

# FCC LTE REPORT

## Certification

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

**Date of Issue:**  
September 26, 2023

**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-2309-FC029

**FCC ID:** A3LSMA256U

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

Model(s): SM-A256U  
 Additional Model(s): SM-A256U1/DS, SM-S256VL  
 EUT Type: Mobile phone  
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)  
 FCC Rule Part(s): §27, §2

### Main 2 Ant

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band66/4 (1.4)	1710.7 – 1779.3	1M10G7D	QPSK	0.210	23.22
		1M10W7D	16QAM	0.173	22.38
		1M09W7D	64QAM	0.146	21.65
		1M10W7D	256QAM	0.073	18.62
LTE – Band66/4 (3)	1711.5 – 1778.5	2M72G7D	QPSK	0.208	23.19
		2M71W7D	16QAM	0.172	22.36
		2M71W7D	64QAM	0.144	21.59
LTE – Band66/4 (5)	1712.5 – 1777.5	2M72W7D	256QAM	0.073	18.62
		4M52G7D	QPSK	0.202	23.06
		4M52W7D	16QAM	0.167	22.22
LTE – Band66/4 (10)	1712.5 – 1777.5	4M52W7D	64QAM	0.143	21.54
		4M52W7D	256QAM	0.074	18.67
		9M01G7D	QPSK	0.217	23.37
		9M01W7D	16QAM	0.183	22.63
LTE – Band66/4 (15)	1715.0 – 1775.0	9M00W7D	64QAM	0.147	21.66
		9M01W7D	256QAM	0.072	18.60
		13M5G7D	QPSK	0.186	22.70
		13M5W7D	16QAM	0.160	22.04
LTE – Band66/4 (20)	1717.5 – 1772.5	13M5W7D	64QAM	0.137	21.36
		13M5W7D	256QAM	0.074	18.70
		17M9G7D	QPSK	0.200	23.02
		17M9W7D	16QAM	0.166	22.19
LTE – Band66/4 (20)	1720.0 – 1770.0	17M9W7D	64QAM	0.142	21.53
		18M0W7D	256QAM	0.072	18.56

**Main 3 Ant**

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band66/4 (1.4)	1710.7 – 1779.3	1M10G7D	QPSK	0.068	18.35
		1M09W7D	16QAM	0.057	17.55
		1M09W7D	64QAM	0.045	16.49
		1M09W7D	256QAM	0.022	13.48
LTE – Band66/4 (3)	1711.5 – 1778.5	2M72G7D	QPSK	0.068	18.30
		2M71W7D	16QAM	0.057	17.54
		2M71W7D	64QAM	0.044	16.46
		2M72W7D	256QAM	0.022	13.45
LTE – Band66/4 (5)	1712.5 – 1777.5	4M53G7D	QPSK	0.071	18.51
		4M52W7D	16QAM	0.059	17.69
		4M52W7D	64QAM	0.046	16.67
		4M53W7D	256QAM	0.023	13.66
LTE – Band66/4 (10)	1715.0 – 1775.0	9M03G7D	QPSK	0.072	18.60
		9M02W7D	16QAM	0.059	17.72
		9M03W7D	64QAM	0.047	16.76
		9M04W7D	256QAM	0.024	13.77
LTE – Band66/4 (15)	1717.5 – 1772.5	13M5G7D	QPSK	0.071	18.54
		13M5W7D	16QAM	0.060	17.75
		13M5W7D	64QAM	0.047	16.72
		13M5W7D	256QAM	0.024	13.73
LTE – Band66/4 (20)	1720.0 – 1770.0	18M0G7D	QPSK	0.073	18.65
		18M0W7D	16QAM	0.061	17.82
		18M0W7D	64QAM	0.048	16.82
		18M0W7D	256QAM	0.024	13.80

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-2309-FC029

---

REVIEWED BY



---

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

---

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

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.  
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-2309-FC029	September 26, 2023	- First Approval Report

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

## Table of Contents

REVIEWED BY .....	3
1. GENERAL INFORMATION .....	6
2. INTRODUCTION .....	7
2.1. DESCRIPTION OF EUT .....	7
2.2. MEASURING INSTRUMENT CALIBRATION .....	7
2.3. TEST FACILITY .....	7
3. DESCRIPTION OF TESTS.....	8
3.1 TEST PROCEDURE .....	8
3.2 RADIATED POWER.....	9
3.3 RADIATED SPURIOUS EMISSIONS .....	10
3.4 PEAK- TO- AVERAGE RATIO.....	11
3.5 OCCUPIED BANDWIDTH. ....	13
3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL .....	14
3.7 BAND EDGE .....	15
3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE .....	17
3.9 WORST CASE(RADIATED TEST) .....	18
3.10 WORST CASE(CONDUCTED TEST) .....	20
4. LIST OF TEST EQUIPMENT .....	21
5. MEASUREMENT UNCERTAINTY .....	22
6. SUMMARY OF TEST RESULTS .....	23
7. SAMPLE CALCULATION .....	24
8. TEST DATA (Main 2 Ant).....	26
8.1 EQUIVALENT ISOTROPIC RADIATED POWER.....	26
8.2 RADIATED SPURIOUS EMISSIONS .....	29
8.3 PEAK-TO-AVERAGE RATIO.....	30
8.4 OCCUPIED BANDWIDTH .....	31
8.5 CONDUCTED SPURIOUS EMISSIONS .....	32
8.6 BAND EDGE .....	33
8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE .....	34
9. TEST DATA (Main 3 Ant).....	52
9.1 EQUIVALENT ISOTROPIC RADIATED POWER.....	52
9.2 RADIATED SPURIOUS EMISSIONS .....	55
9.3 PEAK-TO-AVERAGE RATIO.....	56
9.4 OCCUPIED BANDWIDTH .....	57
9.5 CONDUCTED SPURIOUS EMISSIONS .....	58
9.6 BAND EDGE .....	59
9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE .....	60
10. TEST PLOTS (Main 2 Ant) .....	78
11. TEST PLOTS (Main 3 Ant) .....	199
12. ANNEX A_ TEST SETUP PHOTO.....	320

# 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>	A3LSMA256U
<b>Application Type:</b>	Certification
<b>FCC Classification:</b>	PCS Licensed Transmitter Held to Ear (PCE)
<b>FCC Rule Part(s):</b>	§27, §2
<b>EUT Type:</b>	Mobile phone
<b>Model(s):</b>	SM-A256U
<b>Additional Model(s):</b>	SM-A256U1/DS, SM-S256VL
<b>Tx Frequency:</b>	1710.7 MHz – 1779.3 MHz (LTE – Band 66/4 (1.4 MHz)) 1711.5 MHz – 1778.5 MHz (LTE – Band 66/4 (3 MHz)) 1712.5 MHz – 1777.5 MHz (LTE – Band 66/4 (5 MHz)) 1715.0 MHz – 1775.0 MHz (LTE – Band 66/4 (10 MHz)) 1717.5 MHz – 1772.5 MHz (LTE – Band 66/4 (15 MHz)) 1720.0 MHz – 1770.0 MHz (LTE – Band 66/4 (20 MHz))
<b>Date(s) of Tests:</b>	May 22, 2023 ~ September 04, 2023
<b>Serial number:</b>	Radiated: R3CW50MGDKF Conducted: 74530c3036337ece

## **2. INTRODUCTION**

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

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

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

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

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

### **2.3. TEST FACILITY**

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

### 3. DESCRIPTION OF TESTS

#### 3.1 TEST PROCEDURE

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



## 3.2 RADIATED POWER

### Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

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

### Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5 % of the expected OBW, not to exceed 1 MHz
3. VBW  $\geq$  3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points  $>$  2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

### Test Note

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

The power is calculated by the following formula;

$$P_d \text{ (dBm)} = P_g \text{ (dBm)} - \text{cable loss (dB)} + \text{antenna gain (dB)}$$

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

3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value.

These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference

between the gain of the horn and an isotropic antenna are taken into consideration

4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

### 3.3 RADIATED SPURIOUS EMISSIONS

#### Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

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

#### Test Settings

1. RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz
2. VBW  $\geq 3 \times$  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 1 GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.  
The spurious emissions is calculated by the following formula;

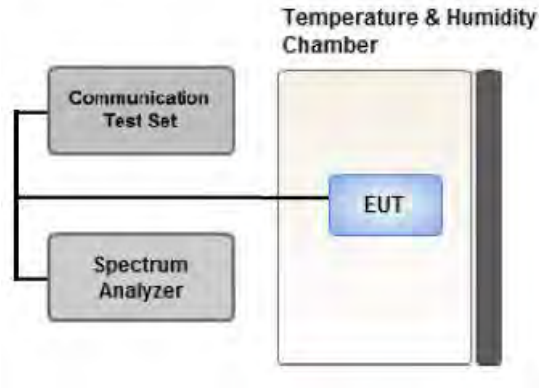
$$\text{Result}_{(dBm)} = P_g_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

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

### 3.4 PEAK- TO- AVERAGE RATIO



**Test setup**

#### ① CCDF Procedure for PAPR

##### **Test Settings**

1. Set resolution/measurement bandwidth  $\geq$  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)**

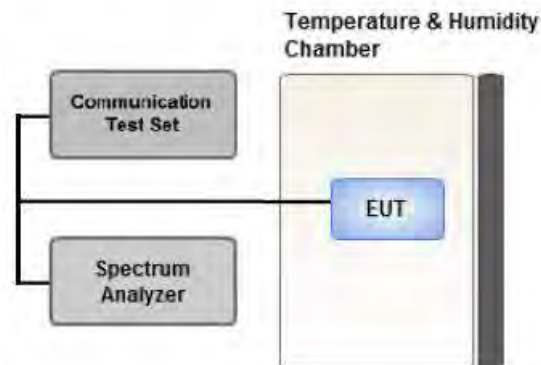
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW  $\geq 3 \times$  RBW.

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.

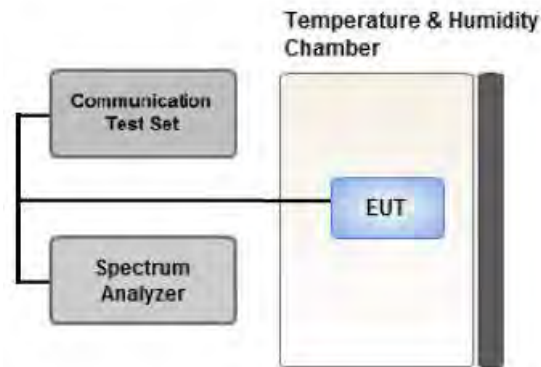
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5 % of the expected OBW
3. VBW  $\geq$  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.

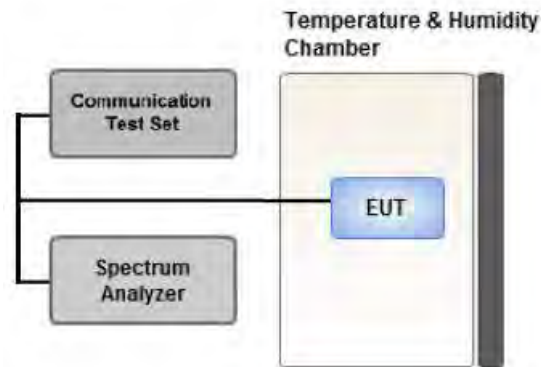
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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 = trace average
5. Sweep time = auto
6. Number of points in sweep  $\geq$  2 x Span / RBW

### 3.7 BAND EDGE



**Test setup**

#### **Test Overview**

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

#### **Test Settings**

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1 % of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points  $\geq 2 \times \text{Span}/\text{RBW}$
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

**Test Notes**

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

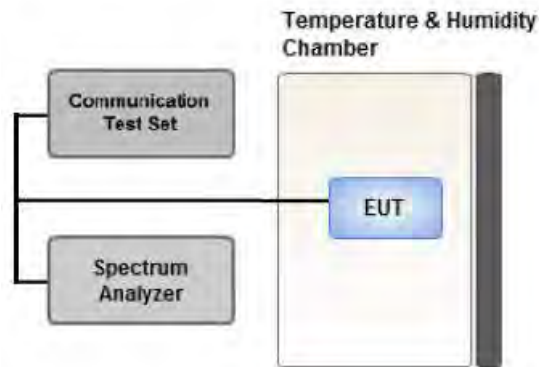
All measurements were done at 2 channels(low and high operational frequency range.)

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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



### 3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



#### Test setup

#### Test Overview

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

The frequency stability of the transmitter is measured by:

1. Temperature:

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

2. Primary Supply Voltage:

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

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

#### Test Settings

1. The carrier frequency of the transmitter is measured at room temperature

(20 °C to provide a reference).

2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter.

Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

3. Frequency measurements are made at 10 °C intervals ranging from -30 °C to +50 °C. A period of at

least one half-hour is provided to allow stabilization of the equipment at each temperature level.

**3.9 WORST CASE(RADIATED TEST)**

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.  
 Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc)  
 Worst case : Stand alone
- We were performed the RSE test in condition of co-location.  
 Mode : Stand alone, Simultaneous transmission scenarios  
 Worst case : Stand alone
- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported. (Worst case : 10 MHz(Main 2 Ant), 20 MHz(Main 3 Ant))
- The worst case is reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data.
- Please refer to the table below.
- LTE Band 66 (1710 – 1780 MHz) overlaps the entire frequency range of LTE Band 4 (1710 - 1755 MHz) and they have the same Tune-up power. Therefore, test data provided in this report covers Band 4 as well as Band 66.
- SM-A256U & additional models were tested and the worst case results are reported.  
 (Worst case : SM-A256U)

[ Main 2 Ant Worst case ]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset	Axis			
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	1.4	Low	1	5	X			
			Mid, High	1	0				
		3	Low	1	14				
			Mid, High	1	0				
		5	Low	1	24				
			Mid, High	1	0				
		10	Low	1	49				
			Mid, High	1	0				
		15	Low	1	74				
			Mid, High	1	0				
		20	Low	1	99				
			Mid, High	1	0				
		Radiated Spurious and Harmonic Emissions	QPSK	10	Low		1	49	X
					Mid, High		1	0	

[ Main 3 Ant Worst case ]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	1	0	Z
Radiated Spurious and Harmonic Emissions	QPSK	1	0	Z

**3.10 WORST CASE(CONDUCTED TEST)**

- All modes of operation were investigated and the worst case configuration results are reported.
- LTE Band 66 (1710 – 1780 MHz) overlaps the entire frequency range of LTE Band 4 (1710 - 1755 MHz) and they have the same Tune-up power. Therefore, test data provided in this report covers Band 4 as well as Band 66.
- SM-A256U & additional models were tested and the worst case results are reported.  
(Worst case : SM-A256U)

[ 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

#### 4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
RF Switching System	FBSR-02B(1.2G HPF+LNA)	T&M SYSTEM	F1L1	01/19/2024	Annual
RF Switching System	FBSR-02B(3.3G HPF+LNA)	T&M SYSTEM	F1L2	01/19/2024	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	5001	04/19/2024	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/23/2024	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	03/09/2025	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	03/09/2025	Biennial
Chamber	SU-642	ESPEC	93008124	02/22/2024	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/17/2025	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/15/2023	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	03/28/2025	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/20/2024	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/19/2024	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	08/17/2024	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/10/2024	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/17/2024	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	895	08/16/2024	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	1135	03/21/2024	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262094331	12/01/2023	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6201026545	01/05/2024	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	06/22/2024	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/24/2024	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

**Note:**

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

## 5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the  $U_{\text{CISPR}}$  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)	1.90 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (9 kHz ~ 30 MHz)	4.14 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (30 MHz ~ 1 GHz)	5.16 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (1 GHz ~ 18 GHz)	5.57 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (18 GHz ~ 40 GHz)	5.76 (Confidence level about 95 %, $k=2$ )
Radiated Disturbance (Above 40 GHz)	5.52 (Confidence level about 95 %, $k=2$ )

## 6. SUMMARY OF TEST RESULTS

### 6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §27.53(h)	< 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	§27.50(d)(5)	< 13 dB	PASS
Frequency stability / variation of ambient temperature	§2.1055, § 27.54	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	§27.50(d)(4)	< 1 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(h)	< 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
132322	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 (Main 2 Ant)

### 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
1710.7	LTE B66/B4 1.4 MHz	QPSK	-19.37	13.74	10.04	2.06	H	< 1.00	0.148	21.72
		16-QAM	-20.09	13.02	10.04	2.06	H		0.126	21.00
		64-QAM	-20.70	12.41	10.04	2.06	H		0.109	20.39
		256-QAM	-22.82	10.29	10.04	2.06	H		0.067	18.27
1745.0		QPSK	-18.05	15.12	10.18	2.08	H		0.210	23.22
		16-QAM	-18.89	14.28	10.18	2.08	H		0.173	22.38
		64-QAM	-19.62	13.55	10.18	2.08	H		0.146	21.65
		256-QAM	-22.65	10.52	10.18	2.08	H		0.073	18.62
1779.3		QPSK	-19.40	13.76	10.26	2.12	H		0.155	21.90
		16-QAM	-20.22	12.94	10.26	2.12	H		0.128	21.08
		64-QAM	-20.92	12.24	10.26	2.12	H		0.109	20.38
		256-QAM	-23.44	9.72	10.26	2.12	H		0.061	17.86

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
									W	W
1711.5	LTE B66/B4 3 MHz	QPSK	-19.31	13.80	10.04	2.06	H	< 1.00	0.151	21.78
		16-QAM	-19.93	13.18	10.04	2.06	H		0.131	21.16
		64-QAM	-20.66	12.45	10.04	2.06	H		0.110	20.43
		256-QAM	-22.68	10.43	10.04	2.06	H		0.069	18.41
1745.0		QPSK	-18.08	15.09	10.18	2.08	H		0.208	23.19
		16-QAM	-18.91	14.26	10.18	2.08	H		0.172	22.36
		64-QAM	-19.68	13.49	10.18	2.08	H		0.144	21.59
		256-QAM	-22.65	10.52	10.18	2.08	H		0.073	18.62
1778.5		QPSK	-19.33	13.83	10.26	2.12	H		0.157	21.97
		16-QAM	-20.17	12.99	10.26	2.12	H		0.130	21.13
		64-QAM	-20.82	12.34	10.26	2.12	H		0.112	20.48
		256-QAM	-23.28	9.88	10.26	2.12	H		0.063	18.02

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1712.5	LTE B66/B4 5 MHz	QPSK	-19.24	13.87	10.04	2.06	H	< 1.00	0.153	21.85
		16-QAM	-19.93	13.18	10.04	2.06	H		0.131	21.16
		64-QAM	-20.55	12.56	10.04	2.06	H		0.113	20.54
		256-QAM	-22.67	10.44	10.04	2.06	H		0.069	18.42
1745.0		QPSK	-18.21	14.96	10.18	2.08	H		0.202	23.06
		16-QAM	-19.05	14.12	10.18	2.08	H		0.167	22.22
		64-QAM	-19.73	13.44	10.18	2.08	H		0.143	21.54
		256-QAM	-22.60	10.57	10.18	2.08	H		0.074	18.67
1777.5		QPSK	-19.16	14.00	10.26	2.12	H		0.164	22.14
		16-QAM	-20.06	13.10	10.26	2.12	H		0.133	21.24
		64-QAM	-20.72	12.44	10.26	2.12	H		0.114	20.58
		256-QAM	-23.24	9.92	10.26	2.12	H		0.064	18.06

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1715.0	LTE B66/B4 10 MHz	QPSK	-18.12	14.99	10.06	2.06	H	< 1.00	0.199	22.99
		16-QAM	-18.78	14.33	10.06	2.06	H		0.171	22.33
		64-QAM	-19.54	13.57	10.06	2.06	H		0.144	21.57
		256-QAM	-22.58	10.53	10.06	2.06	H		0.071	18.53
1745.0		QPSK	-17.90	15.27	10.18	2.08	H		0.217	23.37
		16-QAM	-18.64	14.53	10.18	2.08	H		0.183	22.63
		64-QAM	-19.61	13.56	10.18	2.08	H		0.147	21.66
		256-QAM	-22.67	10.50	10.18	2.08	H		0.072	18.60
1775.0		QPSK	-18.30	14.85	10.25	2.12	H		0.198	22.98
		16-QAM	-19.23	13.92	10.25	2.12	H		0.160	22.05
		64-QAM	-20.07	13.08	10.25	2.12	H		0.132	21.21
		256-QAM	-23.12	10.03	10.25	2.12	H		0.065	18.16

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1717.5	LTE B66/B4 15 MHz	QPSK	-18.80	14.32	10.08	2.06	H	< 1.00	0.171	22.34
		16-QAM	-19.45	13.67	10.08	2.06	H		0.148	21.69
		64-QAM	-20.14	12.98	10.08	2.06	H		0.126	21.00
		256-QAM	-22.59	10.53	10.08	2.06	H		0.072	18.55
1745.0		QPSK	-18.57	14.60	10.18	2.08	H		0.186	22.70
		16-QAM	-19.23	13.94	10.18	2.08	H		0.160	22.04
		64-QAM	-19.91	13.26	10.18	2.08	H		0.137	21.36
		256-QAM	-22.57	10.60	10.18	2.08	H		0.074	18.70
1772.5		QPSK	-18.94	14.21	10.24	2.13	H		0.171	22.32
		16-QAM	-19.65	13.50	10.24	2.13	H		0.145	21.61
		64-QAM	-20.30	12.85	10.24	2.13	H		0.125	20.96
		256-QAM	-23.14	10.01	10.24	2.13	H		0.065	18.12

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1720.0	LTE B66/B4 20 MHz	QPSK	-18.50	14.62	10.08	2.06	H	< 1.00	0.184	22.64
		16-QAM	-19.15	13.97	10.08	2.06	H		0.158	21.99
		64-QAM	-19.83	13.29	10.08	2.06	H		0.135	21.31
		256-QAM	-22.58	10.54	10.08	2.06	H		0.072	18.56
1745.0		QPSK	-18.25	14.92	10.18	2.08	H		0.200	23.02
		16-QAM	-19.08	14.09	10.18	2.08	H		0.166	22.19
		64-QAM	-19.74	13.43	10.18	2.08	H		0.142	21.53
		256-QAM	-22.71	10.46	10.18	2.08	H		0.072	18.56
1770.0		QPSK	-19.01	14.14	10.24	2.13	H		0.168	22.25
		16-QAM	-19.76	13.39	10.24	2.13	H		0.141	21.50
		64-QAM	-20.40	12.75	10.24	2.13	H		0.122	20.86
		256-QAM	-23.18	9.97	10.24	2.13	H		0.064	18.08

### 8.2 RADIATED SPURIOUS EMISSIONS

- ▣ OPERATING FREQUENCY: 1745.0 MHz
- ▣ MEASURED OUTPUT POWER: 23.37 dBm = 0.217 W
- ▣ MODE: LTE B66/B4
- ▣ MODULATION SIGNAL: 10 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT:  $43 + 10 \log_{10}(W) =$  36.37 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
132022 (1715.0)	3 430.00	-54.82	12.54	-61.22	3.02	H	-51.70	75.06
	5 145.00	-57.12	12.29	-54.87	3.70	V	-46.28	69.65
	6 860.00	-56.12	11.98	-49.55	4.38	H	-41.95	65.32
132322 (1745.0)	3 490.00	-54.71	12.42	-60.58	2.99	V	-51.15	74.52
	5 235.00	-56.35	12.71	-55.58	3.82	V	-46.68	70.05
	6 980.00	-56.30	11.52	-48.57	4.41	H	-41.46	64.83
132622 (1775.0)	3 550.00	-53.91	12.40	-59.39	3.09	V	-50.08	73.45
	5 325.00	-55.99	13.00	-55.24	3.81	V	-46.05	69.42
	7 100.00	-56.25	10.90	-47.15	4.45	H	-40.70	64.06

**8.3 PEAK-TO-AVERAGE RATIO**

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
66/4	1.4 MHz	1745.0	QPSK	6	0	5.27
			16-QAM			5.76
			64-QAM			5.99
			256-QAM			6.11
	3 MHz		QPSK	15		5.39
			16-QAM			5.88
			64-QAM			6.10
			256-QAM			6.14
	5 MHz		QPSK	25		5.33
			16-QAM			5.92
			64-QAM			6.11
			256-QAM			6.18
	10 MHz		QPSK	50		5.40
			16-QAM			5.87
			64-QAM			6.17
			256-QAM			6.17
	15 MHz		QPSK	75		5.31
			16-QAM			5.89
			64-QAM			6.19
			256-QAM			6.19
20 MHz	QPSK	100	5.33			
	16-QAM		5.88			
	64-QAM		6.19			
	256-QAM		6.20			

**Note:**

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 139 ~ 162.

**8.4 OCCUPIED BANDWIDTH**

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
66/4	1.4 MHz	1745.0	QPSK	6	0	1.1013
			16-QAM			1.1008
			64-QAM			1.0933
			256-QAM			1.0968
	3 MHz		QPSK	15		2.7159
			16-QAM			2.7107
			64-QAM			2.7115
			256-QAM			2.7174
	5 MHz		QPSK	25		4.5215
			16-QAM			4.5217
			64-QAM			4.5187
			256-QAM			4.5168
	10 MHz		QPSK	50		9.0139
			16-QAM			9.0108
			64-QAM			9.0005
			256-QAM			9.0071
	15 MHz		QPSK	75		13.503
			16-QAM			13.472
			64-QAM			13.479
			256-QAM			13.469
20 MHz	QPSK	100	17.905			
	16-QAM		17.935			
	64-QAM		17.939			
	256-QAM		17.958			

**Note:**

1. Plots of the EUT's Occupied Bandwidth are shown Page 115 ~ 138.

**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)
66/4	1.4	1710.7	3.4213	27.976	-74.048	-46.072	-13.00
		1745.0	3.4896	27.976	-74.357	-46.381	
		1779.3	3.5599	27.976	-74.259	-46.283	
	3	1711.5	3.4213	27.976	-74.891	-46.915	
		1745.0	3.4881	27.976	-74.056	-46.080	
		1778.5	3.5604	27.976	-73.921	-45.945	
	5	1712.5	3.4213	27.976	-73.720	-45.744	
		1745.0	3.4866	27.976	-73.922	-45.946	
		1777.5	3.5599	27.976	-73.716	-45.740	
	10	1715.0	3.4218	27.976	-73.285	-45.309	
		1745.0	3.4816	27.976	-74.119	-46.143	
		1775.0	3.5594	27.976	-74.211	-46.235	
	15	1717.5	3.4223	27.976	-74.548	-46.572	
		1745.0	3.4771	27.976	-73.780	-45.804	
		1772.5	3.5589	27.976	-75.014	-47.038	
	20	1720.0	3.4228	27.976	-73.077	-45.101	
		1745.0	3.4726	27.976	-74.170	-46.194	
		1770.0	3.5584	27.976	-74.417	-46.441	

**Note:**

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 163 ~ 198.
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(26.5)	30.131



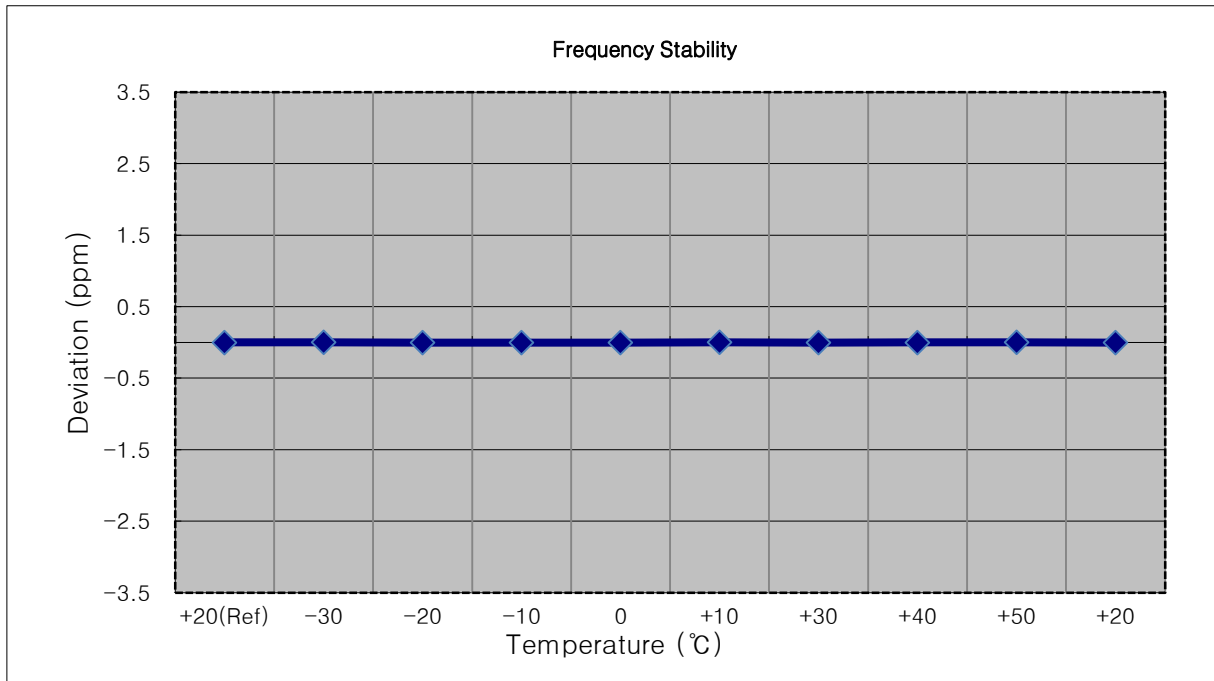
## 8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 79~114.

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

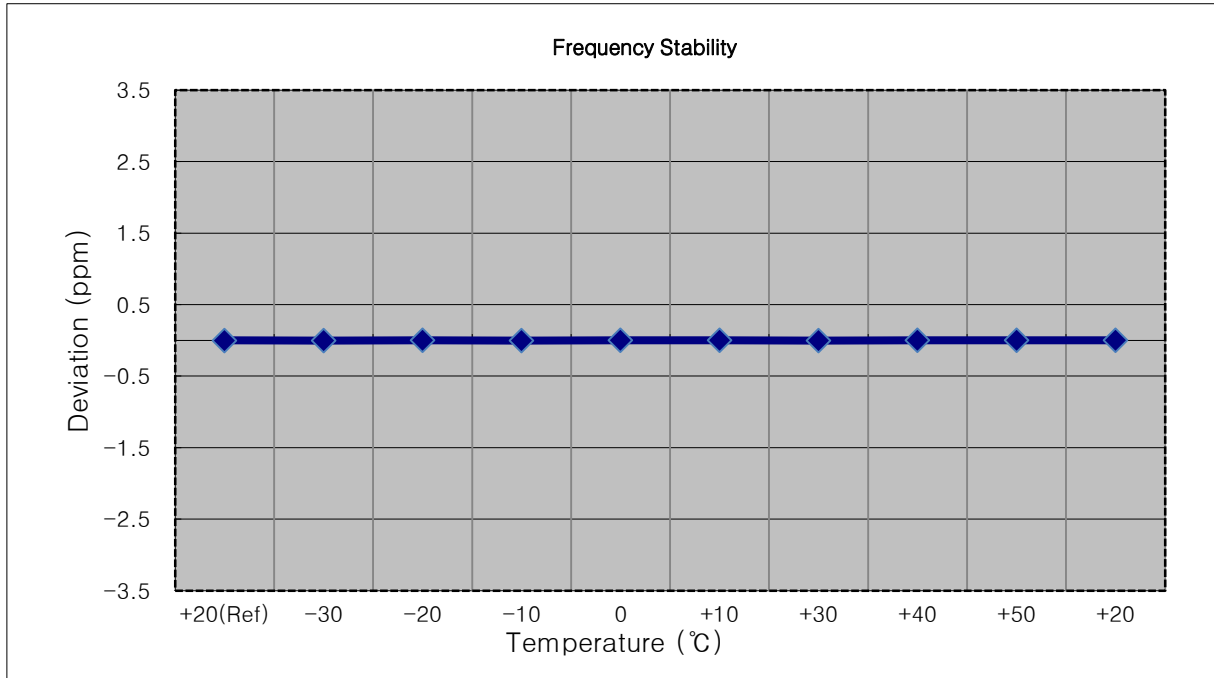
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1710,700,000 Hz
- ▣ CHANNEL: 131979 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1710 699 997	0.0	0.000 000	0.000
100 %		-30	1710 699 999	2.2	0.000 000	0.001
100 %		-20	1710 699 995	-2.6	0.000 000	-0.002
100 %		-10	1710 699 994	-3.4	0.000 000	-0.002
100 %		0	1710 699 995	-2.7	0.000 000	-0.002
100 %		+10	1710 700 000	2.7	0.000 000	0.002
100 %		+30	1710 699 994	-2.8	0.000 000	-0.002
100 %		+40	1710 699 996	-1.7	0.000 000	-0.001
100 %		+50	1710 700 001	4.0	0.000 000	0.002
Batt. Endpoint		3.550	+20	1710 699 994	-2.9	0.000 000



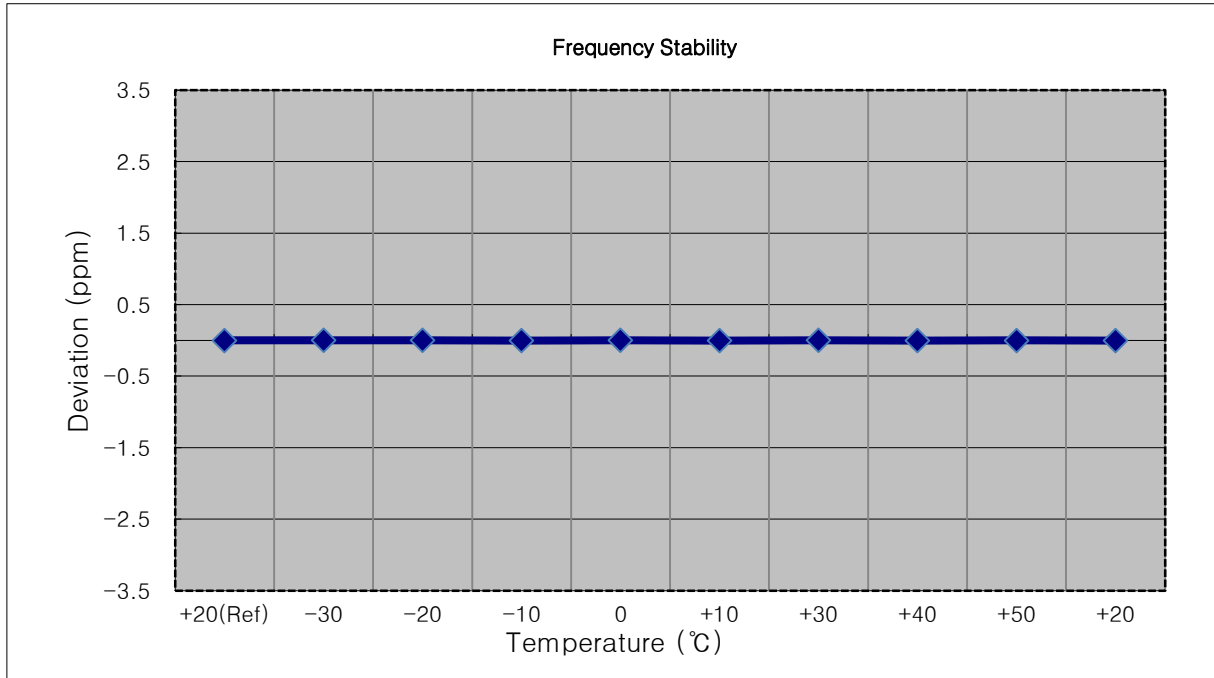
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1711,500,000 Hz
- ▣ CHANNEL: 131987 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1711 499 998	0.0	0.000 000	0.000
100 %		-30	1711 499 995	-2.9	0.000 000	-0.002
100 %		-20	1711 500 002	4.0	0.000 000	0.002
100 %		-10	1711 499 995	-3.3	0.000 000	-0.002
100 %		0	1711 500 000	2.6	0.000 000	0.002
100 %		+10	1711 500 001	2.7	0.000 000	0.002
100 %		+30	1711 499 996	-2.3	0.000 000	-0.001
100 %		+40	1711 500 001	3.3	0.000 000	0.002
100 %		+50	1711 500 001	2.7	0.000 000	0.002
Batt. Endpoint	3.550	+20	1711 500 001	2.9	0.000 000	0.002



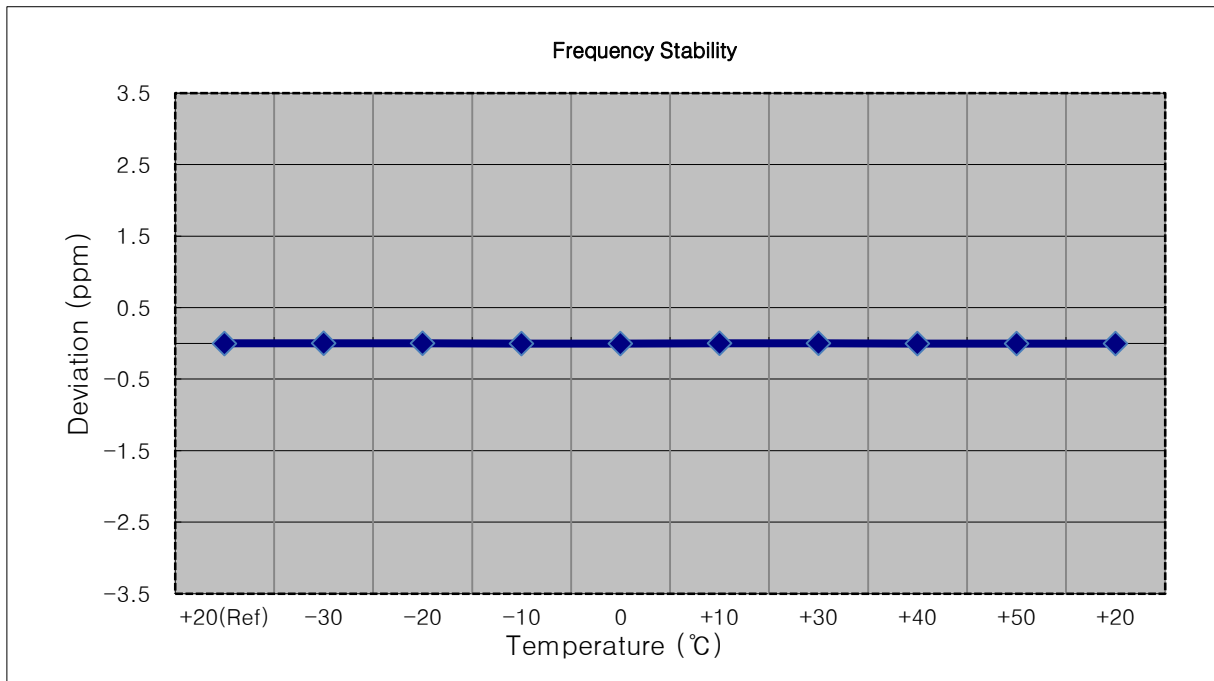
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1712,500,000 Hz
- ▣ CHANNEL: 131997 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1712 500 006	0.0	0.000 000	0.000
100 %		-30	1712 500 010	3.6	0.000 000	0.002
100 %		-20	1712 500 009	2.7	0.000 000	0.002
100 %		-10	1712 500 004	-2.4	0.000 000	-0.001
100 %		0	1712 500 011	5.0	0.000 000	0.003
100 %		+10	1712 500 003	-3.6	0.000 000	-0.002
100 %		+30	1712 500 009	2.9	0.000 000	0.002
100 %		+40	1712 500 003	-3.4	0.000 000	-0.002
100 %		+50	1712 500 005	-1.6	0.000 000	-0.001
Batt. Endpoint	3.550	+20	1712 500 002	-4.0	0.000 000	-0.002



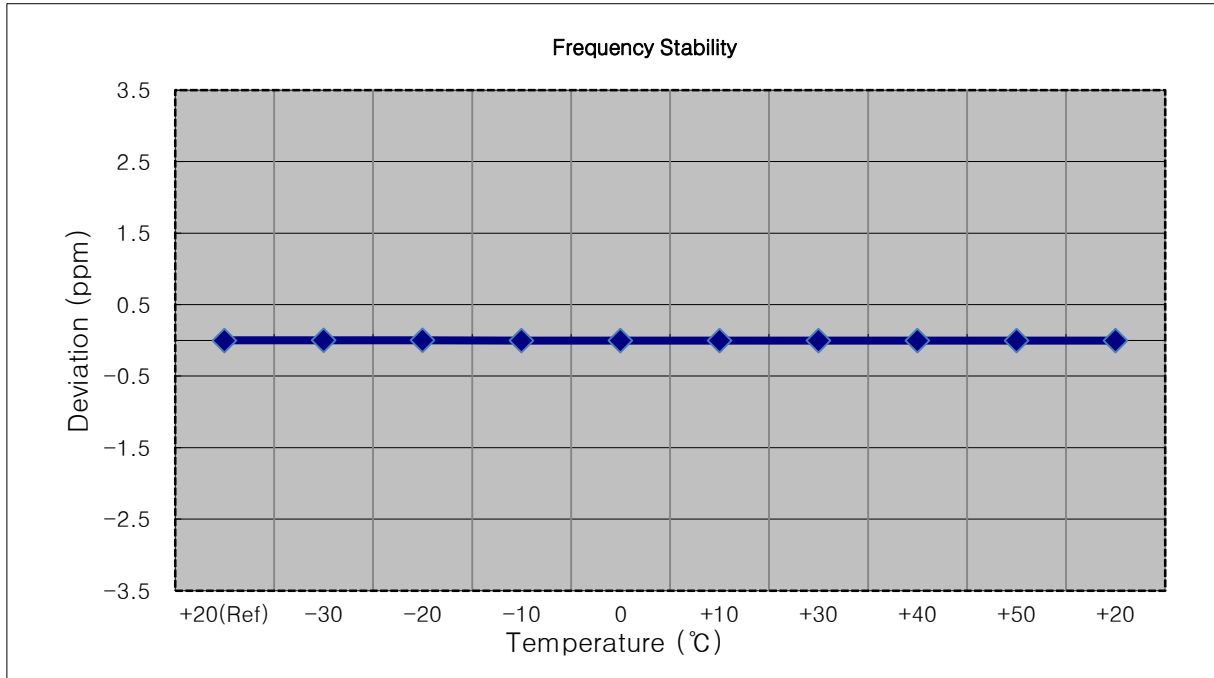
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1715,000,000 Hz
- ▣ CHANNEL: 132022 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1714 999 996	0.0	0.000 000	0.000
100 %		-30	1715 000 000	3.8	0.000 000	0.002
100 %		-20	1714 999 999	2.5	0.000 000	0.001
100 %		-10	1714 999 994	-2.4	0.000 000	-0.001
100 %		0	1714 999 992	-4.0	0.000 000	-0.002
100 %		+10	1715 000 000	3.4	0.000 000	0.002
100 %		+30	1714 999 998	2.3	0.000 000	0.001
100 %		+40	1714 999 994	-2.3	0.000 000	-0.001
100 %		+50	1714 999 993	-3.3	0.000 000	-0.002
Batt. Endpoint	3.550	+20	1714 999 991	-4.7	0.000 000	-0.003



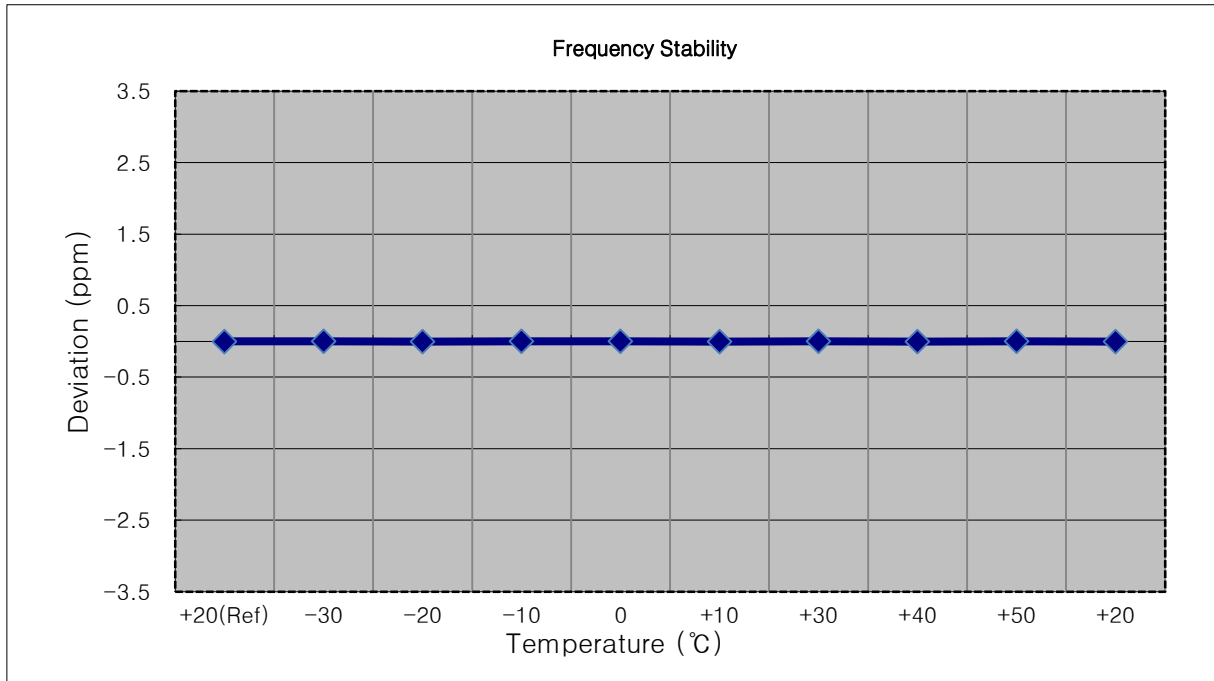
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1717,500,000 Hz
- ▣ CHANNEL: 132047 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1717 500 003	0.0	0.000 000	0.000
100 %		-30	1717 500 006	3.2	0.000 000	0.002
100 %		-20	1717 500 005	2.7	0.000 000	0.002
100 %		-10	1717 500 000	-2.3	0.000 000	-0.001
100 %		0	1717 500 000	-3.1	0.000 000	-0.002
100 %		+10	1717 500 000	-2.5	0.000 000	-0.001
100 %		+30	1717 499 999	-3.6	0.000 000	-0.002
100 %		+40	1717 499 999	-3.4	0.000 000	-0.002
100 %		+50	1717 499 999	-4.1	0.000 000	-0.002
Batt. Endpoint	3.550	+20	1717 499 999	-3.8	0.000 000	-0.002



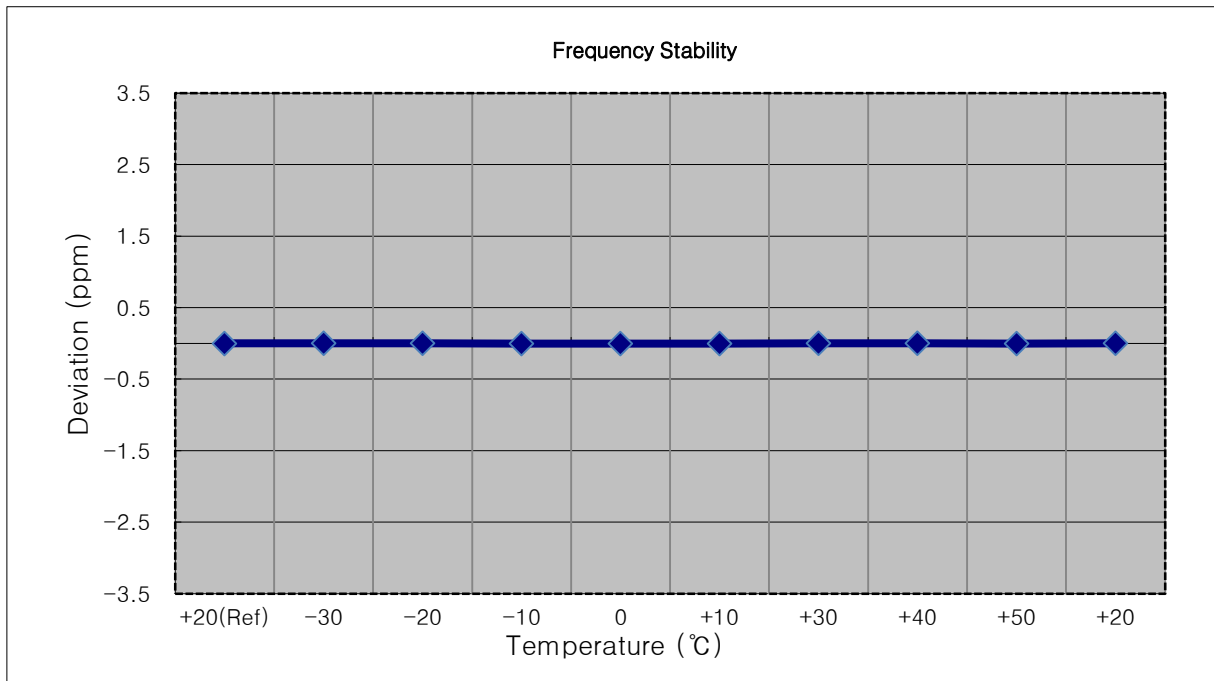
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1720,000,000 Hz
- ▣ CHANNEL: 132072 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1719 999 997	0.0	0.000 000	0.000
100 %		-30	1719 999 999	2.3	0.000 000	0.001
100 %		-20	1719 999 994	-2.3	0.000 000	-0.001
100 %		-10	1719 999 999	2.0	0.000 000	0.001
100 %		0	1720 000 001	4.0	0.000 000	0.002
100 %		+10	1719 999 993	-3.5	0.000 000	-0.002
100 %		+30	1719 999 999	2.3	0.000 000	0.001
100 %		+40	1719 999 995	-2.2	0.000 000	-0.001
100 %		+50	1720 000 000	2.8	0.000 000	0.002
Batt. Endpoint		3.550	+20	1719 999 995	-2.2	0.000 000



- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

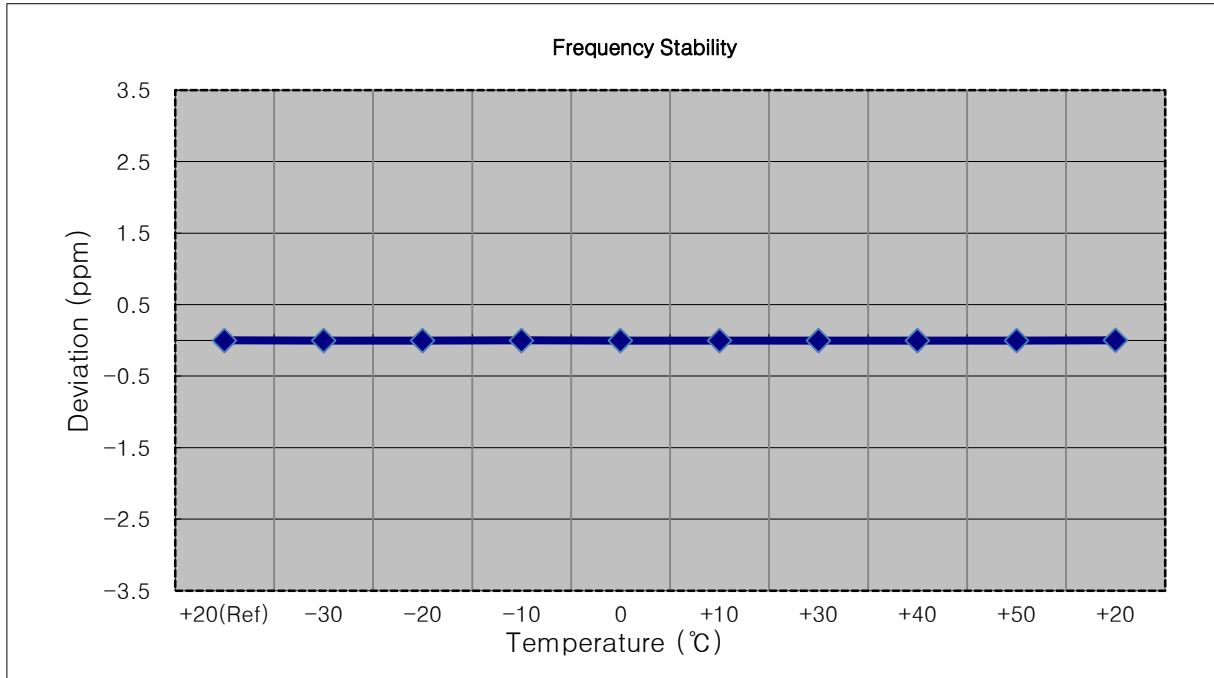
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1745 000 003	0.0	0.000 000	0.000
100 %		-30	1745 000 006	3.1	0.000 000	0.002
100 %		-20	1745 000 006	3.0	0.000 000	0.002
100 %		-10	1745 000 000	-3.0	0.000 000	-0.002
100 %		0	1745 000 000	-3.0	0.000 000	-0.002
100 %		+10	1745 000 000	-2.5	0.000 000	-0.001
100 %		+30	1745 000 006	3.0	0.000 000	0.002
100 %		+40	1745 000 005	2.2	0.000 000	0.001
100 %		+50	1745 000 000	-2.4	0.000 000	-0.001
Batt. Endpoint	3.550	+20	1745 000 005	2.4	0.000 000	0.001





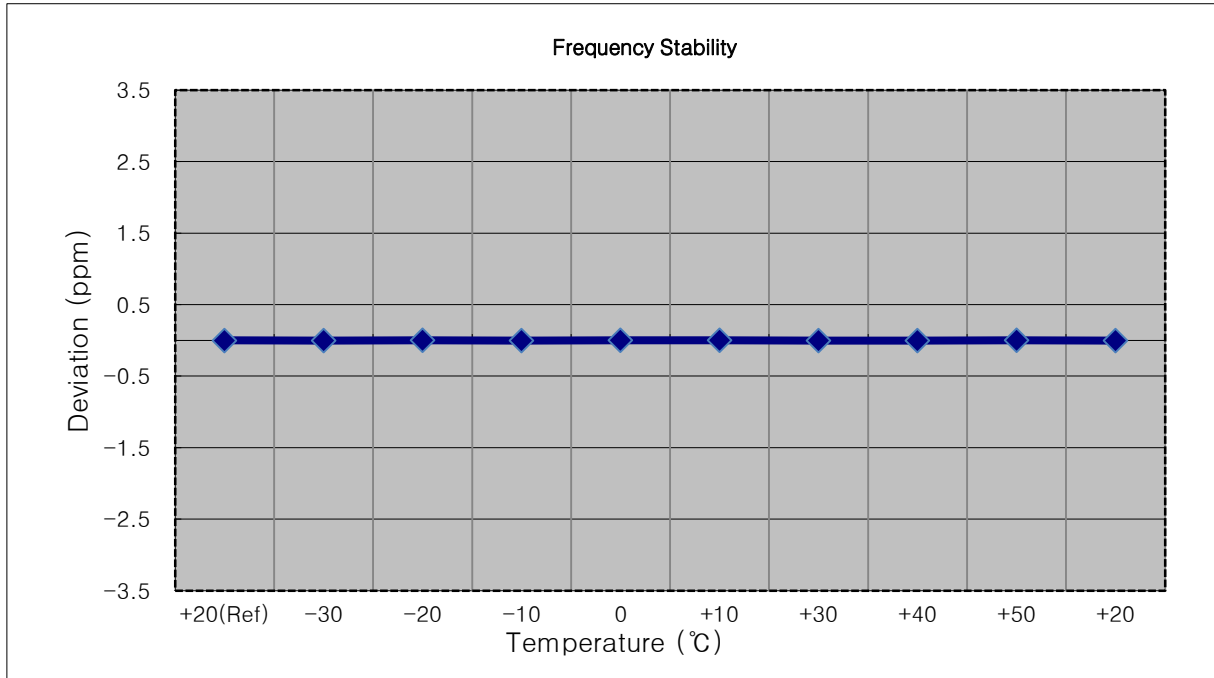
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1744 999 995	0.0	0.000 000	0.000
100 %		-30	1744 999 992	-2.8	0.000 000	-0.002
100 %		-20	1744 999 993	-2.1	0.000 000	-0.001
100 %		-10	1744 999 993	-2.0	0.000 000	-0.001
100 %		0	1744 999 993	-2.2	0.000 000	-0.001
100 %		+10	1744 999 989	-5.8	0.000 000	-0.003
100 %		+30	1744 999 993	-2.2	0.000 000	-0.001
100 %		+40	1744 999 992	-3.1	0.000 000	-0.002
100 %		+50	1744 999 993	-2.1	0.000 000	-0.001
Batt. Endpoint	3.550	+20	1744 999 998	2.5	0.000 000	0.001



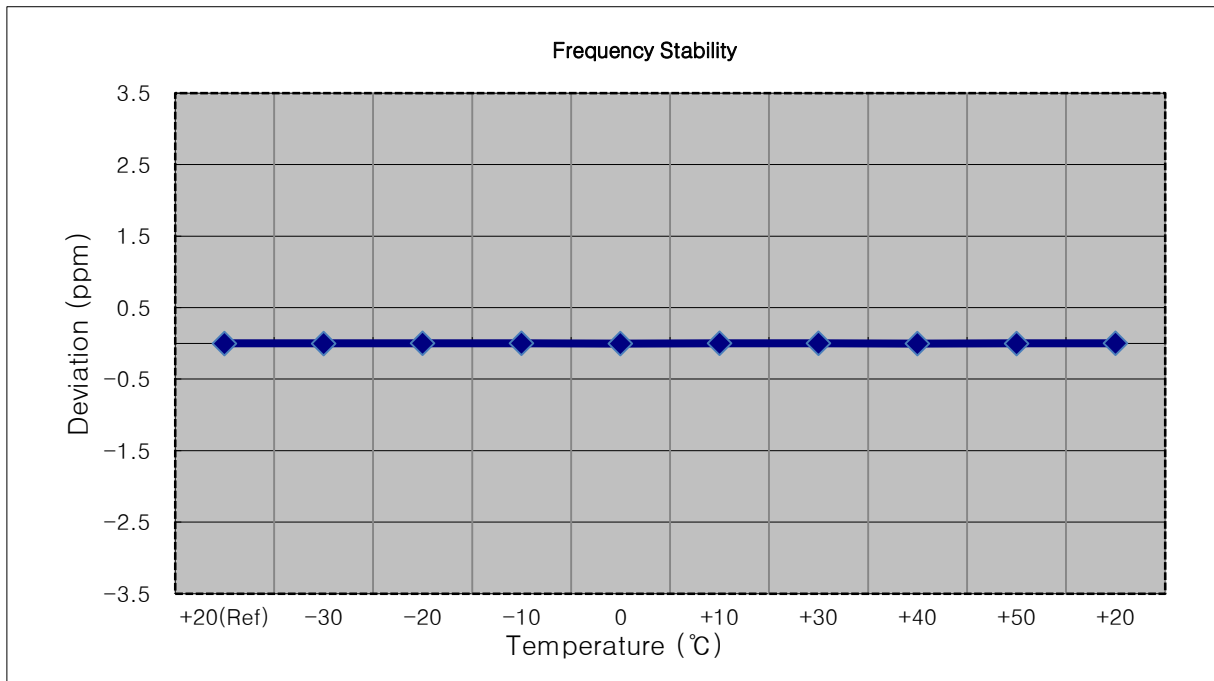
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1744 999 998	0.0	0.000 000	0.000
100 %		-30	1744 999 995	-2.9	0.000 000	-0.002
100 %		-20	1745 000 002	4.1	0.000 000	0.002
100 %		-10	1744 999 995	-2.7	0.000 000	-0.002
100 %		0	1745 000 001	2.8	0.000 000	0.002
100 %		+10	1745 000 001	3.2	0.000 000	0.002
100 %		+30	1744 999 995	-3.4	0.000 000	-0.002
100 %		+40	1744 999 993	-5.5	0.000 000	-0.003
100 %		+50	1745 000 000	2.4	0.000 000	0.001
Batt. Endpoint	3.550	+20	1744 999 996	-2.5	0.000 000	-0.001



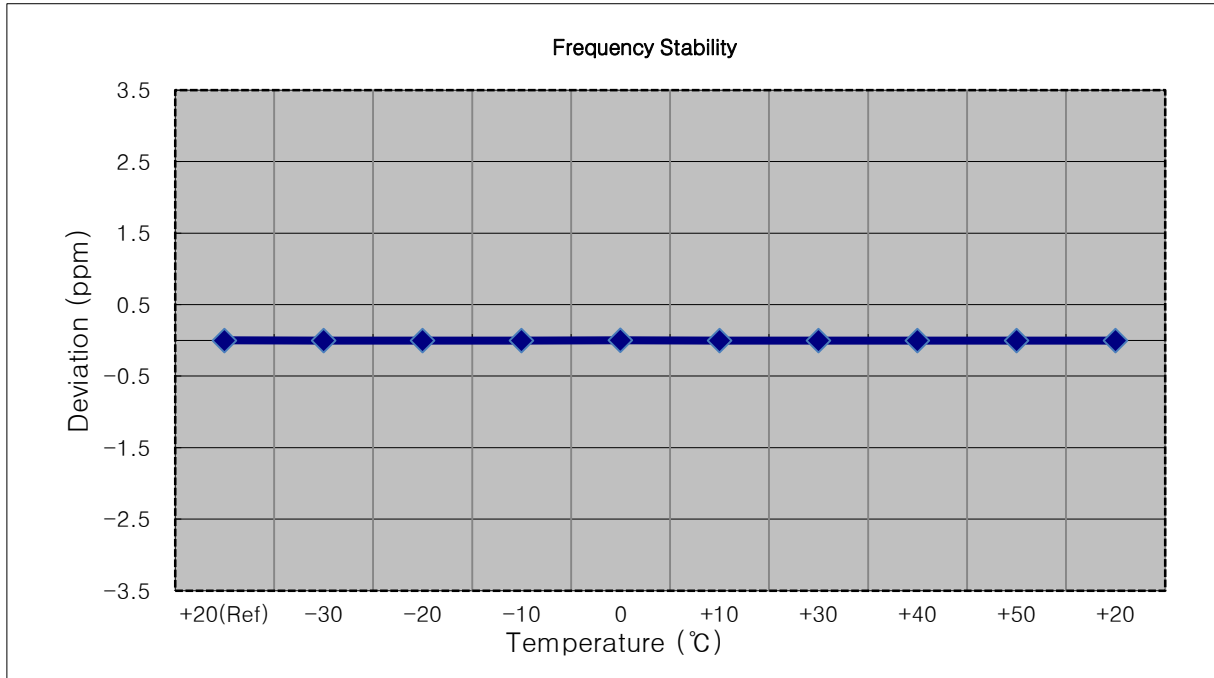
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1745 000 004	0.0	0.000 000	0.000
100 %		-30	1745 000 002	-1.8	0.000 000	-0.001
100 %		-20	1745 000 007	3.1	0.000 000	0.002
100 %		-10	1745 000 009	5.4	0.000 000	0.003
100 %		0	1745 000 002	-2.1	0.000 000	-0.001
100 %		+10	1745 000 007	2.8	0.000 000	0.002
100 %		+30	1745 000 007	2.8	0.000 000	0.002
100 %		+40	1745 000 000	-4.1	0.000 000	-0.002
100 %		+50	1745 000 006	1.9	0.000 000	0.001
Batt. Endpoint	3.550	+20	1745 000 007	3.1	0.000 000	0.002



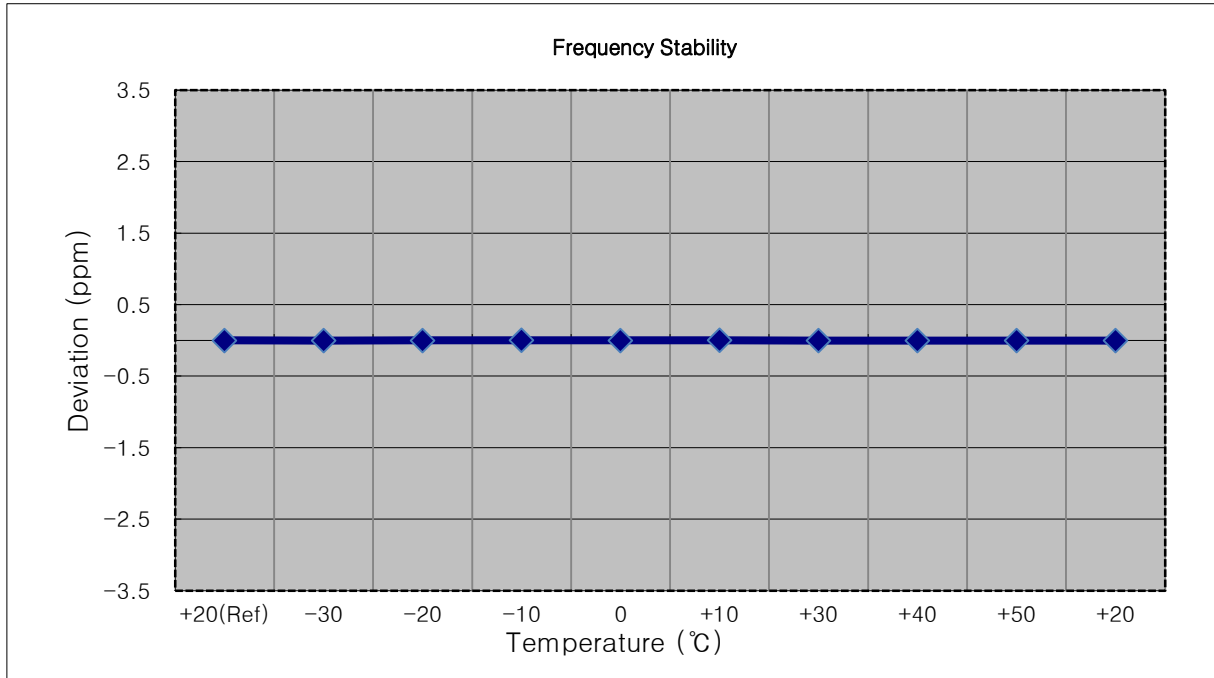
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1744 999 997	0.0	0.000 000	0.000
100 %		-30	1744 999 994	-2.3	0.000 000	-0.001
100 %		-20	1744 999 994	-2.7	0.000 000	-0.002
100 %		-10	1744 999 993	-3.2	0.000 000	-0.002
100 %		0	1745 000 002	5.2	0.000 000	0.003
100 %		+10	1744 999 995	-2.1	0.000 000	-0.001
100 %		+30	1744 999 991	-5.2	0.000 000	-0.003
100 %		+40	1744 999 993	-3.7	0.000 000	-0.002
100 %		+50	1744 999 994	-2.8	0.000 000	-0.002
Batt. Endpoint	3.550	+20	1744 999 993	-3.3	0.000 000	-0.002



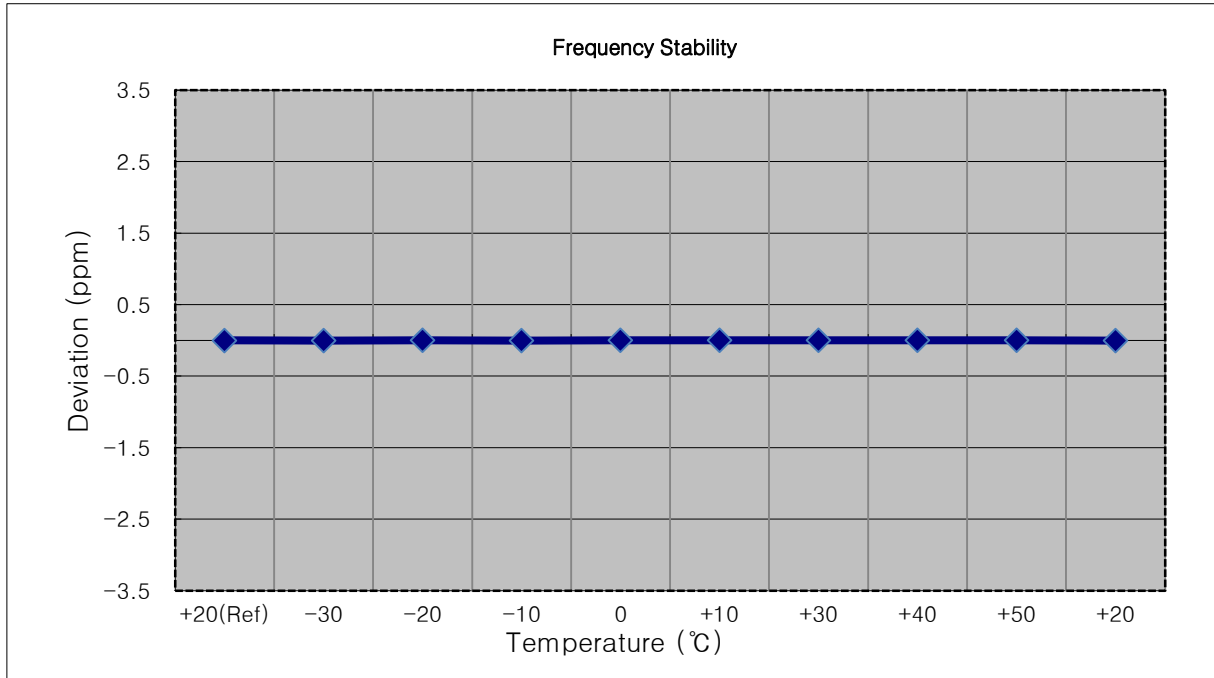
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1744 999 996	0.0	0.000 000	0.000
100 %		-30	1744 999 994	-2.6	0.000 000	-0.001
100 %		-20	1744 999 998	1.5	0.000 000	0.001
100 %		-10	1744 999 998	2.0	0.000 000	0.001
100 %		0	1744 999 995	-1.9	0.000 000	-0.001
100 %		+10	1745 000 000	3.5	0.000 000	0.002
100 %		+30	1744 999 992	-4.1	0.000 000	-0.002
100 %		+40	1744 999 994	-2.2	0.000 000	-0.001
100 %		+50	1744 999 994	-2.7	0.000 000	-0.002
Batt. Endpoint	3.550	+20	1744 999 992	-4.0	0.000 000	-0.002



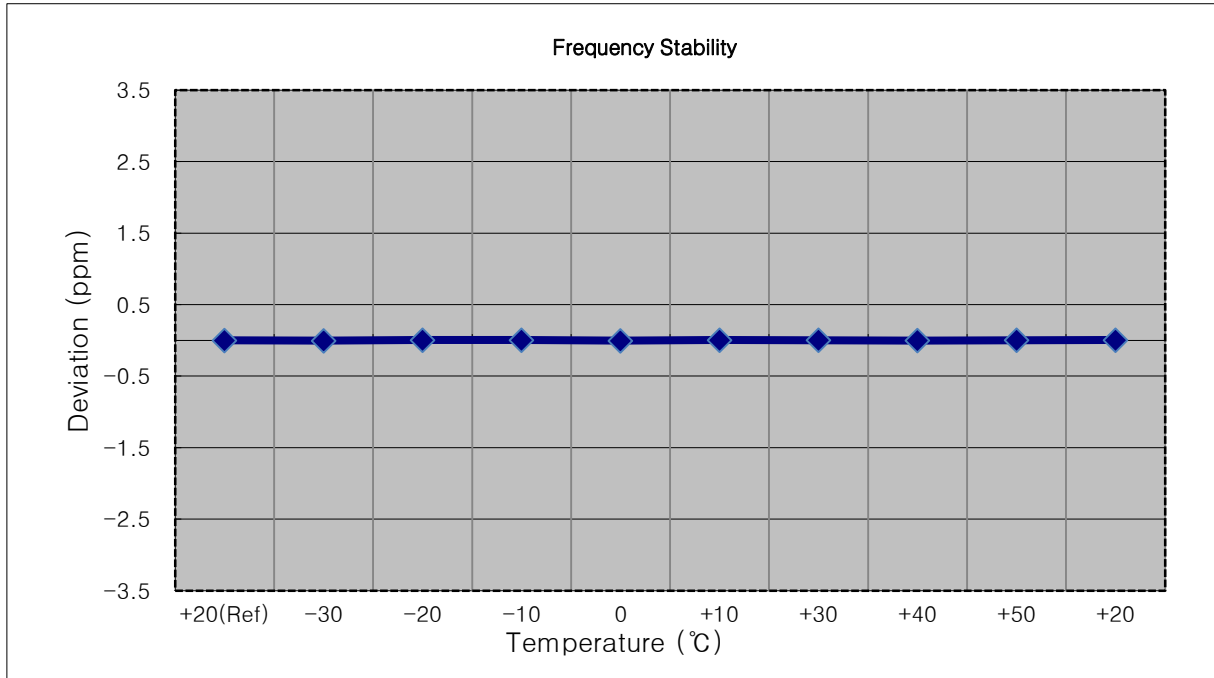
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1779,300,000 Hz
- ▣ CHANNEL: 132665 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1779 299 998	0.0	0.000 000	0.000
100 %		-30	1779 299 993	-4.2	0.000 000	-0.002
100 %		-20	1779 300 003	4.9	0.000 000	0.003
100 %		-10	1779 299 993	-4.9	0.000 000	-0.003
100 %		0	1779 300 000	2.8	0.000 000	0.002
100 %		+10	1779 300 001	2.9	0.000 000	0.002
100 %		+30	1779 300 002	4.8	0.000 000	0.003
100 %		+40	1779 300 003	5.0	0.000 000	0.003
100 %		+50	1779 300 001	3.8	0.000 000	0.002
Batt. Endpoint	3.550	+20	1779 299 995	-3.0	0.000 000	-0.002



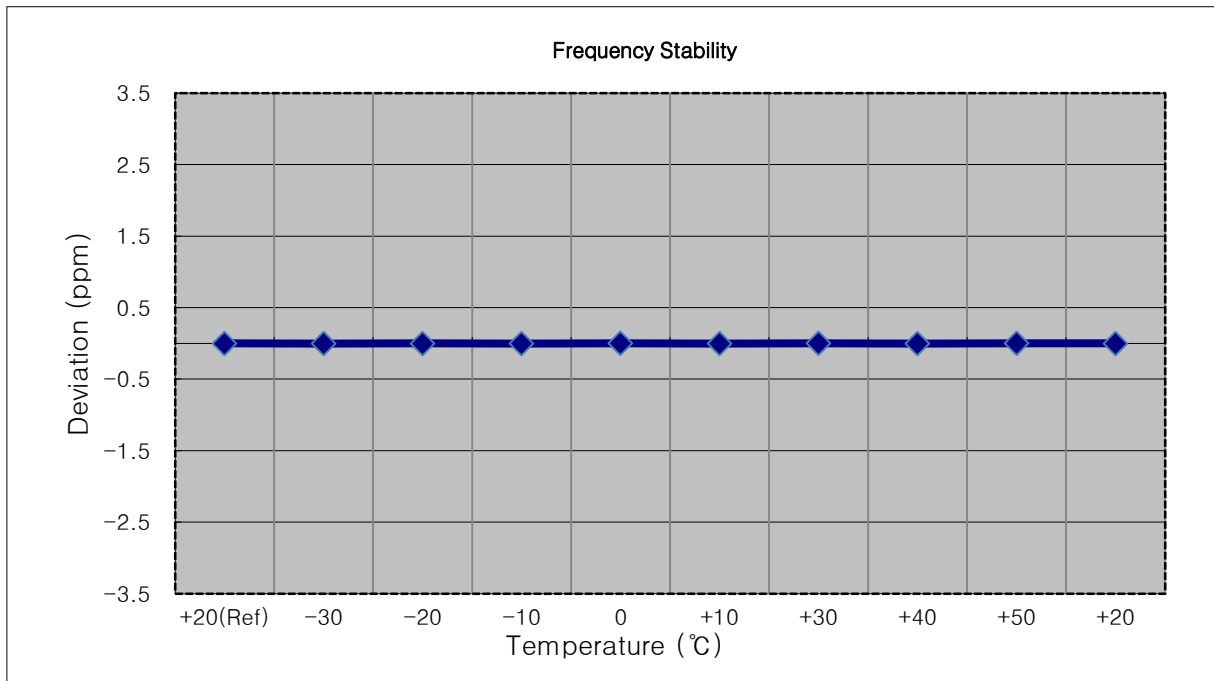
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1778,500,000 Hz
- ▣ CHANNEL: 132657 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1778 499 991	0.0	0.000 000	0.000
100 %		-30	1778 499 983	-8.5	0.000 000	-0.005
100 %		-20	1778 499 998	7.1	0.000 000	0.004
100 %		-10	1778 499 999	7.8	0.000 000	0.004
100 %		0	1778 499 984	-6.8	0.000 000	-0.004
100 %		+10	1778 499 999	7.6	0.000 000	0.004
100 %		+30	1778 499 997	5.8	0.000 000	0.003
100 %		+40	1778 499 988	-3.2	0.000 000	-0.002
100 %		+50	1778 499 994	3.1	0.000 000	0.002
Batt. Endpoint	3.550	+20	1778 500 000	8.8	0.000 000	0.005



- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1777,500,000 Hz
- ▣ CHANNEL: 132647 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

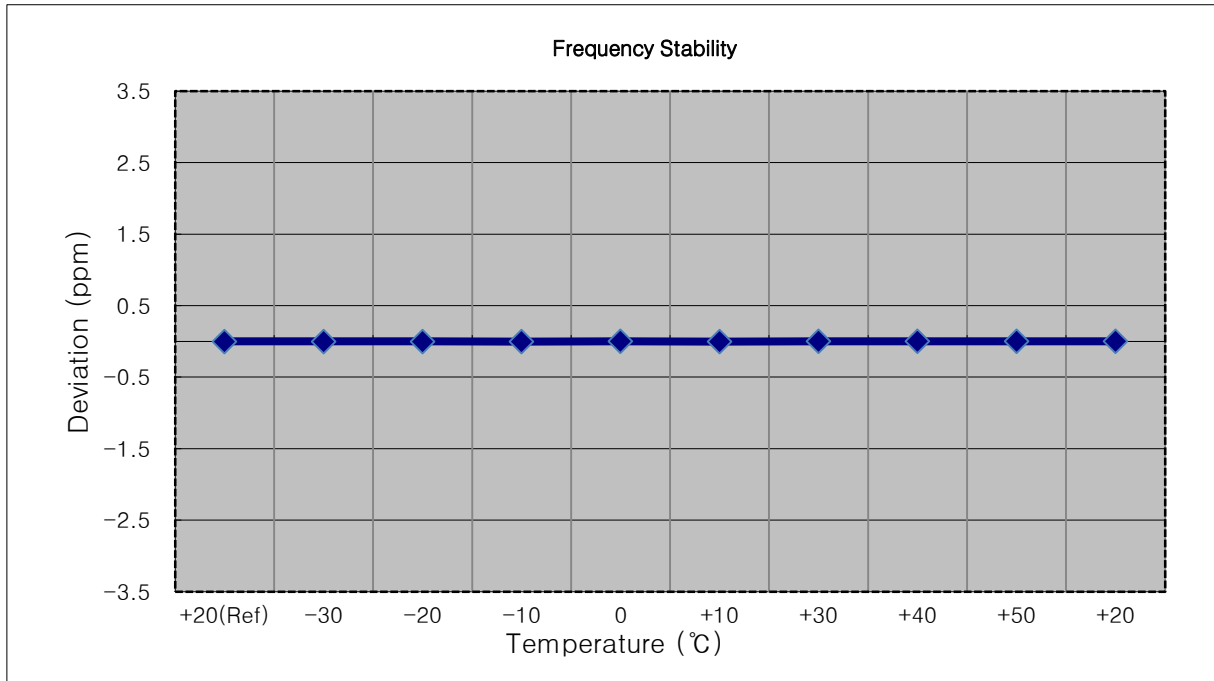
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1777 499 996	0.0	0.000 000	0.000
100 %		-30	1777 499 992	-4.5	0.000 000	-0.003
100 %		-20	1777 499 998	1.5	0.000 000	0.001
100 %		-10	1777 499 992	-3.7	0.000 000	-0.002
100 %		0	1777 500 000	3.8	0.000 000	0.002
100 %		+10	1777 499 993	-3.1	0.000 000	-0.002
100 %		+30	1777 499 999	2.6	0.000 000	0.001
100 %		+40	1777 499 994	-2.5	0.000 000	-0.001
100 %		+50	1777 500 000	4.1	0.000 000	0.002
Batt. Endpoint	3.550	+20	1777 499 998	1.9	0.000 000	0.001





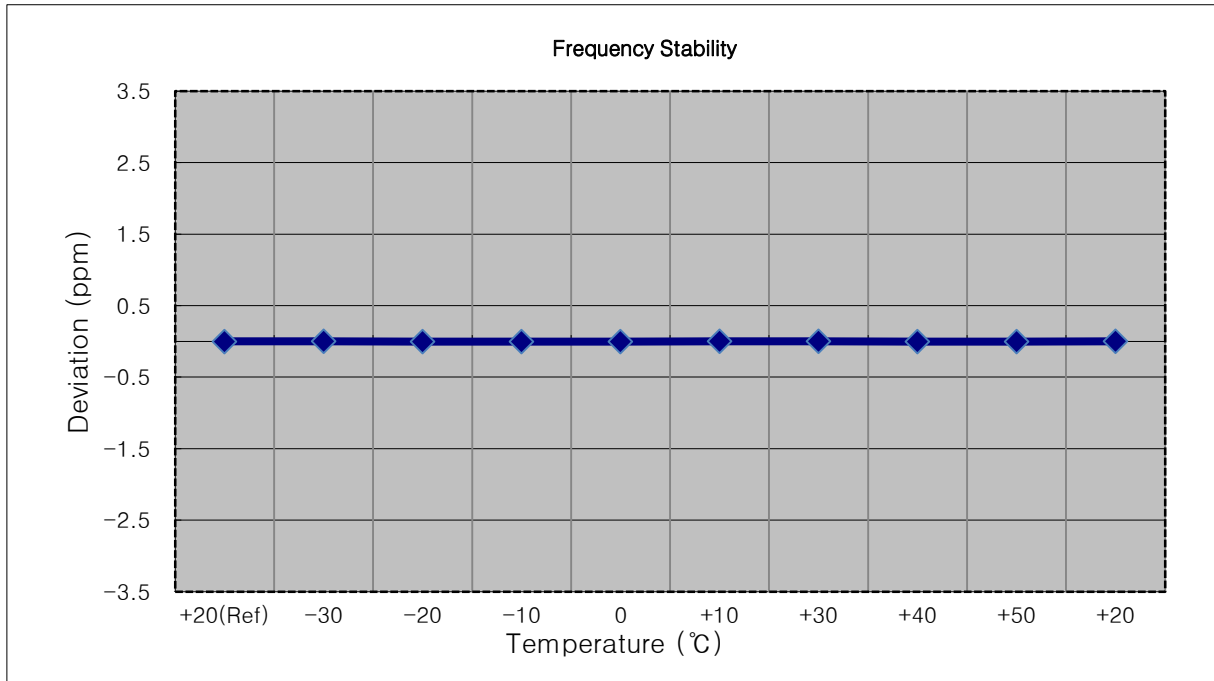
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1775,000,000 Hz
- ▣ CHANNEL: 132622 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1775 000 005	0.0	0.000 000	0.000
100 %		-30	1775 000 004	-1.3	0.000 000	-0.001
100 %		-20	1775 000 007	1.8	0.000 000	0.001
100 %		-10	1775 000 002	-3.0	0.000 000	-0.002
100 %		0	1775 000 007	2.4	0.000 000	0.001
100 %		+10	1775 000 001	-3.5	0.000 000	-0.002
100 %		+30	1775 000 009	3.6	0.000 000	0.002
100 %		+40	1775 000 010	5.3	0.000 000	0.003
100 %		+50	1775 000 009	3.8	0.000 000	0.002
Batt. Endpoint		3.550	+20	1775 000 008	3.0	0.000 000



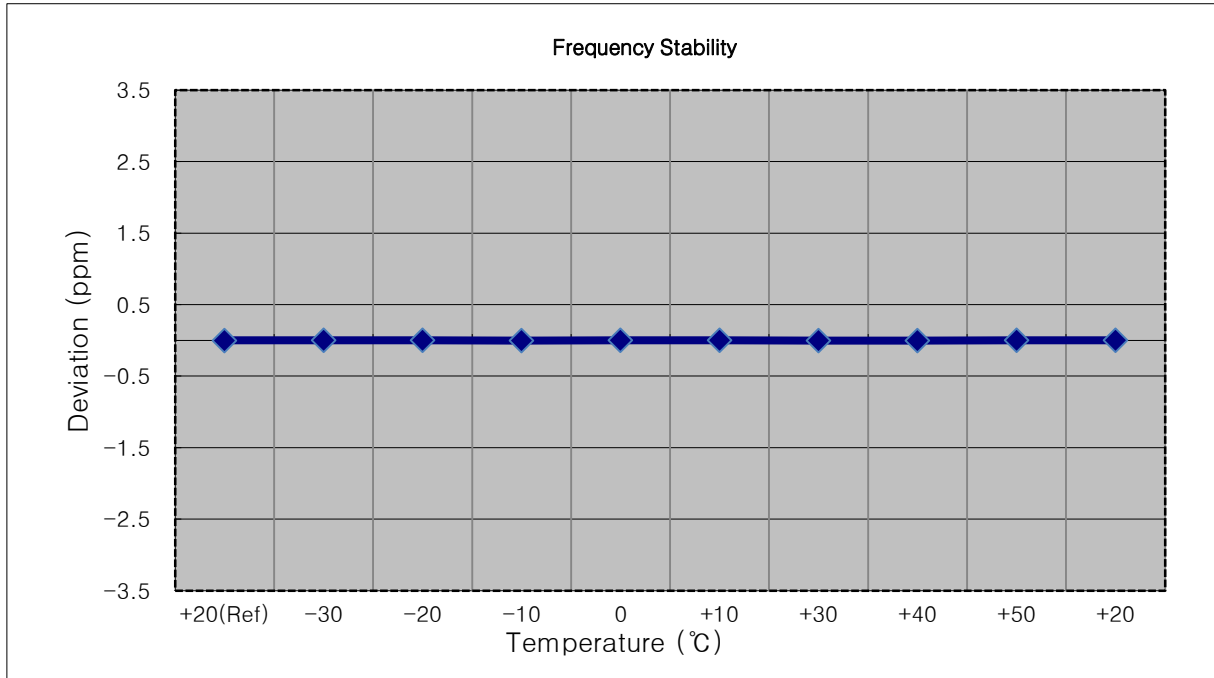
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1772,500,000 Hz
- ▣ CHANNEL: 132597 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1772 500 004	0.0	0.000 000	0.000
100 %		-30	1772 500 008	3.6	0.000 000	0.002
100 %		-20	1772 500 001	-3.3	0.000 000	-0.002
100 %		-10	1772 500 000	-3.7	0.000 000	-0.002
100 %		0	1772 500 001	-2.7	0.000 000	-0.002
100 %		+10	1772 500 006	2.1	0.000 000	0.001
100 %		+30	1772 500 008	3.4	0.000 000	0.002
100 %		+40	1772 500 001	-3.1	0.000 000	-0.002
100 %		+50	1772 500 002	-2.1	0.000 000	-0.001
Batt. Endpoint		3.550	+20	1772 500 007	2.7	0.000 000



- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1770,000,000 Hz
- ▣ CHANNEL: 132572 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 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)	1770 000 003	0.0	0.000 000	0.000
100 %		-30	1770 000 006	3.2	0.000 000	0.002
100 %		-20	1770 000 006	3.6	0.000 000	0.002
100 %		-10	1769 999 999	-3.7	0.000 000	-0.002
100 %		0	1770 000 006	3.7	0.000 000	0.002
100 %		+10	1770 000 007	4.5	0.000 000	0.003
100 %		+30	1769 999 999	-3.7	0.000 000	-0.002
100 %		+40	1770 000 000	-2.3	0.000 000	-0.001
100 %		+50	1770 000 006	3.0	0.000 000	0.002
Batt. Endpoint		3.550	+20	1770 000 006	3.1	0.000 000



### 9. TEST DATA (Main 3 Ant)

#### 9.1 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
1710.7	LTE B66/B4 1.4 MHz	QPSK	-22.46	10.74	9.60	1.99	V	< 1.00	0.068	18.35
		16-QAM	-23.26	9.94	9.60	1.99	V		0.057	17.55
		64-QAM	-24.32	8.88	9.60	1.99	V		0.045	16.49
		256-QAM	-27.33	5.87	9.60	1.99	V		0.022	13.48
1745.0		QPSK	-24.17	9.43	9.75	2.04	V		0.052	17.14
		16-QAM	-24.93	8.67	9.75	2.04	V		0.044	16.38
		64-QAM	-25.97	7.63	9.75	2.04	V		0.034	15.34
		256-QAM	-29.07	4.53	9.75	2.04	V		0.017	12.24
1779.3		QPSK	-25.05	8.41	9.90	2.08	V		0.042	16.23
		16-QAM	-25.84	7.62	9.90	2.08	V		0.035	15.44
		64-QAM	-26.87	6.59	9.90	2.08	V		0.028	14.41
		256-QAM	-29.94	3.52	9.90	2.08	V		0.014	11.34

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1711.5	LTE B66/B4 3 MHz	QPSK	-22.51	10.69	9.60	1.99	V	< 1.00	0.068	18.30
		16-QAM	-23.27	9.93	9.60	1.99	V		0.057	17.54
		64-QAM	-24.35	8.85	9.60	1.99	V		0.044	16.46
		256-QAM	-27.36	5.84	9.60	1.99	V		0.022	13.45
1745.0		QPSK	-24.10	9.50	9.75	2.04	V		0.053	17.21
		16-QAM	-24.88	8.72	9.75	2.04	V		0.044	16.43
		64-QAM	-25.92	7.68	9.75	2.04	V		0.035	15.39
		256-QAM	-29.00	4.60	9.75	2.04	V		0.017	12.31
1778.5		QPSK	-25.09	8.37	9.90	2.08	V		0.042	16.19
		16-QAM	-25.90	7.56	9.90	2.08	V		0.035	15.38
		64-QAM	-26.96	6.50	9.90	2.08	V		0.027	14.32
		256-QAM	-30.05	3.41	9.90	2.08	V		0.013	11.23

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1712.5	LTE B66/B4 5 MHz	QPSK	-22.45	10.91	9.60	2.00	V	< 1.00	0.071	18.51
		16-QAM	-23.27	10.09	9.60	2.00	V		0.059	17.69
		64-QAM	-24.29	9.07	9.60	2.00	V		0.046	16.67
		256-QAM	-27.30	6.06	9.60	2.00	V		0.023	13.66
1745.0		QPSK	-23.94	9.66	9.75	2.04	V		0.055	17.37
		16-QAM	-24.73	8.87	9.75	2.04	V		0.046	16.58
		64-QAM	-25.78	7.82	9.75	2.04	V		0.036	15.53
		256-QAM	-28.81	4.79	9.75	2.04	V		0.018	12.50
1777.5		QPSK	-24.87	8.67	9.90	2.08	V		0.045	16.49
		16-QAM	-25.63	7.91	9.90	2.08	V		0.037	15.73
		64-QAM	-26.69	6.85	9.90	2.08	V		0.029	14.67
		256-QAM	-29.71	3.83	9.90	2.08	V		0.015	11.65

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1715.0	LTE B66/B4 10 MHz	QPSK	-22.36	11.00	9.60	2.00	V	< 1.00	0.072	18.60
		16-QAM	-23.24	10.12	9.60	2.00	V		0.059	17.72
		64-QAM	-24.20	9.16	9.60	2.00	V		0.047	16.76
		256-QAM	-27.19	6.17	9.60	2.00	V		0.024	13.77
1745.0		QPSK	-23.59	10.01	9.75	2.04	V		0.059	17.72
		16-QAM	-24.40	9.20	9.75	2.04	V		0.049	16.91
		64-QAM	-25.43	8.17	9.75	2.04	V		0.039	15.88
		256-QAM	-28.40	5.20	9.75	2.04	V		0.020	12.91
1775.0		QPSK	-24.57	8.97	9.90	2.08	V		0.048	16.79
		16-QAM	-25.37	8.17	9.90	2.08	V		0.040	15.99
		64-QAM	-26.36	7.18	9.90	2.08	V		0.032	15.00
		256-QAM	-29.37	4.17	9.90	2.08	V		0.016	11.99

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1717.5	LTE B66/B4 15 MHz	QPSK	-22.42	10.94	9.60	2.00	V	< 1.00	0.071	18.54
		16-QAM	-23.21	10.15	9.60	2.00	V		0.060	17.75
		64-QAM	-24.24	9.12	9.60	2.00	V		0.047	16.72
		256-QAM	-27.23	6.13	9.60	2.00	V		0.024	13.73
1745.0		QPSK	-23.65	9.95	9.75	2.04	V		0.058	17.66
		16-QAM	-24.45	9.15	9.75	2.04	V		0.049	16.86
		64-QAM	-25.45	8.15	9.75	2.04	V		0.039	15.86
		256-QAM	-28.49	5.11	9.75	2.04	V		0.019	12.82
1772.5		QPSK	-24.61	8.93	9.90	2.08	V		0.047	16.75
		16-QAM	-25.38	8.16	9.90	2.08	V		0.040	15.98
		64-QAM	-26.41	7.13	9.90	2.08	V		0.031	14.95
		256-QAM	-29.43	4.11	9.90	2.08	V		0.016	11.93

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1720.0	LTE B66/B4 20 MHz	QPSK	-22.45	11.05	9.60	2.00	V	< 1.00	0.073	18.65
		16-QAM	-23.28	10.22	9.60	2.00	V		0.061	17.82
		64-QAM	-24.28	9.22	9.60	2.00	V		0.048	16.82
		256-QAM	-27.30	6.20	9.60	2.00	V		0.024	13.80
1745.0		QPSK	-23.58	10.02	9.75	2.04	V		0.059	17.73
		16-QAM	-24.37	9.23	9.75	2.04	V		0.049	16.94
		64-QAM	-25.38	8.22	9.75	2.04	V		0.039	15.93
		256-QAM	-28.45	5.15	9.75	2.04	V		0.019	12.86
1770.0		QPSK	-24.60	9.04	9.90	2.09	V		0.048	16.85
		16-QAM	-25.38	8.26	9.90	2.09	V		0.041	16.07
		64-QAM	-26.45	7.19	9.90	2.09	V		0.032	15.00
		256-QAM	-29.42	4.22	9.90	2.09	V		0.016	12.03

**9.2 RADIATED SPURIOUS EMISSIONS**

- ▣ OPERATING FREQUENCY: 1720.0 MHz
- ▣ MEASURED OUTPUT POWER: 18.65 dBm = 0.073 W
- ▣ MODE: LTE B66/B4
- ▣ MODULATION SIGNAL: 20 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT:  $43 + 10 \log_{10}(W) =$  31.65 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
132072 (1720.0)	3 440.00	-59.87	11.10	-60.82	2.97	V	-52.69	71.34
	5 160.00	-61.83	11.00	-57.00	3.69	V	-49.69	68.34
	6 880.00	-62.67	10.80	-50.98	4.28	V	-44.46	63.11
	8 600.00	-60.15	10.40	-46.60	4.80	H	-41.00	59.65
	10 320.00	-63.37	11.10	-45.60	5.34	V	-39.84	58.49
132322 (1745.0)	3 490.00	-60.37	11.20	-61.81	3.00	H	-53.61	72.26
	5 235.00	-61.17	11.10	-56.24	3.70	H	-48.84	67.49
	6 980.00	-63.81	10.90	-51.10	4.30	H	-44.50	63.15
	8 725.00	-59.78	10.30	-45.42	4.88	V	-40.00	58.65
	10 470.00	-61.90	11.30	-44.17	5.43	H	-38.30	56.95
132572 (1770.0)	3 540.00	-57.67	11.30	-59.47	3.02	V	-51.19	69.84
	5 310.00	-60.56	11.40	-56.20	3.65	V	-48.45	67.10
	7 080.00	-62.20	10.70	-48.32	4.34	V	-41.96	60.61
	8 850.00	-61.41	10.50	-47.32	4.95	V	-41.77	60.43
	10 620.00	-63.33	11.20	-44.81	5.41	V	-39.02	57.67

**9.3 PEAK-TO-AVERAGE RATIO**

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
66/4	1.4 MHz	1745.0	QPSK	6	0	5.44
			16-QAM			5.90
			64-QAM			6.14
			256-QAM			6.70
	3 MHz		QPSK	15		5.49
			16-QAM			6.01
			64-QAM			6.29
			256-QAM			6.81
	5 MHz		QPSK	25		5.52
			16-QAM			6.07
			64-QAM			6.25
			256-QAM			6.81
	10 MHz		QPSK	50		5.57
			16-QAM			6.12
			64-QAM			6.36
			256-QAM			6.88
	15 MHz		QPSK	75		5.58
			16-QAM			6.14
			64-QAM			6.34
			256-QAM			6.86
20 MHz	QPSK	100	5.66			
	16-QAM		6.21			
	64-QAM		6.43			
	256-QAM		6.90			

**Note:**

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 260 ~ 283.



**9.4 OCCUPIED BANDWIDTH**

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
66/4	1.4 MHz	1745.0	QPSK	6	0	1.0976
			16-QAM			1.0930
			64-QAM			1.0898
			256-QAM			1.0927
	3 MHz		QPSK	15		2.7183
			16-QAM			2.7114
			64-QAM			2.7130
			256-QAM			2.7153
	5 MHz		QPSK	25		4.5339
			16-QAM			4.5194
			64-QAM			4.5175
			256-QAM			4.5298
	10 MHz		QPSK	50		9.0277
			16-QAM			9.0239
			64-QAM			9.0284
			256-QAM			9.0372
	15 MHz		QPSK	75		13.499
			16-QAM			13.518
			64-QAM			13.504
			256-QAM			13.498
20 MHz	QPSK	100	17.995			
	16-QAM		17.990			
	64-QAM		17.967			
	256-QAM		17.988			

**Note:**

1. Plots of the EUT's Occupied Bandwidth are shown Page 236 ~ 259.

**9.5 CONDUCTED SPURIOUS EMISSIONS**

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
66/4	1.4	1710.7	3.8031	36.200	-69.612	-33.412	-13.00
		1745.0	9.7383	36.815	-70.441	-33.626	
		1779.3	6.0165	36.815	-70.132	-33.317	
	3	1711.5	4.8774	36.200	-70.755	-34.555	
		1745.0	4.0674	36.200	-69.967	-33.767	
		1778.5	4.0185	36.200	-70.480	-34.280	
	5	1712.5	9.9716	36.815	-70.444	-33.629	
		1745.0	8.2966	36.815	-70.683	-33.868	
		1777.5	8.2488	36.815	-70.465	-33.650	
	10	1715.0	8.2612	36.815	-70.891	-34.076	
		1745.0	3.7992	36.200	-70.348	-34.148	
		1775.0	3.7234	36.200	-70.463	-34.263	
	15	1717.5	8.8629	36.815	-70.361	-33.546	
		1745.0	3.7673	36.200	-70.473	-34.273	
		1772.5	4.0300	36.200	-70.790	-34.590	
	20	1720.0	9.9492	36.815	-70.642	-33.827	
		1745.0	4.0354	36.200	-69.675	-33.475	
		1770.0	8.3021	36.815	-70.407	-33.592	

**Note:**

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 284 ~ 319.
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	33.494
1 – 5	36.200
5 – 10	36.815
10 – 15	37.340
15 – 20	37.713
Above 20(26.5)	38.355

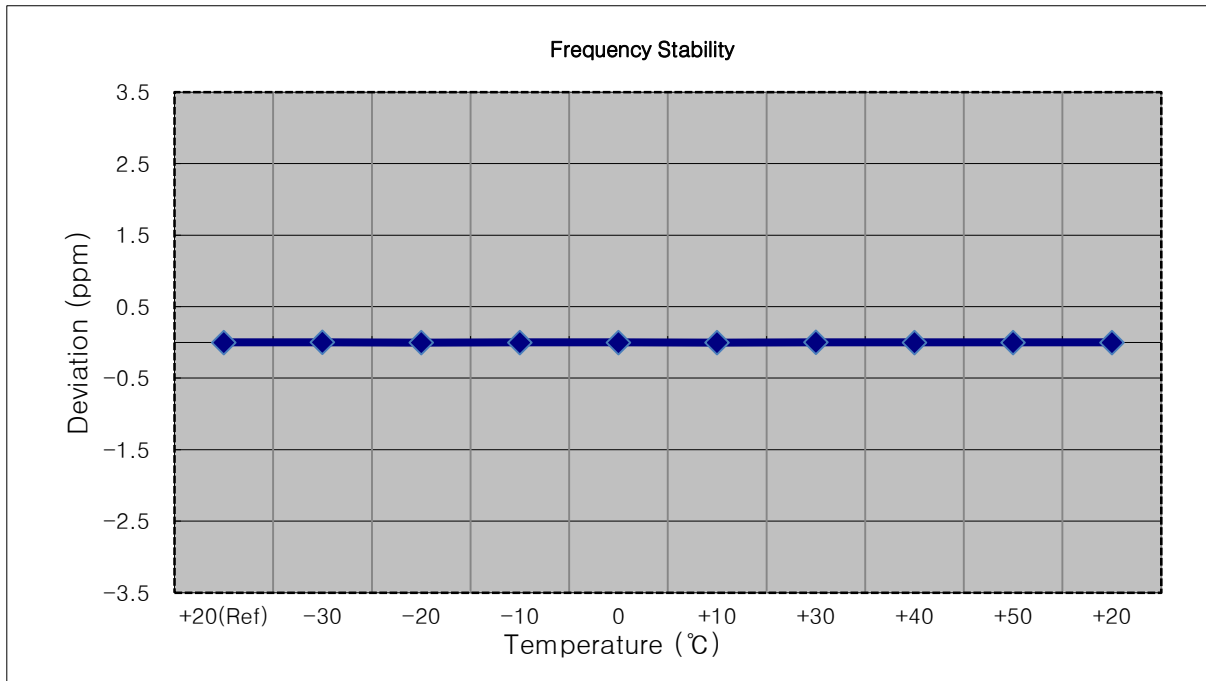
## **9.6 BAND EDGE**

- Plots of the EUT's Band Edge are shown Page 200~235.

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

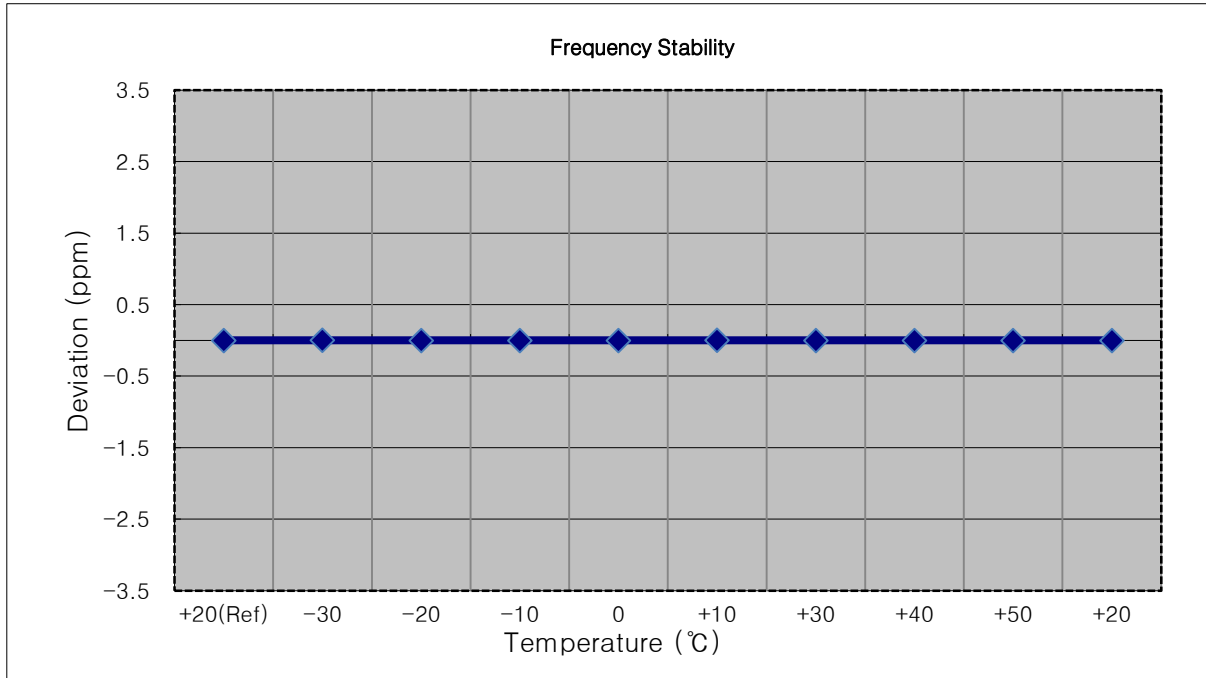
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1710,700,000 Hz
- ▣ CHANNEL: 131979 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1710 700 000	0.0	0.000 000	0.000
100 %		-30	1710 700 002	1.9	0.000 000	0.001
100 %		-20	1710 699 997	-2.8	0.000 000	-0.002
100 %		-10	1710 700 001	0.9	0.000 000	0.001
100 %		0	1710 700 000	0.4	0.000 000	0.000
100 %		+10	1710 699 997	-2.7	0.000 000	-0.002
100 %		+30	1710 700 002	1.9	0.000 000	0.001
100 %		+40	1710 700 000	0.6	0.000 000	0.000
100 %		+50	1710 700 000	0.3	0.000 000	0.000
Batt. Endpoint		3.550	+20	1710 699 998	-1.9	0.000 000



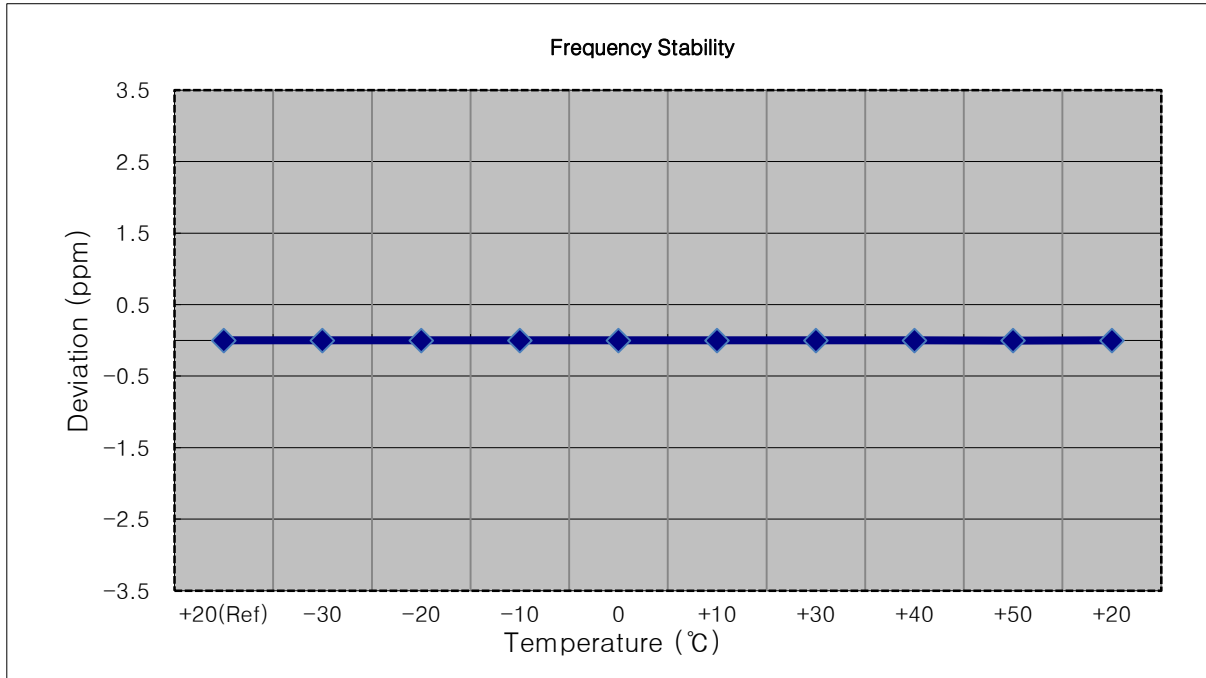
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1711,500,000 Hz
- ▣ CHANNEL: 131987 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1711 499 999	0.0	0.000 000	0.000
100 %		-30	1711 500 001	1.9	0.000 000	0.001
100 %		-20	1711 500 000	1.4	0.000 000	0.001
100 %		-10	1711 499 999	0.5	0.000 000	0.000
100 %		0	1711 500 000	0.7	0.000 000	0.000
100 %		+10	1711 500 002	2.9	0.000 000	0.002
100 %		+30	1711 499 999	0.2	0.000 000	0.000
100 %		+40	1711 499 999	0.4	0.000 000	0.000
100 %		+50	1711 500 000	0.8	0.000 000	0.000
Batt. Endpoint	3.550	+20	1711 499 998	-1.4	0.000 000	-0.001



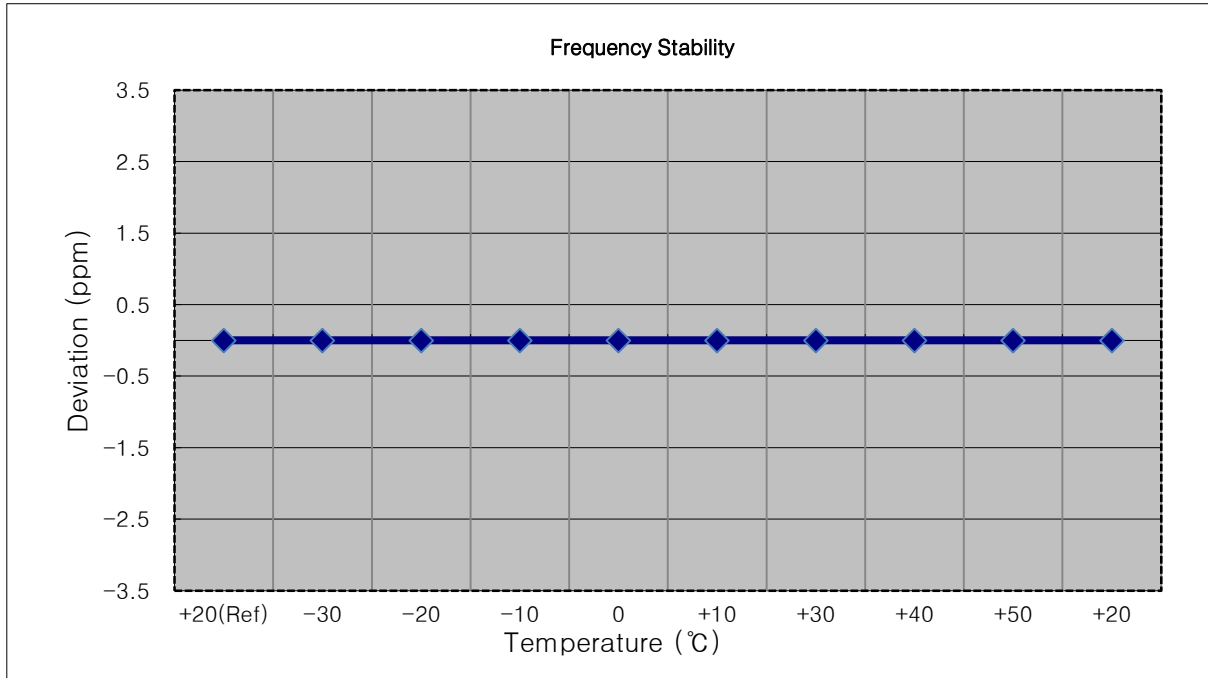
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1712,500,000 Hz
- ▣ CHANNEL: 131997 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1712 500 002	0.0	0.000 000	0.000
100 %		-30	1712 500 002	-0.2	0.000 000	0.000
100 %		-20	1712 500 004	1.6	0.000 000	0.001
100 %		-10	1712 500 003	1.0	0.000 000	0.001
100 %		0	1712 500 002	0.0	0.000 000	0.000
100 %		+10	1712 500 003	0.7	0.000 000	0.000
100 %		+30	1712 500 003	0.4	0.000 000	0.000
100 %		+40	1712 500 004	1.4	0.000 000	0.001
100 %		+50	1712 500 000	-2.1	0.000 000	-0.001
Batt. Endpoint	3.550	+20	1712 500 002	-0.3	0.000 000	0.000



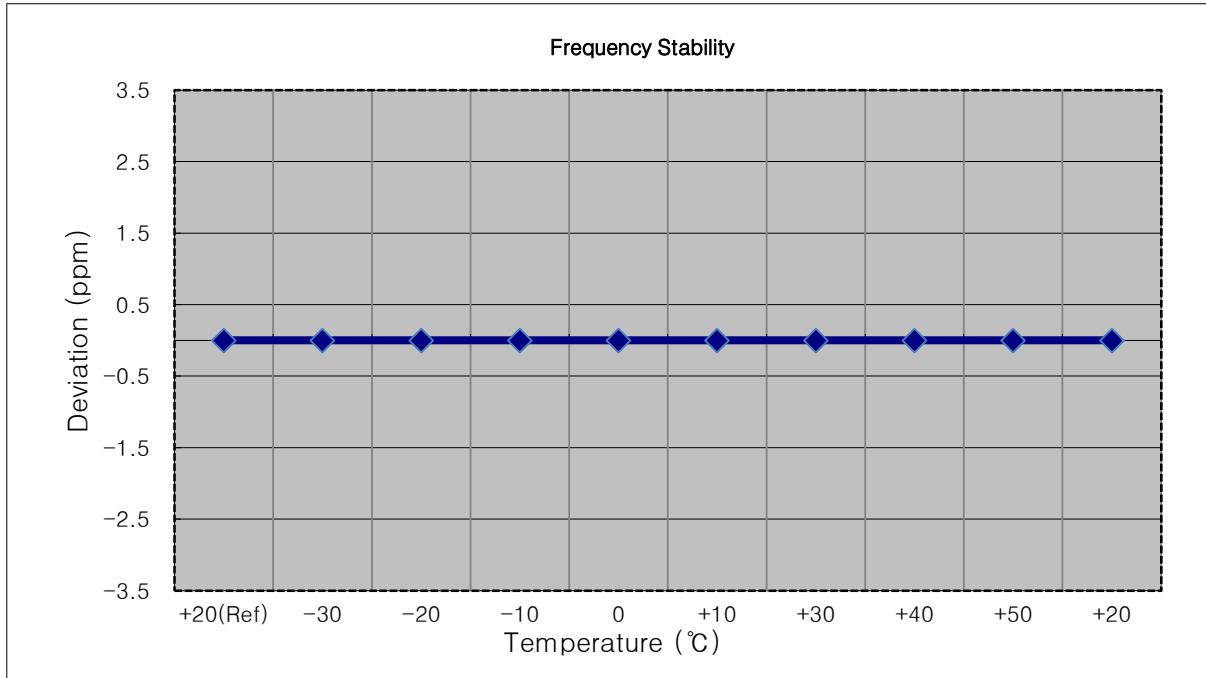
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1715,000,000 Hz
- ▣ CHANNEL: 132022 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1715 000 001	0.0	0.000 000	0.000
100 %		-30	1715 000 001	0.4	0.000 000	0.000
100 %		-20	1715 000 001	0.1	0.000 000	0.000
100 %		-10	1715 000 002	0.5	0.000 000	0.000
100 %		0	1715 000 001	0.2	0.000 000	0.000
100 %		+10	1715 000 001	-0.5	0.000 000	0.000
100 %		+30	1715 000 001	-0.4	0.000 000	0.000
100 %		+40	1715 000 001	-0.2	0.000 000	0.000
100 %		+50	1715 000 000	-0.9	0.000 000	-0.001
Batt. Endpoint	3.550	+20	1715 000 002	1.0	0.000 000	0.001



- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1717,500,000 Hz
- ▣ CHANNEL: 132047 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

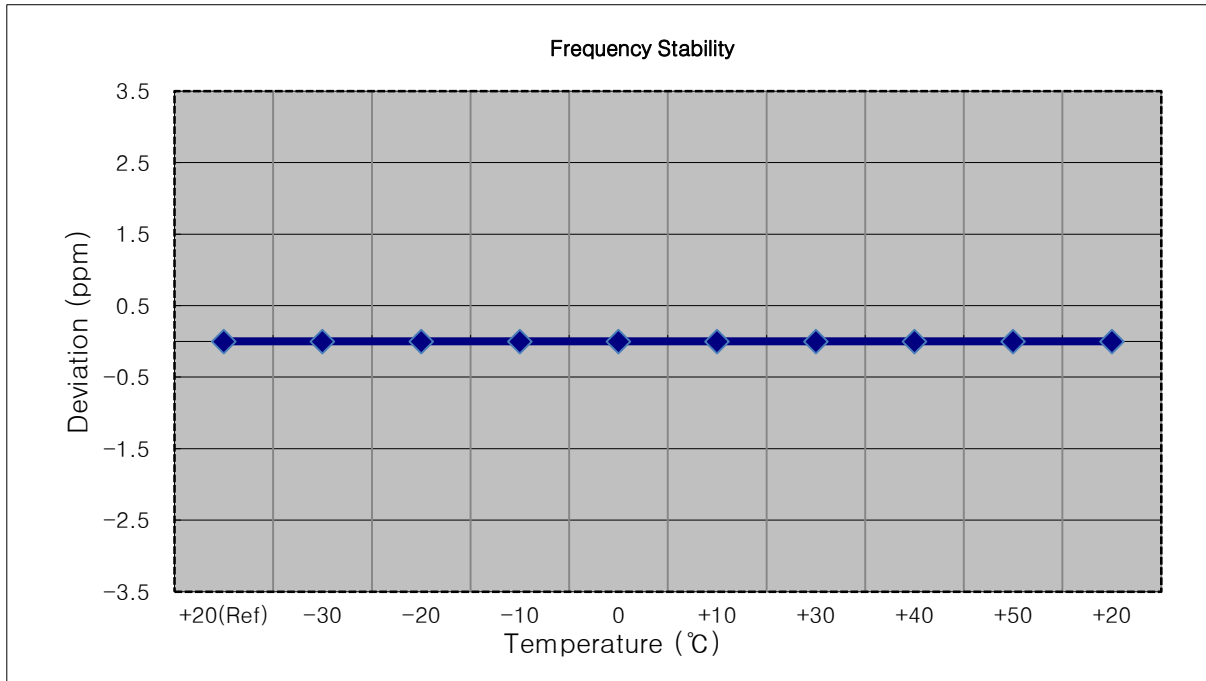
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1717 500 001	0.0	0.000 000	0.000
100 %		-30	1717 500 000	-0.6	0.000 000	0.000
100 %		-20	1717 500 000	-0.3	0.000 000	0.000
100 %		-10	1717 500 000	-0.3	0.000 000	0.000
100 %		0	1717 499 999	-1.2	0.000 000	-0.001
100 %		+10	1717 500 001	0.8	0.000 000	0.000
100 %		+30	1717 500 001	-0.1	0.000 000	0.000
100 %		+40	1717 499 999	-1.6	0.000 000	-0.001
100 %		+50	1717 500 001	-0.1	0.000 000	0.000
Batt. Endpoint	3.550	+20	1717 500 001	0.0	0.000 000	0.000





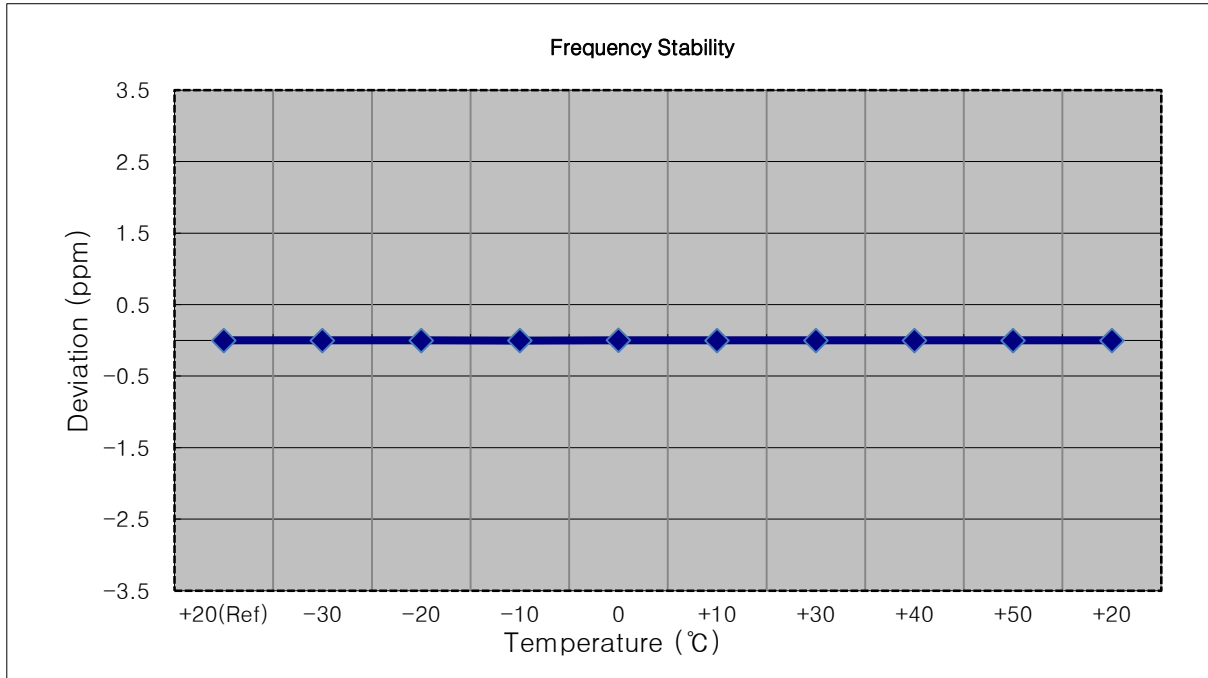
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1720,000,000 Hz
- ▣ CHANNEL: 132072 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1720 000 002	0.0	0.000 000	0.000
100 %		-30	1720 000 001	-1.3	0.000 000	-0.001
100 %		-20	1720 000 002	-0.8	0.000 000	0.000
100 %		-10	1720 000 002	-0.6	0.000 000	0.000
100 %		0	1720 000 003	0.2	0.000 000	0.000
100 %		+10	1720 000 004	1.2	0.000 000	0.001
100 %		+30	1720 000 002	-0.4	0.000 000	0.000
100 %		+40	1720 000 004	1.5	0.000 000	0.001
100 %		+50	1720 000 003	0.4	0.000 000	0.000
Batt. Endpoint		3.550	+20	1720 000 003	1.1	0.000 000



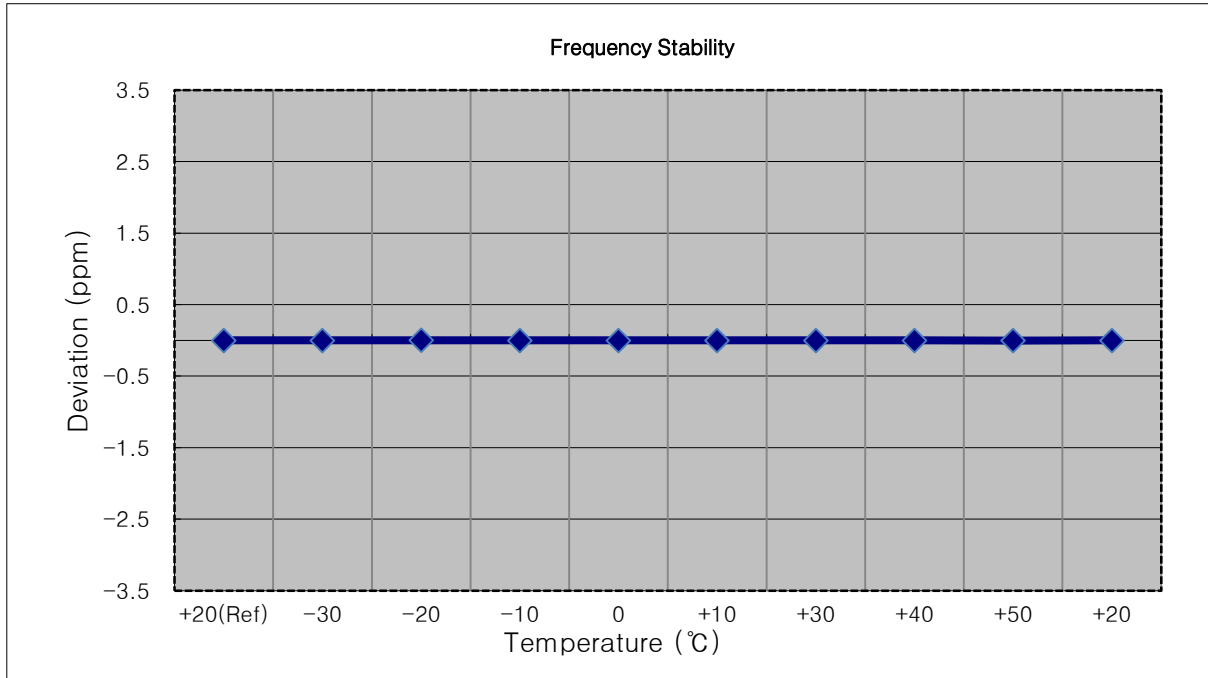
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1745 000 000	0.0	0.000 000	0.000
100 %		-30	1745 000 000	0.4	0.000 000	0.000
100 %		-20	1745 000 000	0.8	0.000 000	0.000
100 %		-10	1744 999 997	-2.1	0.000 000	-0.001
100 %		0	1745 000 002	2.4	0.000 000	0.001
100 %		+10	1744 999 999	-0.9	0.000 000	-0.001
100 %		+30	1745 000 001	1.7	0.000 000	0.001
100 %		+40	1745 000 000	0.1	0.000 000	0.000
100 %		+50	1745 000 000	0.1	0.000 000	0.000
Batt. Endpoint	3.550	+20	1745 000 000	0.5	0.000 000	0.000



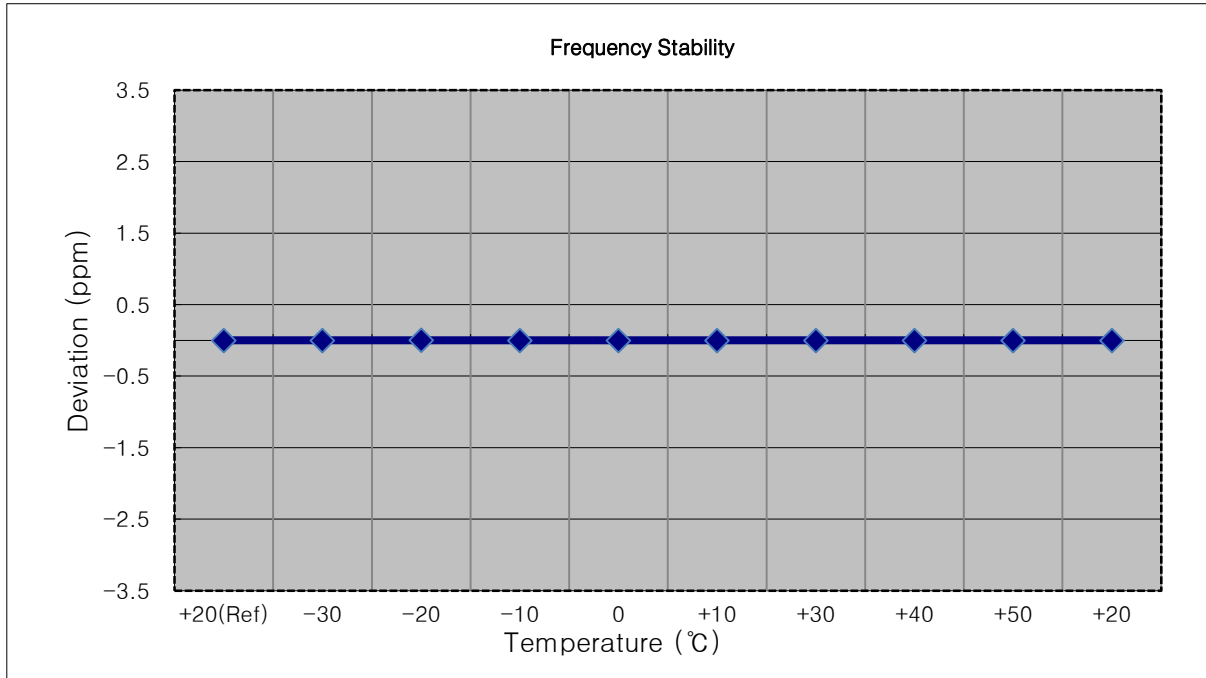
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1744 999 001	0.0	0.000 000	0.000
100 %		-30	1744 999 003	1.7	0.000 000	0.001
100 %		-20	1744 999 003	2.5	0.000 000	0.001
100 %		-10	1744 999 002	0.8	0.000 000	0.000
100 %		0	1744 999 001	-0.3	0.000 000	0.000
100 %		+10	1744 999 001	0.1	0.000 000	0.000
100 %		+30	1744 999 001	-0.4	0.000 000	0.000
100 %		+40	1744 999 002	0.5	0.000 000	0.000
100 %		+50	1744 998 999	-2.5	0.000 000	-0.001
Batt. Endpoint	3.550	+20	1744 999 002	1.2	0.000 000	0.001



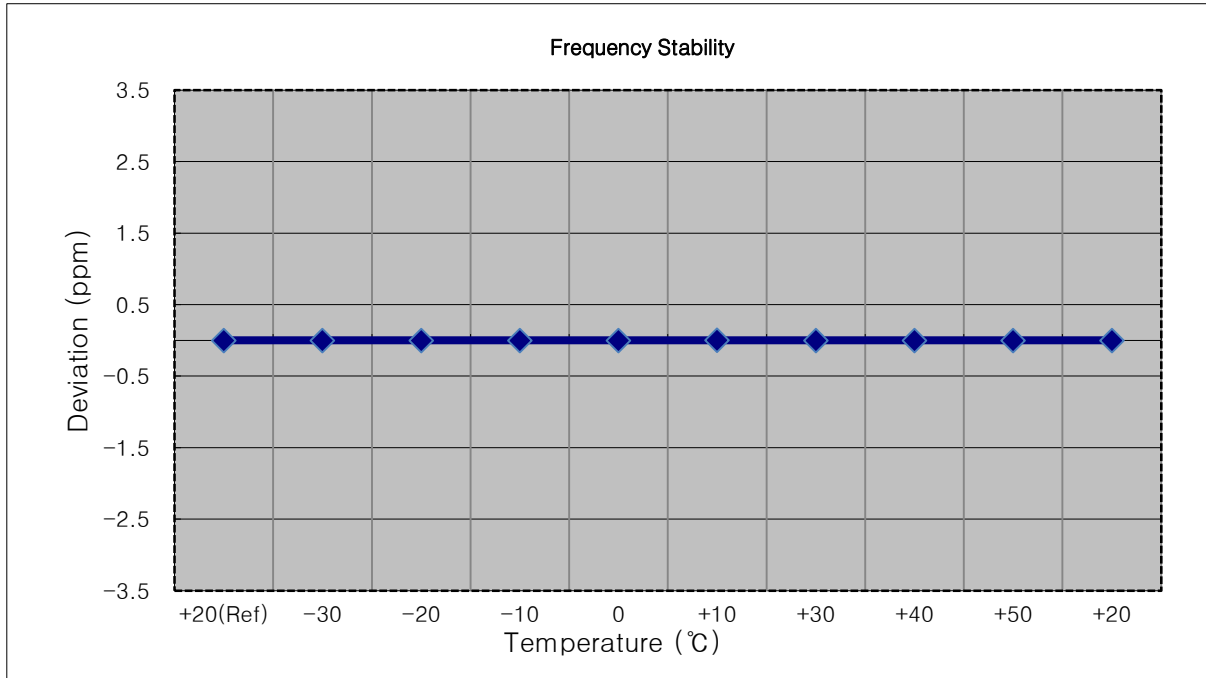
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1745 000 000	0.0	0.000 000	0.000
100 %		-30	1745 000 001	1.2	0.000 000	0.001
100 %		-20	1745 000 002	2.4	0.000 000	0.001
100 %		-10	1745 000 000	0.3	0.000 000	0.000
100 %		0	1745 000 001	0.6	0.000 000	0.000
100 %		+10	1745 000 000	-0.2	0.000 000	0.000
100 %		+30	1745 000 002	1.6	0.000 000	0.001
100 %		+40	1745 000 001	0.8	0.000 000	0.000
100 %		+50	1745 000 001	1.2	0.000 000	0.001
Batt. Endpoint	3.550	+20	1744 999 999	-1.0	0.000 000	-0.001



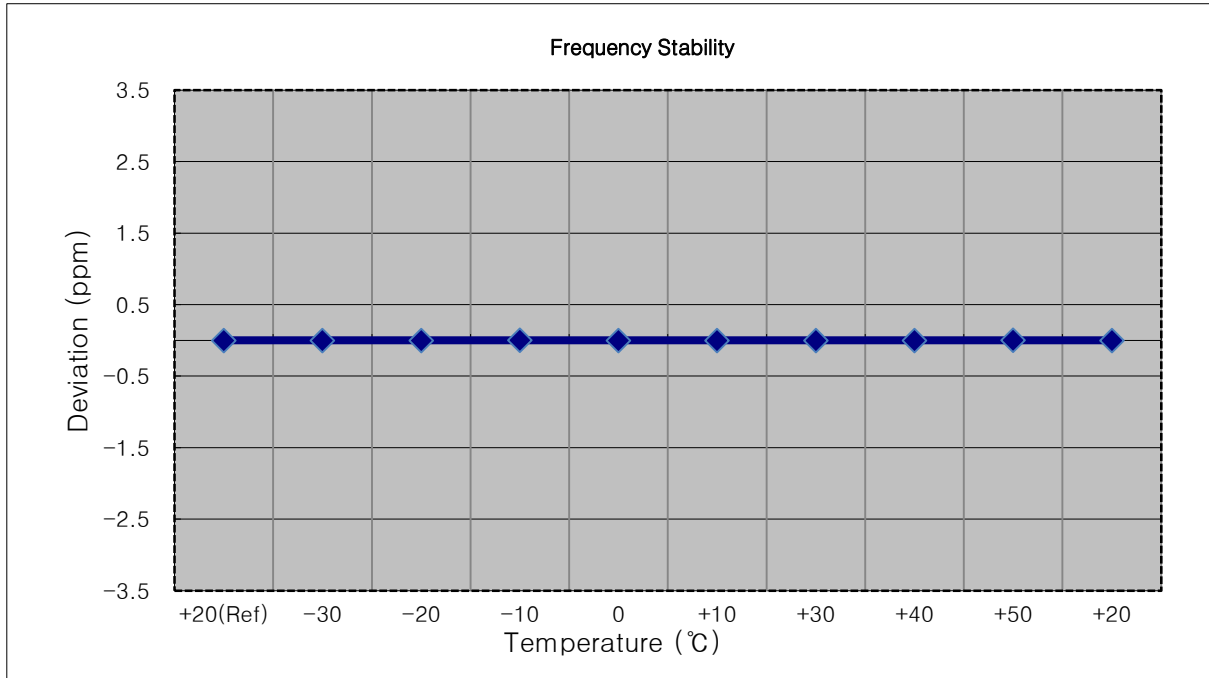
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1745 000 000	0.0	0.000 000	0.000
100 %		-30	1745 000 000	0.1	0.000 000	0.000
100 %		-20	1744 999 999	-0.8	0.000 000	0.000
100 %		-10	1745 000 000	0.0	0.000 000	0.000
100 %		0	1745 000 000	0.0	0.000 000	0.000
100 %		+10	1745 000 002	2.7	0.000 000	0.002
100 %		+30	1745 000 000	0.7	0.000 000	0.000
100 %		+40	1744 999 999	-0.6	0.000 000	0.000
100 %		+50	1745 000 000	0.8	0.000 000	0.000
Batt. Endpoint	3.550	+20	1745 000 001	1.8	0.000 000	0.001



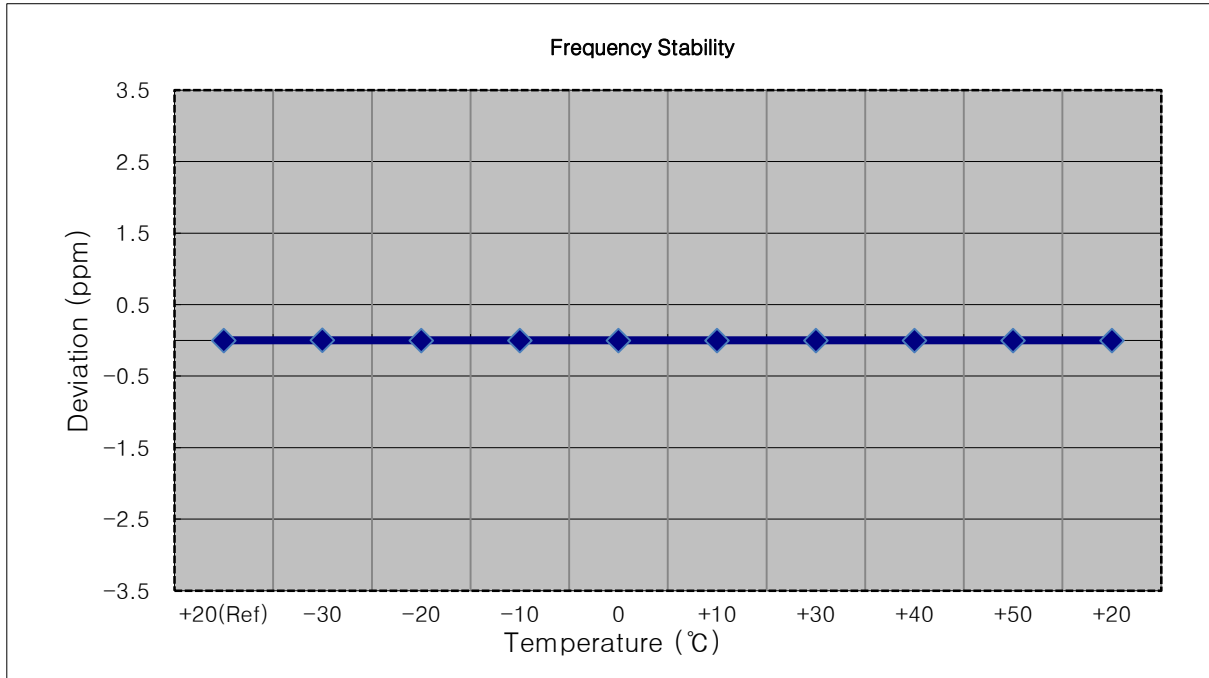
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1744 999 999	0.0	0.000 000	0.000
100 %		-30	1744 999 999	0.0	0.000 000	0.000
100 %		-20	1745 000 000	0.6	0.000 000	0.000
100 %		-10	1745 000 002	2.4	0.000 000	0.001
100 %		0	1744 999 998	-1.3	0.000 000	-0.001
100 %		+10	1745 000 000	0.4	0.000 000	0.000
100 %		+30	1744 999 999	-0.6	0.000 000	0.000
100 %		+40	1744 999 998	-1.5	0.000 000	-0.001
100 %		+50	1745 000 001	2.1	0.000 000	0.001
Batt. Endpoint	3.550	+20	1745 000 001	1.5	0.000 000	0.001



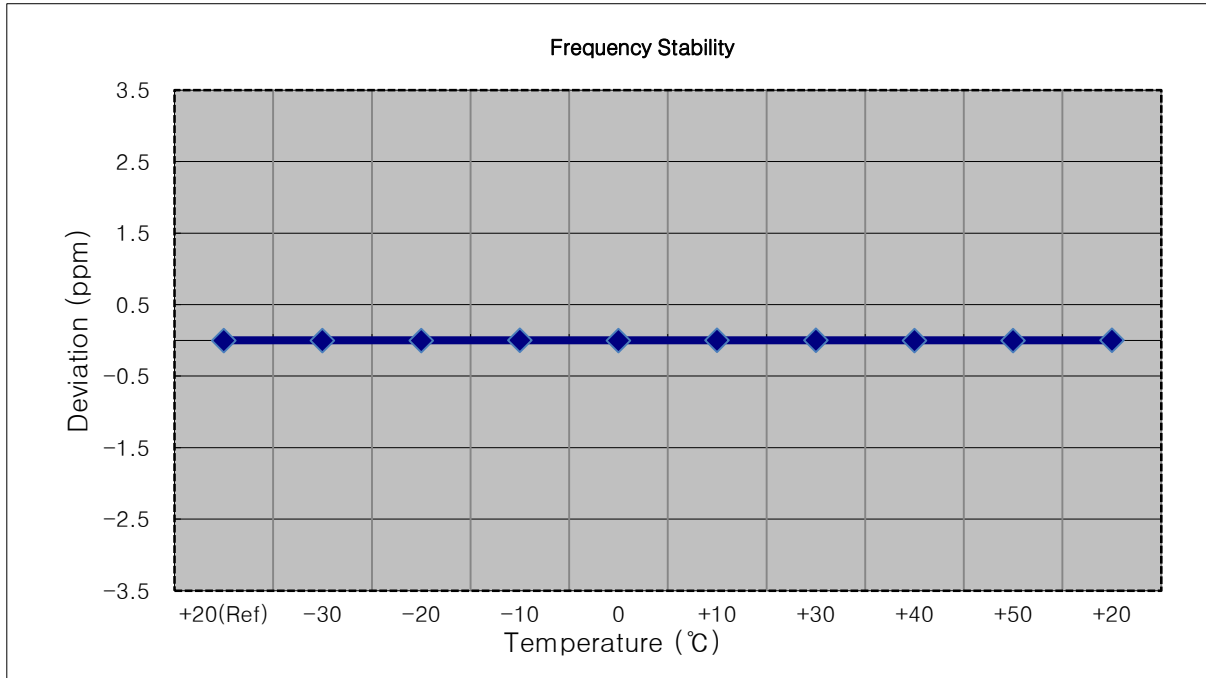
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 132322 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1745 000 001	0.0	0.000 000	0.000
100 %		-30	1745 000 003	1.9	0.000 000	0.001
100 %		-20	1745 000 001	0.4	0.000 000	0.000
100 %		-10	1745 000 001	0.0	0.000 000	0.000
100 %		0	1745 000 000	-1.0	0.000 000	-0.001
100 %		+10	1745 000 001	0.3	0.000 000	0.000
100 %		+30	1745 000 001	0.1	0.000 000	0.000
100 %		+40	1745 000 001	-0.4	0.000 000	0.000
100 %		+50	1745 000 003	1.8	0.000 000	0.001
Batt. Endpoint	3.550	+20	1745 000 002	1.4	0.000 000	0.001



- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1779,300,000 Hz
- ▣ CHANNEL: 132665 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

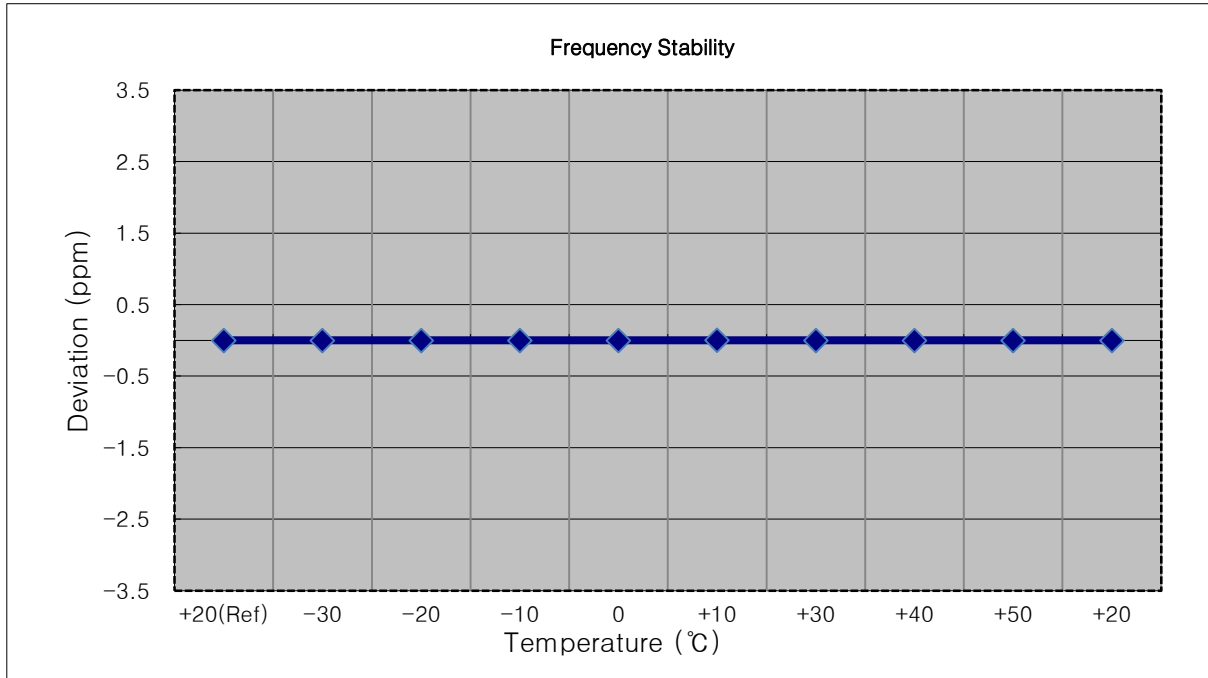
Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1779 299 001	0.0	0.000 000	0.000
100 %		-30	1779 299 000	-1.3	0.000 000	-0.001
100 %		-20	1779 299 000	-0.7	0.000 000	0.000
100 %		-10	1779 299 004	3.2	0.000 000	0.002
100 %		0	1779 299 000	-0.6	0.000 000	0.000
100 %		+10	1779 299 003	2.3	0.000 000	0.001
100 %		+30	1779 299 003	2.2	0.000 000	0.001
100 %		+40	1779 299 003	1.9	0.000 000	0.001
100 %		+50	1779 299 000	-0.9	0.000 000	-0.001
Batt. Endpoint	3.550	+20	1779 299 003	2.5	0.000 000	0.001





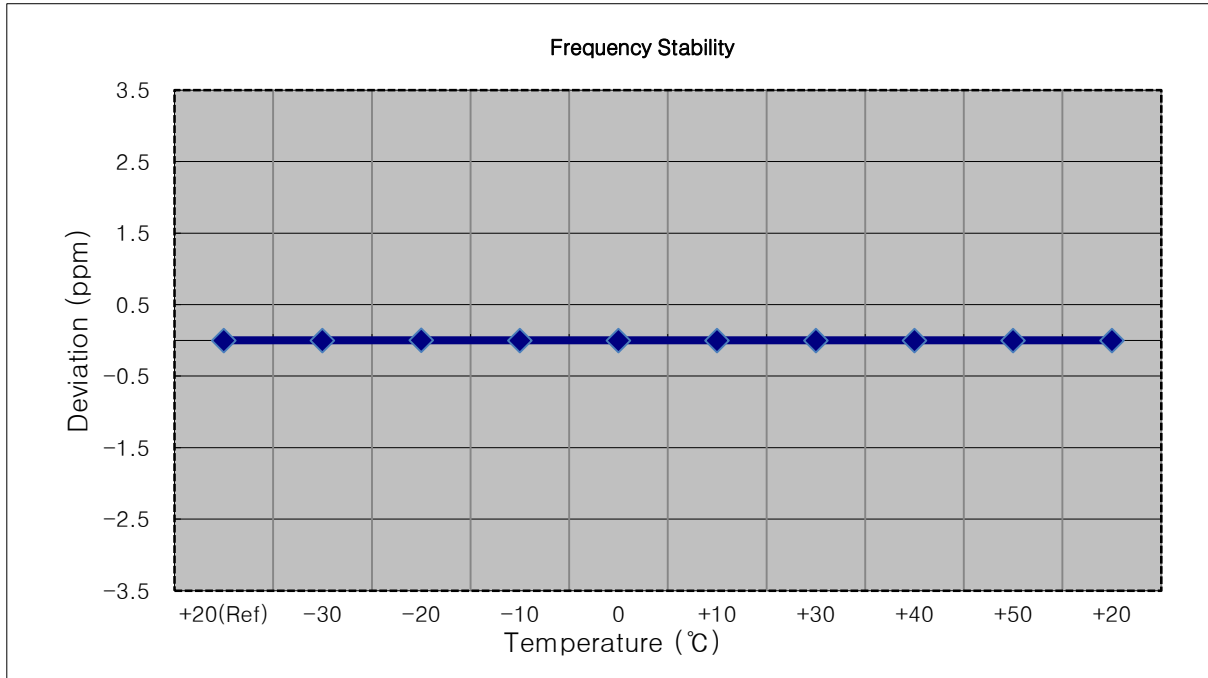
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1778,500,000 Hz
- ▣ CHANNEL: 132657 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1778 499 001	0.0	0.000 000	0.000
100 %		-30	1778 499 000	-0.8	0.000 000	0.000
100 %		-20	1778 499 002	1.2	0.000 000	0.001
100 %		-10	1778 499 002	1.4	0.000 000	0.001
100 %		0	1778 499 003	1.7	0.000 000	0.001
100 %		+10	1778 499 003	2.3	0.000 000	0.001
100 %		+30	1778 499 002	0.5	0.000 000	0.000
100 %		+40	1778 499 000	-1.1	0.000 000	-0.001
100 %		+50	1778 499 000	-0.8	0.000 000	0.000
Batt. Endpoint	3.550	+20	1778 499 000	-0.7	0.000 000	0.000



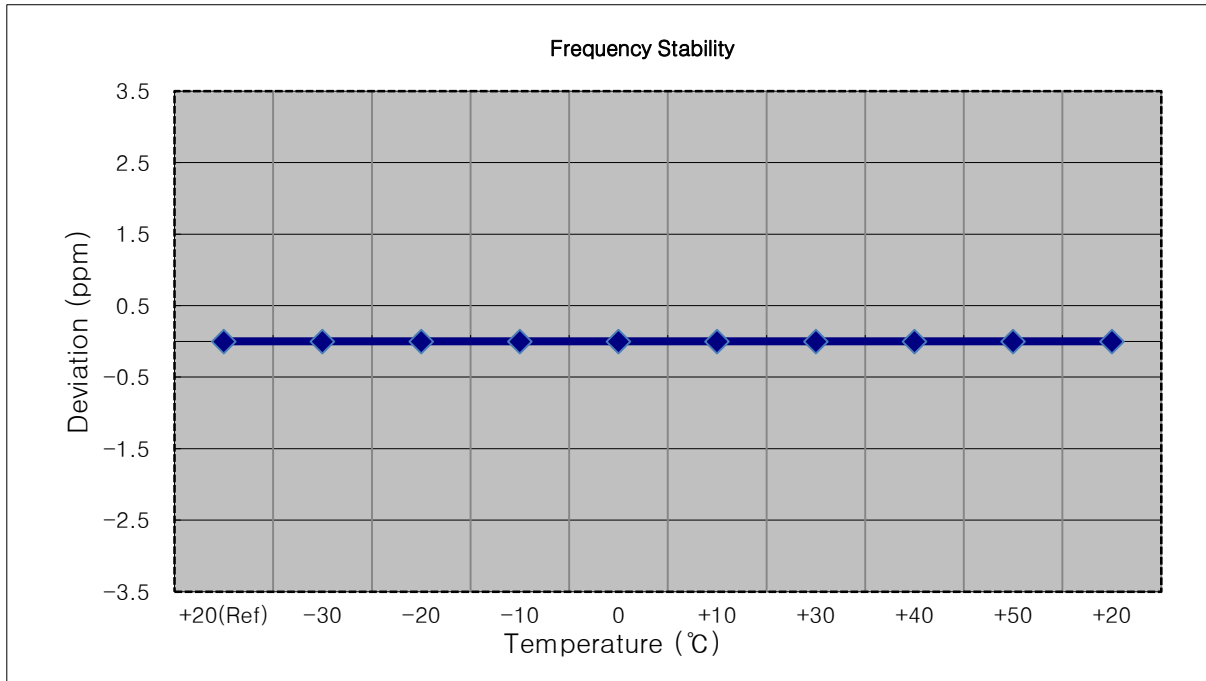
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1777,500,000 Hz
- ▣ CHANNEL: 132647 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1777 499 998	0.0	0.000 000	0.000
100 %		-30	1777 499 999	1.2	0.000 000	0.001
100 %		-20	1777 500 000	2.4	0.000 000	0.001
100 %		-10	1777 499 998	0.3	0.000 000	0.000
100 %		0	1777 499 999	0.6	0.000 000	0.000
100 %		+10	1777 499 998	-0.2	0.000 000	0.000
100 %		+30	1777 500 000	1.6	0.000 000	0.001
100 %		+40	1777 499 999	0.8	0.000 000	0.000
100 %		+50	1777 499 999	1.2	0.000 000	0.001
Batt. Endpoint	3.550	+20	1777 499 997	-1.0	0.000 000	-0.001



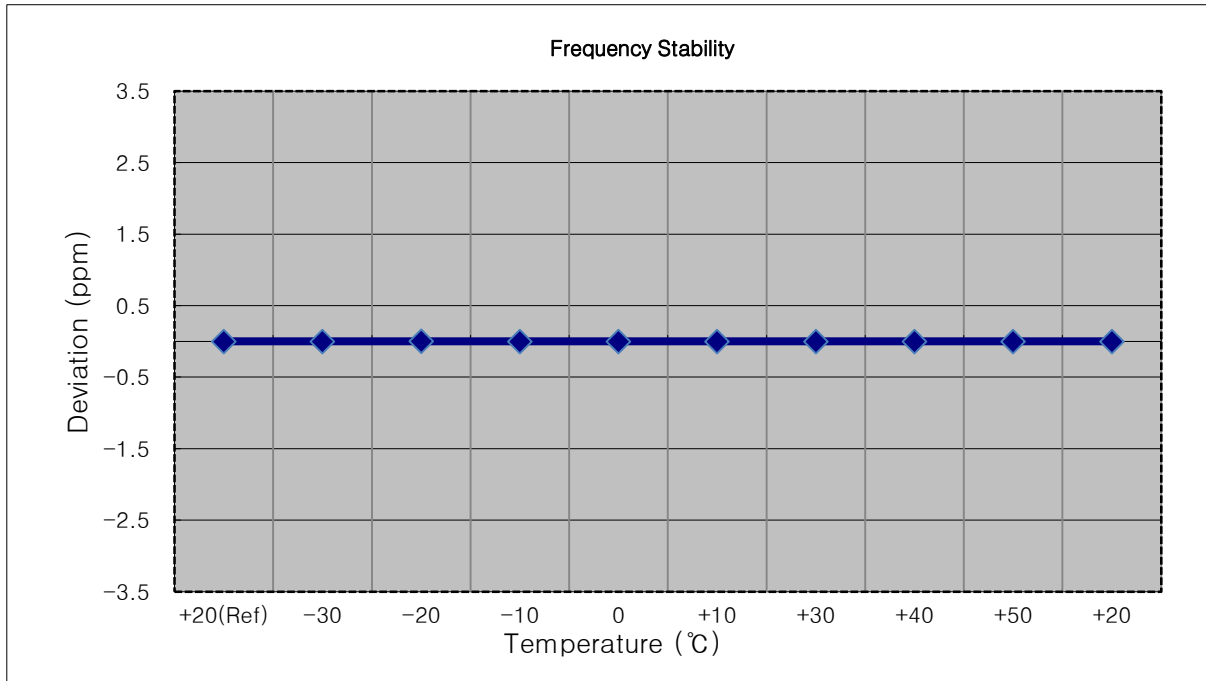
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1775,000,000 Hz
- ▣ CHANNEL: 132622 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1775 000 001	0.0	0.000 000	0.000
100 %		-30	1775 000 000	-1.0	0.000 000	-0.001
100 %		-20	1775 000 002	0.4	0.000 000	0.000
100 %		-10	1775 000 000	-1.1	0.000 000	-0.001
100 %		0	1775 000 001	-0.4	0.000 000	0.000
100 %		+10	1775 000 002	1.1	0.000 000	0.001
100 %		+30	1775 000 001	-0.6	0.000 000	0.000
100 %		+40	1775 000 000	-1.6	0.000 000	-0.001
100 %		+50	1775 000 001	-0.1	0.000 000	0.000
Batt. Endpoint		3.550	+20	1775 000 002	1.1	0.000 000



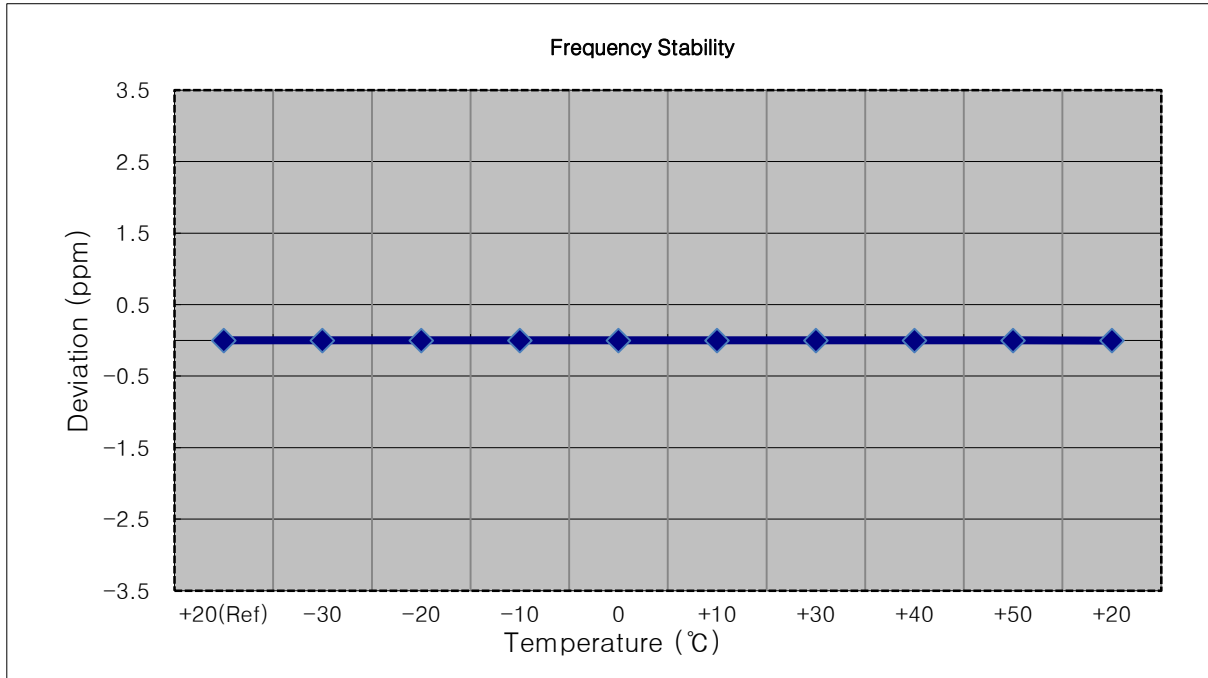
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1772,500,000 Hz
- ▣ CHANNEL: 132597 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1772 500 002	0.0	0.000 000	0.000
100 %		-30	1772 500 002	-0.1	0.000 000	0.000
100 %		-20	1772 500 004	2.0	0.000 000	0.001
100 %		-10	1772 500 002	0.3	0.000 000	0.000
100 %		0	1772 500 001	-0.7	0.000 000	0.000
100 %		+10	1772 500 003	1.6	0.000 000	0.001
100 %		+30	1772 500 002	0.7	0.000 000	0.000
100 %		+40	1772 500 002	0.5	0.000 000	0.000
100 %		+50	1772 500 003	1.1	0.000 000	0.001
Batt. Endpoint		3.550	+20	1772 500 001	-0.3	0.000 000



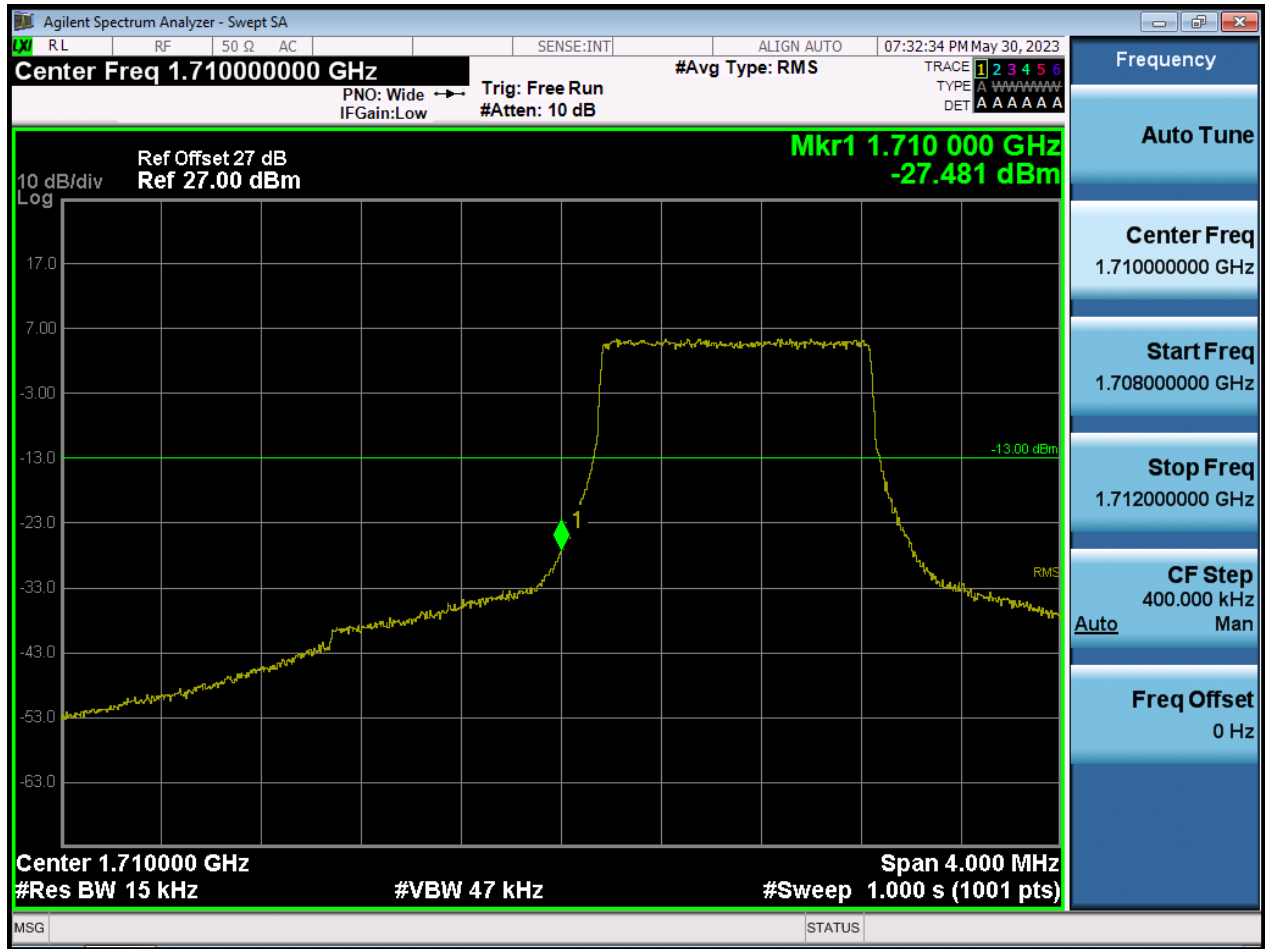
- ▣ MODE: LTE 66/4
- ▣ OPERATING FREQUENCY: 1770,000,000 Hz
- ▣ CHANNEL: 132572 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1770 000 000	0.0	0.000 000	0.000
100 %		-30	1770 000 000	-0.5	0.000 000	0.000
100 %		-20	1769 999 999	-1.5	0.000 000	-0.001
100 %		-10	1770 000 002	1.5	0.000 000	0.001
100 %		0	1770 000 000	0.3	0.000 000	0.000
100 %		+10	1769 999 999	-1.0	0.000 000	-0.001
100 %		+30	1769 999 999	-0.8	0.000 000	0.000
100 %		+40	1769 999 998	-1.7	0.000 000	-0.001
100 %		+50	1770 000 002	1.7	0.000 000	0.001
Batt. Endpoint	3.550	+20	1769 999 997	-3.3	0.000 000	-0.002



## 10. TEST PLOTS (Main 2 Ant)

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



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

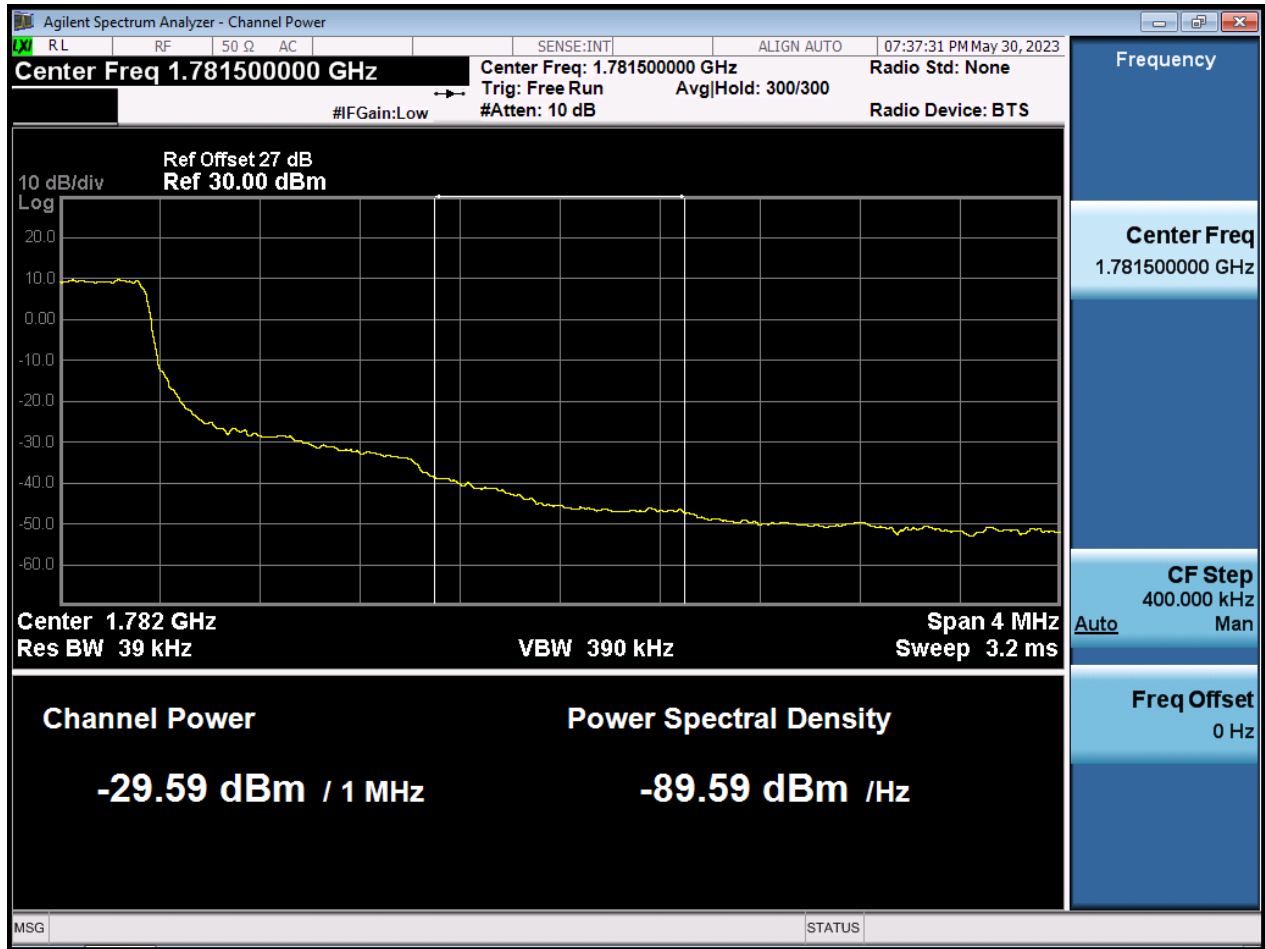




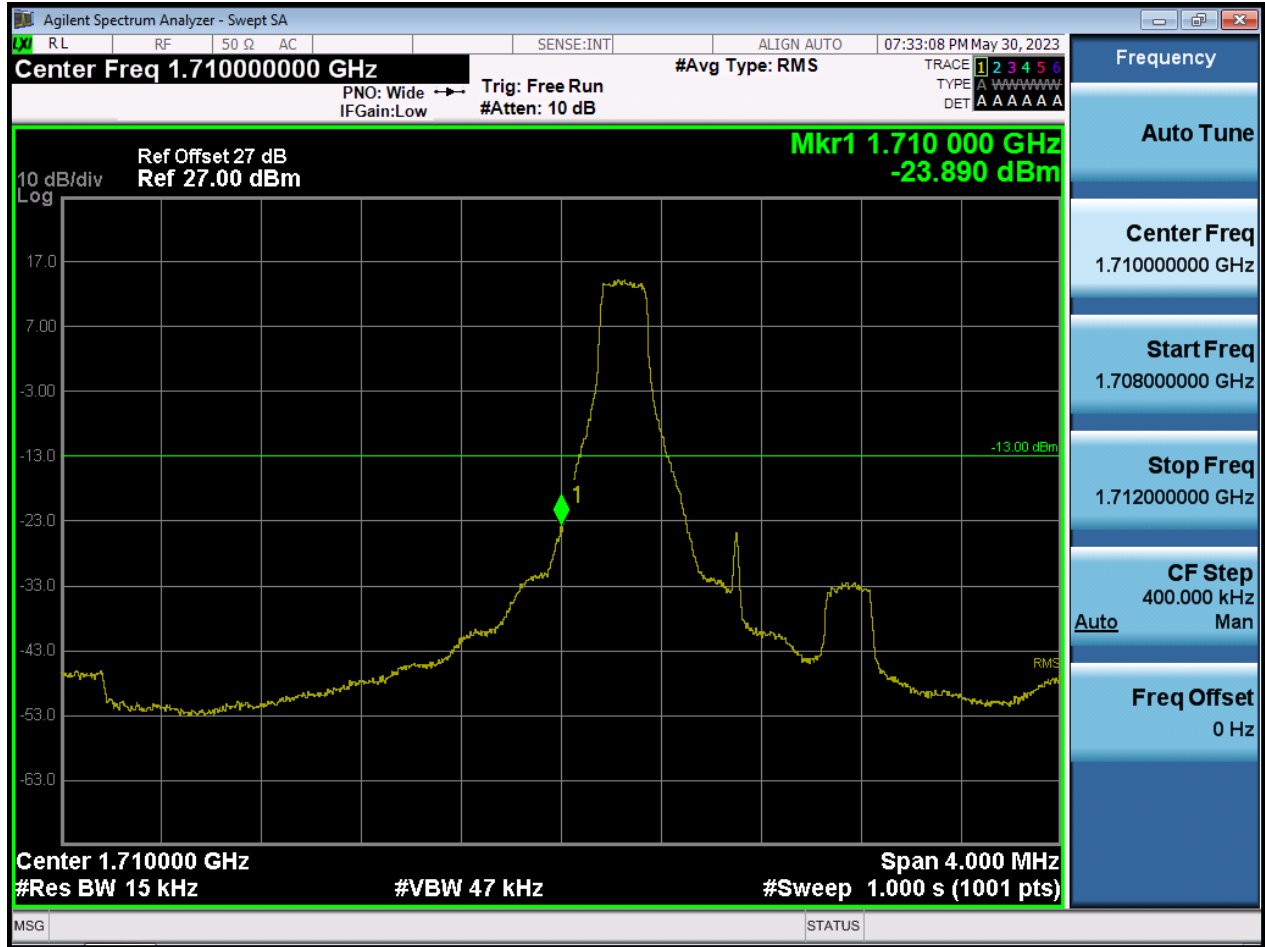
BW1.4 M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(1)



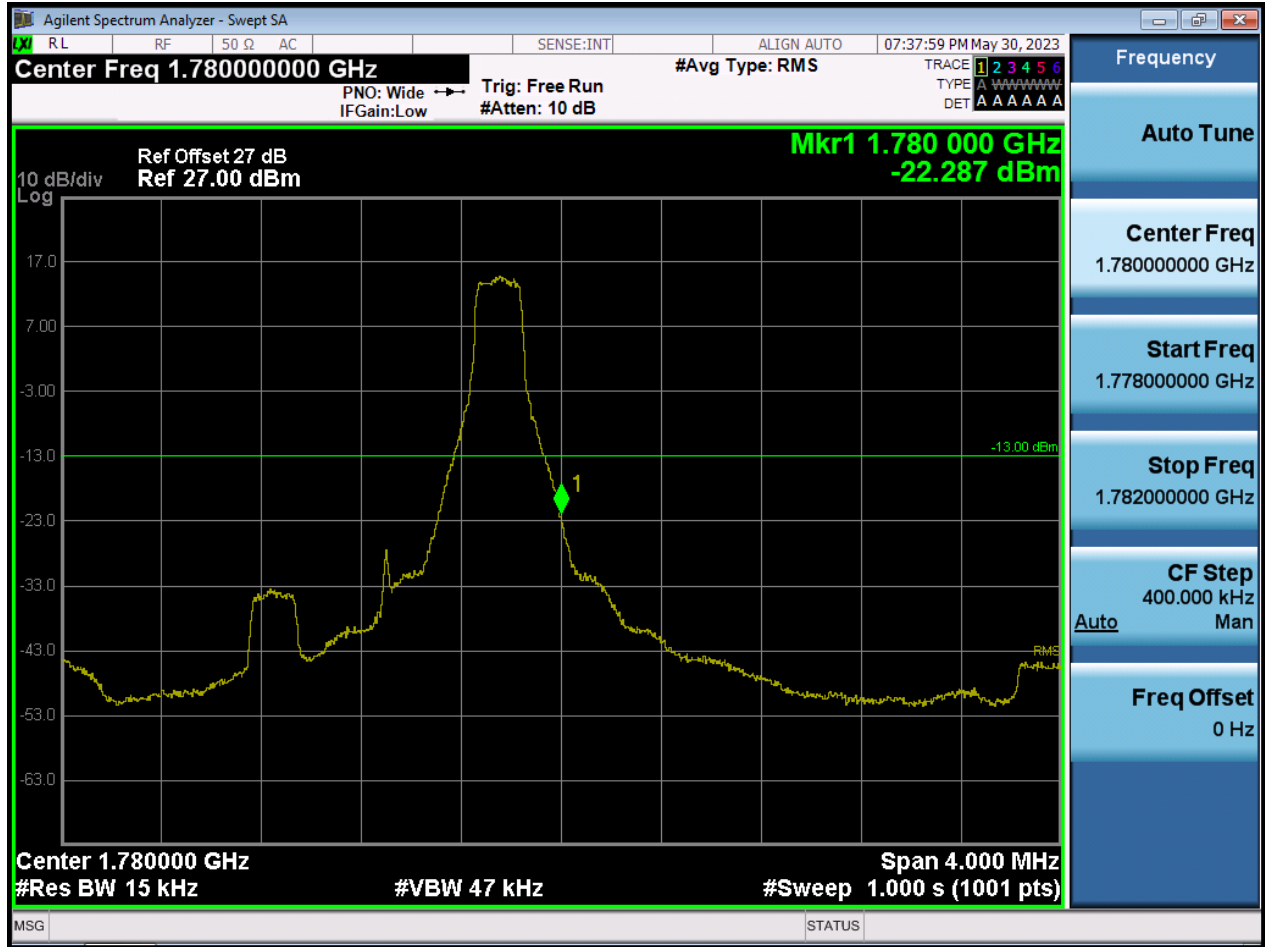
BW1.4 M\_BandEdge\_Highest Channel\_QPSK\_FullIRB(2)



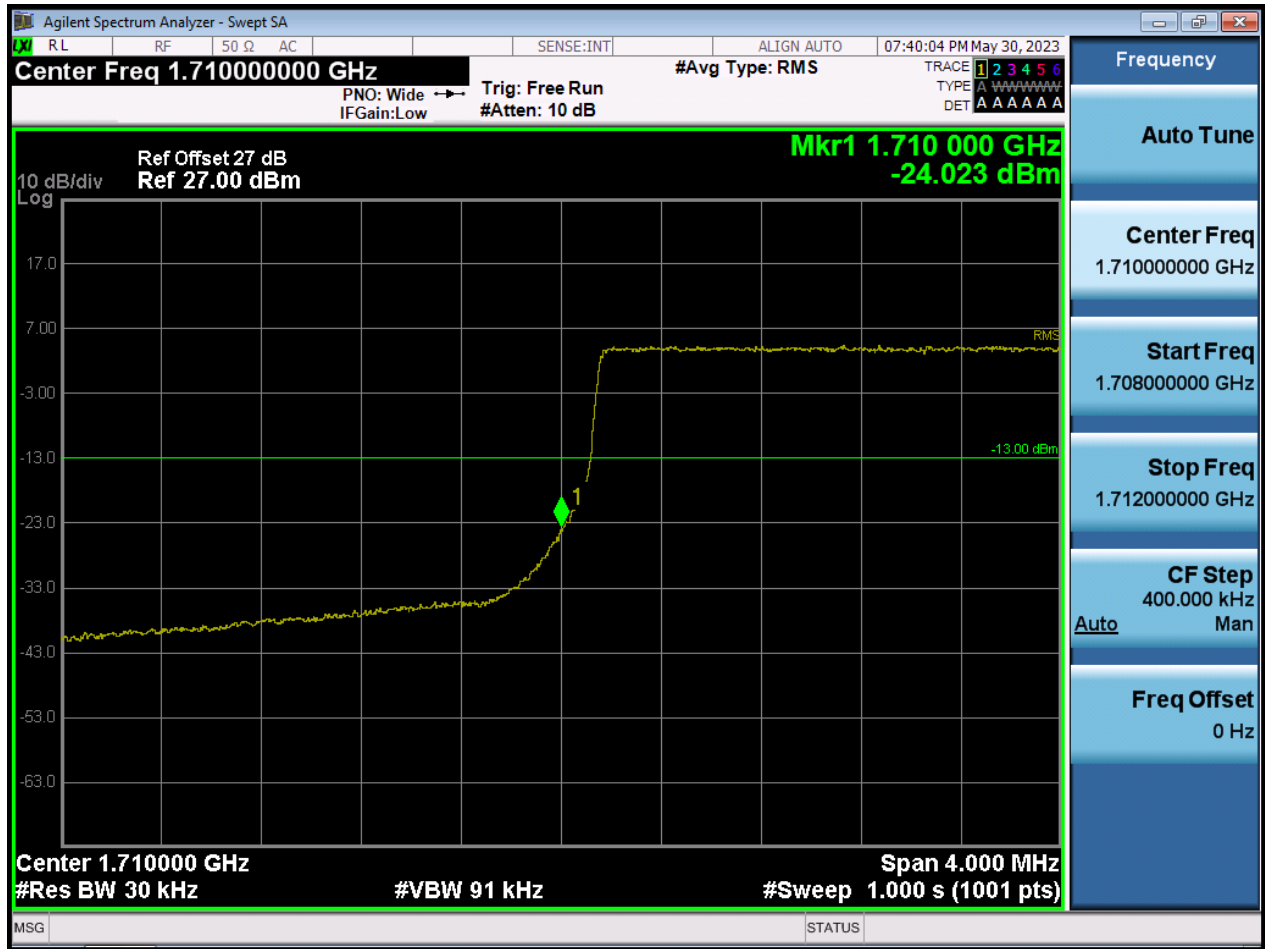
BW1.4 M\_BandEdge\_Lowest Channel\_QPSK\_1RB



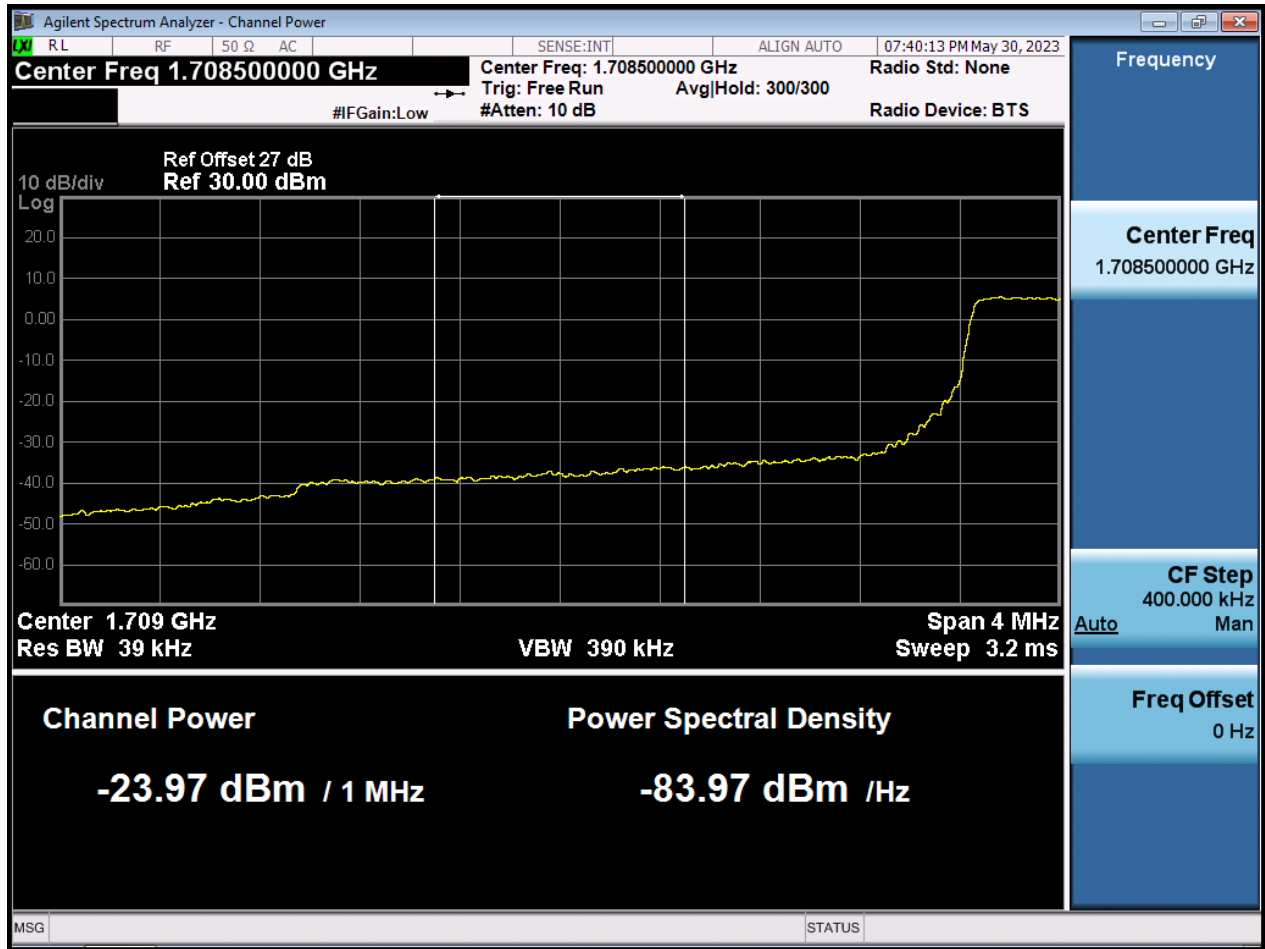
BW1.4 M\_BandEdge\_Highest Channel\_QPSK\_1RB



BW3 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1)



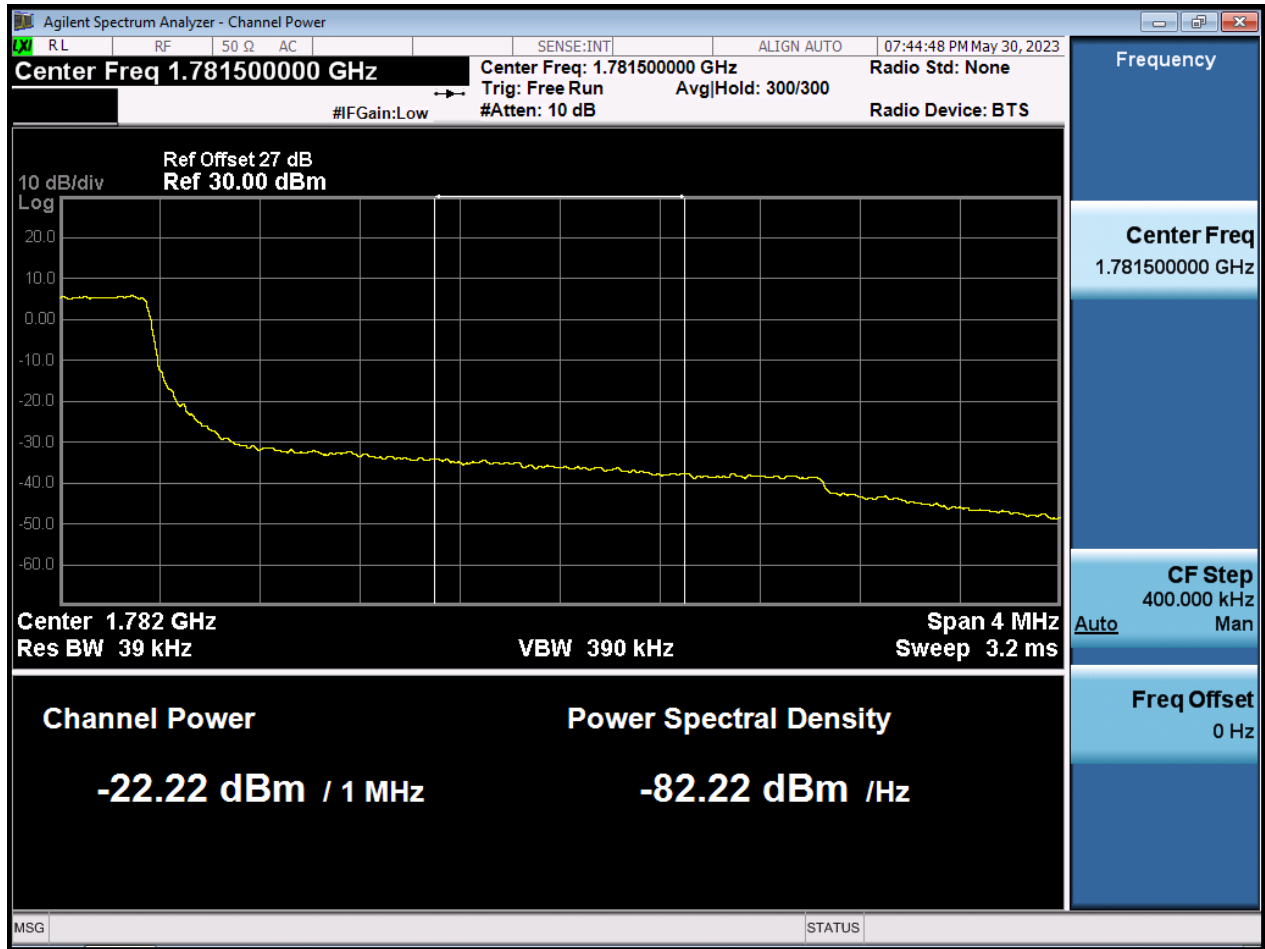
BW3 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(2)



BW3 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1)

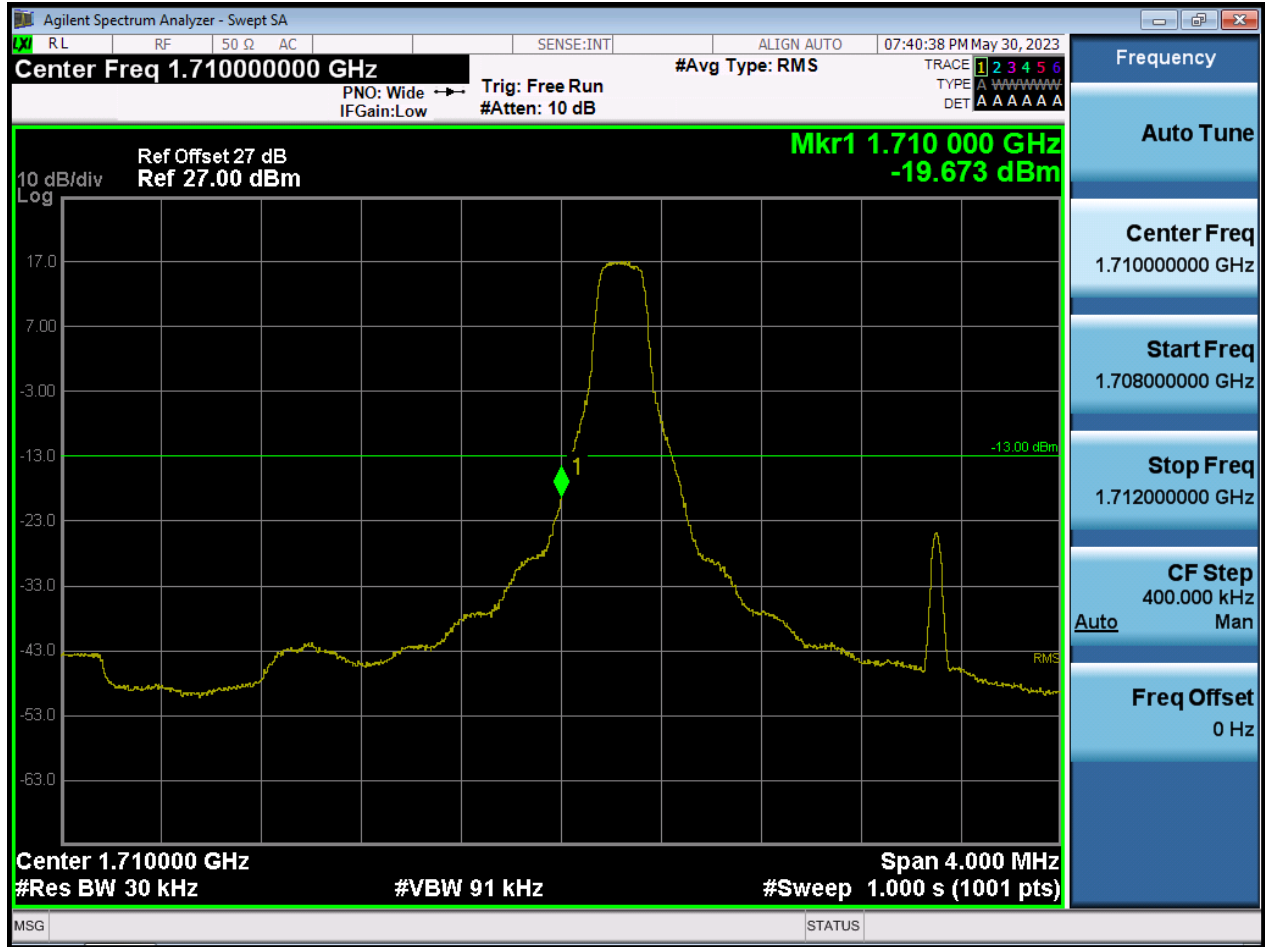


BW3 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2)





BW3 M\_BandEdge\_Lowest Channel\_QPSK\_1RB



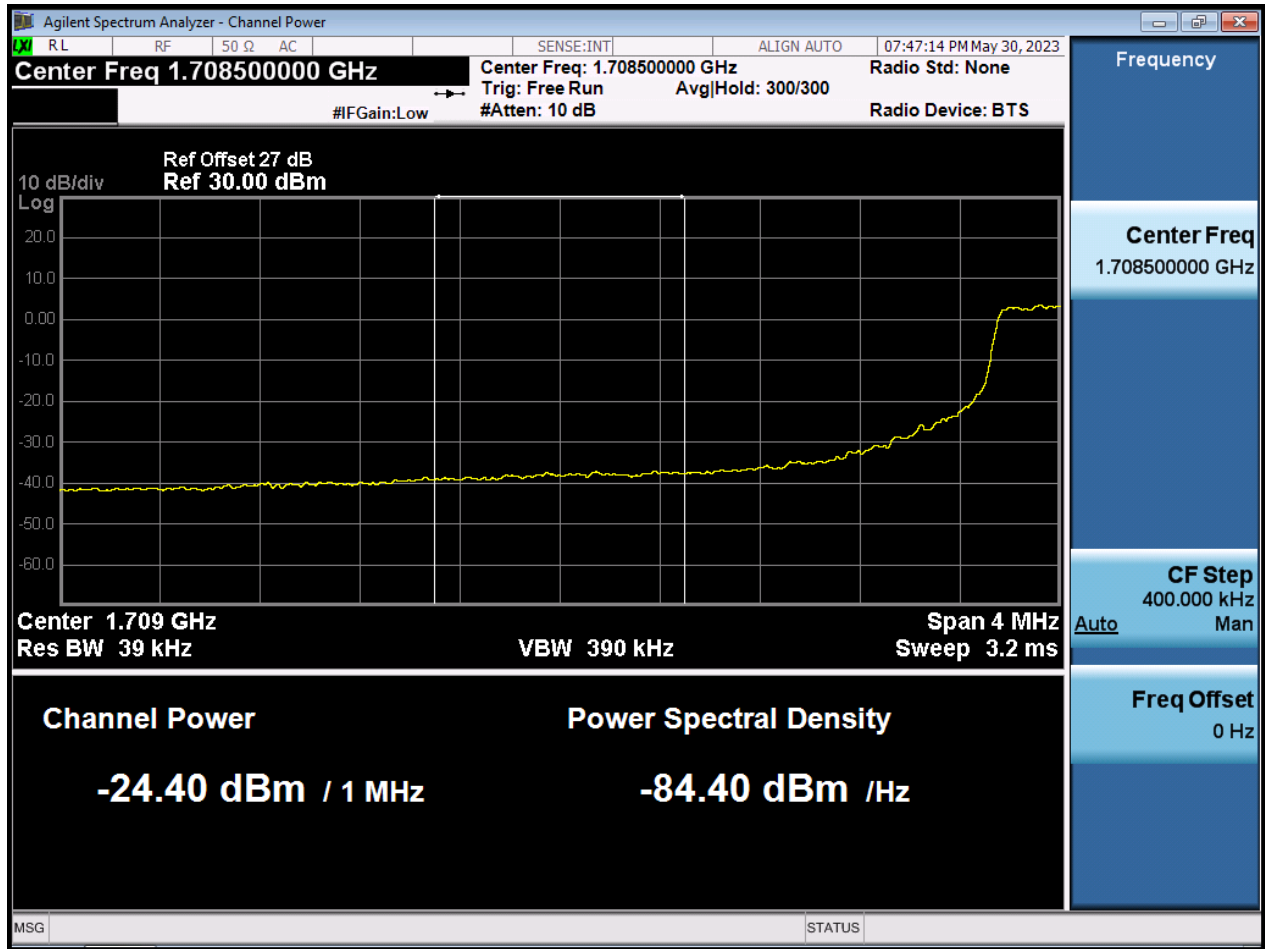
BW3 M\_BandEdge\_Highest Channel\_QPSK\_1RB



BW5 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1)



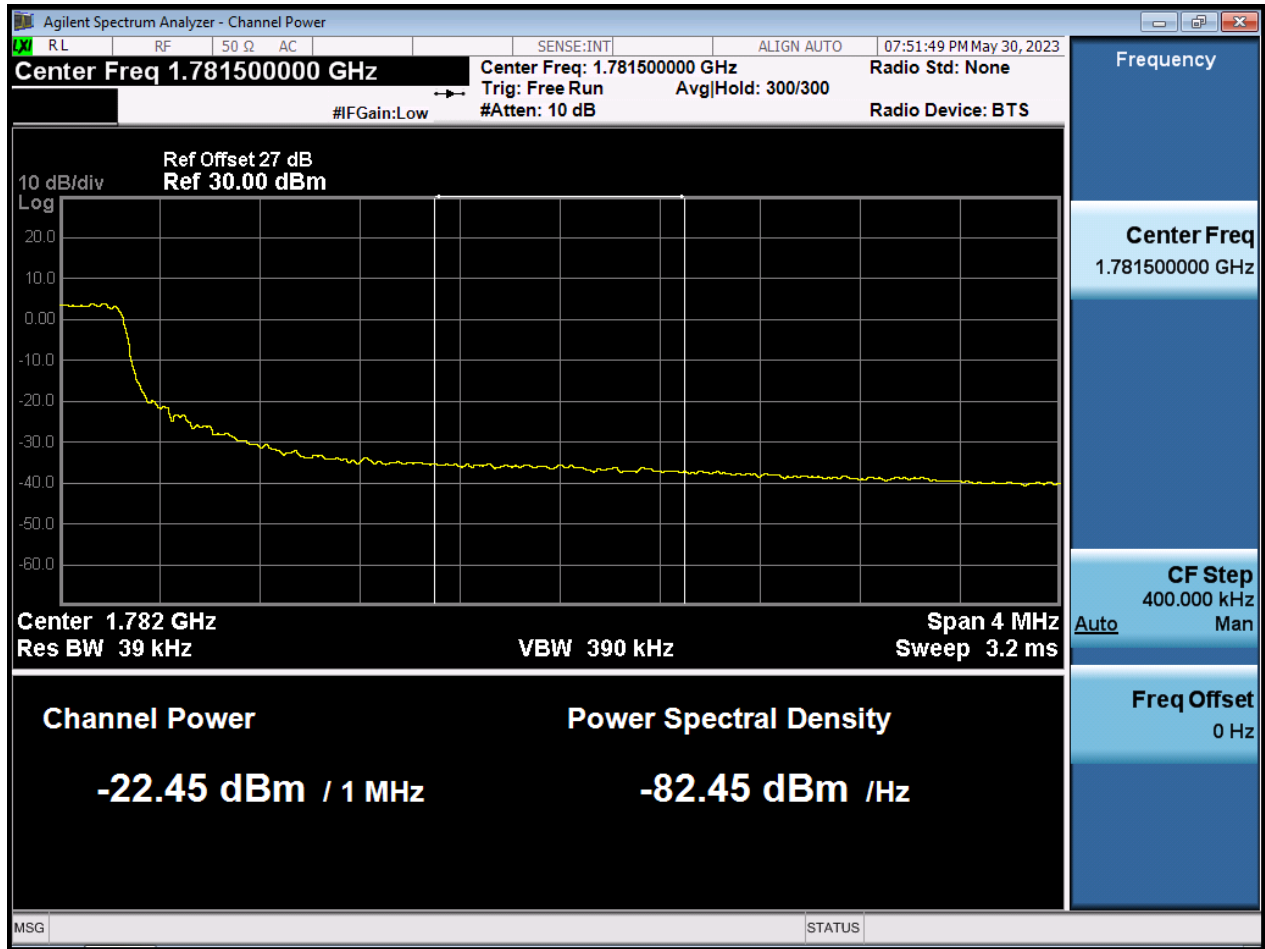
BW5 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(2)



BW5 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1)



BW5 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2)



BW5 M\_BandEdge\_Lowest Channel\_QPSK\_1RB



BW5 M\_BandEdge\_Highest Channel\_QPSK\_1RB

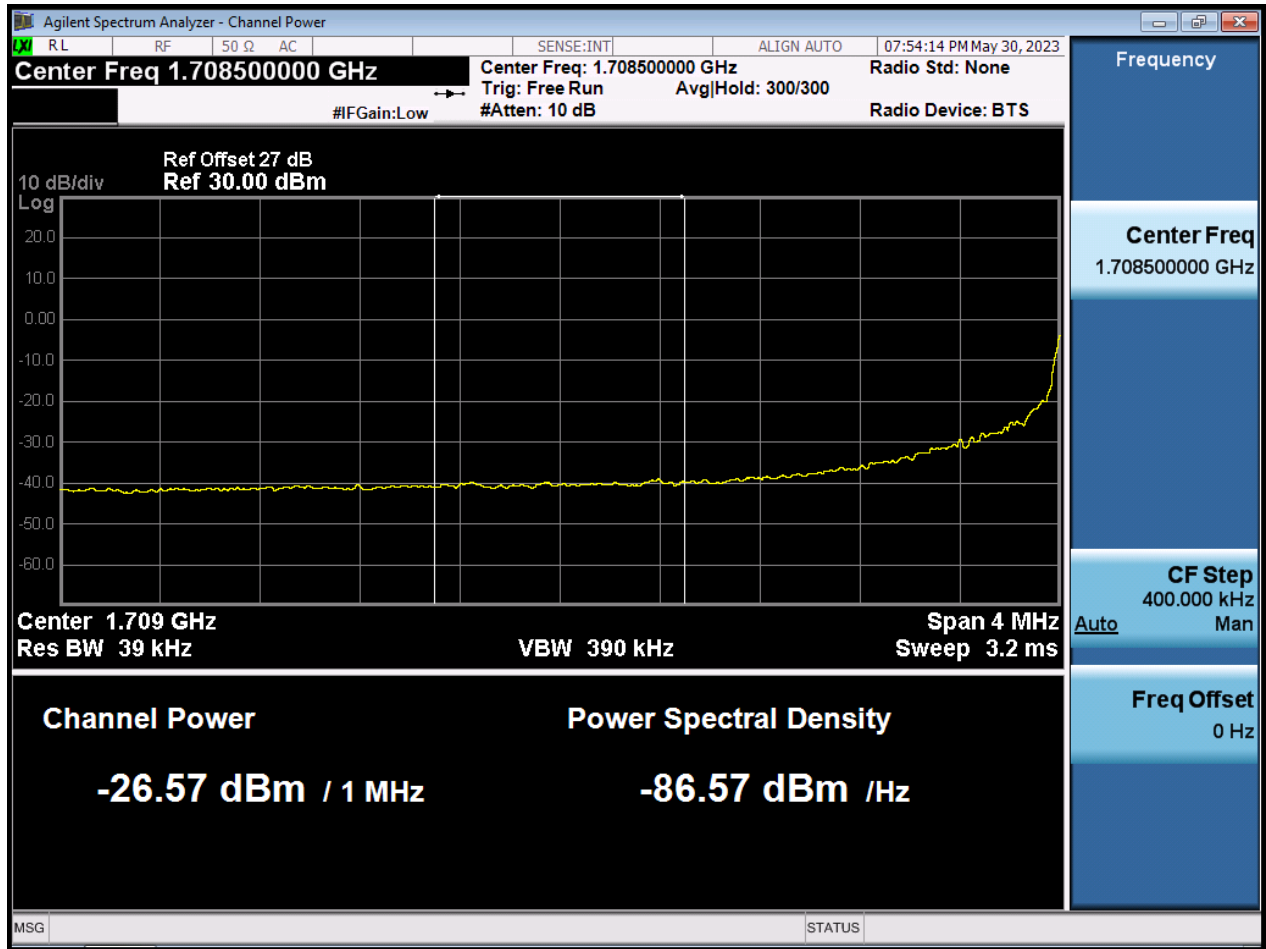




BW10 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1)



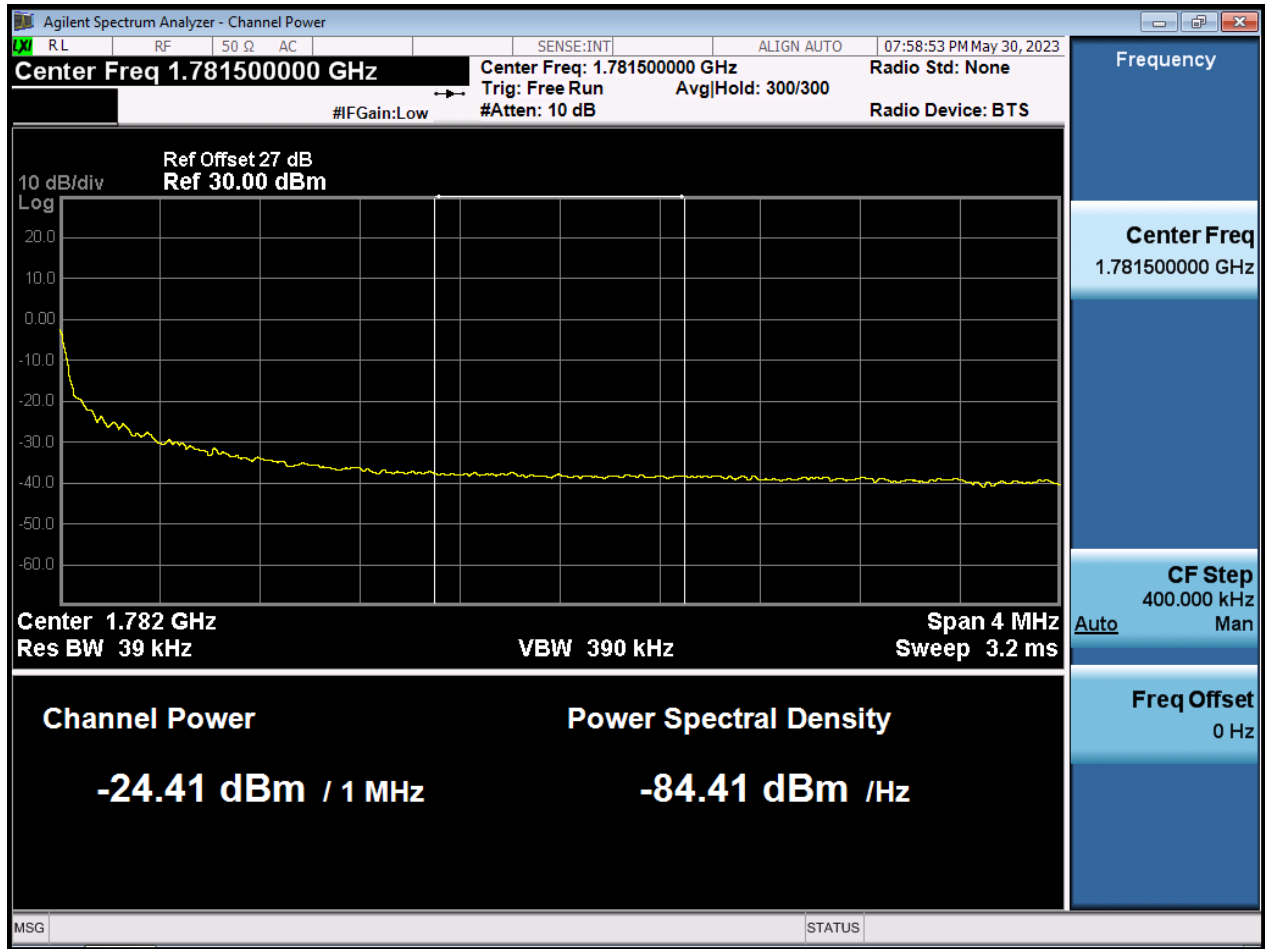
BW10 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2)



BW10 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1)



BW10 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2)



BW10 M\_BandEdge\_Lowest Channel\_QPSK\_1RB



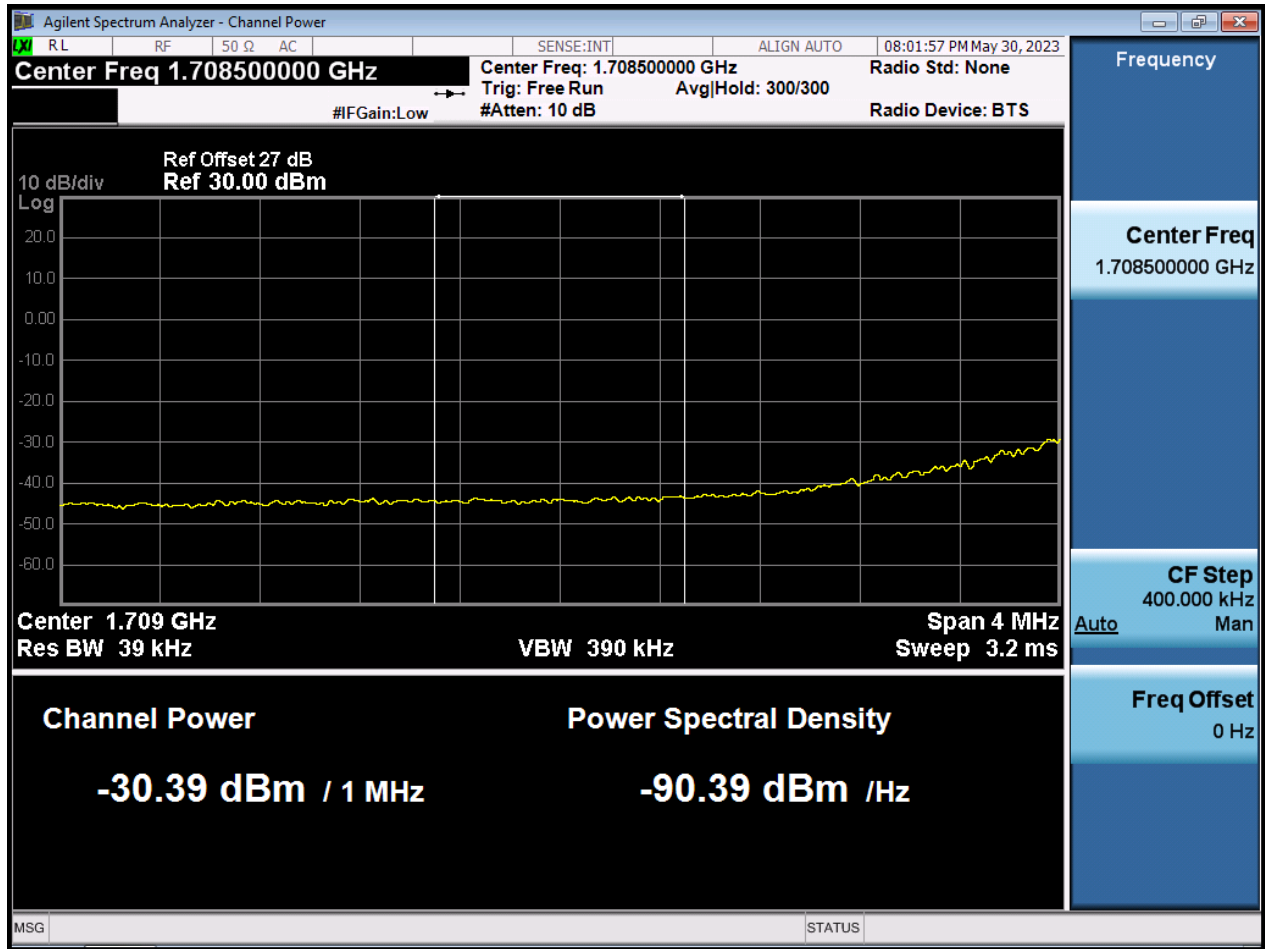
BW10 M\_BandEdge\_Highest Channel\_QPSK\_1RB



BW15 M\_BandEdge\_Lowest Channel\_QPSK\_FullIRB(1)



BW15 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2)

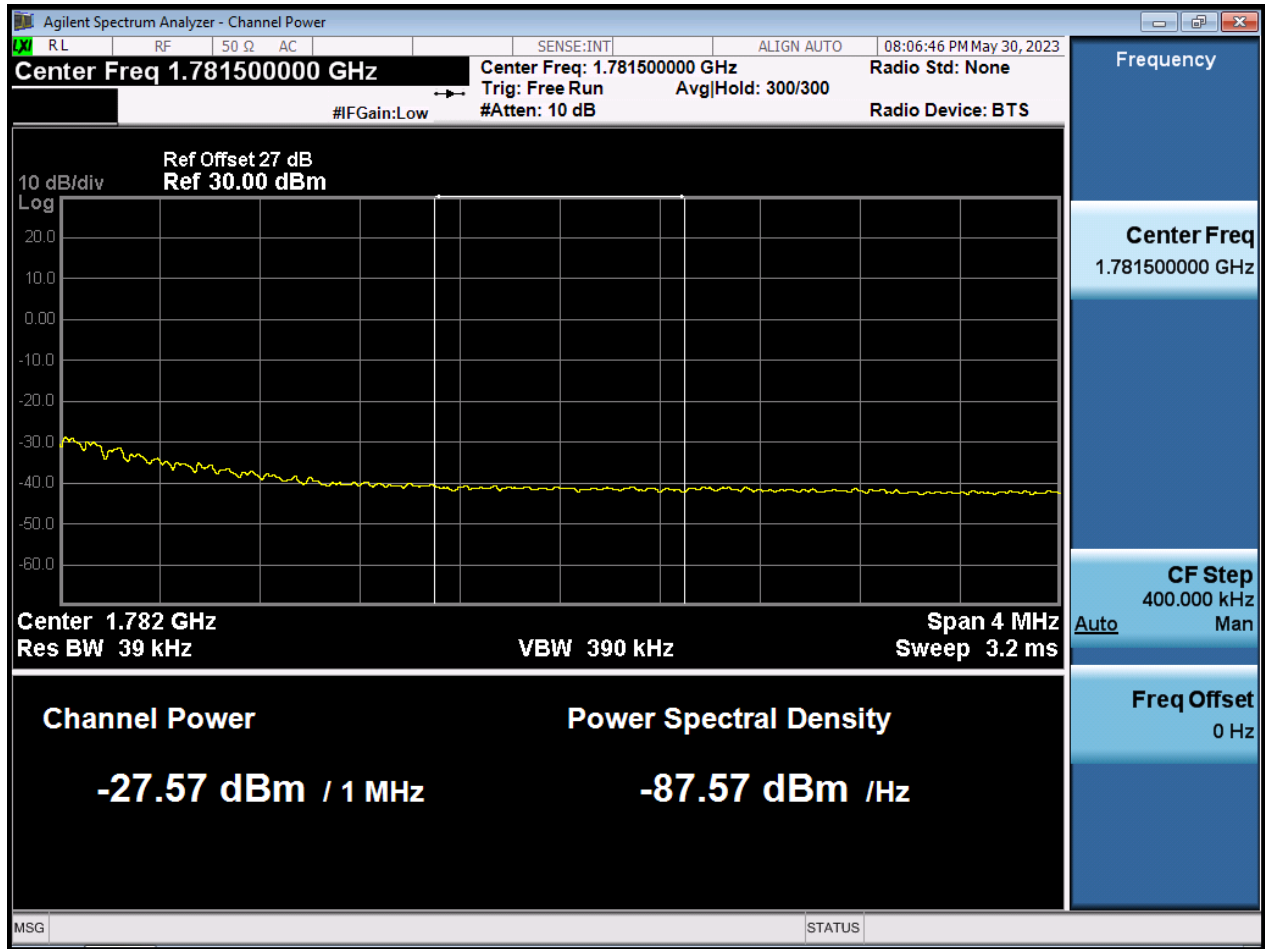




BW15 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1)



BW15 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2)



BW15 M\_BandEdge\_Lowest Channel\_QPSK\_1RB



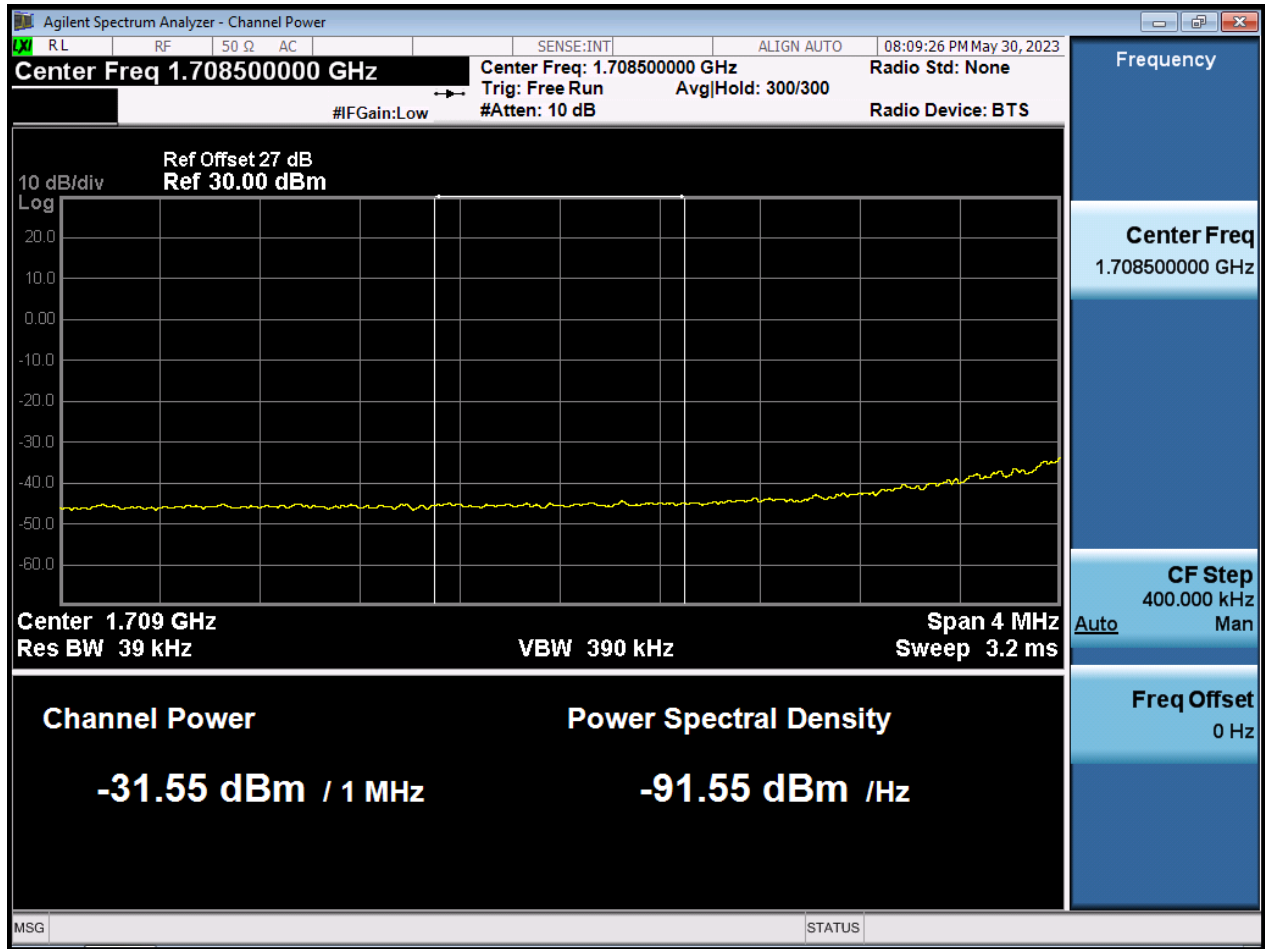
BW15 M\_BandEdge\_Highest Channel\_QPSK\_1RB



BW20 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(1)



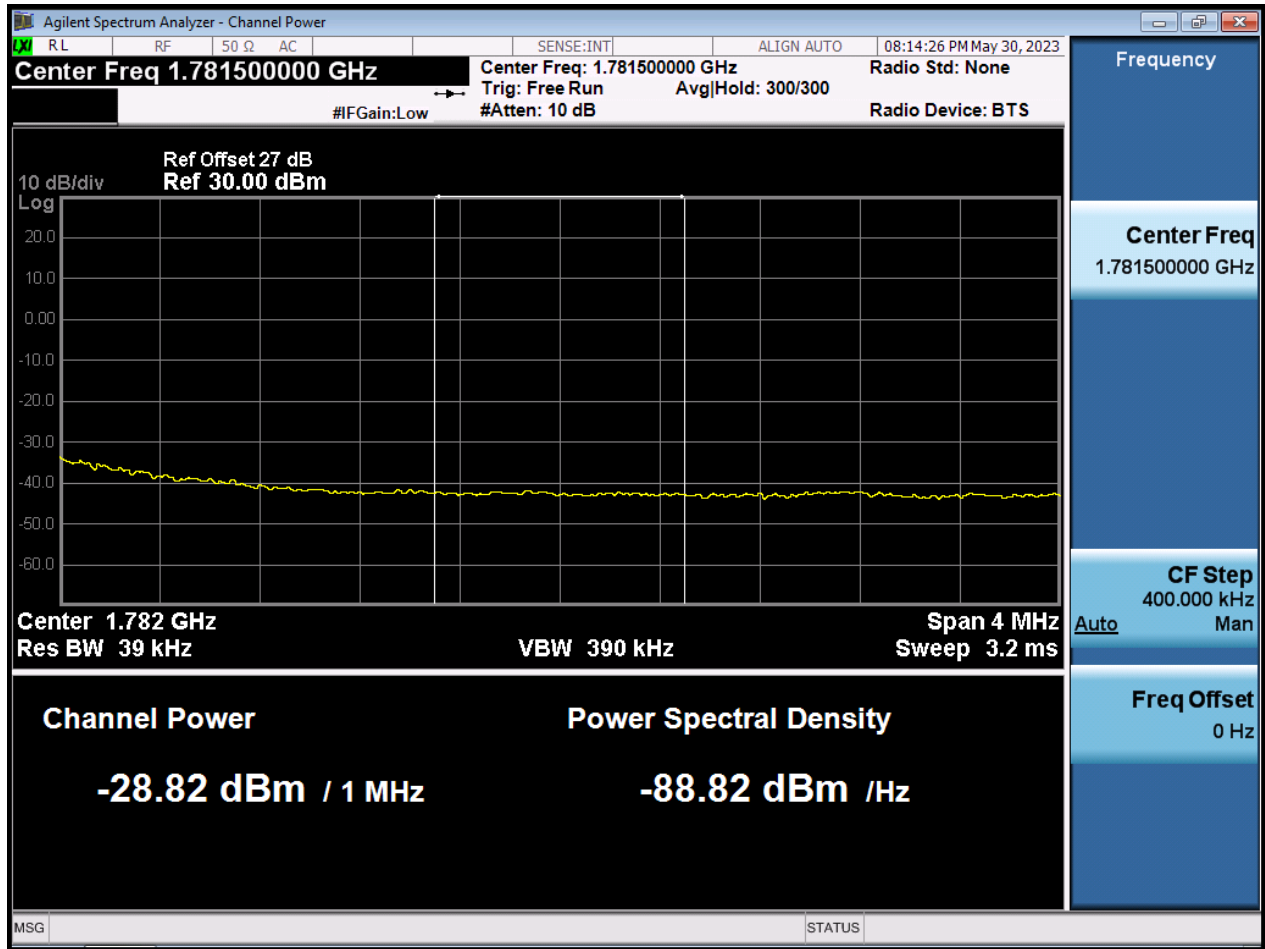
BW20 M\_BandEdge\_Lowest Channel\_QPSK\_FullRB(2)



BW20 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(1)



BW20 M\_BandEdge\_Highest Channel\_QPSK\_FullRB(2)





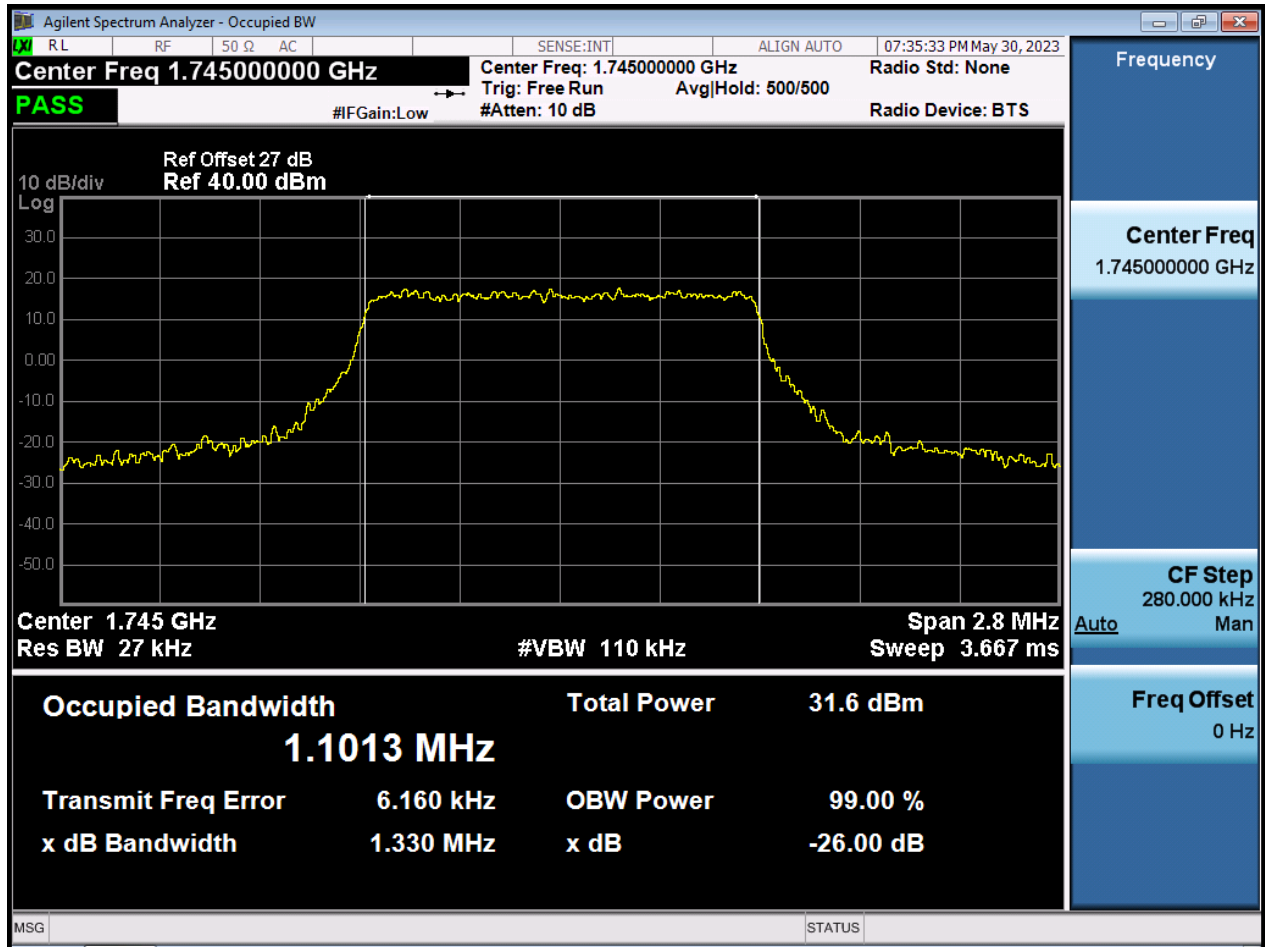
BW20 M\_BandEdge\_Lowest Channel\_QPSK\_1RB



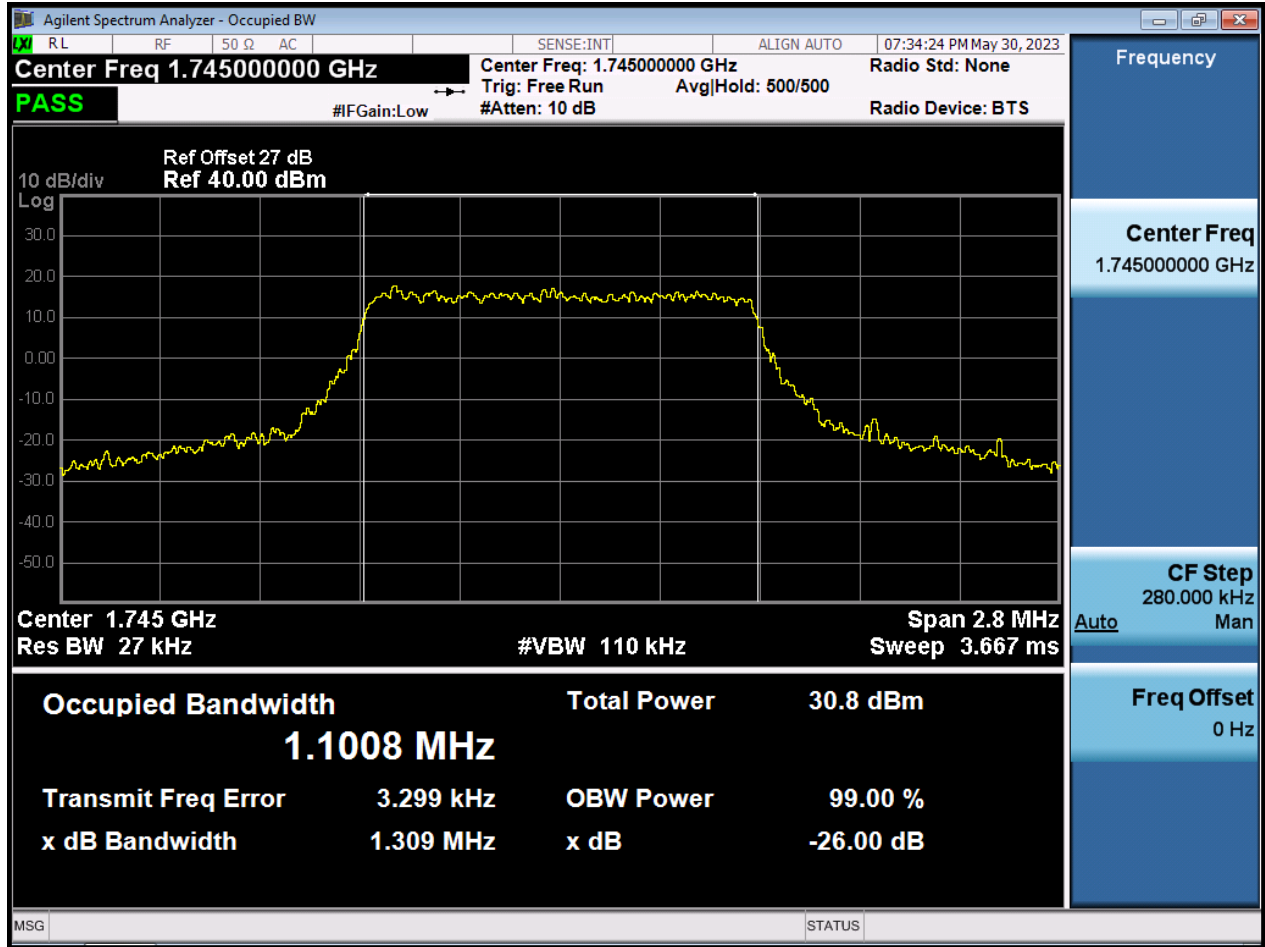
BW20 M\_BandEdge\_Highest Channel\_QPSK\_1RB



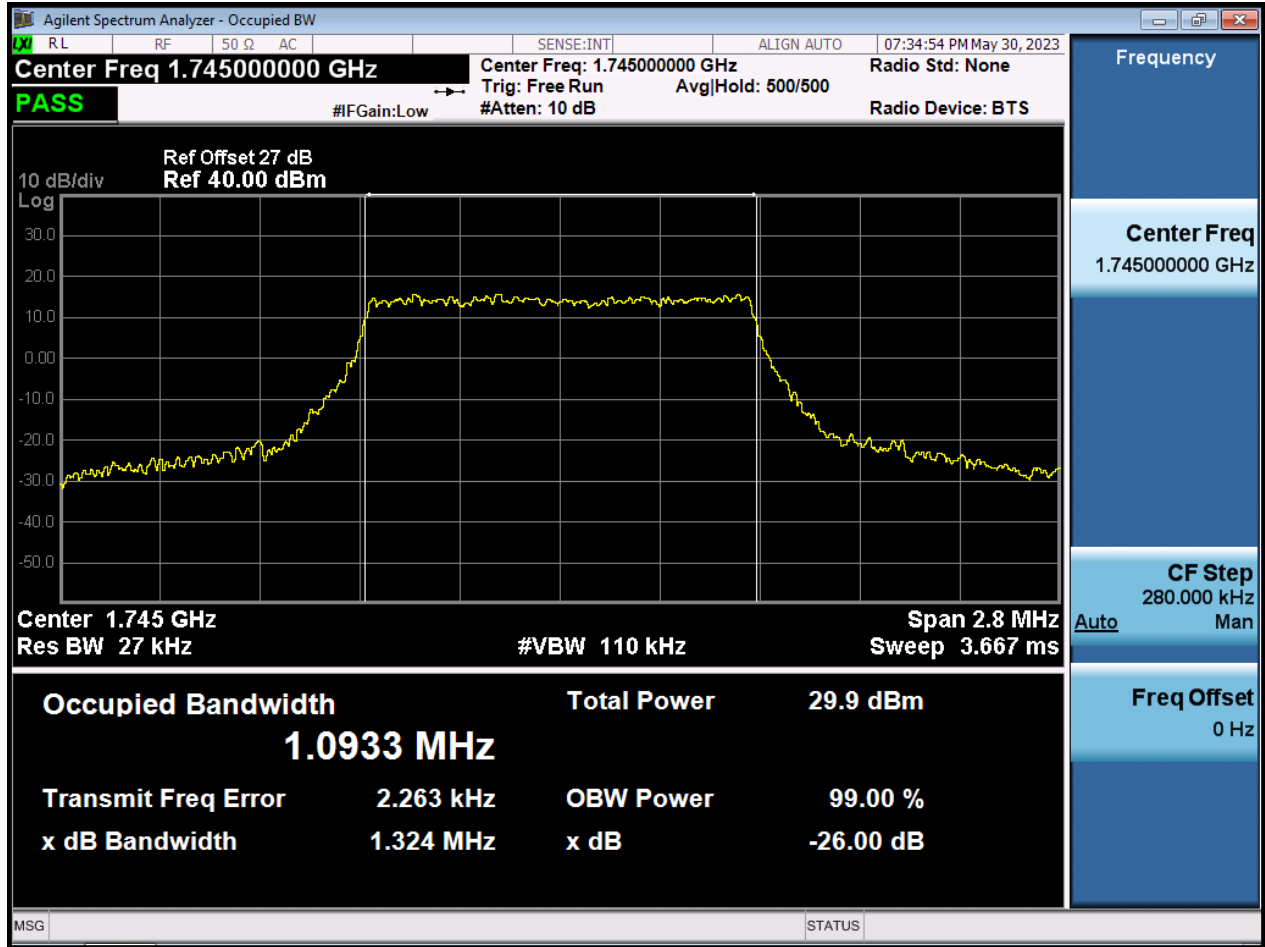
BW1.4 M\_OBW\_Middle Channel\_QPSK\_FullRB



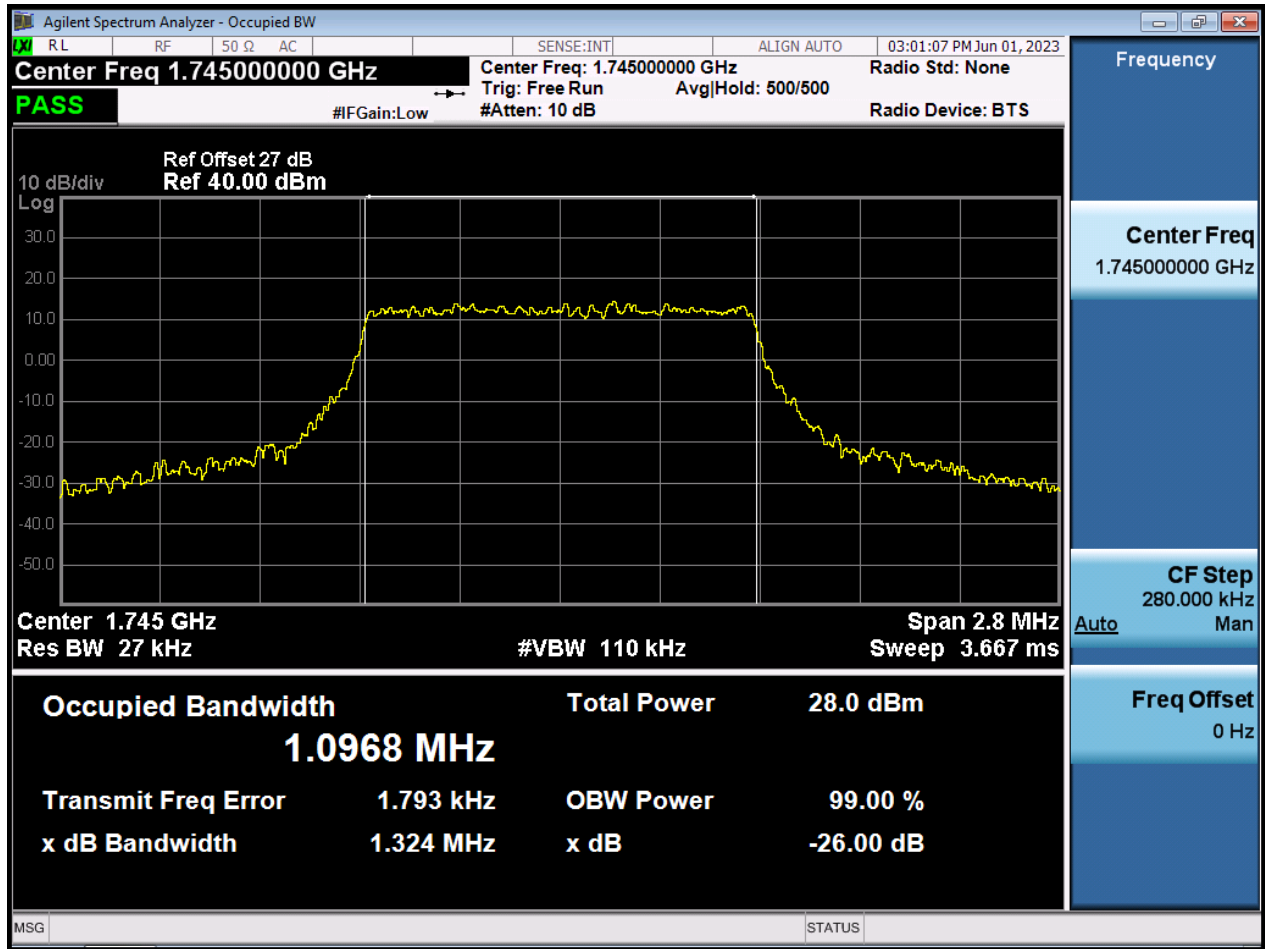
BW1.4 M\_OBW\_Middle Channel\_16QAM\_FullRB



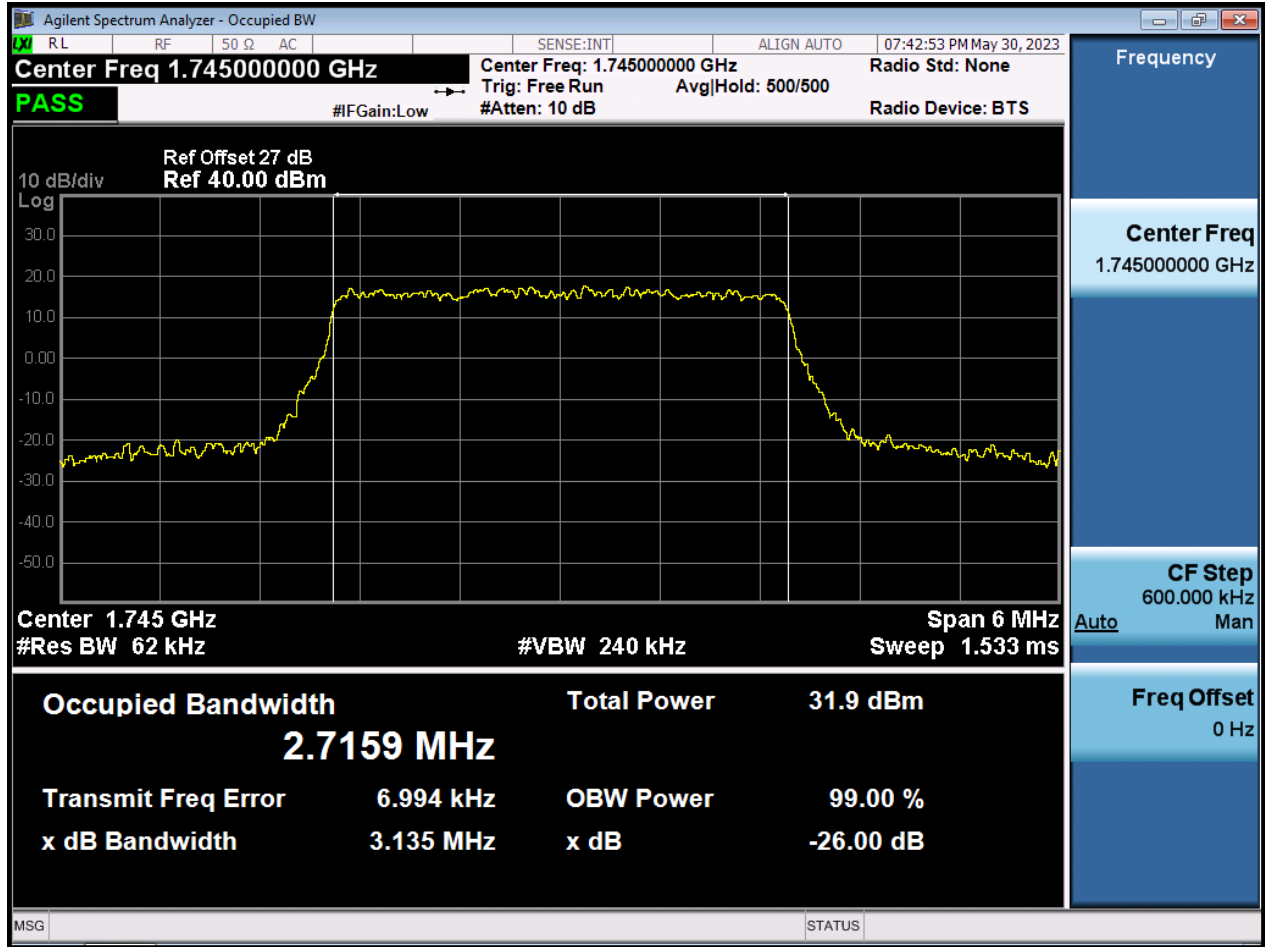
BW1.4 M\_OBW\_Middle Channel\_64QAM\_FullIRB



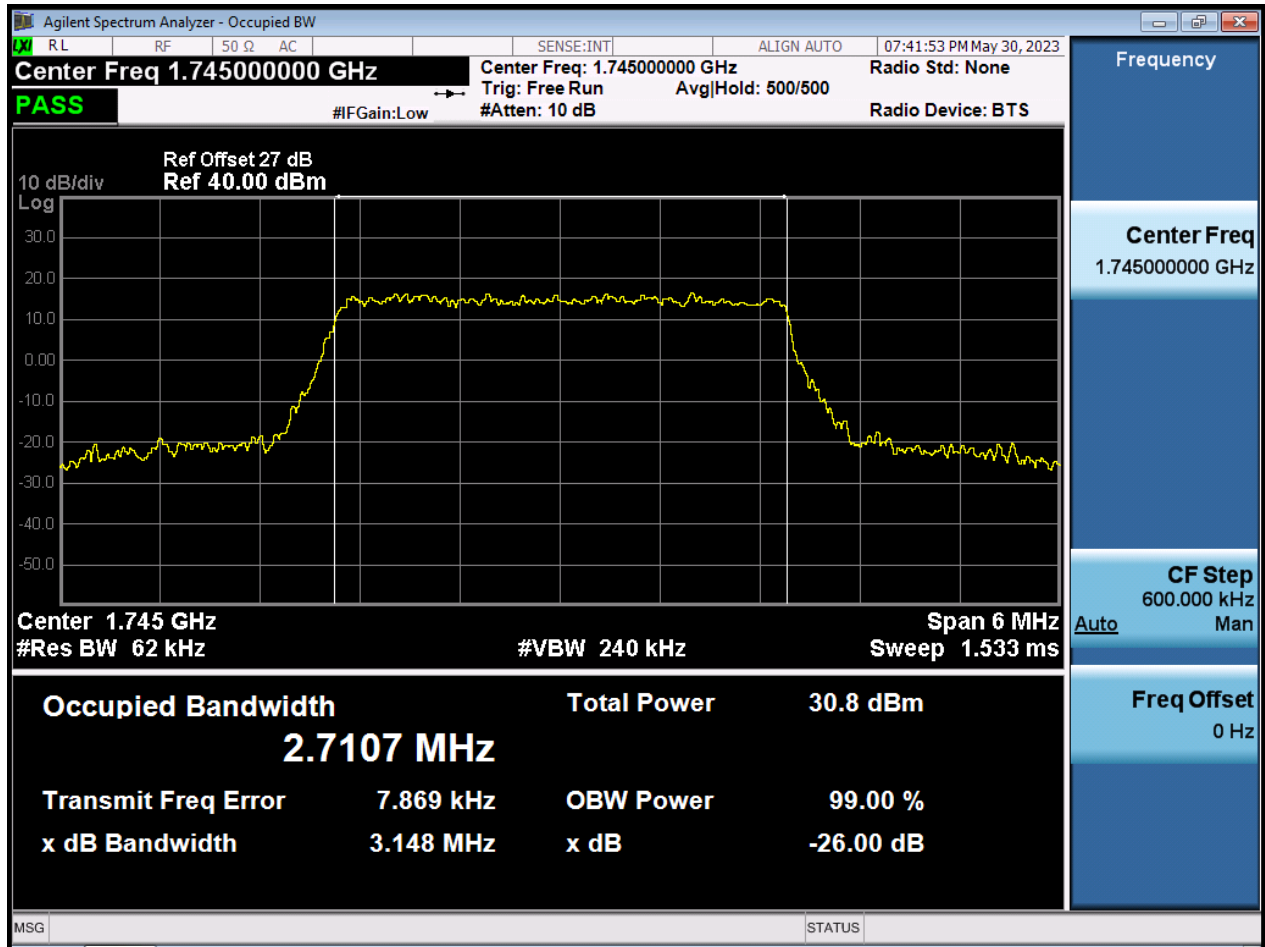
BW1.4 M\_OBW\_Middle Channel\_256QAM\_FullRB



BW3 M\_OBW\_Middle Channel\_QPSK\_FullIRB

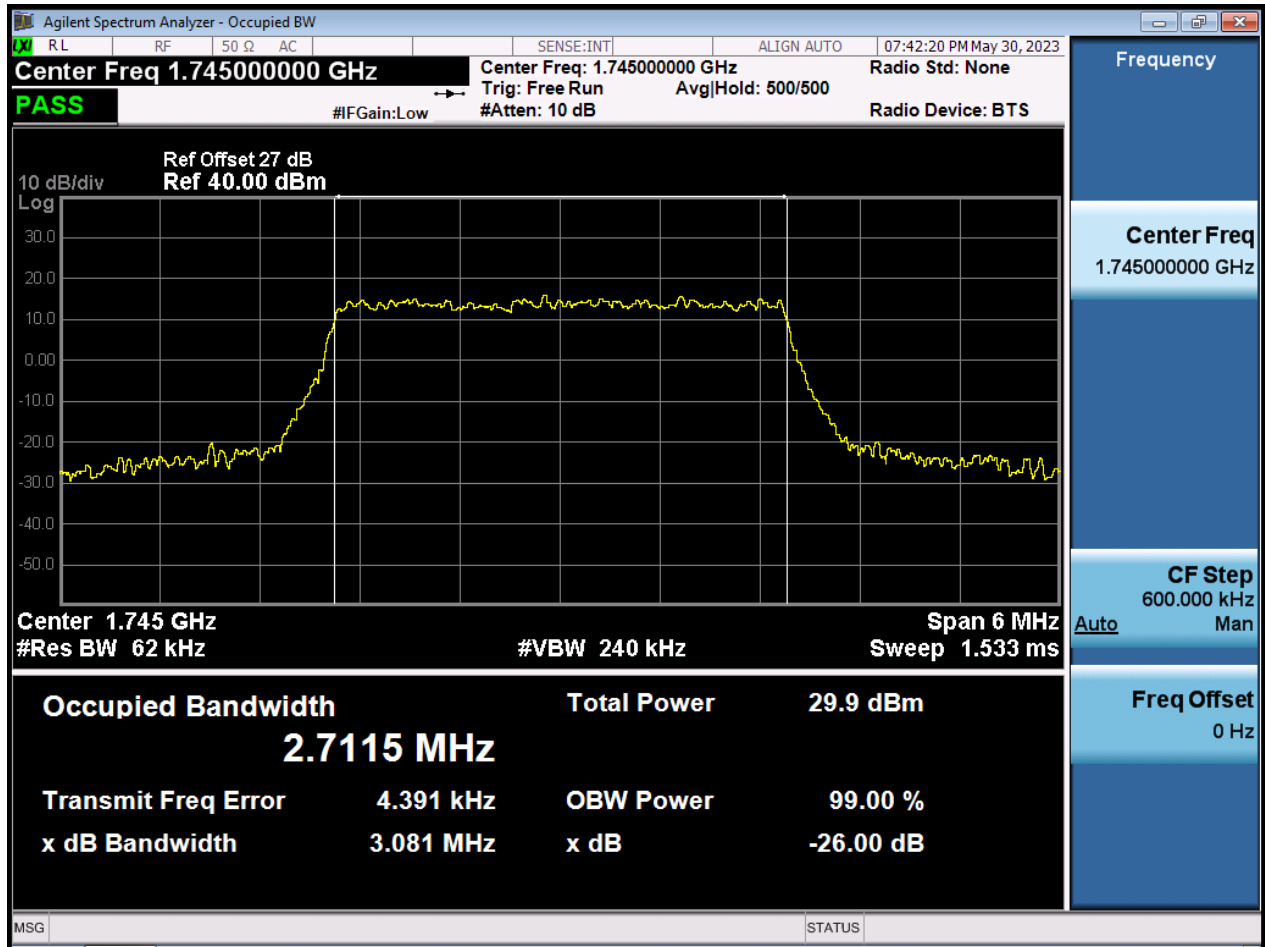


BW3 M\_OBW\_Middle Channel\_16QAM\_FullRB

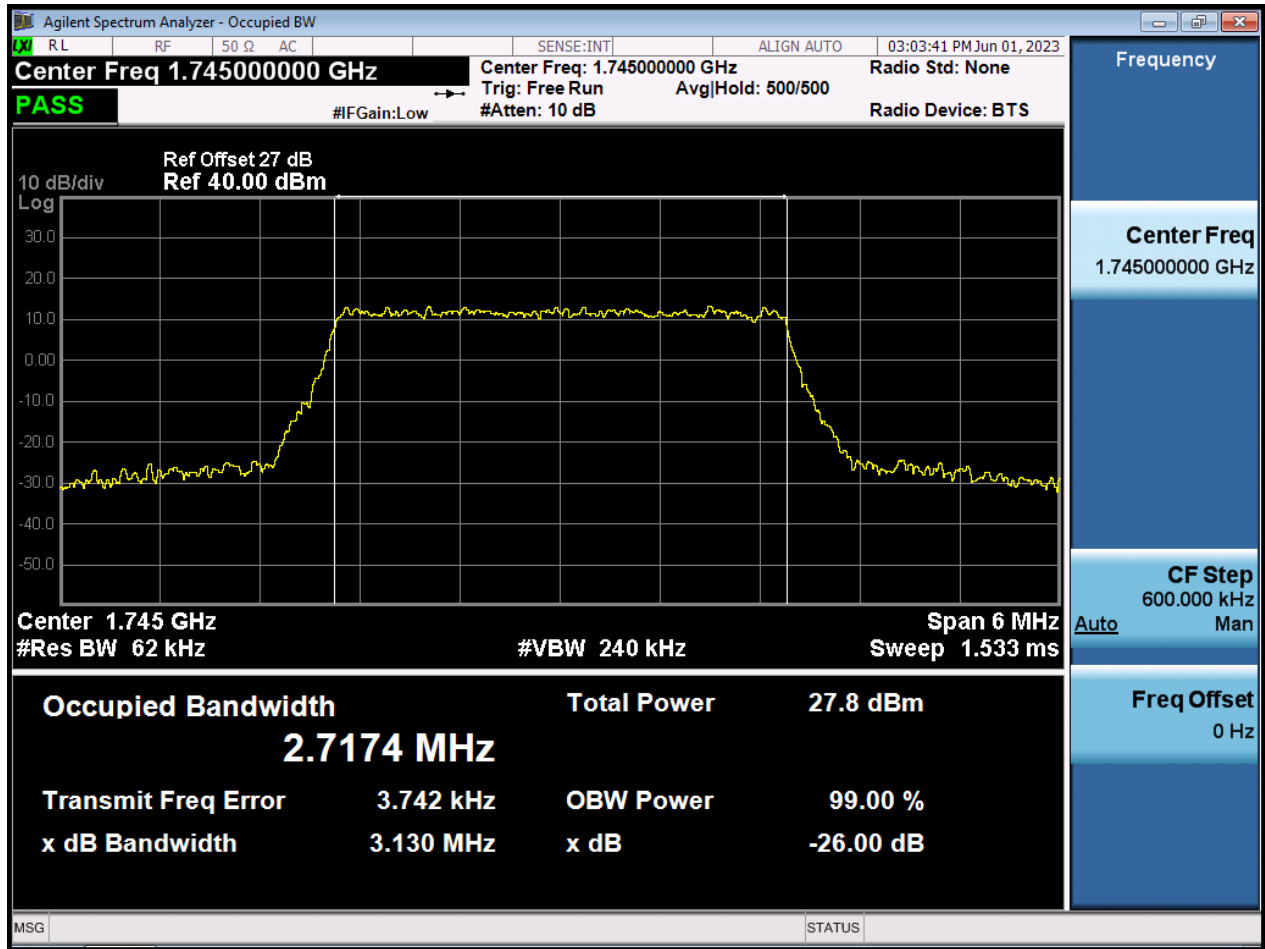




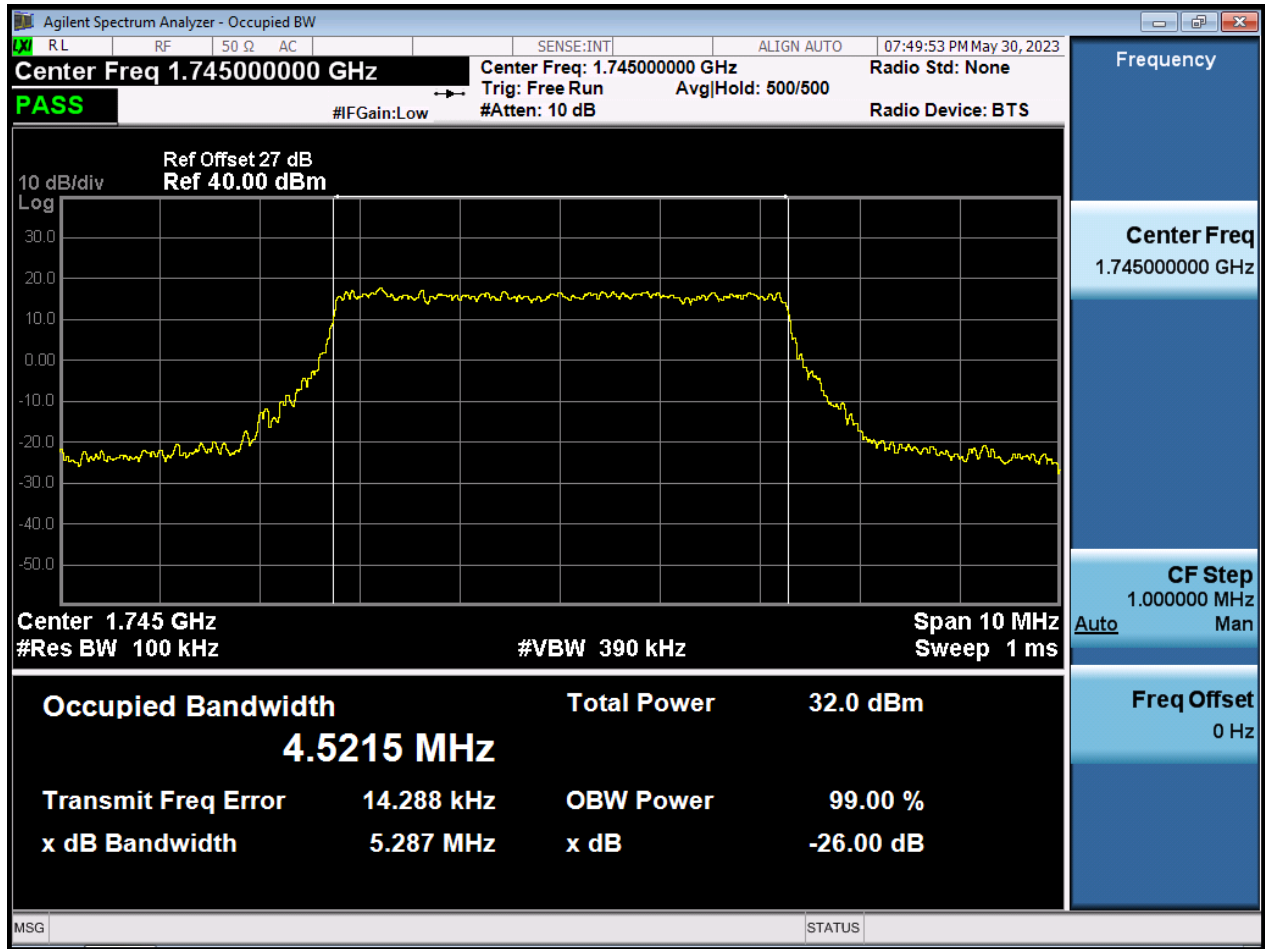
BW3 M\_OBW\_Middle Channel\_64QAM\_FullRB



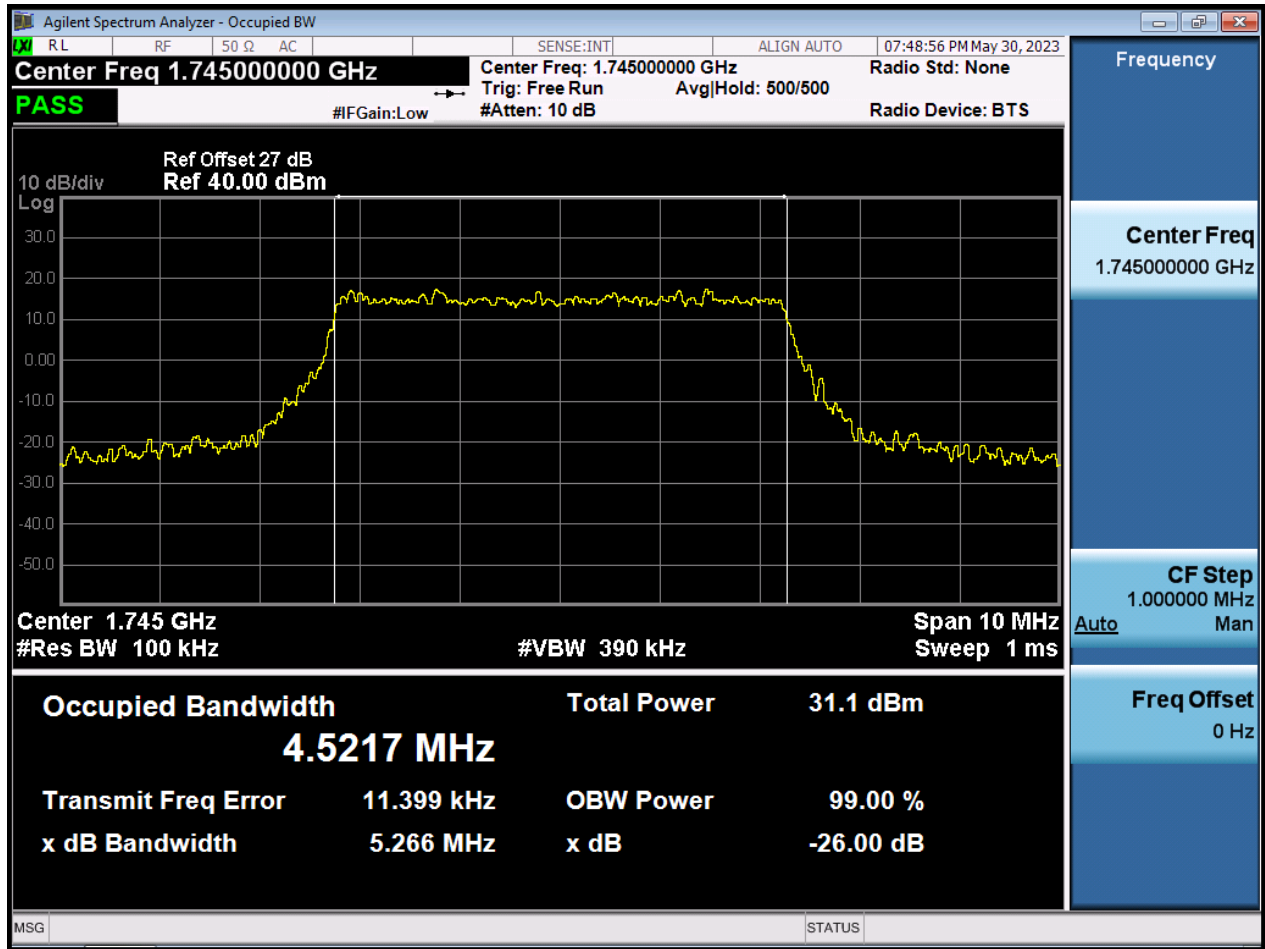
BW3 M\_OBW\_Middle Channel\_256QAM\_FullIRB



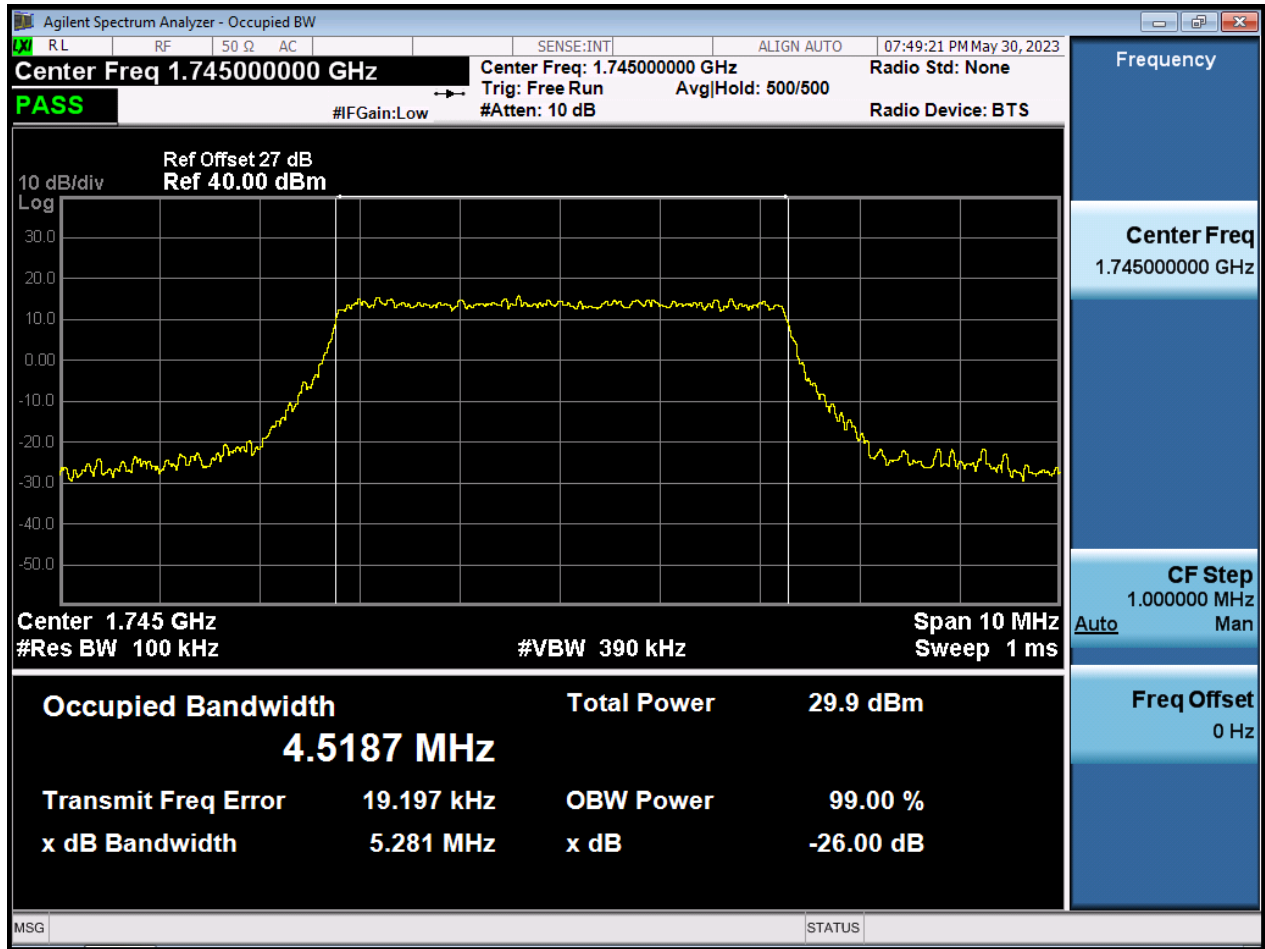
BW5 M\_OBW\_Middle Channel\_QPSK\_FullIRB



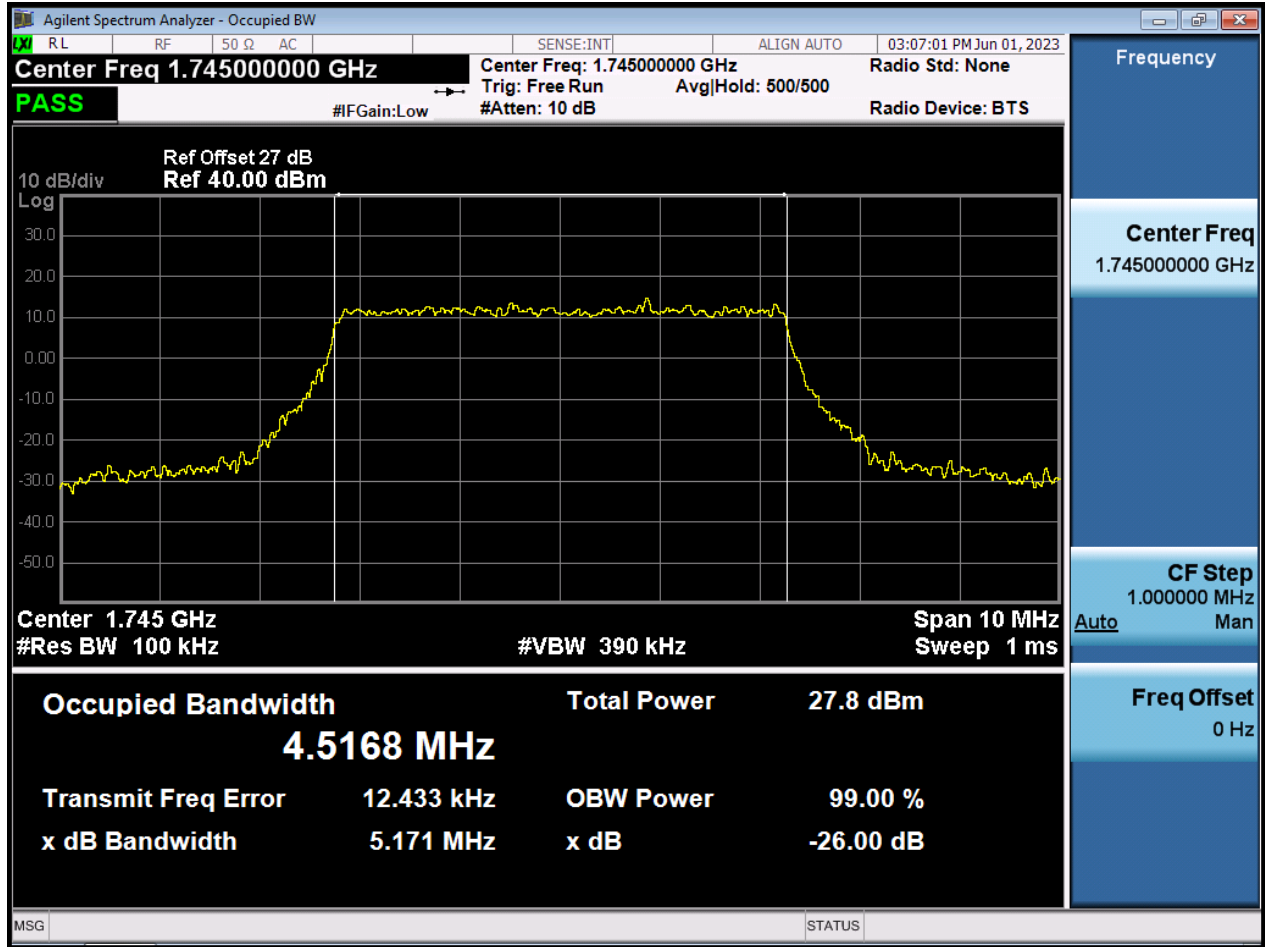
BW5 M\_OBW\_Middle Channel\_16QAM\_FullRB



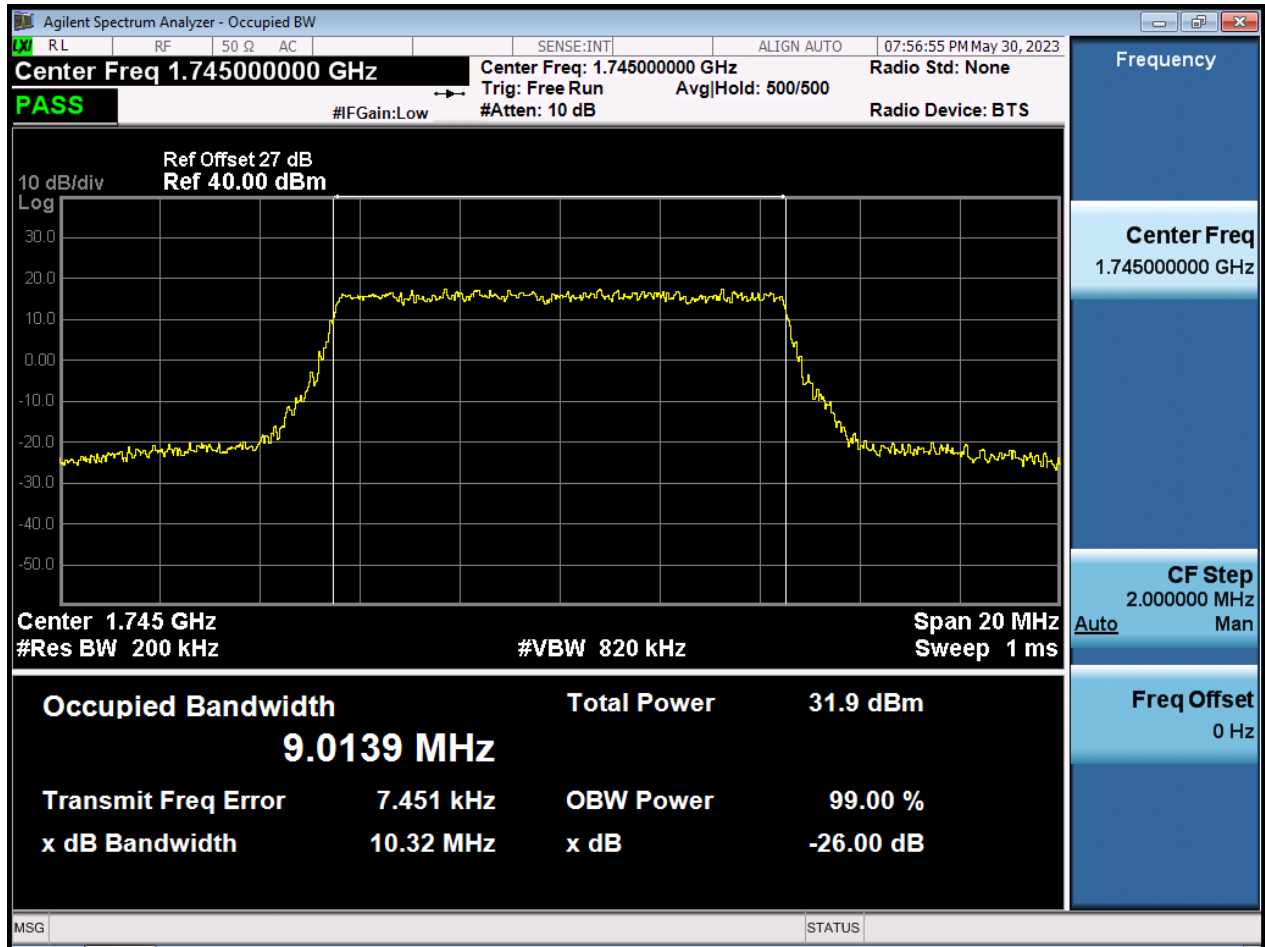
BW5 M\_OBW\_Middle Channel\_64QAM\_FullRB



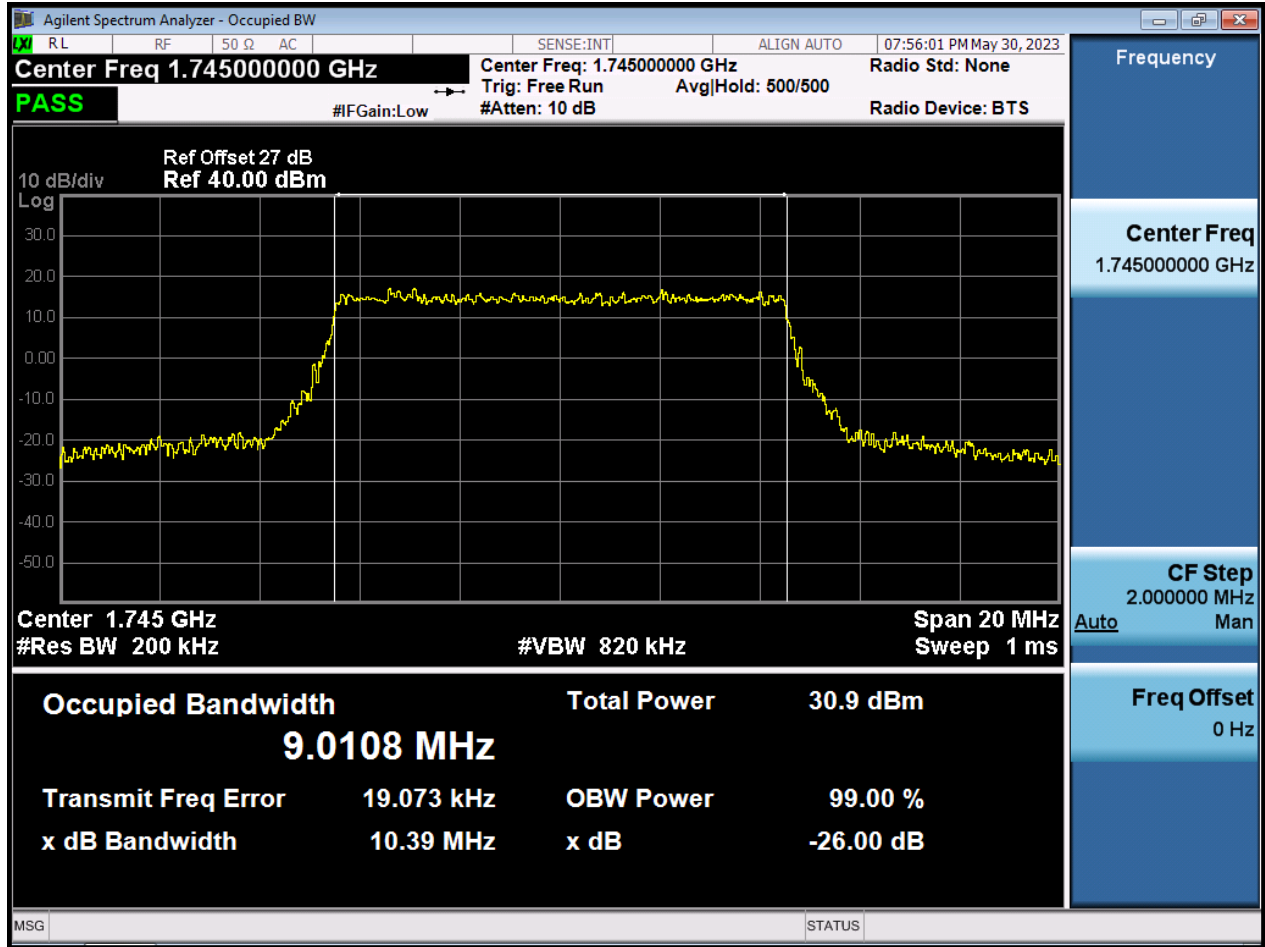
BW5 M\_OBW\_Middle Channel\_256QAM\_FullIRB



BW10 M\_OBW\_Middle Channel\_QPSK\_FullRB

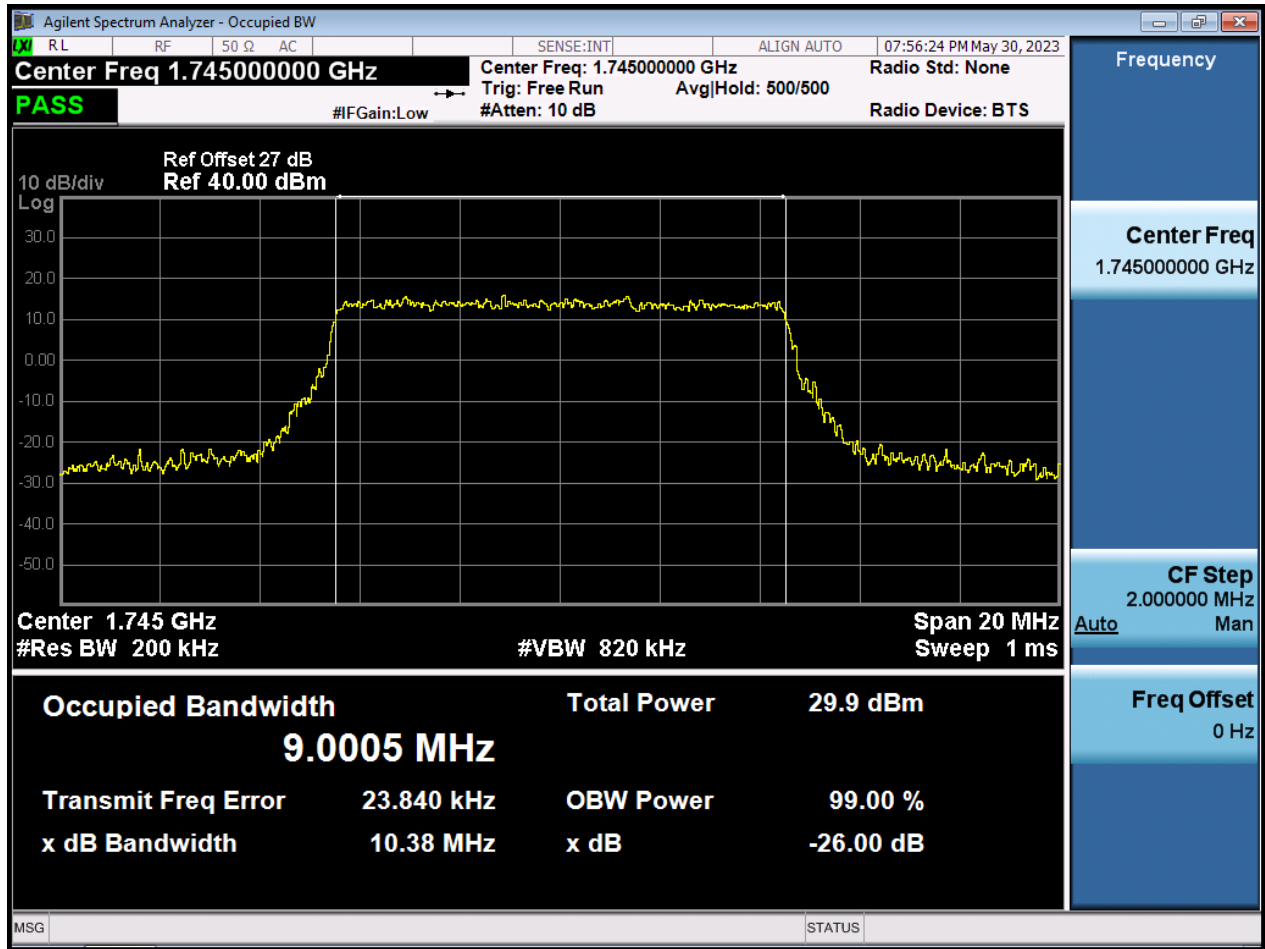


BW10 M\_OBW\_Middle Channel\_16QAM\_FullIRB

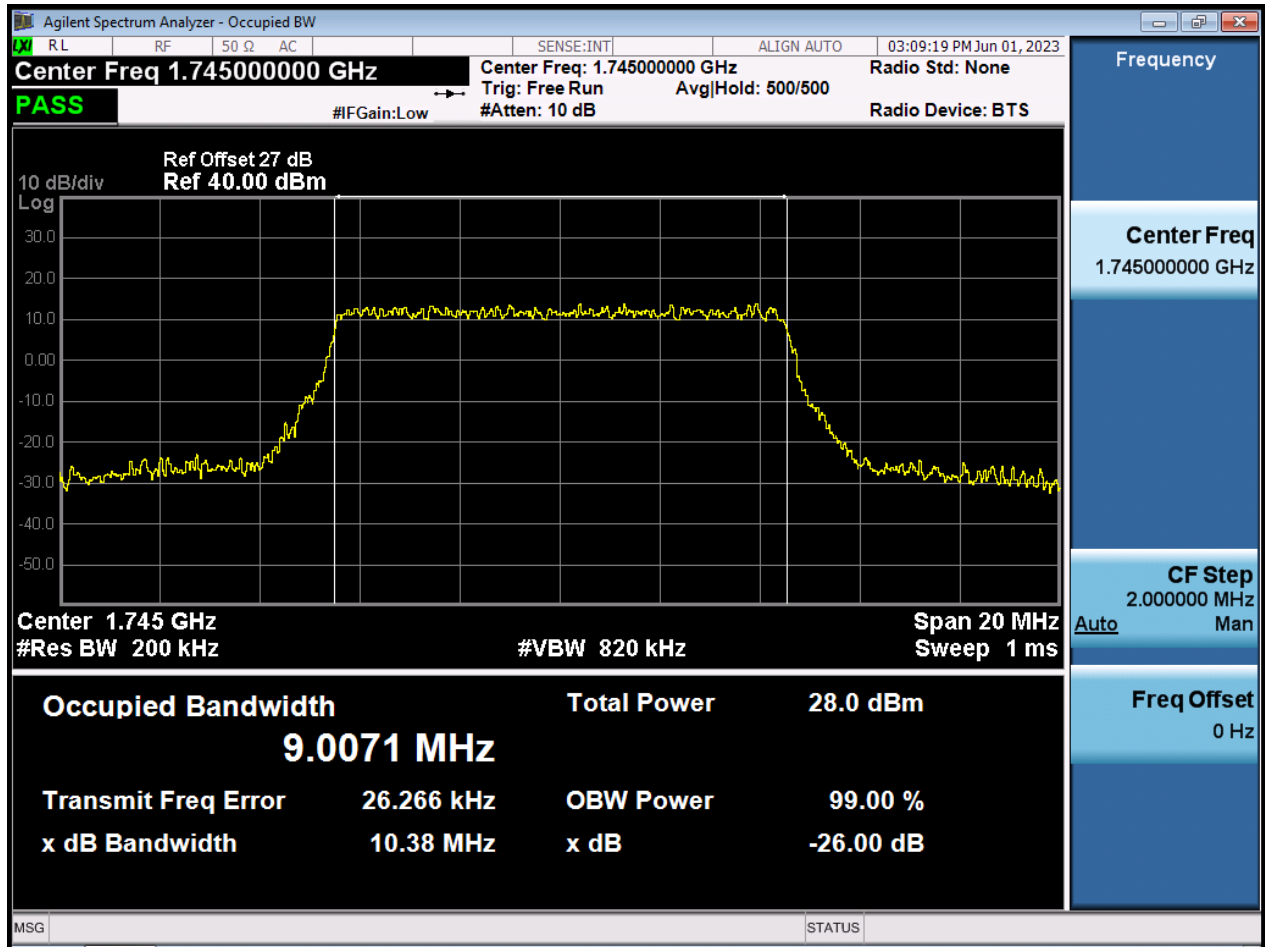




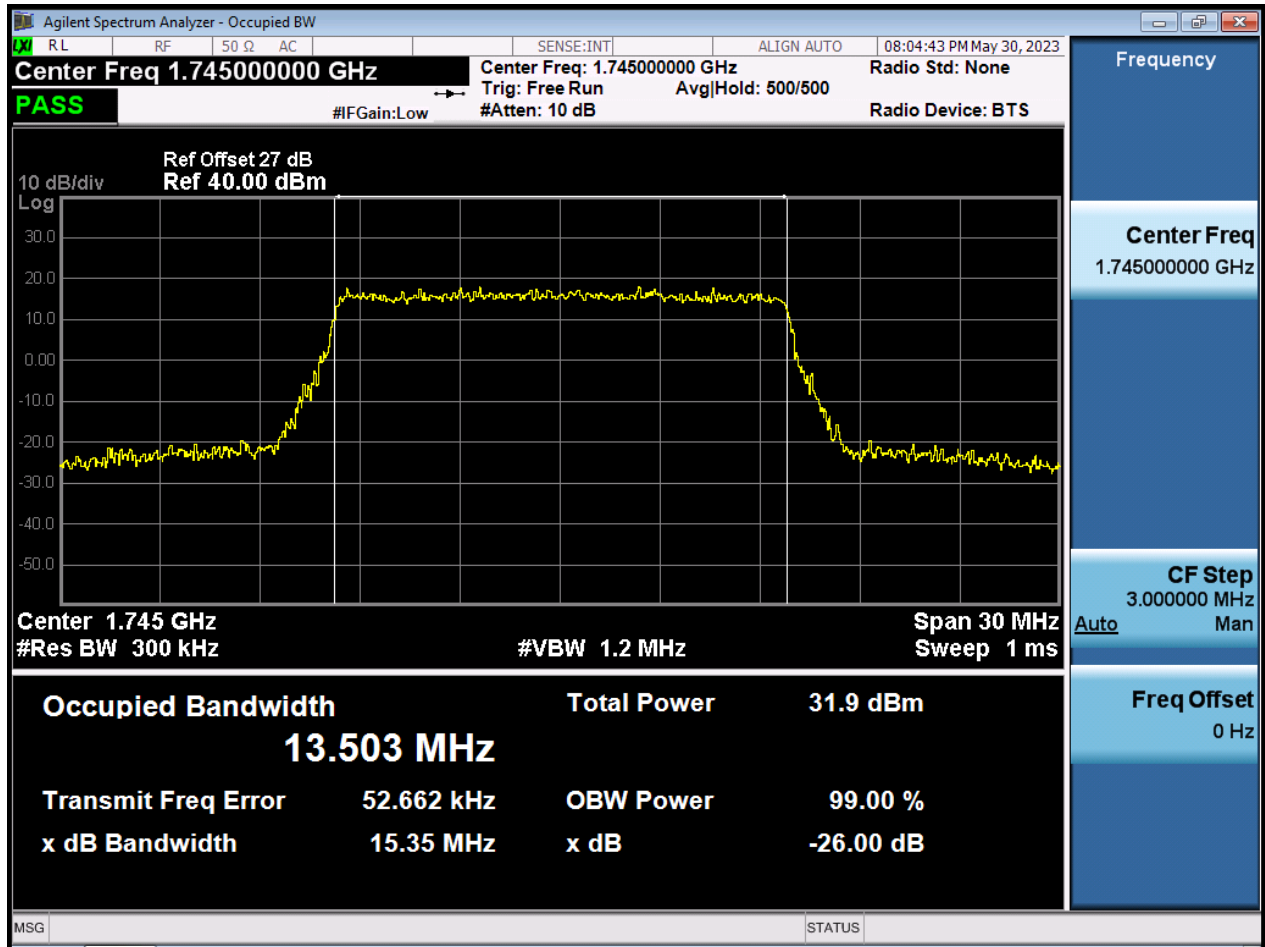
BW10 M\_OBW\_Middle Channel\_64QAM\_FullIRB



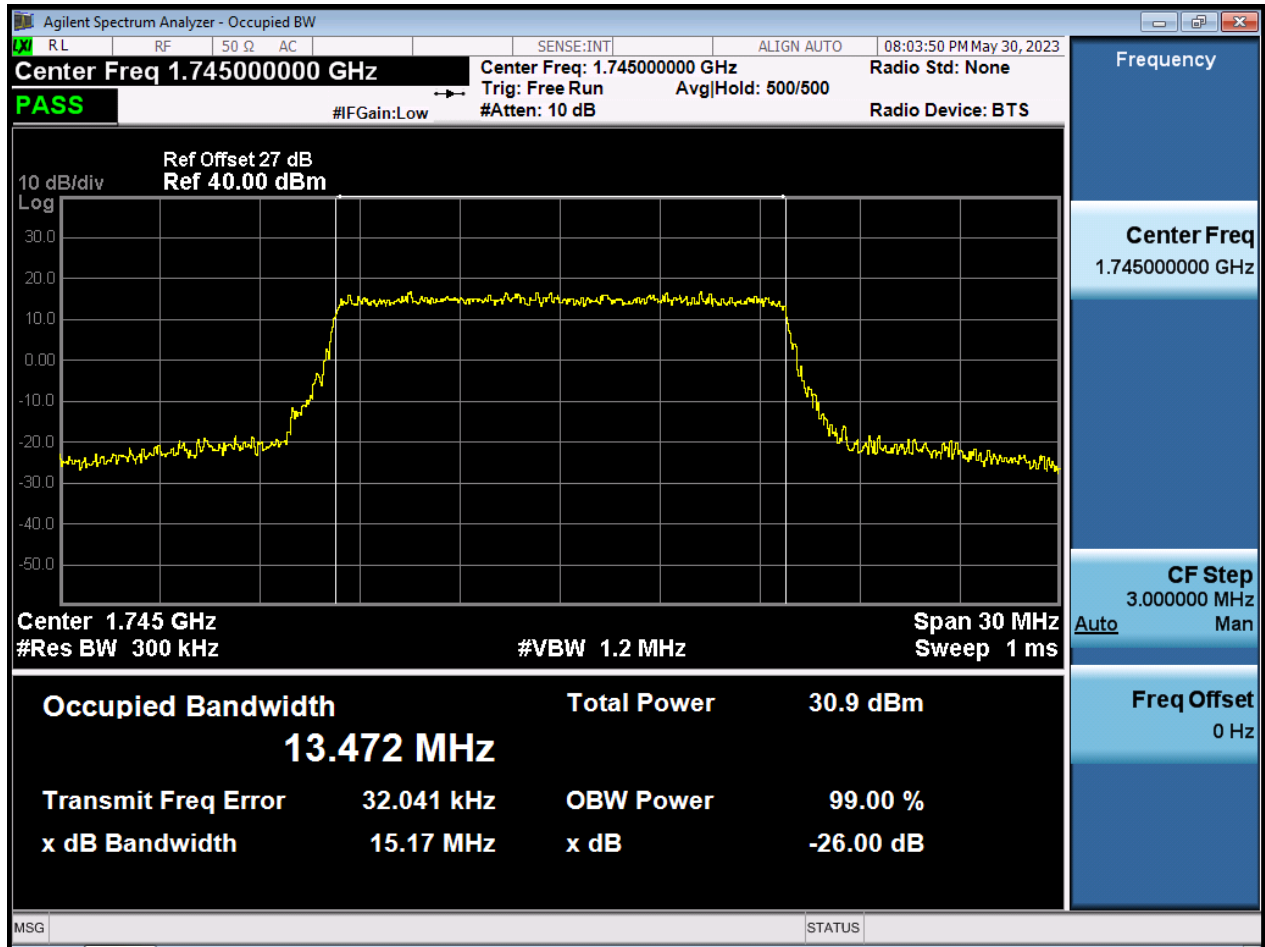
BW10 M\_OBW\_Middle Channel\_256QAM\_FullIRB



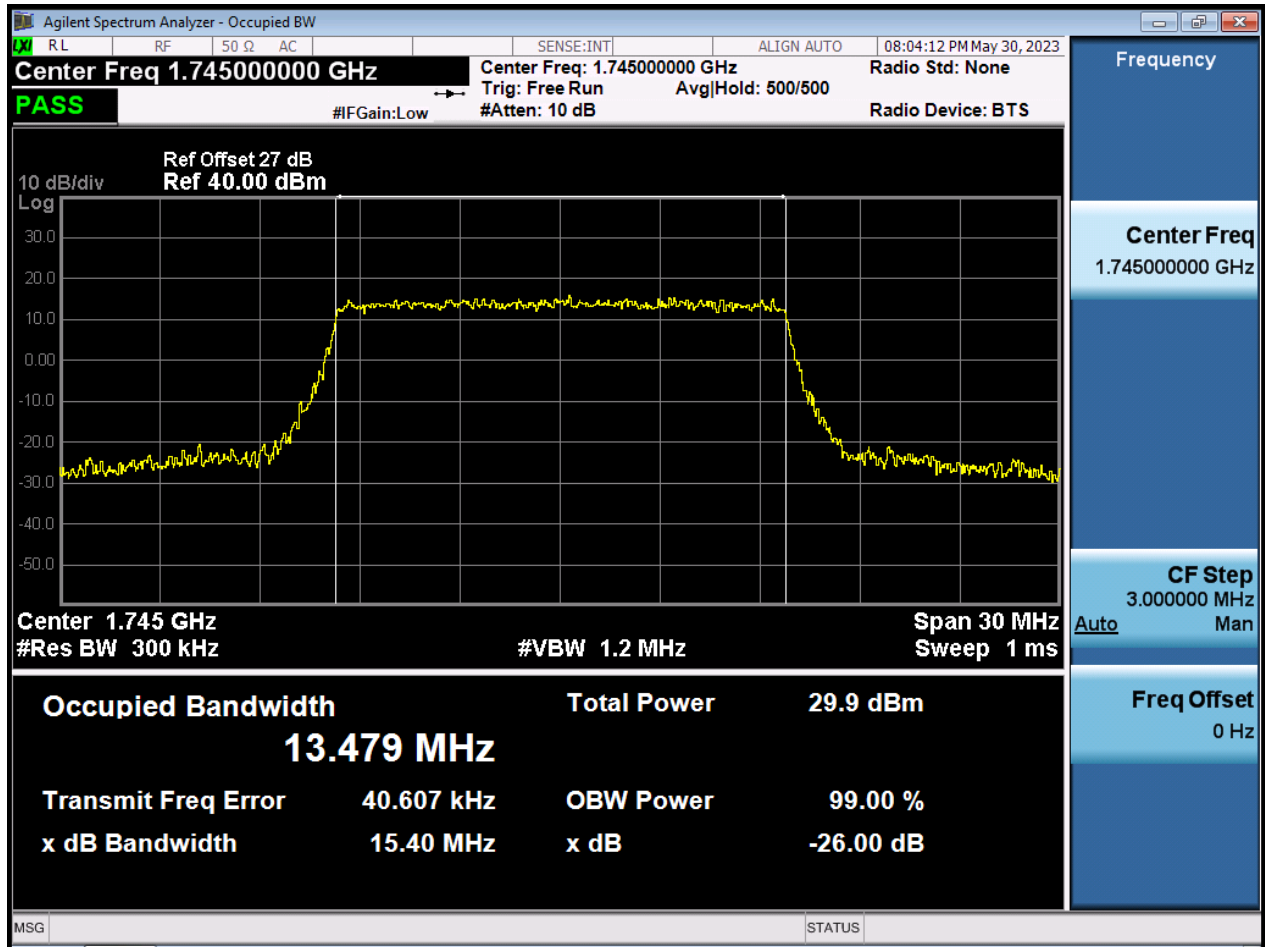
BW15 M\_OBW\_Middle Channel\_QPSK\_FullRB



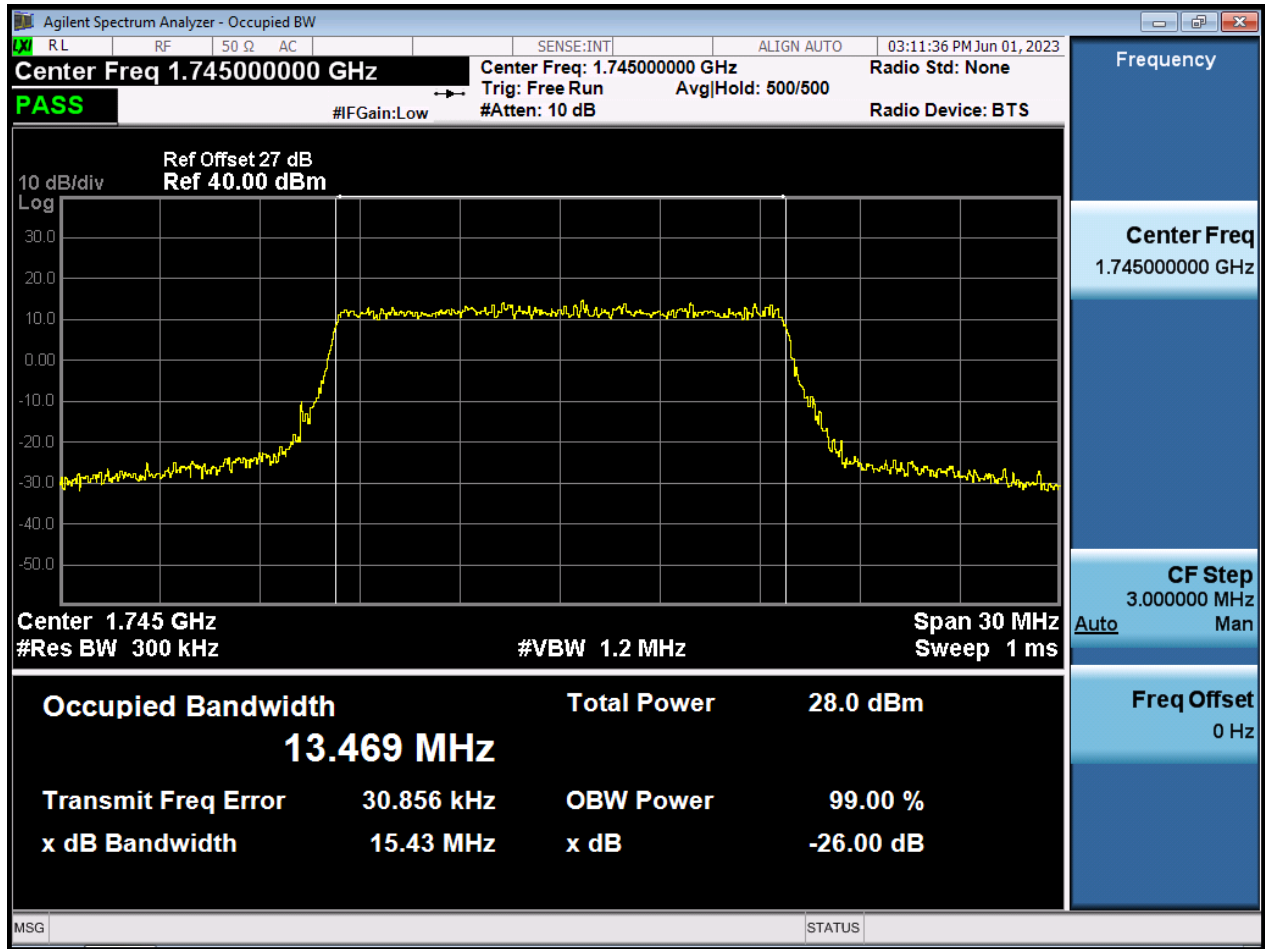
BW15 M\_OBW\_Middle Channel\_16QAM\_FullIRB



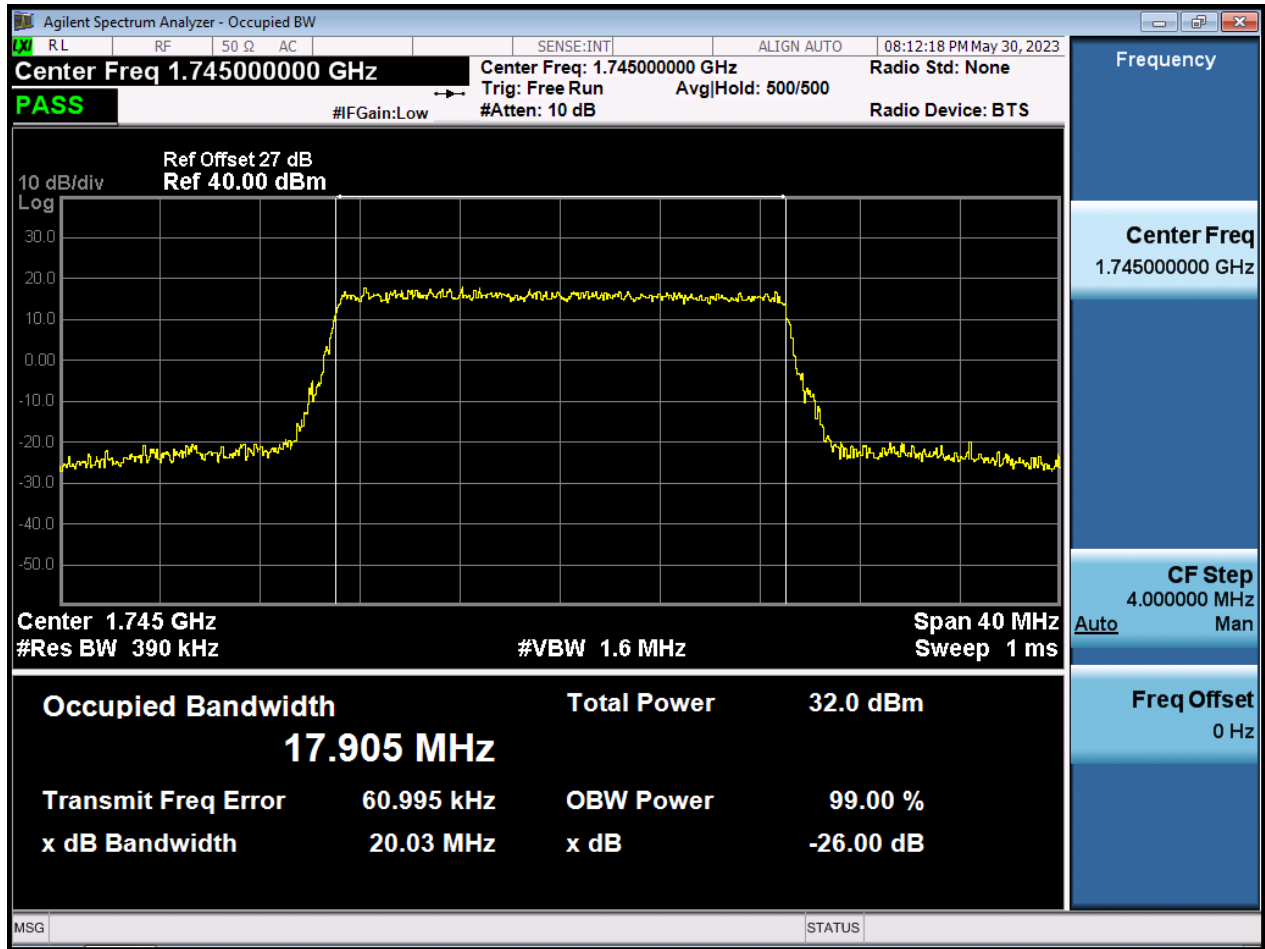
BW15 M\_OBW\_Middle Channel\_64QAM\_FullIRB



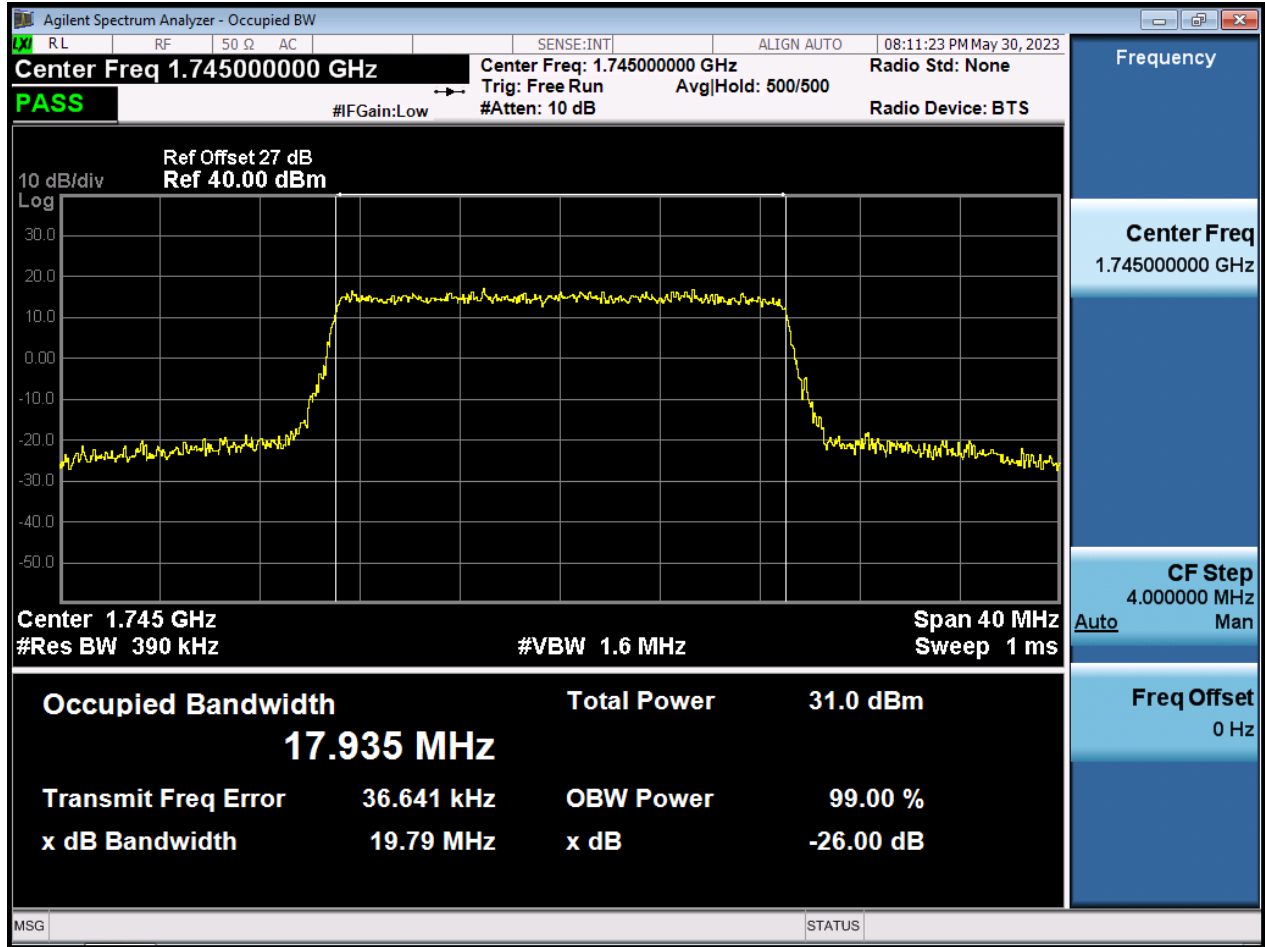
BW15 M\_OBW\_Middle Channel\_256QAM\_FullIRB



BW20 M\_OBW\_Middle Channel\_QPSK\_FullRB

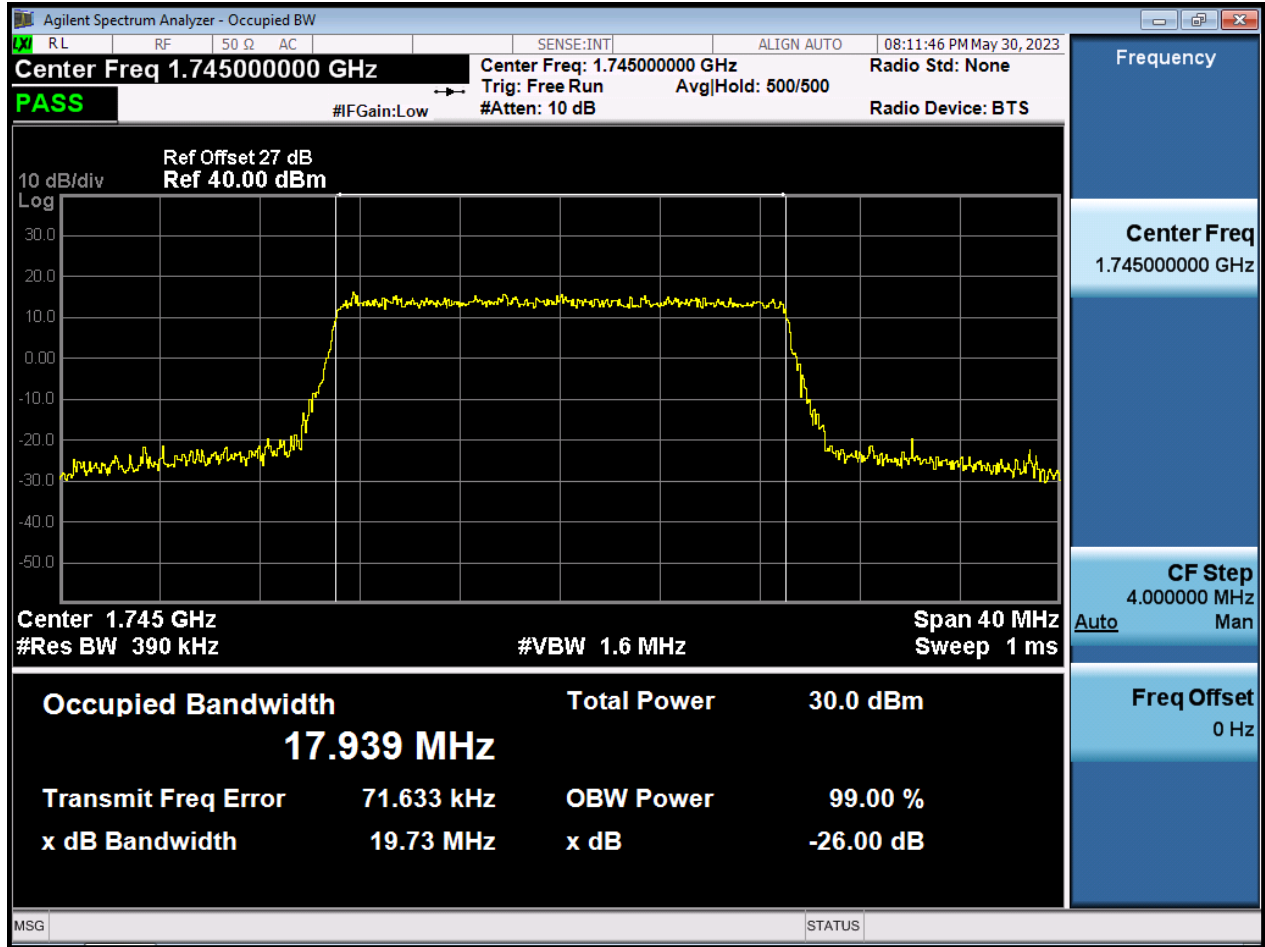


BW20 M\_OBW\_Middle Channel\_16QAM\_FullIRB

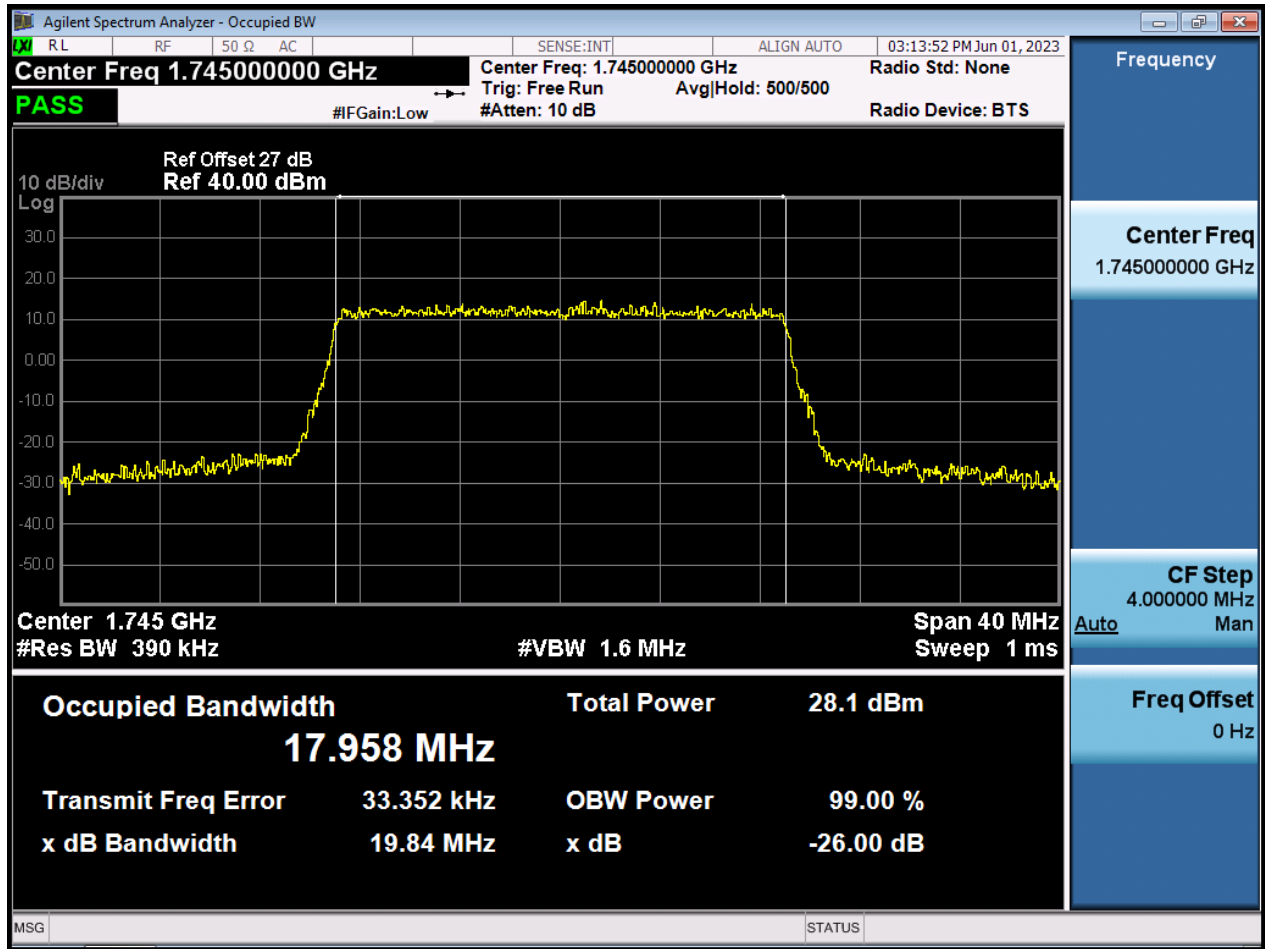




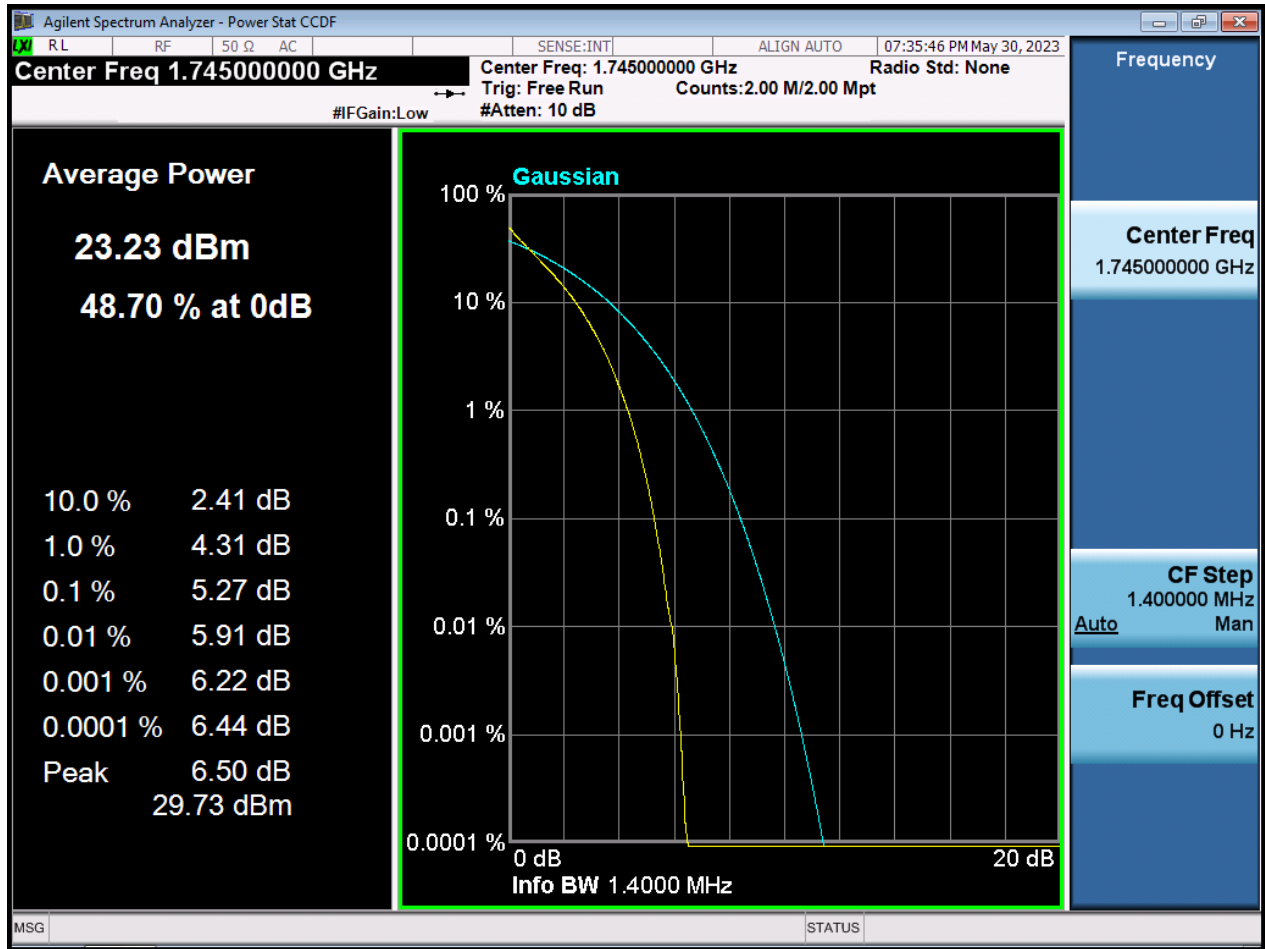
BW20 M\_OBW\_Middle Channel\_64QAM\_FullIRB



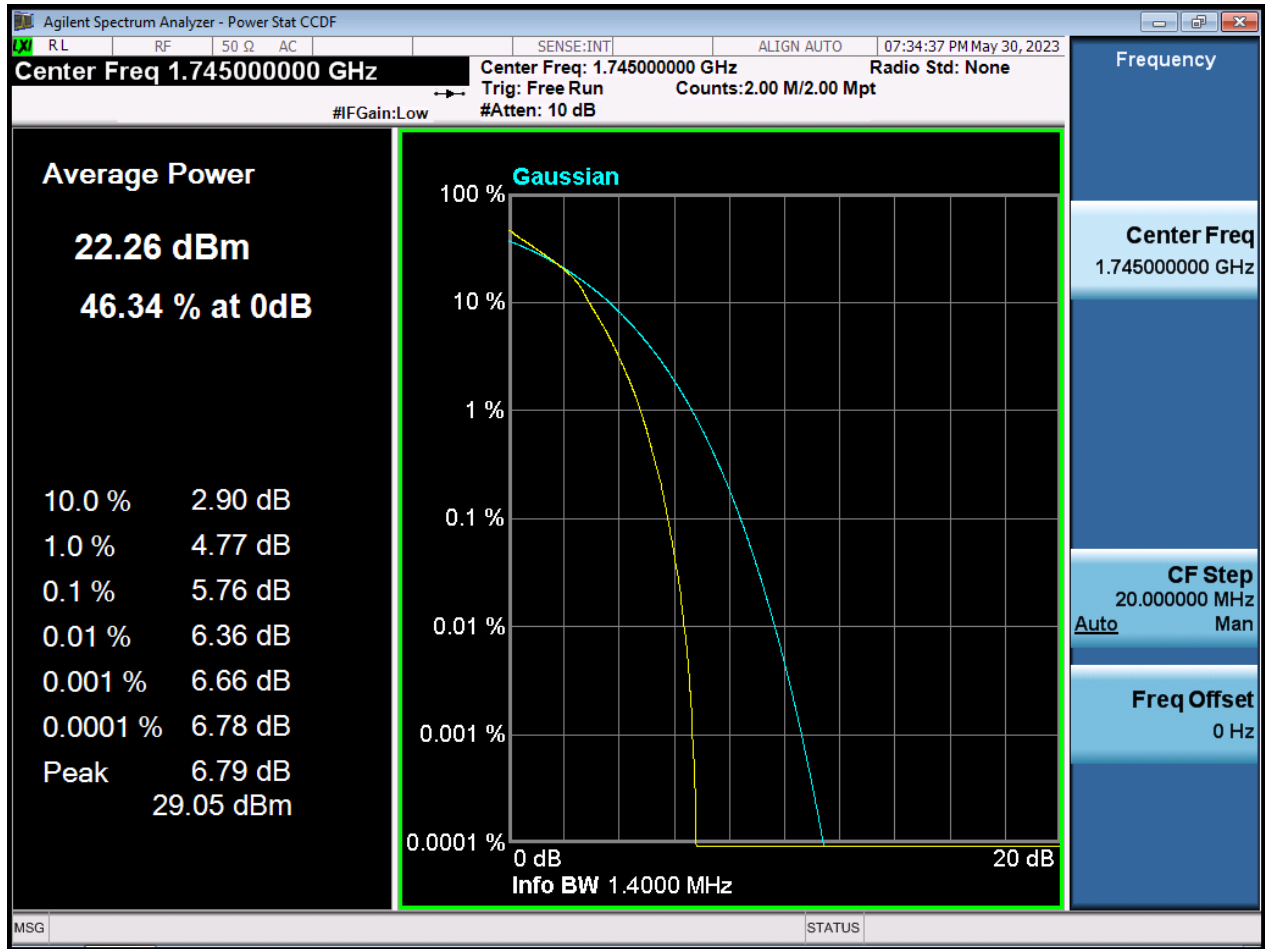
BW20 M\_OBW\_Middle Channel\_256QAM\_FullRB



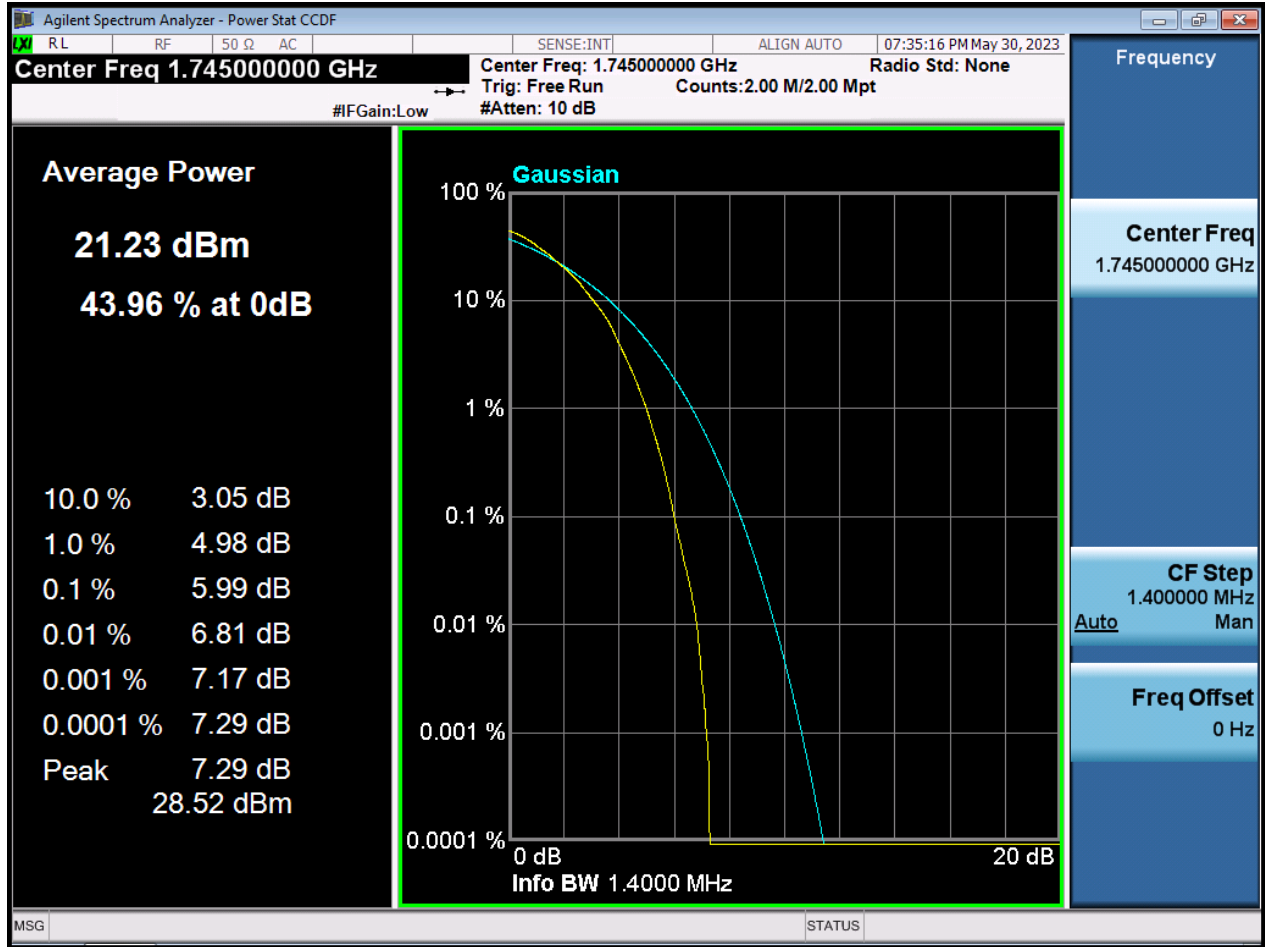
BW1.4 M\_PAR\_Middle Channel\_QPSK\_FullIRB



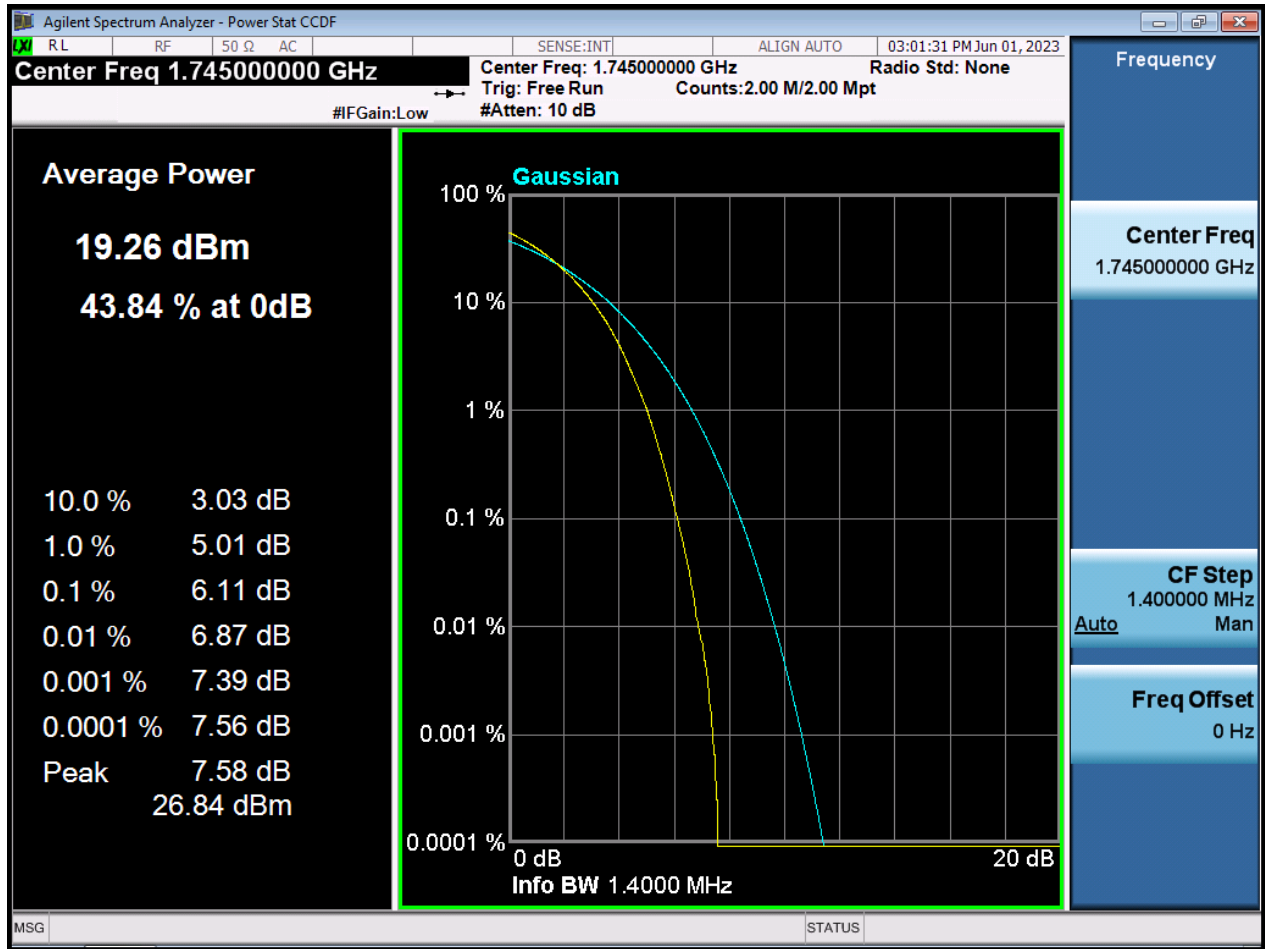
BW1.4 M\_PAR\_Middle Channel\_16QAM\_FullIRB



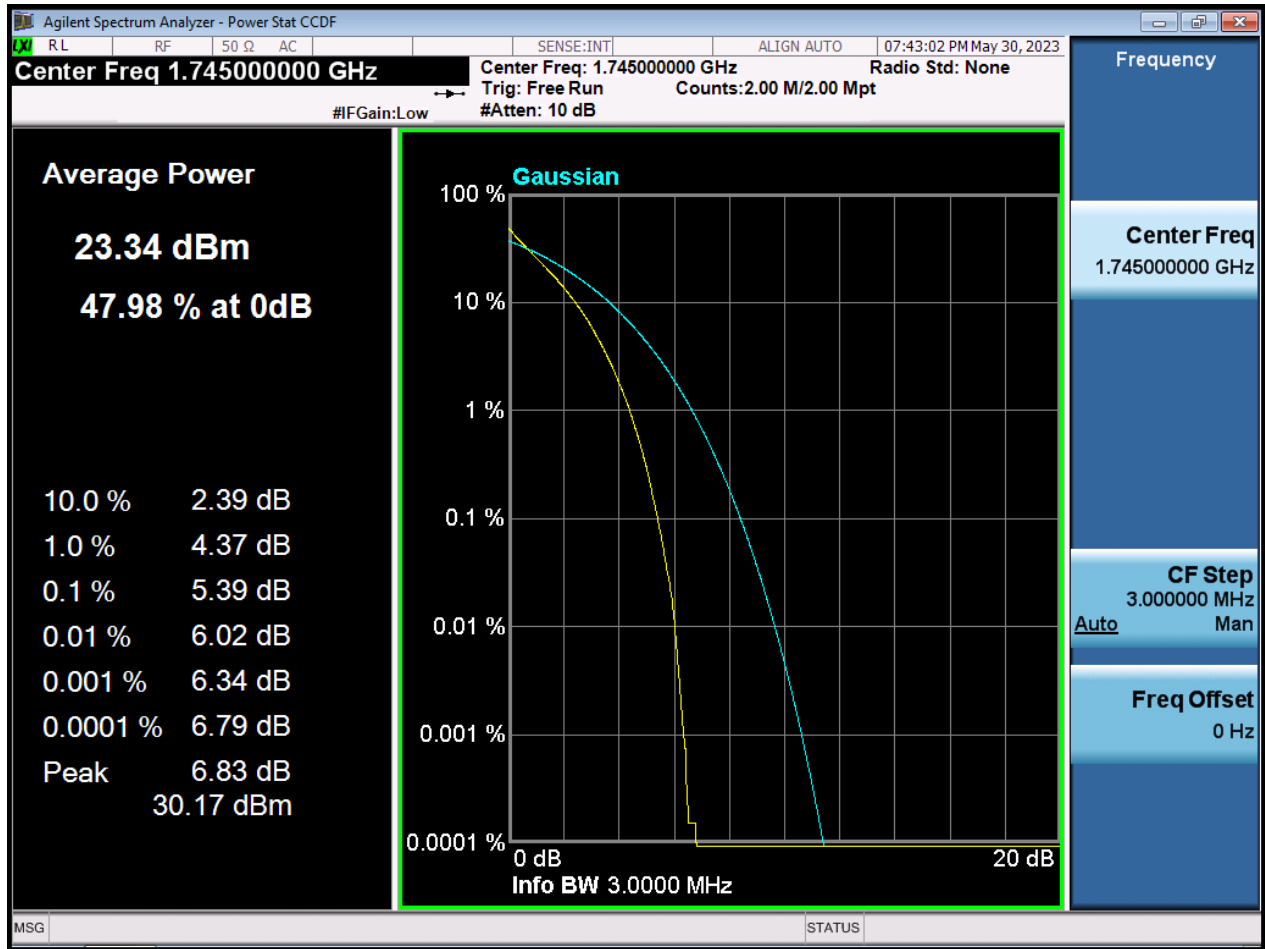
BW1.4 M\_PAR\_Middle Channel\_64QAM\_FullIRB



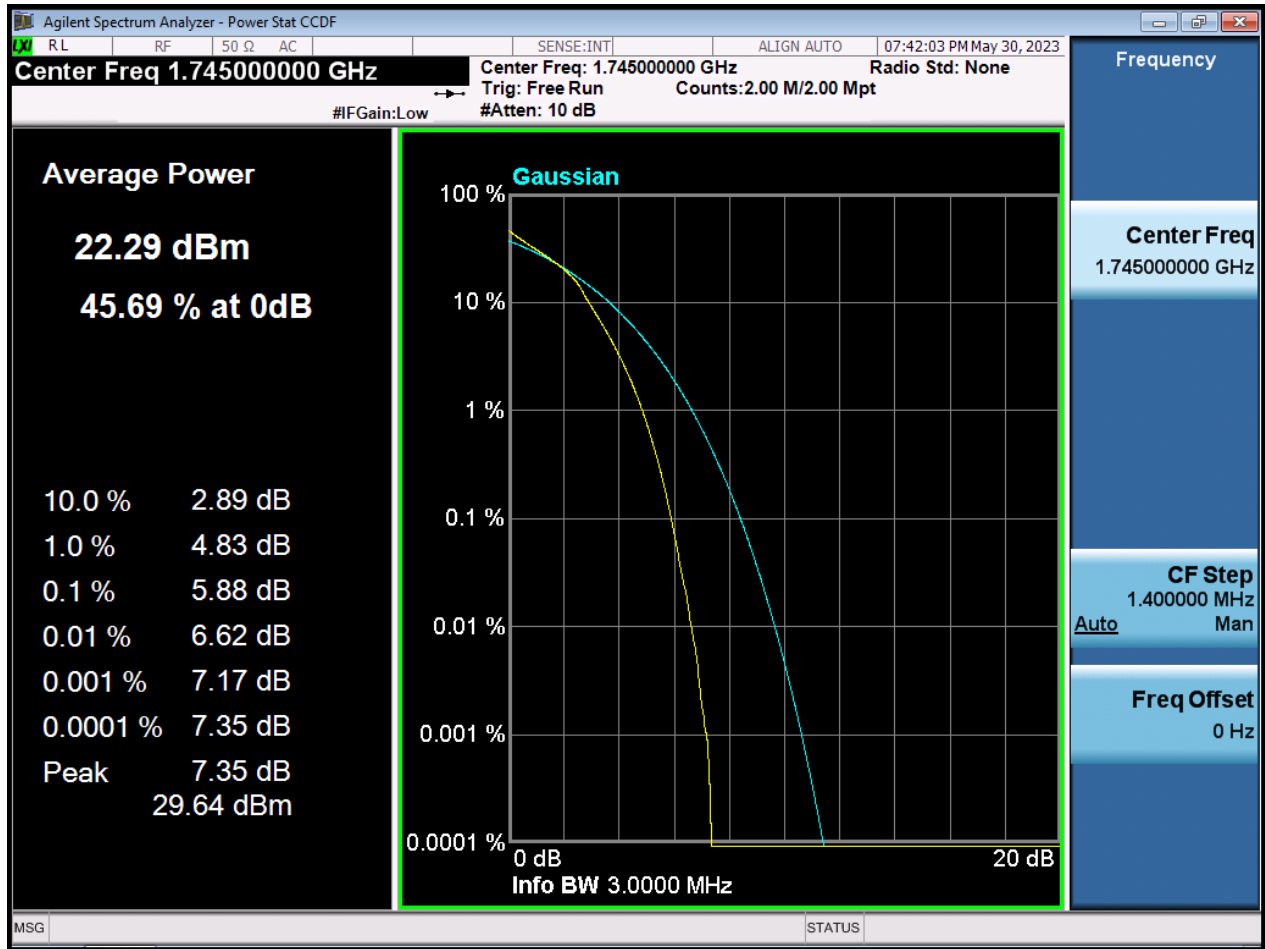
BW1.4 M\_PAR\_Middle Channel\_256QAM\_FullRB



BW3 M\_PAR\_Middle Channel\_QPSK\_FullIRB

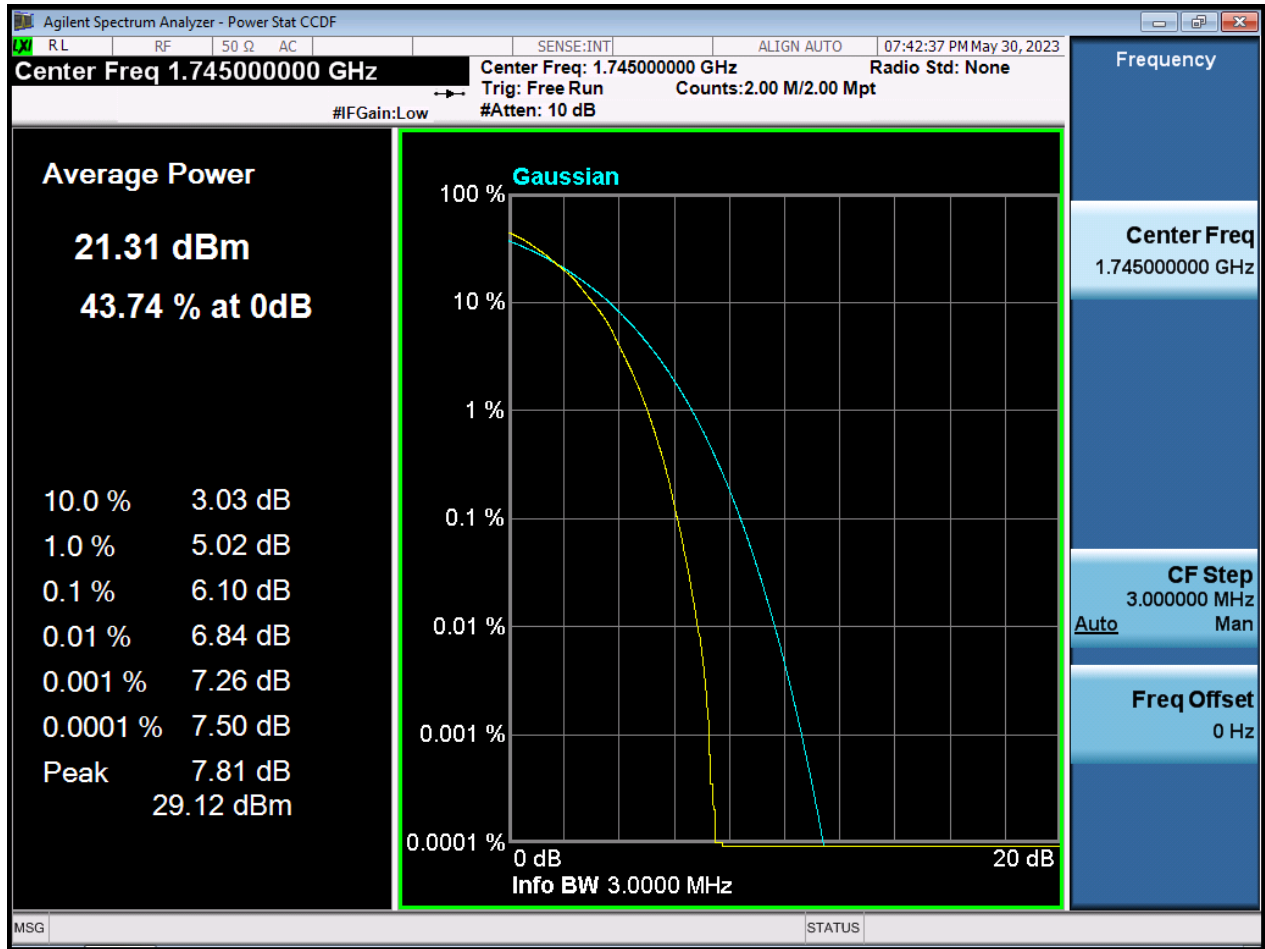


BW3 M\_PAR\_Middle Channel\_16QAM\_FullRB

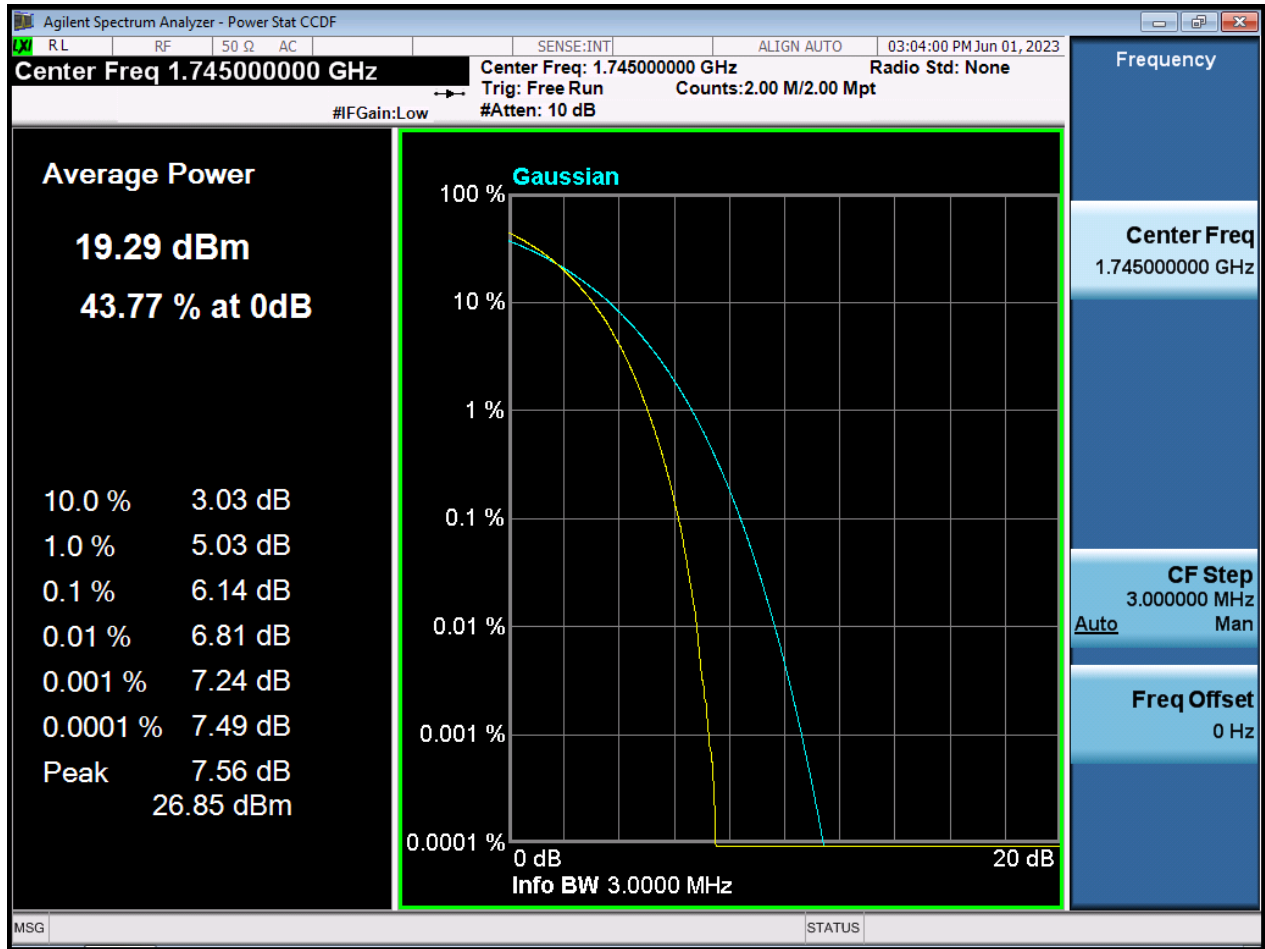




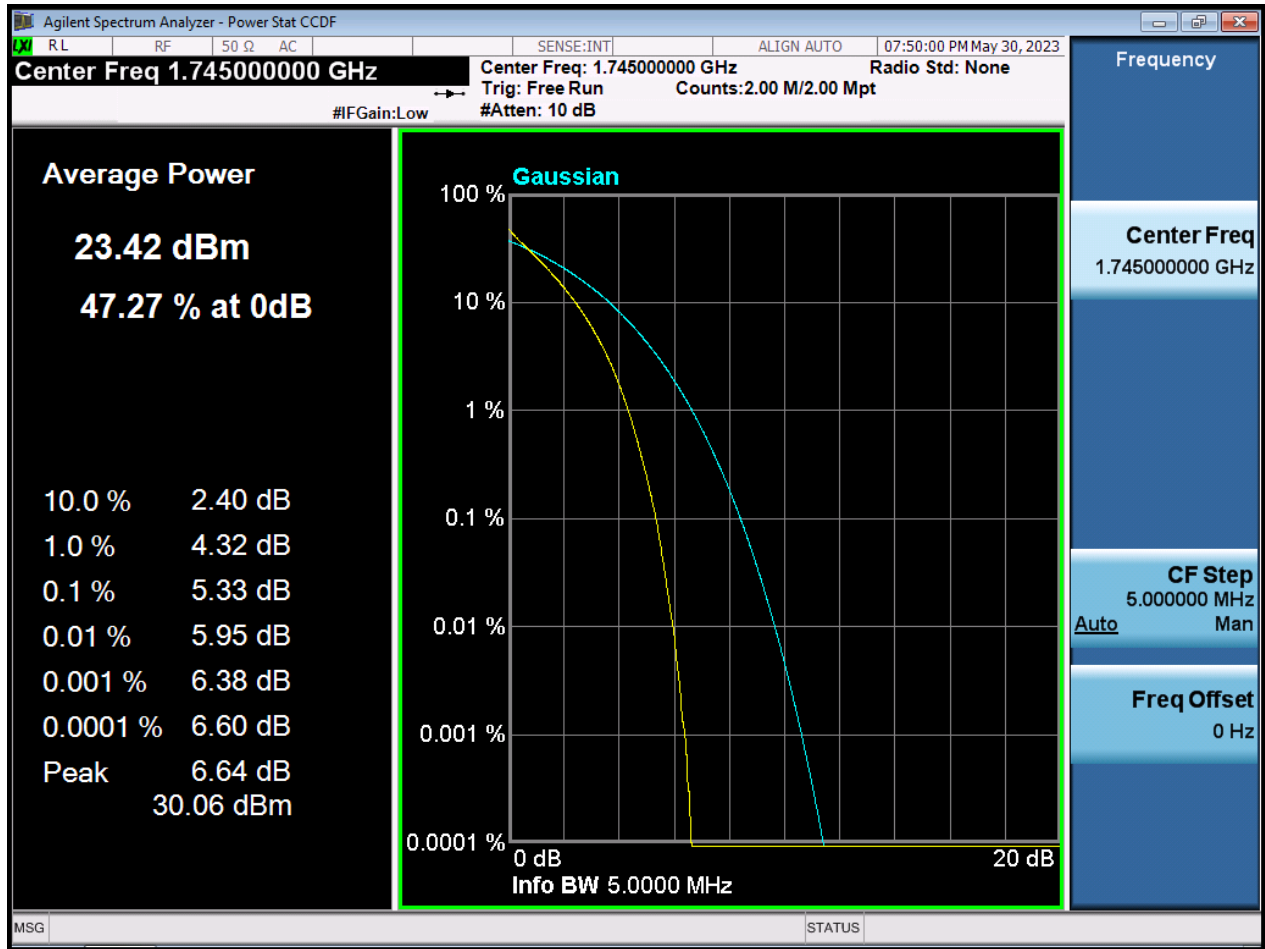
BW3 M\_PAR\_Middle Channel\_64QAM\_FullRB



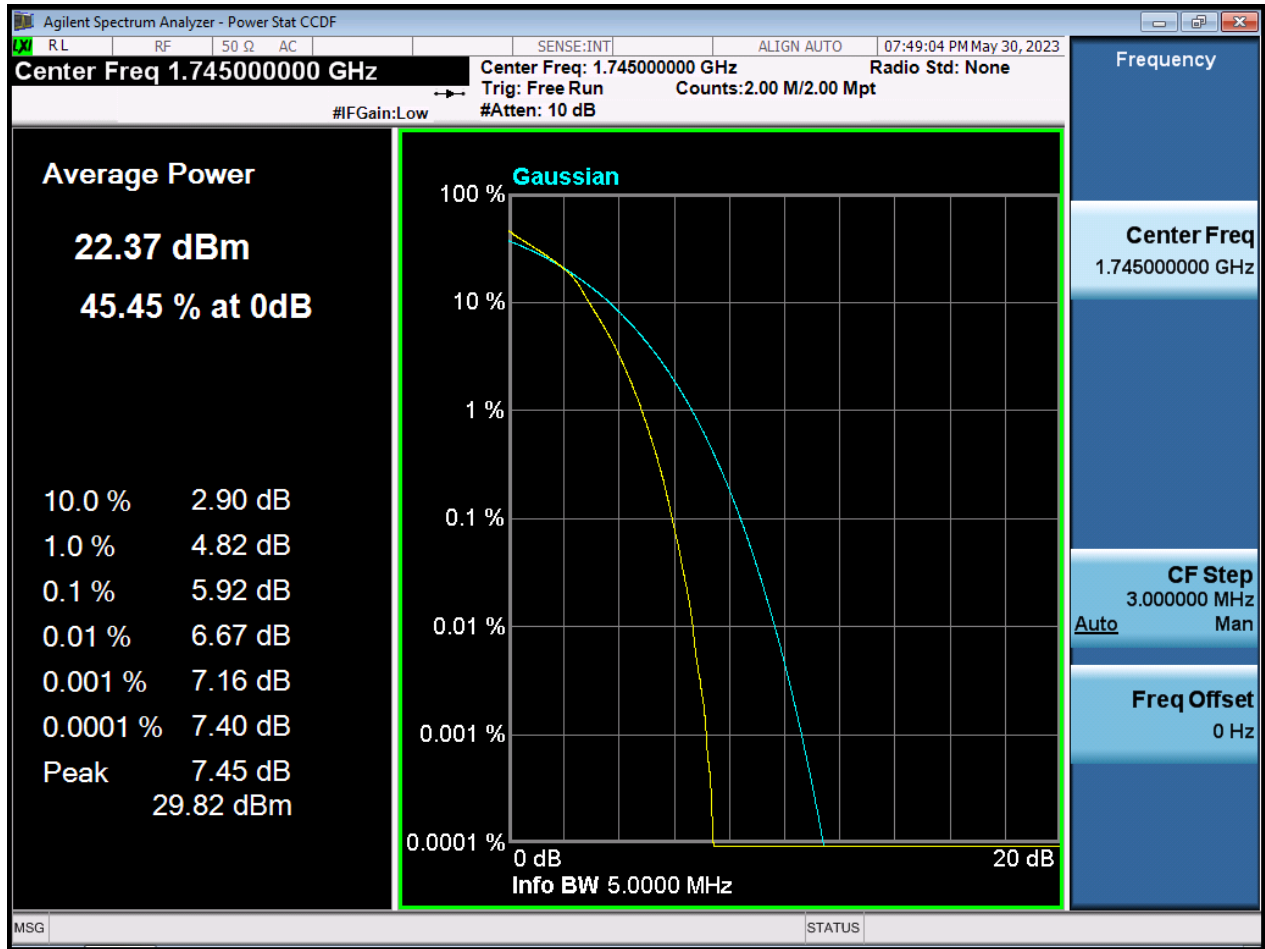
BW3 M\_PAR\_Middle Channel\_256QAM\_FullRB



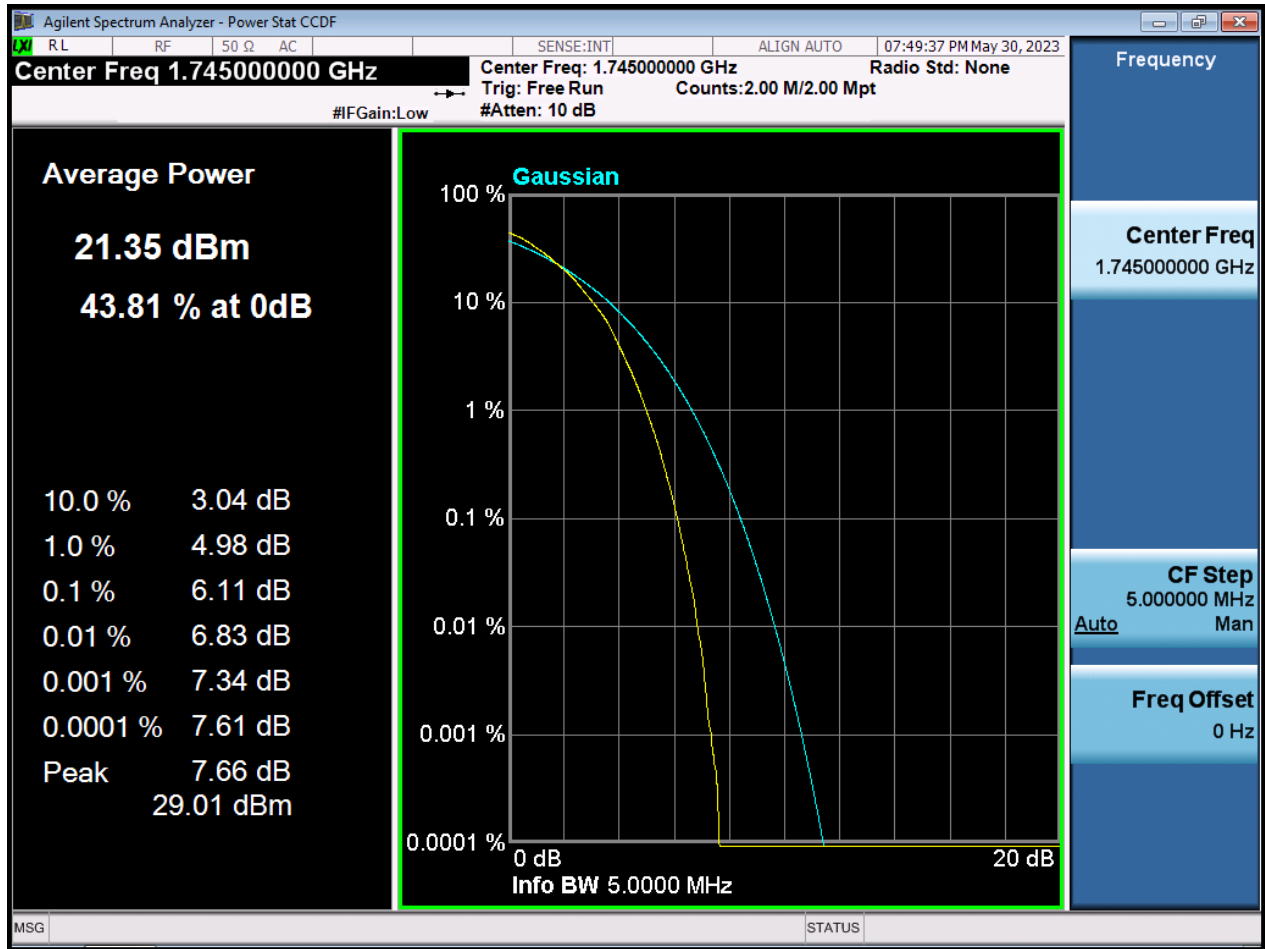
BW5 M\_PAR\_Middle Channel\_QPSK\_FullIRB



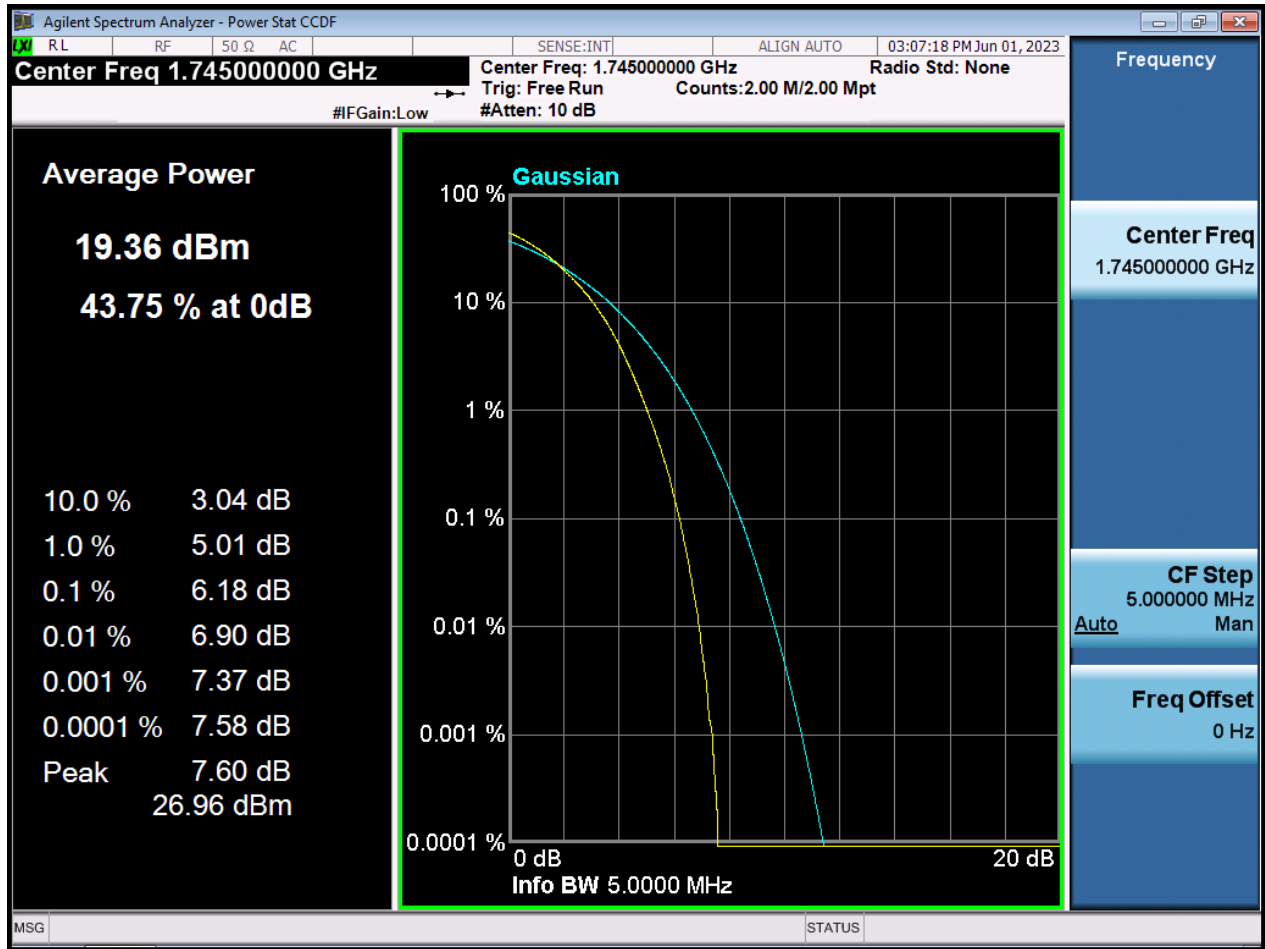
BW5 M\_PAR\_Middle Channel\_16QAM\_FullRB



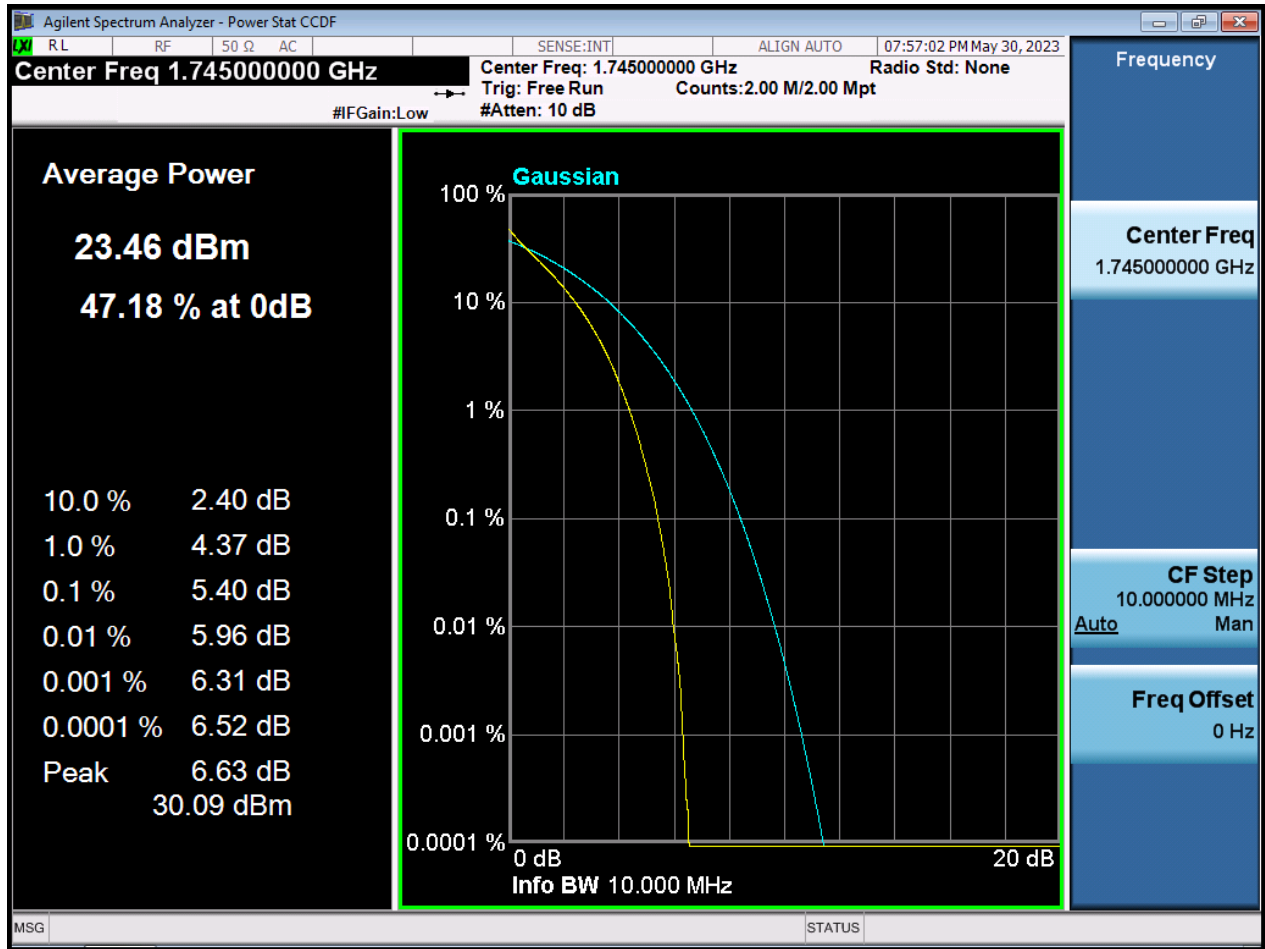
BW5 M\_PAR\_Middle Channel\_64QAM\_FullRB



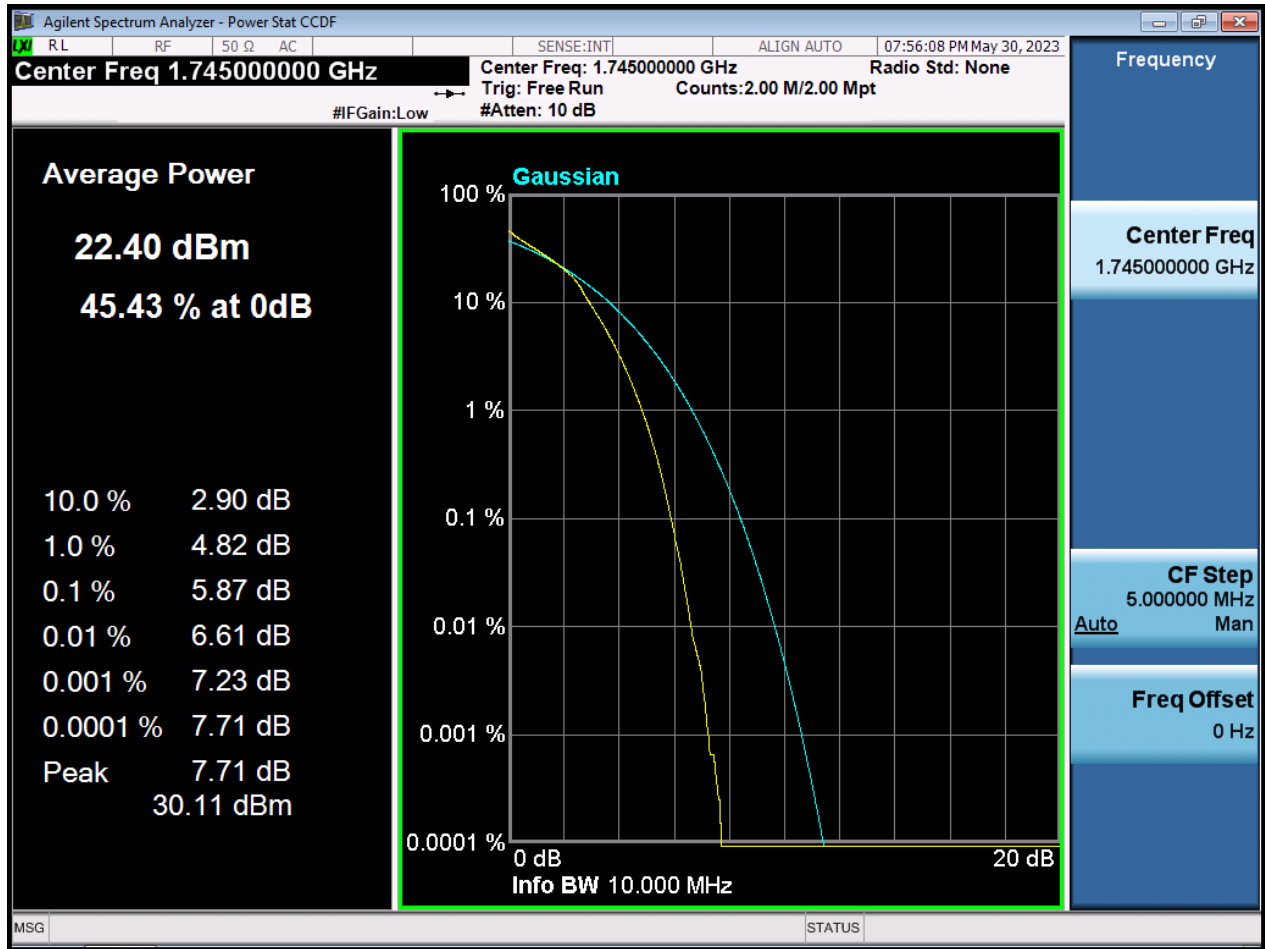
BW5 M\_PAR\_Middle Channel\_256QAM\_FullRB



BW10 M\_PAR\_Middle Channelz\_QPSK\_FullRB

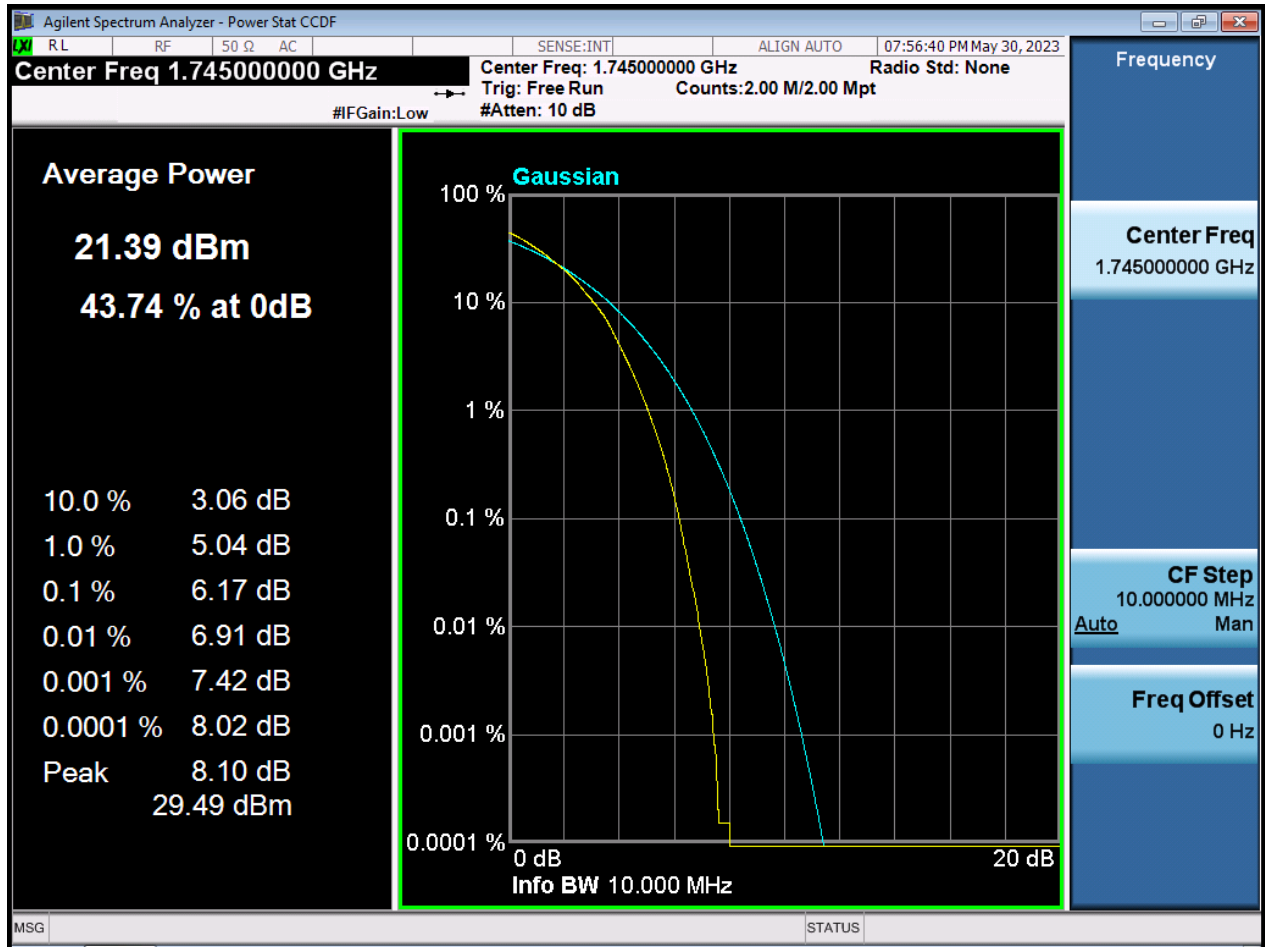


BW10 M\_PAR\_Middle Channel\_16QAM\_FullRB

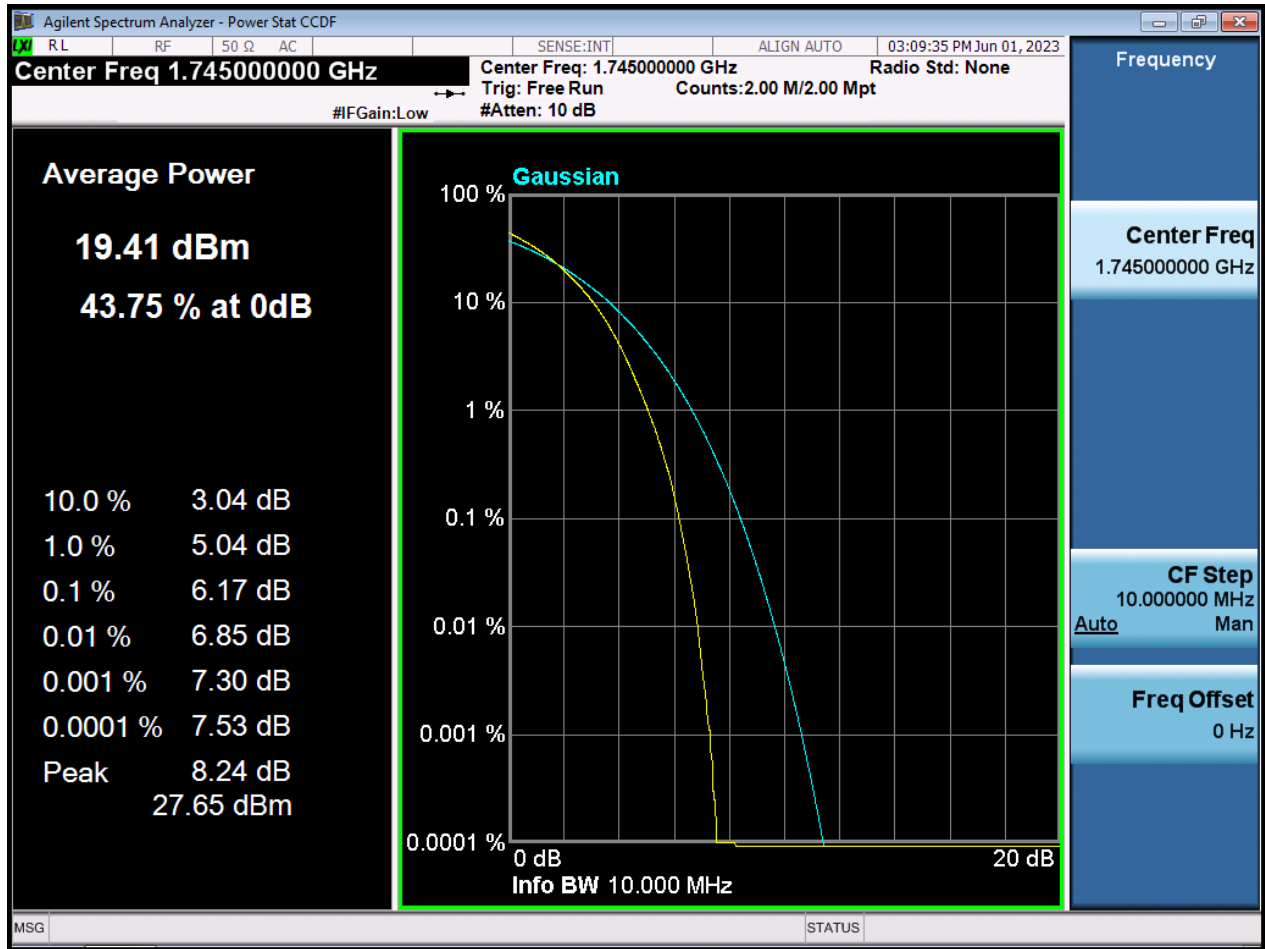




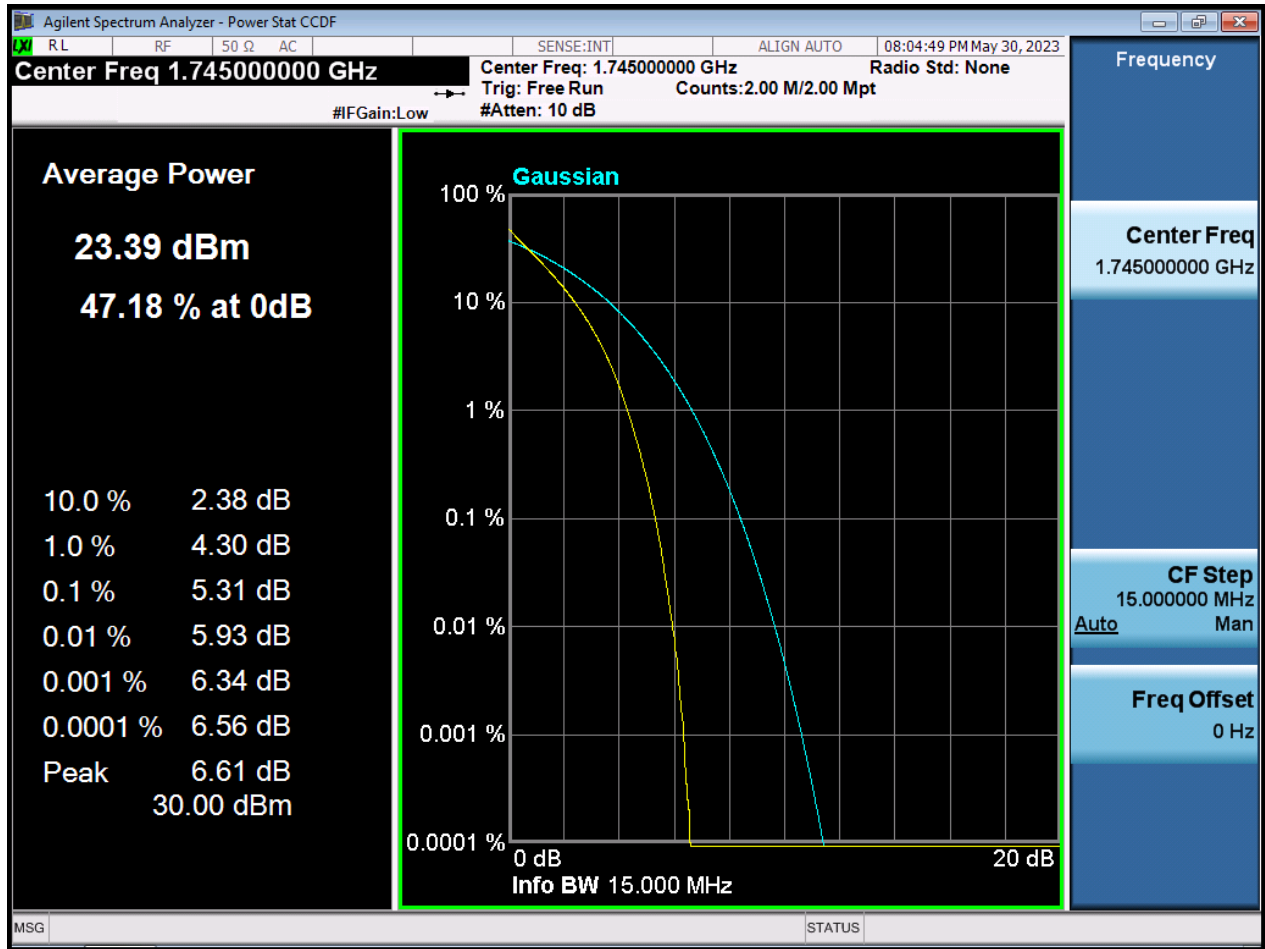
BW10 M\_PAR\_Middle Channel\_64QAM\_FullRB



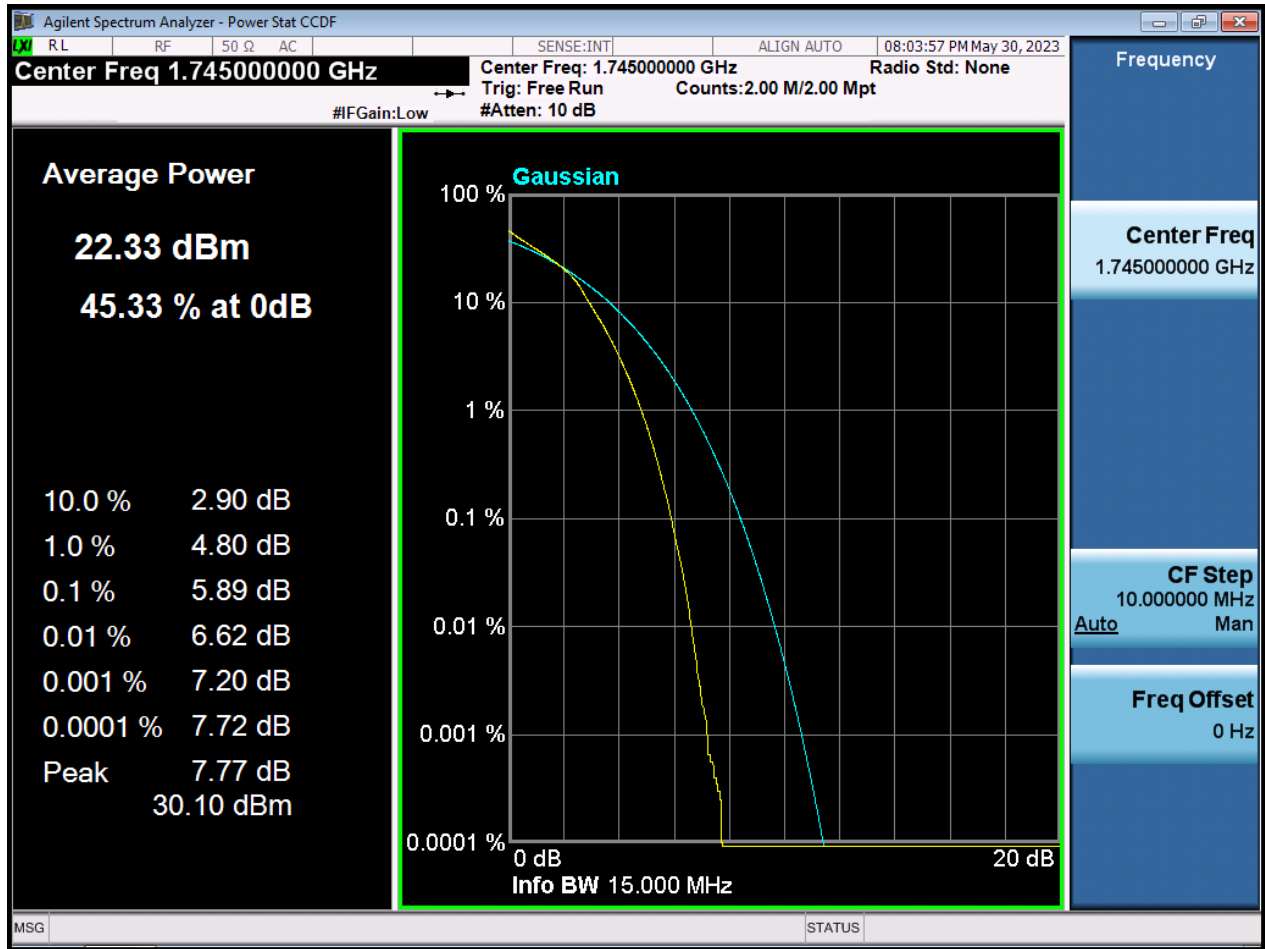
BW10 M\_PAR\_Middle Channel\_256QAM\_FullIRB



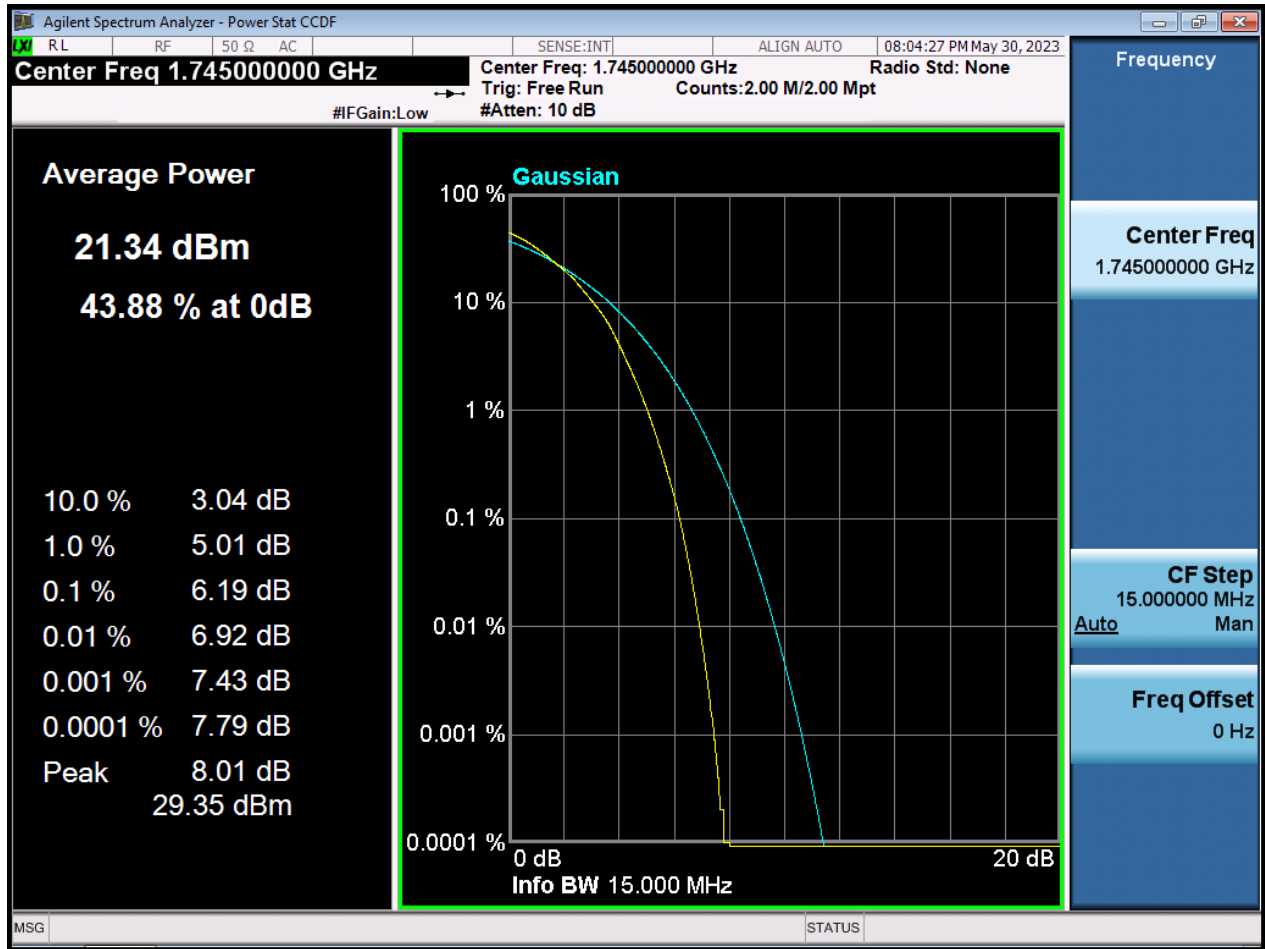
BW15 M\_PAR\_Middle Channel\_QPSK\_FullRB



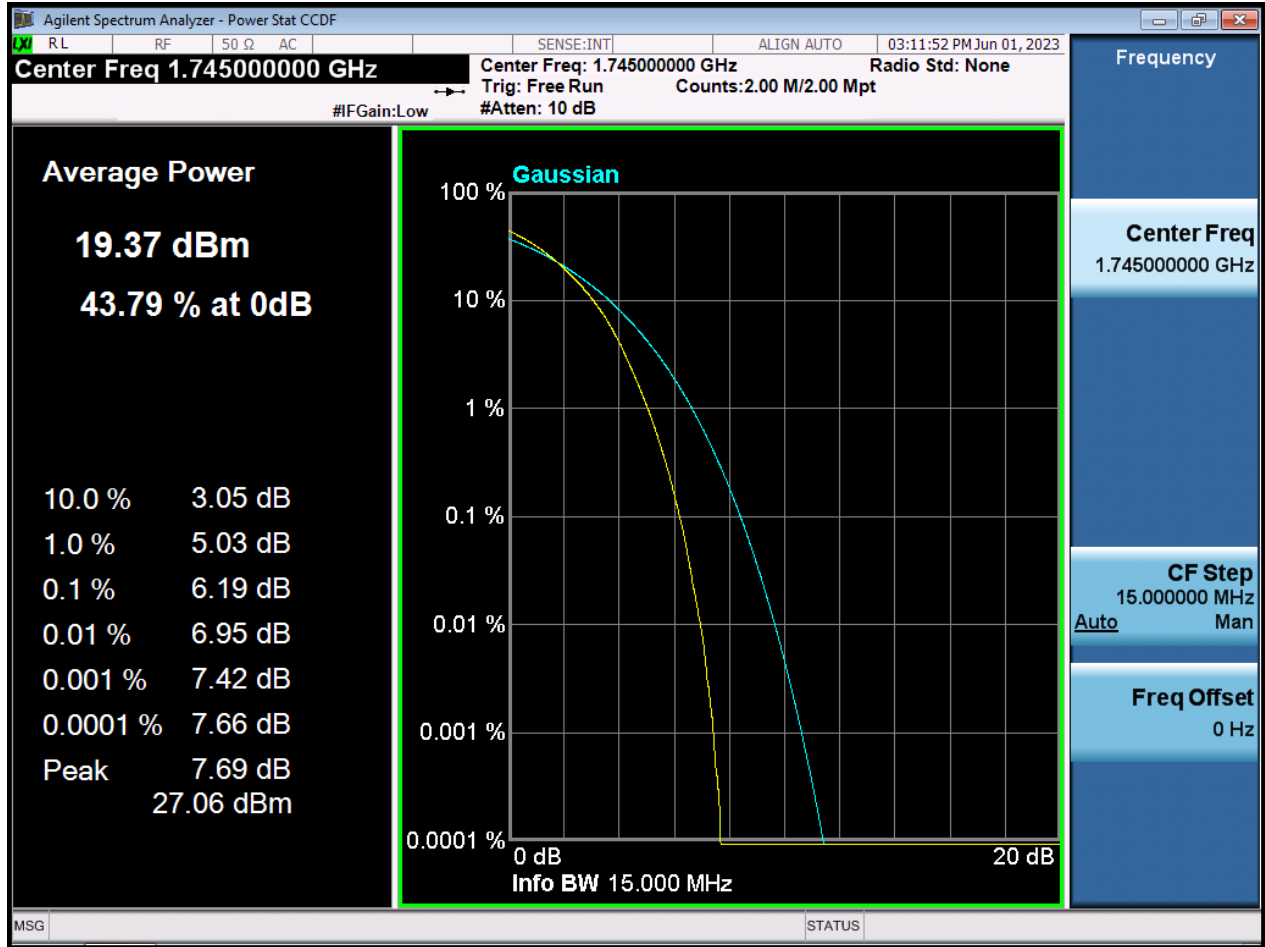
BW15 M\_PAR\_Middle Channel\_16QAM\_FullRB



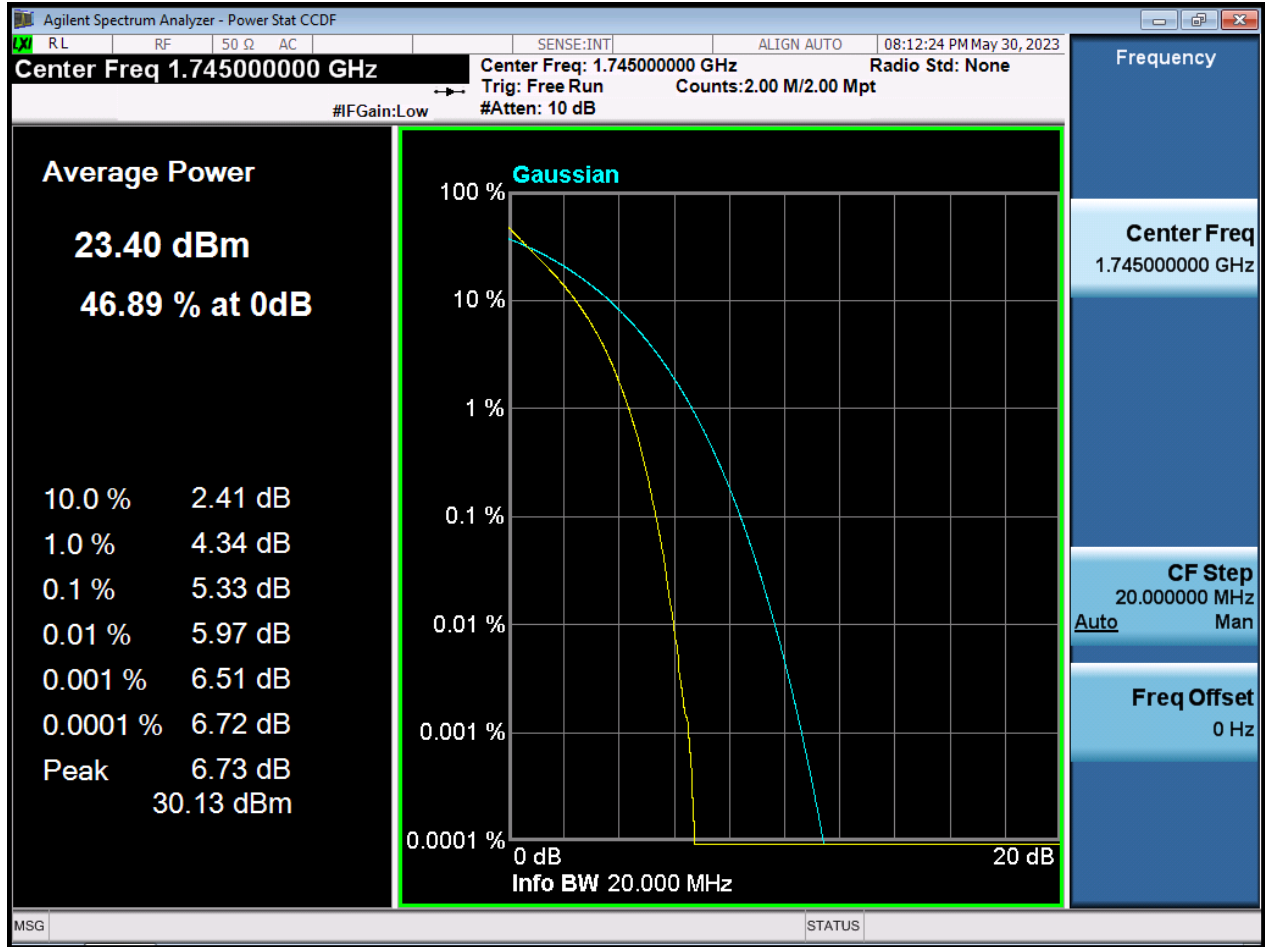
BW15 M\_PAR\_Middle Channel\_64QAM\_FullRB



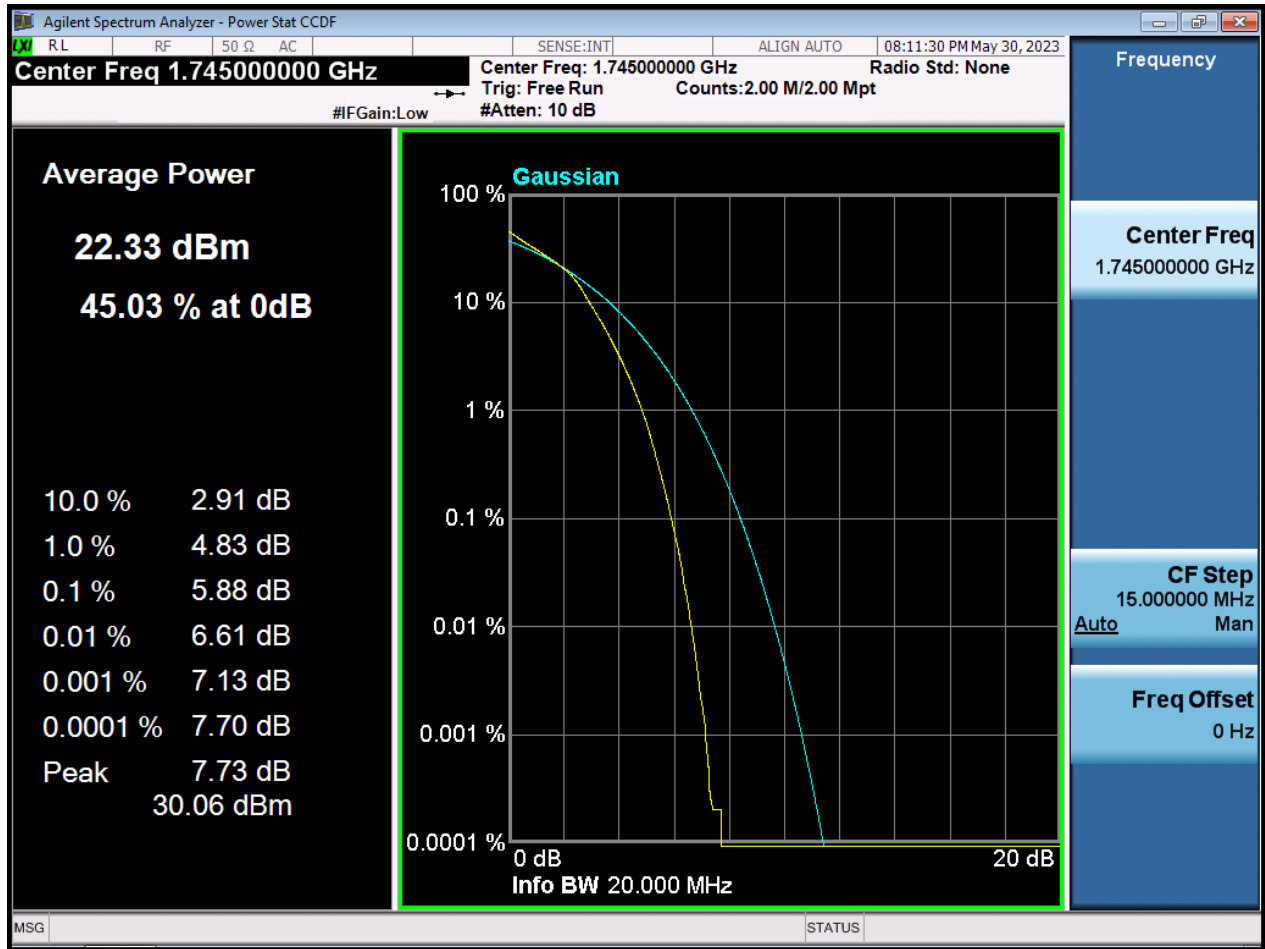
BW15 M\_PAR\_Middle Channel\_256QAM\_FullIRB



BW20 M\_PAR\_Middle Channel\_QPSK\_FullRB

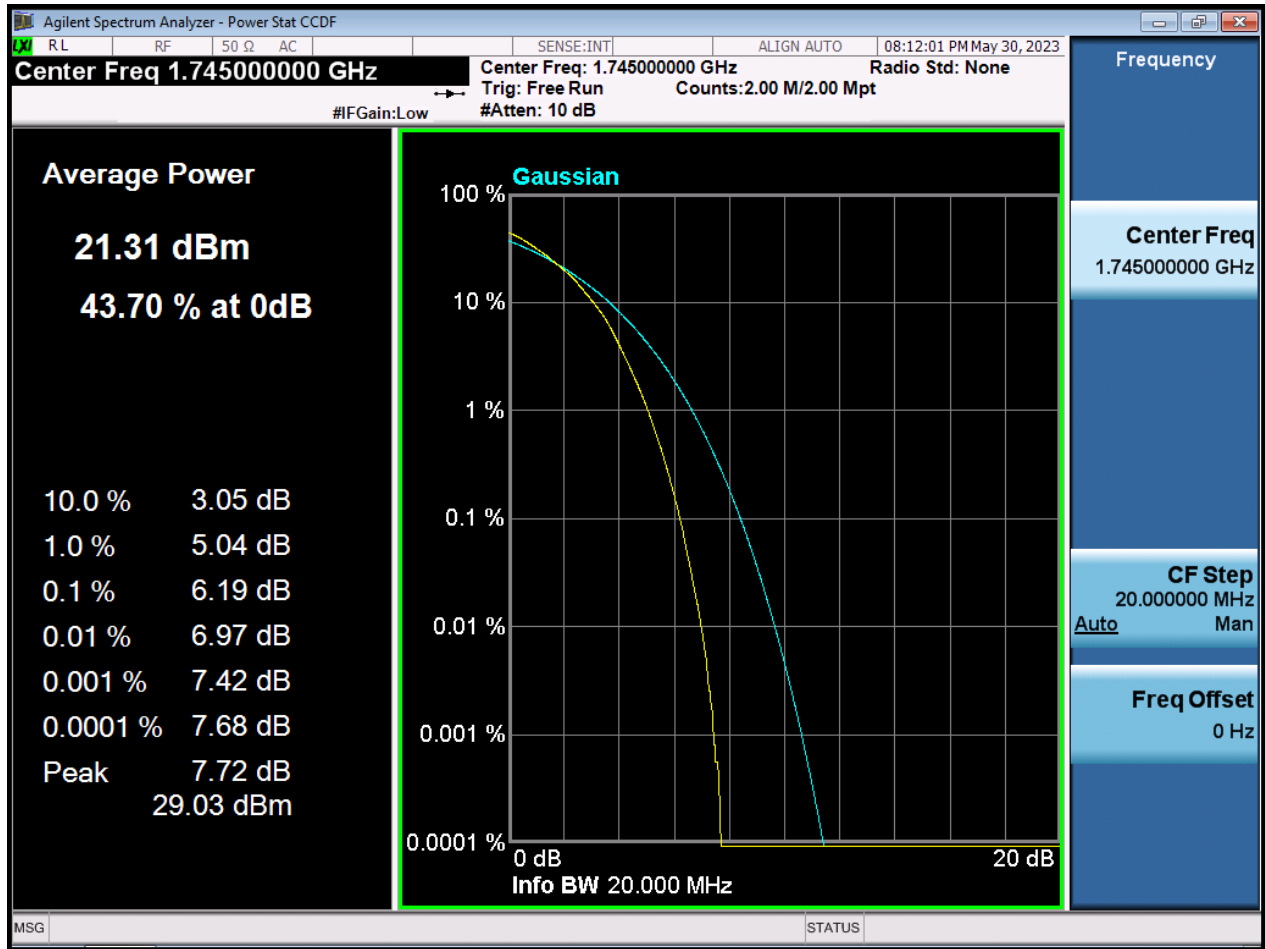


BW20 M\_PAR\_Middle Channel\_16QAM\_FullRB

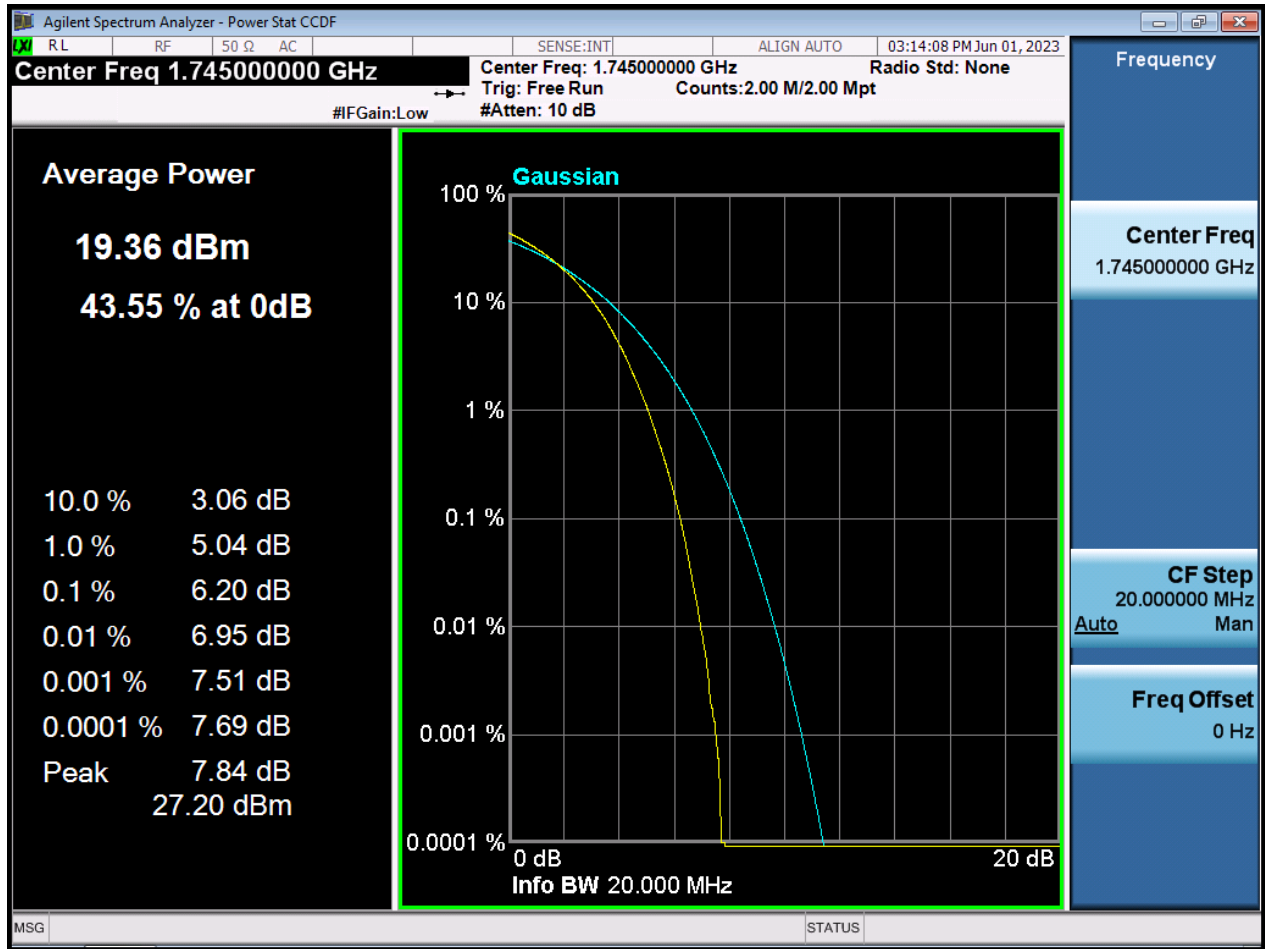




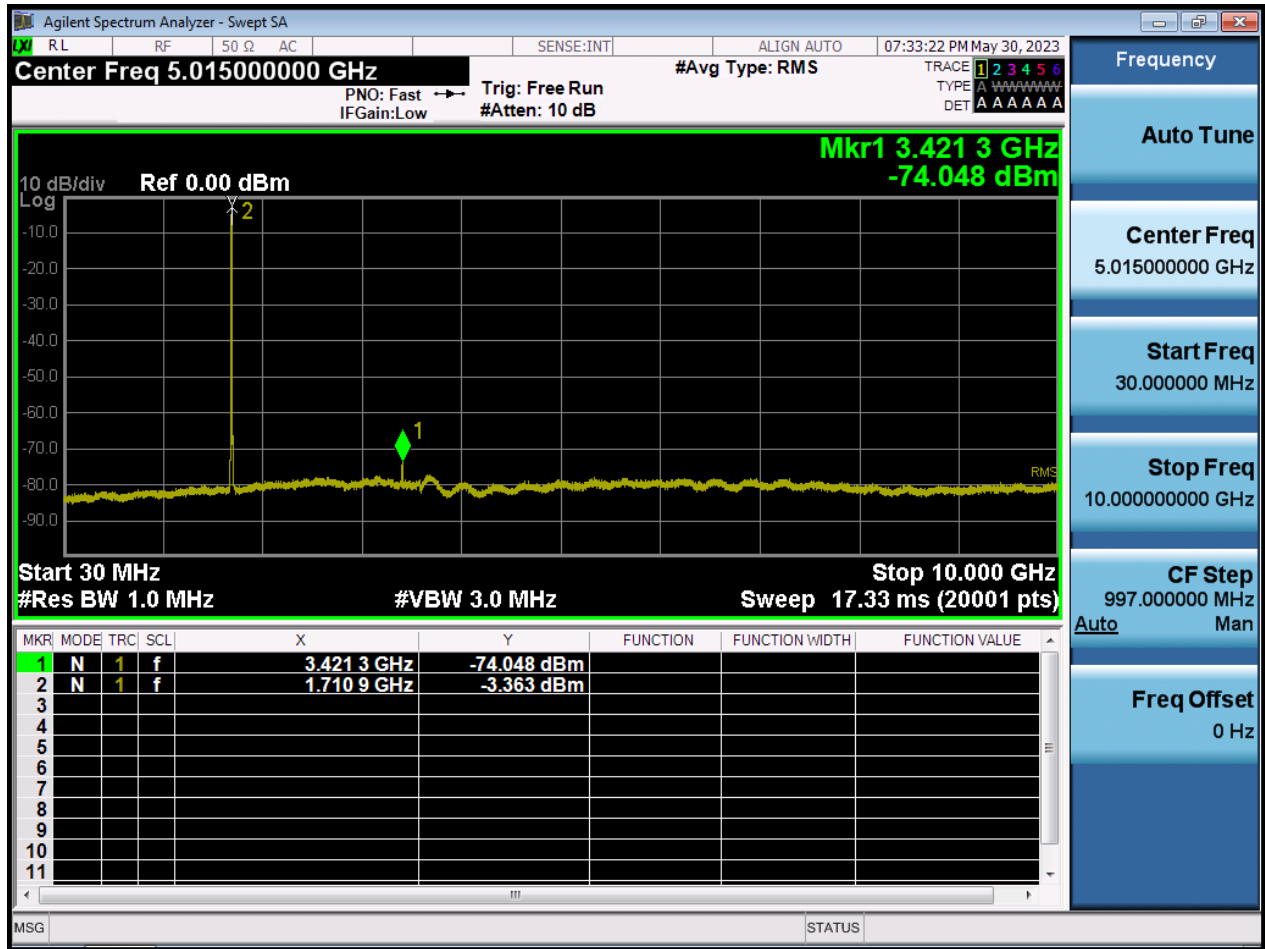
BW20 M\_PAR\_Middle Channel\_64QAM\_FullRB



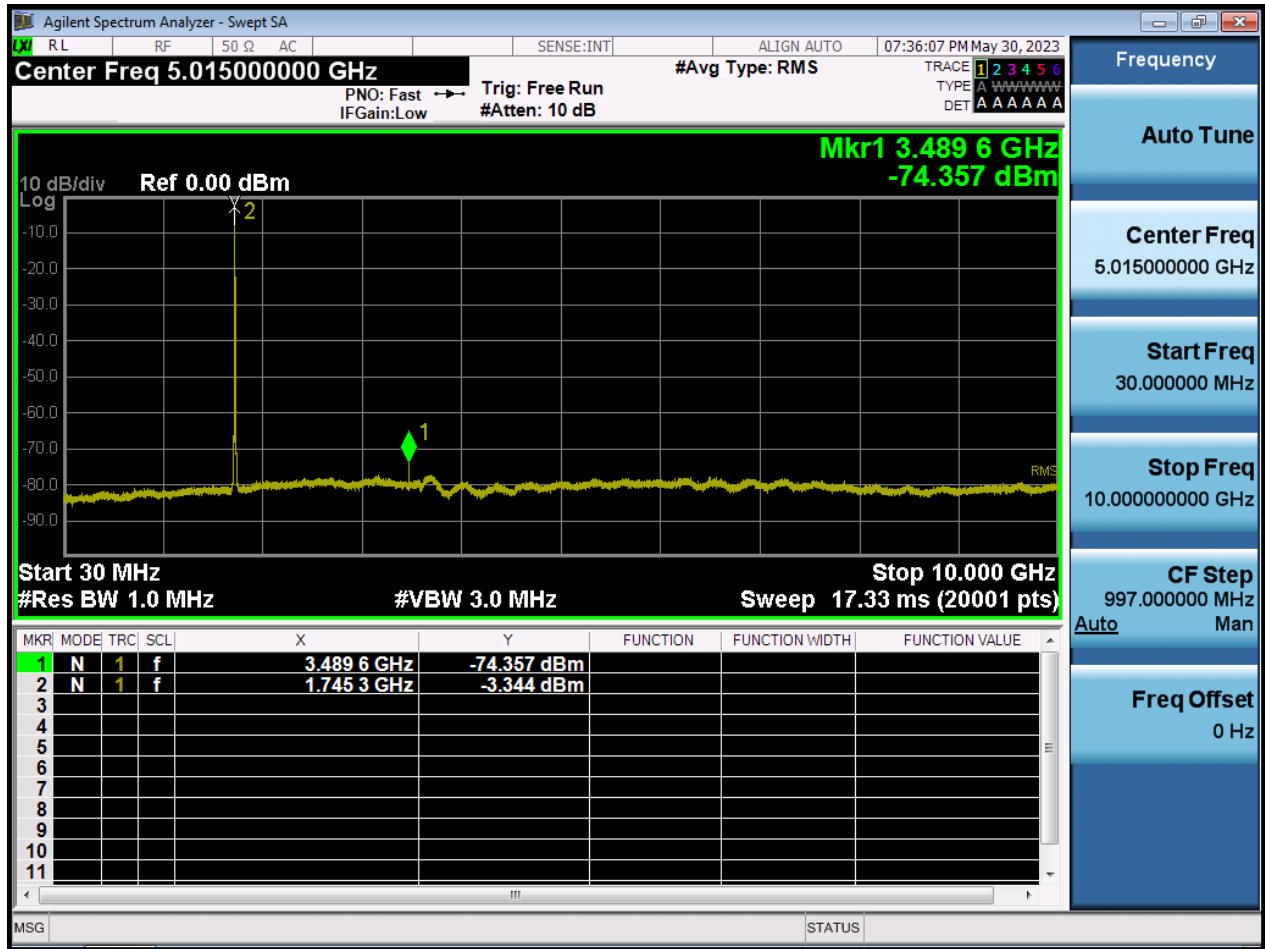
BW20 M\_PAR\_Middle Channel\_256QAM\_FullIRB



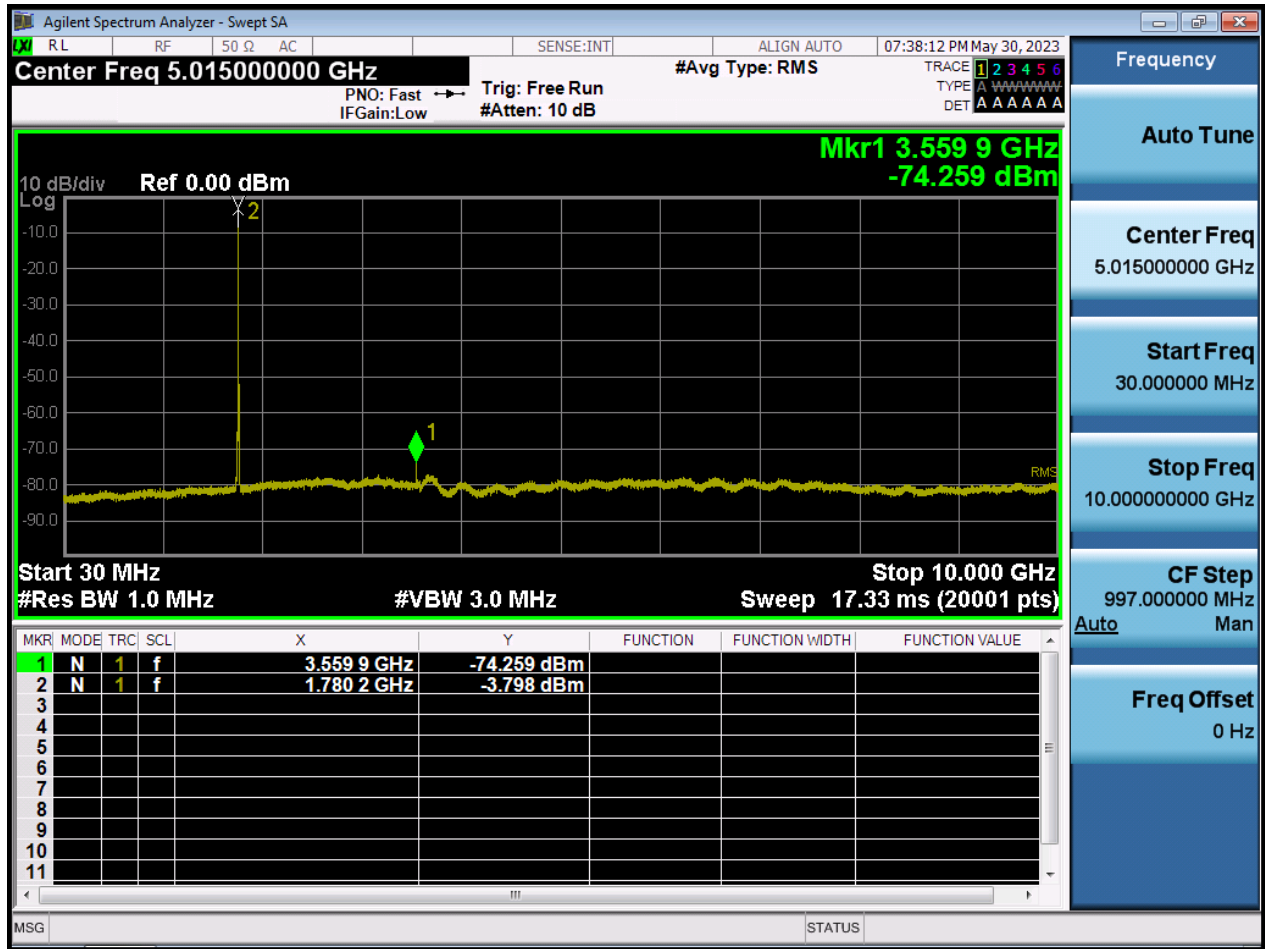
BW1.4 M\_CSE(30 M-10 G)\_Lowest Channel\_QPSK\_1RB



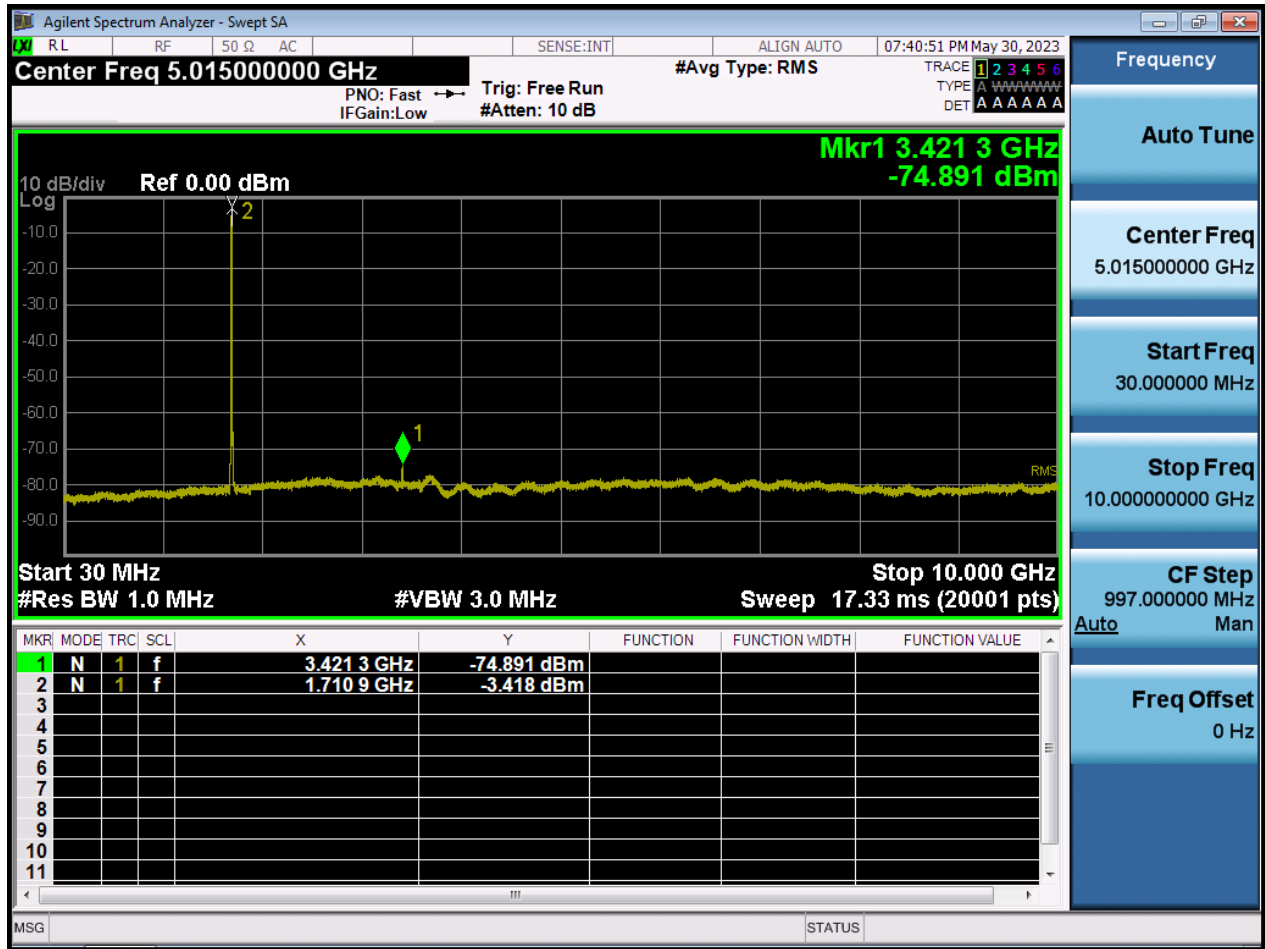
BW1.4 M\_CSE(30 M-10 G)\_Middle Channel\_QPSK\_1RB



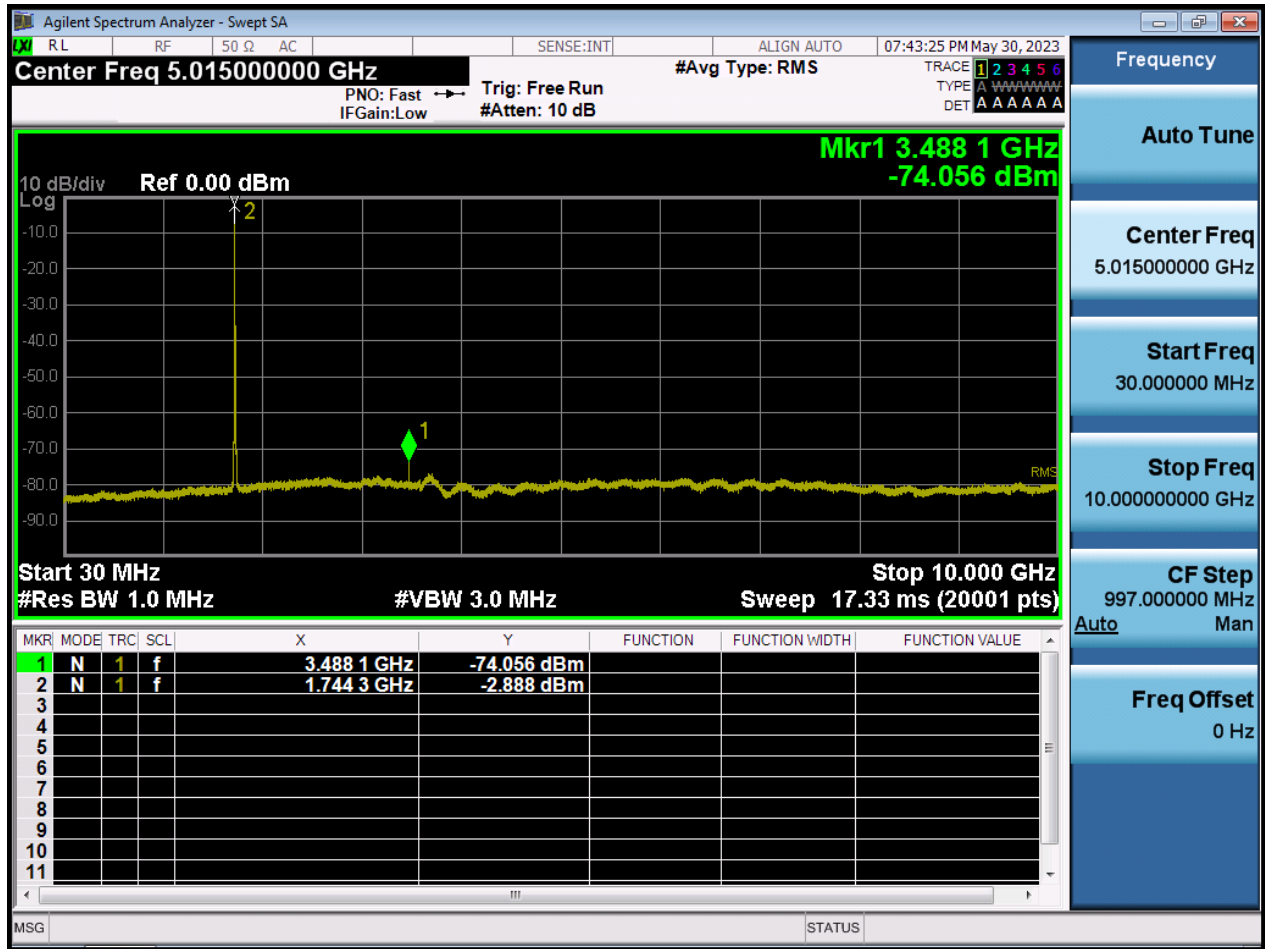
BW1.4 M\_CSE(30 M-10 G)\_Highest Channel\_QPSK\_1RB



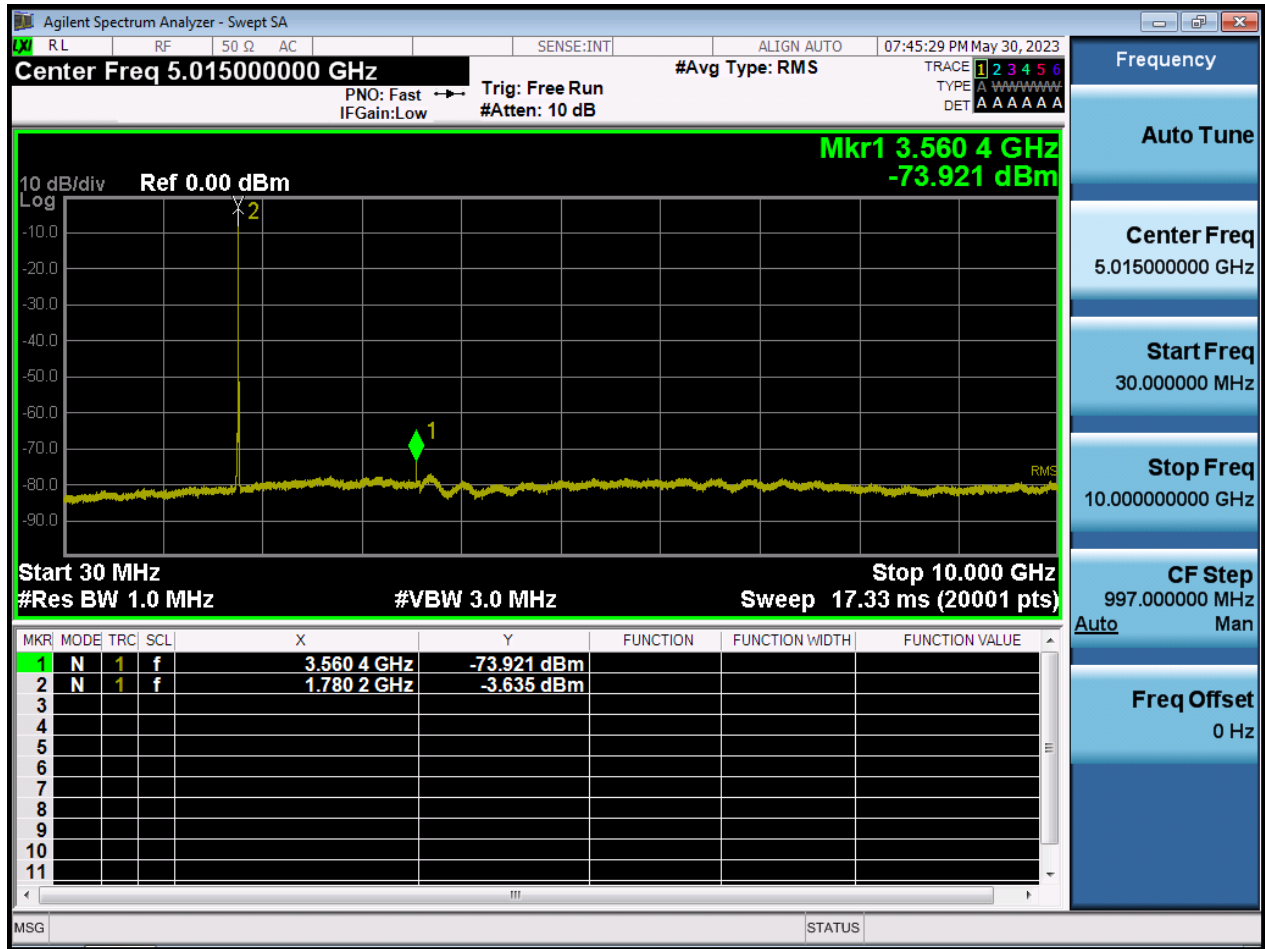
BW3 M\_CSE(30 M-10 G)\_Lowest Channel\_QPSK\_1RB



BW3 M\_CSE(30 M-10 G)\_Middle Channel\_QPSK\_1RB

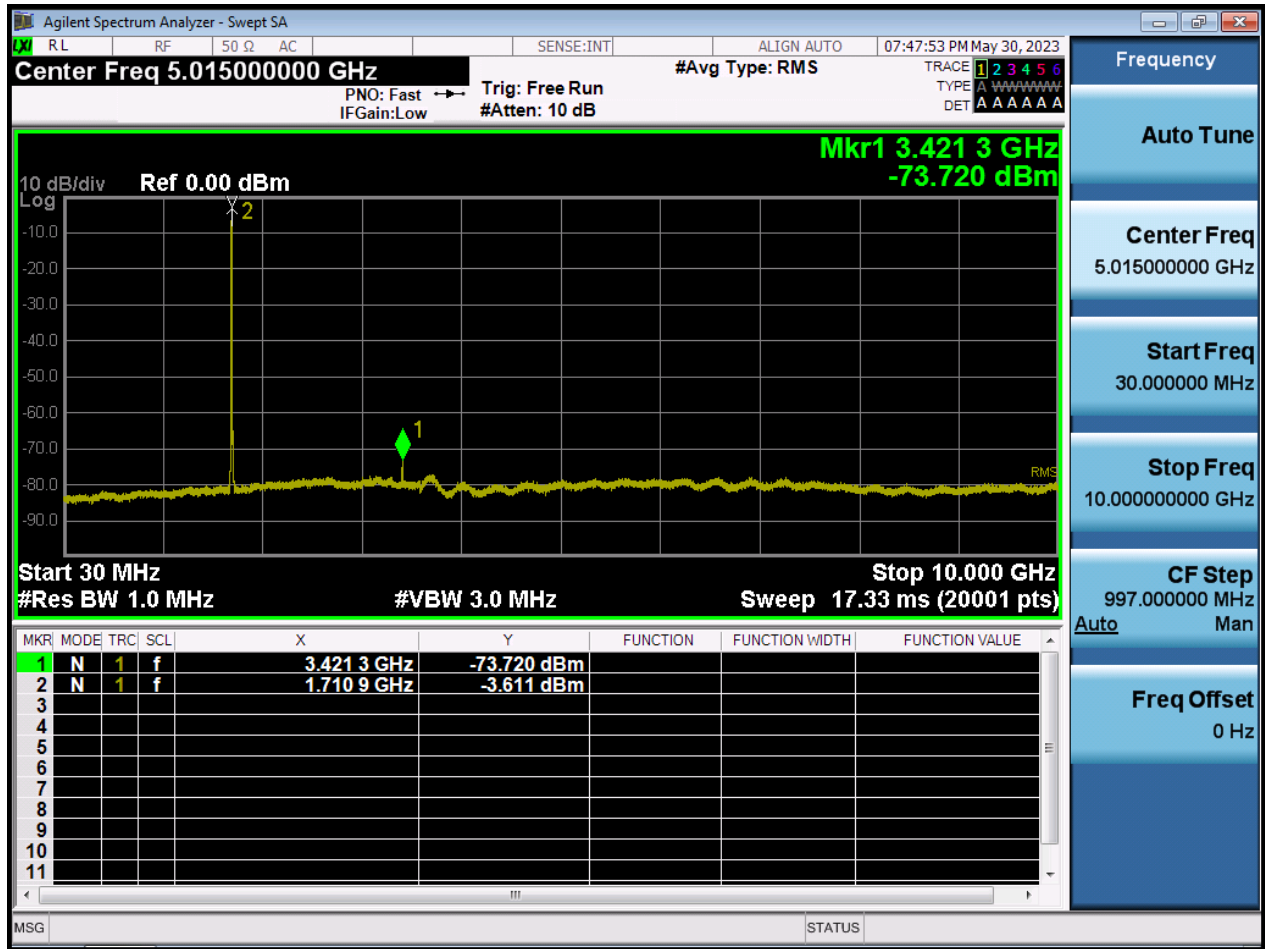


BW3 M\_CSE(30 M-10 G)\_Highest Channel\_QPSK\_1RB

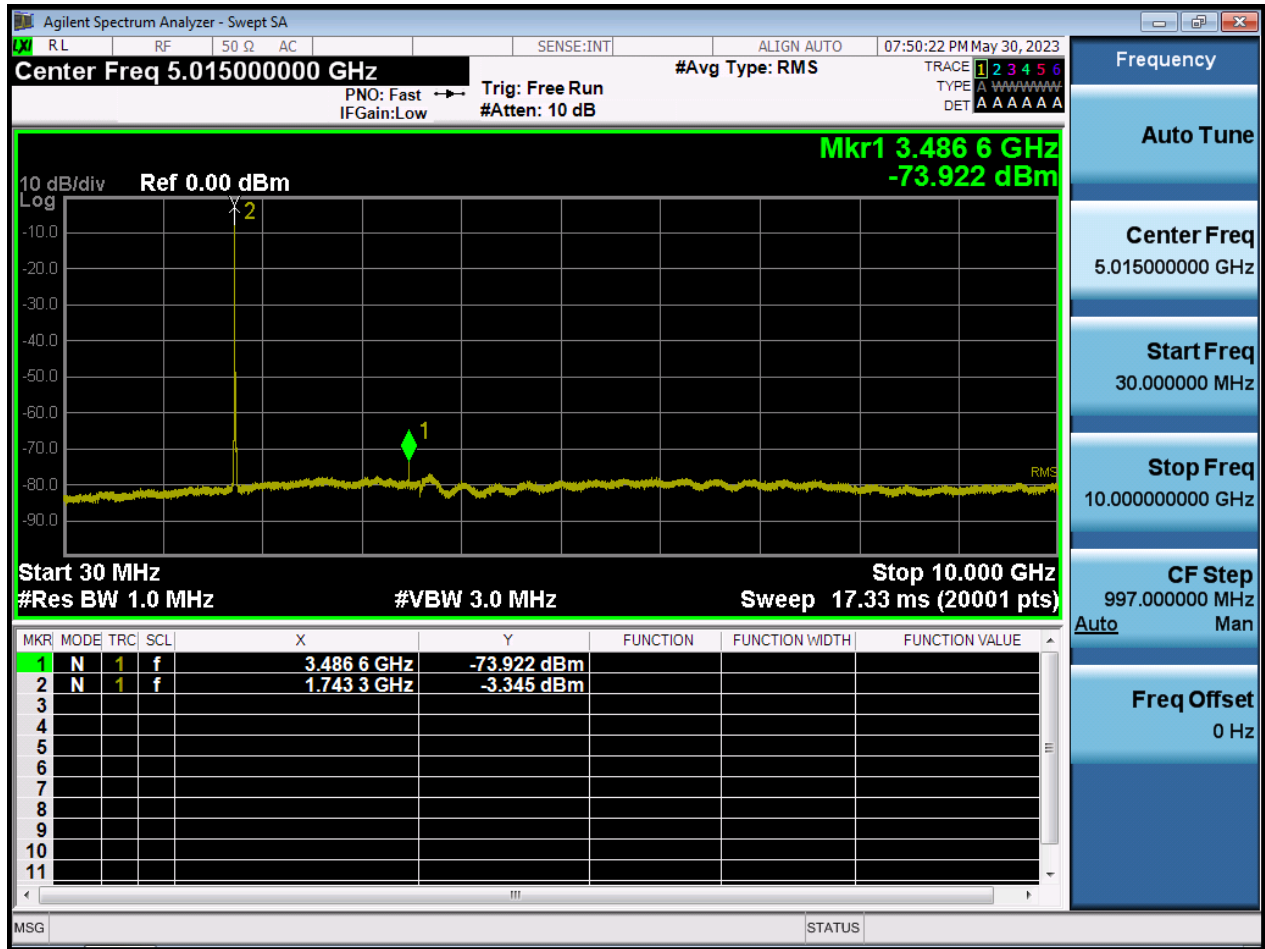




BW5 M\_CSE(30 M-10 G)\_Lowest Channel\_QPSK\_1RB



BW5 M\_CSE(30 M-10 G)\_Middle Channel\_QPSK\_1RB



BW5 M\_CSE(30 M-10 G)\_Highest Channel\_QPSK\_1RB

