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# 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 31, 2019

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

**Report No.:** HCT-RF-1912-FI009-R1

**FCC ID:** A3LSMT307U

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

Model(s): SM-T307U
EUT Type: Tablet
FCC Classification: PCS Licensed Transmitter (PCB)
FCC Rule Part(s): §27, §2

| | Mode (MHz) | Tx Frequency (MHz) | Emission Designator | Modulation | EIRP | |
|---|---|---|---|---|---|---|
| | | | | | Max. Power (W) | Max. Power (dBm) |
| Power Class 3 | LTE – Band 41(5) | 2498.5 – 2687.5 | 4M52G7D | QPSK | 0.498 | 26.97 |
| | | | 4M54W7D | 16QAM | 0.373 | 25.72 |
| | | | 4M54W7D | 64QAM | 0.275 | 24.39 |
| | LTE – Band 41(10) | 2501.0 – 2685.0 | 8M98G7D | QPSK | 0.484 | 26.85 |
| | | | 9M01W7D | 16QAM | 0.369 | 25.67 |
| | | | 8M99W7D | 64QAM | 0.261 | 24.16 |
| | LTE – Band 41(15) | 2503.5 – 2682.5 | 13M5G7D | QPSK | 0.488 | 26.88 |
| | | | 13M5W7D | 16QAM | 0.357 | 25.52 |
| | | | 13M5W7D | 64QAM | 0.255 | 24.07 |
| | LTE – Band 41(20) | 2506.0 – 2680.0 | 17M9G7D | QPSK | 0.449 | 26.52 |
| | | | 17M9W7D | 16QAM | 0.332 | 25.21 |
| | | | 17M9W7D | 64QAM | 0.244 | 23.87 |
| Power Class 2 | LTE – Band 41 (5) | 2498.5 – 2687.5 | 4M50G7D | QPSK | 0.973 | 29.88 |
| | | | 4M52W7D | 16QAM | 0.703 | 28.47 |
| | | | 4M53W7D | 64QAM | 0.529 | 27.23 |
| | LTE – Band 41 (10) | 2501.0 – 2685.0 | 9M00G7D | QPSK | 0.946 | 29.76 |
| | | | 8M98W7D | 16QAM | 0.698 | 28.44 |
| | | | 8M96W7D | 64QAM | 0.500 | 26.99 |
| | LTE – Band 41 (15) | 2503.5 – 2682.5 | 13M5G7D | QPSK | 0.949 | 29.77 |
| | | | 13M5W7D | 16QAM | 0.684 | 28.35 |
| | | | 13M5W7D | 64QAM | 0.519 | 27.15 |
| | LTE – Band 41 (20) | 2506.0 – 2680.0 | 17M9G7D | QPSK | 0.879 | 29.44 |
| | | | 17M9W7D | 16QAM | 0.627 | 27.97 |
| | | | 17M9W7D | 64QAM | 0.490 | 26.90 |

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

**Report prepared by : Kwon Jeong**
**Engineer of Telecommunication Testing Center**

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

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

# Version

| TEST REPORT NO. | DATE | DESCRIPTION |
|---|---|---|
| HCT-RF-1912-FI009 | December 11, 2019 | - First Approval Report |
| HCT-RF-1912-FI009-R1 | December 31, 2019 | - Deleted the IC information. |

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

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

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# 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:** | A3LSMT307U |
| **Application Type:** | Certification |
| **FCC Classification:** | PCS Licensed Transmitter (PCB) |
| **FCC Rule Part(s):** | §27, §2 |
| **EUT Type:** | Tablet |
| **Model(s):** | SM-T307U |
| **Tx Frequency:** | 2498.5 – 2687.5 : 5 MHz<br>2501.0 – 2685.0 : 10 MHz<br>2503.5 – 2682.5 : 15 MHz<br>2506.0 – 2680.0 : 20 MHz |
| **Date(s) of Tests:** | October 22, 2019 ~ December 05, 2019 |

# 2. INTRODUCTION

## 2.1. DESCRIPTION OF EUT

The EUT was a Tablet with UMTS and LTE.

It also supports IEEE 802.11 a/b/g/n/ac (HT20/40/80), Bluetooth, BT LE, ANT+.

## 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<br>- ANSI C63.26-2015 – Section 5.4.4 |
| Channel Edge | - KDB 971168 D01 v03r01 – Section 6.0<br>- ANSI C63.26-2015 – Section 5.7 |
| Spurious and Harmonic Emissions at Antenna Terminal | - KDB 971168 D01 v03r01 – Section 6.0<br>- 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<br>- ANSI C63.26-2015 – Section 5.2.3.4<br>- ANSI C63.26-2015 – Section 5.2.6(only GSM) |
| Frequency stability | - ANSI C63.26-2015 – Section 5.6 |
| Effective Radiated Power/<br>Effective Isotropic Radiated Power | - KDB 971168 D01 v03r01 – Section 5.2 & 5.8<br>- ANSI/TIA-603-E-2016 – Section 2.2.17 |
| Radiated Spurious and Harmonic Emissions | - KDB 971168 D01 v03r01 – Section 6.2<br>- 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 NormalHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points > 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

**Test Note**

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

   The power is calculated by the following formula;

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

   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 = 100kHz for emissions below 1GHz and NormalHz for emissions above 1GHz
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 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
   The spurious emissions is calculated by the following formula;

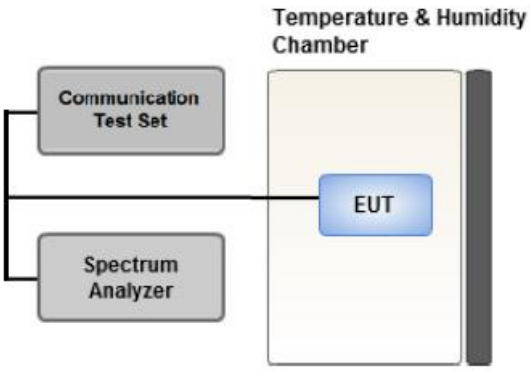
$$Result_{(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

$$EIRP_{(dBm)} = ERP_{(dBm)} + 2.15$$

### 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.

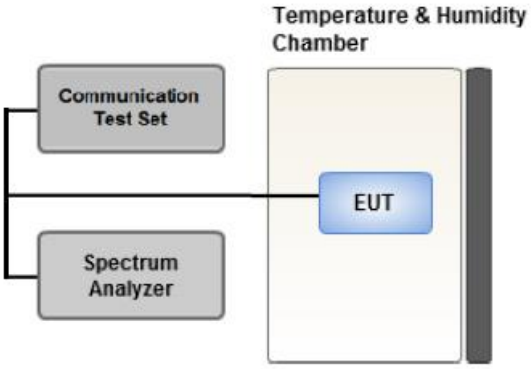
1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

**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.

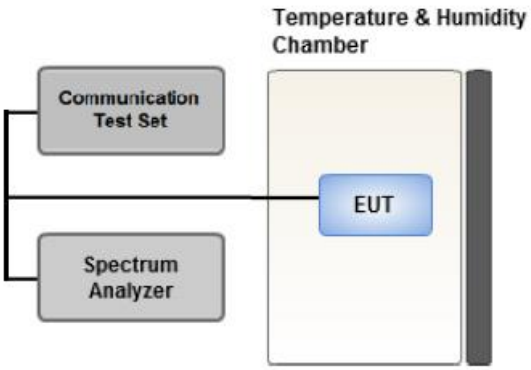
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

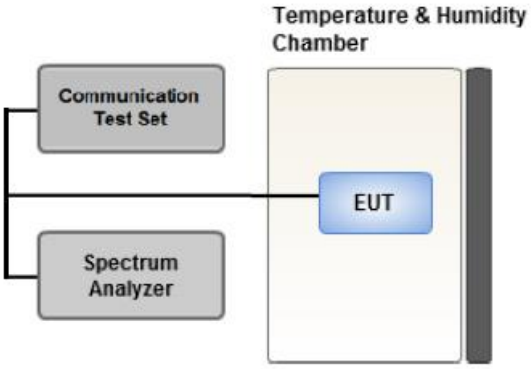
**Test Overview**

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 = Peak
4. Trace Mode = max hold
5. Sweep time = auto
6. Number of points in sweep ≥ 2 x Span / RBW

### 3.7 CHANNEL 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.

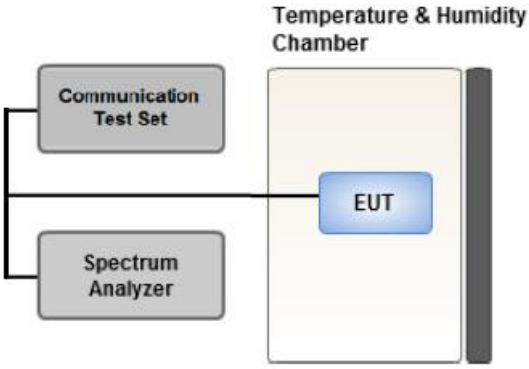
**Test Settings**

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. Within 1MHz 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**

1. The attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge,
2. 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge.
3. 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge.
4. The attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz.
5. 55 + 10 log (P) dB at or below 2490.5 MHz.
6. X is the greater of 6MHz or the actual emission bandwidth
7. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer

### 3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE




**Test setup**

**Test Overview**

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

The frequency stability of the transmitter is measured by:

1. Temperature:

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

2. Primary Supply Voltage:

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

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

**Test Settings**

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

### 3.9 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.
- 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.
- All modes of operation were investigated and the worst case configuration results are reported.
- Please refer to the table below.

[ Worst case ]

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

### 3.10 WORST CASE(CONDUCTED TEST)

- Worst case : Of all modulation, We have tested modulation of the high Conducted Output Power.
  Conducted Output Power value can be confirmed on the SAR report.

[ Worst case ]

| Test Description | Modulation | Bandwidth (MHz) | Frequency | RB size | RB offset |
|---|---|---|---|---|---|
| **Occupied Bandwidth** | QPSK, 16QAM, 64QAM | 5, 10, 15, 20 | Mid | Full RB | 0 |
| **Peak-To-Average Radio** | QPSK, 16QAM, 64QAM | 5, 10, 15, 20 | Mid | Full RB | 0 |
| **Channel Edge** | QPSK | 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 |
| | | 5, 10, 15, 20 | Low, Mid, High | Full RB | 0 |
| **Spurious and Harmonic Emissions at Antenna Terminal** | QPSK | 5, 10, 15, 20 | Low, Mid, High | 1 | 0 |

## 4. LIST OF TEST EQUIPMENT

| Manufacture | Model/ Equipment | Serial Number | Calibration Date | Calibration Interval | Calibration Due |
|---|---|---|---|---|---|
| T&M SYSTEM | FBSR-02B(WHK1.2/15G-10EF)/H.P.F | - | 06/10/2019 | Annual | 06/10/2020 |
| T&M SYSTEM | FBSR-02B(WHK3.3/18G-10EF)/H.P.F | - | 06/10/2019 | Annual | 06/10/2020 |
| Hewlett Packard | 11667B / Power Splitter(DC~26.5 GHz) | 11275 | 05/03/2019 | Annual | 05/03/2020 |
| Agilent | E3632A/DC Power Supply | MY40004326 | 07/01/2019 | Annual | 07/01/2020 |
| Schwarzbeck | UHAP/ Dipole Antenna | 557 | 03/29/2019 | Biennial | 03/29/2021 |
| Schwarzbeck | UHAP/ Dipole Antenna | 558 | 03/29/2019 | Biennial | 03/29/2021 |
| ESPEC | SU-642 / Chamber | 93000717 | 08/14/2019 | Annual | 08/14/2020 |
| Schwarzbeck | BBHA 9120D/ Horn Antenna(1~18GHz) | 147 | 08/29/2019 | Biennial | 08/29/2021 |
| Schwarzbeck | BBHA 9120D/ Horn Antenna(1~18GHz) | 9120D-1298 | 09/25/2019 | Biennial | 09/25/2021 |
| Schwarzbeck | BBHA 9170/ Horn Antenna(15~40GHz) | BBHA9170342 | 04/29/2019 | Biennial | 04/29/2021 |
| Schwarzbeck | BBHA 9170/ Horn Antenna(15~40GHz) | BBHA9170124 | 01/28/2019 | Biennial | 01/28/2021 |
| Agilent | N9020A/Signal Analyzer(10Hz~26.5GHz) | MY51110063 | 05/08/2019 | Annual | 05/08/2020 |
| Hewlett Packard | 8493C/ATTENUATOR(20dB) | 17280 | 06/04/2019 | Annual | 06/04/2020 |
| REOHDE & SCHWARZ | FSV40/Spectrum Analyzer(10Hz~40GHz) | 100931 | 10/14/2019 | Annual | 10/14/2020 |
| Agilent | 8960 (E5515C)/ Base Station | MY48360800 | 08/27/2019 | Annual | 08/27/2020 |
| Schwarzbeck | FMZB1513/ Loop Antenna(9kHz~30MHz) | 1513-175 | 08/23/2018 | Biennial | 08/23/2020 |
| Schwarzbeck | VULB9160/ Bilog Antenna | 9160-3368 | 08/09/2018 | Biennial | 08/09/2020 |
| Schwarzbeck | VULB9160/ Hybrid Antenna | 760 | 03/22/2019 | Biennial | 03/22/2021 |
| Anritsu Corp. | MT8821C/Wideband Radio Communication Tester | 6201502997 | 08/09/2019 | Annual | 08/09/2020 |
| Anritsu Corp. | MT8820C/Wideband Radio Communication Tester | 6201026545 | 01/30/2019 | Annual | 01/30/2020 |
| REOHDE & SCHWARZ | SMB100A/ SIGNAL GENERATOR (100kHz~40GHz) | 177633 | 07/15/2019 | Annual | 07/15/2020 |
| REOHDE & SCHWARZ | ESU40 / EMI TEST RECEIVER | 100524 | 05/17/2019 | Annual | 05/17/2020 |
| HCT CO., LTD., | FCC LTE Mobile Conducted RF Automation Test Software | - | - | - | - |

Note:

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

## 5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014. All measurement uncertainty values are shown with a coverage factor of $k$ = 2 to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the $U_{CISPR}$ 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) | 1.82 |
| Radiated Disturbance (9 kHz ~ 30 MHz) | 3.40 |
| Radiated Disturbance (30 MHz ~ 1 GHz) | 4.80 |
| Radiated Disturbance (1 GHz ~ 18 GHz) | 5.70 |
| Radiated Disturbance (18 GHz ~ 40 GHz) | 5.05 |

# 6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

| Test Description | FCC Part Section(s) | Test Limit | Test Result |
|---|---|---|---|
| Occupied Bandwidth | §2.1049 | N/A | PASS |
| Band Edge / Spurious and Harmonic Emissions at Antenna Terminal. | §2.1051, §27.53(m)(4) | ■ < 40 + 10log10 (P[Watts]) at Channel edges<br>■ < 43 + 10log10 (P[Watts]) between 5 and X MHz from Channel edges<br>■ < 55 + 10log10 (P[Watts]) beyond X MHz beyond from Channel edges<br>■ < 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz | PASS |
| Conducted Output Power | §2.1046 | N/A | See Note1 |
| Frequency stability / variation of ambient temperature | §2.1055, §27.54 | Emission must remain in band | PASS |

Note:

1. See SAR Report
2. The same samples were used for SAR and EMC

6.2 Test Condition : Radiated Test

| Test Description | FCC Part Section(s) | Test Limit | Test Result |
|---|---|---|---|
| Equivalent Isotropic Radiated Power | §27.50(h)(2) | < 2 Watts max. EIRP | PASS |
| Radiated Spurious and Harmonic Emissions | §2.1053, §27.53(m)(4) | < 55 + 10log10 (P[Watts]) | 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 |
| 40620 | 2593.0 | -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

16QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

64QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

# 8. TEST DATA

## 8.1 EQUIVALENT ISOTROPIC RADIATED POWER

### 8.1.1 Power Class 3

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitute Level (dBm) | Ant. Gain(dBi) | C.L | Pol | Limit | EIRP | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm |
| 2498.5 | LTE B41 5 MHz | QPSK | -20.20 | 16.55 | 10.70 | 2.31 | H | < 2.00 | 0.312 | 24.94 |
| | | 16-QAM | -21.45 | 15.30 | 10.70 | 2.31 | H | | 0.234 | 23.69 |
| | | 64-QAM | -22.64 | 14.11 | 10.70 | 2.31 | H | | 0.178 | 22.50 |
| 2593.0 | | QPSK | -18.45 | 18.34 | 10.98 | 2.35 | H | | 0.498 | 26.97 |
| | | 16-QAM | -19.70 | 17.09 | 10.98 | 2.35 | H | | 0.373 | 25.72 |
| | | 64-QAM | -21.03 | 15.76 | 10.98 | 2.35 | H | | 0.275 | 24.39 |
| 2687.5 | | QPSK | -19.85 | 17.31 | 11.10 | 2.39 | H | | 0.400 | 26.02 |
| | | 16-QAM | -21.23 | 15.93 | 11.10 | 2.39 | H | | 0.291 | 24.64 |
| | | 64-QAM | -22.52 | 14.64 | 11.10 | 2.39 | H | | 0.216 | 23.35 |

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitute Level (dBm) | Ant. Gain(dBi) | C.L | Pol | Limit | EIRP | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm |
| 2501.0 | LTE B41 10 MHz | QPSK | -20.18 | 16.57 | 10.70 | 2.31 | H | < 2.00 | 0.314 | 24.96 |
| | | 16-QAM | -21.54 | 15.21 | 10.70 | 2.31 | H | | 0.229 | 23.60 |
| | | 64-QAM | -22.94 | 13.81 | 10.70 | 2.31 | H | | 0.166 | 22.20 |
| 2593.0 | | QPSK | -18.57 | 18.22 | 10.98 | 2.35 | H | | 0.484 | 26.85 |
| | | 16-QAM | -19.75 | 17.04 | 10.98 | 2.35 | H | | 0.369 | 25.67 |
| | | 64-QAM | -21.26 | 15.53 | 10.98 | 2.35 | H | | 0.261 | 24.16 |
| 2685.0 | | QPSK | -19.62 | 17.46 | 11.10 | 2.39 | H | | 0.414 | 26.17 |
| | | 16-QAM | -20.90 | 16.18 | 11.10 | 2.39 | H | | 0.308 | 24.89 |
| | | 64-QAM | -22.25 | 14.83 | 11.10 | 2.39 | H | | 0.226 | 23.54 |

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitute Level (dBm) | Ant. Gain(dBi) | C.L | Pol | Limit | EIRP | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm |
| 2503.5 | LTE B41 15 MHz | QPSK | -20.16 | 16.59 | 10.70 | 2.31 | H | < 2.00 | 0.315 | 24.98 |
| | | 16-QAM | -21.58 | 15.17 | 10.70 | 2.31 | H | | 0.227 | 23.56 |
| | | 64-QAM | -22.74 | 14.01 | 10.70 | 2.31 | H | | 0.174 | 22.40 |
| 2593.0 | | QPSK | -18.54 | 18.25 | 10.98 | 2.35 | H | | 0.488 | 26.88 |
| | | 16-QAM | -19.90 | 16.89 | 10.98 | 2.35 | H | | 0.357 | 25.52 |
| | | 64-QAM | -21.35 | 15.44 | 10.98 | 2.35 | H | | 0.255 | 24.07 |
| 2682.5 | | QPSK | -20.02 | 16.96 | 11.10 | 2.38 | H | | 0.370 | 25.68 |
| | | 16-QAM | -21.52 | 15.46 | 11.10 | 2.38 | H | | 0.262 | 24.18 |
| | | 64-QAM | -22.75 | 14.23 | 11.10 | 2.38 | H | | 0.197 | 22.95 |

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitute Level (dBm) | Ant. Gain(dBi) | C.L | Pol | Limit | EIRP | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm |
| 2506.0 | LTE B41 20 MHz | QPSK | -20.09 | 16.58 | 10.73 | 2.32 | H | < 2.00 | 0.316 | 24.99 |
| | | 16-QAM | -21.47 | 15.20 | 10.73 | 2.32 | H | | 0.230 | 23.61 |
| | | 64-QAM | -22.68 | 13.99 | 10.73 | 2.32 | H | | 0.174 | 22.40 |
| 2593.0 | | QPSK | -18.90 | 17.89 | 10.98 | 2.35 | H | | 0.449 | 26.52 |
| | | 16-QAM | -20.21 | 16.58 | 10.98 | 2.35 | H | | 0.332 | 25.21 |
| | | 64-QAM | -21.55 | 15.24 | 10.98 | 2.35 | H | | 0.244 | 23.87 |
| 2680.0 | | QPSK | -19.56 | 17.42 | 11.10 | 2.38 | H | | 0.411 | 26.14 |
| | | 16-QAM | -20.79 | 16.19 | 11.10 | 2.38 | H | | 0.310 | 24.91 |
| | | 64-QAM | -22.10 | 14.88 | 11.10 | 2.38 | H | | 0.229 | 23.60 |

### 8.1.2 Power Class 2

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitute Level (dBm) | Ant. Gain(dBi) | C.L | Pol | Limit | EIRP | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm |
| 2498.5 | LTE B41/ 5 MHz | QPSK | -17.15 | 19.60 | 10.70 | 2.31 | H | < 2.00 | 0.630 | 27.99 |
| | | 16-QAM | -18.30 | 18.45 | 10.70 | 2.31 | H | | 0.483 | 26.84 |
| | | 64-QAM | -19.87 | 16.88 | 10.70 | 2.31 | H | | 0.337 | 25.27 |
| 2593.0 | | QPSK | -15.54 | 21.25 | 10.98 | 2.35 | H | | 0.973 | 29.88 |
| | | 16-QAM | -16.95 | 19.84 | 10.98 | 2.35 | H | | 0.703 | 28.47 |
| | | 64-QAM | -18.19 | 18.60 | 10.98 | 2.35 | H | | 0.529 | 27.23 |
| 2687.5 | | QPSK | -16.84 | 20.32 | 11.10 | 2.39 | H | | 0.800 | 29.03 |
| | | 16-QAM | -18.11 | 19.05 | 11.10 | 2.39 | H | | 0.597 | 27.76 |
| | | 64-QAM | -19.59 | 17.57 | 11.10 | 2.39 | H | | 0.425 | 26.28 |

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitute Level (dBm) | Ant. Gain(dBi) | C.L | Pol | Limit | EIRP | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm |
| 2501.0 | LTE B41/ 10 MHz | QPSK | -17.12 | 19.63 | 10.70 | 2.31 | H | < 2.00 | 0.634 | 28.02 |
| | | 16-QAM | -18.50 | 18.25 | 10.70 | 2.31 | H | | 0.462 | 26.64 |
| | | 64-QAM | -19.57 | 17.18 | 10.70 | 2.31 | H | | 0.361 | 25.57 |
| 2593.0 | | QPSK | -15.66 | 21.13 | 10.98 | 2.35 | H | | 0.946 | 29.76 |
| | | 16-QAM | -16.98 | 19.81 | 10.98 | 2.35 | H | | 0.698 | 28.44 |
| | | 64-QAM | -18.43 | 18.36 | 10.98 | 2.35 | H | | 0.500 | 26.99 |
| 2685.0 | | QPSK | -16.71 | 20.37 | 11.10 | 2.39 | H | | 0.808 | 29.08 |
| | | 16-QAM | -18.03 | 19.05 | 11.10 | 2.39 | H | | 0.596 | 27.76 |
| | | 64-QAM | -19.47 | 17.61 | 11.10 | 2.39 | H | | 0.428 | 26.32 |

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitute Level (dBm) | Ant. Gain(dBi) | C.L | Pol | Limit | EIRP | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm |
| 2503.5 | LTE B41/ 15 MHz | QPSK | -17.07 | 19.68 | 10.70 | 2.31 | H | < 2.00 | 0.642 | 28.07 |
| | | 16-QAM | -18.38 | 18.37 | 10.70 | 2.31 | H | | 0.475 | 26.76 |
| | | 64-QAM | -19.54 | 17.21 | 10.70 | 2.31 | H | | 0.363 | 25.60 |
| 2593.0 | | QPSK | -15.65 | 21.14 | 10.98 | 2.35 | H | | 0.949 | 29.77 |
| | | 16-QAM | -17.07 | 19.72 | 10.98 | 2.35 | H | | 0.684 | 28.35 |
| | | 64-QAM | -18.27 | 18.52 | 10.98 | 2.35 | H | | 0.519 | 27.15 |
| 2682.5 | | QPSK | -17.10 | 19.88 | 11.10 | 2.38 | H | | 0.724 | 28.60 |
| | | 16-QAM | -18.39 | 18.59 | 11.10 | 2.38 | H | | 0.538 | 27.31 |
| | | 64-QAM | -19.92 | 17.06 | 11.10 | 2.38 | H | | 0.378 | 25.78 |

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitute Level (dBm) | Ant. Gain(dBi) | C.L | Pol | Limit | EIRP | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | W | dBm |
| 2506.0 | LTE B41/ 20 MHz | QPSK | -16.97 | 19.70 | 10.73 | 2.32 | H | < 2.00 | 0.647 | 28.11 |
| | | 16-QAM | -18.36 | 18.31 | 10.73 | 2.32 | H | | 0.470 | 26.72 |
| | | 64-QAM | -19.57 | 17.10 | 10.73 | 2.32 | H | | 0.356 | 25.51 |
| 2593.0 | | QPSK | -15.98 | 20.81 | 10.98 | 2.35 | H | | 0.879 | 29.44 |
| | | 16-QAM | -17.45 | 19.34 | 10.98 | 2.35 | H | | 0.627 | 27.97 |
| | | 64-QAM | -18.52 | 18.27 | 10.98 | 2.35 | H | | 0.490 | 26.90 |
| 2680.0 | | QPSK | -16.66 | 20.32 | 11.10 | 2.38 | H | | 0.802 | 29.04 |
| | | 16-QAM | -17.96 | 19.02 | 11.10 | 2.38 | H | | 0.594 | 27.74 |
| | | 64-QAM | -19.40 | 17.58 | 11.10 | 2.38 | H | | 0.427 | 26.30 |

## 8.2 RADIATED SPURIOUS EMISSIONS

### 8.2.1 Power Class 3

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 26.97 dBm = 0.498 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 5 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 51.97 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L | Pol | EIRP (dBm) | dBc | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 39675 (2498.5) | 4,997.00 | -57.17 | 12.70 | -68.96 | 3.35 | H | -59.61 | 86.58 | Peak |
| | 7,495.50 | -52.81 | 11.20 | -54.49 | 4.29 | H | -47.58 | 74.55 | Peak |
| | 9,994.00 | -54.72 | 11.89 | -53.03 | 5.04 | H | -46.18 | 73.15 | Peak |
| | 12,492.50 | -47.45 | 13.88 | -45.88 | 5.78 | H | -37.78 | 64.75 | Peak |
| 40620 (2593.0) | 5,186.00 | -56.77 | 12.75 | -68.54 | 3.44 | V | -59.23 | 86.20 | Peak |
| | 7,779.00 | -50.75 | 11.65 | -53.39 | 4.36 | V | -46.10 | 73.07 | Peak |
| | 10,372.00 | -49.84 | 10.75 | -46.58 | 5.16 | V | -40.99 | 67.96 | Peak |
| | 12,965.00 | -47.85 | 13.40 | -42.42 | 5.81 | V | -34.83 | 61.80 | Peak |
| | 15,558.00 | -51.87 | 16.08 | -46.17 | 6.32 | V | -36.41 | 63.38 | Peak |
| 41565 (2687.5) | 5,375.00 | -57.38 | 13.52 | -68.65 | 3.52 | H | -58.65 | 85.63 | Peak |
| | 8,062.50 | -54.11 | 10.93 | -54.72 | 4.45 | V | -48.24 | 75.21 | Peak |
| | 10,750.00 | -48.42 | 10.90 | -44.84 | 5.31 | V | -39.25 | 66.22 | Peak |
| | 13,437.50 | -49.60 | 12.63 | -42.58 | 5.84 | V | -35.79 | 62.76 | Peak |

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 26.85 dBm = 0.484 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 10 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 51.85 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L | Pol | EIRP (dBm) | dBc | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 39700 (2501.0) | 5,002.00 | -55.99 | 12.70 | -67.78 | 3.35 | H | -58.43 | 85.28 | Peak |
| | 7,503.00 | -50.55 | 11.20 | -52.12 | 4.29 | H | -45.21 | 72.06 | Peak |
| | 10,004.00 | -56.34 | 10.84 | -53.63 | 5.03 | H | -47.82 | 74.67 | Peak |
| | 12,505.00 | -48.55 | 13.90 | -46.52 | 5.72 | H | -38.34 | 65.19 | Peak |
| 40620 (2593.0) | 5,186.00 | -57.43 | 12.75 | -69.20 | 3.44 | H | -59.89 | 86.74 | Peak |
| | 7,779.00 | -50.01 | 11.65 | -52.65 | 4.36 | V | -45.36 | 72.21 | Peak |
| | 10,372.00 | -51.68 | 10.75 | -48.42 | 5.16 | V | -42.83 | 69.68 | Peak |
| | 12,965.00 | -49.54 | 13.40 | -44.11 | 5.81 | H | -36.52 | 63.37 | Peak |
| 41540 (2685.0) | 5,370.00 | -56.22 | 13.25 | -67.30 | 3.52 | V | -57.57 | 84.42 | Peak |
| | 8,055.00 | -57.96 | 10.92 | -58.56 | 4.46 | V | -52.10 | 78.95 | Peak |
| | 10,740.00 | -51.43 | 10.90 | -48.13 | 5.29 | H | -42.52 | 69.37 | Peak |
| | 13,425.00 | -51.60 | 12.65 | -45.06 | 5.87 | V | -38.28 | 65.13 | Peak |

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 26.88 dBm = 0.488 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 15 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 51.88 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L | Pol | EIRP (dBm) | dBc | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 39725 (2503.5) | 5,007.00 | -56.18 | 12.65 | -67.23 | 3.35 | V | -57.93 | 84.81 | Peak |
| | 7,510.50 | -51.29 | 11.25 | -53.06 | 4.29 | H | -46.10 | 72.98 | Peak |
| | 10,014.00 | -54.25 | 11.02 | -51.47 | 5.03 | V | -45.48 | 72.36 | Peak |
| | 12,517.50 | -47.29 | 13.90 | -44.98 | 5.66 | H | -36.74 | 63.62 | Peak |
| 40620 (2593.0) | 5,186.00 | -56.91 | 12.75 | -68.68 | 3.44 | H | -59.37 | 86.25 | Peak |
| | 7,779.00 | -50.96 | 11.65 | -53.60 | 4.36 | V | -46.31 | 73.19 | Peak |
| | 10,372.00 | -51.42 | 10.75 | -48.16 | 5.16 | V | -42.57 | 69.45 | Peak |
| | 12,965.00 | -48.03 | 13.40 | -42.60 | 5.81 | V | -35.01 | 61.89 | Peak |
| | 15,558.00 | -54.71 | 16.08 | -49.01 | 6.32 | V | -39.25 | 66.13 | Peak |
| 41515 (2682.5) | 5,365.00 | -56.85 | 13.27 | -67.95 | 3.52 | V | -58.20 | 85.08 | Peak |
| | 8,047.50 | -55.25 | 10.90 | -55.83 | 4.46 | V | -49.39 | 76.27 | Peak |
| | 10,730.00 | -54.98 | 10.90 | -51.80 | 5.25 | H | -46.15 | 73.03 | Peak |
| | 13,412.50 | -52.39 | 12.68 | -45.82 | 5.87 | H | -39.01 | 65.90 | Peak |

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 26.52 dBm = 0.449 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 20 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 51.52 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L | Pol | EIRP (dBm) | dBc | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 39750 (2506.0) | 5,012.00 | -56.09 | 12.65 | -67.14 | 3.35 | H | -57.84 | 84.36 | Peak |
| | 7,518.00 | -49.33 | 11.30 | -51.32 | 4.30 | H | -44.32 | 70.84 | Peak |
| | 10,024.00 | -54.56 | 11.05 | -51.70 | 5.02 | H | -45.67 | 72.19 | Peak |
| | 12,530.00 | -44.90 | 13.90 | -42.34 | 5.67 | H | -34.11 | 60.63 | Peak |
| 40620 (2593.0) | 5,186.00 | -46.60 | 12.75 | -58.37 | 3.44 | V | -49.06 | 75.58 | Peak |
| | 7,779.00 | -51.98 | 11.65 | -54.62 | 4.36 | V | -47.33 | 73.85 | Peak |
| | 10,372.00 | -49.90 | 10.75 | -46.64 | 5.16 | H | -41.05 | 67.57 | Peak |
| | 12,965.00 | -46.47 | 13.40 | -41.04 | 5.81 | H | -33.45 | 59.97 | Peak |
| | 15,558.00 | -53.70 | 16.08 | -48.00 | 6.32 | V | -38.24 | 64.76 | Peak |
| 41490 (2680.0) | 5,360.00 | -56.01 | 13.28 | -67.13 | 3.51 | V | -57.36 | 83.88 | Peak |
| | 8,040.00 | -53.91 | 10.93 | -54.56 | 4.48 | H | -48.11 | 74.63 | Peak |
| | 10,720.00 | -54.29 | 10.90 | -51.50 | 5.24 | V | -45.84 | 72.36 | Peak |
| | 13,400.00 | -49.18 | 12.70 | -42.59 | 5.87 | H | -35.76 | 62.28 | Peak |

### 8.2.2 Power Class 2

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 29.88 dBm = 0.973 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 5 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 54.88 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L | Pol | EIRP (dBm) | dBc | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 39675 (2498.5) | 4,997.00 | -49.80 | 12.70 | -61.59 | 3.35 | H | -52.24 | 82.12 | Peak |
| | 7,495.50 | -45.71 | 11.20 | -47.39 | 4.29 | H | -40.48 | 70.36 | Peak |
| | 9,994.00 | -51.78 | 11.89 | -50.09 | 5.04 | V | -43.24 | 73.12 | Peak |
| | 12,492.50 | -42.84 | 13.88 | -41.27 | 5.78 | H | -33.17 | 63.05 | Peak |
| | 14,991.00 | -49.17 | 12.83 | -41.64 | 6.21 | H | -35.02 | 64.90 | Peak |
| 40620 (2593.0) | 5,186.00 | -56.99 | 12.75 | -68.76 | 3.44 | V | -59.45 | 89.33 | Peak |
| | 7,779.00 | -47.39 | 11.65 | -50.03 | 4.36 | V | -42.74 | 72.62 | Peak |
| | 10,372.00 | -47.65 | 10.75 | -44.39 | 5.16 | H | -38.80 | 68.68 | Peak |
| | 12,965.00 | -45.95 | 13.40 | -40.52 | 5.81 | H | -32.93 | 62.82 | Average |
| | 15,558.00 | -51.59 | 16.08 | -45.89 | 6.32 | V | -36.13 | 66.01 | Peak |
| 41565 (2687.5) | 5,375.00 | -52.96 | 13.52 | -64.23 | 3.52 | V | -54.23 | 84.12 | Peak |
| | 8,062.50 | -47.98 | 10.93 | -48.59 | 4.45 | H | -42.11 | 71.99 | Peak |
| | 10,750.00 | -47.39 | 10.90 | -43.81 | 5.31 | V | -38.22 | 68.10 | Peak |
| | 13,437.50 | -47.71 | 12.63 | -40.69 | 5.84 | H | -33.90 | 63.78 | Average |

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 29.76 dBm = 0.946 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 10 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 54.76 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L | Pol | EIRP (dBm) | dBc | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 39700 (2501.0) | 5,002.00 | -53.06 | 12.70 | -64.85 | 3.35 | H | -55.50 | 85.26 | Peak |
| | 7,503.00 | -46.73 | 11.20 | -48.30 | 4.29 | H | -41.39 | 71.15 | Peak |
| | 10,004.00 | -51.29 | 10.84 | -48.58 | 5.03 | H | -42.77 | 72.53 | Peak |
| | 12,505.00 | -43.29 | 13.90 | -41.26 | 5.72 | V | -33.08 | 62.84 | Peak |
| | 15,006.00 | -49.58 | 12.93 | -41.99 | 6.21 | H | -35.27 | 65.03 | Peak |
| 40620 (2593.0) | 5,186.00 | -56.45 | 12.75 | -68.22 | 3.44 | H | -58.91 | 88.67 | Peak |
| | 7,779.00 | -48.41 | 11.65 | -51.05 | 4.36 | H | -43.76 | 73.52 | Peak |
| | 10,372.00 | -48.51 | 10.75 | -45.25 | 5.16 | H | -39.66 | 69.42 | Peak |
| | 12,965.00 | -46.08 | 13.40 | -40.65 | 5.81 | H | -33.06 | 62.83 | Average |
| | 15,558.00 | -51.22 | 16.08 | -45.52 | 6.32 | H | -35.76 | 65.52 | Peak |
| 41540 (2685.0) | 5,370.00 | -56.23 | 13.25 | -67.31 | 3.52 | V | -57.58 | 87.34 | Peak |
| | 8,055.00 | -51.72 | 10.92 | -52.32 | 4.46 | H | -45.86 | 75.62 | Peak |
| | 10,740.00 | -49.06 | 10.90 | -45.76 | 5.29 | V | -40.15 | 69.91 | Peak |
| | 13,425.00 | -43.68 | 12.65 | -37.14 | 5.87 | V | -30.36 | 60.12 | Peak |

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 29.77 dBm = 0.949 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 15 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 54.77 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L | Pol | EIRP (dBm) | dBc | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 39725 (2503.5) | 5,007.00 | -52.89 | 12.65 | -63.94 | 3.35 | H | -54.64 | 84.41 | Peak |
| | 7,510.50 | -41.87 | 11.25 | -43.64 | 4.29 | H | -36.68 | 66.45 | Peak |
| | 10,014.00 | -52.56 | 11.02 | -49.78 | 5.03 | V | -43.79 | 73.56 | Peak |
| | 12,517.50 | -43.05 | 13.90 | -40.74 | 5.66 | H | -32.50 | 62.27 | Peak |
| | 15,021.00 | -50.15 | 13.00 | -42.68 | 6.22 | V | -35.90 | 65.67 | Peak |
| 40620 (2593.0) | 5,186.00 | -57.07 | 12.75 | -68.84 | 3.44 | V | -59.53 | 89.30 | Peak |
| | 7,779.00 | -49.61 | 11.65 | -52.25 | 4.36 | H | -44.96 | 74.73 | Peak |
| | 10,372.00 | -50.78 | 10.75 | -47.52 | 5.16 | H | -41.93 | 71.70 | Peak |
| | 12,965.00 | -43.03 | 13.40 | -37.60 | 5.81 | V | -30.01 | 59.78 | Peak |
| | 15,558.00 | -54.10 | 16.08 | -48.40 | 6.32 | H | -38.64 | 68.41 | Peak |
| 41515 (2682.5) | 5,365.00 | -55.85 | 13.27 | -66.95 | 3.52 | V | -57.20 | 86.97 | Peak |
| | 8,047.50 | -48.92 | 10.90 | -49.50 | 4.46 | H | -43.06 | 72.83 | Peak |
| | 10,730.00 | -51.16 | 10.90 | -47.98 | 5.25 | V | -42.33 | 72.10 | Peak |
| | 13,412.50 | -44.12 | 12.68 | -37.55 | 5.87 | H | -30.74 | 60.52 | Peak |

▣ OPERATING FREQUENCY : 2593.0 MHz

▣ MEASURED OUTPUT POWER: 29.44 dBm = 0.879 W

▣ MODE: LTE B41

▣ MODULATION SIGNAL: 20 MHz QPSK

▣ DISTANCE: 1 meters

▣ LIMIT: 55 + 10 log10 (W) = 54.44 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L | Pol | EIRP (dBm) | dBc | Detector |
|---|---|---|---|---|---|---|---|---|---|
| 39750 (2506.0) | 5,012.00 | -50.91 | 12.65 | -61.96 | 3.35 | H | -52.66 | 82.10 | Peak |
| | 7,518.00 | -46.23 | 11.30 | -48.22 | 4.30 | V | -41.22 | 70.66 | Peak |
| | 10,024.00 | -51.25 | 11.05 | -48.39 | 5.02 | H | -42.36 | 71.80 | Peak |
| | 12,530.00 | -43.16 | 13.90 | -40.60 | 5.67 | V | -32.37 | 61.81 | Peak |
| | 15,036.00 | -50.15 | 13.03 | -42.78 | 6.22 | V | -35.97 | 65.41 | Peak |
| 40620 (2593.0) | 5,186.00 | -56.41 | 12.75 | -68.18 | 3.44 | V | -58.87 | 88.31 | Peak |
| | 7,779.00 | -48.87 | 11.65 | -51.51 | 4.36 | V | -44.22 | 73.66 | Peak |
| | 10,372.00 | -50.28 | 10.75 | -47.02 | 5.16 | H | -41.43 | 70.87 | Peak |
| | 12,965.00 | -41.96 | 13.40 | -36.53 | 5.81 | H | -28.94 | 58.38 | Peak |
| | 15,558.00 | -52.19 | 16.08 | -46.49 | 6.32 | H | -36.73 | 66.17 | Peak |
| 41490 (2680.0) | 5,360.00 | -54.07 | 13.28 | -65.19 | 3.51 | V | -55.42 | 84.86 | Peak |
| | 8,040.00 | -48.23 | 10.93 | -48.88 | 4.48 | H | -42.43 | 71.87 | Peak |
| | 10,720.00 | -51.53 | 10.90 | -48.74 | 5.24 | V | -43.08 | 72.52 | Peak |
| | 13,400.00 | -48.52 | 12.70 | -41.93 | 5.87 | V | -35.10 | 64.54 | Peak |

## 8.3 PEAK-TO-AVERAGE RATIO

### 8.3.1 Power Class 3

| Band | Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resource Block Offset | Data (dB ) |
|---|---|---|---|---|---|---|
| 41 | 5 MHz | 2593.0 | QPSK | 25 | 0 | 5.80 |
| | | | 16-QAM | | | 6.20 |
| | | | 64-QAM | | | 6.21 |
| | 10 MHz | | QPSK | 50 | | 5.74 |
| | | | 16-QAM | | | 5.95 |
| | | | 64-QAM | | | 6.01 |
| | 15 MHz | | QPSK | 75 | | 5.69 |
| | | | 16-QAM | | | 5.95 |
| | | | 64-QAM | | | 5.98 |
| | 20 MHz | | QPSK | 100 | | 5.71 |
| | | | 16-QAM | | | 5.97 |
| | | | 64-QAM | | | 6.00 |

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 93 ~ 104.

### 8.3.2 Power Class 2

| Band | Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resource Block Offset | Data (dB ) |
|---|---|---|---|---|---|---|
| 41 | 5 MHz | 2593.0 | QPSK | 25 | 0 | 5.88 |
| | | | 16-QAM | | | 6.15 |
| | | | 64-QAM | | | 6.14 |
| | 10 MHz | | QPSK | 50 | | 5.82 |
| | | | 16-QAM | | | 6.04 |
| | | | 64-QAM | | | 6.06 |
| | 15 MHz | | QPSK | 75 | | 5.70 |
| | | | 16-QAM | | | 5.97 |
| | | | 64-QAM | | | 6.04 |
| | 20 MHz | | QPSK | 100 | | 5.77 |
| | | | 16-QAM | | | 6.04 |
| | | | 64-QAM | | | 6.08 |

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 105 ~ 116.

## 8.4 OCCUPIED BANDWIDTH

### 8.4.1 Power Class 3

| Band | Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resource Block Offset | Data ( MHz ) |
|---|---|---|---|---|---|---|
| 41 | 5 MHz | 2593.0 | QPSK | 25 | 0 | 4.5194 |
| | | | 16-QAM | | | 4.5388 |
| | | | 64-QAM | | | 4.5397 |
| | 10 MHz | | QPSK | 50 | | 8.9793 |
| | | | 16-QAM | | | 9.0120 |
| | | | 64-QAM | | | 8.9863 |
| | 15 MHz | | QPSK | 75 | | 13.485 |
| | | | 16-QAM | | | 13.449 |
| | | | 64-QAM | | | 13.473 |
| | 20 MHz | | QPSK | 100 | | 17.909 |
| | | | 16-QAM | | | 17.938 |
| | | | 64-QAM | | | 17.932 |

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 69 ~ 80.

### 8.4.2 Power Class 2

| Band | Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resource Block Offset | Data ( MHz ) |
|---|---|---|---|---|---|---|
| 41 | 5 MHz | 2593.0 | QPSK | 25 | 0 | 4.5006 |
| | | | 16-QAM | | | 4.5155 |
| | | | 64-QAM | | | 4.5313 |
| | 10 MHz | | QPSK | 50 | | 9.0035 |
| | | | 16-QAM | | | 8.9805 |
| | | | 64-QAM | | | 8.9585 |
| | 15 MHz | | QPSK | 75 | | 13.452 |
| | | | 16-QAM | | | 13.465 |
| | | | 64-QAM | | | 13.458 |
| | 20 MHz | | QPSK | 100 | | 17.914 |
| | | | 16-QAM | | | 17.933 |
| | | | 64-QAM | | | 17.909 |

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 81 ~ 92.

## 8.5 CONDUCTED SPURIOUS EMISSIONS

### 8.5.1 Power Class 3

| Band | Band Width (MHz) | Frequency (MHz) | Frequency of Maximum Harmonic (GHz) | Factor (dB) | Measurement Maximum Data (dBm) | Result (dBm) | Limit (dBm) |
|---|---|---|---|---|---|---|---|
| 41 | 5 | 2498.5 | 25.8623 | 30.131 | -66.218 | -36.087 | -25.00 |
| | | 2593.0 | 26.0974 | 30.131 | -66.698 | -36.567 | |
| | | 2687.5 | 26.0908 | 30.131 | -66.605 | -36.474 | |
| | 10 | 2501.0 | 26.3936 | 30.131 | -66.148 | -36.017 | |
| | | 2593.0 | 25.8136 | 30.131 | -66.519 | -36.388 | |
| | | 2685.0 | 26.1547 | 30.131 | -66.895 | -36.764 | |
| | 15 | 2503.5 | 25.8198 | 30.131 | -66.262 | -36.131 | |
| | | 2593.0 | 26.0941 | 30.131 | -66.541 | -36.410 | |
| | | 2682.5 | 26.3569 | 30.131 | -66.169 | -36.038 | |
| | 20 | 2506.0 | 26.1374 | 30.131 | -66.684 | -36.553 | |
| | | 2593.0 | 25.9303 | 30.131 | -66.648 | -36.517 | |
| | | 2680.0 | 25.8647 | 30.131 | -66.574 | -36.443 | |

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 173 ~ 200.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor(dB) = Cable Loss + Attenuator + Power Splitter

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

### 8.5.2 Power Class 2

| Band | Band Width (MHz) | Frequency (MHz) | Frequency of Maximum Harmonic (GHz) | Factor (dB) | Measurement Maximum Data (dBm) | Result (dBm) | Limit (dBm) |
|---|---|---|---|---|---|---|---|
| 41 | 5 | 2498.5 | 26.4163 | 30.131 | -67.028 | -36.897 | -25.00 |
| | | 2593.0 | 2.7234 | 27.976 | -66.933 | -38.957 | |
| | | 2687.5 | 25.6647 | 30.131 | -66.802 | -36.671 | |
| | 10 | 2501.0 | 26.2500 | 30.131 | -67.137 | -37.006 | |
| | | 2593.0 | 26.0582 | 30.131 | -66.854 | -36.723 | |
| | | 2685.0 | 26.1848 | 30.131 | -66.114 | -35.983 | |
| | 15 | 2503.5 | 0.8411 | 25.270 | -62.299 | -37.029 | |
| | | 2593.0 | 26.4183 | 30.131 | -66.225 | -36.094 | |
| | | 2682.5 | 10.7570 | 29.116 | -66.185 | -37.069 | |
| | 20 | 2506.0 | 0.8455 | 25.270 | -62.786 | -37.516 | |
| | | 2593.0 | 26.4447 | 30.131 | -66.608 | -36.477 | |
| | | 2680.0 | 26.2339 | 30.131 | -66.470 | -36.339 | |

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 201 ~ 228.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor(dB) = Cable Loss + Attenuator + Power Splitter

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

## 8.6 CHANNEL EDGE

### 8.6.1 Power Class 3

| Band Width | Frequency (MHz) | Modulation | RB (Size/ Offset) | 2 495 MHz ~ 2 496 MHz | C.E ~ (C.E +NormalHz) | 2 490.5 MHz ~ 2 495 MHz | (C.E + 1 MHz) ~ (C.E + 5 MHz) | Below 2 490.5 MHz | (C.E + 5 MHz) ~ (C.E + X MHz) | Above (C.E + X MHz) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lower | Upper | Lower | Upper | Lower | Upper | Upper |
| 5 MHz | 2498.5 | QPSK | 25/0 | -27.13 | -22.90 | -27.40 | -26.82 | -39.51 | -38.36 | -39.86 |
| 10 MHz | 2501.0 | QPSK | 50/0 | -26.27 | -26.24 | -26.08 | -26.93 | -34.56 | -31.17 | -40.99 |
| 15 MHz | 2503.5 | QPSK | 75/0 | -29.08 | -29.05 | -30.21 | -29.41 | -35.57 | -36.26 | -41.92 |
| 20 MHz | 2506.0 | QPSK | 100/0 | -30.03 | -29.46 | -29.90 | -30.71 | -35.62 | -34.92 | -43.00 |
| Limit | | | | -13.0 | -10.0 | -13.0 | -10.0 | -25.0 | -13.0 | -25.0 |

| Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resoure Block Offset | C.E ~ (C.E ± NormalHz) | | (C.E ± 1 MHz) ~ (C.E ± 5 MHz) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower | Upper | Lower | Upper |
| 5 MHz | 2593.0 | QPSK | 25 | 0 | -23.89 | -23.09 | -26.77 | -27.98 |
| | 2687.5 | QPSK | 25 | 0 | -22.40 | -22.07 | -23.75 | -23.73 |
| 10 MHz | 2593.0 | QPSK | 50 | 0 | -28.23 | -27.27 | -26.58 | -27.39 |
| | 2685.0 | QPSK | 50 | 0 | -25.59 | -27.41 | -24.68 | -27.49 |
| 15 MHz | 2593.0 | QPSK | 75 | 0 | -29.11 | -30.27 | -28.93 | -30.00 |
| | 2682.5 | QPSK | 75 | 0 | -27.80 | -29.64 | -27.59 | -28.49 |
| 20 MHz | 2593.0 | QPSK | 100 | 0 | -28.26 | -29.31 | -27.27 | -28.66 |
| | 2680.0 | QPSK | 100 | 0 | -29.30 | -30.16 | -29.16 | -29.96 |
| Limit | | | | | -10.0 | | -10.0 | |

| Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resoure Block Offset | (C.E ± 5 MHz) ~ (C.E ± X MHz) | | Above (C.E ± X MHz) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower | Upper | Lower | Upper |
| 5 MHz | 2593.0 | QPSK | 25 | 0 | -36.98 | -38.50 | -37.50 | -39.16 |
| | 2687.5 | QPSK | 25 | 0 | -35.52 | -37.45 | -36.17 | -38.33 |
| 10 MHz | 2593.0 | QPSK | 50 | 0 | -33.51 | -32.96 | -40.04 | -41.91 |
| | 2685.0 | QPSK | 50 | 0 | -30.64 | -32.16 | -38.38 | -41.44 |
| 15 MHz | 2593.0 | QPSK | 75 | 0 | -35.08 | -35.23 | -38.77 | -42.95 |
| | 2682.5 | QPSK | 75 | 0 | -31.05 | -32.14 | -36.98 | -43.18 |
| 20 MHz | 2593.0 | QPSK | 100 | 0 | -31.43 | -31.12 | -39.37 | -43.00 |
| | 2680.0 | QPSK | 100 | 0 | -31.93 | -33.48 | -40.14 | -46.29 |
| Limit | | | | | -13.0 | | -25.0 | |

Note:

1. C.E = Channel Edge
2. X = X is the greater of 6MHz or the actual emission bandwidth.
3. X = 6MHz(5MHz Bandwidth), 10MHz(10MHz Bandwidth), 15MHz(15MHz Bandwidth), 20MHz(20MHz Bandwidth)
4. Plots of the EUT's Channel Edge are shown Page 117 ~ 144. (1RB & Full RB)

### 8.6.2 Power Class 2

| Band Width | Frequency (MHz) | Modulation | RB (Size/ Offset) | 2 495 MHz ~ 2 496 MHz | C.E ~ (C.E +NormalHz) | 2 490.5 MHz ~ 2 495 MHz | (C.E + 1 MHz) ~ (C.E + 5 MHz) | Below 2 490.5 MHz | (C.E + 5 MHz) ~ (C.E + X MHz) | Above (C.E + X MHz) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Lower | Upper | Lower | Upper | Lower | Upper | Upper |
| 5 MHz | 2498.5 | QPSK | 25/0 | -19.41 | -20.34 | -22.28 | -22.91 | -37.49 | -35.37 | -36.45 |
| 10 MHz | 2501.0 | QPSK | 50/0 | -22.99 | -21.91 | -20.33 | -22.12 | -29.43 | -28.73 | -37.69 |
| 15 MHz | 2503.5 | QPSK | 75/0 | -25.31 | -24.48 | -23.91 | -25.98 | -29.43 | -31.12 | -36.35 |
| 20 MHz | 2506.0 | QPSK | 100/0 | -25.00 | -27.00 | -23.45 | -28.15 | -29.58 | -32.04 | -36.28 |
| Limit | | | | -13.0 | -10.0 | -13.0 | -10.0 | -25.0 | -13.0 | -25.0 |

| Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resoure Block Offset | C.E ~ (C.E ± NormalHz) | | (C.E ± 1 MHz) ~ (C.E ± 5 MHz) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower | Upper | Lower | Upper |
| 5 MHz | 2593.0 | QPSK | 25 | 0 | -20.76 | -20.35 | -20.70 | -23.45 |
| | 2687.5 | QPSK | 25 | 0 | -19.47 | -19.26 | -19.50 | -18.38 |
| 10 MHz | 2593.0 | QPSK | 50 | 0 | -22.61 | -22.36 | -20.55 | -22.81 |
| | 2685.0 | QPSK | 50 | 0 | -21.81 | -22.27 | -21.40 | -22.97 |
| 15 MHz | 2593.0 | QPSK | 75 | 0 | -24.70 | -25.15 | -23.38 | -24.57 |
| | 2682.5 | QPSK | 75 | 0 | -23.63 | -24.50 | -25.48 | -26.17 |
| 20 MHz | 2593.0 | QPSK | 100 | 0 | -23.49 | -24.72 | -21.54 | -23.71 |
| | 2680.0 | QPSK | 100 | 0 | -26.55 | -26.24 | -26.89 | -26.49 |
| Limit | | | | | -10.0 | | -10.0 | |

| Band Width | Frequency (MHz) | Modulation | Resource Block Size | Resoure Block Offset | (C.E ± 5 MHz) ~ (C.E ± X MHz) | | Above (C.E ± X MHz) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower | Upper | Lower | Upper |
| 5 MHz | 2593.0 | QPSK | 25 | 0 | -34.59 | -36.01 | -36.09 | -37.57 |
| | 2687.5 | QPSK | 25 | 0 | -32.72 | -34.86 | -32.97 | -35.91 |
| 10 MHz | 2593.0 | QPSK | 50 | 0 | -29.29 | -29.81 | -36.55 | -38.07 |
| | 2685.0 | QPSK | 50 | 0 | -29.22 | -26.87 | -34.08 | -36.82 |
| 15 MHz | 2593.0 | QPSK | 75 | 0 | -29.29 | -29.34 | -33.95 | -37.11 |
| | 2682.5 | QPSK | 75 | 0 | -29.14 | -29.05 | -33.78 | -39.45 |
| 20 MHz | 2593.0 | QPSK | 100 | 0 | -26.42 | -26.93 | -34.80 | -36.83 |
| | 2680.0 | QPSK | 100 | 0 | -29.75 | -28.63 | -34.16 | -41.75 |
| Limit | | | | | -13.0 | | -25.0 | |

Note:

1. C.E = Channel Edge
2. X = X is the greater of 6MHz or the actual emission bandwidth.
3. X = 6MHz(5MHz Bandwidth), 10MHz(10MHz Bandwidth), 15MHz(15MHz Bandwidth), 20MHz(20MHz Bandwidth)
4. Plots of the EUT's Channel Edge are shown Page 145 ~ 172. (1RB & Full RB)

## 8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

### 8.7.1 Power Class 3

▣ MODE: LTE 41

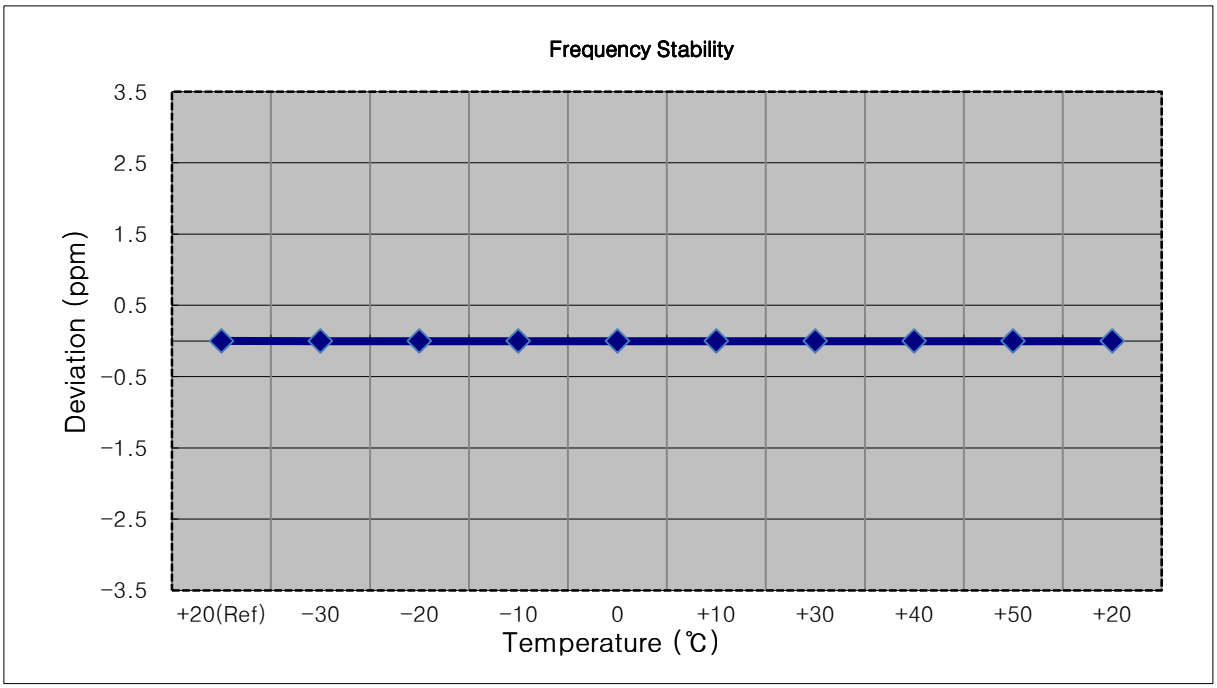
▣ OPERATING FREQUENCY: 2498,500,000 Hz

▣ BANDWIDTH: 39675 (5 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2498 499 993 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2498 499 987 | -6.8 | 0.000 000 | -0.003 |
| 100% | | -20 | 2498 499 987 | -6.9 | 0.000 000 | -0.003 |
| 100% | | -10 | 2498 499 985 | -8.1 | 0.000 000 | -0.003 |
| 100% | | 0 | 2498 499 987 | -6.2 | 0.000 000 | -0.002 |
| 100% | | +10 | 2498 499 985 | -8.3 | 0.000 000 | -0.003 |
| 100% | | +30 | 2498 499 986 | -7.6 | 0.000 000 | -0.003 |
| 100% | | +40 | 2498 499 986 | -7.9 | 0.000 000 | -0.003 |
| 100% | | +50 | 2498 499 986 | -7.3 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2498 499 986 | -7.9 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

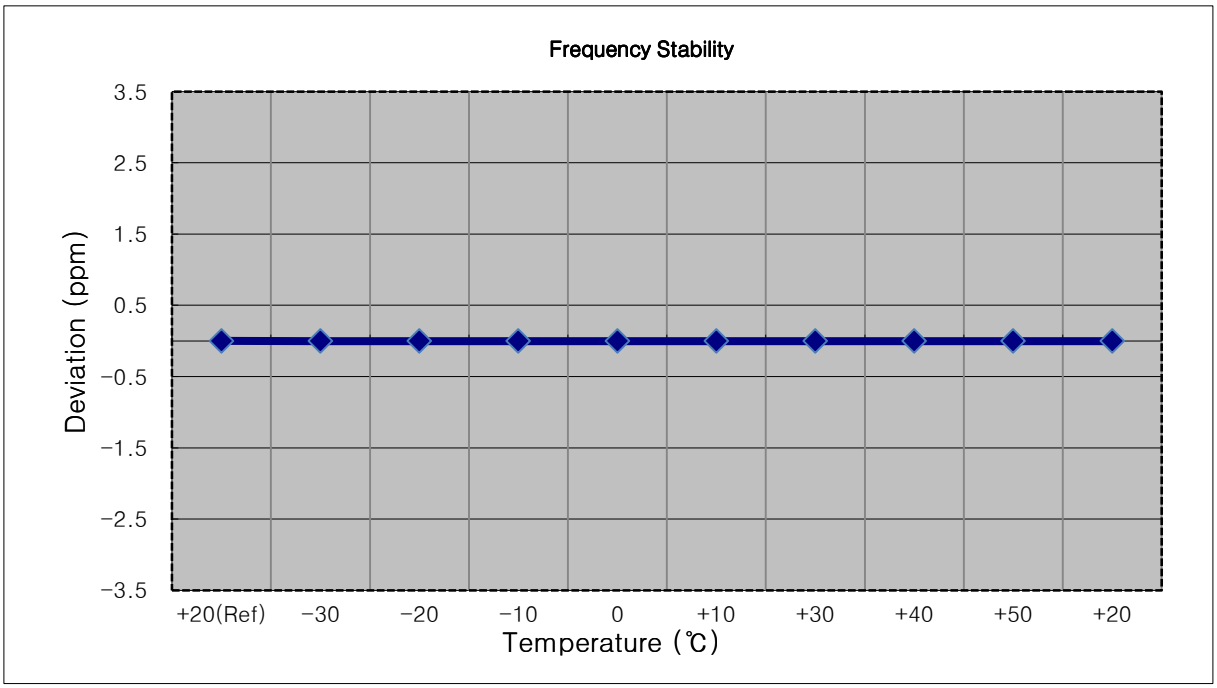
▣ OPERATING FREQUENCY: 2501,000,000 Hz

▣ BANDWIDTH: 39700 (10 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2500 999 992 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2500 999 983 | -9.2 | 0.000 000 | -0.004 |
| 100% | | -20 | 2500 999 984 | -8.2 | 0.000 000 | -0.003 |
| 100% | | -10 | 2500 999 985 | -7.6 | 0.000 000 | -0.003 |
| 100% | | 0 | 2500 999 983 | -8.8 | 0.000 000 | -0.004 |
| 100% | | +10 | 2500 999 984 | -7.8 | 0.000 000 | -0.003 |
| 100% | | +30 | 2500 999 984 | -8.1 | 0.000 000 | -0.003 |
| 100% | | +40 | 2500 999 984 | -8.7 | 0.000 000 | -0.003 |
| 100% | | +50 | 2500 999 985 | -7.1 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2500 999 983 | -8.8 | 0.000 000 | -0.004 |



▣ MODE: LTE 41

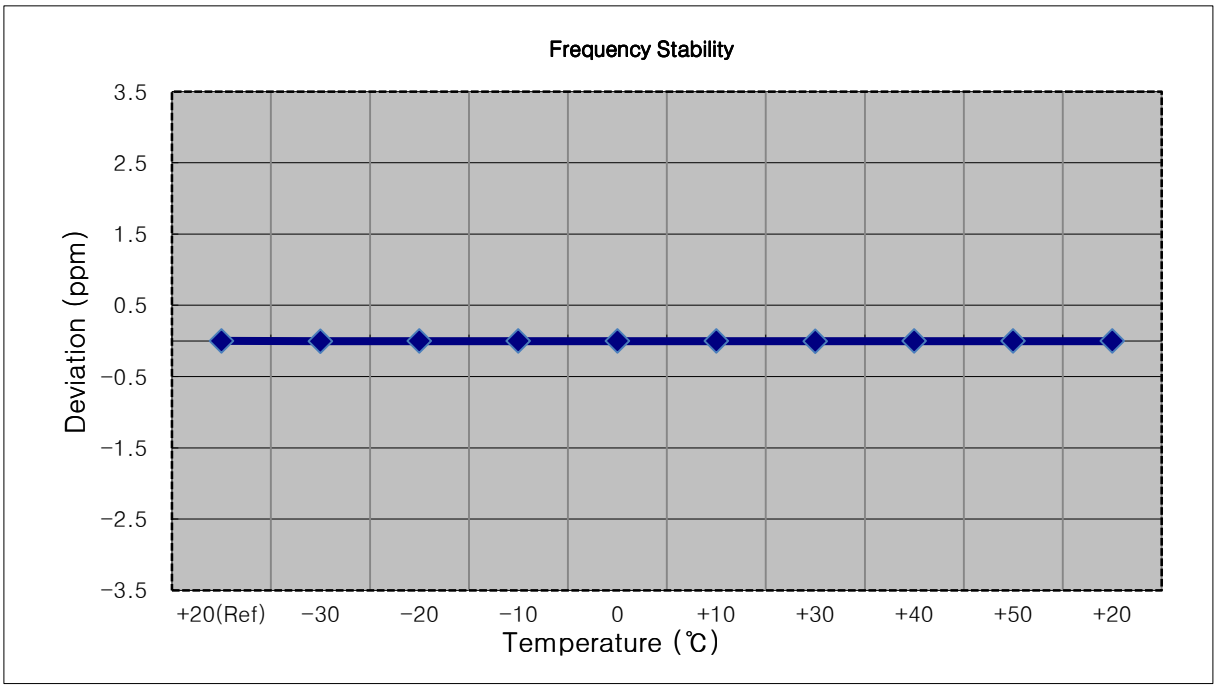
▣ OPERATING FREQUENCY: 2503,500,000 Hz

▣ BANDWIDTH: 39725 (15 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2503 499 990 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2503 499 980 | -10.1 | 0.000 000 | -0.004 |
| 100% | | -20 | 2503 499 984 | -6.3 | 0.000 000 | -0.003 |
| 100% | | -10 | 2503 499 984 | -6.4 | 0.000 000 | -0.003 |
| 100% | | 0 | 2503 499 983 | -7.0 | 0.000 000 | -0.003 |
| 100% | | +10 | 2503 499 986 | -4.2 | 0.000 000 | -0.002 |
| 100% | | +30 | 2503 499 978 | -12.0 | 0.000 000 | -0.005 |
| 100% | | +40 | 2503 499 985 | -5.9 | 0.000 000 | -0.002 |
| 100% | | +50 | 2503 499 982 | -8.3 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2503 499 983 | -7.3 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

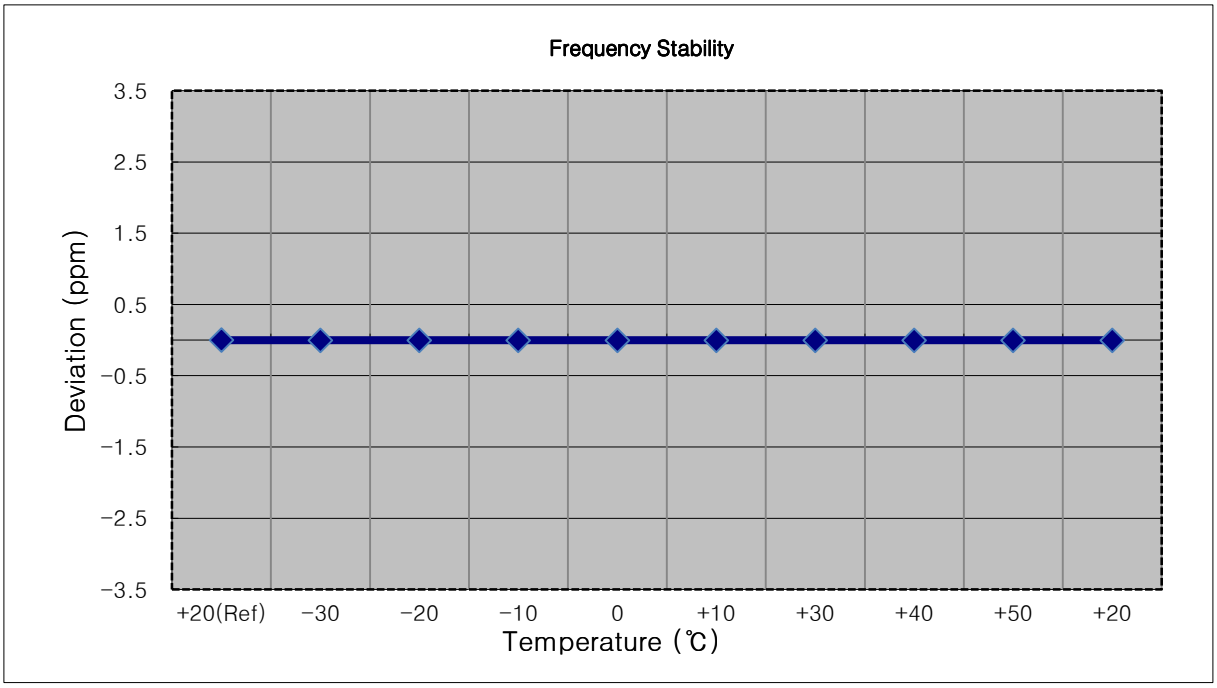
▣ OPERATING FREQUENCY: 2506,000,000 Hz

▣ BANDWIDTH: 39750 (20 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2505 999 995 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2505 999 987 | -7.1 | 0.000 000 | -0.003 |
| 100% | | -20 | 2505 999 987 | -7.2 | 0.000 000 | -0.003 |
| 100% | | -10 | 2505 999 986 | -8.7 | 0.000 000 | -0.003 |
| 100% | | 0 | 2505 999 987 | -7.1 | 0.000 000 | -0.003 |
| 100% | | +10 | 2505 999 988 | -6.4 | 0.000 000 | -0.003 |
| 100% | | +30 | 2505 999 985 | -9.9 | 0.000 000 | -0.004 |
| 100% | | +40 | 2505 999 988 | -6.5 | 0.000 000 | -0.003 |
| 100% | | +50 | 2505 999 987 | -7.4 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2505 999 988 | -7.0 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

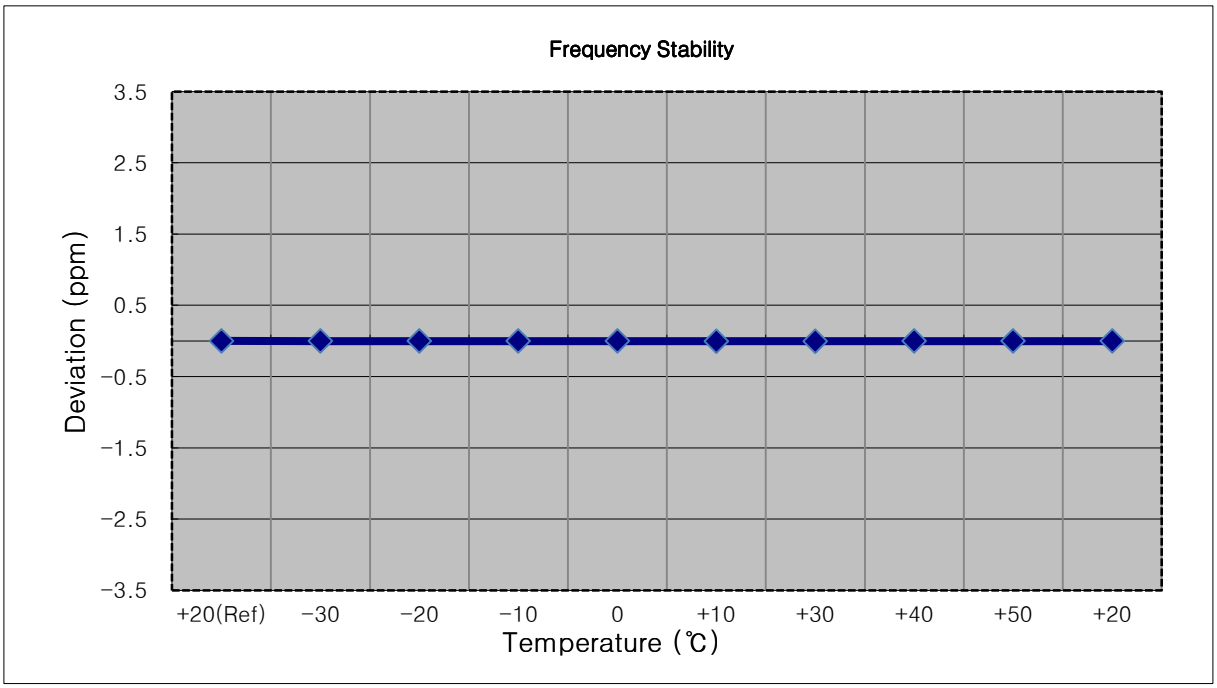
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (5 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2592 999 994 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2592 999 984 | -9.6 | 0.000 000 | -0.004 |
| 100% | | -20 | 2592 999 987 | -6.8 | 0.000 000 | -0.003 |
| 100% | | -10 | 2592 999 986 | -7.8 | 0.000 000 | -0.003 |
| 100% | | 0 | 2592 999 987 | -7.0 | 0.000 000 | -0.003 |
| 100% | | +10 | 2592 999 984 | -9.8 | 0.000 000 | -0.004 |
| 100% | | +30 | 2592 999 983 | -11.2 | 0.000 000 | -0.004 |
| 100% | | +40 | 2592 999 987 | -6.4 | 0.000 000 | -0.002 |
| 100% | | +50 | 2592 999 986 | -7.9 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2592 999 985 | -8.9 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

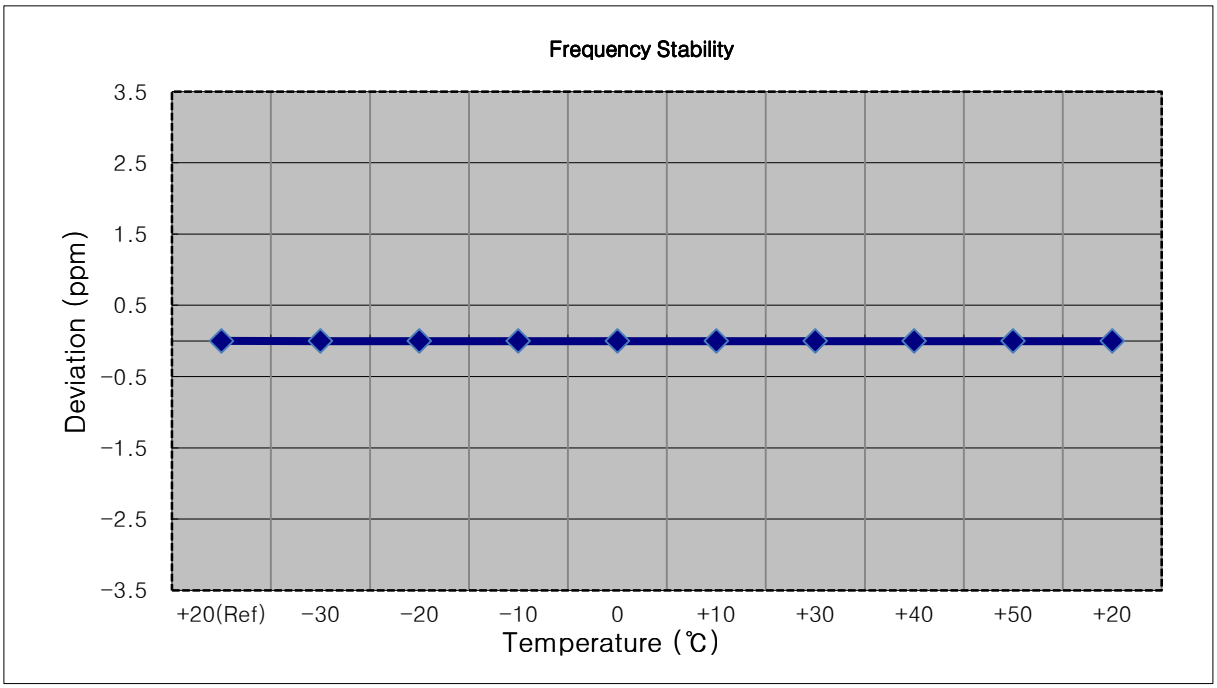
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (10 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2592 999 993 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2592 999 985 | -8.1 | 0.000 000 | -0.003 |
| 100% | | -20 | 2592 999 985 | -7.9 | 0.000 000 | -0.003 |
| 100% | | -10 | 2592 999 985 | -8.3 | 0.000 000 | -0.003 |
| 100% | | 0 | 2592 999 983 | -9.7 | 0.000 000 | -0.004 |
| 100% | | +10 | 2592 999 986 | -7.0 | 0.000 000 | -0.003 |
| 100% | | +30 | 2592 999 983 | -9.6 | 0.000 000 | -0.004 |
| 100% | | +40 | 2592 999 986 | -6.9 | 0.000 000 | -0.003 |
| 100% | | +50 | 2592 999 984 | -9.0 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2592 999 985 | -7.6 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

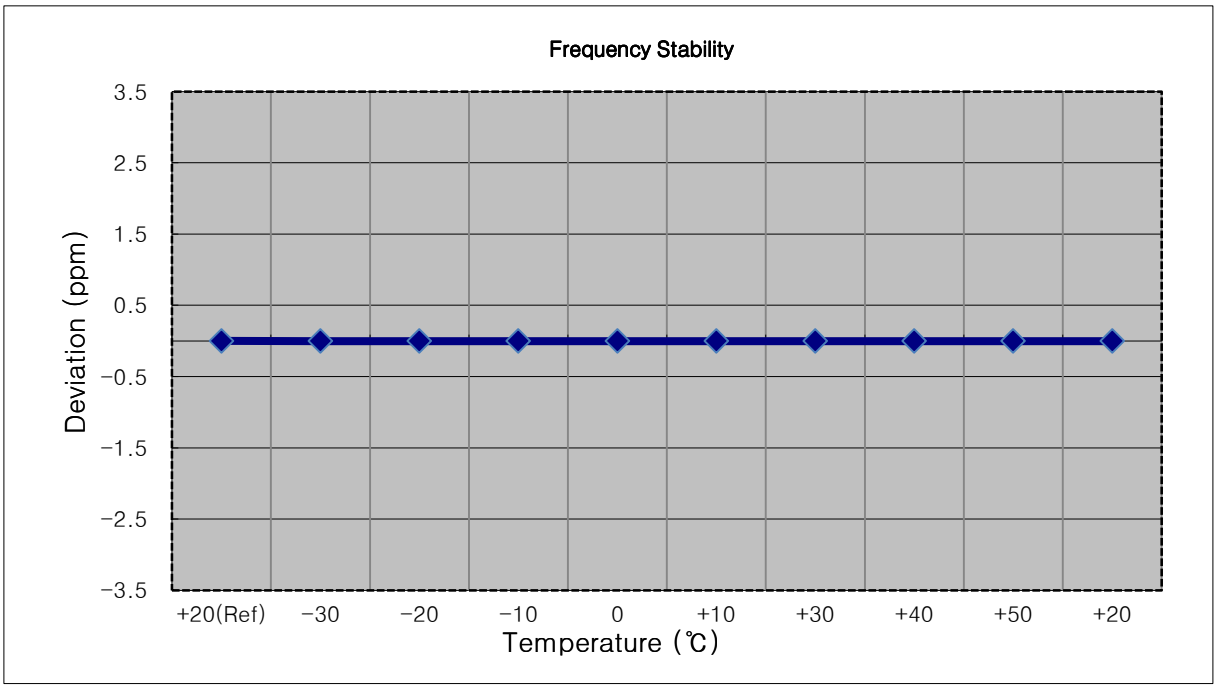
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (15 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2592 999 994 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2592 999 988 | -6.2 | 0.000 000 | -0.002 |
| 100% | | -20 | 2592 999 987 | -6.9 | 0.000 000 | -0.003 |
| 100% | | -10 | 2592 999 987 | -6.5 | 0.000 000 | -0.003 |
| 100% | | 0 | 2592 999 987 | -7.1 | 0.000 000 | -0.003 |
| 100% | | +10 | 2592 999 988 | -6.1 | 0.000 000 | -0.002 |
| 100% | | +30 | 2592 999 987 | -7.4 | 0.000 000 | -0.003 |
| 100% | | +40 | 2592 999 986 | -7.8 | 0.000 000 | -0.003 |
| 100% | | +50 | 2592 999 987 | -7.1 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2592 999 989 | -5.4 | 0.000 000 | -0.002 |



▣ MODE: LTE 41

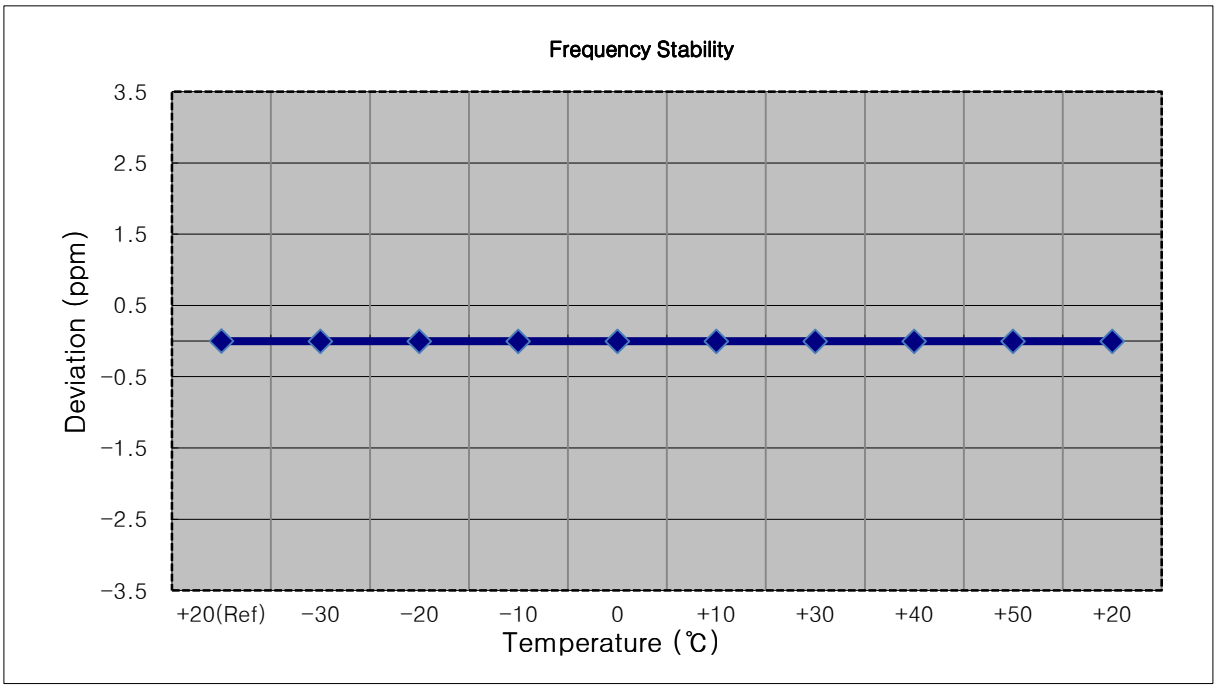
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (20 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2592 999 991 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2592 999 984 | -6.9 | 0.000 000 | -0.003 |
| 100% | | -20 | 2592 999 982 | -8.7 | 0.000 000 | -0.003 |
| 100% | | -10 | 2592 999 984 | -6.7 | 0.000 000 | -0.003 |
| 100% | | 0 | 2592 999 986 | -5.5 | 0.000 000 | -0.002 |
| 100% | | +10 | 2592 999 981 | -9.9 | 0.000 000 | -0.004 |
| 100% | | +30 | 2592 999 981 | -10.2 | 0.000 000 | -0.004 |
| 100% | | +40 | 2592 999 985 | -6.5 | 0.000 000 | -0.003 |
| 100% | | +50 | 2592 999 982 | -9.1 | 0.000 000 | -0.004 |
| 85% | 7.300 | +20 | 2592 999 983 | -8.0 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

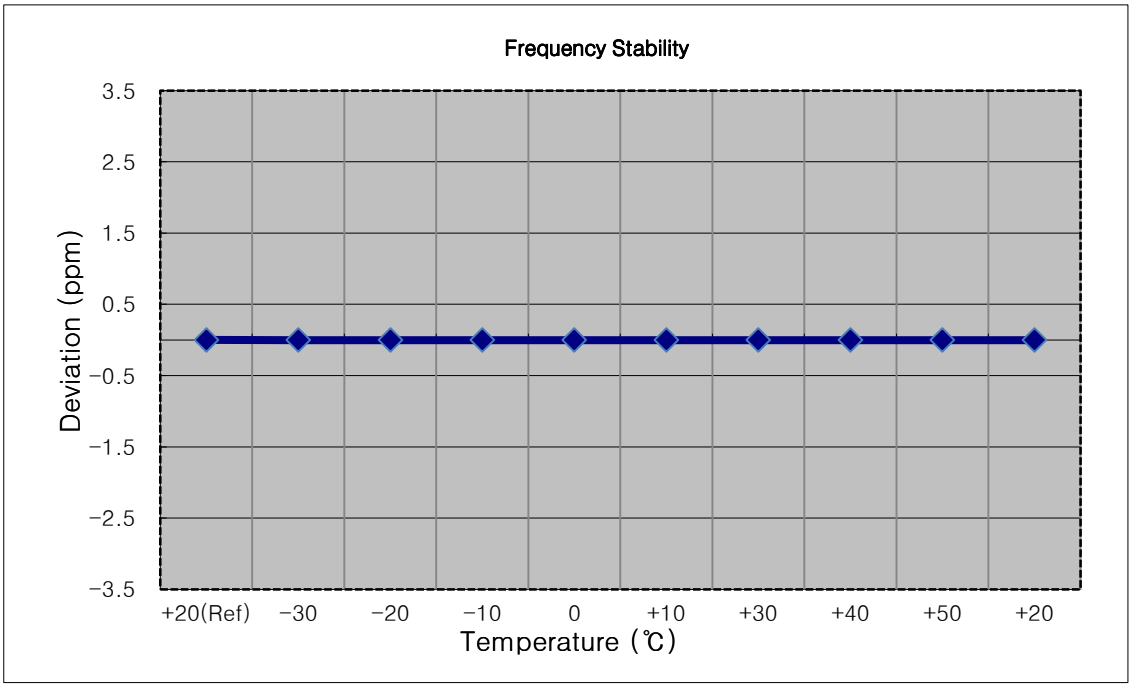
▣ OPERATING FREQUENCY: 2687,500,000 Hz

▣ BANDWIDTH: 41565 (5 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2687 499 992 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2687 499 986 | -6.1 | 0.000 000 | -0.002 |
| 100% | | -20 | 2687 499 984 | -7.9 | 0.000 000 | -0.003 |
| 100% | | -10 | 2687 499 984 | -8.2 | 0.000 000 | -0.003 |
| 100% | | 0 | 2687 499 985 | -6.8 | 0.000 000 | -0.003 |
| 100% | | +10 | 2687 499 987 | -5.1 | 0.000 000 | -0.002 |
| 100% | | +30 | 2687 499 987 | -5.4 | 0.000 000 | -0.002 |
| 100% | | +40 | 2687 499 984 | -7.7 | 0.000 000 | -0.003 |
| 100% | | +50 | 2687 499 985 | -7.3 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2687 499 983 | -9.5 | 0.000 000 | -0.004 |



▣ MODE: LTE 41

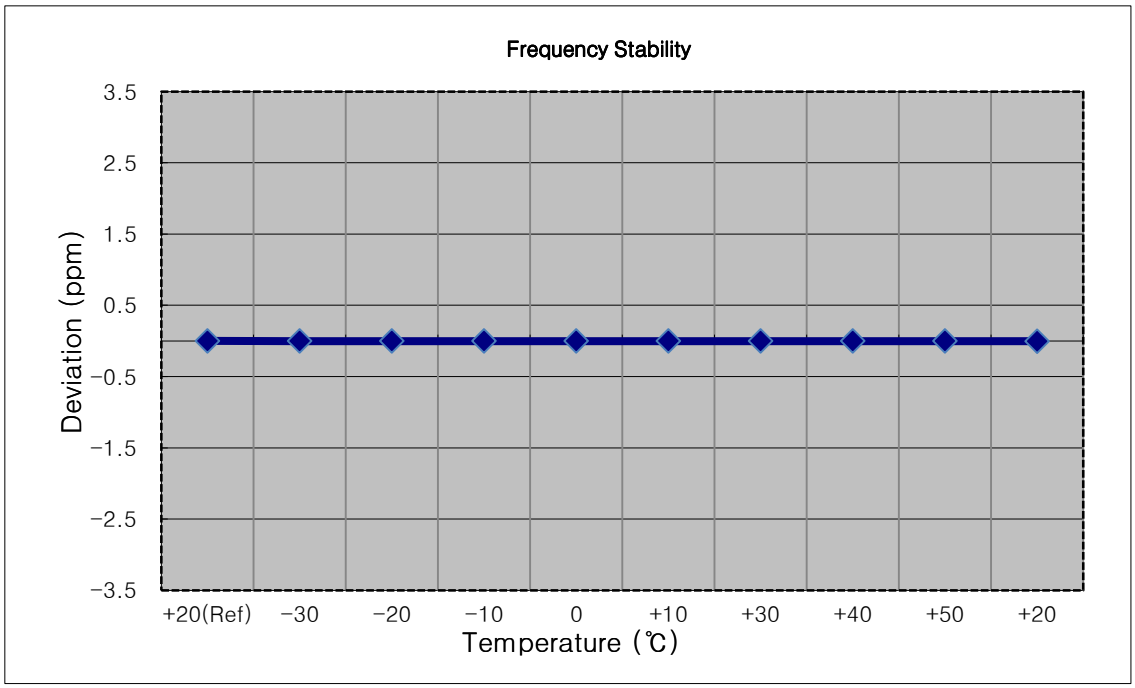
▣ OPERATING FREQUENCY: 2685,000,000 Hz

▣ BANDWIDTH: 41540 (10 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2684 999 993 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2684 999 985 | -8.1 | 0.000 000 | -0.003 |
| 100% | | -20 | 2684 999 985 | -7.6 | 0.000 000 | -0.003 |
| 100% | | -10 | 2684 999 986 | -7.5 | 0.000 000 | -0.003 |
| 100% | | 0 | 2684 999 984 | -8.6 | 0.000 000 | -0.003 |
| 100% | | +10 | 2684 999 985 | -8.2 | 0.000 000 | -0.003 |
| 100% | | +30 | 2684 999 984 | -9.5 | 0.000 000 | -0.004 |
| 100% | | +40 | 2684 999 986 | -7.0 | 0.000 000 | -0.003 |
| 100% | | +50 | 2684 999 985 | -8.0 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2684 999 982 | -11.2 | 0.000 000 | -0.004 |



▣ MODE: LTE 41

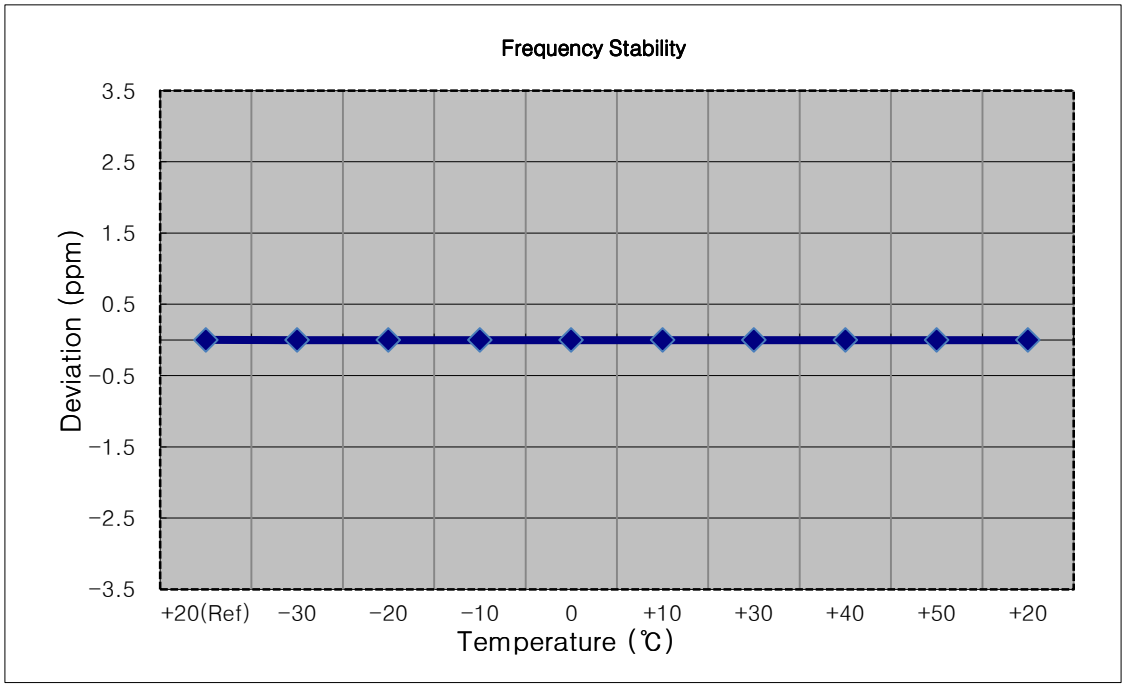
▣ OPERATING FREQUENCY: 2682,500,000 Hz

▣ BANDWIDTH: 41515 (15 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2682 499 993 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2682 499 985 | -7.9 | 0.000 000 | -0.003 |
| 100% | | -20 | 2682 499 988 | -4.8 | 0.000 000 | -0.002 |
| 100% | | -10 | 2682 499 985 | -8.0 | 0.000 000 | -0.003 |
| 100% | | 0 | 2682 499 984 | -8.3 | 0.000 000 | -0.003 |
| 100% | | +10 | 2682 499 985 | -7.4 | 0.000 000 | -0.003 |
| 100% | | +30 | 2682 499 984 | -9.2 | 0.000 000 | -0.003 |
| 100% | | +40 | 2682 499 985 | -8.0 | 0.000 000 | -0.003 |
| 100% | | +50 | 2682 499 984 | -8.3 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2682 499 986 | -6.5 | 0.000 000 | -0.002 |



▣ MODE: LTE 41

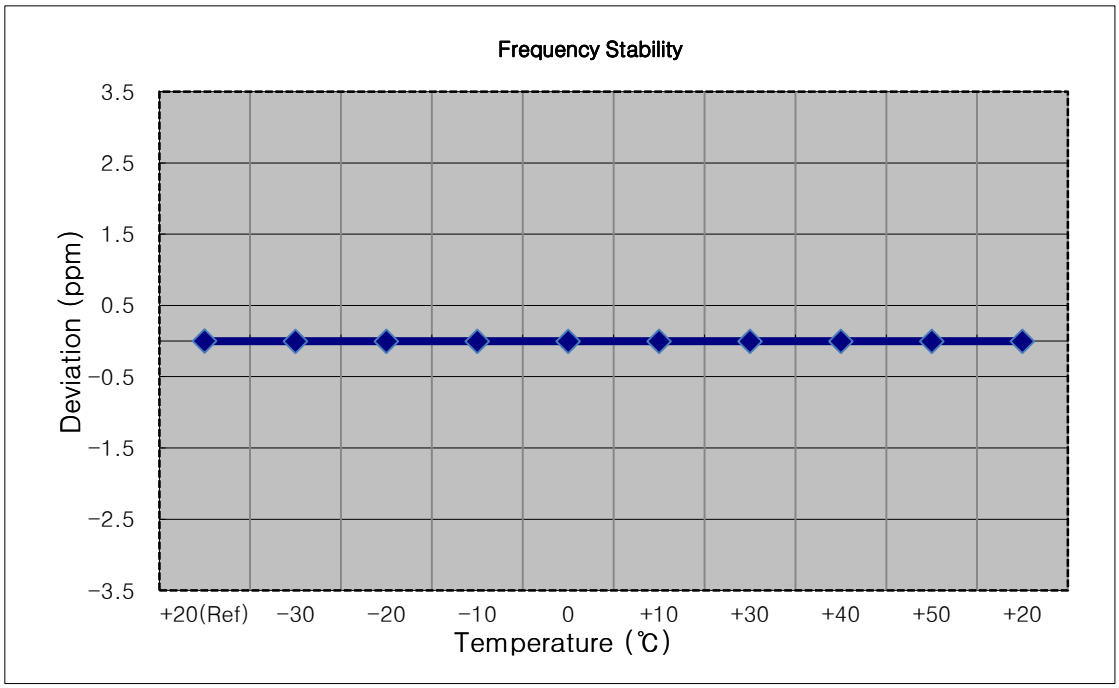
▣ OPERATING FREQUENCY: 2680,000,000 Hz

▣ BANDWIDTH: 41490 (20 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2679 999 992 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2679 999 983 | -9.4 | 0.000 000 | -0.004 |
| 100% | | -20 | 2679 999 984 | -8.0 | 0.000 000 | -0.003 |
| 100% | | -10 | 2679 999 984 | -8.0 | 0.000 000 | -0.003 |
| 100% | | 0 | 2679 999 986 | -6.3 | 0.000 000 | -0.002 |
| 100% | | +10 | 2679 999 987 | -5.3 | 0.000 000 | -0.002 |
| 100% | | +30 | 2679 999 985 | -7.3 | 0.000 000 | -0.003 |
| 100% | | +40 | 2679 999 983 | -9.0 | 0.000 000 | -0.003 |
| 100% | | +50 | 2679 999 986 | -6.5 | 0.000 000 | -0.002 |
| 85% | 7.300 | +20 | 2679 999 987 | -5.6 | 0.000 000 | -0.002 |



### 8.7.2 Power Class 2

▣ MODE: LTE 41

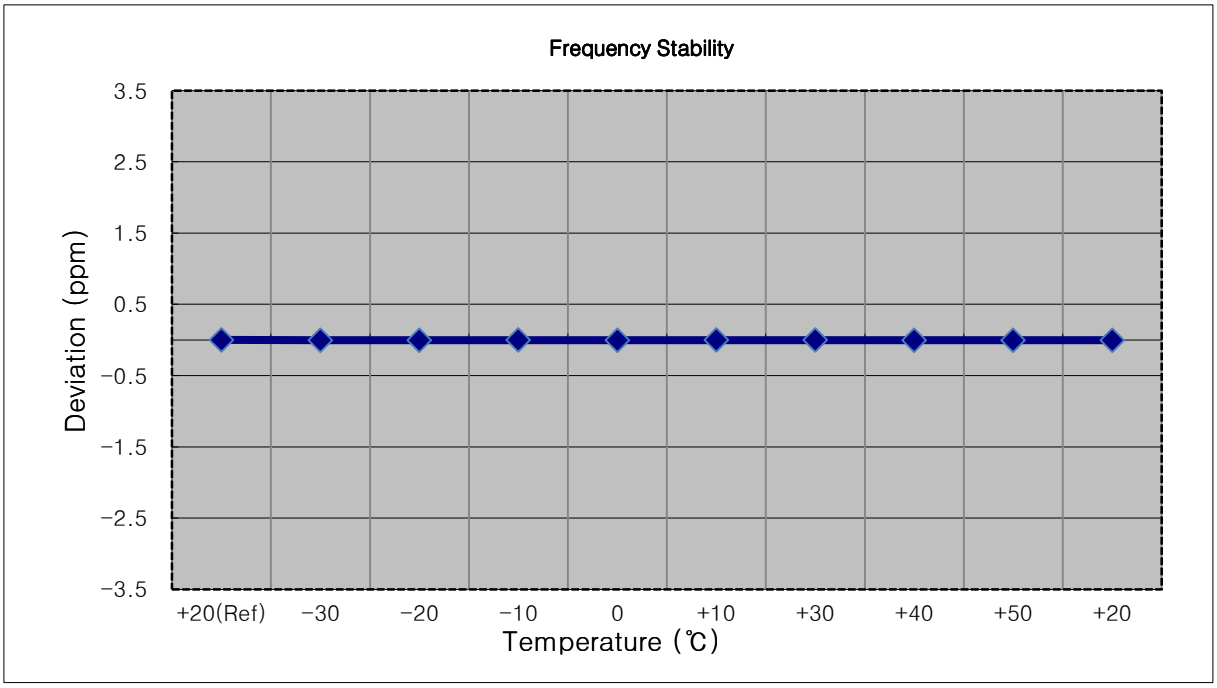
▣ OPERATING FREQUENCY: 2498,500,000 Hz

▣ BANDWIDTH: 39675 (5 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2498 499 991 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2498 499 981 | -9.8 | 0.000 000 | -0.004 |
| 100% | | -20 | 2498 499 981 | -9.5 | 0.000 000 | -0.004 |
| 100% | | -10 | 2498 499 983 | -7.5 | 0.000 000 | -0.003 |
| 100% | | 0 | 2498 499 981 | -9.7 | 0.000 000 | -0.004 |
| 100% | | +10 | 2498 499 983 | -8.1 | 0.000 000 | -0.003 |
| 100% | | +30 | 2498 499 983 | -8.2 | 0.000 000 | -0.003 |
| 100% | | +40 | 2498 499 981 | -10.0 | 0.000 000 | -0.004 |
| 100% | | +50 | 2498 499 981 | -9.9 | 0.000 000 | -0.004 |
| 85% | 7.300 | +20 | 2498 499 981 | -9.5 | 0.000 000 | -0.004 |



▣ MODE: LTE 41

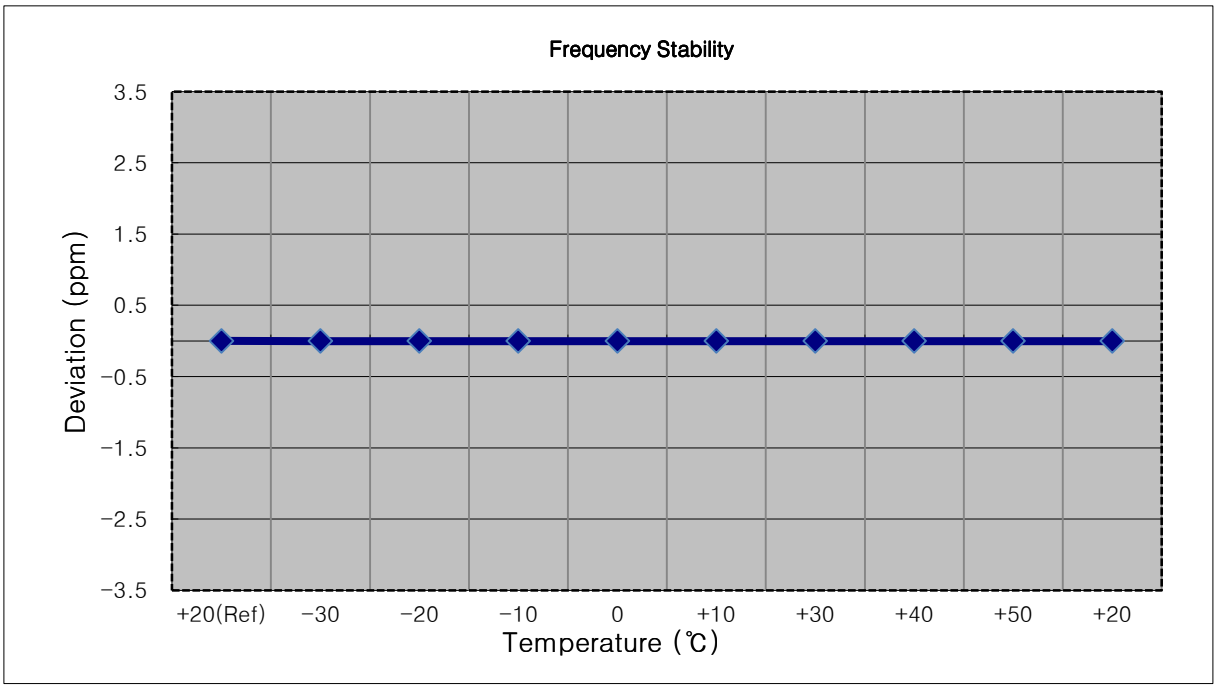
▣ OPERATING FREQUENCY: 2501,000,000 Hz

▣ BANDWIDTH: 39700 (10 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2500 999 992 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2500 999 984 | -8.1 | 0.000 000 | -0.003 |
| 100% | | -20 | 2500 999 985 | -7.2 | 0.000 000 | -0.003 |
| 100% | | -10 | 2500 999 985 | -6.9 | 0.000 000 | -0.003 |
| 100% | | 0 | 2500 999 984 | -8.6 | 0.000 000 | -0.003 |
| 100% | | +10 | 2500 999 984 | -8.5 | 0.000 000 | -0.003 |
| 100% | | +30 | 2500 999 984 | -8.3 | 0.000 000 | -0.003 |
| 100% | | +40 | 2500 999 985 | -6.8 | 0.000 000 | -0.003 |
| 100% | | +50 | 2500 999 985 | -6.7 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2500 999 985 | -6.8 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

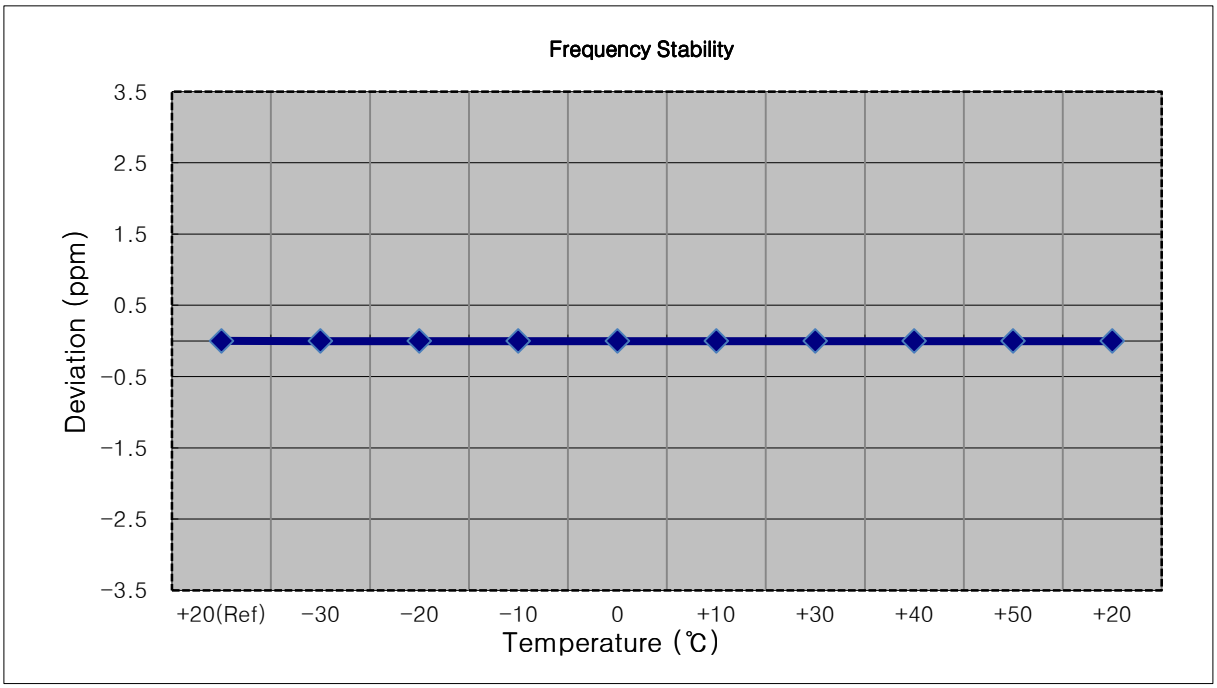
▣ OPERATING FREQUENCY: 2503,500,000 Hz

▣ BANDWIDTH: 39725 (15 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2503 499 994 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2503 499 988 | -5.7 | 0.000 000 | -0.002 |
| 100% | | -20 | 2503 499 988 | -6.4 | 0.000 000 | -0.003 |
| 100% | | -10 | 2503 499 986 | -8.1 | 0.000 000 | -0.003 |
| 100% | | 0 | 2503 499 987 | -6.9 | 0.000 000 | -0.003 |
| 100% | | +10 | 2503 499 988 | -5.6 | 0.000 000 | -0.002 |
| 100% | | +30 | 2503 499 987 | -7.1 | 0.000 000 | -0.003 |
| 100% | | +40 | 2503 499 986 | -7.9 | 0.000 000 | -0.003 |
| 100% | | +50 | 2503 499 990 | -4.3 | 0.000 000 | -0.002 |
| 85% | 7.300 | +20 | 2503 499 986 | -8.2 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

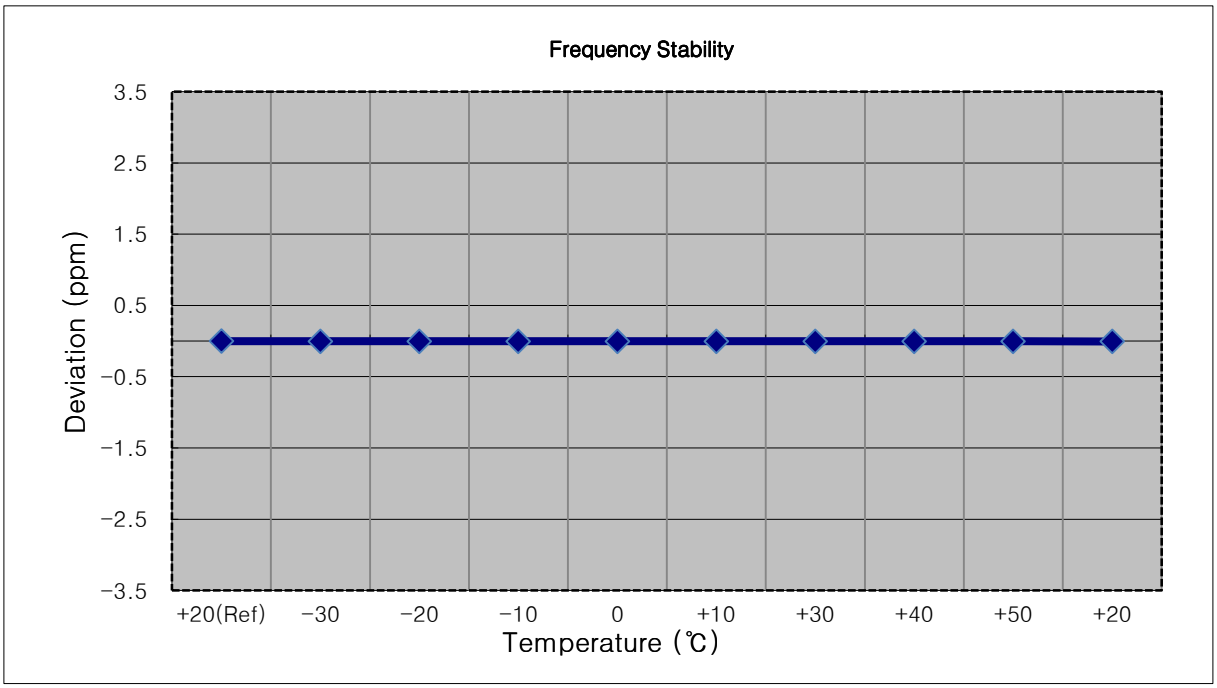
▣ OPERATING FREQUENCY: 2506,000,000 Hz

▣ BANDWIDTH: 39750 (20 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2505 999 993 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2505 999 985 | -8.3 | 0.000 000 | -0.003 |
| 100% | | -20 | 2505 999 987 | -6.3 | 0.000 000 | -0.003 |
| 100% | | -10 | 2505 999 986 | -7.1 | 0.000 000 | -0.003 |
| 100% | | 0 | 2505 999 985 | -7.6 | 0.000 000 | -0.003 |
| 100% | | +10 | 2505 999 986 | -6.8 | 0.000 000 | -0.003 |
| 100% | | +30 | 2505 999 984 | -8.4 | 0.000 000 | -0.003 |
| 100% | | +40 | 2505 999 985 | -7.4 | 0.000 000 | -0.003 |
| 100% | | +50 | 2505 999 985 | -7.4 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2505 999 982 | -10.5 | 0.000 000 | -0.004 |



▣ MODE: LTE 41

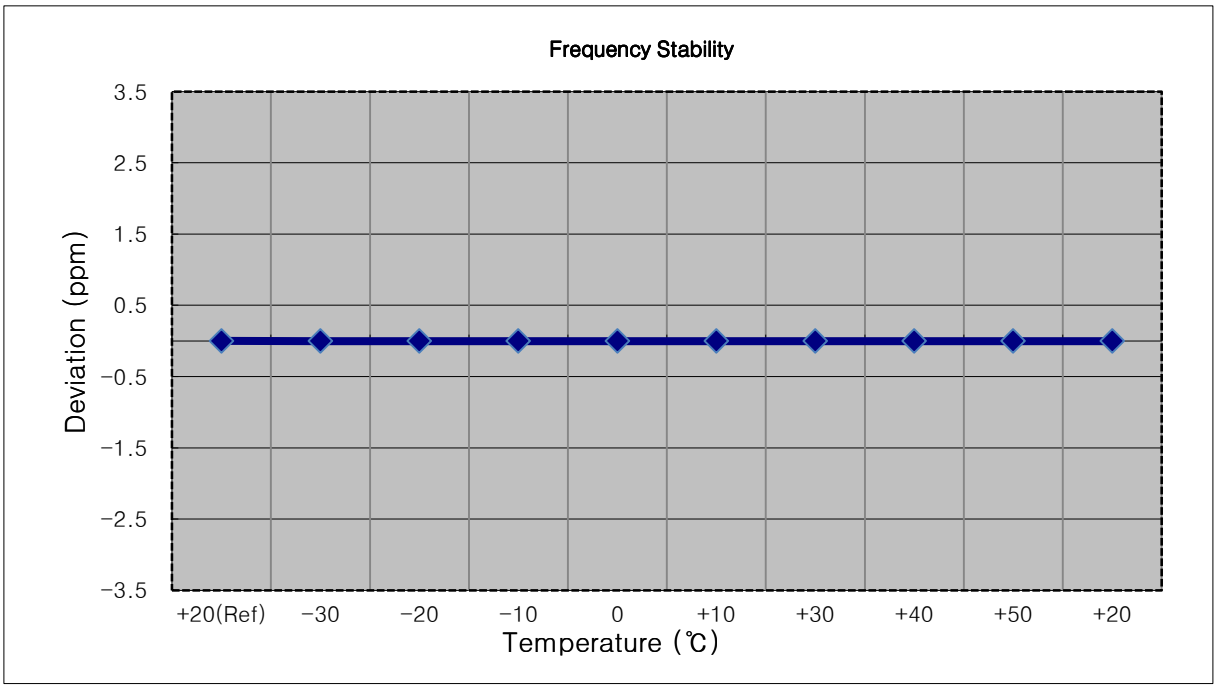
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (5 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2592 999 993 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2592 999 986 | -6.8 | 0.000 000 | -0.003 |
| 100% | | -20 | 2592 999 984 | -8.3 | 0.000 000 | -0.003 |
| 100% | | -10 | 2592 999 984 | -8.3 | 0.000 000 | -0.003 |
| 100% | | 0 | 2592 999 984 | -8.4 | 0.000 000 | -0.003 |
| 100% | | +10 | 2592 999 986 | -7.0 | 0.000 000 | -0.003 |
| 100% | | +30 | 2592 999 985 | -8.1 | 0.000 000 | -0.003 |
| 100% | | +40 | 2592 999 985 | -7.2 | 0.000 000 | -0.003 |
| 100% | | +50 | 2592 999 985 | -7.6 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2592 999 986 | -6.9 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

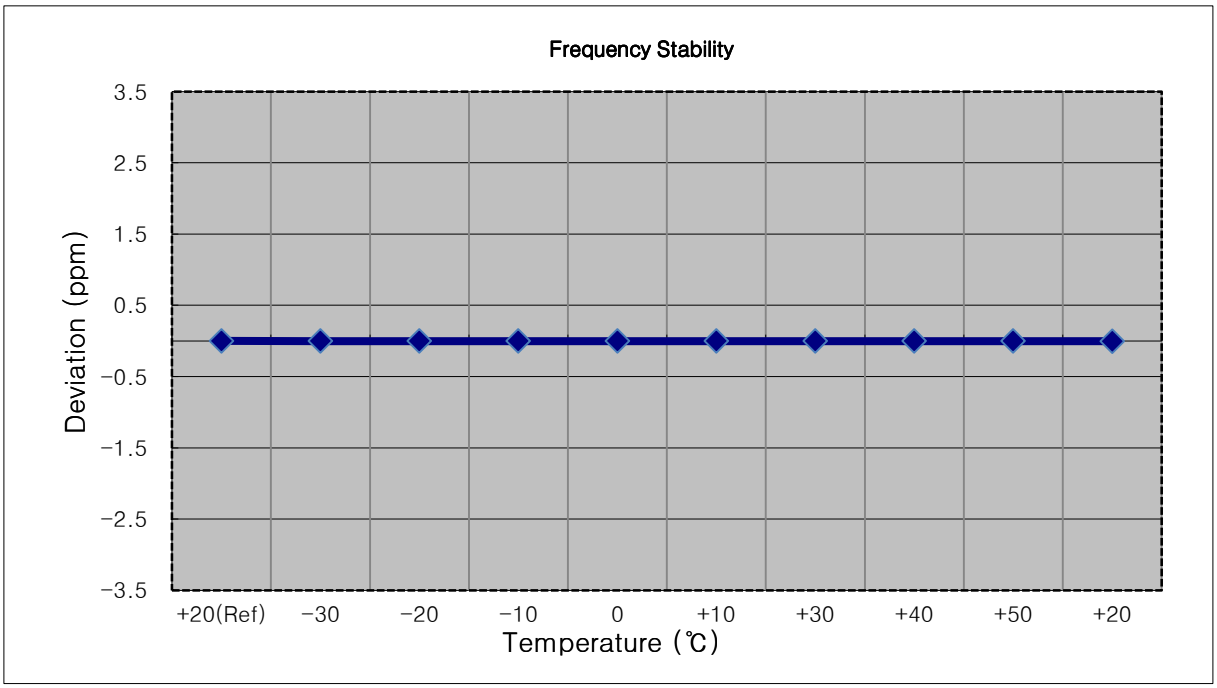
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (10 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2592 999 992 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2592 999 983 | -8.5 | 0.000 000 | -0.003 |
| 100% | | -20 | 2592 999 986 | -5.8 | 0.000 000 | -0.002 |
| 100% | | -10 | 2592 999 984 | -8.0 | 0.000 000 | -0.003 |
| 100% | | 0 | 2592 999 986 | -6.0 | 0.000 000 | -0.002 |
| 100% | | +10 | 2592 999 984 | -7.4 | 0.000 000 | -0.003 |
| 100% | | +30 | 2592 999 984 | -8.2 | 0.000 000 | -0.003 |
| 100% | | +40 | 2592 999 985 | -6.9 | 0.000 000 | -0.003 |
| 100% | | +50 | 2592 999 985 | -6.7 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2592 999 982 | -10.1 | 0.000 000 | -0.004 |



▣ MODE: LTE 41

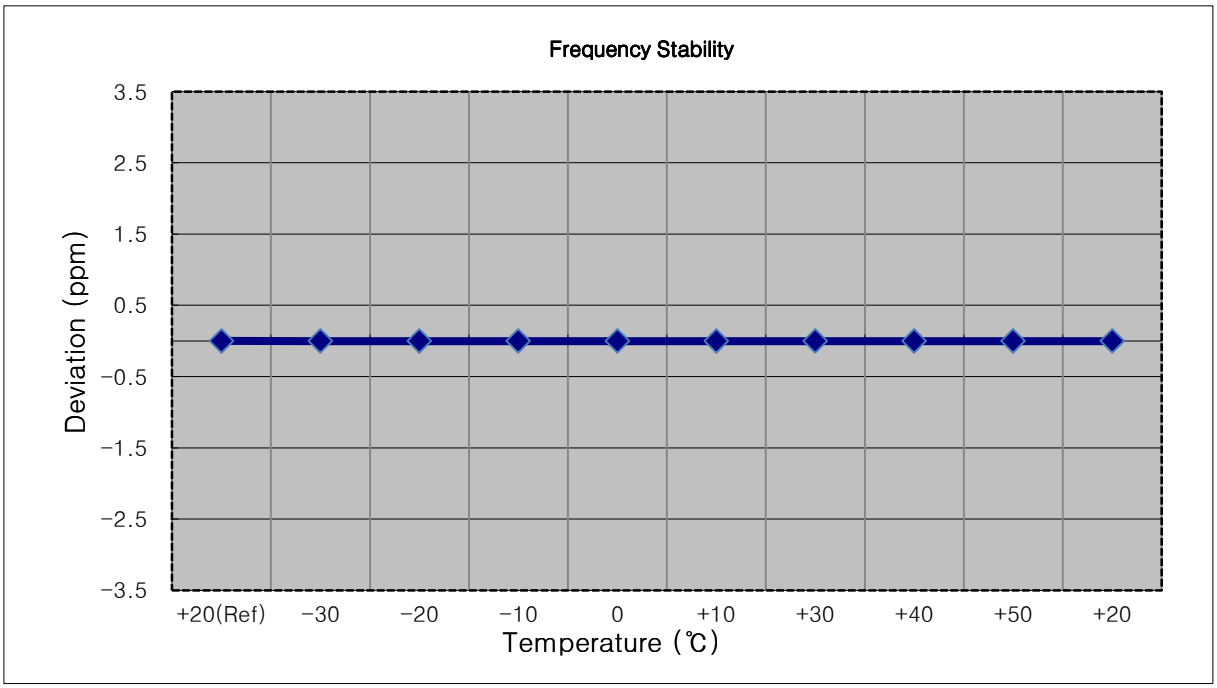
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (15 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2592 999 991 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2592 999 982 | -9.1 | 0.000 000 | -0.004 |
| 100% | | -20 | 2592 999 981 | -9.7 | 0.000 000 | -0.004 |
| 100% | | -10 | 2592 999 984 | -6.9 | 0.000 000 | -0.003 |
| 100% | | 0 | 2592 999 983 | -7.6 | 0.000 000 | -0.003 |
| 100% | | +10 | 2592 999 984 | -6.6 | 0.000 000 | -0.003 |
| 100% | | +30 | 2592 999 983 | -8.0 | 0.000 000 | -0.003 |
| 100% | | +40 | 2592 999 984 | -6.6 | 0.000 000 | -0.003 |
| 100% | | +50 | 2592 999 984 | -6.6 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2592 999 982 | -8.3 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

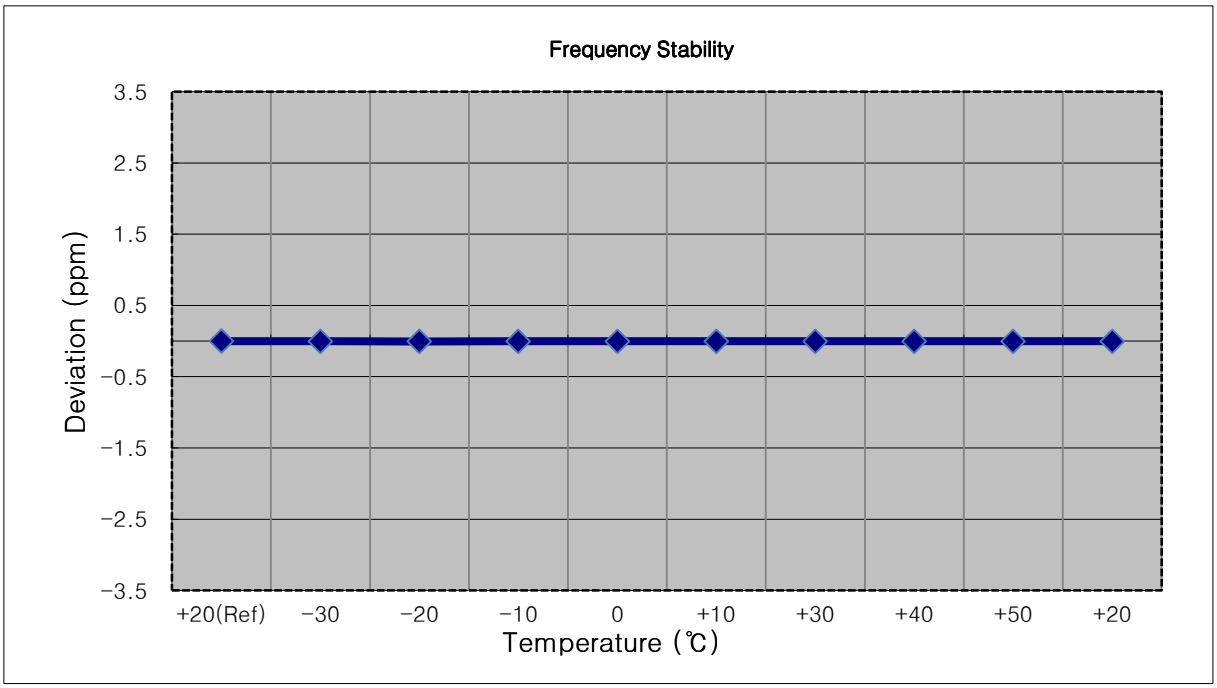
▣ OPERATING FREQUENCY: 2593,000,000 Hz

▣ BANDWIDTH: 40620 (20 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2592 999 989 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2592 999 980 | -8.9 | 0.000 000 | -0.003 |
| 100% | | -20 | 2592 999 977 | -11.9 | 0.000 000 | -0.005 |
| 100% | | -10 | 2592 999 980 | -8.5 | 0.000 000 | -0.003 |
| 100% | | 0 | 2592 999 980 | -8.6 | 0.000 000 | -0.003 |
| 100% | | +10 | 2592 999 978 | -10.5 | 0.000 000 | -0.004 |
| 100% | | +30 | 2592 999 981 | -7.7 | 0.000 000 | -0.003 |
| 100% | | +40 | 2592 999 981 | -7.3 | 0.000 000 | -0.003 |
| 100% | | +50 | 2592 999 979 | -9.5 | 0.000 000 | -0.004 |
| 85% | 7.300 | +20 | 2592 999 978 | -10.1 | 0.000 000 | -0.004 |



▣ MODE: LTE 41

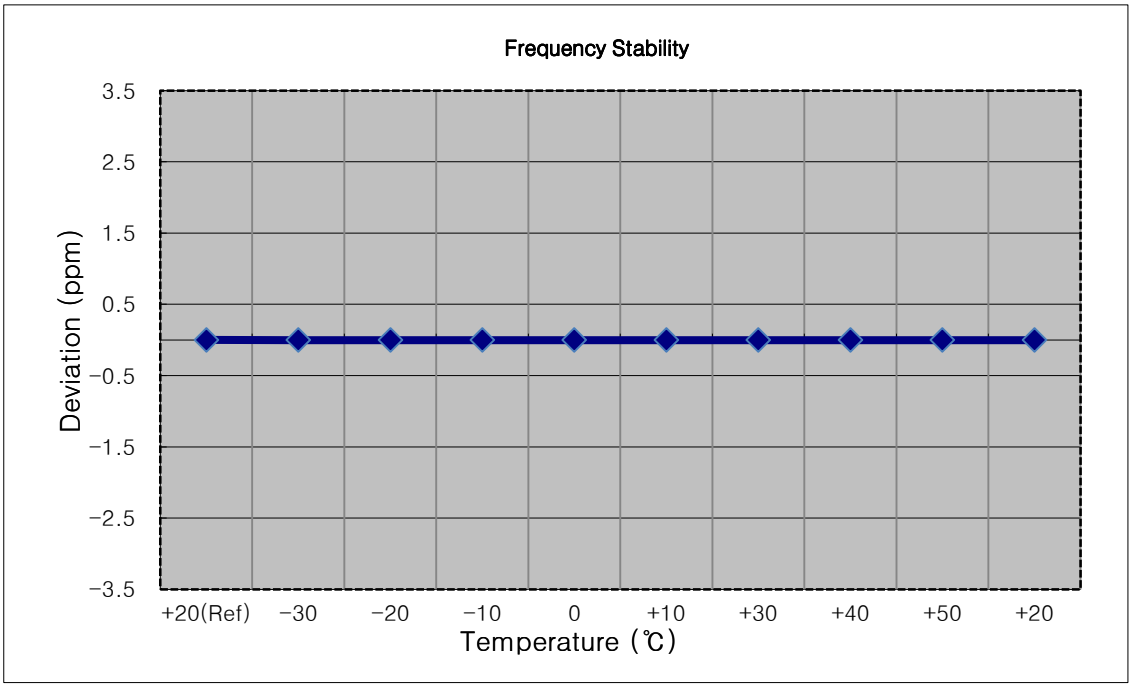
▣ OPERATING FREQUENCY: 2687,500,000 Hz

▣ BANDWIDTH: 41565 (5 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2687 499 992 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2687 499 985 | -6.9 | 0.000 000 | -0.003 |
| 100% | | -20 | 2687 499 984 | -8.1 | 0.000 000 | -0.003 |
| 100% | | -10 | 2687 499 983 | -9.0 | 0.000 000 | -0.003 |
| 100% | | 0 | 2687 499 985 | -7.6 | 0.000 000 | -0.003 |
| 100% | | +10 | 2687 499 985 | -7.1 | 0.000 000 | -0.003 |
| 100% | | +30 | 2687 499 984 | -8.2 | 0.000 000 | -0.003 |
| 100% | | +40 | 2687 499 983 | -9.2 | 0.000 000 | -0.003 |
| 100% | | +50 | 2687 499 983 | -9.2 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2687 499 985 | -7.7 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

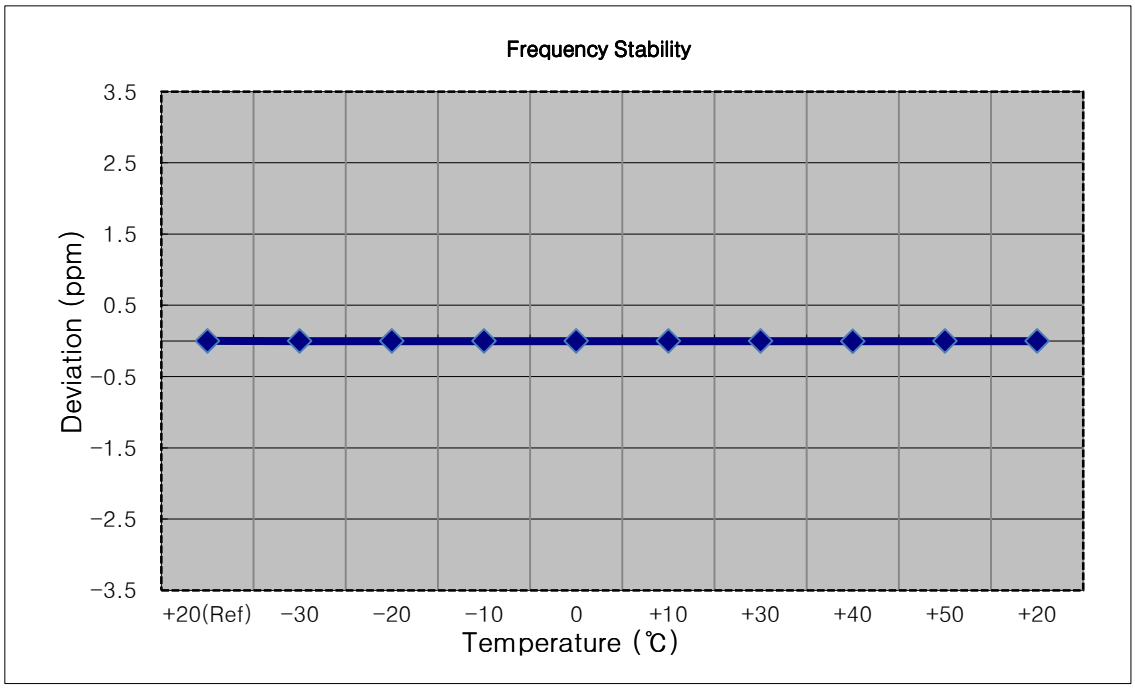
▣ OPERATING FREQUENCY: 2685,000,000 Hz

▣ BANDWIDTH: 41540 (10 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2684 999 990 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2684 999 981 | -8.9 | 0.000 000 | -0.003 |
| 100% | | -20 | 2684 999 980 | -9.6 | 0.000 000 | -0.004 |
| 100% | | -10 | 2684 999 981 | -9.1 | 0.000 000 | -0.003 |
| 100% | | 0 | 2684 999 981 | -8.5 | 0.000 000 | -0.003 |
| 100% | | +10 | 2684 999 980 | -9.8 | 0.000 000 | -0.004 |
| 100% | | +30 | 2684 999 981 | -9.1 | 0.000 000 | -0.003 |
| 100% | | +40 | 2684 999 979 | -10.3 | 0.000 000 | -0.004 |
| 100% | | +50 | 2684 999 982 | -8.0 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2684 999 980 | -9.9 | 0.000 000 | -0.004 |



▣ MODE: LTE 41

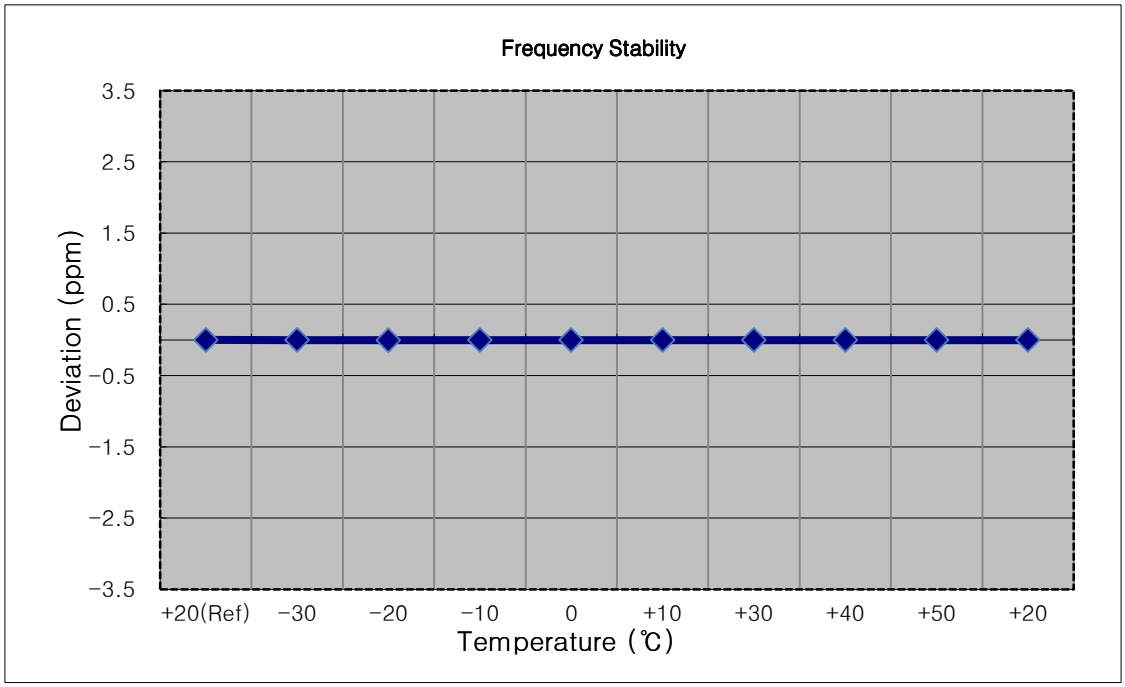
▣ OPERATING FREQUENCY: 2682,500,000 Hz

▣ BANDWIDTH: 41515 (15 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2682 499 991 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2682 499 984 | -7.3 | 0.000 000 | -0.003 |
| 100% | | -20 | 2682 499 981 | -10.6 | 0.000 000 | -0.004 |
| 100% | | -10 | 2682 499 983 | -8.0 | 0.000 000 | -0.003 |
| 100% | | 0 | 2682 499 983 | -8.2 | 0.000 000 | -0.003 |
| 100% | | +10 | 2682 499 983 | -7.8 | 0.000 000 | -0.003 |
| 100% | | +30 | 2682 499 983 | -8.6 | 0.000 000 | -0.003 |
| 100% | | +40 | 2682 499 984 | -7.0 | 0.000 000 | -0.003 |
| 100% | | +50 | 2682 499 983 | -7.9 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2682 499 982 | -9.0 | 0.000 000 | -0.003 |



▣ MODE: LTE 41

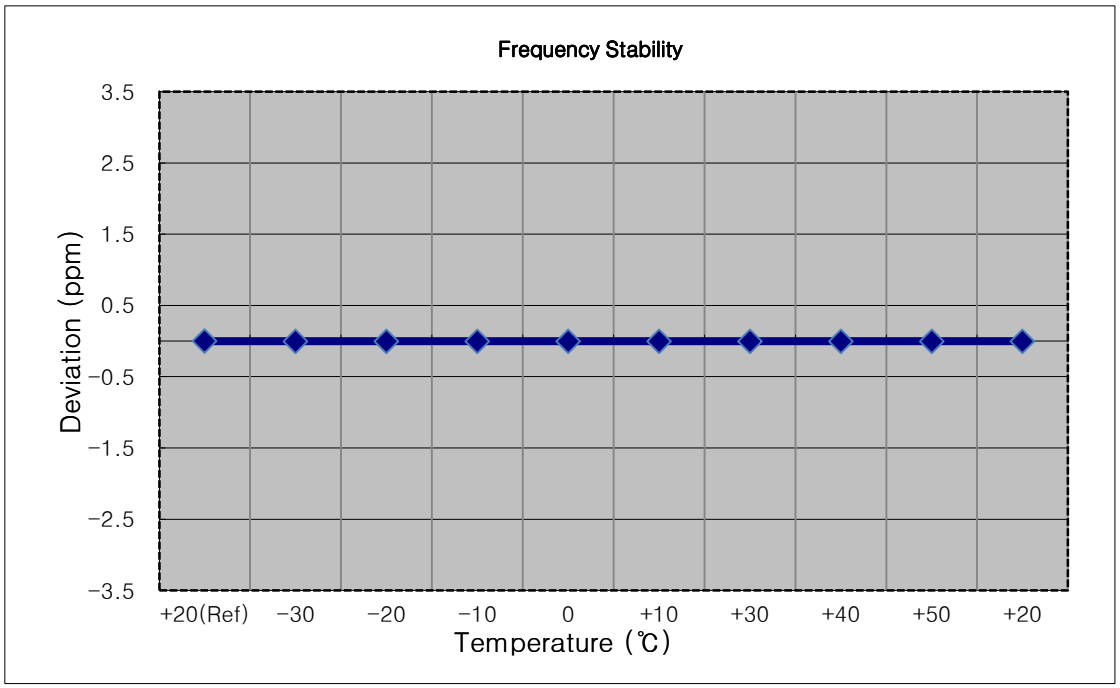
▣ OPERATING FREQUENCY: 2680,000,000 Hz

▣ BANDWIDTH: 41490 (20 MHz)

▣ REFERENCE VOLTAGE: 7.70 VDC

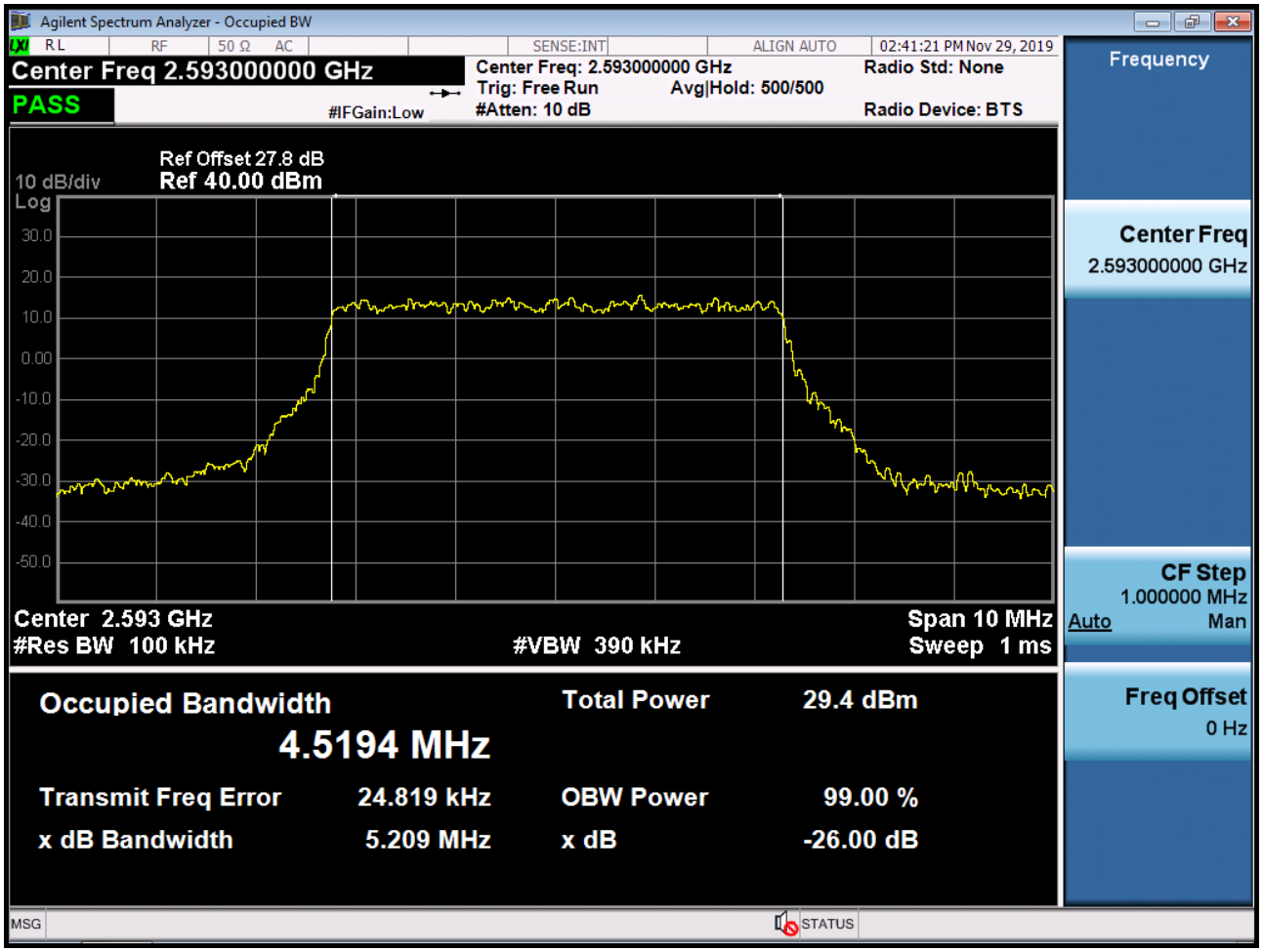
▣ DEVIATION LIMIT: Emission must remain in band

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 7.700 | +20(Ref) | 2679 999 994 | 0.0 | 0.000 000 | 0.000 |
| 100% | | -30 | 2679 999 988 | -6.1 | 0.000 000 | -0.002 |
| 100% | | -20 | 2679 999 987 | -7.0 | 0.000 000 | -0.003 |
| 100% | | -10 | 2679 999 988 | -5.4 | 0.000 000 | -0.002 |
| 100% | | 0 | 2679 999 986 | -7.4 | 0.000 000 | -0.003 |
| 100% | | +10 | 2679 999 986 | -7.5 | 0.000 000 | -0.003 |
| 100% | | +30 | 2679 999 984 | -9.5 | 0.000 000 | -0.004 |
| 100% | | +40 | 2679 999 986 | -8.0 | 0.000 000 | -0.003 |
| 100% | | +50 | 2679 999 987 | -6.9 | 0.000 000 | -0.003 |
| 85% | 7.300 | +20 | 2679 999 985 | -8.5 | 0.000 000 | -0.003 |

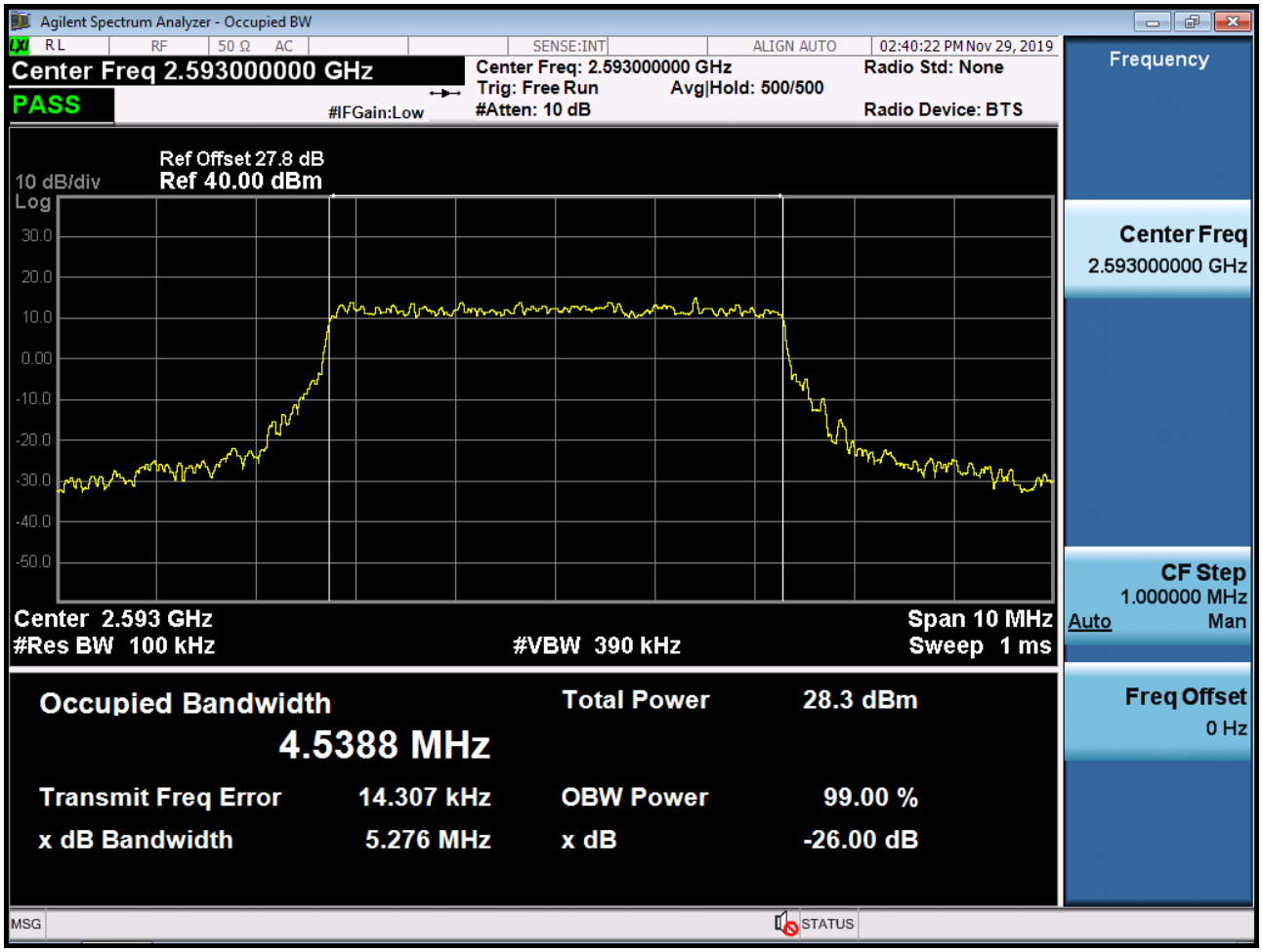


## 9. TEST PLOTS

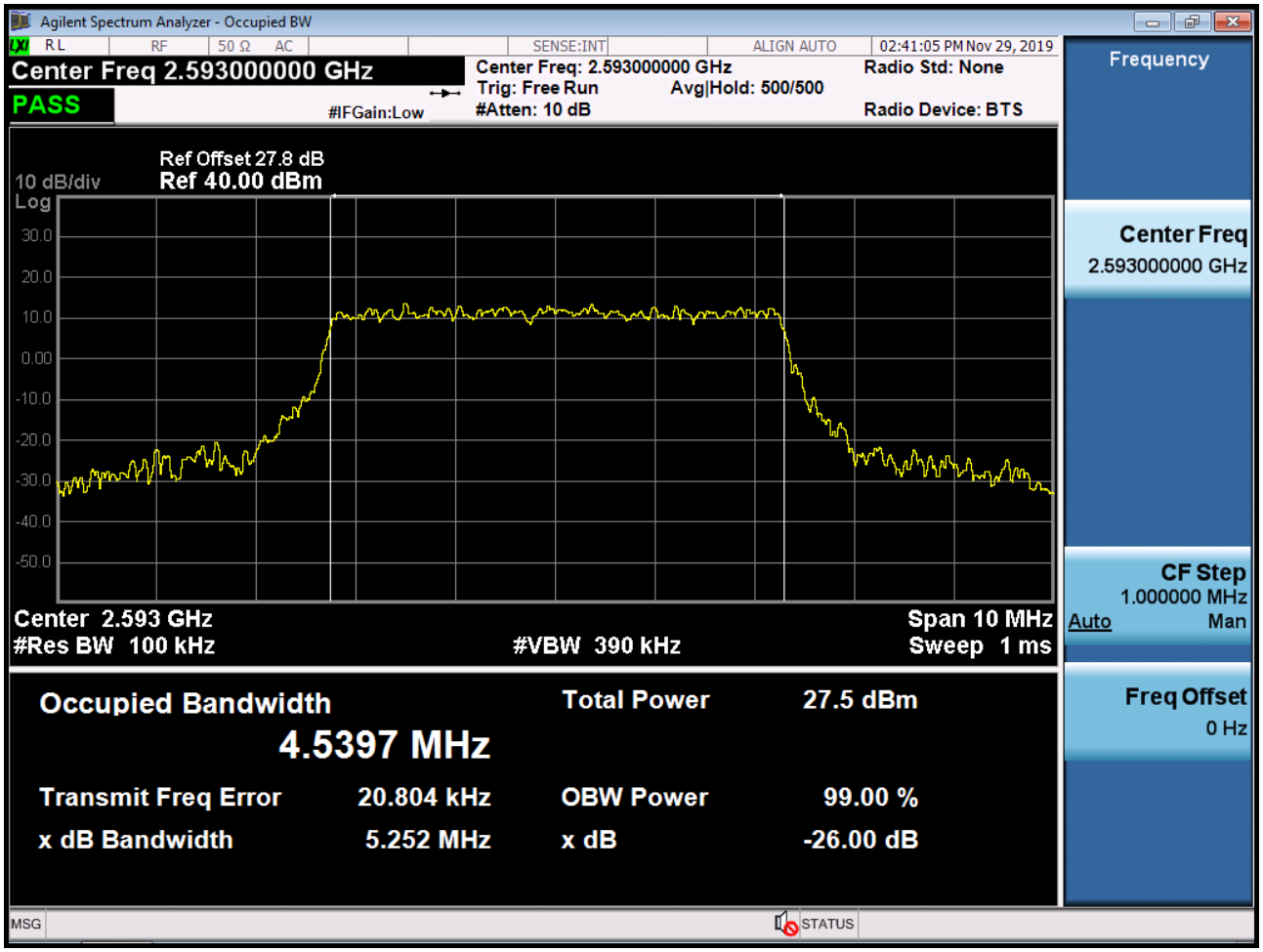
Occupied Bandwidth Plot (5 MHz Ch.40620 QPSK RB 25) (POWER CLASS 3)



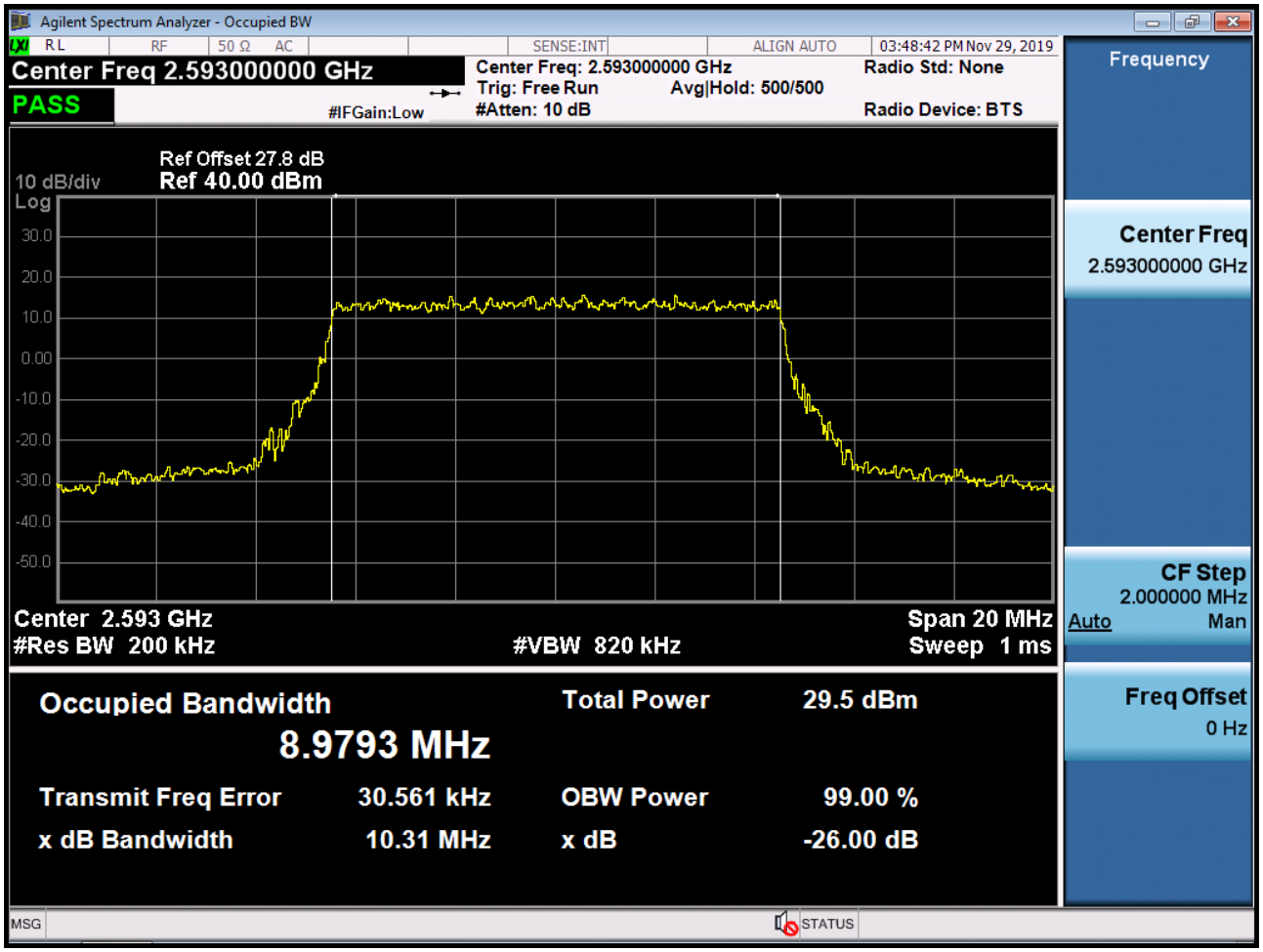
Occupied Bandwidth Plot (5 MHz Ch.40620 16-QAM RB 25) (POWER CLASS 3)



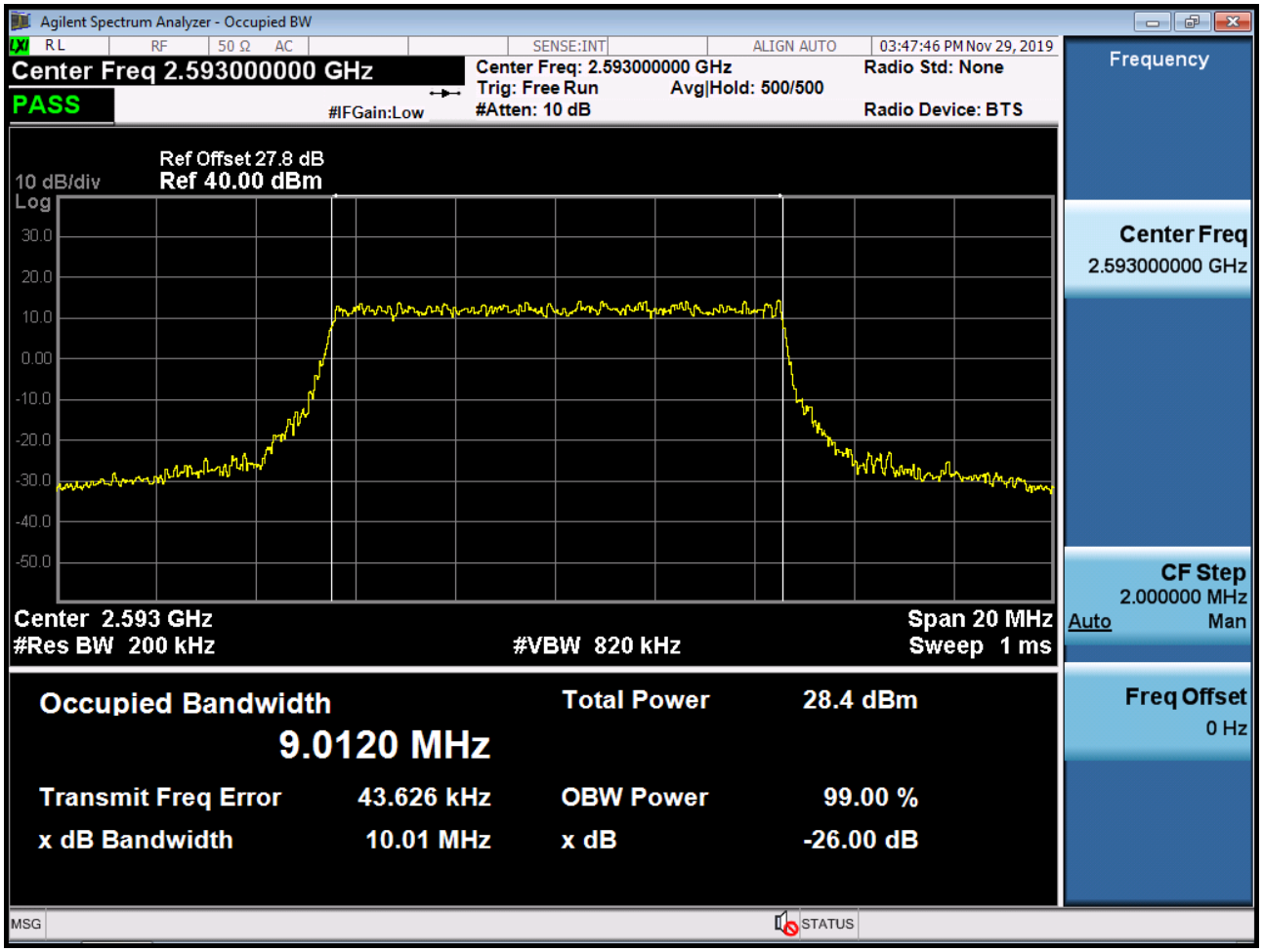
Occupied Bandwidth Plot (5 MHz Ch.40620 64-QAM RB 25) (POWER CLASS 3)



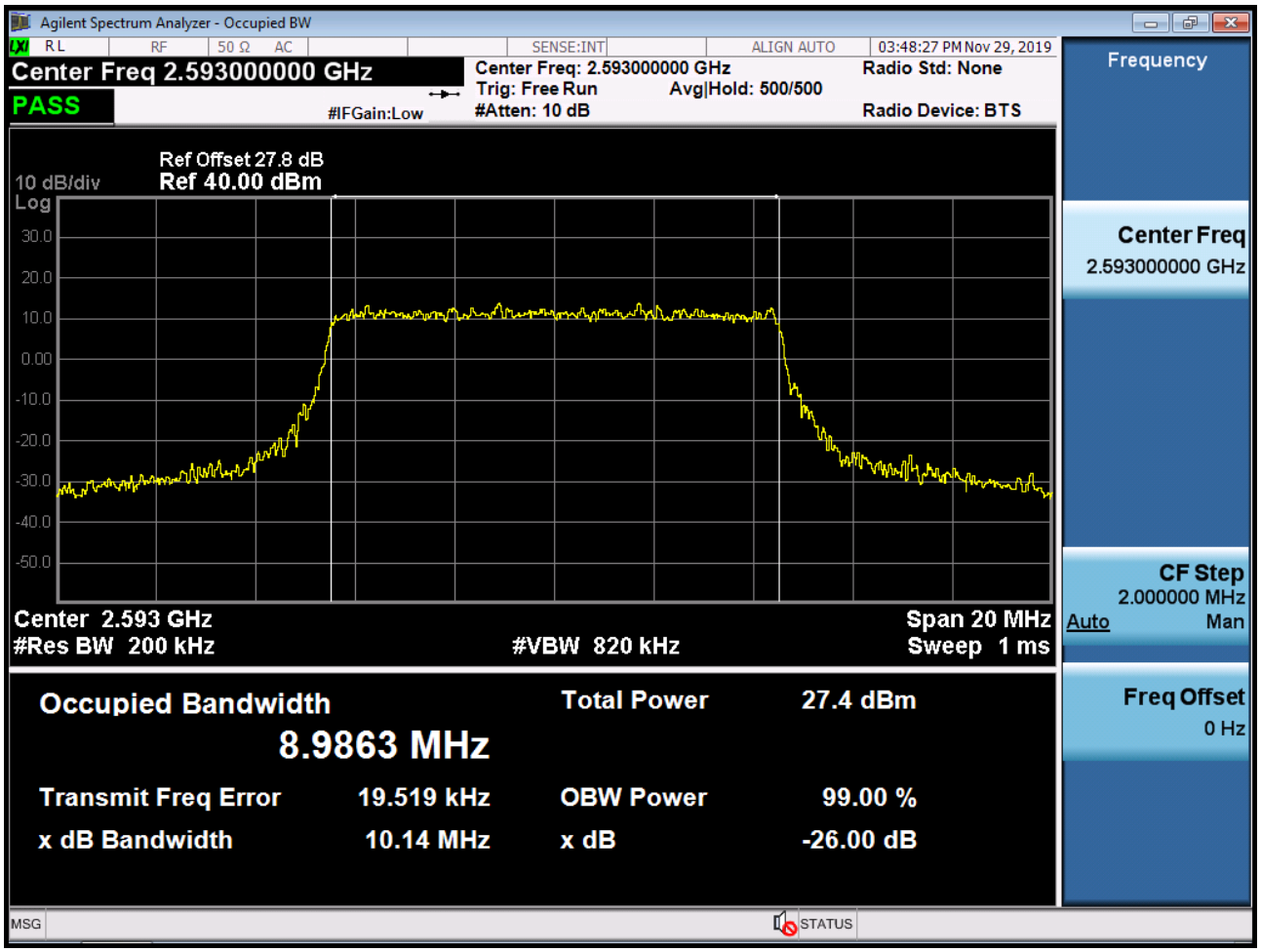
Occupied Bandwidth Plot (10 MHz Ch.40620 QPSK RB 50) (POWER CLASS 3)



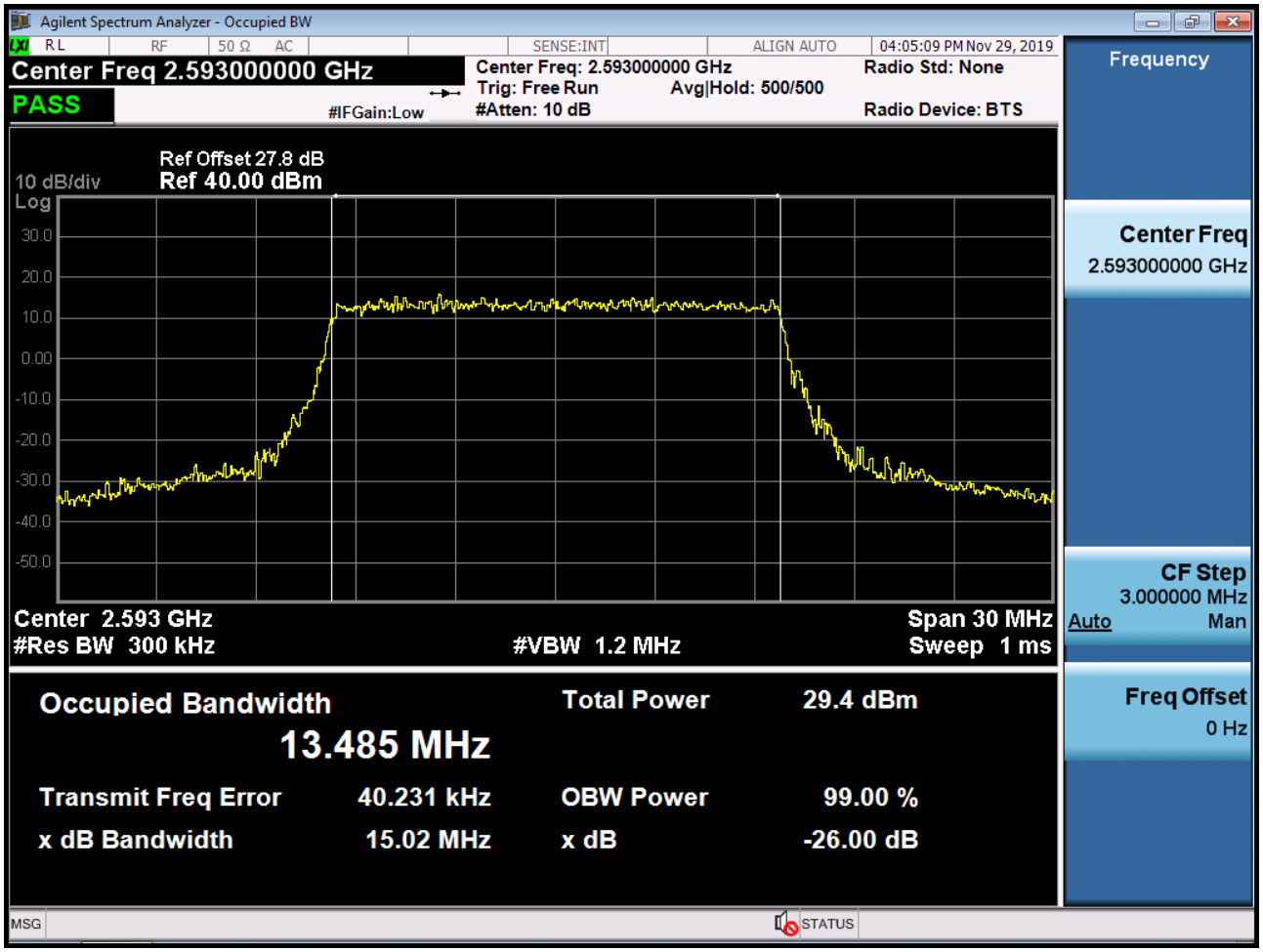
Occupied Bandwidth Plot (10 MHz Ch.40620 16-QAM RB 50) (POWER CLASS 3)



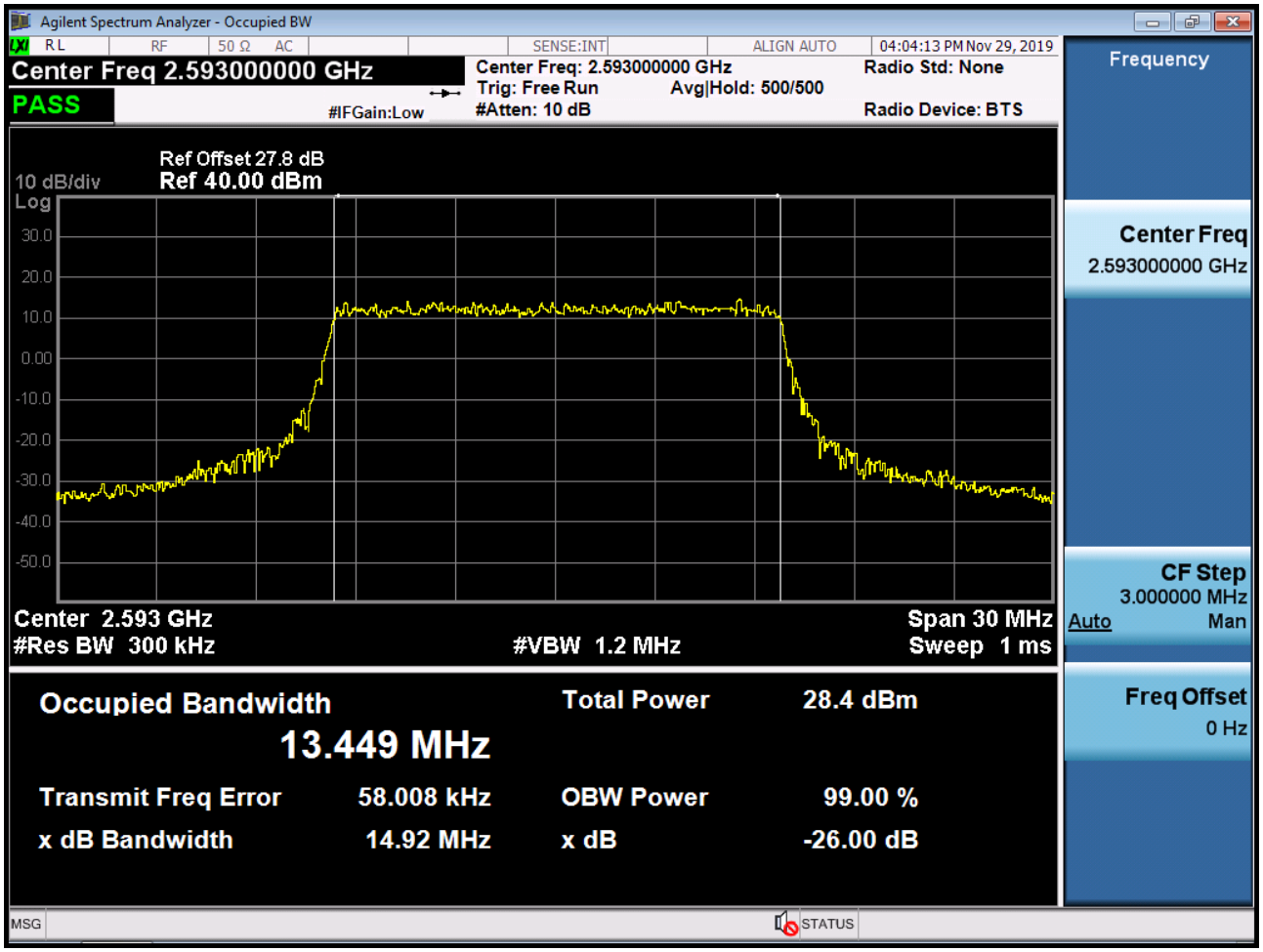
Occupied Bandwidth Plot (10 MHz Ch.40620 64-QAM RB 50) (POWER CLASS 3)



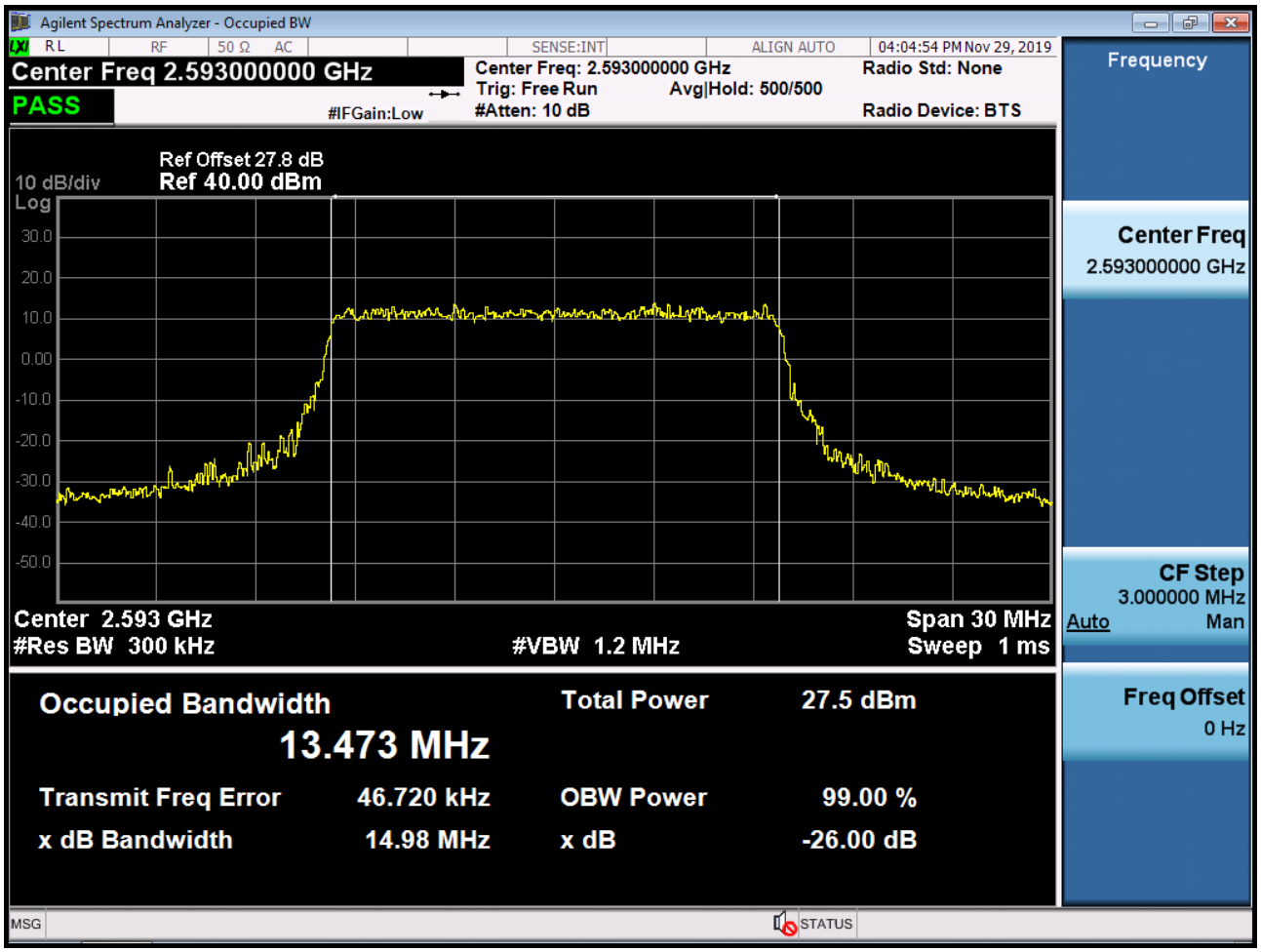
Occupied Bandwidth Plot (15 MHz Ch.40620 QPSK RB 75) (POWER CLASS 3)



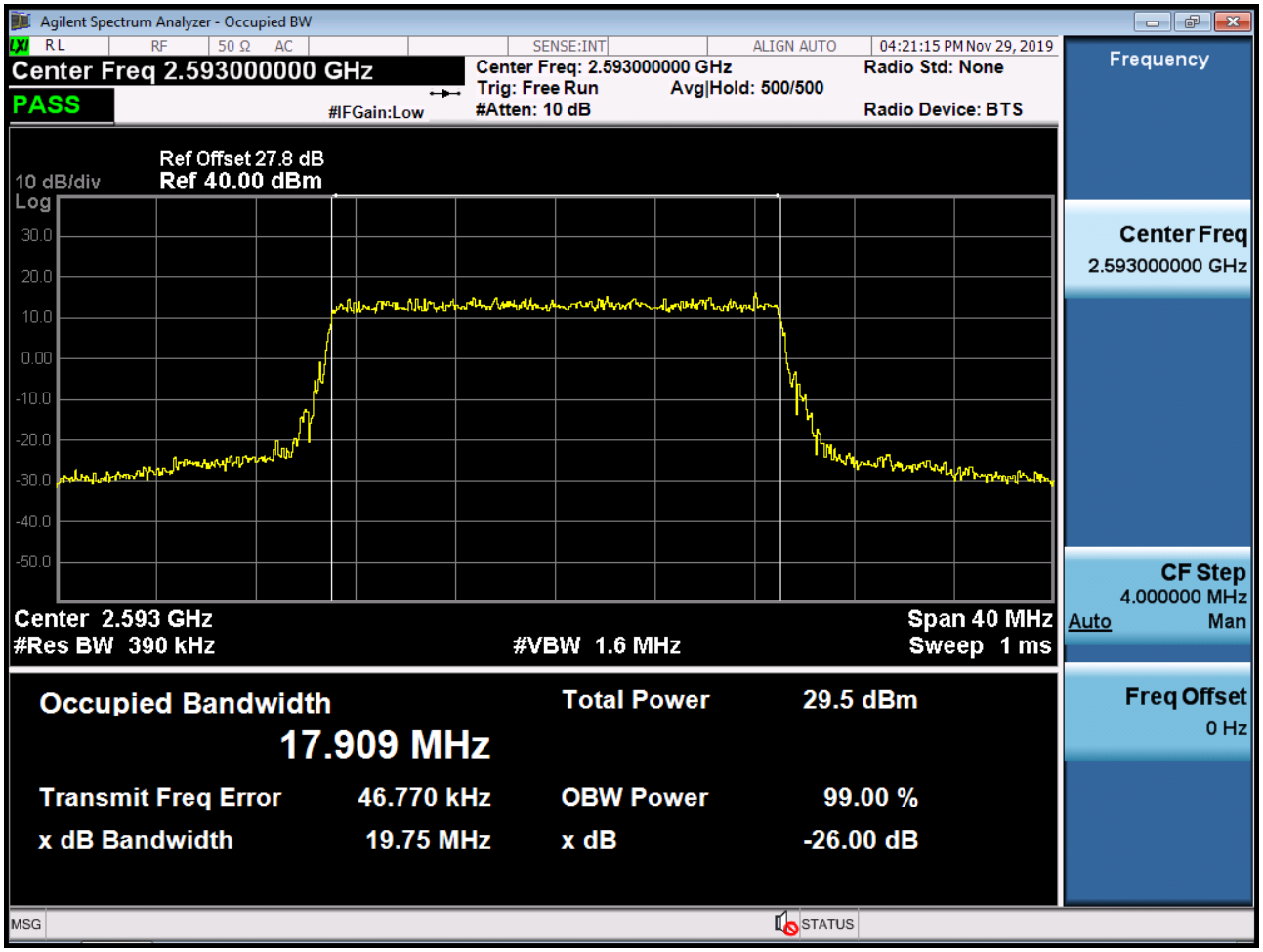
Occupied Bandwidth Plot (15 MHz Ch.40620 16-QAM RB 75) (POWER CLASS 3)



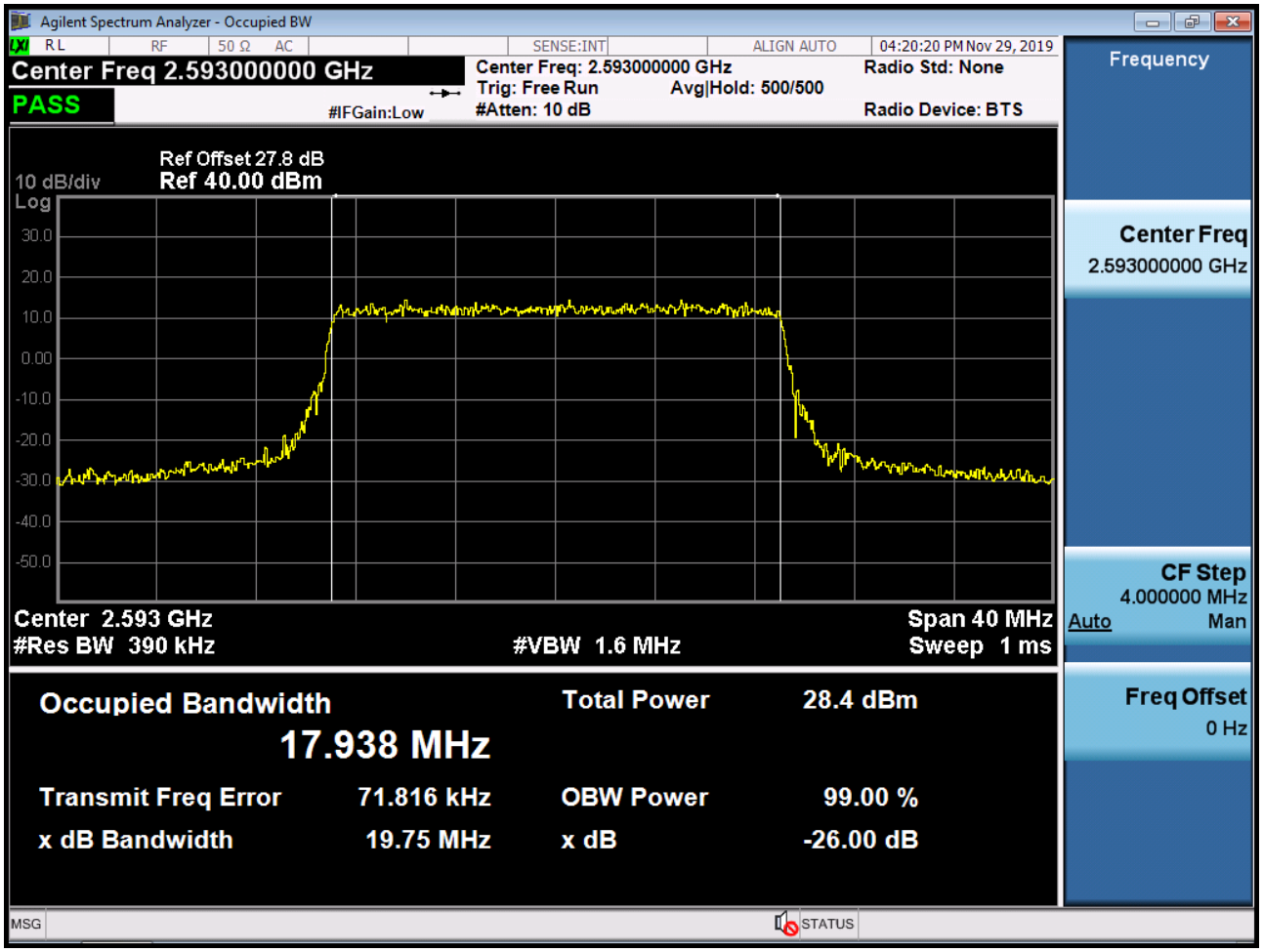
Occupied Bandwidth Plot (15 MHz Ch.40620 64-QAM RB 75) (POWER CLASS 3)



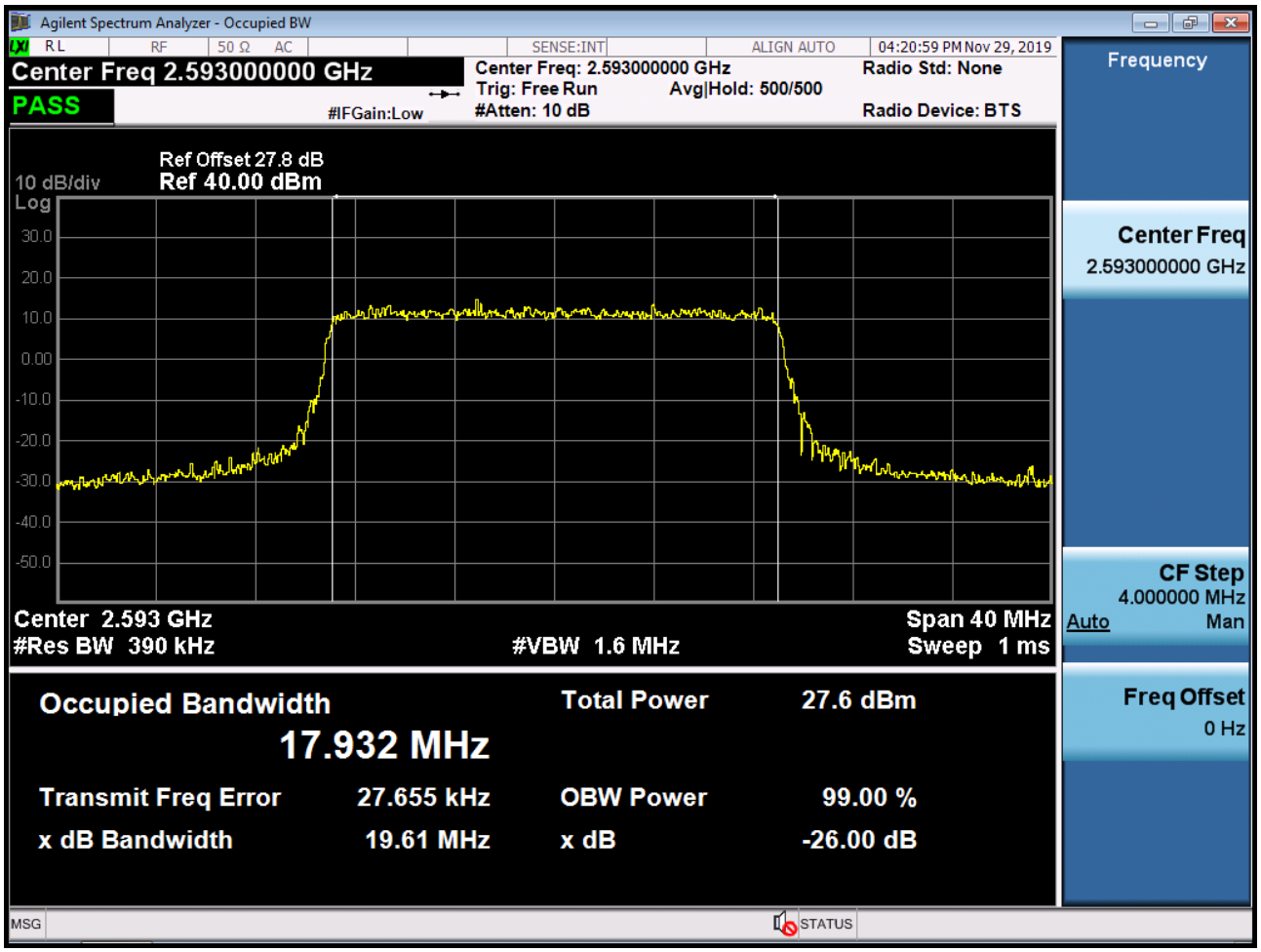
Occupied Bandwidth Plot (20 MHz Ch.40620 QPSK RB 100) (POWER CLASS 3)



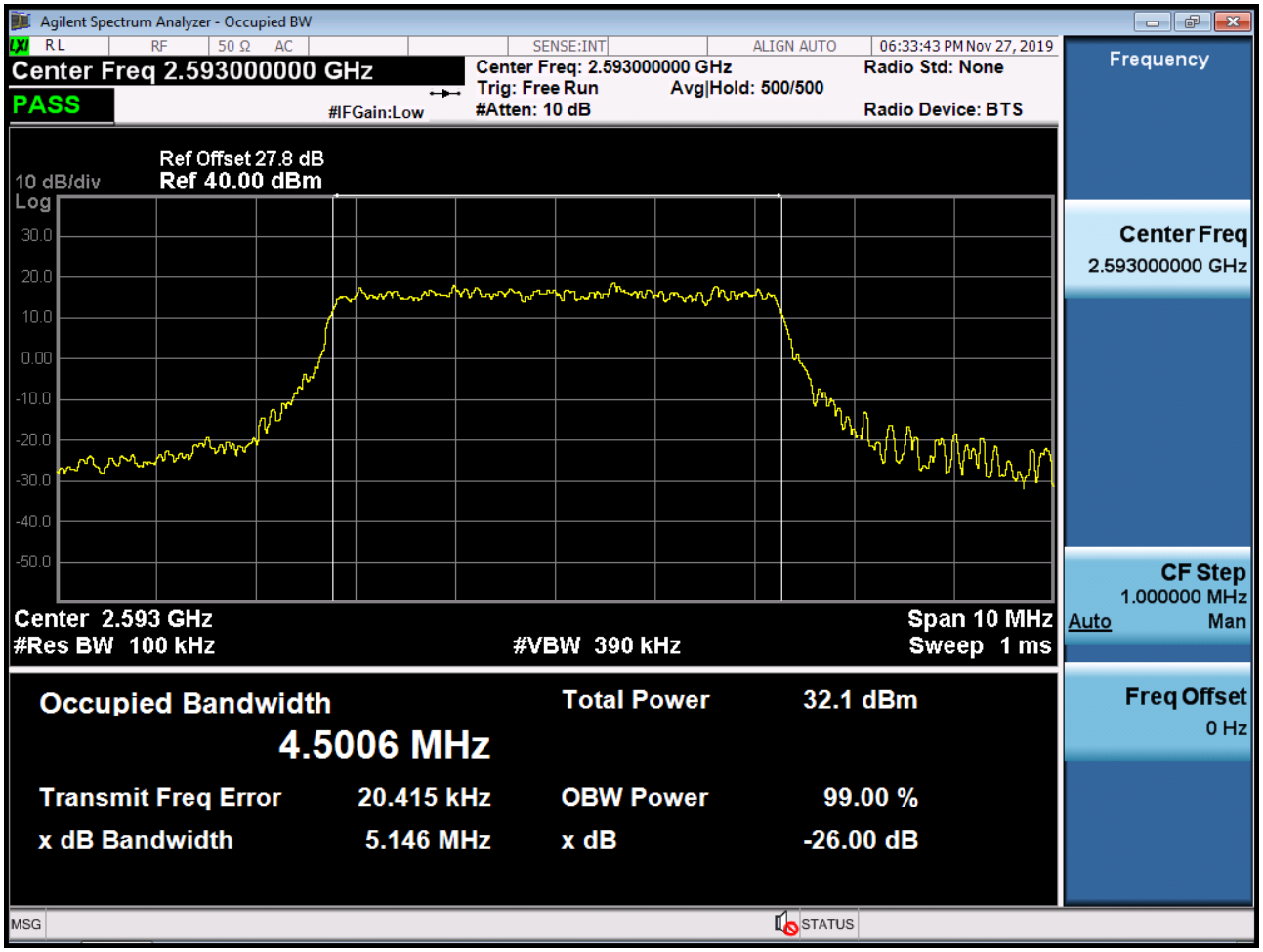
Occupied Bandwidth Plot (20 MHz Ch.40620 16-QAM RB 100) (POWER CLASS 3)



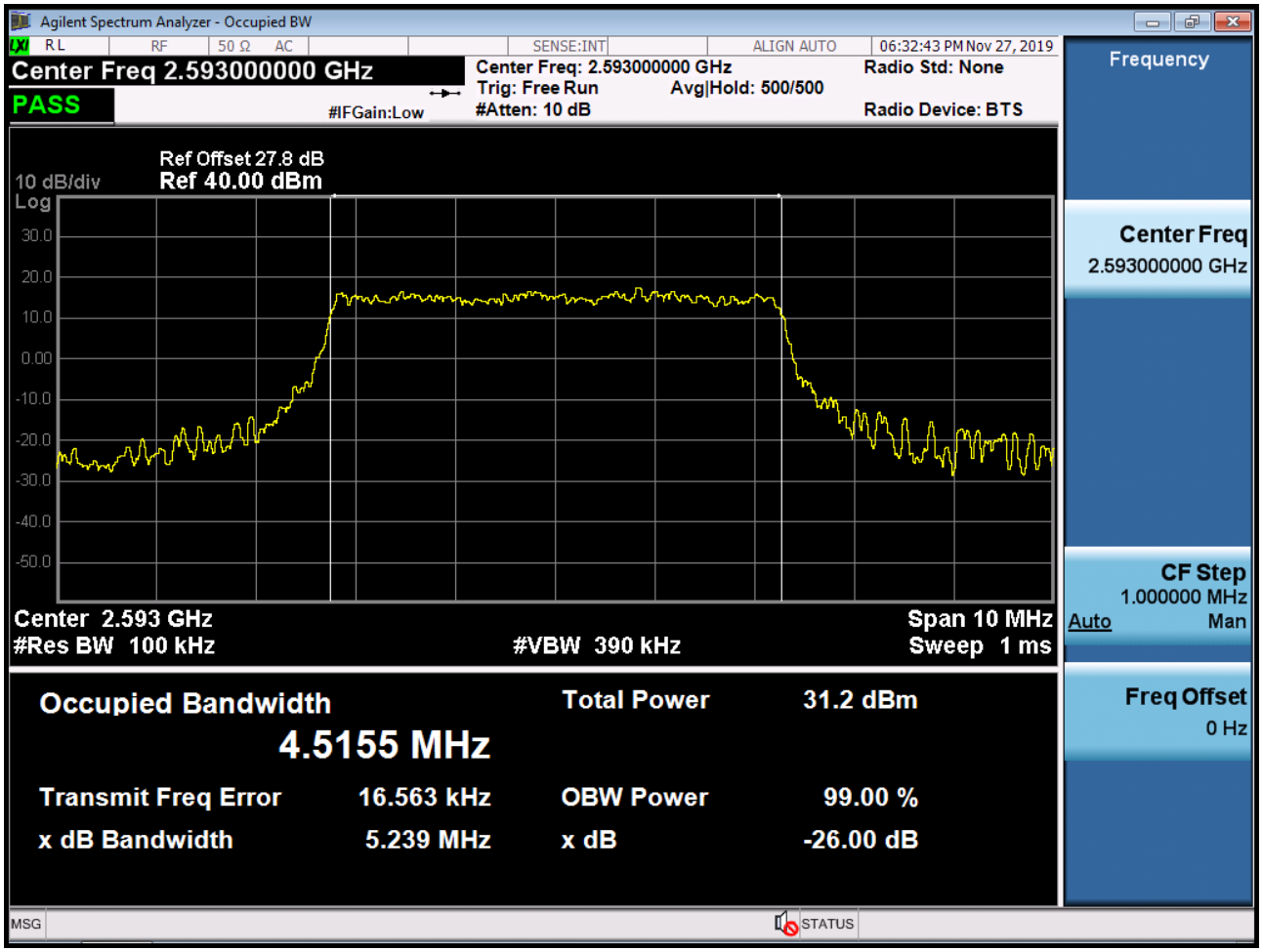
Occupied Bandwidth Plot (20 MHz Ch.40620 64-QAM RB 100) (POWER CLASS 3)



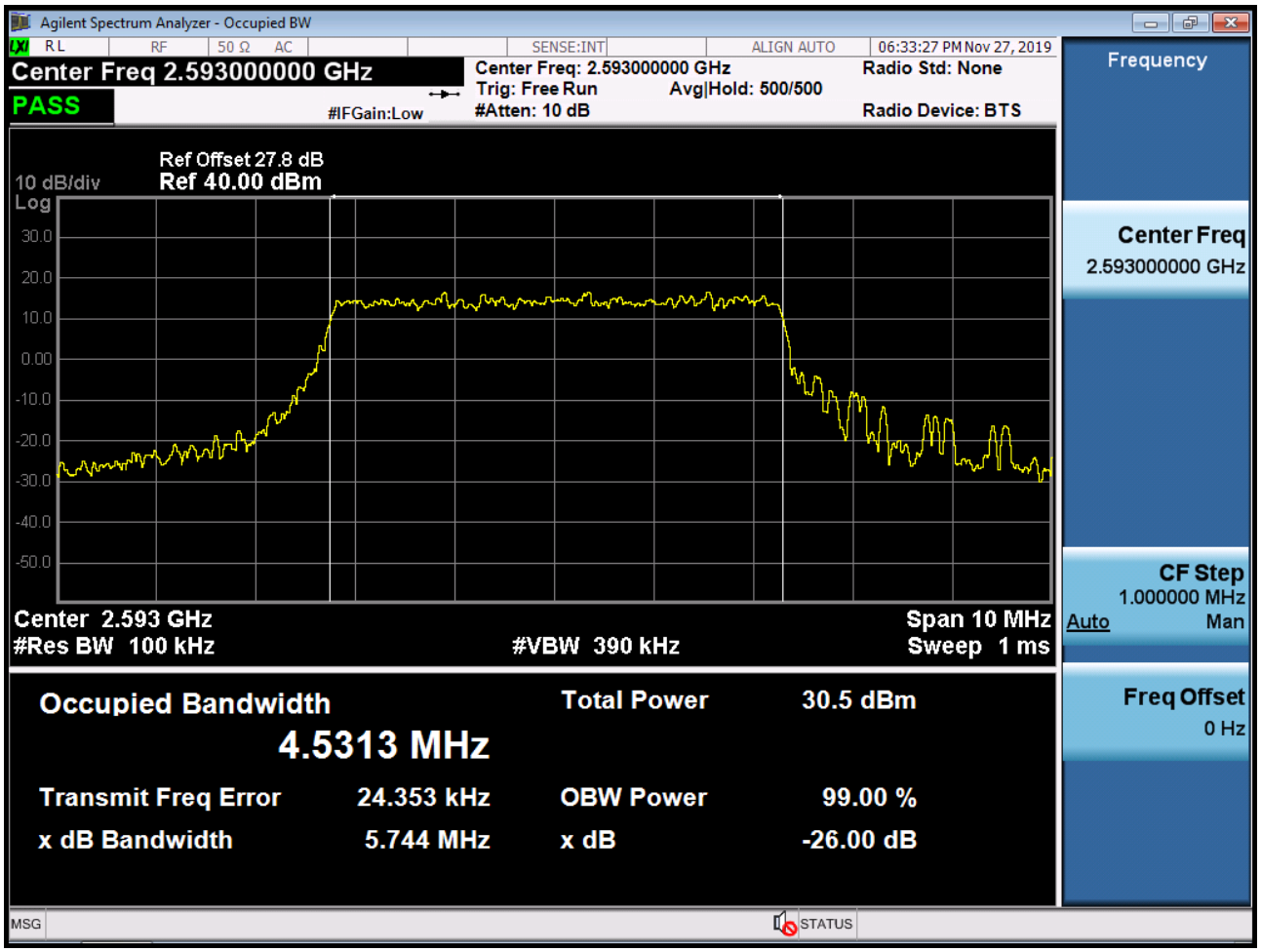
Occupied Bandwidth Plot (5 MHz Ch.40620 QPSK RB 25) (POWER CLASS 2)



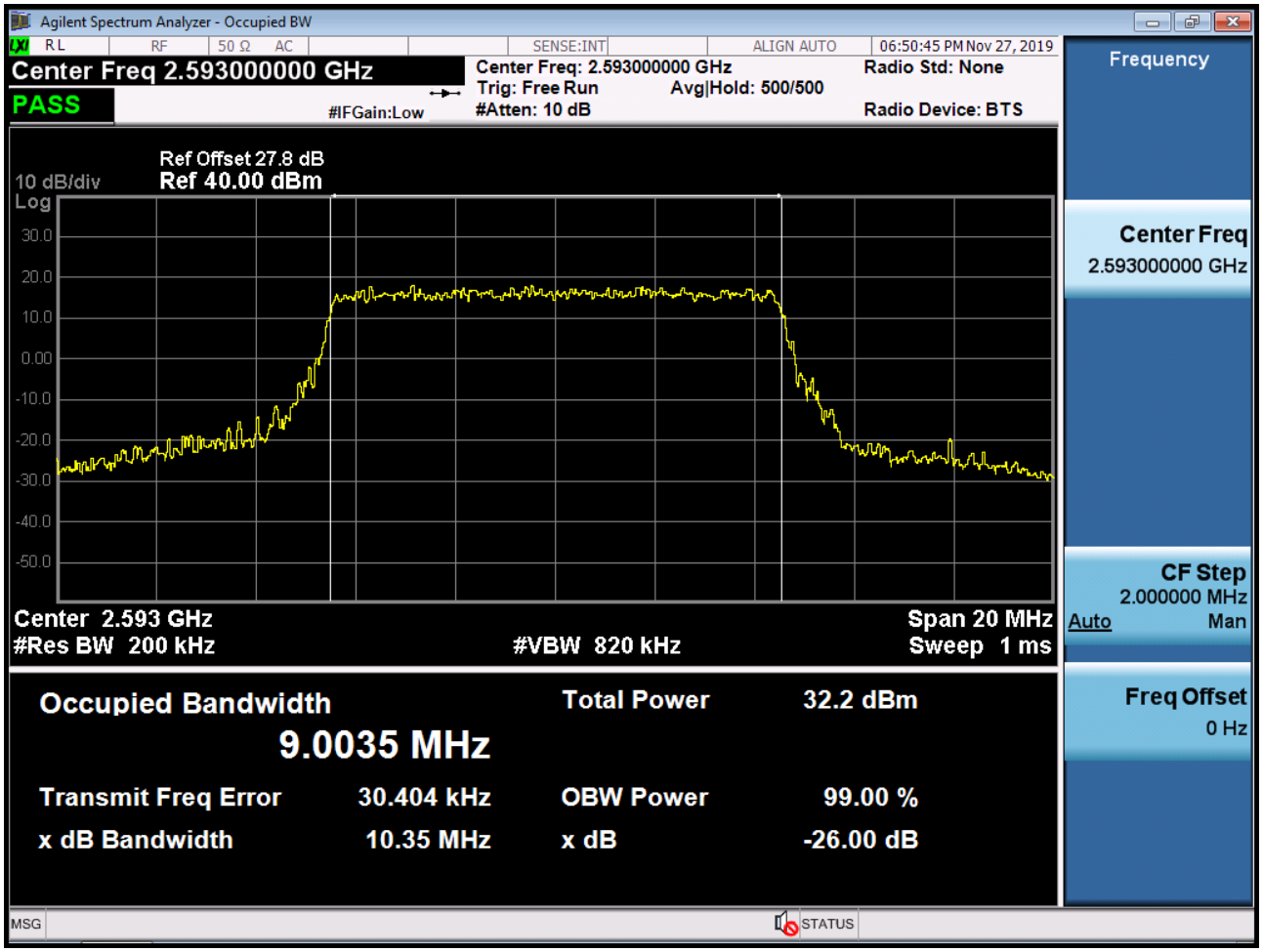
Occupied Bandwidth Plot (5 MHz Ch.40620 16-QAM RB 25) (POWER CLASS 2)



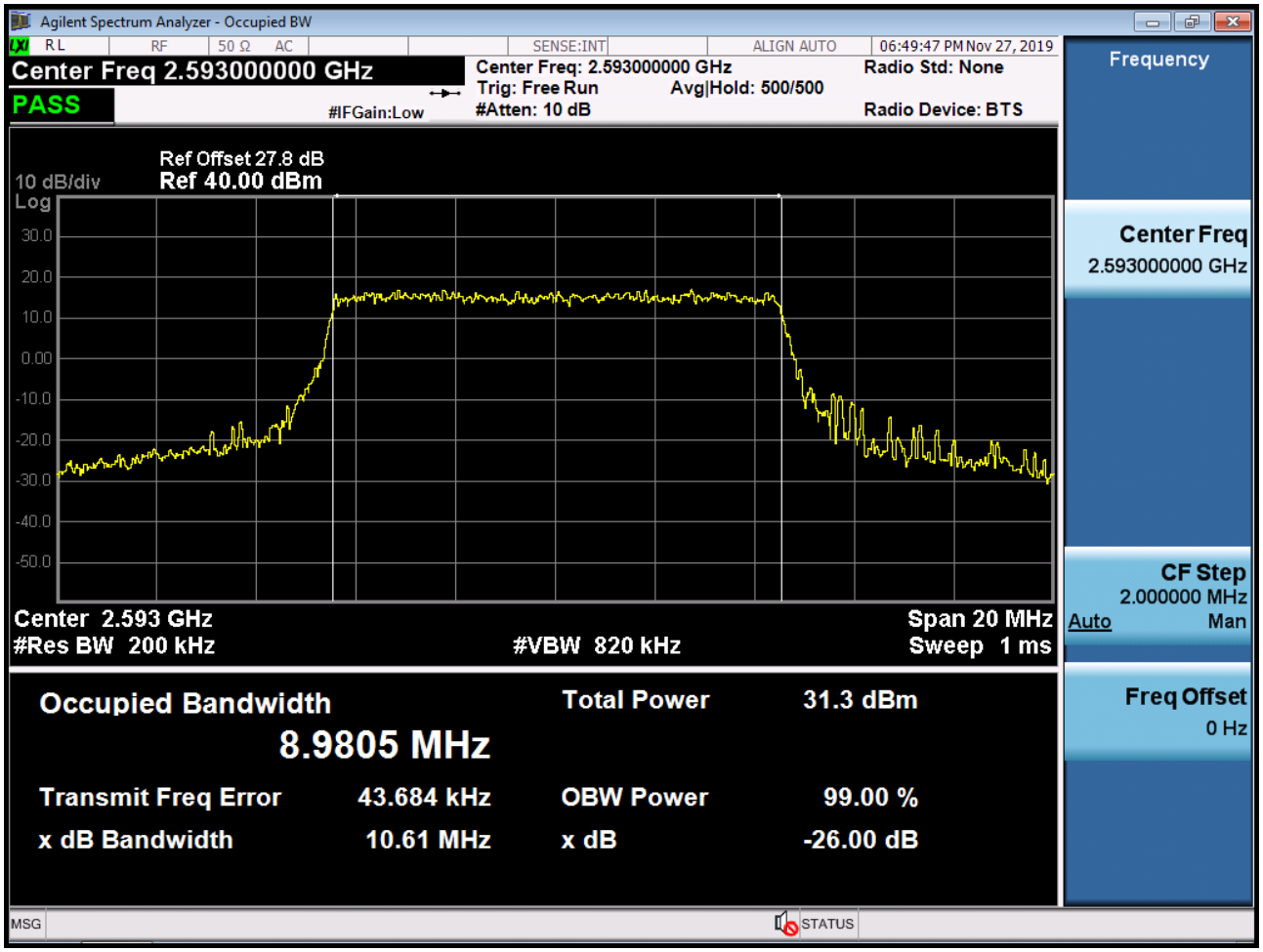
Occupied Bandwidth Plot (5 MHz Ch.40620 16-QAM RB 25) (POWER CLASS 2)



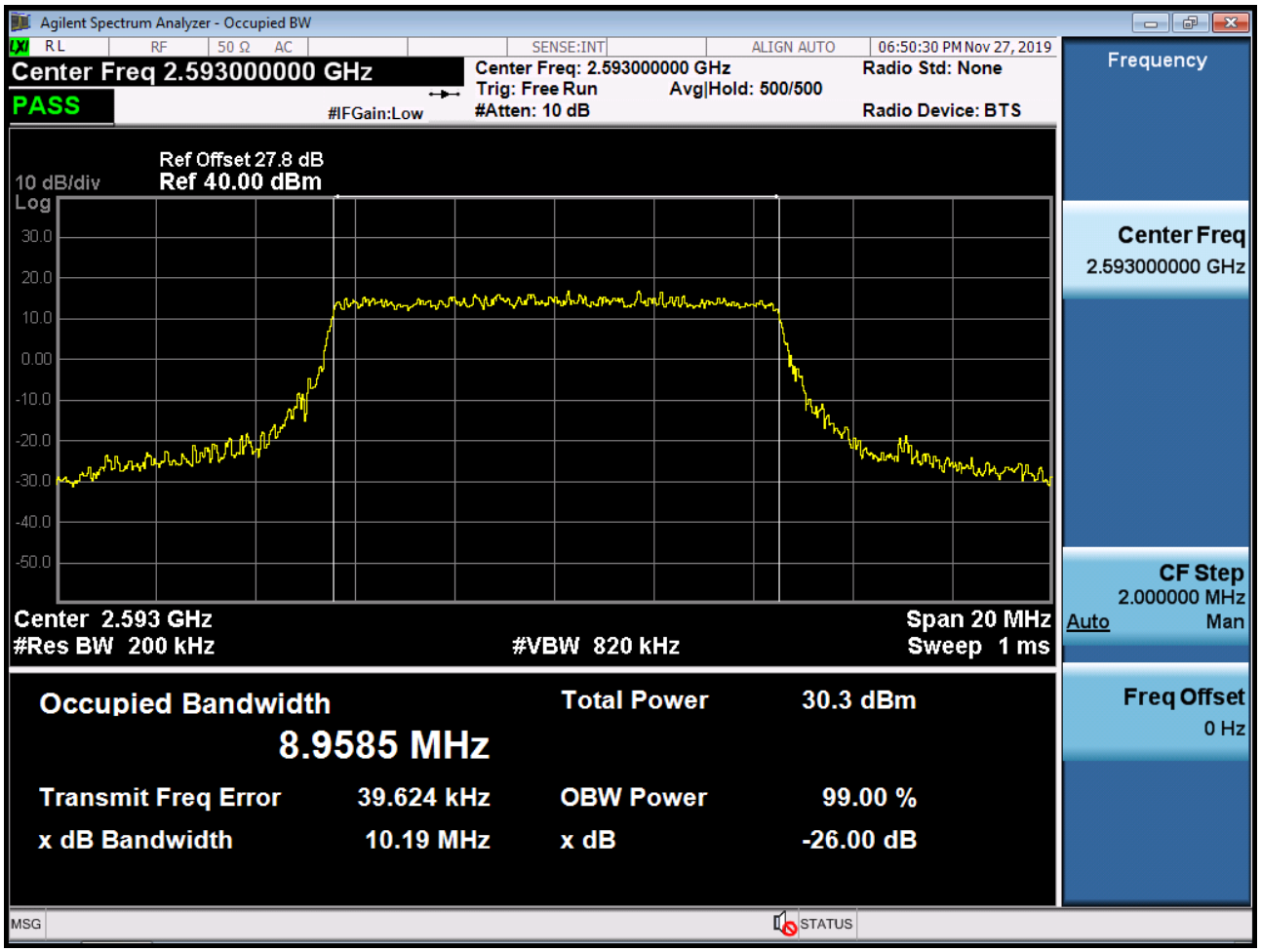
Occupied Bandwidth Plot (10 MHz Ch.40620 QPSK RB 50) (POWER CLASS 2)



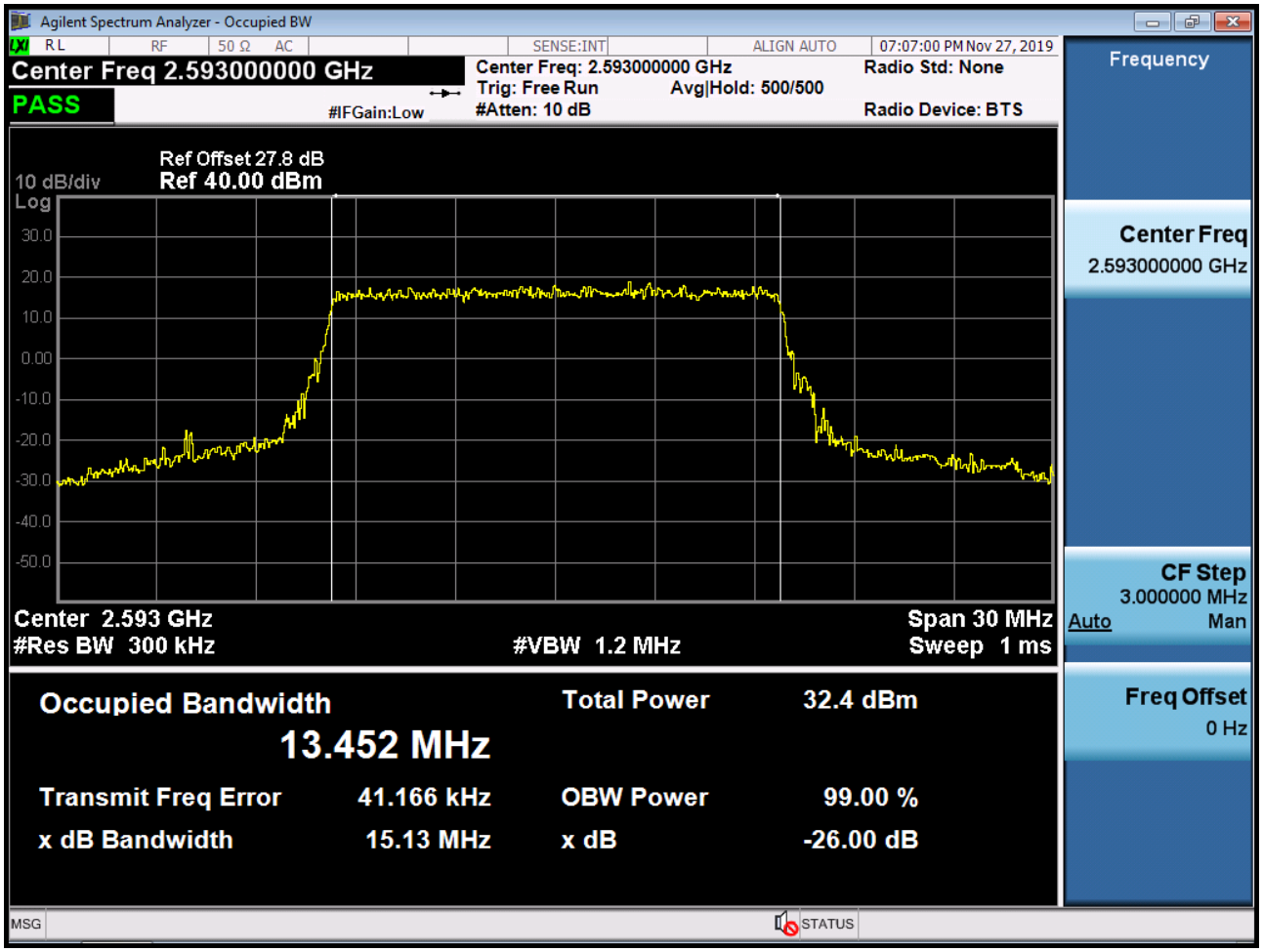
Occupied Bandwidth Plot (10 MHz Ch.40620 16-QAM RB 50) (POWER CLASS 2)



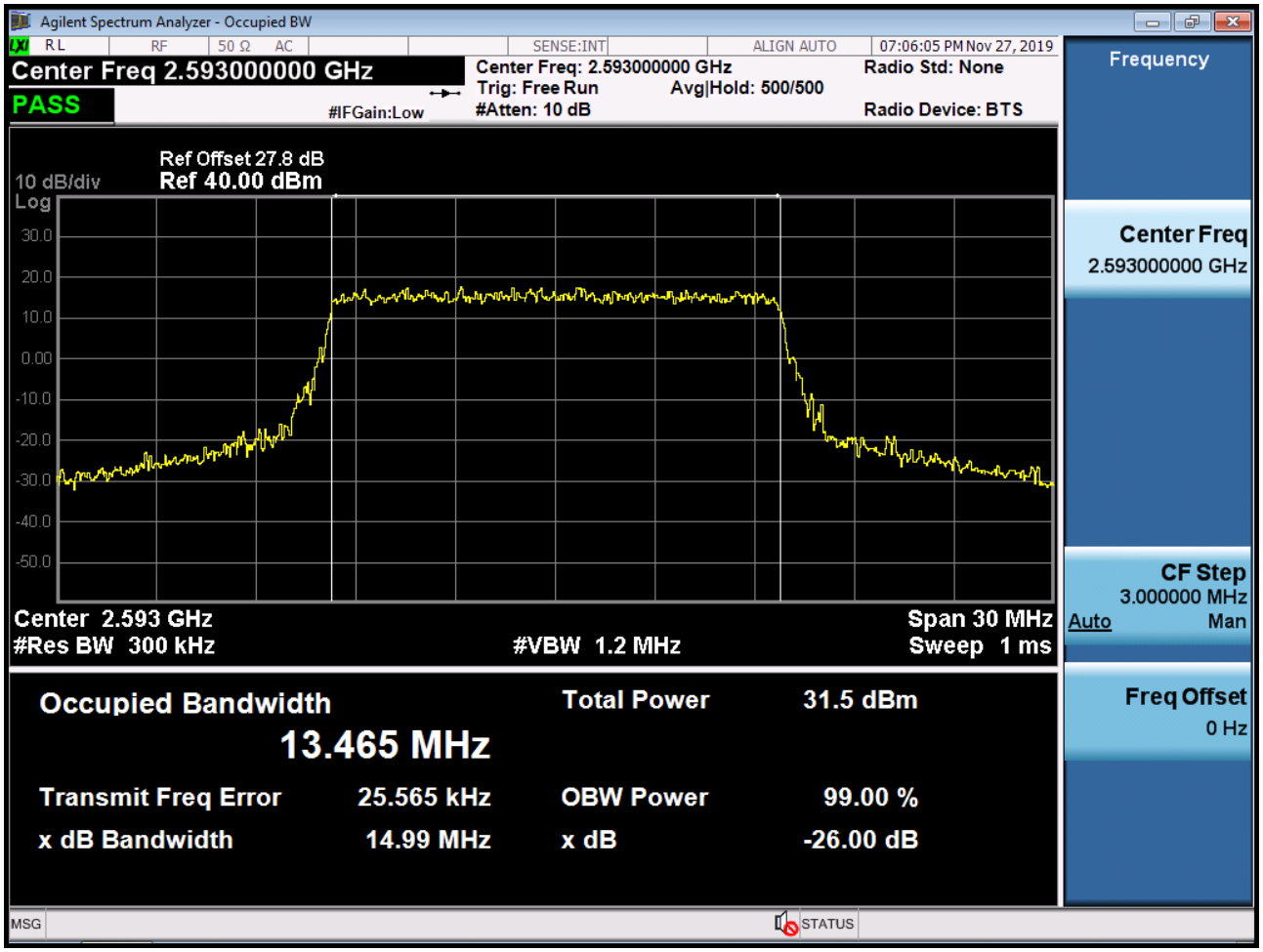
Occupied Bandwidth Plot (10 MHz Ch.40620 64-QAM RB 50) (POWER CLASS 2)



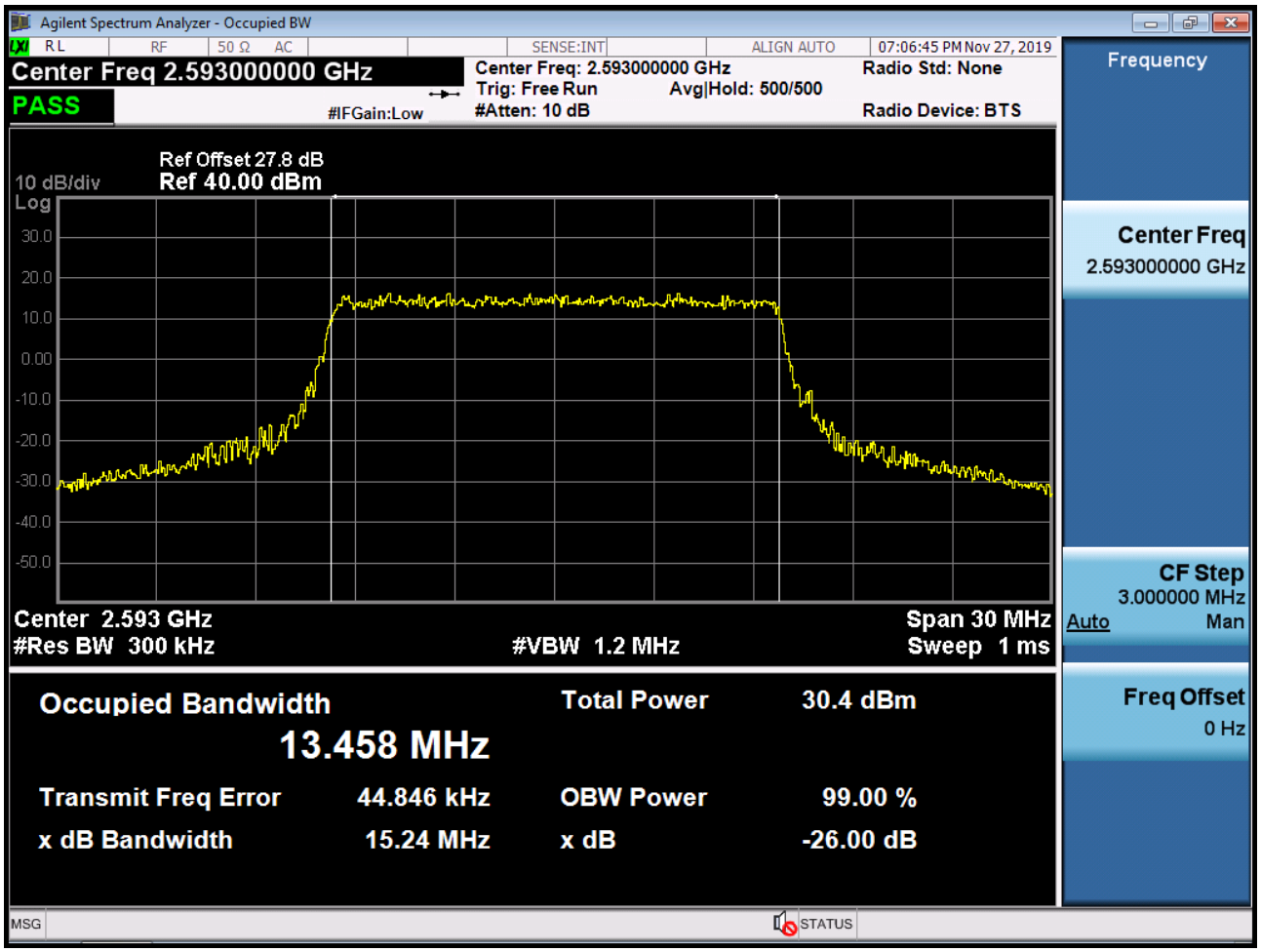
Occupied Bandwidth Plot (15 MHz Ch.40620 QPSK RB 75) (POWER CLASS 2)



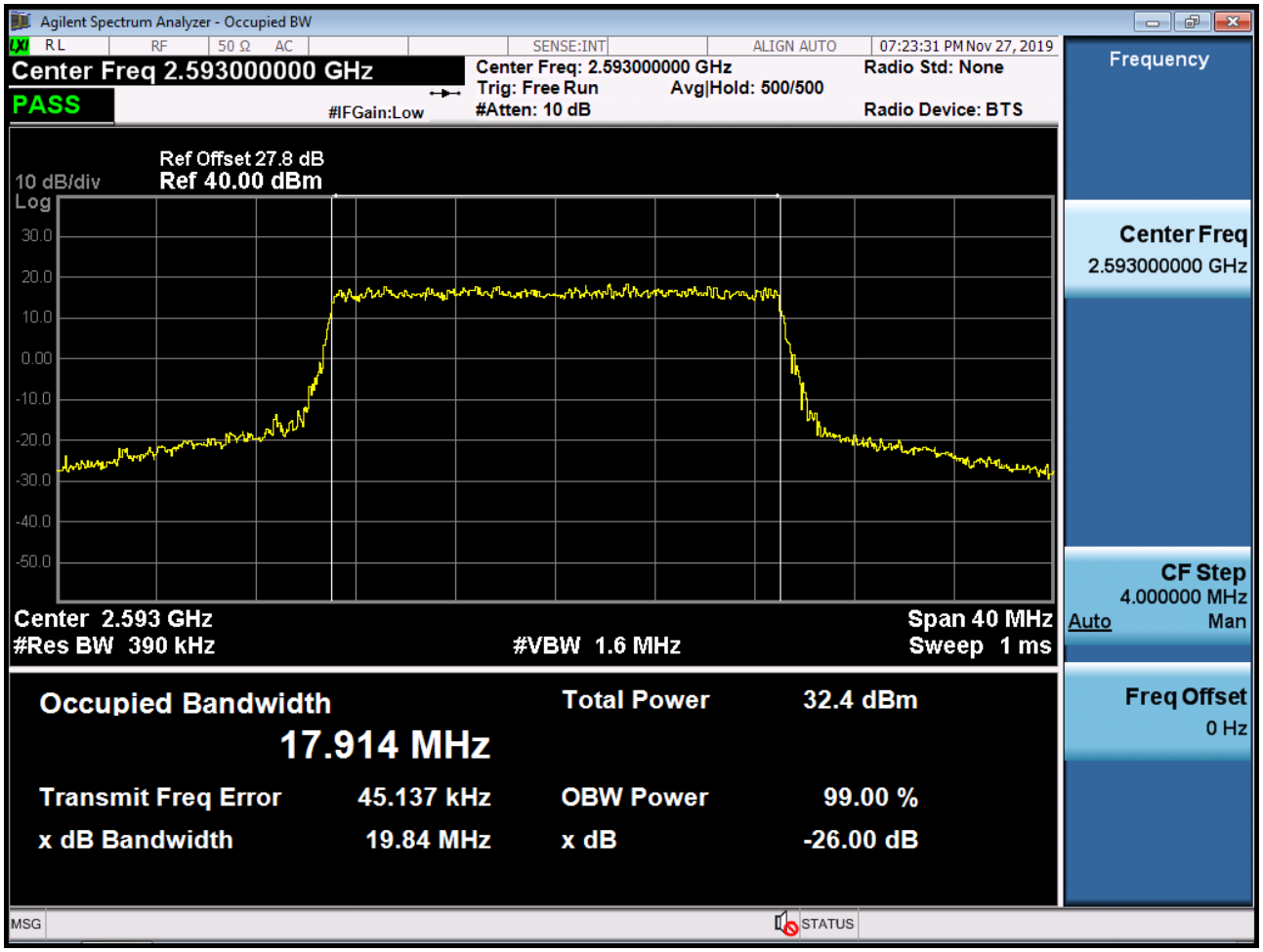
Occupied Bandwidth Plot (15 MHz Ch.40620 16-QAM RB 75) (POWER CLASS 2)



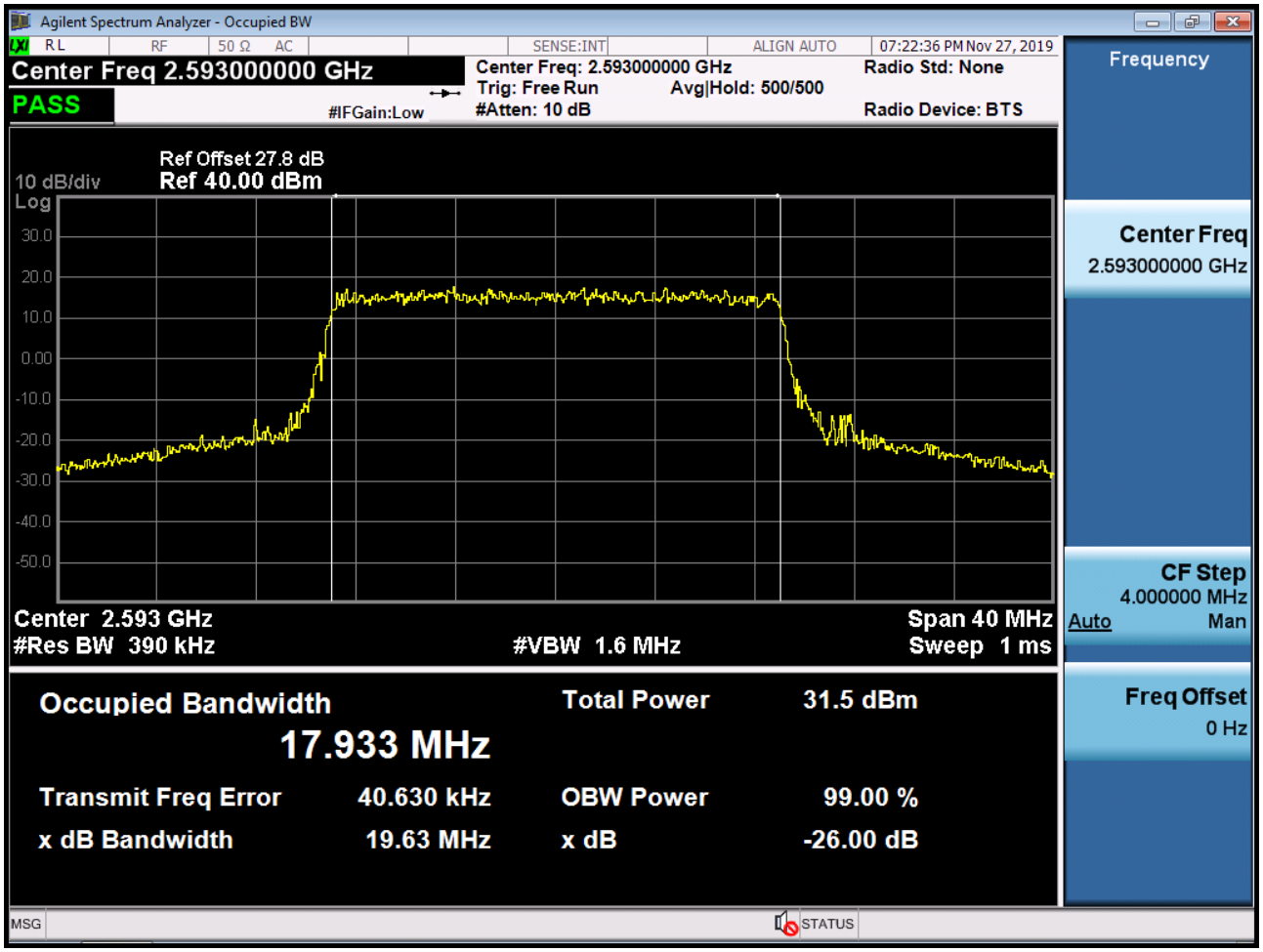
Occupied Bandwidth Plot (15 MHz Ch.40620 64-QAM RB 75) (POWER CLASS 2)



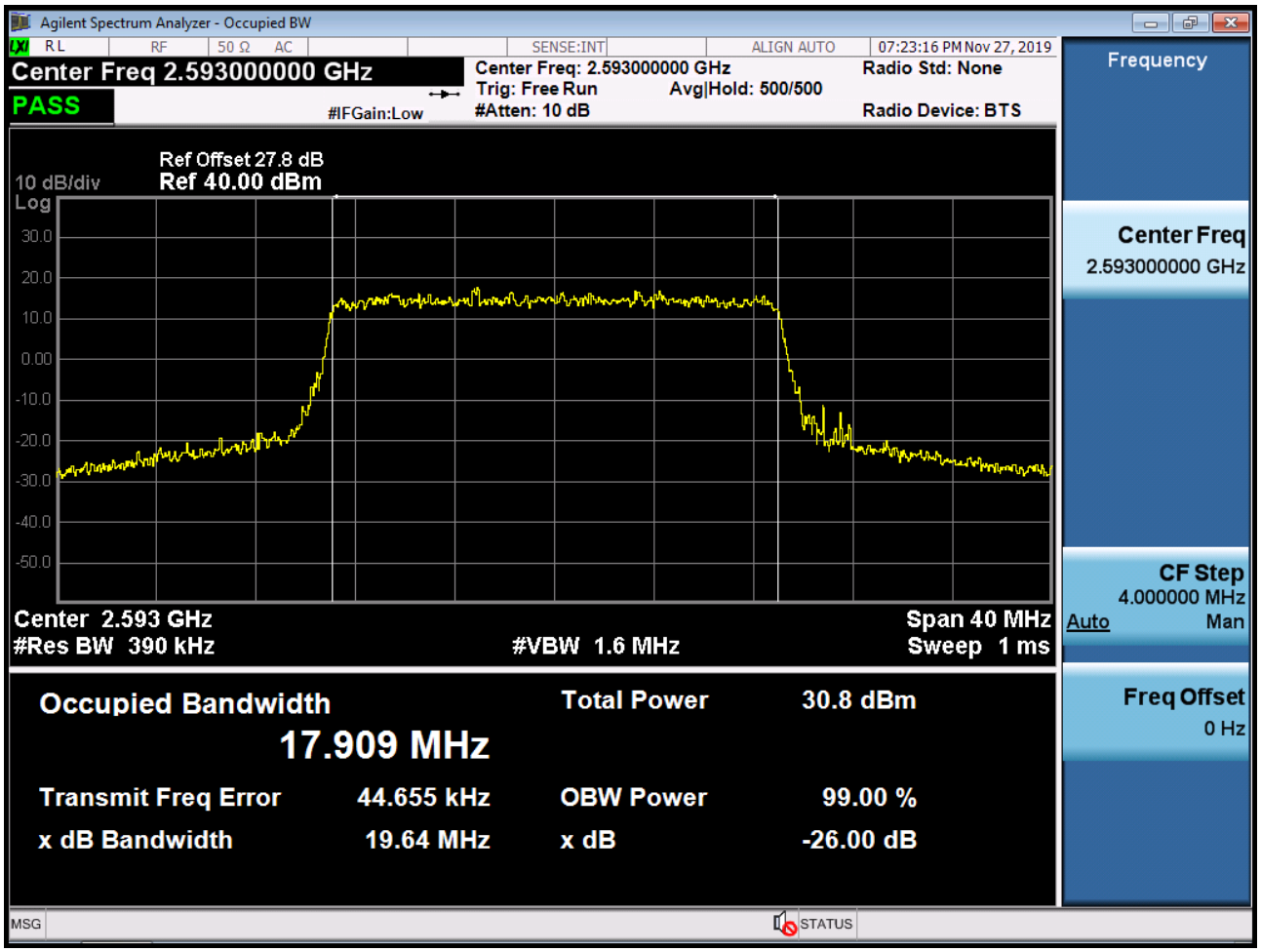
Occupied Bandwidth Plot (20 MHz Ch.40620 QPSK RB 100) (POWER CLASS 2)



Occupied Bandwidth Plot (20 MHz Ch.40620 16-QAM RB 100) (POWER CLASS 2)

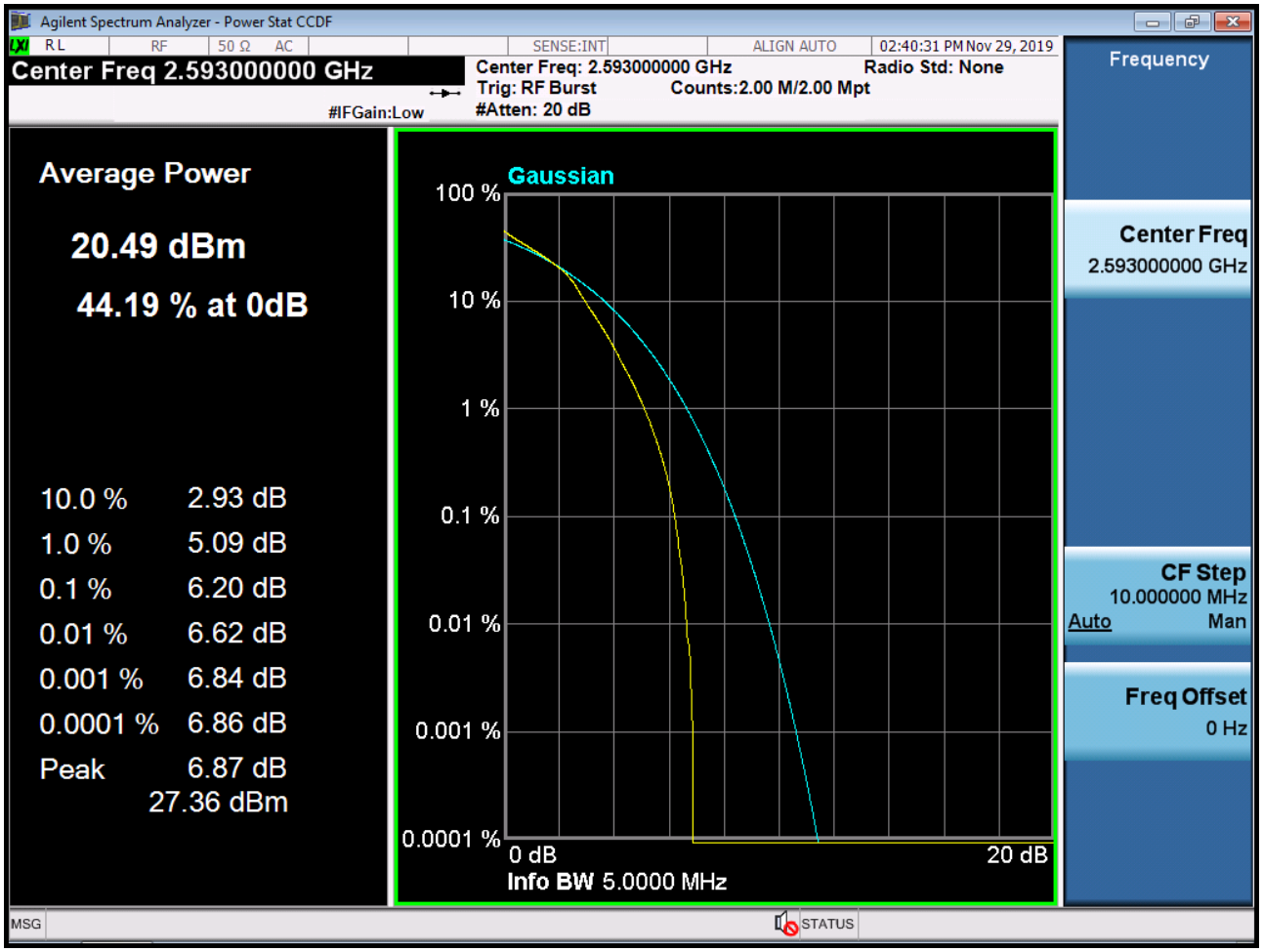


Occupied Bandwidth Plot (20 MHz Ch.40620 64-QAM RB 100) (POWER CLASS 2)

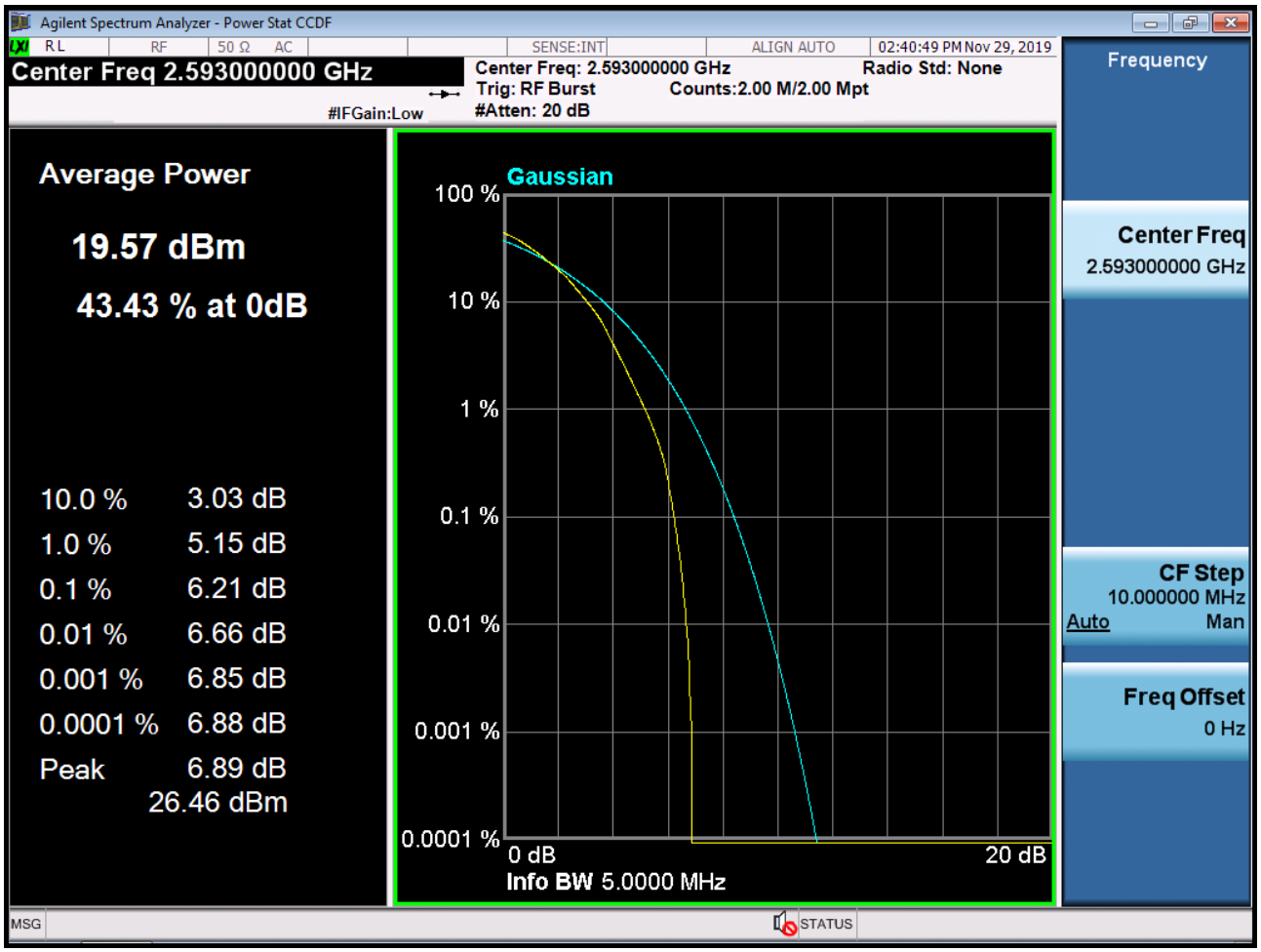


PAR Plot (5M BW_Ch.40620_QPSK_RB25_0) (POWER CLASS 3)

PAR Plot (5M BW_Ch.40620_16QAM_RB25_0) (POWER CLASS 3)



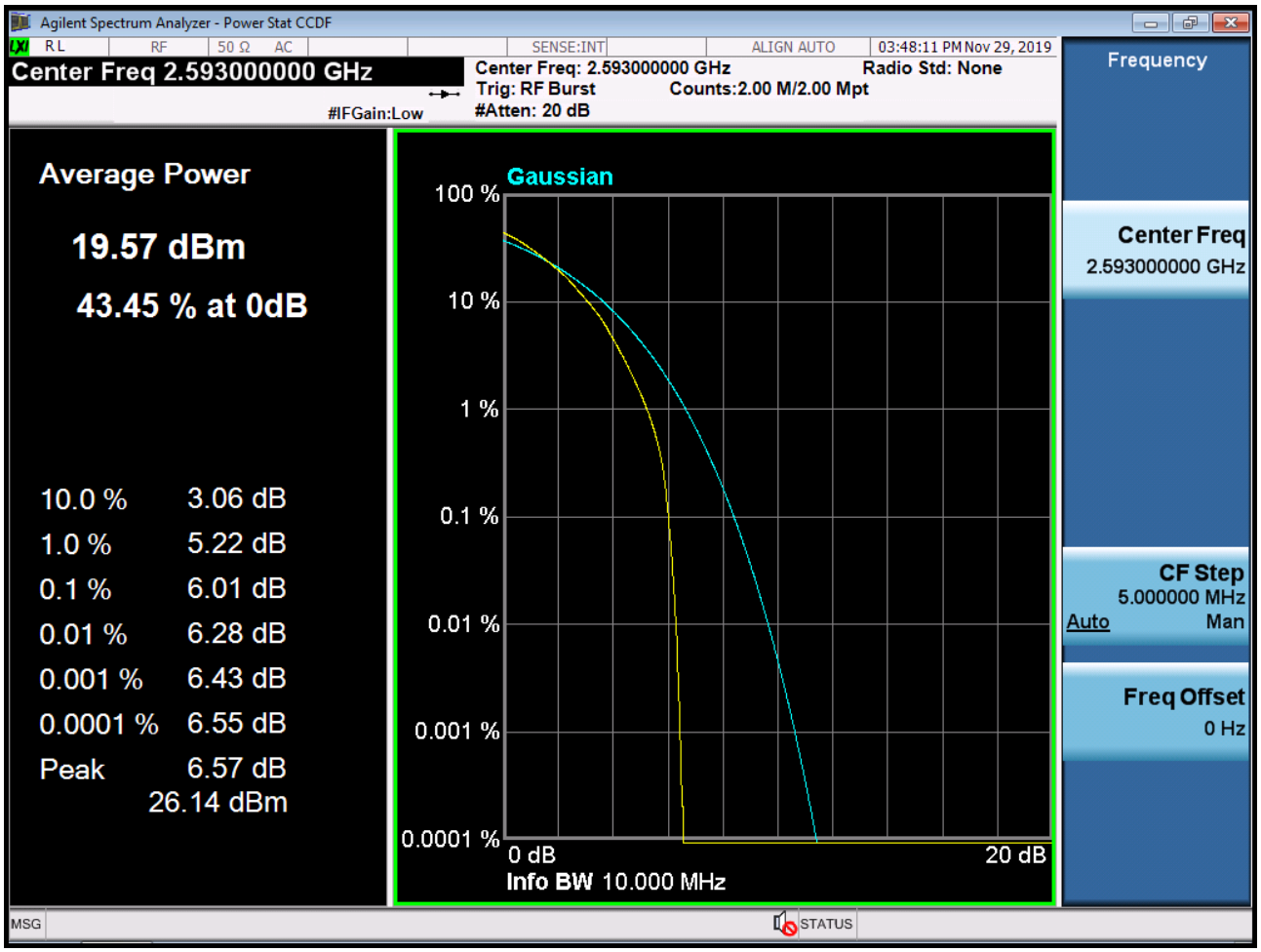
PAR Plot (5M BW_Ch.40620_64QAM_RB25_0) (POWER CLASS 3)



PAR Plot (10M BW_Ch.40620_QPSK_RB50_0) (POWER CLASS 3)

PAR Plot (10M BW_Ch.40620_16QAM_RB50_0) (POWER CLASS 3)

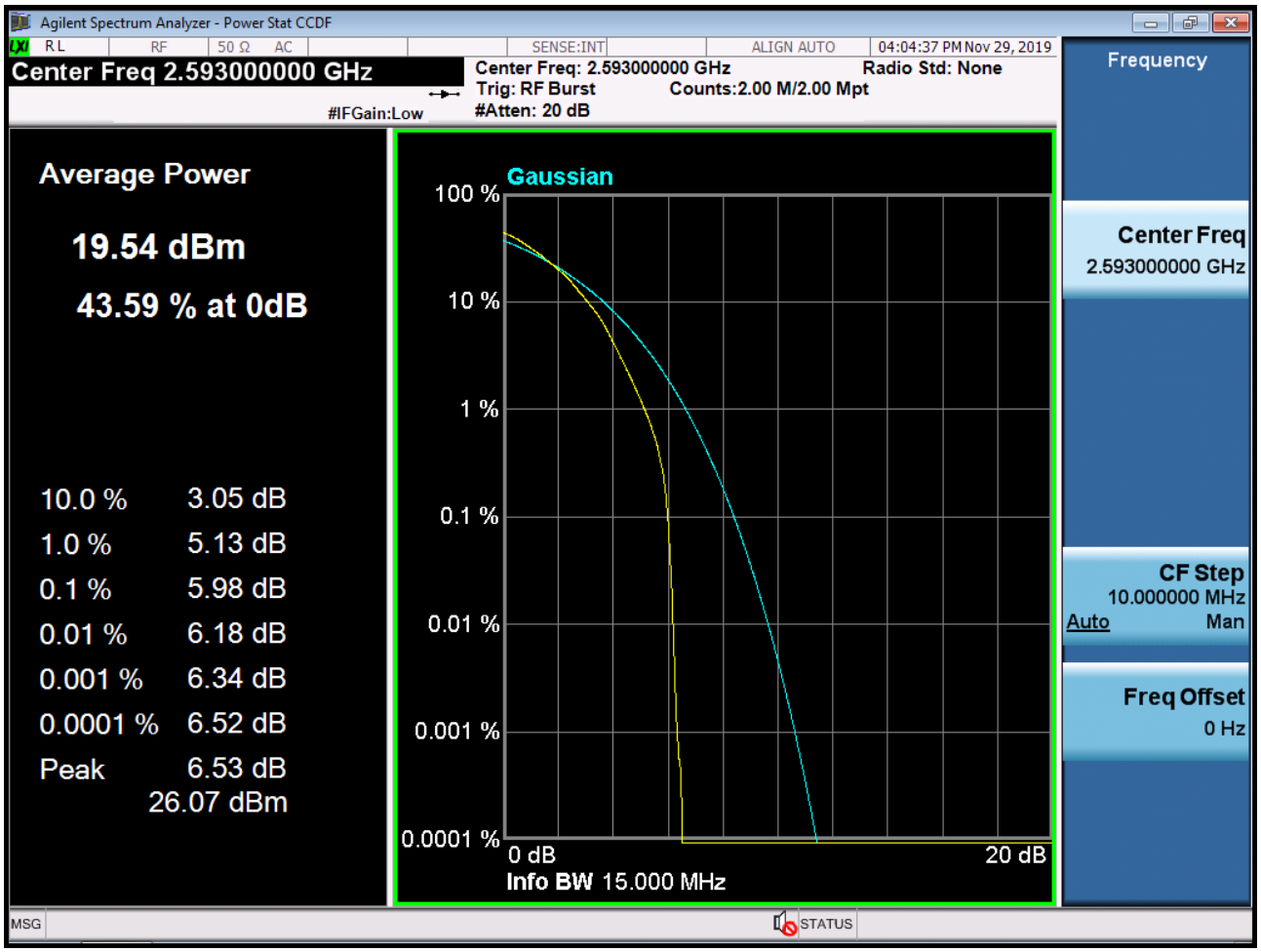
PAR Plot (10M BW_Ch.40620_64QAM_RB50_0) (POWER CLASS 3)



PAR Plot (15M BW_Ch.40620_QPSK_RB75_0) (POWER CLASS 3)

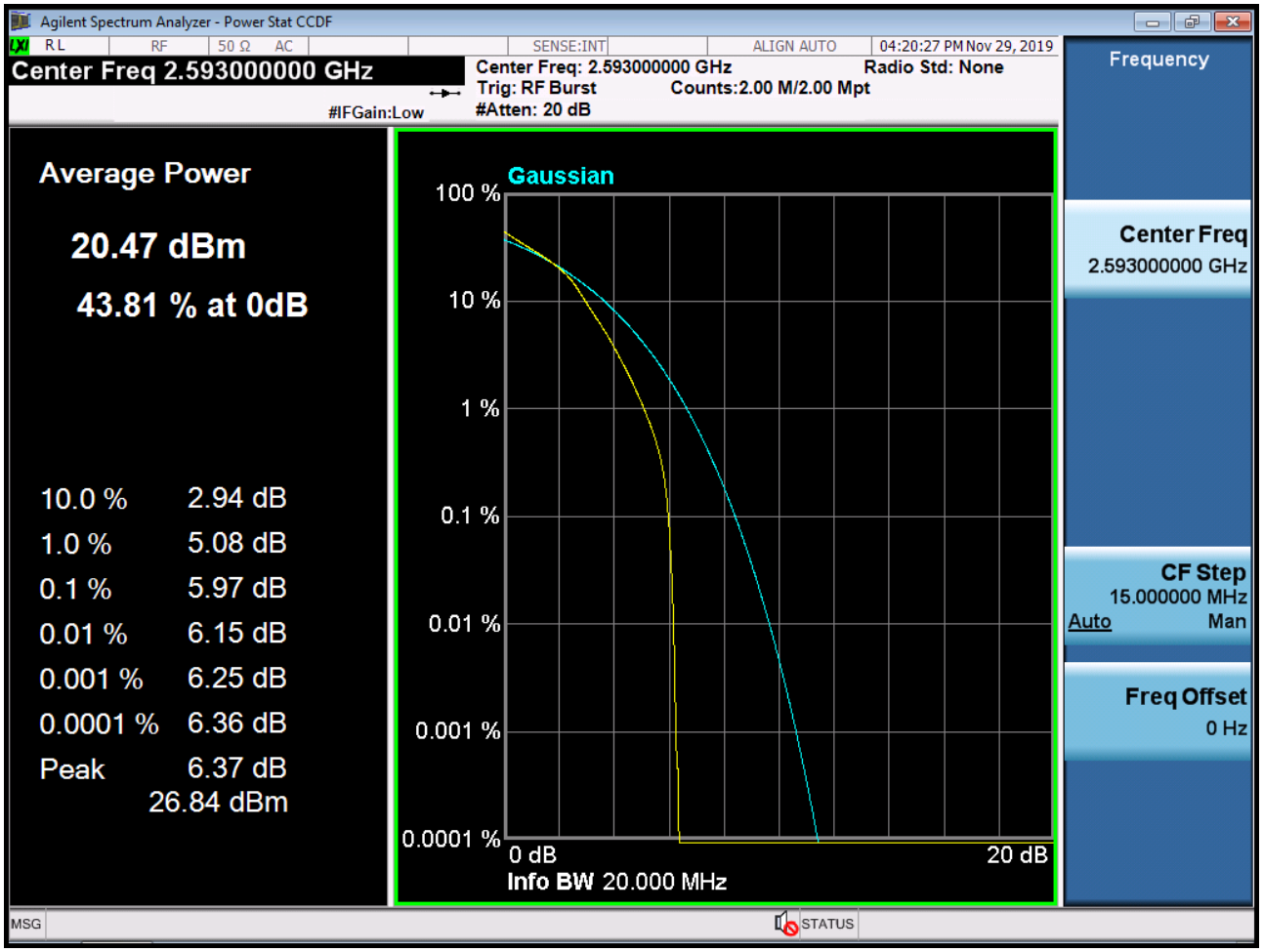
PAR Plot (15M BW_Ch.40620_16QAM_RB75_0) (POWER CLASS 3)

PAR Plot (15M BW_Ch.40620_64QAM_RB75_0) (POWER CLASS 3)

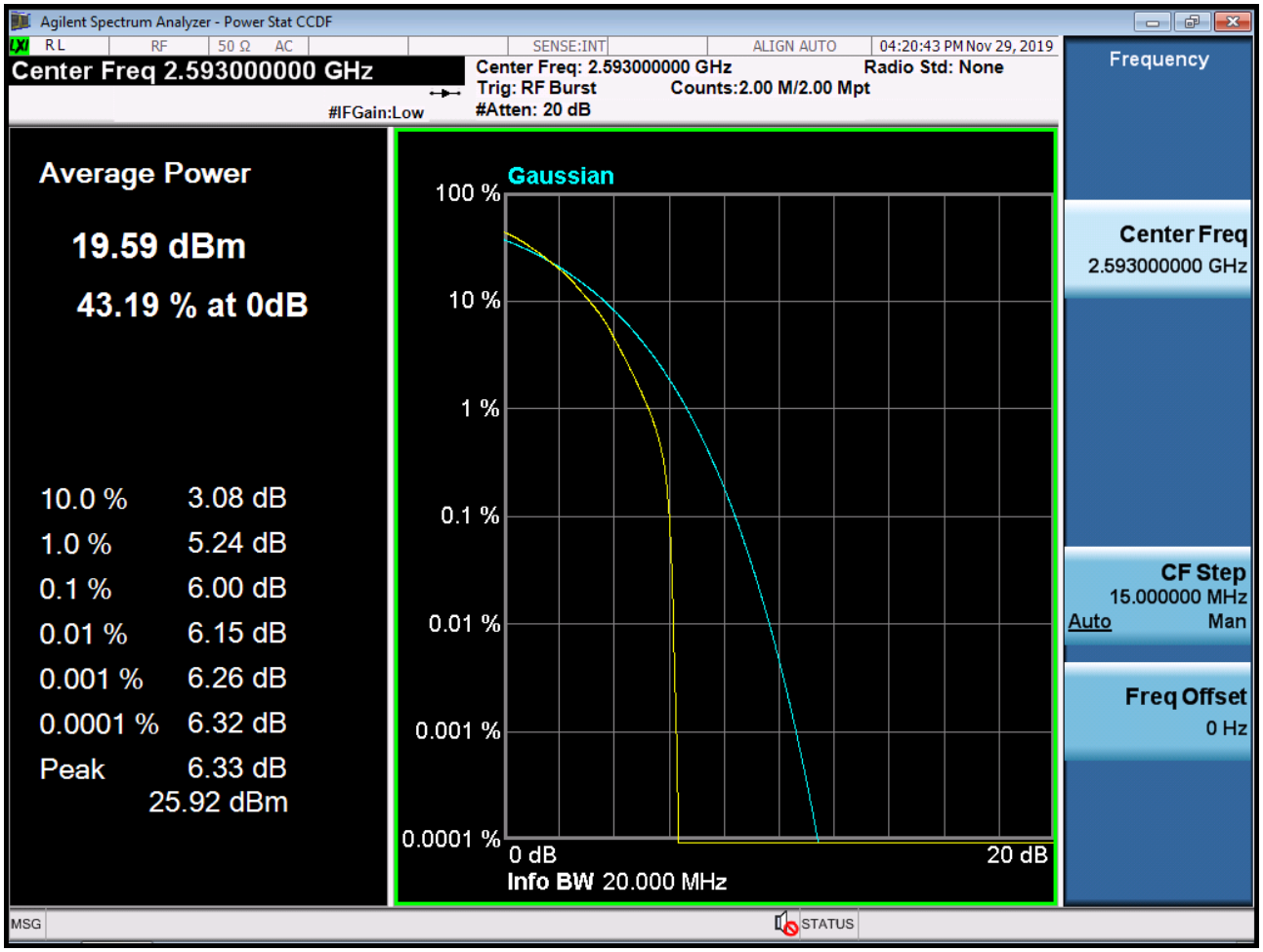


PAR Plot (20M BW_Ch.40620_QPSK_RB100_0) (POWER CLASS 3)

PAR Plot (20M BW_Ch.40620_16QAM_RB100_0) (POWER CLASS 3)



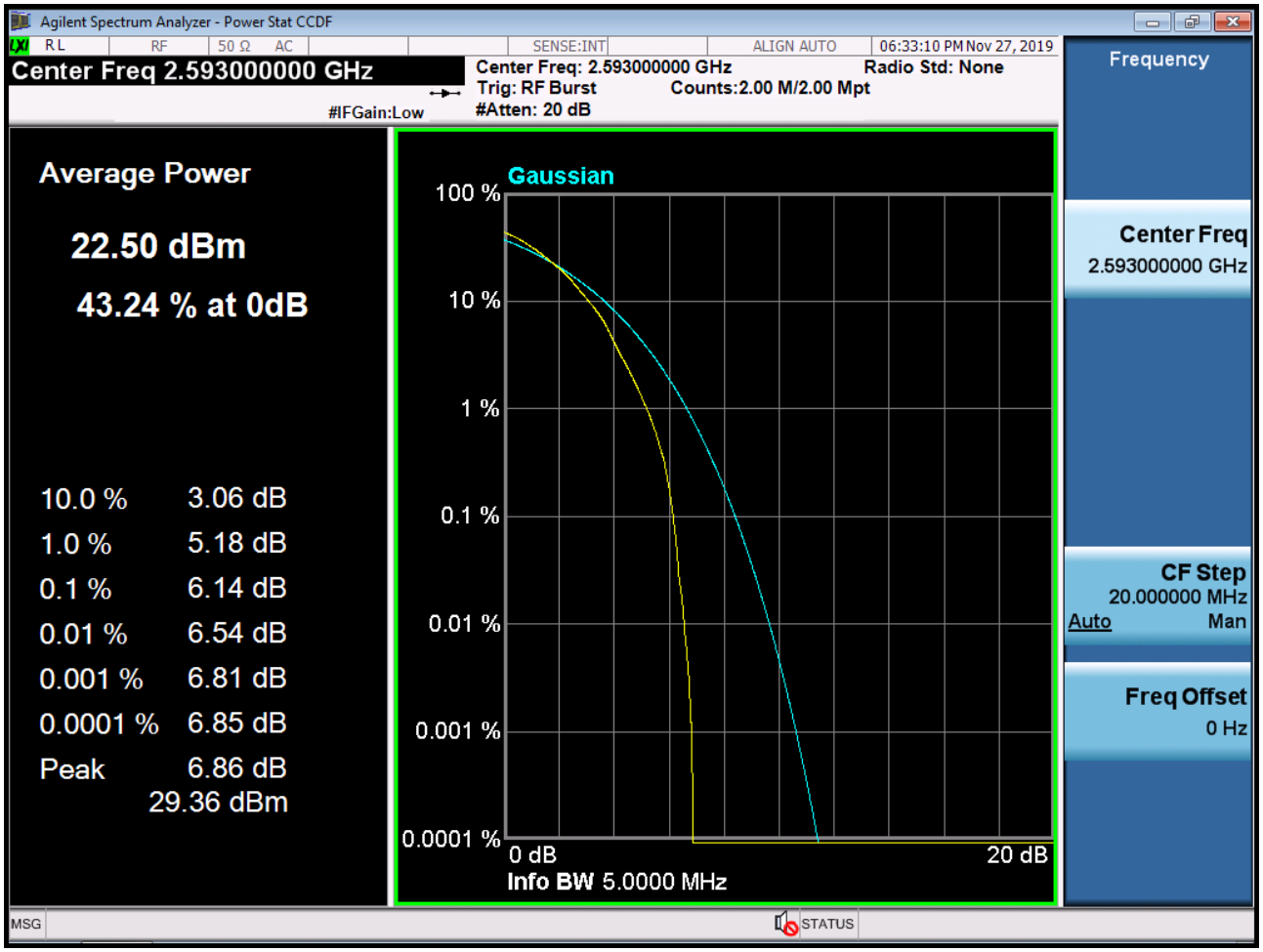
PAR Plot (20M BW_Ch.40620_64QAM_RB100_0) (POWER CLASS 3)



PAR Plot (5M BW_Ch.40620_QPSK_RB25_0) (POWER CLASS 2)

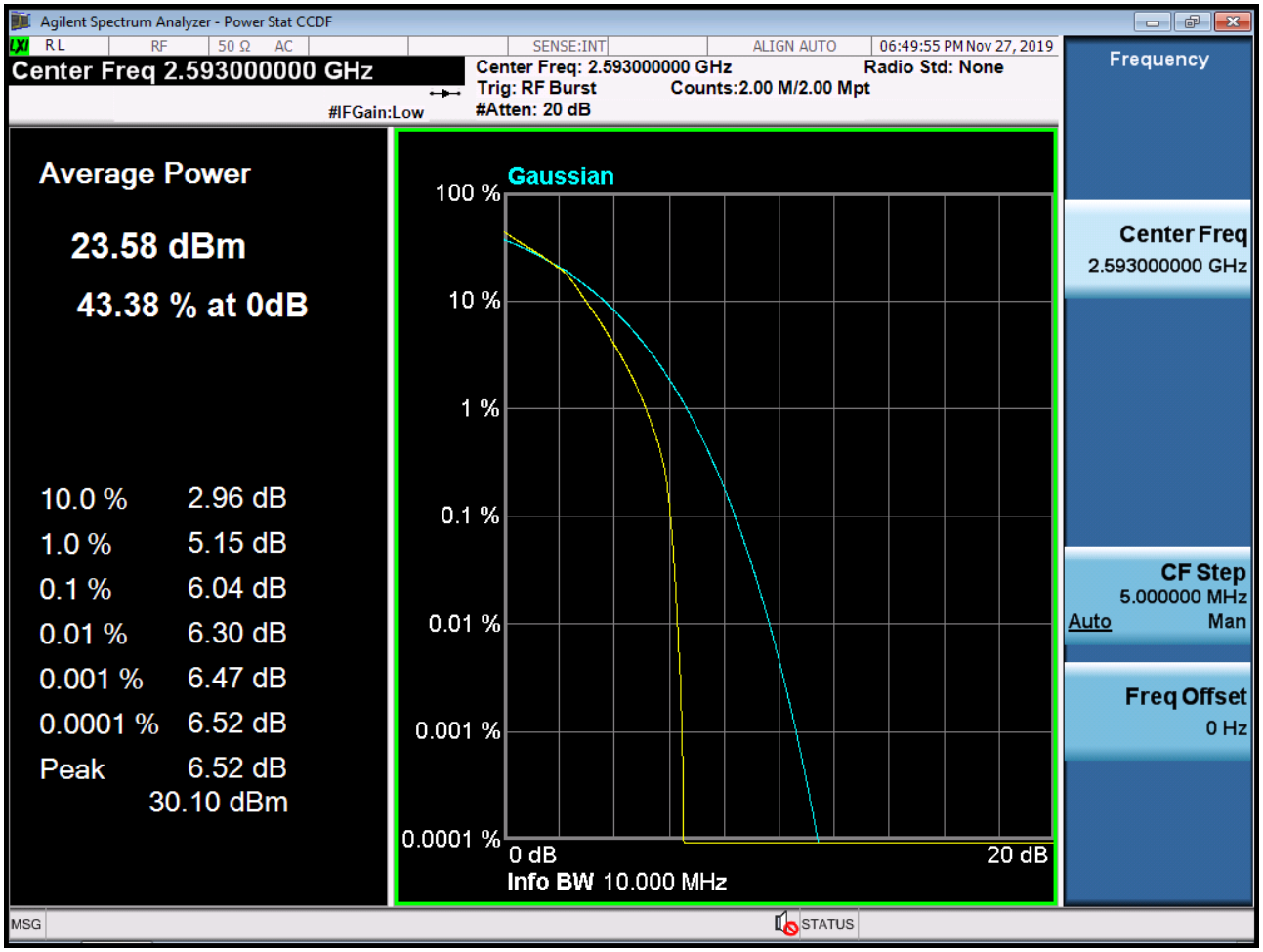
PAR Plot (5M BW_Ch.40620_16QAM_RB25_0) (POWER CLASS 2)

PAR Plot (5M BW_Ch.40620_64QAM_RB25_0) (POWER CLASS 2)



PAR Plot (10M BW_Ch.40620_QPSK_RB50_0) (POWER CLASS 2)

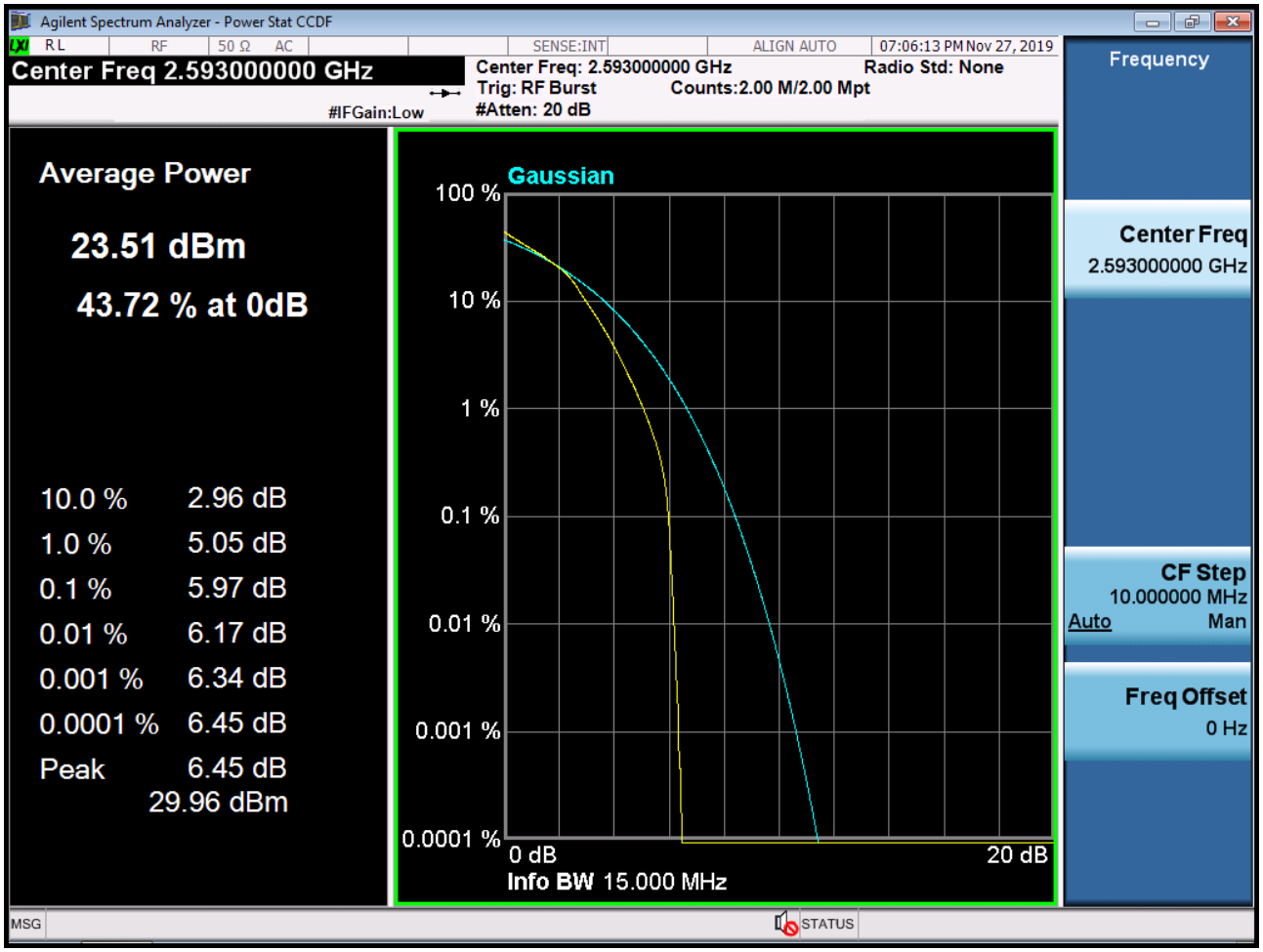
PAR Plot (10M BW_Ch.40620_16QAM_RB50_0) (POWER CLASS 2)



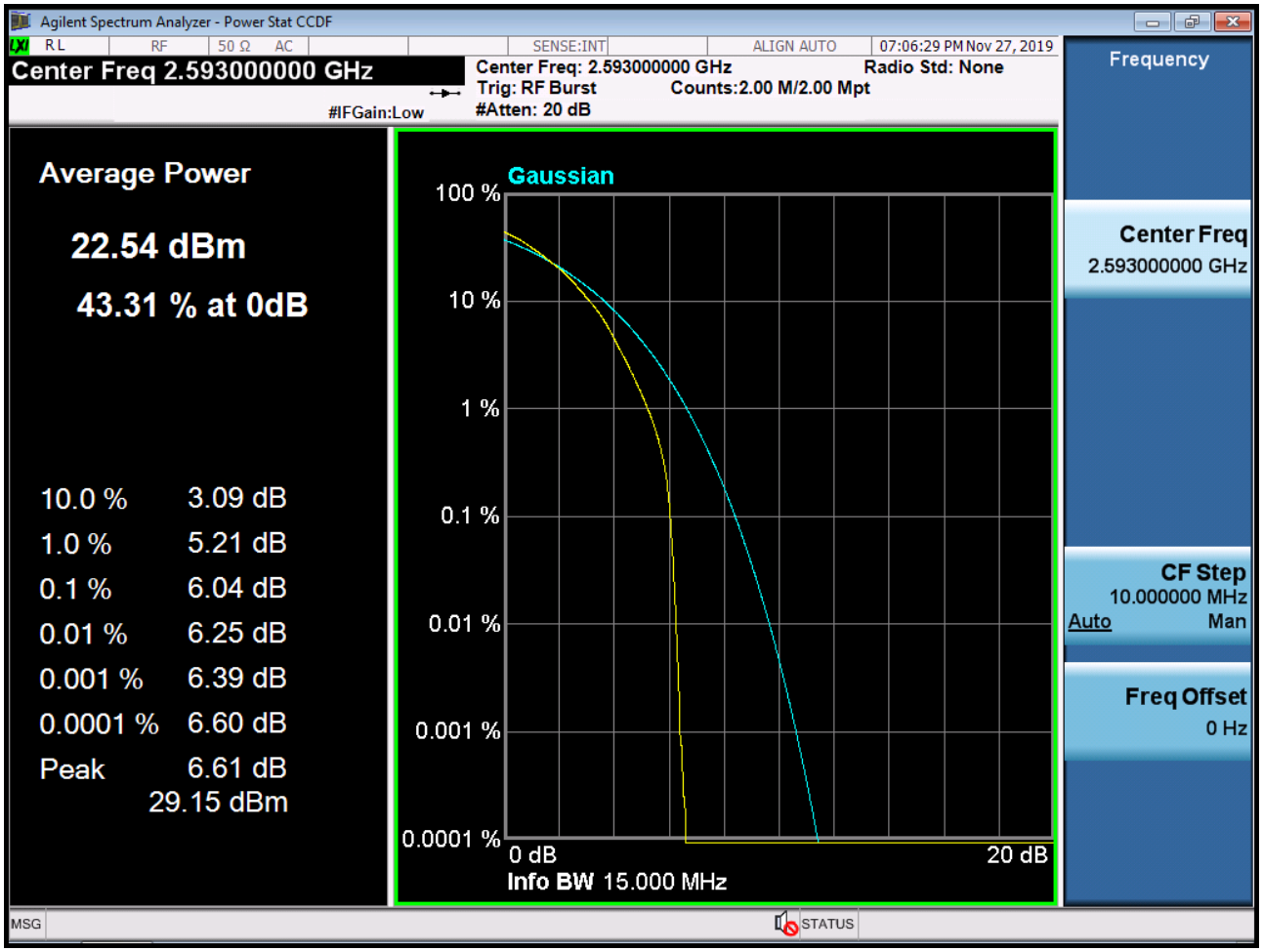
PAR Plot (10M BW_Ch.40620_64QAM_RB50_0) (POWER CLASS 2)

PAR Plot (15M BW_Ch.40620_QPSK_RB75_0) (POWER CLASS 2)

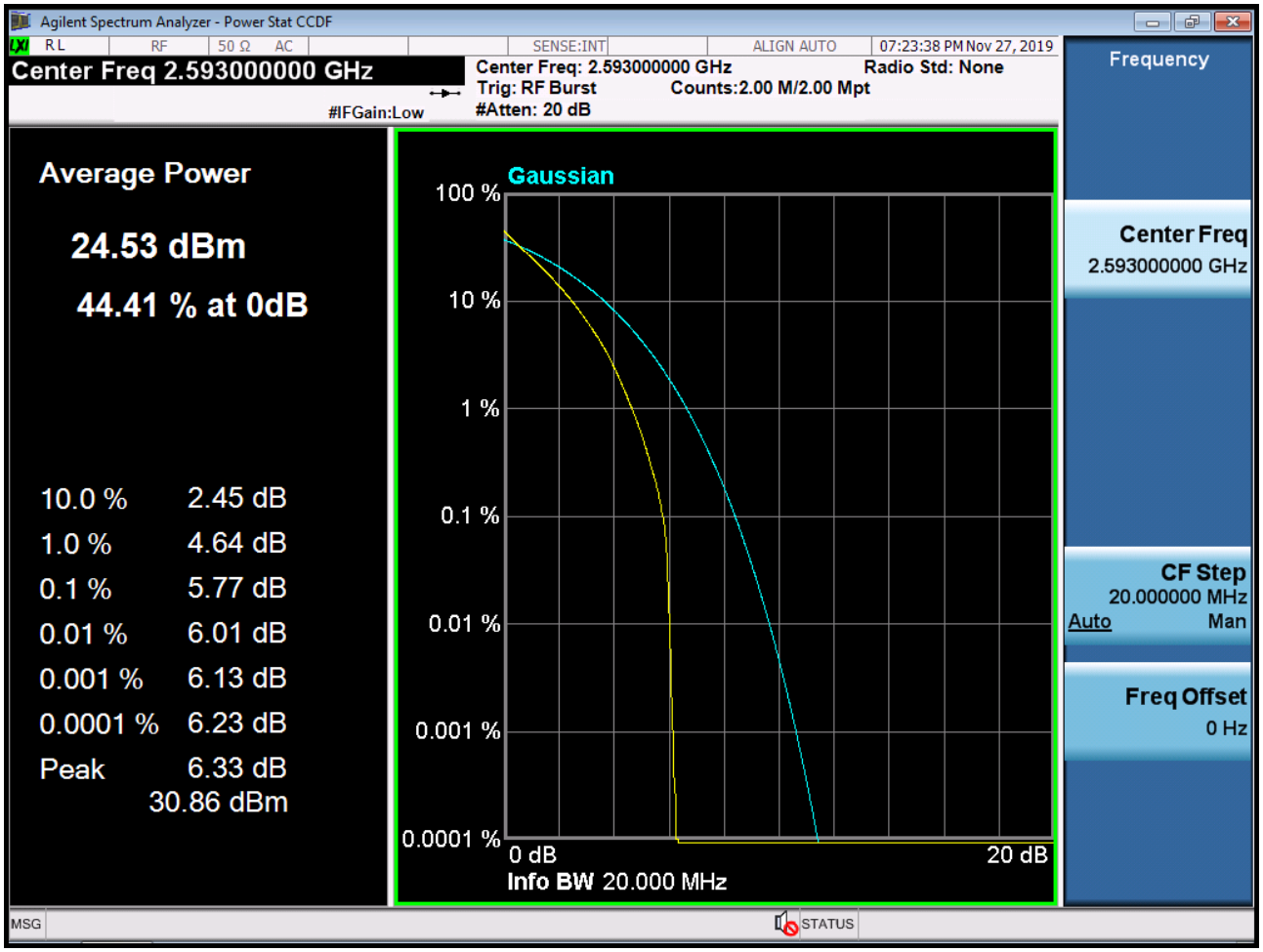
PAR Plot (15M BW_Ch.40620_16QAM_RB75_0) (POWER CLASS 2)



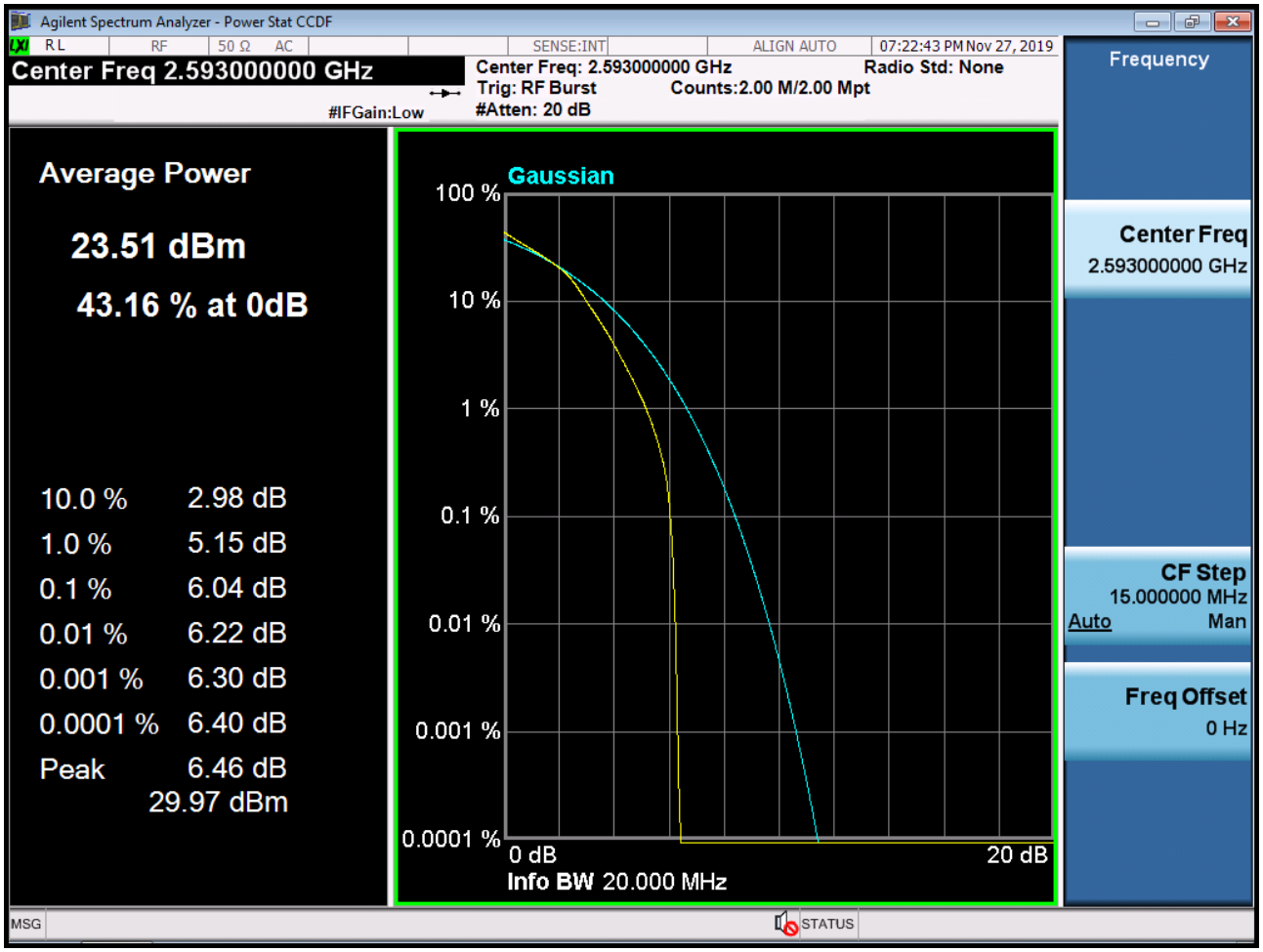
PAR Plot (15M BW_Ch.40620_64QAM_RB75_0) (POWER CLASS 2)



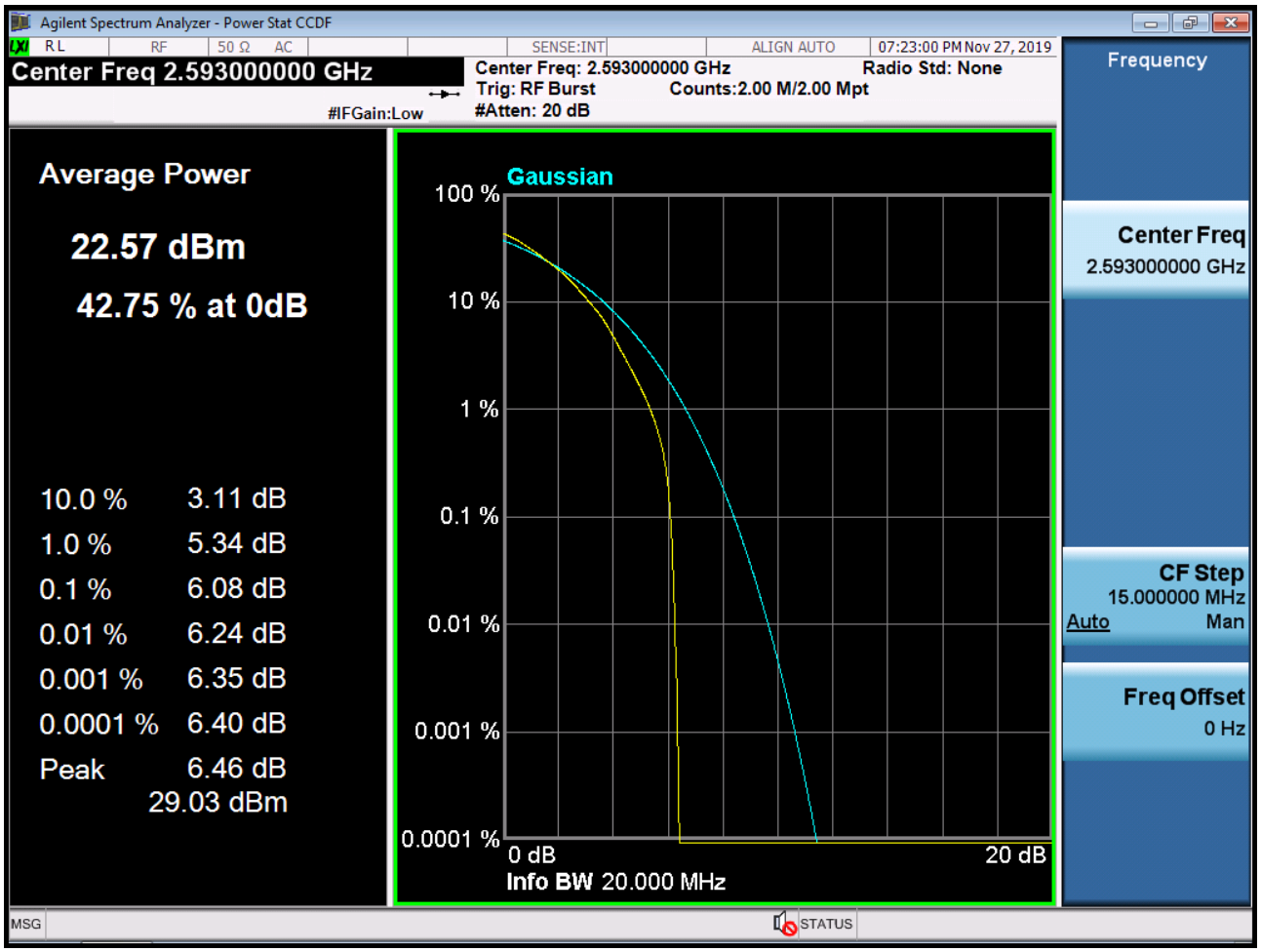
PAR Plot (20M BW_Ch.40620_QPSK_RB100_0) (POWER CLASS 2)



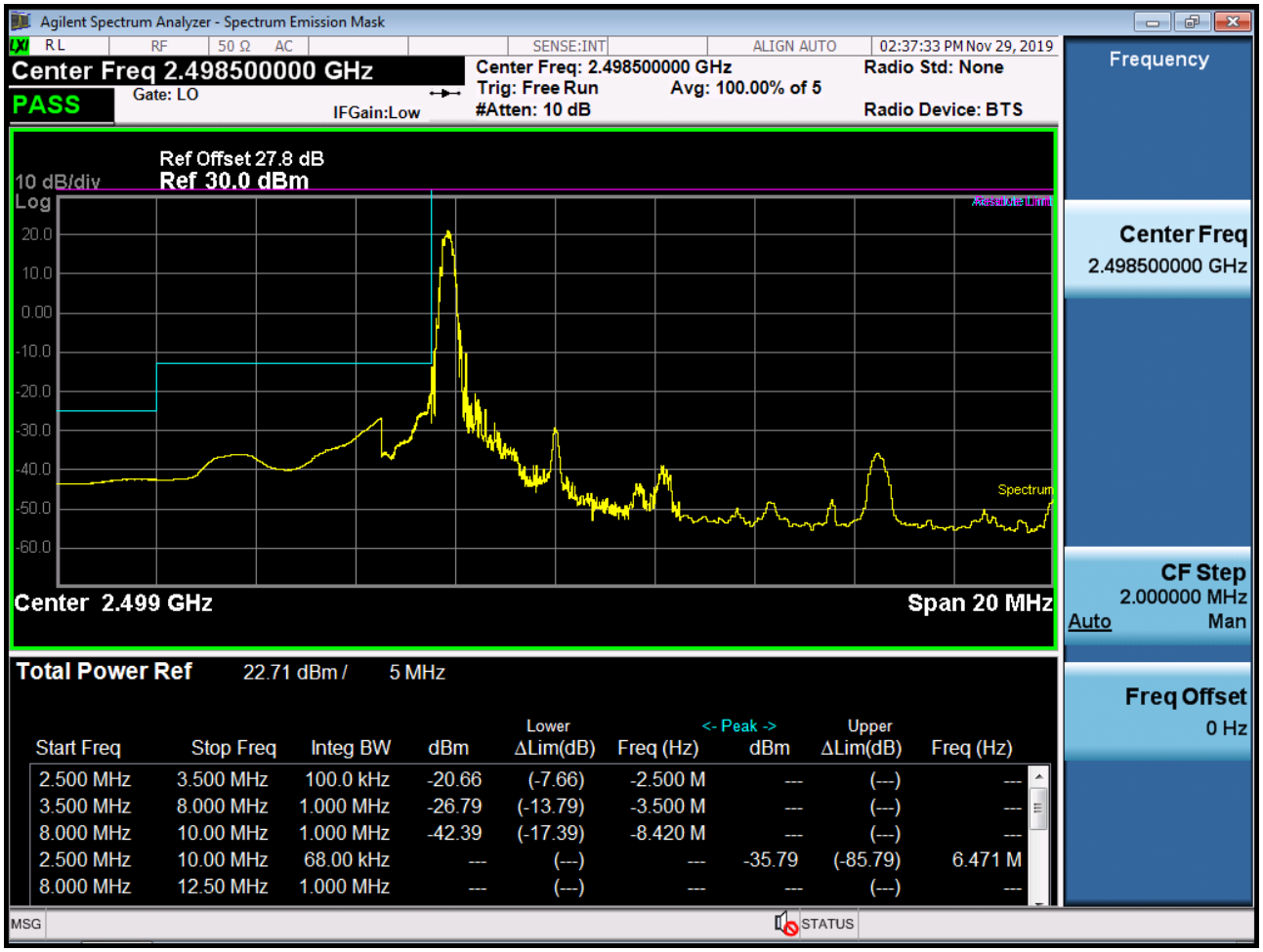
PAR Plot (20M BW_Ch.40620_16QAM_RB100_0) (POWER CLASS 2)



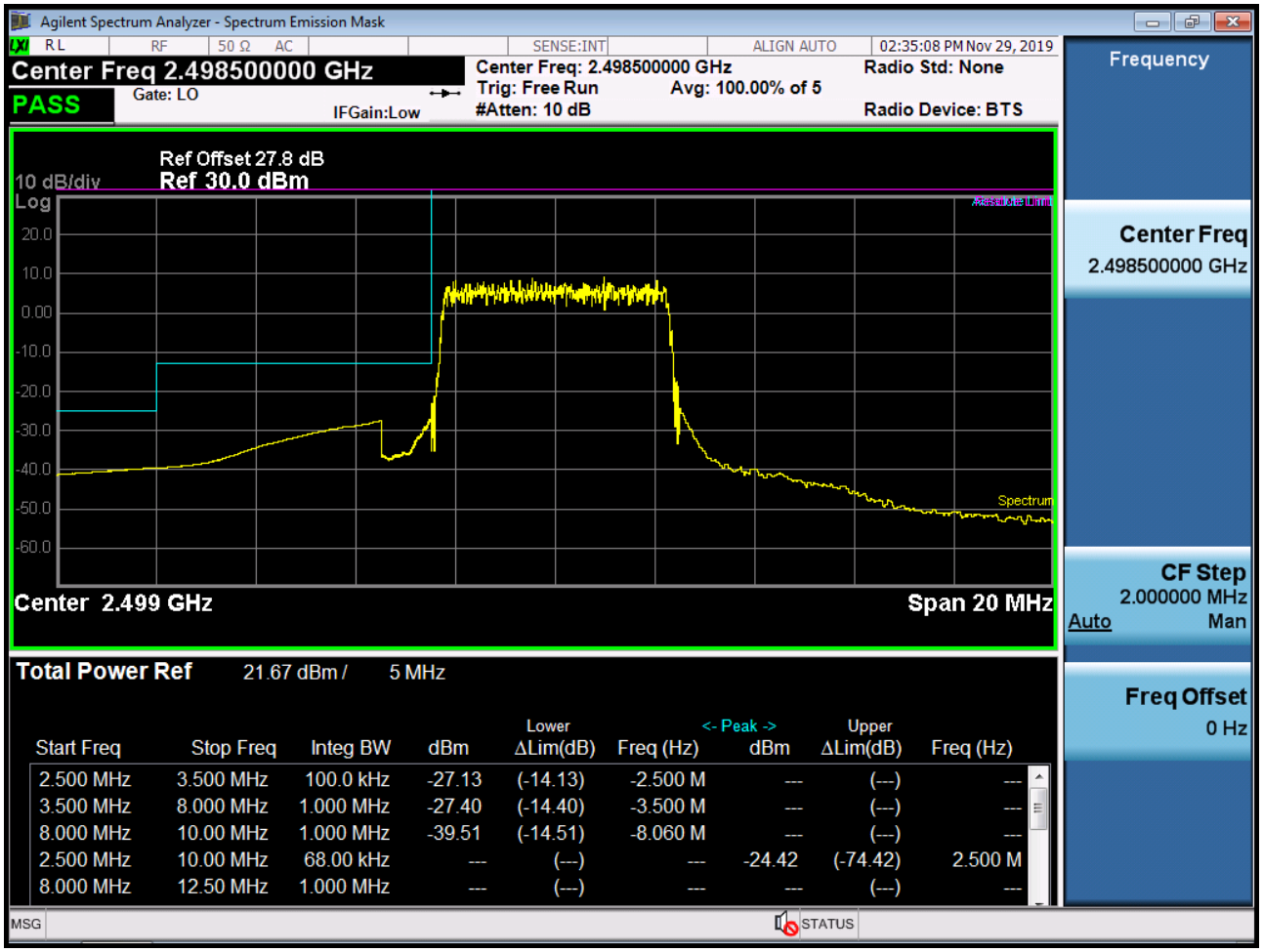
PAR Plot (20M BW_Ch.40620_64QAM_RB100_0) (POWER CLASS 2)



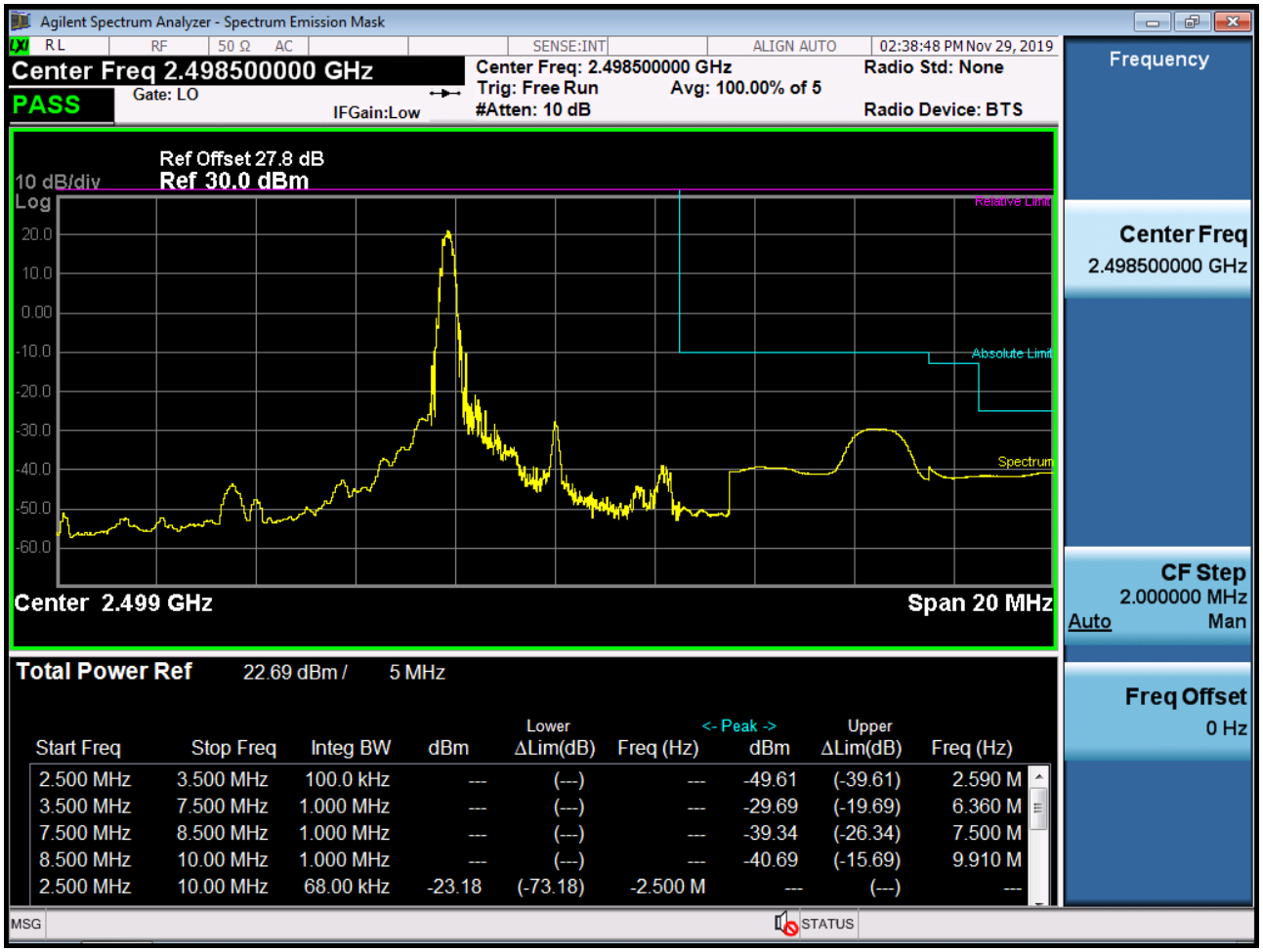
BAND 41. Low Channel Edge Plot (5 MHz Ch.39675 QPSK RB 1, Offset 0)-1(POWER CLASS 3)



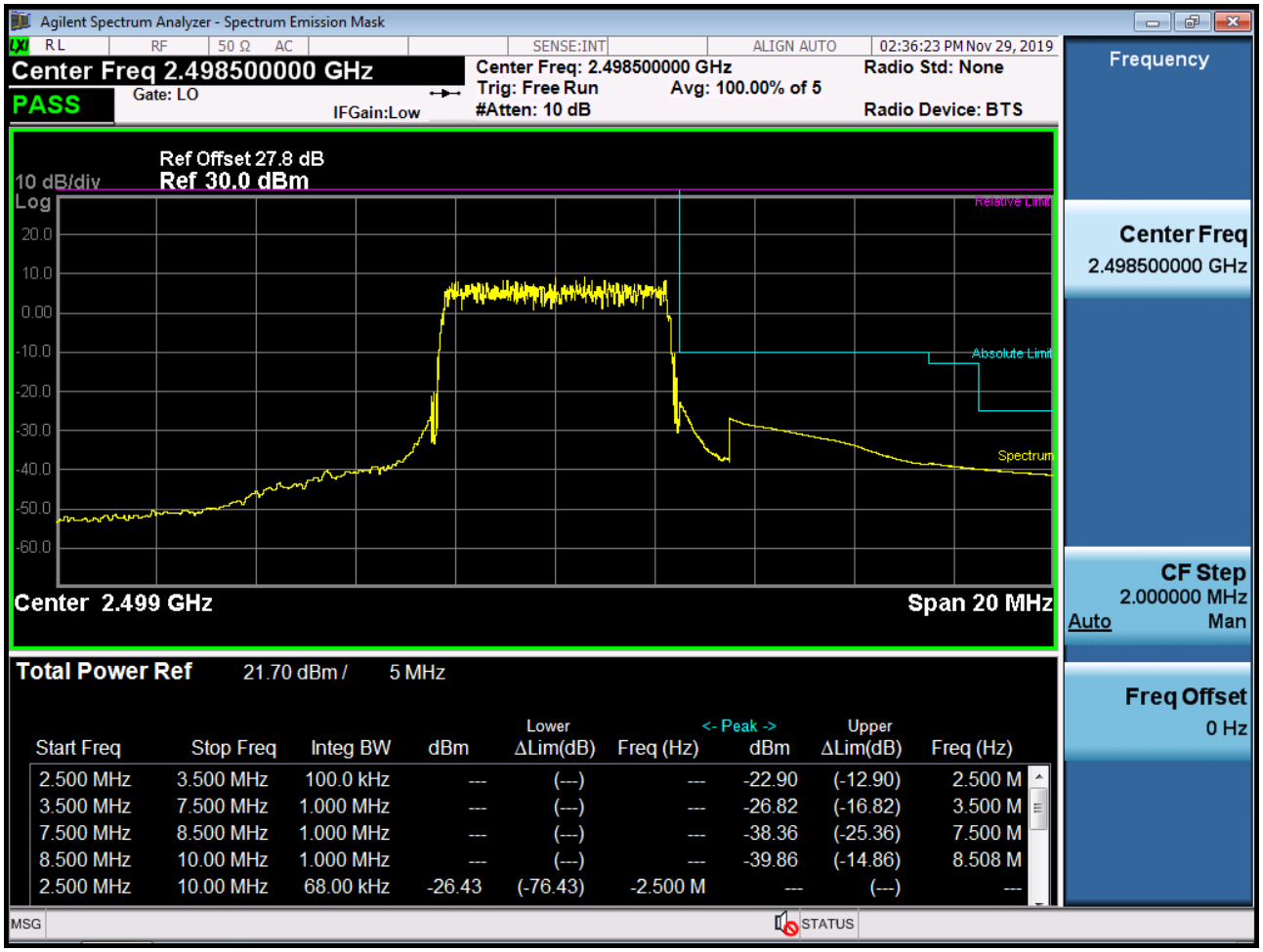
BAND 41. Low Channel Edge Plot (5 MHz Ch.39675 QPSK RB 25, Offset 0)-1(POWER CLASS 3)



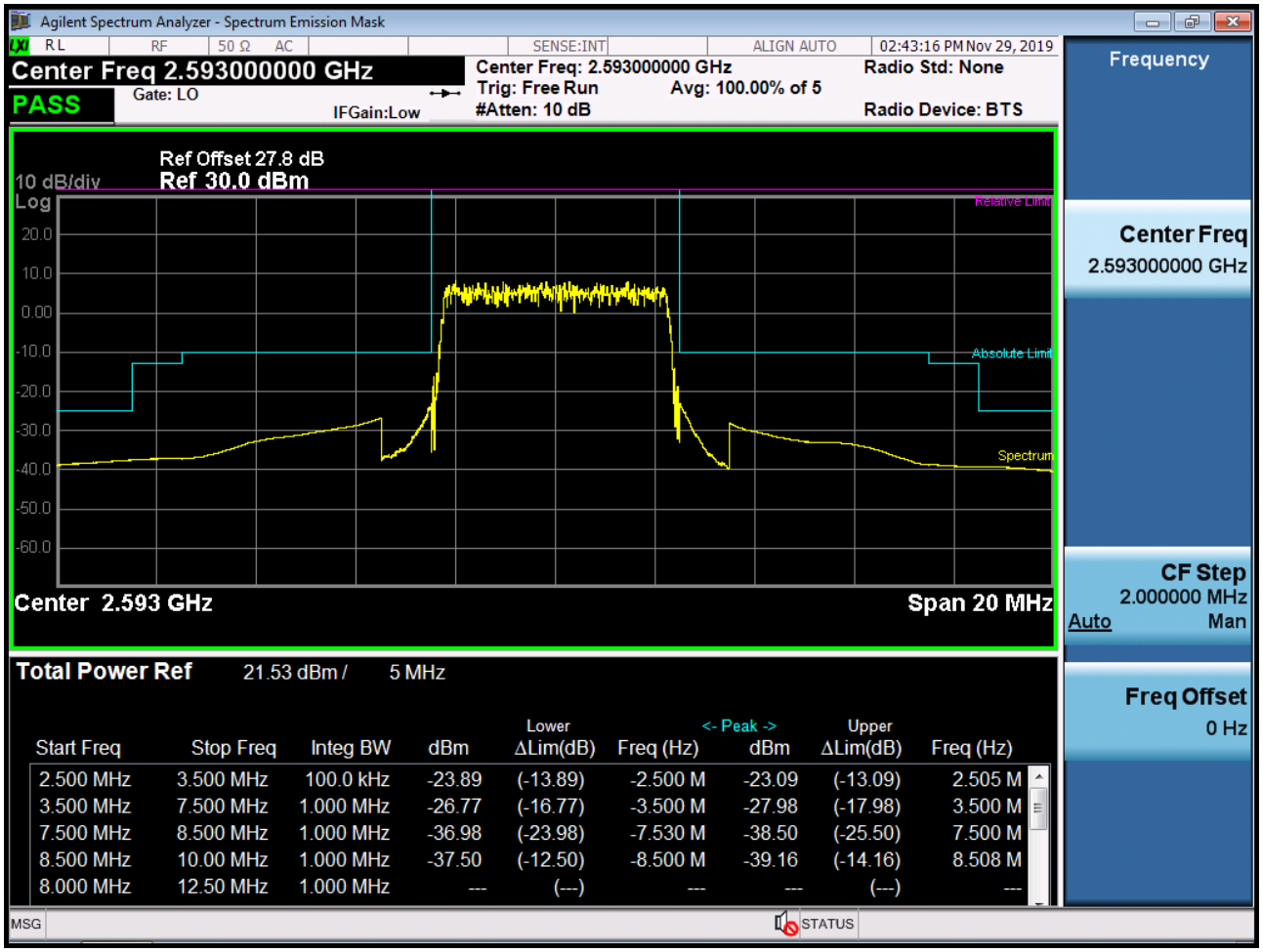
BAND 41. Low Channel Edge Plot (5 MHz Ch.39675 QPSK_RB25_Offset 0)-2(POWER CLASS 3)



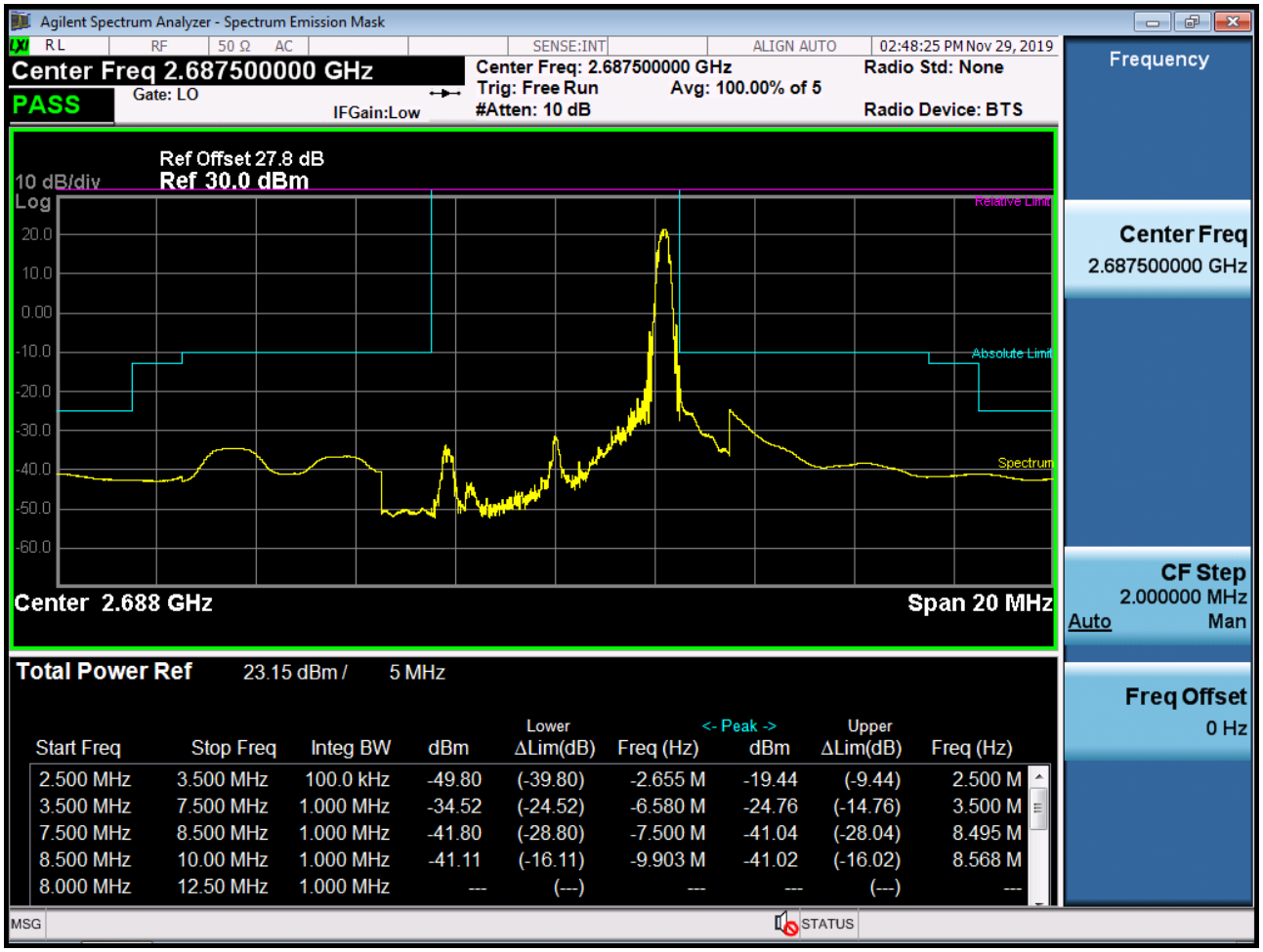
BAND 41. Low Channel Edge Plot (5 MHz Ch.39675 QPSK_RB25_Offset 0)-2(POWER CLASS 3)



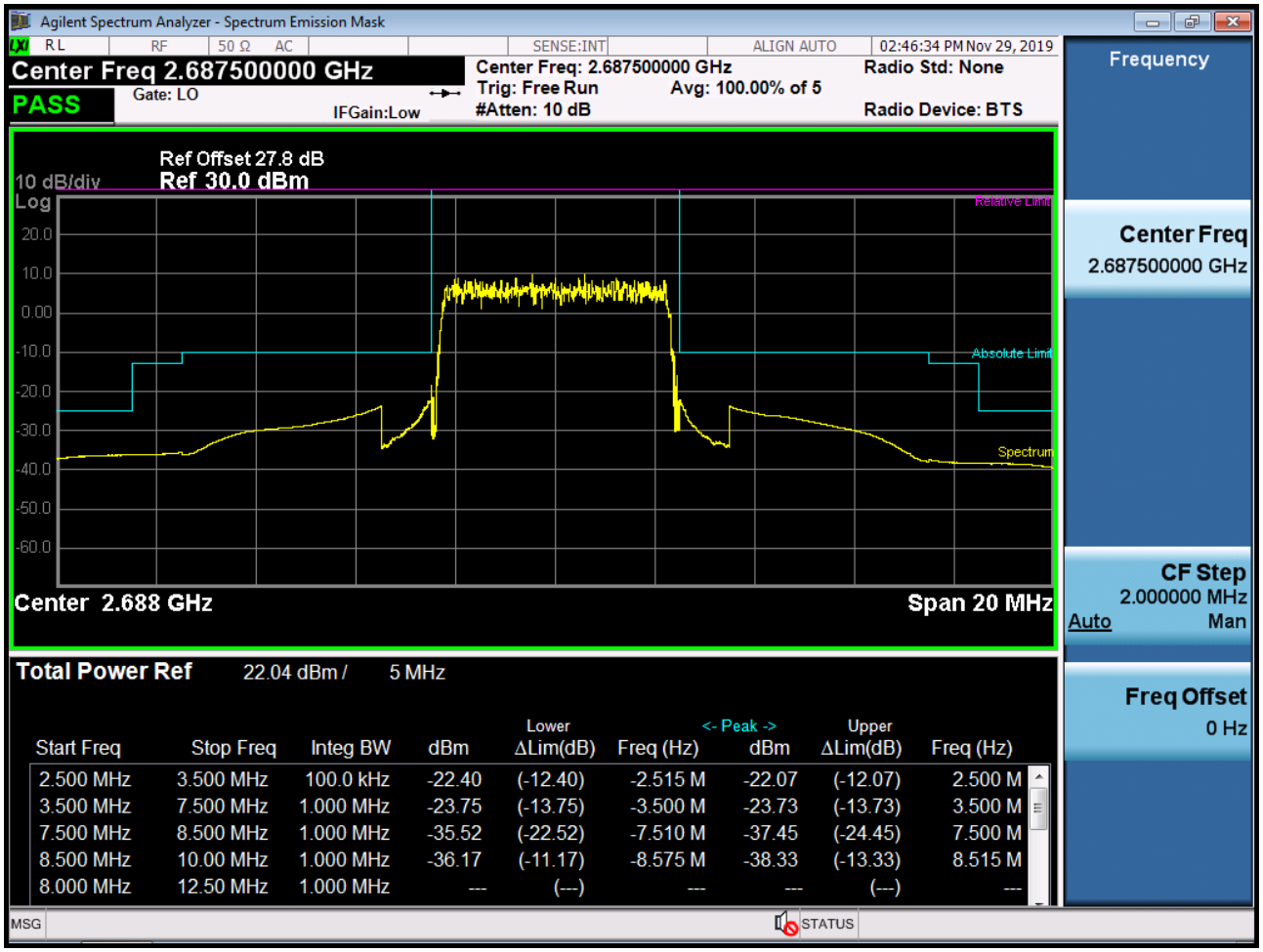
BAND 41. Mid Channel Edge Plot (5 MHz Ch.40620 QPSK RB 25) (POWER CLASS 3)



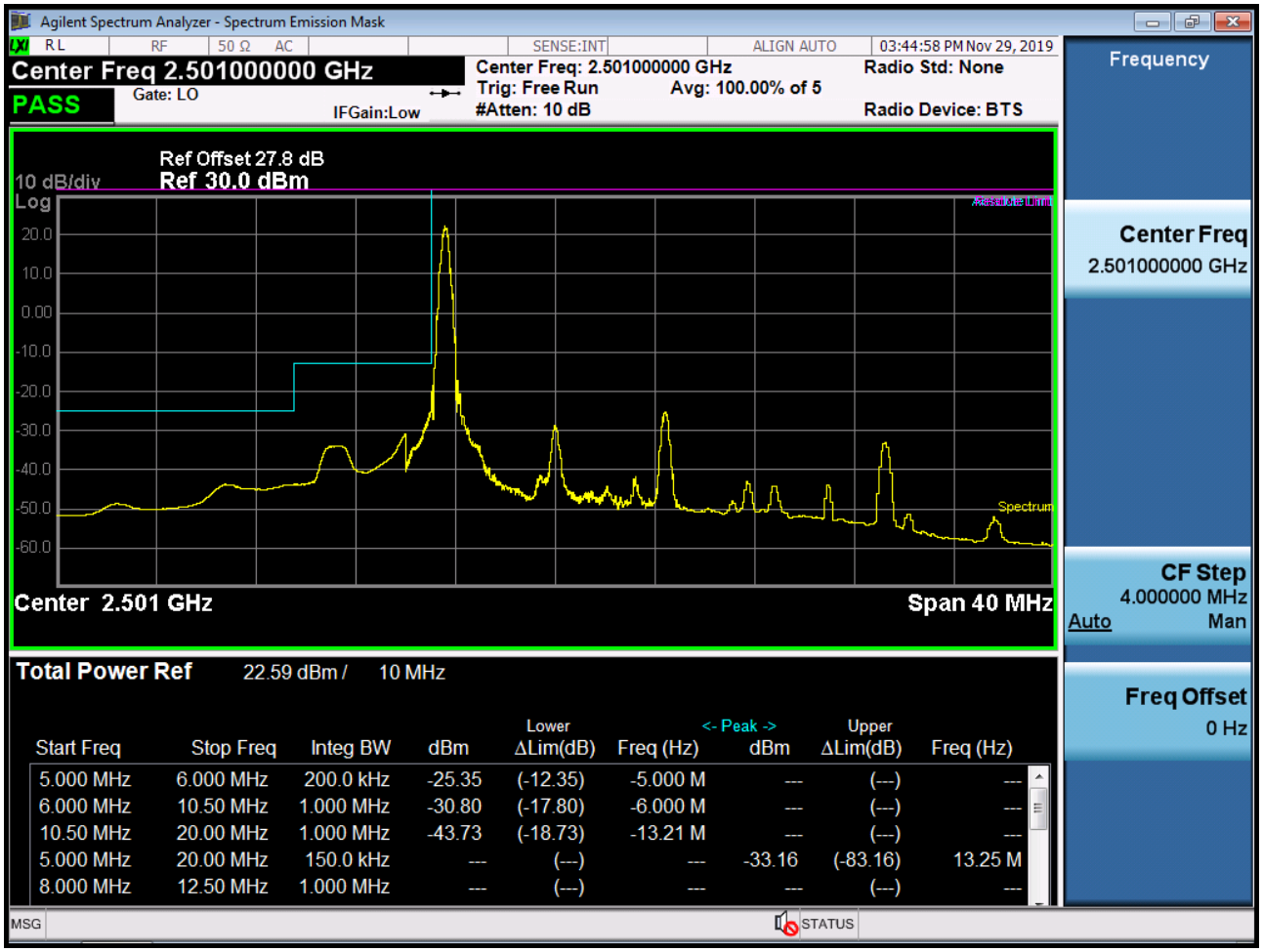
BAND 41. High Channel Edge Plot (5 MHz Ch.41565 QPSK RB 1, Offset 0) (POWER CLASS 3)



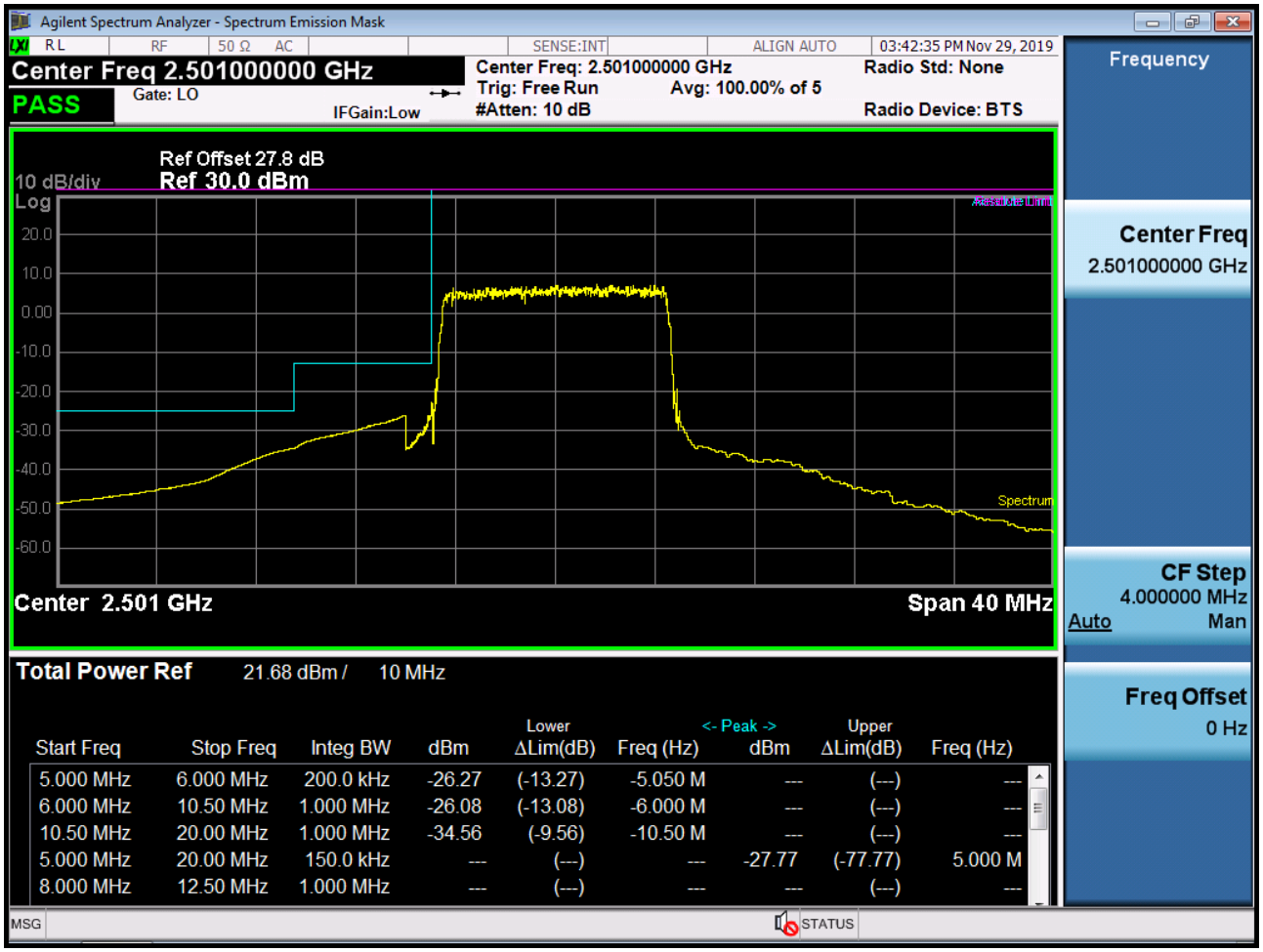
BAND 41. High Channel Edge Plot (5 MHz Ch.41565 QPSK_RB25_Offset 0) (POWER CLASS 3)



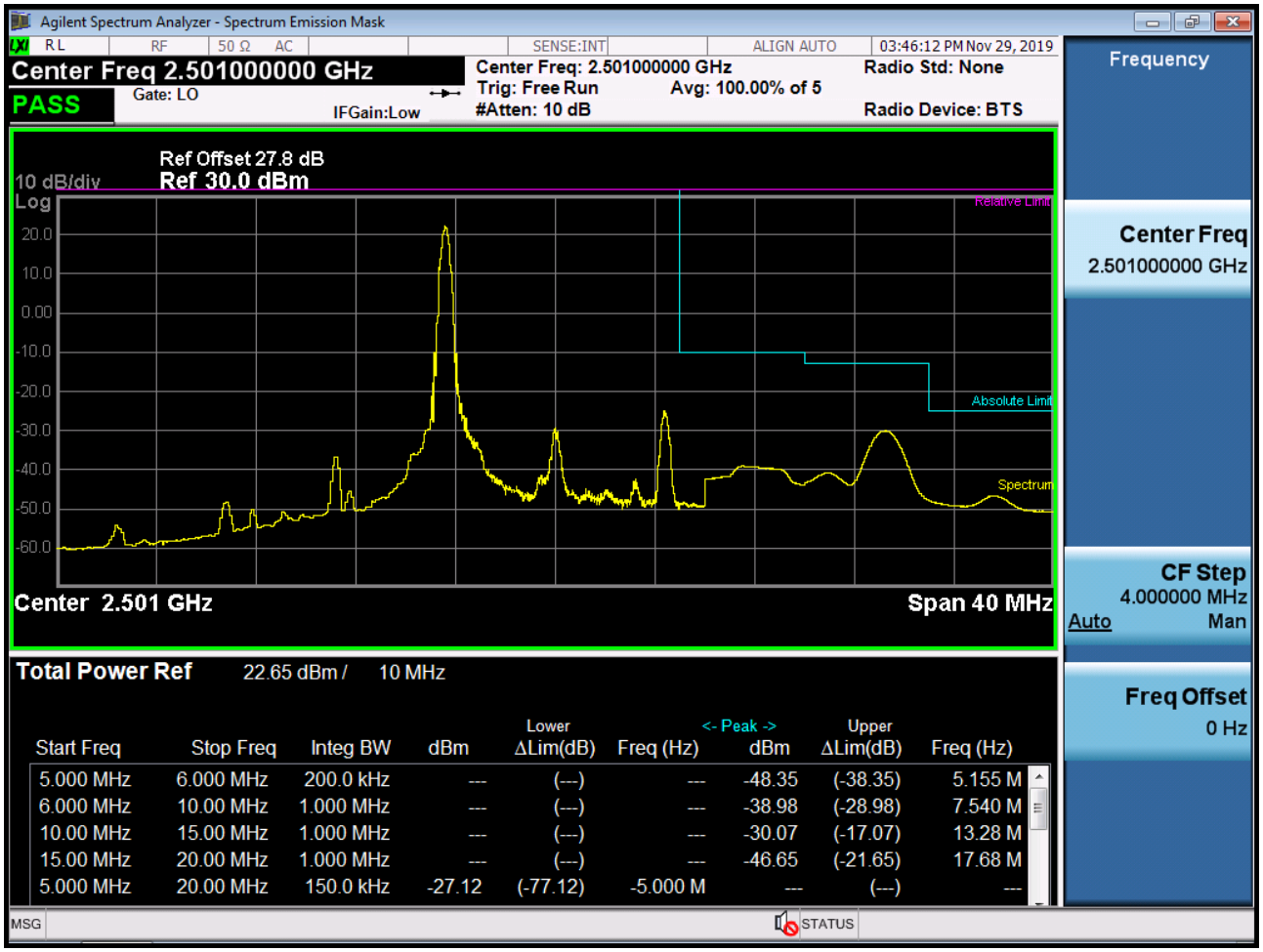
BAND 41. Low Channel Edge Plot (10 MHz Ch.39700 QPSK RB 1, Offset 0)-1(POWER CLASS 3)



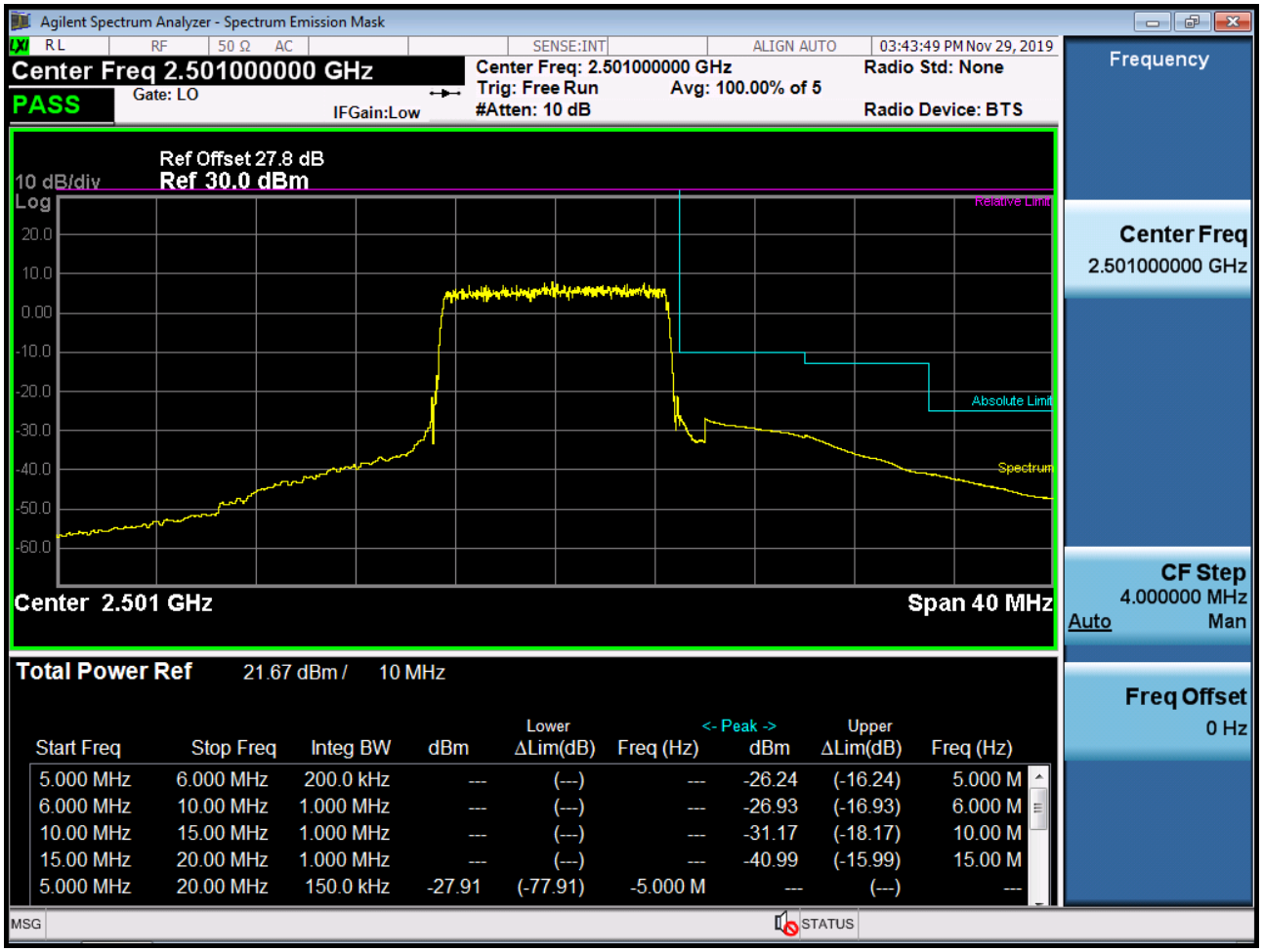
BAND 41. Low Channel Edge Plot (10 MHz Ch.39700 QPSK RB 25, Offset 0)-1(POWER CLASS 3)



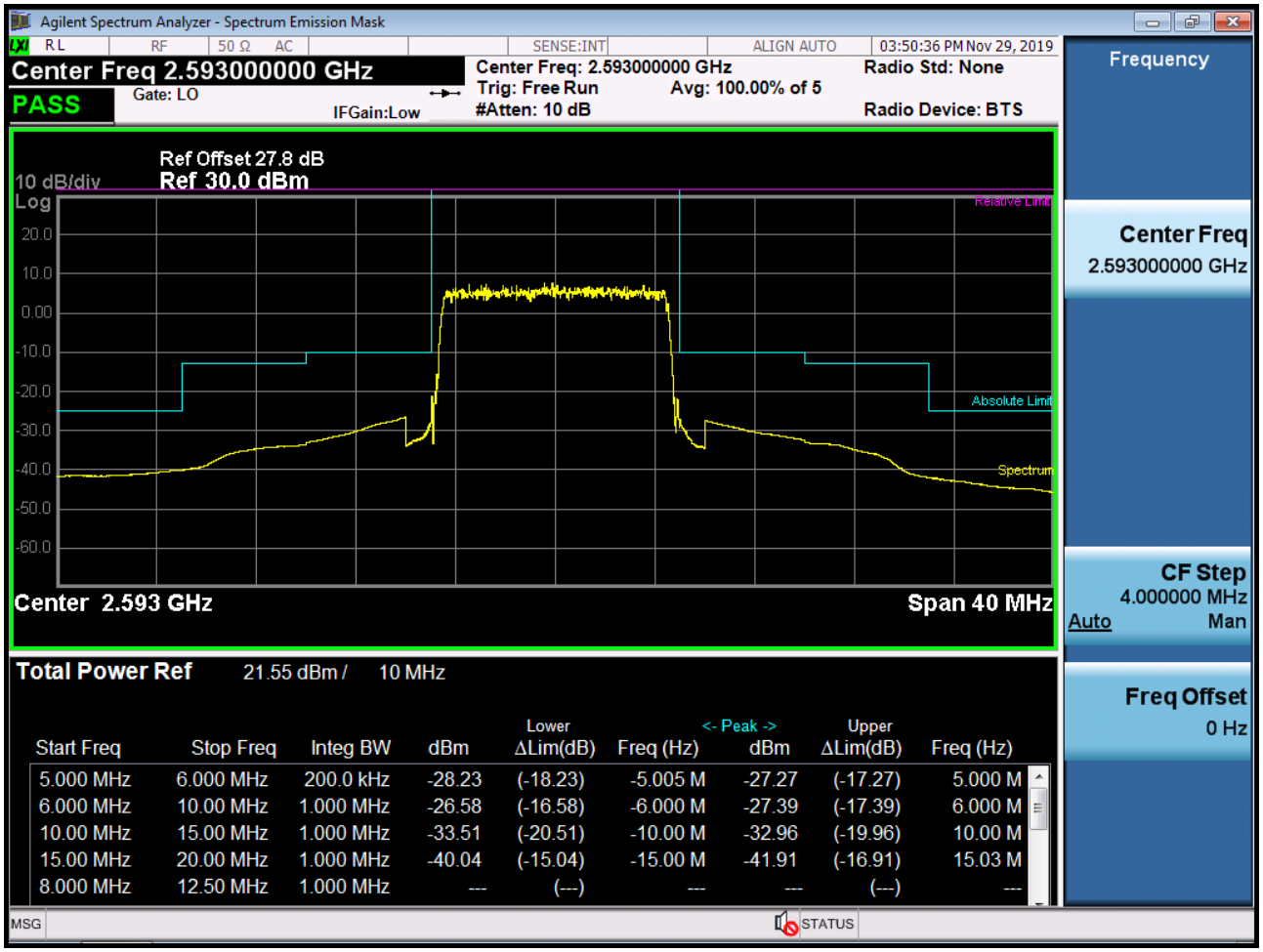
BAND 41. Low Channel Edge Plot (10 MHz Ch.39700 QPSK_RB1_Offset 0)-2(POWER CLASS 3)



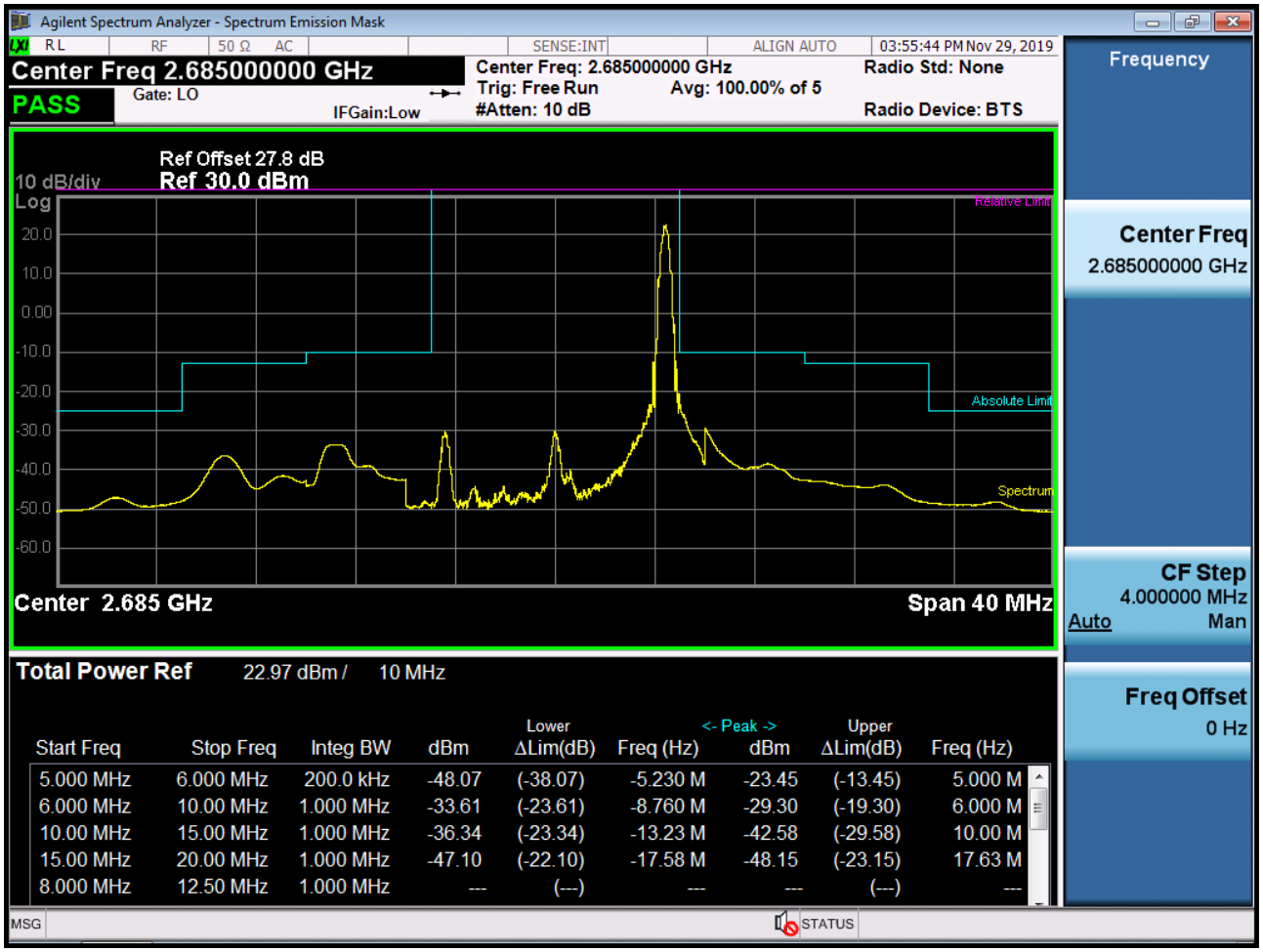
BAND 41. Low Channel Edge Plot (10 MHz Ch.39700 QPSK_RB50_Offset 0)-2(POWER CLASS 3)



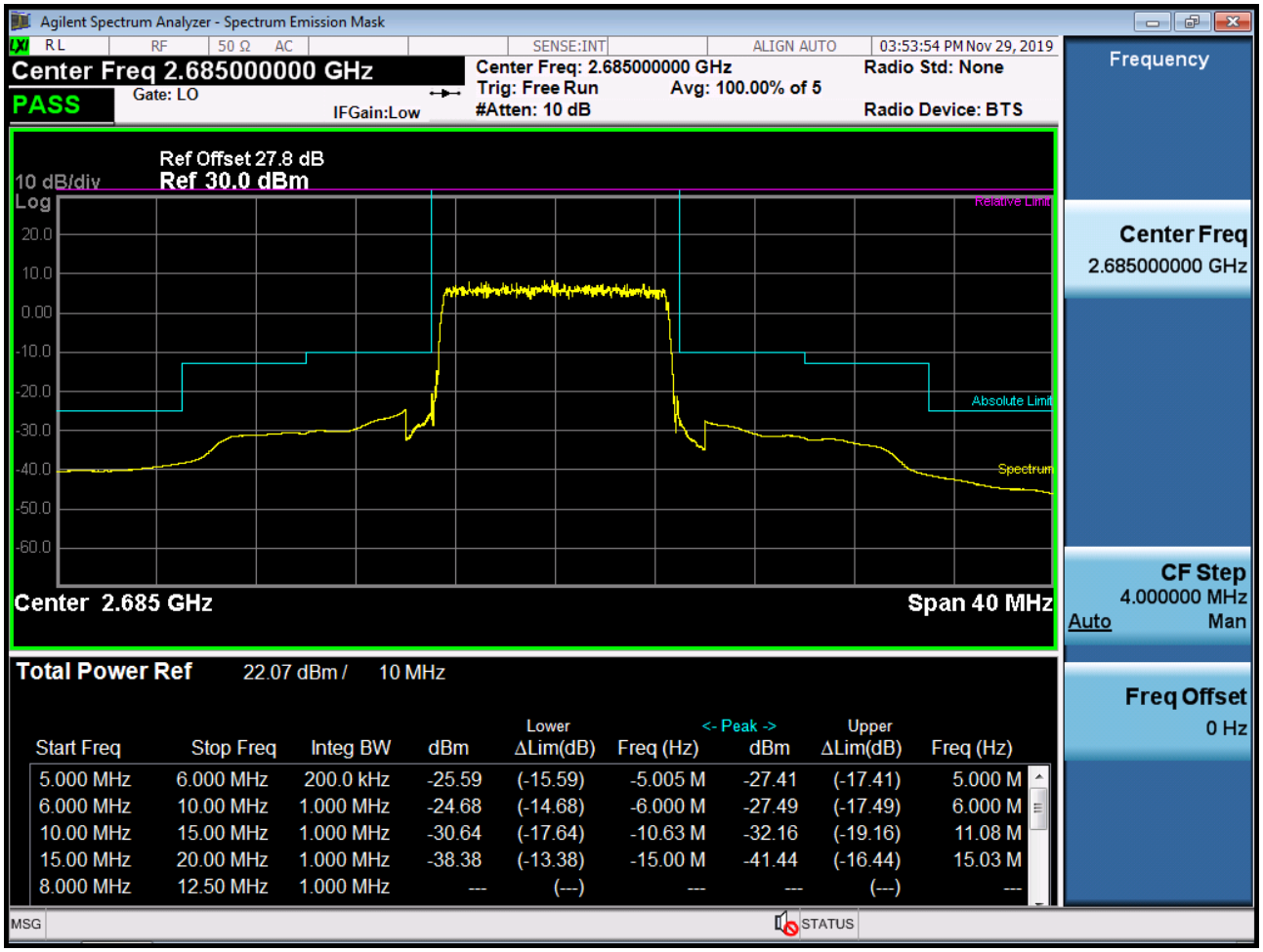
BAND 41. Mid Channel Edge Plot (10 MHz Ch.40620 QPSK RB 50) (POWER CLASS 3)



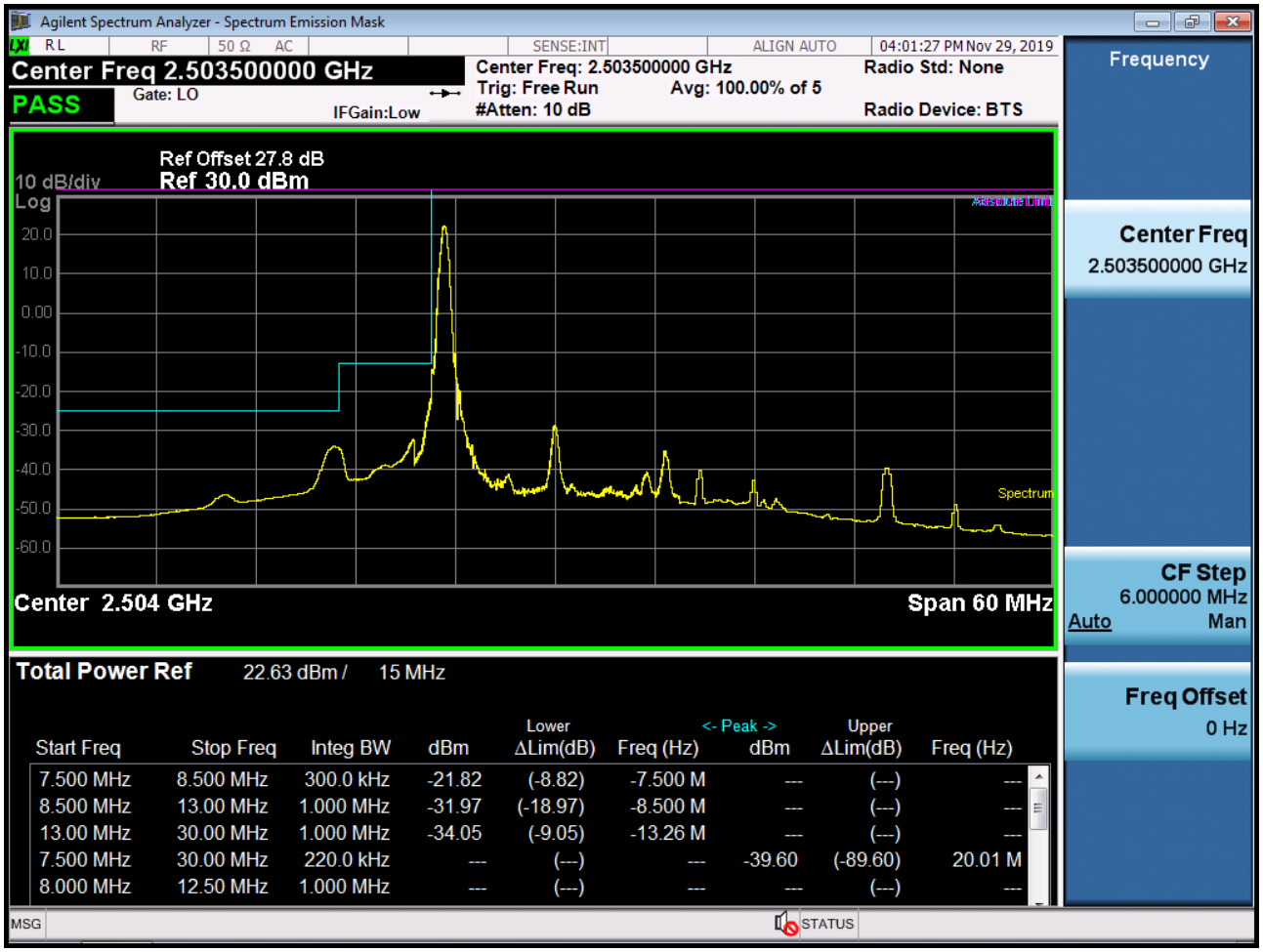
BAND 41. High Channel Edge Plot (10 MHz Ch.41540 QPSK RB 1, Offset 0) (POWER CLASS 3)



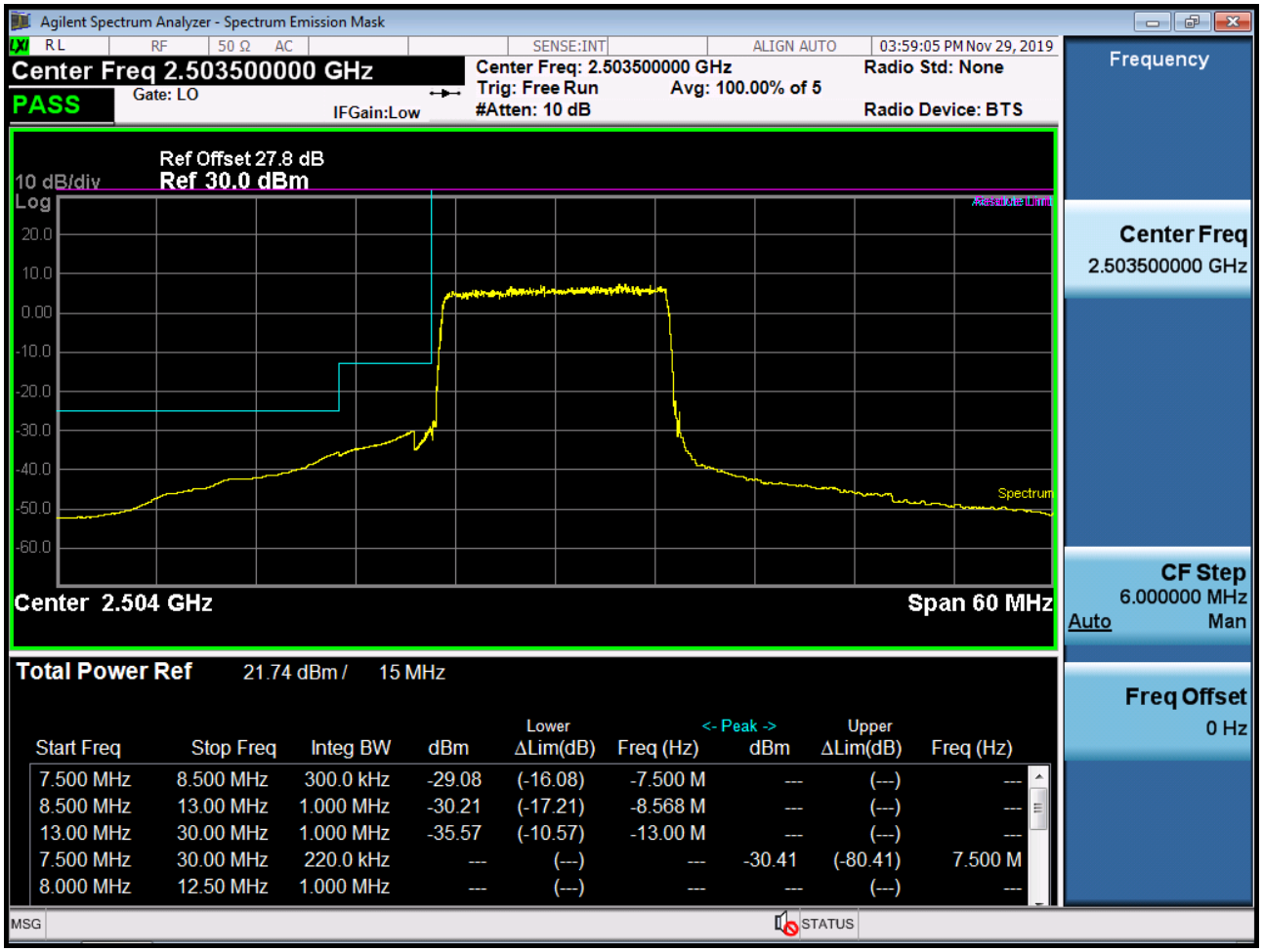
BAND 41. High Channel Edge Plot (10 MHz Ch.41540 QPSK_RB50_Offset 0) (POWER CLASS 3)



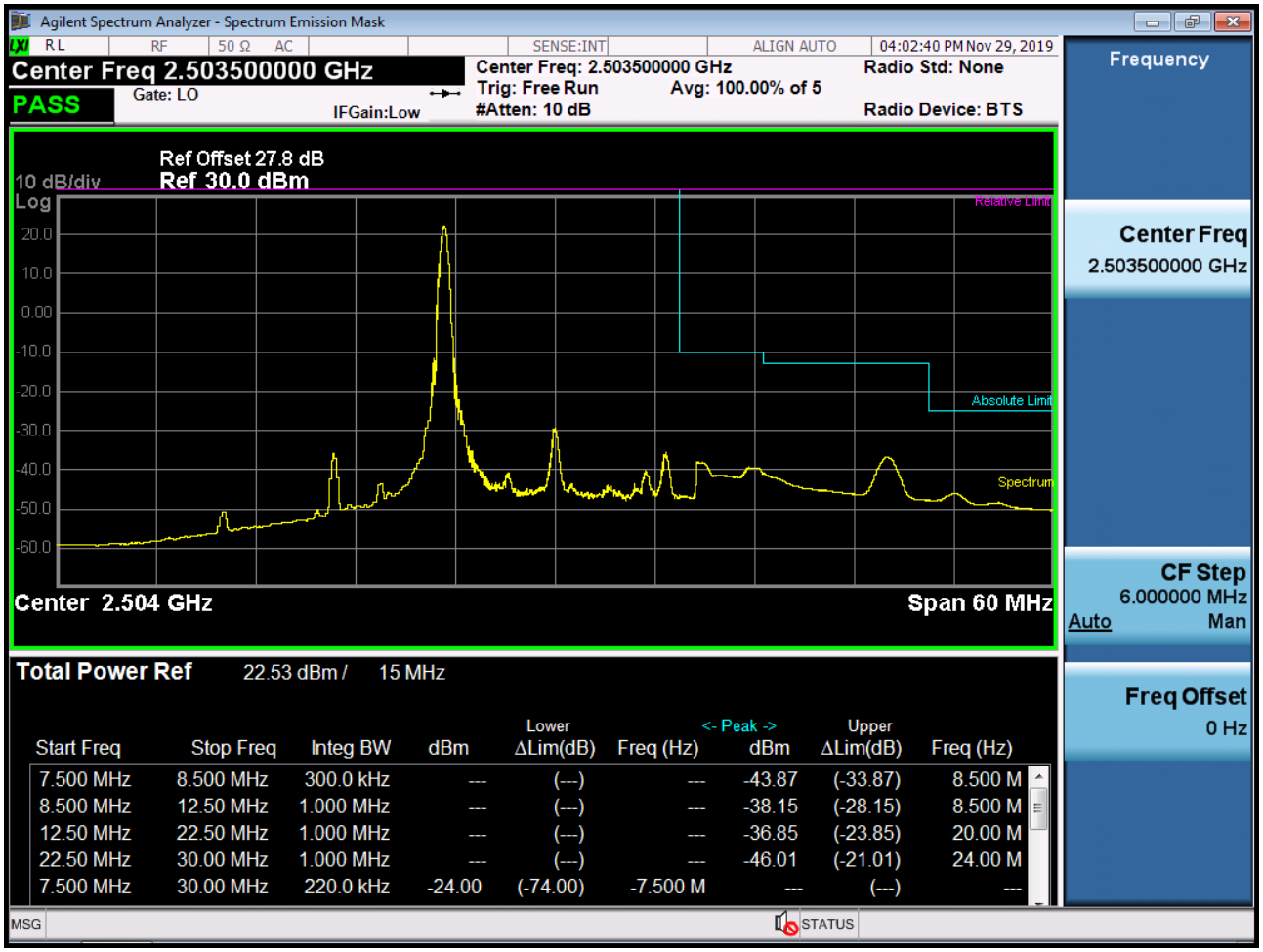
BAND 41. Low Channel Edge Plot (15 MHz Ch.39725 QPSK RB 1, Offset 0)-1(POWER CLASS 3)



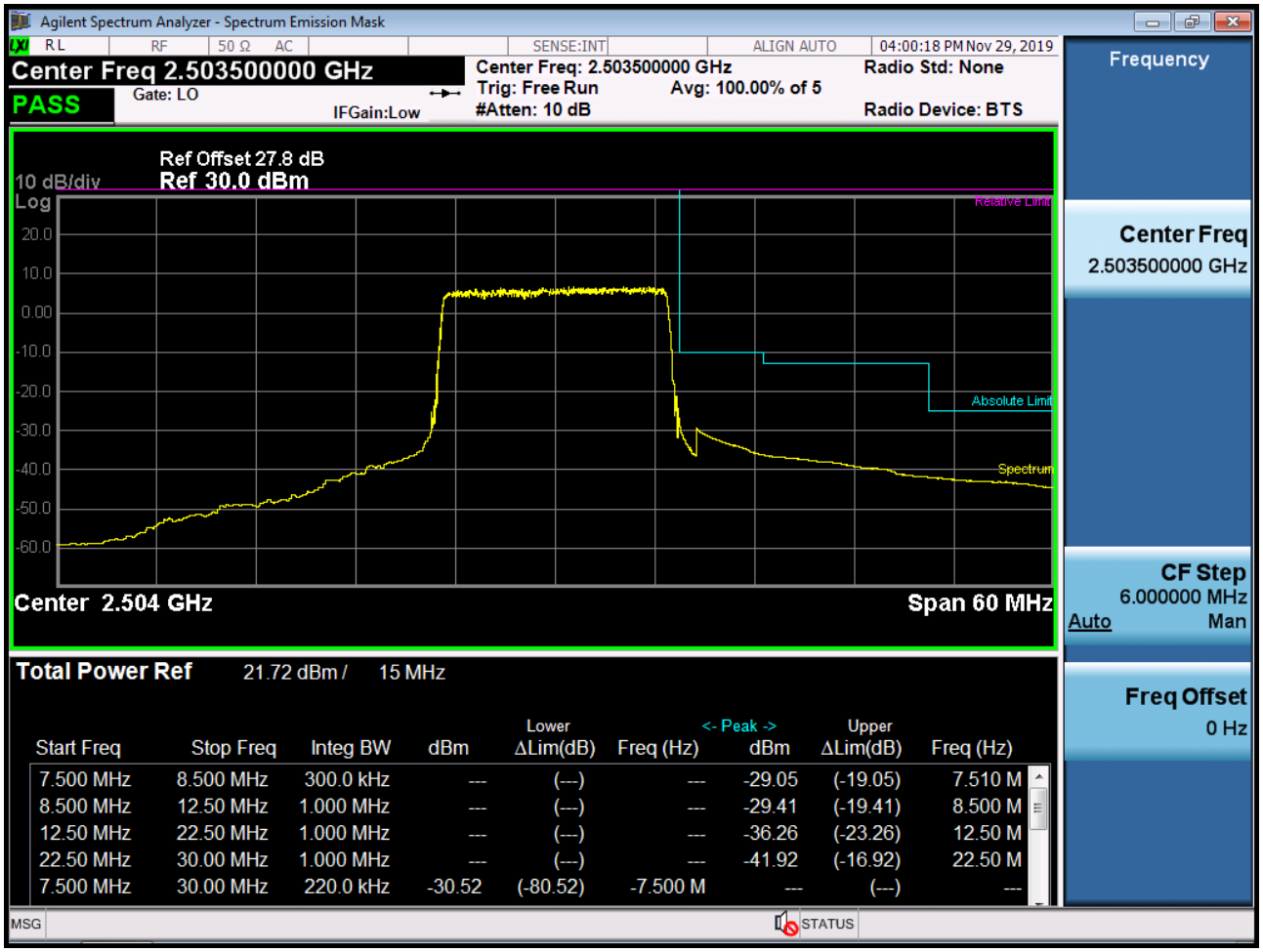
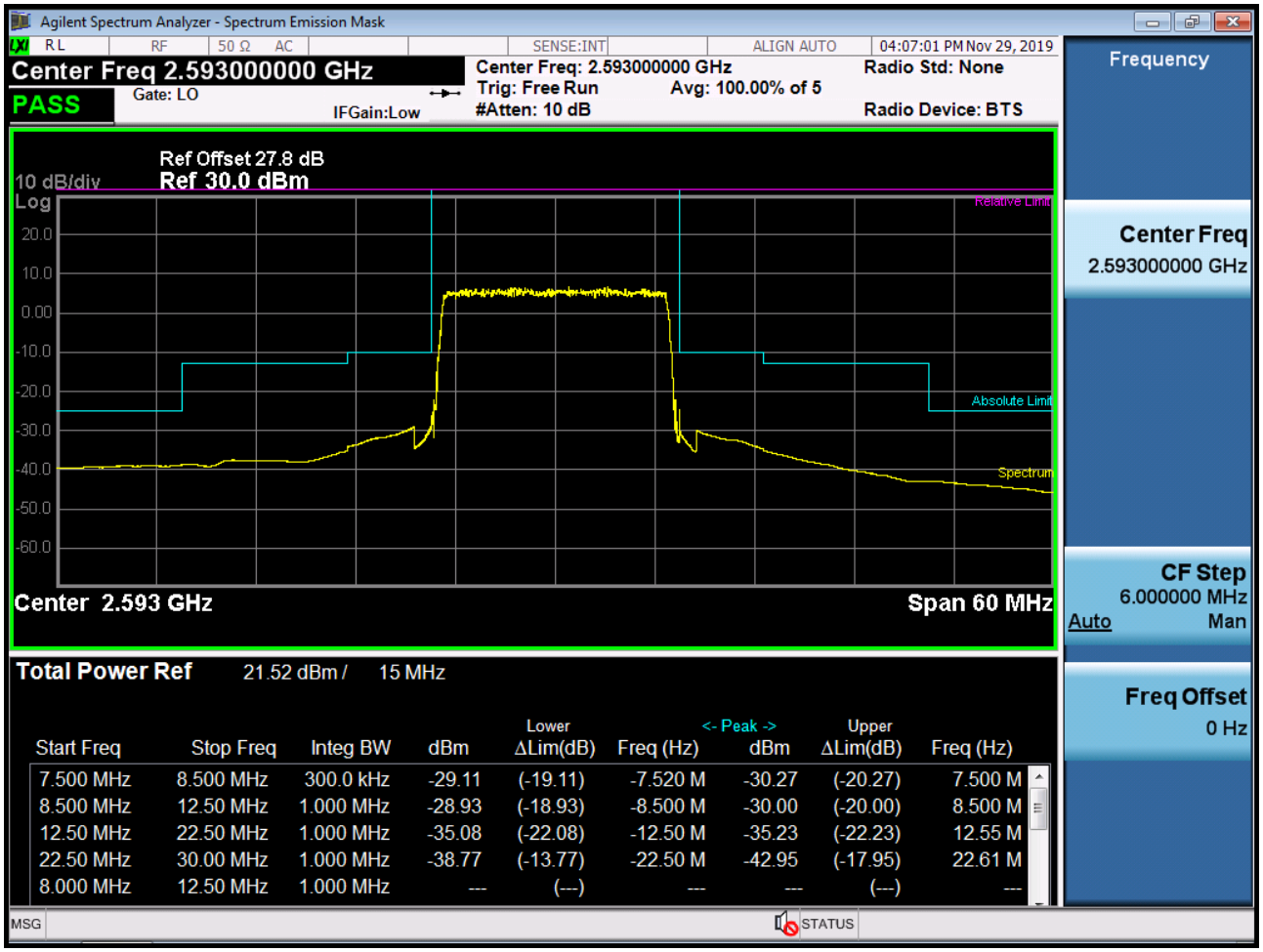
BAND 41. Low Channel Edge Plot (15 MHz Ch.39725 QPSK RB 75, Offset 0)-1(POWER CLASS 3)



BAND 41. Low Channel Edge Plot (15 MHz Ch.39725 QPSK_RB1_Offset 0)-2(POWER CLASS 3)



BAND 41. Low Channel Edge Plot (15 MHz Ch.39725 QPSK_RB75_Offset 0)-2(POWER CLASS 3)



BAND 41. Mid Channel Edge Plot (15 MHz Ch.40620 QPSK RB 75) (POWER CLASS 3)