74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEL: +82-31-645-6300 FAX: +82-31-645-6401

FCC LTE REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

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

Date of Issue:
December 27, 2022

Location:
HCT CO., LTD.,
74, Seoicheon-ro 578beon-gil, Majang-myeon,
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

Report No.: HCT-RF-2212-FC011

FCC ID:	**A3LSMM146B**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s):	SM-M146B/DSN
EUT Type:	Mobile phone
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§27, §2

Main 2 Ant

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band66/4 (1.4)	1710.7 – 1779.3	1M10G7D	QPSK	0.195	22.90
		1M10W7D	16QAM	0.160	22.04
		1M10W7D	64QAM	0.128	21.07
		1M09W7D	256QAM	0.064	18.03
LTE – Band66/4 (3)	1711.5 – 1778.5	2M72G7D	QPSK	0.196	22.92
		2M72W7D	16QAM	0.159	22.01
		2M72W7D	64QAM	0.126	20.99
		2M72W7D	256QAM	0.065	18.13
LTE – Band66/4 (5)	1712.5 – 1777.5	4M52G7D	QPSK	0.196	22.93
		4M54W7D	16QAM	0.160	22.03
		4M52W7D	64QAM	0.127	21.03
		4M52W7D	256QAM	0.065	18.15
LTE – Band66/4 (10)	1715.0 – 1775.0	9M00G7D	QPSK	0.199	22.99
		8M99W7D	16QAM	0.161	22.06
		9M03W7D	64QAM	0.128	21.06
		9M00W7D	256QAM	0.066	18.18
LTE – Band66/4 (15)	1717.5 – 1772.5	13M5G7D	QPSK	0.201	23.04
		13M5W7D	16QAM	0.163	22.12
		13M5W7D	64QAM	0.132	21.19
		13M5W7D	256QAM	0.067	18.25
LTE – Band66/4 (20)	1720.0 – 1770.0	18M0G7D	QPSK	0.196	22.92
		18M0W7D	16QAM	0.161	22.08
		18M0W7D	64QAM	0.129	21.11
		17M9W7D	256QAM	0.065	18.13

Main 3 Ant

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band66 (1.4)	1710.7 – 1779.3	1M09G7D	QPSK	0.166	22.19
		1M09W7D	16QAM	0.129	21.11
		1M09W7D	64QAM	0.104	20.16
		1M10W7D	256QAM	0.052	17.16
LTE – Band66 (3)	1711.5 – 1778.5	2M72G7D	QPSK	0.166	22.20
		2M73W7D	16QAM	0.129	21.09
		2M74W7D	64QAM	0.104	20.17
		2M71W7D	256QAM	0.053	17.23
LTE – Band66 (5)	1712.5 – 1777.5	4M55G7D	QPSK	0.159	22.01
		4M49W7D	16QAM	0.124	20.93
		4M50W7D	64QAM	0.099	19.97
		4M55W7D	256QAM	0.050	17.01
LTE – Band66 (10)	1715.0 – 1775.0	9M00G7D	QPSK	0.173	22.37
		9M00W7D	16QAM	0.138	21.39
		9M01W7D	64QAM	0.105	20.21
		8M99W7D	256QAM	0.055	17.38
LTE – Band66 (15)	1717.5 – 1772.5	13M5G7D	QPSK	0.168	22.25
		13M4W7D	16QAM	0.130	21.13
		13M5W7D	64QAM	0.107	20.28
		13M5W7D	256QAM	0.053	17.26
LTE – Band66 (20)	1720.0 – 1770.0	17M9G7D	QPSK	0.173	22.38
		18M0W7D	16QAM	0.134	21.27
		17M9W7D	64QAM	0.110	20.40
		18M0W7D	256QAM	0.055	17.40

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

REVIEWED BY

Report prepared by : Jin Woo Yu
Engineer of Telecommunication Testing Center

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

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

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

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2212-FC011	December 27, 2022	- First Approval Report

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

Table of Contents

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:	A3LSMM146B
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§27, §2
EUT Type:	Mobile phone
Model(s):	SM-M146B/DSN
Tx Frequency:	**Main 2 Ant** 1710.7 MHz – 1779.3 MHz (LTE – Band 66/4 (1.4 MHz)) 1711.5 MHz – 1778.5 MHz (LTE – Band 66/4 (3 MHz)) 1712.5 MHz – 1777.5 MHz (LTE – Band 66/4 (5 MHz)) 1715.0 MHz – 1775.0 MHz (LTE – Band 66/4 (10 MHz)) 1717.5 MHz – 1772.5 MHz (LTE – Band 66/4 (15 MHz)) 1720.0 MHz – 1770.0 MHz (LTE – Band 66/4 (20 MHz)) **Main 3 Ant** 1710.7 MHz – 1779.3 MHz (LTE – Band 66 (1.4 MHz)) 1711.5 MHz – 1778.5 MHz (LTE – Band 66 (3 MHz)) 1712.5 MHz – 1777.5 MHz (LTE – Band 66 (5 MHz)) 1715.0 MHz – 1775.0 MHz (LTE – Band 66 (10 MHz)) 1717.5 MHz – 1772.5 MHz (LTE – Band 66 (15 MHz)) 1720.0 MHz – 1770.0 MHz (LTE – Band 66 (20 MHz))
Date(s) of Tests:	November 15, 2022 ~ December 21, 2022
Serial number:	Radiated: R3CTA0GVPVT(Main 2 Ant), R3CTA0GVRHP(Main 3 Ant) Conducted: R3CTA0GW2KB(Main 2, 3 Ant)

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

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

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

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

Test Note

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

   The power is calculated by the following formula;

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

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

3.3 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

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

Test Settings

1. RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points > 2 x span / RBW
5. Detector = Peak
6. Trace mode = Max Hold
7. The trace was allowed to stabilize
8. Test channel : Low/ Middle/ High
9. Frequency range : We are performed all frequency to 10^{th} harmonics from 9 kHz.

Test Note

1. Measurements value show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
2. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data
3. For spurious emissions above 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;

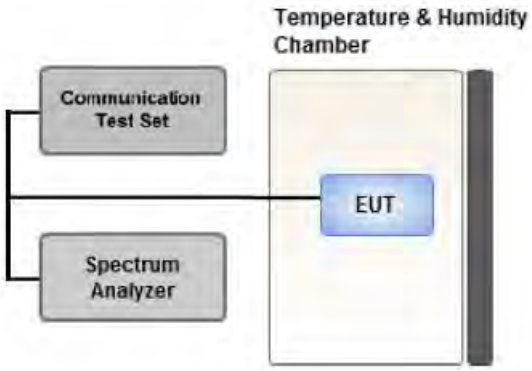
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

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

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

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

② **Alternate Procedure for PAPR**

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

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

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

Test Settings(Peak Power)

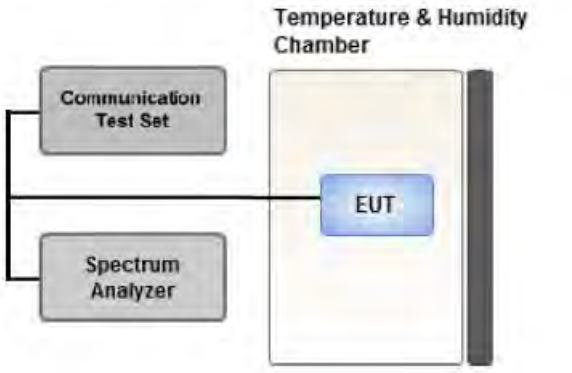
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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

Test Settings(Average Power)

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

3.5 OCCUPIED BANDWIDTH.



Test setup

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

The EUT makes a call to the communication simulator.

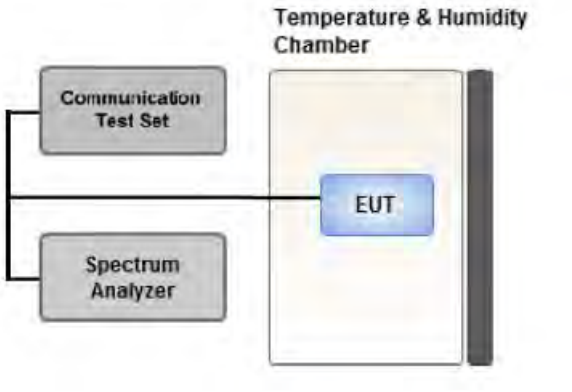
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 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 ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5 % of the 99 % occupied bandwidth observed in Step 7

3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic.

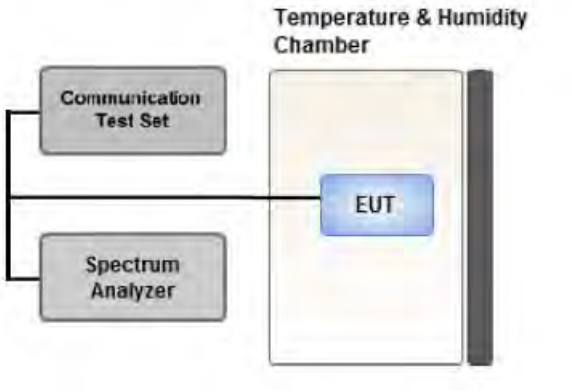
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Settings

1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = RMS
4. Trace Mode = trace average
5. Sweep time = auto
6. Number of points in sweep ≥ 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 ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Notes

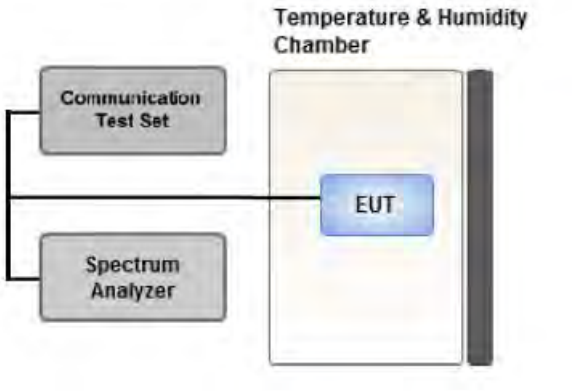
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a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

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

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

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

3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

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

The frequency stability of the transmitter is measured by:

1. Temperature:

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

2. Primary Supply Voltage:

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

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

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20 °C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10 °C intervals ranging from -30 °C to +50 °C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

3.9 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.
  Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc)
  Worst case : Stand alone
- We were performed the RSE test in condition of co-location.
  Mode : Stand alone, Simultaneous transmission scenarios
  Worst case : Stand alone
- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported.

(Main 2 Ant Worst case : 15 MHz)
(Main 3 Ant Worst case : 20 MHz)

- The worst case is reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data.
- Please refer to the table below.
- LTE Band 66 (1710 – 1780 MHz) overlaps the entire frequency range of LTE Band 4 (1710 - 1755 MHz) and they have the same Tune-up power. Therefore, test data provided in this report covers Band 4 as well as Band 66. (Main 2 Ant)

[Main 2 Ant Worst case]

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

[Main 3 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, Mid, High	1	0	Z
		3	Low	1	14	
			Mid, High	1	0	
		5	Low	1	24	
			Mid, High	1	0	
		10	Low, Mid, High	1	49	
		15	Low, Mid, High	1	74	
		20	Low, Mid, High	1	99	
Radiated Spurious and Harmonic Emissions	QPSK	20	Low, Mid, High	1	99	X

3.10 WORST CASE(CONDUCTED TEST)

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

[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
H.P.F	FBSR-02B(WHK1.2/15 G-10EF)	T&M SYSTEM	-	02/18/2023	Annual
H.P.F	FBSR-02B(WHK3.3/18 G-10EF)	T&M SYSTEM	-	02/18/2023	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	11275	03/11/2023	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/21/2023	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	04/05/2023	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	04/05/2023	Biennial
Chamber	SU-642	ESPEC	93008124	03/04/2023	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/30/2023	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	04/12/2023	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	05/02/2023	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	05/18/2023	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	08/29/2023	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/18/2023	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/17/2024	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/03/2023	Biennial
Hybrid Antenna	VULB9168	Schwarzbeck	760	02/22/2023	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262116770	07/05/2023	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6200863156	12/29/2022	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2023	Annual
Wideband Radio Communication Tester	MT8000A	Anritsu Corp.	6262302511	05/18/2023	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/30/2023	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

Note:

1. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
2. 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 (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	2.00 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.40 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.74 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.51 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.92 (Confidence level about 95 %, k=2)
Radiated Disturbance (Above 40 GHz)	5.48 (Confidence level about 95 %, k=2)

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §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	**See Note1**
Peak- to- Average Ratio	§27.50(d)(5)	< 13 dB	PASS
Frequency stability / variation of ambient temperature	§2.1055, § 27.54	Emission must remain in band	PASS

Note:

1. See SAR Report

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§27.50(d)(4)	< 1 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(h)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol.	ERP	
channel	Freq.(MHz)						W	dBm
128	824.20	-21.37	38.40	-10.61	0.95	H	0.483	26.84

ERP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.

2) During the test , the turn table is rotated until the maximum signal is found.

3) Record the field strength meter's level.

4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.

5) Increase the signal generator output till the field strength meter's level is equal to the item (3).

6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power.

7.2 EIRP Sample Calculation

Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	EIRP	
channel	Freq.(MHz)						W	dBm
132322	1,732.50	-15.75	18.45	9.90	1.76	H	0.456	26.59

EIRP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.

2) During the test , the turn table is rotated until the maximum signal is found.

3) Record the field strength meter's level.

4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.

5) Increase the signal generator output till the field strength meter's level is equal to the item (3).

6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.

7.3. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

8. TEST DATA (Main 2 Ant)

8.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1710.7	LTE B66/B4 1.4 MHz	QPSK	-18.19	14.92	10.04	2.06	H	< 1.00	0.195	22.90
		16-QAM	-19.05	14.06	10.04	2.06	H		0.160	22.04
		64-QAM	-20.02	13.09	10.04	2.06	H		0.128	21.07
		256-QAM	-23.06	10.05	10.04	2.06	H		0.064	18.03
1745.0		QPSK	-18.73	14.44	10.18	2.08	H		0.179	22.54
		16-QAM	-19.59	13.58	10.18	2.08	H		0.147	21.68
		64-QAM	-20.57	12.60	10.18	2.08	H		0.117	20.70
		256-QAM	-23.56	9.61	10.18	2.08	H		0.059	17.71
1779.3		QPSK	-20.16	13.00	10.26	2.12	H		0.130	21.14
		16-QAM	-21.03	12.13	10.26	2.12	H		0.106	20.27
		64-QAM	-21.98	11.18	10.26	2.12	H		0.086	19.32
		256-QAM	-24.96	8.20	10.26	2.12	H		0.043	16.34

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1711.5	LTE B66/B4 3 MHz	QPSK	-18.17	14.94	10.04	2.06	H	< 1.00	0.196	22.92
		16-QAM	-19.08	14.03	10.04	2.06	H		0.159	22.01
		64-QAM	-20.10	13.01	10.04	2.06	H		0.126	20.99
		256-QAM	-22.96	10.15	10.04	2.06	H		0.065	18.13
1745.0		QPSK	-18.77	14.40	10.18	2.08	H		0.178	22.50
		16-QAM	-19.63	13.54	10.18	2.08	H		0.146	21.64
		64-QAM	-20.62	12.55	10.18	2.08	H		0.116	20.65
		256-QAM	-23.55	9.62	10.18	2.08	H		0.059	17.72
1778.5		QPSK	-19.99	13.17	10.26	2.12	H		0.135	21.31
		16-QAM	-20.85	12.31	10.26	2.12	H		0.111	20.45
		64-QAM	-21.90	11.26	10.26	2.12	H		0.087	19.40
		256-QAM	-24.86	8.30	10.26	2.12	H		0.044	16.44

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1712.5	LTE B66/B4 5 MHz	QPSK	-18.16	14.95	10.04	2.06	H	< 1.00	0.196	22.93
		16-QAM	-19.06	14.05	10.04	2.06	H		0.160	22.03
		64-QAM	-20.06	13.05	10.04	2.06	H		0.127	21.03
		256-QAM	-22.94	10.17	10.04	2.06	H		0.065	18.15
1745.0		QPSK	-18.75	14.42	10.18	2.08	H		0.179	22.52
		16-QAM	-19.58	13.59	10.18	2.08	H		0.148	21.69
		64-QAM	-20.58	12.59	10.18	2.08	H		0.117	20.69
		256-QAM	-23.56	9.61	10.18	2.08	H		0.059	17.71
1777.5		QPSK	-19.81	13.35	10.26	2.12	H		0.141	21.49
		16-QAM	-20.61	12.55	10.26	2.12	H		0.117	20.69
		64-QAM	-21.61	11.55	10.26	2.12	H		0.093	19.69
		256-QAM	-24.67	8.49	10.26	2.12	H		0.046	16.63

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1715.0	LTE B66/B4 10 MHz	QPSK	-18.12	14.99	10.06	2.06	H	< 1.00	0.199	22.99
		16-QAM	-19.05	14.06	10.06	2.06	H		0.161	22.06
		64-QAM	-20.05	13.06	10.06	2.06	H		0.128	21.06
		256-QAM	-22.93	10.18	10.06	2.06	H		0.066	18.18
1745.0		QPSK	-18.66	14.51	10.18	2.08	H		0.182	22.61
		16-QAM	-19.47	13.70	10.18	2.08	H		0.151	21.80
		64-QAM	-20.52	12.65	10.18	2.08	H		0.119	20.75
		256-QAM	-23.48	9.69	10.18	2.08	H		0.060	17.79
1775.0		QPSK	-19.51	13.64	10.25	2.12	H		0.150	21.77
		16-QAM	-20.33	12.82	10.25	2.12	H		0.124	20.95
		64-QAM	-21.35	11.80	10.25	2.12	H		0.098	19.93
		256-QAM	-24.40	8.75	10.25	2.12	H		0.049	16.88

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1717.5	LTE B66/B4 15 MHz	QPSK	-18.10	15.02	10.08	2.06	H	< 1.00	0.201	23.04
		16-QAM	-19.02	14.10	10.08	2.06	H		0.163	22.12
		64-QAM	-19.95	13.17	10.08	2.06	H		0.132	21.19
		256-QAM	-22.89	10.23	10.08	2.06	H		0.067	18.25
1745.0		QPSK	-18.53	14.64	10.18	2.08	H		0.188	22.74
		16-QAM	-19.34	13.83	10.18	2.08	H		0.156	21.93
		64-QAM	-20.33	12.84	10.18	2.08	H		0.124	20.94
		256-QAM	-23.37	9.80	10.18	2.08	H		0.062	17.90
1772.5		QPSK	-19.30	13.85	10.24	2.13	H		0.157	21.96
		16-QAM	-20.09	13.06	10.24	2.13	H		0.131	21.17
		64-QAM	-21.02	12.13	10.24	2.13	H		0.106	20.24
		256-QAM	-24.15	9.00	10.24	2.13	H		0.051	17.11

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1720.0	LTE B66/B4 20 MHz	QPSK	-18.22	14.90	10.08	2.06	H	< 1.00	0.196	22.92
		16-QAM	-19.06	14.06	10.08	2.06	H		0.161	22.08
		64-QAM	-20.03	13.09	10.08	2.06	H		0.129	21.11
		256-QAM	-23.01	10.11	10.08	2.06	H		0.065	18.13
1745.0		QPSK	-18.65	14.52	10.18	2.08	H		0.183	22.62
		16-QAM	-19.47	13.70	10.18	2.08	H		0.151	21.80
		64-QAM	-20.43	12.74	10.18	2.08	H		0.121	20.84
		256-QAM	-23.42	9.75	10.18	2.08	H		0.061	17.85
1770.0		QPSK	-19.11	14.04	10.24	2.13	H		0.164	22.15
		16-QAM	-19.93	13.22	10.24	2.13	H		0.136	21.33
		64-QAM	-20.87	12.28	10.24	2.13	H		0.109	20.39
		256-QAM	-23.93	9.22	10.24	2.13	H		0.054	17.33

8.2 RADIATED SPURIOUS EMISSIONS

▣ OPERATING FREQUENCY: 1717.5 MHz

▣ MEASURED OUTPUT POWER: 23.04 dBm = 0.201 W

▣ MODE: LTE B66/B4

▣ MODULATION SIGNAL: 15 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 log10 (W) = 36.04 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
132047 (1717.5)	3 435.00	-54.39	12.53	-60.65	3.02	H	-51.15	74.18
	5 152.50	-49.30	12.30	-47.44	3.69	V	-38.83	61.86
	6 870.00	-56.55	11.96	-49.81	4.37	H	-42.22	65.25
132322 (1745.0)	3 490.00	-50.38	12.42	-56.25	2.99	V	-46.82	69.86
	5 235.00	-41.80	12.71	-41.03	3.82	V	-32.13	55.17
	6 980.00	-55.41	11.52	-47.68	4.41	H	-40.57	63.61
132597 (1772.5)	3 545.00	-50.00	12.40	-55.66	3.08	V	-46.34	69.38
	5 317.50	-41.22	13.00	-40.37	3.81	V	-31.18	54.22
	7 090.00	-57.40	10.94	-48.43	4.45	H	-41.94	64.97

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
66/4	1.4 MHz	1745.0	QPSK	6	0	5.27
			16-QAM			5.82
			64-QAM			5.84
			256-QAM			6.48
	3 MHz		QPSK	15		5.44
			16-QAM			5.89
			64-QAM			5.92
			256-QAM			6.50
	5 MHz		QPSK	25		5.34
			16-QAM			5.89
			64-QAM			5.87
			256-QAM			6.44
	10 MHz		QPSK	50		5.40
			16-QAM			5.99
			64-QAM			5.94
			256-QAM			6.45
	15 MHz		QPSK	75		5.38
			16-QAM			6.12
			64-QAM			6.27
			256-QAM			6.43
	20 MHz		QPSK	100		5.37
			16-QAM			6.09
			64-QAM			6.26
			256-QAM			6.44

Note:

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

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
66/4	1.4 MHz	1745.0	QPSK	6	0	1.1029
			16-QAM			1.0972
			64-QAM			1.0986
			256-QAM			1.0939
	3 MHz		QPSK	15		2.7211
			16-QAM			2.7146
			64-QAM			2.7208
			256-QAM			2.7152
	5 MHz		QPSK	25		4.5234
			16-QAM			4.5369
			64-QAM			4.5227
			256-QAM			4.5170
	10 MHz		QPSK	50		8.9966
			16-QAM			8.9908
			64-QAM			9.0292
			256-QAM			8.9993
	15 MHz		QPSK	75		13.493
			16-QAM			13.464
			64-QAM			13.462
			256-QAM			13.472
	20 MHz		QPSK	100		17.971
			16-QAM			17.946
			64-QAM			17.971
			256-QAM			17.930

Note:

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

8.5 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
66/4	1.4	1710.7	3.4213	27.976	-72.596	-44.620	-13.00
		1745.0	3.4896	27.976	-74.275	-46.299	
		1779.3	3.5604	27.976	-75.411	-47.435	
	3	1711.5	3.4213	27.976	-73.661	-45.685	
		1745.0	3.4881	27.976	-73.910	-45.934	
		1778.5	3.5604	27.976	-74.399	-46.423	
	5	1712.5	3.4213	27.976	-73.224	-45.248	
		1745.0	3.4861	27.976	-74.241	-46.265	
		1777.5	3.5599	27.976	-73.879	-45.903	
	10	1715.0	3.4218	27.976	-72.370	-44.394	
		1745.0	3.4816	27.976	-74.614	-46.638	
		1775.0	3.5594	27.976	-74.593	-46.617	
	15	1717.5	1.6845	27.976	-73.708	-45.732	
		1745.0	3.4771	27.976	-73.494	-45.518	
		1772.5	3.5589	27.976	-75.007	-47.031	
	20	1720.0	3.4228	27.976	-73.598	-45.622	
		1745.0	3.4726	27.976	-73.994	-46.018	
		1770.0	3.5584	27.976	-75.407	-47.431	

Note:

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

2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0

3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)

4. Factor (dB) = Cable Loss + Attenuator + Power Splitter

Frequency Range (GHz)	Factor [dB]
0.03 – 1	25.270
1 – 5	27.976
5 – 10	28.591
10 – 15	29.116
15 – 20	29.489
Above 20(26.5)	30.131

8.6 BAND EDGE

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

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE 66/4

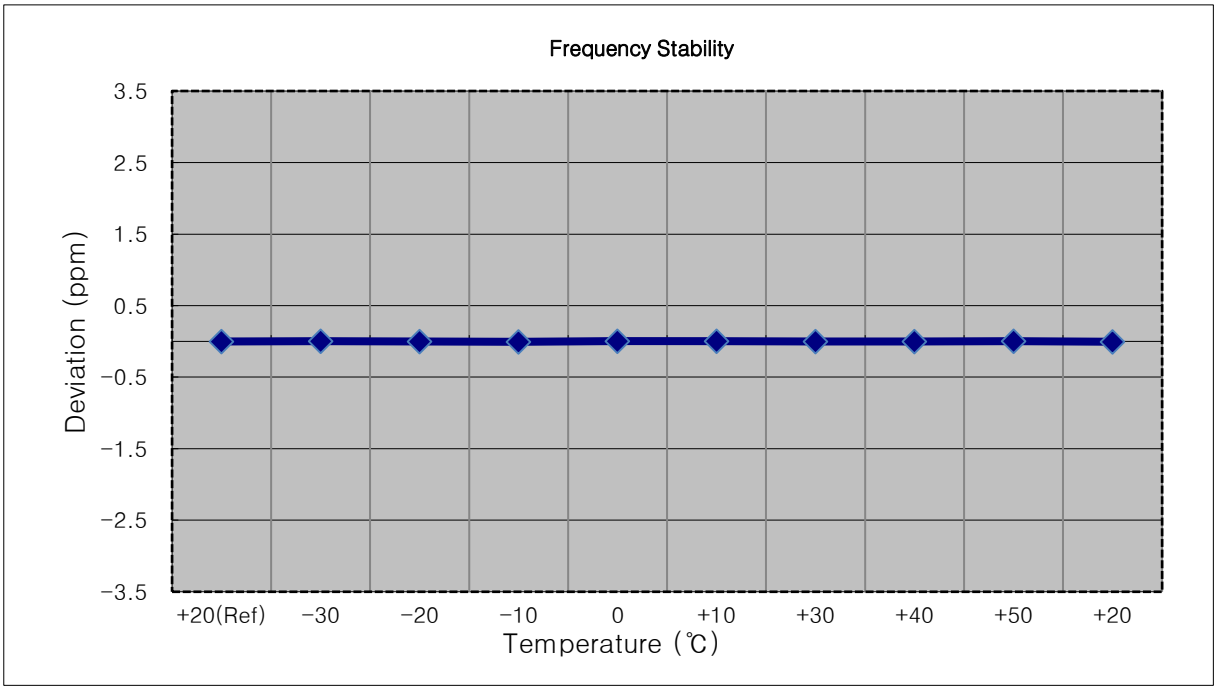
▣ OPERATING FREQUENCY: 1710,700,000 Hz

▣ CHANNEL: 131979 (1.4 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1710 699 995	0.0	0.000 000	0.000
100 %		-30	1710 700 001	6.2	0.000 000	0.004
100 %		-20	1710 699 990	-4.8	0.000 000	-0.003
100 %		-10	1710 699 988	-6.7	0.000 000	-0.004
100 %		0	1710 700 003	7.8	0.000 000	0.005
100 %		+10	1710 700 002	6.5	0.000 000	0.004
100 %		+30	1710 699 991	-4.0	0.000 000	-0.002
100 %		+40	1710 699 989	-5.7	0.000 000	-0.003
100 %		+50	1710 700 002	6.7	0.000 000	0.004
Batt. Endpoint	3.400	+20	1710 699 987	-8.3	0.000 000	-0.005



▣ MODE: LTE 66/4

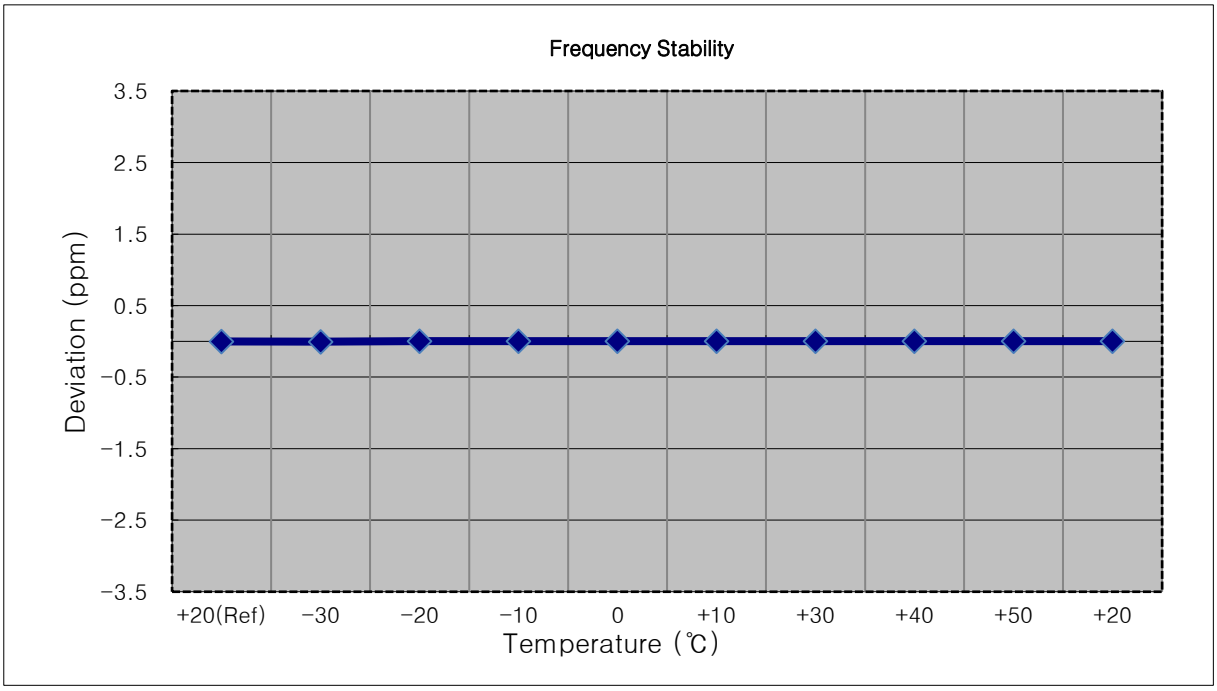
▣ OPERATING FREQUENCY: 1711,500,000 Hz

▣ CHANNEL: 131987 (3 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1711 500 004	0.0	0.000 000	0.000
100 %		-30	1711 499 998	-6.2	0.000 000	-0.004
100 %		-20	1711 500 011	6.1	0.000 000	0.004
100 %		-10	1711 500 009	4.3	0.000 000	0.003
100 %		0	1711 500 009	5.0	0.000 000	0.003
100 %		+10	1711 500 010	5.7	0.000 000	0.003
100 %		+30	1711 500 009	4.5	0.000 000	0.003
100 %		+40	1711 500 011	6.1	0.000 000	0.004
100 %		+50	1711 500 008	3.4	0.000 000	0.002
Batt. Endpoint	3.400	+20	1711 500 009	4.2	0.000 000	0.002



▣ MODE: LTE 66/4

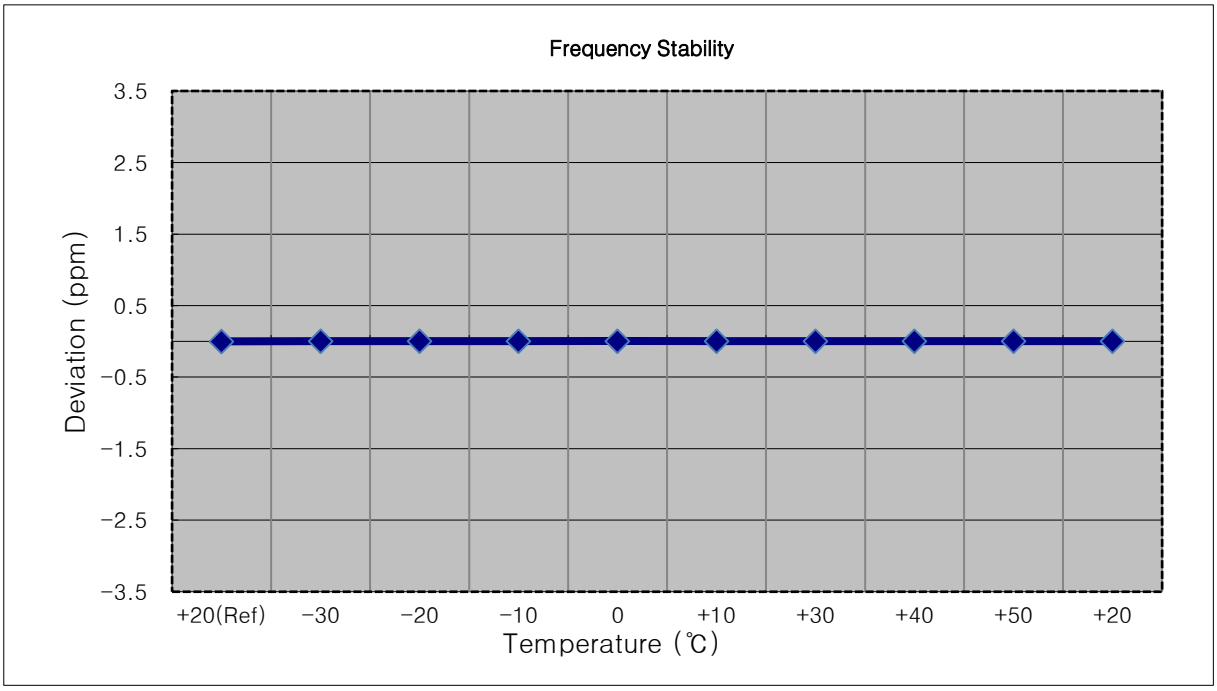
▣ OPERATING FREQUENCY: 1712,500,000 Hz

▣ CHANNEL: 131997 (5 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1712 500 004	0.0	0.000 000	0.000
100 %		-30	1712 500 008	4.3	0.000 000	0.003
100 %		-20	1712 500 011	7.3	0.000 000	0.004
100 %		-10	1712 500 011	6.6	0.000 000	0.004
100 %		0	1712 500 014	9.5	0.000 001	0.006
100 %		+10	1712 500 009	5.3	0.000 000	0.003
100 %		+30	1712 500 009	4.8	0.000 000	0.003
100 %		+40	1712 500 009	4.8	0.000 000	0.003
100 %		+50	1712 500 008	4.1	0.000 000	0.002
Batt. Endpoint	3.400	+20	1712 500 012	7.6	0.000 000	0.004



▣ MODE: LTE 66/4

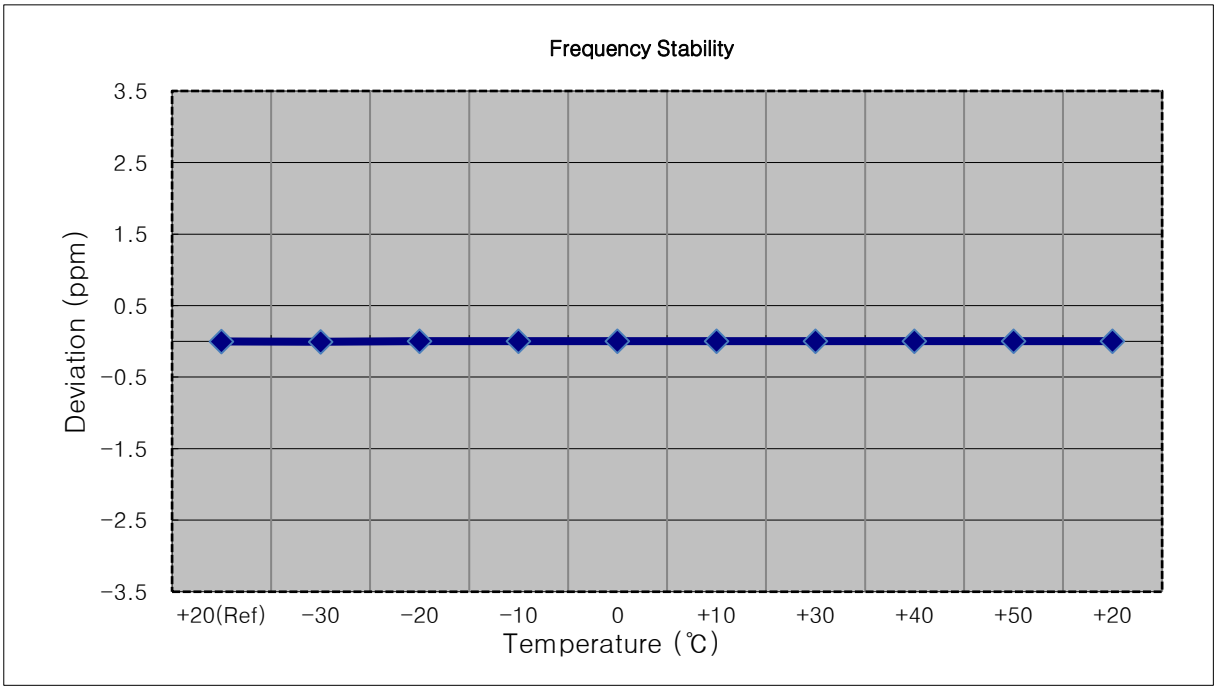
▣ OPERATING FREQUENCY: 1715,000,000 Hz

▣ CHANNEL: 132022 (10 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1715 000 004	0.0	0.000 000	0.000
100 %		-30	1714 999 995	-8.8	-0.000 001	-0.005
100 %		-20	1715 000 007	3.4	0.000 000	0.002
100 %		-10	1715 000 009	5.6	0.000 000	0.003
100 %		0	1715 000 008	4.3	0.000 000	0.003
100 %		+10	1715 000 008	4.1	0.000 000	0.002
100 %		+30	1715 000 008	4.7	0.000 000	0.003
100 %		+40	1715 000 010	6.2	0.000 000	0.004
100 %		+50	1715 000 010	6.0	0.000 000	0.003
Batt. Endpoint	3.400	+20	1715 000 006	2.5	0.000 000	0.001



▣ MODE: LTE 66/4

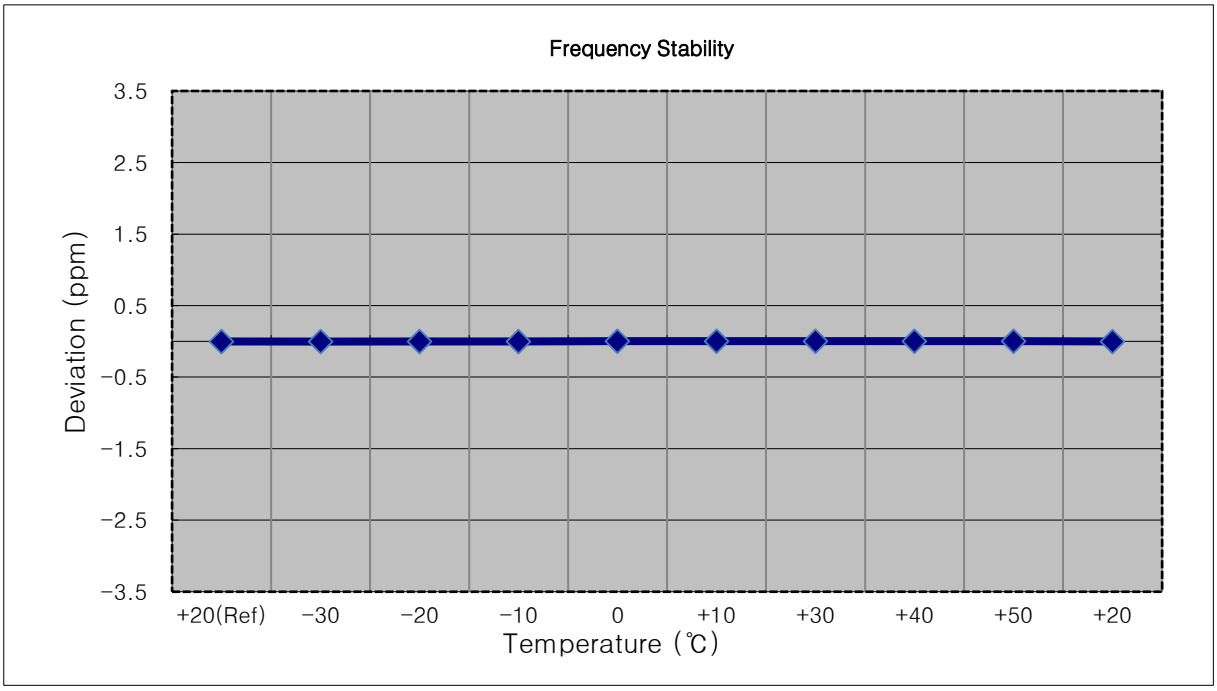
▣ OPERATING FREQUENCY: 1717,500,000 Hz

▣ CHANNEL: 132047 (15 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1717 499 994	0.0	0.000 000	0.000
100 %		-30	1717 499 990	-4.6	0.000 000	-0.003
100 %		-20	1717 499 990	-4.5	0.000 000	-0.003
100 %		-10	1717 499 991	-3.3	0.000 000	-0.002
100 %		0	1717 499 998	4.1	0.000 000	0.002
100 %		+10	1717 500 000	5.3	0.000 000	0.003
100 %		+30	1717 499 998	3.7	0.000 000	0.002
100 %		+40	1717 500 000	5.5	0.000 000	0.003
100 %		+50	1717 499 997	2.9	0.000 000	0.002
Batt. Endpoint	3.400	+20	1717 499 990	-4.2	0.000 000	-0.002



▣ MODE: LTE 66/4

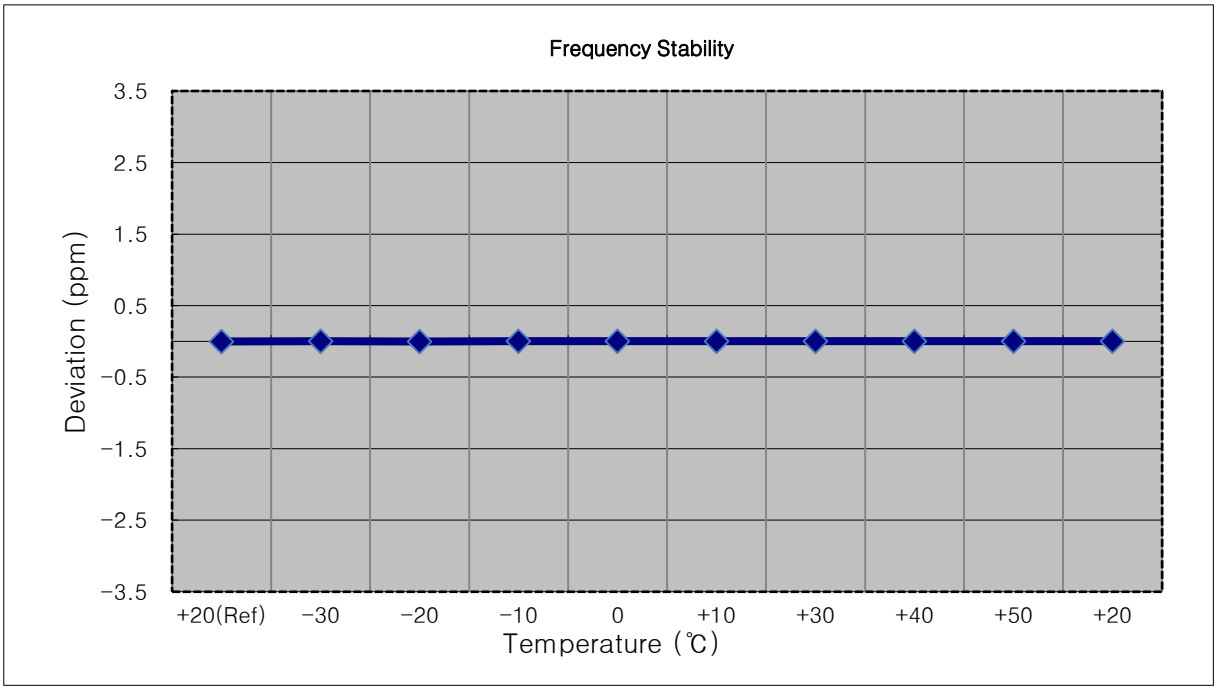
▣ OPERATING FREQUENCY: 1720,000,000 Hz

▣ CHANNEL: 132072 (20 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1720 000 004	0.0	0.000 000	0.000
100 %		-30	1720 000 009	4.7	0.000 000	0.003
100 %		-20	1720 000 002	-2.7	0.000 000	-0.002
100 %		-10	1720 000 008	4.1	0.000 000	0.002
100 %		0	1720 000 008	3.4	0.000 000	0.002
100 %		+10	1720 000 008	3.8	0.000 000	0.002
100 %		+30	1720 000 008	3.9	0.000 000	0.002
100 %		+40	1720 000 008	3.8	0.000 000	0.002
100 %		+50	1720 000 008	3.6	0.000 000	0.002
Batt. Endpoint	3.400	+20	1720 000 008	4.0	0.000 000	0.002



▣ MODE: LTE 66/4

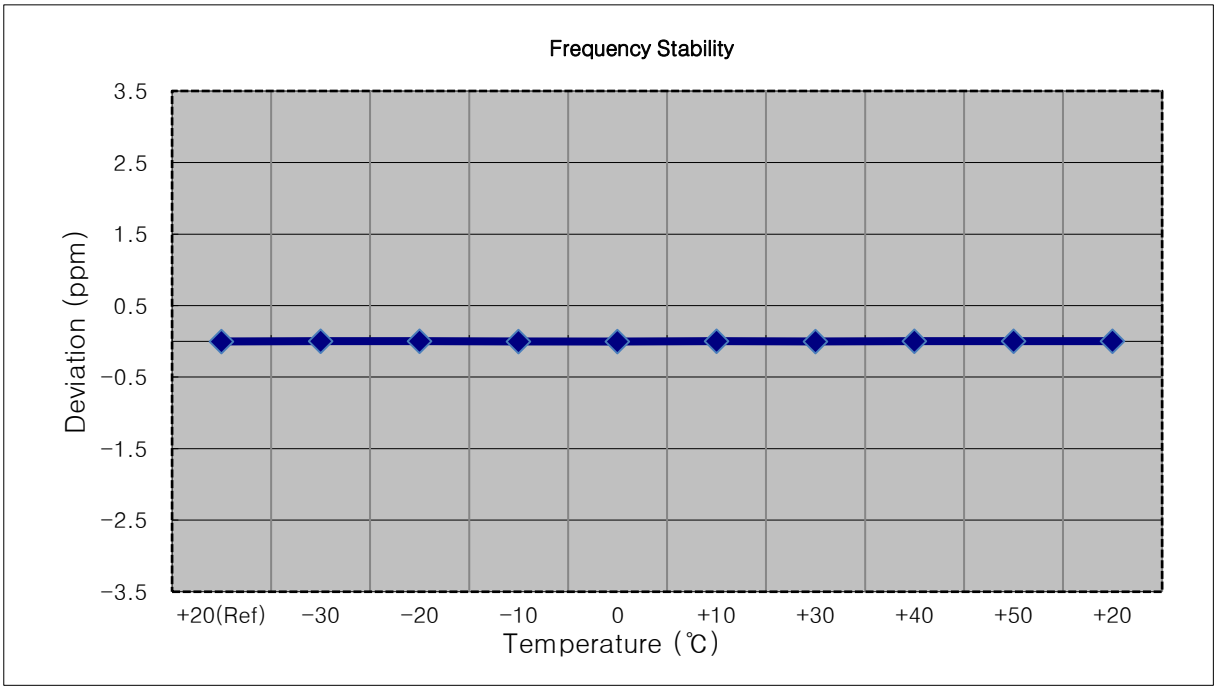
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (1.4 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 006	0.0	0.000 000	0.000
100 %		-30	1745 000 011	5.8	0.000 000	0.003
100 %		-20	1745 000 010	4.9	0.000 000	0.003
100 %		-10	1745 000 002	-3.7	0.000 000	-0.002
100 %		0	1745 000 001	-4.2	0.000 000	-0.002
100 %		+10	1745 000 010	4.1	0.000 000	0.002
100 %		+30	1745 000 003	-2.9	0.000 000	-0.002
100 %		+40	1745 000 010	4.3	0.000 000	0.002
100 %		+50	1745 000 010	4.6	0.000 000	0.003
Batt. Endpoint	3.400	+20	1745 000 009	3.8	0.000 000	0.002



▣ MODE: LTE 66/4

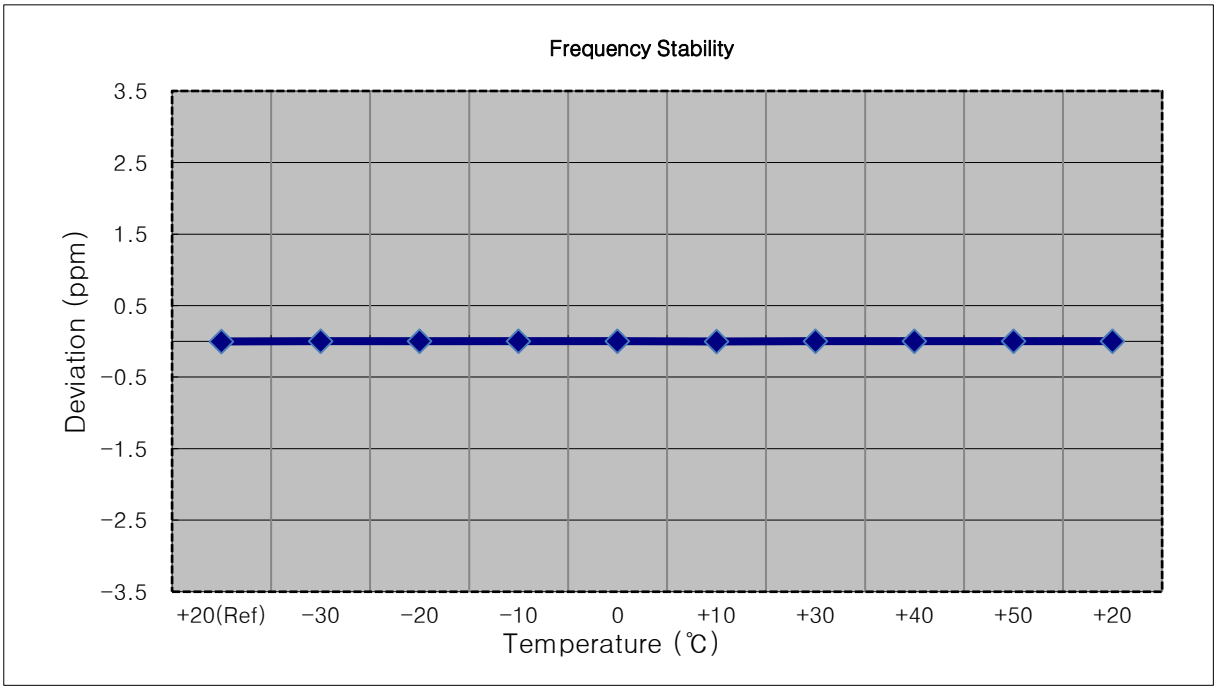
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (3 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 003	0.0	0.000 000	0.000
100 %		-30	1745 000 007	3.5	0.000 000	0.002
100 %		-20	1745 000 008	4.6	0.000 000	0.003
100 %		-10	1745 000 007	3.3	0.000 000	0.002
100 %		0	1745 000 007	3.6	0.000 000	0.002
100 %		+10	1745 000 001	-2.4	0.000 000	-0.001
100 %		+30	1745 000 007	3.6	0.000 000	0.002
100 %		+40	1745 000 007	4.1	0.000 000	0.002
100 %		+50	1745 000 007	3.5	0.000 000	0.002
Batt. Endpoint	3.400	+20	1745 000 007	4.0	0.000 000	0.002



▣ MODE: LTE 66/4

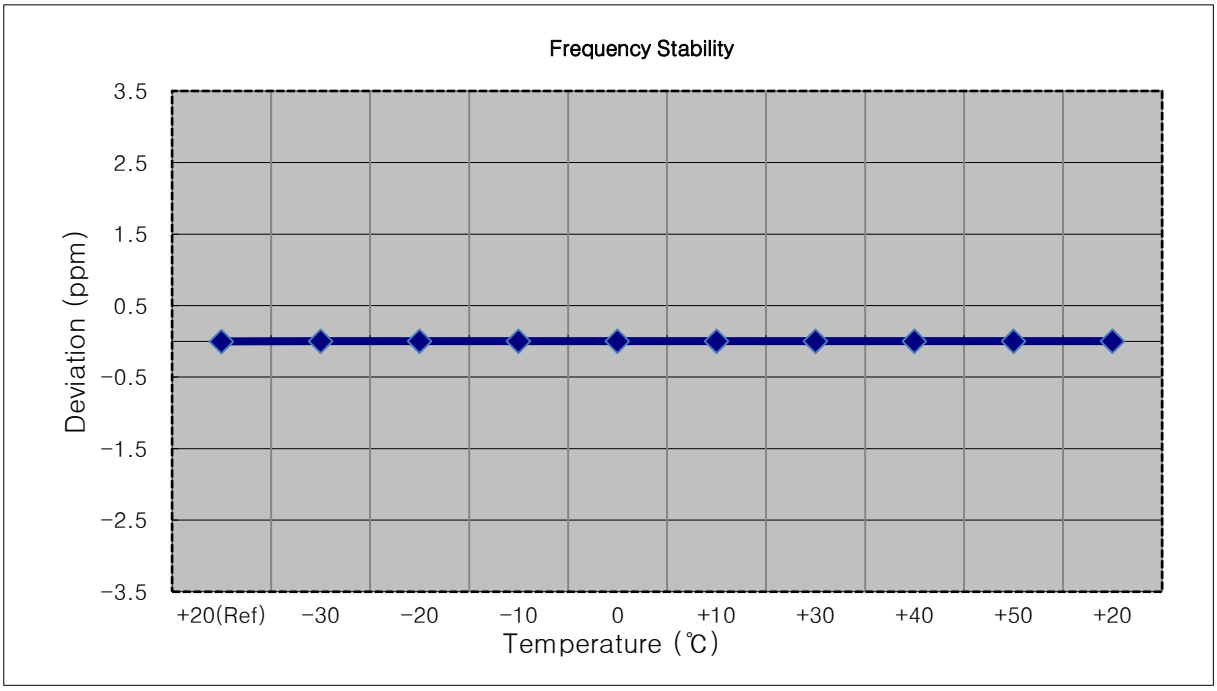
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (5 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 003	0.0	0.000 000	0.000
100 %		-30	1745 000 007	3.5	0.000 000	0.002
100 %		-20	1745 000 008	4.9	0.000 000	0.003
100 %		-10	1745 000 006	3.0	0.000 000	0.002
100 %		0	1745 000 009	6.1	0.000 000	0.003
100 %		+10	1745 000 007	4.1	0.000 000	0.002
100 %		+30	1745 000 007	4.0	0.000 000	0.002
100 %		+40	1745 000 006	3.1	0.000 000	0.002
100 %		+50	1745 000 006	2.9	0.000 000	0.002
Batt. Endpoint	3.400	+20	1745 000 007	4.1	0.000 000	0.002



▣ MODE: LTE 66/4

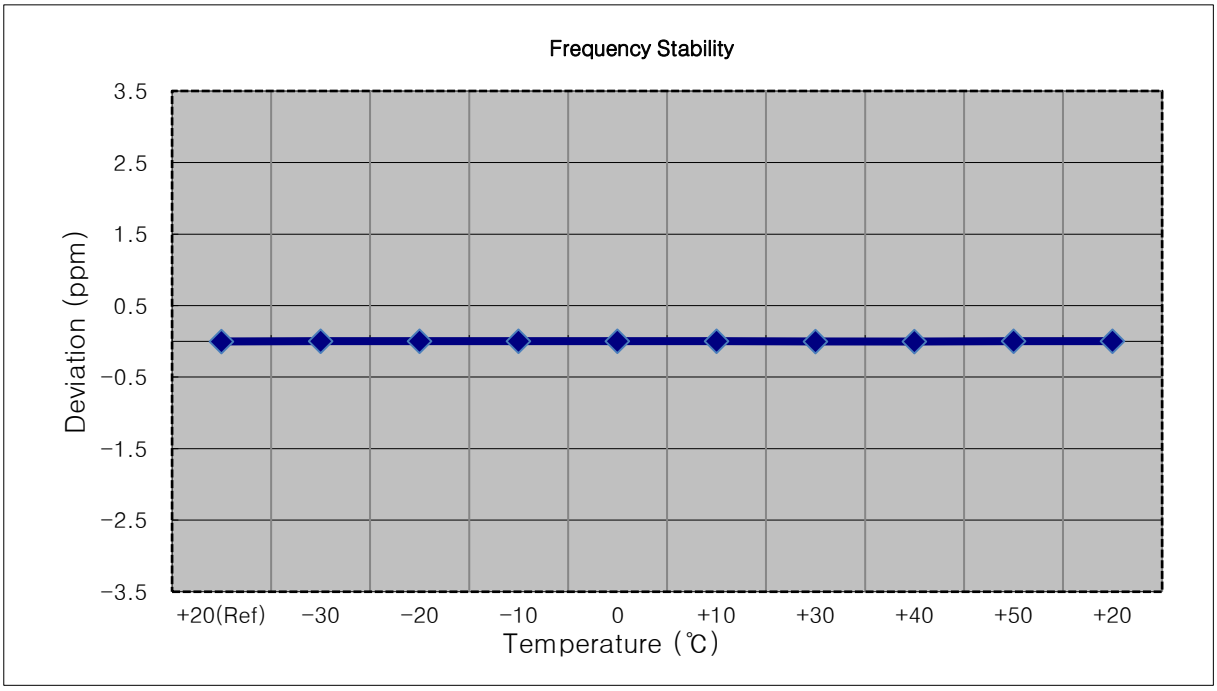
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (10 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 003	0.0	0.000 000	0.000
100 %		-30	1745 000 008	4.3	0.000 000	0.002
100 %		-20	1745 000 007	3.8	0.000 000	0.002
100 %		-10	1745 000 006	2.9	0.000 000	0.002
100 %		0	1745 000 007	3.4	0.000 000	0.002
100 %		+10	1745 000 006	3.1	0.000 000	0.002
100 %		+30	1745 000 002	-1.5	0.000 000	-0.001
100 %		+40	1744 999 999	-4.2	0.000 000	-0.002
100 %		+50	1745 000 008	4.9	0.000 000	0.003
Batt. Endpoint	3.400	+20	1745 000 007	4.1	0.000 000	0.002



▣ MODE: LTE 66/4

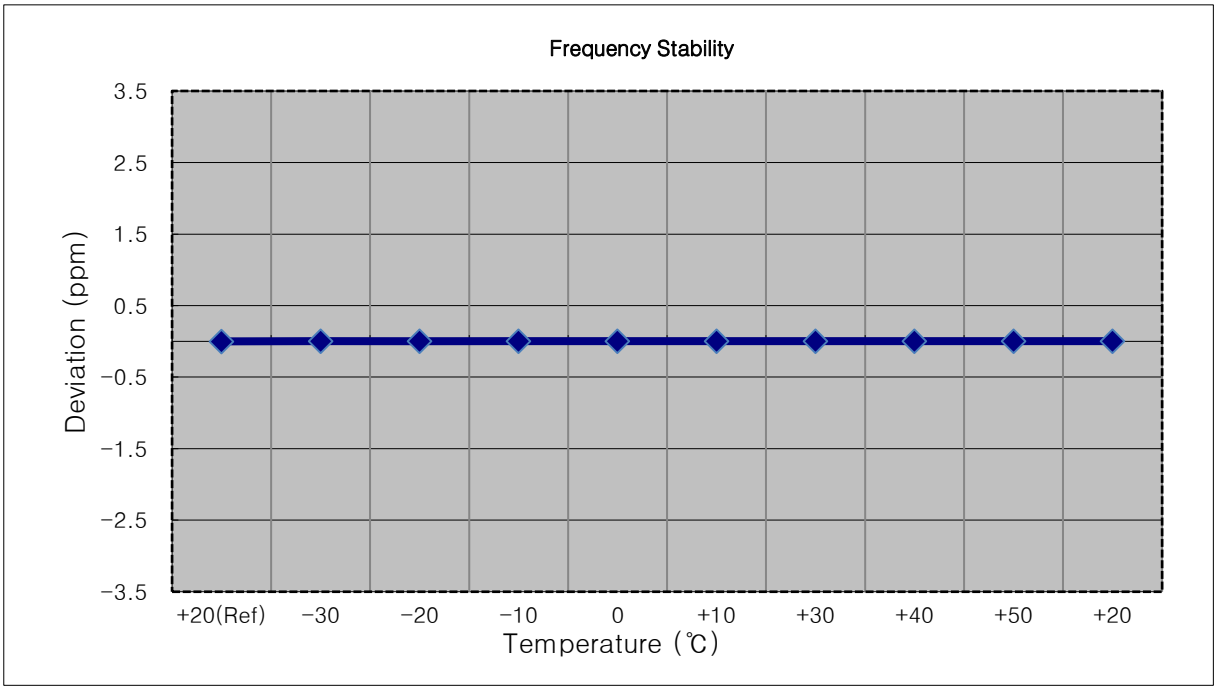
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (15 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 002	0.0	0.000 000	0.000
100 %		-30	1745 000 005	2.5	0.000 000	0.001
100 %		-20	1745 000 006	3.8	0.000 000	0.002
100 %		-10	1745 000 005	2.7	0.000 000	0.002
100 %		0	1745 000 006	3.7	0.000 000	0.002
100 %		+10	1745 000 005	3.2	0.000 000	0.002
100 %		+30	1745 000 005	3.3	0.000 000	0.002
100 %		+40	1745 000 005	2.5	0.000 000	0.001
100 %		+50	1745 000 005	2.4	0.000 000	0.001
Batt. Endpoint	3.400	+20	1745 000 005	3.3	0.000 000	0.002



▣ MODE: LTE 66/4

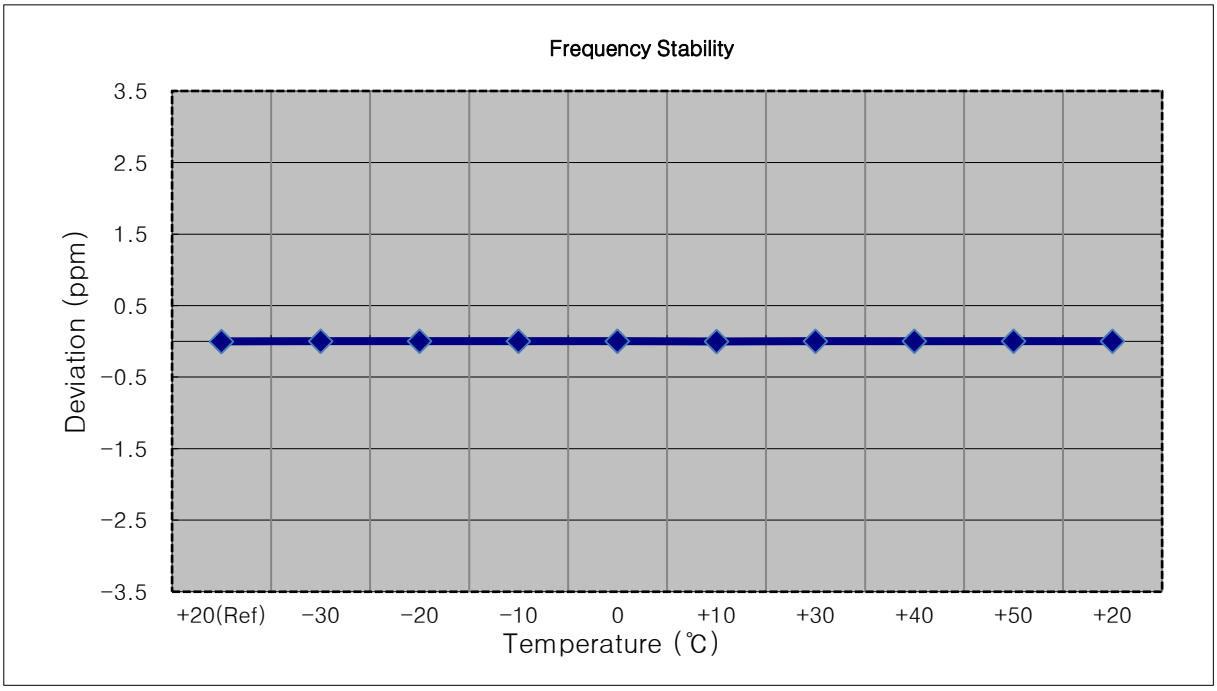
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (20 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 004	0.0	0.000 000	0.000
100 %		-30	1745 000 009	4.5	0.000 000	0.003
100 %		-20	1745 000 006	2.2	0.000 000	0.001
100 %		-10	1745 000 009	4.3	0.000 000	0.002
100 %		0	1745 000 008	3.5	0.000 000	0.002
100 %		+10	1745 000 006	1.6	0.000 000	0.001
100 %		+30	1745 000 007	2.8	0.000 000	0.002
100 %		+40	1745 000 009	4.6	0.000 000	0.003
100 %		+50	1745 000 007	2.3	0.000 000	0.001
Batt. Endpoint	3.400	+20	1745 000 007	3.0	0.000 000	0.002



▣ MODE: LTE 66/4

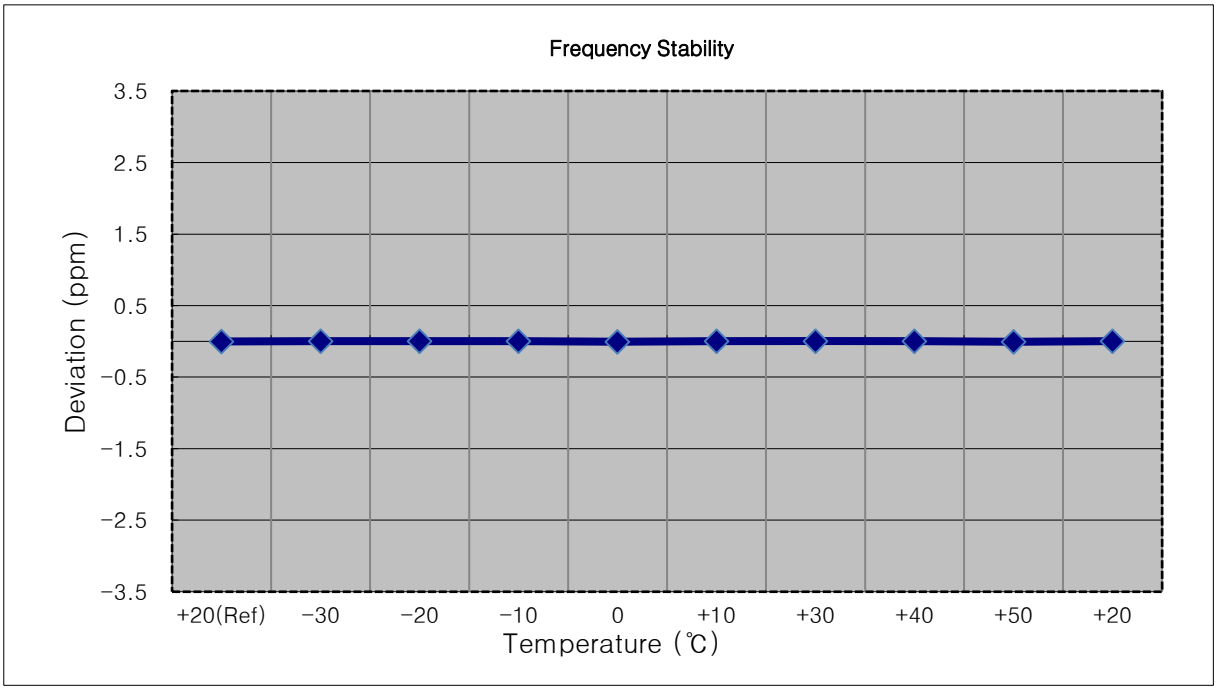
▣ OPERATING FREQUENCY: 1779,300,000 Hz

▣ CHANNEL: 132665 (1.4 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1779 299 994	0.0	0.000 000	0.000
100 %		-30	1779 300 000	5.9	0.000 000	0.003
100 %		-20	1779 300 000	6.0	0.000 000	0.003
100 %		-10	1779 300 000	5.8	0.000 000	0.003
100 %		0	1779 299 986	-8.4	0.000 000	-0.005
100 %		+10	1779 300 000	5.9	0.000 000	0.003
100 %		+30	1779 300 003	8.4	0.000 000	0.005
100 %		+40	1779 299 999	5.1	0.000 000	0.003
100 %		+50	1779 299 987	-6.9	0.000 000	-0.004
Batt. Endpoint	3.400	+20	1779 300 001	6.8	0.000 000	0.004



▣ MODE: LTE 66/4

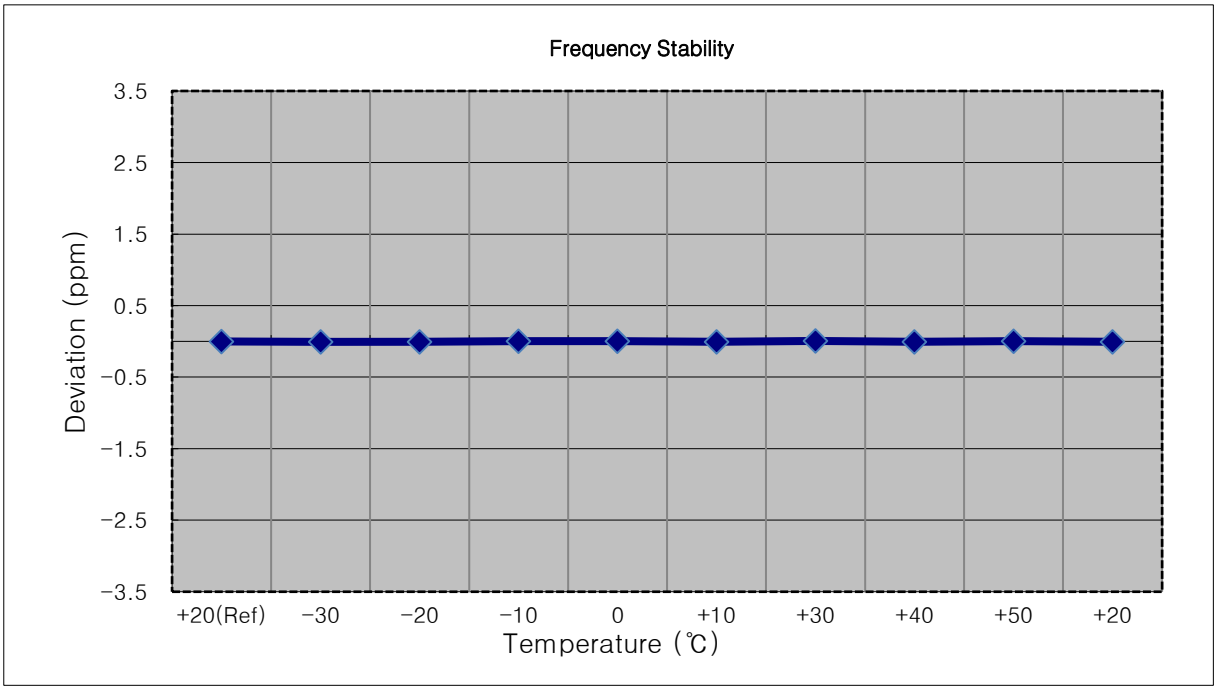
▣ OPERATING FREQUENCY: 1778,500,000 Hz

▣ CHANNEL: 132657 (3 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1778 499 990	0.0	0.000 000	0.000
100 %		-30	1778 499 978	-12.3	-0.000 001	-0.007
100 %		-20	1778 499 979	-11.0	-0.000 001	-0.006
100 %		-10	1778 500 000	9.4	0.000 001	0.005
100 %		0	1778 499 998	7.5	0.000 000	0.004
100 %		+10	1778 499 984	-6.8	0.000 000	-0.004
100 %		+30	1778 500 001	10.6	0.000 001	0.006
100 %		+40	1778 499 982	-8.0	0.000 000	-0.004
100 %		+50	1778 499 998	7.8	0.000 000	0.004
Batt. Endpoint	3.400	+20	1778 499 979	-11.0	-0.000 001	-0.006



▣ MODE: LTE 66/4

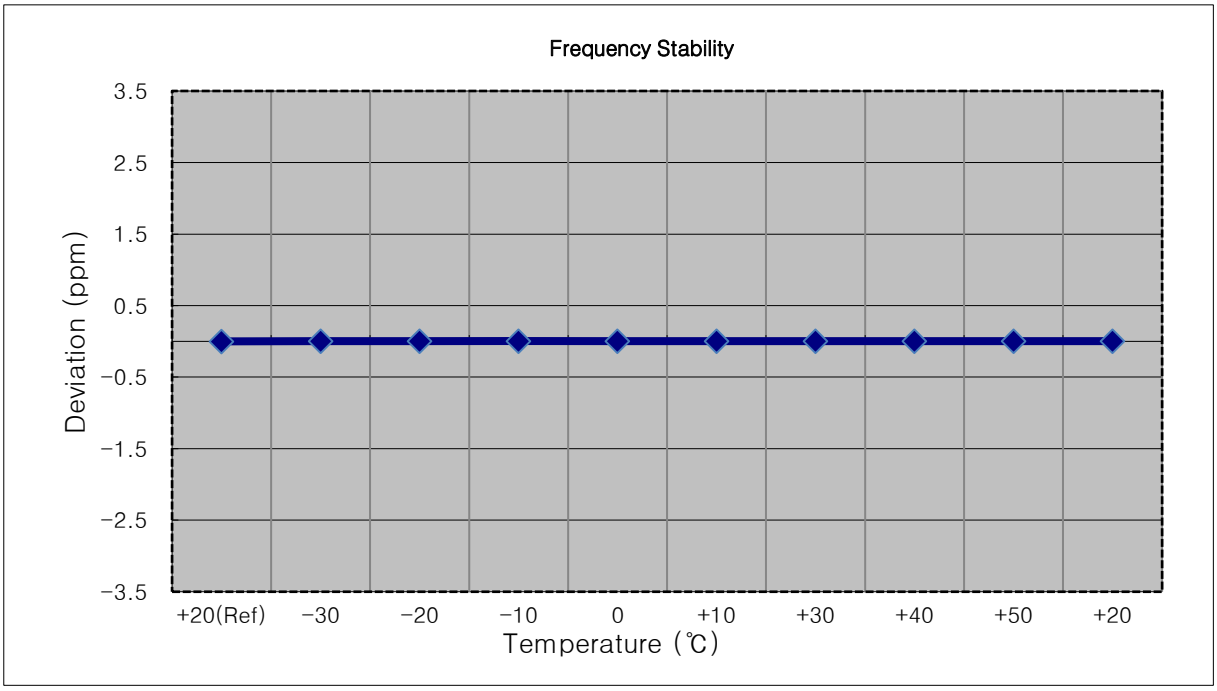
▣ OPERATING FREQUENCY: 1777,500,000 Hz

▣ CHANNEL: 132647 (5 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1777 500 006	0.0	0.000 000	0.000
100 %		-30	1777 500 011	5.1	0.000 000	0.003
100 %		-20	1777 500 009	3.4	0.000 000	0.002
100 %		-10	1777 500 014	8.3	0.000 000	0.005
100 %		0	1777 500 011	5.4	0.000 000	0.003
100 %		+10	1777 500 012	5.8	0.000 000	0.003
100 %		+30	1777 500 012	6.3	0.000 000	0.004
100 %		+40	1777 500 011	5.0	0.000 000	0.003
100 %		+50	1777 500 010	4.1	0.000 000	0.002
Batt. Endpoint	3.400	+20	1777 500 013	7.3	0.000 000	0.004



▣ MODE: LTE 66/4

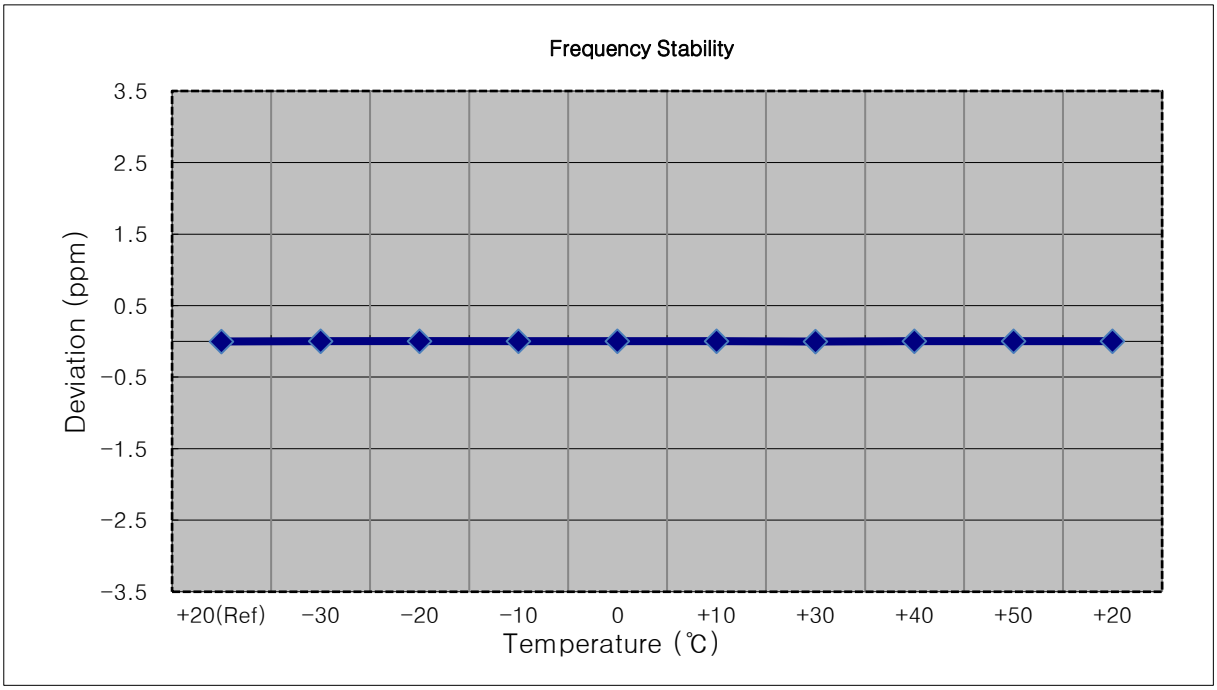
▣ OPERATING FREQUENCY: 1775,000,000 Hz

▣ CHANNEL: 132622 (10 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1774 999 995	0.0	0.000 000	0.000
100 %		-30	1774 999 999	3.7	0.000 000	0.002
100 %		-20	1775 000 003	7.6	0.000 000	0.004
100 %		-10	1774 999 998	3.5	0.000 000	0.002
100 %		0	1775 000 001	6.3	0.000 000	0.004
100 %		+10	1775 000 000	5.2	0.000 000	0.003
100 %		+30	1774 999 991	-4.2	0.000 000	-0.002
100 %		+40	1775 000 001	6.1	0.000 000	0.003
100 %		+50	1775 000 001	5.9	0.000 000	0.003
Batt. Endpoint	3.400	+20	1774 999 999	4.0	0.000 000	0.002



▣ MODE: LTE 66/4

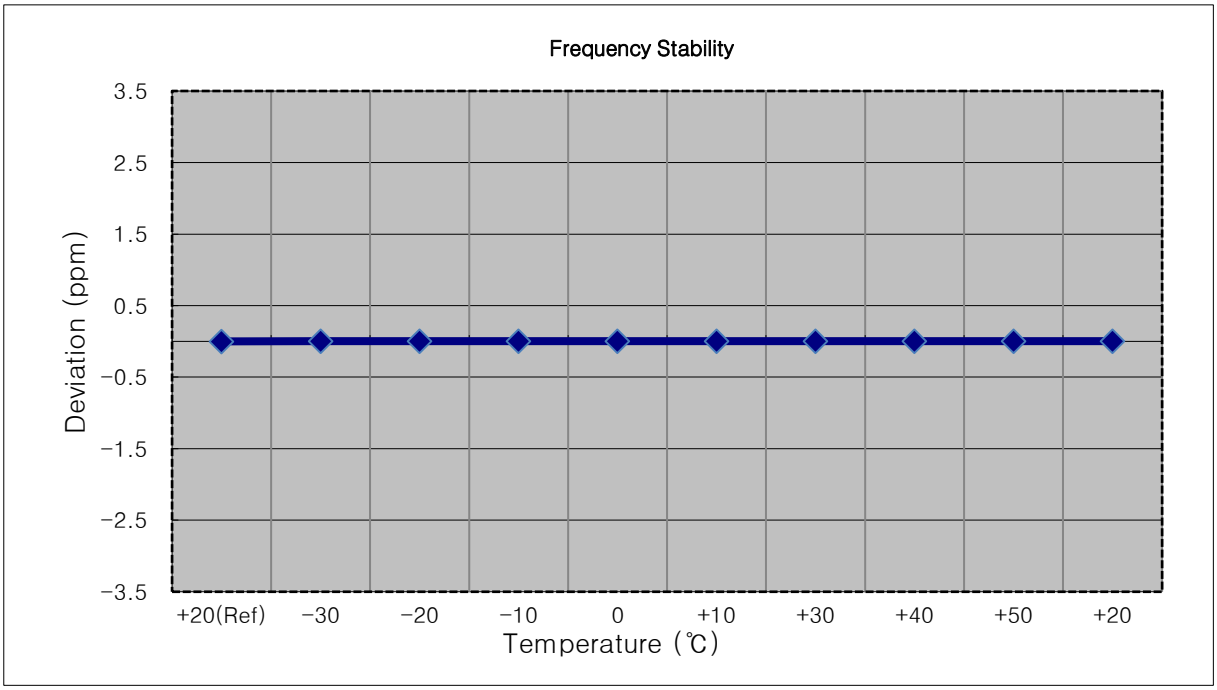
▣ OPERATING FREQUENCY: 1772,500,000 Hz

▣ CHANNEL: 132597 (15 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1772 500 003	0.0	0.000 000	0.000
100 %		-30	1772 500 007	3.4	0.000 000	0.002
100 %		-20	1772 500 008	4.6	0.000 000	0.003
100 %		-10	1772 500 007	3.8	0.000 000	0.002
100 %		0	1772 500 008	4.7	0.000 000	0.003
100 %		+10	1772 500 005	2.3	0.000 000	0.001
100 %		+30	1772 500 008	4.7	0.000 000	0.003
100 %		+40	1772 500 007	3.7	0.000 000	0.002
100 %		+50	1772 500 007	3.5	0.000 000	0.002
Batt. Endpoint	3.400	+20	1772 500 009	6.1	0.000 000	0.003



▣ MODE: LTE 66/4

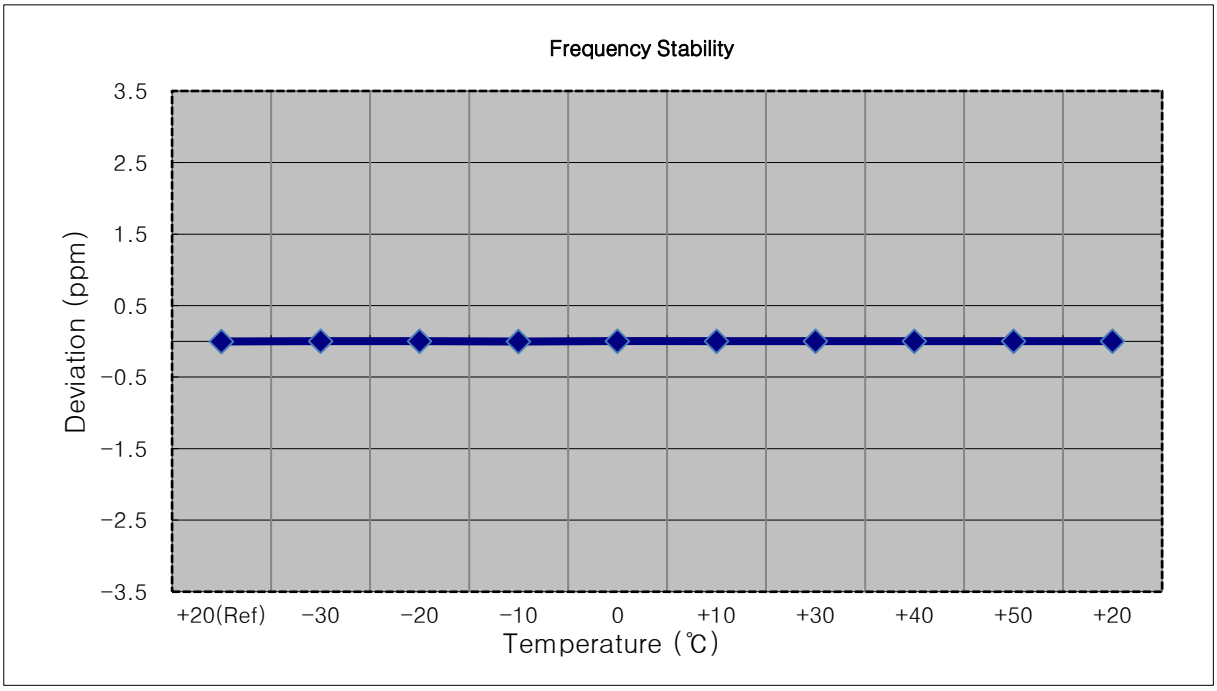
▣ OPERATING FREQUENCY: 1770,000,000 Hz

▣ CHANNEL: 132572 (20 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1770 000 006	0.0	0.000 000	0.000
100 %		-30	1770 000 010	4.1	0.000 000	0.002
100 %		-20	1770 000 011	4.7	0.000 000	0.003
100 %		-10	1770 000 002	-3.9	0.000 000	-0.002
100 %		0	1770 000 014	7.8	0.000 000	0.004
100 %		+10	1770 000 012	5.8	0.000 000	0.003
100 %		+30	1770 000 011	4.7	0.000 000	0.003
100 %		+40	1770 000 009	3.0	0.000 000	0.002
100 %		+50	1770 000 011	4.9	0.000 000	0.003
Batt. Endpoint	3.400	+20	1770 000 010	3.9	0.000 000	0.002



9. TEST DATA (Main 3 Ant)

9.1 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1710.7	LTE B66 1.4 MHz	QPSK	-21.39	11.81	9.60	1.99	V	< 1.00	0.087	19.42
		16-QAM	-22.50	10.70	9.60	1.99	V		0.068	18.31
		64-QAM	-23.48	9.72	9.60	1.99	V		0.054	17.33
		256-QAM	-26.39	6.81	9.60	1.99	V		0.028	14.42
1745.0		QPSK	-20.06	13.54	9.75	2.04	V		0.133	21.25
		16-QAM	-21.18	12.42	9.75	2.04	V		0.103	20.13
		64-QAM	-22.10	11.50	9.75	2.04	V		0.083	19.21
		256-QAM	-25.09	8.51	9.75	2.04	V		0.042	16.22
1779.3		QPSK	-19.09	14.37	9.90	2.08	V		0.166	22.19
		16-QAM	-20.17	13.29	9.90	2.08	V		0.129	21.11
		64-QAM	-21.12	12.34	9.90	2.08	V		0.104	20.16
		256-QAM	-24.12	9.34	9.90	2.08	V		0.052	17.16

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1711.5	LTE B66 3 MHz	QPSK	-21.60	11.60	9.60	1.99	V	< 1.00	0.083	19.21
		16-QAM	-22.74	10.46	9.60	1.99	V		0.064	18.07
		64-QAM	-23.67	9.53	9.60	1.99	V		0.052	17.14
		256-QAM	-26.60	6.60	9.60	1.99	V		0.026	14.21
1745.0		QPSK	-20.35	13.25	9.75	2.04	V		0.125	20.96
		16-QAM	-21.44	12.16	9.75	2.04	V		0.097	19.87
		64-QAM	-22.40	11.20	9.75	2.04	V		0.078	18.91
		256-QAM	-25.34	8.26	9.75	2.04	V		0.040	15.97
1778.5		QPSK	-19.08	14.38	9.90	2.08	V		0.166	22.20
		16-QAM	-20.19	13.27	9.90	2.08	V		0.129	21.09
		64-QAM	-21.11	12.35	9.90	2.08	V		0.104	20.17
		256-QAM	-24.05	9.41	9.90	2.08	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
1712.5	LTE B66 5 MHz	QPSK	-20.94	12.42	9.60	2.00	V	< 1.00	0.100	20.02
		16-QAM	-21.96	11.40	9.60	2.00	V		0.079	19.00
		64-QAM	-22.99	10.37	9.60	2.00	V		0.063	17.97
		256-QAM	-25.93	7.43	9.60	2.00	V		0.032	15.03
1745.0		QPSK	-19.70	13.90	9.75	2.04	V		0.145	21.61
		16-QAM	-20.80	12.80	9.75	2.04	V		0.112	20.51
		64-QAM	-21.75	11.85	9.75	2.04	V		0.090	19.56
		256-QAM	-24.73	8.87	9.75	2.04	V		0.046	16.58
1777.5		QPSK	-19.35	14.19	9.90	2.08	V		0.159	22.01
		16-QAM	-20.43	13.11	9.90	2.08	V		0.124	20.93
		64-QAM	-21.39	12.15	9.90	2.08	V		0.099	19.97
		256-QAM	-24.35	9.19	9.90	2.08	V		0.050	17.01

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1715.0	LTE B66 10 MHz	QPSK	-20.66	12.70	9.60	2.00	V	< 1.00	0.107	20.30
		16-QAM	-21.71	11.65	9.60	2.00	V		0.084	19.25
		64-QAM	-22.70	10.66	9.60	2.00	V		0.067	18.26
		256-QAM	-25.58	7.78	9.60	2.00	V		0.035	15.38
1745.0		QPSK	-19.44	14.16	9.75	2.04	V		0.154	21.87
		16-QAM	-20.54	13.06	9.75	2.04	V		0.119	20.77
		64-QAM	-21.46	12.14	9.75	2.04	V		0.097	19.85
		256-QAM	-24.49	9.11	9.75	2.04	V		0.048	16.82
1775.0		QPSK	-18.99	14.55	9.90	2.08	V		0.173	22.37
		16-QAM	-19.97	13.57	9.90	2.08	V		0.138	21.39
		64-QAM	-21.15	12.39	9.90	2.08	V		0.105	20.21
		256-QAM	-23.98	9.56	9.90	2.08	V		0.055	17.38

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1717.5	LTE B66 15 MHz	QPSK	-20.34	13.02	9.60	2.00	V	< 1.00	0.115	20.62
		16-QAM	-21.45	11.91	9.60	2.00	V		0.089	19.51
		64-QAM	-22.32	11.04	9.60	2.00	V		0.073	18.64
		256-QAM	-25.28	8.08	9.60	2.00	V		0.037	15.68
1745.0		QPSK	-19.59	14.01	9.75	2.04	V		0.149	21.72
		16-QAM	-20.68	12.92	9.75	2.04	V		0.116	20.63
		64-QAM	-21.59	12.01	9.75	2.04	V		0.094	19.72
		256-QAM	-24.62	8.98	9.75	2.04	V		0.047	16.69
1772.5		QPSK	-19.11	14.43	9.90	2.08	V		0.168	22.25
		16-QAM	-20.23	13.31	9.90	2.08	V		0.130	21.13
		64-QAM	-21.08	12.46	9.90	2.08	V		0.107	20.28
		256-QAM	-24.10	9.44	9.90	2.08	V		0.053	17.26

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
1720.0	LTE B66 20 MHz	QPSK	-20.12	13.38	9.60	2.00	V	< 1.00	0.125	20.98
		16-QAM	-21.17	12.33	9.60	2.00	V		0.098	19.93
		64-QAM	-22.09	11.41	9.60	2.00	V		0.080	19.01
		256-QAM	-25.13	8.37	9.60	2.00	V		0.040	15.97
1745.0		QPSK	-19.45	14.15	9.75	2.04	V		0.153	21.86
		16-QAM	-20.49	13.11	9.75	2.04	V		0.121	20.82
		64-QAM	-21.45	12.15	9.75	2.04	V		0.097	19.86
		256-QAM	-24.46	9.14	9.75	2.04	V		0.048	16.85
1770.0		QPSK	-19.07	14.57	9.90	2.09	V		0.173	22.38
		16-QAM	-20.18	13.46	9.90	2.09	V		0.134	21.27
		64-QAM	-21.05	12.59	9.90	2.09	V		0.110	20.40
		256-QAM	-24.05	9.59	9.90	2.09	V		0.055	17.40

9.2 RADIATED SPURIOUS EMISSIONS

▣ OPERATING FREQUENCY: 1770.0 MHz

▣ MEASURED OUTPUT POWER: 22.38 dBm = 0.173 W

▣ MODE: LTE B66

▣ MODULATION SIGNAL: 20 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 log10 (W) = 35.38 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	dBc
132072 (1720.0)	3 440.00	-57.34	11.10	-58.29	2.97	H	-50.16	72.54
	5 160.00	-46.52	11.00	-41.69	3.69	H	-34.38	56.76
	6 880.00	-62.88	10.80	-51.19	4.28	H	-44.67	67.05
	8 600.00	-57.42	10.40	-43.87	4.80	H	-38.27	60.65
	10 320.00	-64.09	11.10	-46.32	5.34	H	-40.56	62.94
132322 (1745.0)	3 490.00	-58.37	11.20	-59.81	3.00	V	-51.61	73.98
	5 235.00	-58.86	11.10	-53.93	3.70	V	-46.53	68.91
	6 980.00	-63.24	10.90	-50.53	4.30	V	-43.93	66.31
	8 725.00	-61.77	10.30	-47.41	4.88	V	-41.99	64.37
	10 470.00	-62.77	11.30	-45.04	5.43	V	-39.17	61.55
132572 (1770.0)	3 540.00	-59.81	11.30	-61.61	3.02	V	-53.33	75.71
	5 310.00	-61.10	11.40	-56.74	3.65	V	-48.99	71.37
	7 080.00	-62.79	10.70	-48.91	4.34	V	-42.55	64.93
	8 850.00	-62.26	10.50	-48.17	4.95	V	-42.62	65.00
	10 620.00	-63.60	11.20	-45.08	5.41	V	-39.29	61.67

9.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
66	1.4 MHz	1745.0	QPSK	6	0	5.37
			16-QAM			5.88
			64-QAM			5.89
			256-QAM			6.62
	3 MHz		QPSK	15		5.45
			16-QAM			5.93
			64-QAM			5.96
			256-QAM			6.58
	5 MHz		QPSK	25		5.38
			16-QAM			6.04
			64-QAM			6.04
			256-QAM			6.61
	10 MHz		QPSK	50		5.39
			16-QAM			6.02
			64-QAM			6.03
			256-QAM			6.57
	15 MHz		QPSK	75		5.41
			16-QAM			6.15
			64-QAM			6.28
			256-QAM			6.48
	20 MHz		QPSK	100		5.42
			16-QAM			6.12
			64-QAM			6.28
			256-QAM			6.49

Note:

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

9.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
66	1.4 MHz	1745.0	QPSK	6	0	1.0935
			16-QAM			1.0939
			64-QAM			1.0924
			256-QAM			1.0949
	3 MHz		QPSK	15		2.7166
			16-QAM			2.7268
			64-QAM			2.7384
			256-QAM			2.7111
	5 MHz		QPSK	25		4.5508
			16-QAM			4.4887
			64-QAM			4.5002
			256-QAM			4.5471
	10 MHz		QPSK	50		9.0001
			16-QAM			8.9986
			64-QAM			9.0069
			256-QAM			8.9876
	15 MHz		QPSK	75		13.472
			16-QAM			13.349
			64-QAM			13.466
			256-QAM			13.503
	20 MHz		QPSK	100		17.922
			16-QAM			17.971
			64-QAM			17.884
			256-QAM			17.951

Note:

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

9.5 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
66	1.4	1710.7	3.7084	21.976	-67.193	-45.217	-13.00
		1745.0	3.6955	21.976	-66.927	-44.951	
		1779.3	3.7114	21.976	-67.064	-45.088	
	3	1711.5	3.7099	21.976	-67.218	-45.242	
		1745.0	3.7074	21.976	-67.530	-45.554	
		1778.5	3.6960	21.976	-67.231	-45.255	
	5	1712.5	3.4213	21.976	-66.897	-44.921	
		1745.0	3.7084	21.976	-67.175	-45.199	
		1777.5	3.7139	21.976	-67.277	-45.301	
	10	1715.0	3.4218	21.976	-66.730	-44.754	
		1745.0	3.7174	21.976	-67.473	-45.497	
		1775.0	3.6840	21.976	-67.054	-45.078	
	15	1717.5	1.6850	21.976	-66.111	-44.135	
		1745.0	3.6875	21.976	-67.042	-45.066	
		1772.5	3.6671	21.976	-67.494	-45.518	
	20	1720.0	3.4228	21.976	-67.011	-45.035	
		1745.0	3.6925	21.976	-67.147	-45.171	
		1770.0	3.6900	21.976	-68.371	-46.395	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 284 ~ 319.

2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0

3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)

4. Factor (dB) = Cable Loss + Attenuator

Frequency Range (GHz)	Factor [dB]
0.03 – 1	19.270
1 – 5	21.976
5 – 10	22.591
10 – 15	23.116
15 – 20	23.489
Above 20(26.5)	24.131

9.6 BAND EDGE

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

9.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE 66

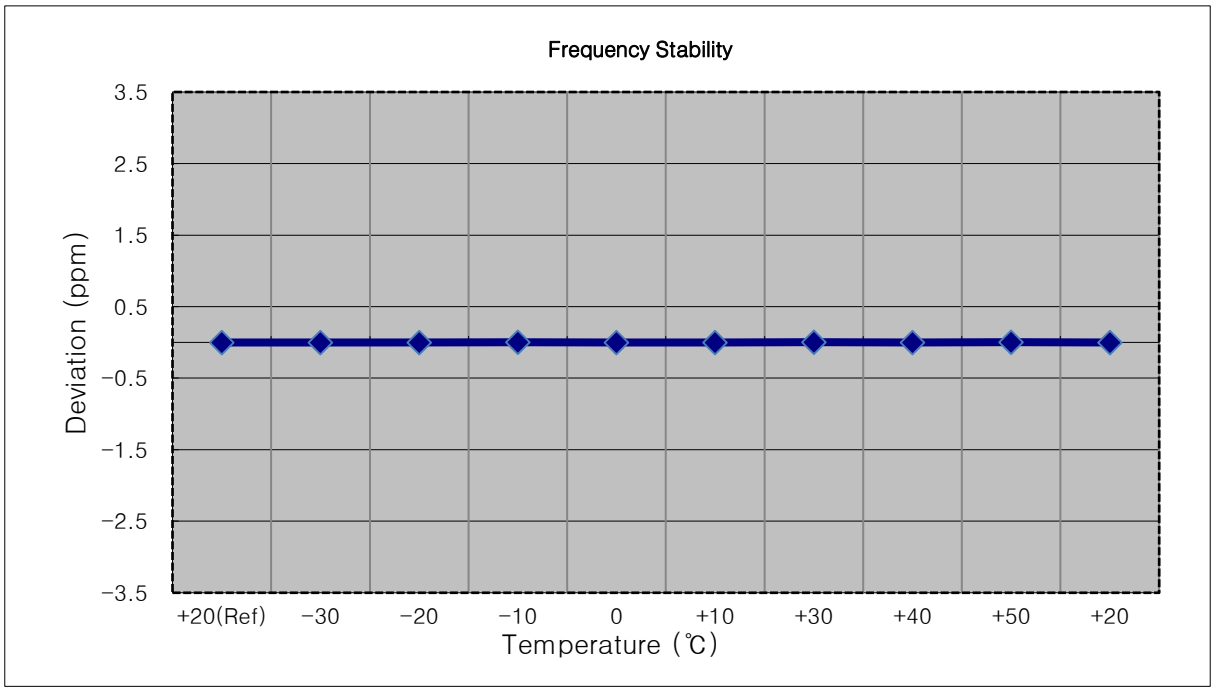
▣ OPERATING FREQUENCY: 1710,700,000 Hz

▣ CHANNEL: 131979 (1.4 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1710 700 000	0.0	0.000 000	0.000
100 %		-30	1710 700 001	0.3	0.000 000	0.000
100 %		-20	1710 699 999	-1.4	0.000 000	-0.001
100 %		-10	1710 700 004	3.7	0.000 000	0.002
100 %		0	1710 700 002	1.8	0.000 000	0.001
100 %		+10	1710 700 001	0.7	0.000 000	0.000
100 %		+30	1710 700 003	2.9	0.000 000	0.002
100 %		+40	1710 700 002	1.5	0.000 000	0.001
100 %		+50	1710 700 003	2.1	0.000 000	0.001
Batt. Endpoint	3.400	+20	1710 700 002	1.7	0.000 000	0.001



▣ MODE: LTE 66

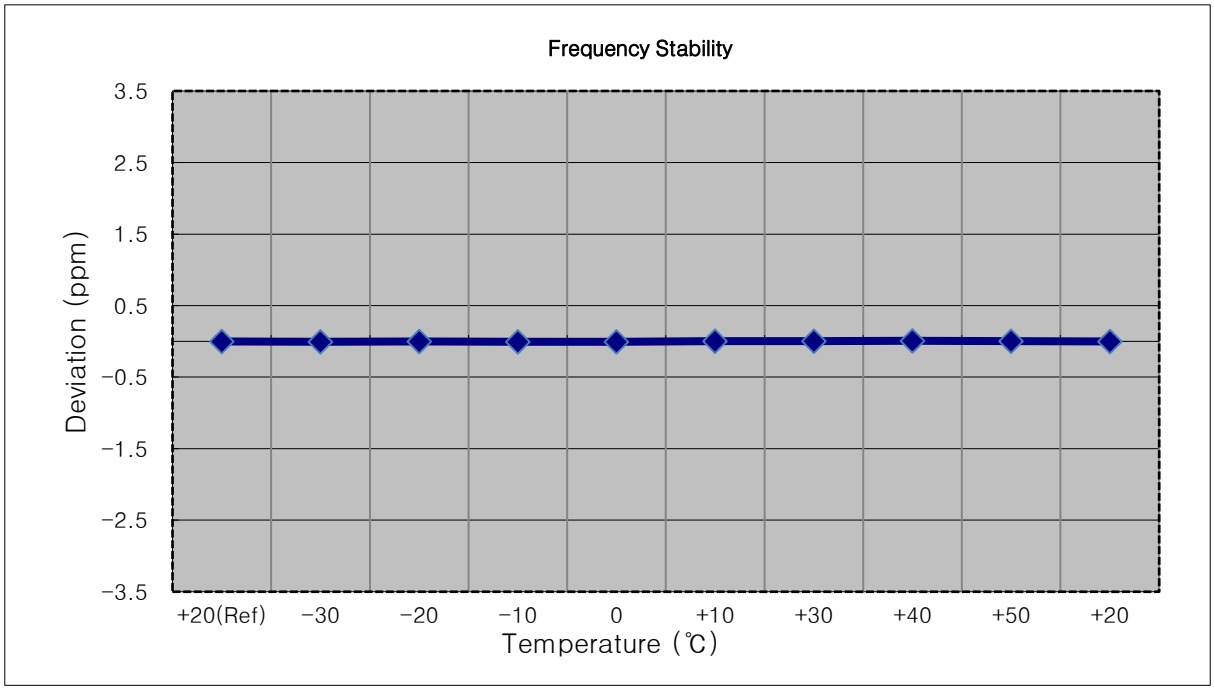
▣ OPERATING FREQUENCY: 1711,500,000 Hz

▣ CHANNEL: 131987 (3 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1711 499 998	0.0	0.000 000	0.000
100 %		-30	1711 499 988	-9.6	-0.000 001	-0.006
100 %		-20	1711 499 999	1.3	0.000 000	0.001
100 %		-10	1711 499 989	-9.4	-0.000 001	-0.005
100 %		0	1711 499 988	-10.4	-0.000 001	-0.006
100 %		+10	1711 500 001	3.4	0.000 000	0.002
100 %		+30	1711 500 000	2.2	0.000 000	0.001
100 %		+40	1711 500 012	14.1	0.000 001	0.008
100 %		+50	1711 500 001	2.8	0.000 000	0.002
Batt. Endpoint	3.400	+20	1711 500 000	1.8	0.000 000	0.001



▣ MODE: LTE 66

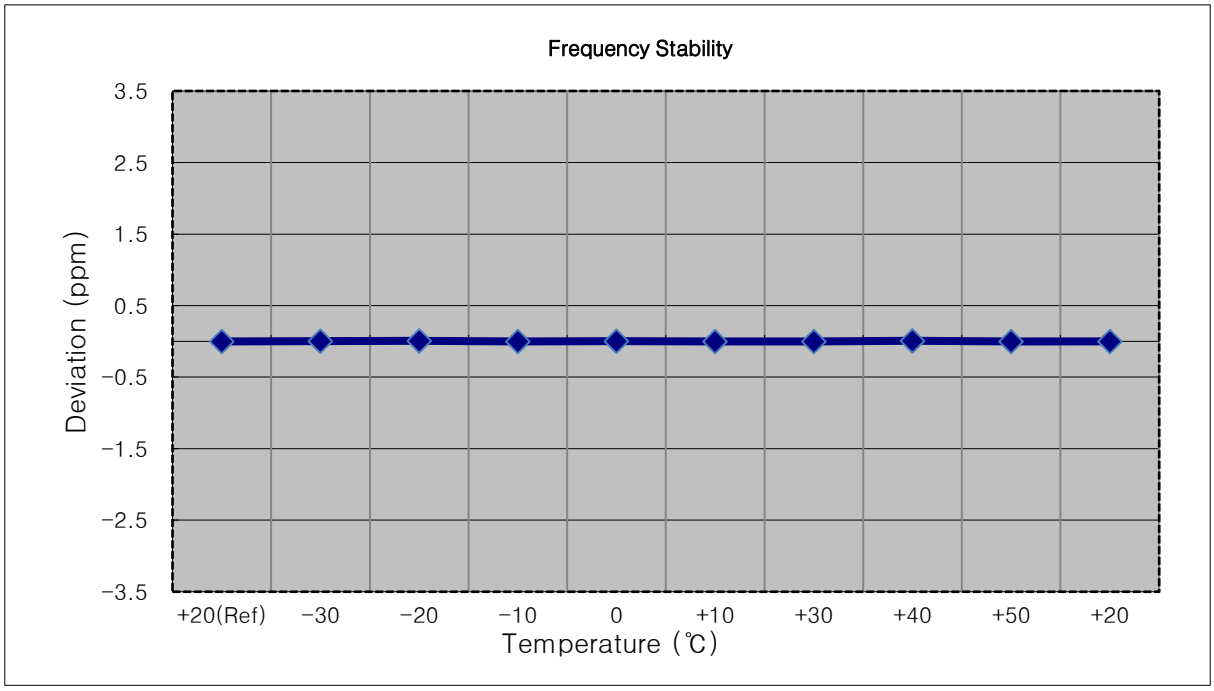
▣ OPERATING FREQUENCY: 1712,500,000 Hz

▣ CHANNEL: 131997 (5 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1712 500 002	0.0	0.000 000	0.000
100 %		-30	1712 500 004	2.0	0.000 000	0.001
100 %		-20	1712 500 016	14.1	0.000 001	0.008
100 %		-10	1712 500 004	1.4	0.000 000	0.001
100 %		0	1712 500 005	3.2	0.000 000	0.002
100 %		+10	1712 500 004	1.4	0.000 000	0.001
100 %		+30	1712 500 004	1.9	0.000 000	0.001
100 %		+40	1712 500 017	14.8	0.000 001	0.009
100 %		+50	1712 500 003	0.7	0.000 000	0.000
Batt. Endpoint	3.400	+20	1712 500 002	0.0	0.000 000	0.000



▣ MODE: LTE 66

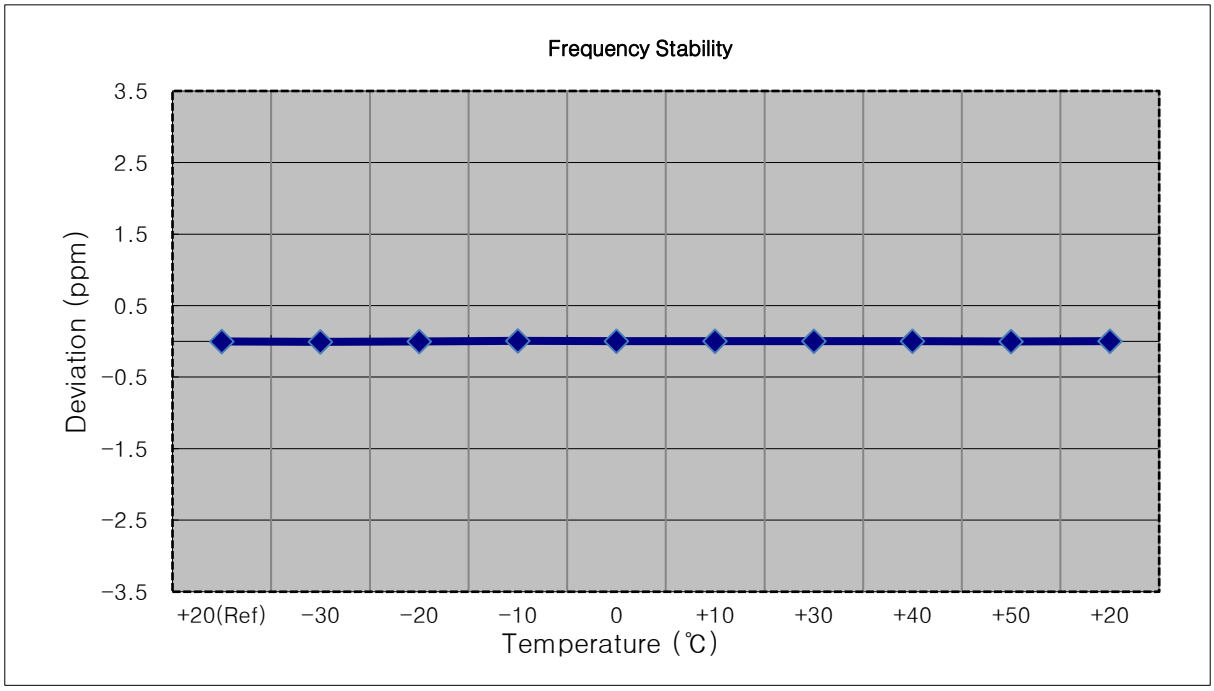
▣ OPERATING FREQUENCY: 1715,000,000 Hz

▣ CHANNEL: 132022 (10 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1715 000 000	0.0	0.000 000	0.000
100 %		-30	1714 999 988	-11.8	-0.000 001	-0.007
100 %		-20	1715 000 001	1.2	0.000 000	0.001
100 %		-10	1715 000 012	12.6	0.000 001	0.007
100 %		0	1715 000 001	1.9	0.000 000	0.001
100 %		+10	1715 000 002	2.2	0.000 000	0.001
100 %		+30	1715 000 002	2.5	0.000 000	0.001
100 %		+40	1715 000 004	4.1	0.000 000	0.002
100 %		+50	1715 000 001	1.3	0.000 000	0.001
Batt. Endpoint	3.400	+20	1715 000 003	3.5	0.000 000	0.002



▣ MODE: LTE 66

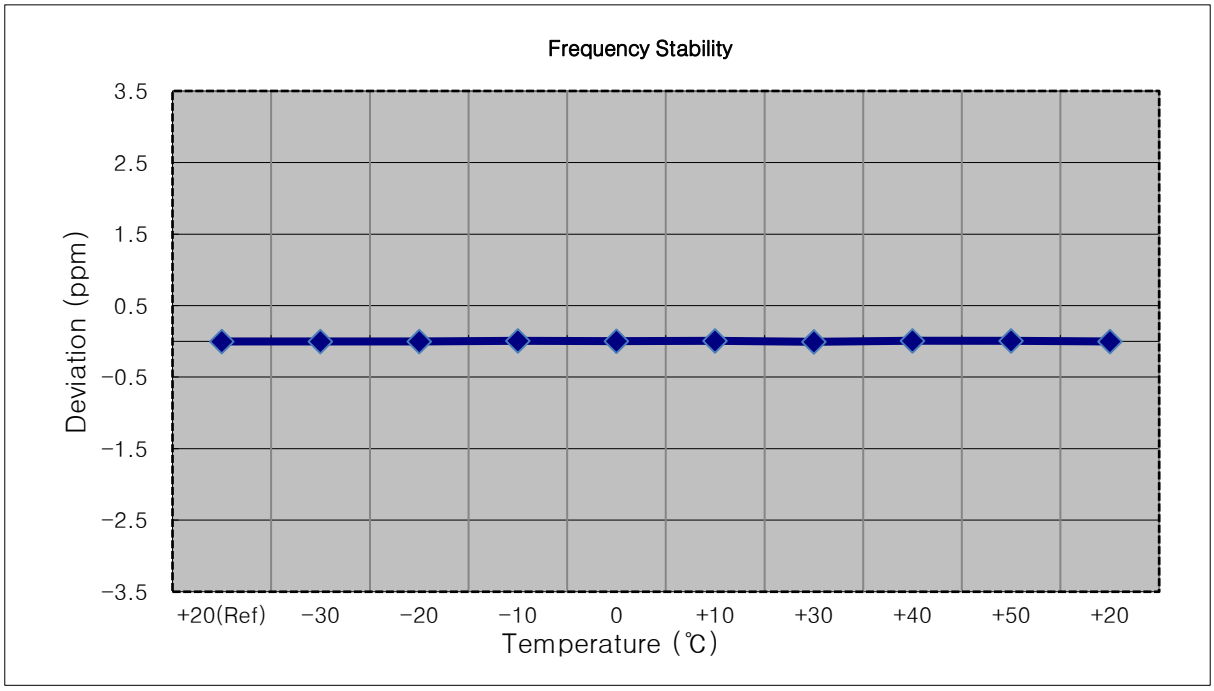
▣ OPERATING FREQUENCY: 1717,500,000 Hz

▣ CHANNEL: 132047 (15 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1717 500 002	0.0	0.000 000	0.000
100 %		-30	1717 500 004	1.6	0.000 000	0.001
100 %		-20	1717 500 004	1.5	0.000 000	0.001
100 %		-10	1717 500 016	14.4	0.000 001	0.008
100 %		0	1717 500 004	2.1	0.000 000	0.001
100 %		+10	1717 500 015	12.6	0.000 001	0.007
100 %		+30	1717 499 992	-10.2	-0.000 001	-0.006
100 %		+40	1717 500 018	15.6	0.000 001	0.009
100 %		+50	1717 500 016	14.3	0.000 001	0.008
Batt. Endpoint	3.400	+20	1717 500 002	0.5	0.000 000	0.000



▣ MODE: LTE 66

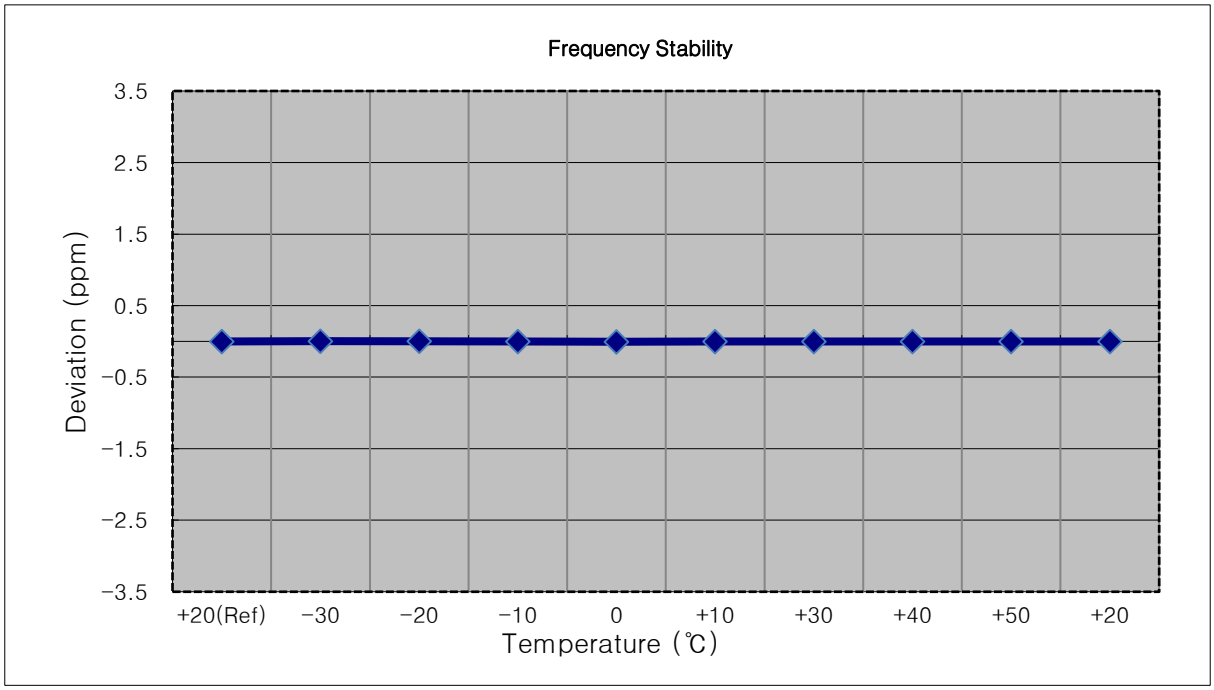
▣ OPERATING FREQUENCY: 1720,000,000 Hz

▣ CHANNEL: 132072 (20 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1720 000 014	0.0	0.000 000	0.000
100 %		-30	1720 000 016	1.9	0.000 000	0.001
100 %		-20	1720 000 017	2.4	0.000 000	0.001
100 %		-10	1720 000 014	-0.2	0.000 000	0.000
100 %		0	1720 000 005	-9.2	-0.000 001	-0.005
100 %		+10	1720 000 015	0.5	0.000 000	0.000
100 %		+30	1720 000 014	0.0	0.000 000	0.000
100 %		+40	1720 000 015	0.9	0.000 000	0.001
100 %		+50	1720 000 015	0.9	0.000 000	0.001
Batt. Endpoint	3.400	+20	1720 000 016	1.4	0.000 000	0.001



▣ MODE: LTE 66

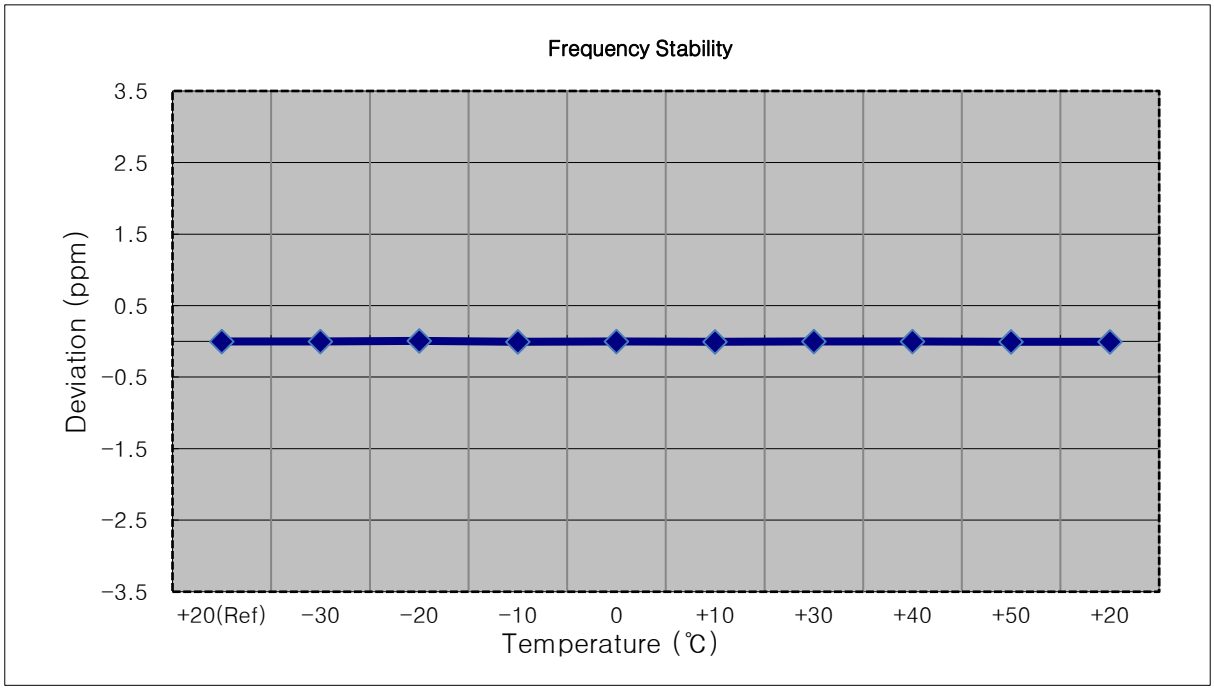
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (1.4 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 002	0.0	0.000 000	0.000
100 %		-30	1745 000 002	-0.3	0.000 000	0.000
100 %		-20	1745 000 014	11.6	0.000 001	0.007
100 %		-10	1744 999 994	-8.6	0.000 000	-0.005
100 %		0	1745 000 002	0.0	0.000 000	0.000
100 %		+10	1744 999 992	-10.2	-0.000 001	-0.006
100 %		+30	1745 000 002	-0.6	0.000 000	0.000
100 %		+40	1745 000 003	0.8	0.000 000	0.000
100 %		+50	1744 999 992	-10.4	-0.000 001	-0.006
Batt. Endpoint	3.400	+20	1744 999 993	-9.2	-0.000 001	-0.005



▣ MODE: LTE 66

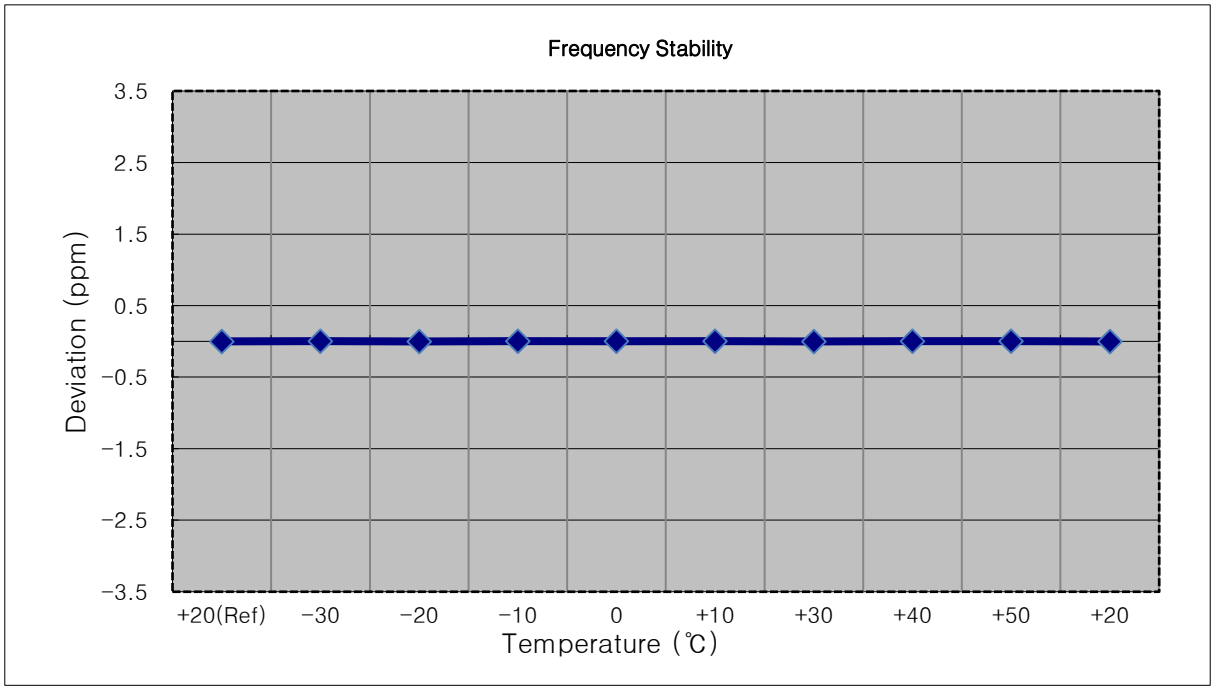
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (3 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 014	0.0	0.000 000	0.000
100 %		-30	1745 000 016	2.7	0.000 000	0.002
100 %		-20	1745 000 014	0.6	0.000 000	0.000
100 %		-10	1745 000 016	2.0	0.000 000	0.001
100 %		0	1745 000 017	3.2	0.000 000	0.002
100 %		+10	1745 000 016	2.9	0.000 000	0.002
100 %		+30	1745 000 014	0.4	0.000 000	0.000
100 %		+40	1745 000 016	2.4	0.000 000	0.001
100 %		+50	1745 000 016	2.7	0.000 000	0.002
Batt. Endpoint	3.400	+20	1745 000 015	1.7	0.000 000	0.001



▣ MODE: LTE 66

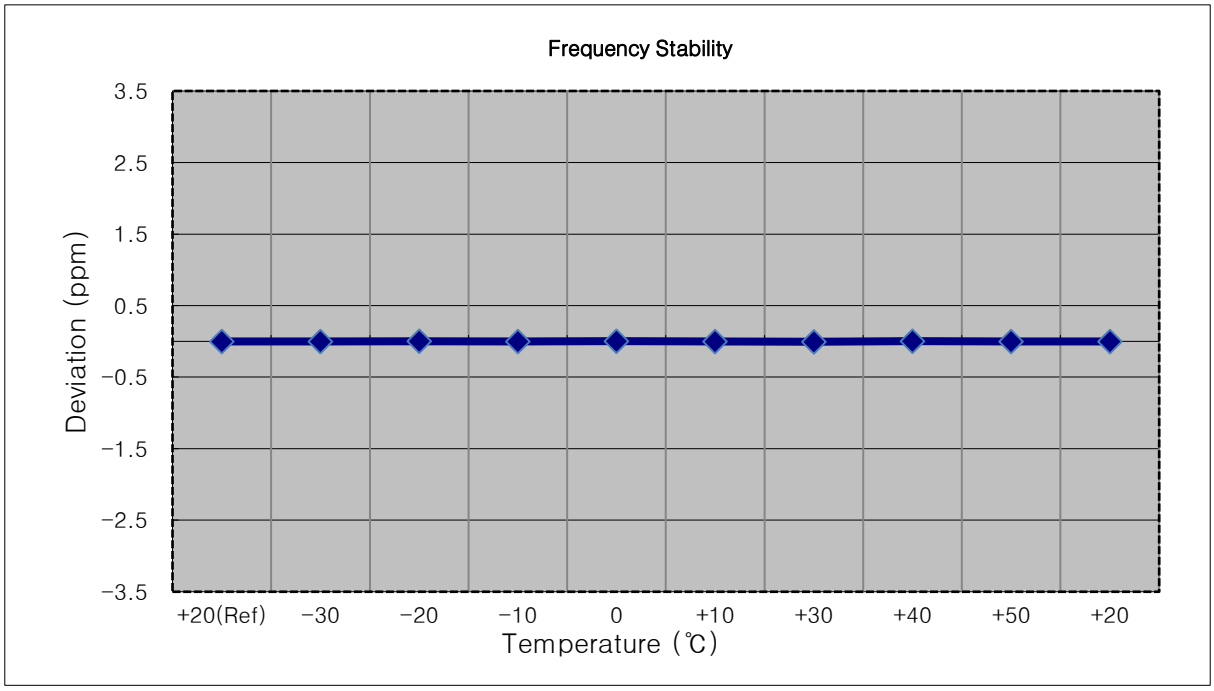
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (5 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 004	0.0	0.000 000	0.000
100 %		-30	1745 000 004	0.4	0.000 000	0.000
100 %		-20	1745 000 006	2.7	0.000 000	0.002
100 %		-10	1745 000 002	-1.6	0.000 000	-0.001
100 %		0	1745 000 006	2.0	0.000 000	0.001
100 %		+10	1745 000 004	0.4	0.000 000	0.000
100 %		+30	1744 999 995	-9.0	-0.000 001	-0.005
100 %		+40	1745 000 006	2.0	0.000 000	0.001
100 %		+50	1745 000 005	1.3	0.000 000	0.001
Batt. Endpoint	3.400	+20	1745 000 003	-0.2	0.000 000	0.000



▣ MODE: LTE 66

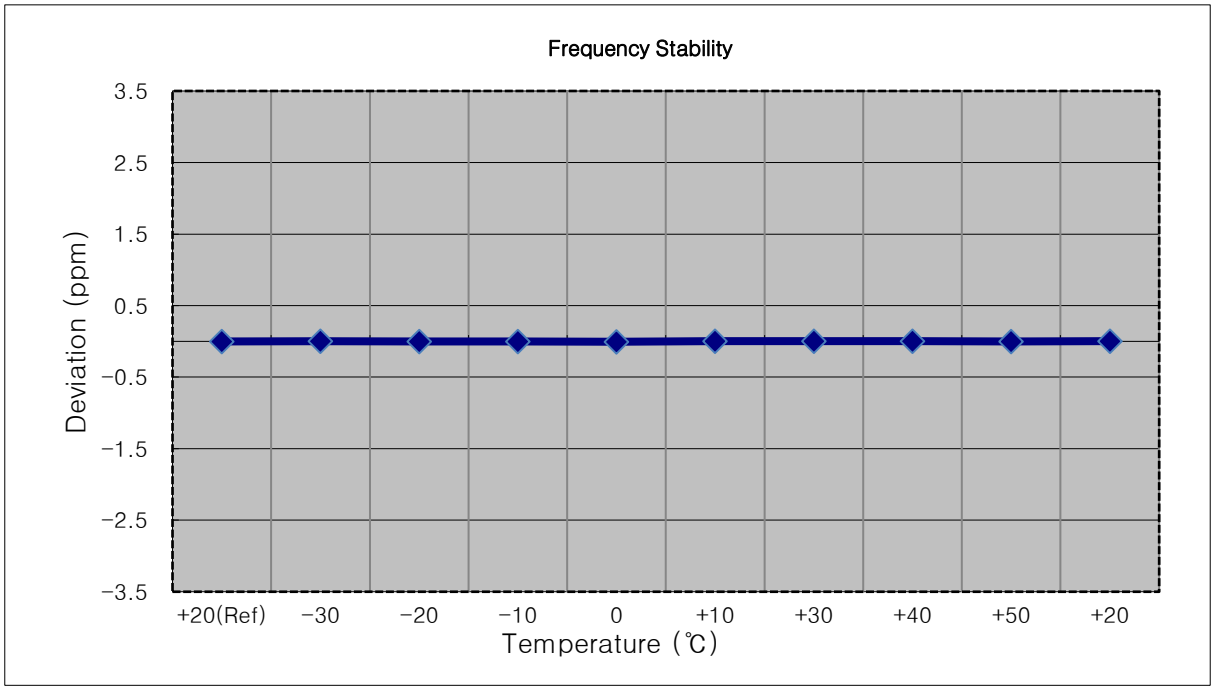
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (10 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 004	0.0	0.000 000	0.000
100 %		-30	1745 000 007	3.8	0.000 000	0.002
100 %		-20	1745 000 005	0.8	0.000 000	0.000
100 %		-10	1745 000 005	1.5	0.000 000	0.001
100 %		0	1744 999 995	-9.0	-0.000 001	-0.005
100 %		+10	1745 000 007	3.5	0.000 000	0.002
100 %		+30	1745 000 006	2.3	0.000 000	0.001
100 %		+40	1745 000 006	2.5	0.000 000	0.001
100 %		+50	1745 000 004	0.6	0.000 000	0.000
Batt. Endpoint	3.400	+20	1745 000 007	2.9	0.000 000	0.002



▣ MODE: LTE 66

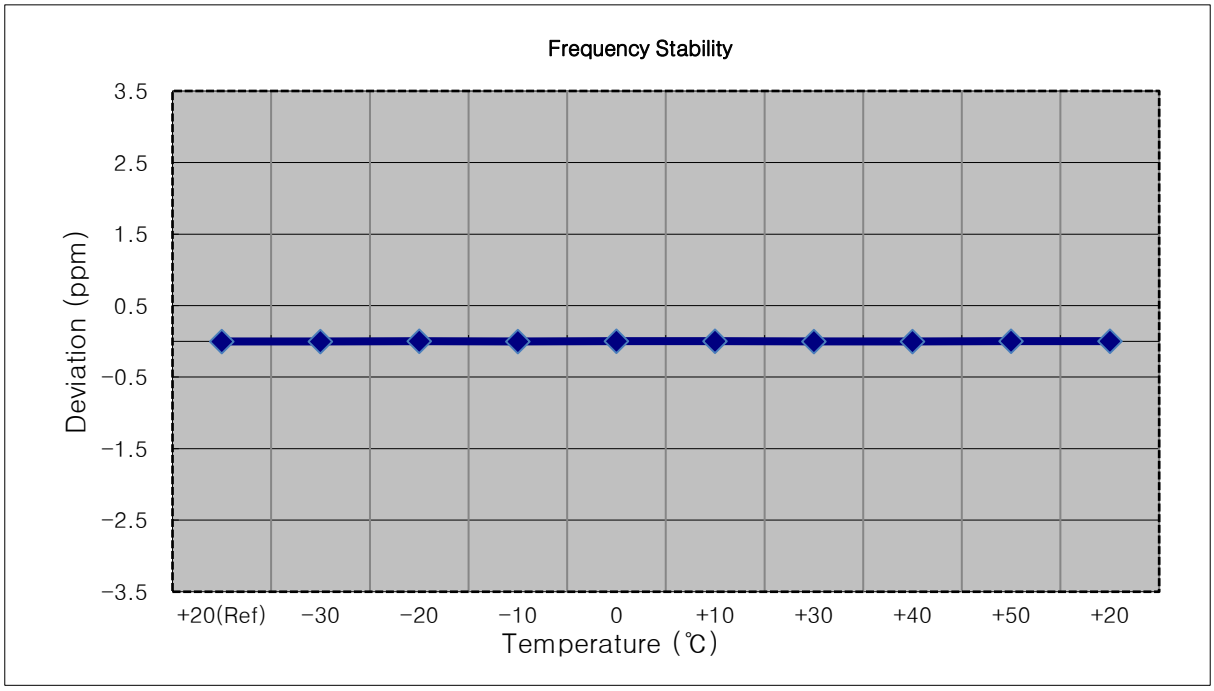
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (15 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1744 999 992	0.0	0.000 000	0.000
100 %		-30	1744 999 994	1.8	0.000 000	0.001
100 %		-20	1744 999 997	4.6	0.000 000	0.003
100 %		-10	1744 999 993	1.0	0.000 000	0.001
100 %		0	1744 999 995	2.9	0.000 000	0.002
100 %		+10	1744 999 996	3.1	0.000 000	0.002
100 %		+30	1744 999 992	-0.8	0.000 000	0.000
100 %		+40	1744 999 994	1.4	0.000 000	0.001
100 %		+50	1744 999 995	2.2	0.000 000	0.001
Batt. Endpoint	3.400	+20	1744 999 995	2.7	0.000 000	0.002



▣ MODE: LTE 66

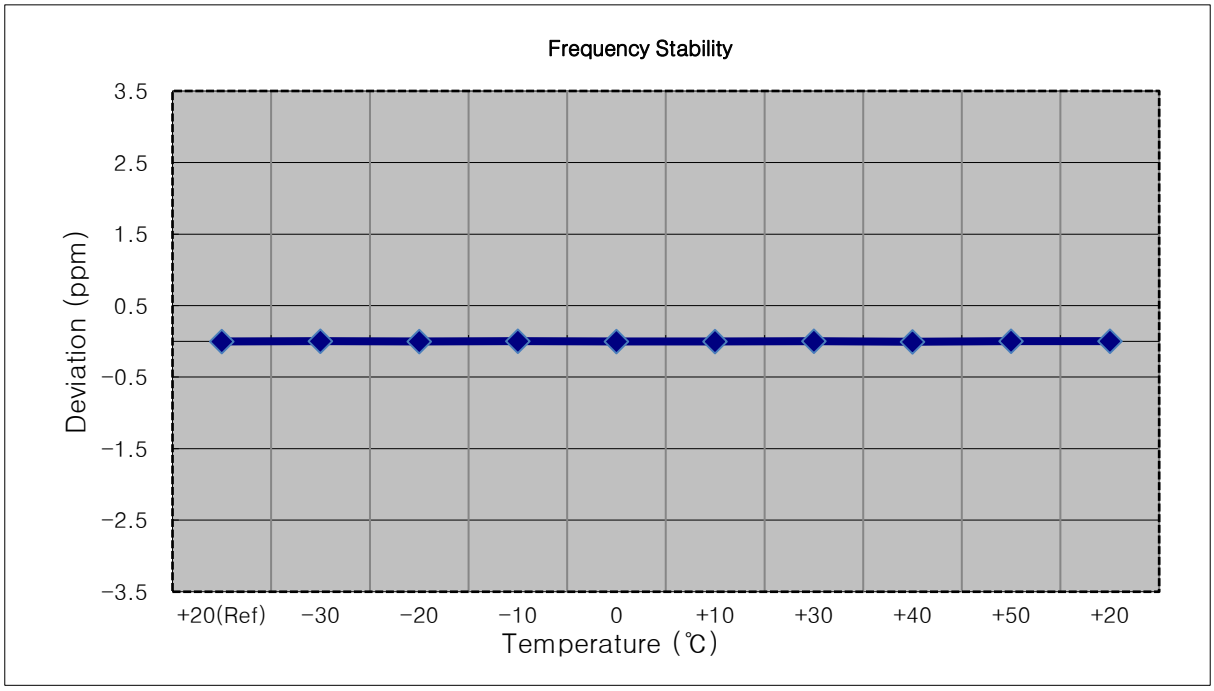
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 132322 (20 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1745 000 001	0.0	0.000 000	0.000
100 %		-30	1745 000 003	2.0	0.000 000	0.001
100 %		-20	1745 000 003	1.9	0.000 000	0.001
100 %		-10	1745 000 004	2.4	0.000 000	0.001
100 %		0	1745 000 001	-0.6	0.000 000	0.000
100 %		+10	1745 000 002	0.8	0.000 000	0.000
100 %		+30	1745 000 006	4.5	0.000 000	0.003
100 %		+40	1744 999 992	-9.1	-0.000 001	-0.005
100 %		+50	1745 000 005	3.2	0.000 000	0.002
Batt. Endpoint	3.400	+20	1745 000 004	2.1	0.000 000	0.001



▣ MODE: LTE 66

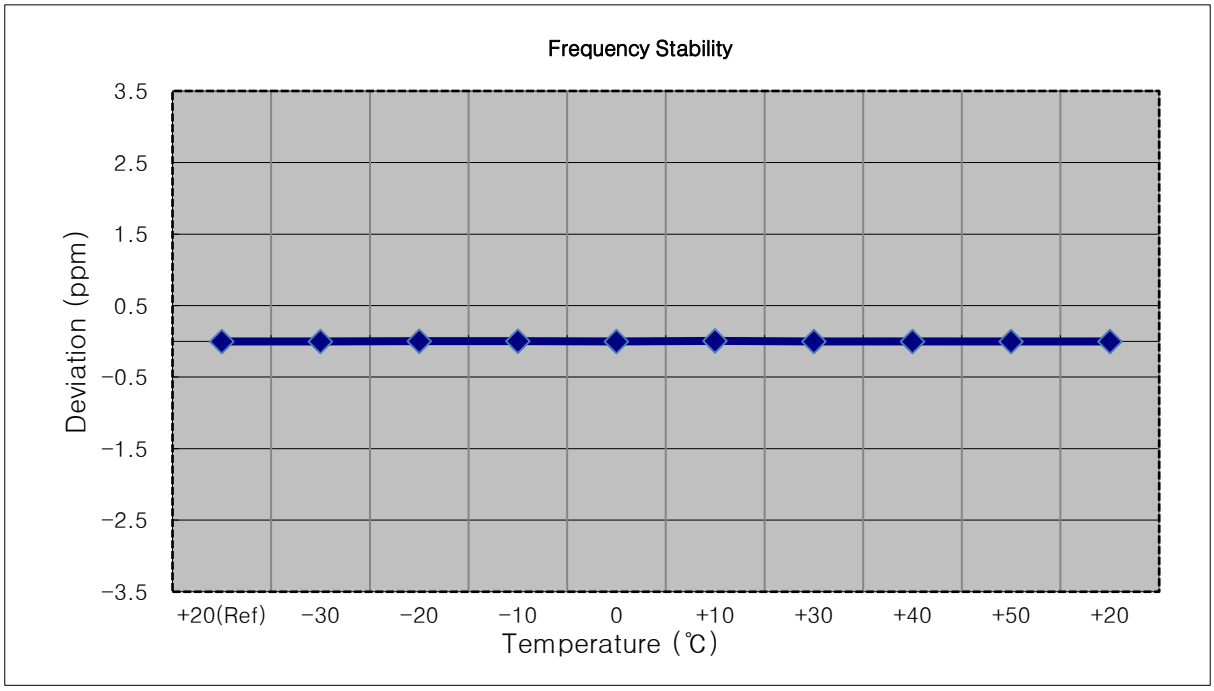
▣ OPERATING FREQUENCY: 1779,300,000 Hz

▣ CHANNEL: 132665 (1.4 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1779 300 003	0.0	0.000 000	0.000
100 %		-30	1779 300 001	-1.3	0.000 000	-0.001
100 %		-20	1779 300 008	5.1	0.000 000	0.003
100 %		-10	1779 300 005	2.6	0.000 000	0.001
100 %		0	1779 300 004	0.7	0.000 000	0.000
100 %		+10	1779 300 014	10.9	0.000 001	0.006
100 %		+30	1779 300 003	0.6	0.000 000	0.000
100 %		+40	1779 300 001	-1.6	0.000 000	-0.001
100 %		+50	1779 300 003	0.5	0.000 000	0.000
Batt. Endpoint	3.400	+20	1779 300 004	1.2	0.000 000	0.001



▣ MODE: LTE 66

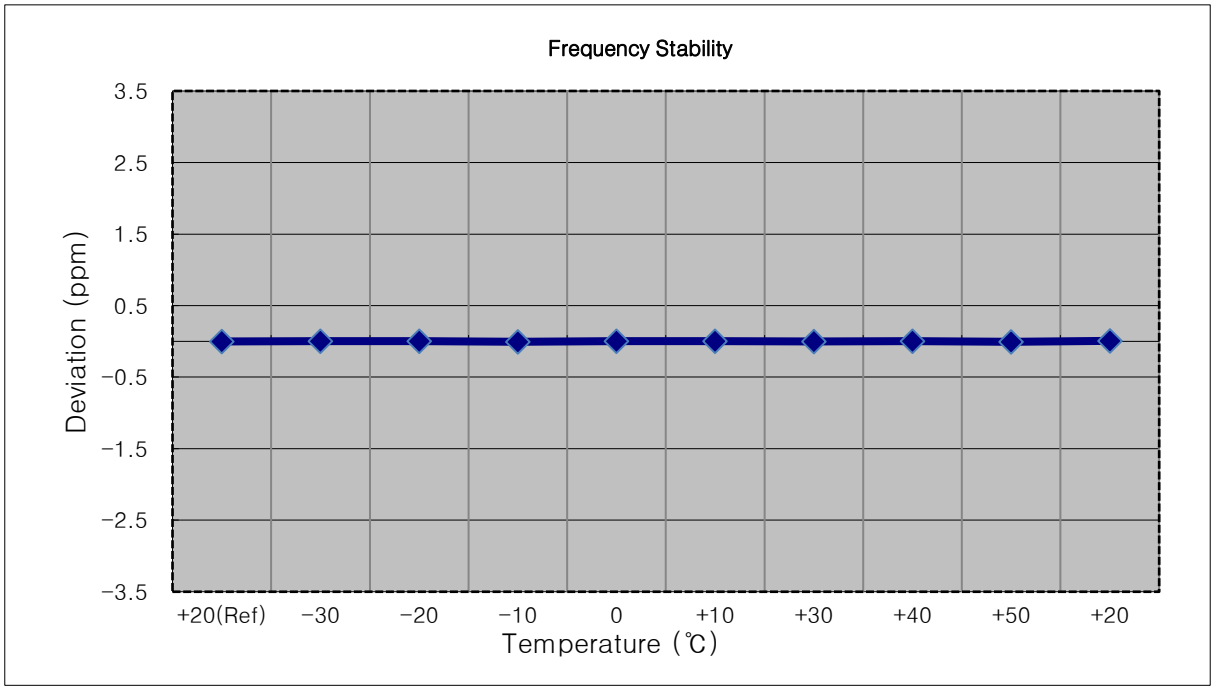
▣ OPERATING FREQUENCY: 1778,500,000 Hz

▣ CHANNEL: 132657 (3 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1778 500 003	0.0	0.000 000	0.000
100 %		-30	1778 500 005	2.0	0.000 000	0.001
100 %		-20	1778 500 007	3.8	0.000 000	0.002
100 %		-10	1778 499 994	-8.6	0.000 000	-0.005
100 %		0	1778 500 006	3.6	0.000 000	0.002
100 %		+10	1778 500 007	3.7	0.000 000	0.002
100 %		+30	1778 500 003	0.5	0.000 000	0.000
100 %		+40	1778 500 008	5.0	0.000 000	0.003
100 %		+50	1778 499 992	-10.5	-0.000 001	-0.006
Batt. Endpoint	3.400	+20	1778 500 015	12.4	0.000 001	0.007



▣ MODE: LTE 66

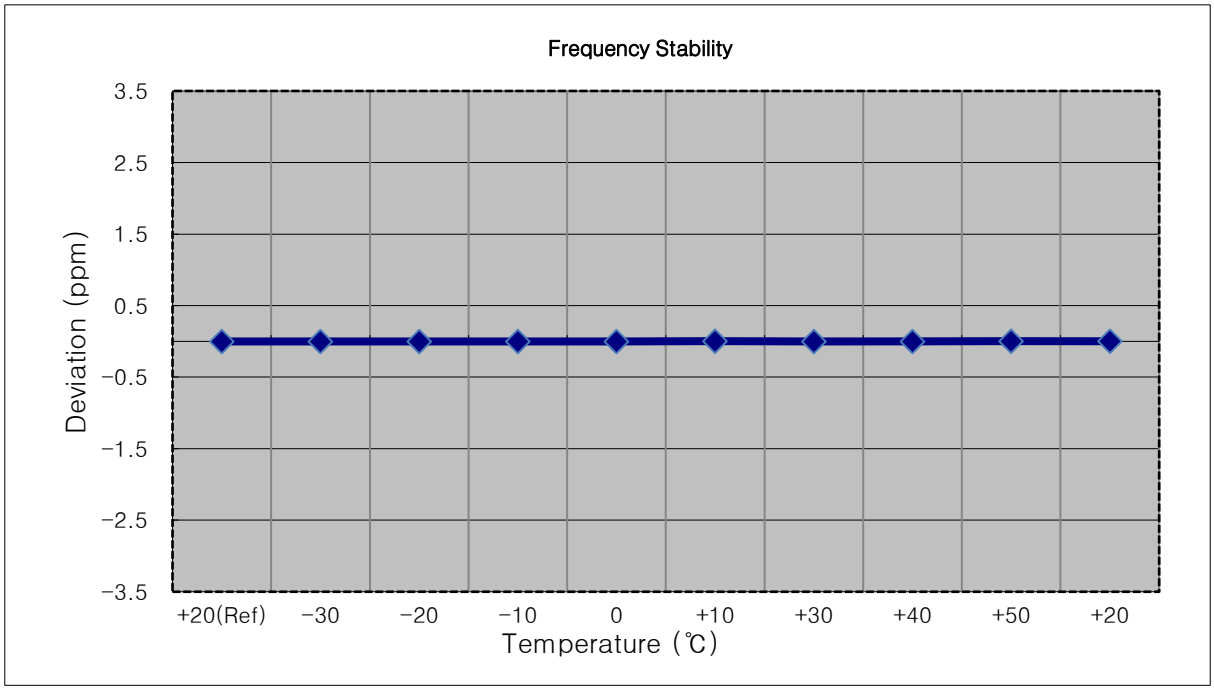
▣ OPERATING FREQUENCY: 1777,500,000 Hz

▣ CHANNEL: 132647 (5 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1777 499 999	0.0	0.000 000	0.000
100 %		-30	1777 500 000	1.2	0.000 000	0.001
100 %		-20	1777 500 000	0.8	0.000 000	0.000
100 %		-10	1777 500 000	1.5	0.000 000	0.001
100 %		0	1777 500 000	1.4	0.000 000	0.001
100 %		+10	1777 500 001	2.2	0.000 000	0.001
100 %		+30	1777 499 999	0.7	0.000 000	0.000
100 %		+40	1777 499 998	-0.3	0.000 000	0.000
100 %		+50	1777 500 001	2.0	0.000 000	0.001
Batt. Endpoint	3.400	+20	1777 500 001	2.5	0.000 000	0.001



▣ MODE: LTE 66

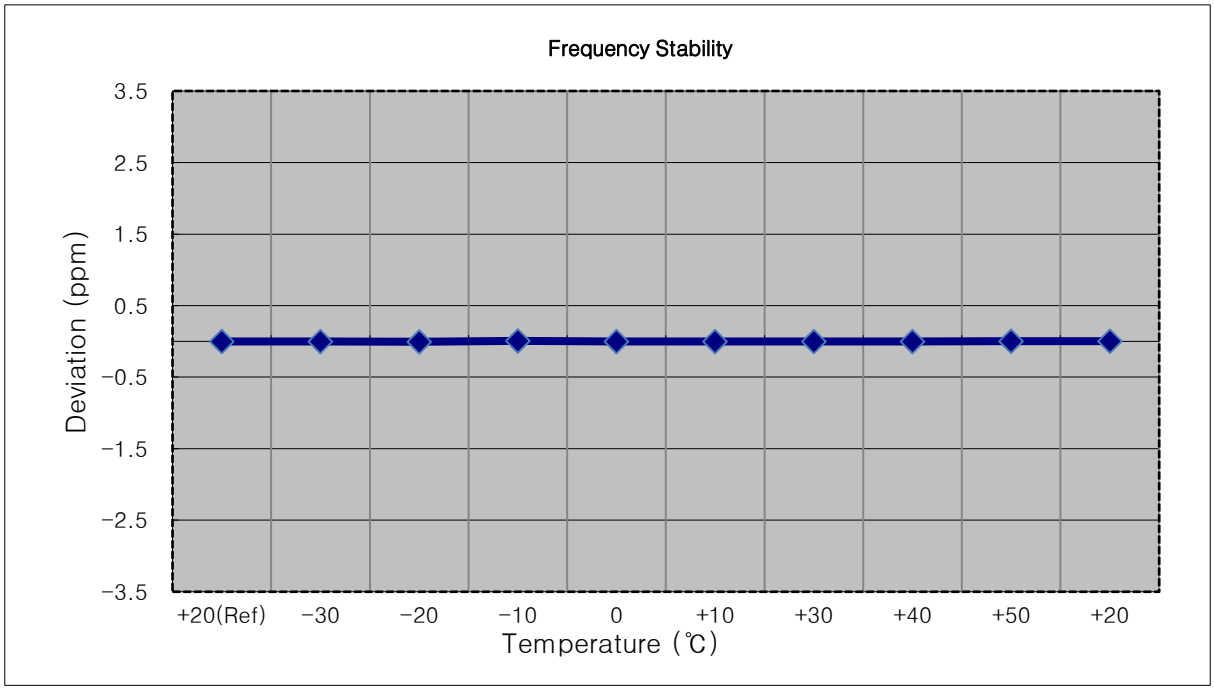
▣ OPERATING FREQUENCY: 1775,000,000 Hz

▣ CHANNEL: 132622 (10 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1775 000 002	0.0	0.000 000	0.000
100 %		-30	1775 000 002	-0.4	0.000 000	0.000
100 %		-20	1774 999 993	-9.5	-0.000 001	-0.005
100 %		-10	1775 000 015	12.8	0.000 001	0.007
100 %		0	1775 000 004	1.3	0.000 000	0.001
100 %		+10	1775 000 004	1.8	0.000 000	0.001
100 %		+30	1775 000 002	0.0	0.000 000	0.000
100 %		+40	1775 000 004	1.5	0.000 000	0.001
100 %		+50	1775 000 006	3.4	0.000 000	0.002
Batt. Endpoint	3.400	+20	1775 000 006	3.9	0.000 000	0.002



▣ MODE: LTE 66

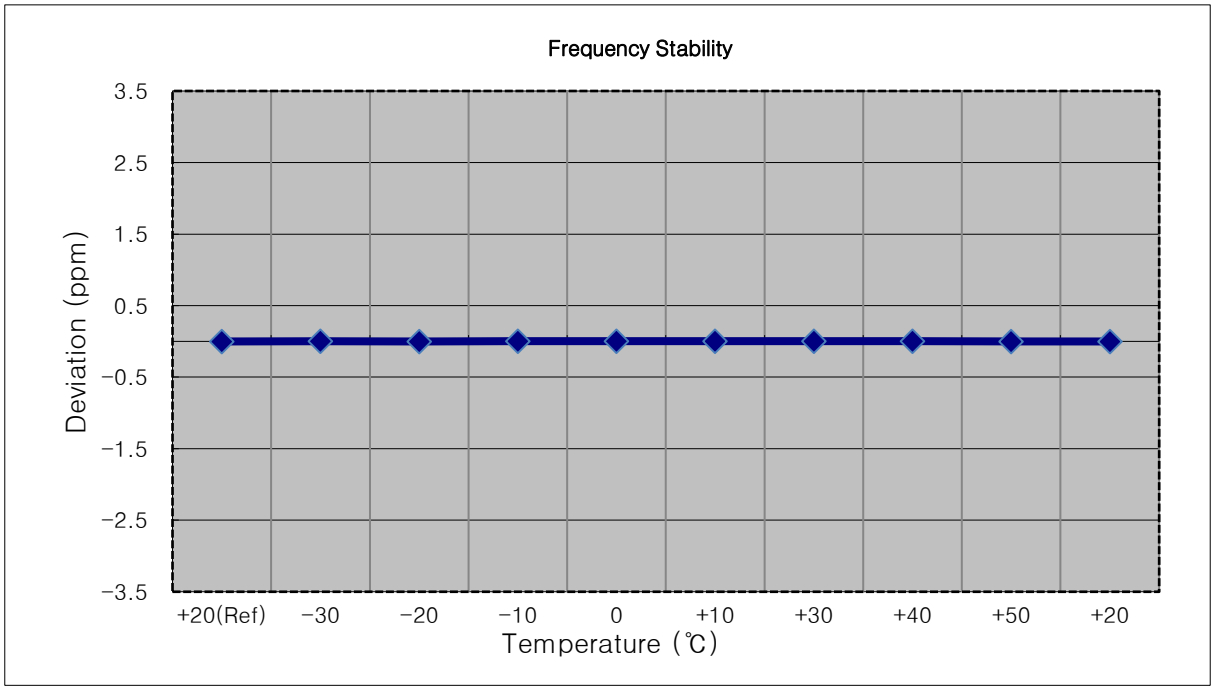
▣ OPERATING FREQUENCY: 1772,500,000 Hz

▣ CHANNEL: 132597 (15 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1772 499 998	0.0	0.000 000	0.000
100 %		-30	1772 500 002	4.2	0.000 000	0.002
100 %		-20	1772 499 999	1.3	0.000 000	0.001
100 %		-10	1772 500 000	2.5	0.000 000	0.001
100 %		0	1772 500 000	2.2	0.000 000	0.001
100 %		+10	1772 500 002	3.9	0.000 000	0.002
100 %		+30	1772 500 000	2.7	0.000 000	0.002
100 %		+40	1772 500 001	3.8	0.000 000	0.002
100 %		+50	1772 499 997	-0.4	0.000 000	0.000
Batt. Endpoint	3.400	+20	1772 499 998	0.0	0.000 000	0.000



▣ MODE: LTE 66

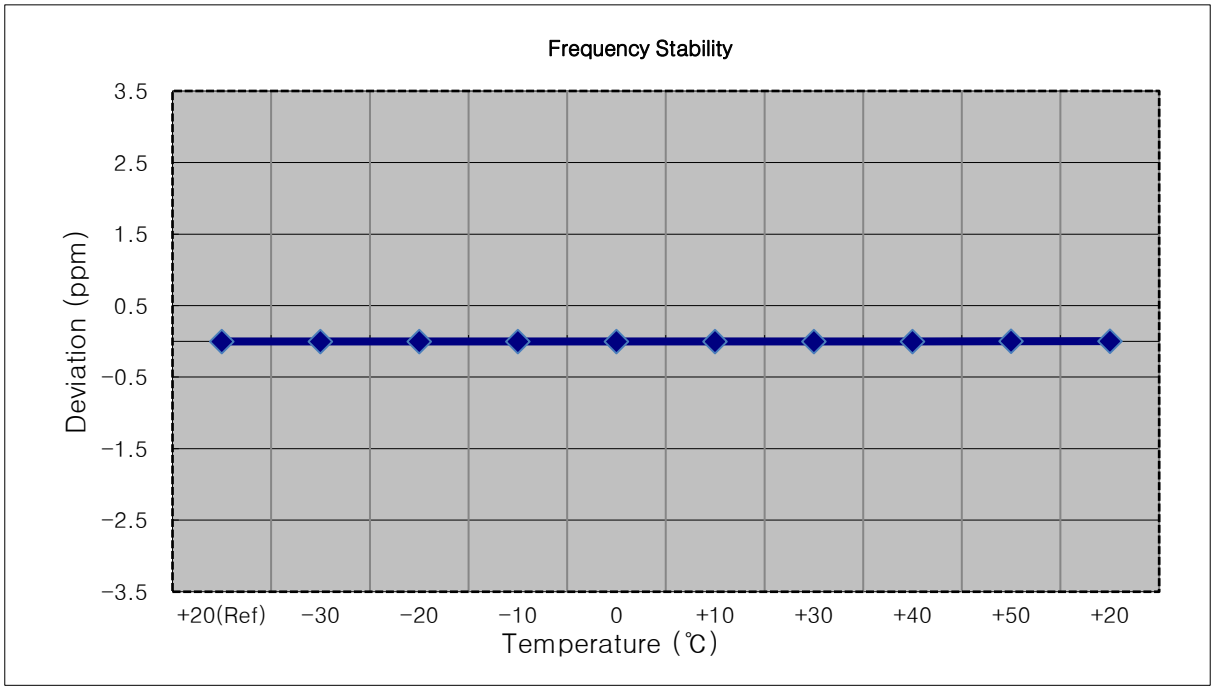
▣ OPERATING FREQUENCY: 1770,000,000 Hz

▣ CHANNEL: 132572 (20 MHz)

▣ REFERENCE VOLTAGE: 4.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	1769 999 998	0.0	0.000 000	0.000
100 %		-30	1769 999 999	1.6	0.000 000	0.001
100 %		-20	1769 999 999	1.3	0.000 000	0.001
100 %		-10	1769 999 999	1.1	0.000 000	0.001
100 %		0	1769 999 999	1.3	0.000 000	0.001
100 %		+10	1769 999 996	-1.6	0.000 000	-0.001
100 %		+30	1769 999 999	1.2	0.000 000	0.001
100 %		+40	1769 999 997	-1.3	0.000 000	-0.001
100 %		+50	1770 000 001	2.9	0.000 000	0.002
Batt. Endpoint	3.400	+20	1770 000 001	2.8	0.000 000	0.002



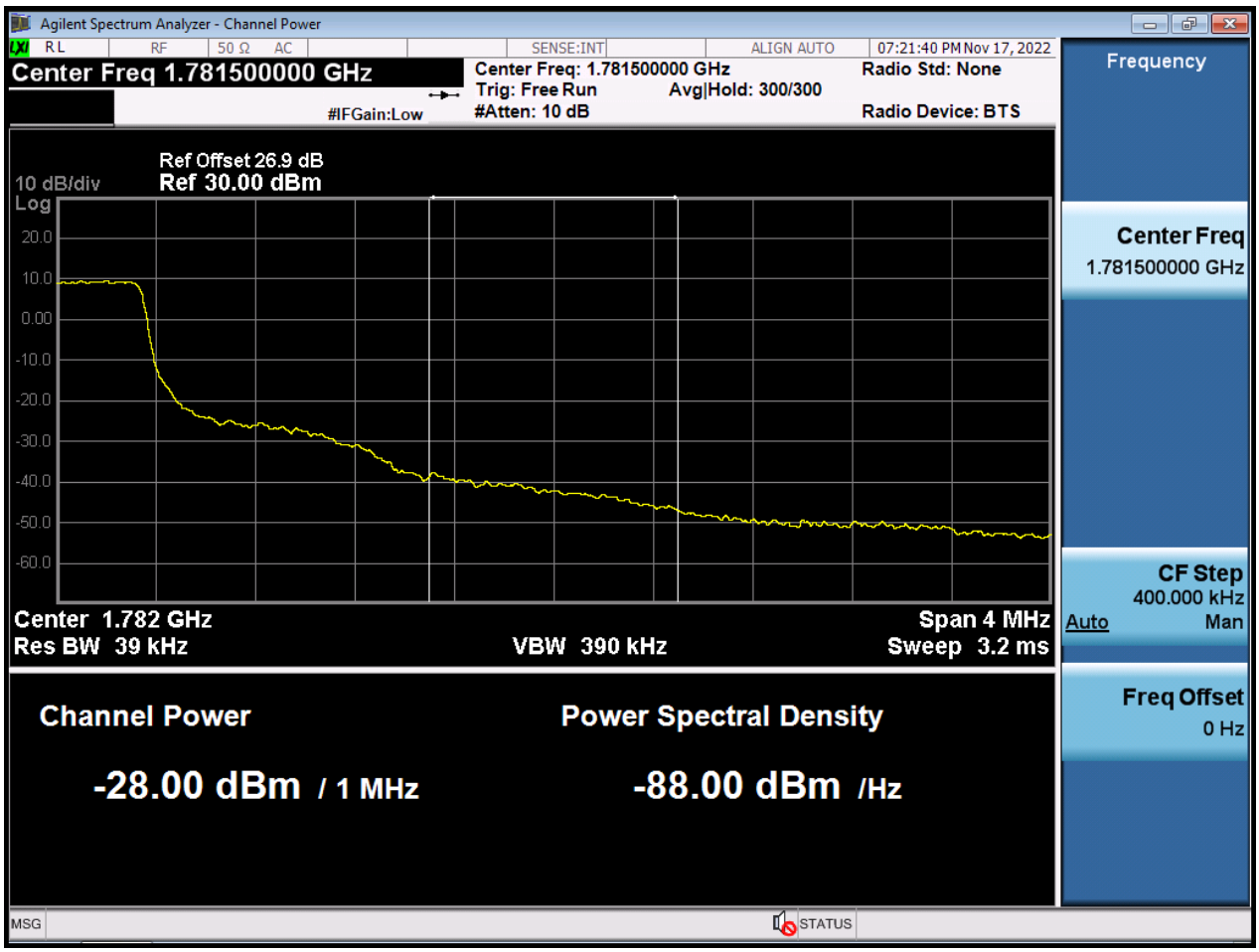
10. TEST PLOTS (Main 2 Ant)

BW1.4 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

BW1.4 M_BandEdge_Lowest Channel_QPSK_FullRB(2)

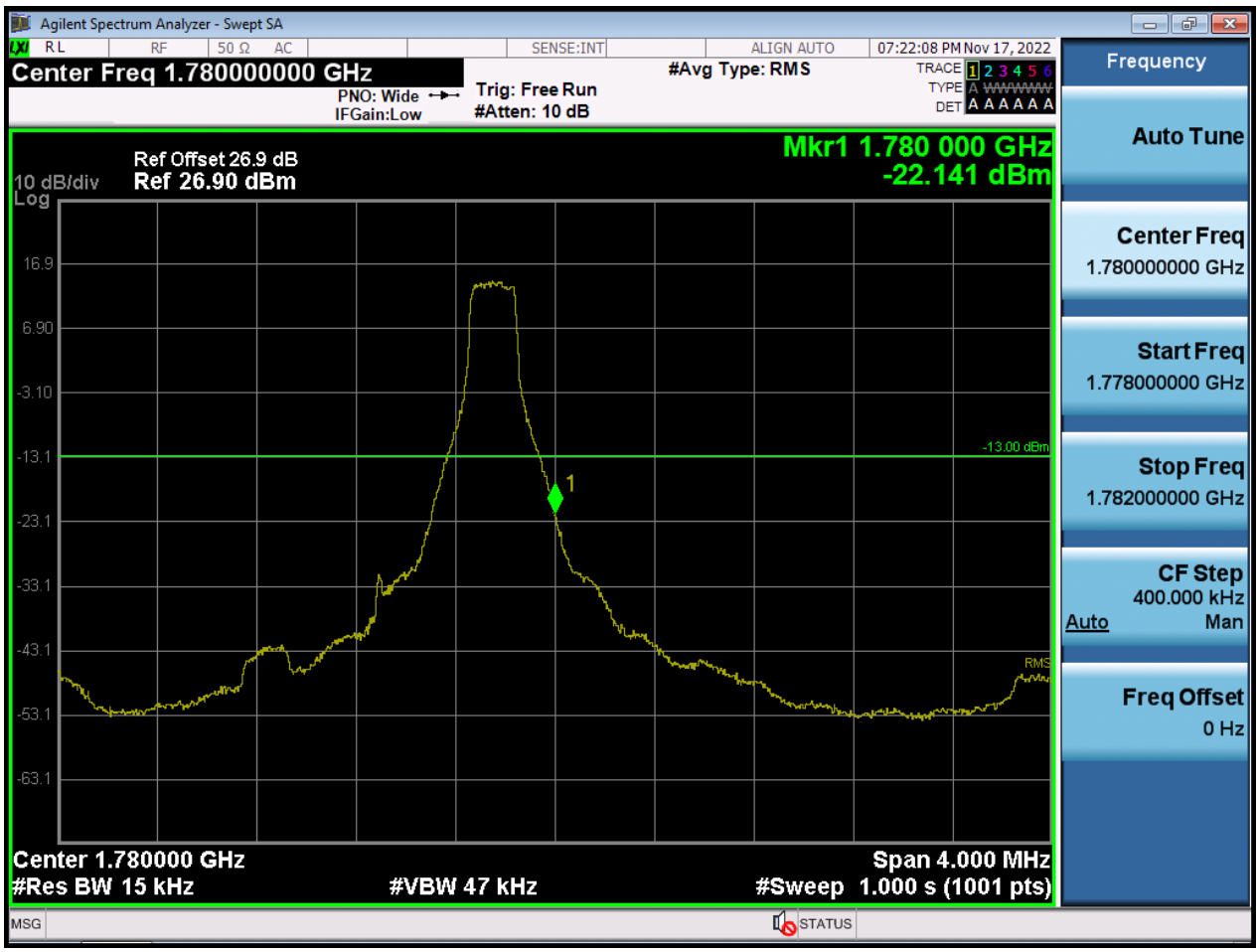
BW1.4 M_BandEdge_Highest Channel_QPSK_FullRB(1)

BW1.4 M_BandEdge_Highest Channel_QPSK_FullRB(2)



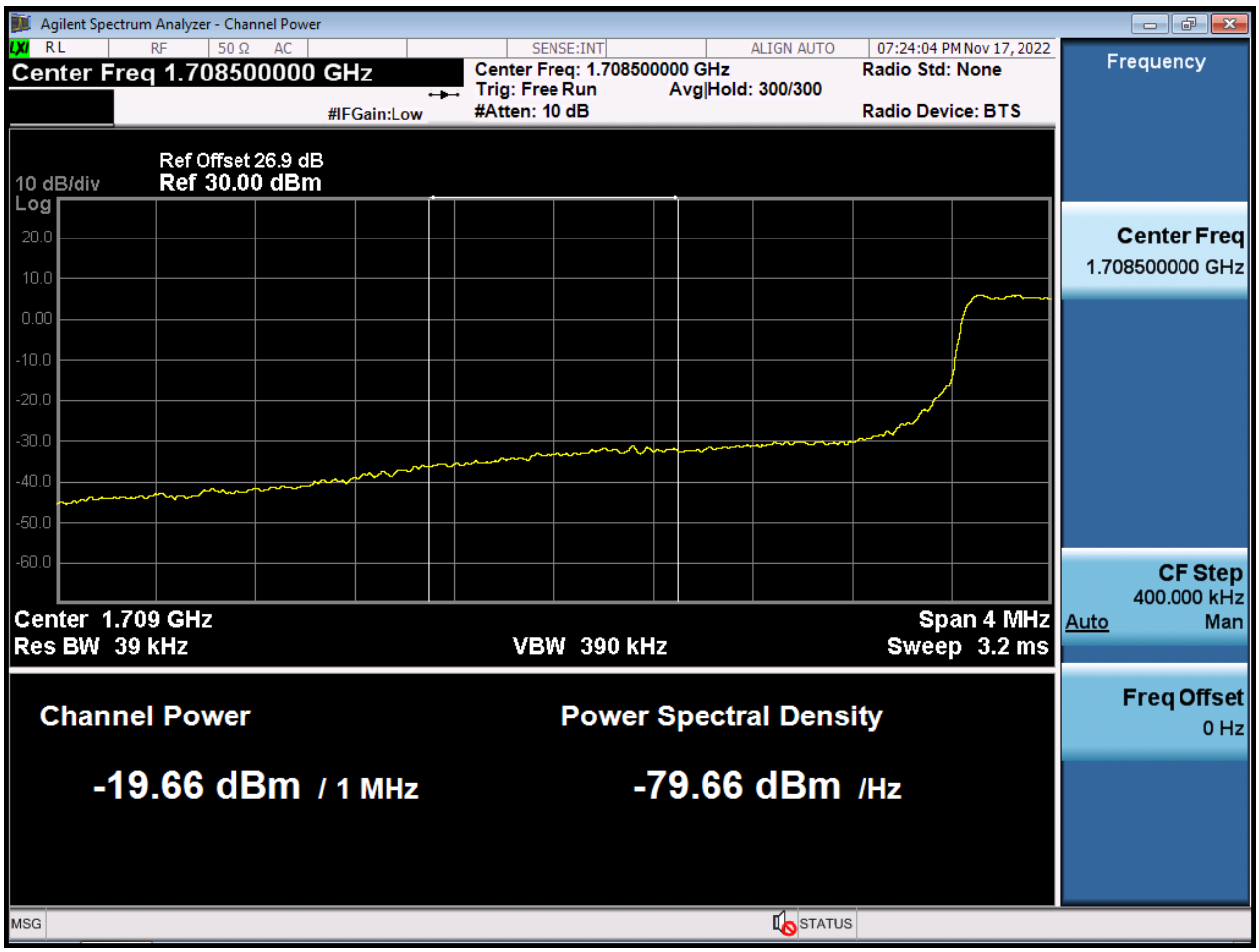
BW1.4 M_BandEdge_Lowest Channel_QPSK_1RB

BW1.4 M_BandEdge_Highest Channel_QPSK_1RB



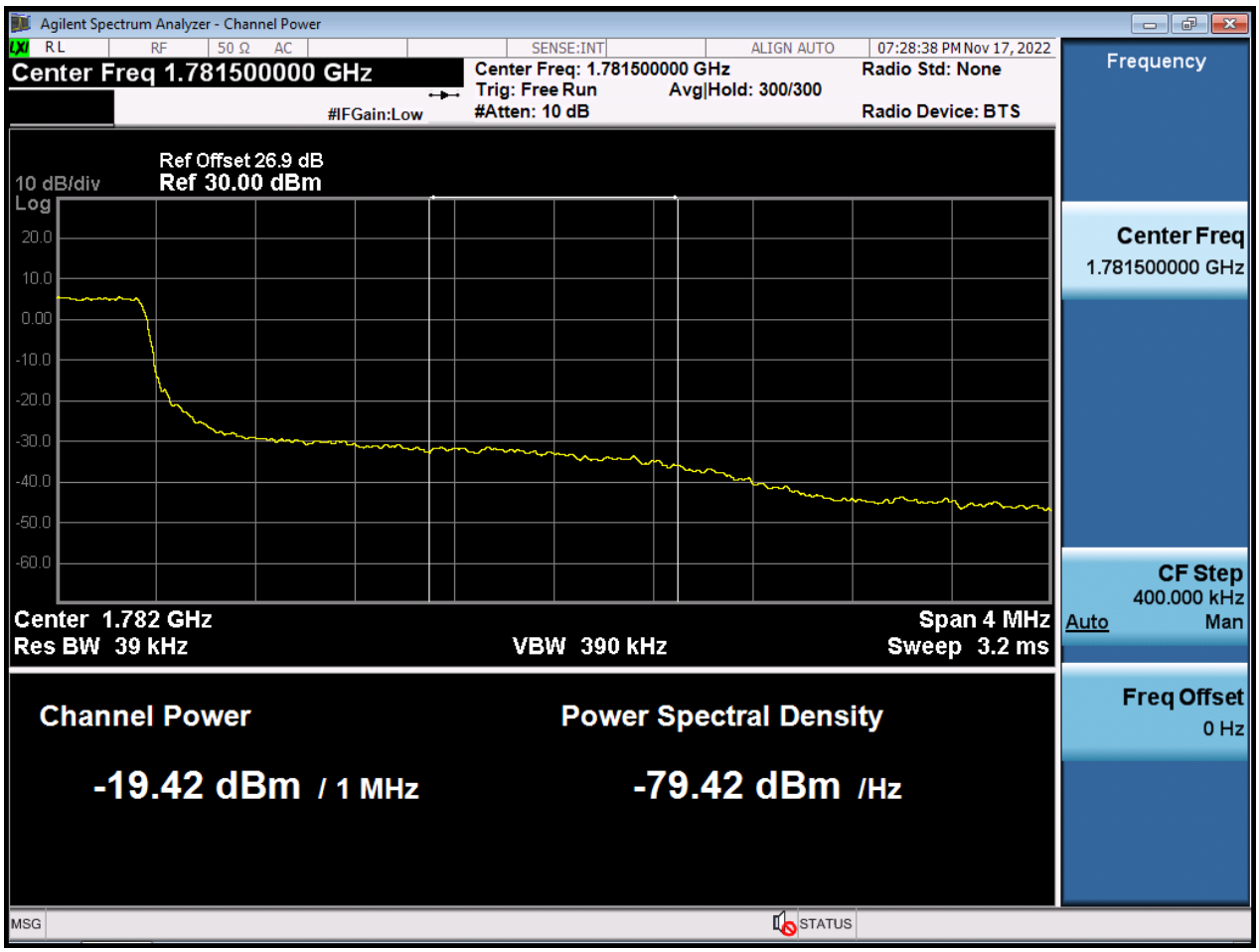
BW3 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

BW3 M_BandEdge_Lowest Channel_QPSK_FullRB(2)



BW3 M_BandEdge_Highest Channel_QPSK_FullRB(1)

BW3 M_BandEdge_Highest Channel_QPSK_FullRB(2)

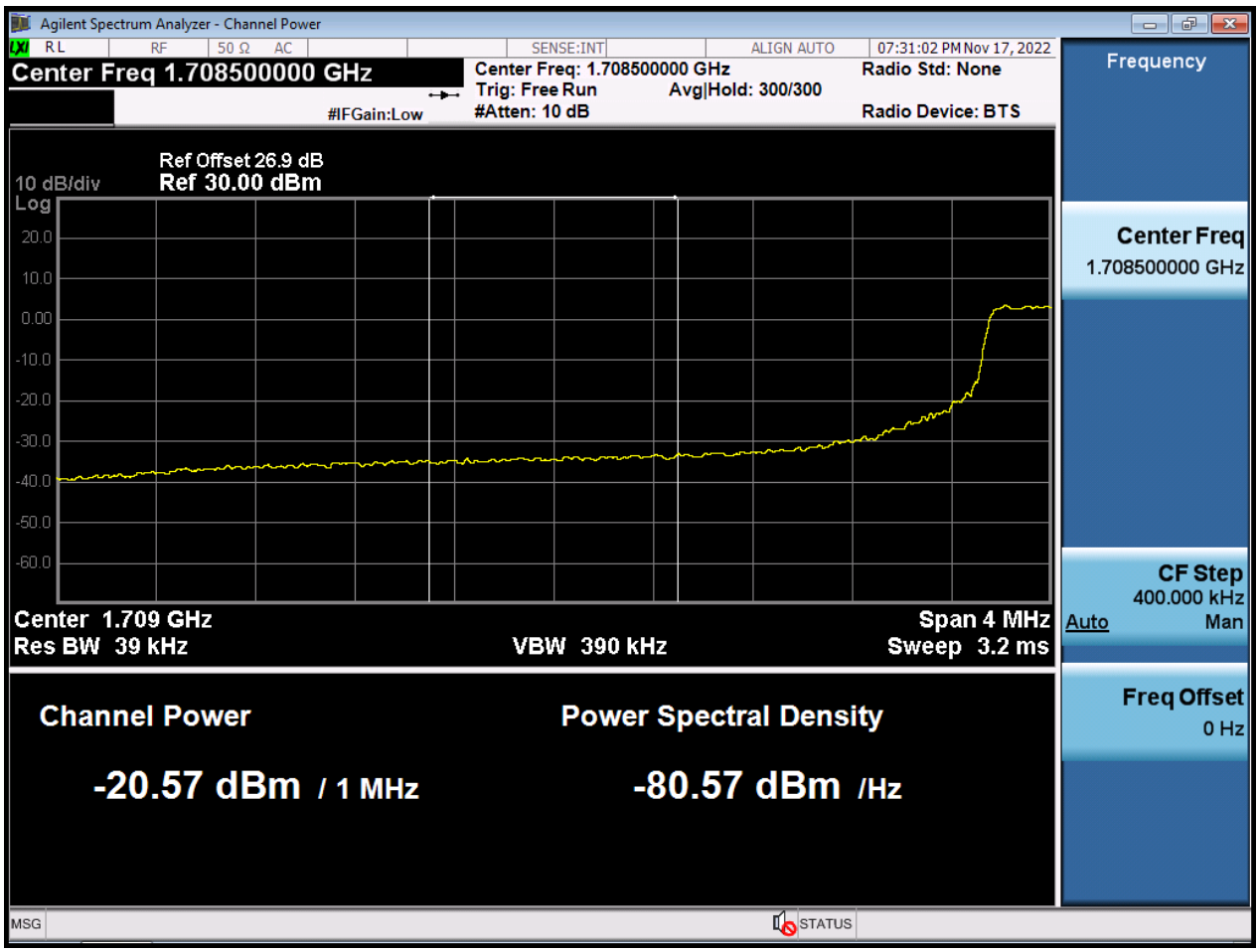


BW3 M_BandEdge_Lowest Channel_QPSK_1RB

BW3 M_BandEdge_Highest Channel_QPSK_1RB

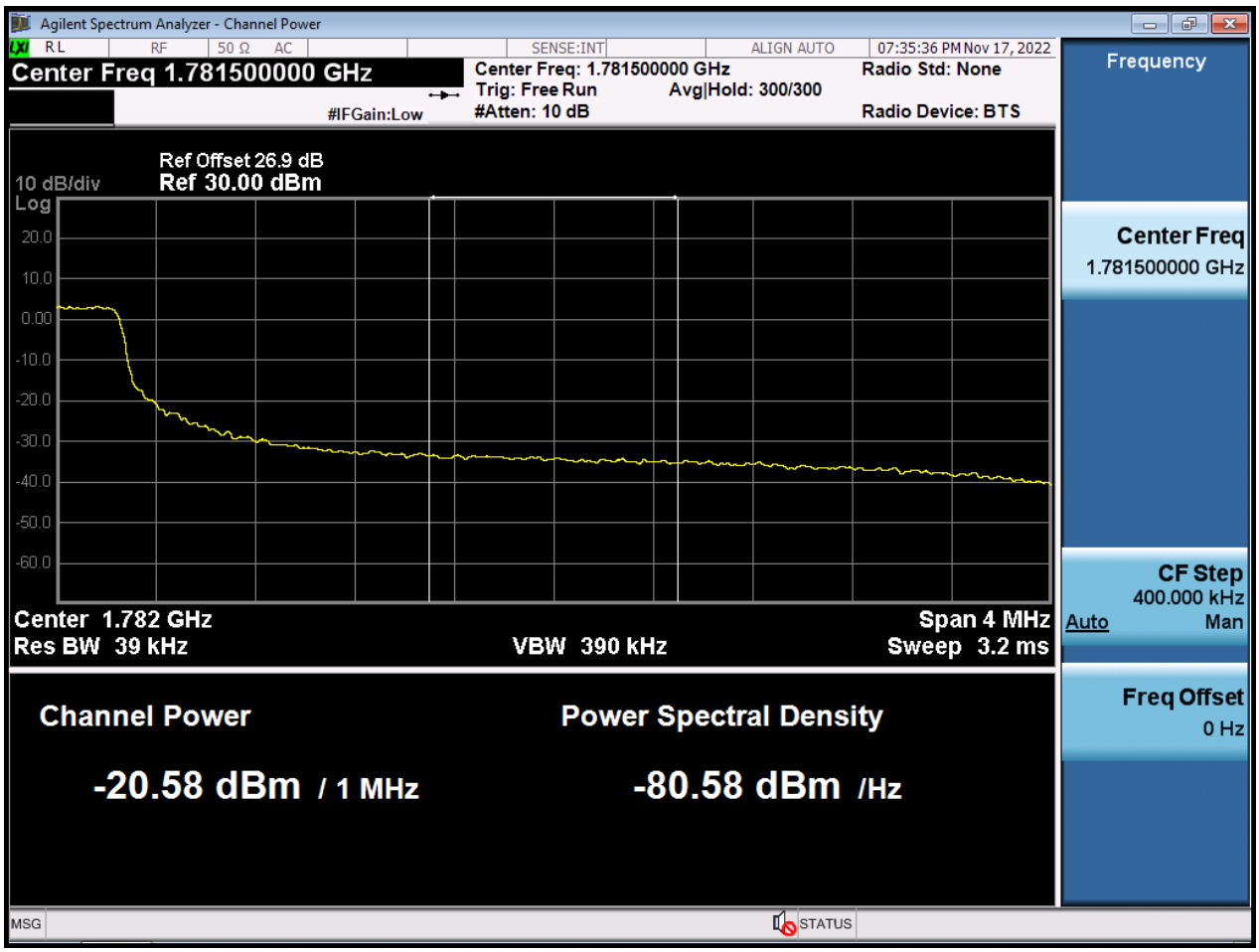
BW5 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

BW5 M_BandEdge_Lowest Channel_QPSK_FullRB(2)



BW5 M_BandEdge_Highest Channel_QPSK_FullRB(1)

BW5 M_BandEdge_Highest Channel_QPSK_FullRB(2)

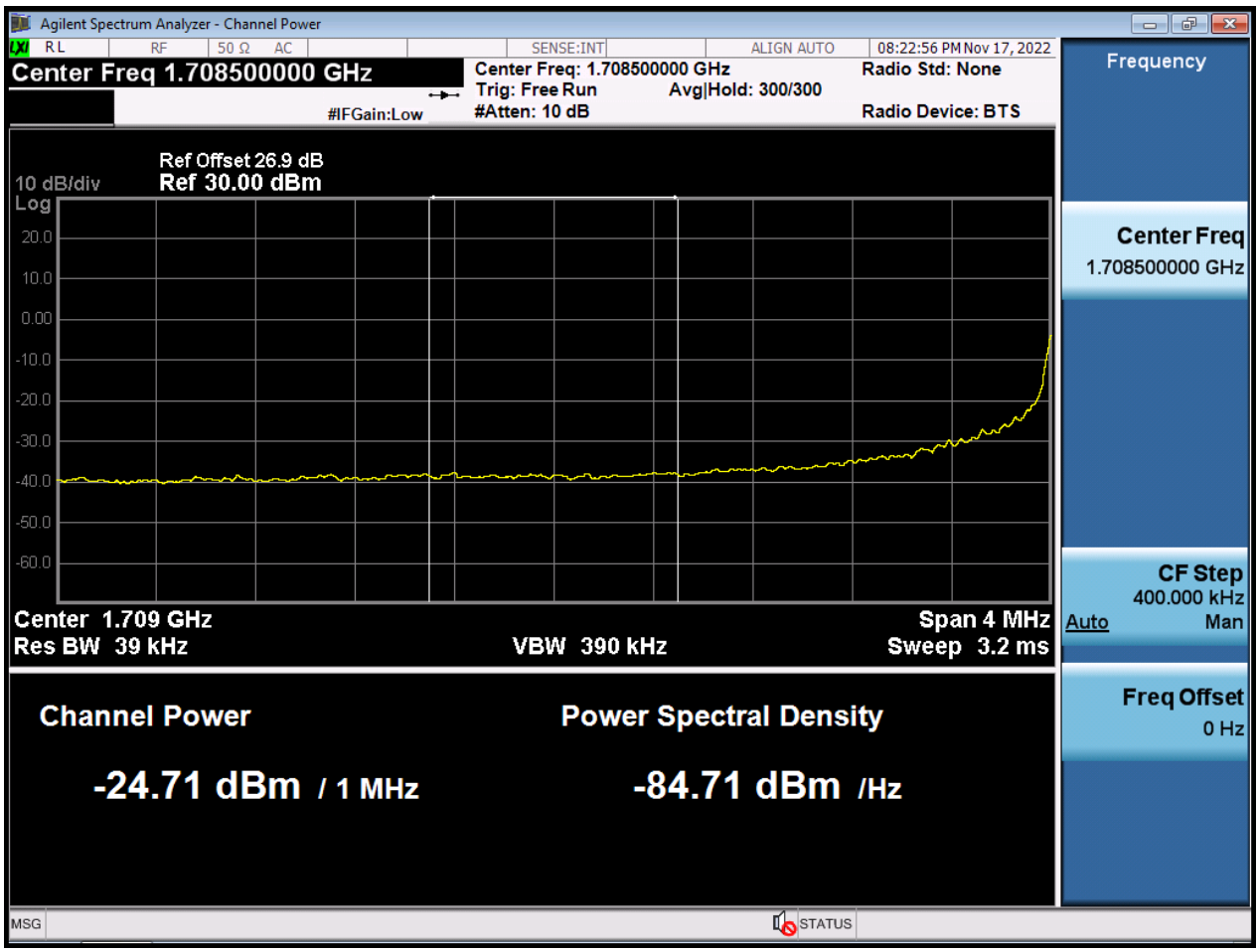


BW5 M_BandEdge_Lowest Channel_QPSK_1RB

BW5 M_BandEdge_Highest Channel_QPSK_1RB

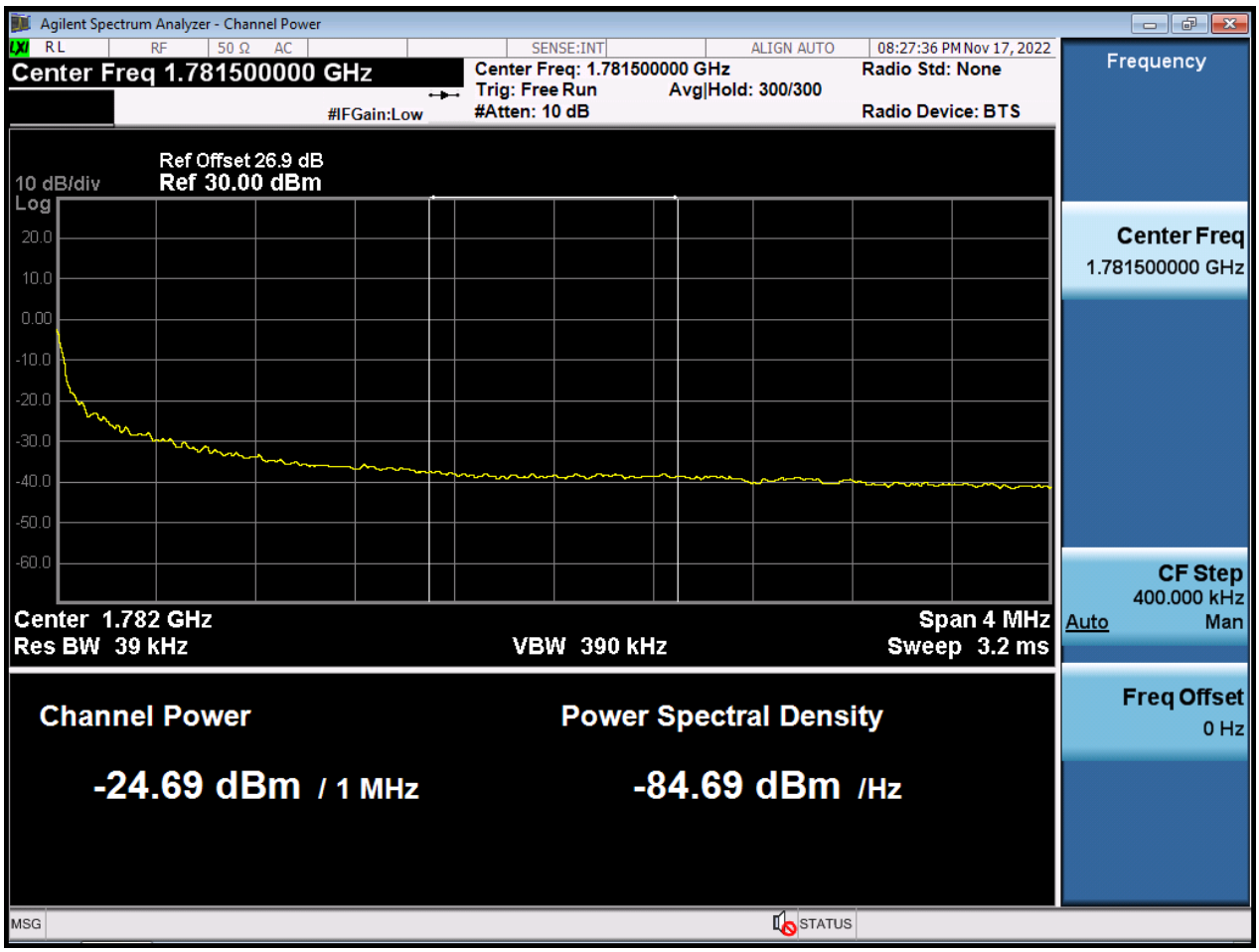
BW10 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

BW10 M_BandEdge_Lowest Channel_QPSK_FullRB(2)



BW10 M_BandEdge_Highest Channel_QPSK_FullRB(1)

BW10 M_BandEdge_Highest Channel_QPSK_FullRB(2)

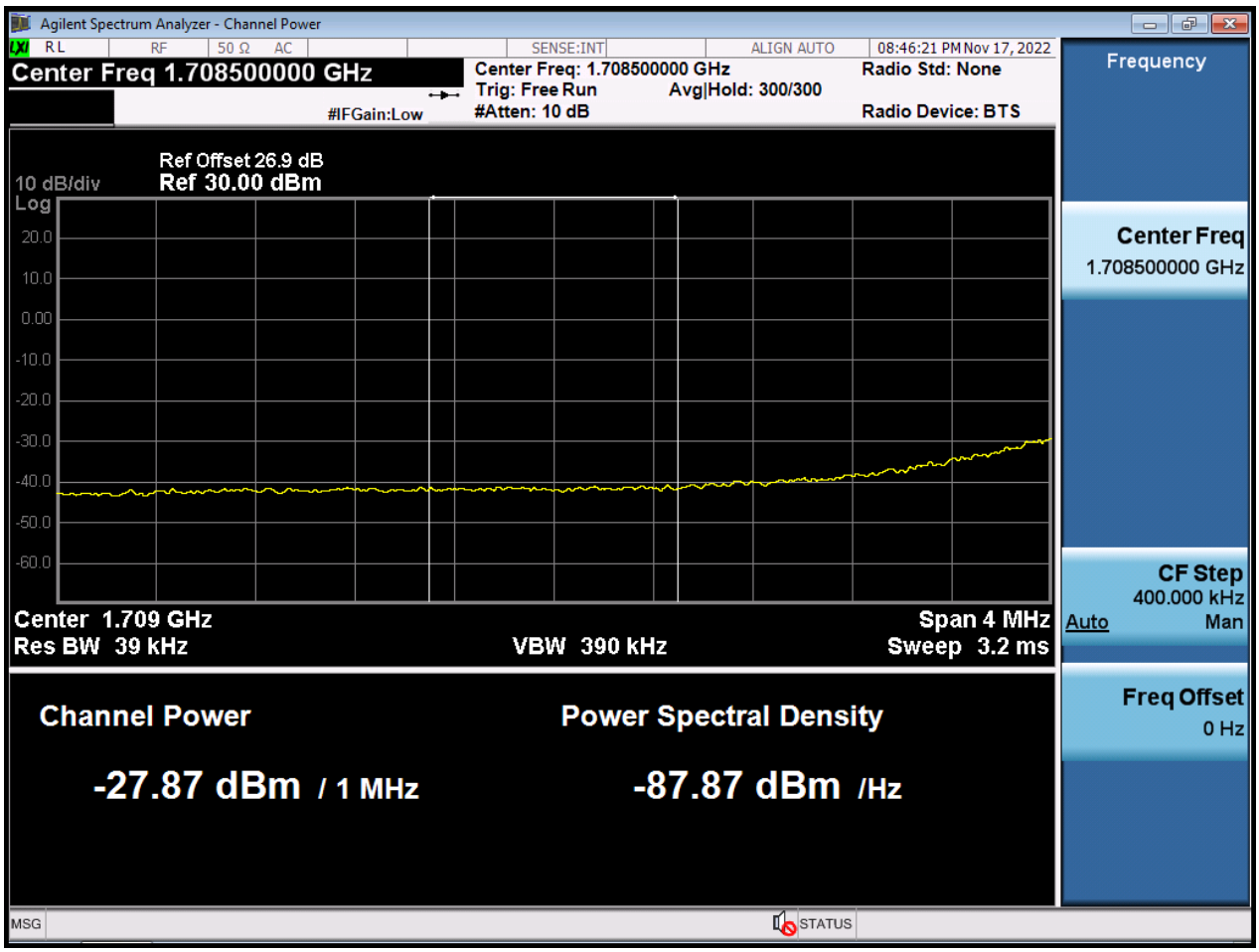


BW10 M_BandEdge_Lowest Channel_QPSK_1RB

BW10 M_BandEdge_Highest Channel_QPSK_1RB

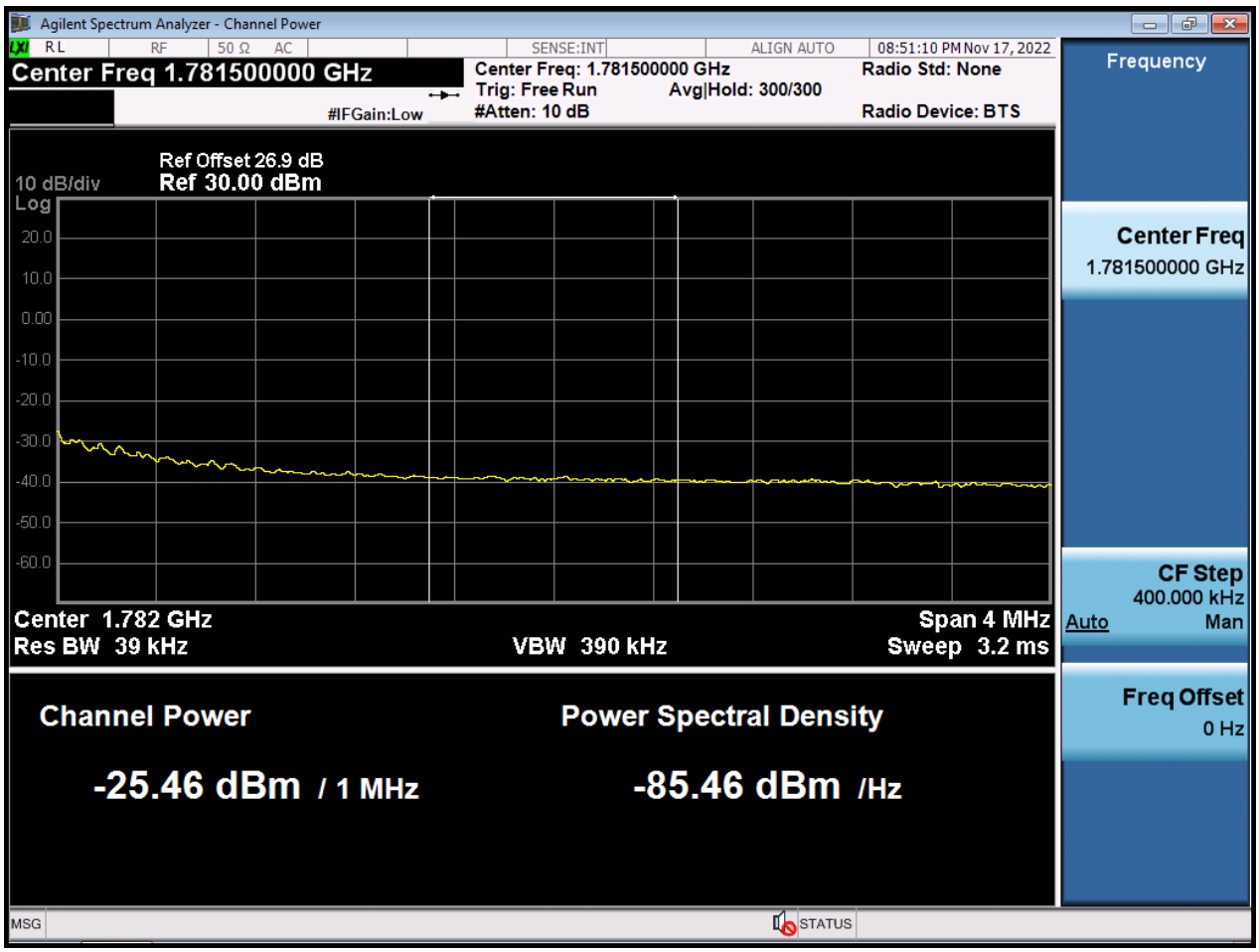
BW15 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

BW15 M_BandEdge_Lowest Channel_QPSK_FullRB(2)



BW15 M_BandEdge_Highest Channel_QPSK_FullRB(1)

BW15 M_BandEdge_Highest Channel_QPSK_FullRB(2)

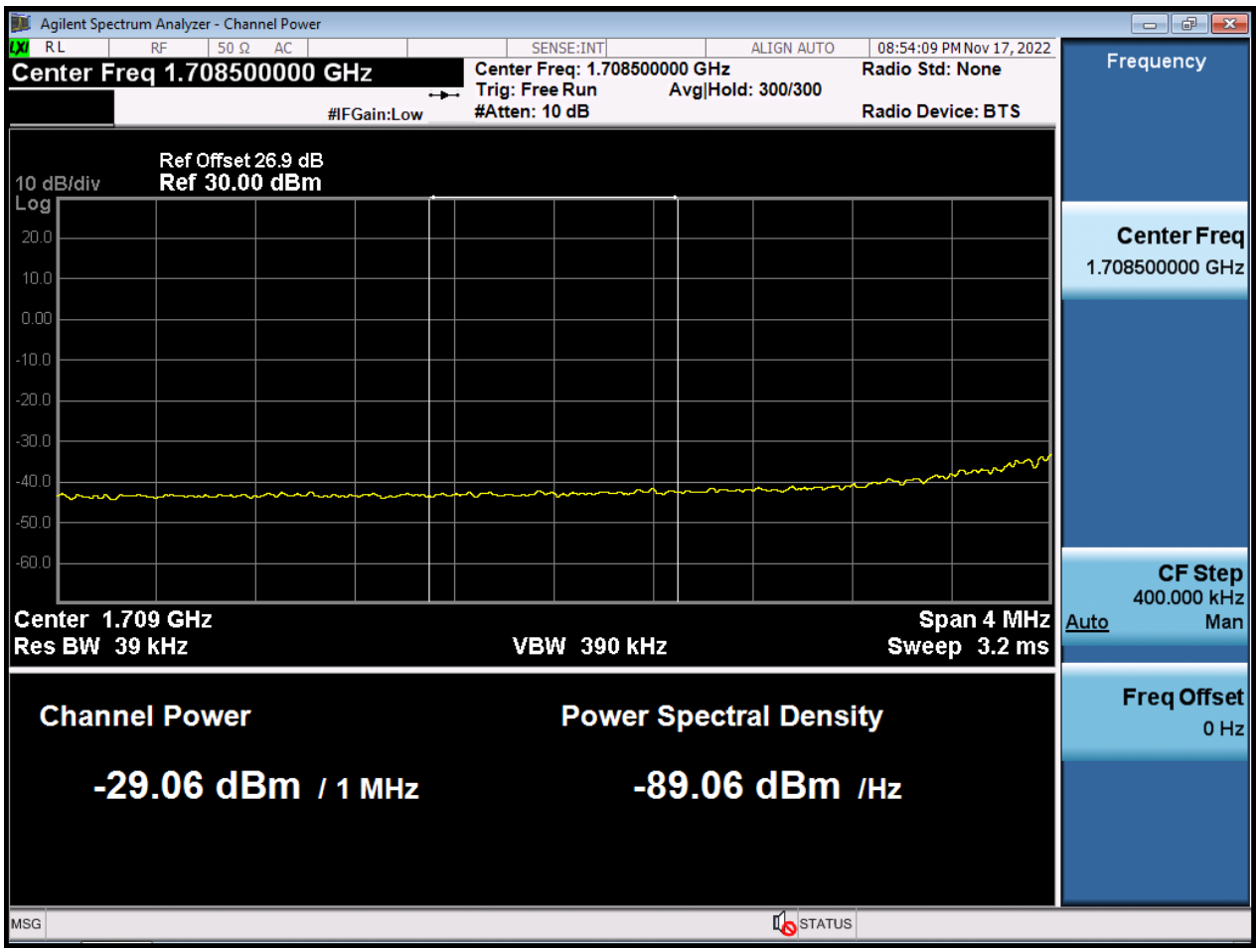


BW15 M_BandEdge_Lowest Channel_QPSK_1RB

BW15 M_BandEdge_Highest Channel_QPSK_1RB

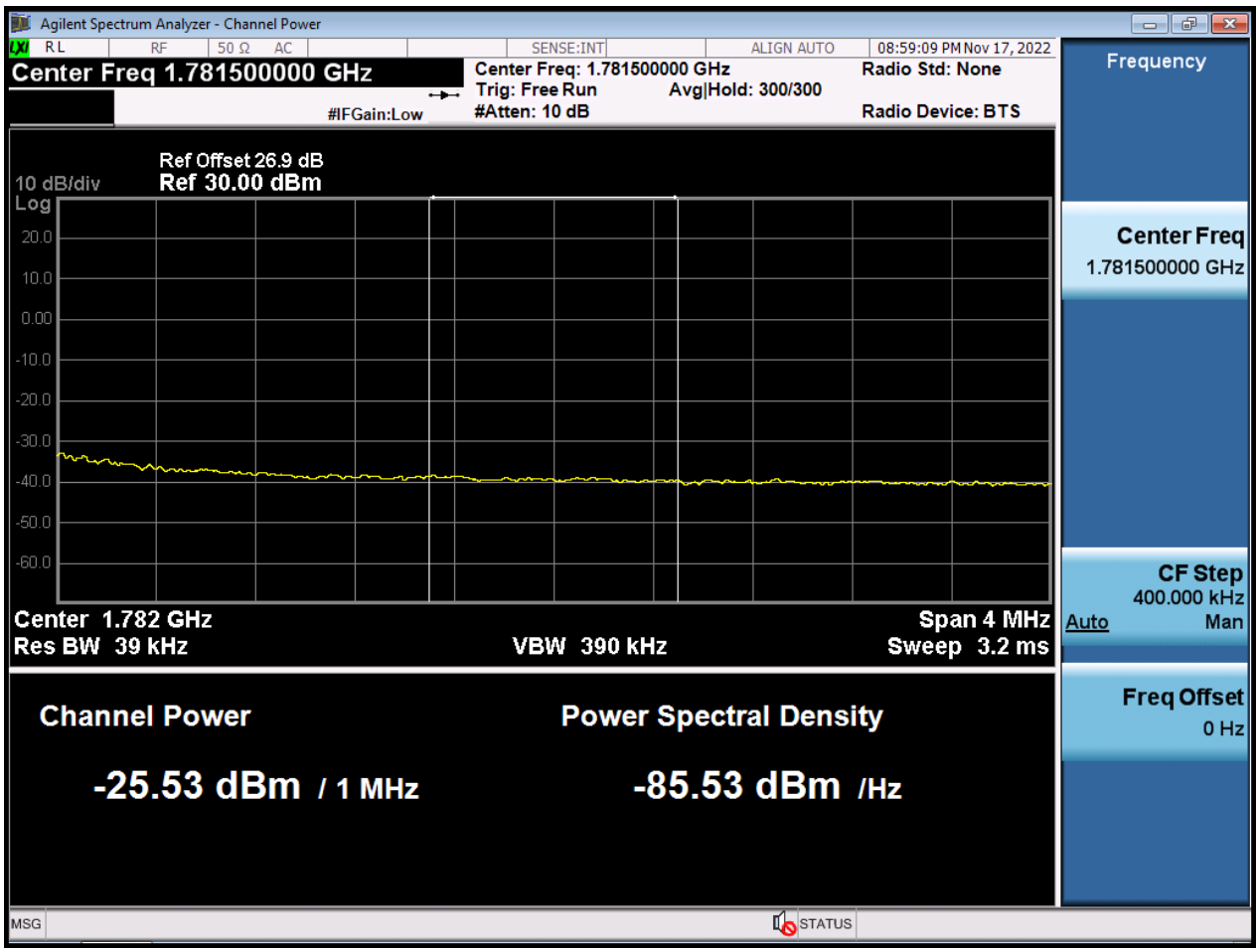
BW20 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

BW20 M_BandEdge_Lowest Channel_QPSK_FullRB(2)



BW20 M_BandEdge_Highest Channel_QPSK_FullRB(1)

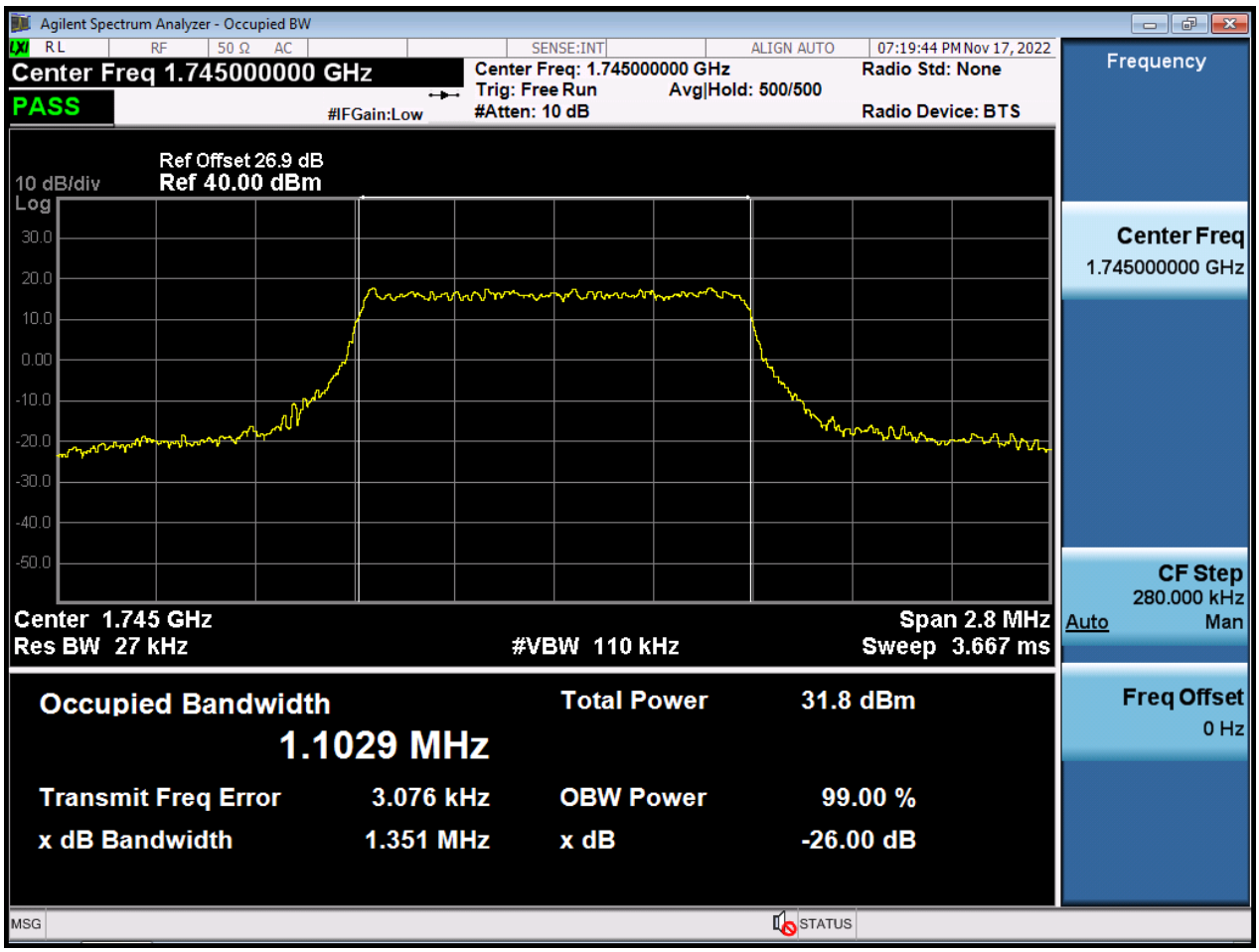
BW20 M_BandEdge_Highest Channel_QPSK_FullRB(2)



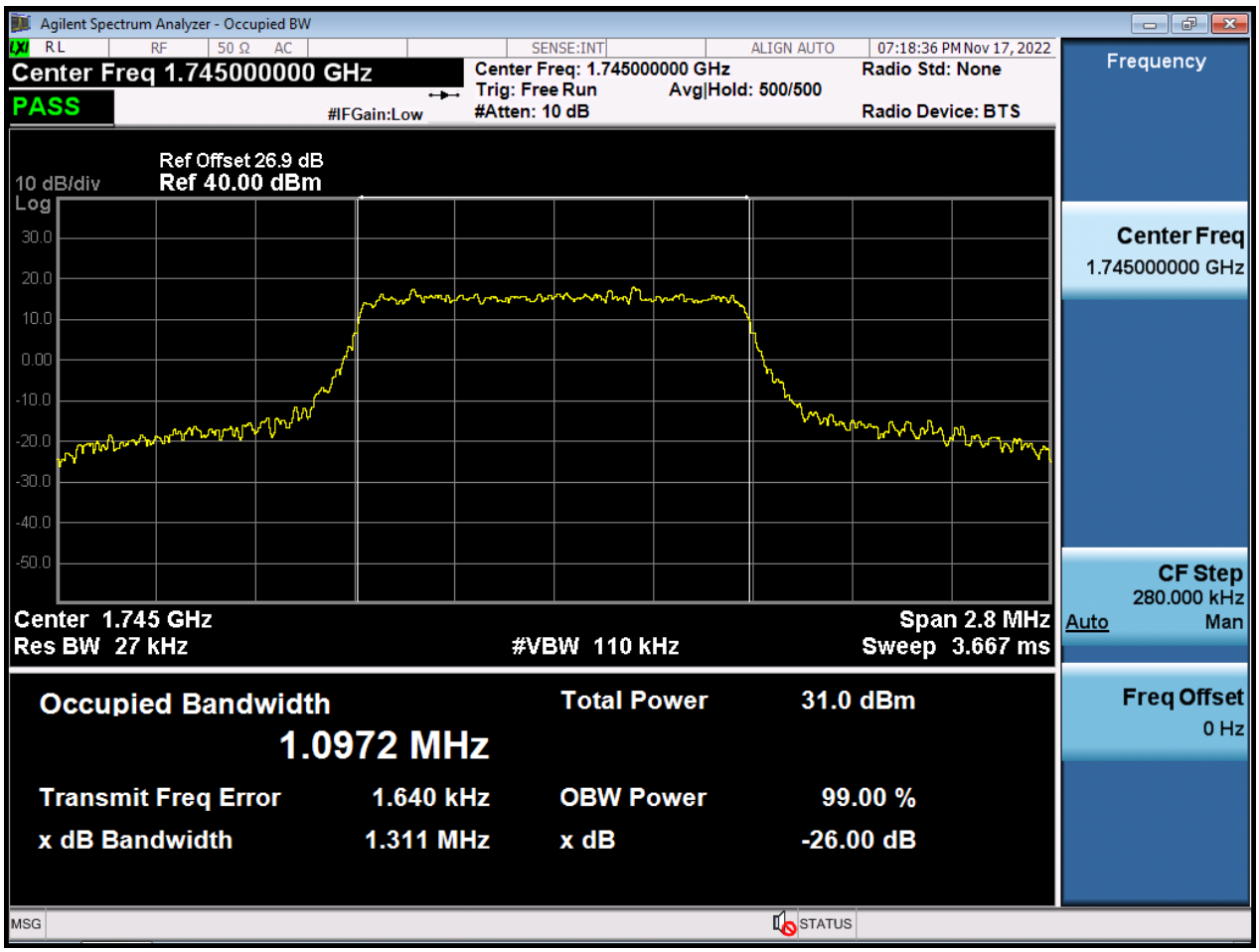
BW20 M_BandEdge_Lowest Channel_QPSK_1RB

BW20 M_BandEdge_Highest Channel_QPSK_1RB

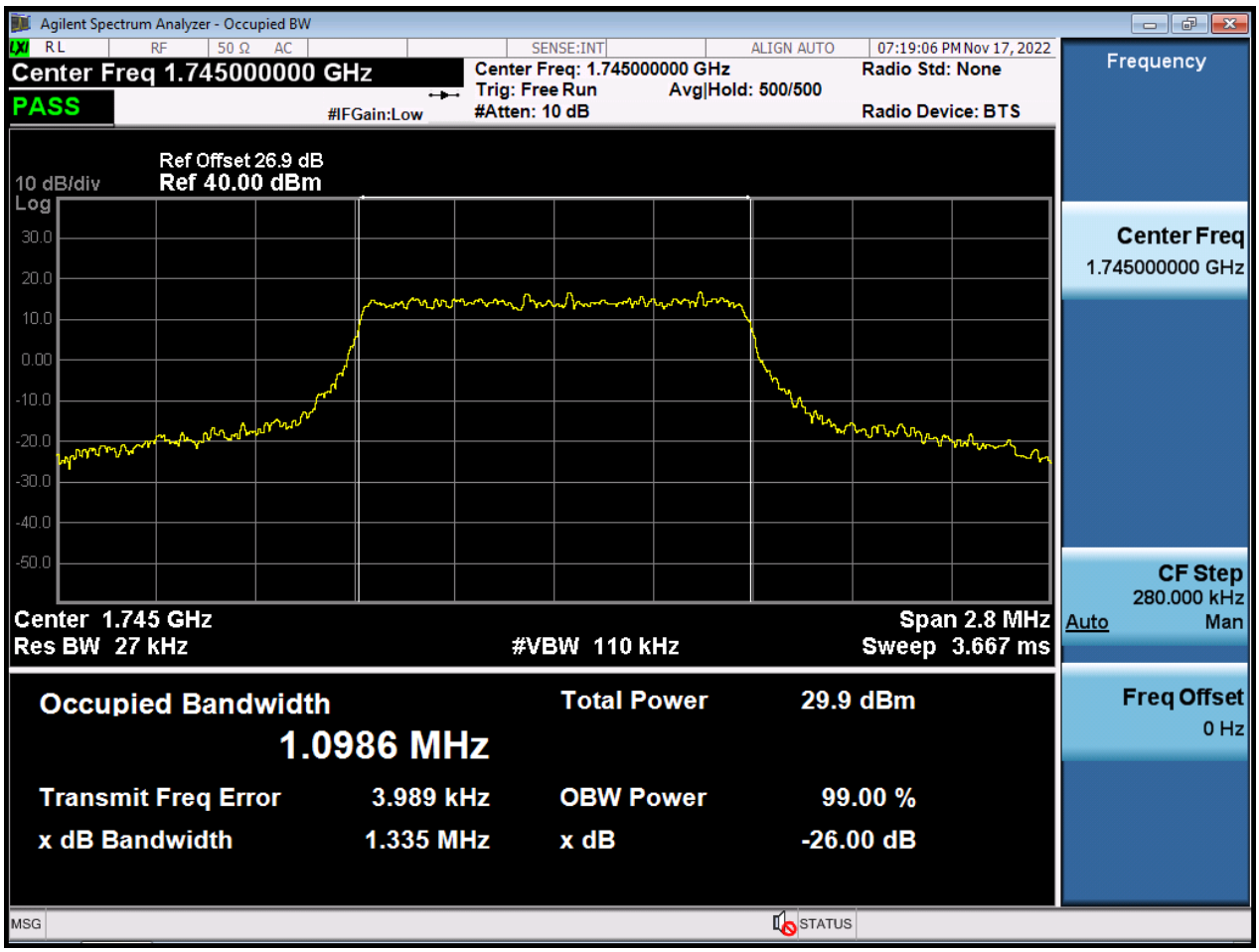
BW1.4 M_OBW_Middle Channel_QPSK_FullRB



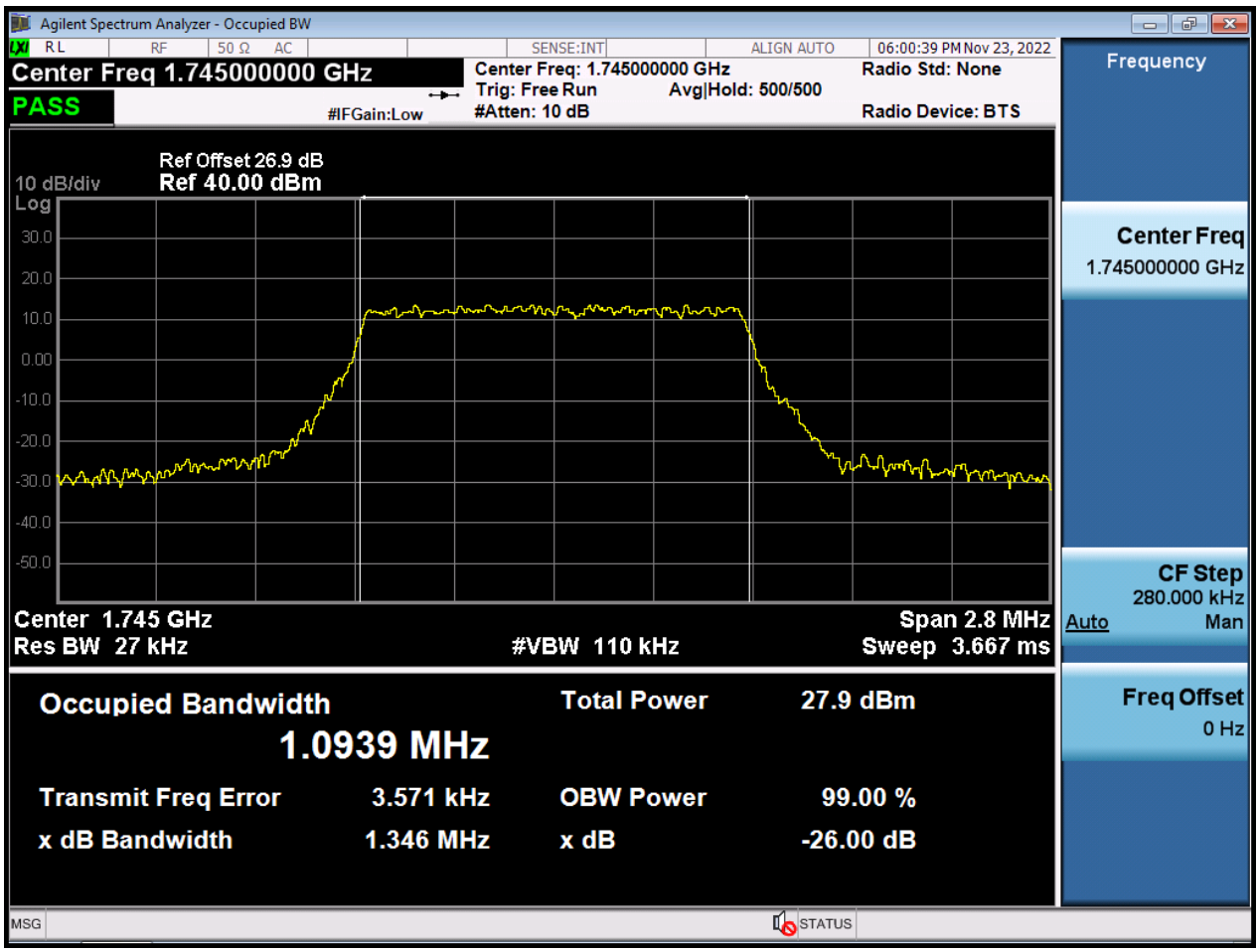
BW1.4 M_OBW_Middle Channel_16QAM_FullRB



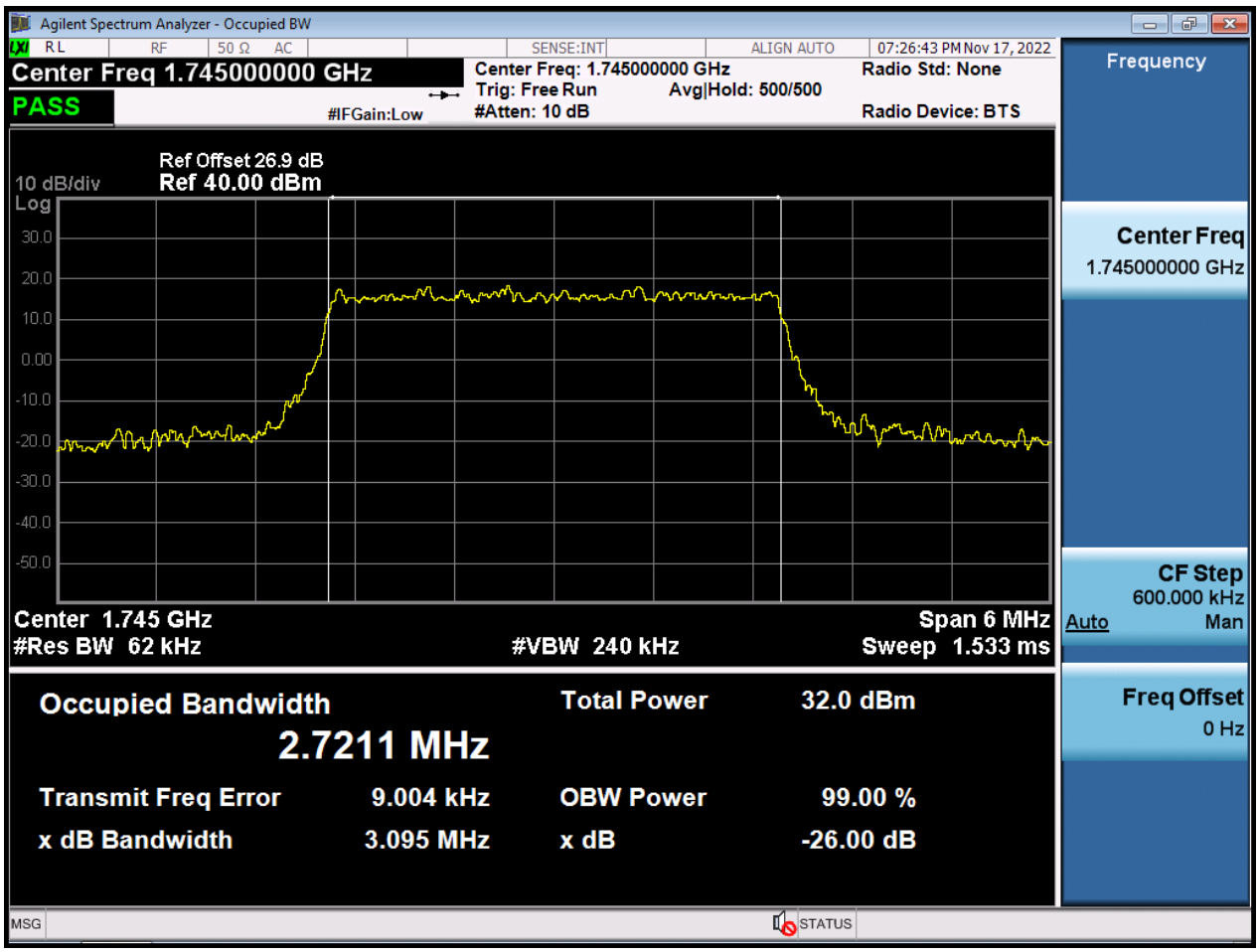
BW1.4 M_OBW_Middle Channel_64QAM_FullRB



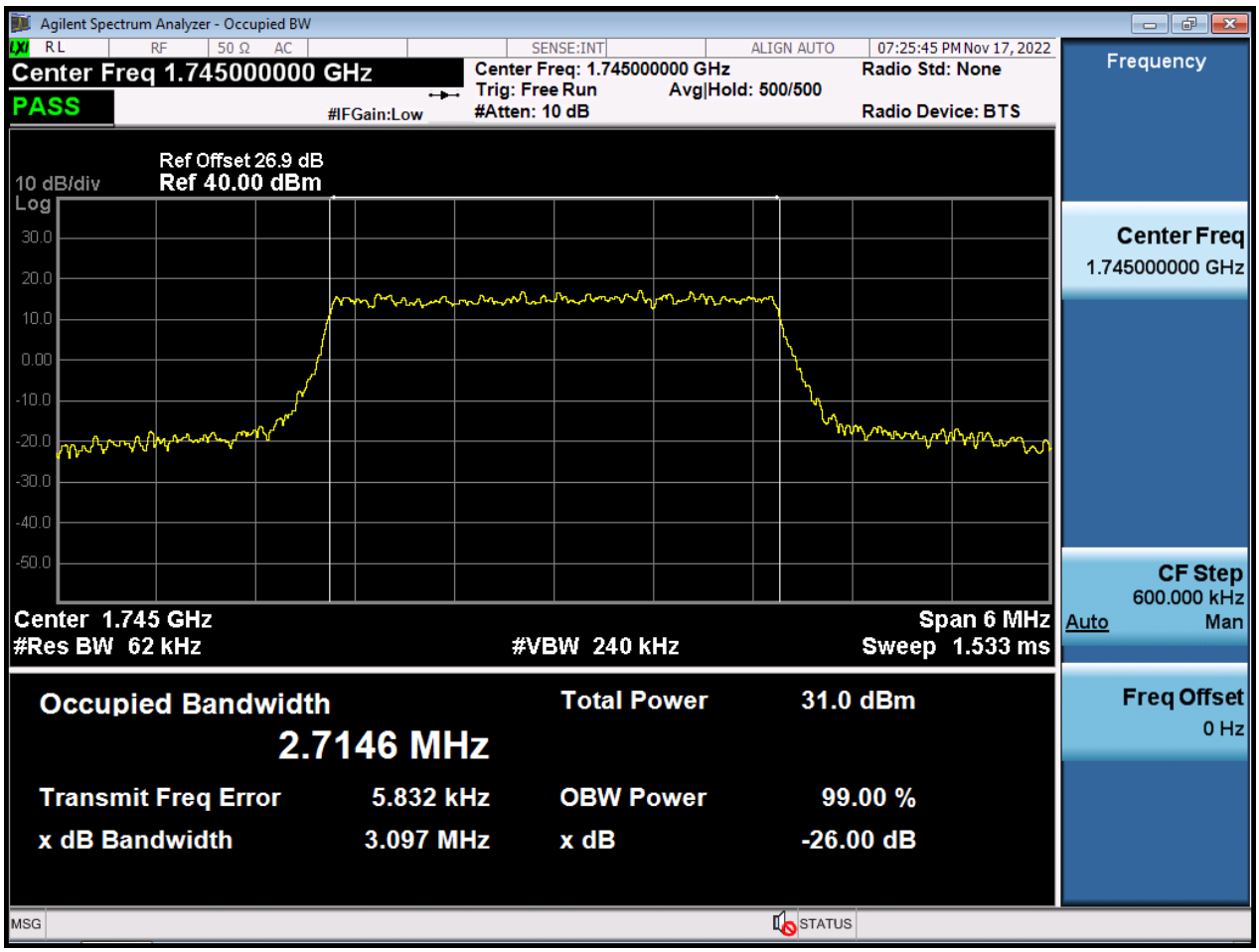
BW1.4 M_OBW_Middle Channel_256QAM_FullRB



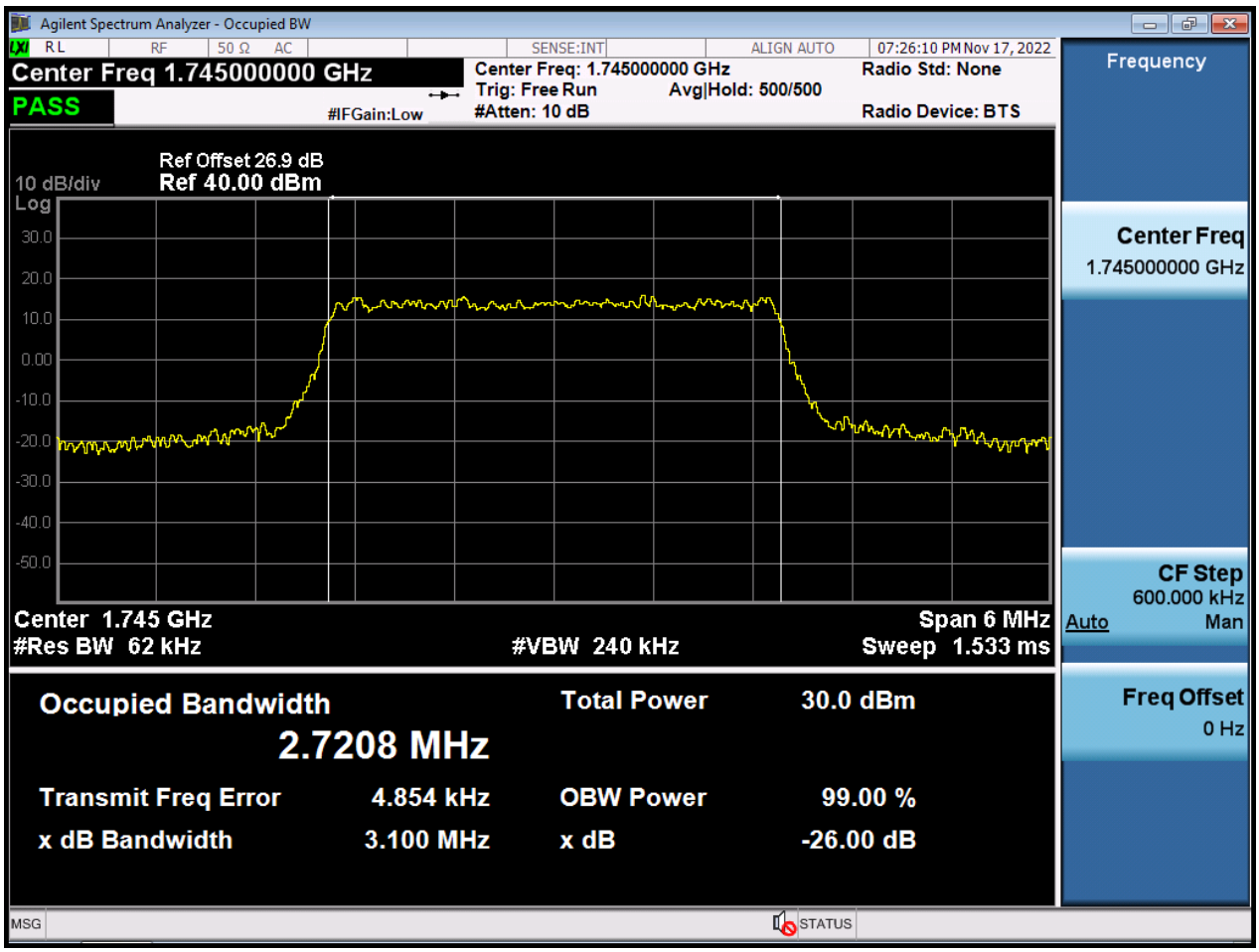
BW3 M_OBW_Middle Channel_QPSK_FullRB



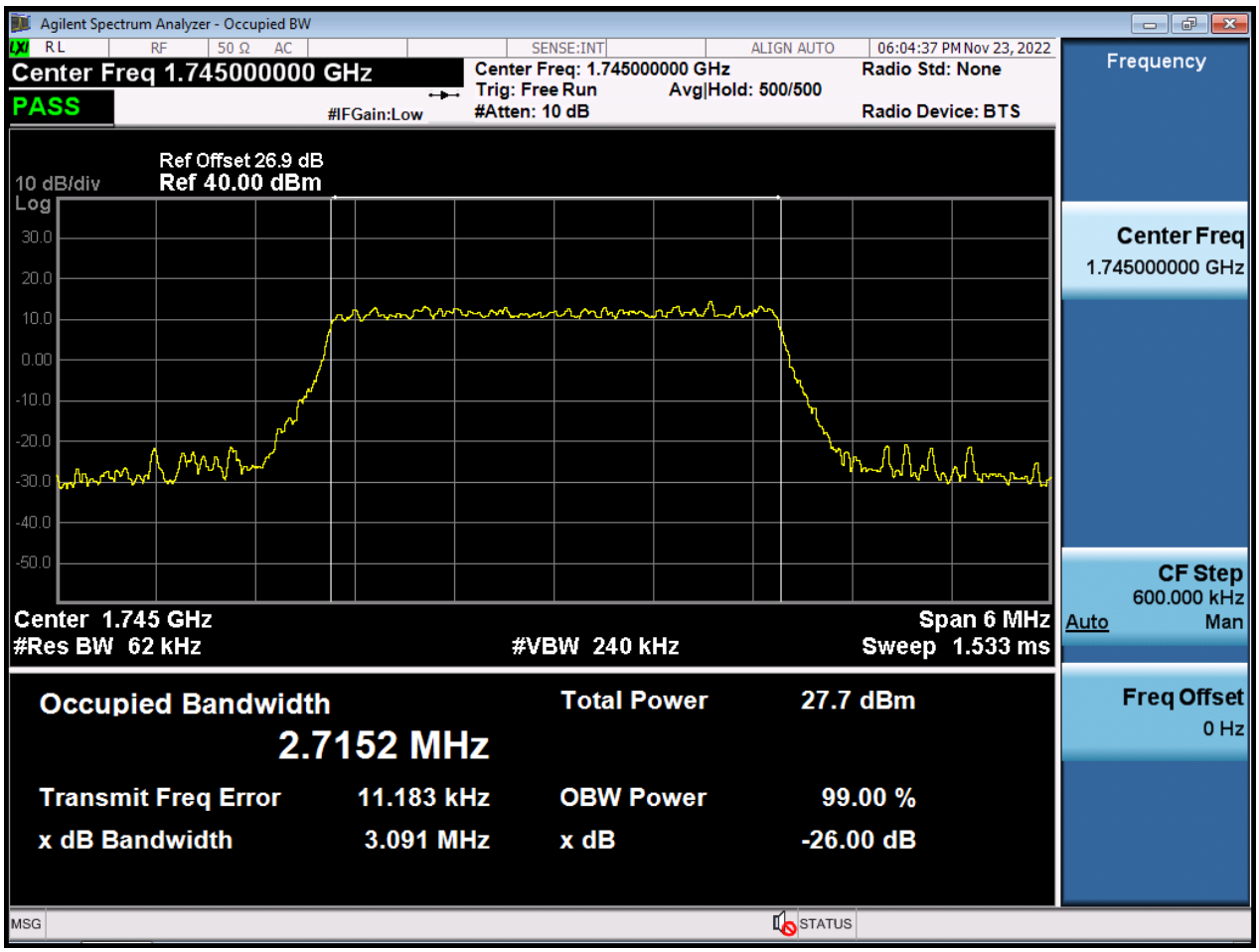
BW3 M_OBW_Middle Channel_16QAM_FullRB



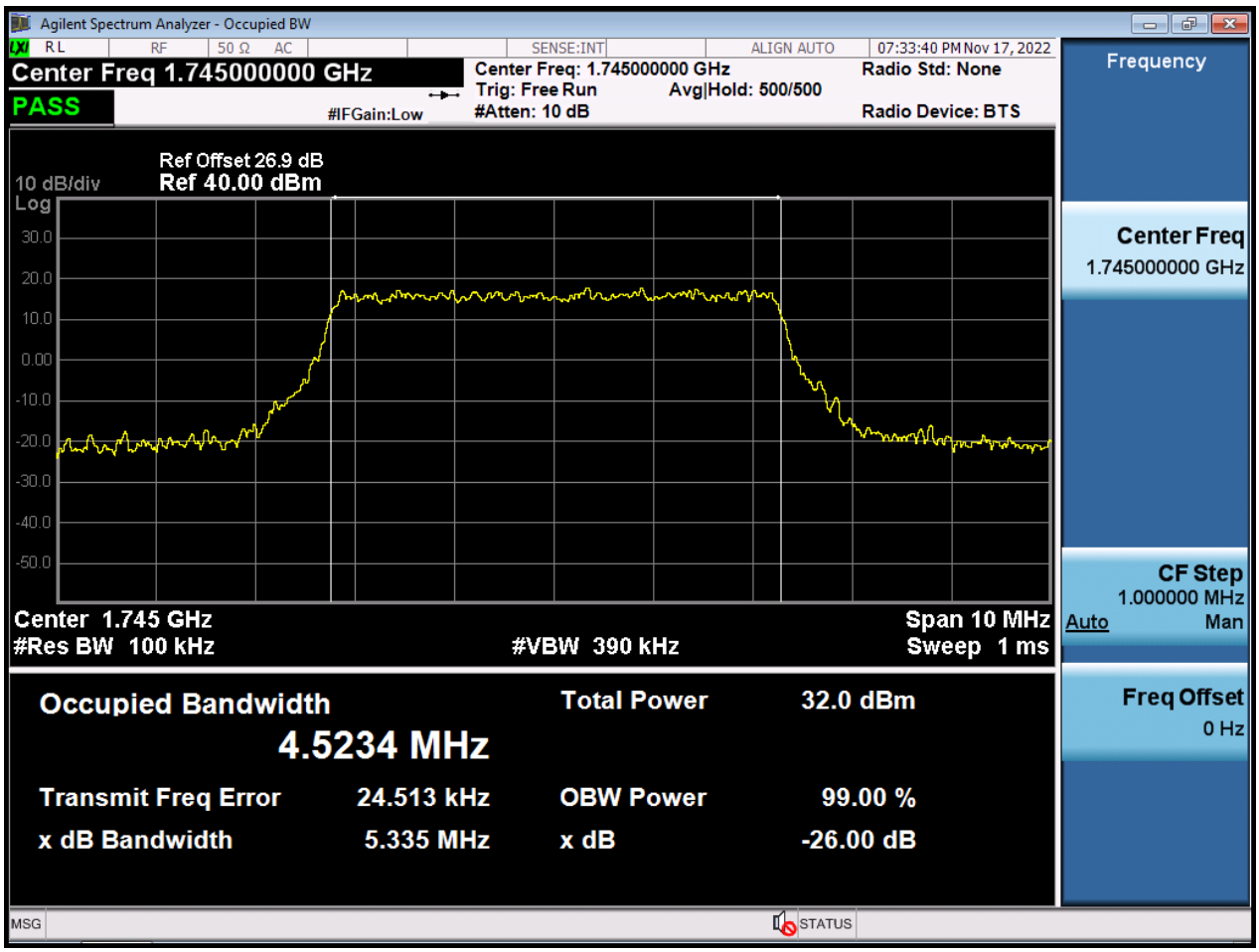
BW3 M_OBW_Middle Channel_64QAM_FullRB



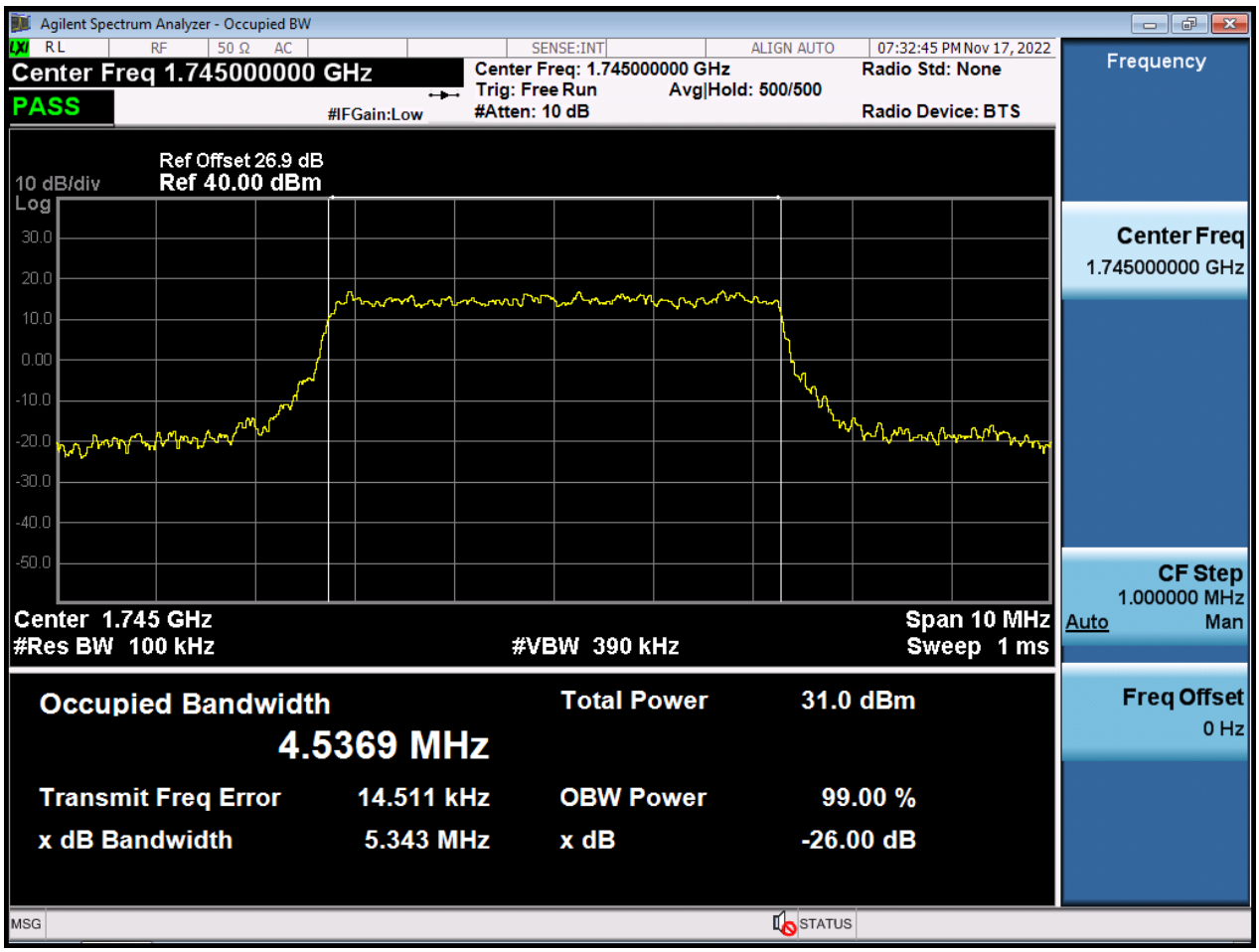
BW3 M_OBW_Middle Channel_256QAM_FullRB



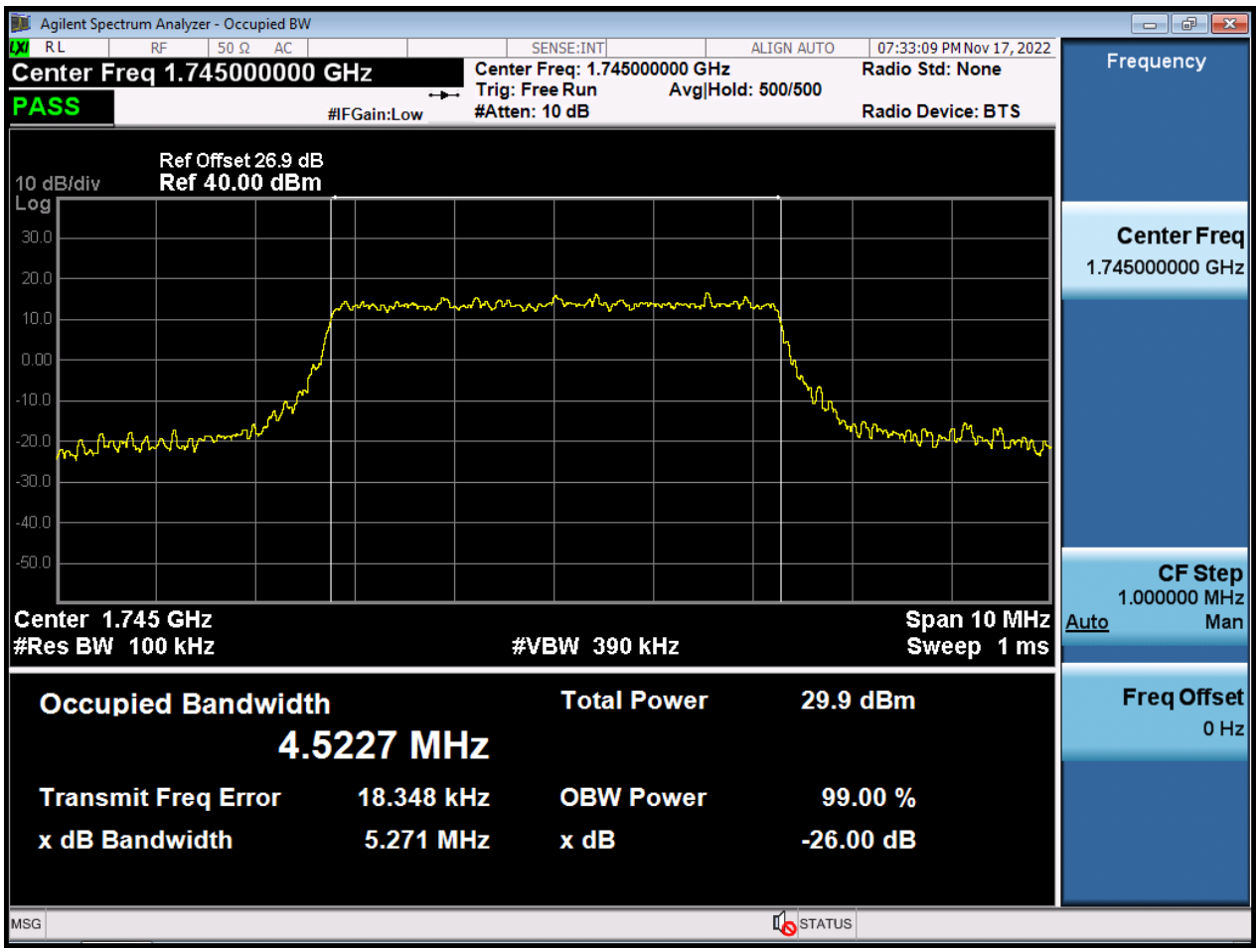
BW5 M_OBW_Middle Channel_QPSK_FullRB



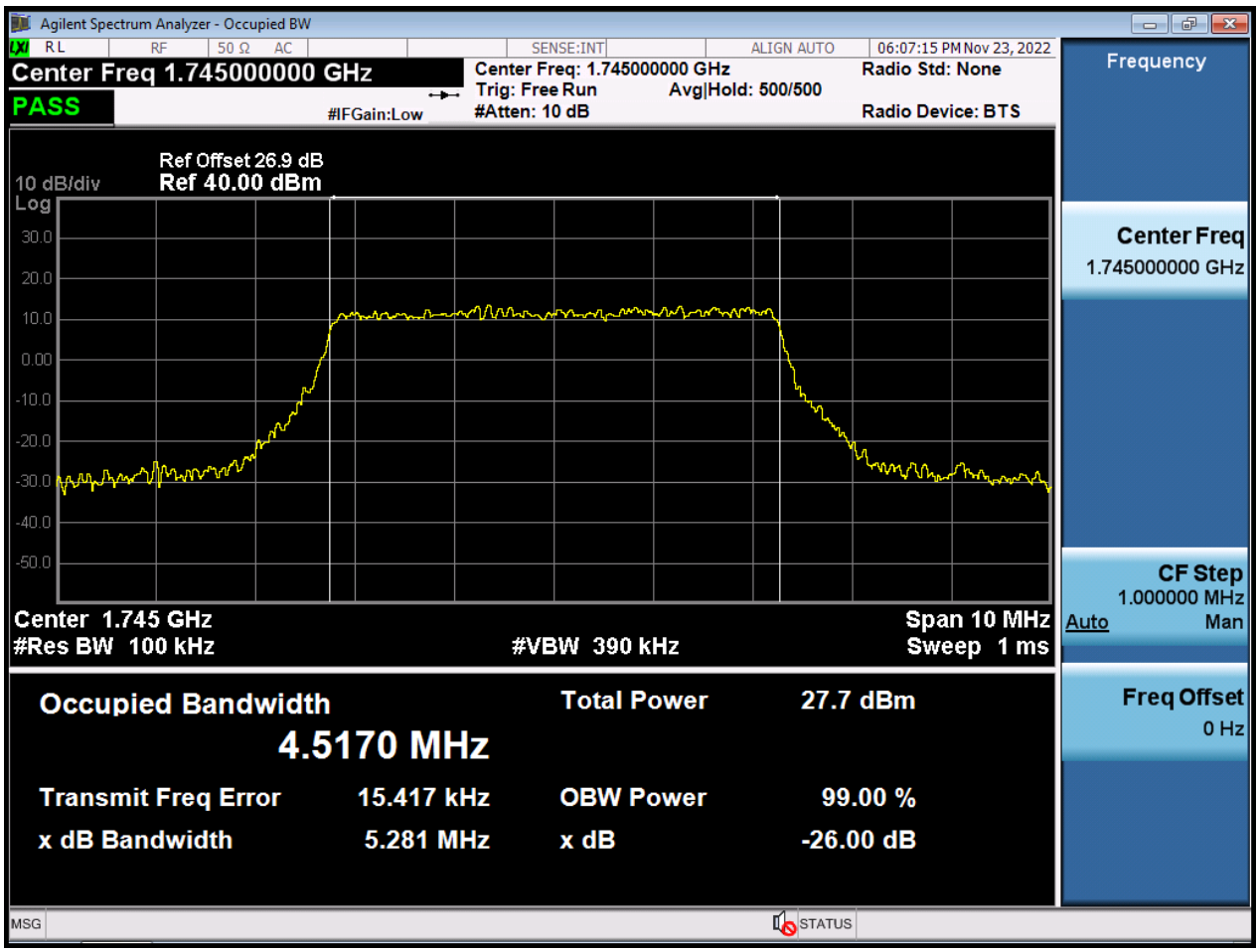
BW5 M_OBW_Middle Channel_16QAM_FullRB



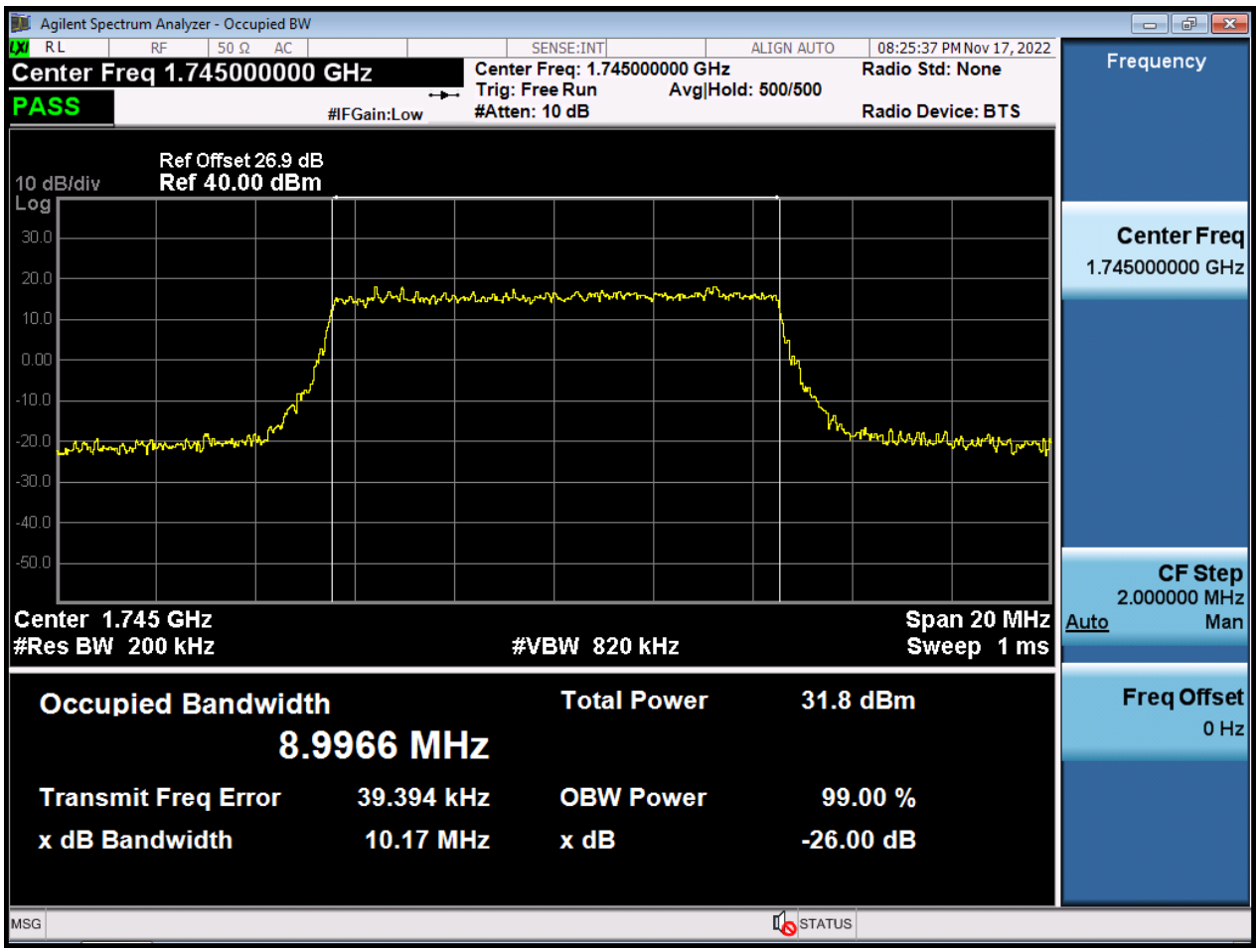
BW5 M_OBW_Middle Channel_64QAM_FullRB



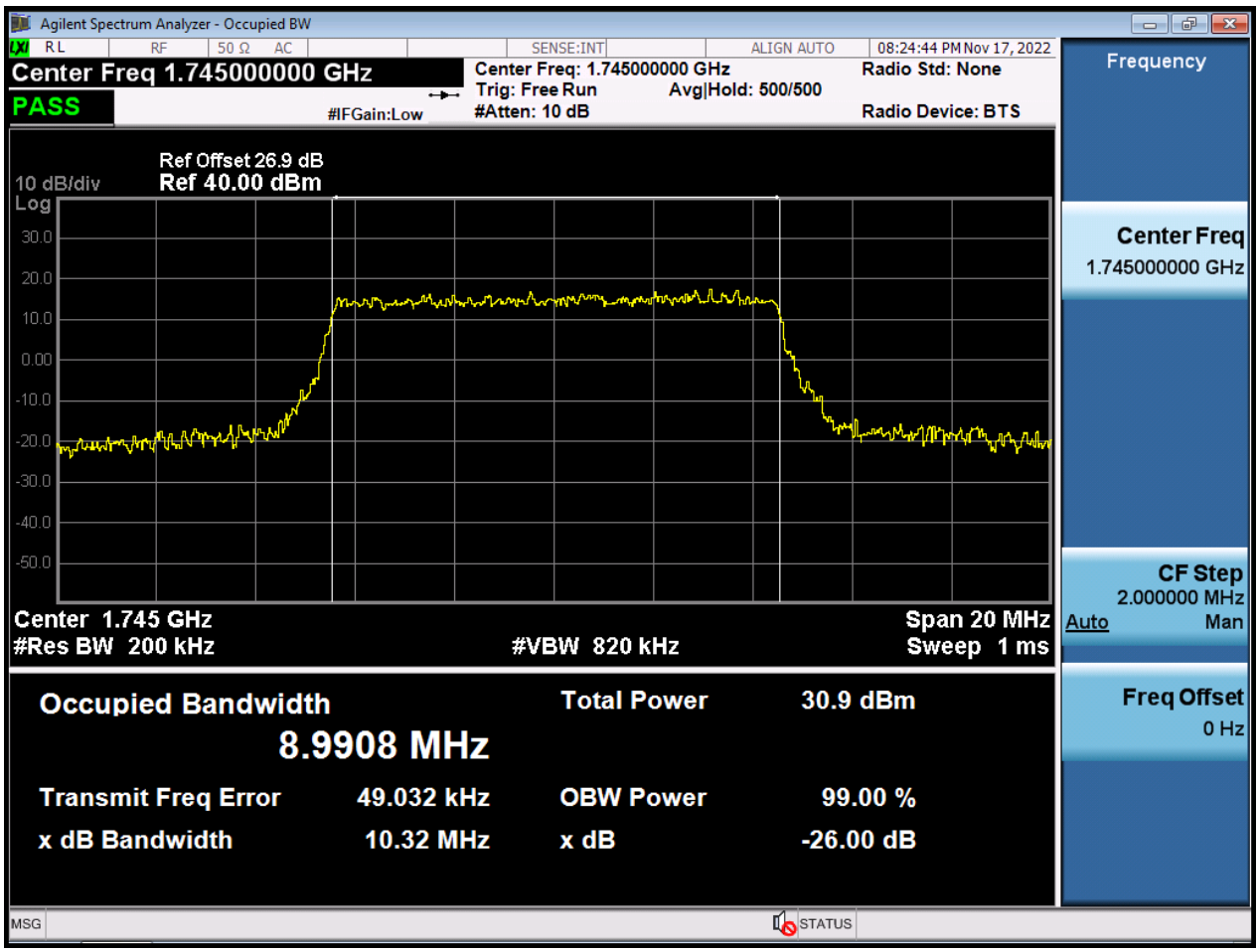
BW5 M_OBW_Middle Channel_256QAM_FullRB



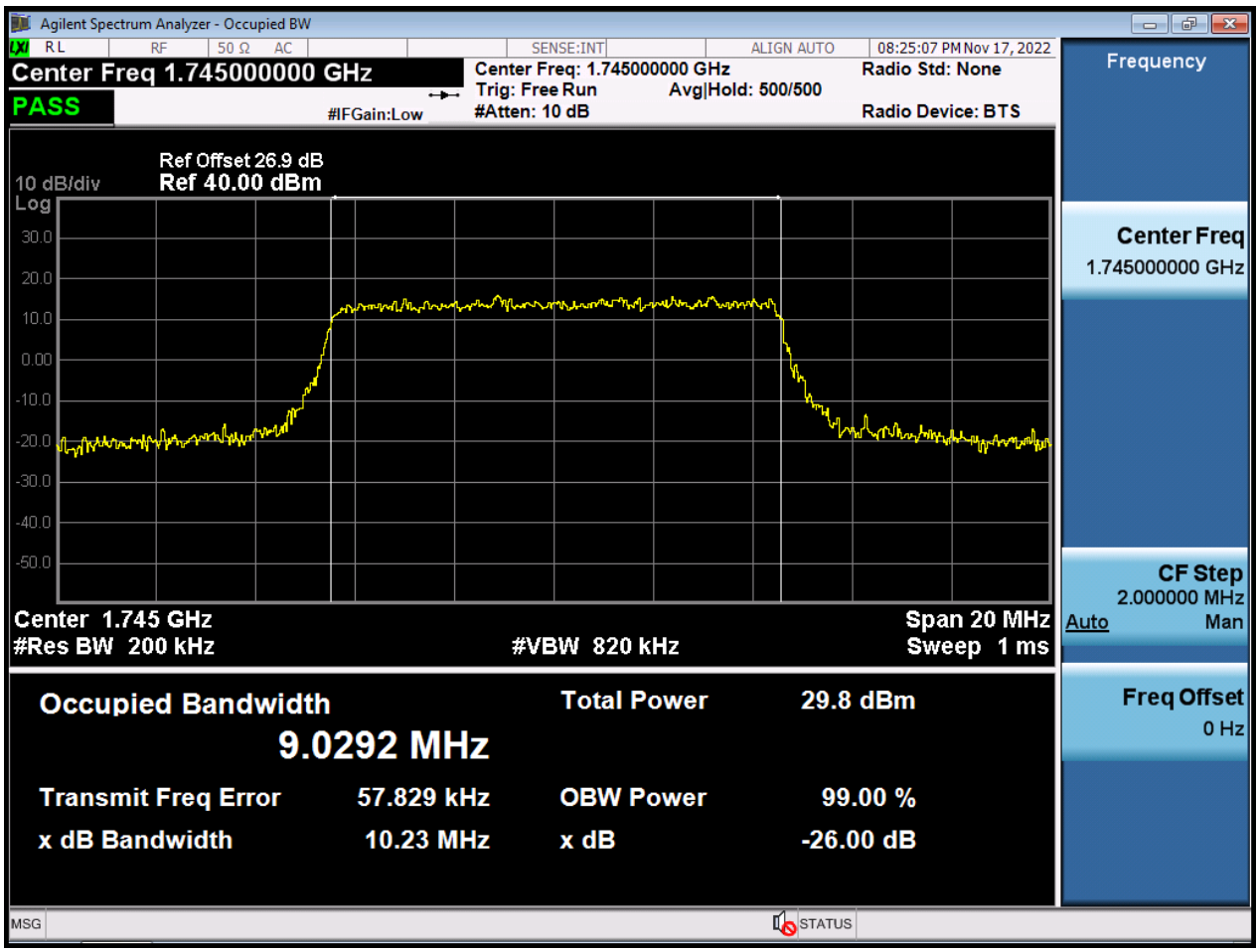
BW10 M_OBW_Middle Channel_QPSK_FullRB



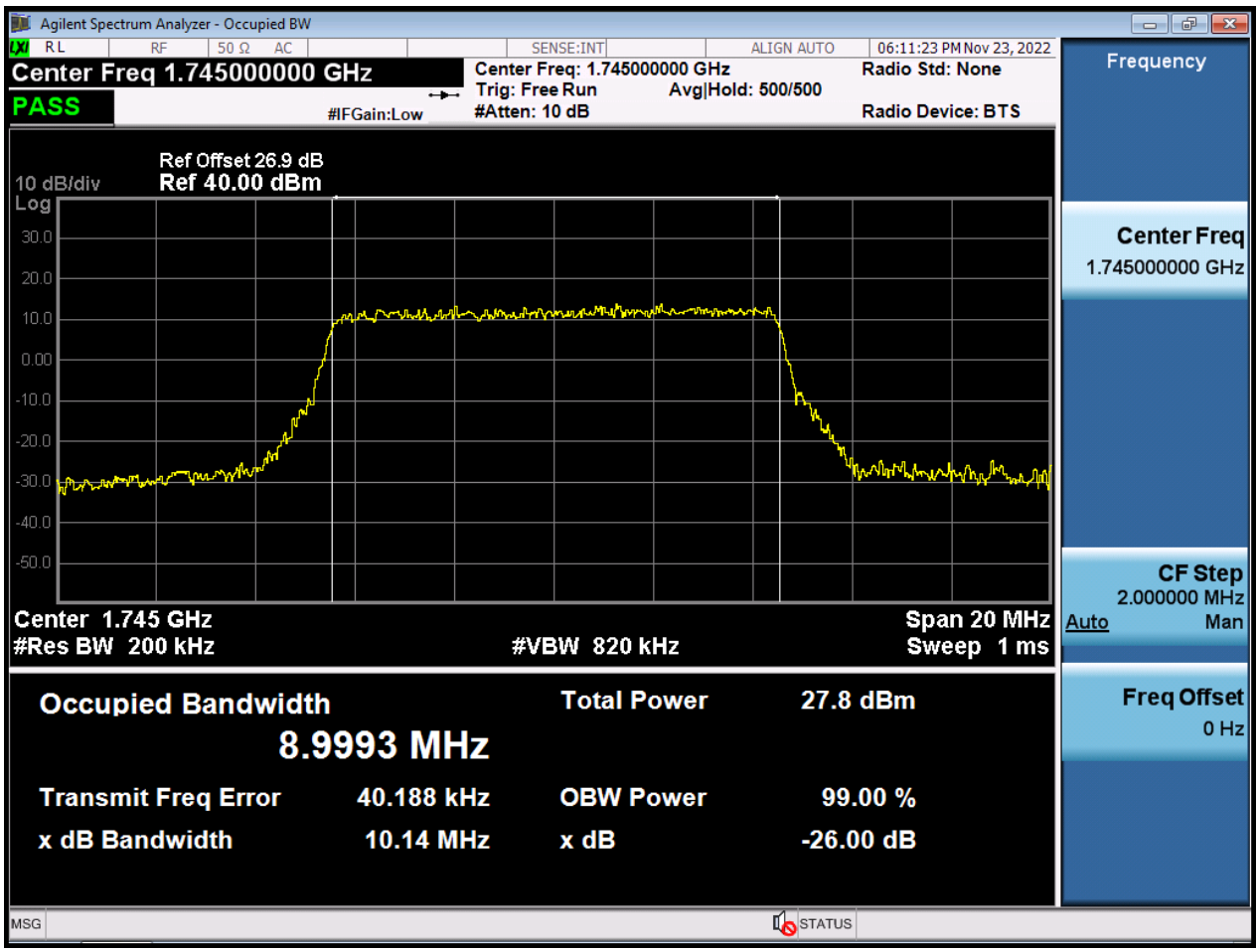
BW10 M_OBW_Middle Channel_16QAM_FullRB



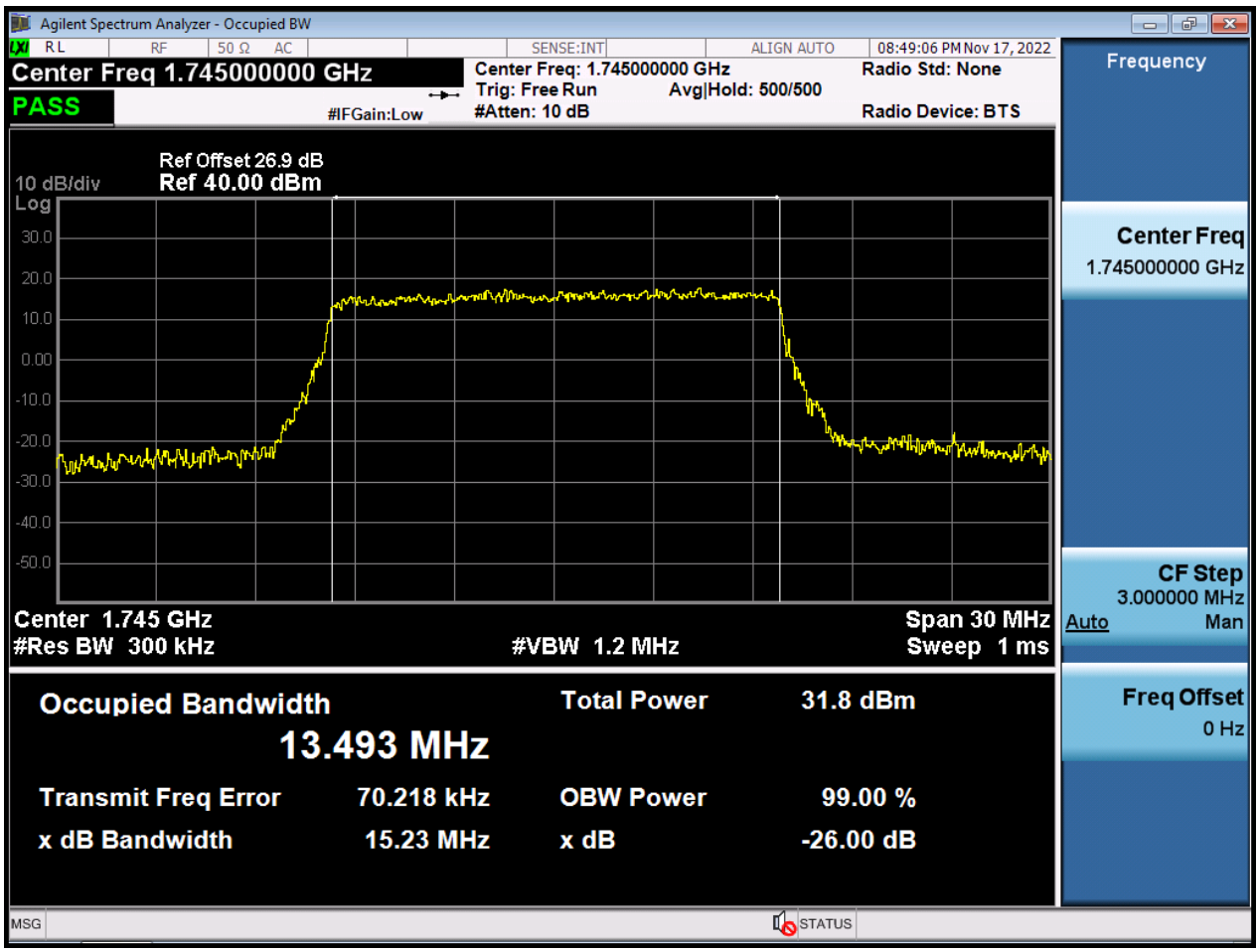
BW10 M_OBW_Middle Channel_64QAM_FullRB



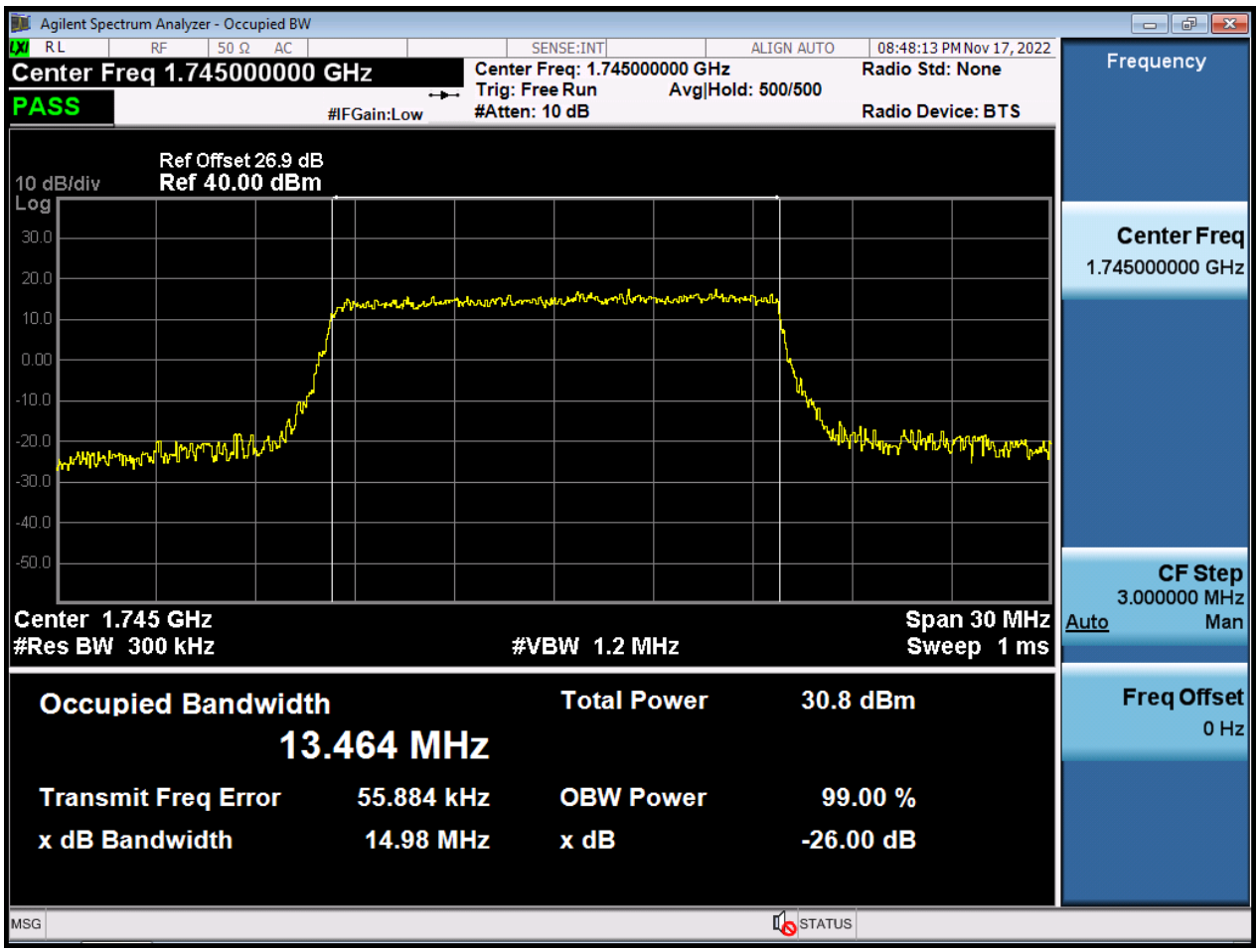
BW10 M_OBW_Middle Channel_256QAM_FullRB



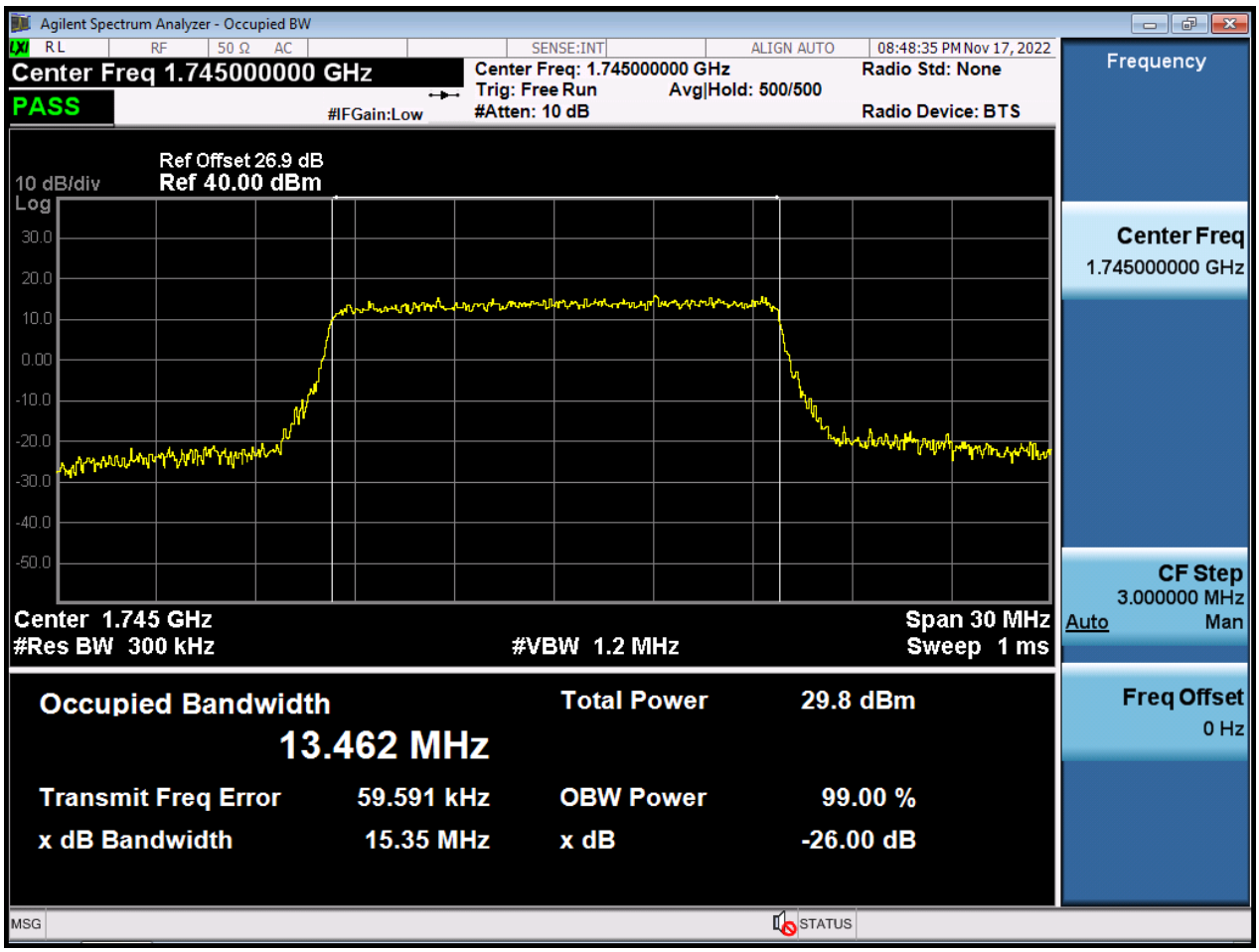
BW15 M_OBW_Middle Channel_QPSK_FullRB



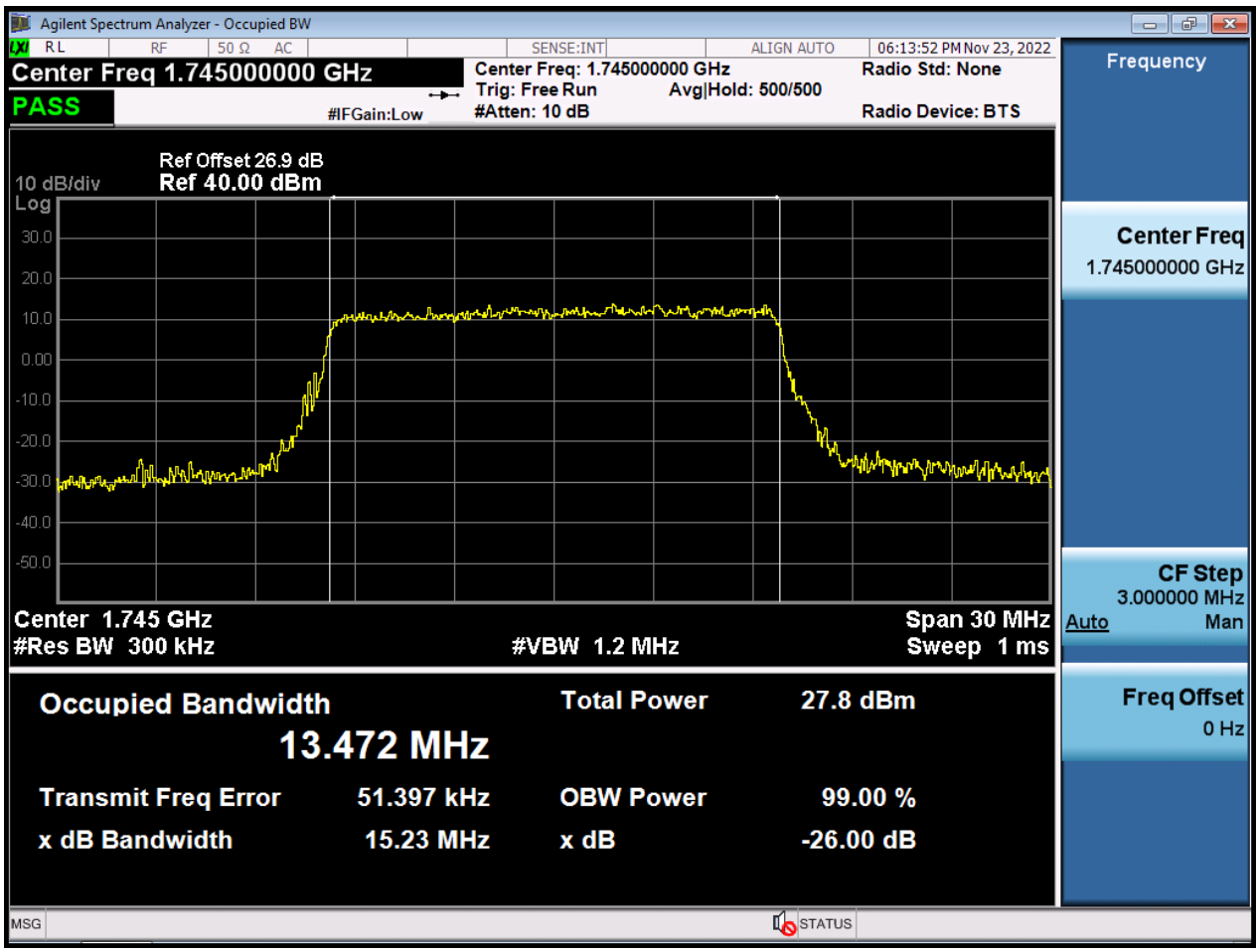
BW15 M_OBW_Middle Channel_16QAM_FullRB



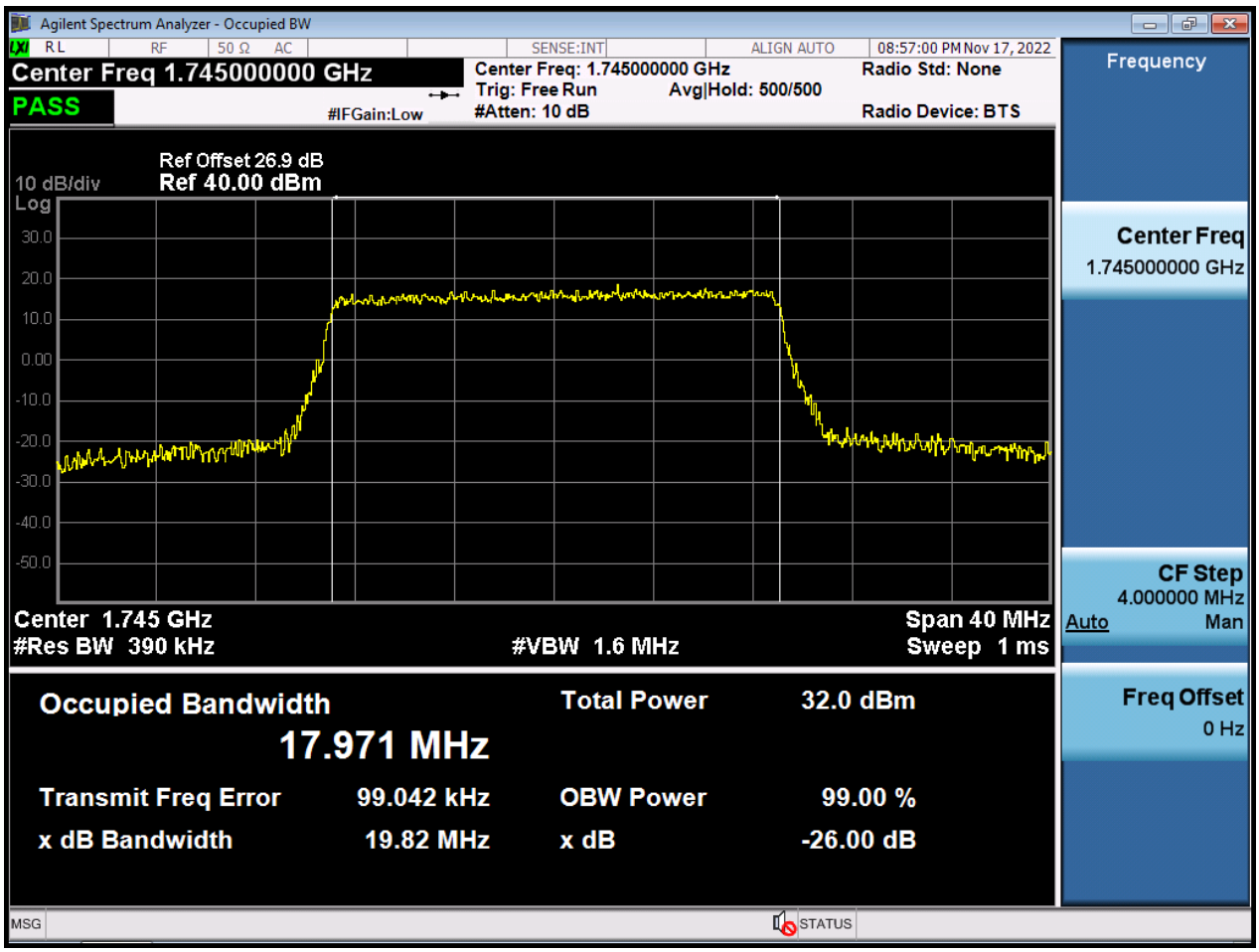
BW15 M_OBW_Middle Channel_64QAM_FullRB



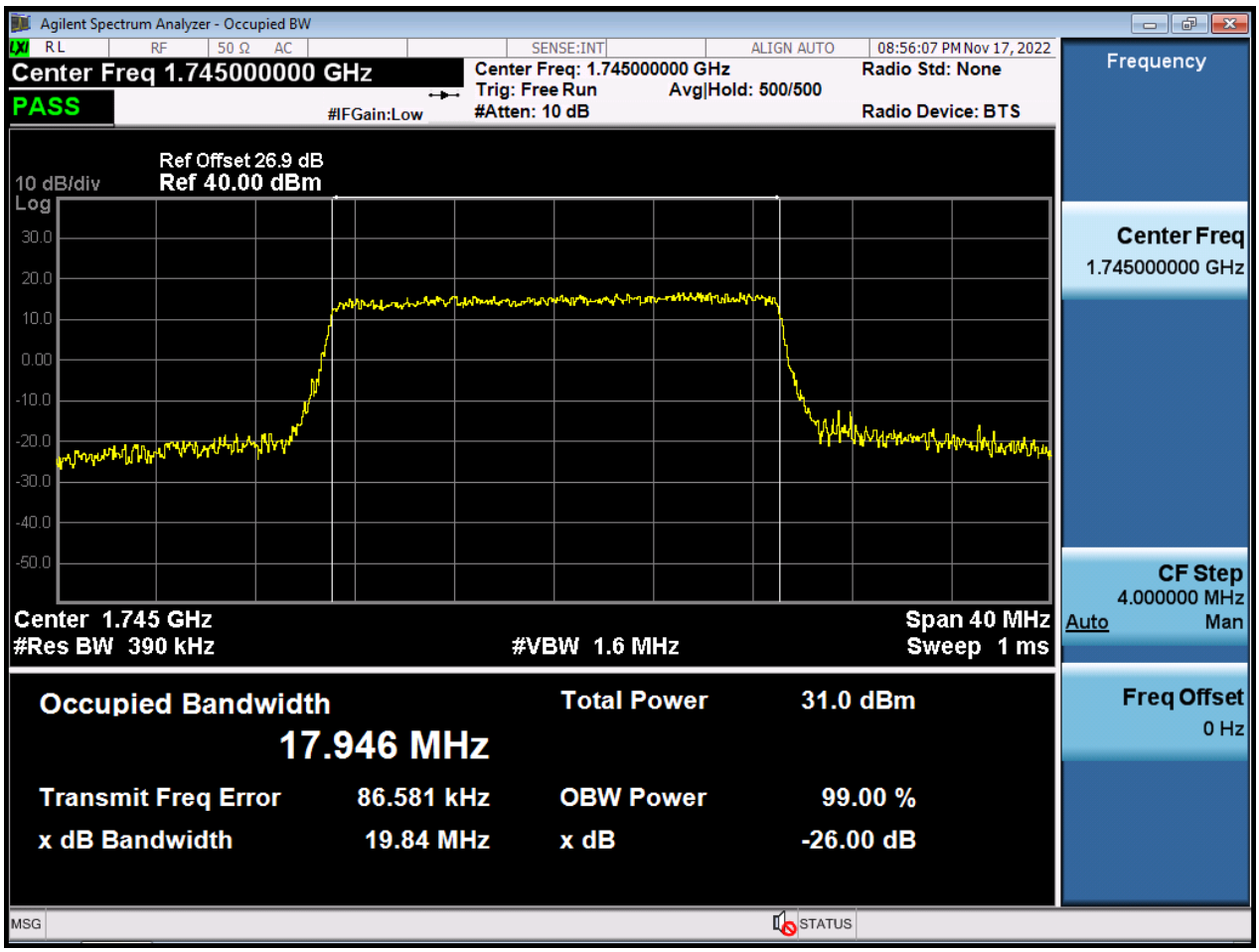
BW15 M_OBW_Middle Channel_256QAM_FullRB



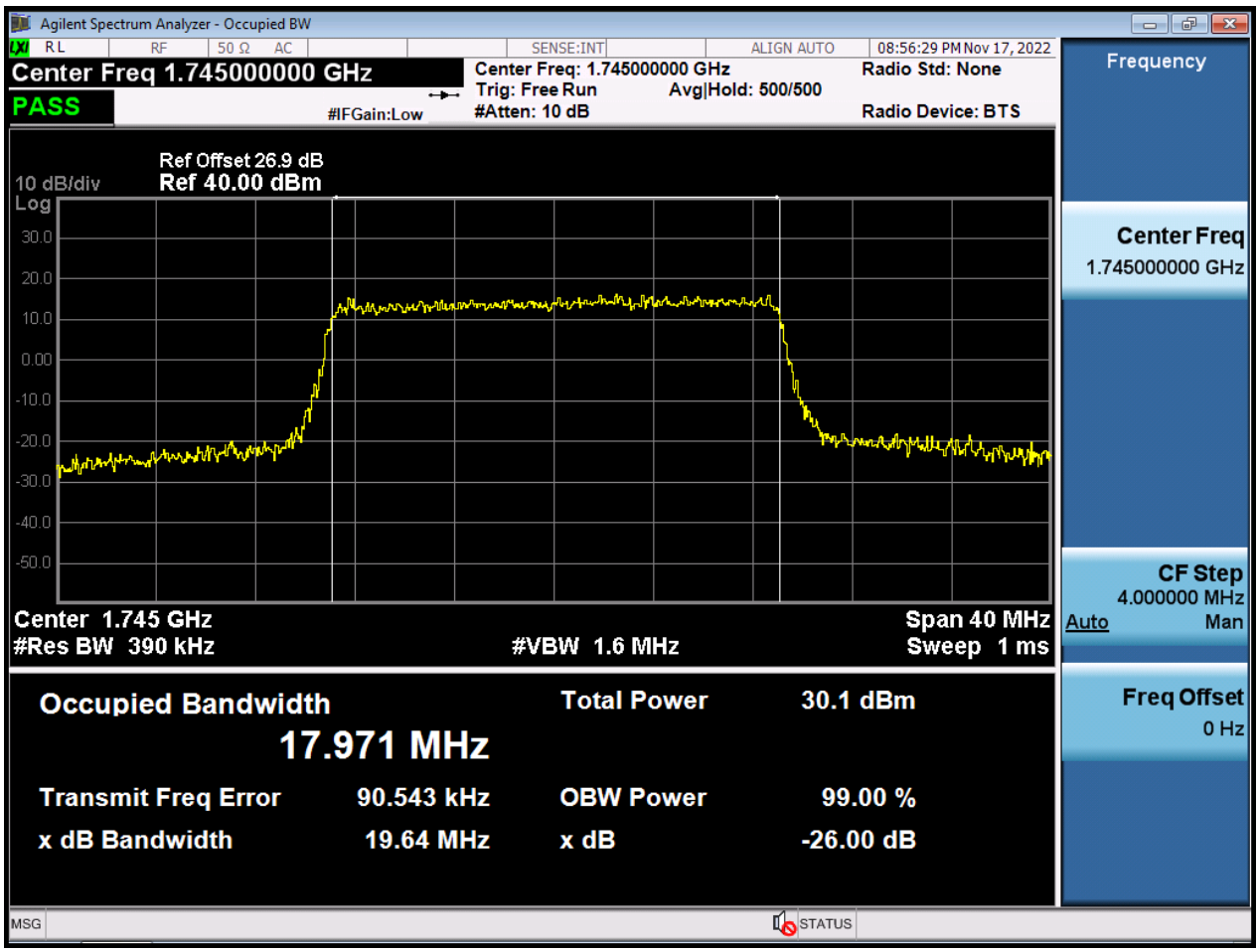
BW20 M_OBW_Middle Channel_QPSK_FullRB



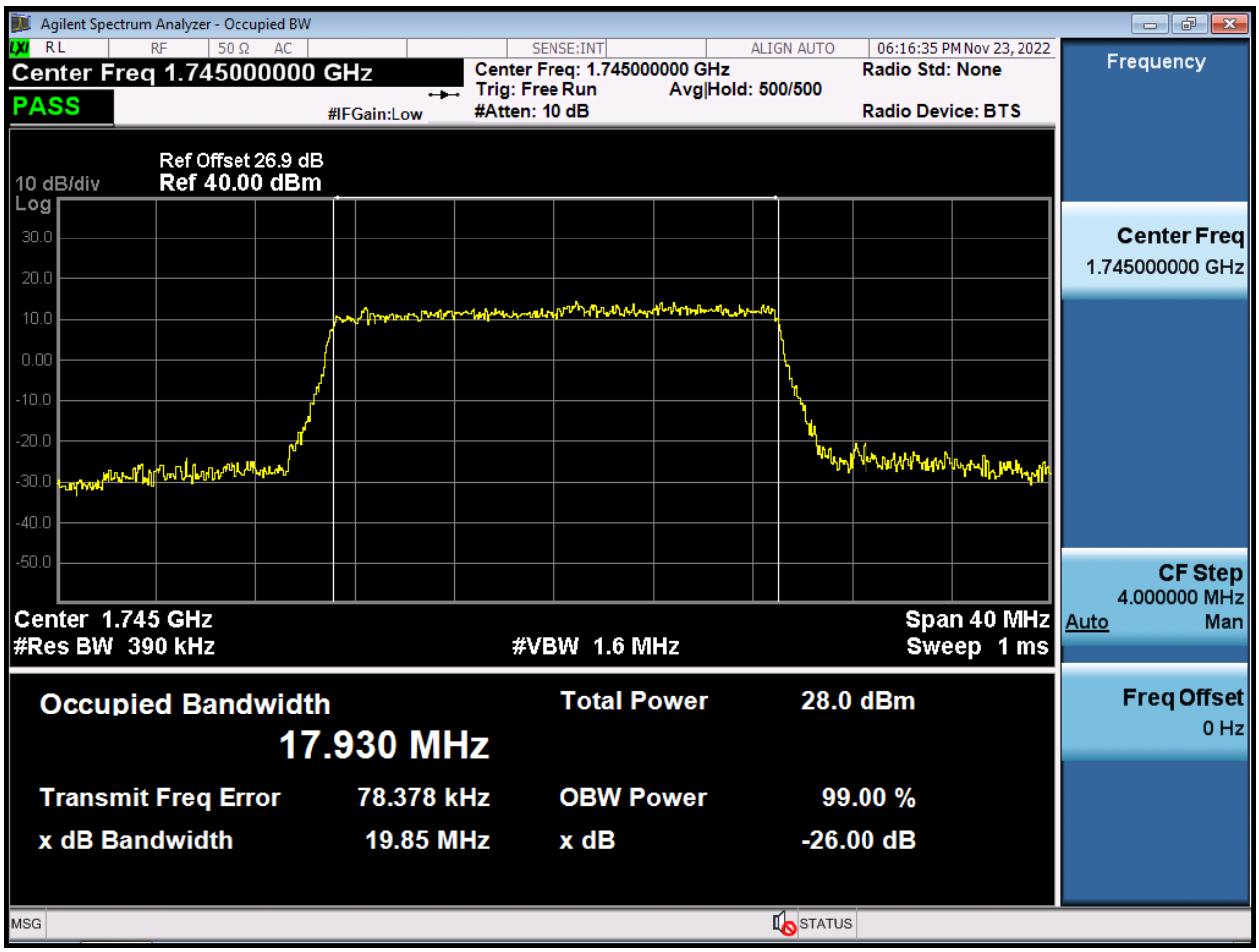
BW20 M_OBW_Middle Channel_16QAM_FullRB



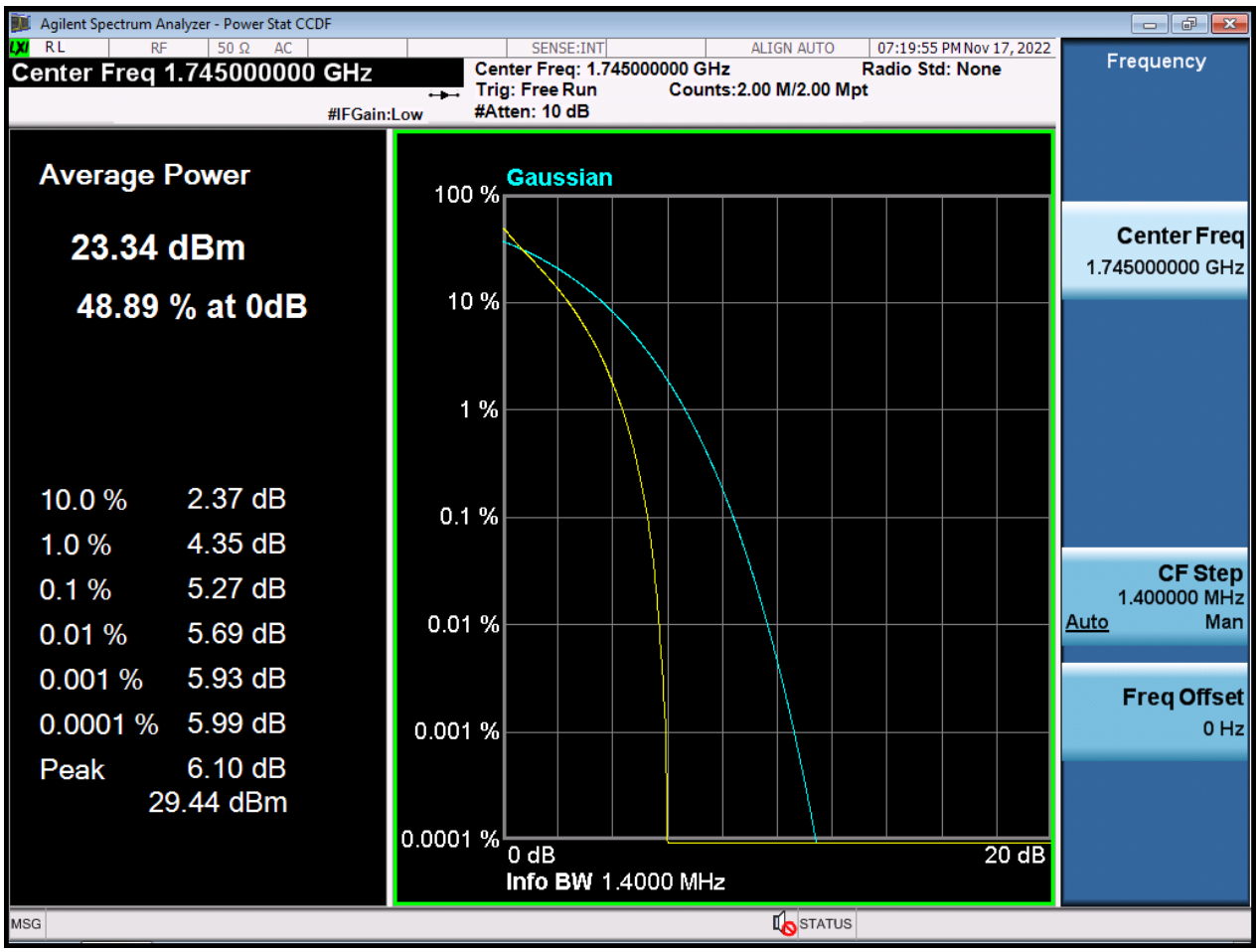
BW20 M_OBW_Middle Channel_64QAM_FullRB



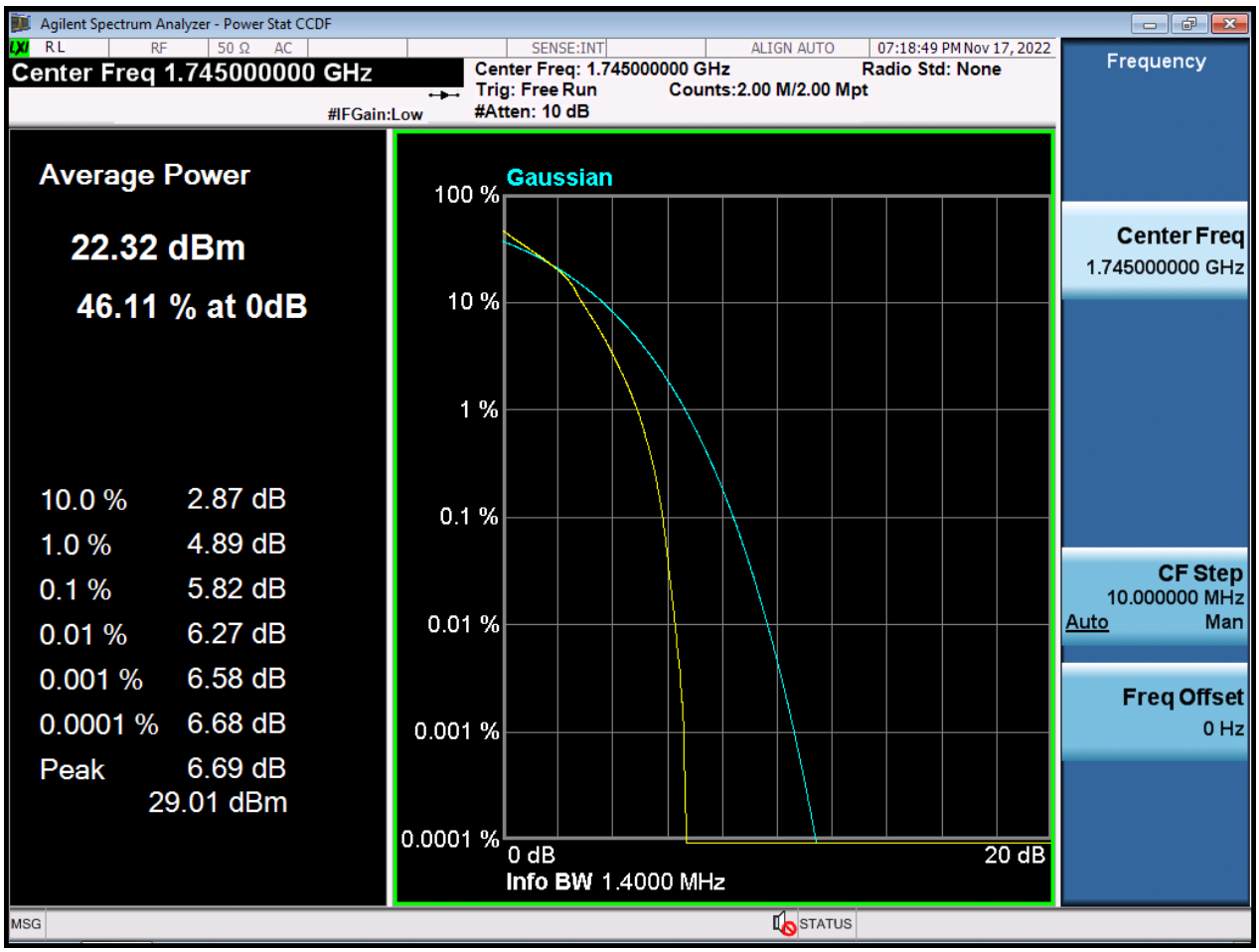
BW20 M_OBW_Middle Channel_256QAM_FullRB



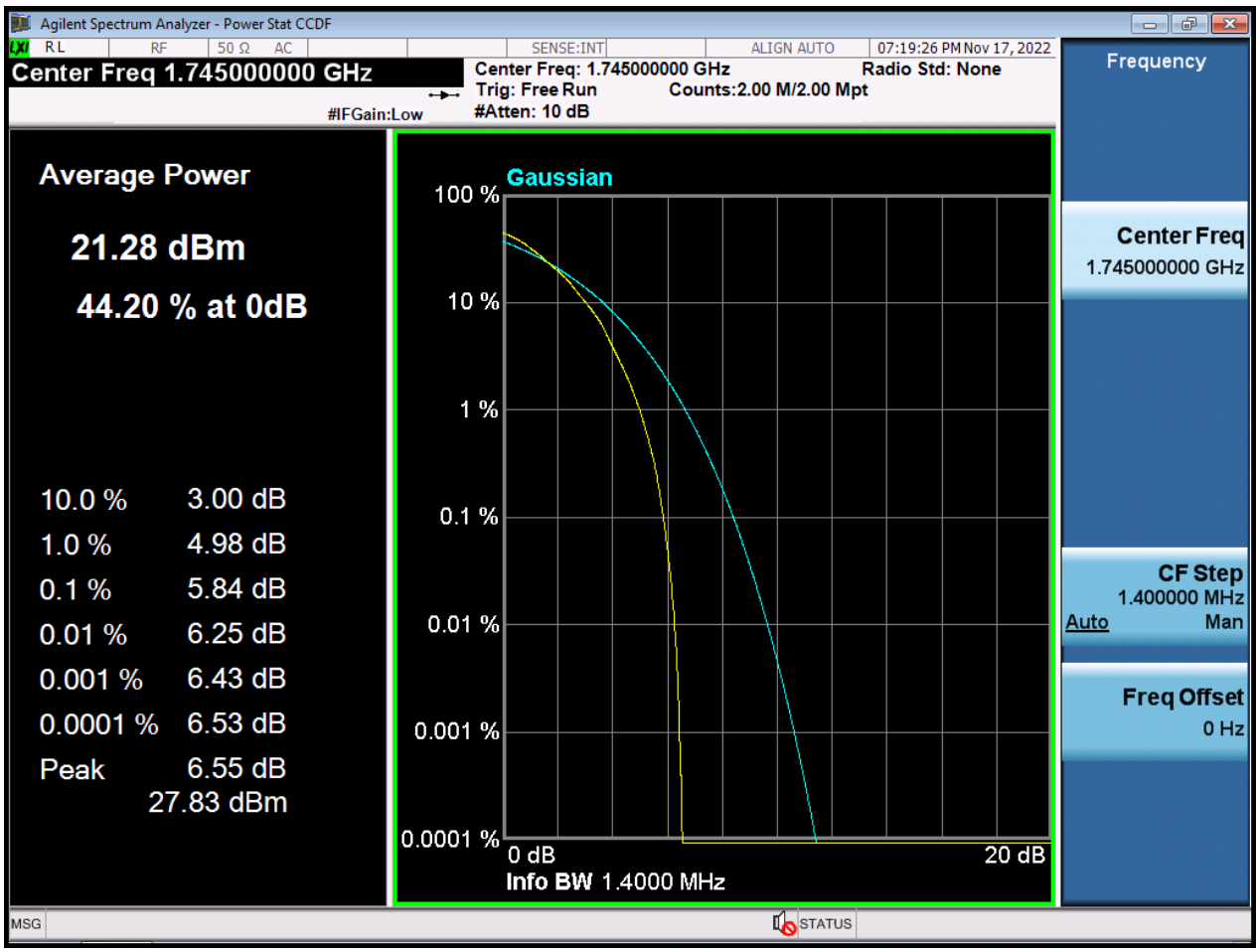
BW1.4 M_PAR_Middle Channel_QPSK_FullRB



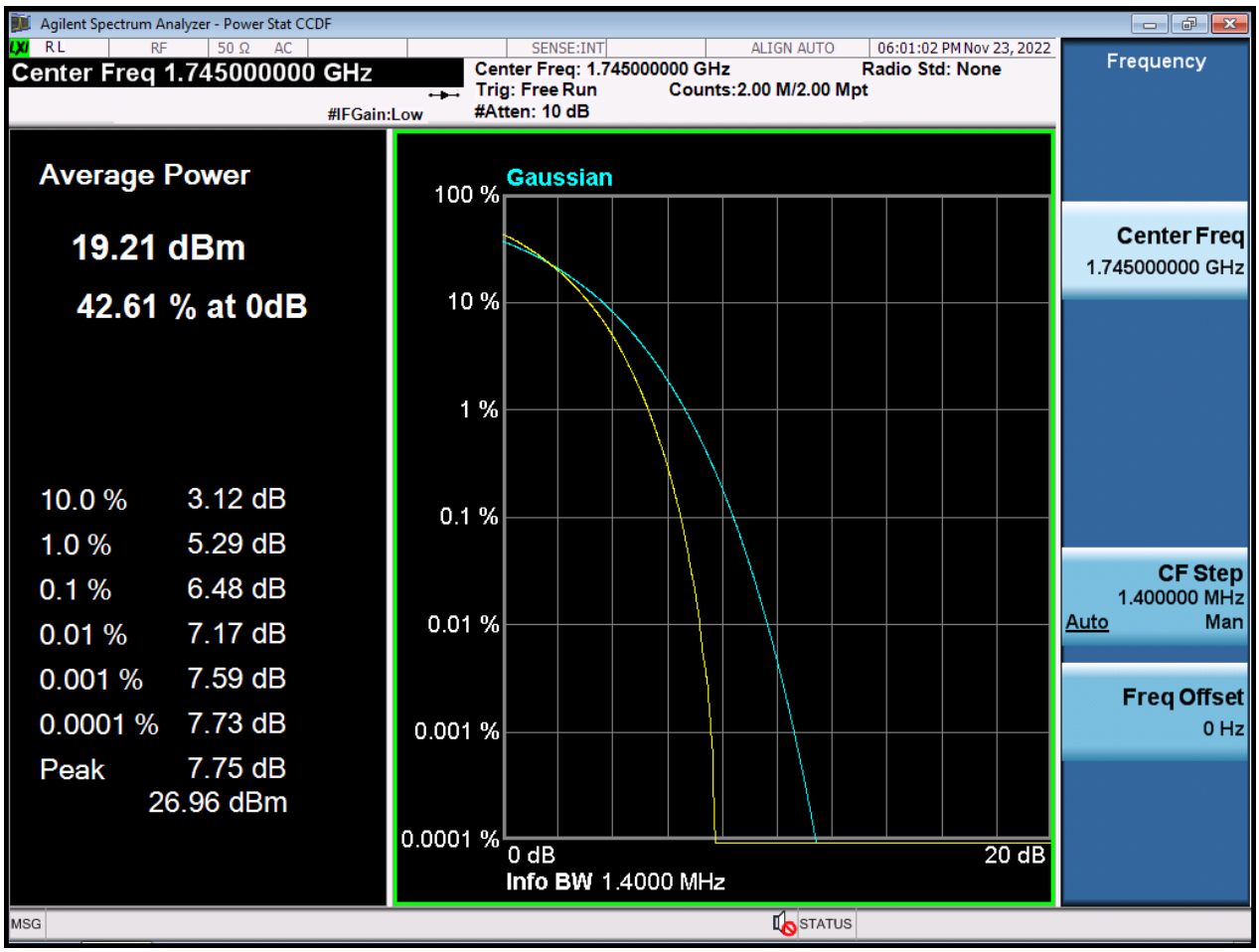
BW1.4 M_PAR_Middle Channel_16QAM_FullRB



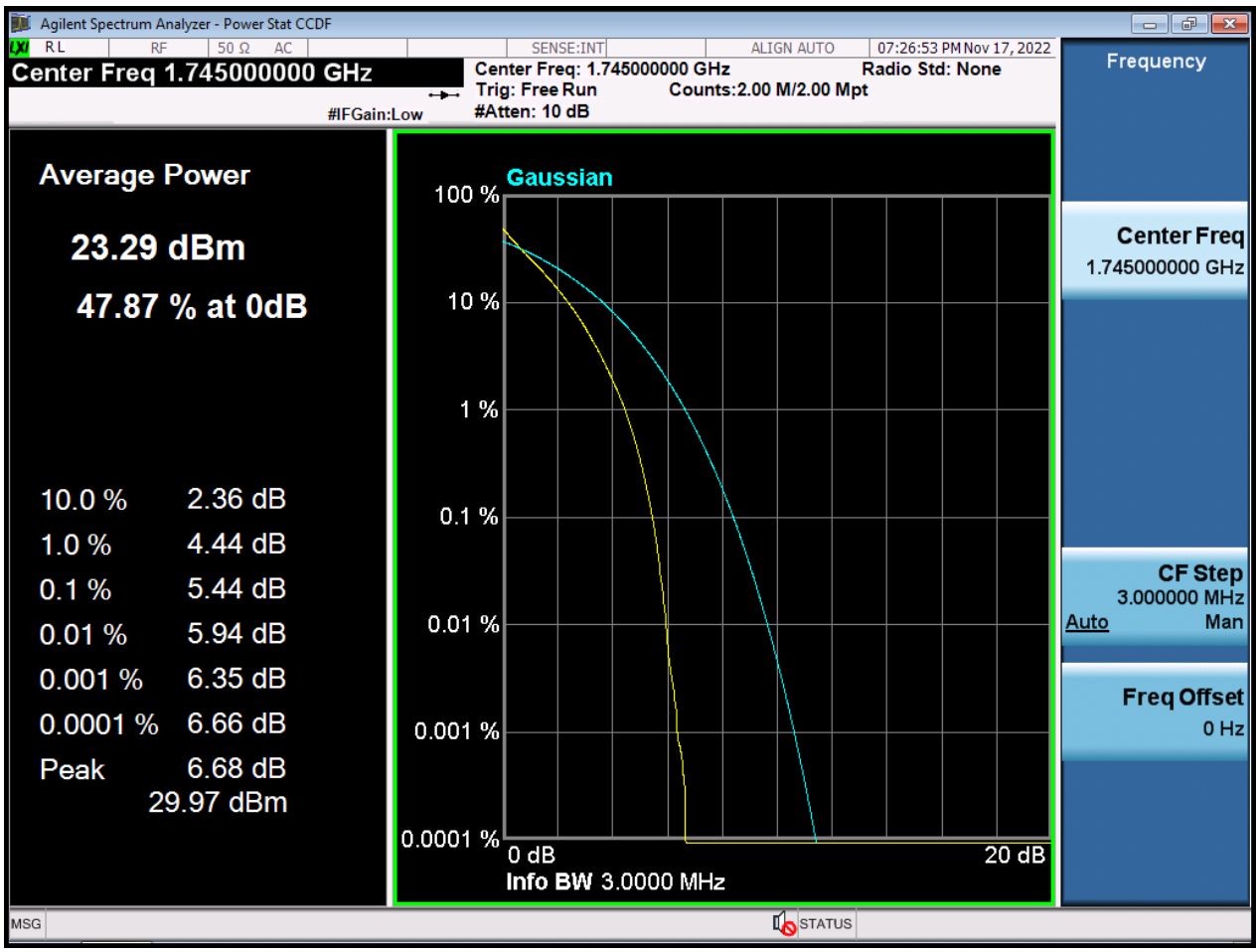
BW1.4 M_PAR_Middle Channel_64QAM_FullRB



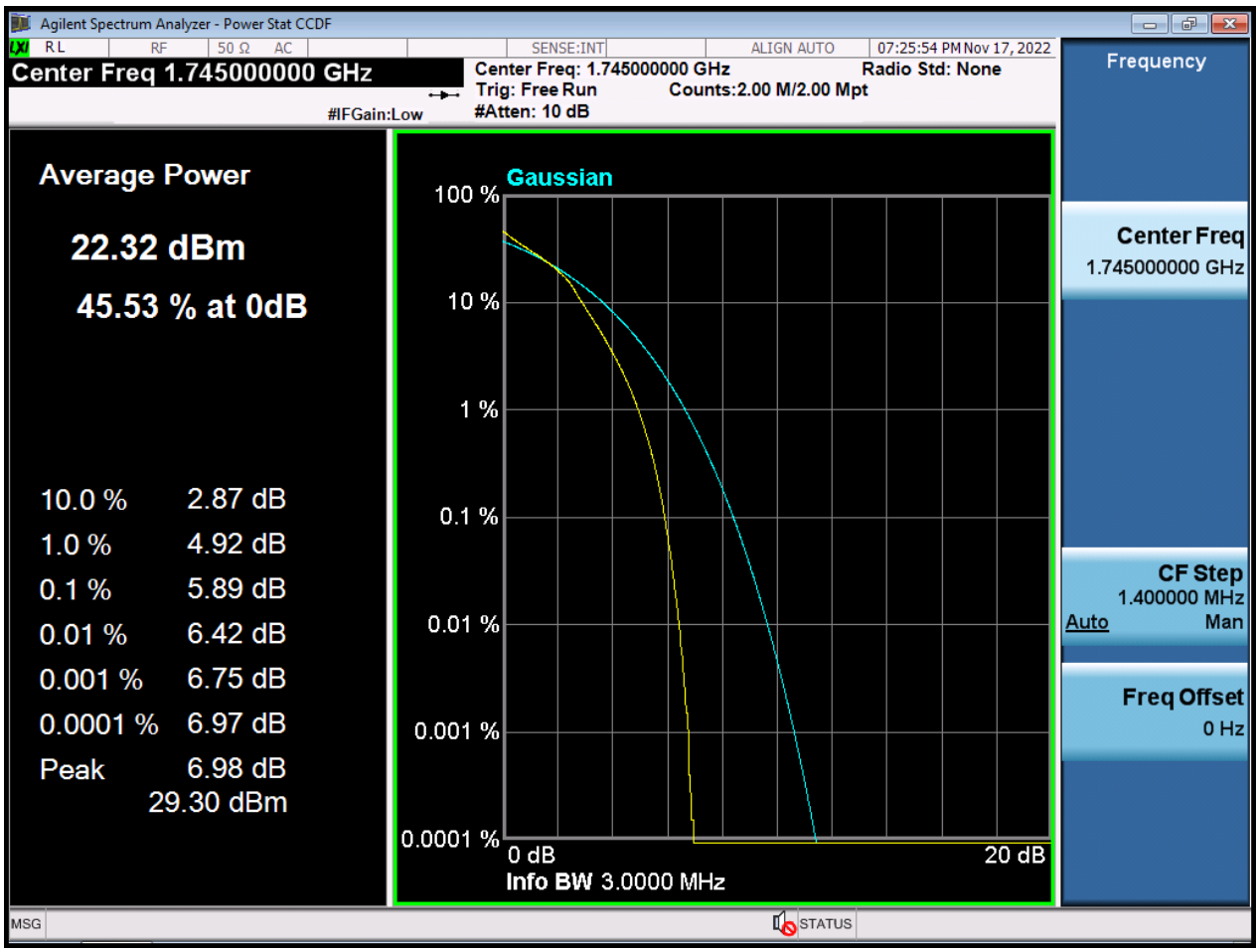
BW1.4 M_PAR_Middle Channel_256QAM_FullRB



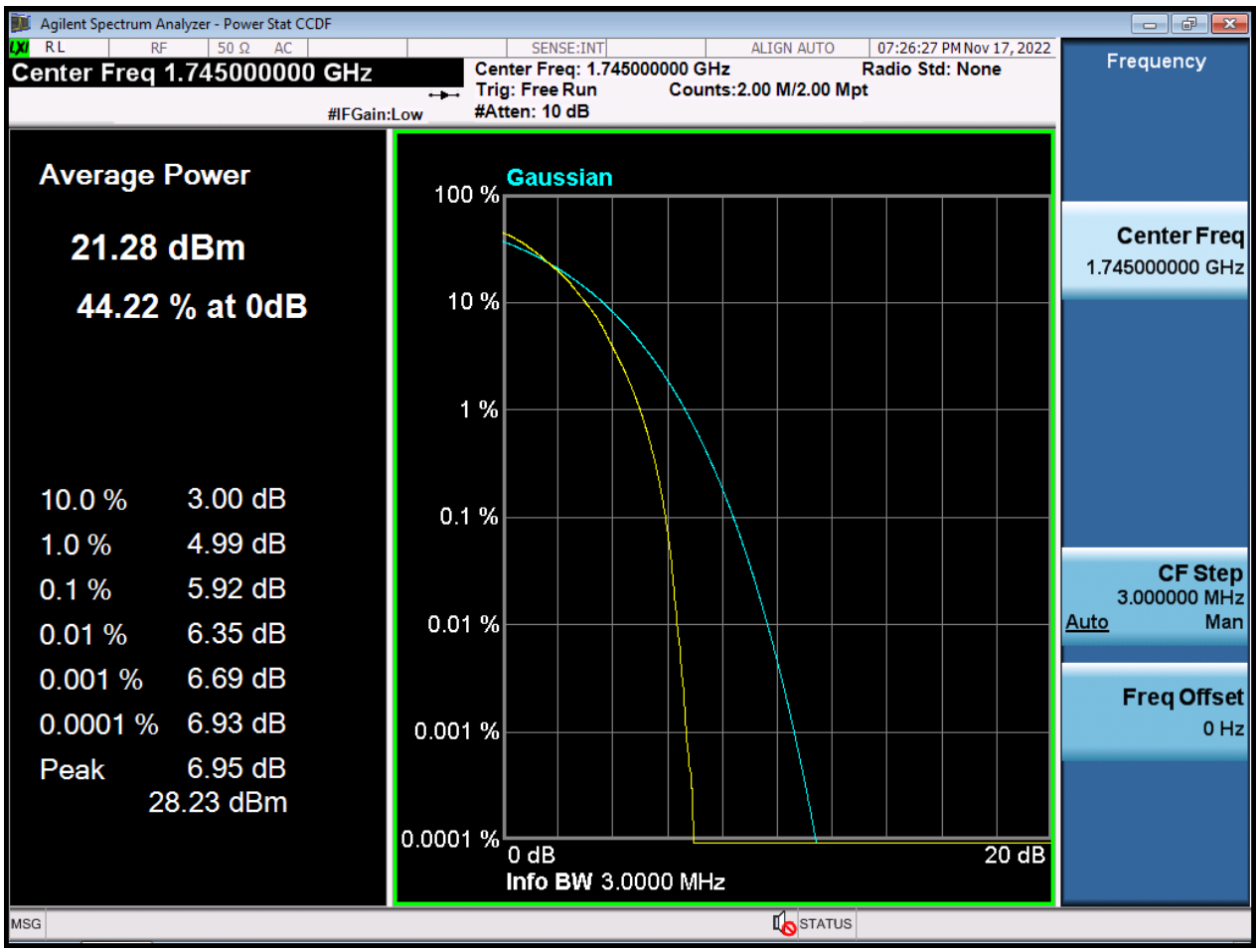
BW3 M_PAR_Middle Channel_QPSK_FullRB



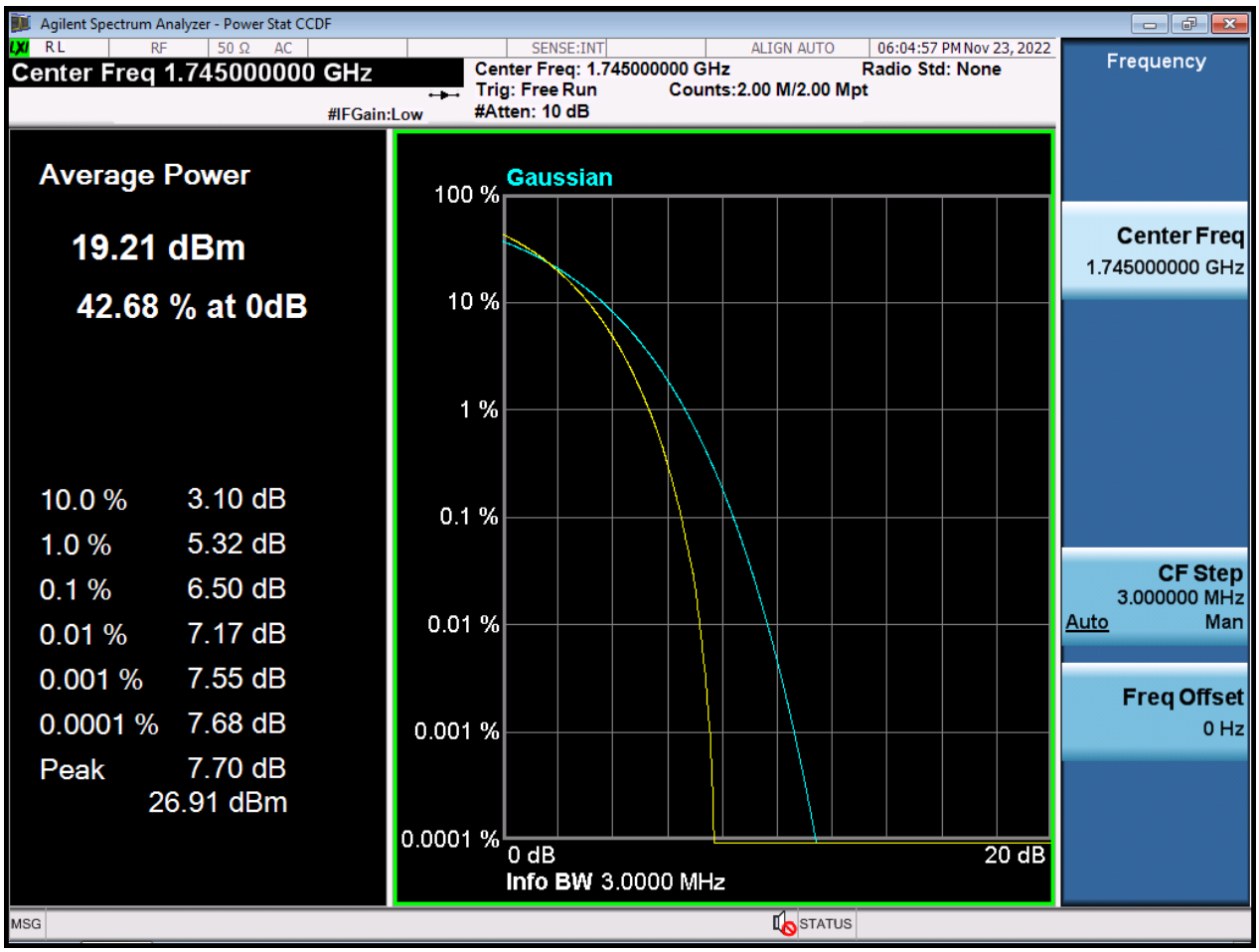
BW3 M_PAR_Middle Channel_16QAM_FullRB



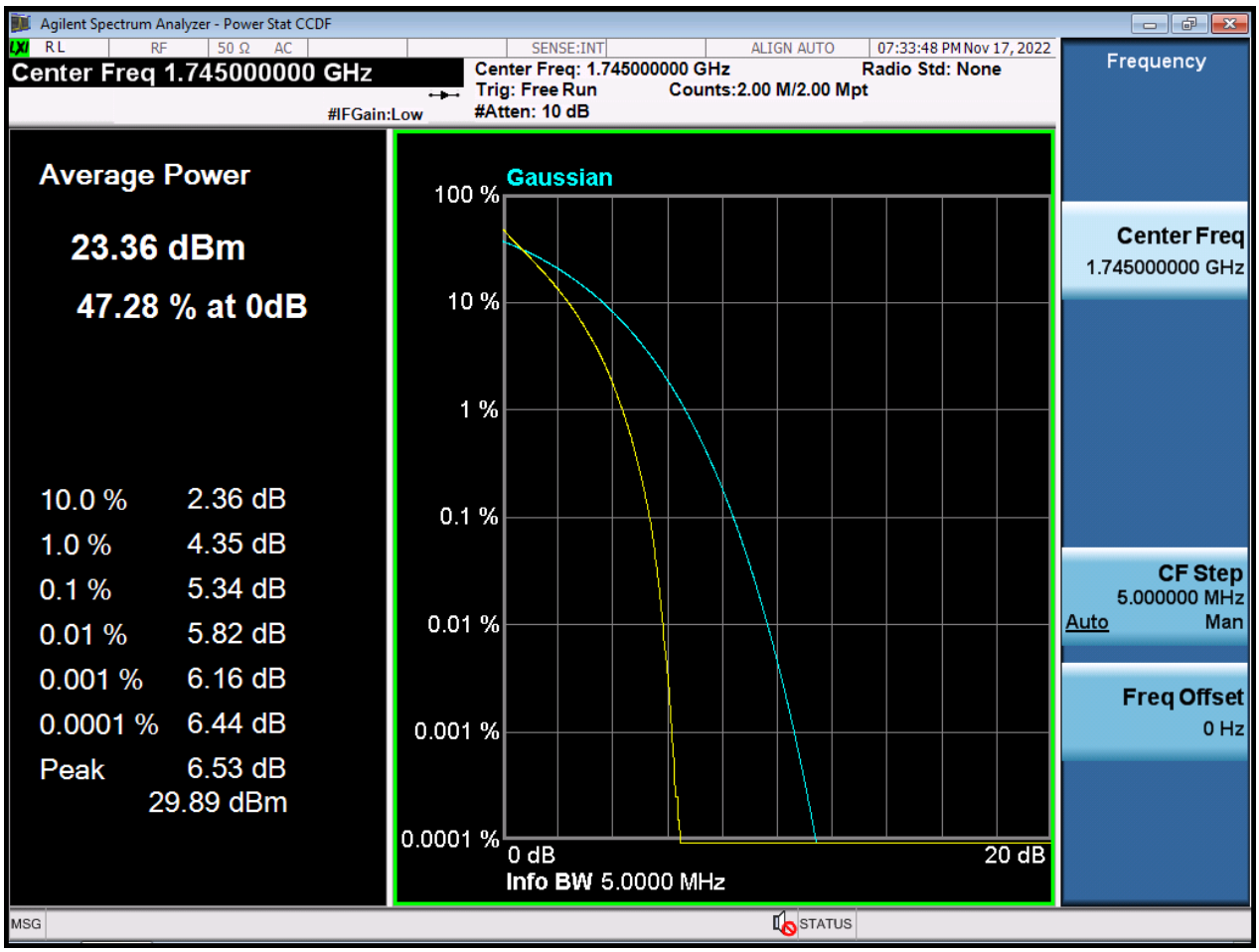
BW3 M_PAR_Middle Channel_64QAM_FullRB



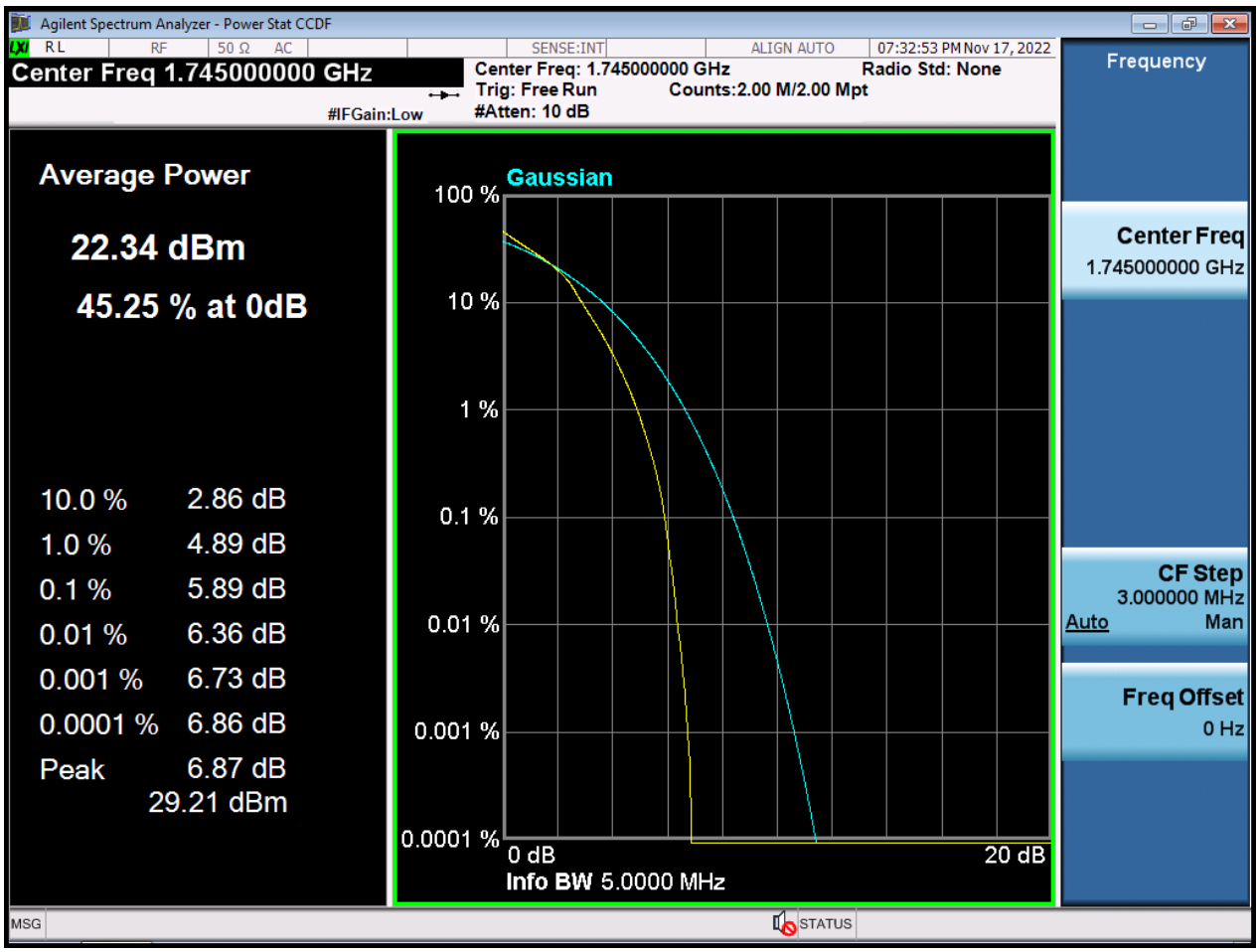
BW3 M_PAR_Middle Channel_256QAM_FullRB



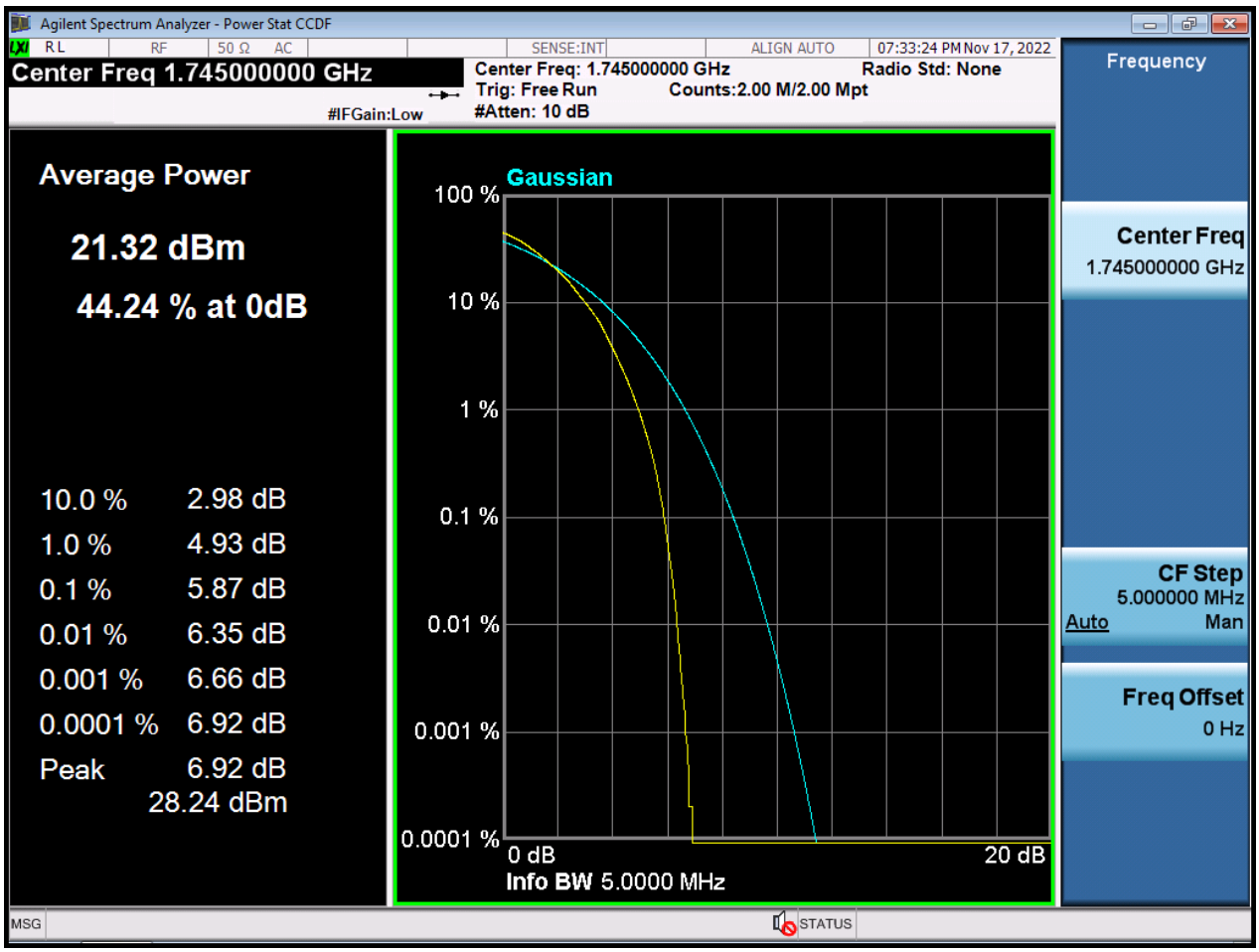
BW5 M_PAR_Middle Channel_QPSK_FullRB



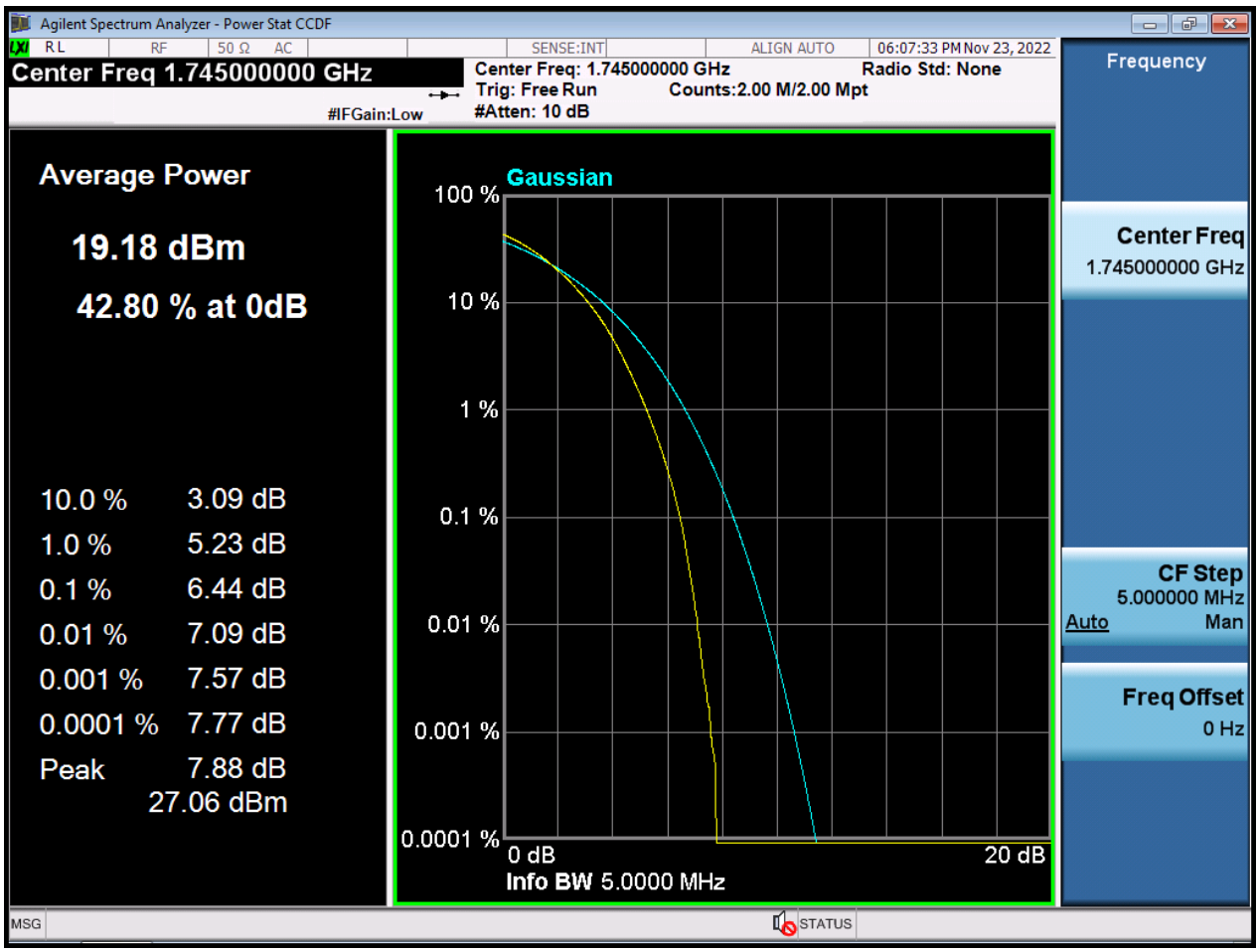
BW5 M_PAR_Middle Channel_16QAM_FullRB



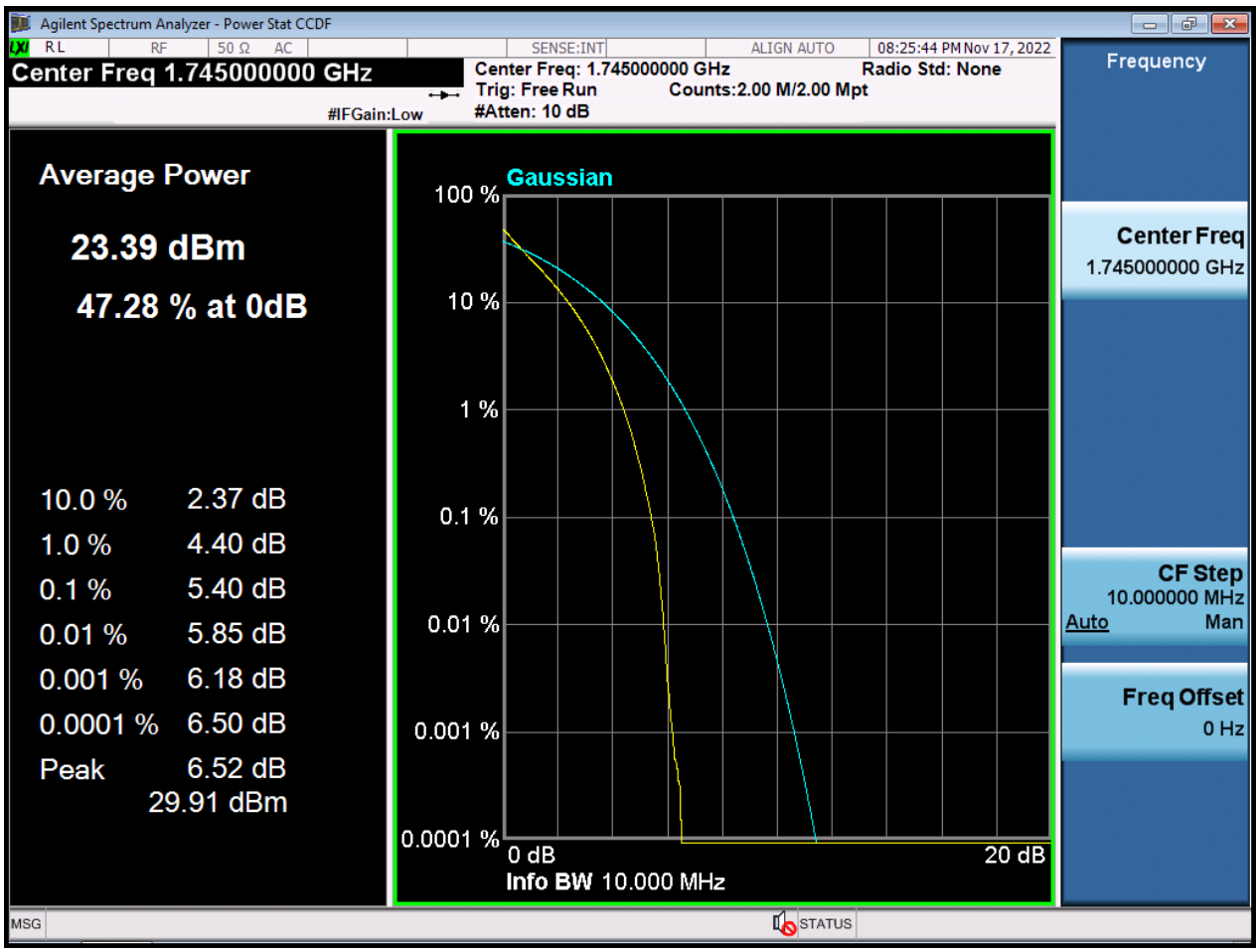
BW5 M_PAR_Middle Channel_64QAM_FullRB



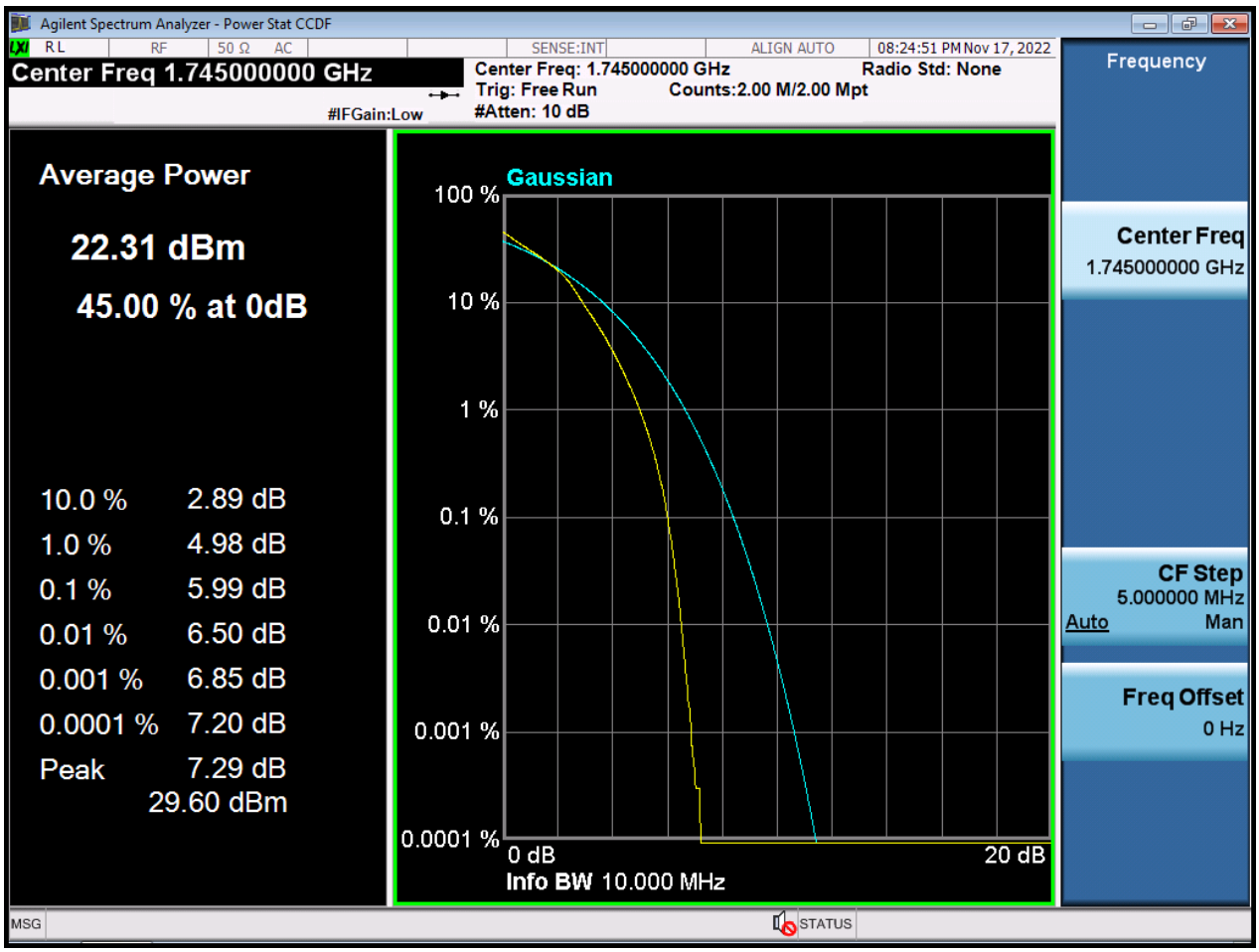
BW5 M_PAR_Middle Channel_256QAM_FullRB



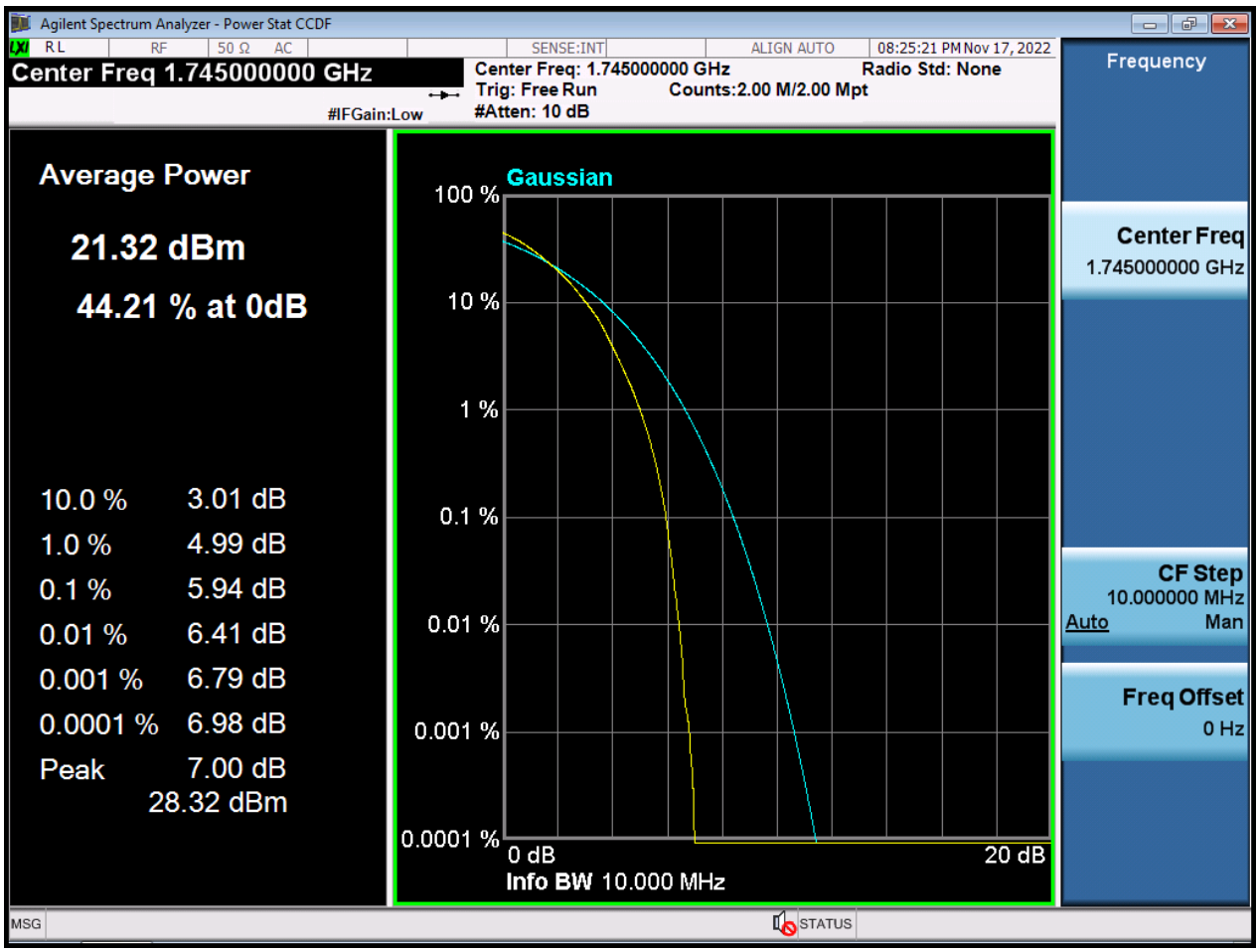
BW10 M_PAR_Middle Channelz_QPSK_FullRB



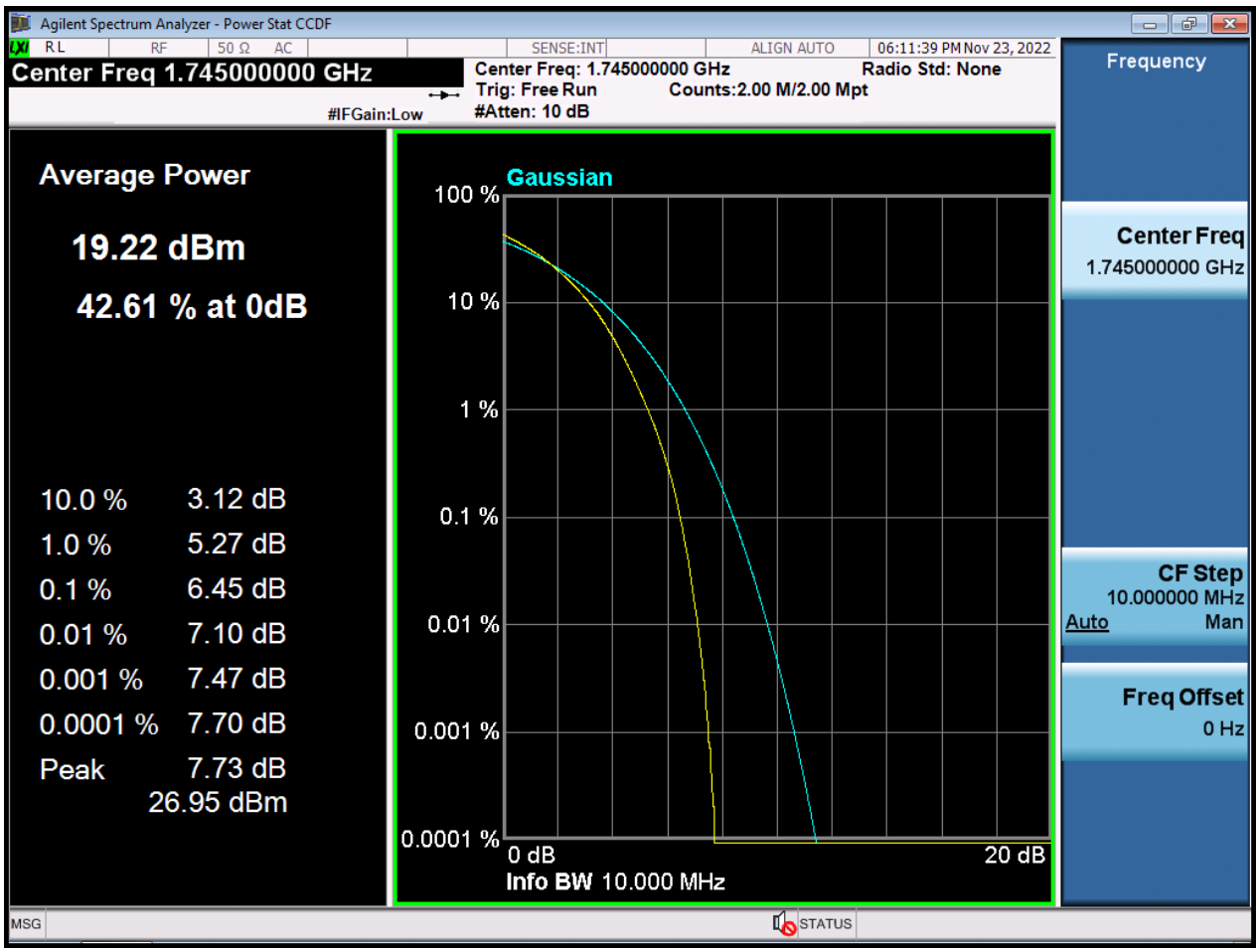
BW10 M_PAR_Middle Channel_16QAM_FullRB



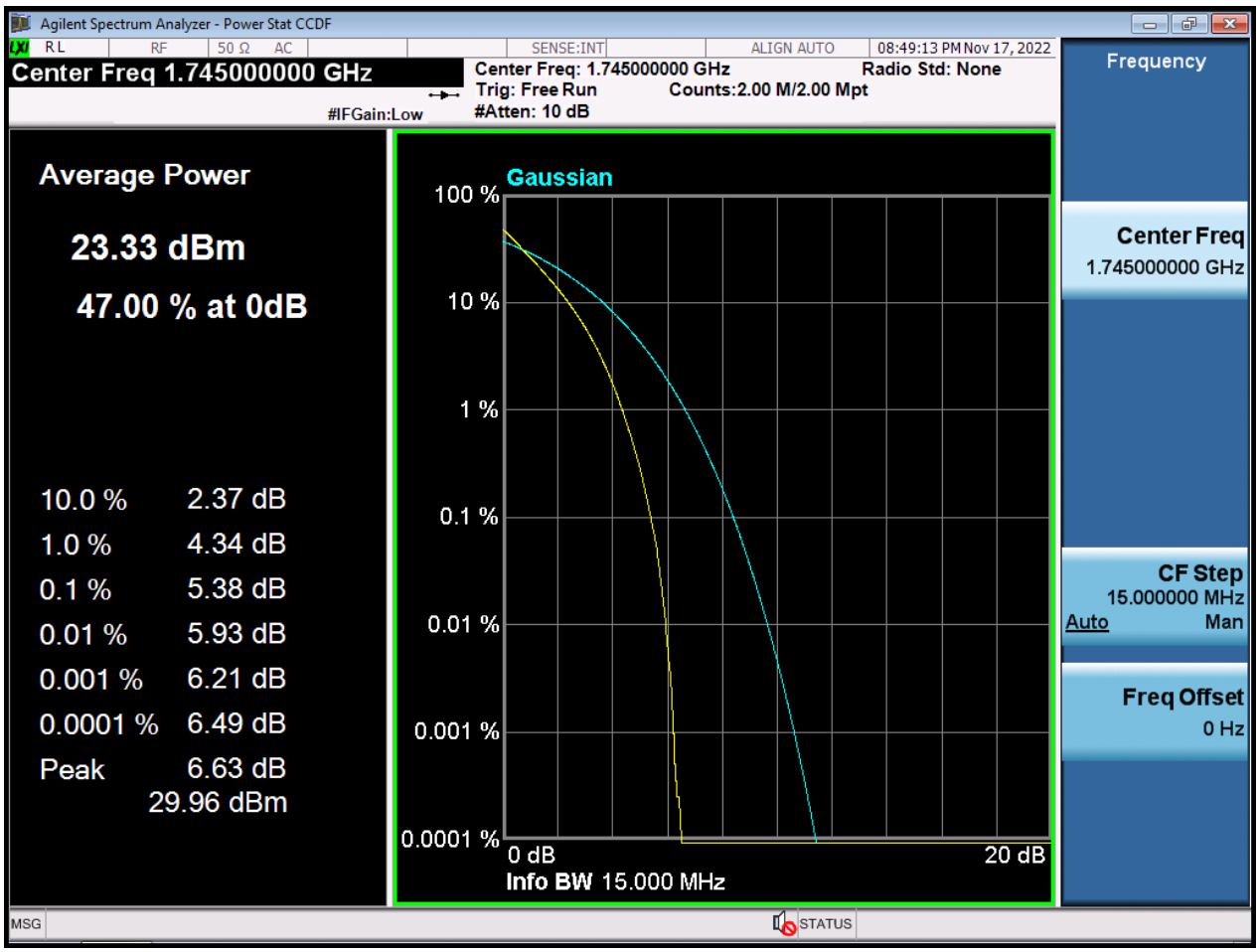
BW10 M_PAR_Middle Channel_64QAM_FullRB



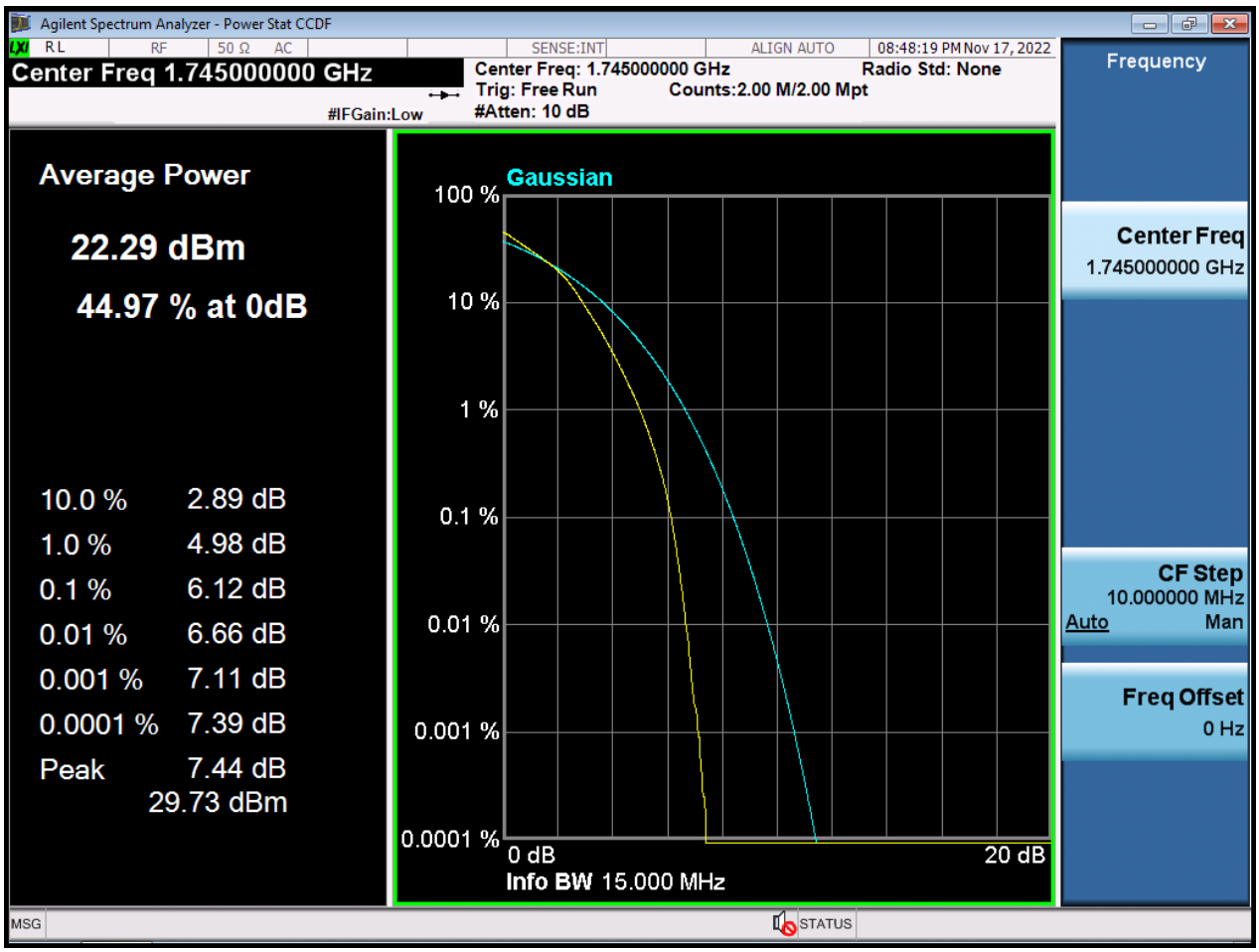
BW10 M_PAR_Middle Channel_256QAM_FullRB



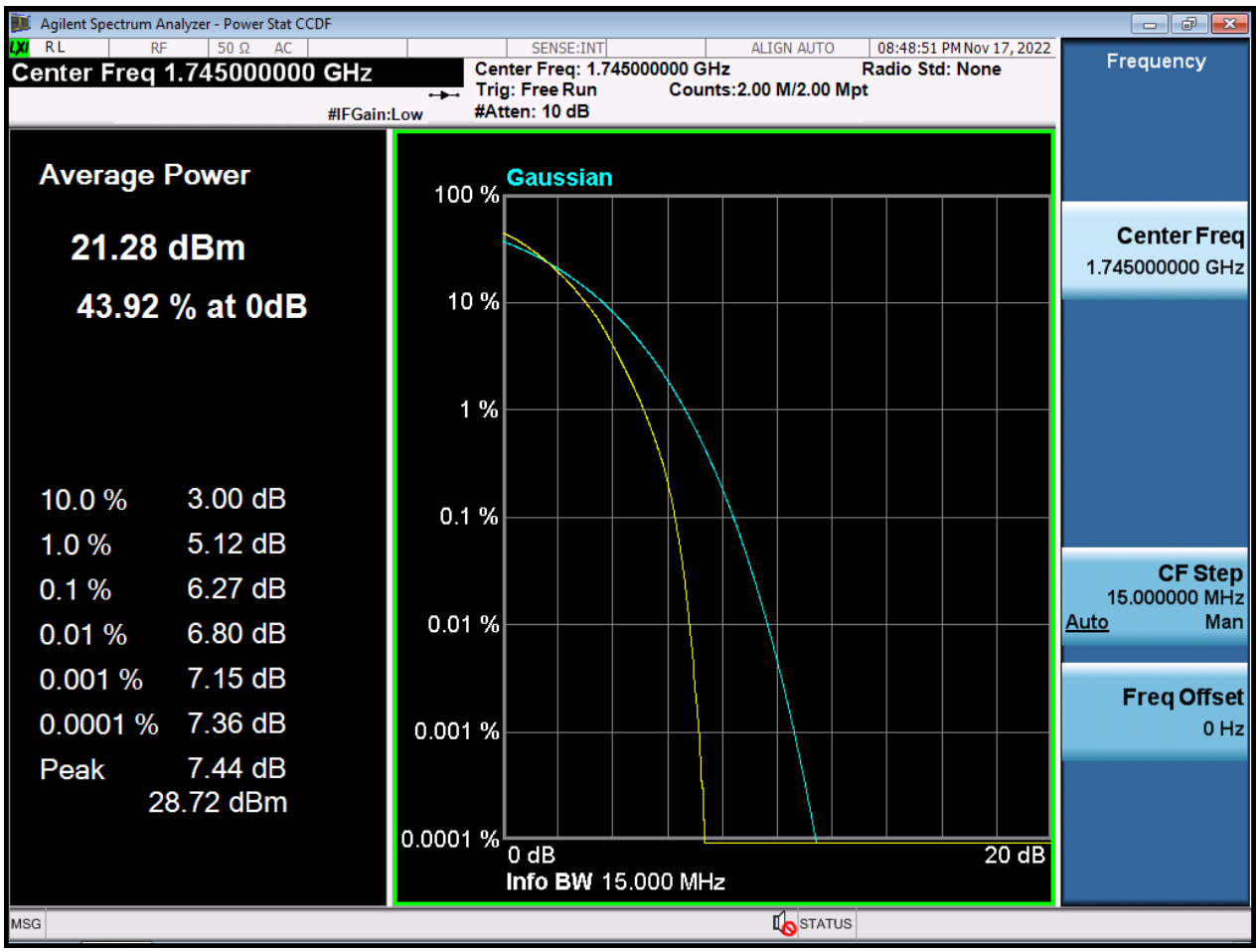
BW15 M_PAR_Middle Channel_QPSK_FullRB



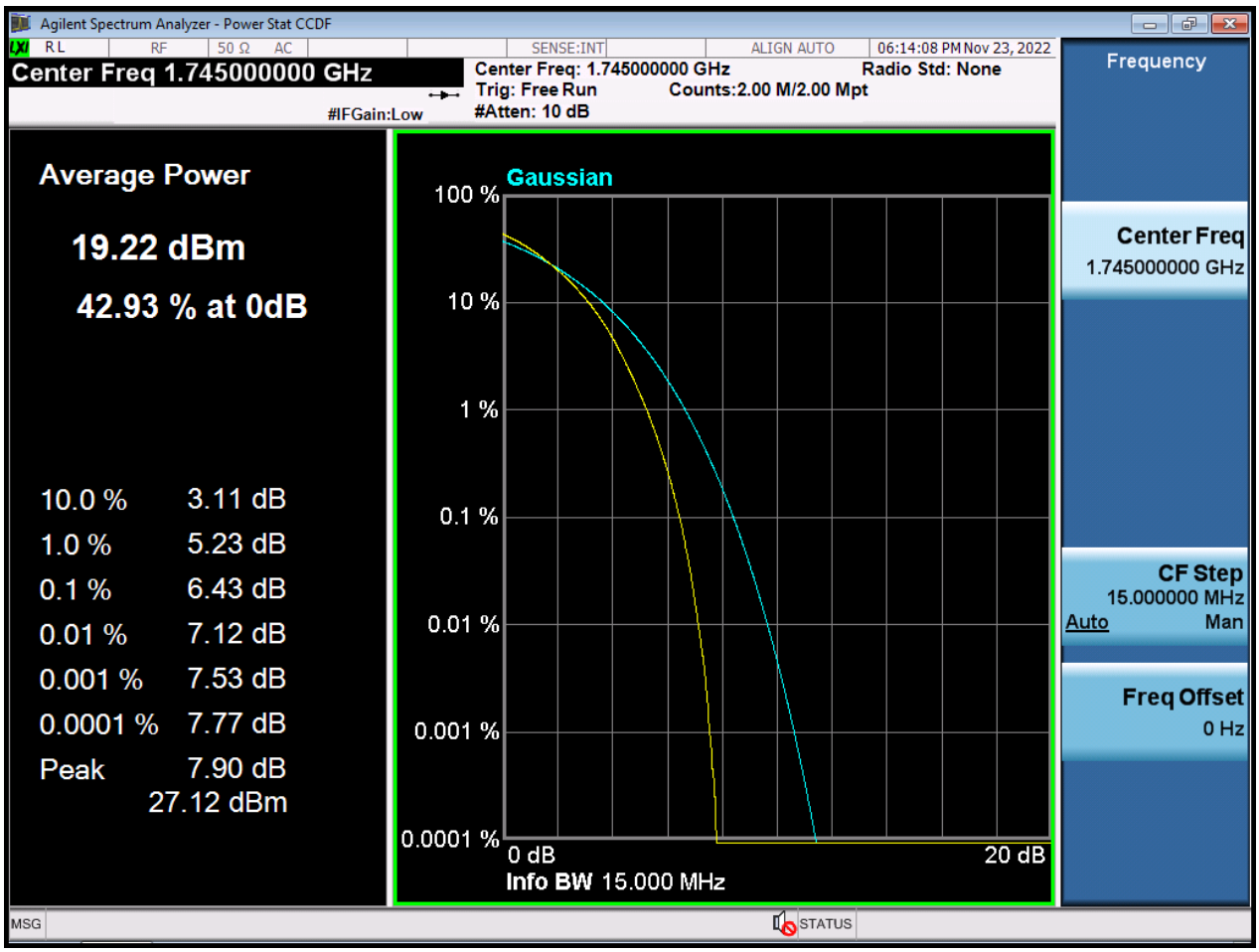
BW15 M_PAR_Middle Channel_16QAM_FullRB



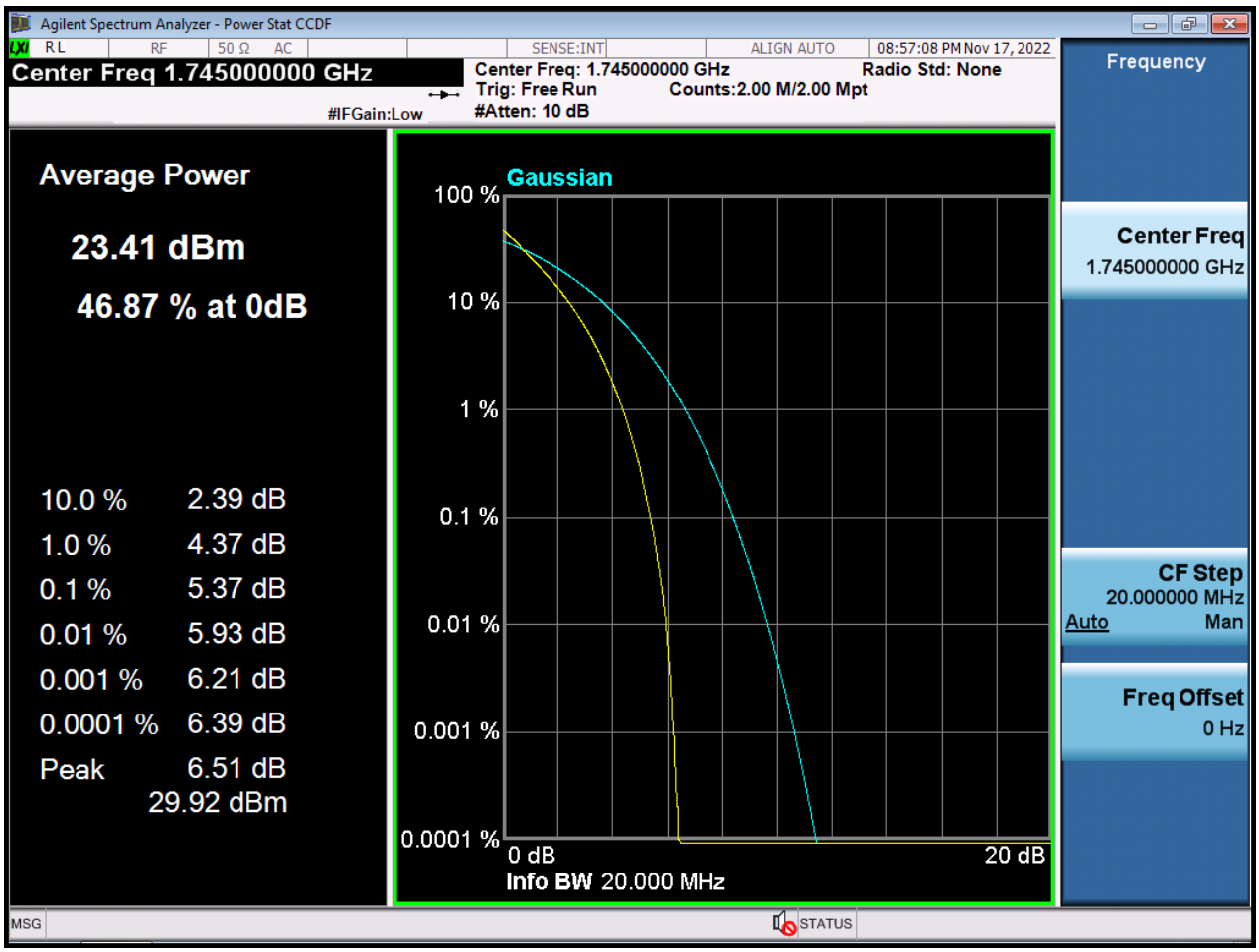
BW15 M_PAR_Middle Channel_64QAM_FullRB



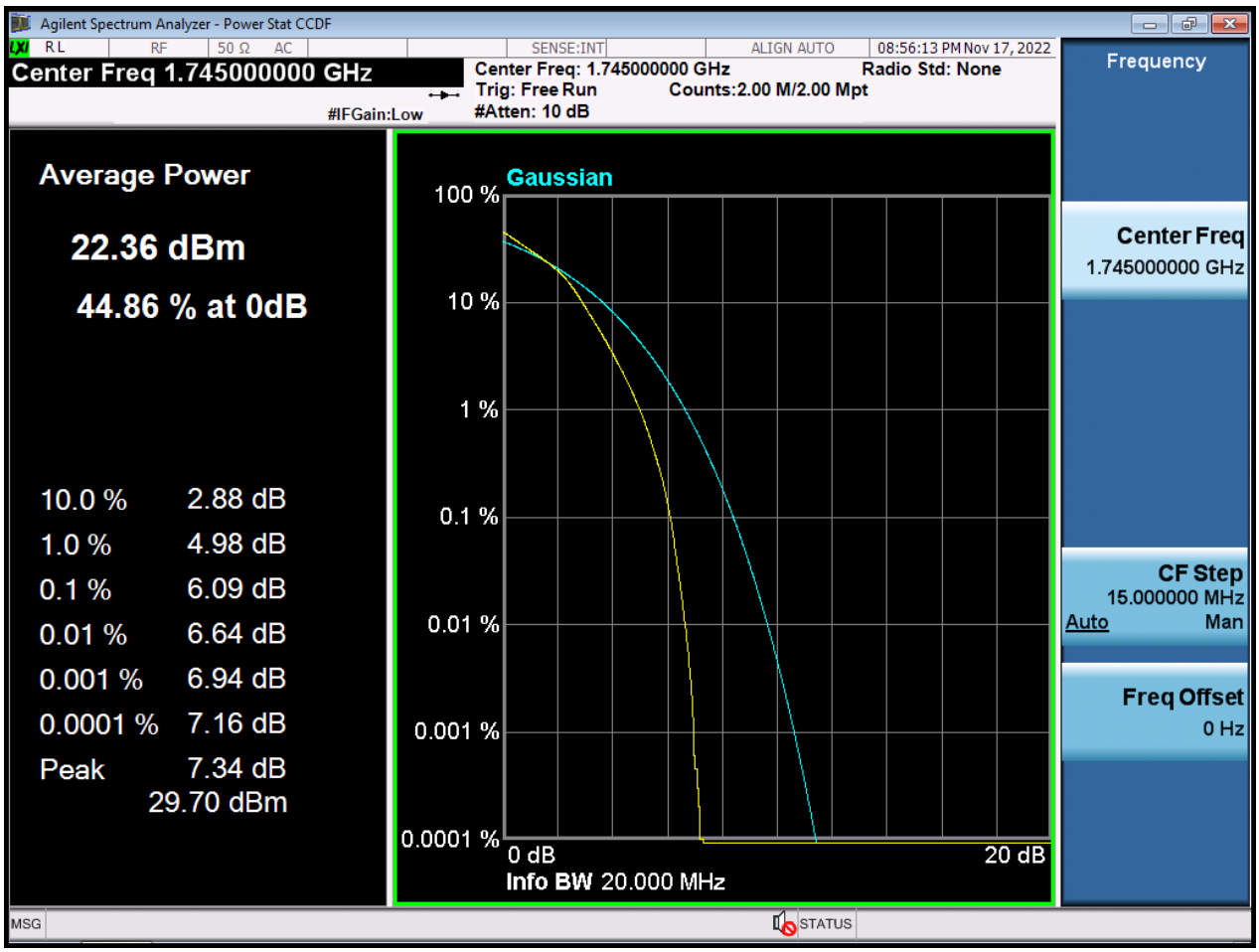
BW15 M_PAR_Middle Channel_256QAM_FullRB



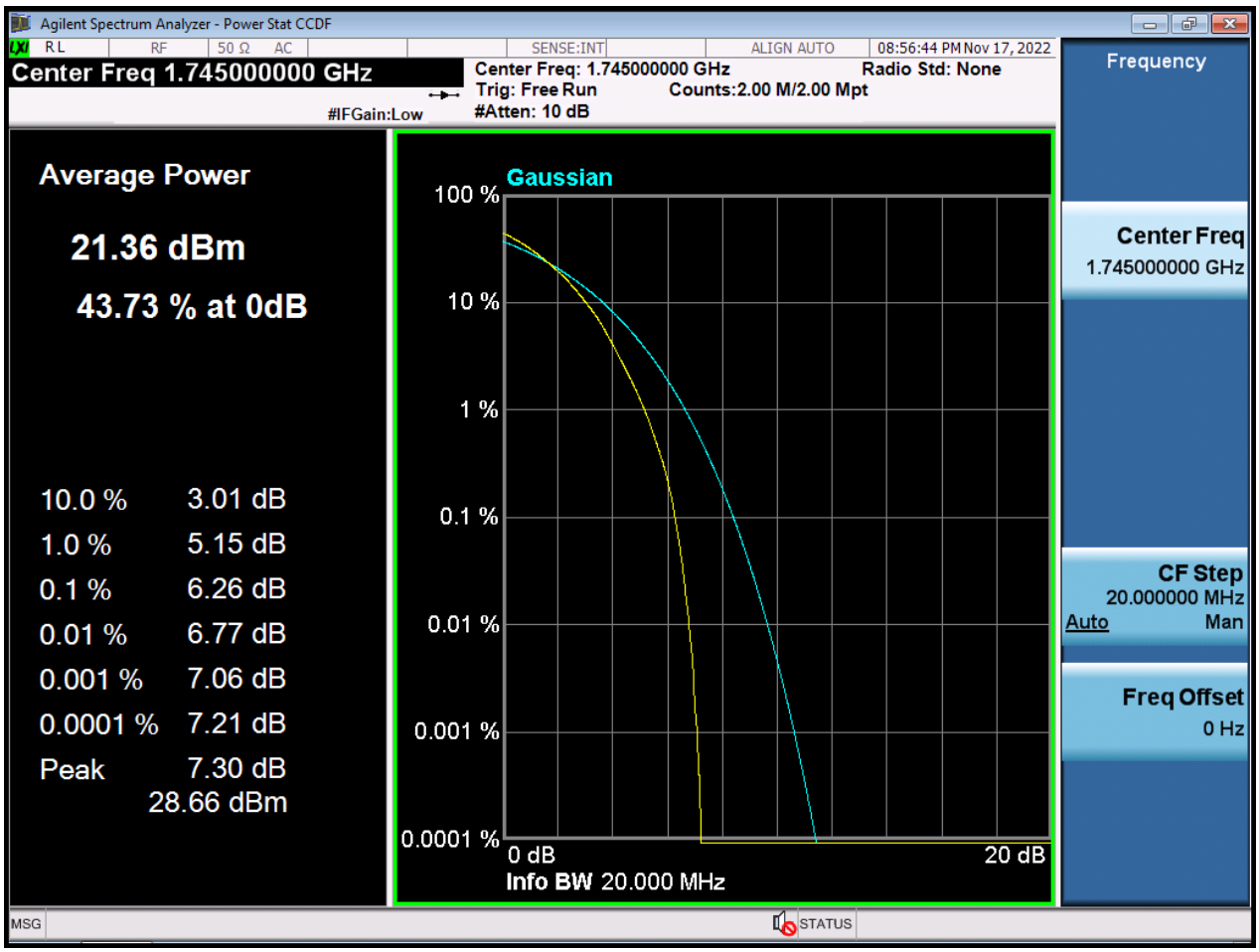
BW20 M_PAR_Middle Channel_QPSK_FullRB



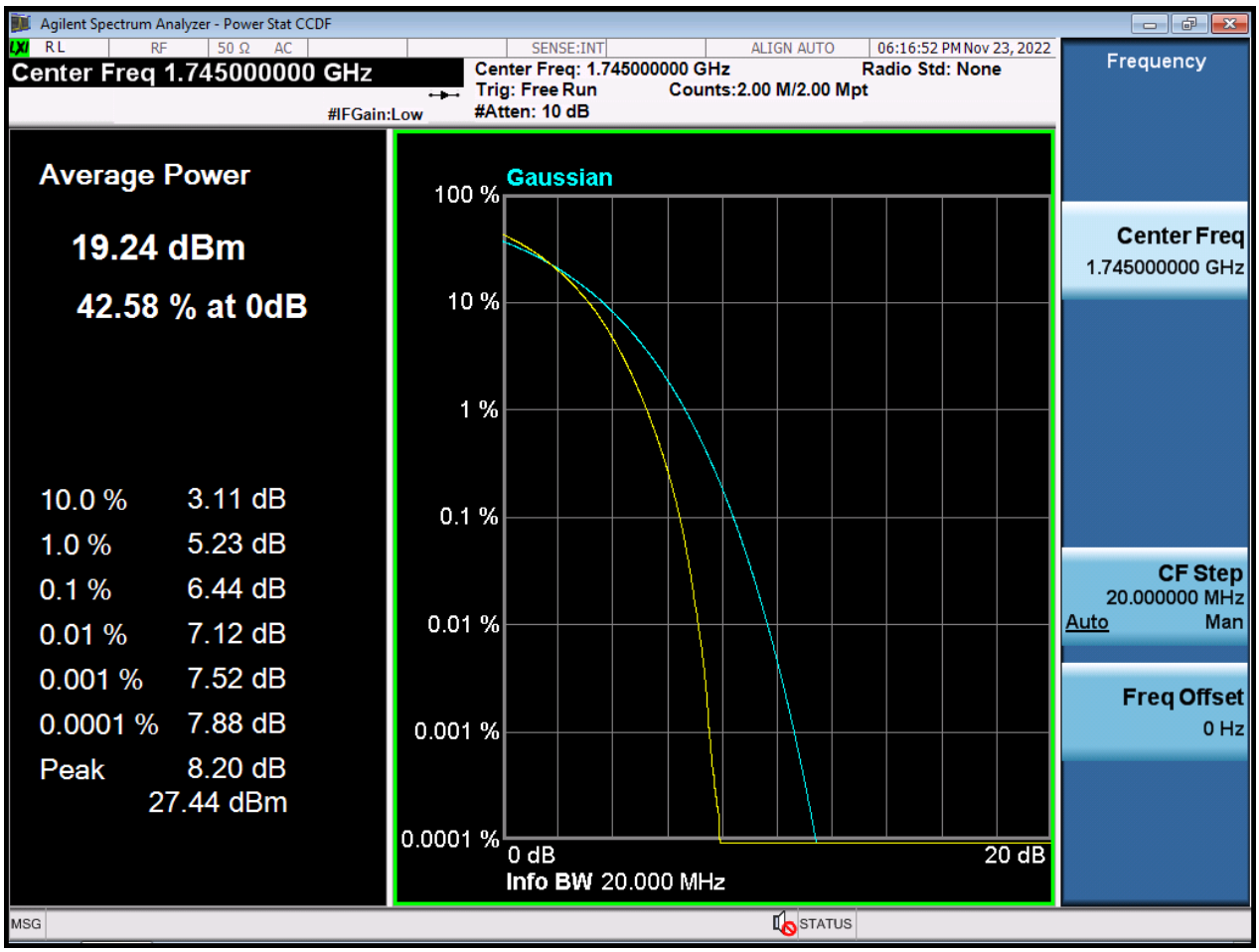
BW20 M_PAR_Middle Channel_16QAM_FullRB



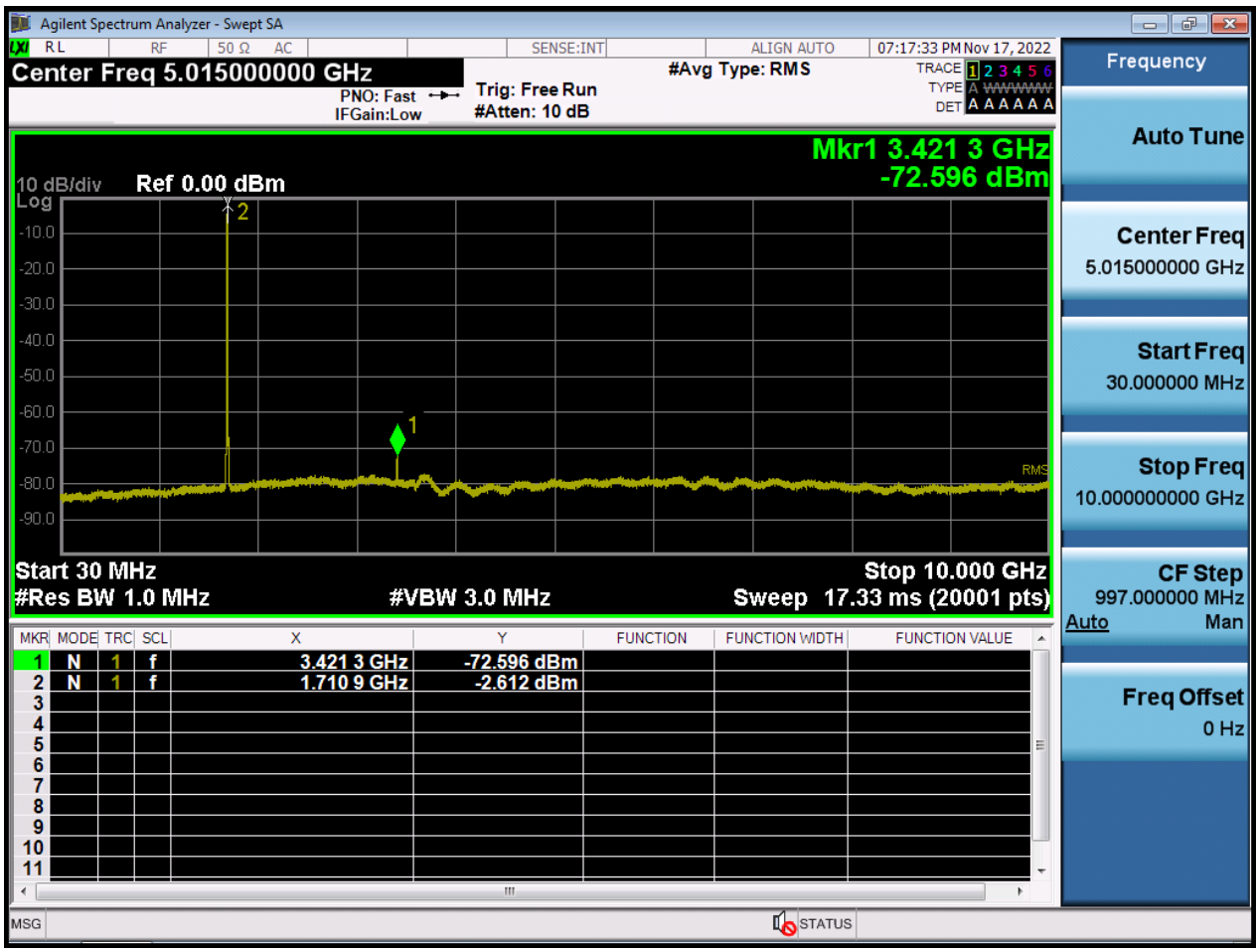
BW20 M_PAR_Middle Channel_64QAM_FullRB



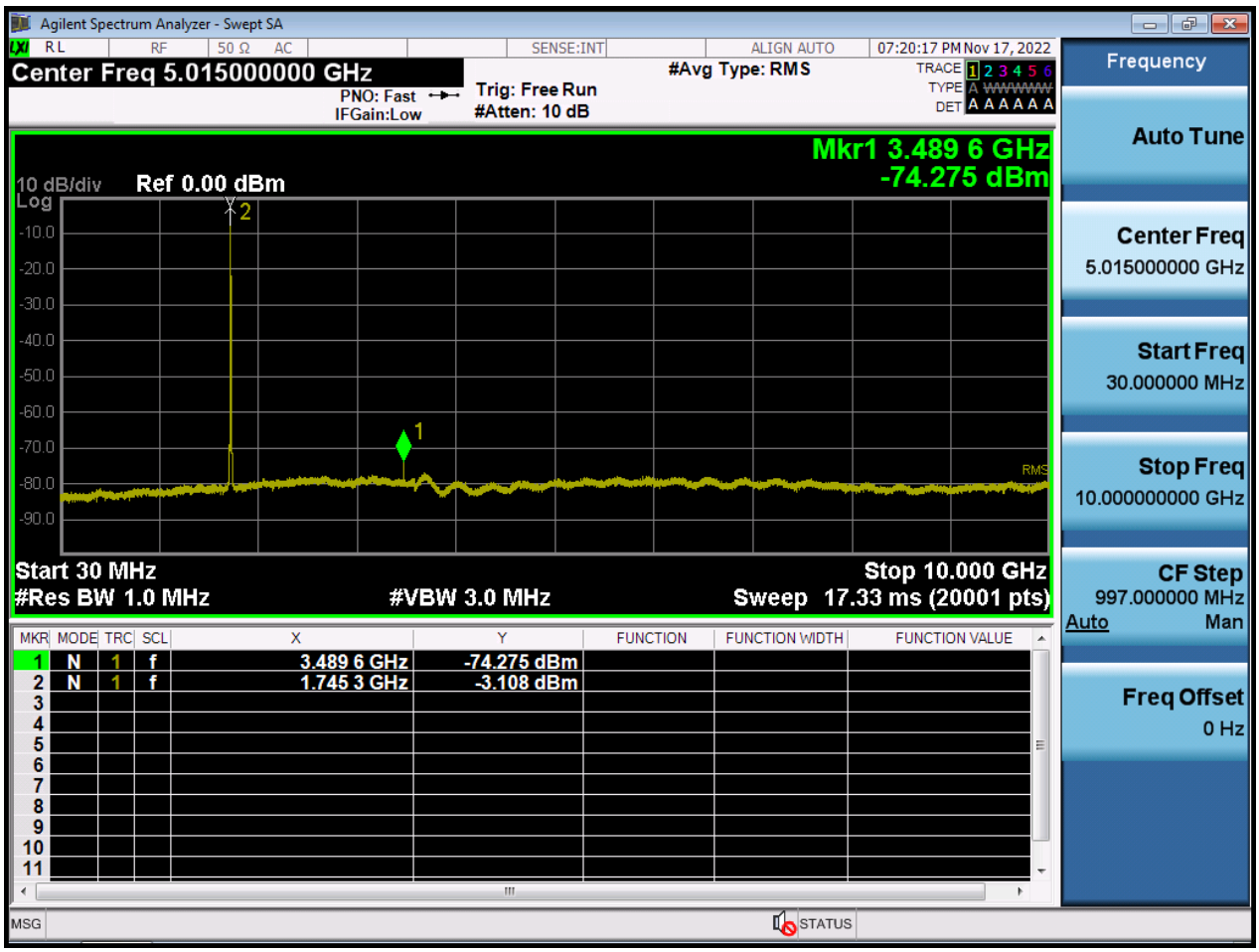
BW20 M_PAR_Middle Channel_256QAM_FullRB



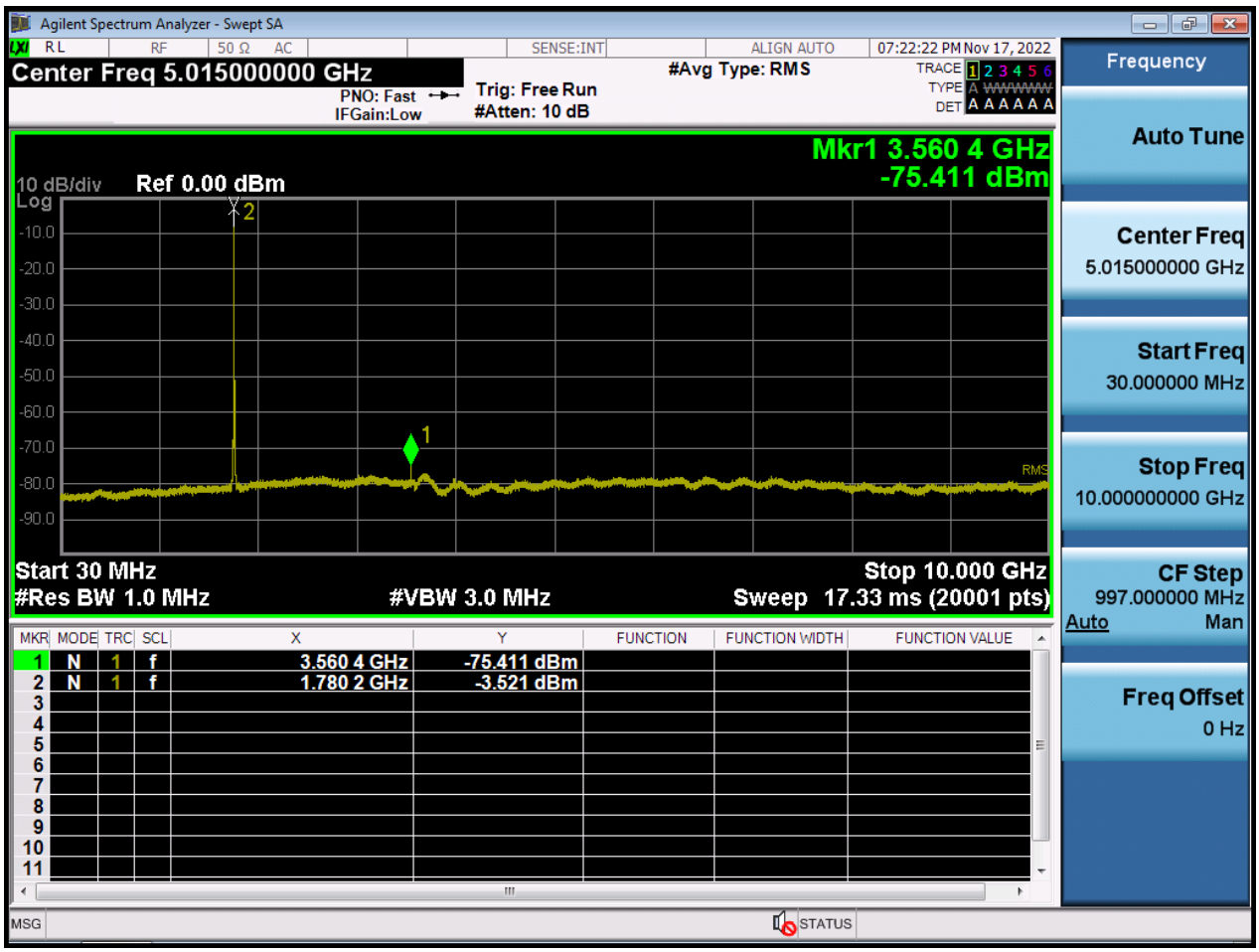
BW1.4 M_CSE(30 M-10 G)_Lowest Channel_QPSK_1RB



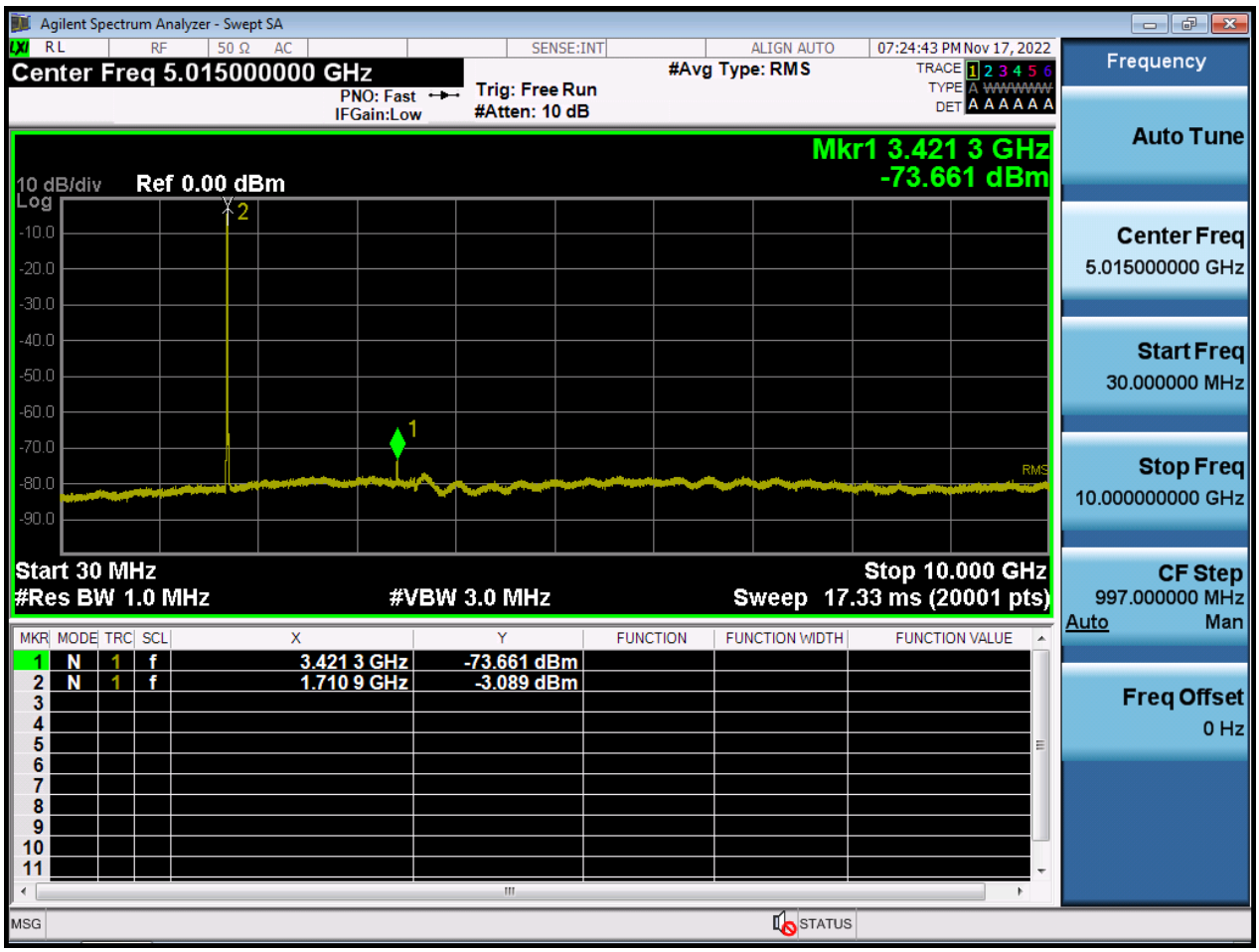
BW1.4 M_CSE(30 M-10 G)_Middle Channel_QPSK_1RB



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