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TEST REPORT

FCC LTE Test for TFGMEIBBCD4
Certification

APPLICANT
LG Electronics Inc.

REPORT NO.
HCT-RF-2310-FC002

DATE OF ISSUE
October 5, 2023

Tested by
Jung Ki Lim

Technical Manager
Jong Seok Lee

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TEST REPORT

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Additional Model
TFGMEIBBCD5, TFGMEIBBCD6, TFGMEIBBCD7, TFGMEIBBCD8, TFGMEIBBCD9, TFGMEIBBCDA, TFGMEIBBCDB, TFGMEIBBCDC

Applicant	**LG Electronics Inc.** 10, MagokJungang-ro, Gangseo-gu, Seoul 07796, Republic of Korea
Eut Type Model Name	GM Onstar Gen12 ROW TFGMEIBBCD4
FCC ID	BEJTFGMEIBBCD4
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§ 27, § 2

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test results were applied only to the test methods required by the standard.

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	October 05, 2023	Initial Release

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)

Test Report Statement:
The above Test Report is not related to the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme) / A2LA(American Association for Laboratory Accreditation), which signed the ILAC-MRA.

If this report is required to confirmation of authenticity, please contact to www.hct.co.kr

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	LG Electronics Inc.
Address:	10, Magok Jungang-ro, Gangseo-gu, Seoul 07796, Republic of Korea
FCC ID:	BEJTFGMEIBBCD4
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§ 27, § 2
EUT Type:	GM Onstar Gen12 ROW
Model(s):	TFGMEIBBCD4
Additional Model:	TFGMEIBBCD5,TFGMEIBBCD6,TFGMEIBBCD7,TFGMEIBBCD8, TFGMEIBBCD9, TFGMEIBBCDA, TFGMEIBBCDB, TFGMEIBBCDC
Tx Frequency:	1710.7 MHz – 1754.3 MHz (LTE – Band 4 (1.4 MHz)) 1711.5 MHz – 1753.5 MHz (LTE – Band 4 (3 MHz)) 1712.5 MHz – 1752.5 MHz (LTE – Band 4 (5 MHz)) 1715.0 MHz – 1750.0 MHz (LTE – Band 4 (10 MHz)) 1717.5 MHz – 1747.5 MHz (LTE – Band 4 (15 MHz)) 1720.0 MHz – 1745.0 MHz (LTE – Band 4 (20 MHz))
Date(s) of Tests:	February 27, 2023 ~ October 05, 2023
Serial number:	Radiated - Internal Antenna : EBR42280001K_#17 - External Antenna : EBR4228001K_#16 Conducted: EBR36018829_#075
External Antenna Information	ANT5 : 86531607 ANT4 : 86575530 DUT4 : 85608774

1.1. MAXIMUM OUTPUT POWER

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP External Antenna		EIRP Internal Antenna	
				Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)
LTE – Band4 (1.4)	1710.7 – 1754.3	1M09G7D	QPSK	0.348	25.41	0.718	28.56
		1M09W7D	16QAM	0.295	24.70	0.740	28.69
		1M09W7D	64QAM	0.228	23.58	0.710	28.51
		1M09W7D	256QAM	0.114	20.58	0.404	26.06
LTE – Band4 (3)	1711.5 – 1753.5	2M71G7D	QPSK	0.356	25.51	0.685	28.36
		2M71W7D	16QAM	0.299	24.75	0.738	28.68
		2M71W7D	64QAM	0.229	23.60	0.703	28.47
		2M71W7D	256QAM	0.116	20.64	0.400	26.02
LTE – Band4 (5)	1712.5 – 1752.5	4M51G7D	QPSK	0.348	25.42	0.681	28.33
		4M51W7D	16QAM	0.305	24.84	0.738	28.68
		4M50W7D	64QAM	0.231	23.64	0.685	28.36
		4M51W7D	256QAM	0.117	20.68	0.391	25.92
LTE – Band4 (10)	1715.0 – 1750.0	9M02G7D	QPSK	0.355	25.50	0.681	28.33
		9M98W7D	16QAM	0.315	24.98	0.719	28.57
		9M98W7D	64QAM	0.234	23.70	0.689	28.38
		9M96W7D	256QAM	0.117	20.67	0.396	25.98
LTE – Band4 (15)	1717.5 – 1747.5	13M5G7D	QPSK	0.348	25.41	0.685	28.36
		13M5W7D	16QAM	0.301	24.79	0.693	28.41
		13M5W7D	64QAM	0.237	23.75	0.689	28.38
		13M4W7D	256QAM	0.119	20.76	0.393	25.94
LTE – Band4 (20)	1720.0 – 1745.0	18M0G7D	QPSK	0.352	25.47	0.679	28.32
		17M9W7D	16QAM	0.303	24.82	0.713	28.53
		17M9W7D	64QAM	0.239	23.79	0.710	28.51
		17M9W7D	256QAM	0.117	20.67	0.396	25.98

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a GM Onstar Gen12 ROW with GSM/GPRS/EGPRS/UMTS and LTE, Sub6.

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

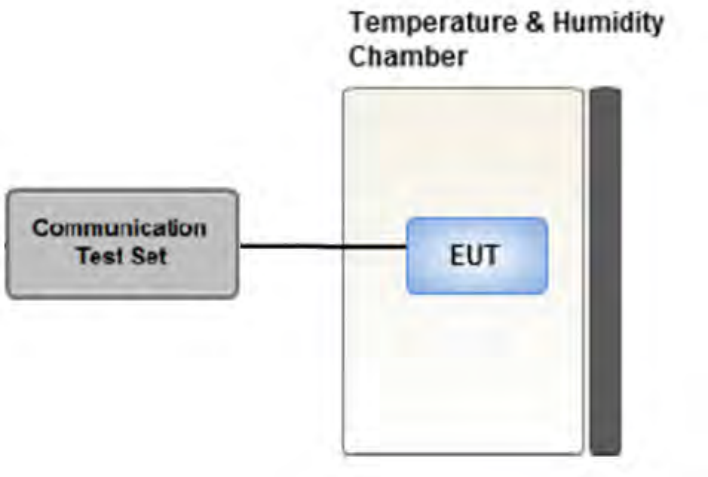
The Fully-anechoic chamber and conducted measurement facility used to collect the radiated data are located at the **74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.**

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	- KDB 971168 D01 v03r01 – Section 5.2
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 CONDUCTED OUTPUT POWER



Test setup

Test Overview

When an average power meter is used to perform RF output power measurements, the fundamental condition that measurements be performed only over durations of active transmissions at maximum output power level applies.

Conducted Output Power was tested in accordance with KDB971168 D01 Power Meas License Digital Systems v03r01, Section 5.2.

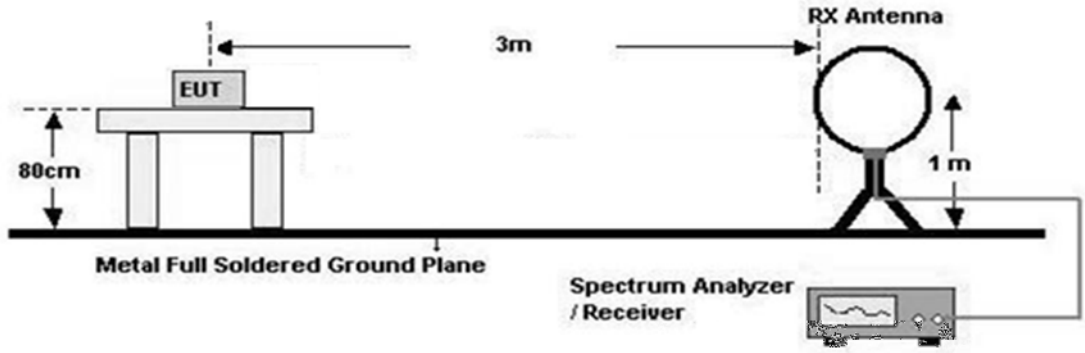
3.3 RADIATED TEST

Test Overview

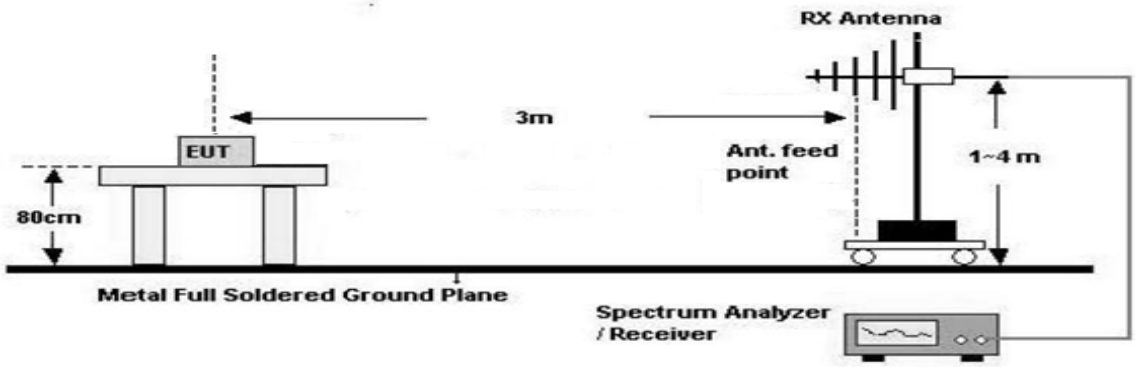
Radiated tests are performed in the semi-anechoic chamber. The equipment under test is placed on a non-conductive table on semi-anechoic chamber.

Test Configuration

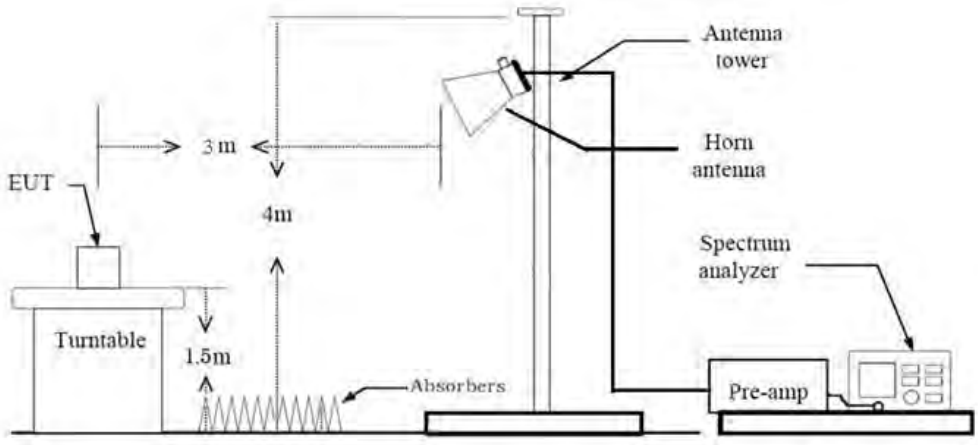
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



3.3.1 RADIATED POWER

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 EUT is placed on a turntable, which is 0.8 m above ground plane. (Below 1 GHz)
2. The EUT is placed on a turntable, which is 1.5 m above ground plane. (Above 1 GHz)
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
6. 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.
7. Total(dBμV/m) = Measured Value(dBμV) + Cable Loss(dB) + Antenna Factor(dB/m) + Distance Factor(D.F)
8. EIRP (dBm)
   = Total (dBμV/m) + 20 log D − 104.8 (where D is the measurement distance in meters. D=3)
   = Total (dBμV/m) - 95.2(dB)
9. ERP(dBm) = EIRP(dBm) - 2.15(dB)

3.3.2 RADIATED SPURIOUS EMISSIONS

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 10th harmonics from 9 kHz.

Test Note

1. 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
2. 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.

Below 30 MHz

1. The loop antenna was placed at a location 3 m from the EUT
2. The EUT is placed on a turntable, which is 0.8 m above ground plane.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. Distance Correction Factor(0.009 MHz – 0.490 MHz) = 40log(3 m/300 m) = - 80 dB
   Measurement Distance : 3 m
6. Distance Correction Factor(0.490 MHz – 30 MHz) = 40log(3 m/30 m) = - 40 dB
   Measurement Distance : 3 m
7. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
8. EIRP (dBm)
   = Total (dBμV/m) + 20 log D − 104.8 (where D is the measurement distance in meters. D=3)
   = Total (dBμV/m) - 95.2(dB)
9. ERP(dBm) = EIRP(dBm) - 2.15(dB)

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

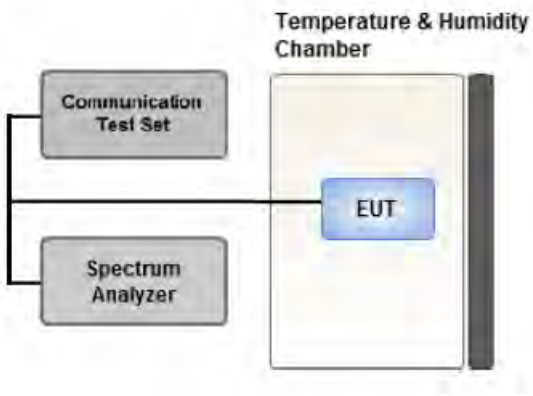
Below 1 GHz

1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
2. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m to find out the highest emissions.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L)
7. Total(dBμV/m) = Measured Value(dBμV) + Cable Loss(dB) + Antenna Factor(dB/m) + Distance Factor(D.F)
8. EIRP (dBm)
   = Total (dBμV/m) + 20 log D − 104.8 (where D is the measurement distance in meters. D=3)
   = Total (dBμV/m) - 95.2(dB)
9. ERP(dBm) = EIRP(dBm) - 2.15(dB)

Above 1 GHz

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Total(dBμV/m) = Measured Value(dBμV) + Cable Loss(dB) + Antenna Factor(dB/m) + Distance Factor(D.F)
   + H.P.F(dB) - Amp Gain(dB)
8. EIRP (dBm)
   = Total (dBμV/m) + 20 log D − 104.8 (where D is the measurement distance in meters. D=3)
   = Total (dBμV/m) - 95.2(dB)

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 as P_{Pk}.

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

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

Test Settings(Peak Power)

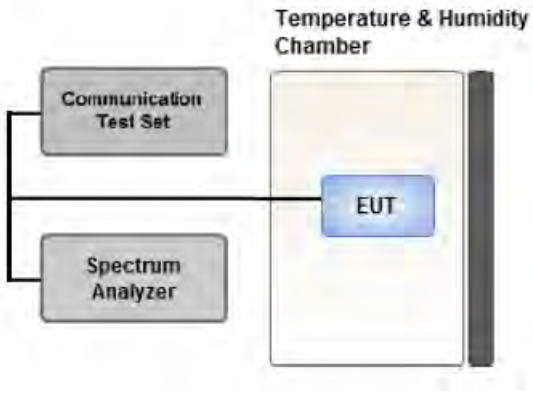
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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

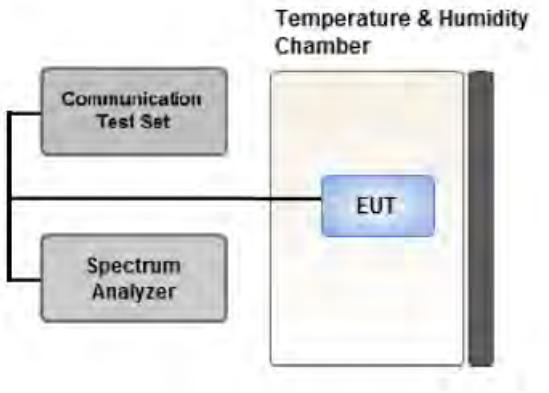
The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

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

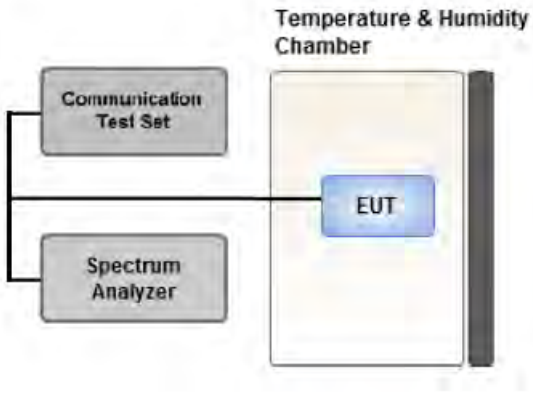
Test Overview

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 = 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 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

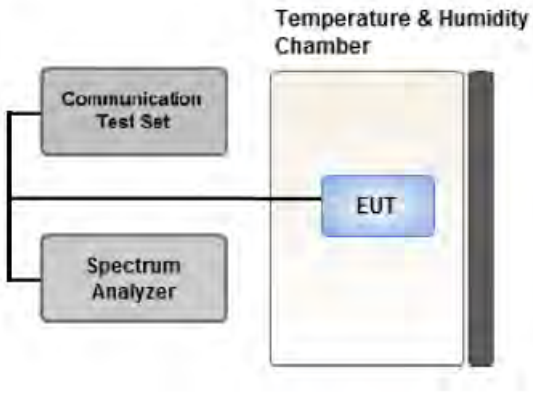
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. Within 1 MHz of the channel edge the RBW should be 2 % of EBW, then 1 MHz after that.
4. VBW > 3 x RBW
5. 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 : Internal Antenna, External Antenna (ANT 5, ANT 4, DUT 4)

  Worst case : Internal Antenna, External Antenna (ANT 4)
- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported. (Worst case : 3 MHz(External Antenna), 1.4 MHz(Internal Antenna))
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- Please refer to the table below.
- TFGMEIBBCD4 & additional models were tested and the worst case results are reported.

  (Worst case : TFGMEIBBCD4)

[External Antenna Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	See Section 8.1		Only X
Radiated Spurious and Harmonic Emissions	QPSK	See Section 8.2		Only X

[Internal Antenna Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	See Section 9.1		Y
Radiated Spurious and Harmonic Emissions	16QAM	See Section 9.2		Y

3.10 WORST CASE(CONDUCTED TEST)

- All modes of operation were investigated and the worst case configuration results are reported.
- TFGMEIBBCD4 & additional models were tested and the worst case results are reported.
  (Worst case : TFGMEIBBCD4)

[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
Antenna Position Tower	MA4640/800-XP-ET	Innco systems	N/A	N/A	N/A
Turn Table	DS2000-S	Innco systems	N/A	N/A	N/A
Turn Table	Turn Table	Ets	N/A	N/A	N/A
Controller (Antenna mast & Turn Table)	CO3000	Innco systems	CO3000/1251/48920320/P	N/A	N/A
Amp & Filter Bank Switch Controller	FBSM-01B	TNM system	TM20090002	N/A	N/A
RF Switch System	TMX0132C	TNM System	TM21100002	N/A	N/A
RF Switch System	FBSR-04C(3G HPF+LNA)	TNM System	S4L1	08/18/2024	Annual
RF Switch System	FBSR-04C(LNA)	TNM System	S4L4	08/18/2024	Annual
RF Switch System	FBSR-04C(Thru)	TNM System	S4L6	08/18/2024	Annual
HIGHPASS FILTER	WHKX10-900-1000-15000-40SS	WAINWRIGHT INSTRUMENTS	16	08/01/2024	Annual
HIGHPASS FILTER	WHNX6.0/26.5G-6SS	WAINWRIGHT INSTRUMENTS	1	01/19/2024	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/01/2023	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/02/2024	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/17/2024	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120	Schwarzbeck	937	02/13/2025	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/09/2025	Biennial
Hybrid Antenna	VULB9160	Schwarzbeck	760	02/24/2025	Biennial
Trilog Broadband Antenna	VULB 9168	Schwarzbeck	895	08/16/2024	Biennial
Chamber	SU-642	ESPEC	93008124	02/22/2024	Annual
Power Splitter(DC~26.5 GHz)	11667B	Hewlett Packard	11275	03/02/2024	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/23/2024	Annual
4-Way Divider	ZC4PD-K1844+	Mini-Circuits	942907	09/19/2024	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/19/2024	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	101436	02/22/2024	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/10/2024	Annual
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262287701	05/22/2024	Annual
Wideband Radio Communication Tester	MT8000A	Anritsu Corp.	6262302511	05/23/2024	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	06/22/2024	Annual

Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/20/2024	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/24/2024	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

Note:

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

5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.90 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.14 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.82 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.74 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.76 (Confidence level about 95 %, k=2)
Radiated Disturbance (Above 40 GHz)	5.52 (Confidence level about 95 %, k=2)

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§ 2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§ 2.1051, § 27.53(h)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§ 2.1046	N/A	PASS
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

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. EMISSION DESIGNATOR

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

8. TEST DATA

8.1 Conducted Output Power

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)		
				19957	20175	20393
				1710.7 MHz	1732.5 MHz	1754.3 MHz
1.4 MHz	QPSK	1	0	22.75	22.80	22.73
		1	3	22.85	23.01	22.78
		1	5	22.83	22.85	22.82
		3	0	22.88	22.85	22.81
		3	1	22.88	22.89	22.80
		3	3	22.91	22.87	22.84
		6	0	21.95	21.98	21.95
	16QAM	1	0	22.07	22.05	21.94
		1	3	22.32	22.28	22.03
		1	5	22.13	22.09	22.09
		3	0	22.04	22.05	21.99
		3	1	22.18	22.12	22.05
		3	3	22.06	22.04	22.01
		6	0	21.07	21.02	21.01
	64QAM	1	0	21.10	21.13	21.06
		1	3	21.12	21.20	21.11
		1	5	21.08	21.05	21.13
		3	0	21.04	21.01	20.97
		3	1	21.18	21.12	21.06
		3	3	21.04	21.13	21.02
		6	0	20.03	20.00	19.95
	256QAM	1	0	18.04	18.13	18.06
		1	3	18.11	18.21	18.00
		1	5	18.06	18.12	17.96
		3	0	18.11	18.04	18.01
		3	1	18.14	18.14	18.05
		3	3	18.03	18.10	18.05
		6	0	18.07	17.96	17.95

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)		
				19965	20175	20385
				1711.5 MHz	1732.5 MHz	1753.5 MHz
3 MHz	QPSK	1	0	22.83	22.89	22.81
		1	3	22.93	22.97	22.78
		1	5	22.98	22.94	22.82
		3	0	21.99	21.98	22.01
		3	1	22.08	22.00	22.03
		3	3	22.02	22.02	22.03
		6	0	22.08	22.06	22.03
	16QAM	1	0	22.08	22.25	22.14
		1	3	22.18	22.12	22.12
		1	5	22.30	22.30	22.13
		3	0	21.04	21.01	21.00
		3	1	21.16	21.10	21.11
		3	3	21.08	21.12	21.08
		6	0	21.13	21.04	21.05
	64QAM	1	0	21.18	21.25	21.13
		1	3	21.11	21.17	21.09
		1	5	21.24	21.39	21.13
		3	0	20.09	20.10	19.99
		3	1	20.19	20.13	20.03
		3	3	20.10	20.13	20.01
		6	0	20.00	20.06	20.03
	256QAM	1	0	18.18	18.28	18.14
		1	3	18.17	18.17	18.01
		1	5	18.20	18.21	18.18
		3	0	18.05	18.10	17.99
		3	1	18.20	18.09	18.01
		3	3	18.17	18.16	18.05
		6	0	18.10	18.10	17.99

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)		
				19975	20175	20375
				1712.5 MHz	1732.5 MHz	1752.5 MHz
5 MHz	QPSK	1	0	22.89	22.85	22.75
		1	3	22.94	22.91	22.82
		1	5	22.98	22.93	22.87
		3	0	22.02	21.92	21.95
		3	1	22.09	22.03	21.91
		3	3	22.06	22.05	22.03
		6	0	22.07	22.00	22.11
	16QAM	1	0	22.22	22.18	22.09
		1	3	22.02	22.17	22.17
		1	5	22.34	22.15	22.26
		3	0	21.00	21.04	20.96
		3	1	21.08	21.05	21.02
		3	3	21.12	21.13	21.05
		6	0	21.06	21.07	21.01
	64QAM	1	0	21.13	21.10	21.19
		1	3	21.24	21.29	21.20
		1	5	21.18	21.28	21.15
		3	0	20.03	20.01	20.03
		3	1	20.13	20.08	19.97
		3	3	20.10	20.14	20.07
		6	0	20.11	20.11	19.94
	256QAM	1	0	18.16	18.08	18.23
		1	3	18.24	18.17	18.17
		1	5	18.13	18.23	18.15
		3	0	18.13	18.07	17.95
		3	1	18.13	18.18	17.98
		3	3	18.19	18.09	18.06
		6	0	18.14	18.03	17.96

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)		
				20000	20175	20350
				1715 MHz	1732.5 MHz	1750 MHz
10 MHz	QPSK	1	0	22.87	23.05	22.79
		1	3	22.87	22.82	22.70
		1	5	22.85	22.82	22.80
		3	0	21.93	21.97	21.88
		3	1	22.06	22.02	21.97
		3	3	22.16	22.05	22.00
		6	0	22.02	22.05	22.00
	16QAM	1	0	22.12	22.08	22.20
		1	3	22.18	22.14	22.09
		1	5	22.15	22.15	22.18
		3	0	21.02	20.96	20.92
		3	1	21.07	21.06	21.00
		3	3	21.17	21.04	21.11
		6	0	21.10	21.08	20.87
	64QAM	1	0	21.29	21.25	20.98
		1	3	21.20	21.01	21.25
		1	5	21.07	21.14	21.10
		3	0	19.95	20.02	19.88
		3	1	20.06	20.10	20.03
		3	3	20.10	20.00	20.10
		6	0	20.07	20.08	19.87
	256QAM	1	0	18.03	17.93	17.87
		1	3	18.05	18.25	17.97
		1	5	18.24	18.04	18.12
		3	0	18.01	17.97	17.96
		3	1	18.13	18.09	18.03
		3	3	18.10	18.08	18.07
		6	0	18.05	18.11	17.94

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)		
				20025	20175	20325
				1717.5 MHz	1732.5 MHz	1747.5 MHz
15 MHz	QPSK	1	0	22.96	23.05	22.91
		1	3	22.79	22.99	22.68
		1	5	22.92	22.85	22.71
		3	0	22.10	22.07	21.93
		3	1	22.08	21.91	21.93
		3	3	22.06	22.01	21.92
		6	0	22.08	21.98	21.86
	16QAM	1	0	22.29	22.18	22.26
		1	3	22.32	22.36	21.98
		1	5	22.24	22.08	22.14
		3	0	20.98	21.01	20.93
		3	1	21.10	21.00	20.95
		3	3	21.06	20.92	20.98
		6	0	21.13	20.97	20.90
	64QAM	1	0	21.09	21.38	21.16
		1	3	21.18	21.21	21.02
		1	5	21.18	21.18	21.08
		3	0	20.07	20.09	19.97
		3	1	20.08	19.99	19.92
		3	3	20.11	19.99	19.90
		6	0	20.07	19.98	19.97
	256QAM	1	0	18.11	18.12	18.14
		1	3	18.13	17.96	18.08
		1	5	18.35	18.17	18.12
		3	0	17.98	18.01	18.00
		3	1	18.14	18.02	17.93
		3	3	18.07	18.07	17.99
		6	0	18.09	18.00	17.98

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)		
				20050	20175	20300
				1720 MHz	1732.5 MHz	1745 MHz
20 MHz	QPSK	1	0	22.91	23.03	23.04
		1	3	23.01	22.97	22.84
		1	5	23.09	22.99	22.94
		3	0	22.03	22.07	21.96
		3	1	22.14	22.13	21.93
		3	3	22.07	22.05	22.02
		6	0	22.15	22.07	21.98
	16QAM	1	0	22.24	22.22	22.27
		1	3	22.18	22.06	22.01
		1	5	22.28	22.17	22.12
		3	0	21.01	21.07	21.03
		3	1	21.09	21.10	20.98
		3	3	21.08	21.11	21.28
		6	0	21.11	20.97	20.98
	64QAM	1	0	21.23	21.19	21.25
		1	3	21.09	21.17	21.07
		1	5	21.37	21.12	21.19
		3	0	19.99	20.14	19.99
		3	1	20.11	20.07	19.91
		3	3	20.09	20.08	20.05
		6	0	20.18	20.01	20.00
	256QAM	1	0	18.23	18.12	18.30
		1	3	18.12	18.25	17.98
		1	5	18.18	18.08	18.16
		3	0	18.12	18.09	18.02
		3	1	18.17	18.16	18.02
		3	3	18.20	18.06	17.99
		6	0	18.16	18.10	17.98

8.2 EQUIVALENT ISOTROPIC RADIATED POWER

8.2.1 External Antenna

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1710.7	LTE B4 1.4 MHz	QPSK	87.65	32.07	119.72	V	< 1.00	0.283	24.52	1	3
		16-QAM	87.12	32.07	119.19	V		0.251	23.99		
		64-QAM	85.83	32.07	117.90	V		0.186	22.70		
		256-QAM	82.88	32.07	114.95	V		0.094	19.75		
1732.5		QPSK	88.20	32.41	120.61	V		0.348	25.41	1	5
		16-QAM	87.49	32.41	119.90	V		0.295	24.70		
		64-QAM	86.37	32.41	118.78	V		0.228	23.58		
		256-QAM	83.37	32.41	115.78	V		0.114	20.58		
1754.3		QPSK	87.37	32.20	119.57	V		0.274	24.37	1	3
		16-QAM	86.66	32.20	118.86	V		0.232	23.66		
		64-QAM	85.66	32.20	117.86	V		0.185	22.66		
		256-QAM	82.59	32.20	114.79	V		0.091	19.59		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1711.5	LTE B4 3 MHz	QPSK	87.62	32.13	119.75	V	< 1.00	0.285	24.55	1	0
		16-QAM	86.90	32.13	119.03	V		0.242	23.83		
		64-QAM	85.85	32.13	117.98	V		0.190	22.78		
		256-QAM	82.92	32.13	115.05	V		0.097	19.85		
1732.5		QPSK	88.30	32.41	120.71	V		0.356	25.51	1	0
		16-QAM	87.54	32.41	119.95	V		0.299	24.75		
		64-QAM	86.39	32.41	118.80	V		0.229	23.60		
		256-QAM	83.43	32.41	115.84	V		0.116	20.64		
1753.5		QPSK	87.50	32.23	119.73	V		0.284	24.53	1	0
		16-QAM	87.05	32.23	119.28	V		0.256	24.08		
		64-QAM	85.79	32.23	118.02	V		0.191	22.82		
		256-QAM	82.83	32.23	115.06	V		0.097	19.86		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1712.5	LTE B4 5 MHz	QPSK	87.56	32.16	119.72	V	< 1.00	0.283	24.52	1	0
		16-QAM	86.96	32.16	119.12	V		0.247	23.92		
		64-QAM	85.80	32.16	117.96	V		0.189	22.76		
		256-QAM	82.60	32.16	114.76	V		0.090	19.56		
1732.5		QPSK	88.21	32.41	120.62	V		0.348	25.42	1	0
		16-QAM	87.63	32.41	120.04	V		0.305	24.84		
		64-QAM	86.43	32.41	118.84	V		0.231	23.64		
		256-QAM	83.47	32.41	115.88	V		0.117	20.68		
1752.5		QPSK	87.27	32.24	119.51	V		0.270	24.31	1	0
		16-QAM	86.64	32.24	118.88	V		0.233	23.68		
		64-QAM	85.35	32.24	117.59	V		0.173	22.39		
		256-QAM	82.44	32.24	114.68	V		0.089	19.48		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1715.0	LTE B4 10 MHz	QPSK	87.61	32.24	119.85	V	< 1.00	0.292	24.65	1	0
		16-QAM	86.92	32.24	119.16	V		0.249	23.96		
		64-QAM	85.62	32.24	117.86	V		0.185	22.66		
		256-QAM	82.83	32.24	115.07	V		0.097	19.87		
1732.5		QPSK	88.29	32.41	120.70	V		0.355	25.50	1	0
		16-QAM	87.77	32.41	120.18	V		0.315	24.98		
		64-QAM	86.49	32.41	118.90	V		0.234	23.70		
		256-QAM	83.46	32.41	115.87	V		0.117	20.67		
1750.0		QPSK	87.65	32.20	119.85	V		0.292	24.65	1	0
		16-QAM	87.02	32.20	119.22	V		0.252	24.02		
		64-QAM	85.66	32.20	117.86	V		0.185	22.66		
		256-QAM	82.77	32.20	114.97	V		0.095	19.77		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1717.5	LTE B4 15 MHz	QPSK	87.70	32.28	119.98	V	< 1.00	0.300	24.78	1	0
		16-QAM	86.96	32.28	119.24	V		0.253	24.04		
		64-QAM	85.93	32.28	118.21	V		0.200	23.01		
		256-QAM	82.87	32.28	115.15	V		0.099	19.95		
1732.5		QPSK	88.20	32.41	120.61	V		0.348	25.41	1	0
		16-QAM	87.58	32.41	119.99	V		0.301	24.79		
		64-QAM	86.54	32.41	118.95	V		0.237	23.75		
		256-QAM	83.55	32.41	115.96	V		0.119	20.76		
1747.5		QPSK	88.09	32.28	120.37	V		0.329	25.17	1	0
		16-QAM	87.38	32.28	119.66	V		0.279	24.46		
		64-QAM	86.23	32.28	118.51	V		0.214	23.31		
		256-QAM	83.30	32.28	115.58	V		0.109	20.38		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1720.0	LTE B4 20 MHz	QPSK	87.74	32.31	120.05	V	< 1.00	0.306	24.85	1	0
		16-QAM	86.84	32.31	119.15	V		0.248	23.95		
		64-QAM	85.99	32.31	118.30	V		0.204	23.10		
		256-QAM	82.89	32.31	115.20	V		0.100	20.00		
1732.5		QPSK	88.26	32.41	120.67	V		0.352	25.47	1	0
		16-QAM	87.61	32.41	120.02	V		0.303	24.82		
		64-QAM	86.58	32.41	118.99	V		0.239	23.79		
		256-QAM	83.46	32.41	115.87	V		0.117	20.67		
1745.0		QPSK	88.28	32.30	120.58	V		0.345	25.38	1	0
		16-QAM	87.48	32.30	119.78	V		0.287	24.58		
		64-QAM	86.58	32.30	118.88	V		0.233	23.68		
		256-QAM	83.56	32.30	115.86	V		0.116	20.66		

8.2.2 Internal Antenna

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1710.7	LTE B4 1.4 MHz	QPSK	90.82	32.07	122.89	H	< 1.00	0.588	27.69	1	0
		16-QAM	91.15	32.07	123.22	H		0.634	28.02		
		64-QAM	90.81	32.07	122.88	H		0.586	27.68		
		256-QAM	88.36	32.07	120.43	H		0.333	25.23		
1732.5		QPSK	91.35	32.41	123.76	H		0.718	28.56	1	3
		16-QAM	91.48	32.41	123.89	H		0.740	28.69		
		64-QAM	91.30	32.41	123.71	H		0.710	28.51		
		256-QAM	88.85	32.41	121.26	H		0.404	26.06		
1754.3		QPSK	90.92	32.20	123.12	H		0.619	27.92	1	3
		16-QAM	91.25	32.20	123.45	H		0.668	28.25		
		64-QAM	91.20	32.20	123.40	H		0.661	28.20		
		256-QAM	88.71	32.20	120.91	H		0.372	25.71		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1711.5	LTE B4 3 MHz	QPSK	90.98	32.13	123.11	H	< 1.00	0.618	27.91	1	14
		16-QAM	91.28	32.13	123.41	H		0.662	28.21		
		64-QAM	91.14	32.13	123.27	H		0.641	28.07		
		256-QAM	88.64	32.13	120.77	H		0.361	25.57		
1732.5		QPSK	91.15	32.41	123.56	H		0.685	28.36	1	14
		16-QAM	91.47	32.41	123.88	H		0.738	28.68		
		64-QAM	91.26	32.41	123.67	H		0.703	28.47		
		256-QAM	88.81	32.41	121.22	H		0.400	26.02		
1753.5		QPSK	91.08	32.23	123.31	H		0.647	28.11	1	0
		16-QAM	91.40	32.23	123.63	H		0.697	28.43		
		64-QAM	91.25	32.23	123.48	H		0.673	28.28		
		256-QAM	88.64	32.23	120.87	H		0.369	25.67		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1712.5	LTE B4 5 MHz	QPSK	91.07	32.16	123.23	H	< 1.00	0.635	28.03	1	13
		16-QAM	91.36	32.16	123.52	H		0.679	28.32		
		64-QAM	91.12	32.16	123.28	H		0.643	28.08		
		256-QAM	88.70	32.16	120.86	H		0.368	25.66		
1732.5		QPSK	91.12	32.41	123.53	H		0.681	28.33	1	24
		16-QAM	91.47	32.41	123.88	H		0.738	28.68		
		64-QAM	91.15	32.41	123.56	H		0.685	28.36		
		256-QAM	88.71	32.41	121.12	H		0.391	25.92		
1752.5		QPSK	91.10	32.24	123.34	H		0.651	28.14	1	13
		16-QAM	91.42	32.24	123.66	H		0.701	28.46		
		64-QAM	91.25	32.24	123.49	H		0.674	28.29		
		256-QAM	88.85	32.24	121.09	H		0.388	25.89		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1715.0	LTE B4 10 MHz	QPSK	91.23	32.24	123.47	H	< 1.00	0.671	28.27	1	49
		16-QAM	91.38	32.24	123.62	H		0.695	28.42		
		64-QAM	91.33	32.24	123.57	H		0.687	28.37		
		256-QAM	88.87	32.24	121.11	H		0.390	25.91		
1732.5		QPSK	91.12	32.41	123.53	H		0.681	28.33	1	25
		16-QAM	91.36	32.41	123.77	H		0.719	28.57		
		64-QAM	91.17	32.41	123.58	H		0.689	28.38		
		256-QAM	88.77	32.41	121.18	H		0.396	25.98		
1750.0		QPSK	91.06	32.20	123.26	H		0.640	28.06	1	0
		16-QAM	91.35	32.20	123.55	H		0.684	28.35		
		64-QAM	91.10	32.20	123.30	H		0.646	28.10		
		256-QAM	88.57	32.20	120.77	H		0.361	25.57		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1717.5	LTE B4 15 MHz	QPSK	91.01	32.28	123.29	H	< 1.00	0.643	28.09	1	38
		16-QAM	91.27	32.28	123.55	H		0.683	28.35		
		64-QAM	91.20	32.28	123.48	H		0.672	28.28		
		256-QAM	88.76	32.28	121.04	H		0.383	25.84		
1732.5		QPSK	91.15	32.41	123.56	H		0.685	28.36	1	38
		16-QAM	91.20	32.41	123.61	H		0.693	28.41		
		64-QAM	91.17	32.41	123.58	H		0.689	28.38		
		256-QAM	88.73	32.41	121.14	H		0.393	25.94		
1747.5		QPSK	90.90	32.28	123.18	H		0.628	27.98	1	0
		16-QAM	91.10	32.28	123.38	H		0.658	28.18		
		64-QAM	91.03	32.28	123.31	H		0.647	28.11		
		256-QAM	88.45	32.28	120.73	H		0.357	25.53		

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBμV)	A.F+C.L+D.F (dB/m)	Total (dBμV/m)	Pol	Limit	EIRP		RB	
							W	W	dBm	Size	Offset
1720.0	LTE B4 20 MHz	QPSK	91.00	32.31	123.31	H	< 1.00	0.647	28.11	1	50
		16-QAM	91.13	32.31	123.44	H		0.682	28.34		
		64-QAM	91.32	32.31	123.63	H		0.678	28.31		
		256-QAM	88.79	32.31	121.10	H		0.389	25.90		
1732.5		QPSK	91.11	32.41	123.52	H		0.678	28.32	1	0
		16-QAM	91.32	32.41	123.73	H		0.712	28.53		
		64-QAM	91.30	32.41	123.71	H		0.709	28.51		
		256-QAM	88.77	32.41	121.18	H		0.396	25.98		
1745.0		QPSK	90.98	32.30	123.28	H		0.643	28.08	1	0
		16-QAM	90.92	32.30	123.22	H		0.644	28.09		
		64-QAM	91.00	32.30	123.30	H		0.638	28.05		
		256-QAM	88.60	32.30	120.90	H		0.372	25.70		

8.3 RADIATED SPURIOUS EMISSIONS

8.3.1 External Antenna

▣ OPERATING FREQUENCY: 1732.5 MHz

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 3 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBµV)	A.F+C.L+D.F+H.P.F-A.G (dB/m)	Total (dBµV/m)	Pol.	Result (dBm)	Limit (dBm)	RB	
								Size	Offset
19965 (1711.5)	3 423.00	55.98	-12.55	43.43	V	-51.77	-13.00	1	0
	5 134.50	53.16	-7.11	46.05	V	-49.15	-13.00		
	6 846.00	50.81	-2.89	47.92	V	-47.28	-13.00		
20175 (1732.5)	3 465.00	61.46	-12.37	49.09	V	-46.11	-13.00	1	0
	5 197.50	64.83	-7.40	57.43	V	-37.77	-13.00		
	6 930.00	50.52	-2.58	47.94	V	-47.26	-13.00		
20385 (1753.5)	3 507.00	55.73	-12.18	43.55	V	-51.65	-13.00	1	0
	5 260.50	55.57	-7.57	48.00	V	-47.20	-13.00		
	7 014.00	52.19	-2.25	49.94	V	-45.26	-13.00		

8.3.2 Internal Antenna

▣ OPERATING FREQUENCY: 1732.5 MHz

▣ MODE: LTE B4

▣ MODULATION SIGNAL: 1.4 MHz 16QAM

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBμV)	A.F+C.L+D.F+H.P.F-A.G (dB/m)	Total (dBμV/m)	Pol.	Result (dBm)	Limit (dBm)	RB	
								Size	Offset
19957 (1710.7)	3 421.40	57.69	-12.55	45.14	H	-50.06	-13.00	1	0
	5 132.10	55.01	-7.09	47.92	H	-47.28	-13.00		
	6 842.80	51.95	-2.89	49.06	H	-46.14	-13.00		
	8 553.50	52.45	0.92	53.37	V	-41.83	-13.00		
	10 264.20	49.20	5.08	54.28	V	-40.92	-13.00		
20175 (1732.5)	3 465.00	53.38	-12.37	41.01	V	-54.19	-13.00	1	3
	5 197.50	54.92	-7.40	47.52	H	-47.68	-13.00		
	6 930.00	52.21	-2.58	49.63	H	-45.57	-13.00		
	8 662.50	52.43	1.29	53.72	V	-41.48	-13.00		
	10 395.00	50.87	5.39	56.26	H	-38.94	-13.00		
20393 (1754.3)	3 508.60	54.44	-12.14	42.30	V	-52.90	-13.00	1	3
	5 262.90	52.70	-7.58	45.12	H	-50.08	-13.00		
	7 017.20	53.37	-2.18	51.19	H	-44.01	-13.00		
	8 771.50	50.45	1.56	52.01	H	-43.19	-13.00		
	10 525.80	49.27	5.53	54.80	V	-40.40	-13.00		

8.4 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
4	1.4 MHz	1732.5	QPSK	6	0	5.46
			16-QAM			6.09
			64-QAM			6.70
			256-QAM			6.69
	3 MHz		QPSK	15		5.29
			16-QAM			6.06
			64-QAM			6.65
			256-QAM			6.66
	5 MHz		QPSK	25		5.31
			16-QAM			6.04
			64-QAM			6.63
			256-QAM			6.60
	10 MHz		QPSK	50		5.36
			16-QAM			6.07
			64-QAM			6.60
			256-QAM			6.57
	15 MHz		QPSK	75		5.37
			16-QAM			6.06
			64-QAM			6.60
			256-QAM			6.57
	20 MHz		QPSK	100		5.30
			16-QAM			6.02
			64-QAM			6.59
			256-QAM			6.61

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 124 ~ 147.

8.5 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
4	1.4 MHz	1732.5	QPSK	6	0	1.0911
			16-QAM			1.0918
			64-QAM			1.0888
			256-QAM			1.0892
	3 MHz		QPSK	15		2.7074
			16-QAM			2.7142
			64-QAM			2.7059
			256-QAM			2.7135
	5 MHz		QPSK	25		4.5100
			16-QAM			4.5069
			64-QAM			4.5021
			256-QAM			4.5082
	10 MHz		QPSK	50		9.0164
			16-QAM			8.9747
			64-QAM			8.9753
			256-QAM			8.9579
	15 MHz		QPSK	75		13.487
			16-QAM			13.446
			64-QAM			13.477
			256-QAM			13.430
	20 MHz		QPSK	100		17.945
			16-QAM			17.919
			64-QAM			17.908
			256-QAM			17.911

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 100 ~ 123.

8.6 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
4	1.4	1710.7	3.4208	27.976	-75.836	-47.860	-13.00
		1732.5	3.4647	27.976	-74.556	-46.580	
		1754.3	3.5100	27.976	-76.617	-48.641	
	3	1711.5	3.4213	27.976	-75.328	-47.352	
		1732.5	3.4632	27.976	-74.550	-46.574	
		1753.5	3.5100	27.976	-76.870	-48.894	
	5	1712.5	3.4213	27.976	-76.092	-48.116	
		1732.5	3.4612	27.976	-75.078	-47.102	
		1752.5	3.5100	27.976	-76.082	-48.106	
	10	1715.0	3.4218	27.976	-75.456	-47.480	
		1732.5	3.4567	27.976	-75.633	-47.657	
		1750.0	3.5095	27.976	-74.868	-46.892	
	15	1717.5	3.4223	27.976	-75.828	-47.852	
		1732.5	3.4522	27.976	-75.241	-47.265	
		1747.5	3.5090	27.976	-76.171	-48.195	
	20	1720.0	3.4228	27.976	-74.487	-46.511	
		1732.5	3.4477	27.976	-75.170	-47.194	
		1745.0	3.5085	27.976	-76.174	-48.198	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 148 ~ 183.
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

8.7 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 64 ~ 99.

8.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE 4

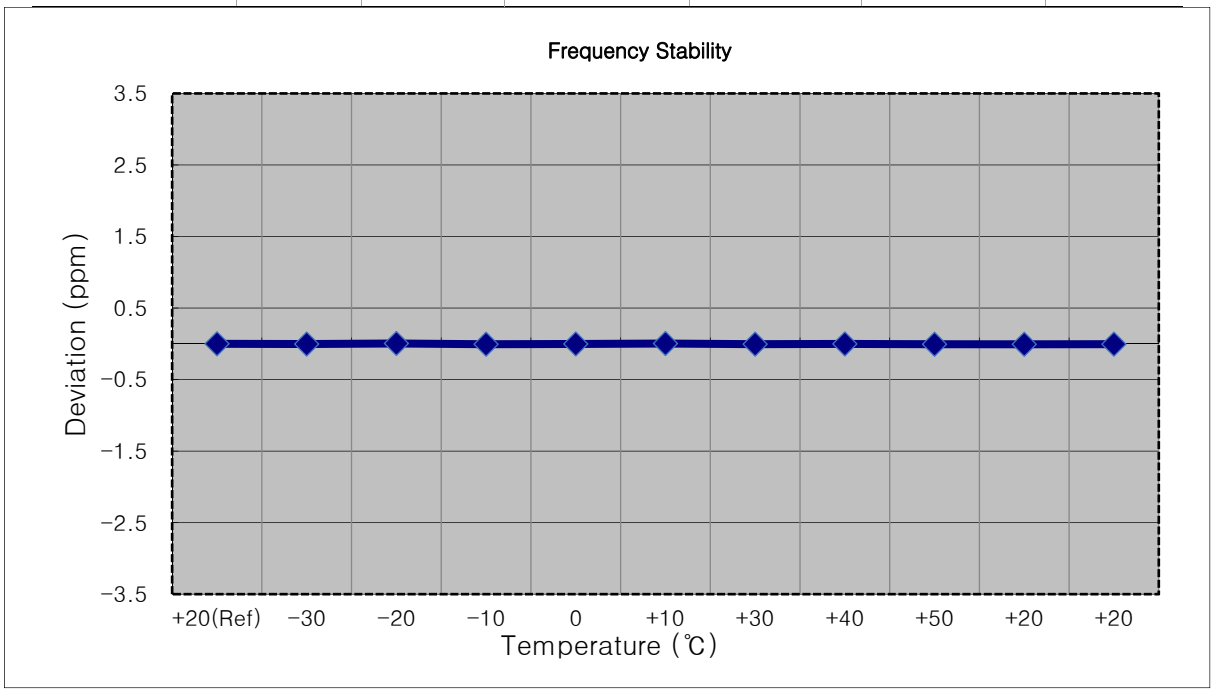
▣ OPERATING FREQUENCY: 1710,700,000 Hz

▣ CHANNEL: 19957 (1.4 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1710 699 992	0.0	0.000 000	0.000
100 %		-30	1710 699 986	-5.7	0.000 000	-0.003
100 %		-20	1710 700 000	8.3	0.000 000	0.005
100 %		-10	1710 699 982	-10.0	-0.000 001	-0.006
100 %		0	1710 699 988	-3.8	0.000 000	-0.002
100 %		+10	1710 699 998	6.1	0.000 000	0.004
100 %		+30	1710 699 983	-8.8	-0.000 001	-0.005
100 %		+40	1710 699 988	-3.3	0.000 000	-0.002
100 %		+50	1710 699 981	-10.8	-0.000 001	-0.006
85 %	11.475	+20	1710 699 981	-11.0	-0.000 001	-0.006
115 %	15.525	+20	1710 699 983	-8.9	-0.000 001	-0.005



▣ MODE: LTE 4

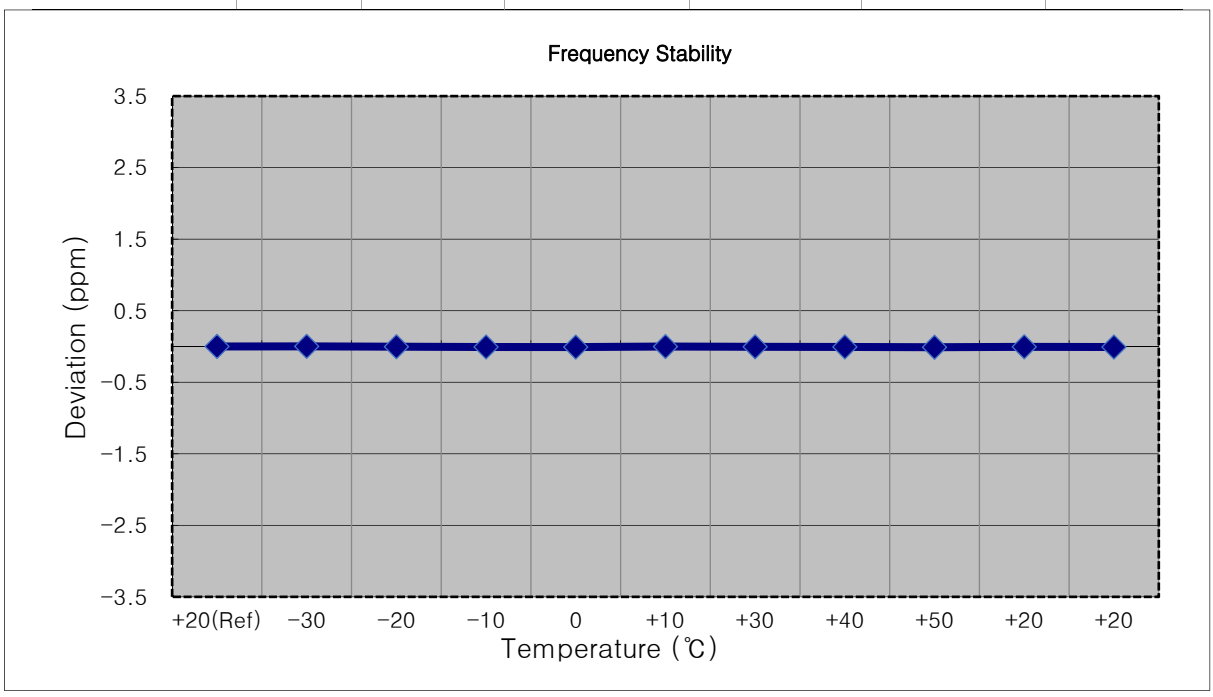
▣ OPERATING FREQUENCY: 1711,500,000 Hz

▣ CHANNEL: 19965 (3 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1711 499 987	0.0	0.000 000	0.000
100 %		-30	1711 499 990	3.0	0.000 000	0.002
100 %		-20	1711 499 981	-5.9	0.000 000	-0.003
100 %		-10	1711 499 974	-12.6	-0.000 001	-0.007
100 %		0	1711 499 972	-14.8	-0.000 001	-0.009
100 %		+10	1711 499 985	-2.0	0.000 000	-0.001
100 %		+30	1711 499 979	-7.5	0.000 000	-0.004
100 %		+40	1711 499 975	-11.5	-0.000 001	-0.007
100 %		+50	1711 499 969	-18.2	-0.000 001	-0.011
85 %	11.475	+20	1711 499 978	-8.8	-0.000 001	-0.005
115 %	15.525	+20	1711 499 973	-13.4	-0.000 001	-0.008



▣ MODE: LTE 4

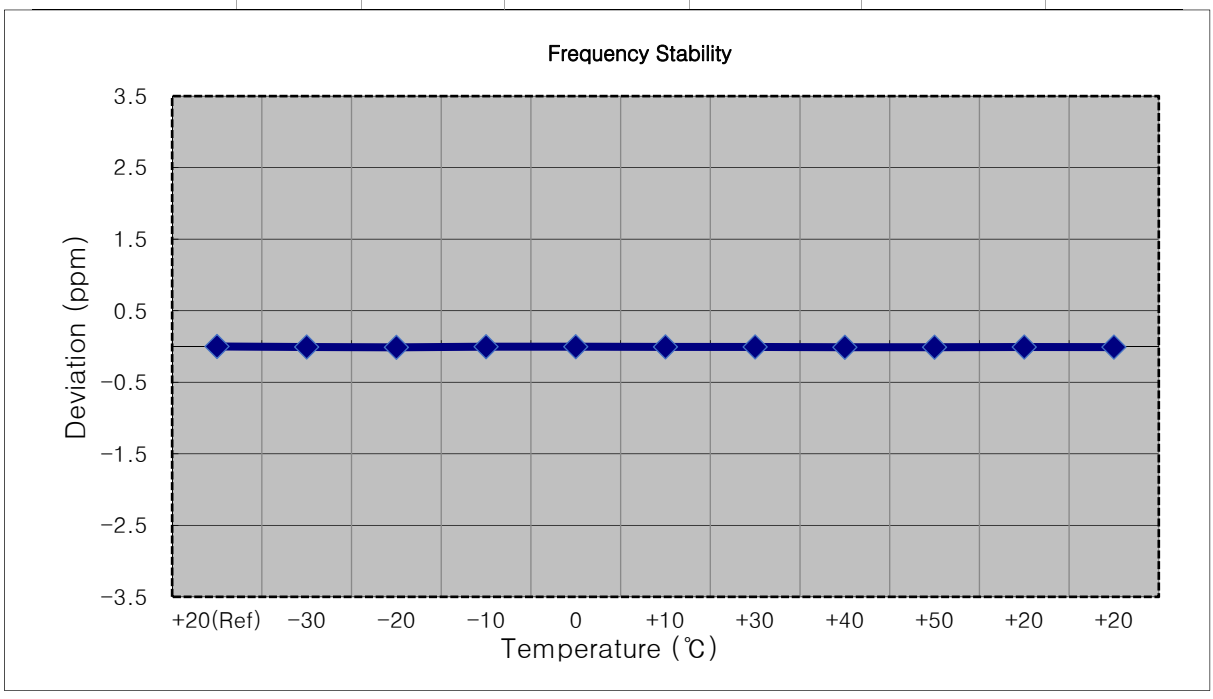
▣ OPERATING FREQUENCY: 1712,500,000 Hz

▣ CHANNEL: 19975 (5 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1712 499 991	0.0	0.000 000	0.000
100 %		-30	1712 499 978	-12.7	-0.000 001	-0.007
100 %		-20	1712 499 971	-20.2	-0.000 001	-0.012
100 %		-10	1712 499 985	-5.8	0.000 000	-0.003
100 %		0	1712 499 986	-5.6	0.000 000	-0.003
100 %		+10	1712 499 981	-10.2	-0.000 001	-0.006
100 %		+30	1712 499 980	-11.3	-0.000 001	-0.007
100 %		+40	1712 499 973	-18.4	-0.000 001	-0.011
100 %		+50	1712 499 973	-17.8	-0.000 001	-0.010
85 %	11.475	+20	1712 499 978	-13.4	-0.000 001	-0.008
115 %	15.525	+20	1712 499 976	-15.1	-0.000 001	-0.009



▣ MODE: LTE 4

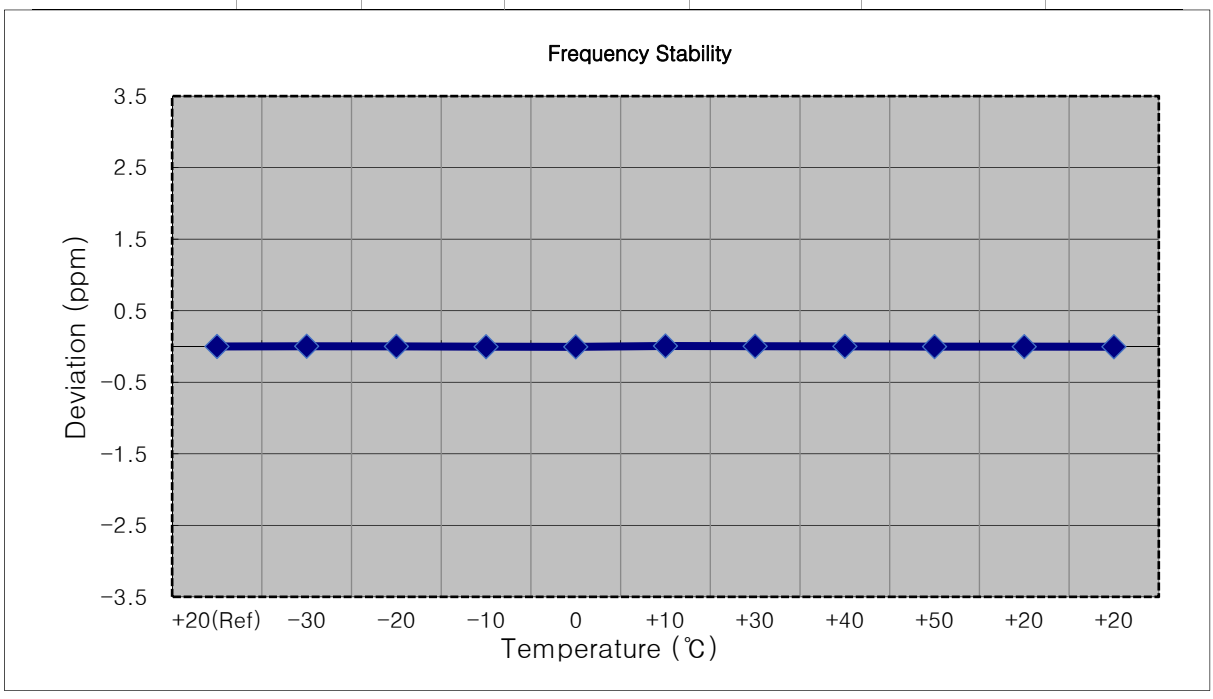
▣ OPERATING FREQUENCY: 1715,000,000 Hz

▣ CHANNEL: 20000 (10 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1714 999 986	0.0	0.000 000	0.000
100 %		-30	1714 999 992	5.4	0.000 000	0.003
100 %		-20	1714 999 988	2.0	0.000 000	0.001
100 %		-10	1714 999 980	-5.9	0.000 000	-0.003
100 %		0	1714 999 977	-9.0	-0.000 001	-0.005
100 %		+10	1714 999 998	11.9	0.000 001	0.007
100 %		+30	1714 999 992	5.9	0.000 000	0.003
100 %		+40	1714 999 989	2.3	0.000 000	0.001
100 %		+50	1714 999 982	-3.9	0.000 000	-0.002
85 %	11.475	+20	1714 999 982	-4.4	0.000 000	-0.003
115 %	15.525	+20	1714 999 979	-7.1	0.000 000	-0.004



▣ MODE: LTE 4

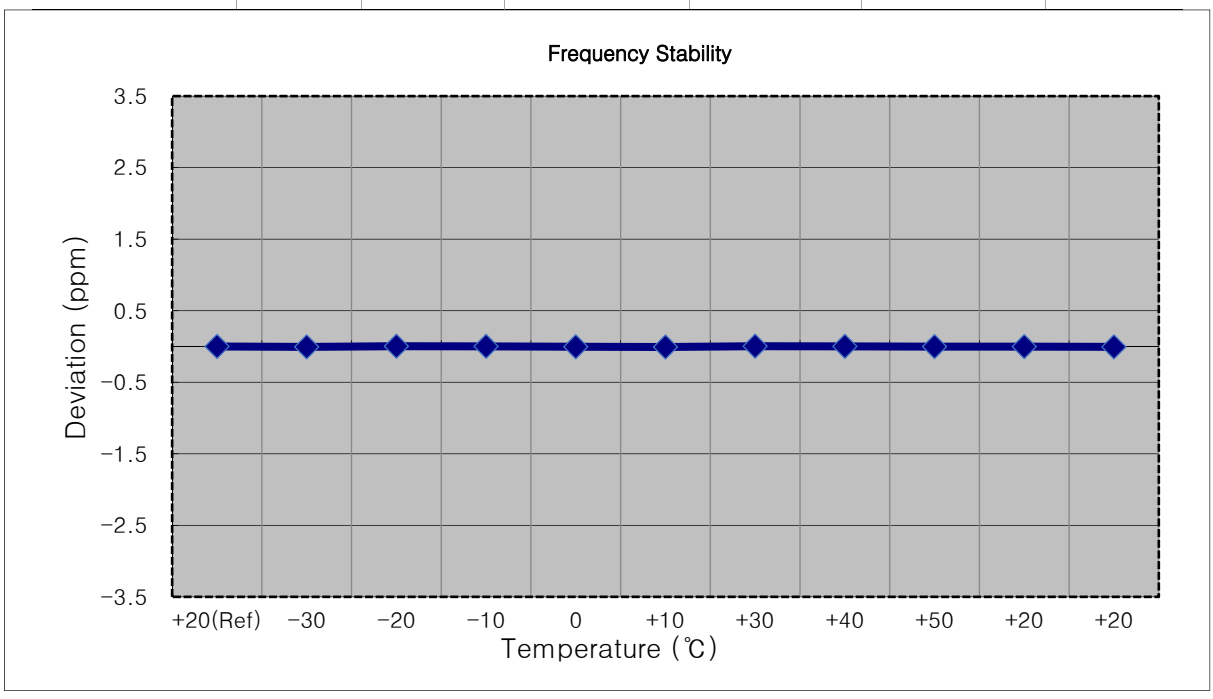
▣ OPERATING FREQUENCY: 1717,500,000 Hz

▣ CHANNEL: 20025 (15 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1717 499 994	0.0	0.000 000	0.000
100 %		-30	1717 499 984	-10.3	-0.000 001	-0.006
100 %		-20	1717 500 000	5.8	0.000 000	0.003
100 %		-10	1717 499 997	2.5	0.000 000	0.001
100 %		0	1717 499 987	-7.0	0.000 000	-0.004
100 %		+10	1717 499 982	-12.2	-0.000 001	-0.007
100 %		+30	1717 500 001	7.2	0.000 000	0.004
100 %		+40	1717 499 997	2.5	0.000 000	0.001
100 %		+50	1717 499 990	-4.0	0.000 000	-0.002
85 %	11.475	+20	1717 499 990	-3.8	0.000 000	-0.002
115 %	15.525	+20	1717 499 985	-9.4	-0.000 001	-0.005



▣ MODE: LTE 4

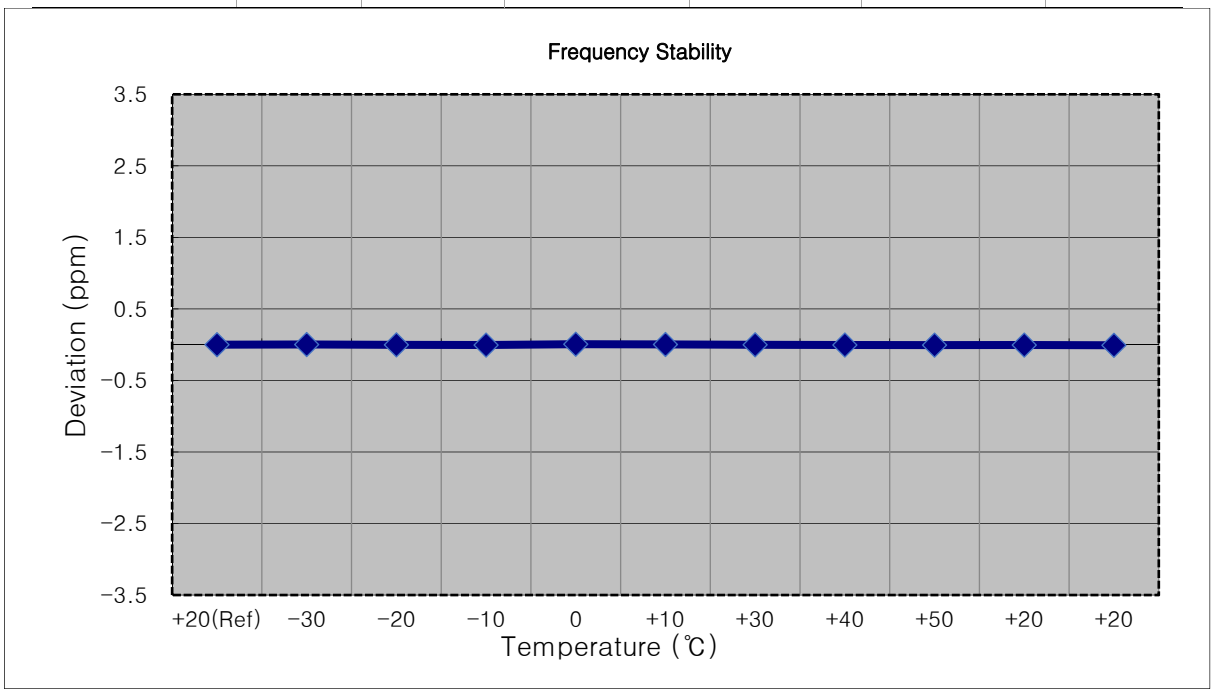
▣ OPERATING FREQUENCY: 1720,000,000 Hz

▣ CHANNEL: 20050 (20 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1719 999 987	0.0	0.000 000	0.000
100 %		-30	1719 999 992	4.5	0.000 000	0.003
100 %		-20	1719 999 983	-4.3	0.000 000	-0.003
100 %		-10	1719 999 979	-8.6	-0.000 001	-0.005
100 %		0	1719 999 999	11.2	0.000 001	0.007
100 %		+10	1719 999 993	5.8	0.000 000	0.003
100 %		+30	1719 999 984	-2.9	0.000 000	-0.002
100 %		+40	1719 999 980	-7.8	0.000 000	-0.005
100 %		+50	1719 999 977	-10.6	-0.000 001	-0.006
85 %	11.475	+20	1719 999 978	-8.9	-0.000 001	-0.005
115 %	15.525	+20	1719 999 974	-13.6	-0.000 001	-0.008



▣ MODE: LTE 4

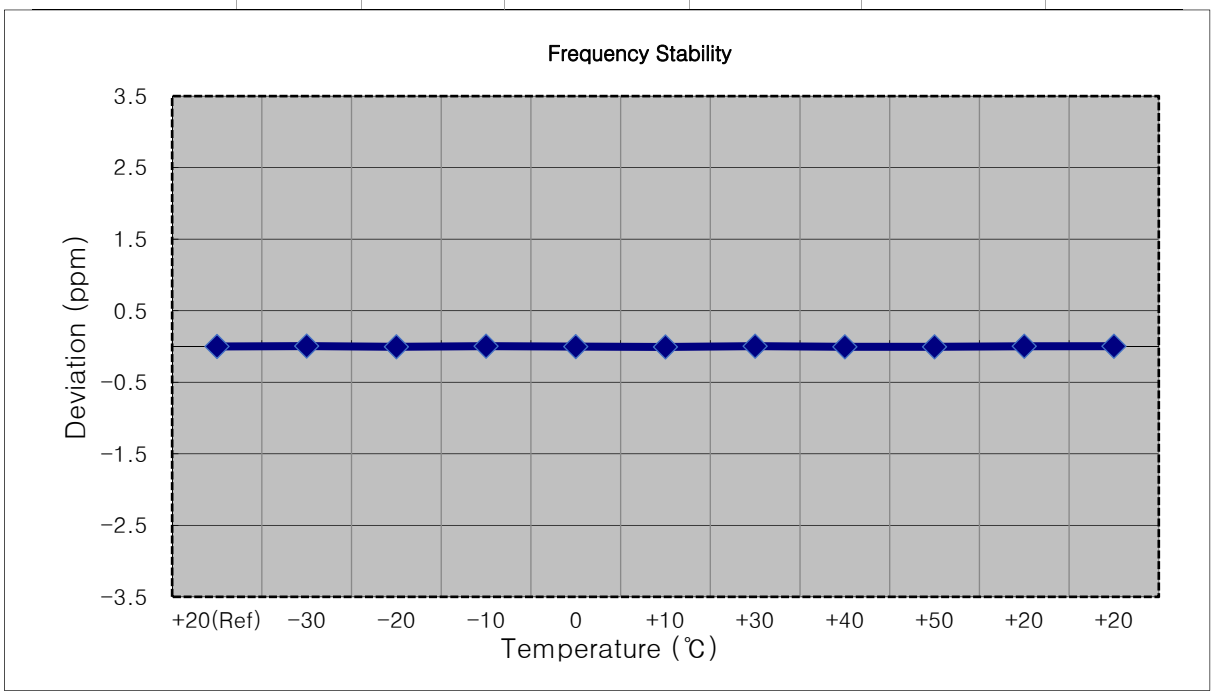
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (1.4 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1732 499 988	0.0	0.000 000	0.000
100 %		-30	1732 499 998	9.3	0.000 001	0.005
100 %		-20	1732 499 981	-7.7	0.000 000	-0.004
100 %		-10	1732 499 996	7.3	0.000 000	0.004
100 %		0	1732 499 985	-3.2	0.000 000	-0.002
100 %		+10	1732 499 977	-11.8	-0.000 001	-0.007
100 %		+30	1732 499 996	7.2	0.000 000	0.004
100 %		+40	1732 499 980	-8.4	0.000 000	-0.005
100 %		+50	1732 499 980	-8.7	-0.000 001	-0.005
85 %	11.475	+20	1732 499 994	5.4	0.000 000	0.003
115 %	15.525	+20	1732 499 994	6.0	0.000 000	0.003



▣ MODE: LTE 4

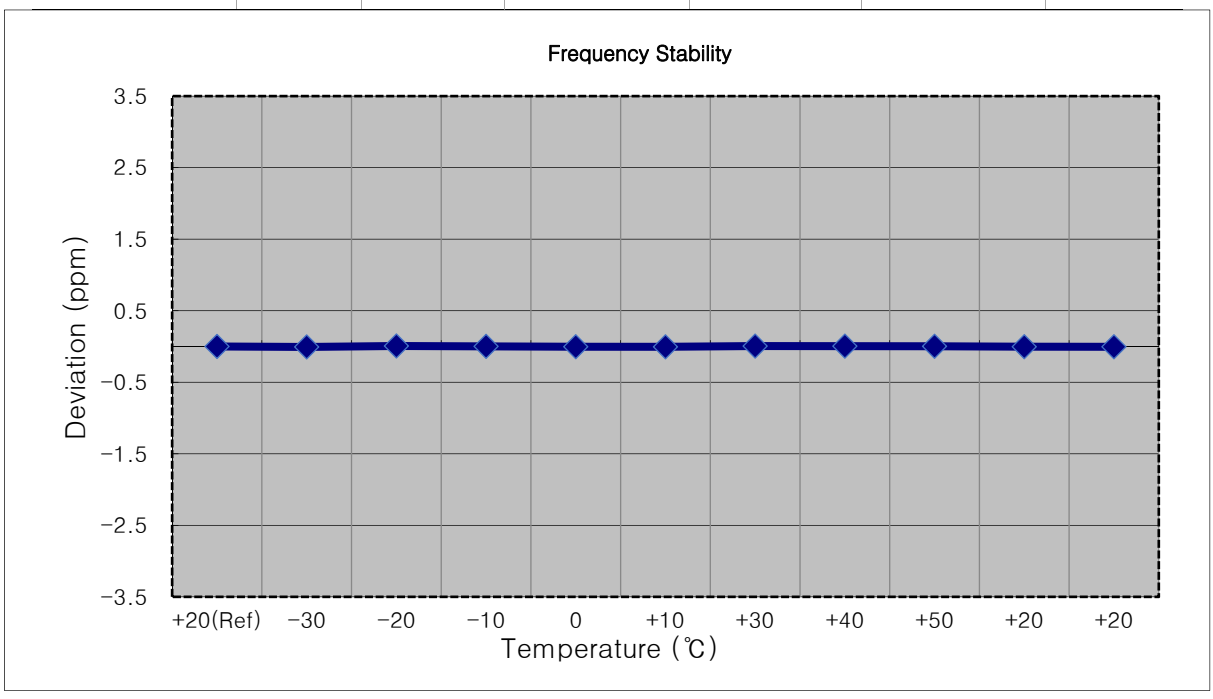
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (3 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1732 499 992	0.0	0.000 000	0.000
100 %		-30	1732 499 980	-11.9	-0.000 001	-0.007
100 %		-20	1732 500 004	11.6	0.000 001	0.007
100 %		-10	1732 499 995	2.6	0.000 000	0.002
100 %		0	1732 499 986	-6.2	0.000 000	-0.004
100 %		+10	1732 499 984	-8.5	0.000 000	-0.005
100 %		+30	1732 500 002	9.5	0.000 001	0.005
100 %		+40	1732 500 000	7.7	0.000 000	0.004
100 %		+50	1732 499 997	4.5	0.000 000	0.003
85 %	11.475	+20	1732 499 987	-5.5	0.000 000	-0.003
115 %	15.525	+20	1732 499 985	-7.6	0.000 000	-0.004



▣ MODE: LTE 4

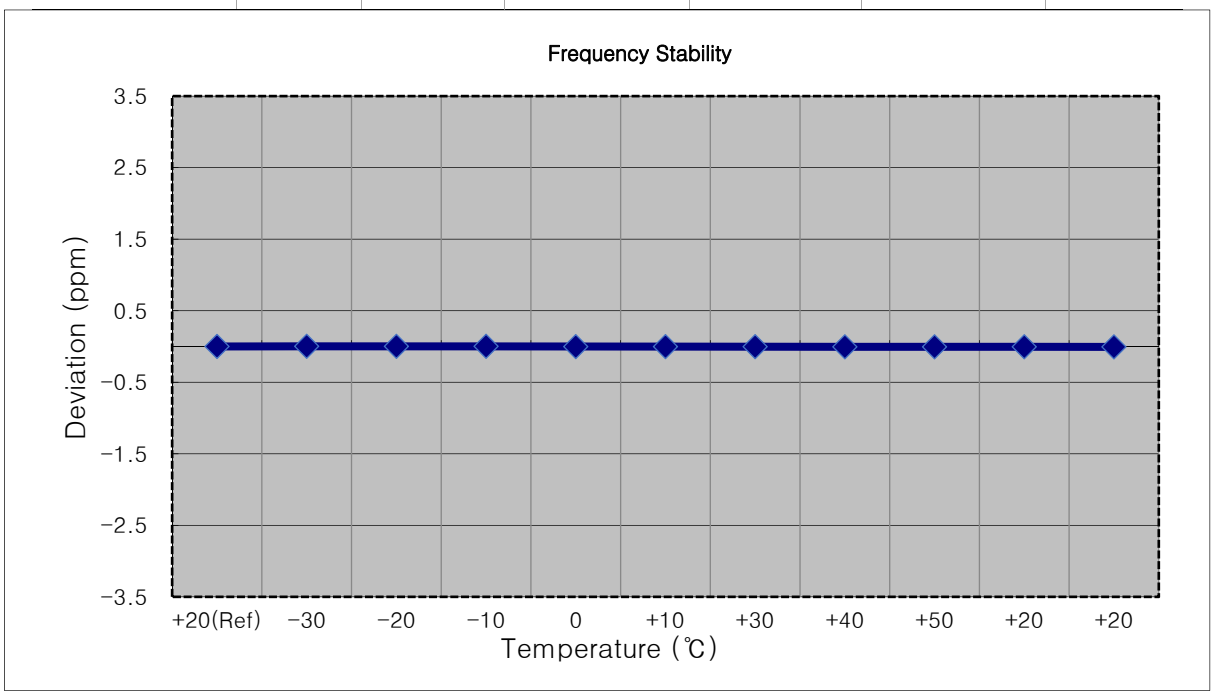
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (5 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1732 500 010	0.0	0.000 000	0.000
100 %		-30	1732 500 015	4.6	0.000 000	0.003
100 %		-20	1732 500 013	3.0	0.000 000	0.002
100 %		-10	1732 500 014	4.1	0.000 000	0.002
100 %		0	1732 500 007	-3.2	0.000 000	-0.002
100 %		+10	1732 500 006	-3.8	0.000 000	-0.002
100 %		+30	1732 500 005	-5.4	0.000 000	-0.003
100 %		+40	1732 500 002	-8.4	0.000 000	-0.005
100 %		+50	1732 500 002	-8.2	0.000 000	-0.005
85 %	11.475	+20	1732 500 003	-7.6	0.000 000	-0.004
115 %	15.525	+20	1732 500 000	-10.0	-0.000 001	-0.006



▣ MODE: LTE 4

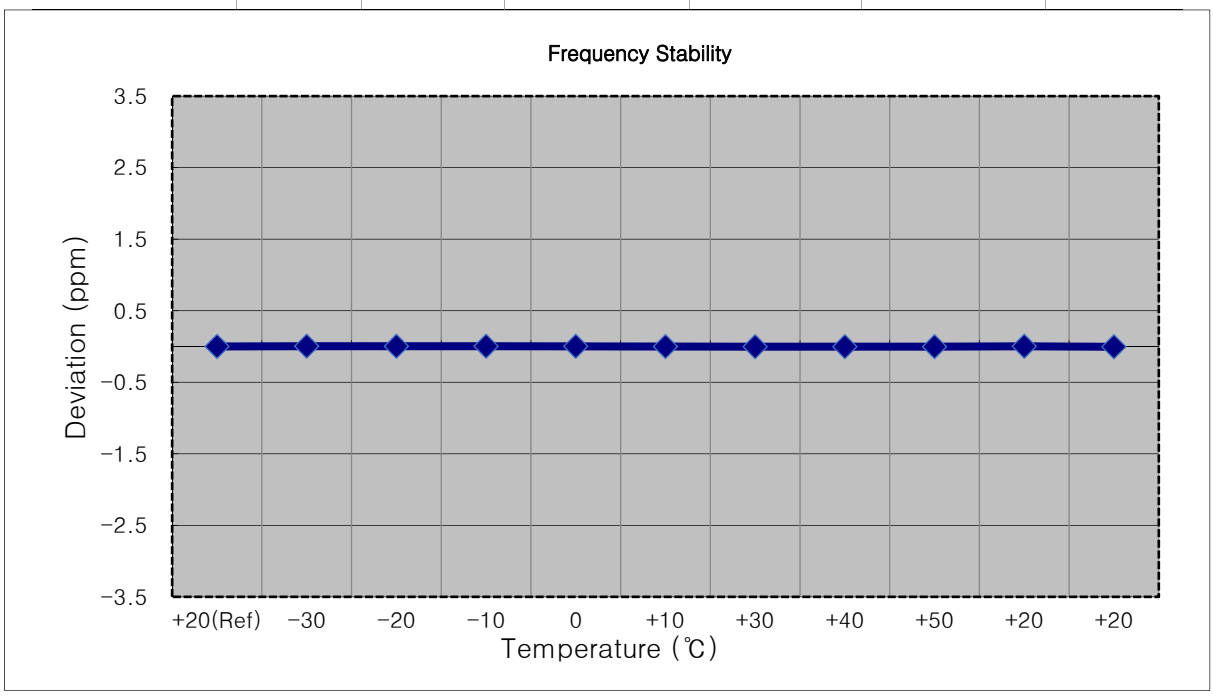
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (10 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1732 500 007	0.0	0.000 000	0.000
100 %		-30	1732 500 014	6.7	0.000 000	0.004
100 %		-20	1732 500 012	4.5	0.000 000	0.003
100 %		-10	1732 500 012	4.9	0.000 000	0.003
100 %		0	1732 500 011	3.6	0.000 000	0.002
100 %		+10	1732 500 004	-2.8	0.000 000	-0.002
100 %		+30	1732 500 001	-6.5	0.000 000	-0.004
100 %		+40	1732 500 003	-4.5	0.000 000	-0.003
100 %		+50	1732 500 002	-4.9	0.000 000	-0.003
85 %	11.475	+20	1732 500 011	4.1	0.000 000	0.002
115 %	15.525	+20	1732 500 000	-7.4	0.000 000	-0.004



▣ MODE: LTE 4

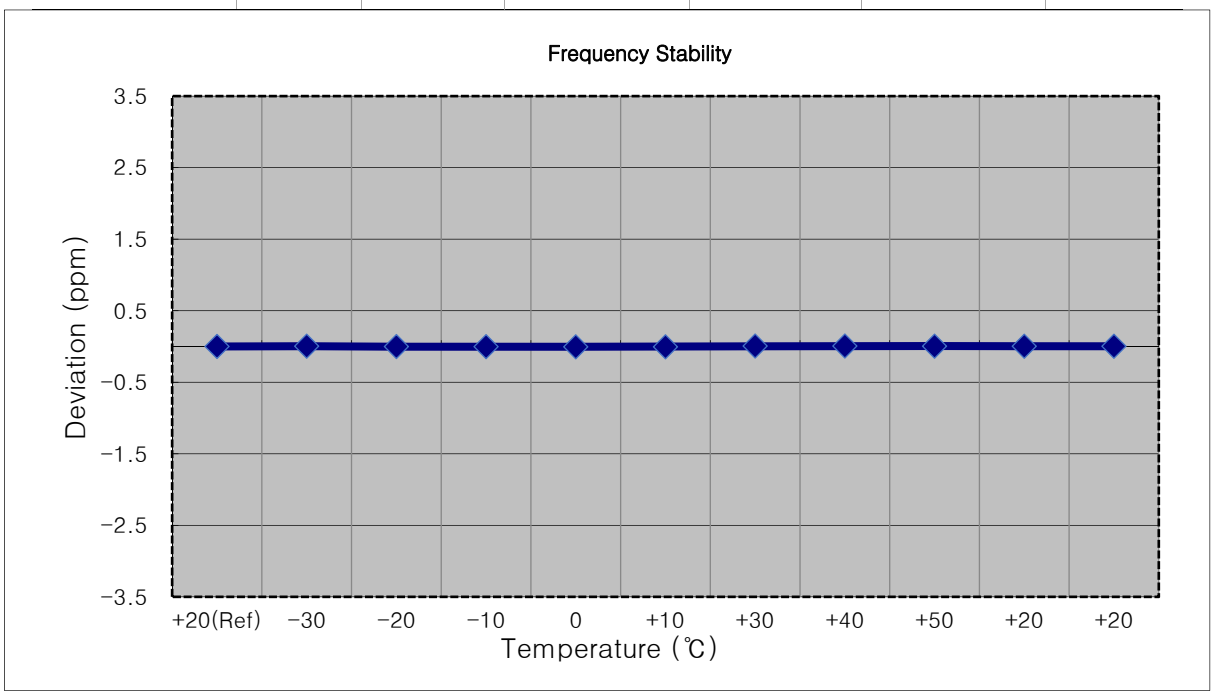
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (15 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1732 500 011	0.0	0.000 000	0.000
100 %		-30	1732 500 018	6.3	0.000 000	0.004
100 %		-20	1732 500 009	-2.5	0.000 000	-0.001
100 %		-10	1732 500 006	-5.4	0.000 000	-0.003
100 %		0	1732 500 002	-9.0	-0.000 001	-0.005
100 %		+10	1732 500 003	-8.5	0.000 000	-0.005
100 %		+30	1732 500 022	10.6	0.000 001	0.006
100 %		+40	1732 500 022	11.2	0.000 001	0.006
100 %		+50	1732 500 018	6.7	0.000 000	0.004
85 %	11.475	+20	1732 500 017	6.1	0.000 000	0.004
115 %	15.525	+20	1732 500 016	5.1	0.000 000	0.003



▣ MODE: LTE 4

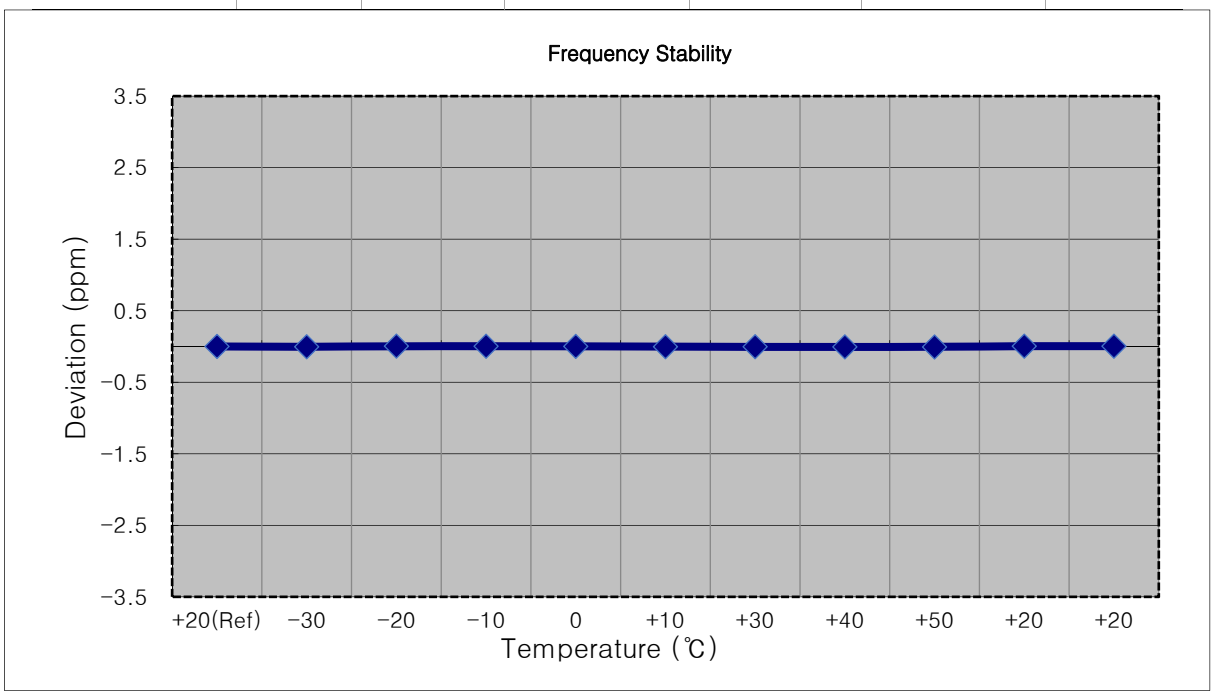
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (20 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1732 499 994	0.0	0.000 000	0.000
100 %		-30	1732 499 986	-8.0	0.000 000	-0.005
100 %		-20	1732 500 002	8.6	0.000 000	0.005
100 %		-10	1732 500 000	6.0	0.000 000	0.003
100 %		0	1732 499 995	1.0	0.000 000	0.001
100 %		+10	1732 499 988	-5.7	0.000 000	-0.003
100 %		+30	1732 499 988	-6.1	0.000 000	-0.004
100 %		+40	1732 499 983	-10.5	-0.000 001	-0.006
100 %		+50	1732 499 981	-12.7	-0.000 001	-0.007
85 %	11.475	+20	1732 500 001	6.9	0.000 000	0.004
115 %	15.525	+20	1732 500 001	7.2	0.000 000	0.004



▣ MODE: LTE 4

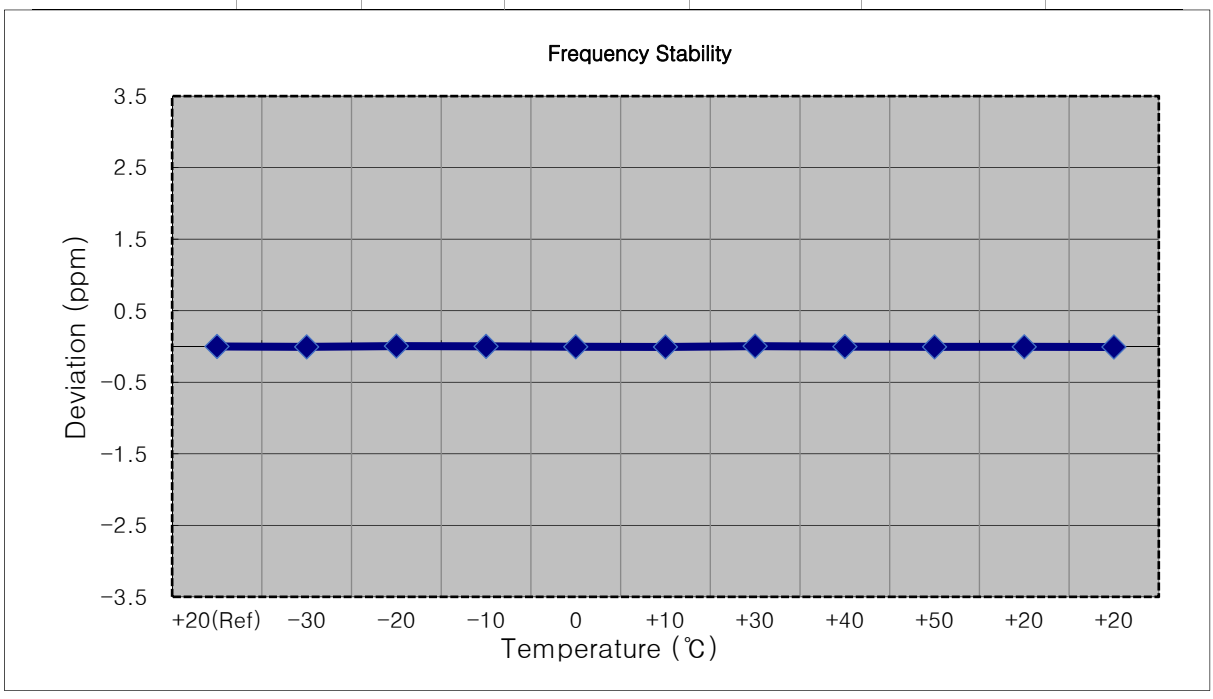
▣ OPERATING FREQUENCY: 1754,300,000 Hz

▣ CHANNEL: 20393 (1.4 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1754 300 003	0.0	0.000 000	0.000
100 %		-30	1754 299 993	-9.8	-0.000 001	-0.006
100 %		-20	1754 300 013	9.6	0.000 001	0.005
100 %		-10	1754 300 007	3.6	0.000 000	0.002
100 %		0	1754 299 996	-7.5	0.000 000	-0.004
100 %		+10	1754 299 991	-11.8	-0.000 001	-0.007
100 %		+30	1754 300 011	7.7	0.000 000	0.004
100 %		+40	1754 299 999	-3.8	0.000 000	-0.002
100 %		+50	1754 299 994	-9.7	-0.000 001	-0.006
85 %	11.475	+20	1754 299 995	-8.6	0.000 000	-0.005
115 %	15.525	+20	1754 299 991	-12.3	-0.000 001	-0.007



▣ MODE: LTE 4

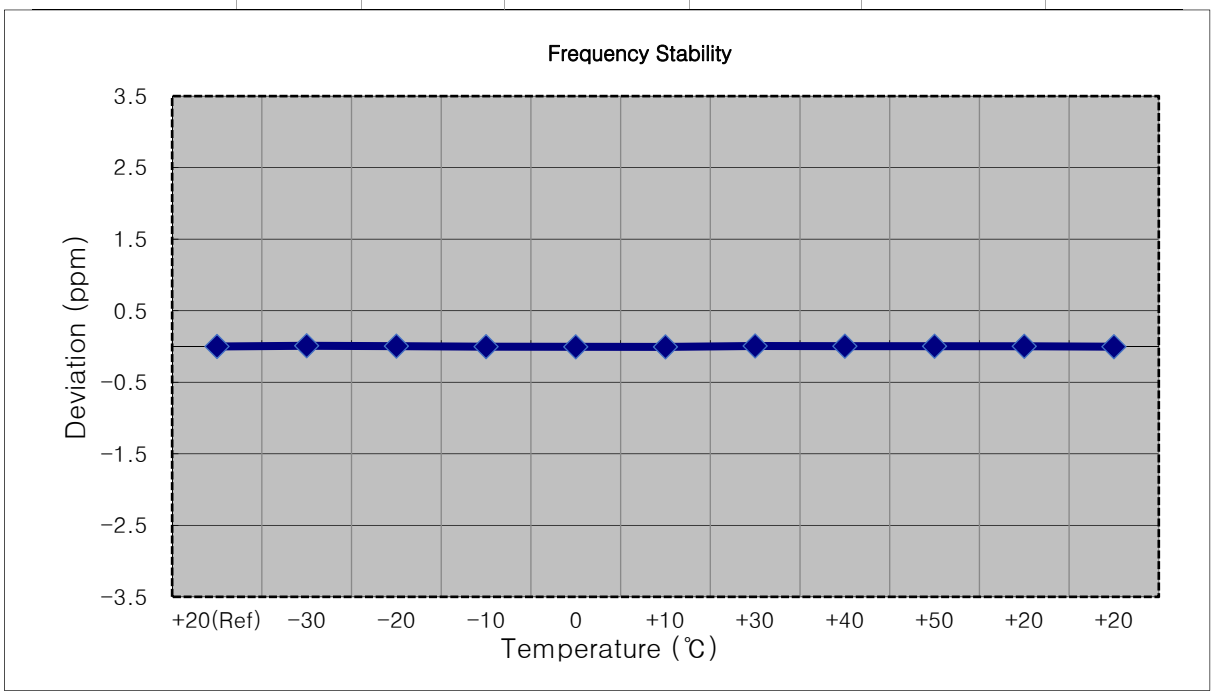
▣ OPERATING FREQUENCY: 1753,500,000 Hz

▣ CHANNEL: 20385 (3 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1753 499 986	0.0	0.000 000	0.000
100 %		-30	1753 500 003	17.2	0.000 001	0.010
100 %		-20	1753 499 994	8.0	0.000 000	0.005
100 %		-10	1753 499 980	-5.4	0.000 000	-0.003
100 %		0	1753 499 978	-8.2	0.000 000	-0.005
100 %		+10	1753 499 975	-10.4	-0.000 001	-0.006
100 %		+30	1753 499 997	11.6	0.000 001	0.007
100 %		+40	1753 499 993	7.4	0.000 000	0.004
100 %		+50	1753 499 992	6.0	0.000 000	0.003
85 %	11.475	+20	1753 499 991	4.8	0.000 000	0.003
115 %	15.525	+20	1753 499 980	-5.6	0.000 000	-0.003



▣ MODE: LTE 4

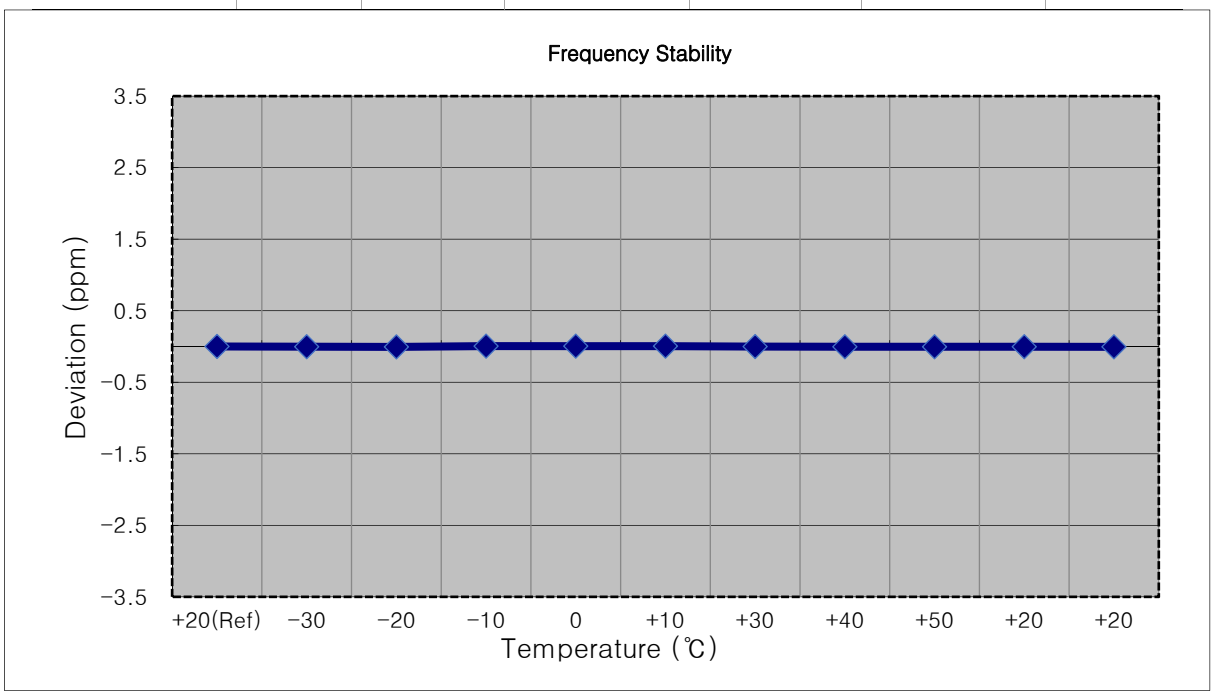
▣ OPERATING FREQUENCY: 1752,500,000 Hz

▣ CHANNEL: 20375 (5 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1752 499 996	0.0	0.000 000	0.000
100 %		-30	1752 499 990	-5.9	0.000 000	-0.003
100 %		-20	1752 499 985	-10.4	-0.000 001	-0.006
100 %		-10	1752 500 004	8.4	0.000 000	0.005
100 %		0	1752 500 003	7.6	0.000 000	0.004
100 %		+10	1752 500 004	8.6	0.000 000	0.005
100 %		+30	1752 499 993	-2.7	0.000 000	-0.002
100 %		+40	1752 499 988	-7.5	0.000 000	-0.004
100 %		+50	1752 499 989	-7.1	0.000 000	-0.004
85 %	11.475	+20	1752 499 989	-6.5	0.000 000	-0.004
115 %	15.525	+20	1752 499 987	-8.9	-0.000 001	-0.005



▣ MODE: LTE 4

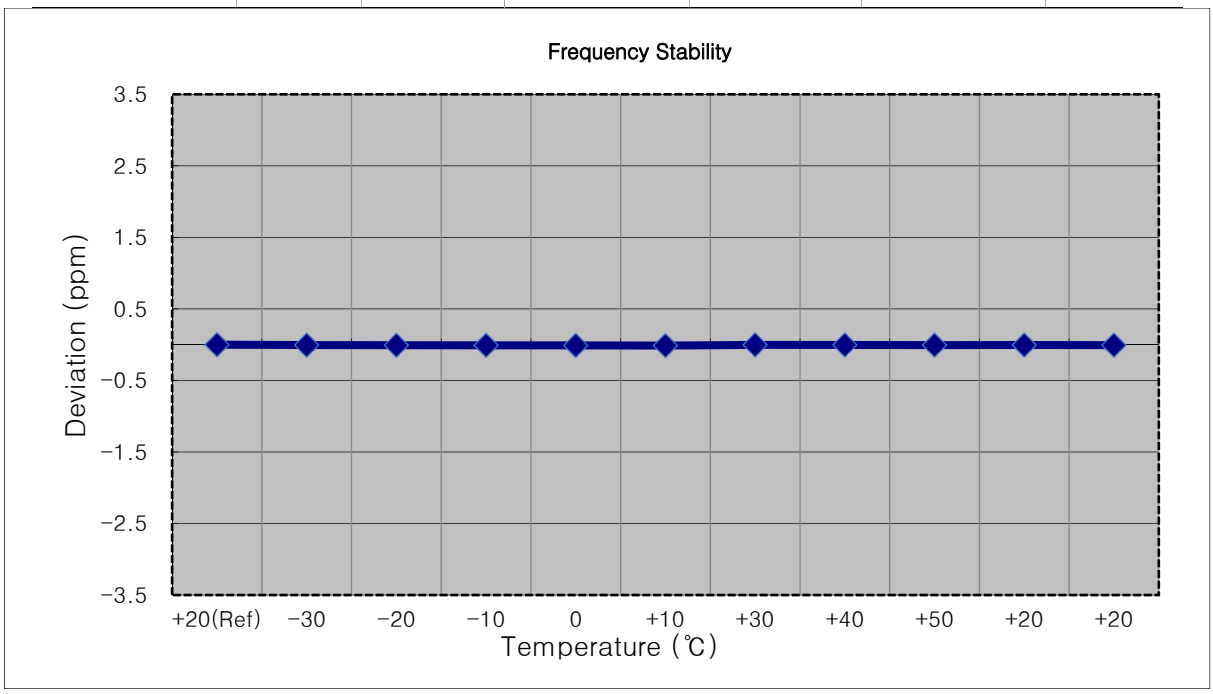
▣ OPERATING FREQUENCY: 1750,000,000 Hz

▣ CHANNEL: 20350 (10 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	13.500	+20(Ref)	1749 999 993	0.0	0.000 000	0.000
100 %		-30	1749 999 983	-10.2	-0.000 001	-0.006
100 %		-20	1749 999 979	-13.7	-0.000 001	-0.008
100 %		-10	1749 999 977	-15.9	-0.000 001	-0.009
100 %		0	1749 999 975	-17.7	-0.000 001	-0.010
100 %		+10	1749 999 970	-22.7	-0.000 001	-0.013
100 %		+30	1749 999 987	-5.8	0.000 000	-0.003
100 %		+40	1749 999 986	-6.9	0.000 000	-0.004
100 %		+50	1749 999 982	-10.5	-0.000 001	-0.006
85 %	11.475	+20	1749 999 984	-8.5	0.000 000	-0.005
115 %	15.525	+20	1749 999 982	-11.2	-0.000 001	-0.006



▣ MODE: LTE 4

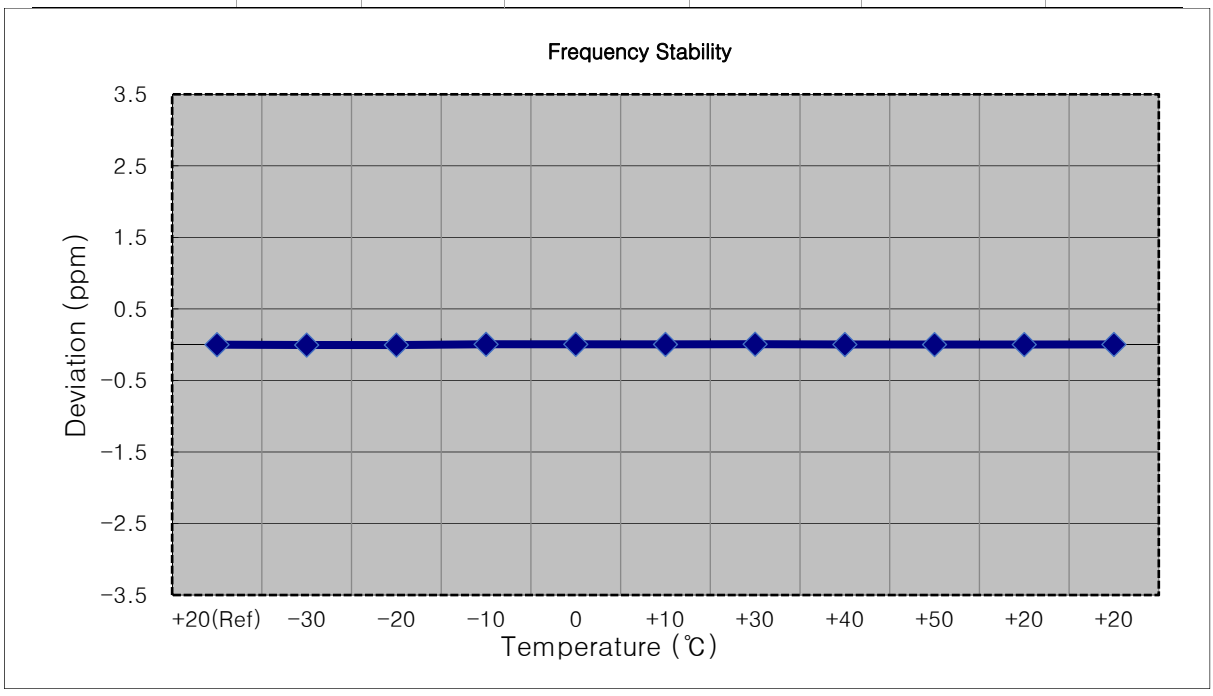
▣ OPERATING FREQUENCY: 1747,500,000 Hz

▣ CHANNEL: 20325 (15 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	13.500	+20(Ref)	1747 499 994	0.0	0.000 000	0.000
100 %		-30	1747 499 985	-9.0	-0.000 001	-0.005
100 %		-20	1747 499 985	-9.7	-0.000 001	-0.006
100 %		-10	1747 500 004	9.6	0.000 001	0.005
100 %		0	1747 500 003	9.1	0.000 001	0.005
100 %		+10	1747 500 001	7.2	0.000 000	0.004
100 %		+30	1747 500 006	11.4	0.000 001	0.007
100 %		+40	1747 499 999	4.3	0.000 000	0.002
100 %		+50	1747 499 997	3.1	0.000 000	0.002
85 %	11.475	+20	1747 499 997	2.9	0.000 000	0.002
115 %	15.525	+20	1747 500 000	5.9	0.000 000	0.003



▣ MODE: LTE 4

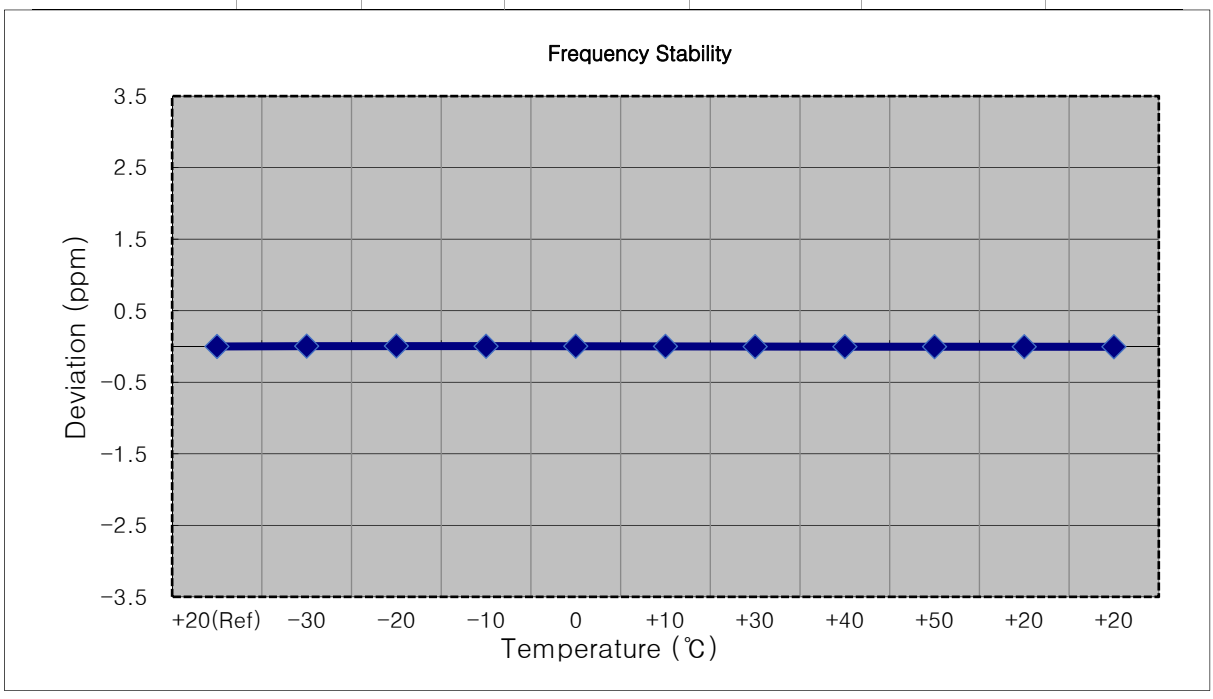
▣ OPERATING FREQUENCY: 1745,000,000 Hz

▣ CHANNEL: 20300 (20 MHz)

▣ REFERENCE VOLTAGE: 13.500 VDC

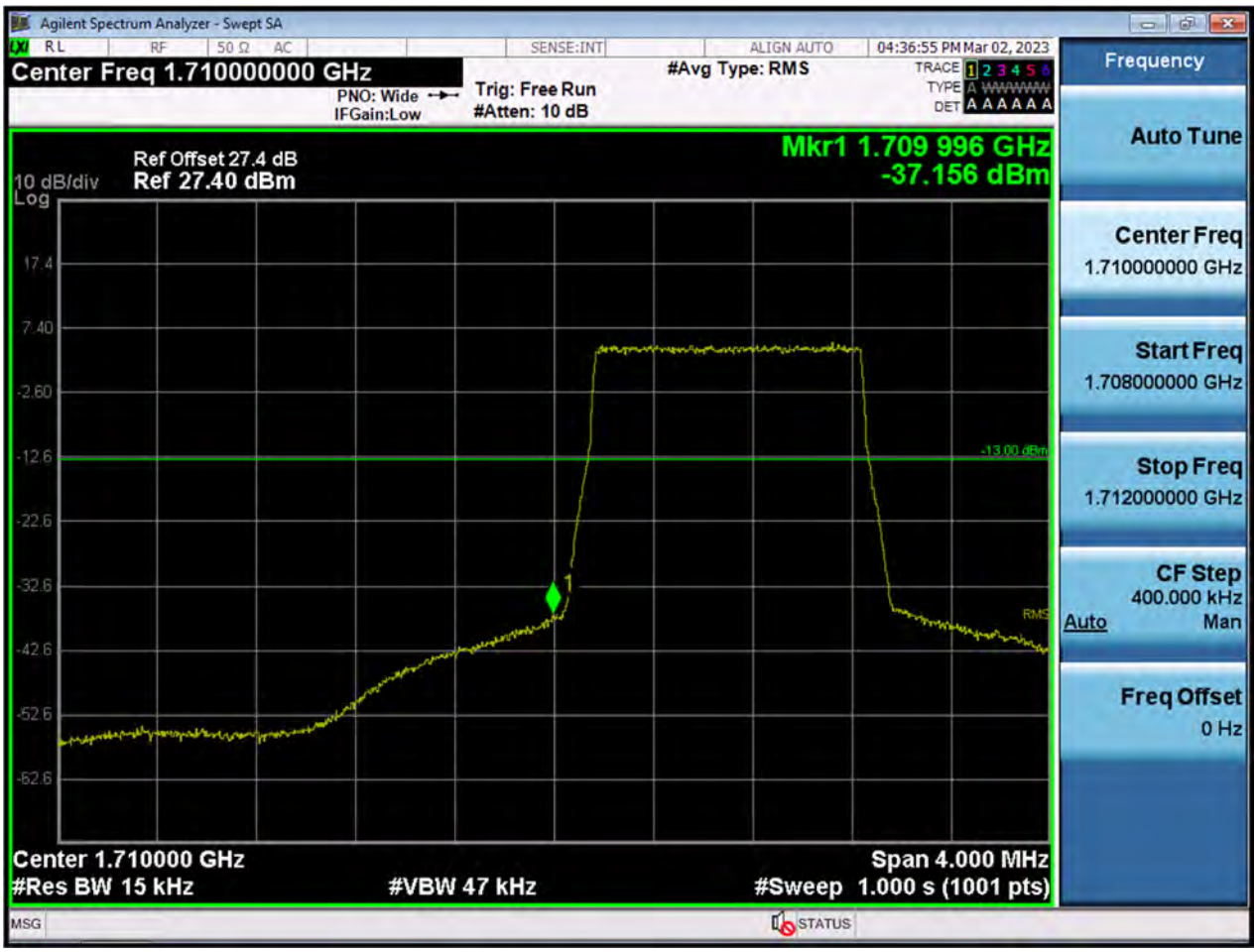
▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.500	+20(Ref)	1744 999 990	0.0	0.000 000	0.000
100 %		-30	1744 999 998	8.0	0.000 000	0.005
100 %		-20	1745 000 002	12.2	0.000 001	0.007
100 %		-10	1744 999 996	5.5	0.000 000	0.003
100 %		0	1744 999 997	6.4	0.000 000	0.004
100 %		+10	1744 999 993	3.0	0.000 000	0.002
100 %		+30	1744 999 986	-3.8	0.000 000	-0.002
100 %		+40	1744 999 985	-5.2	0.000 000	-0.003
100 %		+50	1744 999 985	-5.2	0.000 000	-0.003
85 %	11.475	+20	1744 999 984	-6.7	0.000 000	-0.004
115 %	15.525	+20	1744 999 983	-7.4	0.000 000	-0.004

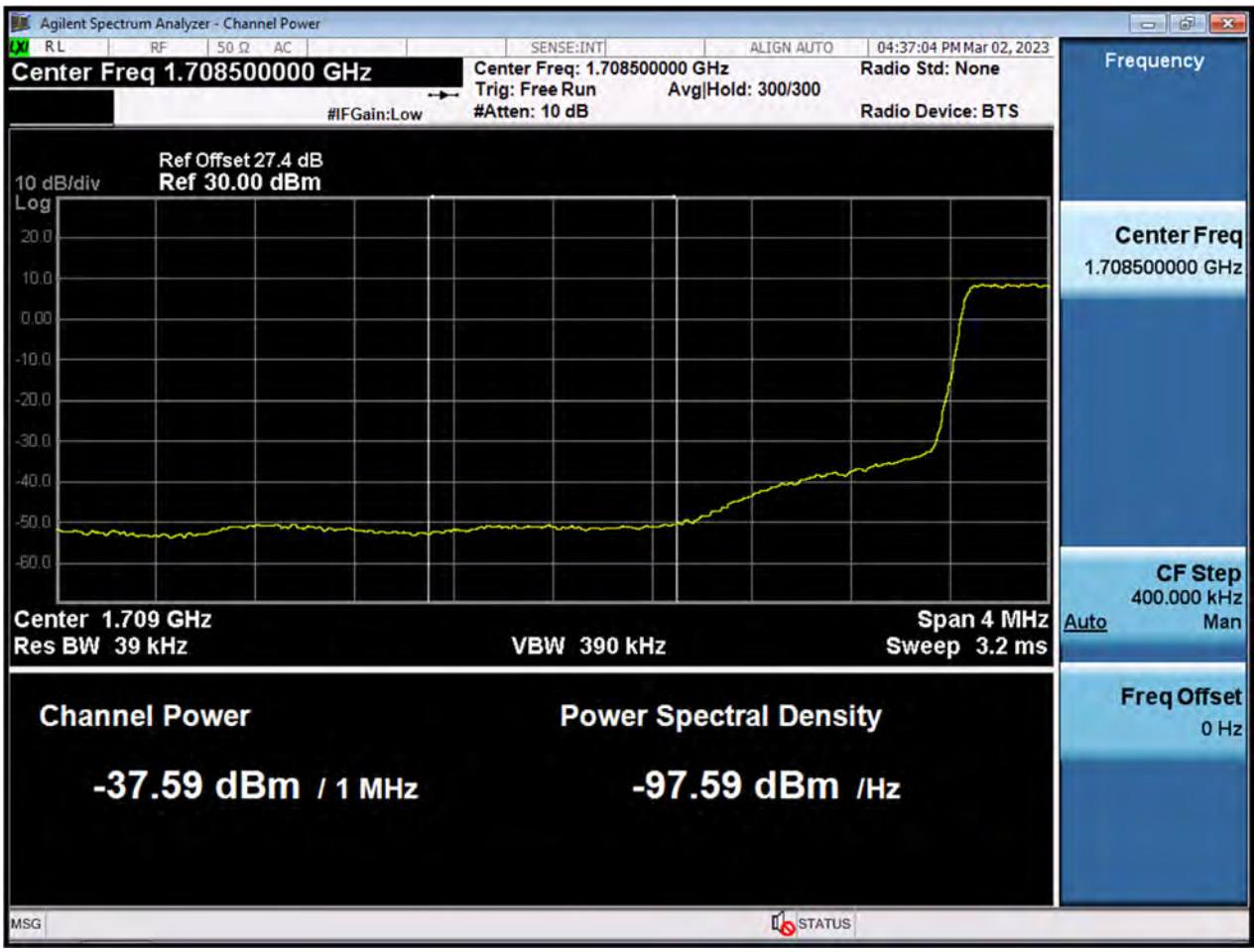


9. TEST PLOTS

BW1.4 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

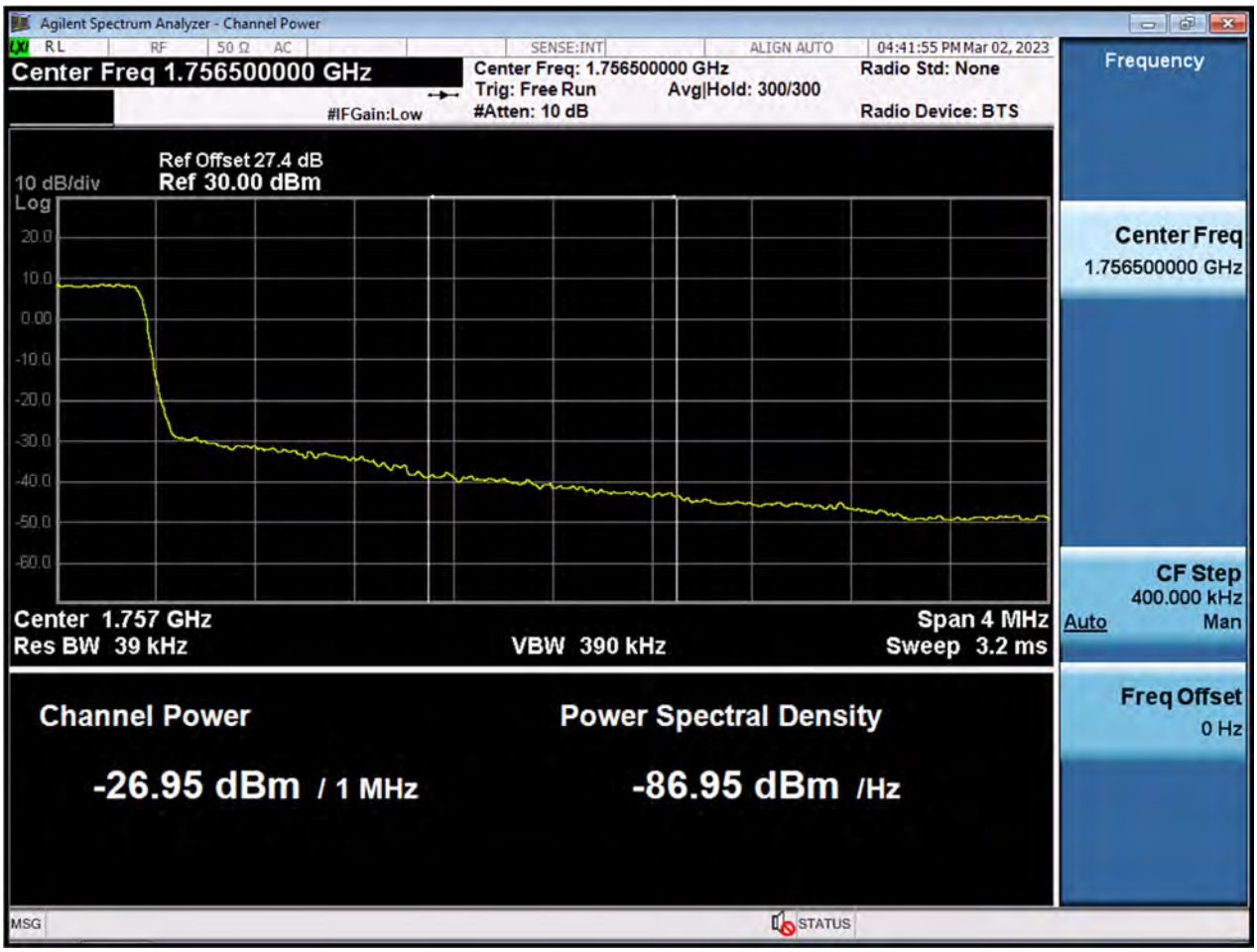


BW1.4 M_BandEdge_Lowest Channel_QPSK_FullRB(2)

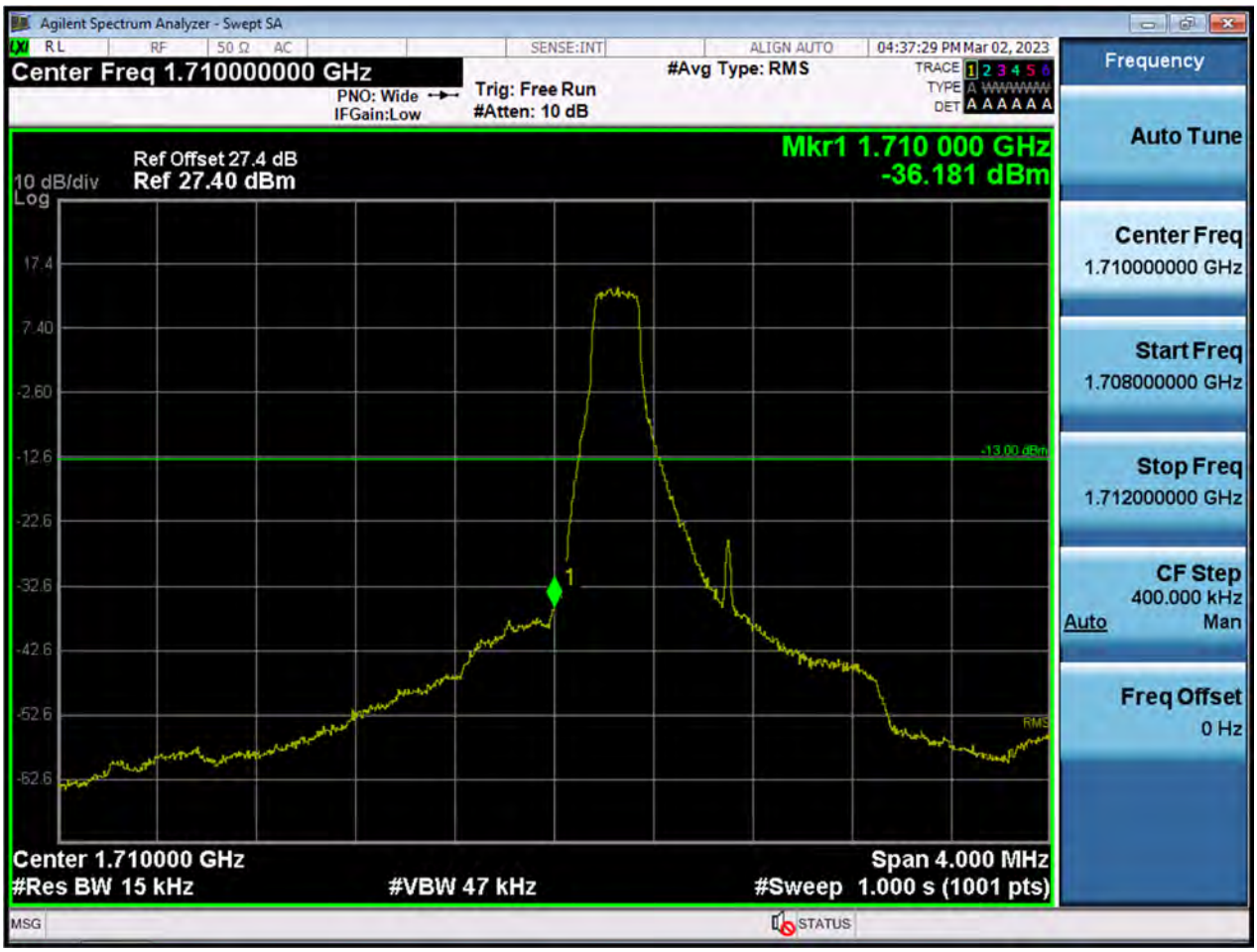


BW1.4 M_BandEdge_Highest Channel_QPSK_FullRB(1)

BW1.4 M_BandEdge_Highest Channel_QPSK_FullRB(2)



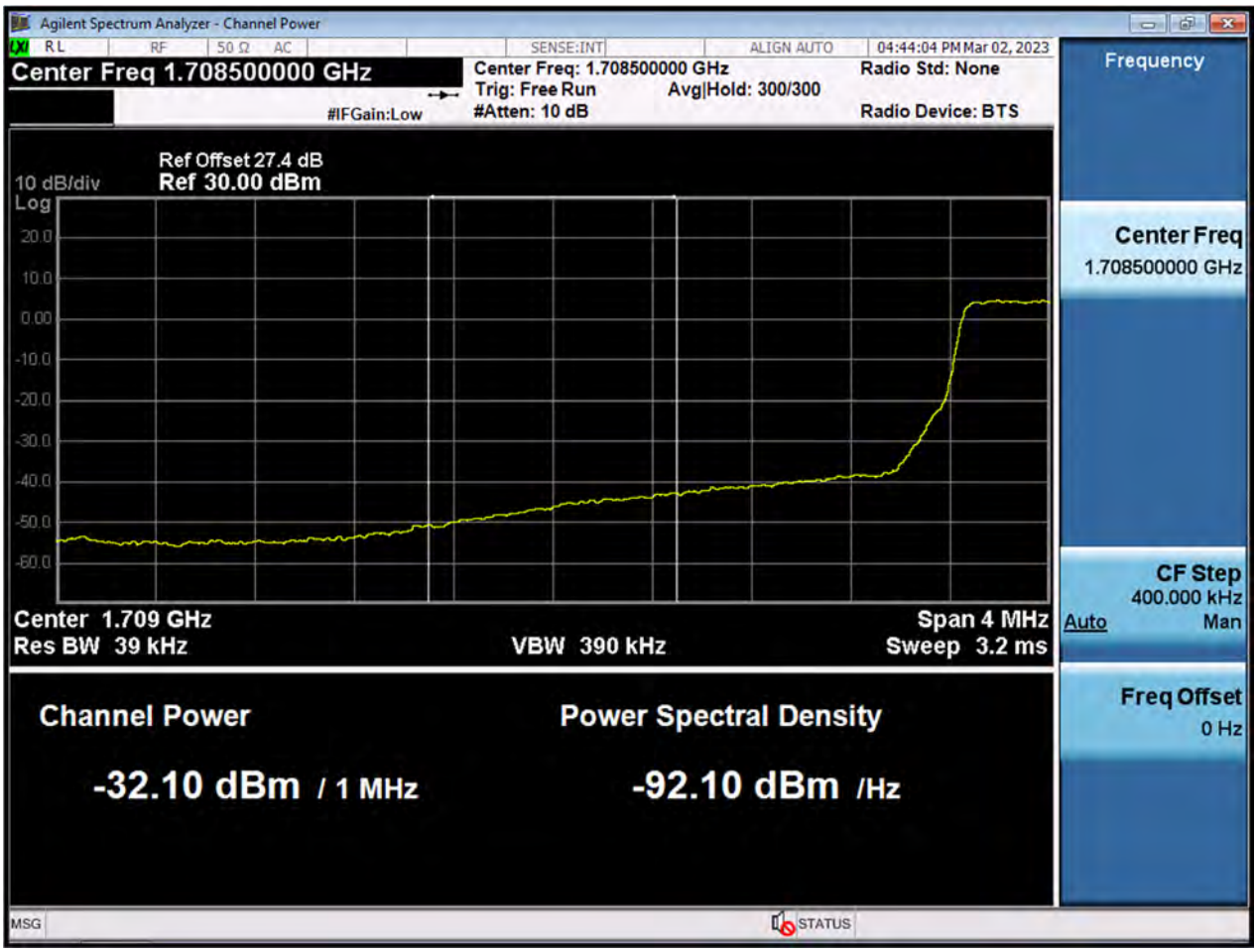
BW1.4 M_BandEdge_Lowest Channel_QPSK_1RB



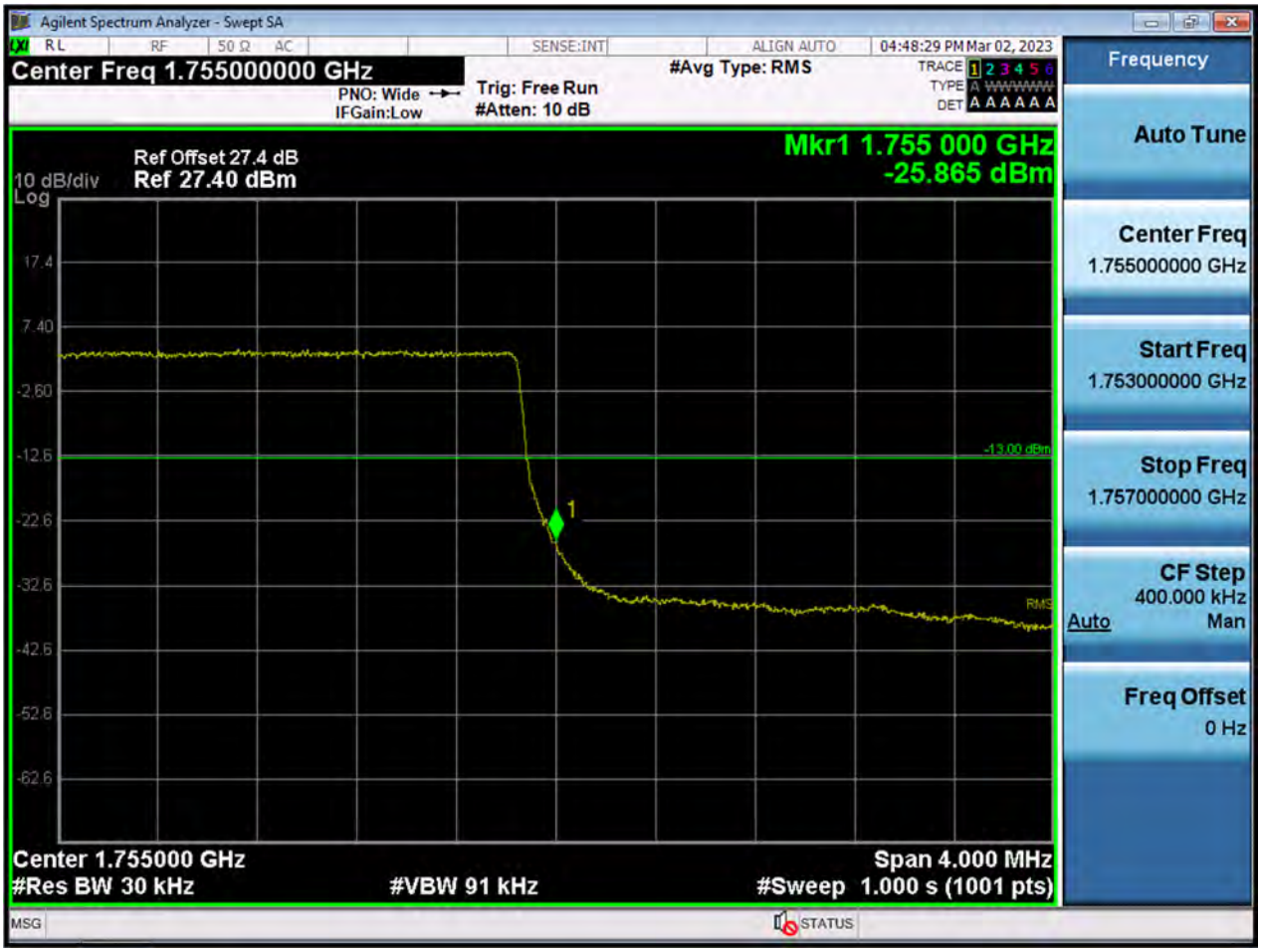
BW1.4 M_BandEdge_Highest Channel_QPSK_1RB

BW3 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

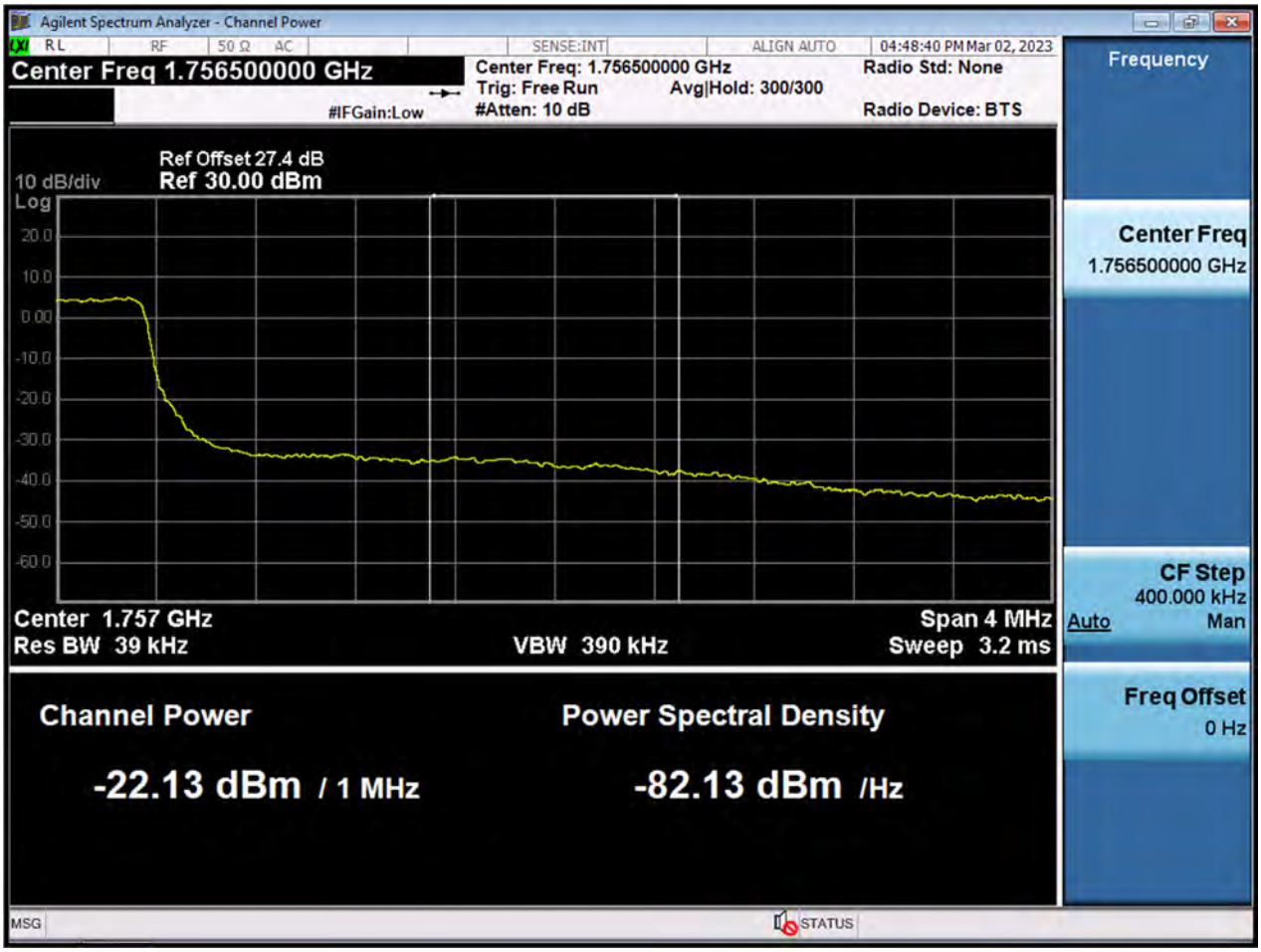
BW3 M_BandEdge_Lowest Channel_QPSK_FullRB(2)



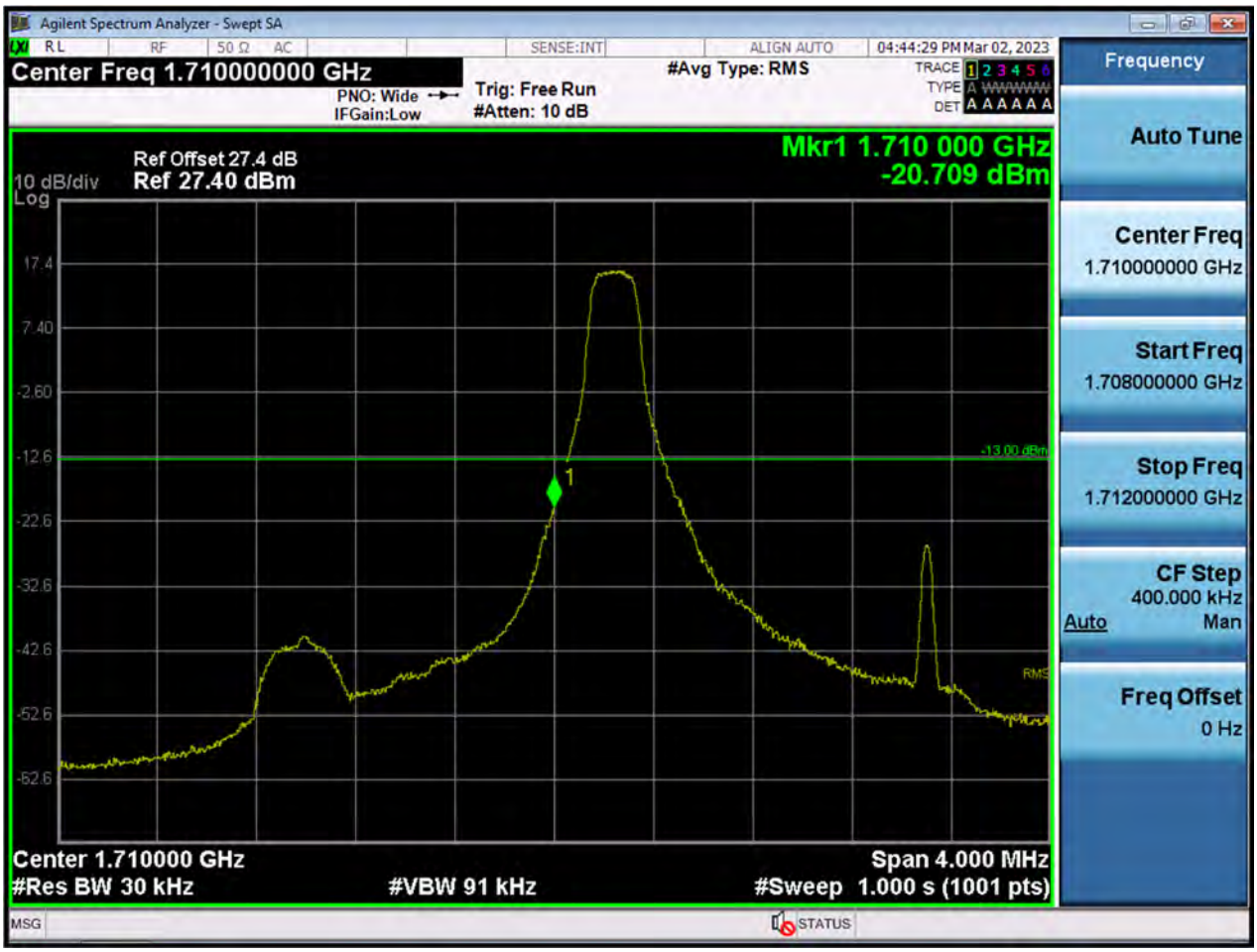
BW3 M_BandEdge_Highest Channel_QPSK_FullRB(1)



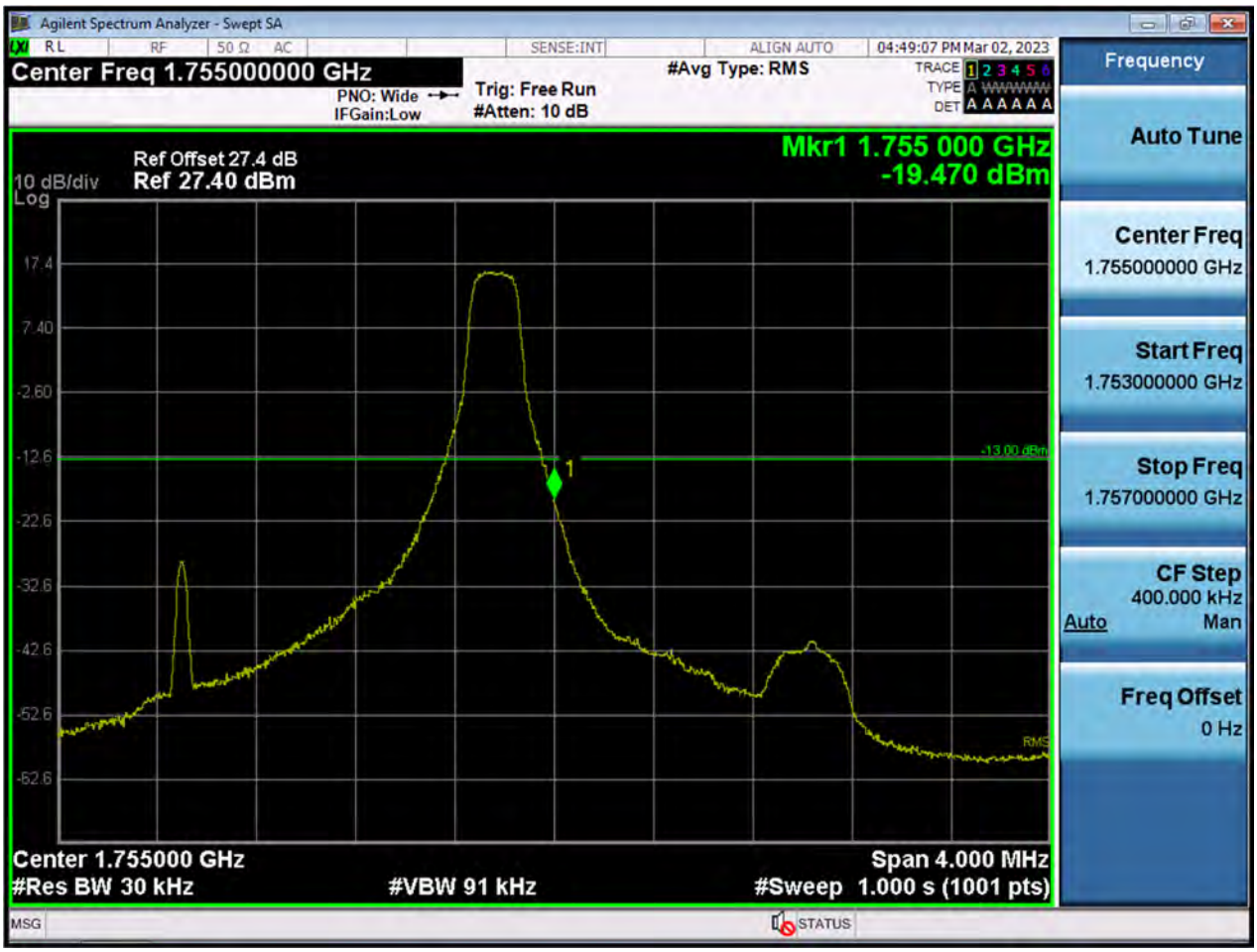
BW3 M_BandEdge_Highest Channel_QPSK_FullRB(2)



BW3 M_BandEdge_Lowest Channel_QPSK_1RB

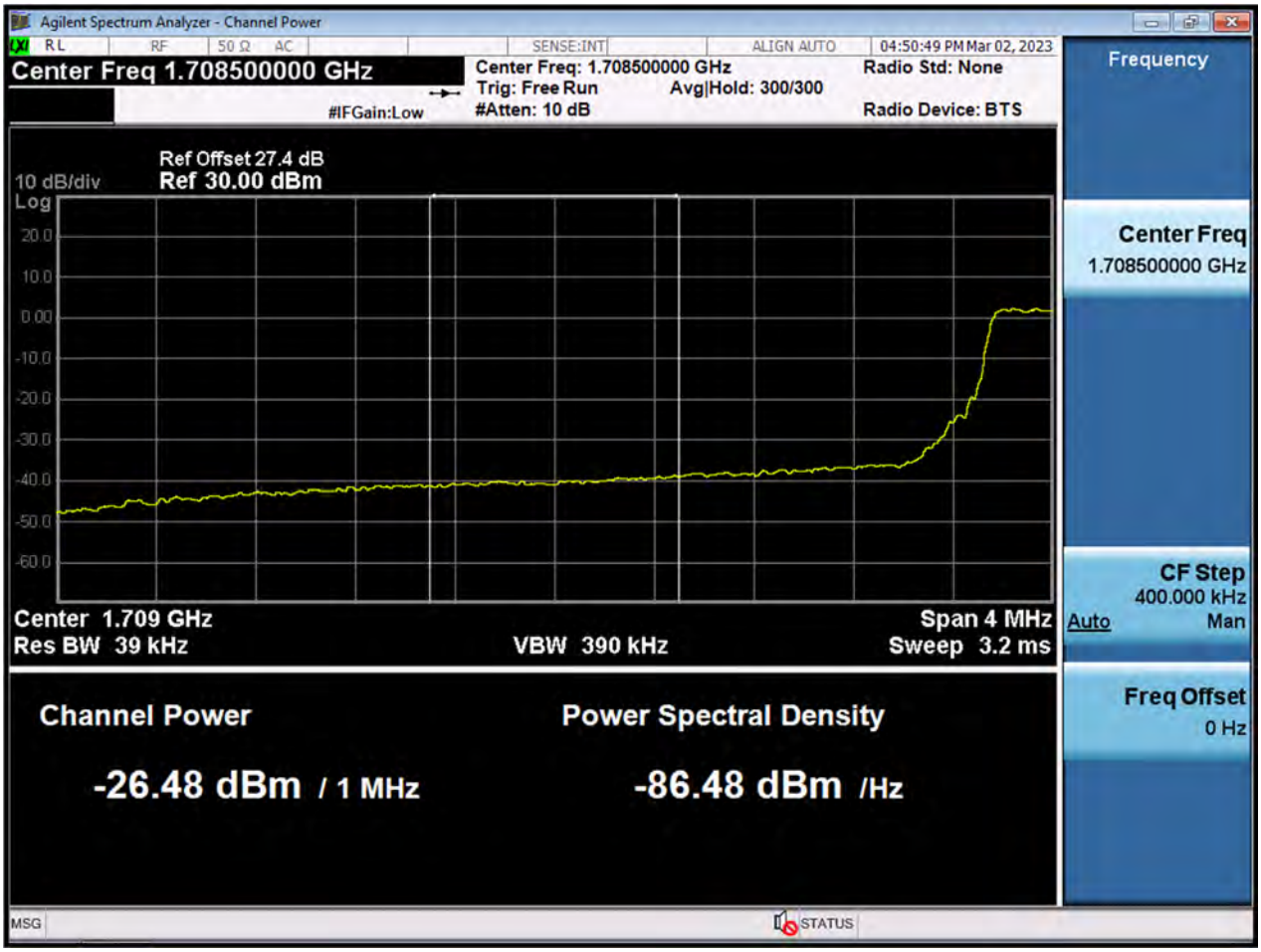


BW3 M_BandEdge_Highest Channel_QPSK_1RB



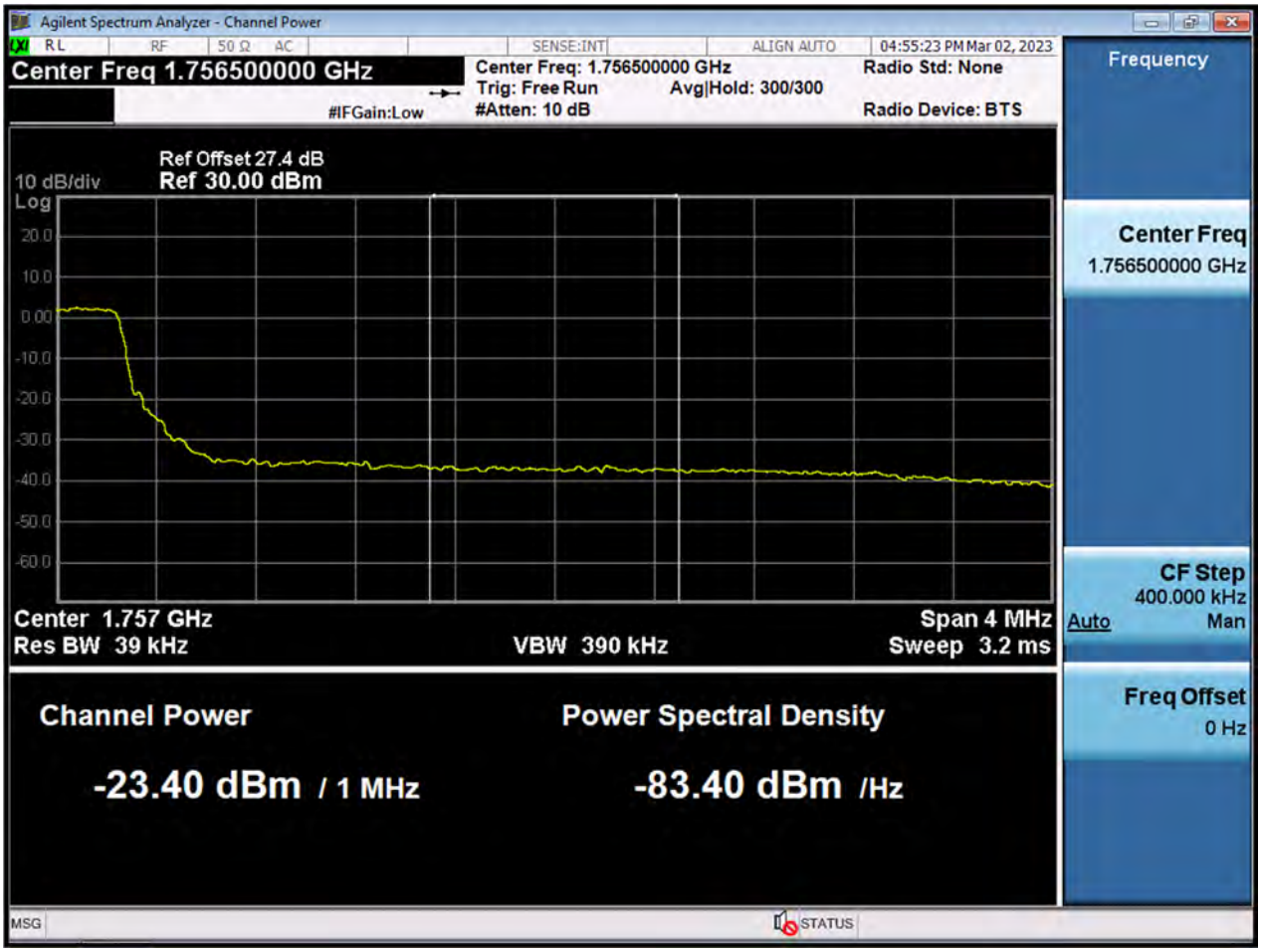
BW5 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

BW5 M_BandEdge_Lowest Channel_QPSK_FullRB(2)

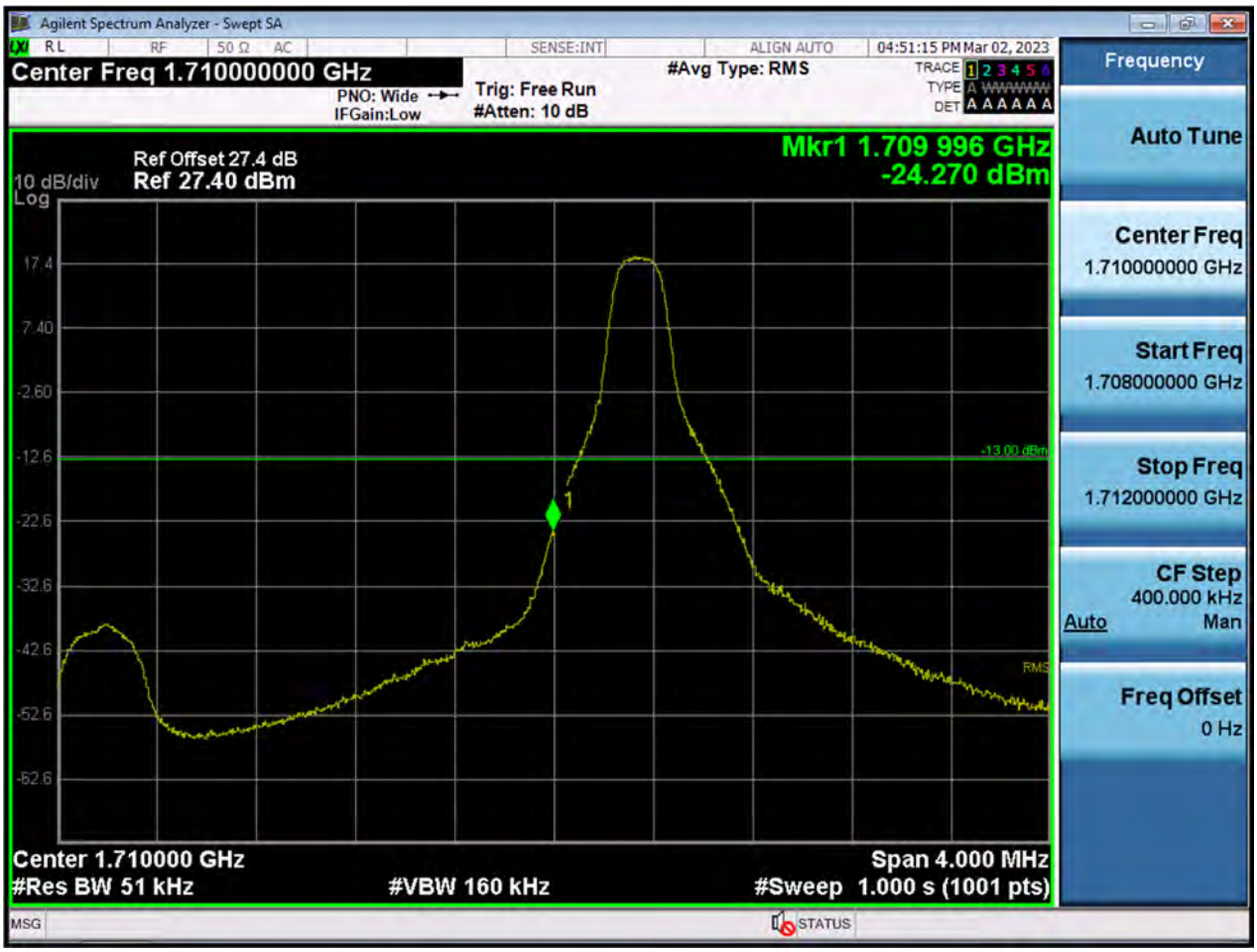


BW5 M_BandEdge_Highest Channel_QPSK_FullRB(1)

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)

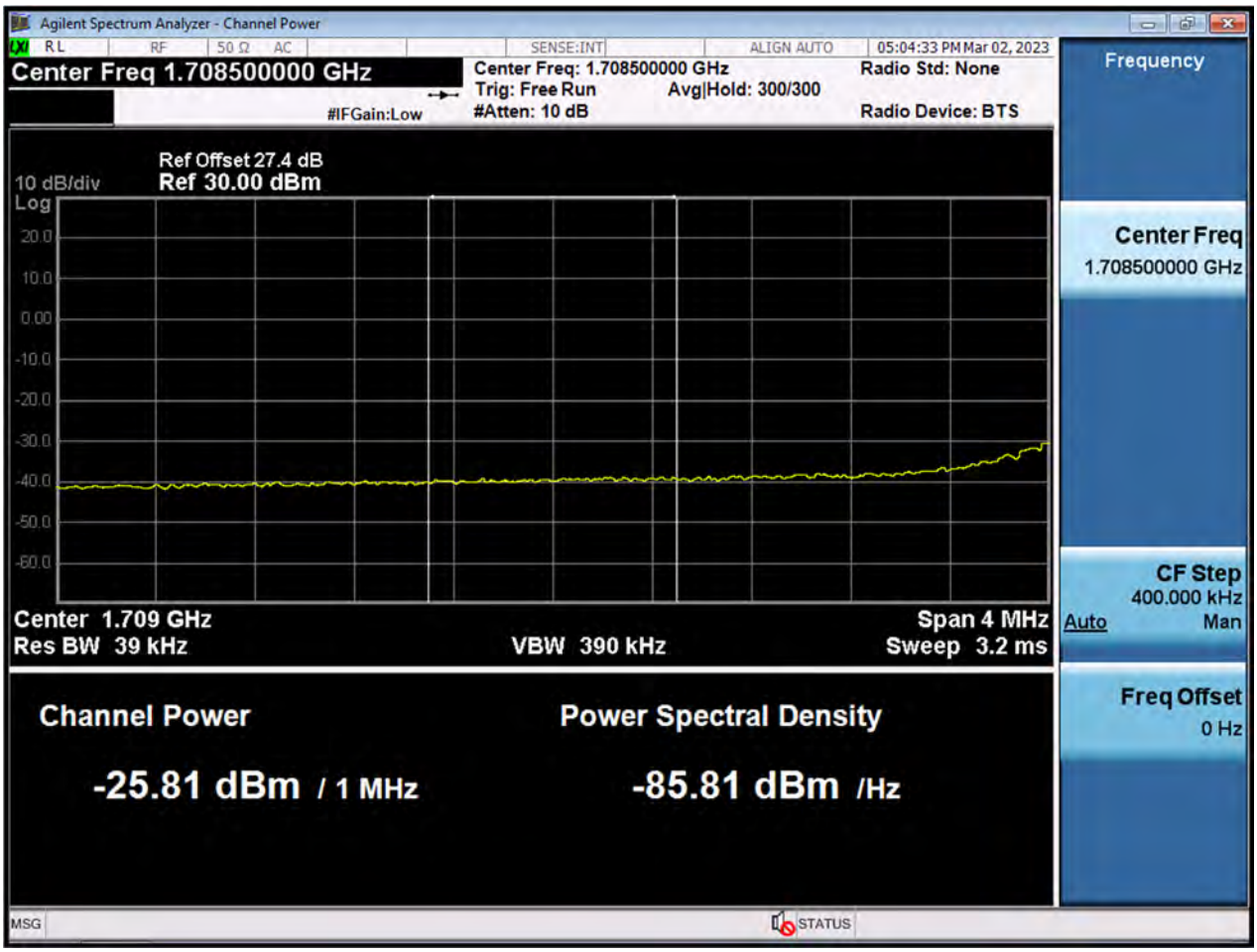
BW10 M_BandEdge_Highest Channel_QPSK_FullRB(2)

BW10 M_BandEdge_Lowest Channel_QPSK_1RB

BW10 M_BandEdge_Highest Channel_QPSK_1RB

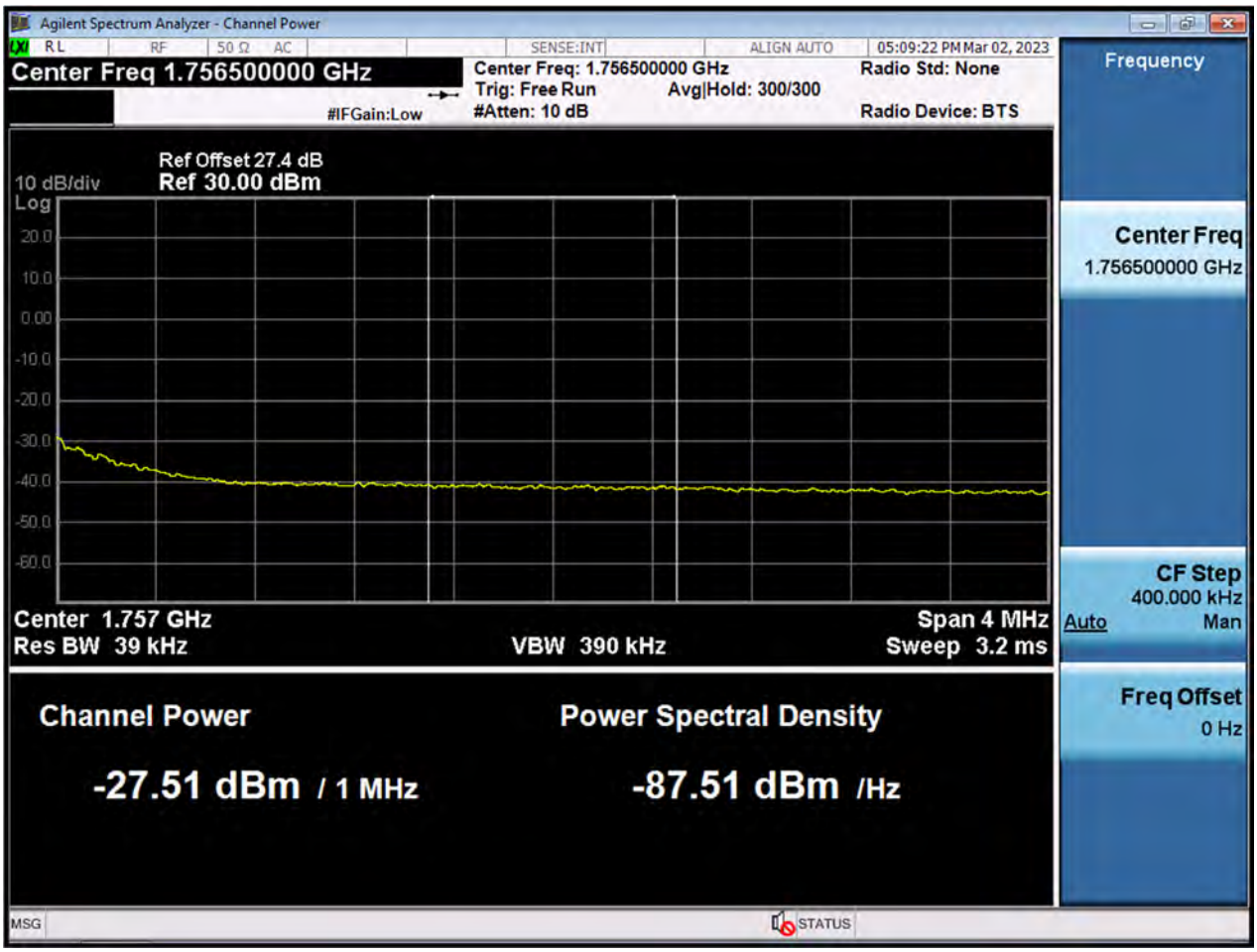
BW15 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

BW15 M_BandEdge_Lowest Channel_QPSK_FullRB(2)



BW15 M_BandEdge_Highest Channel_QPSK_FullRB(1)

BW15 M_BandEdge_Highest Channel_QPSK_FullRB(2)

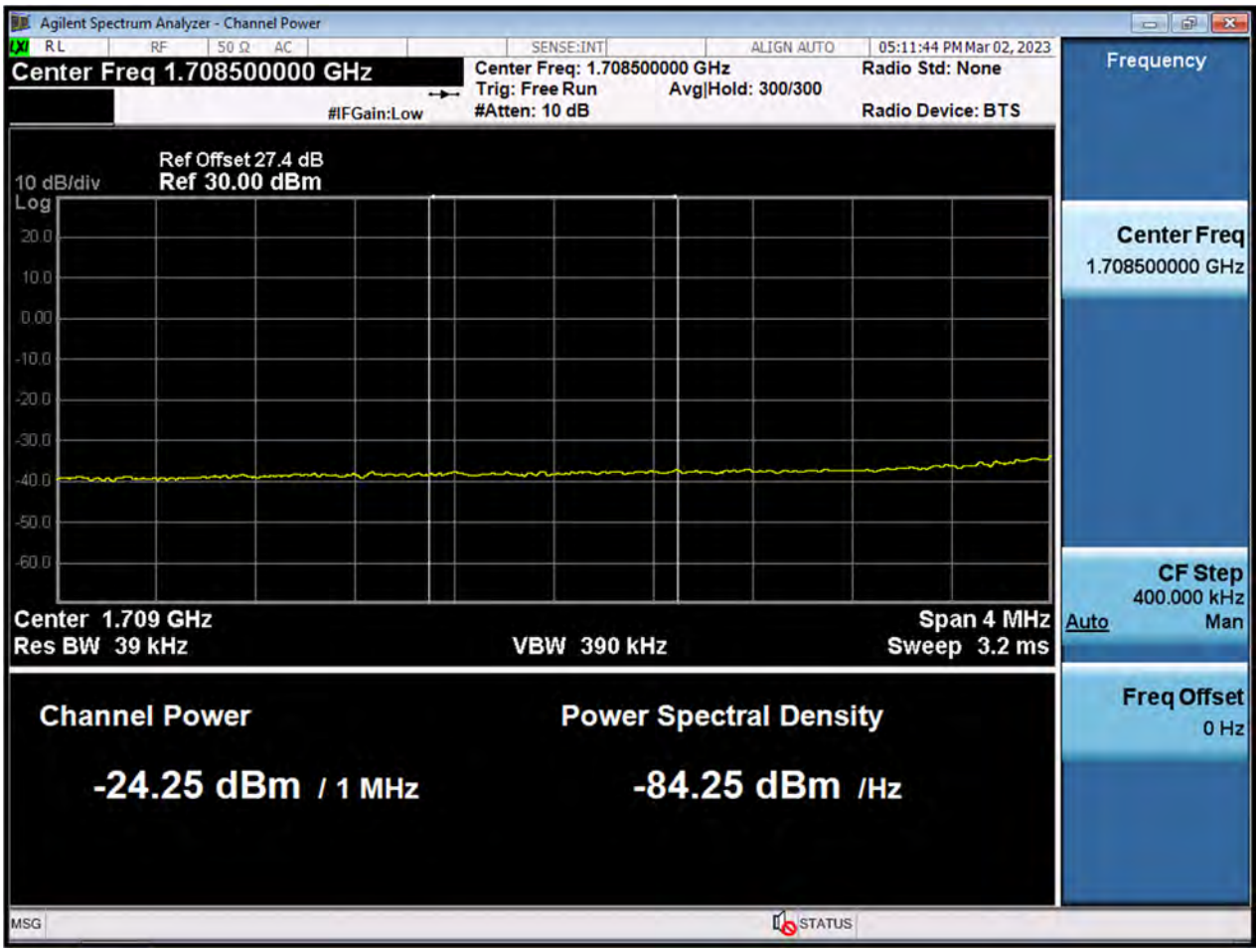


BW15 M_BandEdge_Lowest Channel_QPSK_1RB

BW15 M_BandEdge_Highest Channel_QPSK_1RB

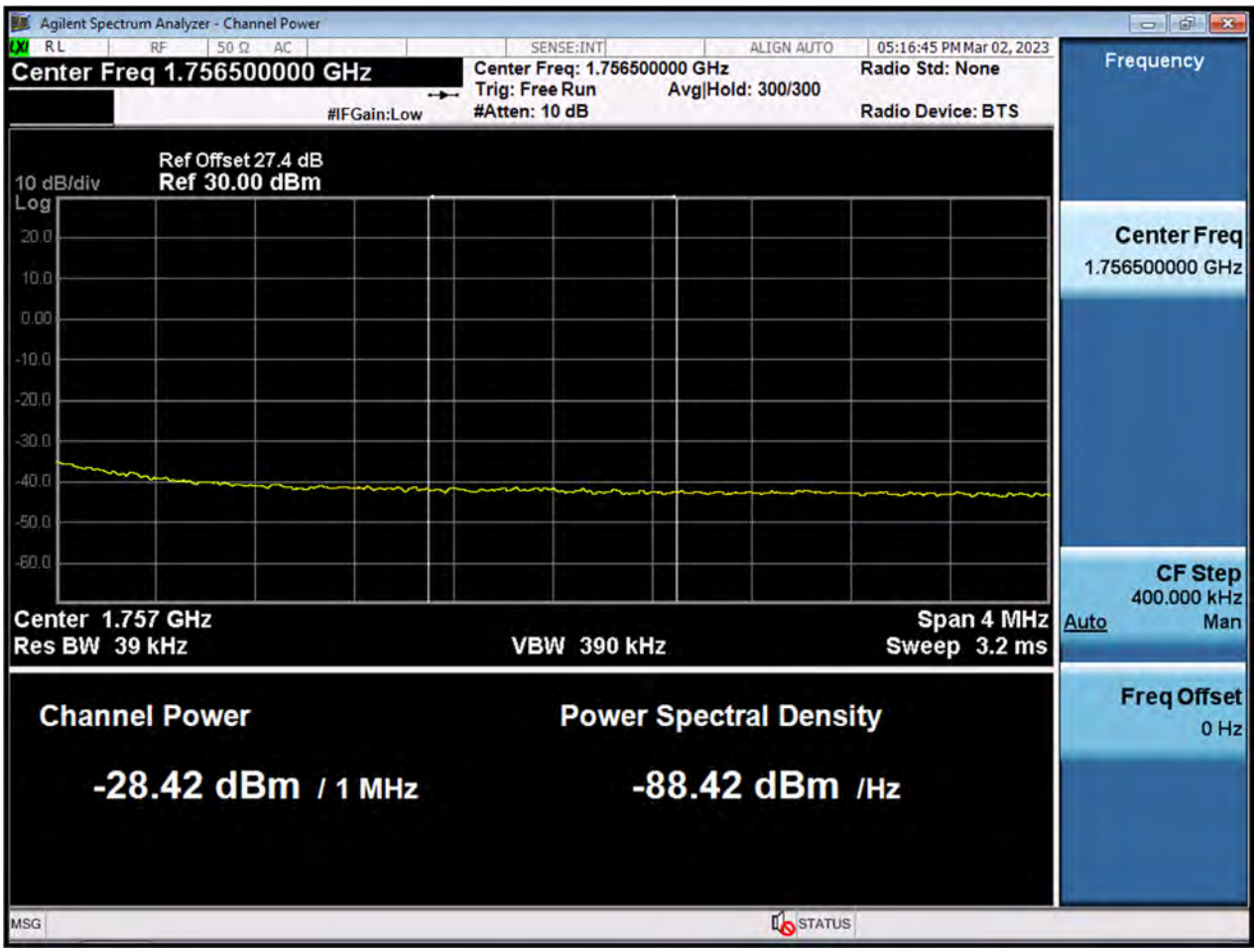
BW20 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

BW20 M_BandEdge_Lowest Channel_QPSK_FullRB(2)



BW20 M_BandEdge_Highest Channel_QPSK_FullRB(1)

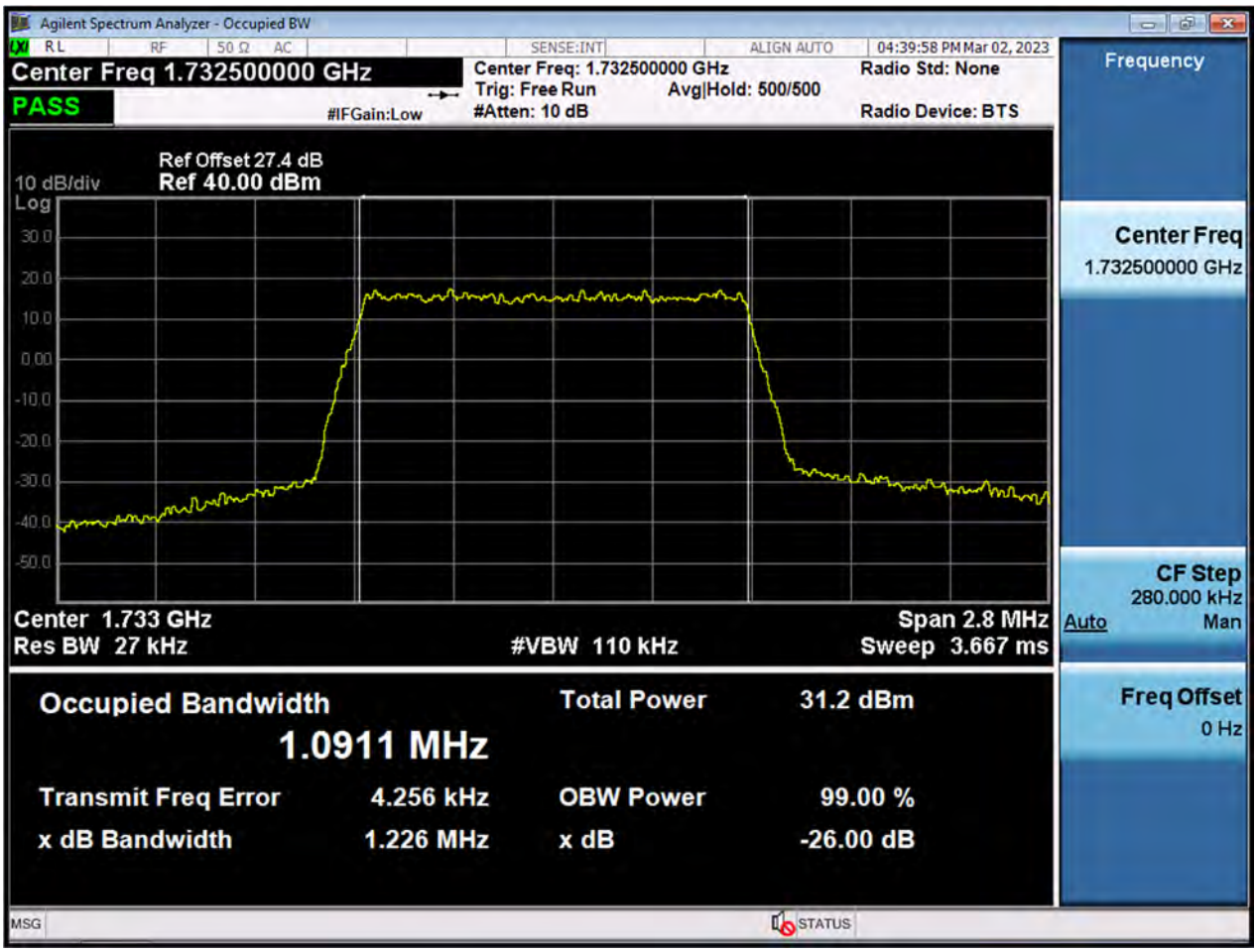
BW20 M_BandEdge_Highest Channel_QPSK_FullRB(2)



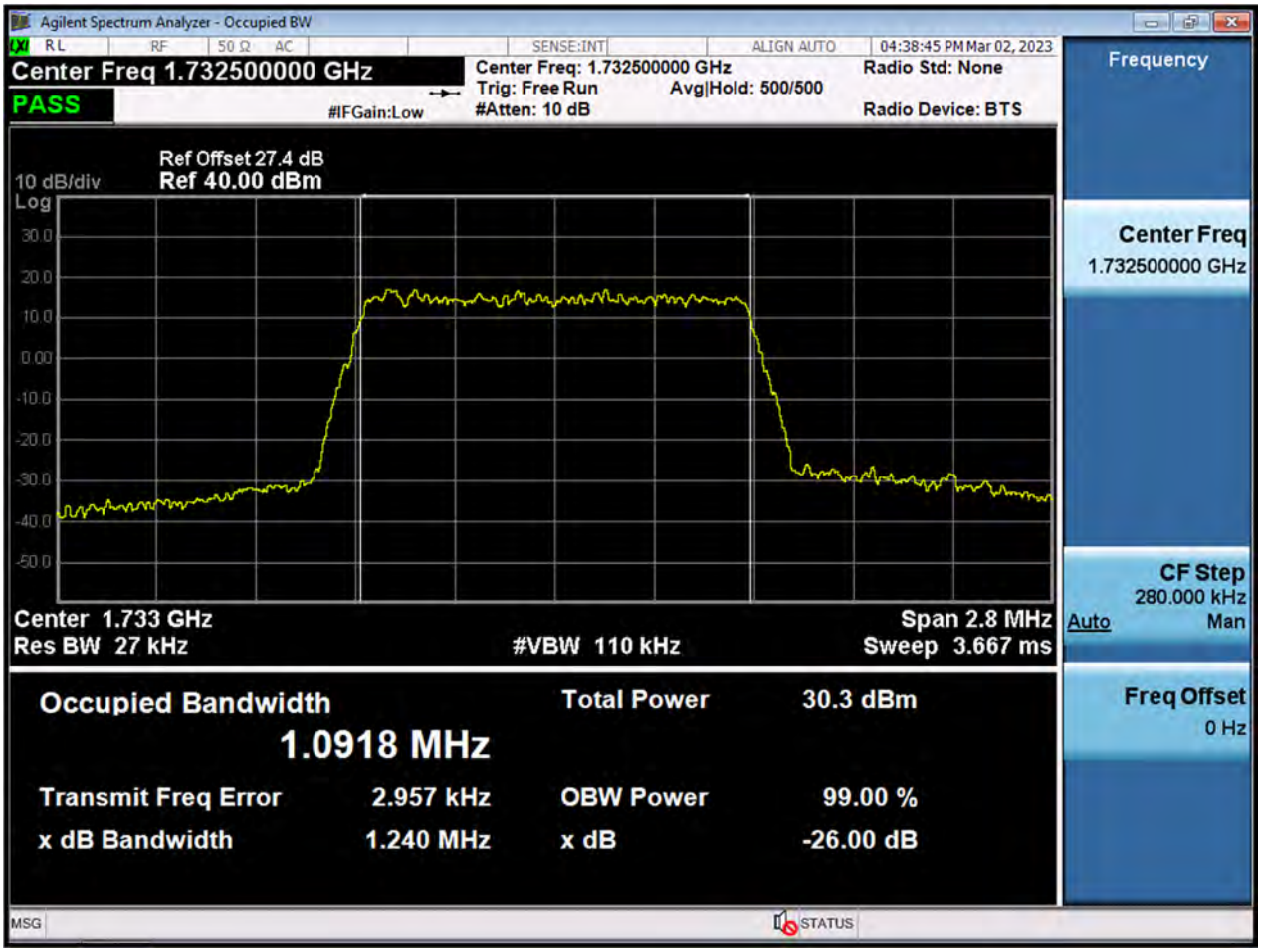
BW20 M_BandEdge_Lowest Channel_QPSK_1RB

BW20 M_BandEdge_Highest Channel_QPSK_1RB

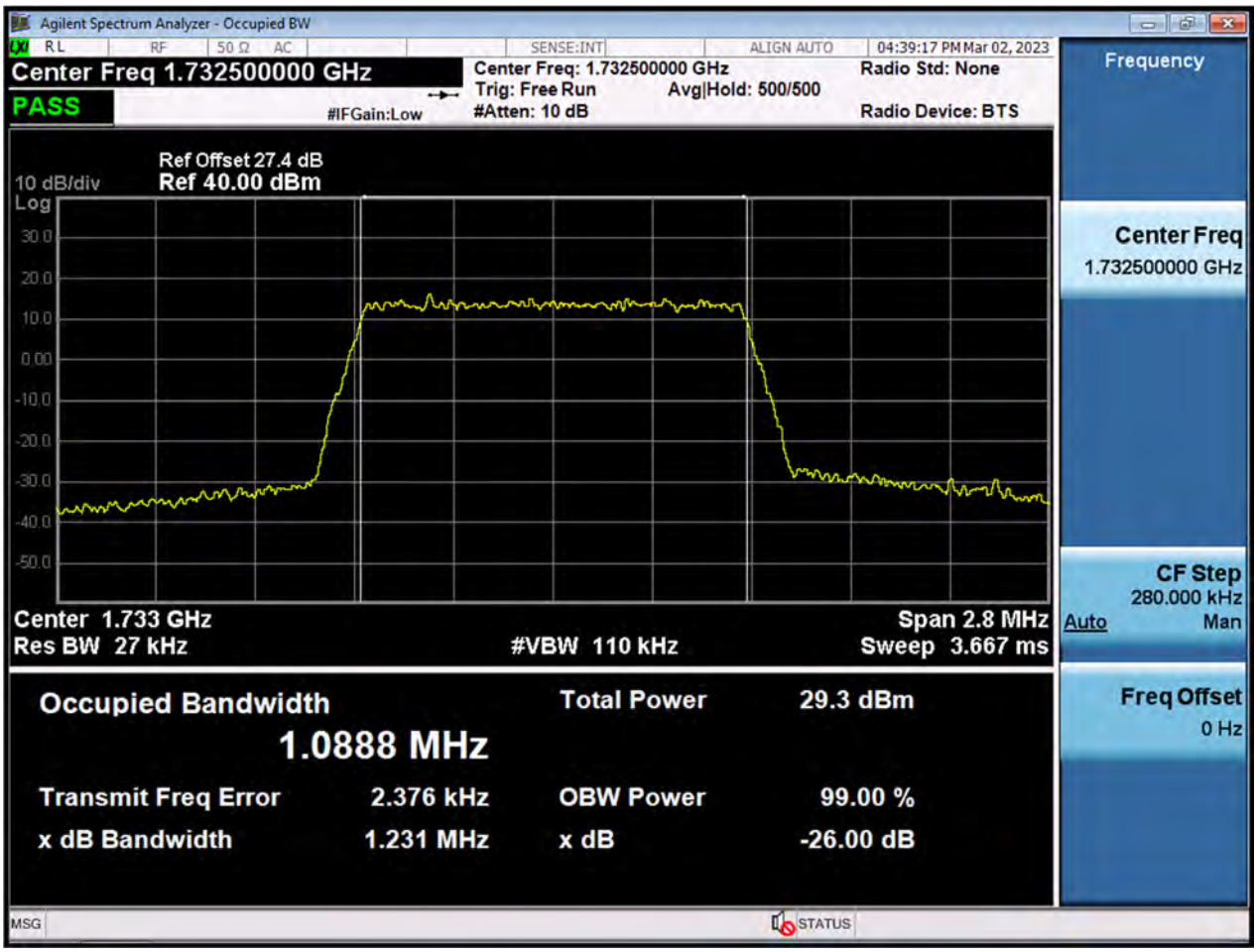
BW1.4 M_OBW_Middle Channel_QPSK_FullRB



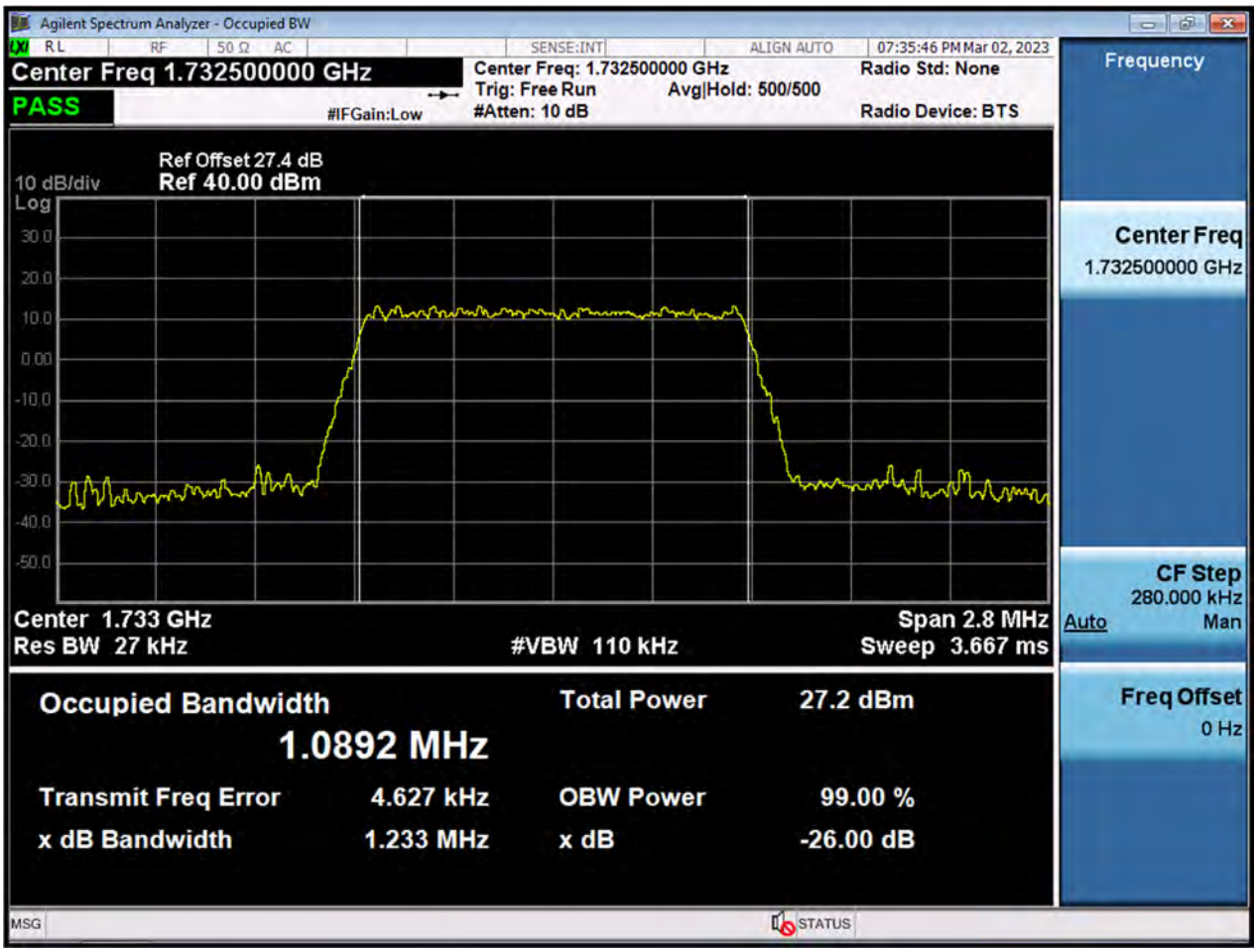
BW1.4 M_OBW_Middle Channel_16QAM_FullRB



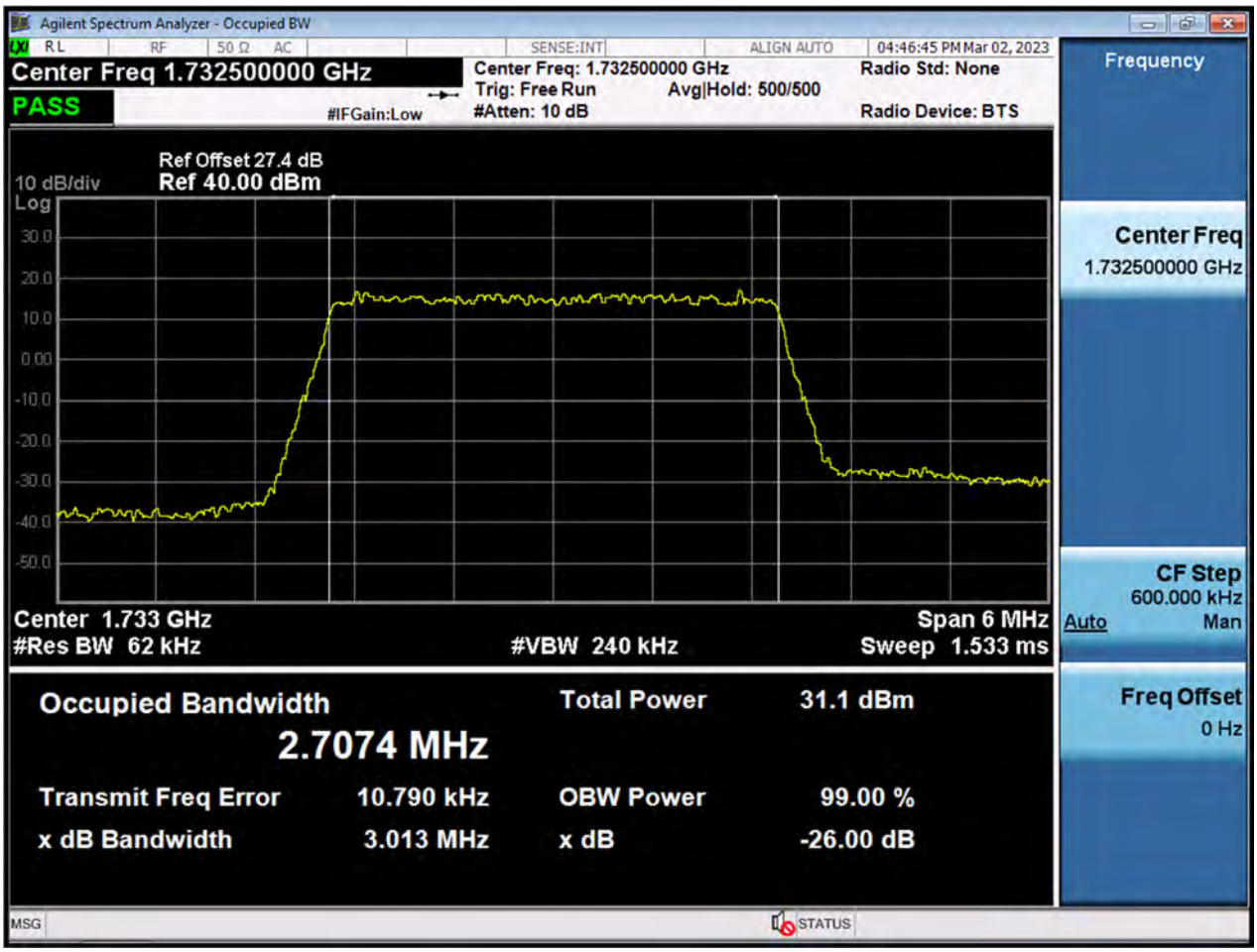
BW1.4 M_OBW_Middle Channel_64QAM_FullRB



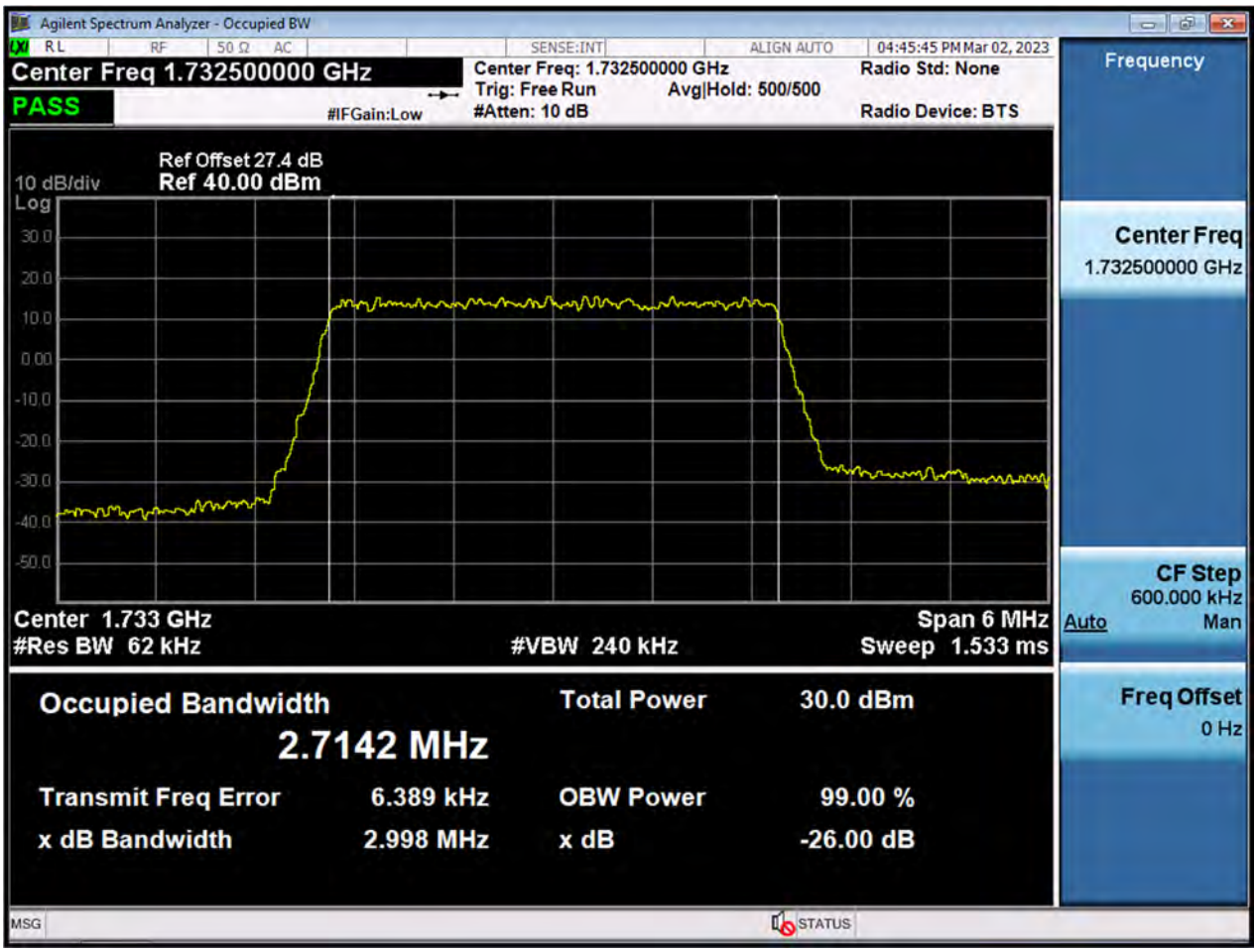
BW1.4 M_OBW_Middle Channel_256QAM_FullRB



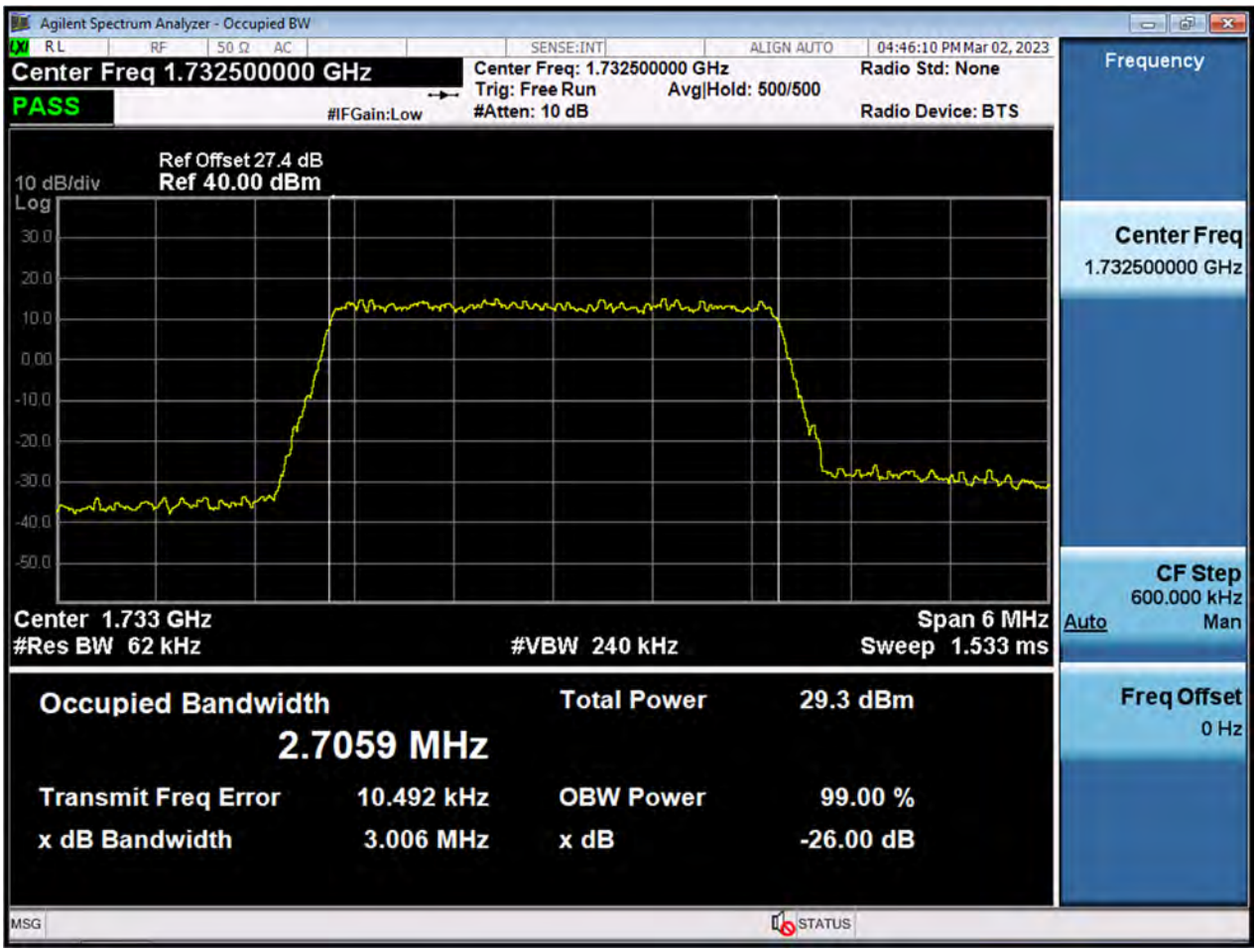
BW3 M_OBW_Middle Channel_QPSK_FullRB



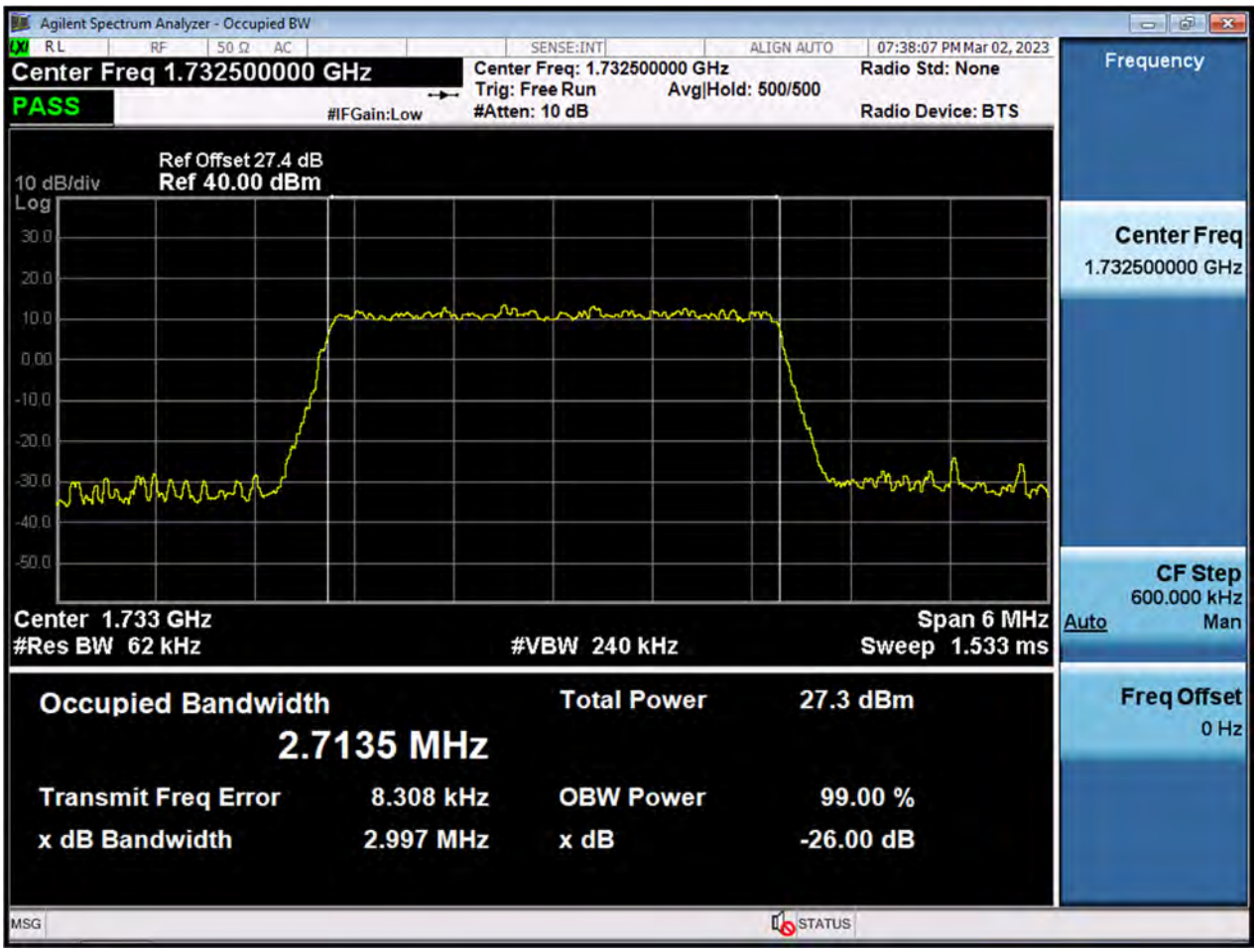
BW3 M_OBW_Middle Channel_16QAM_FullRB



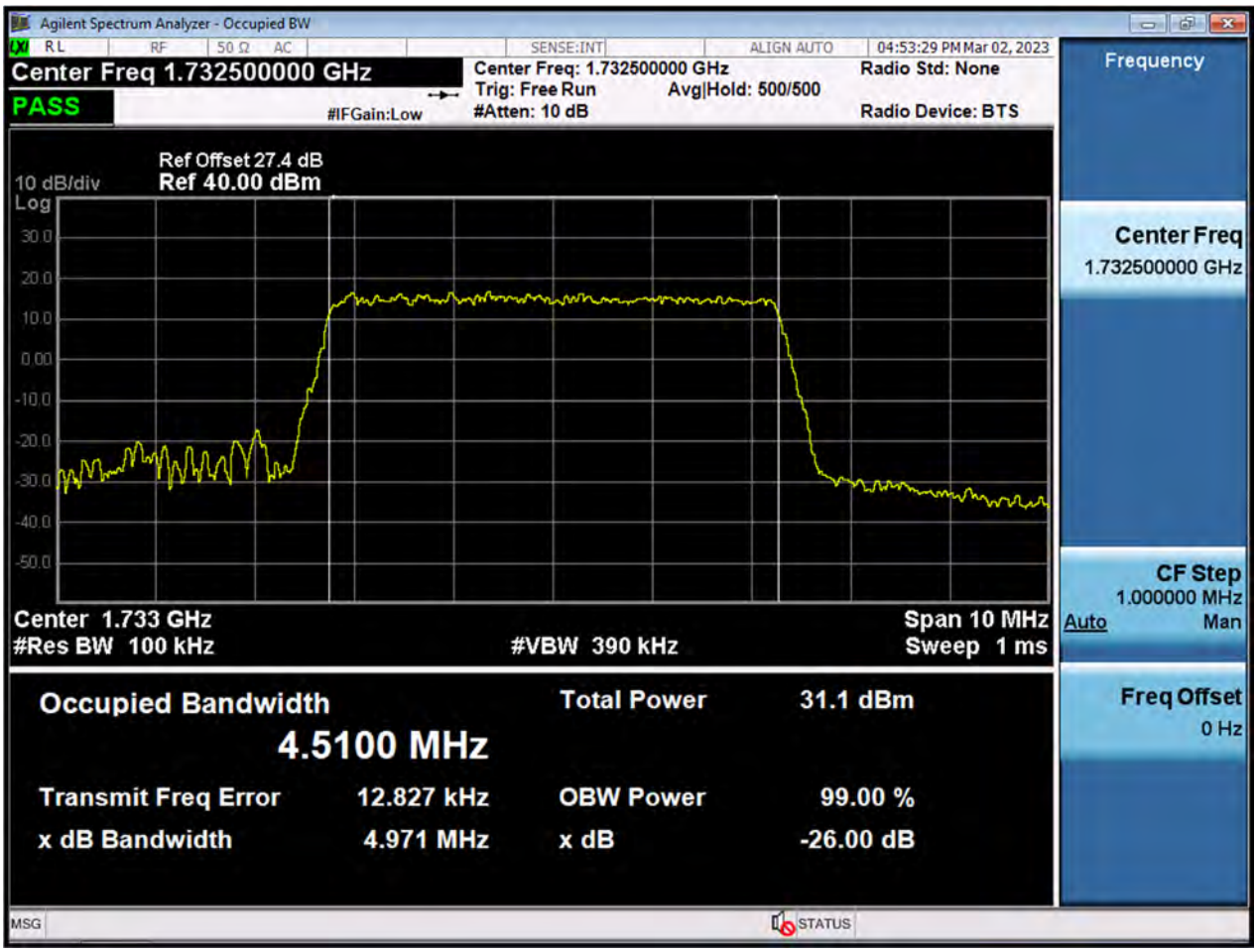
BW3 M_OBW_Middle Channel_64QAM_FullRB



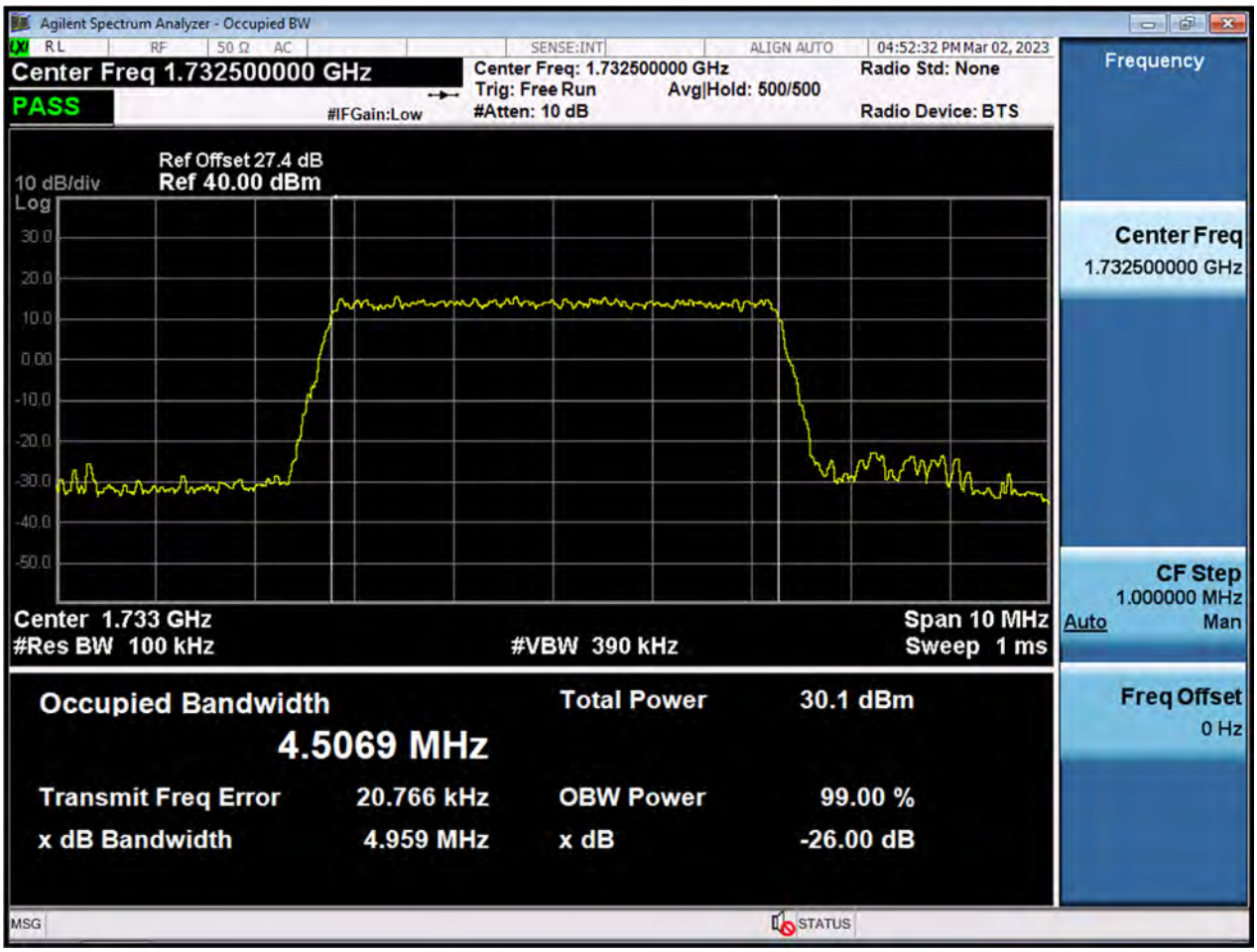
BW3 M_OBW_Middle Channel_256QAM_FullRB



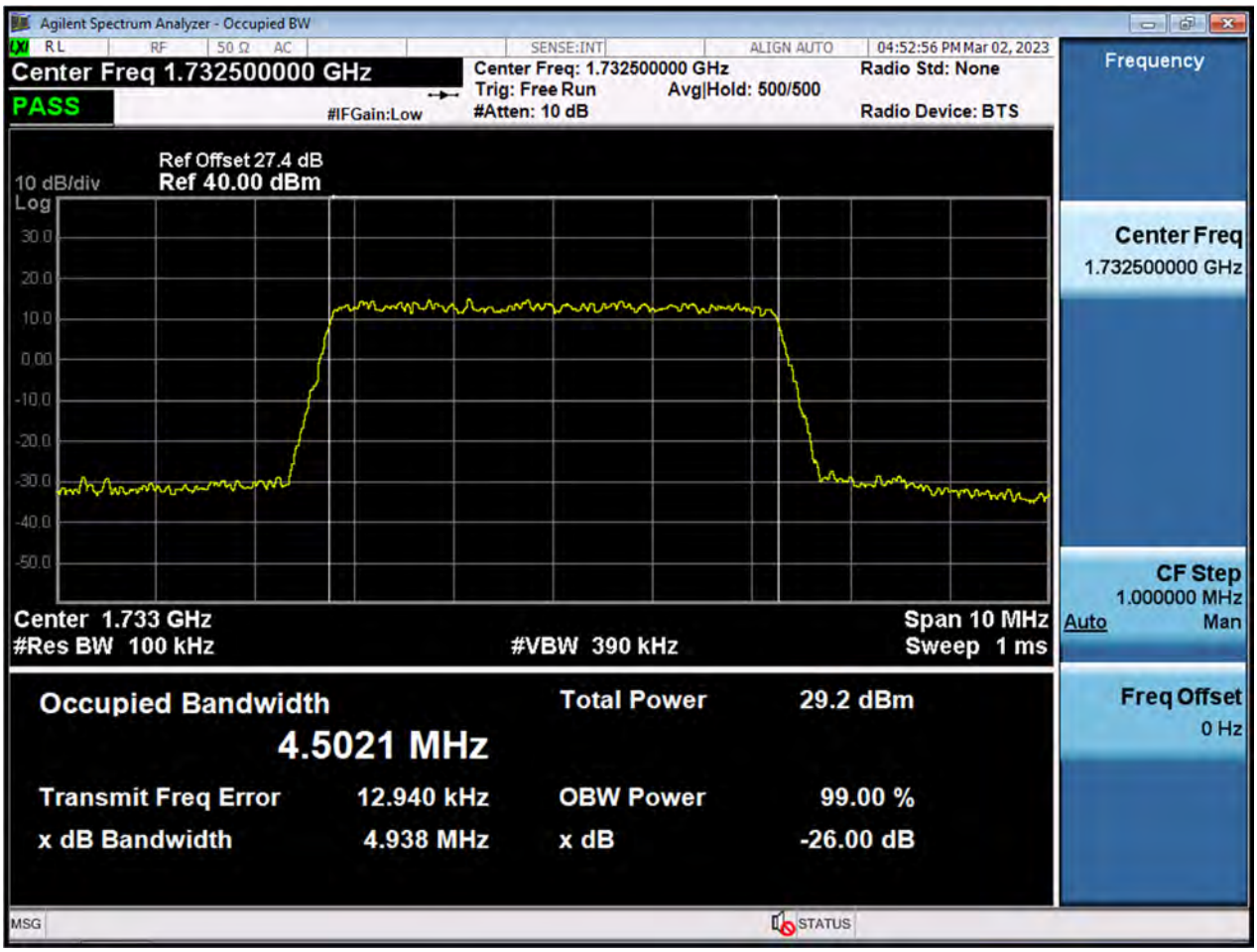
BW5 M_OBW_Middle Channel_QPSK_FullRB



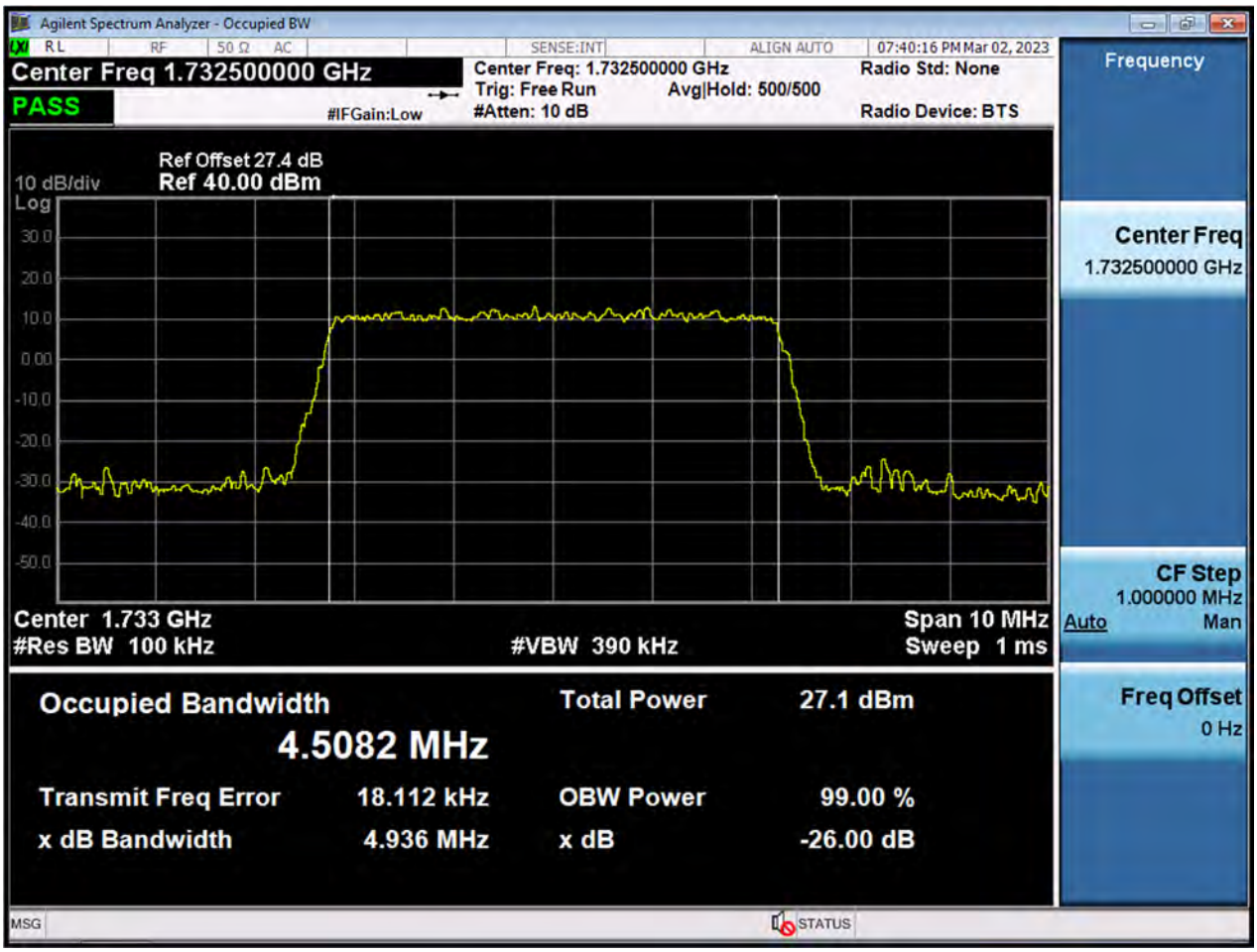
BW5 M_OBW_Middle Channel_16QAM_FullRB



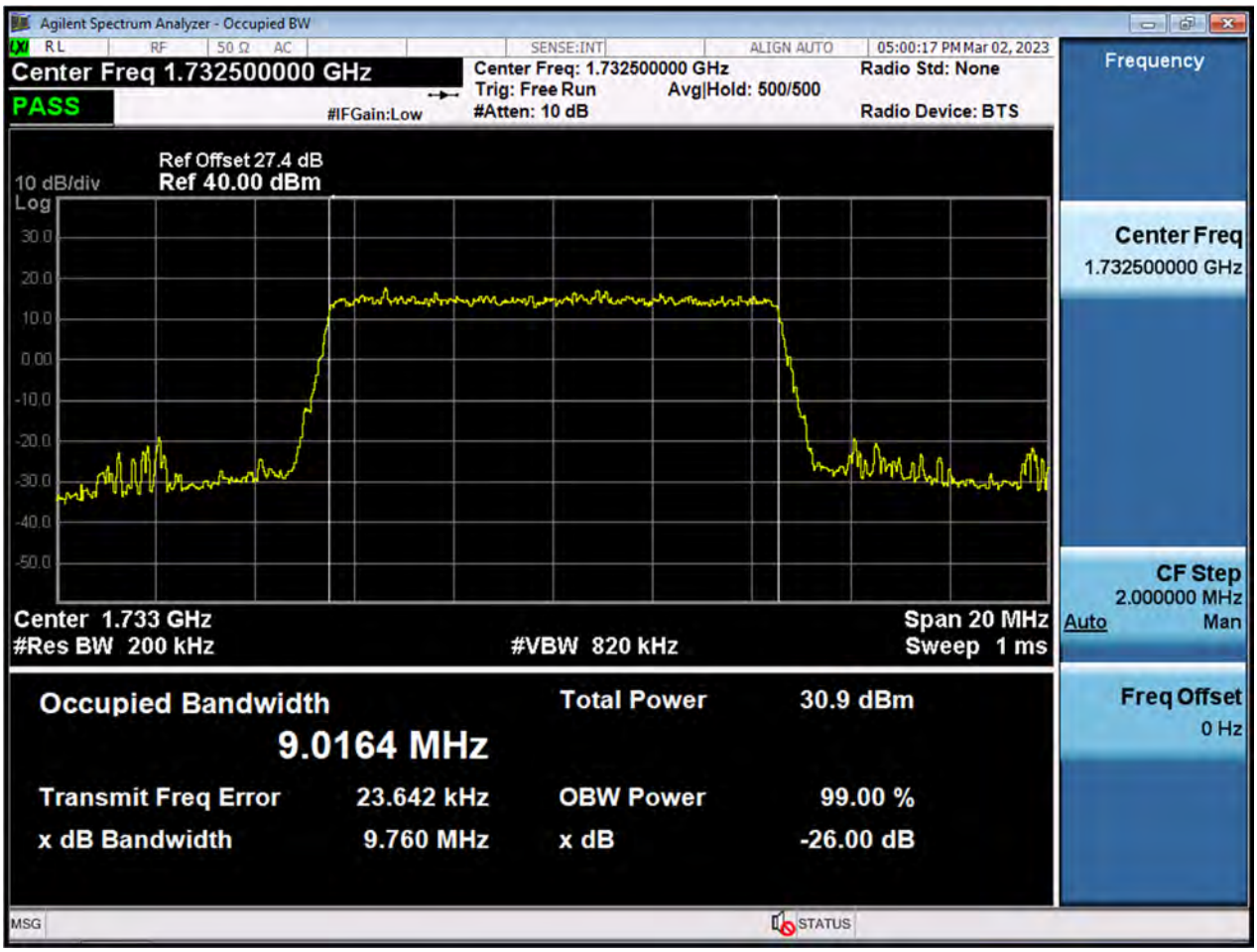
BW5 M_OBW_Middle Channel_64QAM_FullRB



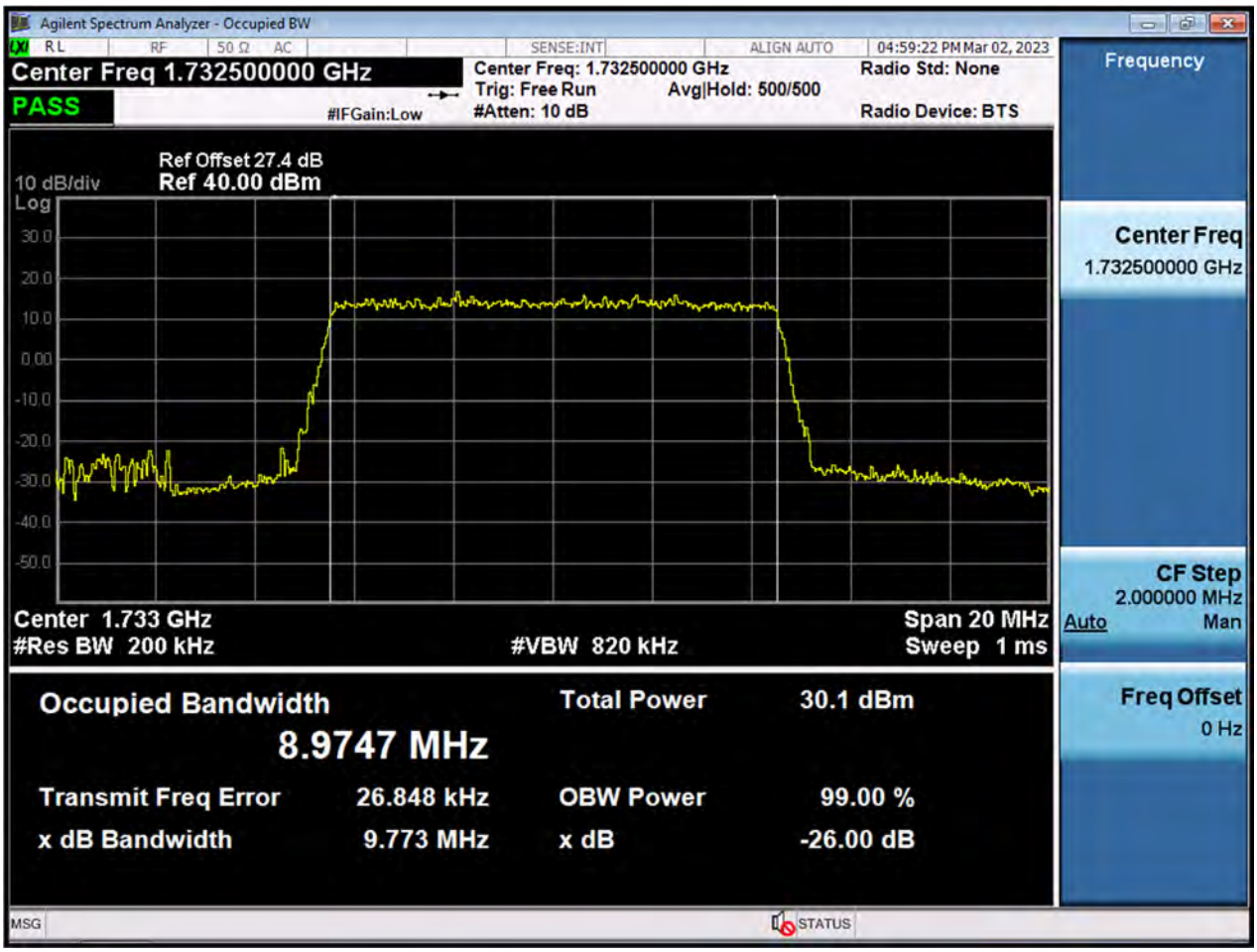
BW5 M_OBW_Middle Channel_256QAM_FullRB



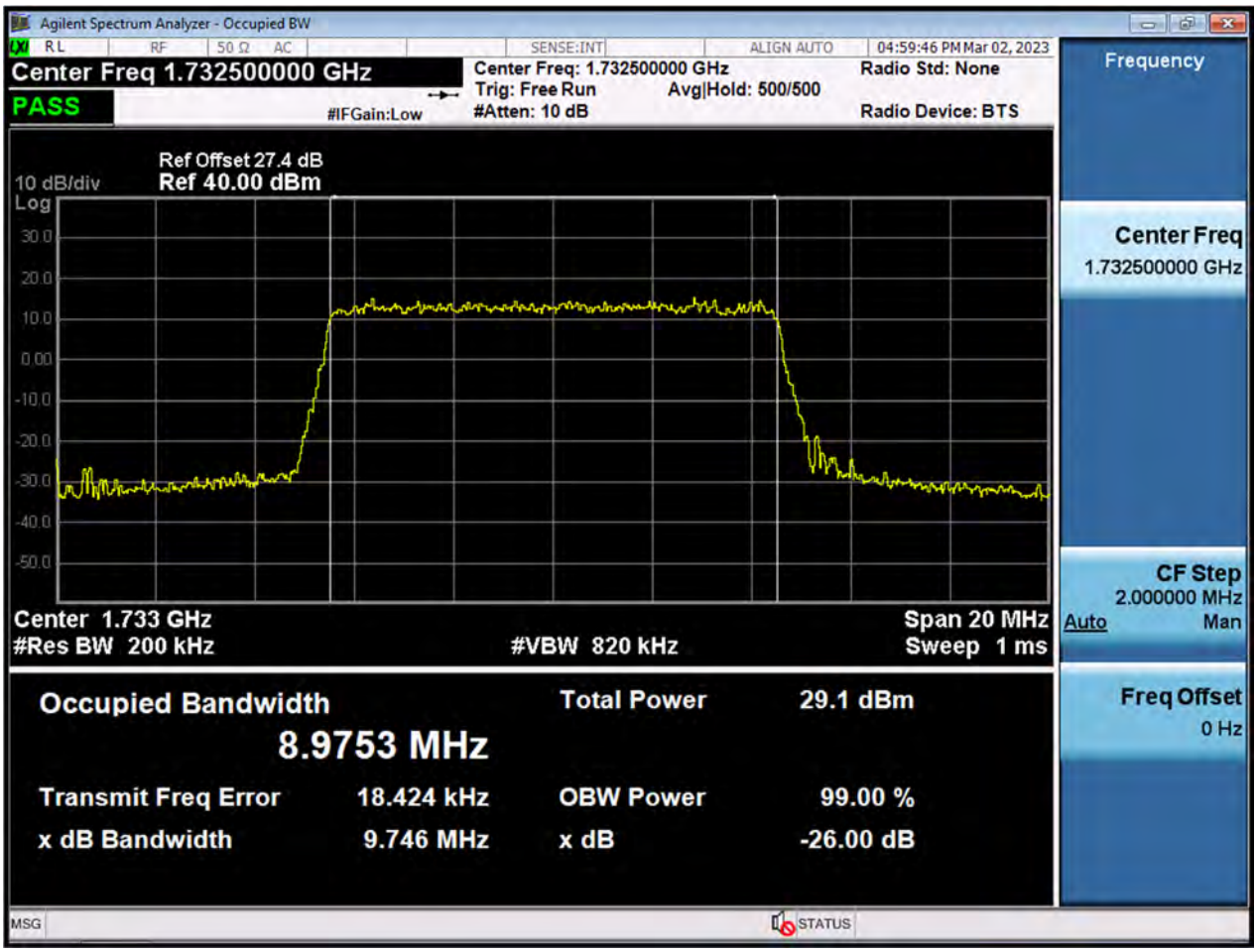
BW10 M_OBW_Middle Channel_QPSK_FullRB



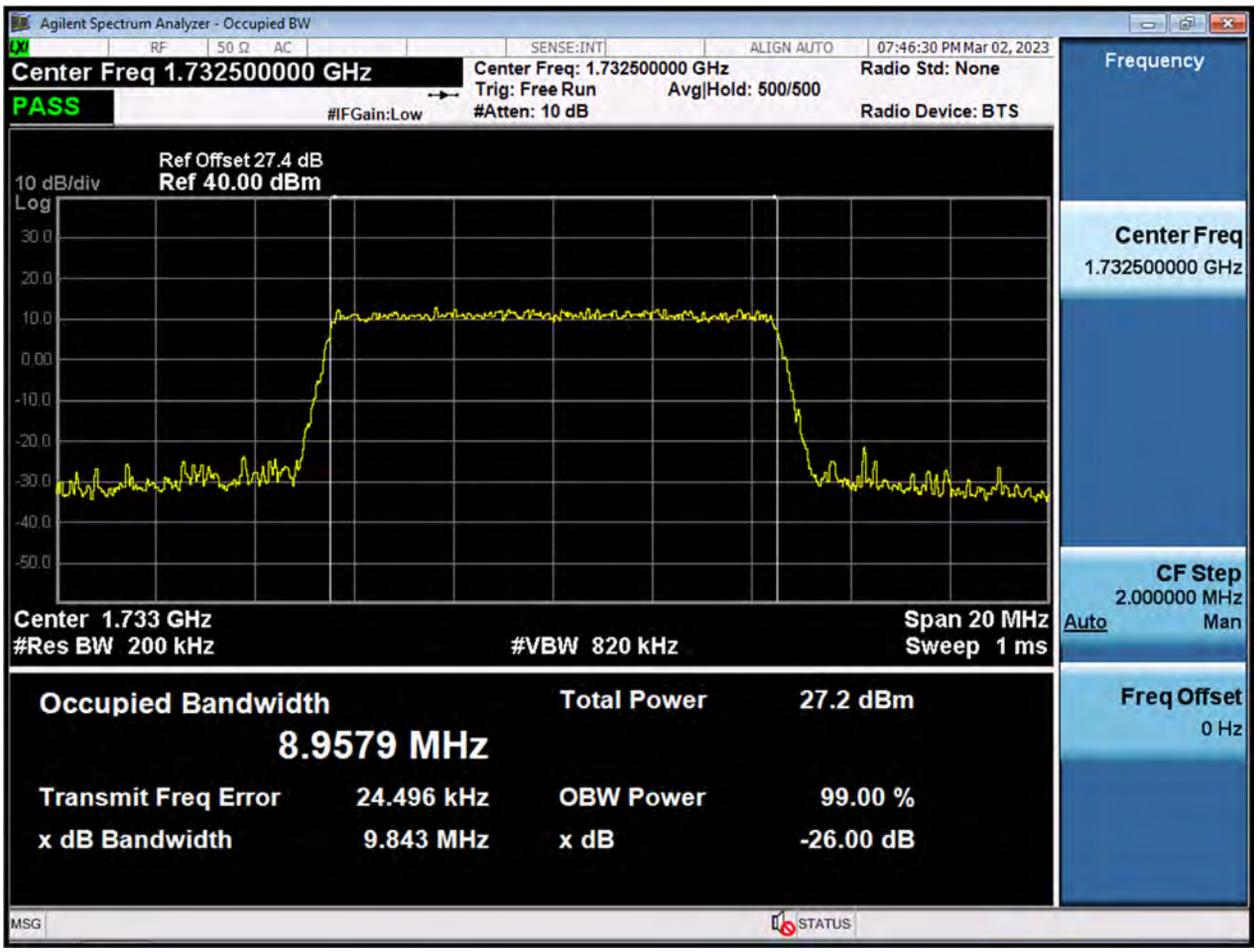
BW10 M_OBW_Middle Channel_16QAM_FullRB



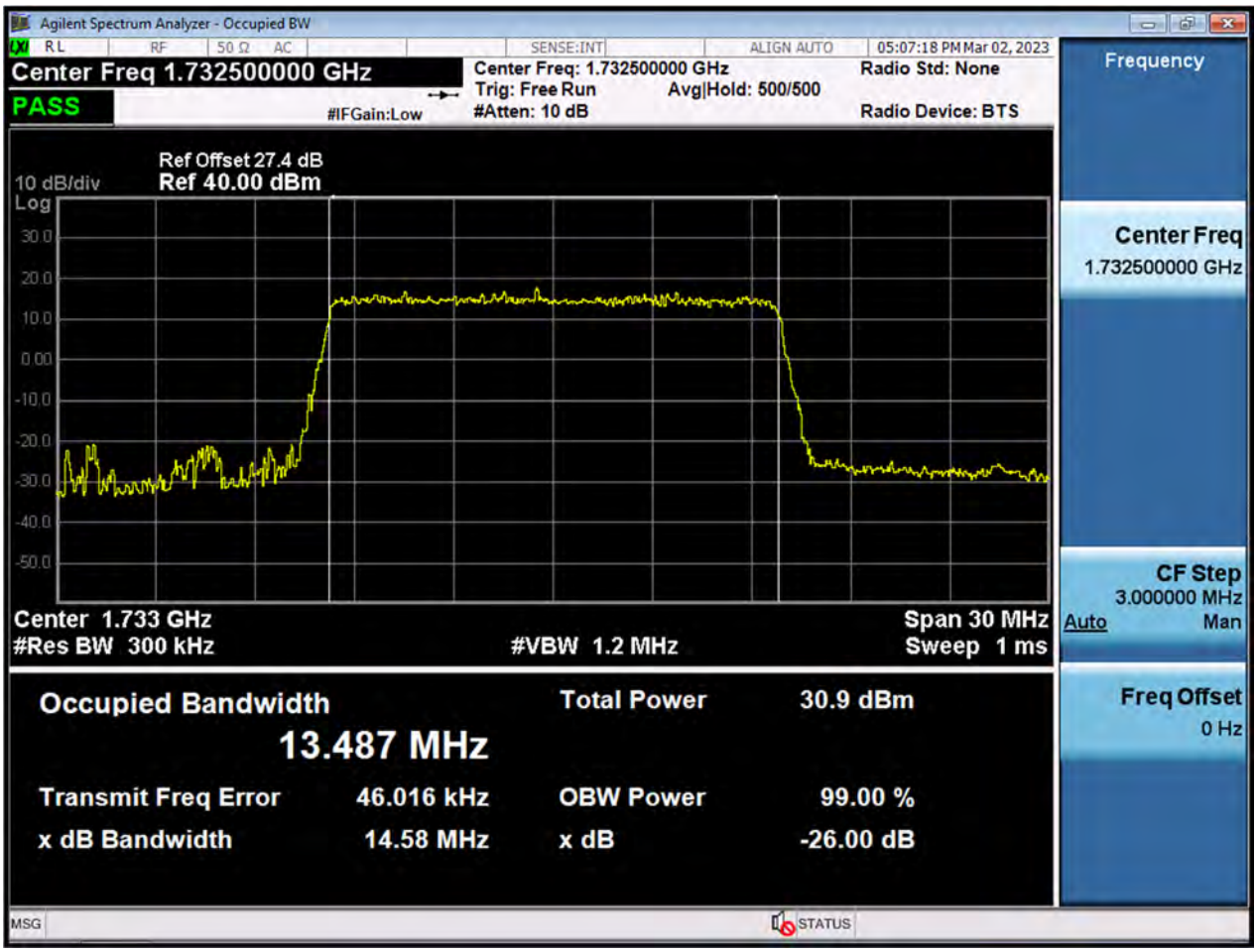
BW10 M_OBW_Middle Channel_64QAM_FullRB



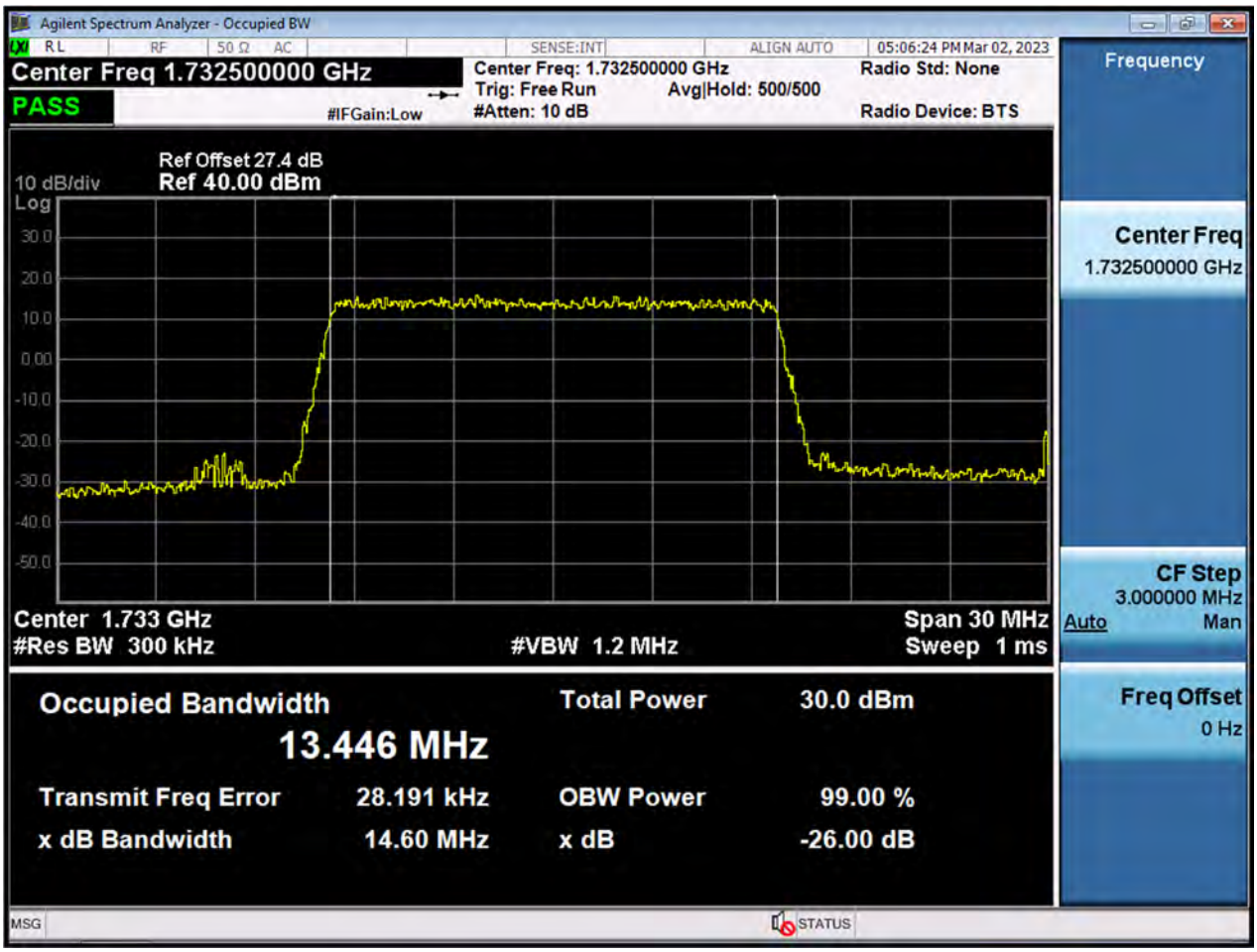
BW10 M_OBW_Middle Channel_256QAM_FullRB



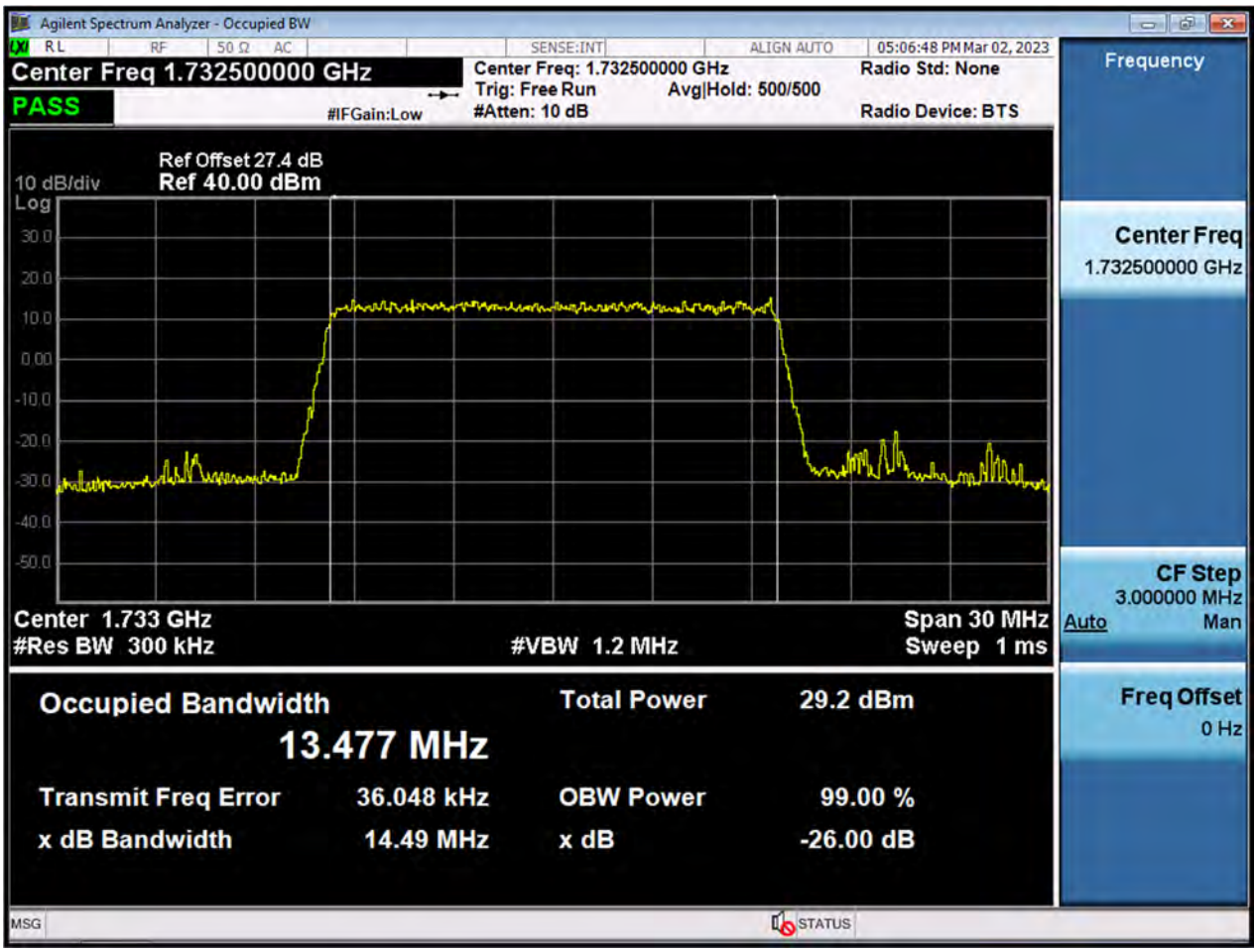
BW15 M_OBW_Middle Channel_QPSK_FullRB



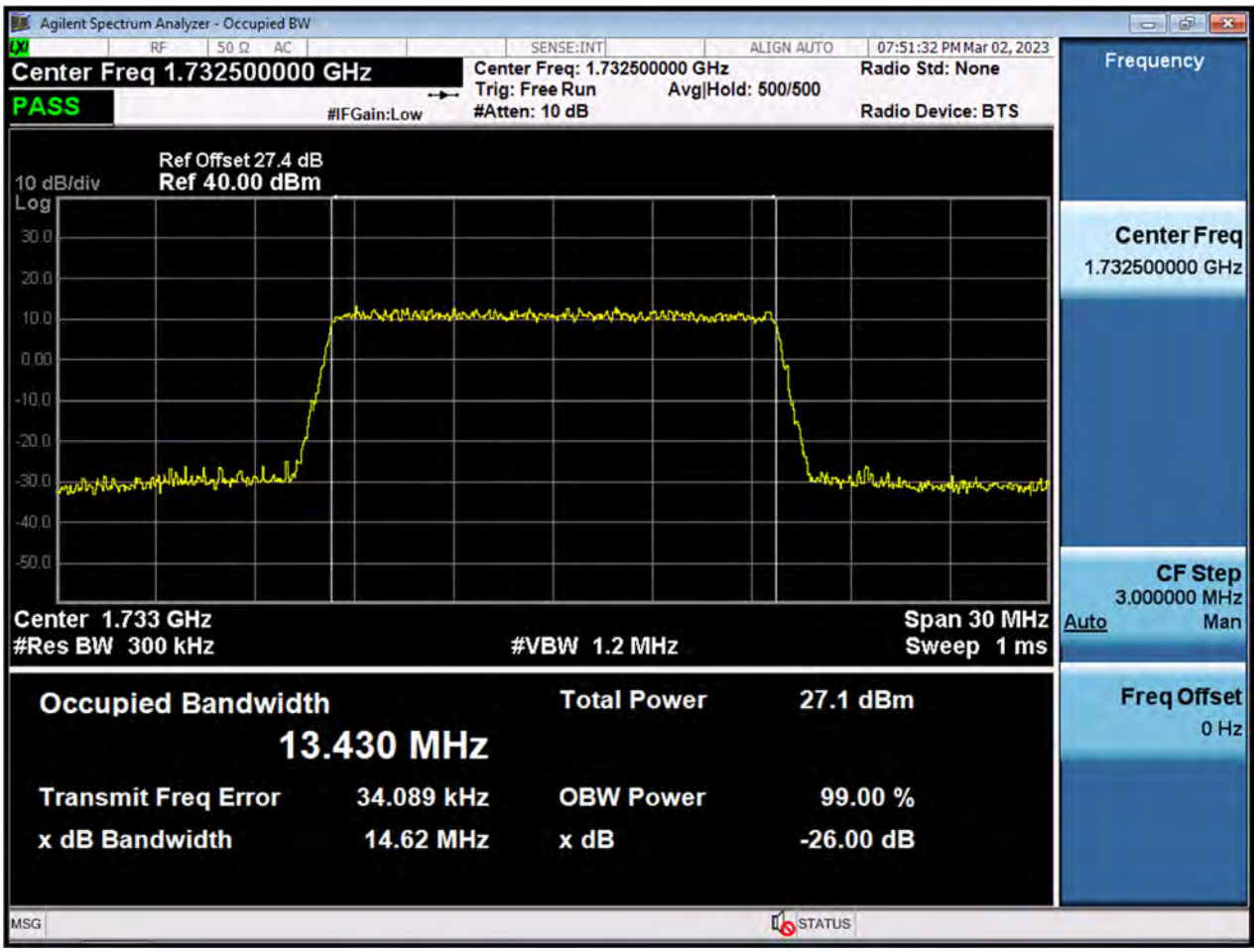
BW15 M_OBW_Middle Channel_16QAM_FullRB



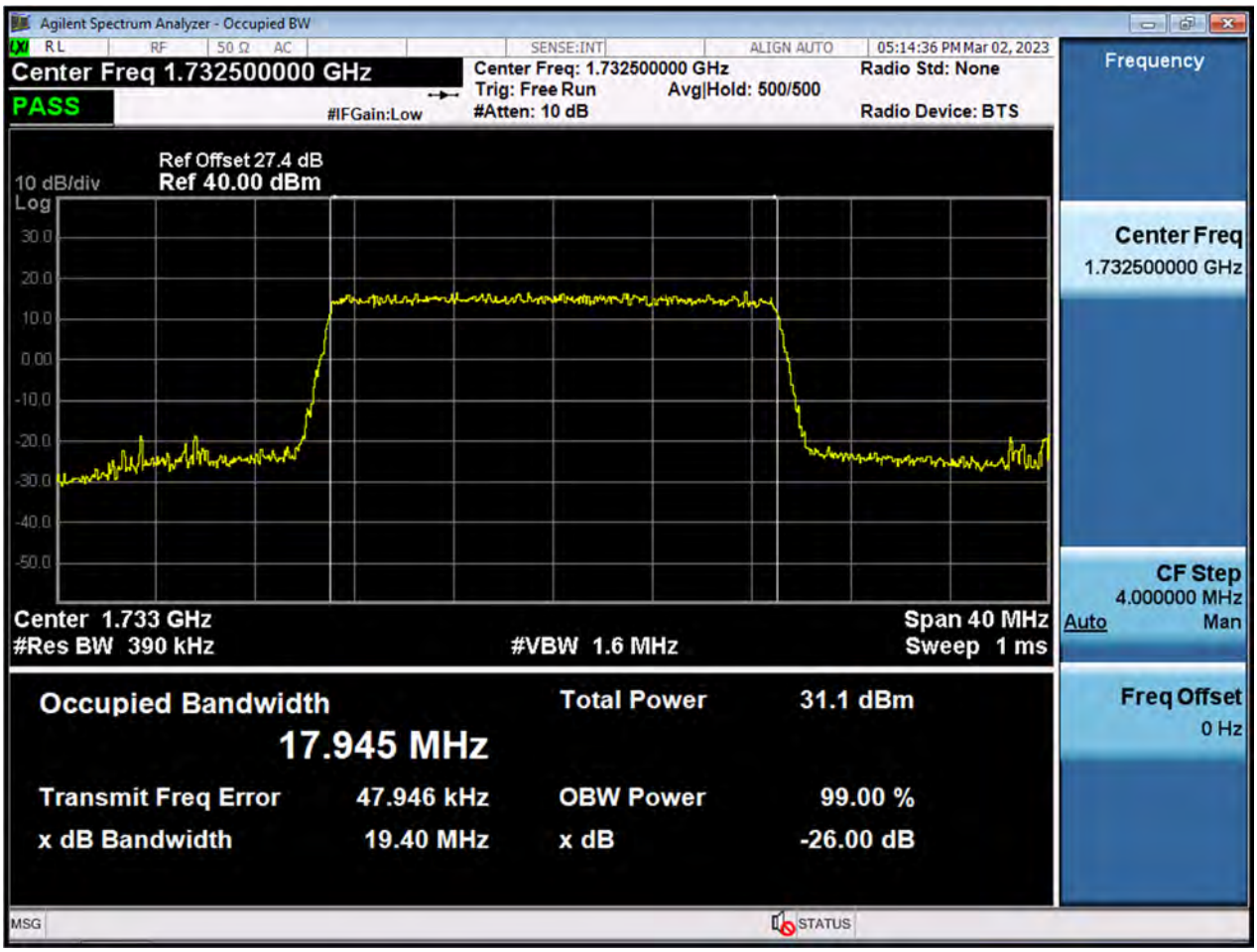
BW15 M_OBW_Middle Channel_64QAM_FullRB



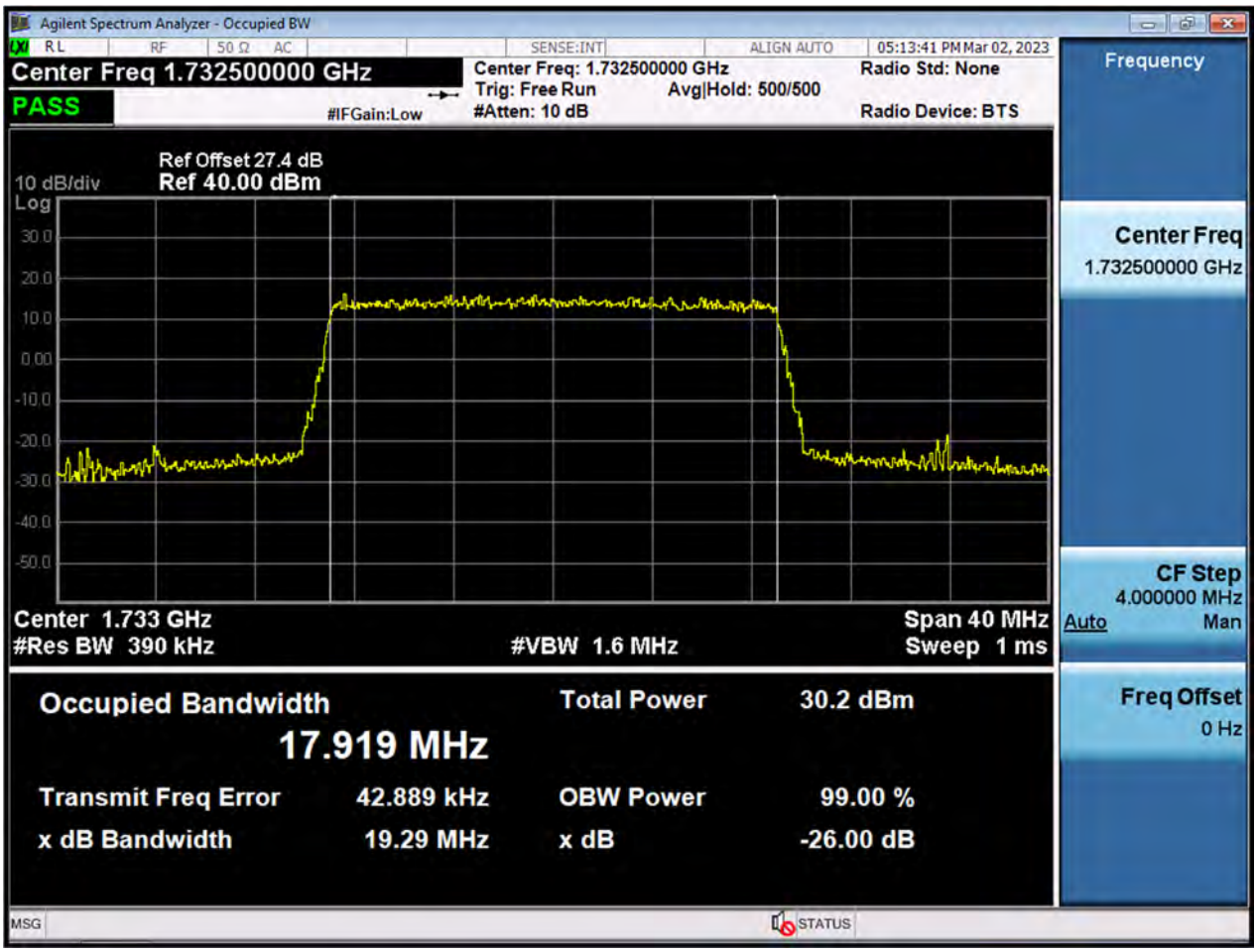
BW15 M_OBW_Middle Channel_256QAM_FullRB



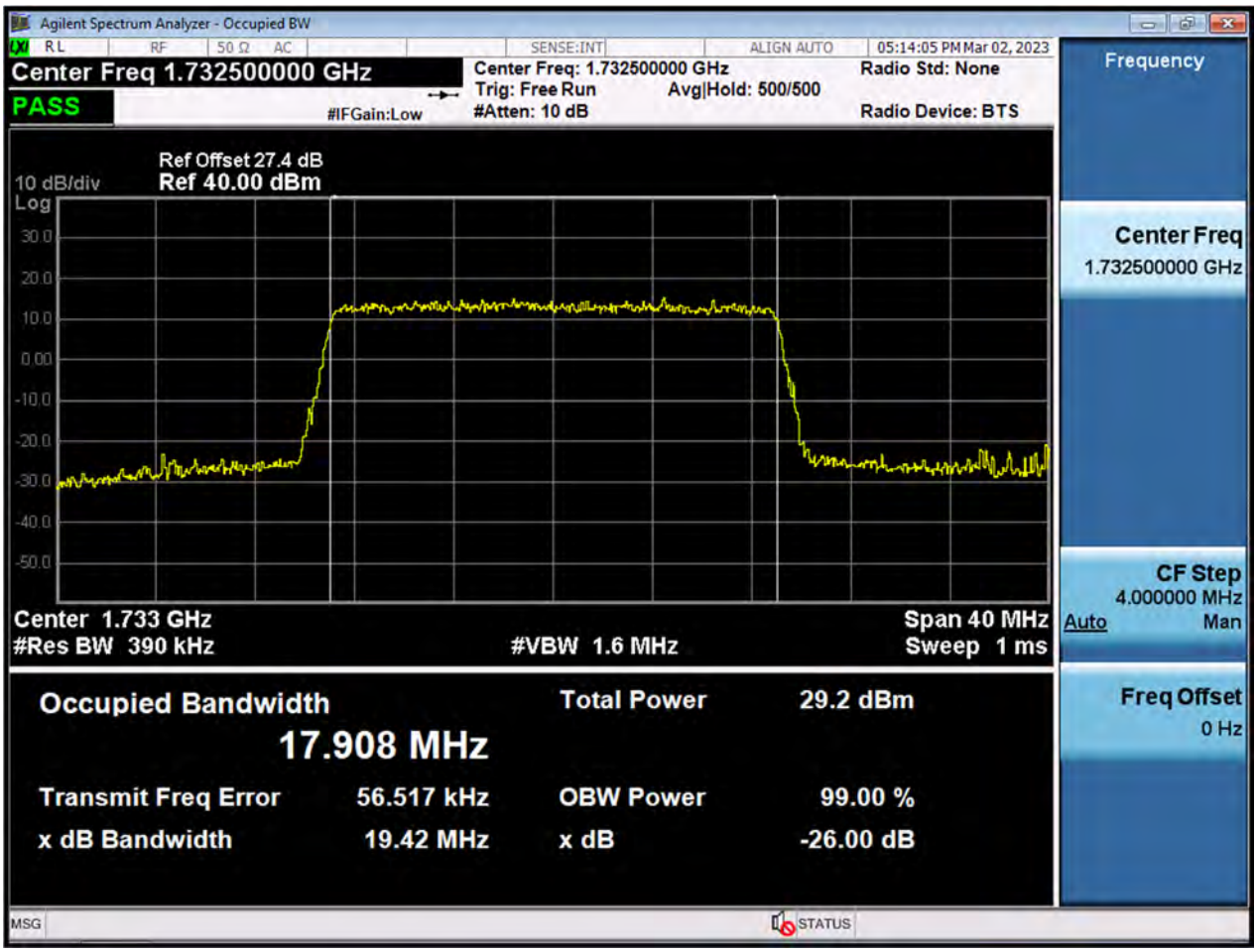
BW20 M_OBW_Middle Channel_QPSK_FullRB



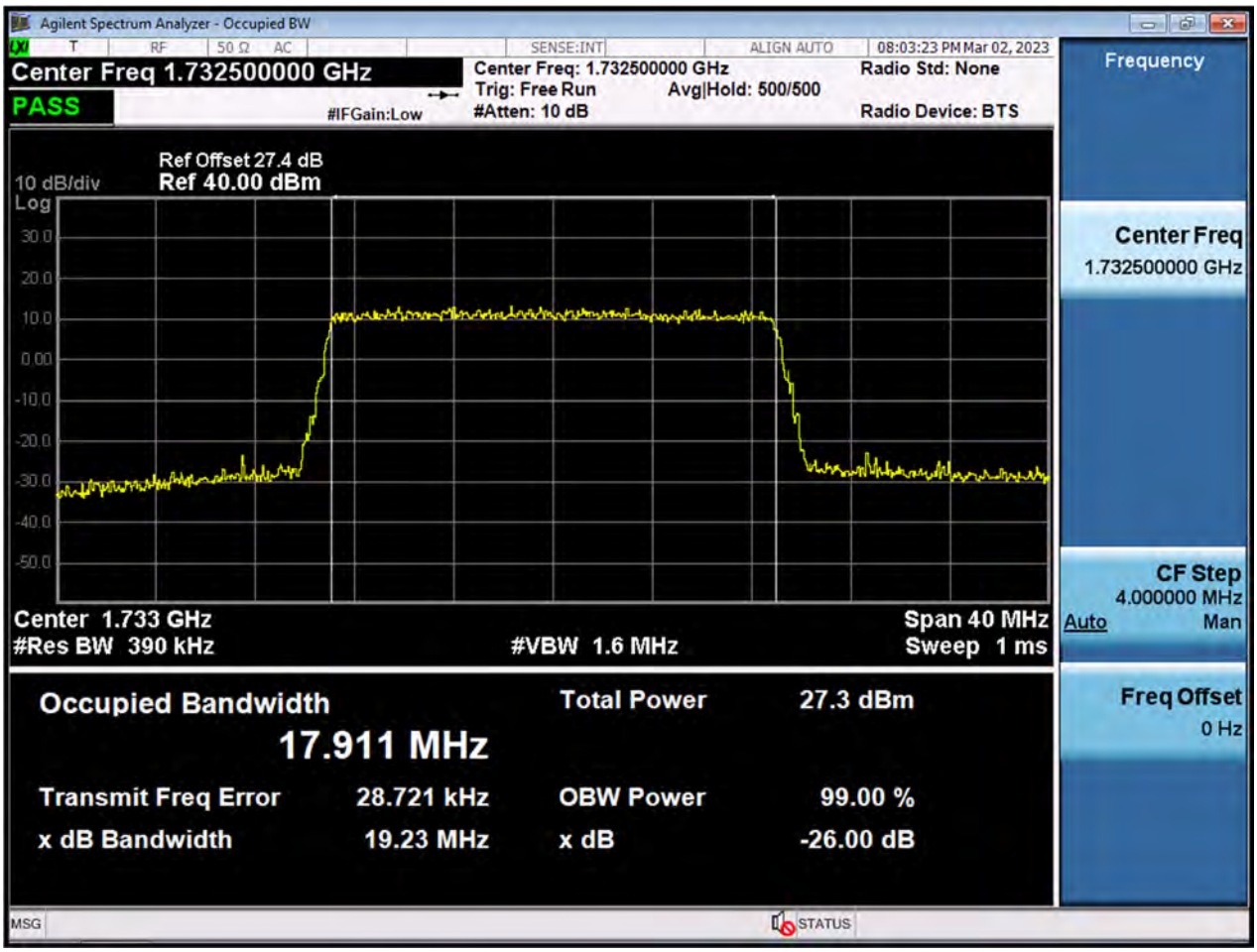
BW20 M_OBW_Middle Channel_16QAM_FullRB



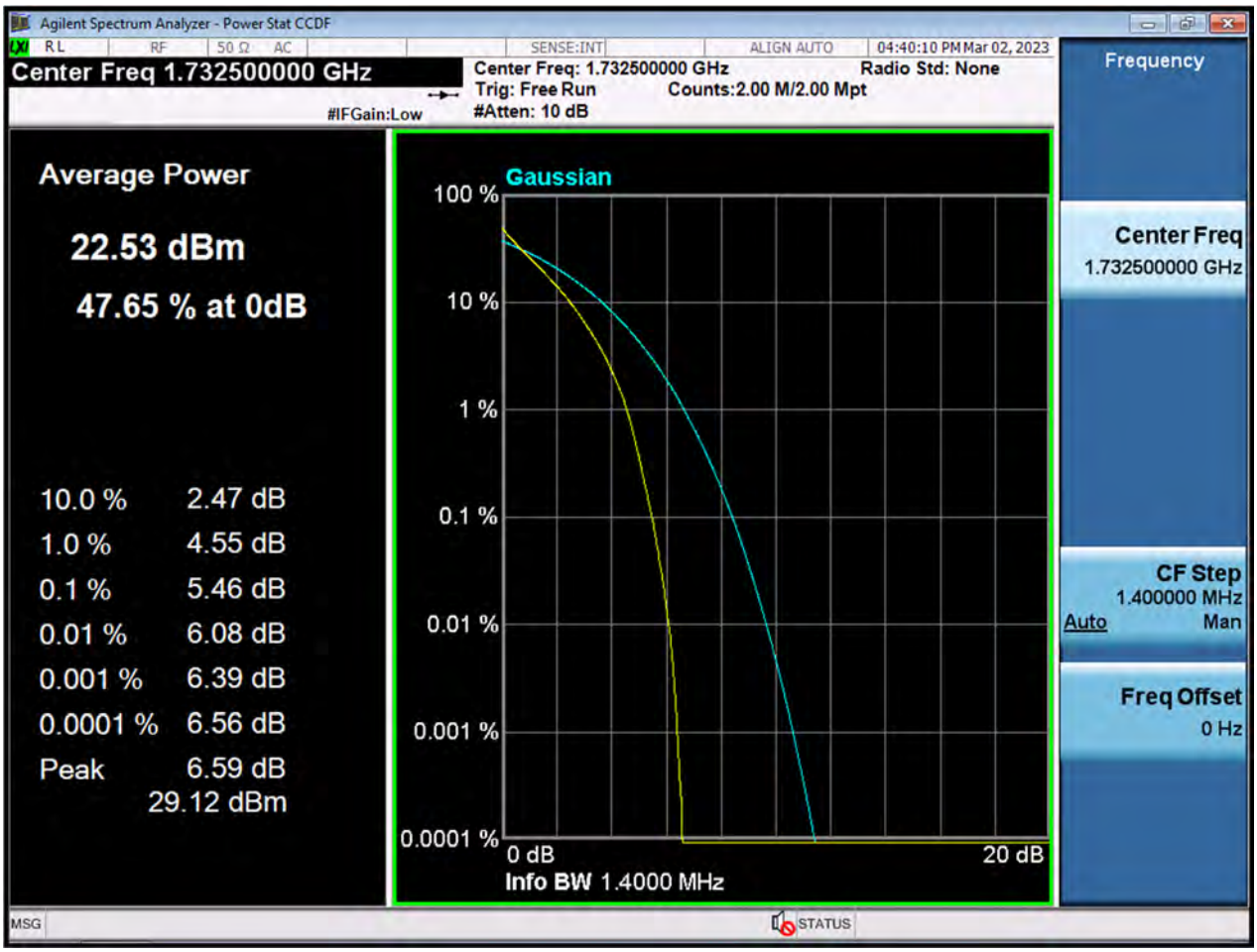
BW20 M_OBW_Middle Channel_64QAM_FullRB



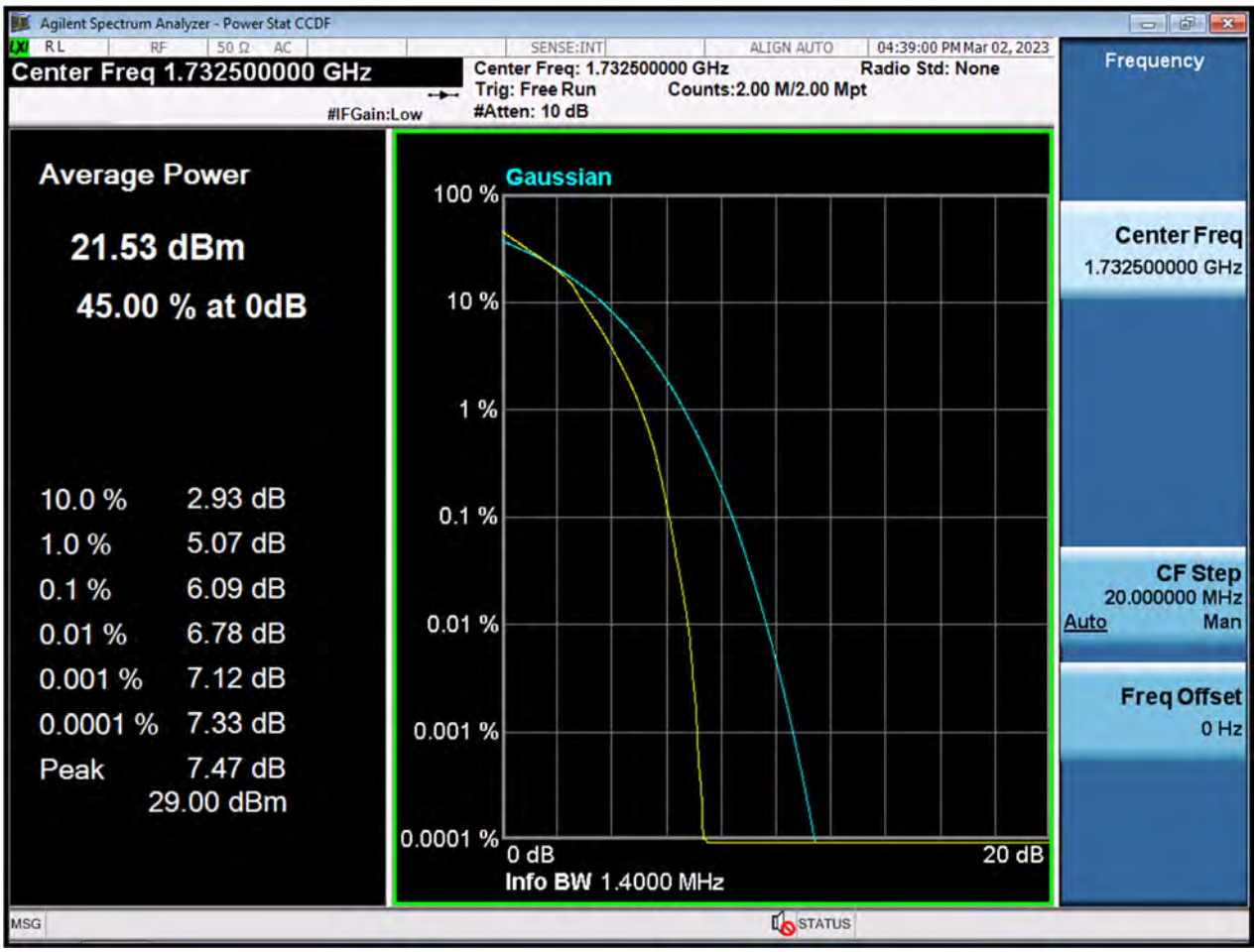
BW20 M_OBW_Middle Channel_256QAM_FullRB



BW1.4 M_PAR_Middle Channel_QPSK_FullRB



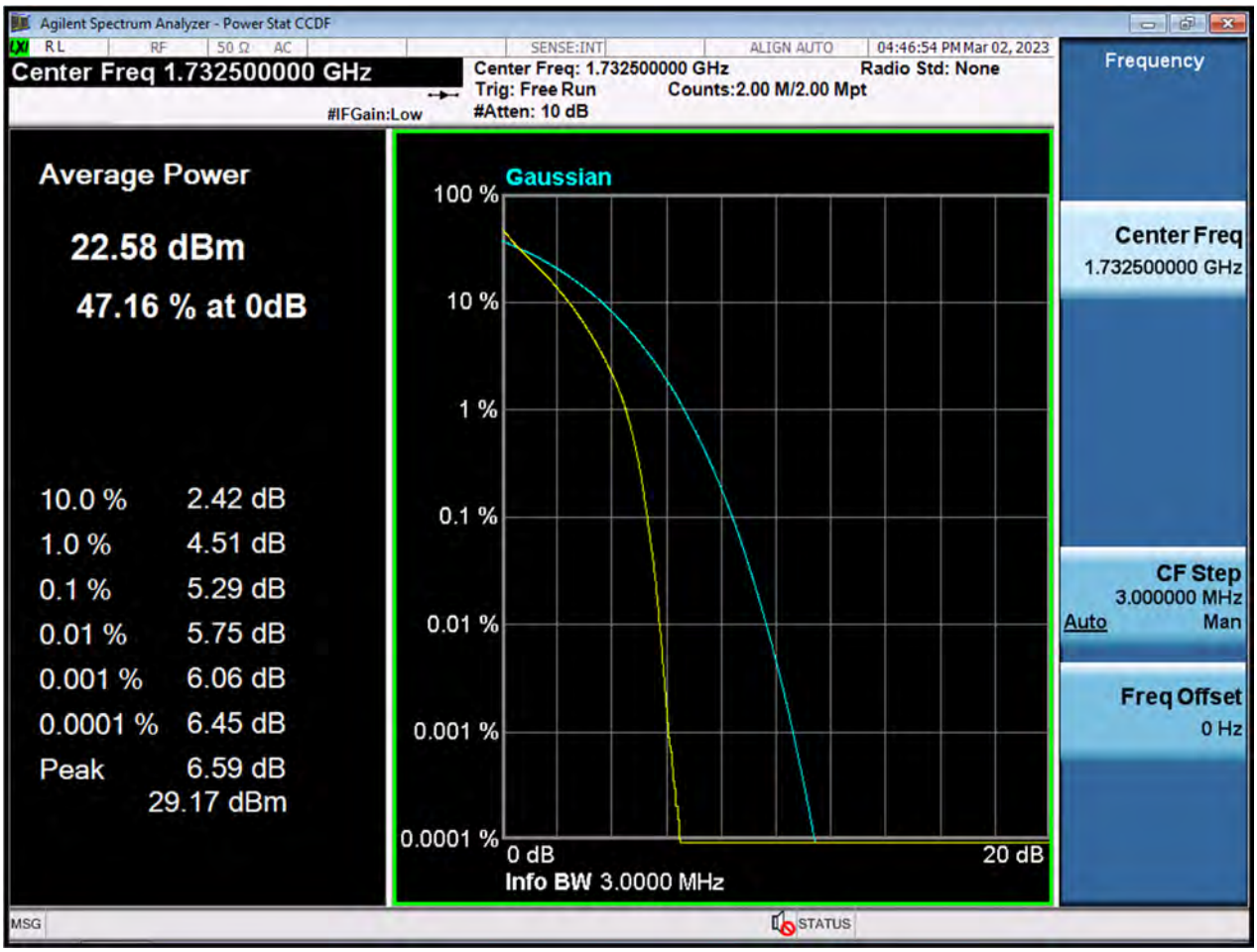
BW1.4 M_PAR_Middle Channel_16QAM_FullRB



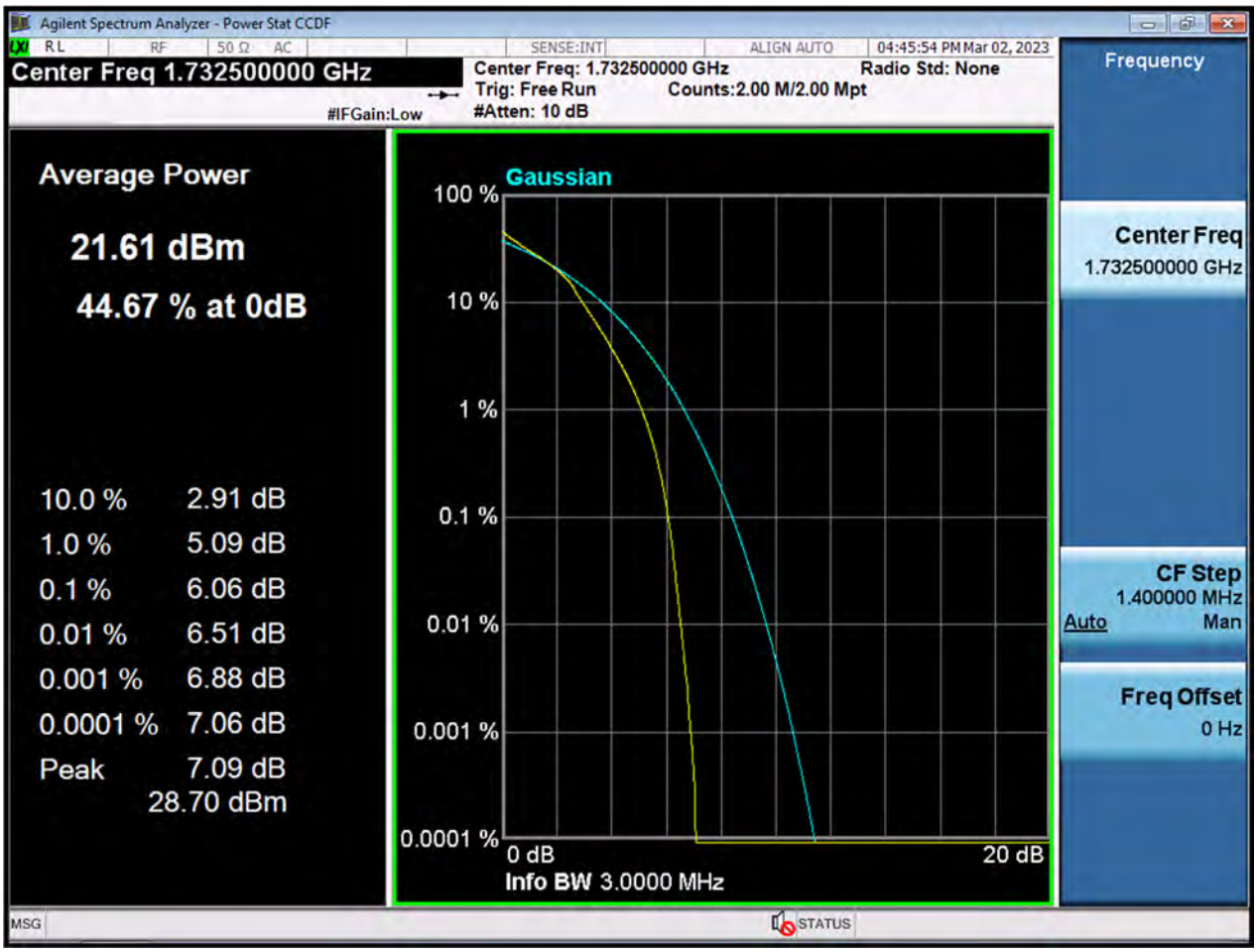
BW1.4 M_PAR_Middle Channel_64QAM_FullRB

BW1.4 M_PAR_Middle Channel_256QAM_FullRB

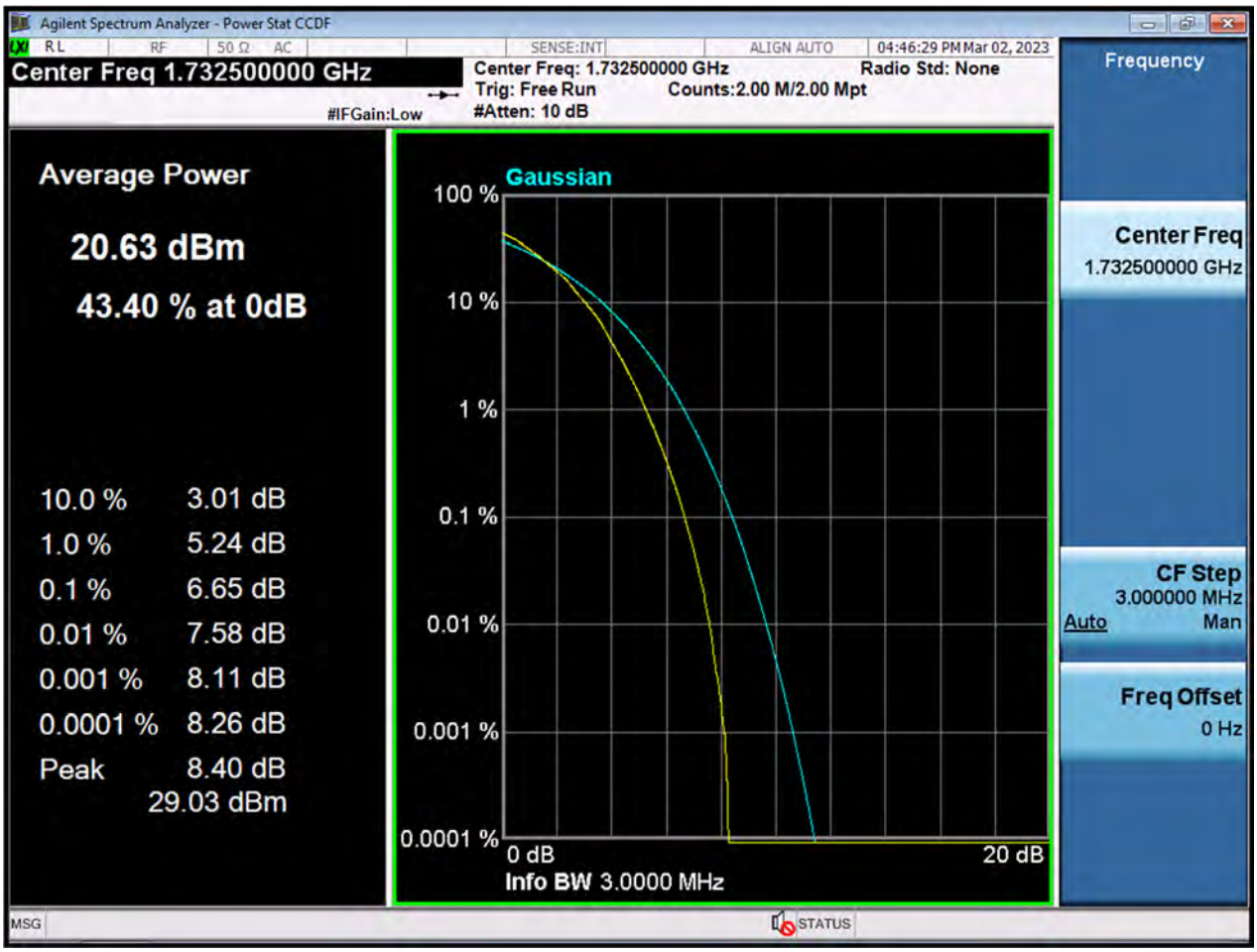
BW3 M_PAR_Middle Channel_QPSK_FullRB



BW3 M_PAR_Middle Channel_16QAM_FullRB



BW3 M_PAR_Middle Channel_64QAM_FullRB

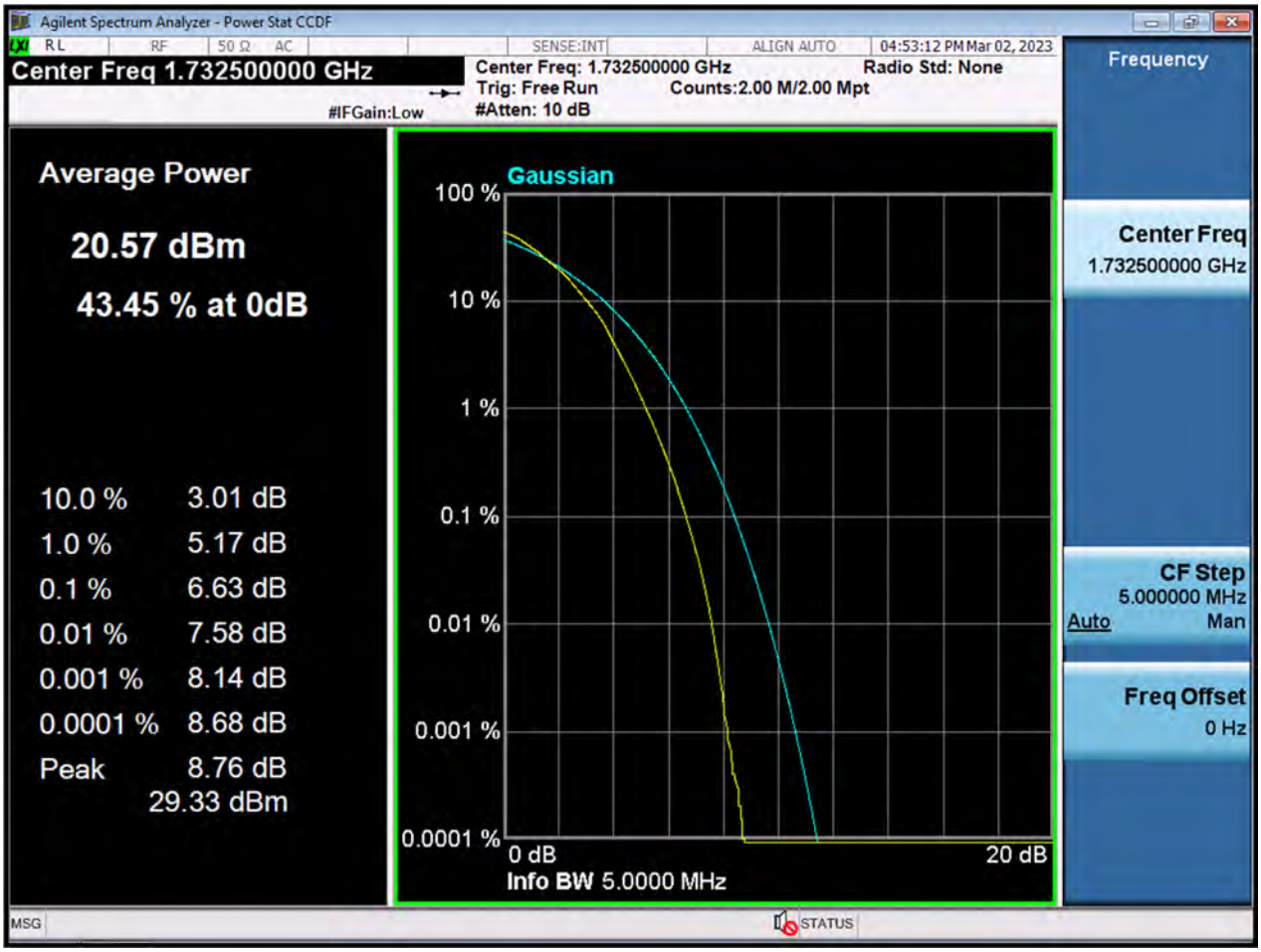


BW3 M_PAR_Middle Channel_256QAM_FullRB

BW5 M_PAR_Middle Channel_QPSK_FullRB

BW5 M_PAR_Middle Channel_16QAM_FullRB

BW5 M_PAR_Middle Channel_64QAM_FullRB

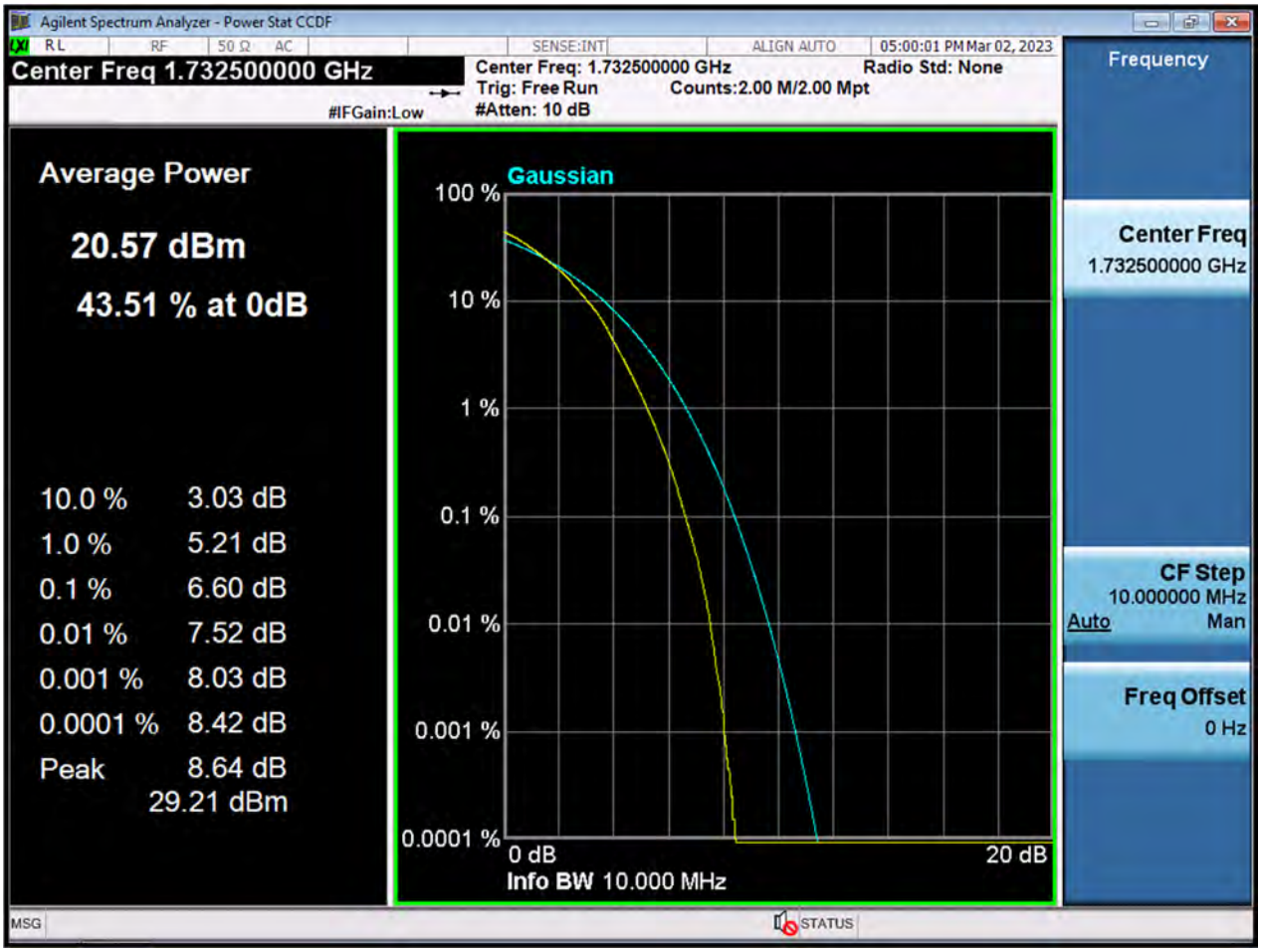


BW5 M_PAR_Middle Channel_256QAM_FullRB

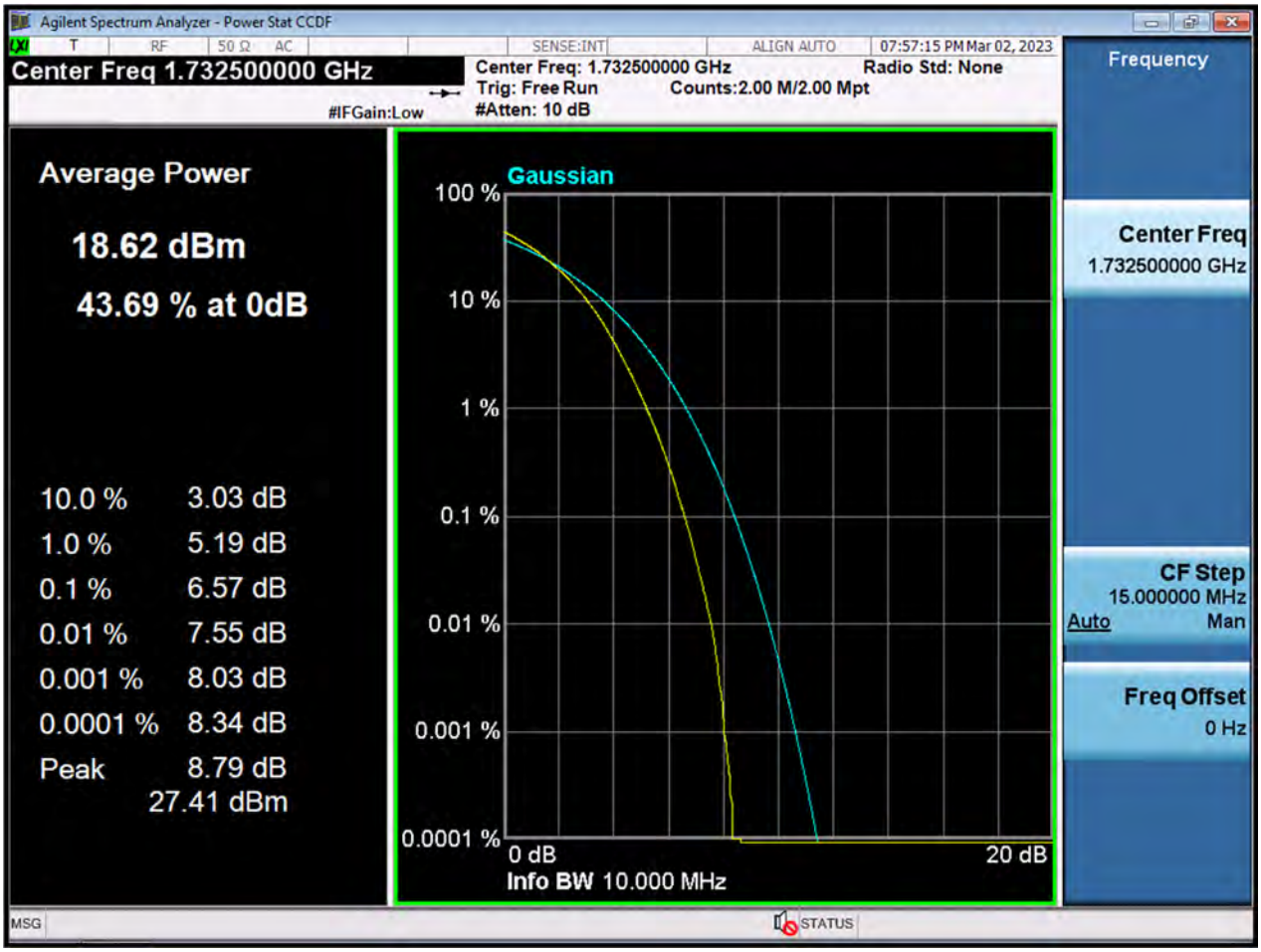
BW10 M_PAR_Middle Channelz_QPSK_FullRB

BW10 M_PAR_Middle Channel_16QAM_FullRB

BW10 M_PAR_Middle Channel_64QAM_FullRB



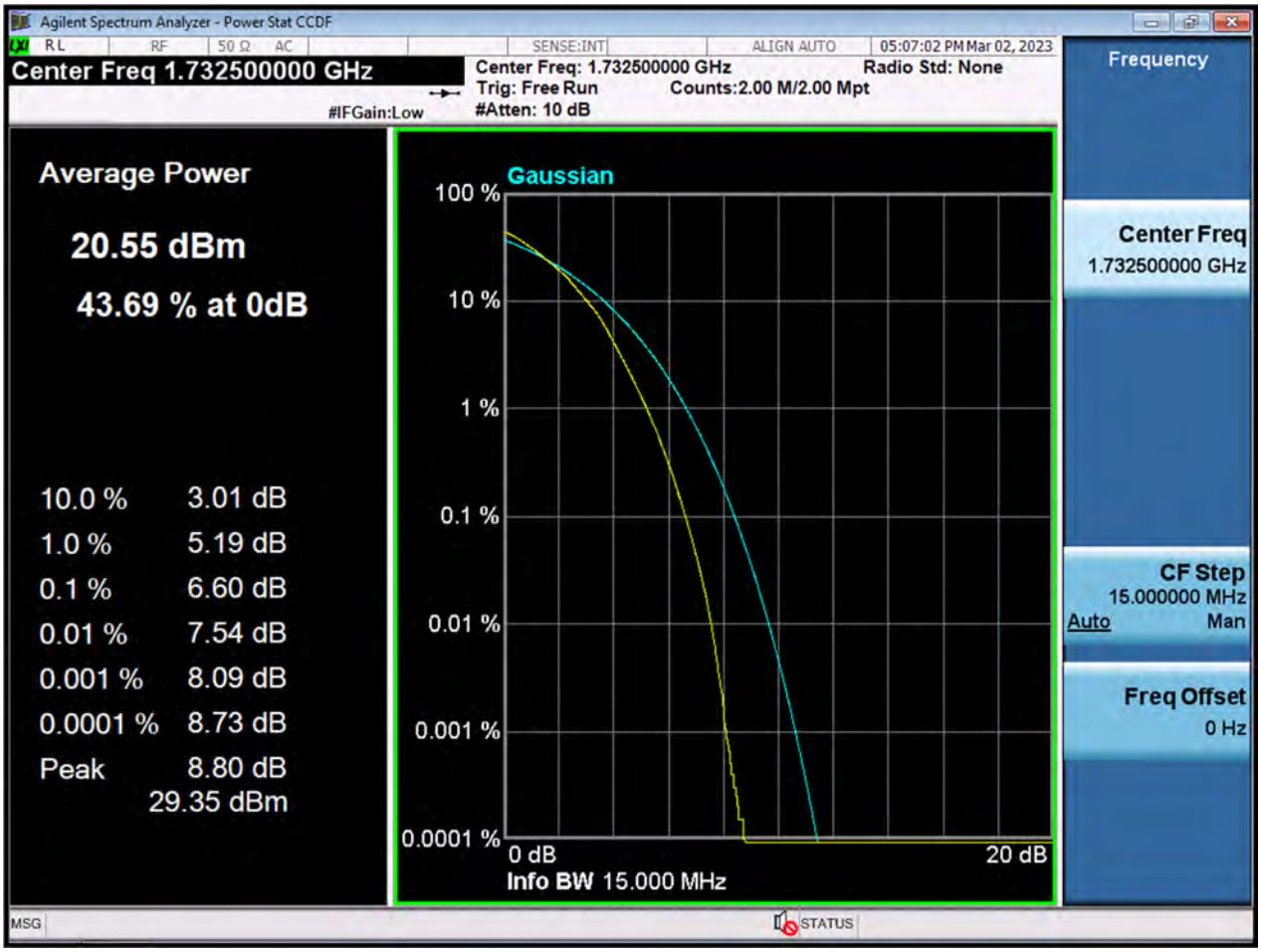
BW10 M_PAR_Middle Channel_256QAM_FullRB



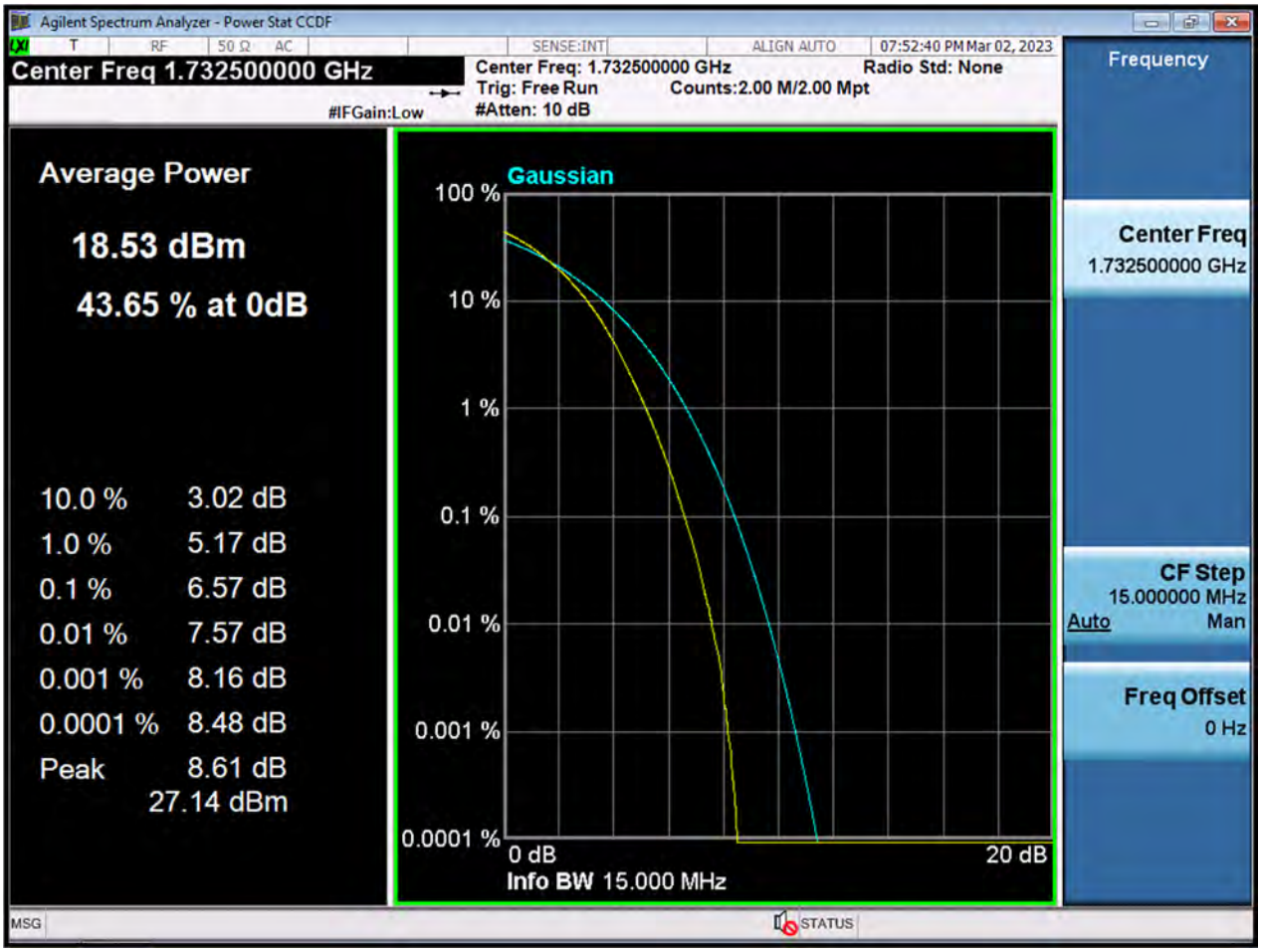
BW15 M_PAR_Middle Channel_QPSK_FullRB

BW15 M_PAR_Middle Channel_16QAM_FullRB

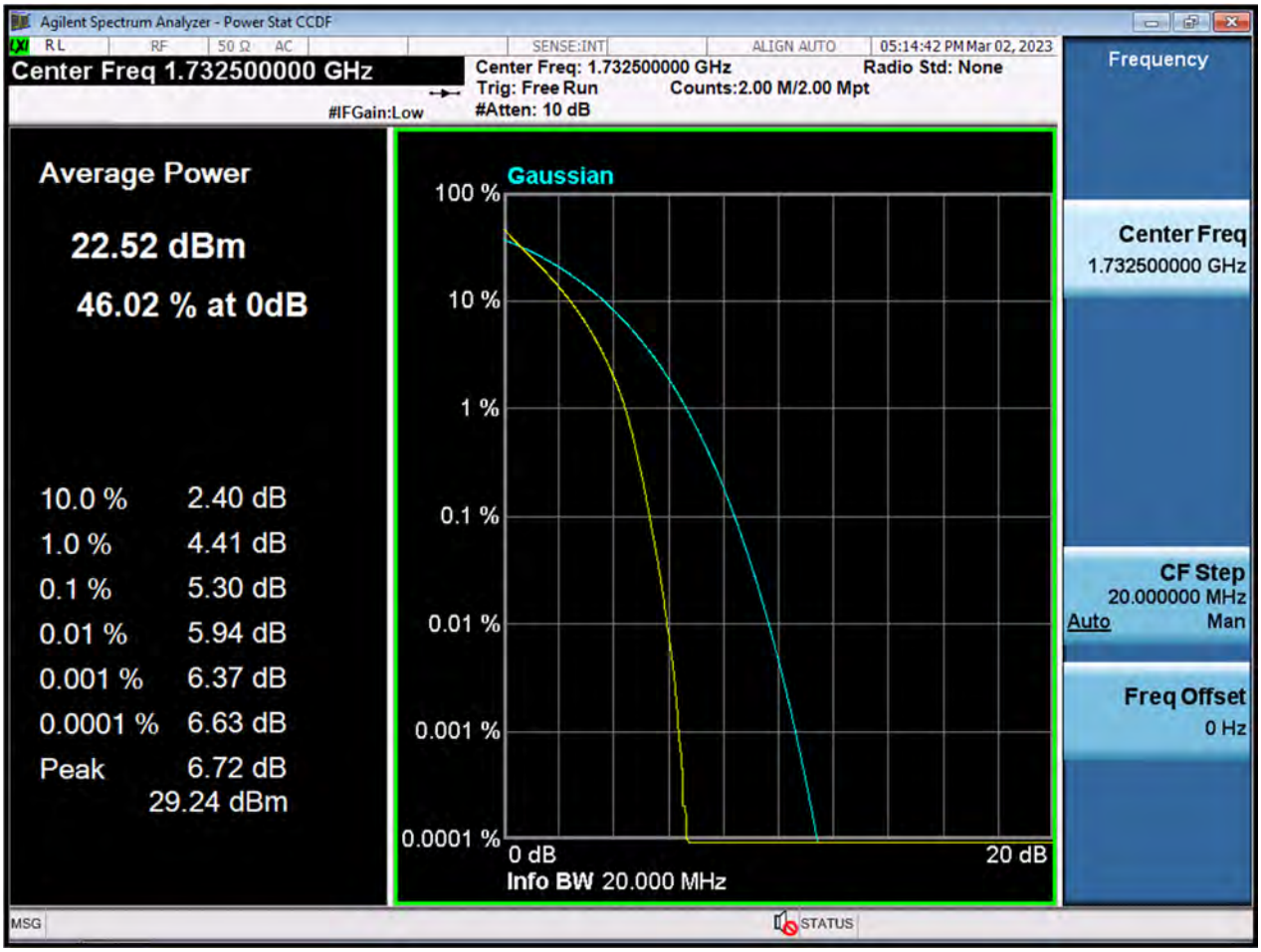
BW15 M_PAR_Middle Channel_64QAM_FullRB



BW15 M_PAR_Middle Channel_256QAM_FullRB

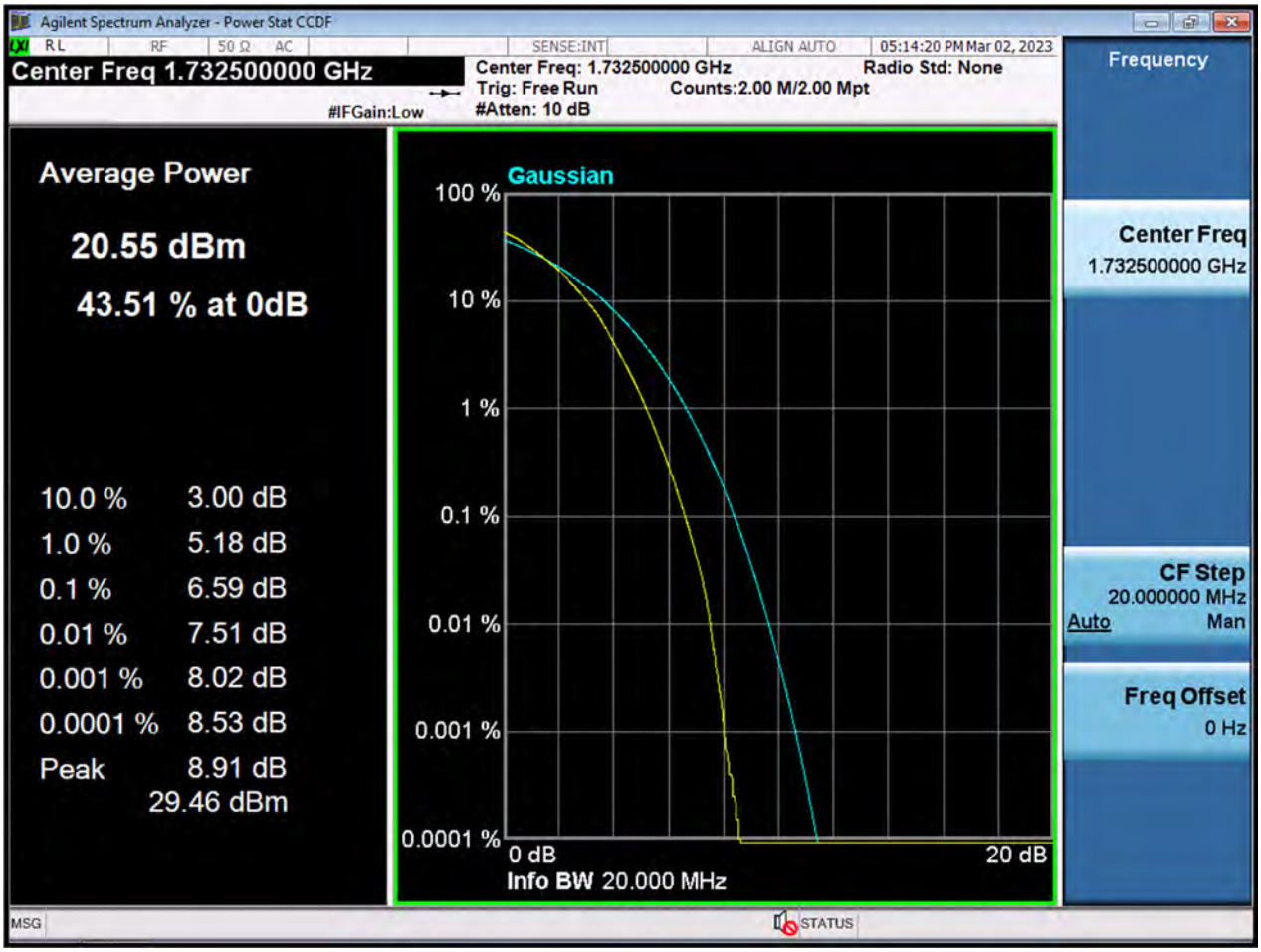


BW20 M_PAR_Middle Channel_QPSK_FullRB

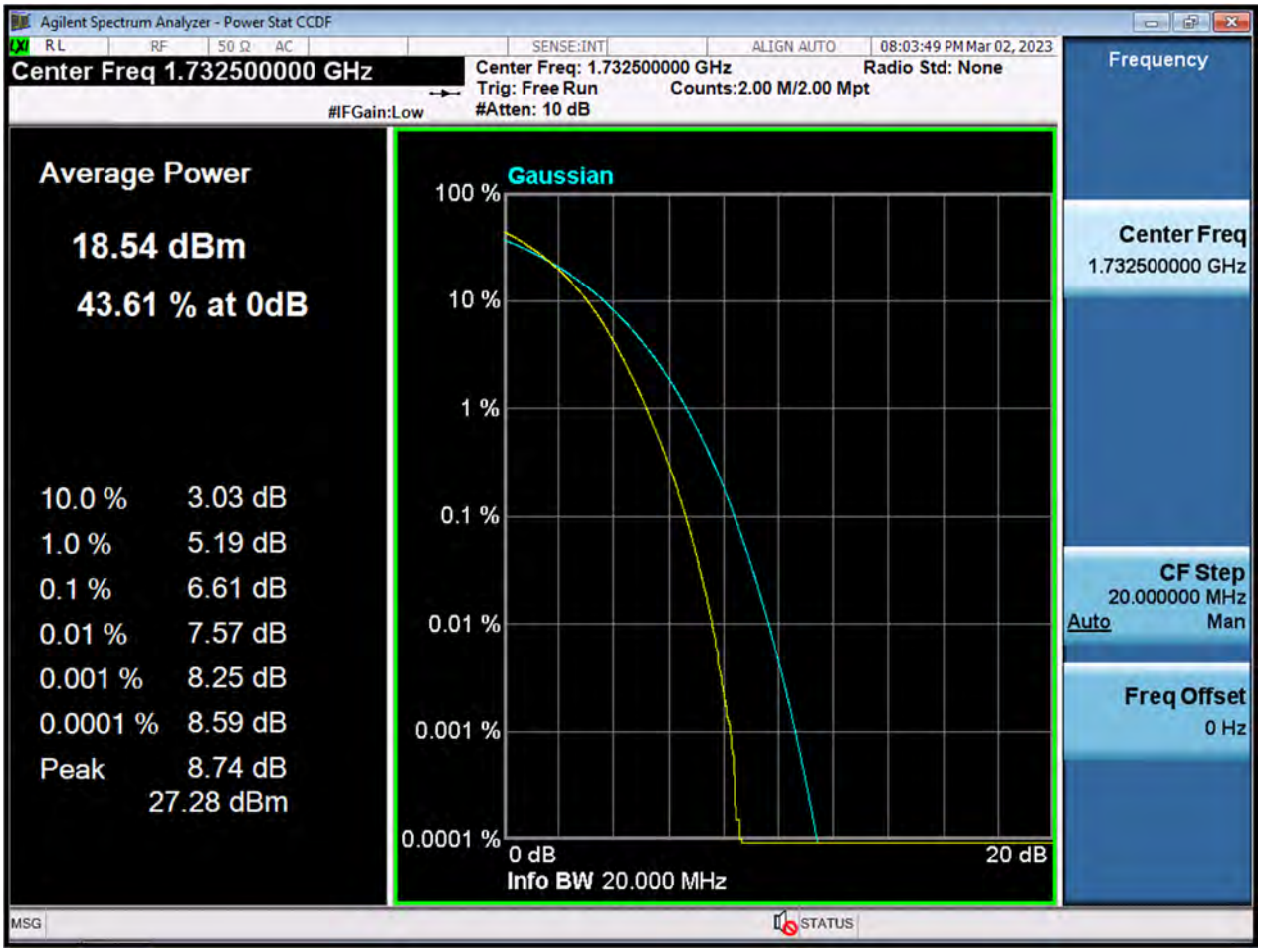


BW20 M_PAR_Middle Channel_16QAM_FullRB

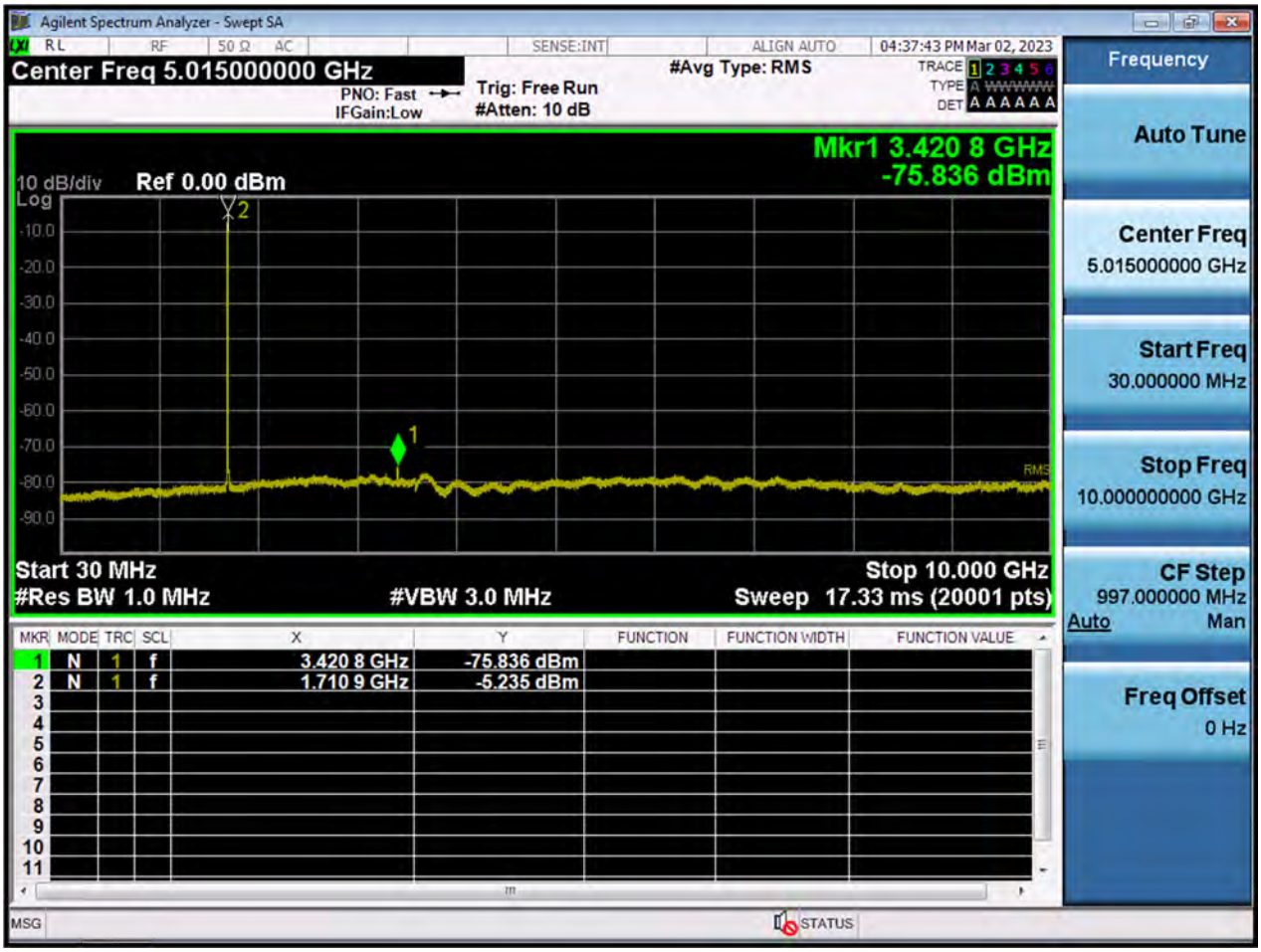
BW20 M_PAR_Middle Channel_64QAM_FullRB



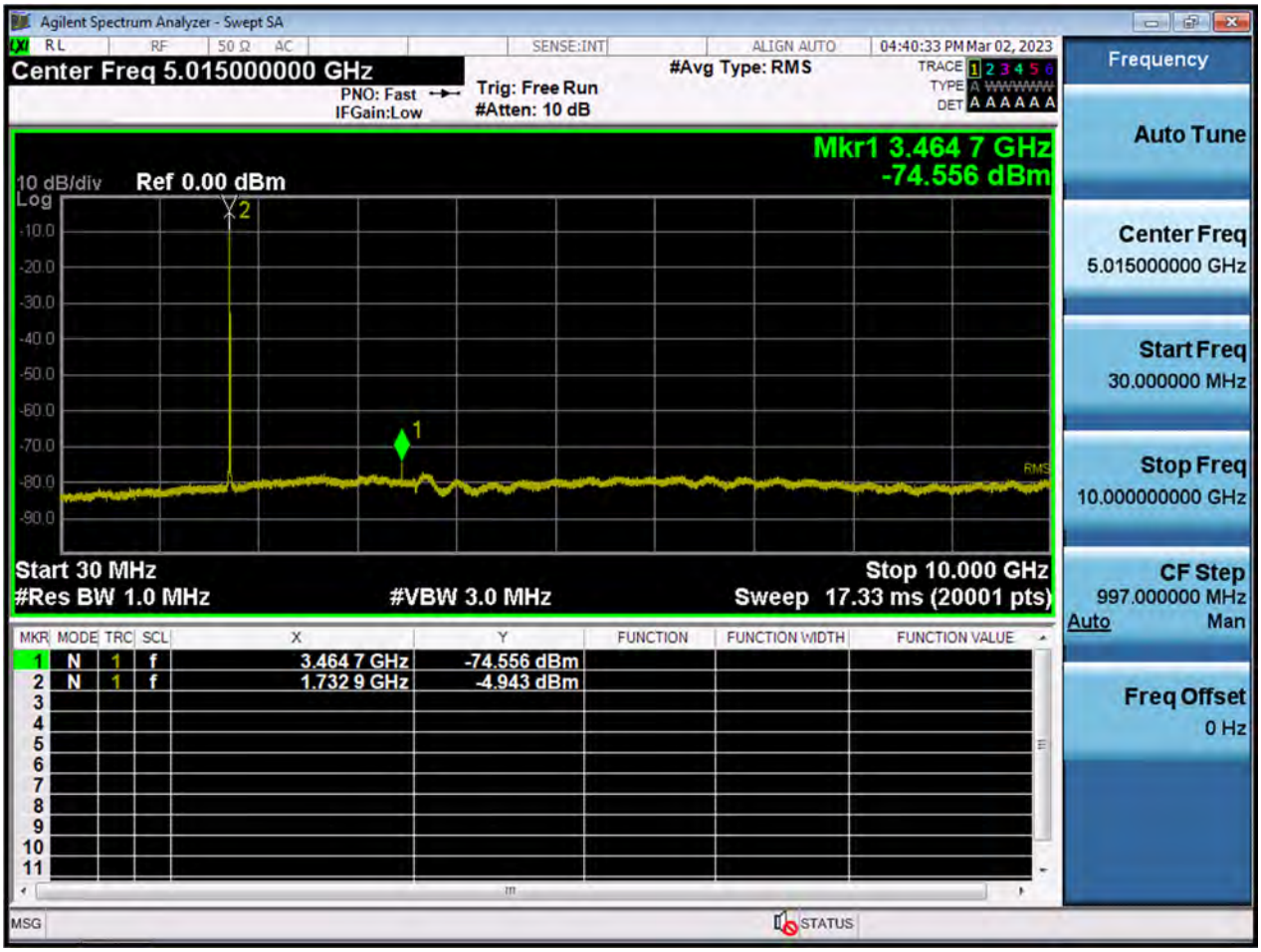
BW20 M_PAR_Middle Channel_256QAM_FullRB



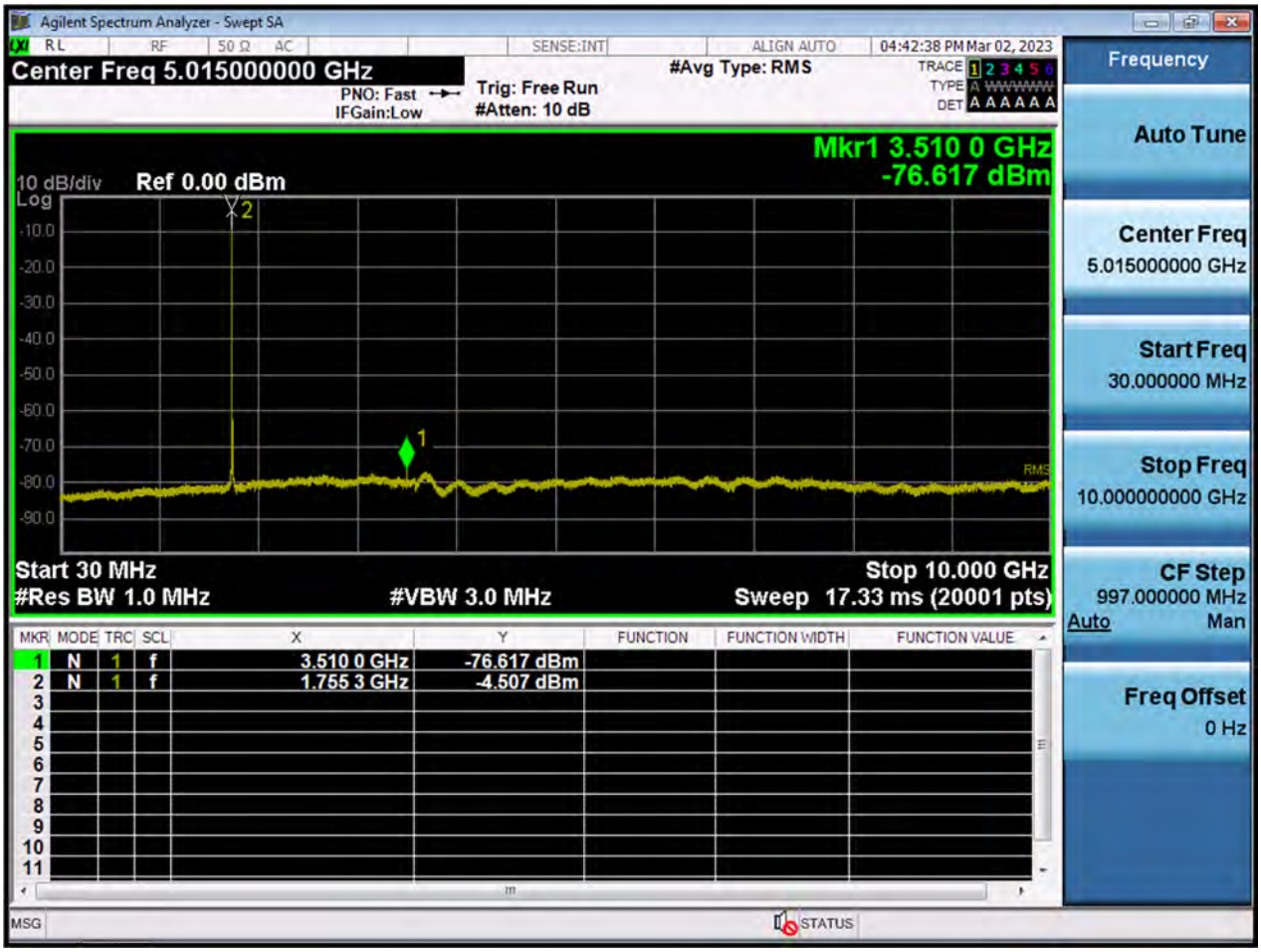
BW1.4 M_CSE(30 M-10 G)_Lowest Channel_QPSK_1RB



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