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 21, 2022
Location:
HCT CO., LTD.,
74, Seoicheon-ro 578beon-gil, Majang-myeon,
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
Report No.: HCT-RF-2210-FC021

FCC ID: **A3LSMS911B**

APPLICANT: **SAMSUNG Electronics Co., Ltd.**

Model(s): SM-S911B/DS
Additional Model(s): SM-S911B
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	4M51G7D	PI/2 BPSK	0.115	20.61
		4M50G7D	QPSK	0.115	20.59
		4M53W7D	16QAM	0.093	19.67
		4M51W7D	64QAM	0.061	17.85
		4M50W7D	256QAM	0.039	15.90
Sub6 n25(2) (10)	1855.0 - 1910.0	8M96G7D	PI/2 BPSK	0.117	20.69
		8M94G7D	QPSK	0.116	20.65
		8M98W7D	16QAM	0.095	19.78
		9M01W7D	64QAM	0.062	17.91
		9M00W7D	256QAM	0.039	15.96
Sub6 n25(2) (15)	1857.5 - 1907.5	13M4G7D	PI/2 BPSK	0.117	20.67
		13M4G7D	QPSK	0.116	20.65
		13M4W7D	16QAM	0.095	19.80
		13M5W7D	64QAM	0.062	17.90
		13M5W7D	256QAM	0.040	16.04
Sub6 n25(2) (20)	1860.0 - 1905.0	17M9G7D	PI/2 BPSK	0.112	20.50
		17M9G7D	QPSK	0.111	20.46
		17M9W7D	16QAM	0.091	19.58
		17M9W7D	64QAM	0.059	17.72
		17M9W7D	256QAM	0.038	15.84

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

REVIEWED BY

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

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

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

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

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2210-FC021	October 21, 2022	- First Approval Report

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

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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:	A3LSMS911B
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-S911B/DS
Additional Model(s):	SM-S911B
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 02, 2022~ October 14, 2022
Serial number:	Radiated: R3CT706PQ9B Conducted: R3CT706PHYK

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 (20/40/80/160 MHz), Bluetooth, BT LE, NFC, AIT, WPT.

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

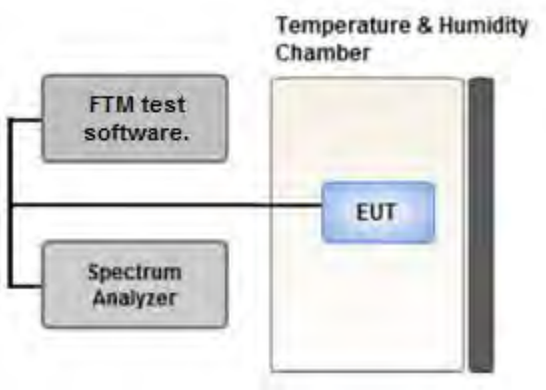
$$Result_{(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

$$EIRP_{(dBm)} = ERP_{(dBm)} + 2.15$$

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① **CCDF Procedure for PAPR**

Test Settings

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

② **Alternate Procedure for PAPR**

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as P_{Pk}.

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

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

Test Settings(Peak Power)

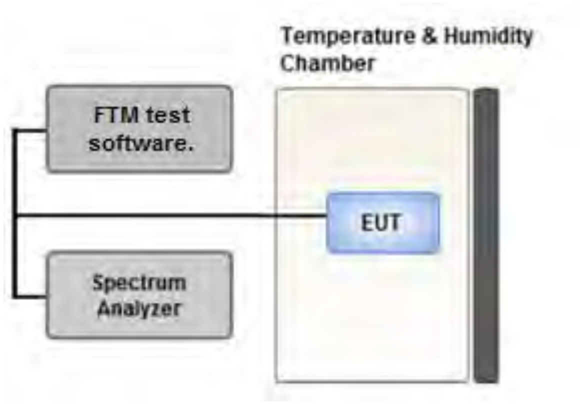
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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

Test Settings(Average Power)

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

3.5 OCCUPIED BANDWIDTH.



Test setup

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

The EUT makes a call to the communication simulator.

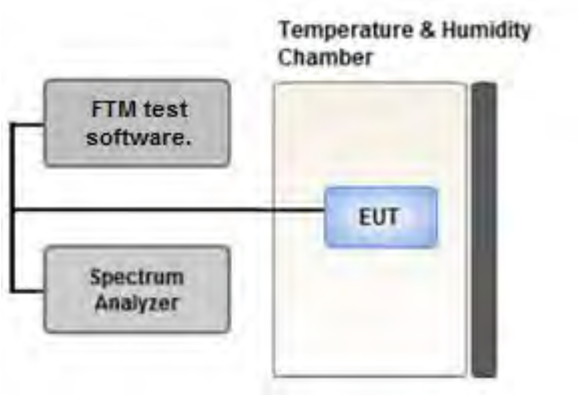
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5 % of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5 % of the 99 % occupied bandwidth observed in Step 7

3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

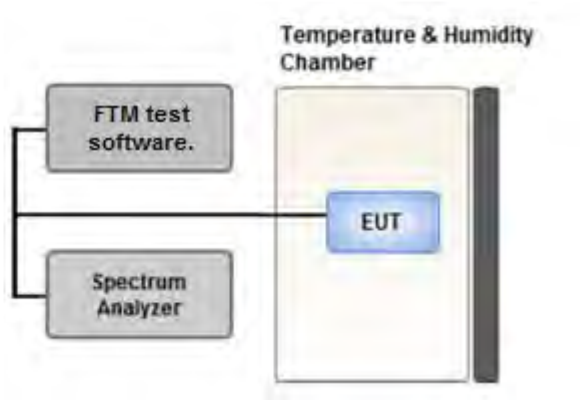
Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Settings

1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = RMS
4. Trace Mode = Average
5. Sweep time = auto
6. Number of points in sweep ≥ 2 * 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

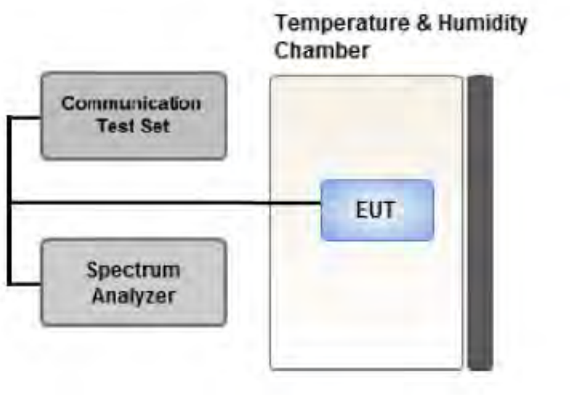
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a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

Where Margin < 1 dB the emission level is either corrected by 10 log(1 MHz/ RB) or the emission is integrated over a 1 MHz bandwidth to determine the final result. When using the integration method the integration window is either centered on the emission or, for emissions at the band edge, centered by an offset of 500 kHz from the block edge so that the integration window is the 1 MHz adjacent to the block edge.

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)
- BAND 25 (1850 – 1915 MHz) overlaps the entire frequency range of BAND 2 (1850 - 1910 MHz) and they have the same Tune-up power. Therefore, test data provided in this report covers BAND 2 as well as 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: NSA (12A-n25A)
  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.
  Mode : Stand alone, Simultaneous transmission scenarios
  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: 12A-n25A(BW 10 MHz))
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported.
  (Worst case : 10 MHz)
- SM-S911B/DS & additional models were tested and the worst case results are reported.
  (Worst case : SM-S911B/DS)

[Worst case]

<table>
<tr><th>Test Description</th><th>Modulation</th><th>RB size</th><th>RB offset</th><th>Axis</th></tr>
<tr><td>Effective Isotropic Radiated Power</td><td>PI/2 BPSK,
QPSK,
16QAM,
64QAM,
256QAM</td><td colspan="2">See Section 8.1</td><td>Z</td></tr>
<tr><td>Radiated Spurious and Harmonic Emissions</td><td>QPSK</td><td colspan="2">See Section 8.2</td><td>Z</td></tr>
</table>

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)
- BAND 25 (1850 – 1915 MHz) overlaps the entire frequency range of BAND 2 (1850 - 1910 MHz) and they have the same Tune-up power. Therefore, test data provided in this report covers BAND 2 as well as BAND 25.
- All modes of operation were investigated and the worst case configuration results are reported.
  Mode: SA, NSA
  Worst case: NSA (12A-n25A)
- All RB sizes, offsets of operation were investigated and the worst case configuration results are reported.
  Please refer to the table below.
- SM-S911B/DS & additional models were tested and the worst case results are reported.
  (Worst case : SM-S911B/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	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	03/27/2024	Biennial
Precision Dipole Antenna	UHAP	Schwarzbeck	01274	03/27/2024	Biennial
Horn Antenna(1~18 GHz)	BBHA 9120D	Schwarzbeck	02289	03/21/2024	Biennial
Horn Antenna(1~18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1299	05/04/2023	Biennial
Horn Antenna(15~40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Horn Antenna(15~40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	04/12/2023	Biennial
Loop Antenna(9 kHz~30 MHz)	FMZB1513	Rohde & Schwarz	1513-175	06/04/2023	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	05/18/2023	Annual
High Pass Filter	WHKX10-2700-3000-18000-40SS	Wainwright Instruments	145	05/18/2023	Annual
High Pass Filter	WHNX6-4740-6000-26500-40CC	Wainwright Instruments	11	05/18/2023	Annual
LOW NOISE AMP (100 MHz ~ 18 GHz)	CBLU1183540B-01	CERNEX	26822	05/18/2023	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/02/2022	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/11/2023	Annual
DC Power Supply	E3632A	Hewlett Packard	MY40004427	09/05/2023	Annual
Power Splitter(DC~26.5 GHz)	11667B	Hewlett Packard	11275	03/11/2023	Annual
Chamber	SU-642	ESPEC	93008124	03/04/2023	Annual
Signal Analyzer(10 Hz~26.5 GHz)	N9020A	Agilent	MY51110063	04/19/2023	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	05/18/2023	Annual
Spectrum Analyzer(10 Hz~40 GHz)	FSV40	REOHDE & SCHWARZ	101436	02/25/2023	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/18/2023	Annual
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262287700	05/19/2023	Annual
Wideband Radio Communication Tester	MT8000A	Anritsu Corp.	6262302511	05/18/2023	Annual
SIGNAL GENERATOR (100 kHz~40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2023	Annual
Signal Analyzer(5 Hz~40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/30/2023	Annual
4-Way Divider	ZC4PD-K1844+	Mini-Circuits	942907	09/27/2023	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. Espectially, 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)	2.00 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.40 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.74 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.51 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.92 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (Above 40 GHz)	5.48 (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. Radiated 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
20175	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 = 4 M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4 M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4 M48W7D

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
1852.5	Sub6 n25(2)/ 5 MHz [15 kHz]	PI/2 BPSK	-20.83	12.76	10.00	2.15	V	< 2.00	0.115	20.61	1	1
		QPSK	-20.85	12.74	10.00	2.15	V		0.115	20.59		
		16-QAM	-21.77	11.82	10.00	2.15	V		0.093	19.67		
		64-QAM	-23.59	10.00	10.00	2.15	V		0.061	17.85		
		256-QAM	-25.54	8.05	10.00	2.15	V		0.039	15.90		
1882.5		PI/2 BPSK	-21.50	12.10	10.00	2.21	V		0.097	19.89	1	1
		QPSK	-21.62	11.98	10.00	2.21	V		0.095	19.77		
		16-QAM	-22.37	11.23	10.00	2.21	V		0.080	19.02		
		64-QAM	-24.46	9.14	10.00	2.21	V		0.049	16.93		
		256-QAM	-26.45	7.15	10.00	2.21	V		0.031	14.94		
1912.5		PI/2 BPSK	-22.98	11.04	10.01	2.11	V		0.078	18.94	1	1
		QPSK	-23.09	10.93	10.01	2.11	V		0.076	18.83		
		16-QAM	-23.92	10.10	10.01	2.11	V		0.063	18.00		
		64-QAM	-25.79	8.23	10.01	2.11	V		0.041	16.13		
		256-QAM	-27.60	6.42	10.01	2.11	V		0.027	14.32		

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
1855.0	Sub6 n25(2)/ 10 MHz [15 kHz]	PI/2 BPSK	-20.75	12.84	10.00	2.15	V	< 2.00	0.117	20.69	1	1
		QPSK	-20.79	12.80	10.00	2.15	V		0.116	20.65		
		16-QAM	-21.66	11.93	10.00	2.15	V		0.095	19.78		
		64-QAM	-23.53	10.06	10.00	2.15	V		0.062	17.91		
		256-QAM	-25.48	8.11	10.00	2.15	V		0.039	15.96		
1882.5		PI/2 BPSK	-21.41	12.19	10.00	2.21	V		0.100	19.98	1	1
		QPSK	-21.43	12.17	10.00	2.21	V		0.099	19.96		
		16-QAM	-22.36	11.24	10.00	2.21	V		0.080	19.03		
		64-QAM	-24.23	9.37	10.00	2.21	V		0.052	17.16		
		256-QAM	-26.13	7.47	10.00	2.21	V		0.034	15.26		
1910.0		PI/2 BPSK	-22.72	11.30	10.01	2.11	V		0.083	19.20	1	26
		QPSK	-22.75	11.27	10.01	2.11	V		0.083	19.17		
		16-QAM	-23.54	10.48	10.01	2.11	V		0.069	18.38		
		64-QAM	-25.53	8.49	10.01	2.11	V		0.044	16.39		
		256-QAM	-27.36	6.66	10.01	2.11	V		0.029	14.56		

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
1857.5	Sub6 n25(2)/ 15 MHz [15 kHz]	PI/2 BPSK	-20.77	12.82	10.00	2.15	V	< 2.00	0.117	20.67	1	1
		QPSK	-20.79	12.80	10.00	2.15	V		0.116	20.65		
		16-QAM	-21.64	11.95	10.00	2.15	V		0.095	19.80		
		64-QAM	-23.54	10.05	10.00	2.15	V		0.062	17.90		
		256-QAM	-25.40	8.19	10.00	2.15	V		0.040	16.04		
1882.5		PI/2 BPSK	-21.57	12.03	10.00	2.21	V		0.096	19.82	1	1
		QPSK	-21.59	12.01	10.00	2.21	V		0.095	19.80		
		16-QAM	-22.50	11.10	10.00	2.21	V		0.077	18.89		
		64-QAM	-24.33	9.27	10.00	2.21	V		0.051	17.06		
		256-QAM	-26.03	7.57	10.00	2.21	V		0.034	15.36		
1907.5		PI/2 BPSK	-22.19	11.78	10.01	2.13	V		0.092	19.66	1	1
		QPSK	-22.25	11.72	10.01	2.13	V		0.091	19.60		
		16-QAM	-23.07	10.90	10.01	2.13	V		0.076	18.78		
		64-QAM	-25.05	8.92	10.01	2.13	V		0.048	16.80		
		256-QAM	-26.78	7.19	10.01	2.13	V		0.032	15.07		

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
1860.0	Sub6 n25(2)/ 20 MHz [15 kHz]	PI/2 BPSK	-20.67	12.67	10.00	2.17	V	< 2.00	0.112	20.50	1	1
		QPSK	-20.71	12.63	10.00	2.17	V		0.111	20.46		
		16-QAM	-21.59	11.75	10.00	2.17	V		0.091	19.58		
		64-QAM	-23.45	9.89	10.00	2.17	V		0.059	17.72		
		256-QAM	-25.33	8.01	10.00	2.17	V		0.038	15.84		
1882.5		PI/2 BPSK	-21.39	12.21	10.00	2.21	V		0.100	20.00	1	1
		QPSK	-21.42	12.18	10.00	2.21	V		0.099	19.97		
		16-QAM	-22.25	11.35	10.00	2.21	V		0.082	19.14		
		64-QAM	-24.19	9.41	10.00	2.21	V		0.052	17.20		
		256-QAM	-25.78	7.82	10.00	2.21	V		0.036	15.61		
1905.0		PI/2 BPSK	-21.96	12.01	10.01	2.13	V		0.097	19.89	1	1
		QPSK	-22.03	11.94	10.01	2.13	V		0.096	19.82		
		16-QAM	-22.89	11.08	10.01	2.13	V		0.079	18.96		
		64-QAM	-24.75	9.22	10.01	2.13	V		0.051	17.10		
		256-QAM	-26.52	7.45	10.01	2.13	V		0.034	15.33		

8.2 RADIATED SPURIOUS EMISSIONS

- ▣ NR Band: N25(2)
- ▣ LTE Band(Anchor): B12
- ▣ Bandwidth: 10 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)	RB	
									Size	Offset
371000 (1855.0)	3 710.00	-60.41	11.40	-60.79	3.11	V	-52.50	-13.00	1	1
	5 565.00	-62.57	11.90	-56.89	3.85	V	-48.84	-13.00		
	7 420.00	-63.91	10.80	-48.97	4.46	V	-42.63	-13.00		
	9 275.00	-59.42	10.80	-44.83	5.07	V	-39.10	-13.00		
	11 130.00	-62.90	11.30	-44.54	5.61	V	-38.85	-13.00		
376500 (1882.5)	3 765.00	-60.91	11.30	-60.98	3.09	V	-52.77	-13.00	1	1
	5 647.50	-62.59	11.85	-57.17	3.89	V	-49.21	-13.00		
	7 530.00	-64.72	11.10	-50.25	4.50	V	-43.65	-13.00		
	9 412.50	-62.93	10.80	-47.60	5.07	V	-41.87	-13.00		
	11 295.00	-63.74	11.35	-45.41	5.64	V	-39.70	-13.00		
382000 (1910.0)	3 820.00	-61.71	11.10	-60.79	3.10	V	-52.79	-13.00	1	26
	5 730.00	-62.66	11.70	-56.35	3.85	V	-48.50	-13.00		
	7 640.00	-64.22	11.20	-50.64	4.53	V	-43.97	-13.00		
	9 550.00	-63.52	11.00	-48.06	5.16	V	-42.22	-13.00		
	11 460.00	-64.14	11.40	-44.26	5.69	V	-38.55	-13.00		

▣ ENDC-Mode : 12A(10 MHz)-n25A(10 MHz)

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
23095 (707.5)	1415.00	-60.29	7.61	-66.92	1.87	V	-61.17	-13.00
	2122.50	-61.88	8.98	-67.70	2.31	V	-61.03	-13.00
	2830.00	-62.07	10.52	-66.08	2.73	V	-58.29	-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	4.02
			QPSK			5.27
			16-QAM			6.10
			64-QAM			6.59
			256-QAM			6.52
	10 MHz		BPSK	50		4.10
			QPSK			5.40
			16-QAM			6.31
			64-QAM			6.49
			256-QAM			6.87
	15 MHz		BPSK	75		4.29
			QPSK			5.51
			16-QAM			6.33
			64-QAM			6.47
			256-QAM			6.70
	20 MHz		BPSK	100		4.43
			QPSK			5.45
			16-QAM			6.19
			64-QAM			6.41
			256-QAM			6.64

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 56 ~ 75.

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	4.5119
			QPSK			4.5002
			16-QAM			4.5245
			64-QAM			4.5046
			256-QAM			4.5020
	10 MHz		BPSK	50		8.9640
			QPSK			8.9395
			16-QAM			8.9821
			64-QAM			9.0087
			256-QAM			9.0032
	15 MHz		BPSK	75		13.426
			QPSK			13.426
			16-QAM			13.439
			64-QAM			13.501
			256-QAM			13.470
	20 MHz		BPSK	100		17.882
			QPSK			17.903
			16-QAM			17.886
			64-QAM			17.853
			256-QAM			17.896

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 36 ~ 55.

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	9.6735	30.815	-70.197	-39.382	-13.00
		1882.5	9.9701	30.815	-71.352	-40.537	
		1912.5	5.2129	30.815	-71.158	-40.343	
	10	1855.0	3.7792	30.200	-71.172	-40.972	
		1882.5	4.0644	30.200	-70.651	-40.451	
		1910.0	9.9417	30.815	-71.193	-40.378	
	15	1857.5	3.7802	30.200	-70.736	-40.536	
		1882.5	9.1007	30.815	-71.155	-40.340	
		1907.5	3.7433	30.200	-71.179	-40.979	
	20	1860.0	4.0983	30.200	-70.915	-40.715	
		1882.5	3.8106	30.200	-71.011	-40.811	
		1905.0	4.0255	30.200	-70.349	-40.149	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 100 ~ 123.
2. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
3. Factor(dB) = Cable Loss + Attenuator + Power Splitter

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	32.355

8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 76 ~ 99.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ BandWidth: 5 MHz

▣ Voltage(100 %): 3.880 VDC

▣ Batt. Endpoint: 3.300 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 499 998	0.0	0.000 000	0.000
	100%	-30	1852 499 995	-3.3	0.000 000	-0.002
	100%	-20	1852 499 995	-2.8	0.000 000	-0.002
	100%	-10	1852 499 997	-1.3	0.000 000	-0.001
	100%	0	1852 499 997	-1.3	0.000 000	-0.001
	100%	+10	1852 499 994	-4.1	0.000 000	-0.002
	100%	+30	1852 499 994	-3.8	0.000 000	-0.002
	100%	+40	1852 499 995	-3.1	0.000 000	-0.002
	100%	+50	1852 499 993	-4.6	0.000 000	-0.002
	Batt. Endpoint	+20	1852 499 996	-2.0	0.000 000	-0.001
1912.5	100%	+20(Ref)	1912 499 995	0.0	0.000 000	0.000
	100%	-30	1912 499 990	-5.0	0.000 000	-0.003
	100%	-20	1912 499 988	-7.6	0.000 000	-0.004
	100%	-10	1912 499 989	-6.8	0.000 000	-0.004
	100%	0	1912 499 990	-5.8	0.000 000	-0.003
	100%	+10	1912 499 991	-4.8	0.000 000	-0.003
	100%	+30	1912 499 989	-6.2	0.000 000	-0.003
	100%	+40	1912 499 991	-4.6	0.000 000	-0.002
	100%	+50	1912 499 988	-7.2	0.000 000	-0.004
	Batt. Endpoint	+20	1912 499 989	-6.5	0.000 000	-0.003

▣ BandWidth: 10 MHz

▣ Voltage(100 %): 3.880 VDC

▣ Batt. Endpoint: 3.300 VDC

▣ LIMIT: Emission must remain in band

Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
1855.0	100%	+20(Ref)	1854 999 996	0.0	0.000 000	0.000
	100%	-30	1854 999 992	-4.0	0.000 000	-0.002
	100%	-20	1854 999 990	-6.3	0.000 000	-0.003
	100%	-10	1854 999 992	-3.9	0.000 000	-0.002
	100%	0	1854 999 991	-4.9	0.000 000	-0.003
	100%	+10	1854 999 993	-3.6	0.000 000	-0.002
	100%	+30	1854 999 993	-3.1	0.000 000	-0.002
	100%	+40	1854 999 992	-4.0	0.000 000	-0.002
	100%	+50	1854 999 994	-1.9	0.000 000	-0.001
	Batt. Endpoint	+20	1854 999 991	-5.4	0.000 000	-0.003
1910.0	100%	+20(Ref)	1910 000 007	0.0	0.000 000	0.000
	100%	-30	1910 000 014	7.3	0.000 000	0.004
	100%	-20	1910 000 015	7.8	0.000 000	0.004
	100%	-10	1910 000 015	7.6	0.000 000	0.004
	100%	0	1910 000 014	7.3	0.000 000	0.004
	100%	+10	1910 000 011	4.2	0.000 000	0.002
	100%	+30	1910 000 014	7.3	0.000 000	0.004
	100%	+40	1910 000 016	8.5	0.000 000	0.004
	100%	+50	1910 000 016	8.8	0.000 000	0.005
	Batt. Endpoint	+20	1910 000 015	7.8	0.000 000	0.004

▣ BandWidth: 15 MHz

▣ Voltage(100 %): 3.880 VDC

▣ Batt. Endpoint: 3.300 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 500 001	0.0	0.000 000	0.000
	100%	-30	1857 499 999	-1.4	0.000 000	-0.001
	100%	-20	1857 500 001	-0.1	0.000 000	0.000
	100%	-10	1857 500 000	-0.4	0.000 000	0.000
	100%	0	1857 499 997	-3.8	0.000 000	-0.002
	100%	+10	1857 500 002	0.9	0.000 000	0.001
	100%	+30	1857 500 002	0.7	0.000 000	0.000
	100%	+40	1857 499 997	-4.1	0.000 000	-0.002
	100%	+50	1857 500 002	1.4	0.000 000	0.001
	Batt. Endpoint	+20	1857 500 001	0.0	0.000 000	0.000
1907.5	100%	+20(Ref)	1907 500 000	0.0	0.000 000	0.000
	100%	-30	1907 500 000	-0.4	0.000 000	0.000
	100%	-20	1907 500 000	0.1	0.000 000	0.000
	100%	-10	1907 500 001	0.7	0.000 000	0.000
	100%	0	1907 499 998	-1.9	0.000 000	-0.001
	100%	+10	1907 500 001	0.8	0.000 000	0.000
	100%	+30	1907 500 000	-0.6	0.000 000	0.000
	100%	+40	1907 500 003	2.5	0.000 000	0.001
	100%	+50	1907 500 001	1.2	0.000 000	0.001
	Batt. Endpoint	+20	1907 500 001	0.6	0.000 000	0.000

▣ BandWidth: 20 MHz

▣ Voltage(100 %): 3.880 VDC

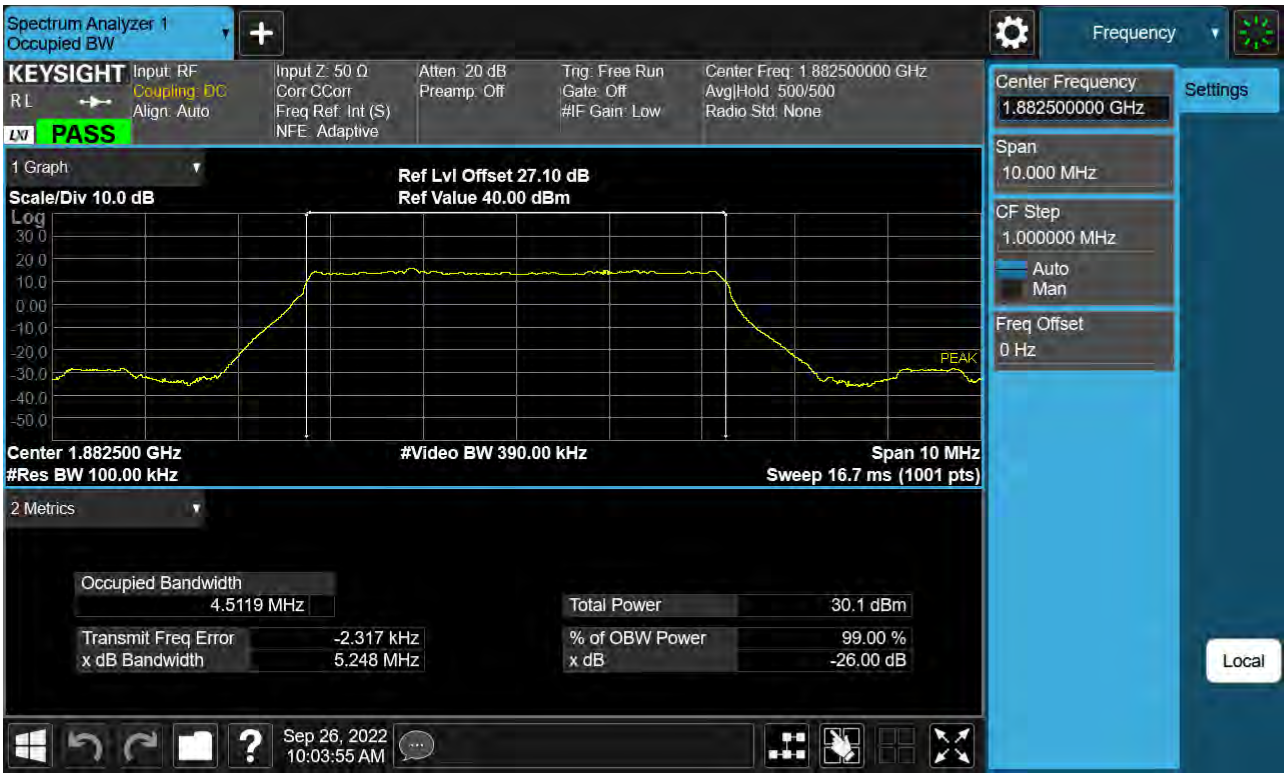
▣ Batt. Endpoint: 3.300 VDC

▣ LIMIT: Emission must remain in band

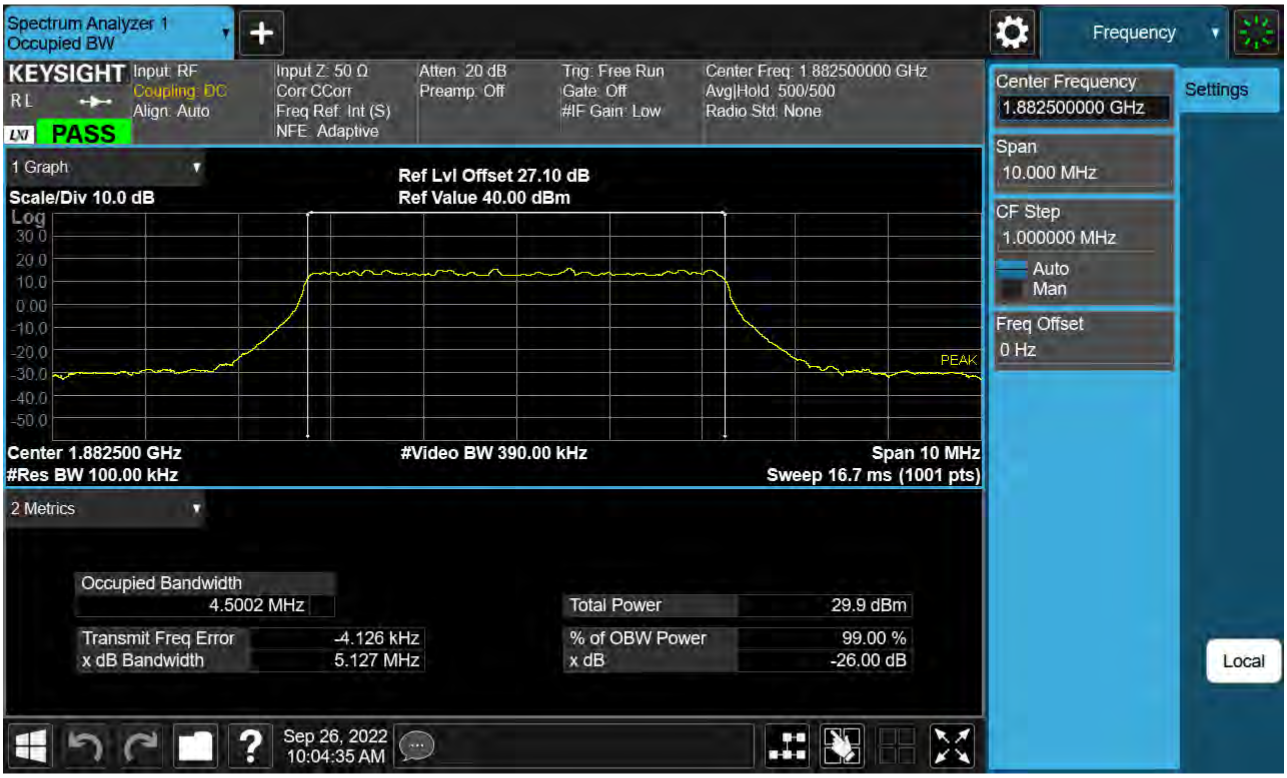
Test. Frequncy (MHz)	Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
1860.0	100%	+20(Ref)	1860 000 000	0.0	0.000 000	0.000
	100%	-30	1859 999 999	-0.5	0.000 000	0.000
	100%	-20	1860 000 001	1.4	0.000 000	0.001
	100%	-10	1859 999 999	-0.6	0.000 000	0.000
	100%	0	1860 000 001	1.0	0.000 000	0.001
	100%	+10	1860 000 001	1.1	0.000 000	0.001
	100%	+30	1859 999 998	-1.7	0.000 000	-0.001
	100%	+40	1859 999 998	-2.1	0.000 000	-0.001
	100%	+50	1860 000 001	0.9	0.000 000	0.000
	Batt. Endpoint	+20	1859 999 998	-1.7	0.000 000	-0.001
1905.0	100%	+20(Ref)	1905 000 000	0.0	0.000 000	0.000
	100%	-30	1905 000 001	1.2	0.000 000	0.001
	100%	-20	1904 999 999	-0.6	0.000 000	0.000
	100%	-10	1905 000 001	1.4	0.000 000	0.001
	100%	0	1905 000 002	1.9	0.000 000	0.001
	100%	+10	1904 999 998	-1.5	0.000 000	-0.001
	100%	+30	1905 000 001	1.2	0.000 000	0.001
	100%	+40	1904 999 999	-0.5	0.000 000	0.000
	100%	+50	1904 999 999	-1.2	0.000 000	-0.001
	Batt. Endpoint	+20	1905 000 000	-0.1	0.000 000	0.000

9. TEST PLOTS

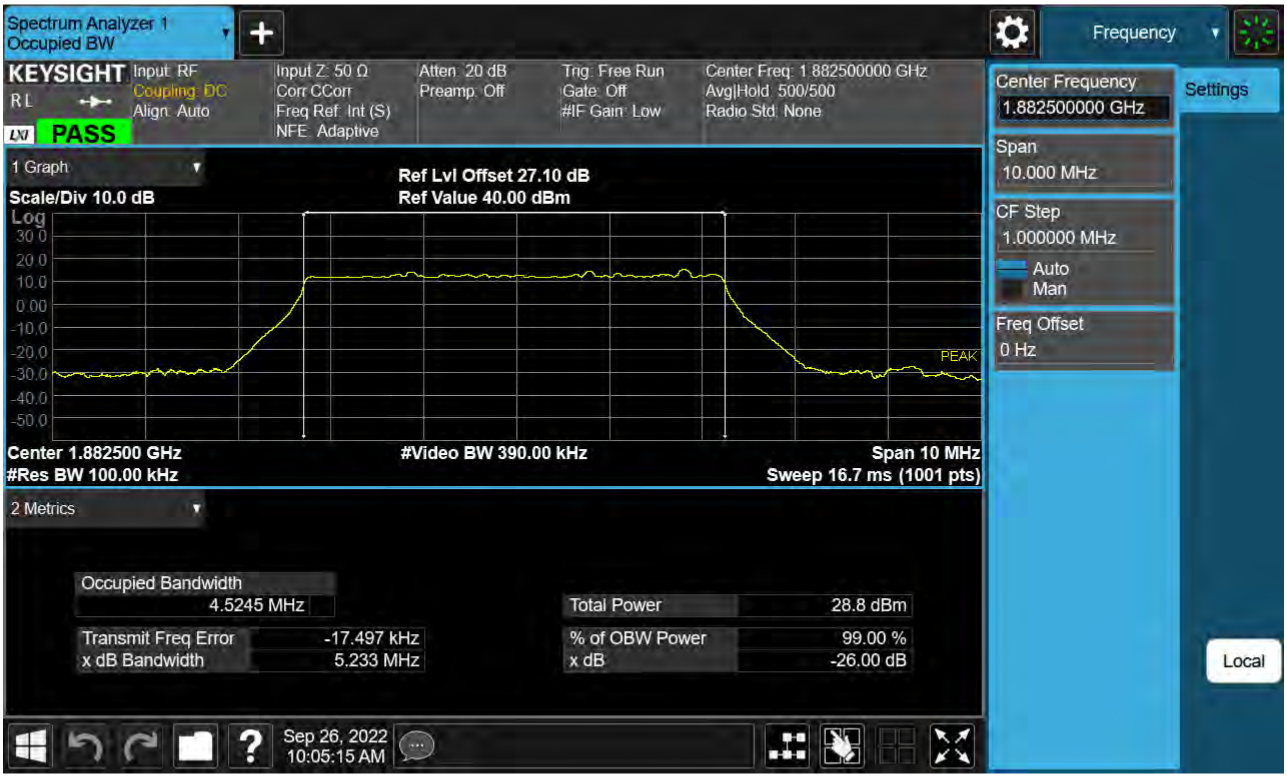
Sub6 n25(2). Occupied Bandwidth Plot (5 M BW Ch.376500 BPSK_ Full RB _0)



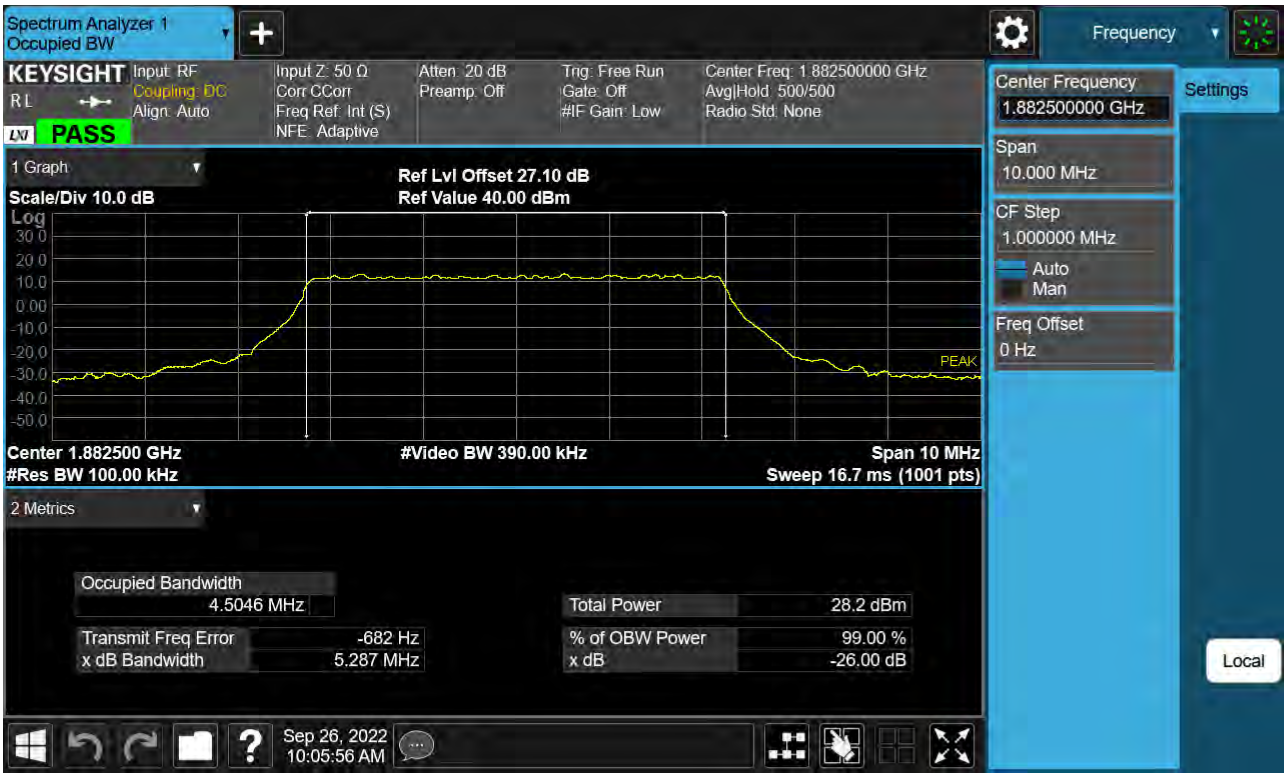
Sub6 n25(2). Occupied Bandwidth Plot (5 M BW Ch.376500 QPSK_ Full RB _0)



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



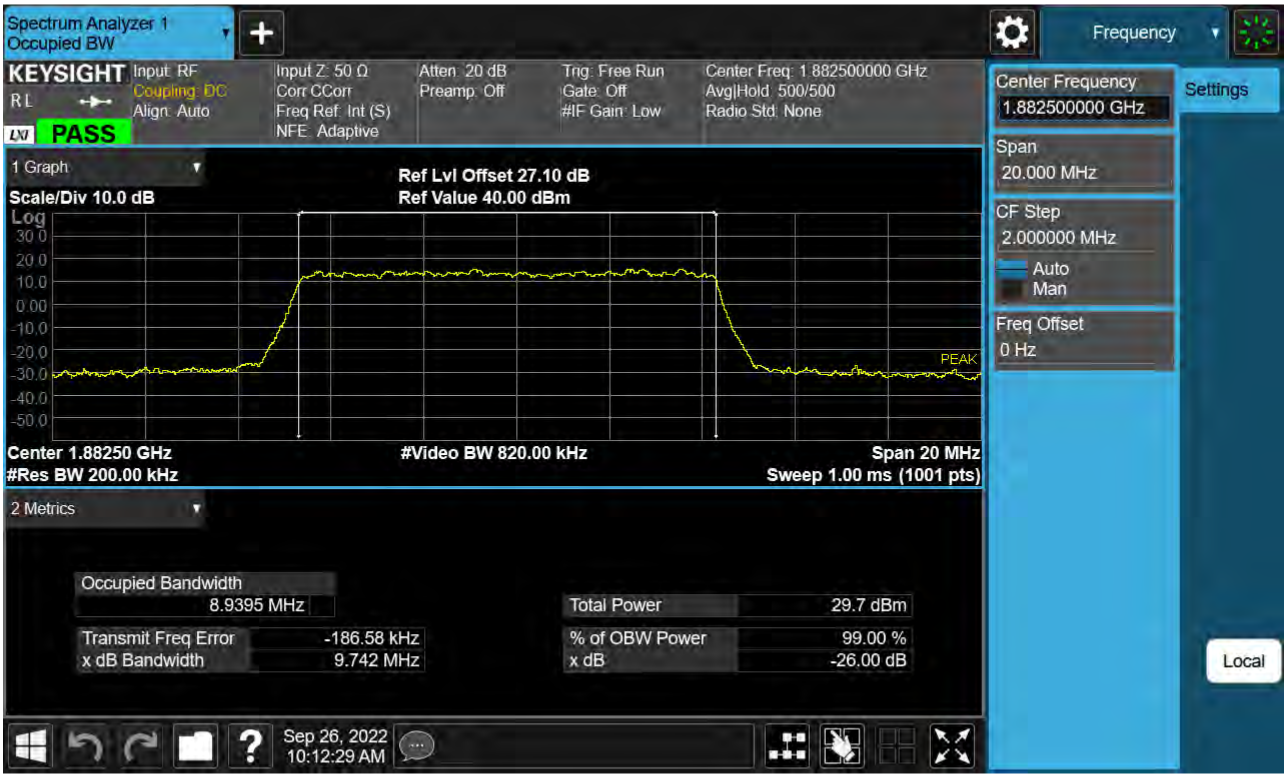
Sub6 n25(2). Occupied Bandwidth Plot (5 M BW Ch.376500 64QAM_ Full RB _0)



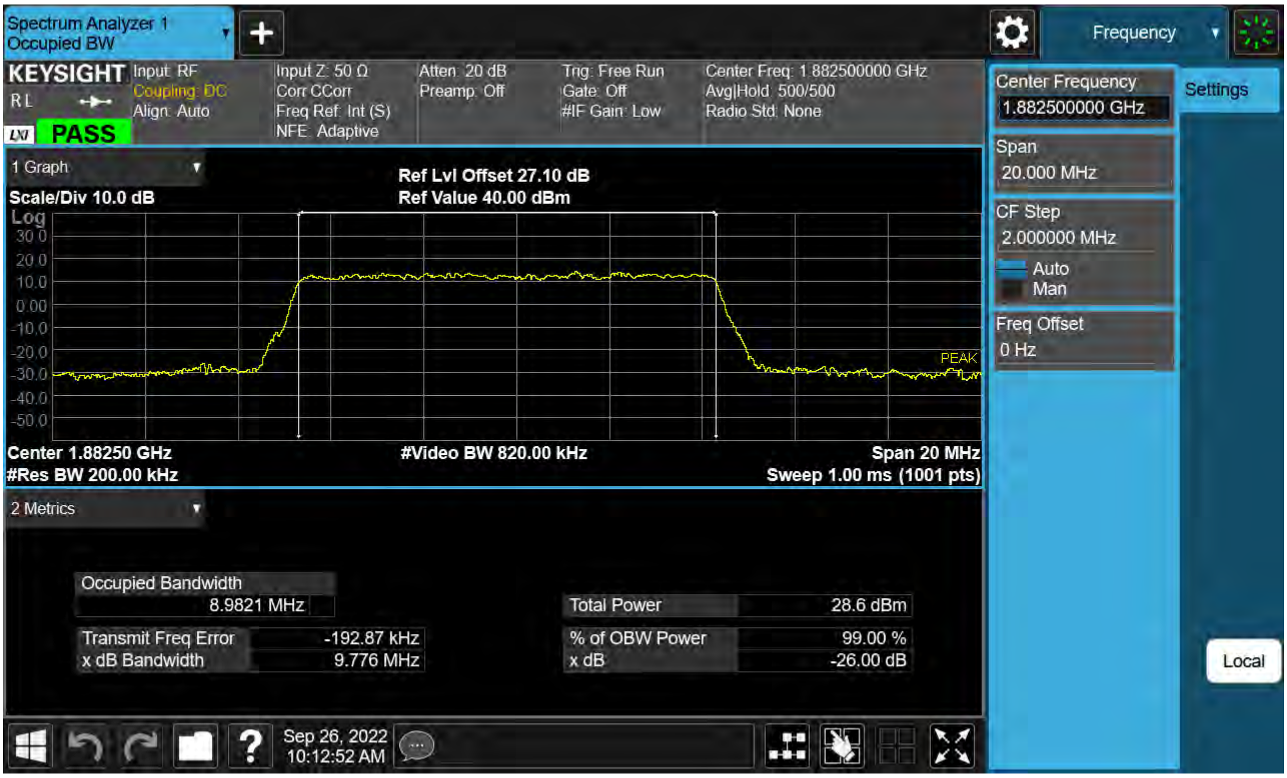
Sub6 n25(2). Occupied Bandwidth Plot (5 M BW Ch.376500 256QAM_ Full RB _0)

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)



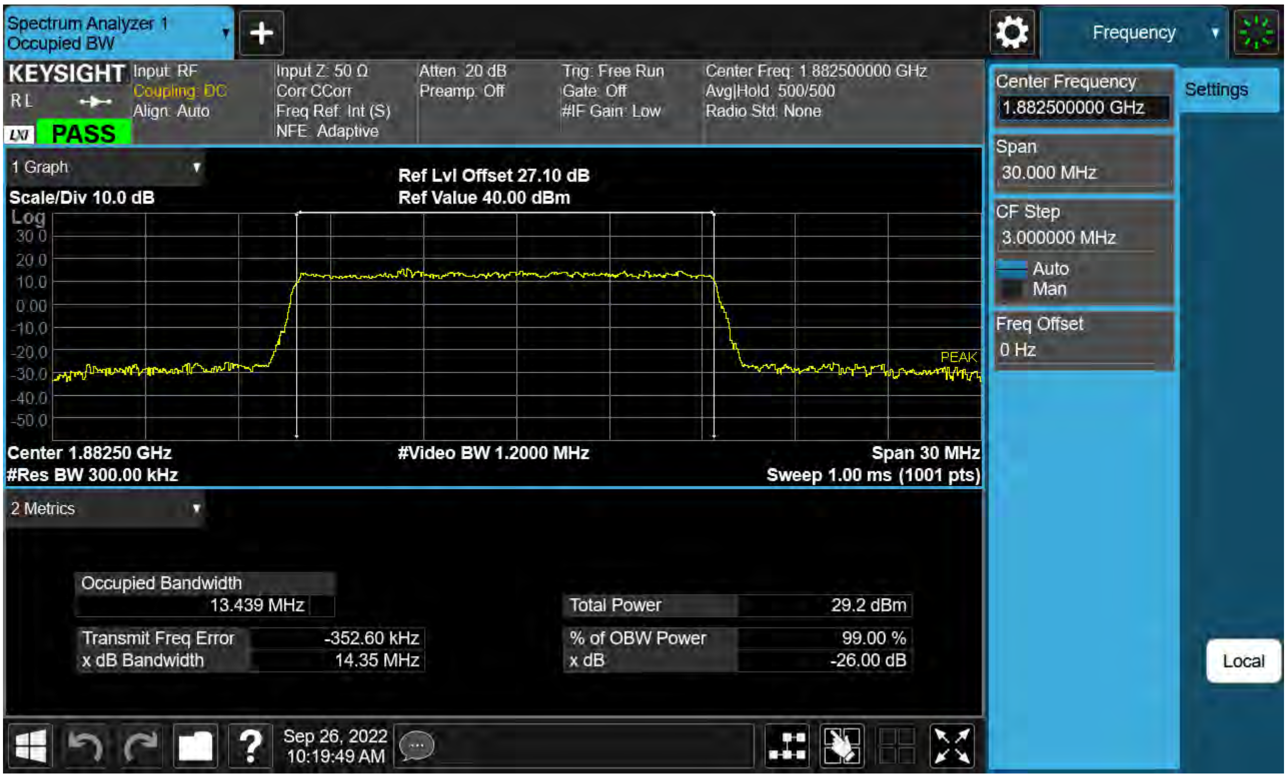
Sub6 n25(2). Occupied Bandwidth Plot (10 M BW Ch.376500 64QAM _ Full RB _0)

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)

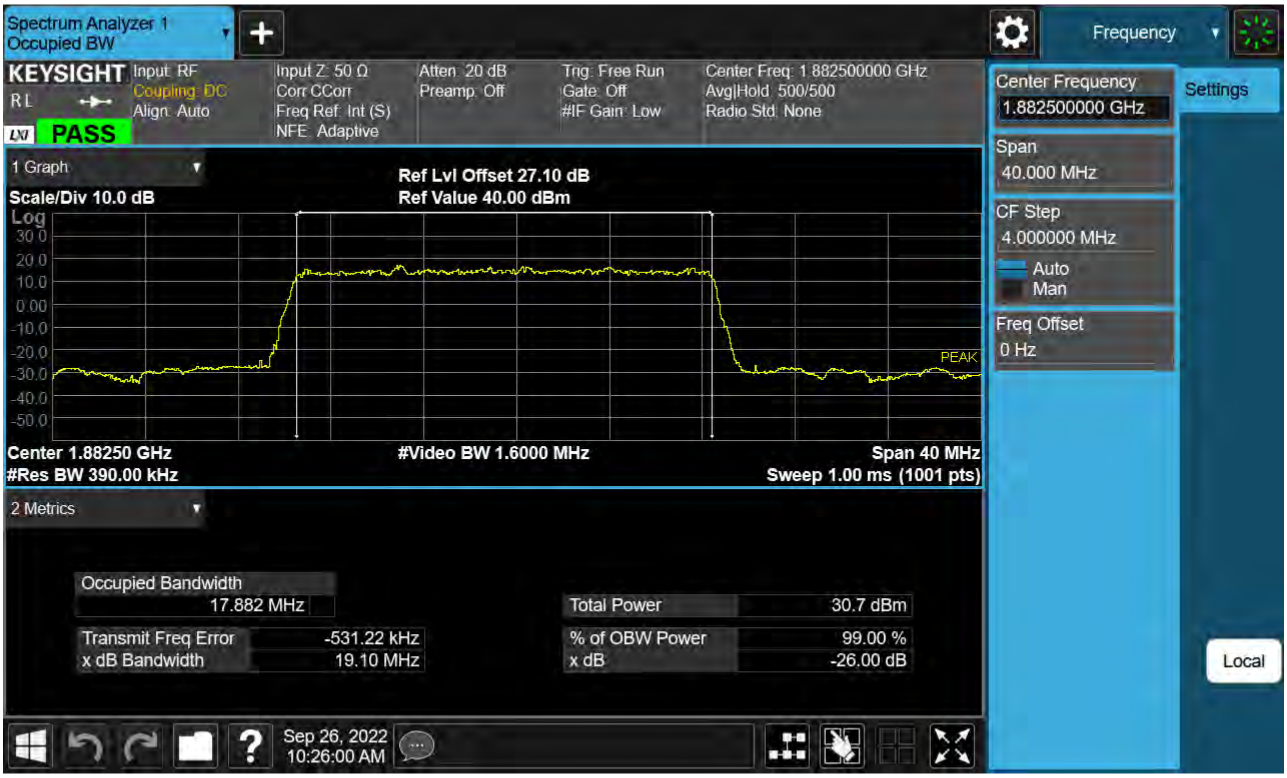
Sub6 n25(2). Occupied Bandwidth Plot (15 M BW Ch.376500 16QAM _ Full RB _0)



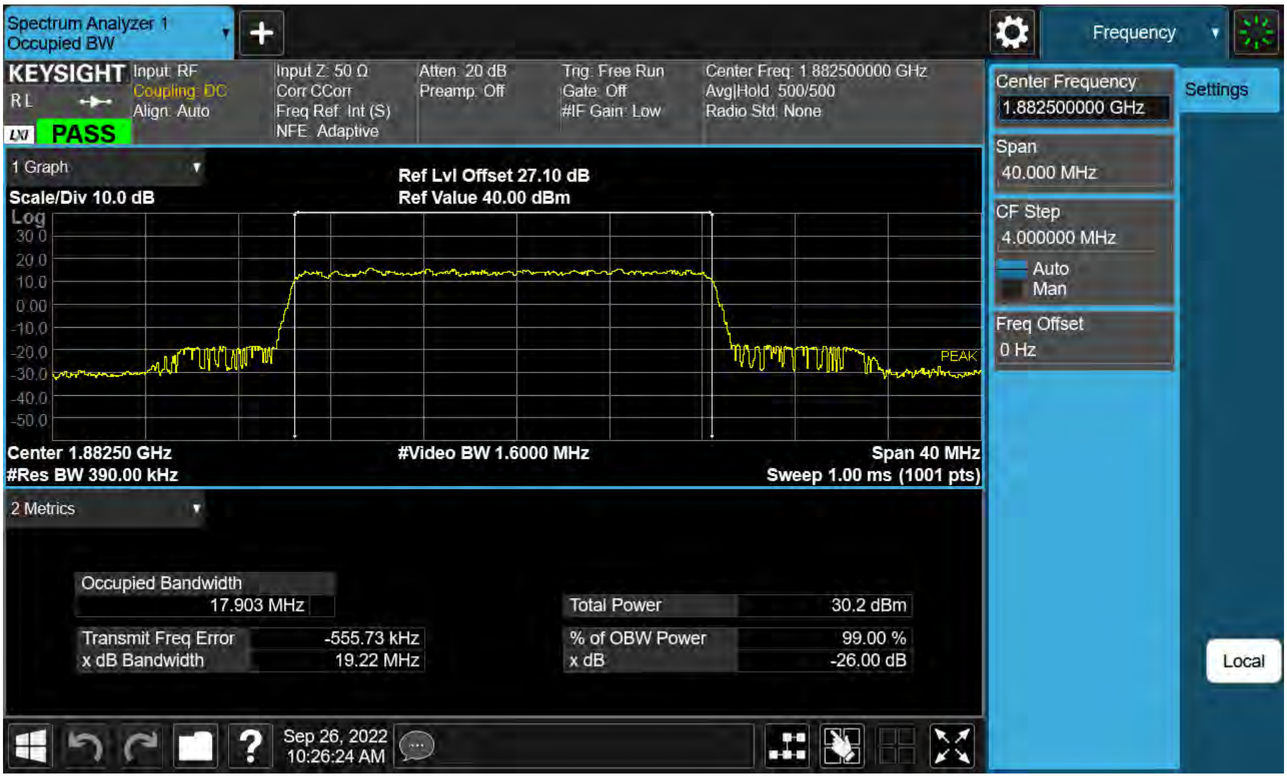
Sub6 n25(2). Occupied Bandwidth Plot (15 M BW Ch.376500 64QAM _ Full RB _0)

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)

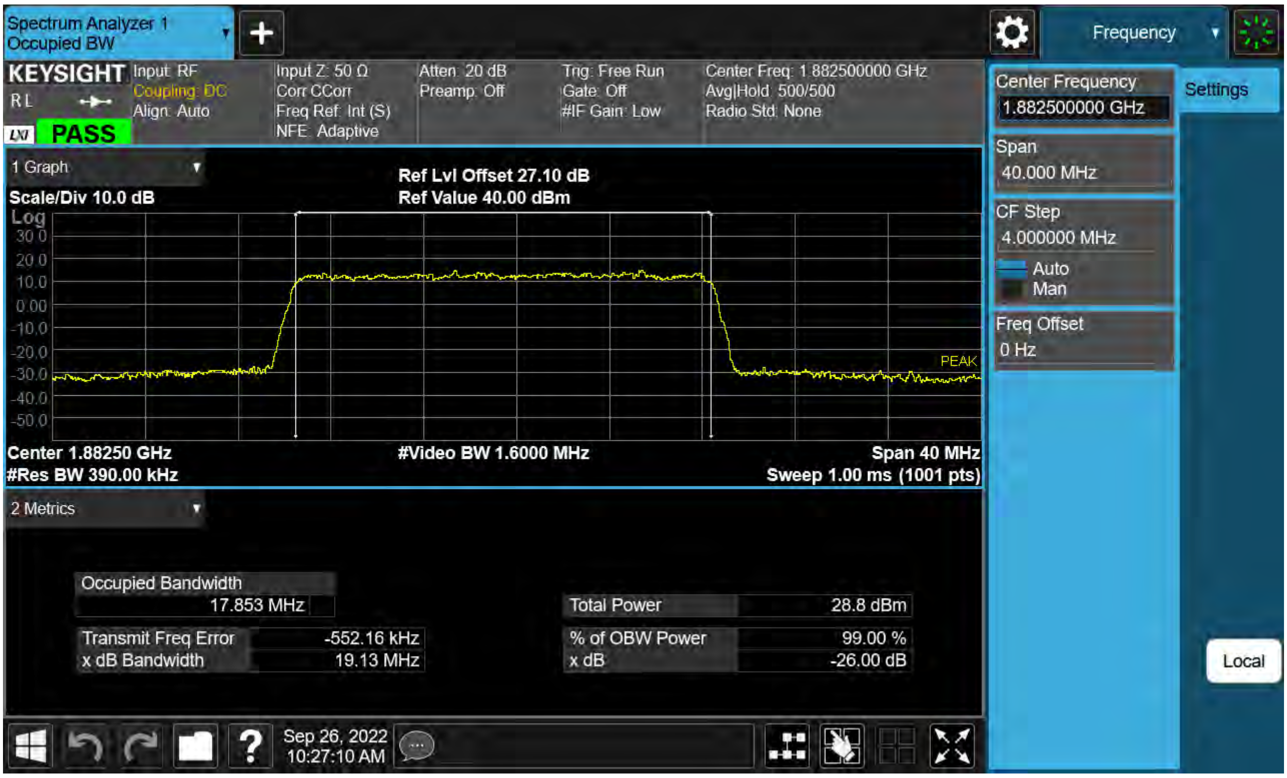


Sub6 n25(2). Occupied Bandwidth Plot (20 M BW Ch.376500 QPSK _ Full RB _0)

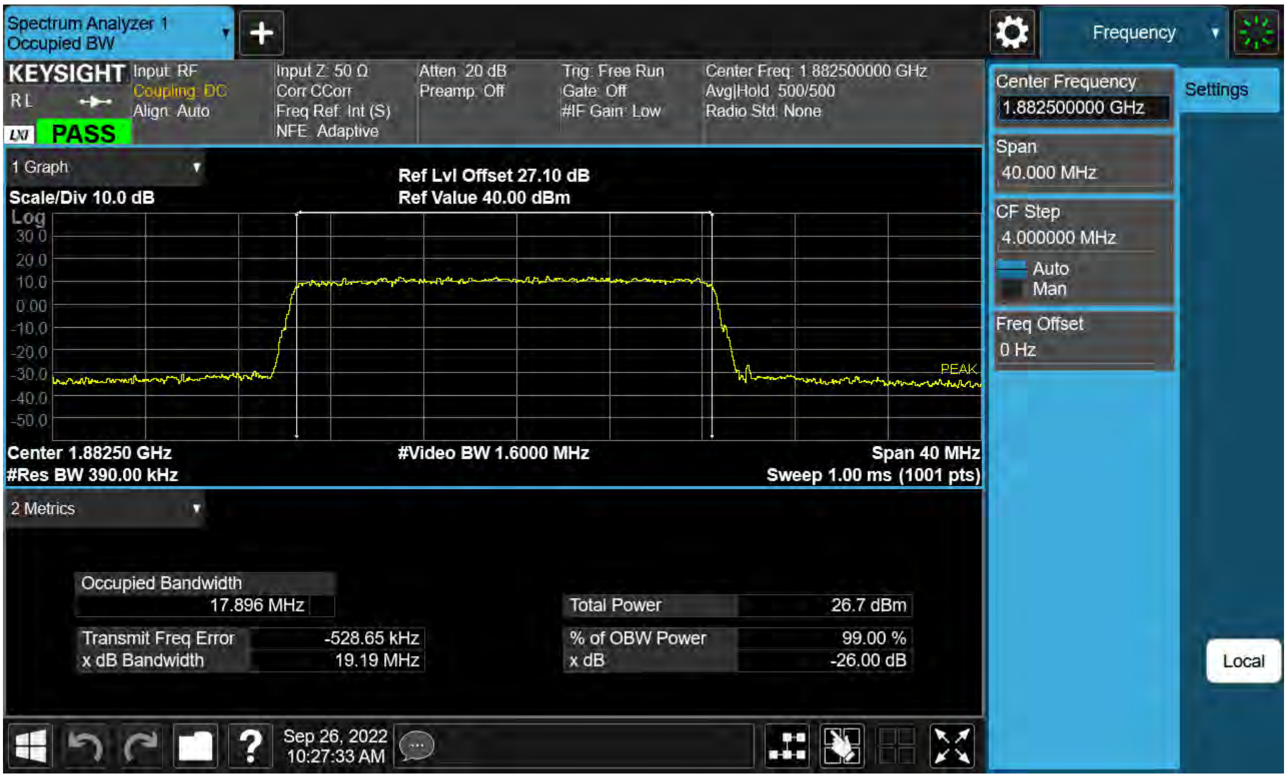


Sub6 n25(2). Occupied Bandwidth Plot (20 M BW Ch.376500 16QAM _ Full RB _0)

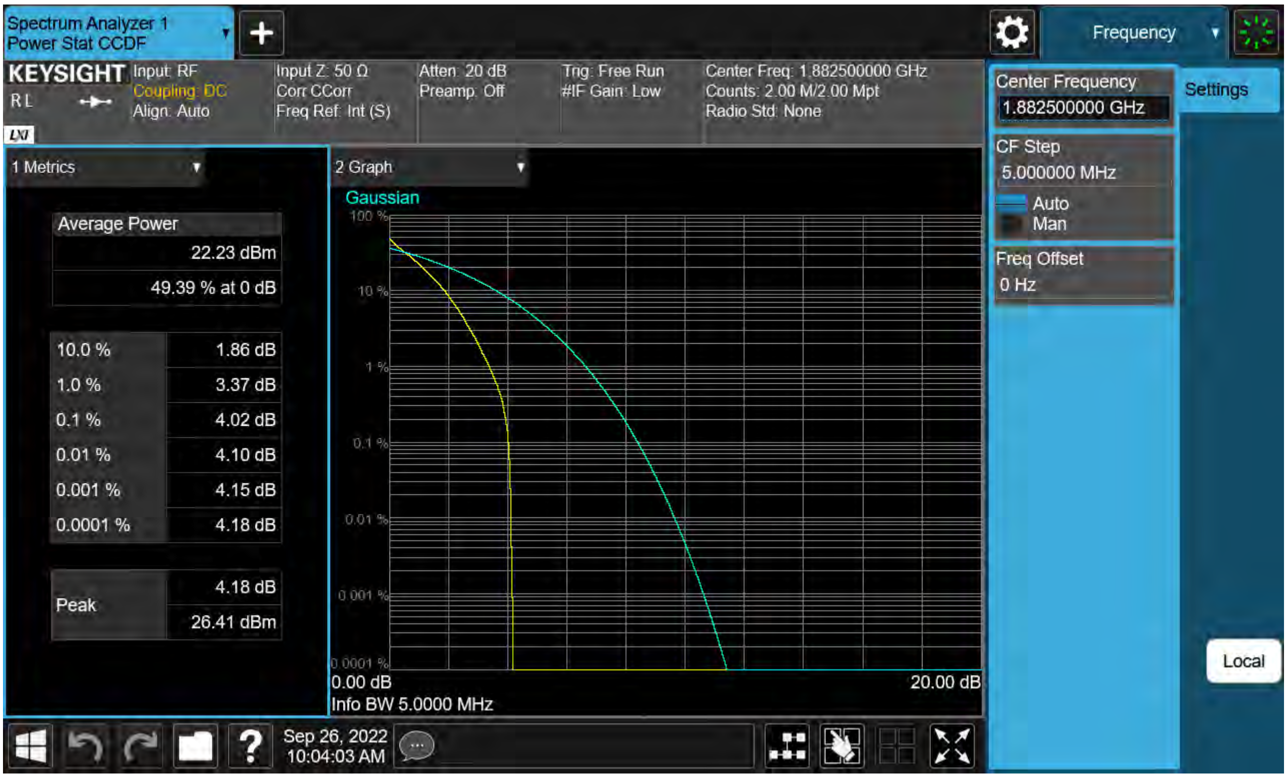
Sub6 n25(2). Occupied Bandwidth Plot (20 M BW Ch.376500 64QAM _ Full RB _0)



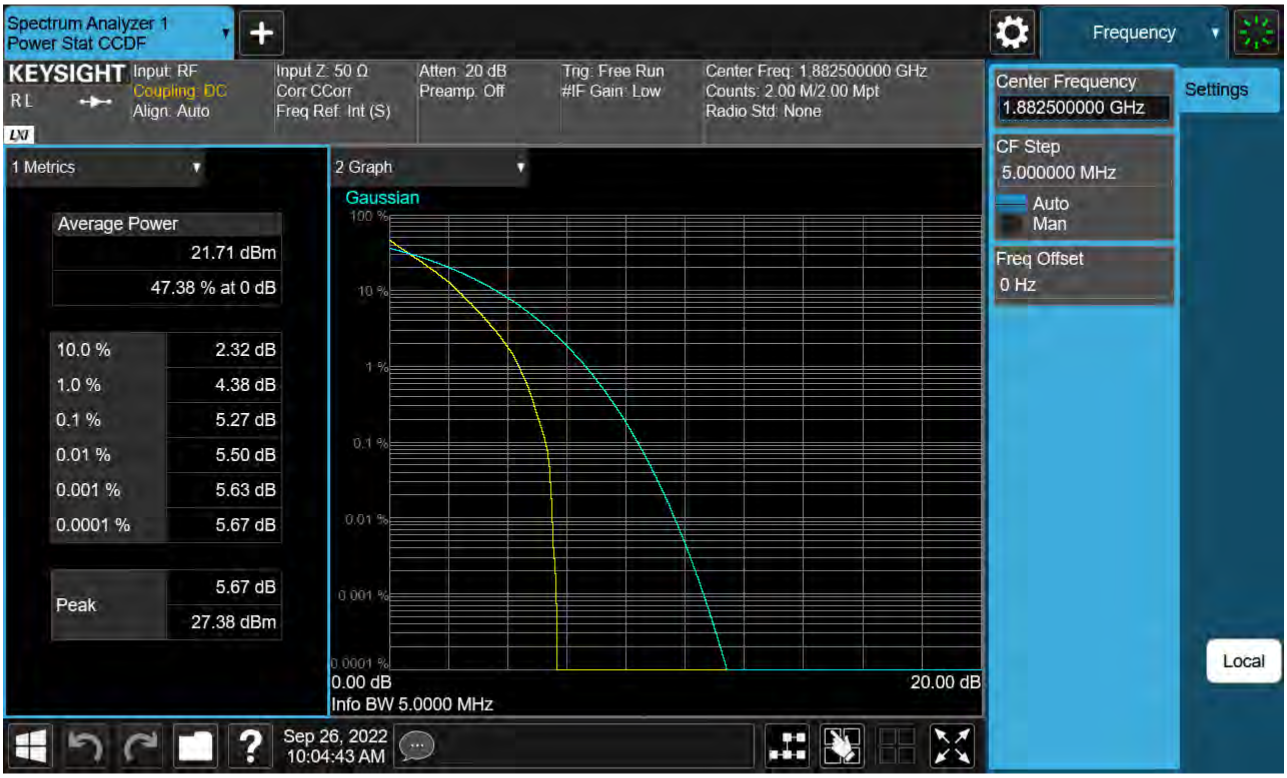
Sub6 n25(2). Occupied Bandwidth Plot (20 M BW Ch.376500 256QAM _ Full RB _0)



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

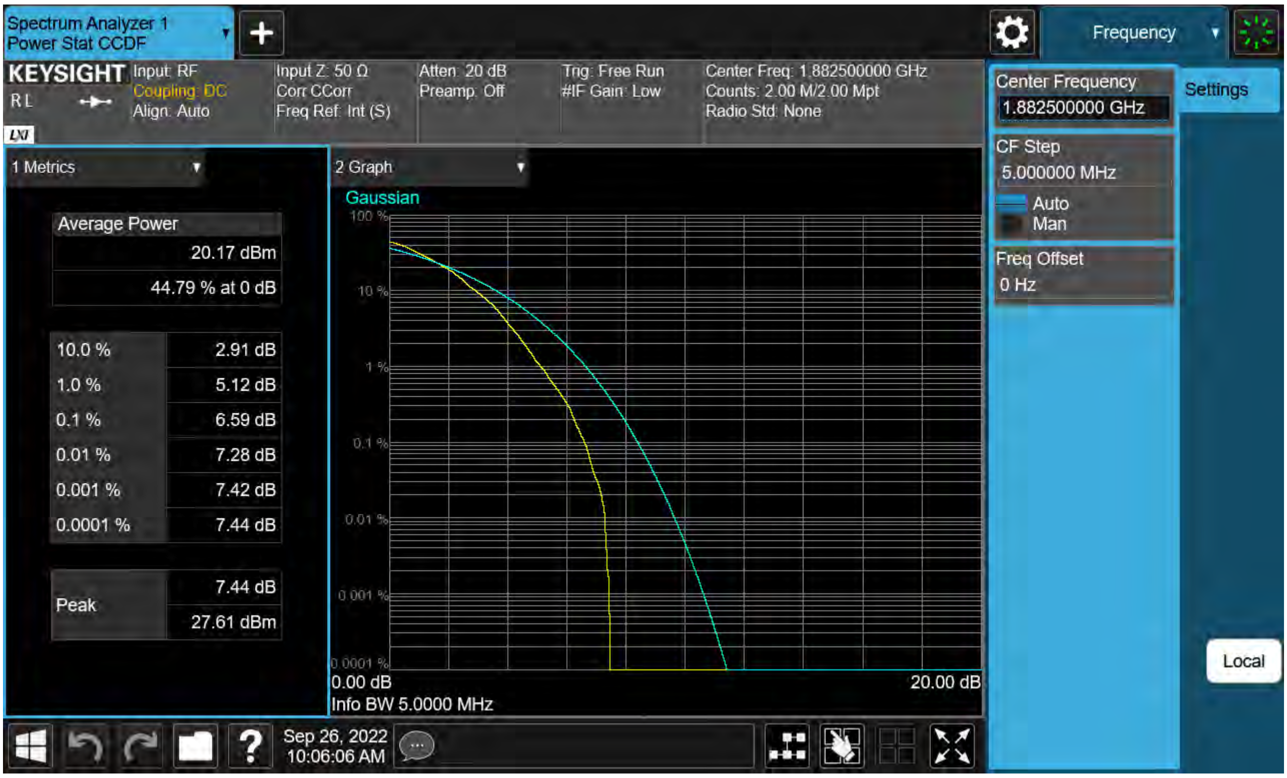


Sub6 n25(2). PAR Plot (5 M BW Ch.376500 QPSK _ Full RB _0)



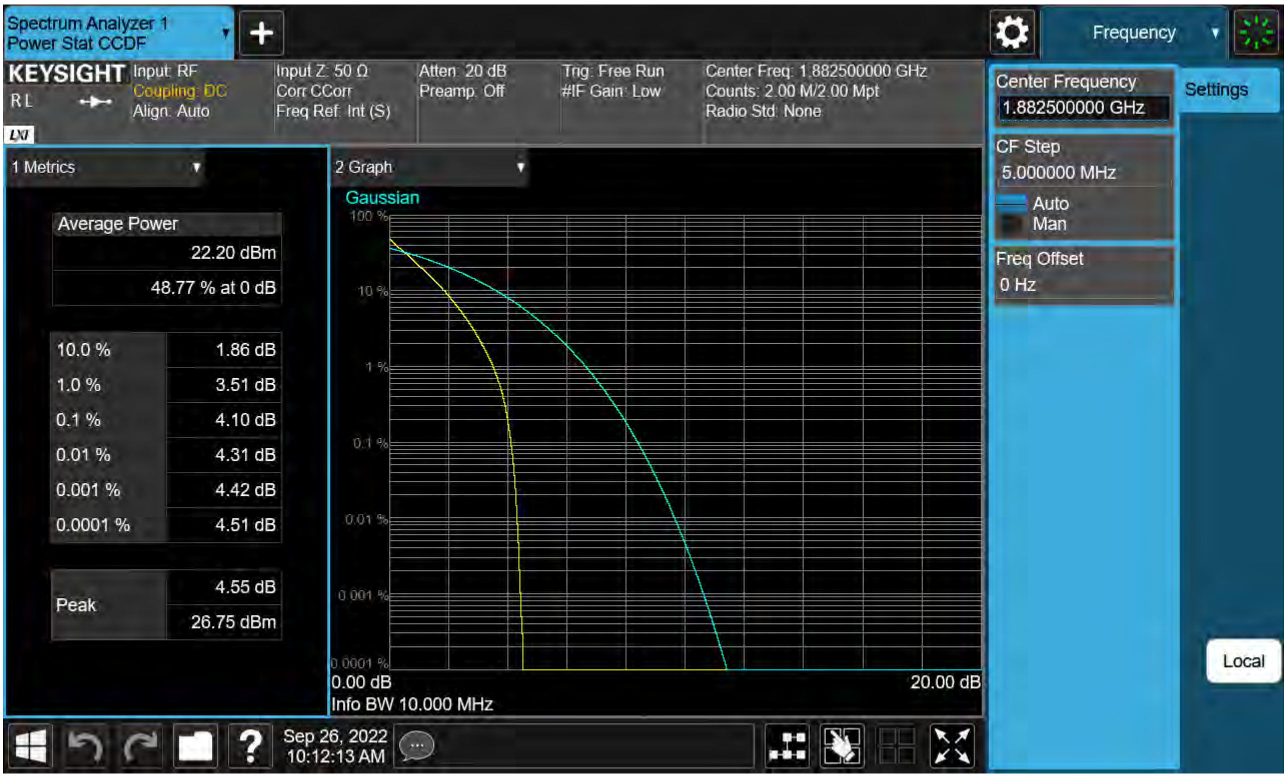
Sub6 n25(2). PAR Plot (5 M BW Ch.376500 16QAM_ Full RB _0)

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

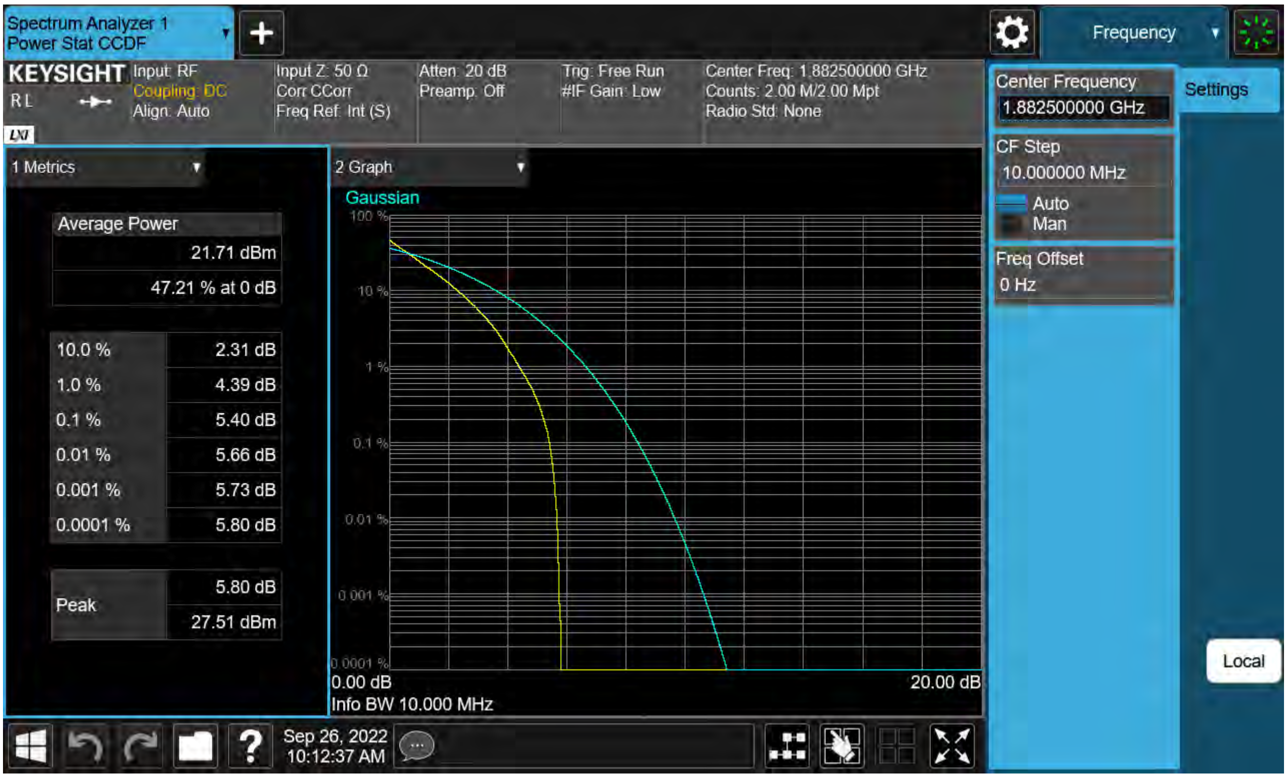


Sub6 n25(2). PAR Plot (5 M BW Ch.376500 256QAM_ Full RB _0)

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)



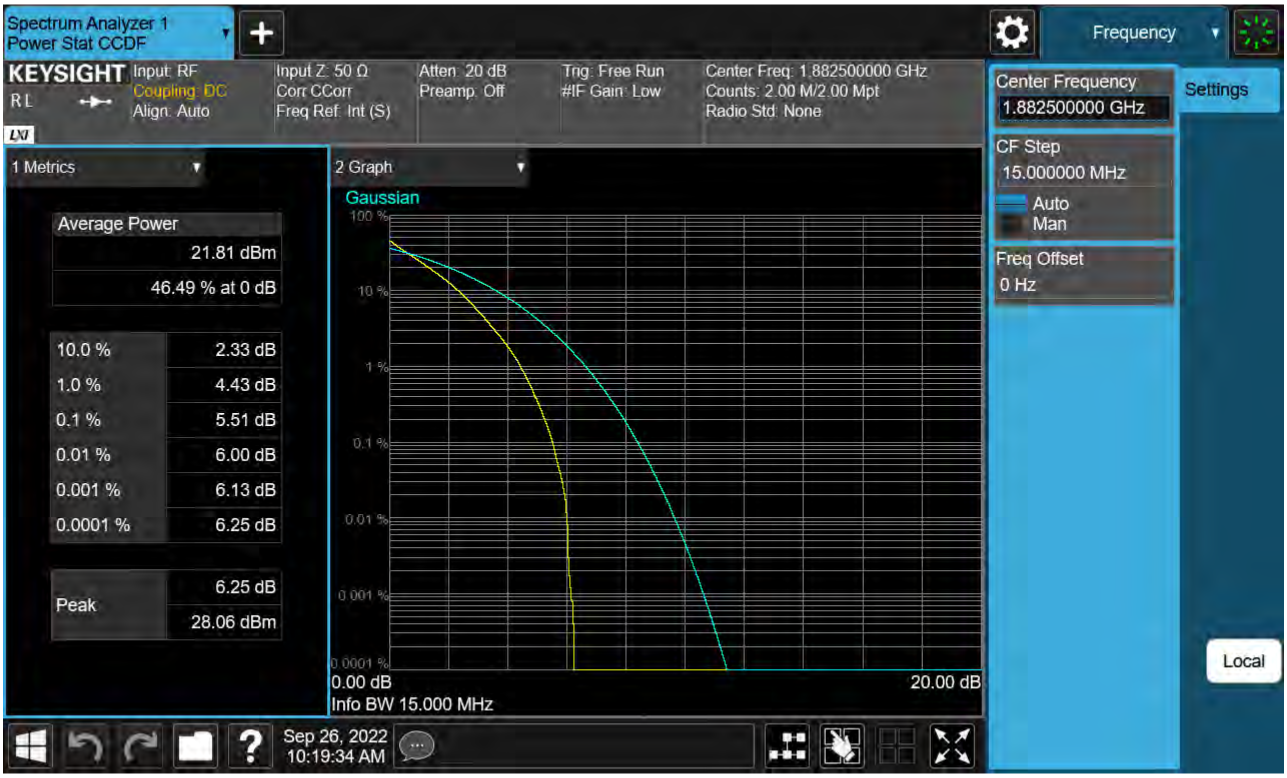
Sub6 n25(2). PAR Plot (10 M BW Ch.376500 16QAM _ Full RB _0)

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)



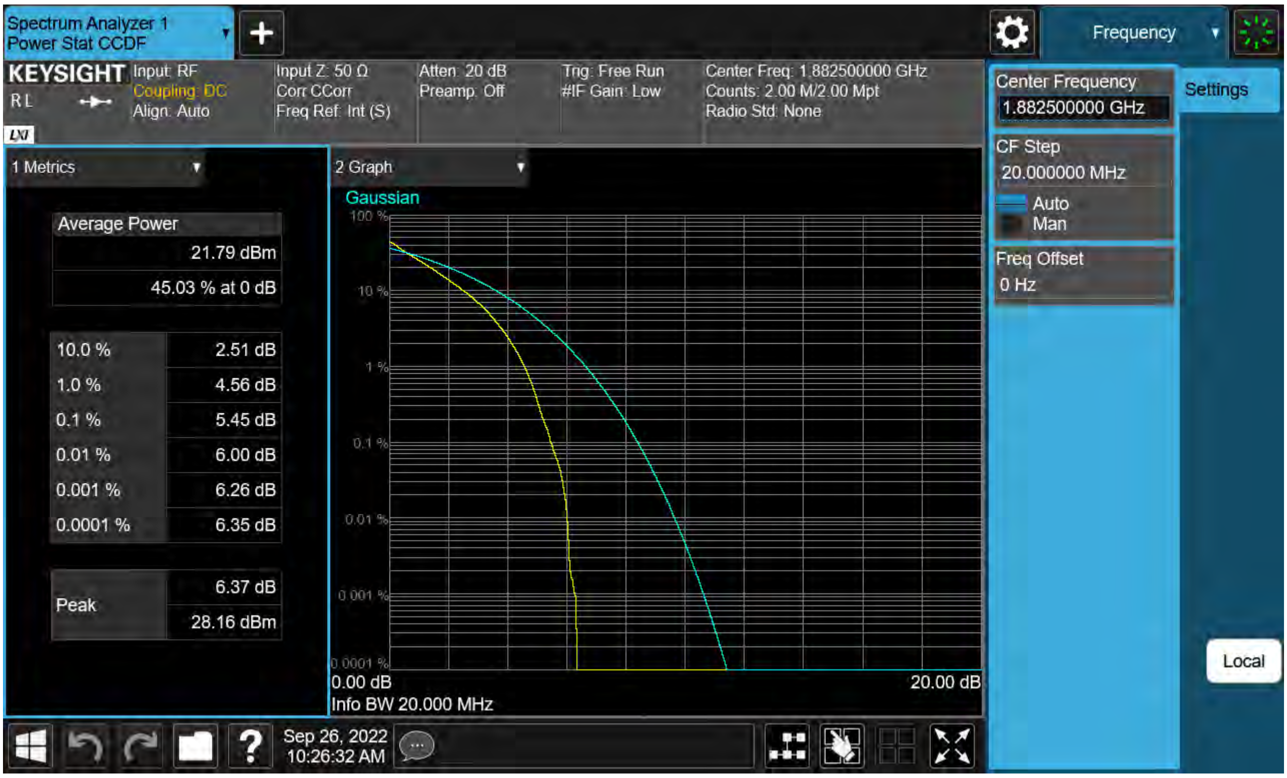
Sub6 n25(2). PAR Plot (15 M BW Ch.376500 16QAM _ Full RB _0)

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)

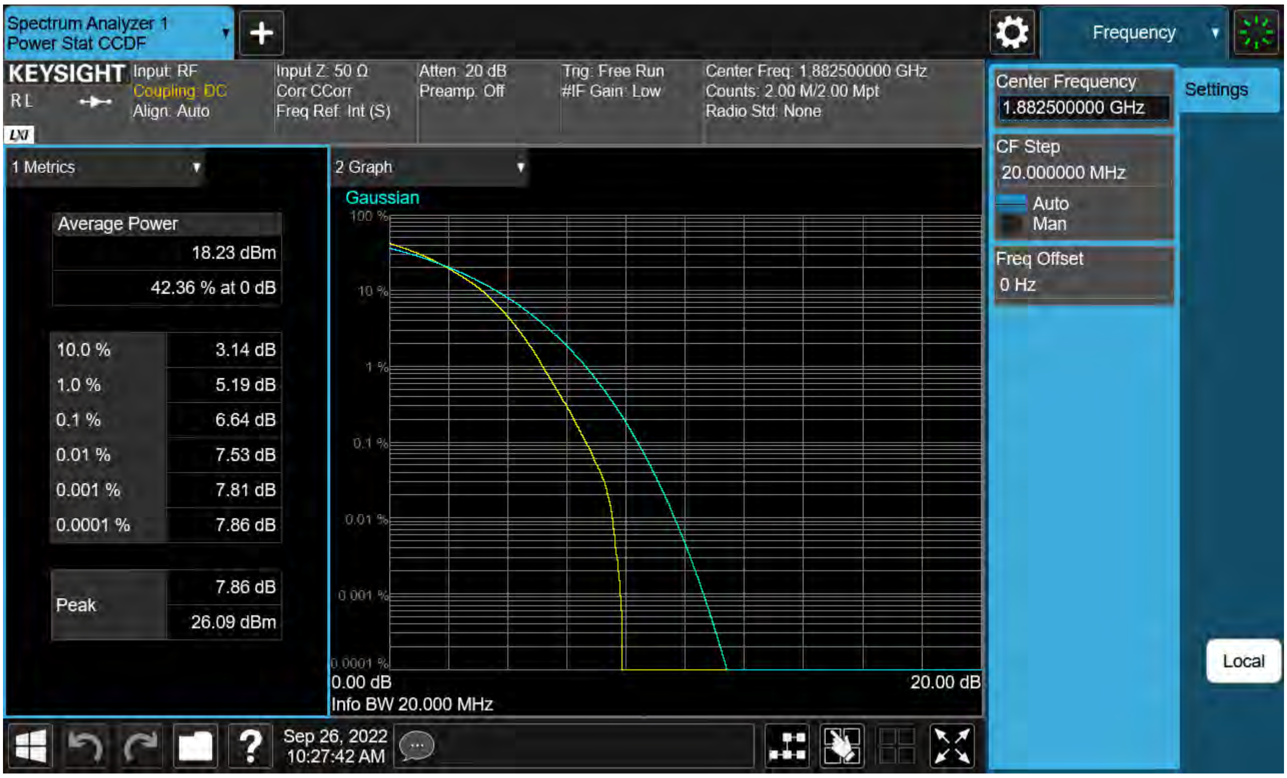
Sub6 n25(2). PAR Plot (20 M BW Ch.376500 QPSK _ Full RB _0)



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)

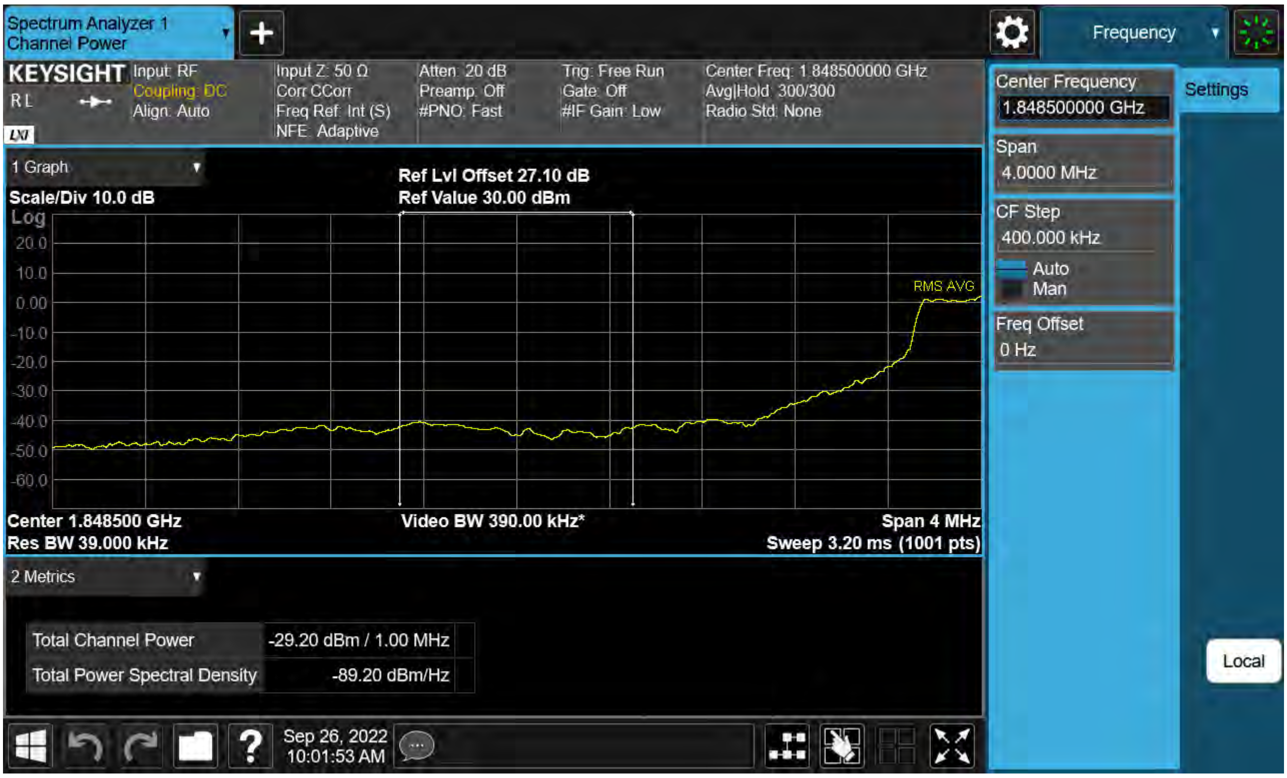
Sub6 n25(2). PAR Plot (20 M BW Ch.376500 256QAM _ Full RB _0)



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_RB25_Offset 0) -1

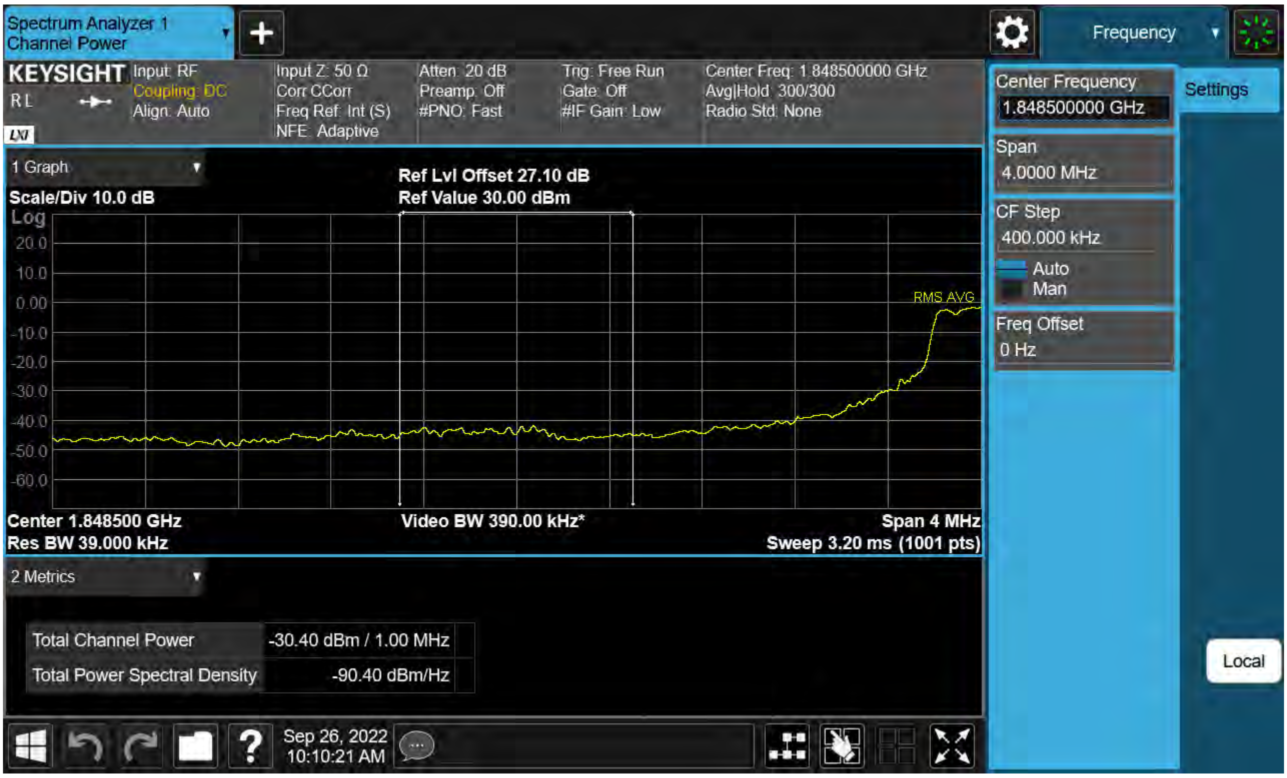
Sub6 n25(2). Lower Extended Band Edge Plot (5 M BW Ch.370500 BPSK_RB25_0) -2



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_RB50_Offset 0) -1

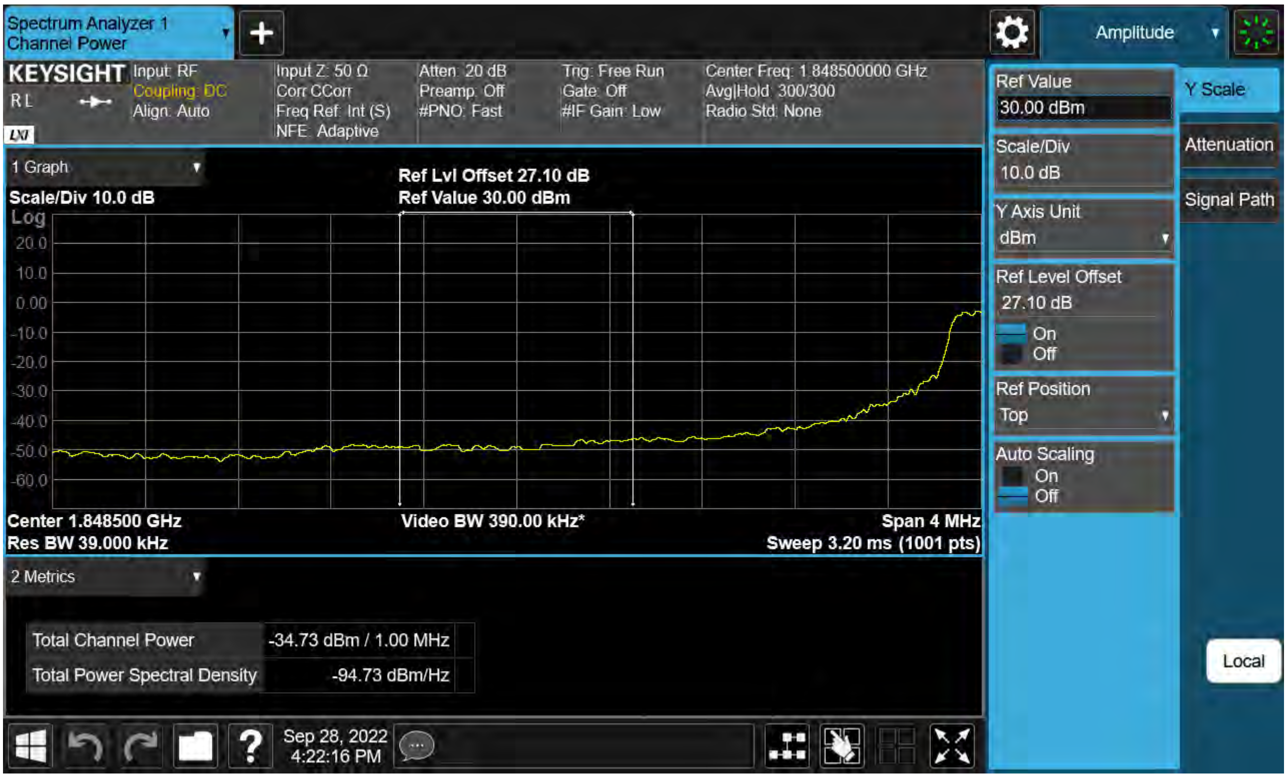
Sub6 n25(2). Lower Extended Band Edge Plot (10 M BW Ch.371000 BPSK_RB50_0) -2



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_RB75_Offset 0) -1

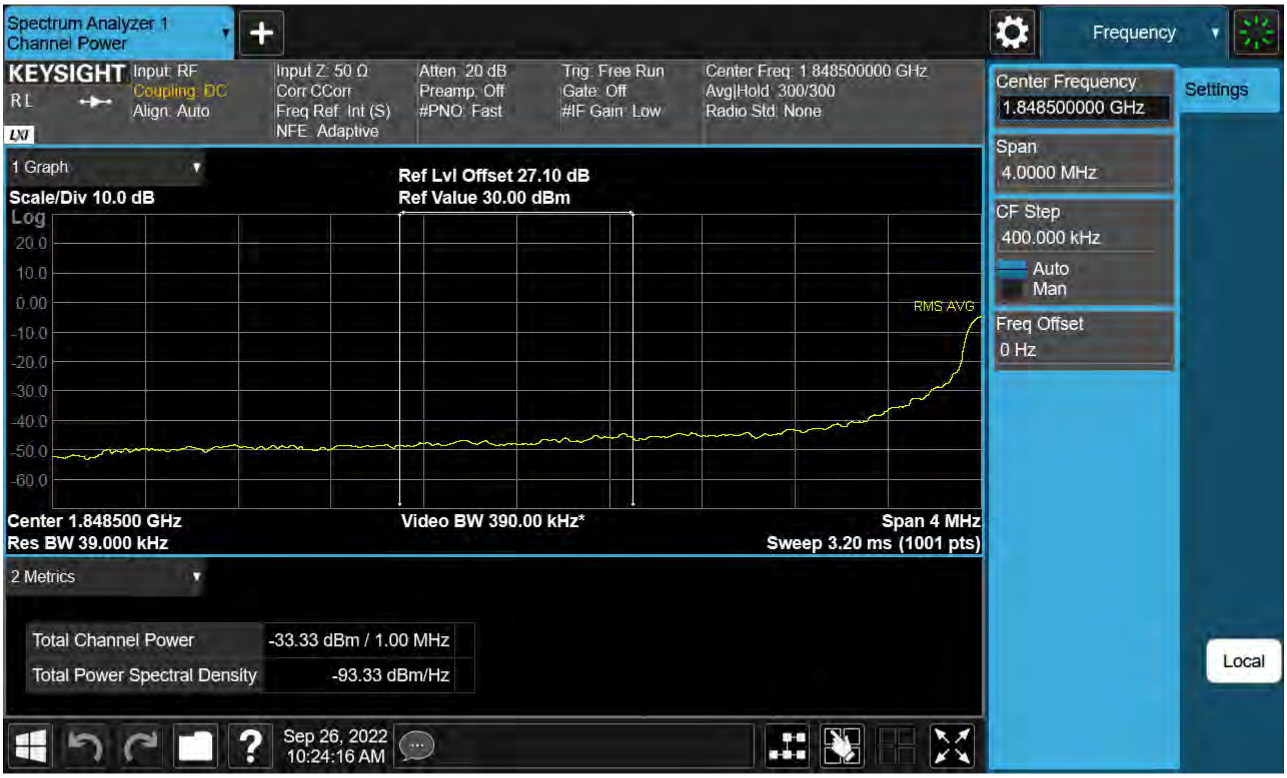
Sub6 n25(2). Lower Extended Band Edge Plot (15 M BW Ch.371500 BPSK_RB75_0) -2



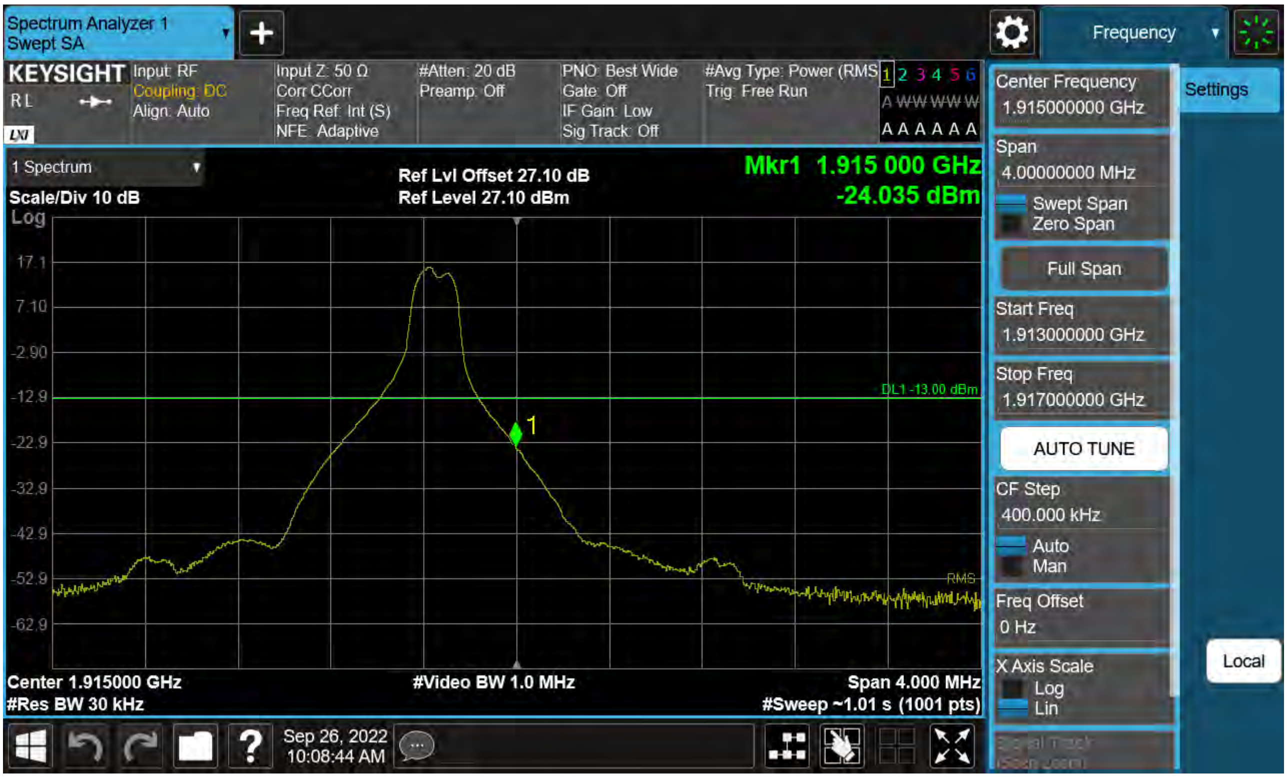
Sub6 n25(2). Lower Band Edge Plot (20 M BW Ch.372000 BPSK_RB1_Offset 0)

Sub6 n25(2). Lower Band Edge Plot (20 M BW Ch.372000 BPSK_RB100_Offset 0) -1

Sub6 n25(2). Lower Extended Band Edge Plot (20 M BW Ch.372000 BPSK_RB100_0) -2

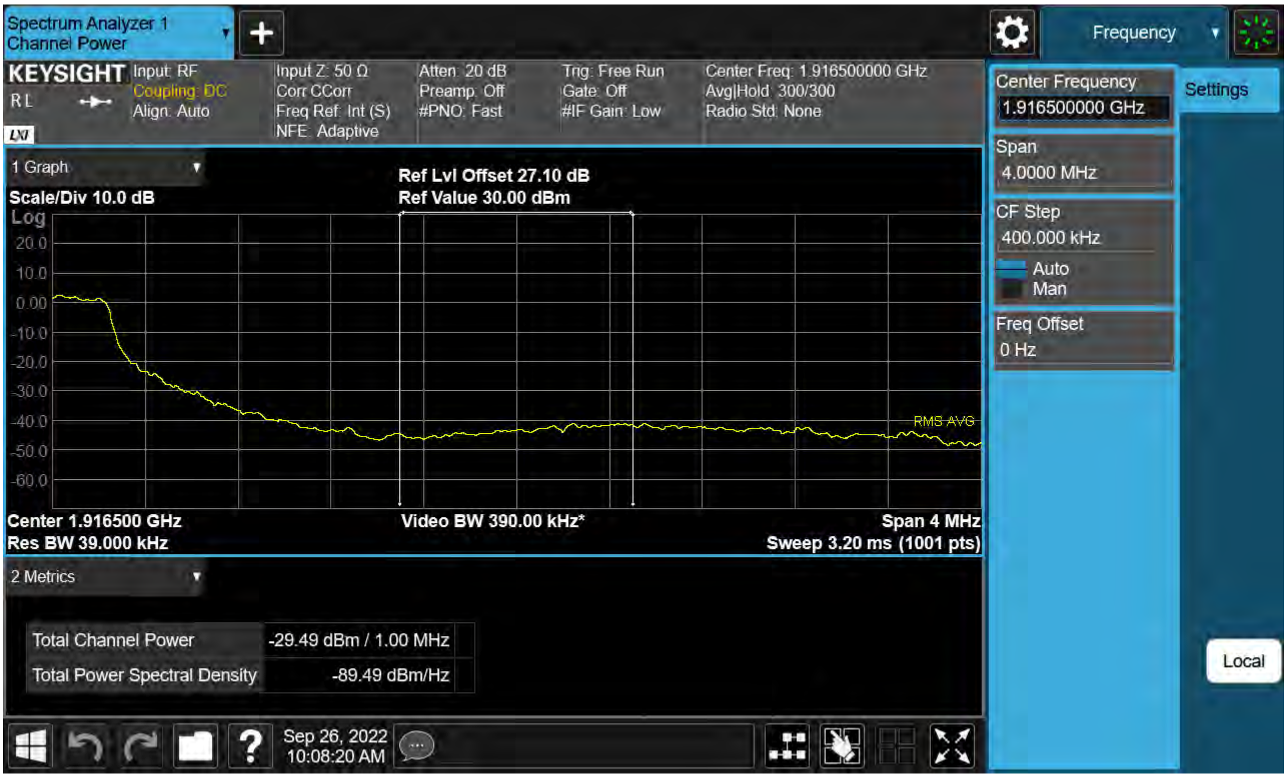


Sub6 n25(2). Upper Band Edge Plot (5 M BW Ch.382500 BPSK_RB1_Offset 24)



Sub6 n25(2). Upper Band Edge Plot (5 M BW Ch.382500 BPSK_RB25_Offset 0) -1

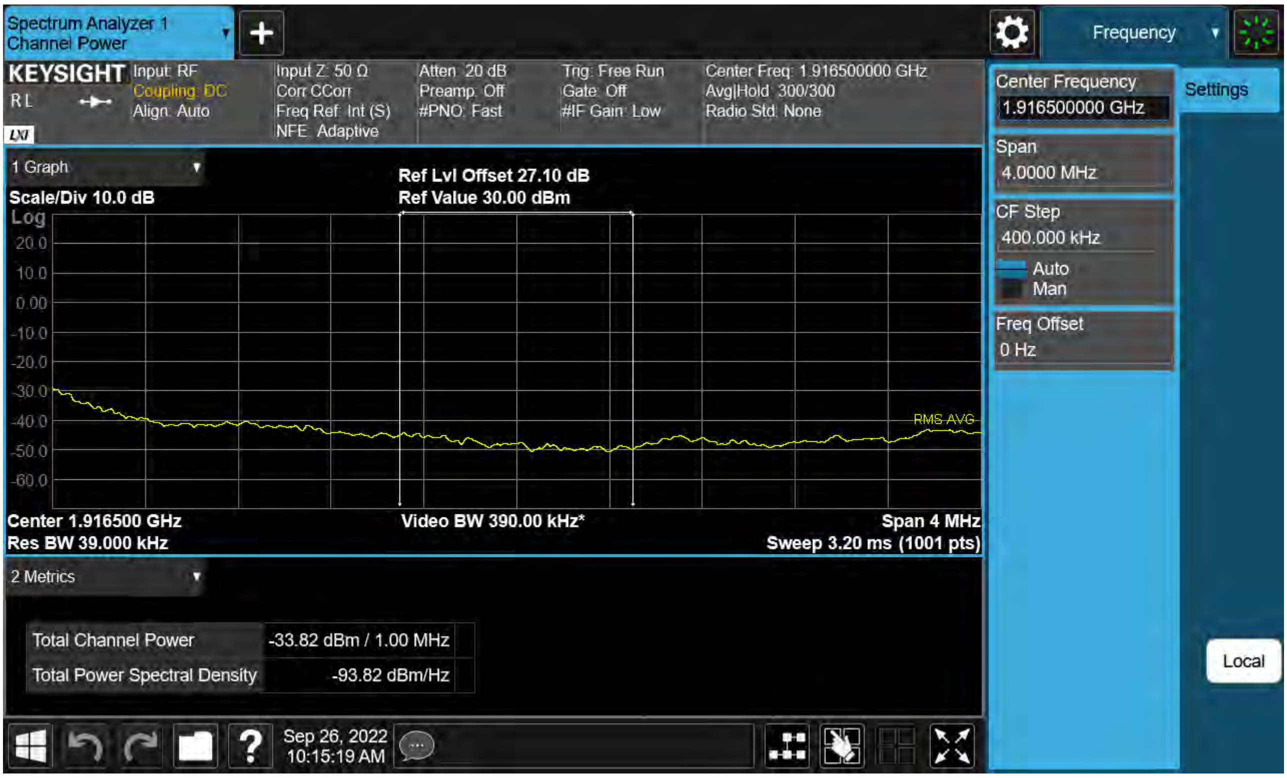
Sub6 n25(2). Upper Extended Band Edge Plot (5 M BW Ch.382500 BPSK_RB25_0) -2



Sub6 n25(2). Upper Band Edge Plot (10 M BW Ch.382000 BPSK_RB1_Offset 49)

Sub6 n25(2). Upper Band Edge Plot (10 M BW Ch.382000 BPSK_RB50_Offset 0) -1

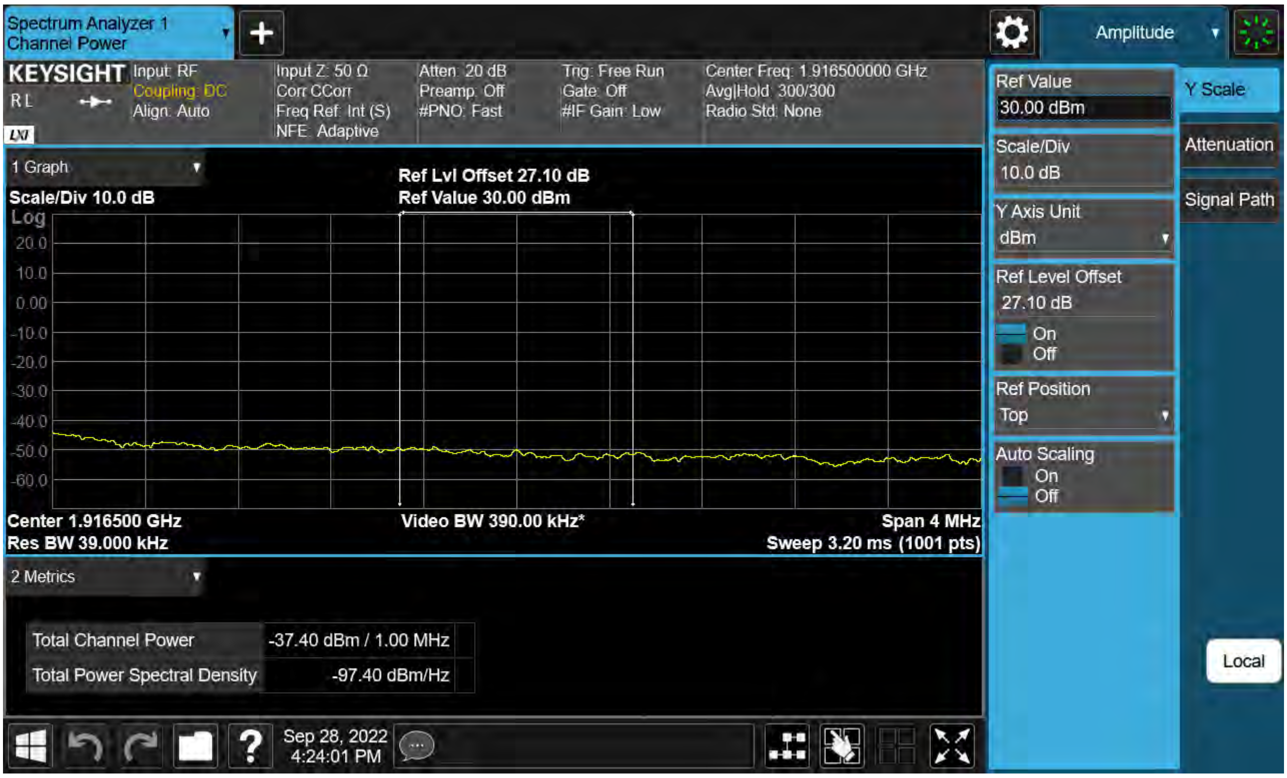
Sub6 n25(2). Upper Extended Band Edge Plot (10 M BW Ch.382000 BPSK_RB50_0) -2



Sub6 n25(2). Upper Band Edge Plot (15 M BW Ch.381500 BPSK_RB1_Offset 74)

Sub6 n25(2). Upper Band Edge Plot (15 M BW Ch.381500 BPSK_RB75_Offset 0) -1

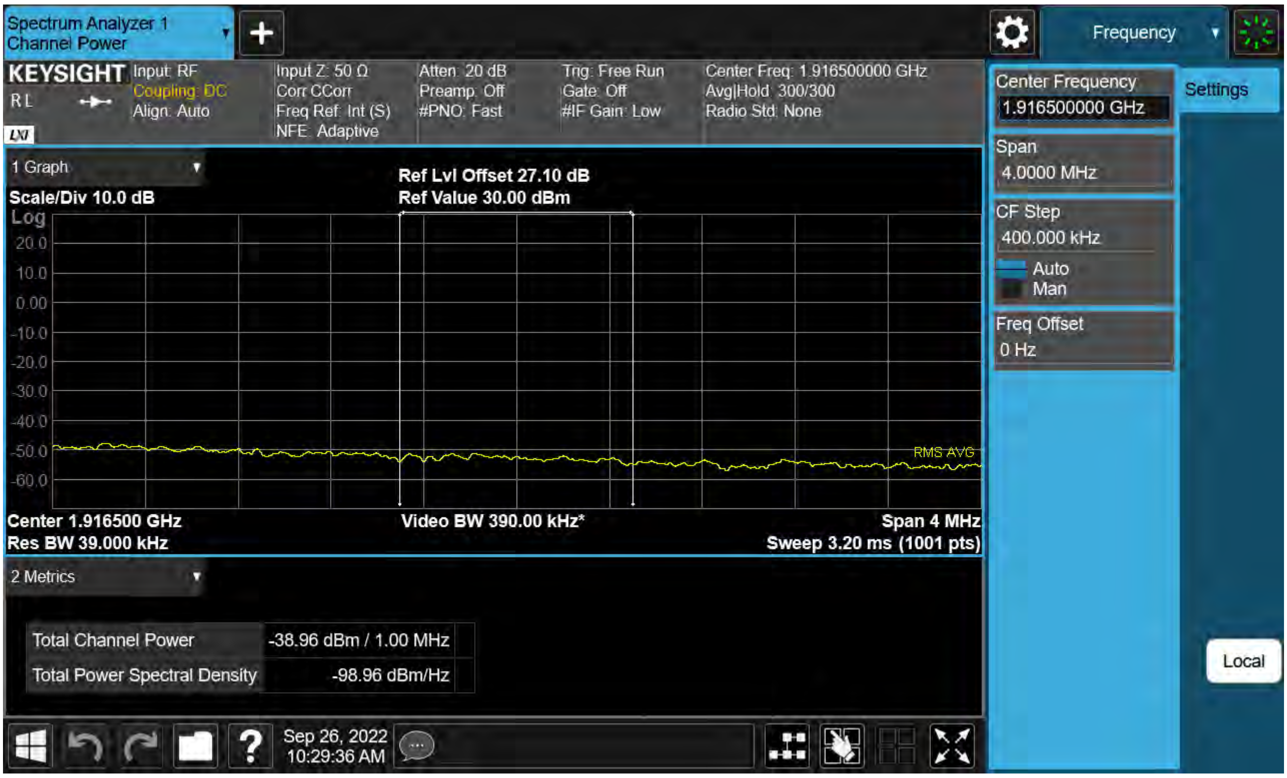
Sub6 n25(2). Upper Extended Band Edge Plot (15 M BW Ch.381500 BPSK_RB75_0) -2



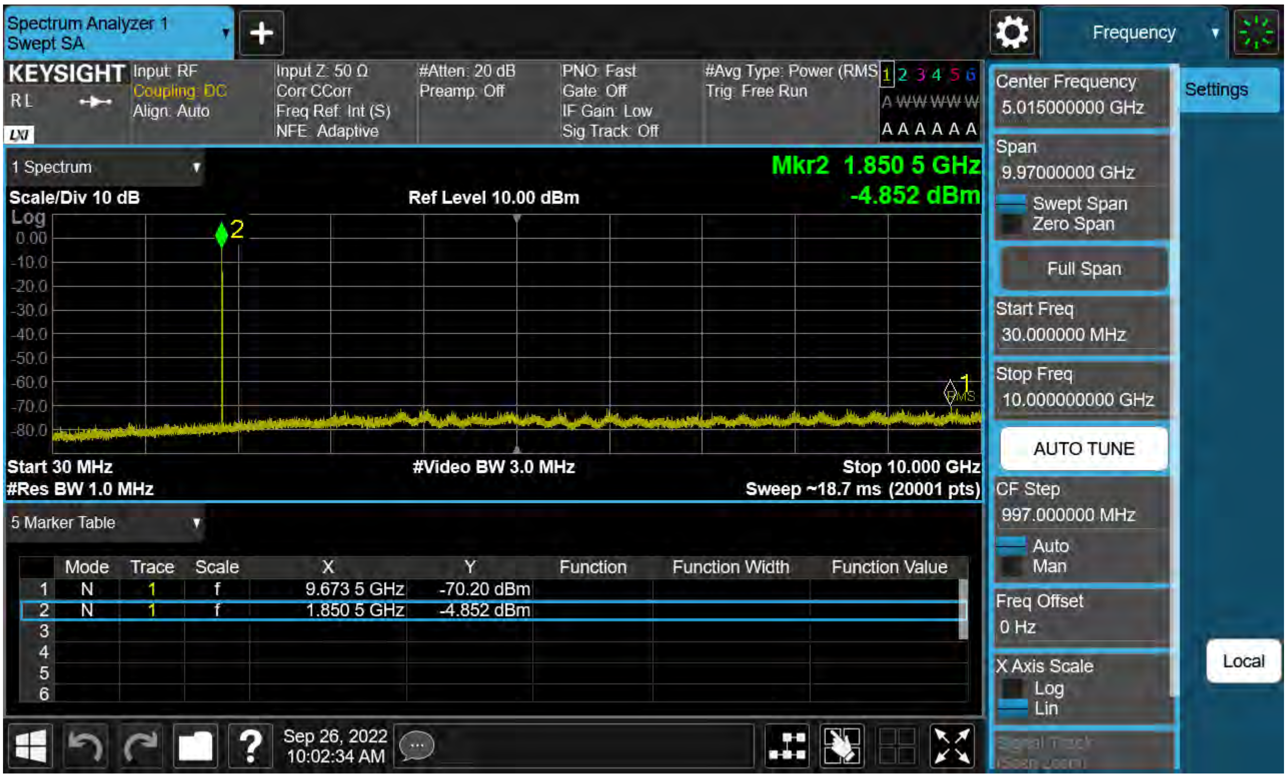
Sub6 n25(2). Upper Band Edge Plot (20 M BW Ch.381000 BPSK_RB1_Offset 99)

Sub6 n25(2). Upper Band Edge Plot (20 M BW Ch.381000 BPSK_RB100_Offset 0) -1

Sub6 n25(2). Upper Extended Band Edge Plot (20 M BW Ch.381000 BPSK_RB100_0) -2

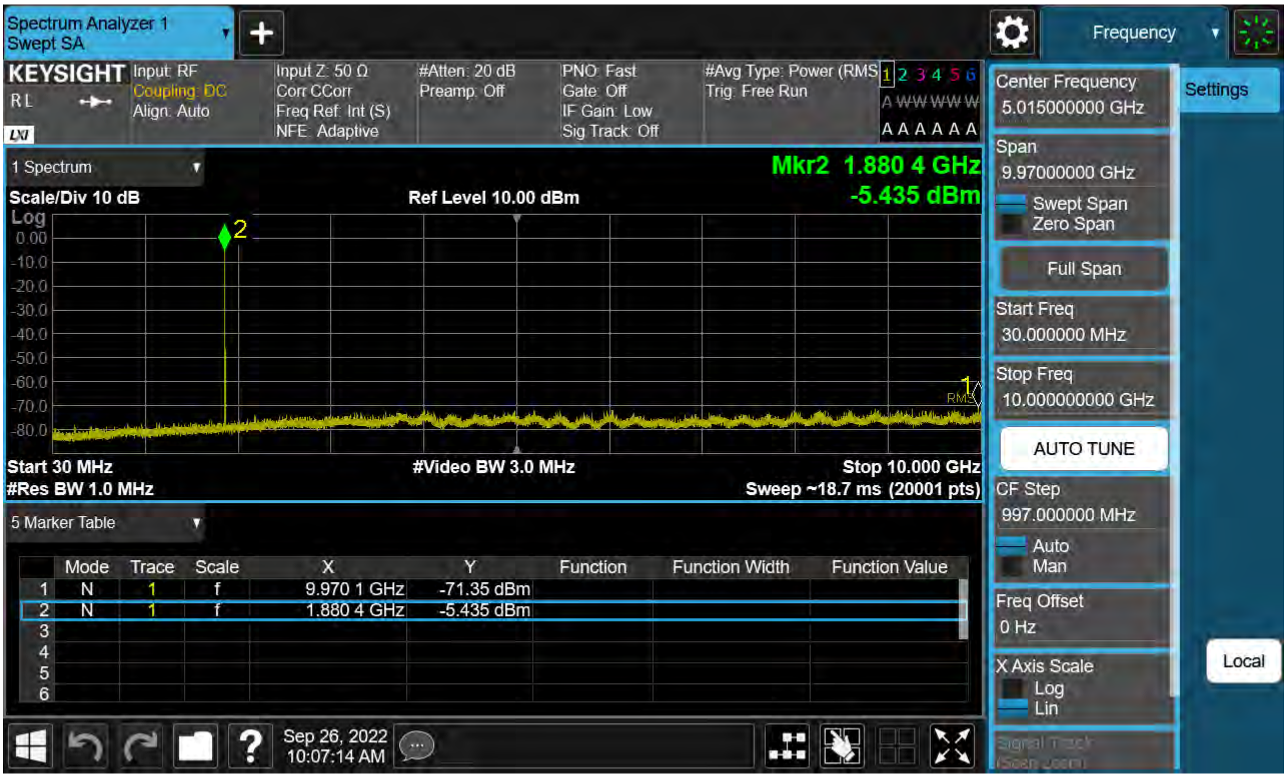


Sub6 n25(2). Conducted Spurious_1 (370500ch_5 MHz_BPSK_RB 1_1)

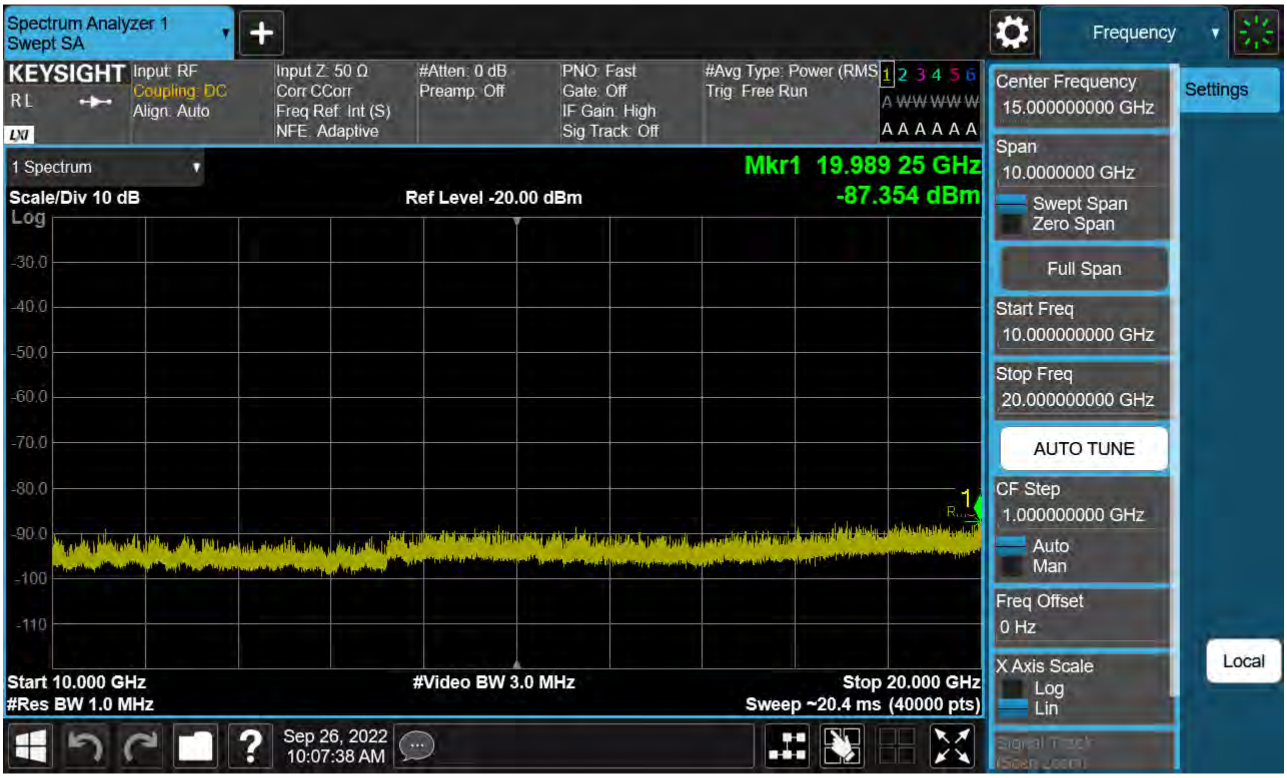


Sub6 n25(2). Conducted Spurious_2 (370500ch_5 MHz_BPSK_RB 1_1)

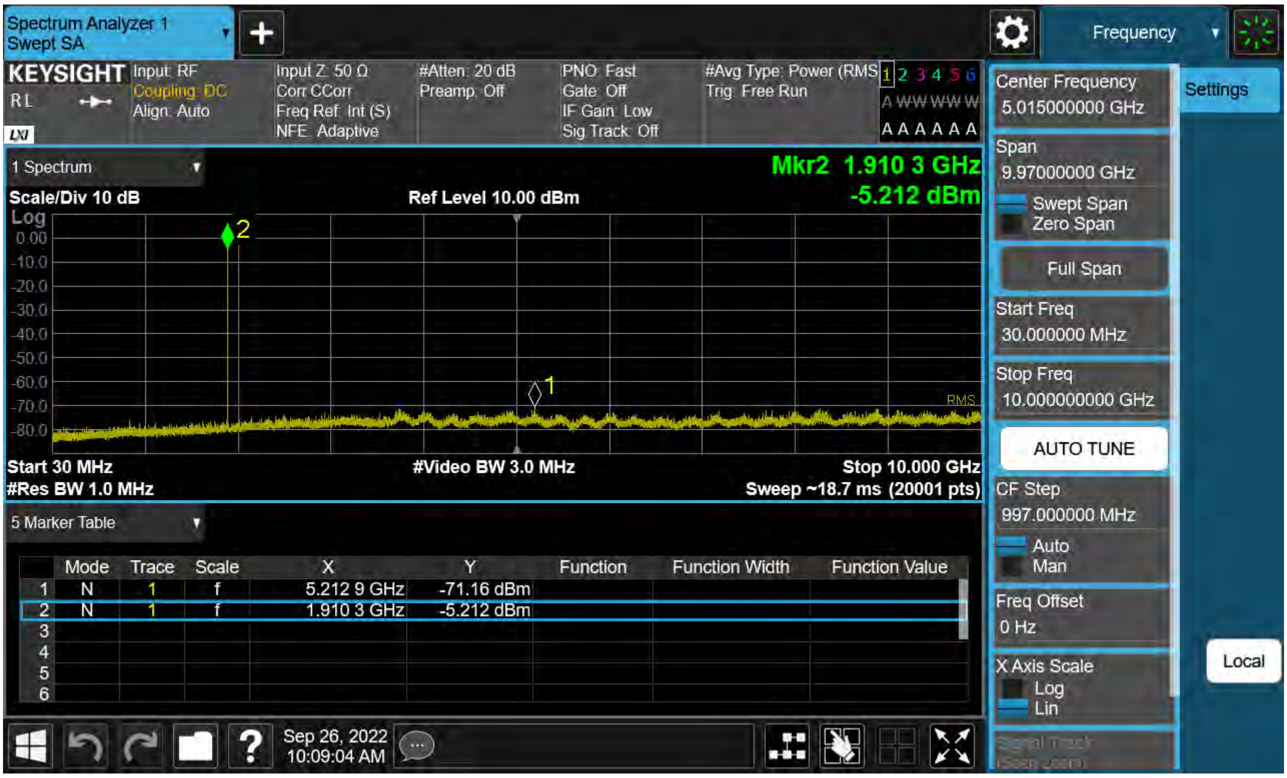
Sub6 n25(2). Conducted Spurious_1 (376500ch_5 MHz_BPSK_RB 1_1)



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

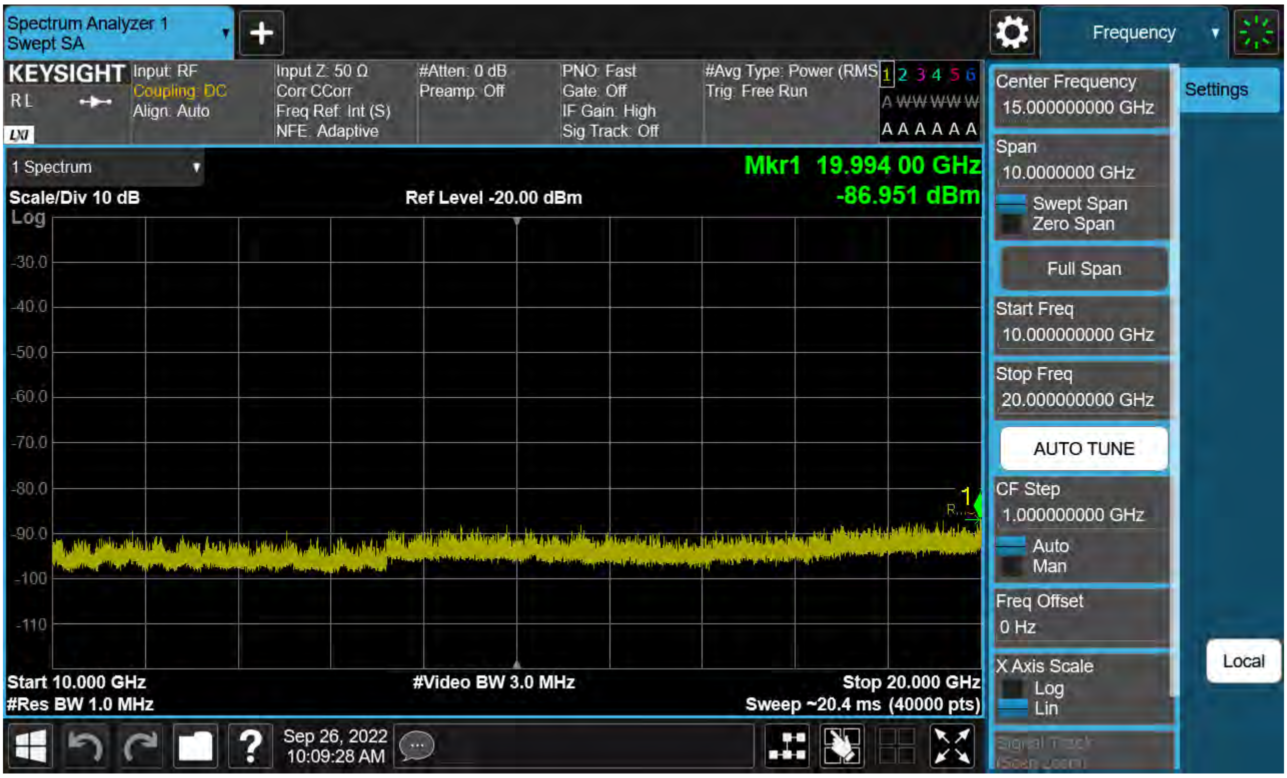


Sub6 n25(2). Conducted Spurious_1 (382500ch_5 MHz_BPSK_RB 1_1)

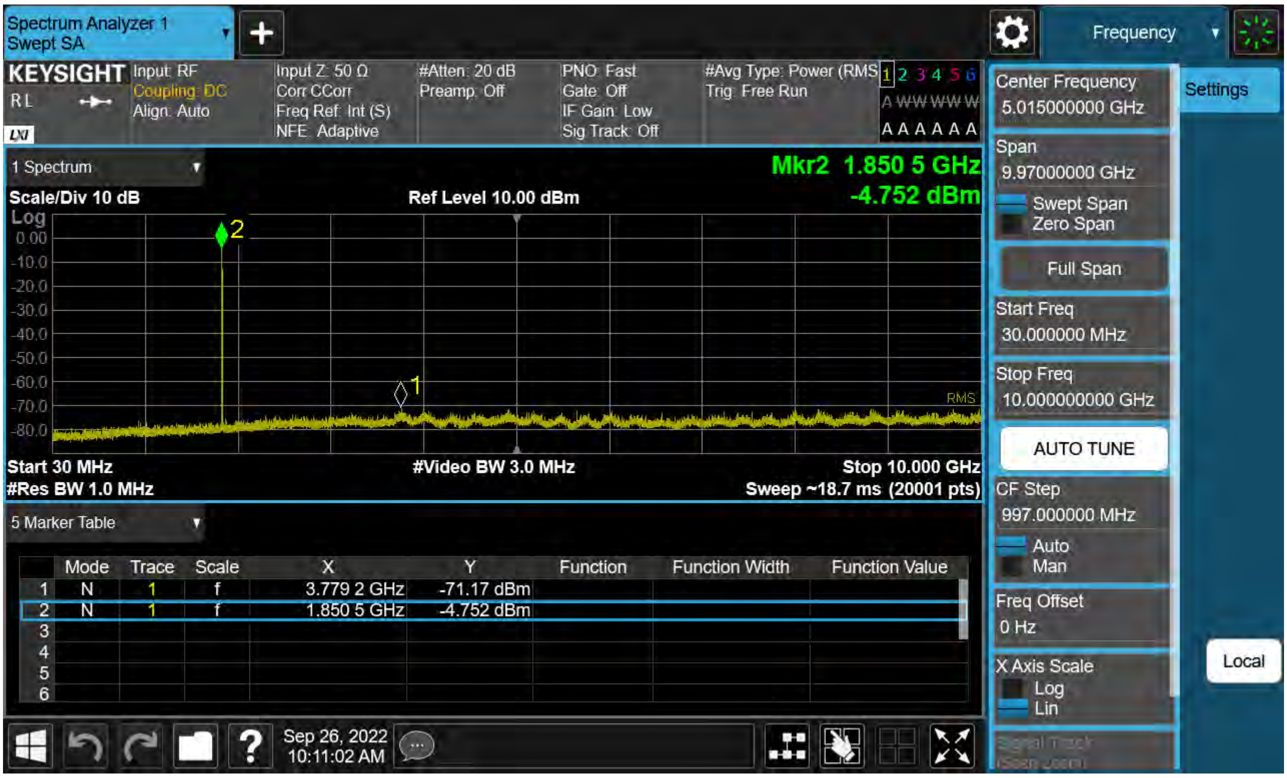


	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	5.212 9 GHz	-71.16 dBm			
2	N	1	f	1.910 3 GHz	-5.212 dBm			
3								
4								
5								
6								

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

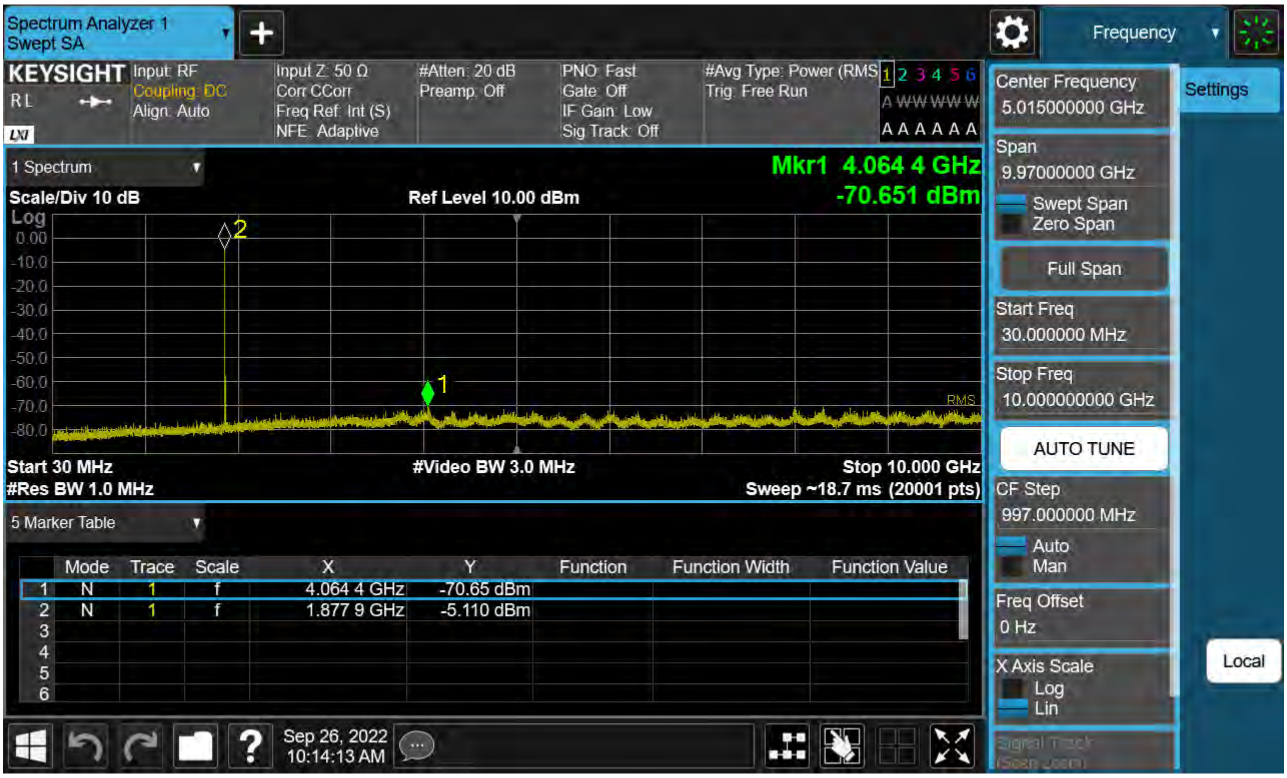


Sub6 n25(2). Conducted Spurious_1 (371000ch_10 MHz_BPSK_RB 1_1)



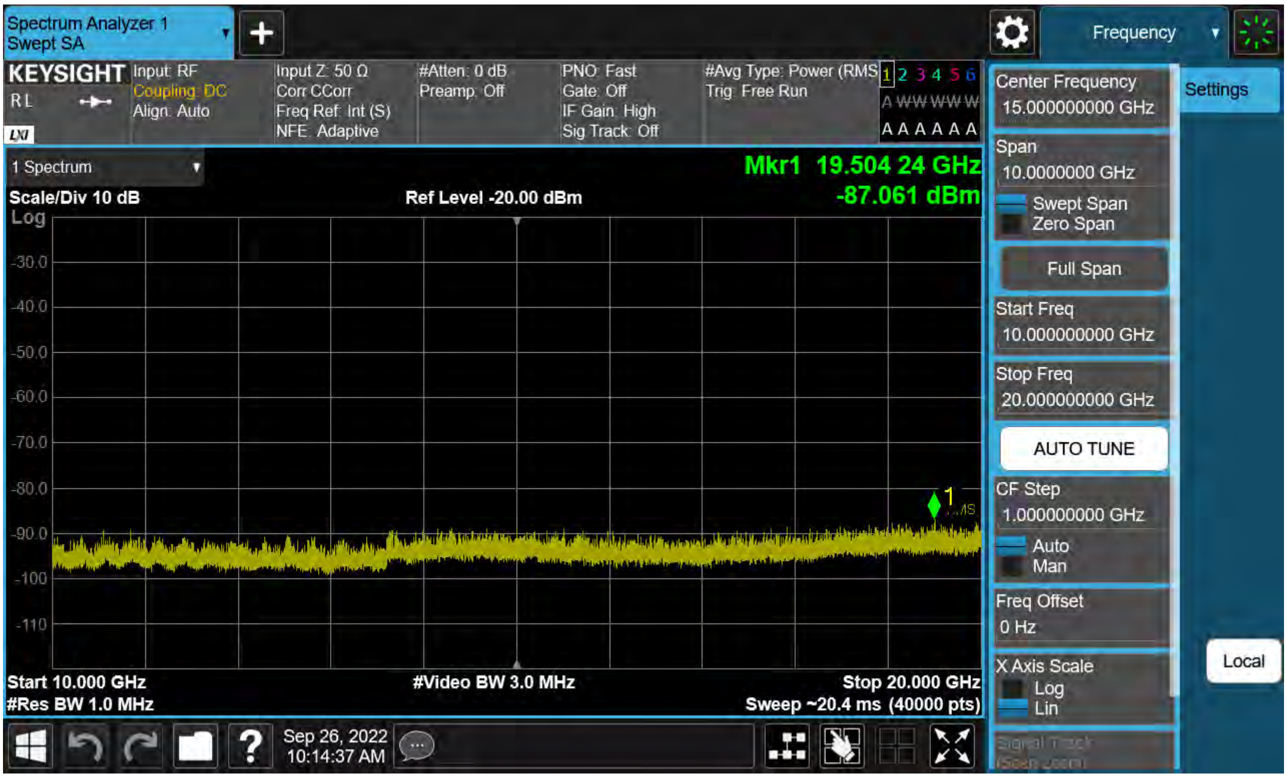
Sub6 n25(2). Conducted Spurious_2 (371000ch_10 MHz_BPSK_RB 1_1)

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

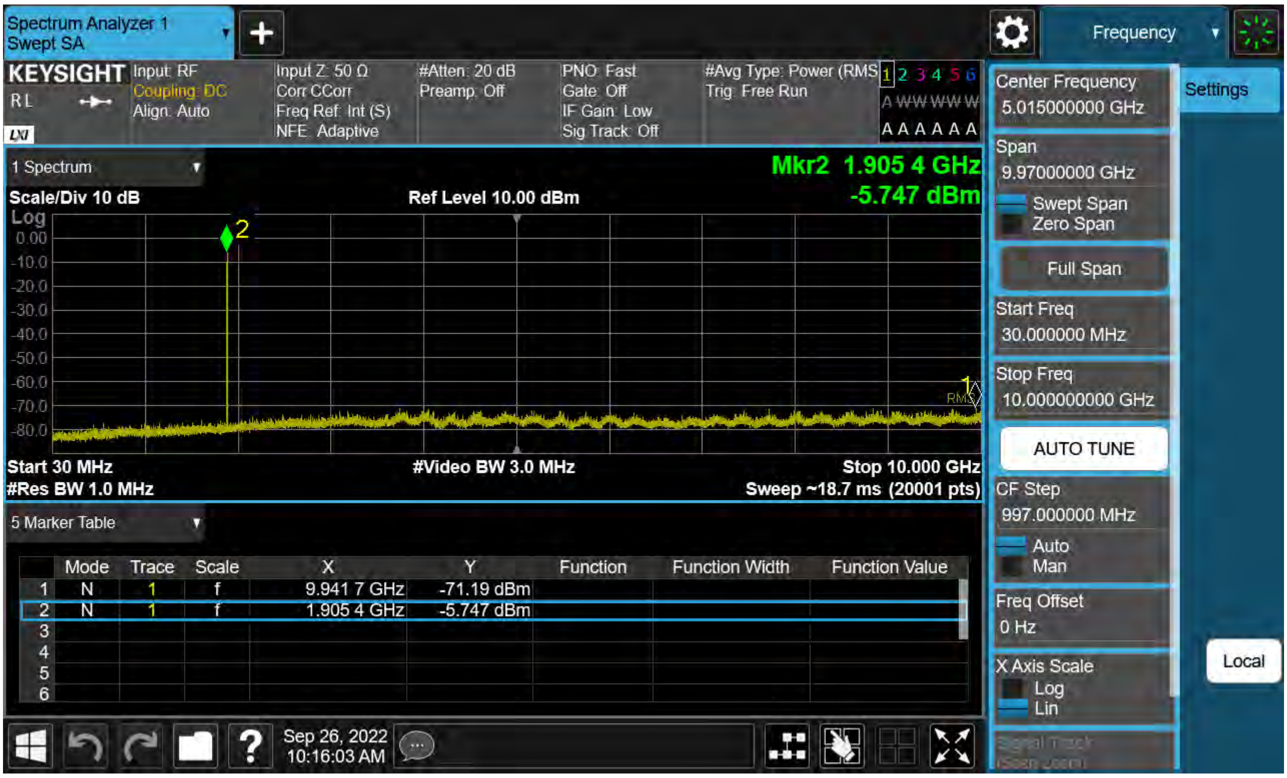


	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	4.064 4 GHz	-70.65 dBm			
2	N	1	f	1.877 9 GHz	-5.110 dBm			
3								
4								
5								
6								

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

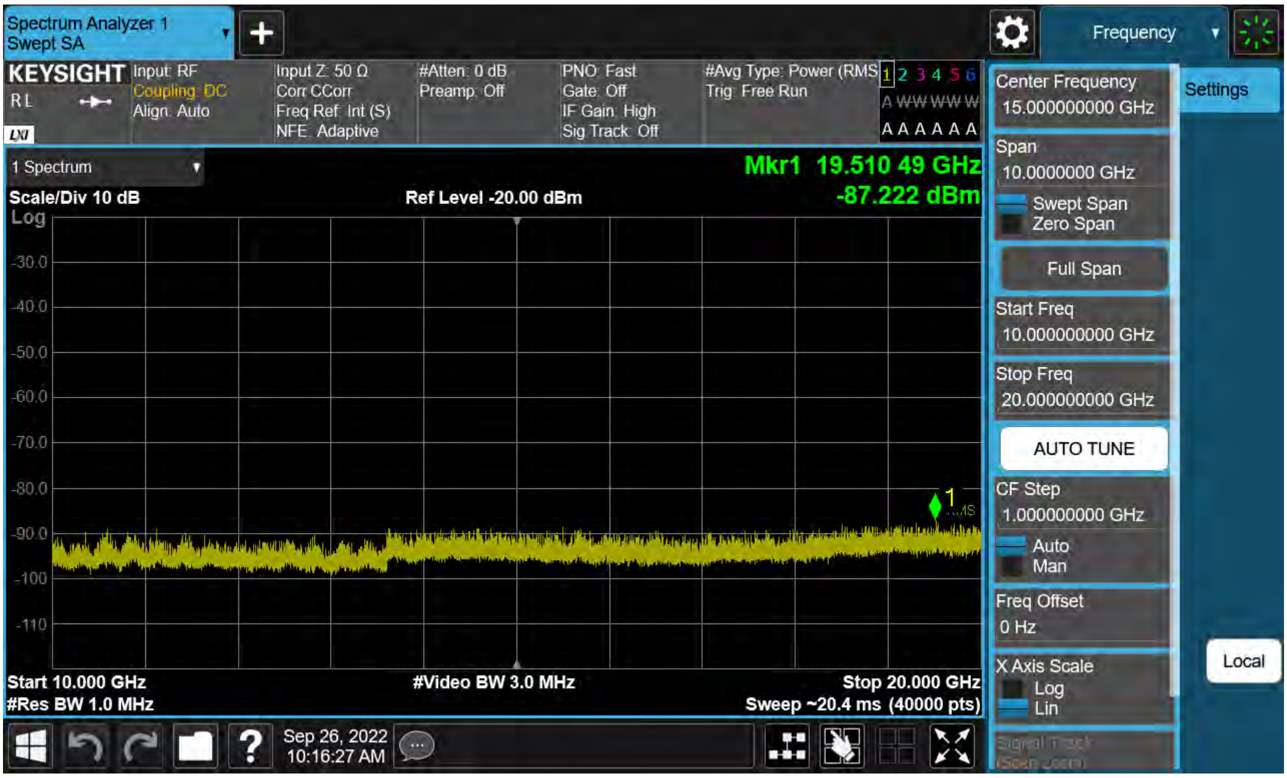


Sub6 n25(2). Conducted Spurious_1 (382000ch_10 MHz_BPSK_RB 1_1)

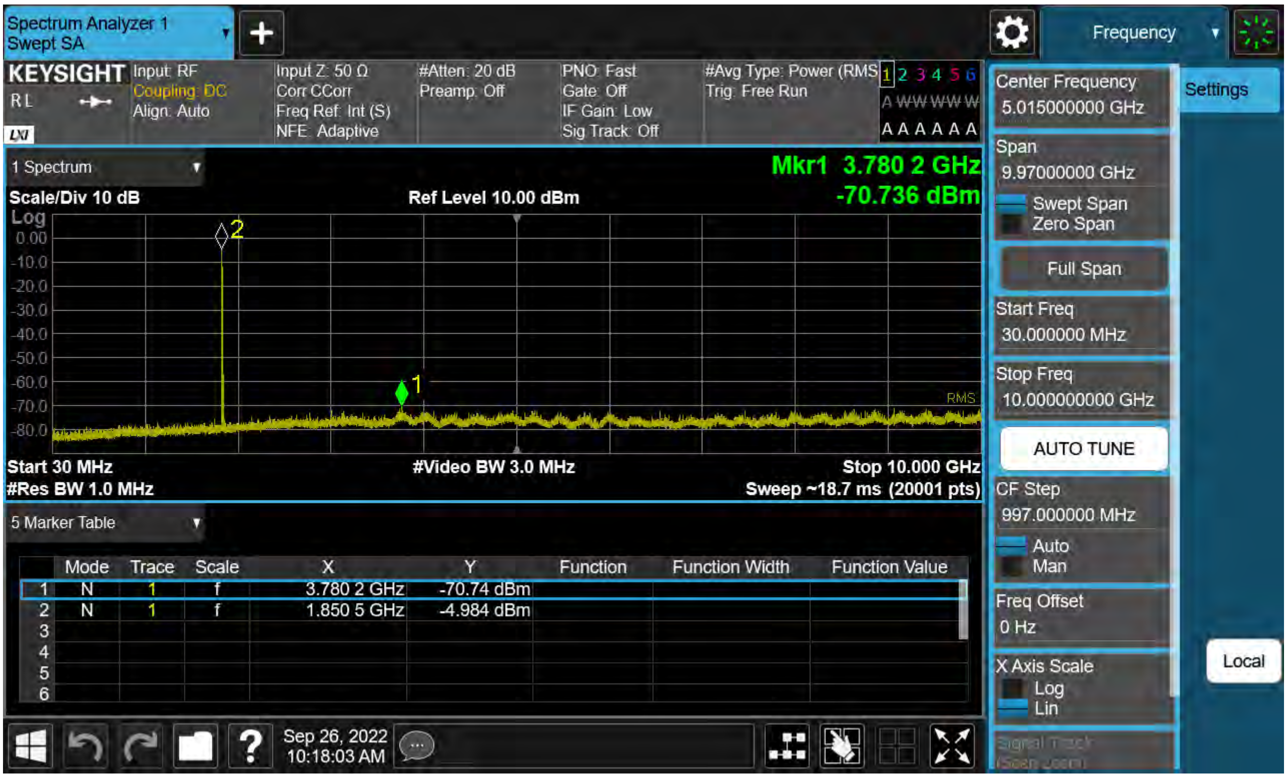


	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	9.941 7 GHz	-71.19 dBm			
2	N	1	f	1.905 4 GHz	-5.747 dBm			
3								
4								
5								
6								

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



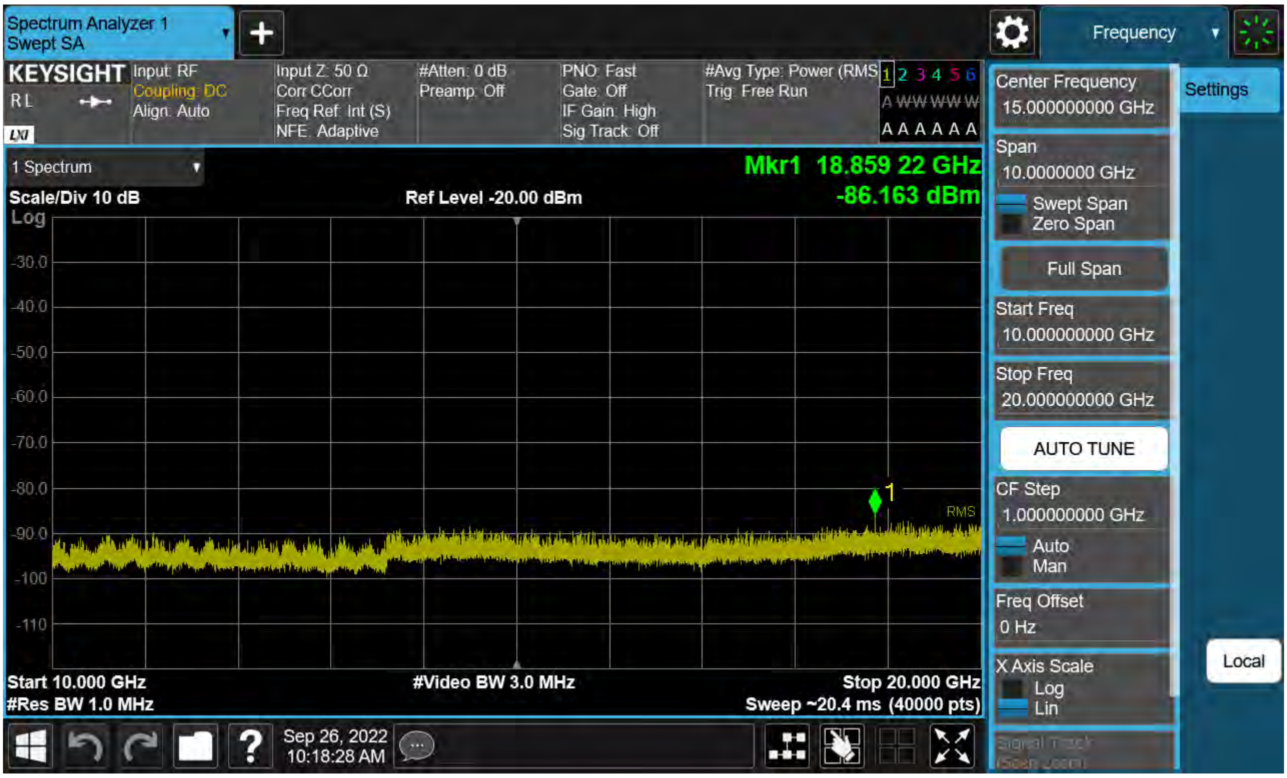
Sub6 n25(2). Conducted Spurious_1 (371500ch_15 MHz_BPSK_RB 1_1)



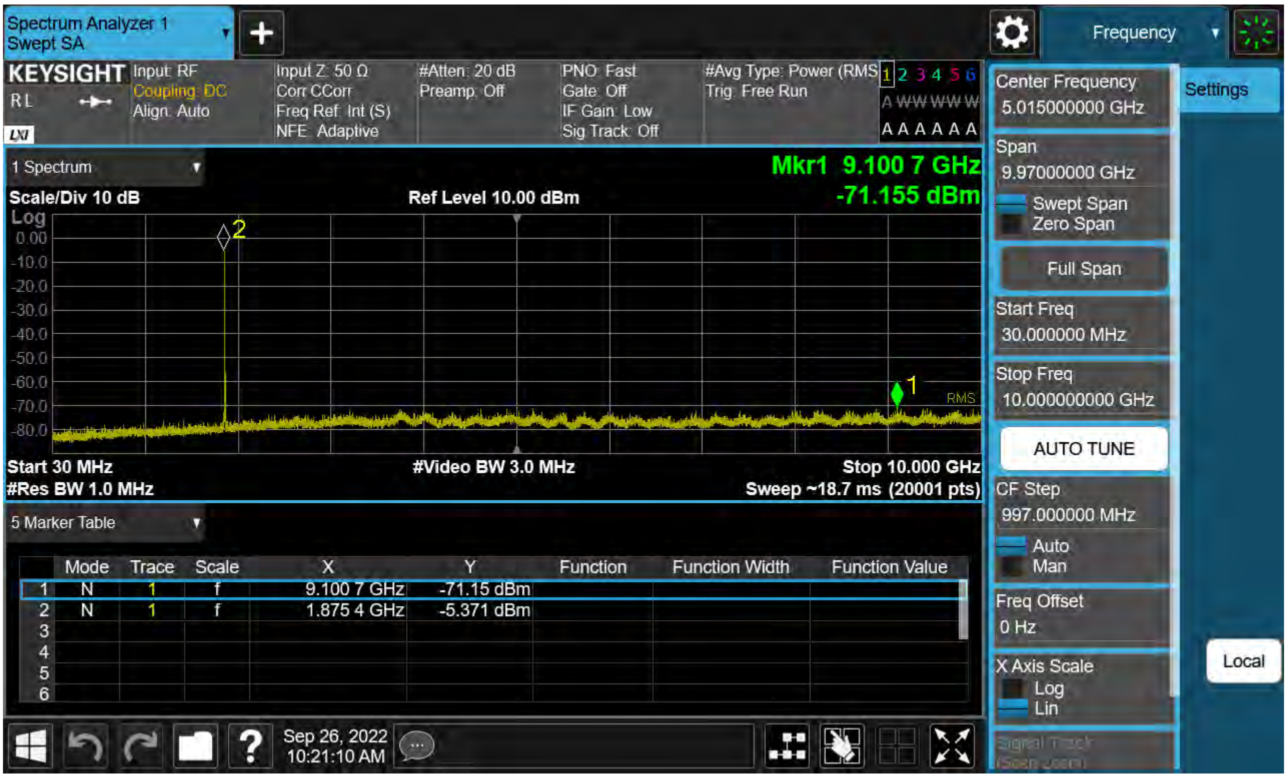
5 Marker Table

	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	3.780 2 GHz	-70.74 dBm			
2	N	1	f	1.850 5 GHz	-4.984 dBm			
3								
4								
5								
6								

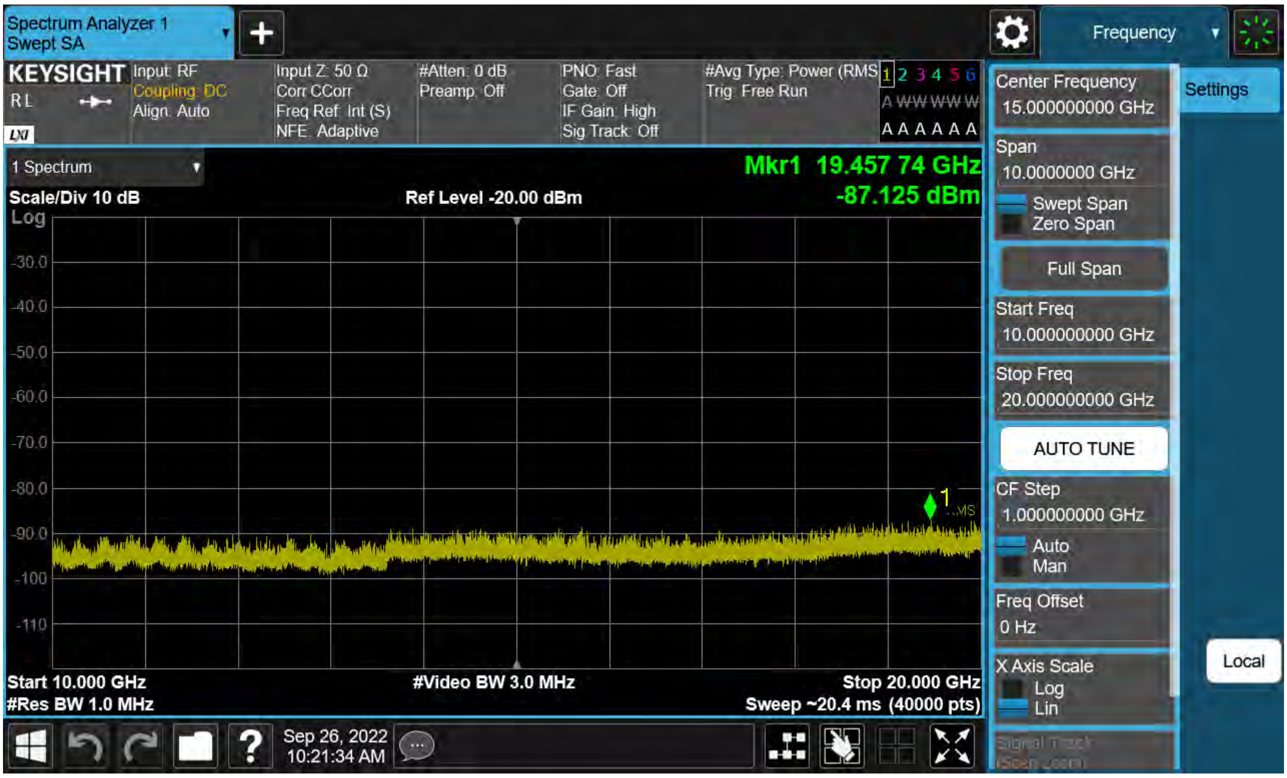
Sub6 n25(2). Conducted Spurious_2 (371500ch_15 MHz_BPSK_RB 1_1)



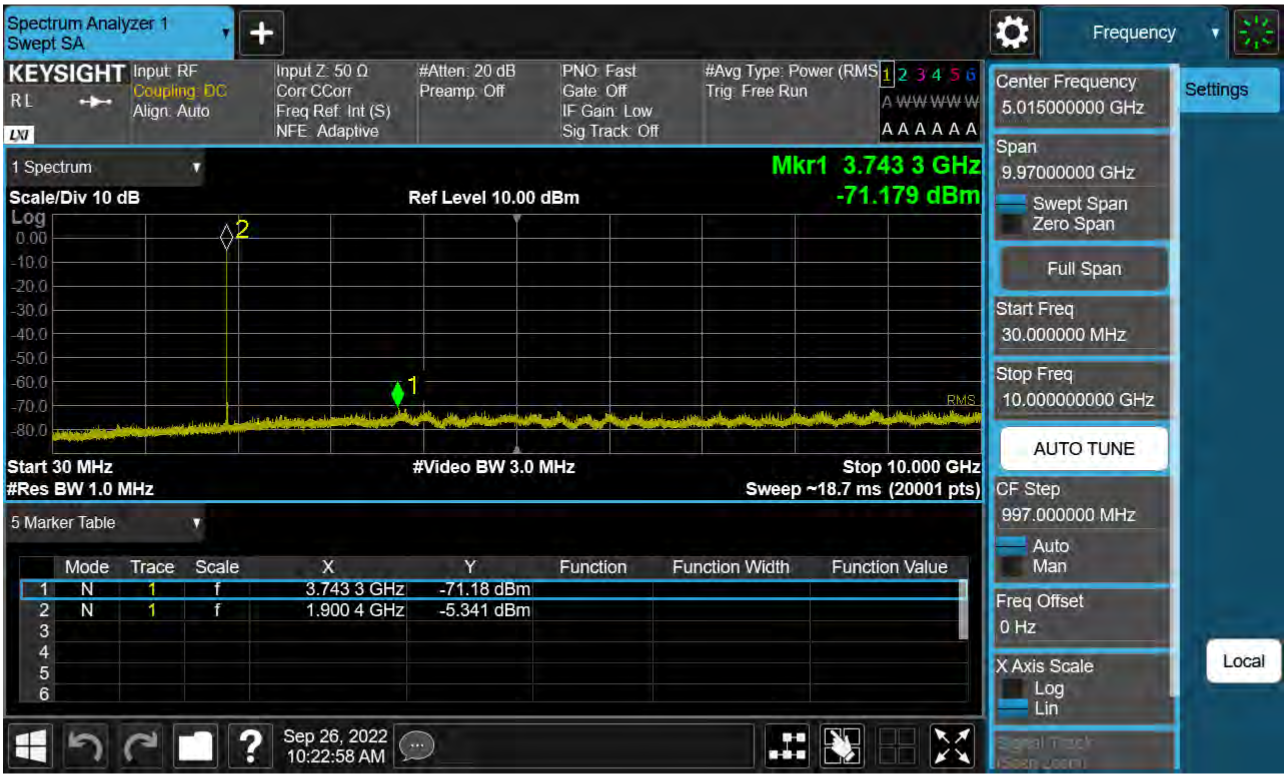
Sub6 n25(2). Conducted Spurious_1 (376500ch_15 MHz_BPSK_RB 1_1)



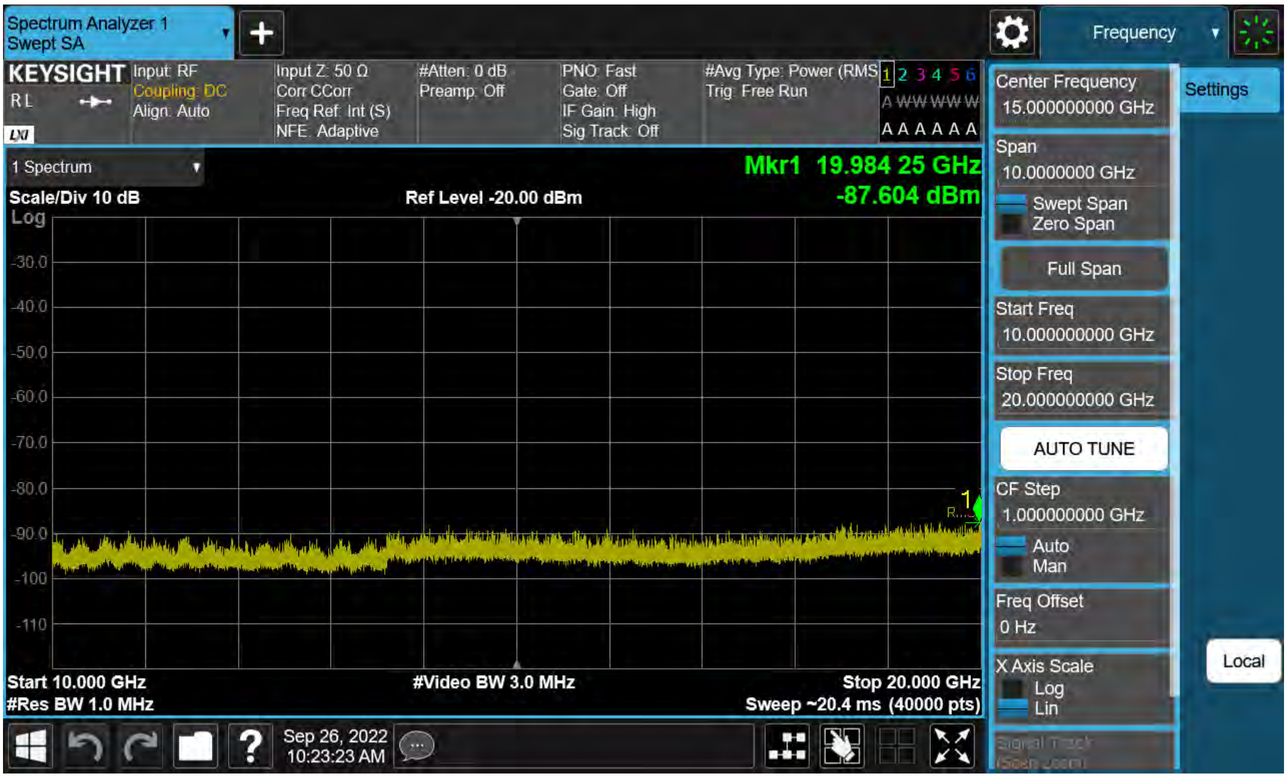
Sub6 n25(2). Conducted Spurious_2 (376500ch_15 MHz_BPSK_RB 1_1)



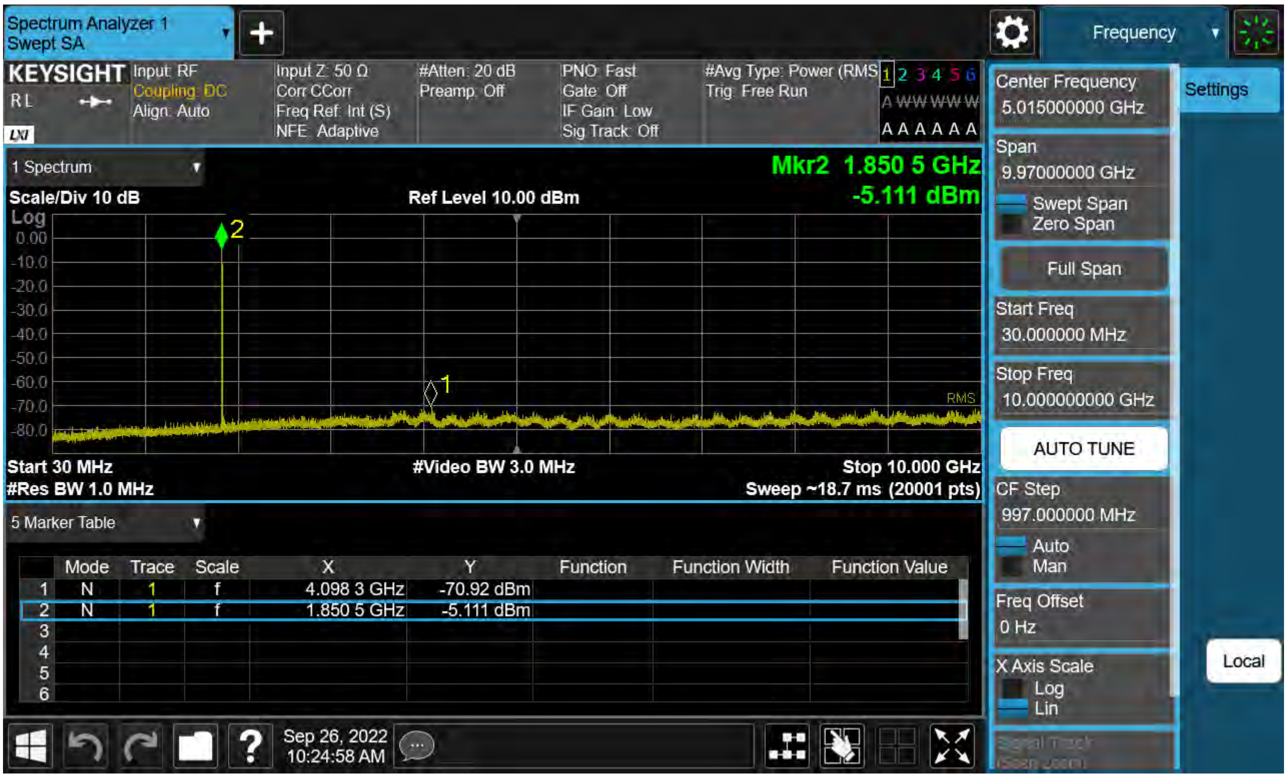
Sub6 n25(2). Conducted Spurious_1 (381500ch_15 MHz_BPSK_RB 1_1)



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



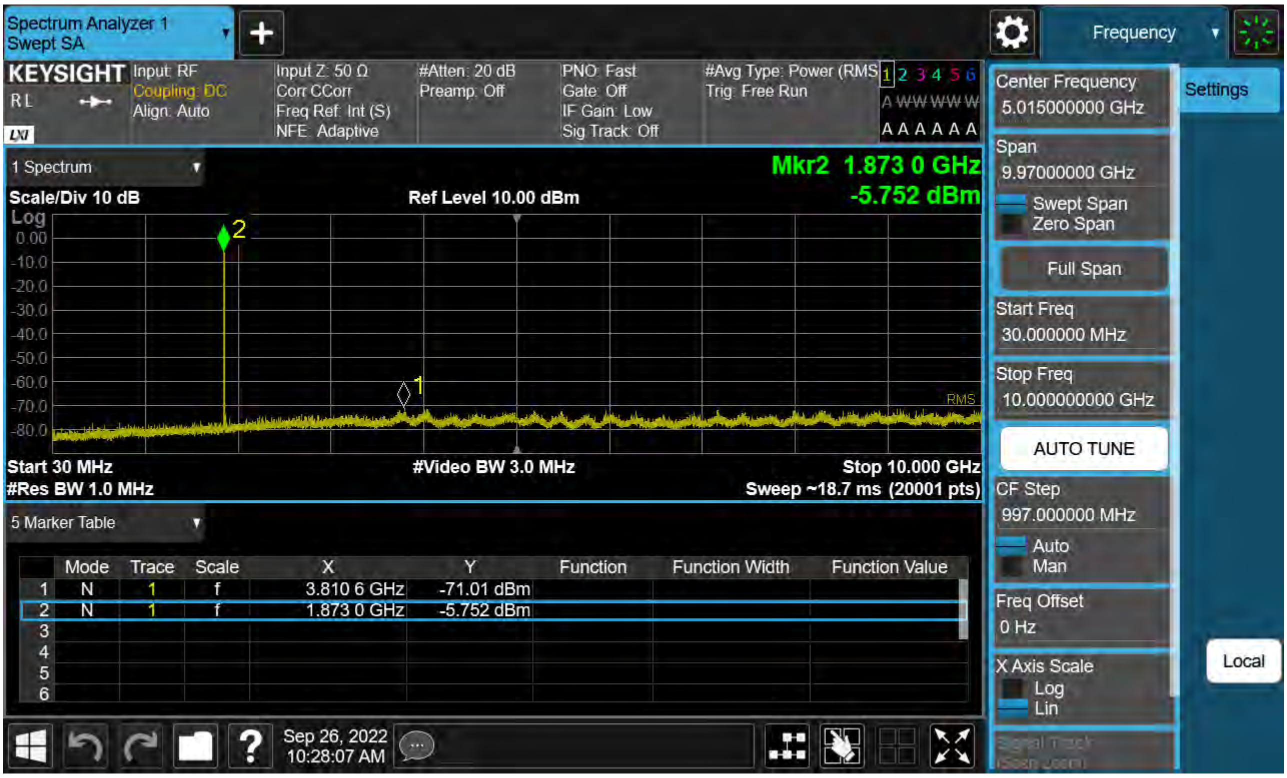
Sub6 n25(2). Conducted Spurious_1 (372000ch_20 MHz_BPSK_RB 1_1)



	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	4.098 3 GHz	-70.92 dBm			
2	N	1	f	1.850 5 GHz	-5.111 dBm			
3								
4								
5								
6								

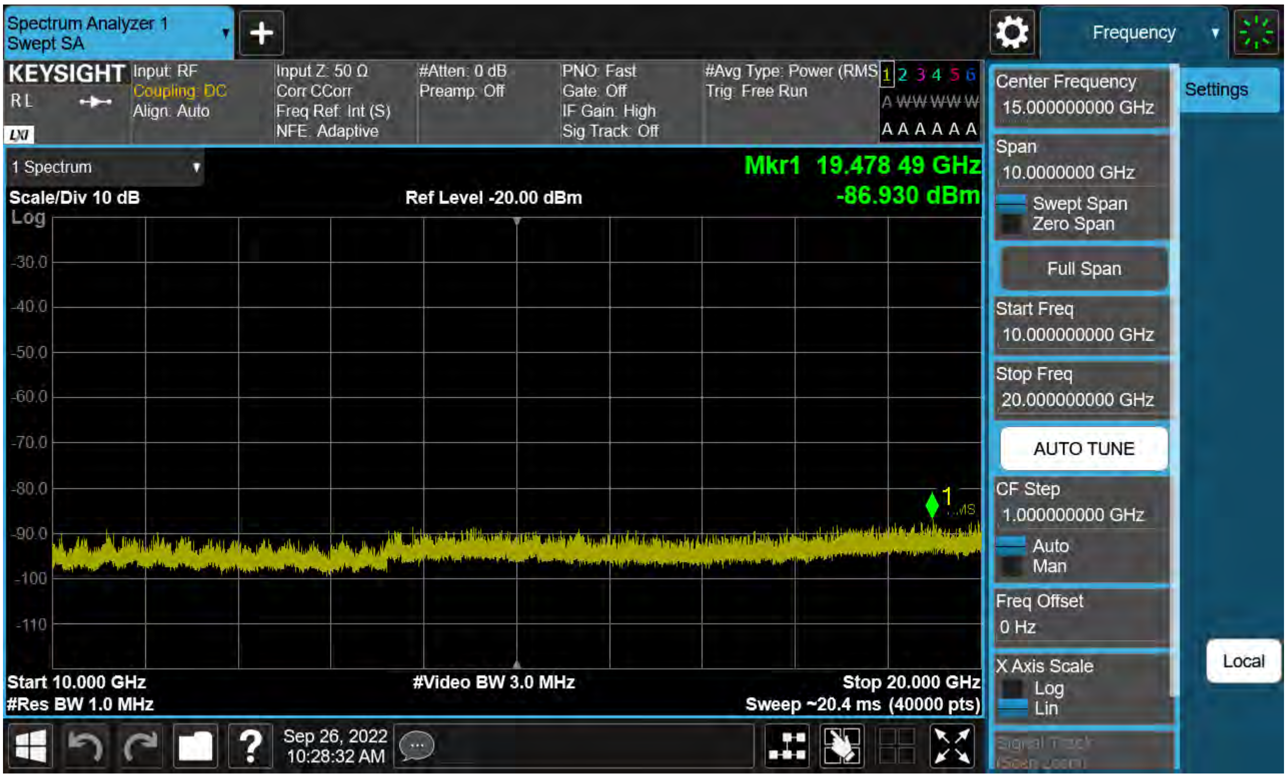
Sub6 n25(2). Conducted Spurious_2 (372000ch_20 MHz_BPSK_RB 1_1)

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

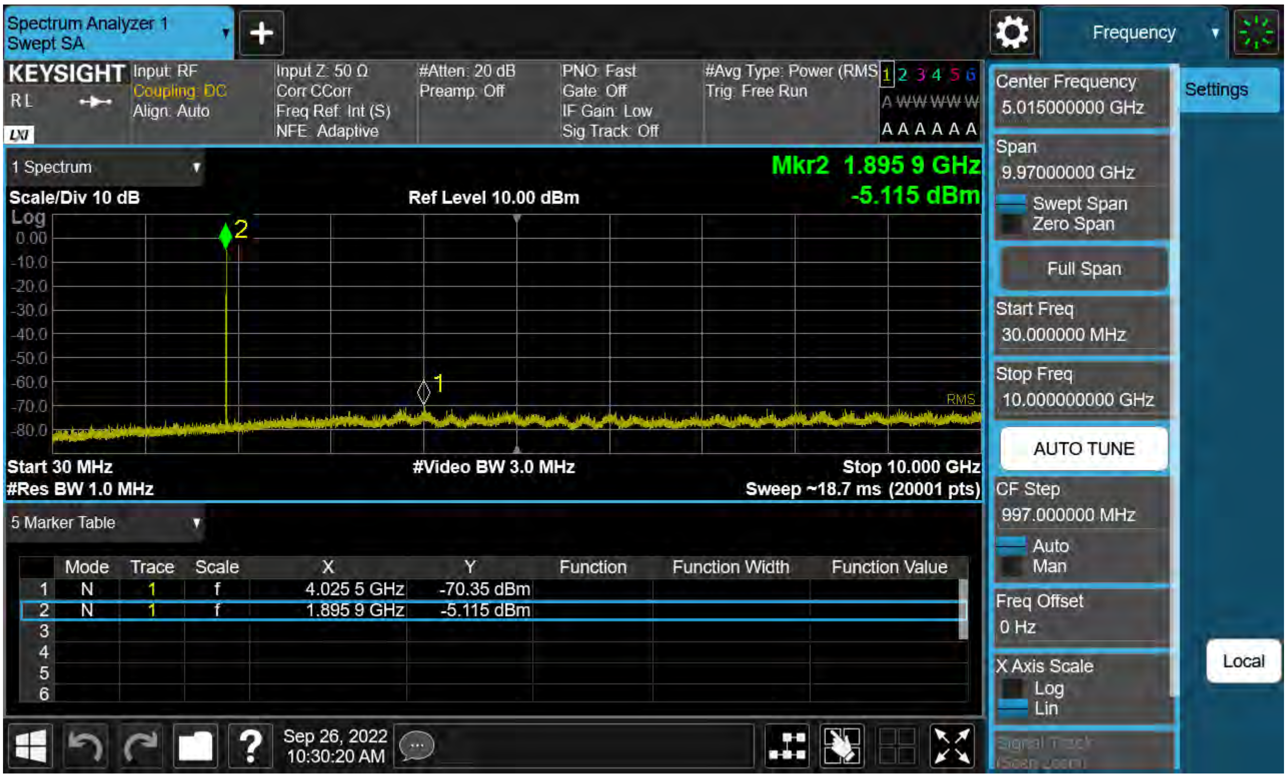


	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	3.810 6 GHz	-71.01 dBm			
2	N	1	f	1.873 0 GHz	-5.752 dBm			
3								
4								
5								
6								

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

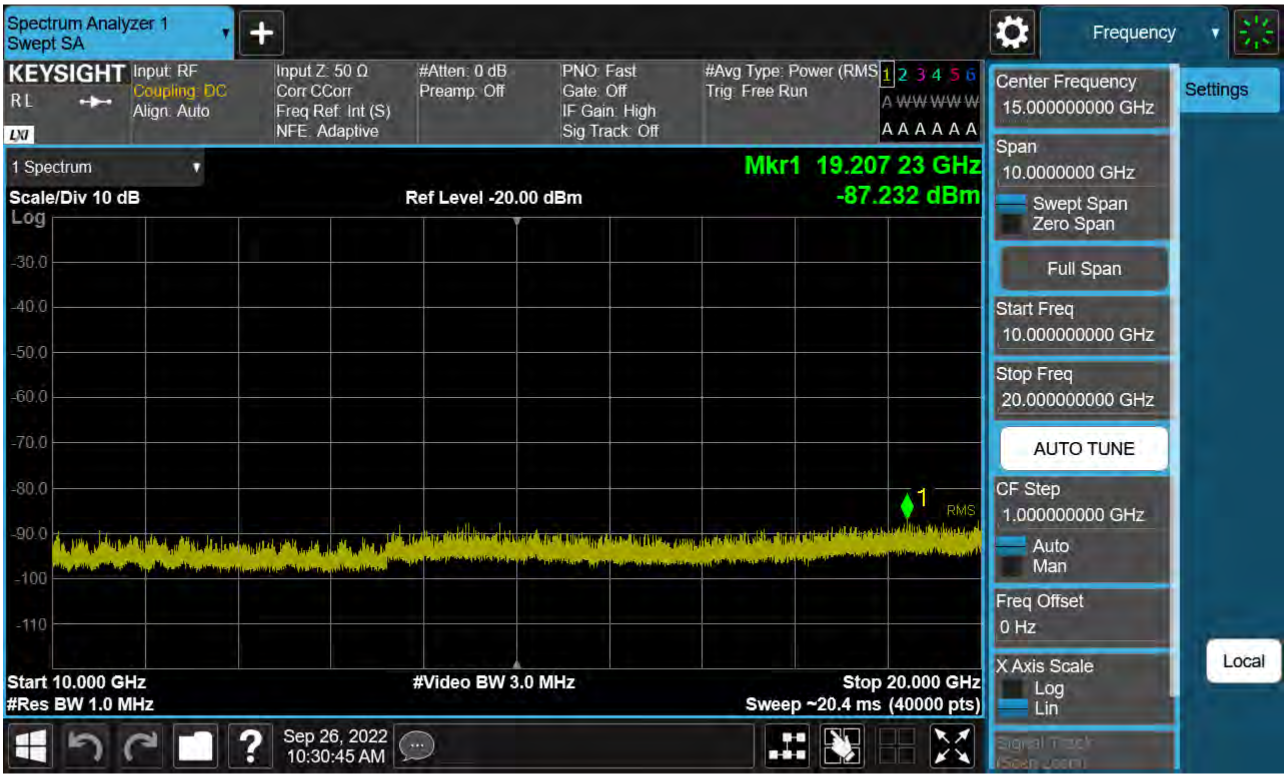


Sub6 n25(2). Conducted Spurious_1 (381000ch_20 MHz_BPSK_RB 1_1)



	Mode	Trace	Scale	X	Y	Function	Function Width	Function Value
1	N	1	f	4.025 5 GHz	-70.35 dBm			
2	N	1	f	1.895 9 GHz	-5.115 dBm			
3								
4								
5								
6								

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-2210-FC021-P