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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:
October 20, 2021

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

Report No.: HCT-RF-2109-FC042

FCC ID:	**A3LSMA136U**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s): SM-A136U
Additional Model(s): SM-A136U1, SM-S136DL
EUT Type: Mobile Phone
FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s): §24, §2

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
Sub6 n25(2) (5)	1852.5 - 1912.5	4M49G7D	PI/2 BPSK	0.182	22.60
		4M49G7D	QPSK	0.181	22.58
		4M51W7D	16QAM	0.145	21.63
		4M49W7D	64QAM	0.102	20.10
		4M57W7D	256QAM	0.061	17.88
Sub6 n25(2) (10)	1855.0 - 1910.0	8M99G7D	PI/2 BPSK	0.168	22.26
		8M97G7D	QPSK	0.168	22.25
		8M95W7D	16QAM	0.133	21.23
		9M00W7D	64QAM	0.095	19.77
		8M98W7D	256QAM	0.056	17.50
Sub6 n25(2) (15)	1857.5 - 1907.5	13M5G7D	PI/2 BPSK	0.186	22.70
		13M5G7D	QPSK	0.185	22.68
		13M5W7D	16QAM	0.146	21.66
		13M5W7D	64QAM	0.106	20.24
		13M4W7D	256QAM	0.062	17.92
Sub6 n25(2) (20)	1860.0 - 1905.0	17M9G7D	PI/2 BPSK	0.167	22.23
		18M0G7D	QPSK	0.167	22.22
		17M9W7D	16QAM	0.131	21.19
		17M9W7D	64QAM	0.094	19.73
		18M0W7D	256QAM	0.055	17.39

The measurements shown in this report were made in accordance with the procedures specified in CFR47 section §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.
HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

REVIEWED BY

Report prepared by : Jae Ryang Do
Engineer of Telecommunication Testing Center

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

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

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

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2109-FC042	October 20, 2021	- First Approval Report

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

Table of Contents

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMA136U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§24, §2
EUT Type:	Mobile Phone
Model(s):	SM-A136U
Additional Model(s):	SM-A136U1, SM-S136DL
SCS(kHz):	15
Bandwidth(MHz):	5, 10, 15, 20
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:	1852.5 MHz – 1912.5 MHz (Sub6 n25(2) (5 MHz)) 1855.0 MHz – 1910.0 MHz (Sub6 n25(2) (10 MHz)) 1857.5 MHz – 1907.5 MHz (Sub6 n25(2) (15 MHz)) 1860.0 MHz – 1905.0 MHz (Sub6 n25(2) (20 MHz))
Date(s) of Tests:	September 13, 2021 ~ October 19, 2021
Serial number:	Radiated: 420015e6dcbb8865 Conducted: R3CR807K62V

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

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- N/A (See SAR Report)
Peak- to- Average Ratio	- KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4 - ANSI C63.26-2015 – Section 5.2.6(only GSM)
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 RADIATED POWER

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-E-2016 Clause 2.2.17.

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5 % of the expected OBW, not to exceed 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 = 100kHz 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;

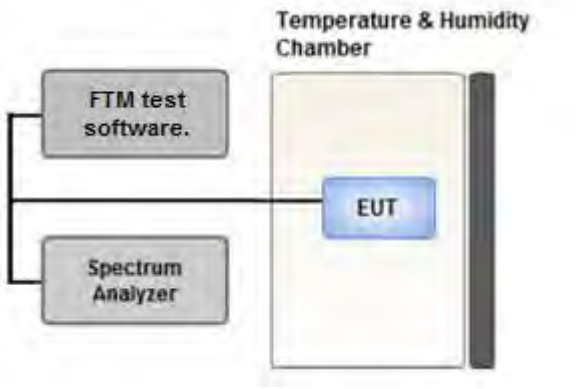
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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:

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

Test Settings(Peak Power)

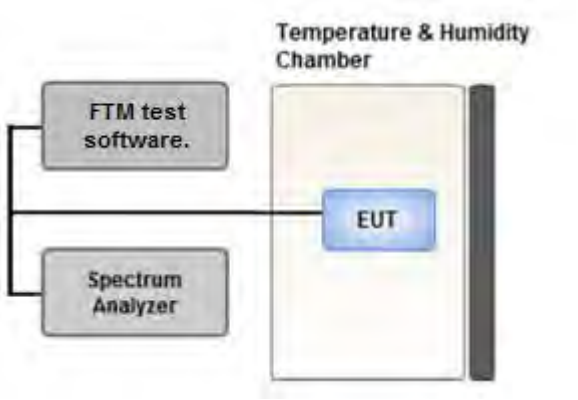
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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.

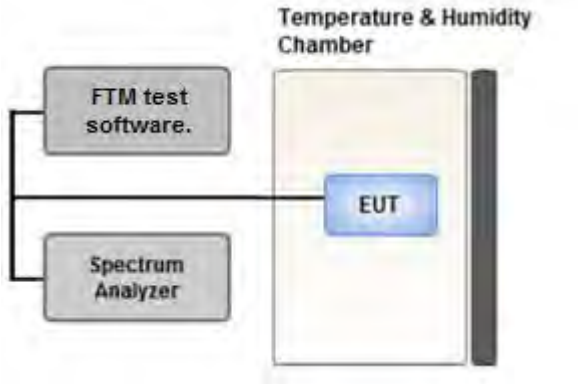
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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 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.

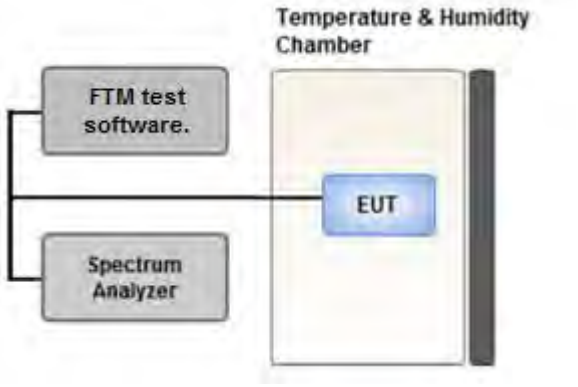
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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 BAND EDGE



Test setup

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum 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. RBW > 1 % of the emission bandwidth
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

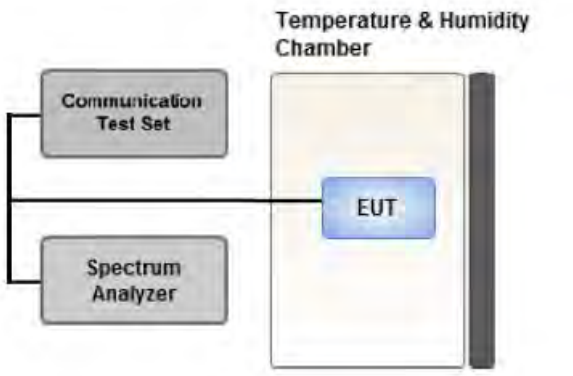
Test Notes

According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

All measurements were done at 2 channels(low and high operational frequency range.)

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)
- NR BAND 25 (1850 – 1915 MHz) overlaps the entire frequency range of NR BAND 2 (1850 - 1910 MHz) and they have the same Tune-up power. Therefore, test data provided in this report covers NR BAND 2 as well as NR BAND 25.
- 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: SA, NSA
  Worst case: SA
- 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: 12A-n25A(BW 15 MHz))
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-A136U & additional models were tested and the worst case results are reported.
  (Worst case : SM-A136U)

[Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	1	1	X
Radiated Spurious and Harmonic Emissions	QPSK	1	1	X

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)
- NR BAND 25 (1850 – 1915 MHz) overlaps the entire frequency range of NR BAND 2 (1850 - 1910 MHz) and they have the same Tune-up power. Therefore, test data provided in this report covers NR BAND 2 as well as NR BAND 25.
- All modes of operation were investigated and the worst case configuration results are reported.
  Mode: SA, NSA
  Worst case: SA
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-A136U & additional models were tested and the worst case results are reported.
  (Worst case : SM-A136U)

[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	5, 10, 15, 20	Mid	Full RB	0
Band Edge	PI/2 BPSK	5	Low	1	0
			High	1	24
		10	Low	1	0
			High	1	51
		15	Low	1	0
			High	1	78
		20	Low	1	0
			High	1	105
		5, 10, 15, 20	Low, High	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	PI/2 BPSK	5, 10, 15, 20	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	02/11/2022	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	12/04/2021	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.	6262116770	07/12/2022	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6201026545	01/07/2022	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
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, §24.238(a)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§2.1046	N/A	**See Note1**
Peak- to- Average Ratio	§24.232(d)	< 13 dB	PASS
Frequency stability / variation of ambient temperature	§24.235	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	§24.232(c)	< 2 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §24.238(a)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

Note:

1. Radiateded tests were tested using 5G Wireless Tester

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

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

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

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

3) Record the field strength meter's level.

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

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

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

7.2 EIRP Sample Calculation

Ch./ Freq.		Measured Level(dBm)	Substitute Level(dBm)	Ant. Gain (dBi)	C.L	Pol.	EIRP	
channel	Freq.(MHz)						W	dBm
349000	1,732.50	-15.75	18.45	9.90	1.76	H	0.456	26.59

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

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

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

3) Record the field strength meter's level.

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

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

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

7.3. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

8. TEST DATA

8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1852.5	Sub6 n25(2)/ 5 MHz [15 kHz]	PI/2 BPSK	-20.10	13.62	10.10	2.15	H	< 2.00	0.143	21.57
		QPSK	-20.13	13.59	10.10	2.15	H		0.142	21.54
		16-QAM	-21.12	12.60	10.10	2.15	H		0.113	20.55
		64-QAM	-22.55	11.17	10.10	2.15	H		0.082	19.12
		256-QAM	-24.88	8.84	10.10	2.15	H		0.048	16.79
1882.5		PI/2 BPSK	-18.99	14.20	9.98	2.25	H		0.156	21.93
		QPSK	-19.02	14.17	9.98	2.25	H		0.155	21.90
		16-QAM	-20.21	12.98	9.98	2.25	H		0.118	20.71
		64-QAM	-21.68	11.51	9.98	2.25	H		0.084	19.24
		256-QAM	-23.82	9.37	9.98	2.25	H		0.051	17.10
1912.5		PI/2 BPSK	-18.90	14.89	9.88	2.17	H		0.182	22.60
		QPSK	-18.92	14.87	9.88	2.17	H		0.181	22.58
		16-QAM	-19.87	13.92	9.88	2.17	H		0.145	21.63
		64-QAM	-21.40	12.39	9.88	2.17	H		0.102	20.10
		256-QAM	-23.62	10.17	9.88	2.17	H		0.061	17.88

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1855.0	Sub6 n25(2)/ 10 MHz [15 kHz]	PI/2 BPSK	-20.35	13.06	10.08	2.17	H	< 2.00	0.125	20.97
		QPSK	-20.36	13.05	10.08	2.17	H		0.125	20.96
		16-QAM	-21.33	12.08	10.08	2.17	H		0.100	19.99
		64-QAM	-22.82	10.59	10.08	2.17	H		0.071	18.50
		256-QAM	-25.14	8.27	10.08	2.17	H		0.041	16.18
1882.5		PI/2 BPSK	-19.52	13.67	9.98	2.25	H		0.138	21.40
		QPSK	-19.53	13.66	9.98	2.25	H		0.138	21.39
		16-QAM	-20.41	12.78	9.98	2.25	H		0.112	20.51
		64-QAM	-21.95	11.24	9.98	2.25	H		0.079	18.97
		256-QAM	-24.20	8.99	9.98	2.25	H		0.047	16.72
1910.0		PI/2 BPSK	-19.24	14.54	9.89	2.17	H		0.168	22.26
		QPSK	-19.25	14.53	9.89	2.17	H		0.168	22.25
		16-QAM	-20.27	13.51	9.89	2.17	H		0.133	21.23
		64-QAM	-21.73	12.05	9.89	2.17	H		0.095	19.77
		256-QAM	-24.00	9.78	9.89	2.17	H		0.056	17.50

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1857.5	Sub6 n25(2)/ 15 MHz [15 kHz]	PI/2 BPSK	-20.20	12.89	10.06	2.19	H	< 2.00	0.119	20.76
		QPSK	-20.21	12.88	10.06	2.19	H		0.119	20.75
		16-QAM	-21.22	11.87	10.06	2.19	H		0.094	19.74
		64-QAM	-22.66	10.43	10.06	2.19	H		0.068	18.30
		256-QAM	-25.02	8.07	10.06	2.19	H		0.039	15.94
1882.5		PI/2 BPSK	-19.52	13.67	9.98	2.25	H		0.138	21.40
		QPSK	-19.54	13.65	9.98	2.25	H		0.137	21.38
		16-QAM	-20.52	12.67	9.98	2.25	H		0.110	20.40
		64-QAM	-21.97	11.22	9.98	2.25	H		0.079	18.95
		256-QAM	-24.29	8.90	9.98	2.25	H		0.046	16.63
1907.5		PI/2 BPSK	-18.80	14.97	9.90	2.17	H		0.186	22.70
		QPSK	-18.82	14.95	9.90	2.17	H		0.185	22.68
		16-QAM	-19.84	13.93	9.90	2.17	H		0.146	21.66
		64-QAM	-21.26	12.51	9.90	2.17	H		0.106	20.24
		256-QAM	-23.58	10.19	9.90	2.17	H		0.062	17.92

Freq (MHz)	Mod/ Bandwidth [SCS (kHz)]	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1860.0	Sub6 n25(2)/ 20 MHz [15 kHz]	PI/2 BPSK	-20.22	12.87	10.06	2.19	H	< 2.00	0.119	20.74
		QPSK	-20.25	12.84	10.06	2.19	H		0.118	20.71
		16-QAM	-21.22	11.87	10.06	2.19	H		0.094	19.74
		64-QAM	-22.70	10.39	10.06	2.19	H		0.067	18.26
		256-QAM	-25.03	8.06	10.06	2.19	H		0.039	15.93
1882.5		PI/2 BPSK	-19.58	13.61	9.98	2.25	H		0.136	21.34
		QPSK	-19.61	13.58	9.98	2.25	H		0.135	21.31
		16-QAM	-20.56	12.63	9.98	2.25	H		0.109	20.36
		64-QAM	-22.04	11.15	9.98	2.25	H		0.077	18.88
		256-QAM	-24.33	8.86	9.98	2.25	H		0.046	16.59
1905.0		PI/2 BPSK	-19.19	14.52	9.89	2.19	H		0.167	22.23
		QPSK	-19.20	14.51	9.89	2.19	H		0.167	22.22
		16-QAM	-20.23	13.48	9.89	2.19	H		0.131	21.19
		64-QAM	-21.69	12.02	9.89	2.19	H		0.094	19.73
		256-QAM	-24.03	9.68	9.89	2.19	H		0.055	17.39

8.2 RADIATED SPURIOUS EMISSIONS

▣ NR Band: N25(2)
▣ Bandwidth: 15 MHz
▣ Modulation: PI/2 BPSK
▣ Distance: 3 meters
▣ SCS: 15 kHz

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
371500 (1857.5)	3 715.00	-59.03	11.70	-59.34	3.18	H	-50.82	-13.00
	5 572.50	-60.34	12.06	-54.66	3.95	H	-46.55	-13.00
	7 430.00	-63.97	11.32	-49.65	4.46	H	-42.79	-13.00
	9 287.50	-61.50	11.36	-46.90	5.09	H	-40.63	-13.00
	11 145.00	-63.28	12.30	-44.84	5.66	H	-38.19	-13.00
376500 (1882.5)	3 765.00	-59.94	11.61	-59.94	3.16	H	-51.48	-13.00
	5 647.50	-59.43	12.00	-53.58	3.94	H	-45.52	-13.00
	7 530.00	-63.72	11.56	-49.91	4.54	H	-42.89	-13.00
	9 412.50	-60.27	11.20	-45.17	5.17	H	-39.14	-13.00
	11 295.00	-64.14	12.11	-45.37	5.68	H	-38.94	-13.00
381500 (1907.5)	3 815.00	-59.40	11.34	-59.39	3.17	H	-51.22	-13.00
	5 722.50	-61.32	11.76	-55.83	3.94	H	-48.01	-13.00
	7 630.00	-62.55	11.60	-48.20	4.55	H	-41.15	-13.00
	9 537.50	-62.38	11.28	-46.49	5.14	H	-40.35	-13.00
	11 445.00	-63.52	12.30	-43.67	5.78	H	-37.15	-13.00

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

(Worst case: 12A-n25A(15 MHz))

▣ NR Band: N25(2)

▣ LTE Band(Anchor): B12

▣ Bandwidth: 15 MHz

▣ Modulation: PI/2 BPSK

▣ Distance: 3 meters

▣ SCS: 15 kHz

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
23095 (707.5)	1,415.00	-56.49	7.63	-63.14	1.87	H	-57.37	-13.00
	2,122.50	-60.11	8.98	-65.93	2.31	H	-59.26	-13.00
	2,830.00	-59.04	10.52	-63.05	2.73	V	-55.26	-13.00

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Sub6 n25(2)	5 MHz	1882.5	BPSK	25	0	4.19
			QPSK			5.29
			16-QAM			6.06
			64-QAM			6.14
			256-QAM			6.26
	10 MHz		BPSK	50		4.13
			QPSK			5.31
			16-QAM			5.97
			64-QAM			6.19
			256-QAM			6.32
	15 MHz		BPSK	75		4.13
			QPSK			5.18
			16-QAM			5.84
			64-QAM			6.14
			256-QAM			6.34
	20 MHz		BPSK	100		4.03
			QPSK			5.11
			16-QAM			5.88
			64-QAM			6.21
			256-QAM			6.31

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 57 ~ 76.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Sub6 n25(2)	5 MHz	1882.5	BPSK	25	0	4.4862
			QPSK			4.4871
			16-QAM			4.5050
			64-QAM			4.4856
			256-QAM			4.5711
	10 MHz		BPSK	52		8.9944
			QPSK			8.9707
			16-QAM			8.9478
			64-QAM			8.9997
			256-QAM			8.9800
	15 MHz		BPSK	79		13.478
			QPSK			13.498
			16-QAM			13.451
			64-QAM			13.451
			256-QAM			13.434
	20 MHz		BPSK	106		17.943
			QPSK			17.990
			16-QAM			17.918
			64-QAM			17.912
			256-QAM			17.974

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 37 ~ 56.

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 n25(2)	5	1852.5	5.9916	30.815	-70.646	-39.831	-13.00
		1882.5	4.0200	30.200	-70.180	-39.980	
		1912.5	6.0459	30.815	-70.617	-39.802	
	10	1855.0	6.0215	30.815	-68.828	-38.013	
		1882.5	3.0629	30.200	-67.680	-37.480	
		1910.0	8.2916	30.815	-70.804	-39.989	
	15	1857.5	9.1610	30.815	-70.863	-40.048	
		1882.5	4.0664	30.200	-69.428	-39.228	
		1907.5	3.8201	30.200	-70.018	-39.818	
	20	1860.0	3.8007	30.200	-70.587	-40.387	
		1882.5	9.6501	30.815	-69.916	-39.101	
		1905.0	5.2219	30.815	-70.103	-39.288	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 101 ~ 124.
2. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
3. Factor(dB) = Cable Loss + Attenuator

Frequency Range (GHz)	Factor [dB]
0.03 – 1	27.494
1 – 5	30.200
5 – 10	30.815
10 – 15	31.340
15 – 20	31.713
Above 20(26.5)	32.355

8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 77 ~ 100.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ BandWidth: 5 MHz

▣ Voltage(100 %): 3.850 VDC

▣ Batt. Endpoint: 3.400 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
1852.5	100 %	+20(Ref)	1852 500 008	0.0	0.000 000	0.000
	100 %	-30	1852 500 023	15.5	0.000 001	0.008
	100 %	-20	1852 500 025	16.8	0.000 001	0.009
	100 %	-10	1852 500 024	16.4	0.000 001	0.009
	100 %	0	1852 500 017	8.9	0.000 000	0.005
	100 %	+10	1852 500 023	15.4	0.000 001	0.008
	100 %	+30	1852 500 017	9.4	0.000 001	0.005
	100 %	+40	1852 500 022	13.8	0.000 001	0.007
	100 %	+50	1852 500 016	8.6	0.000 000	0.005
	Batt. Endpoint	+20	1852 500 016	8.4	0.000 000	0.005
1912.5	100 %	+20(Ref)	1912 500 012	0.0	0.000 000	0.000
	100 %	-30	1912 500 020	7.6	0.000 000	0.004
	100 %	-20	1912 500 017	5.2	0.000 000	0.003
	100 %	-10	1912 500 024	12.5	0.000 001	0.007
	100 %	0	1912 500 019	7.5	0.000 000	0.004
	100 %	+10	1912 500 023	11.5	0.000 001	0.006
	100 %	+30	1912 500 016	4.3	0.000 000	0.002
	100 %	+40	1912 500 017	5.4	0.000 000	0.003
	100 %	+50	1912 500 016	4.1	0.000 000	0.002
	Batt. Endpoint	+20	1912 500 017	5.3	0.000 000	0.003

▣ BandWidth: 10 MHz

▣ Voltage(100 %): 3.850 VDC

▣ Batt. Endpoint: 3.400 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
1855.0	100 %	+20(Ref)	1855 000 008	0.0	0.000 000	0.000
	100 %	-30	1855 000 019	11.9	0.000 001	0.006
	100 %	-20	1855 000 021	13.8	0.000 001	0.007
	100 %	-10	1855 000 015	8.0	0.000 000	0.004
	100 %	0	1855 000 017	9.2	0.000 000	0.005
	100 %	+10	1855 000 021	13.3	0.000 001	0.007
	100 %	+30	1855 000 016	8.4	0.000 000	0.005
	100 %	+40	1855 000 021	13.4	0.000 001	0.007
	100 %	+50	1855 000 020	12.4	0.000 001	0.007
	Batt. Endpoint	+20	1855 000 020	12.1	0.000 001	0.007
1910.0	100 %	+20(Ref)	1910 000 011	0.0	0.000 000	0.000
	100 %	-30	1910 000 019	8.3	0.000 000	0.004
	100 %	-20	1910 000 020	8.6	0.000 000	0.004
	100 %	-10	1910 000 015	4.4	0.000 000	0.002
	100 %	0	1910 000 026	15.2	0.000 001	0.008
	100 %	+10	1910 000 027	16.2	0.000 001	0.008
	100 %	+30	1910 000 015	4.0	0.000 000	0.002
	100 %	+40	1910 000 024	12.7	0.000 001	0.007
	100 %	+50	1910 000 016	4.7	0.000 000	0.002
	Batt. Endpoint	+20	1910 000 020	9.5	0.000 000	0.005

▣ BandWidth: 15 MHz

▣ Voltage(100 %): 3.850 VDC

▣ Batt. Endpoint: 3.400 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
1857.5	100 %	+20(Ref)	1857 500 010	0.0	0.000 000	0.000
	100 %	-30	1857 500 025	15.1	0.000 001	0.008
	100 %	-20	1857 500 027	16.8	0.000 001	0.009
	100 %	-10	1857 500 021	11.5	0.000 001	0.006
	100 %	0	1857 500 018	7.5	0.000 000	0.004
	100 %	+10	1857 500 017	7.0	0.000 000	0.004
	100 %	+30	1857 500 014	3.8	0.000 000	0.002
	100 %	+40	1857 500 015	5.2	0.000 000	0.003
	100 %	+50	1857 500 026	15.9	0.000 001	0.009
	Batt. Endpoint	+20	1857 500 015	4.7	0.000 000	0.003
1907.5	100 %	+20(Ref)	1907 500 011	0.0	0.000 000	0.000
	100 %	-30	1907 500 026	14.6	0.000 001	0.008
	100 %	-20	1907 500 019	8.4	0.000 000	0.004
	100 %	-10	1907 500 026	15.2	0.000 001	0.008
	100 %	0	1907 500 016	5.0	0.000 000	0.003
	100 %	+10	1907 500 027	16.1	0.000 001	0.008
	100 %	+30	1907 500 026	15.1	0.000 001	0.008
	100 %	+40	1907 500 018	6.9	0.000 000	0.004
	100 %	+50	1907 500 021	9.5	0.000 000	0.005
	Batt. Endpoint	+20	1907 500 015	4.0	0.000 000	0.002

▣ BandWidth: 20 MHz

▣ Voltage(100 %): 3.850 VDC

▣ Batt. Endpoint: 3.400 VDC

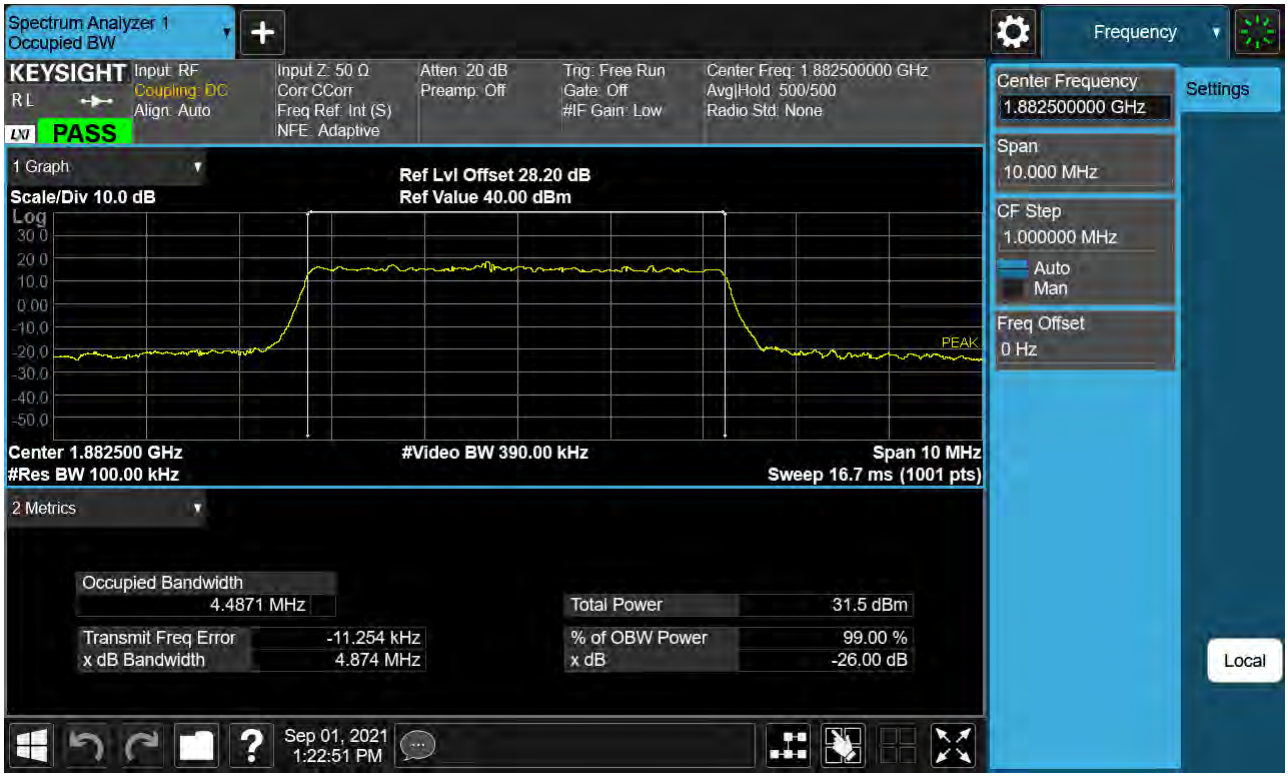
▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
1860.0	100 %	+20(Ref)	1860 000 016	0.0	0.000 000	0.000
	100 %	-30	1860 000 020	3.4	0.000 000	0.002
	100 %	-20	1860 000 028	11.1	0.000 001	0.006
	100 %	-10	1860 000 024	7.6	0.000 000	0.004
	100 %	0	1860 000 024	7.8	0.000 000	0.004
	100 %	+10	1860 000 029	12.5	0.000 001	0.007
	100 %	+30	1860 000 026	9.7	0.000 001	0.005
	100 %	+40	1860 000 022	5.9	0.000 000	0.003
	100 %	+50	1860 000 026	9.3	0.000 001	0.005
	Batt. Endpoint	+20	1860 000 028	11.1	0.000 001	0.006
1905.0	100 %	+20(Ref)	1905 000 013	0.0	0.000 000	0.000
	100 %	-30	1905 000 027	14.3	0.000 001	0.008
	100 %	-20	1905 000 020	7.4	0.000 000	0.004
	100 %	-10	1905 000 019	5.6	0.000 000	0.003
	100 %	0	1905 000 028	14.5	0.000 001	0.008
	100 %	+10	1905 000 021	7.9	0.000 000	0.004
	100 %	+30	1905 000 021	7.6	0.000 000	0.004
	100 %	+40	1905 000 024	11.1	0.000 001	0.006
	100 %	+50	1905 000 018	4.5	0.000 000	0.002
	Batt. Endpoint	+20	1905 000 025	12.2	0.000 001	0.006

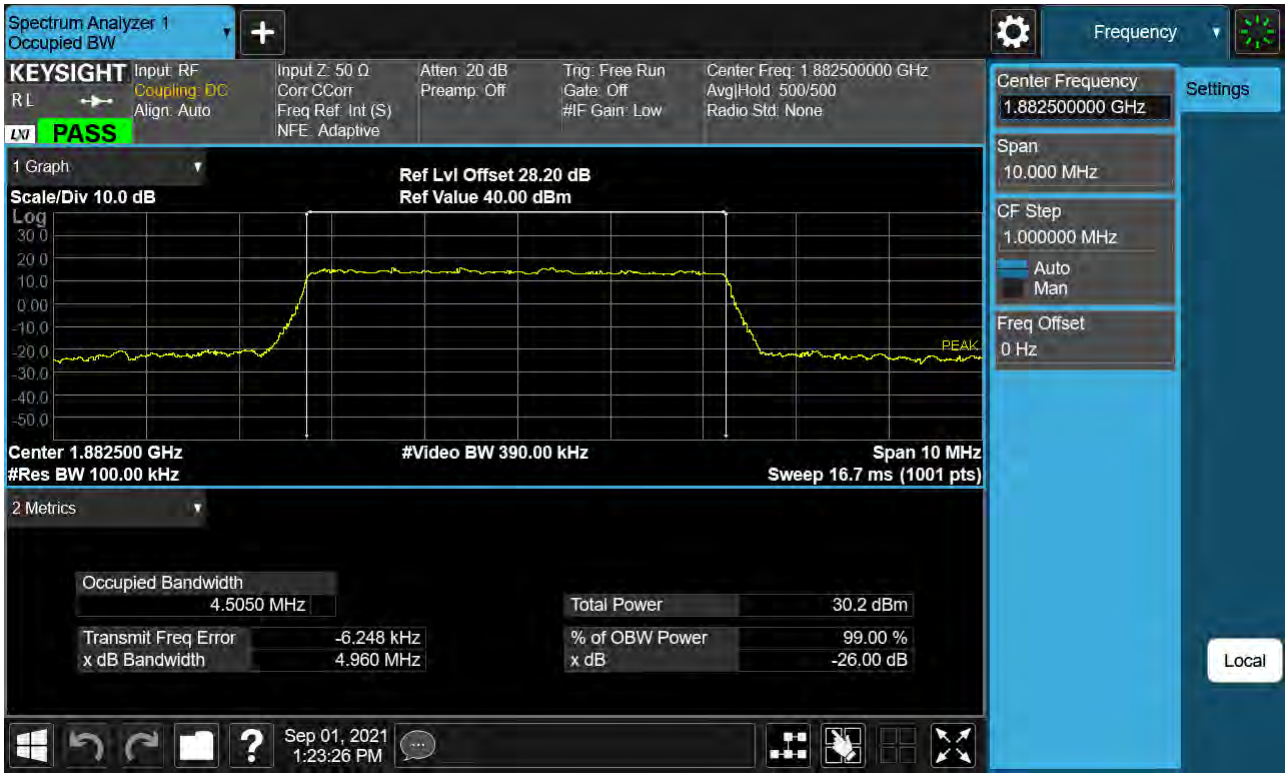
9. TEST PLOTS

Sub6 n25(2). Occupied Bandwidth Plot (5 M BW Ch.376500 BPSK_ Full RB _0)

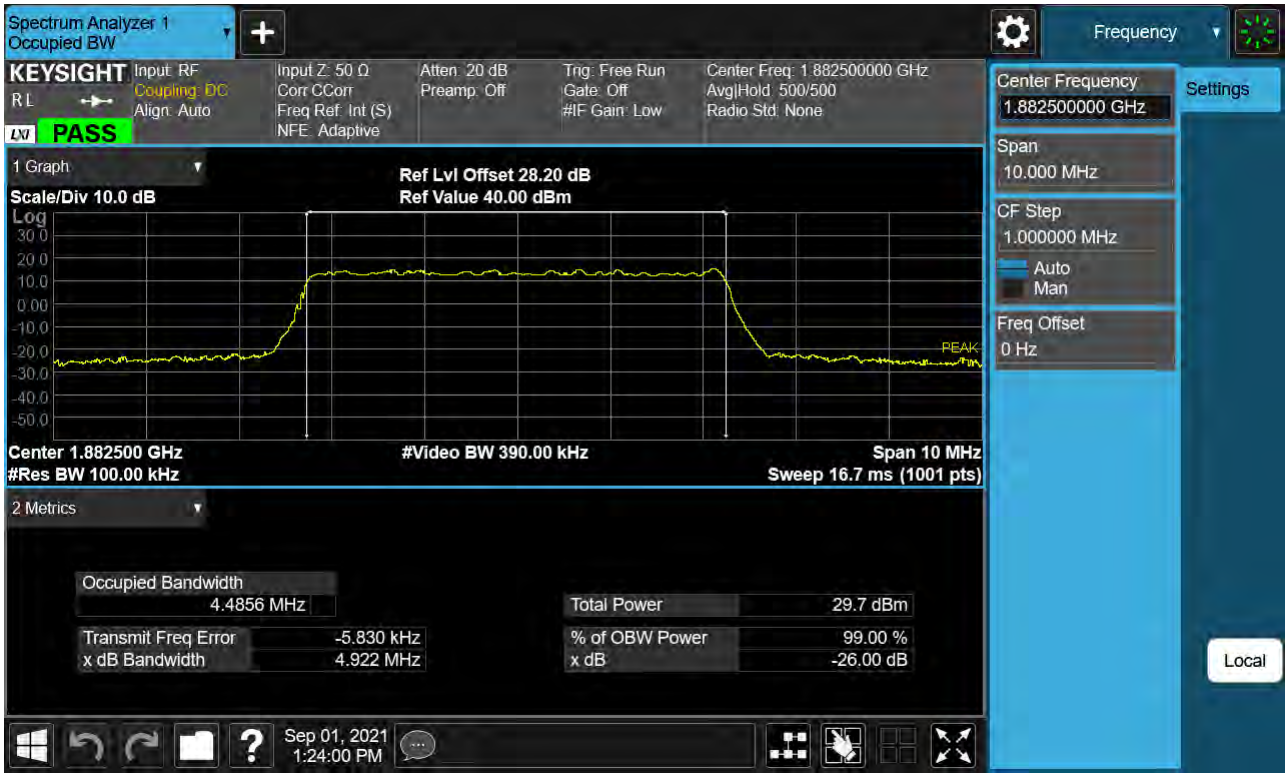
Sub6 n25(2). Occupied Bandwidth Plot (5 M BW Ch.376500 QPSK_ Full RB _0)



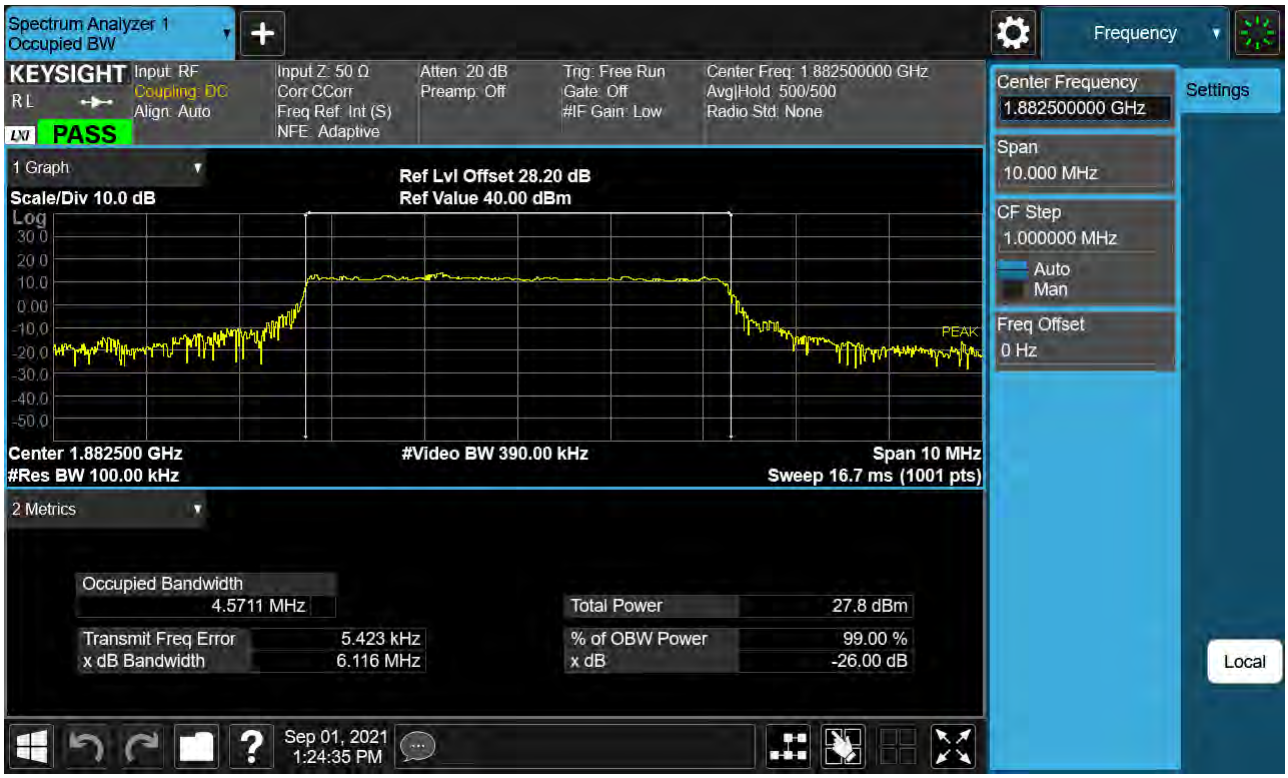
Sub6 n25(2). Occupied Bandwidth Plot (5 M BW Ch.376500 16QAM _ Full RB _0)



Sub6 n25(2). Occupied Bandwidth Plot (5 M BW Ch.376500 64QAM_ Full RB _0)



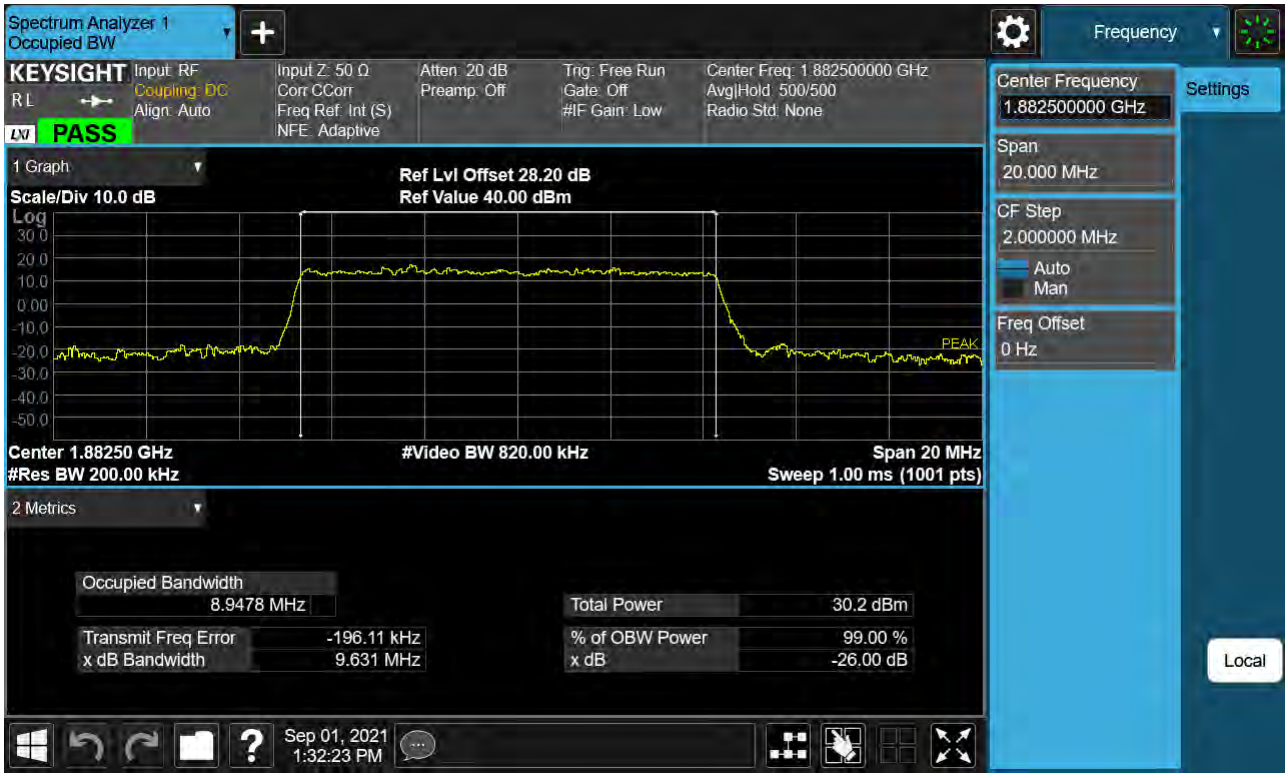
Sub6 n25(2). Occupied Bandwidth Plot (5 M BW Ch.376500 256QAM_ Full RB _0)



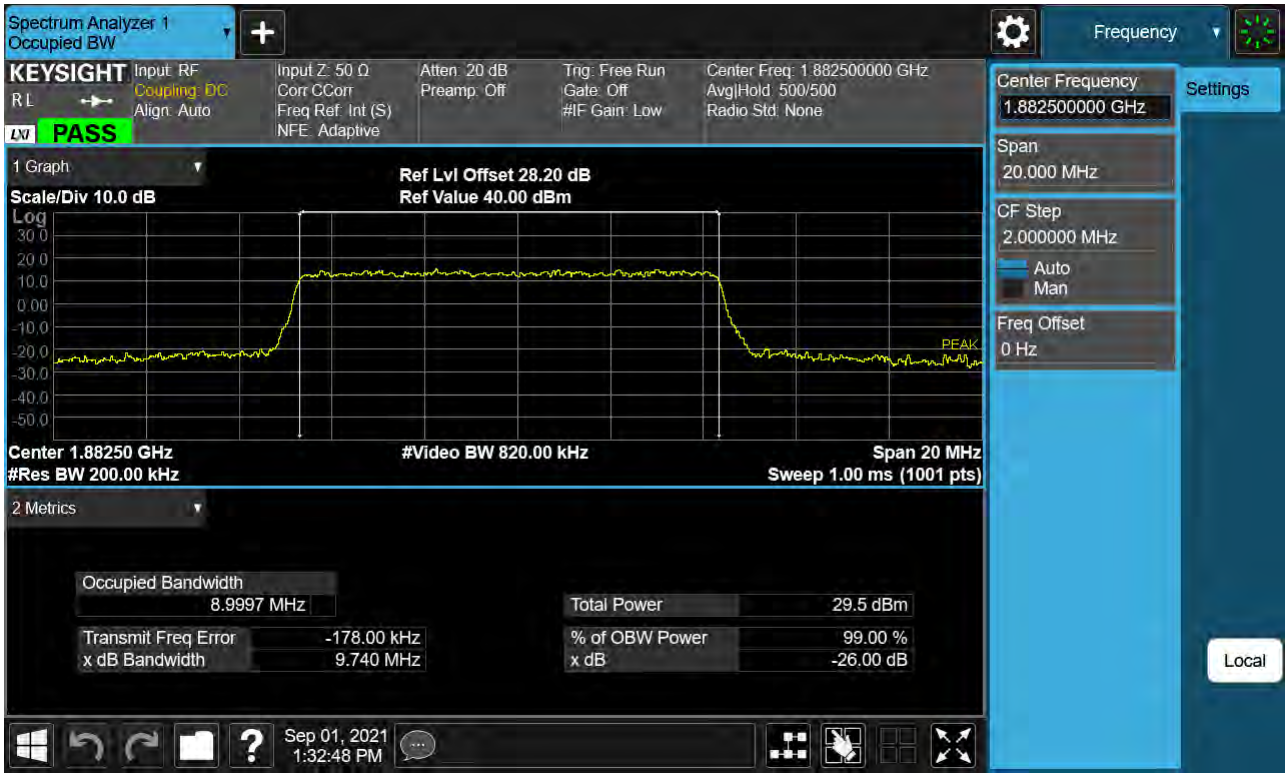
Sub6 n25(2). Occupied Bandwidth Plot (10 M BW Ch.376500 BPSK _ Full RB _0)

Sub6 n25(2). Occupied Bandwidth Plot (10 M BW Ch.376500 QPSK _ Full RB _0)

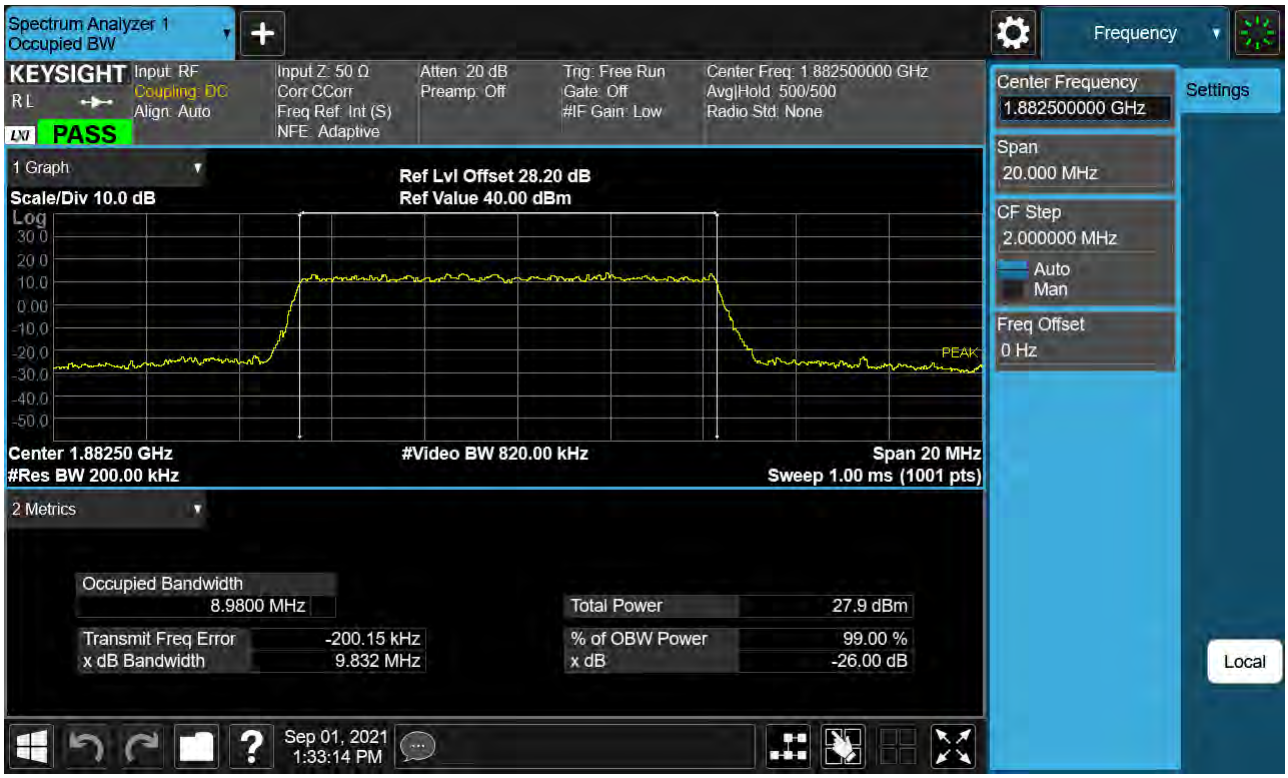
Sub6 n25(2). Occupied Bandwidth Plot (10 M BW Ch.376500 16QAM _ Full RB _0)



Sub6 n25(2). Occupied Bandwidth Plot (10 M BW Ch.376500 64QAM _ Full RB _0)



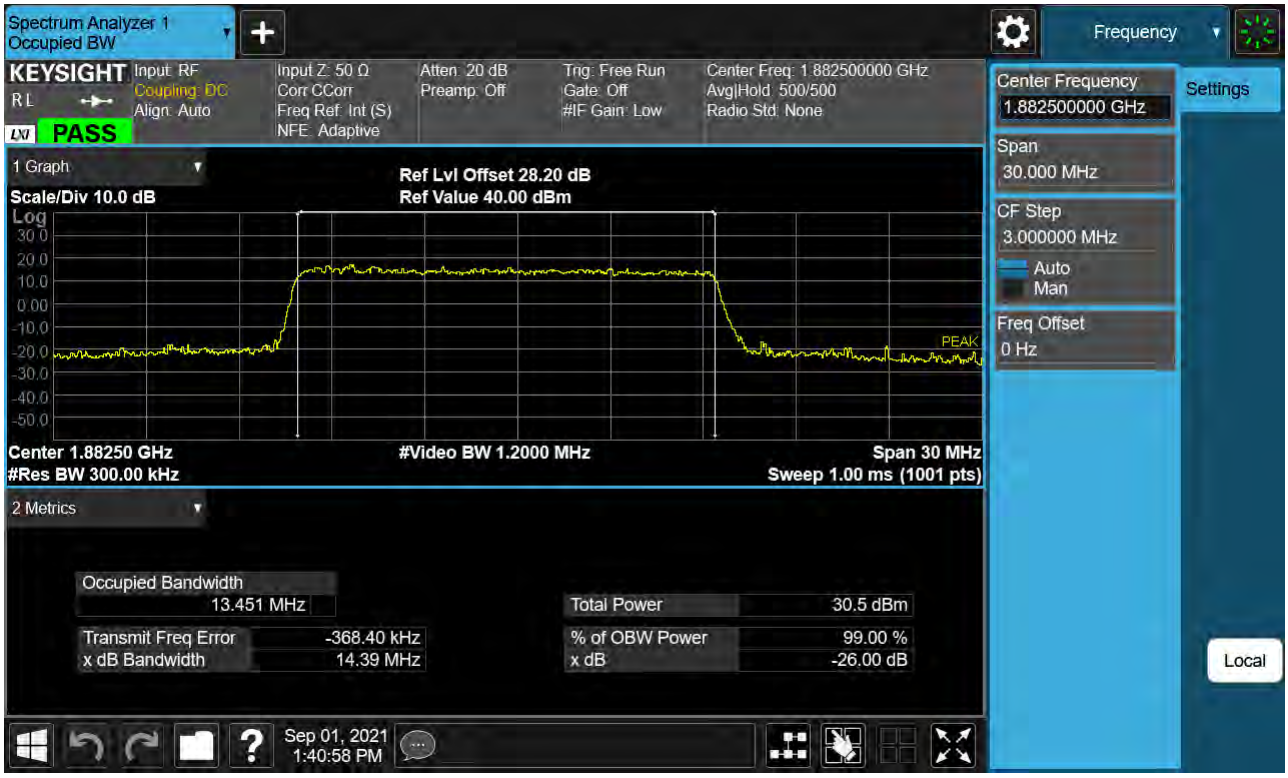
Sub6 n25(2). Occupied Bandwidth Plot (10 M BW Ch.376500 256QAM _ Full RB _0)



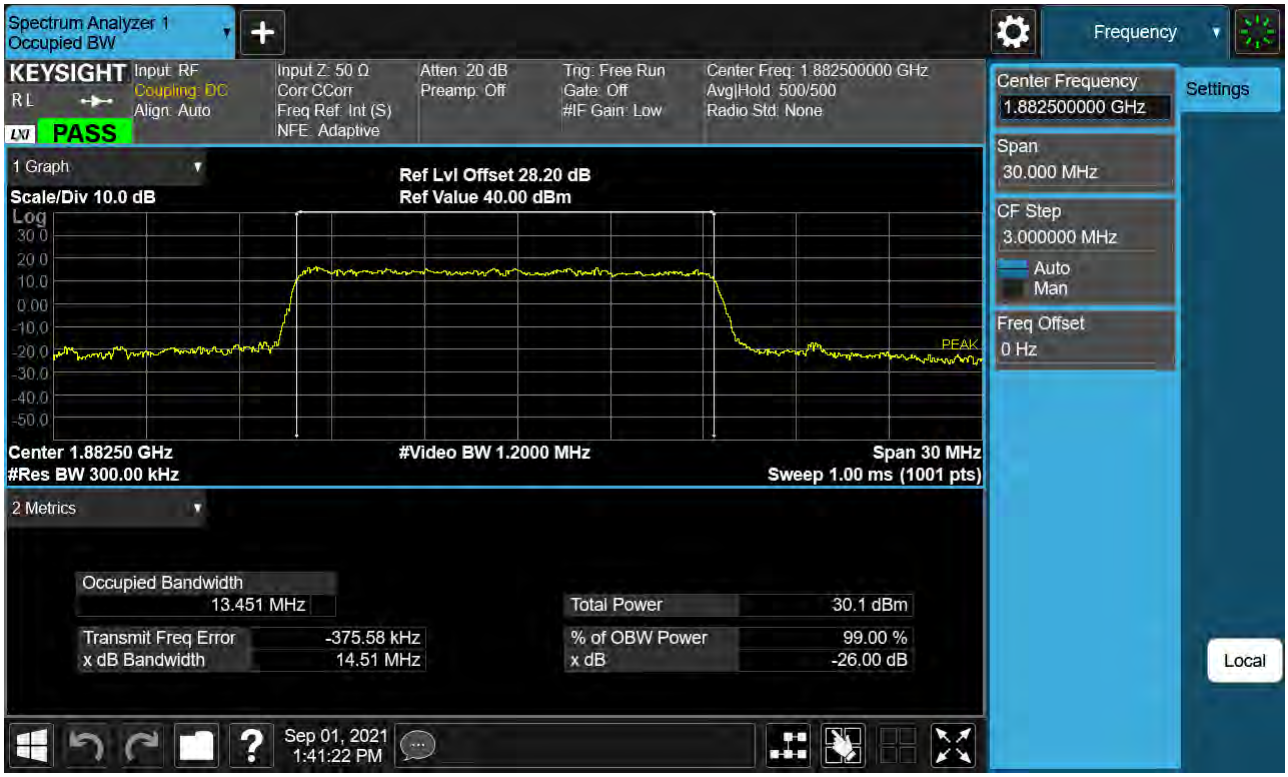
Sub6 n25(2). Occupied Bandwidth Plot (15 M BW Ch.376500 BPSK_ Full RB _0)

Sub6 n25(2). Occupied Bandwidth Plot (15 M BW Ch.376500 QPSK _ Full RB _0)

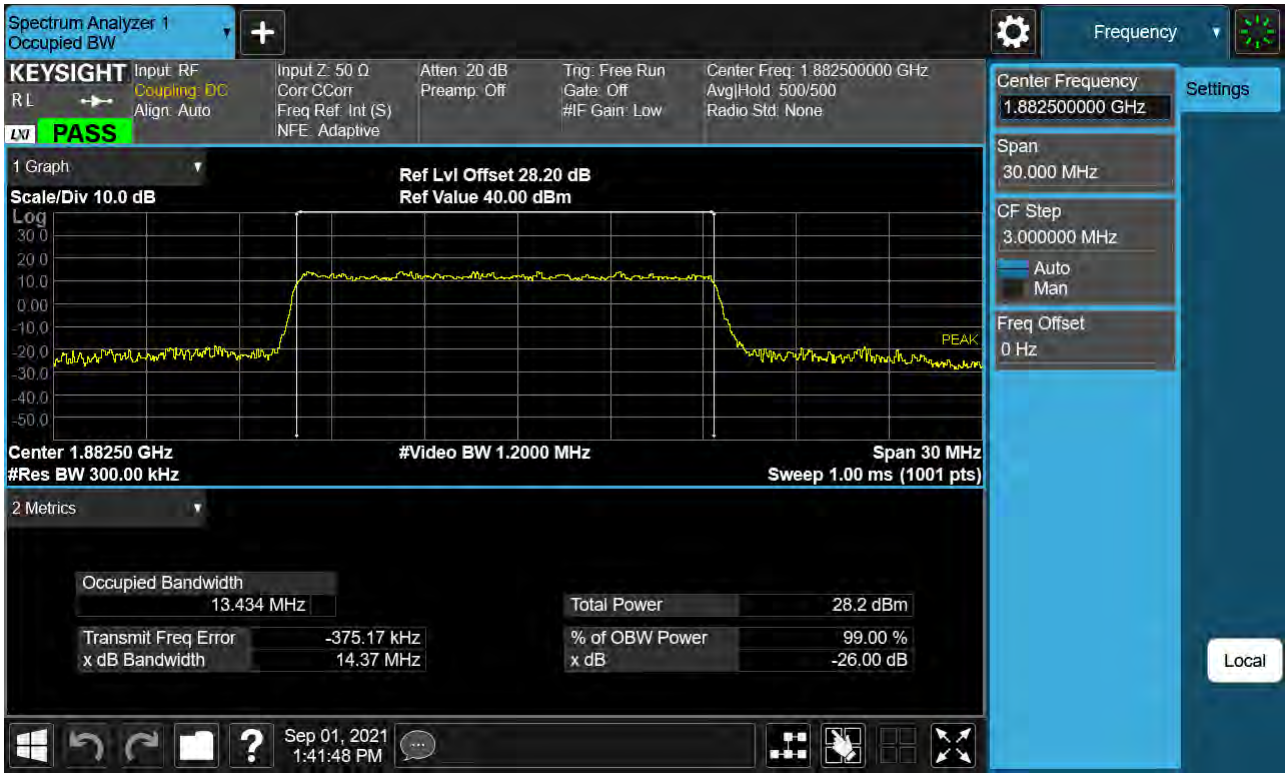
Sub6 n25(2). Occupied Bandwidth Plot (15 M BW Ch.376500 16QAM _ Full RB _0)



Sub6 n25(2). Occupied Bandwidth Plot (15 M BW Ch.376500 64QAM _ Full RB _0)



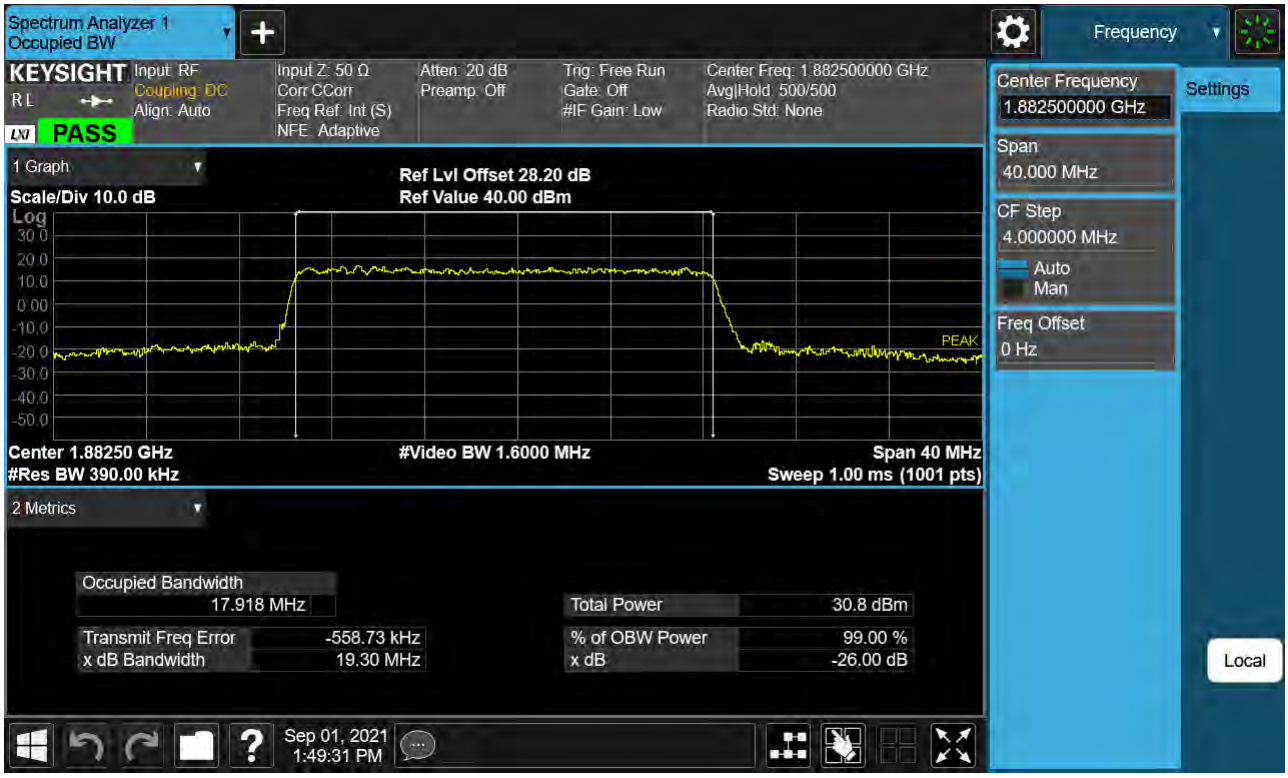
Sub6 n25(2). Occupied Bandwidth Plot (15 M BW Ch.376500 256QAM _ Full RB _0



Sub6 n25(2). Occupied Bandwidth Plot (20 M BW Ch.376500 BPSK _ Full RB _0)

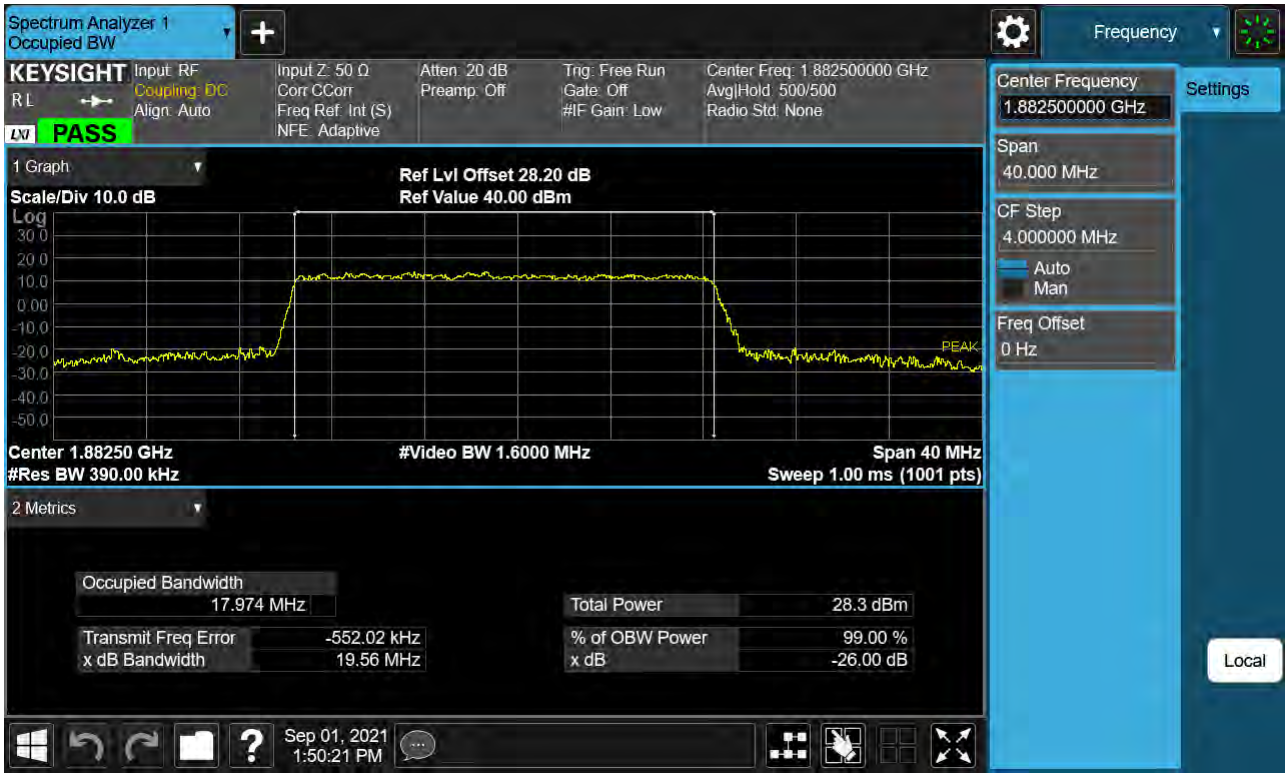
Sub6 n25(2). Occupied Bandwidth Plot (20 M BW Ch.376500 QPSK _ Full RB _0)

Sub6 n25(2). Occupied Bandwidth Plot (20 M BW Ch.376500 16QAM _ Full RB _0)

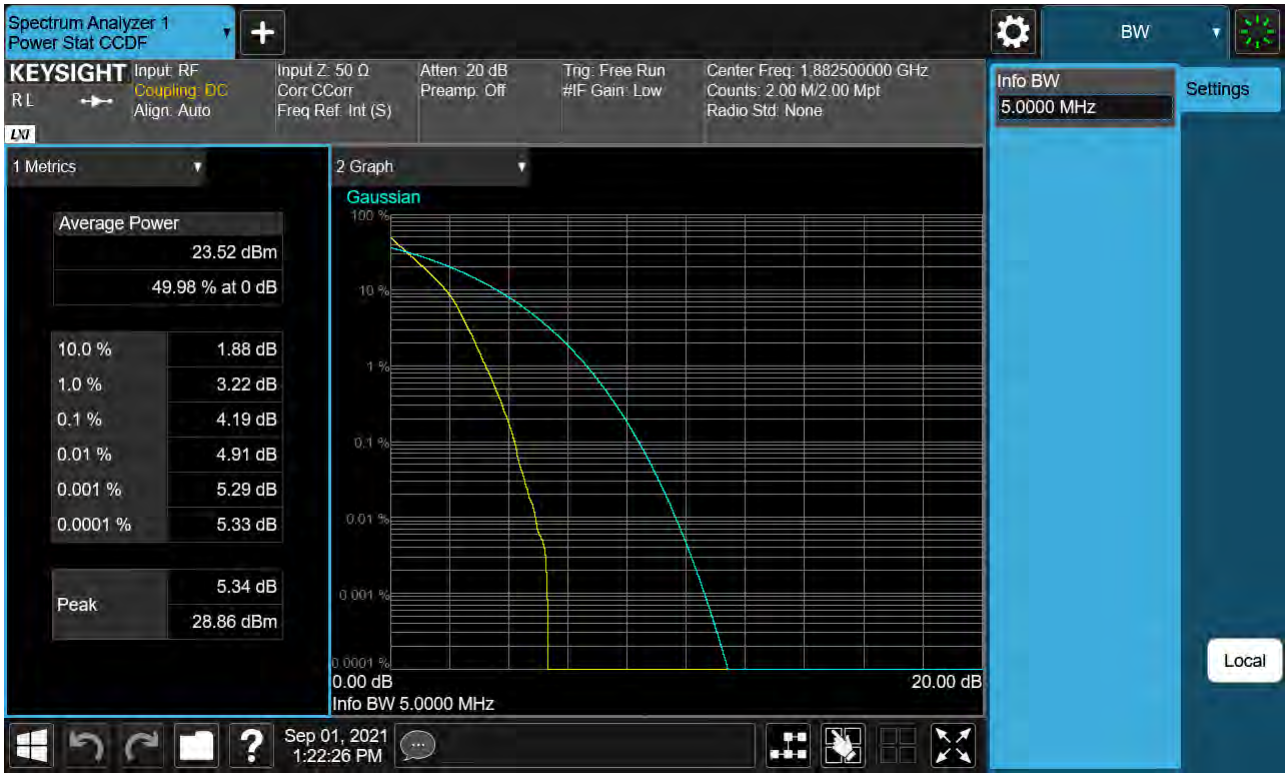


Sub6 n25(2). Occupied Bandwidth Plot (20 M BW Ch.376500 64QAM _ Full RB _0)

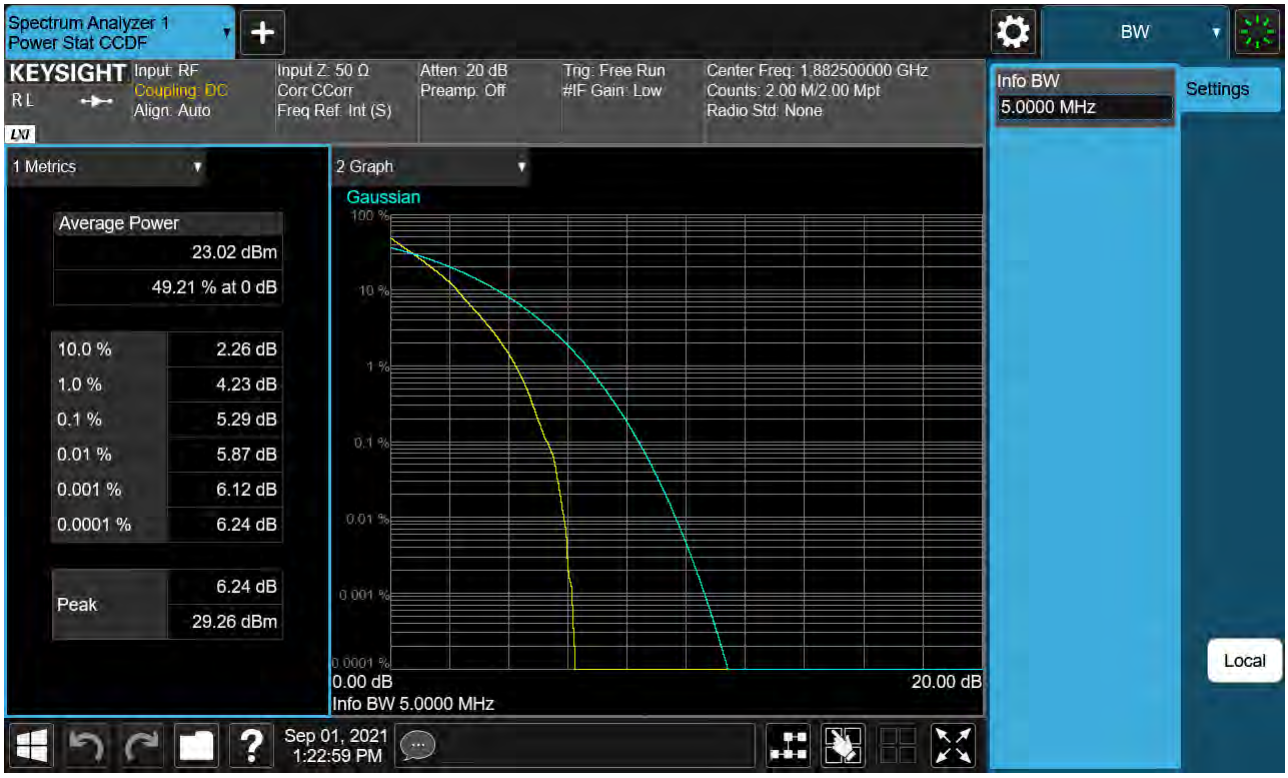
Sub6 n25(2). Occupied Bandwidth Plot (20 M BW Ch.376500 256QAM _ Full RB _0)



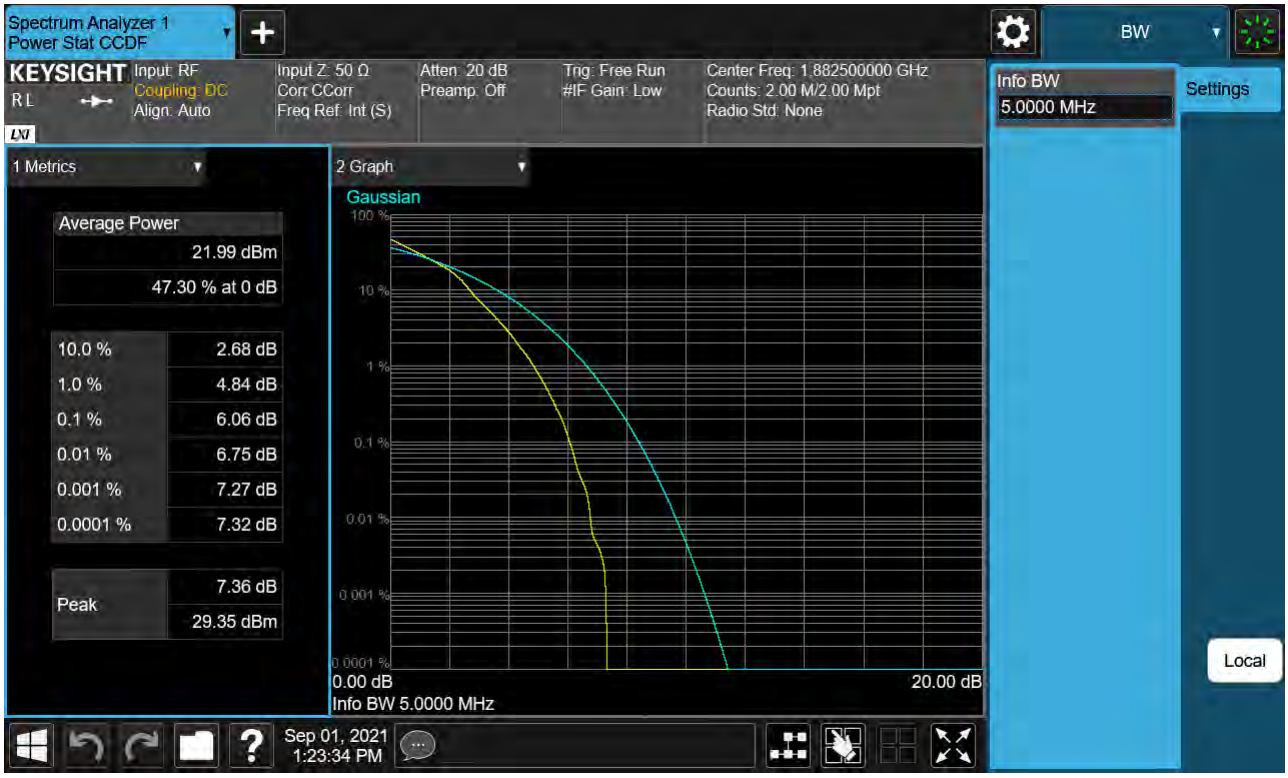
Sub6 n25(2). PAR Plot (5 M BW Ch.376500 BPSK_ Full RB _0)



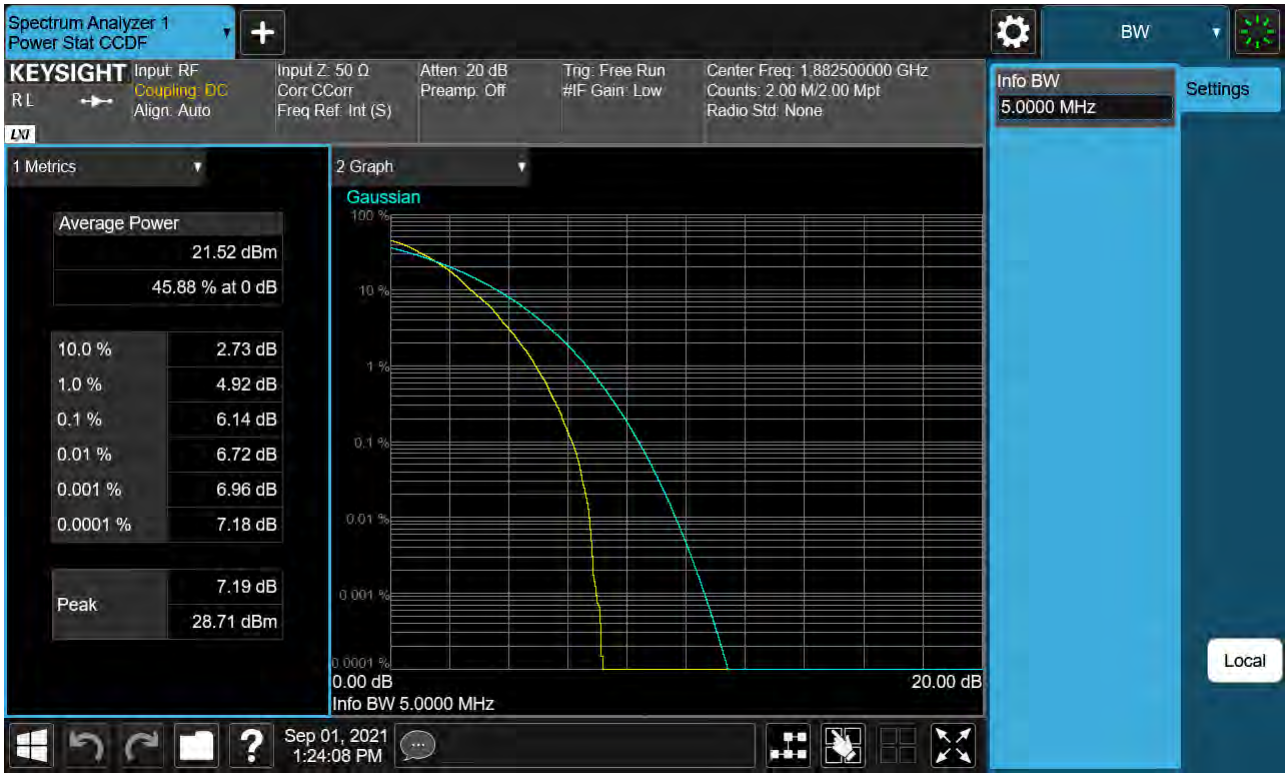
Sub6 n25(2). PAR Plot (5 M BW Ch.376500 QPSK _ Full RB _0)



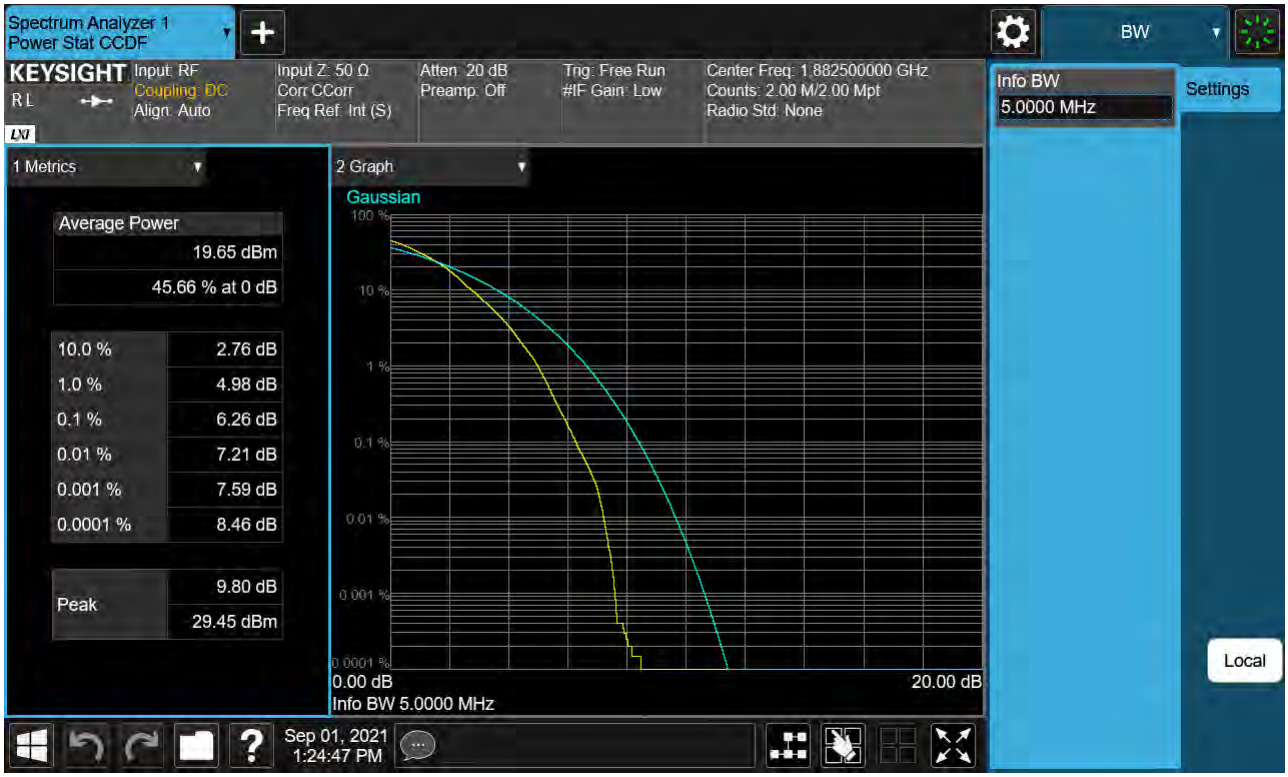
Sub6 n25(2). PAR Plot (5 M BW Ch.376500 16QAM_ Full RB _0)



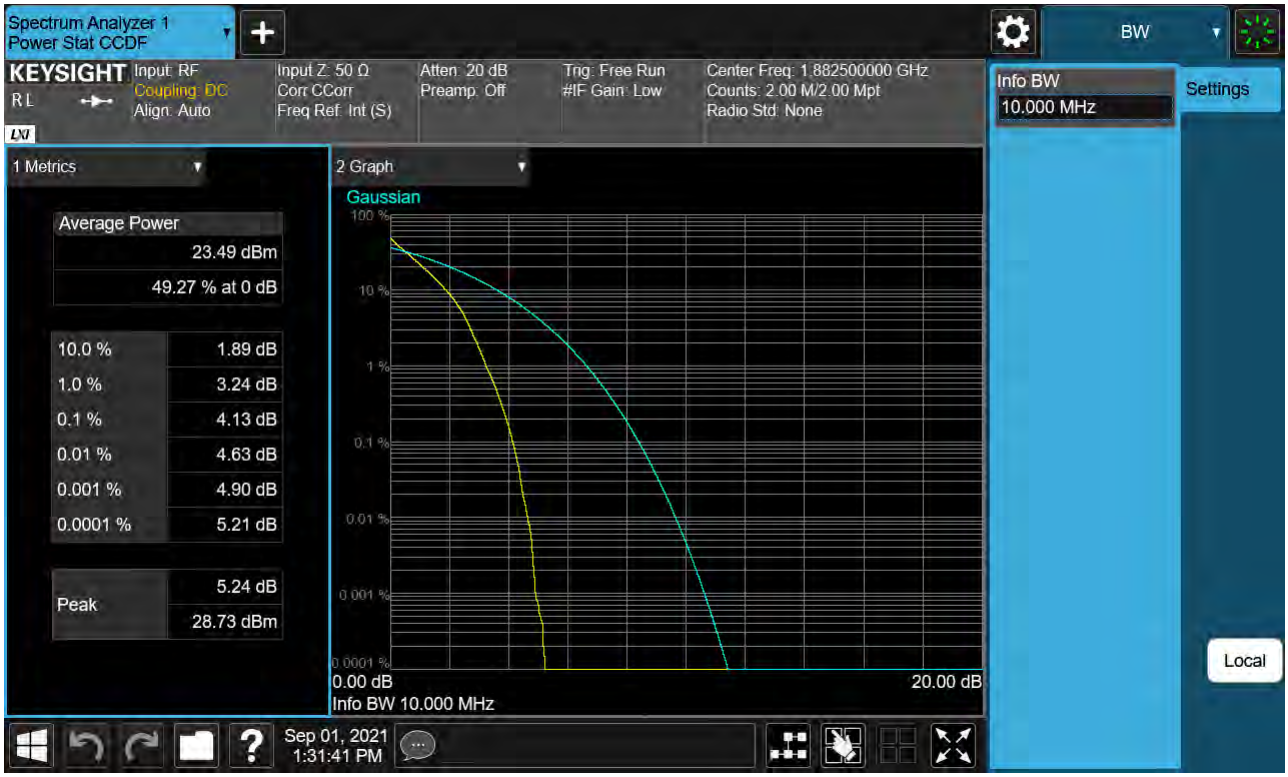
Sub6 n25(2). PAR Plot (5 M BW Ch.376500 64QAM_ Full RB _0)



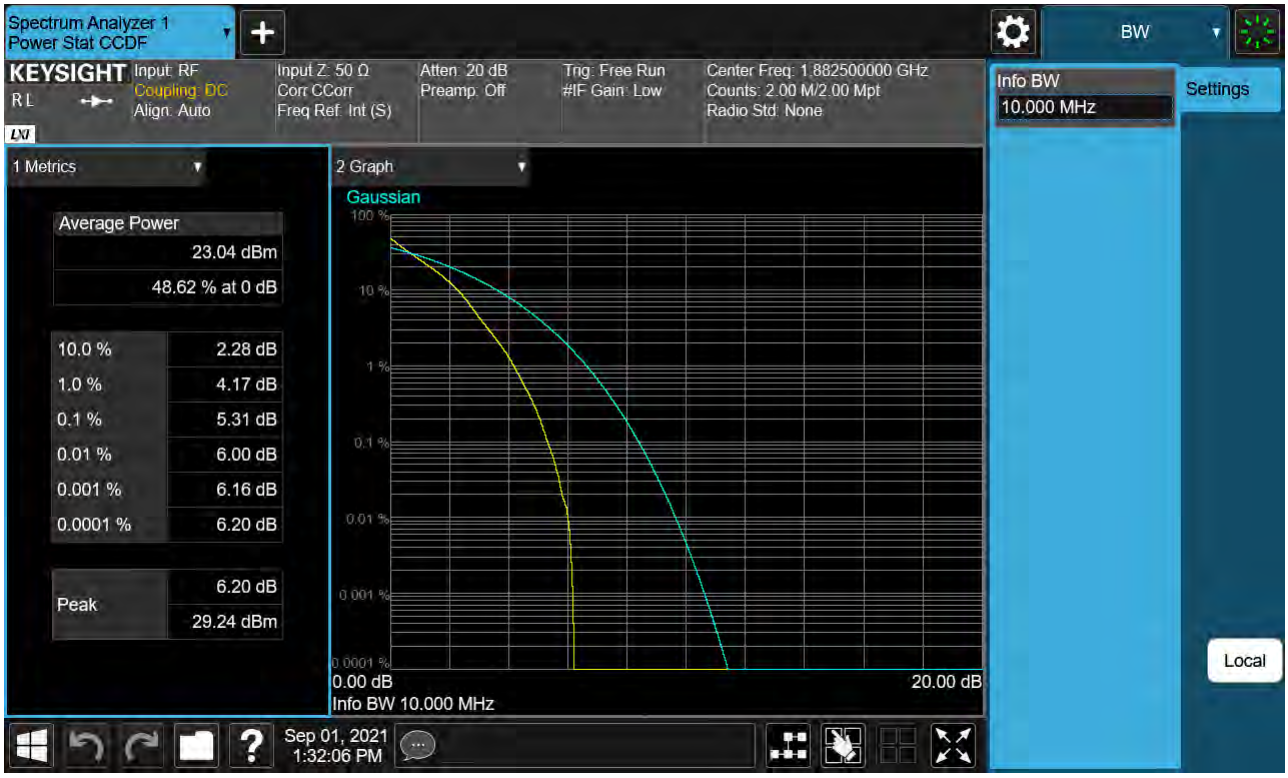
Sub6 n25(2). PAR Plot (5 M BW Ch.376500 256QAM_ Full RB _0)



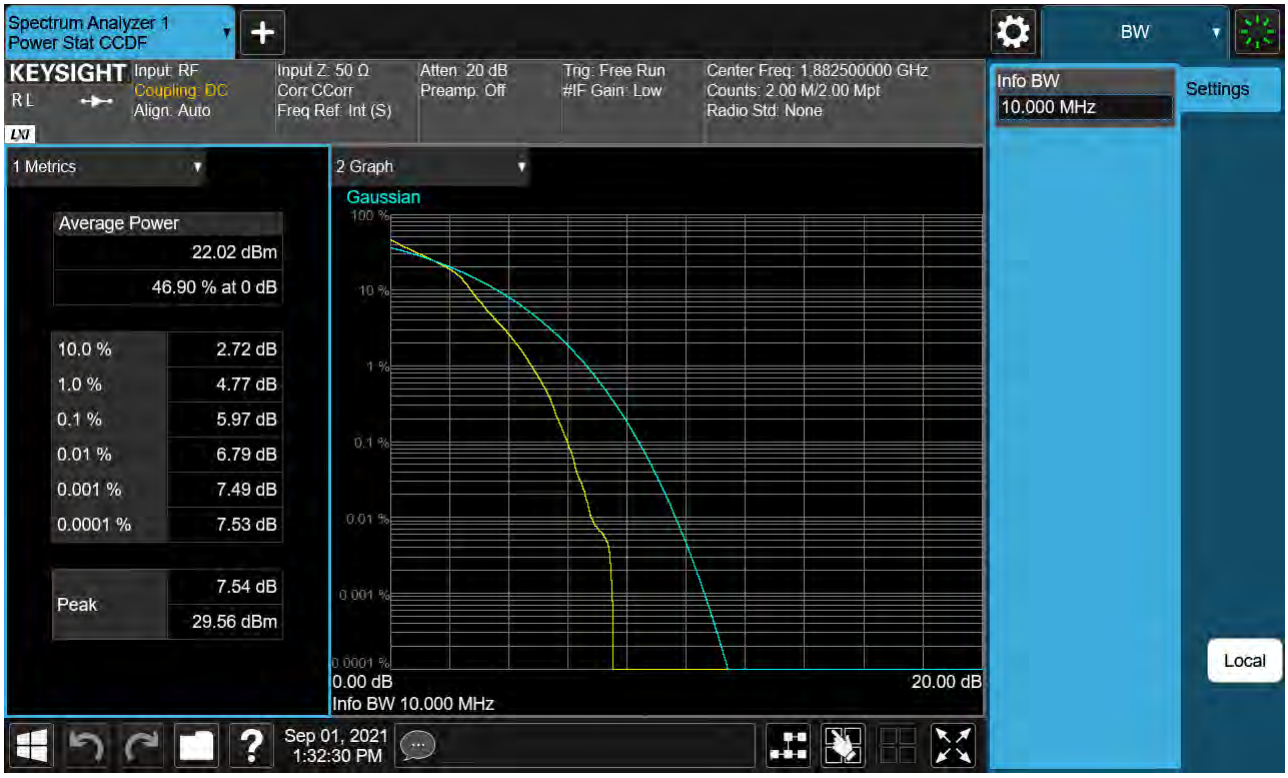
Sub6 n25(2). PAR Plot (10 M BW Ch.376500 BPSK _ Full RB _0)



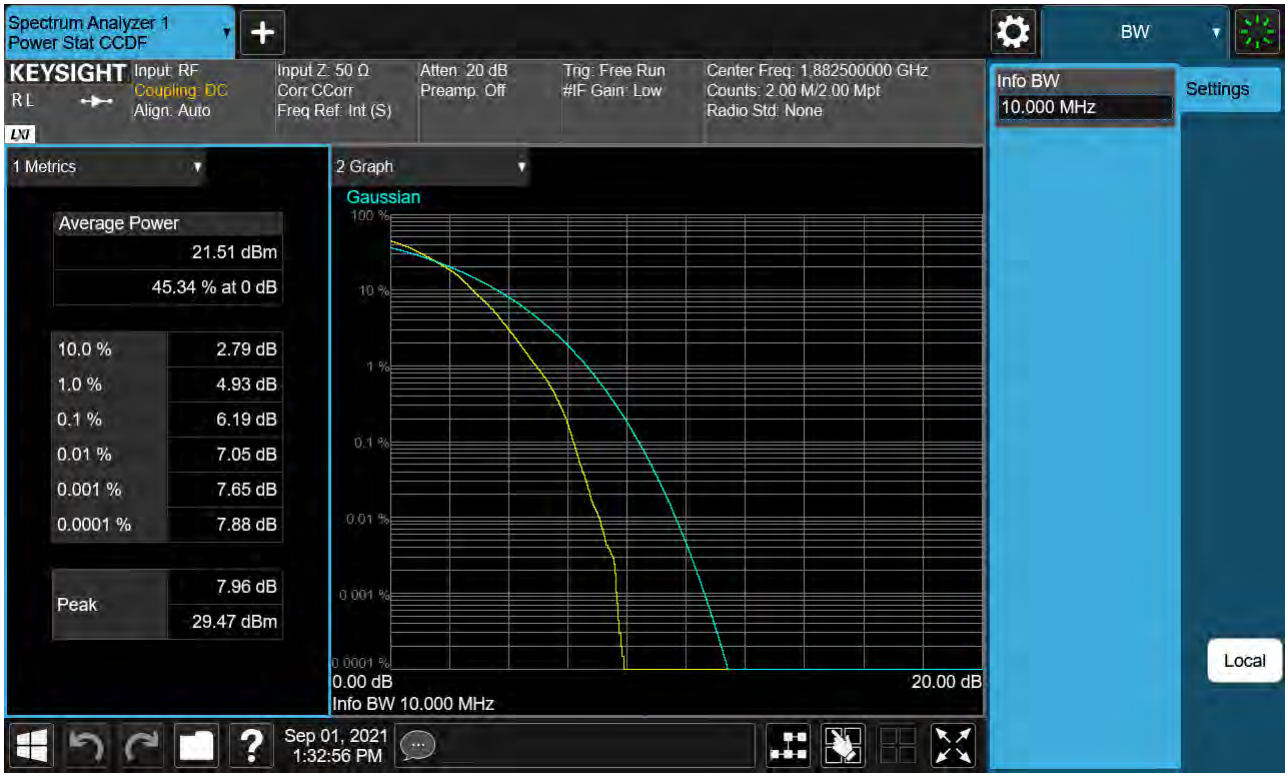
Sub6 n25(2). PAR Plot (10 M BW Ch.376500 QPSK _ Full RB _0)



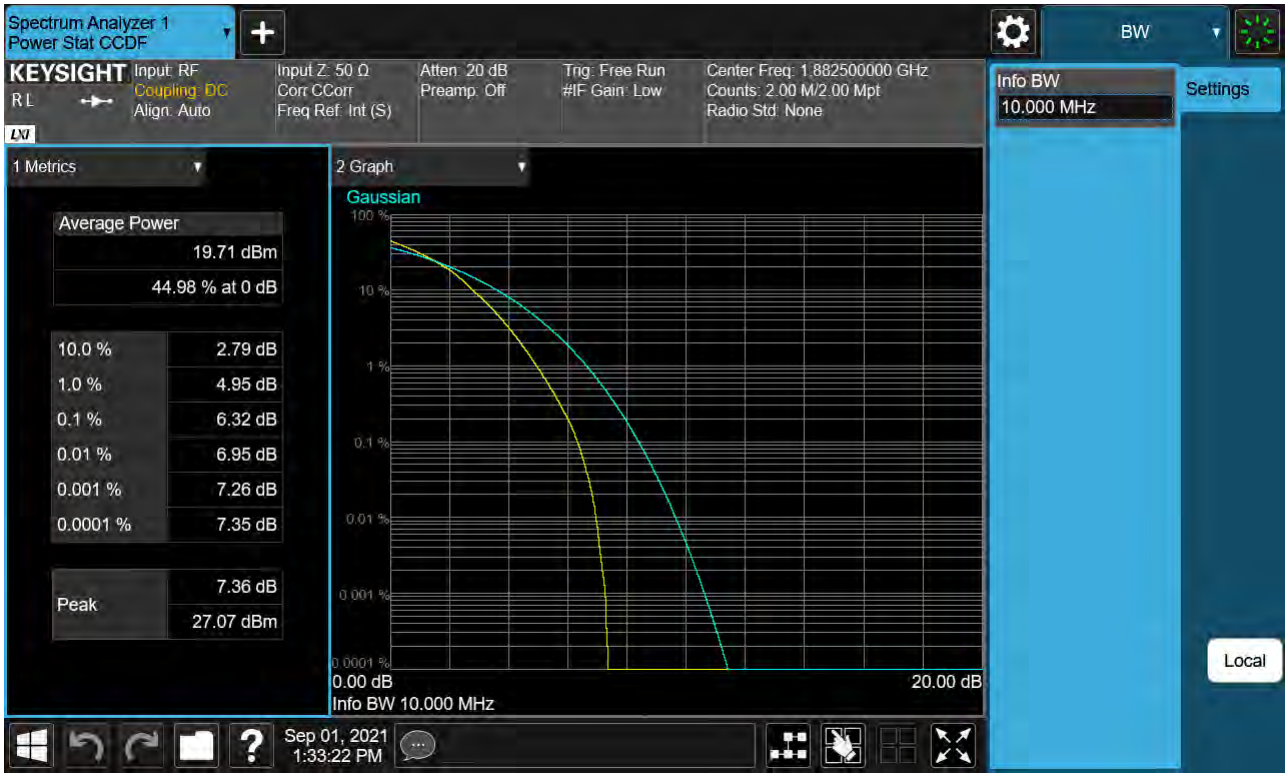
Sub6 n25(2). PAR Plot (10 M BW Ch.376500 16QAM _ Full RB _0)



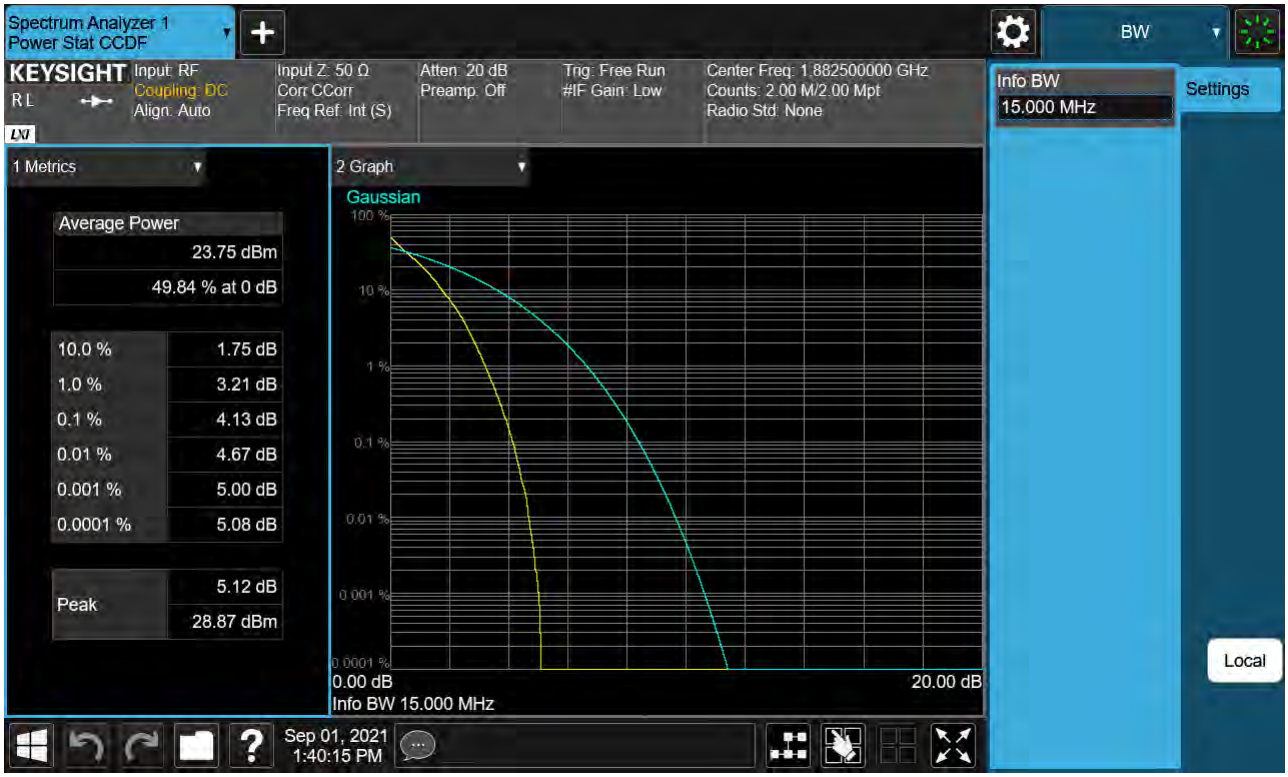
Sub6 n25(2). PAR Plot (10 M BW Ch.376500 64QAM _ Full RB _0)



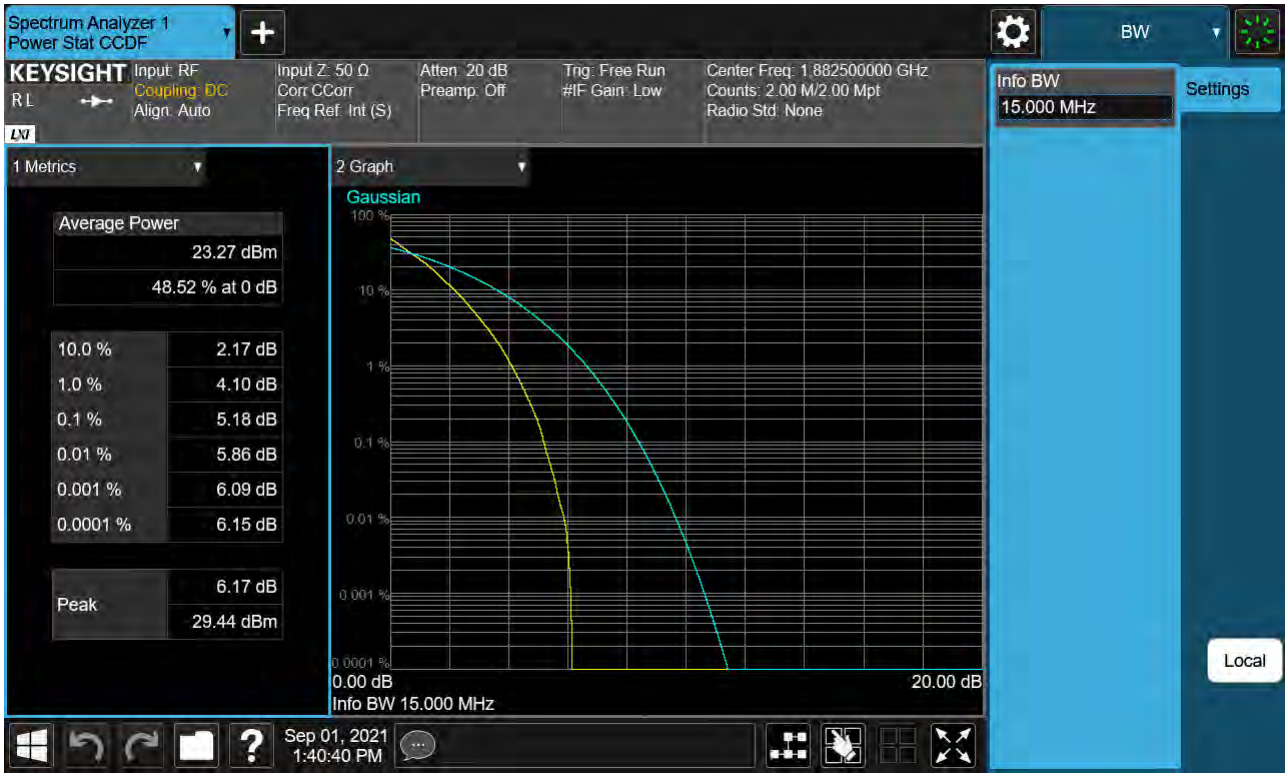
Sub6 n25(2). PAR Plot (10 M BW Ch.376500 256QAM _ Full RB _0)



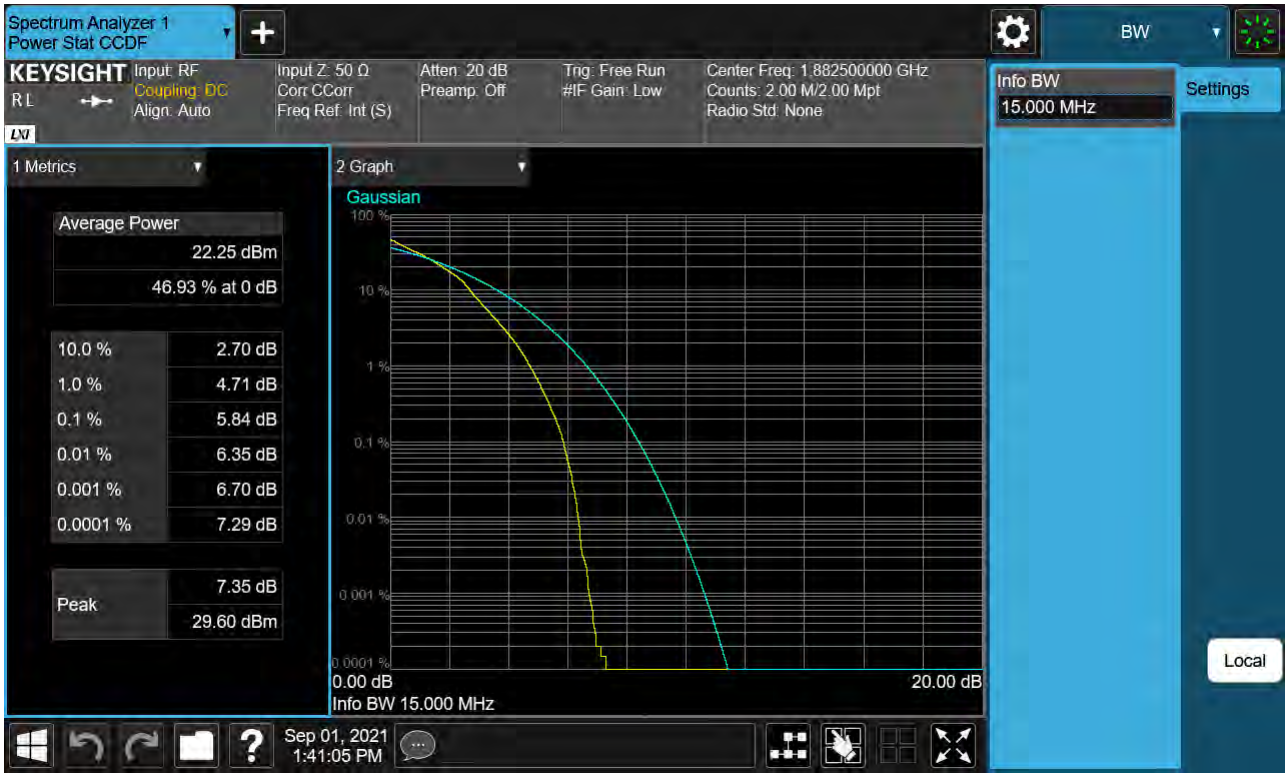
Sub6 n25(2). PAR Plot (15 M BW Ch.376500 BPSK _ Full RB _0)



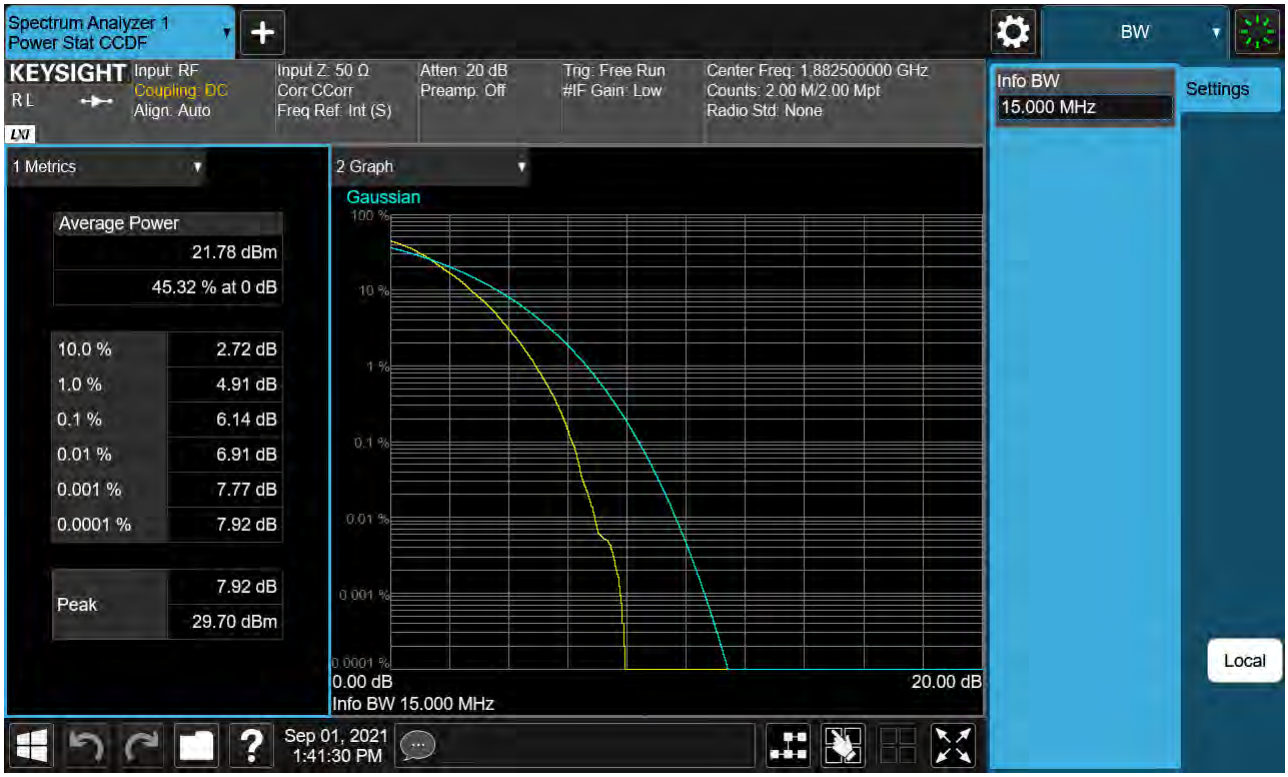
Sub6 n25(2). PAR Plot (15 M BW Ch.376500 QPSK _ Full RB _0)



Sub6 n25(2). PAR Plot (15 M BW Ch.376500 16QAM _ Full RB _0)

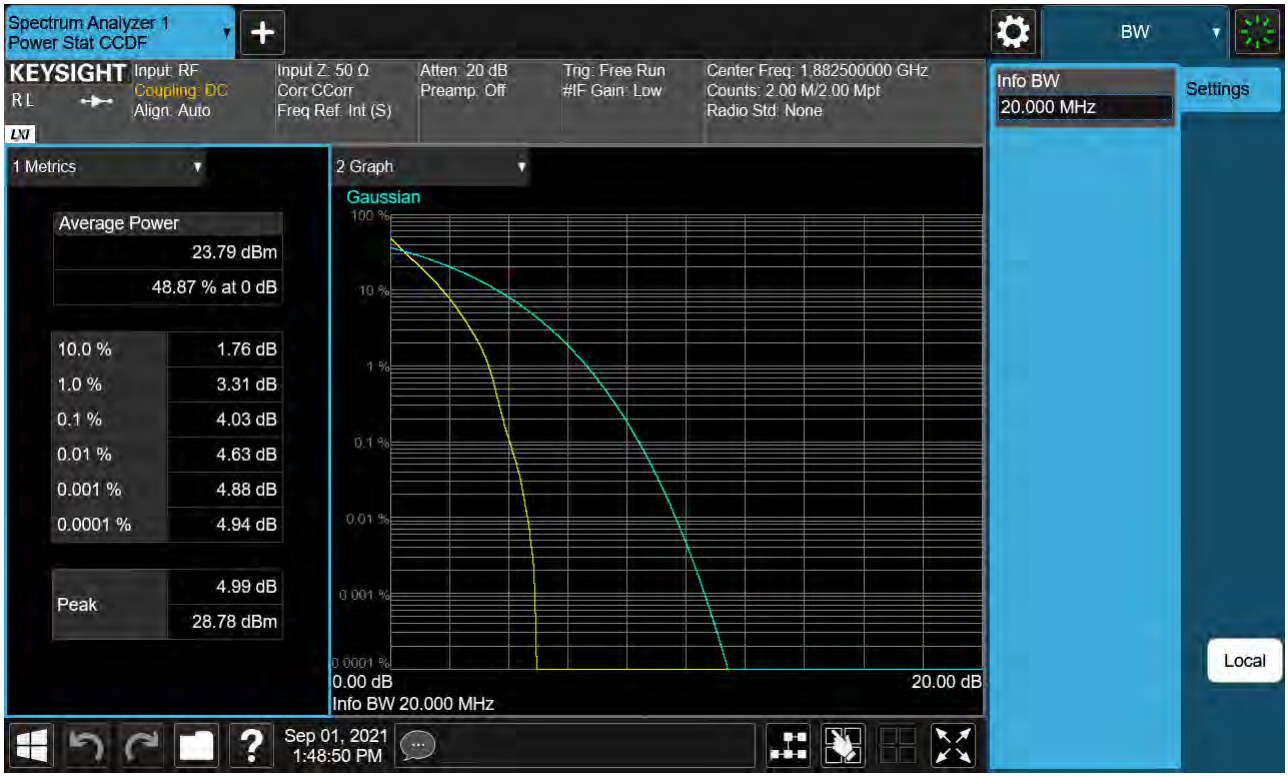


Sub6 n25(2). PAR Plot (15 M BW Ch.376500 64QAM _ Full RB _0)

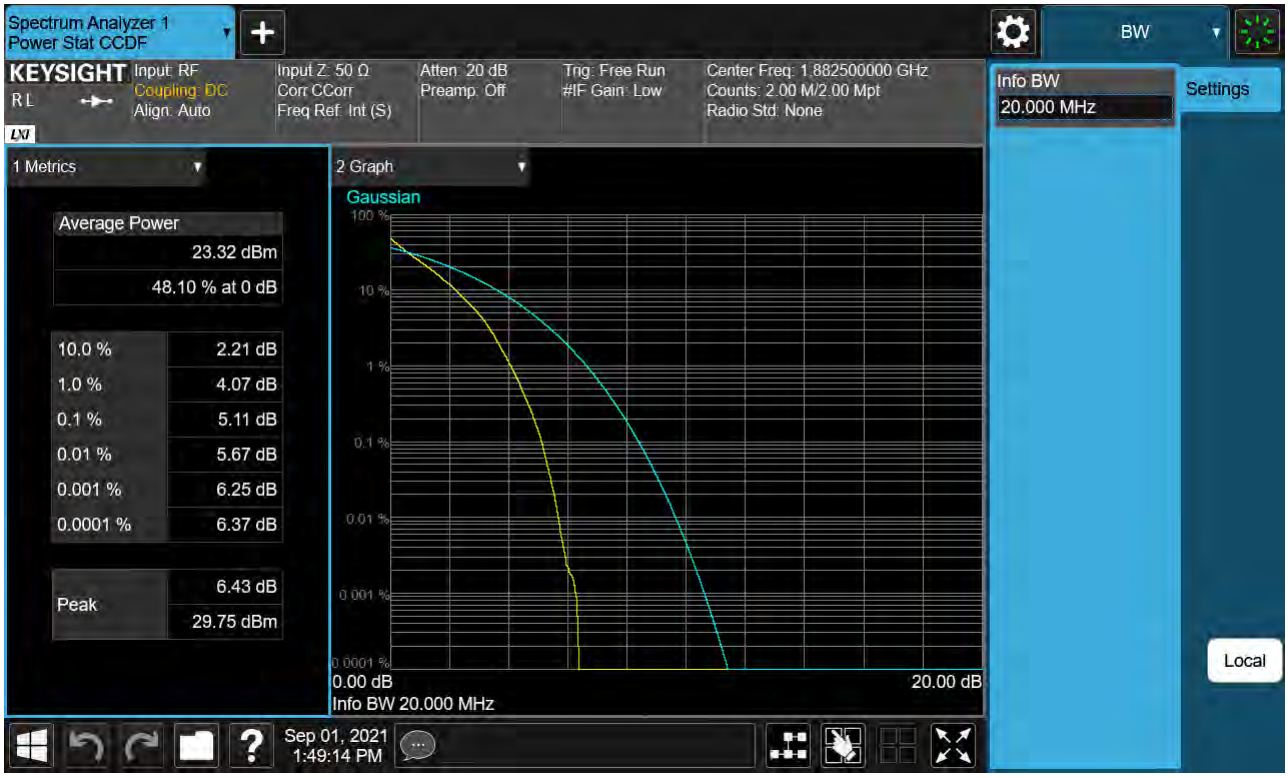


Sub6 n25(2). PAR Plot (15 M BW Ch.376500 256QAM _ Full RB _0)

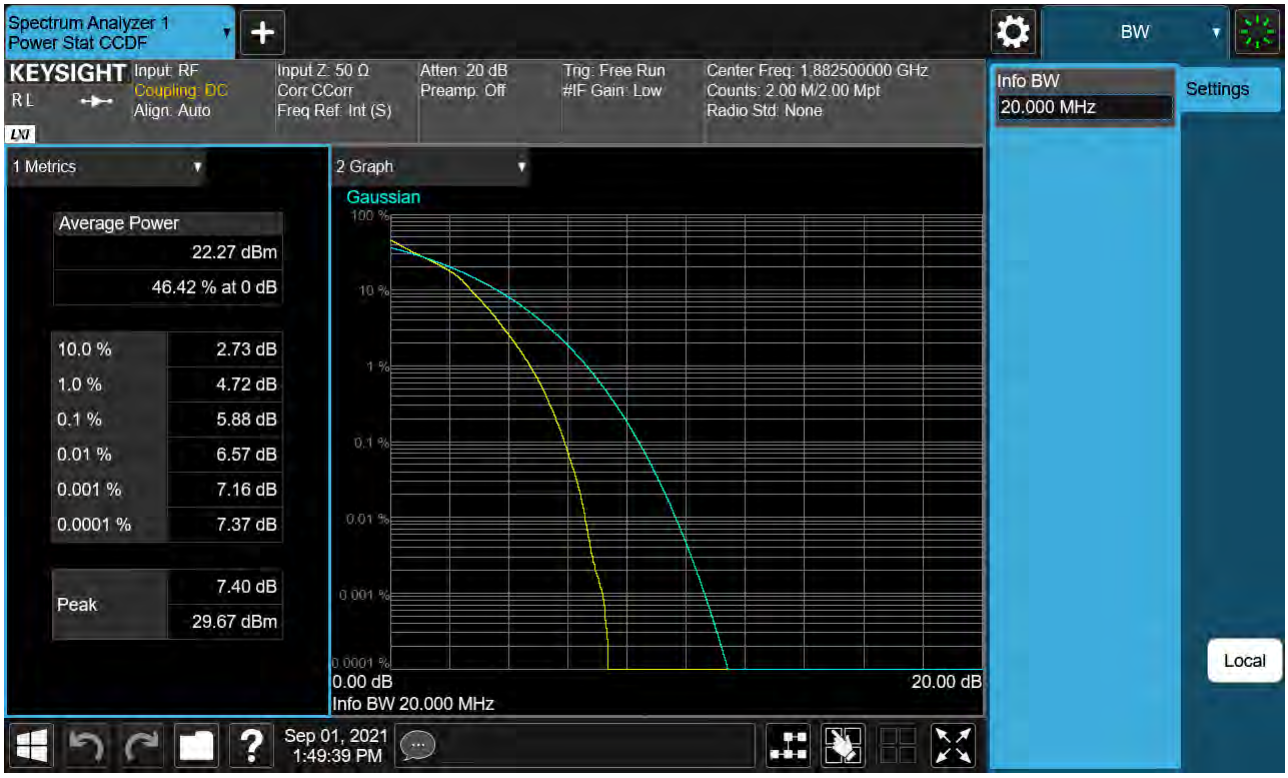
Sub6 n25(2). PAR Plot (20 M BW Ch.376500 BPSK _ Full RB _0)



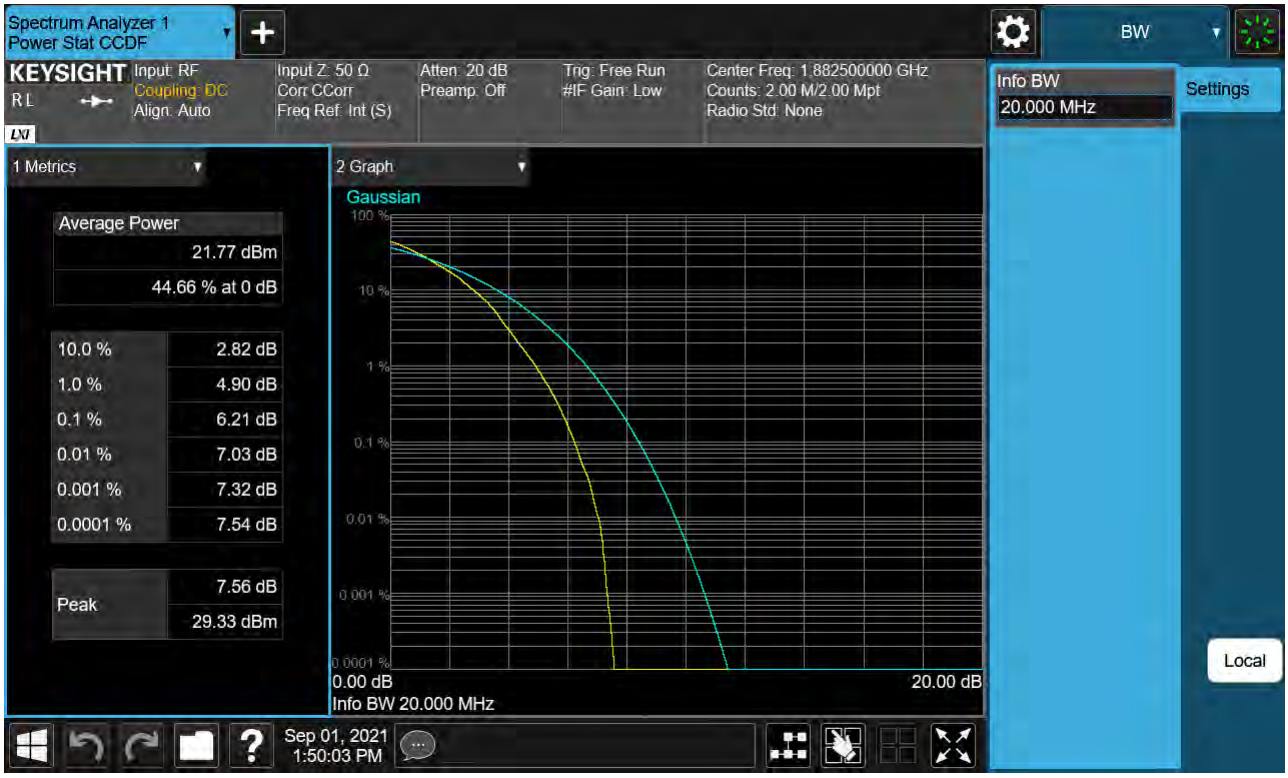
Sub6 n25(2). PAR Plot (20 M BW Ch.376500 QPSK _ Full RB _0)



Sub6 n25(2). PAR Plot (20 M BW Ch.376500 16QAM _ Full RB _0)



Sub6 n25(2). PAR Plot (20 M BW Ch.376500 64QAM _ Full RB _0)

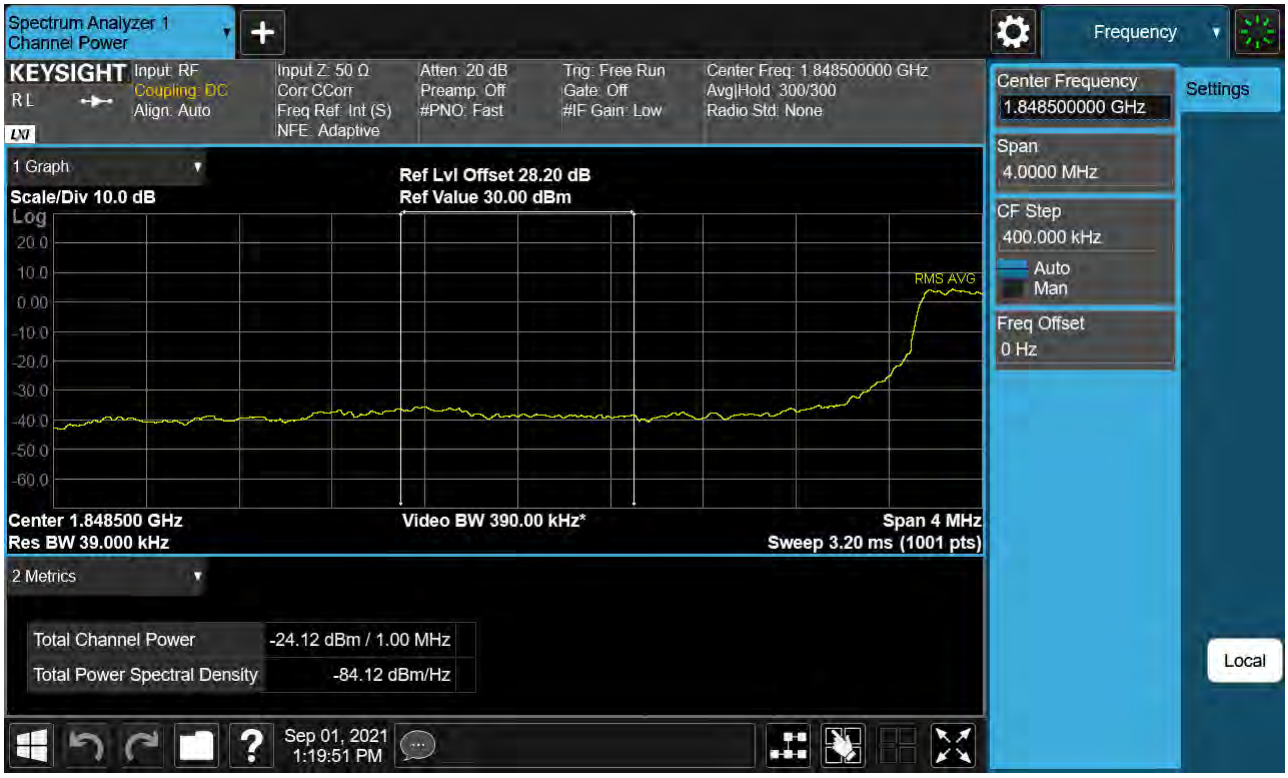


Sub6 n25(2). PAR Plot (20 M BW Ch.376500 256QAM _ Full RB _0)

Sub6 n25(2). Lower Band Edge Plot (5 M BW Ch.370500 BPSK_RB1_Offset 0)

Sub6 n25(2). Lower Band Edge Plot (5 M BW Ch.370500 BPSK_Full RB) -1

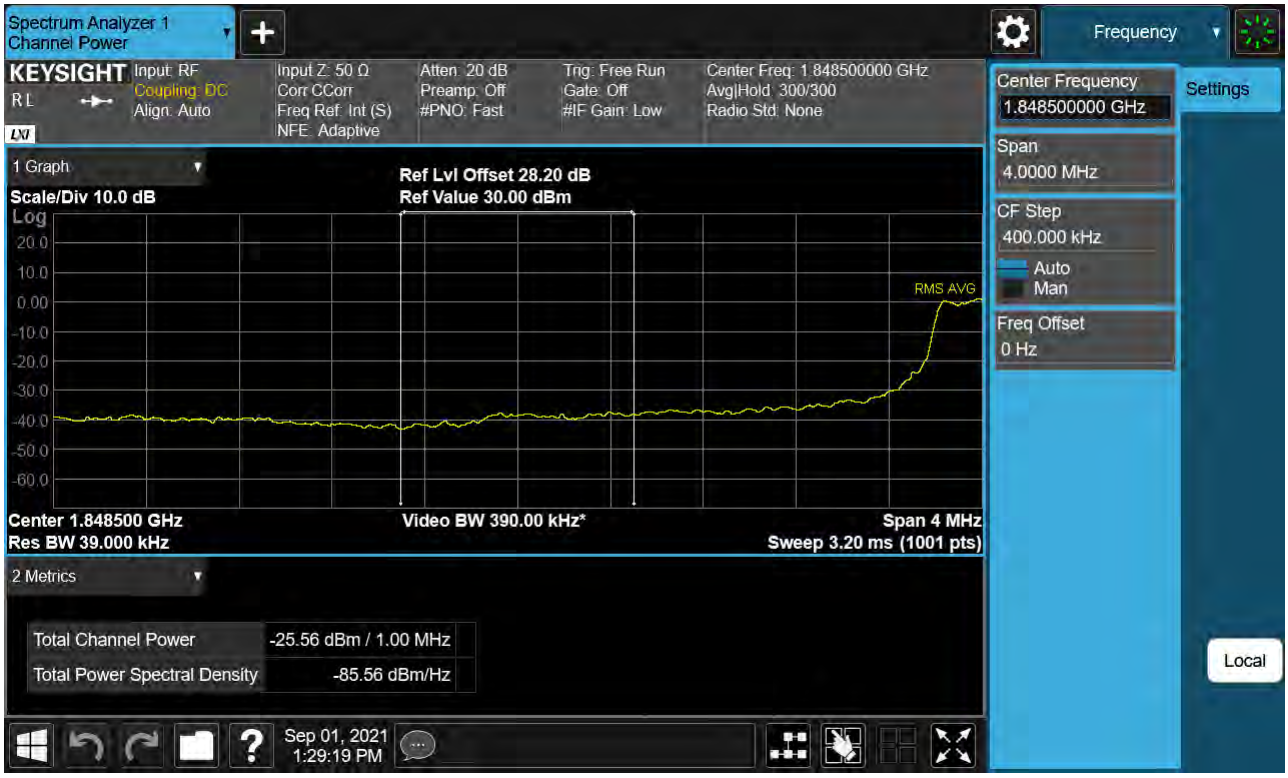
Sub6 n25(2). Lower Extended Band Edge Plot (5 M BW Ch.370500 BPSK_ Full RB) -2



Sub6 n25(2). Lower Band Edge Plot (10 M BW Ch.371000 BPSK_RB1_Offset 0)

Sub6 n25(2). Lower Band Edge Plot (10 M BW Ch.371000 BPSK_ Full RB) -1

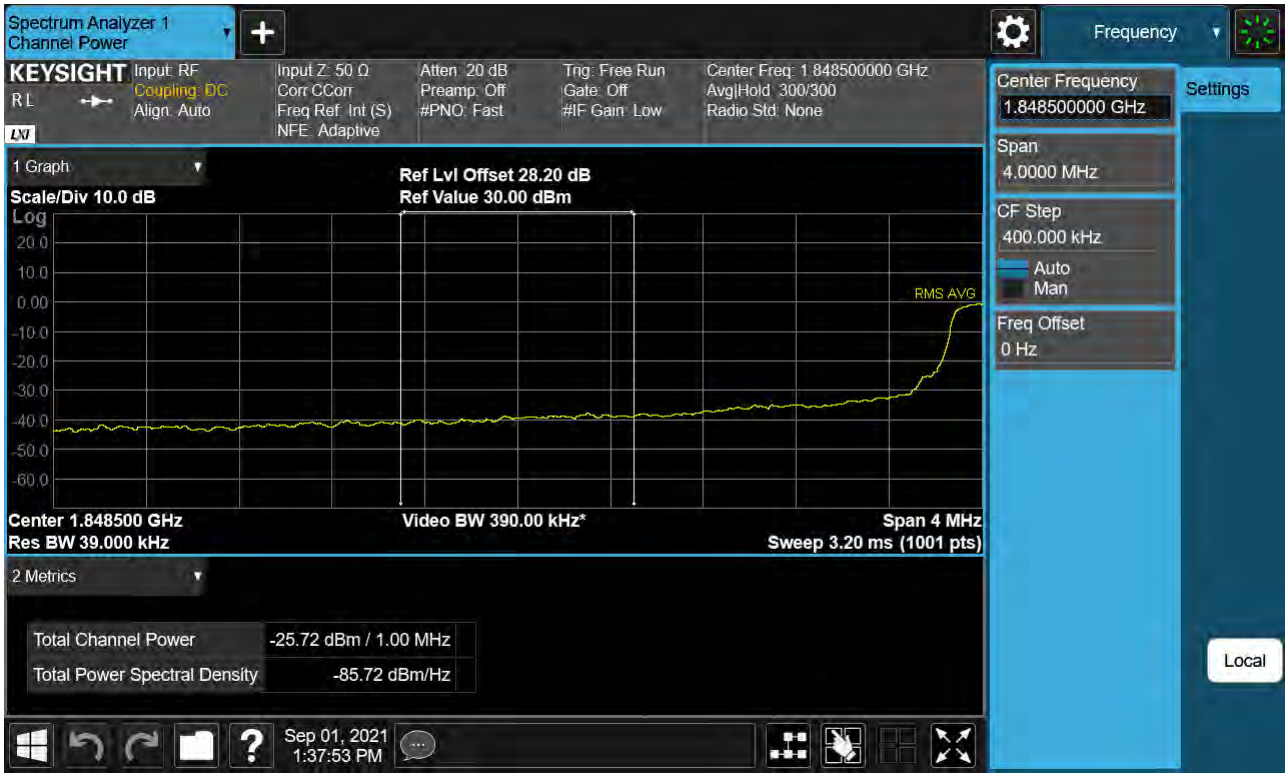
Sub6 n25(2). Lower Extended Band Edge Plot (10 M BW Ch.371000 BPSK_ Full RB) -2



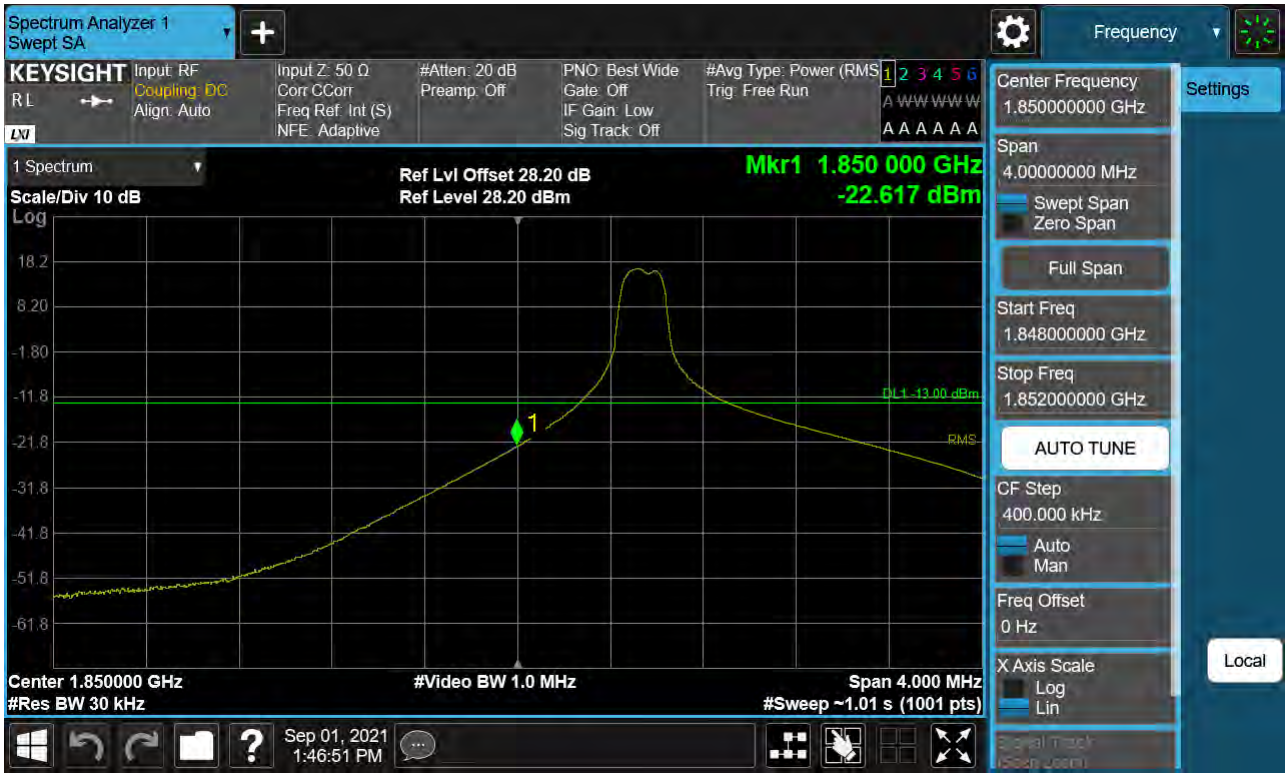
Sub6 n25(2). Lower Band Edge Plot (15 M BW Ch.371500 BPSK_RB1_Offset 0)

Sub6 n25(2). Lower Band Edge Plot (15 M BW Ch.371500 BPSK_ Full RB) -1

Sub6 n25(2). Lower Extended Band Edge Plot (15 M BW Ch.371500 BPSK_ Full RB) -2

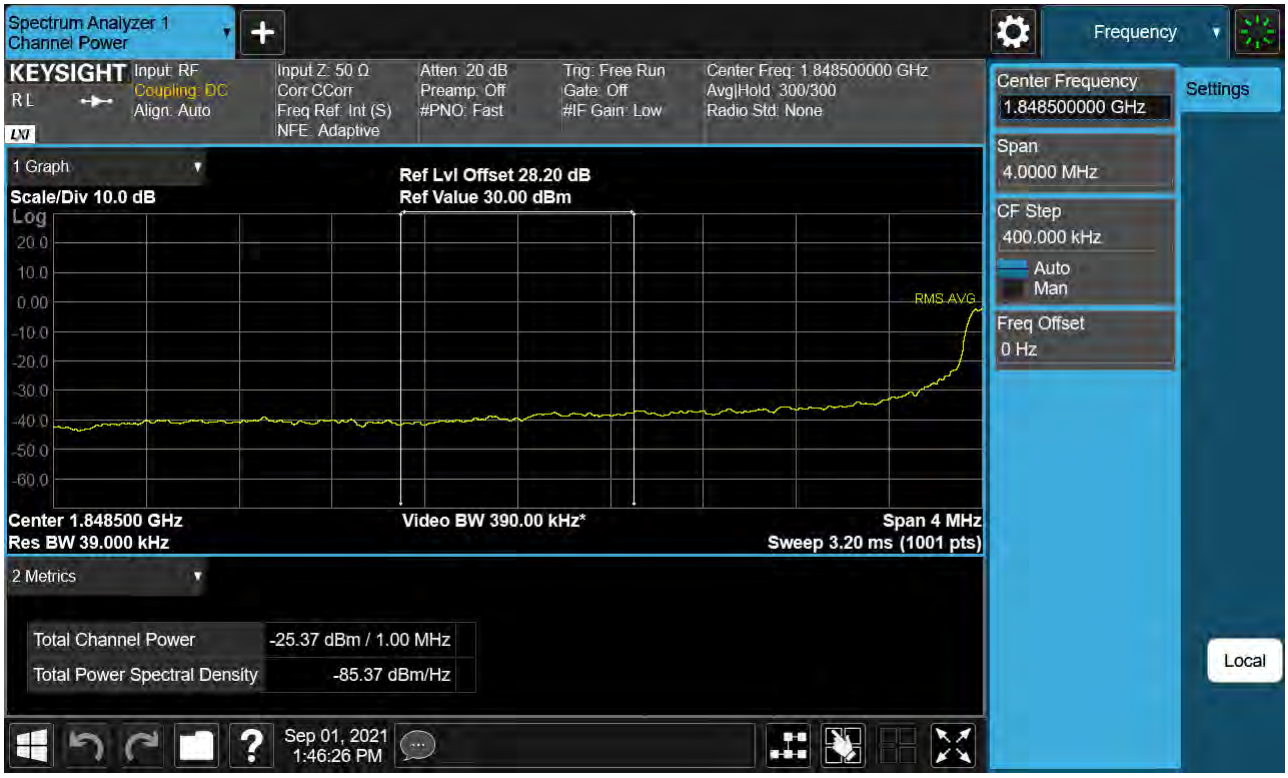


Sub6 n25(2). Lower Band Edge Plot (20 M BW Ch.372000 BPSK_RB1_Offset 0)



Sub6 n25(2). Lower Band Edge Plot (20 M BW Ch.372000 BPSK_ Full RB) -1

Sub6 n25(2). Lower Extended Band Edge Plot (20 M BW Ch.372000 BPSK_ Full RB) -2



Sub6 n25(2). Upper Band Edge Plot (5 M BW Ch.382500 BPSK_RB1_Offset 24)

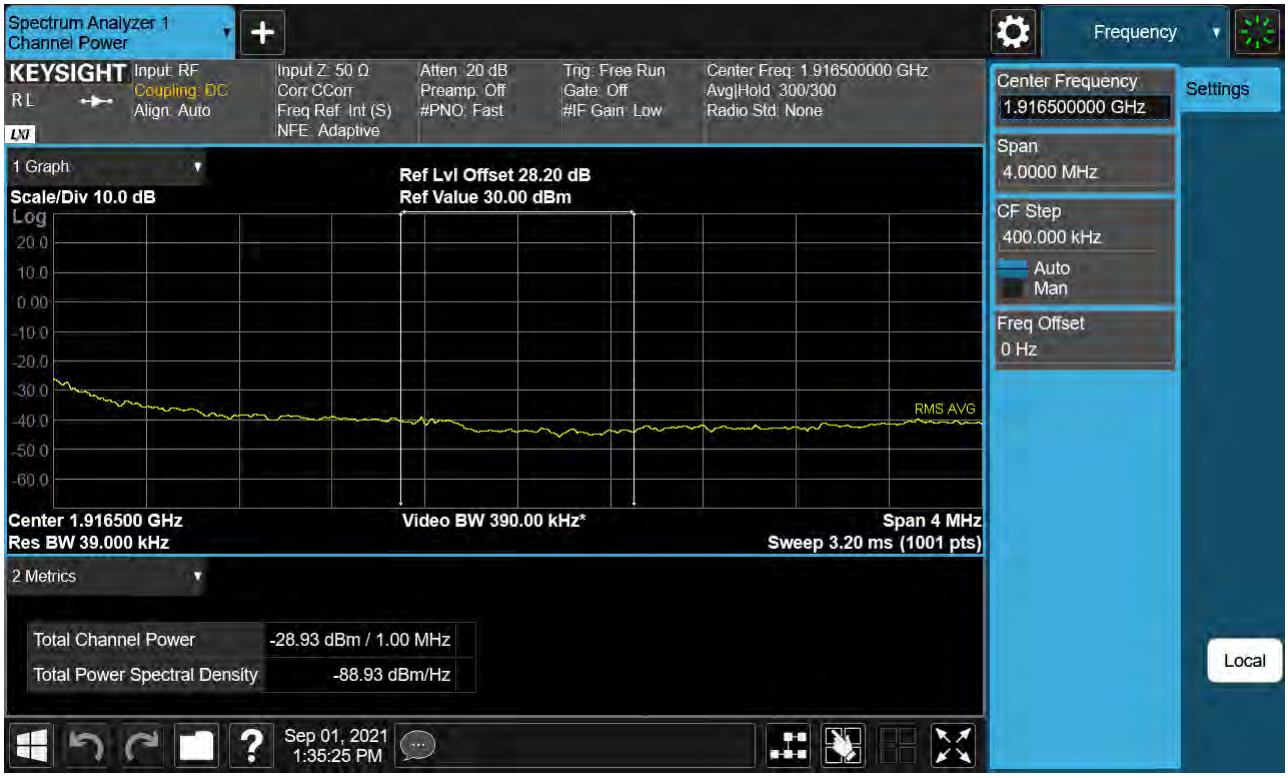
Sub6 n25(2). Upper Band Edge Plot (5 M BW Ch.382500 BPSK_ Full RB) -1

Sub6 n25(2). Upper Extended Band Edge Plot (5 M BW Ch.382500 BPSK_ Full RB) -2

Sub6 n25(2). Upper Band Edge Plot (10 M BW Ch.382000 BPSK_RB1_Offset 51)

Sub6 n25(2). Upper Band Edge Plot (10 M BW Ch.382000 BPSK_ Full RB) -1

Sub6 n25(2). Upper Extended Band Edge Plot (10 M BW Ch.382000 BPSK_ Full RB) -2



Sub6 n25(2). Upper Band Edge Plot (15 M BW Ch.381500 BPSK_RB1_Offset 78)

Sub6 n25(2). Upper Band Edge Plot (15 M BW Ch.381500 BPSK_ Full RB) -1

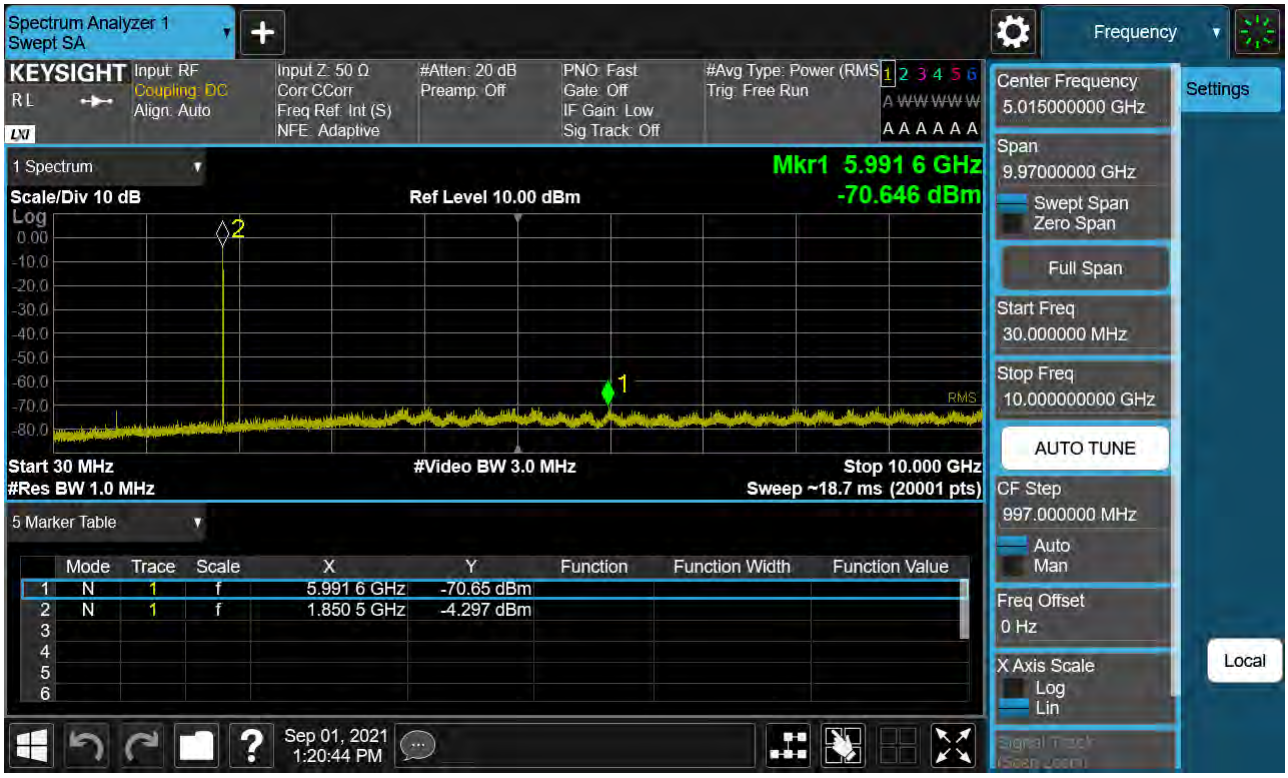
Sub6 n25(2). Upper Extended Band Edge Plot (15 M BW Ch.381500 BPSK_ Full RB) -2

Sub6 n25(2). Upper Band Edge Plot (20 M BW Ch.381000 BPSK_RB1_Offset 105)

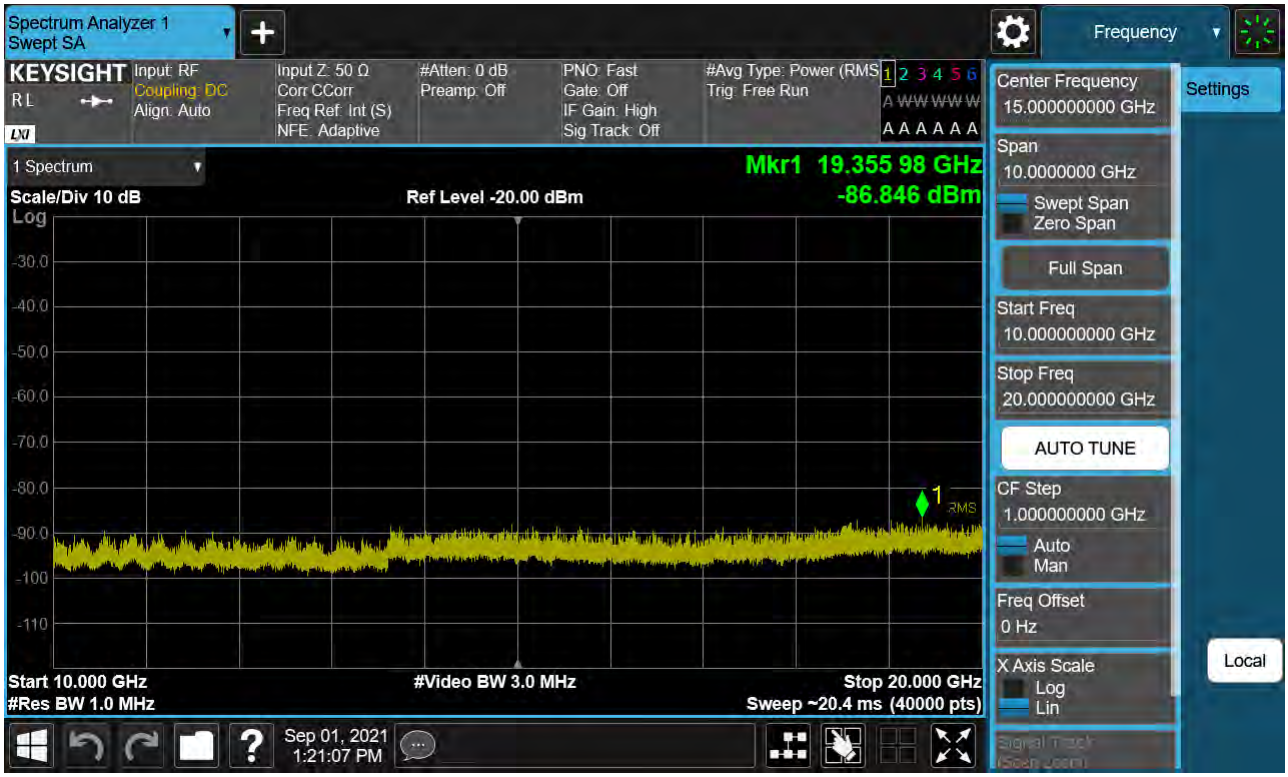
Sub6 n25(2). Upper Band Edge Plot (20 M BW Ch.381000 BPSK_ Full RB) -1

Sub6 n25(2). Upper Extended Band Edge Plot (20 M BW Ch.381000 BPSK_ Full RB) -2

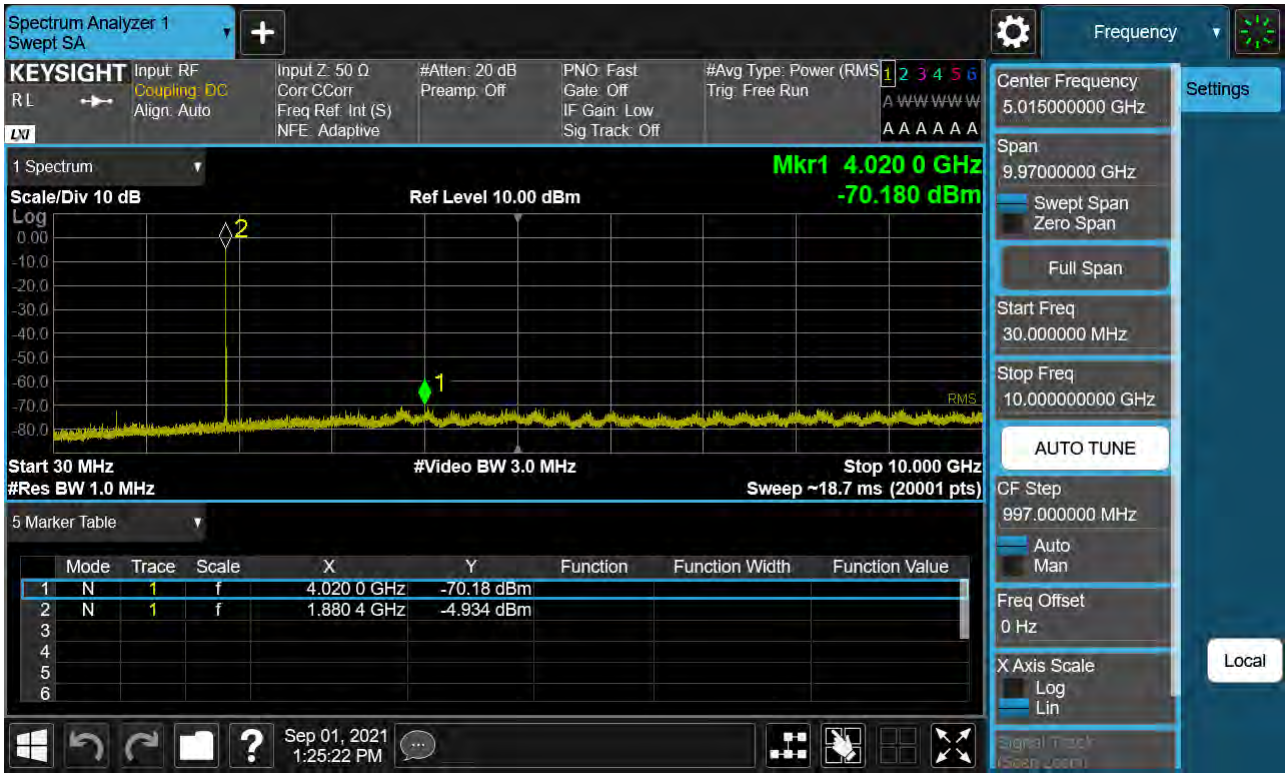
Sub6 n25(2). Conducted Spurious_1 (370500ch_5 MHz_BPSK_RB 1_1)



Sub6 n25(2). Conducted Spurious_2 (370500ch_5 MHz_BPSK_RB 1_1)

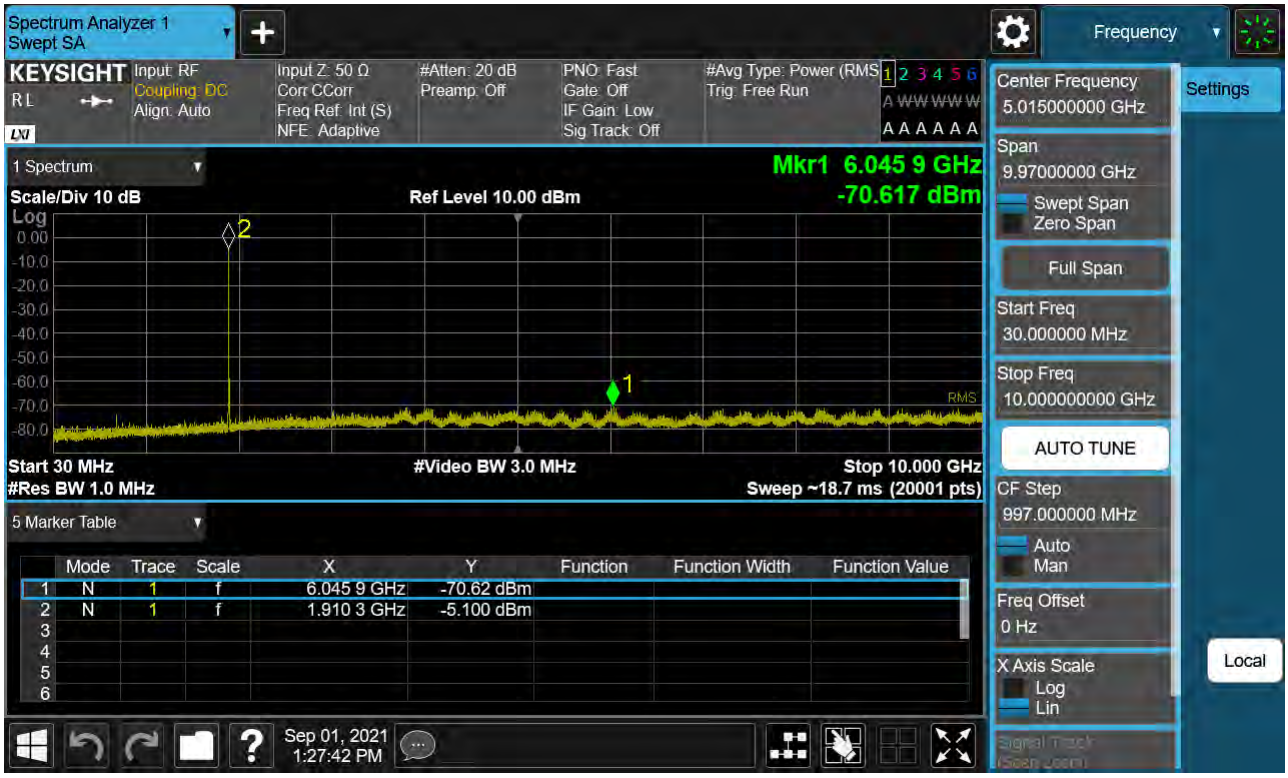


Sub6 n25(2). Conducted Spurious_1 (376500ch_5 MHz_BPSK_RB 1_1)



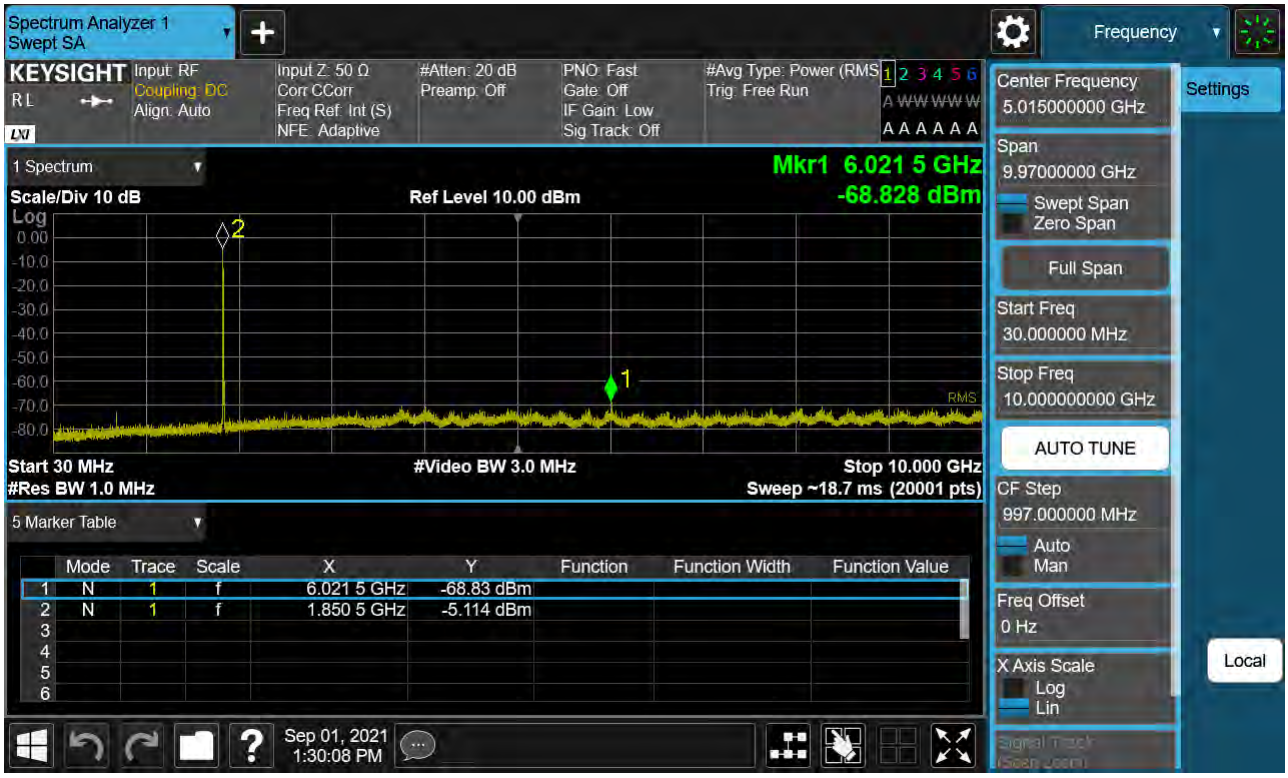
Sub6 n25(2). Conducted Spurious_2 (376500ch_5 MHz_BPSK_RB 1_1)

Sub6 n25(2). Conducted Spurious_1 (382500ch_5 MHz_BPSK_RB 1_1)



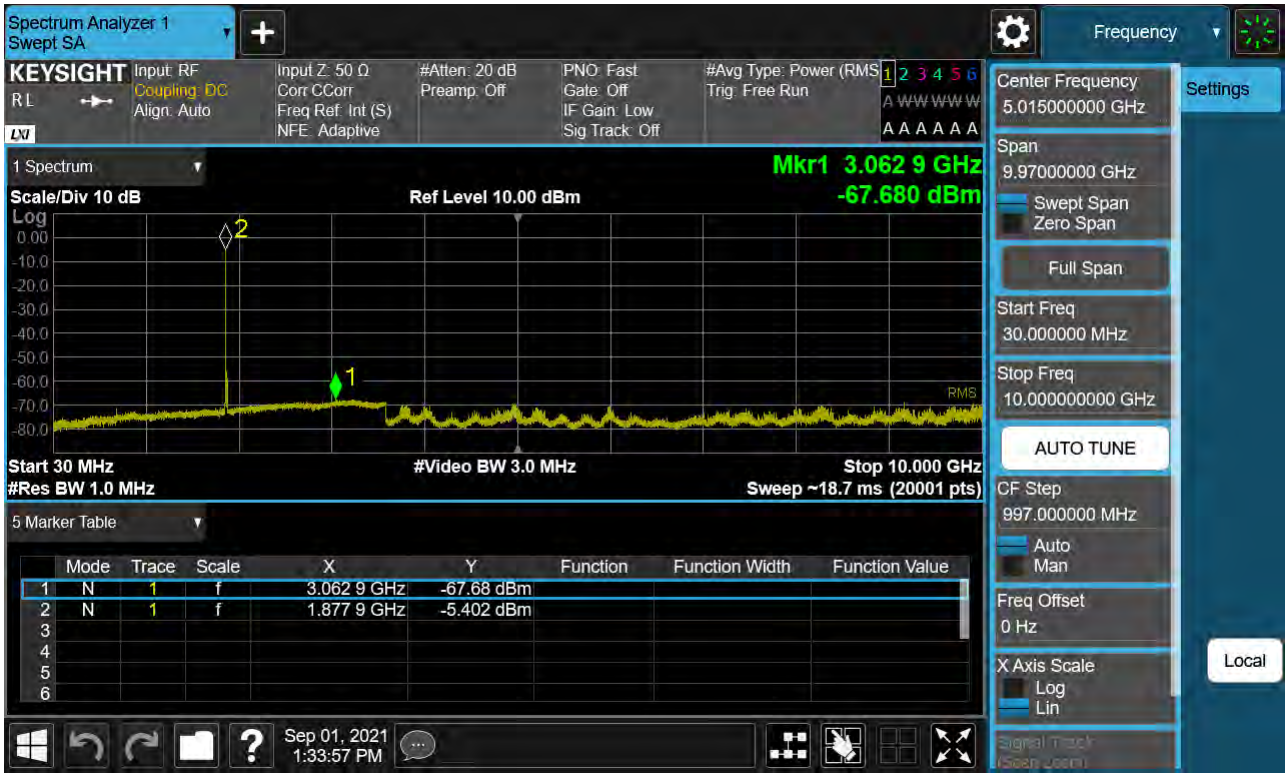
Sub6 n25(2). Conducted Spurious_2 (382500ch_5 MHz_BPSK_RB 1_1)

Sub6 n25(2). Conducted Spurious_1 (371000ch_10 MHz_BPSK_RB 1_1)

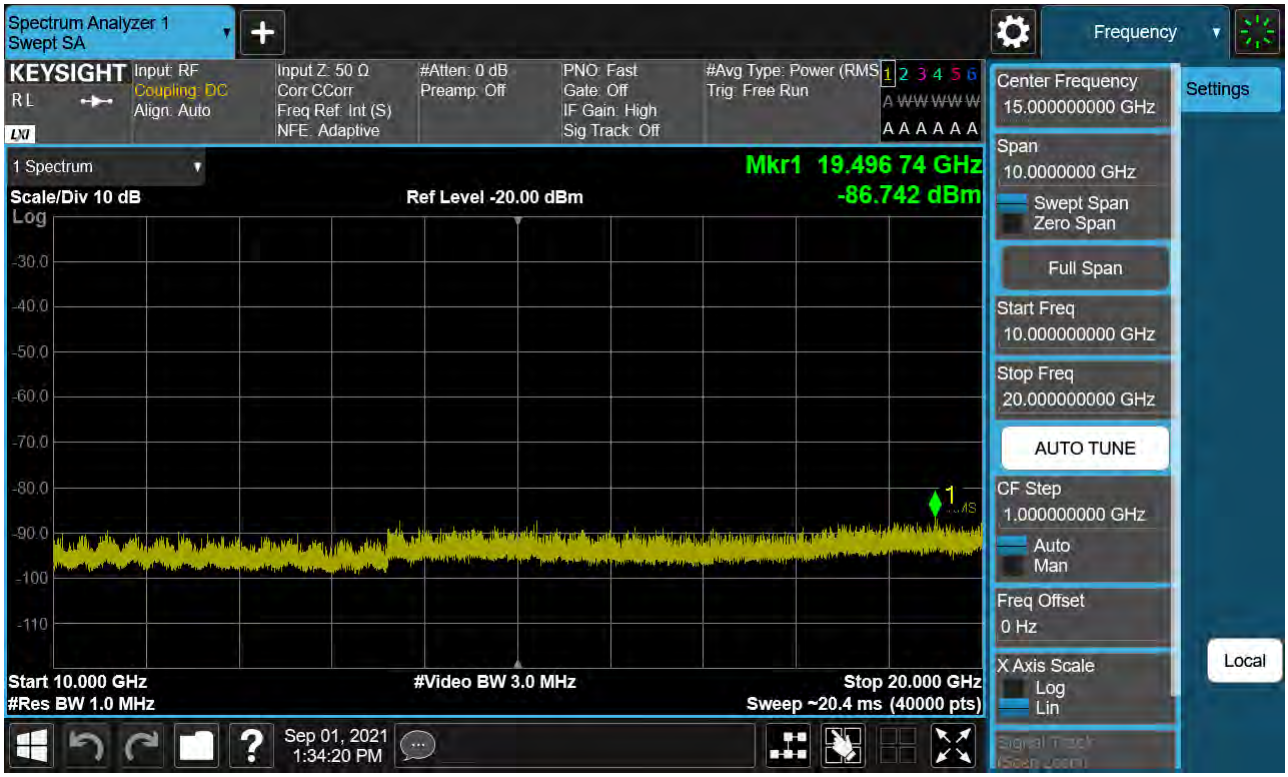


Sub6 n25(2). Conducted Spurious_2 (371000ch_10 MHz_BPSK_RB 1_1)

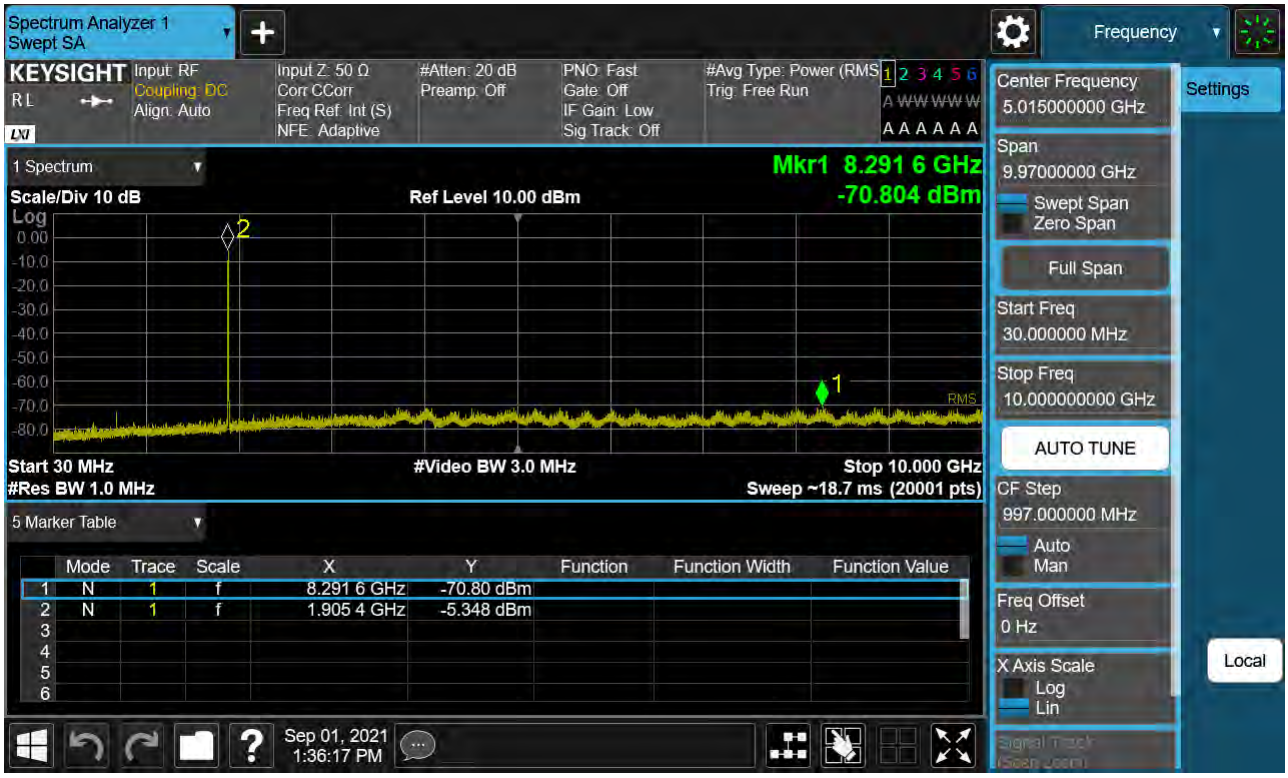
Sub6 n25(2). Conducted Spurious_1 (376500ch_10 MHz_BPSK_RB 1_1)



Sub6 n25(2). Conducted Spurious_2 (376500ch_10 MHz_BPSK_RB 1_1)

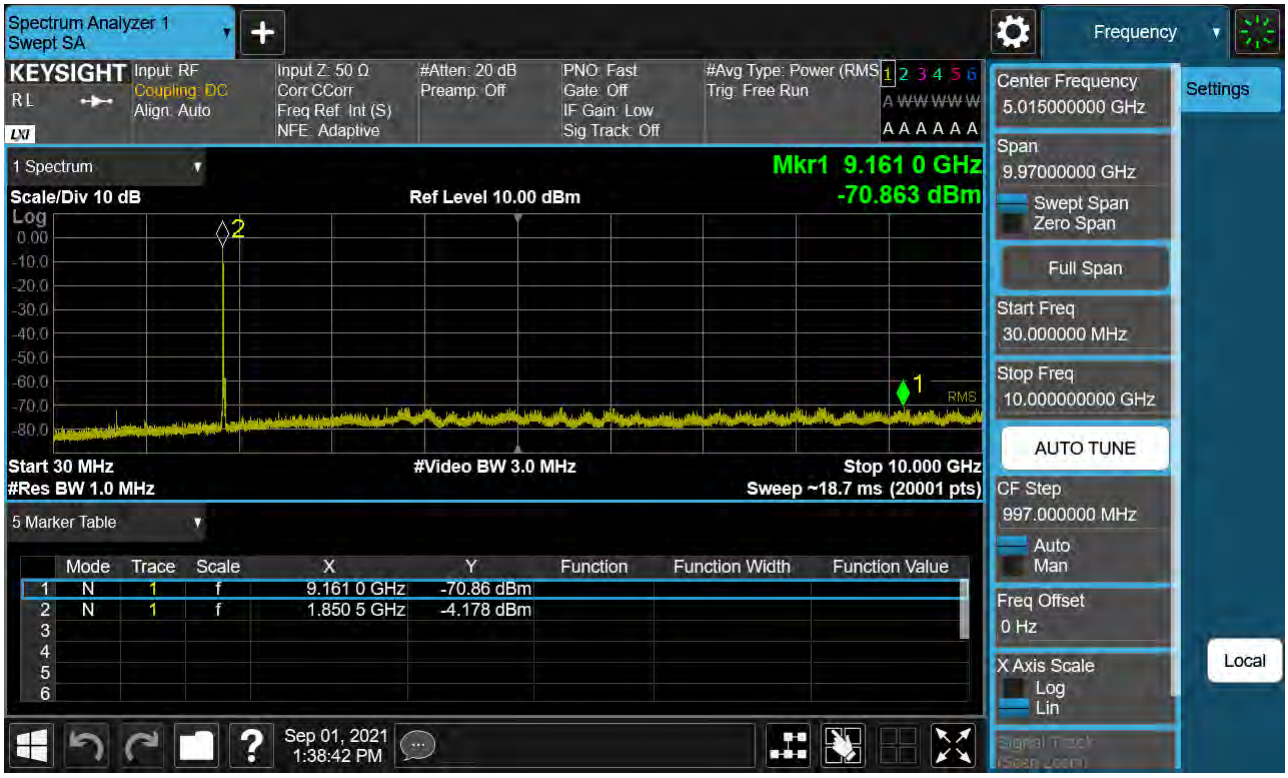


Sub6 n25(2). Conducted Spurious_1 (382000ch_10 MHz_BPSK_RB 1_1)

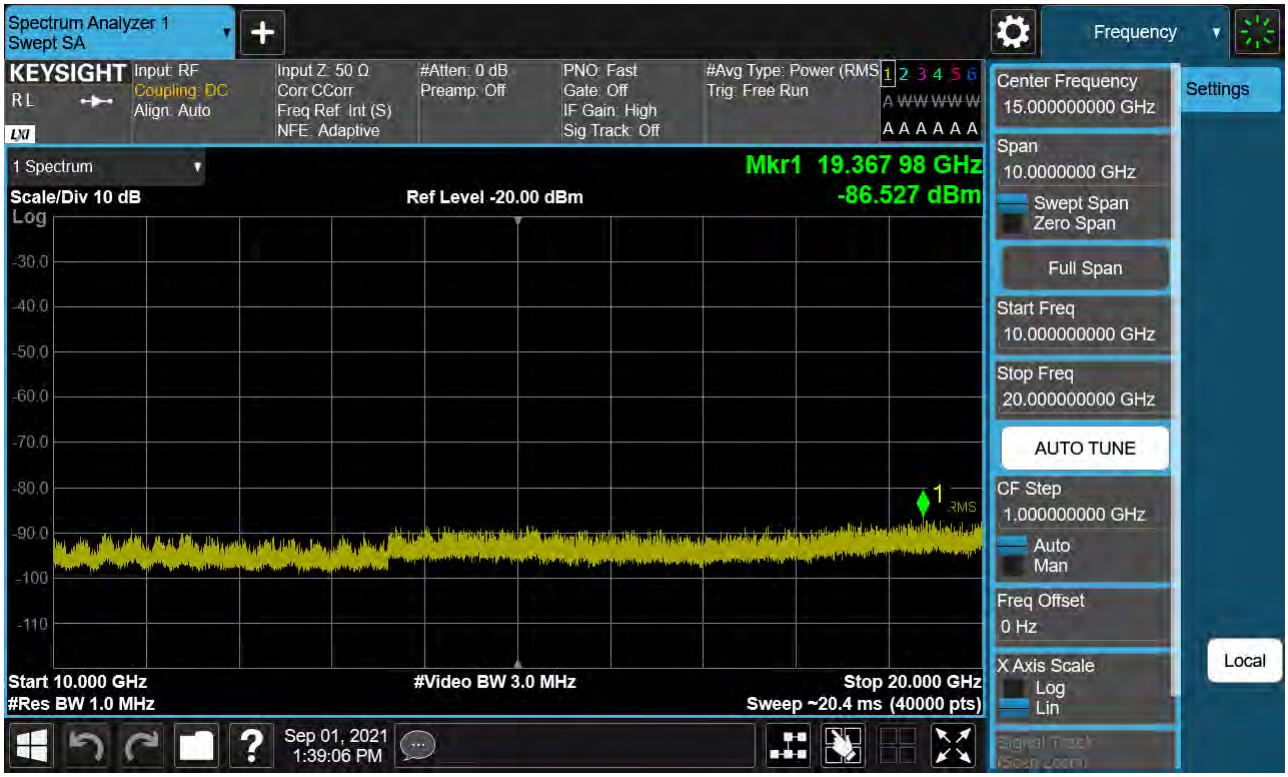


Sub6 n25(2). Conducted Spurious_2 (382000ch_10 MHz_BPSK_RB 1_1)

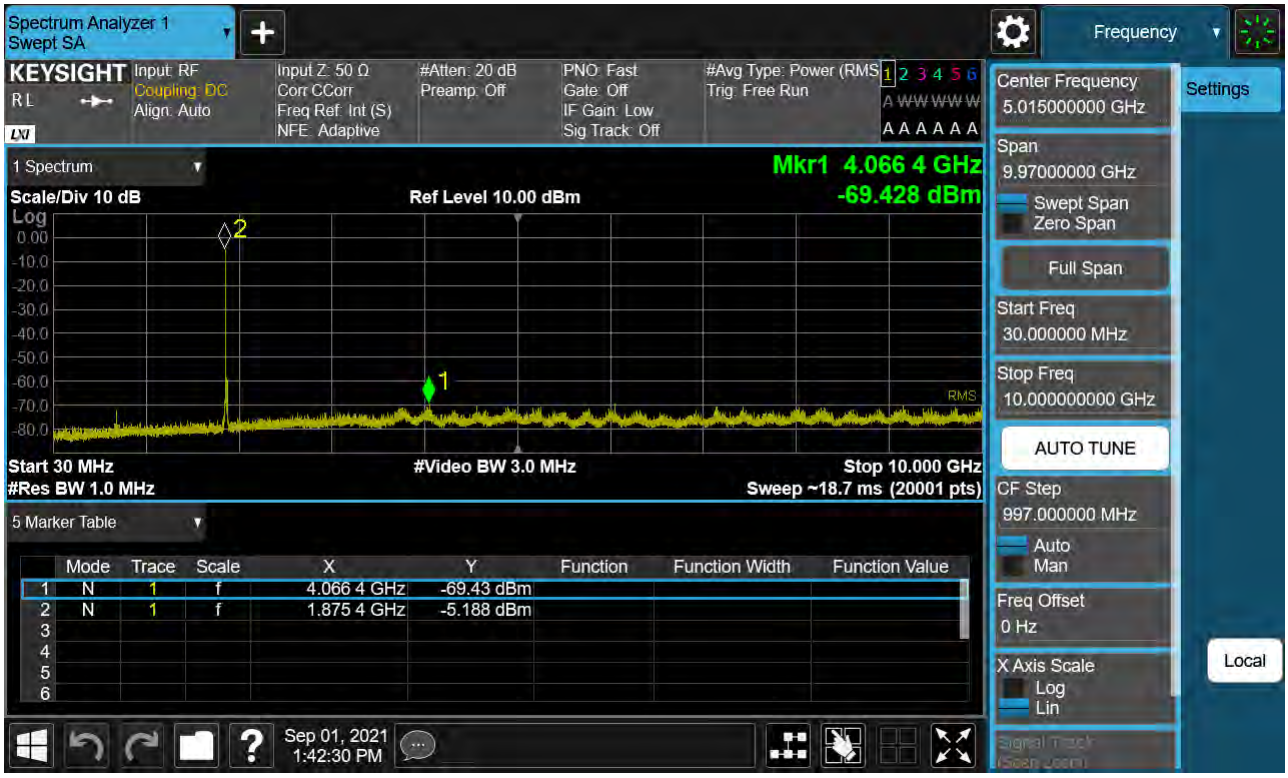
Sub6 n25(2). Conducted Spurious_1 (371500ch_15 MHz_BPSK_RB 1_1)



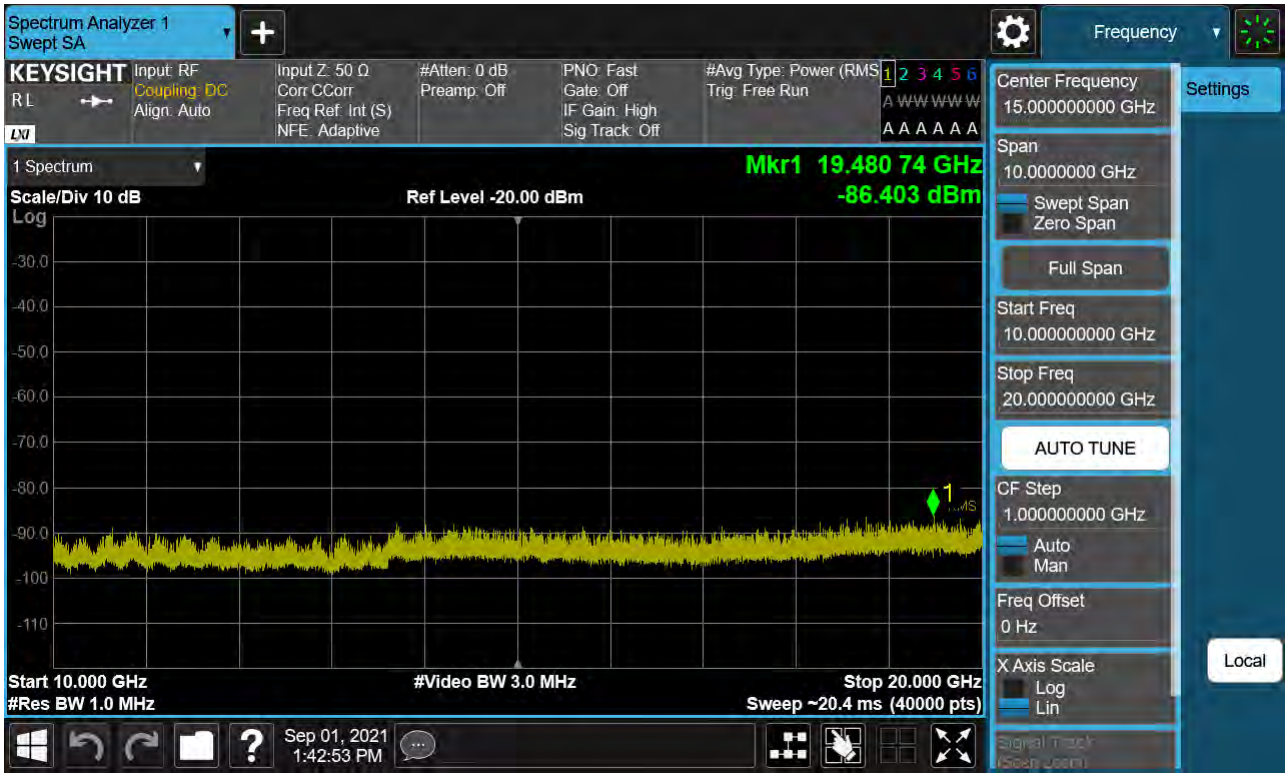
Sub6 n25(2). Conducted Spurious_2 (371500ch_15 MHz_BPSK_RB 1_1)



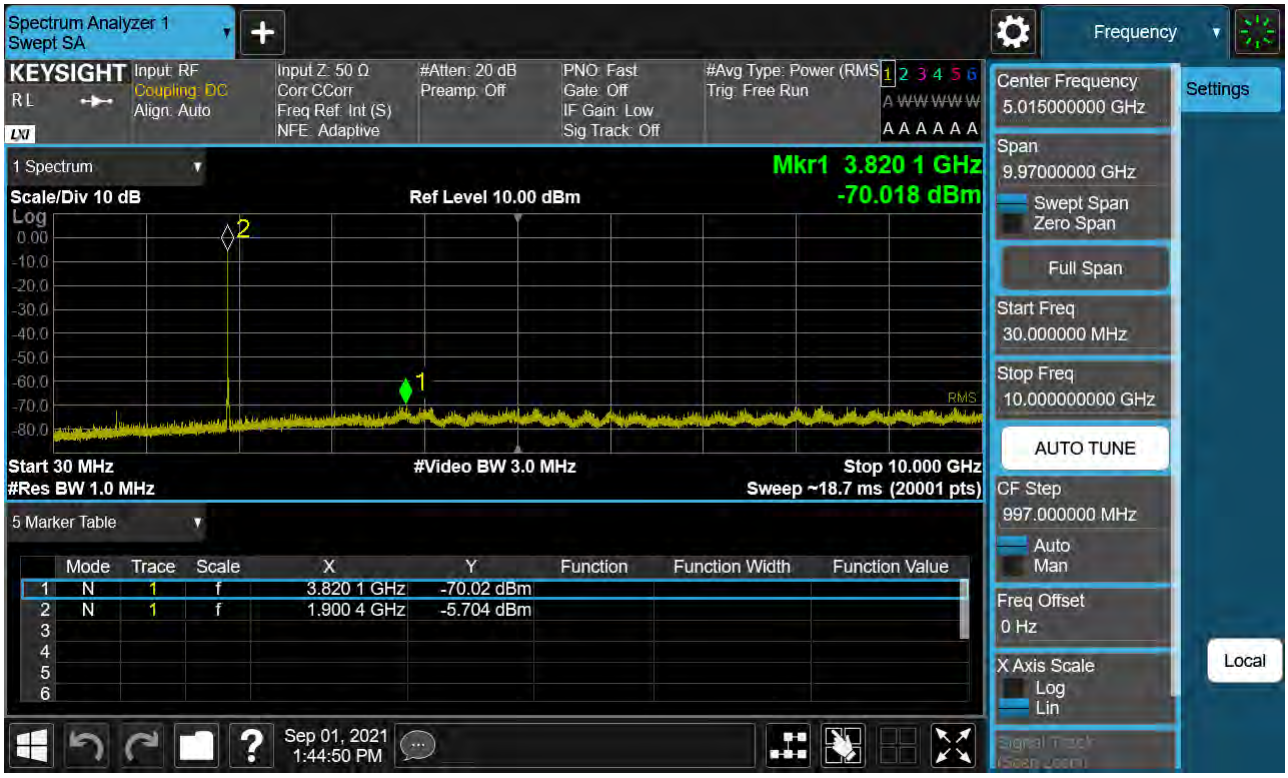
Sub6 n25(2). Conducted Spurious_1 (376500ch_15 MHz_BPSK_RB 1_1)



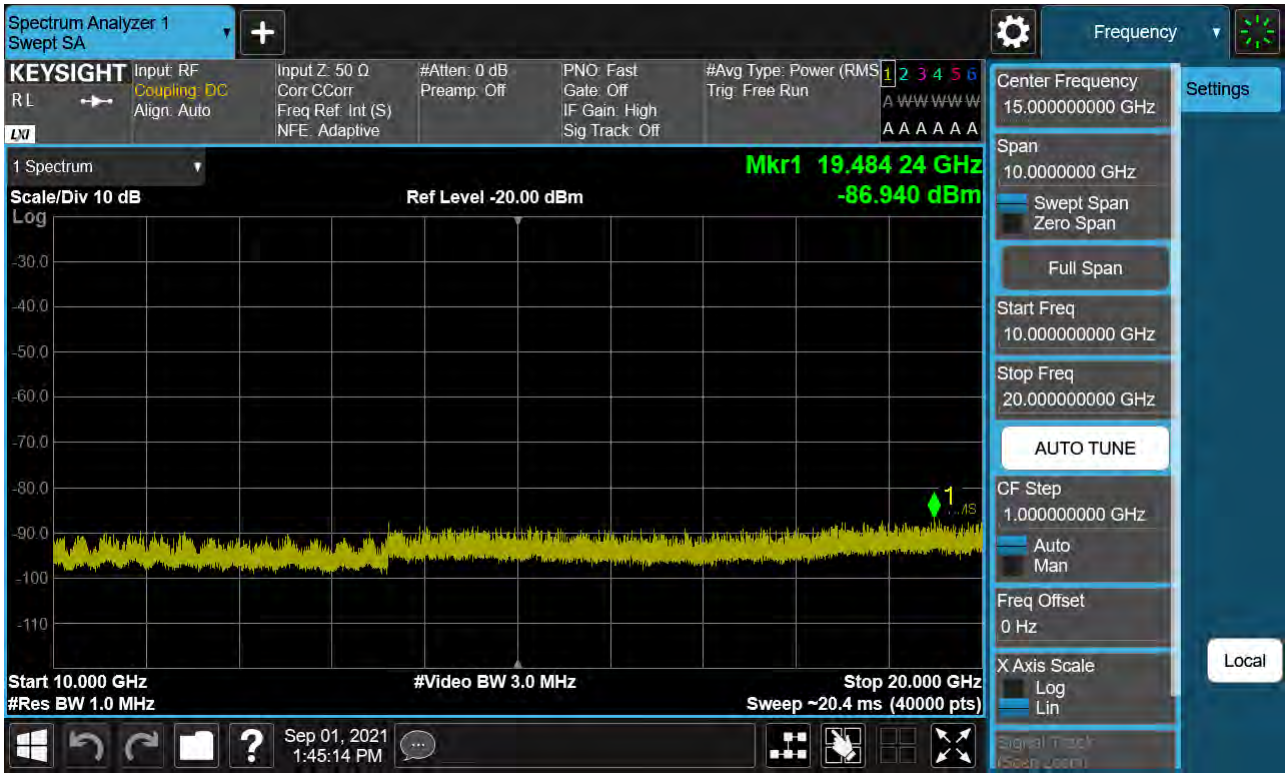
Sub6 n25(2). Conducted Spurious_2 (376500ch_15 MHz_BPSK_RB 1_1)



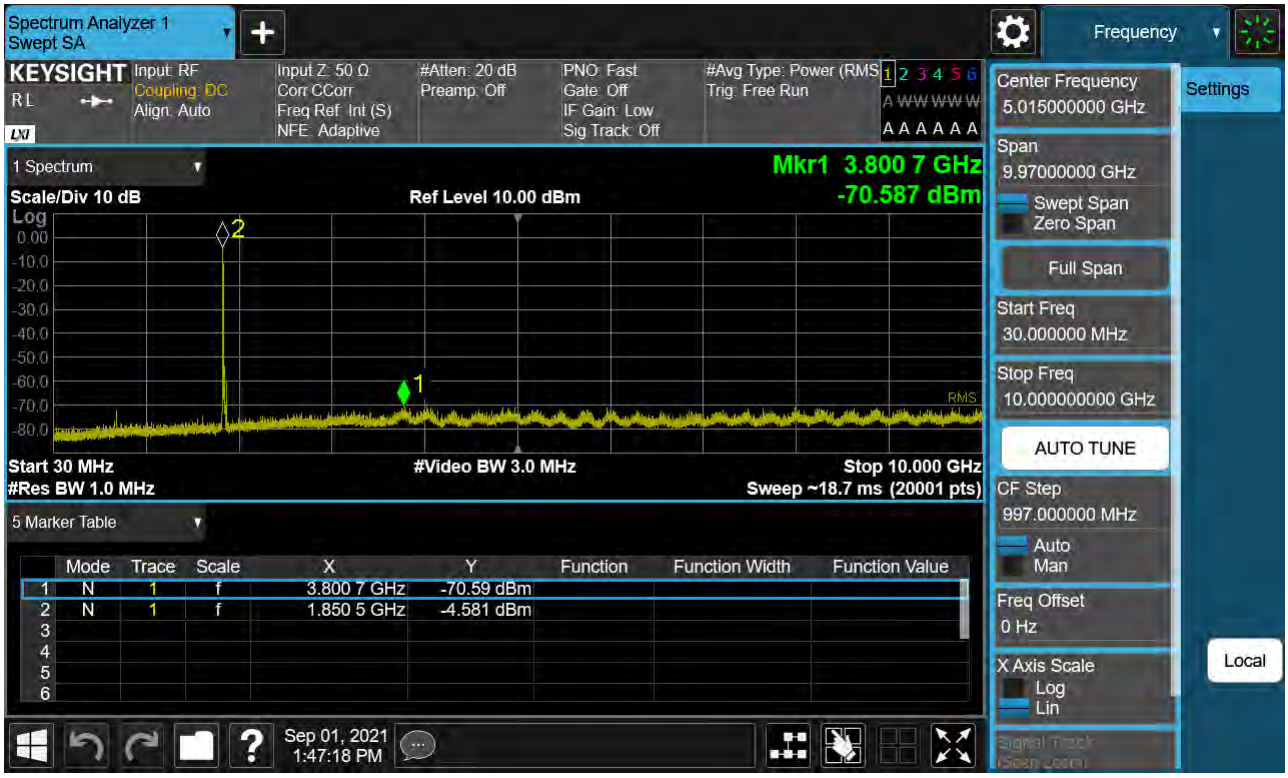
Sub6 n25(2). Conducted Spurious_1 (381500ch_15 MHz_BPSK_RB 1_1)



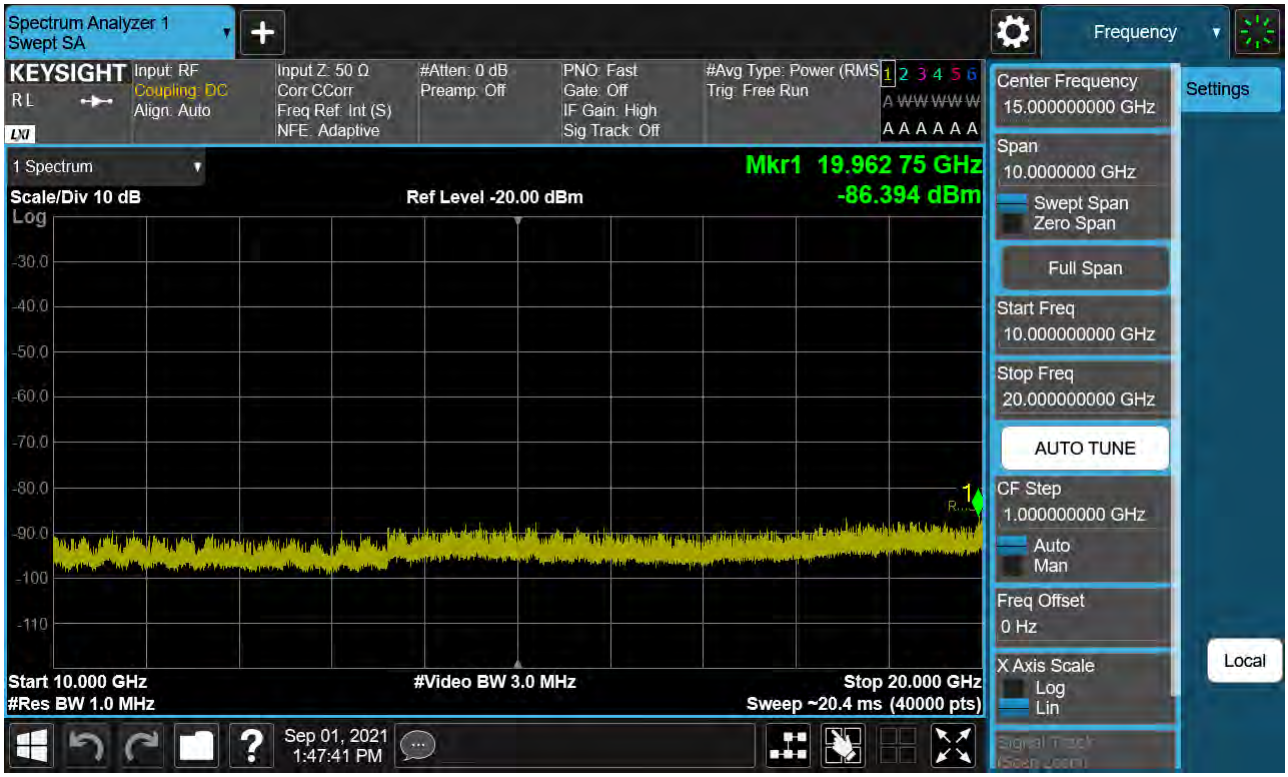
Sub6 n25(2). Conducted Spurious_2 (381500ch_15 MHz_BPSK_RB 1_1)



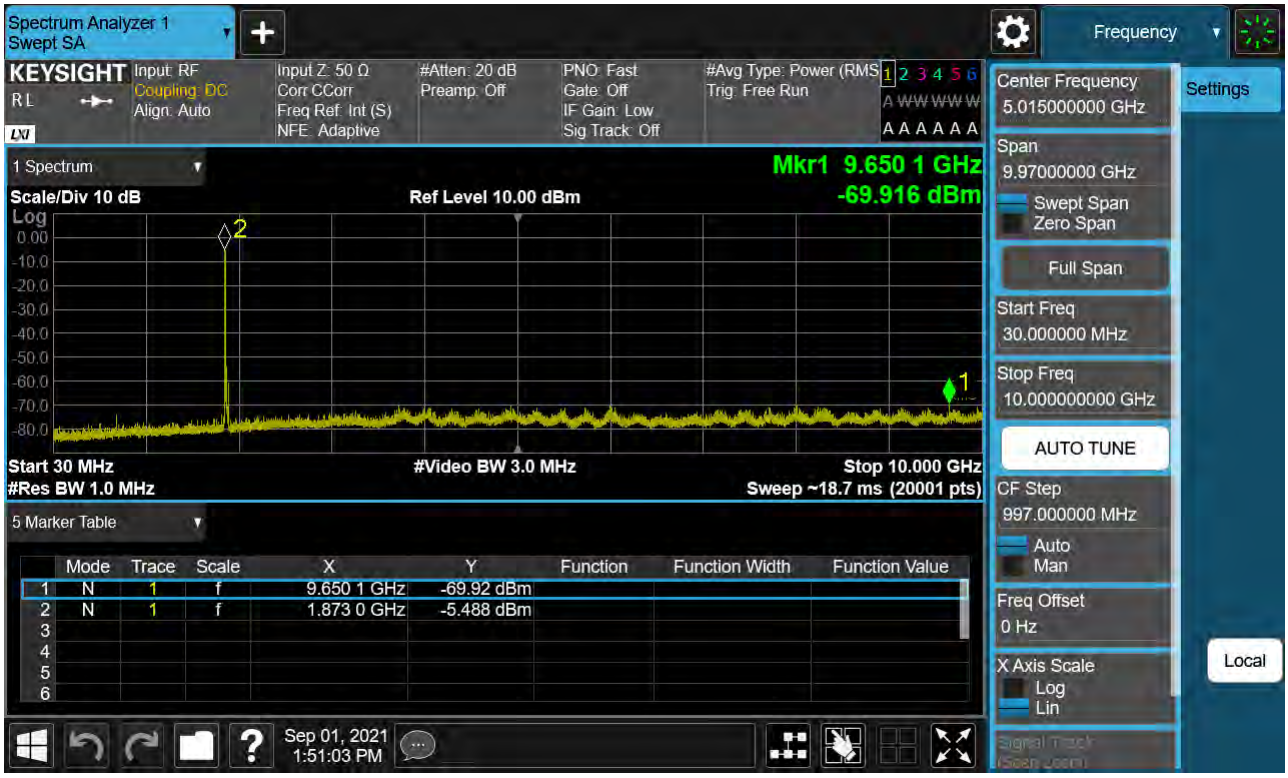
Sub6 n25(2). Conducted Spurious_1 (372000ch_20 MHz_BPSK_RB 1_1)



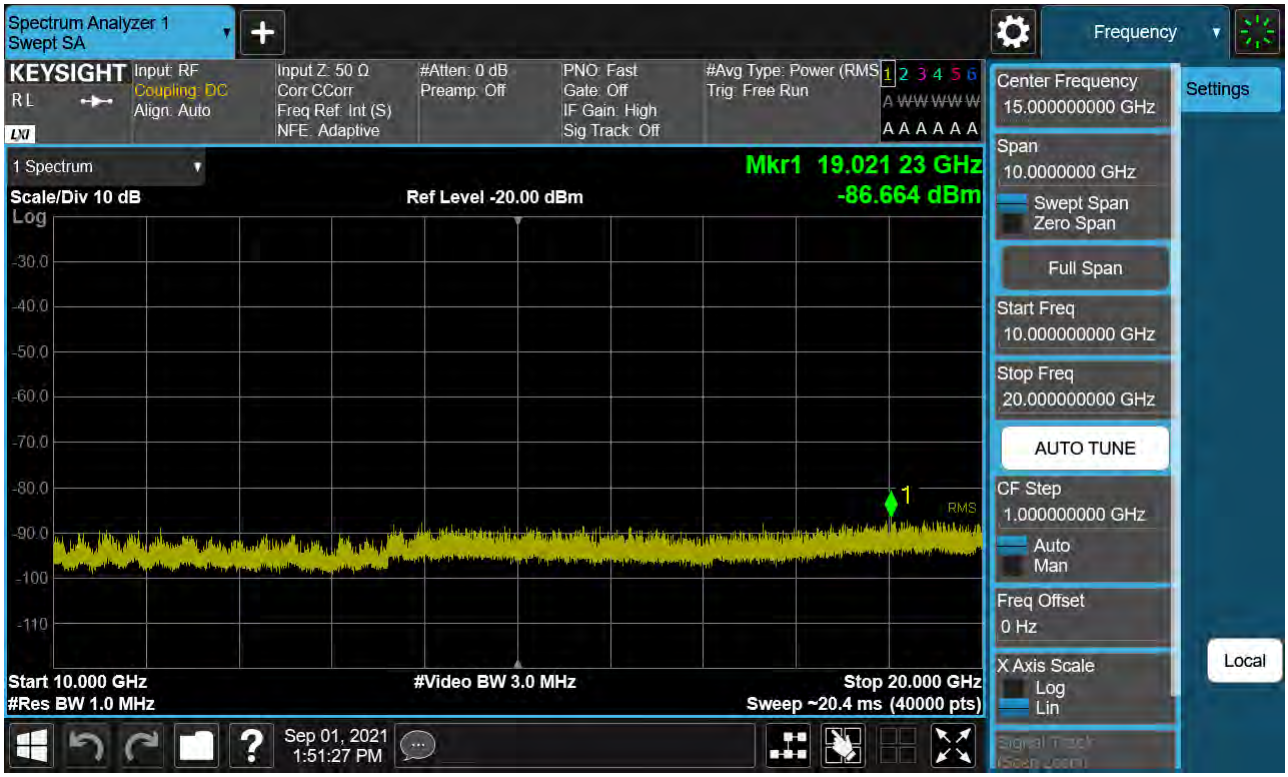
Sub6 n25(2). Conducted Spurious_2 (372000ch_20 MHz_BPSK_RB 1_1)



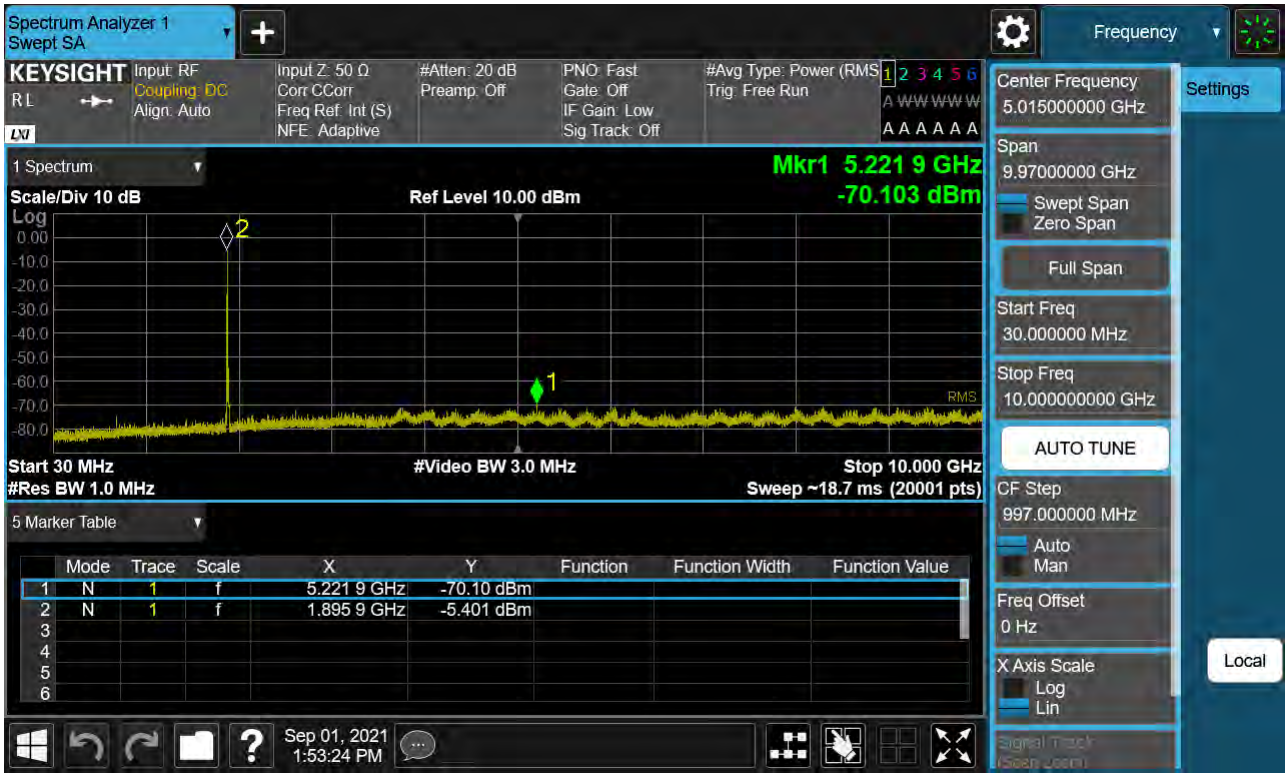
Sub6 n25(2). Conducted Spurious_1 (376500ch_20 MHz_BPSK_RB 1_1)



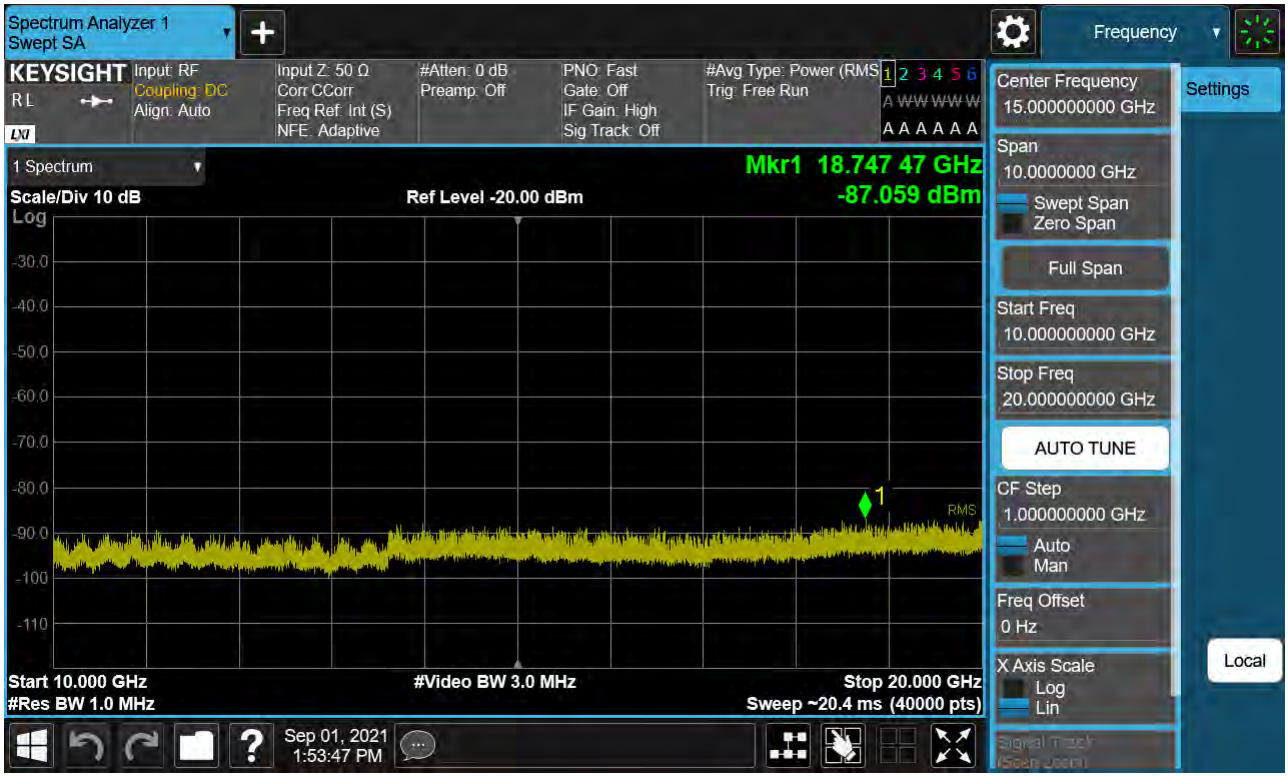
Sub6 n25(2). Conducted Spurious_2 (376500ch_20 MHz_BPSK_RB 1_1)



Sub6 n25(2). Conducted Spurious_1 (381000ch_20 MHz_BPSK_RB 1_1)



Sub6 n25(2). Conducted Spurious_2 (381000ch_20 MHz_BPSK_RB 1_1)



10. APPENDIX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2109-FC042-P