

# FCC LTE REPORT

## Certification

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

**Date of Issue:**  
June 15, 2021

**Address:**  
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Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

**Location:**  
HCT CO., LTD.,  
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Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

**Report No.:** HCT-RF-2105-FC016-R1

**FCC ID:** A3LSMG990U

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

Model(s): SM-G990U  
 Additional Model(s): SM-G990U1/DS, SM-G990U1  
 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 – Band25/2 (1.4)	1850.7 - 1914.3	1M09G7D	QPSK	0.254	24.04
		1M09W7D	16QAM	0.219	23.41
		1M09W7D	64QAM	0.167	22.23
		1M09W7D	256QAM	0.084	19.22
LTE – Band25/2 (3)	1851.5 - 1913.5	2M71G7D	QPSK	0.250	23.98
		2M70W7D	16QAM	0.214	23.30
		2M70W7D	64QAM	0.169	22.29
LTE – Band25/2 (5)	1852.5 - 1912.5	2M70W7D	256QAM	0.083	19.19
		4M50G7D	QPSK	0.239	23.78
		4M49W7D	16QAM	0.207	23.16
		4M49W7D	64QAM	0.163	22.12
LTE – Band25/2 (10)	1852.5 - 1912.5	4M51W7D	256QAM	0.080	19.02
		8M98G7D	QPSK	0.231	23.63
		8M98W7D	16QAM	0.203	23.08
		8M98W7D	64QAM	0.154	21.87
LTE – Band25/2 (15)	1855.0 - 1910.0	8M96W7D	256QAM	0.076	18.80
		13M5G7D	QPSK	0.262	24.19
		13M5W7D	16QAM	0.223	23.49
		13M5W7D	64QAM	0.161	22.07
LTE – Band25/2 (20)	1857.5 - 1907.5	13M5W7D	256QAM	0.081	19.07
		17M9G7D	QPSK	0.250	23.98
		17M9W7D	16QAM	0.230	23.61
		17M9W7D	64QAM	0.171	22.33
LTE – Band25/2 (20)	1860.0 - 1905.0	17M9W7D	256QAM	0.077	18.86

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 No.: HCT-RF-2105-FC016-R1

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REVIEWED BY



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

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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)

\* The report shall not be reproduced except in full(only partly) without approval of the laboratory.

## Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2105-FC016	May 26, 2021	- First Approval Report
HCT-RF-2105-FC016-R1	June 15, 2021	- Revised the Additional model(s). (SM-G990U1 added)

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

<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>	A3LSMG990U
<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-G990U
<b>Additional Model(s):</b>	SM-G990U1/DS, SM-G990U1
<b>Tx Frequency:</b>	1850.7 MHz – 1914.3 MHz (LTE – Band25/2 (1.4 MHz)) 1851.5 MHz – 1913.5 MHz (LTE – Band25/2 (3 MHz)) 1852.5 MHz – 1912.5 MHz (LTE – Band25/2 (5 MHz)) 1855.0 MHz – 1910.0 MHz (LTE – Band25/2 (10 MHz)) 1857.5 MHz – 1907.5 MHz (LTE – Band25/2 (15 MHz)) 1860.0 MHz – 1905.0 MHz (LTE – Band25/2 (20 MHz))
<b>Date(s) of Tests:</b>	April 19, 2021 ~ May 18, 2021
<b>Serial number:</b>	Radiated: R3CR315S6MD Conducted: R3CR3117FBH

## **2. INTRODUCTION**

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

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS, CDMA(BC0, 1, 10) and LTE, Sub6.

It also supports IEEE 802.11 a/b/g/n/ac/ax (HT20/40/80), Bluetooth, BT LE, NFC, WPT, mmWave(n260/261).

### **2.2. MEASURING INSTRUMENT CALIBRATION**

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

### **2.3. TEST FACILITY**

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

### 3. DESCRIPTION OF TESTS

#### 3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
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 ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points > 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

### Test Note

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

The power is calculated by the following formula;

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

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;

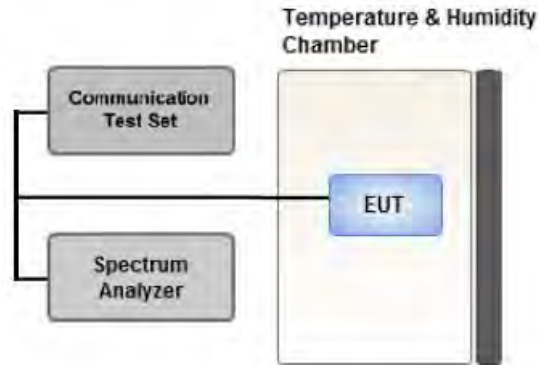
$$\text{Result}_{(\text{dBm})} = P_{g(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

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

If the fundamental 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.

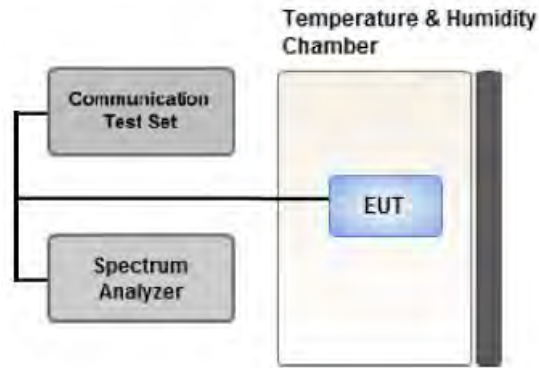
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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**

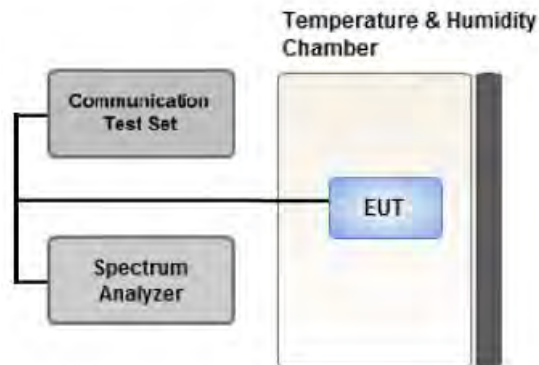
#### **Test Overview**

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.

**3.9 WORST CASE(RADIATED TEST)**

- 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. (In the case of radiated spurious emissions, only the B.W result that confirmed the maximum radiated power was 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.
- LTE BAND 25 (1850 – 1915 MHz) overlaps the entire frequency range of LTE 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.
- SM-G990U & additional models were tested and the worst case results are reported. (Worst case : SM-G990U)

[ Worst case ]

Test Description	Modulation	RB size	RB offset	Axis
<b>Effective Isotropic Radiated Power</b>	QPSK, 16QAM, 64QAM, 256QAM	1	0	X
<b>Radiated Spurious and Harmonic Emissions</b>	QPSK	1	0	X



**3.10 WORST CASE(CONDUCTED TEST)**

[ Worst case ]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth	QPSK, 16QAM, 64QAM, 256QAM	1.4, 3, 5, 10, 15, 20	Mid	Full RB	0
Peak-To-Average Ratio	QPSK, 16QAM, 64QAM, 256QAM	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

- All modes of operation were investigated and the worst case configuration results are reported.
- LTE BAND 25 (1850 – 1915 MHz) overlaps the entire frequency range of LTE 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.
- SM-G990U & additional models were tested and the worst case results are reported.
- (Worst case : SM-G990U)

#### 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	-	03/02/2021	Annual	03/02/2022
T&M SYSTEM	FBSR-02B(WHK3.3/18G-10EF)/H.P.F	-	03/02/2021	Annual	03/02/2022
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	04/07/2021	Annual	04/07/2022
Hewlett Packard	E3632A/DC Power Supply	MY40004427	09/16/2020	Annual	09/16/2021
Schwarzbeck	UHAP/ Dipole Antenna	557	04/05/2021	Biennial	04/05/2023
Schwarzbeck	UHAP/ Dipole Antenna	558	04/05/2021	Biennial	04/05/2023
ESPEC	SU-642 / Chamber	93008124	03/15/2021	Annual	03/15/2022
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	10/13/2020	Biennial	10/13/2022
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	02/11/2020	Biennial	02/11/2022
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY50200093	11/17/2020	Annual	11/17/2021
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/04/2020	Annual	06/04/2021
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	100931	10/14/2020	Annual	10/14/2021
Agilent	8960 (E5515C)/ Base Station	MY48360800	08/26/2020	Annual	08/26/2021
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-333	03/19/2020	Biennial	03/19/2022
Schwarzbeck	VULB9160/ Bilog Antenna	3150	03/03/2021	Biennial	03/03/2023
Schwarzbeck	VULB9168/ Hybrid Antenna	760	02/22/2021	Biennial	02/22/2023
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6262116770	07/22/2020	Annual	07/22/2021
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/07/2021	Annual	01/07/2022
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/13/2020	Annual	07/13/2021
KEYSIGHT	N9030B / Signal Analyzer(5Hz~40.0GHz)	MY55480167	06/04/2020	Annual	06/04/2021
HCT CO., LTD.,	FCC LTE Mobile Conducted RF Automation Test Software	-	-	-	-

Note:

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

## 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	<u>See Note1</u>
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

### 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

#### QAM Modulation

**Emission Designator = 4M48W7D**

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

## 8. TEST DATA

### 8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	dBm
1850.7	LTE B25/B2 1.4 MHz	QPSK	-18.53	15.55	10.10	2.11	H	< 2.00	0.226	23.54	
		16-QAM	-19.21	14.87	10.10	2.11	H		0.193	22.86	
		64-QAM	-20.80	13.28	10.10	2.11	H		0.134	21.27	
		256-QAM	-23.36	10.72	10.10	2.11	H		0.074	18.71	
1882.5		QPSK	-18.51	16.04	10.15	2.15	H		0.254	24.04	
		16-QAM	-19.14	15.41	10.15	2.15	H		0.219	23.41	
		64-QAM	-20.32	14.23	10.15	2.15	H		0.167	22.23	
		256-QAM	-23.33	11.22	10.15	2.15	H		0.084	19.22	
1914.3		QPSK	-19.48	15.17	10.24	2.16	H		0.212	23.26	
		16-QAM	-20.23	14.42	10.24	2.16	H		0.178	22.51	
		64-QAM	-21.59	13.06	10.24	2.16	H		0.130	21.15	
		256-QAM	-24.29	10.36	10.24	2.16	H		0.070	18.45	

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	dBm
1851.5	LTE B25/B2 3 MHz	QPSK	-18.46	15.62	10.10	2.11	H	< 2.00	0.230	23.61	
		16-QAM	-19.15	14.93	10.10	2.11	H		0.196	22.92	
		64-QAM	-20.82	13.26	10.10	2.11	H		0.133	21.25	
		256-QAM	-23.29	10.79	10.10	2.11	H		0.076	18.78	
1882.5		QPSK	-18.57	15.98	10.15	2.15	H		0.250	23.98	
		16-QAM	-19.25	15.30	10.15	2.15	H		0.214	23.30	
		64-QAM	-20.26	14.29	10.15	2.15	H		0.169	22.29	
		256-QAM	-23.36	11.19	10.15	2.15	H		0.083	19.19	
1913.5		QPSK	-19.28	15.26	10.23	2.15	H		0.216	23.34	
		16-QAM	-19.99	14.55	10.23	2.15	H		0.183	22.63	
		64-QAM	-21.30	13.24	10.23	2.15	H		0.136	21.32	
		256-QAM	-24.10	10.44	10.23	2.15	H		0.071	18.52	

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 B25/B2 5 MHz	QPSK	-18.49	15.59	10.10	2.11	H	< 2.00	0.228	23.58
		16-QAM	-19.15	14.93	10.10	2.11	H		0.196	22.92
		64-QAM	-20.85	13.23	10.10	2.11	H		0.132	21.22
		256-QAM	-23.30	10.78	10.10	2.11	H		0.075	18.77
1882.5		QPSK	-18.77	15.78	10.15	2.15	H		0.239	23.78
		16-QAM	-19.39	15.16	10.15	2.15	H		0.207	23.16
		64-QAM	-20.43	14.12	10.15	2.15	H		0.163	22.12
		256-QAM	-23.53	11.02	10.15	2.15	H		0.080	19.02
1912.5		QPSK	-19.31	15.23	10.23	2.15	H		0.214	23.31
		16-QAM	-19.96	14.58	10.23	2.15	H		0.185	22.66
		64-QAM	-21.04	13.50	10.23	2.15	H		0.144	21.58
		256-QAM	-24.14	10.40	10.23	2.15	H		0.071	18.48

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 B25/B2 10 MHz	QPSK	-18.72	15.43	10.12	2.12	H	< 2.00	0.220	23.43
		16-QAM	-19.37	14.78	10.12	2.12	H		0.189	22.78
		64-QAM	-21.16	12.99	10.12	2.12	H		0.125	20.99
		256-QAM	-23.49	10.66	10.12	2.12	H		0.073	18.66
1882.5		QPSK	-18.92	15.63	10.15	2.15	H		0.231	23.63
		16-QAM	-19.47	15.08	10.15	2.15	H		0.203	23.08
		64-QAM	-20.68	13.87	10.15	2.15	H		0.154	21.87
		256-QAM	-23.75	10.80	10.15	2.15	H		0.076	18.80
1910.0		QPSK	-19.05	15.49	10.23	2.15	H		0.228	23.57
		16-QAM	-19.64	14.90	10.23	2.15	H		0.199	22.98
		64-QAM	-20.81	13.73	10.23	2.15	H		0.152	21.81
		256-QAM	-24.14	10.40	10.23	2.15	H		0.071	18.48



Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	dBm
1857.5	LTE B25/B2 15 MHz	QPSK	-18.72	15.49	10.13	2.12	H	< 2.00	0.224	23.50	
		16-QAM	-19.38	14.83	10.13	2.12	H		0.192	22.84	
		64-QAM	-20.80	13.41	10.13	2.12	H		0.139	21.42	
		256-QAM	-23.55	10.66	10.13	2.12	H		0.074	18.67	
1882.5		QPSK	-18.36	16.19	10.15	2.15	H		0.262	24.19	
		16-QAM	-19.06	15.49	10.15	2.15	H		0.223	23.49	
		64-QAM	-20.51	14.04	10.15	2.15	H		0.160	22.04	
		256-QAM	-23.48	11.07	10.15	2.15	H		0.081	19.07	
1907.5		QPSK	-18.85	15.69	10.23	2.15	H		0.238	23.77	
		16-QAM	-19.27	15.27	10.23	2.15	H		0.216	23.35	
		64-QAM	-20.55	13.99	10.23	2.15	H		0.161	22.07	
		256-QAM	-23.89	10.65	10.23	2.15	H		0.075	18.73	

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit		EIRP	
								W	W	dBm	dBm
1860.0	LTE B25/B2 20 MHz	QPSK	-18.58	15.63	10.13	2.12	H	< 2.00	0.231	23.64	
		16-QAM	-19.19	15.02	10.13	2.12	H		0.201	23.03	
		64-QAM	-20.75	13.46	10.13	2.12	H		0.140	21.47	
		256-QAM	-23.77	10.44	10.13	2.12	H		0.070	18.45	
1882.5		QPSK	-18.63	15.92	10.15	2.15	H		0.247	23.92	
		16-QAM	-19.34	15.21	10.15	2.15	H		0.209	23.21	
		64-QAM	-21.10	13.45	10.15	2.15	H		0.140	21.45	
		256-QAM	-23.78	10.77	10.15	2.15	H		0.075	18.77	
1905.0		QPSK	-18.75	16.01	10.12	2.15	H		0.250	23.98	
		16-QAM	-19.12	15.64	10.12	2.15	H		0.230	23.61	
		64-QAM	-20.40	14.36	10.12	2.15	H		0.171	22.33	
		256-QAM	-23.87	10.89	10.12	2.15	H		0.077	18.86	

**8.2 RADIATED SPURIOUS EMISSIONS**

- ▣ OPERATING FREQUENCY: 1882.5 MHz
- ▣ MEASURED OUTPUT POWER: 24.19 dBm = 0.262 W
- ▣ MOD: LTE B25/B2
- ▣ MODULATION SIGNAL: 15 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT:  $43 + 10 \log_{10}(W) =$  37.19 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
26115 (1857.5)	3 715.00	-54.41	12.44	-58.66	3.09	V	-49.31	73.50
	5 572.50	-56.39	13.20	-54.41	3.83	V	-45.04	69.23
	7 430.00	-66.34	11.15	-55.82	4.41	V	-49.08	73.27
26365 (1882.5)	3 765.00	-54.79	12.47	-58.82	3.10	V	-49.45	73.64
	5 647.50	-56.65	13.30	-54.59	3.87	V	-45.16	69.35
	7 530.00	-57.45	11.30	-47.02	4.45	V	-40.17	64.36
26615 (1907.5)	3 815.00	-55.14	12.40	-59.53	3.14	V	-50.26	74.45
	5 722.50	-55.60	13.35	-52.63	3.88	V	-43.16	67.35
	7 630.00	-57.79	11.60	-47.46	4.48	V	-40.34	64.53

**8.3 PEAK-TO-AVERAGE RATIO**

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data ( dB )
25/2	1.4 MHz	1882.5	QPSK	6	0	5.19
			16-QAM	6	0	6.01
			64-QAM	6	0	6.70
			256-QAM	6	0	6.58
	3 MHz		QPSK	15	0	5.13
			16-QAM	15	0	5.96
			64-QAM	15	0	6.57
			256-QAM	15	0	6.60
	5 MHz		QPSK	25	0	5.09
			16-QAM	25	0	5.92
			64-QAM	25	0	6.55
			256-QAM	25	0	6.61
	10 MHz		QPSK	50	0	5.16
			16-QAM	50	0	5.97
			64-QAM	50	0	6.57
			256-QAM	50	0	6.55
	15 MHz		QPSK	75	0	5.25
			16-QAM	75	0	6.02
			64-QAM	75	0	6.54
			256-QAM	75	0	6.60
20 MHz	QPSK	100	0	5.29		
	16-QAM	100	0	6.01		
	64-QAM	100	0	6.55		
	256-QAM	100	0	6.61		

**Note:**

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 109 ~ 132.

**8.4 OCCUPIED BANDWIDTH**

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data ( MHz )
25/2	1.4 MHz	1882.5	QPSK	6	0	1.0899
			16-QAM	6	0	1.0880
			64-QAM	6	0	1.0907
			256-QAM	6	0	1.0872
	3 MHz		QPSK	15	0	2.7125
			16-QAM	15	0	2.6976
			64-QAM	15	0	2.6984
			256-QAM	15	0	2.7042
	5 MHz		QPSK	25	0	4.5016
			16-QAM	25	0	4.4879
			64-QAM	25	0	4.4915
			256-QAM	25	0	4.5123
	10 MHz		QPSK	50	0	8.9773
			16-QAM	50	0	8.9751
			64-QAM	50	0	8.9833
			256-QAM	50	0	8.9609
	15 MHz		QPSK	75	0	13.451
			16-QAM	75	0	13.464
			64-QAM	75	0	13.472
			256-QAM	75	0	13.448
20 MHz	QPSK	100	0	17.901		
	16-QAM	100	0	17.905		
	64-QAM	100	0	17.907		
	256-QAM	100	0	17.904		

**Note:**

1. Plots of the EUT's Occupied Bandwidth are shown Page 85 ~ 108.

**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)
25/2	1.4	3.6790	3.7049	27.976	-77.077	-49.101	-13.00
		3.6790	3.6875	27.976	-77.220	-49.244	
		3.6780	3.6925	27.976	-77.396	-49.420	
	3	3.6815	3.6760	27.976	-76.989	-49.013	
		3.7114	3.6965	27.976	-77.066	-49.090	
		3.6885	3.6925	27.976	-77.378	-49.402	
	5	3.7194	3.6805	27.976	-77.410	-49.434	
		3.7114	3.7089	27.976	-77.345	-49.369	
		3.6850	3.6870	27.976	-77.426	-49.450	
	10	3.7189	3.7015	27.976	-76.547	-48.571	
		3.7044	3.7174	27.976	-76.735	-48.759	
		3.6785	3.7005	27.976	-77.367	-49.391	
	15	3.6910	3.7094	27.976	-77.064	-49.088	
		3.7039	3.6965	27.976	-77.241	-49.265	
		3.7044	3.7049	27.976	-76.886	-48.910	
	20	3.7169	3.6905	27.976	-76.930	-48.954	
		3.7124	3.6945	27.976	-77.116	-49.140	
		3.7005	3.6800	27.976	-77.181	-49.205	

**Note:**

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 133 ~ 168.
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

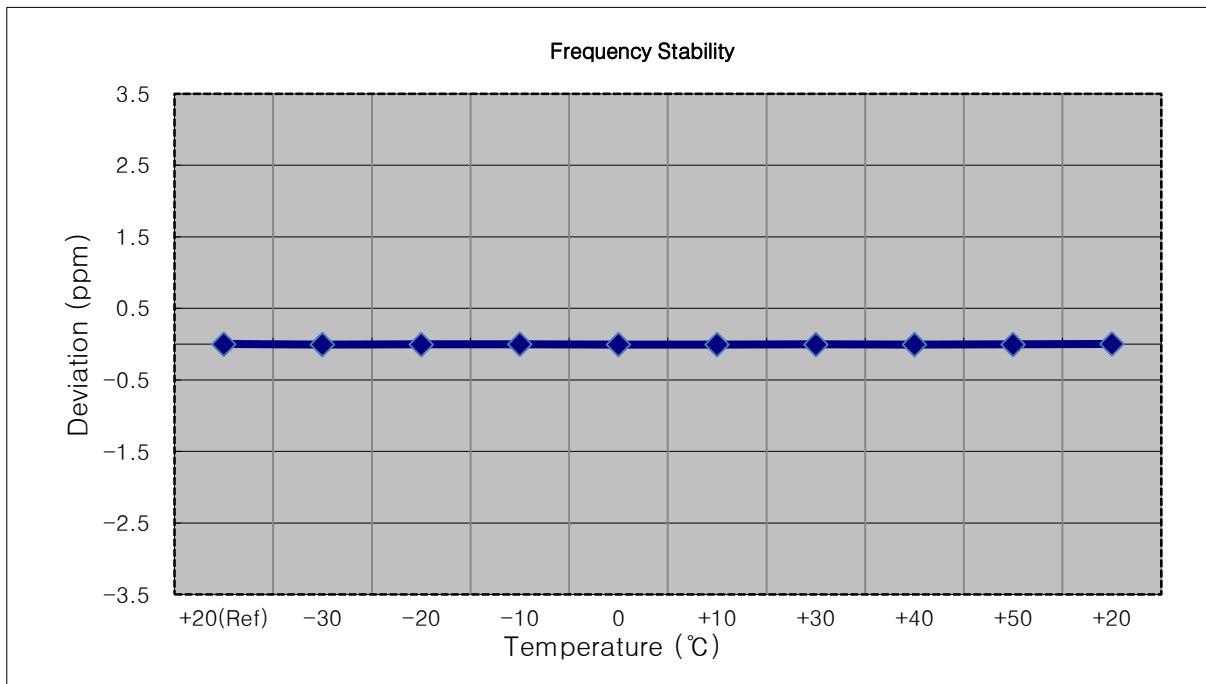
**8.6 BAND EDGE**

- Plots of the EUT's Band Edge are shown Page 49 ~ 84.

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

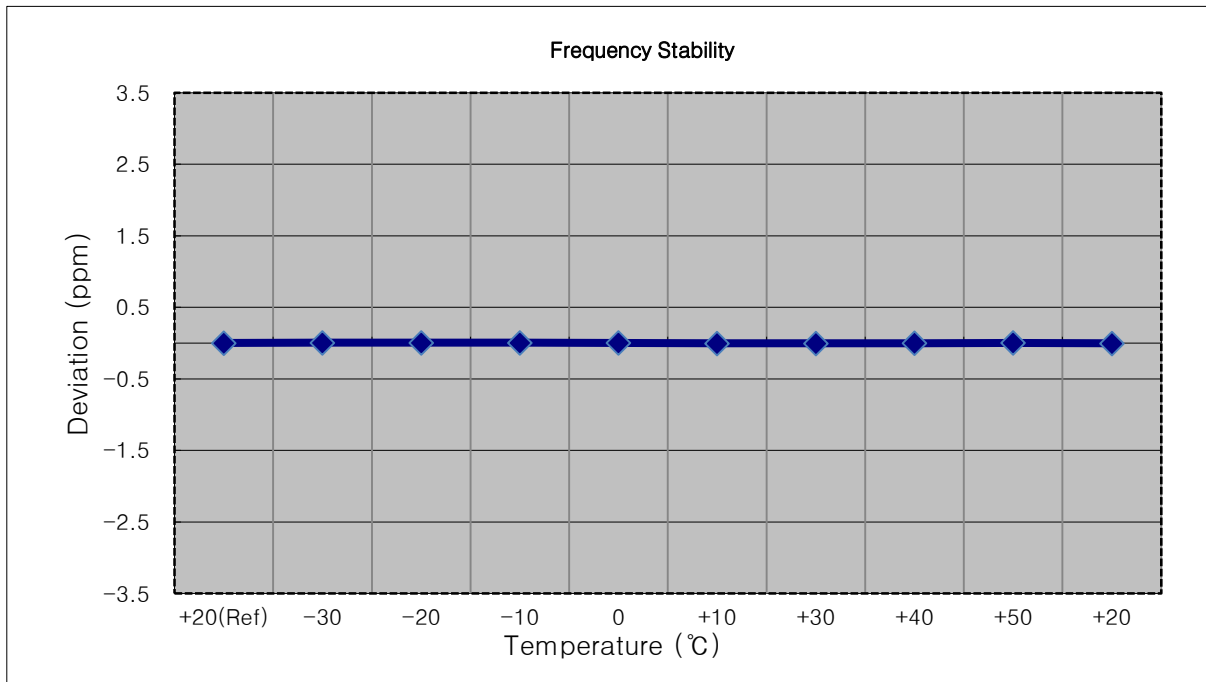
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1850,700,000 Hz
- ▣ CHANNEL: 26047 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1850 699 990	0.0	0.000 000	0.000
100%		-30	1850 699 978	-11.9	-0.000 001	-0.006
100%		-20	1850 699 983	-7.4	0.000 000	-0.004
100%		-10	1850 699 988	-2.3	0.000 000	-0.001
100%		0	1850 699 980	-10.2	-0.000 001	-0.006
100%		+10	1850 699 980	-10.3	-0.000 001	-0.006
100%		+30	1850 699 982	-7.9	0.000 000	-0.004
100%		+40	1850 699 980	-9.8	-0.000 001	-0.005
100%		+50	1850 699 984	-6.4	0.000 000	-0.003
Batt. Endpoint		3.650	+20	1850 699 997	6.3	0.000 000



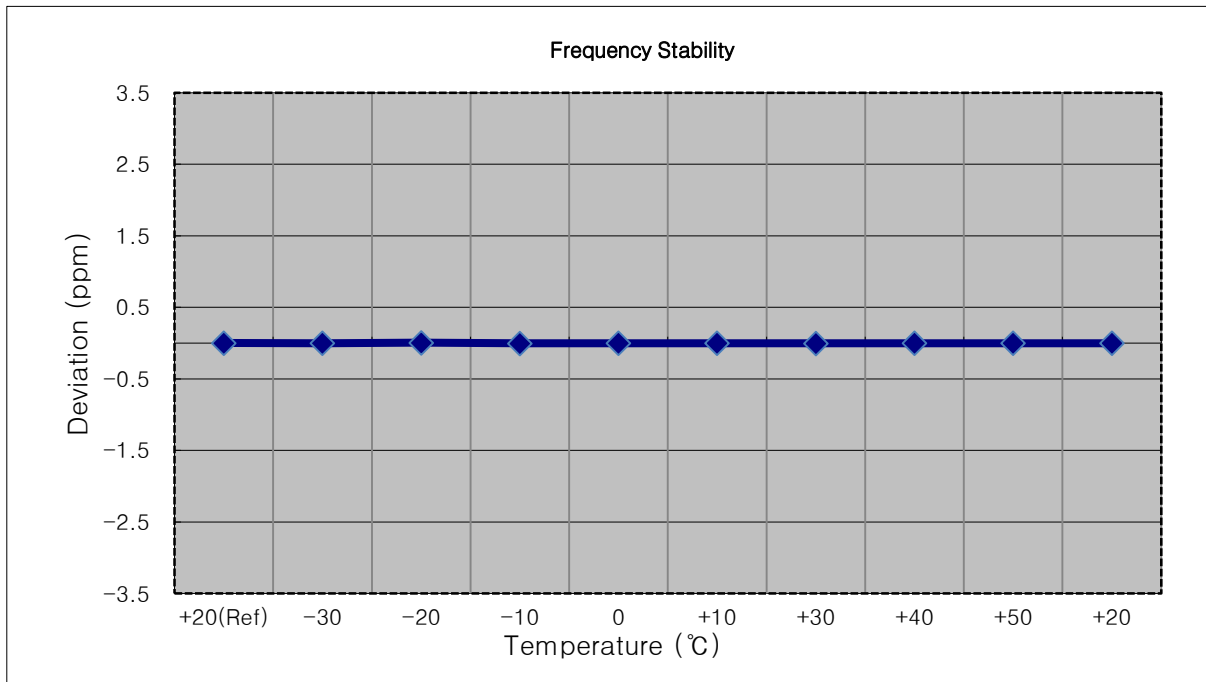
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1851,500,000 Hz
- ▣ CHANNEL: 26055 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1851 499 991	0.0	0.000 000	0.000
100%		-30	1851 499 998	7.5	0.000 000	0.004
100%		-20	1851 499 998	7.1	0.000 000	0.004
100%		-10	1851 500 001	10.5	0.000 001	0.006
100%		0	1851 499 997	6.1	0.000 000	0.003
100%		+10	1851 499 985	-6.0	0.000 000	-0.003
100%		+30	1851 499 984	-7.2	0.000 000	-0.004
100%		+40	1851 499 986	-4.5	0.000 000	-0.002
100%		+50	1851 499 994	3.6	0.000 000	0.002
Batt. Endpoint		3.650	+20	1851 499 982	-8.7	0.000 000



- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1852,500,000 Hz
- ▣ CHANNEL: 26065 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

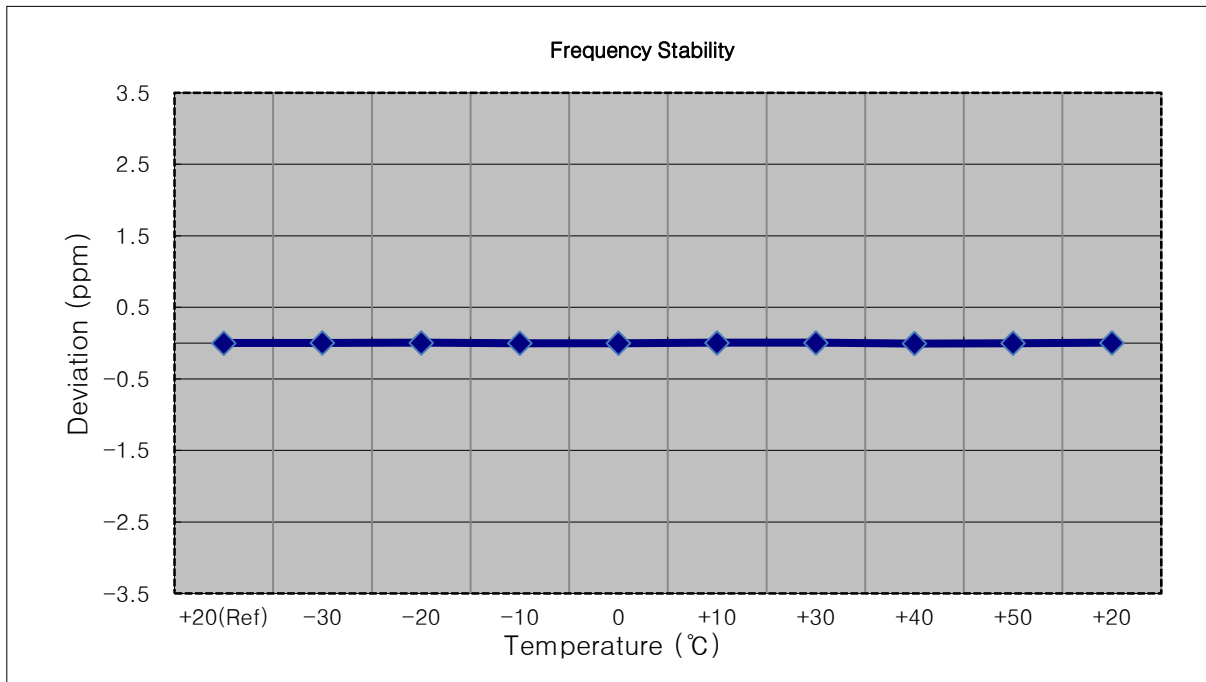
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1852 499 997	0.0	0.000 000	0.000
100%		-30	1852 499 992	-4.2	0.000 000	-0.002
100%		-20	1852 500 004	7.7	0.000 000	0.004
100%		-10	1852 499 988	-8.5	0.000 000	-0.005
100%		0	1852 499 991	-5.1	0.000 000	-0.003
100%		+10	1852 499 991	-5.2	0.000 000	-0.003
100%		+30	1852 499 987	-9.2	0.000 000	-0.005
100%		+40	1852 499 992	-4.2	0.000 000	-0.002
100%		+50	1852 499 991	-5.2	0.000 000	-0.003
Batt. Endpoint		3.650	+20	1852 499 993	-3.7	0.000 000





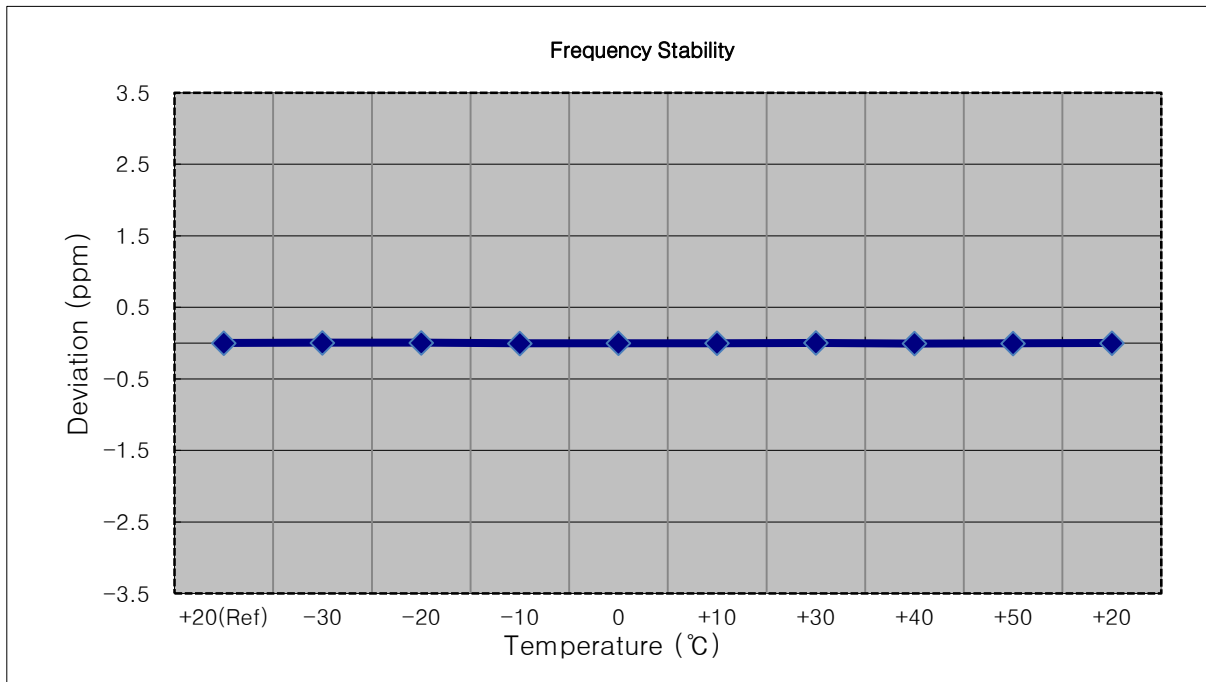
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1855,000,000 Hz
- ▣ CHANNEL: 26090 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1854 999 997	0.0	0.000 000	0.000
100%		-30	1855 000 002	4.4	0.000 000	0.002
100%		-20	1855 000 005	7.4	0.000 000	0.004
100%		-10	1854 999 993	-4.3	0.000 000	-0.002
100%		0	1854 999 994	-3.5	0.000 000	-0.002
100%		+10	1855 000 004	7.1	0.000 000	0.004
100%		+30	1855 000 006	8.5	0.000 000	0.005
100%		+40	1854 999 988	-9.8	-0.000 001	-0.005
100%		+50	1854 999 996	-1.7	0.000 000	-0.001
Batt. Endpoint		3.650	+20	1855 000 004	7.1	0.000 000



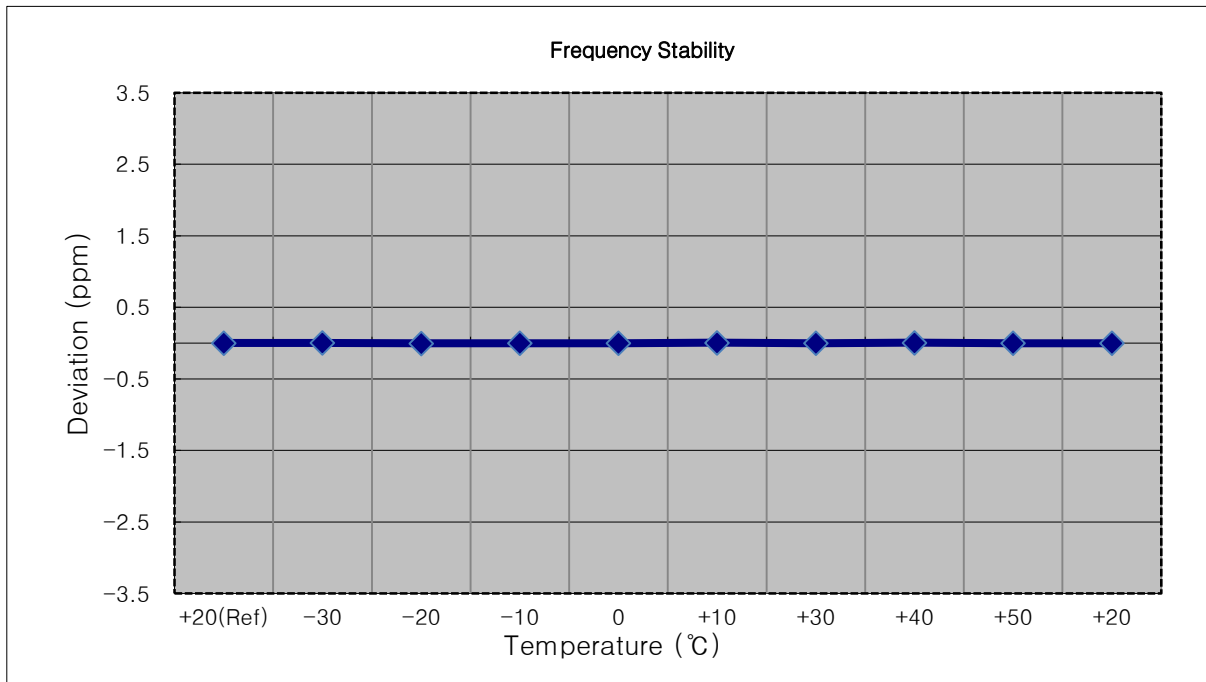
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1857,500,000 Hz
- ▣ CHANNEL: 26115 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1857 499 997	0.0	0.000 000	0.000
100%		-30	1857 500 004	7.1	0.000 000	0.004
100%		-20	1857 500 004	7.0	0.000 000	0.004
100%		-10	1857 499 989	-7.5	0.000 000	-0.004
100%		0	1857 499 994	-2.3	0.000 000	-0.001
100%		+10	1857 499 994	-2.6	0.000 000	-0.001
100%		+30	1857 500 003	6.7	0.000 000	0.004
100%		+40	1857 499 986	-10.6	-0.000 001	-0.006
100%		+50	1857 499 990	-6.8	0.000 000	-0.004
Batt. Endpoint		3.650	+20	1857 499 999	2.7	0.000 000



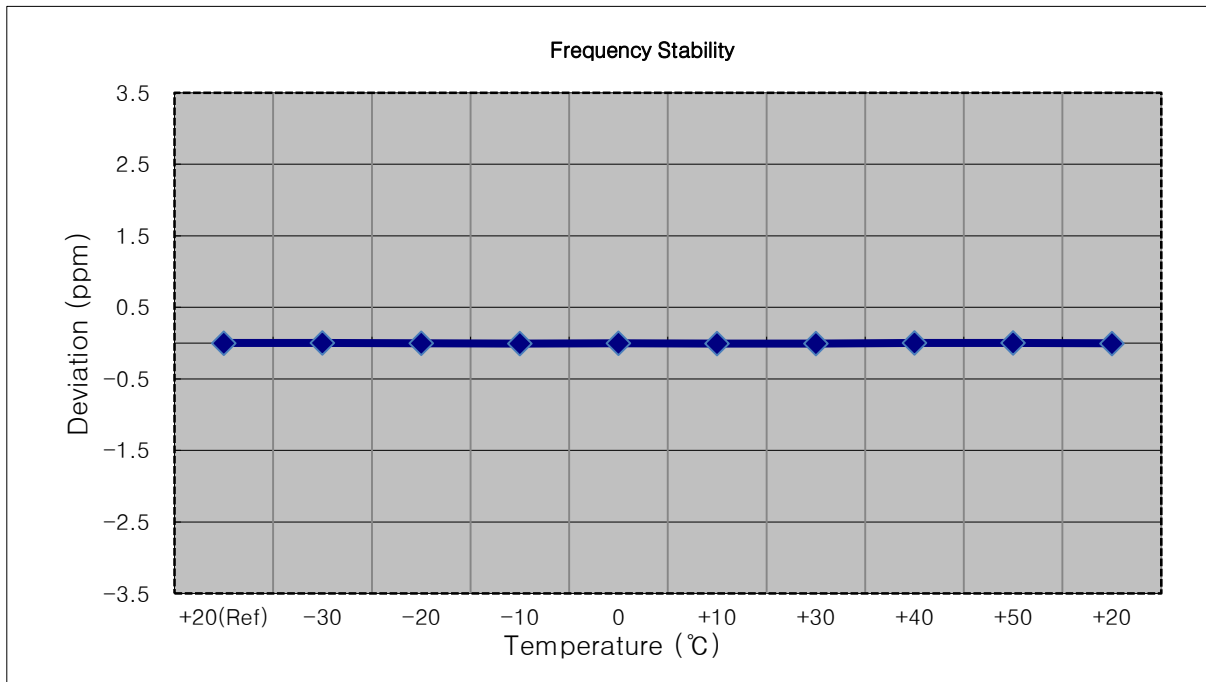
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1860,000,000 Hz
- ▣ CHANNEL: 26140 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1860 000 009	0.0	0.000 000	0.000
100%		-30	1860 000 016	6.7	0.000 000	0.004
100%		-20	1860 000 002	-7.2	0.000 000	-0.004
100%		-10	1860 000 005	-4.1	0.000 000	-0.002
100%		0	1860 000 006	-2.9	0.000 000	-0.002
100%		+10	1860 000 016	7.1	0.000 000	0.004
100%		+30	1860 000 004	-4.8	0.000 000	-0.003
100%		+40	1860 000 018	8.7	0.000 000	0.005
100%		+50	1860 000 005	-3.7	0.000 000	-0.002
Batt. Endpoint		3.650	+20	1860 000 006	-2.9	0.000 000



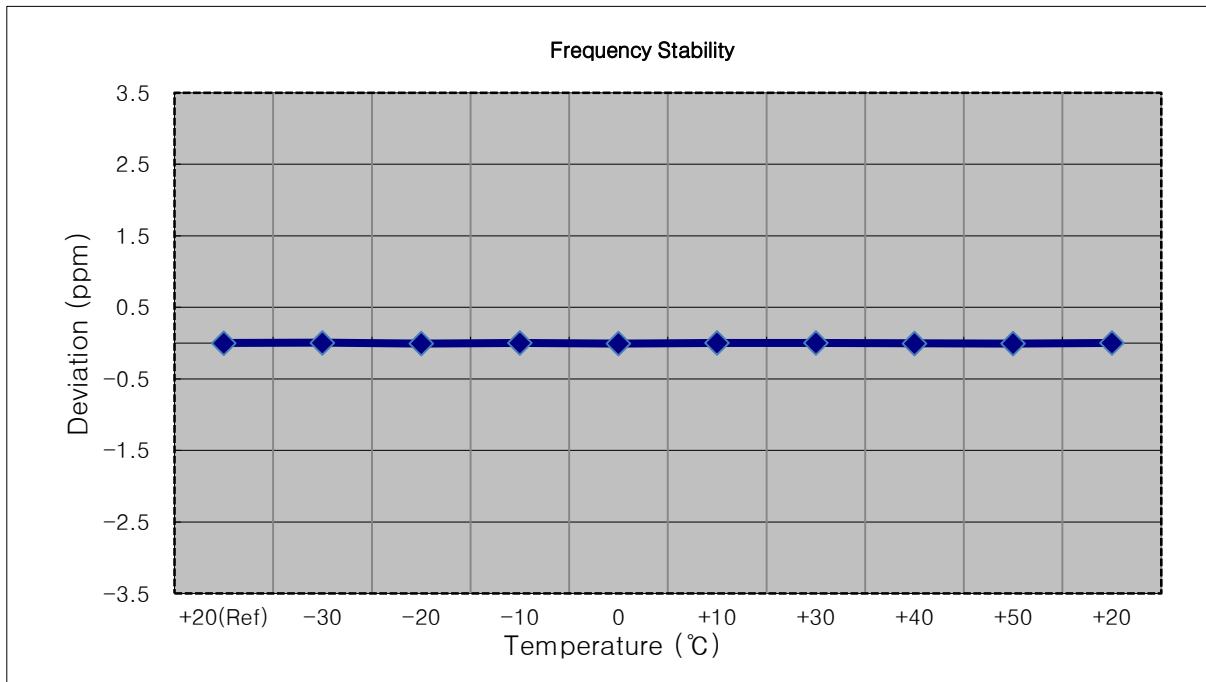
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1882,500,000 Hz
- ▣ CHANNEL: 26365 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1882 499 994	0.0	0.000 000	0.000
100%		-30	1882 500 000	6.9	0.000 000	0.004
100%		-20	1882 499 988	-5.6	0.000 000	-0.003
100%		-10	1882 499 983	-10.9	-0.000 001	-0.006
100%		0	1882 499 990	-3.6	0.000 000	-0.002
100%		+10	1882 499 984	-10.0	-0.000 001	-0.005
100%		+30	1882 499 984	-9.9	-0.000 001	-0.005
100%		+40	1882 500 000	6.7	0.000 000	0.004
100%		+50	1882 499 997	3.1	0.000 000	0.002
Batt. Endpoint		3.650	+20	1882 499 986	-7.5	0.000 000



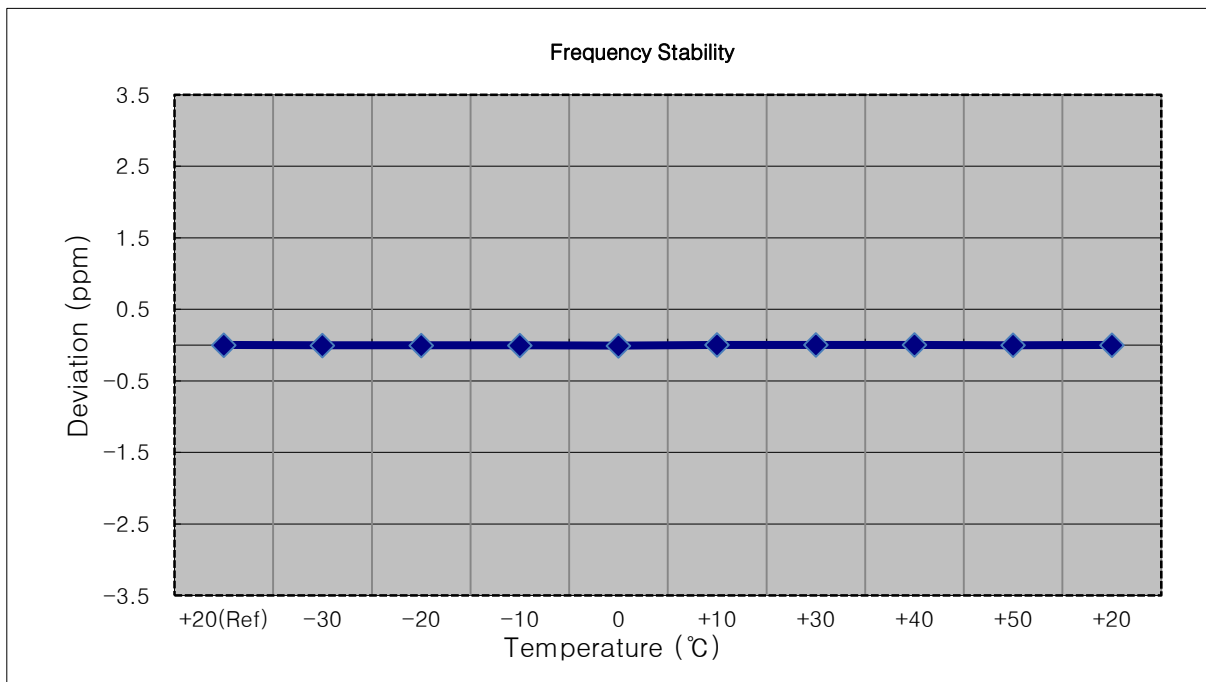
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1882,500,000 Hz
- ▣ CHANNEL: 26365 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1882 499 994	0.0	0.000 000	0.000
100%		-30	1882 500 002	7.8	0.000 000	0.004
100%		-20	1882 499 982	-11.3	-0.000 001	-0.006
100%		-10	1882 499 997	2.9	0.000 000	0.002
100%		0	1882 499 984	-10.1	-0.000 001	-0.005
100%		+10	1882 499 999	5.0	0.000 000	0.003
100%		+30	1882 499 998	4.4	0.000 000	0.002
100%		+40	1882 499 986	-8.0	0.000 000	-0.004
100%		+50	1882 499 981	-13.0	-0.000 001	-0.007
Batt. Endpoint		3.650	+20	1882 499 998	3.9	0.000 000



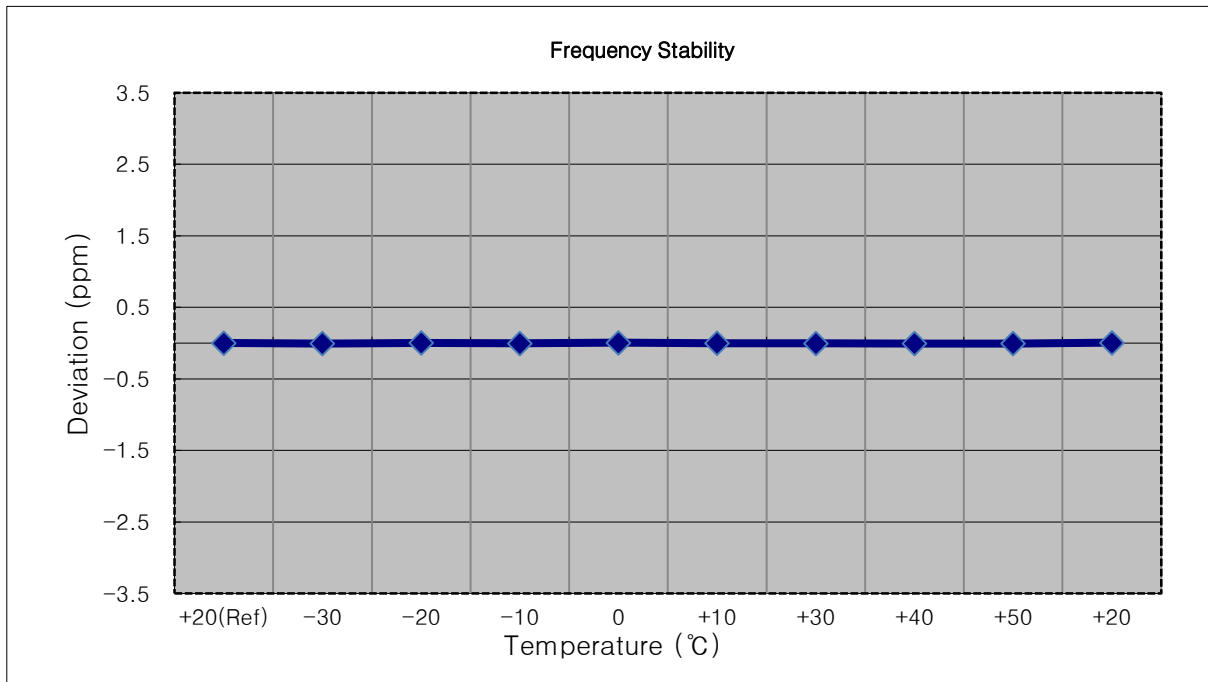
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1882,500,000 Hz
- ▣ CHANNEL: 26365 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1882 500 003	0.0	0.000 000	0.000
100%		-30	1882 499 994	-8.8	0.000 000	-0.005
100%		-20	1882 499 994	-9.5	-0.000 001	-0.005
100%		-10	1882 499 996	-7.1	0.000 000	-0.004
100%		0	1882 499 989	-14.3	-0.000 001	-0.008
100%		+10	1882 500 009	5.7	0.000 000	0.003
100%		+30	1882 500 009	5.5	0.000 000	0.003
100%		+40	1882 500 007	3.6	0.000 000	0.002
100%		+50	1882 500 001	-2.4	0.000 000	-0.001
Batt. Endpoint		3.650	+20	1882 500 006	2.4	0.000 000



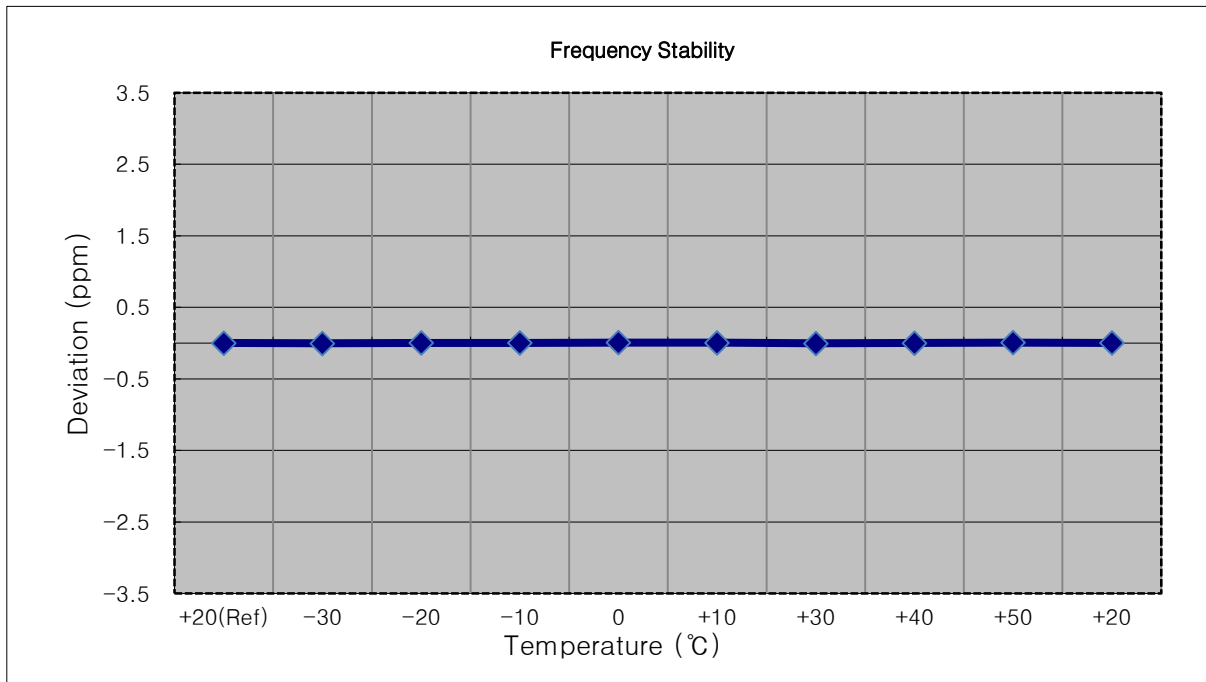
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1882,500,000 Hz
- ▣ CHANNEL: 26365 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1882 500 006	0.0	0.000 000	0.000
100%		-30	1882 499 995	-10.2	-0.000 001	-0.005
100%		-20	1882 500 011	5.6	0.000 000	0.003
100%		-10	1882 499 996	-9.4	0.000 000	-0.005
100%		0	1882 500 015	9.6	0.000 001	0.005
100%		+10	1882 500 003	-3.0	0.000 000	-0.002
100%		+30	1882 499 997	-8.9	0.000 000	-0.005
100%		+40	1882 499 993	-12.8	-0.000 001	-0.007
100%		+50	1882 499 993	-12.2	-0.000 001	-0.006
Batt. Endpoint		3.650	+20	1882 500 015	9.8	0.000 001



- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1882,500,000 Hz
- ▣ CHANNEL: 26365 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

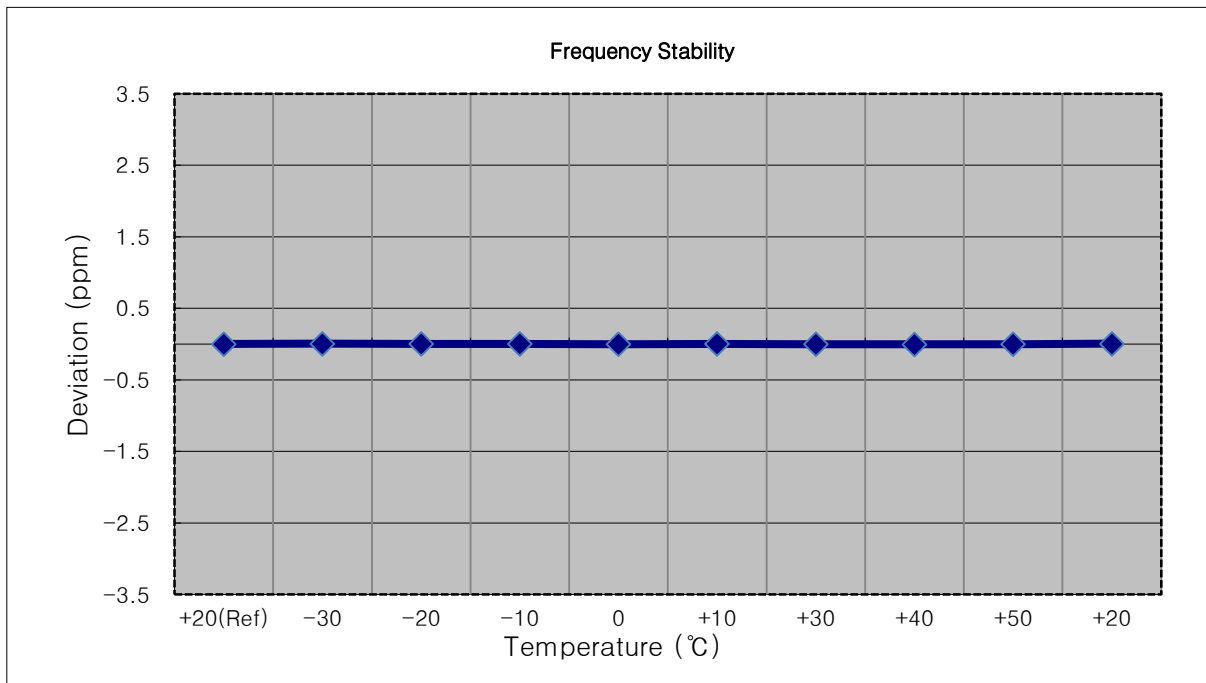
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1882 500 002	0.0	0.000 000	0.000
100%		-30	1882 499 993	-8.9	0.000 000	-0.005
100%		-20	1882 500 007	5.0	0.000 000	0.003
100%		-10	1882 500 006	4.2	0.000 000	0.002
100%		0	1882 500 014	12.2	0.000 001	0.006
100%		+10	1882 500 011	8.4	0.000 000	0.004
100%		+30	1882 499 994	-8.2	0.000 000	-0.004
100%		+40	1882 500 004	2.0	0.000 000	0.001
100%		+50	1882 500 015	12.8	0.000 001	0.007
Batt. Endpoint		3.650	+20	1882 500 008	5.7	0.000 000





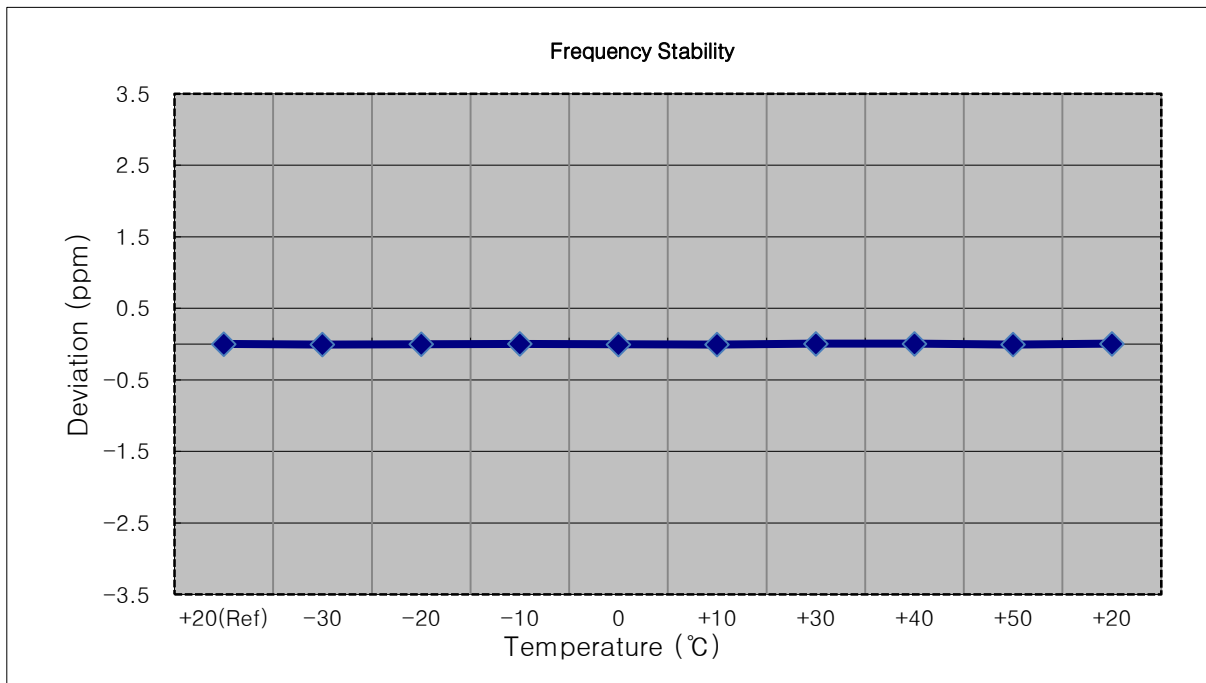
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1882,500,000 Hz
- ▣ CHANNEL: 26365 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1882 499 994	0.0	0.000 000	0.000
100%		-30	1882 500 001	7.5	0.000 000	0.004
100%		-20	1882 499 999	5.5	0.000 000	0.003
100%		-10	1882 499 997	3.0	0.000 000	0.002
100%		0	1882 499 992	-2.2	0.000 000	-0.001
100%		+10	1882 499 998	4.5	0.000 000	0.002
100%		+30	1882 499 989	-5.3	0.000 000	-0.003
100%		+40	1882 499 987	-6.5	0.000 000	-0.003
100%		+50	1882 499 989	-5.0	0.000 000	-0.003
Batt. Endpoint		3.650	+20	1882 500 001	7.3	0.000 000



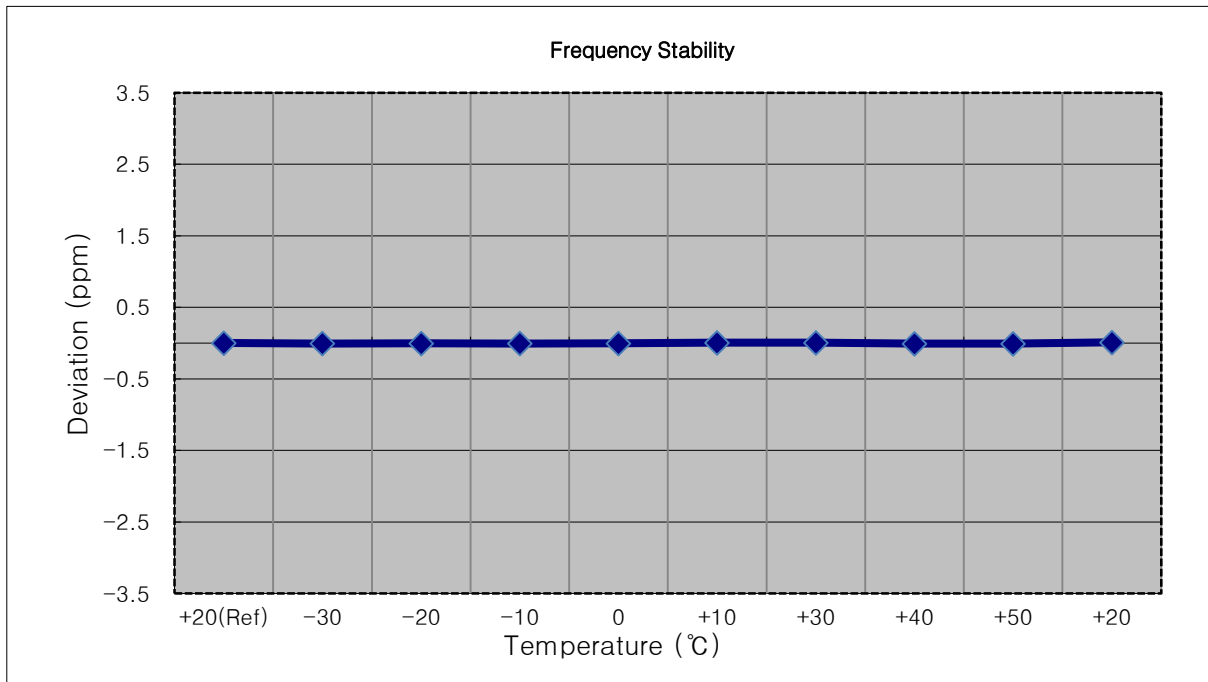
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1914,300,000 Hz
- ▣ CHANNEL: 26683 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1914 299 989	0.0	0.000 000	0.000
100%		-30	1914 299 976	-13.5	-0.000 001	-0.007
100%		-20	1914 299 984	-5.2	0.000 000	-0.003
100%		-10	1914 299 996	6.5	0.000 000	0.003
100%		0	1914 299 980	-9.4	0.000 000	-0.005
100%		+10	1914 299 976	-12.9	-0.000 001	-0.007
100%		+30	1914 299 997	7.9	0.000 000	0.004
100%		+40	1914 300 000	10.6	0.000 001	0.006
100%		+50	1914 299 977	-12.2	-0.000 001	-0.006
Batt. Endpoint		3.650	+20	1914 299 997	8.1	0.000 000



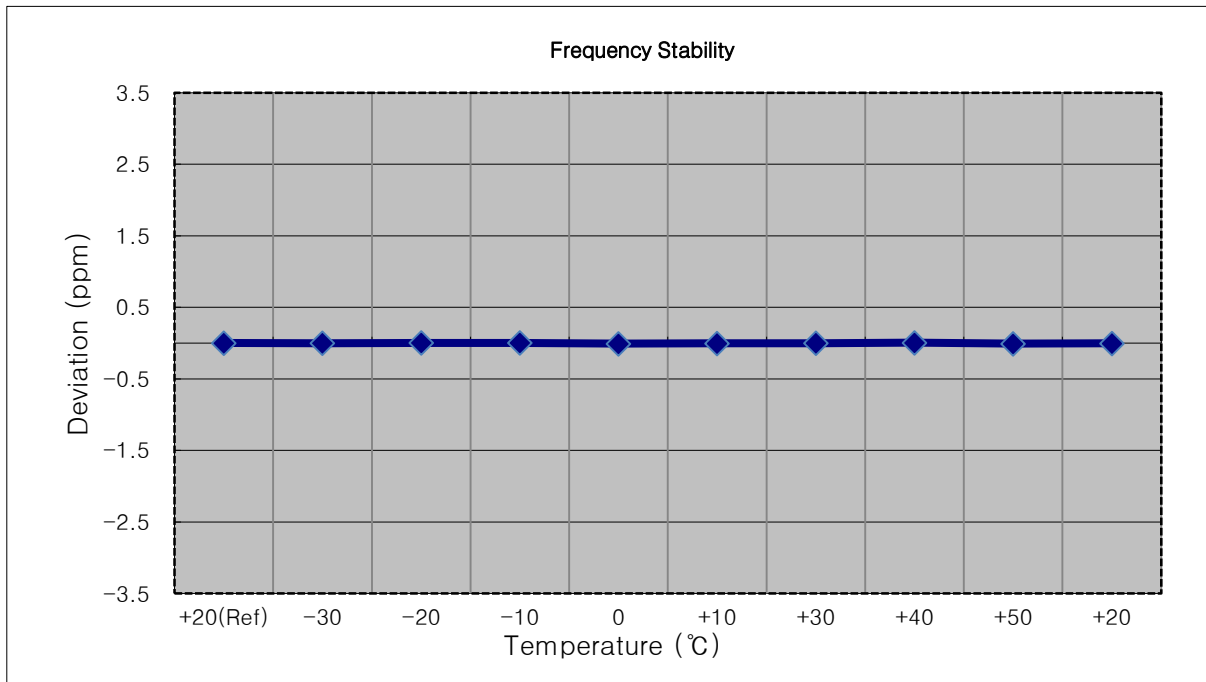
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1913,500,000 Hz
- ▣ CHANNEL: 26675 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1913 500 020	0.0	0.000 000	0.000
100%		-30	1913 500 008	-12.0	-0.000 001	-0.006
100%		-20	1913 500 014	-6.5	0.000 000	-0.003
100%		-10	1913 500 008	-12.0	-0.000 001	-0.006
100%		0	1913 500 011	-9.7	-0.000 001	-0.005
100%		+10	1913 500 029	8.5	0.000 000	0.004
100%		+30	1913 500 030	9.7	0.000 001	0.005
100%		+40	1913 500 002	-18.1	-0.000 001	-0.009
100%		+50	1913 500 004	-16.3	-0.000 001	-0.009
Batt. Endpoint		3.650	+20	1913 500 039	18.7	0.000 001



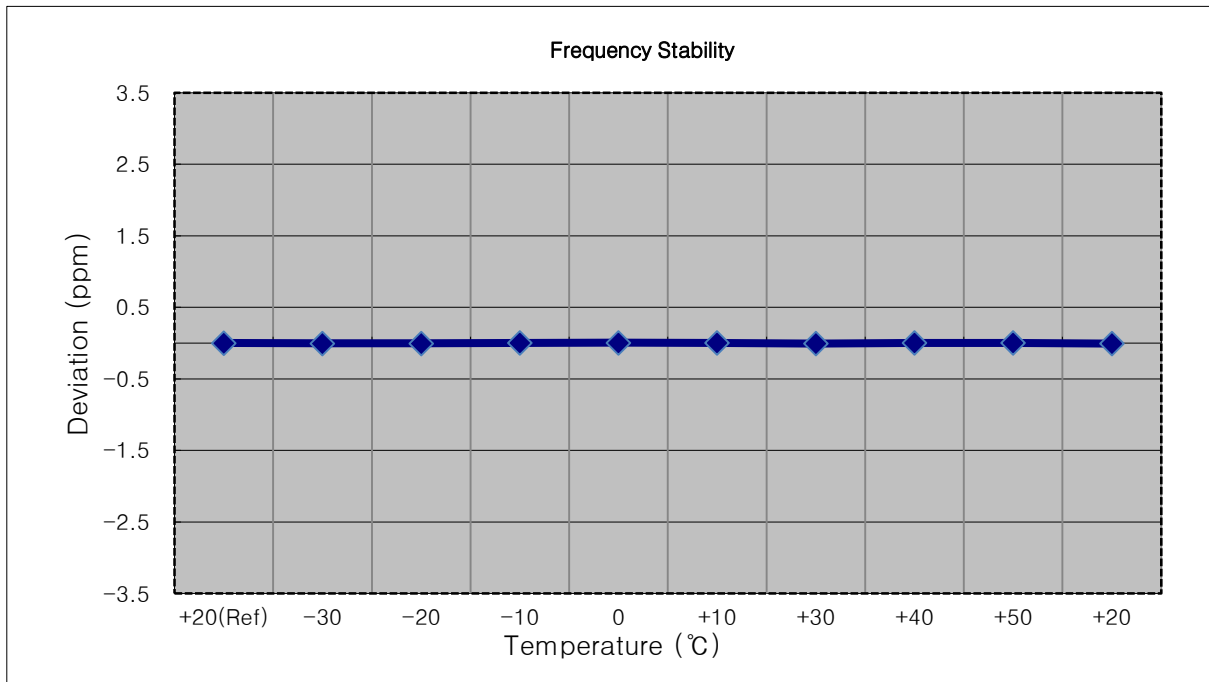
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1912,500,000 Hz
- ▣ CHANNEL: 26665 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1912 499 995	0.0	0.000 000	0.000
100%		-30	1912 499 990	-5.6	0.000 000	-0.003
100%		-20	1912 500 000	4.4	0.000 000	0.002
100%		-10	1912 500 000	4.6	0.000 000	0.002
100%		0	1912 499 978	-17.2	-0.000 001	-0.009
100%		+10	1912 499 989	-5.9	0.000 000	-0.003
100%		+30	1912 499 990	-5.0	0.000 000	-0.003
100%		+40	1912 500 002	7.1	0.000 000	0.004
100%		+50	1912 499 977	-17.8	-0.000 001	-0.009
Batt. Endpoint		3.650	+20	1912 499 987	-8.0	0.000 000



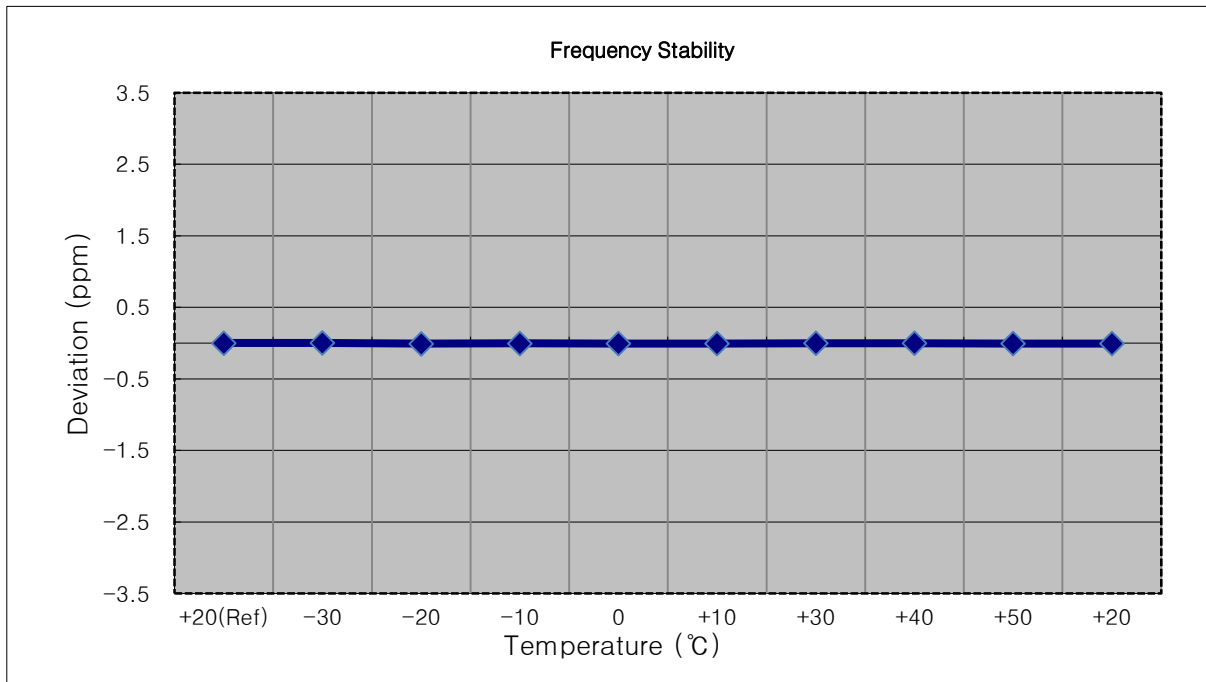
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1910,000,000 Hz
- ▣ CHANNEL: 26640 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1909 999 992	0.0	0.000 000	0.000
100%		-30	1909 999 982	-9.9	-0.000 001	-0.005
100%		-20	1909 999 983	-8.6	0.000 000	-0.005
100%		-10	1909 999 998	5.9	0.000 000	0.003
100%		0	1910 000 000	8.2	0.000 000	0.004
100%		+10	1909 999 995	2.9	0.000 000	0.002
100%		+30	1909 999 981	-10.9	-0.000 001	-0.006
100%		+40	1909 999 998	6.0	0.000 000	0.003
100%		+50	1909 999 997	5.5	0.000 000	0.003
Batt. Endpoint		3.650	+20	1909 999 980	-11.3	-0.000 001



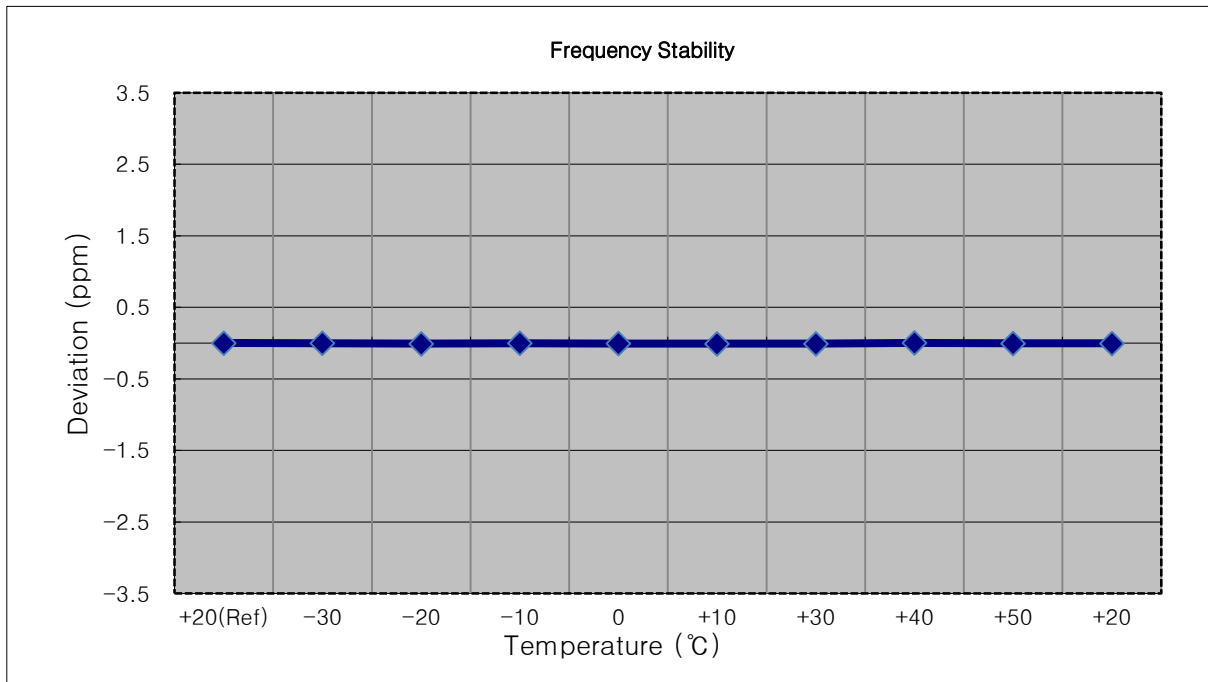
- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1907,500,000 Hz
- ▣ CHANNEL: 26615 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1907 499 995	0.0	0.000 000	0.000
100%		-30	1907 500 000	5.6	0.000 000	0.003
100%		-20	1907 499 977	-17.5	-0.000 001	-0.009
100%		-10	1907 499 986	-8.4	0.000 000	-0.004
100%		0	1907 499 981	-13.4	-0.000 001	-0.007
100%		+10	1907 499 983	-12.2	-0.000 001	-0.006
100%		+30	1907 499 991	-4.0	0.000 000	-0.002
100%		+40	1907 499 989	-5.7	0.000 000	-0.003
100%		+50	1907 499 981	-13.7	-0.000 001	-0.007
Batt. Endpoint		3.650	+20	1907 499 981	-13.4	-0.000 001



- ▣ MODE: LTE B25/B2
- ▣ OPERATING FREQUENCY: 1905,000,000 Hz
- ▣ CHANNEL: 26590 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.88 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

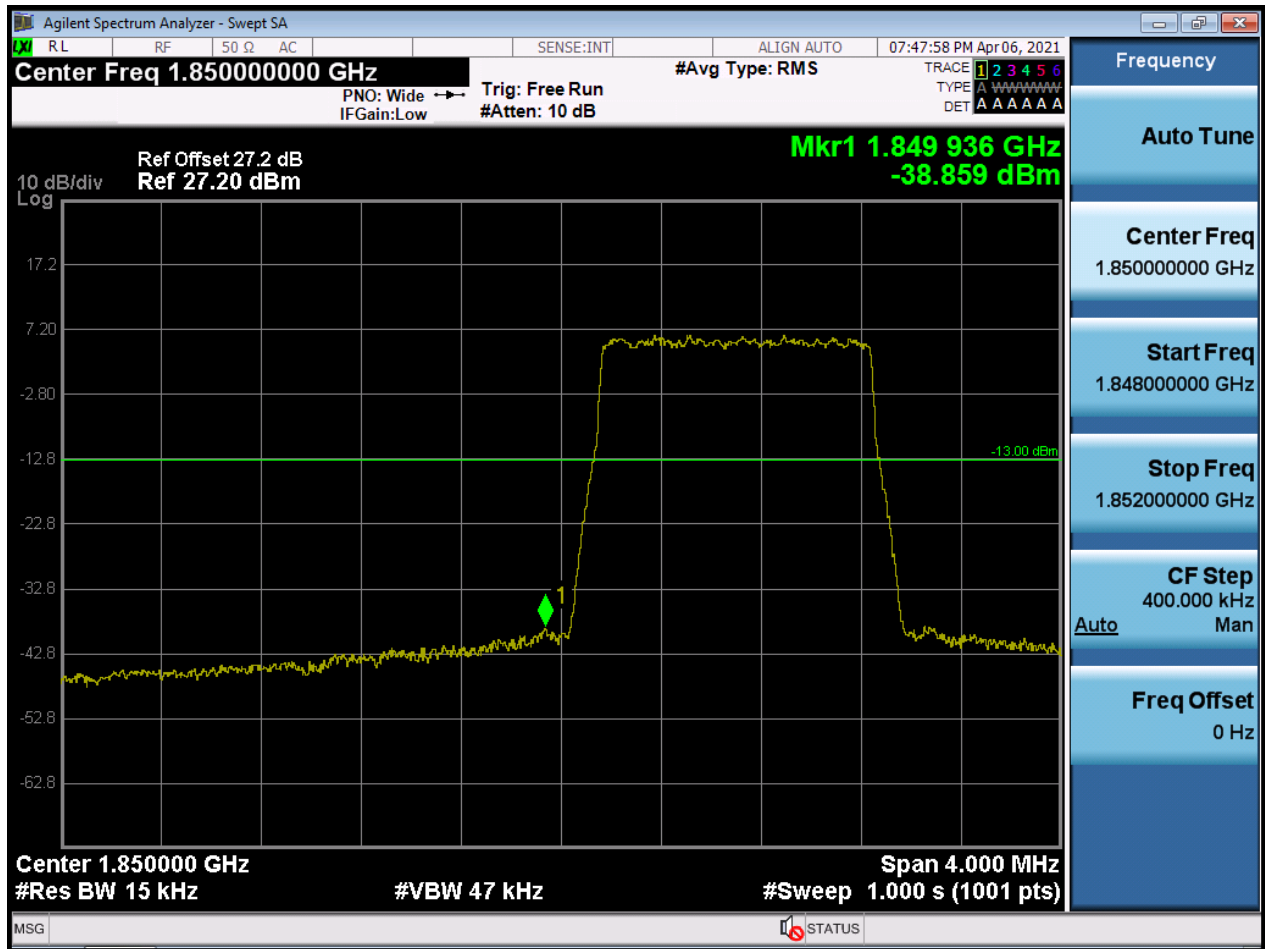
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	1905 000 005	0.0	0.000 000	0.000
100%		-30	1905 000 000	-5.1	0.000 000	-0.003
100%		-20	1904 999 989	-16.2	-0.000 001	-0.009
100%		-10	1905 000 000	-5.3	0.000 000	-0.003
100%		0	1904 999 995	-10.4	-0.000 001	-0.005
100%		+10	1904 999 989	-16.0	-0.000 001	-0.008
100%		+30	1904 999 988	-17.2	-0.000 001	-0.009
100%		+40	1905 000 012	7.0	0.000 000	0.004
100%		+50	1905 000 000	-5.8	0.000 000	-0.003
Batt. Endpoint		3.650	+20	1904 999 998	-7.3	0.000 000



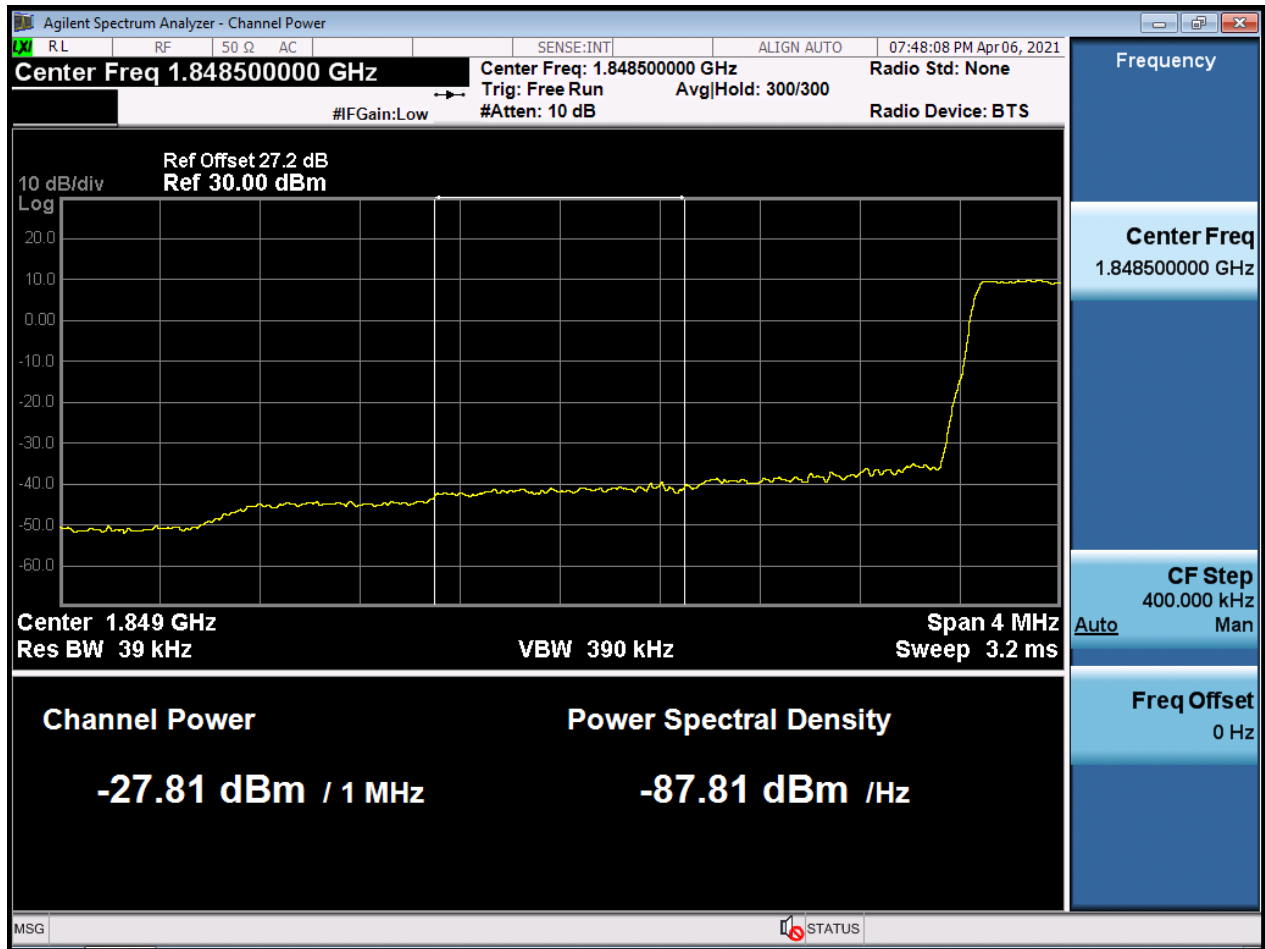
## 9. TEST PLOTS



BW1.4M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1)



BW1.4M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2)



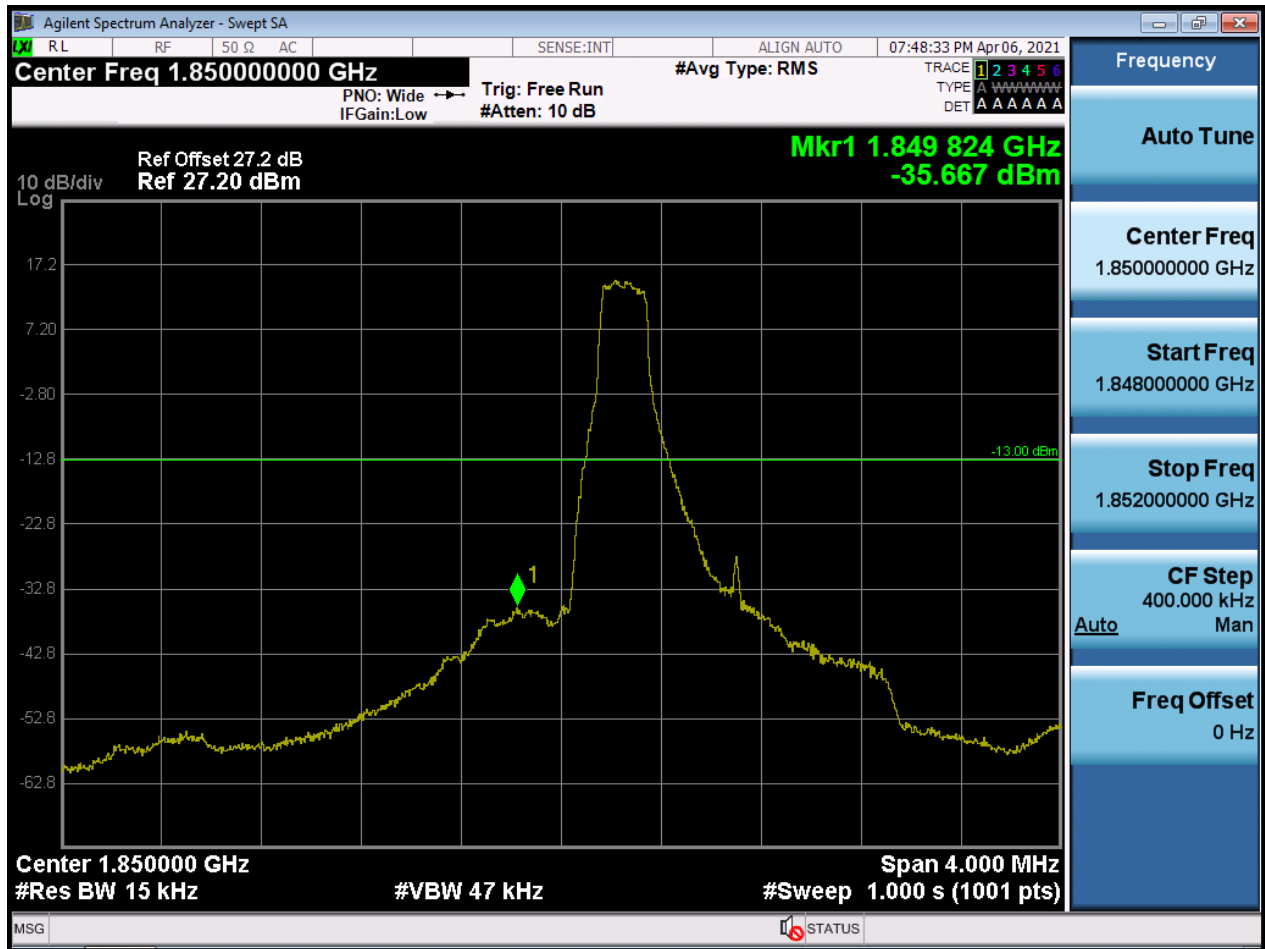
BW1.4M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1)



BW1.4M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2)



BW1.4M\_BandEdge\_Lowest Channel\_QPSK\_1RB



BW1.4M\_BandEdge\_Highest Channel\_QPSK\_1RB



BW3M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(1)



BW3M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2)

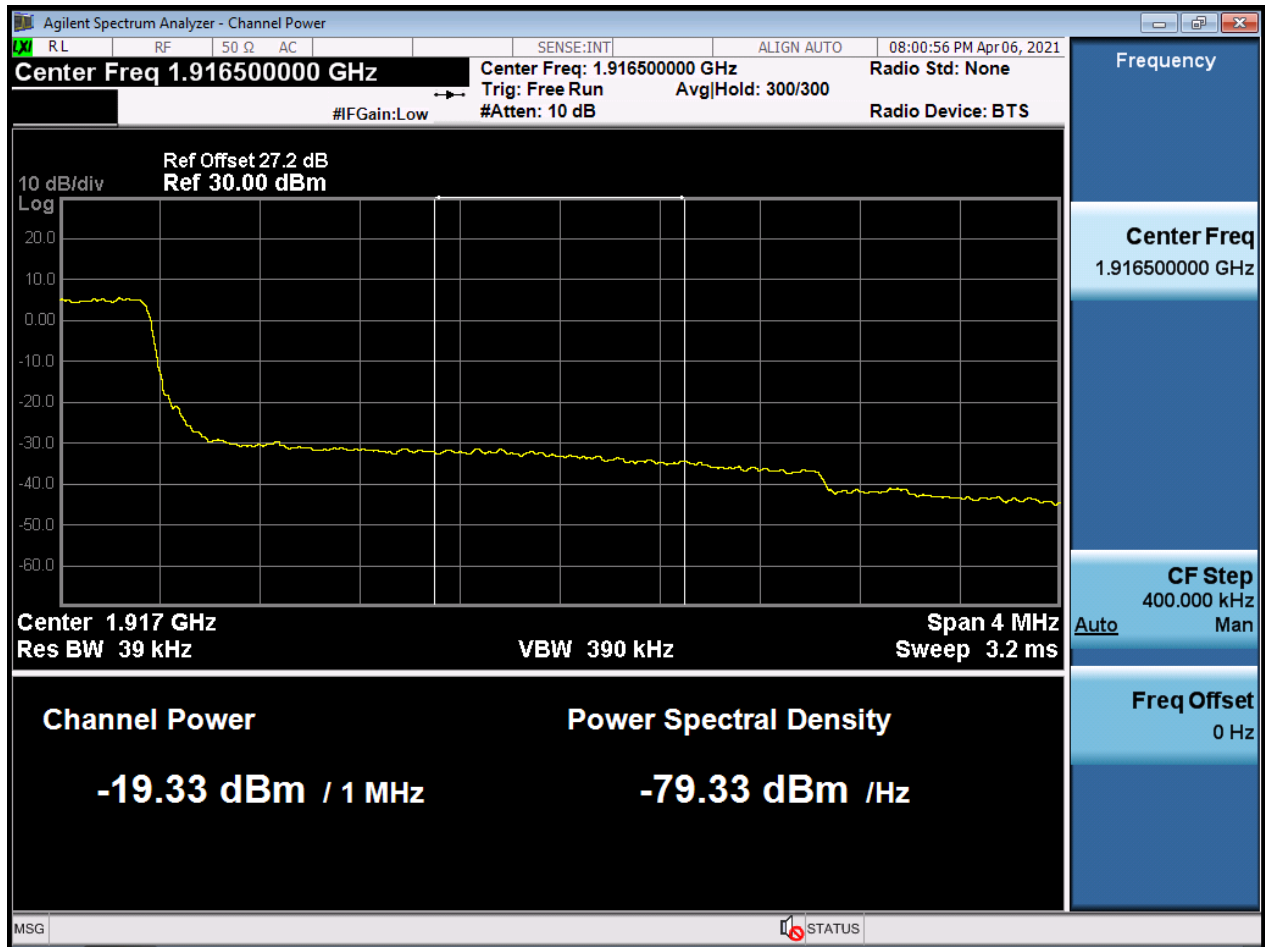




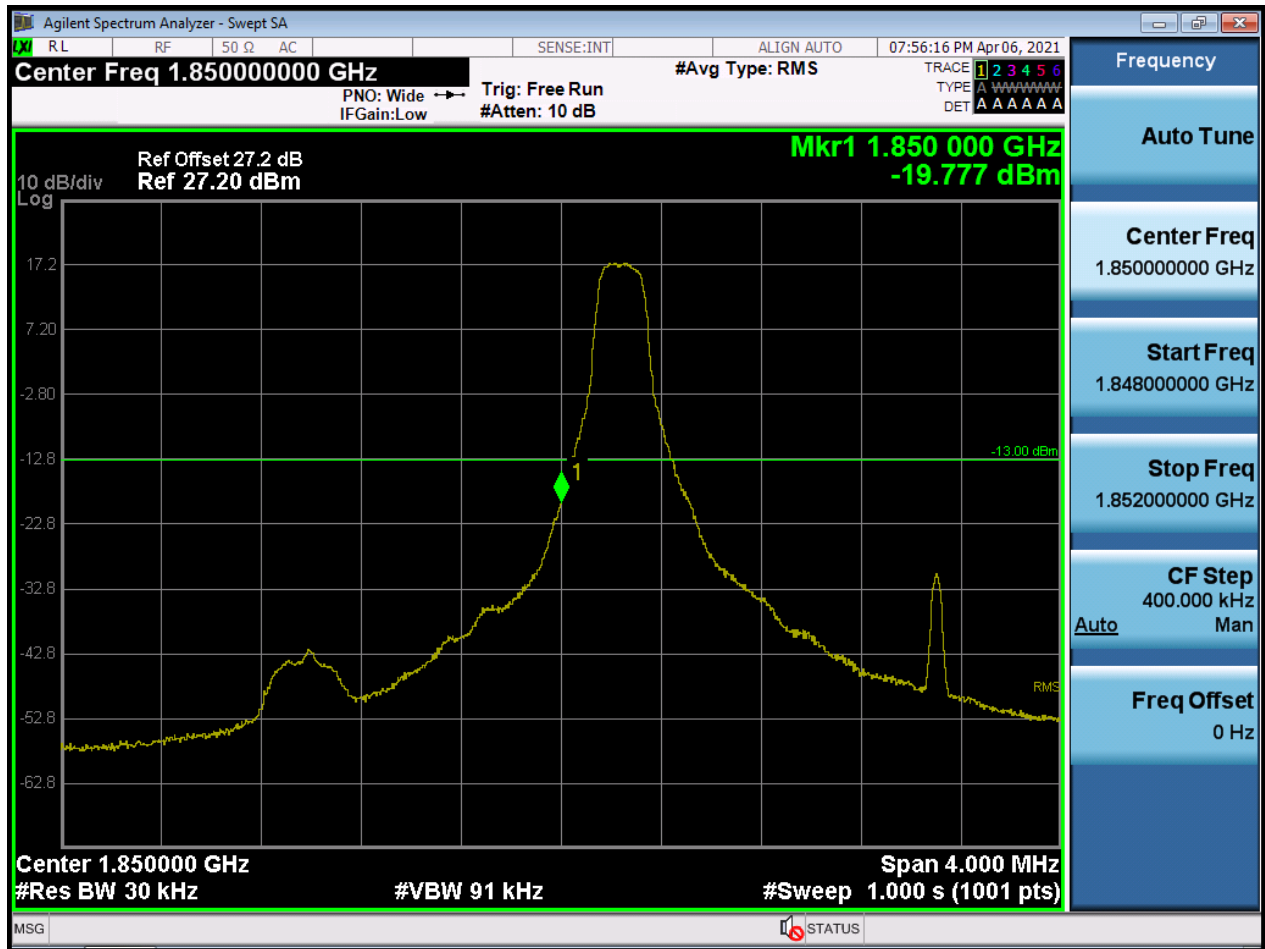
BW3M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(1)



BW3M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(2)



BW3M\_BandEdge\_Lowest Channel\_QPSK\_1RB



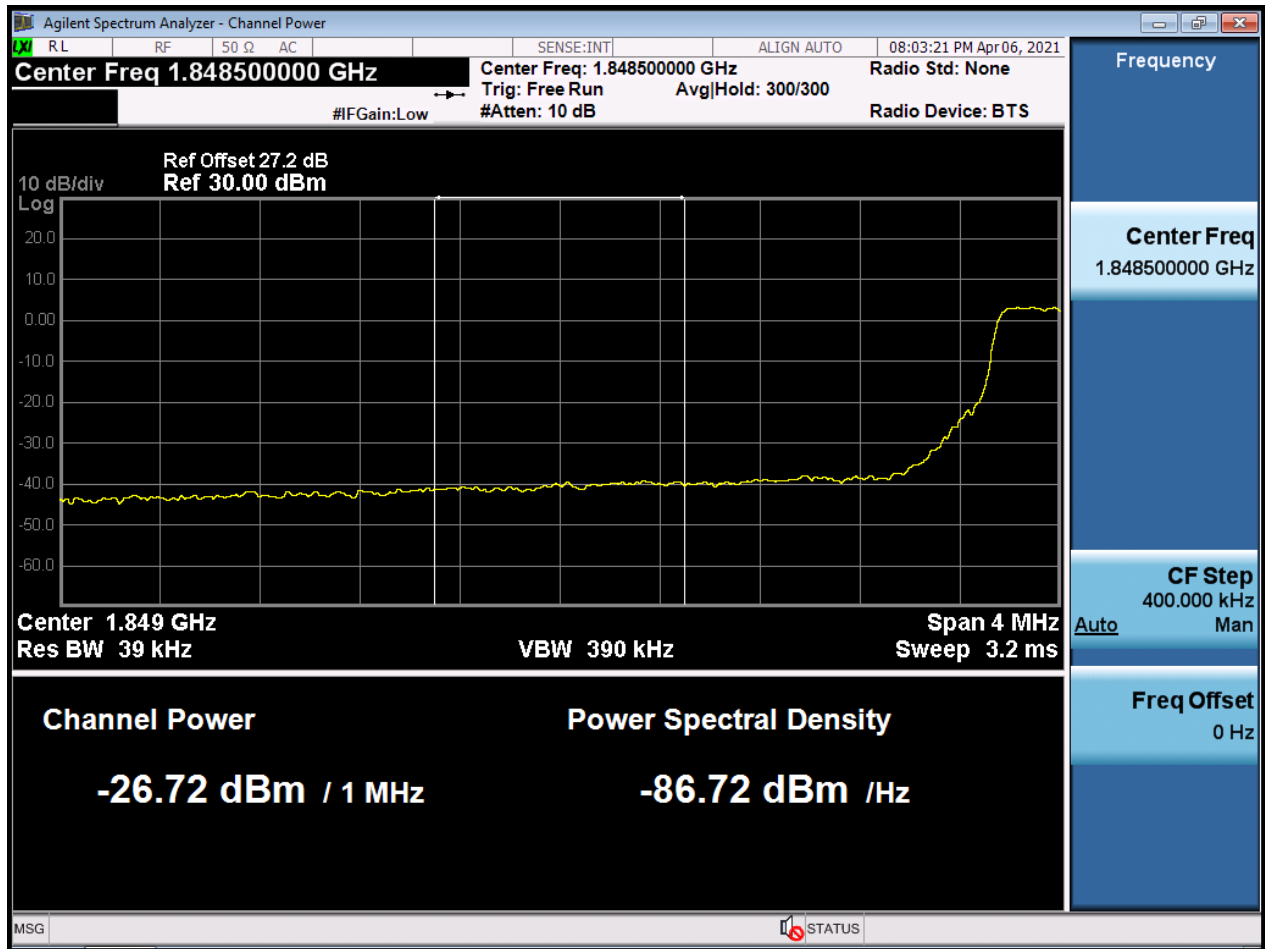
BW3M\_BandEdge\_Highest Channel\_QPSK\_1RB



BW5M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1)



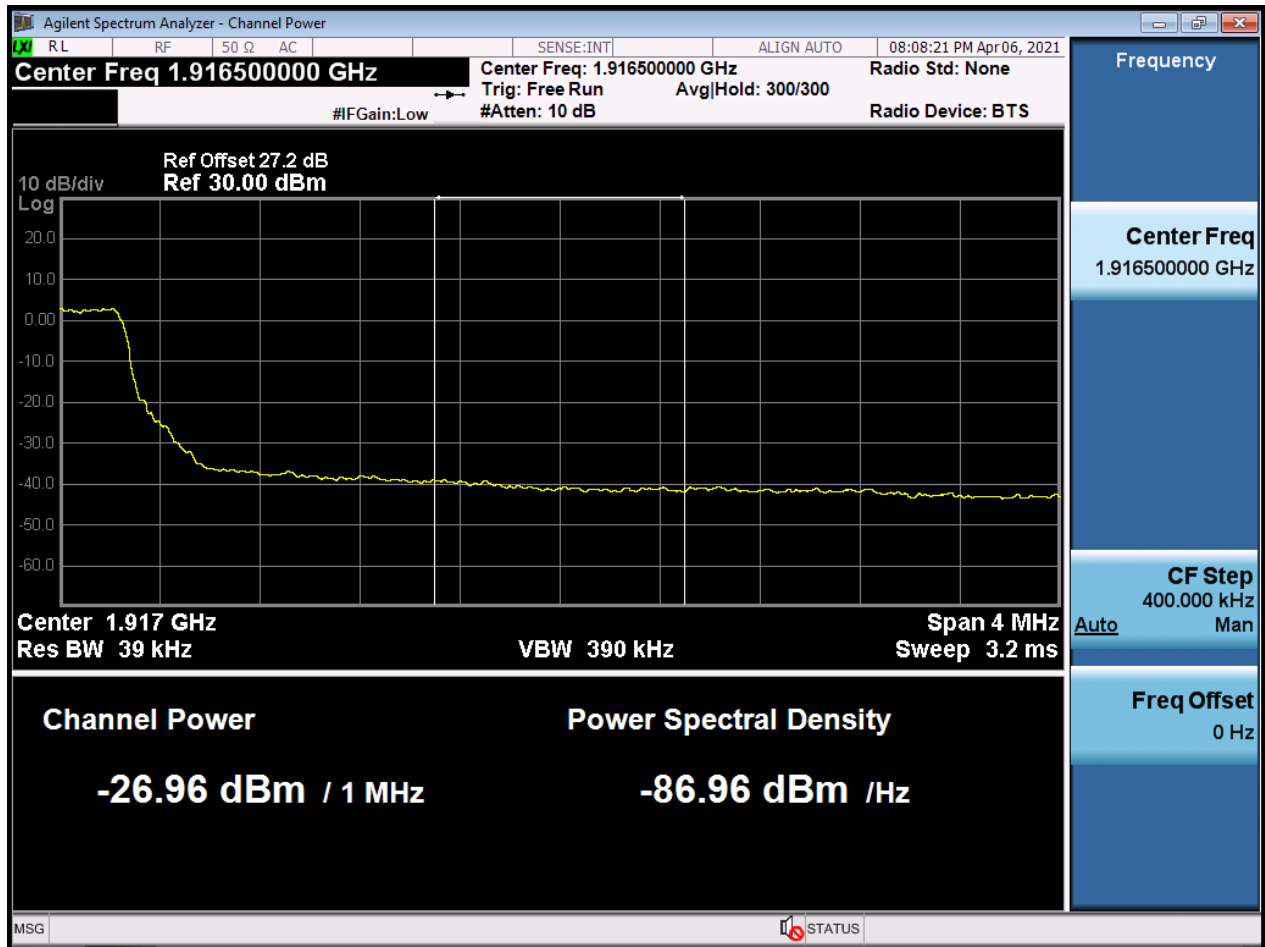
BW5M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2)



BW5M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(1)

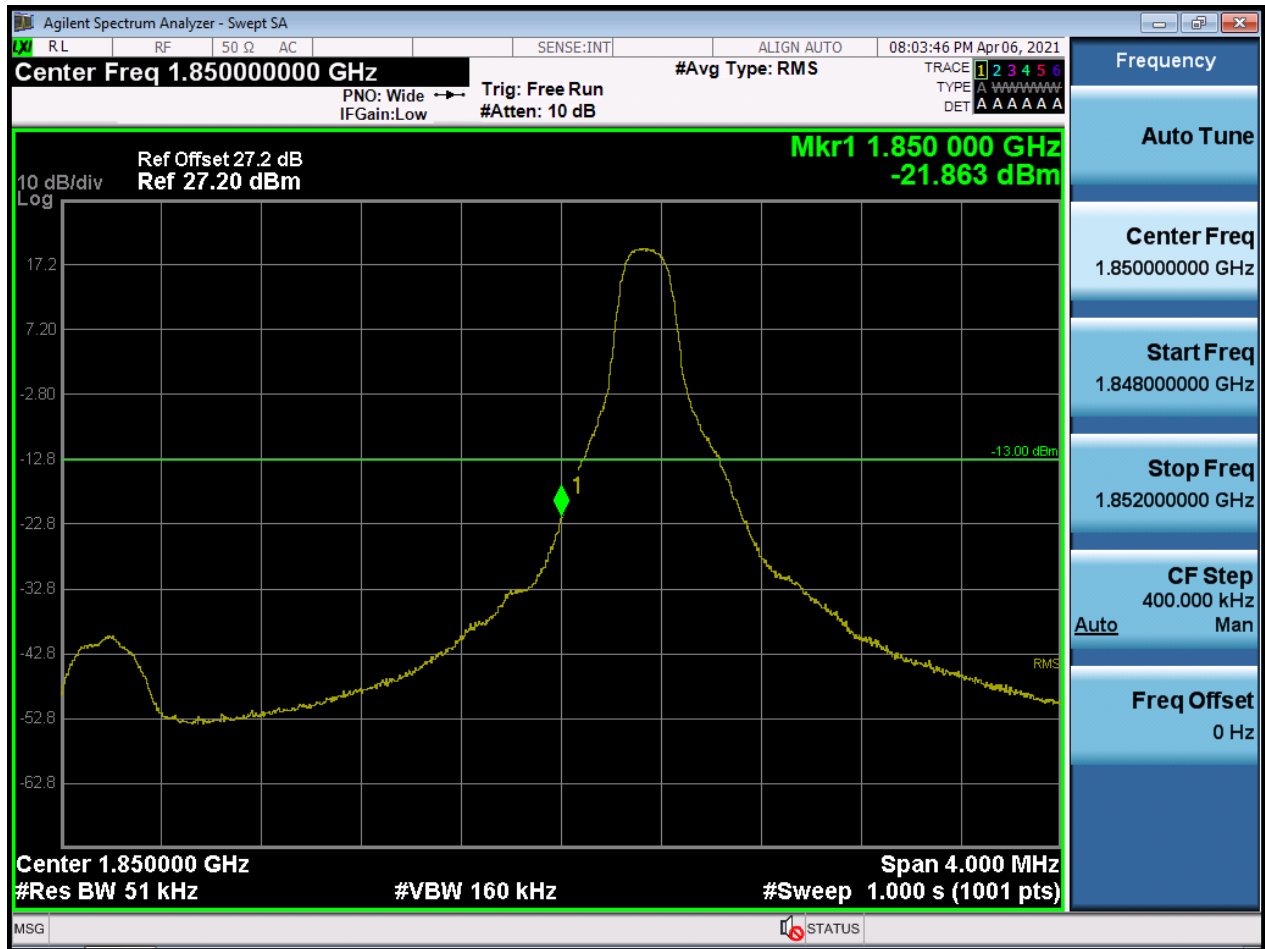


BW5M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(2)

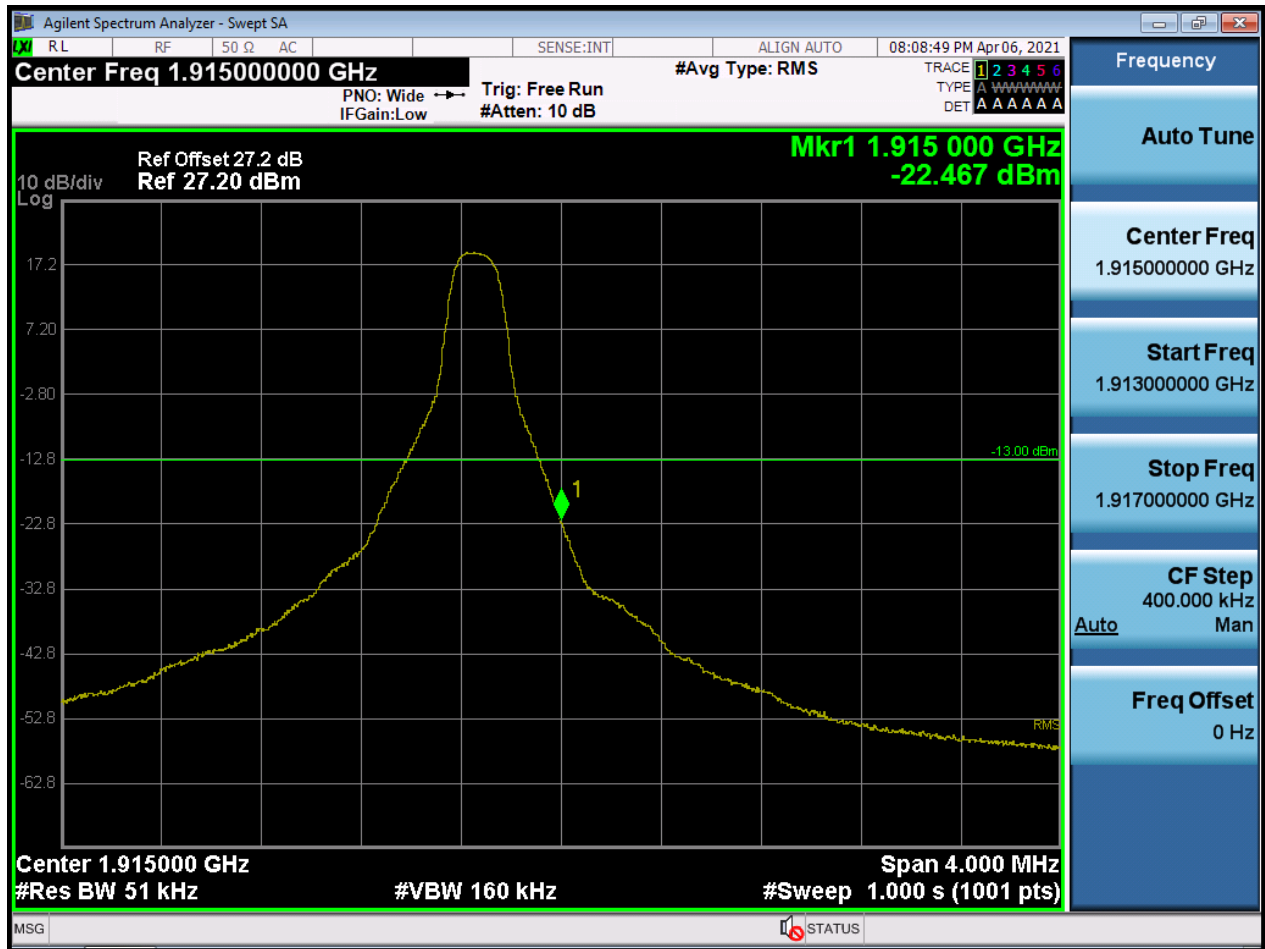




BW5M\_BandEdge\_Lowest Channel\_QPSK\_1RB



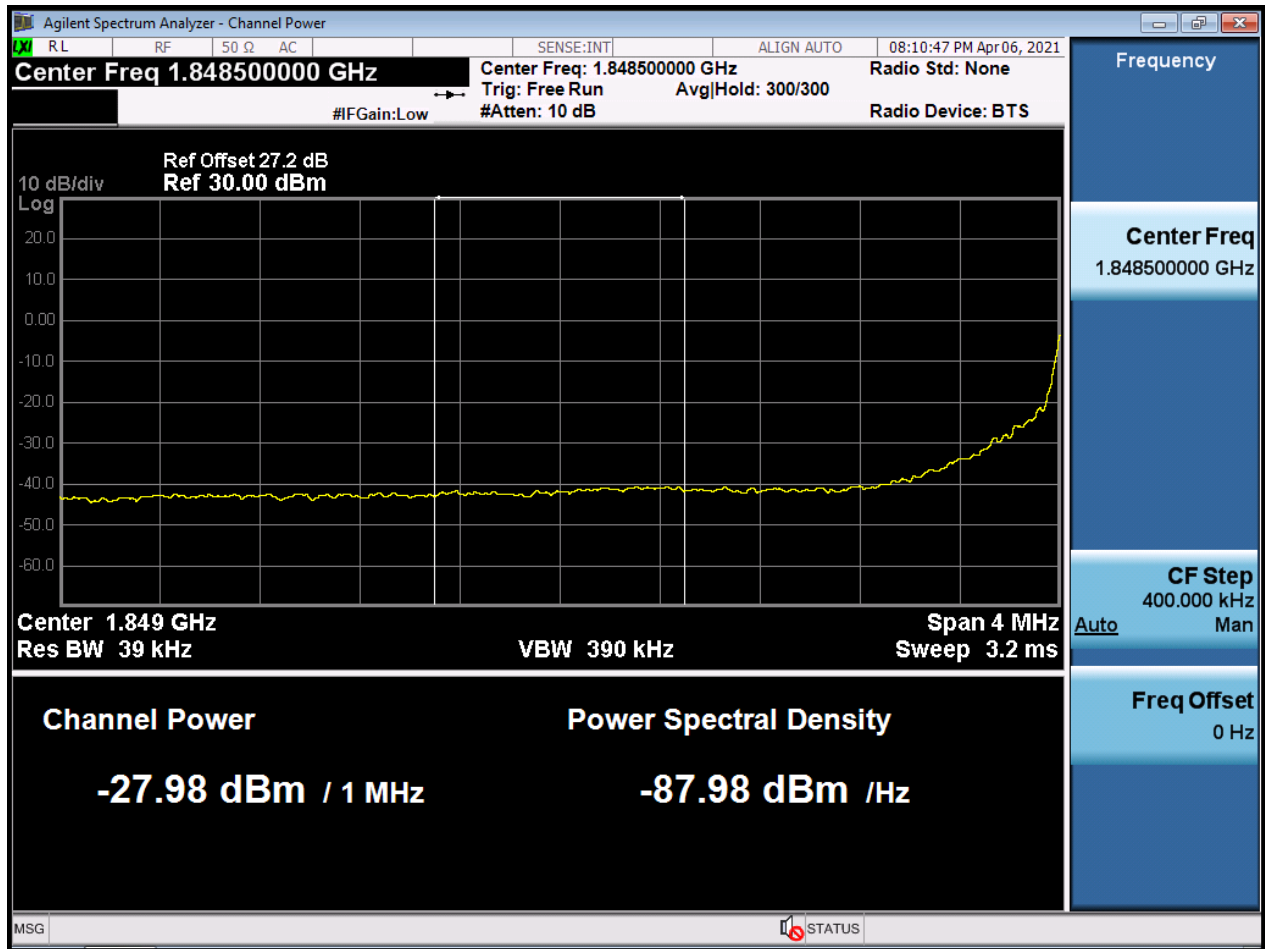
BW5M\_BandEdge\_Highest Channel\_QPSK\_1RB



BW10M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(1)



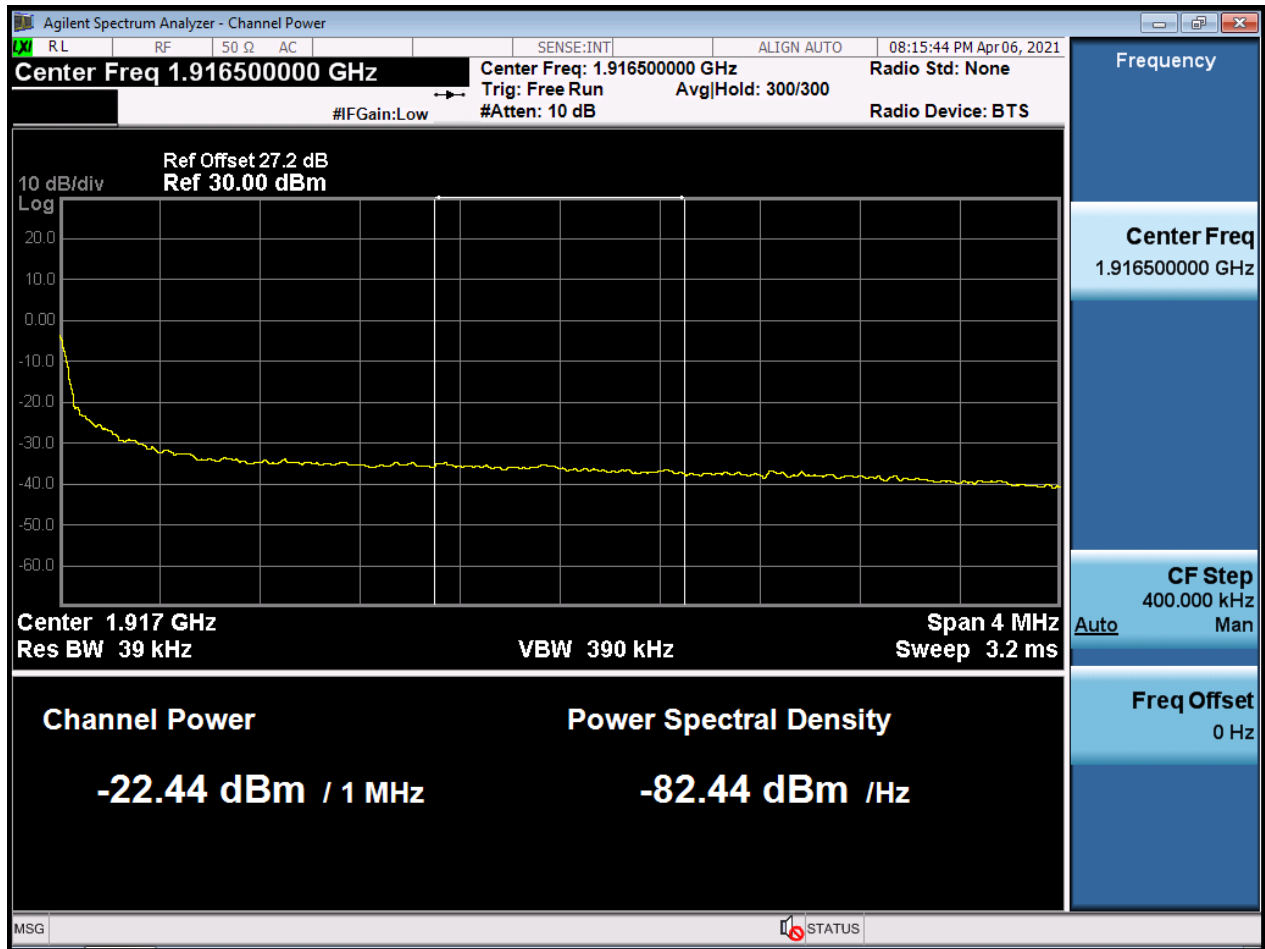
BW10M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2)



BW10M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1)



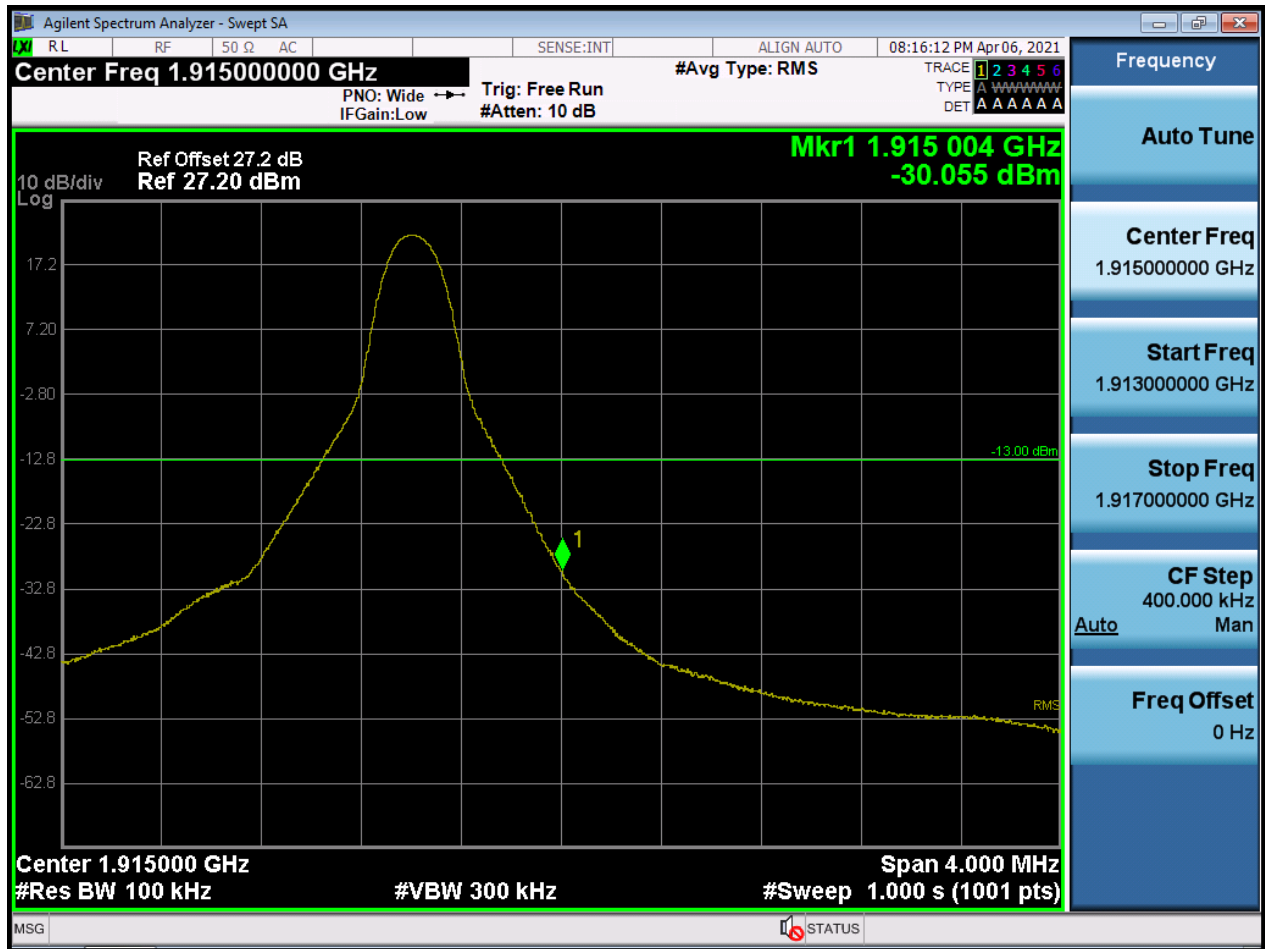
BW10M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2)



BW10M\_BandEdge\_Lowest Channel\_QPSK\_1RB



BW10M\_BandEdge\_Highest Channel\_QPSK\_1RB

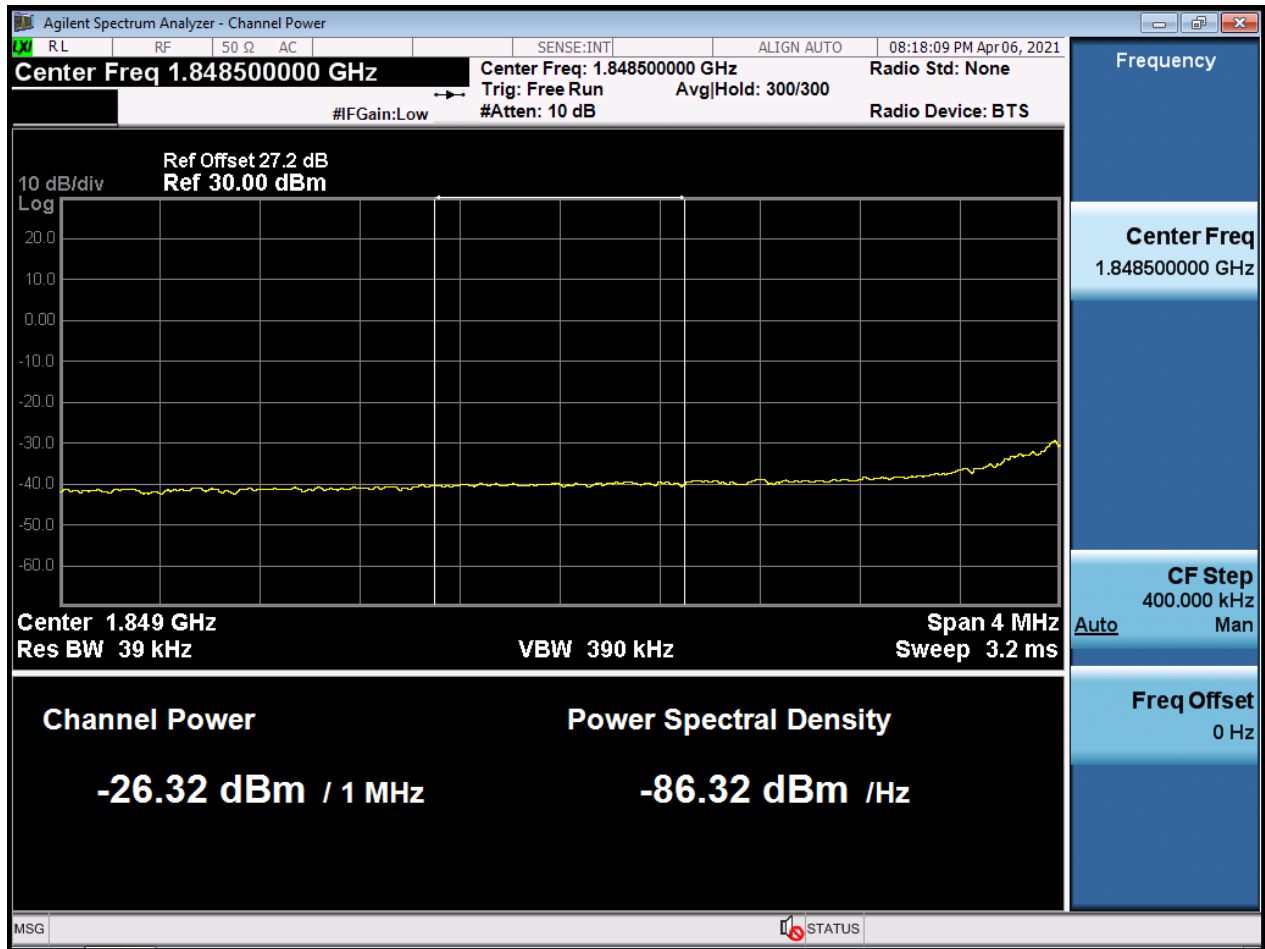




BW15M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(1)



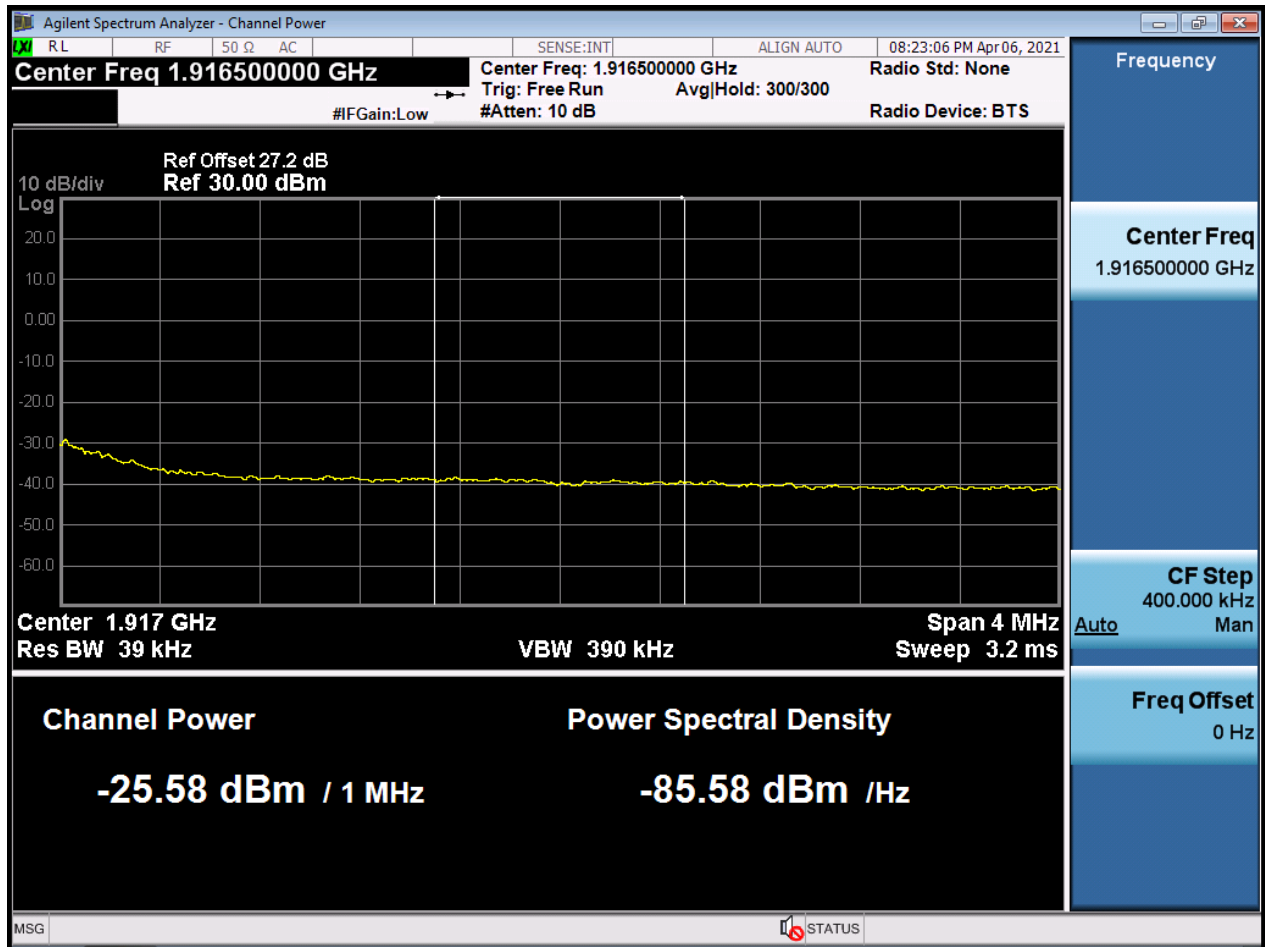
BW15M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2)



BW15M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1)



BW15M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2)



BW15M\_BandEdge\_Lowest Channel\_QPSK\_1RB



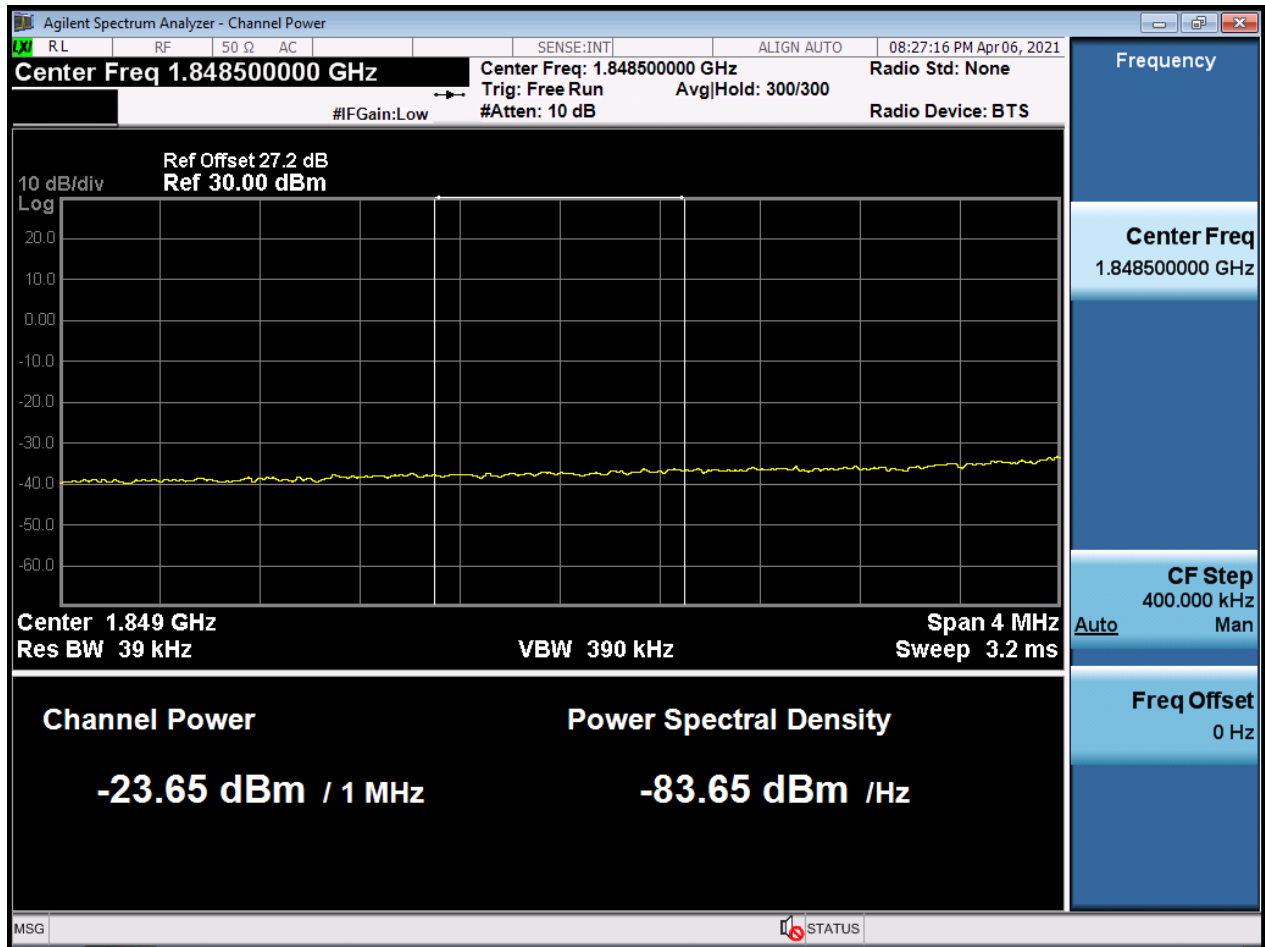
BW15M\_BandEdge\_Highest Channel\_QPSK\_1RB



BW20M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(1)



BW20M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2)

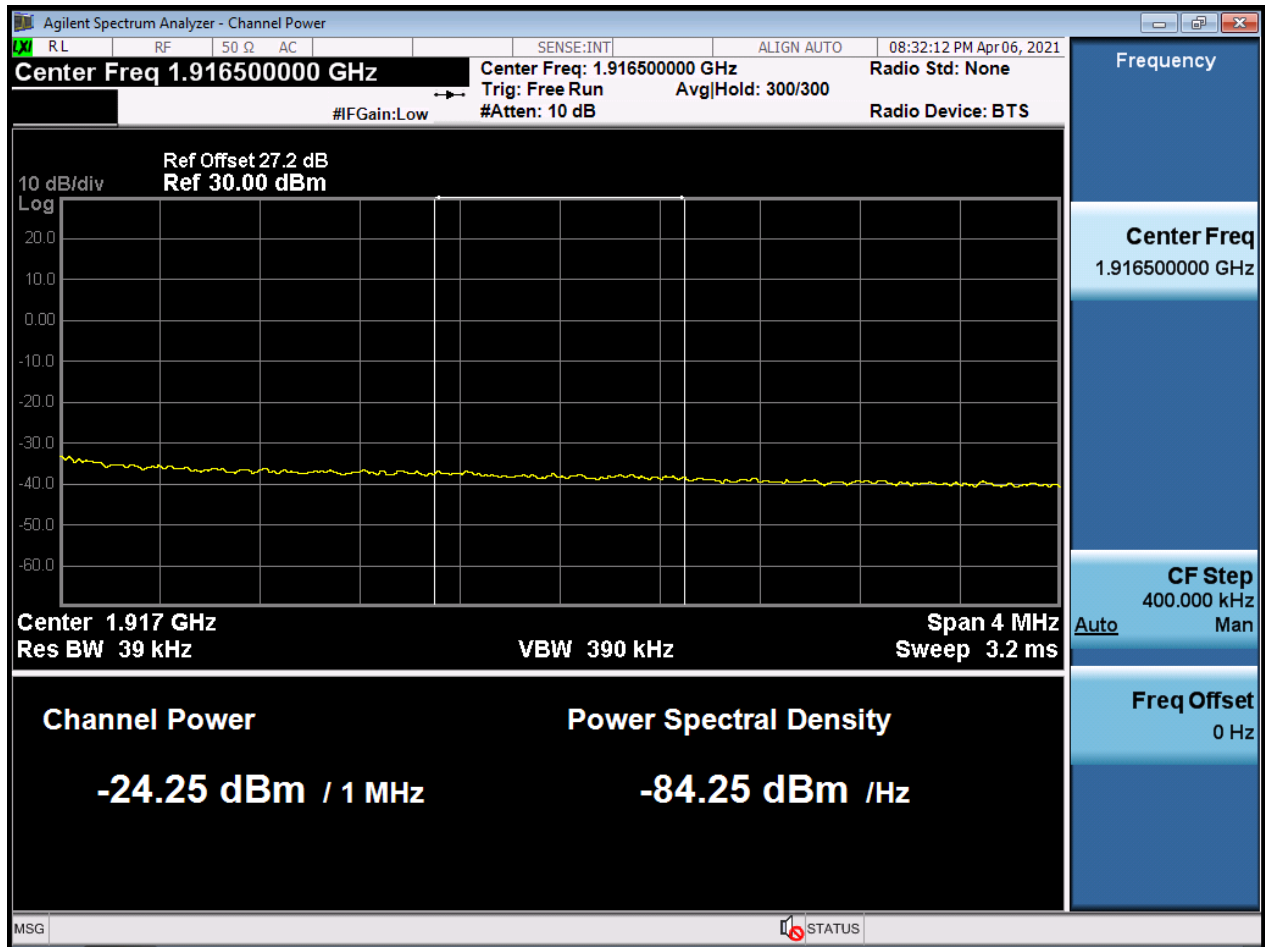




BW20M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1)



BW20M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2)



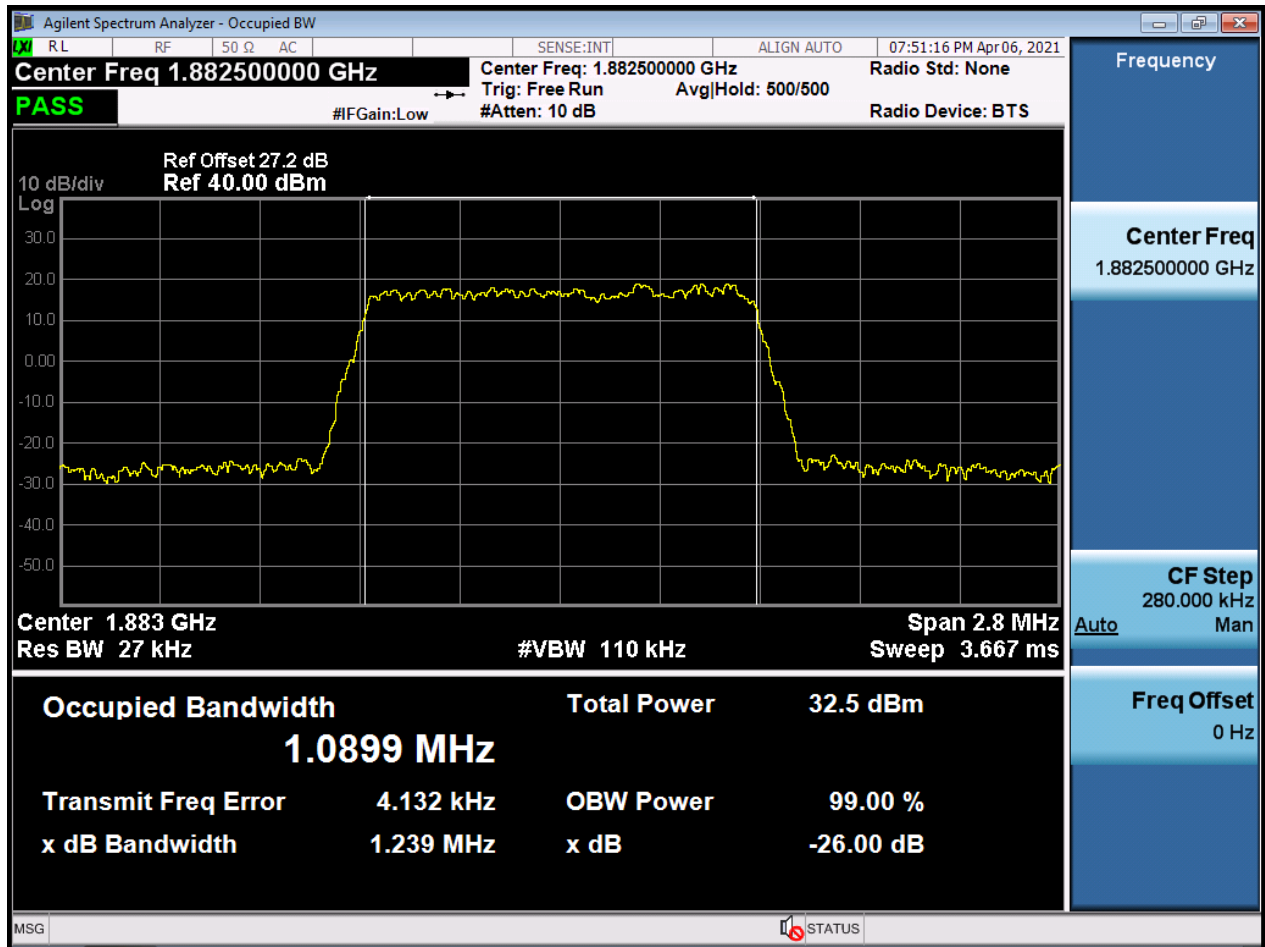
BW20M\_BandEdge\_Lowest Channel\_QPSK\_1RB



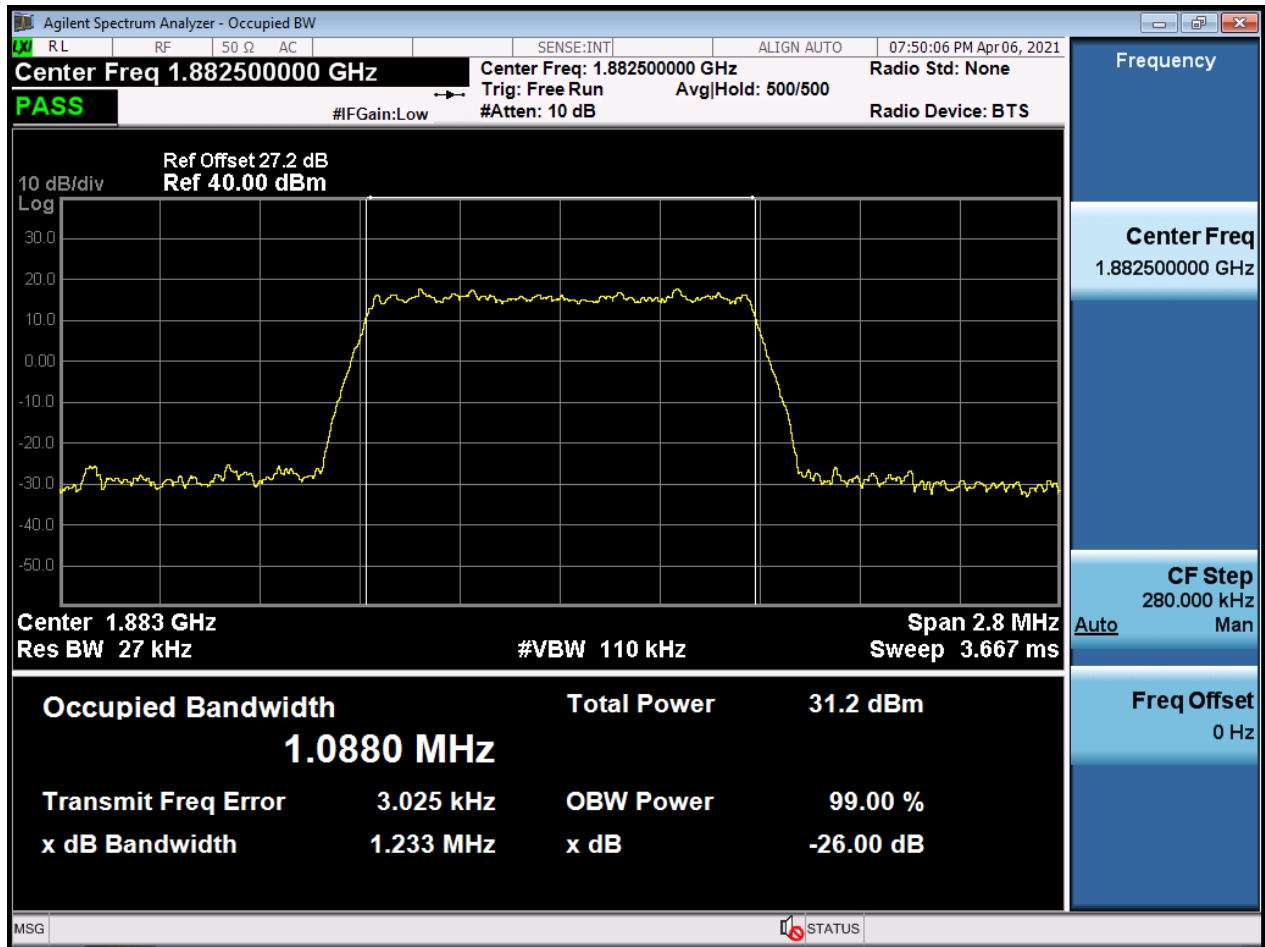
BW20M\_BandEdge\_Highest Channel\_QPSK\_1RB



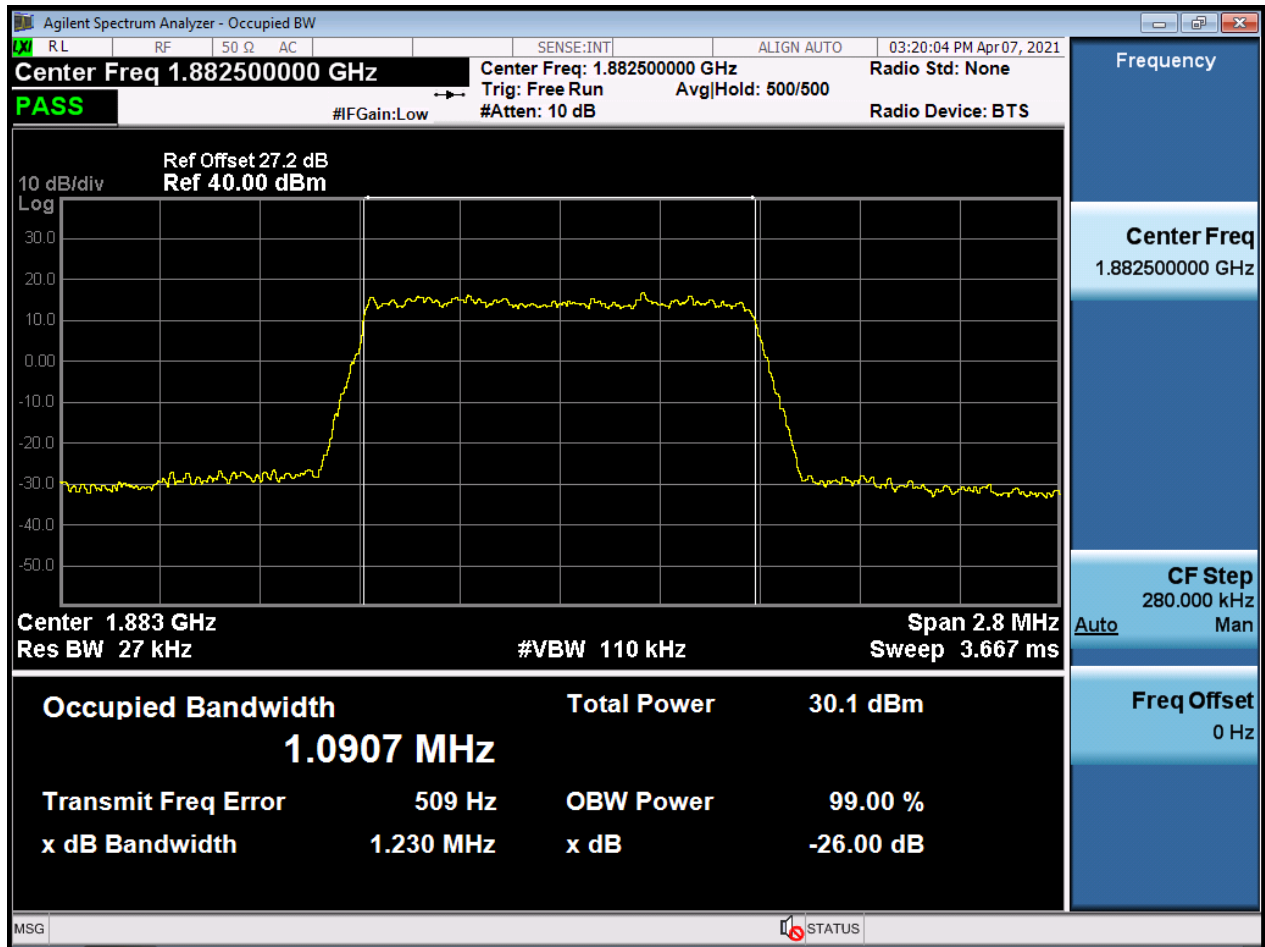
BW1.4M\_OBW\_Middle Channel\_QPSK\_FullIRB



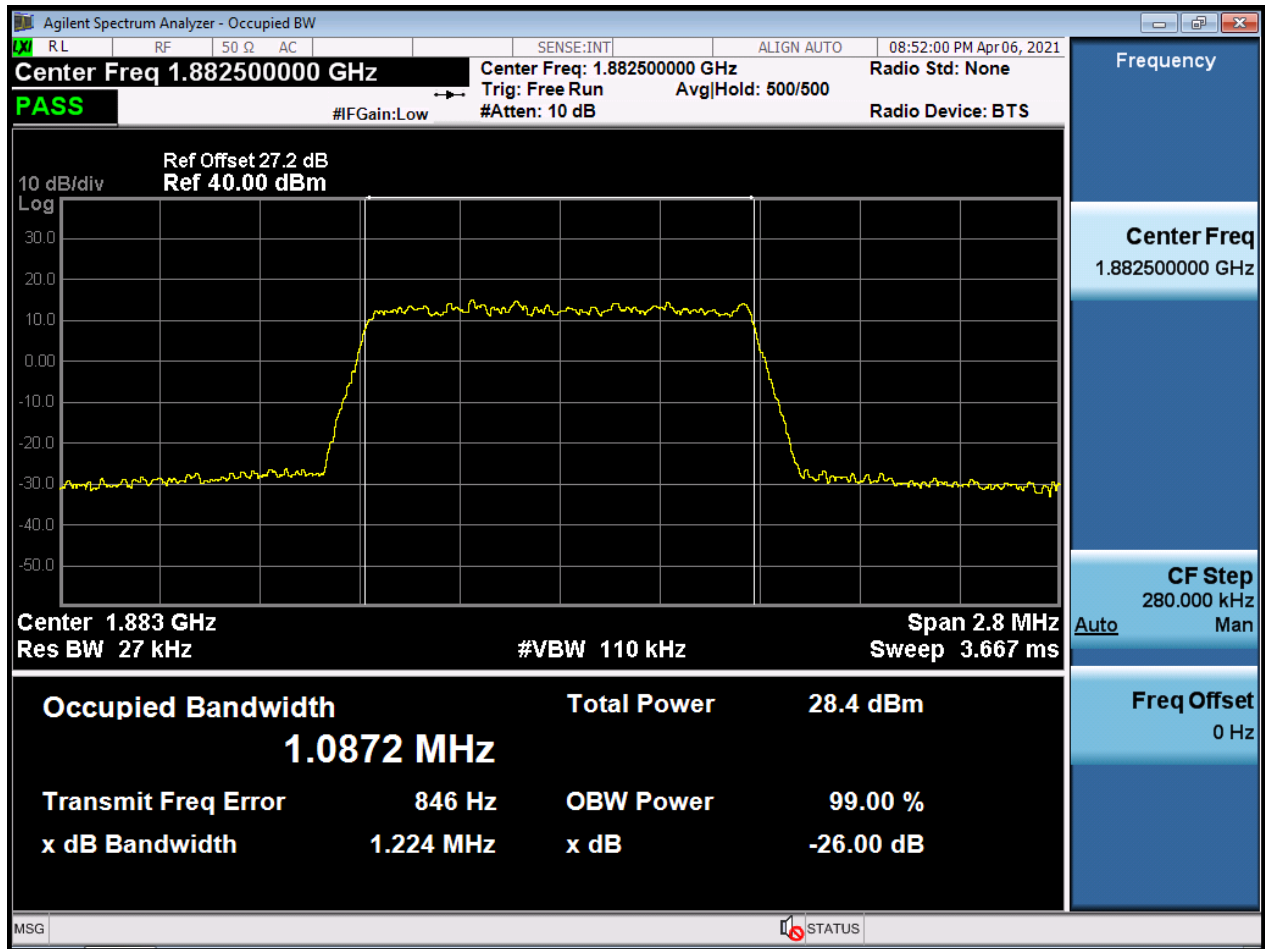
BW1.4M\_OBW\_Middle Channel\_16QAM\_FullIRB



BW1.4M\_OBW\_Middle Channel\_64QAM\_FullIRB

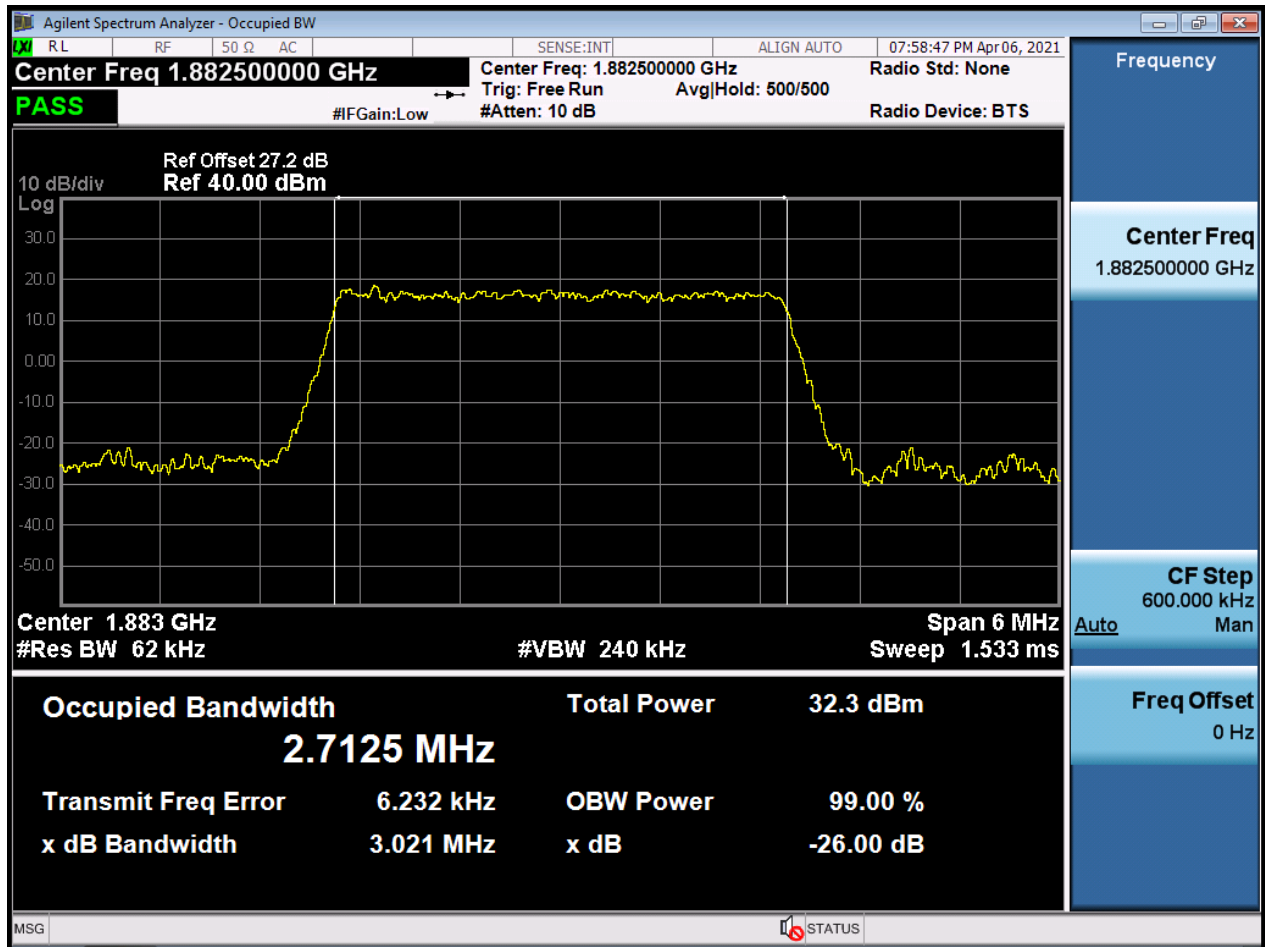


BW1.4M\_OBW\_Middle Channel\_256QAM\_FullRB

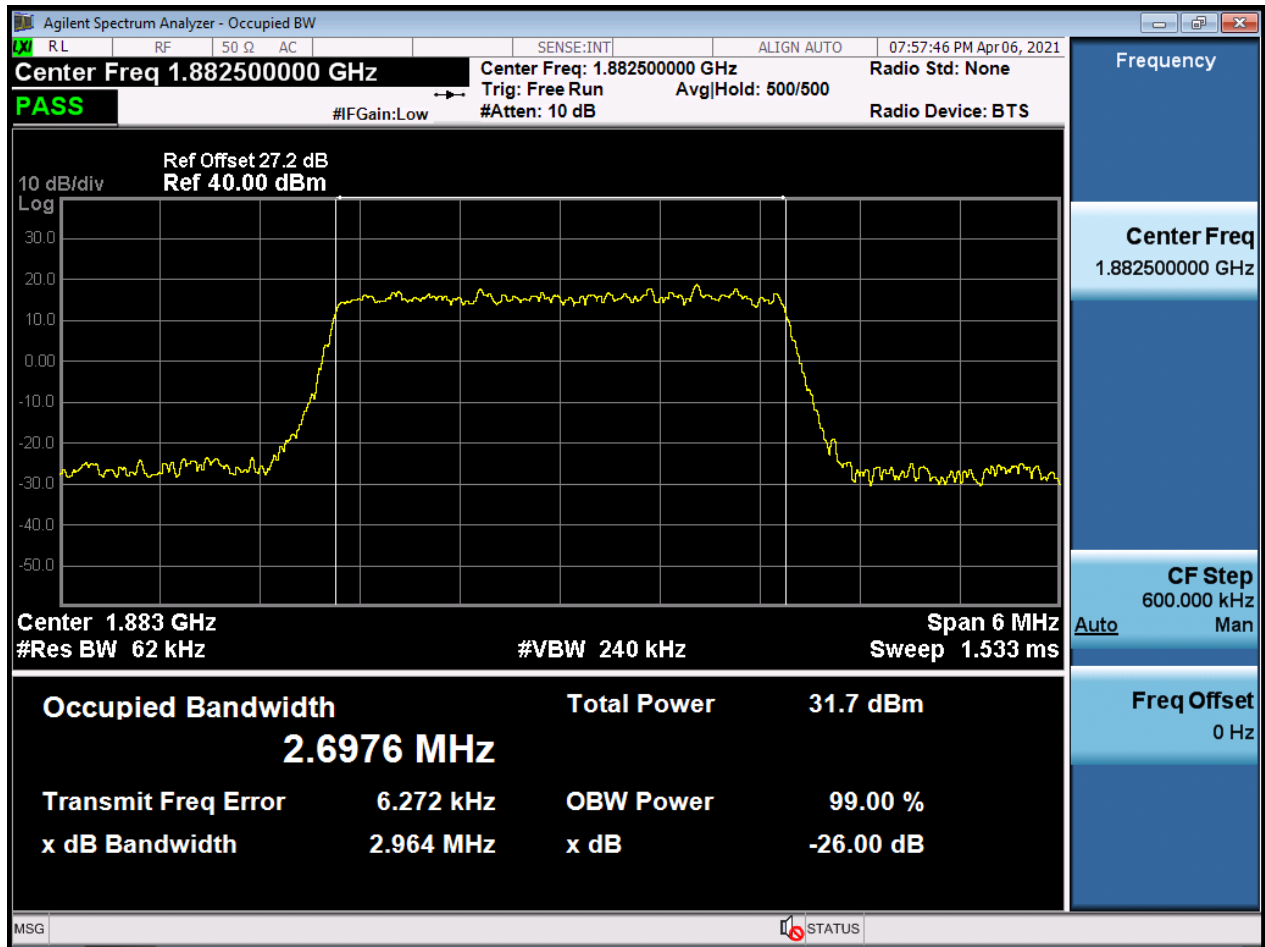




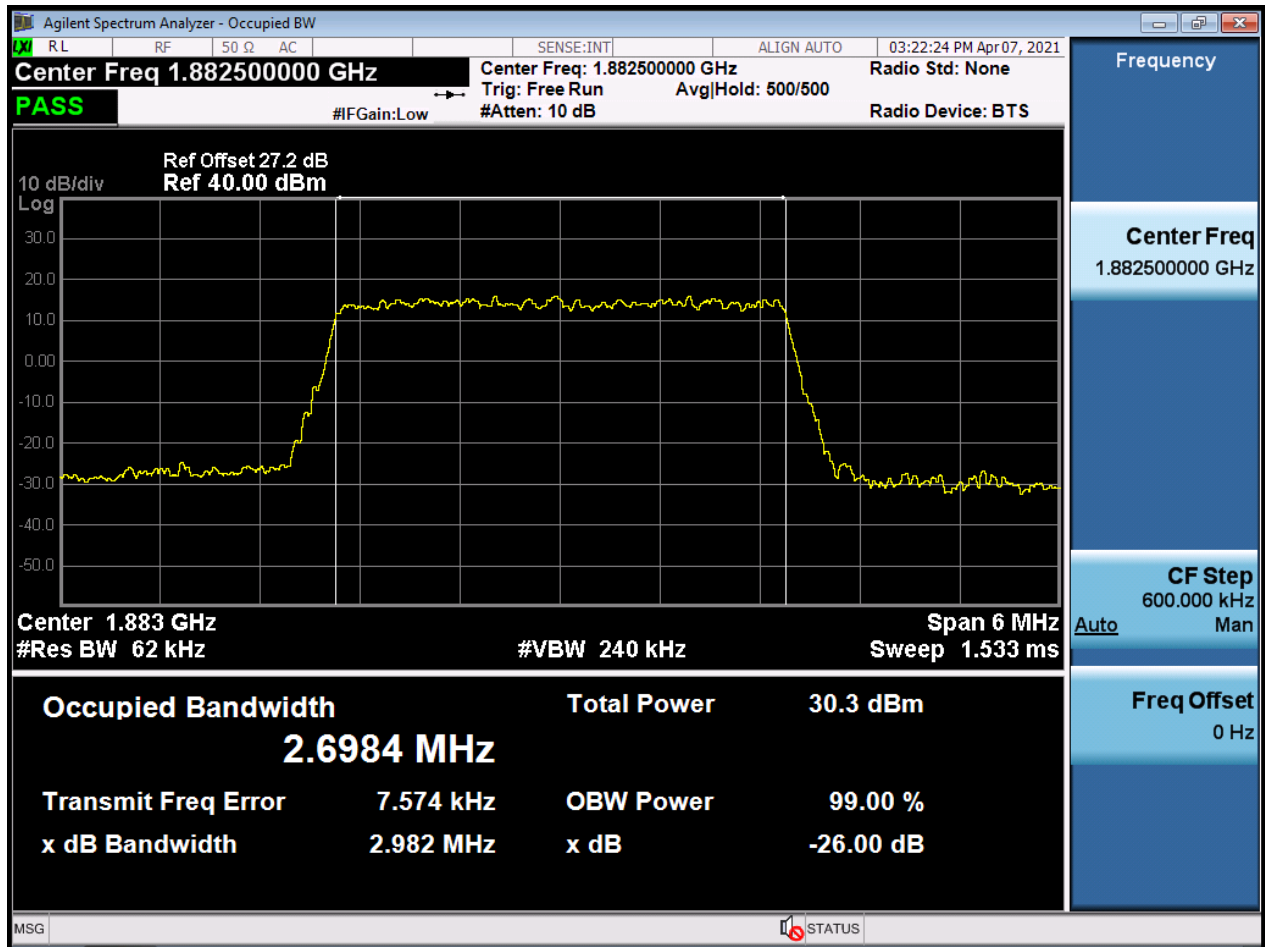
BW3M\_OBW\_Middle Channel\_QPSK\_FullIRB



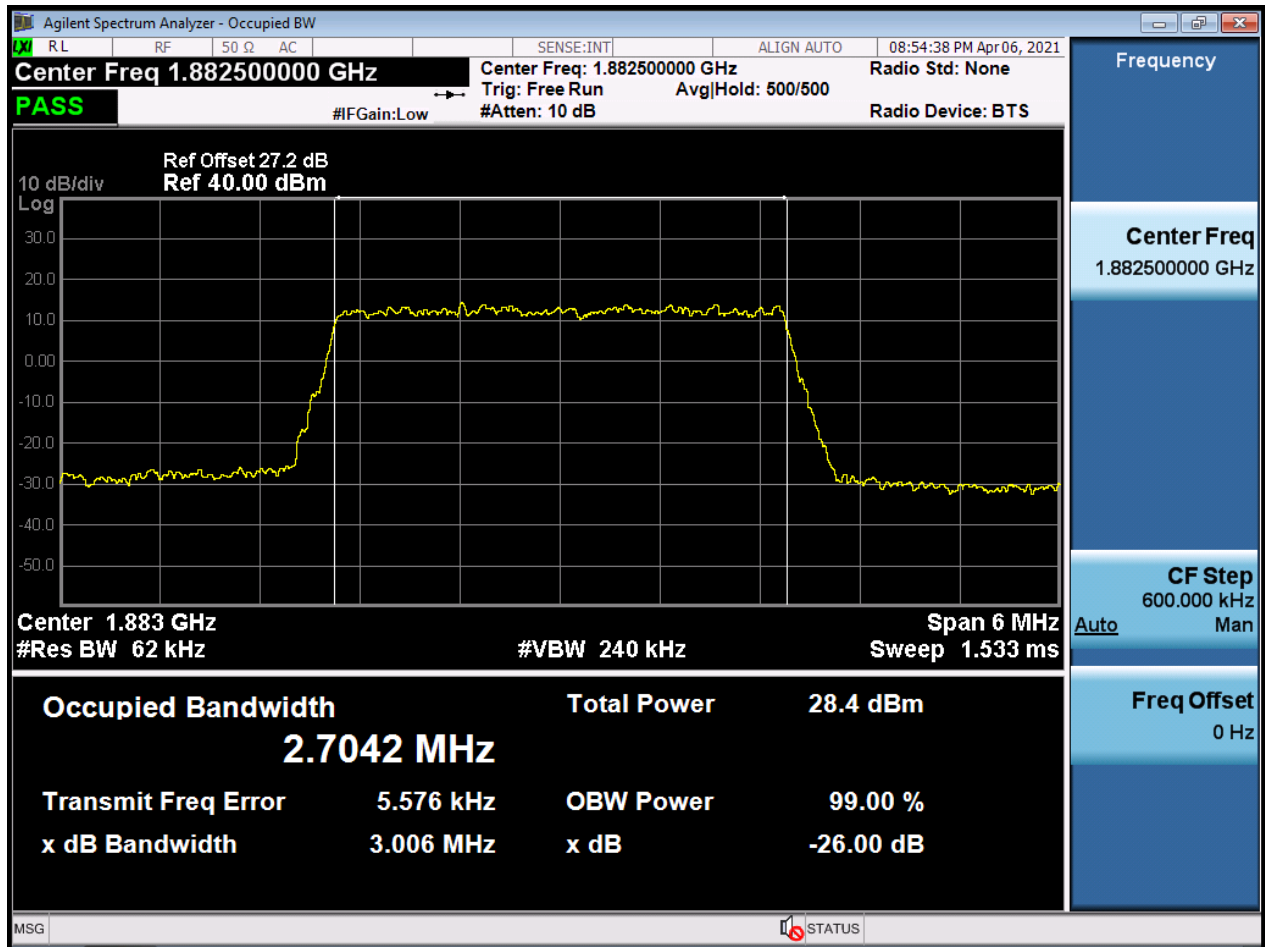
BW3M\_OBW\_Middle Channel\_16QAM\_FullRB



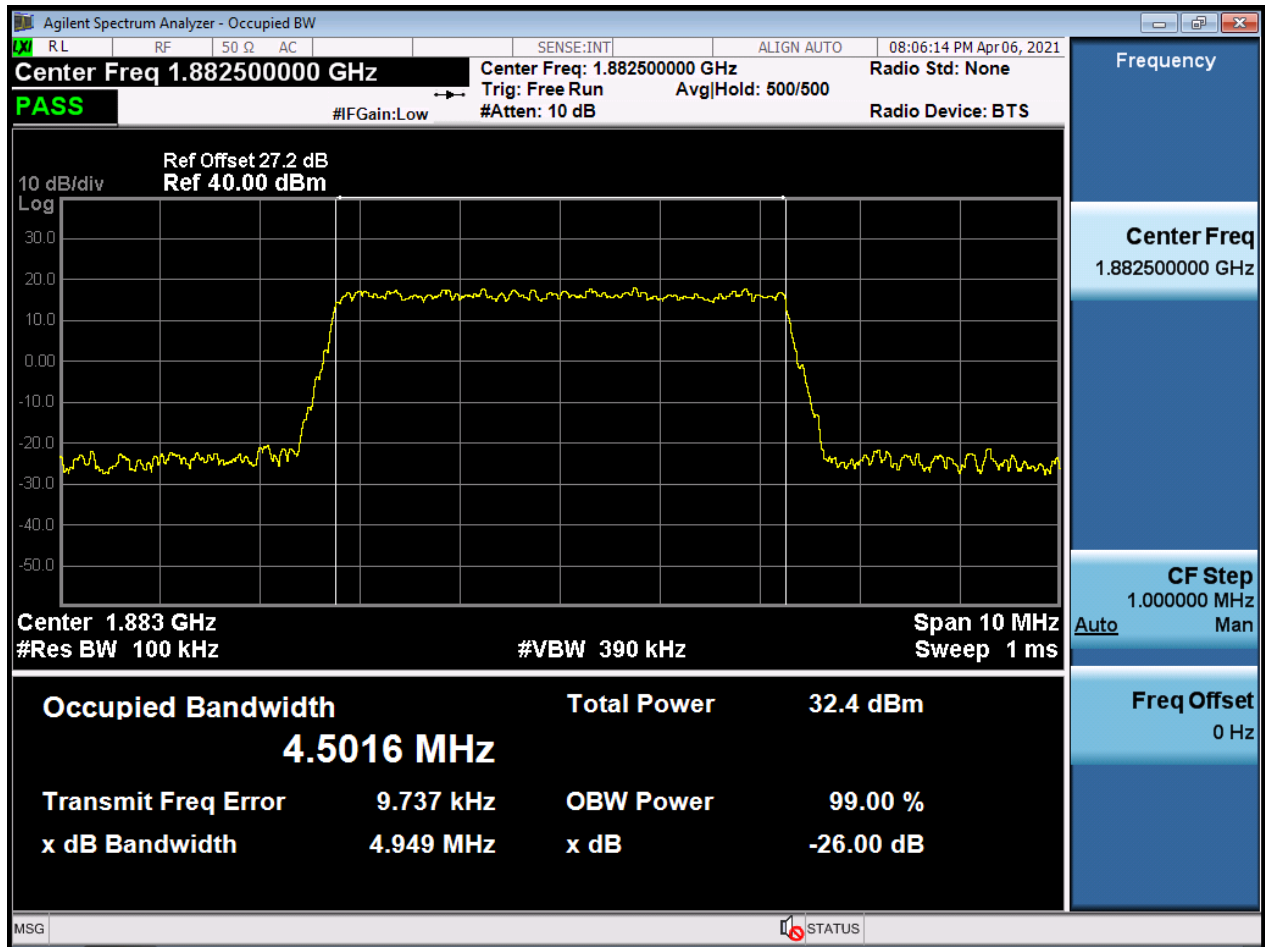
BW3M\_OBW\_Middle Channel\_64QAM\_FullRB



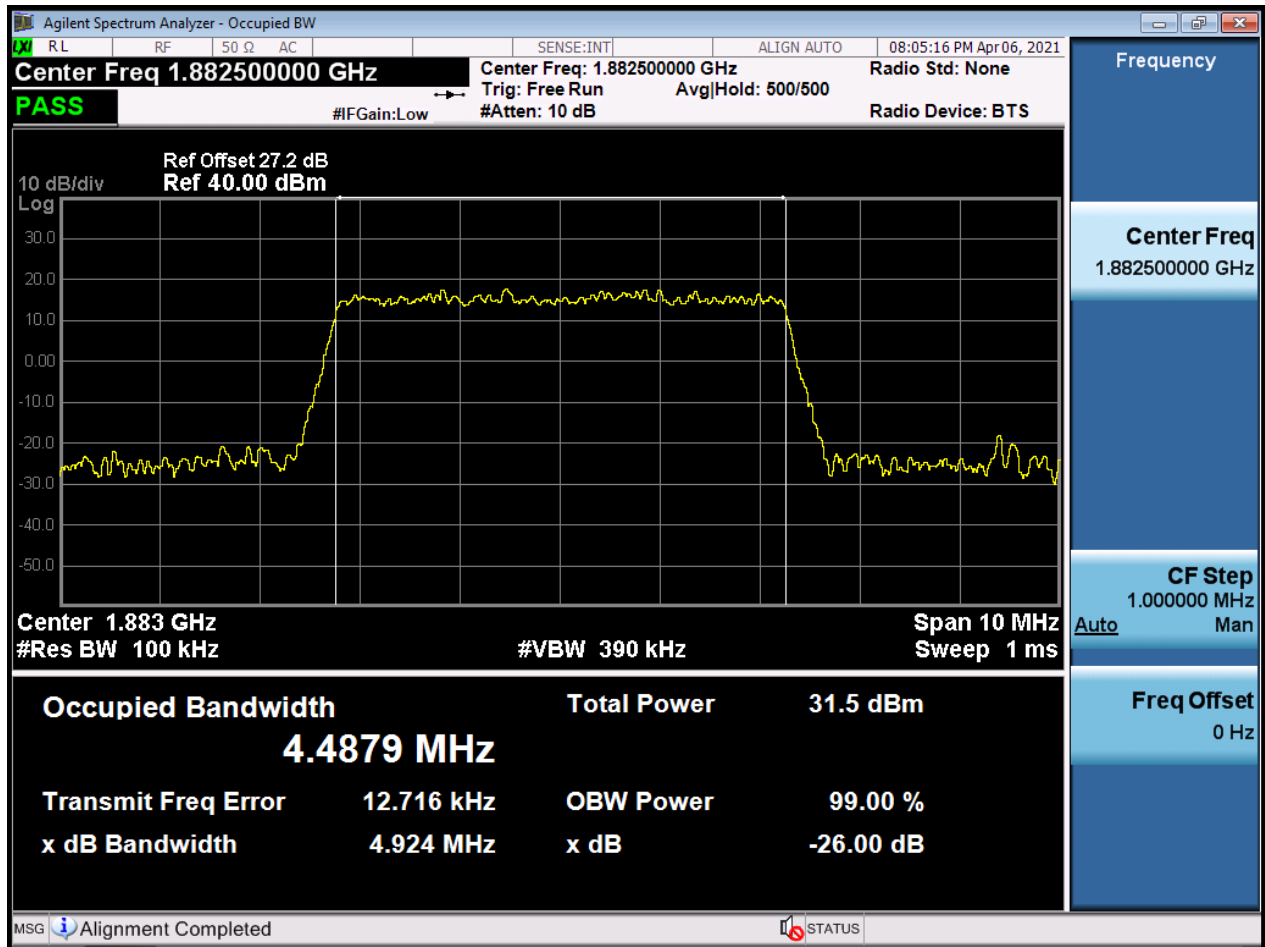
BW3M\_OBW\_Middle Channel\_256QAM\_FullRB



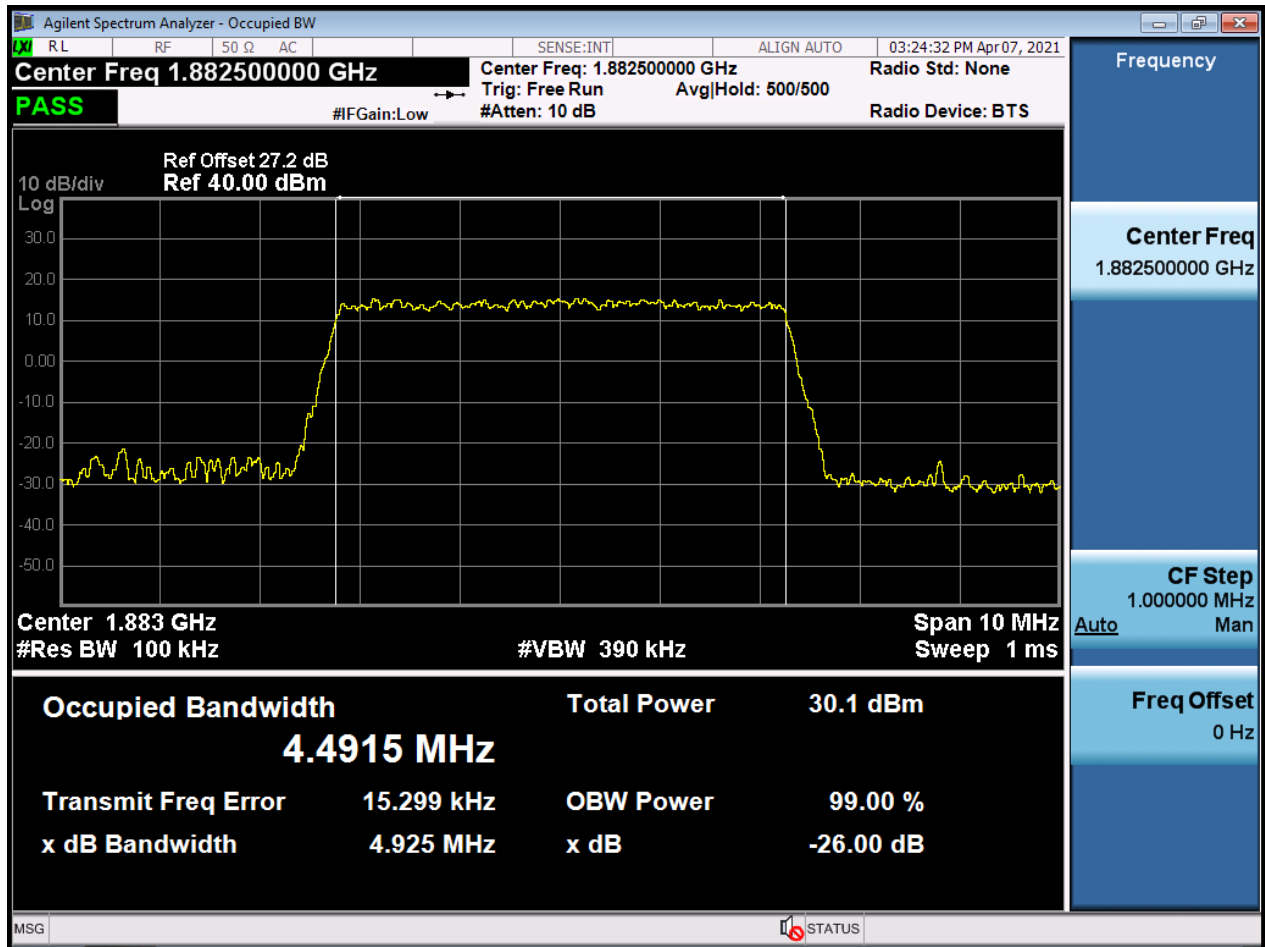
BW5M\_OBW\_Middle Channel\_QPSK\_FullIRB



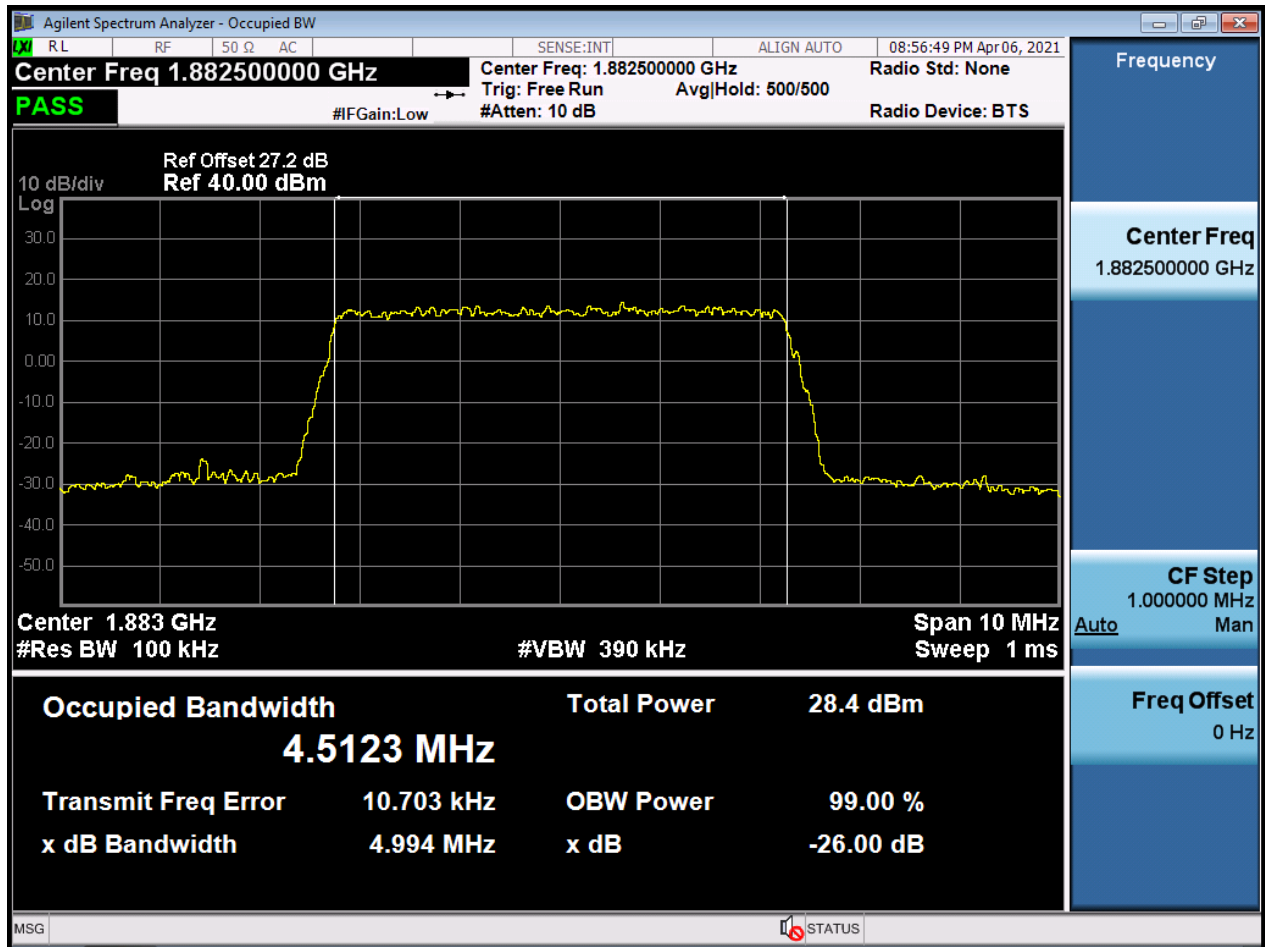
BW5M\_OBW\_Middle Channel\_16QAM\_FullRB



BW5M\_OBW\_Middle Channel\_64QAM\_FullRB

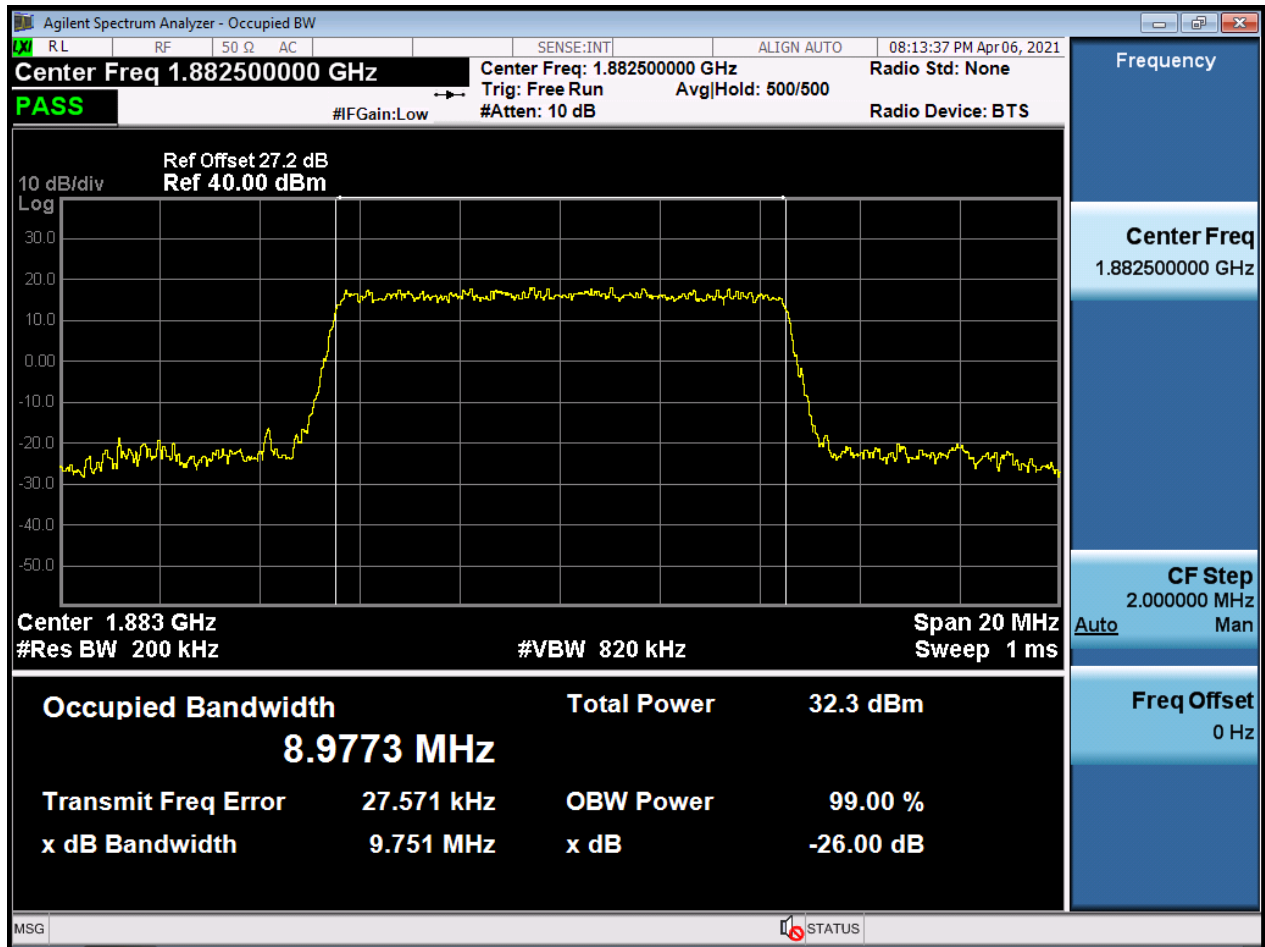


BW5M\_OBW\_Middle Channel\_256QAM\_FullIRB

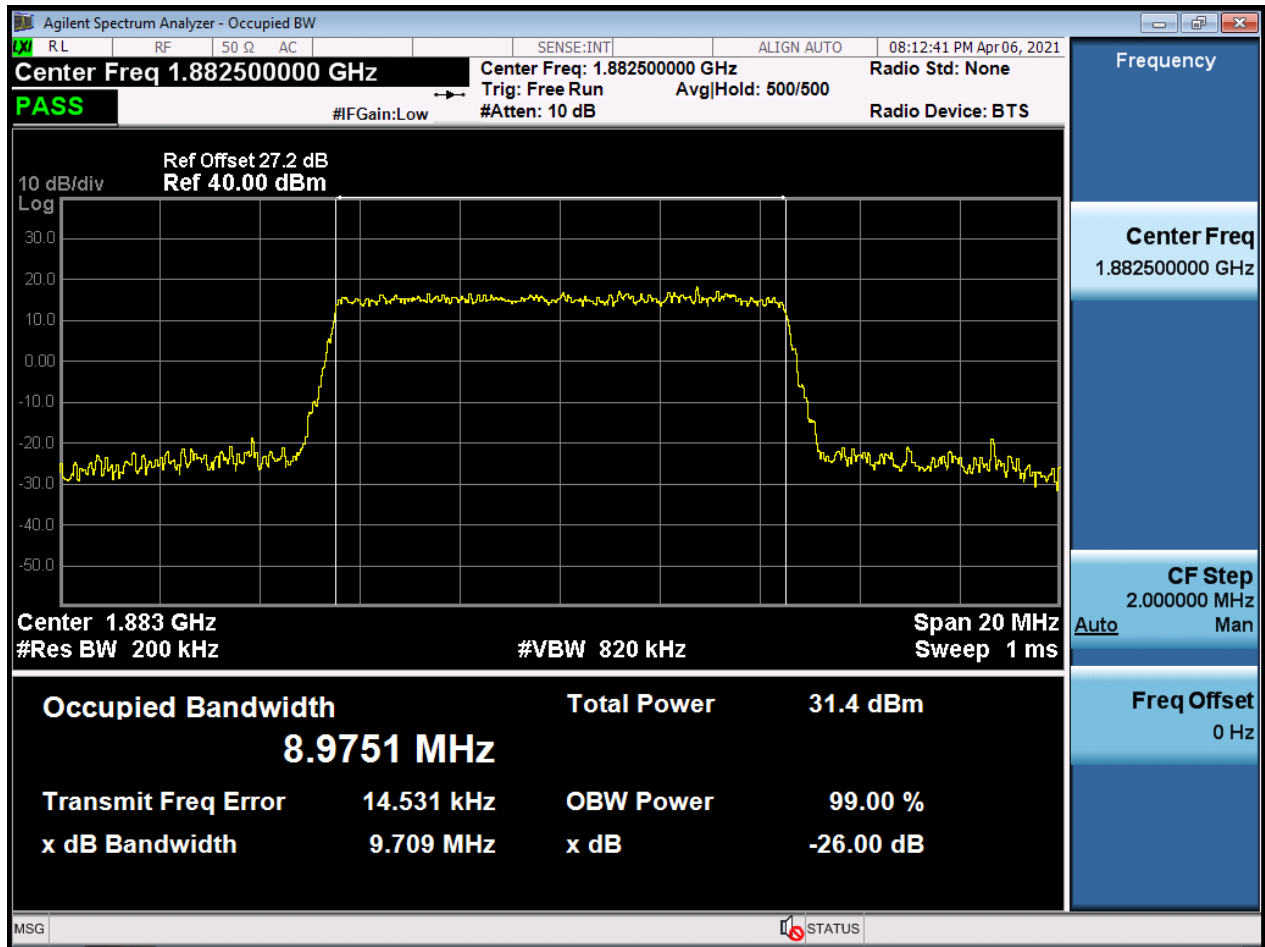




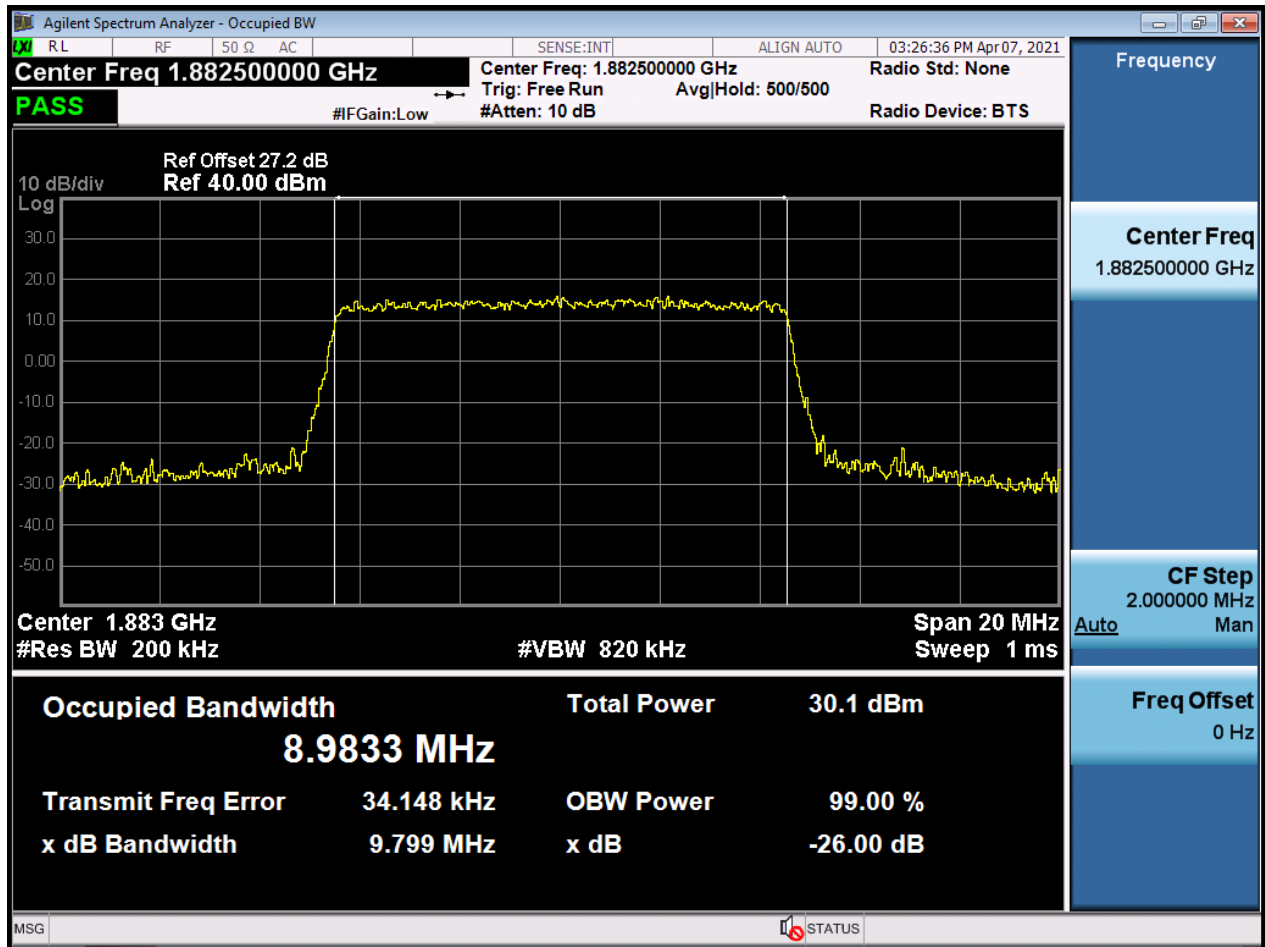
BW10M\_OBW\_Middle Channel\_QPSK\_FullRB



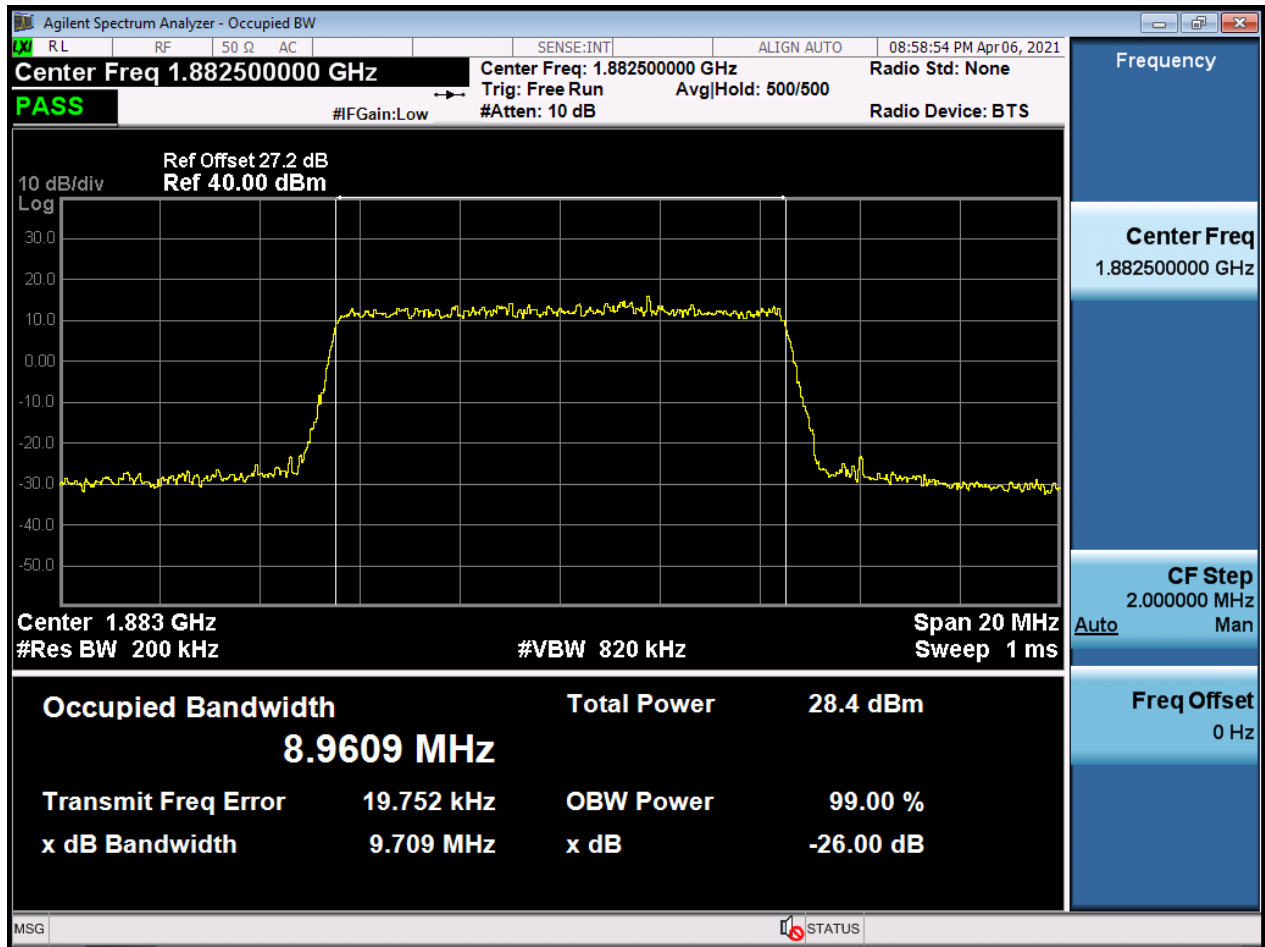
BW10M\_OBW\_Middle Channel\_16QAM\_FullIRB



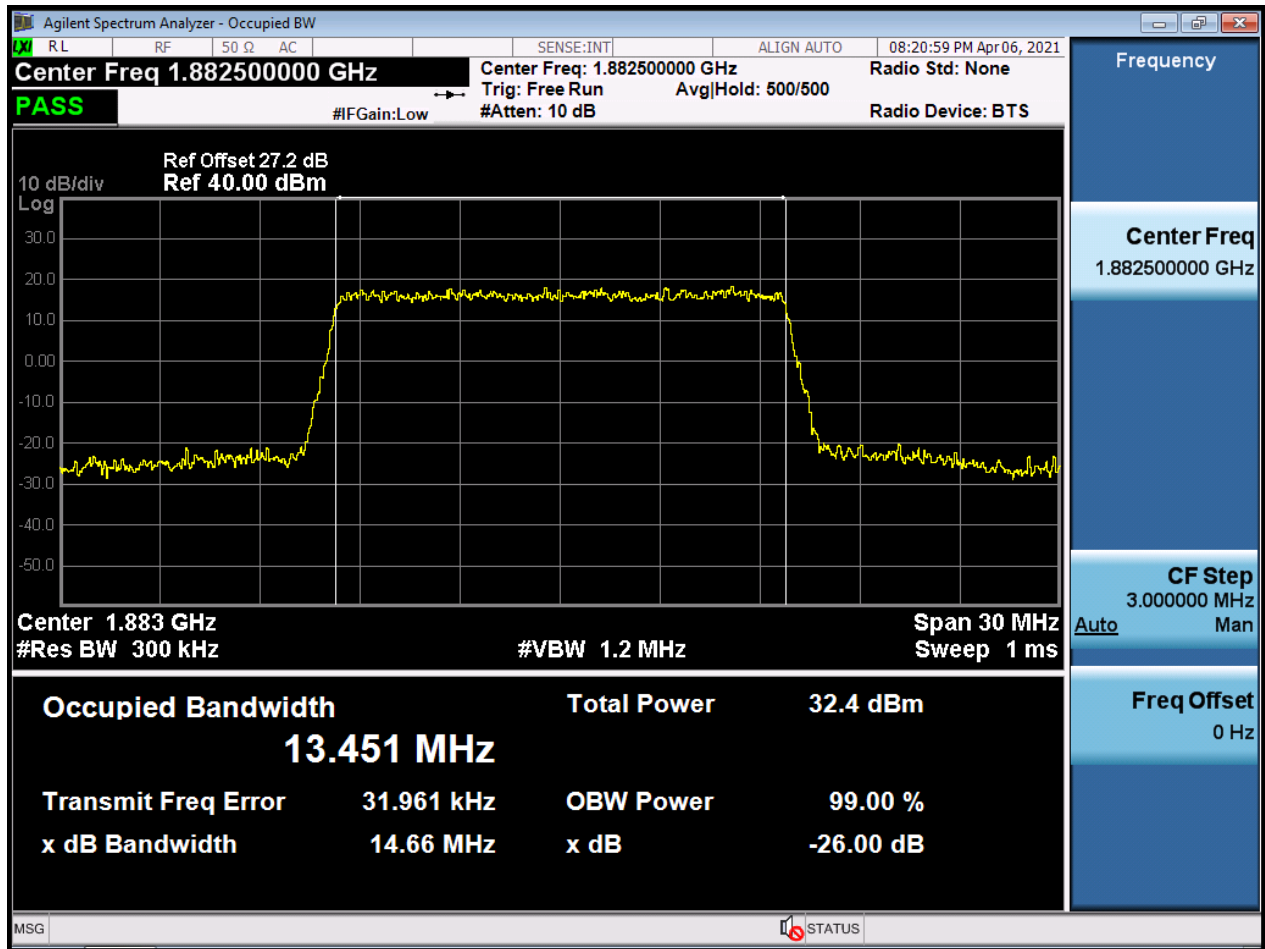
BW10M\_OBW\_Middle Channel\_64QAM\_FullIRB



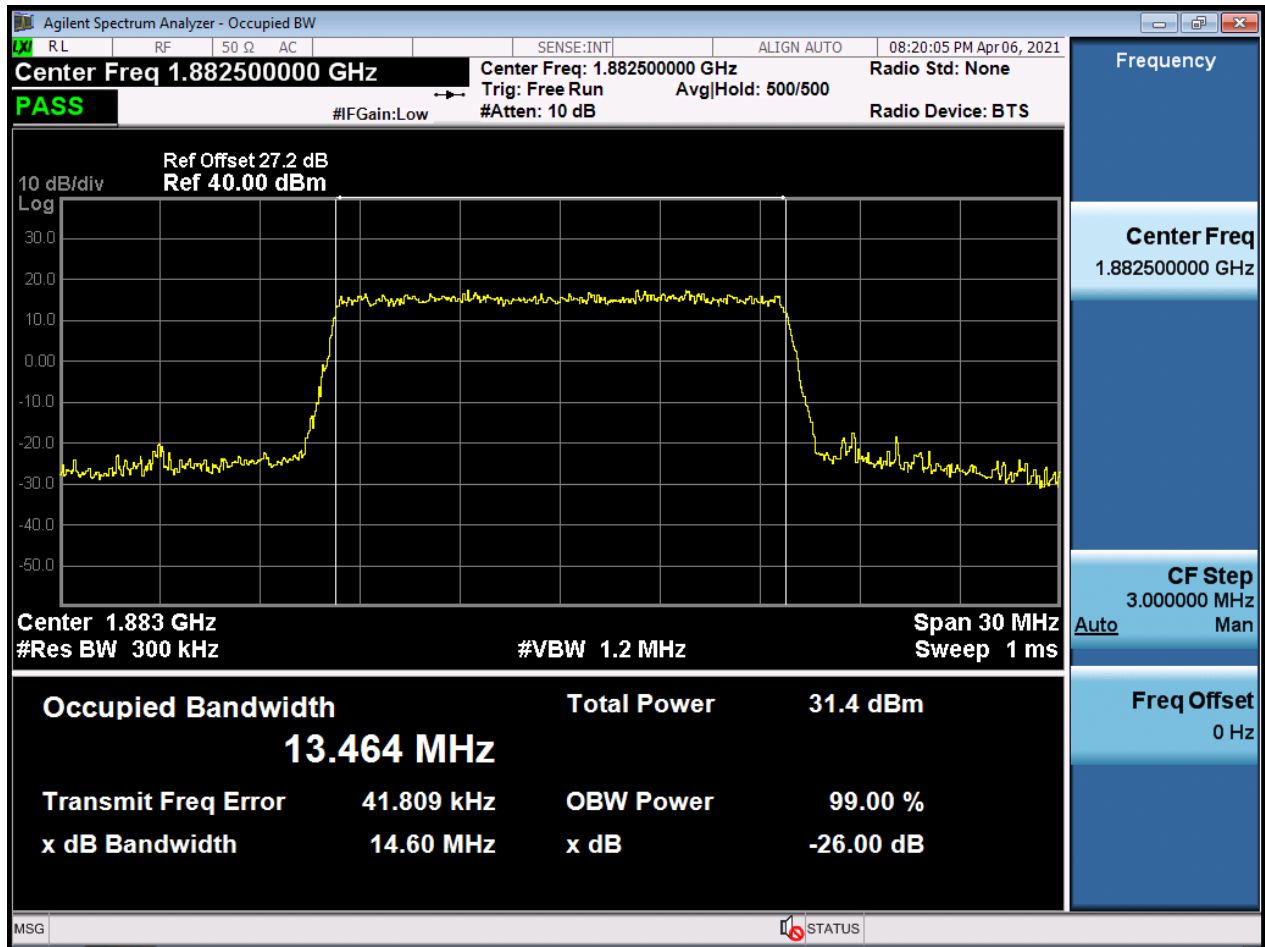
BW10M\_OBW\_Middle Channel\_256QAM\_FullRB



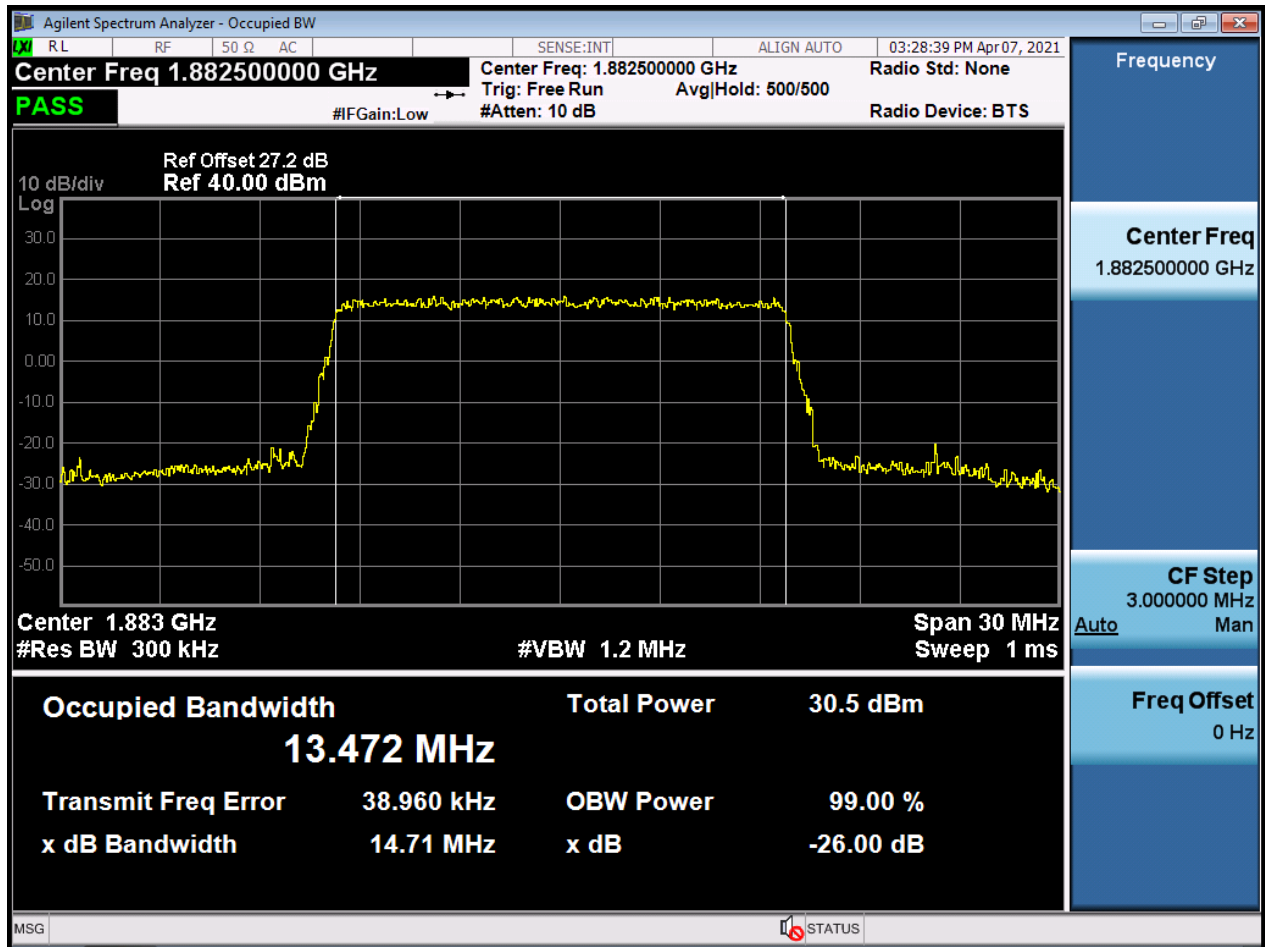
BW15M\_OBW\_Middle Channel\_QPSK\_FullRB



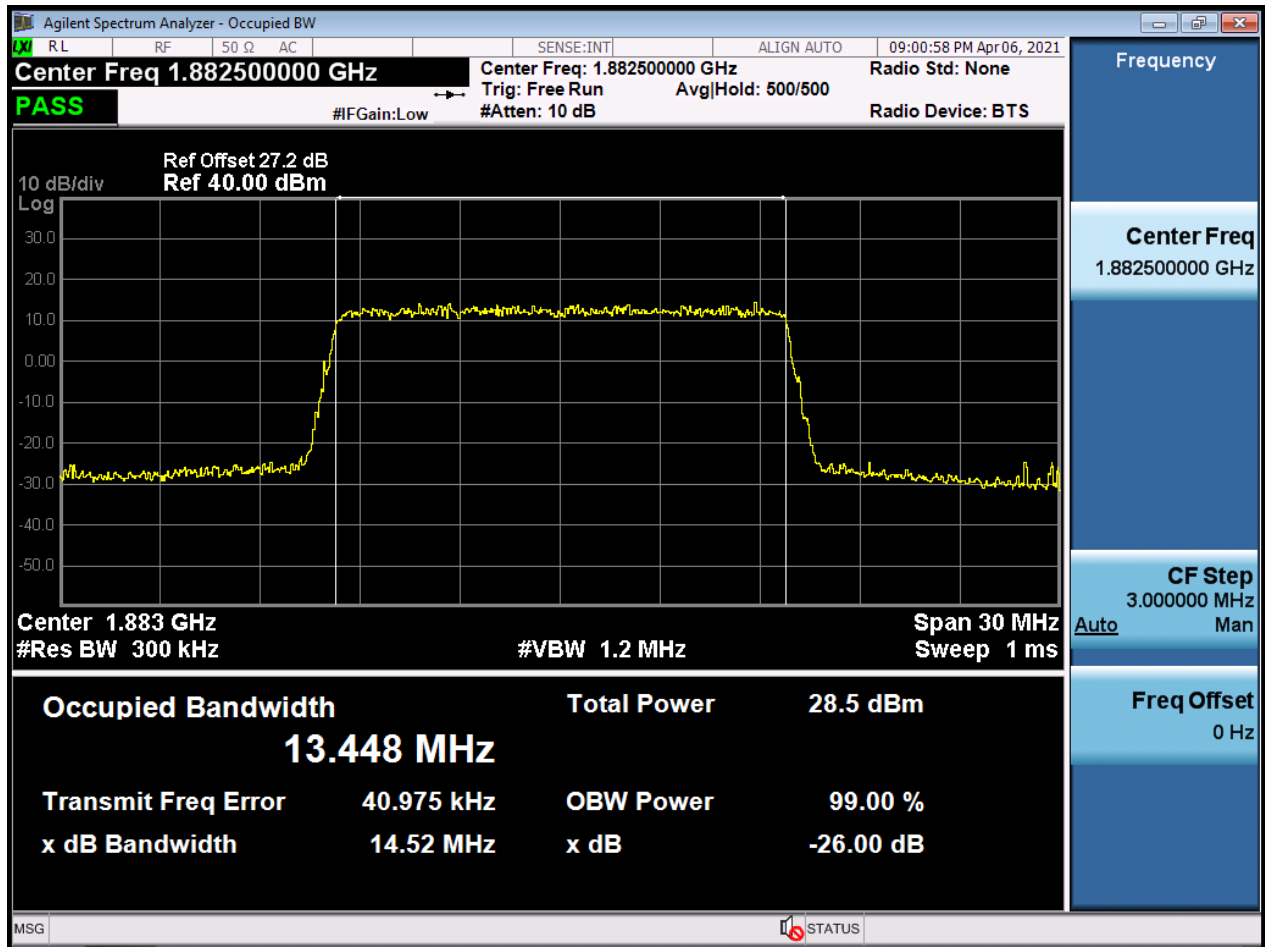
BW15M\_OBW\_Middle Channel\_16QAM\_FullIRB



BW15M\_OBW\_Middle Channel\_64QAM\_FullIRB

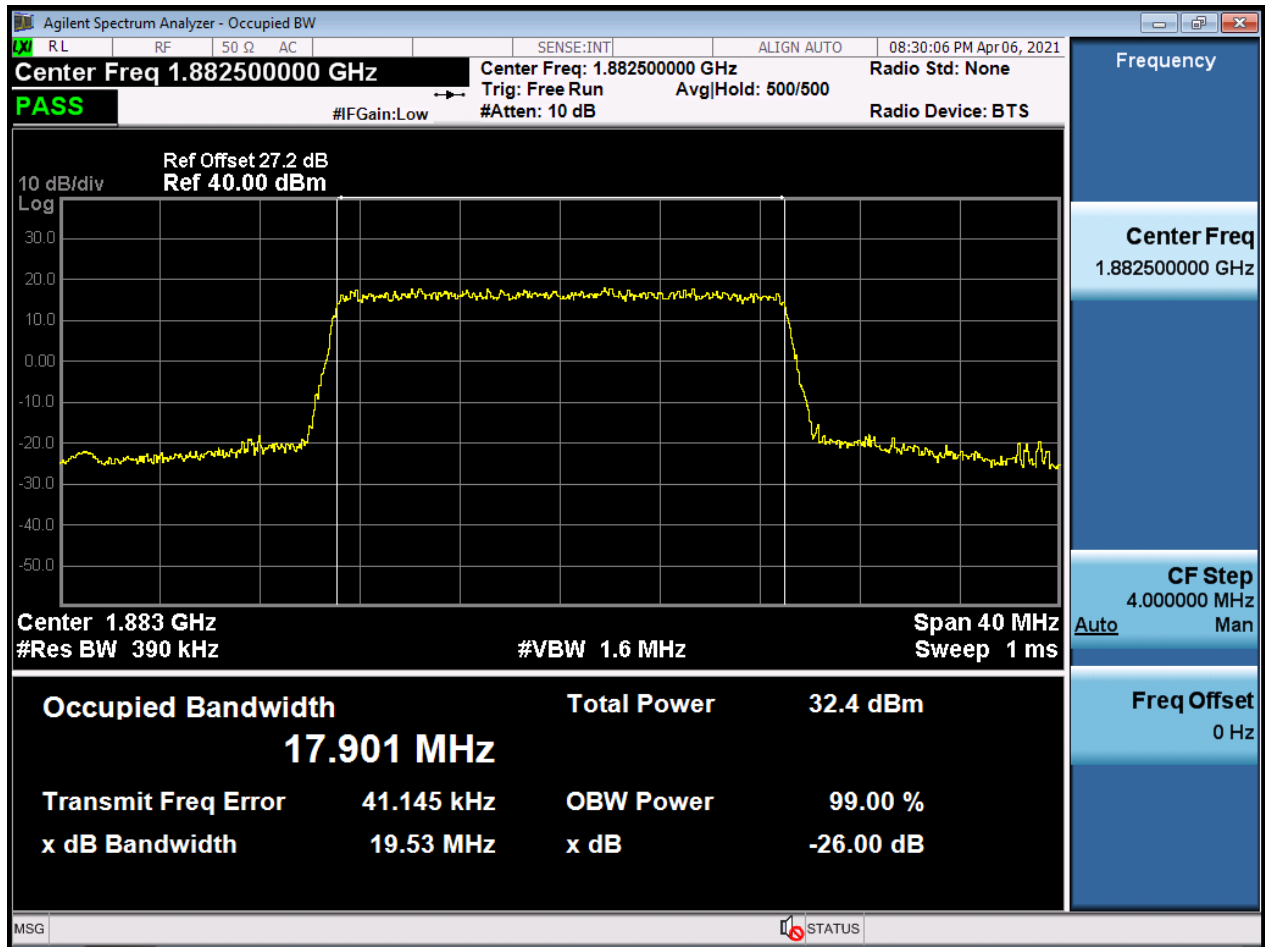


BW15M\_OBW\_Middle Channel\_256QAM\_FullRB

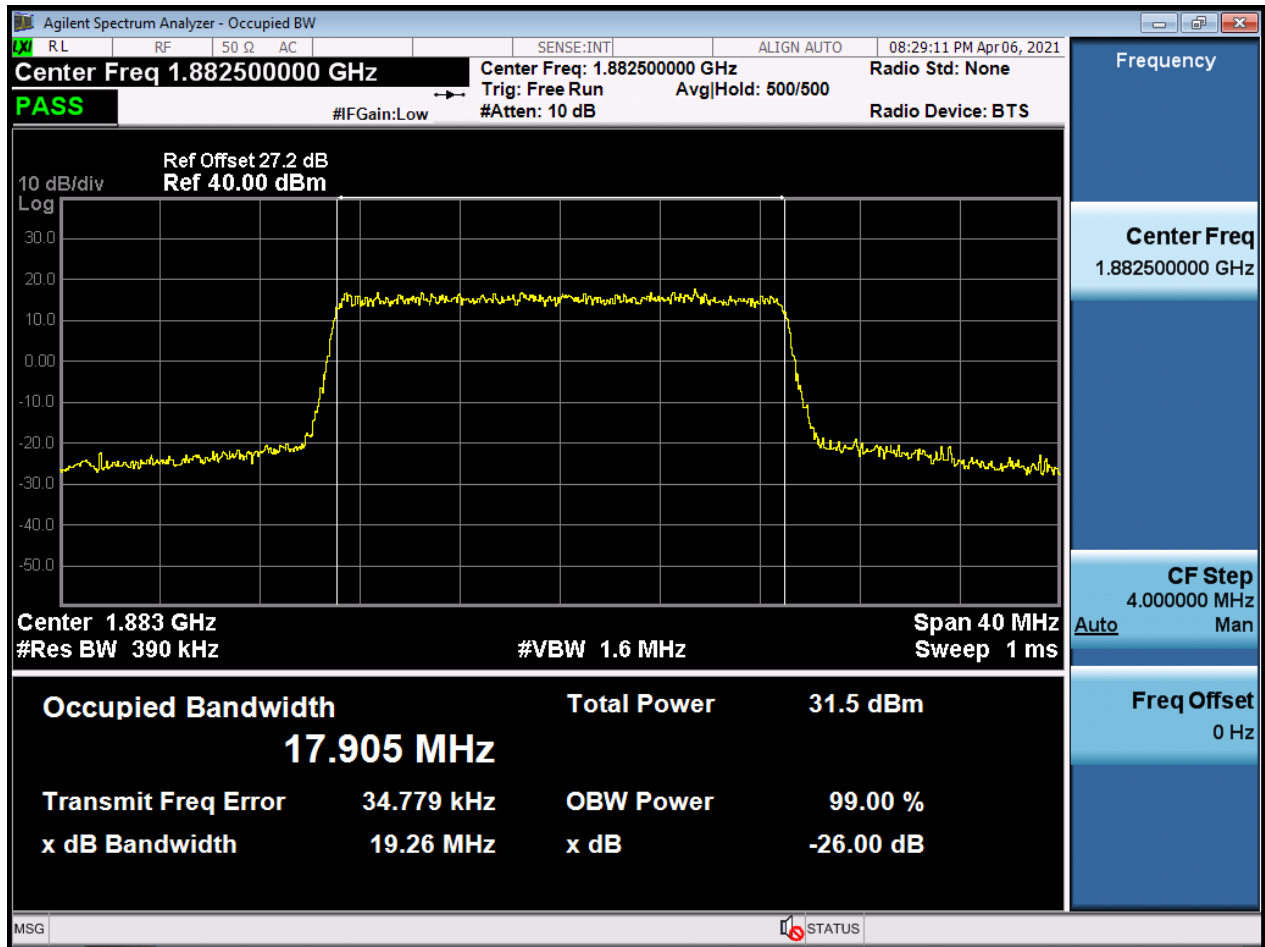




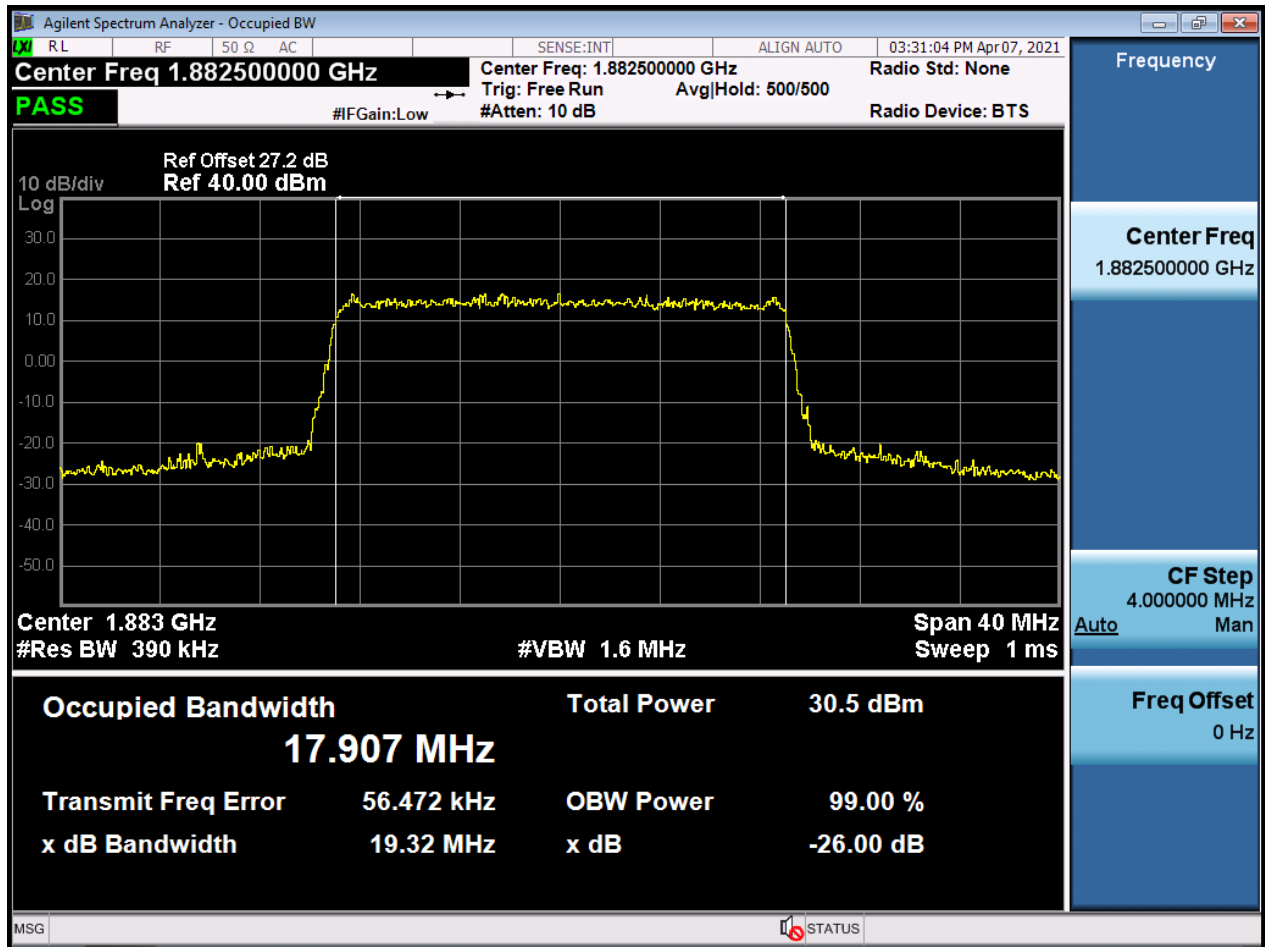
BW20M\_OBW\_Middle Channel\_QPSK\_FullRB



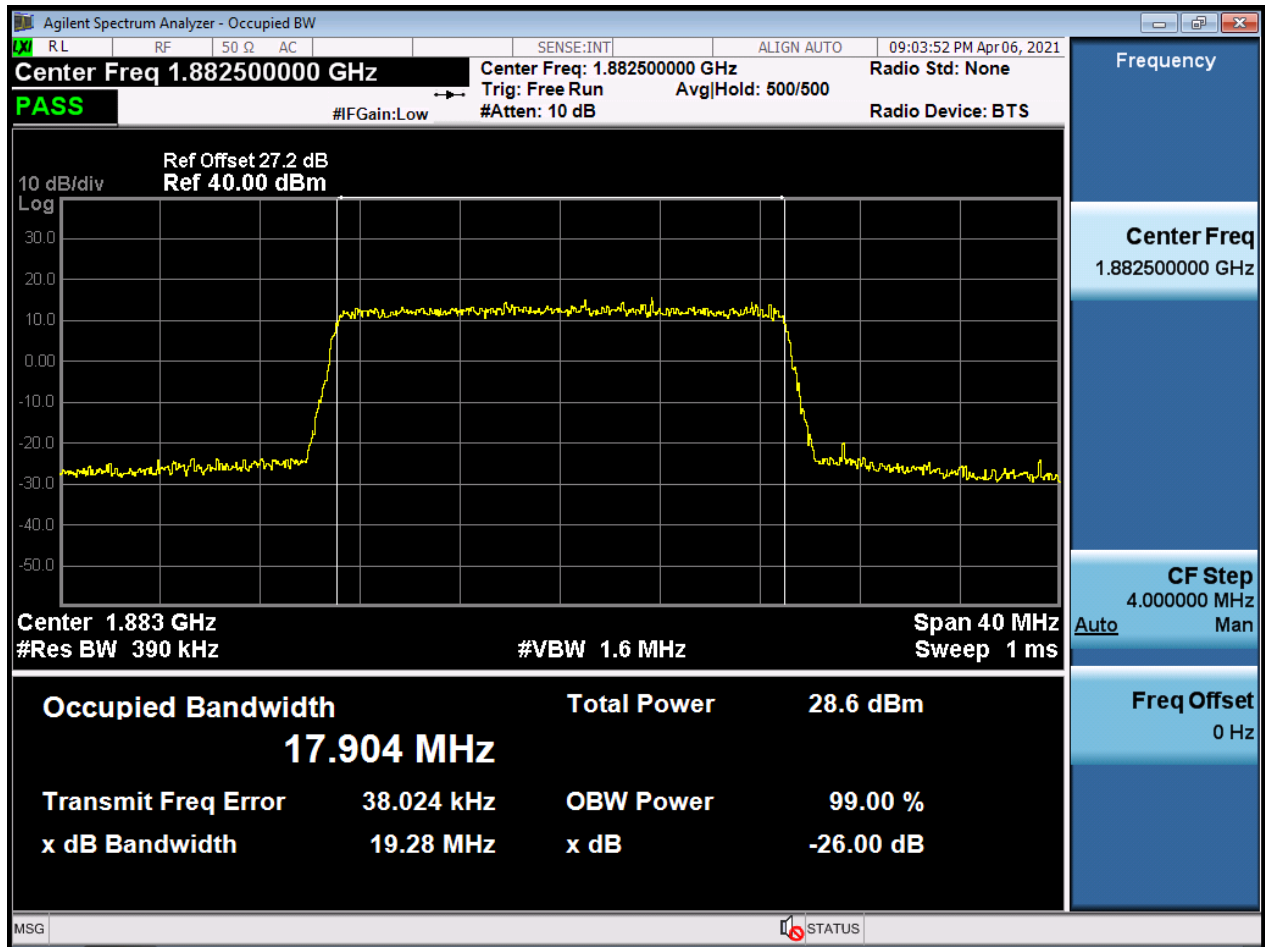
BW20M\_OBW\_Middle Channel\_16QAM\_FullIRB



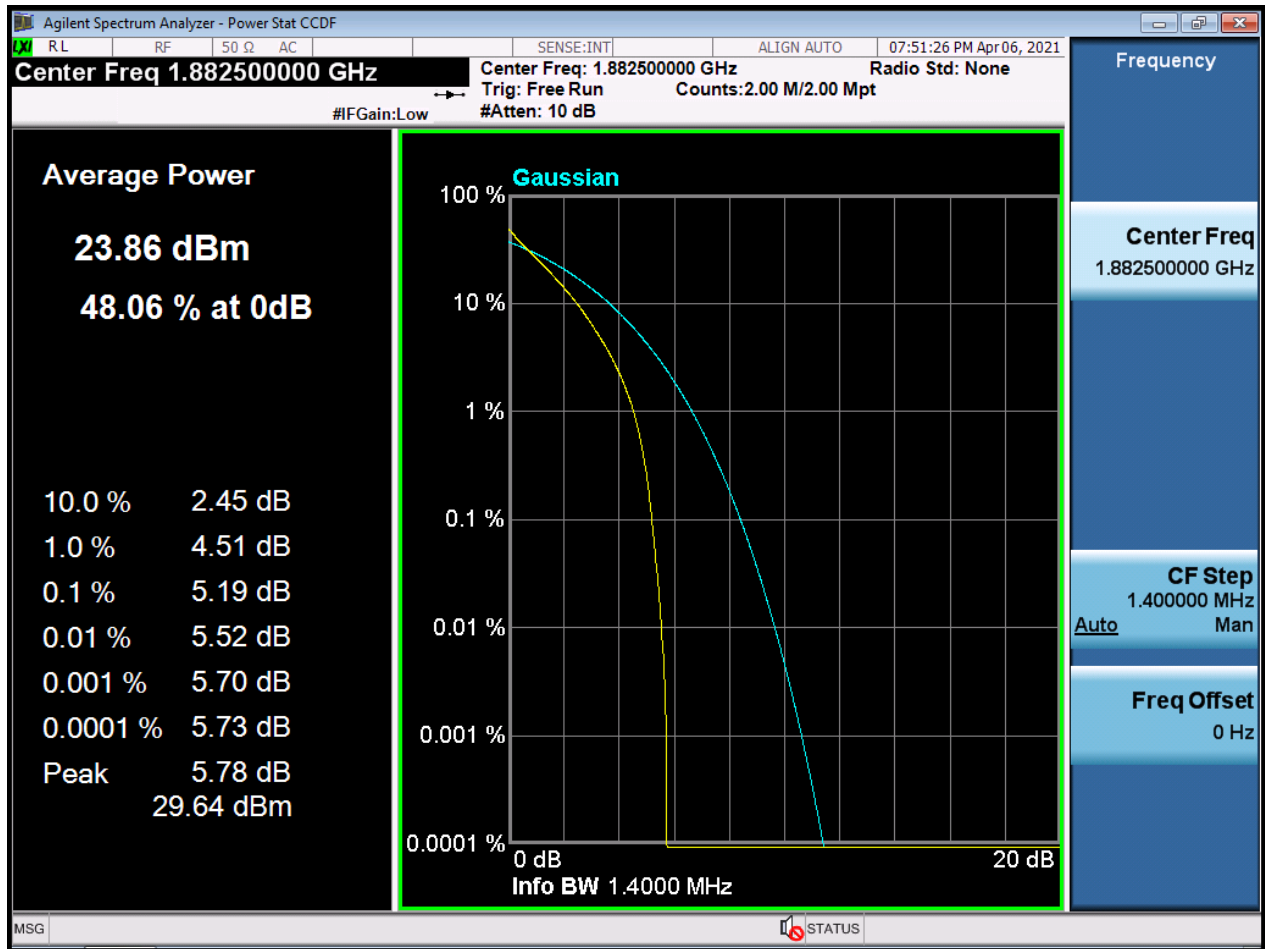
BW20M\_OBW\_Middle Channel\_64QAM\_FullIRB



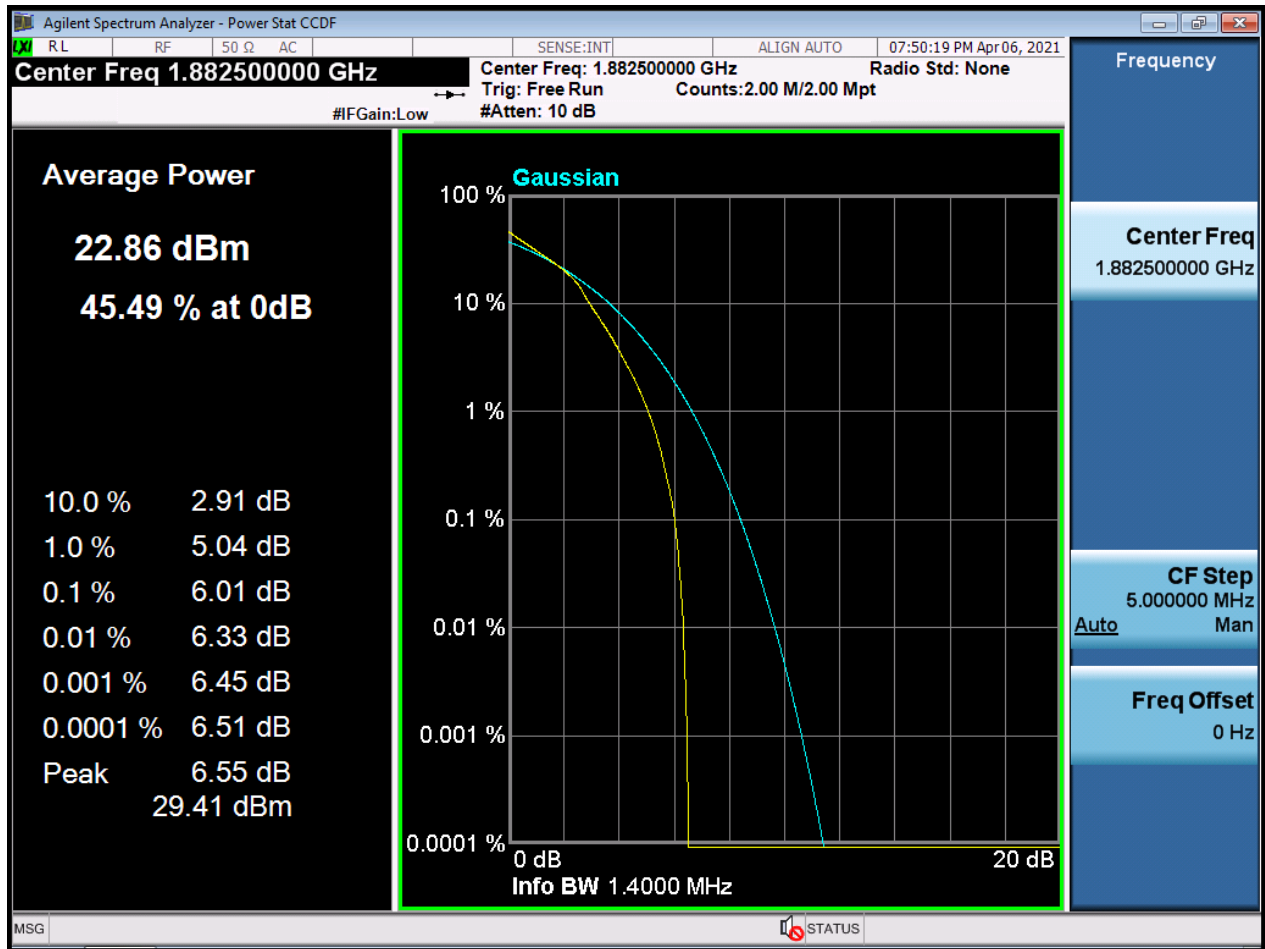
BW20M\_OBW\_Middle Channel\_256QAM\_FullIRB



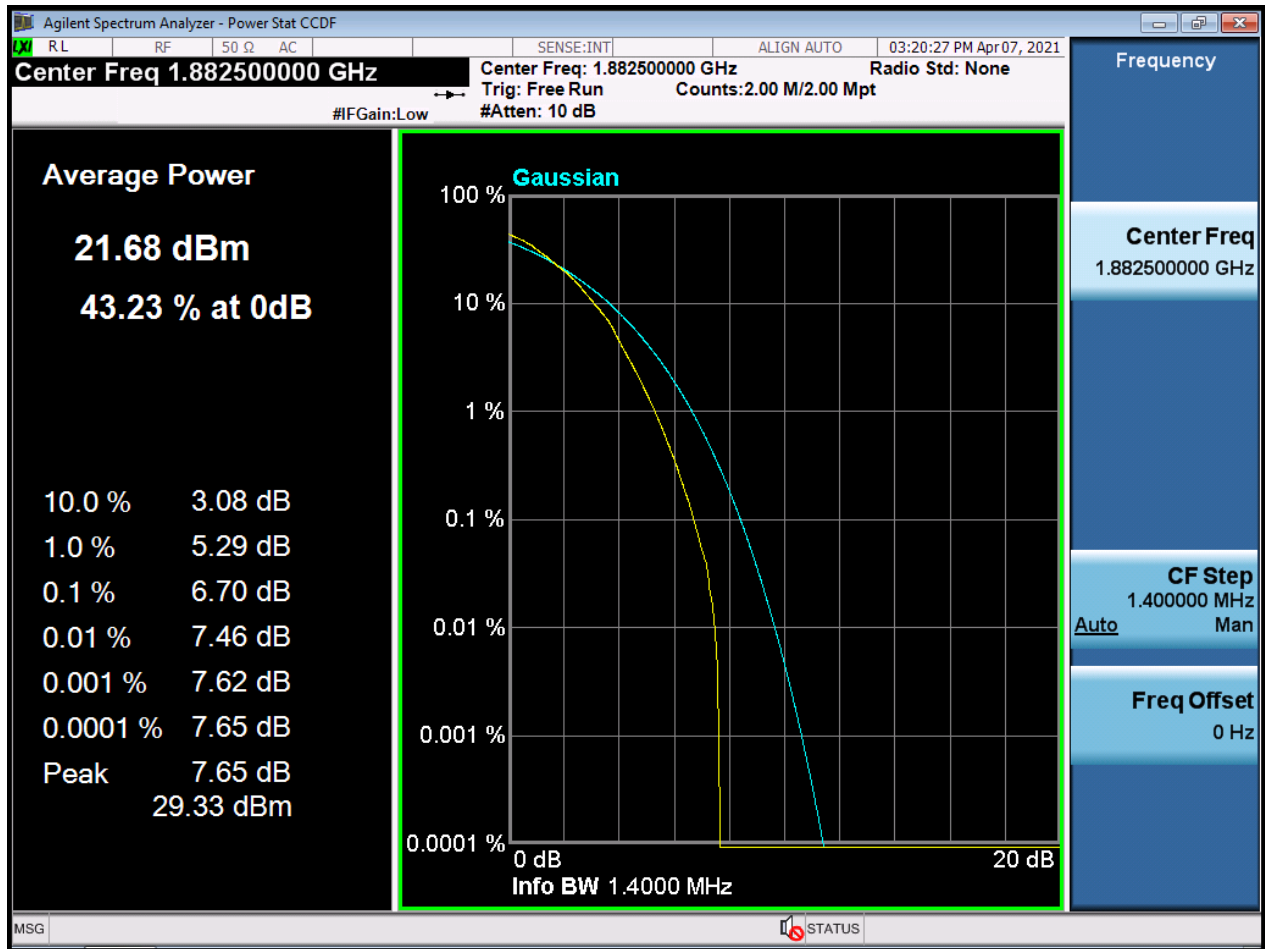
BW1.4M\_PAR\_Middle Channel\_QPSK\_FullRB



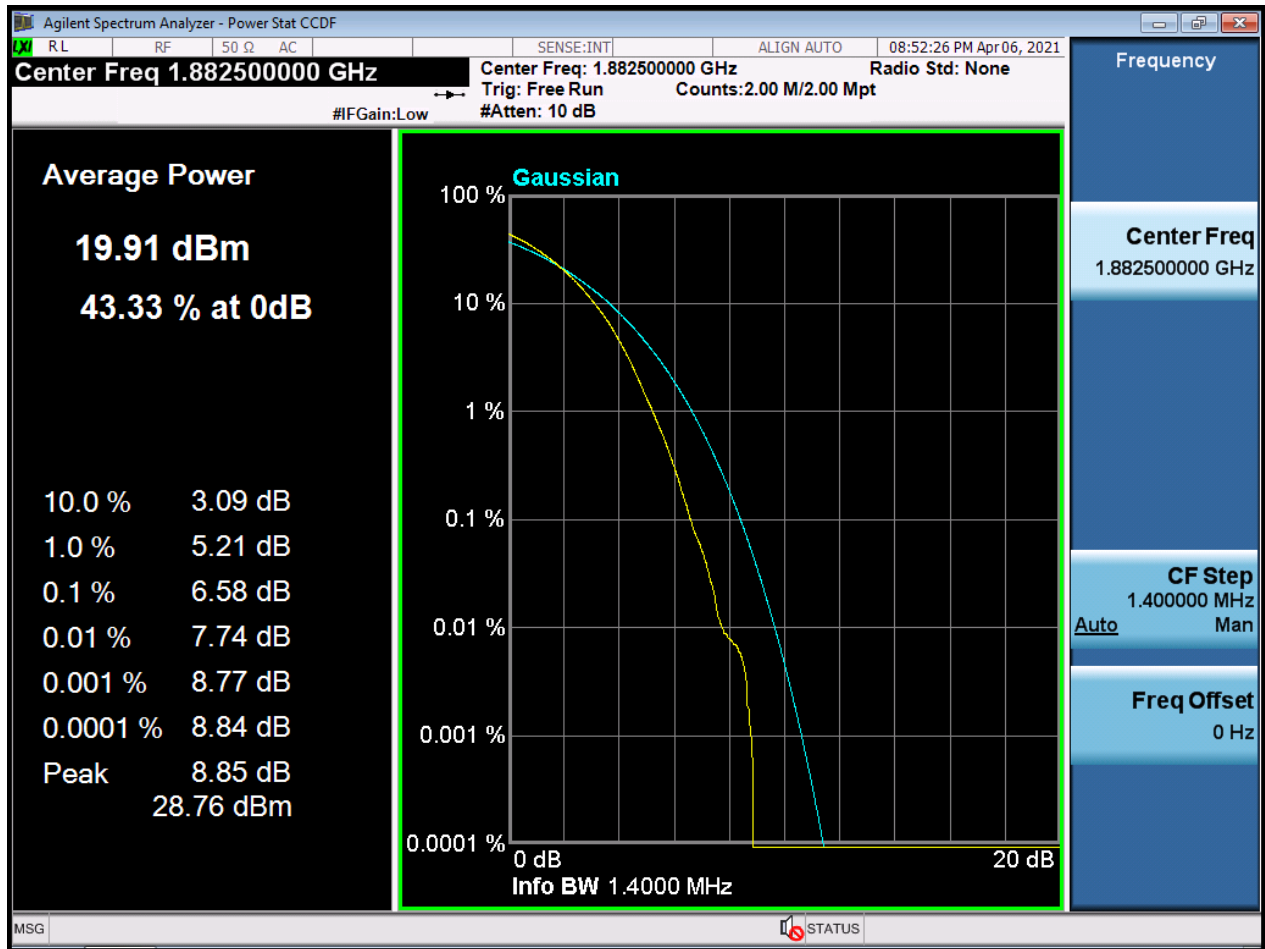
BW1.4M\_PAR\_Middle Channel\_16QAM\_FullRB



BW1.4M\_PAR\_Middle Channel\_64QAM\_FullRB

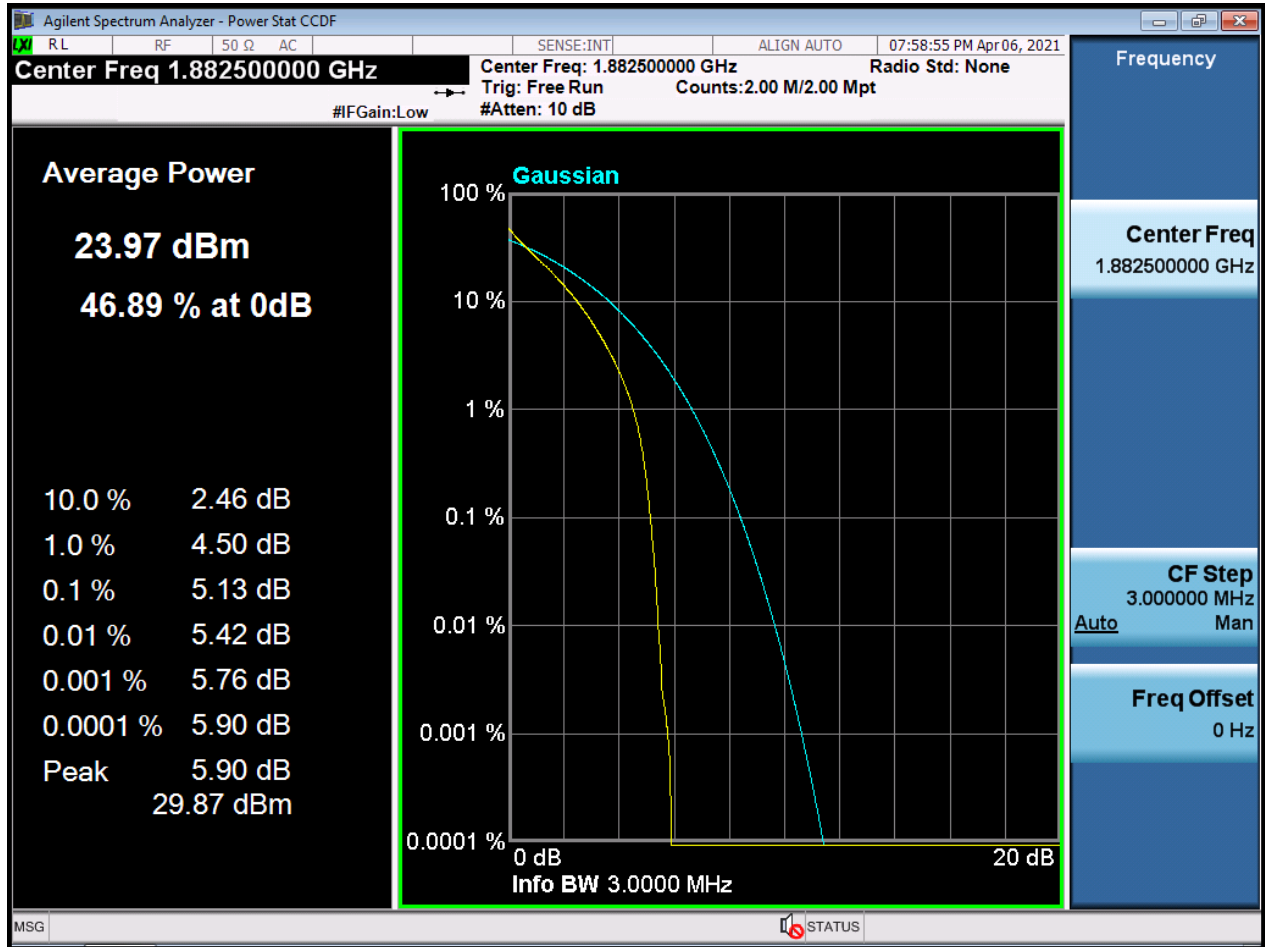


BW1.4M\_PAR\_Middle Channel\_256QAM\_FullIRB

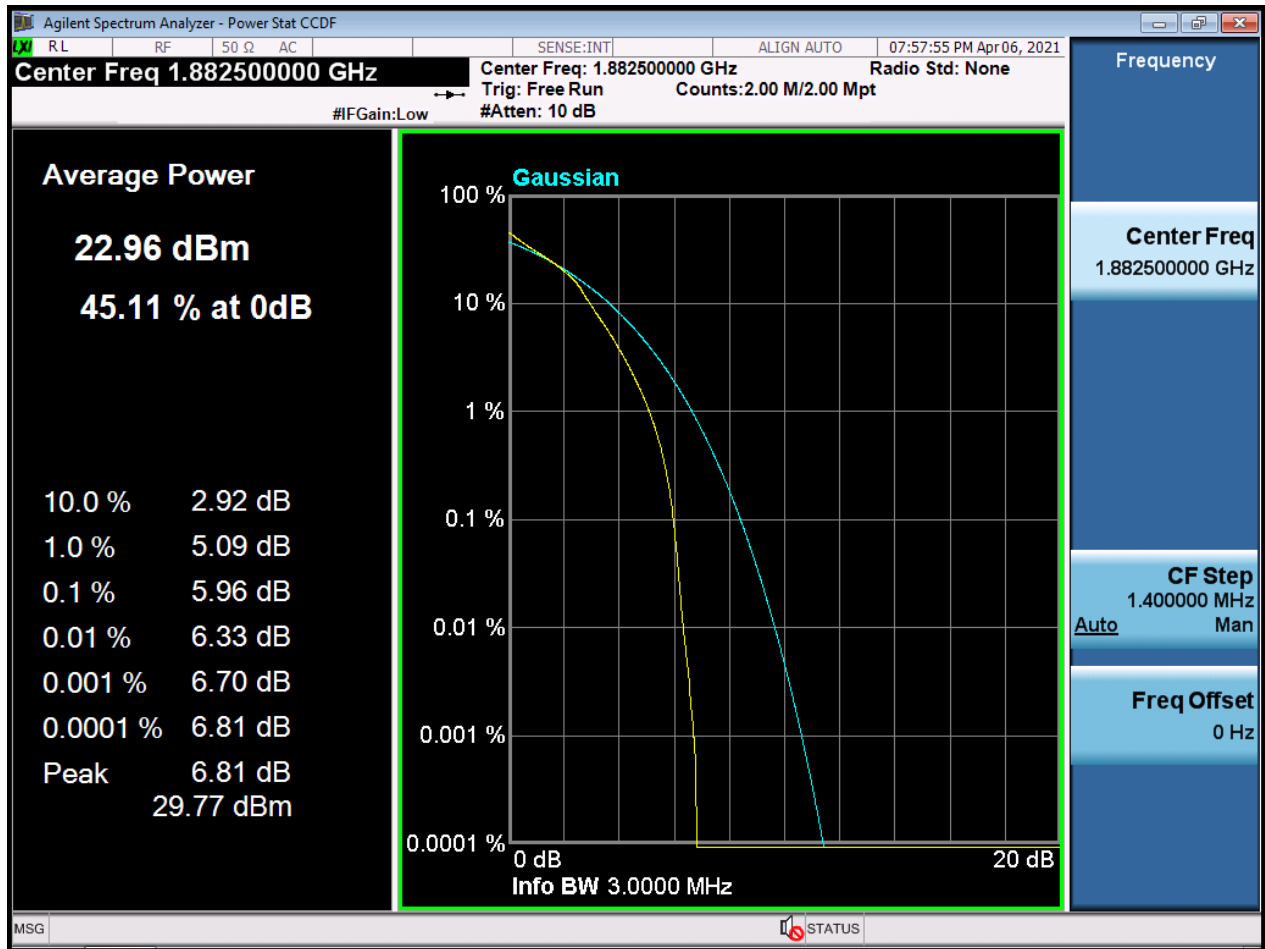




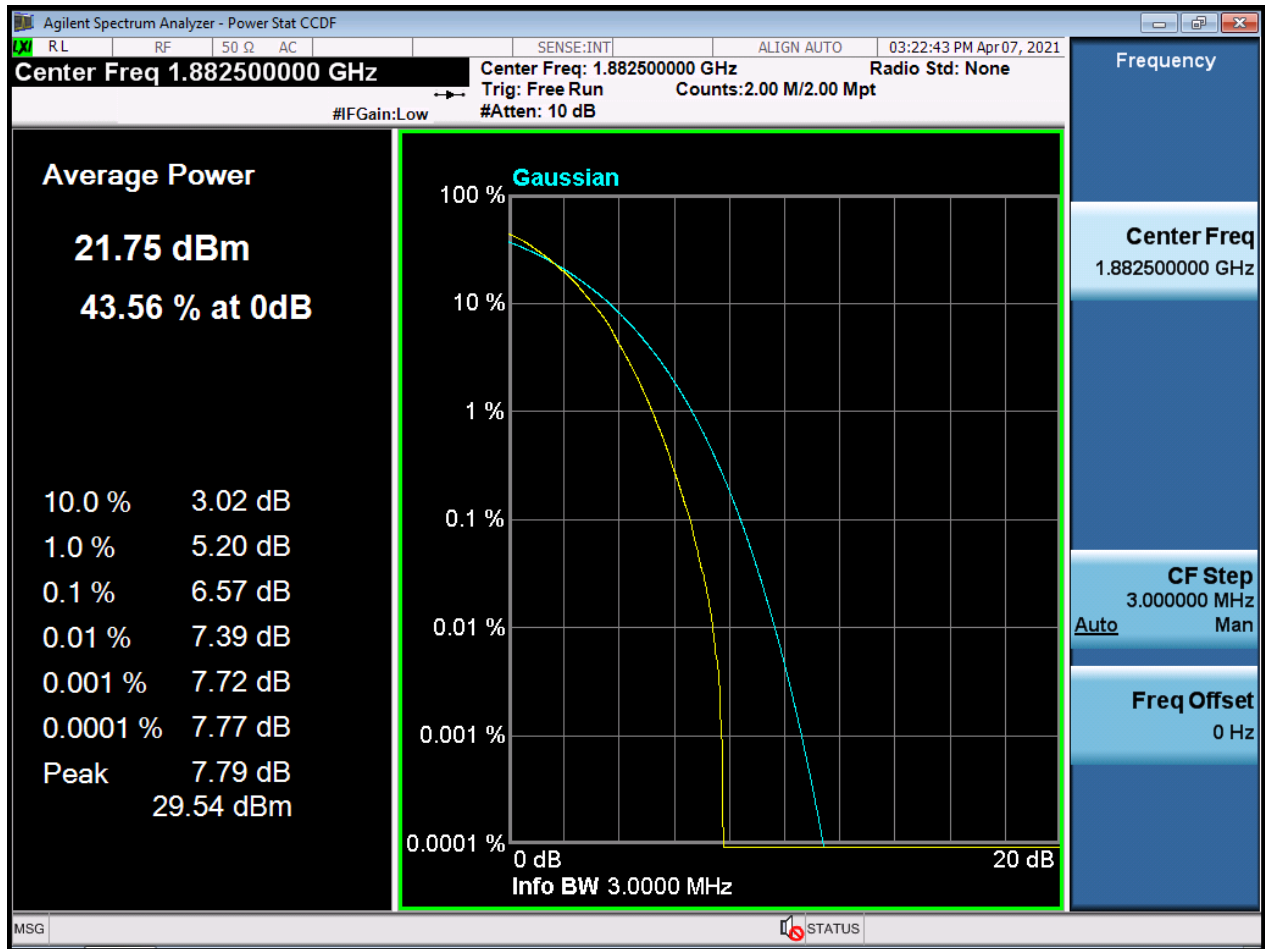
BW3M\_PAR\_Middle Channel\_QPSK\_FullRB



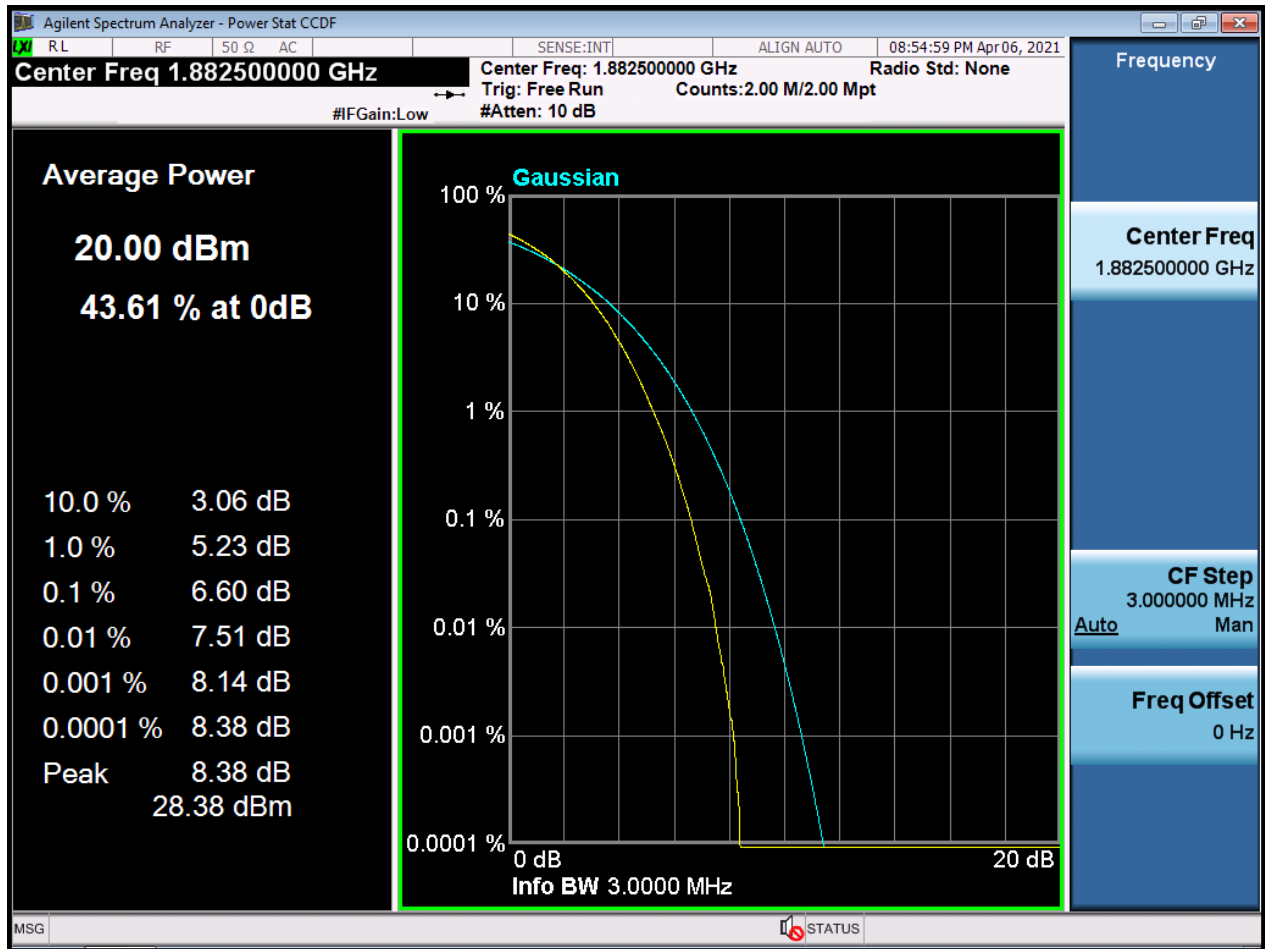
BW3M\_PAR\_Middle Channel\_16QAM\_FullIRB



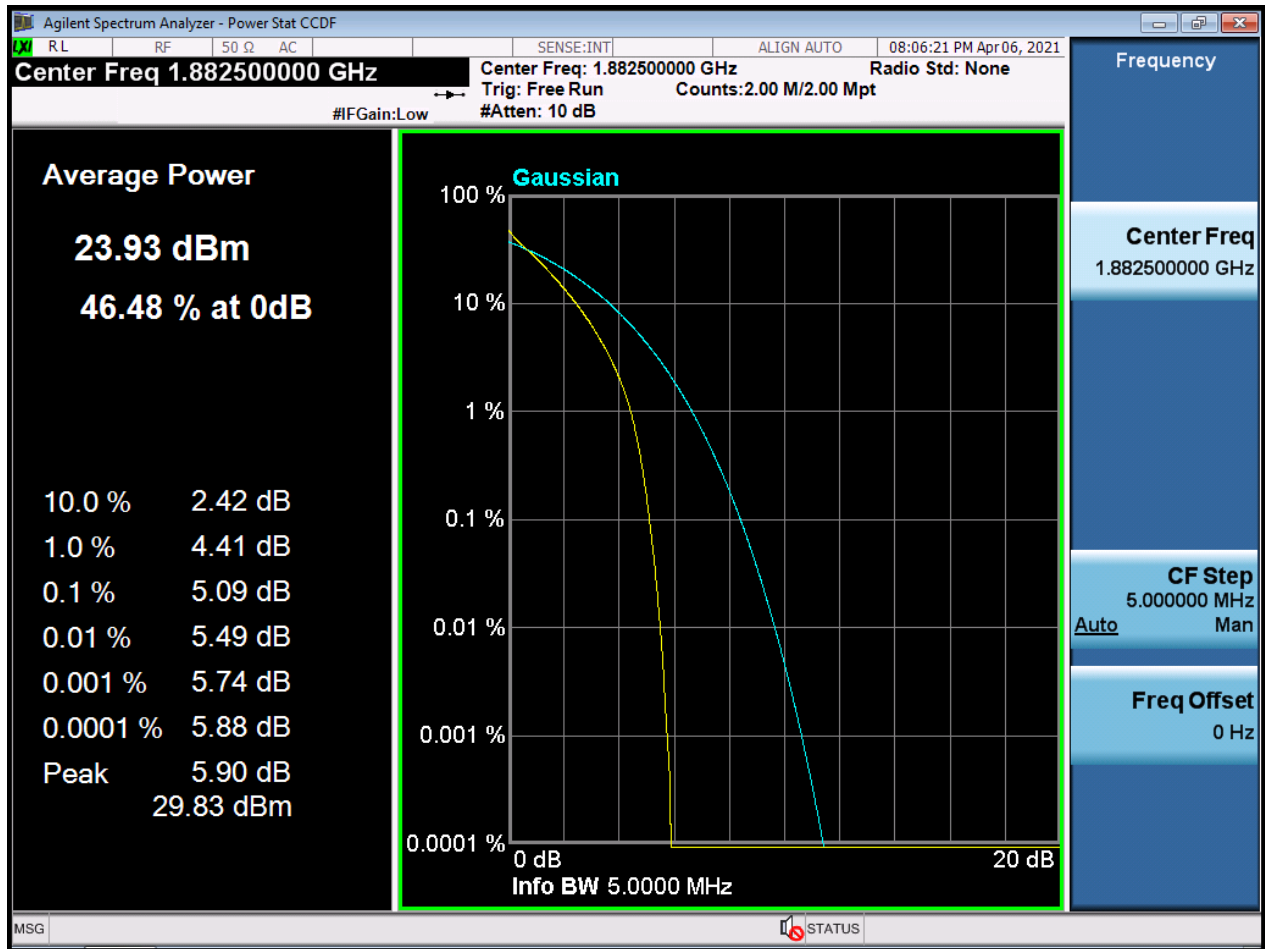
BW3M\_PAR\_Middle Channel\_64QAM\_FullIRB



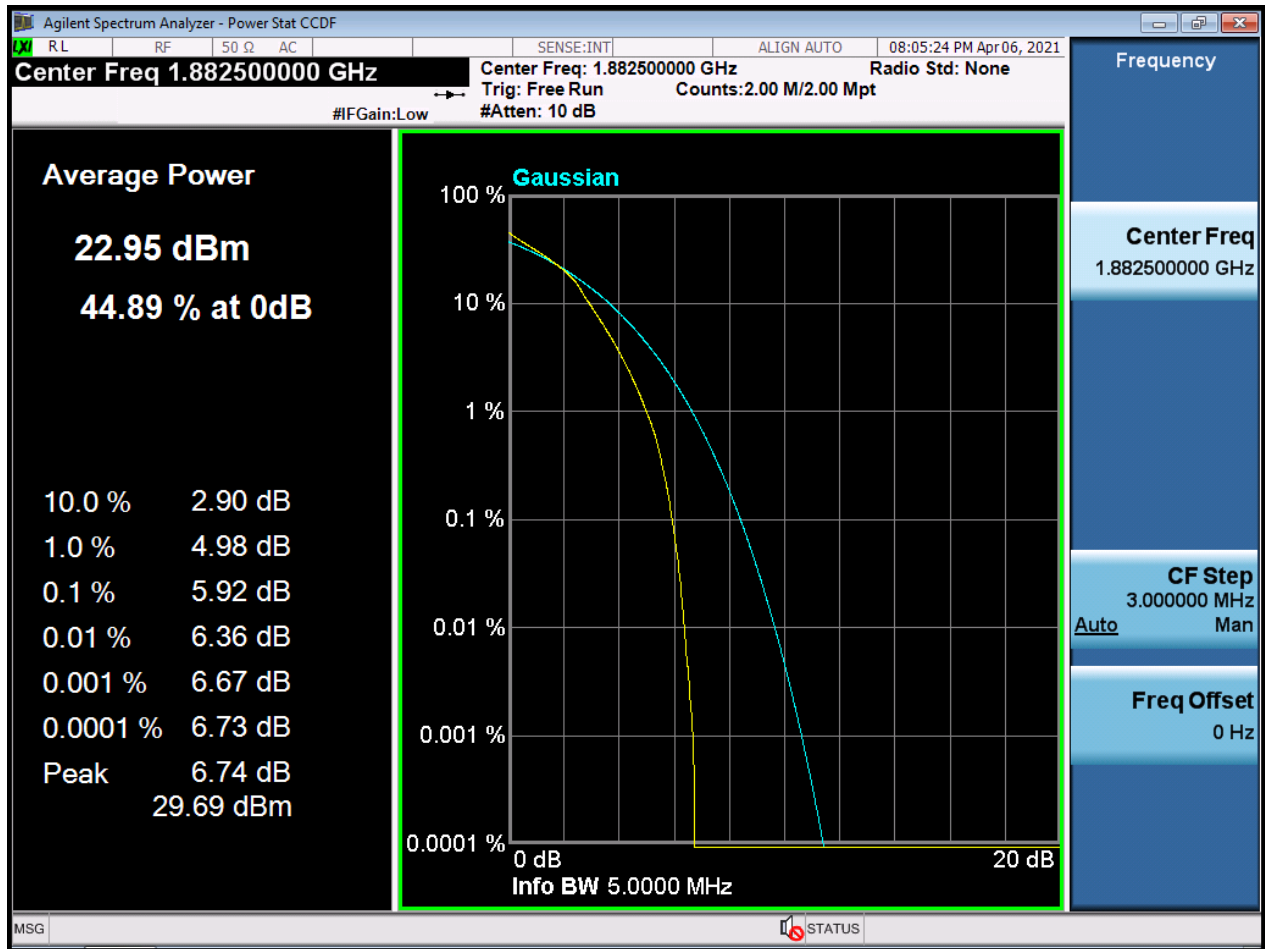
BW3M\_PAR\_Middle Channel\_256QAM\_FullIRB



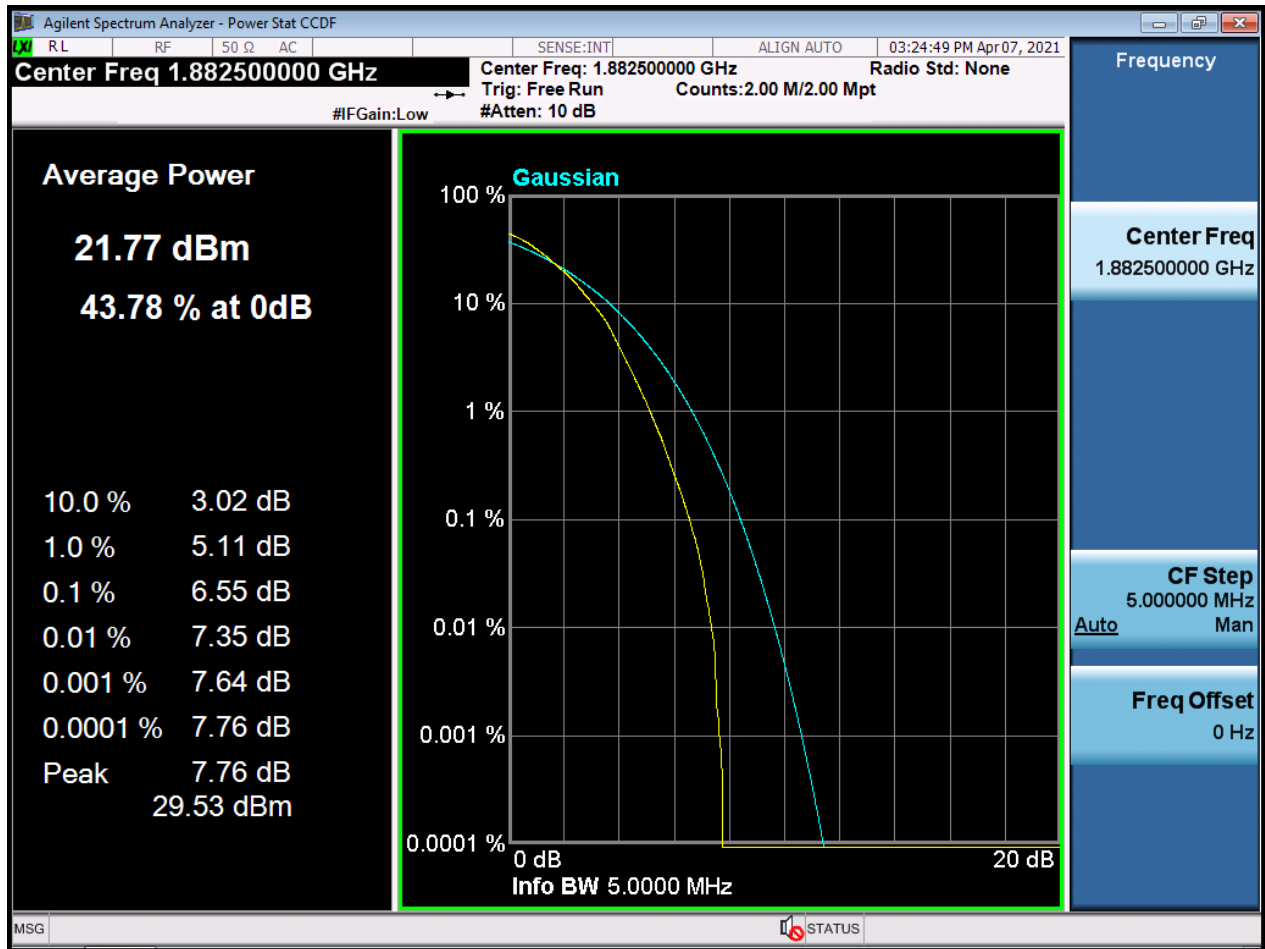
BW5M\_PAR\_Middle Channel\_QPSK\_FullRB



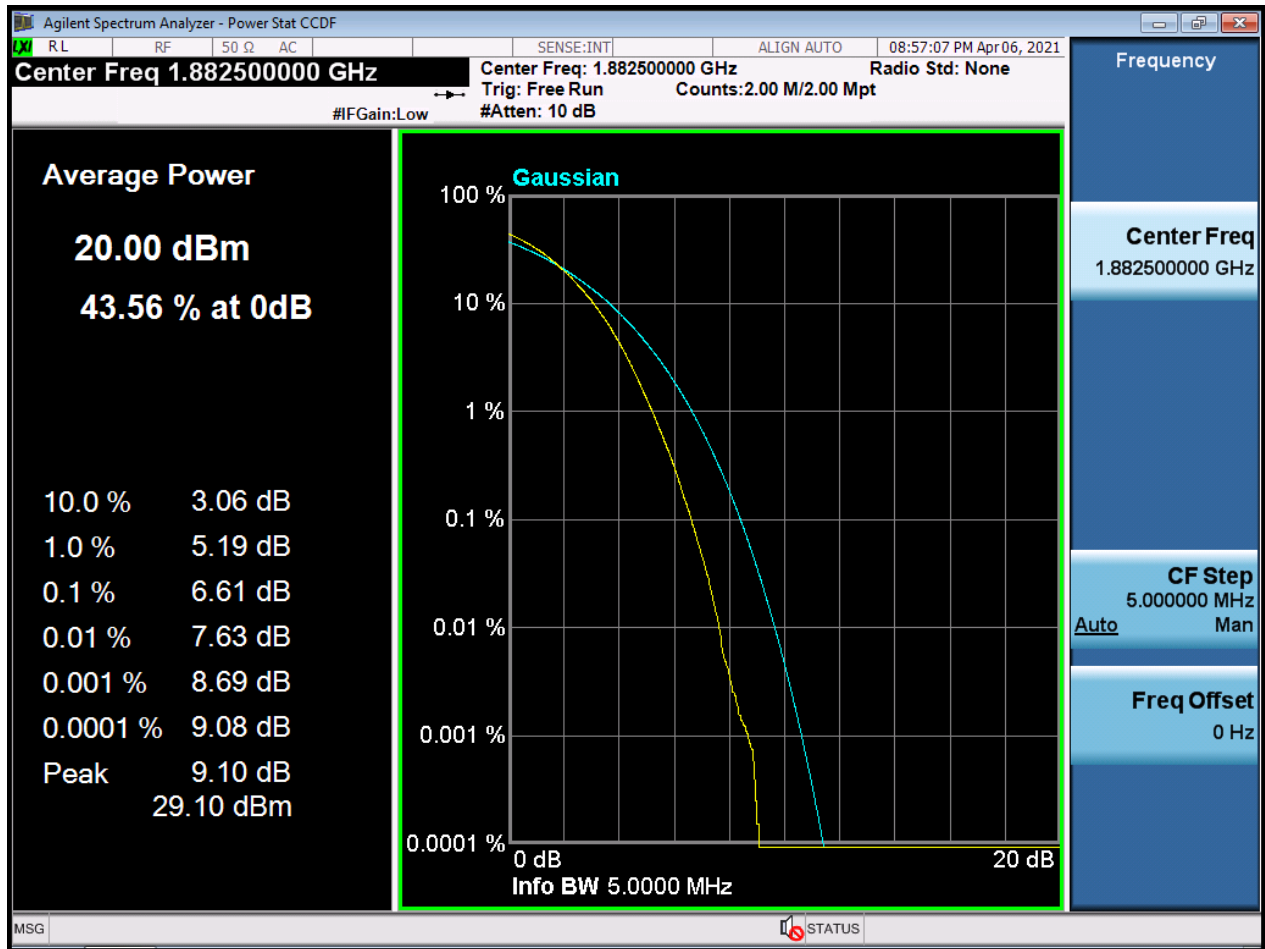
BW5M\_PAR\_Middle Channel\_16QAM\_FullIRB



BW5M\_PAR\_Middle Channel\_64QAM\_FullIRB

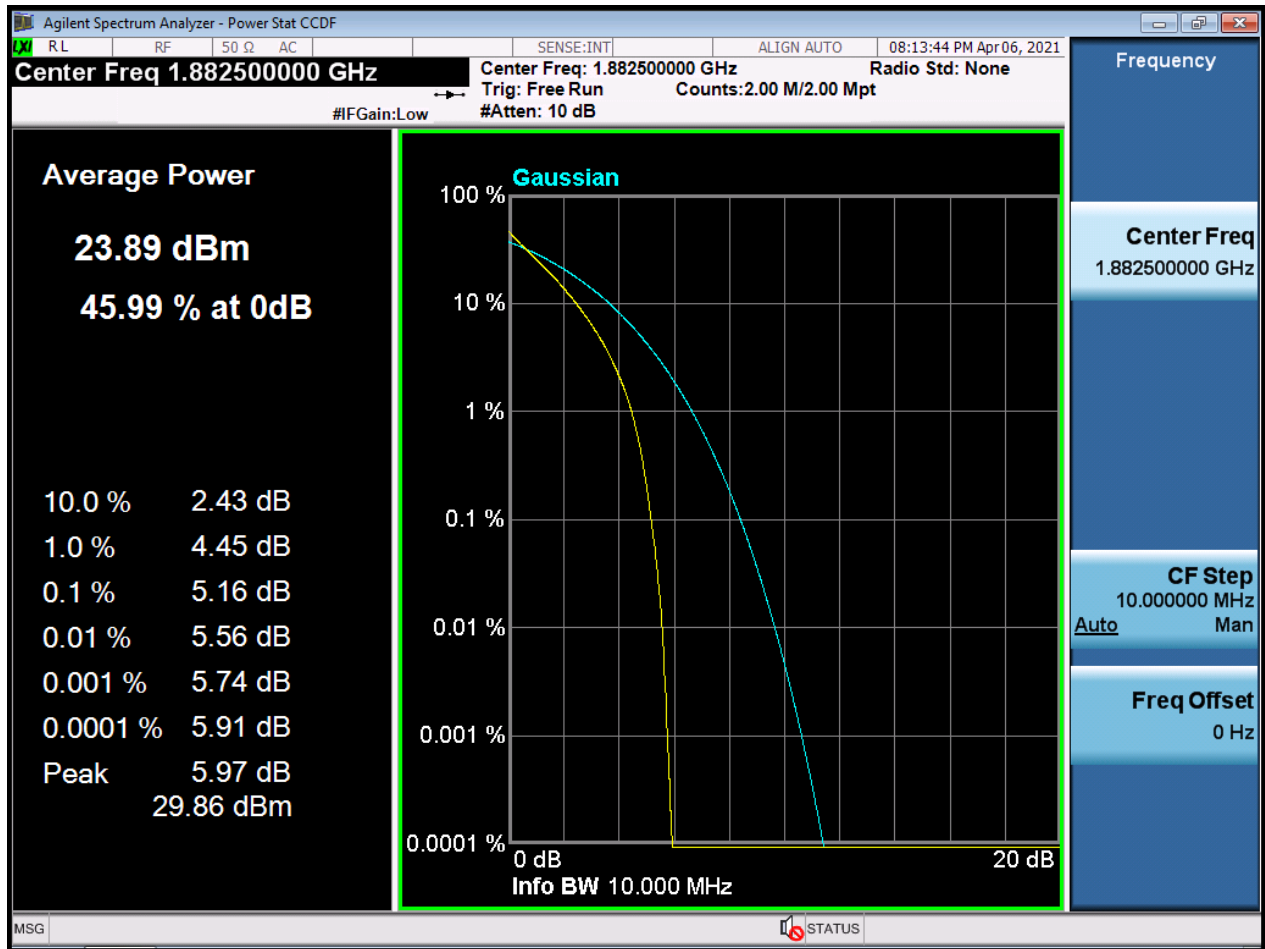


BW5M\_PAR\_Middle Channel\_256QAM\_FullIRB

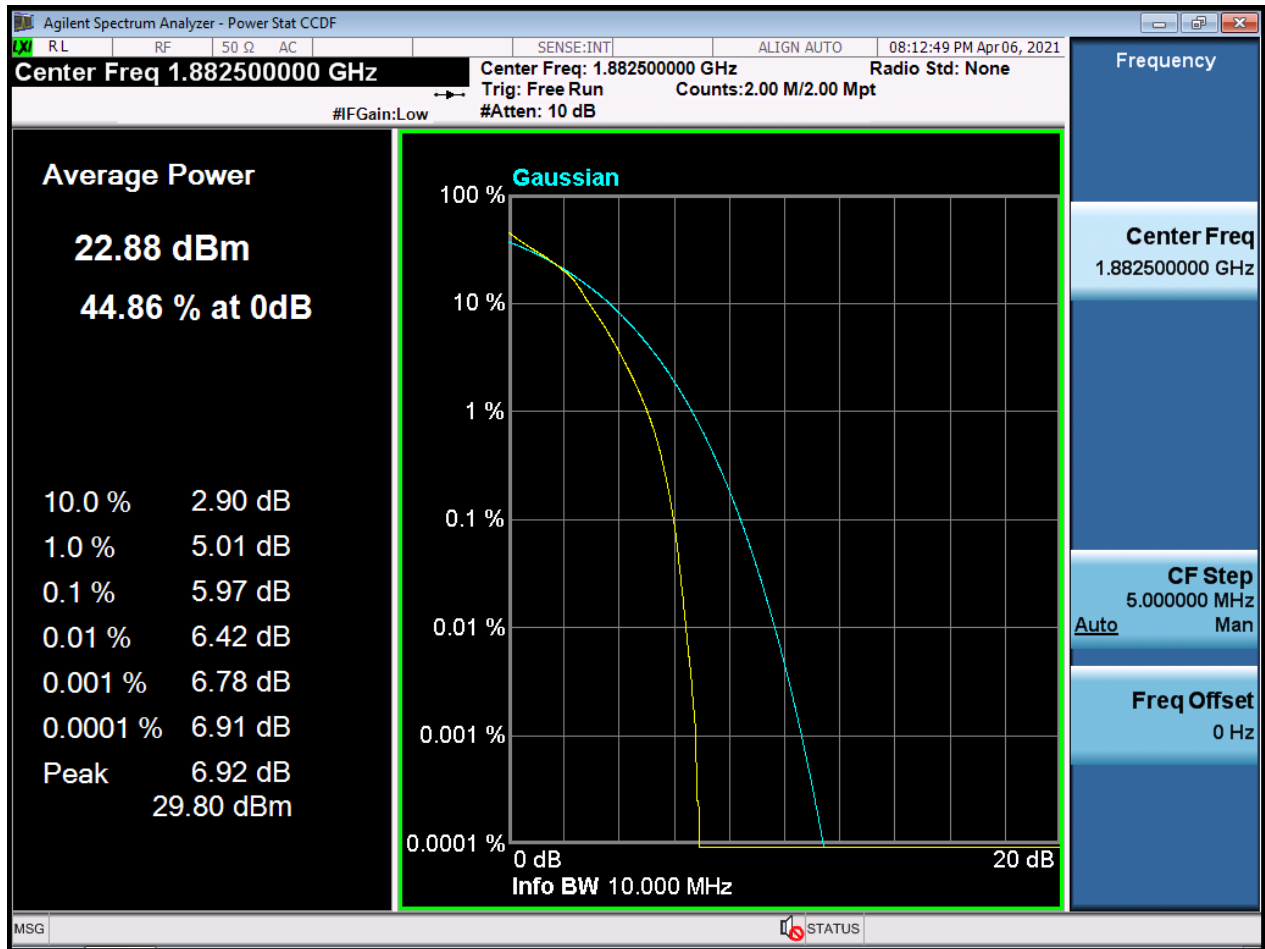




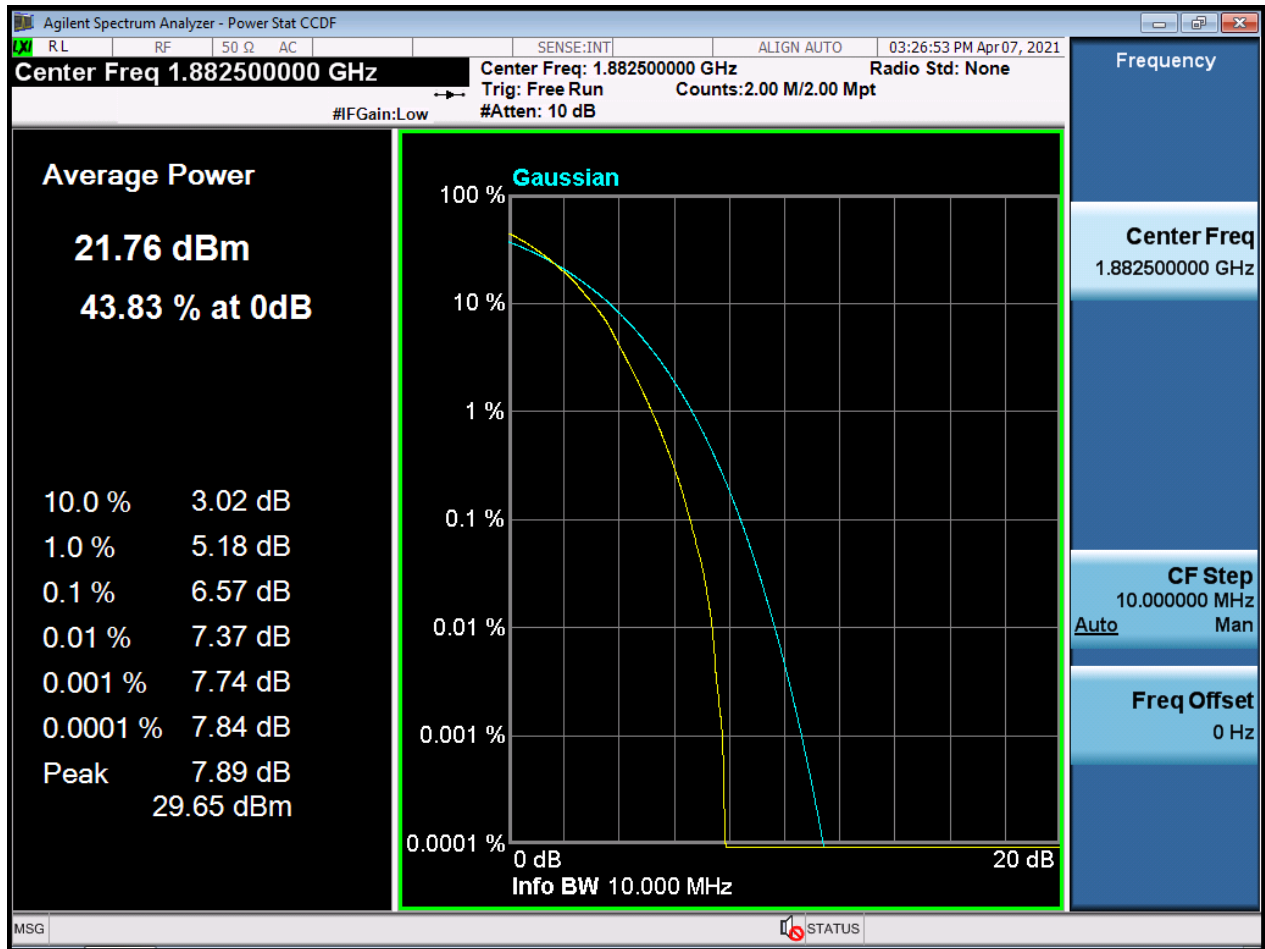
BW10M\_PAR\_Middle Channelz\_QPSK\_FullIRB



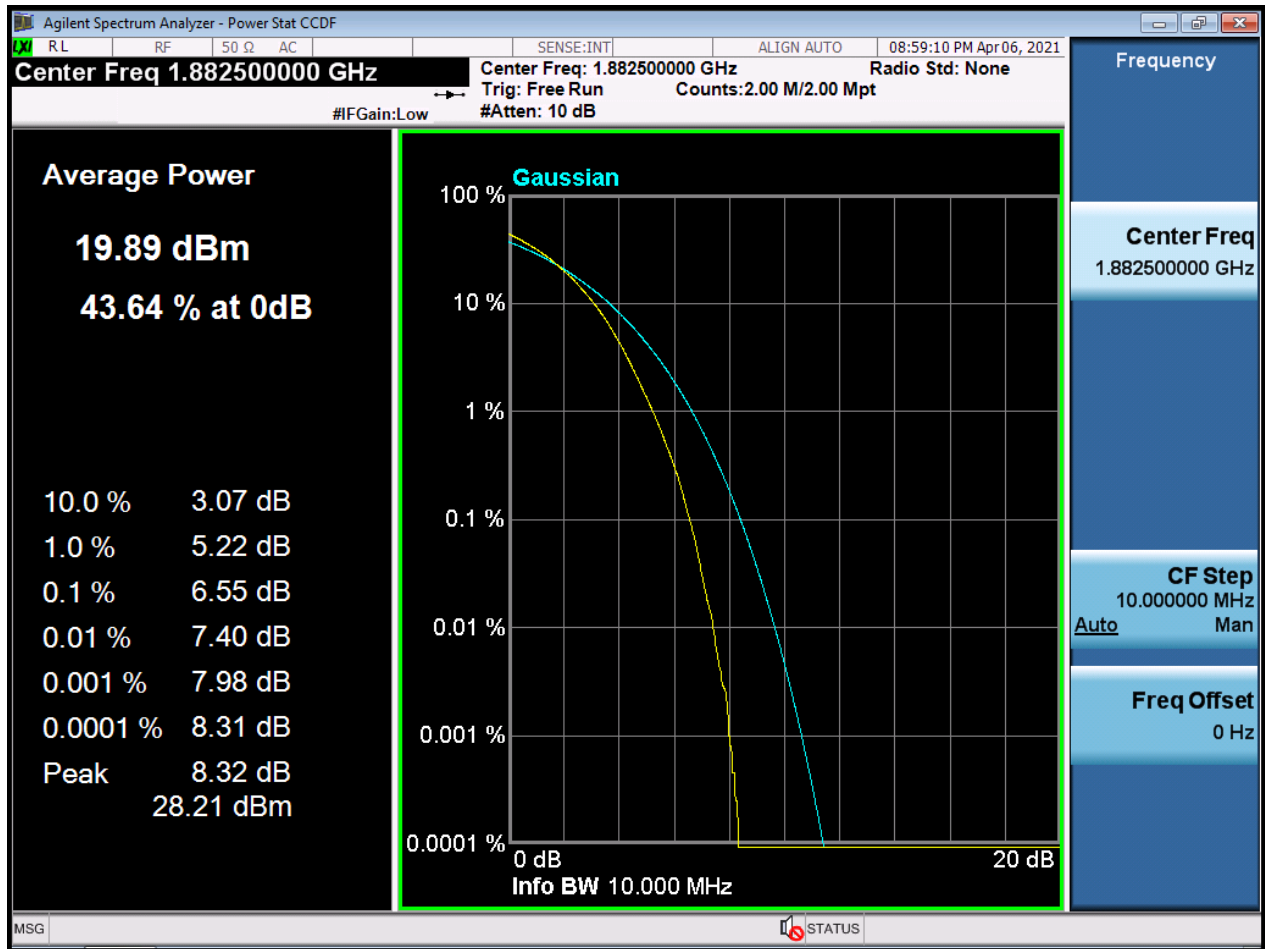
BW10M\_PAR\_Middle Channel\_16QAM\_FullIRB



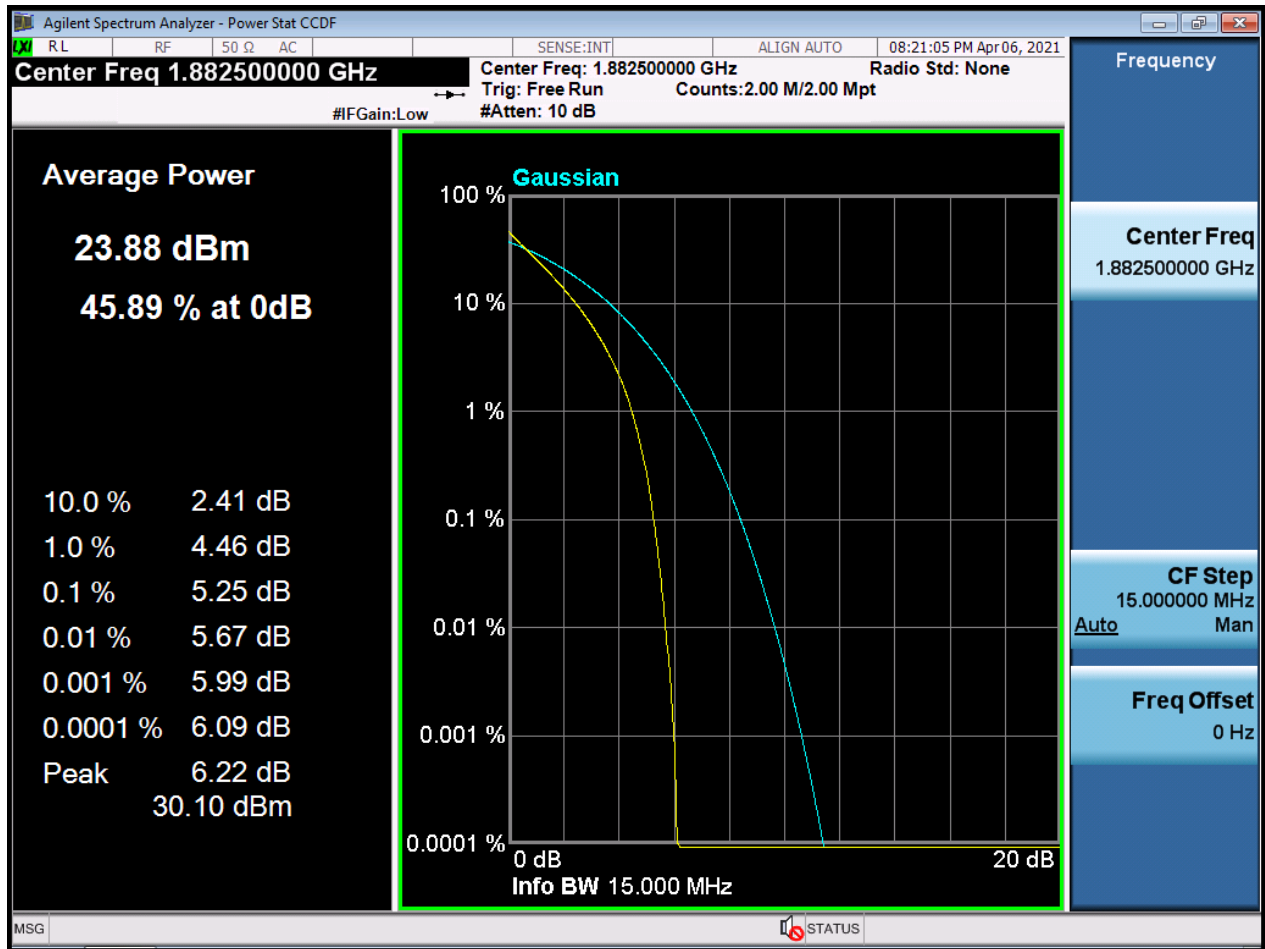
BW10M\_PAR\_Middle Channel\_64QAM\_FullIRB



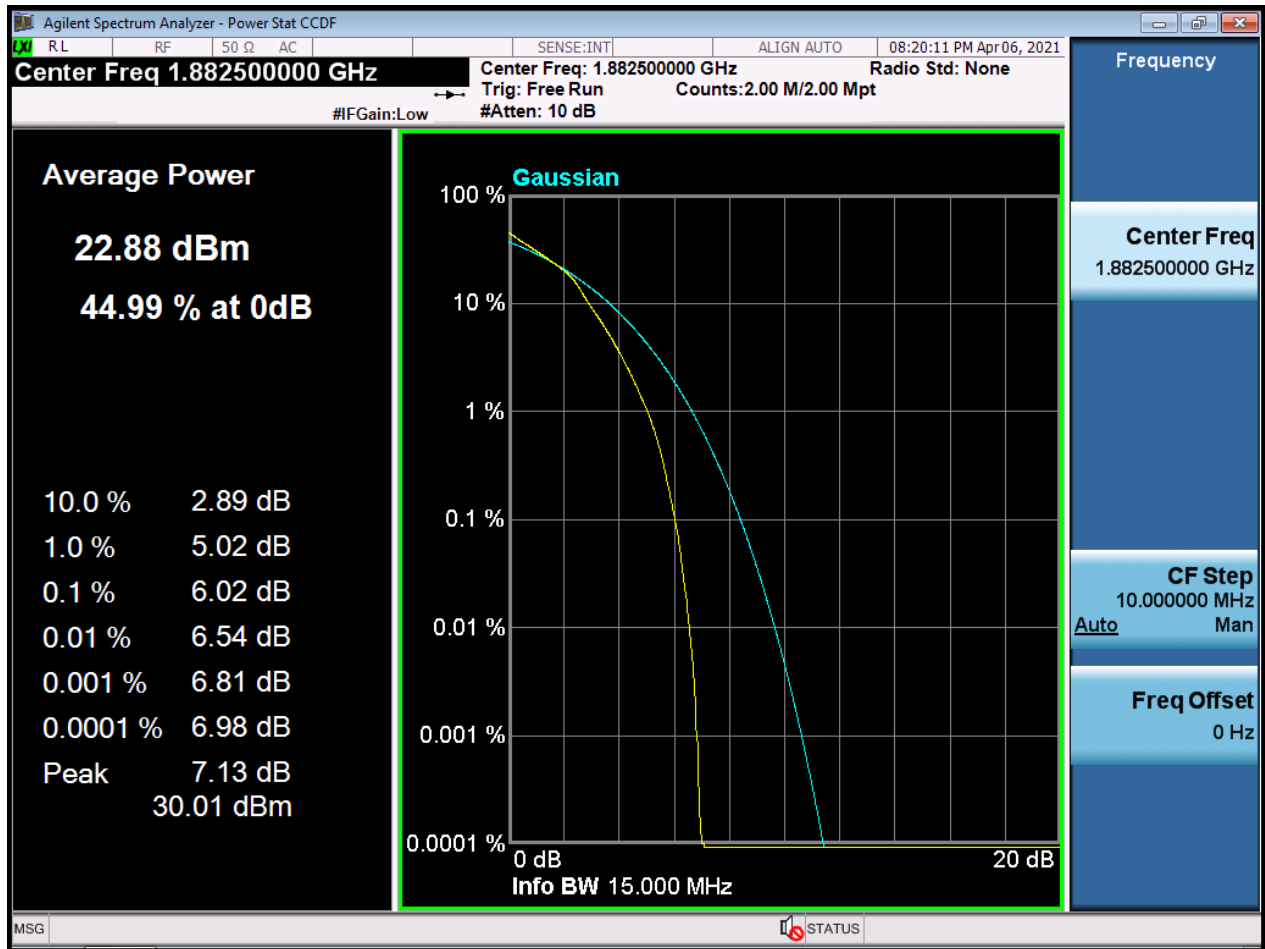
BW10M\_PAR\_Middle Channel\_256QAM\_FullIRB



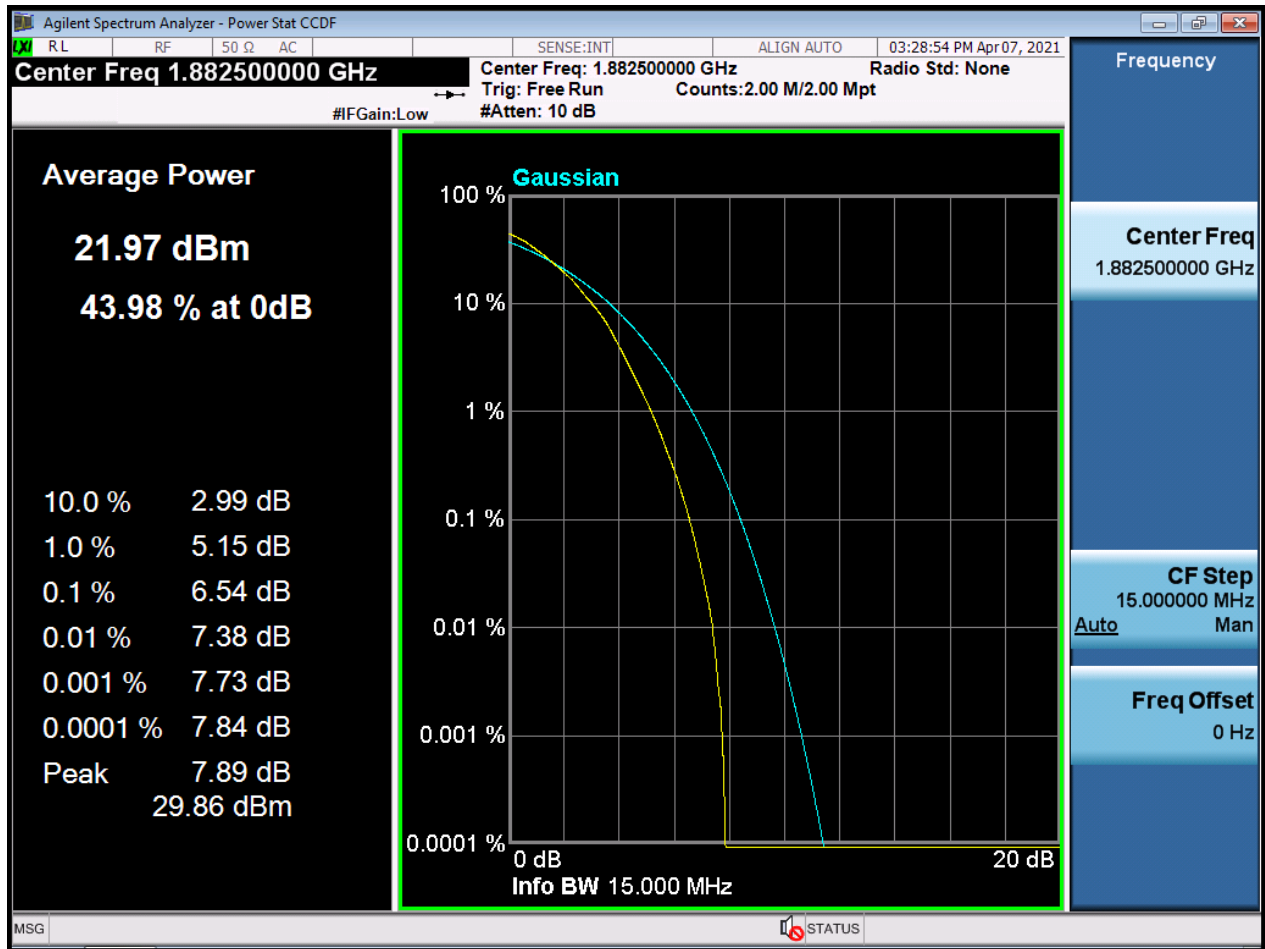
BW15M\_PAR\_Middle Channel\_QPSK\_FullIRB



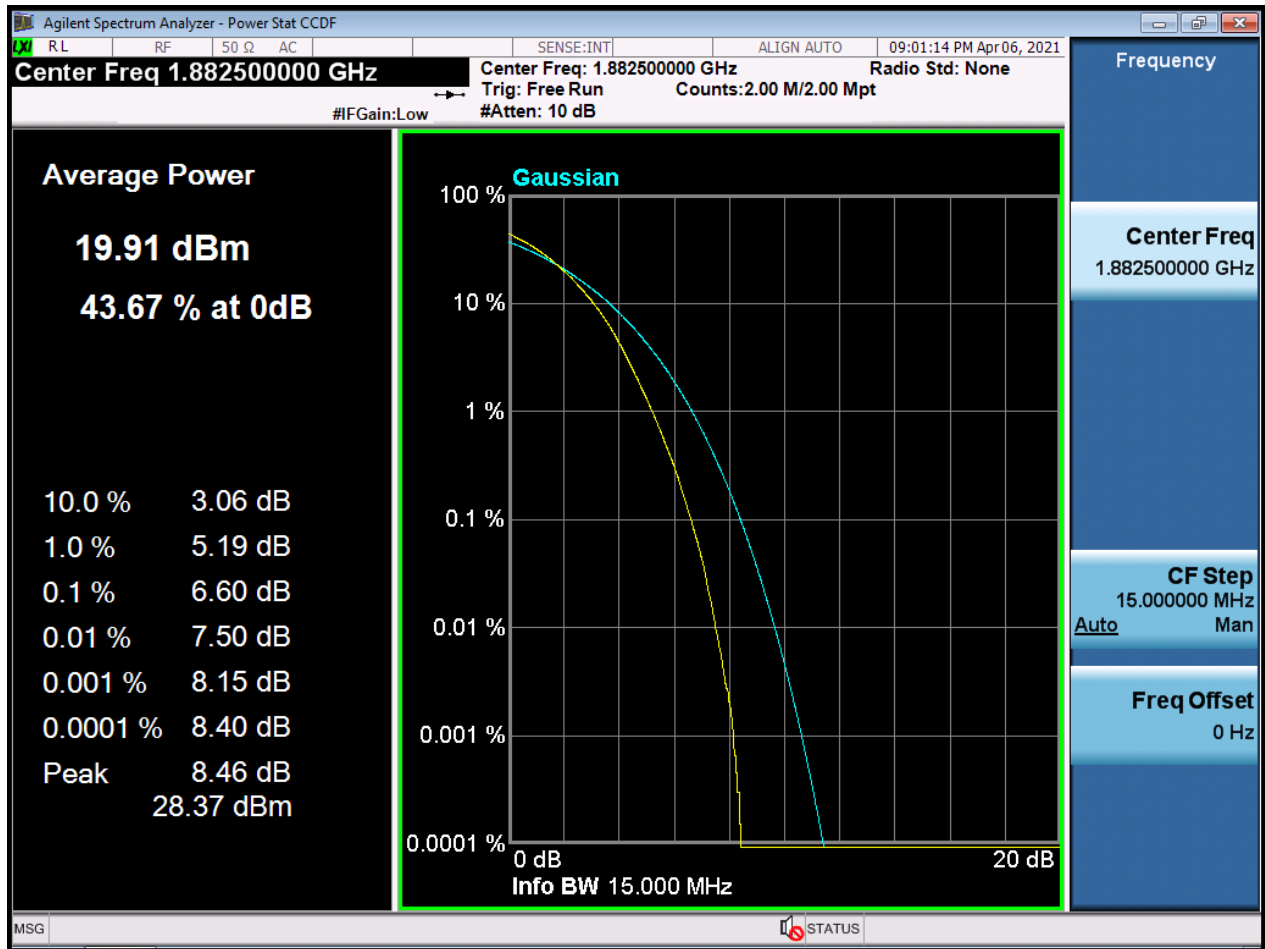
BW15M\_PAR\_Middle Channel\_16QAM\_FullIRB



BW15M\_PAR\_Middle Channel\_64QAM\_FullIRB

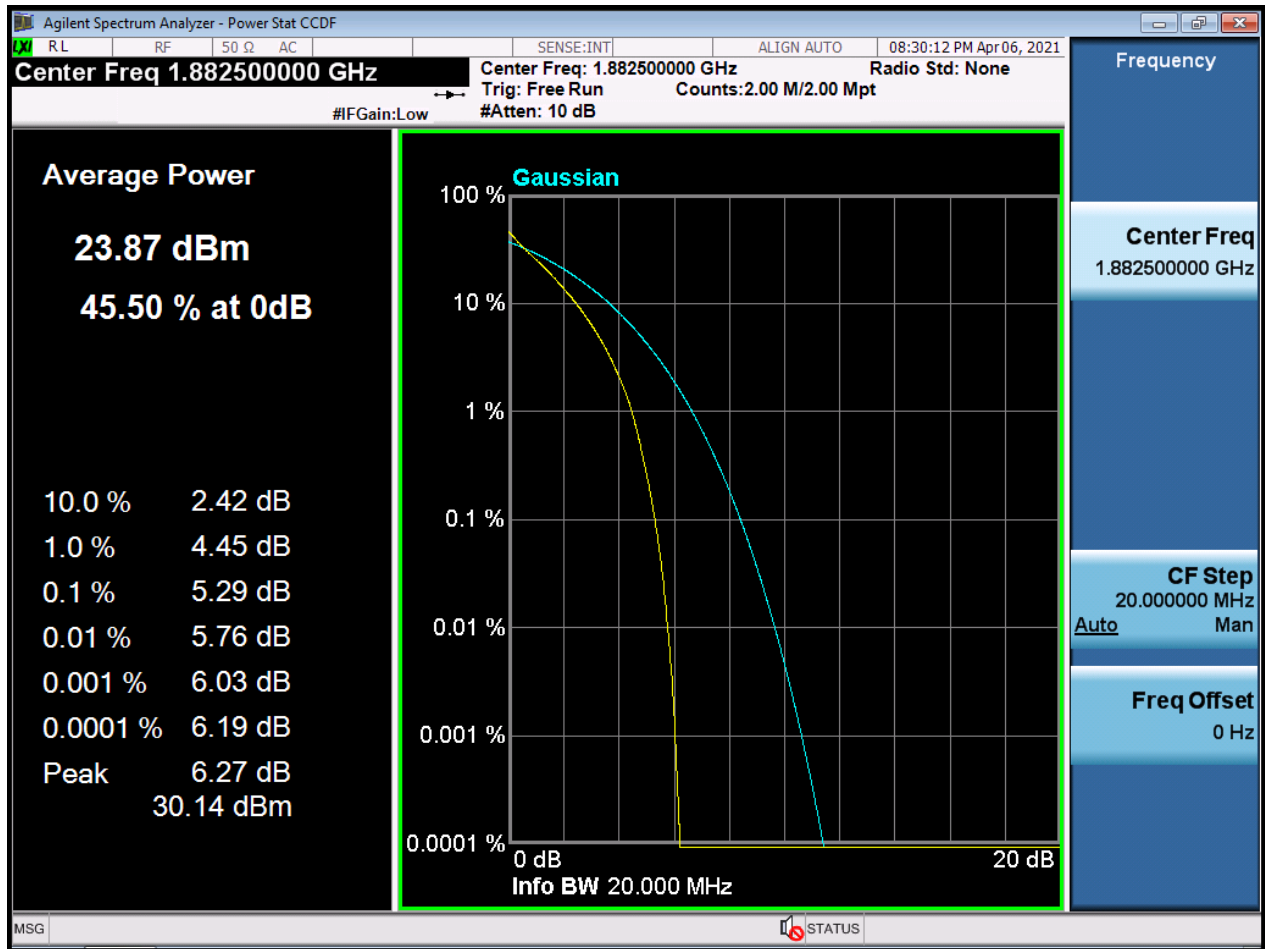


BW15M\_PAR\_Middle Channel\_256QAM\_FullIRB

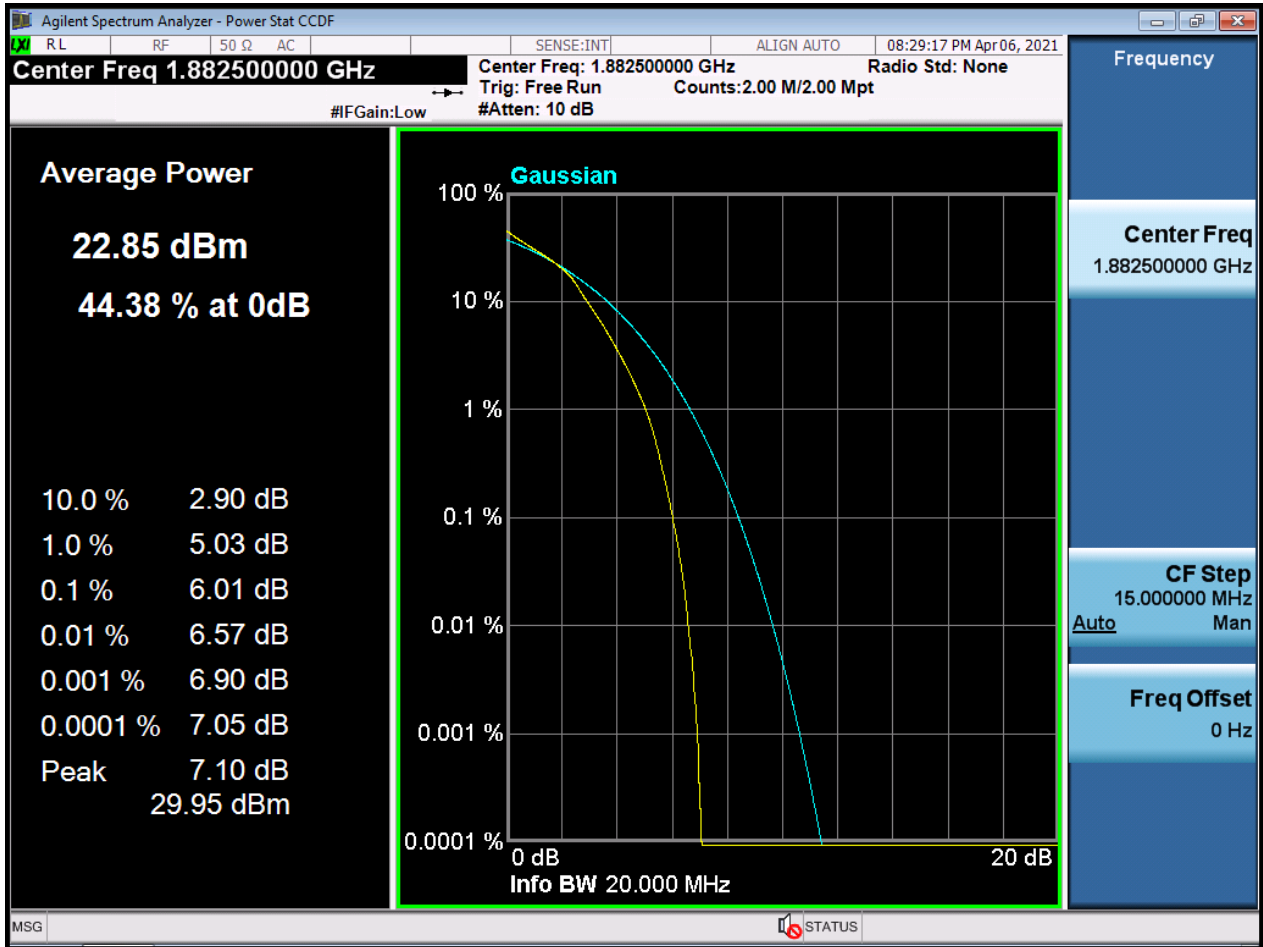




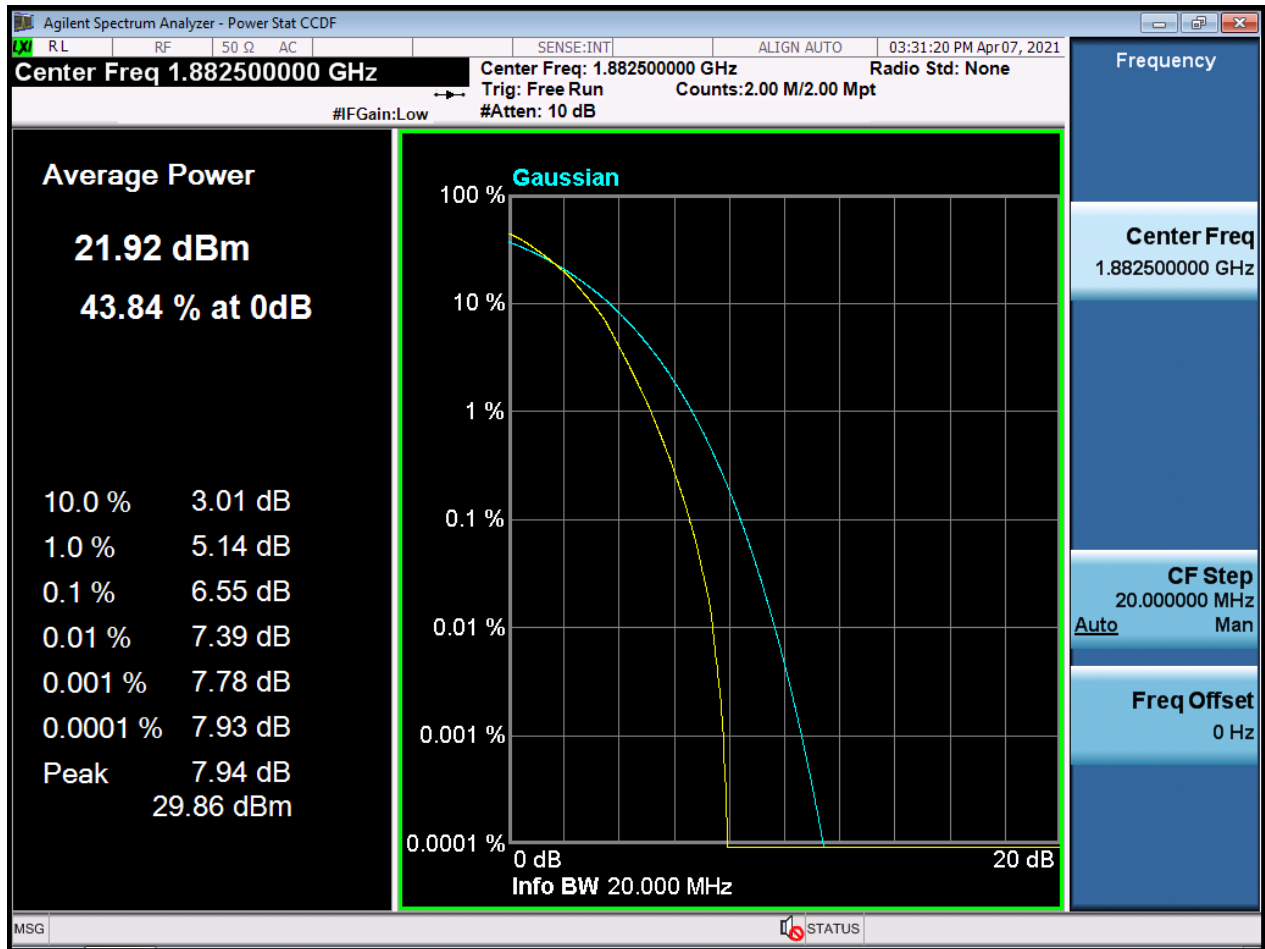
BW20M\_PAR\_Middle Channel\_QPSK\_FullIRB



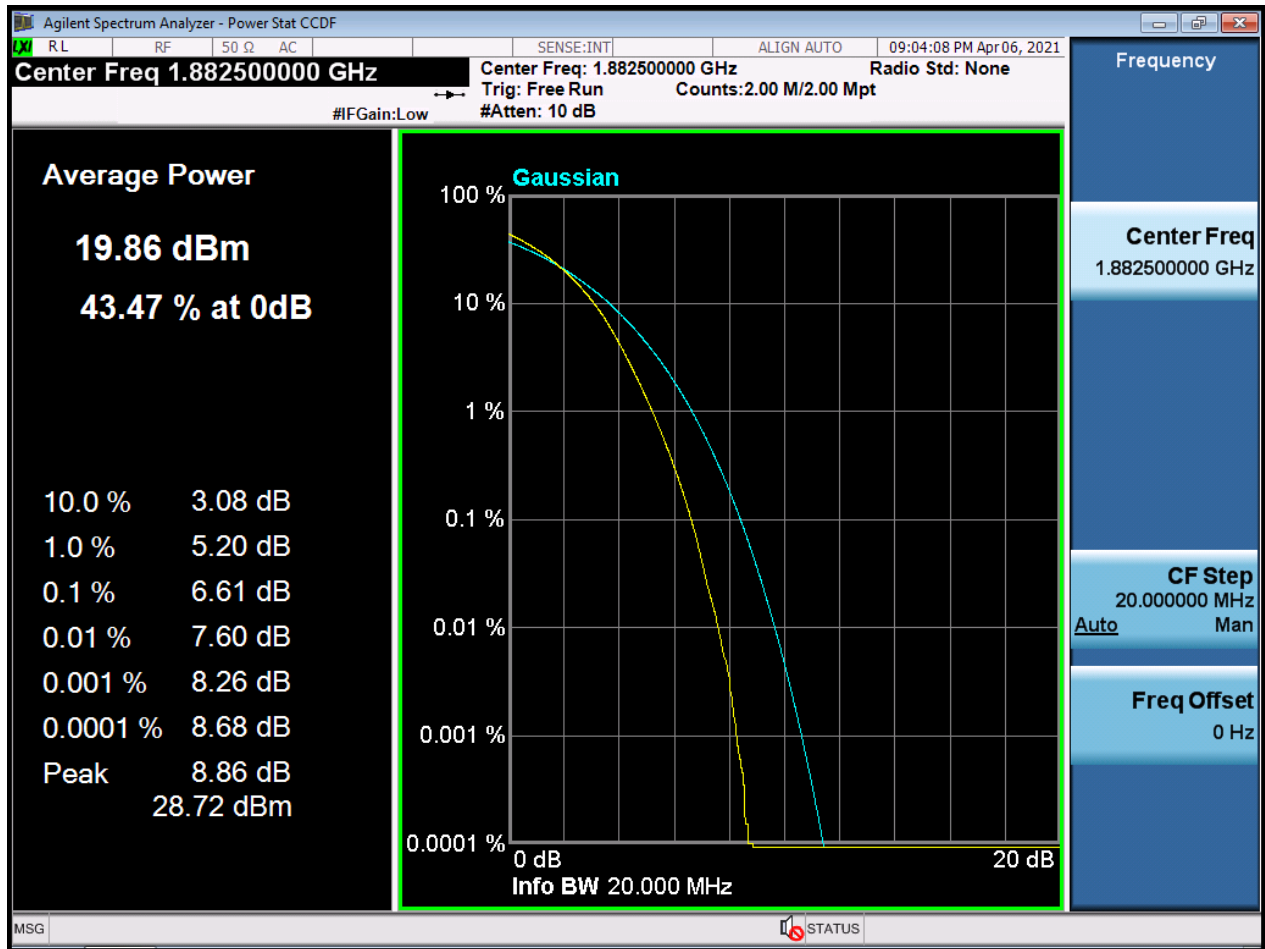
BW20M\_PAR\_Middle Channel\_16QAM\_FullIRB



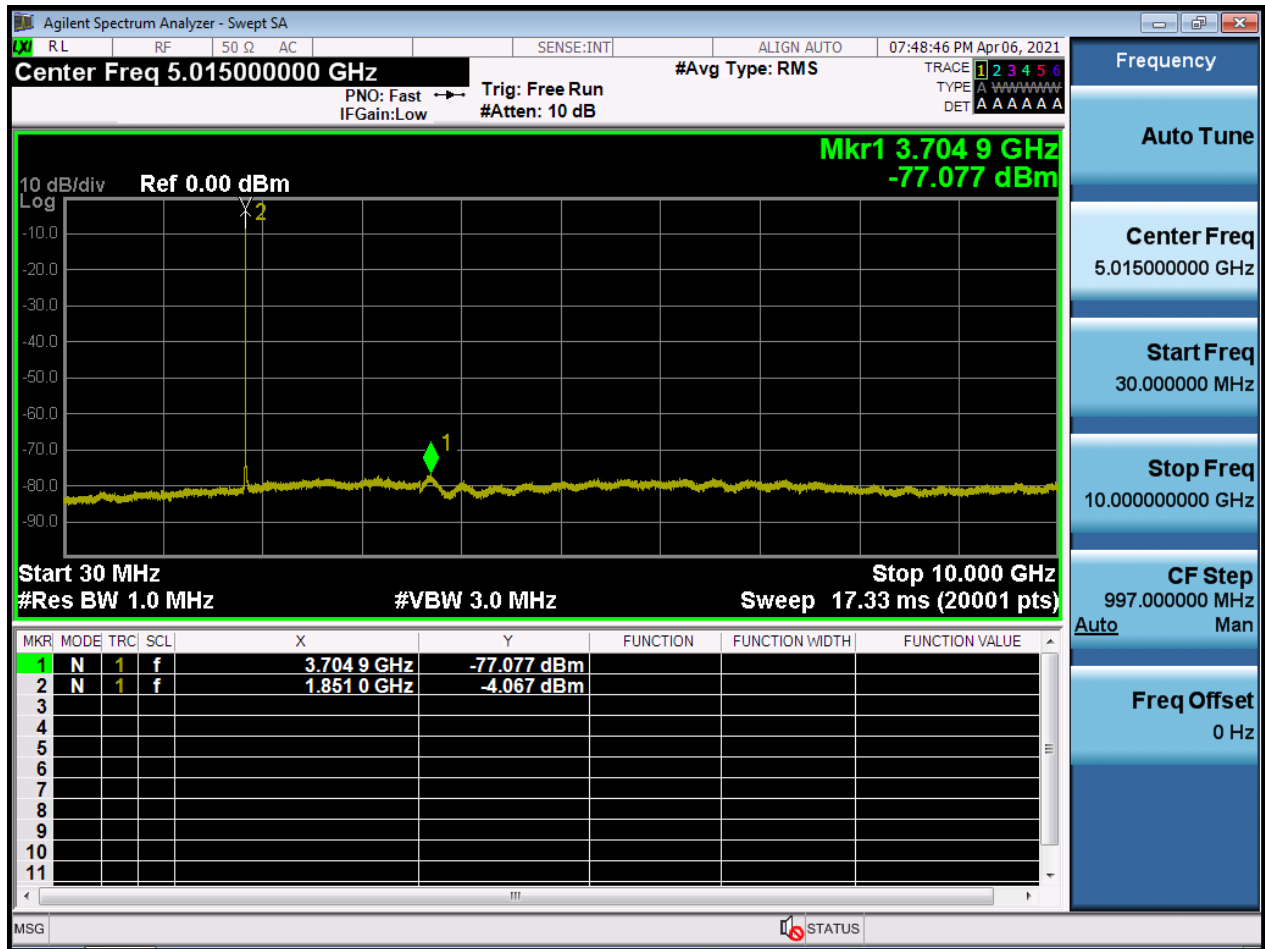
BW20M\_PAR\_Middle Channel\_64QAM\_FullIRB



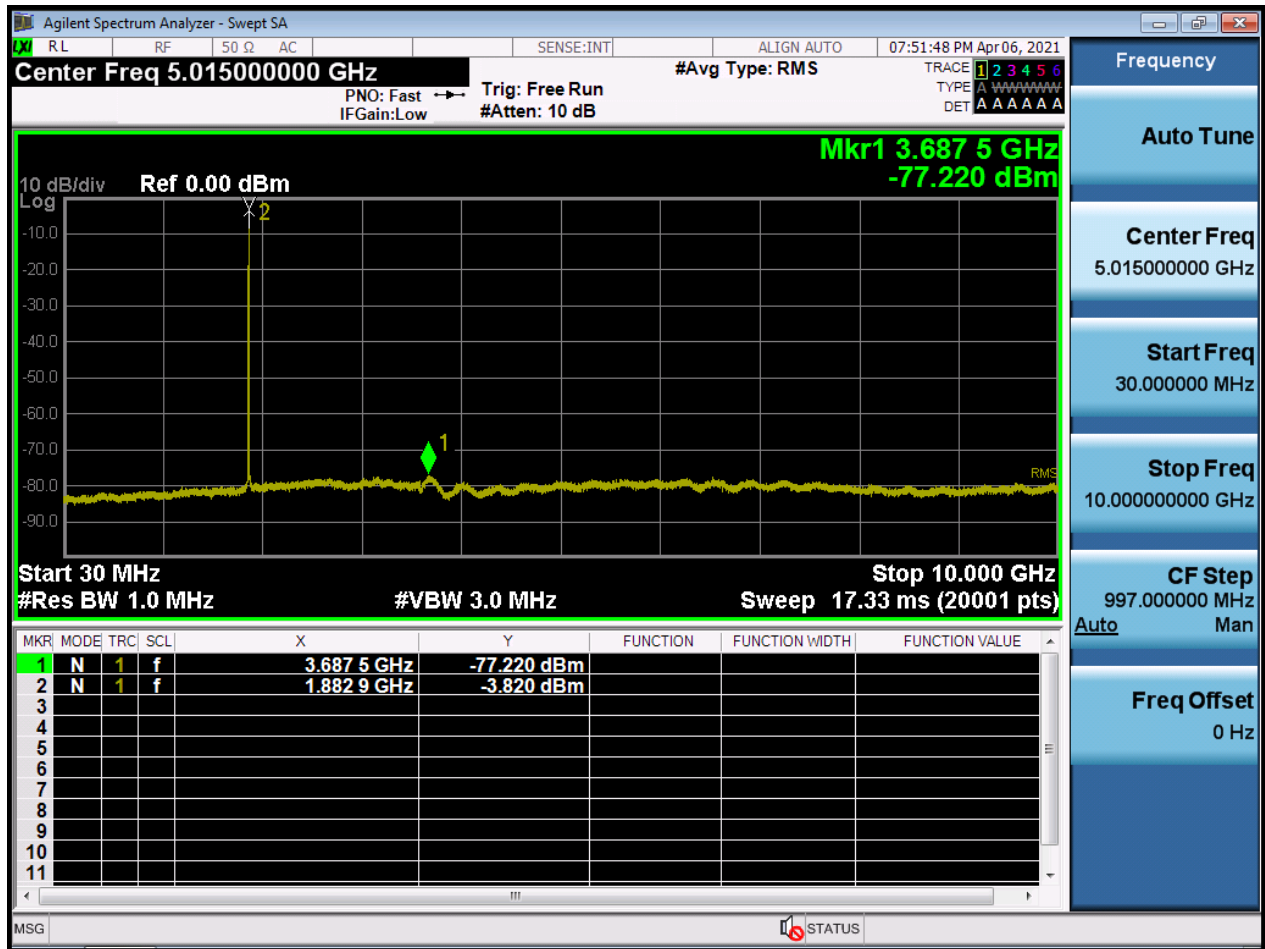
BW20M\_PAR\_Middle Channel\_256QAM\_FullIRB



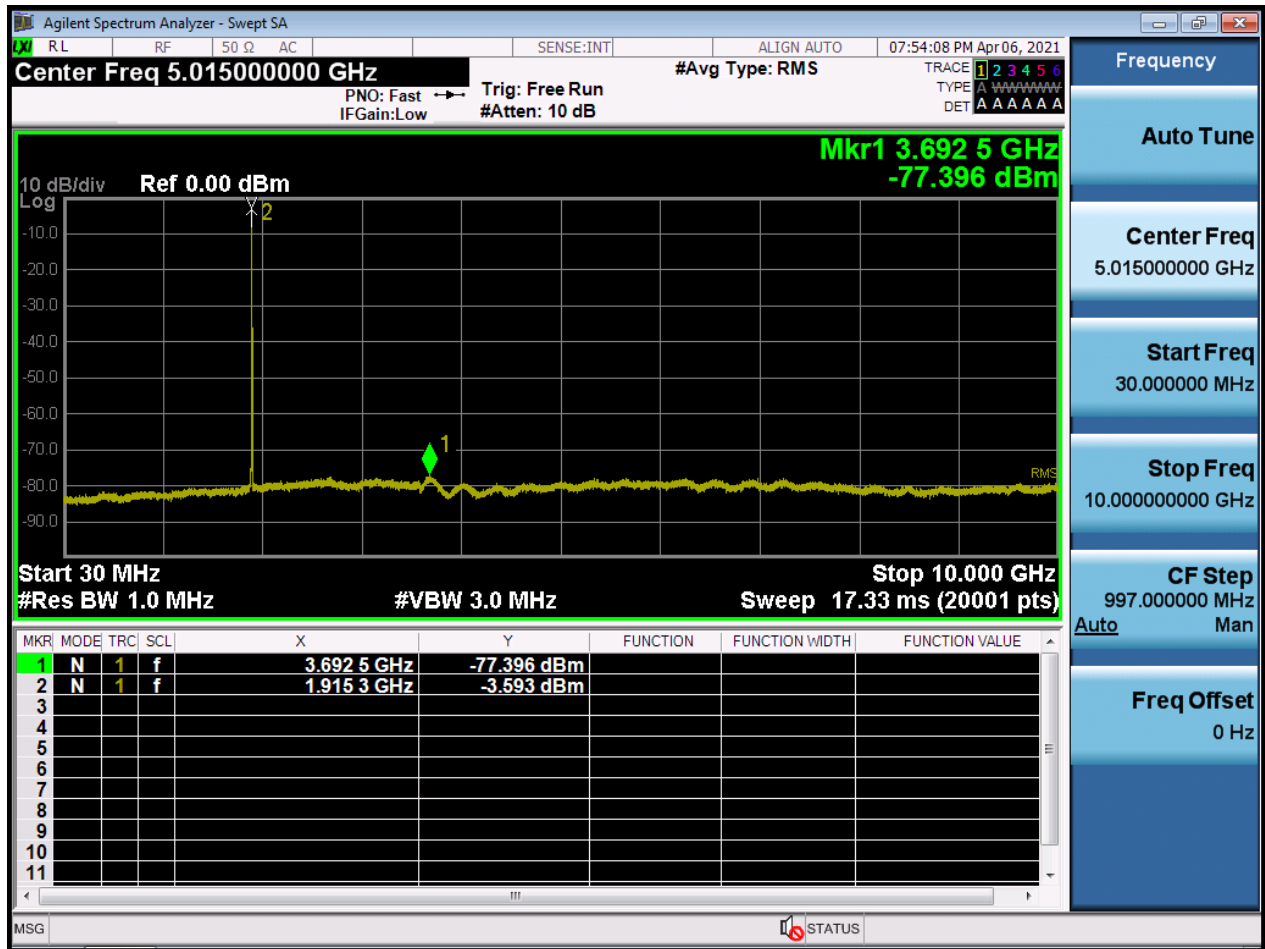
BW1.4M\_CSE(30M-10G)\_Lowest Channel\_QPSK\_1RB



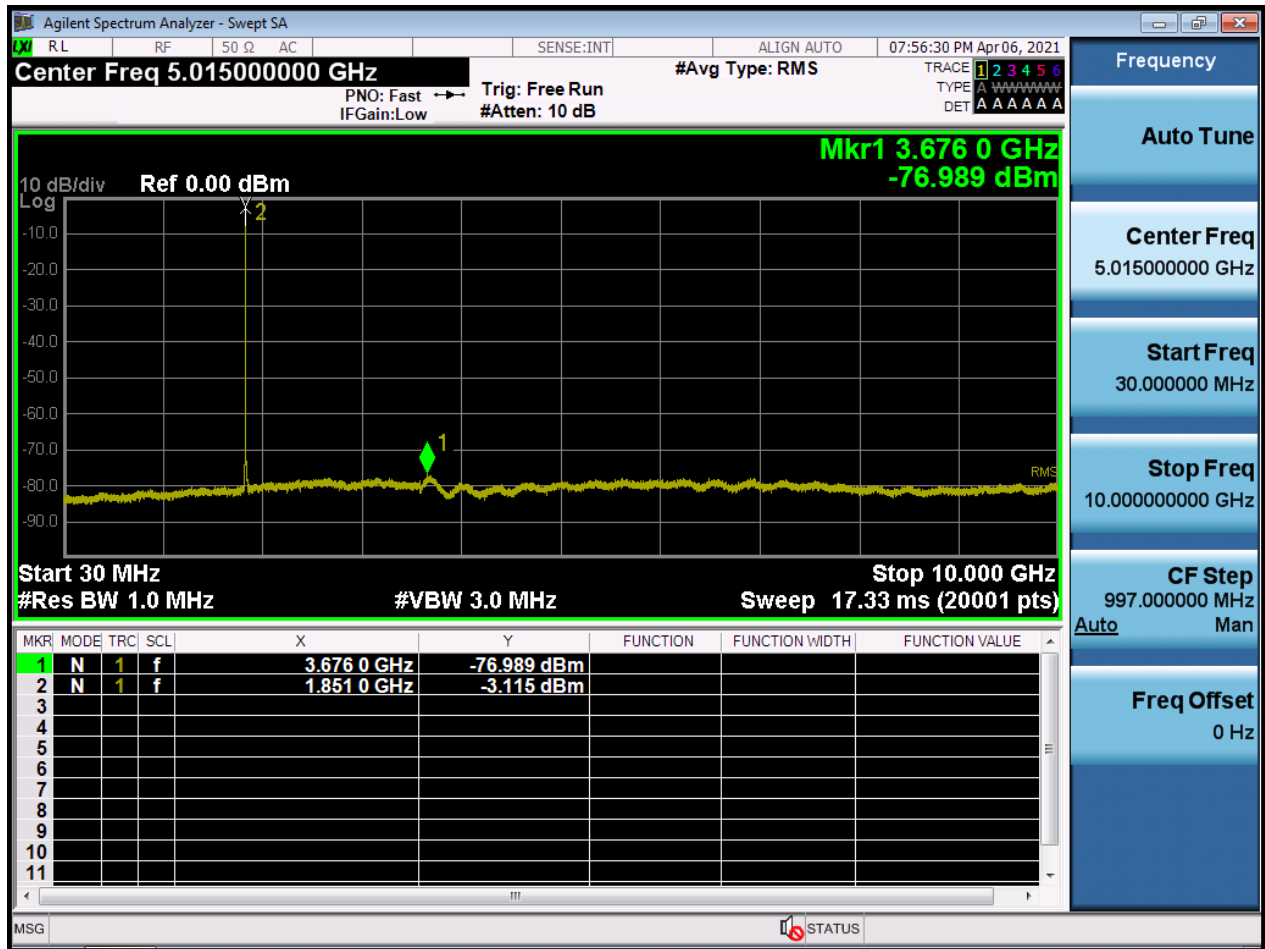
BW1.4M\_CSE(30M-10G)\_Middle Channel\_QPSK\_1RB



BW1.4M\_CSE(30M-10G)\_Highest Channel\_QPSK\_1RB

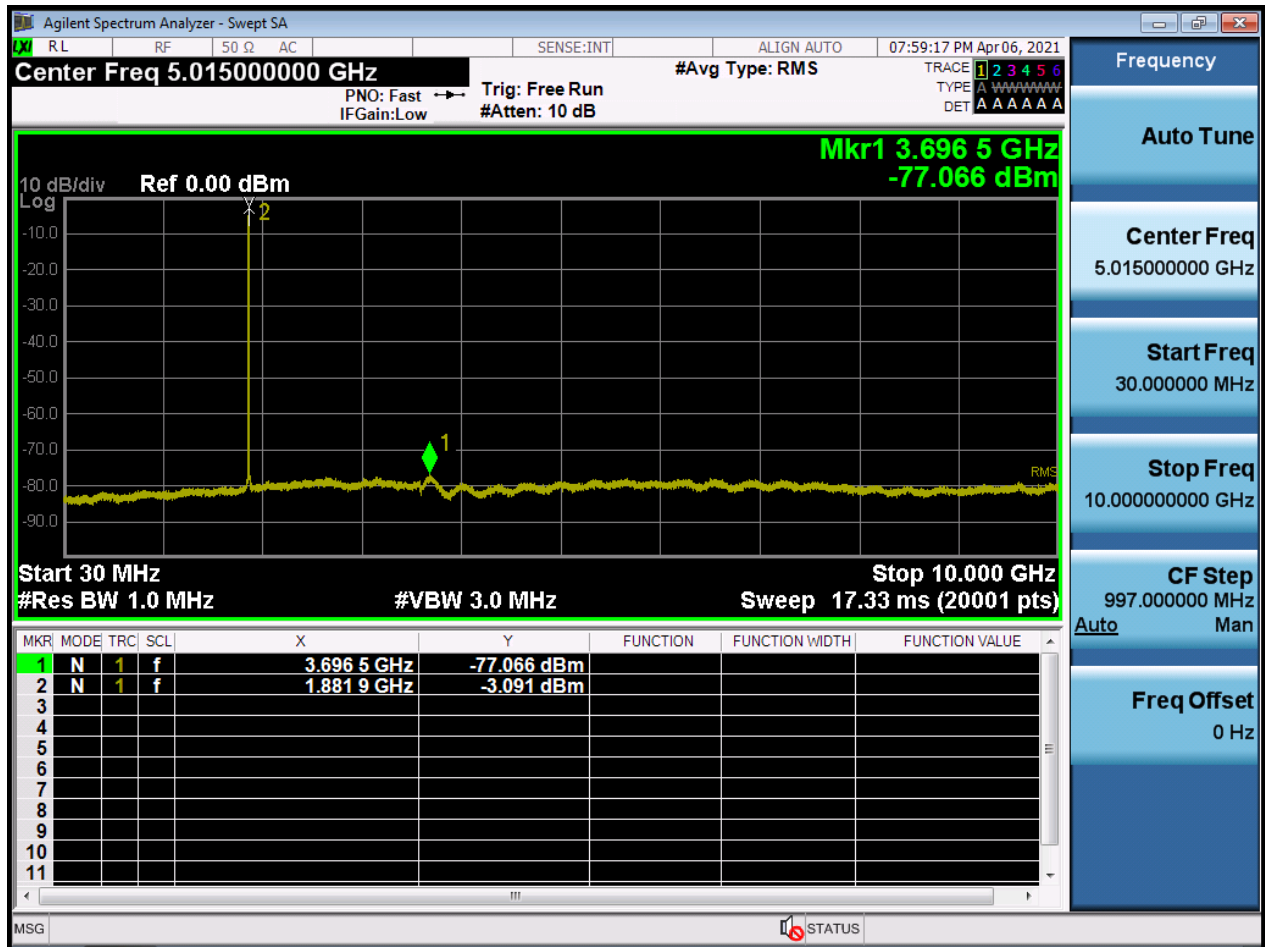


BW3M\_CSE(30M-10G)\_Lowest Channel\_QPSK\_1RB

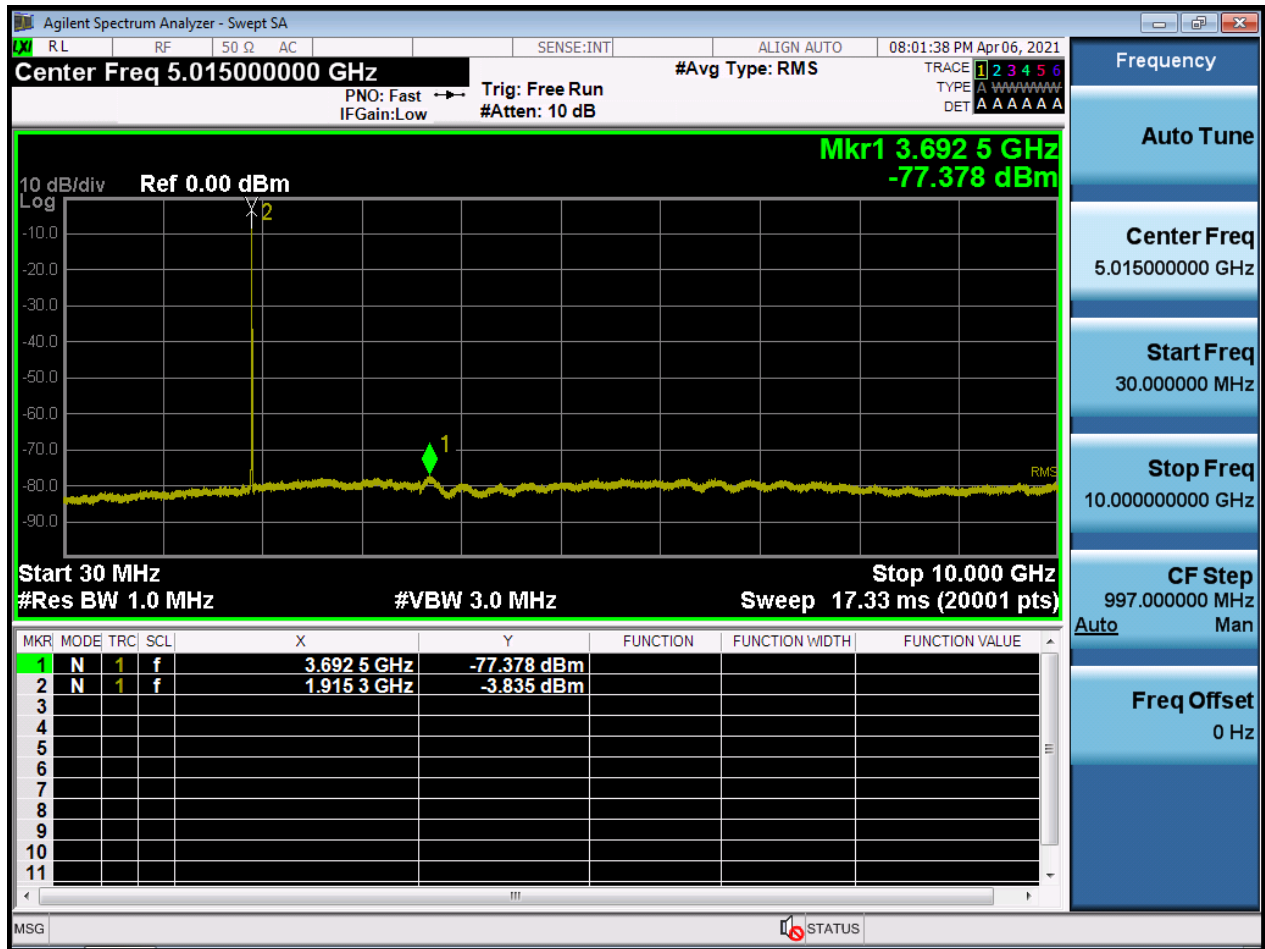




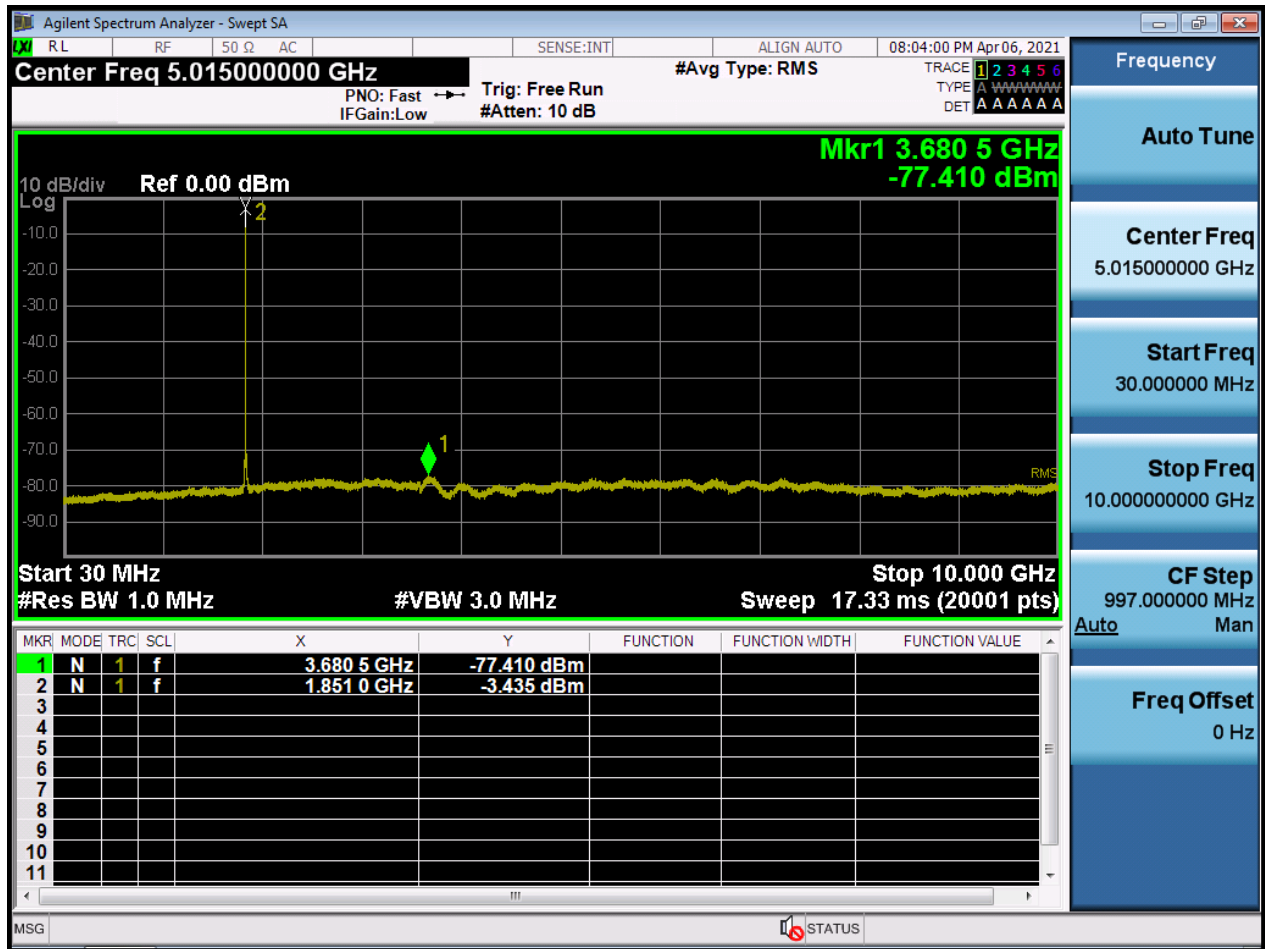
BW3M\_CSE(30M-10G)\_Middle Channel\_QPSK\_1RB



BW3M\_CSE(30M-10G)\_Highest Channel\_QPSK\_1RB



BW5M\_CSE(30M-10G)\_Lowest Channel\_QPSK\_1RB



BW5M\_CSE(30M-10G)\_Middle Channel\_QPSK\_1RB

