

# FCC LTE REPORT

## Certification

**Applicant Name:**  
SAMSUNG Electronics Co., Ltd.

**Date of Issue:**  
October 31, 2019

**Address:**  
129, Samsung-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

**Location:**  
HCT CO., LTD.,  
74, Seoicheon-ro 578beon-gil, Majang-myeon,  
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA  
**Report No.:** HCT-RF-1910-FC011

**FCC ID:** A3LSMG770F

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

Model(s): SM-G770F/DS  
 Additional Model(s): SM-G770F/DSM, SM-G770F  
 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)
LTE – Band2 (1.4)	1850.7 - 1909.3	1M09G7D	QPSK	0.164	22.14
		1M09W7D	16QAM	0.138	21.41
		1M09W7D	64QAM	0.110	20.42
LTE – Band2 (3)	1851.5 - 1908.5	2M71G7D	QPSK	0.163	22.12
		2M70W7D	16QAM	0.138	21.41
		2M70W7D	64QAM	0.109	20.38
LTE – Band2 (5)	1852.5 - 1907.5	4M50G7D	QPSK	0.159	22.02
		4M49W7D	16QAM	0.135	21.31
		4M50W7D	64QAM	0.106	20.27
LTE – Band2 (10)	1855.0 - 1905.0	8M97G7D	QPSK	0.160	22.03
		8M98W7D	16QAM	0.132	21.19
		8M98W7D	64QAM	0.104	20.17
LTE – Band2 (15)	1857.5 - 1902.5	13M5G7D	QPSK	0.152	21.82
		13M4W7D	16QAM	0.135	21.29
		13M4W7D	64QAM	0.106	20.26
LTE – Band2 (20)	1860.0 - 1900.0	18M0G7D	QPSK	0.151	21.80
		17M9W7D	16QAM	0.134	21.28
		17M9W7D	64QAM	0.106	20.24

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)



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



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

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

# Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1910-FC011	October 31, 2019	- First Approval Report

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

This laboratory is not accredited for the test results marked \*.

The above Test Report is the accredited test result by KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA.(HCT Accreditation No.: KT197)

## Table of Contents

1. GENERAL INFORMATION .....	4
2. INTRODUCTION .....	5
2.1. DESCRIPTION OF EUT.....	5
2.2. MEASURING INSTRUMENT CALIBRATION .....	5
2.3. TEST FACILITY .....	5
3. DESCRIPTION OF TESTS.....	6
3.1 TEST PROCEDURE .....	6
3.2 RADIATED POWER.....	7
3.3 RADIATED SPURIOUS EMISSIONS .....	8
3.4 PEAK- TO- AVERAGE RATIO.....	9
3.5 OCCUPIED BANDWIDTH. ....	11
3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL .....	12
3.7 BAND EDGE .....	13
3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE .....	14
3.8 WORST CASE(RADIATED TEST).....	15
3.9 WORST CASE(CONDUCTED TEST) .....	16
4. LIST OF TEST EQUIPMENT .....	17
5. MEASUREMENT UNCERTAINTY .....	18
6. SUMMARY OF TEST RESULTS .....	19
7. SAMPLE CALCULATION .....	20
8. TEST DATA .....	22
8.1 EQUIVALENT ISOTROPIC RADIATED POWER.....	22
8.2 RADIATED SPURIOUS EMISSIONS .....	25
8.3 PEAK-TO-AVERAGE RATIO.....	31
8.4 OCCUPIED BANDWIDTH .....	32
8.5 CONDUCTED SPURIOUS EMISSIONS .....	33
8.6 BAND EDGE .....	33
8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE .....	34
9. TEST PLOTS.....	52
10. APPENDIX A_ TEST SETUP PHOTO .....	161
11. ANNEX B_ EMI TEST RESULT .....	162

# MEASUREMENT REPORT

## 1. GENERAL INFORMATION

<b>Applicant Name:</b>	SAMSUNG Electronics Co., Ltd.
<b>Address:</b>	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
<b>FCC ID:</b>	A3LSMG770F
<b>Application Type:</b>	Certification
<b>FCC Classification:</b>	PCS Licensed Transmitter Held to Ear (PCE)
<b>FCC Rule Part(s):</b>	§24, §2
<b>EUT Type:</b>	Mobile Phone
<b>Model(s):</b>	SM-G770F/DS
<b>Additional Model(s):</b>	SM-G770F/DSM, SM-G770F
<b>Tx Frequency:</b>	1850.7 MHz – 1909.3 MHz (LTE – Band2 (1.4 MHz)) 1851.5 MHz – 1908.5 MHz (LTE – Band2 (3 MHz)) 1852.5 MHz – 1907.5 MHz (LTE – Band2 (5 MHz)) 1855.0 MHz – 1905.0 MHz (LTE – Band2 (10 MHz)) 1857.5 MHz – 1902.5 MHz (LTE – Band2 (15 MHz)) 1860.0 MHz – 1900.0 MHz (LTE – Band2 (20 MHz))
<b>Date(s) of Tests:</b>	September 09, 2019 ~ October 14, 2019

## **2. INTRODUCTION**

### **2.1. DESCRIPTION OF EUT**

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

It also supports IEEE 802.11 a/b/g/n/ac (HT20/40/80), Bluetooth, NFC, ANT+.

### **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 1MHz
3. VBW  $\geq 3 \times$  RBW
4. Span = 1.5 times the OBW
5. No. of sweep points  $> 2 \times$  span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

### Test Note

1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
2. A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

The power is calculated by the following formula;

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

Where:  $P_d$  is the dipole equivalent power and  $P_g$  is the generator output power into the substitution antenna.

3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration
4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

### 3.3 RADIATED SPURIOUS EMISSIONS

#### Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA-603-E-2016.

#### Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW  $\geq 3 \times$  RBW
3. Span = 1.5 times the OBW
4. No. of sweep points  $> 2 \times$  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<sup>th</sup> 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;

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

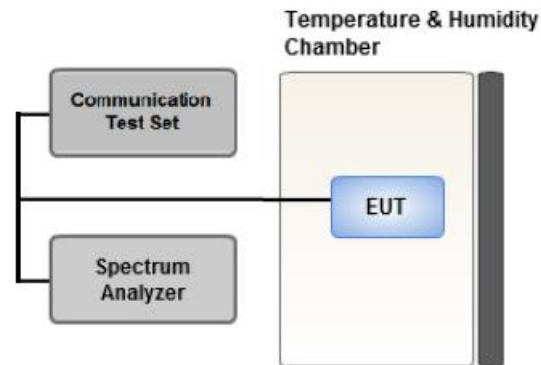
Where:  $P_g$  is the generator output power into the substitution antenna.

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

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



### 3.4 PEAK- TO- AVERAGE RATIO



**Test setup**

#### ① CCDF Procedure for PAPR

##### **Test Settings**

1. Set resolution/measurement bandwidth  $\geq$  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:

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

**Test Settings(Peak Power)**

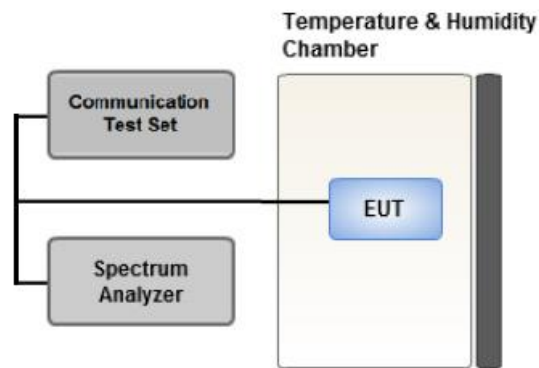
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW  $\geq 3 \times$  RBW.

1. Set the RBW  $\geq$  OBW.
2. Set VBW  $\geq 3 \times$  RBW.
3. Set span  $\geq 2 \times$  OBW.
4. Sweep time  $\geq 10 \times$  (number of points in sweep)  $\times$  (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  $2 \times$  to  $3 \times$  the OBW.
2. Set RBW  $\geq$  OBW.
3. Set VBW  $\geq 3 \times$  RBW.
4. Set number of measurement points in sweep  $\geq 2 \times$  span / RBW.
5. Sweep time:  
Set  $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission period})]$  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  $[10 \log (1/\text{duty cycle})]$  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.

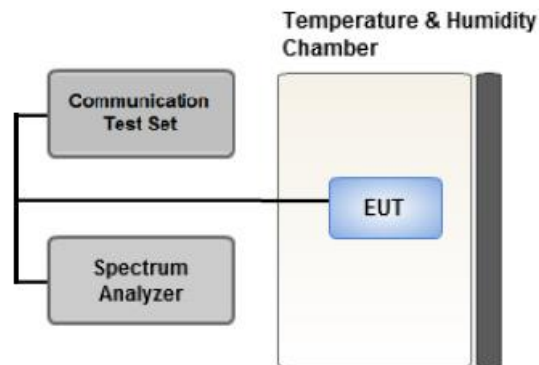
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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  $\geq$  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**

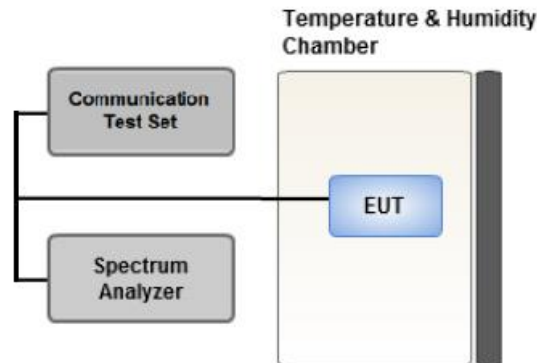
#### **Test Overview**

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  $\geq$  3 MHz
3. Detector = RMS
4. Trace Mode = Average
5. Sweep time = auto
6. Number of points in sweep  $\geq$  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  $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

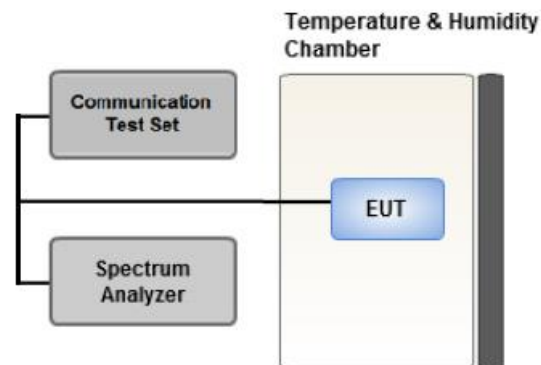
#### Test Notes

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.

**3.8 WORST CASE(RADIATED TEST)**

- This device uses a tuner circuit that dynamically updates the antenna impedance parameters to optimize antenna performance for certain bands and modes of operation.  
The tuner for this device was set to simulate a **"free space"** condition where the transmit antenna is matched to the medium into which it is transmitting and, thus, the power is at its maximum level.
- 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.
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- Please refer to the table below.
- SM-G770FDS & additional models were tested and the worst case results are reported.  
(Worst case : SM-G770FDS)

[ Worst case ]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM	1	0	Z
Radiated Spurious and Harmonic Emissions	QPSK	1	0	X

**3.9 WORST CASE(CONDUCTED TEST)**

[ Worst case ]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset		
Occupied Bandwidth	QPSK, 16QAM, 64QAM	1.4, 3, 5, 10, 15, 20	Mid	Full RB	0		
Peak-To-Average Ratio	QPSK, 16QAM, 64QAM	1.4, 3, 5, 10, 15, 20	Mid	Full RB	0		
Band Edge	* QPSK	1.4	Low	1	0		
			High	1	5		
		3	Low	1	0		
			High	1	14		
		5	Low	1	0		
			High	1	24		
		10	Low	1	0		
			High	1	49		
		15	Low	1	0		
			High	1	74		
		20	Low	1	0		
			High	1	99		
				1.4, 3, 5, 10, 15, 20	Low, High	Full RB	0
		Spurious and Harmonic Emissions at Antenna Terminal	* QPSK	1.4, 3, 5, 10, 15, 20	Low, Mid, High	1	0

\* Worst case : Of all modulation, We have tested modulation of the high Conducted Output Power.

Conducted Output Power value can be confirmed on the SAR report.

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

- SM-G770FDS & additional models were tested and the worst case results are reported.

(Worst case : SM-G770FDS)



#### 4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibrati on Interval	Calibration Due
T&M SYSTEM	FBSR-02B(WHK1.2/15G-10EF)/H.P.F	-	06/10/2019	Annual	06/10/2020
T&M SYSTEM	FBSR-02B(WHK3.3/18G-10EF)/H.P.F	-	06/10/2019	Annual	06/10/2020
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	05/03/2019	Annual	05/03/2020
Agilent	E3632A/DC Power Supply	MY40004326	07/01/2019	Annual	07/01/2020
Schwarzbeck	UHAP/ Dipole Antenna	557	03/29/2019	Biennial	03/29/2021
Schwarzbeck	UHAP/ Dipole Antenna	558	03/29/2019	Biennial	03/29/2021
ESPEC	SU-642 / Chamber	93000717	08/14/2019	Annual	08/14/2020
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	08/29/2019	Biennial	08/29/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1298	09/25/2019	Biennial	09/25/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/29/2019	Biennial	04/29/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	01/28/2019	Biennial	01/28/2021
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY51110063	05/08/2019	Annual	05/08/2020
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/04/2019	Annual	06/04/2020
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	100931	10/14/2019	Annual	10/14/2020
Agilent	8960 (E5515C)/ Base Station	MY48360800	08/27/2019	Annual	08/27/2020
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	08/23/2018	Biennial	08/23/2020
Schwarzbeck	VULB9160/ Bilog Antenna	9160-3368	08/09/2018	Biennial	08/09/2020
Schwarzbeck	VULB9160/ Hybrid Antenna	760	03/22/2019	Biennial	03/22/2021
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6201502997	08/09/2019	Annual	08/09/2020
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/30/2019	Annual	01/30/2020
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/15/2019	Annual	07/15/2020
REOHDE & SCHWARZ	ESU40 / EMI TEST RECEIVER	100524	05/17/2019	Annual	05/17/2020
HCT CO., LTD.,	FCC LTE Mobile Conducted RF Automation Test Software	-	-	-	-

**Note:**

- Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
- 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  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty ( $\pm$ dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

## 6. SUMMARY OF TEST RESULTS

### 6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §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	<b><u>See Note1</u></b>
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. The same samples were used for SAR and EMC

### 6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§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

## 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 = 4M17F9W**

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

**QPSK Modulation**

**Emission Designator = 4M48G7D**

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

**16QAM Modulation**

**Emission Designator = 4M48W7D**

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

## 8. TEST DATA

### 8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
									W	dBm
1850.7	LTE B2/ 1.4 MHz	QPSK	-20.13	13.68	10.13	1.95	V	< 2.00	0.153	21.86
		16-QAM	-20.87	12.94	10.13	1.95	V		0.129	21.12
		64-QAM	-21.89	11.92	10.13	1.95	V		0.102	20.10
1880.0		QPSK	-20.36	13.53	10.15	1.98	V		0.148	21.70
		16-QAM	-21.04	12.85	10.15	1.98	V		0.126	21.02
		64-QAM	-22.04	11.85	10.15	1.98	V		0.100	20.02
1909.3		QPSK	-20.43	13.91	10.23	2.00	V		0.164	22.14
		16-QAM	-21.16	13.18	10.23	2.00	V		0.138	21.41
		64-QAM	-22.15	12.19	10.23	2.00	V		0.110	20.42

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
									W	dBm
1851.5	LTE B2/ 3 MHz	QPSK	-20.10	13.54	10.10	1.94	V	< 2.00	0.148	21.70
		16-QAM	-20.79	12.85	10.10	1.94	V		0.126	21.01
		64-QAM	-21.82	11.82	10.10	1.94	V		0.100	19.98
1880.0		QPSK	-20.21	13.68	10.15	1.98	V		0.153	21.85
		16-QAM	-20.89	13.00	10.15	1.98	V		0.131	21.17
		64-QAM	-21.91	11.98	10.15	1.98	V		0.103	20.15
1908.5		QPSK	-20.45	13.89	10.23	2.00	V		0.163	22.12
		16-QAM	-21.16	13.18	10.23	2.00	V		0.138	21.41
		64-QAM	-22.19	12.15	10.23	2.00	V		0.109	20.38

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1852.5	LTE B2/ 5 MHz	QPSK	-20.09	13.55	10.10	1.94	V	< 2.00	0.148	21.71
		16-QAM	-20.77	12.87	10.10	1.94	V		0.127	21.03
		64-QAM	-21.80	11.84	10.10	1.94	V		0.100	20.00
1880.0		QPSK	-20.22	13.67	10.15	1.98	V		0.153	21.84
		16-QAM	-20.88	13.01	10.15	1.98	V		0.131	21.18
		64-QAM	-21.89	12.00	10.15	1.98	V		0.104	20.17
1907.5		QPSK	-20.55	13.79	10.23	2.00	V		0.159	22.02
		16-QAM	-21.26	13.08	10.23	2.00	V		0.135	21.31
		64-QAM	-22.30	12.04	10.23	2.00	V		0.106	20.27

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1855.0	LTE B2/ 10 MHz	QPSK	-20.14	13.67	10.12	1.94	V	< 2.00	0.153	21.85
		16-QAM	-20.82	12.99	10.12	1.94	V		0.131	21.17
		64-QAM	-21.88	11.93	10.12	1.94	V		0.103	20.11
1880.0		QPSK	-20.66	13.23	10.15	1.98	V		0.138	21.40
		16-QAM	-21.35	12.54	10.15	1.98	V		0.118	20.71
		64-QAM	-22.41	11.48	10.15	1.98	V		0.092	19.65
1905.0		QPSK	-20.27	13.82	10.22	2.00	V		0.160	22.03
		16-QAM	-21.11	12.97	10.22	2.00	V		0.132	21.19
		64-QAM	-22.13	11.96	10.22	2.00	V		0.104	20.17

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1857.5	LTE B2/ 15 MHz	QPSK	-20.17	13.64	10.13	1.95	V	< 2.00	0.152	21.82
		16-QAM	-20.70	13.11	10.13	1.95	V		0.135	21.29
		64-QAM	-21.73	12.08	10.13	1.95	V		0.106	20.26
1880.0		QPSK	-20.56	13.33	10.15	1.98	V		0.141	21.50
		16-QAM	-21.10	12.79	10.15	1.98	V		0.125	20.96
		64-QAM	-22.11	11.78	10.15	1.98	V		0.099	19.95
1902.5		QPSK	-20.72	13.23	10.20	2.00	V		0.139	21.43
		16-QAM	-21.28	12.67	10.20	2.00	V		0.122	20.87
		64-QAM	-22.30	11.65	10.20	2.00	V		0.097	19.85

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1860.0	LTE B2/ 20 MHz	QPSK	-20.19	13.62	10.13	1.95	V	< 2.00	0.151	21.80
		16-QAM	-20.71	13.10	10.13	1.95	V		0.134	21.28
		64-QAM	-21.75	12.06	10.13	1.95	V		0.106	20.24
1880.0		QPSK	-20.35	13.54	10.15	1.98	V		0.148	21.71
		16-QAM	-20.91	12.98	10.15	1.98	V		0.130	21.15
		64-QAM	-21.92	11.97	10.15	1.98	V		0.103	20.14
1900.0		QPSK	-20.50	13.45	10.20	2.00	V		0.146	21.65
		16-QAM	-20.99	12.96	10.20	2.00	V		0.131	21.16
		64-QAM	-22.06	11.89	10.20	2.00	V		0.102	20.09



**8.2 RADIATED SPURIOUS EMISSIONS**

- ▣ OPERATING FREQUENCY: 1909.3 MHz
- ▣ MEASURED OUTPUT POWER: 22.14 dBm = 0.164 W
- ▣ MODE: LTE B2
- ▣ MODULATION SIGNAL: 1.4 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT:  $43 + 10 \log_{10}(W) =$  35.14 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
18607 (1850.7)	3,701.40	-46.46	12.40	-51.43	2.86	H	-41.89	64.02
	5,552.10	-56.39	13.10	-54.84	3.58	H	-45.32	67.45
	7,402.80	-56.73	11.10	-46.94	4.26	H	-40.10	62.23
18900 (1880.0)	3,760.00	-47.71	12.48	-52.68	2.88	H	-43.09	65.22
	5,640.00	-56.95	13.30	-55.57	3.62	H	-45.89	68.03
	7,520.00	-57.48	11.30	-47.31	4.30	V	-40.31	62.44
19193 (1909.3)	3,818.60	-42.41	12.40	-47.38	2.90	H	-37.88	60.02
	5,727.90	-56.82	13.35	-54.72	3.63	V	-45.00	67.14
	7,637.20	-57.89	11.63	-50.82	4.34	V	-43.53	65.66

- ▣ OPERATING FREQUENCY: 1908.5 MHz
- ▣ MEASURED OUTPUT POWER: 22.12 dBm = 0.163 W
- ▣ MODE: LTE B2
- ▣ MODULATION SIGNAL: 3 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT:  $43 + 10 \log_{10} (W) =$  35.12 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
18615 (1851.5)	3,703.00	-52.84	12.40	-57.81	2.86	H	-48.27	70.38
	5,554.50	-56.44	13.14	-54.90	3.58	H	-45.34	67.46
	7,406.00	-57.99	11.12	-48.14	4.25	H	-41.28	63.39
18900 (1880.0)	3,760.00	-50.07	12.48	-55.04	2.88	H	-45.45	67.56
	5,640.00	-56.73	13.30	-55.35	3.62	H	-45.67	67.79
	7,520.00	-57.28	11.30	-47.11	4.30	H	-40.11	62.22
19185 (1908.5)	3,817.00	-50.30	12.40	-55.27	2.90	H	-45.77	67.89
	5,725.50	-57.53	13.35	-55.41	3.63	H	-45.69	67.81
	7,634.00	-58.70	11.62	-51.61	4.34	H	-44.33	66.45

- ▣ OPERATING FREQUENCY: 1907.5 MHz
- ▣ MEASURED OUTPUT POWER: 22.02 dBm = 0.159 W
- ▣ MODE: LTE B2
- ▣ MODULATION SIGNAL: 5 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT:  $43 + 10 \log_{10} (W) =$  35.02 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
18625 (1852.5)	3,705.00	-53.67	12.42	-58.65	2.86	H	-49.10	71.11
	5,557.50	-56.92	13.15	-55.38	3.58	H	-45.81	67.83
	7,410.00	-57.24	11.13	-47.33	4.25	H	-40.45	62.46
18900 (1880.0)	3,760.00	-50.14	12.48	-55.11	2.88	H	-45.52	67.53
	5,640.00	-56.66	13.30	-55.28	3.62	H	-45.60	67.62
	7,520.00	-57.26	11.30	-47.09	4.30	H	-40.09	62.10
19175 (1907.5)	3,815.00	-50.83	12.40	-55.80	2.90	H	-46.30	68.32
	5,722.50	-57.67	13.35	-55.53	3.63	H	-45.81	67.83
	7,630.00	-58.62	11.60	-48.57	4.34	H	-41.31	63.32

- ▣ OPERATING FREQUENCY: 1905.0 MHz
- ▣ MEASURED OUTPUT POWER: 22.03 dBm = 0.160 W
- ▣ MODE: LTE B2
- ▣ MODULATION SIGNAL: 10 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT:  $43 + 10 \log_{10}(W) =$  35.03 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
18650 (1855.0)	3,710.00	-51.99	12.43	-56.98	2.86	H	-47.41	69.45
	5,565.00	-56.75	13.18	-55.08	3.59	H	-45.49	67.52
	7,420.00	-57.21	11.15	-47.45	4.24	H	-40.54	62.57
18900 (1880.0)	3,760.00	-50.85	12.48	-55.82	2.88	H	-46.23	68.26
	5,640.00	-57.31	13.30	-55.93	3.62	H	-46.25	68.28
	7,520.00	-57.55	11.30	-47.38	4.30	H	-40.38	62.41
19150 (1905.0)	3,810.00	-50.29	12.40	-55.33	2.90	H	-45.83	67.86
	5,715.00	-58.17	13.37	-56.04	3.63	H	-46.30	68.33
	7,620.00	-58.68	11.60	-48.72	4.34	H	-41.46	63.49

- ▣ OPERATING FREQUENCY: 1857.5 MHz
- ▣ MEASURED OUTPUT POWER: 21.82 dBm = 0.152 W
- ▣ MODE: LTE B2
- ▣ MODULATION SIGNAL: 15 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT:  $43 + 10 \log_{10}(W) =$  34.82 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
18675 (1857.5)	3,715.00	-51.52	12.44	-56.58	2.87	H	-47.00	68.82
	5,572.50	-57.73	13.20	-55.94	3.59	H	-46.33	68.14
	7,430.00	-57.26	11.15	-47.32	4.25	H	-40.42	62.24
18900 (1880.0)	3,760.00	-50.80	12.48	-55.77	2.88	H	-46.18	67.99
	5,640.00	-57.70	13.30	-56.32	3.62	H	-46.64	68.46
	7,520.00	-57.97	11.30	-47.80	4.30	H	-40.80	62.61
19125 (1902.5)	3,805.00	-52.67	12.40	-57.63	2.90	H	-48.13	69.95
	5,707.50	-58.23	13.39	-56.06	3.63	H	-46.30	68.12
	7,610.00	-59.05	11.55	-49.09	4.32	H	-41.86	63.68

- ▣ OPERATING FREQUENCY: 1860.00 MHz
- ▣ MEASURED OUTPUT POWER: 21.80 dBm = 0.151 W
- ▣ MODE: LTE B2
- ▣ MODULATION SIGNAL: 20 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT:  $43 + 10 \log_{10}(W) =$  34.80 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
18700 (1860.0)	3,720.00	-47.53	12.45	-52.65	2.87	H	-43.07	64.87
	5,580.00	-57.21	13.20	-54.60	3.58	H	-44.98	66.78
	7,440.00	-56.44	11.18	-46.24	4.25	H	-39.31	61.11
18900 (1880.0)	3,760.00	-50.02	12.48	-54.99	2.88	H	-45.40	67.19
	5,640.00	-56.45	13.30	-55.07	3.62	H	-45.39	67.19
	7,520.00	-55.55	11.30	-45.38	4.30	H	-38.38	60.17
19100 (1900.0)	3,800.00	-48.63	12.40	-53.51	2.90	H	-44.01	65.81
	5,700.00	-56.42	13.40	-54.23	3.63	H	-44.46	66.25
	7,600.00	-58.11	11.50	-48.25	4.32	H	-41.07	62.87

**8.3 PEAK-TO-AVERAGE RATIO**

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data ( dB )
2	1.4 MHz	1880.0	QPSK	6	0	4.94
			16-QAM	6	0	5.73
			64-QAM	6	0	6.45
	3 MHz		QPSK	15	0	5.00
			16-QAM	15	0	5.79
			64-QAM	15	0	6.41
	5 MHz		QPSK	25	0	4.99
			16-QAM	25	0	5.77
			64-QAM	25	0	6.40
	10 MHz		QPSK	50	0	5.02
			16-QAM	50	0	5.78
			64-QAM	50	0	6.38
	15 MHz		QPSK	75	0	4.99
			16-QAM	75	0	5.74
			64-QAM	75	0	6.39
20 MHz	QPSK	100	0	5.01		
	16-QAM	100	0	5.76		
	64-QAM	100	0	6.41		

**Note:**

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 71 ~ 88.

**8.4 OCCUPIED BANDWIDTH**

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data ( MHz )
2	1.4 MHz	1880.0	QPSK	6	0	1.0922
			16-QAM	6	0	1.0878
			64-QAM	6	0	1.0935
	3 MHz		QPSK	15	0	2.7082
			16-QAM	15	0	2.7011
			64-QAM	15	0	2.7028
	5 MHz		QPSK	25	0	4.4999
			16-QAM	25	0	4.4926
			64-QAM	25	0	4.5001
	10 MHz		QPSK	50	0	8.9703
			16-QAM	50	0	8.9814
			64-QAM	50	0	8.9777
	15 MHz		QPSK	75	0	13.461
			16-QAM	75	0	13.424
			64-QAM	75	0	13.442
	20 MHz		QPSK	100	0	17.945
			16-QAM	100	0	17.906
			64-QAM	100	0	17.895

**Note:**

1. Plots of the EUT's Occupied Bandwidth are shown Page 53 ~ 70.



**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)
2	1.4	1850.7	3.7209	27.976	-77.117	-49.141	-13.00
		1880.0	3.6840	27.976	-76.948	-48.972	
		1909.3	7.6396	28.591	-75.467	-46.876	
	3	1851.5	7.4013	28.591	-77.080	-48.489	
		1880.0	7.5155	28.591	-77.208	-48.617	
		1908.5	7.6396	28.591	-75.203	-46.612	
	5	1852.5	7.4018	28.591	-77.000	-48.409	
		1880.0	7.5120	28.591	-76.896	-48.305	
		1907.5	7.6391	28.591	-75.780	-47.189	
	10	1855.0	7.4028	28.591	-76.931	-48.340	
		1880.0	3.6805	27.976	-77.434	-49.458	
		1905.0	7.6381	28.591	-75.773	-47.182	
	15	1857.5	7.4038	28.591	-76.803	-48.212	
		1880.0	3.6850	27.976	-77.214	-49.238	
		1902.5	7.6376	28.591	-75.982	-47.391	
	20	1860.0	7.4048	28.591	-77.018	-48.427	
		1880.0	7.4851	28.591	-77.089	-48.498	
		1900.0	7.6361	28.591	-75.844	-47.253	

**Note:**

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 125 ~ 160.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor(dB) = Cable Loss + Attenuator + Power Splitter

Frequency Range (GHz)	Factor [dB]
0.03 – 1	25.270
1 – 5	27.976
5 – 10	28.591
10 – 15	29.116
15 – 20	29.489
Above 20	30.131

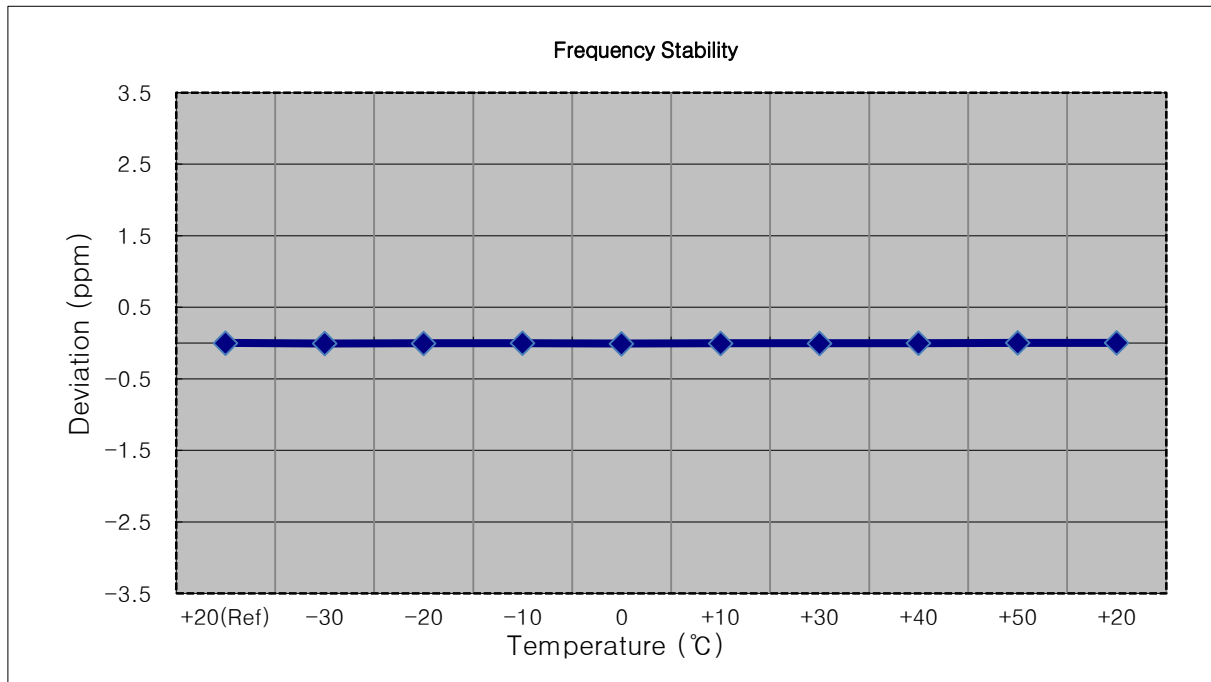
**8.6 BAND EDGE**

- Plots of the EUT's Band Edge are shown Page 89 ~ 124.

**8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE**

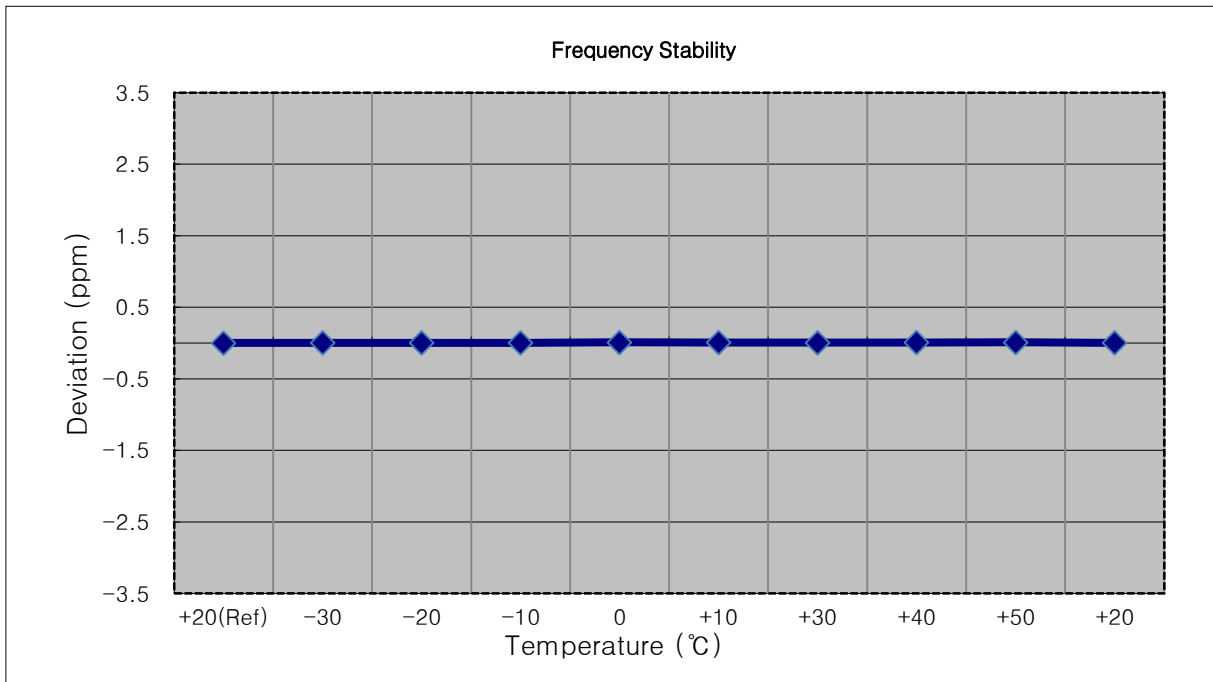
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1850.700.000 Hz
- ▣ CHANNEL: 18607 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1850 700 005	0.0	0.000 000	0.000
100%		-30	1850 699 994	-11.4	-0.000 001	-0.006
100%		-20	1850 699 998	-7.6	0.000 000	-0.004
100%		-10	1850 700 000	-5.2	0.000 000	-0.003
100%		0	1850 699 991	-14.4	-0.000 001	-0.008
100%		+10	1850 699 997	-8.5	0.000 000	-0.005
100%		+30	1850 699 998	-7.7	0.000 000	-0.004
100%		+40	1850 700 001	-4.1	0.000 000	-0.002
100%		+50	1850 700 011	6.2	0.000 000	0.003
Batt. Endpoint		3.400	+20	1850 700 010	4.4	0.000 000



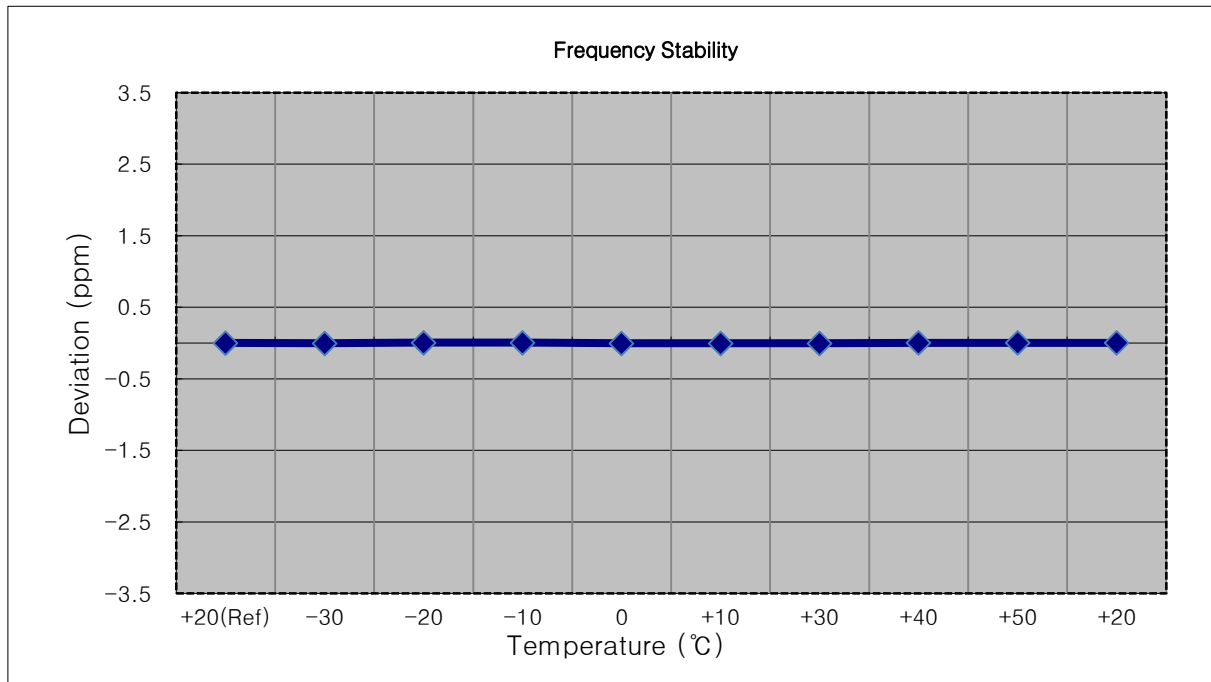
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1851,500,000 Hz
- ▣ CHANNEL: 18615 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1851 500 010	0.0	0.000 000	0.000
100%		-30	1851 500 013	3.5	0.000 000	0.002
100%		-20	1851 500 014	4.5	0.000 000	0.002
100%		-10	1851 500 014	4.1	0.000 000	0.002
100%		0	1851 500 026	16.5	0.000 001	0.009
100%		+10	1851 500 021	11.1	0.000 001	0.006
100%		+30	1851 500 019	9.5	0.000 001	0.005
100%		+40	1851 500 023	13.3	0.000 001	0.007
100%		+50	1851 500 026	16.4	0.000 001	0.009
Batt. Endpoint	3.400	+20	1851 500 017	6.7	0.000 000	0.004



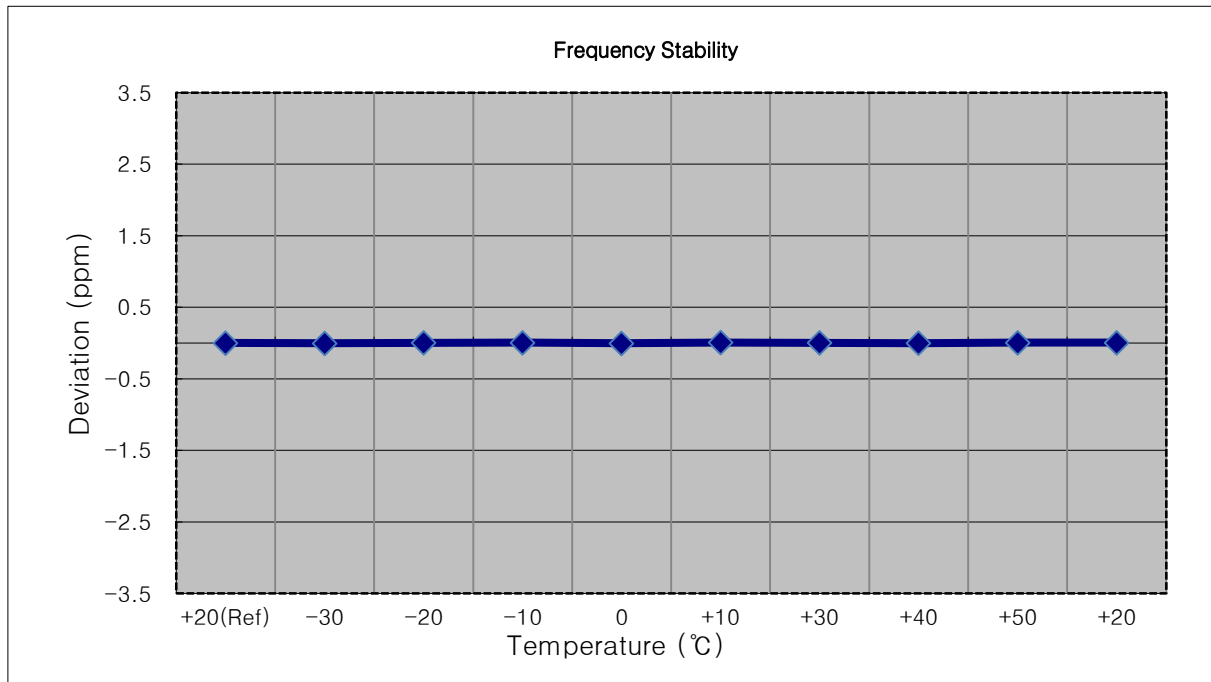
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1852.500.000 Hz
- ▣ CHANNEL: 18625 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1852 500 007	0.0	0.000 000	0.000
100%		-30	1852 499 998	-9.4	-0.000 001	-0.005
100%		-20	1852 500 016	9.1	0.000 000	0.005
100%		-10	1852 500 015	7.8	0.000 000	0.004
100%		0	1852 499 998	-9.4	-0.000 001	-0.005
100%		+10	1852 499 999	-7.9	0.000 000	-0.004
100%		+30	1852 499 998	-9.6	-0.000 001	-0.005
100%		+40	1852 500 013	6.2	0.000 000	0.003
100%		+50	1852 500 013	5.7	0.000 000	0.003
Batt. Endpoint	3.400	+20	1852 500 014	6.7	0.000 000	0.004



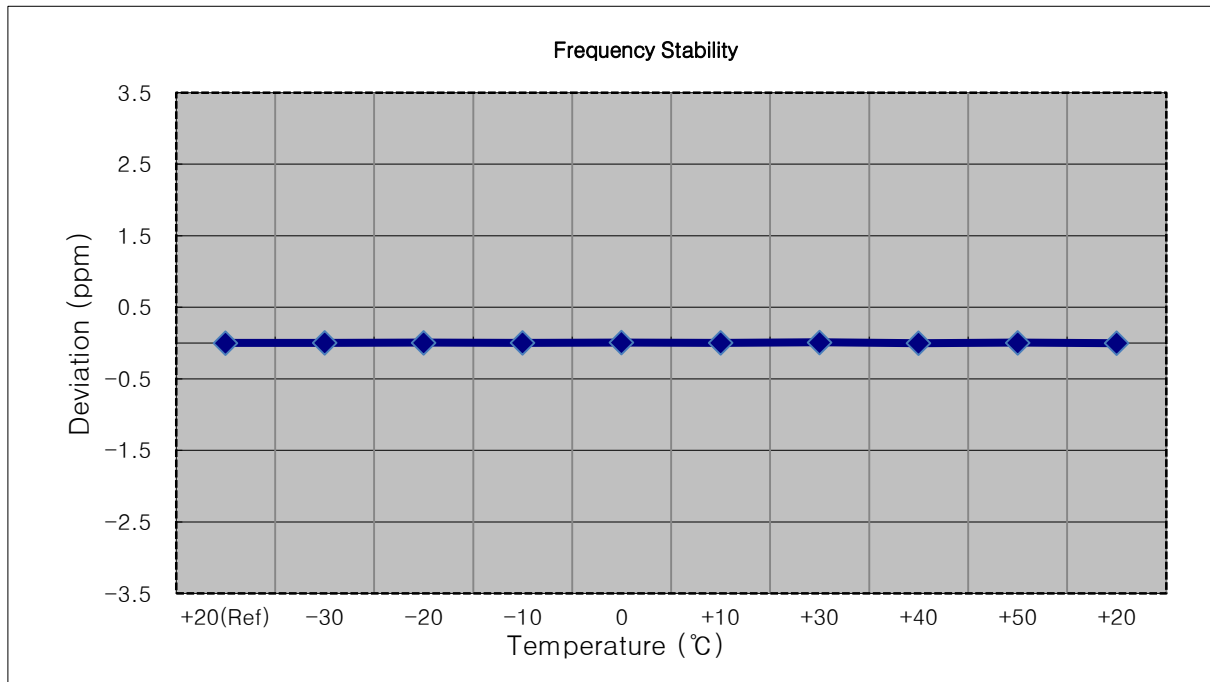
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1855,000,000 Hz
- ▣ CHANNEL: 18650 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1855 000 009	0.0	0.000 000	0.000
100%		-30	1855 000 001	-8.4	0.000 000	-0.005
100%		-20	1855 000 016	6.5	0.000 000	0.004
100%		-10	1855 000 019	9.6	0.000 001	0.005
100%		0	1855 000 002	-7.3	0.000 000	-0.004
100%		+10	1855 000 023	14.1	0.000 001	0.008
100%		+30	1855 000 013	3.5	0.000 000	0.002
100%		+40	1855 000 006	-3.3	0.000 000	-0.002
100%		+50	1855 000 018	9.0	0.000 000	0.005
Batt. Endpoint	3.400	+20	1855 000 019	9.4	0.000 001	0.005



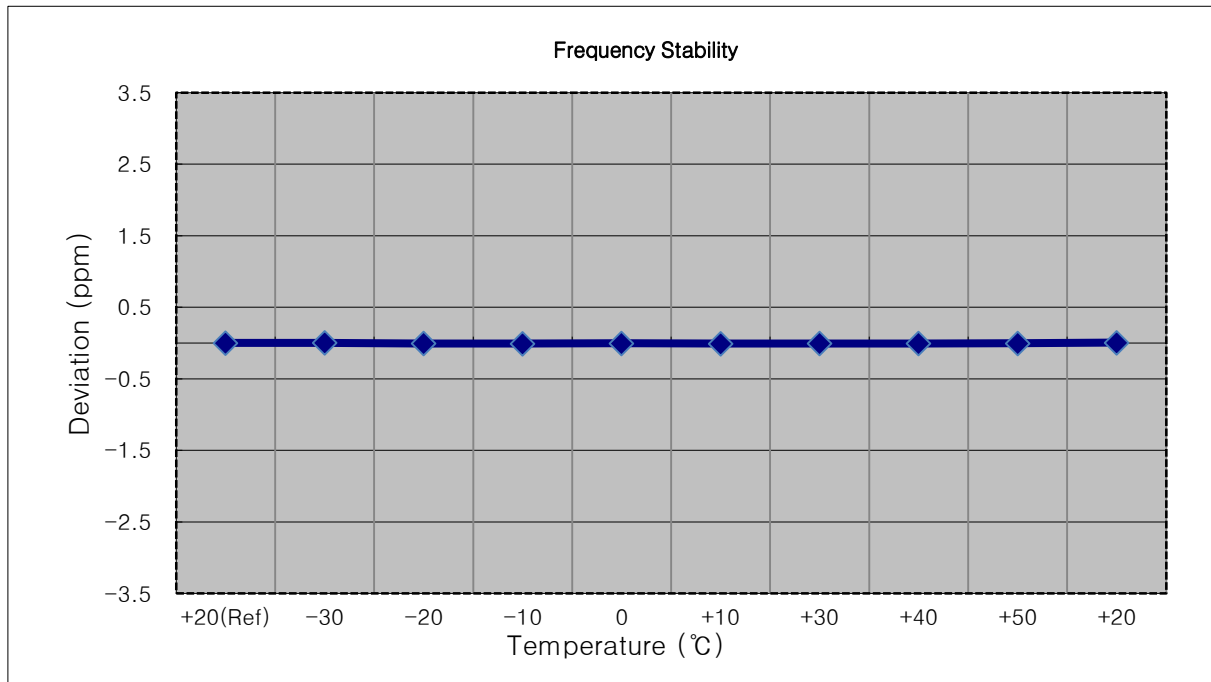
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1857.500.000 Hz
- ▣ CHANNEL: 18675 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1857 500 011	0.0	0.000 000	0.000
100%		-30	1857 500 017	5.8	0.000 000	0.003
100%		-20	1857 500 021	10.0	0.000 001	0.005
100%		-10	1857 500 018	6.6	0.000 000	0.004
100%		0	1857 500 025	13.3	0.000 001	0.007
100%		+10	1857 500 015	3.6	0.000 000	0.002
100%		+30	1857 500 027	15.9	0.000 001	0.009
100%		+40	1857 500 010	-1.9	0.000 000	-0.001
100%		+50	1857 500 018	6.9	0.000 000	0.004
Batt. Endpoint	3.400	+20	1857 500 009	-2.8	0.000 000	-0.002



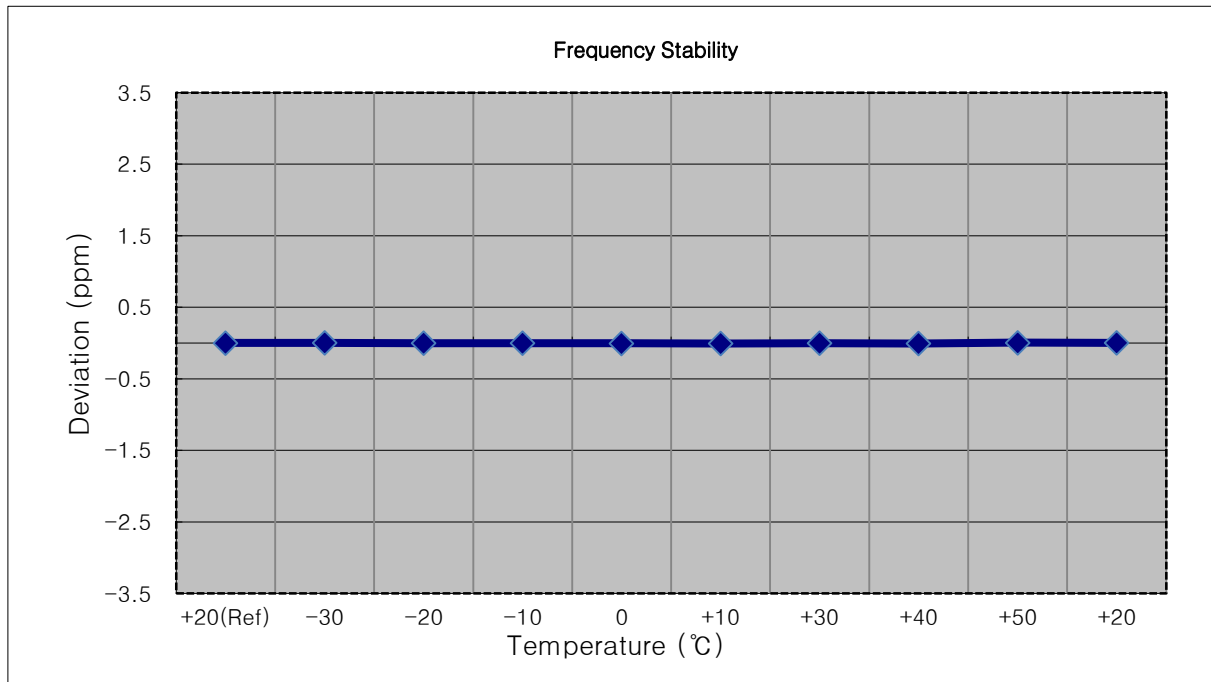
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1860,000,000 Hz
- ▣ CHANNEL: 18700 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1859 999 994	0.0	0.000 000	0.000
100%		-30	1860 000 000	5.3	0.000 000	0.003
100%		-20	1859 999 981	-13.5	-0.000 001	-0.007
100%		-10	1859 999 980	-14.2	-0.000 001	-0.008
100%		0	1859 999 988	-6.6	0.000 000	-0.004
100%		+10	1859 999 978	-16.1	-0.000 001	-0.009
100%		+30	1859 999 981	-13.3	-0.000 001	-0.007
100%		+40	1859 999 982	-12.3	-0.000 001	-0.007
100%		+50	1859 999 987	-7.6	0.000 000	-0.004
Batt. Endpoint	3.400	+20	1860 000 002	7.9	0.000 000	0.004



- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

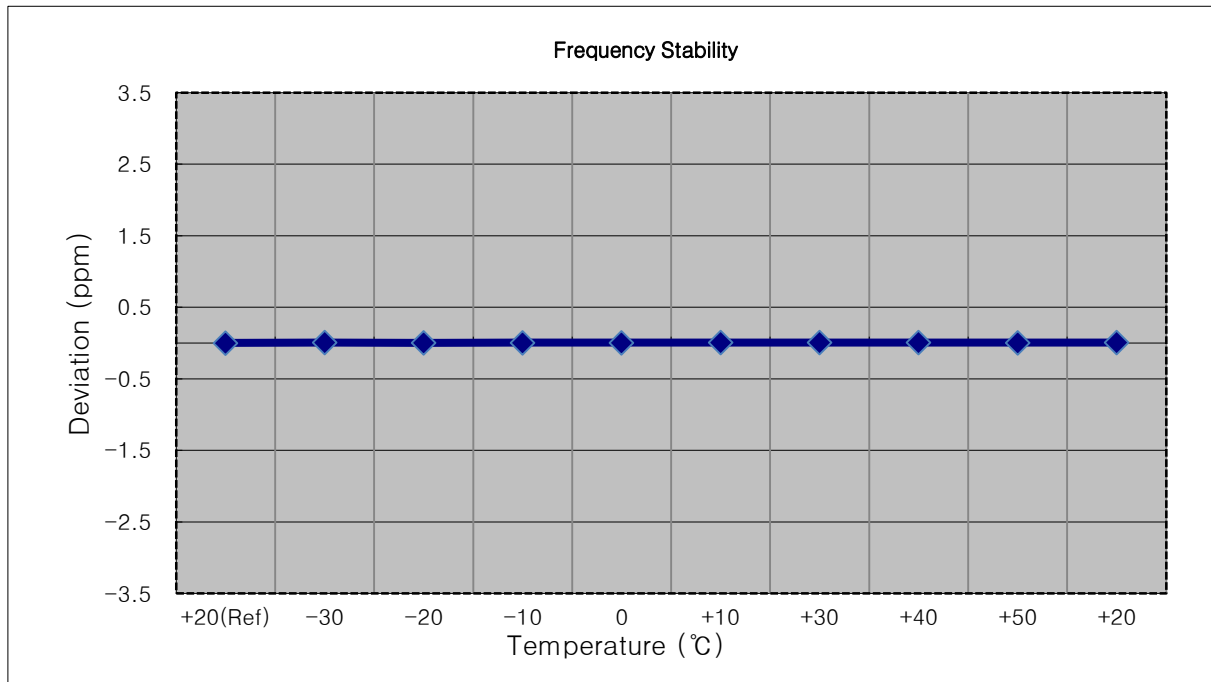
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1880 000 007	0.0	0.000 000	0.000
100%		-30	1880 000 013	6.3	0.000 000	0.003
100%		-20	1880 000 002	-5.2	0.000 000	-0.003
100%		-10	1880 000 002	-5.4	0.000 000	-0.003
100%		0	1880 000 000	-7.5	0.000 000	-0.004
100%		+10	1879 999 997	-10.3	-0.000 001	-0.005
100%		+30	1880 000 002	-5.0	0.000 000	-0.003
100%		+40	1879 999 994	-13.4	-0.000 001	-0.007
100%		+50	1880 000 014	7.2	0.000 000	0.004
Batt. Endpoint	3.400	+20	1880 000 012	4.5	0.000 000	0.002





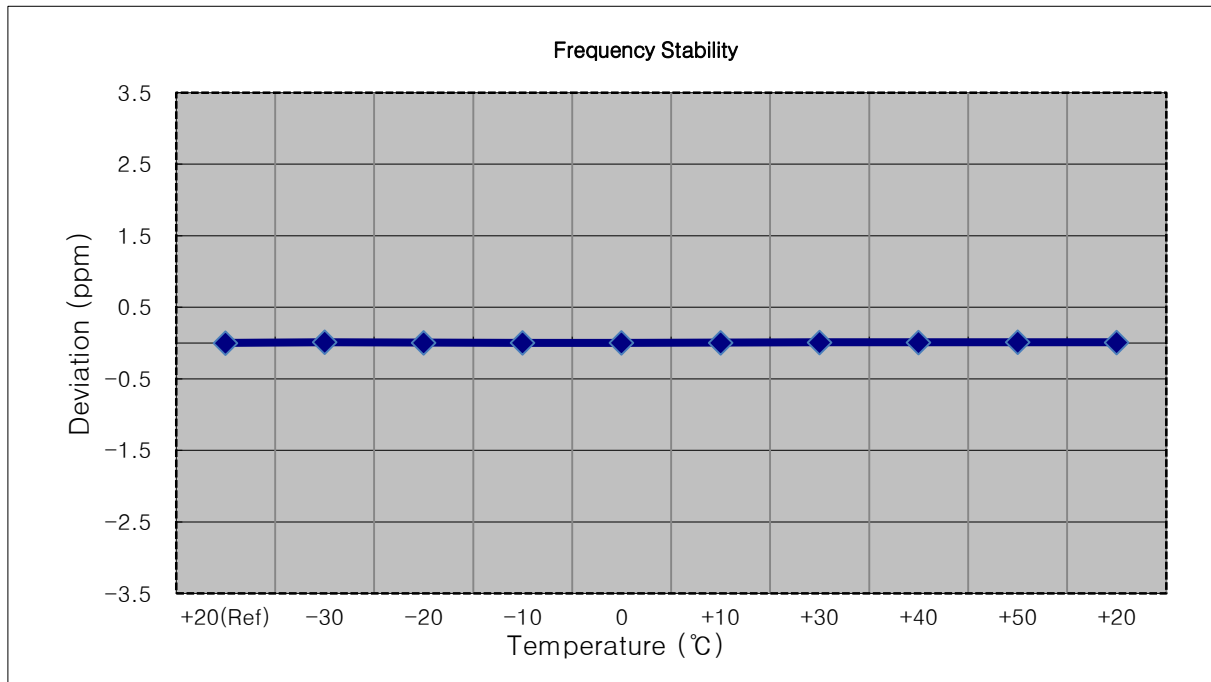
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1880 000 008	0.0	0.000 000	0.000
100%		-30	1880 000 021	12.7	0.000 001	0.007
100%		-20	1880 000 012	3.4	0.000 000	0.002
100%		-10	1880 000 016	7.9	0.000 000	0.004
100%		0	1880 000 017	8.3	0.000 000	0.004
100%		+10	1880 000 020	11.7	0.000 001	0.006
100%		+30	1880 000 023	14.4	0.000 001	0.008
100%		+40	1880 000 021	12.6	0.000 001	0.007
100%		+50	1880 000 017	8.5	0.000 000	0.005
Batt. Endpoint	3.400	+20	1880 000 022	13.4	0.000 001	0.007



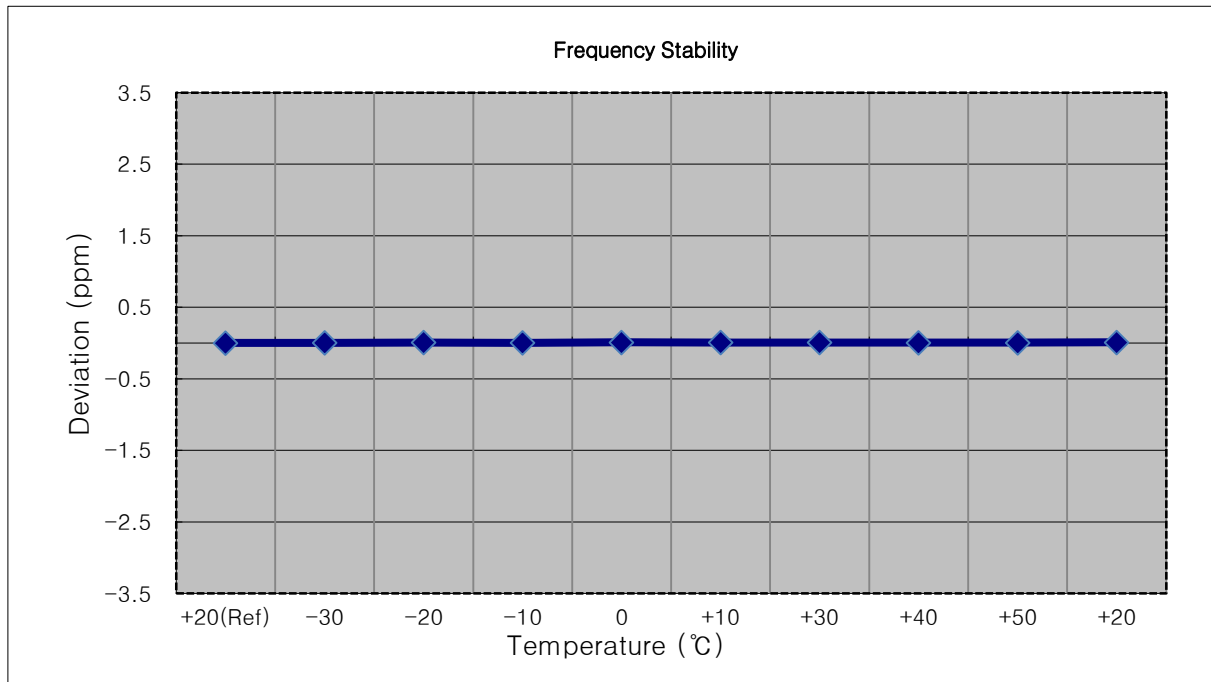
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1880 000 014	0.0	0.000 000	0.000
100%		-30	1880 000 034	20.0	0.000 001	0.011
100%		-20	1880 000 022	8.0	0.000 000	0.004
100%		-10	1880 000 016	2.8	0.000 000	0.001
100%		0	1880 000 020	6.2	0.000 000	0.003
100%		+10	1880 000 023	9.0	0.000 000	0.005
100%		+30	1880 000 030	16.6	0.000 001	0.009
100%		+40	1880 000 031	17.0	0.000 001	0.009
100%		+50	1880 000 035	21.2	0.000 001	0.011
Batt. Endpoint	3.400	+20	1880 000 031	17.9	0.000 001	0.010



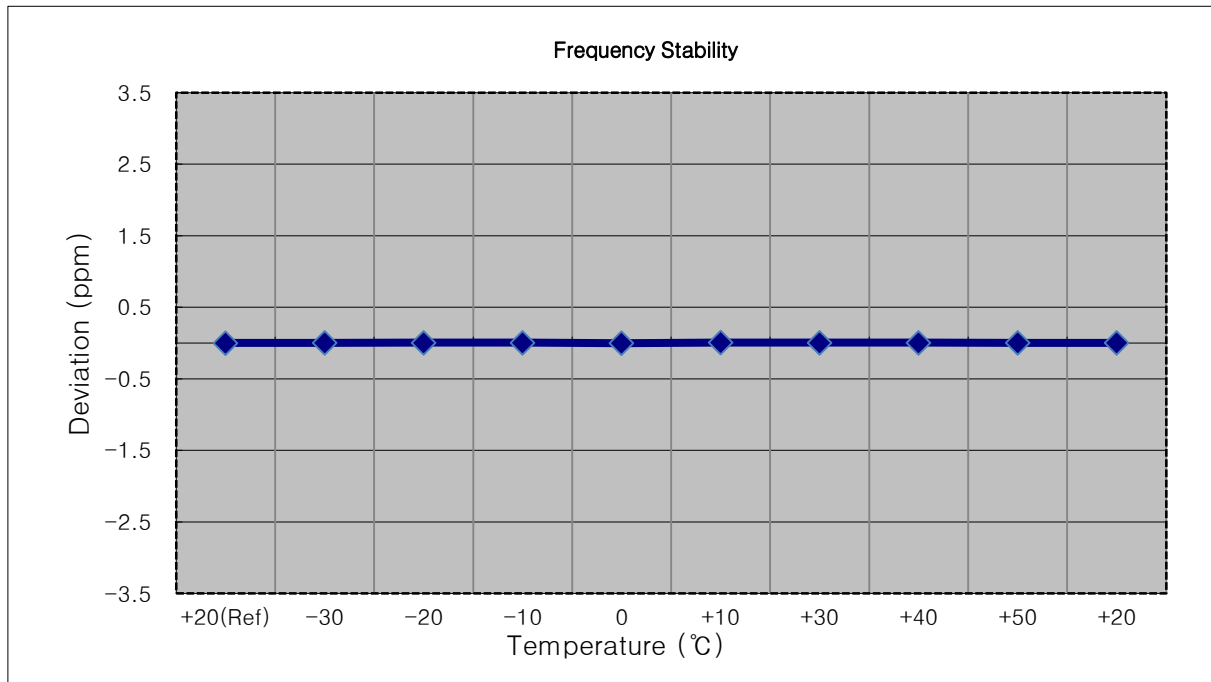
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1880 000 015	0.0	0.000 000	0.000
100%		-30	1880 000 018	3.0	0.000 000	0.002
100%		-20	1880 000 027	12.6	0.000 001	0.007
100%		-10	1880 000 021	5.9	0.000 000	0.003
100%		0	1880 000 031	16.0	0.000 001	0.009
100%		+10	1880 000 028	12.9	0.000 001	0.007
100%		+30	1880 000 028	13.4	0.000 001	0.007
100%		+40	1880 000 022	7.4	0.000 000	0.004
100%		+50	1880 000 022	7.6	0.000 000	0.004
Batt. Endpoint	3.400	+20	1880 000 033	18.3	0.000 001	0.010



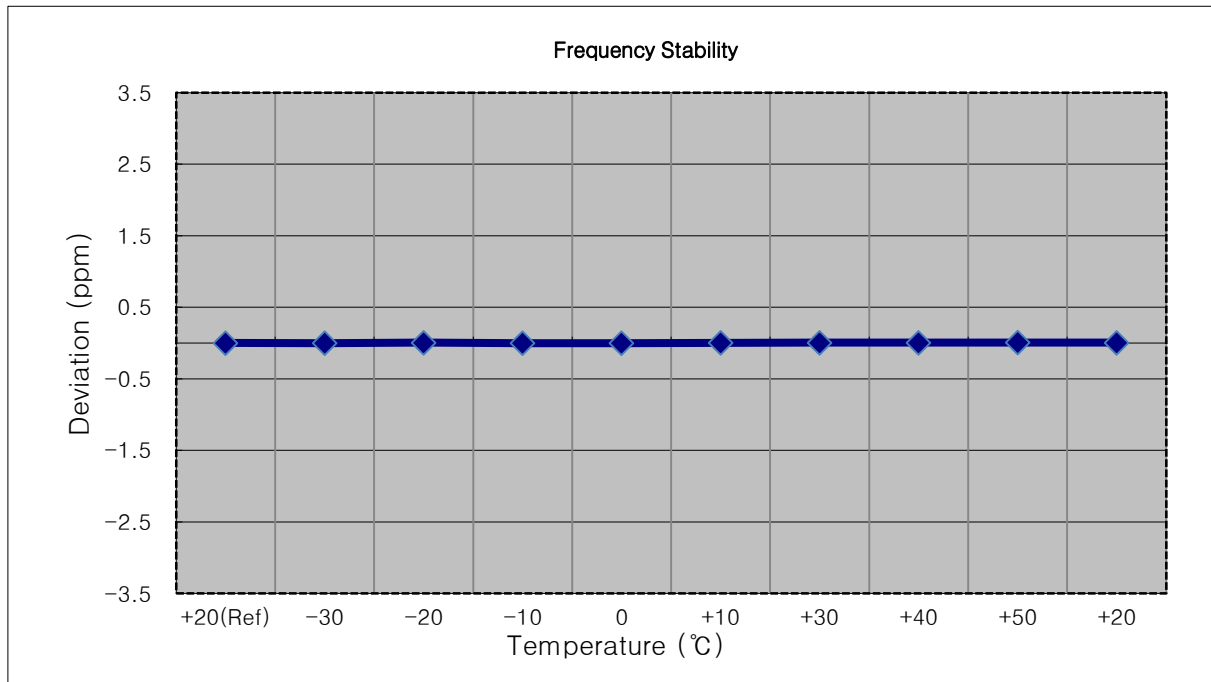
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1880 000 015	0.0	0.000 000	0.000
100%		-30	1880 000 018	3.7	0.000 000	0.002
100%		-20	1880 000 025	10.1	0.000 001	0.005
100%		-10	1880 000 025	9.9	0.000 001	0.005
100%		0	1880 000 011	-4.0	0.000 000	-0.002
100%		+10	1880 000 028	13.0	0.000 001	0.007
100%		+30	1880 000 025	10.1	0.000 001	0.005
100%		+40	1880 000 022	7.8	0.000 000	0.004
100%		+50	1880 000 020	5.3	0.000 000	0.003
Batt. Endpoint	3.400	+20	1880 000 020	5.6	0.000 000	0.003



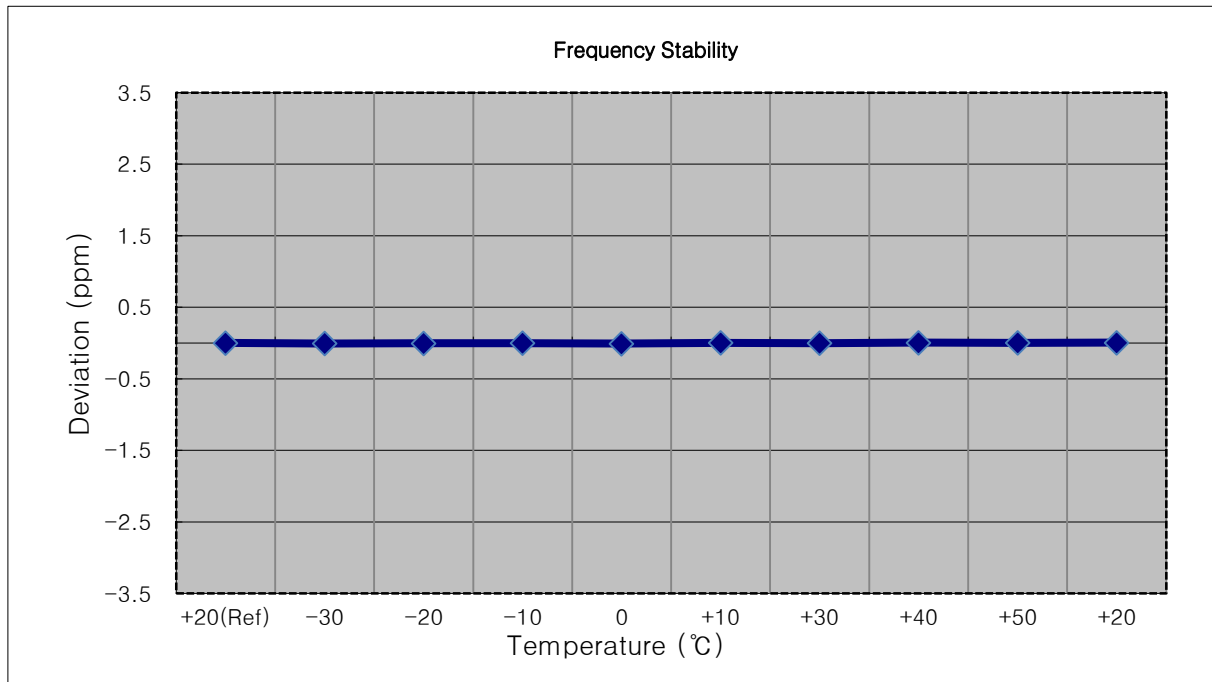
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1880 000 003	0.0	0.000 000	0.000
100%		-30	1879 999 998	-4.5	0.000 000	-0.002
100%		-20	1880 000 010	7.0	0.000 000	0.004
100%		-10	1879 999 999	-3.5	0.000 000	-0.002
100%		0	1879 999 998	-5.2	0.000 000	-0.003
100%		+10	1880 000 006	2.9	0.000 000	0.002
100%		+30	1880 000 013	9.8	0.000 001	0.005
100%		+40	1880 000 012	9.5	0.000 001	0.005
100%		+50	1880 000 015	12.6	0.000 001	0.007
Batt. Endpoint	3.400	+20	1880 000 012	8.7	0.000 000	0.005



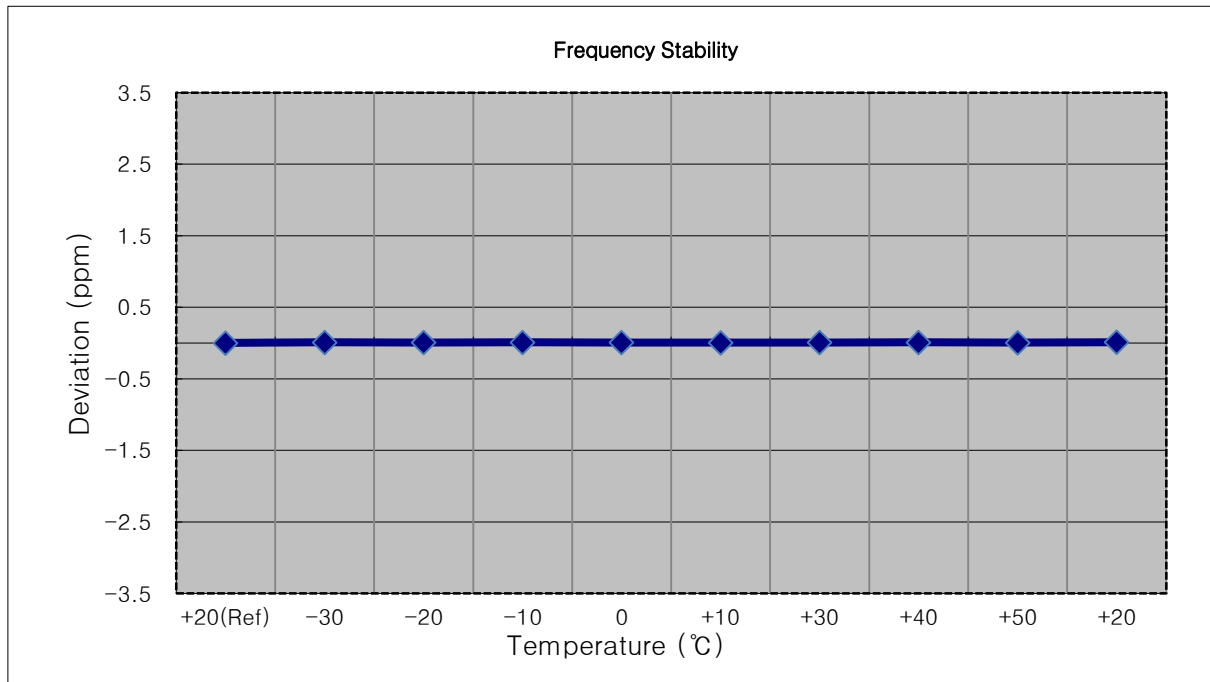
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1909,300,000 Hz
- ▣ CHANNEL: 19193 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1909 300 006	0.0	0.000 000	0.000
100%		-30	1909 299 996	-10.7	-0.000 001	-0.006
100%		-20	1909 299 997	-8.9	0.000 000	-0.005
100%		-10	1909 300 001	-5.3	0.000 000	-0.003
100%		0	1909 299 990	-16.0	-0.000 001	-0.008
100%		+10	1909 300 013	6.6	0.000 000	0.003
100%		+30	1909 300 003	-3.5	0.000 000	-0.002
100%		+40	1909 300 016	9.5	0.000 000	0.005
100%		+50	1909 300 010	3.5	0.000 000	0.002
Batt. Endpoint	3.400	+20	1909 300 014	7.3	0.000 000	0.004



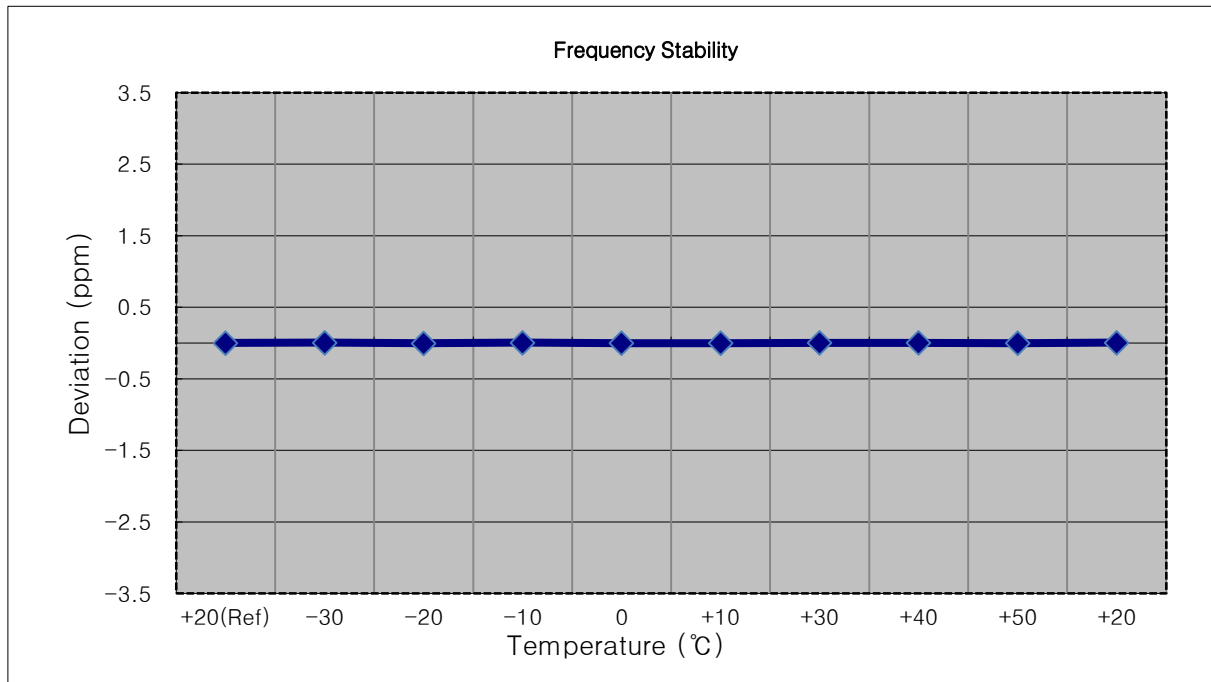
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1908,500,000 Hz
- ▣ CHANNEL: 19185 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1908 500 014	0.0	0.000 000	0.000
100%		-30	1908 500 032	17.6	0.000 001	0.009
100%		-20	1908 500 029	14.1	0.000 001	0.007
100%		-10	1908 500 031	16.2	0.000 001	0.008
100%		0	1908 500 028	13.6	0.000 001	0.007
100%		+10	1908 500 023	8.7	0.000 000	0.005
100%		+30	1908 500 027	12.4	0.000 001	0.006
100%		+40	1908 500 031	16.8	0.000 001	0.009
100%		+50	1908 500 026	11.1	0.000 001	0.006
Batt. Endpoint	3.400	+20	1908 500 034	19.9	0.000 001	0.010



- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1907,500,000 Hz
- ▣ CHANNEL: 19175 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

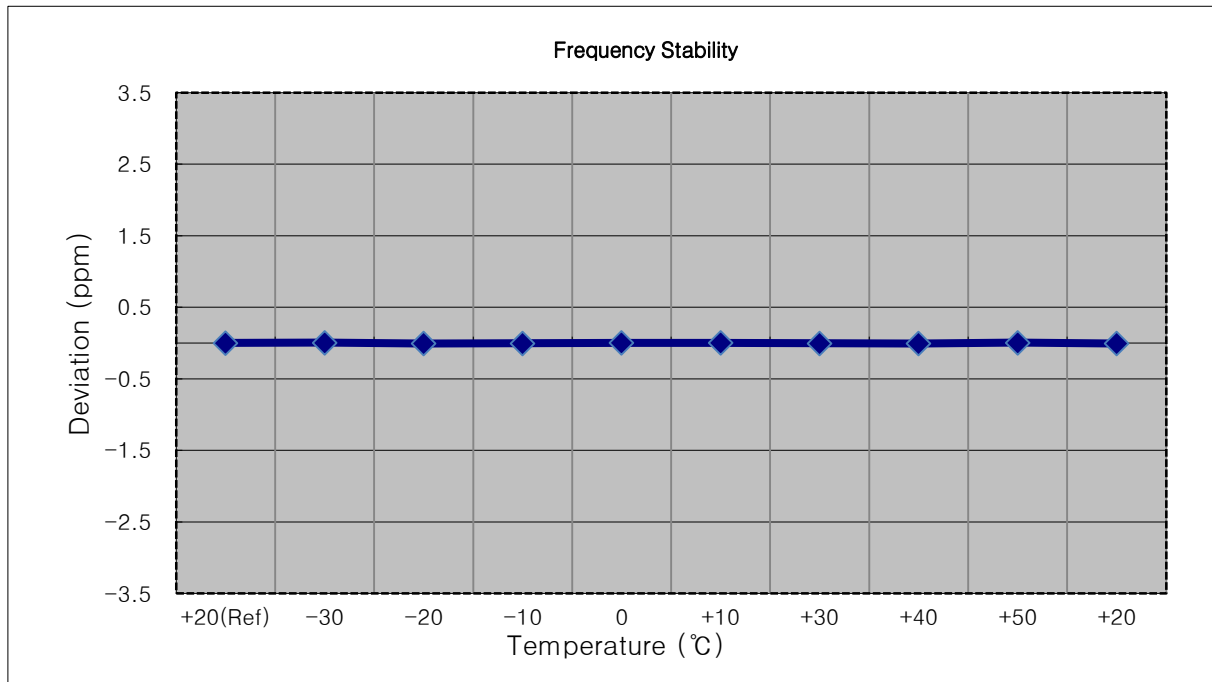
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1907 500 003	0.0	0.000 000	0.000
100%		-30	1907 500 013	10.6	0.000 001	0.006
100%		-20	1907 499 996	-6.8	0.000 000	-0.004
100%		-10	1907 500 011	7.9	0.000 000	0.004
100%		0	1907 499 998	-5.2	0.000 000	-0.003
100%		+10	1907 499 998	-4.4	0.000 000	-0.002
100%		+30	1907 500 008	5.4	0.000 000	0.003
100%		+40	1907 500 009	6.6	0.000 000	0.003
100%		+50	1907 500 000	-2.9	0.000 000	-0.002
Batt. Endpoint	3.400	+20	1907 500 012	8.8	0.000 000	0.005





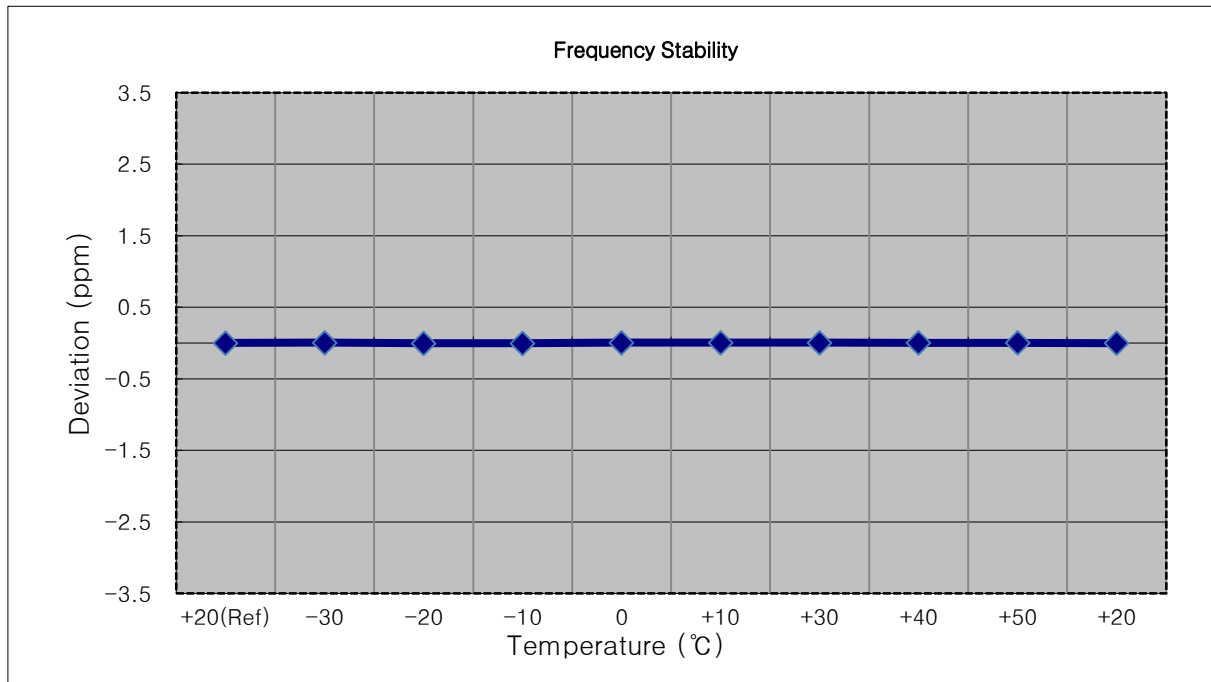
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1905,000,000 Hz
- ▣ CHANNEL: 19150 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1904 999 986	0.0	0.000 000	0.000
100%		-30	1904 999 994	7.7	0.000 000	0.004
100%		-20	1904 999 974	-11.6	-0.000 001	-0.006
100%		-10	1904 999 976	-9.8	-0.000 001	-0.005
100%		0	1904 999 990	4.0	0.000 000	0.002
100%		+10	1904 999 993	6.5	0.000 000	0.003
100%		+30	1904 999 979	-7.2	0.000 000	-0.004
100%		+40	1904 999 973	-13.0	-0.000 001	-0.007
100%		+50	1904 999 994	8.2	0.000 000	0.004
Batt. Endpoint		3.400	+20	1904 999 974	-12.1	-0.000 001



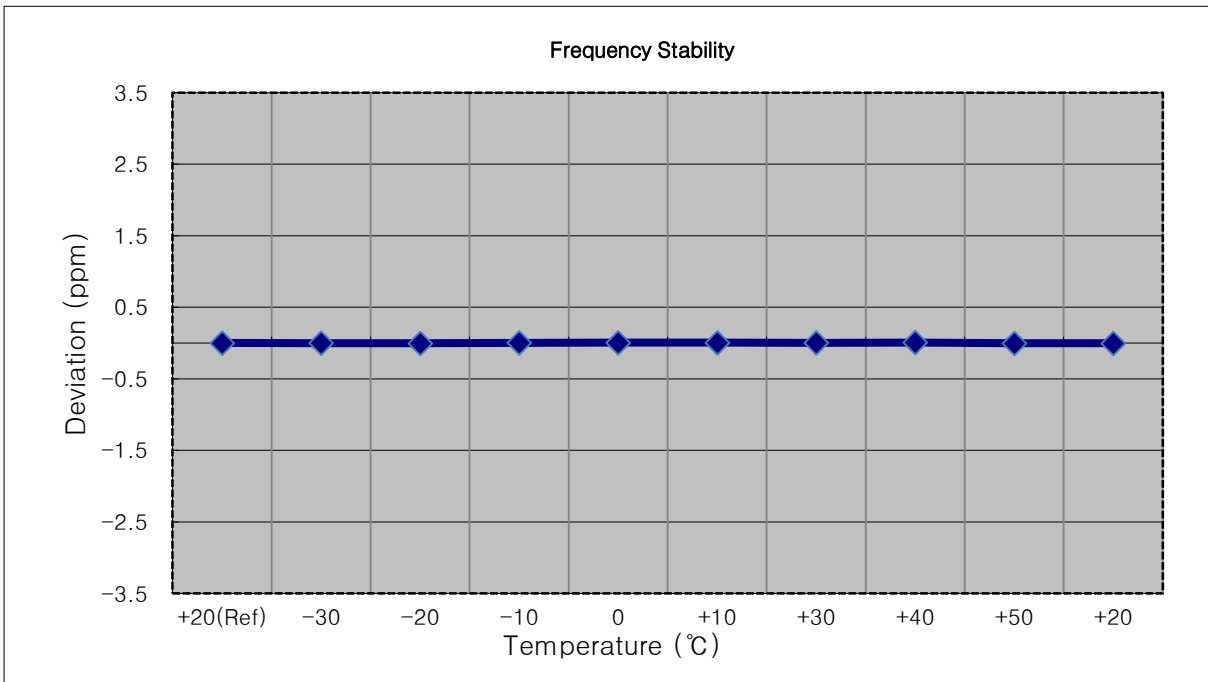
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1902.500.000 Hz
- ▣ CHANNEL: 19125 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1902 500 013	0.0	0.000 000	0.000
100%		-30	1902 500 021	7.7	0.000 000	0.004
100%		-20	1902 500 007	-6.0	0.000 000	-0.003
100%		-10	1902 500 007	-6.3	0.000 000	-0.003
100%		0	1902 500 023	9.7	0.000 001	0.005
100%		+10	1902 500 024	10.5	0.000 001	0.006
100%		+30	1902 500 023	9.7	0.000 001	0.005
100%		+40	1902 500 016	3.2	0.000 000	0.002
100%		+50	1902 500 020	7.0	0.000 000	0.004
Batt. Endpoint	3.400	+20	1902 500 010	-3.7	0.000 000	-0.002



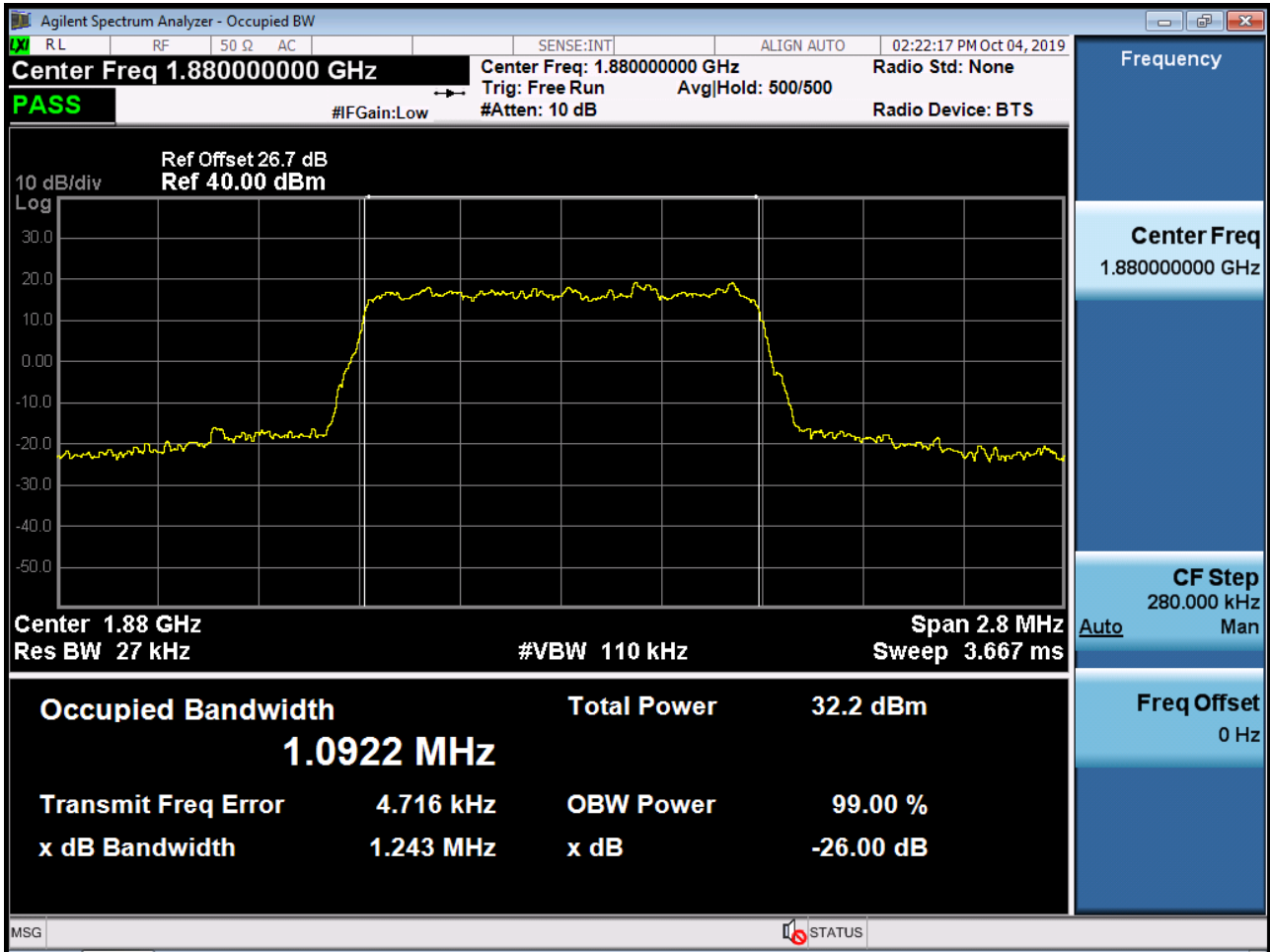
- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1900,000,000 Hz
- ▣ CHANNEL: 19100 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.85 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.850	+20(Ref)	1899 999 993	0.0	0.000 000	0.000
100%		-30	1899 999 991	-2.3	0.000 000	-0.001
100%		-20	1899 999 983	-9.7	-0.000 001	-0.005
100%		-10	1899 999 997	4.1	0.000 000	0.002
100%		0	1900 000 004	10.7	0.000 001	0.006
100%		+10	1900 000 004	11.0	0.000 001	0.006
100%		+30	1899 999 997	4.0	0.000 000	0.002
100%		+40	1900 000 005	11.6	0.000 001	0.006
100%		+50	1899 999 984	-8.7	0.000 000	-0.005
Batt. Endpoint		3.400	+20	1899 999 984	-9.4	0.000 000

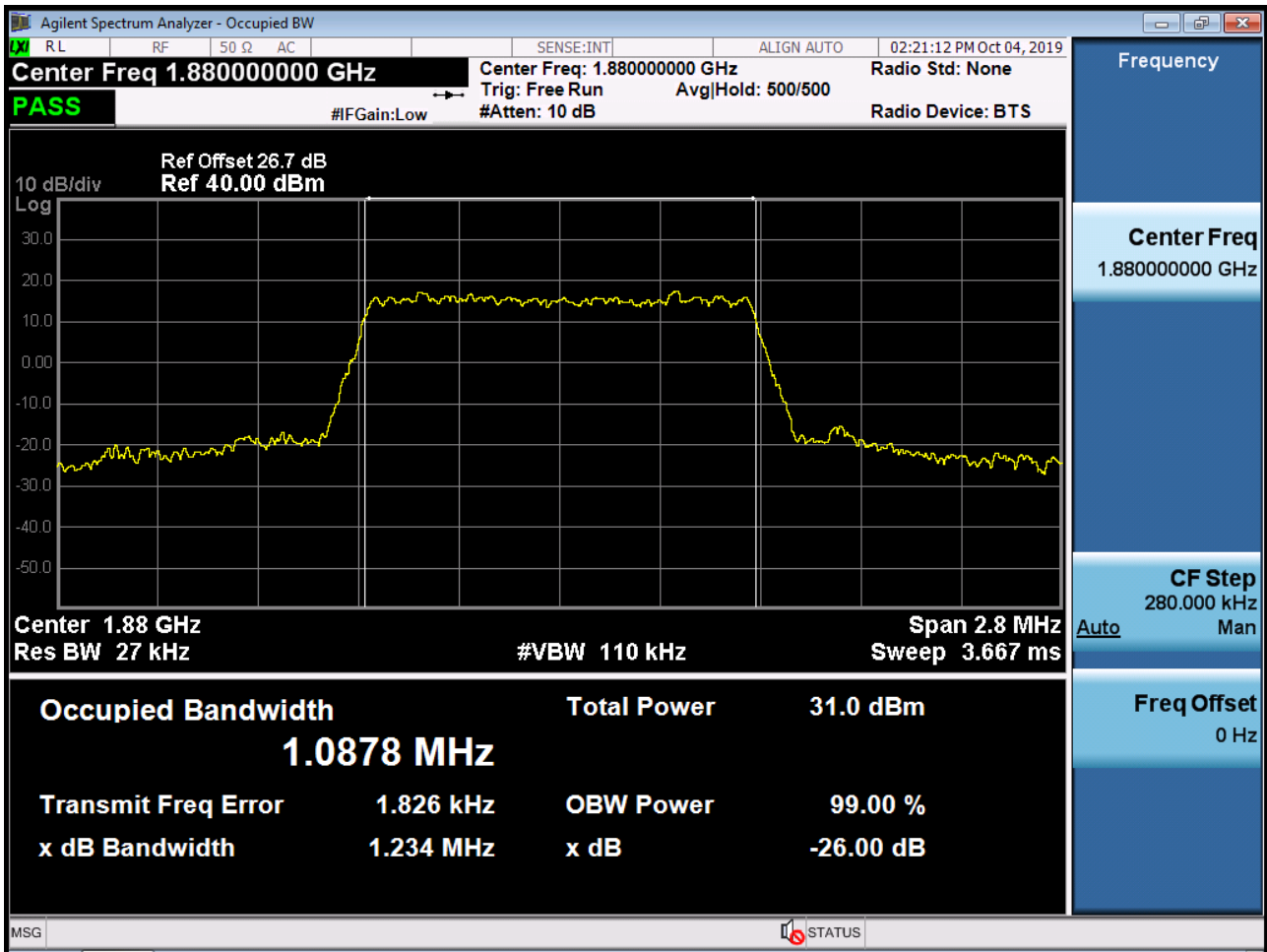


## 9. TEST PLOTS

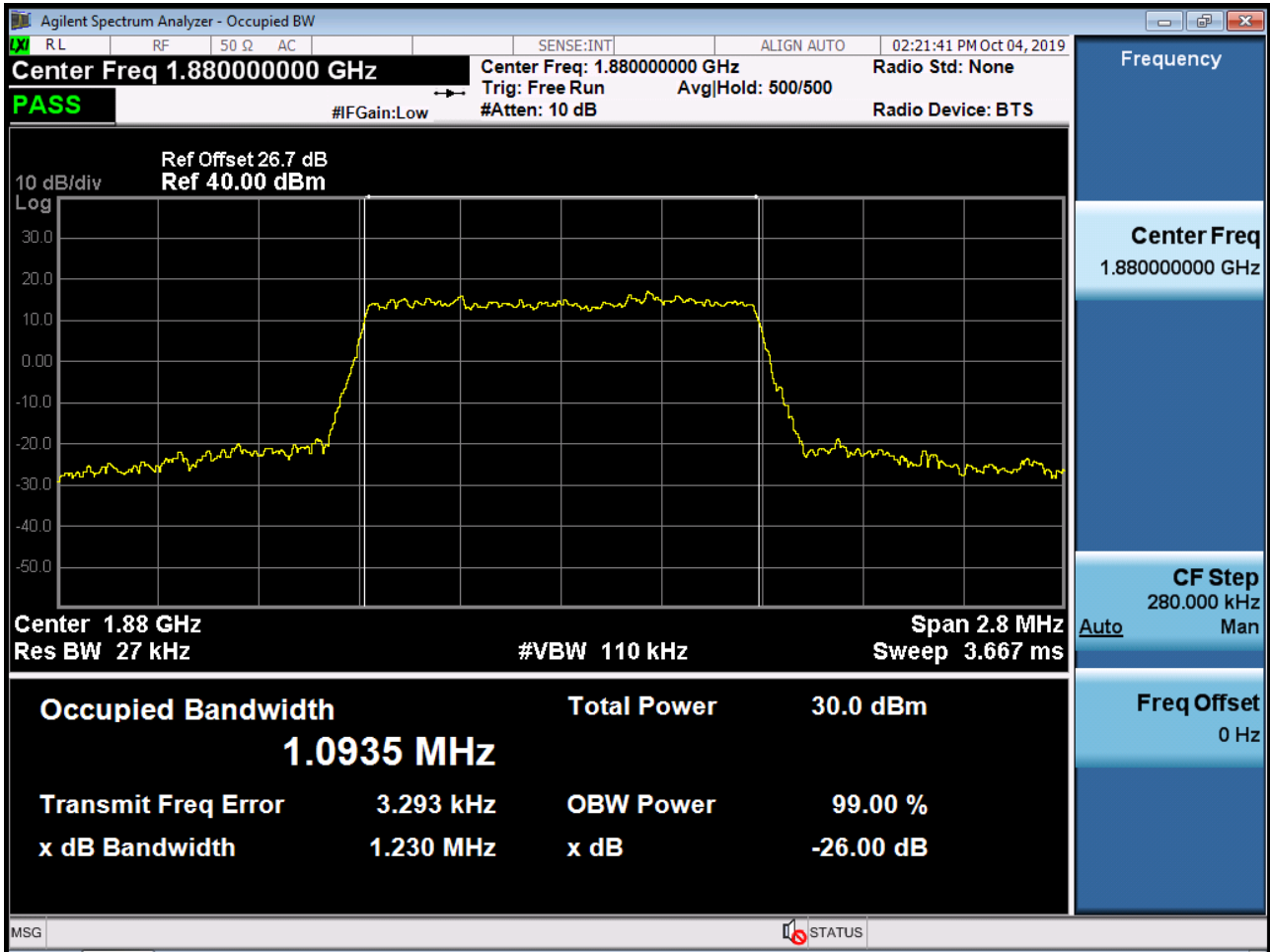
BAND 2. Occupied Bandwidth Plot (1.4M BW Ch.18900 QPSK RB 6\_0)



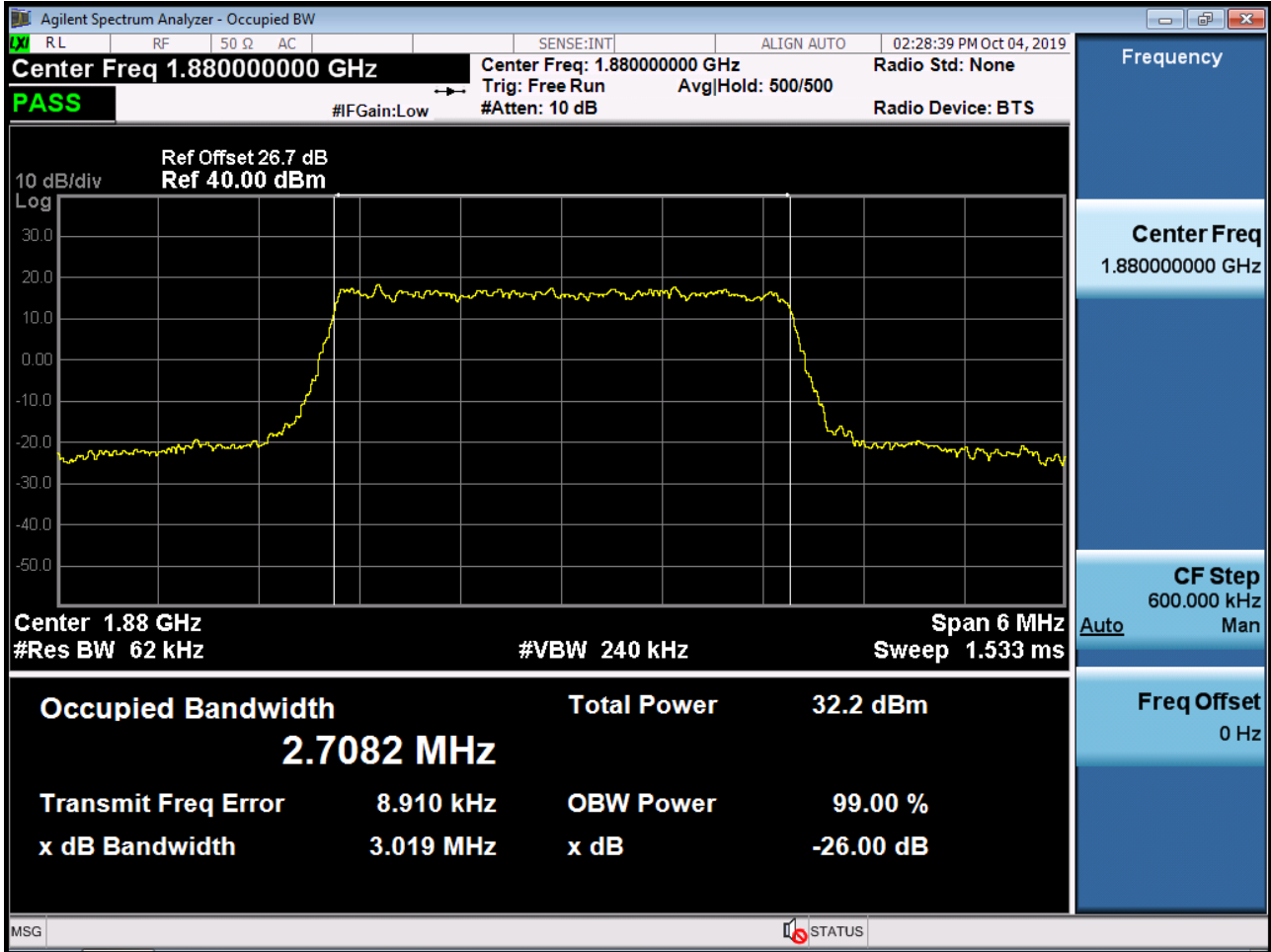
BAND 2. Occupied Bandwidth Plot (1.4M BW Ch.18900 16QAM RB 6\_0)



BAND 2. Occupied Bandwidth Plot (1.4M BW Ch.18900 64QAM RB 6\_0)

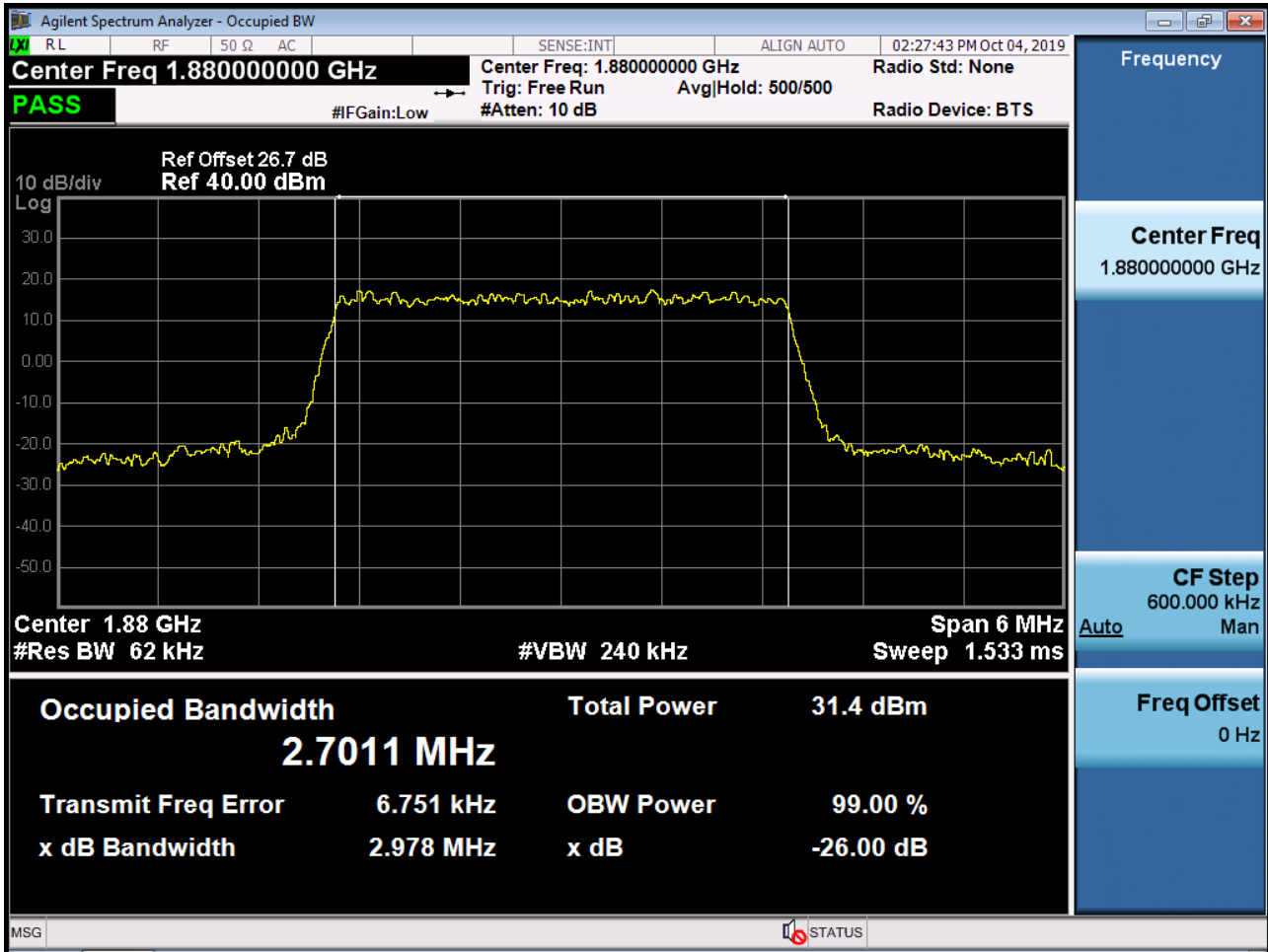


BAND 2. Occupied Bandwidth Plot (3M BW Ch.18900 QPSK RB 15\_0)

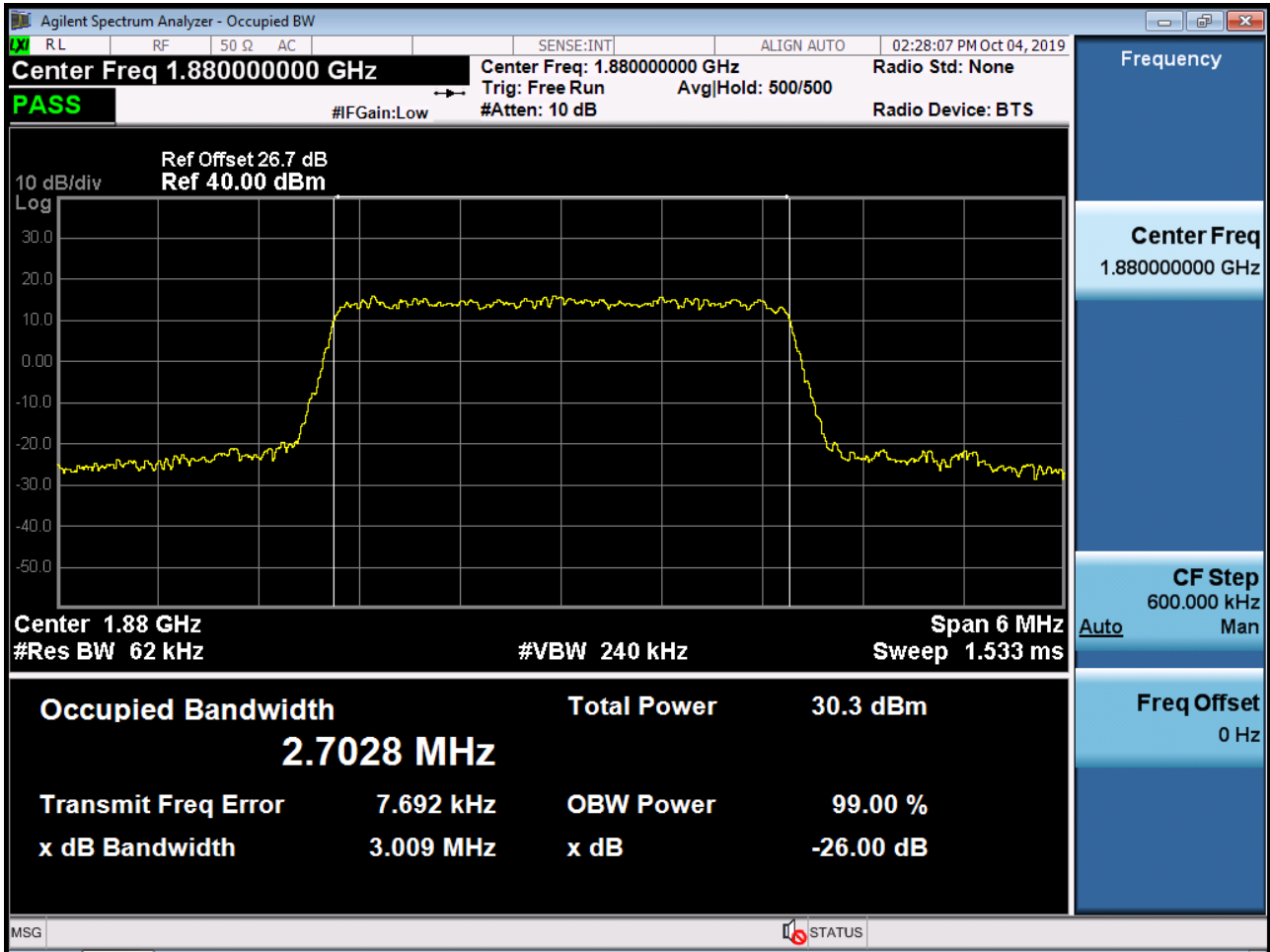




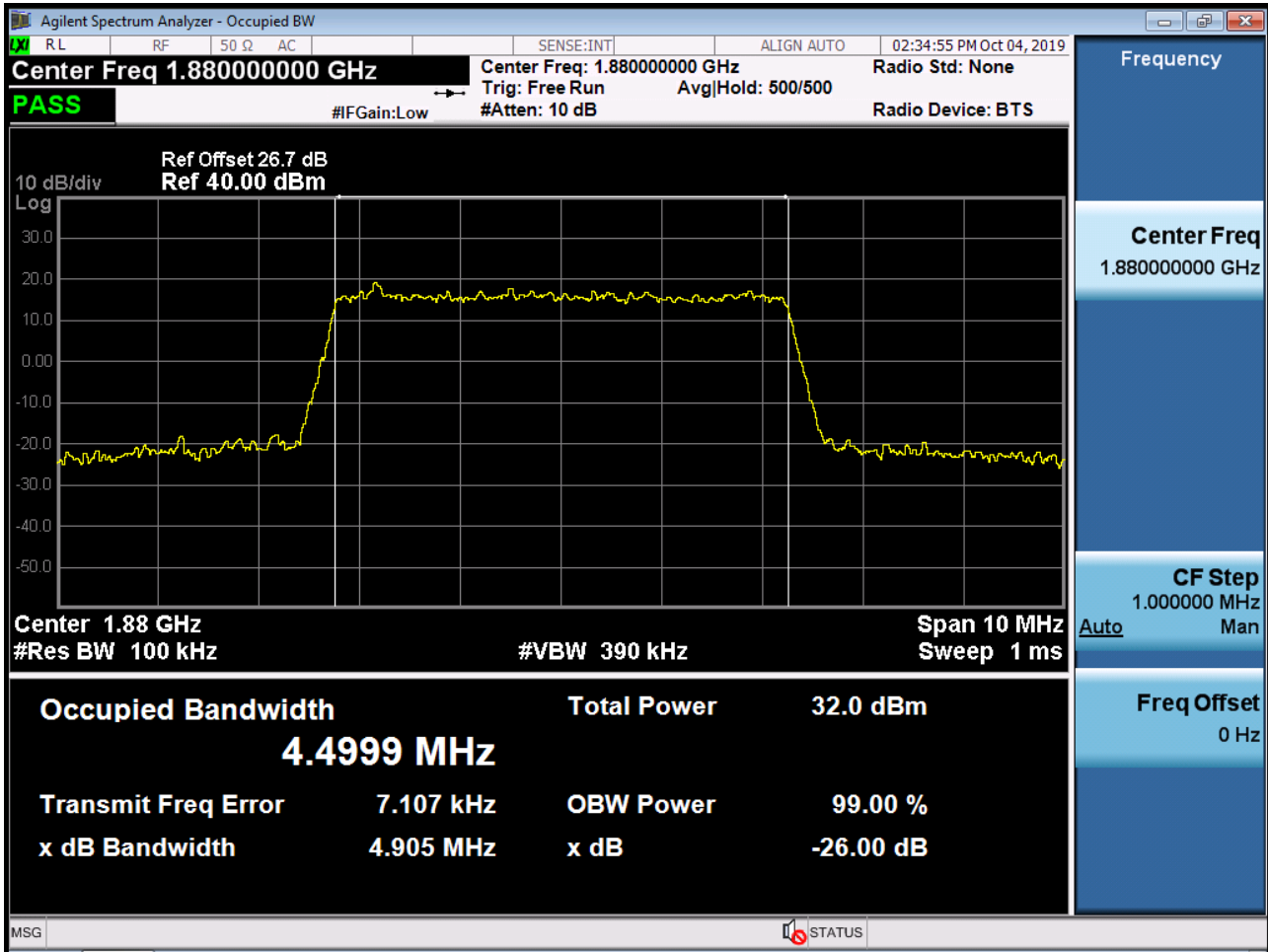
BAND 2. Occupied Bandwidth Plot (3M BW Ch.18900 16QAM RB 15\_0)



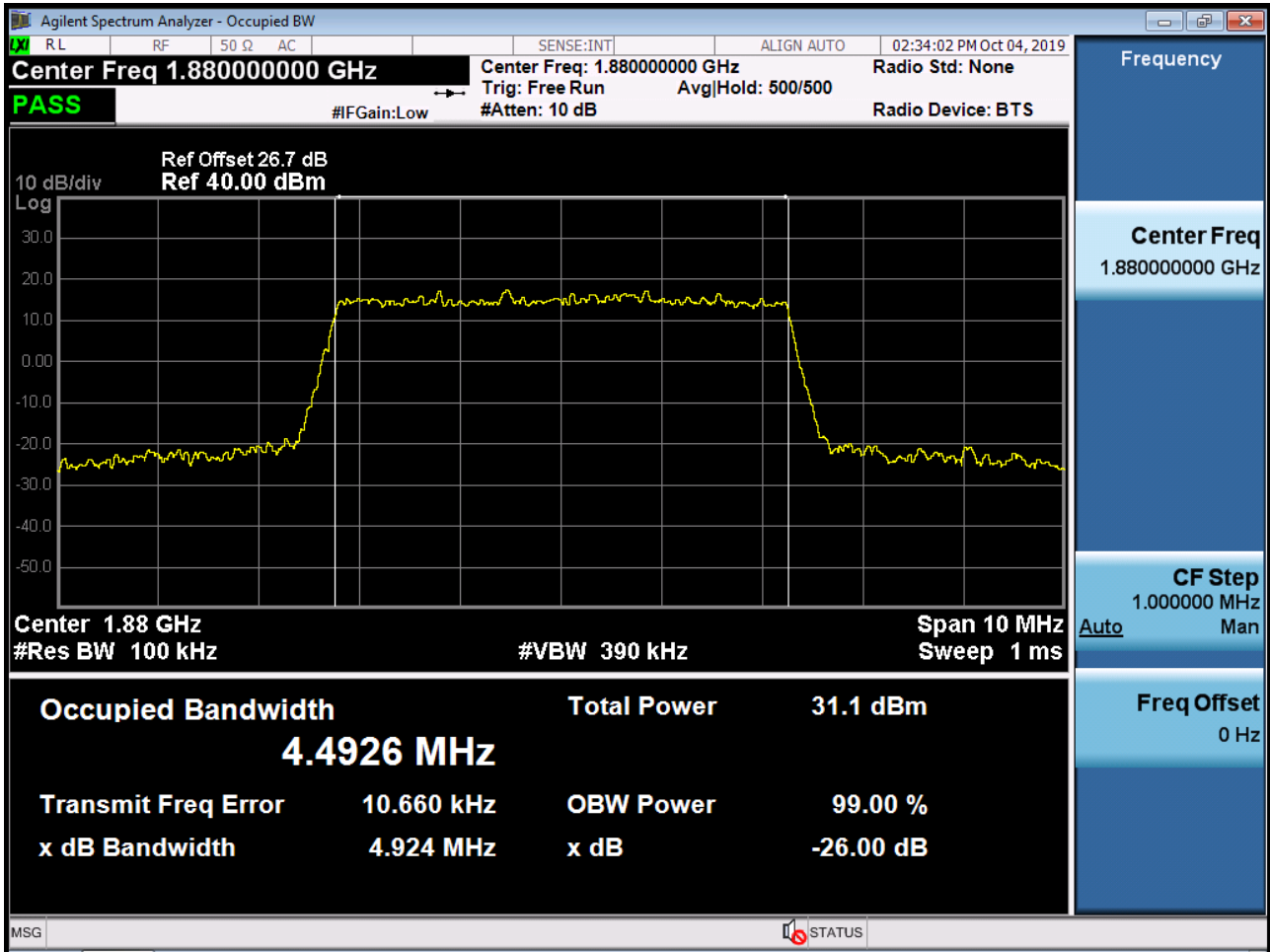
BAND 2. Occupied Bandwidth Plot (3M BW Ch.18900 64QAM RB 15\_0)



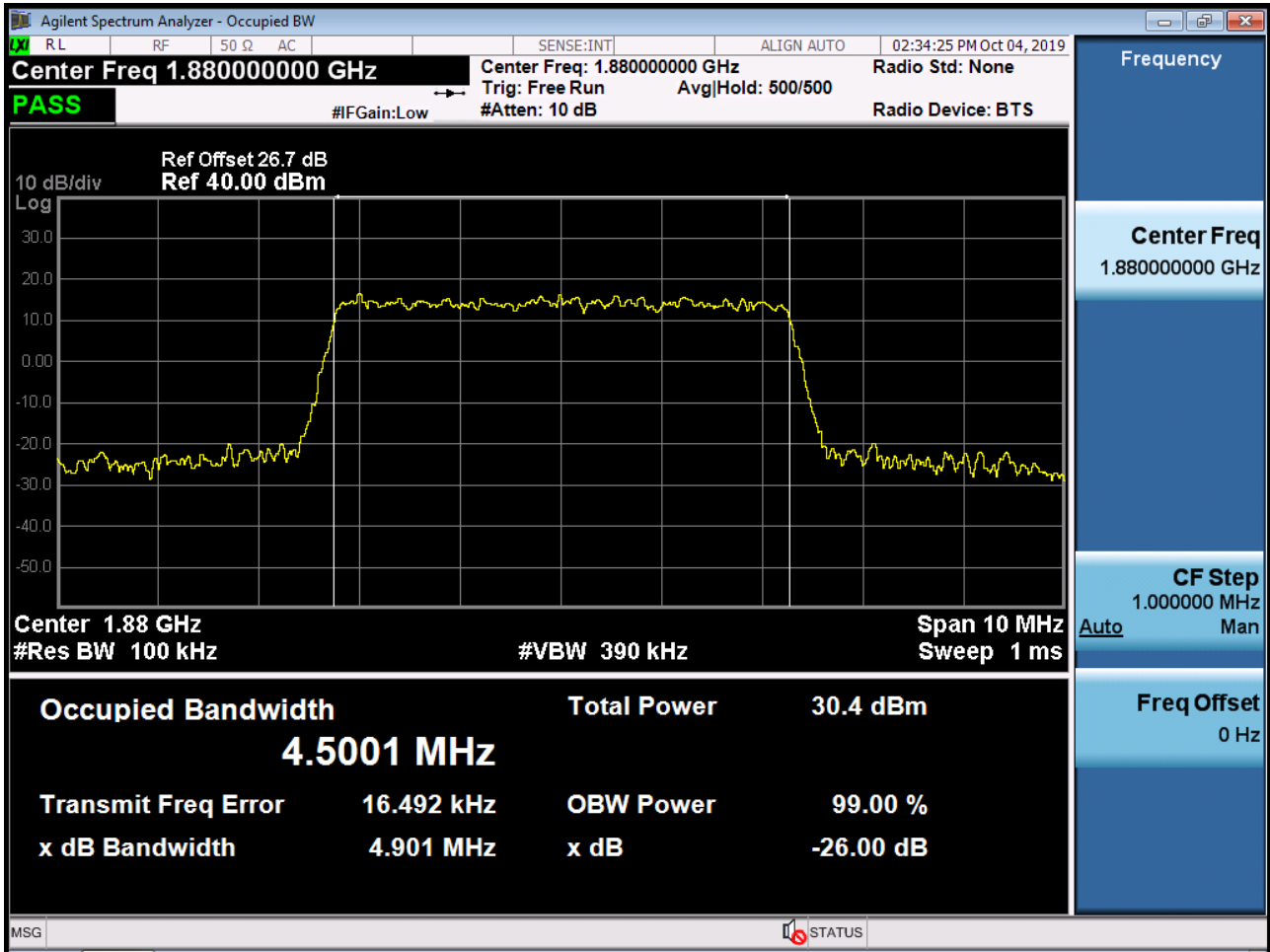
BAND 2. Occupied Bandwidth Plot (5M BW Ch.18900 QPSK RB 25\_0)



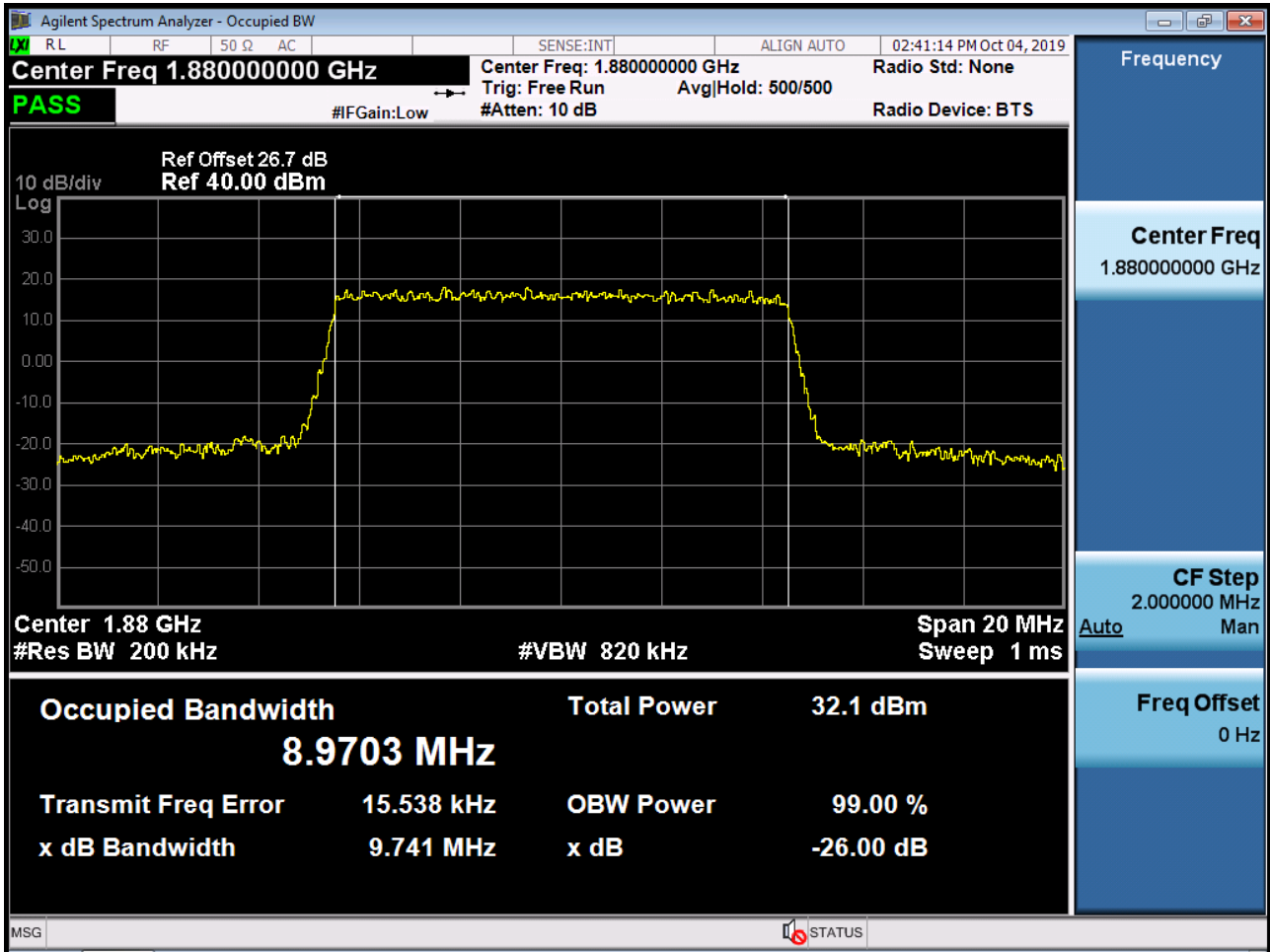
BAND 2. Occupied Bandwidth Plot (5M BW Ch.18900 16QAM RB 25\_0)



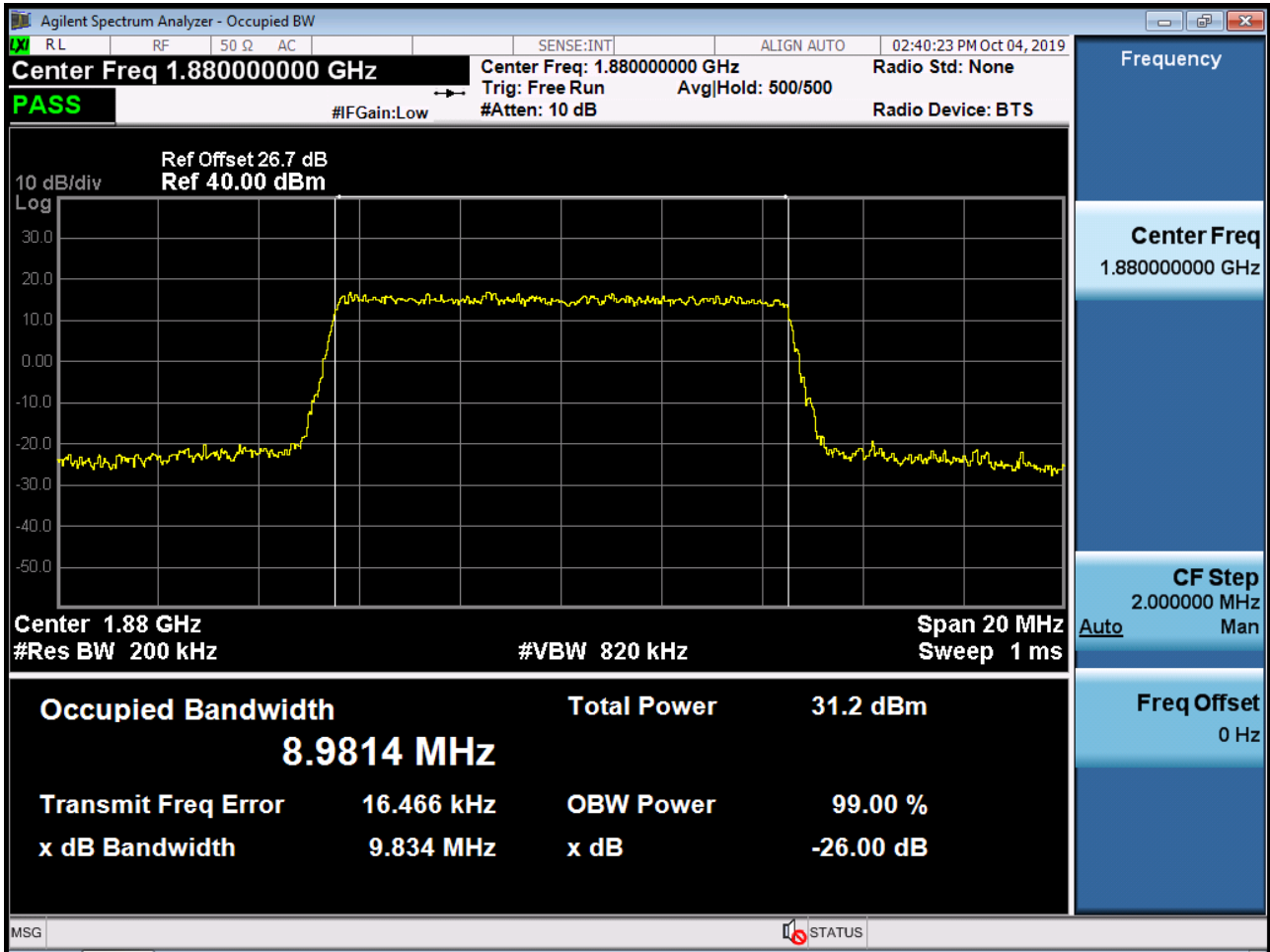
BAND 2. Occupied Bandwidth Plot (5M BW Ch.18900 64QAM RB 25\_0)



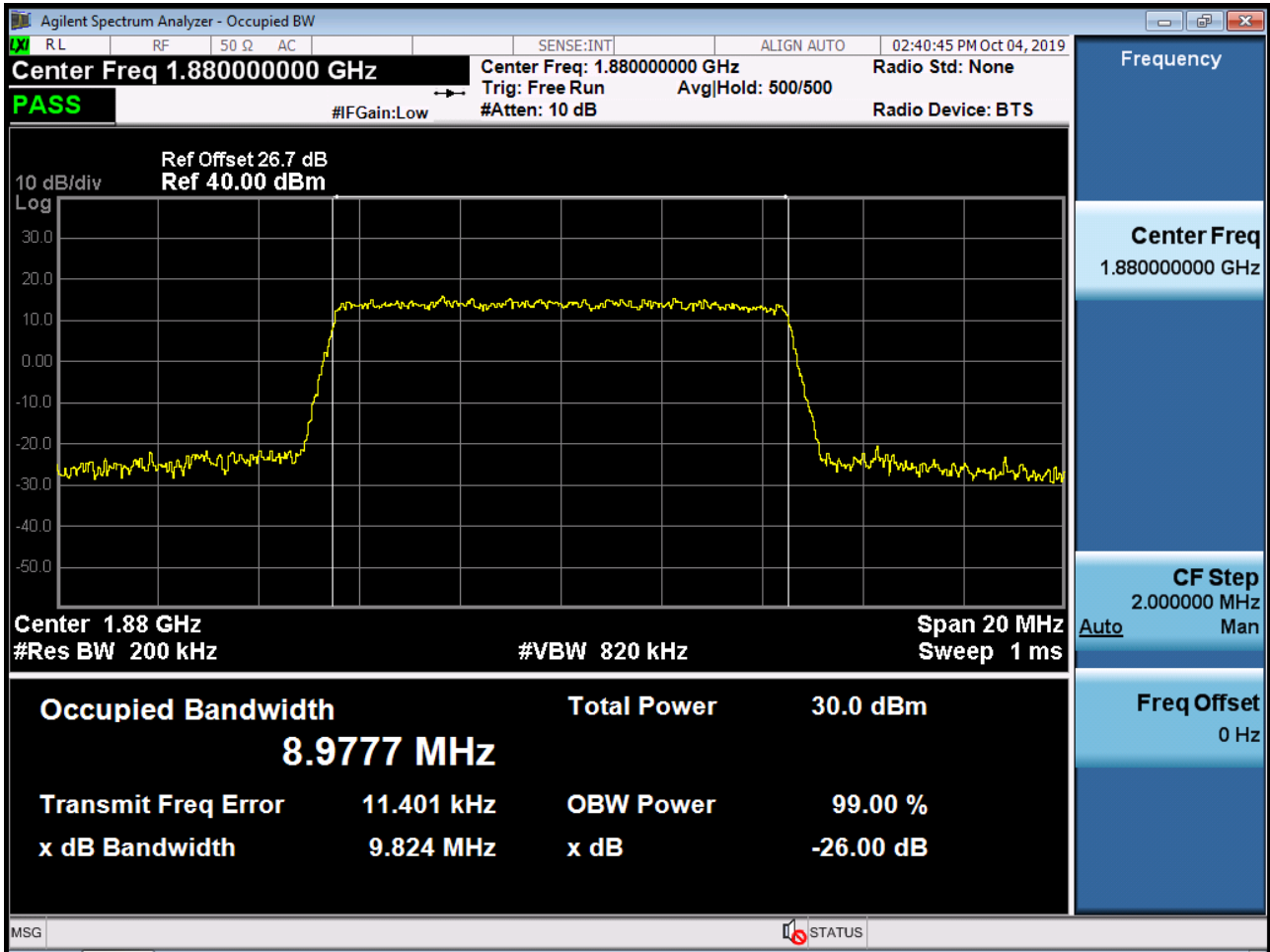
BAND 2. Occupied Bandwidth Plot (10M BW Ch.18900 QPSK RB 50\_0)



BAND 2. Occupied Bandwidth Plot (10M BW Ch.18900 16QAM RB 50\_0)

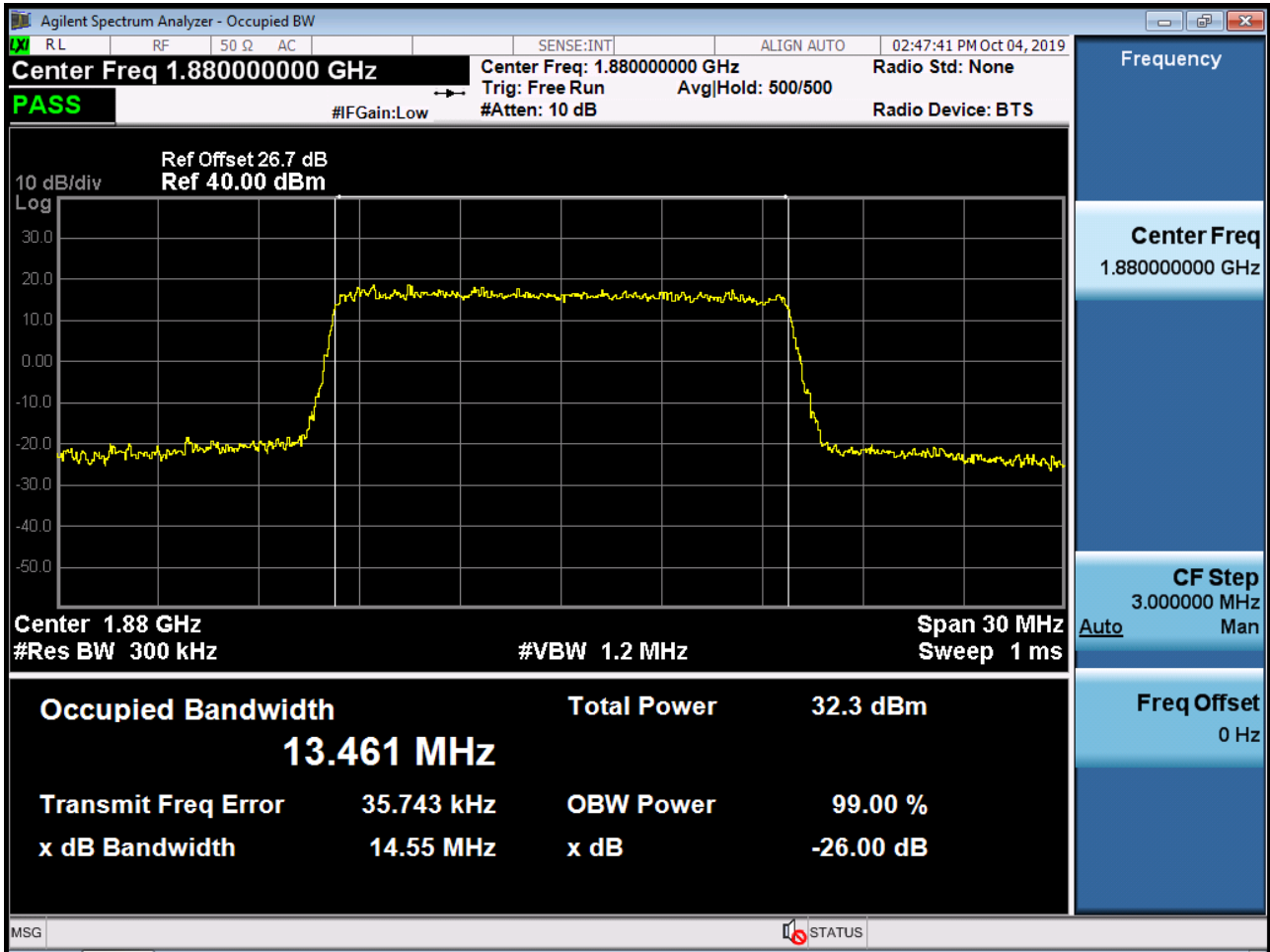


BAND 2. Occupied Bandwidth Plot (10M BW Ch.18900 64QAM RB 50\_0)

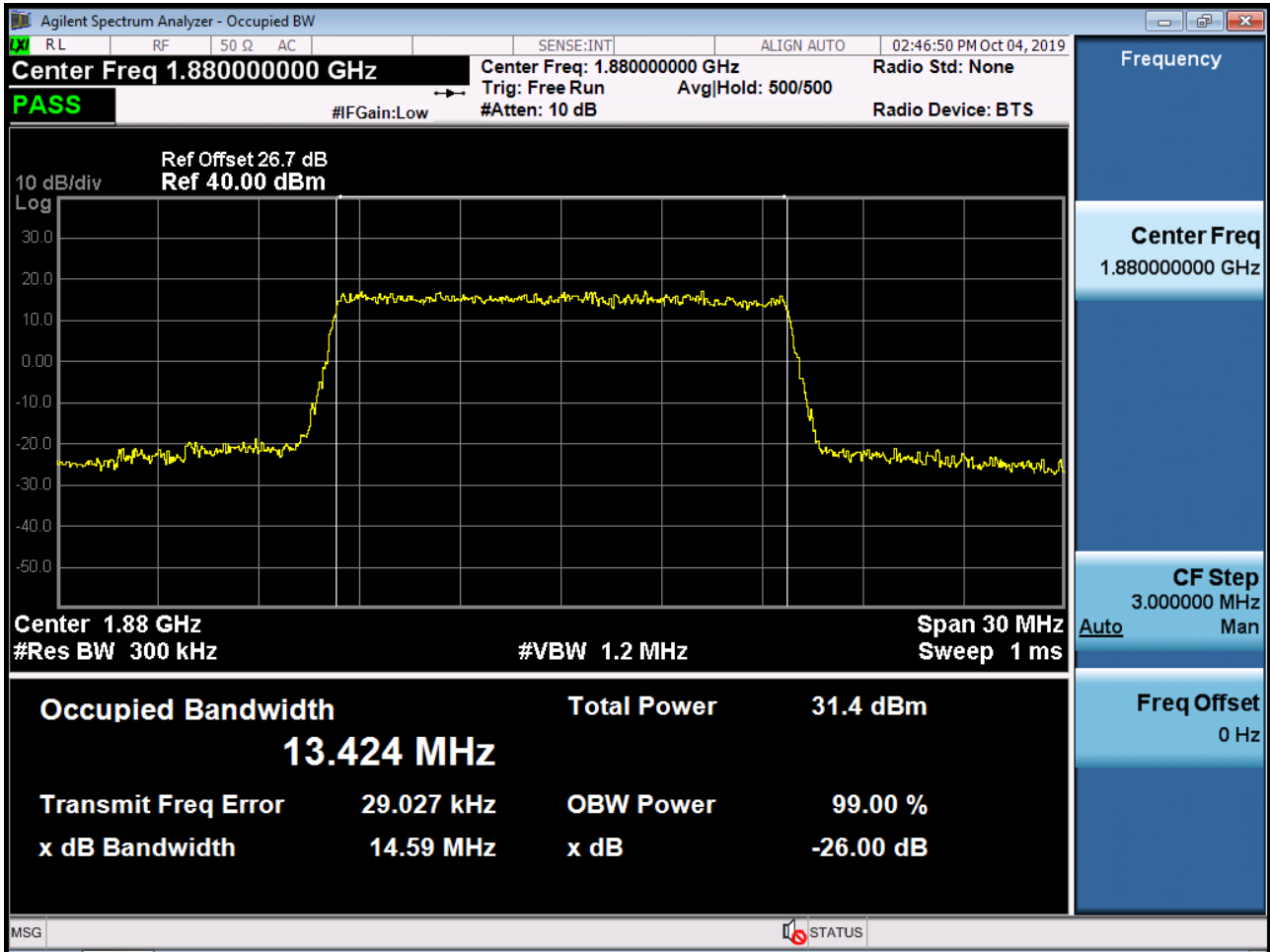




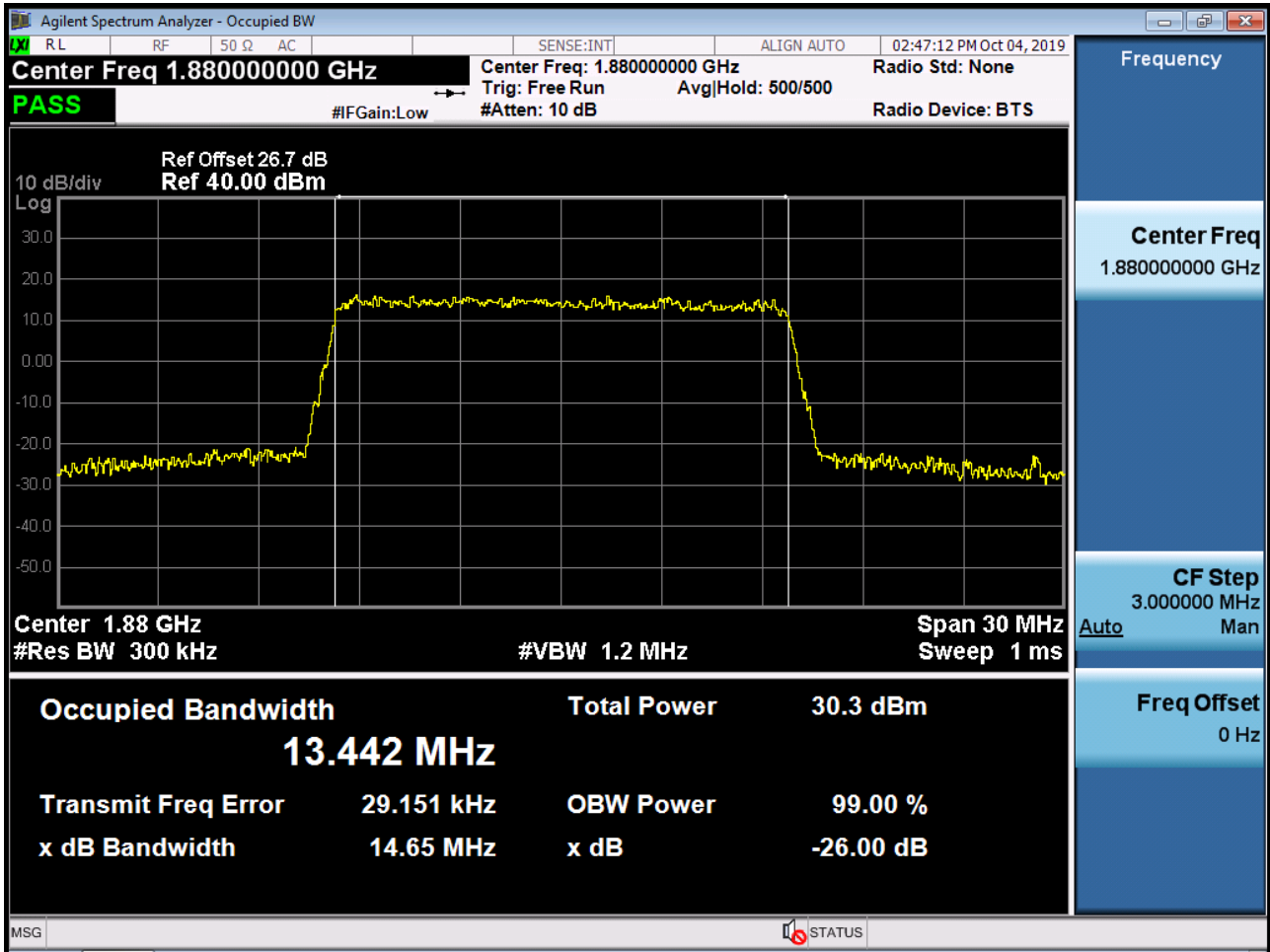
BAND 2. Occupied Bandwidth Plot (15M BW Ch.18900 QPSK RB 75\_0)



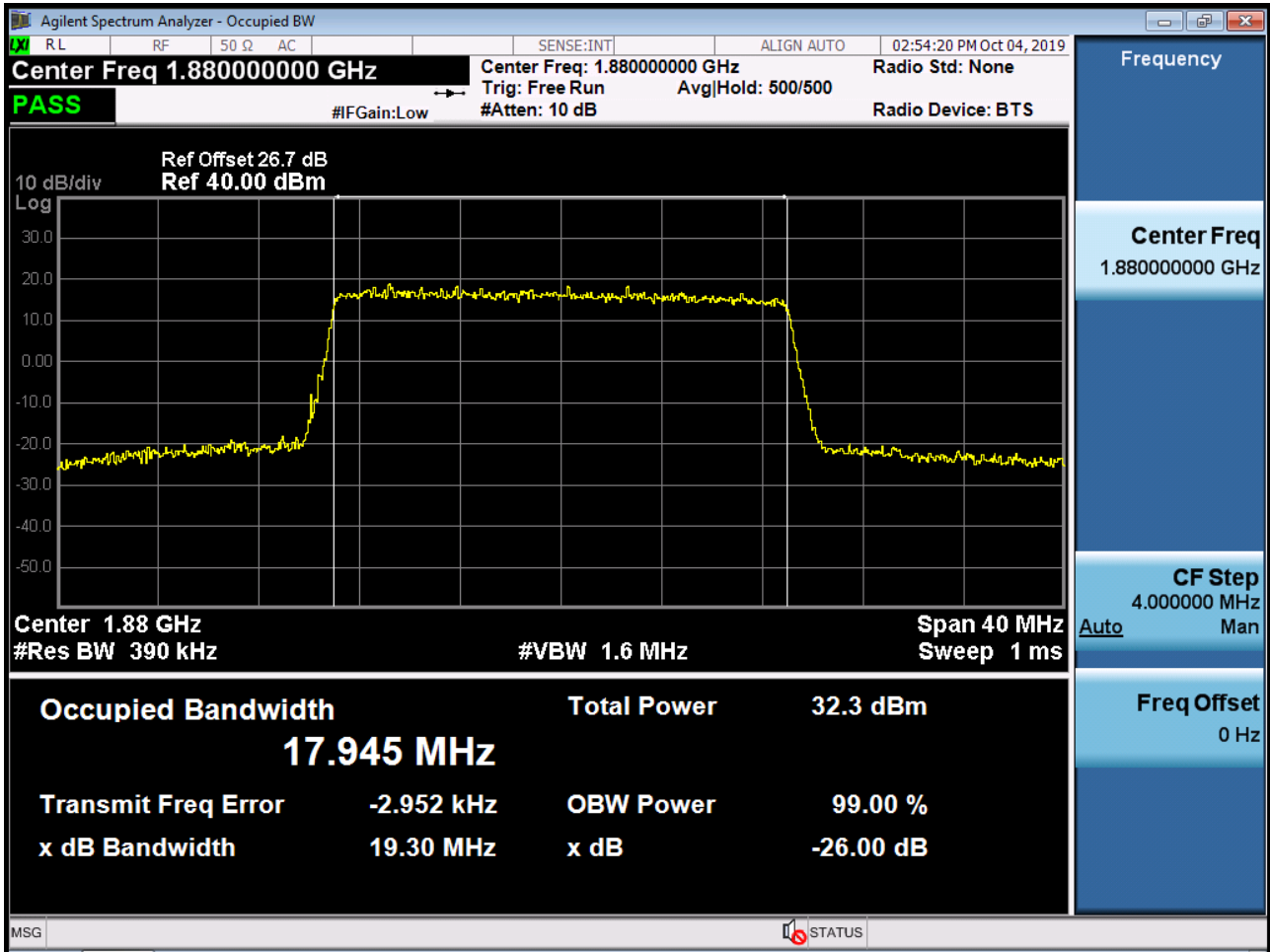
BAND 2. Occupied Bandwidth Plot (15M BW Ch.18900 16QAM RB 75\_0)



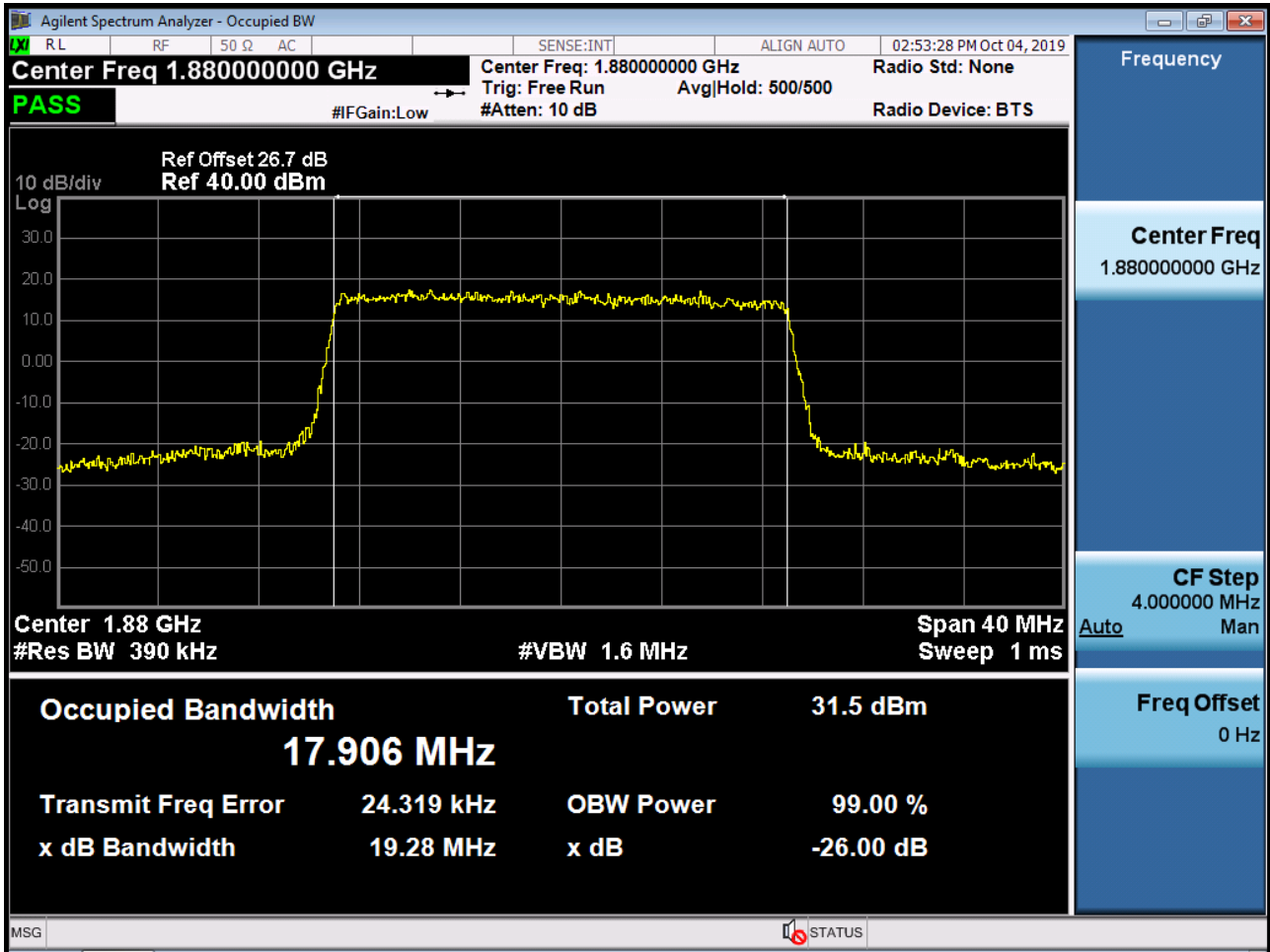
BAND 2. Occupied Bandwidth Plot (15M BW Ch.18900 64QAM RB 75\_0)



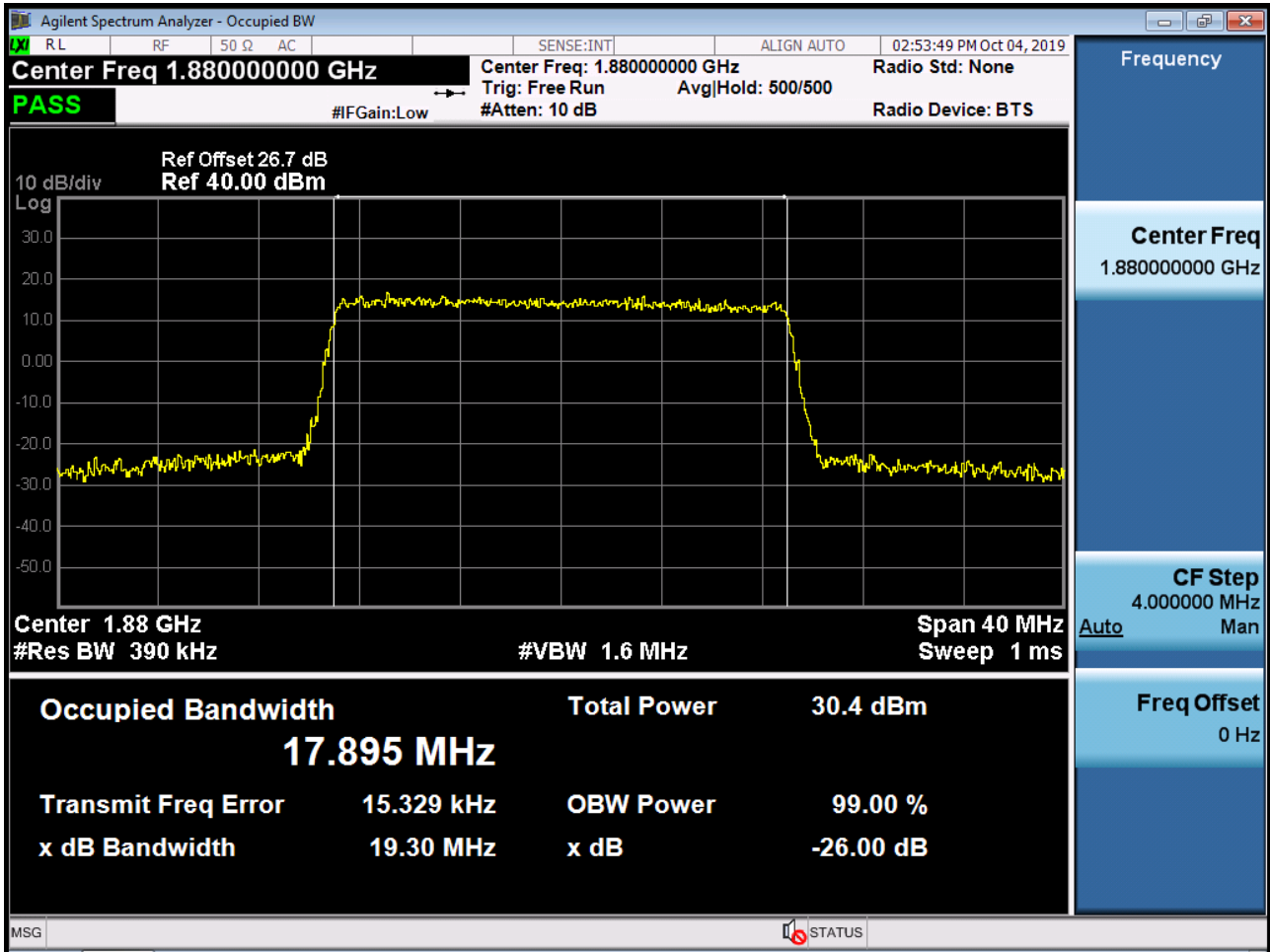
BAND 2. Occupied Bandwidth Plot (20M BW Ch.18900 QPSK RB 100\_0)



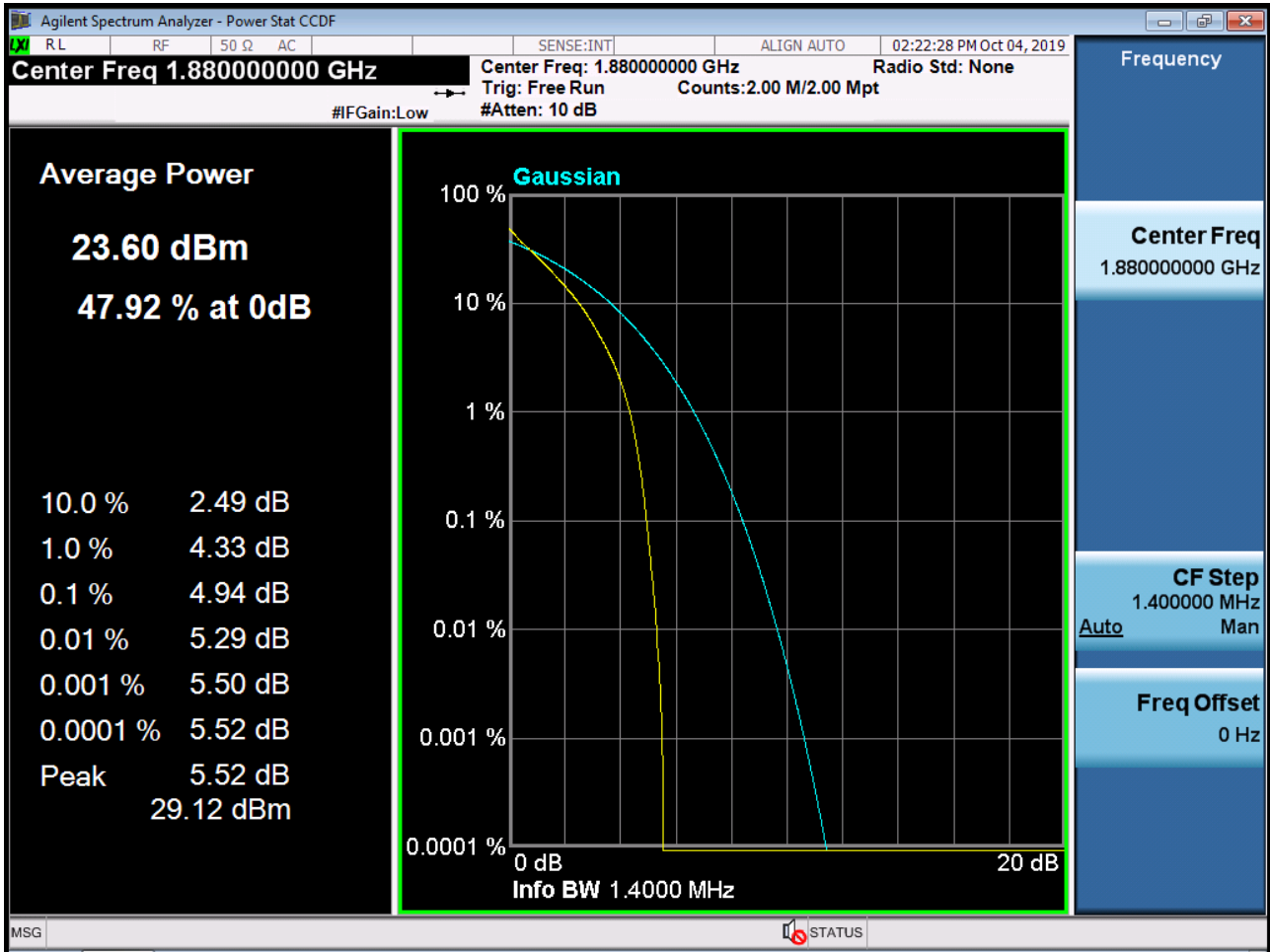
BAND 2. Occupied Bandwidth Plot (20M BW Ch.18900 16QAM RB 100\_0)



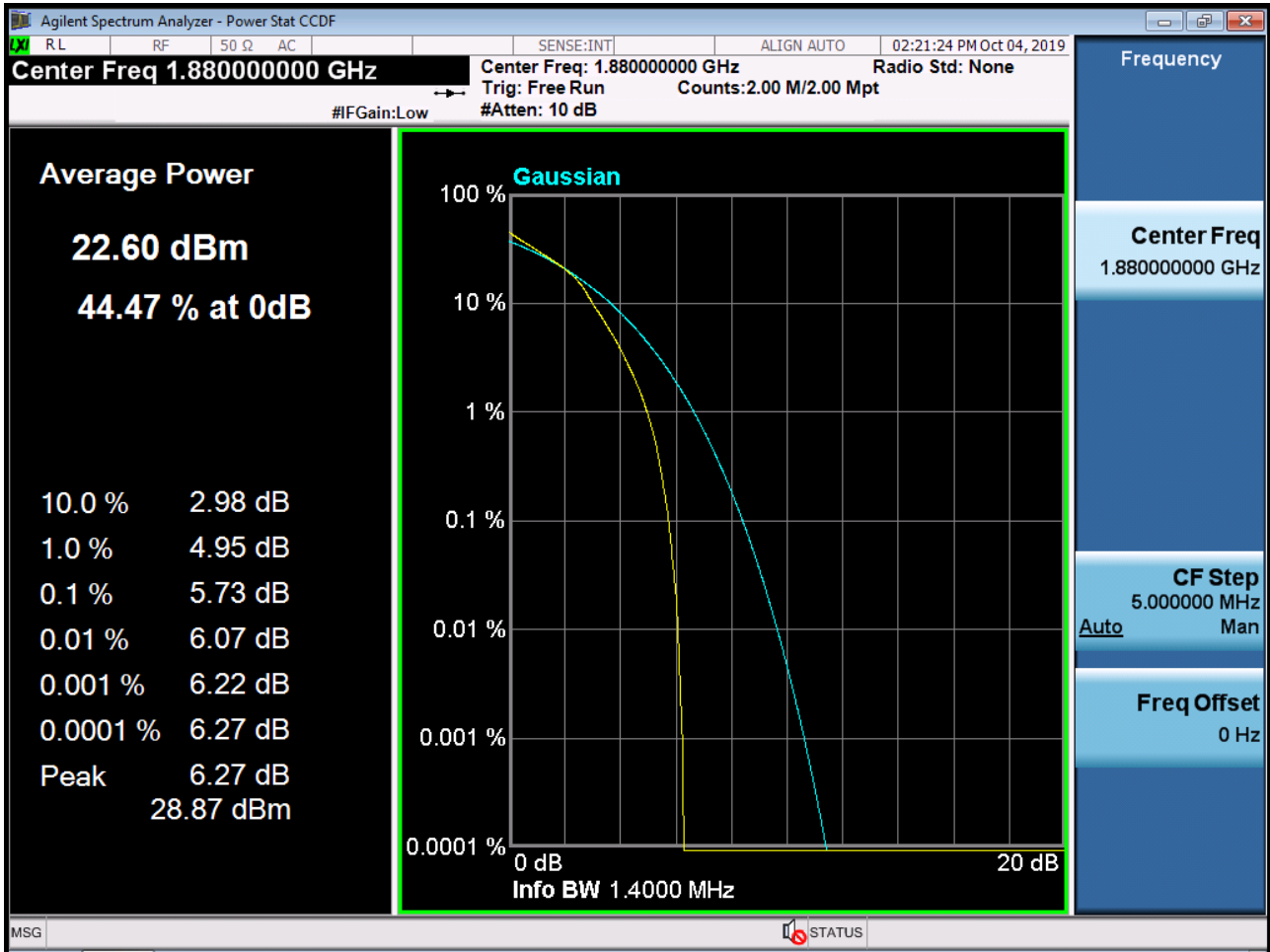
BAND 2. Occupied Bandwidth Plot (20M BW Ch.18900 64QAM RB 100\_0)



BAND 2. PAR Plot (1.4M BW Ch.18900 QPSK RB 6\_0)

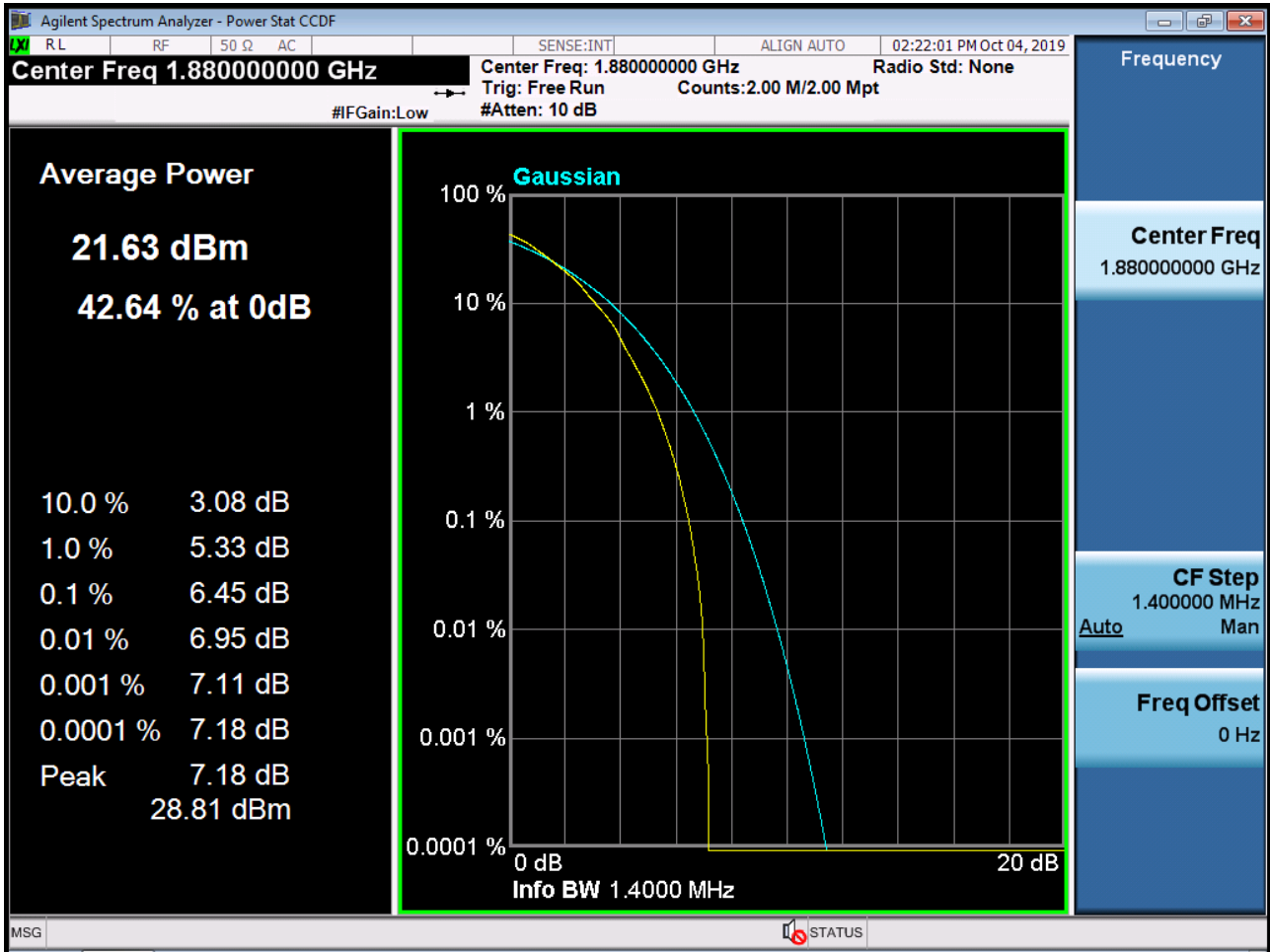


BAND 2. PAR Plot (1.4M BW Ch.18900 16QAM RB 6\_0)

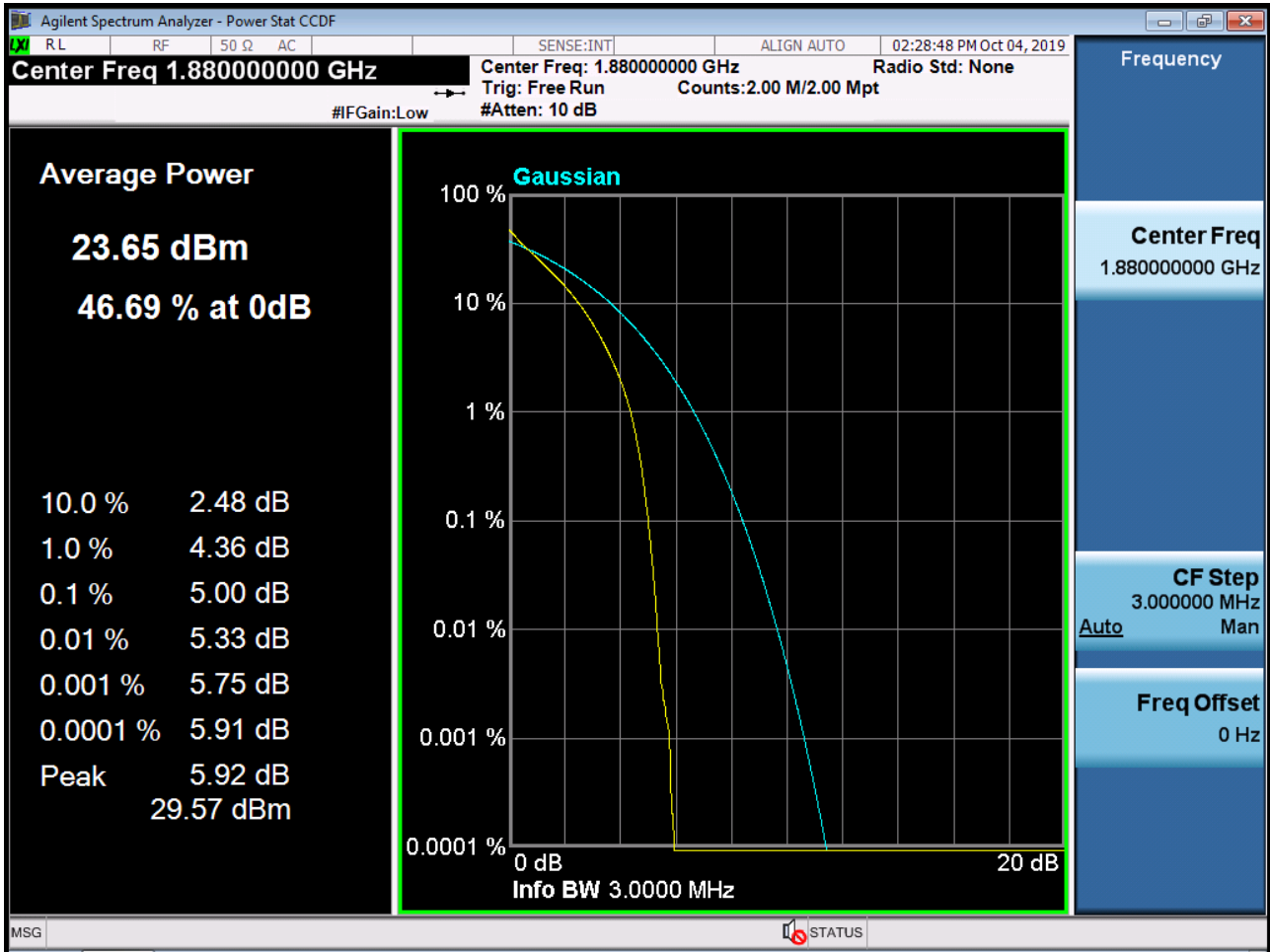




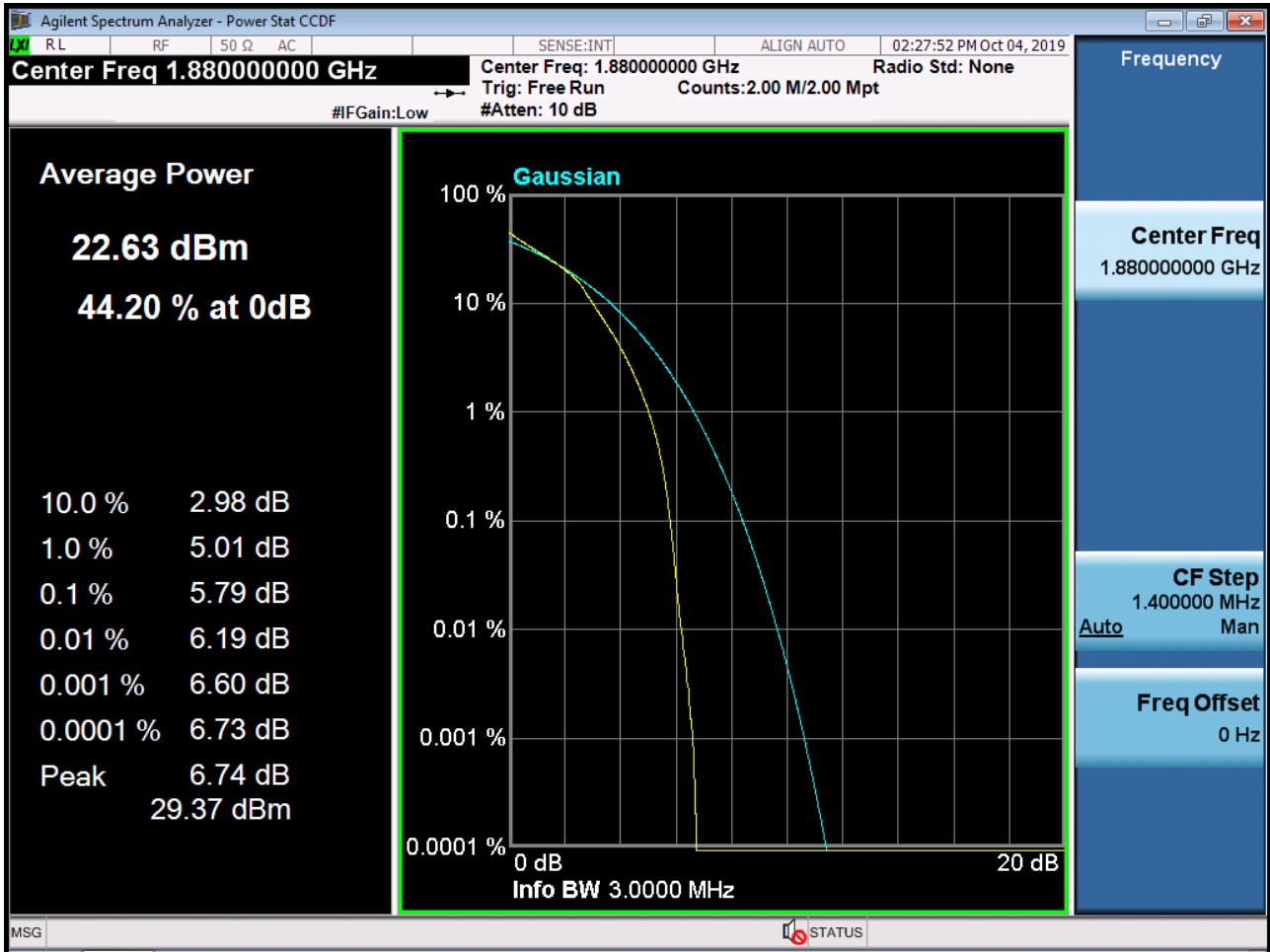
BAND 2. PAR Plot (1.4M BW Ch.18900 64QAM RB 6\_0)



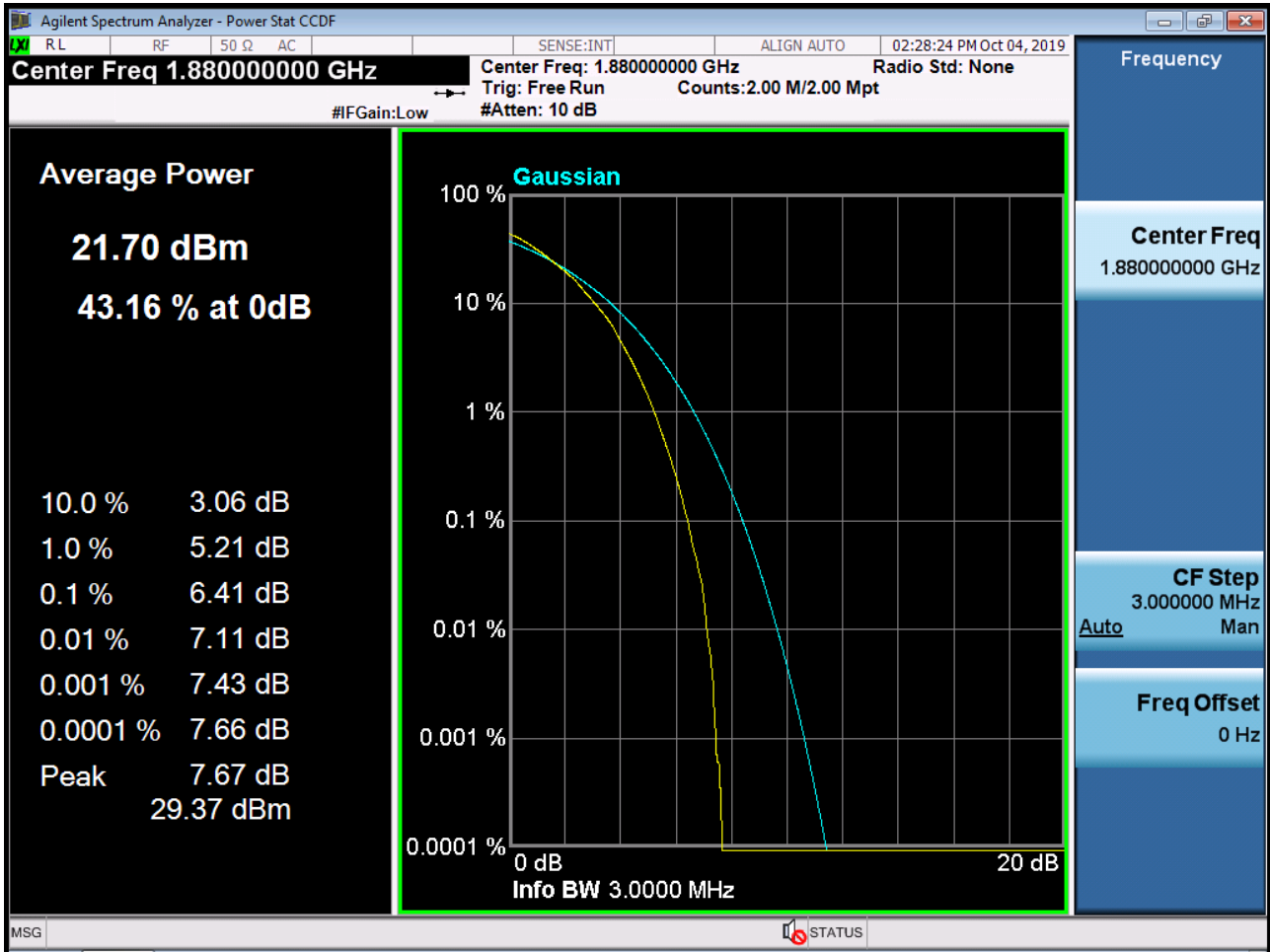
BAND 2. PAR Plot (3M BW Ch.18900 QPSK RB 15\_0)



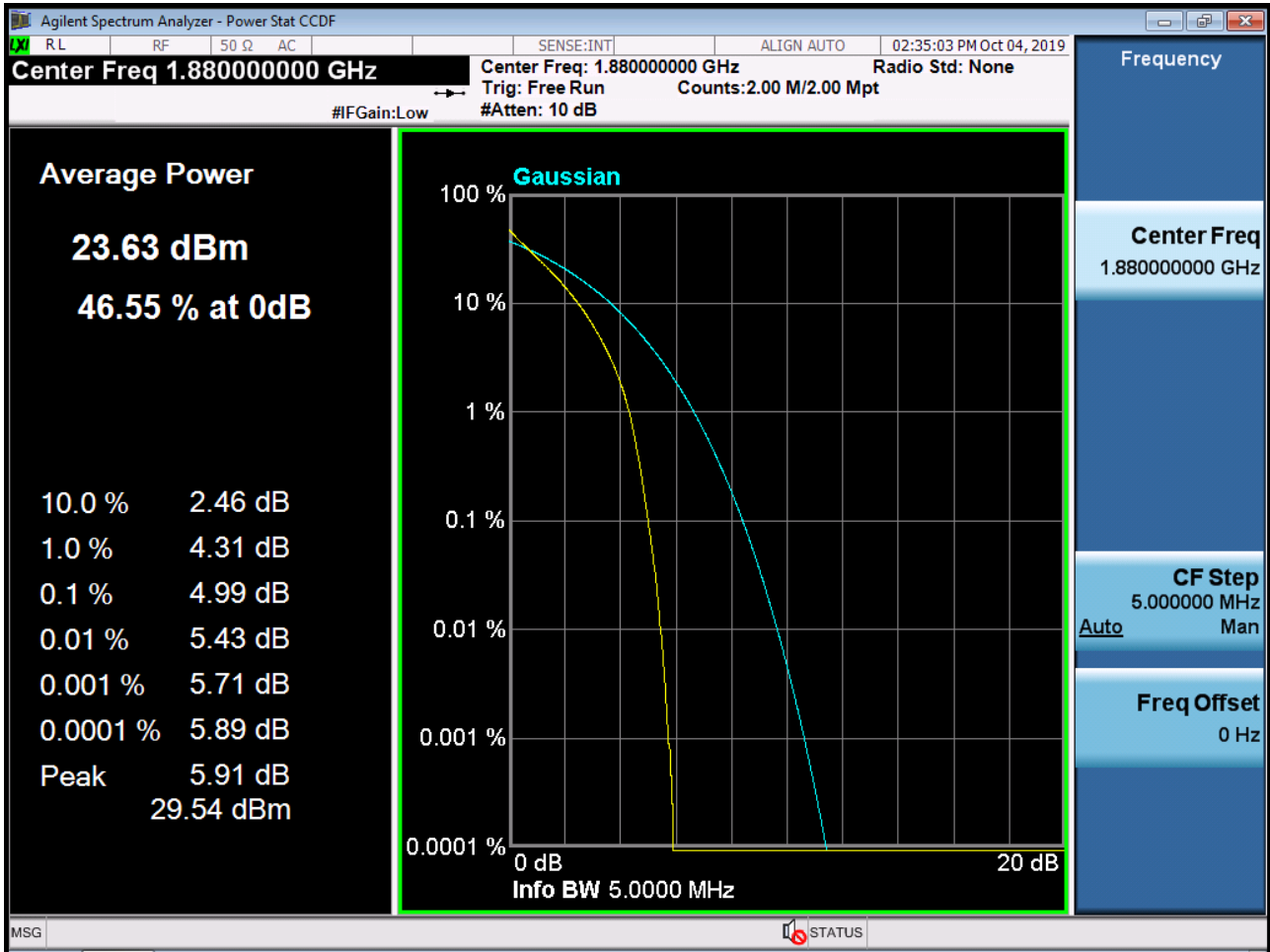
BAND 2. PAR Plot (3M BW Ch.18900 16QAM RB 15\_0)



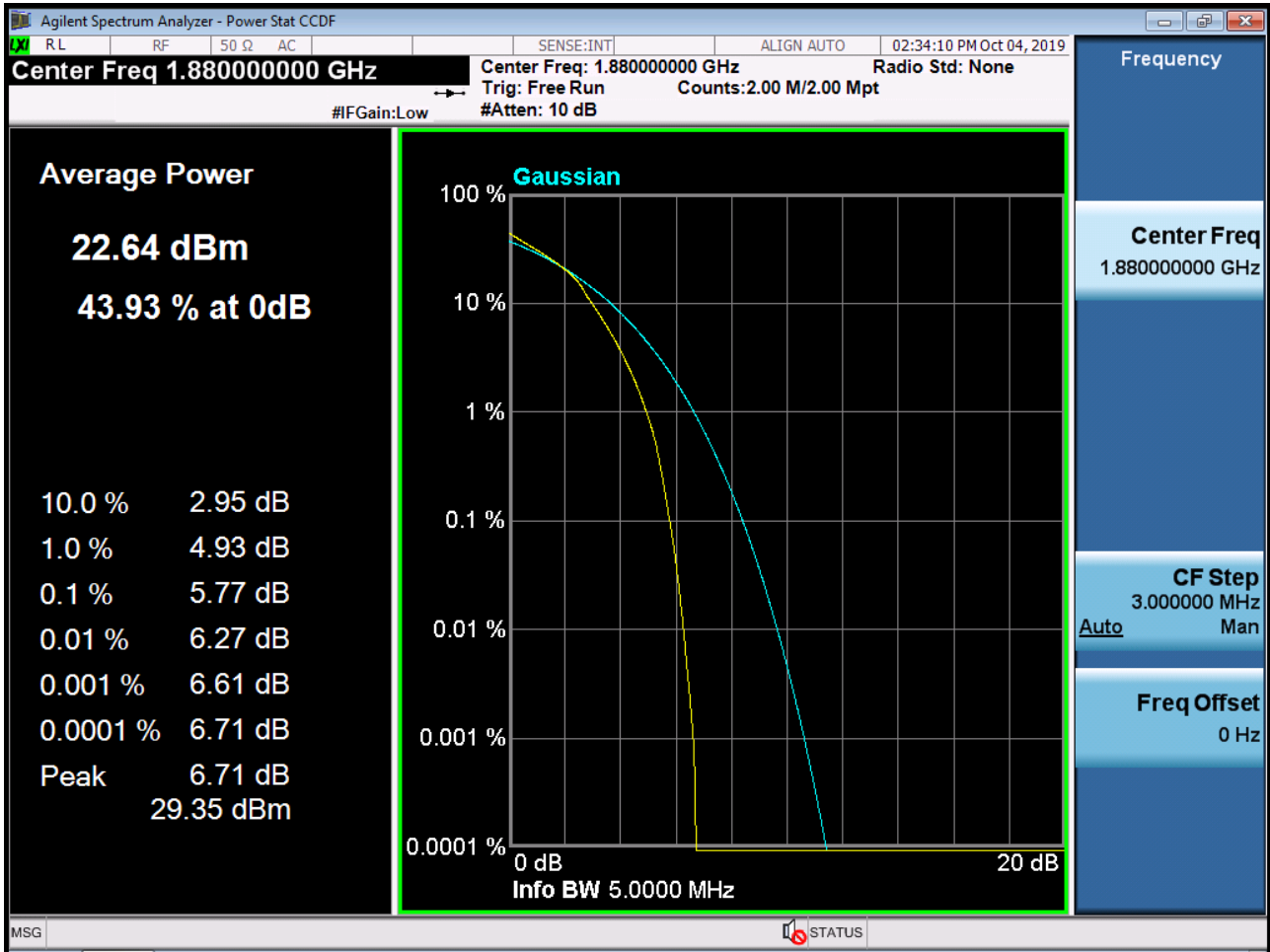
BAND 2. PAR Plot (3M BW Ch.18900 64QAM RB 15\_0)



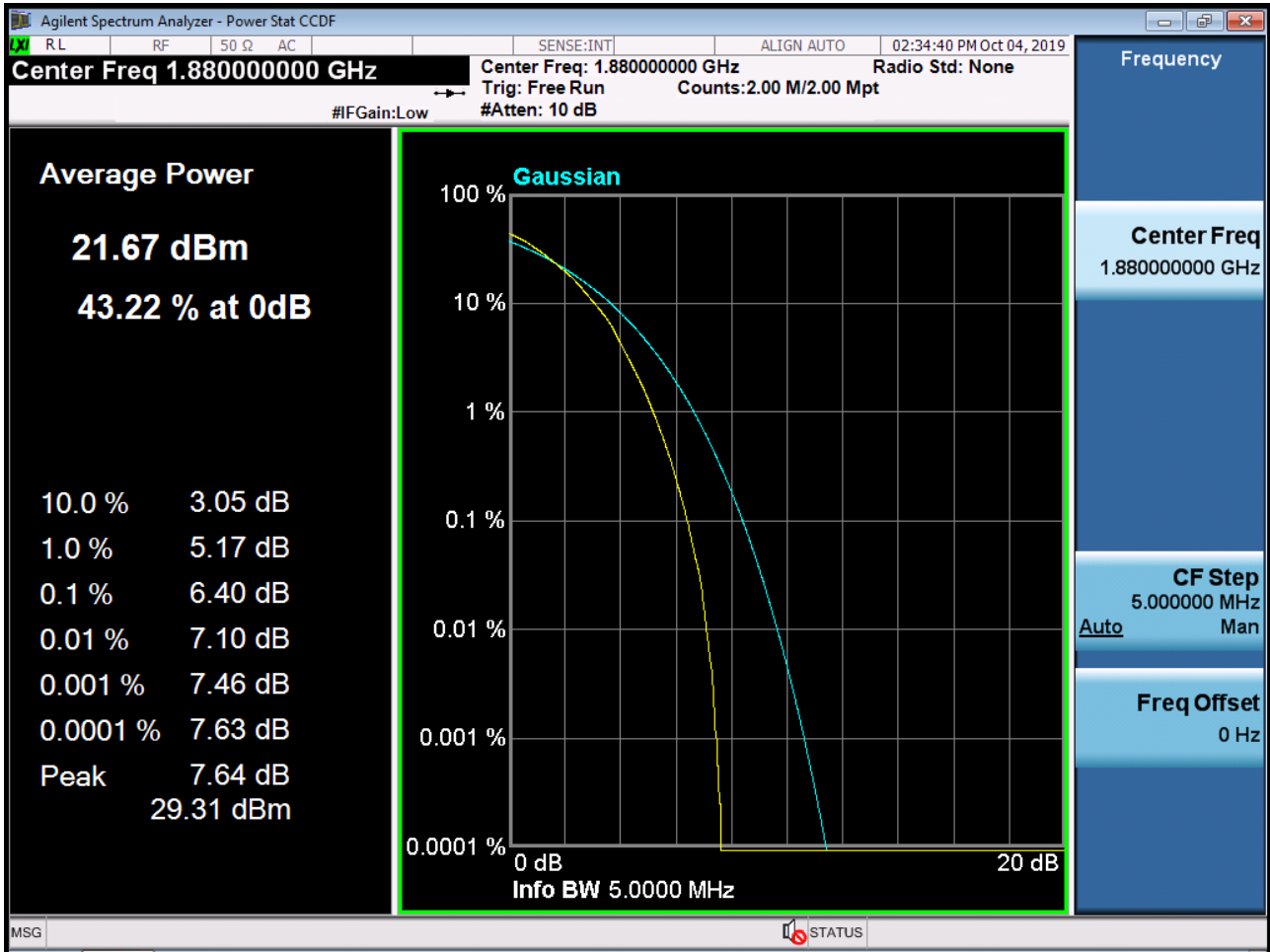
BAND 2. PAR Plot (5M BW Ch.18900 QPSK RB 25\_0)



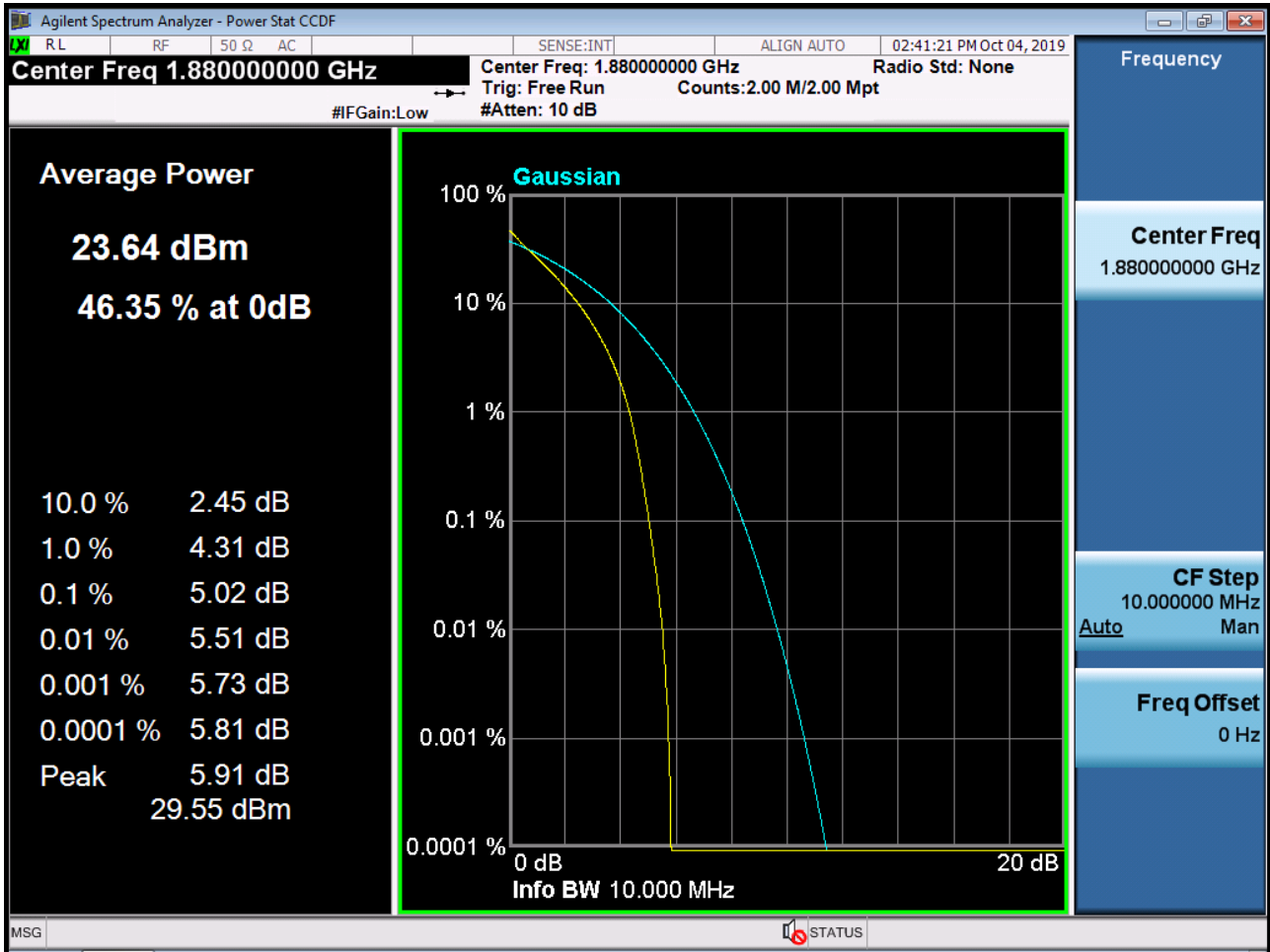
BAND 2. PAR Plot (5M BW Ch.18900 16QAM RB 25\_0)



BAND 2. PAR Plot (5M BW Ch.18900 64QAM RB 25\_0)

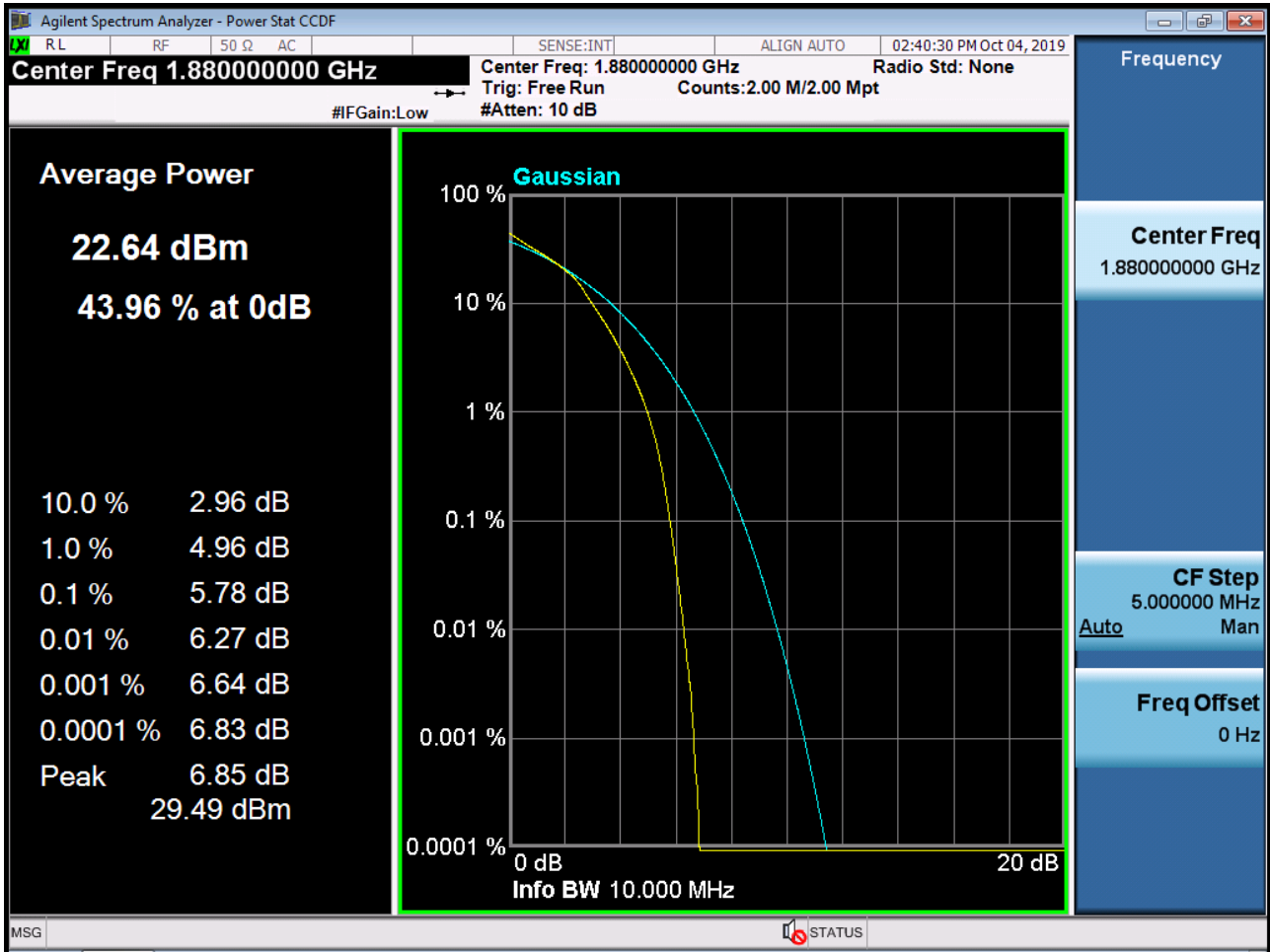


BAND 2. PAR Plot (10M BW Ch.18900 QPSK RB 50\_0)

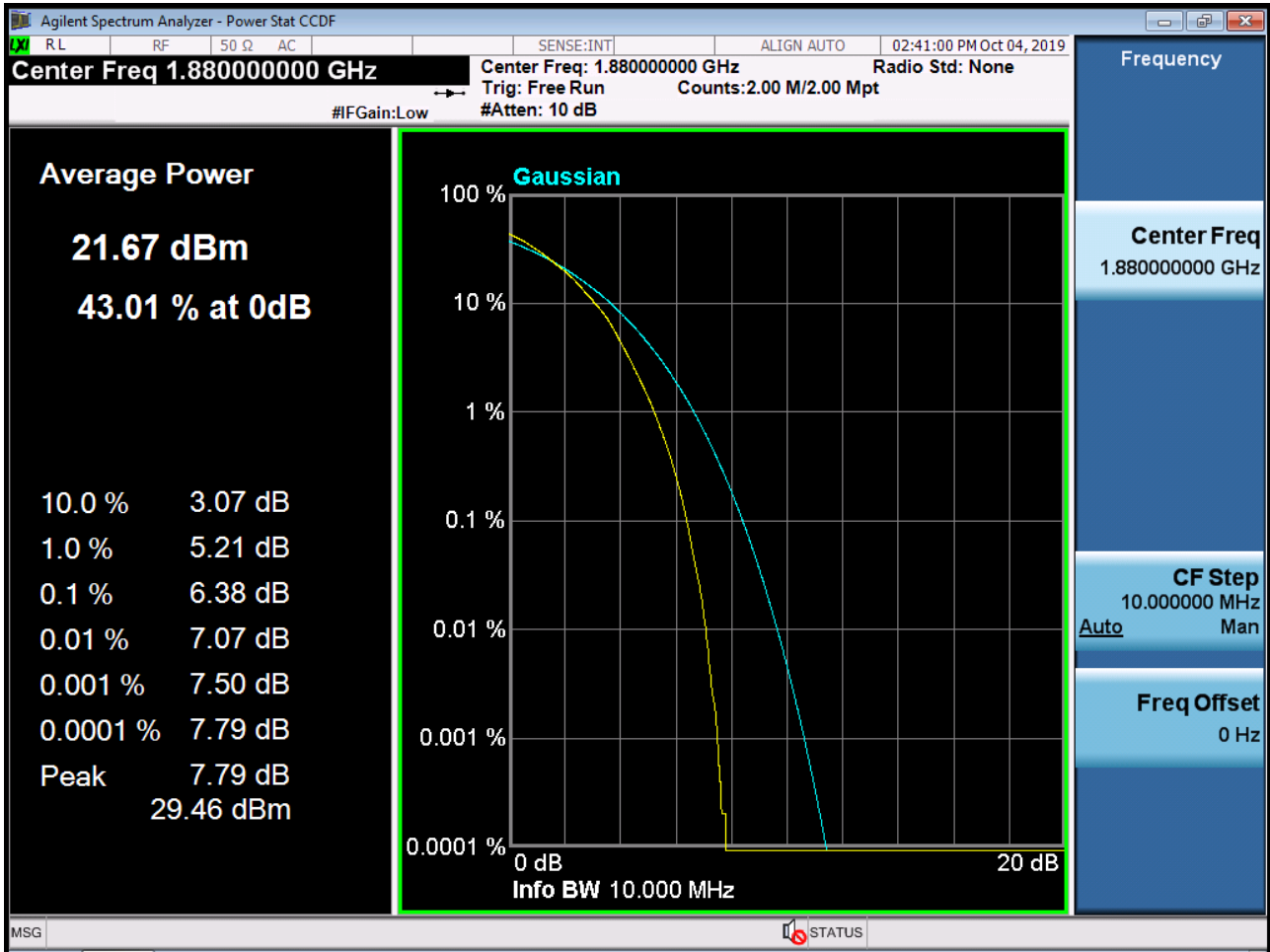




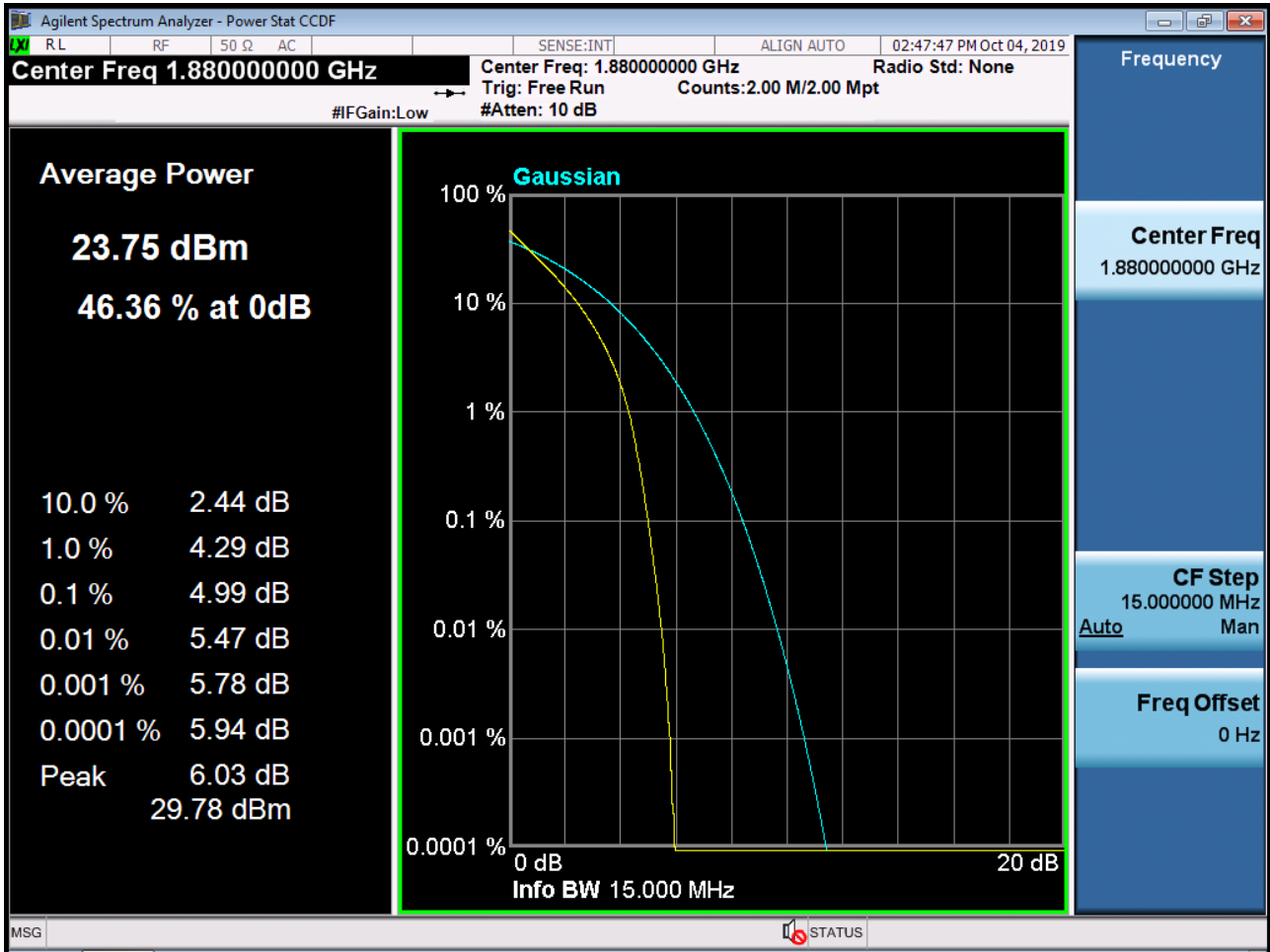
BAND 2. PAR Plot (10M BW Ch.18900 16QAM RB 50\_0)



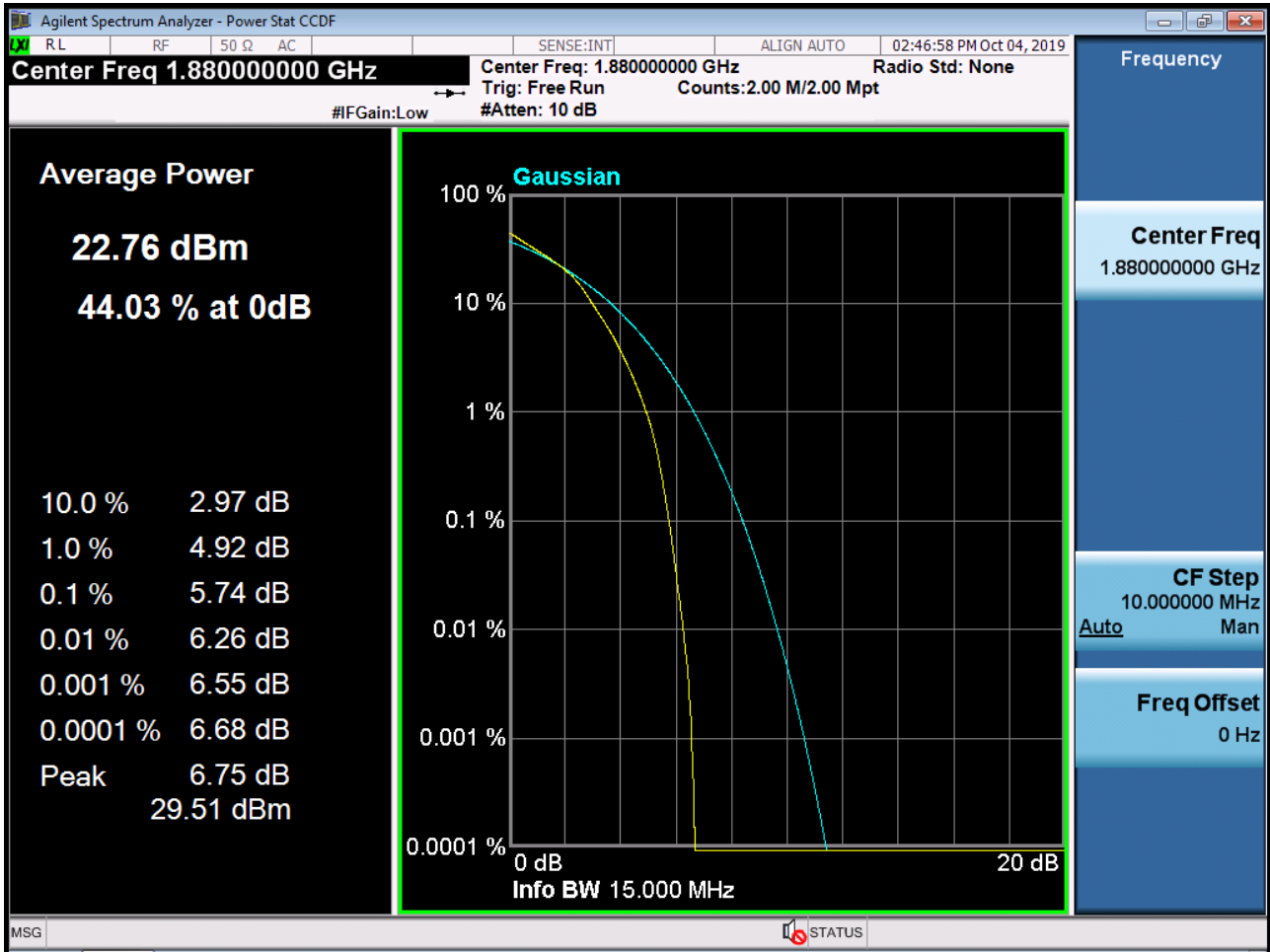
BAND 2. PAR Plot (10M BW Ch.18900 64QAM RB 50\_0)



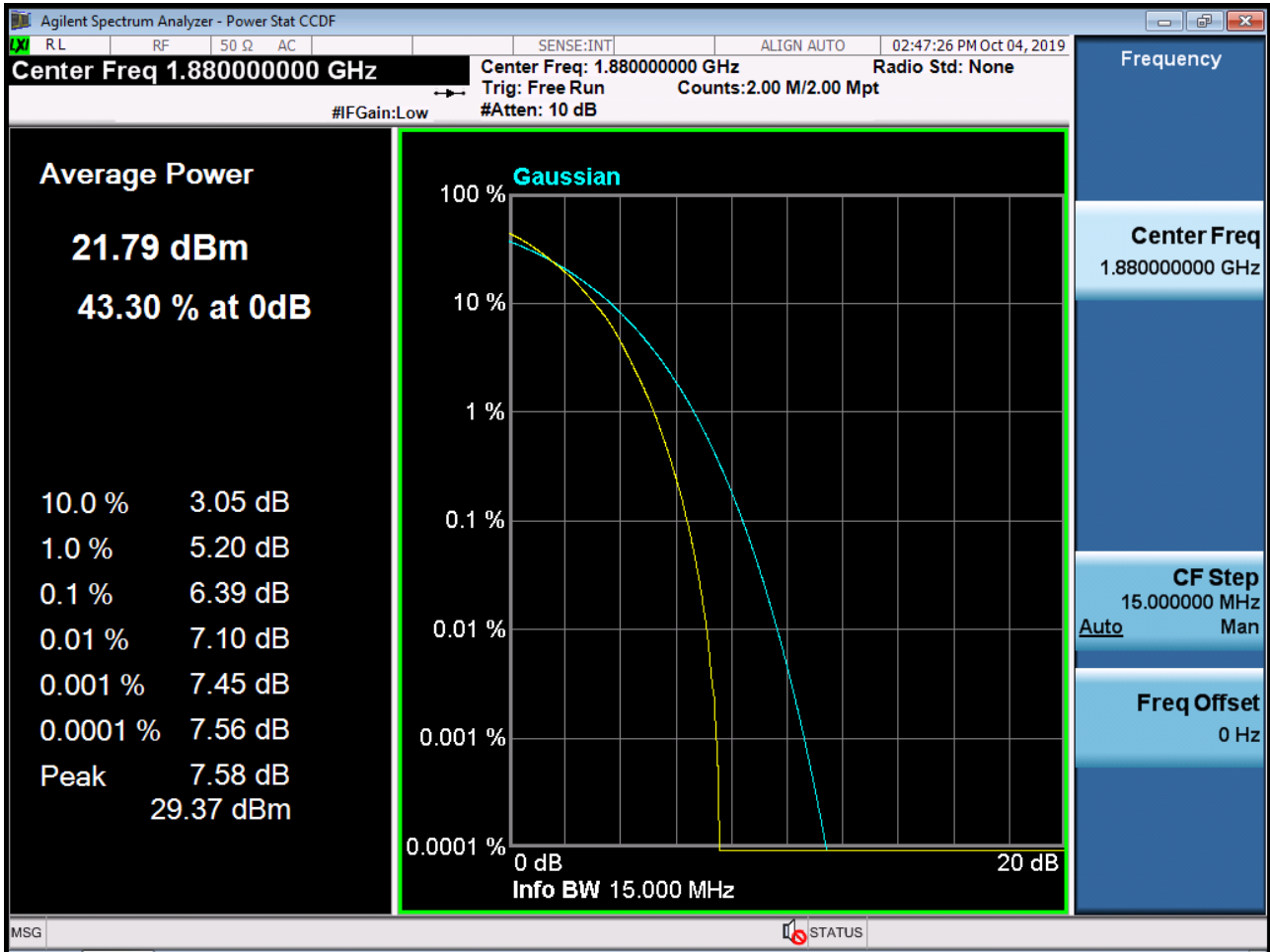
BAND 2. PAR Plot (15M BW Ch.18900 QPSK RB 75\_0)



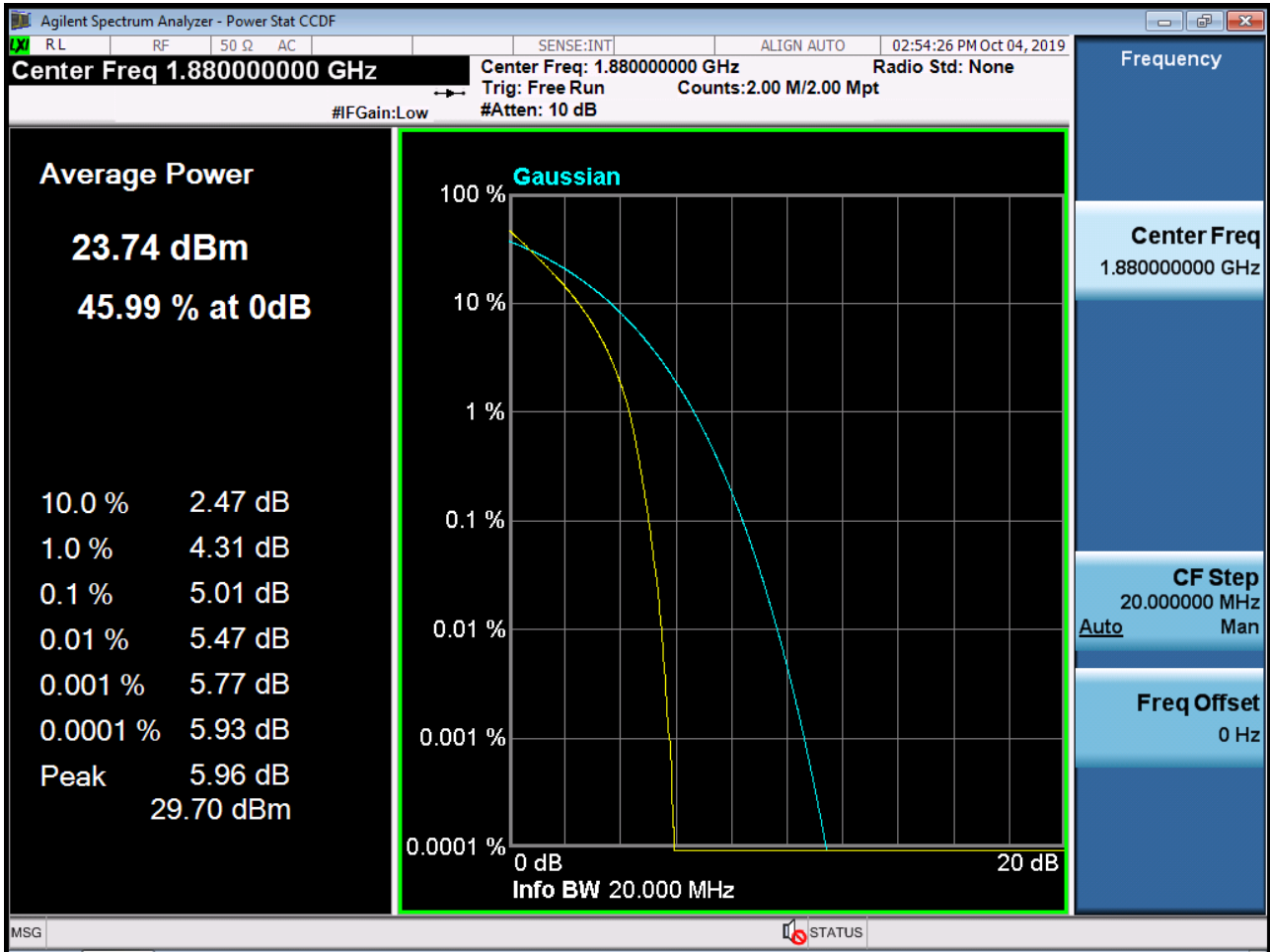
BAND 2. PAR Plot (15M BW Ch.18900 16QAM RB 75\_0)



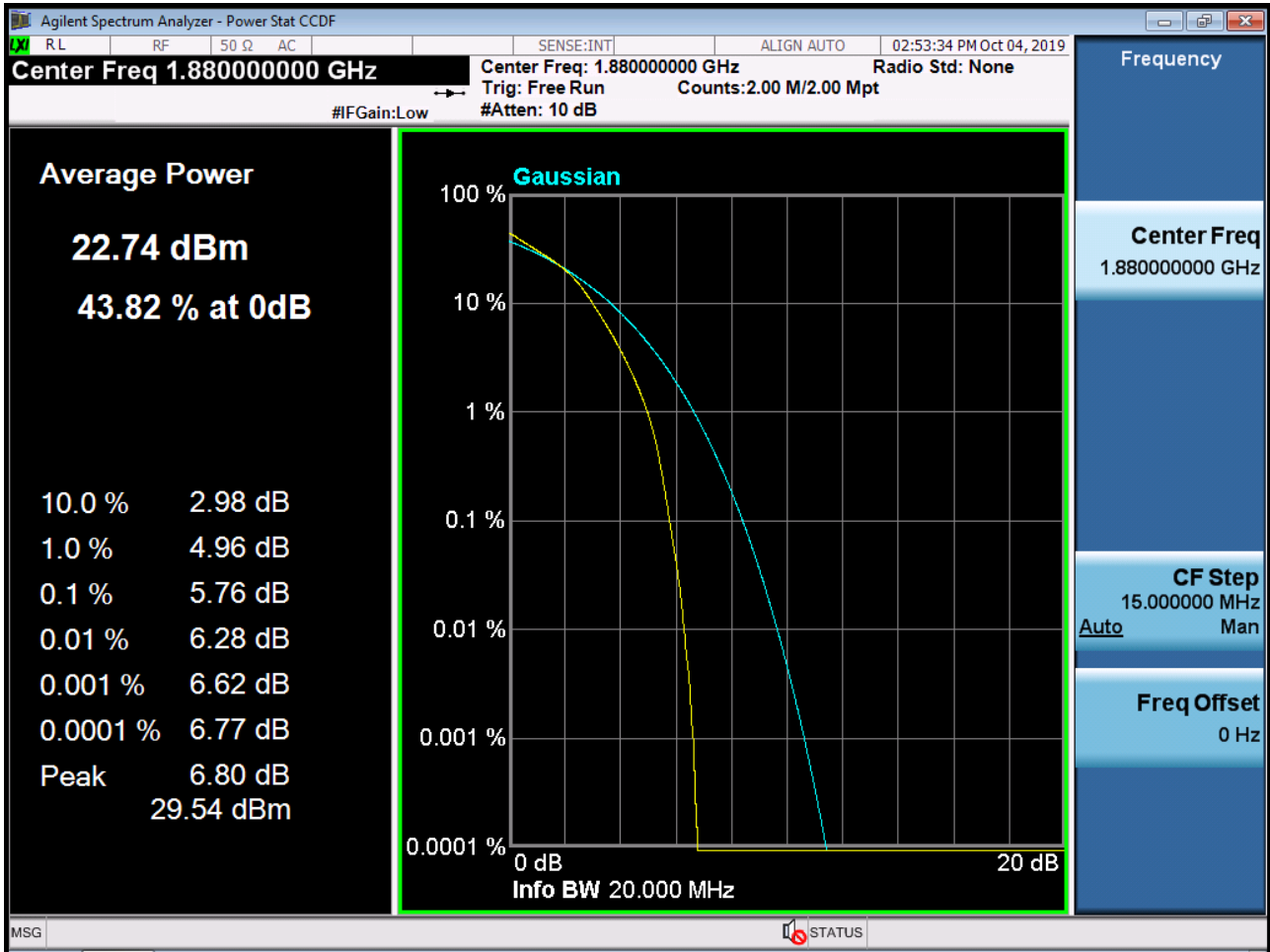
BAND 2. PAR Plot (15M BW Ch.18900 64QAM RB 75\_0)



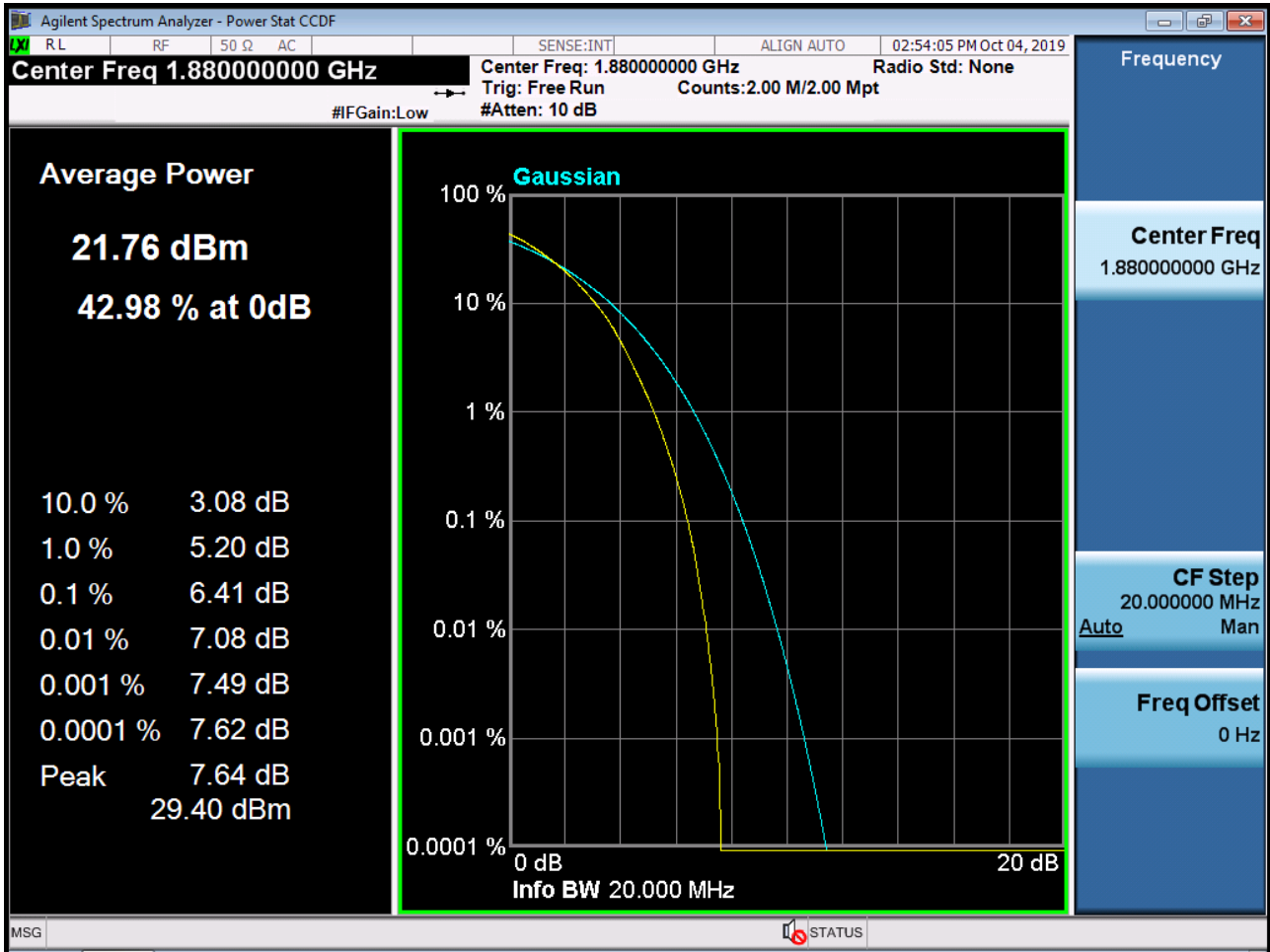
BAND 2. PAR Plot (20M BW Ch.18900 QPSK RB 100\_0)



BAND 2. PAR Plot (20M BW Ch.18900 16QAM RB 100\_0)

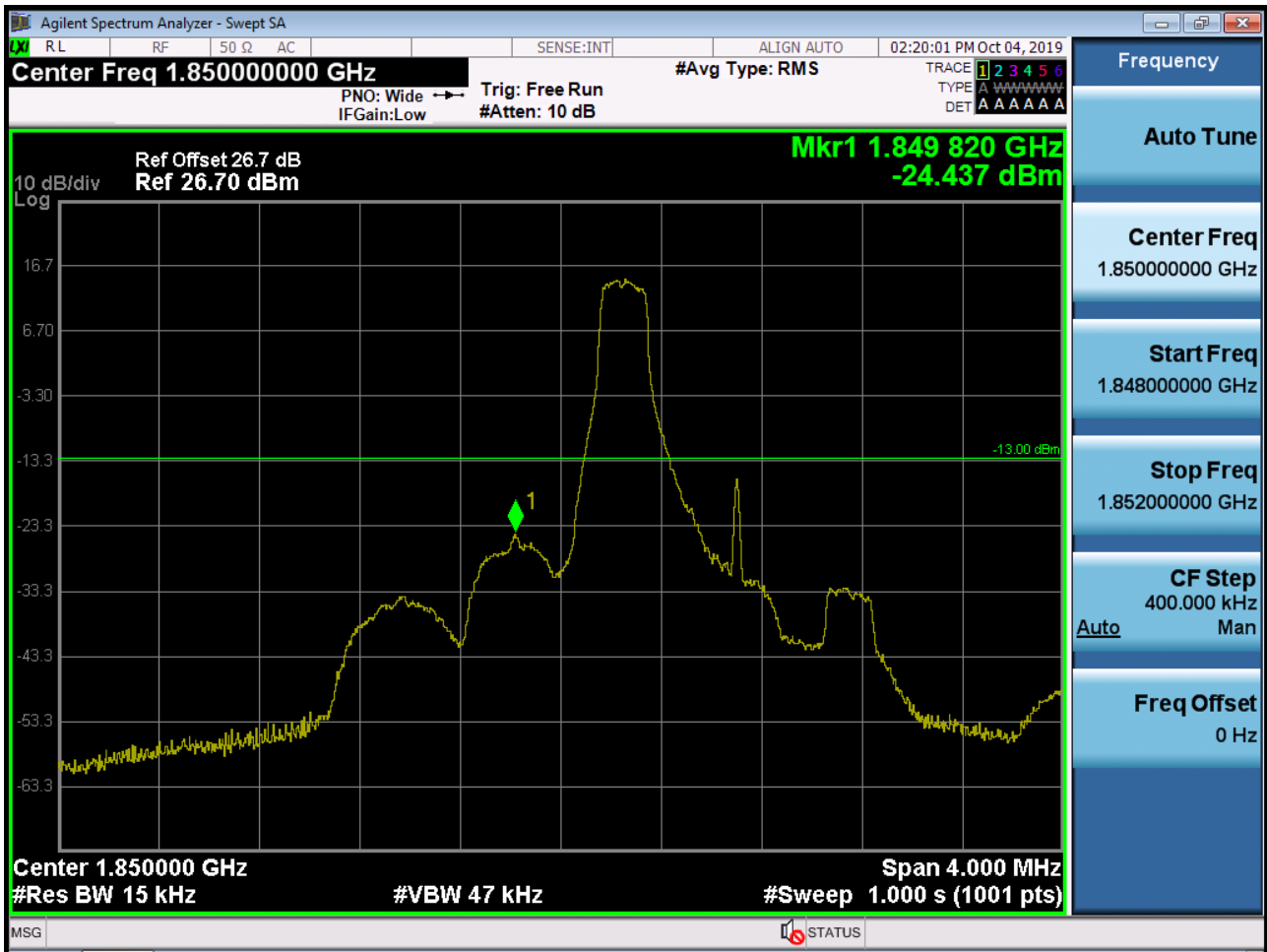


BAND 2. PAR Plot (20M BW Ch.18900 64QAM RB 100\_0)

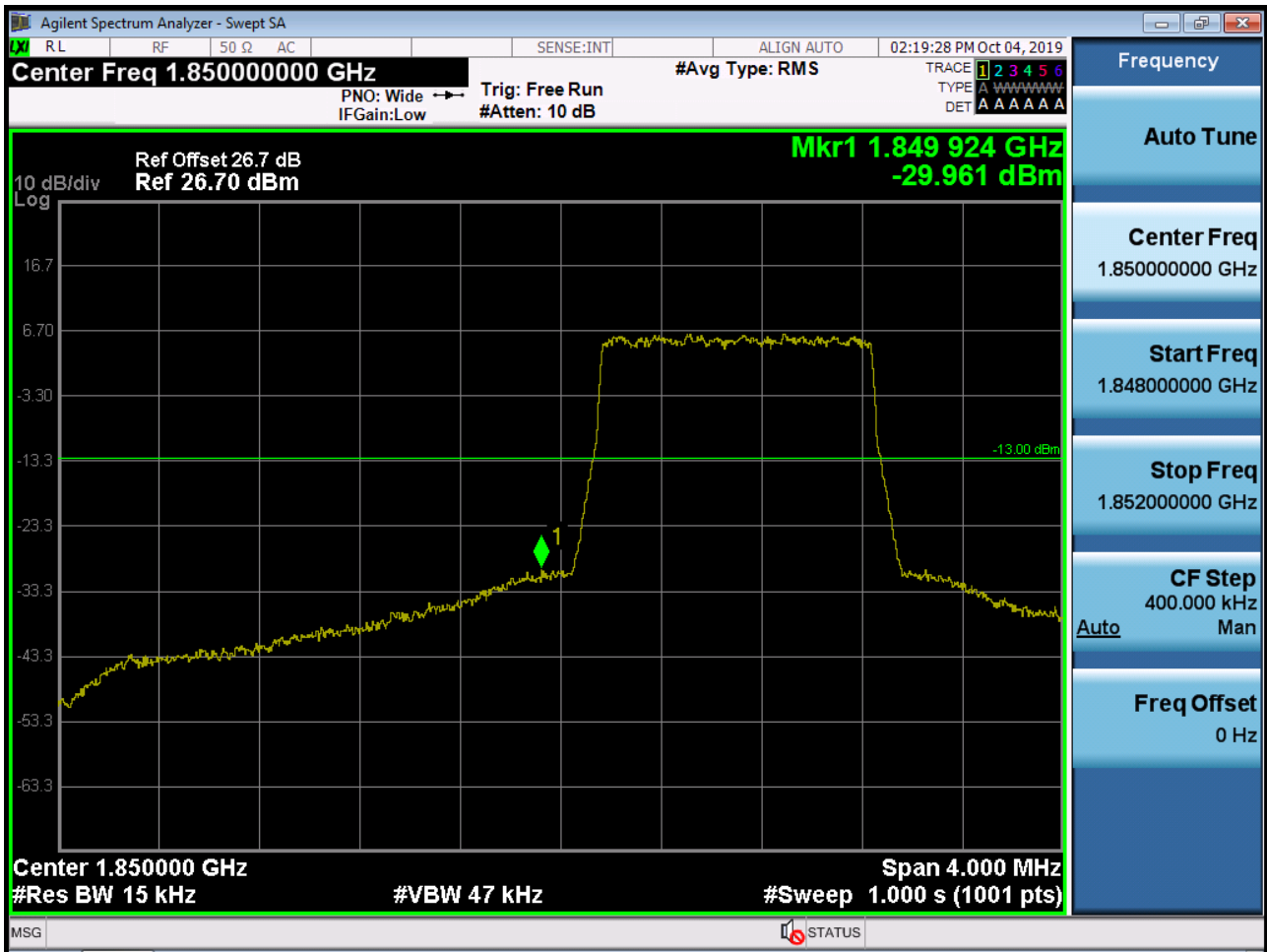




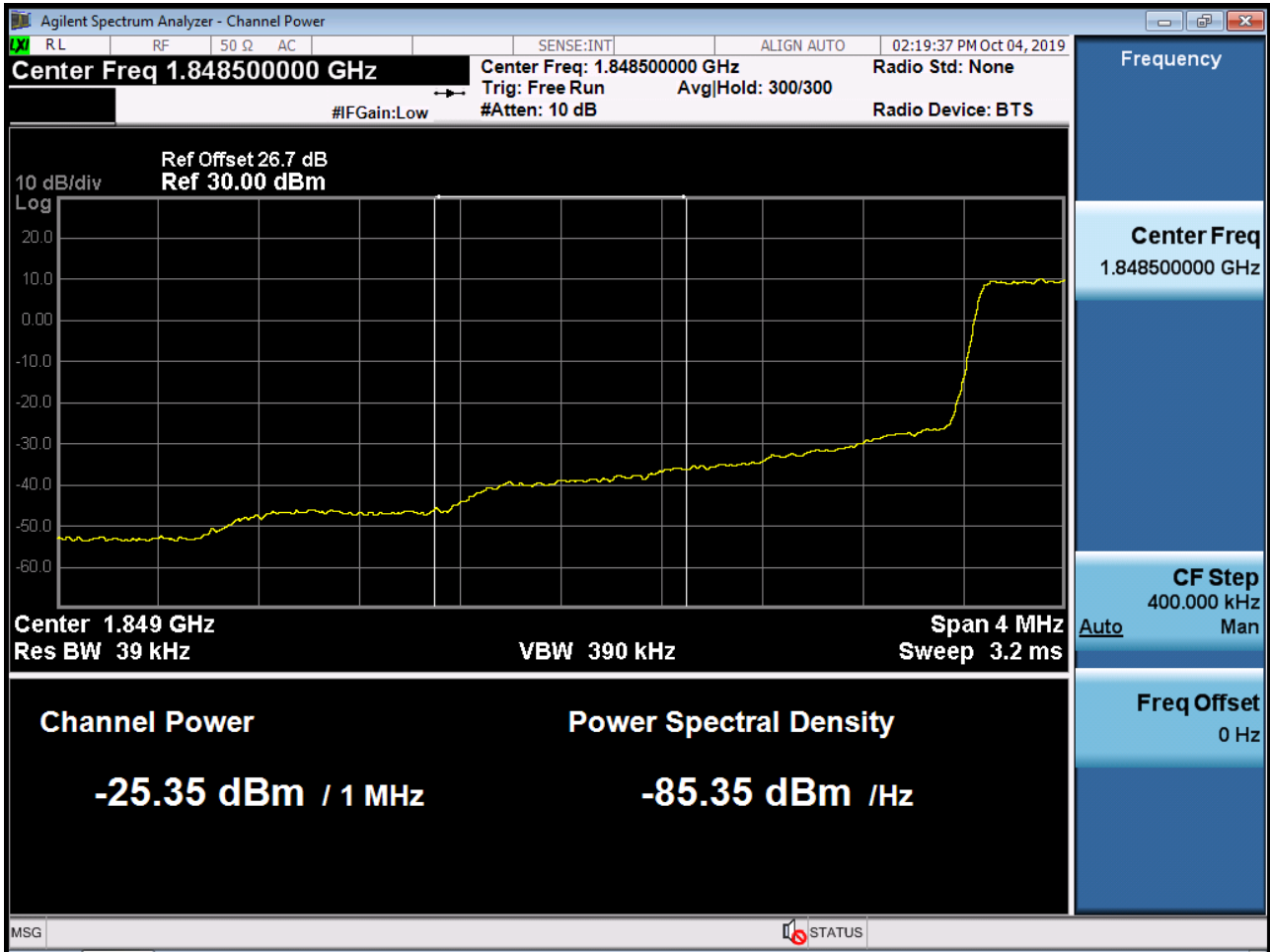
BAND 2. Lower Band Edge Plot (1.4M BW Ch.18607 QPSK\_RB1\_Offset 0) -1



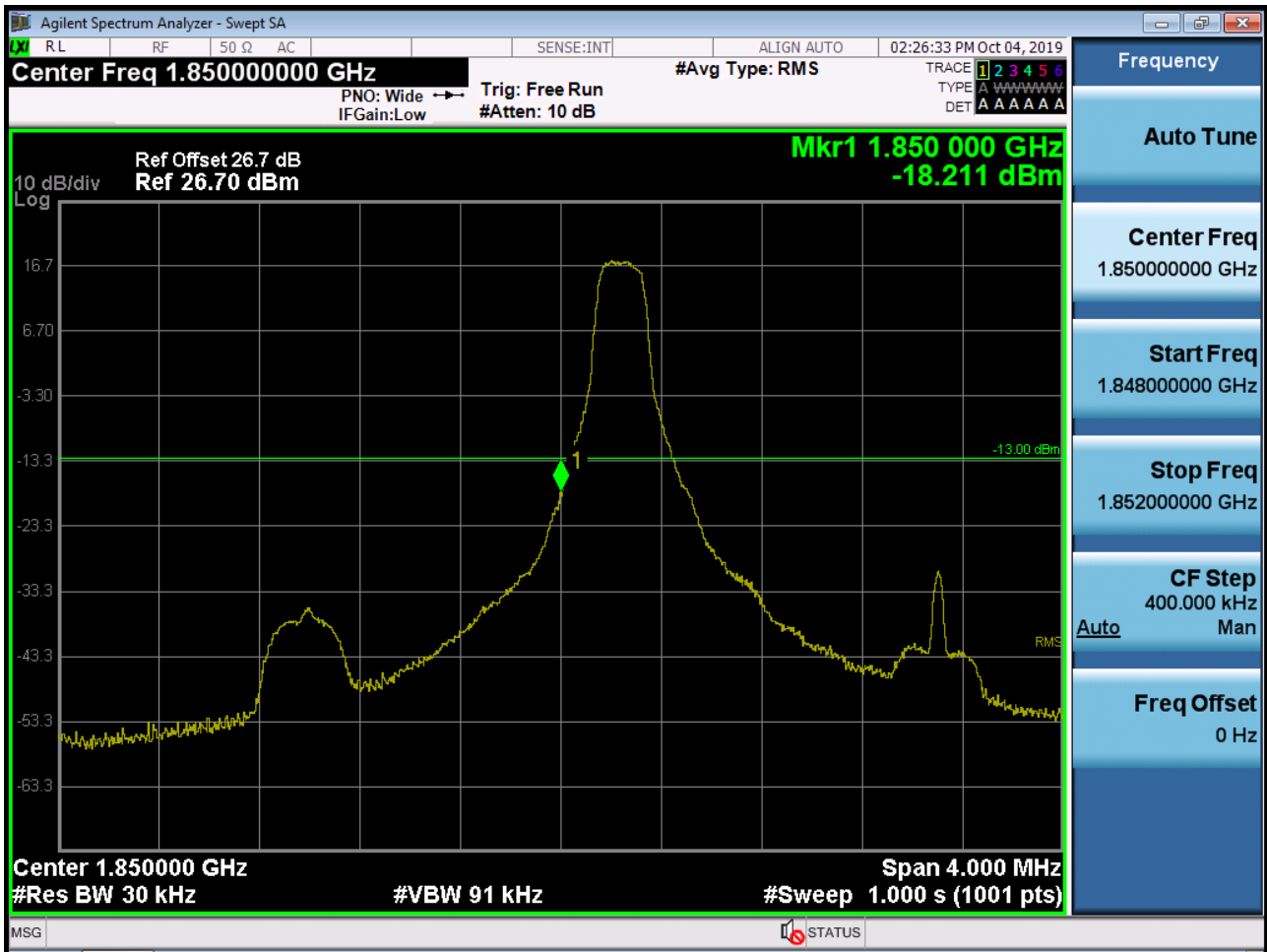
BAND 2. Lower Band Edge Plot (1.4M BW Ch.18607 QPSK\_RB6\_Offset 0) -2



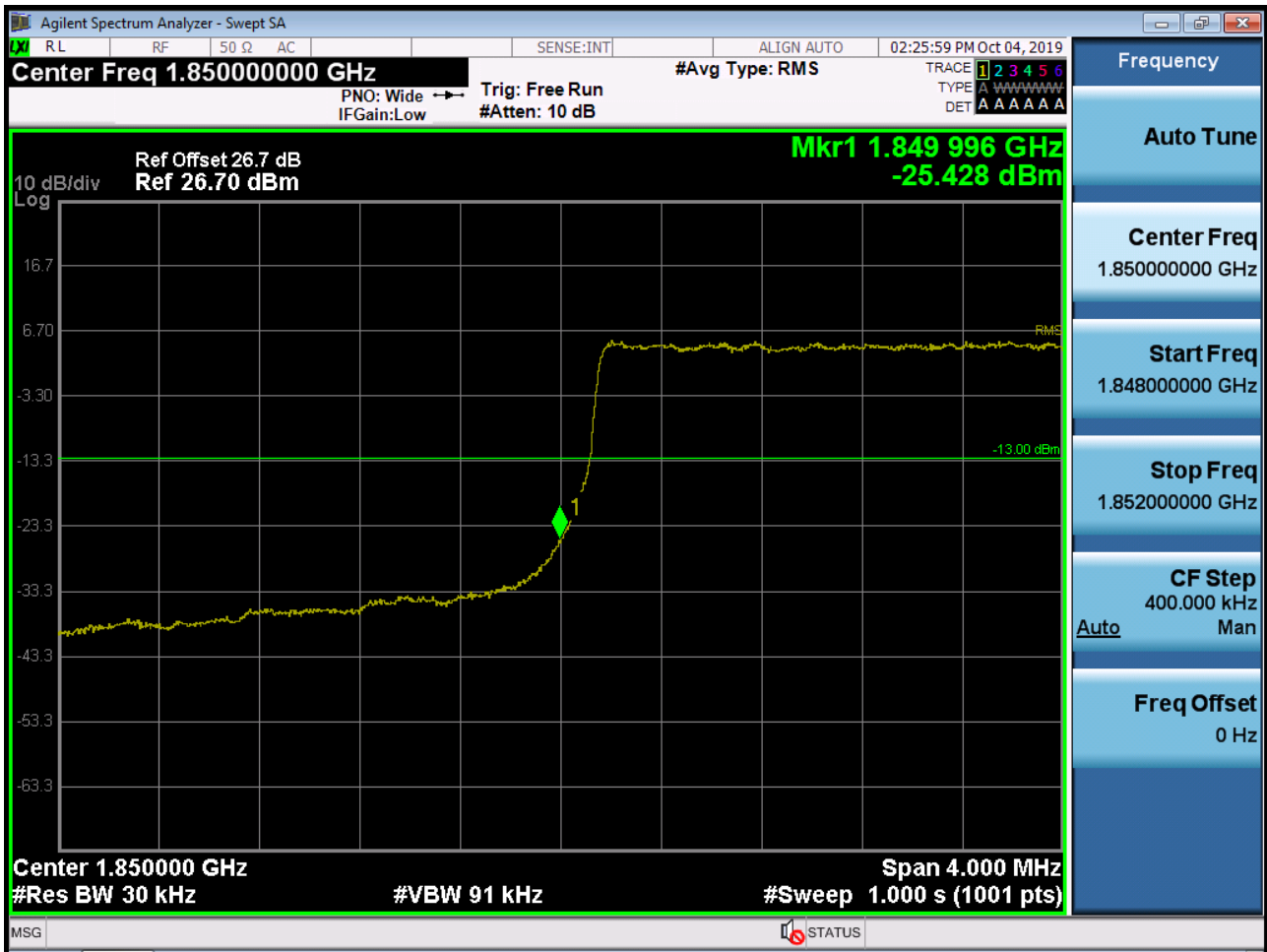
BAND 2. Lower Extended Band Edge Plot (1.4M BW Ch.18607 QPSK\_RB6\_0) -3



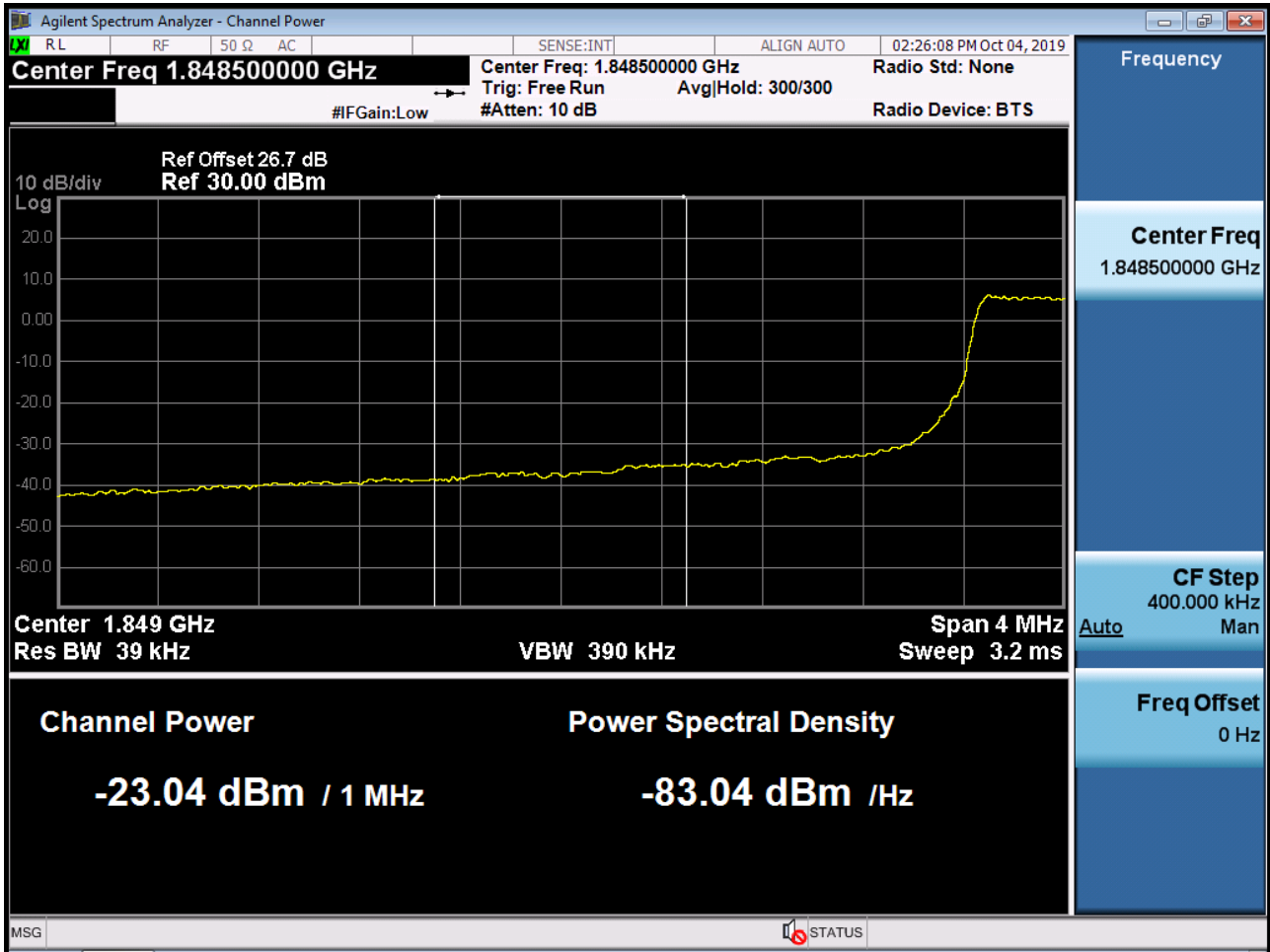
BAND 2. Lower Band Edge Plot (3M BW Ch.18615 QPSK\_RB1\_Offset 0) -1



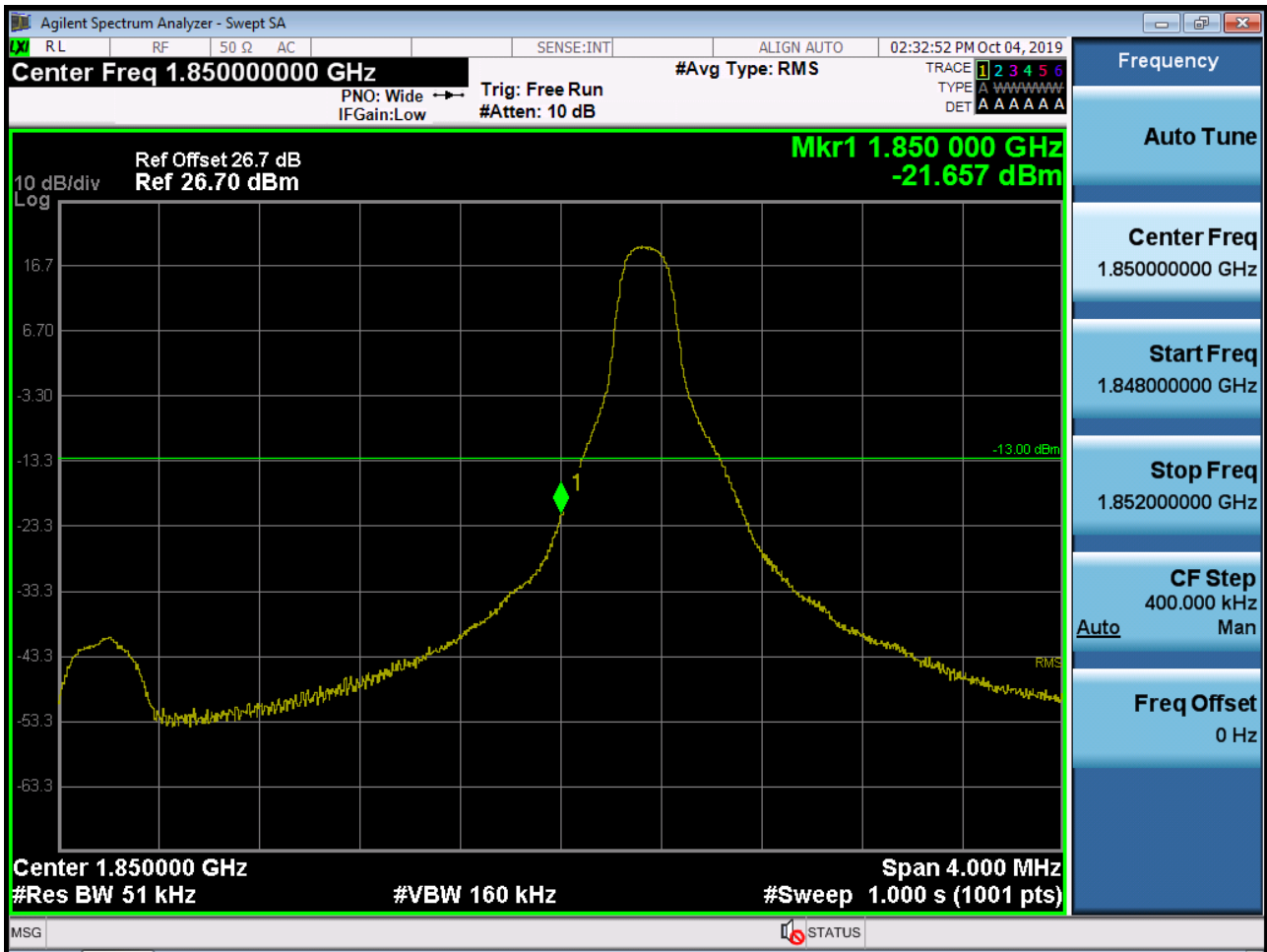
BAND 2. Lower Band Edge Plot (3M BW Ch.18615 QPSK\_RB15\_Offset 0) -2



BAND 2. Lower Extended Band Edge Plot (3M BW Ch.18615 QPSK\_RB15\_0) -3



BAND 2. Lower Band Edge Plot (5M BW Ch.18625 QPSK\_RB1\_Offset 0) -1



BAND 2. Lower Band Edge Plot (5M BW Ch.18625 QPSK\_RB25\_Offset 0) -2





BAND 2. Lower Extended Band Edge Plot (5M BW Ch.18625 QPSK\_RB25\_0) -3





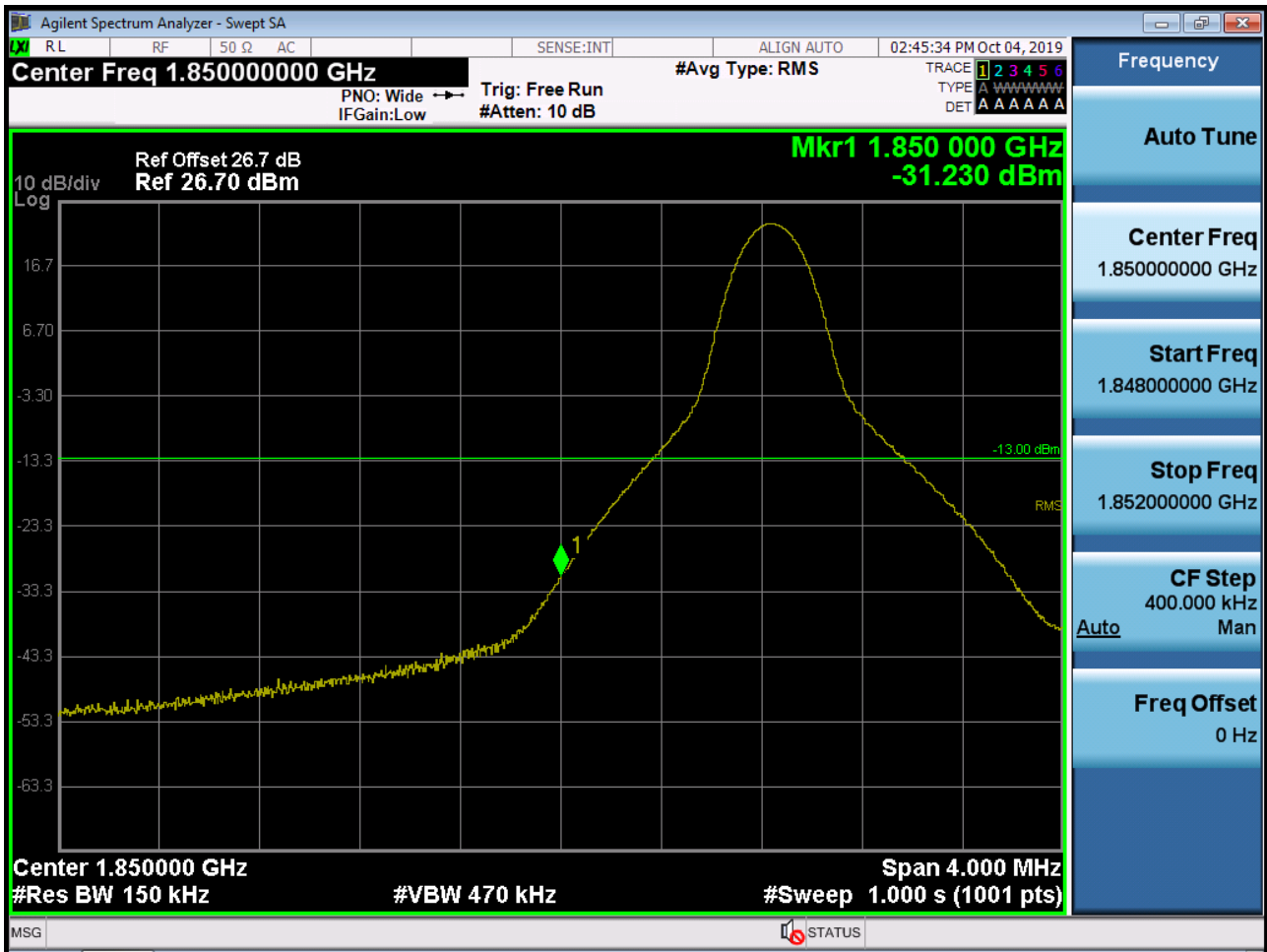
BAND 2. Lower Band Edge Plot (10M BW Ch.18650 QPSK\_RB50\_Offset 0) -2



BAND 2. Lower Extended Band Edge Plot (10M BW Ch.18650 QPSK\_RB50\_0) -3



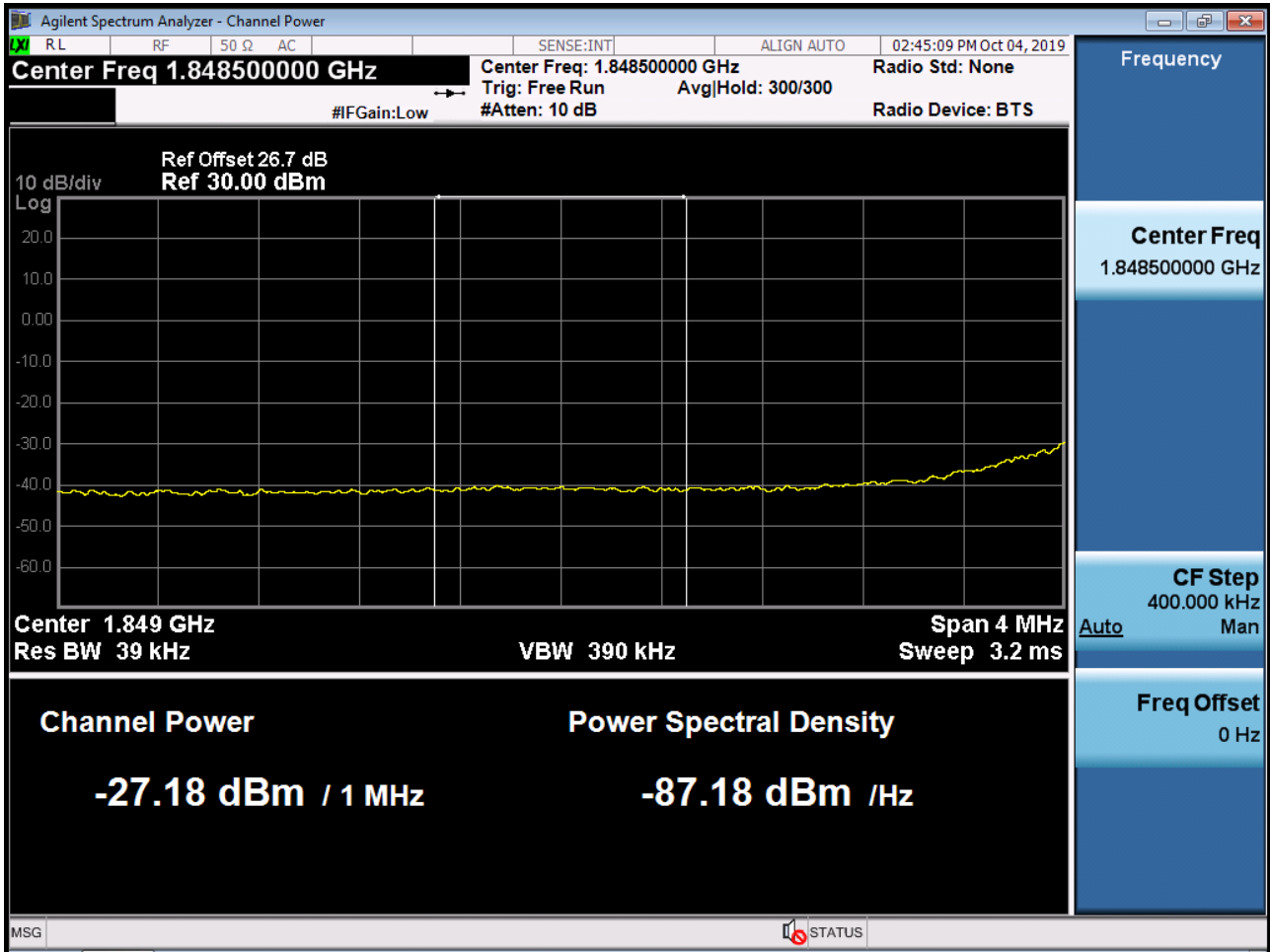
BAND 2. Lower Band Edge Plot (15M BW Ch.18675 QPSK\_RB75\_Offset 0) -1



BAND 2. Lower Band Edge Plot (15M BW Ch.18675 QPSK\_RB75\_Offset 0) -2



BAND 2. Lower Extended Band Edge Plot (15M BW Ch.18675 QPSK\_RB75\_0) -3



BAND 2. Lower Band Edge Plot (20M BW Ch.18700 QPSK\_RB1\_Offset 0) -1

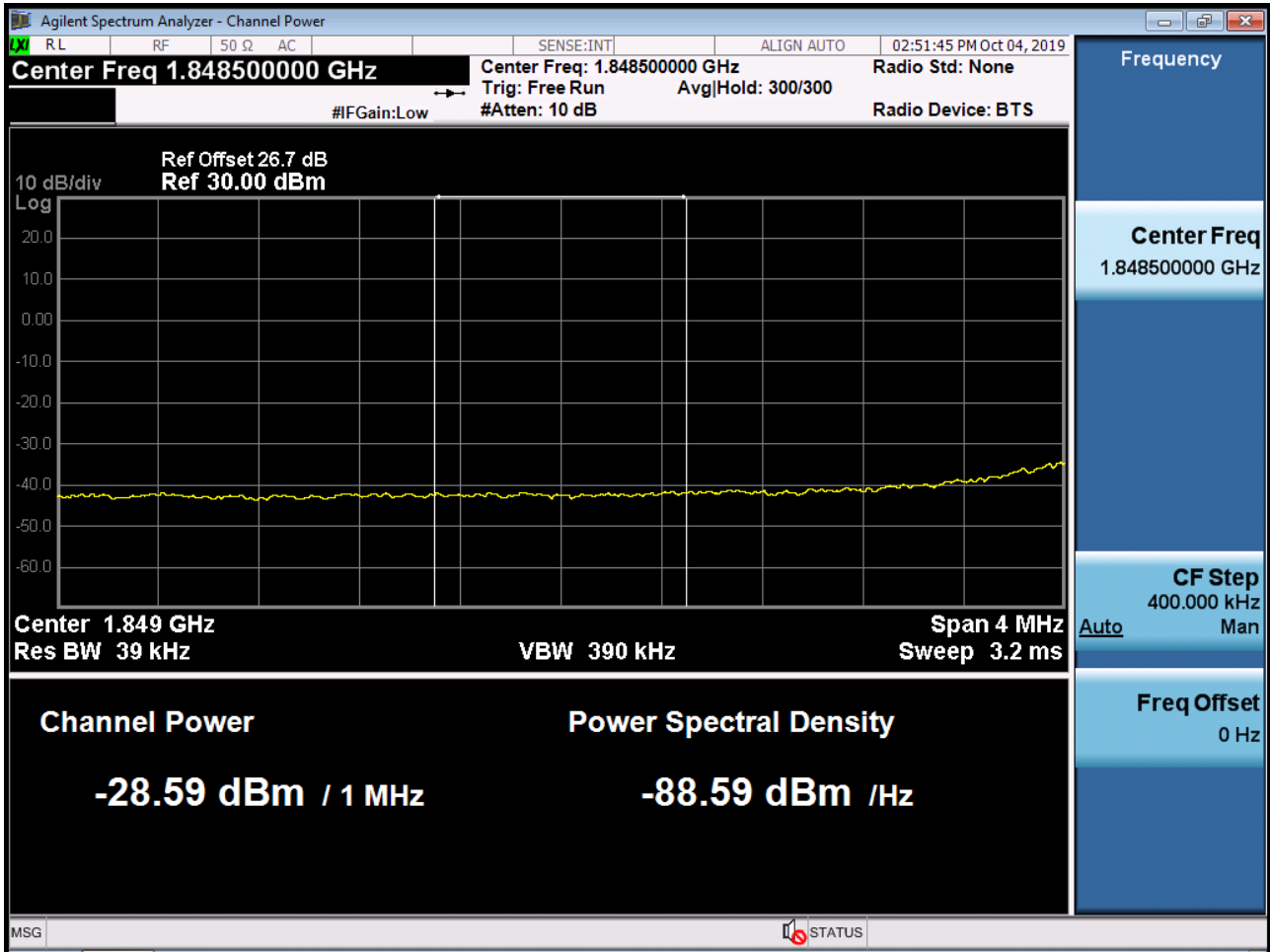




BAND 2. Lower Band Edge Plot (20M BW Ch.18700 QPSK\_RB100\_Offset 0) -2



BAND 2. Lower Extended Band Edge Plot (20M BW Ch.18700 QPSK\_RB100\_0) -3



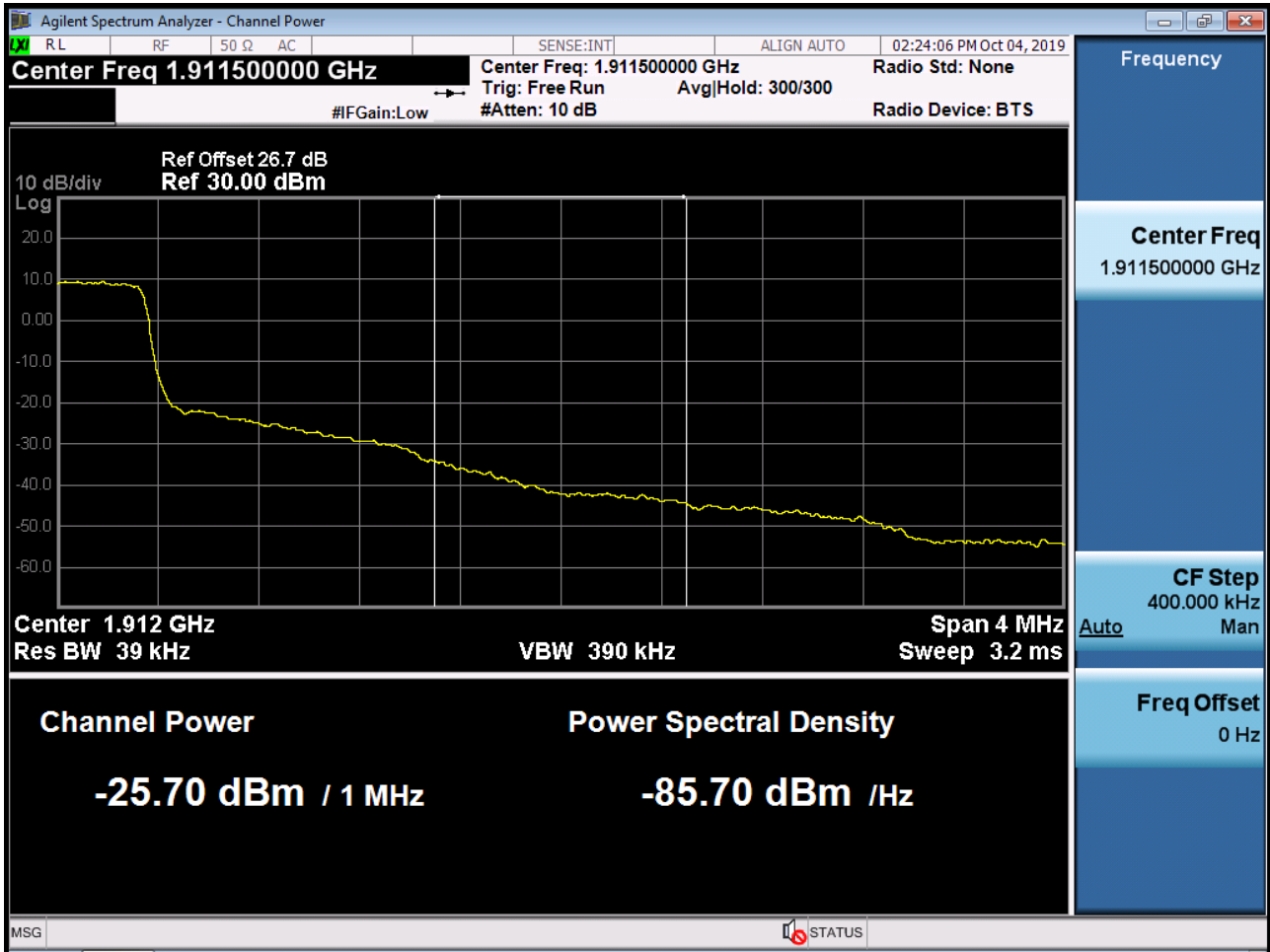
BAND 2. Upper Band Edge Plot (1.4M BW Ch.19193 QPSK\_RB1\_Offset 5) -1



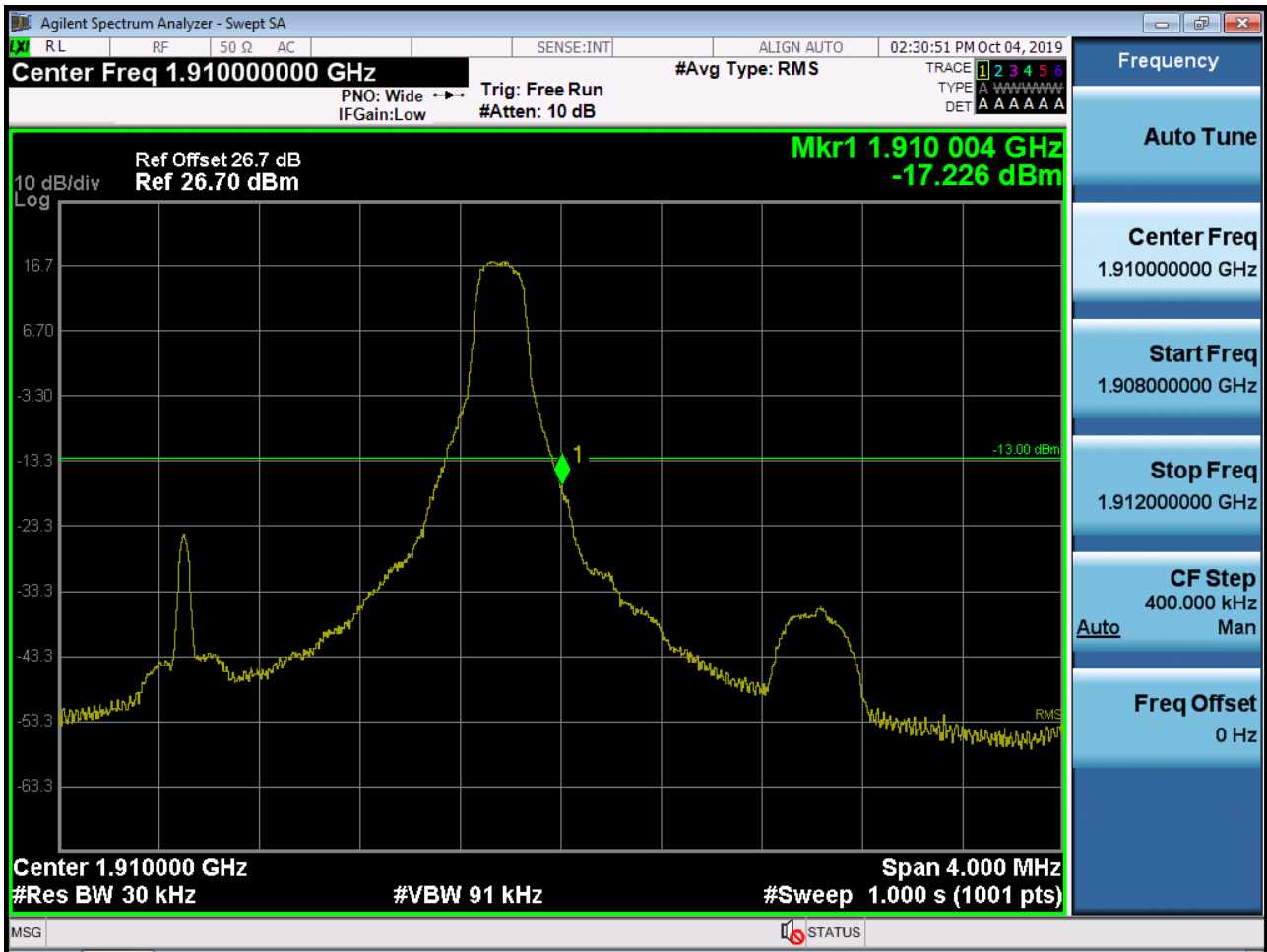
BAND 2. Upper Band Edge Plot (1.4M BW Ch.19193 QPSK\_RB6\_Offset 0) -2



BAND 2. Upper Extended Band Edge Plot (1.4M BW Ch.19193 QPSK\_RB6\_0) -3



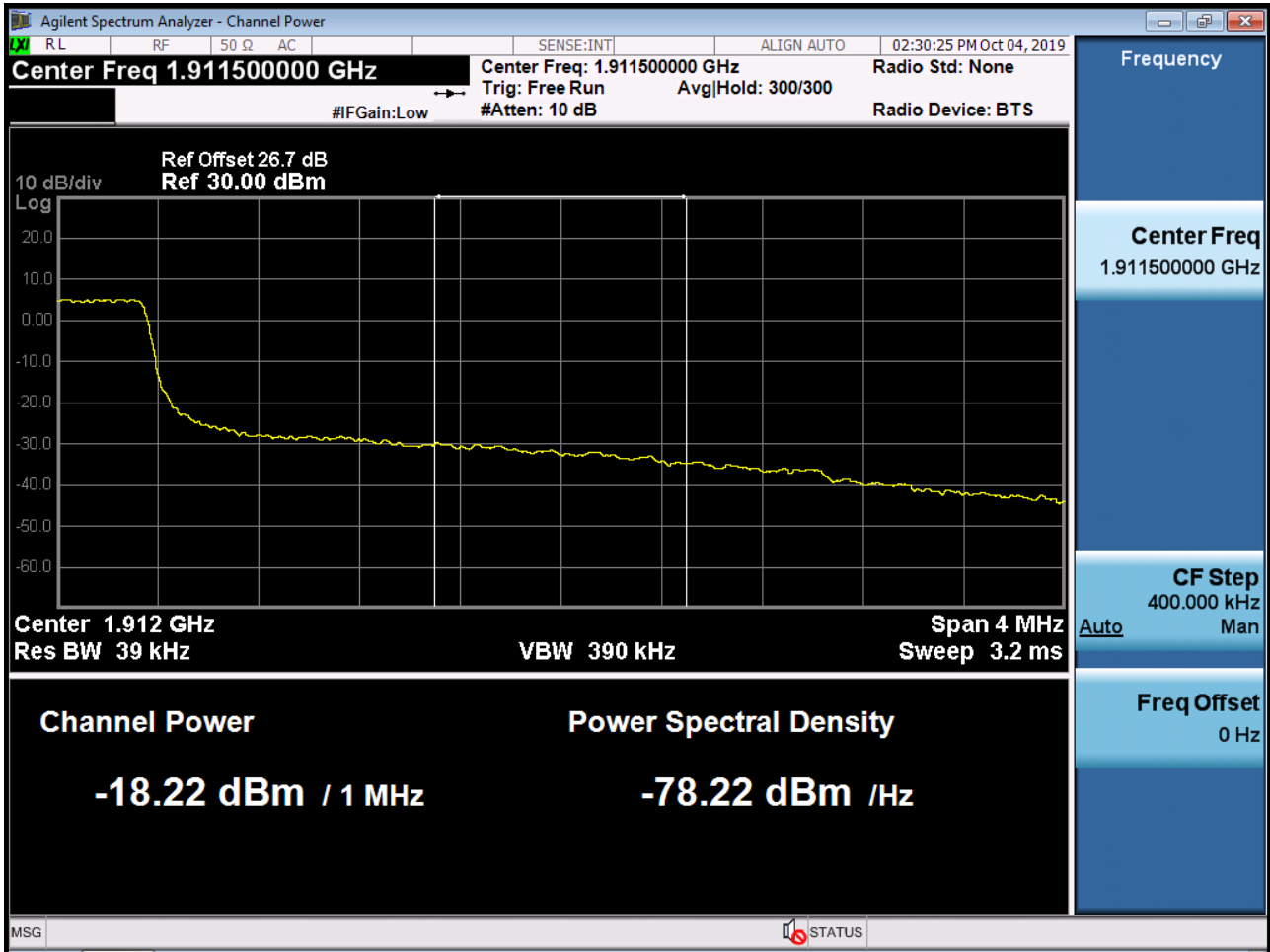
BAND 2. Upper Band Edge Plot (3M BW Ch.19185 QPSK\_RB1\_Offset 14) -1



BAND 2. Upper Band Edge Plot (3M BW Ch.19185 QPSK\_RB15\_Offset 0) -2

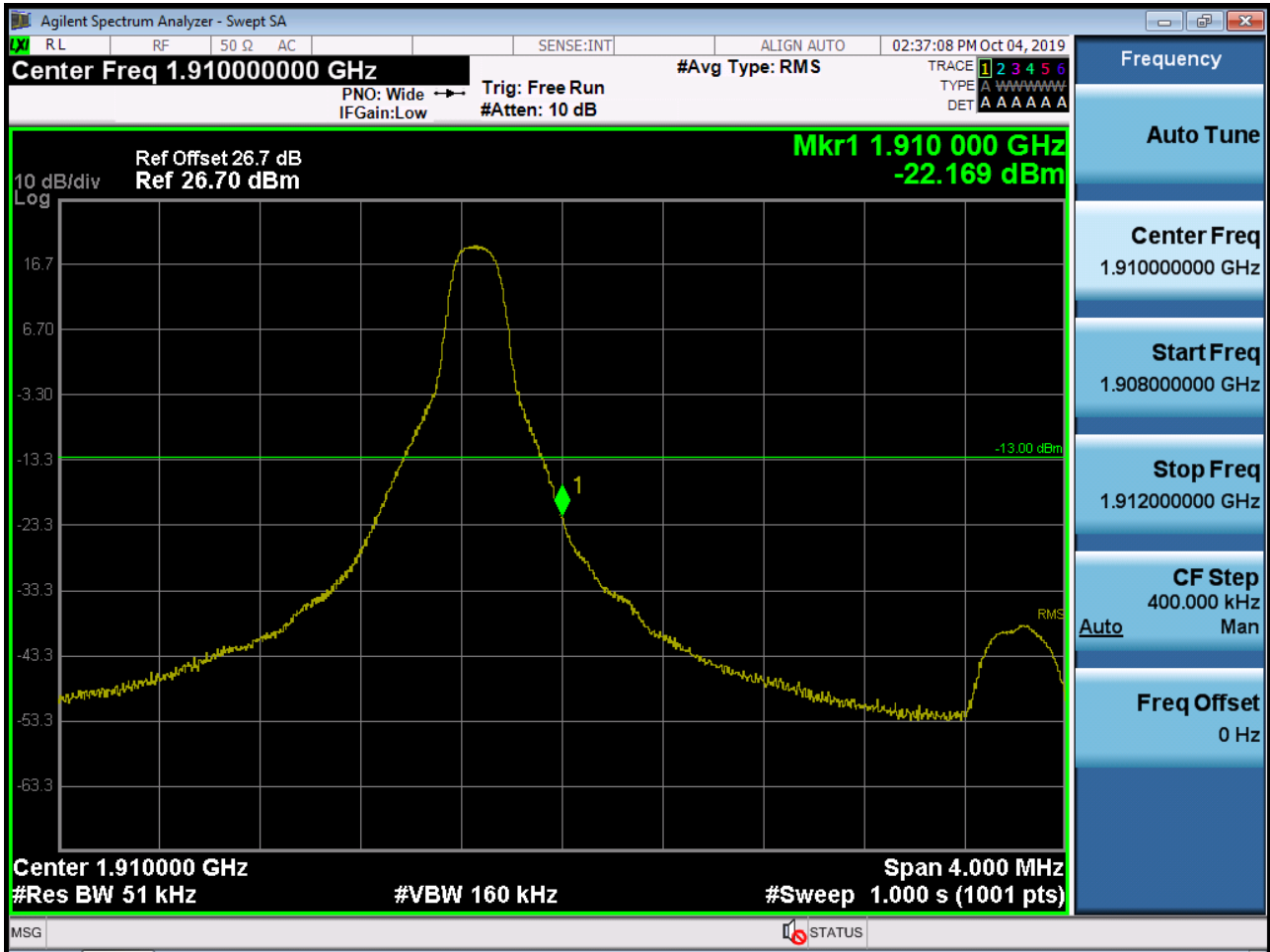


BAND 2. Upper Extended Band Edge Plot (3M BW Ch.19185 QPSK\_RB15 0) -3





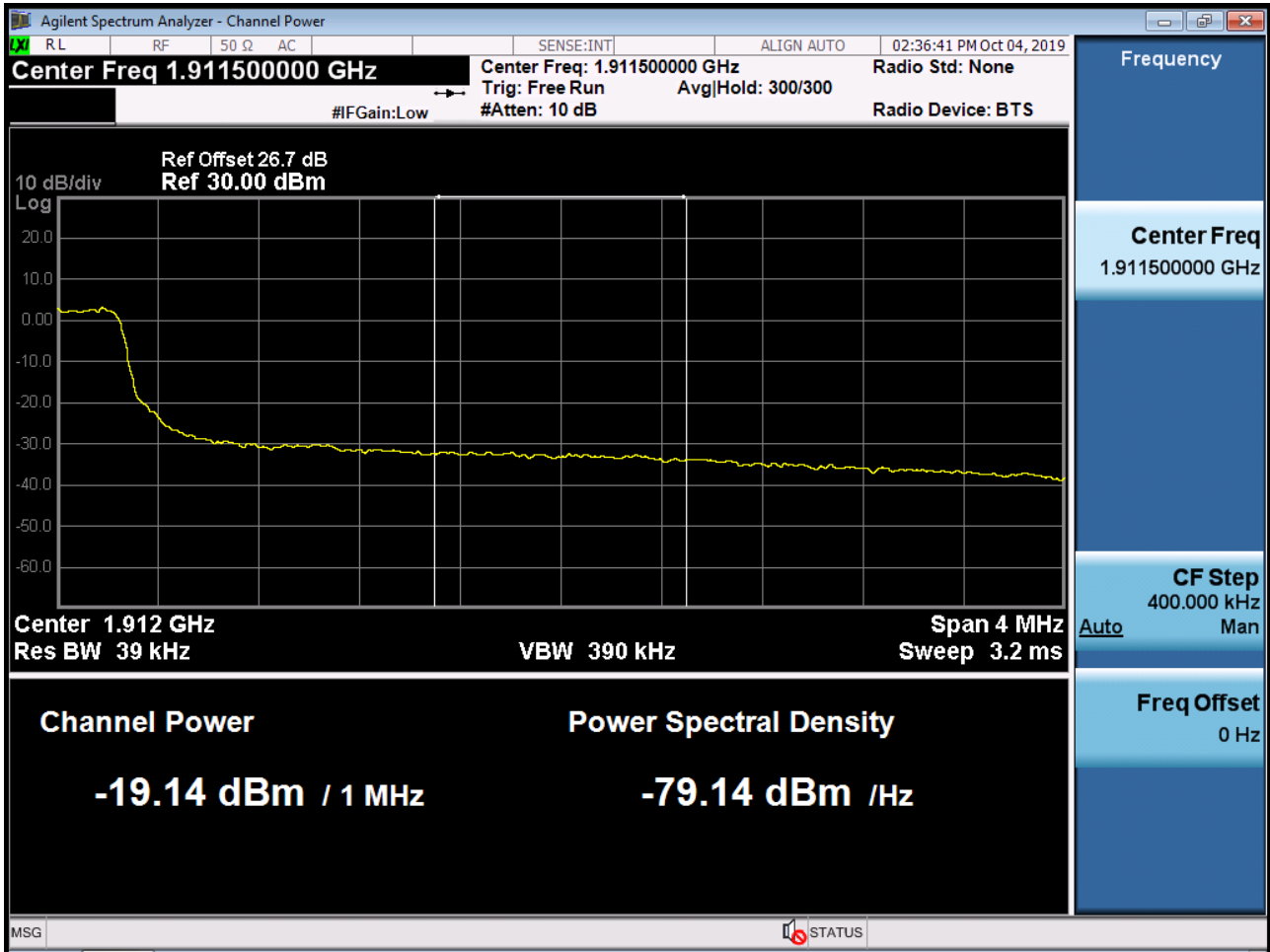
BAND 2. Upper Band Edge Plot (5M BW Ch.19175 QPSK\_RB1\_Offset 24) -1



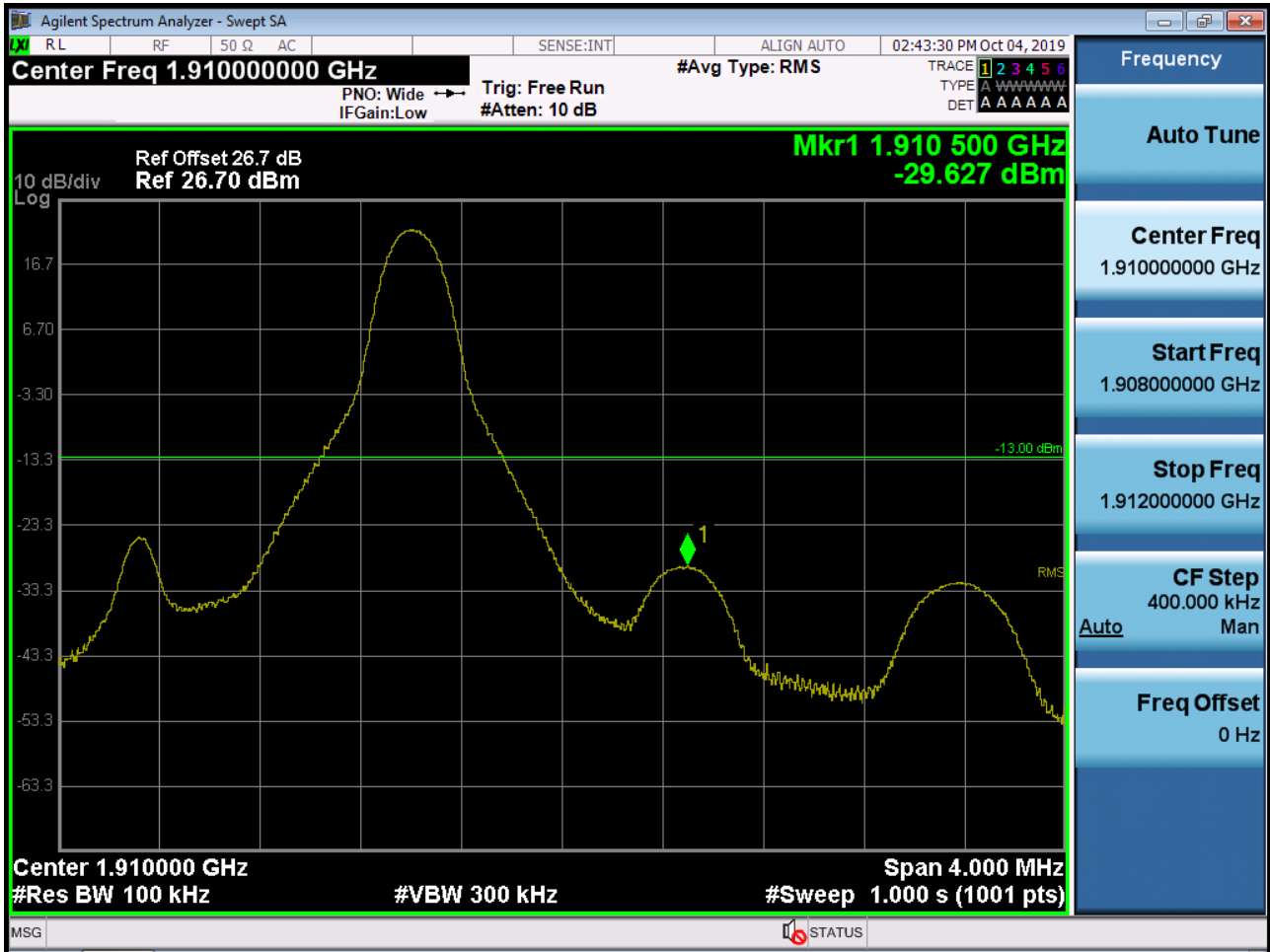
BAND 2. Upper Band Edge Plot (5M BW Ch.19175 QPSK\_RB25\_Offset 0) -2



BAND 2. Upper Extended Band Edge Plot (5M BW Ch.19175 QPSK\_RB25\_0) -3



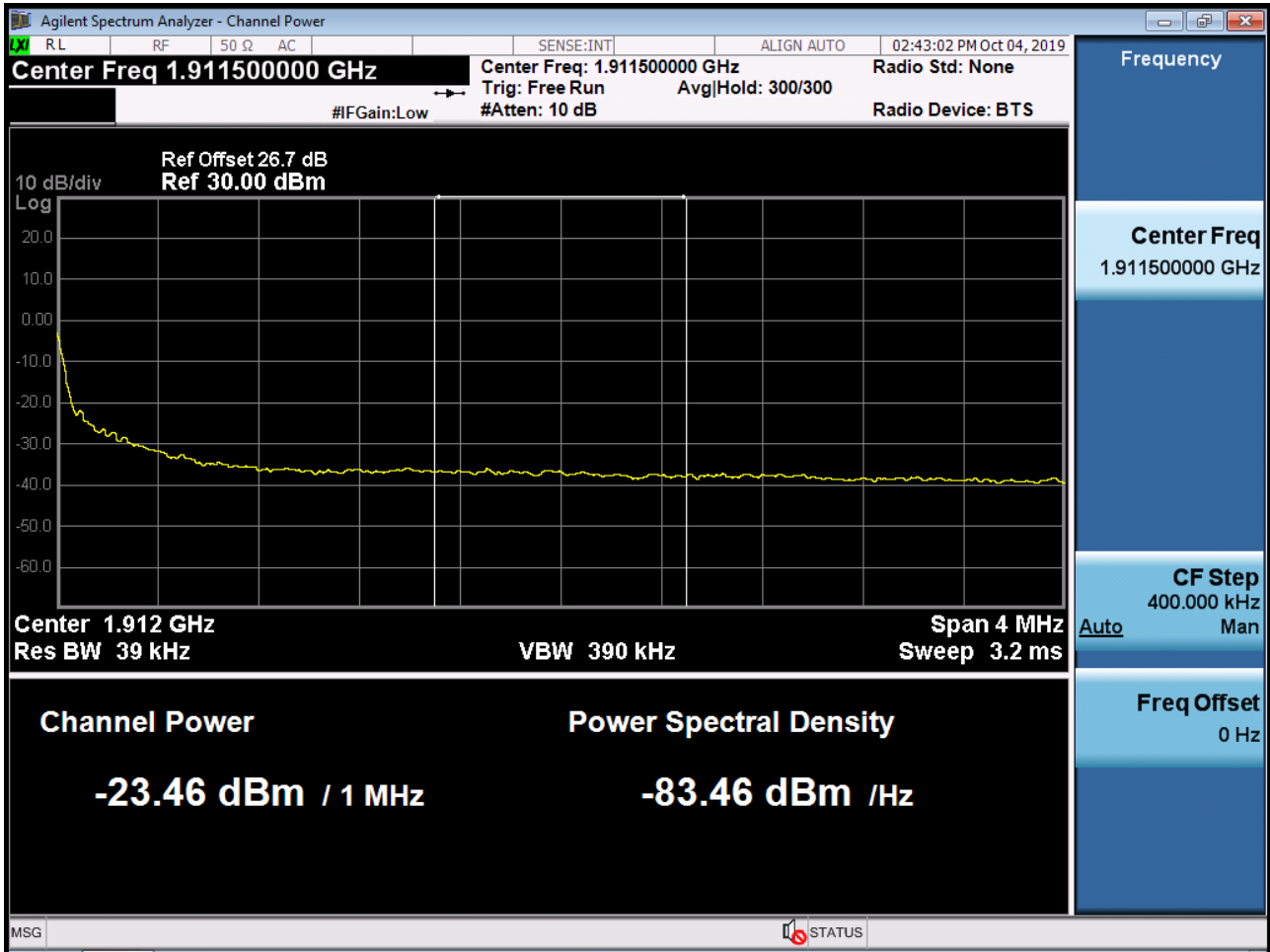
BAND 2. Upper Band Edge Plot (10M BW Ch.19150 QPSK\_RB1\_Offset 49) -1



BAND 2. Upper Band Edge Plot (10M BW Ch.19150 QPSK\_RB50\_Offset 0) -2



BAND 2. Upper Extended Band Edge Plot (10M BW Ch.19150 QPSK\_RB50\_0) -3



BAND 2. Upper Band Edge Plot (15M BW Ch.19125 QPSK\_RB1\_Offset 74) -1

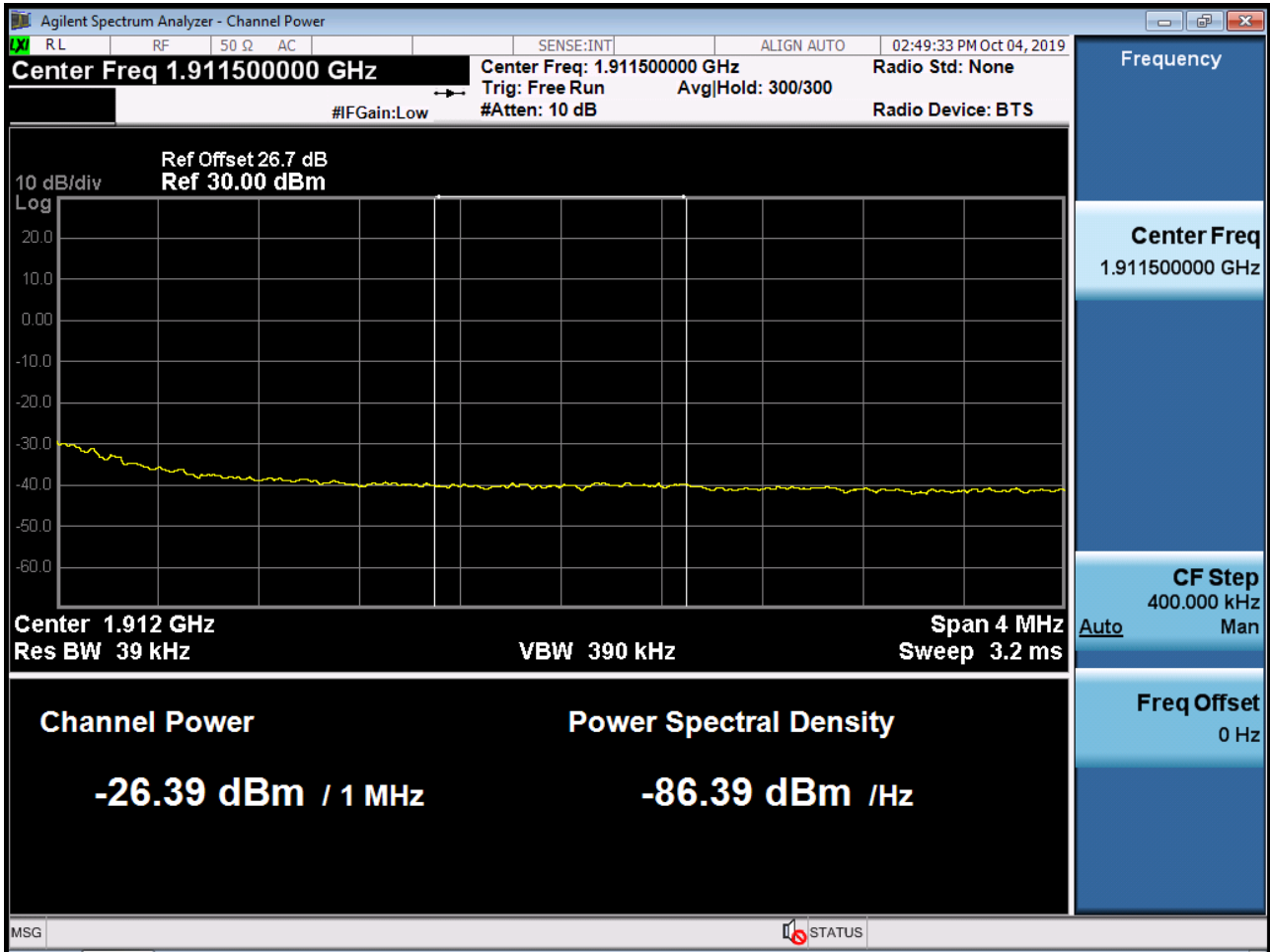


BAND 2. Upper Band Edge Plot (15M BW Ch.19125 QPSK\_RB75\_Offset 0) -2





BAND 2. Upper Extended Band Edge Plot (15M BW Ch.19125 QPSK\_RB75\_0) -3



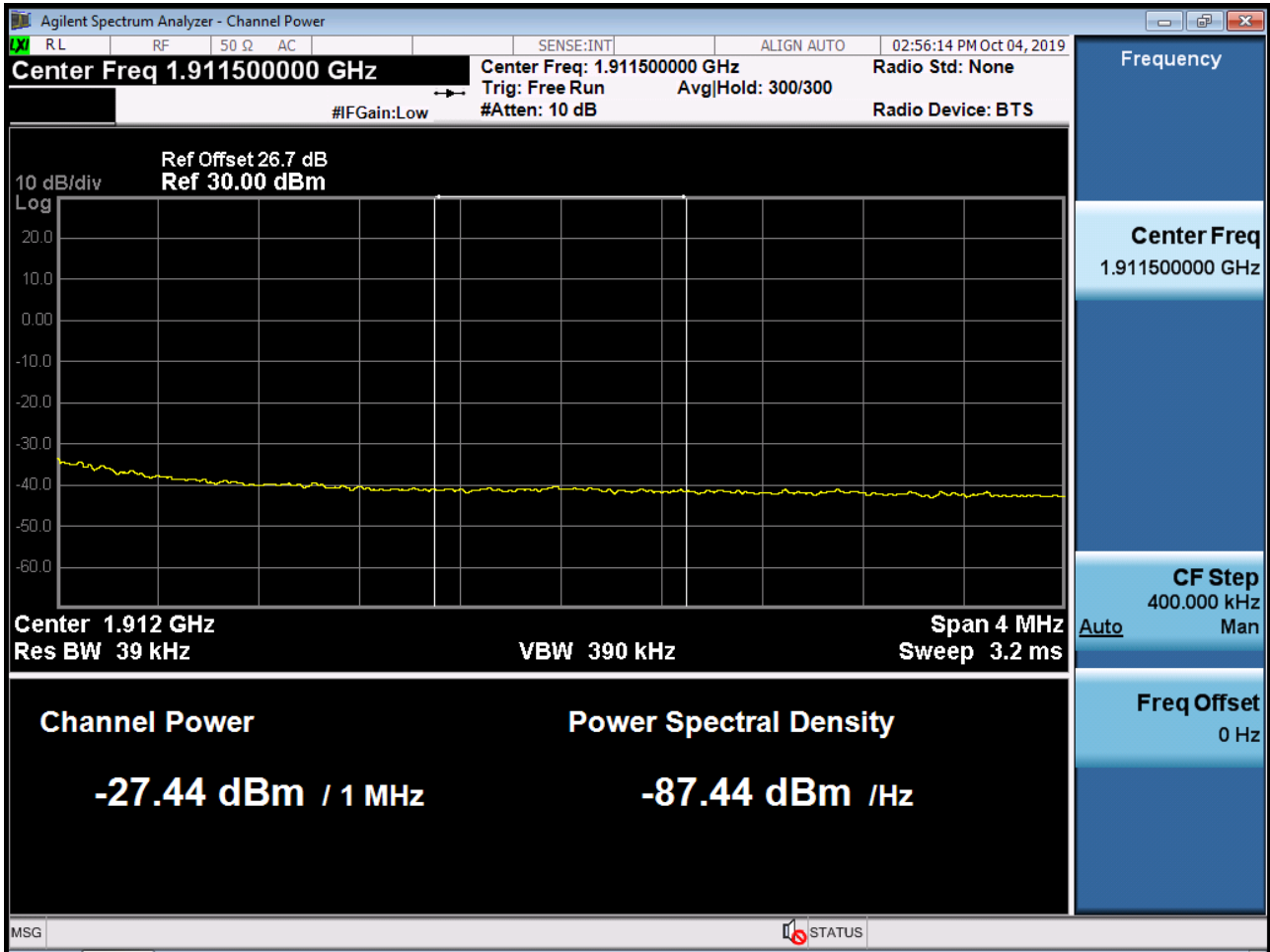
BAND 2. Upper Band Edge Plot (20M BW Ch.19100 QPSK\_RB1\_Offset 99) -1



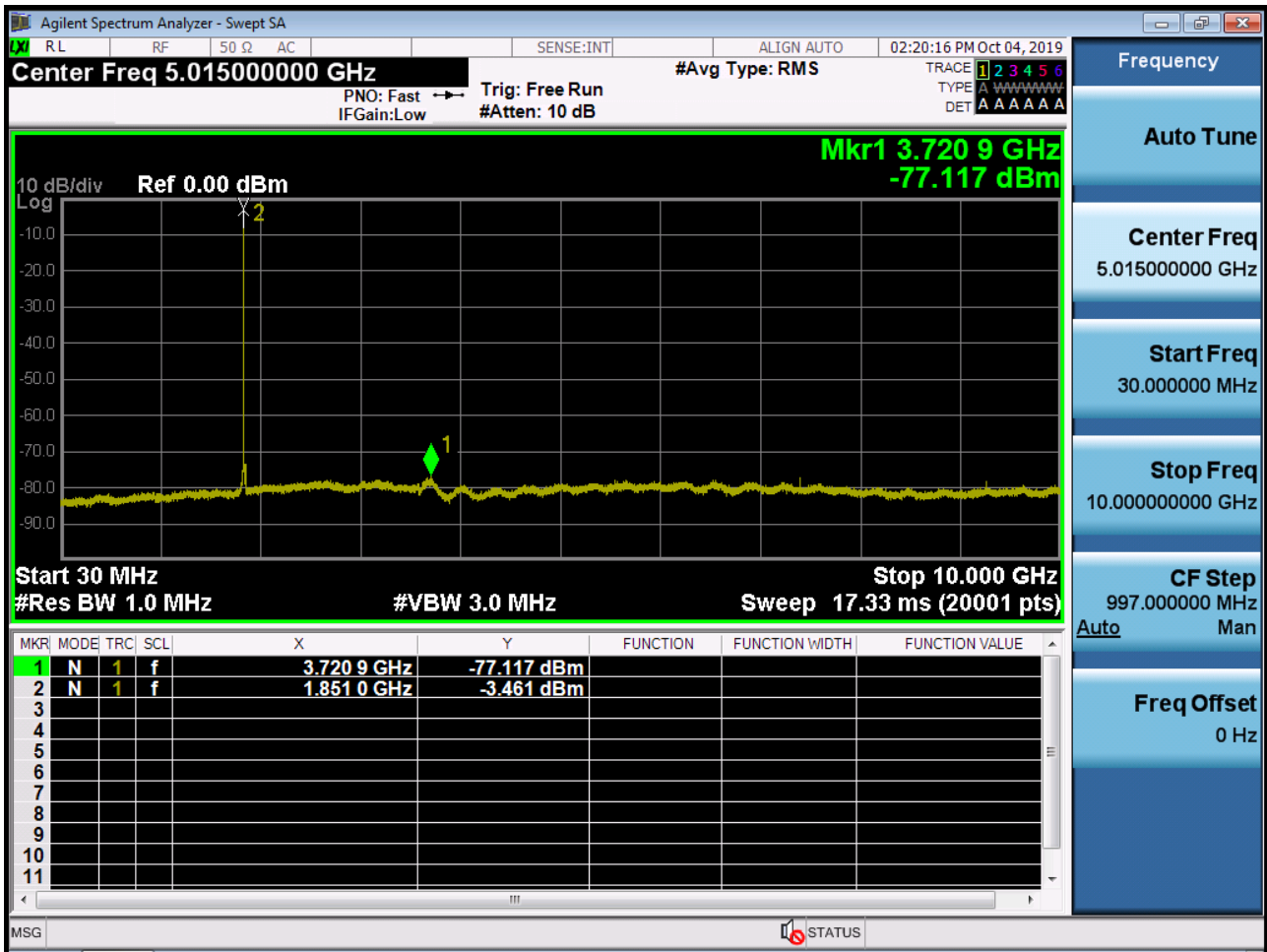
BAND 2. Upper Band Edge Plot (20M BW Ch.19100 QPSK\_RB100\_Offset 0) -2



BAND 2. Upper Extended Band Edge Plot (20M BW Ch.19100 QPSK\_RB100\_0) -3



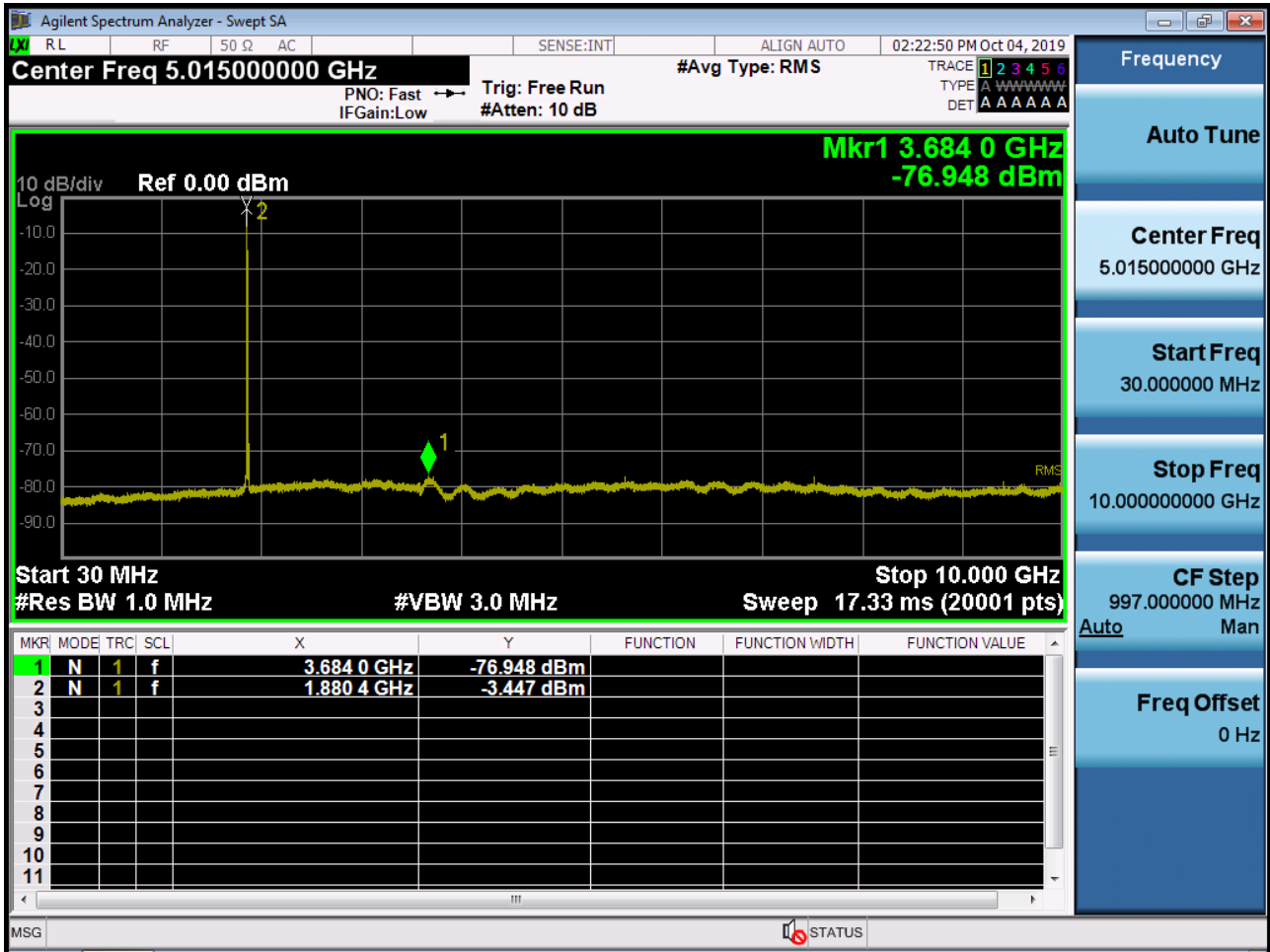
BAND 2. Conducted Spurious\_1 (18607ch\_1.4MHz\_QPSK\_RB 1\_0)



BAND 2. Conducted Spurious\_2 (18607ch\_1.4MHz\_QPSK\_RB 1\_0)



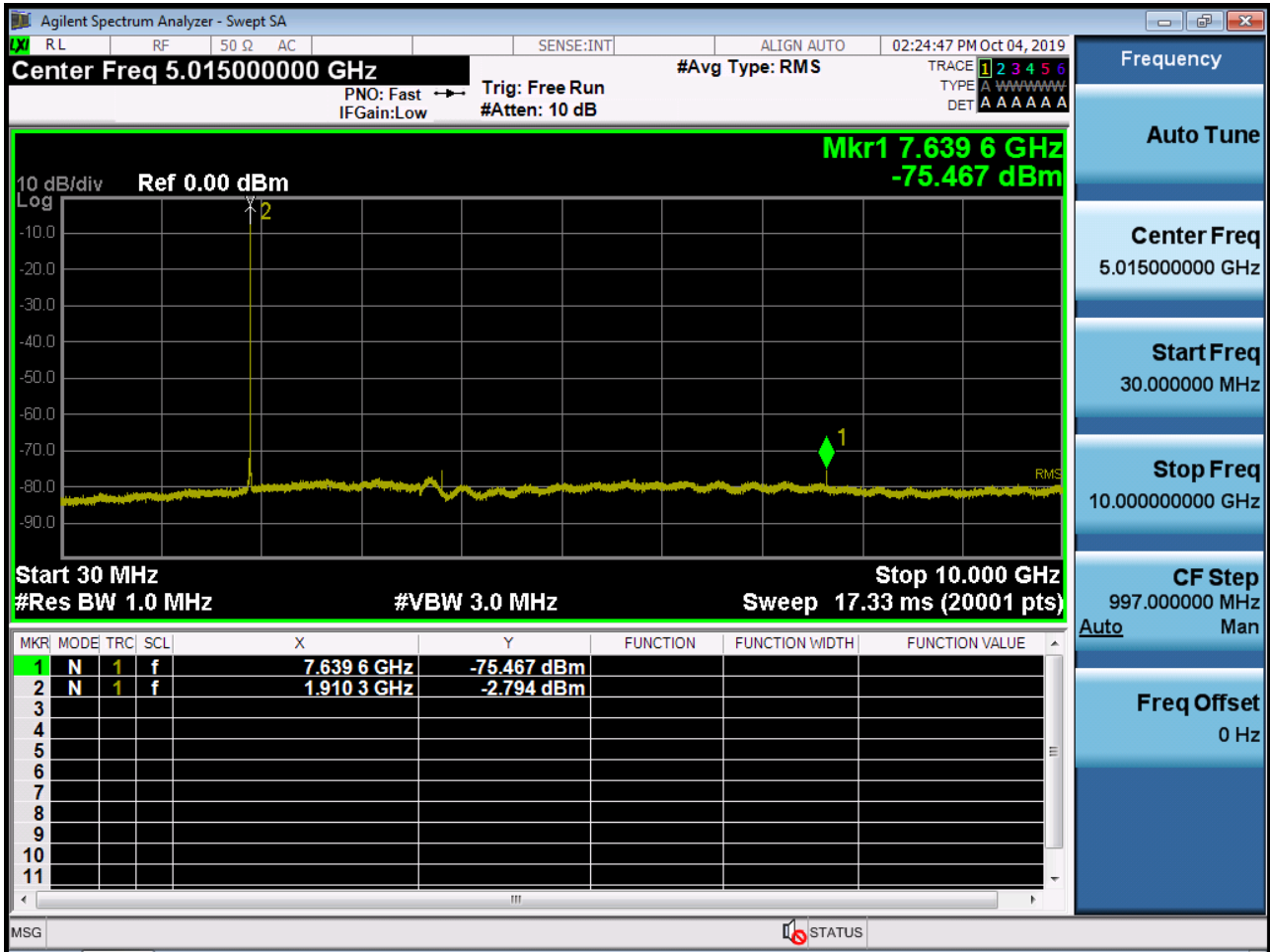
BAND 2. Conducted Spurious\_1 (18900ch\_1.4MHz\_QPSK\_RB 1\_0)







BAND 2. Conducted Spurious\_1 (19193ch\_1.4MHz\_QPSK\_RB 1\_0)



BAND 2. Conducted Spurious\_2 (19193ch\_1.4MHz\_QPSK\_RB 1\_0)

