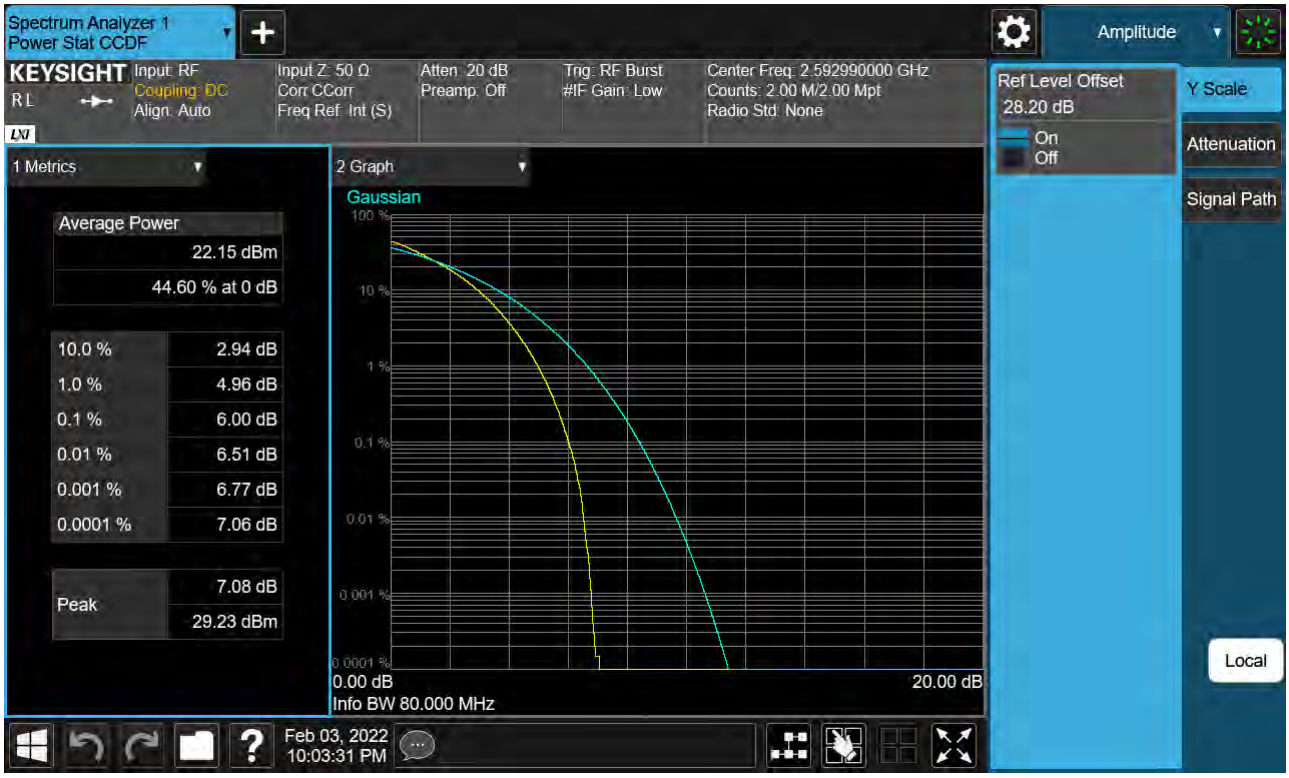
Sub6 n41. PAR Plot (80 M BW_Ch.518598_BPSK)



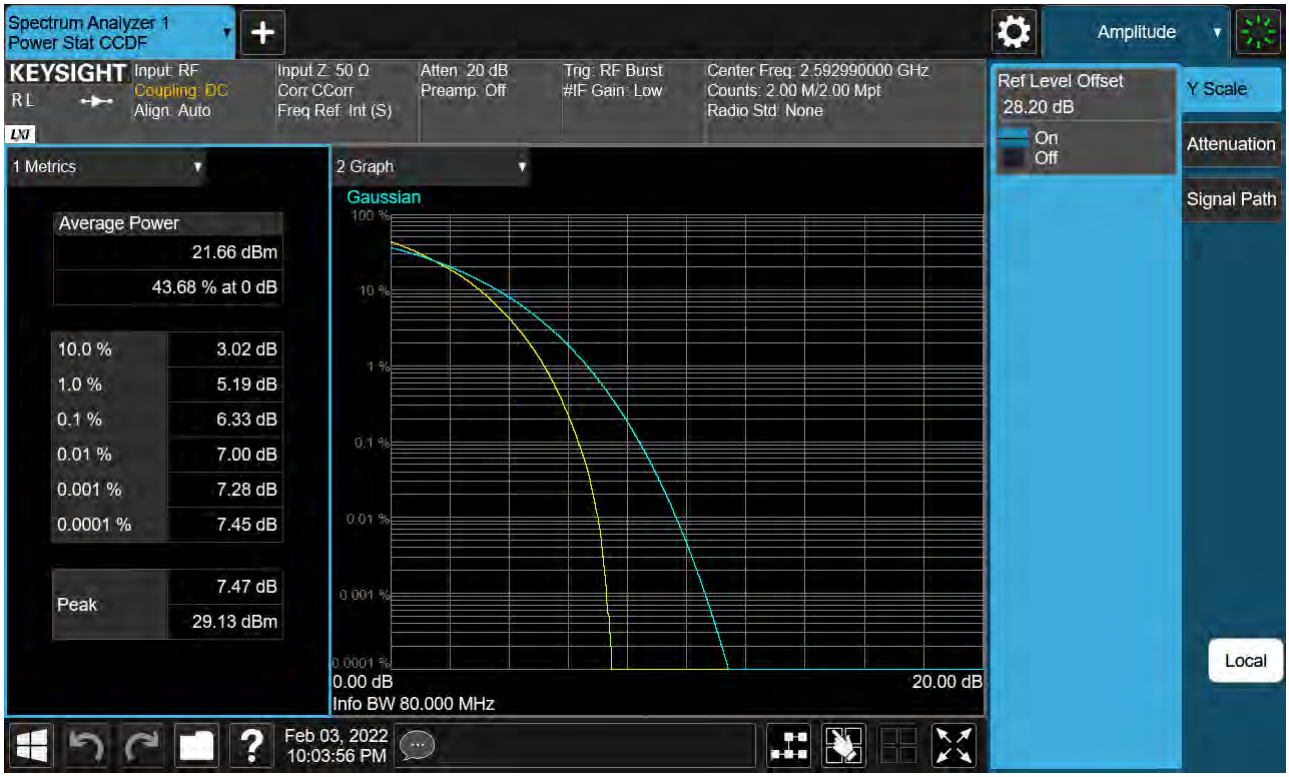
Sub6 n41. PAR Plot (80 M BW_Ch.518598_QPSK)



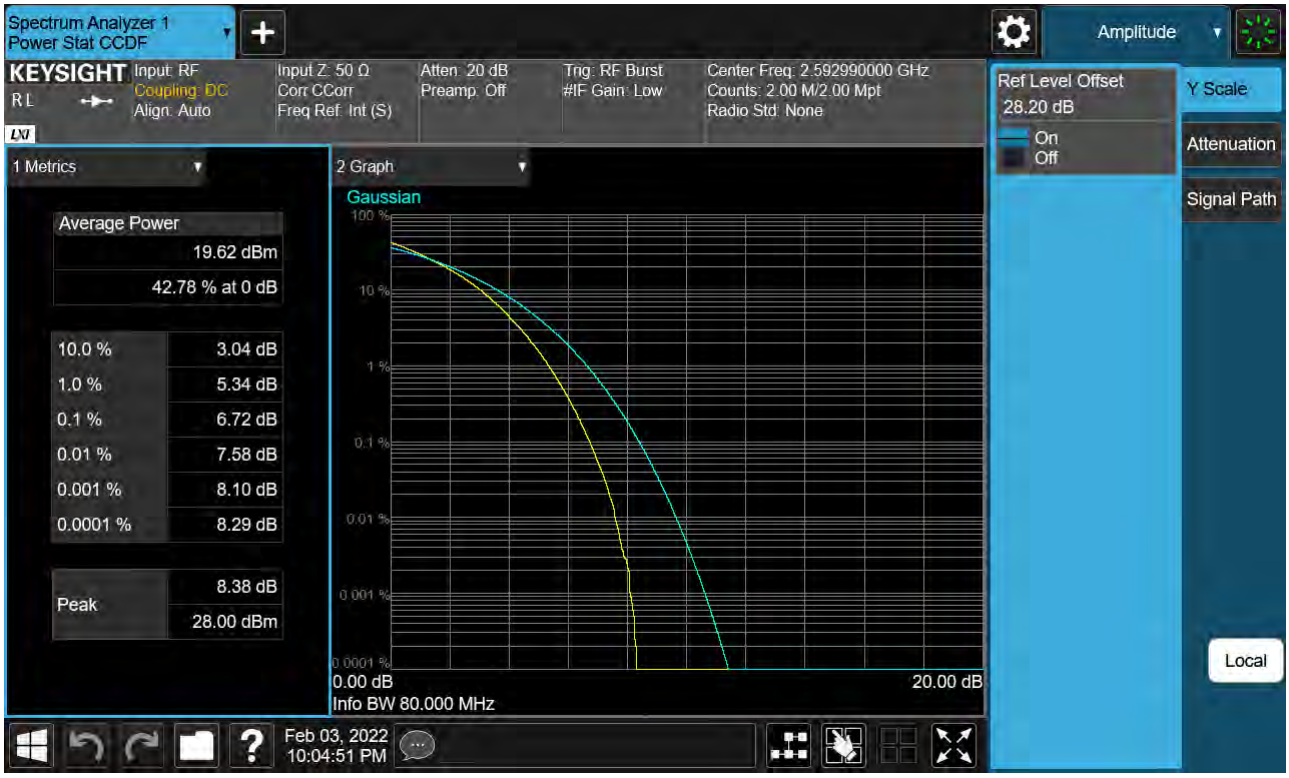
Sub6 n41. PAR Plot (80 M BW_Ch.518598_16QAM)



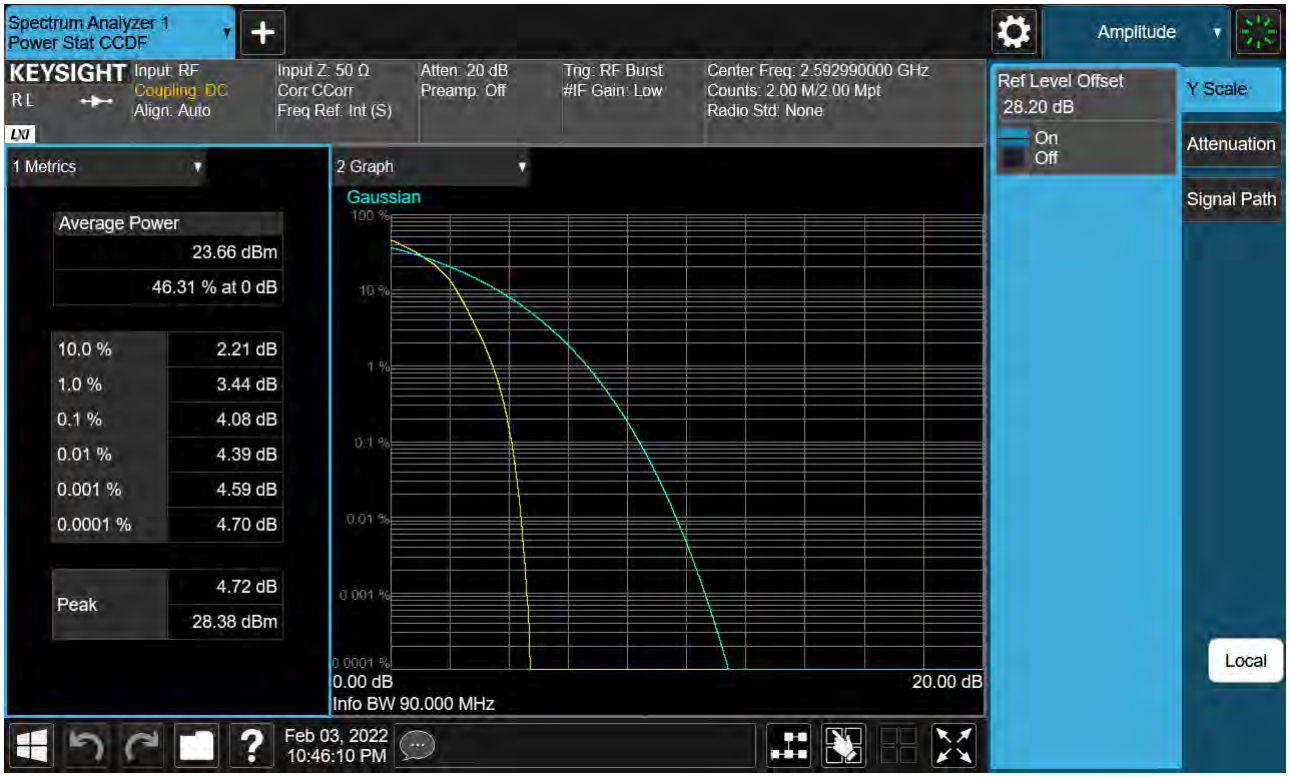
Sub6 n41. PAR Plot (80 M BW_Ch.518598_64QAM)



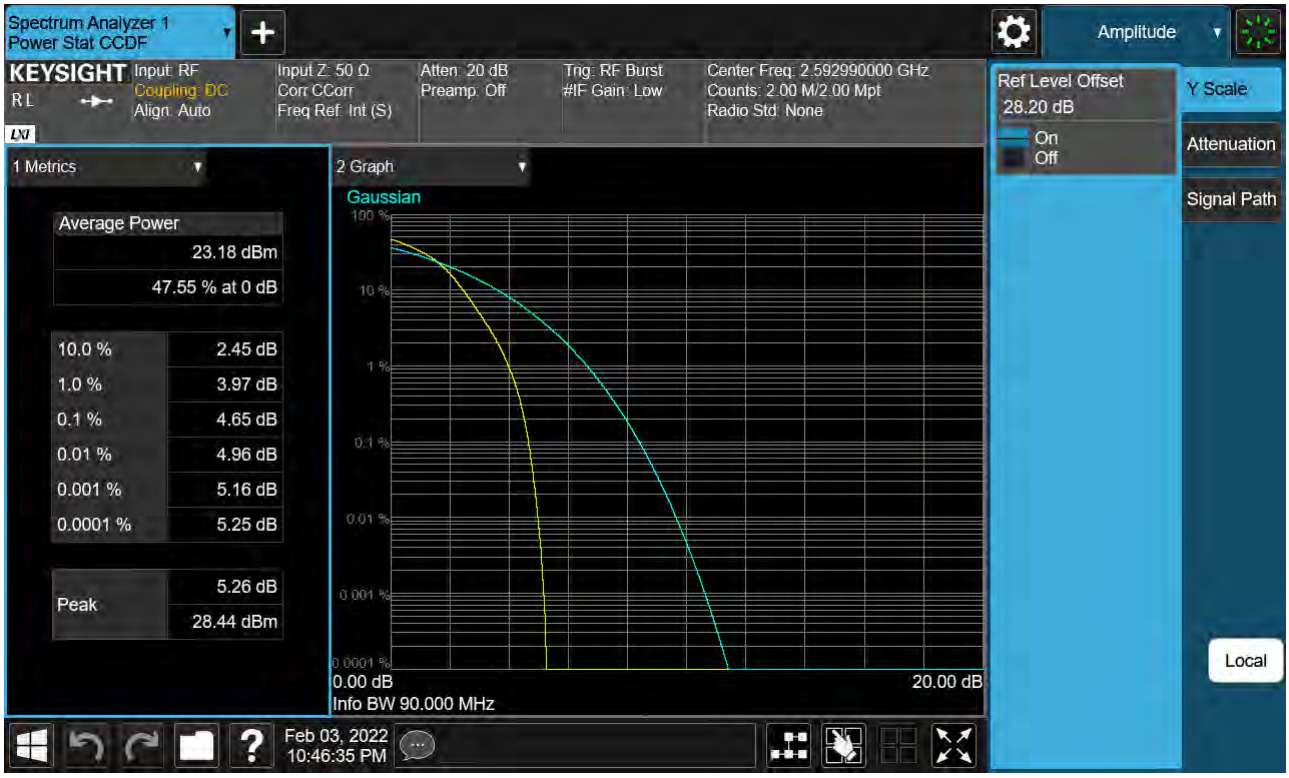
Sub6 n41. PAR Plot (80 M BW_Ch.518598_256QAM)



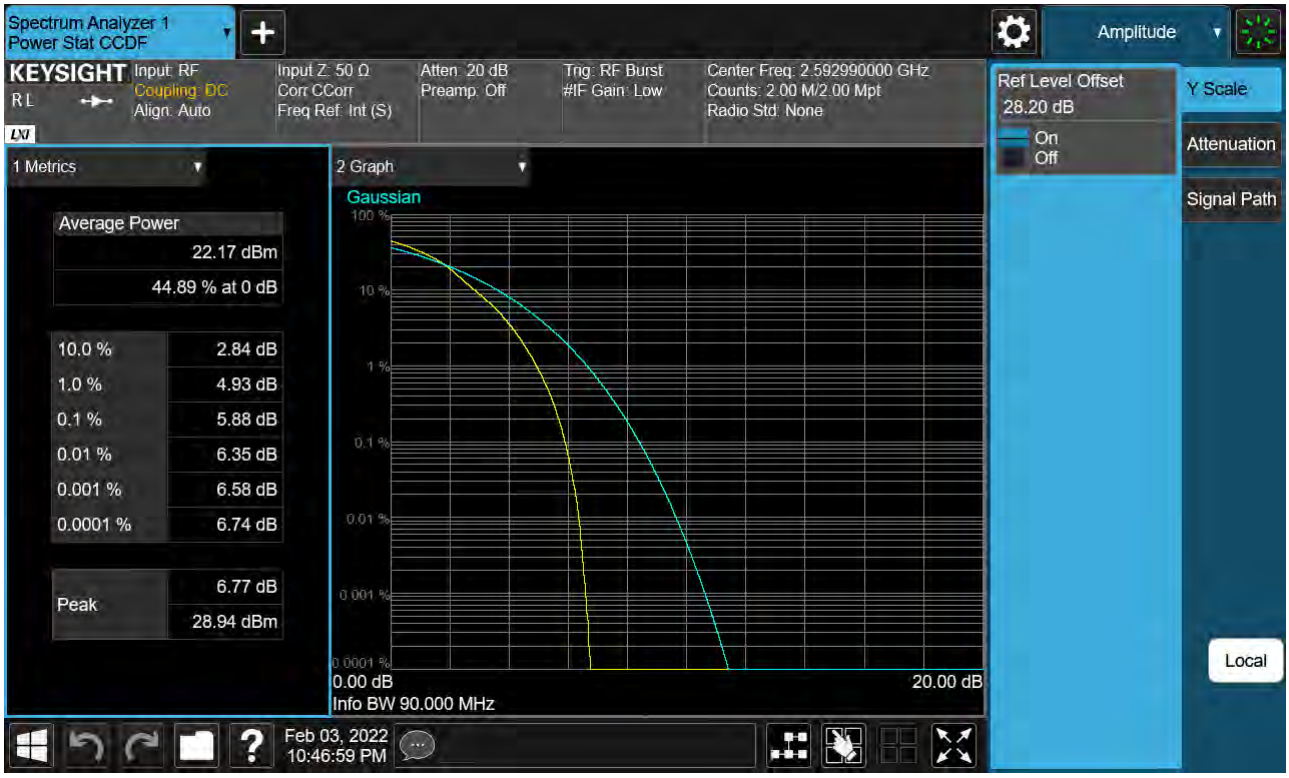
Sub6 n41. PAR Plot (90 M BW_Ch.518598_BPSK)



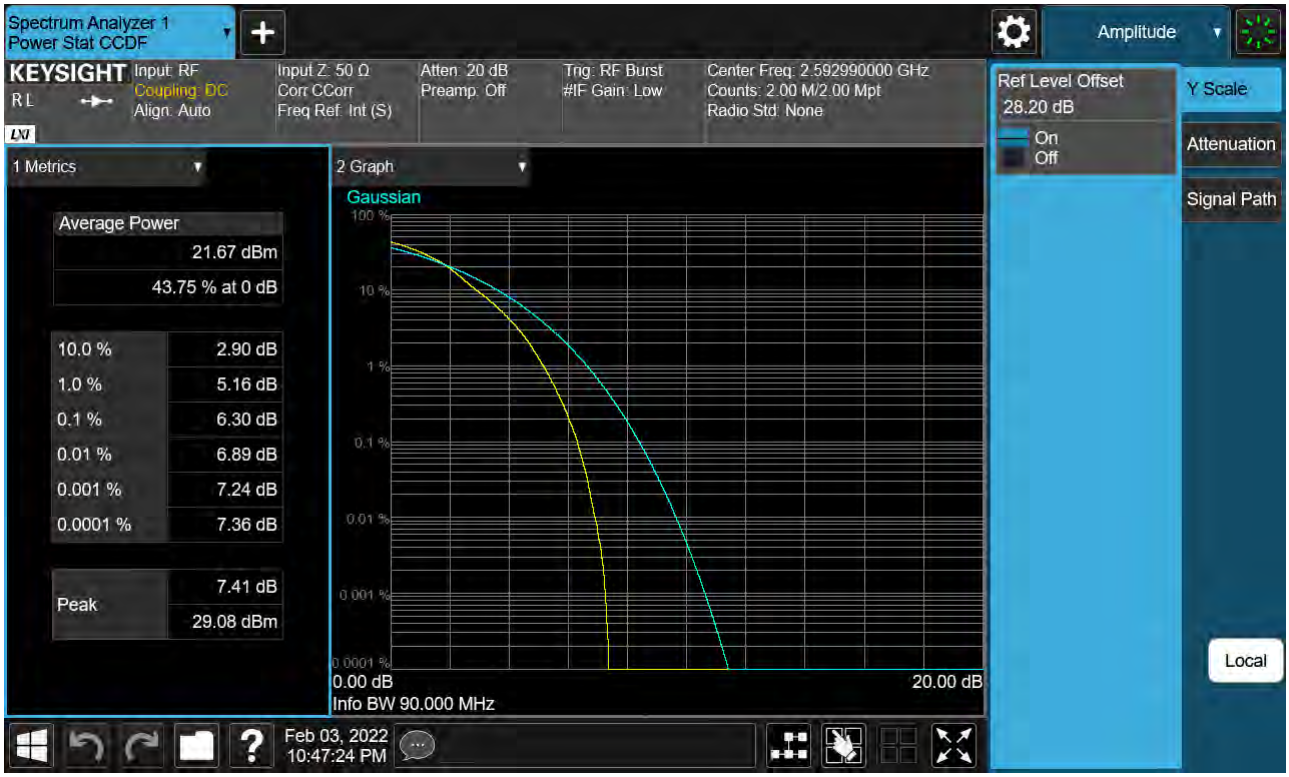
Sub6 n41. PAR Plot (90 M BW_Ch.518598_QPSK)



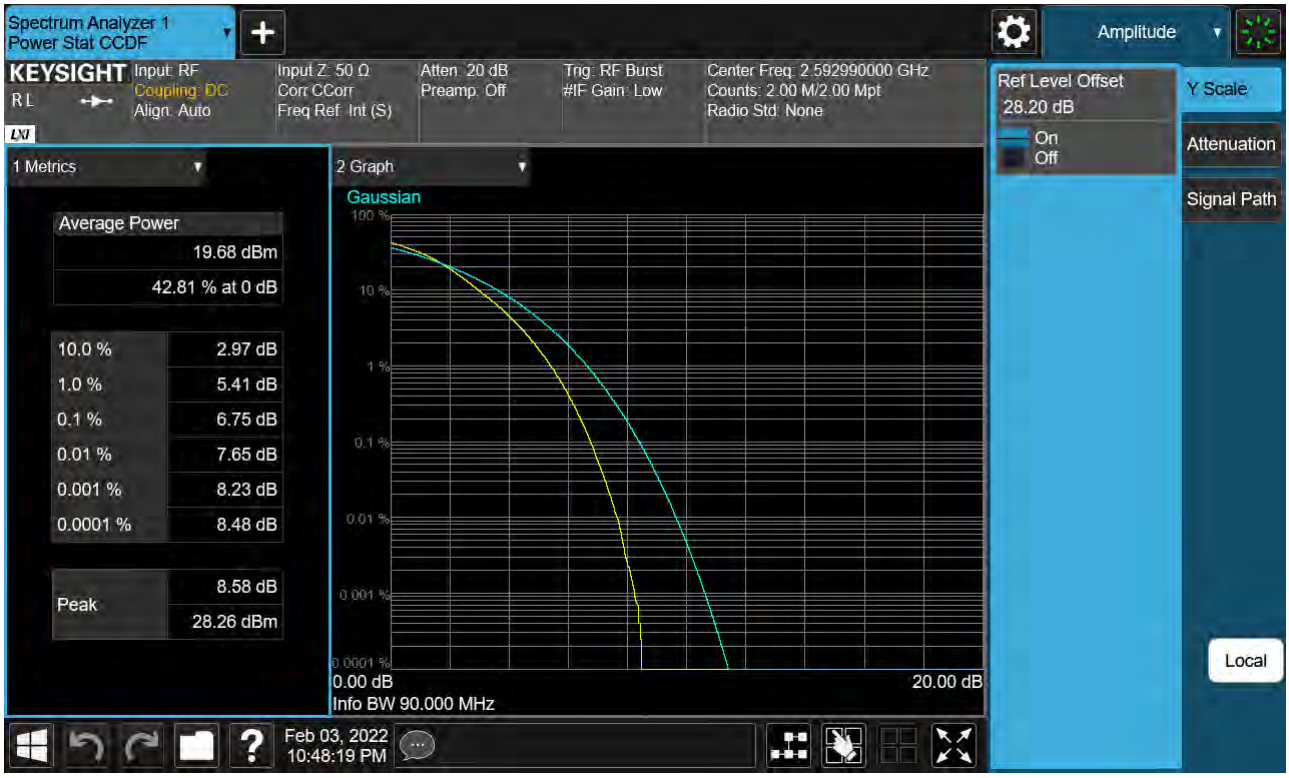
Sub6 n41. PAR Plot (90 M BW_Ch.518598_16QAM)



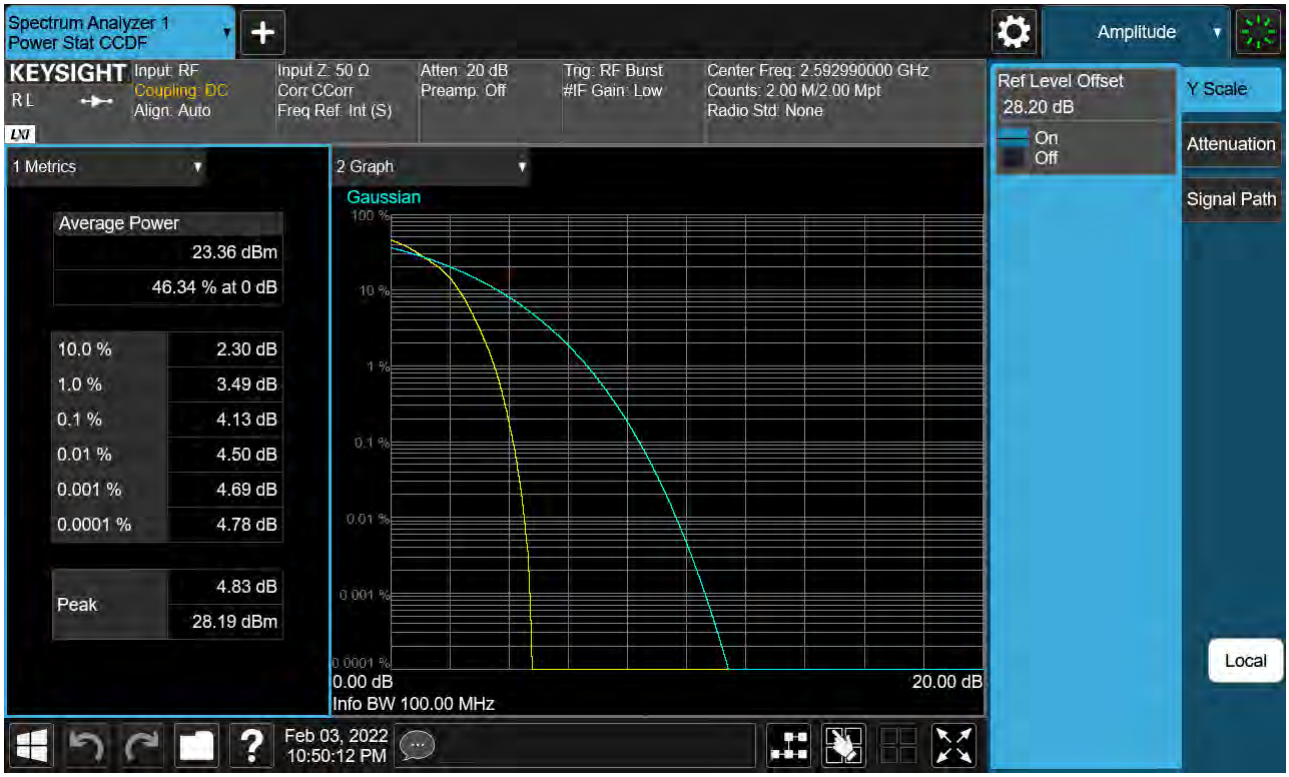
Sub6 n41. PAR Plot (90 M BW_Ch.518598_64QAM)



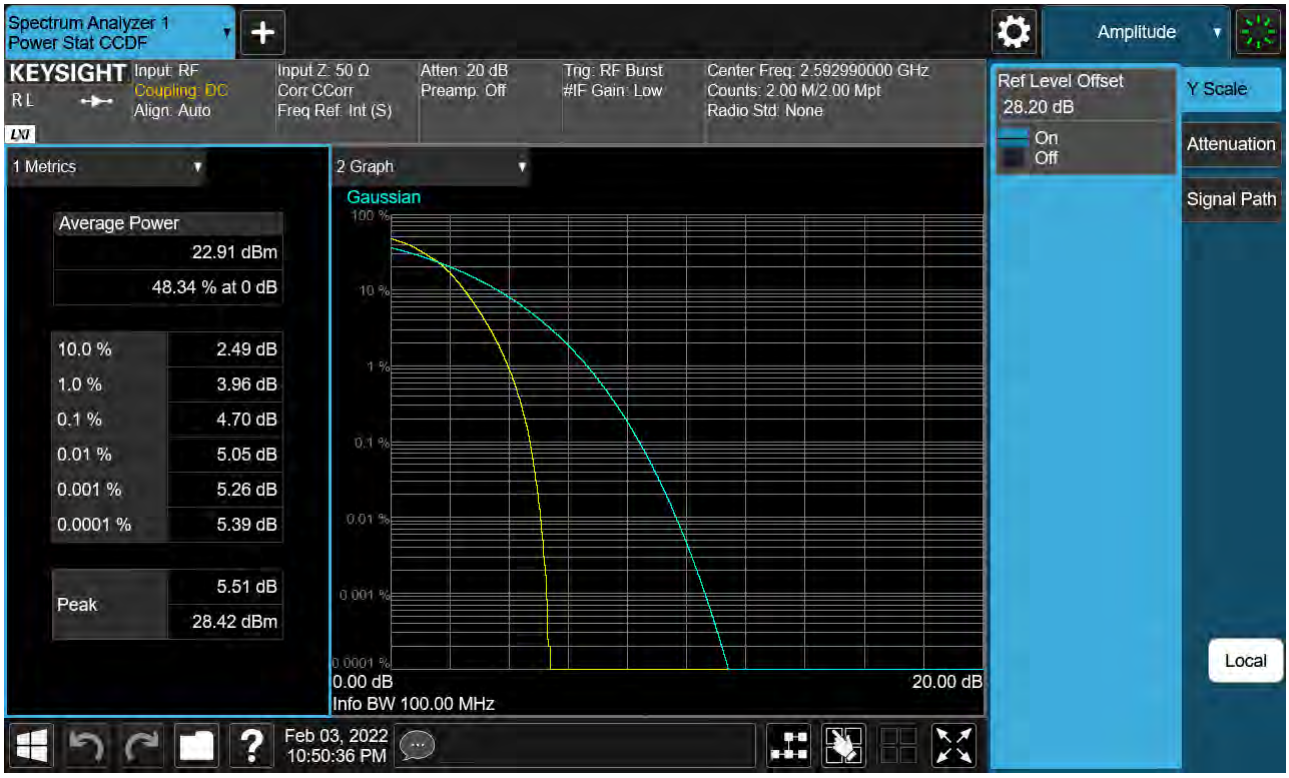
Sub6 n41. PAR Plot (90 M BW_Ch.518598_256QAM)



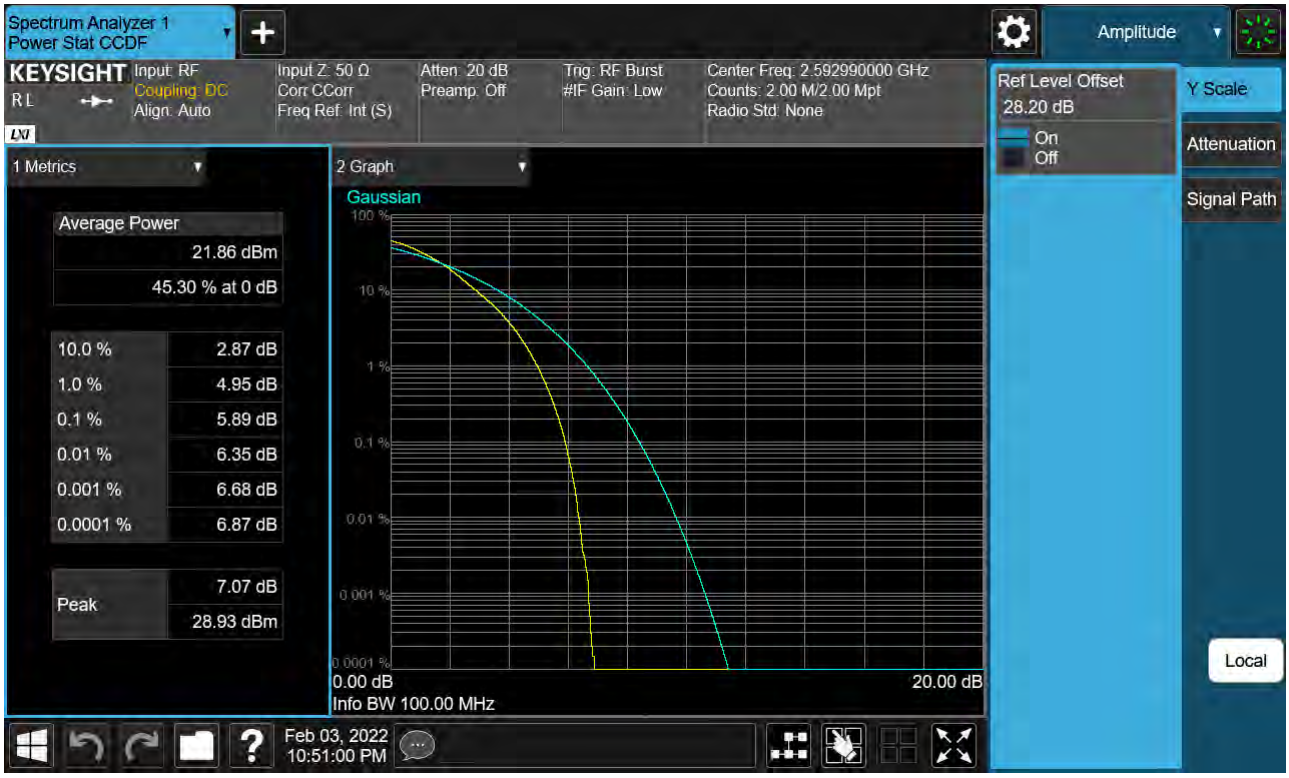
Sub6 n41. PAR Plot (100 M BW_Ch.518598_BPSK)



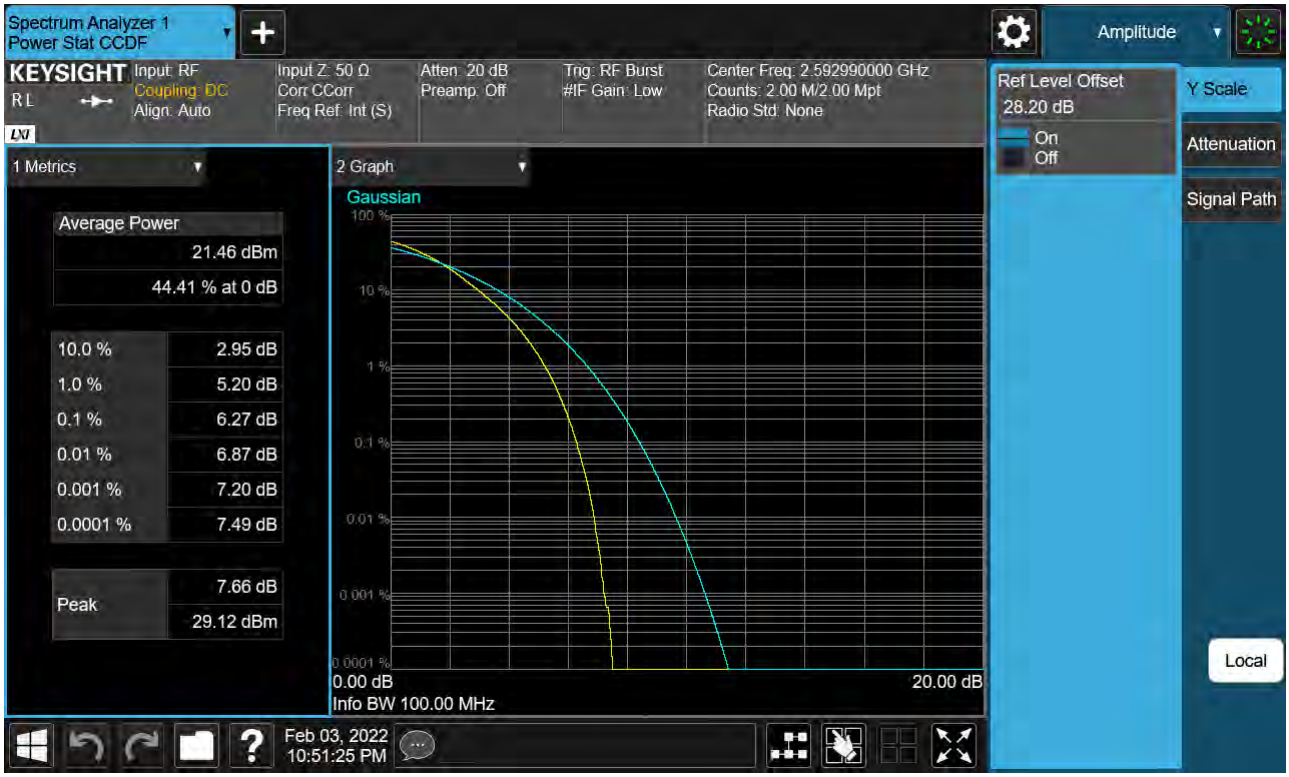
Sub6 n41. PAR Plot (100 M BW_Ch.518598_QPSK)



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

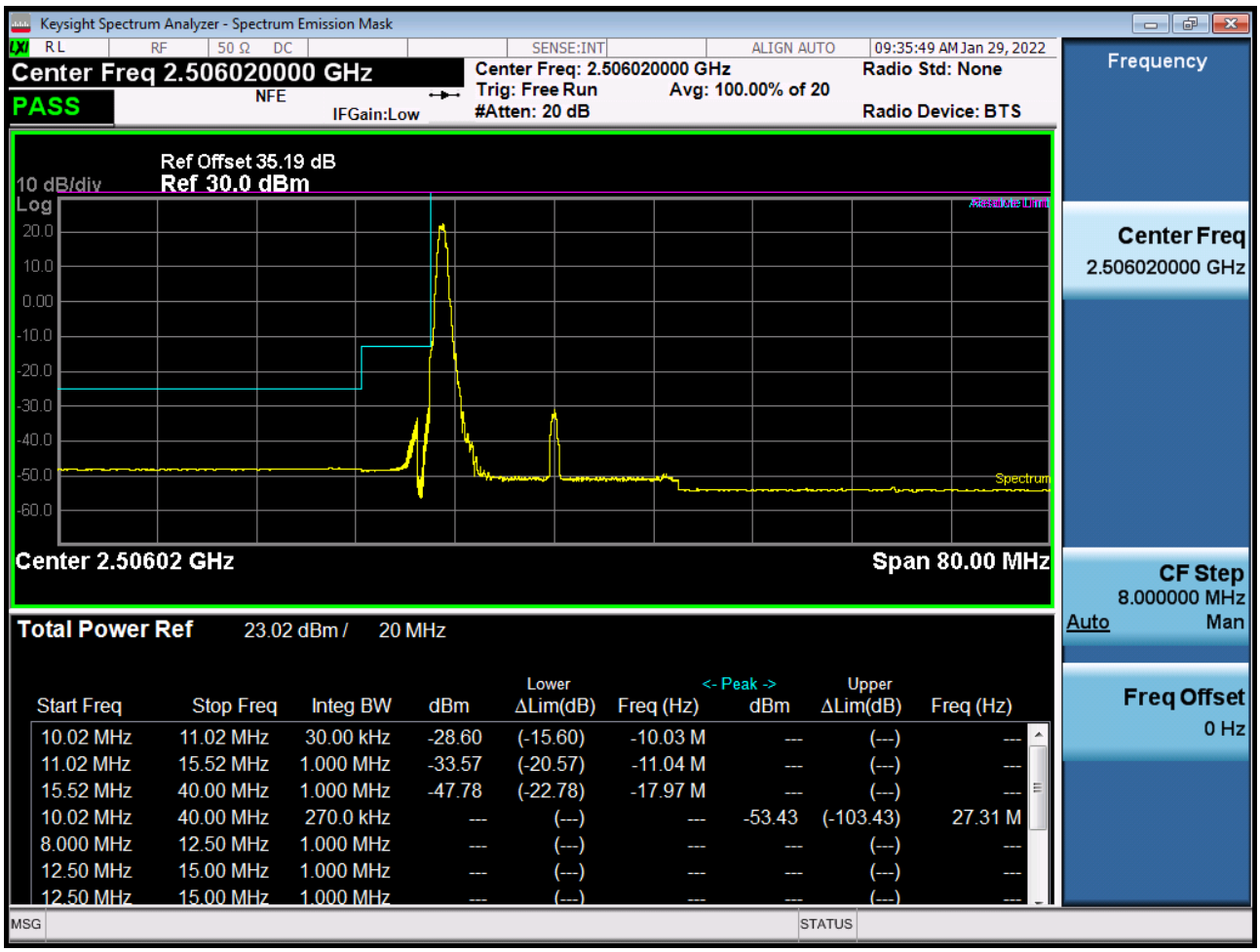


Sub6 n41. PAR Plot (100 M BW_Ch.518598_64QAM)

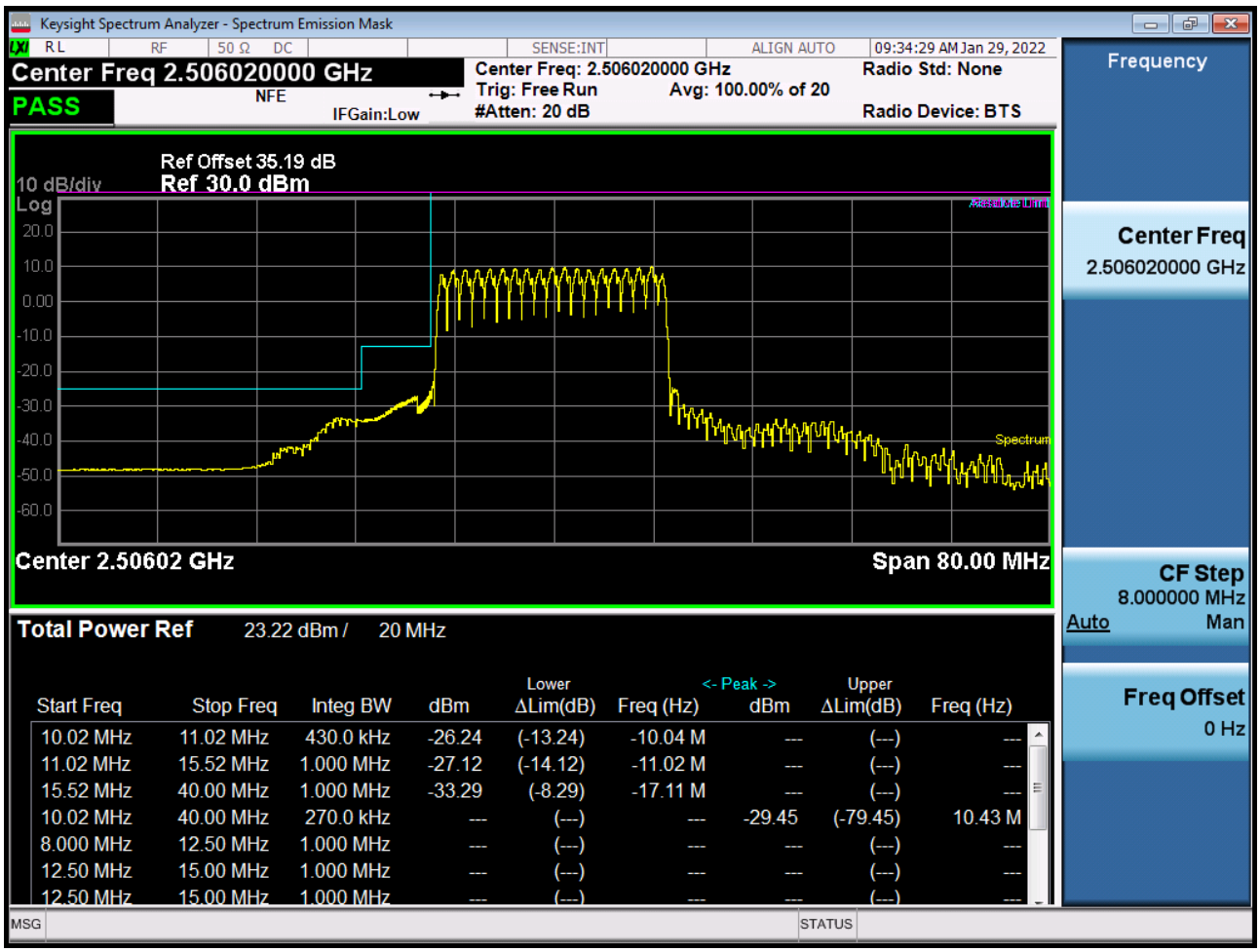


Sub6 n41. PAR Plot (100 M BW_Ch.518598_256QAM)

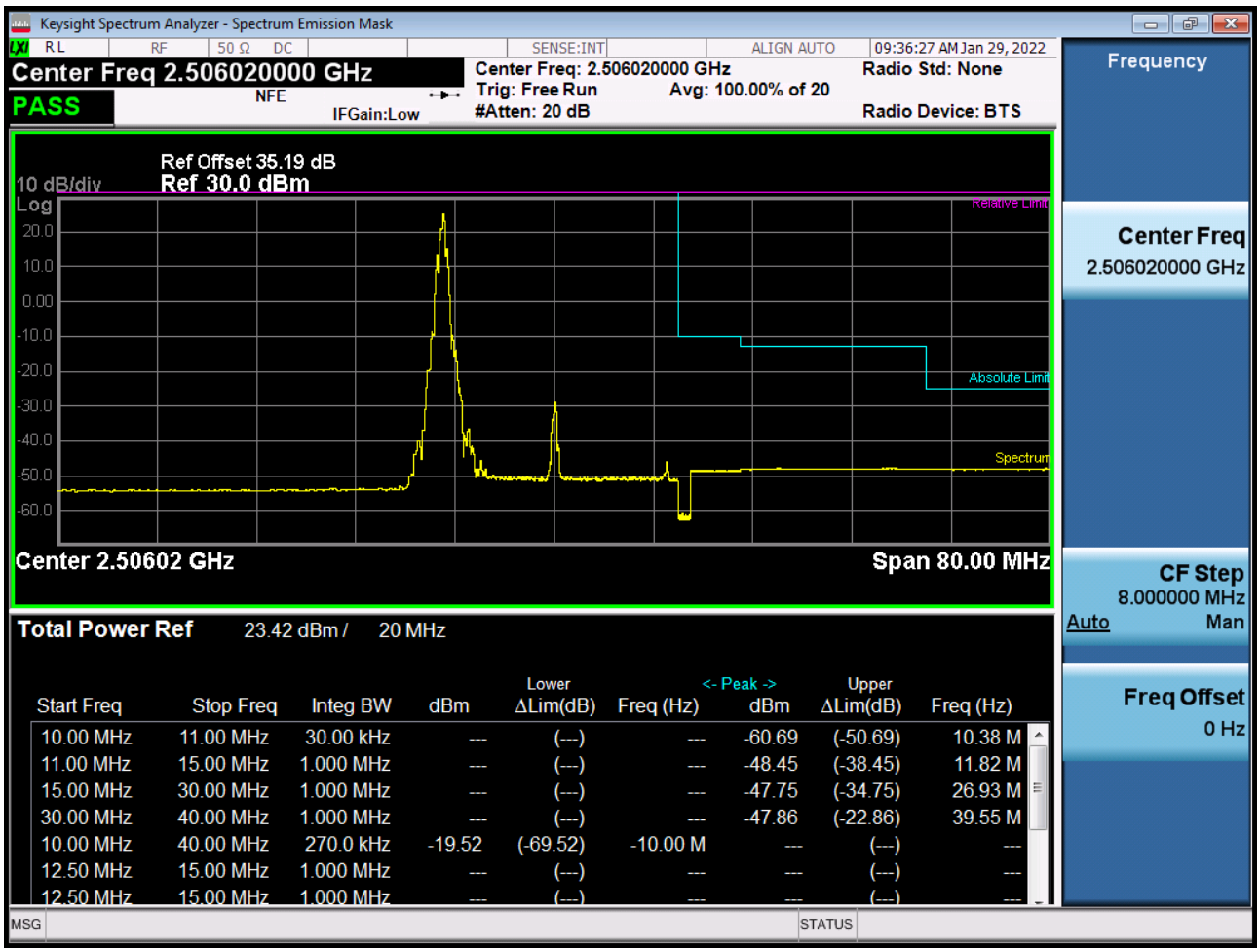
Sub6 n41. Low Channel Edge Plot (20 MHz Ch.501204 BPSK RB 1)-1



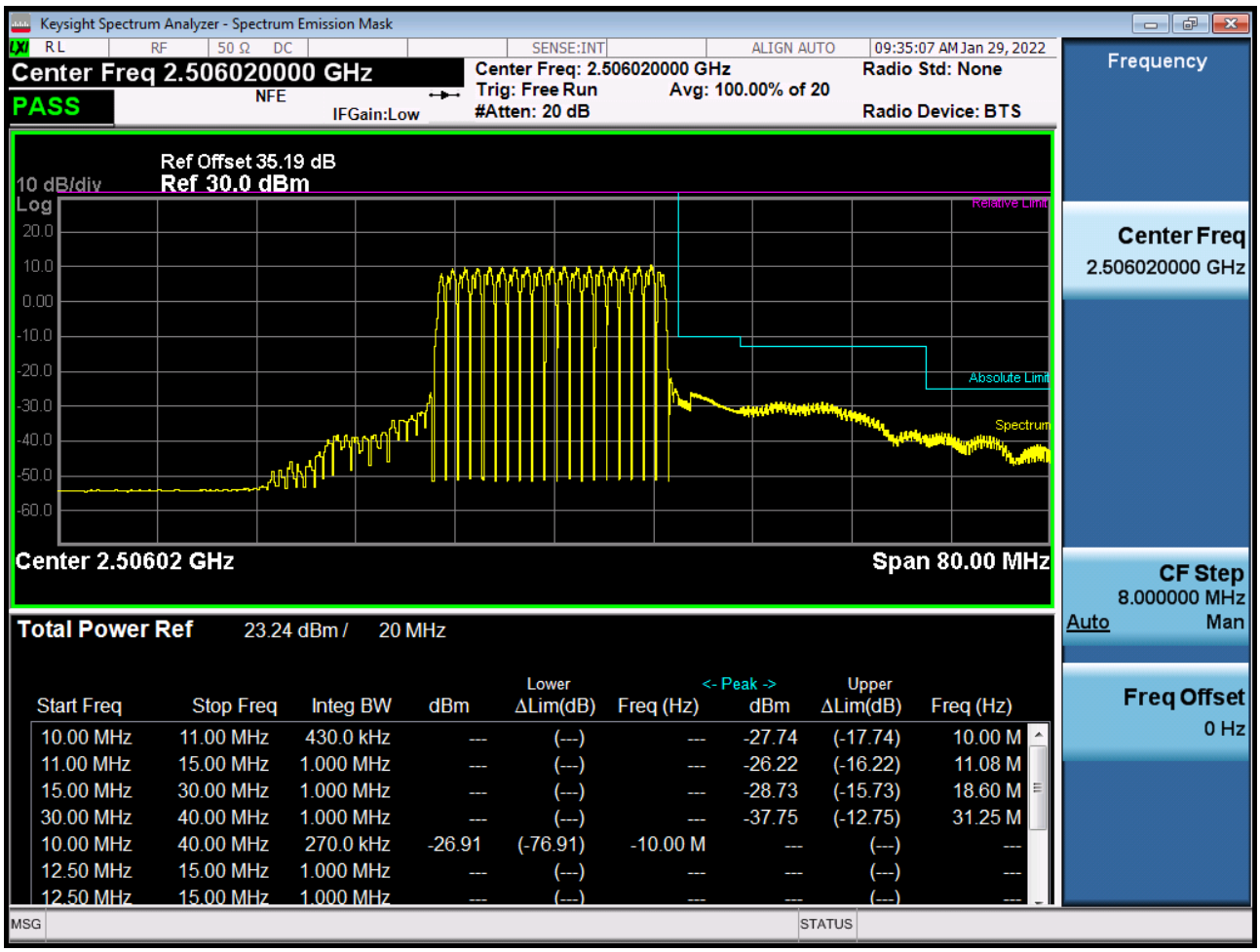
Sub6 n41. Low Channel Edge Plot (20 MHz Ch.501204 BPSK)-1



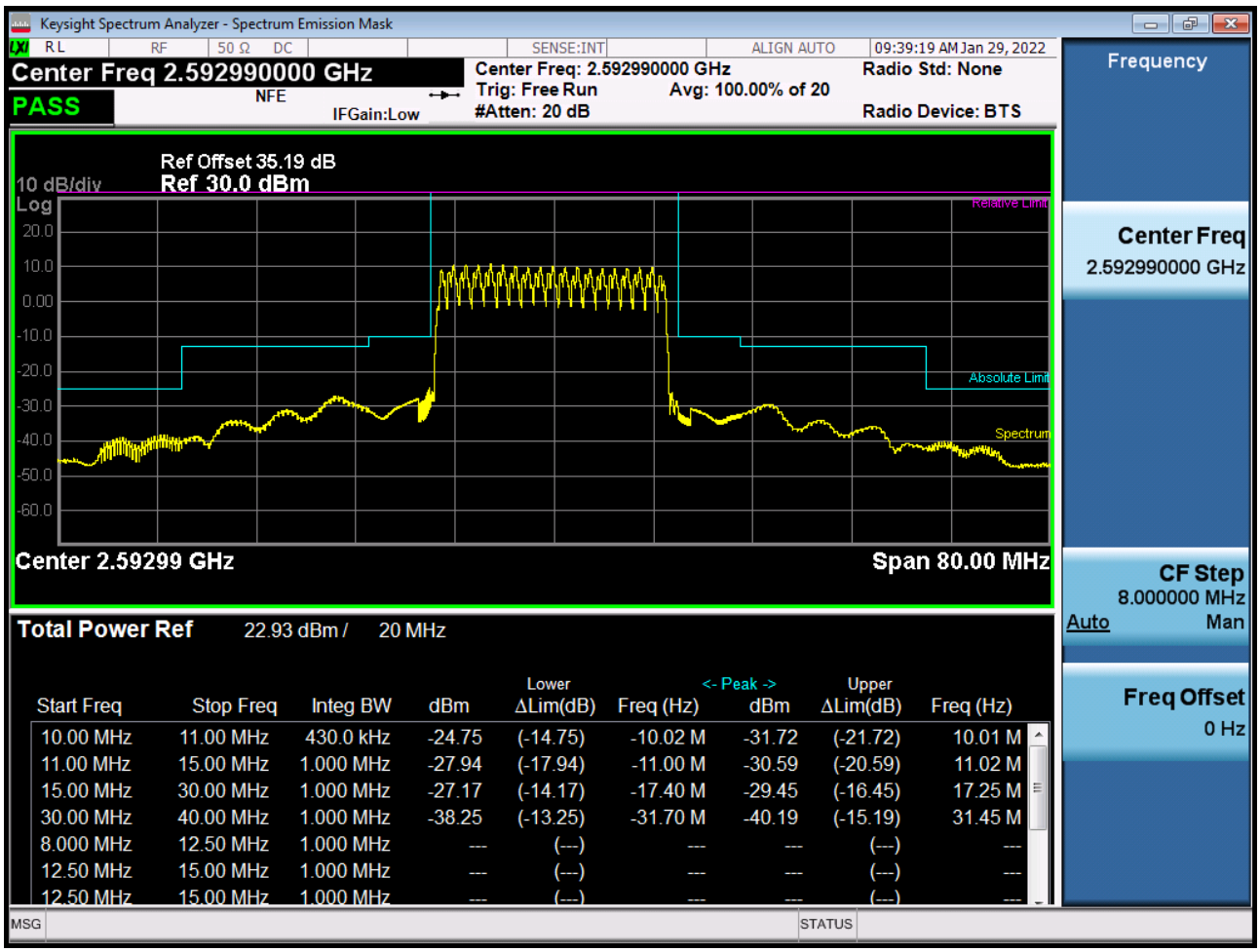
Sub6 n41. Low Channel Edge Plot (20 MHz Ch.501204 BPSK_RB1)-2



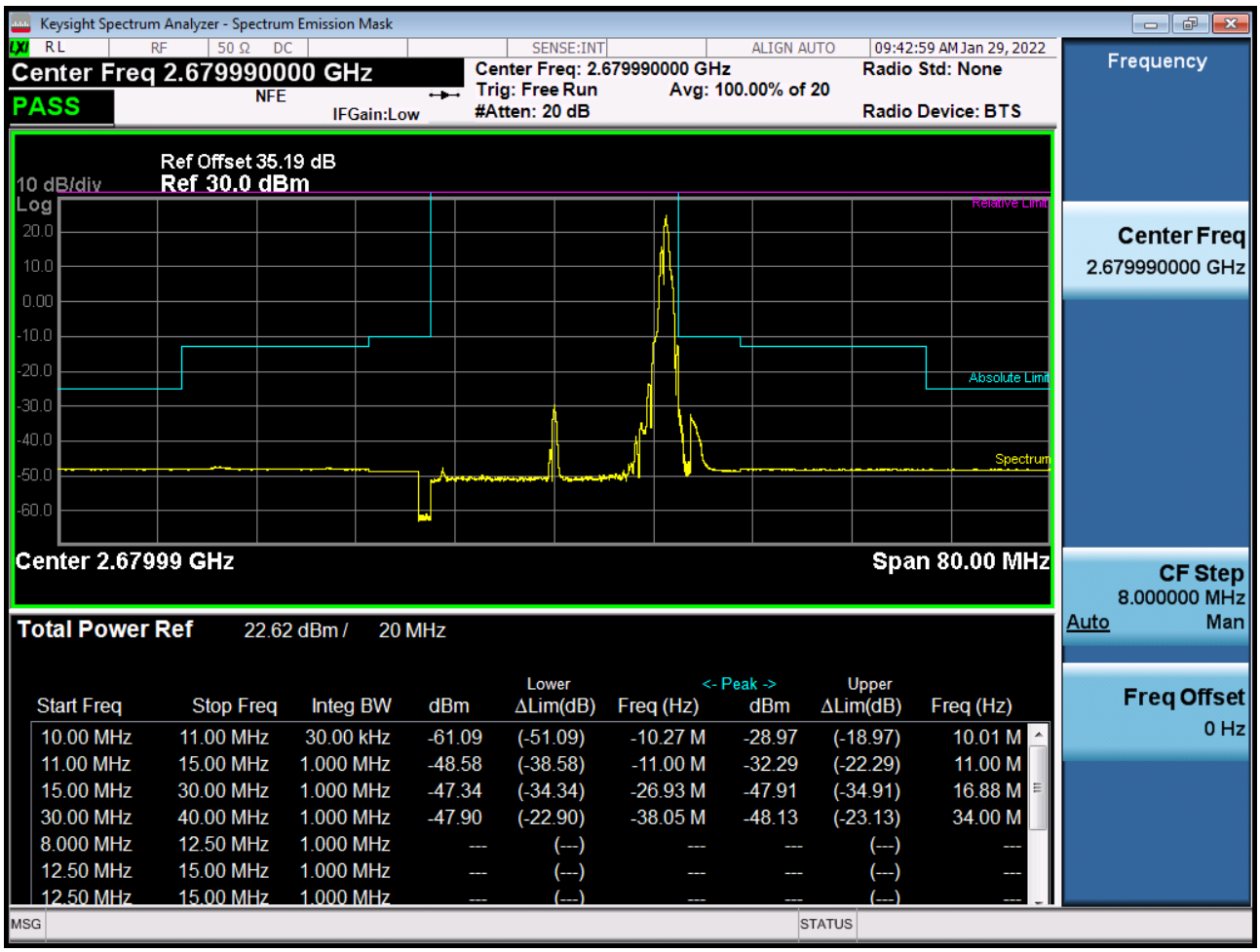
Sub6 n41. Low Channel Edge Plot (20 MHz Ch.501204 BPSK)-2



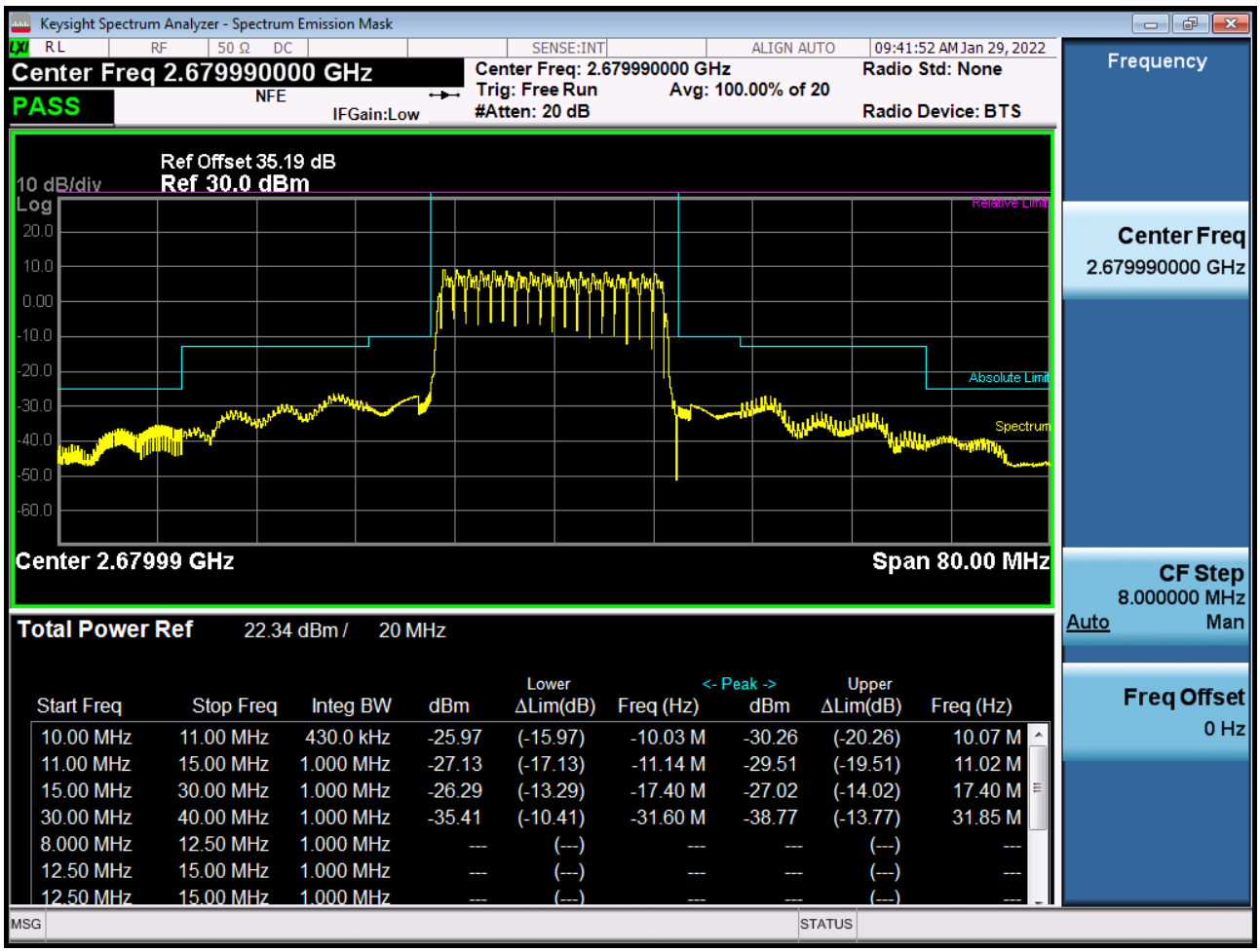
Sub6 n41. Mid Channel Edge Plot (20 MHz Ch.518598 BPSK)



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

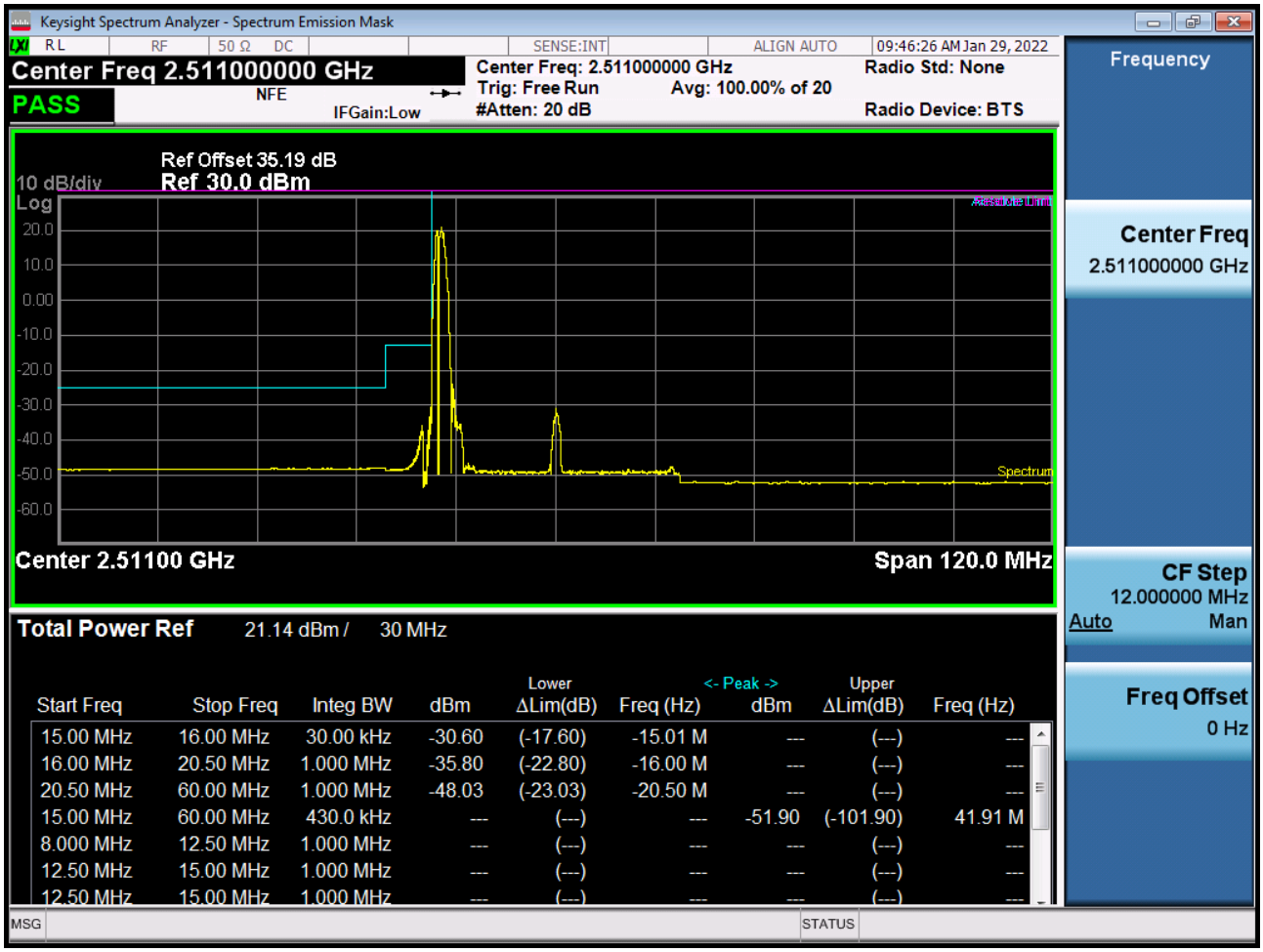


Sub6 n41. High Channel Edge Plot (20 MHz Ch.535998 BPSK)

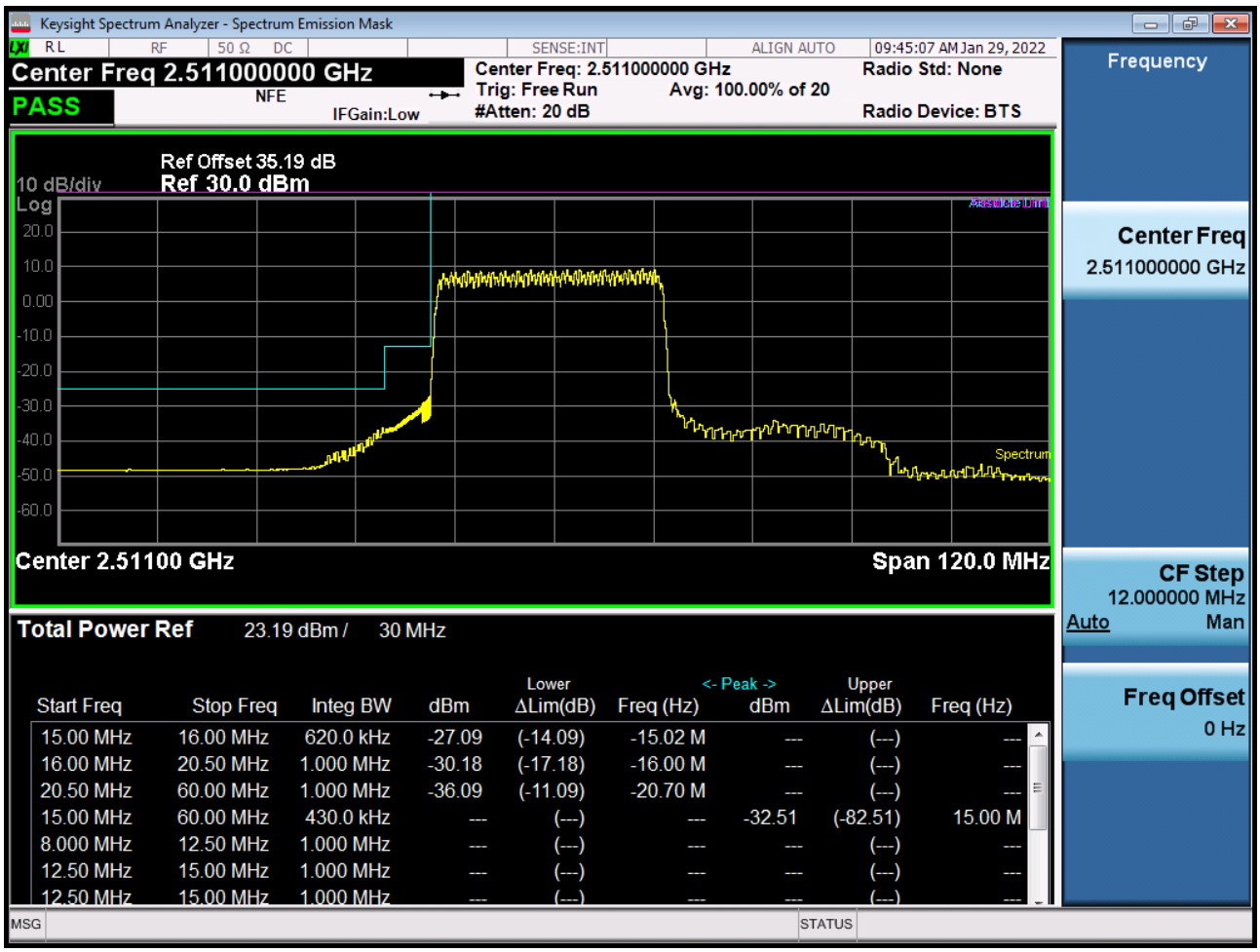


Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
10.00 MHz	11.00 MHz	430.0 kHz	-25.97	(-15.97)	-10.03 M	-30.26	(-20.26)	10.07 M
11.00 MHz	15.00 MHz	1.000 MHz	-27.13	(-17.13)	-11.14 M	-29.51	(-19.51)	11.02 M
15.00 MHz	30.00 MHz	1.000 MHz	-26.29	(-13.29)	-17.40 M	-27.02	(-14.02)	17.40 M
30.00 MHz	40.00 MHz	1.000 MHz	-35.41	(-10.41)	-31.60 M	-38.77	(-13.77)	31.85 M
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

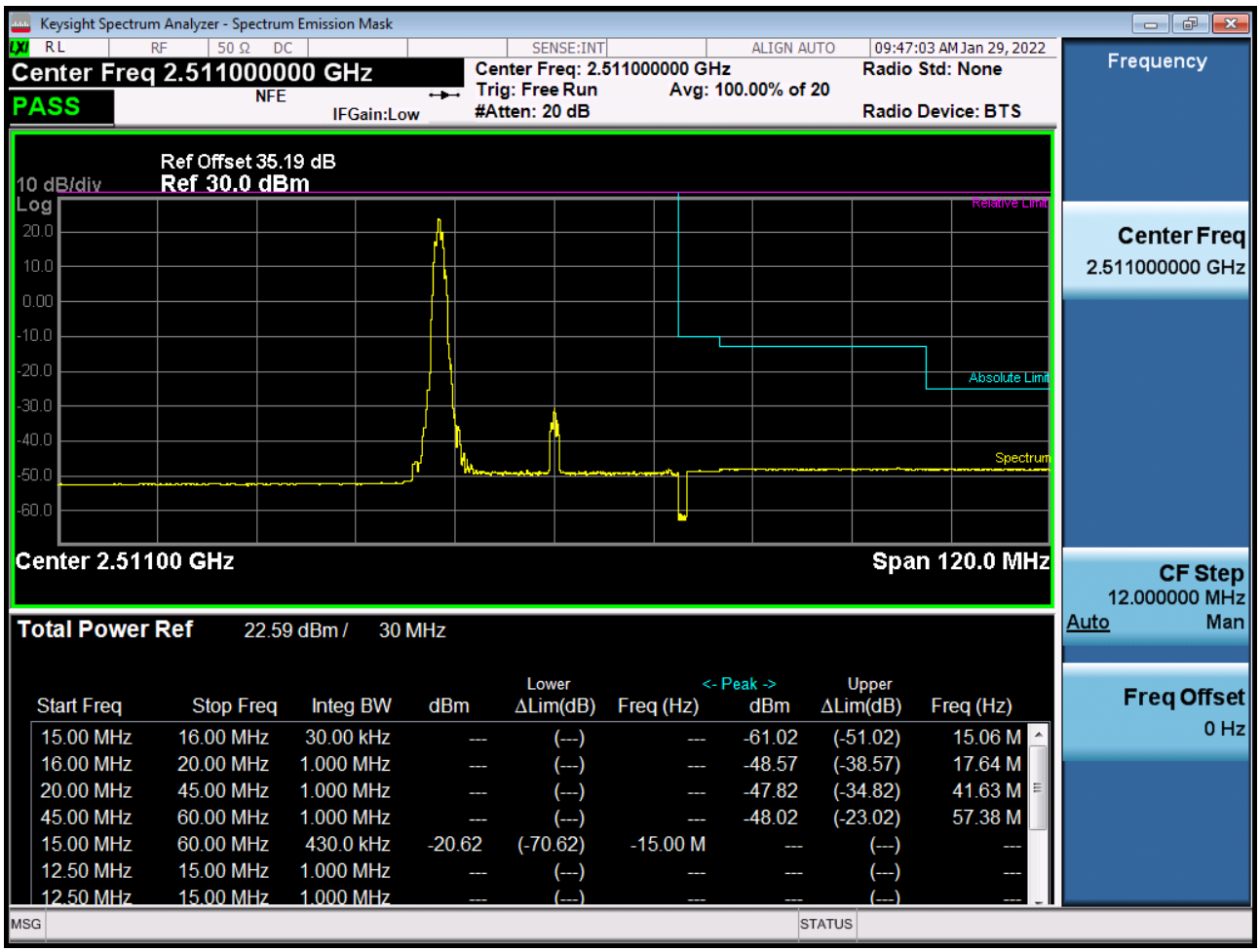
Sub6 n41. Low Channel Edge Plot (30 MHz Ch.502200 BPSK RB 1)-1



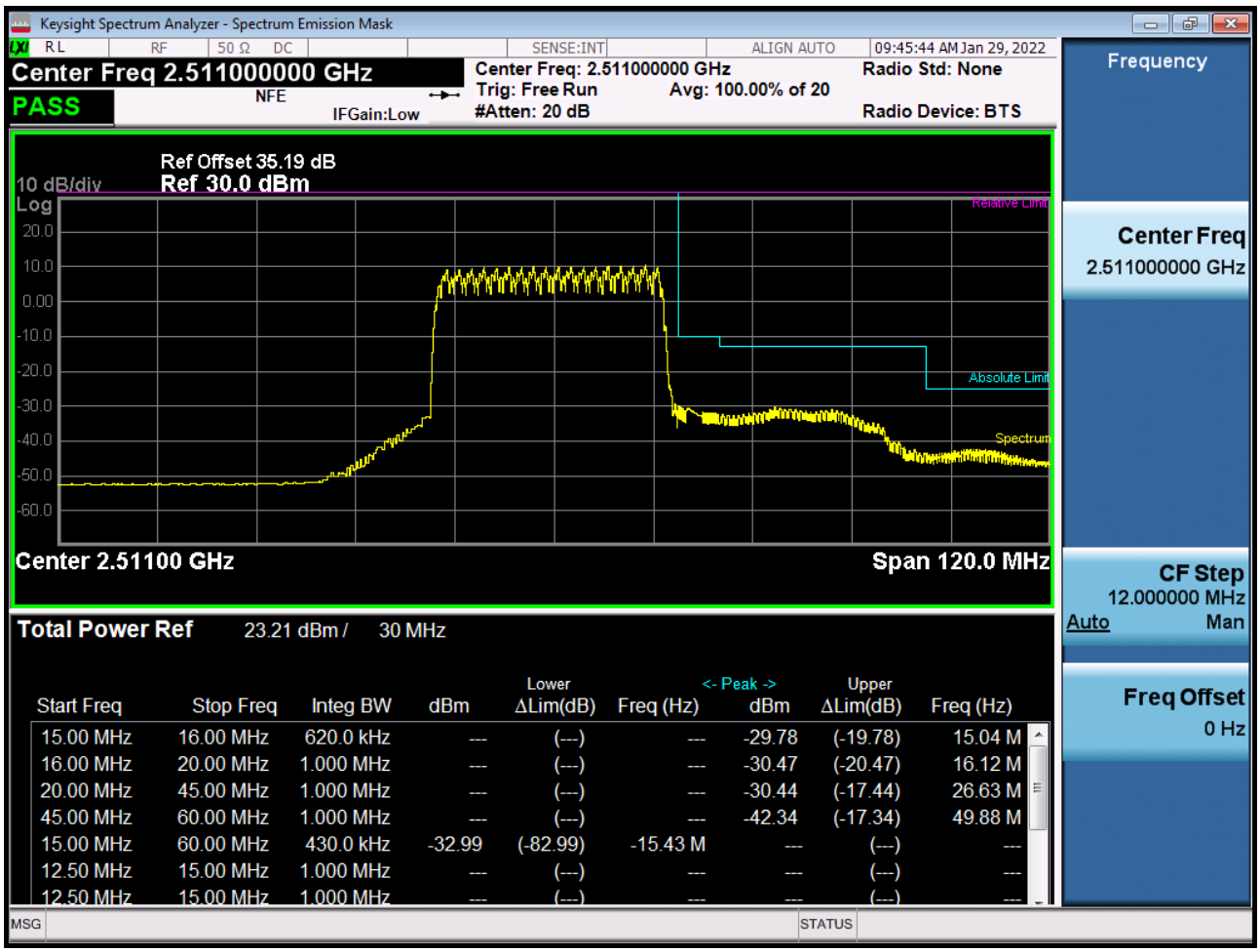
Sub6 n41. Low Channel Edge Plot (30 MHz Ch.502200 BPSK)-1



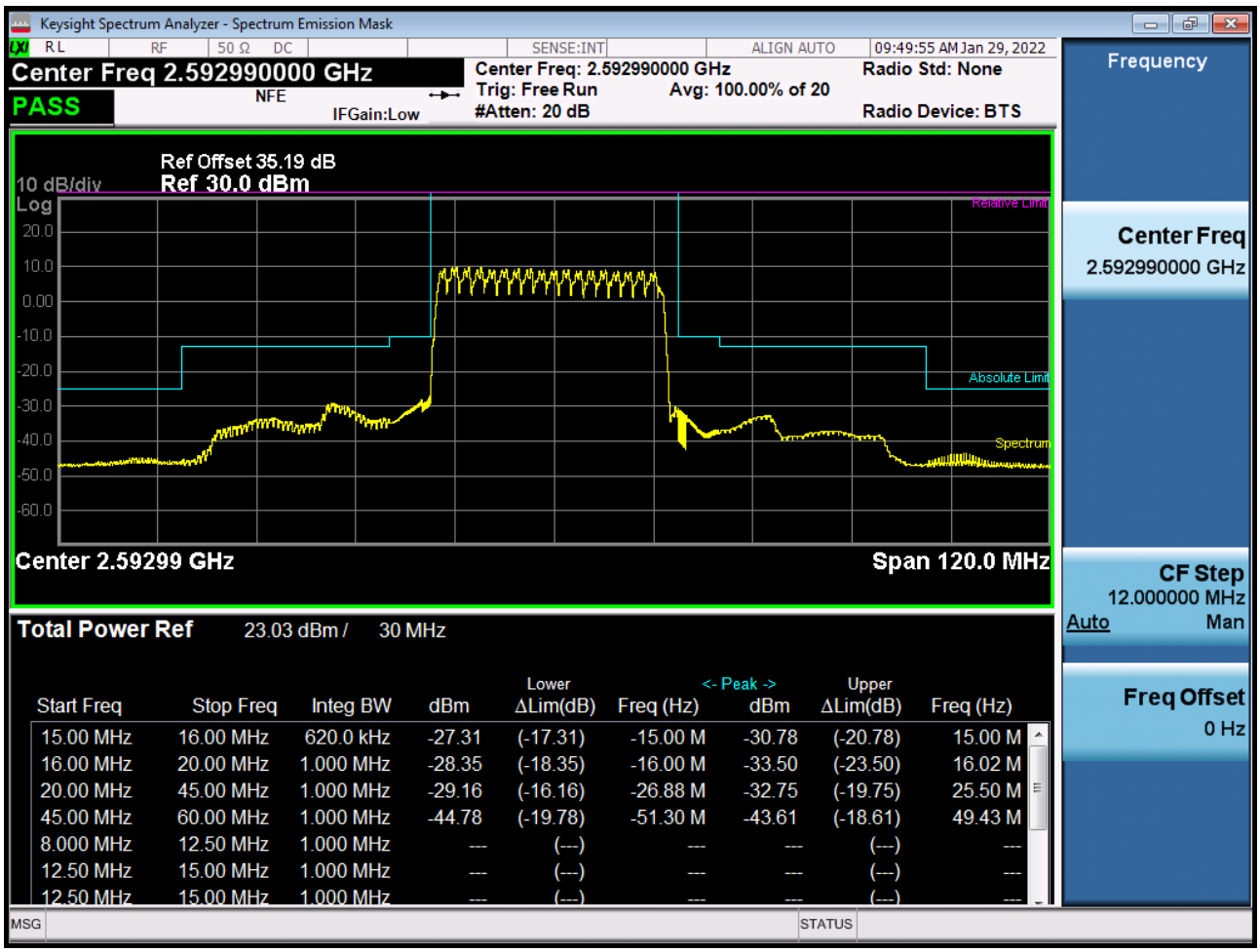
Sub6 n41. Low Channel Edge Plot (30 MHz Ch.502200 BPSK_RB1)-2



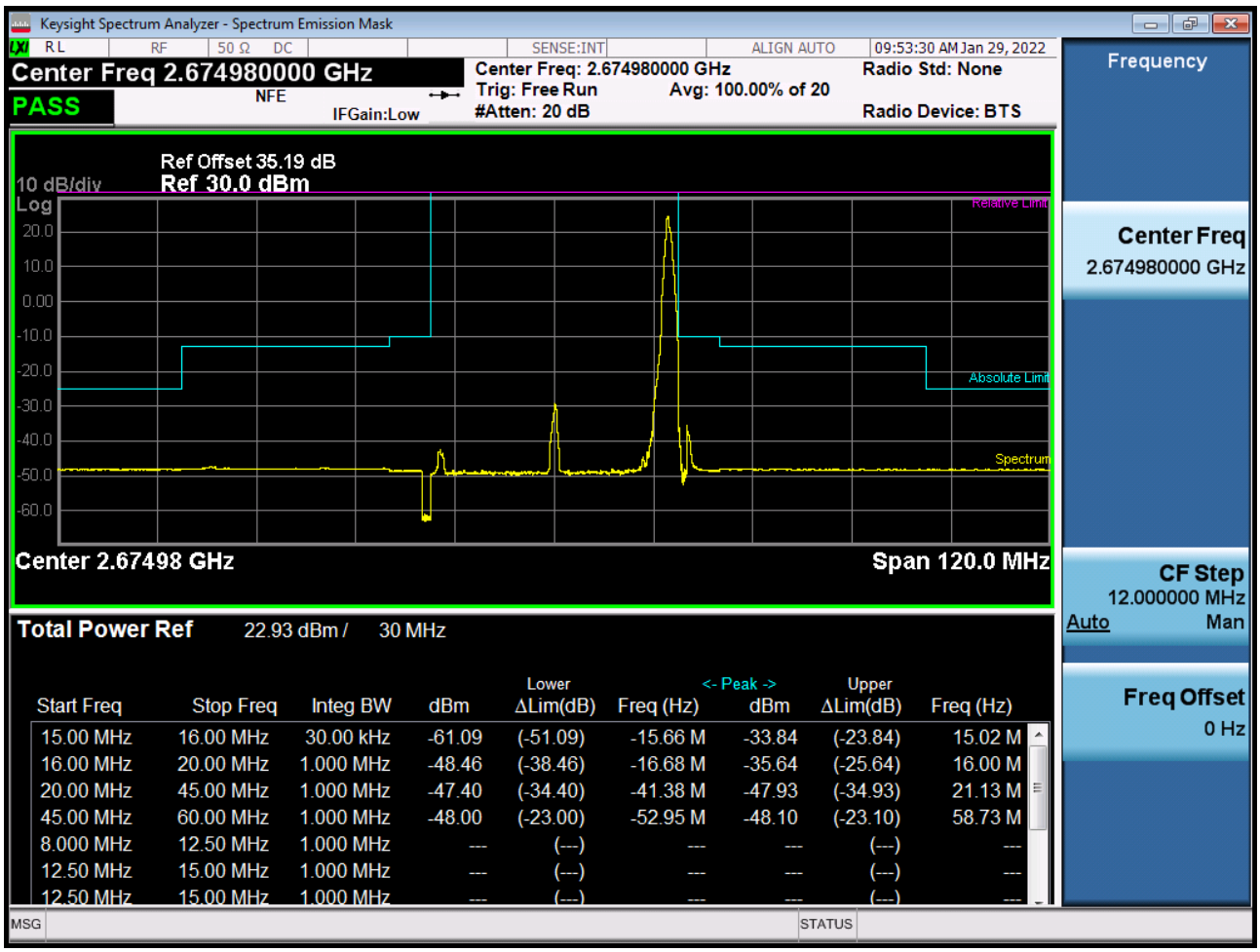
Sub6 n41. Low Channel Edge Plot (30 MHz Ch.502200 BPSK)-2



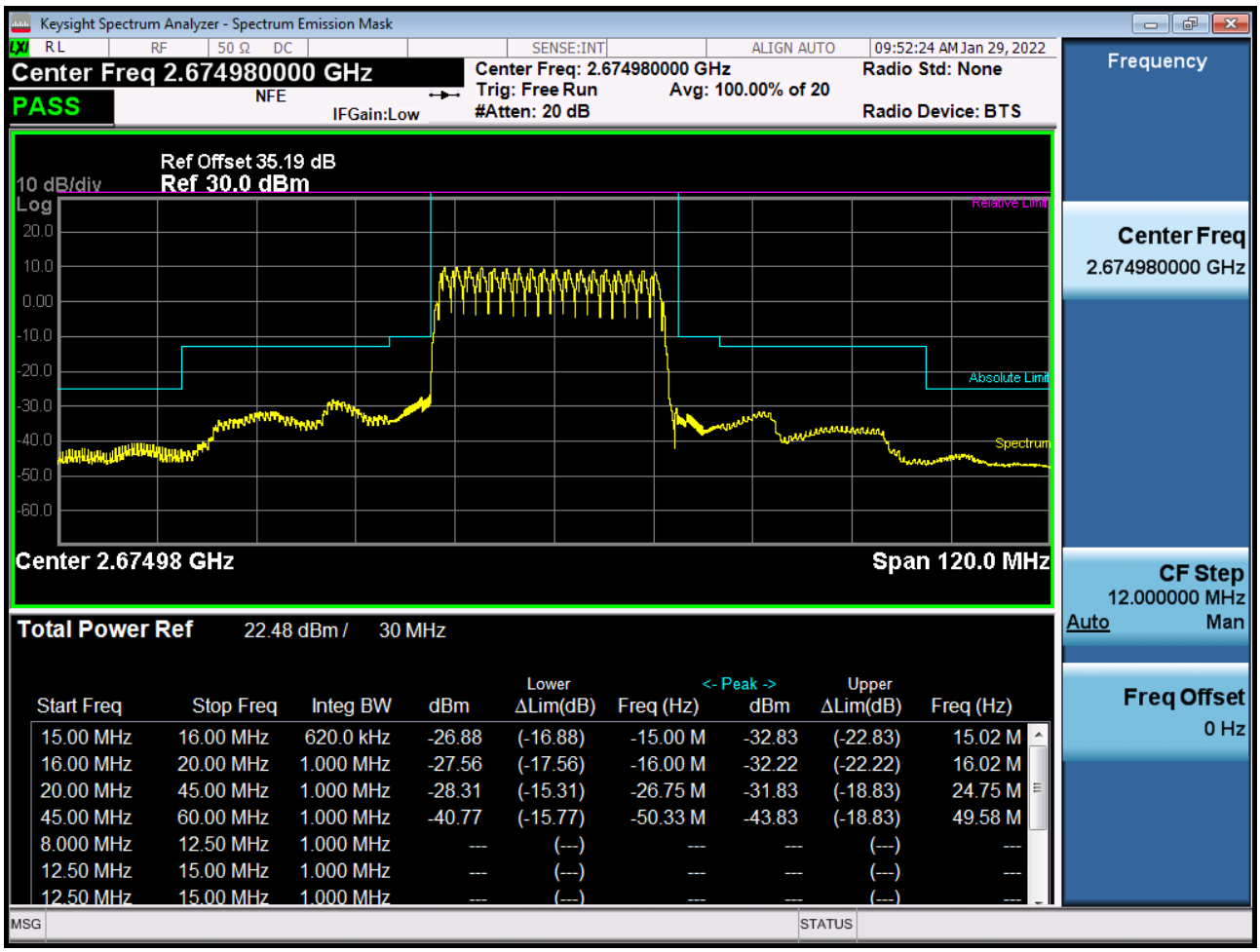
Sub6 n41. Mid Channel Edge Plot (30 MHz Ch.518598 BPSK)



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

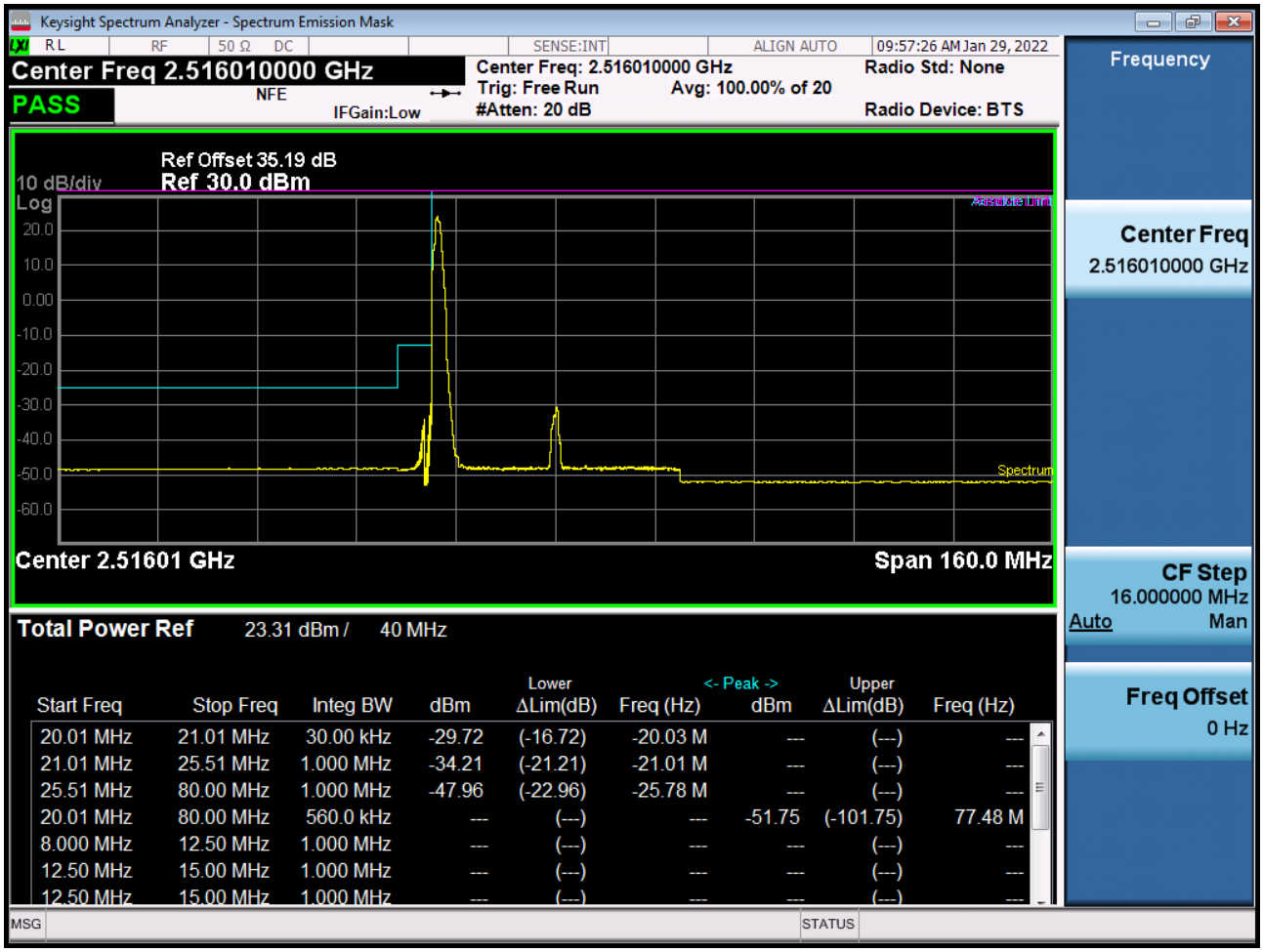


Sub6 n41. High Channel Edge Plot (30 MHz Ch.534996 BPSK)

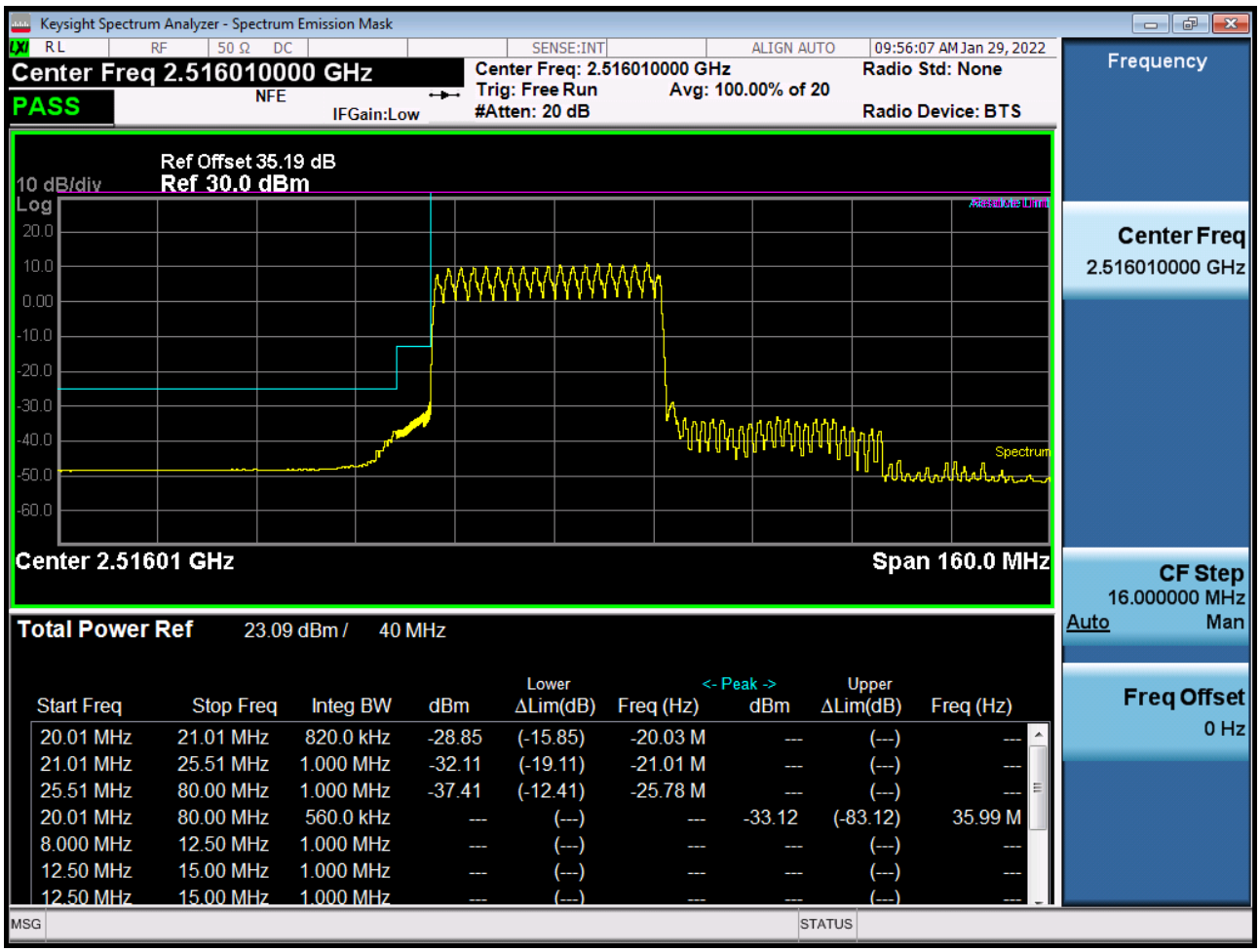


Start Freq	Stop Freq	Integ BW	dBm	Lower ΔLim(dB)	Lower Freq (Hz)	<- Peak -> dBm	Upper ΔLim(dB)	Upper Freq (Hz)
15.00 MHz	16.00 MHz	620.0 kHz	-26.88	(-16.88)	-15.00 M	-32.83	(-22.83)	15.02 M
16.00 MHz	20.00 MHz	1.000 MHz	-27.56	(-17.56)	-16.00 M	-32.22	(-22.22)	16.02 M
20.00 MHz	45.00 MHz	1.000 MHz	-28.31	(-15.31)	-26.75 M	-31.83	(-18.83)	24.75 M
45.00 MHz	60.00 MHz	1.000 MHz	-40.77	(-15.77)	-50.33 M	-43.83	(-18.83)	49.58 M
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

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



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



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