

FCC LTE REPORT

Certification

Applicant Name:

SAMSUNG Electronics Co., Ltd.

Date of Issue:

October 17, 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-2310-FC063

FCC ID:
A3LSMS926B
APPLICANT:
SAMSUNG Electronics Co., Ltd.

Model(s): SM-S926B/DS
 Additional Model(s): SM-S926B
 EUT Type: Mobile phone
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 FCC Rule Part(s): §27

Main 1 Ant

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band4 (1.4)	1710.7 – 1754.3	1M10G7D	QPSK	0.151	21.78
		1M10W7D	16QAM	0.126	20.99
		1M10W7D	64QAM	0.101	20.05
		1M10W7D	256QAM	0.050	16.97
LTE – Band4 (3)	1711.5 – 1753.5	2M73G7D	QPSK	0.156	21.92
		2M73W7D	16QAM	0.128	21.06
		2M71W7D	64QAM	0.102	20.08
		2M72W7D	256QAM	0.051	17.09
LTE – Band4 (5)	1712.5 – 1752.5	4M53G7D	QPSK	0.156	21.94
		4M53W7D	16QAM	0.132	21.21
		4M52W7D	64QAM	0.107	20.29
		4M54W7D	256QAM	0.053	17.24
LTE – Band4 (10)	1715.0 – 1750.0	9M03G7D	QPSK	0.161	22.07
		9M02W7D	16QAM	0.131	21.19
		9M06W7D	64QAM	0.107	20.29
		9M00W7D	256QAM	0.053	17.23
LTE – Band4 (15)	1717.5 – 1747.5	13M5G7D	QPSK	0.154	21.88
		13M5W7D	16QAM	0.131	21.19
		13M5W7D	64QAM	0.104	20.16
		13M5W7D	256QAM	0.052	17.13
LTE – Band4 (20)	1720.0 – 1745.0	18M0G7D	QPSK	0.151	21.78
		18M0W7D	16QAM	0.125	20.98
		18M0W7D	64QAM	0.100	19.98
		18M0W7D	256QAM	0.049	16.93

Sub 2 Ant

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band4 (1.4)	1710.7 – 1754.3	1M10G7D	QPSK	0.127	21.04
		1M09W7D	16QAM	0.106	20.24
		1M10W7D	64QAM	0.083	19.20
		1M10W7D	256QAM	0.042	16.23
LTE – Band4 (3)	1711.5 – 1753.5	2M71G7D	QPSK	0.128	21.08
		2M72W7D	16QAM	0.106	20.26
		2M72W7D	64QAM	0.084	19.24
		2M71W7D	256QAM	0.042	16.20
LTE – Band4 (5)	1712.5 – 1752.5	4M52G7D	QPSK	0.128	21.06
		4M51W7D	16QAM	0.107	20.30
		4M52W7D	64QAM	0.085	19.31
		4M51W7D	256QAM	0.042	16.22
LTE – Band4 (10)	1715.0 – 1750.0	9M00G7D	QPSK	0.131	21.17
		9M02W7D	16QAM	0.107	20.28
		9M00W7D	64QAM	0.085	19.29
		9M01W7D	256QAM	0.043	16.34
LTE – Band4 (15)	1717.5 – 1747.5	13M5G7D	QPSK	0.129	21.12
		13M5W7D	16QAM	0.108	20.35
		13M5W7D	64QAM	0.085	19.27
		13M5W7D	256QAM	0.043	16.34
LTE – Band4 (20)	1720.0 – 1745.0	18M0G7D	QPSK	0.131	21.18
		17M9W7D	16QAM	0.108	20.32
		17M9W7D	64QAM	0.086	19.36
		17M9W7D	256QAM	0.043	16.35

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-2310-FC063

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.

Test Report Statement:

The above Test Report is not related to the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA.

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

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2310-FC063	October 17, 2023	- First Approval Report

Table of Contents

REVIEWED BY	3
1. GENERAL INFORMATION	7
2. INTRODUCTION	8
2.1. DESCRIPTION OF EUT	8
2.2. MEASURING INSTRUMENT CALIBRATION	8
2.3. TEST FACILITY	8
3. DESCRIPTION OF TESTS.....	9
3.1 TEST PROCEDURE	9
3.2 RADIATED POWER.....	10
3.3 RADIATED SPURIOUS EMISSIONS	11
3.4 PEAK- TO- AVERAGE RATIO.....	12
3.5 OCCUPIED BANDWIDTH.	14
3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL	15
3.7 BAND EDGE	16
3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE	18
3.9 WORST CASE(RADIATED TEST)	19
3.10 WORST CASE(CONDUCTED TEST)	21
4. LIST OF TEST EQUIPMENT	22
5. MEASUREMENT UNCERTAINTY	23
6. SUMMARY OF TEST RESULTS	24
7. SAMPLE CALCULATION	25
8. TEST DATA (Main 1 Ant).....	27
8.1 EQUIVALENT ISOTROPIC RADIATED POWER.....	27
8.2 RADIATED SPURIOUS EMISSIONS	30
8.3 PEAK-TO-AVERAGE RATIO.....	31
8.4 OCCUPIED BANDWIDTH	32
8.5 CONDUCTED SPURIOUS EMISSIONS	33
8.6 BAND EDGE	34
8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE	35
9. TEST DATA (Sub 2 Ant)	53
9.1 EQUIVALENT ISOTROPIC RADIATED POWER.....	53
9.2 RADIATED SPURIOUS EMISSIONS	56
9.3 PEAK-TO-AVERAGE RATIO.....	57
9.4 OCCUPIED BANDWIDTH	58
9.5 CONDUCTED SPURIOUS EMISSIONS	59
9.6 BAND EDGE	60
9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE	61

10. TEST DATA (Main 1 Ant , Sub 2 Ant) 79
 10.1 UPLINK CARRIER AGGREGATION 79
 10.1.1 RADIATED SPURIOUS EMISSIONS 80

11. TEST PLOTS (Main 1 Ant) 82

12. TEST PLOTS (Sub 2 Ant) 203

13. ANNEX A_ TEST SETUP PHOTO 324

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMS926B
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§27
EUT Type:	Mobile phone
Model(s):	SM-S926B/DS
Additional Model(s):	SM-S926B
Tx Frequency:	1710.7 MHz – 1754.3 MHz (LTE – Band 4 (1.4 MHz)) 1711.5 MHz – 1753.5 MHz (LTE – Band 4 (3 MHz)) 1712.5 MHz – 1752.5 MHz (LTE – Band 4 (5 MHz)) 1715.0 MHz – 1750.0 MHz (LTE – Band 4 (10 MHz)) 1717.5 MHz – 1747.5 MHz (LTE – Band 4 (15 MHz)) 1720.0 MHz – 1745.0 MHz (LTE – Band 4 (20 MHz))
Date(s) of Tests:	August 29, 2023 ~ October 10, 2023
Serial number:	Radiated: R3CW70NE0XA Conducted: R3CW70NDT7T

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

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

It also supports IEEE 802.11 a/b/g/n/ac/ax (20/40/80/160 MHz), WIFI 6E, Bluetooth, BT LE, NFC, UWB, WPT.

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- N/A (See SAR Report)
Peak- to- Average Ratio	- KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4
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 10th 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;

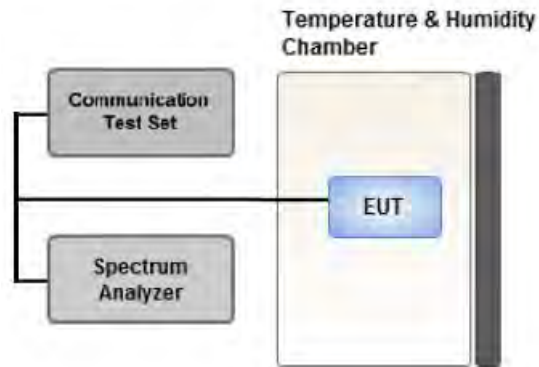
$$\text{Result}_{(dBm)} = P_g_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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.

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

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)

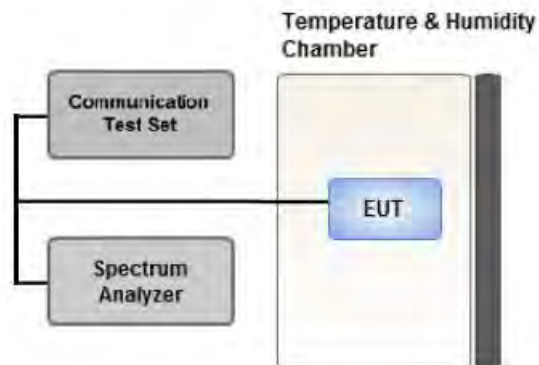
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW $\geq 3 \times$ RBW.

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.

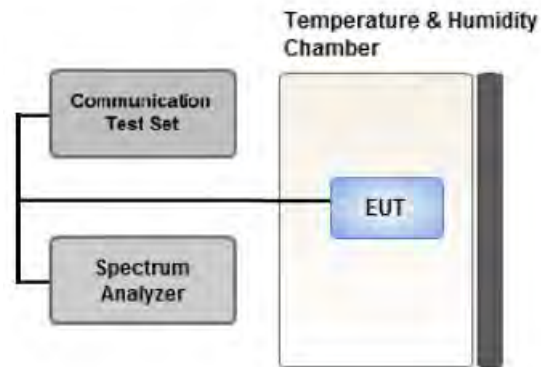
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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.

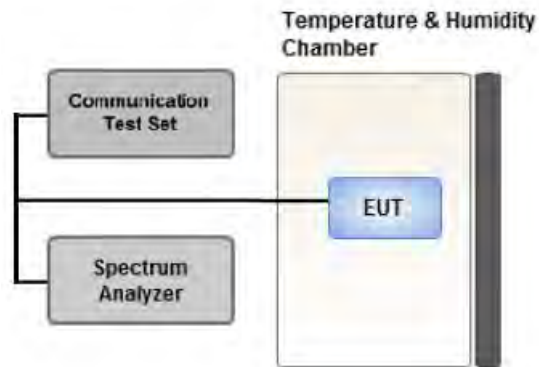
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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 $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Notes

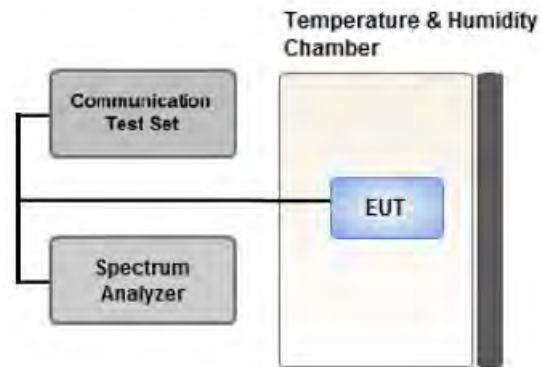
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block 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 was investigated and the worst case bandwidth results are reported. (Worst case : 10 MHz(Main 1 Ant), 20 MHz(Sub 2 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.
- SM-S926B/DS & additional models were tested and the worst case results are reported.
 (Worst case : SM-S926B/DS)

[Main 1 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	Y

[Sub 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	20	Low		1	99	Z
					Mid, High		1	0	

3.10 WORST CASE(CONDUCTED TEST)

- All modes of operation were investigated and the worst case configuration results are reported.
- SM-S926B/DS & additional models were tested and the worst case results are reported.

(Worst case : SM-S926B/DS)

[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_{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	<u>See Note1</u>
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 1 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 B4 1.4 MHz	QPSK	-19.70	14.03	9.94	2.24	V	< 1.00	0.149	21.73
		16-QAM	-20.47	13.26	9.94	2.24	V		0.125	20.96
		64-QAM	-21.40	12.33	9.94	2.24	V		0.101	20.03
		256-QAM	-24.51	9.22	9.94	2.24	V		0.049	16.92
1732.5		QPSK	-20.07	13.62	10.07	2.17	V		0.142	21.52
		16-QAM	-20.92	12.77	10.07	2.17	V		0.117	20.67
		64-QAM	-21.86	11.83	10.07	2.17	V		0.094	19.73
		256-QAM	-24.95	8.74	10.07	2.17	V		0.046	16.64
1754.3		QPSK	-19.91	13.77	10.18	2.17	V		0.151	21.78
		16-QAM	-20.70	12.98	10.18	2.17	V		0.126	20.99
		64-QAM	-21.64	12.04	10.18	2.17	V		0.101	20.05
		256-QAM	-24.72	8.96	10.18	2.17	V		0.050	16.97

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
									W	W
1711.5	LTE B4 3 MHz	QPSK	-19.66	14.07	9.94	2.24	V	< 1.00	0.150	21.77
		16-QAM	-20.48	13.25	9.94	2.24	V		0.124	20.95
		64-QAM	-21.49	12.24	9.94	2.24	V		0.099	19.94
		256-QAM	-24.46	9.27	9.94	2.24	V		0.050	16.97
1732.5		QPSK	-20.06	13.63	10.07	2.17	V		0.142	21.53
		16-QAM	-20.96	12.73	10.07	2.17	V		0.116	20.63
		64-QAM	-21.87	11.82	10.07	2.17	V		0.094	19.72
		256-QAM	-24.91	8.78	10.07	2.17	V		0.047	16.68
1753.5		QPSK	-19.77	13.91	10.18	2.17	V		0.156	21.92
		16-QAM	-20.63	13.05	10.18	2.17	V		0.128	21.06
		64-QAM	-21.61	12.07	10.18	2.17	V		0.102	20.08
		256-QAM	-24.60	9.08	10.18	2.17	V		0.051	17.09

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 B4 5 MHz	QPSK	-19.71	14.02	9.94	2.24	V	< 1.00	0.150	21.72
		16-QAM	-20.45	13.28	9.94	2.24	V		0.125	20.98
		64-QAM	-21.38	12.35	9.94	2.24	V		0.101	20.05
		256-QAM	-24.44	9.29	9.94	2.24	V		0.050	16.99
1732.5		QPSK	-20.06	13.63	10.07	2.17	V		0.142	21.53
		16-QAM	-20.90	12.79	10.07	2.17	V		0.117	20.69
		64-QAM	-21.88	11.81	10.07	2.17	V		0.094	19.71
		256-QAM	-24.86	8.83	10.07	2.17	V		0.047	16.73
1752.5		QPSK	-19.79	13.92	10.17	2.15	V		0.156	21.94
		16-QAM	-20.52	13.19	10.17	2.15	V		0.132	21.21
		64-QAM	-21.44	12.27	10.17	2.15	V		0.107	20.29
		256-QAM	-24.49	9.22	10.17	2.15	V		0.053	17.24

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 B4 10 MHz	QPSK	-19.67	13.97	9.98	2.23	V	< 1.00	0.148	21.71
		16-QAM	-20.52	13.12	9.98	2.23	V		0.122	20.86
		64-QAM	-21.45	12.19	9.98	2.23	V		0.098	19.93
		256-QAM	-24.51	9.13	9.98	2.23	V		0.049	16.87
1732.5		QPSK	-20.09	13.60	10.07	2.17	V		0.141	21.50
		16-QAM	-20.98	12.71	10.07	2.17	V		0.115	20.61
		64-QAM	-21.86	11.83	10.07	2.17	V		0.094	19.73
		256-QAM	-24.87	8.82	10.07	2.17	V		0.047	16.72
1750.0		QPSK	-19.66	14.05	10.17	2.15	V		0.161	22.07
		16-QAM	-20.54	13.17	10.17	2.15	V		0.131	21.19
		64-QAM	-21.44	12.27	10.17	2.15	V		0.107	20.29
		256-QAM	-24.50	9.21	10.17	2.15	V		0.053	17.23

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 B4 15 MHz	QPSK	-19.74	13.90	10.01	2.22	V	< 1.00	0.147	21.69
		16-QAM	-20.50	13.14	10.01	2.22	V		0.124	20.93
		64-QAM	-21.49	12.15	10.01	2.22	V		0.099	19.94
		256-QAM	-24.49	9.15	10.01	2.22	V		0.049	16.94
1732.5		QPSK	-20.04	13.65	10.07	2.17	V		0.143	21.55
		16-QAM	-20.85	12.84	10.07	2.17	V		0.119	20.74
		64-QAM	-21.82	11.87	10.07	2.17	V		0.095	19.77
		256-QAM	-24.82	8.87	10.07	2.17	V		0.048	16.77
1747.5		QPSK	-19.85	13.86	10.17	2.15	V		0.154	21.88
		16-QAM	-20.54	13.17	10.17	2.15	V		0.131	21.19
		64-QAM	-21.57	12.14	10.17	2.15	V		0.104	20.16
		256-QAM	-24.60	9.11	10.17	2.15	V		0.052	17.13

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 B4 20 MHz	QPSK	-19.70	13.81	10.01	2.22	V	< 1.00	0.145	21.60
		16-QAM	-20.57	12.94	10.01	2.22	V		0.118	20.73
		64-QAM	-21.48	12.03	10.01	2.22	V		0.096	19.82
		256-QAM	-24.48	9.03	10.01	2.22	V		0.048	16.82
1732.5		QPSK	-20.05	13.64	10.07	2.17	V		0.143	21.54
		16-QAM	-20.87	12.82	10.07	2.17	V		0.118	20.72
		64-QAM	-21.84	11.85	10.07	2.17	V		0.094	19.75
		256-QAM	-24.81	8.88	10.07	2.17	V		0.048	16.78
1745.0		QPSK	-19.90	13.78	10.15	2.15	V		0.151	21.78
		16-QAM	-20.70	12.98	10.15	2.15	V		0.125	20.98
		64-QAM	-21.70	11.98	10.15	2.15	V		0.100	19.98
		256-QAM	-24.75	8.93	10.15	2.15	V		0.049	16.93

8.2 RADIATED SPURIOUS EMISSIONS

- ▣ OPERATING FREQUENCY: 1750.0 MHz
- ▣ MEASURED OUTPUT POWER: 22.07 dBm = 0.161 W
- ▣ MODE: LTE B4
- ▣ MODULATION SIGNAL: 10 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: $43 + 10 \log_{10}(W) =$ 35.07 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
20000 (1715.0)	3 430.00	-56.97	12.42	-63.42	3.09	V	-54.09	76.15
	5 145.00	-57.66	12.37	-55.28	3.88	V	-46.79	68.85
	6 860.00	-57.78	11.87	-50.89	4.49	H	-43.51	65.58
20175 (1732.5)	3 465.00	-56.91	12.35	-63.55	3.11	H	-54.31	76.38
	5 197.50	-57.68	12.63	-56.60	3.86	H	-47.83	69.90
	6 930.00	-58.70	11.65	-51.57	4.52	V	-44.44	66.50
20350 (1750.0)	3 500.00	-56.90	12.34	-63.02	3.10	H	-53.78	75.85
	5 250.00	-58.02	12.93	-57.44	3.89	H	-48.40	70.47
	7 000.00	-58.66	11.31	-50.40	4.57	H	-43.66	65.72

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
4	1.4 MHz	1732.5	QPSK	6	0	5.76
			16-QAM			6.49
			64-QAM			6.55
			256-QAM			6.83
	3 MHz		QPSK	15		5.78
			16-QAM			6.42
			64-QAM			6.56
			256-QAM			6.75
	5 MHz		QPSK	25		5.74
			16-QAM			6.44
			64-QAM			6.52
			256-QAM			6.70
	10 MHz		QPSK	50		5.83
			16-QAM			6.41
			64-QAM			6.53
			256-QAM			6.70
	15 MHz		QPSK	75		5.69
			16-QAM			6.39
			64-QAM			6.53
			256-QAM			6.70
20 MHz	QPSK	100	5.65			
	16-QAM		6.42			
	64-QAM		6.51			
	256-QAM		6.71			

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 143 ~ 166.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
4	1.4 MHz	1732.5	QPSK	6	0	1.0975
			16-QAM			1.0966
			64-QAM			1.0984
			256-QAM			1.0978
	3 MHz		QPSK	15		2.7256
			16-QAM			2.7263
			64-QAM			2.7076
			256-QAM			2.7196
	5 MHz		QPSK	25		4.5326
			16-QAM			4.5332
			64-QAM			4.5213
			256-QAM			4.5375
	10 MHz		QPSK	50		9.0344
			16-QAM			9.0197
			64-QAM			9.0638
			256-QAM			9.0033
	15 MHz		QPSK	75		13.495
			16-QAM			13.462
			64-QAM			13.498
			256-QAM			13.505
20 MHz	QPSK	100	17.954			
	16-QAM		17.961			
	64-QAM		17.987			
	256-QAM		17.956			

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 119 ~ 142.

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)
4	1.4	1710.7	3.4213	27.976	-74.816	-46.840	-13.00
		1732.5	3.4647	27.976	-75.757	-47.781	
		1754.3	3.5100	27.976	-75.460	-47.484	
	3	1711.5	3.4208	27.976	-75.134	-47.158	
		1732.5	3.4632	27.976	-75.828	-47.852	
		1753.5	3.5100	27.976	-76.129	-48.153	
	5	1712.5	3.4213	27.976	-75.269	-47.293	
		1732.5	3.4612	27.976	-76.141	-48.165	
		1752.5	3.5100	27.976	-75.881	-47.905	
	10	1715.0	3.4218	27.976	-74.920	-46.944	
		1732.5	3.4567	27.976	-75.943	-47.967	
		1750.0	3.5095	27.976	-75.558	-47.582	
	15	1717.5	3.4223	27.976	-75.641	-47.665	
		1732.5	3.4522	27.976	-74.523	-46.547	
		1747.5	3.6960	27.976	-76.652	-48.676	
	20	1720.0	3.4228	27.976	-75.863	-47.887	
		1732.5	3.4477	27.976	-76.305	-48.329	
		1745.0	3.5085	27.976	-76.828	-48.852	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 167 ~ 202.
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

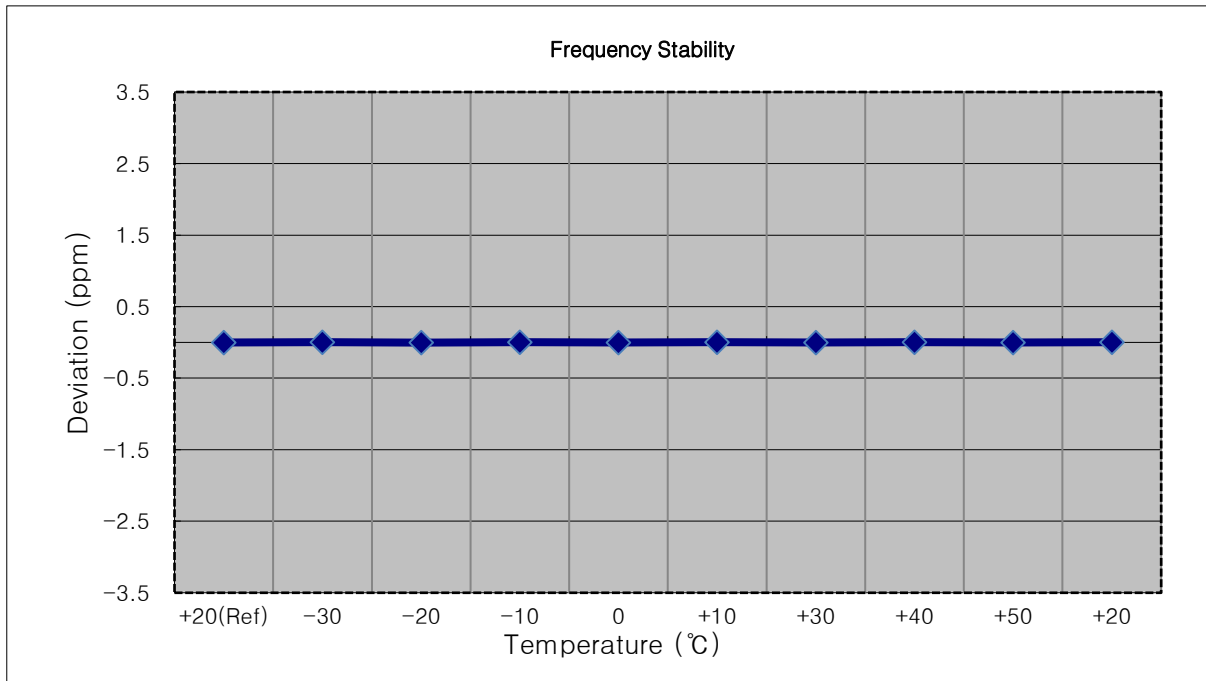
8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 83 ~ 118.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

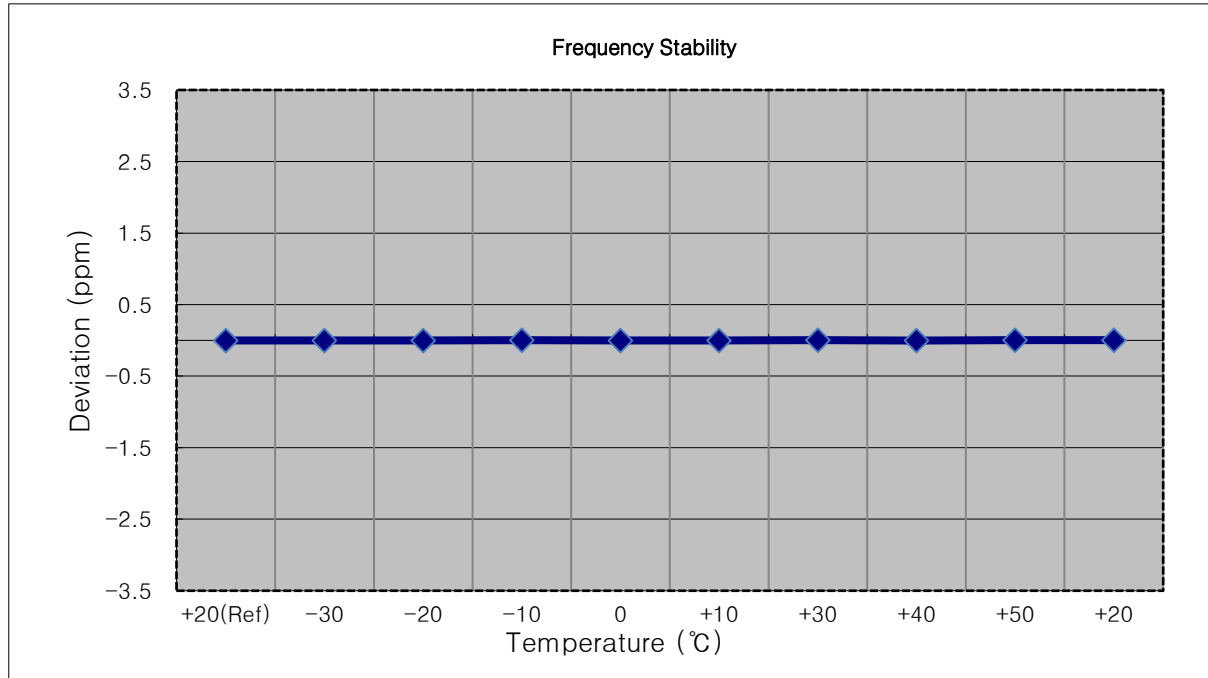
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1710,700,000 Hz
- ▣ CHANNEL: 19957 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1710 700 003	0.0	0.000 000	0.000
100 %		-30	1710 700 007	4.1	0.000 000	0.002
100 %		-20	1710 699 998	-4.9	0.000 000	-0.003
100 %		-10	1710 700 007	3.9	0.000 000	0.002
100 %		0	1710 700 001	-2.3	0.000 000	-0.001
100 %		+10	1710 700 006	3.0	0.000 000	0.002
100 %		+30	1710 699 999	-3.4	0.000 000	-0.002
100 %		+40	1710 700 007	4.3	0.000 000	0.003
100 %		+50	1710 699 999	-3.7	0.000 000	-0.002
Batt. Endpoint		3.300	+20	1710 700 008	4.7	0.000 000



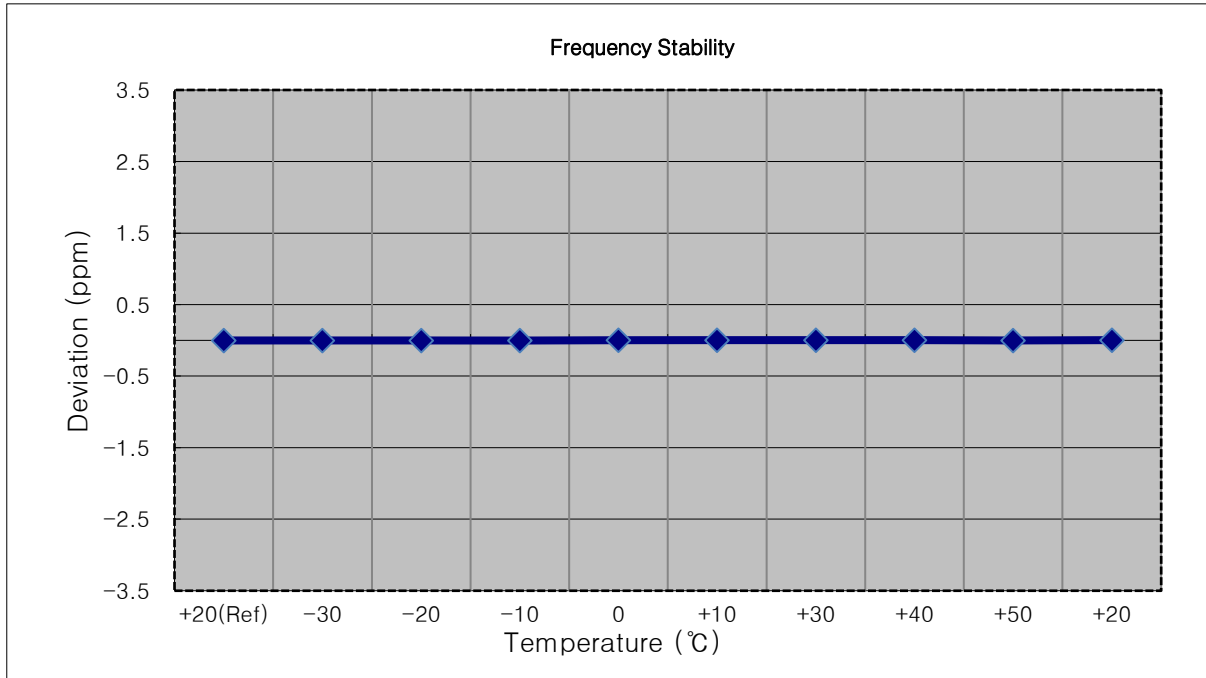
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1711,500,000 Hz
- ▣ CHANNEL: 19965 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1711 500 003	0.0	0.000 000	0.000
100 %		-30	1711 500 000	-2.6	0.000 000	-0.002
100 %		-20	1711 500 000	-2.9	0.000 000	-0.002
100 %		-10	1711 500 007	4.3	0.000 000	0.003
100 %		0	1711 500 001	-2.3	0.000 000	-0.001
100 %		+10	1711 499 999	-4.2	0.000 000	-0.002
100 %		+30	1711 500 006	3.4	0.000 000	0.002
100 %		+40	1711 499 999	-4.4	0.000 000	-0.003
100 %		+50	1711 500 006	3.5	0.000 000	0.002
Batt. Endpoint	3.300	+20	1711 500 007	3.6	0.000 000	0.002



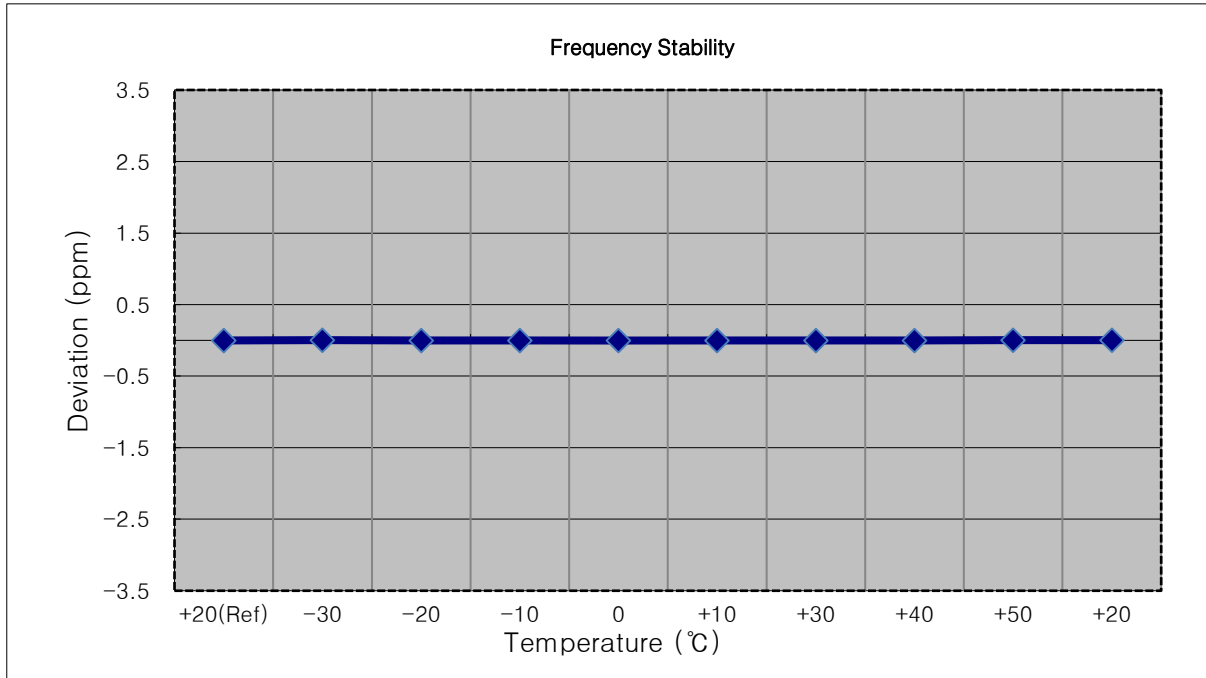
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1712,500,000 Hz
- ▣ CHANNEL: 19975 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1712 499 997	0.0	0.000 000	0.000
100 %		-30	1712 499 994	-3.4	0.000 000	-0.002
100 %		-20	1712 499 998	1.2	0.000 000	0.001
100 %		-10	1712 499 993	-4.2	0.000 000	-0.002
100 %		0	1712 500 001	3.8	0.000 000	0.002
100 %		+10	1712 499 999	2.4	0.000 000	0.001
100 %		+30	1712 500 000	3.0	0.000 000	0.002
100 %		+40	1712 500 001	3.6	0.000 000	0.002
100 %		+50	1712 499 993	-4.1	0.000 000	-0.002
Batt. Endpoint	3.300	+20	1712 500 000	2.8	0.000 000	0.002



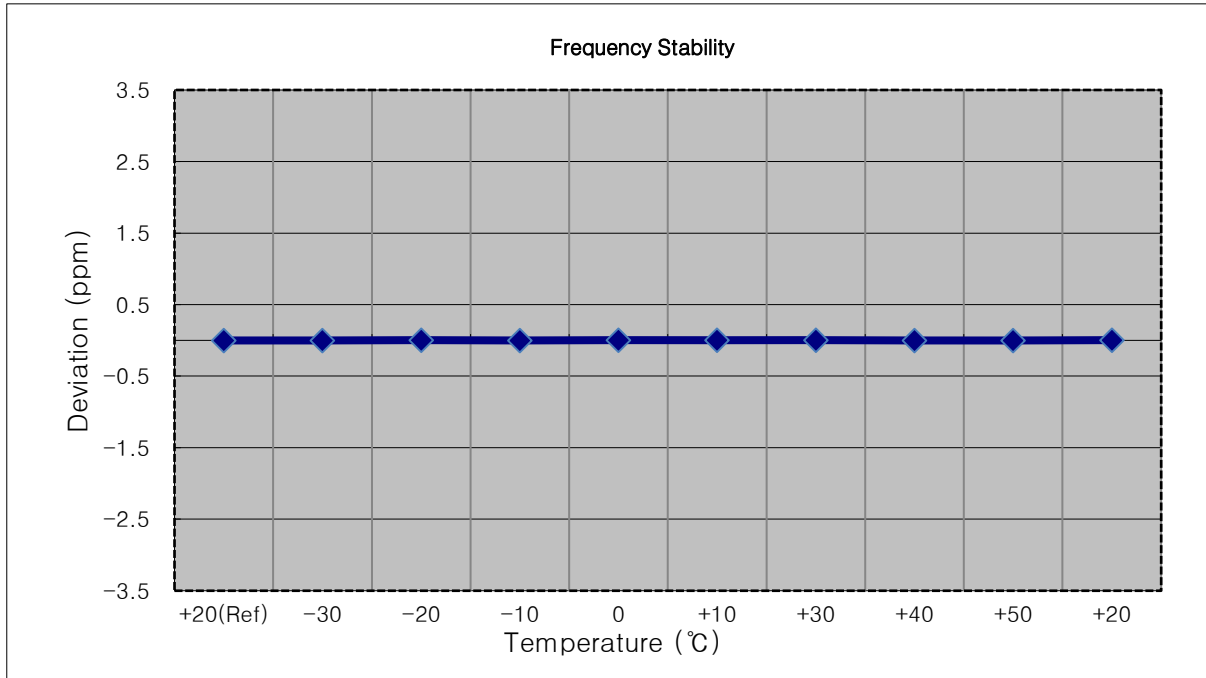
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1715,000,000 Hz
- ▣ CHANNEL: 20000 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1714 999 998	0.0	0.000 000	0.000
100 %		-30	1715 000 002	3.4	0.000 000	0.002
100 %		-20	1715 000 000	1.8	0.000 000	0.001
100 %		-10	1714 999 996	-2.4	0.000 000	-0.001
100 %		0	1714 999 994	-4.1	0.000 000	-0.002
100 %		+10	1714 999 995	-3.4	0.000 000	-0.002
100 %		+30	1714 999 994	-3.9	0.000 000	-0.002
100 %		+40	1714 999 995	-3.7	0.000 000	-0.002
100 %		+50	1715 000 001	3.0	0.000 000	0.002
Batt. Endpoint	3.300	+20	1715 000 003	4.3	0.000 000	0.003



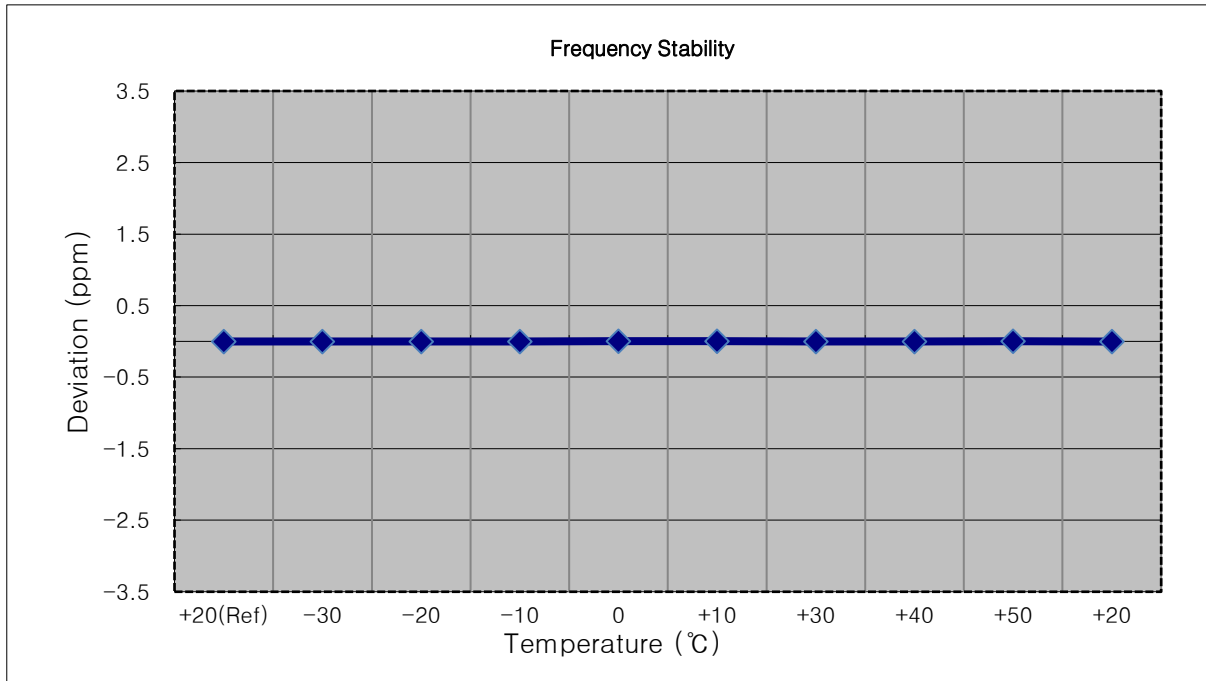
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1717,500,000 Hz
- ▣ CHANNEL: 20025 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1717 499 996	0.0	0.000 000	0.000
100 %		-30	1717 499 994	-2.0	0.000 000	-0.001
100 %		-20	1717 500 000	3.6	0.000 000	0.002
100 %		-10	1717 499 994	-2.5	0.000 000	-0.001
100 %		0	1717 500 000	3.6	0.000 000	0.002
100 %		+10	1717 500 000	4.1	0.000 000	0.002
100 %		+30	1717 499 999	2.7	0.000 000	0.002
100 %		+40	1717 499 994	-2.1	0.000 000	-0.001
100 %		+50	1717 499 993	-2.8	0.000 000	-0.002
Batt. Endpoint	3.300	+20	1717 499 999	3.0	0.000 000	0.002



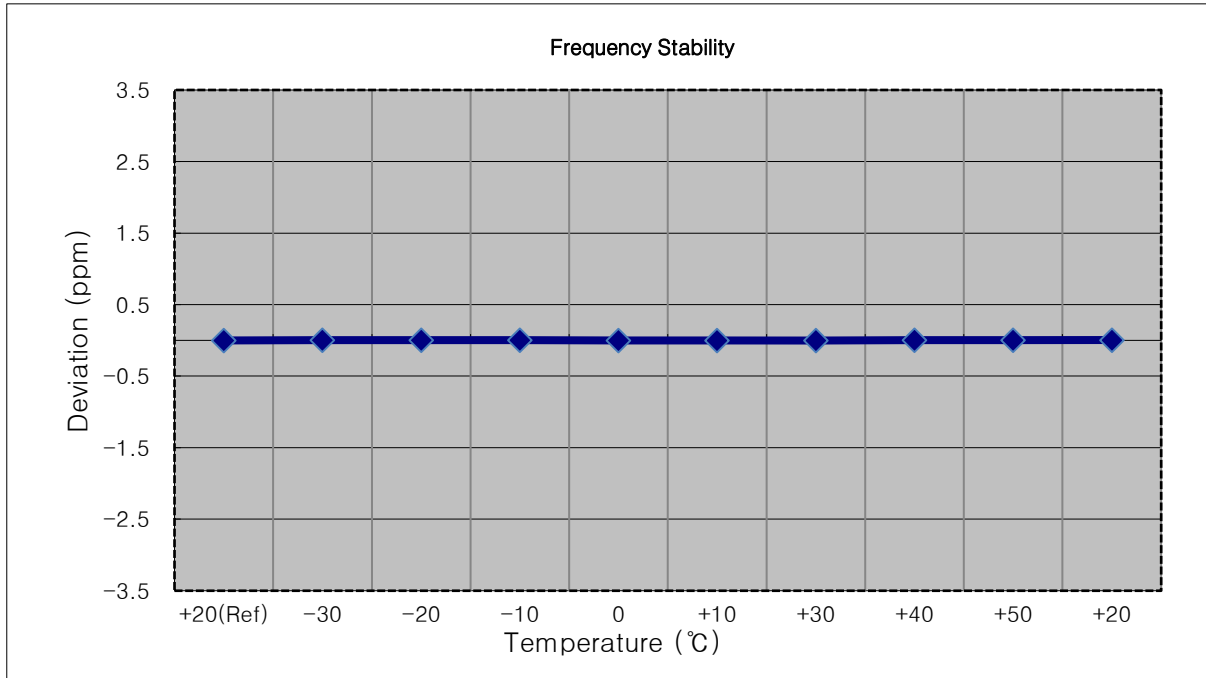
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1720,000,000 Hz
- ▣ CHANNEL: 20050 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1720 000 003	0.0	0.000 000	0.000
100 %		-30	1719 999 999	-3.9	0.000 000	-0.002
100 %		-20	1720 000 004	1.7	0.000 000	0.001
100 %		-10	1720 000 000	-3.2	0.000 000	-0.002
100 %		0	1720 000 006	3.1	0.000 000	0.002
100 %		+10	1720 000 006	3.4	0.000 000	0.002
100 %		+30	1720 000 000	-2.8	0.000 000	-0.002
100 %		+40	1720 000 000	-2.3	0.000 000	-0.001
100 %		+50	1720 000 007	4.0	0.000 000	0.002
Batt. Endpoint		3.300	+20	1719 999 999	-4.1	0.000 000



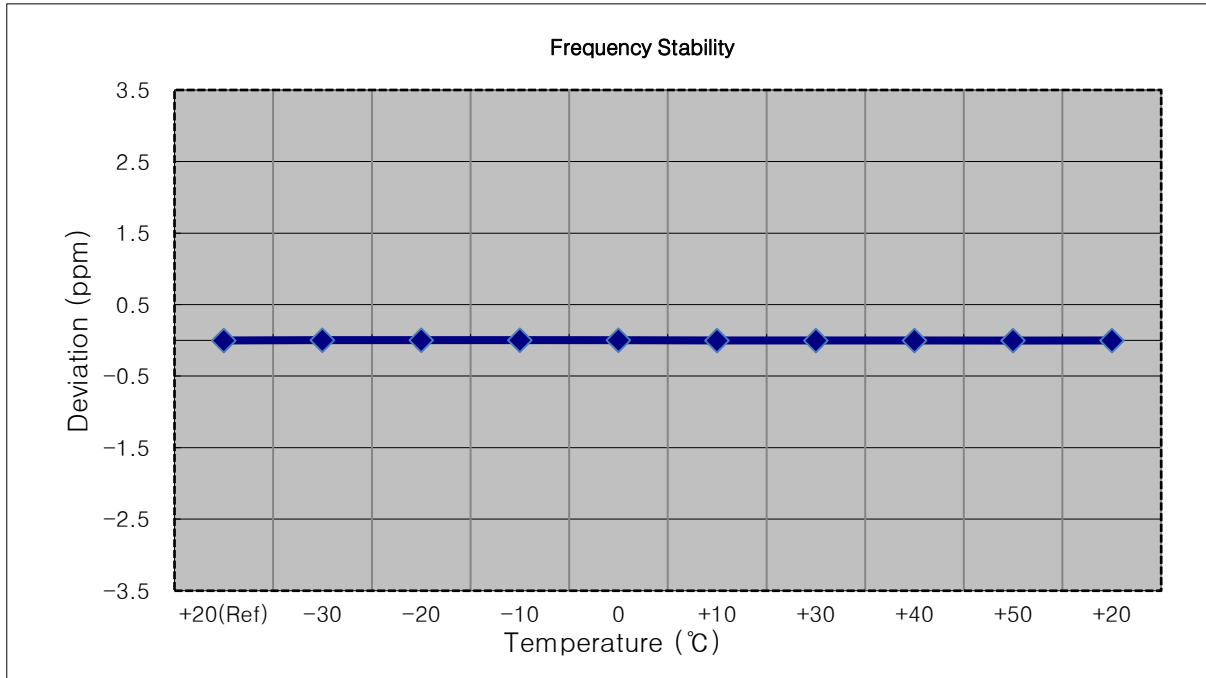
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 500 004	0.0	0.000 000	0.000
100 %		-30	1732 500 008	3.6	0.000 000	0.002
100 %		-20	1732 500 008	3.2	0.000 000	0.002
100 %		-10	1732 500 008	3.4	0.000 000	0.002
100 %		0	1732 500 002	-2.2	0.000 000	-0.001
100 %		+10	1732 500 002	-2.1	0.000 000	-0.001
100 %		+30	1732 500 000	-4.1	0.000 000	-0.002
100 %		+40	1732 500 007	2.9	0.000 000	0.002
100 %		+50	1732 500 007	2.3	0.000 000	0.001
Batt. Endpoint	3.300	+20	1732 500 013	8.2	0.000 000	0.005



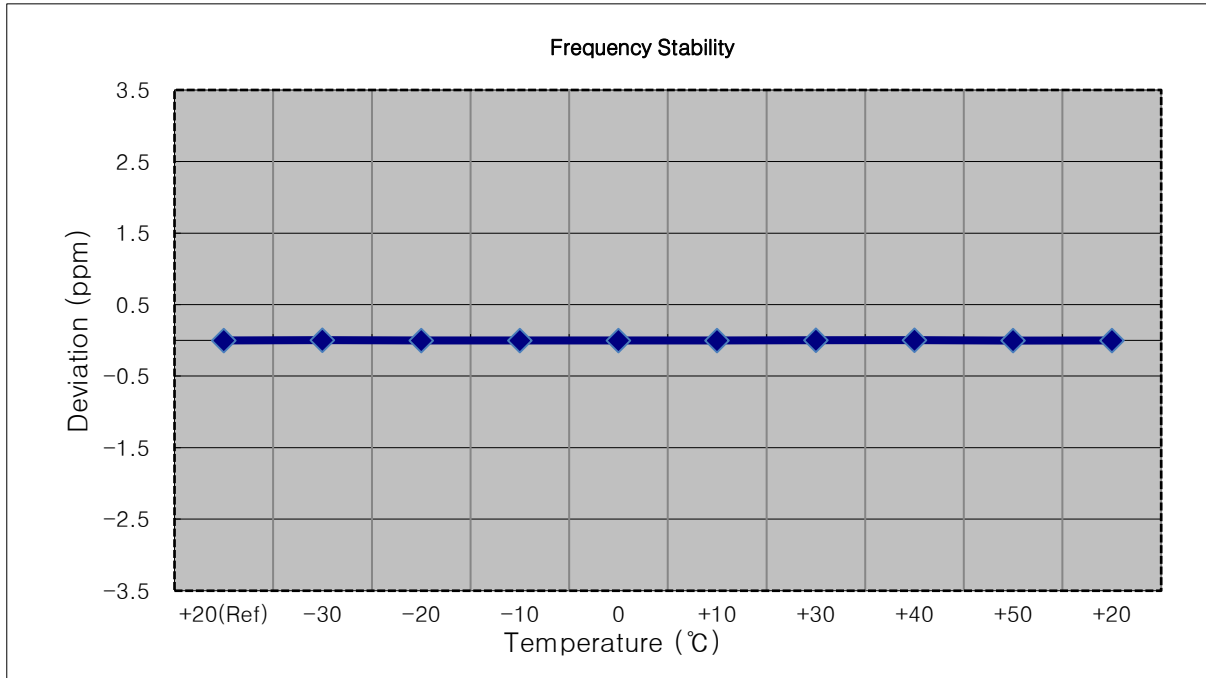
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 499 997	0.0	0.000 000	0.000
100 %		-30	1732 499 999	2.4	0.000 000	0.001
100 %		-20	1732 500 000	3.1	0.000 000	0.002
100 %		-10	1732 500 000	3.1	0.000 000	0.002
100 %		0	1732 500 001	4.2	0.000 000	0.002
100 %		+10	1732 499 994	-3.3	0.000 000	-0.002
100 %		+30	1732 499 995	-2.1	0.000 000	-0.001
100 %		+40	1732 499 994	-2.7	0.000 000	-0.002
100 %		+50	1732 499 993	-4.3	0.000 000	-0.002
Batt. Endpoint	3.300	+20	1732 499 994	-3.0	0.000 000	-0.002



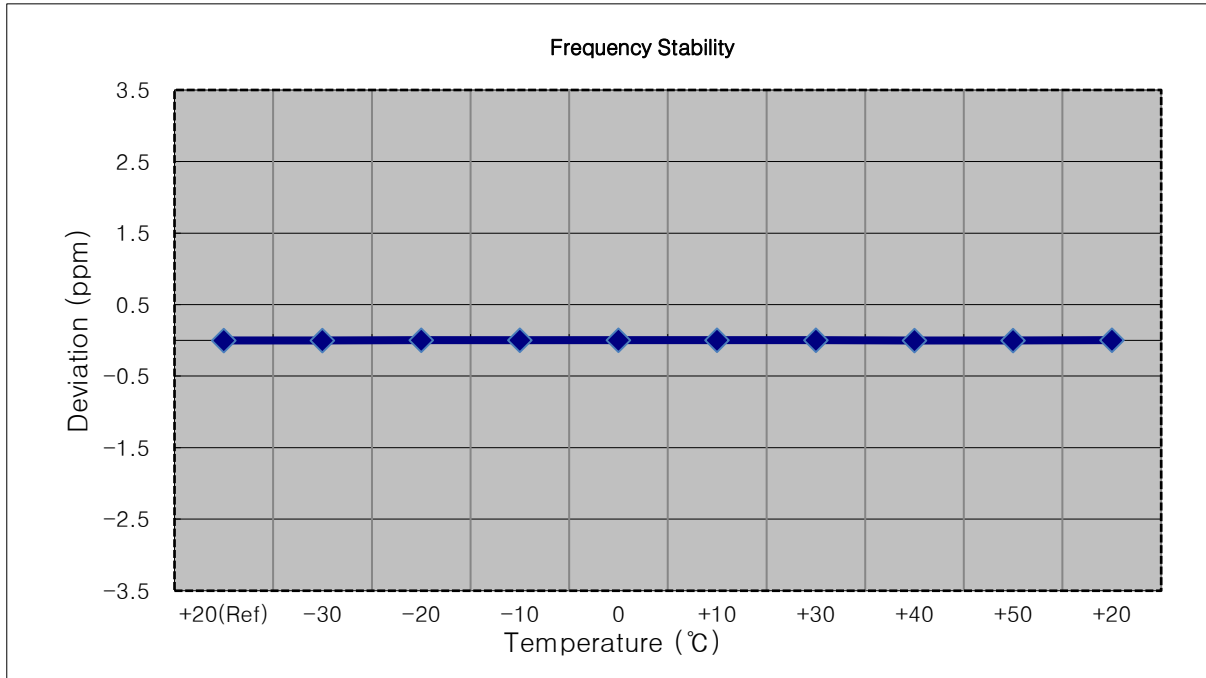
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 500 003	0.0	0.000 000	0.000
100 %		-30	1732 500 006	2.7	0.000 000	0.002
100 %		-20	1732 500 000	-3.6	0.000 000	-0.002
100 %		-10	1732 500 001	-2.8	0.000 000	-0.002
100 %		0	1732 500 000	-3.2	0.000 000	-0.002
100 %		+10	1732 500 001	-2.3	0.000 000	-0.001
100 %		+30	1732 500 007	3.8	0.000 000	0.002
100 %		+40	1732 500 005	1.9	0.000 000	0.001
100 %		+50	1732 499 998	-5.2	0.000 000	-0.003
Batt. Endpoint	3.300	+20	1732 500 000	-3.3	0.000 000	-0.002



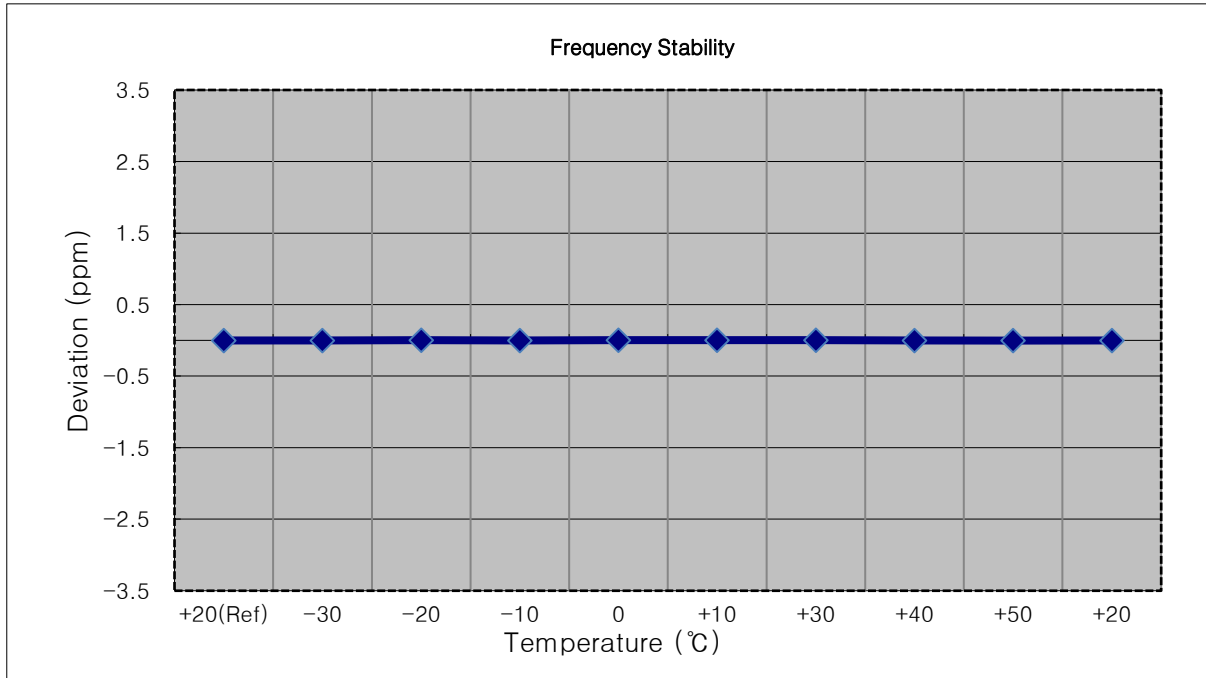
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 500 004	0.0	0.000 000	0.000
100 %		-30	1732 500 001	-2.2	0.000 000	-0.001
100 %		-20	1732 500 007	3.0	0.000 000	0.002
100 %		-10	1732 500 008	4.3	0.000 000	0.002
100 %		0	1732 500 006	2.1	0.000 000	0.001
100 %		+10	1732 500 006	2.7	0.000 000	0.002
100 %		+30	1732 500 006	2.3	0.000 000	0.001
100 %		+40	1732 500 001	-3.0	0.000 000	-0.002
100 %		+50	1732 500 001	-2.7	0.000 000	-0.002
Batt. Endpoint	3.300	+20	1732 500 007	3.2	0.000 000	0.002



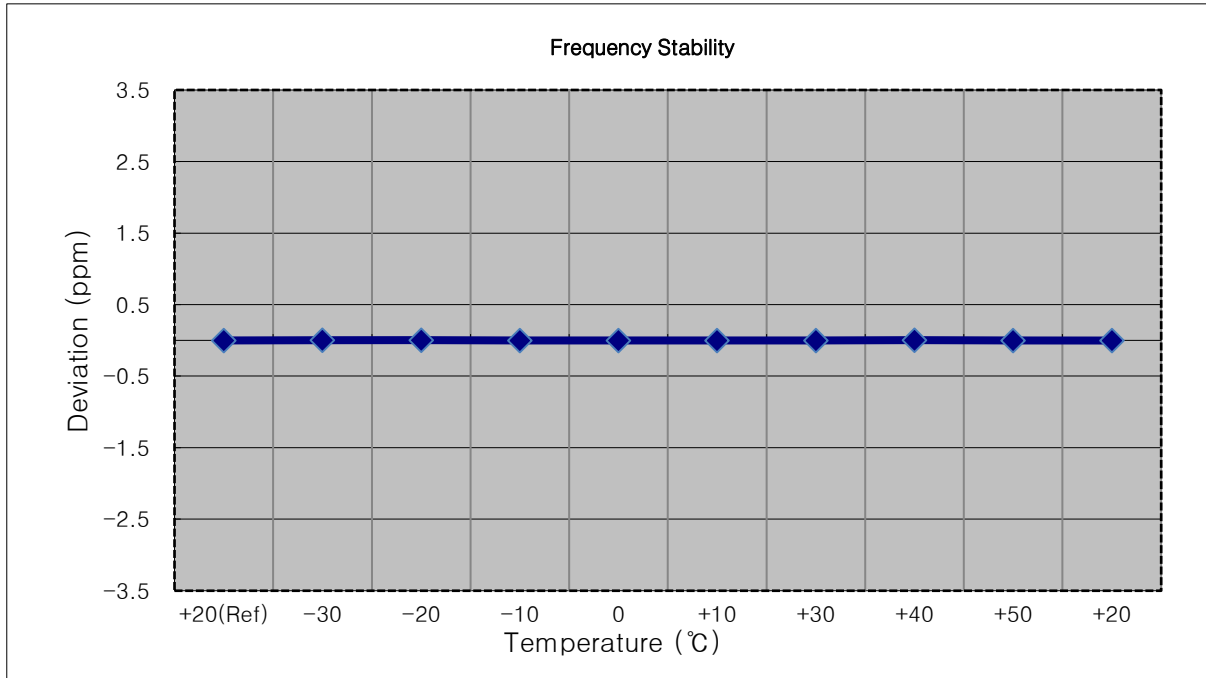
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 499 998	0.0	0.000 000	0.000
100 %		-30	1732 499 995	-2.7	0.000 000	-0.002
100 %		-20	1732 500 003	5.0	0.000 000	0.003
100 %		-10	1732 499 995	-2.8	0.000 000	-0.002
100 %		0	1732 500 001	3.4	0.000 000	0.002
100 %		+10	1732 500 001	2.8	0.000 000	0.002
100 %		+30	1732 500 000	2.1	0.000 000	0.001
100 %		+40	1732 499 995	-2.4	0.000 000	-0.001
100 %		+50	1732 499 993	-5.0	0.000 000	-0.003
Batt. Endpoint	3.300	+20	1732 499 996	-1.6	0.000 000	-0.001



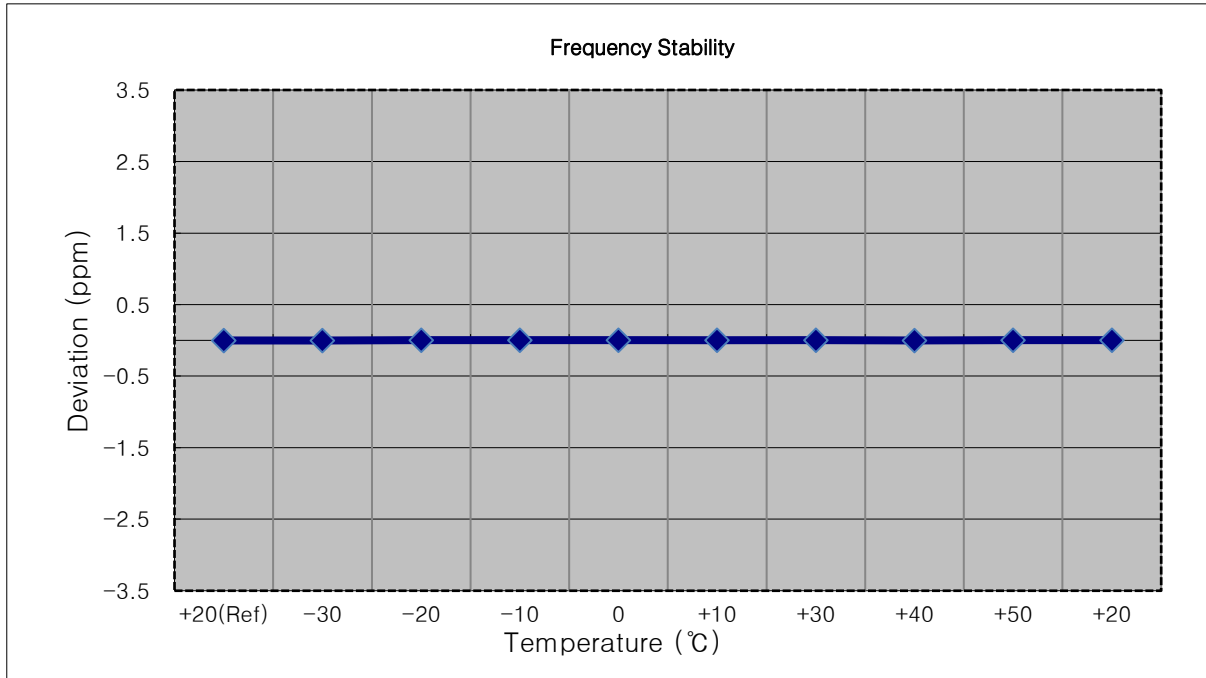
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 500 004	0.0	0.000 000	0.000
100 %		-30	1732 500 008	4.0	0.000 000	0.002
100 %		-20	1732 500 006	2.1	0.000 000	0.001
100 %		-10	1732 500 002	-2.2	0.000 000	-0.001
100 %		0	1732 500 001	-2.8	0.000 000	-0.002
100 %		+10	1732 500 001	-2.9	0.000 000	-0.002
100 %		+30	1732 500 001	-2.6	0.000 000	-0.002
100 %		+40	1732 500 008	3.6	0.000 000	0.002
100 %		+50	1732 500 001	-2.9	0.000 000	-0.002
Batt. Endpoint	3.300	+20	1732 500 000	-3.8	0.000 000	-0.002



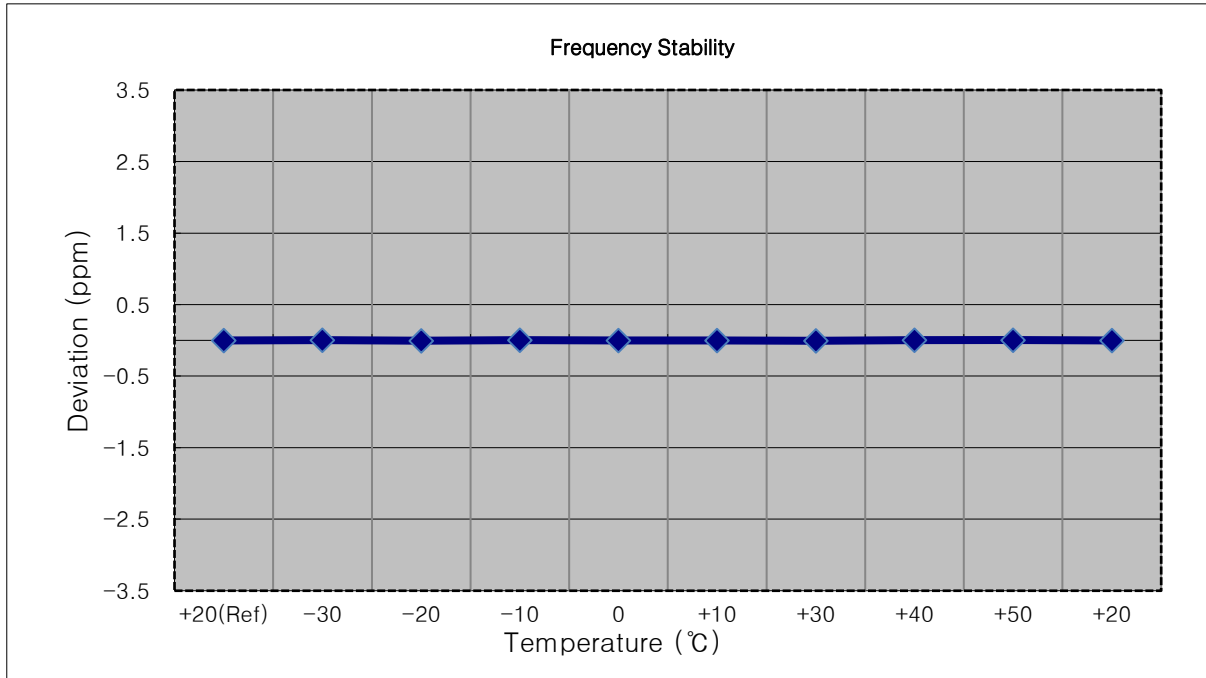
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1754,300,000 Hz
- ▣ CHANNEL: 20393 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1754 299 996	0.0	0.000 000	0.000
100 %		-30	1754 299 992	-3.3	0.000 000	-0.002
100 %		-20	1754 299 999	3.8	0.000 000	0.002
100 %		-10	1754 299 999	3.1	0.000 000	0.002
100 %		0	1754 299 999	3.7	0.000 000	0.002
100 %		+10	1754 300 000	3.9	0.000 000	0.002
100 %		+30	1754 299 999	3.6	0.000 000	0.002
100 %		+40	1754 299 998	1.9	0.000 000	0.001
100 %		+50	1754 299 999	2.9	0.000 000	0.002
Batt. Endpoint	3.300	+20	1754 299 999	3.3	0.000 000	0.002



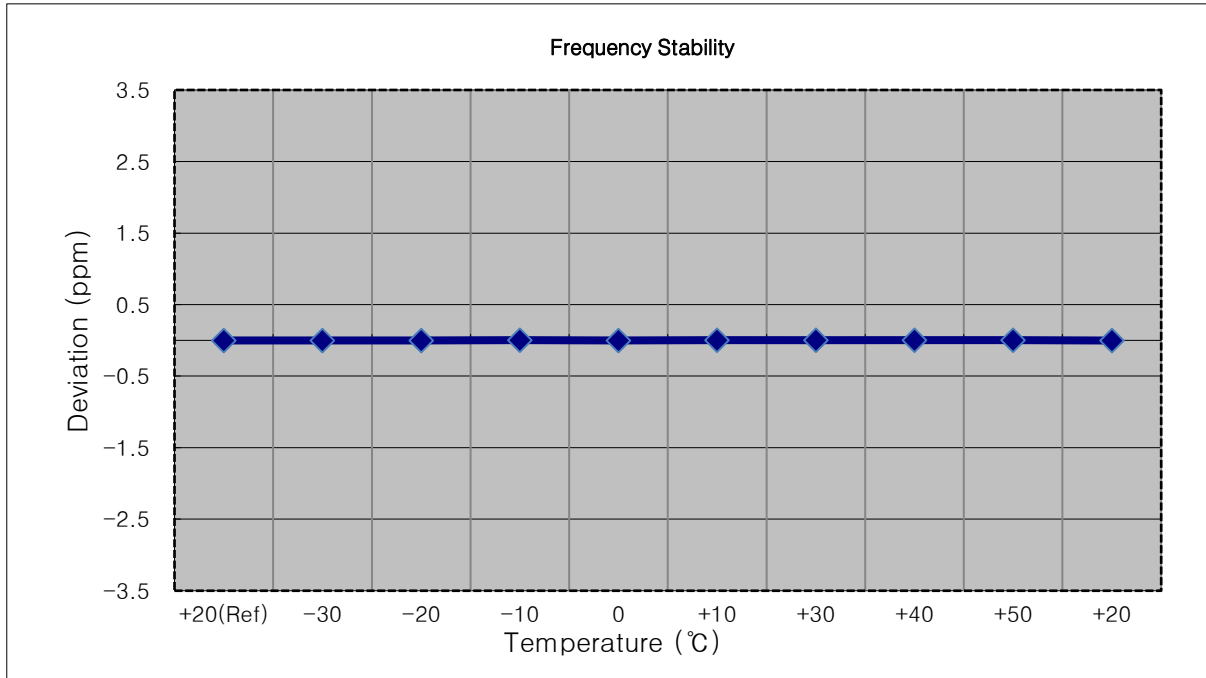
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1753,500,000 Hz
- ▣ CHANNEL: 20385 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1753 499 994	0.0	0.000 000	0.000
100 %		-30	1753 500 000	6.7	0.000 000	0.004
100 %		-20	1753 499 986	-7.9	0.000 000	-0.005
100 %		-10	1753 499 999	5.7	0.000 000	0.003
100 %		0	1753 499 989	-4.2	0.000 000	-0.002
100 %		+10	1753 499 988	-5.4	0.000 000	-0.003
100 %		+30	1753 499 987	-6.6	0.000 000	-0.004
100 %		+40	1753 500 001	7.6	0.000 000	0.004
100 %		+50	1753 500 002	8.3	0.000 000	0.005
Batt. Endpoint	3.300	+20	1753 499 988	-5.9	0.000 000	-0.003



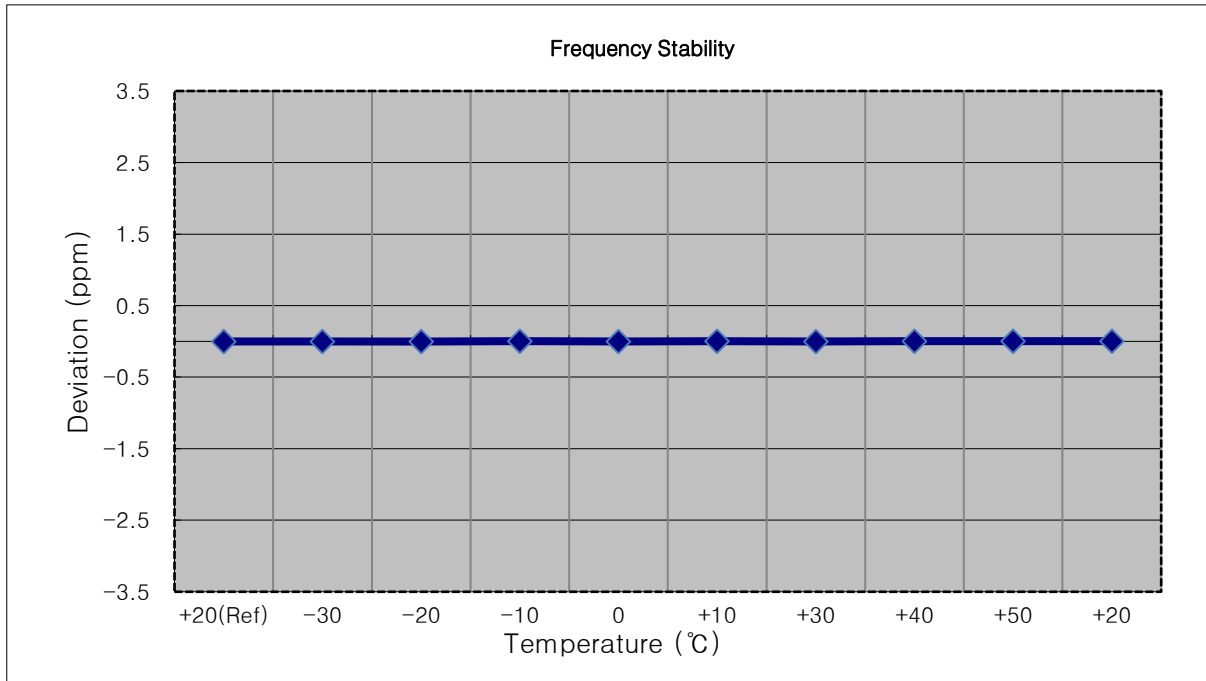
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1752,500,000 Hz
- ▣ CHANNEL: 20375 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1752 500 002	0.0	0.000 000	0.000
100 %		-30	1752 500 000	-2.4	0.000 000	-0.001
100 %		-20	1752 500 004	1.3	0.000 000	0.001
100 %		-10	1752 500 006	3.7	0.000 000	0.002
100 %		0	1752 500 000	-2.9	0.000 000	-0.002
100 %		+10	1752 500 005	3.0	0.000 000	0.002
100 %		+30	1752 500 007	4.7	0.000 000	0.003
100 %		+40	1752 500 006	3.6	0.000 000	0.002
100 %		+50	1752 500 004	2.0	0.000 000	0.001
Batt. Endpoint	3.300	+20	1752 499 998	-4.3	0.000 000	-0.002



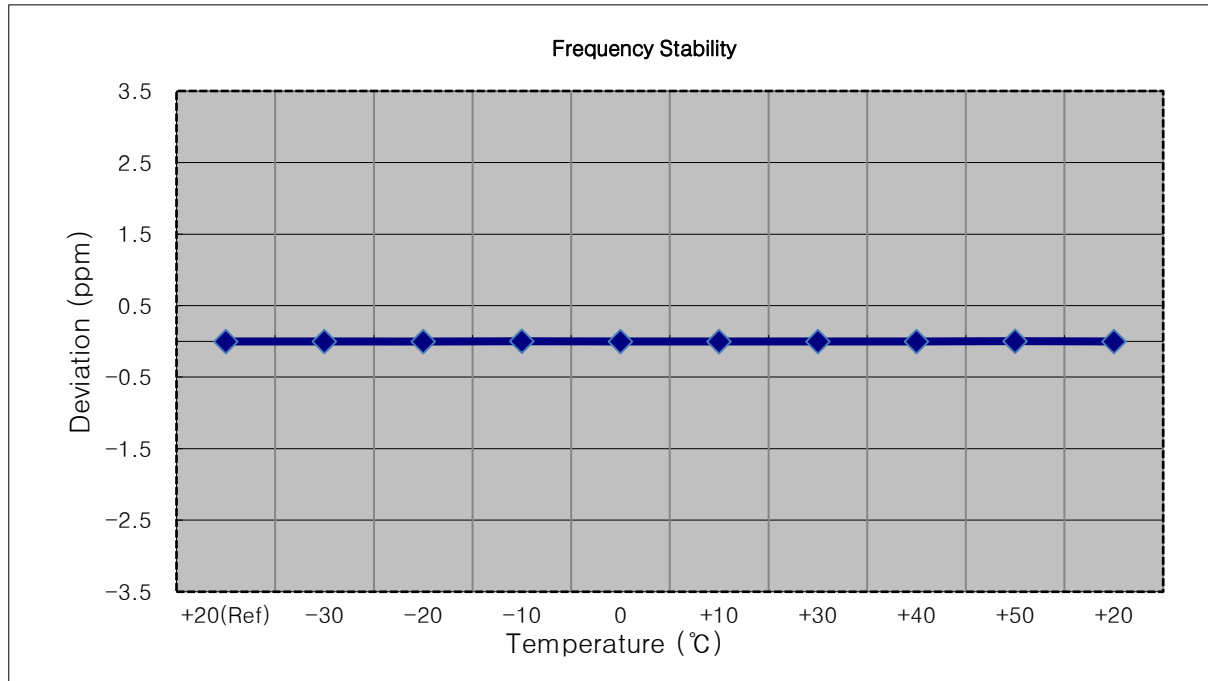
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1750,000,000 Hz
- ▣ CHANNEL: 20350 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1750 000 003	0.0	0.000 000	0.000
100 %		-30	1750 000 000	-3.4	0.000 000	-0.002
100 %		-20	1749 999 999	-4.1	0.000 000	-0.002
100 %		-10	1750 000 006	2.3	0.000 000	0.001
100 %		0	1750 000 001	-2.2	0.000 000	-0.001
100 %		+10	1750 000 008	4.3	0.000 000	0.002
100 %		+30	1750 000 001	-2.6	0.000 000	-0.001
100 %		+40	1750 000 005	2.2	0.000 000	0.001
100 %		+50	1750 000 006	2.7	0.000 000	0.002
Batt. Endpoint		3.300	+20	1750 000 005	2.0	0.000 000



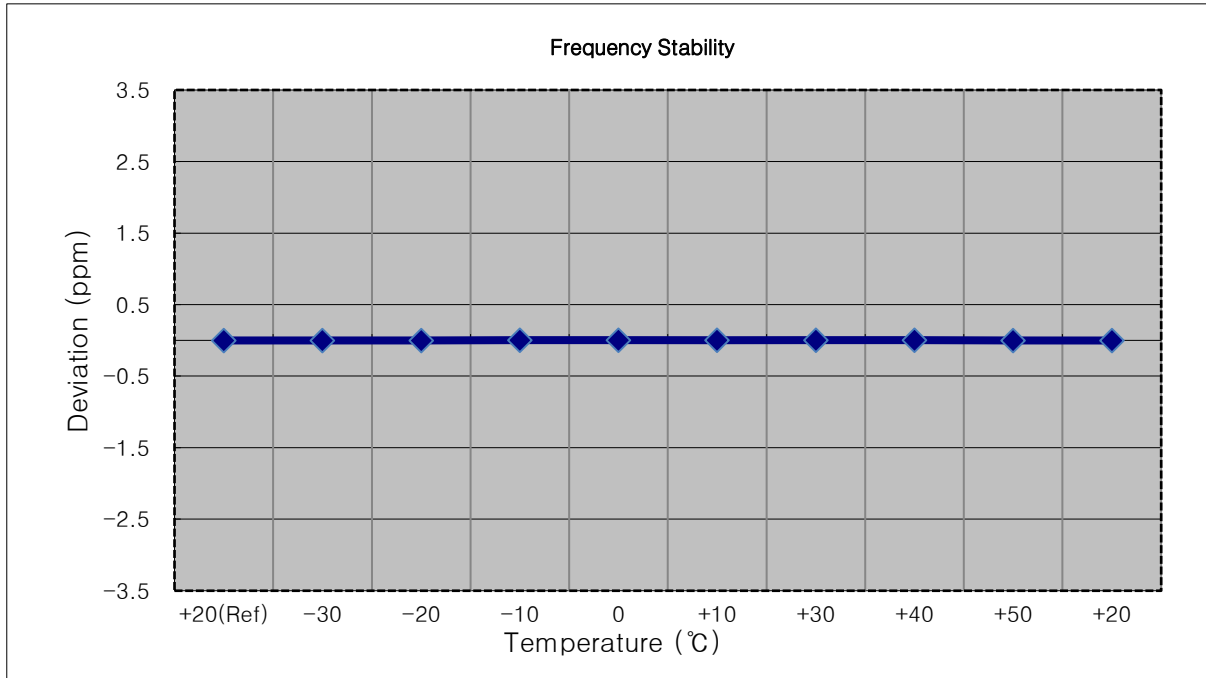
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1747,500,000 Hz
- ▣ CHANNEL: 20325 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1747 499 998	0.0	0.000 000	0.000
100 %		-30	1747 499 995	-2.7	0.000 000	-0.002
100 %		-20	1747 499 994	-3.8	0.000 000	-0.002
100 %		-10	1747 500 001	3.1	0.000 000	0.002
100 %		0	1747 499 995	-2.2	0.000 000	-0.001
100 %		+10	1747 499 995	-2.8	0.000 000	-0.002
100 %		+30	1747 499 994	-3.7	0.000 000	-0.002
100 %		+40	1747 499 995	-2.1	0.000 000	-0.001
100 %		+50	1747 500 000	2.3	0.000 000	0.001
Batt. Endpoint		3.300	+20	1747 499 999	1.0	0.000 000



- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 20300 (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 999 998	0.0	0.000 000	0.000
100 %		-30	1744 999 996	-1.6	0.000 000	-0.001
100 %		-20	1744 999 997	-1.2	0.000 000	-0.001
100 %		-10	1745 000 001	3.4	0.000 000	0.002
100 %		0	1745 000 001	3.2	0.000 000	0.002
100 %		+10	1745 000 002	3.6	0.000 000	0.002
100 %		+30	1745 000 001	2.7	0.000 000	0.002
100 %		+40	1745 000 001	2.8	0.000 000	0.002
100 %		+50	1744 999 996	-1.8	0.000 000	-0.001
Batt. Endpoint	3.300	+20	1744 999 995	-3.4	0.000 000	-0.002



9. TEST DATA (Sub 2 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 B4 1.4 MHz	QPSK	-20.63	13.10	9.94	2.24	H	< 1.00	0.120	20.80
		16-QAM	-21.46	12.27	9.94	2.24	H		0.099	19.97
		64-QAM	-22.49	11.24	9.94	2.24	H		0.078	18.94
		256-QAM	-25.45	8.28	9.94	2.24	H		0.040	15.98
1732.5		QPSK	-20.55	13.14	10.07	2.17	H		0.127	21.04
		16-QAM	-21.35	12.34	10.07	2.17	H		0.106	20.24
		64-QAM	-22.39	11.30	10.07	2.17	H		0.083	19.20
		256-QAM	-25.36	8.33	10.07	2.17	H		0.042	16.23
1754.3		QPSK	-21.02	12.66	10.18	2.17	H		0.117	20.67
		16-QAM	-21.83	11.85	10.18	2.17	H		0.097	19.86
		64-QAM	-22.81	10.87	10.18	2.17	H		0.077	18.88
		256-QAM	-25.79	7.89	10.18	2.17	H		0.039	15.90

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 B4 3 MHz	QPSK	-20.57	13.16	9.94	2.24	H	< 1.00	0.122	20.86
		16-QAM	-21.34	12.39	9.94	2.24	H		0.102	20.09
		64-QAM	-22.40	11.33	9.94	2.24	H		0.080	19.03
		256-QAM	-25.42	8.31	9.94	2.24	H		0.040	16.01
1732.5		QPSK	-20.51	13.18	10.07	2.17	H		0.128	21.08
		16-QAM	-21.33	12.36	10.07	2.17	H		0.106	20.26
		64-QAM	-22.35	11.34	10.07	2.17	H		0.084	19.24
		256-QAM	-25.39	8.30	10.07	2.17	H		0.042	16.20
1753.5		QPSK	-20.85	12.83	10.18	2.17	H		0.121	20.84
		16-QAM	-21.70	11.98	10.18	2.17	H		0.100	19.99
		64-QAM	-22.64	11.04	10.18	2.17	H		0.080	19.05
		256-QAM	-25.71	7.97	10.18	2.17	H		0.040	15.98

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 B4 5 MHz	QPSK	-20.46	13.27	9.94	2.24	H	< 1.00	0.125	20.97
		16-QAM	-21.29	12.44	9.94	2.24	H		0.103	20.14
		64-QAM	-22.28	11.45	9.94	2.24	H		0.082	19.15
		256-QAM	-25.33	8.40	9.94	2.24	H		0.041	16.10
1732.5		QPSK	-20.53	13.16	10.07	2.17	H		0.128	21.06
		16-QAM	-21.29	12.40	10.07	2.17	H		0.107	20.30
		64-QAM	-22.28	11.41	10.07	2.17	H		0.085	19.31
		256-QAM	-25.37	8.32	10.07	2.17	H		0.042	16.22
1752.5		QPSK	-20.80	12.91	10.17	2.15	H		0.124	20.93
		16-QAM	-21.58	12.13	10.17	2.15	H		0.103	20.15
		64-QAM	-22.55	11.16	10.17	2.15	H		0.083	19.18
		256-QAM	-25.62	8.09	10.17	2.15	H		0.041	16.11

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 B4 10 MHz	QPSK	-20.46	13.18	9.98	2.23	H	< 1.00	0.124	20.92
		16-QAM	-21.23	12.41	9.98	2.23	H		0.104	20.15
		64-QAM	-22.27	11.37	9.98	2.23	H		0.082	19.11
		256-QAM	-25.20	8.44	9.98	2.23	H		0.042	16.18
1732.5		QPSK	-20.42	13.27	10.07	2.17	H		0.131	21.17
		16-QAM	-21.35	12.34	10.07	2.17	H		0.106	20.24
		64-QAM	-22.30	11.39	10.07	2.17	H		0.085	19.29
		256-QAM	-25.25	8.44	10.07	2.17	H		0.043	16.34
1750.0		QPSK	-20.63	13.08	10.17	2.15	H		0.129	21.10
		16-QAM	-21.45	12.26	10.17	2.15	H		0.107	20.28
		64-QAM	-22.50	11.21	10.17	2.15	H		0.084	19.23
		256-QAM	-25.42	8.29	10.17	2.15	H		0.043	16.31

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 B4 15 MHz	QPSK	-20.48	13.16	10.01	2.22	H	< 1.00	0.124	20.95
		16-QAM	-21.37	12.27	10.01	2.22	H		0.101	20.06
		64-QAM	-22.38	11.26	10.01	2.22	H		0.080	19.05
		256-QAM	-25.30	8.34	10.01	2.22	H		0.041	16.13
1732.5		QPSK	-20.47	13.22	10.07	2.17	H		0.129	21.12
		16-QAM	-21.24	12.45	10.07	2.17	H		0.108	20.35
		64-QAM	-22.32	11.37	10.07	2.17	H		0.085	19.27
		256-QAM	-25.25	8.44	10.07	2.17	H		0.043	16.34
1747.5		QPSK	-20.65	13.06	10.17	2.15	H		0.128	21.08
		16-QAM	-21.43	12.28	10.17	2.15	H		0.107	20.30
		64-QAM	-22.46	11.25	10.17	2.15	H		0.085	19.27
		256-QAM	-25.45	8.26	10.17	2.15	H		0.042	16.28

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 B4 20 MHz	QPSK	-20.58	12.93	10.01	2.22	H	< 1.00	0.118	20.72
		16-QAM	-21.37	12.14	10.01	2.22	H		0.098	19.93
		64-QAM	-22.35	11.16	10.01	2.22	H		0.079	18.95
		256-QAM	-25.36	8.15	10.01	2.22	H		0.039	15.94
1732.5		QPSK	-20.49	13.20	10.07	2.17	H		0.129	21.10
		16-QAM	-21.38	12.31	10.07	2.17	H		0.105	20.21
		64-QAM	-22.31	11.38	10.07	2.17	H		0.085	19.28
		256-QAM	-25.31	8.38	10.07	2.17	H		0.042	16.28
1745.0		QPSK	-20.50	13.18	10.15	2.15	H		0.131	21.18
		16-QAM	-21.36	12.32	10.15	2.15	H		0.108	20.32
		64-QAM	-22.32	11.36	10.15	2.15	H		0.086	19.36
		256-QAM	-25.33	8.35	10.15	2.15	H		0.043	16.35

9.2 RADIATED SPURIOUS EMISSIONS

- ▣ OPERATING FREQUENCY: 1745.0 MHz
- ▣ MEASURED OUTPUT POWER: 21.18 dBm = 0.131 W
- ▣ MODE: LTE B4
- ▣ MODULATION SIGNAL: 20 MHz QPSK
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: $43 + 10 \log_{10}(W) =$ 34.18 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
20050 (1720.0)	3 440.00	-52.74	12.40	-58.86	3.14	H	-49.60	70.78
	5 160.00	-44.57	12.44	-42.73	3.78	H	-34.07	55.26
	6 880.00	-56.47	11.82	-49.76	4.51	H	-42.45	63.63
20175 (1732.5)	3 465.00	-52.29	12.35	-58.93	3.11	H	-49.69	70.88
	5 197.50	-42.47	12.63	-41.39	3.86	V	-32.62	53.81
	6 930.00	-56.43	11.65	-49.30	4.52	V	-42.17	63.35
20300 (1745.0)	3 490.00	-52.82	12.34	-58.83	3.08	H	-49.57	70.76
	5 235.00	-42.85	12.84	-41.93	3.95	H	-33.04	54.23
	6 980.00	-54.42	11.40	-46.81	4.56	V	-39.97	61.16

9.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
4	1.4 MHz	1732.5	QPSK	6	0	5.99
			16-QAM			6.41
			64-QAM			6.74
			256-QAM			6.78
	3 MHz		QPSK	15		5.92
			16-QAM			6.54
			64-QAM			6.66
			256-QAM			6.63
	5 MHz		QPSK	25		5.86
			16-QAM			6.57
			64-QAM			6.63
			256-QAM			6.57
	10 MHz		QPSK	50		5.96
			16-QAM			6.48
			64-QAM			6.68
			256-QAM			6.59
	15 MHz		QPSK	75		5.80
			16-QAM			6.44
			64-QAM			6.65
			256-QAM			6.59
20 MHz	QPSK	100	5.76			
	16-QAM		6.46			
	64-QAM		6.62			
	256-QAM		6.60			

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 264 ~ 287.

9.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
4	1.4 MHz	1732.5	QPSK	6	0	1.0981
			16-QAM			1.0922
			64-QAM			1.1023
			256-QAM			1.0966
	3 MHz		QPSK	15		2.7047
			16-QAM			2.7220
			64-QAM			2.7145
			256-QAM			2.7089
	5 MHz		QPSK	25		4.5200
			16-QAM			4.5093
			64-QAM			4.5164
			256-QAM			4.5121
	10 MHz		QPSK	50		9.0043
			16-QAM			9.0232
			64-QAM			9.0031
			256-QAM			9.0098
	15 MHz		QPSK	75		13.475
			16-QAM			13.473
			64-QAM			13.472
			256-QAM			13.478
20 MHz	QPSK	100	17.945			
	16-QAM		17.939			
	64-QAM		17.943			
	256-QAM		17.925			

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 240 ~ 263.

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)
4	1.4	1710.7	3.4213	27.976	-73.854	-45.878	-13.00
		1732.5	3.4647	27.976	-75.469	-47.493	
		1754.3	3.5100	27.976	-76.428	-48.452	
	3	1711.5	3.4208	27.976	-76.649	-48.673	
		1732.5	3.4632	27.976	-75.687	-47.711	
		1753.5	3.5100	27.976	-76.363	-48.387	
	5	1712.5	3.4213	27.976	-75.219	-47.243	
		1732.5	3.4612	27.976	-76.128	-48.152	
		1752.5	3.5100	27.976	-76.308	-48.332	
	10	1715.0	3.4218	27.976	-76.604	-48.628	
		1732.5	3.4567	27.976	-76.088	-48.112	
		1750.0	3.5095	27.976	-76.019	-48.043	
	15	1717.5	3.4223	27.976	-74.585	-46.609	
		1732.5	3.4527	27.976	-76.169	-48.193	
		1747.5	3.5090	27.976	-75.870	-47.894	
	20	1720.0	3.4228	27.976	-74.947	-46.971	
		1732.5	3.4477	27.976	-75.277	-47.301	
		1745.0	3.5085	27.976	-75.871	-47.895	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 288 ~ 323.
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

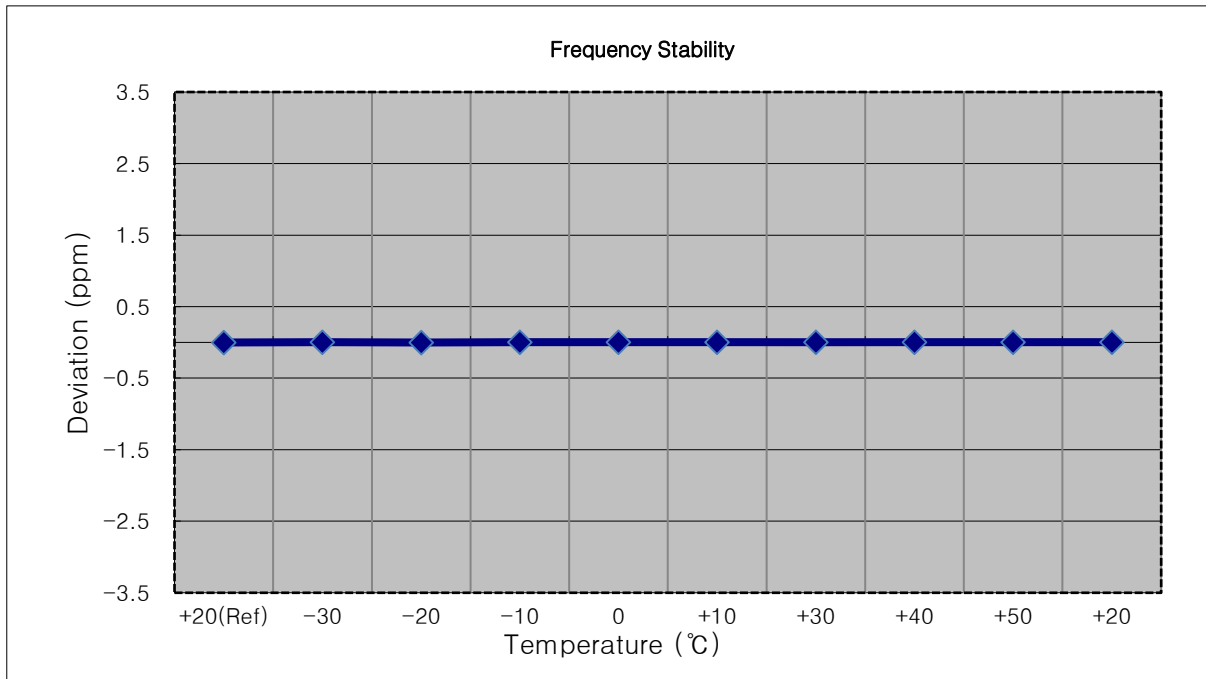
9.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 204 ~ 239.

9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

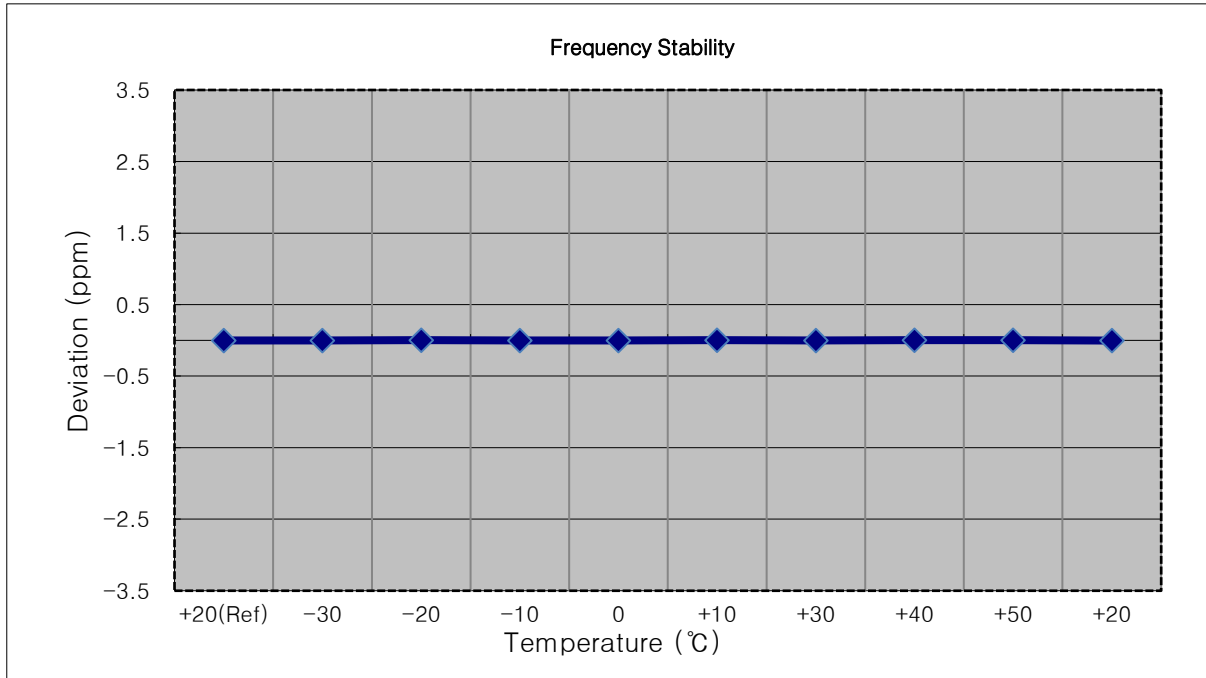
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1710,700,000 Hz
- ▣ CHANNEL: 19957 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

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 700 000	3.3	0.000 000	0.002
100 %		-20	1710 699 994	-2.5	0.000 000	-0.001
100 %		-10	1710 700 000	3.5	0.000 000	0.002
100 %		0	1710 700 000	3.0	0.000 000	0.002
100 %		+10	1710 699 999	2.7	0.000 000	0.002
100 %		+30	1710 700 001	4.7	0.000 000	0.003
100 %		+40	1710 700 001	4.1	0.000 000	0.002
100 %		+50	1710 699 999	2.6	0.000 000	0.002
Batt. Endpoint		3.300	+20	1710 700 001	4.1	0.000 000



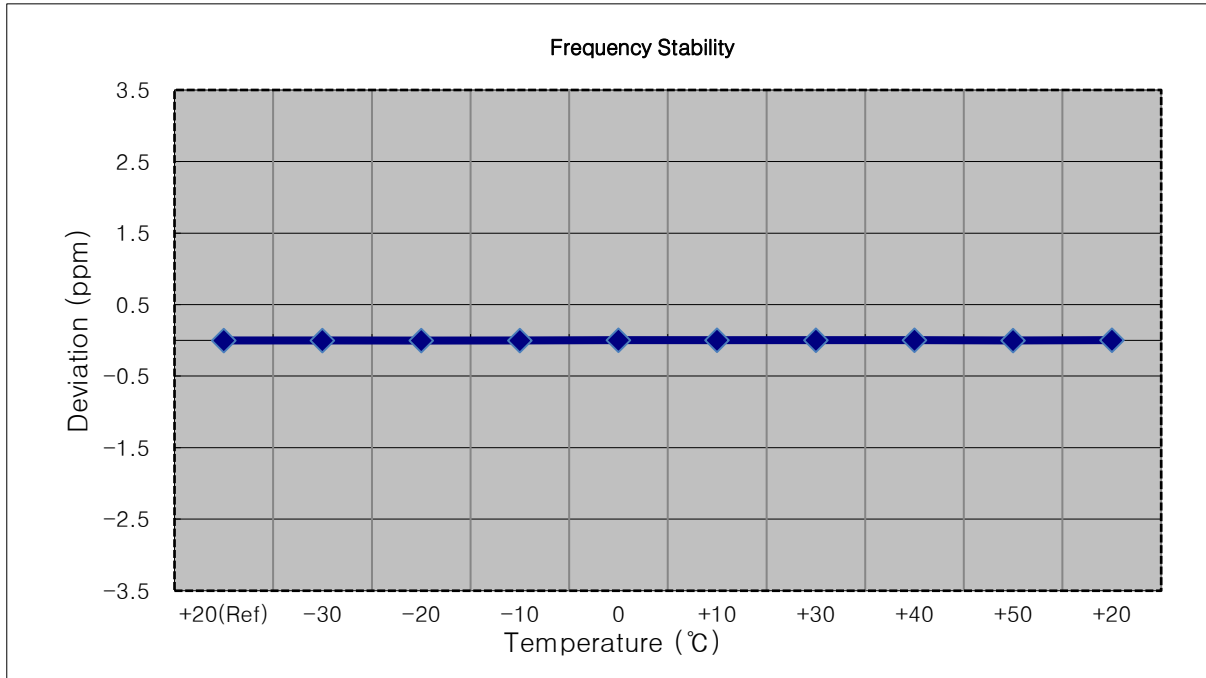
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1711,500,000 Hz
- ▣ CHANNEL: 19965 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1711 499 996	0.0	0.000 000	0.000
100 %		-30	1711 499 993	-2.5	0.000 000	-0.001
100 %		-20	1711 499 999	3.5	0.000 000	0.002
100 %		-10	1711 499 993	-2.6	0.000 000	-0.002
100 %		0	1711 499 993	-3.1	0.000 000	-0.002
100 %		+10	1711 499 998	2.5	0.000 000	0.001
100 %		+30	1711 499 993	-3.1	0.000 000	-0.002
100 %		+40	1711 499 998	2.2	0.000 000	0.001
100 %		+50	1711 500 001	4.8	0.000 000	0.003
Batt. Endpoint	3.300	+20	1711 499 991	-4.8	0.000 000	-0.003



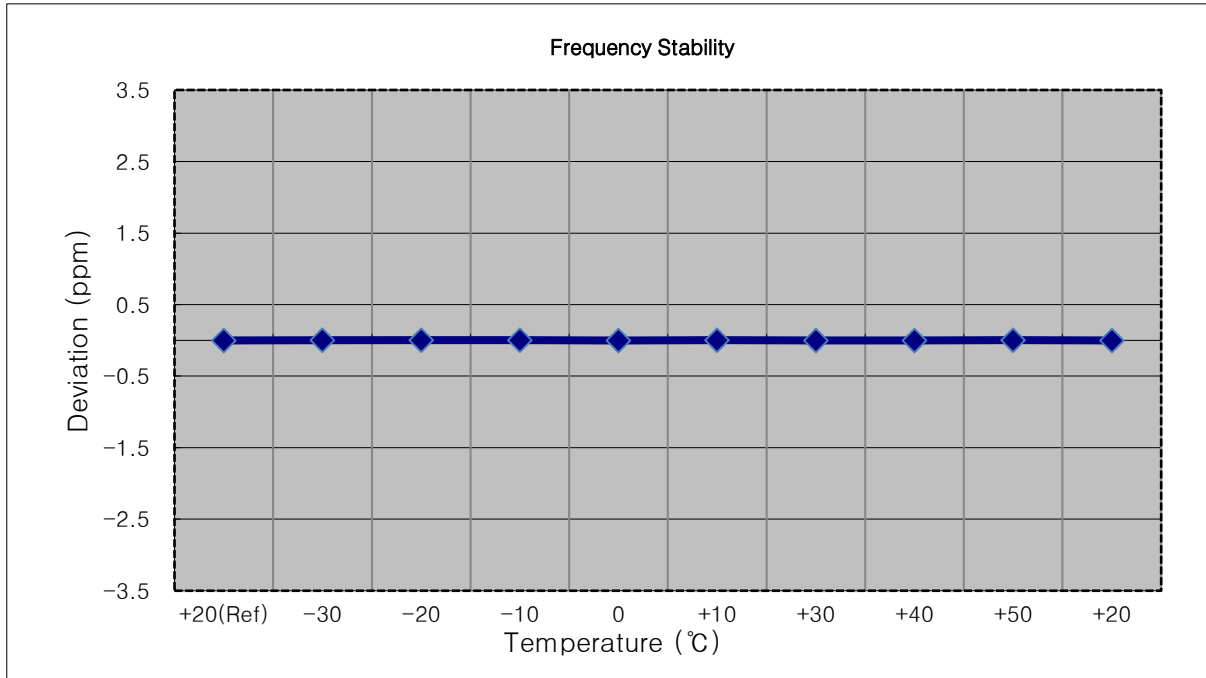
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1712,500,000 Hz
- ▣ CHANNEL: 19975 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1712 500 003	0.0	0.000 000	0.000
100 %		-30	1712 499 999	-4.2	0.000 000	-0.002
100 %		-20	1712 499 999	-4.4	0.000 000	-0.003
100 %		-10	1712 500 000	-3.3	0.000 000	-0.002
100 %		0	1712 500 006	2.3	0.000 000	0.001
100 %		+10	1712 500 008	5.1	0.000 000	0.003
100 %		+30	1712 500 007	3.3	0.000 000	0.002
100 %		+40	1712 500 006	2.9	0.000 000	0.002
100 %		+50	1712 500 002	-1.7	0.000 000	-0.001
Batt. Endpoint	3.300	+20	1712 500 005	2.1	0.000 000	0.001



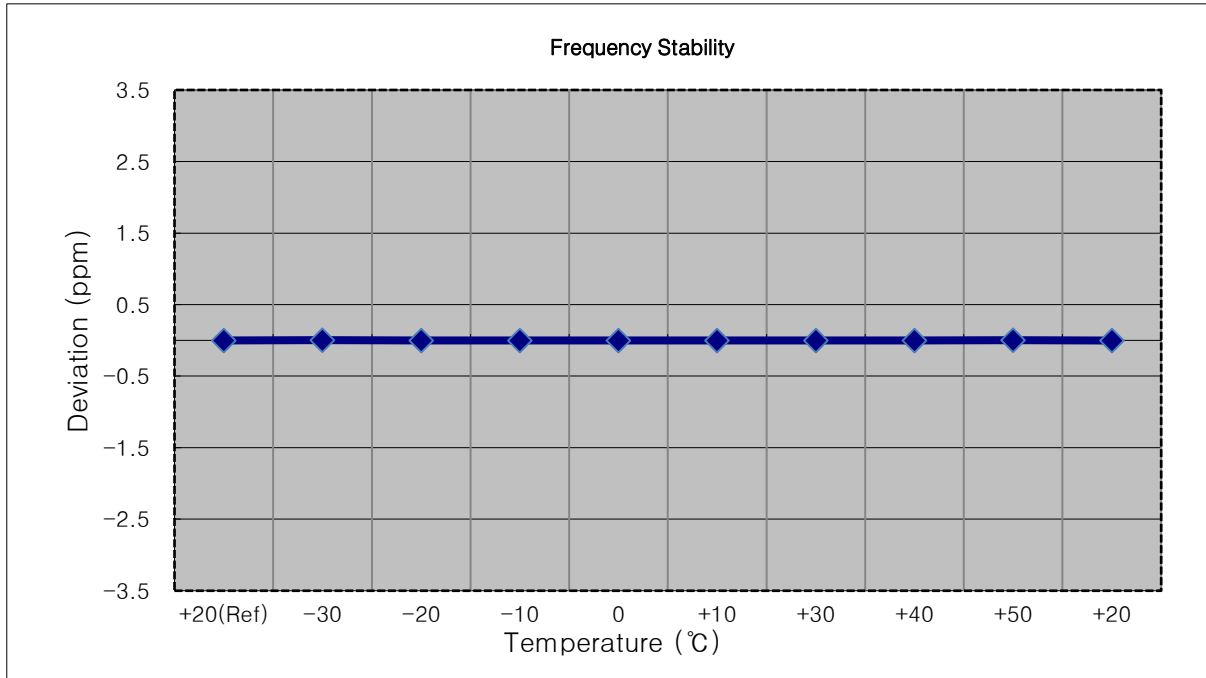
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1715,000,000 Hz
- ▣ CHANNEL: 20000 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1715 000 003	0.0	0.000 000	0.000
100 %		-30	1715 000 007	3.8	0.000 000	0.002
100 %		-20	1715 000 005	2.5	0.000 000	0.001
100 %		-10	1715 000 006	2.9	0.000 000	0.002
100 %		0	1715 000 000	-3.2	0.000 000	-0.002
100 %		+10	1715 000 006	2.7	0.000 000	0.002
100 %		+30	1715 000 000	-3.0	0.000 000	-0.002
100 %		+40	1715 000 000	-2.7	0.000 000	-0.002
100 %		+50	1715 000 006	3.0	0.000 000	0.002
Batt. Endpoint	3.300	+20	1715 000 001	-2.3	0.000 000	-0.001



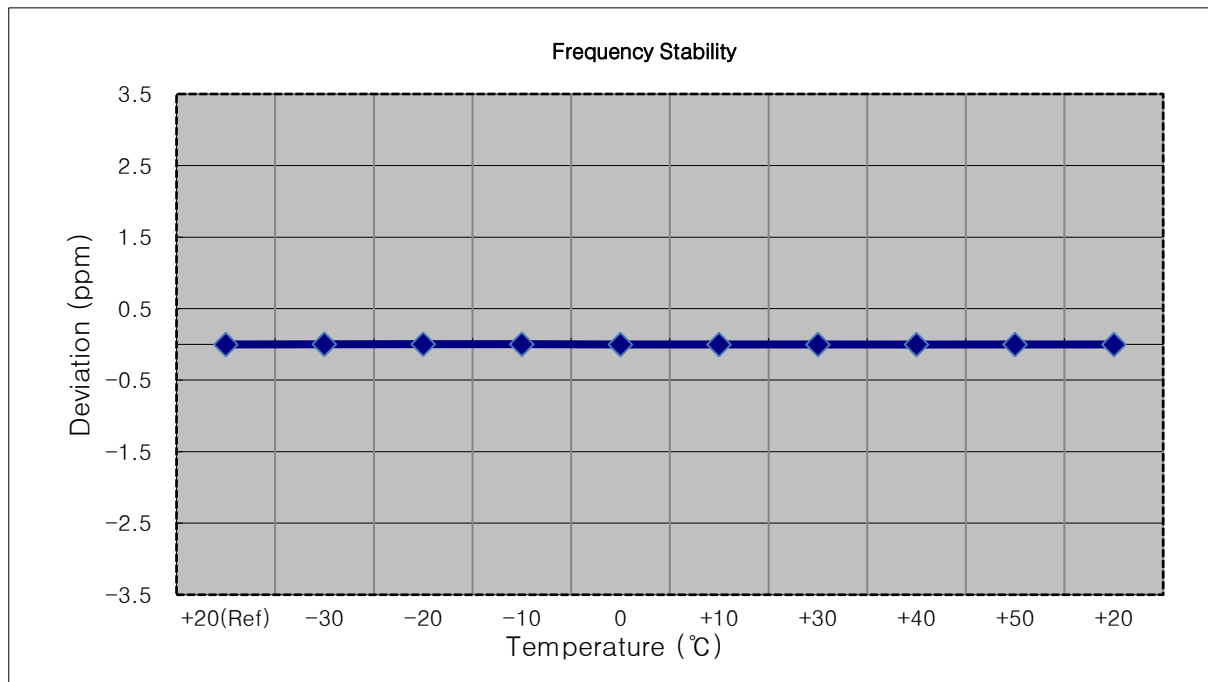
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1717,500,000 Hz
- ▣ CHANNEL: 20025 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1717 500 002	0.0	0.000 000	0.000
100 %		-30	1717 500 005	3.5	0.000 000	0.002
100 %		-20	1717 499 999	-2.7	0.000 000	-0.002
100 %		-10	1717 499 999	-3.0	0.000 000	-0.002
100 %		0	1717 500 000	-1.4	0.000 000	-0.001
100 %		+10	1717 500 000	-2.0	0.000 000	-0.001
100 %		+30	1717 500 000	-1.6	0.000 000	-0.001
100 %		+40	1717 500 004	1.8	0.000 000	0.001
100 %		+50	1717 500 007	4.7	0.000 000	0.003
Batt. Endpoint	3.300	+20	1717 499 998	-3.6	0.000 000	-0.002



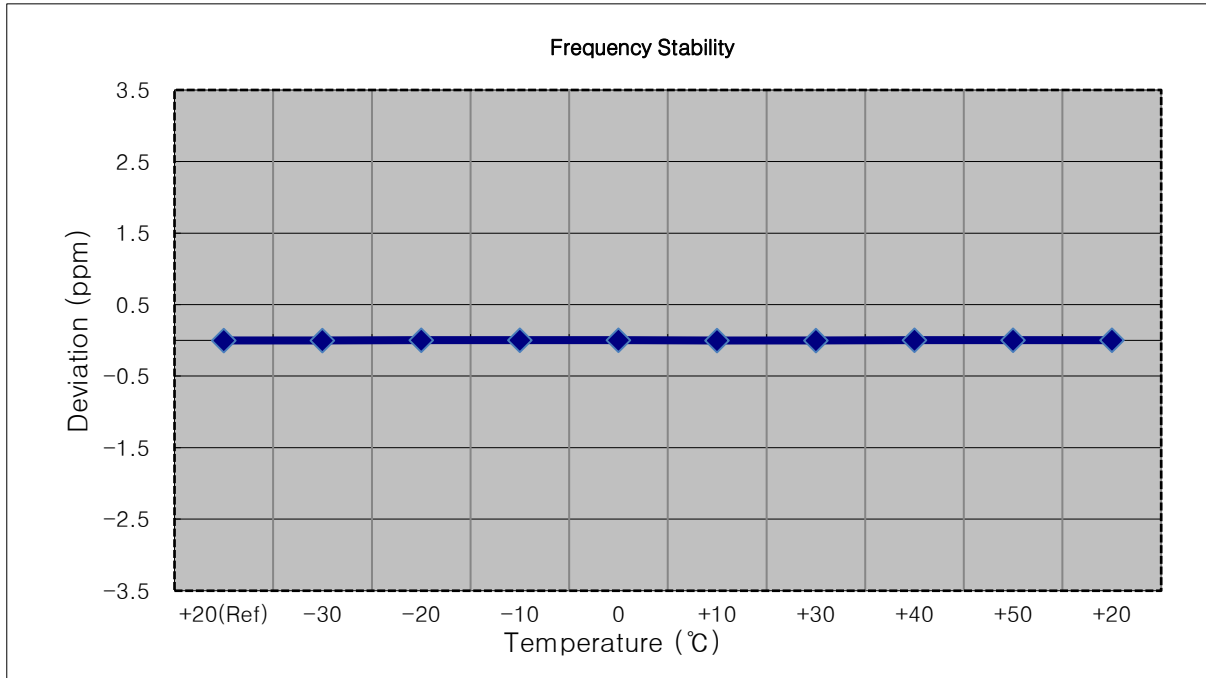
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1720,000,000 Hz
- ▣ CHANNEL: 20050 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1719 999 998	0.0	0.000 000	0.000
100 %		-30	1720 000 001	2.8	0.000 000	0.002
100 %		-20	1720 000 000	1.9	0.000 000	0.001
100 %		-10	1720 000 000	2.3	0.000 000	0.001
100 %		0	1719 999 995	-2.5	0.000 000	-0.001
100 %		+10	1719 999 996	-2.3	0.000 000	-0.001
100 %		+30	1719 999 994	-3.7	0.000 000	-0.002
100 %		+40	1719 999 994	-4.0	0.000 000	-0.002
100 %		+50	1720 000 000	1.7	0.000 000	0.001
Batt. Endpoint		3.300	+20	1719 999 994	-3.6	0.000 000



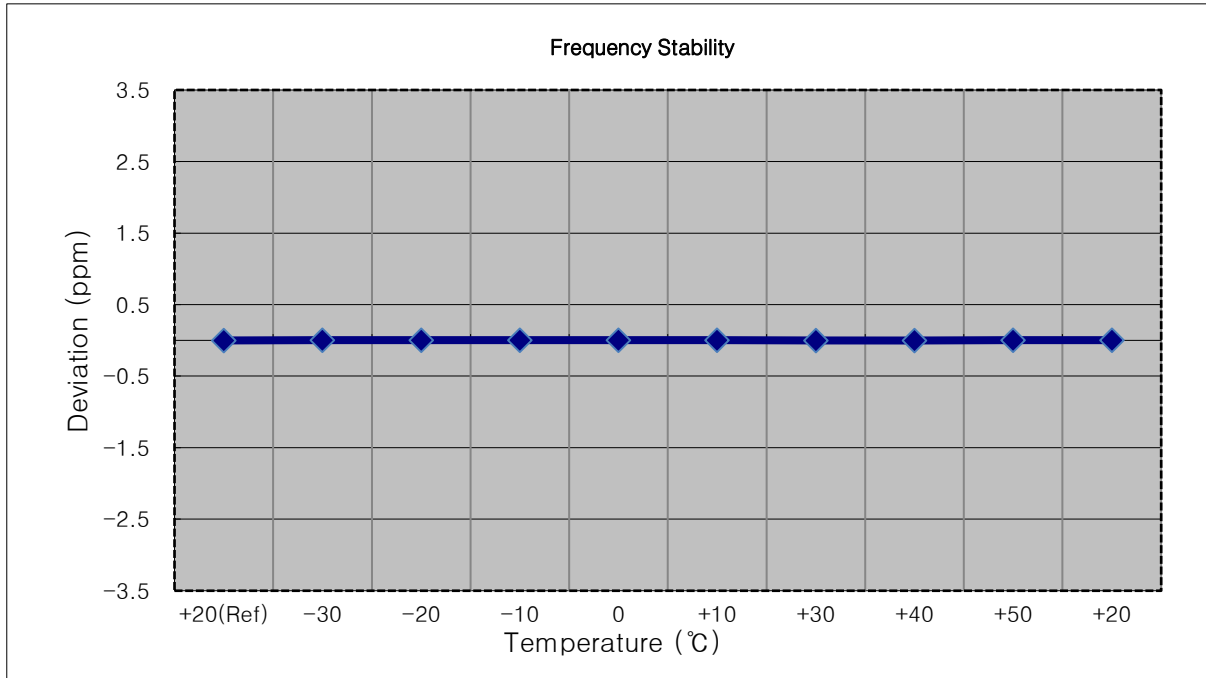
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 500 003	0.0	0.000 000	0.000
100 %		-30	1732 500 001	-2.4	0.000 000	-0.001
100 %		-20	1732 500 007	3.8	0.000 000	0.002
100 %		-10	1732 500 007	4.2	0.000 000	0.002
100 %		0	1732 500 007	3.6	0.000 000	0.002
100 %		+10	1732 500 000	-3.5	0.000 000	-0.002
100 %		+30	1732 500 000	-3.0	0.000 000	-0.002
100 %		+40	1732 500 006	3.0	0.000 000	0.002
100 %		+50	1732 500 006	2.8	0.000 000	0.002
Batt. Endpoint	3.300	+20	1732 500 008	4.4	0.000 000	0.003



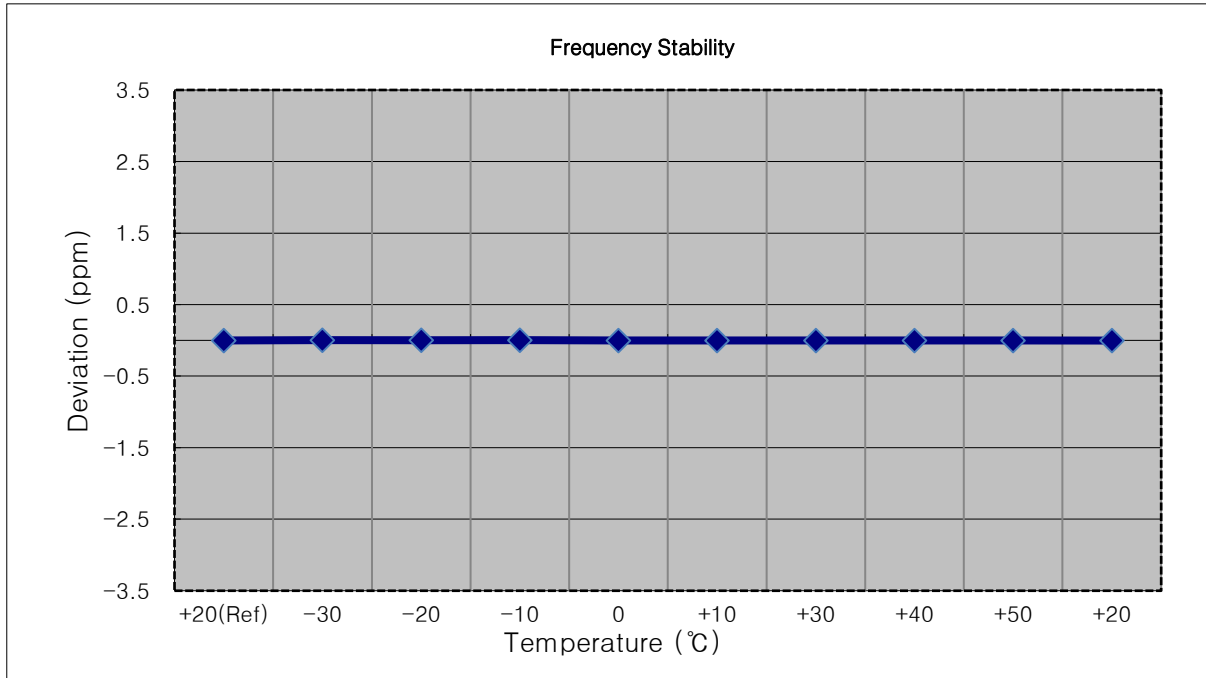
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 500 003	0.0	0.000 000	0.000
100 %		-30	1732 500 007	3.4	0.000 000	0.002
100 %		-20	1732 500 006	3.0	0.000 000	0.002
100 %		-10	1732 500 006	2.5	0.000 000	0.001
100 %		0	1732 500 007	3.6	0.000 000	0.002
100 %		+10	1732 500 008	5.1	0.000 000	0.003
100 %		+30	1732 500 000	-3.3	0.000 000	-0.002
100 %		+40	1732 500 000	-3.4	0.000 000	-0.002
100 %		+50	1732 500 007	3.9	0.000 000	0.002
Batt. Endpoint	3.300	+20	1732 500 008	5.2	0.000 000	0.003



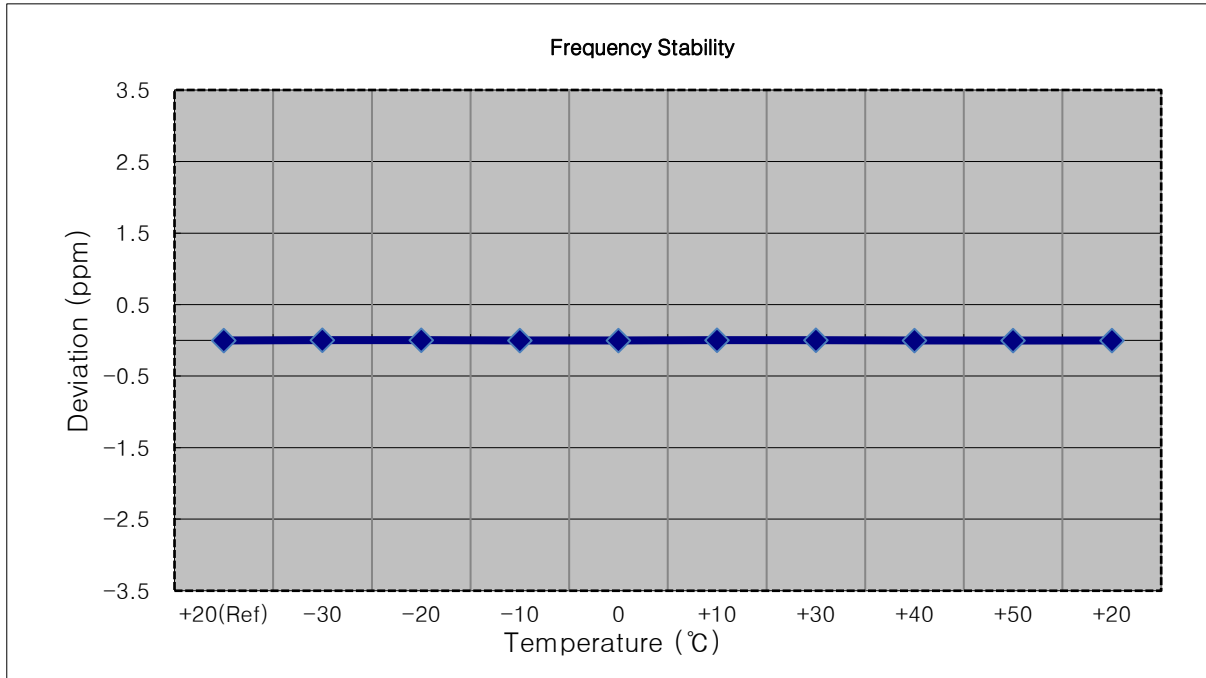
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 500 003	0.0	0.000 000	0.000
100 %		-30	1732 500 005	2.8	0.000 000	0.002
100 %		-20	1732 500 006	3.1	0.000 000	0.002
100 %		-10	1732 500 005	2.5	0.000 000	0.001
100 %		0	1732 500 000	-2.4	0.000 000	-0.001
100 %		+10	1732 499 999	-3.2	0.000 000	-0.002
100 %		+30	1732 500 000	-2.1	0.000 000	-0.001
100 %		+40	1732 500 000	-2.7	0.000 000	-0.002
100 %		+50	1732 500 000	-2.9	0.000 000	-0.002
Batt. Endpoint	3.300	+20	1732 499 998	-4.5	0.000 000	-0.003



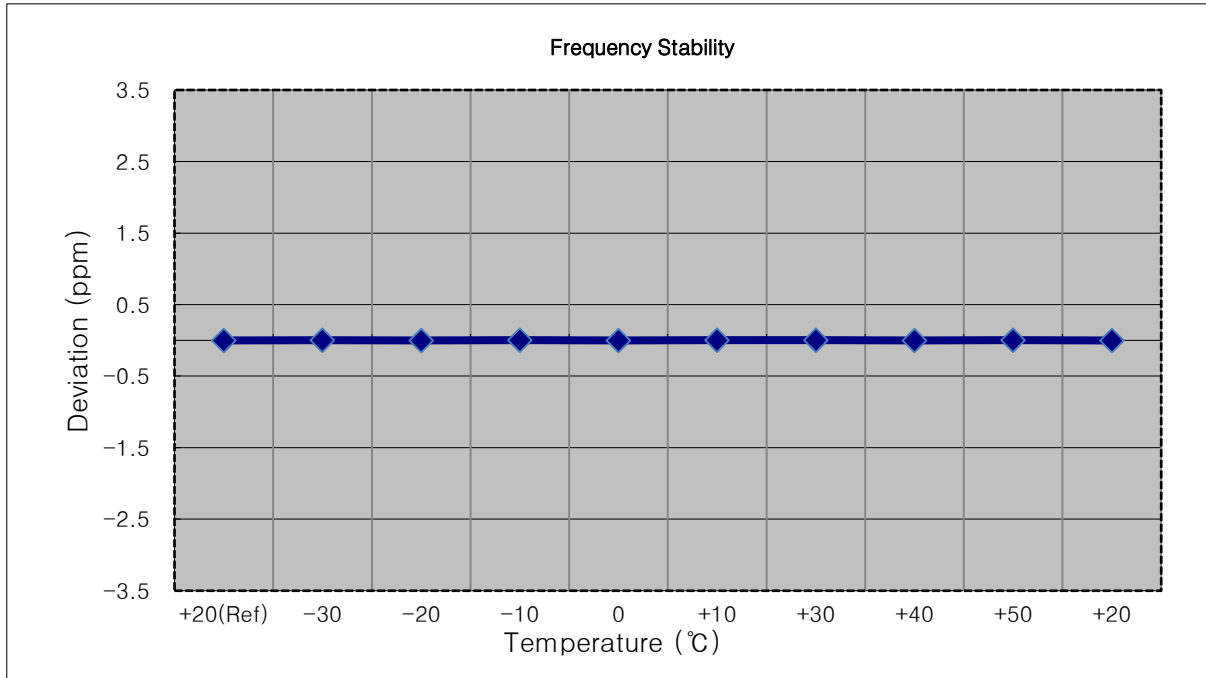
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 500 004	0.0	0.000 000	0.000
100 %		-30	1732 500 007	3.4	0.000 000	0.002
100 %		-20	1732 500 006	2.7	0.000 000	0.002
100 %		-10	1732 500 001	-2.5	0.000 000	-0.001
100 %		0	1732 500 001	-2.8	0.000 000	-0.002
100 %		+10	1732 500 006	2.0	0.000 000	0.001
100 %		+30	1732 500 008	4.6	0.000 000	0.003
100 %		+40	1732 500 001	-3.0	0.000 000	-0.002
100 %		+50	1732 499 999	-4.2	0.000 000	-0.002
Batt. Endpoint	3.300	+20	1732 500 000	-3.8	0.000 000	-0.002



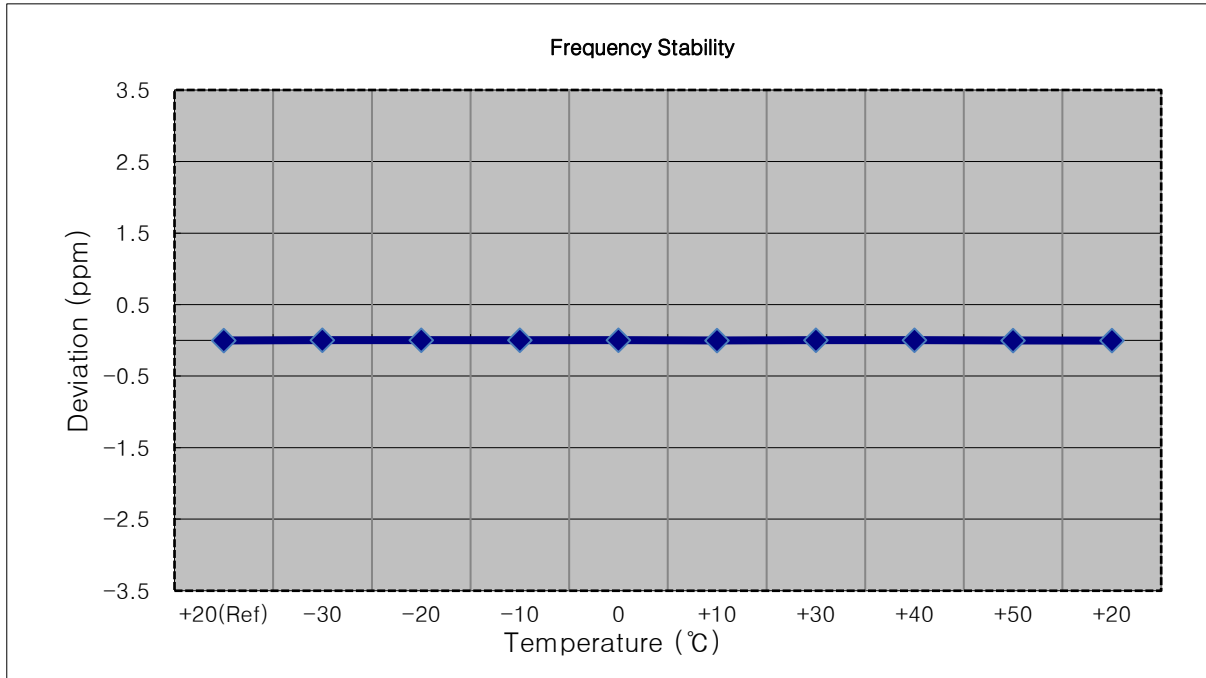
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 499 998	0.0	0.000 000	0.000
100 %		-30	1732 500 001	3.5	0.000 000	0.002
100 %		-20	1732 499 995	-3.0	0.000 000	-0.002
100 %		-10	1732 500 000	2.2	0.000 000	0.001
100 %		0	1732 499 995	-2.4	0.000 000	-0.001
100 %		+10	1732 500 000	2.1	0.000 000	0.001
100 %		+30	1732 500 000	2.4	0.000 000	0.001
100 %		+40	1732 500 000	1.8	0.000 000	0.001
100 %		+50	1732 500 000	2.2	0.000 000	0.001
Batt. Endpoint	3.300	+20	1732 499 994	-3.4	0.000 000	-0.002



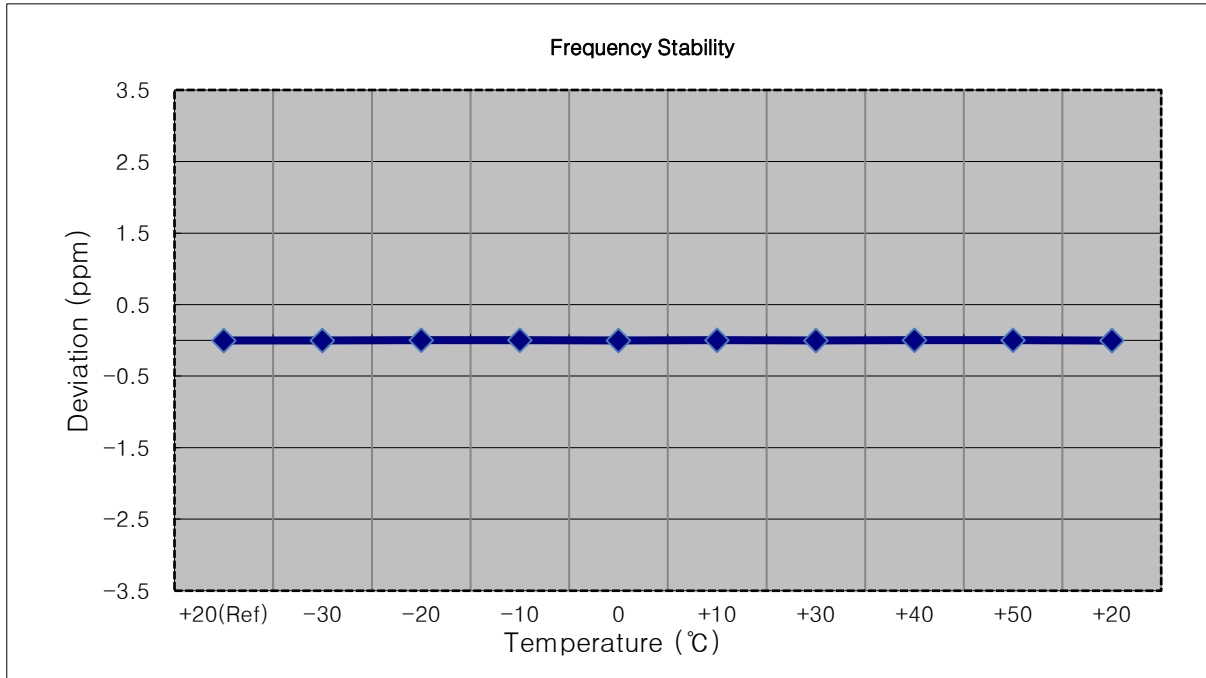
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1732,500,000 Hz
- ▣ CHANNEL: 20175 (20 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1732 500 002	0.0	0.000 000	0.000
100 %		-30	1732 500 004	2.0	0.000 000	0.001
100 %		-20	1732 500 006	3.5	0.000 000	0.002
100 %		-10	1732 500 006	3.8	0.000 000	0.002
100 %		0	1732 500 004	2.1	0.000 000	0.001
100 %		+10	1732 499 999	-3.0	0.000 000	-0.002
100 %		+30	1732 500 006	3.5	0.000 000	0.002
100 %		+40	1732 500 005	3.3	0.000 000	0.002
100 %		+50	1732 500 000	-2.5	0.000 000	-0.001
Batt. Endpoint	3.300	+20	1732 499 997	-5.6	0.000 000	-0.003



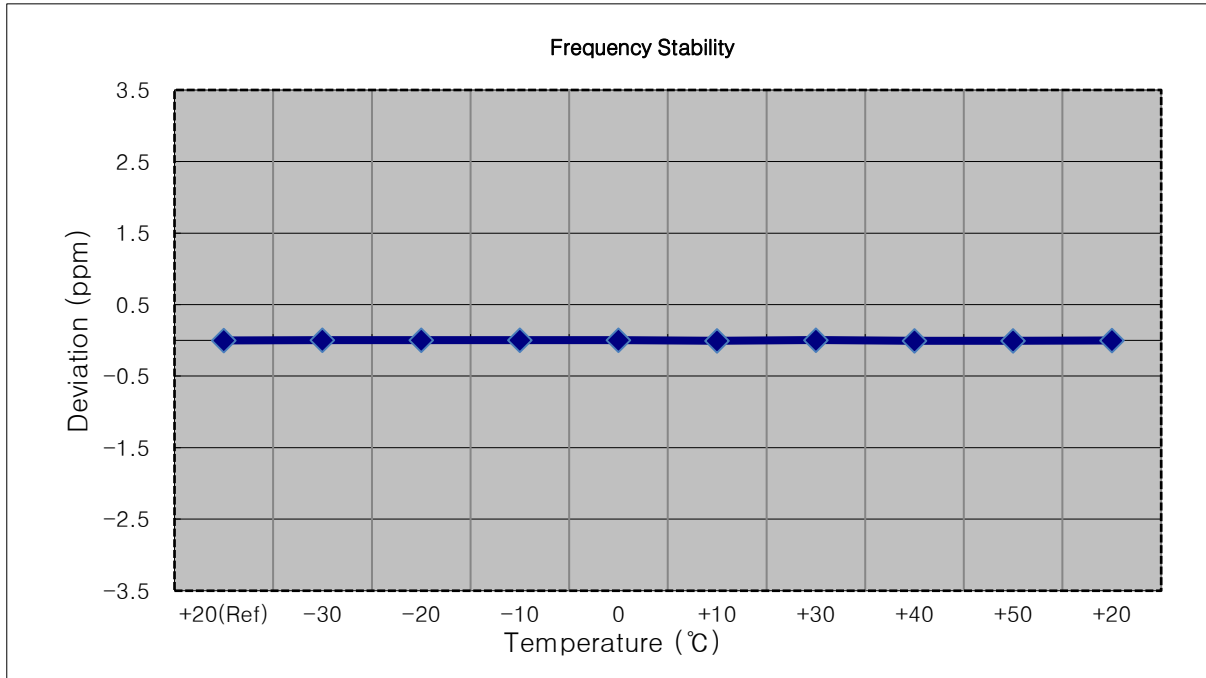
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1754,300,000 Hz
- ▣ CHANNEL: 20393 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1754 299 996	0.0	0.000 000	0.000
100 %		-30	1754 299 994	-2.6	0.000 000	-0.001
100 %		-20	1754 299 999	2.9	0.000 000	0.002
100 %		-10	1754 300 001	4.6	0.000 000	0.003
100 %		0	1754 299 992	-4.4	0.000 000	-0.003
100 %		+10	1754 300 000	3.3	0.000 000	0.002
100 %		+30	1754 299 994	-2.0	0.000 000	-0.001
100 %		+40	1754 300 000	3.3	0.000 000	0.002
100 %		+50	1754 300 000	3.4	0.000 000	0.002
Batt. Endpoint	3.300	+20	1754 299 991	-5.6	0.000 000	-0.003



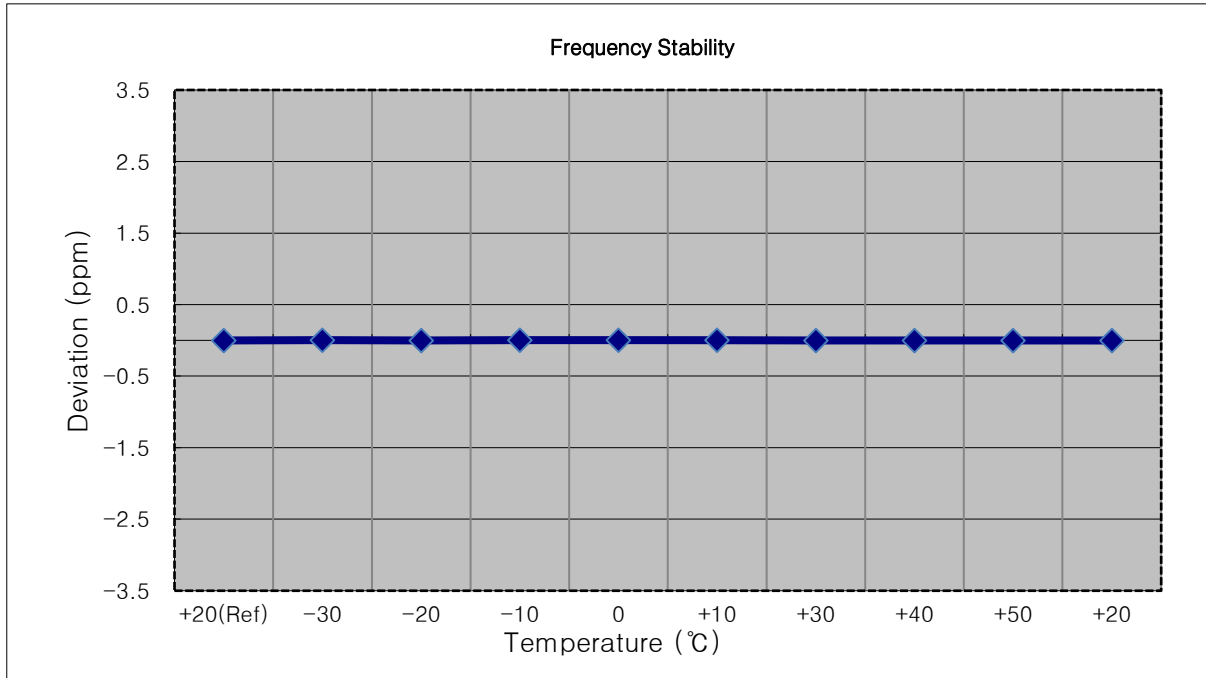
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1753,500,000 Hz
- ▣ CHANNEL: 20385 (3 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1753 499 992	0.0	0.000 000	0.000
100 %		-30	1753 499 997	5.4	0.000 000	0.003
100 %		-20	1753 499 998	6.0	0.000 000	0.003
100 %		-10	1753 499 998	6.0	0.000 000	0.003
100 %		0	1753 499 997	5.0	0.000 000	0.003
100 %		+10	1753 499 985	-6.4	0.000 000	-0.004
100 %		+30	1753 500 000	8.2	0.000 000	0.005
100 %		+40	1753 499 981	-10.2	-0.000 001	-0.006
100 %		+50	1753 499 985	-7.0	0.000 000	-0.004
Batt. Endpoint	3.300	+20	1753 499 989	-3.0	0.000 000	-0.002



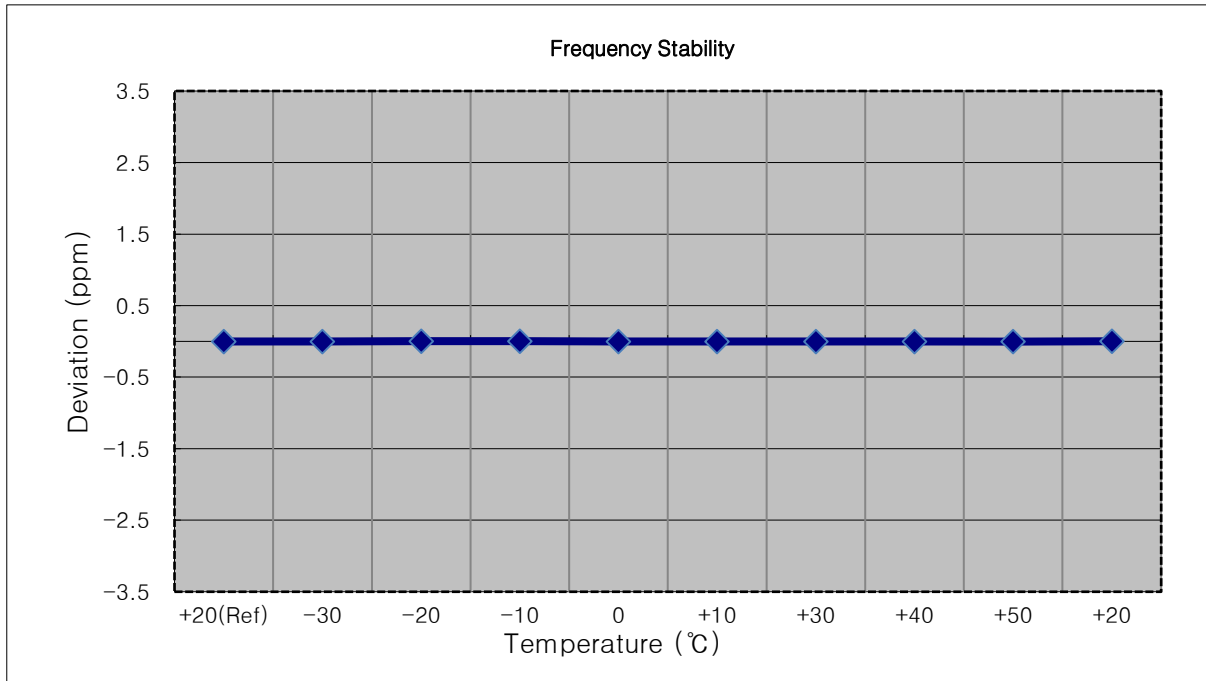
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1752,500,000 Hz
- ▣ CHANNEL: 20375 (5 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1752 499 995	0.0	0.000 000	0.000
100 %		-30	1752 499 999	3.5	0.000 000	0.002
100 %		-20	1752 499 993	-2.4	0.000 000	-0.001
100 %		-10	1752 499 997	2.0	0.000 000	0.001
100 %		0	1752 499 999	3.3	0.000 000	0.002
100 %		+10	1752 499 999	4.0	0.000 000	0.002
100 %		+30	1752 499 994	-1.8	0.000 000	-0.001
100 %		+40	1752 499 993	-2.8	0.000 000	-0.002
100 %		+50	1752 499 994	-1.8	0.000 000	-0.001
Batt. Endpoint	3.300	+20	1752 499 992	-3.4	0.000 000	-0.002



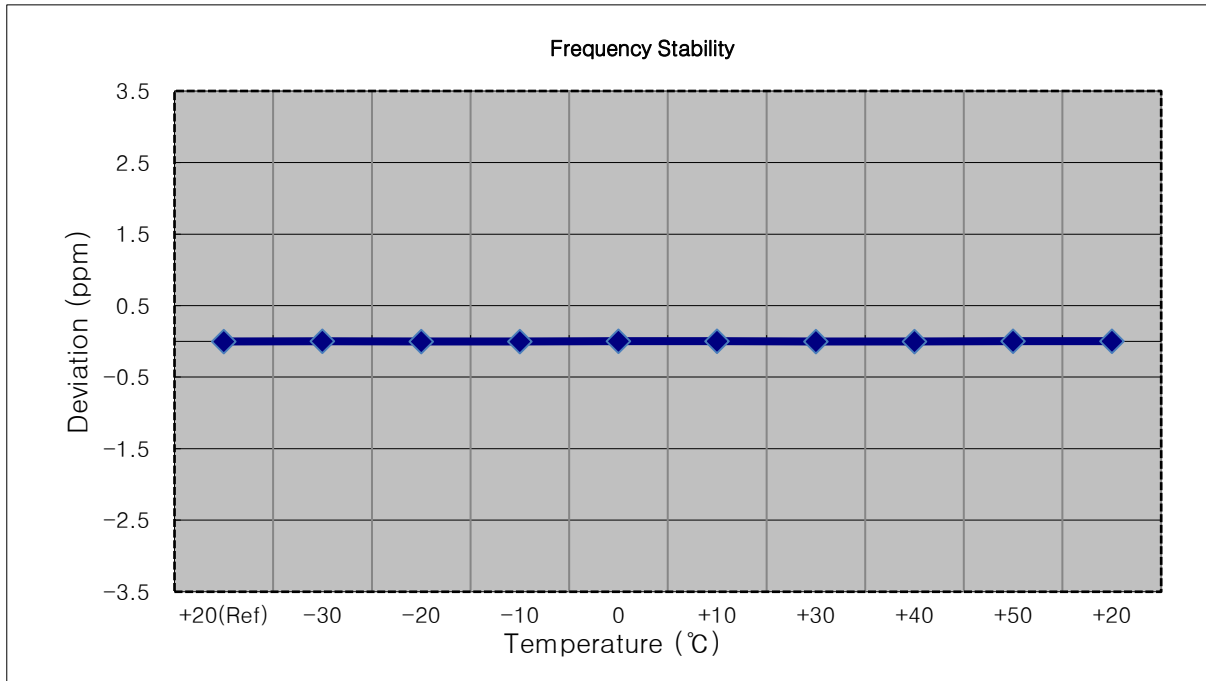
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1750,000,000 Hz
- ▣ CHANNEL: 20350 (10 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1750 000 002	0.0	0.000 000	0.000
100 %		-30	1749 999 998	-4.5	0.000 000	-0.003
100 %		-20	1750 000 005	2.6	0.000 000	0.001
100 %		-10	1750 000 005	3.0	0.000 000	0.002
100 %		0	1749 999 999	-3.0	0.000 000	-0.002
100 %		+10	1749 999 999	-3.0	0.000 000	-0.002
100 %		+30	1750 000 001	-1.4	0.000 000	-0.001
100 %		+40	1749 999 998	-4.0	0.000 000	-0.002
100 %		+50	1749 999 997	-5.3	0.000 000	-0.003
Batt. Endpoint		3.300	+20	1750 000 006	3.1	0.000 000



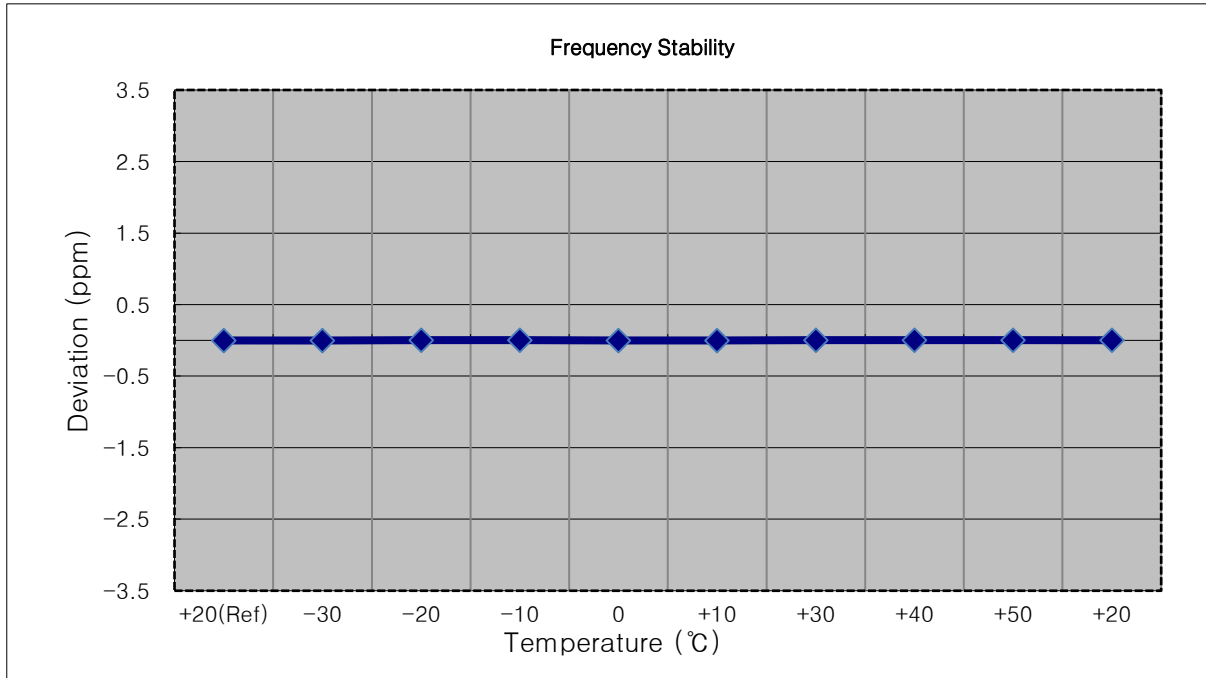
- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1747,500,000 Hz
- ▣ CHANNEL: 20325 (15 MHz)
- ▣ REFERENCE VOLTAGE: 3.880 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.880	+20(Ref)	1747 500 004	0.0	0.000 000	0.000
100 %		-30	1747 500 007	3.0	0.000 000	0.002
100 %		-20	1747 500 002	-2.0	0.000 000	-0.001
100 %		-10	1747 500 006	1.9	0.000 000	0.001
100 %		0	1747 500 006	2.4	0.000 000	0.001
100 %		+10	1747 500 007	2.9	0.000 000	0.002
100 %		+30	1747 500 001	-2.8	0.000 000	-0.002
100 %		+40	1747 500 002	-2.3	0.000 000	-0.001
100 %		+50	1747 500 007	2.9	0.000 000	0.002
Batt. Endpoint		3.300	+20	1747 500 006	2.2	0.000 000



- ▣ MODE: LTE 4
- ▣ OPERATING FREQUENCY: 1745,000,000 Hz
- ▣ CHANNEL: 20300 (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 999 998	0.0	0.000 000	0.000
100 %		-30	1744 999 995	-3.5	0.000 000	-0.002
100 %		-20	1745 000 001	2.5	0.000 000	0.001
100 %		-10	1745 000 000	2.1	0.000 000	0.001
100 %		0	1744 999 997	-1.4	0.000 000	-0.001
100 %		+10	1744 999 997	-1.4	0.000 000	-0.001
100 %		+30	1745 000 001	3.1	0.000 000	0.002
100 %		+40	1745 000 001	3.2	0.000 000	0.002
100 %		+50	1745 000 001	3.0	0.000 000	0.002
Batt. Endpoint	3.300	+20	1745 000 002	3.4	0.000 000	0.002



10. TEST DATA (Main 1 Ant , Sub 2 Ant)

10.1 UPLINK CARRIER AGGREGATION

Test Note

1. All tests were evaluated for the two bands using various combinations of RB size, RB offset, modulation, and channel bandwidth.
2. All modes of operation were investigated and the worst case configuration results are reported in this section.
Please refer to the table below.
3. The worst case is reported with the modulations, RB sizes and offsets.
 - 2A(Main 1 Ant)-4A(Sub 2 Ant)
(PCC - Modulation: QPSK, RB: 1, RB Offset: 0, SCC - Modulation: QPSK, RB: 1, RB Offset: 0)
 - 4A(Main 1 Ant)-2A(Sub 2 Ant)
(PCC - Modulation: QPSK, RB: 1, RB Offset: 0, SCC - Modulation: QPSK, RB: 1, RB Offset: 0)
 - 4A-5A (PCC - Modulation: QPSK, RB: 1, RB Offset: 0, SCC - Modulation: QPSK, RB: 1, RB Offset: 0)
 - 4A-12A (PCC - Modulation: QPSK, RB: 1, RB Offset: 0, SCC - Modulation: QPSK, RB: 1, RB Offset: 49)

Radiated Spurious Emissions

PCC	SCC	PCC		SCC	
		BW(MHz)	Channel	BW(MHz)	Channel
2A(Main 1 Ant)	4A(Sub 2 Ant)	10	18900	20	20300
4A(Main 1 Ant)	2A(Sub 2 Ant)	10	20350	10	18900
4A	5A	10	20350	5	20425
4A	12A	10	20350	10	23130

10.1.1 RADIATED SPURIOUS EMISSIONS

2A(Main 1 Ant)(PCC)-4A(Sub 2 Ant)(SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 760.00	-54.48	12.22	-59.11	3.27	H	-50.16	-13.00
5 640.00	-56.19	13.12	-53.92	4.07	V	-44.87	-13.00
7 520.00	-56.25	10.82	-45.44	4.71	V	-39.33	-13.00

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 490.00	-54.72	12.34	-60.73	3.08	H	-51.47	-13.00
5 235.00	-40.31	12.84	-39.39	3.95	H	-30.50	-13.00
6 980.00	-54.66	11.40	-47.05	4.56	H	-40.21	-13.00

4A(Main 1 Ant)(PCC)-2A(Sub 2 Ant)(SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 500.00	-54.10	12.34	-60.22	3.10	H	-50.98	-13.00
5 250.00	-56.41	12.93	-55.83	3.89	V	-46.79	-13.00
7 000.00	-55.35	11.31	-47.09	4.57	H	-40.35	-13.00

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 760.00	-54.99	12.22	-59.62	3.27	H	-50.67	-13.00
5 640.00	-46.16	13.12	-43.89	4.07	V	-34.84	-13.00
7 520.00	-56.74	10.82	-45.93	4.71	V	-39.82	-13.00

4A(PCC)-5A(SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 500.00	-54.96	12.34	-61.08	3.10	H	-51.84	-13.00
5 250.00	-55.21	12.93	-54.63	3.89	V	-45.59	-13.00
7 000.00	-54.86	11.31	-46.60	4.57	H	-39.86	-13.00

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
1 653.00	-52.98	9.58	-63.53	2.14	V	-56.09	-13.00
2 479.50	-48.31	10.34	-52.79	2.62	V	-45.07	-13.00
3 306.00	-57.80	12.19	-58.99	3.02	H	-49.83	-13.00

4A(PCC)-12A(SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 500.00	-54.98	12.34	-61.10	3.10	V	-51.86	-13.00
5 250.00	-56.21	12.93	-55.63	3.89	V	-46.59	-13.00
7 000.00	-55.98	11.31	-47.72	4.57	H	-40.98	-13.00

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
1 422.00	-51.83	7.74	-60.46	2.00	V	-54.72	-13.00
2 133.00	-36.96	9.36	-41.09	2.42	V	-34.15	-13.00
2 844.00	-57.17	10.78	-58.99	2.80	V	-51.01	-13.00

11. TEST PLOTS (Main 1 Ant)

BW1.4 M_BandEdge_Lowest Channel_QPSK_Full RB(1)



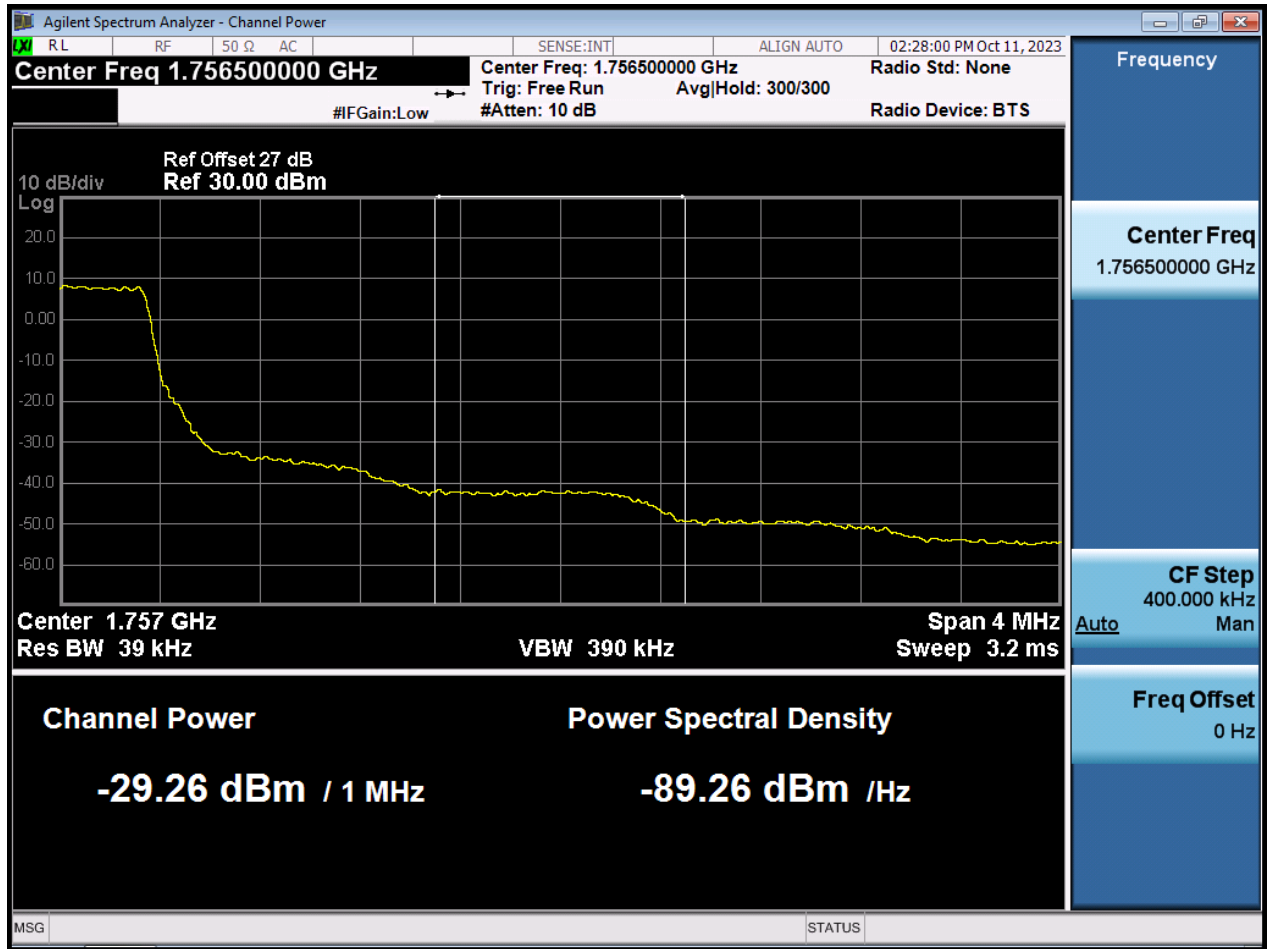
BW1.4 M_BandEdge_Lowest Channel_QPSK_Full RB(2)



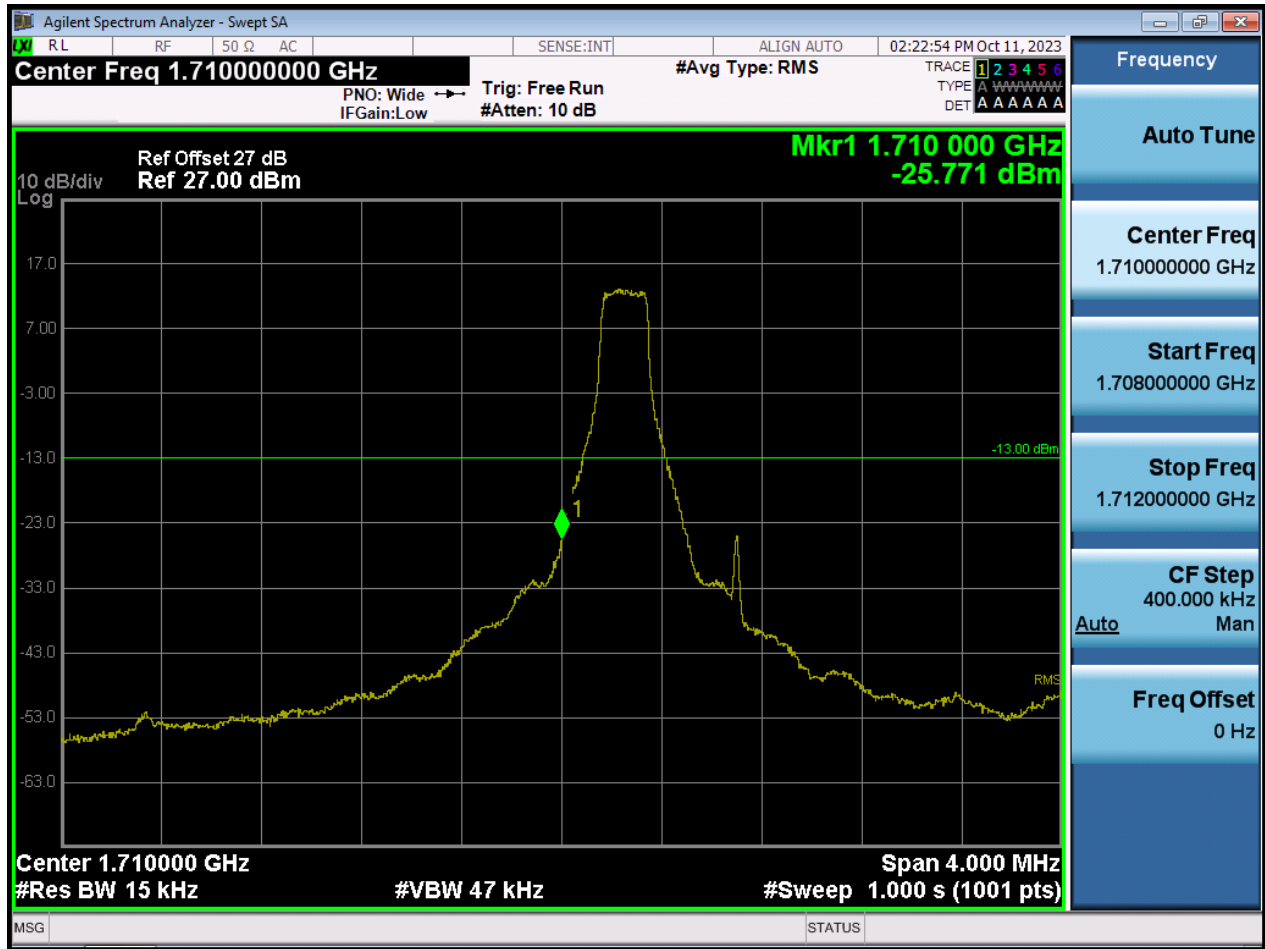
BW1.4 M_BandEdge_Highest Channel_QPSK_Full RB(1)



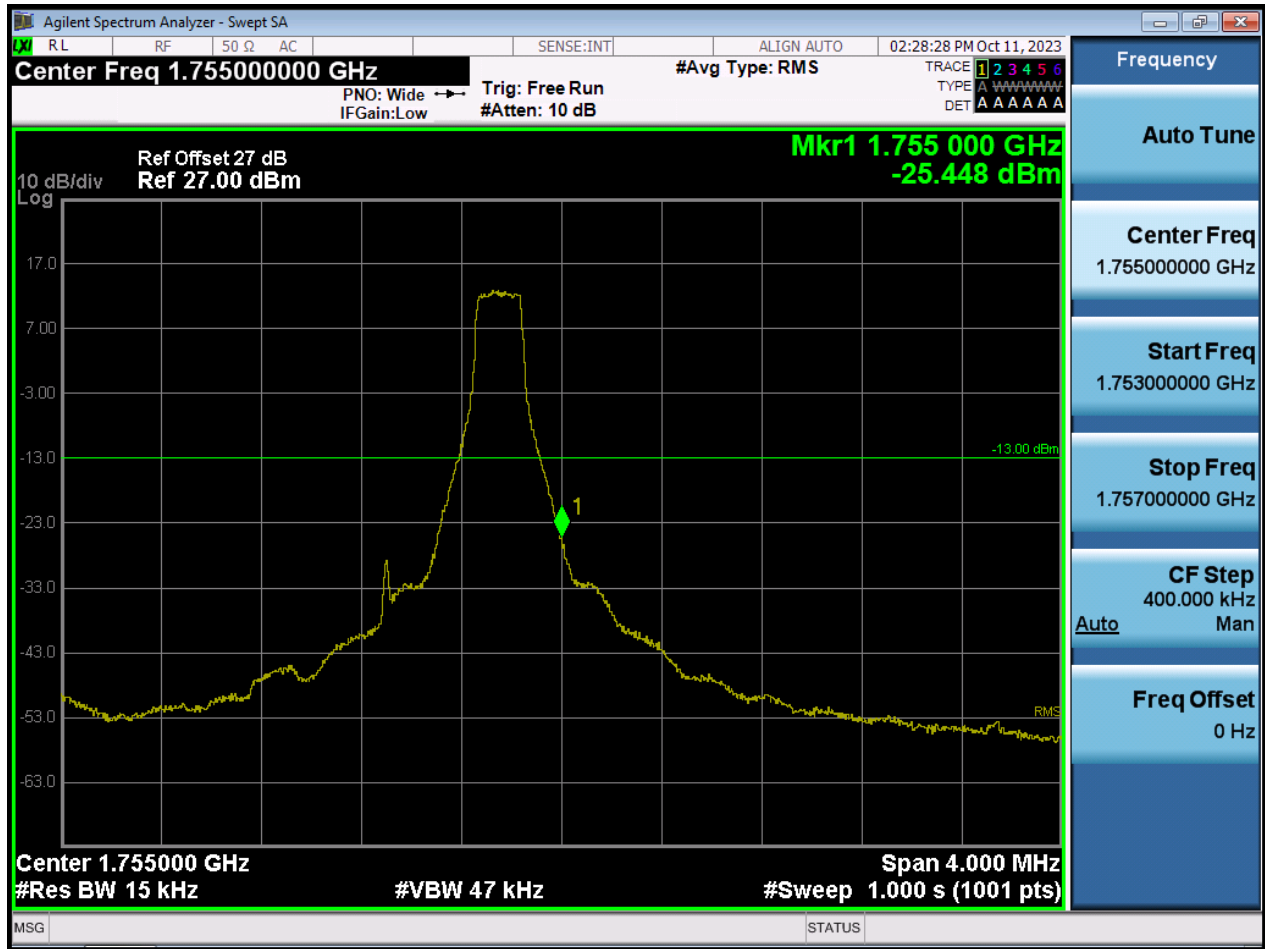
BW1.4 M_BandEdge_Highest Channel_QPSK_Full RB(2)



BW1.4 M_BandEdge_Lowest Channel_QPSK_1RB



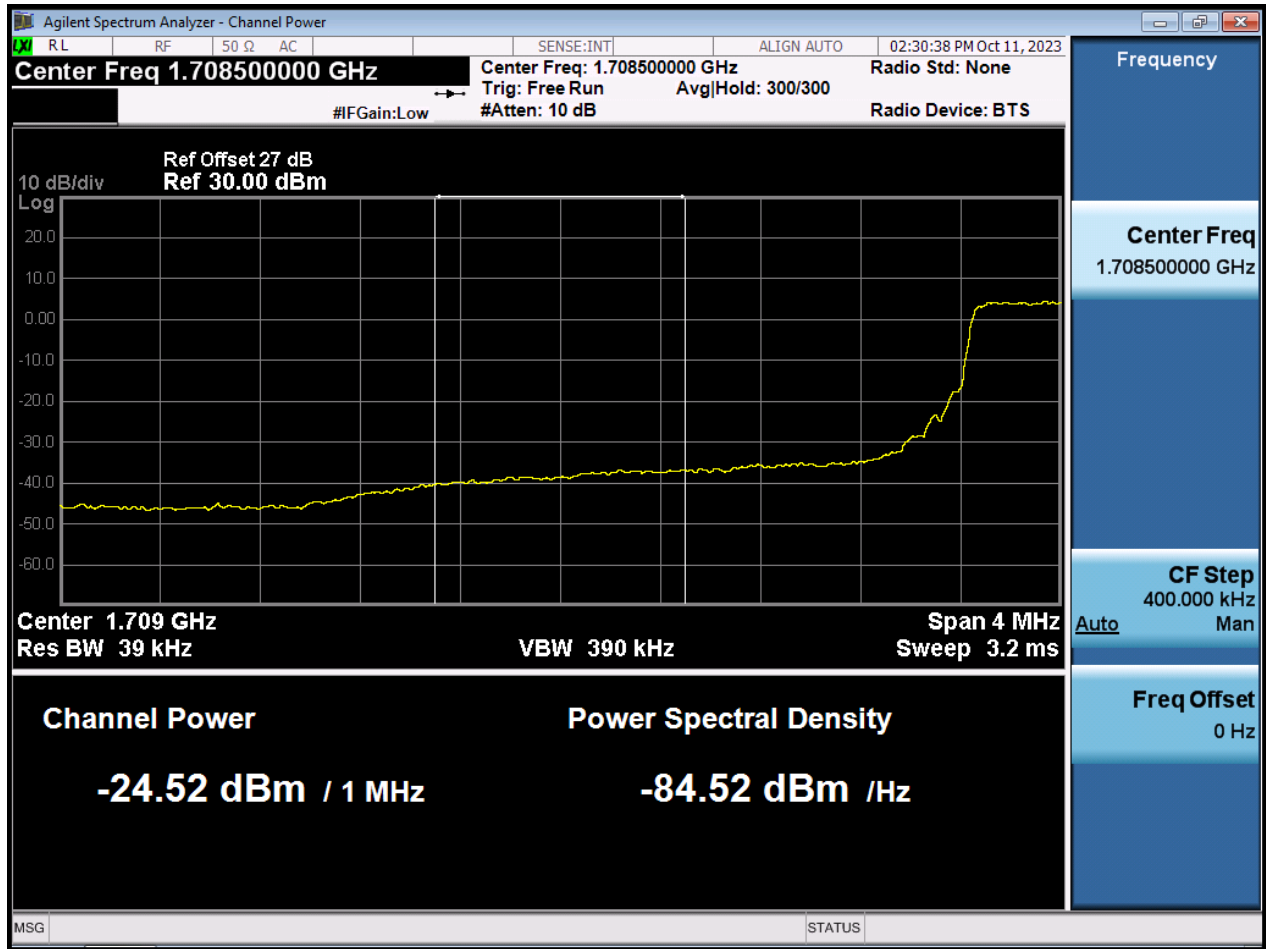
BW1.4 M_BandEdge_Highest Channel_QPSK_1RB



BW3 M_BandEdge_Lowest Channel_QPSK_Full RB(1)



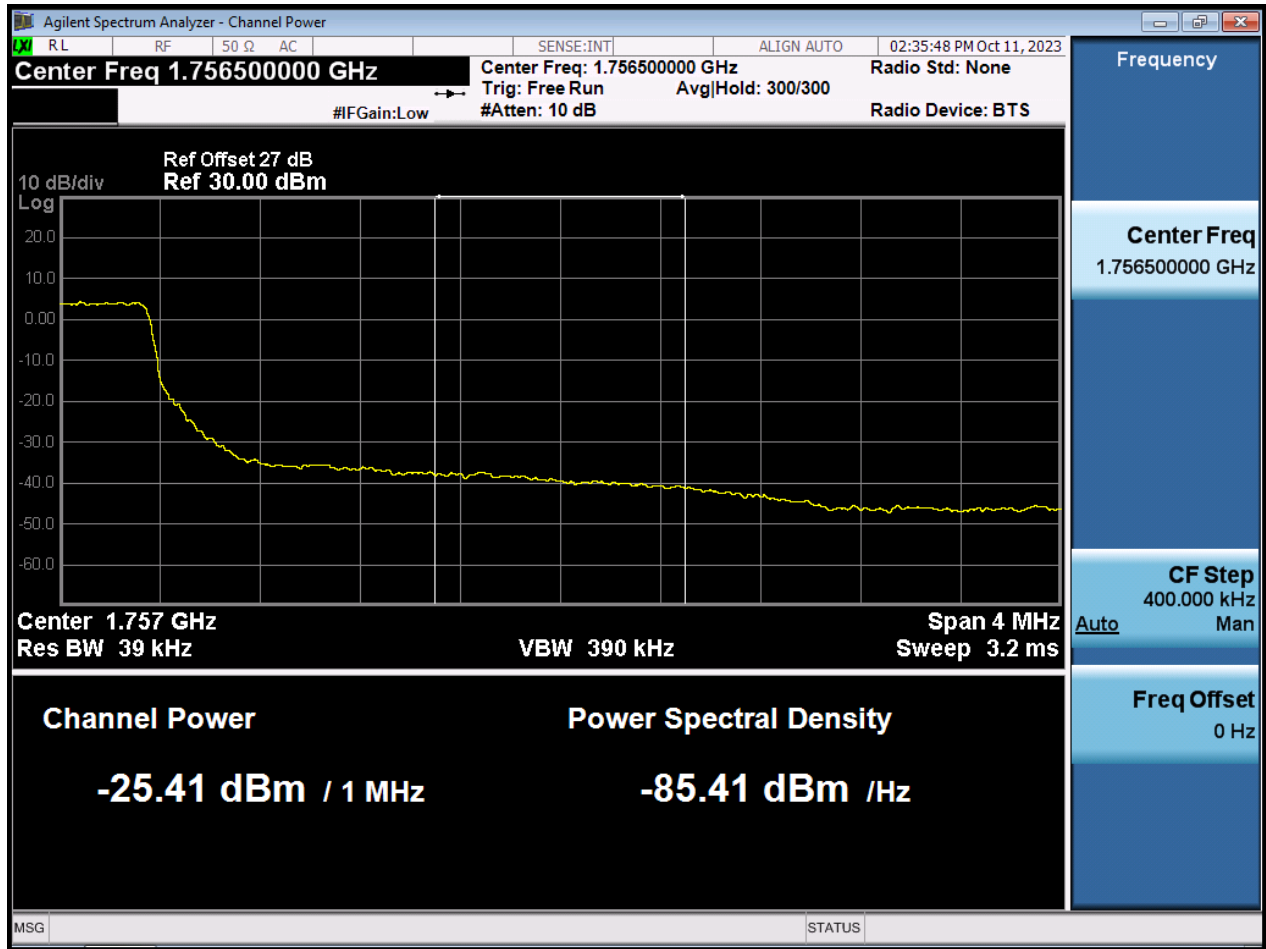
BW3 M_BandEdge_Lowest Channel_QPSK_Full RB(2)



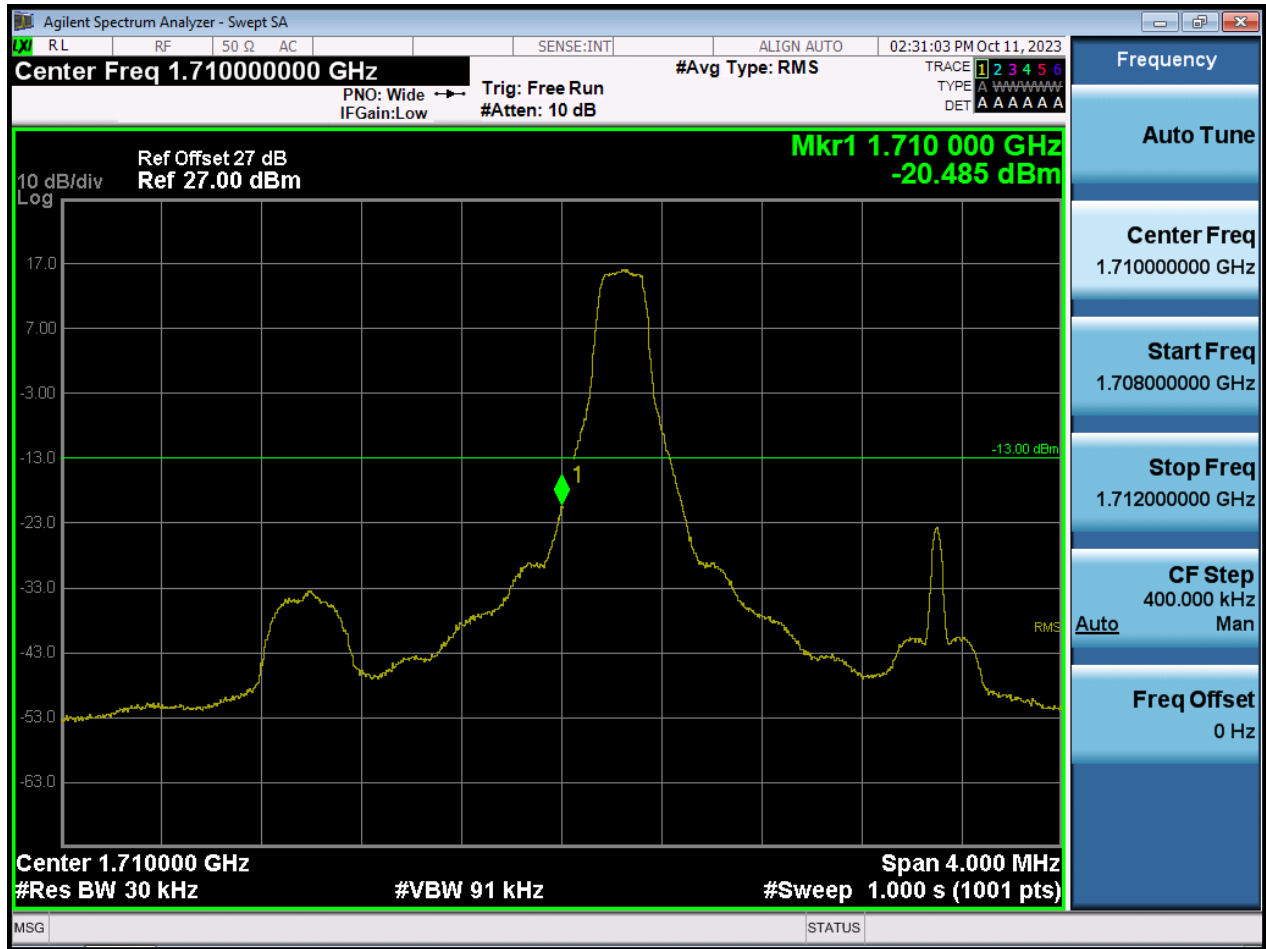
BW3 M_BandEdge_Highest Channel_QPSK_Full RB(1)



BW3 M_BandEdge_Highest Channel_QPSK_Full RB(2)



BW3 M_BandEdge_Lowest Channel_QPSK_1RB



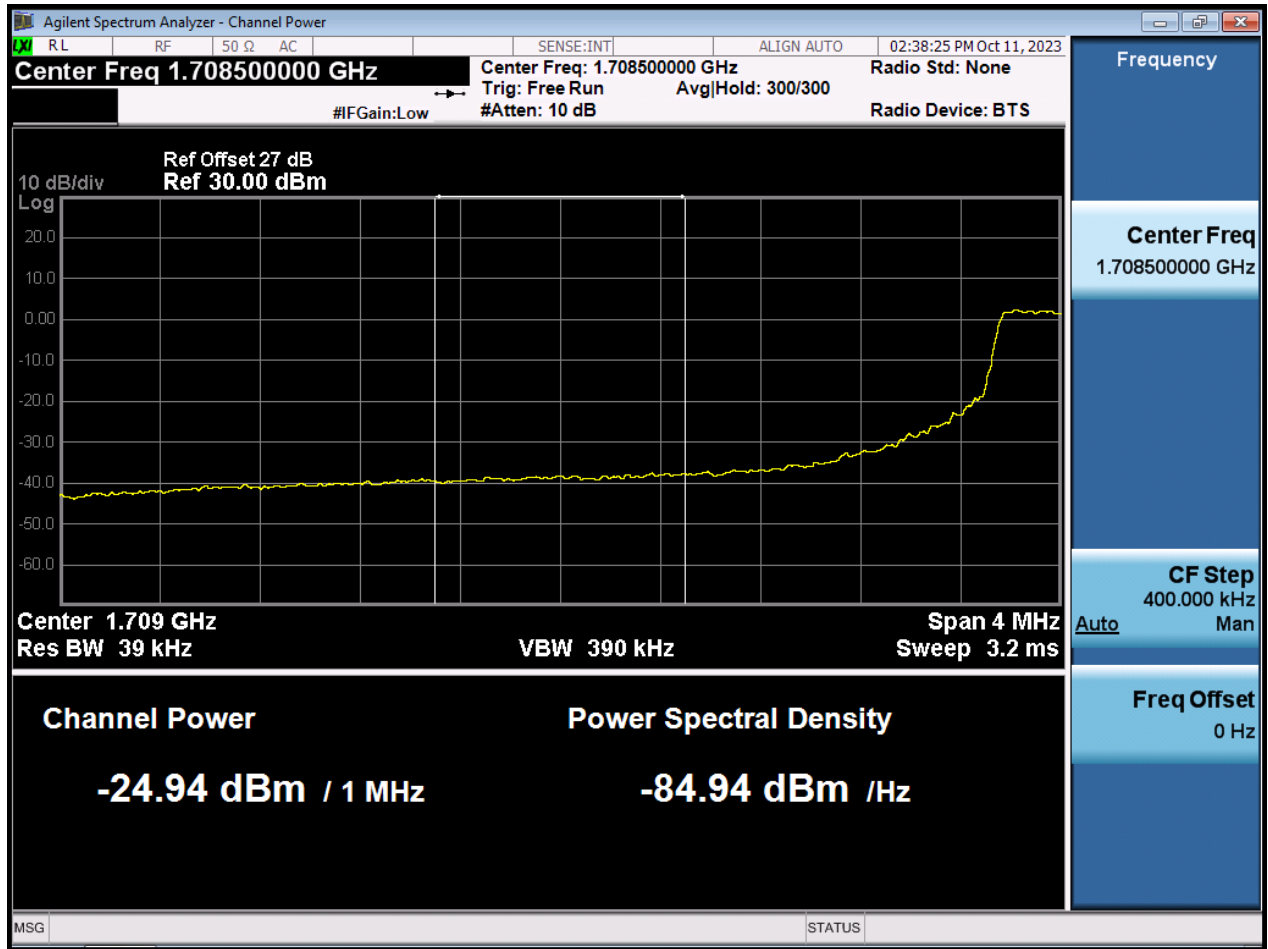
BW3 M_BandEdge_Highest Channel_QPSK_1RB



BW5 M_BandEdge_Lowest Channel_QPSK_Full RB(1)



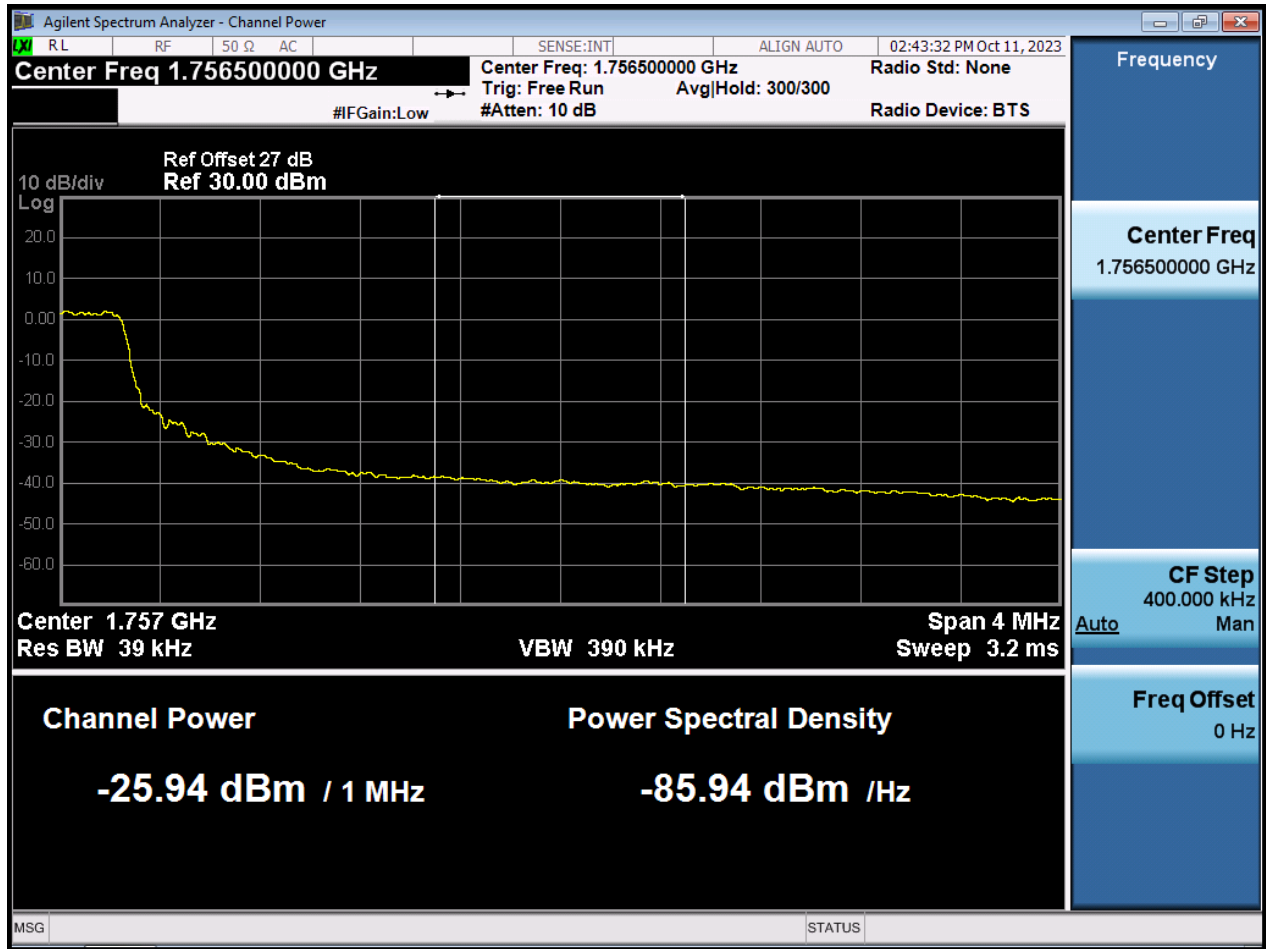
BW5 M_BandEdge_Lowest Channel_QPSK_Full RB(2)



BW5 M_BandEdge_Highest Channel_QPSK_Full RB(1)



BW5 M_BandEdge_Highest Channel_QPSK_Full RB(2)



BW5 M_BandEdge_Lowest Channel_QPSK_1RB



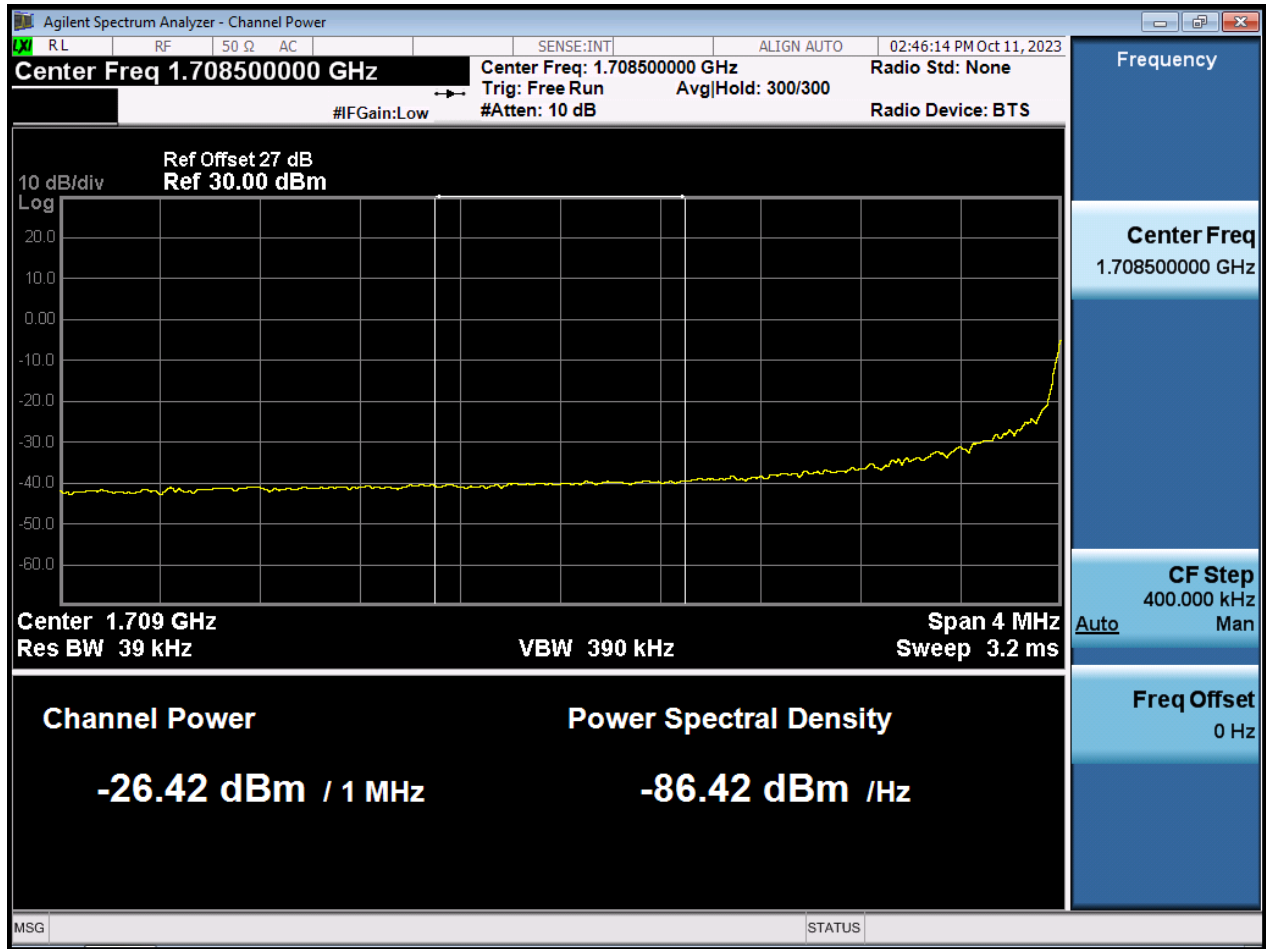
BW5 M_BandEdge_Highest Channel_QPSK_1RB



BW10 M_BandEdge_Lowest Channel_QPSK_Full RB(1)



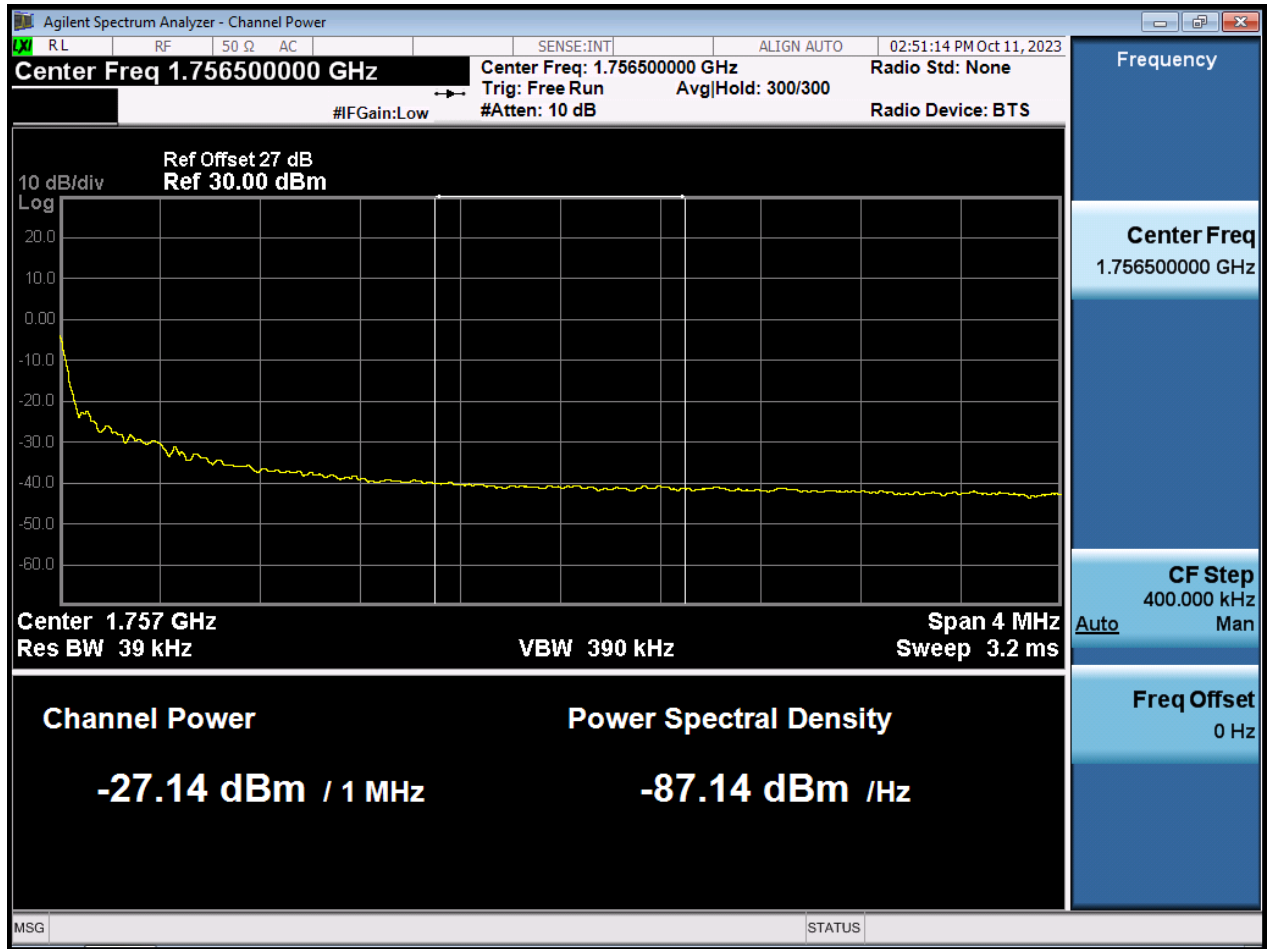
BW10 M_BandEdge_Lowest Channel_QPSK_Full RB(2)



BW10 M_BandEdge_Highest Channel_QPSK_Full RB(1)



BW10 M_BandEdge_Highest Channel_QPSK_Full RB(2)



BW10 M_BandEdge_Lowest Channel_QPSK_1RB



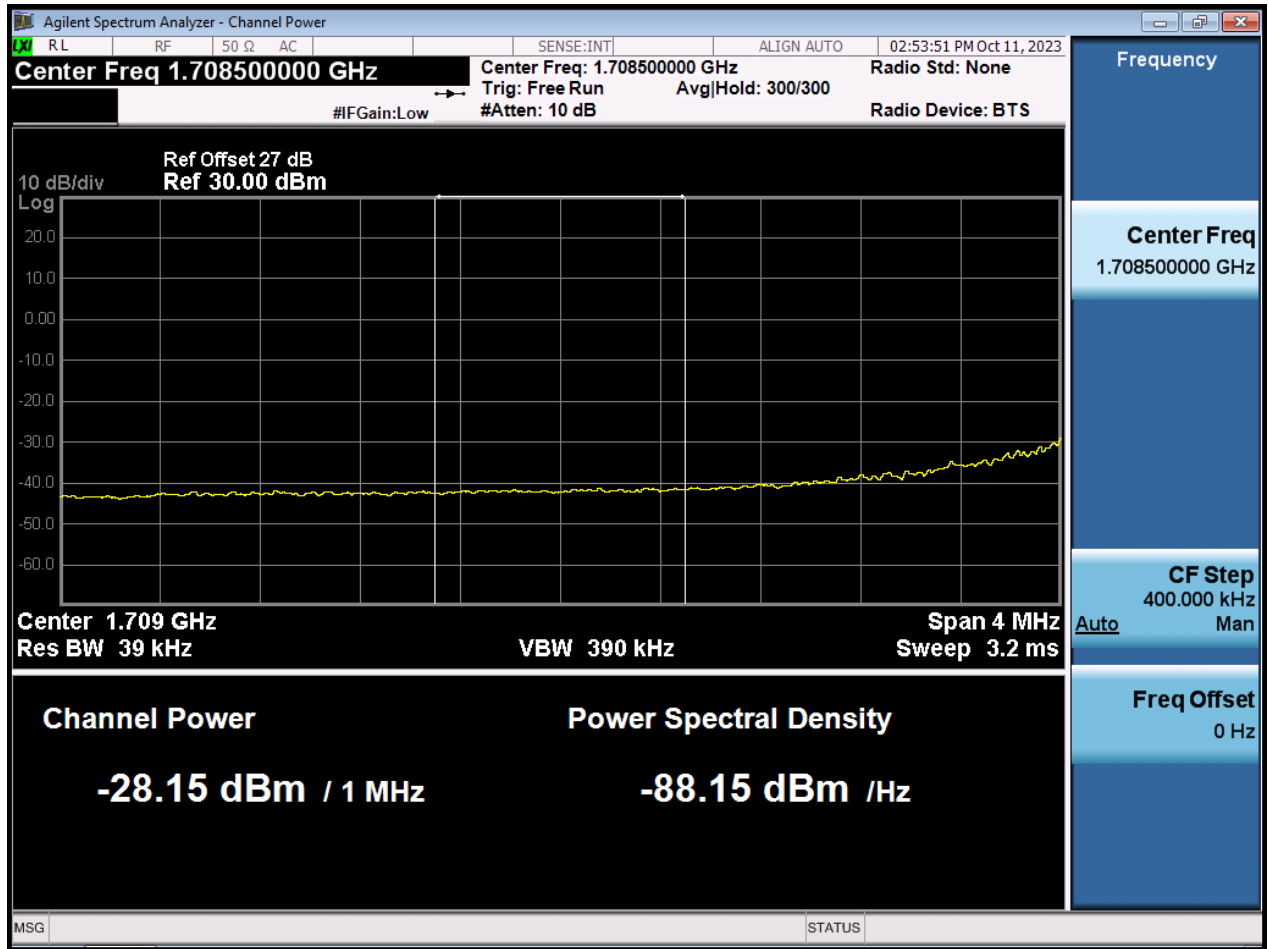
BW10 M_BandEdge_Highest Channel_QPSK_1RB



BW15 M_BandEdge_Lowest Channel_QPSK_Full RB(1)



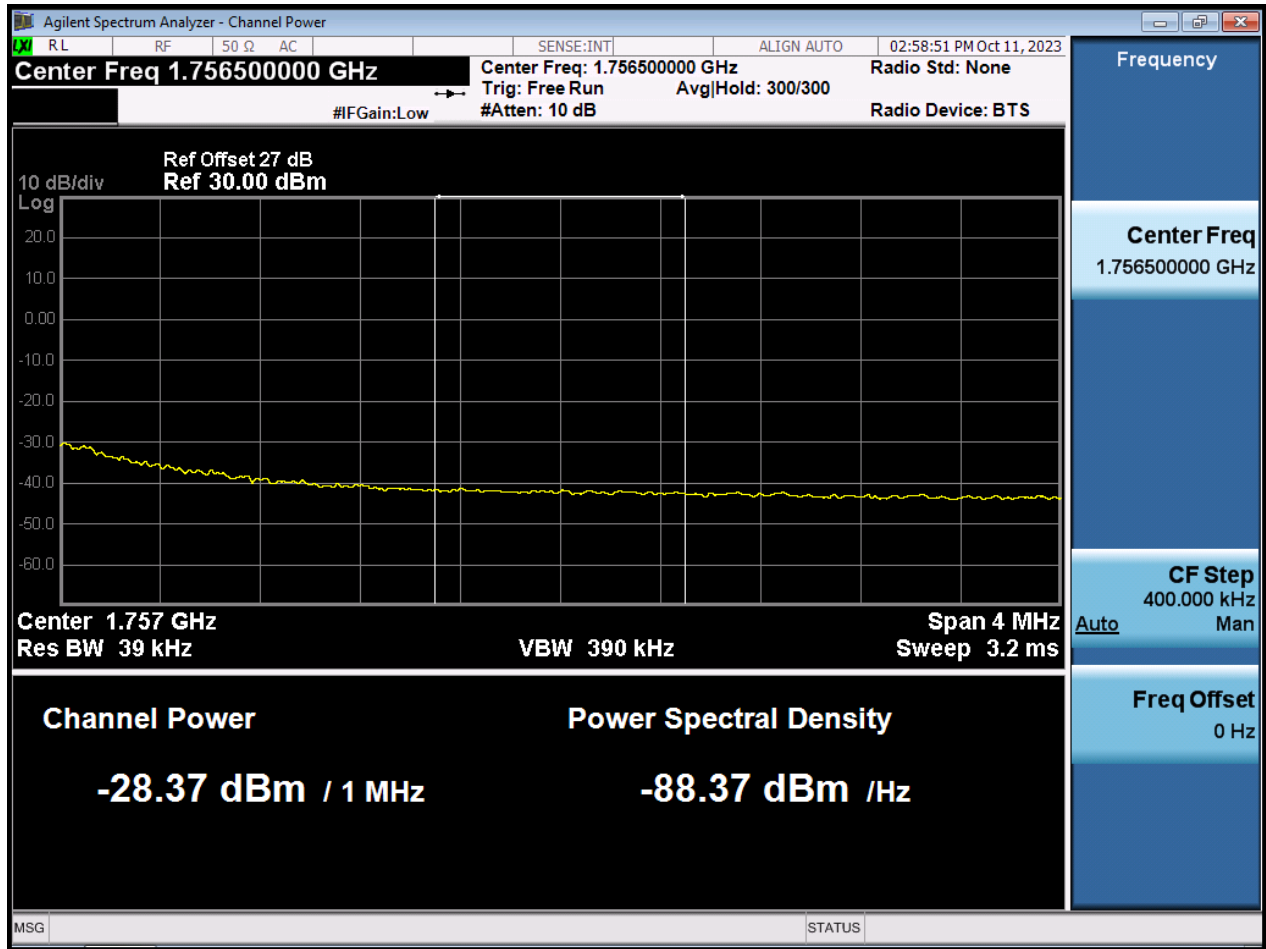
BW15 M_BandEdge_Lowest Channel_QPSK_Full RB(2)



BW15 M_BandEdge_Highest Channel_QPSK_Full RB(1)



BW15 M_BandEdge_Highest Channel_QPSK_Full RB(2)



BW15 M_BandEdge_Lowest Channel_QPSK_1RB



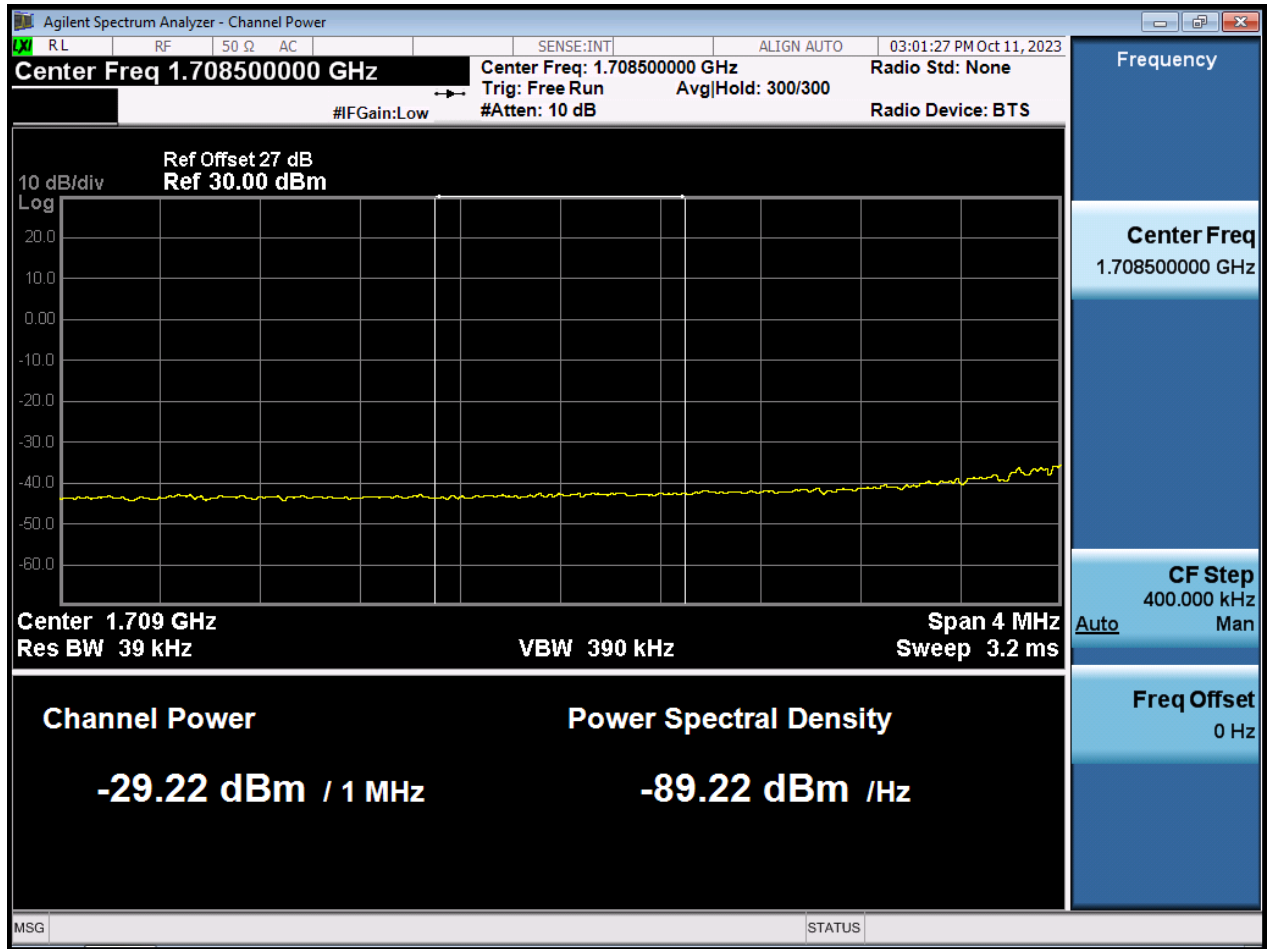
BW15 M_BandEdge_Highest Channel_QPSK_1RB



BW20 M_BandEdge_Lowest Channel_QPSK_Full RB(1)



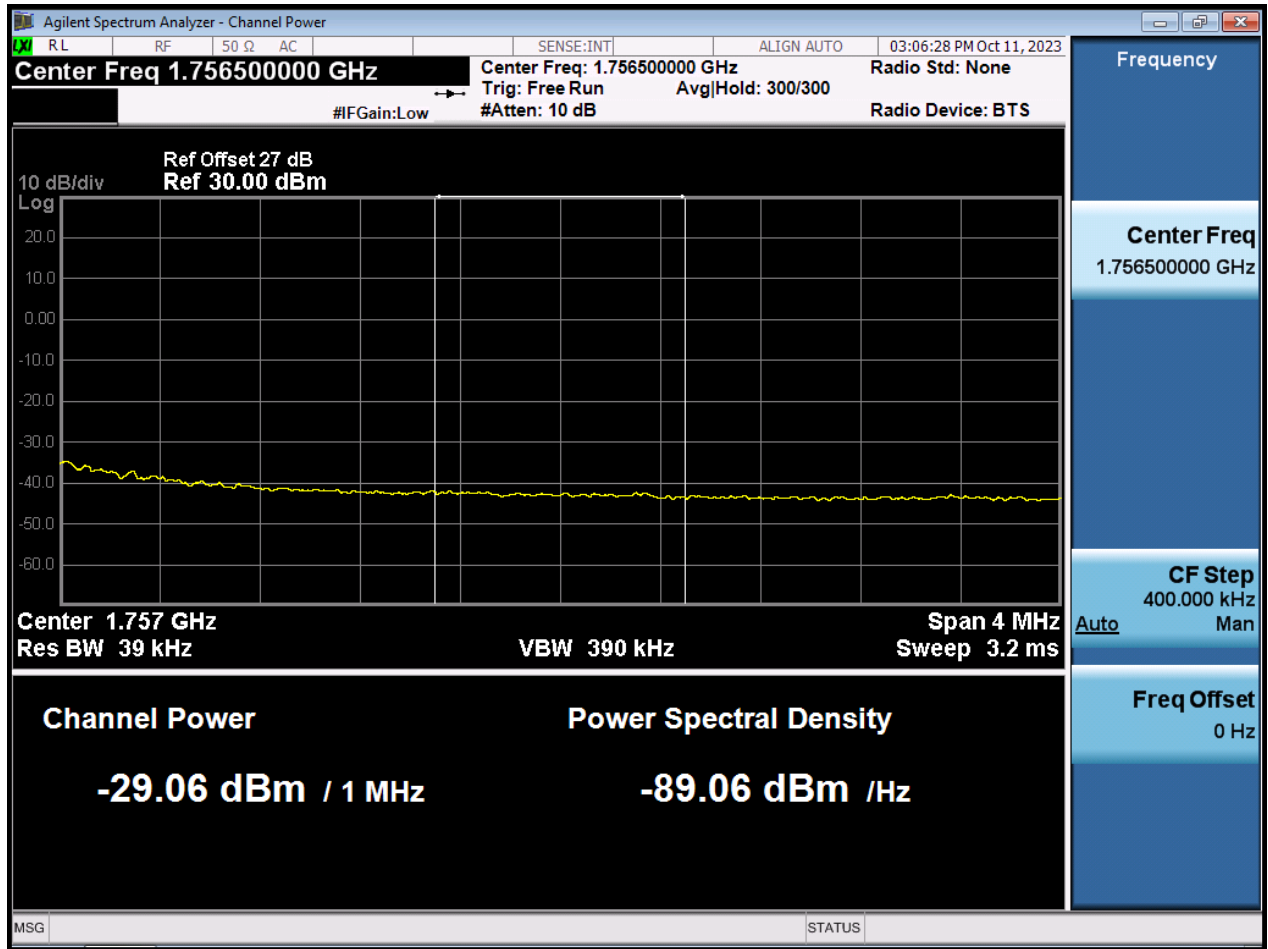
BW20 M_BandEdge_Lowest Channel_QPSK_Full RB(2)



BW20 M_BandEdge_Highest Channel_QPSK_Full RB(1)



BW20 M_BandEdge_Highest Channel_QPSK_Full RB(2)



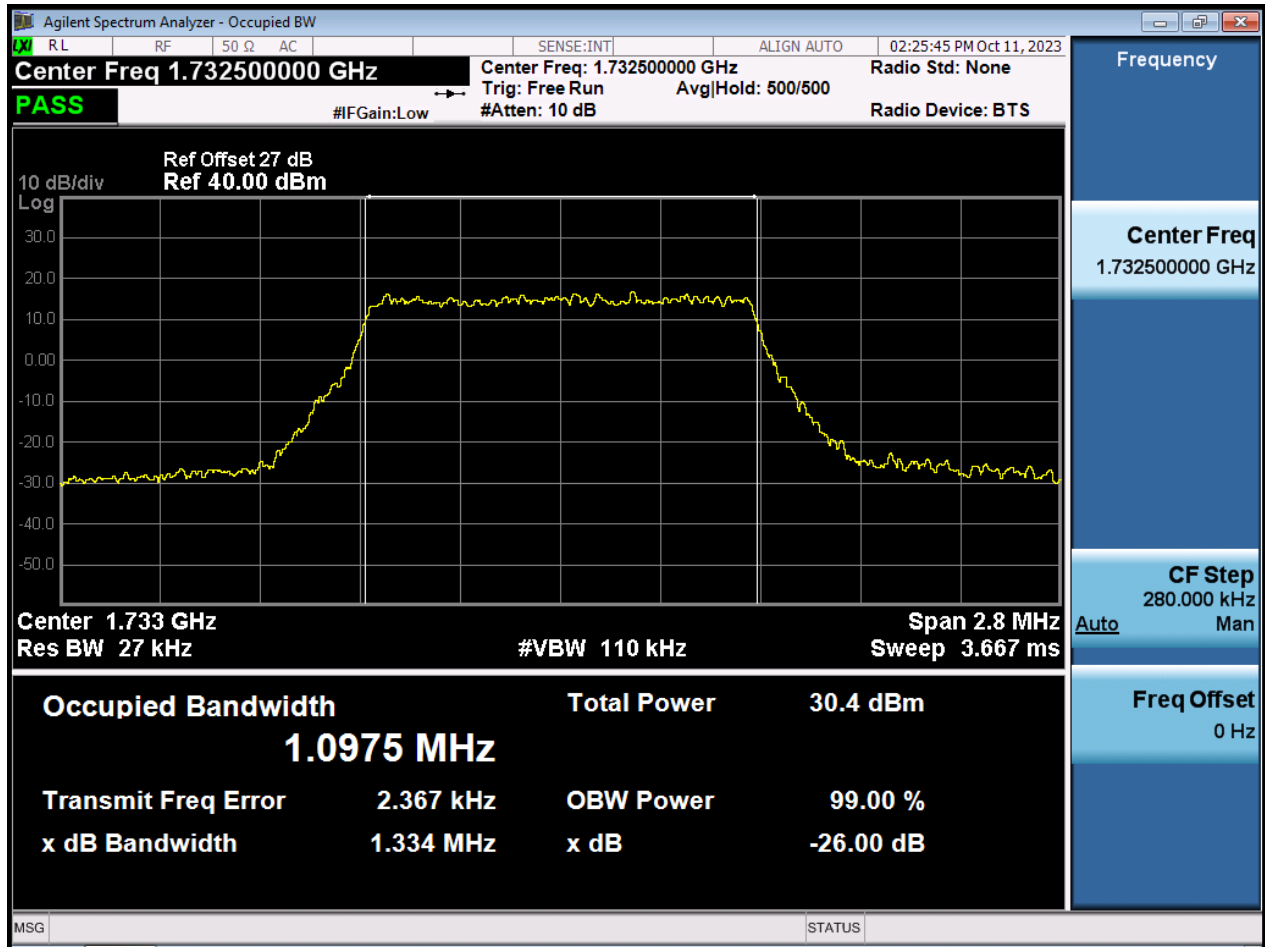
BW20 M_BandEdge_Lowest Channel_QPSK_1RB



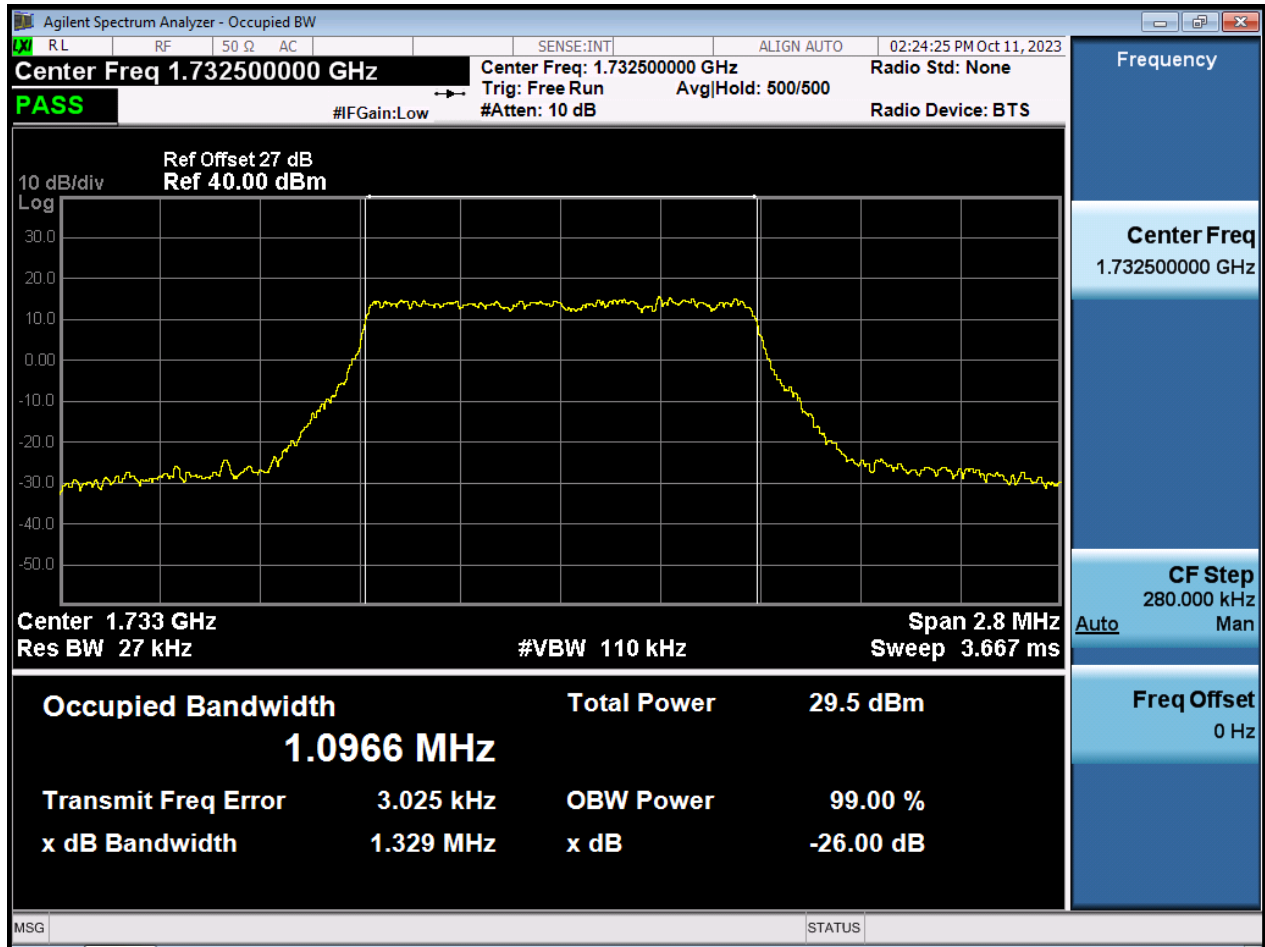
BW20 M_BandEdge_Highest Channel_QPSK_1RB



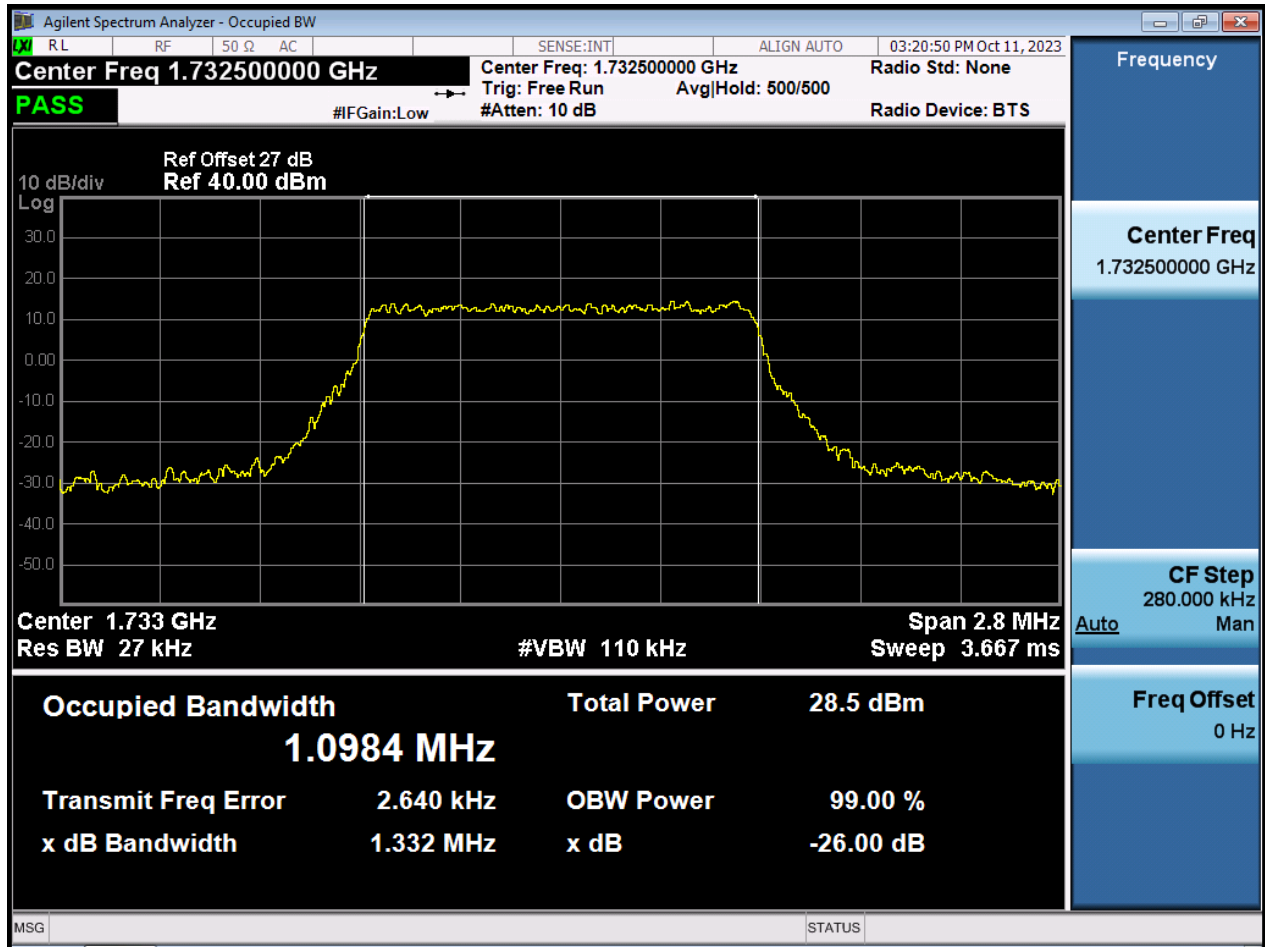
BW1.4 M_OBW_Middle Channel_QPSK_Full RB



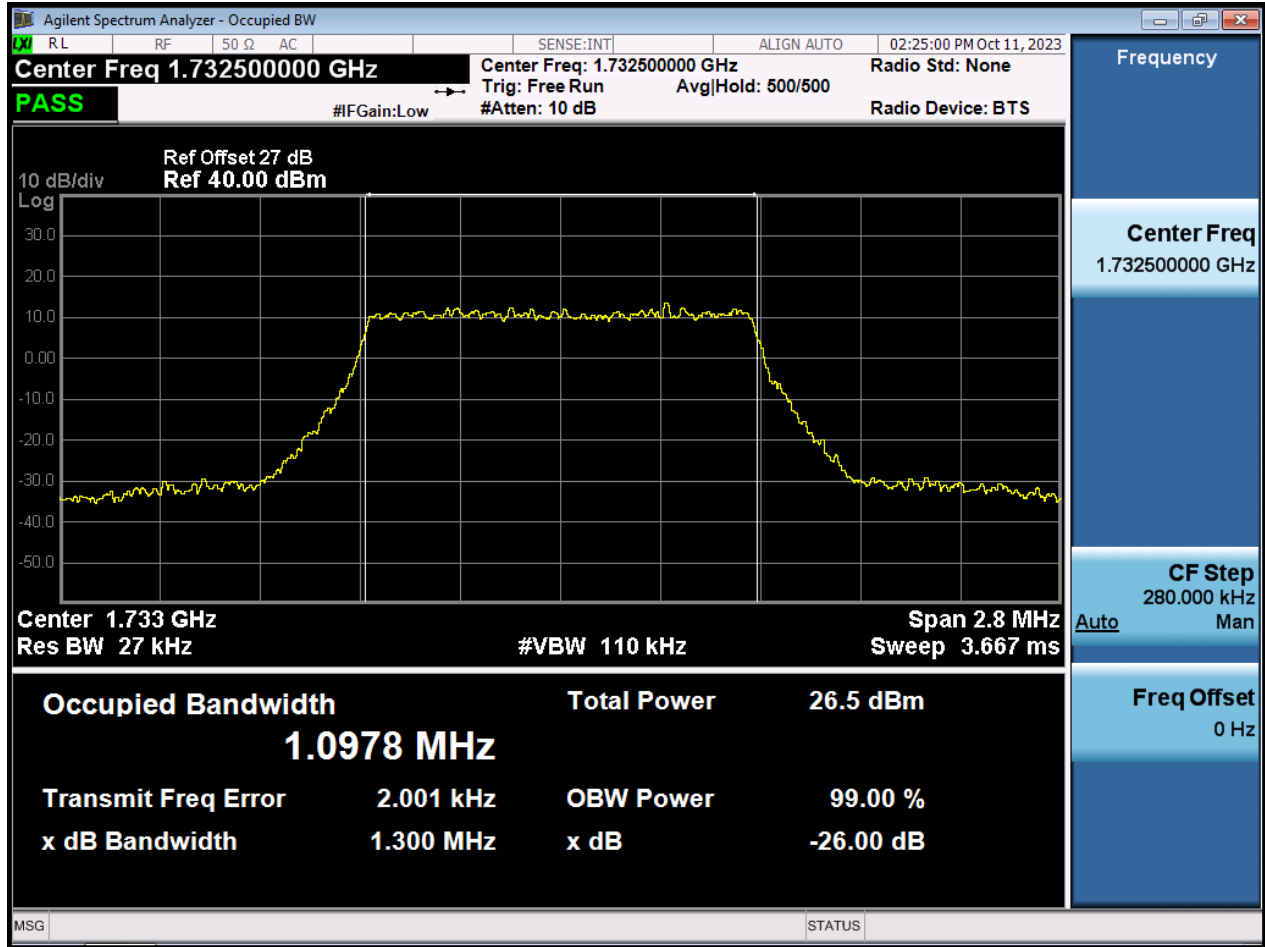
BW1.4 M_OBW_Middle Channel_16QAM_Full RB



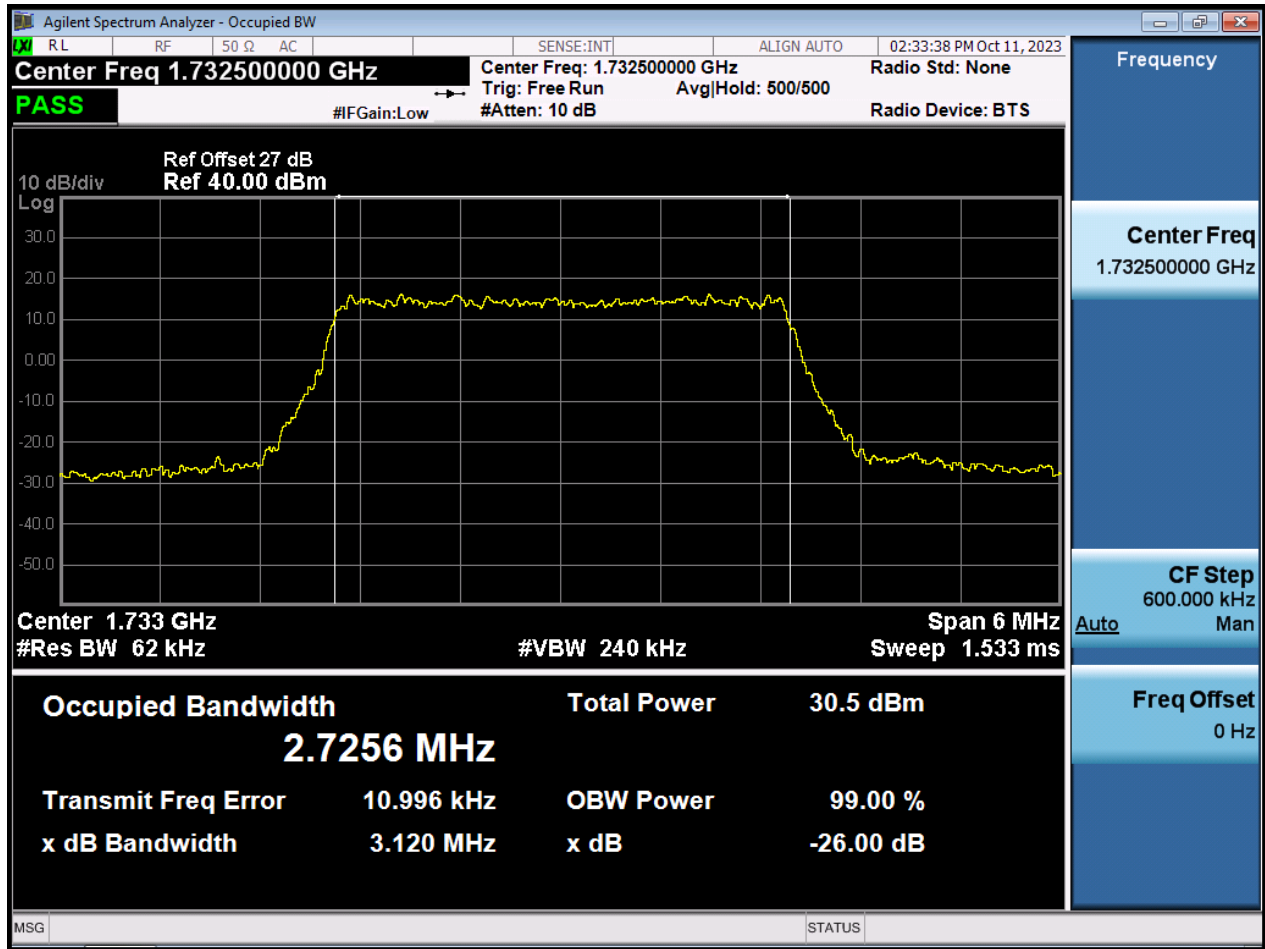
BW1.4 M_OBW_Middle Channel_64QAM_Full RB



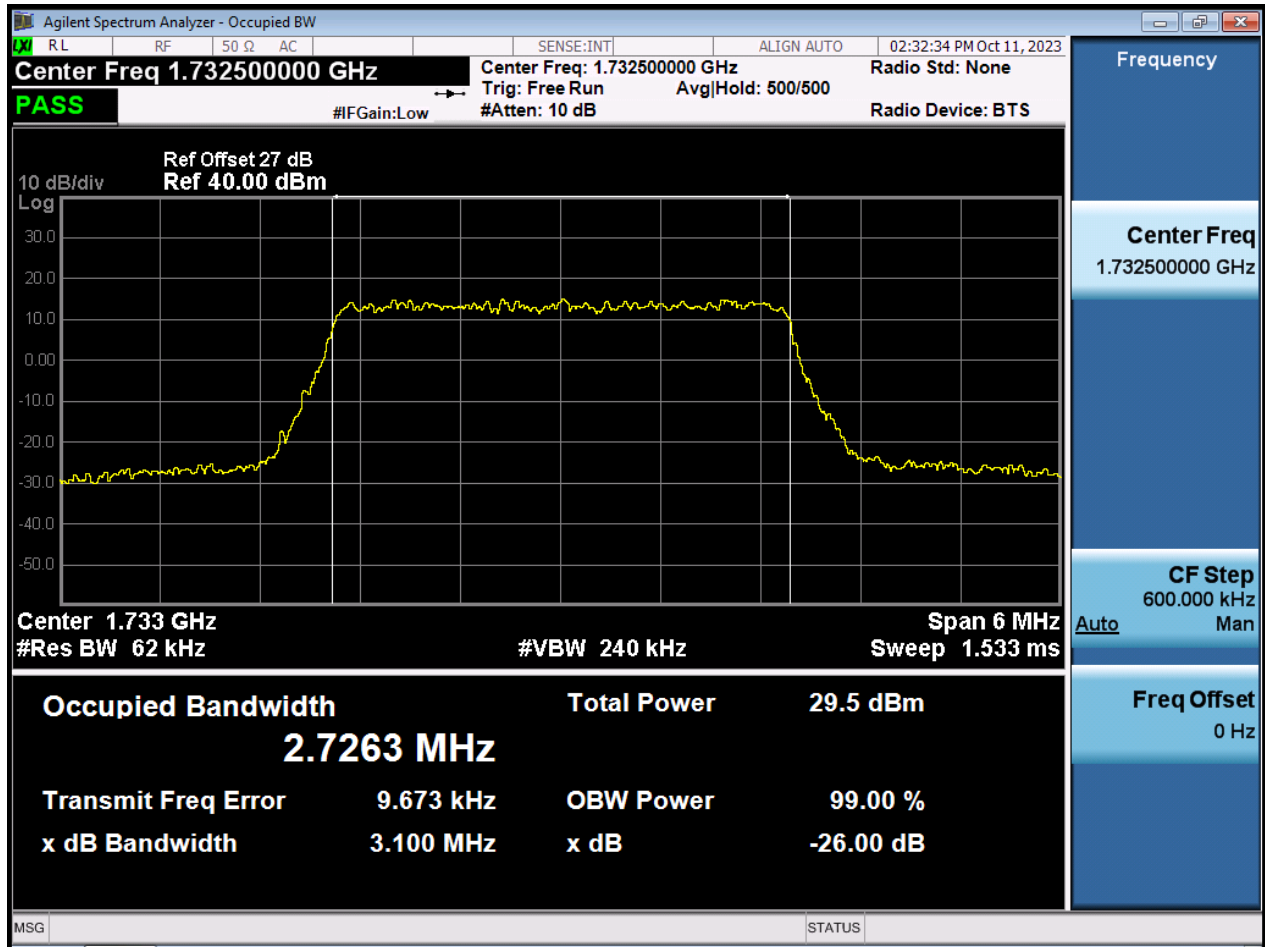
BW1.4 M_OBW_Middle Channel_256QAM_Full RB



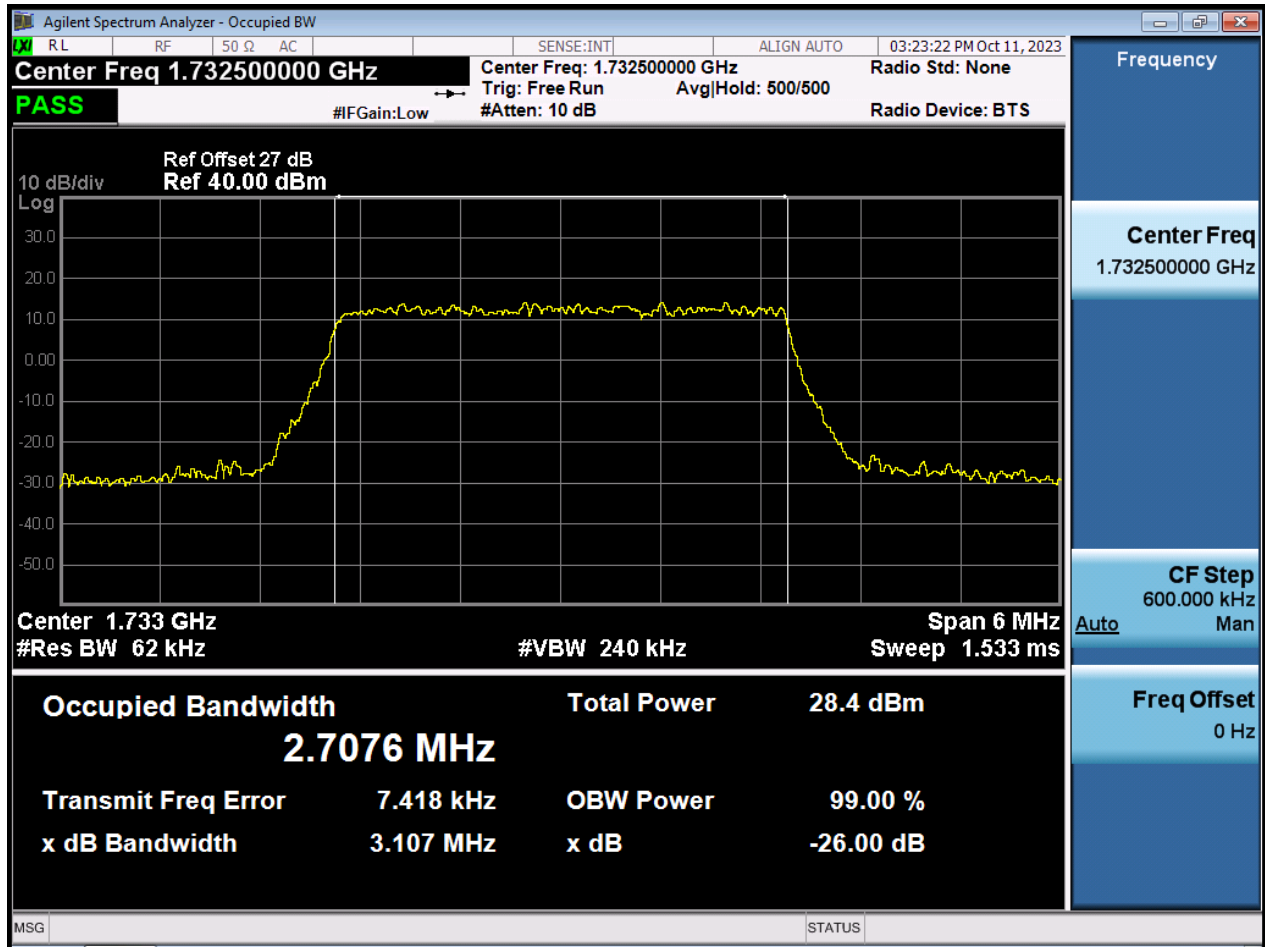
BW3 M_OBW_Middle Channel_QPSK_Full RB



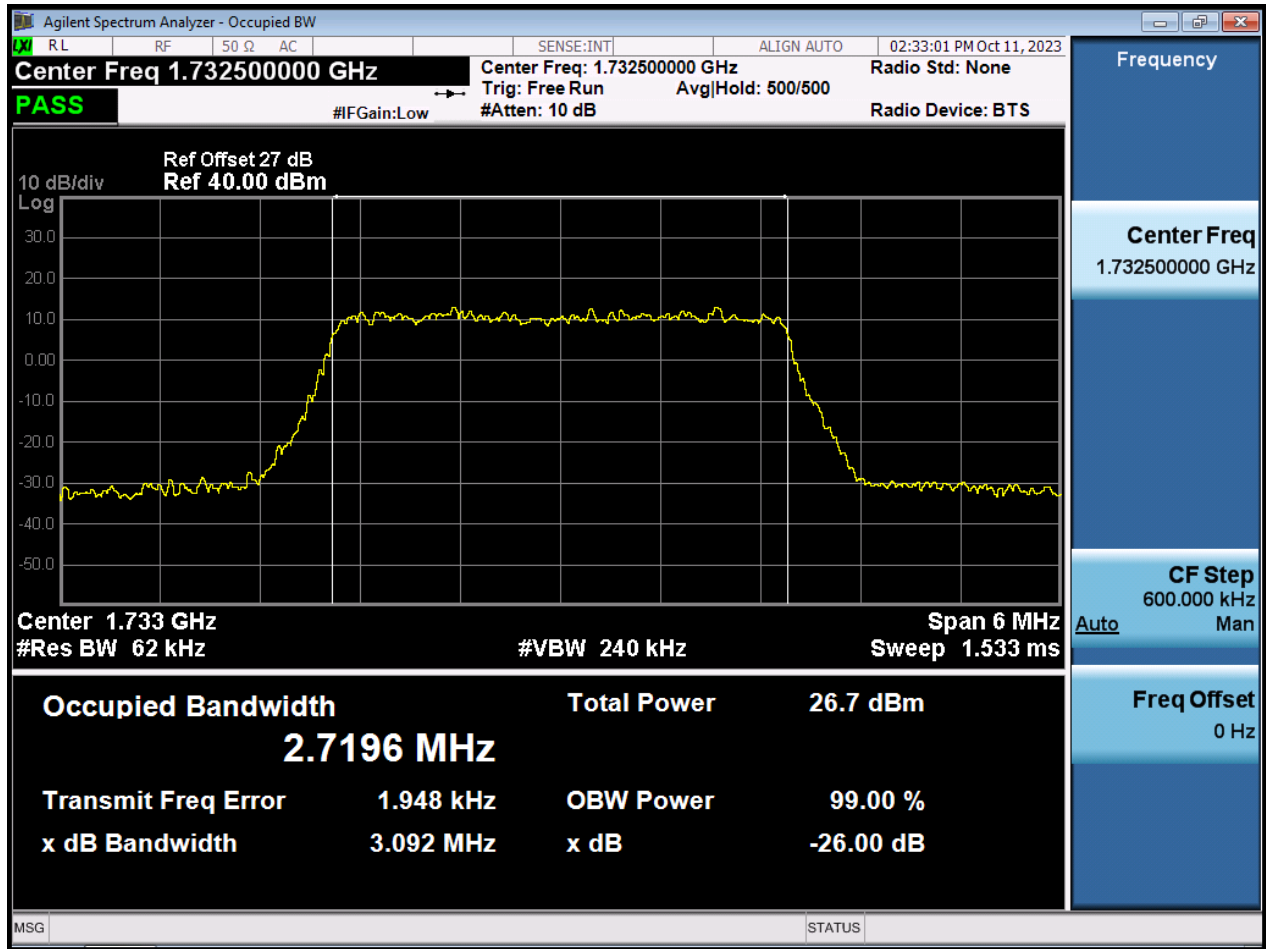
BW3 M_OBW_Middle Channel_16QAM_Full RB



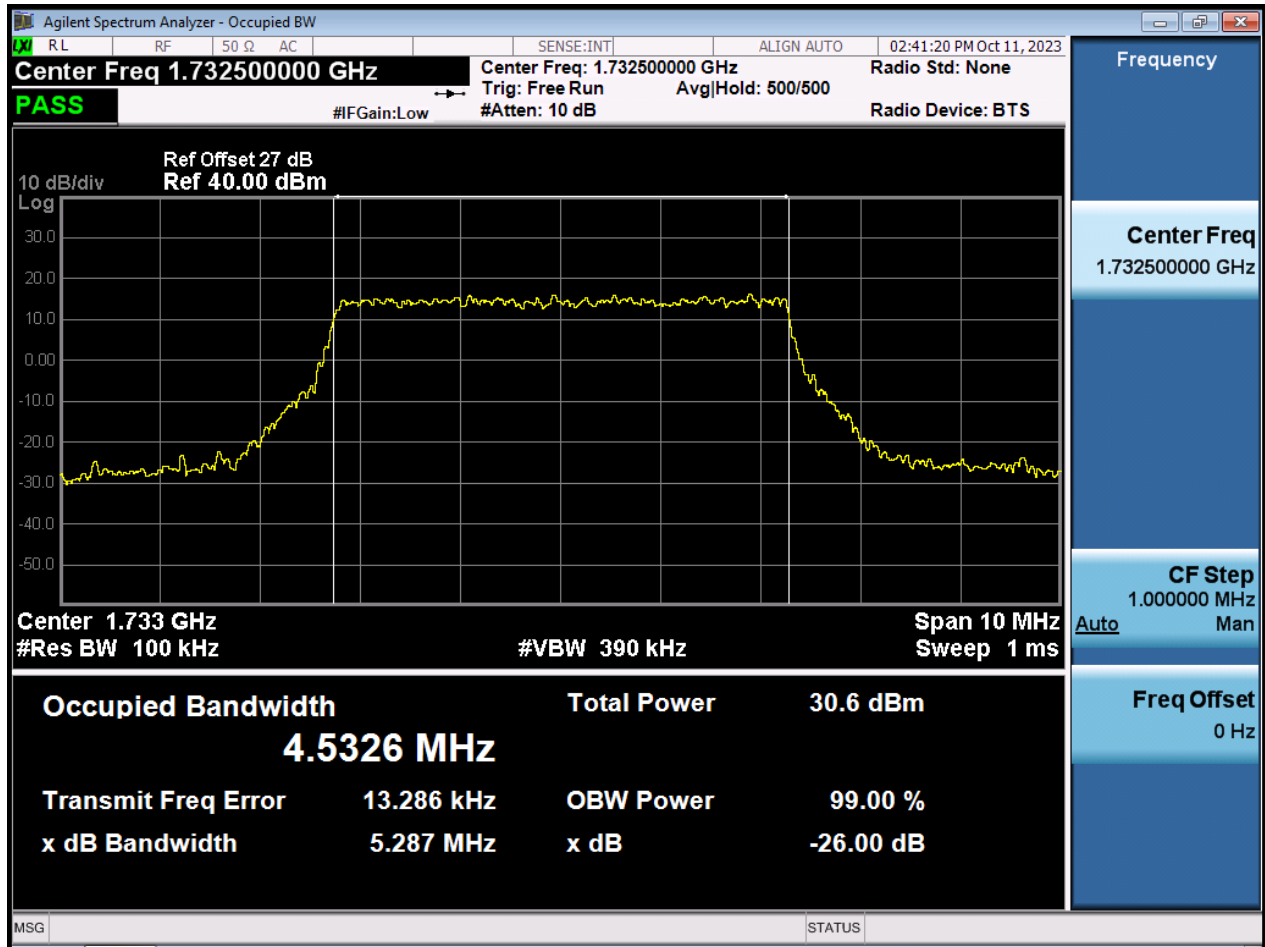
BW3 M_OBW_Middle Channel_64QAM_Full RB



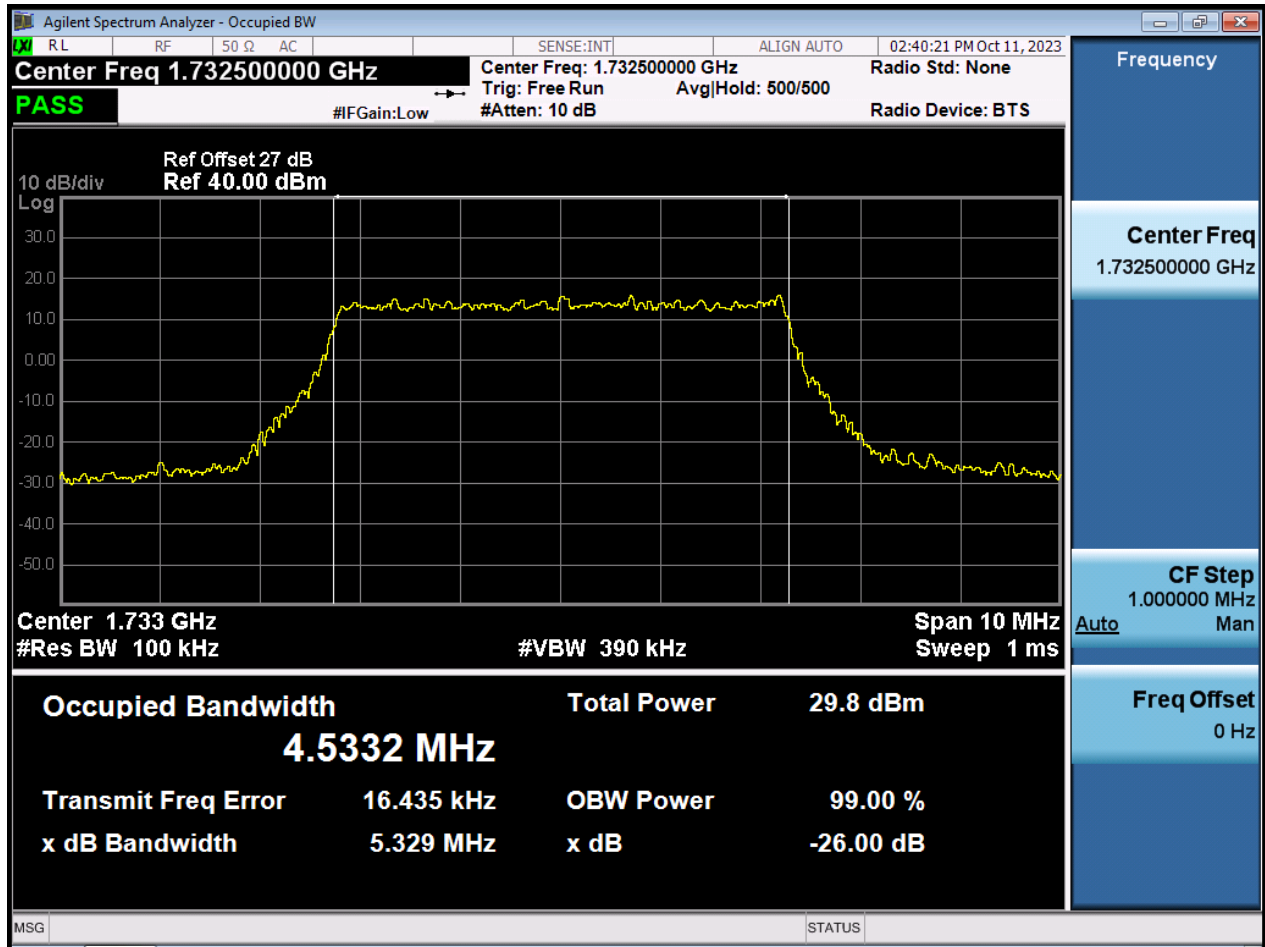
BW3 M_OBW_Middle Channel_256QAM_Full RB



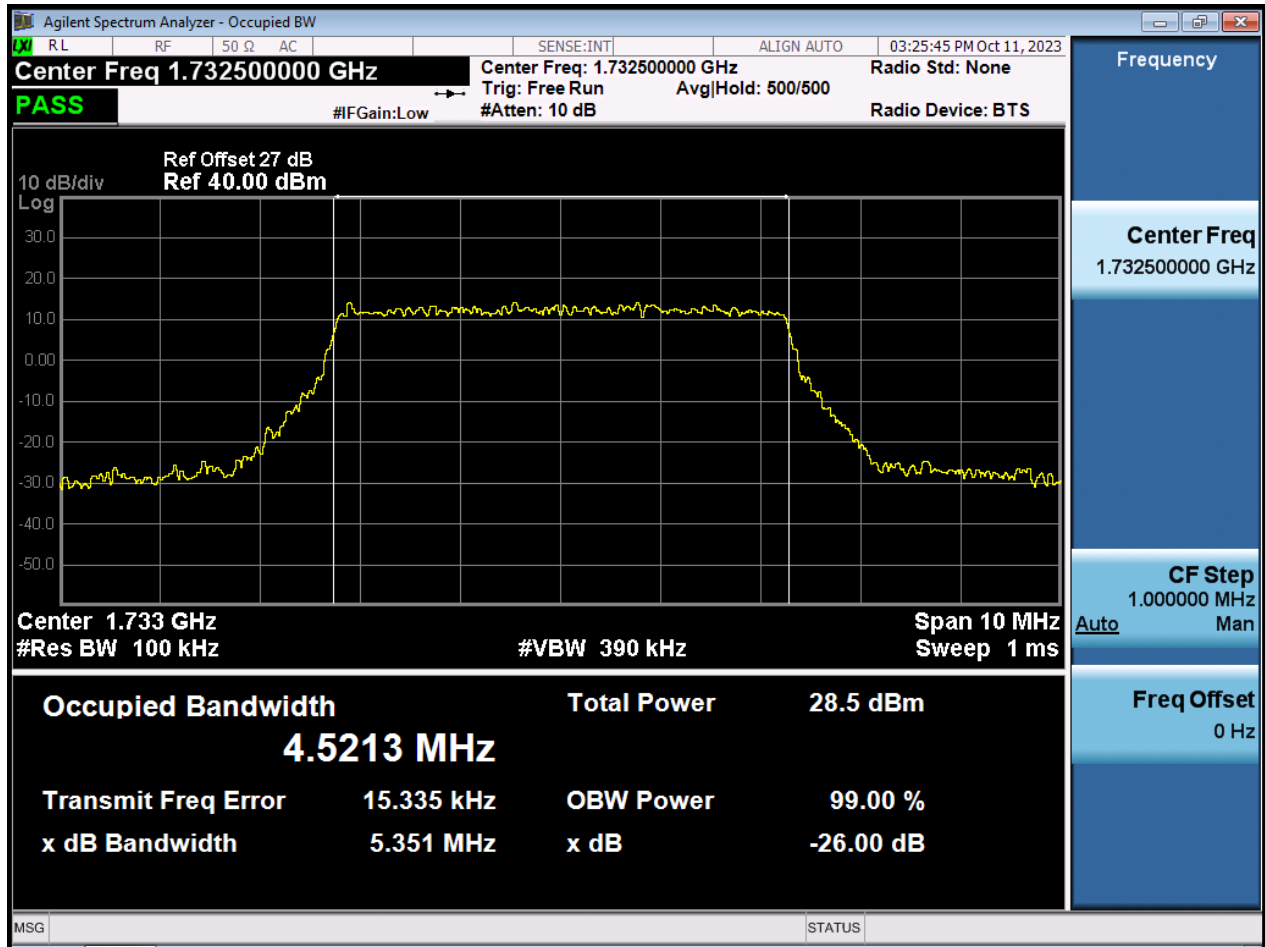
BW5 M_OBW_Middle Channel_QPSK_Full RB



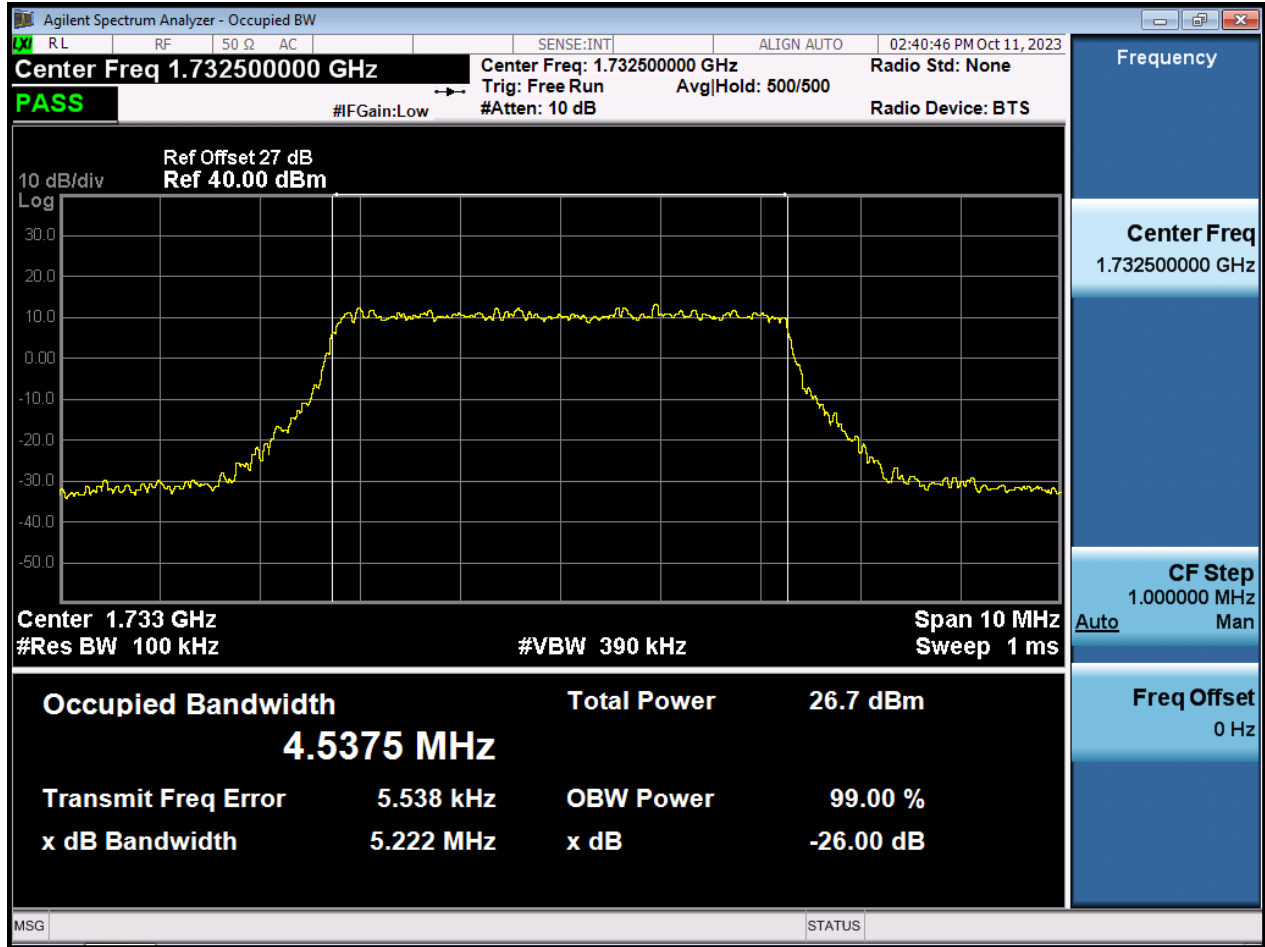
BW5 M_OBW_Middle Channel_16QAM_Full RB



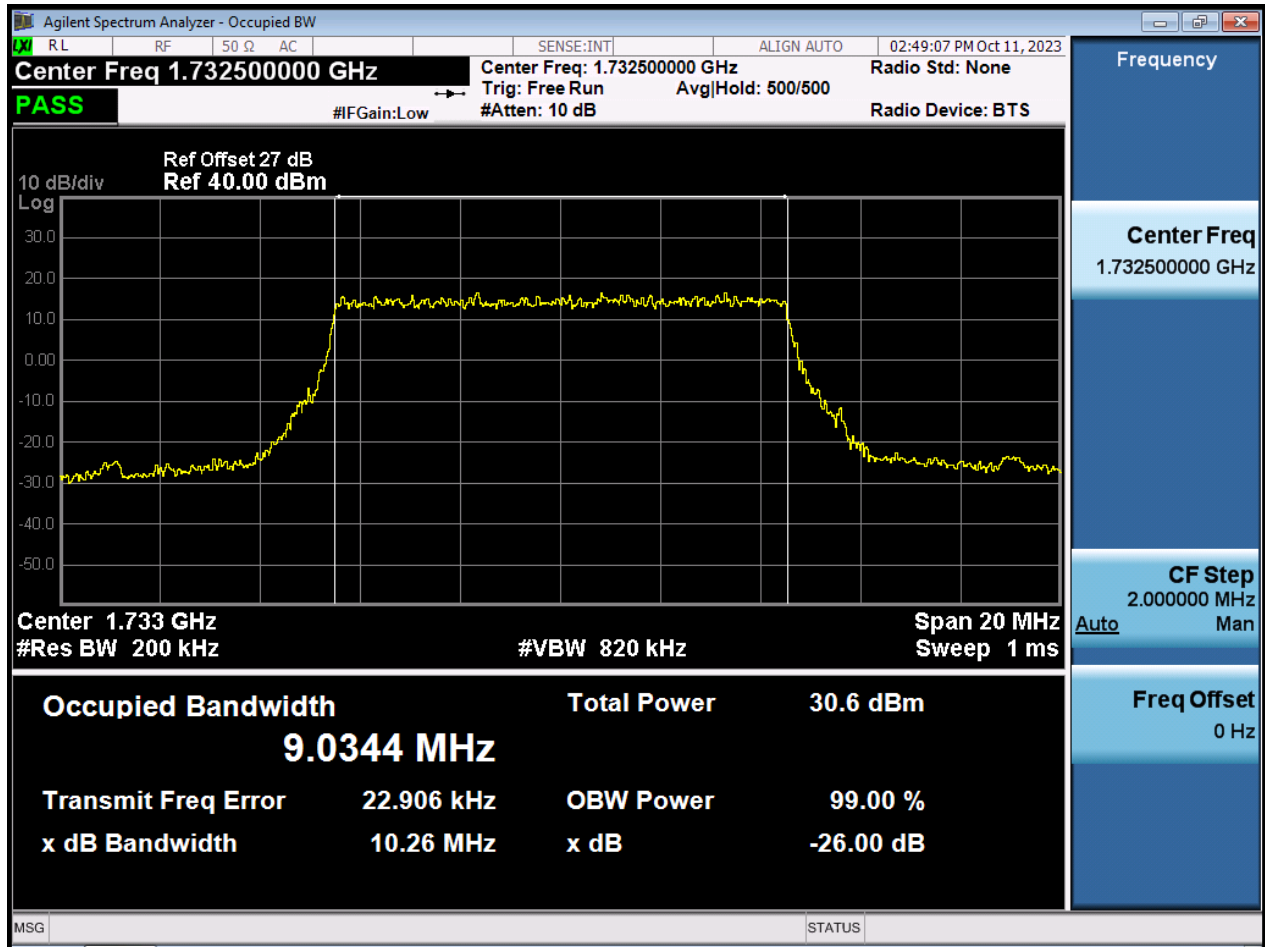
BW5 M_OBW_Middle Channel_64QAM_Full RB



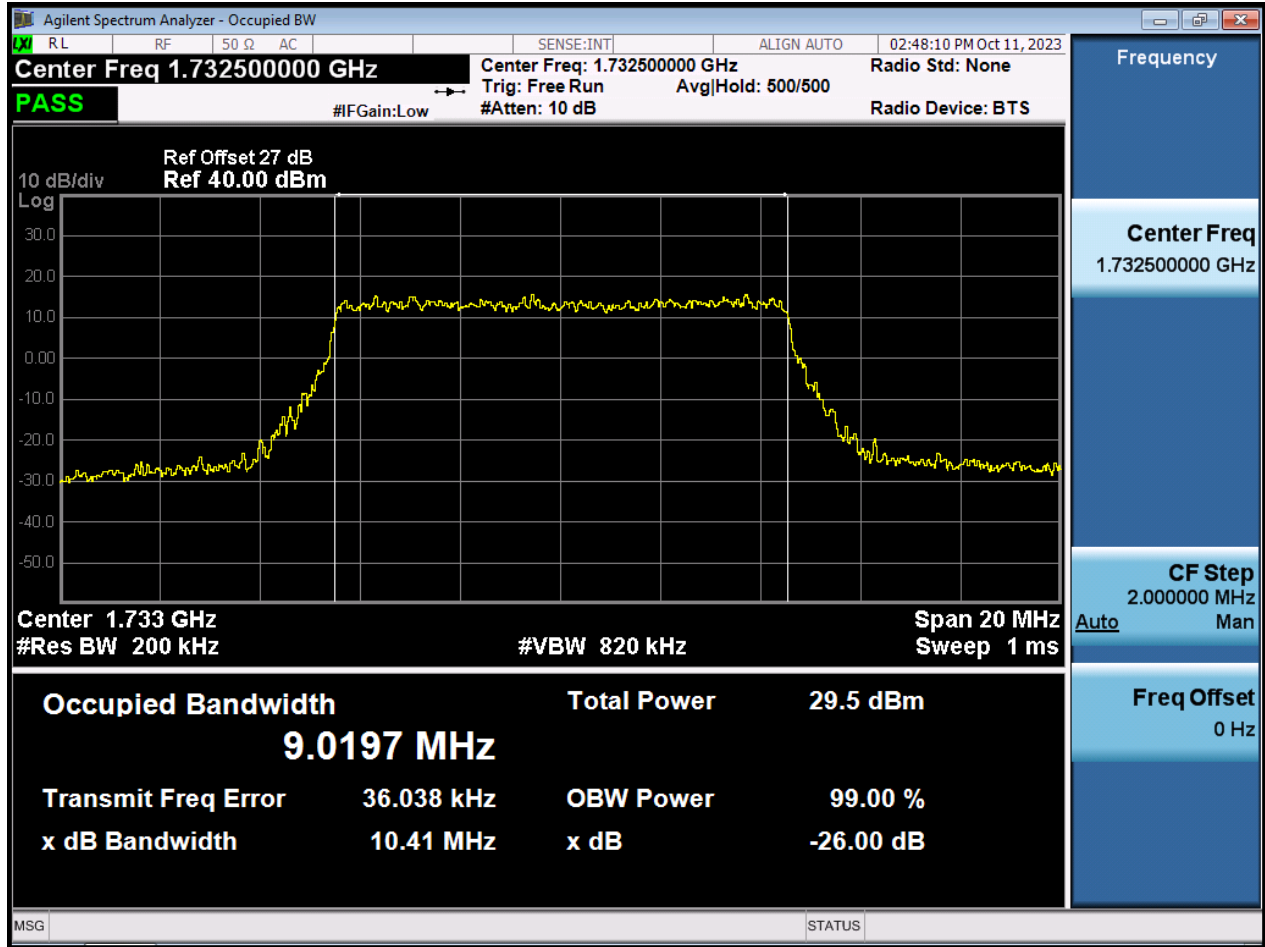
BW5 M_OBW_Middle Channel_256QAM_Full RB



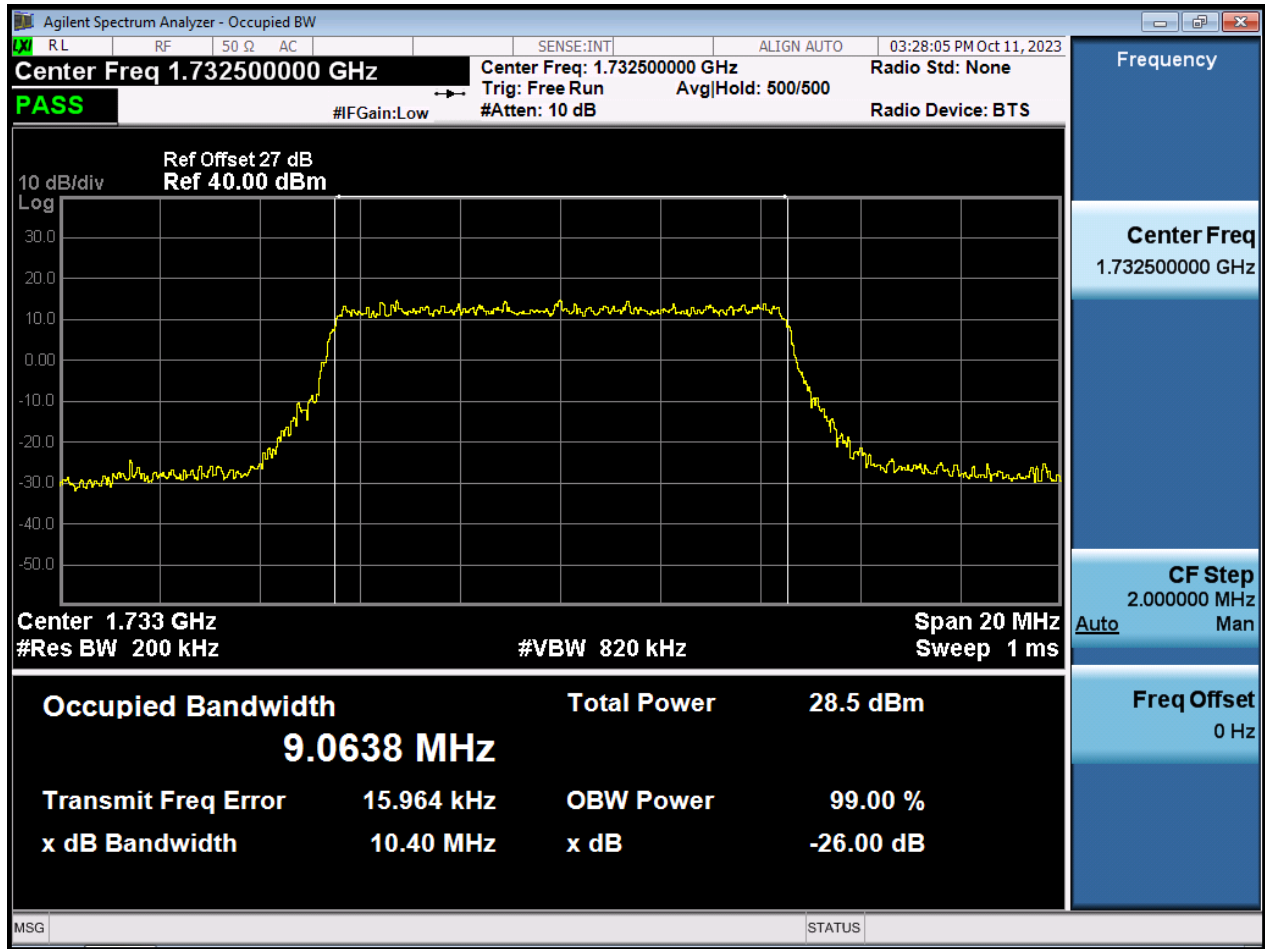
BW10 M_OBW_Middle Channel_QPSK_Full RB



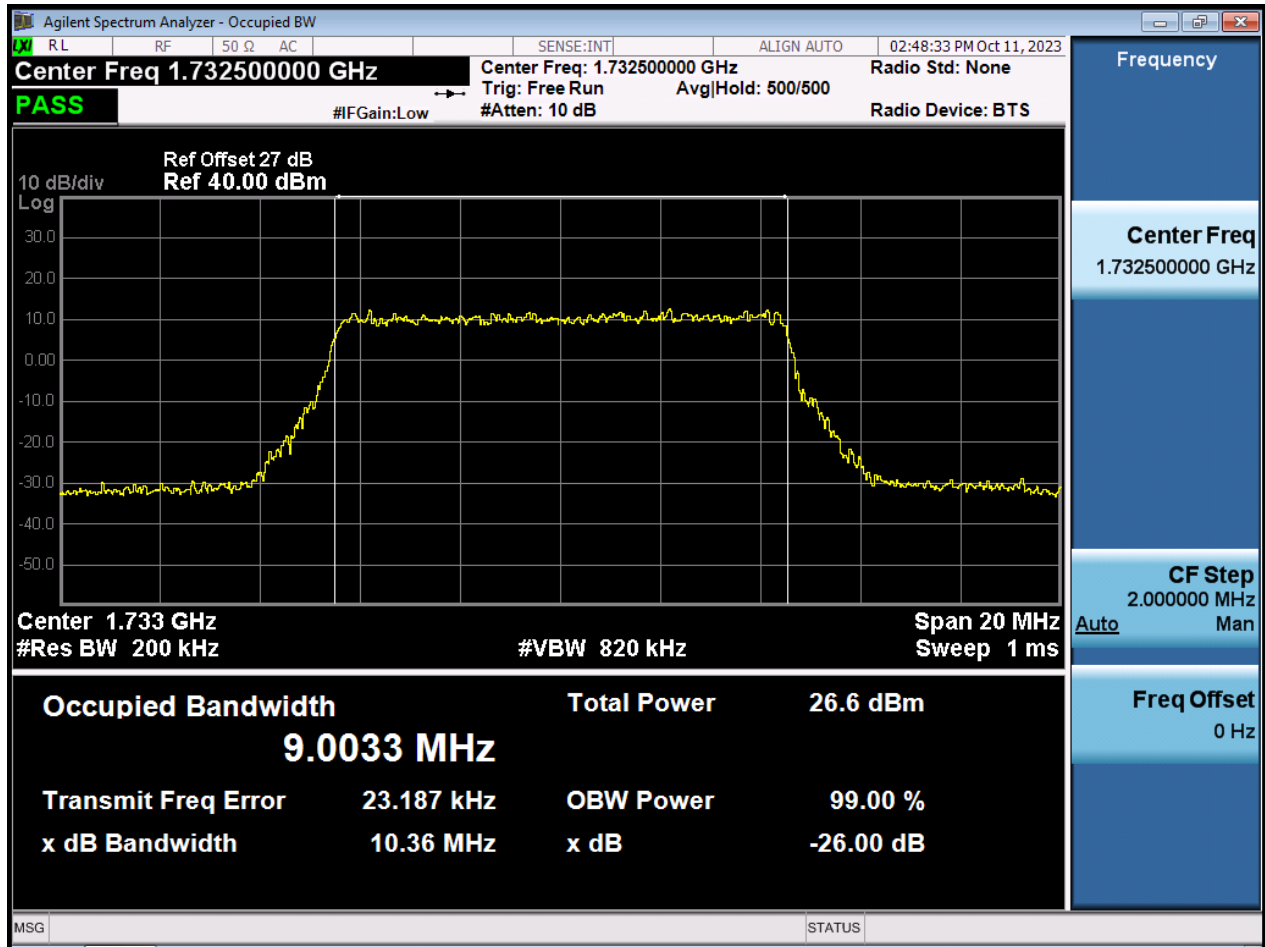
BW10 M_OBW_Middle Channel_16QAM_Full RB



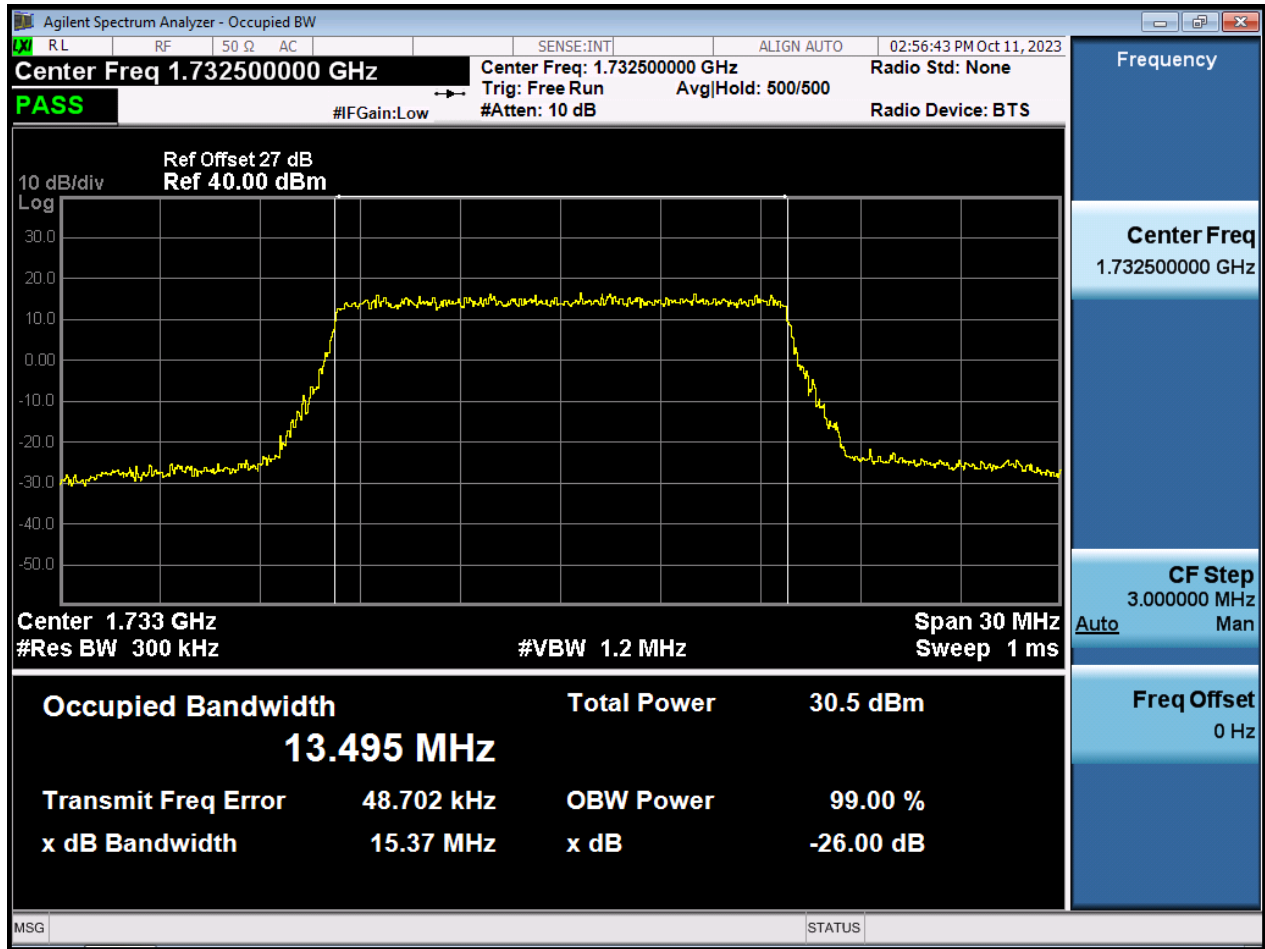
BW10 M_OBW_Middle Channel_64QAM_Full RB



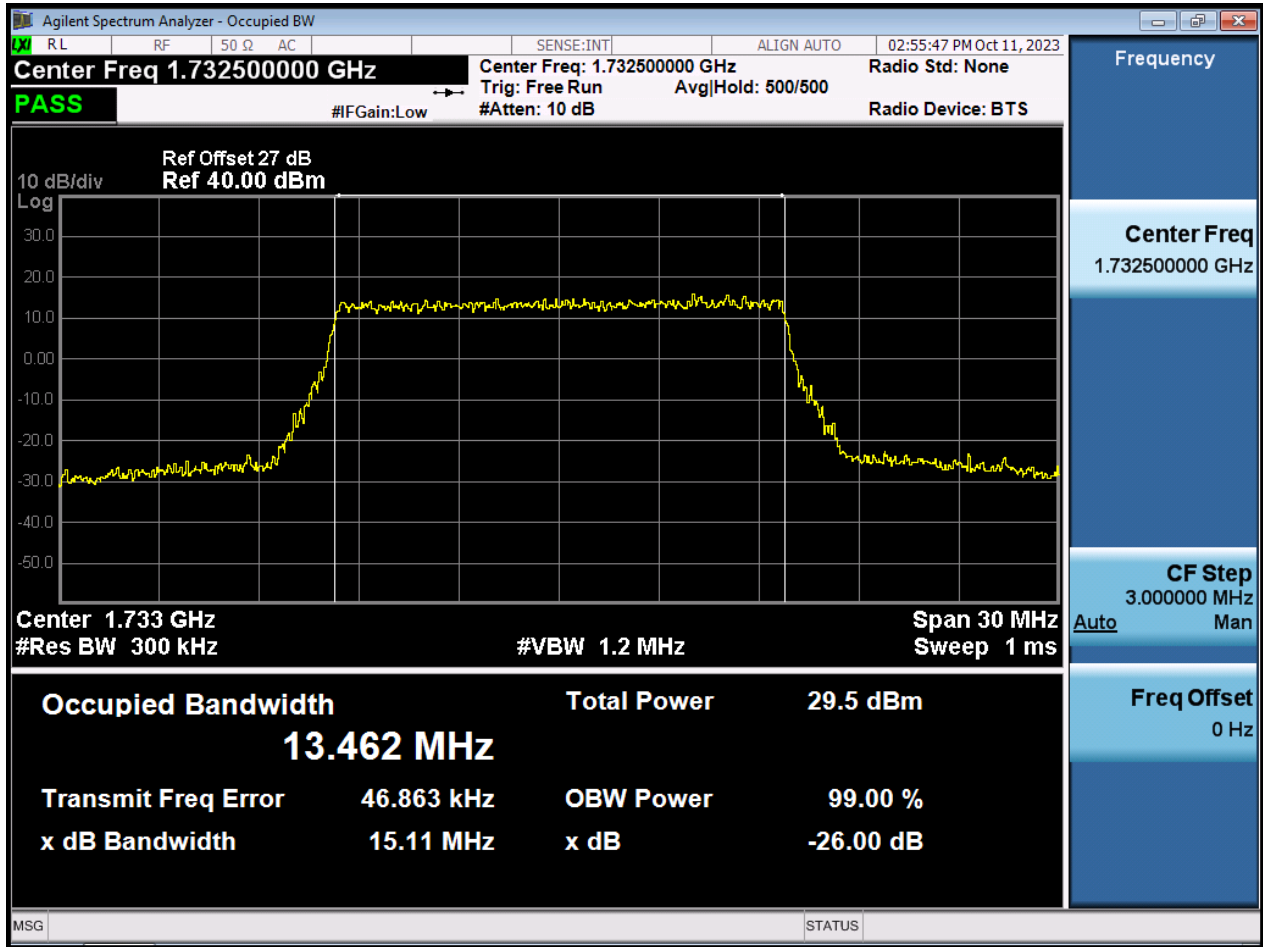
BW10 M_OBW_Middle Channel_256QAM_Full RB



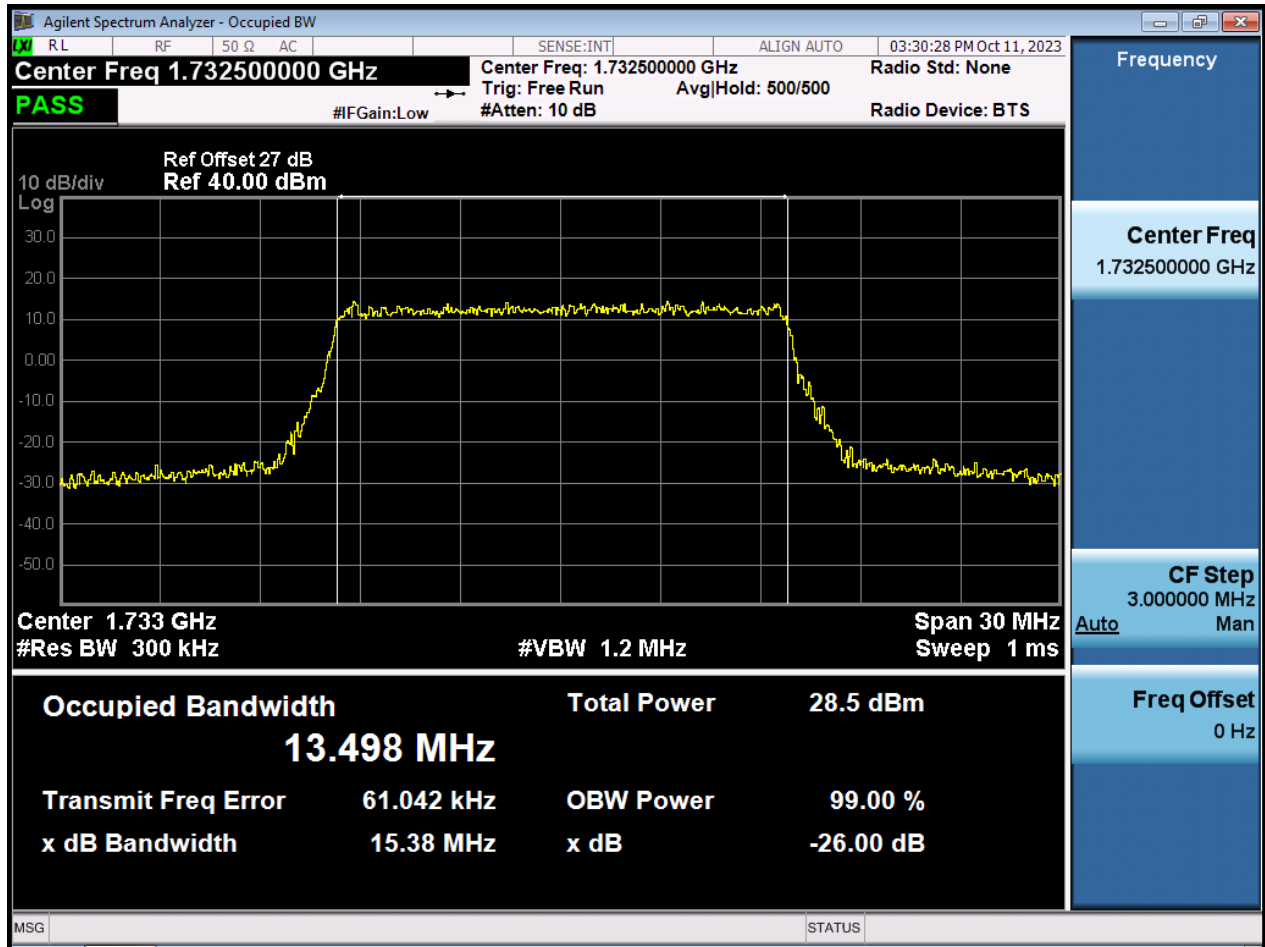
BW15 M_OBW_Middle Channel_QPSK_Full RB



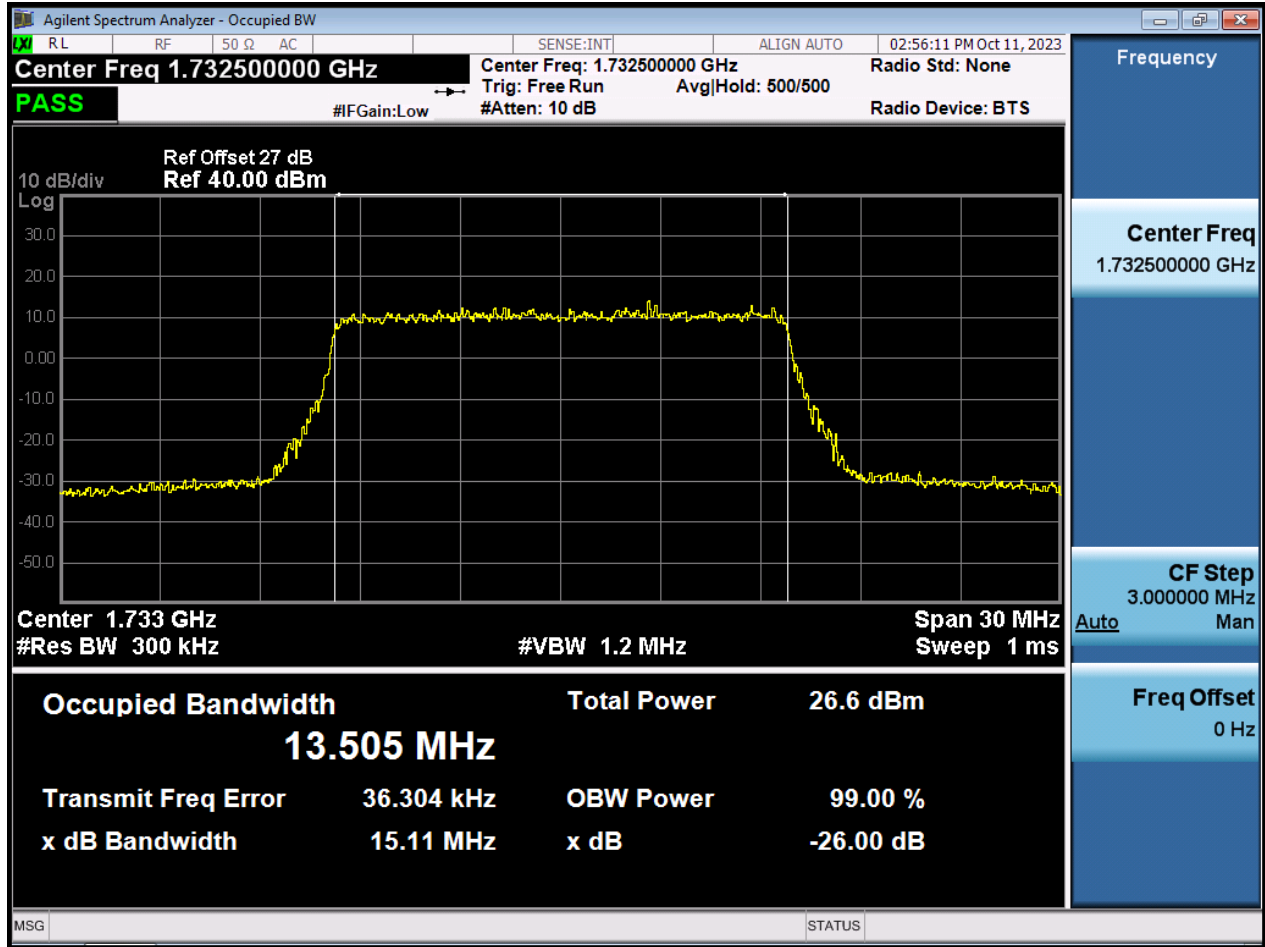
BW15 M_OBW_Middle Channel_16QAM_Full RB



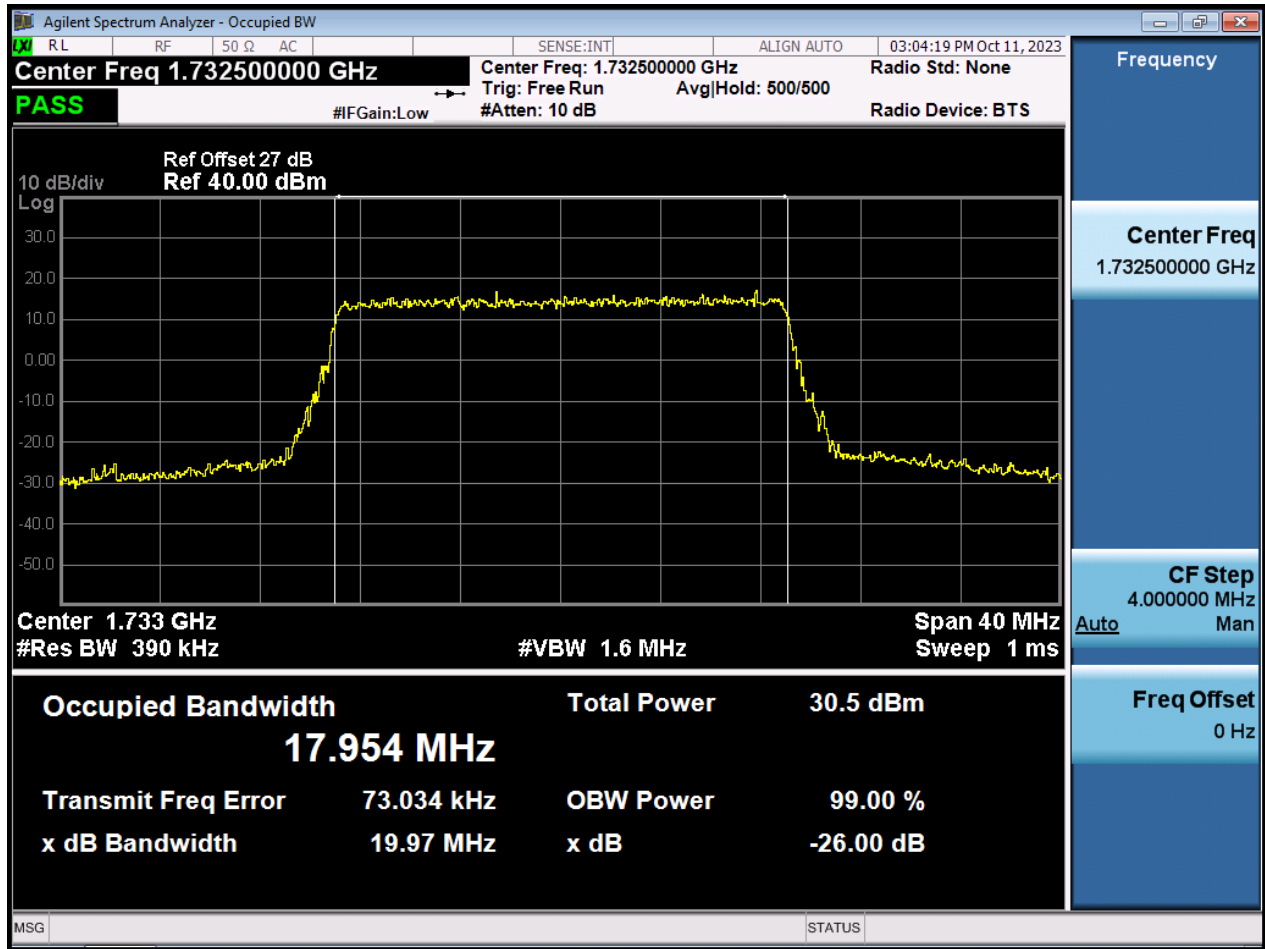
BW15 M_OBW_Middle Channel_64QAM_Full RB



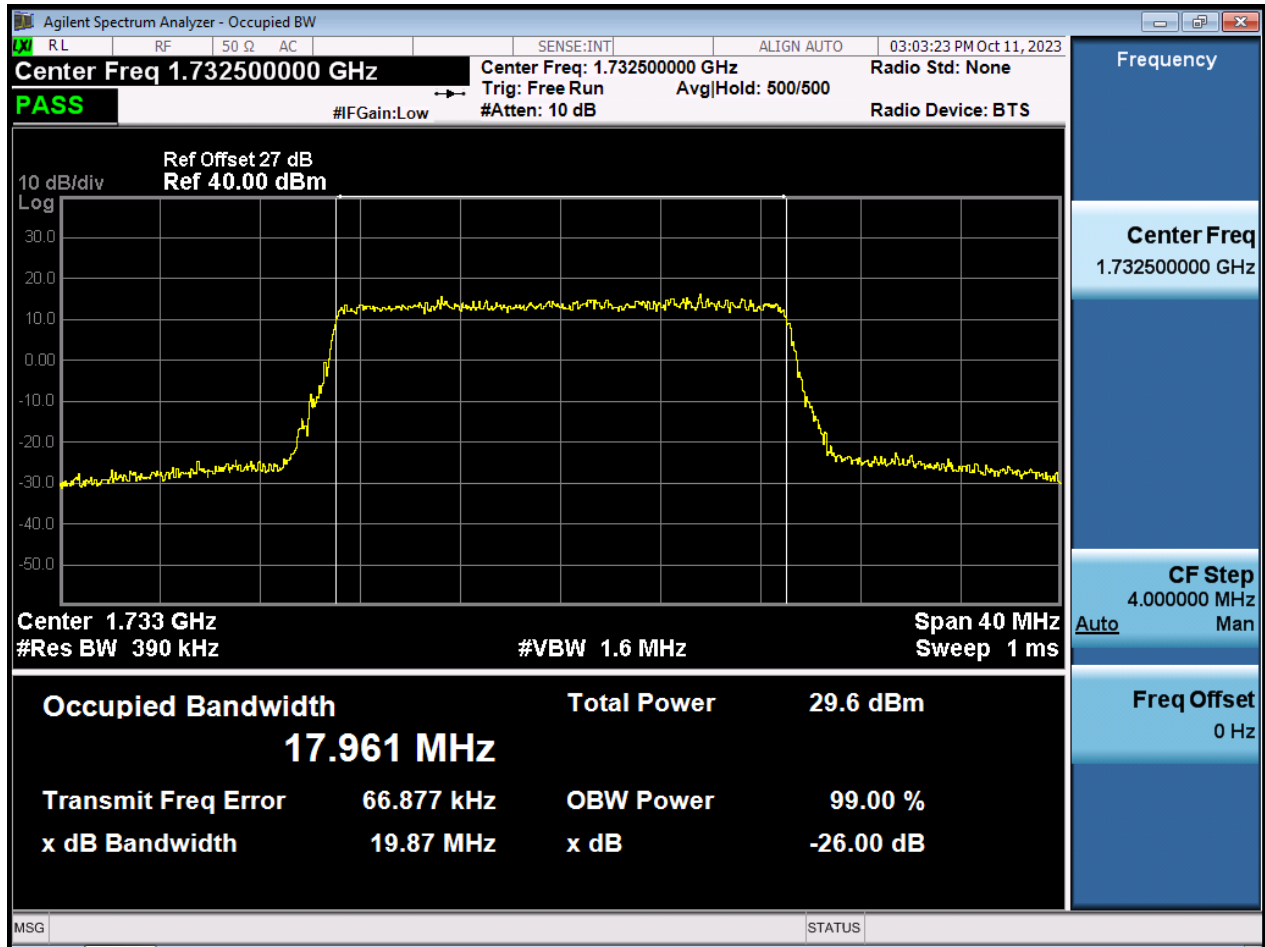
BW15 M_OBW_Middle Channel_256QAM_Full RB



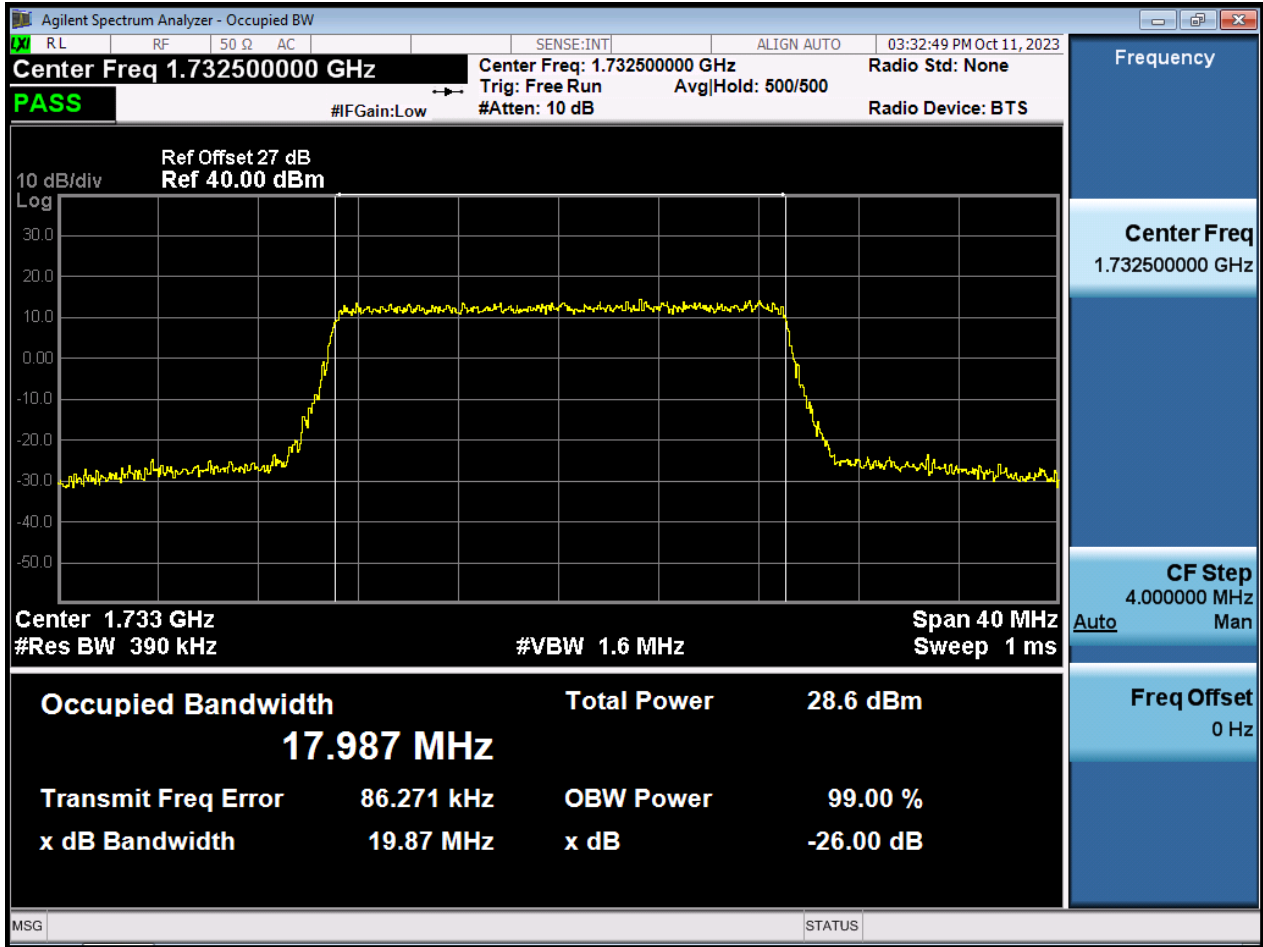
BW20 M_OBW_Middle Channel_QPSK_Full RB



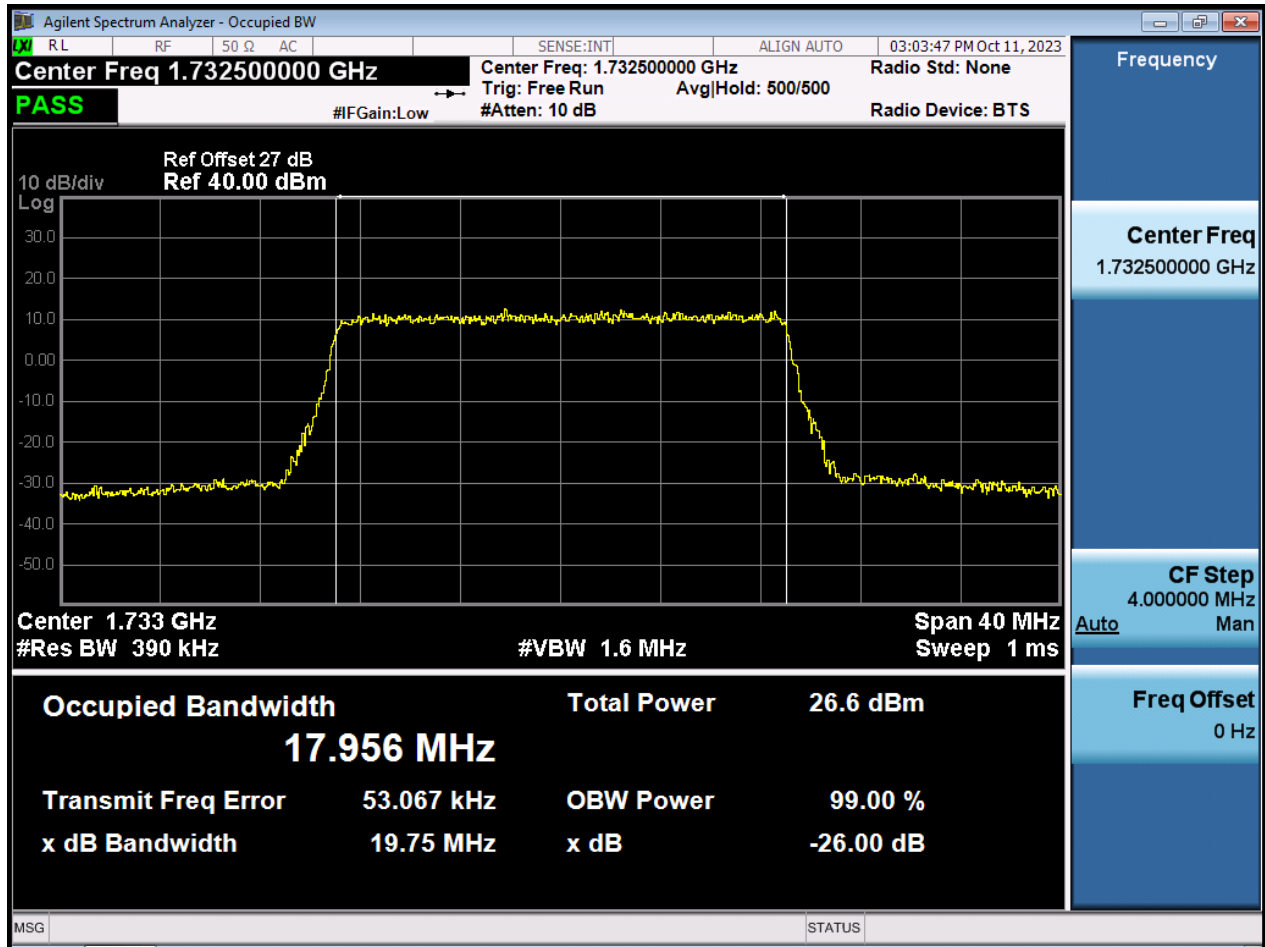
BW20 M_OBW_Middle Channel_16QAM_Full RB



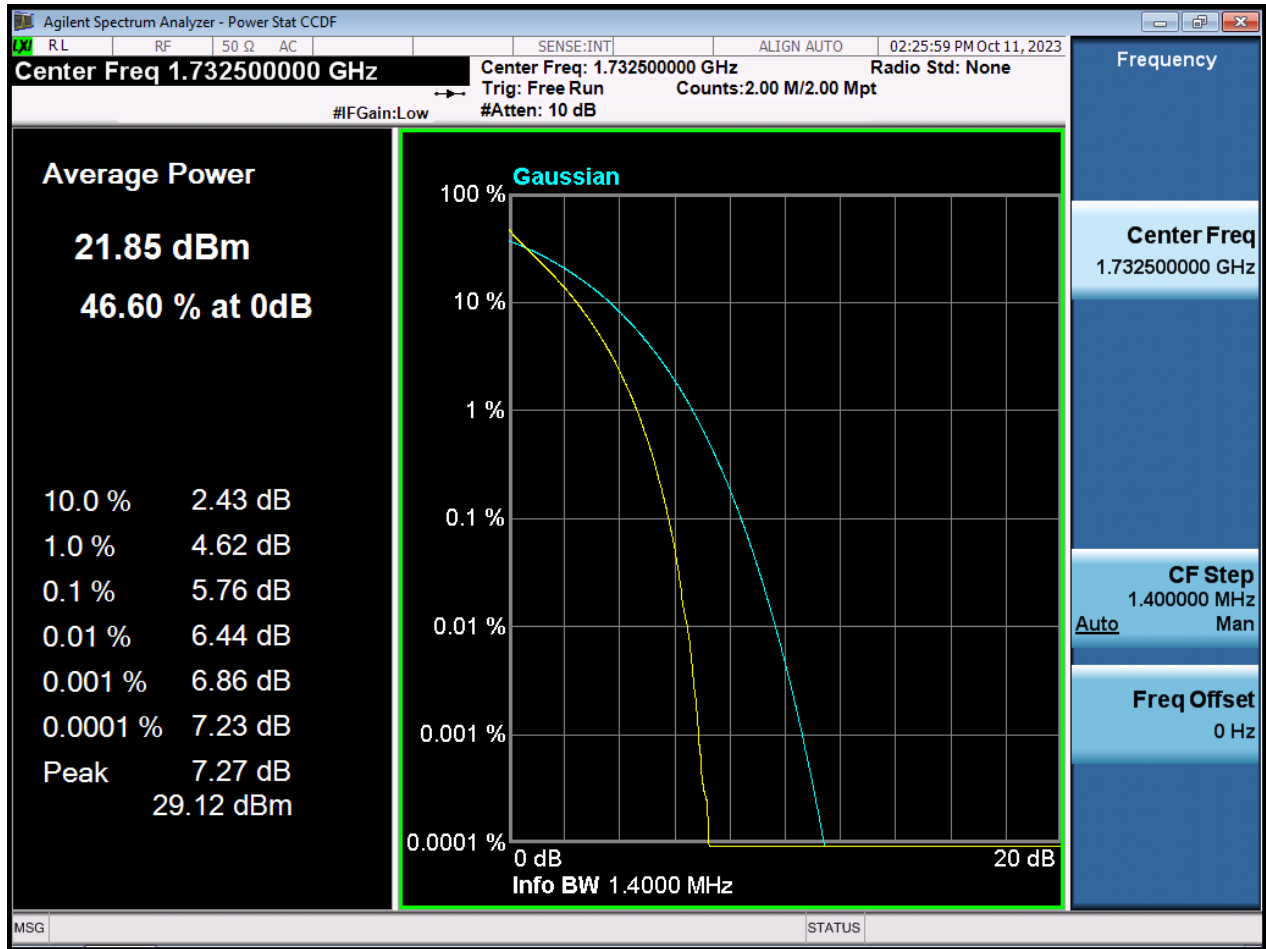
BW20 M_OBW_Middle Channel_64QAM_Full RB



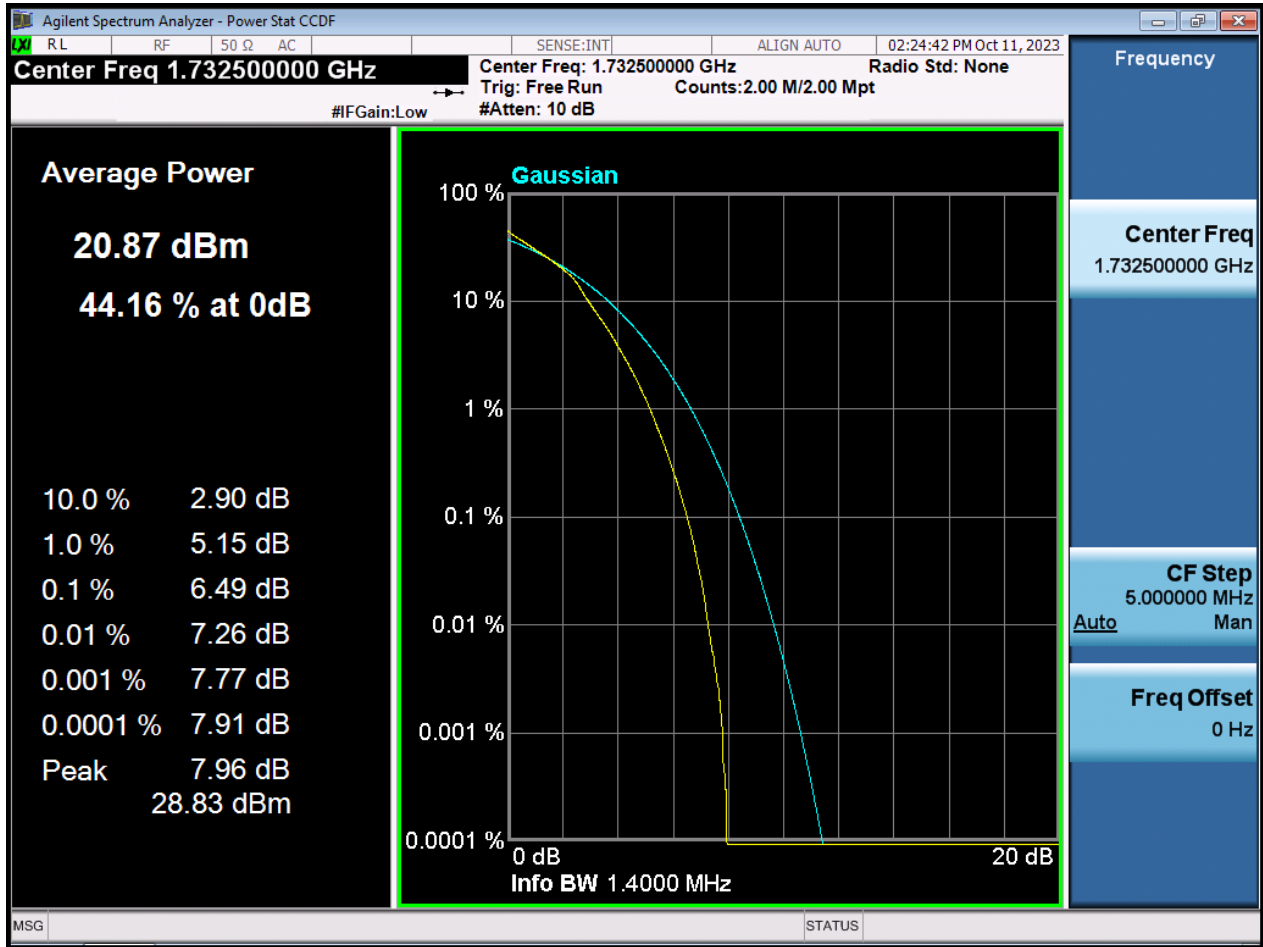
BW20 M_OBW_Middle Channel_256QAM_Full RB



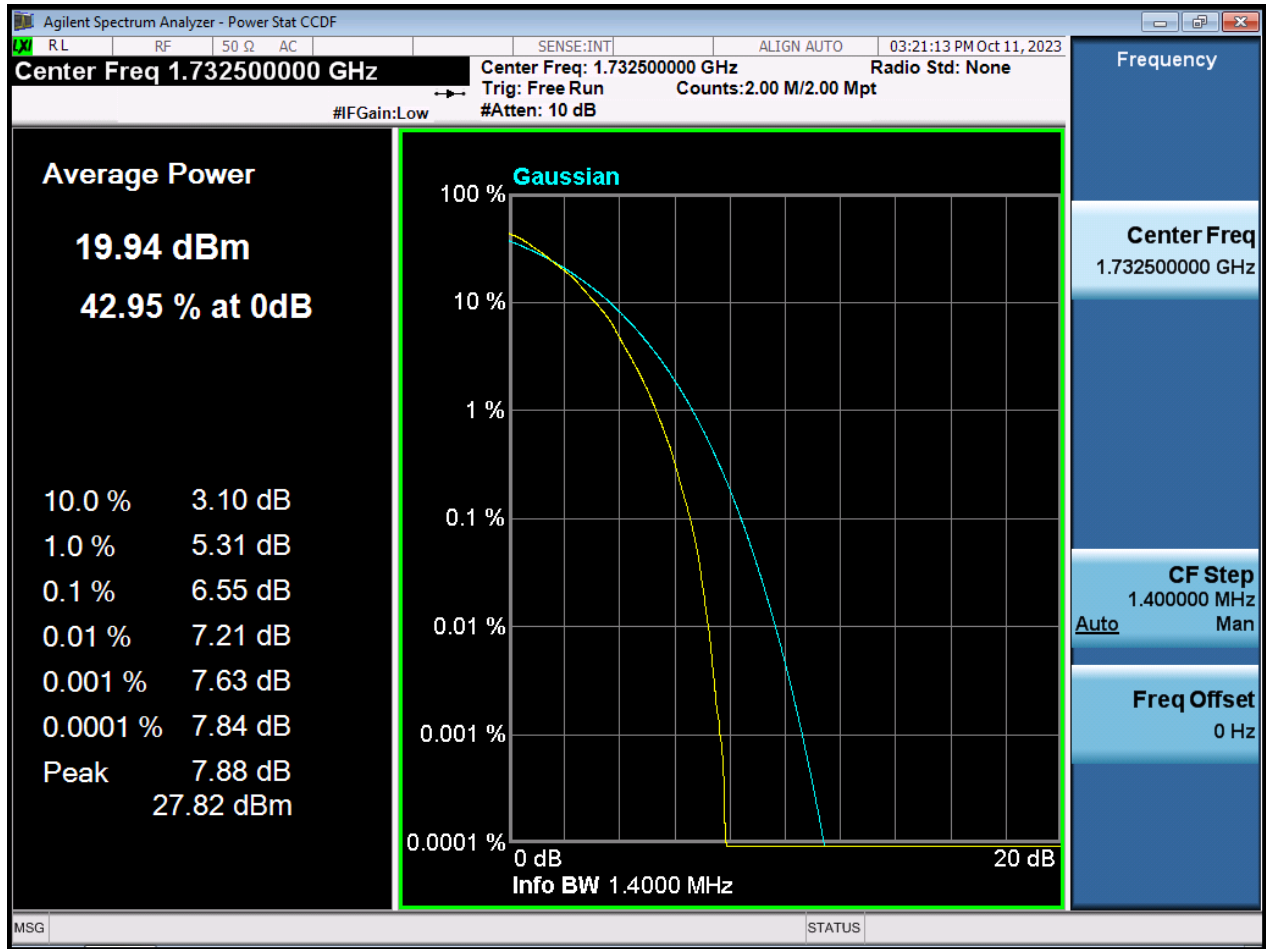
BW1.4 M_PAR_Middle Channel_QPSK_Full RB



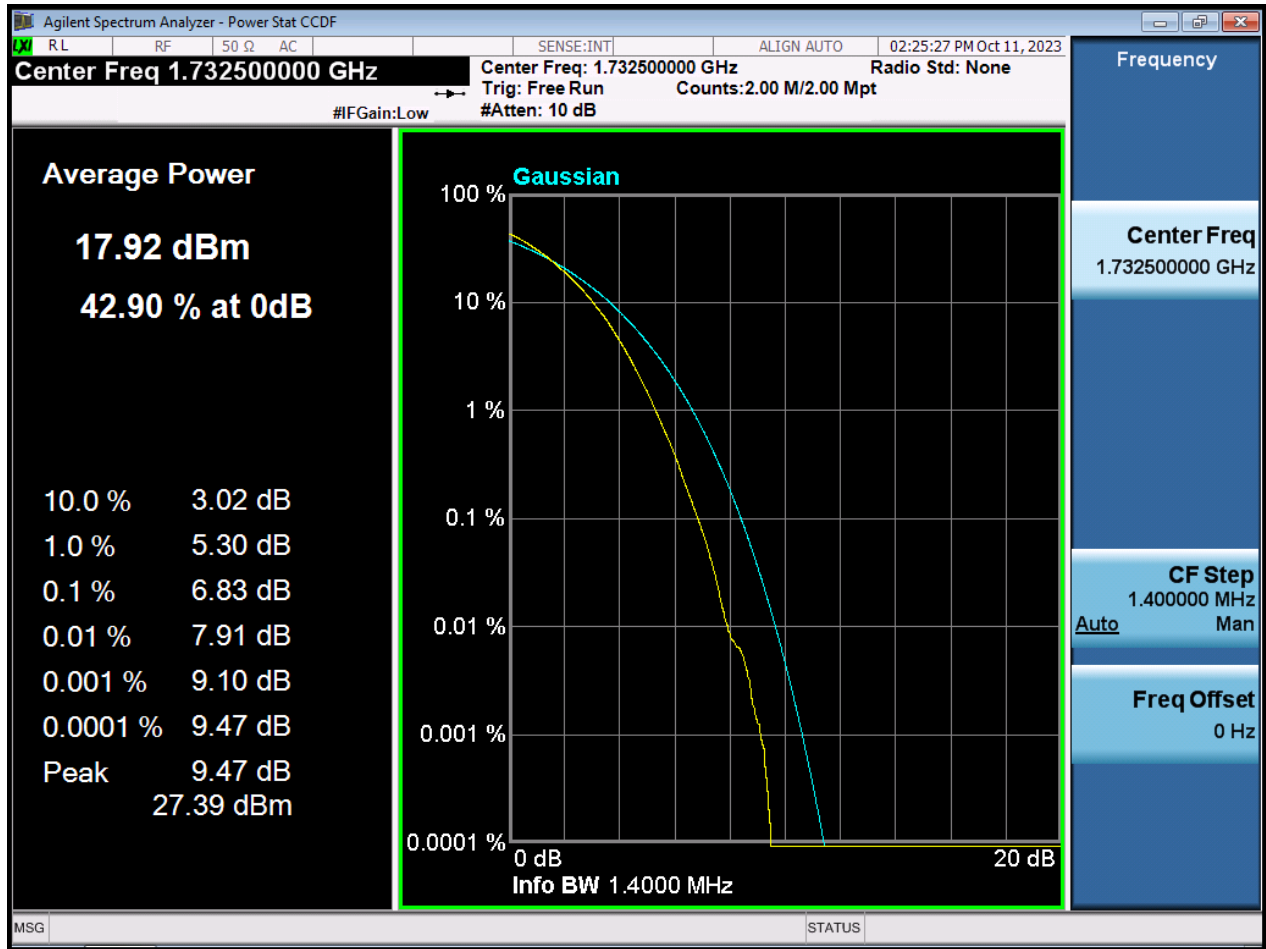
BW1.4 M_PAR_Middle Channel_16QAM_Full RB



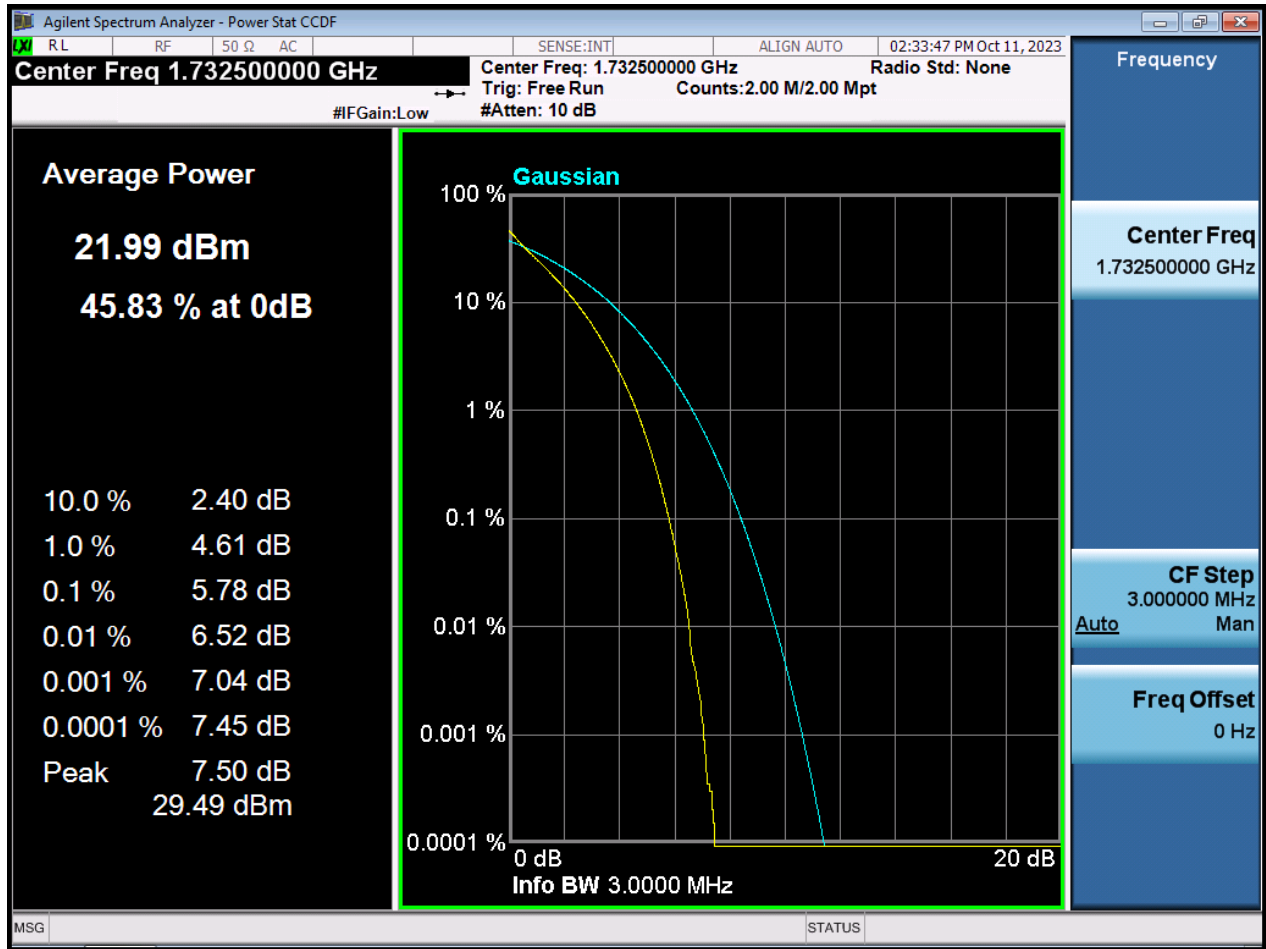
BW1.4 M_PAR_Middle Channel_64QAM_Full RB



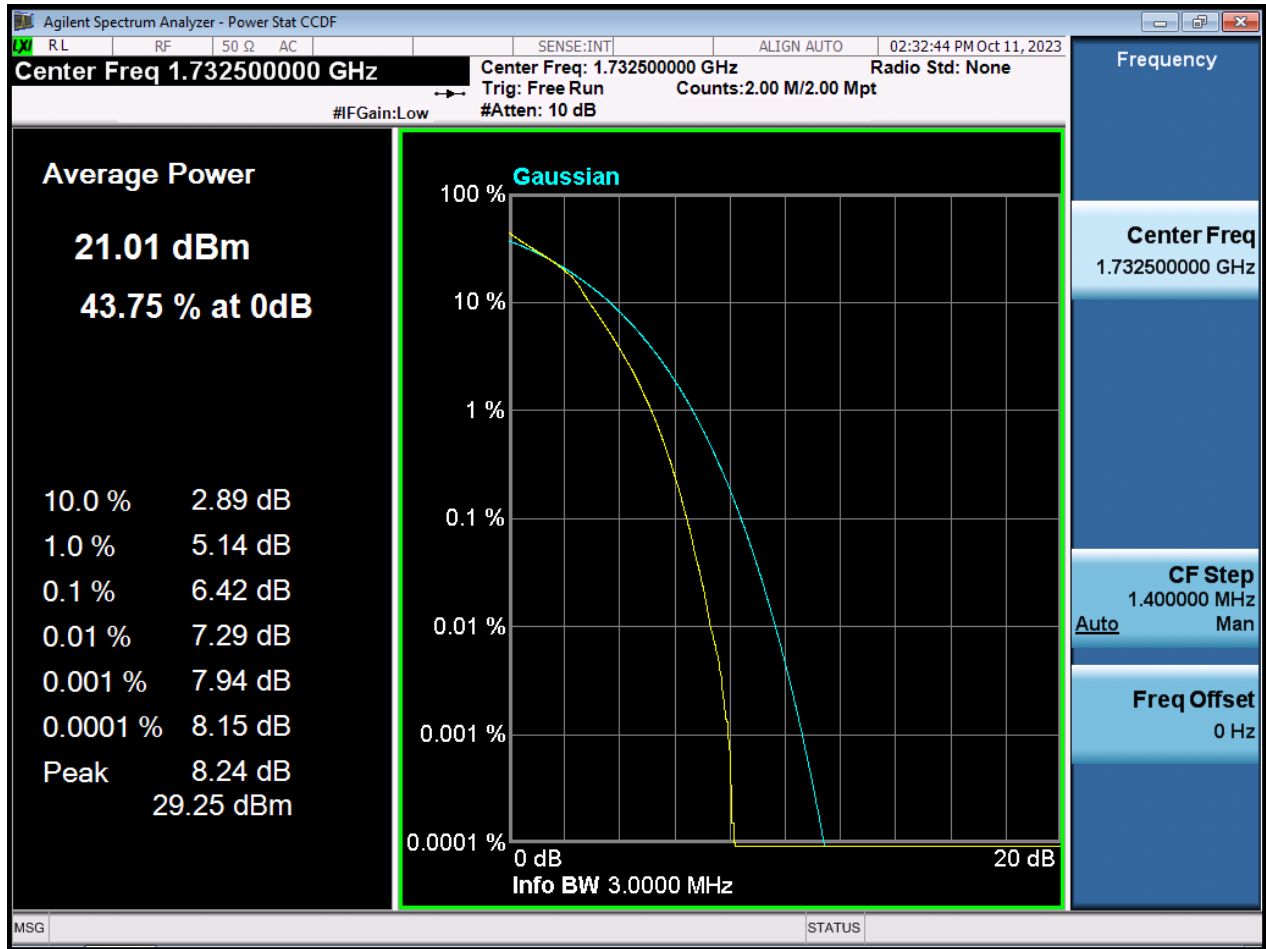
BW1.4 M_PAR_Middle Channel_256QAM_Full RB



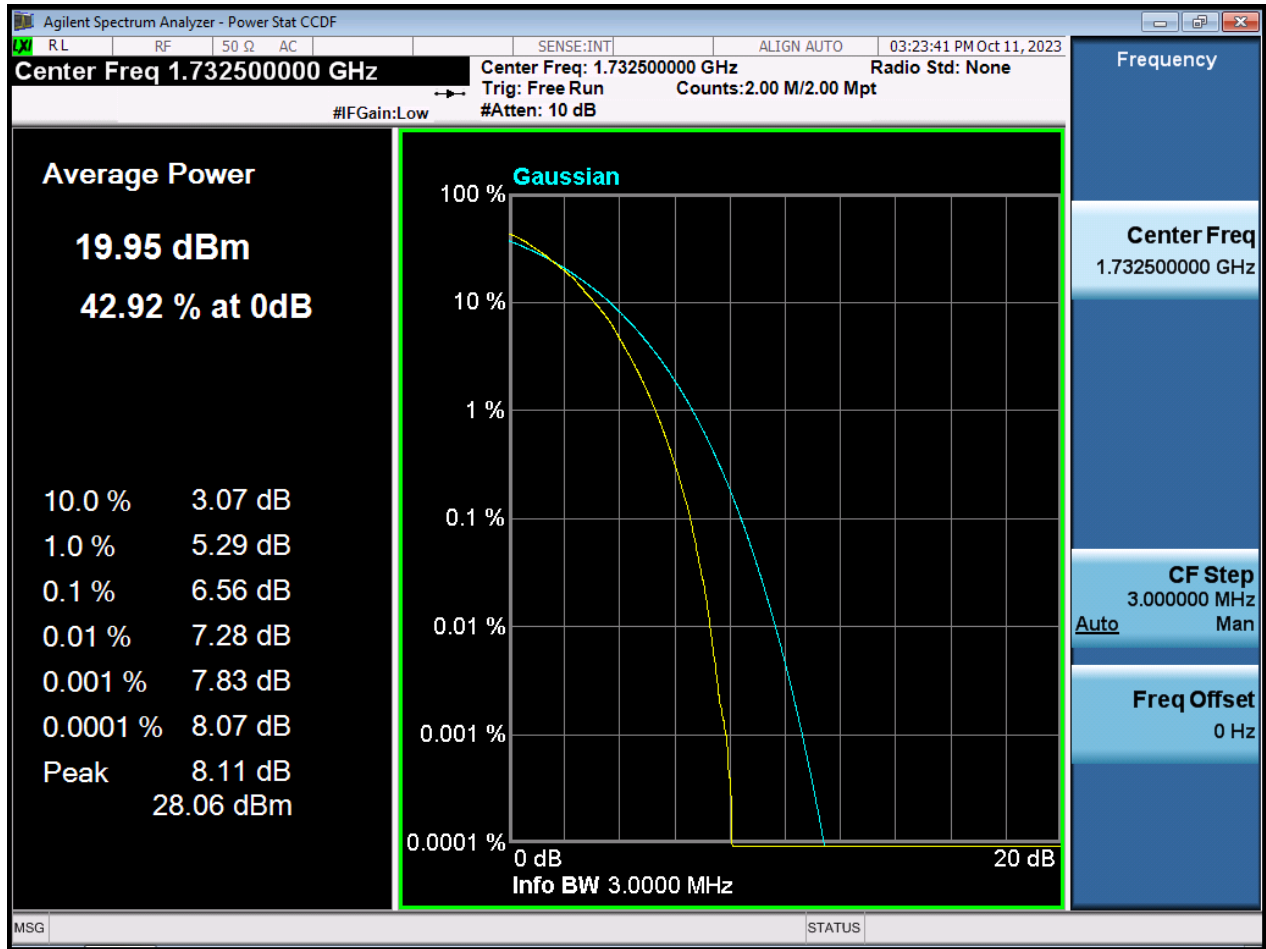
BW3 M_PAR_Middle Channel_QPSK_Full RB



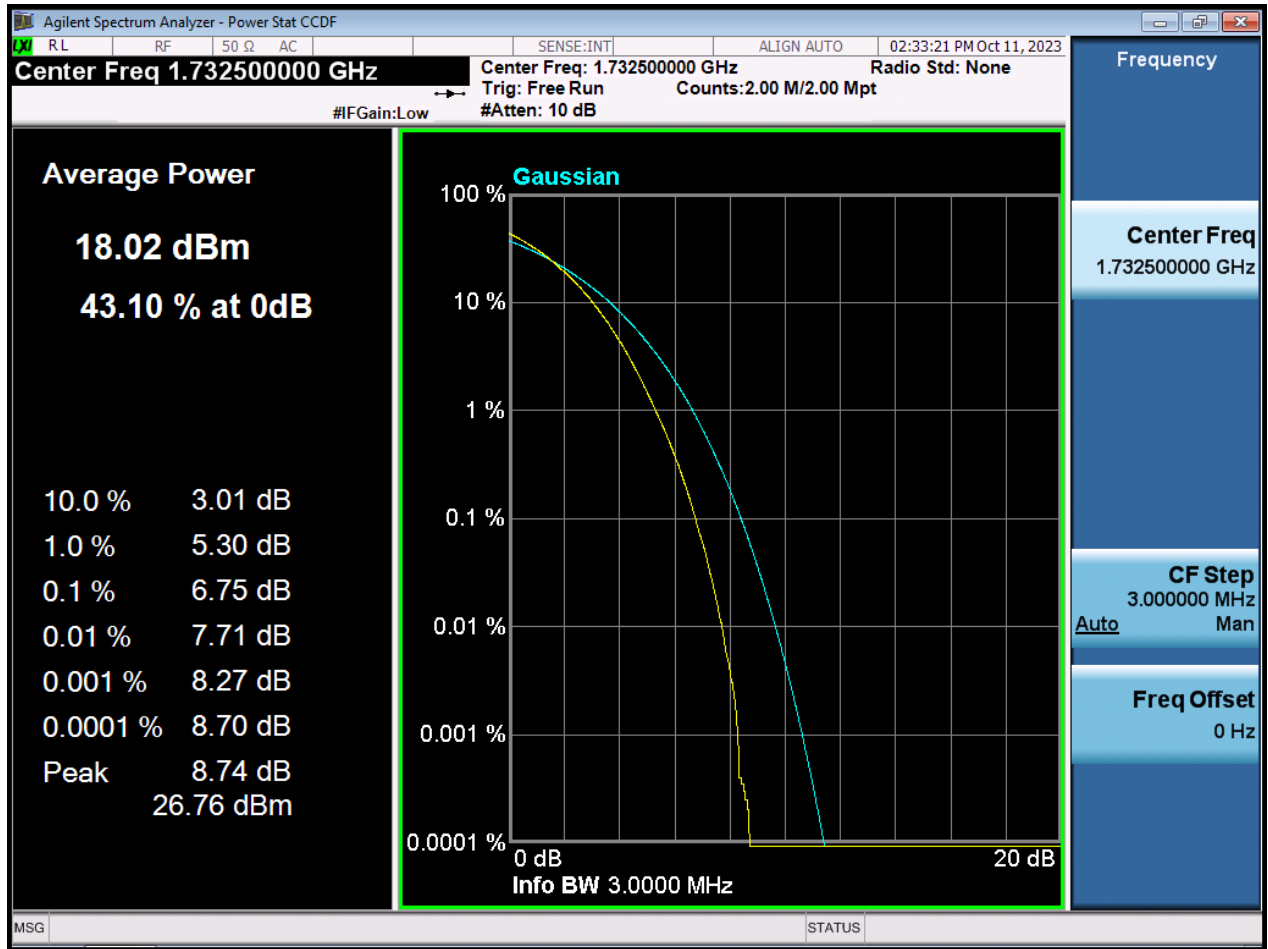
BW3 M_PAR_Middle Channel_16QAM_Full RB



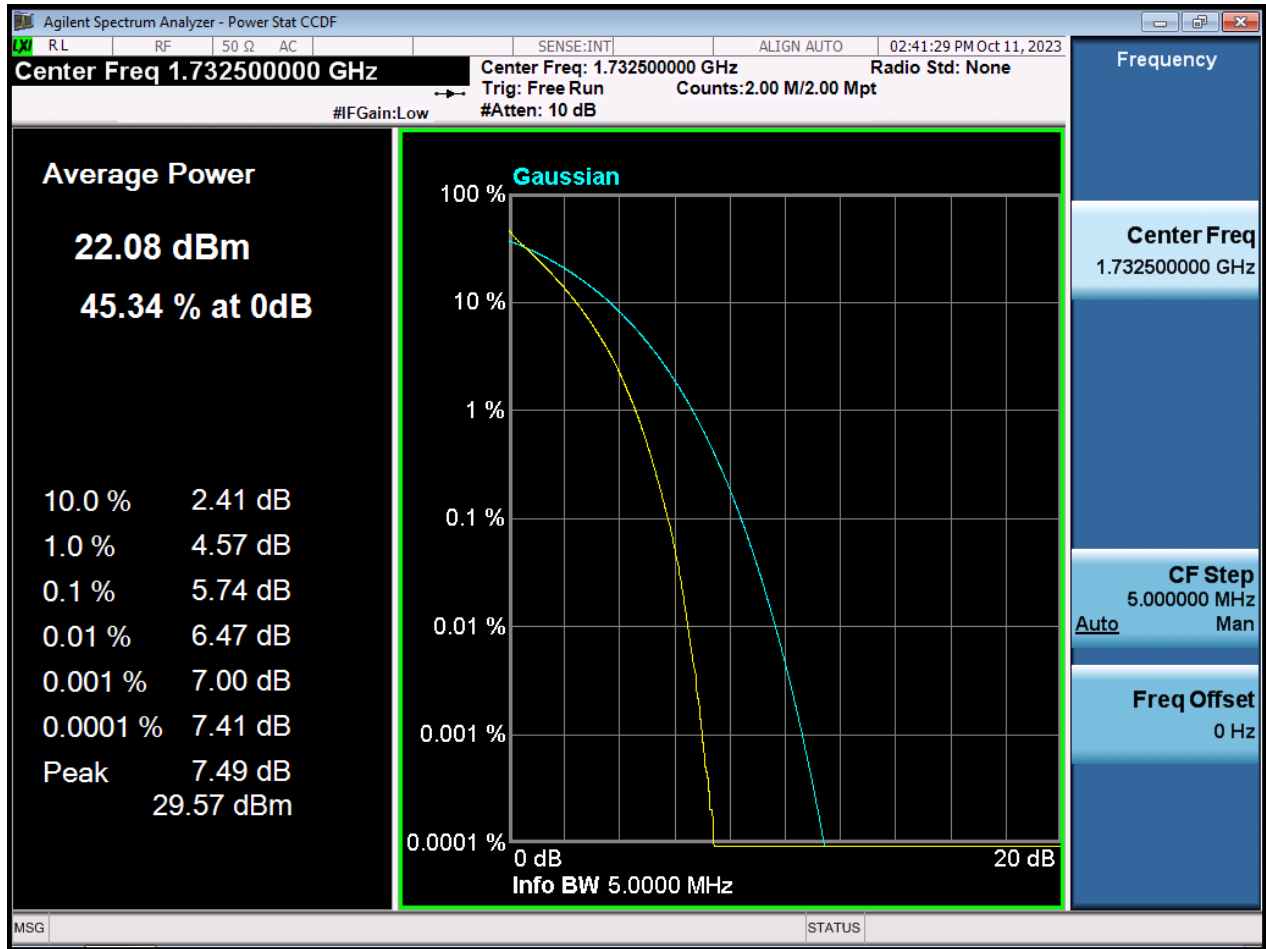
BW3 M_PAR_Middle Channel_64QAM_Full RB



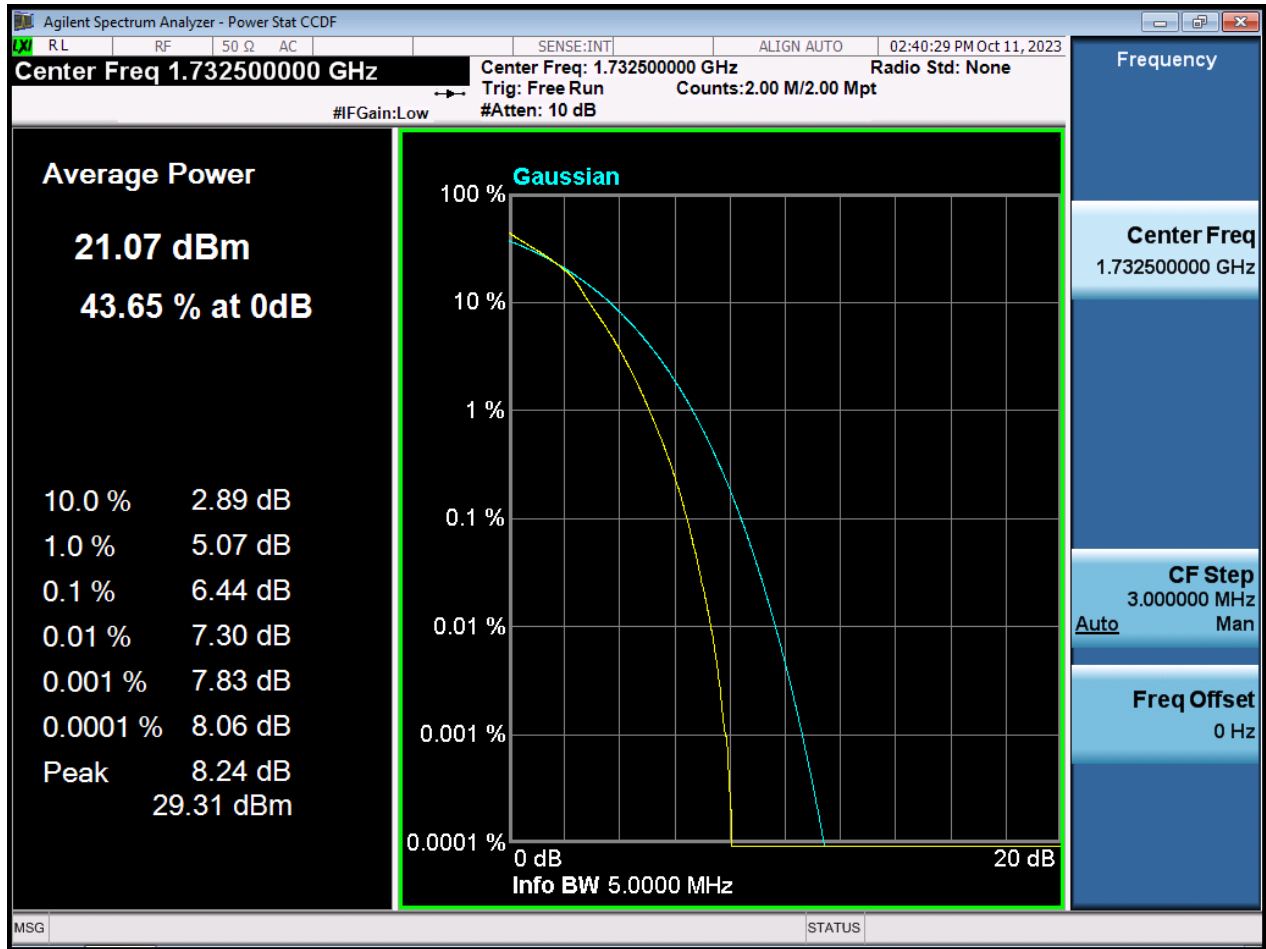
BW3 M_PAR_Middle Channel_256QAM_Full RB



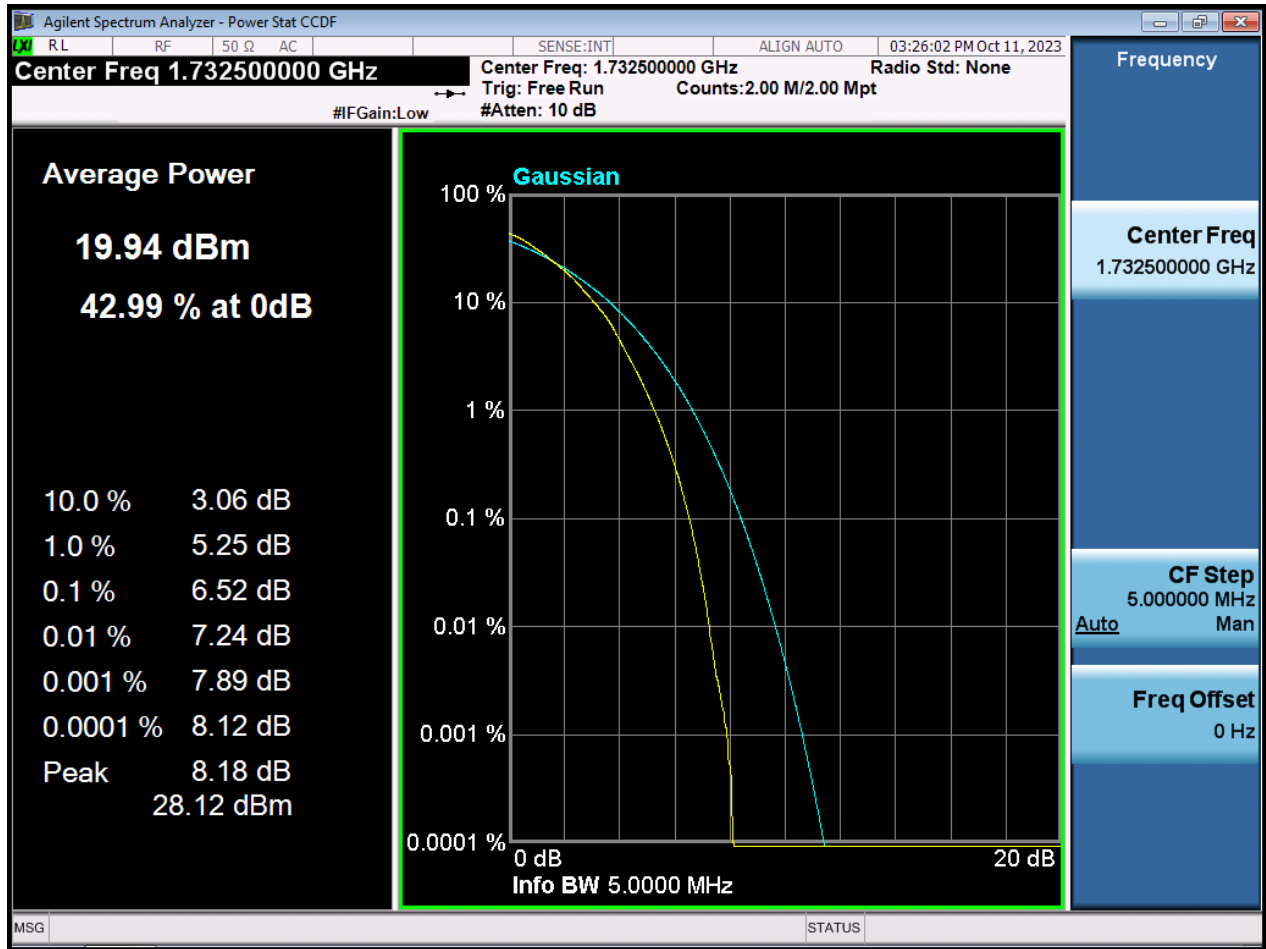
BW5 M_PAR_Middle Channel_QPSK_Full RB



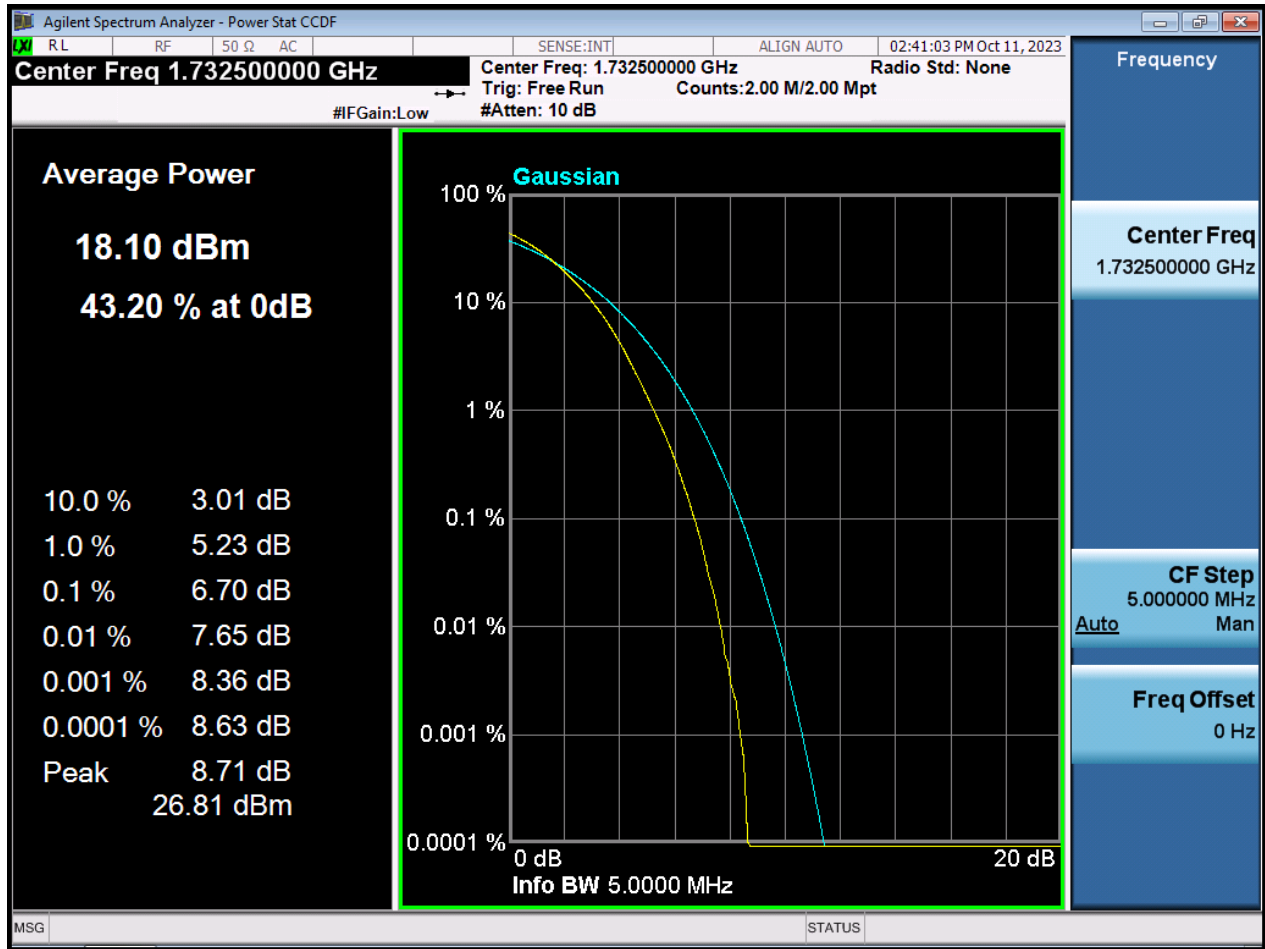
BW5 M_PAR_Middle Channel_16QAM_Full RB



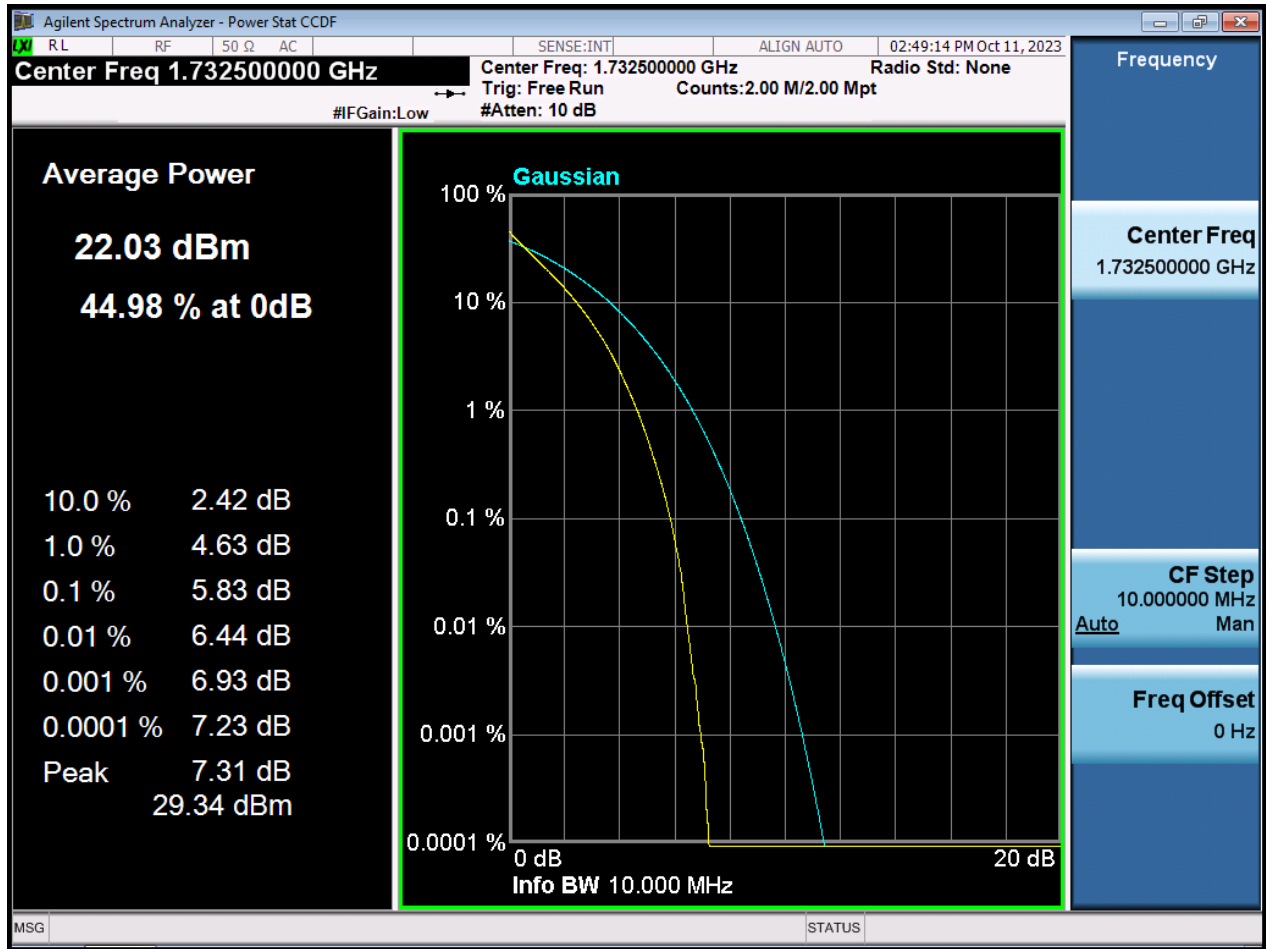
BW5 M_PAR_Middle Channel_64QAM_Full RB



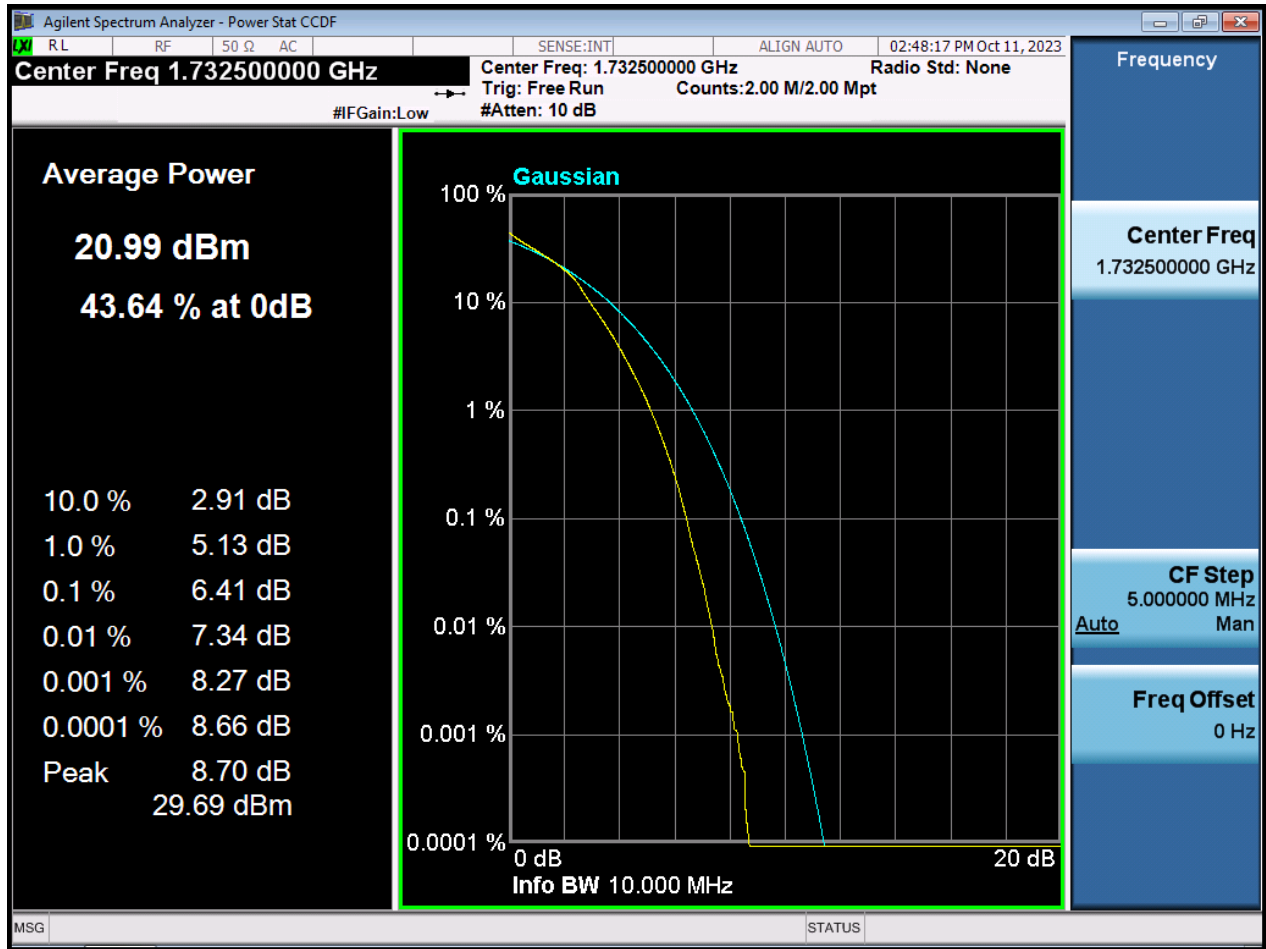
BW5 M_PAR_Middle Channel_256QAM_Full RB



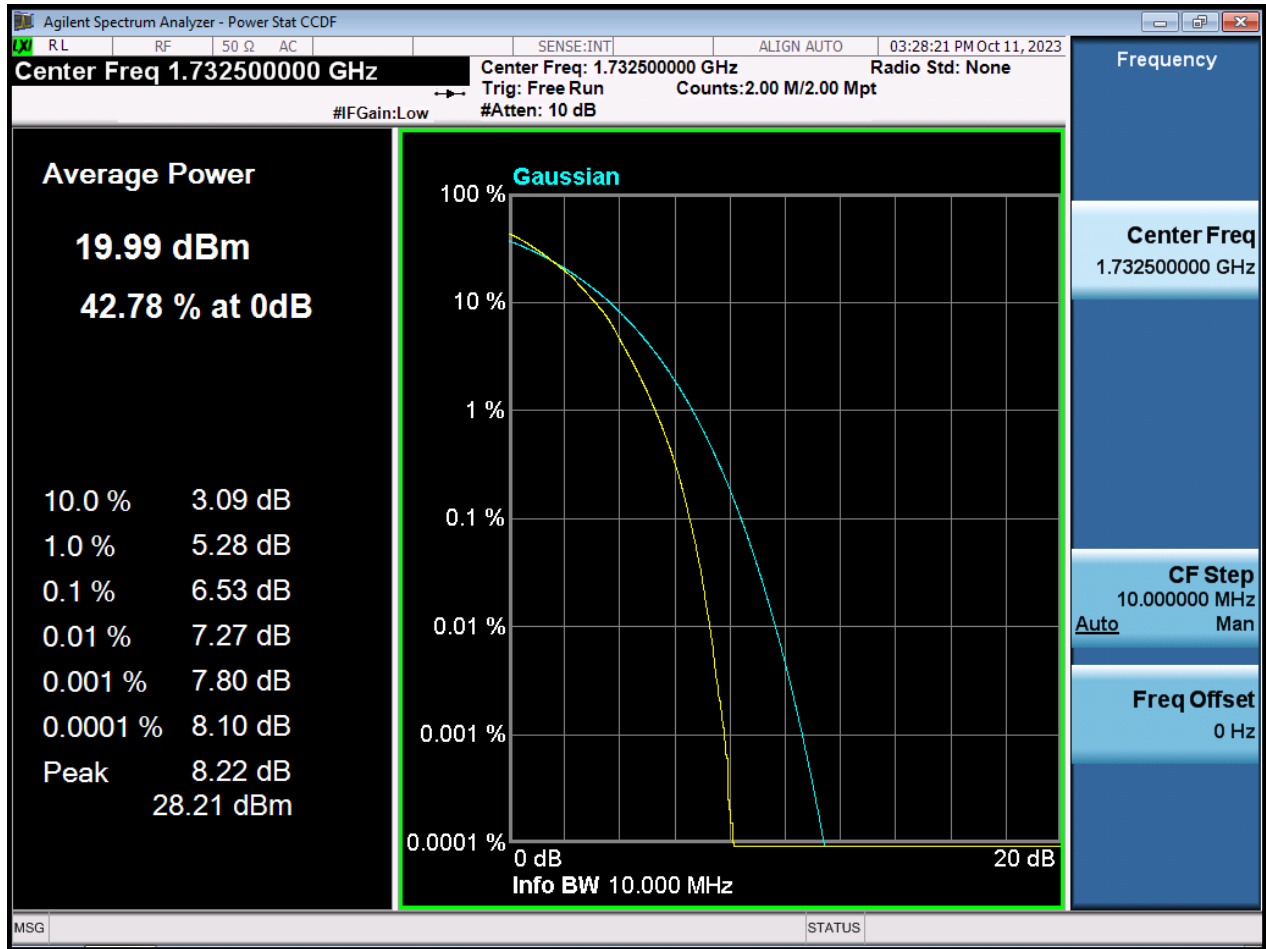
BW10 M_PAR_Middle Channelz_QPSK_Full RB



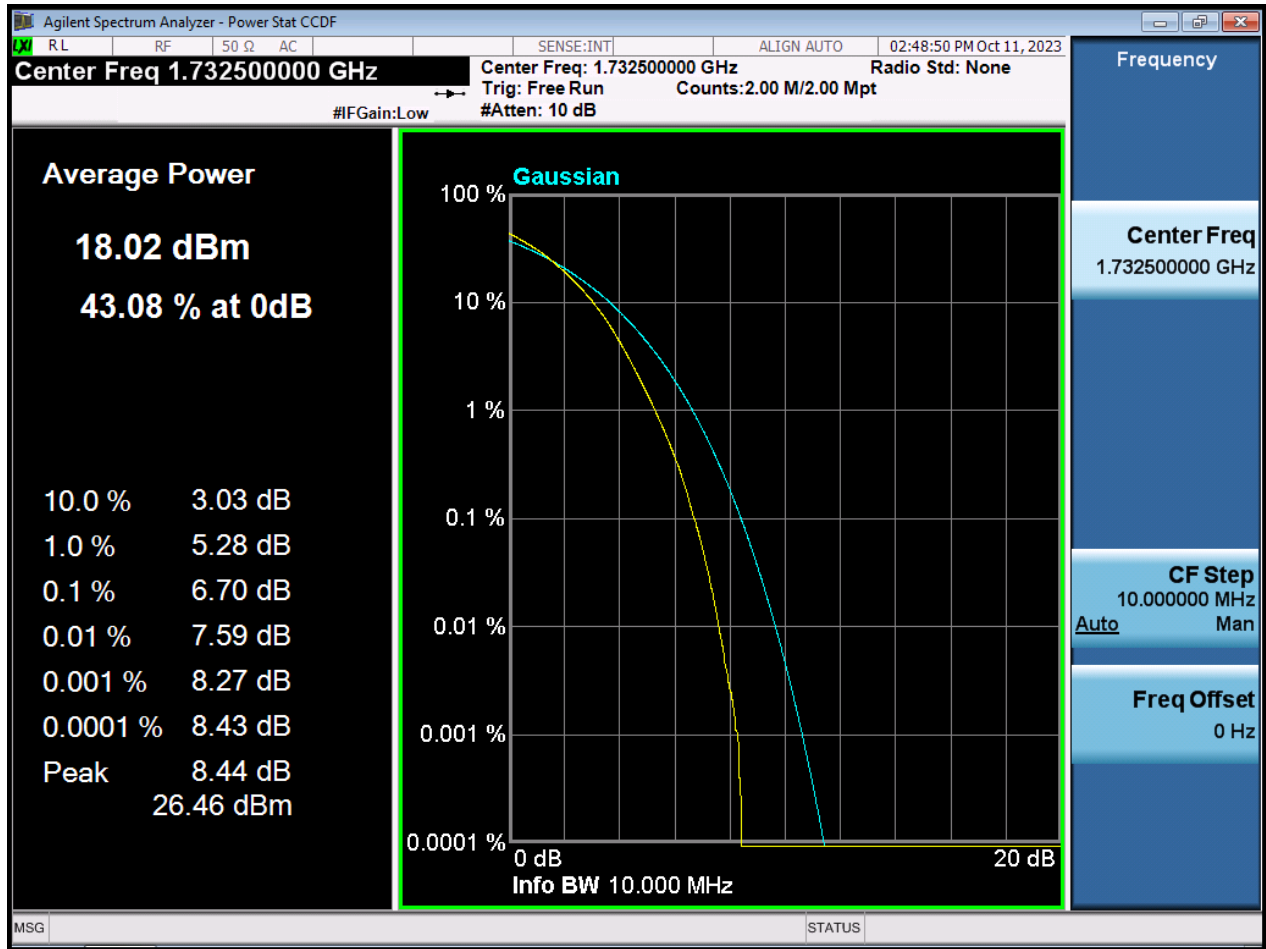
BW10 M_PAR_Middle Channel_16QAM_Full RB



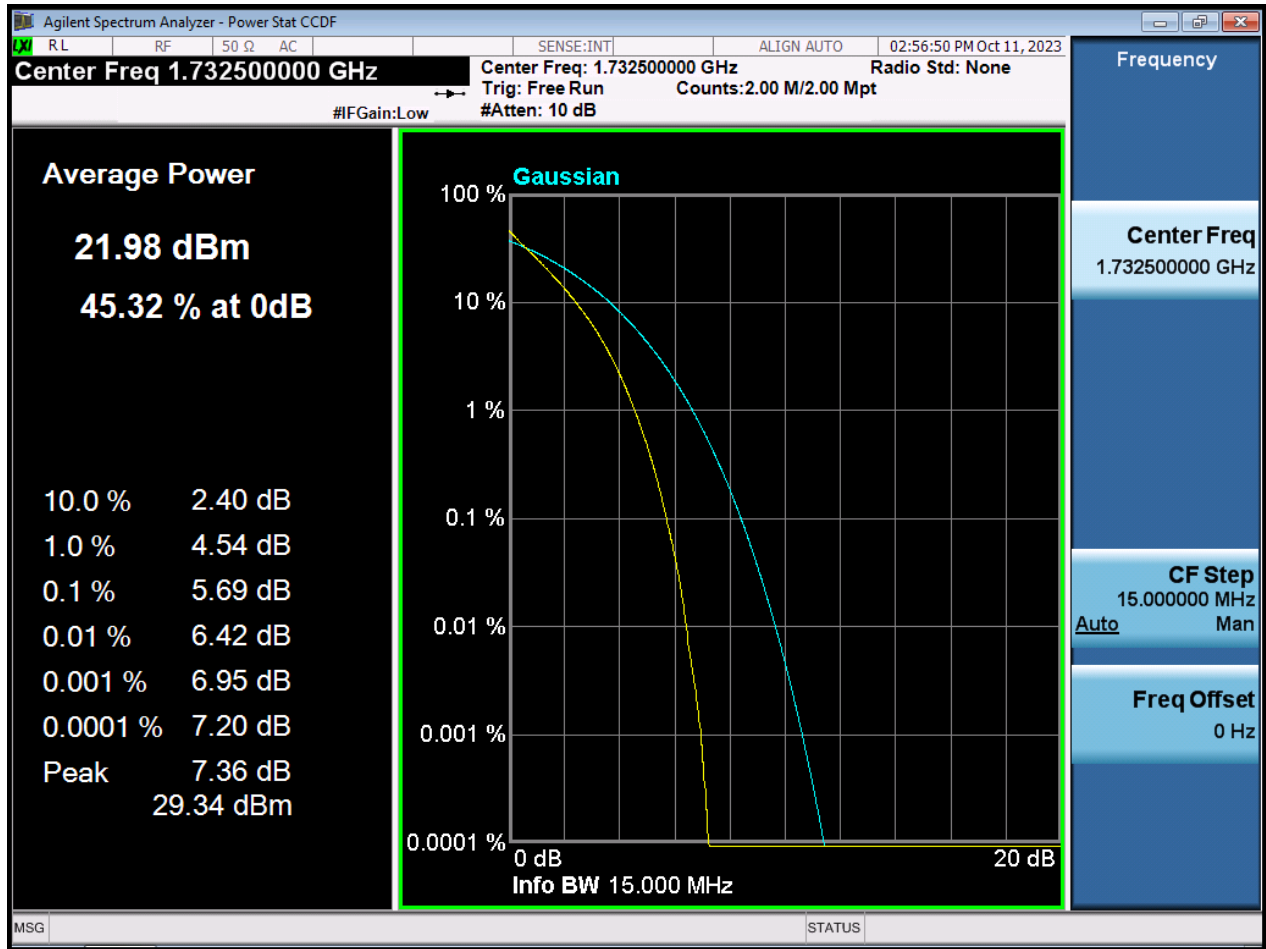
BW10 M_PAR_Middle Channel_64QAM_Full RB



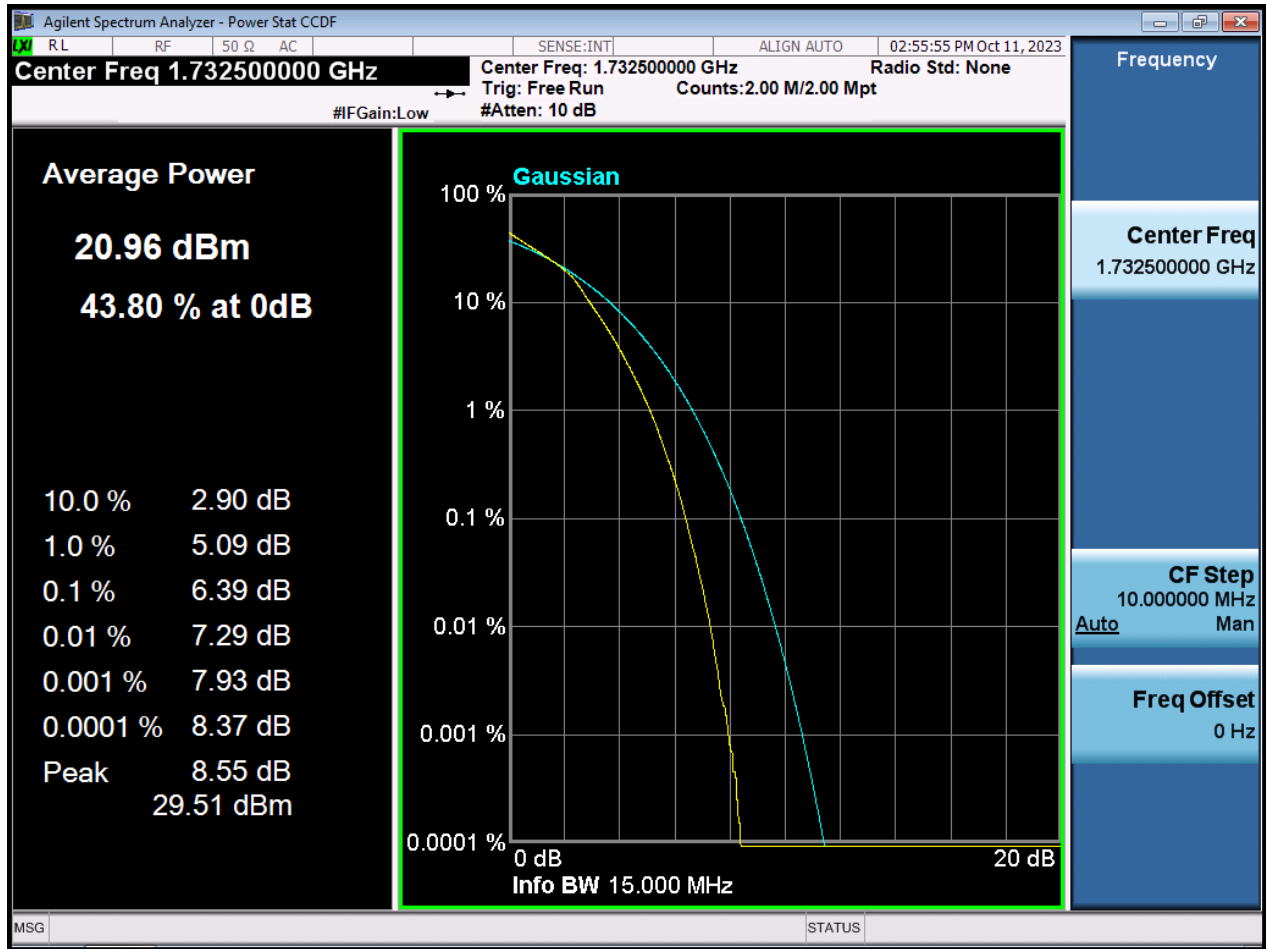
BW10 M_PAR_Middle Channel_256QAM_Full RB



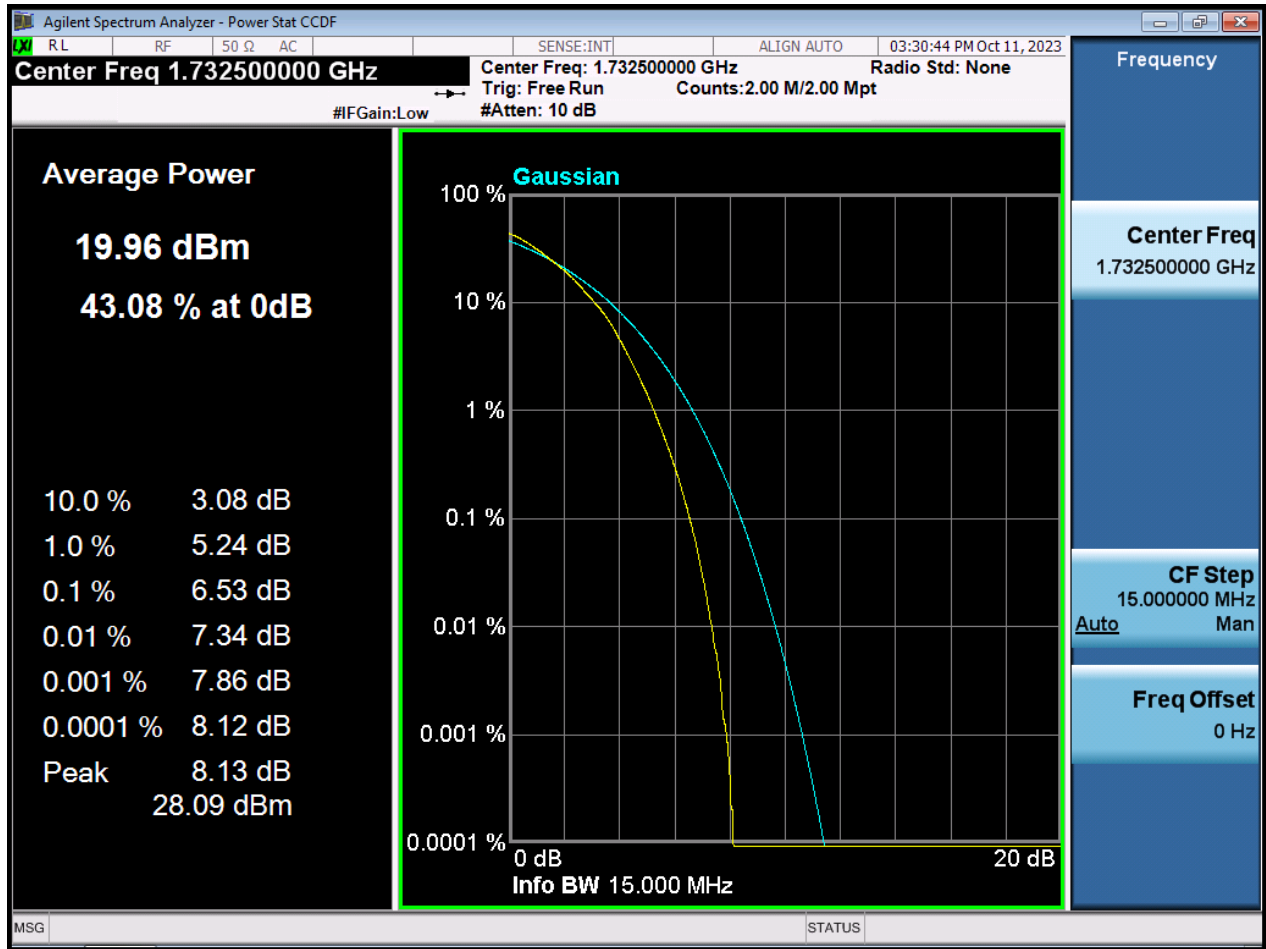
BW15 M_PAR_Middle Channel_QPSK_Full RB



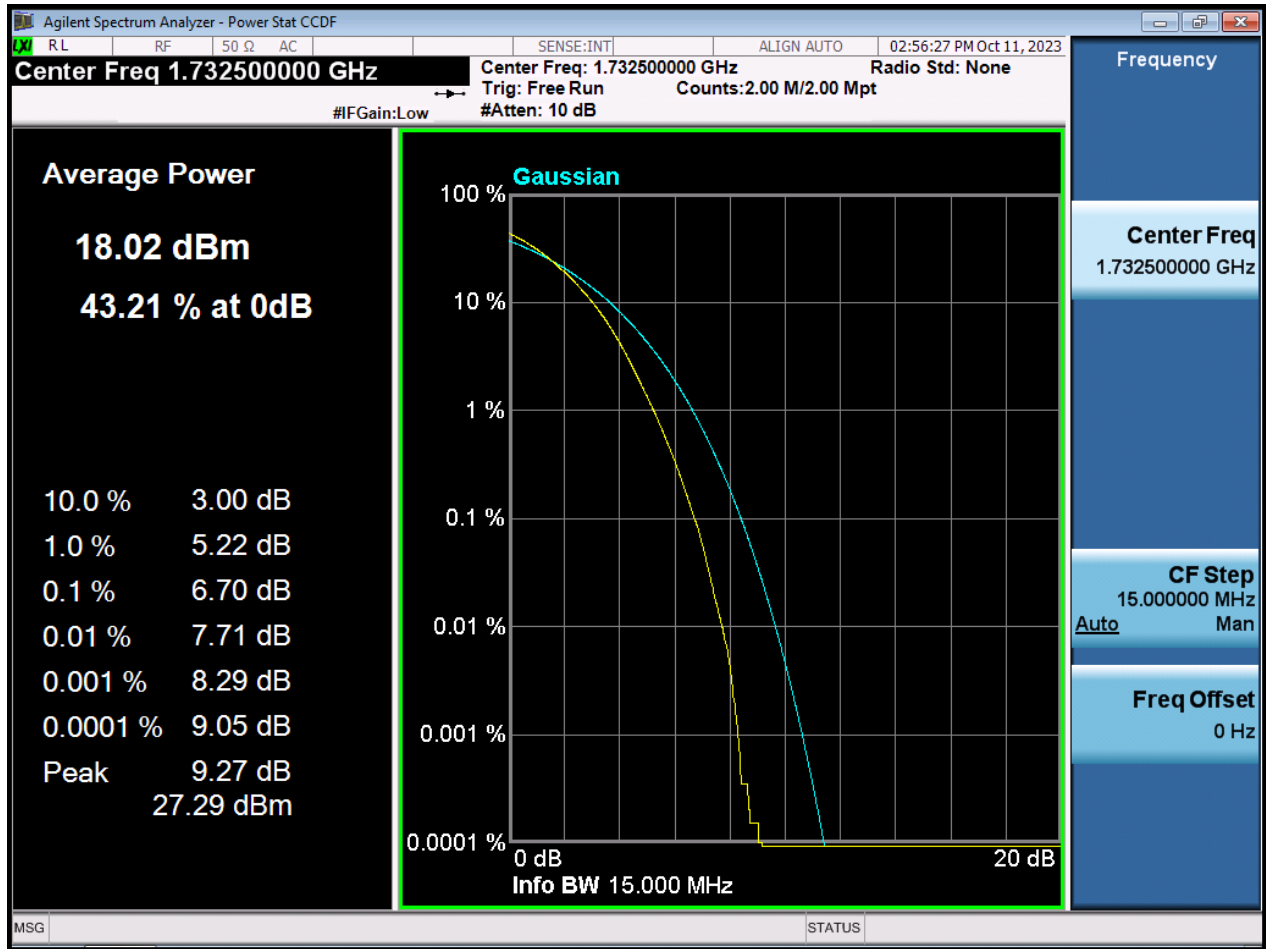
BW15 M_PAR_Middle Channel_16QAM_Full RB



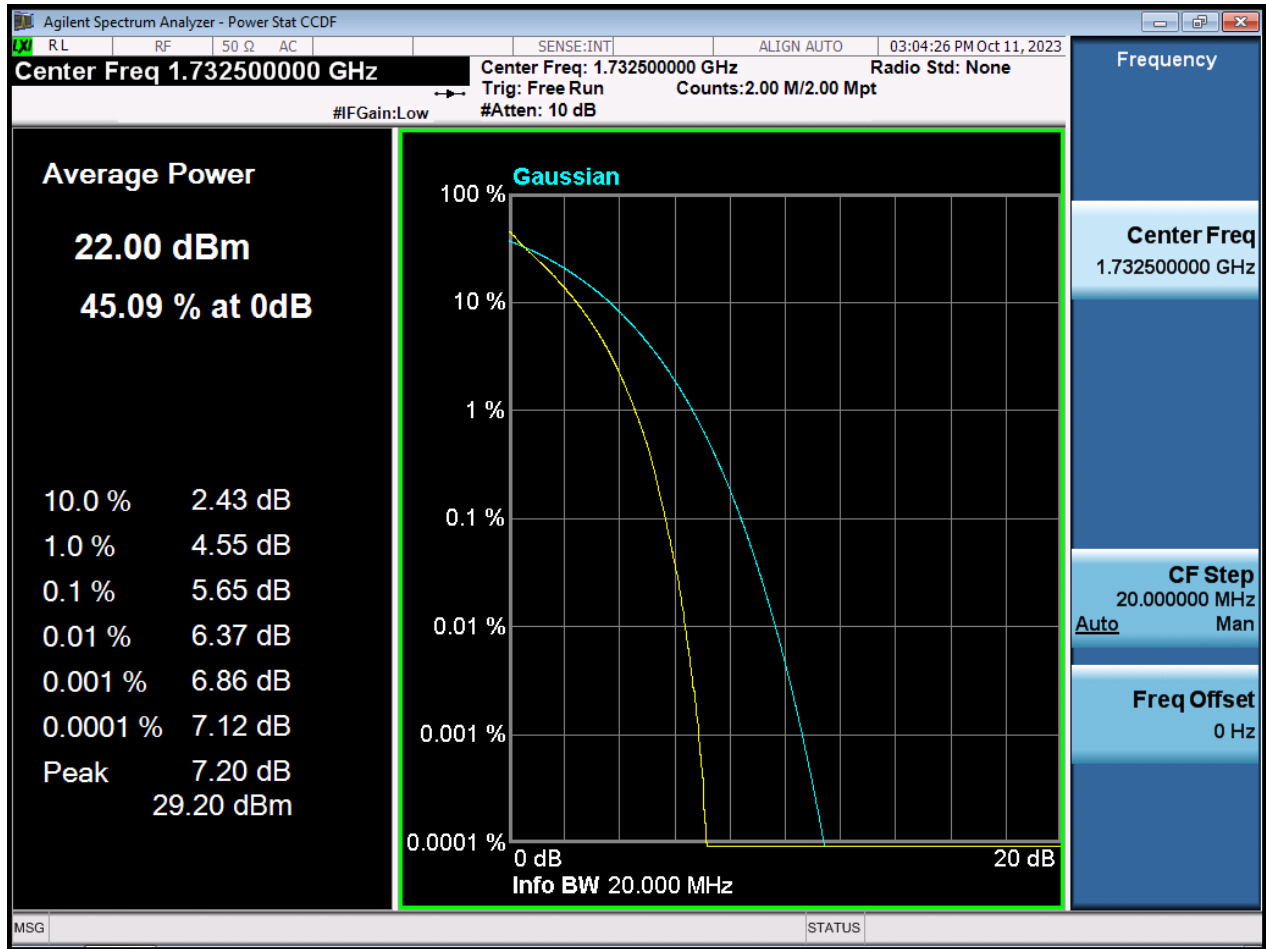
BW15 M_PAR_Middle Channel_64QAM_Full RB



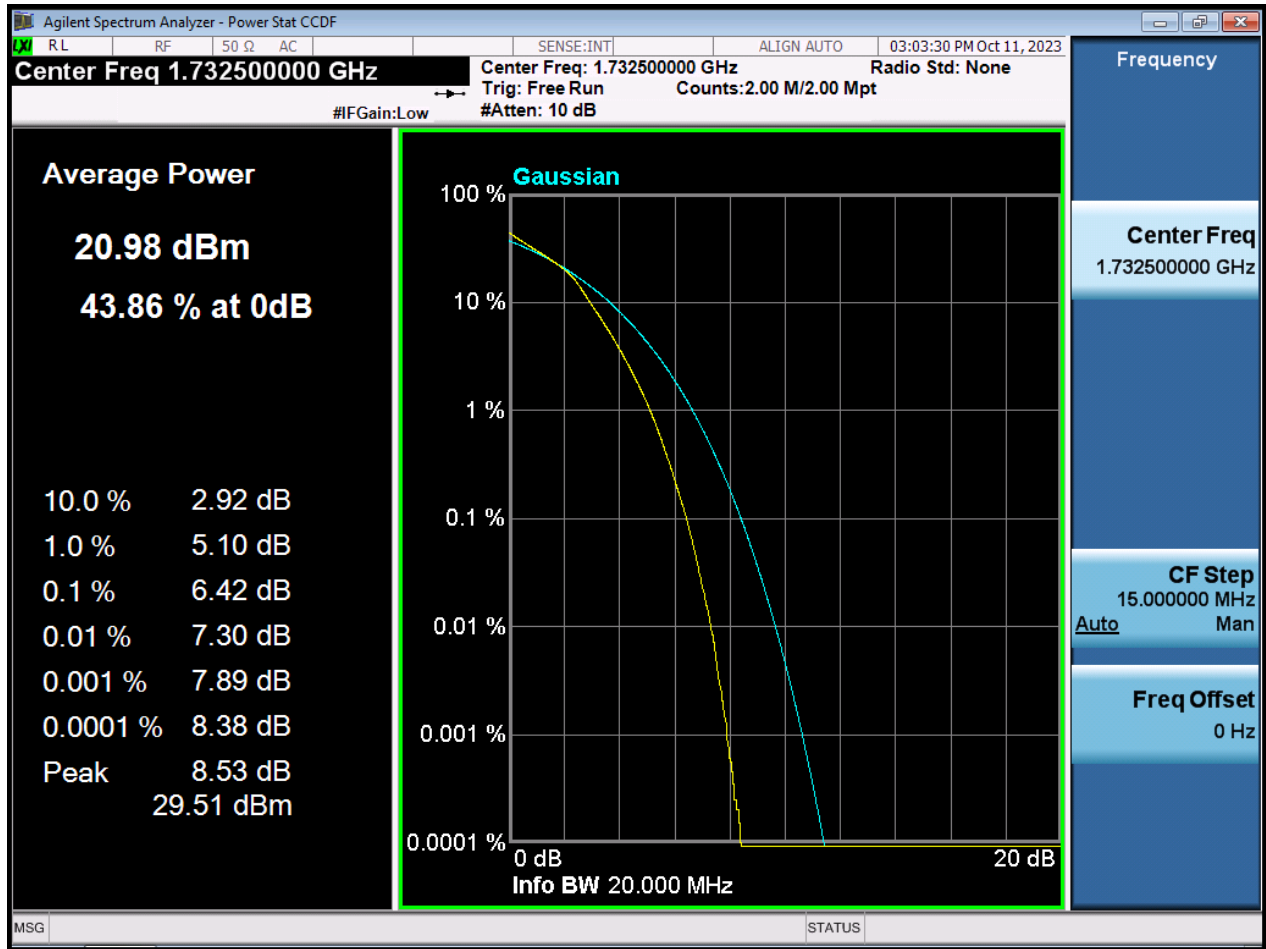
BW15 M_PAR_Middle Channel_256QAM_Full RB



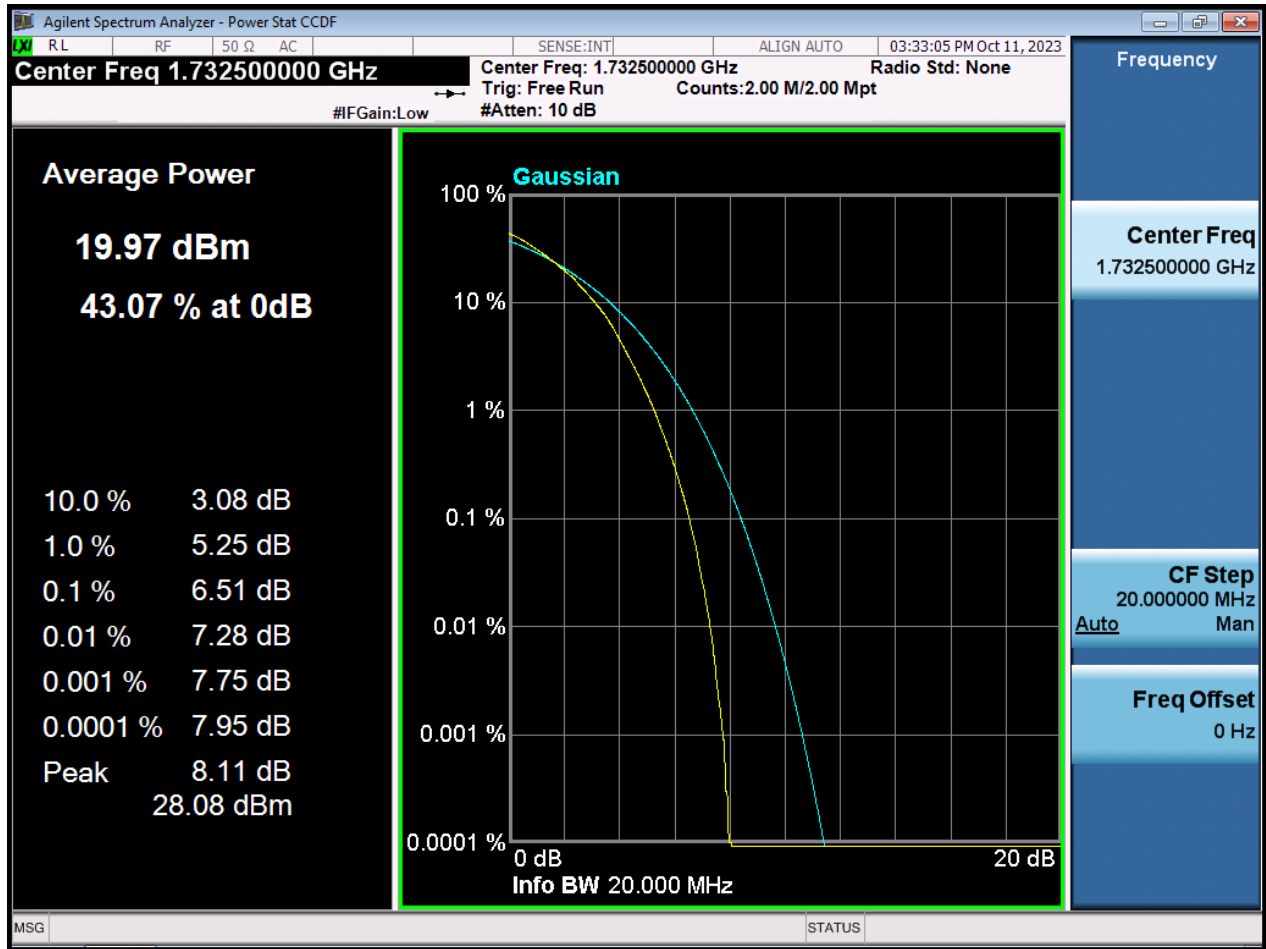
BW20 M_PAR_Middle Channel_QPSK_Full RB



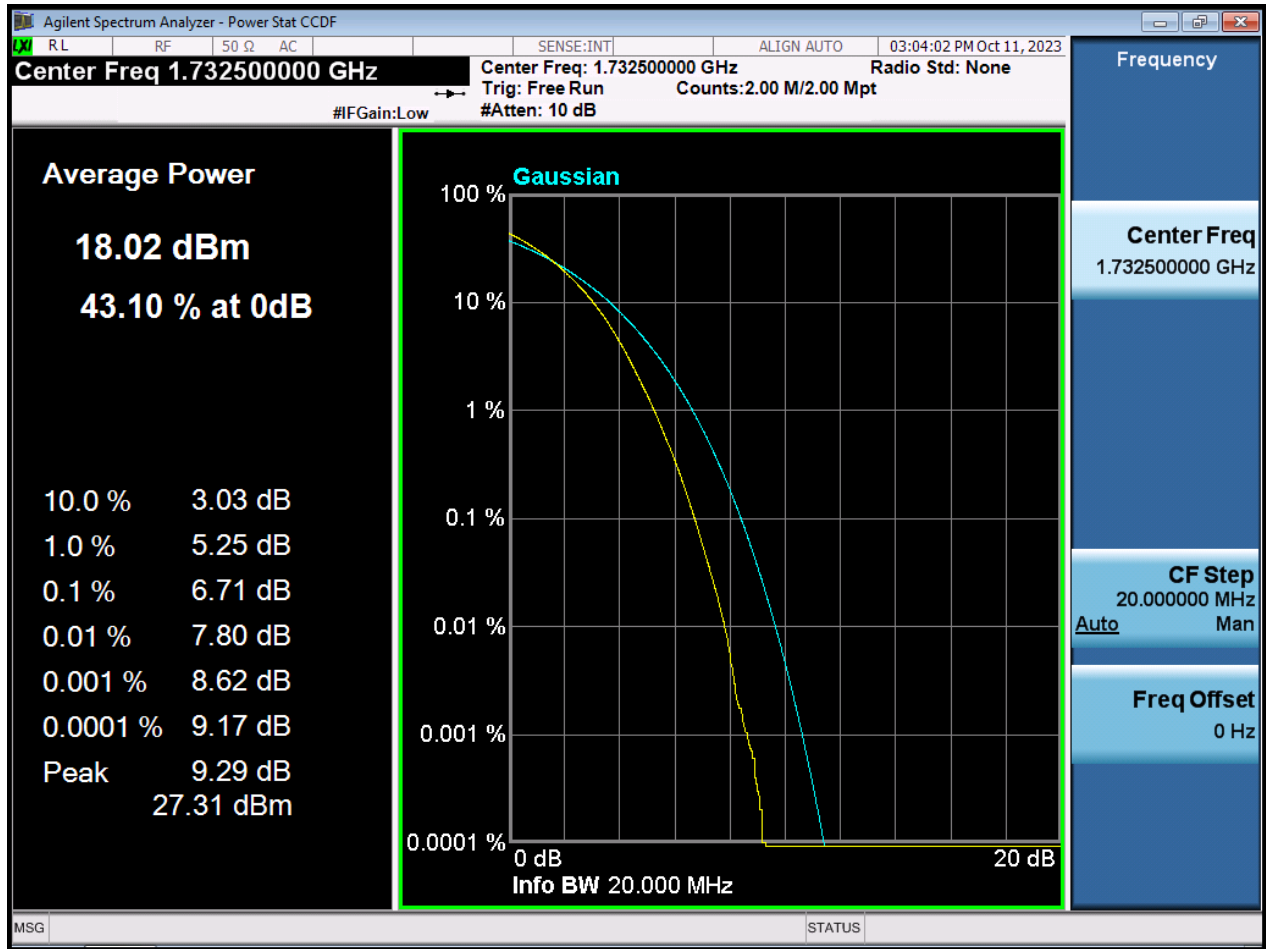
BW20 M_PAR_Middle Channel_16QAM_Full RB



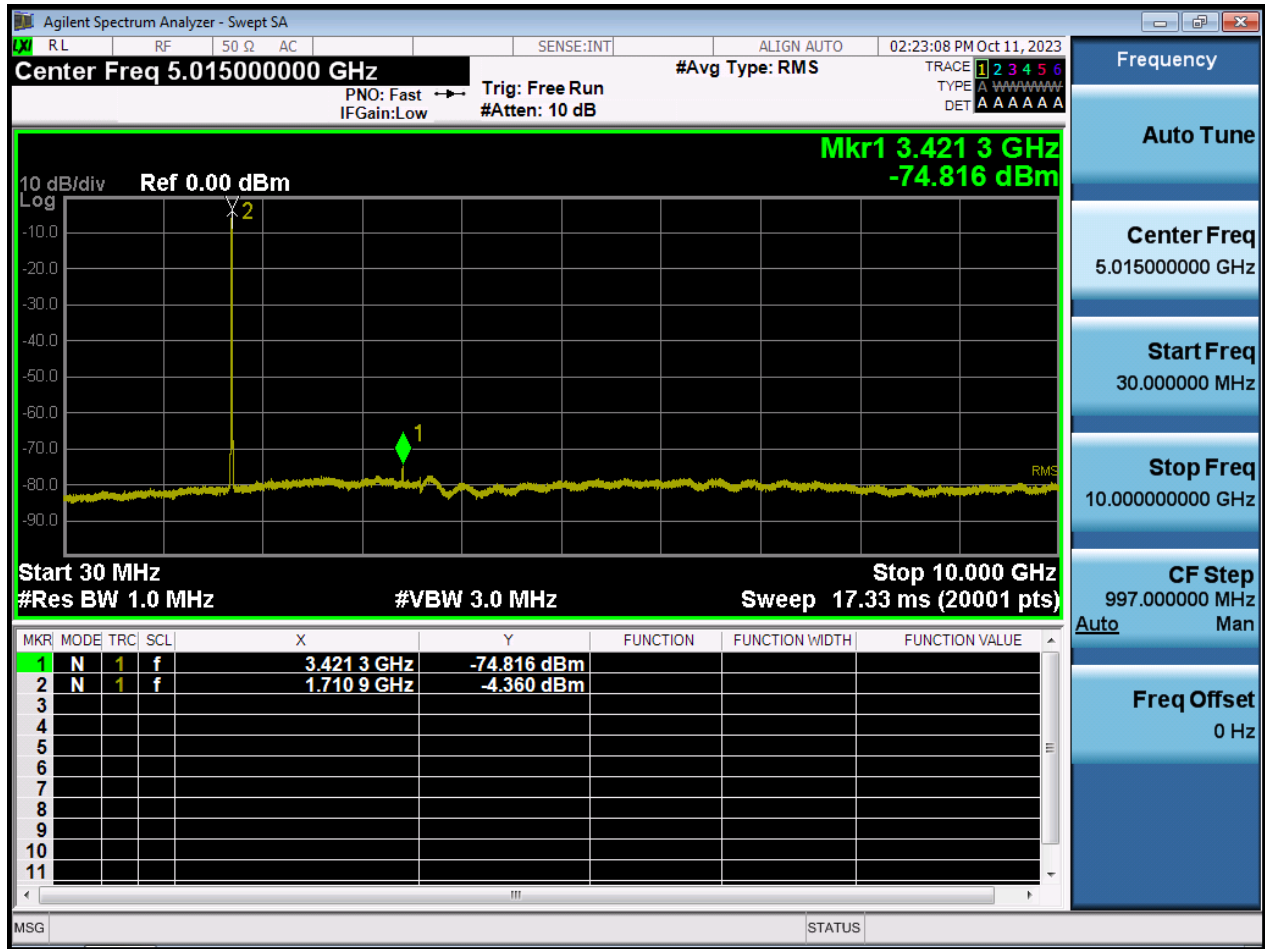
BW20 M_PAR_Middle Channel_64QAM_Full RB



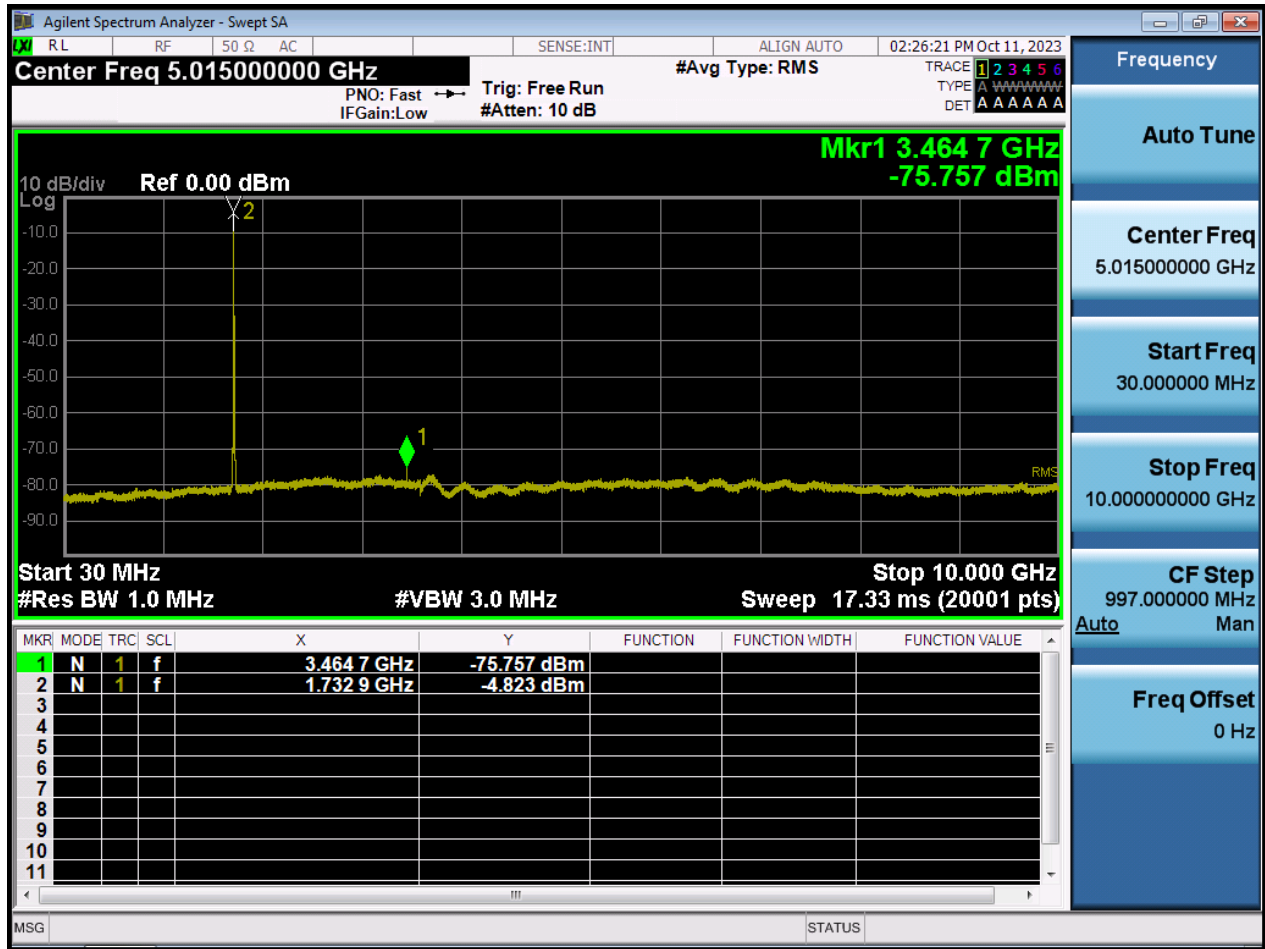
BW20 M_PAR_Middle Channel_256QAM_Full RB



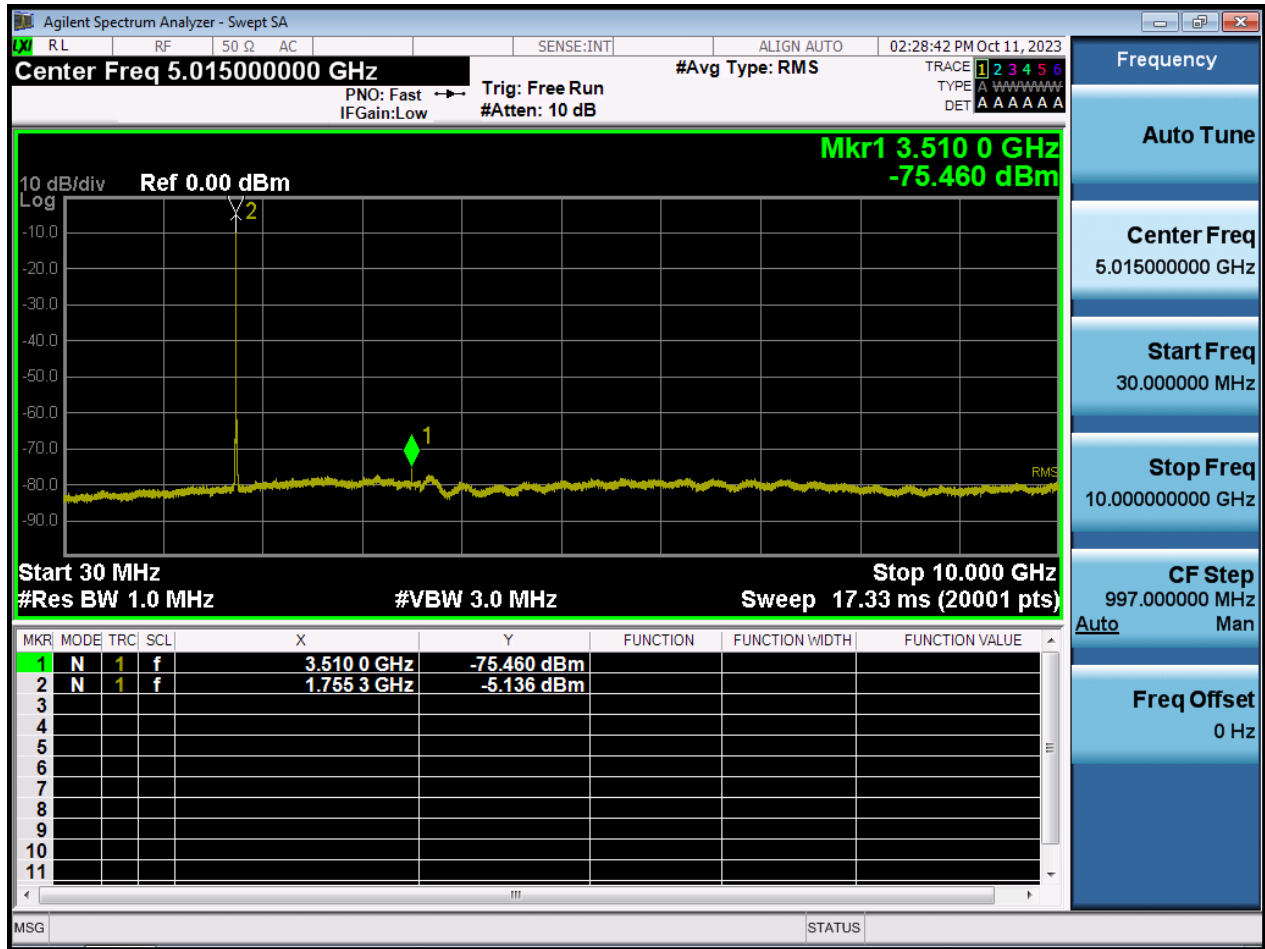
BW1.4 M_CSE(30 M-10 G)_Lowest Channel_QPSK_1RB



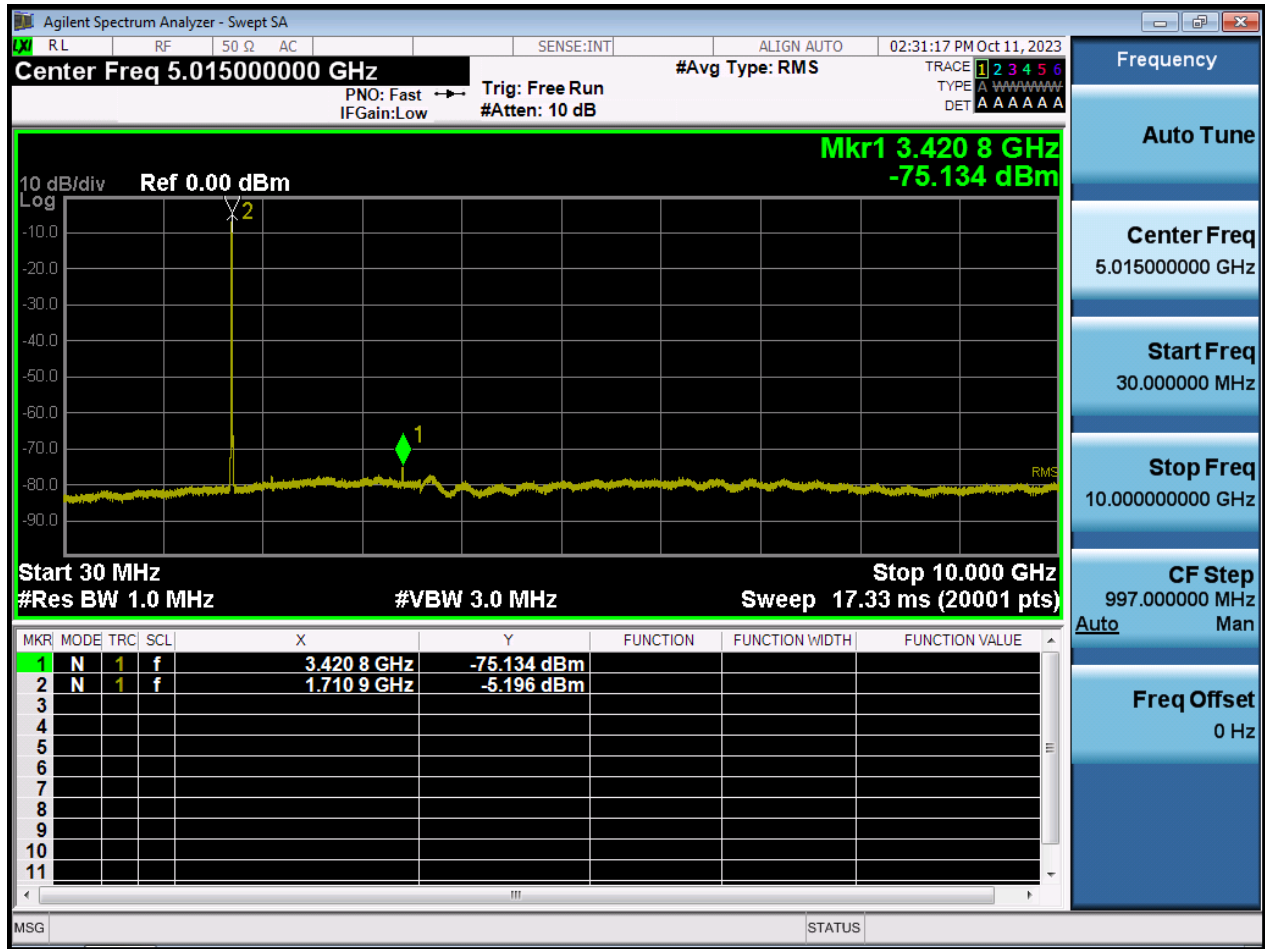
BW1.4 M_CSE(30 M-10 G)_Middle Channel_QPSK_1RB



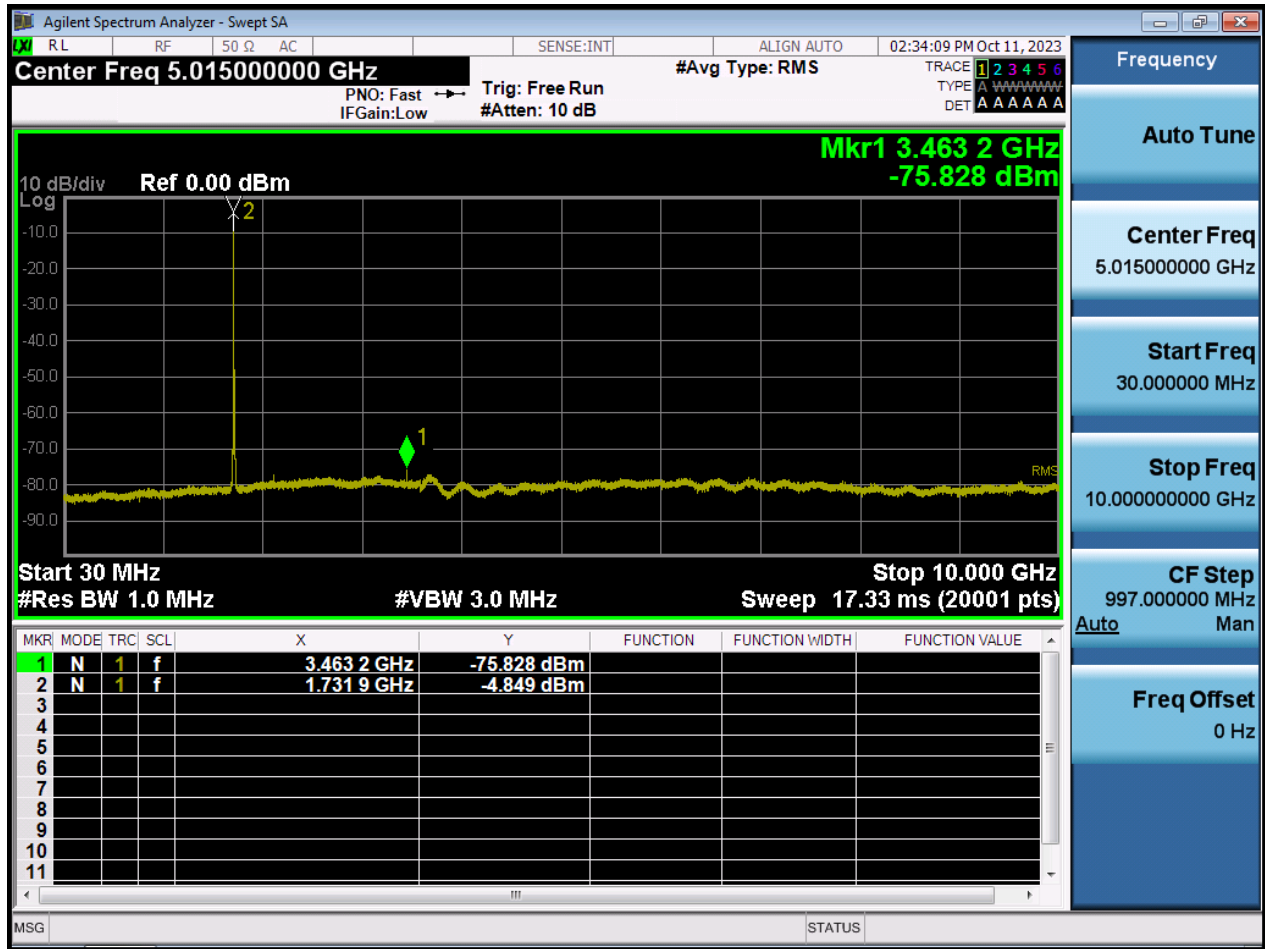
BW1.4 M_CSE(30 M-10 G)_Highest Channel_QPSK_1RB



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

