TEST REPORT

FCC LTE B2 Test for TM19FNNAHD4
Certification

APPLICANT
LG Electronics Inc.

REPORT NO.
HCT-RF-2411-FC007

DATE OF ISSUE
December 6, 2024

Tested by
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Applicant	**LG Electronics Inc.** 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea
Product Name Model Name	Telematics TM19FNNAHD4
FCC ID	BEJTM19FNNAHD4
Date of Test	October 07, 2024 ~ December 05, 2024
Location of Test	■ Permanent Testing Lab ☐ On Site Testing (Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea)
FCC Classification:	PCB Licensed Transmitter (PCB)
Test Standard Used	FCC Rule Part(s) : § 24
Test Results	PASS

REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	December 06, 2024	Initial Release

Notice

Content
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)
The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated. The test results have only been applied with the test methods required by the standard(s).
The laboratory is not accredited for the test results marked *. Information provided by the applicant is marked **. Test results provided by external providers are marked ***.
When confirmation of authenticity of this test report is required, please contact www.hct.co.kr
The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

CONTENTS

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	LG Electronics Inc.
Address:	128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea
FCC ID:	BEJTM19FNNAHD4
Application Type:	Certification
FCC Classification:	PCB Licensed Transmitter (PCB)
FCC Rule Part(s):	§ 24
EUT Type:	Telematics
Model(s):	TM19FNNAHD4
Tx Frequency:	1850.7 MHz – 1909.3 MHz (LTE – Band2 (1.4 MHz)) 1851.5 MHz – 1908.5 MHz (LTE – Band2 (3 MHz)) 1852.5 MHz – 1907.5 MHz (LTE – Band2 (5 MHz)) 1855.0 MHz – 1905.0 MHz (LTE – Band2 (10 MHz)) 1857.5 MHz – 1902.5 MHz (LTE – Band2 (15 MHz)) 1860.0 MHz – 1900.0 MHz (LTE – Band2 (20 MHz))
Date(s) of Tests:	October 07, 2024 ~ December 05, 2024
Serial number:	Radiated : Honda MY26 #03 Conducted : Honda MY26 #01
External Antenna Serial number:	8B505-3NAF-A000 : C03640005
Antenna Information	Please refer to the Antenna Approval Specification document.

1.1. MAXIMUM OUTPUT POWER

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	Conducted Output Power	
				Max. Power (W)	Max. Power (dBm)
LTE – Band2 (1.4)	1850.7 - 1909.3	1M09G7D	QPSK	0.186	22.69
		1M09W7D	16-QAM	0.163	22.12
		1M09W7D	64-QAM	0.124	20.95
		1M09W7D	256-QAM	0.069	18.37
LTE – Band2 (3)	1851.5 - 1908.5	2M71G7D	QPSK	0.190	22.78
		2M71W7D	16-QAM	0.165	22.17
		2M70W7D	64-QAM	0.126	20.99
		2M71W7D	256-QAM	0.070	18.46
LTE – Band2 (5)	1852.5 - 1907.5	4M50G7D	QPSK	0.193	22.85
		4M49W7D	16-QAM	0.167	22.23
		4M52W7D	64-QAM	0.131	21.18
		4M52W7D	256-QAM	0.069	18.37
LTE – Band2 (10)	1855.0 - 1905.0	8M96G7D	QPSK	0.194	22.88
		8M98W7D	16-QAM	0.177	22.49
		8M98W7D	64-QAM	0.130	21.14
		8M98W7D	256-QAM	0.070	18.46
LTE – Band2 (15)	1857.5 - 1902.5	13M5G7D	QPSK	0.196	22.92
		13M5W7D	16-QAM	0.173	22.38
		13M5W7D	64-QAM	0.126	21.01
		13M5W7D	256-QAM	0.068	18.31
LTE – Band2 (20)	1860.0 - 1900.0	18M0G7D	QPSK	0.194	22.88
		17M9W7D	16-QAM	0.166	22.19
		18M0W7D	64-QAM	0.129	21.10
		18M0W7D	256-QAM	0.068	18.35

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Telematics with LTE, Sub 6

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, Republic of Korea**

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- KDB 971168 D01 v03r01 - Section 5.2.4 - ANSI C63.26-2015 - Section 5.2.1 & 5.2.4.2
Peak- to- Average Ratio	- KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Radiated Power	- ANSI C63.26-2015 – Section 5.2.4.4 - KDB 971168 D01 v03r01 – Section 5.8
Radiated Spurious and Harmonic Emissions	- ANSI C63.26-2015 – Section 5.5.3 - KDB 971168 D01 v03r01 – Section 5.8

3.2 CONDUCTED OUTPUT POWER

Test Overview

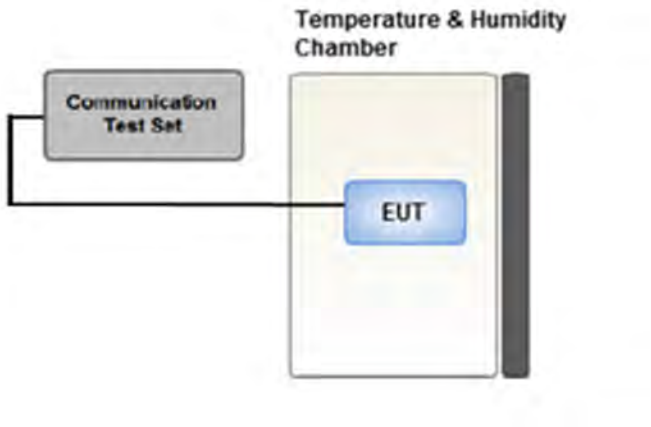
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base station emulator, communications test set, call box, or similar instrumentation that is capable of establishing a communications link with the EUT to enable control over variable parameters (e.g., output power, OBW, etc.).

In some cases, these instruments also include basic digital spectrum analyzer and/or power meter capabilities that can be utilized to measure the RF output power if the specified detectors and requirements can be realized and the measurement functions have been calibrated.

Test Procedure

1. The RF port of the EUT was connected to the Communication Tester via an RF cable.
2. Conducted average power was measured using a calibrated Radio Communication Tester.

Test setup



3.3 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.

Test Settings

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

Test Note

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

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

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

3.4 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method.

Test Settings

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

Test Note

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

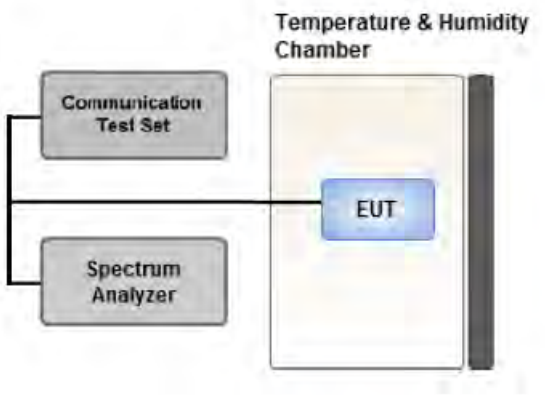
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

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

3.5 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

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

② Alternate Procedure for PAPR

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

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

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

Test Settings(Peak Power)

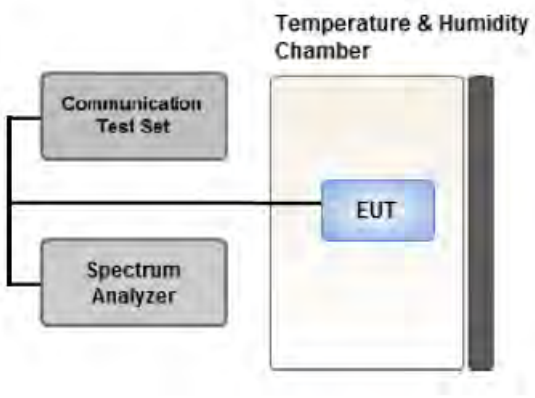
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

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 %.

3.6 OCCUPIED BANDWIDTH.



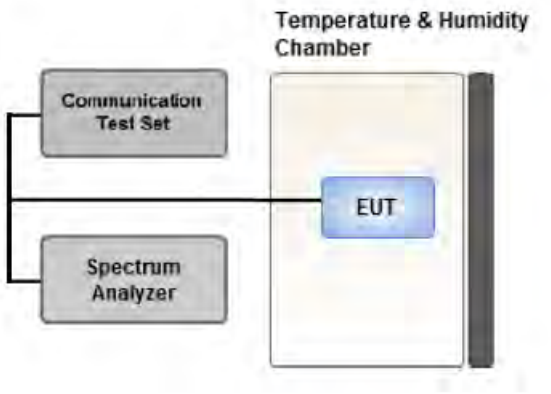
Test setup

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.
The EUT makes a call to the communication simulator.
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99 % occupied bandwidth and the 26 dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5 % of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5 % of the 99 % occupied bandwidth observed in Step 7

3.7 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

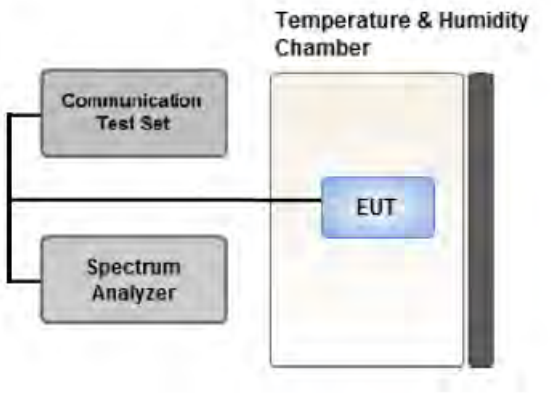
Test Overview

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 * Span / RBW

3.8 BAND EDGE



Test setup

Test Overview

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

Test Settings

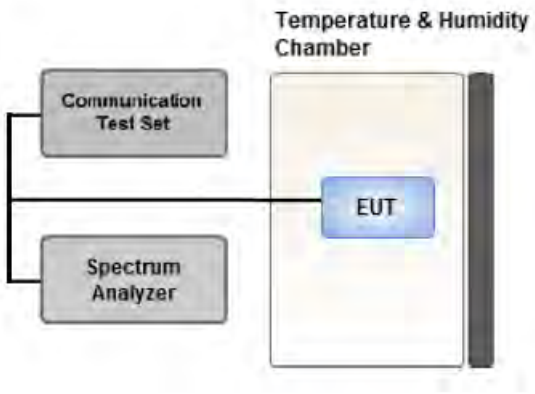
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1 % of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW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

Test Notes

According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.
All measurements were done at 2 channels(low and high operational frequency range.)
The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

3.9 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.

3.10 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.
- All simultaneous transmission scenarios of operation were investigated, and the test results showed no additional significant emissions relative to the least restrictive limit were observed.
  Therefore, only the worst case(stand-alone) results were reported.
- In the case of radiated spurious emissions, all bandwidth of operation was investigated and the worst case bandwidth results are reported. (Worst case :20 MHz)
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- Please refer to the table below.

[External Antenna Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Equivalent Isotropic Radiated Power	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	See Section 8.2.1		Y
Radiated Spurious Emissions	PI/2 BPSK	See Section 8.3.1		Z

[Internal Antenna Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Equivalent Isotropic Radiated Power	PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM	See Section 8.2.2		Z
Radiated Spurious Emissions	PI/2 BPSK	See Section 8.3.2		Z

3.11 WORST CASE(CONDUCTED TEST)

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth	QPSK, 16QAM, 64QAM, 256QAM	1.4, 3, 5, 10, 15, 20	Mid	Full RB	0
Peak-To-Average Ratio	QPSK, 16QAM, 64QAM, 256QAM	1.4, 3, 5, 10, 15, 20	Mid	Full RB	0
Band Edge	QPSK	1.4	Low	1	0
			High	1	5
		3	Low	1	0
			High	1	14
		5	Low	1	0
			High	1	24
		10	Low	1	0
			High	1	49
		15	Low	1	0
			High	1	74
		20	Low	1	0
			High	1	99
		1.4, 3, 5, 10, 15, 20	Low, High	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	QPSK	1.4, 3, 5, 10, 15, 20	Low, Mid, High	1	0

- All modes of operation were investigated and the worst case configuration results are reported.

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacture	Serial No.	Due to Calibration	Calibration Interval
RF Switching System	Switch box(1.2 G HPF+LNA)	HCT CO., LTD.,	F1L1	11/11/2025	Annual
RF Switching System	Switch box(3.3 G HPF+LNA)	HCT CO., LTD.,	F1L2	11/11/2025	Annual
RF Switching System	Switch box(LNA)	HCT CO., LTD.,	F1L4	11/11/2025	Annual
RF Switching System	Switch box(6 G HPF+LNA)	HCT CO., LTD.,	F1L7	11/11/2025	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	5001	04/17/2025	Annual
DC Power Supply	E3632A	Agilent	MY40010147	08/06/2025	Annual
Dipole Antenna	UHAP	Schwarzbeck	01274	03/10/2026	Biennial
Dipole Antenna	UHAP	Schwarzbeck	01288	08/07/2026	Biennial
Chamber	SU-642	ESPEC	93008124	02/19/2025	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/17/2025	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/11/2025	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/20/2026	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	03/28/2025	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/19/2025	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/17/2025	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	08/06/2025	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/05/2025	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/07/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	895	08/28/2026	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	1135	08/19/2026	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262094331	11/13/2025	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6201026545	12/11/2024	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/26/2025	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/17/2025	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

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

5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.
All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.98 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.36 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.70 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.52 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.66 (Confidence level about 95 %, k=2)
Radiated Disturbance (Above 40 GHz)	5.58 (Confidence level about 95 %, k=2)

6. SUMMARY OF TEST RESULTS

6.1 Test Condition: Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§ 2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§ 2.1051, § 24.238(a)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§ 2.1046	N/A	PASS
Peak- to- Average Ratio	§ 24.232(d)	< 13 dB	PASS
Frequency stability / variation of ambient temperature	§ 24.235	Emission must remain in band	PASS

6.2 Test Condition: Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§ 24.232(c)	< 2 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§ 2.1053, § 24.238(a)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

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

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
2) During the test, the turn table is rotated until the maximum signal is found.
3) Record the field strength meter's level.
4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power.

7.2 EIRP Sample Calculation

Ch./ Freq.		Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol.	EIRP	
channel	Freq.(MHz)						W	dBm
20175	1,732.50	-15.75	18.45	9.90	1.76	H	0.456	26.59

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

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
2) During the test, the turn table is rotated until the maximum signal is found.
3) Record the field strength meter's level.
4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.

7.3. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW
GSM BW = 249 kHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W
GSM BW = 249 kHz
G = Phase Modulation
7 = Quantized/Digital Info
W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W
WCDMA BW = 4.17 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D
LTE BW = 4.48 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4M48W7D
LTE BW = 4.48 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

8. TEST DATA

8.1 CONDUCTED OUTPUT POWER

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)			Target MPR (dB)	Target Power
				18607	18900	19193		
				1850.7 MHz	1880 MHz	1909.3 MHz		
1.4 MHz	QPSK	1	0	22.48	22.57	22.52	0	23
		1	3	22.55	22.69	22.61	0	23
		1	5	22.46	22.66	22.58	0	23
		3	0	22.49	22.64	22.60	1	22
		3	1	22.56	22.63	22.69	1	22
		3	3	22.59	22.64	22.59	1	22
		6	0	21.64	21.65	21.64	1	22
	16QAM	1	0	21.94	21.87	22.00	1	22
		1	3	22.04	22.12	21.88	1	22
		1	5	21.81	21.97	21.96	1	22
		3	0	21.78	21.81	21.76	2	21
		3	1	21.71	21.88	21.85	2	21
		3	3	21.72	21.86	21.77	2	21
		6	0	20.66	20.75	20.76	2	21
	64QAM	1	0	20.71	20.91	20.95	2	21
		1	3	20.87	20.94	20.84	2	21
		1	5	20.74	20.85	20.74	2	21
		3	0	20.70	20.70	20.71	3	20
		3	1	20.83	20.87	20.85	3	20
		3	3	20.63	20.84	20.74	3	20
		6	0	19.61	19.71	19.65	3	20
	256QAM	1	0	18.00	18.22	18.37	5	18
		1	3	18.18	18.28	18.22	5	18
		1	5	18.14	18.22	18.02	5	18
		3	0	18.15	18.11	17.97	5	18
		3	1	18.25	18.23	18.02	5	18
		3	3	18.09	18.27	18.06	5	18
		6	0	18.11	18.04	17.90	5	18

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)			Target MPR (dB)	Target Power
				18615	18900	19185		
				1851.5 MHz	1880 MHz	1908.5 MHz		
3 MHz	QPSK	1	0	22.55	22.61	22.67	0	23
		1	7	22.64	22.78	22.62	0	23
		1	14	22.67	22.77	22.67	0	23
		8	0	21.69	21.74	21.73	1	22
		8	3	21.70	21.80	21.78	1	22
		8	7	21.68	21.86	21.75	1	22
		15	0	21.66	21.78	21.75	1	22
	16QAM	1	0	21.90	22.07	22.00	1	22
		1	7	21.94	22.12	21.97	1	22
		1	14	22.05	22.10	22.17	1	22
		8	0	20.77	20.78	20.88	2	21
		8	3	20.81	20.91	20.92	2	21
		8	7	20.78	20.96	20.84	2	21
		15	0	20.73	20.80	20.80	2	21
	64QAM	1	0	20.76	20.85	20.84	2	21
		1	7	20.65	20.98	20.92	2	21
		1	14	20.88	20.95	20.99	2	21
		8	0	19.65	19.70	19.82	3	20
		8	3	19.75	19.78	19.77	3	20
		8	7	19.75	19.82	19.80	3	20
		15	0	19.73	19.78	19.78	3	20
	256QAM	1	0	18.34	18.15	18.16	5	18
		1	7	18.46	18.36	18.20	5	18
		1	14	18.24	18.17	18.06	5	18
		8	0	18.13	18.18	18.06	5	18
		8	3	18.14	18.20	18.15	5	18
		8	7	18.22	18.28	18.02	5	18
		15	0	18.19	18.10	18.04	5	18

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)			Target MPR (dB)	Target Power
				18625	18900	19175		
				1852.5 MHz	1880 MHz	1907.5 MHz		
5 MHz	QPSK	1	0	22.55	22.68	22.60	0	23
		1	12	22.69	22.85	22.71	0	23
		1	24	22.64	22.84	22.72	0	23
		12	0	21.62	21.74	21.70	1	22
		12	6	21.77	21.82	21.77	1	22
		12	11	21.75	21.87	21.76	1	22
		25	0	21.67	21.84	21.70	1	22
	16QAM	1	0	21.96	22.03	21.89	1	22
		1	12	22.11	22.23	22.01	1	22
		1	24	22.04	21.98	22.00	1	22
		12	0	20.72	20.80	20.71	2	21
		12	6	20.82	20.81	20.78	2	21
		12	11	20.78	20.91	20.85	2	21
		25	0	20.72	20.77	20.71	2	21
	64QAM	1	0	20.88	21.02	20.89	2	21
		1	12	21.03	20.96	20.97	2	21
		1	24	20.96	21.18	20.97	2	21
		12	0	19.65	19.84	19.69	3	20
		12	6	19.78	19.73	19.76	3	20
		12	11	19.77	19.87	19.82	3	20
		25	0	19.71	19.71	19.66	3	20
	256QAM	1	0	18.15	18.37	18.19	5	18
		1	12	18.16	18.36	18.25	5	18
		1	24	18.21	18.35	18.29	5	18
		12	0	18.11	18.19	18.16	5	18
		12	6	18.05	18.26	18.21	5	18
		12	11	18.09	18.34	18.11	5	18
		25	0	18.19	18.27	18.25	5	18

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)			Target MPR (dB)	Target Power
				18650	18900	19150		
				1855 MHz	1880 MHz	1905 MHz		
10 MHz	QPSK	1	0	22.53	22.64	22.64	0	23
		1	24	22.38	22.55	22.68	0	23
		1	49	22.61	22.88	22.73	0	23
		25	0	21.64	21.75	21.68	1	22
		25	12	21.75	21.74	21.70	1	22
		25	24	21.73	21.85	21.82	1	22
		50	0	21.78	21.73	21.73	1	22
	16QAM	1	0	21.90	22.49	22.05	1	22
		1	24	22.21	22.13	22.15	1	22
		1	49	21.89	22.21	21.98	1	22
		25	0	20.71	20.85	20.74	2	21
		25	12	20.81	20.88	20.78	2	21
		25	24	20.75	20.95	20.90	2	21
		50	0	20.74	20.69	20.75	2	21
	64QAM	1	0	20.78	20.84	20.73	2	21
		1	24	20.93	20.90	20.81	2	21
		1	49	20.97	21.14	20.97	2	21
		25	0	19.67	19.76	19.82	3	20
		25	12	19.78	19.70	19.70	3	20
		25	24	19.79	19.90	19.79	3	20
		50	0	19.69	19.79	19.73	3	20
	256QAM	1	0	18.17	18.22	18.15	5	18
		1	24	18.24	18.31	18.26	5	18
		1	49	18.29	18.46	18.33	5	18
		25	0	18.11	18.20	18.24	5	18
		25	12	18.05	18.25	18.19	5	18
		25	24	18.14	18.29	18.21	5	18
		50	0	18.10	18.21	18.15	5	18

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)			Target MPR (dB)	Target Power
				18675	18900	19125		
				1857.5 MHz	1880 MHz	1902.5 MHz		
15 MHz	QPSK	1	0	22.64	22.72	22.79	0	23
		1	36	22.66	22.80	22.79	0	23
		1	74	22.55	22.85	22.92	0	23
		36	0	21.68	21.79	21.71	1	22
		36	18	21.77	21.80	21.87	1	22
		36	39	21.83	21.91	21.88	1	22
		75	0	21.77	21.81	21.82	1	22
	16QAM	1	0	21.96	22.38	22.07	1	22
		1	36	22.08	22.02	22.06	1	22
		1	74	21.99	22.11	21.87	1	22
		36	0	20.64	20.80	20.81	2	21
		36	18	20.82	20.89	20.91	2	21
		36	39	20.88	20.96	20.90	2	21
		75	0	20.82	20.91	20.84	2	21
	64QAM	1	0	20.88	20.98	20.88	2	21
		1	36	20.87	21.01	20.95	2	21
		1	74	20.88	21.00	20.91	2	21
		36	0	19.62	19.75	19.77	3	20
		36	18	19.72	19.87	19.87	3	20
		36	39	19.83	19.96	19.83	3	20
		75	0	19.74	19.74	19.82	3	20
	256QAM	1	0	18.18	18.31	18.26	5	18
		1	36	18.11	18.27	18.19	5	18
		1	74	18.05	18.25	18.14	5	18
		36	0	18.20	18.22	18.16	5	18
		36	18	18.21	18.25	18.11	5	18
		36	39	18.16	18.21	18.05	5	18
		75	0	18.04	18.21	18.09	5	18

Bandwidth	Modulation	RB Size	RB Offset	Max.Average Power (dBm)			Target MPR (dB)	Target Power
				18700	18900	19100		
				1860 MHz	1880 MHz	1900 MHz		
20 MHz	QPSK	1	0	22.57	22.69	22.75	0	23
		1	49	22.48	22.82	22.61	0	23
		1	99	22.81	22.88	22.82	0	23
		50	0	21.69	21.75	21.77	1	22
		50	25	21.87	21.85	21.83	1	22
		50	49	21.84	21.97	21.91	1	22
		100	0	21.83	21.81	21.82	1	22
	16QAM	1	0	21.95	22.11	22.18	1	22
		1	49	22.08	22.19	22.14	1	22
		1	99	22.07	22.08	22.10	1	22
		50	0	20.75	20.75	20.79	2	21
		50	25	20.81	20.87	20.84	2	21
		50	49	20.76	20.99	20.92	2	21
		100	0	20.81	20.86	20.82	2	21
	64QAM	1	0	20.82	21.01	20.94	2	21
		1	49	20.80	20.90	20.88	2	21
		1	99	21.03	21.02	21.10	2	21
		50	0	19.70	19.79	19.78	3	20
		50	25	19.82	19.82	19.80	3	20
		50	49	19.84	19.91	19.89	3	20
		100	0	19.80	19.76	19.82	3	20
	256QAM	1	0	18.24	18.35	18.26	5	18
		1	49	18.16	18.34	18.21	5	18
		1	99	18.15	18.25	18.19	5	18
		50	0	18.10	18.26	18.20	5	18
		50	25	18.11	18.24	18.05	5	18
		50	49	18.19	18.22	18.21	5	18
		100	0	18.15	18.25	18.18	5	18

8.2 EQUIVALENT ISOTROPIC RADIATED POWER

8.2.1 External Antenna

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1850.7	LTE B2/ 1.4 MHz	QPSK	-14.22	20.30	10.40	2.07	H	< 2.00	0.729	28.63	1	0
		16-QAM	-14.92	19.60	10.40	2.07	H		0.621	27.93		
		64-QAM	-15.93	18.59	10.40	2.07	H		0.492	26.92		
		256-QAM	-18.94	15.58	10.40	2.07	H		0.246	23.91		
1880.0		QPSK	-14.48	20.47	10.40	2.21	H		0.735	28.66	1	0
		16-QAM	-15.11	19.84	10.40	2.21	H		0.635	28.03		
		64-QAM	-16.14	18.81	10.40	2.21	H		0.501	27.00		
		256-QAM	-19.18	15.77	10.40	2.21	H		0.249	23.96		
1909.3		QPSK	-14.31	20.63	10.40	2.17	H		0.769	28.86	1	0
		16-QAM	-14.99	19.95	10.40	2.17	H		0.658	28.18		
		64-QAM	-16.00	18.94	10.40	2.17	H		0.521	27.17		
		256-QAM	-19.02	15.92	10.40	2.17	H		0.260	24.15		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1851.5	LTE B2/ 3 MHz	QPSK	-14.24	20.28	10.40	2.07	H	< 2.00	0.726	28.61	1	0
		16-QAM	-14.94	19.58	10.40	2.07	H		0.618	27.91		
		64-QAM	-15.93	18.59	10.40	2.07	H		0.492	26.92		
		256-QAM	-18.95	15.57	10.40	2.07	H		0.245	23.90		
1880.0		QPSK	-14.20	20.75	10.40	2.21	H		0.783	28.94	1	0
		16-QAM	-14.92	20.03	10.40	2.21	H		0.664	28.22		
		64-QAM	-15.91	19.04	10.40	2.21	H		0.528	27.23		
		256-QAM	-18.97	15.98	10.40	2.21	H		0.261	24.17		
1908.5		QPSK	-14.38	20.56	10.40	2.17	H		0.757	28.79	1	0
		16-QAM	-15.09	19.85	10.40	2.17	H		0.643	28.08		
		64-QAM	-16.09	18.85	10.40	2.17	H		0.511	27.08		
		256-QAM	-19.10	15.84	10.40	2.17	H		0.255	24.07		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1852.5	LTE B2/ 5 MHz	QPSK	-14.29	20.28	10.40	2.08	H	< 2.00	0.724	28.60	1	0
		16-QAM	-14.95	19.62	10.40	2.08	H		0.622	27.94		
		64-QAM	-15.98	18.59	10.40	2.08	H		0.491	26.91		
		256-QAM	-18.98	15.59	10.40	2.08	H		0.246	23.91		
1880.0		QPSK	-14.05	20.90	10.40	2.21	H		0.811	29.09	1	0
		16-QAM	-14.69	20.26	10.40	2.21	H		0.700	28.45		
		64-QAM	-15.68	19.27	10.40	2.21	H		0.557	27.46		
		256-QAM	-18.73	16.22	10.40	2.21	H		0.276	24.41		
1907.5		QPSK	-14.32	20.62	10.40	2.17	H		0.767	28.85	1	0
		16-QAM	-15.02	19.92	10.40	2.17	H		0.653	28.15		
		64-QAM	-16.03	18.91	10.40	2.17	H		0.518	27.14		
		256-QAM	-19.06	15.88	10.40	2.17	H		0.258	24.11		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1855.0	LTE B2/ 10 MHz	QPSK	-14.16	20.41	10.40	2.08	H	< 2.00	0.746	28.73	1	0
		16-QAM	-14.88	19.69	10.40	2.08	H		0.632	28.01		
		64-QAM	-15.94	18.63	10.40	2.08	H		0.495	26.95		
		256-QAM	-18.98	15.59	10.40	2.08	H		0.246	23.91		
1880.0		QPSK	-13.99	20.96	10.40	2.21	H		0.822	29.15	1	0
		16-QAM	-14.68	20.27	10.40	2.21	H		0.701	28.46		
		64-QAM	-15.73	19.22	10.40	2.21	H		0.551	27.41		
		256-QAM	-18.74	16.21	10.40	2.21	H		0.275	24.40		
1905.0		QPSK	-14.20	20.72	10.40	2.19	H		0.782	28.93	1	0
		16-QAM	-14.86	20.06	10.40	2.19	H		0.671	28.27		
		64-QAM	-15.95	18.97	10.40	2.19	H		0.522	27.18		
		256-QAM	-18.91	16.01	10.40	2.19	H		0.264	24.22		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1857.5	LTE B2/ 15 MHz	QPSK	-14.21	20.43	10.40	2.10	H	< 2.00	0.746	28.73	1	0
		16-QAM	-14.90	19.74	10.40	2.10	H		0.637	28.04		
		64-QAM	-15.93	18.71	10.40	2.10	H		0.502	27.01		
		256-QAM	-18.98	15.66	10.40	2.10	H		0.249	23.96		
1880.0		QPSK	-13.84	21.11	10.40	2.21	H		0.851	29.30	1	0
		16-QAM	-14.57	20.38	10.40	2.21	H		0.719	28.57		
		64-QAM	-15.62	19.33	10.40	2.21	H		0.565	27.52		
		256-QAM	-18.70	16.25	10.40	2.21	H		0.278	24.44		
1902.5		QPSK	-14.05	20.87	10.40	2.19	H		0.809	29.08	1	0
		16-QAM	-14.77	20.15	10.40	2.19	H		0.685	28.36		
		64-QAM	-15.81	19.11	10.40	2.19	H		0.540	27.32		
		256-QAM	-18.88	16.04	10.40	2.19	H		0.266	24.25		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1860.0	LTE B2/ 20 MHz	QPSK	-14.16	20.48	10.40	2.10	H	< 2.00	0.755	28.78	1	0
		16-QAM	-14.88	19.76	10.40	2.10	H		0.640	28.06		
		64-QAM	-15.93	18.71	10.40	2.10	H		0.502	27.01		
		256-QAM	-19.00	15.64	10.40	2.10	H		0.248	23.94		
1880.0		QPSK	-13.66	21.29	10.40	2.21	H		0.887	29.48	1	0
		16-QAM	-14.39	20.56	10.40	2.21	H		0.750	28.75		
		64-QAM	-15.39	19.56	10.40	2.21	H		0.596	27.75		
		256-QAM	-18.50	16.45	10.40	2.21	H		0.291	24.64		
1900.0		QPSK	-14.29	20.59	10.40	2.20	H		0.757	28.79	1	0
		16-QAM	-14.98	19.90	10.40	2.20	H		0.646	28.10		
		64-QAM	-16.00	18.88	10.40	2.20	H		0.511	27.08		
		256-QAM	-19.09	15.79	10.40	2.20	H		0.251	23.99		

8.2.2 Internal Antenna

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1850.7	LTE B2/ 1.4 MHz	QPSK	-14.97	19.55	10.40	2.07	H	< 2.00	0.614	27.88	1	0
		16-QAM	-15.67	18.85	10.40	2.07	H		0.522	27.18		
		64-QAM	-16.68	17.84	10.40	2.07	H		0.414	26.17		
		256-QAM	-19.71	14.81	10.40	2.07	H		0.206	23.14		
1880.0		QPSK	-15.30	19.65	10.40	2.21	H		0.608	27.84	1	0
		16-QAM	-15.95	19.00	10.40	2.21	H		0.524	27.19		
		64-QAM	-16.99	17.96	10.40	2.21	H		0.412	26.15		
		256-QAM	-19.99	14.96	10.40	2.21	H		0.207	23.15		
1909.3		QPSK	-15.85	19.09	10.40	2.17	H		0.540	27.32	1	0
		16-QAM	-16.54	18.40	10.40	2.17	H		0.460	26.63		
		64-QAM	-17.66	17.28	10.40	2.17	H		0.356	25.51		
		256-QAM	-20.58	14.36	10.40	2.17	H		0.182	22.59		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1851.5	LTE B2/ 3 MHz	QPSK	-15.02	19.50	10.40	2.07	H	< 2.00	0.607	27.83	1	0
		16-QAM	-15.72	18.80	10.40	2.07	H		0.516	27.13		
		64-QAM	-16.72	17.80	10.40	2.07	H		0.410	26.13		
		256-QAM	-19.69	14.83	10.40	2.07	H		0.207	23.16		
1880.0		QPSK	-15.04	19.91	10.40	2.21	H		0.646	28.10	1	0
		16-QAM	-15.77	19.18	10.40	2.21	H		0.546	27.37		
		64-QAM	-16.77	18.18	10.40	2.21	H		0.434	26.37		
		256-QAM	-19.83	15.12	10.40	2.21	H		0.214	23.31		
1908.5		QPSK	-15.81	19.13	10.40	2.17	H		0.545	27.36	1	0
		16-QAM	-16.52	18.42	10.40	2.17	H		0.462	26.65		
		64-QAM	-17.53	17.41	10.40	2.17	H		0.366	25.64		
		256-QAM	-20.54	14.40	10.40	2.17	H		0.183	22.63		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1852.5	LTE B2/ 5 MHz	QPSK	-15.02	19.55	10.40	2.08	H	< 2.00	0.612	27.87	1	0
		16-QAM	-15.68	18.89	10.40	2.08	H		0.526	27.21		
		64-QAM	-16.72	17.85	10.40	2.08	H		0.414	26.17		
		256-QAM	-19.73	14.84	10.40	2.08	H		0.207	23.16		
1880.0		QPSK	-14.90	20.05	10.40	2.21	H		0.667	28.24	1	0
		16-QAM	-15.60	19.35	10.40	2.21	H		0.568	27.54		
		64-QAM	-16.63	18.32	10.40	2.21	H		0.448	26.51		
		256-QAM	-19.65	15.30	10.40	2.21	H		0.223	23.49		
1907.5		QPSK	-15.78	19.16	10.40	2.17	H		0.548	27.39	1	0
		16-QAM	-16.48	18.46	10.40	2.17	H		0.467	26.69		
		64-QAM	-17.51	17.43	10.40	2.17	H		0.368	25.66		
		256-QAM	-20.51	14.43	10.40	2.17	H		0.185	22.66		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1855.0	LTE B2/ 10 MHz	QPSK	-14.91	19.66	10.40	2.08	H	< 2.00	0.628	27.98	1	0
		16-QAM	-15.62	18.95	10.40	2.08	H		0.533	27.27		
		64-QAM	-16.70	17.87	10.40	2.08	H		0.416	26.19		
		256-QAM	-19.76	14.81	10.40	2.08	H		0.206	23.13		
1880.0		QPSK	-14.99	19.96	10.40	2.21	H		0.653	28.15	1	0
		16-QAM	-15.67	19.28	10.40	2.21	H		0.558	27.47		
		64-QAM	-16.74	18.21	10.40	2.21	H		0.437	26.40		
		256-QAM	-19.75	15.20	10.40	2.21	H		0.218	23.39		
1905.0		QPSK	-15.46	19.46	10.40	2.19	H		0.585	27.67	1	0
		16-QAM	-16.18	18.74	10.40	2.19	H		0.495	26.95		
		64-QAM	-17.30	17.62	10.40	2.19	H		0.383	25.83		
		256-QAM	-20.29	14.63	10.40	2.19	H		0.192	22.84		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1857.5	LTE B2/ 15 MHz	QPSK	-14.88	19.76	10.40	2.10	H	< 2.00	0.640	28.06	1	0
		16-QAM	-15.56	19.08	10.40	2.10	H		0.547	27.38		
		64-QAM	-16.59	18.05	10.40	2.10	H		0.432	26.35		
		256-QAM	-19.67	14.97	10.40	2.10	H		0.212	23.27		
1880.0		QPSK	-14.82	20.13	10.40	2.21	H		0.679	28.32	1	0
		16-QAM	-15.51	19.44	10.40	2.21	H		0.579	27.63		
		64-QAM	-16.58	18.37	10.40	2.21	H		0.453	26.56		
		256-QAM	-19.65	15.30	10.40	2.21	H		0.223	23.49		
1902.5		QPSK	-15.22	19.70	10.40	2.19	H		0.618	27.91	1	0
		16-QAM	-15.89	19.03	10.40	2.19	H		0.530	27.24		
		64-QAM	-16.90	18.02	10.40	2.19	H		0.420	26.23		
		256-QAM	-20.02	14.90	10.40	2.19	H		0.205	23.11		

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBi)	C.L	Pol	Limit	EIRP		RB	
								W	W	dBm	Size	Offset
1860.0	LTE B2/ 20 MHz	QPSK	-14.85	19.79	10.40	2.10	H	< 2.00	0.644	28.09	1	0
		16-QAM	-15.58	19.06	10.40	2.10	H		0.545	27.36		
		64-QAM	-16.61	18.03	10.40	2.10	H		0.430	26.33		
		256-QAM	-19.70	14.94	10.40	2.10	H		0.211	23.24		
1880.0		QPSK	-14.67	20.28	10.40	2.21	H		0.703	28.47	1	0
		16-QAM	-15.39	19.56	10.40	2.21	H		0.596	27.75		
		64-QAM	-16.43	18.52	10.40	2.21	H		0.469	26.71		
		256-QAM	-19.50	15.45	10.40	2.21	H		0.231	23.64		
1900.0		QPSK	-14.88	20.00	10.40	2.20	H		0.661	28.20	1	0
		16-QAM	-15.66	19.22	10.40	2.20	H		0.552	27.42		
		64-QAM	-16.65	18.23	10.40	2.20	H		0.440	26.43		
		256-QAM	-19.76	15.12	10.40	2.20	H		0.215	23.32		

8.3 RADIATED SPURIOUS EMISSIONS

8.3.1 External Antenna

▣ MODE: LTE B2

▣ MODULATION SIGNAL: 20 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: -13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
18700 (1860.0)	3 720.00	-48.15	12.28	-55.40	3.13	V	-46.25	1	0
	5 580.00	-51.48	13.07	-51.36	3.91	V	-42.20		
	7 440.00	-52.44	10.78	-41.88	4.58	V	-35.68		
18900 (1880.0)	3 760.00	-48.58	12.22	-54.31	3.12	V	-45.21	1	0
	5 640.00	-50.62	13.12	-50.51	3.92	V	-41.31		
	7 520.00	-52.95	10.82	-42.11	4.61	V	-35.90		
19100 (1900.0)	3 800.00	-48.18	12.17	-55.05	3.21	V	-46.09	1	0
	5 700.00	-52.27	13.11	-52.28	4.02	V	-43.19		
	7 600.00	-54.26	11.08	-43.60	4.64	V	-37.16		

8.3.2 Internal Antenna

▣ MODE: LTE B2

▣ MODULATION SIGNAL: 20 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: -13 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	RB	
								Size	Offset
18700 (1860.0)	3 720.00	-49.87	12.28	-57.12	3.13	V	-47.97	1	0
	5 580.00	-54.37	13.07	-54.25	3.91	V	-45.09		
	7 440.00	-55.49	10.78	-44.93	4.58	V	-38.73		
18900 (1880.0)	3 760.00	-49.21	12.22	-54.94	3.12	V	-45.84	1	0
	5 640.00	-53.73	13.12	-53.62	3.92	V	-44.42		
	7 520.00	-56.09	10.82	-45.25	4.61	V	-39.04		
19100 (1900.0)	3 800.00	-48.83	12.17	-55.70	3.21	V	-46.74	1	0
	5 700.00	-54.51	13.11	-54.52	4.02	V	-45.43		
	7 600.00	-55.44	11.08	-44.78	4.64	V	-38.34		

8.4 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
2	1.4 MHz	1880.0	QPSK	6	0	5.52
			16-QAM			6.14
			64-QAM			6.74
			256QAM			6.80
	3 MHz		QPSK	15		5.33
			16-QAM			6.08
			64-QAM			6.67
			256QAM			6.73
	5 MHz		QPSK	25		5.32
			16-QAM			6.07
			64-QAM			6.64
			256QAM			6.67
	10 MHz		QPSK	50		5.40
			16-QAM			6.06
			64-QAM			6.60
			256QAM			6.63
	15 MHz		QPSK	75		5.39
			16-QAM			6.05
			64-QAM			6.62
			256QAM			6.68
	20 MHz		QPSK	100		5.28
			16-QAM			6.04
			64-QAM			6.61
			256QAM			6.69

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 122 ~ 145.

8.5 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
2	1.4 MHz	1880.0	QPSK	6	0	1.0906
			16-QAM			1.0929
			64-QAM			1.0886
			256QAM			1.0922
	3 MHz		QPSK	15		2.7060
			16-QAM			2.7108
			64-QAM			2.7033
			256QAM			2.7131
	5 MHz		QPSK	25		4.5000
			16-QAM			4.4929
			64-QAM			4.5187
			256QAM			4.5174
	10 MHz		QPSK	50		8.9625
			16-QAM			8.9775
			64-QAM			8.9793
			256QAM			8.9754
	15 MHz		QPSK	75		13.462
			16-QAM			13.488
			64-QAM			13.465
			256QAM			13.472
	20 MHz		QPSK	100		17.958
			16-QAM			17.930
			64-QAM			17.962
			256QAM			17.961

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 98 ~ 121.

8.6 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
2	1.4	1850.7	3.6990	28.112	-57.608	-29.496	-13.00
		1880.0	6.2313	28.634	-58.071	-29.437	
		1909.3	3.1307	28.112	-57.304	-29.192	
	3	1851.5	6.8894	28.634	-58.140	-29.506	
		1880.0	7.2782	28.634	-57.926	-29.292	
		1908.5	3.1008	28.112	-57.722	-29.610	
	5	1852.5	3.7189	28.112	-57.530	-29.418	
		1880.0	3.6890	28.112	-56.735	-28.623	
		1907.5	3.7388	28.112	-56.738	-28.626	
	10	1855.0	3.6990	28.112	-56.564	-28.452	
		1880.0	3.3301	28.112	-57.000	-28.888	
		1905.0	2.5823	28.112	-57.352	-29.240	
	15	1857.5	6.4906	28.634	-57.046	-28.412	
		1880.0	3.2902	28.112	-57.369	-29.257	
		1902.5	2.7219	28.112	-58.065	-29.953	
	20	1860.0	3.6990	28.112	-57.264	-29.152	
		1880.0	5.8325	28.634	-57.053	-28.419	
		1900.0	3.6990	28.112	-56.511	-28.399	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 146~ 181.
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	27.500
1 – 5	28.112
5 – 10	28.634
10 – 15	29.245
15 – 20	29.511
Above 20(26.5)	30.210

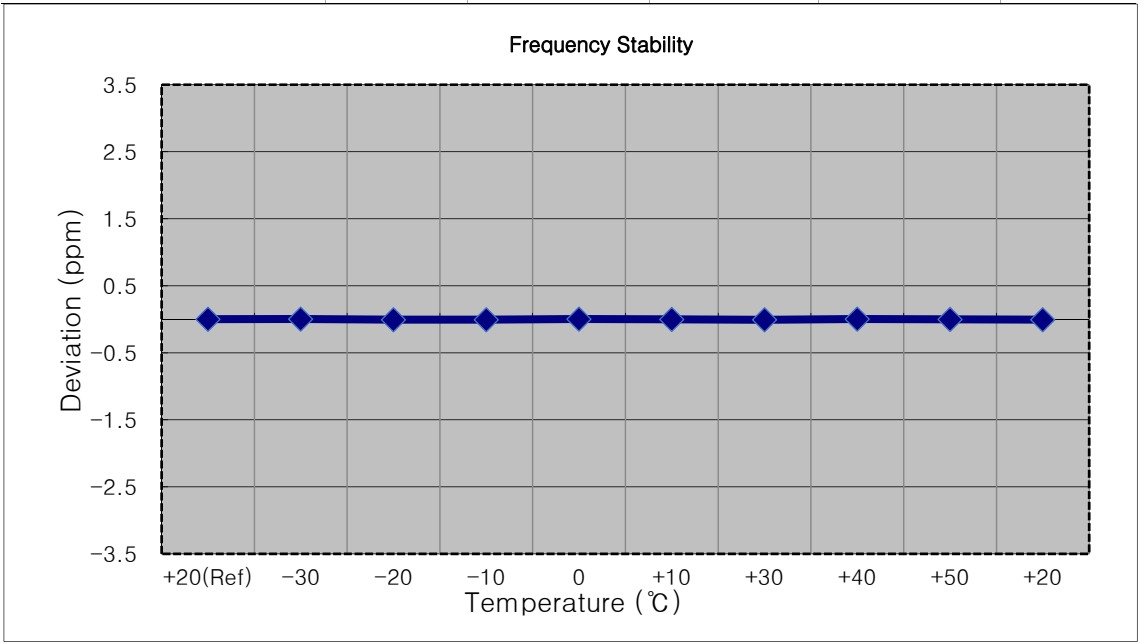
8.7 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 62 ~ 97.

8.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

- ▣ MODE: LTE B2
- ▣ OPERATING FREQUENCY: 1850,700,000 Hz
- ▣ CHANNEL: 18607 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 13.200 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1850 699 990	0.0	0.000 000	0.000
100 %		-30	1850 699 995	4.2	0.000 000	0.002
100 %		-20	1850 699 980	-10.9	-0.000 001	-0.006
100 %		-10	1850 699 979	-11.0	-0.000 001	-0.006
100 %		0	1850 699 996	5.1	0.000 000	0.003
100 %		+10	1850 699 986	-4.8	0.000 000	-0.003
100 %		+30	1850 699 977	-13.4	-0.000 001	-0.007
100 %		+40	1850 699 997	6.1	0.000 000	0.003
100 %		+50	1850 699 988	-2.0	0.000 000	-0.001
115 %		+20	1850 699 989	-1.0	0.000 000	-0.001
85 %		+20	1850 699 981	-9.8	-0.000 001	-0.005



▣ MODE: LTE B2

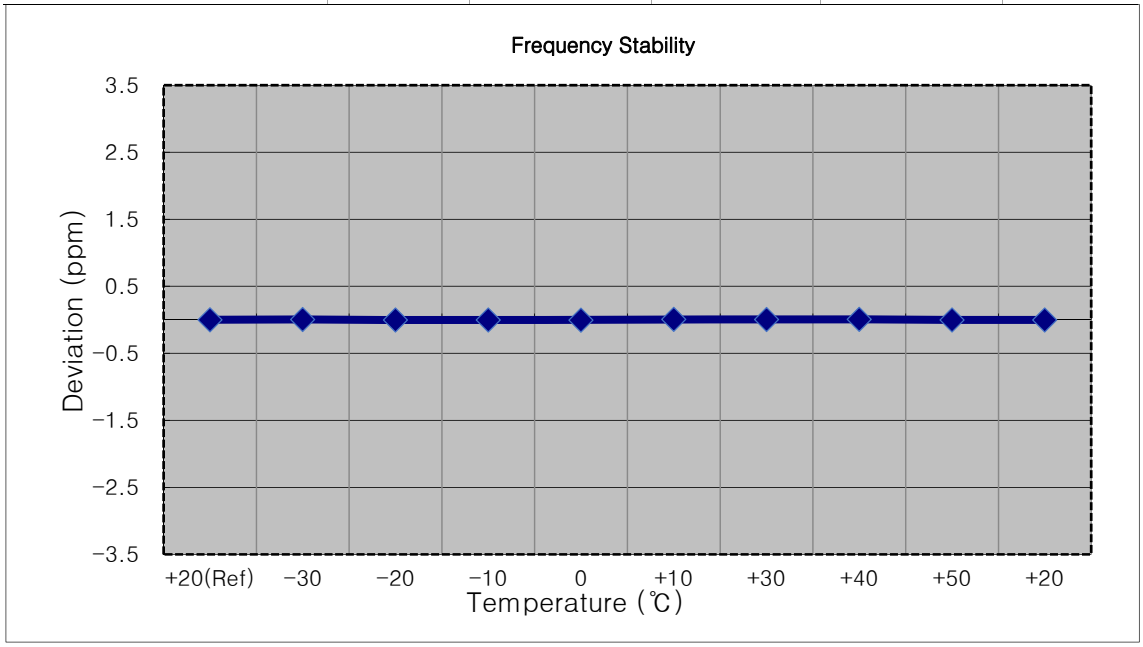
▣ OPERATING FREQUENCY: 1851,500,000 Hz

▣ CHANNEL: 18615 (3 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1851 500 011	0.0	0.000 000	0.000
100 %		-30	1851 500 018	7.0	0.000 000	0.004
100 %		-20	1851 500 006	-5.1	0.000 000	-0.003
100 %		-10	1851 500 005	-6.0	0.000 000	-0.003
100 %		0	1851 500 002	-8.6	0.000 000	-0.005
100 %		+10	1851 500 022	11.2	0.000 001	0.006
100 %		+30	1851 500 018	7.1	0.000 000	0.004
100 %		+40	1851 500 022	10.8	0.000 001	0.006
100 %		+50	1851 500 008	-2.9	0.000 000	-0.002
115 %		+20	1851 500 010	-1.4	0.000 000	-0.001
85 %		+20	1851 500 010	-1.1	0.000 000	-0.001



▣ MODE: LTE B2

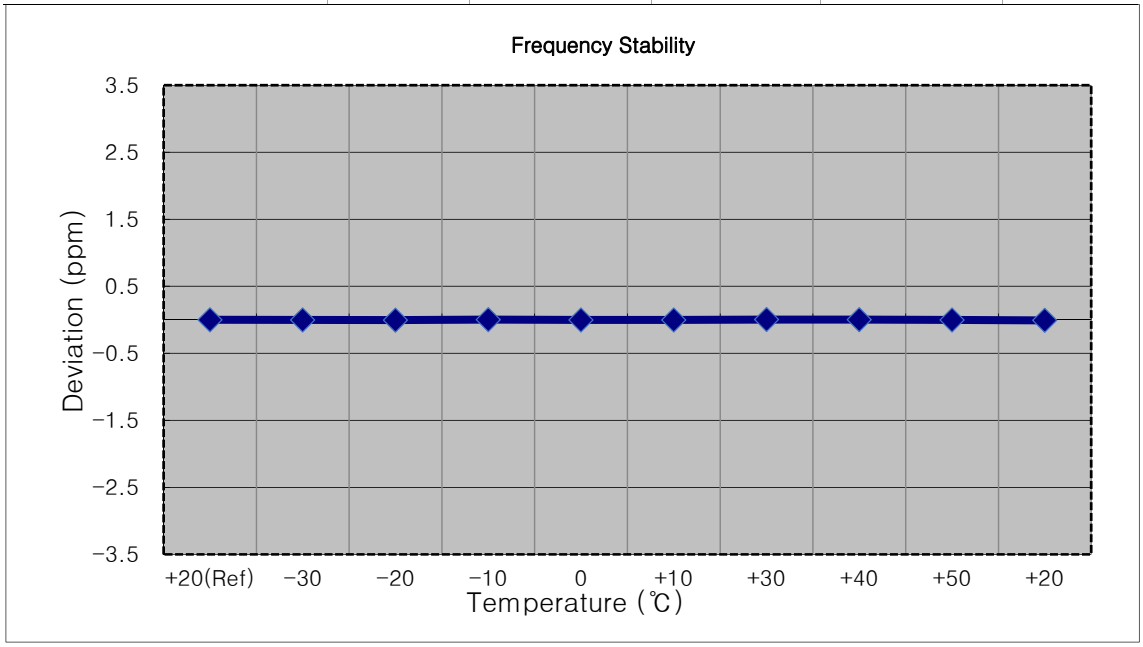
▣ OPERATING FREQUENCY: 1852,500,000 Hz

▣ CHANNEL: 18625 (5 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1852 500 004	0.0	0.000 000	0.000
100 %		-30	1852 499 999	-5.0	0.000 000	-0.003
100 %		-20	1852 499 994	-10.1	-0.000 001	-0.005
100 %		-10	1852 500 010	5.6	0.000 000	0.003
100 %		0	1852 499 998	-5.9	0.000 000	-0.003
100 %		+10	1852 499 998	-5.8	0.000 000	-0.003
100 %		+30	1852 500 012	7.5	0.000 000	0.004
100 %		+40	1852 500 007	2.8	0.000 000	0.002
100 %		+50	1852 499 997	-6.8	0.000 000	-0.004
115 %		+20	1852 500 004	-0.5	0.000 000	0.000
85 %		+20	1852 500 004	3.6	0.000 000	0.002



▣ MODE: LTE B2

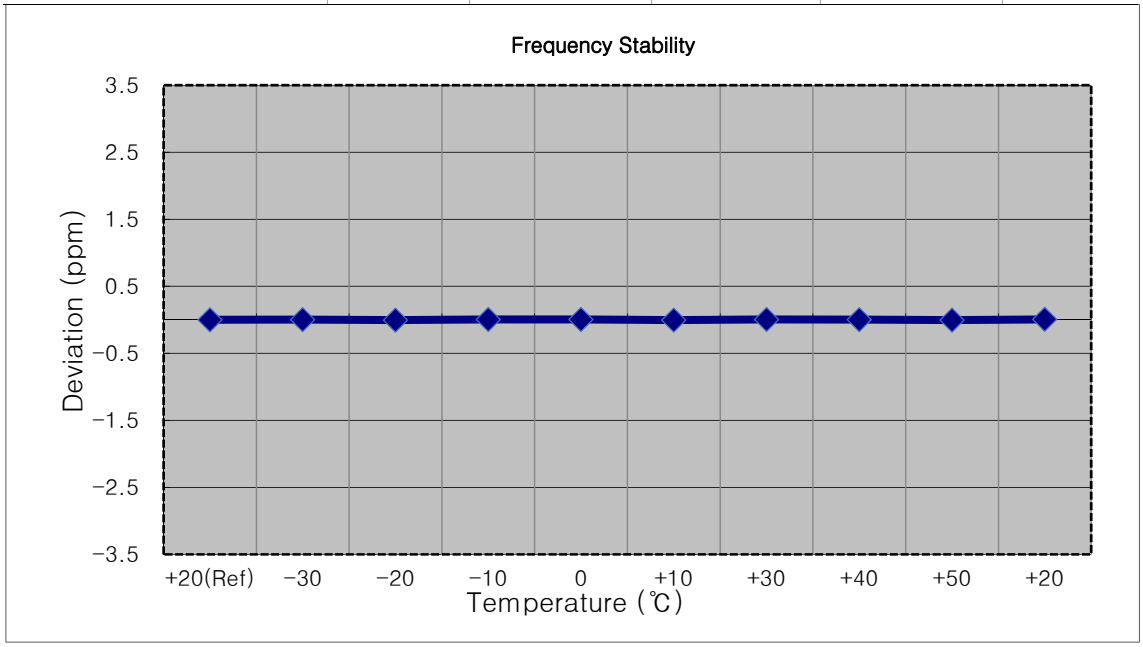
▣ OPERATING FREQUENCY: 1855,000,000 Hz

▣ CHANNEL: 18650 (10 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1854 999 988	0.0	0.000 000	0.000
100 %		-30	1854 999 991	2.3	0.000 000	0.001
100 %		-20	1854 999 981	-7.6	0.000 000	-0.004
100 %		-10	1854 999 995	6.4	0.000 000	0.003
100 %		0	1854 999 997	9.1	0.000 000	0.005
100 %		+10	1854 999 979	-9.4	-0.000 001	-0.005
100 %		+30	1854 999 996	8.0	0.000 000	0.004
100 %		+40	1854 999 992	4.0	0.000 000	0.002
100 %		+50	1854 999 980	-8.0	0.000 000	-0.004
115 %		+20	1854 999 988	-2.6	0.000 000	-0.001
85 %		+20	1854 999 988	7.1	0.000 000	0.004



▣ MODE: LTE B2

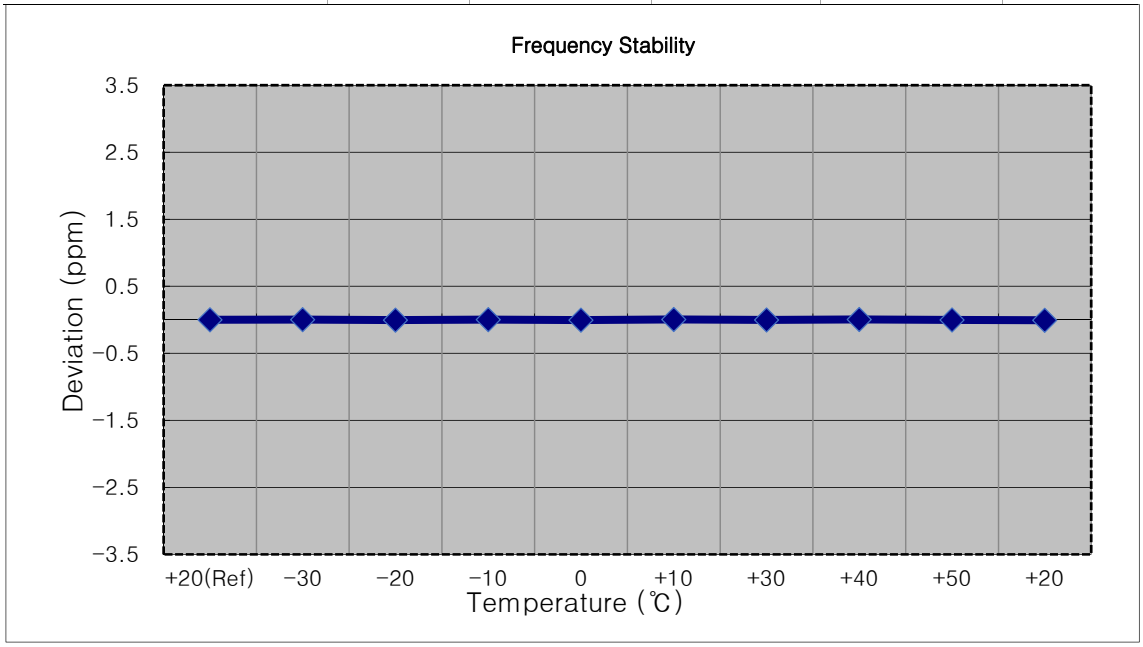
▣ OPERATING FREQUENCY: 1857,500,000 Hz

▣ CHANNEL: 18675 (15 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1857 499 990	0.0	0.000 000	0.000
100 %		-30	1857 499 994	3.8	0.000 000	0.002
100 %		-20	1857 499 980	-10.2	-0.000 001	-0.005
100 %		-10	1857 499 996	5.8	0.000 000	0.003
100 %		0	1857 499 980	-10.3	-0.000 001	-0.006
100 %		+10	1857 499 999	8.6	0.000 000	0.005
100 %		+30	1857 499 984	-5.9	0.000 000	-0.003
100 %		+40	1857 499 998	7.6	0.000 000	0.004
100 %		+50	1857 499 987	-3.3	0.000 000	-0.002
115 %		+20	1857 499 990	-3.3	0.000 000	-0.002
85 %		+20	1857 499 990	-2.3	0.000 000	-0.001



▣ MODE: LTE B2

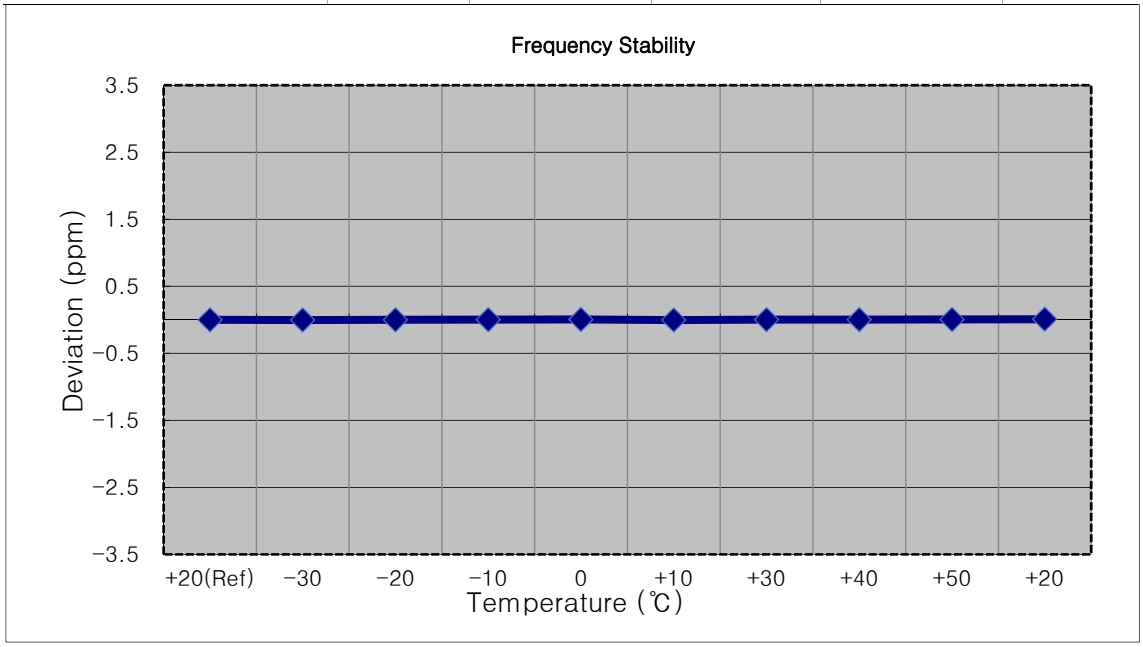
▣ OPERATING FREQUENCY: 1860,000,000 Hz

▣ CHANNEL: 18700 (20 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1860 000 011	0.0	0.000 000	0.000
100 %		-30	1860 000 004	-7.2	0.000 000	-0.004
100 %		-20	1860 000 009	-2.0	0.000 000	-0.001
100 %		-10	1860 000 017	5.8	0.000 000	0.003
100 %		0	1860 000 020	9.1	0.000 000	0.005
100 %		+10	1860 000 004	-7.2	0.000 000	-0.004
100 %		+30	1860 000 015	4.3	0.000 000	0.002
100 %		+40	1860 000 014	3.5	0.000 000	0.002
100 %		+50	1860 000 018	7.0	0.000 000	0.004
115 %		+20	1860 000 011	-7.0	0.000 000	-0.004
85 %		+20	1860 000 011	-2.9	0.000 000	-0.002



▣ MODE: LTE B2

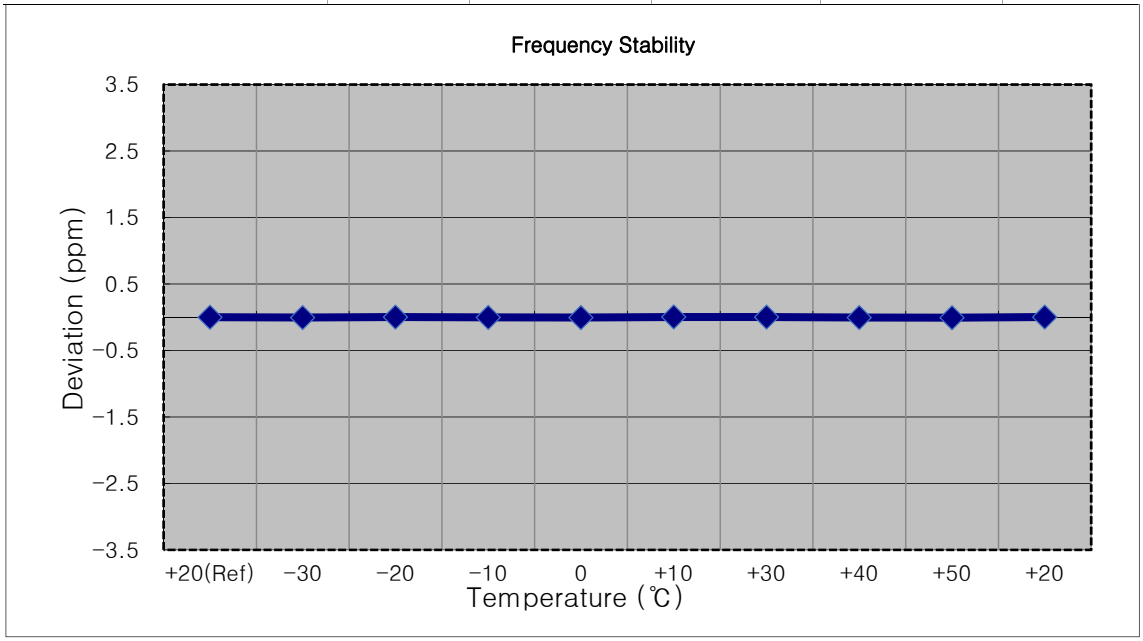
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 18900 (1.4 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1879 999 995	0.0	0.000 000	0.000
100 %		-30	1879 999 984	-10.8	-0.000 001	-0.006
100 %		-20	1880 000 000	5.1	0.000 000	0.003
100 %		-10	1879 999 991	-4.0	0.000 000	-0.002
100 %		0	1879 999 984	-11.4	-0.000 001	-0.006
100 %		+10	1880 000 002	7.0	0.000 000	0.004
100 %		+30	1879 999 997	2.3	0.000 000	0.001
100 %		+40	1879 999 984	-11.0	-0.000 001	-0.006
100 %		+50	1879 999 982	-13.3	-0.000 001	-0.007
115 %		+20	1879 999 984	-11.1	-0.000 001	-0.006
85 %		+20	1879 999 998	3.4	0.000 000	0.002



▣ MODE: LTE B2

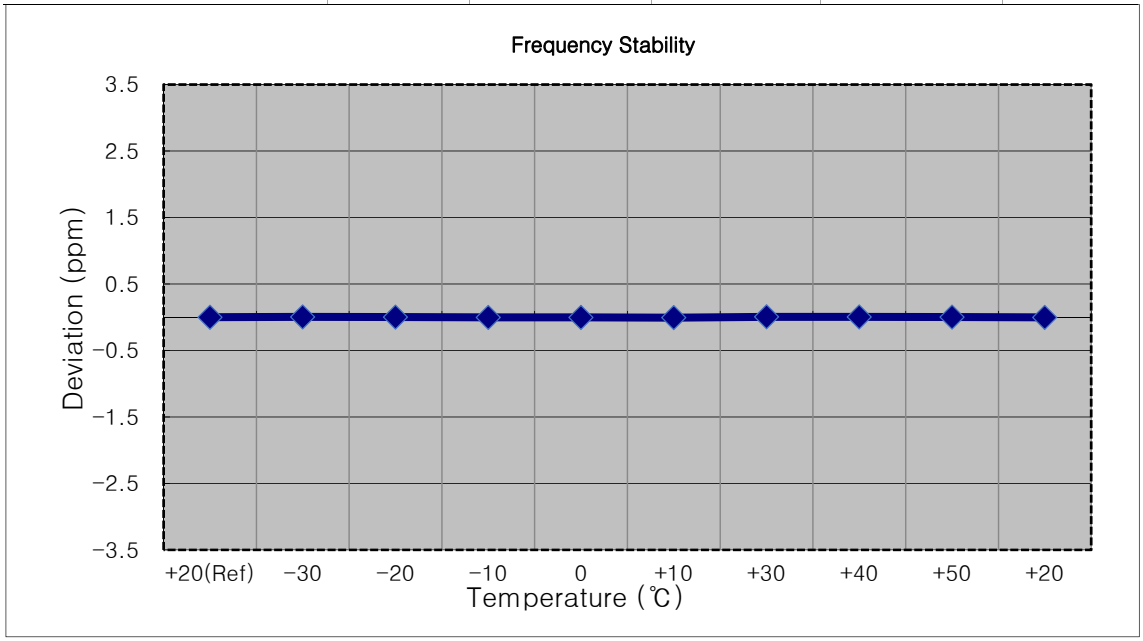
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 18900 (3 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1879 999 988	0.0	0.000 000	0.000
100 %		-30	1879 999 996	7.2	0.000 000	0.004
100 %		-20	1879 999 993	4.2	0.000 000	0.002
100 %		-10	1879 999 984	-4.0	0.000 000	-0.002
100 %		0	1879 999 981	-7.3	0.000 000	-0.004
100 %		+10	1879 999 978	-10.5	-0.000 001	-0.006
100 %		+30	1879 999 999	10.7	0.000 001	0.006
100 %		+40	1879 999 996	7.8	0.000 000	0.004
100 %		+50	1879 999 993	4.7	0.000 000	0.003
115 %		+20	1879 999 987	-1.0	0.000 000	-0.001
85 %		+20	1879 999 979	-9.8	-0.000 001	-0.005



▣ MODE: LTE B2

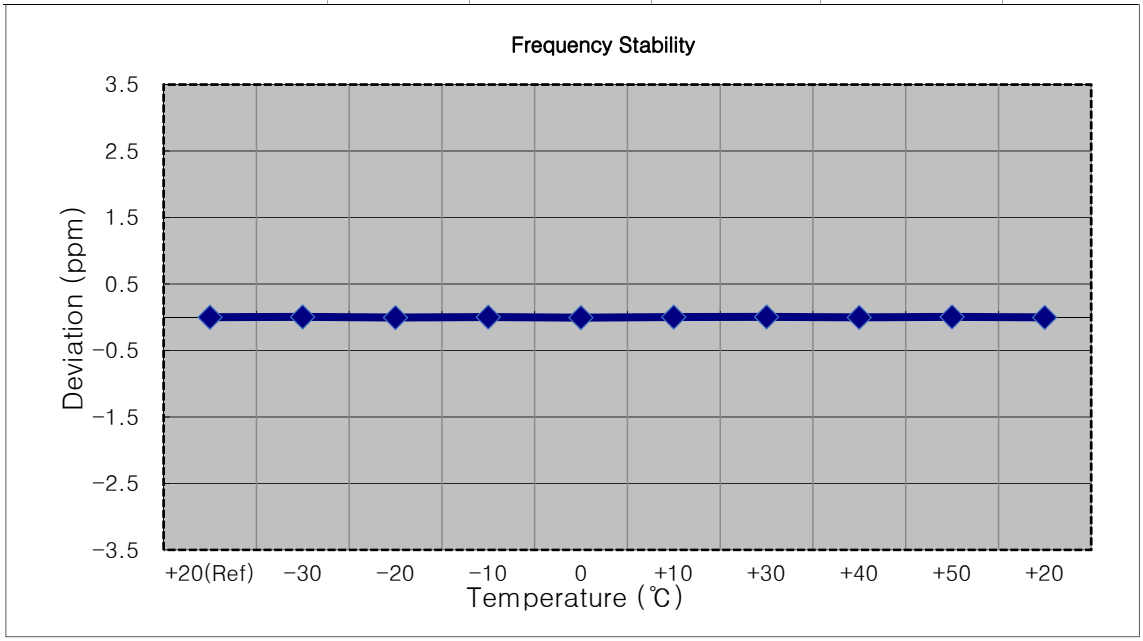
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 18900 (5 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1879 999 993	0.0	0.000 000	0.000
100 %		-30	1880 000 001	7.5	0.000 000	0.004
100 %		-20	1879 999 984	-9.5	-0.000 001	-0.005
100 %		-10	1879 999 996	2.5	0.000 000	0.001
100 %		0	1879 999 981	-11.9	-0.000 001	-0.006
100 %		+10	1879 999 998	5.3	0.000 000	0.003
100 %		+30	1880 000 002	8.4	0.000 000	0.004
100 %		+40	1879 999 987	-6.1	0.000 000	-0.003
100 %		+50	1880 000 000	6.4	0.000 000	0.003
115 %		+20	1879 999 993	-1.0	0.000 000	-0.001
85 %		+20	1879 999 993	-9.8	-0.000 001	-0.005



▣ MODE: LTE B2

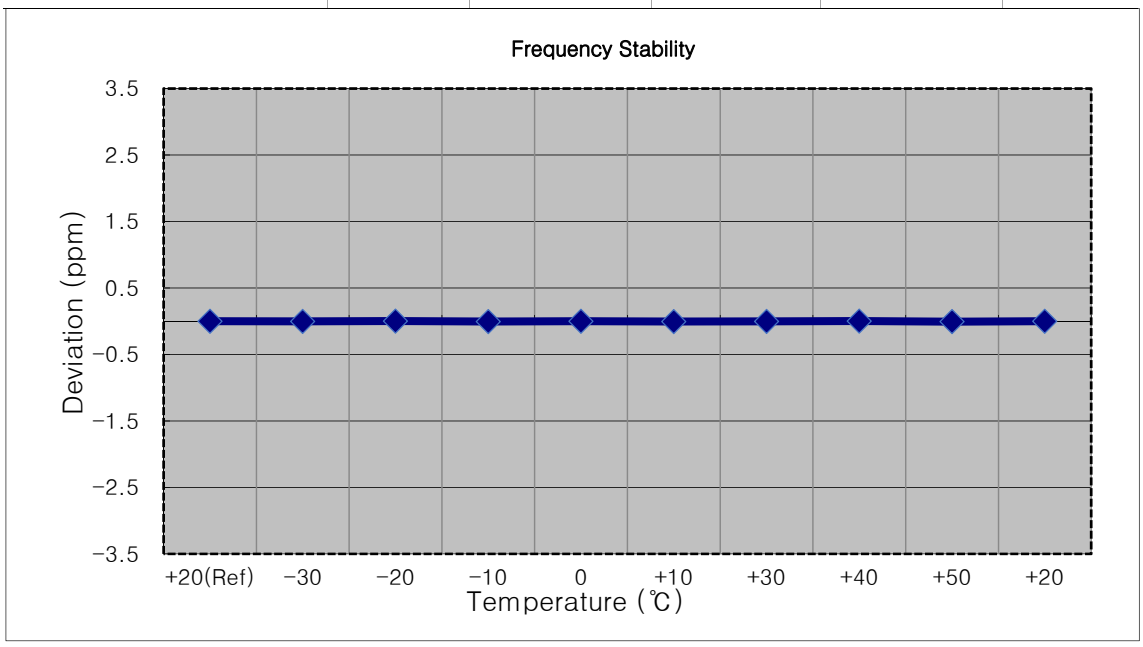
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 18900 (10 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1880 000 010	0.0	0.000 000	0.000
100 %		-30	1880 000 002	-7.6	0.000 000	-0.004
100 %		-20	1880 000 015	5.0	0.000 000	0.003
100 %		-10	1880 000 001	-8.6	0.000 000	-0.005
100 %		0	1880 000 007	-2.6	0.000 000	-0.001
100 %		+10	1879 999 999	-11.1	-0.000 001	-0.006
100 %		+30	1880 000 005	-5.3	0.000 000	-0.003
100 %		+40	1880 000 014	3.8	0.000 000	0.002
100 %		+50	1879 999 998	-11.6	-0.000 001	-0.006
115 %		+20	1880 000 010	-1.1	0.000 000	-0.001
85 %		+20	1880 000 010	3.6	0.000 000	0.002



▣ MODE: LTE B2

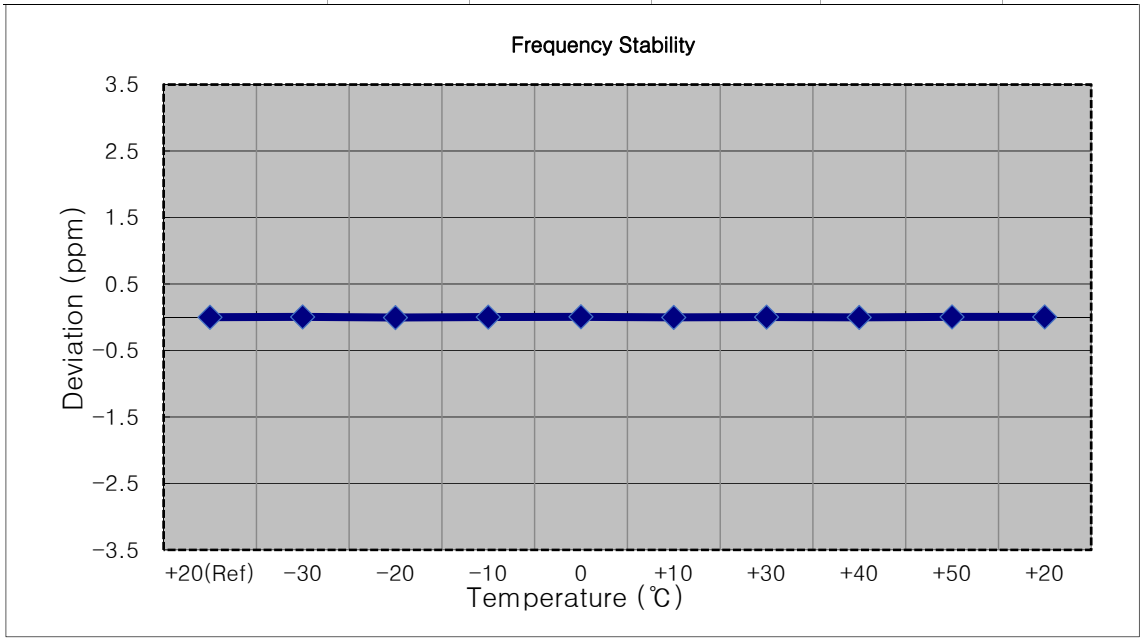
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 18900 (15 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1880 000 007	0.0	0.000 000	0.000
100 %		-30	1880 000 014	7.5	0.000 000	0.004
100 %		-20	1879 999 998	-8.8	0.000 000	-0.005
100 %		-10	1880 000 011	4.9	0.000 000	0.003
100 %		0	1880 000 017	10.7	0.000 001	0.006
100 %		+10	1880 000 002	-4.3	0.000 000	-0.002
100 %		+30	1880 000 012	5.9	0.000 000	0.003
100 %		+40	1879 999 999	-7.2	0.000 000	-0.004
100 %		+50	1880 000 016	9.4	0.000 000	0.005
115 %		+20	1880 000 007	-1.6	0.000 000	-0.001
85 %		+20	1880 000 007	-5.7	0.000 000	-0.003



▣ MODE: LTE B2

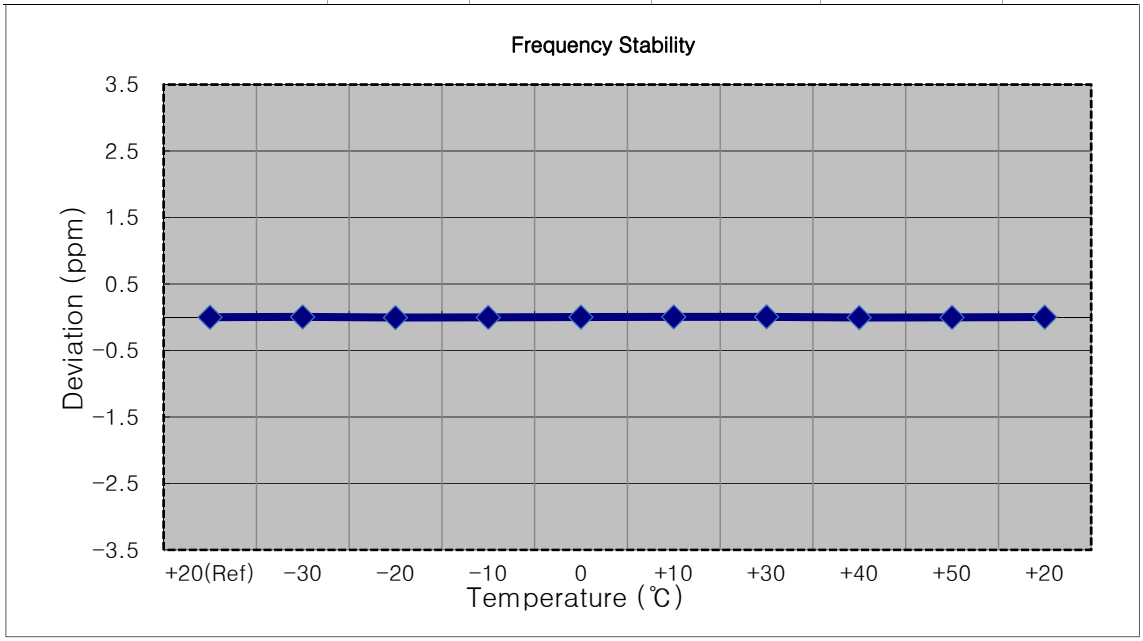
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 18900 (20 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1880 000 009	0.0	0.000 000	0.000
100 %		-30	1880 000 020	10.4	0.000 001	0.006
100 %		-20	1880 000 001	-8.1	0.000 000	-0.004
100 %		-10	1880 000 003	-6.0	0.000 000	-0.003
100 %		0	1880 000 012	2.4	0.000 000	0.001
100 %		+10	1880 000 016	6.3	0.000 000	0.003
100 %		+30	1880 000 021	11.6	0.000 001	0.006
100 %		+40	1880 000 001	-8.7	0.000 000	-0.005
100 %		+50	1880 000 006	-3.5	0.000 000	-0.002
115 %		+20	1880 000 009	-5.5	0.000 000	-0.003
85 %		+20	1880 000 009	-1.6	0.000 000	-0.001



▣ MODE: LTE B2

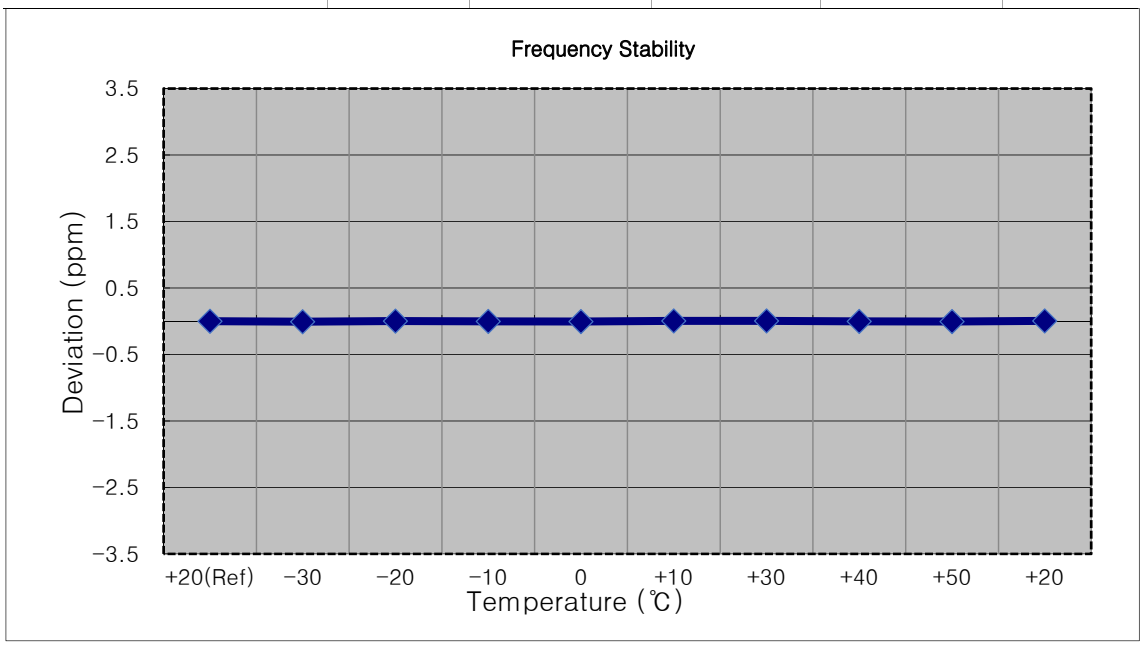
▣ OPERATING FREQUENCY: 1909,300,000 Hz

▣ CHANNEL: 19193 (1.4 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1909 299 990	0.0	0.000 000	0.000
100 %		-30	1909 299 976	-14.0	-0.000 001	-0.007
100 %		-20	1909 299 995	4.8	0.000 000	0.003
100 %		-10	1909 299 983	-7.0	0.000 000	-0.004
100 %		0	1909 299 979	-11.0	-0.000 001	-0.006
100 %		+10	1909 299 996	6.1	0.000 000	0.003
100 %		+30	1909 299 998	8.0	0.000 000	0.004
100 %		+40	1909 299 982	-7.7	0.000 000	-0.004
100 %		+50	1909 299 980	-10.1	-0.000 001	-0.005
115 %		+20	1909 299 981	-8.4	0.000 000	-0.004
85 %		+20	1909 299 999	9.3	0.000 000	0.005



▣ MODE: LTE B2

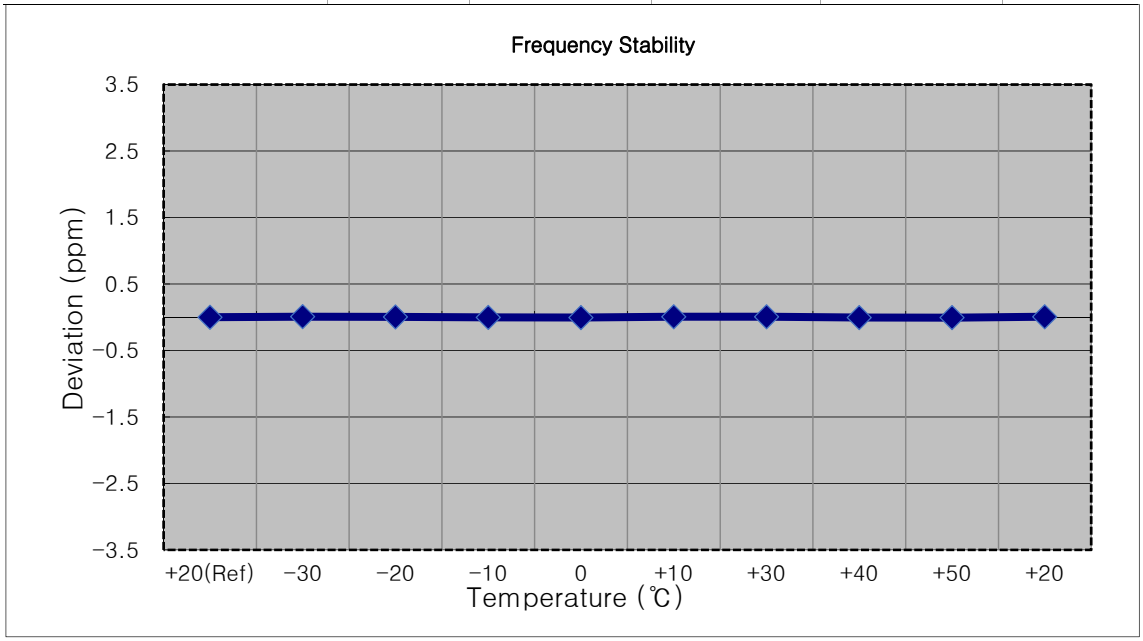
▣ OPERATING FREQUENCY: 1908,500,000 Hz

▣ CHANNEL: 19185 (3 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1908 499 993	0.0	0.000 000	0.000
100 %		-30	1908 500 009	16.1	0.000 001	0.008
100 %		-20	1908 500 001	8.3	0.000 000	0.004
100 %		-10	1908 499 986	-6.6	0.000 000	-0.003
100 %		0	1908 499 982	-10.4	-0.000 001	-0.005
100 %		+10	1908 500 003	10.8	0.000 001	0.006
100 %		+30	1908 500 005	12.6	0.000 001	0.007
100 %		+40	1908 499 982	-10.5	-0.000 001	-0.006
100 %		+50	1908 499 981	-11.8	-0.000 001	-0.006
115 %		+20	1908 499 993	-1.0	0.000 000	-0.001
85 %		+20	1908 499 993	-9.8	-0.000 001	-0.005



▣ MODE: LTE B2

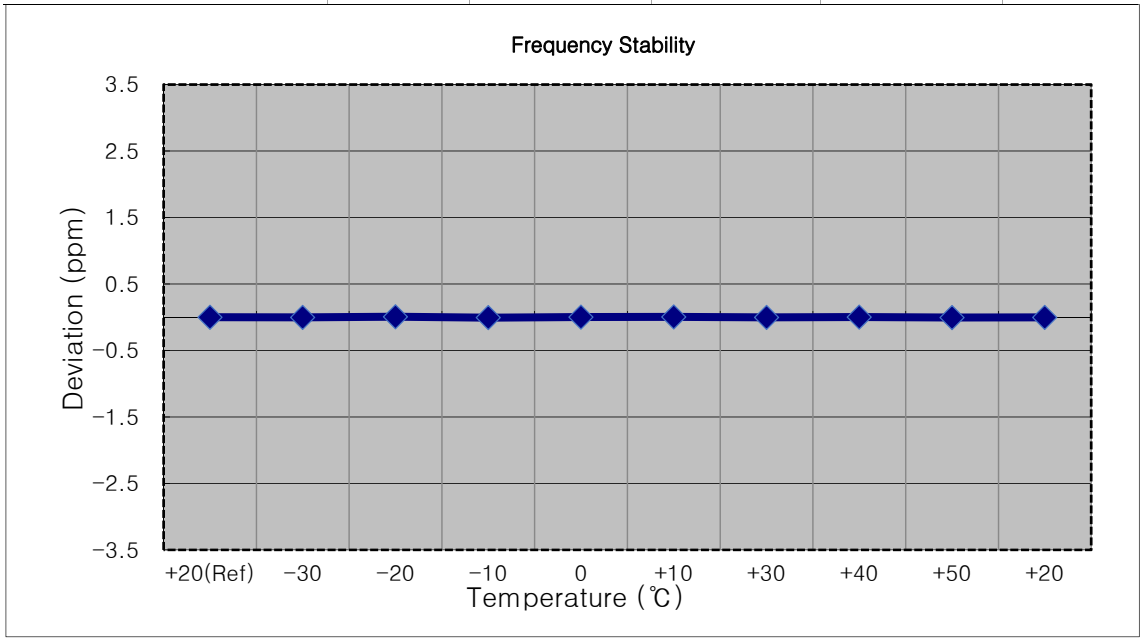
▣ OPERATING FREQUENCY: 1907,500,000 Hz

▣ CHANNEL: 19175 (5 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1907 499 991	0.0	0.000 000	0.000
100 %		-30	1907 499 987	-3.9	0.000 000	-0.002
100 %		-20	1907 500 004	13.7	0.000 001	0.007
100 %		-10	1907 499 980	-10.3	-0.000 001	-0.005
100 %		0	1907 499 993	2.7	0.000 000	0.001
100 %		+10	1907 500 001	10.2	0.000 001	0.005
100 %		+30	1907 499 983	-7.4	0.000 000	-0.004
100 %		+40	1907 499 996	5.5	0.000 000	0.003
100 %		+50	1907 499 981	-9.1	0.000 000	-0.005
115 %		+20	1907 499 991	-1.1	0.000 000	-0.001
85 %		+20	1907 499 991	-3.5	0.000 000	-0.002



▣ MODE: LTE B2

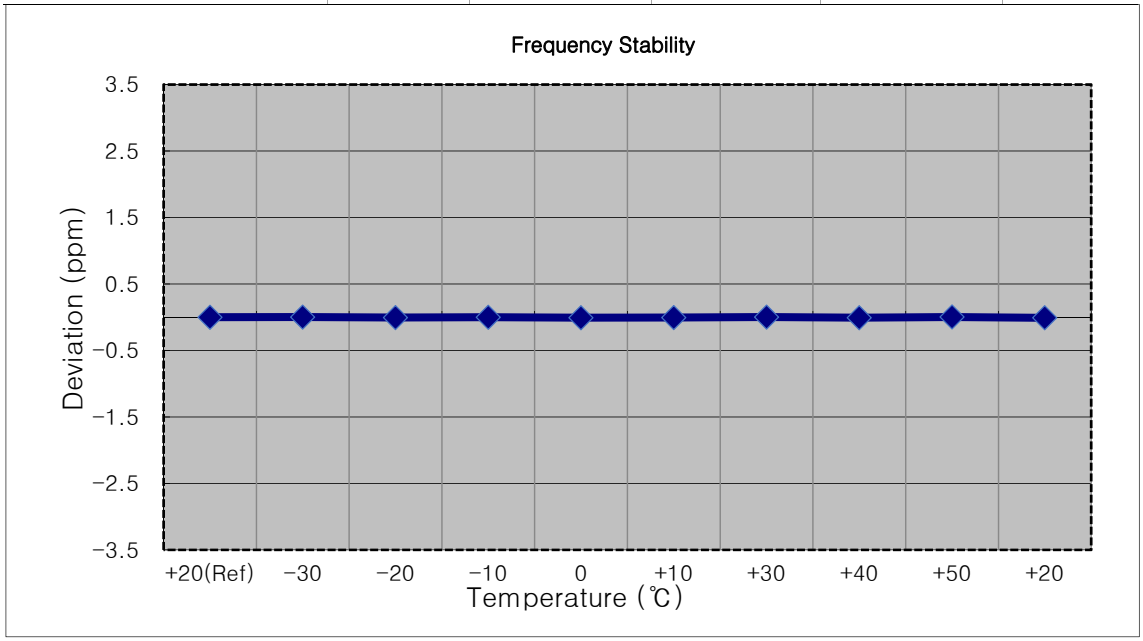
▣ OPERATING FREQUENCY: 1905,000,000 Hz

▣ CHANNEL: 19150 (10 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1904 999 995	0.0	0.000 000	0.000
100 %		-30	1905 000 001	5.8	0.000 000	0.003
100 %		-20	1904 999 985	-10.1	-0.000 001	-0.005
100 %		-10	1904 999 992	-2.5	0.000 000	-0.001
100 %		0	1904 999 981	-13.6	-0.000 001	-0.007
100 %		+10	1904 999 986	-8.6	0.000 000	-0.005
100 %		+30	1904 999 997	2.4	0.000 000	0.001
100 %		+40	1904 999 982	-13.0	-0.000 001	-0.007
100 %		+50	1905 000 002	7.3	0.000 000	0.004
115 %		+20	1904 999 995	-1.4	0.000 000	-0.001
85 %		+20	1904 999 995	5.4	0.000 000	0.003



▣ MODE: LTE B2

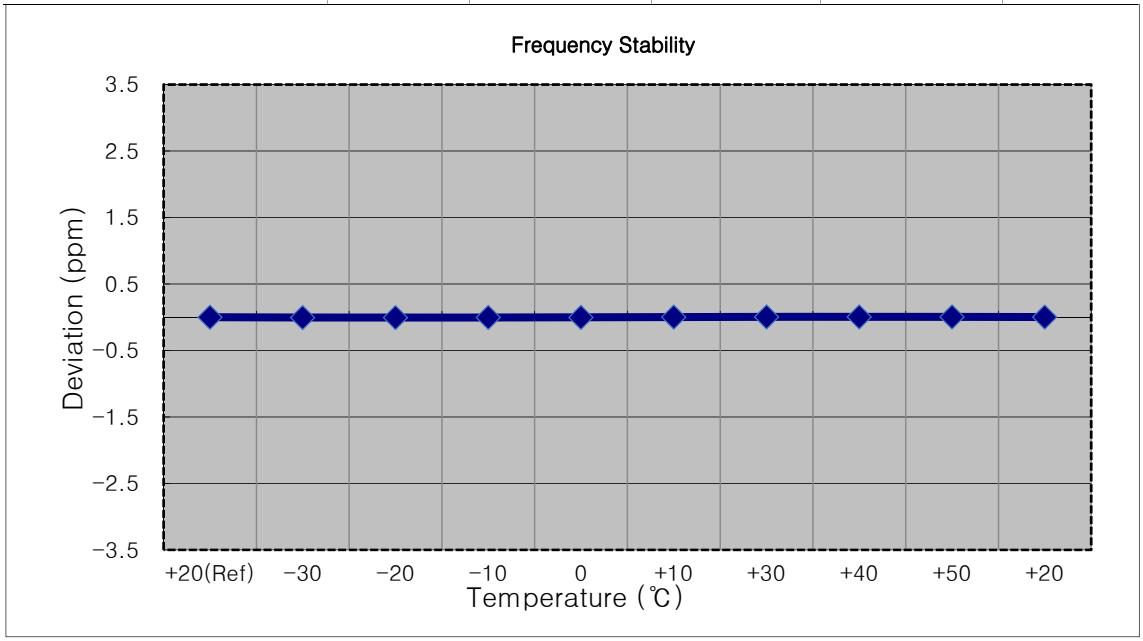
▣ OPERATING FREQUENCY: 1902,500,000 Hz

▣ CHANNEL: 19125 (15 MHz)

▣ REFERENCE VOLTAGE: 3.880 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1902 499 985	0.0	0.000 000	0.000
100 %		-30	1902 499 974	-10.7	-0.000 001	-0.006
100 %		-20	1902 499 974	-11.2	-0.000 001	-0.006
100 %		-10	1902 499 979	-5.5	0.000 000	-0.003
100 %		0	1902 499 981	-3.7	0.000 000	-0.002
100 %		+10	1902 499 988	3.0	0.000 000	0.002
100 %		+30	1902 499 993	7.8	0.000 000	0.004
100 %		+40	1902 499 995	10.2	0.000 001	0.005
100 %		+50	1902 499 992	6.7	0.000 000	0.004
115 %		+20	1902 499 985	4.1	0.000 000	0.002
85 %		+20	1902 499 985	3.3	0.000 000	0.002



▣ MODE: LTE B2

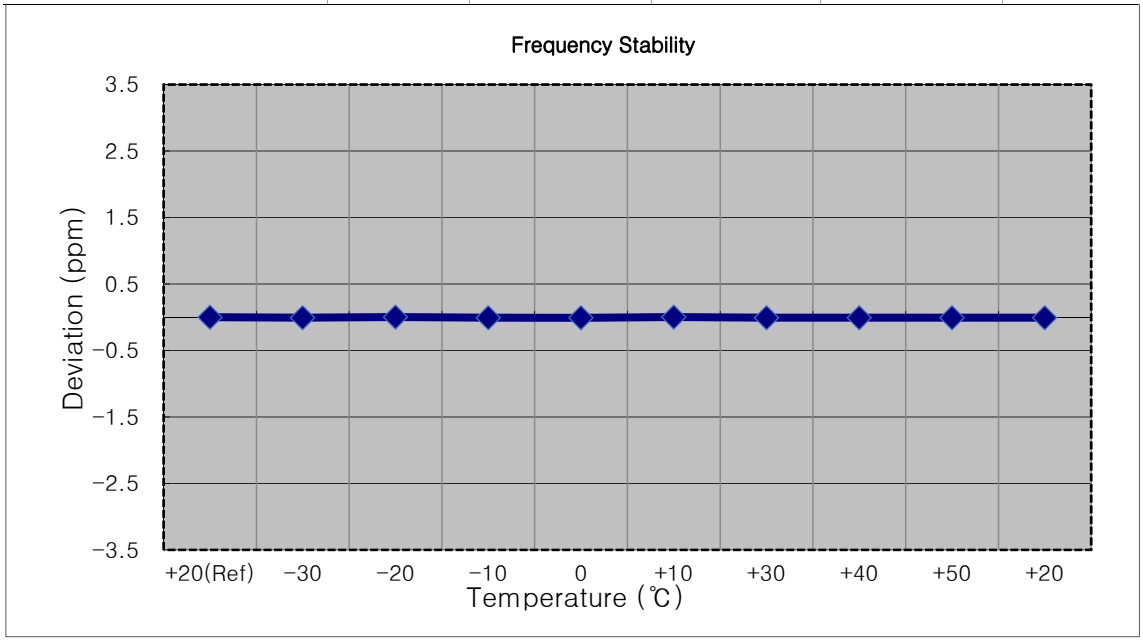
▣ OPERATING FREQUENCY: 1900,000,000 Hz

▣ CHANNEL: 19100 (20 MHz)

▣ REFERENCE VOLTAGE: 13.200 VDC

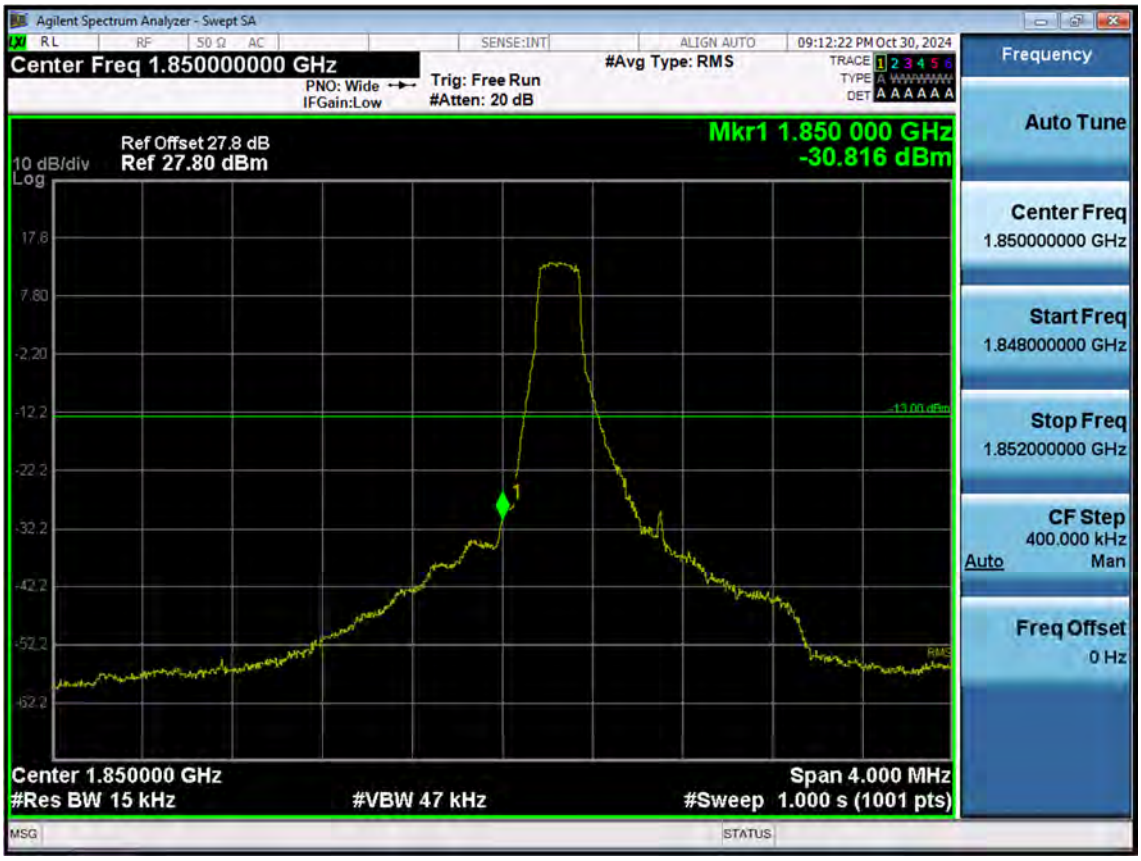
▣ DEVIATION LIMIT: Emission must remain in band

Voltage	Power	Temp.	Frequency	Frequency	Deviation	ppm
(%)	(VDC)	(℃)	(Hz)	Error (Hz)	(%)	
100 %	13.200	+20(Ref)	1899 999 987	0.0	0.000 000	0.000
100 %		-30	1899 999 973	-14.1	-0.000 001	-0.007
100 %		-20	1899 999 993	5.9	0.000 000	0.003
100 %		-10	1899 999 973	-14.1	-0.000 001	-0.007
100 %		0	1899 999 971	-16.6	-0.000 001	-0.009
100 %		+10	1899 999 993	5.6	0.000 000	0.003
100 %		+30	1899 999 973	-14.6	-0.000 001	-0.008
100 %		+40	1899 999 971	-16.5	-0.000 001	-0.009
100 %		+50	1899 999 973	-14.3	-0.000 001	-0.008
115 %		+20	1899 999 987	-3.6	0.000 000	-0.002
85 %		+20	1899 999 987	-1.1	0.000 000	-0.001

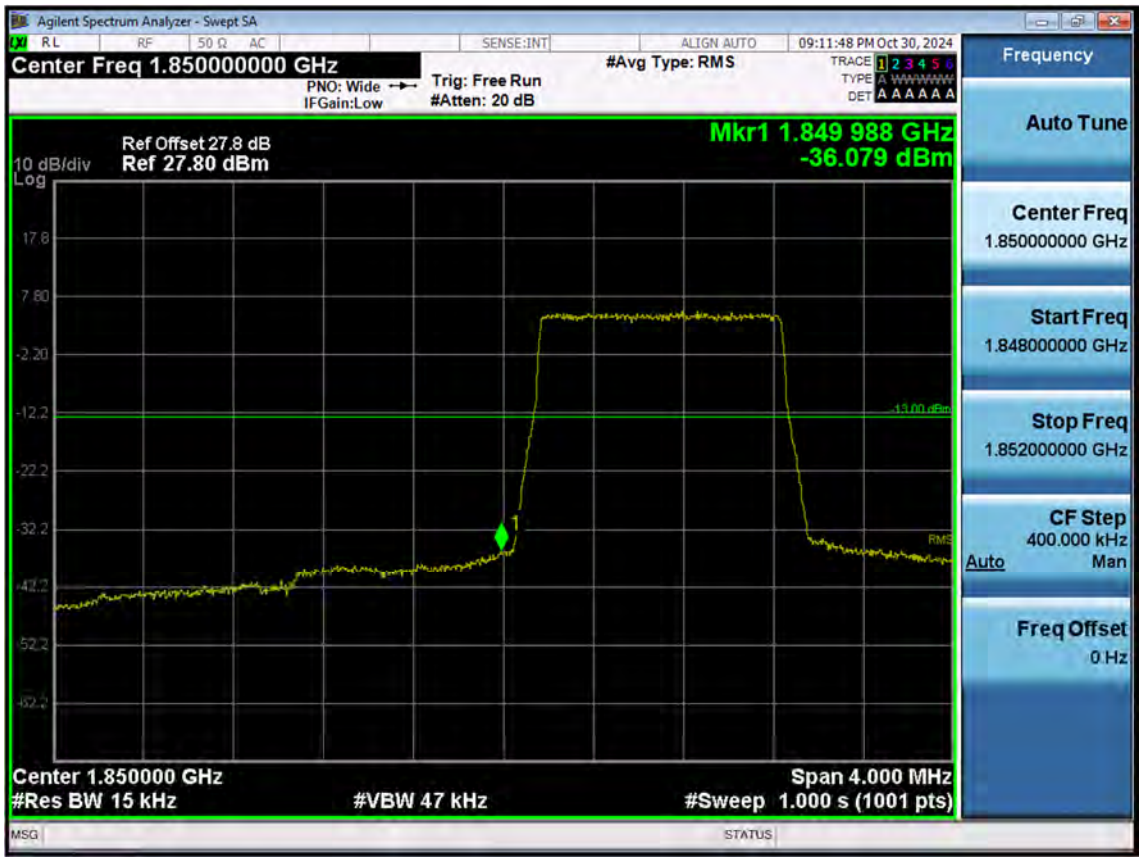


9. TEST PLOTS

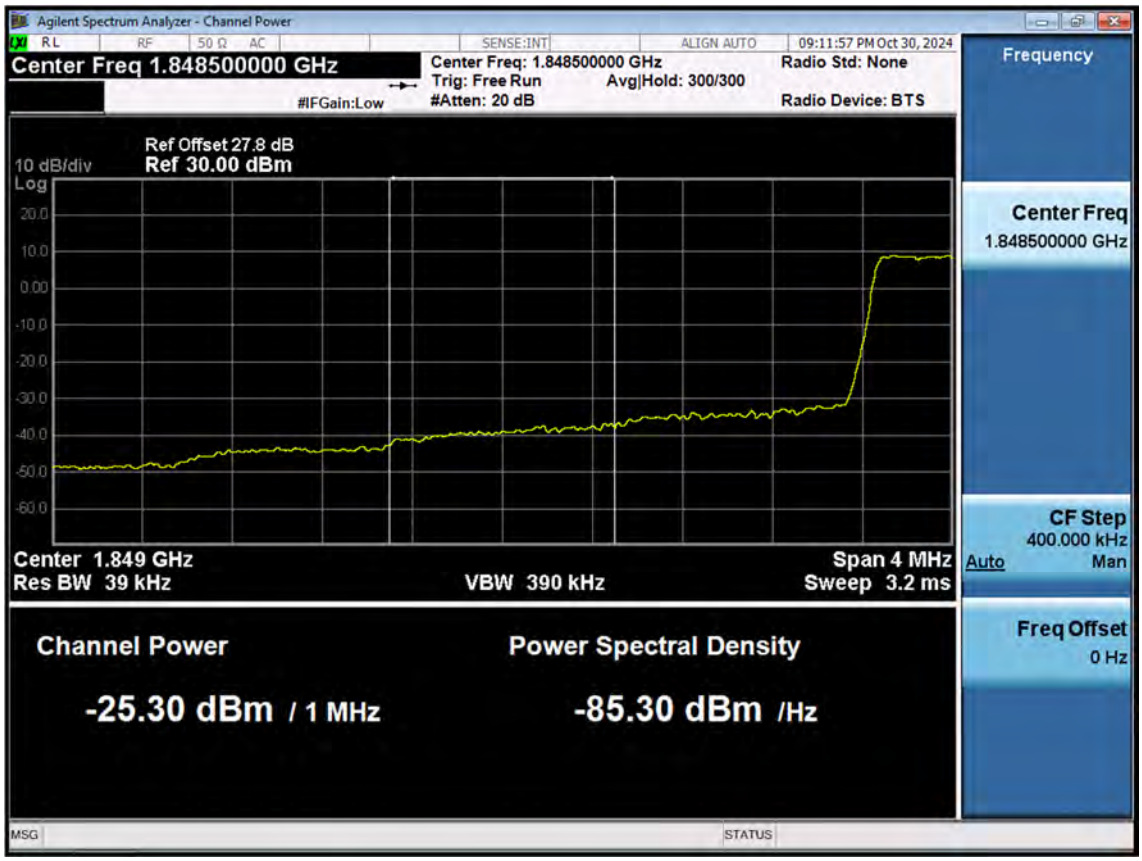
LTE2_1.4 M_BandEdge_Low_QPSK_1RB



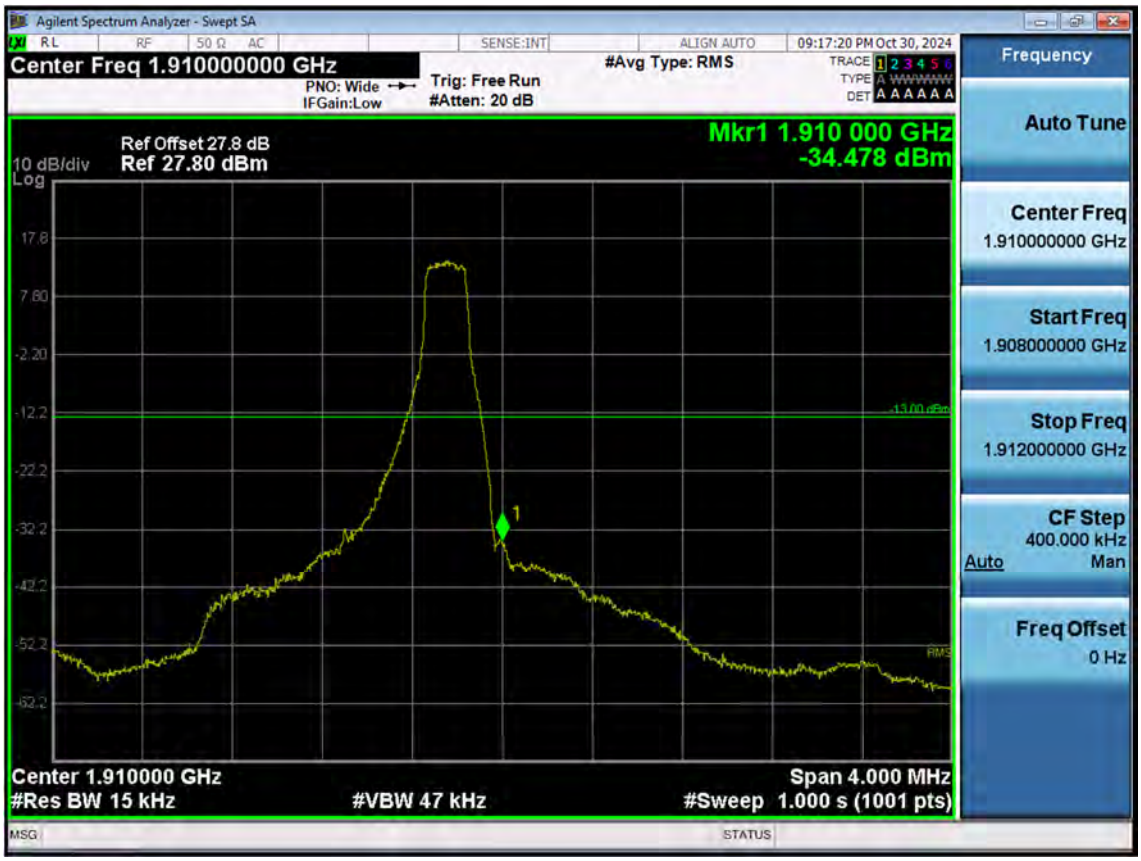
LTE2_1.4 M_BandEdge_Low_QPSK_FullRB



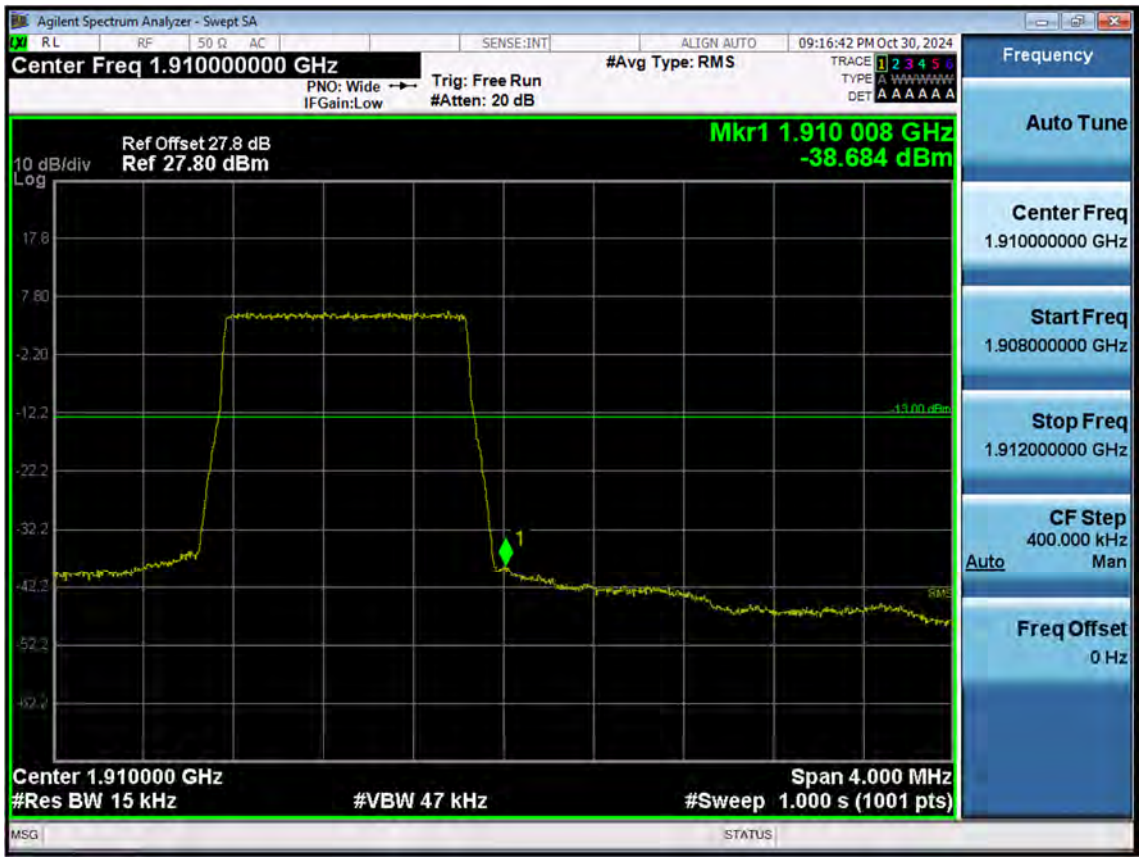
LTE2_1.4 M_Extended Band Edge_Low_QPSK_FullRB



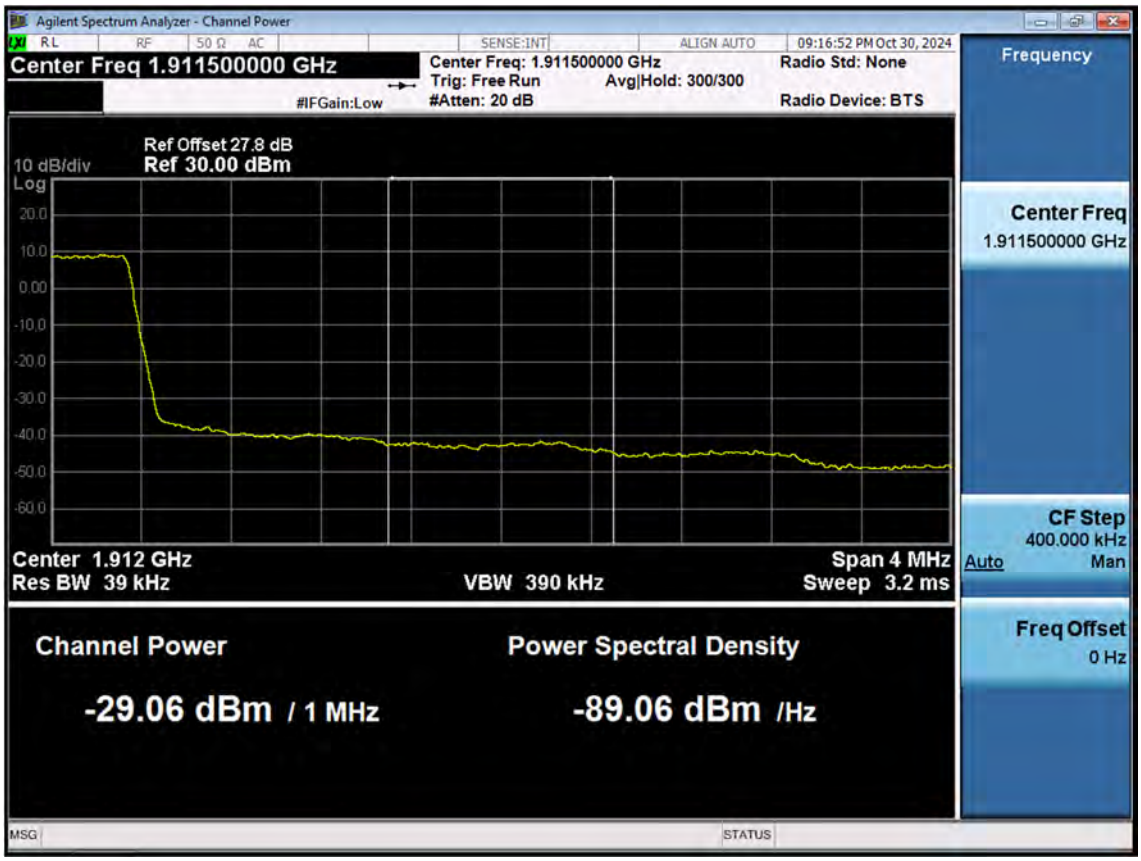
LTE2_1.4 M_BandEdge_High_QPSK_1RB



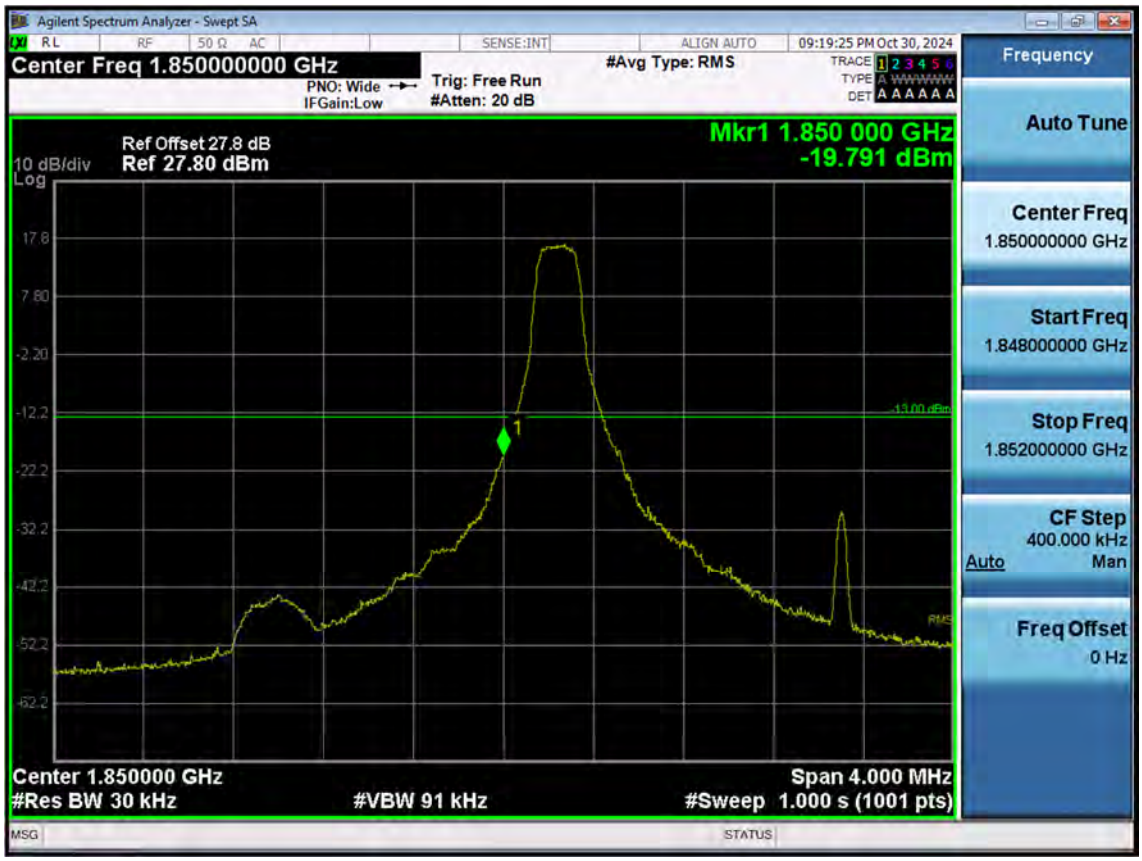
LTE2_1.4 M_BandEdge_High_QPSK_FullRB



LTE2_1.4 M_Extended Band Edge _High_QPSK_FullRB

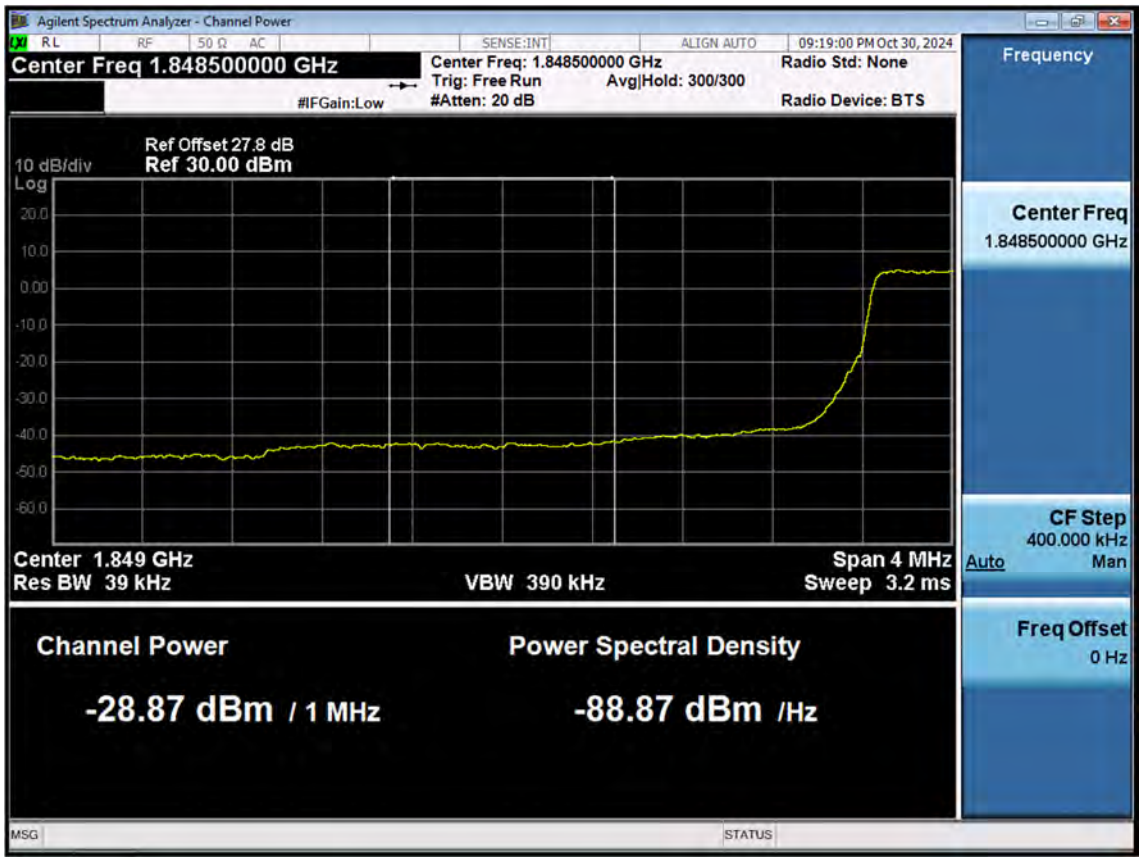


LTE2_3 M_BandEdge_Low_QPSK_1RB

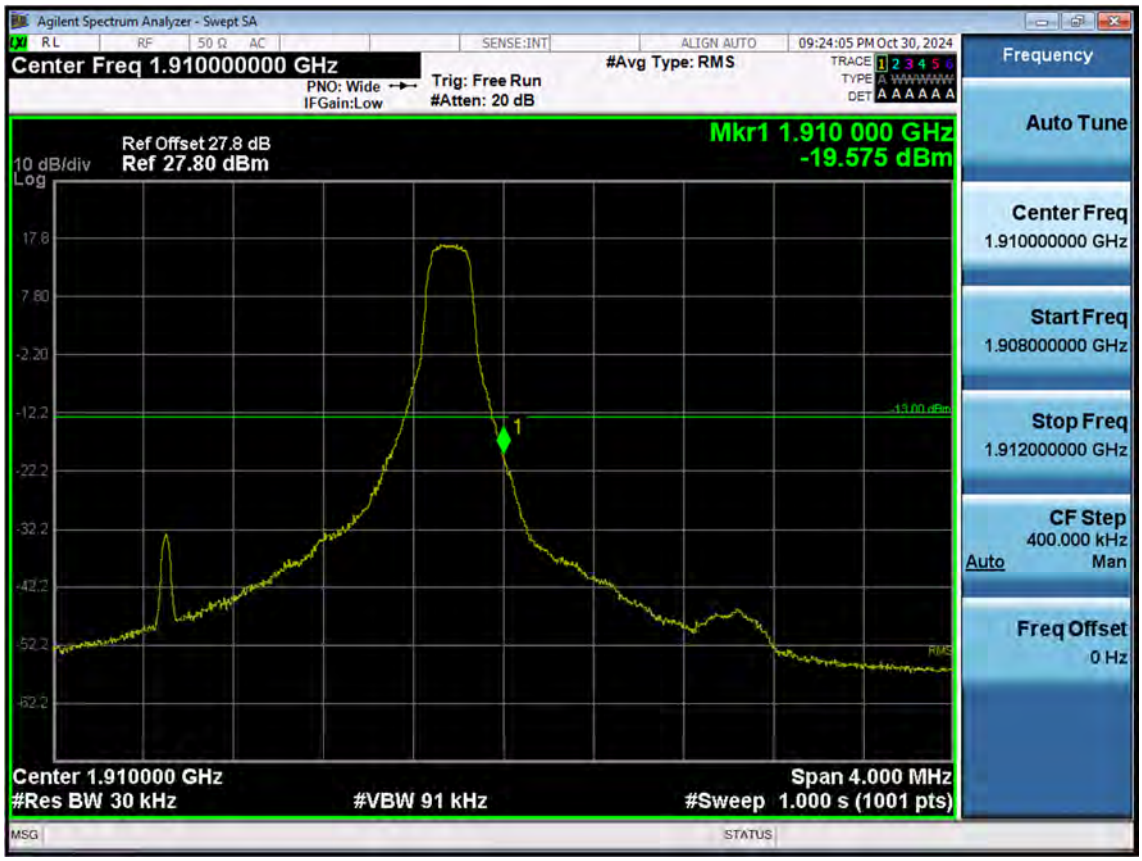


LTE2_3 M_BandEdge_Low_QPSK_FullRB

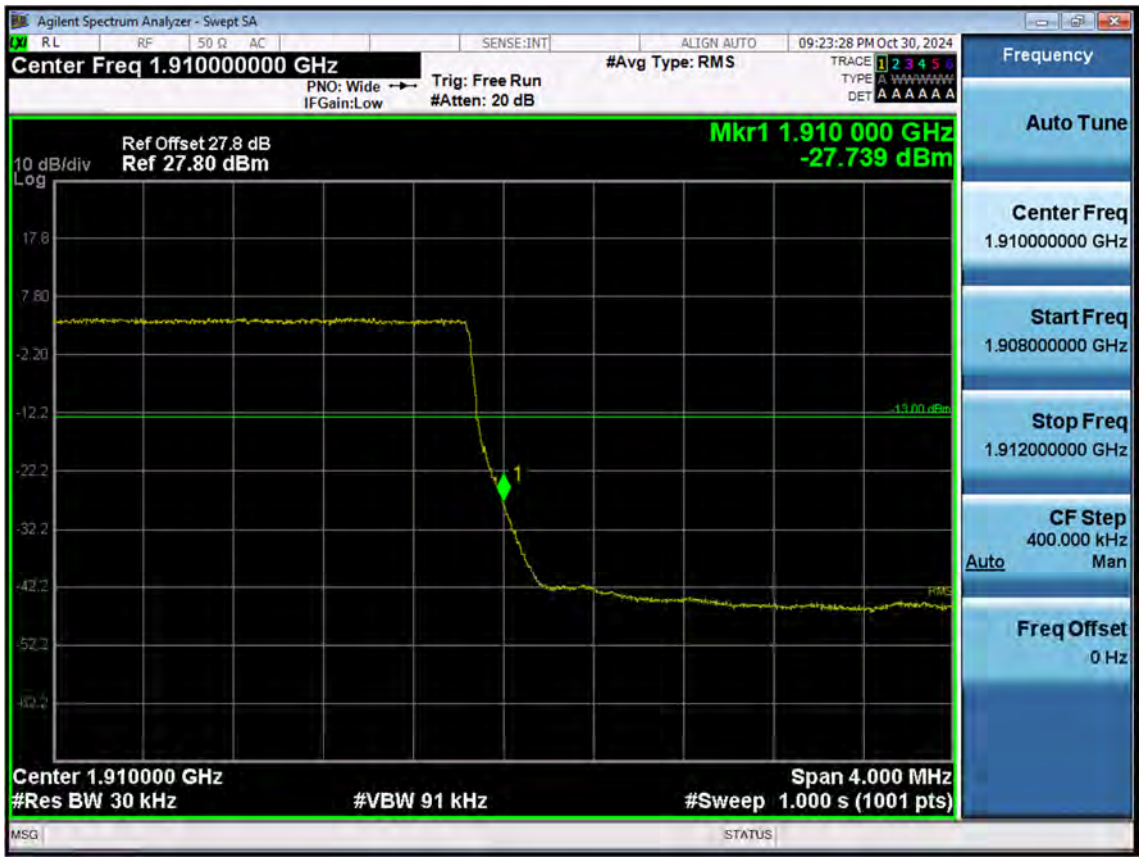
LTE2_3 M_Extended Band Edge_Low_QPSK_FullRB



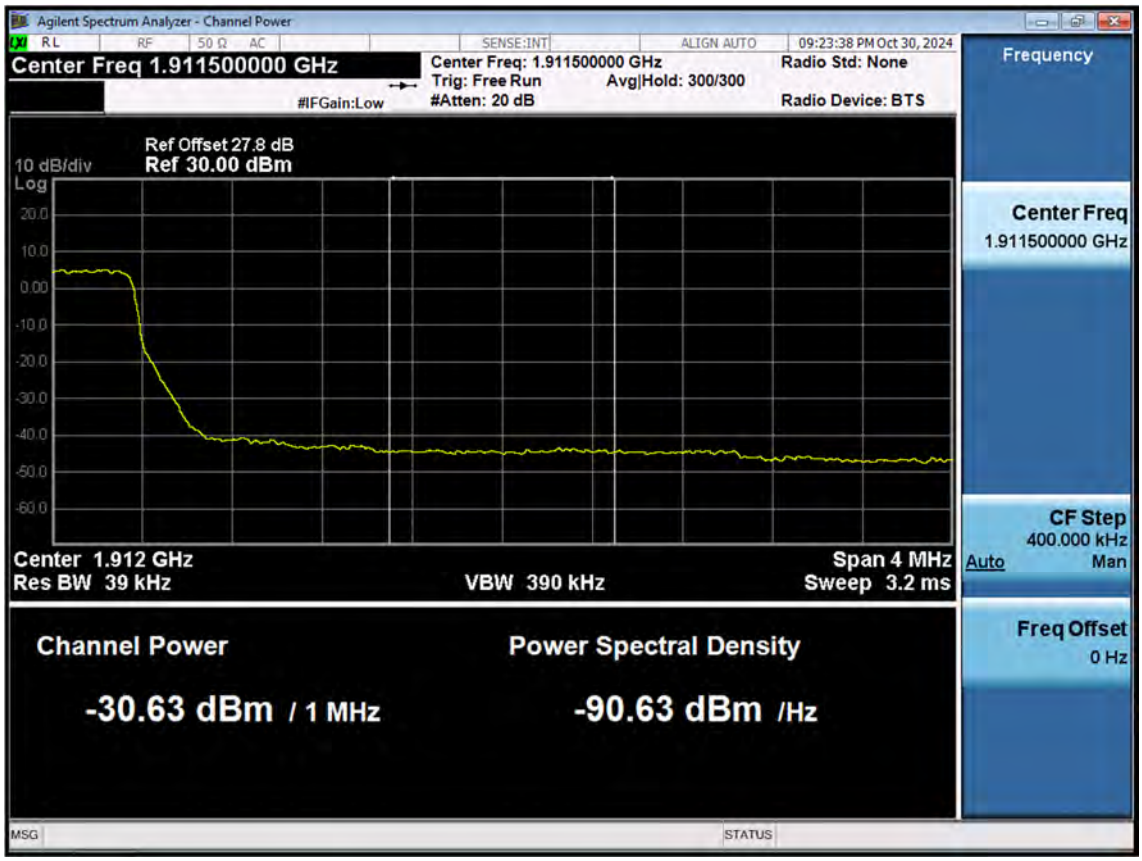
LTE2_3 M_BandEdge_High_QPSK_1RB



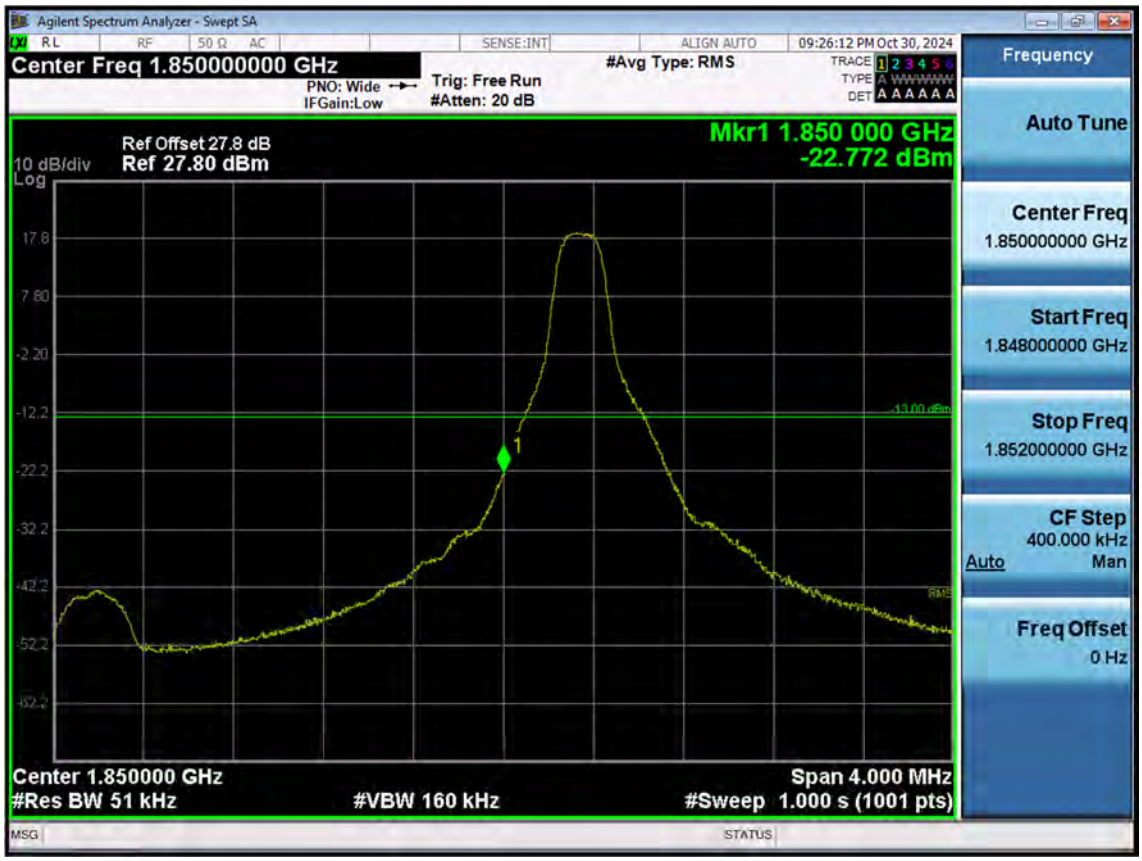
LTE2_3 M_BandEdge_High_QPSK_FullRB



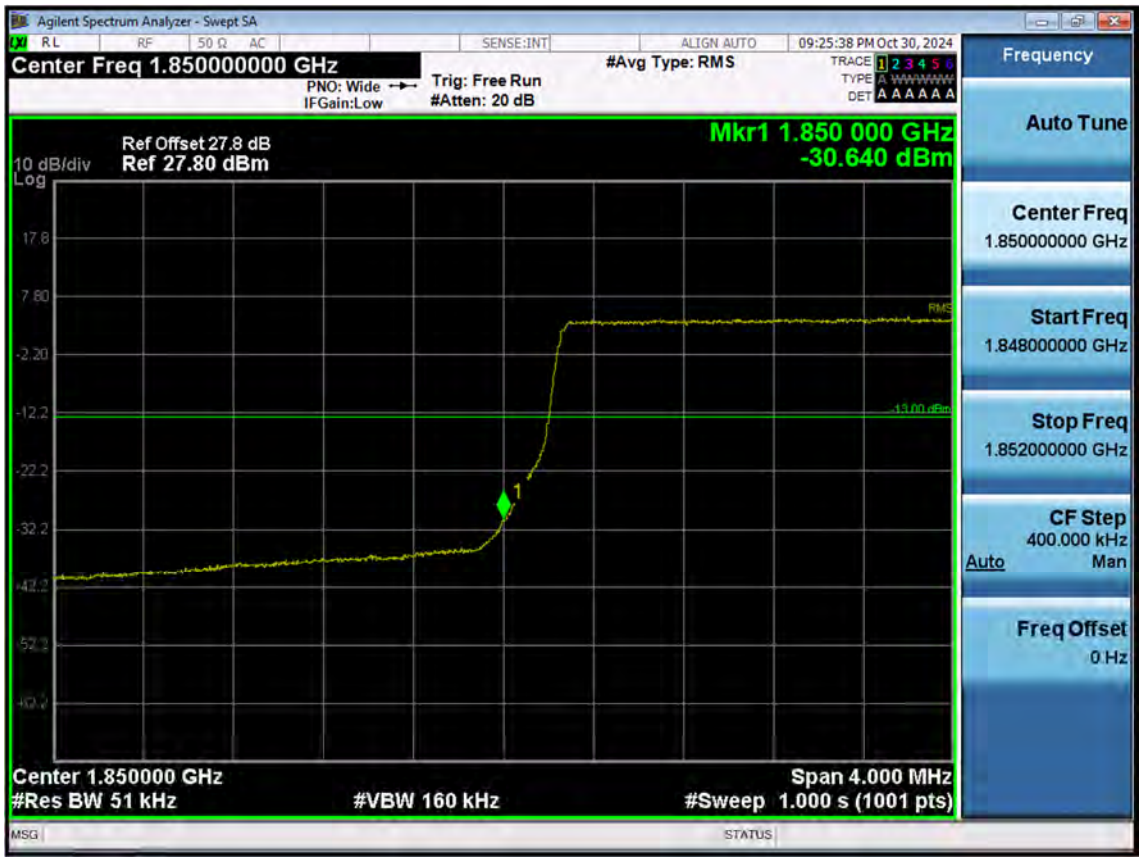
LTE2_3 M_Extended Band Edge_High_QPSK_FullRB



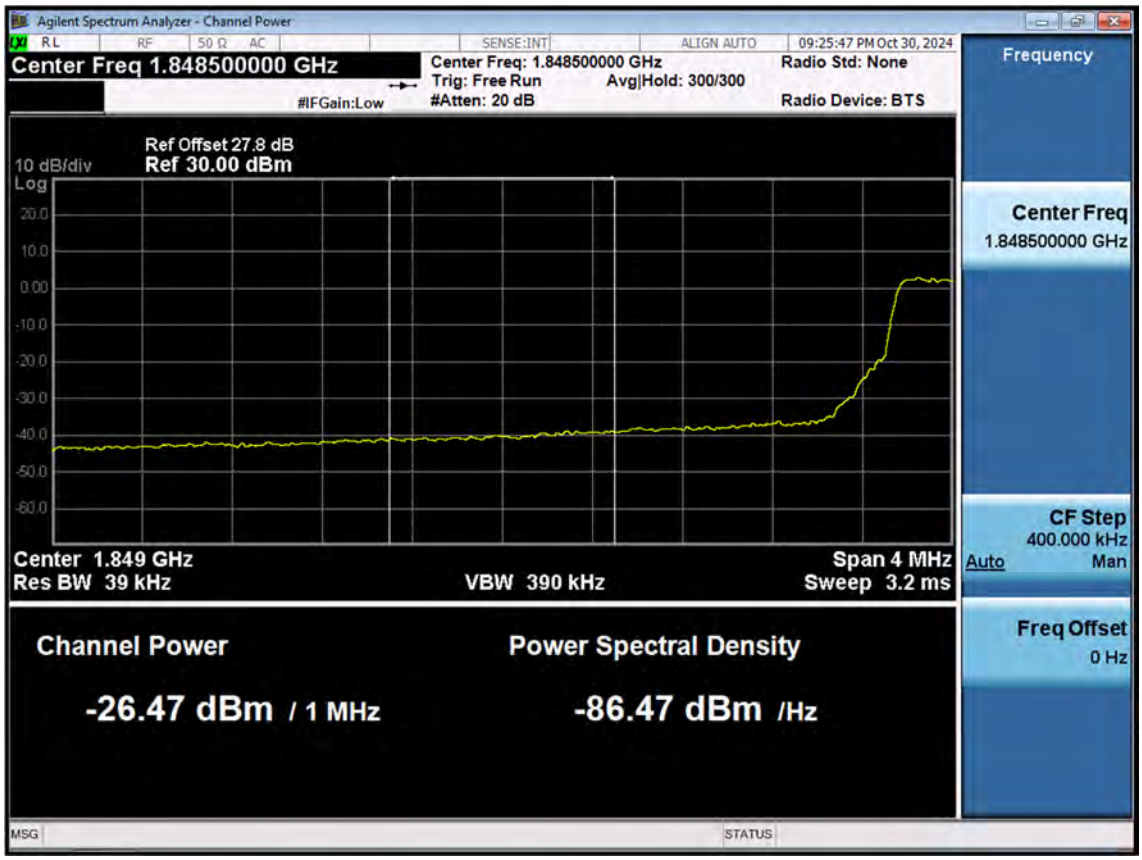
LTE2_5 M_BandEdge_Low_QPSK_1RB



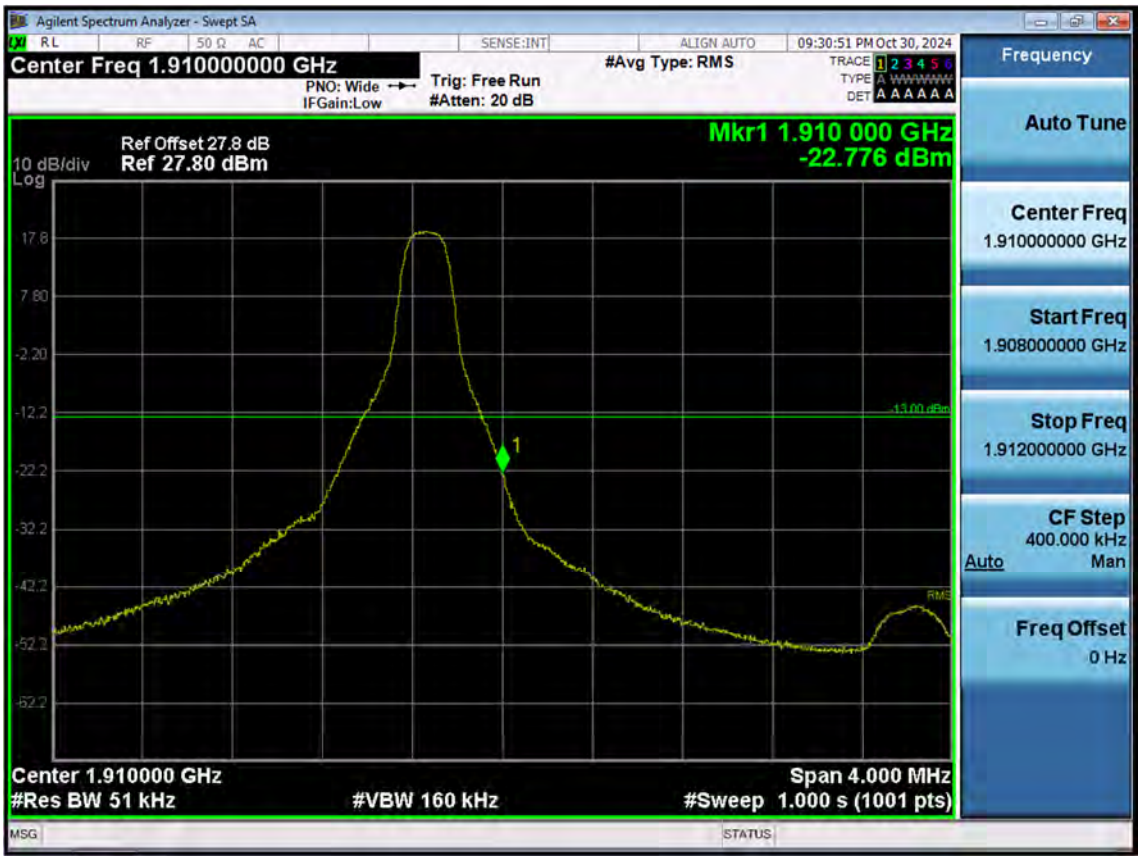
LTE2_5 M_BandEdge_Low_QPSK_FullRB



LTE2_5 M_BandEdge_Low_QPSK_FullRB

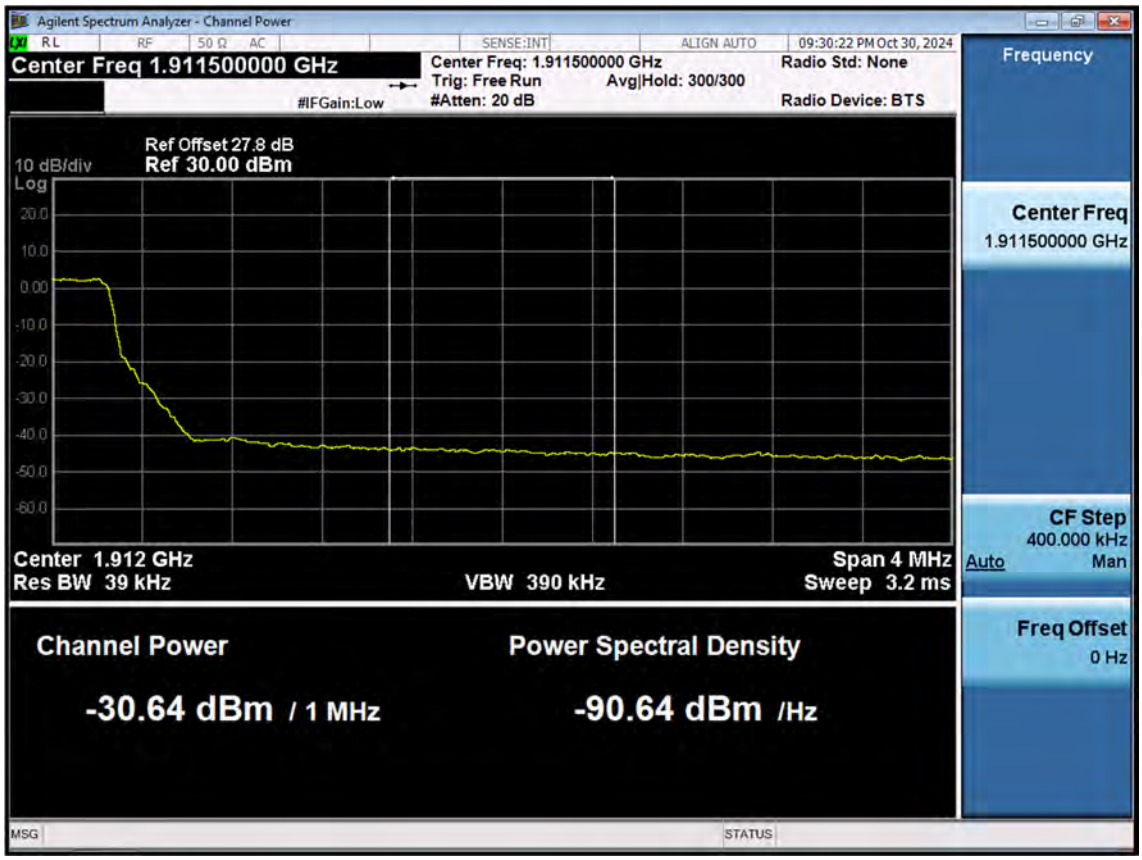


LTE2_5 M_BandEdge_High_QPSK_1RB



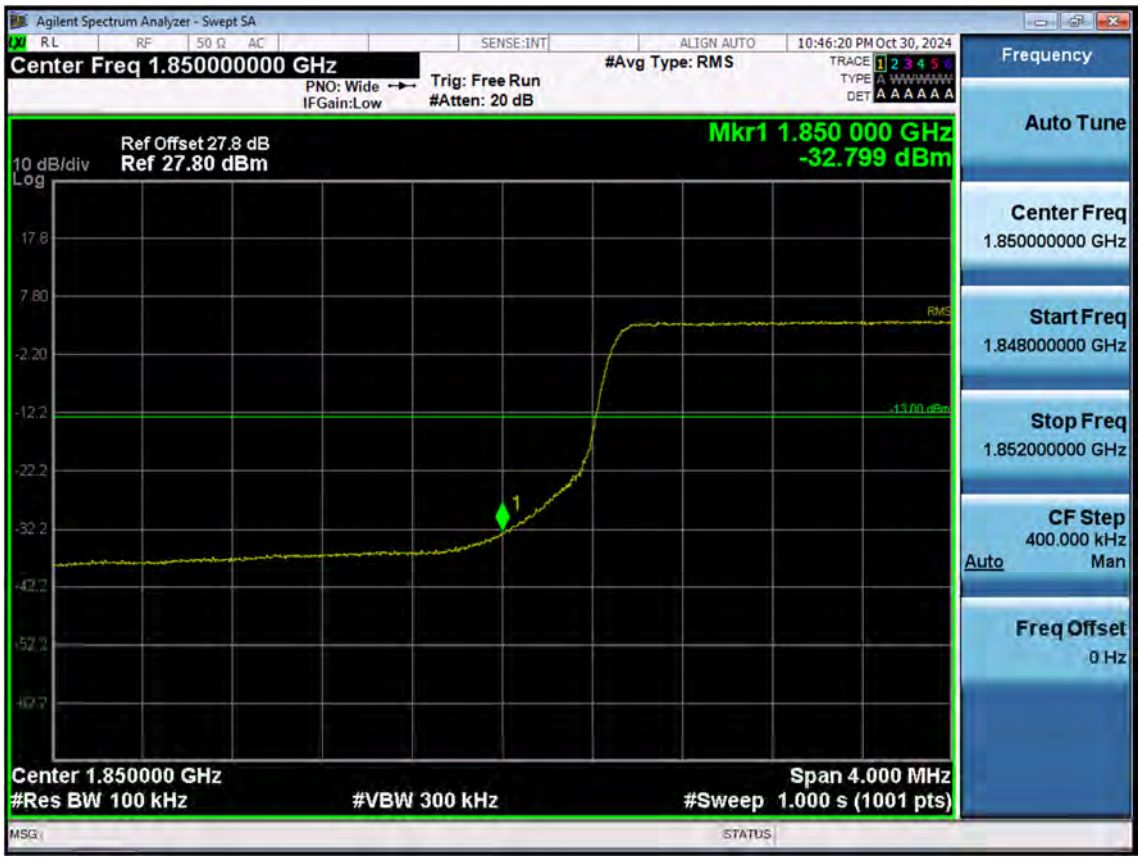
LTE2_5 M_BandEdge_High_QPSK_FullRB

LTE2_5 M_Extended Band Edge_High_QPSK_FullRB

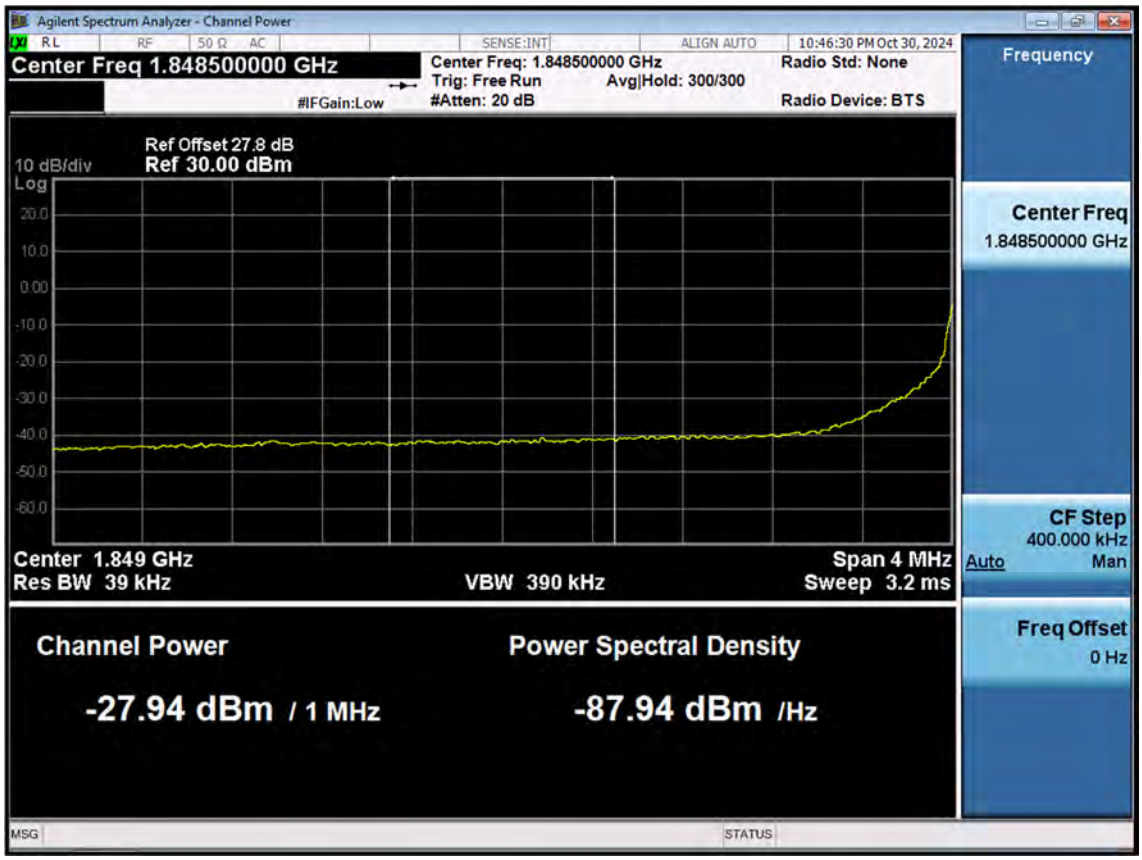


LTE2_10 M_BandEdge_Low_QPSK_1RB

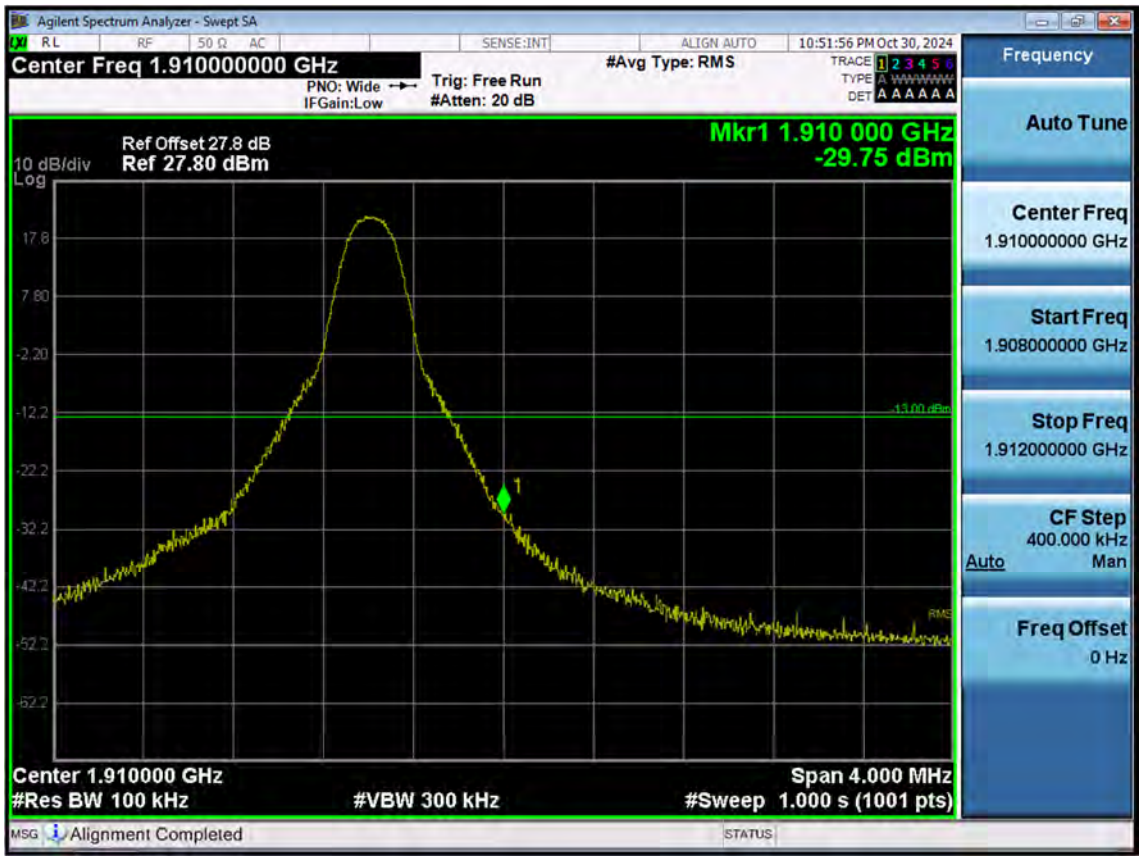
LTE2_10 M_BandEdge_Low_QPSK_FullRB



LTE2_10 M_Extended Band Edge_Low_QPSK_FullRB

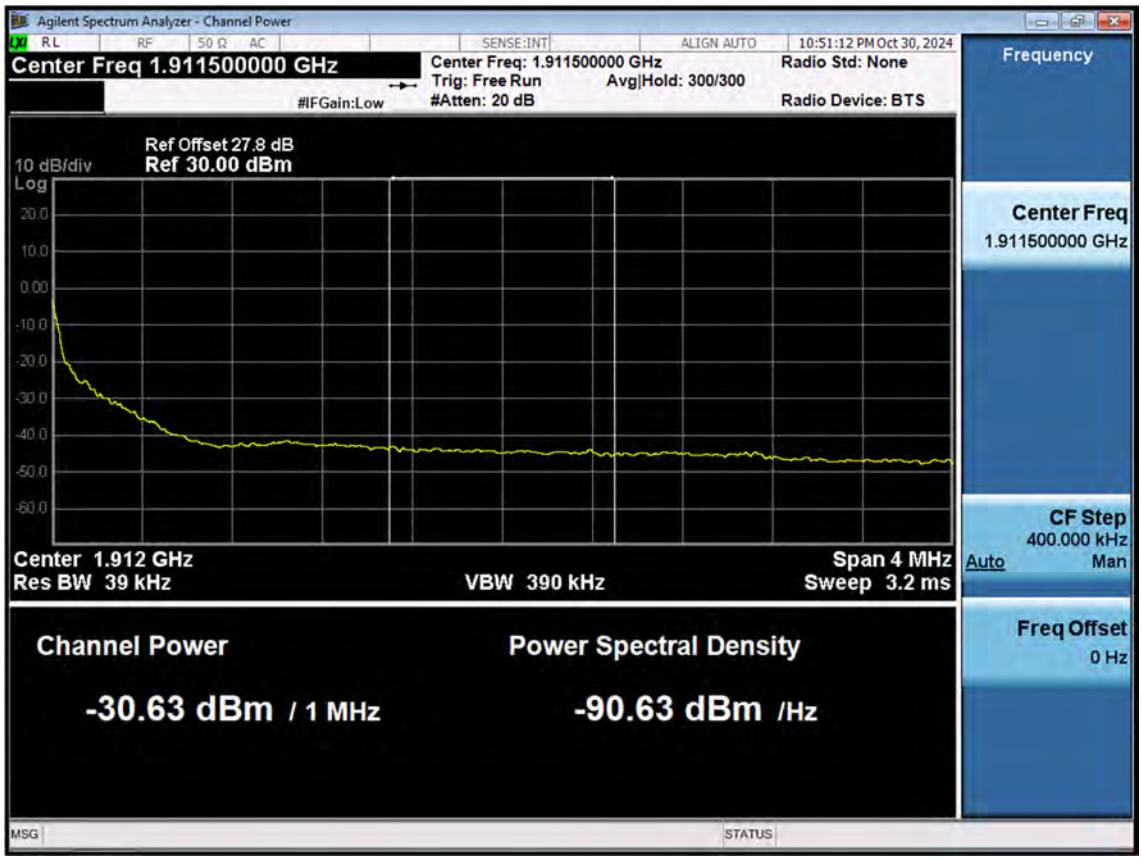


LTE2_10 M_BandEdge_High_QPSK_1RB



LTE2_10 M_BandEdge_High_QPSK_FullRB

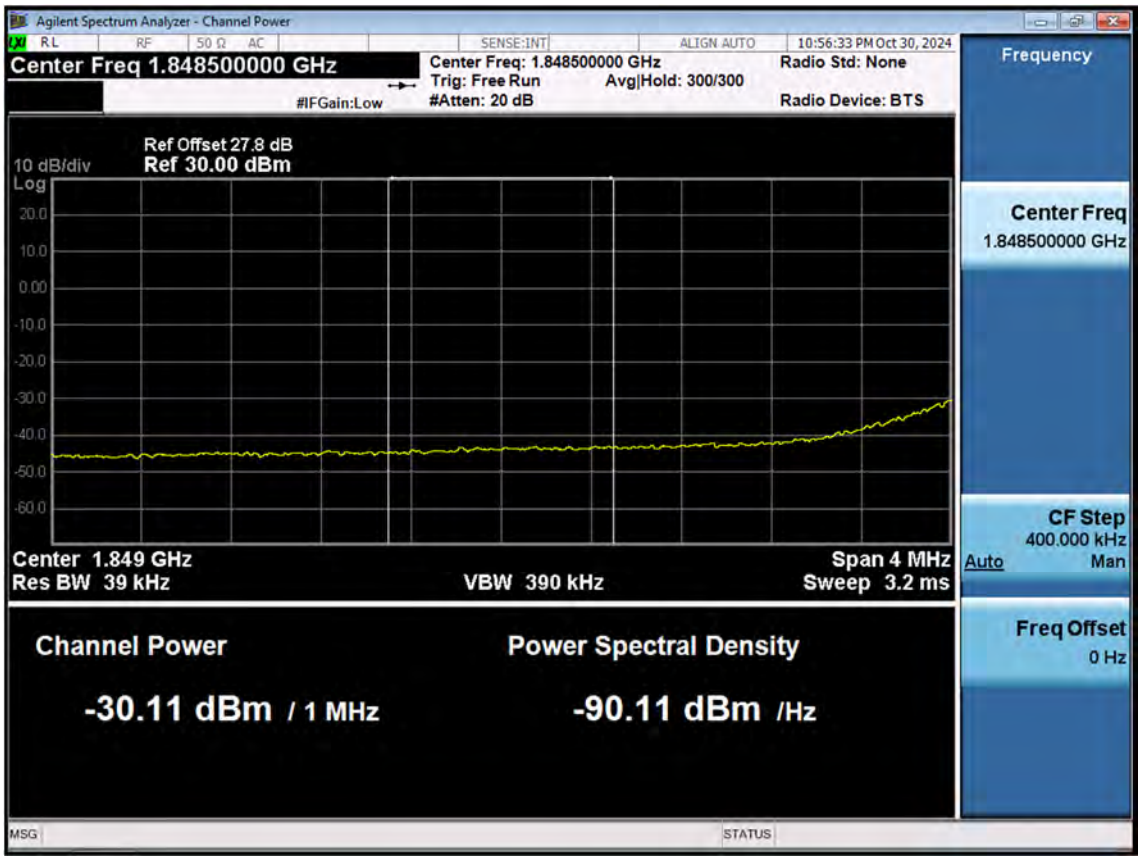
LTE2_10 M_Extended Band Edge_High_QPSK_FullRB



LTE2_15 M_BandEdge_Low__QPSK_1RB

LTE2_15 M_BandEdge_Low_QPSK_FullRB

LTE2_15 M_Extended Band Edge_Low_QPSK_FullRB



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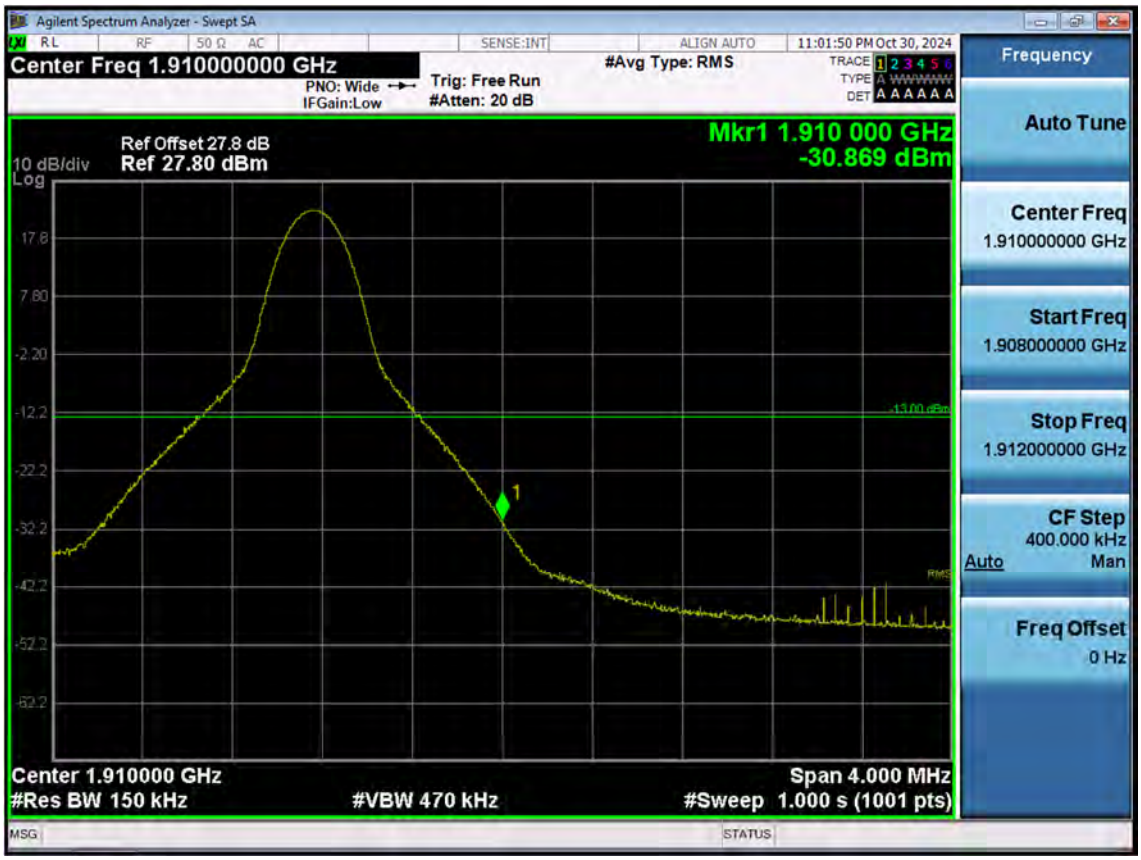
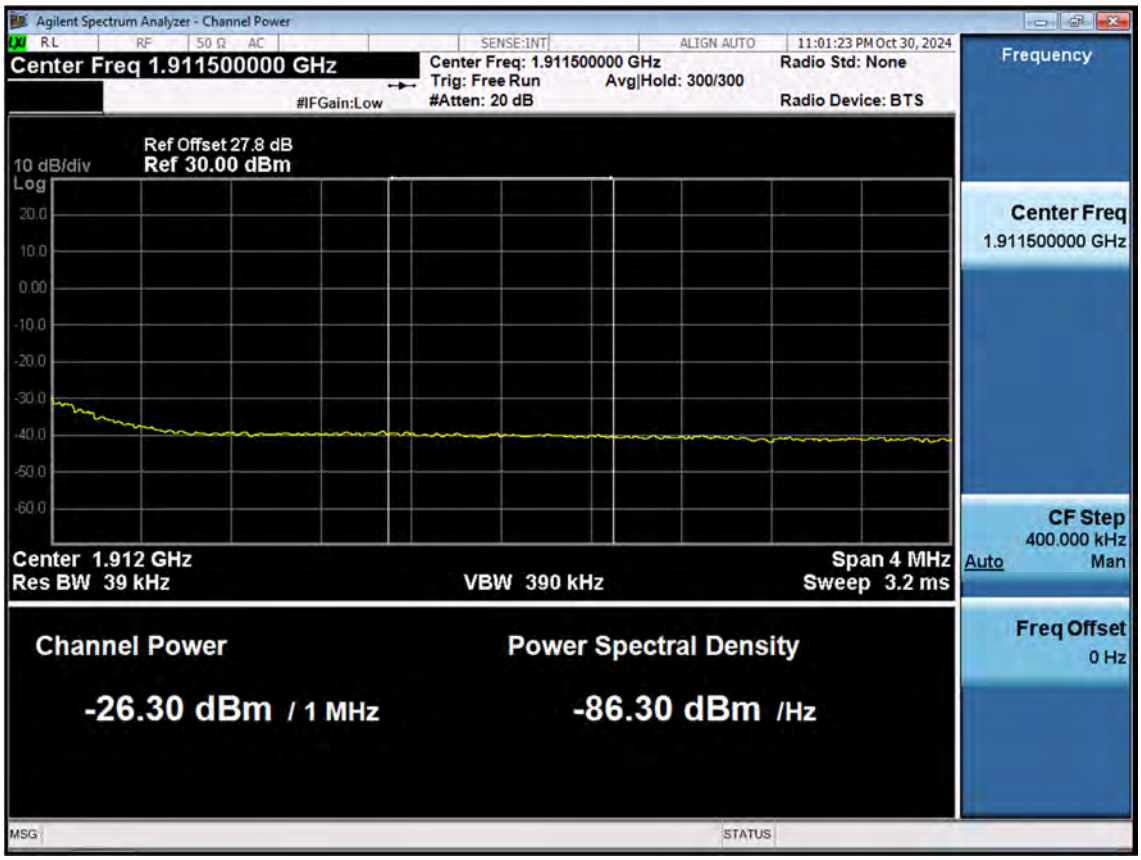


LTE2_15 M_BandEdge_High_QPSK_FullRB

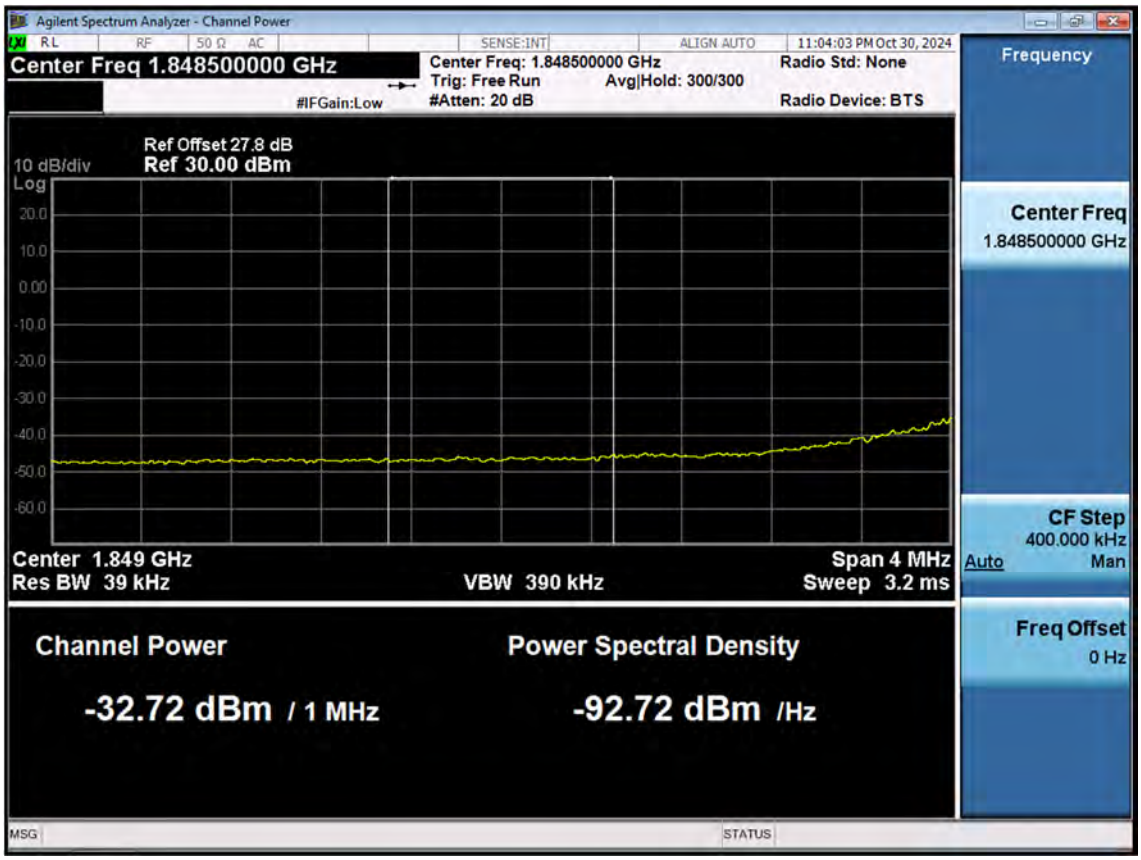
LTE2_15 M_Extended Band Edge _High_QPSK_FullRB



LTE2_20 M_BandEdge_Low_QPSK_1RB

LTE2_20 M_BandEdge_Low_QPSK_FullRB

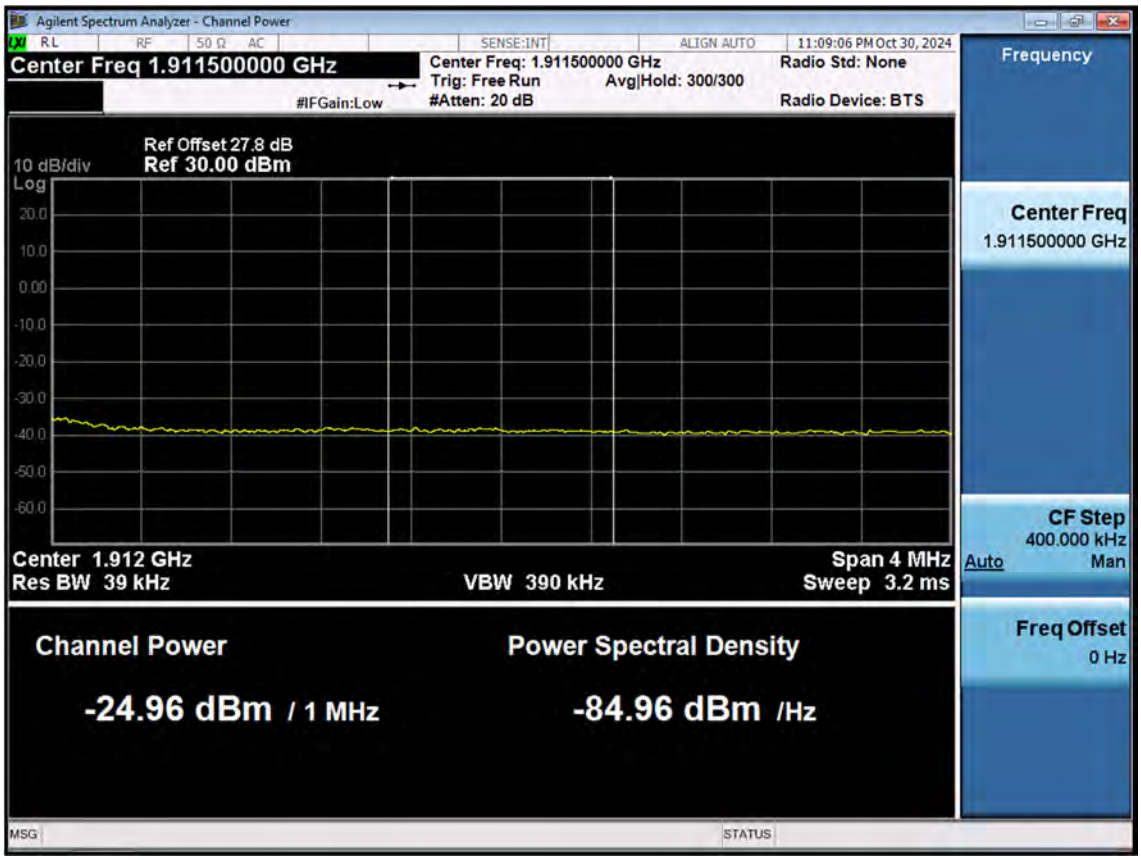
LTE2_20 M_Extended Band Edge_Low_QPSK_FullRB



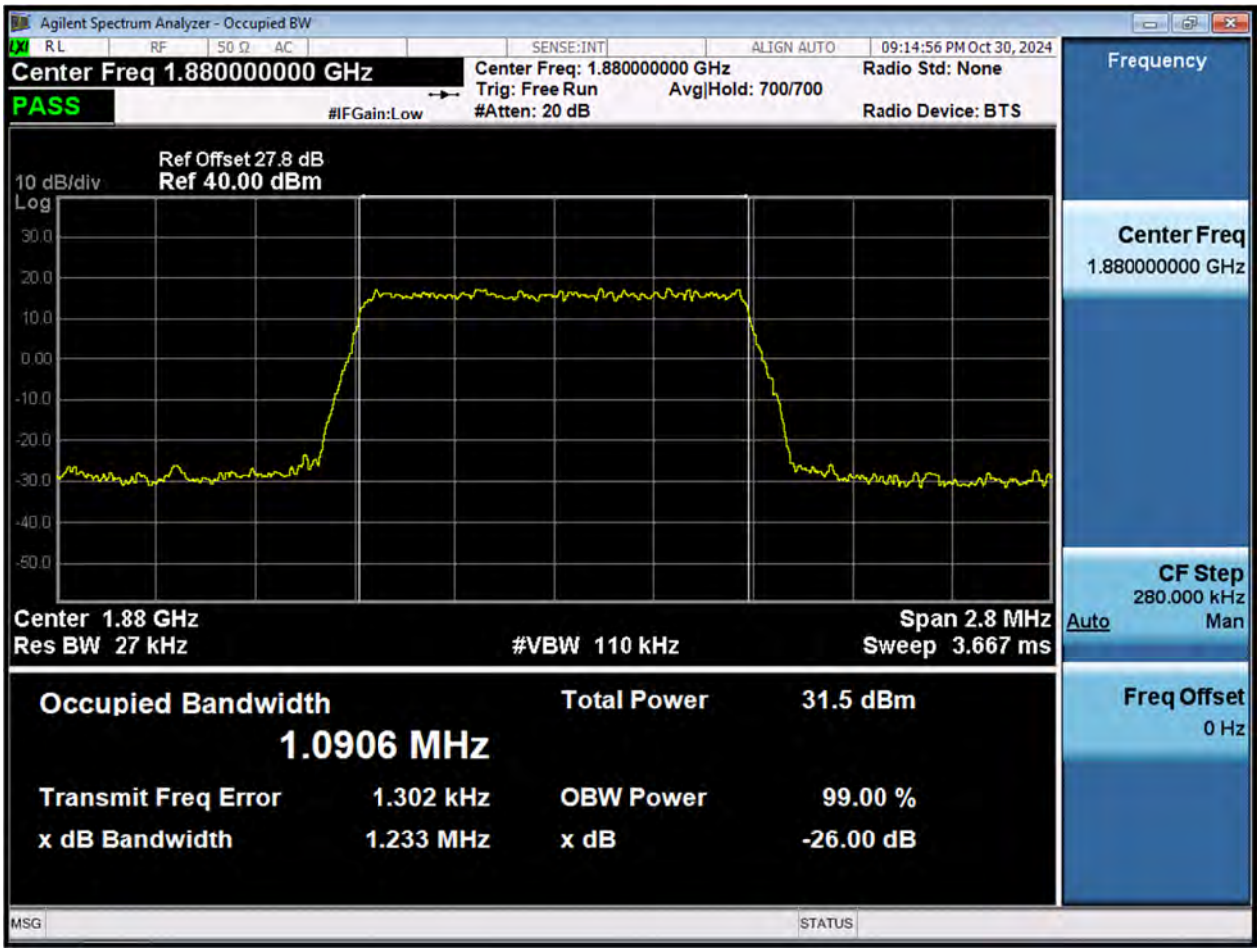
LTE2_20 M_BandEdge_High_QPSK_1RB

LTE2_20 M_BandEdge_High_QPSK_FullRB

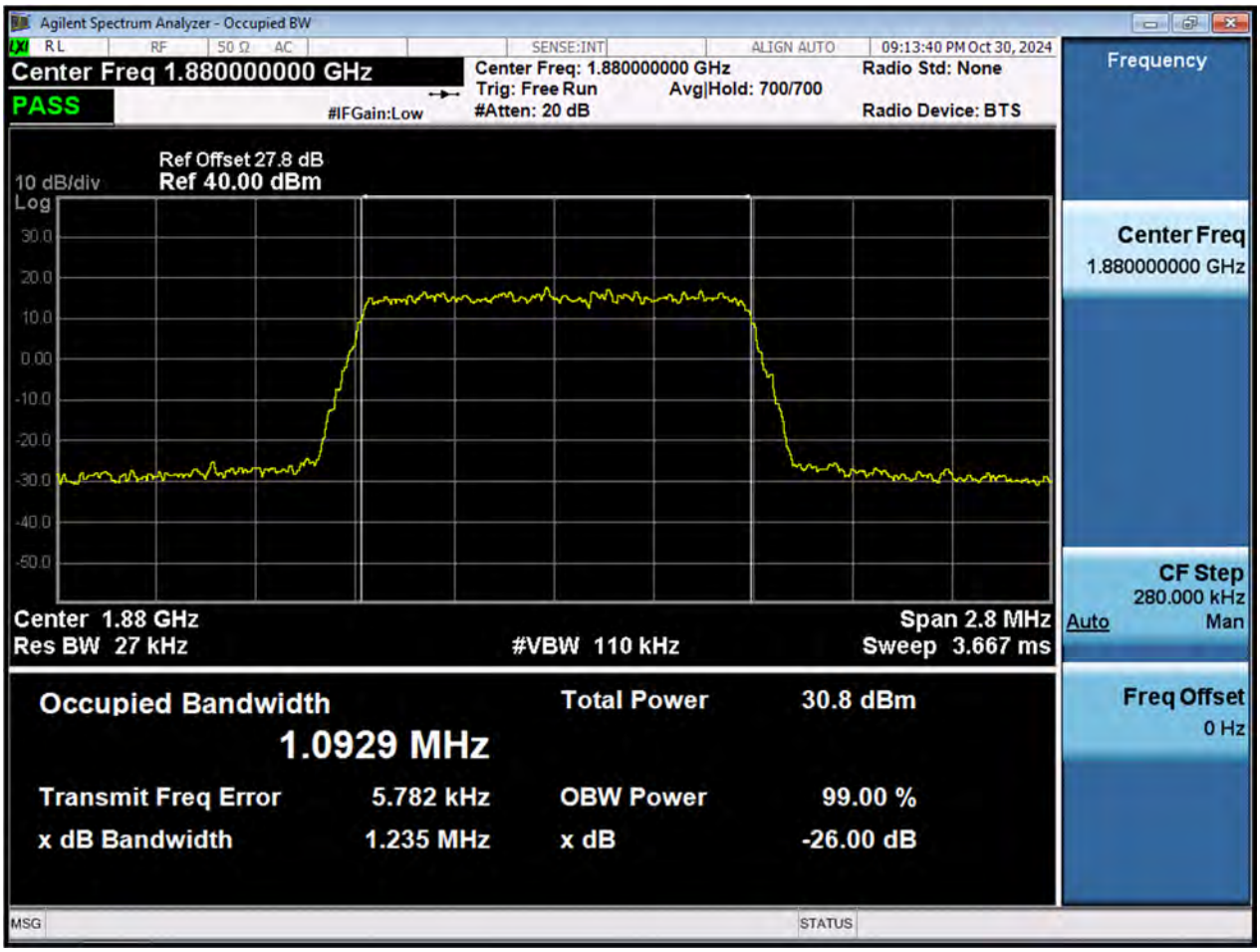
LTE2_20 M_Extended Band Edge_High_QPSK_FullRB



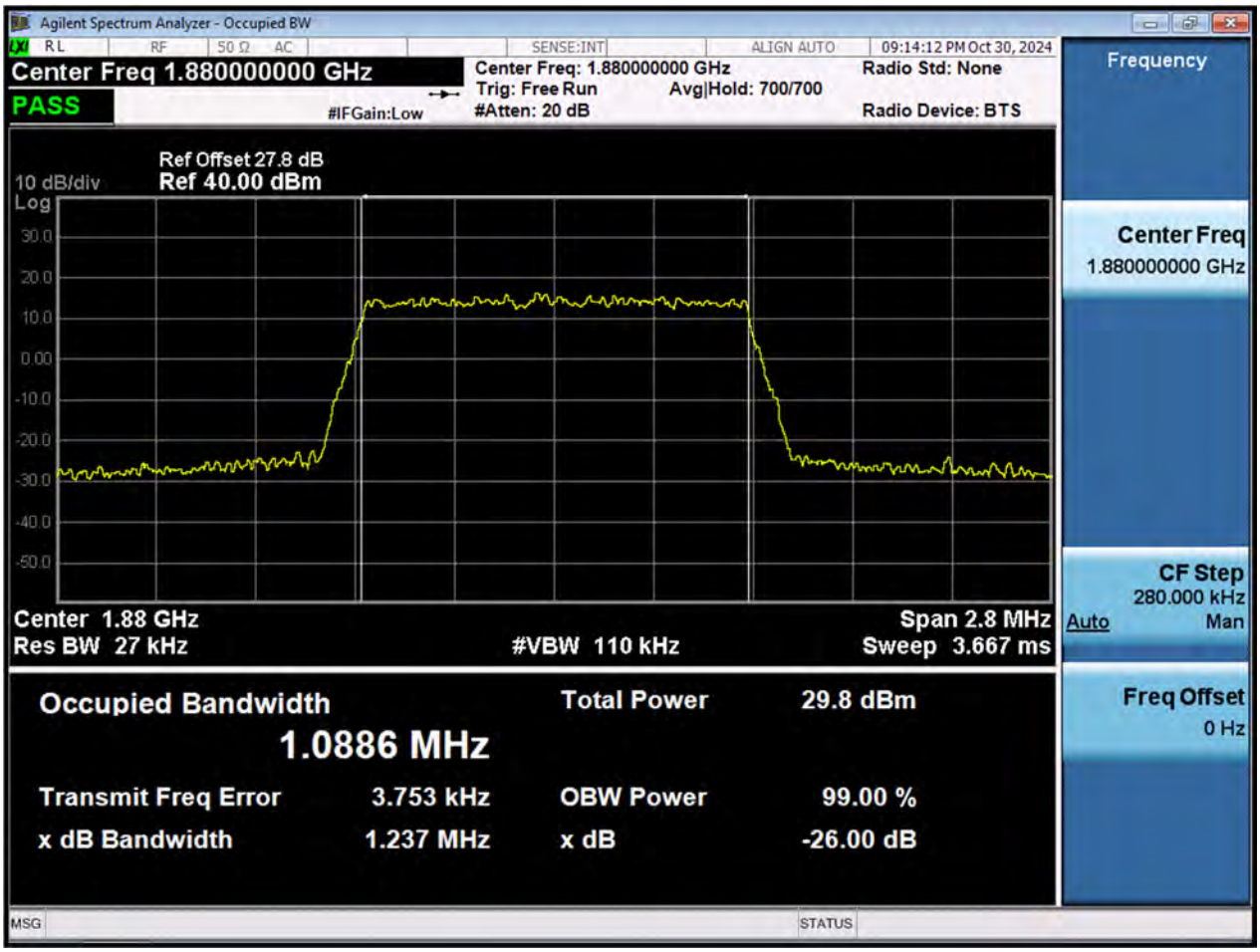
LTE2_1.4 M_OBW_Middle Channel_QPSK_FullRB



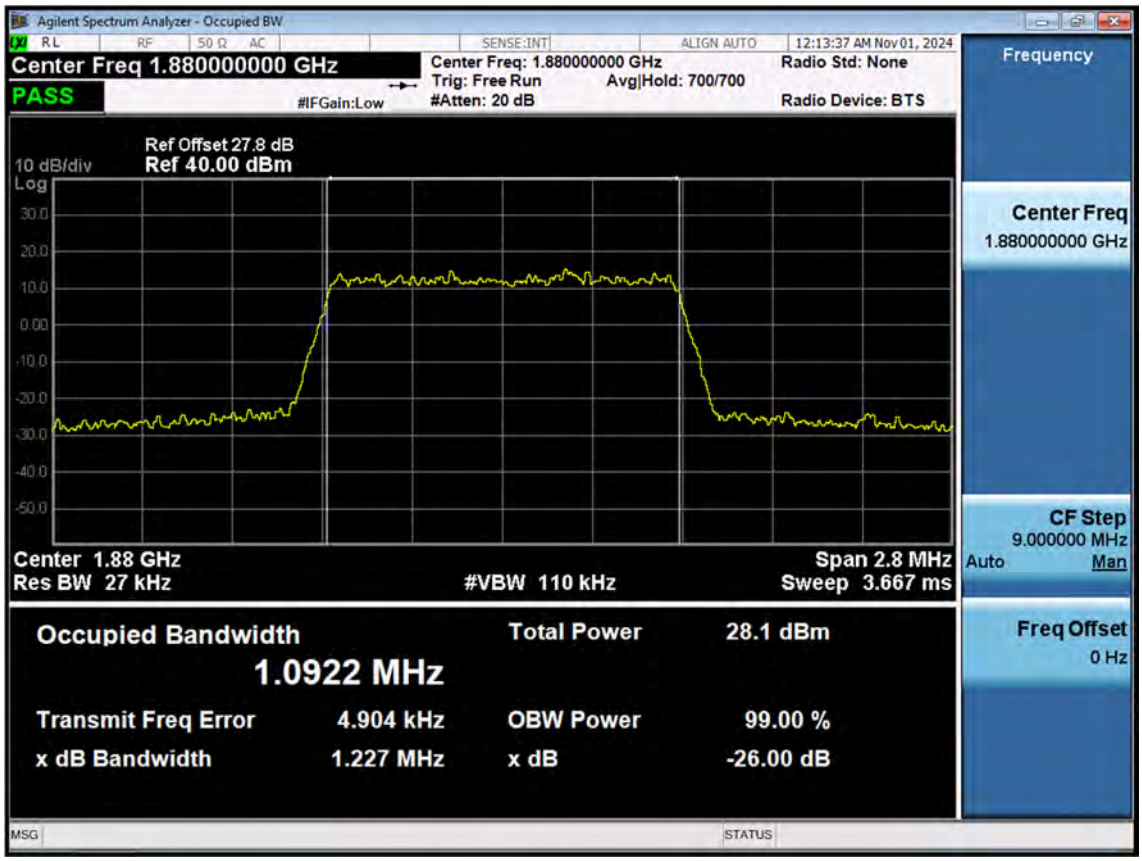
LTE2_1.4 M_OBW_Middle Channel_16QAM_FullRB



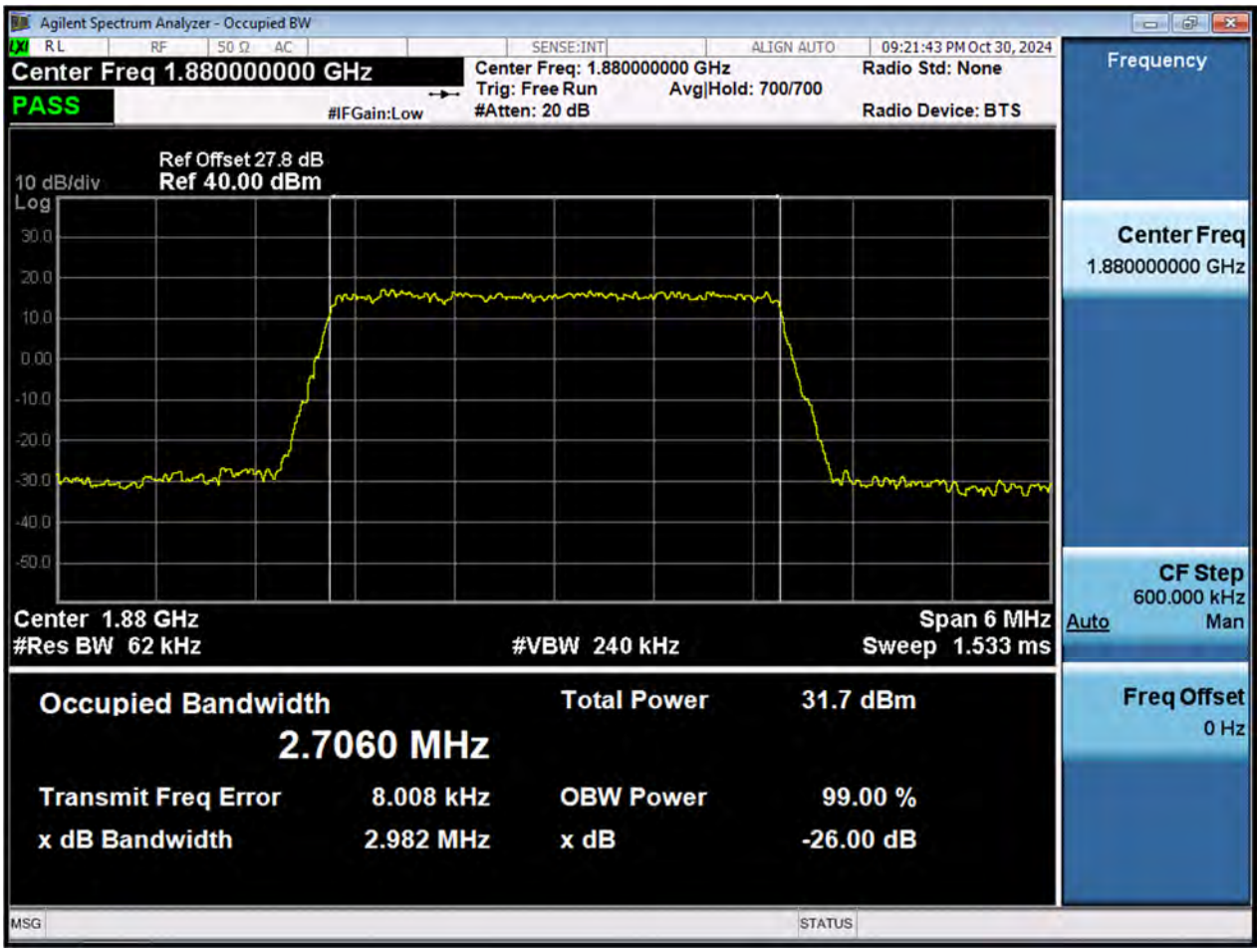
LTE2_1.4 M_OBW_Middle Channel_64QAM_FullRB



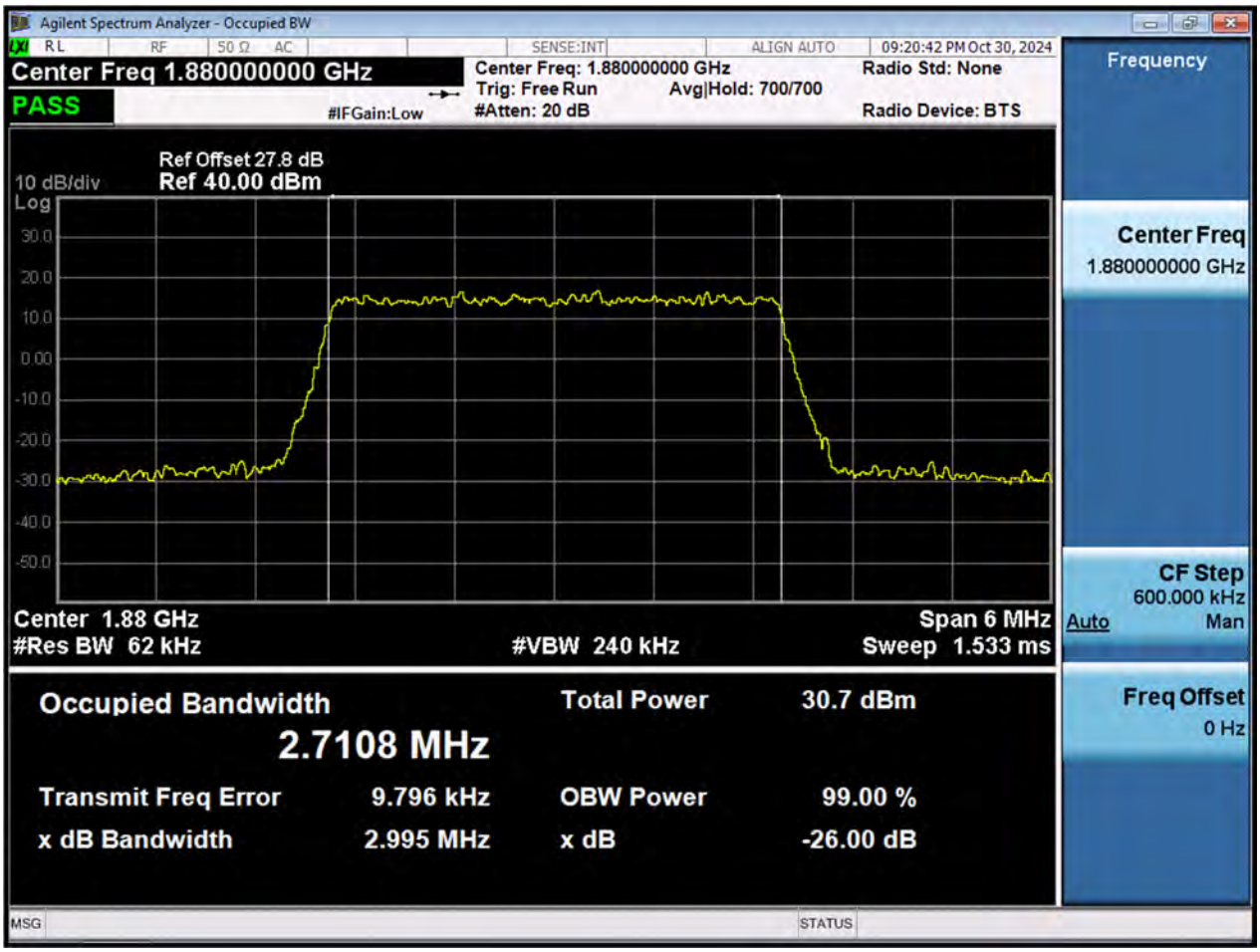
LTE2_1.4 M_OBW_Middle Channel_256QAM_FullRB



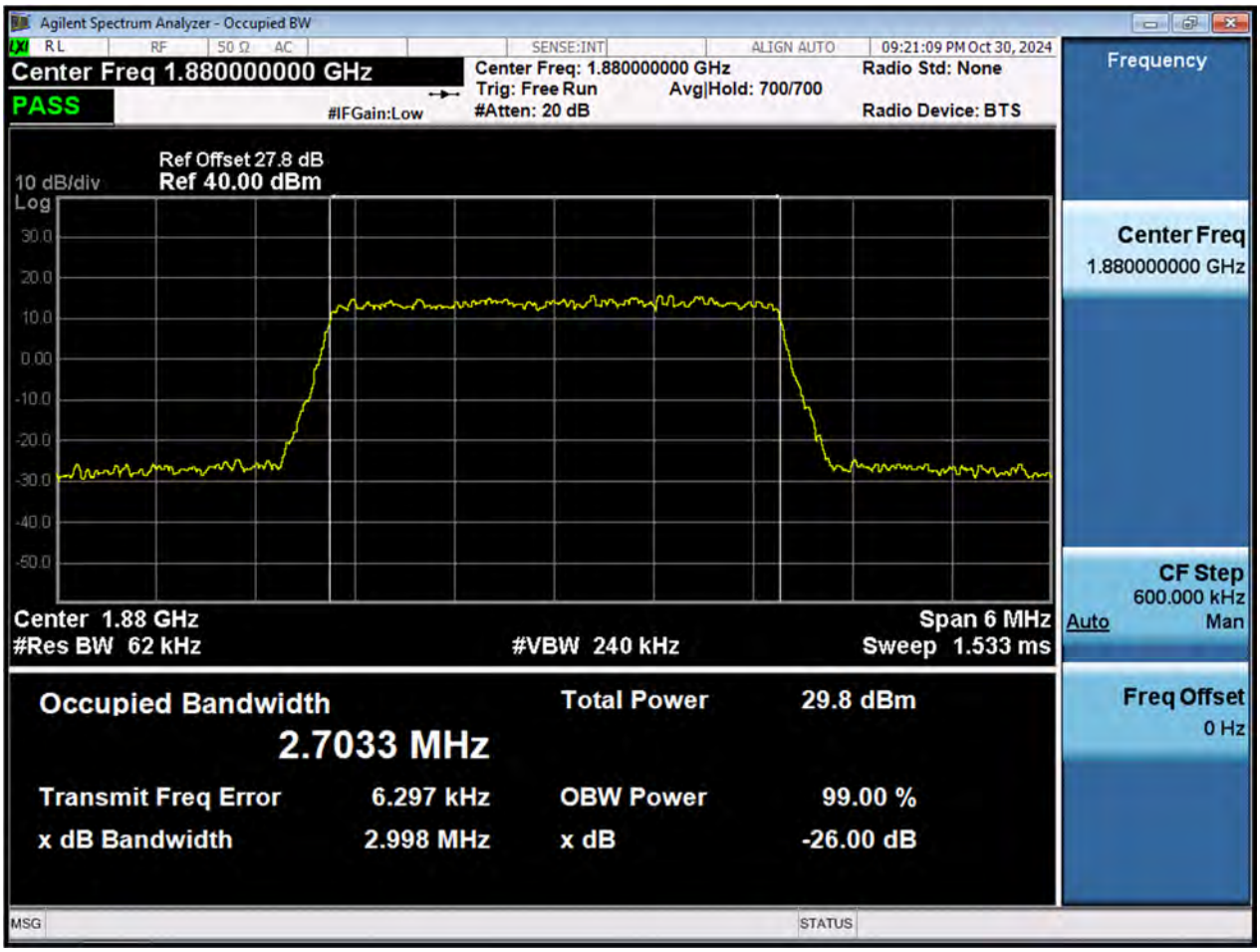
LTE2_3 M_OBW_Middle Channel_QPSK_FullRB



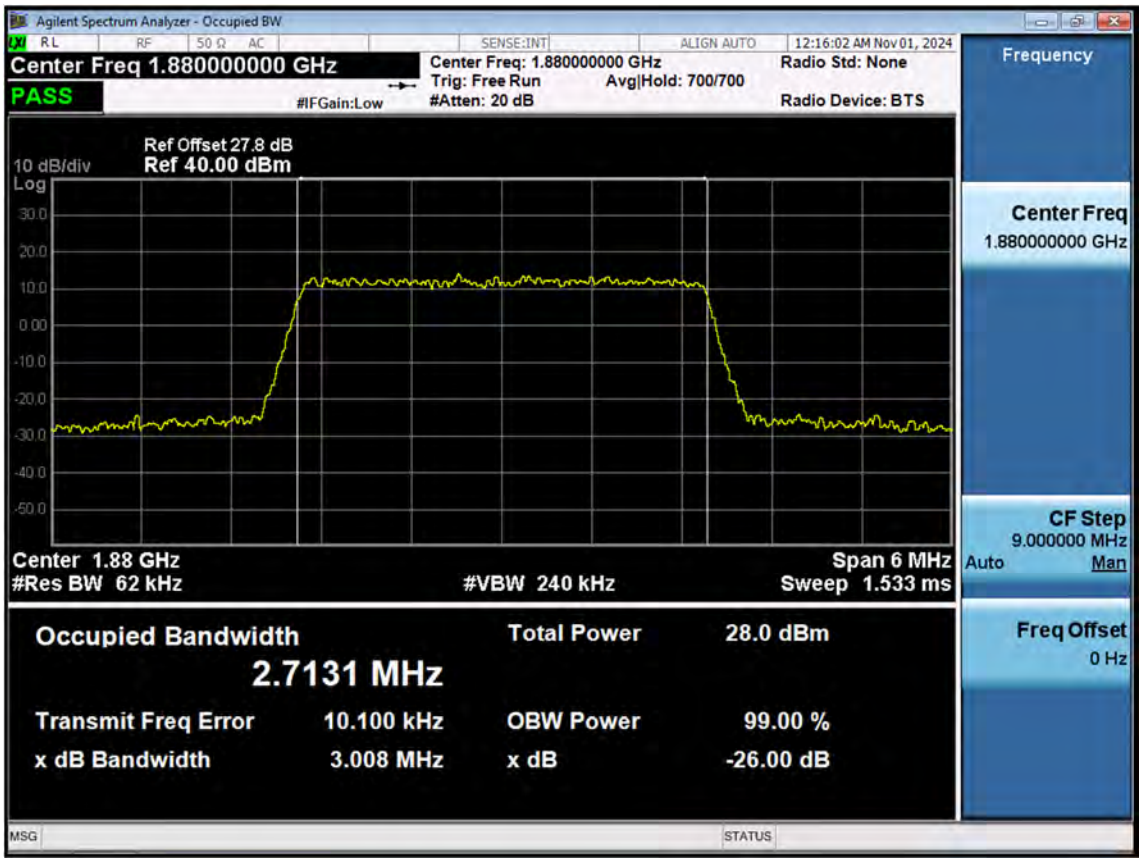
LTE2_3 M_OBW_Middle Channel_16QAM_FullRB



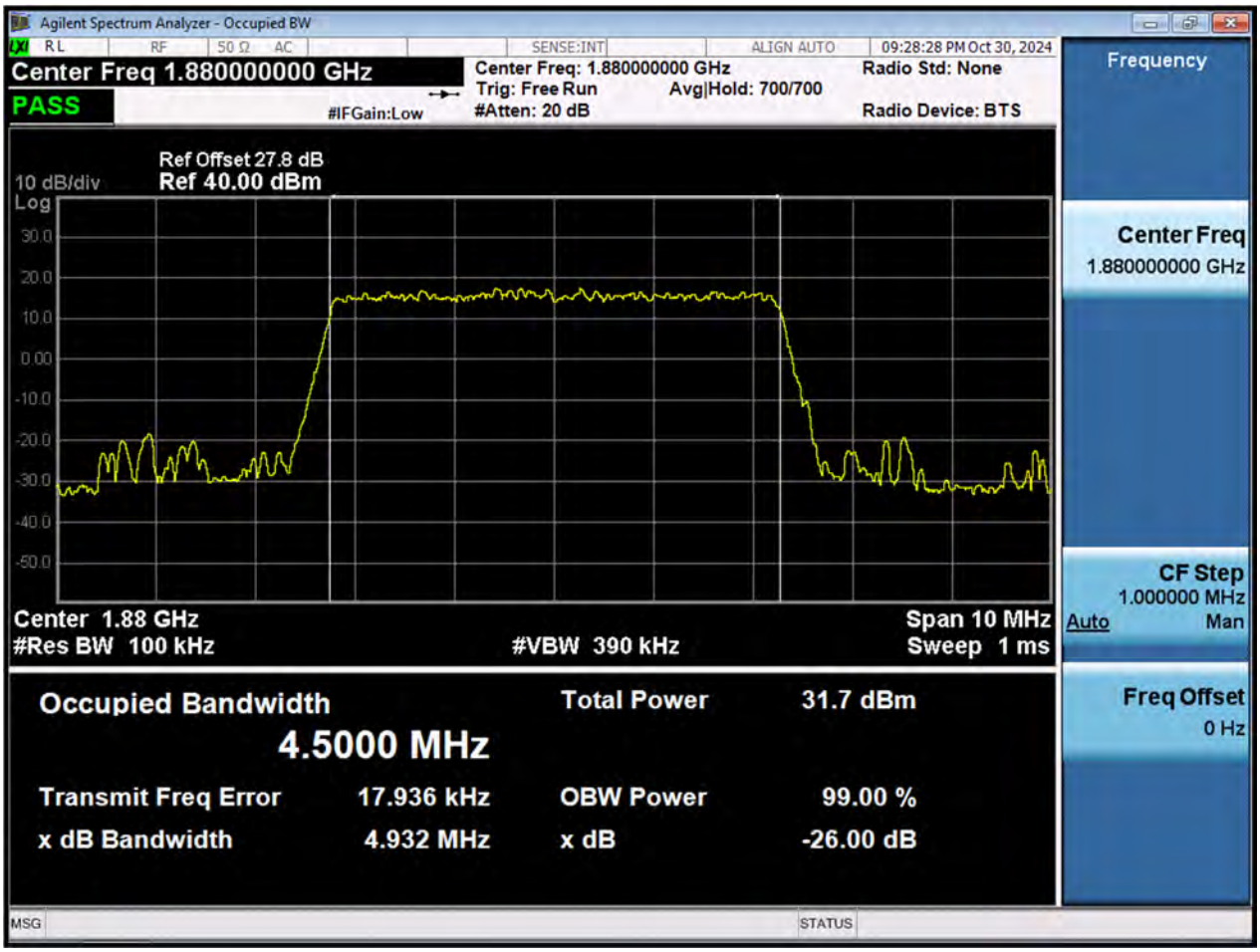
LTE2_3 M_OBW_Middle Channel_64QAM_FullRB



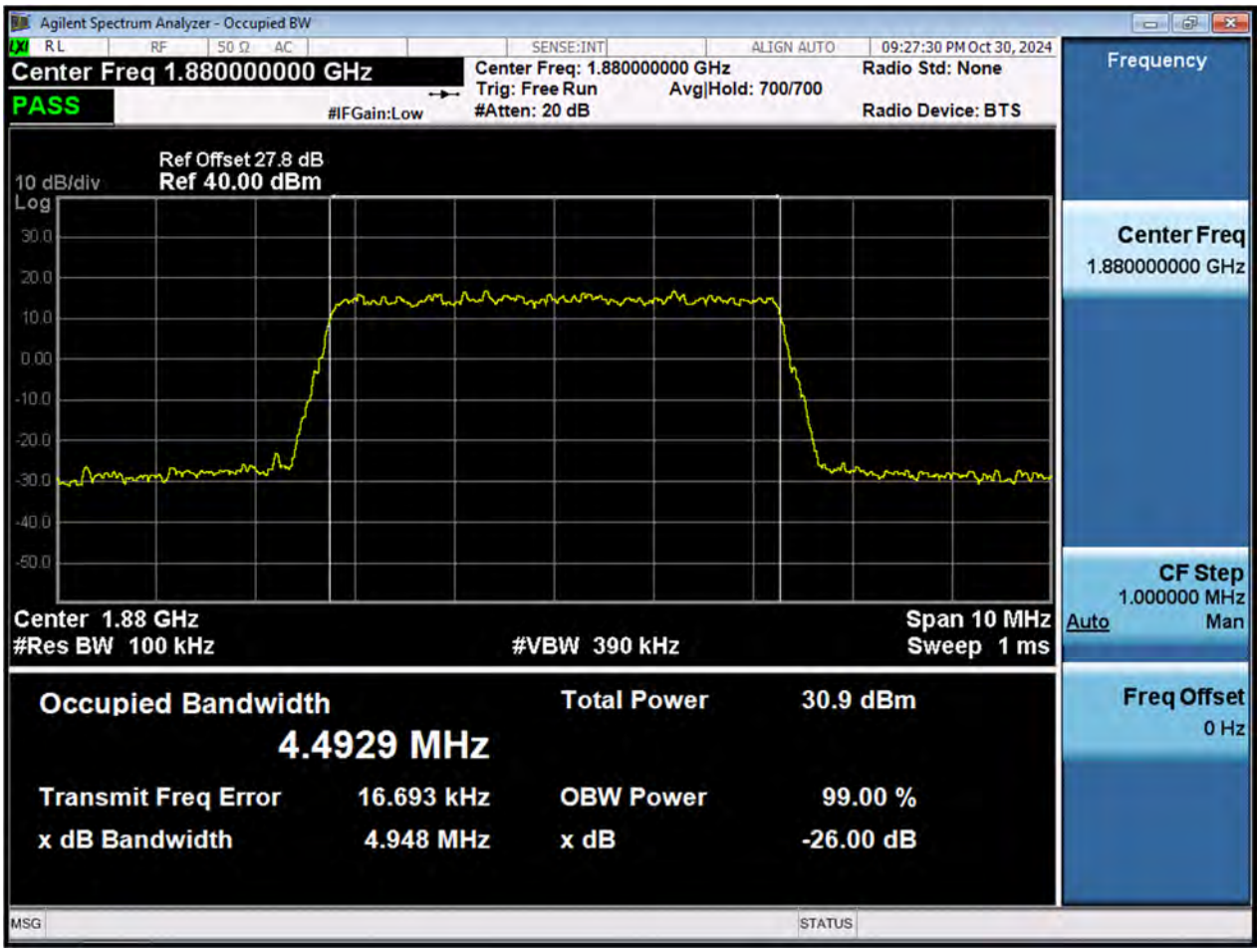
LTE2_3 M_OBW_Middle Channel_256QAM_FullRB



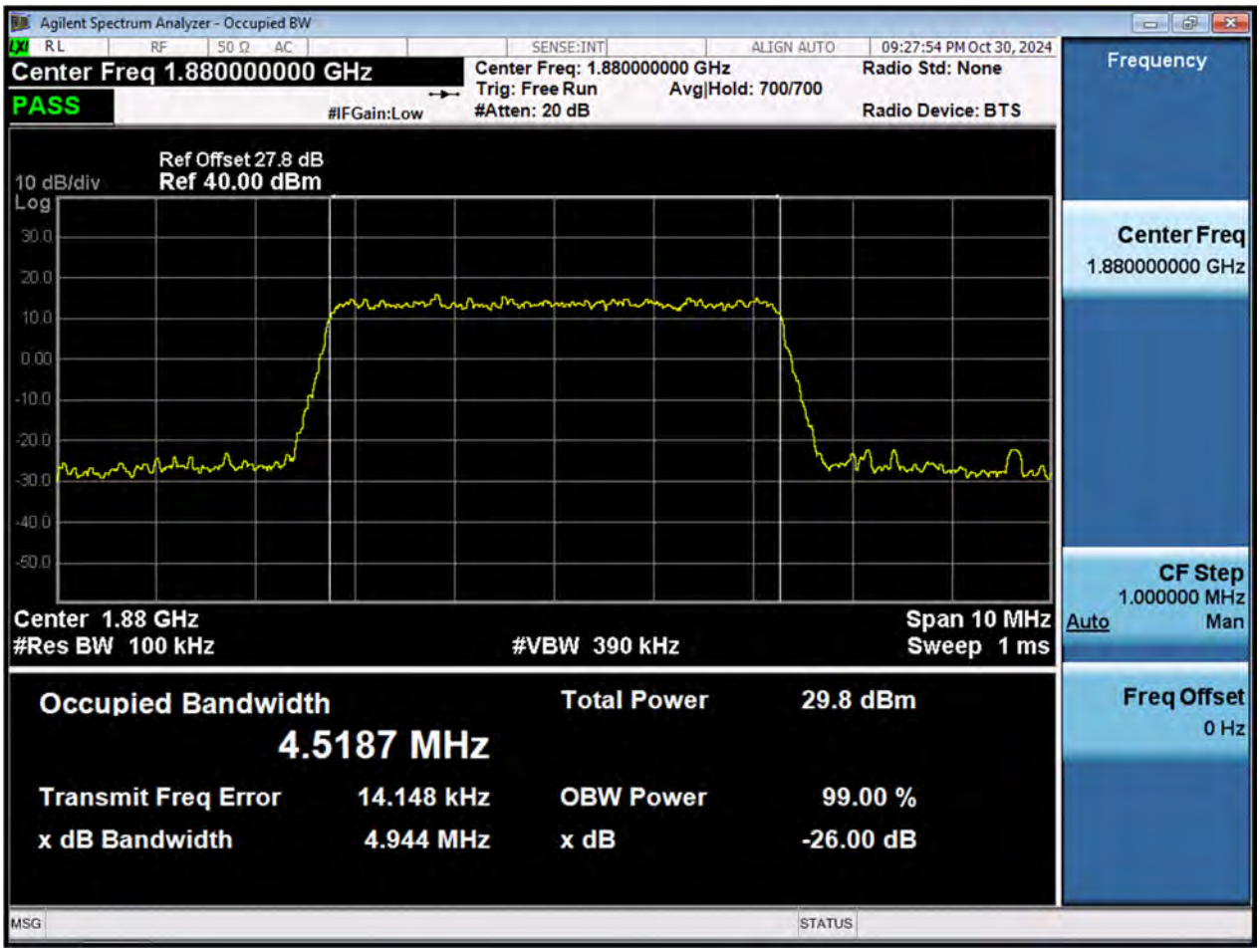
LTE2_5 M_OBW_Middle Channel_QPSK_FullRB



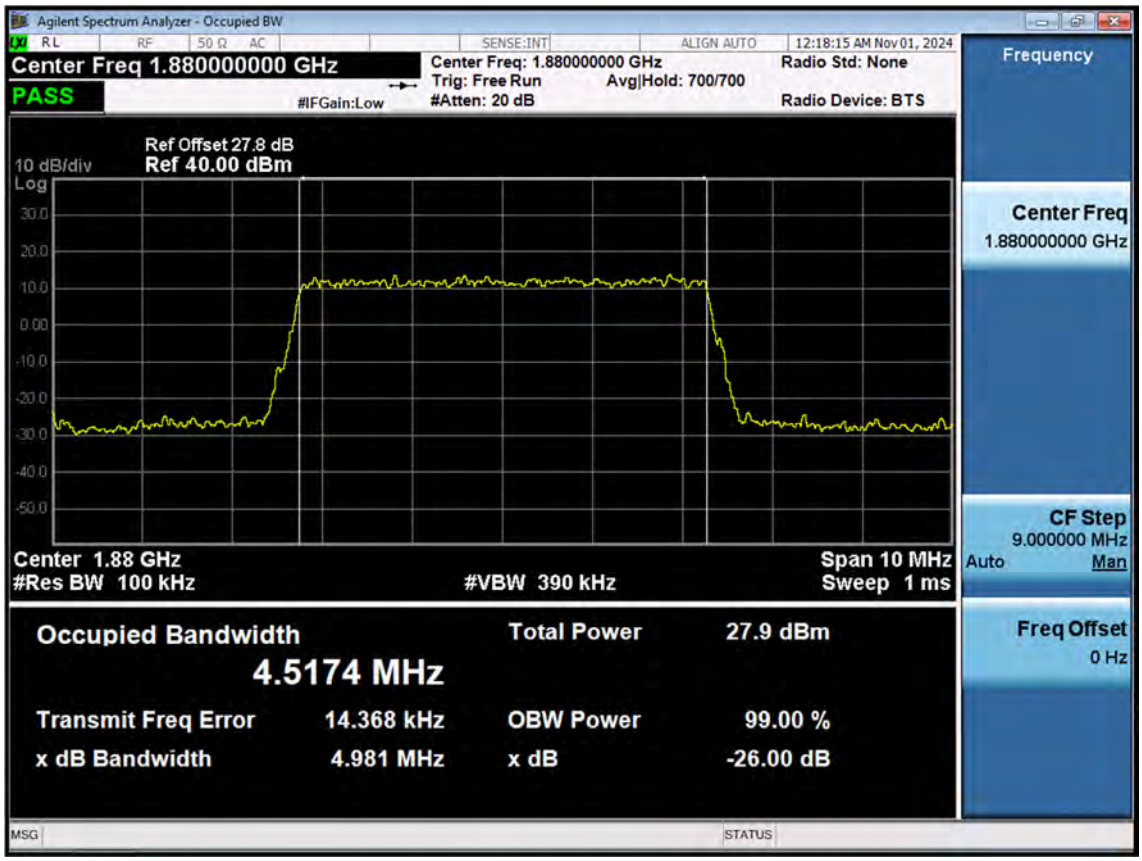
LTE2_5 M_OBW_Middle Channel_16QAM_FullRB



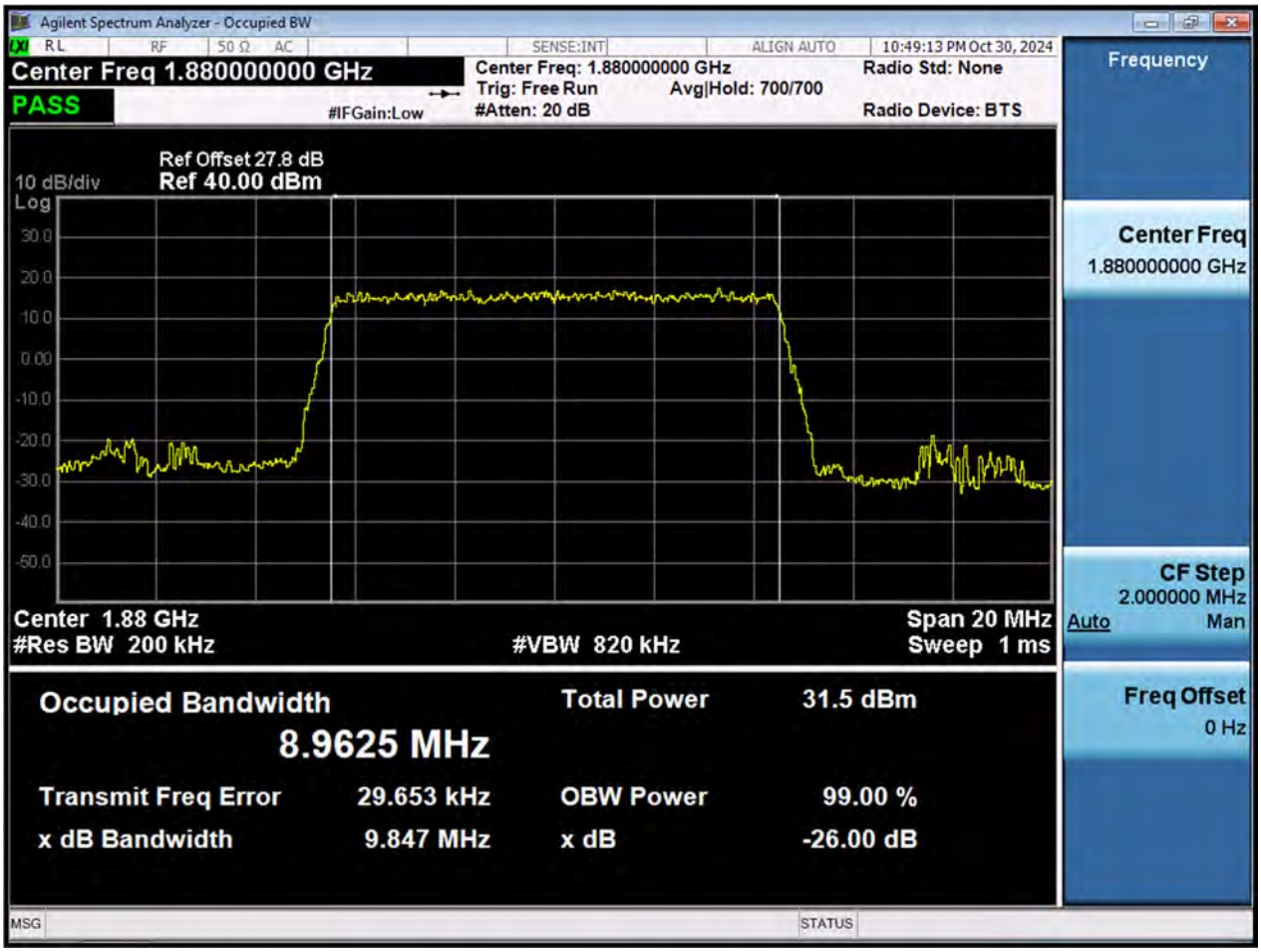
LTE2_5 M_OBW_Middle Channel_64QAM_FullRB



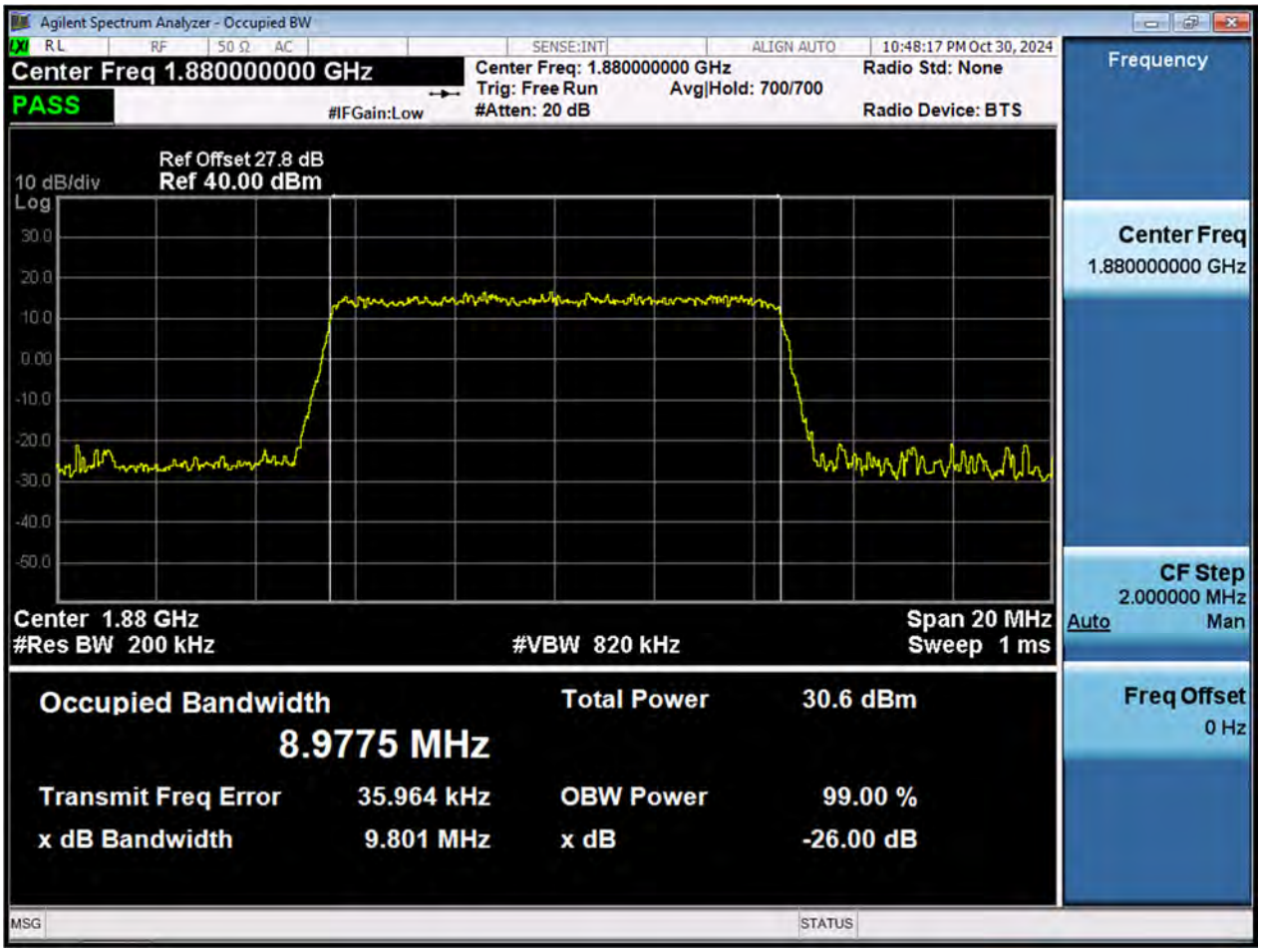
LTE2_5 M_OBW_Middle Channel_256QAM_FullRB



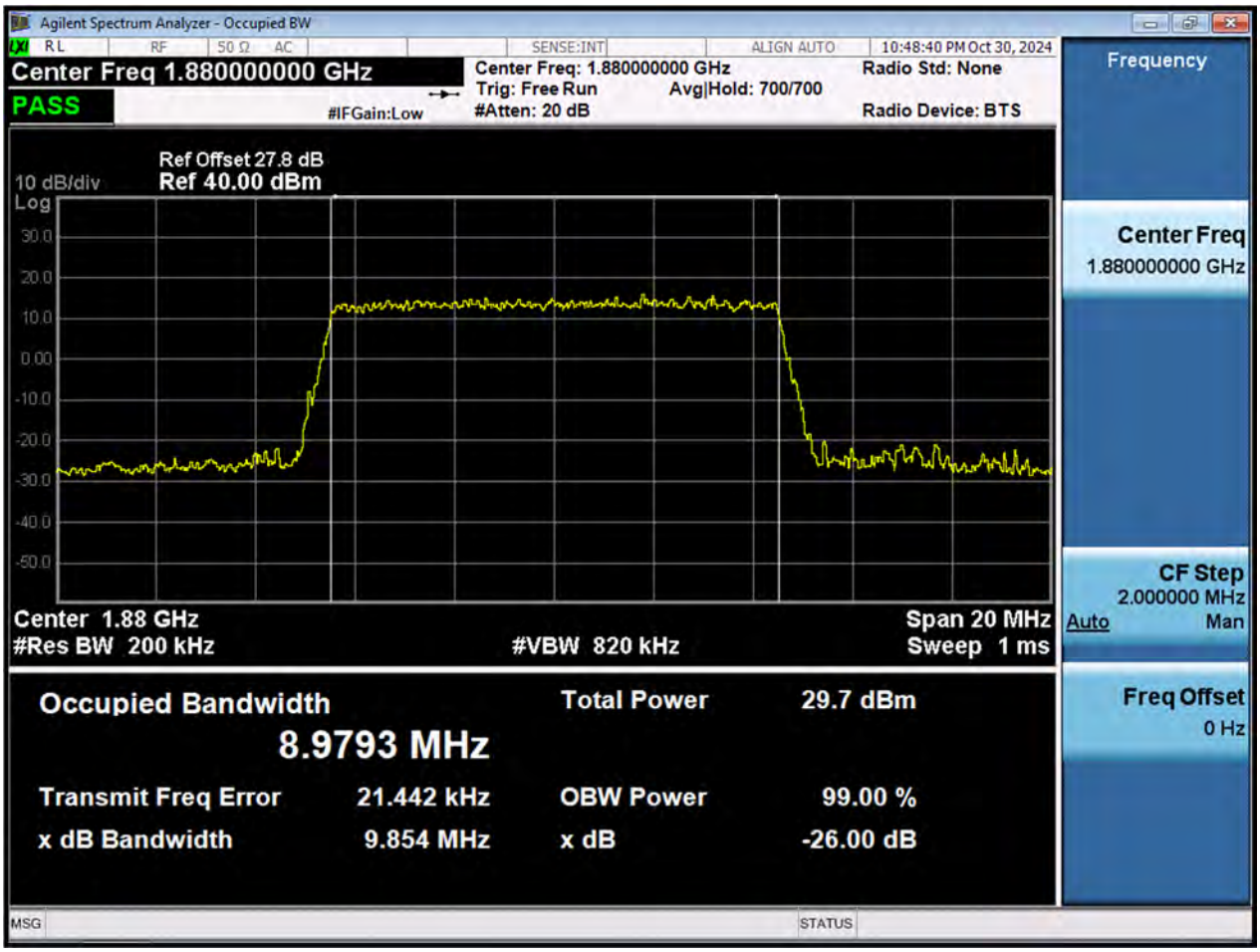
LTE2_10 M_OBW_Middle Channel_QPSK_FullRB



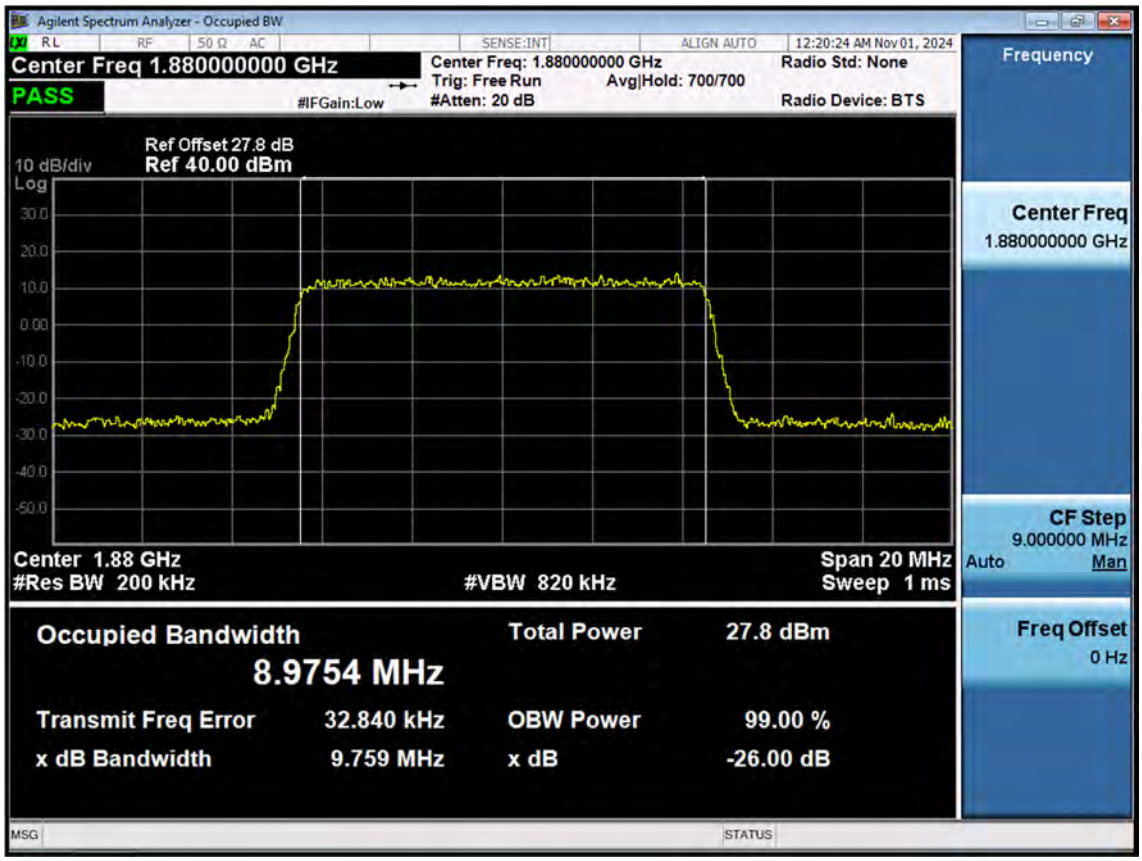
LTE2_10 M_OBW_Middle Channel_16QAM_FullRB



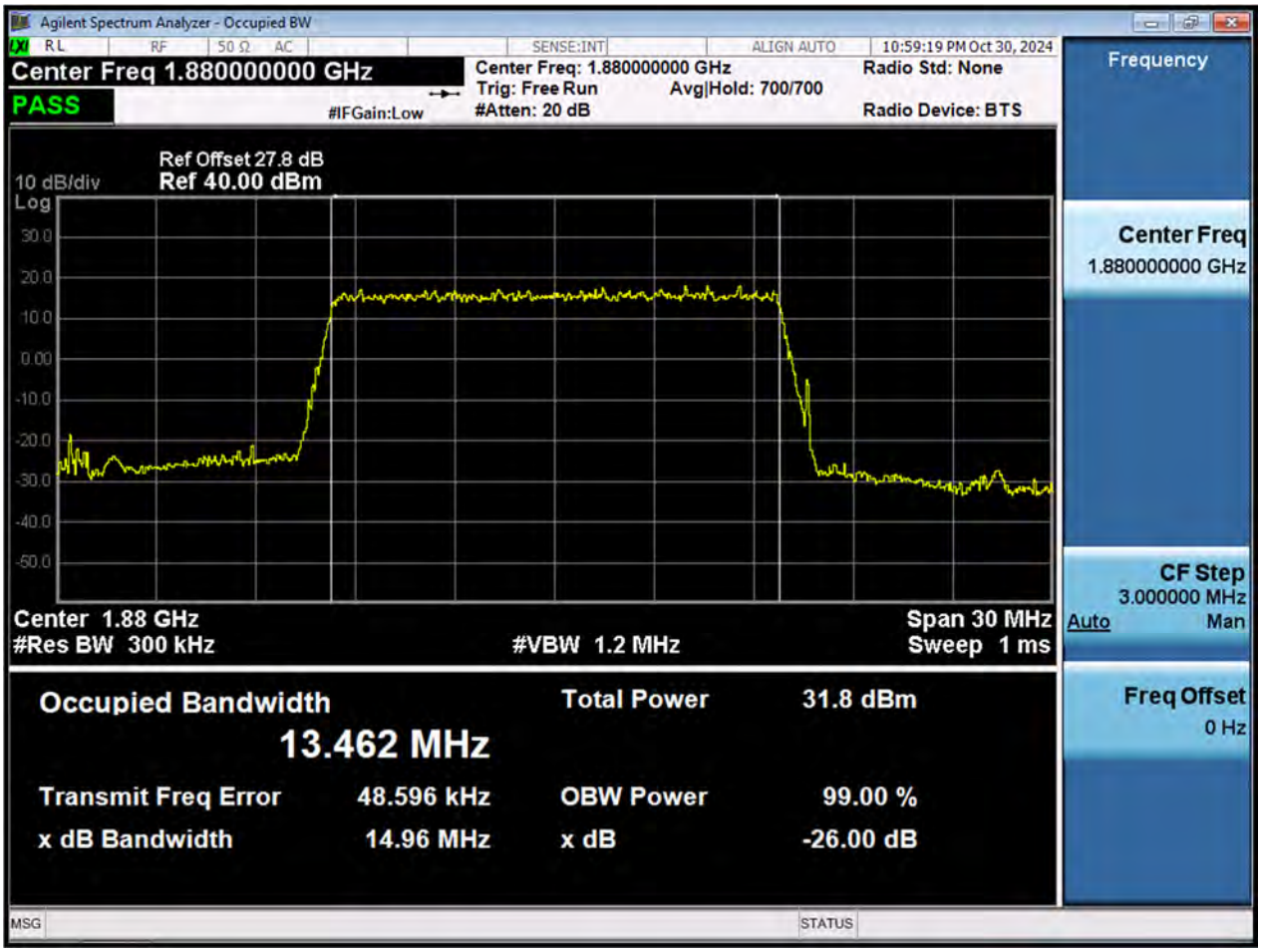
LTE2_10 M_OBW_Middle Channel_64QAM_FullRB



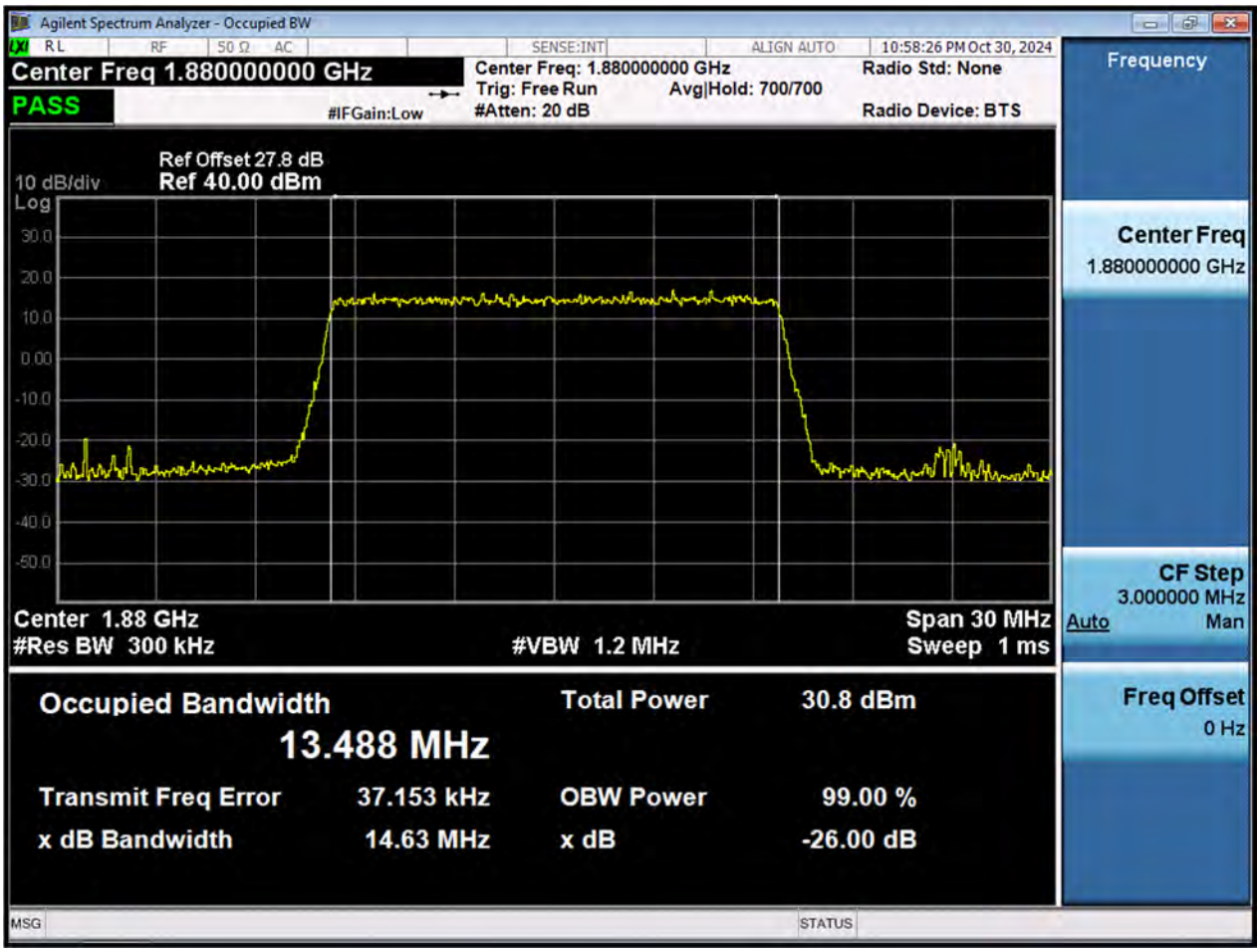
LTE2_10 M_OBW_Middle Channel_256QAM_FullRB



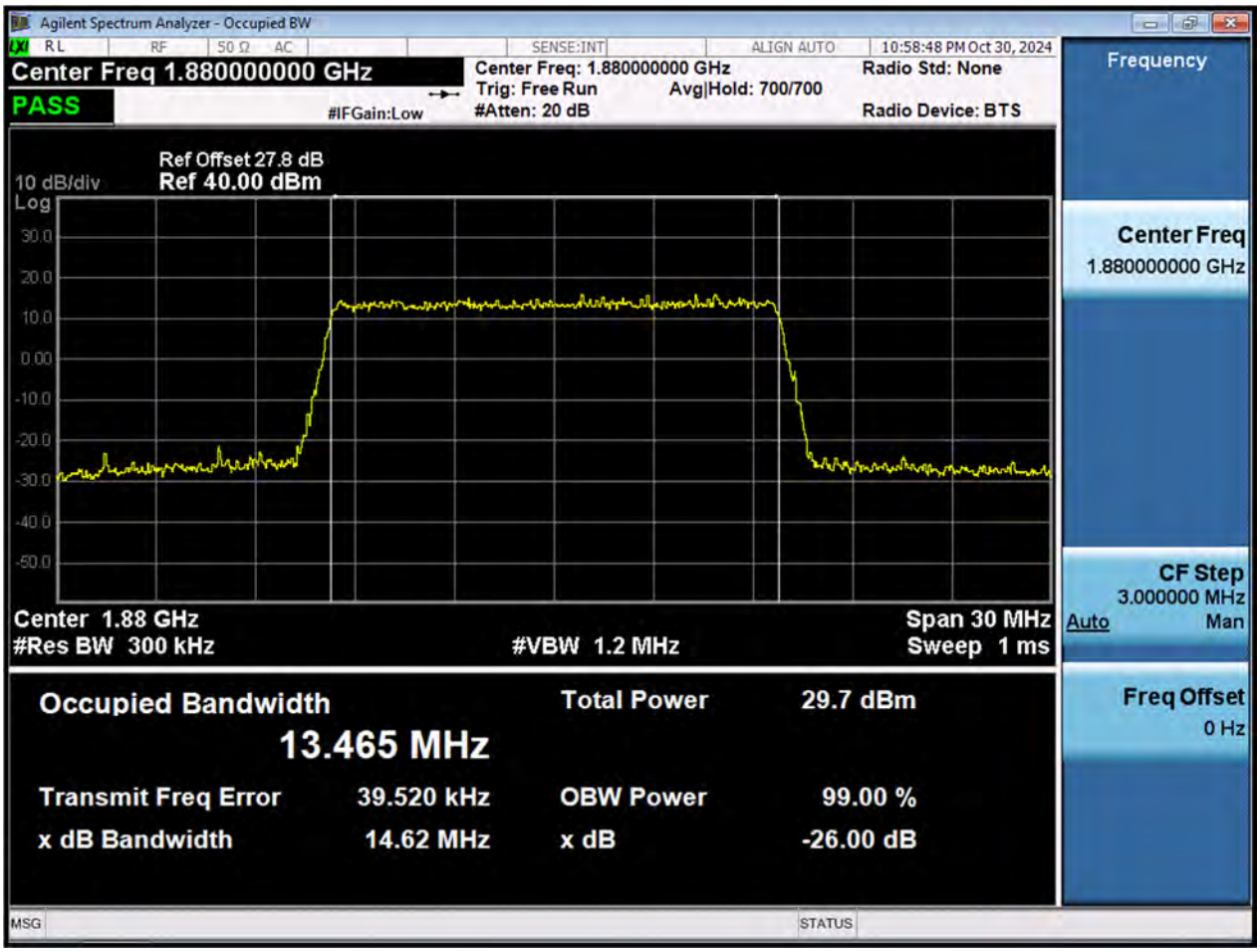
LTE2_15 M_OBW_Middle Channel_QPSK_FullRB



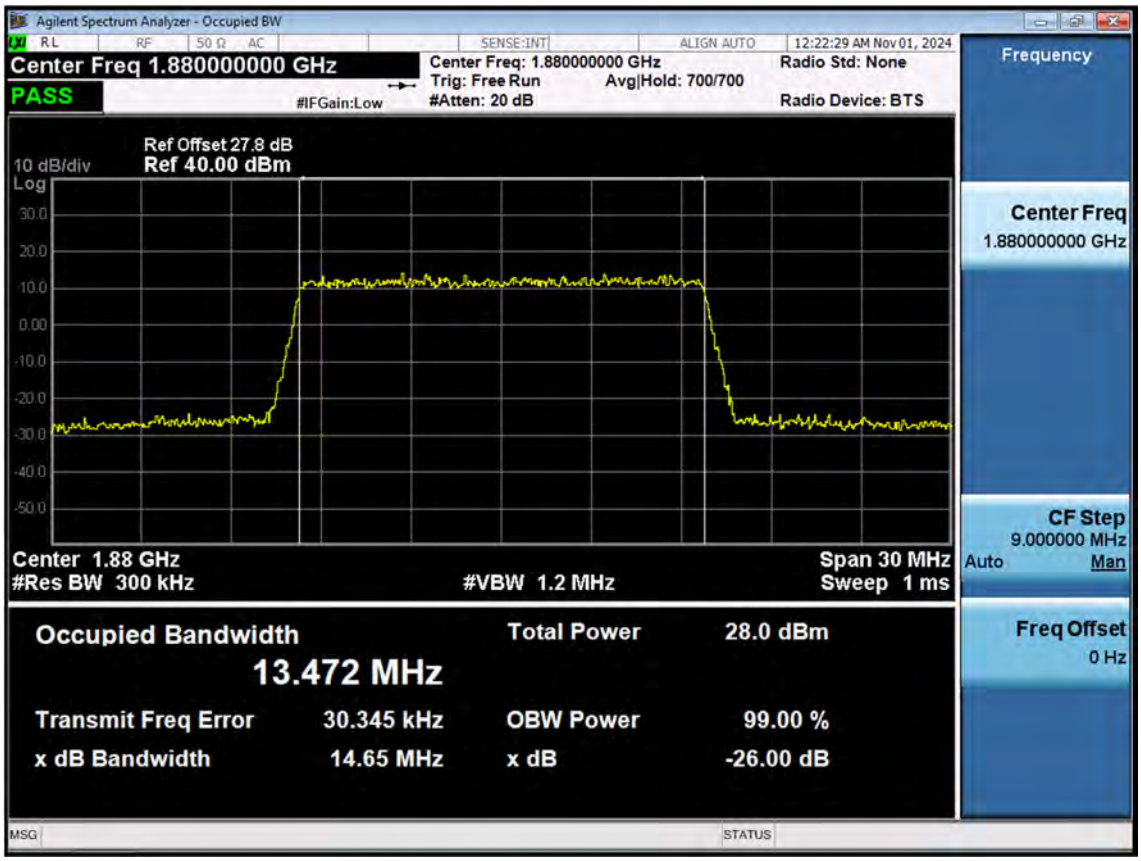
LTE2_15 M_OBW_Middle Channel_16QAM_FullRB



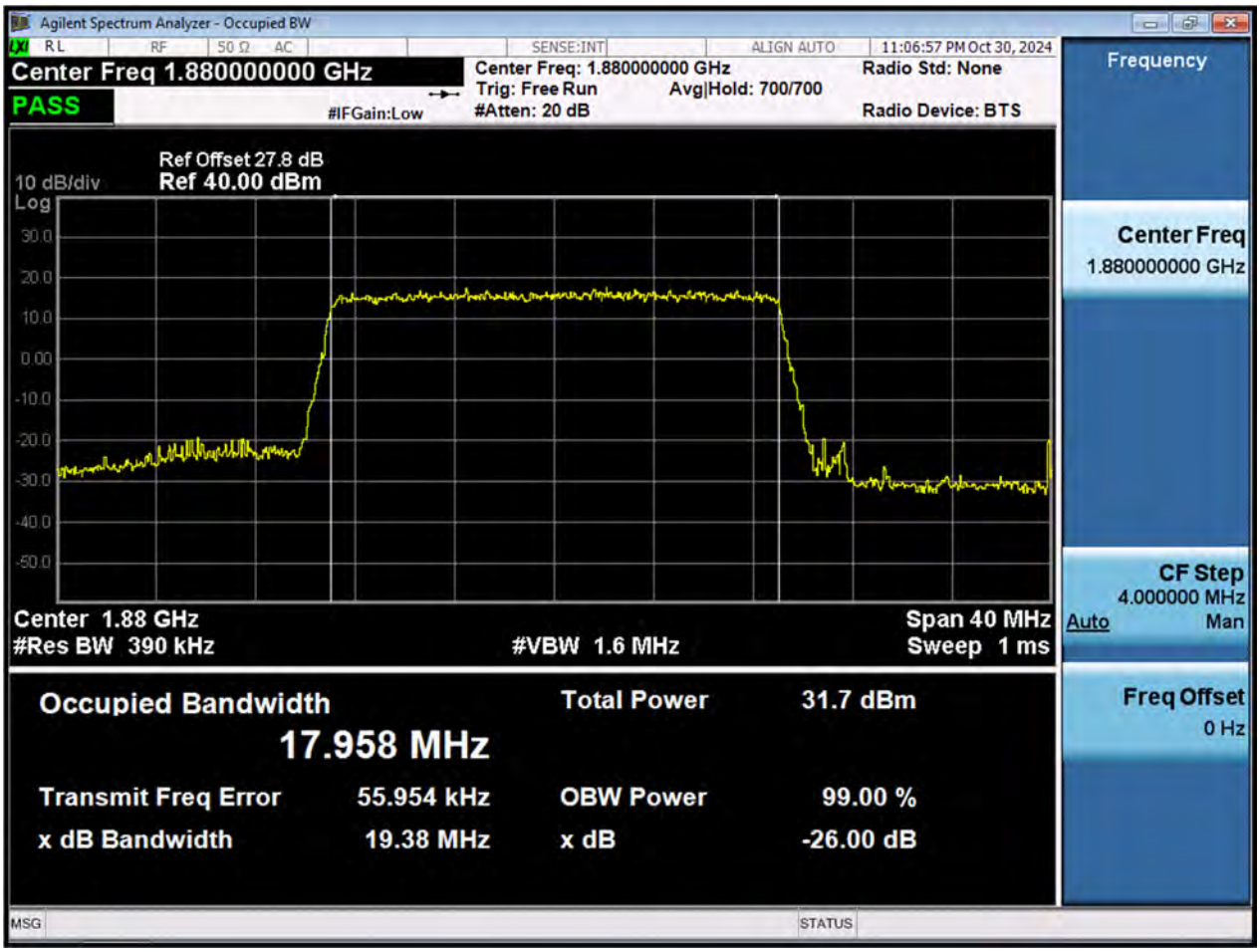
LTE2_15 M_OBW_Middle Channel_64QAM_FullRB



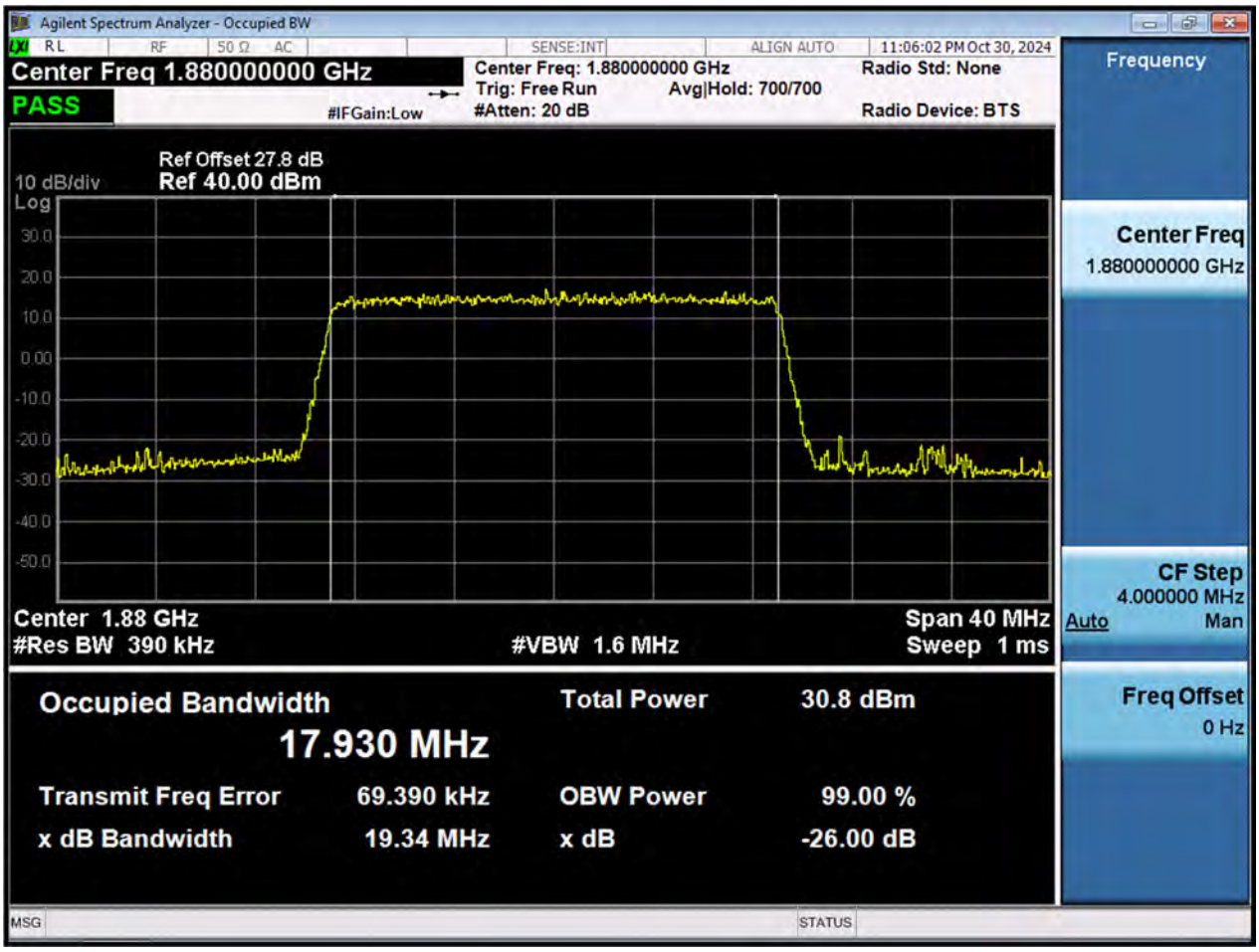
LTE2_15 M_OBW_Middle Channel_256QAM_FullRB



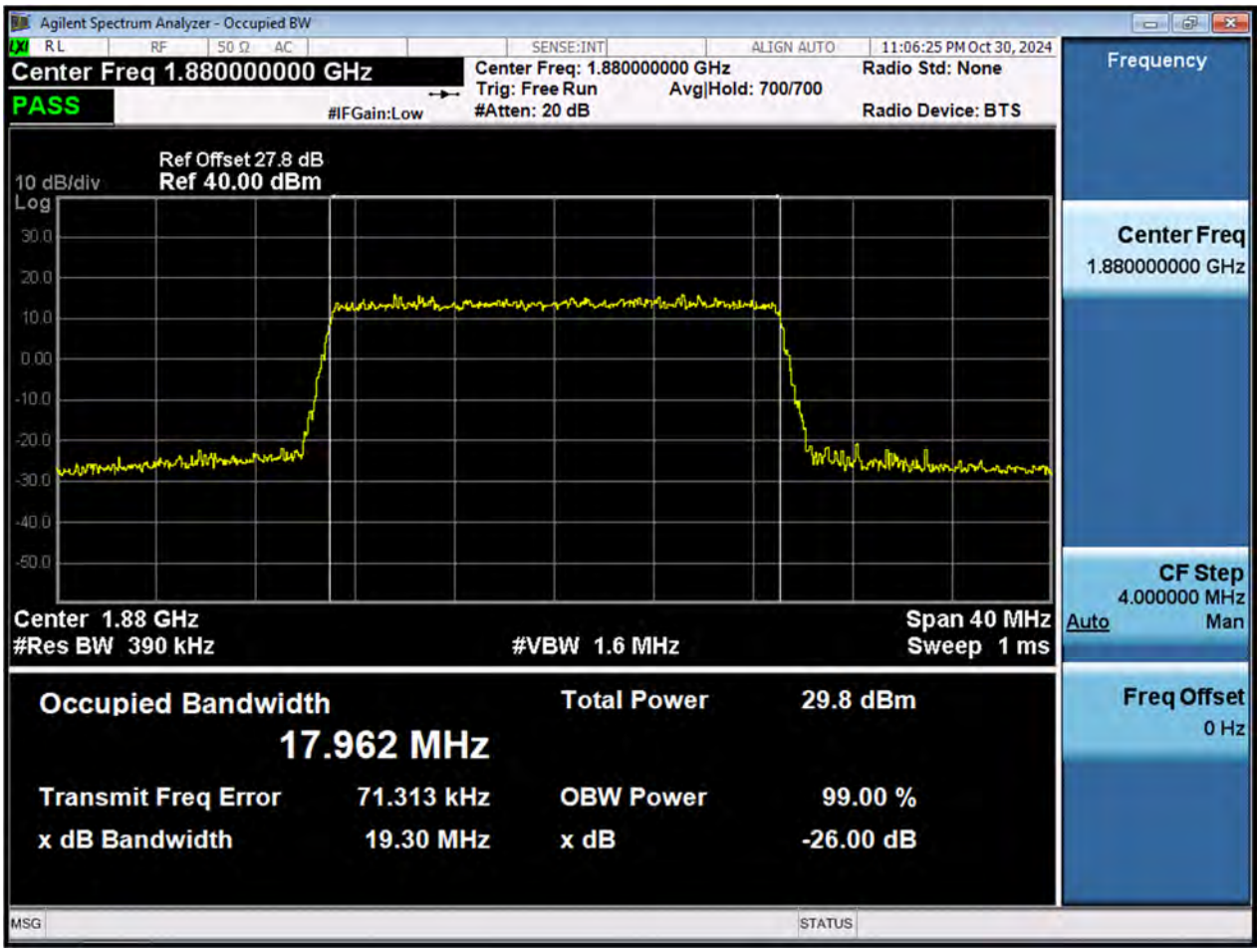
LTE2_20 M_OBW_Middle Channel_QPSK_FullRB



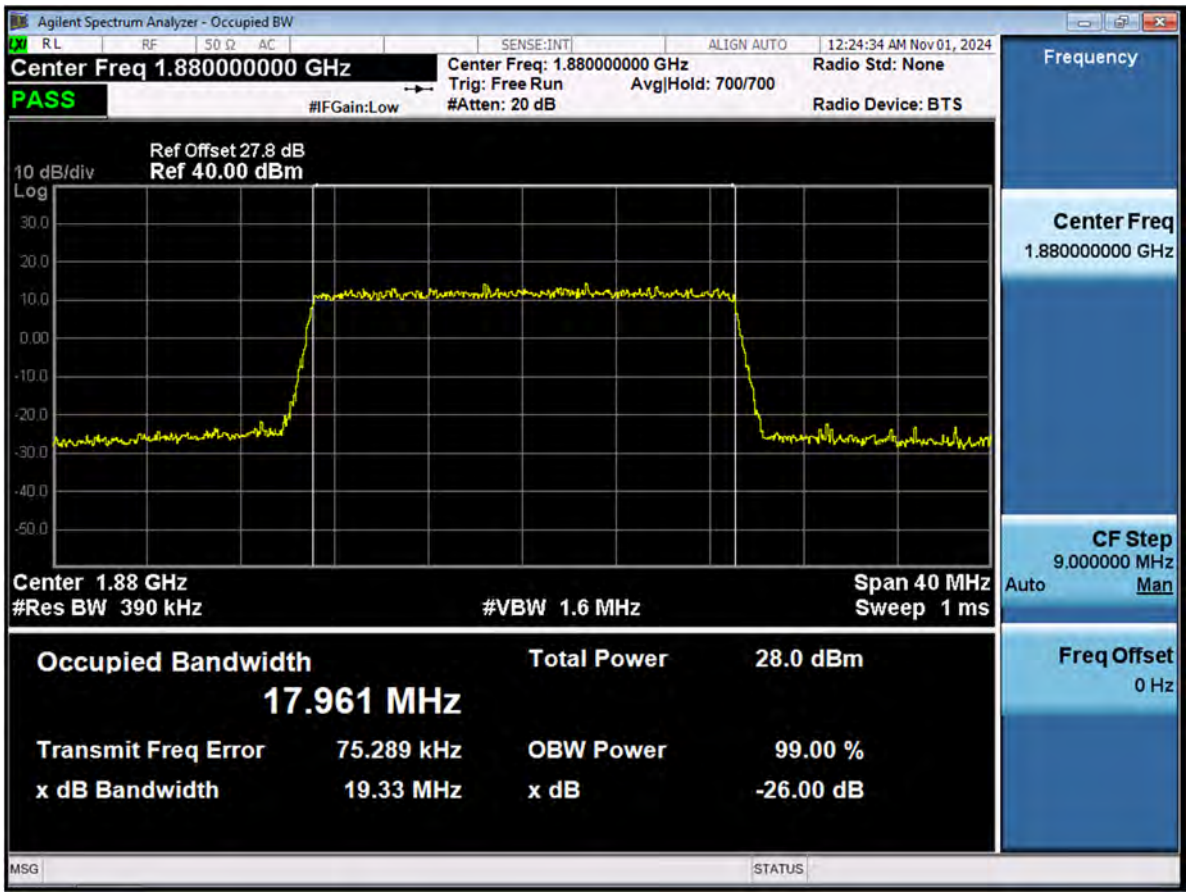
LTE2_20 M_OBW_Middle Channel_16QAM_FullRB



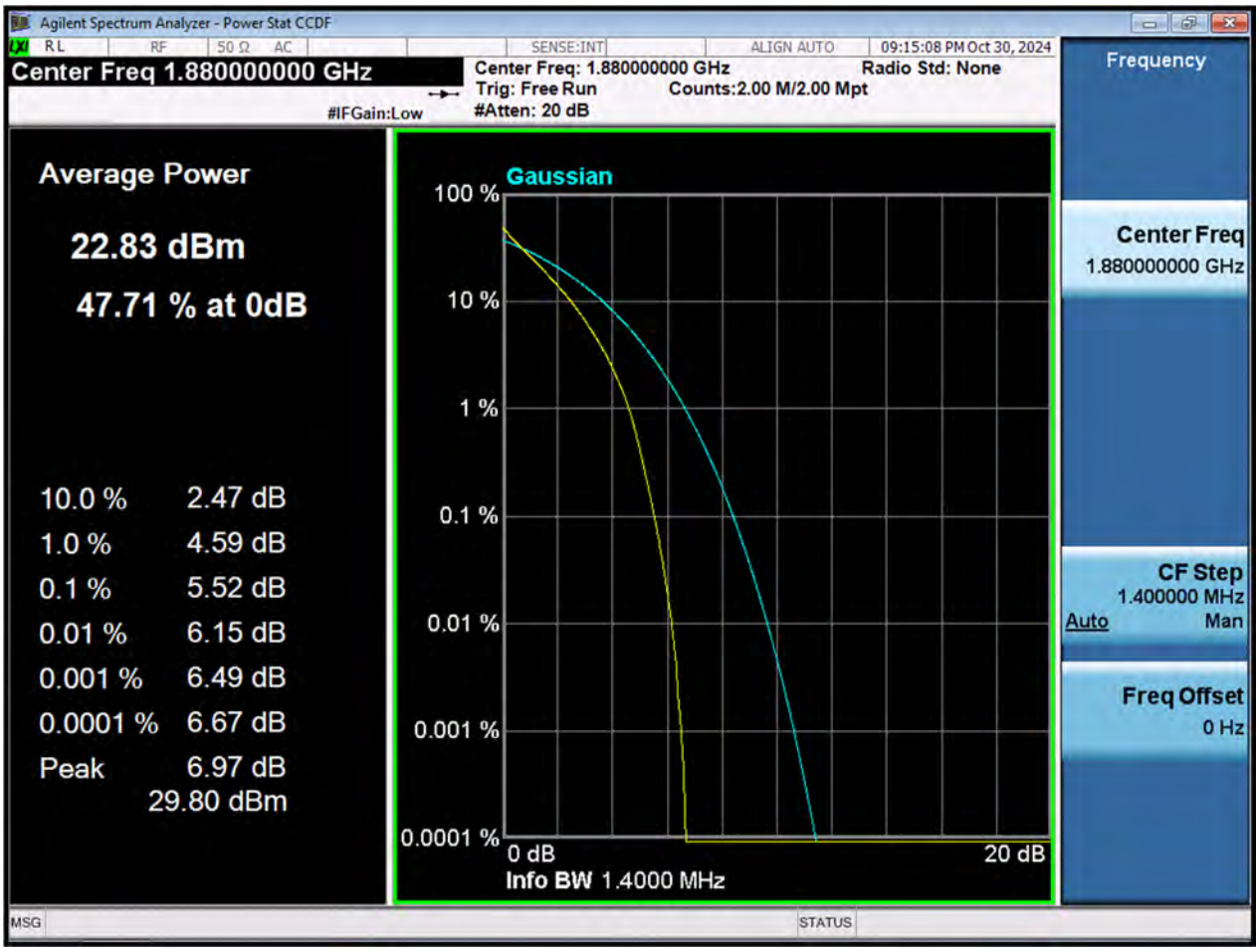
LTE2_20 M_OBW_Middle Channel_64QAM_FullRB



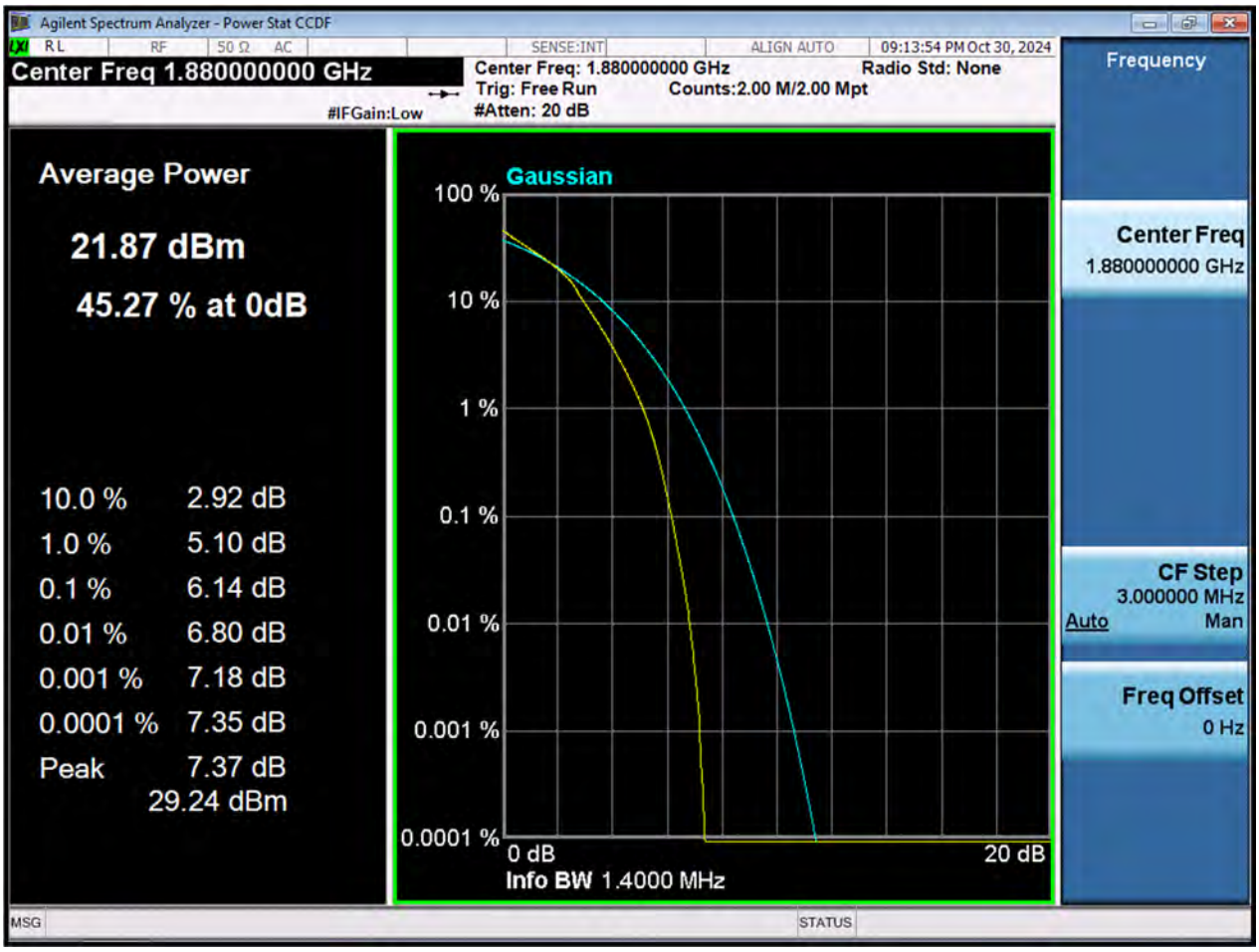
LTE2_20 M_OBW_Middle Channel_256QAM_FullRB



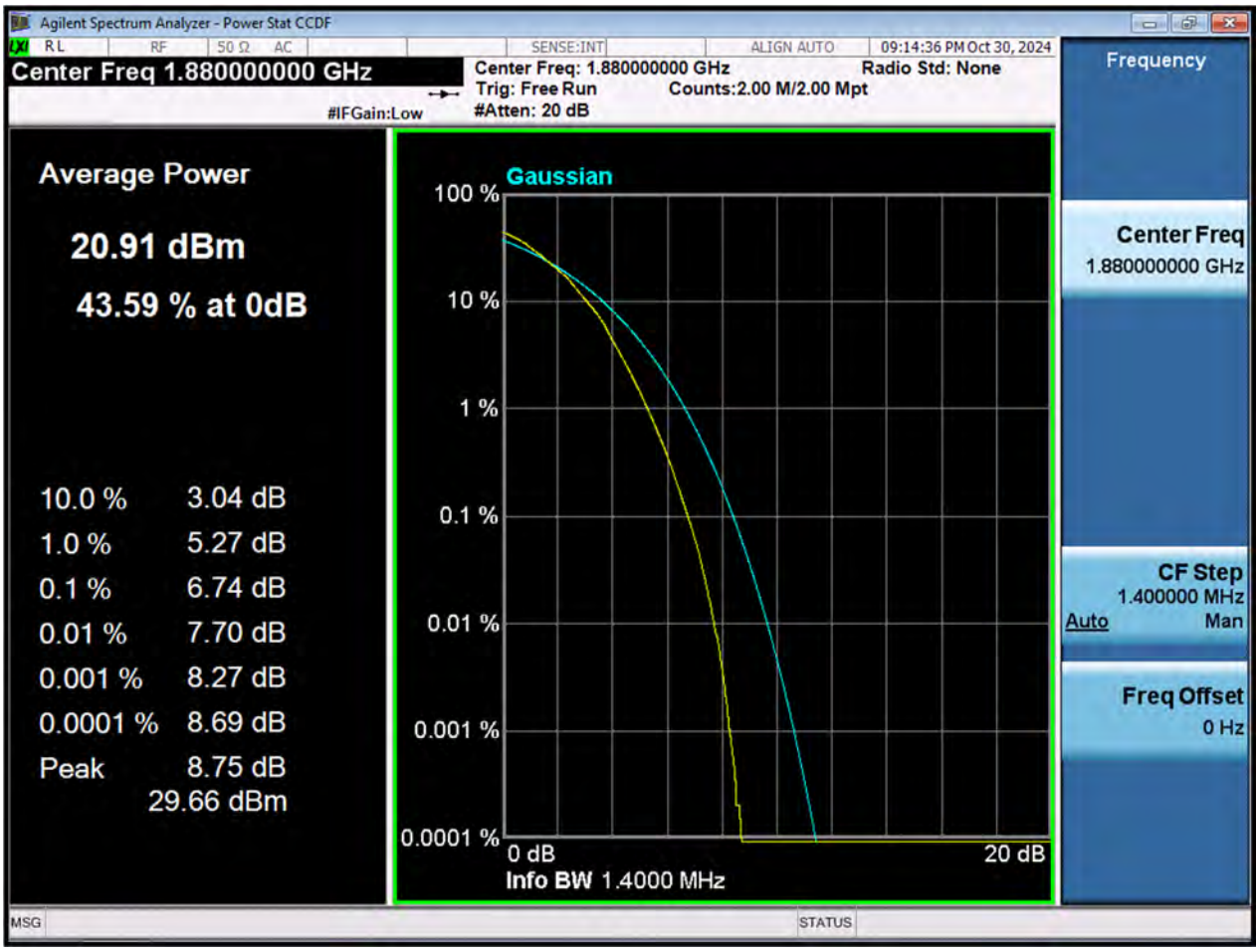
LTE2_1.4 M_PAR_Middle Channel_QPSK_FullRB



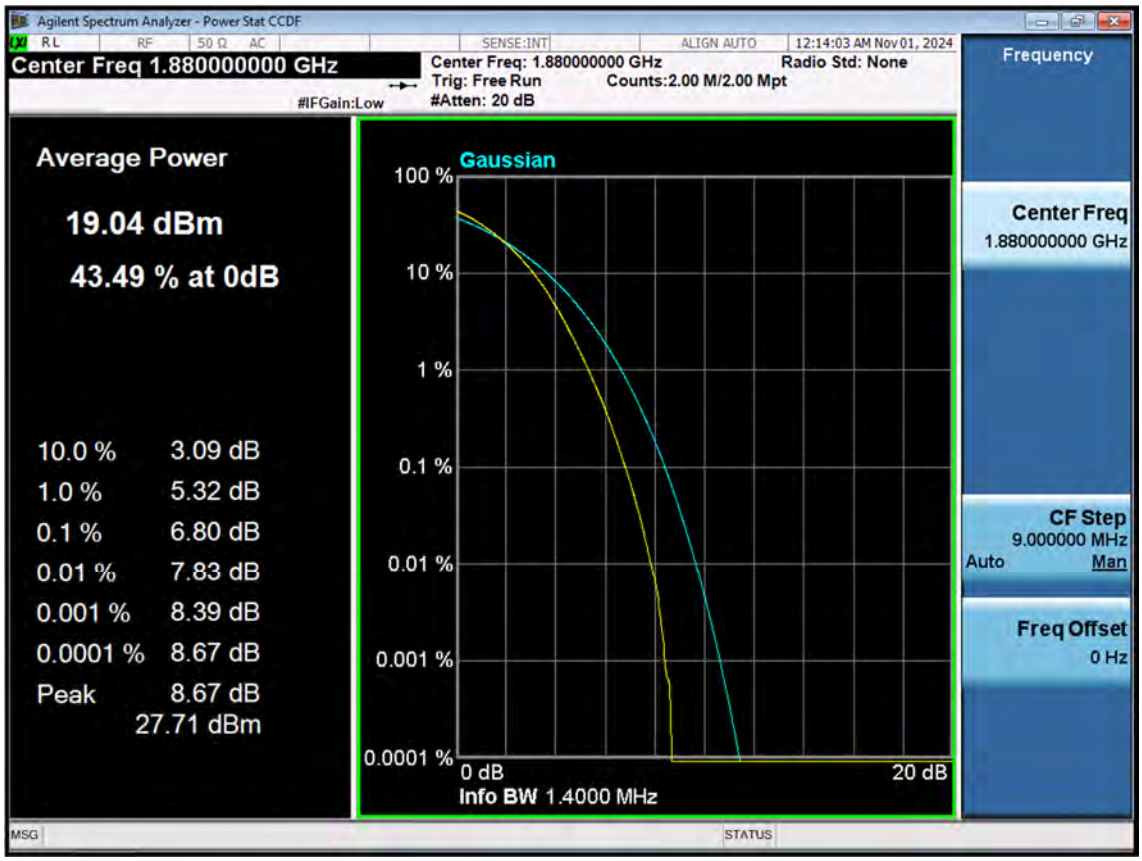
LTE2_1.4 M_PAR_Middle Channel_16QAM_FullRB



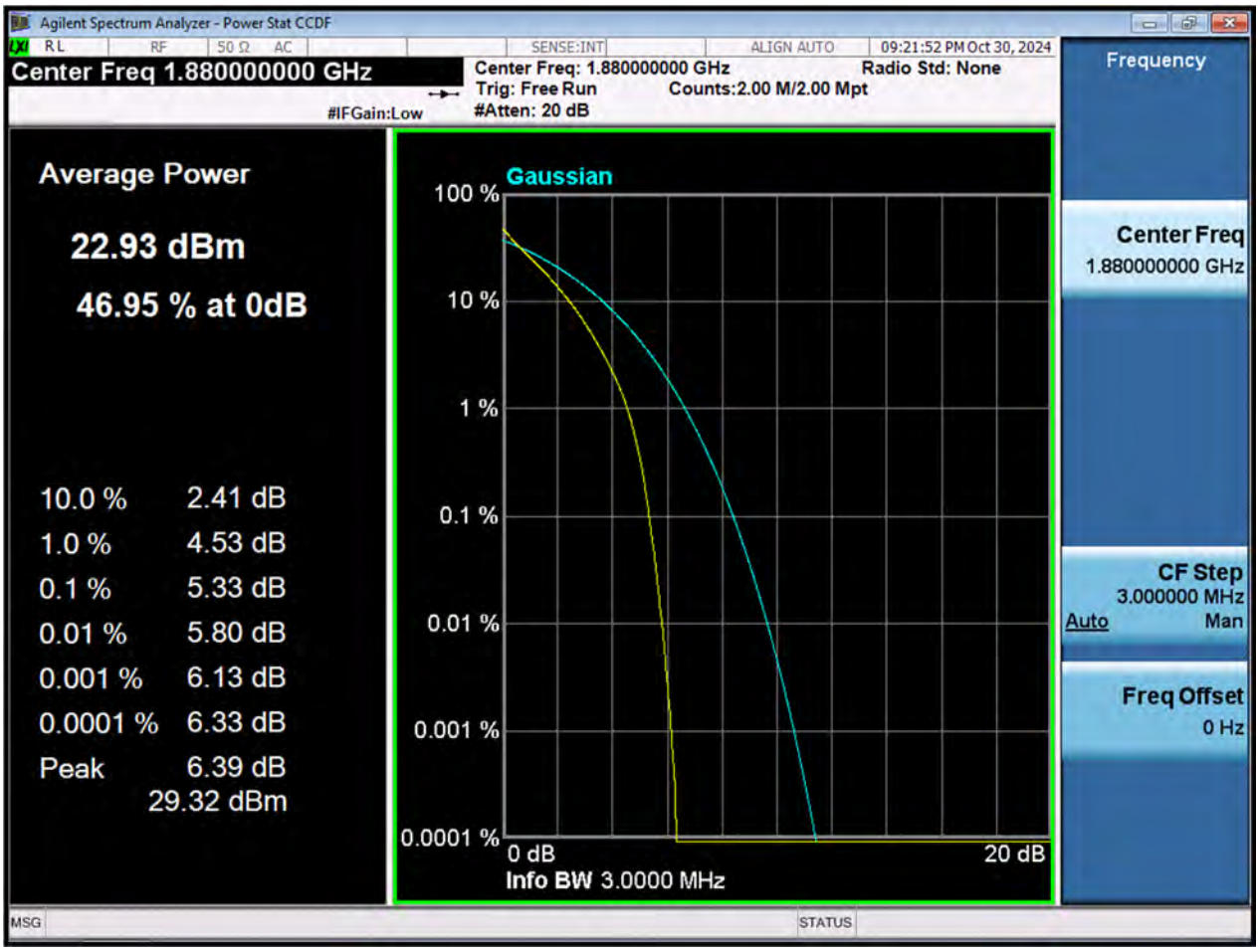
LTE2_1.4 M_PAR_Middle Channel_64QAM_FullRB



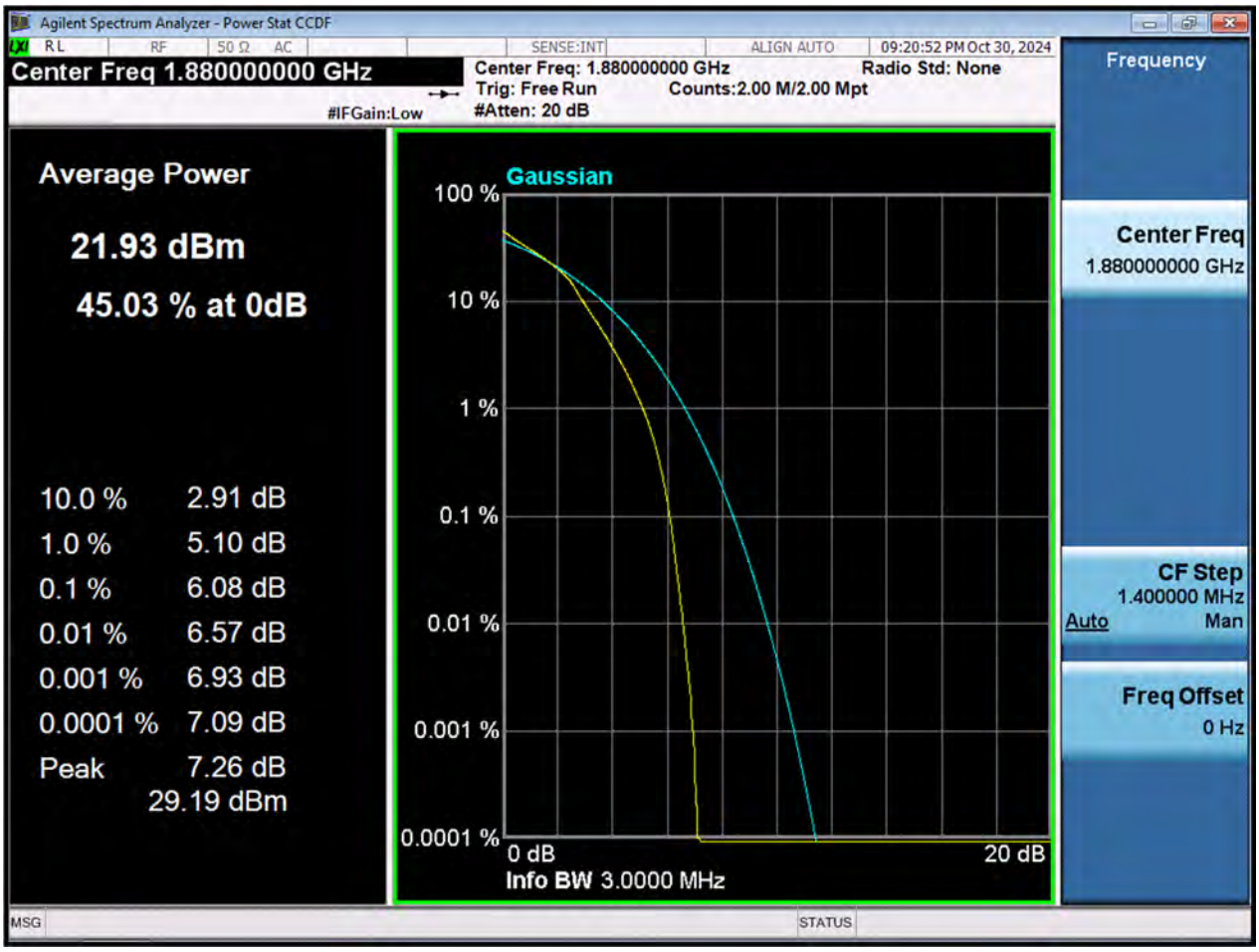
LTE2_1.4 M_PAR_Middle Channel_256QAM_FullRB



LTE2_3 M_PAR_Middle Channel_QPSK_FullRB



LTE2_3 M_PAR_Middle Channel_16QAM_FullRB



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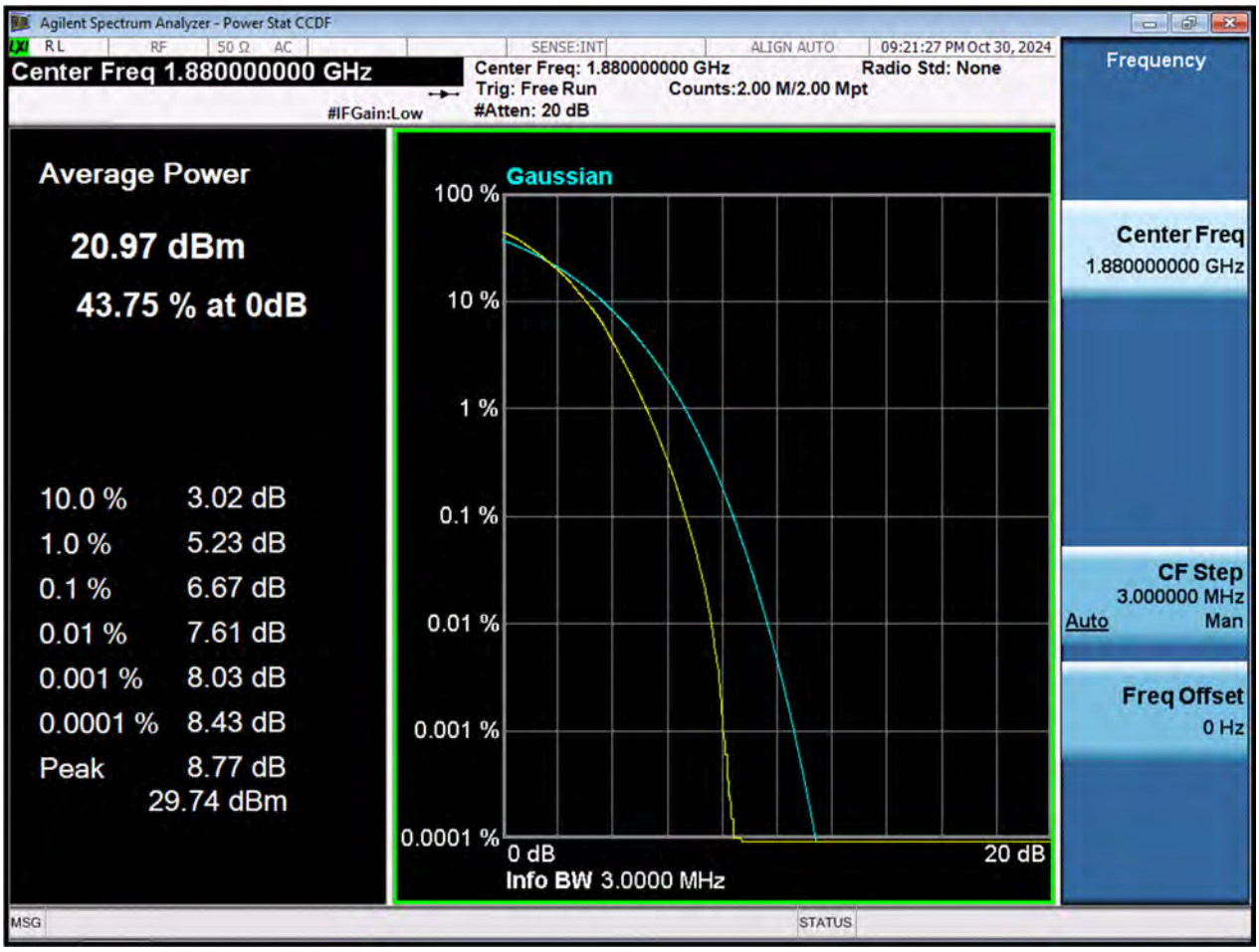
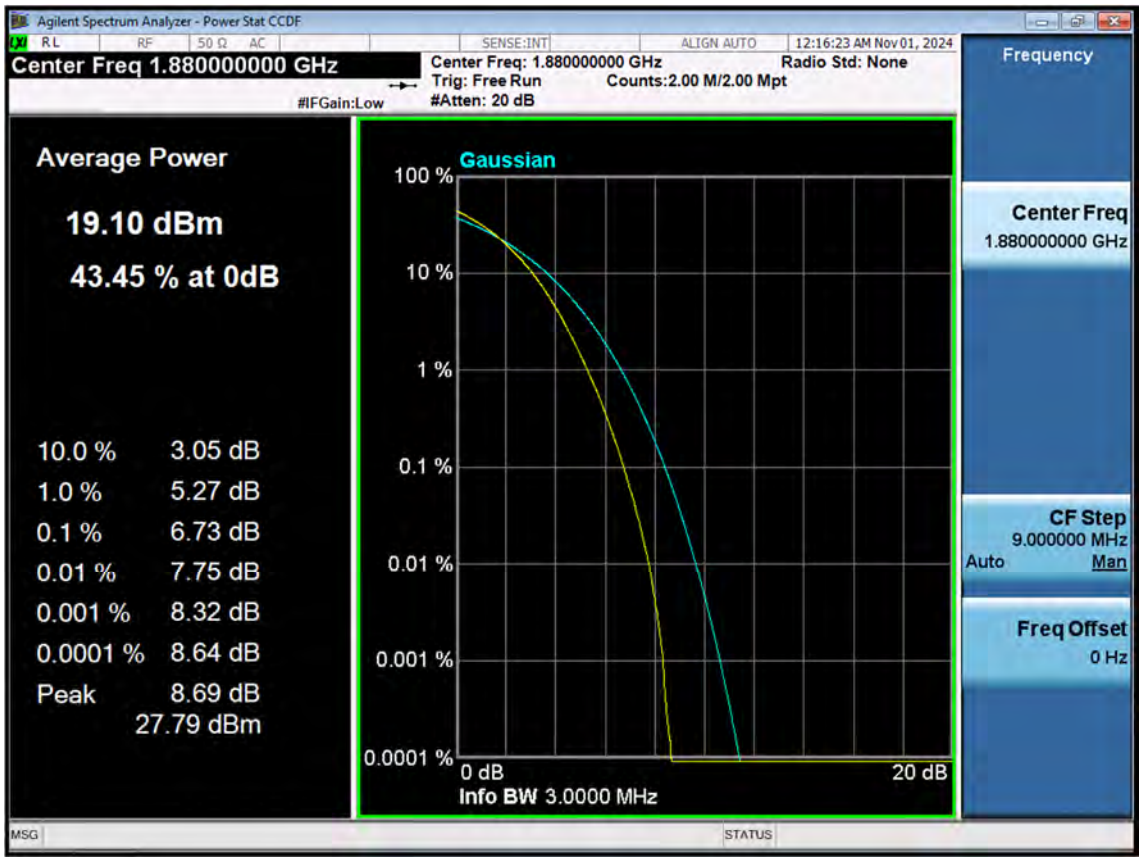
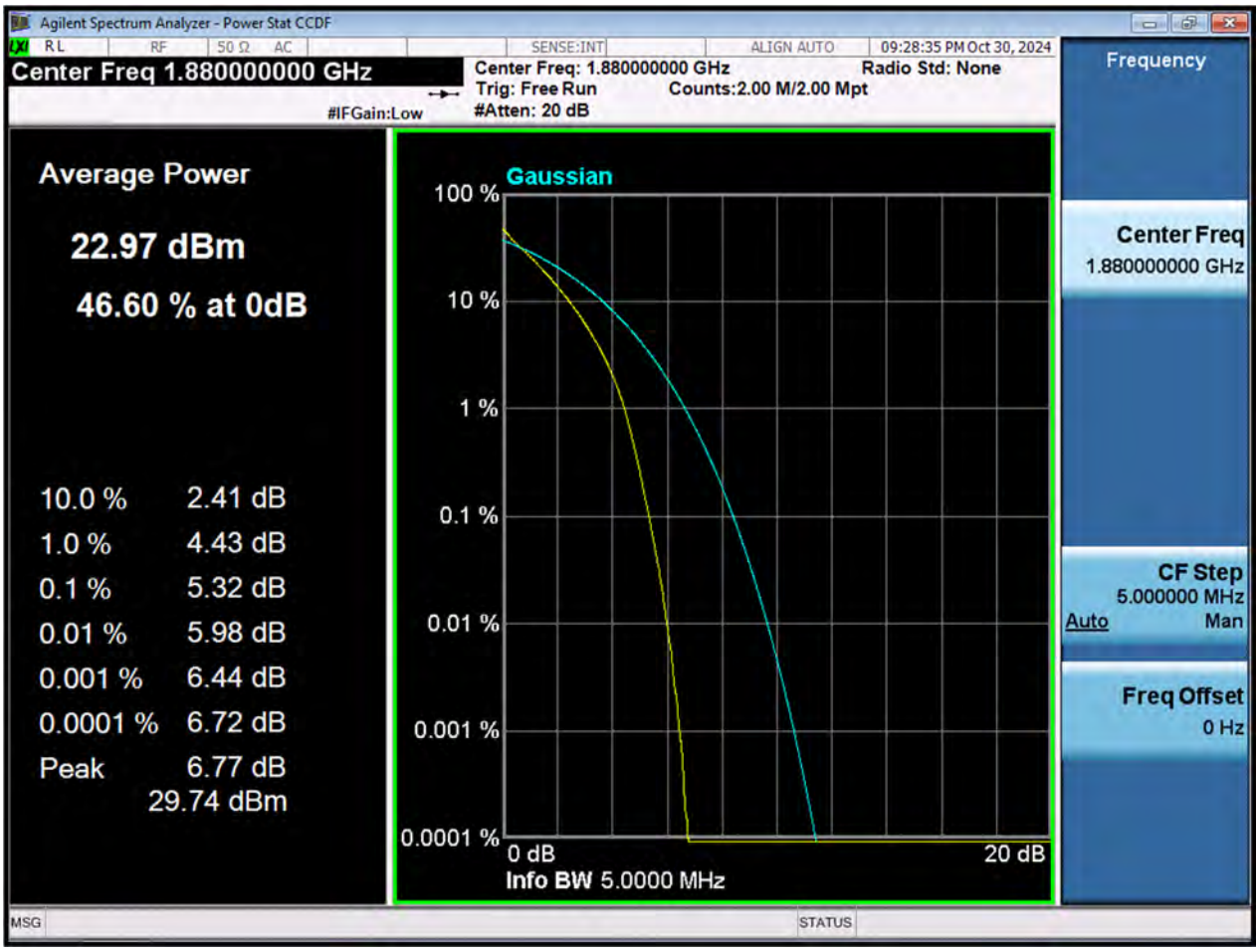


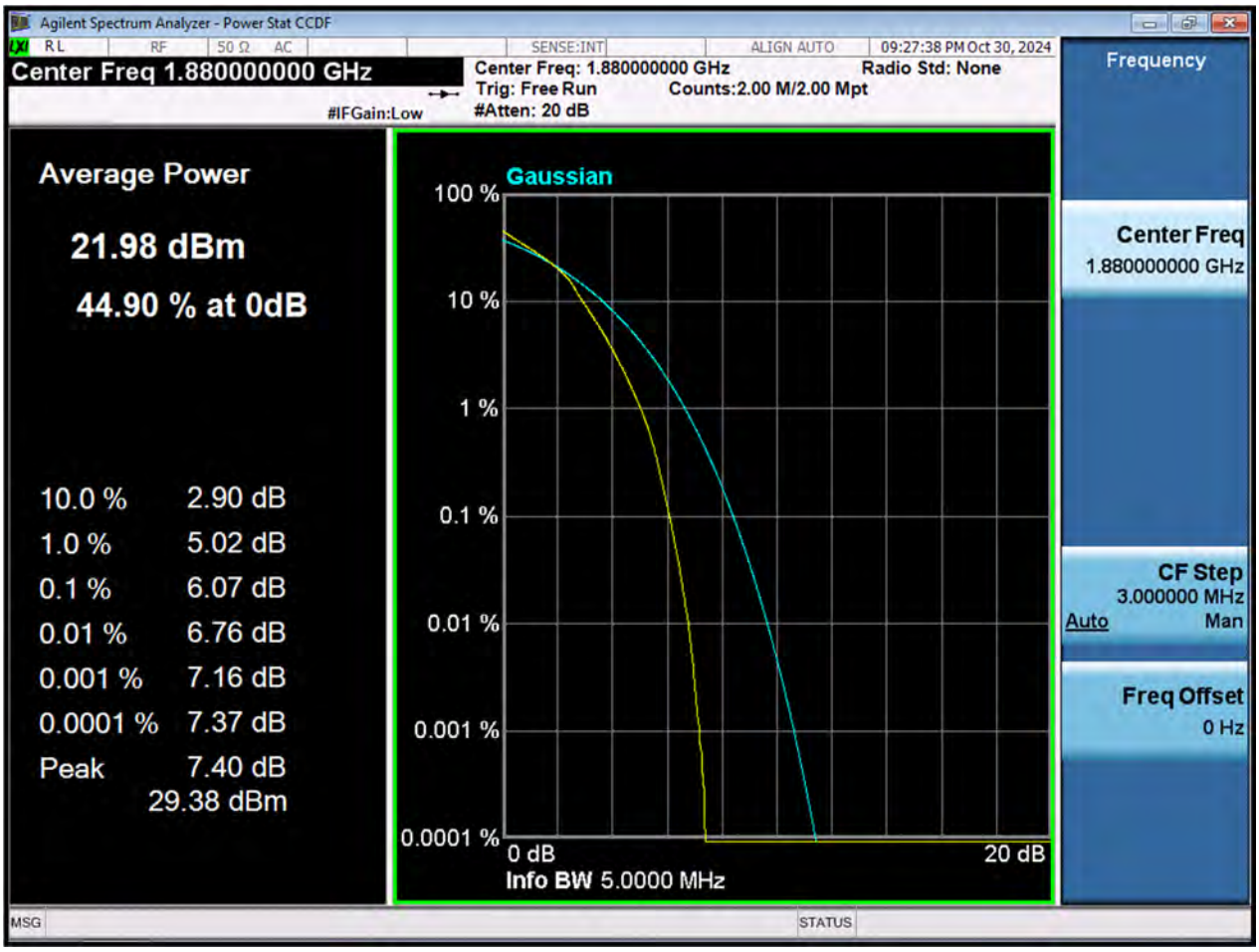
LTE2_3 M_PAR_Middle Channel_256QAM_FullRB



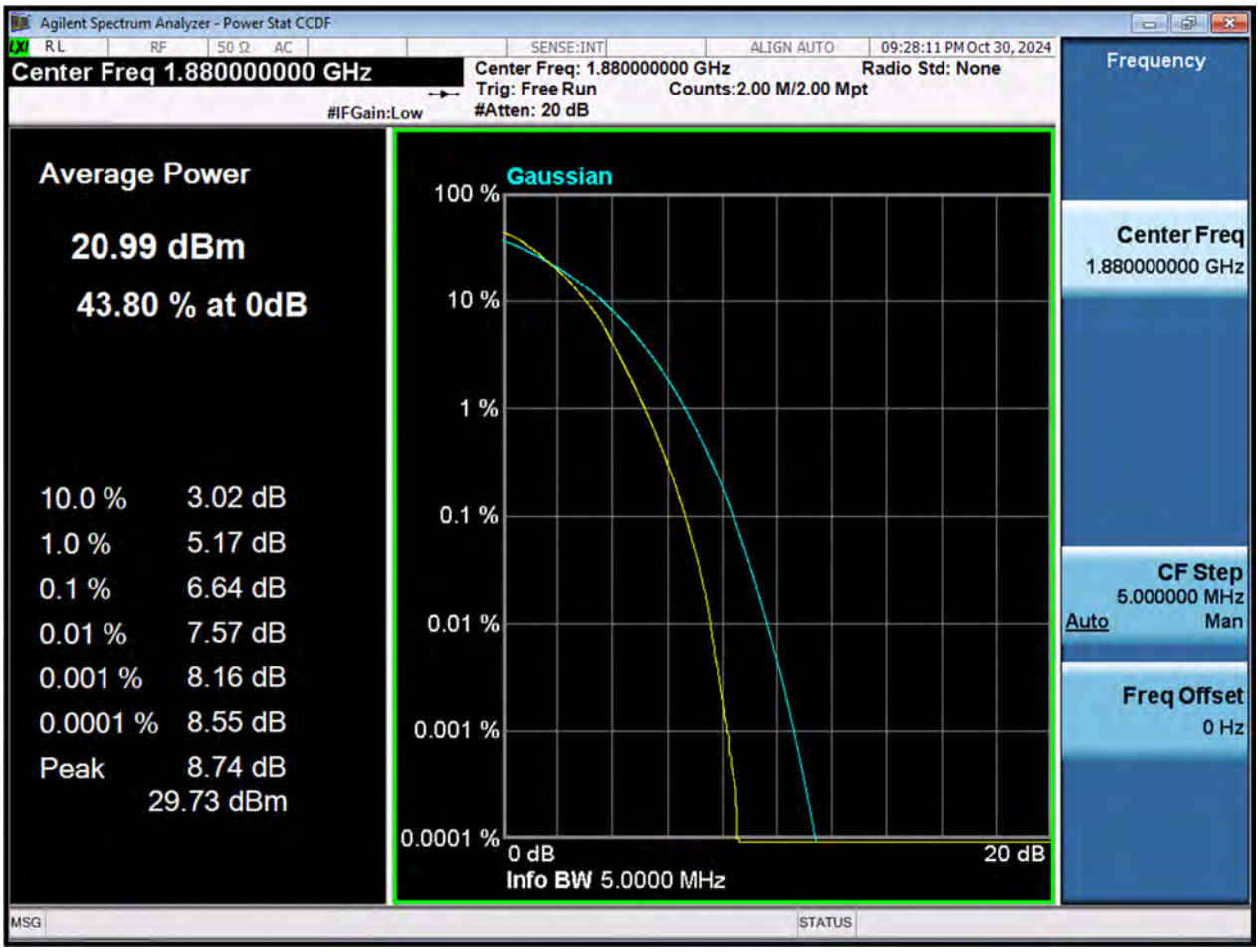
LTE2_5 M_PAR_Middle Channel_QPSK_FullRB



LTE2_5 M_PAR_Middle Channel_16QAM_FullRB



LTE2_5 M_PAR_Middle Channel_64QAM_FullRB



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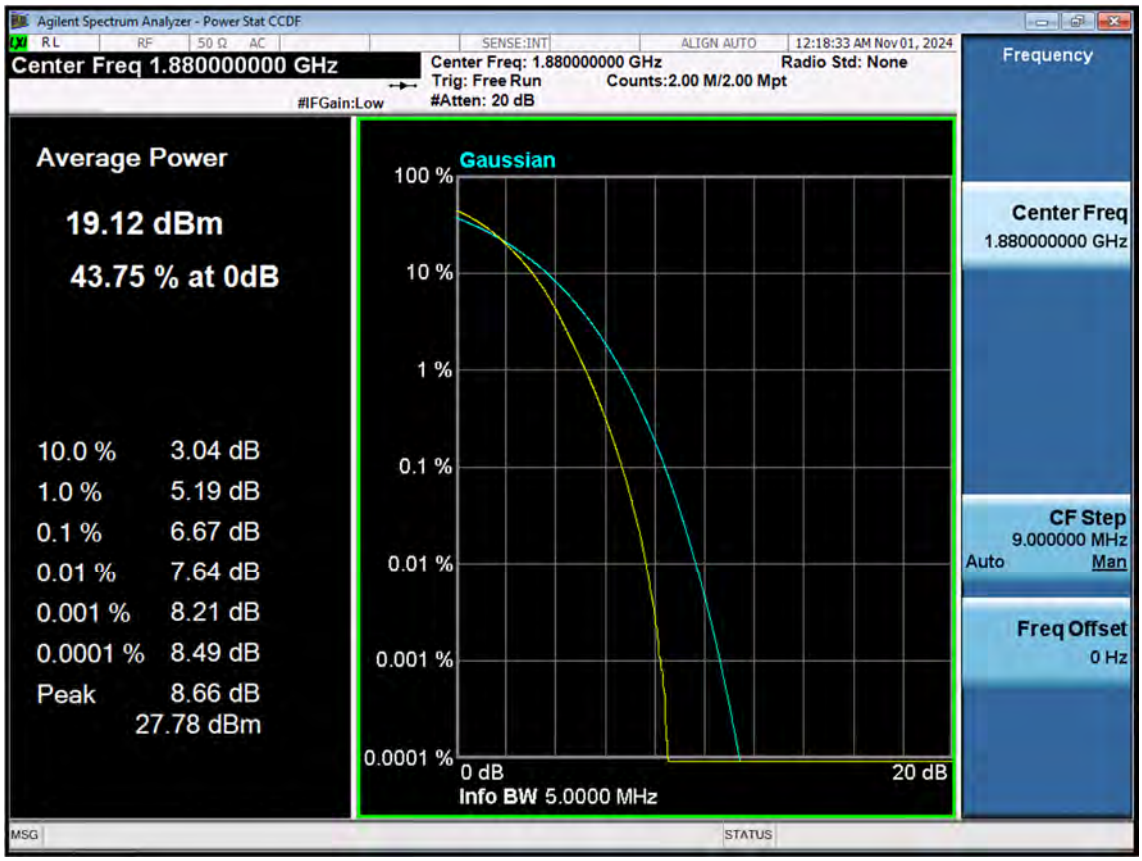
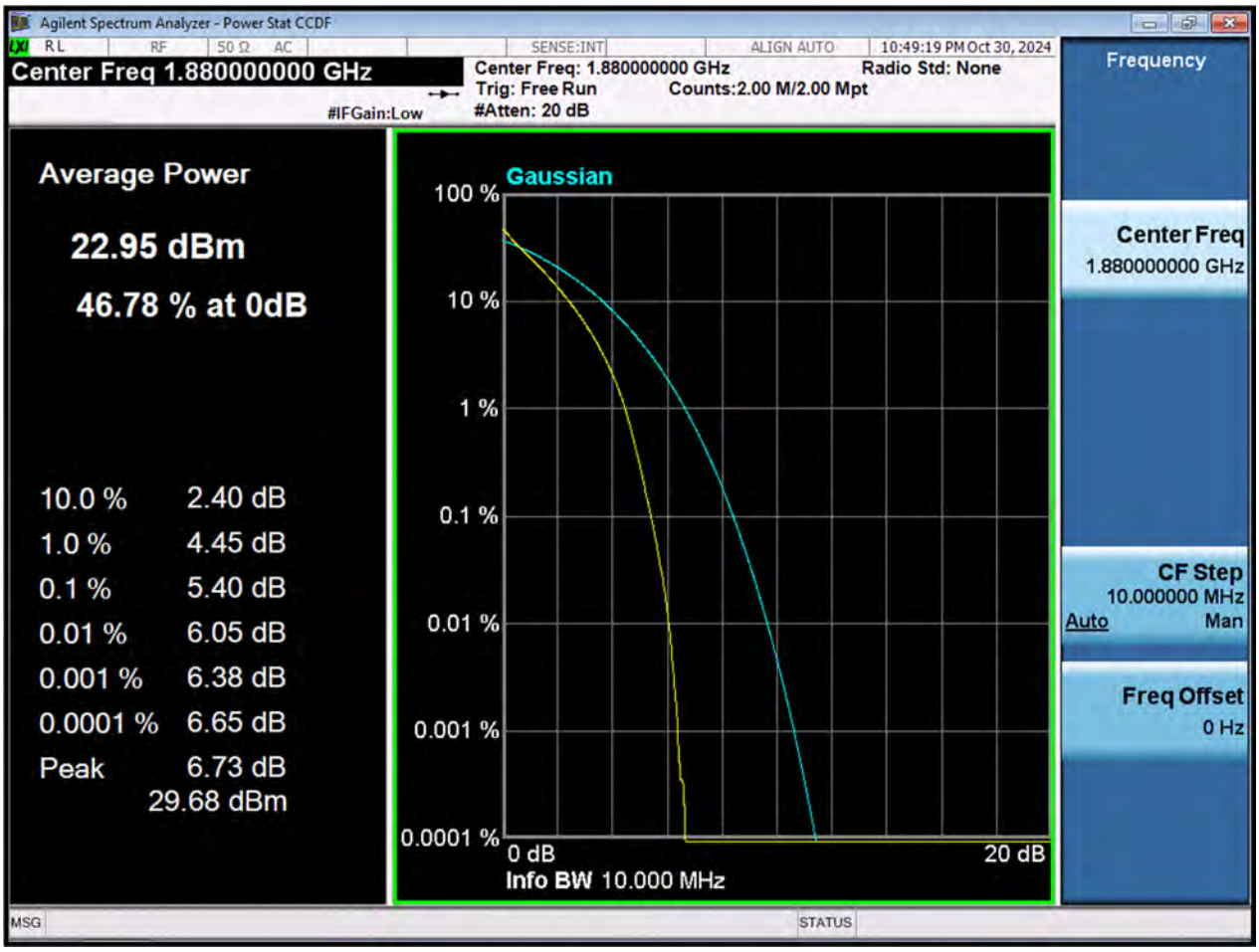
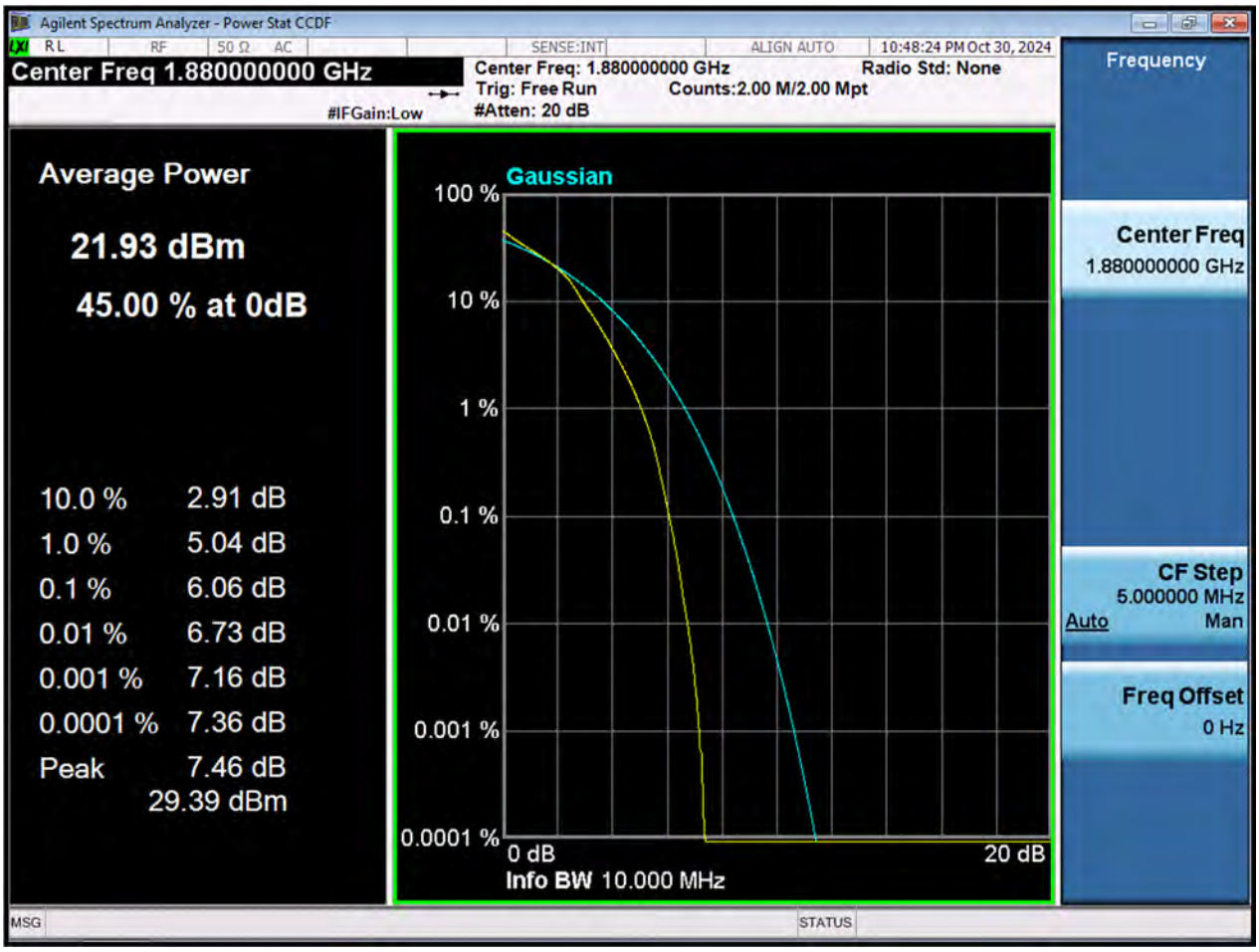


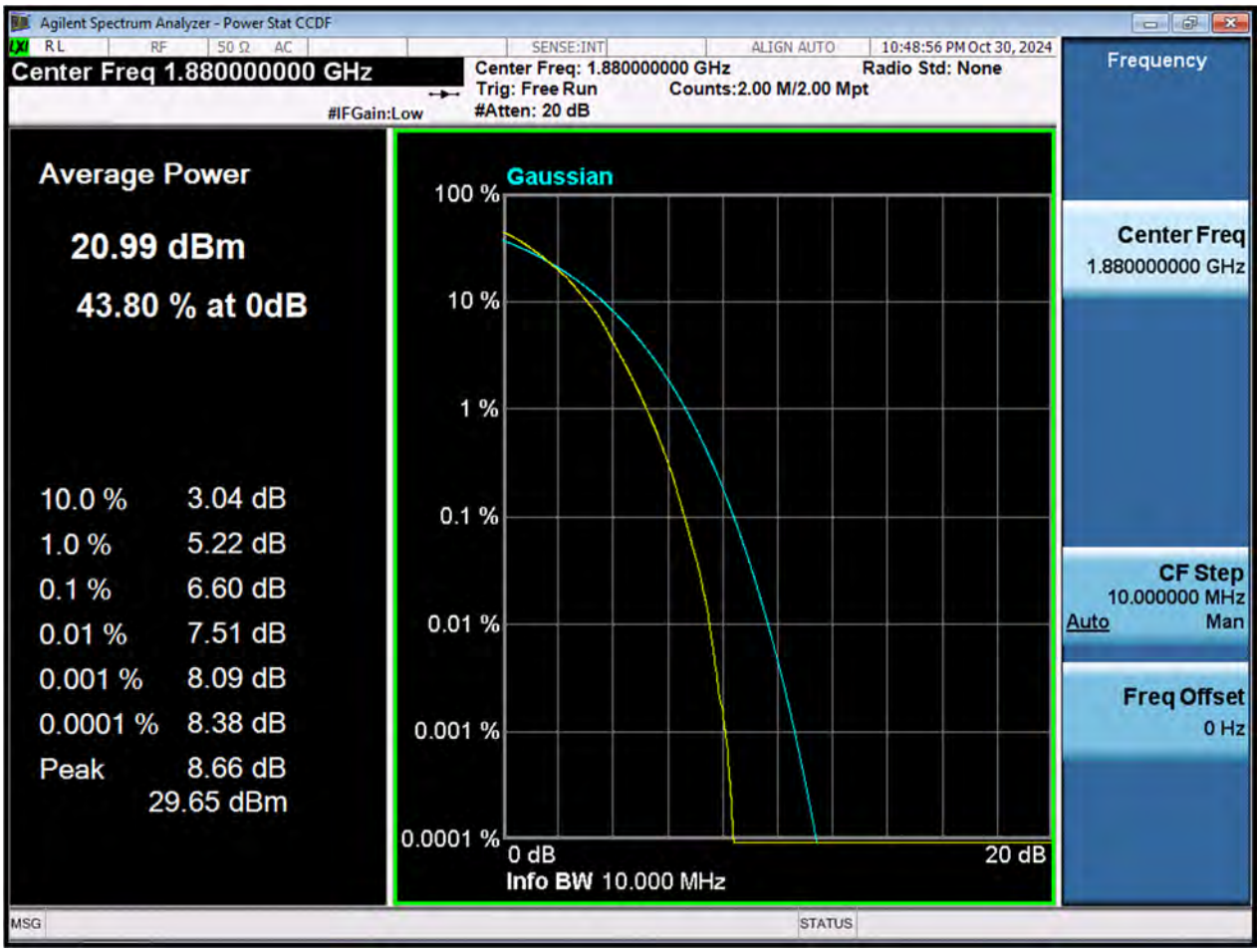
LTE2_10 M_PAR_Middle Channelz_QPSK_FullRB



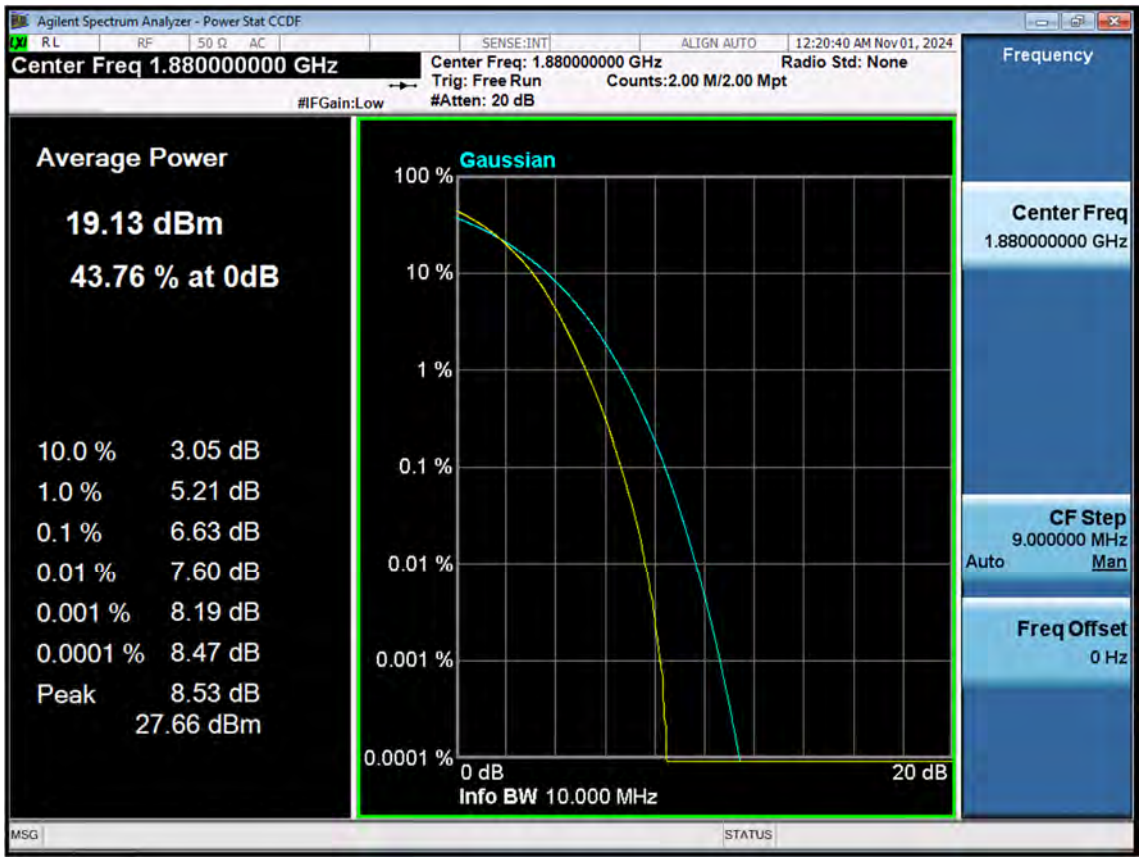
LTE2_10 M_PAR_Middle Channel_16QAM_FullRB



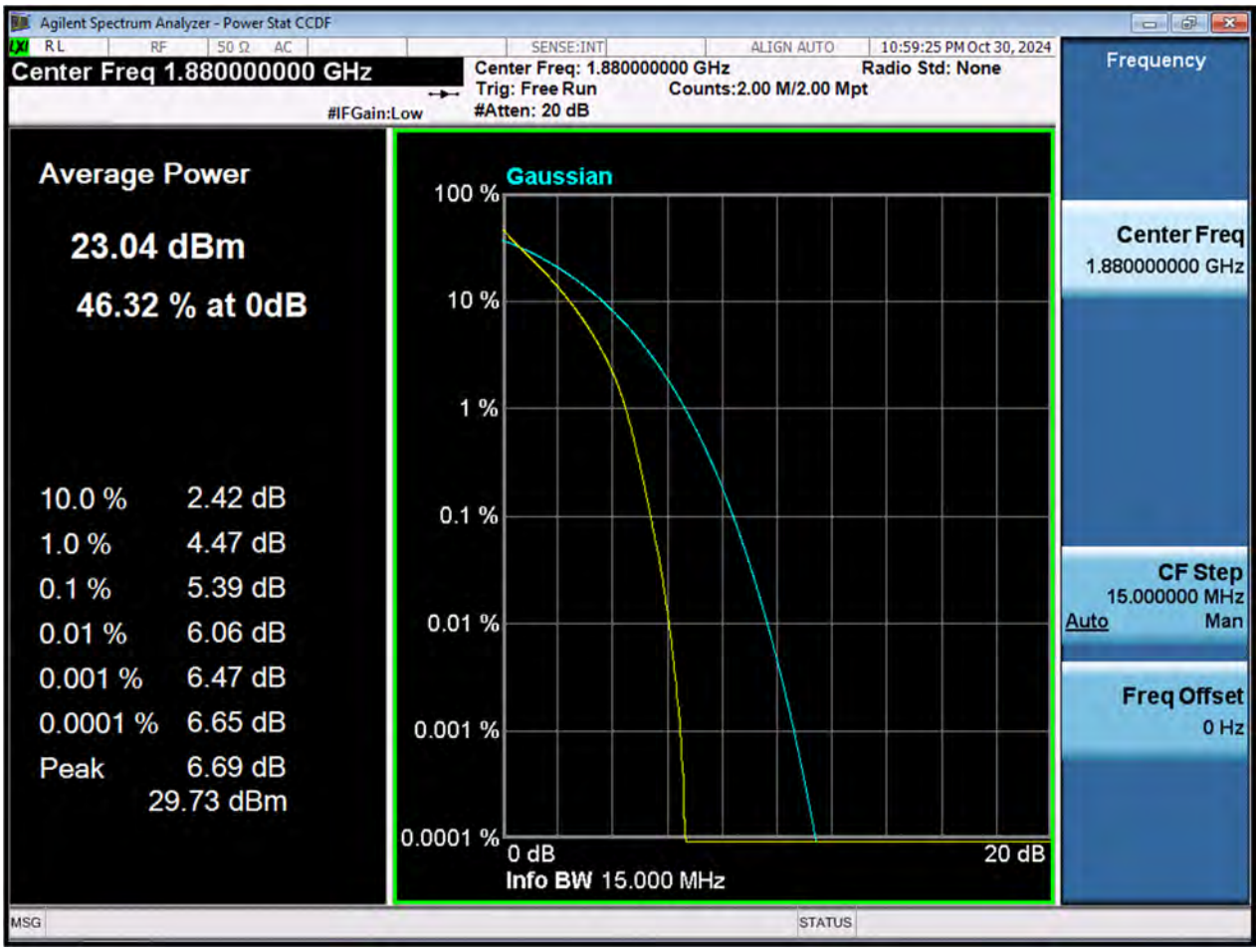
LTE2_10 M_PAR_Middle Channel_64QAM_FullRB



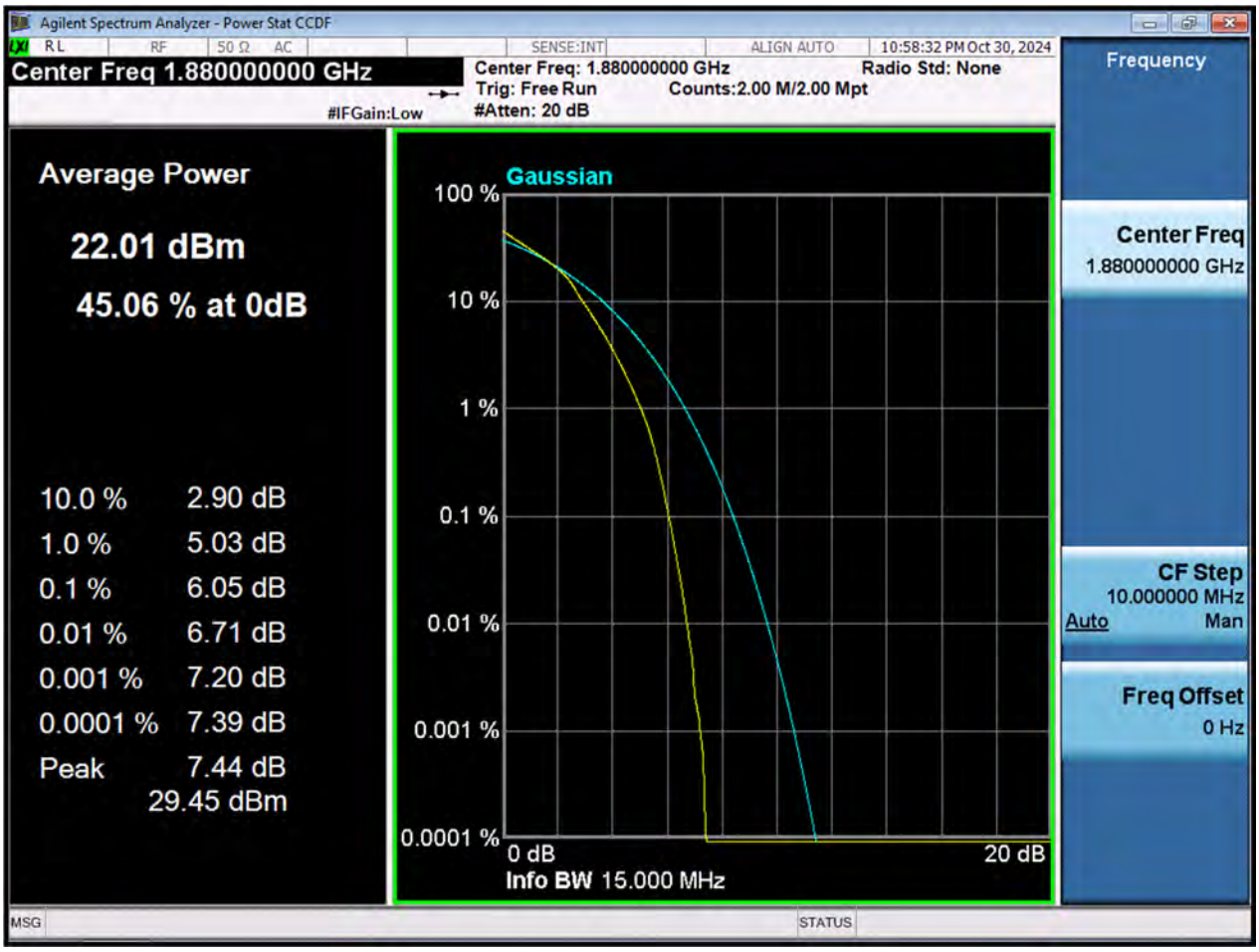
LTE2_10 M_PAR_Middle Channel_256QAM_FullRB



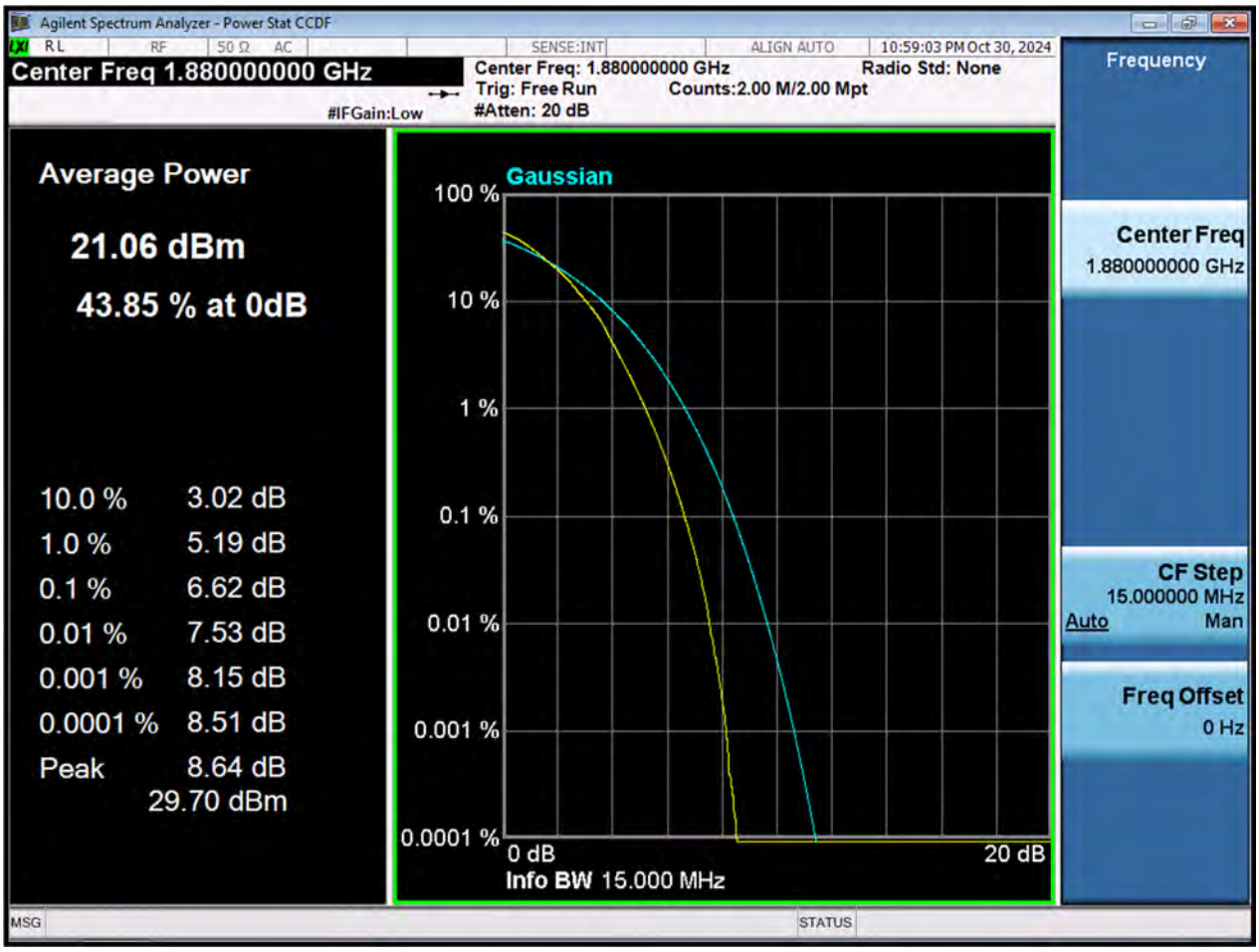
LTE2_15 M_PAR_Middle Channel_QPSK_FullRB



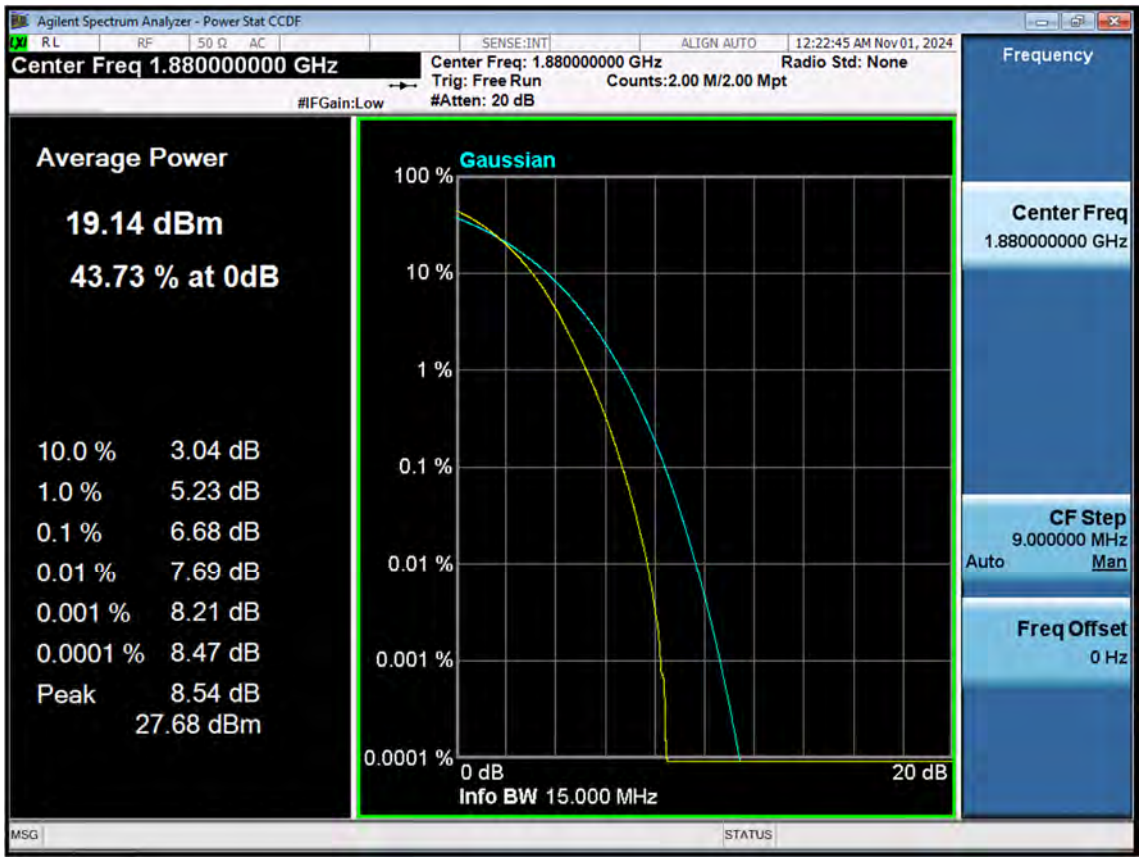
LTE2_15 M_PAR_Middle Channel_16QAM_FullRB



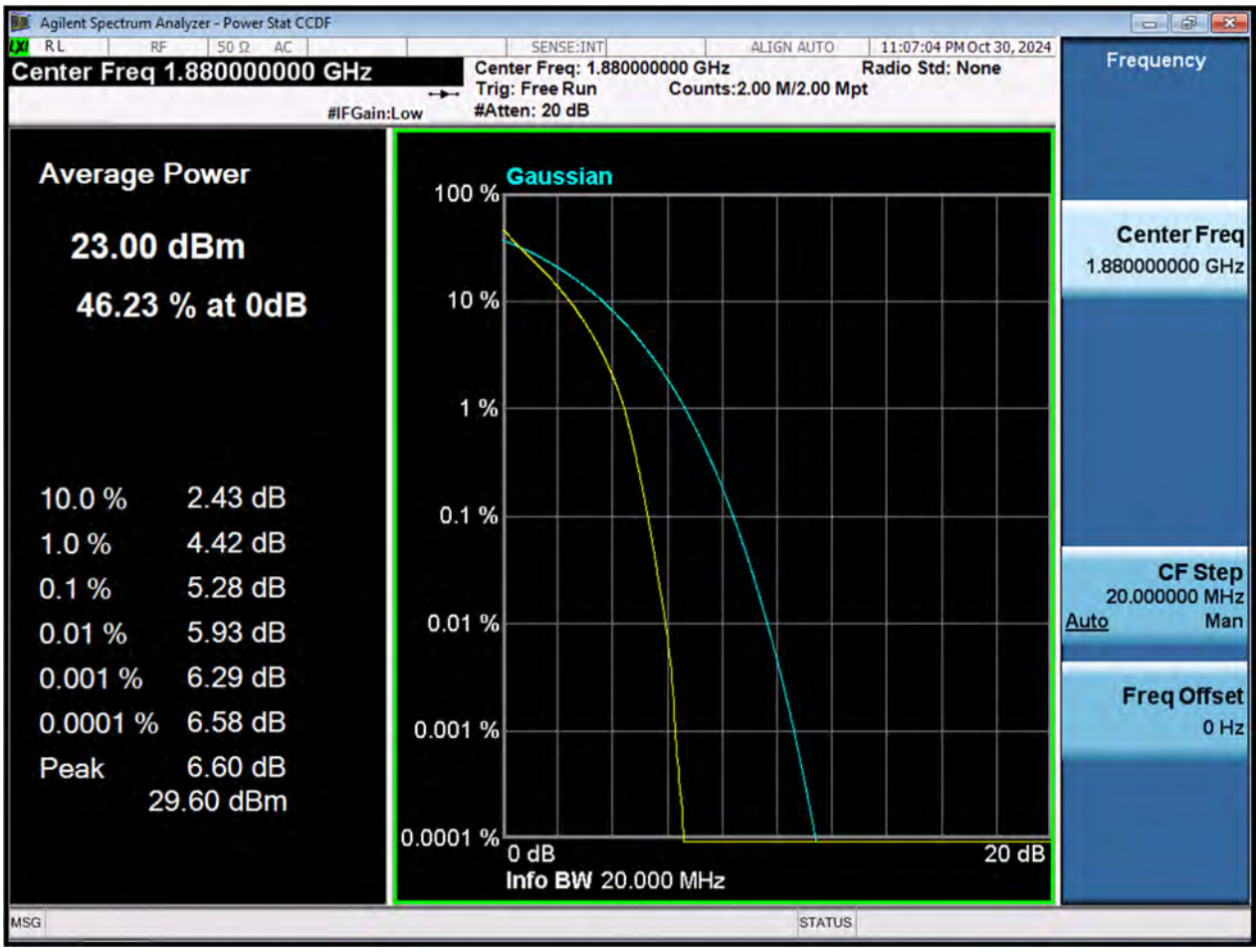
LTE2_15 M_PAR_Middle Channel_64QAM_FullRB



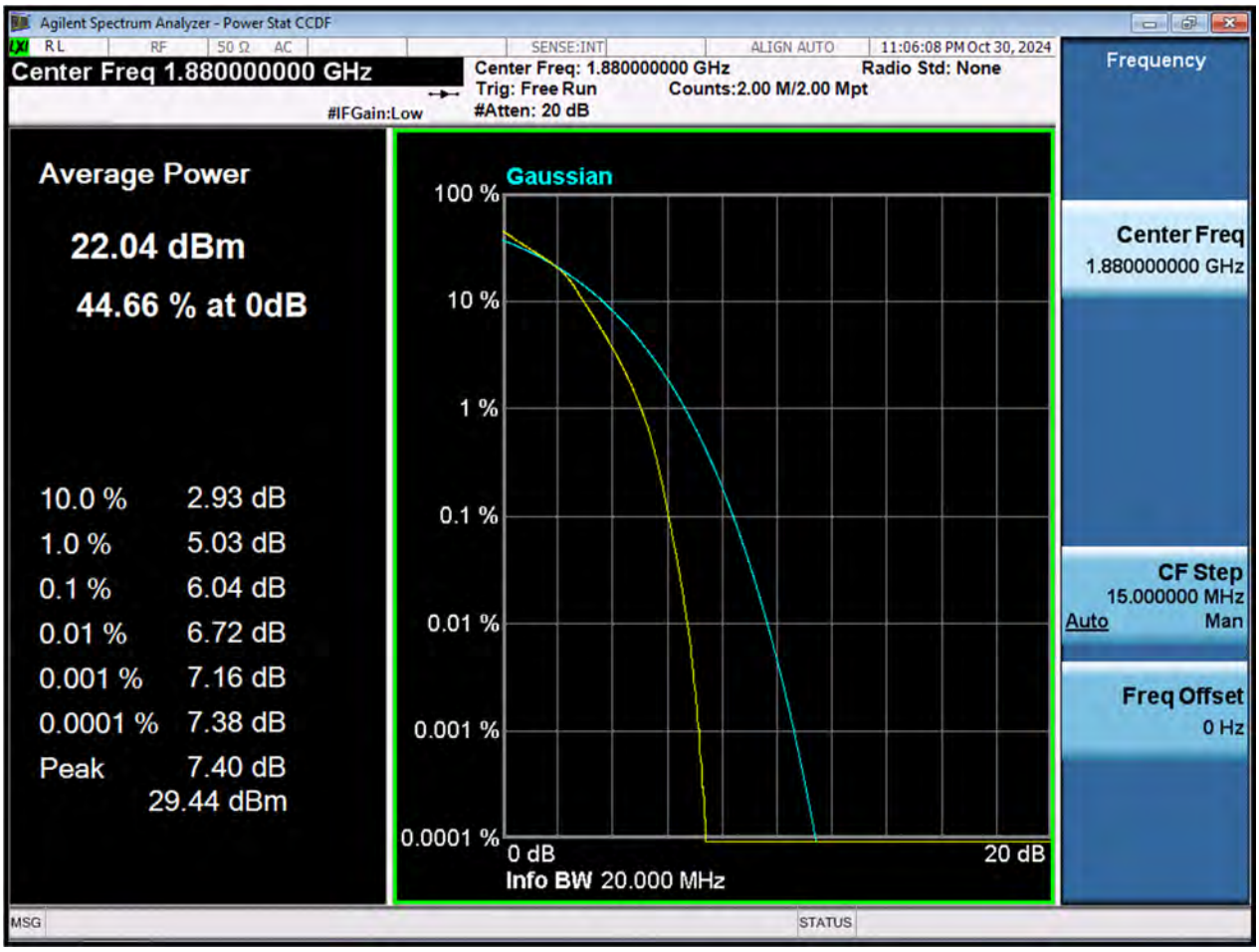
LTE2_15 M_PAR_Middle Channel_256QAM_FullRB



LTE2_20 M_PAR_Middle Channel_QPSK_FullRB



LTE2_20 M_PAR_Middle Channel_16QAM_FullRB



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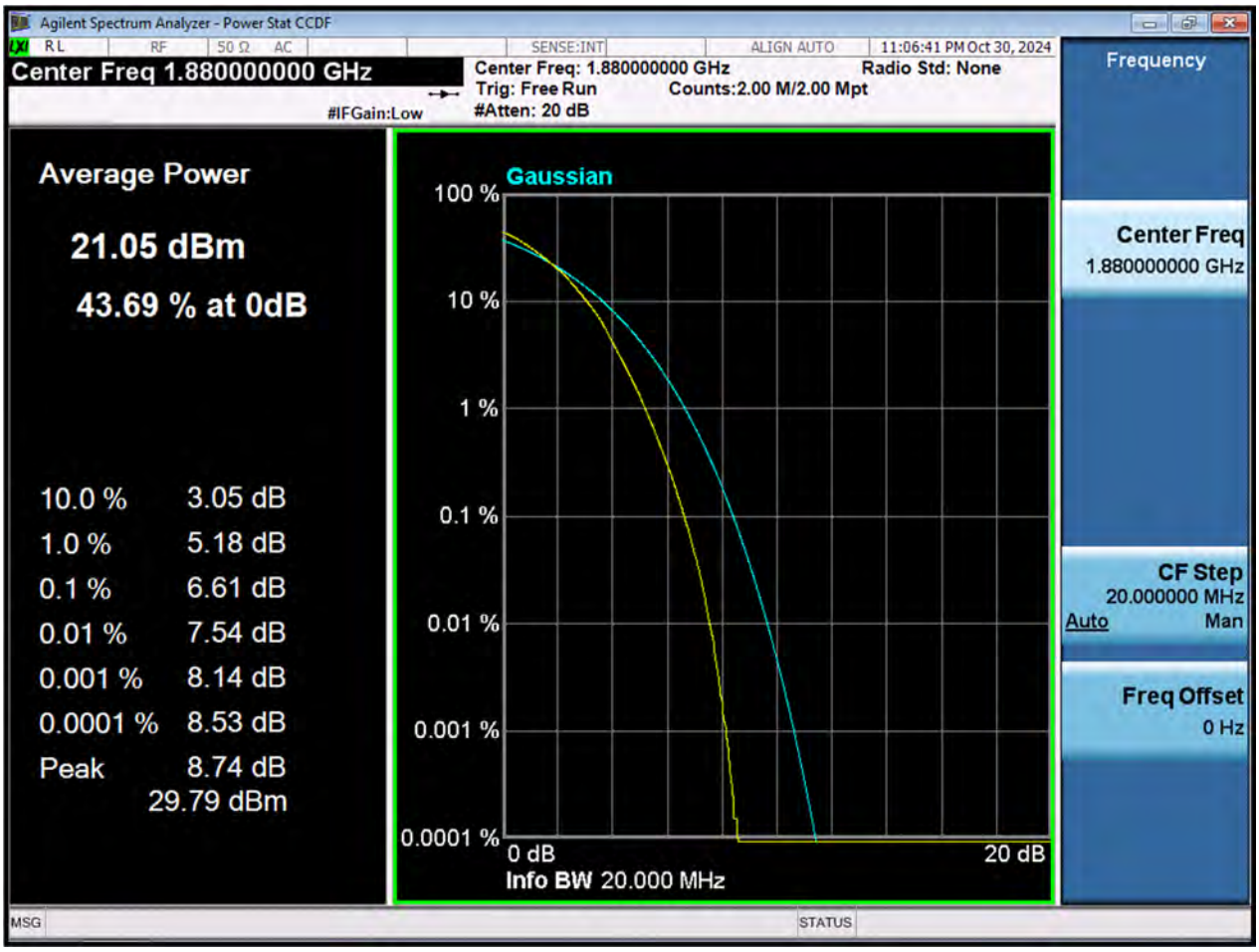
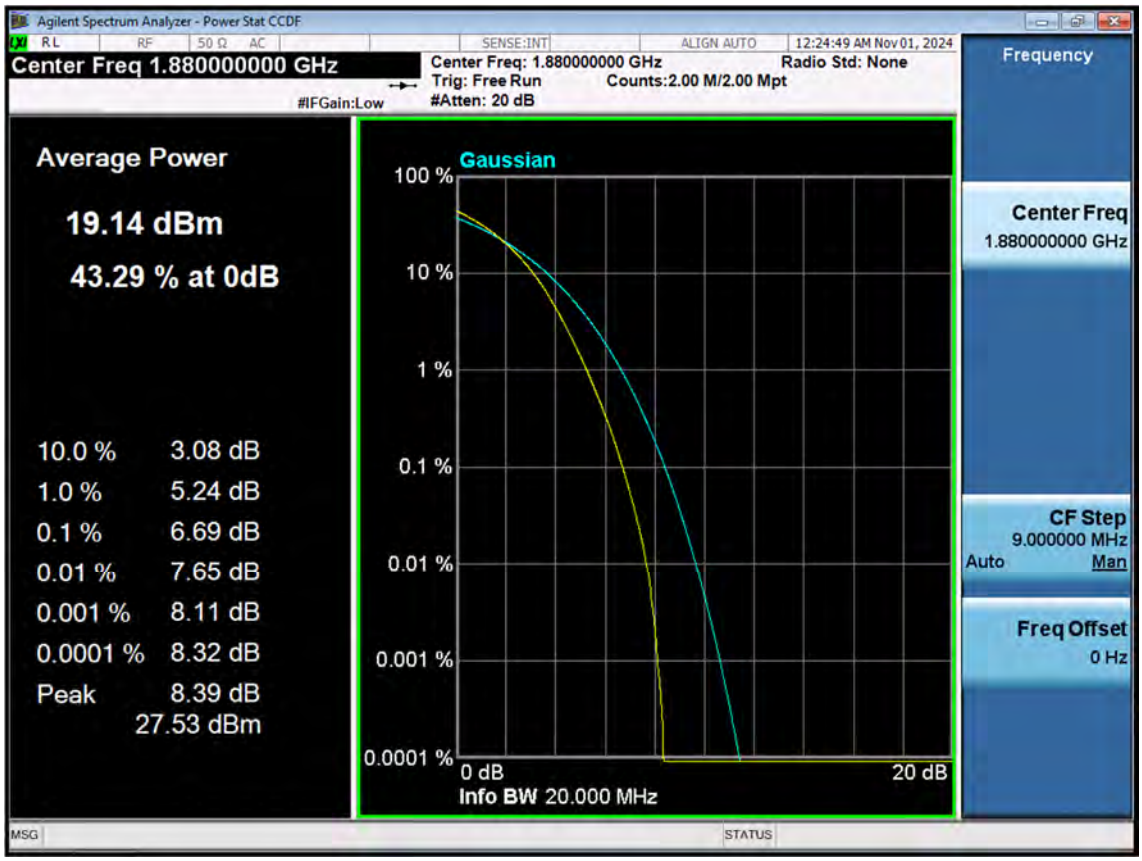
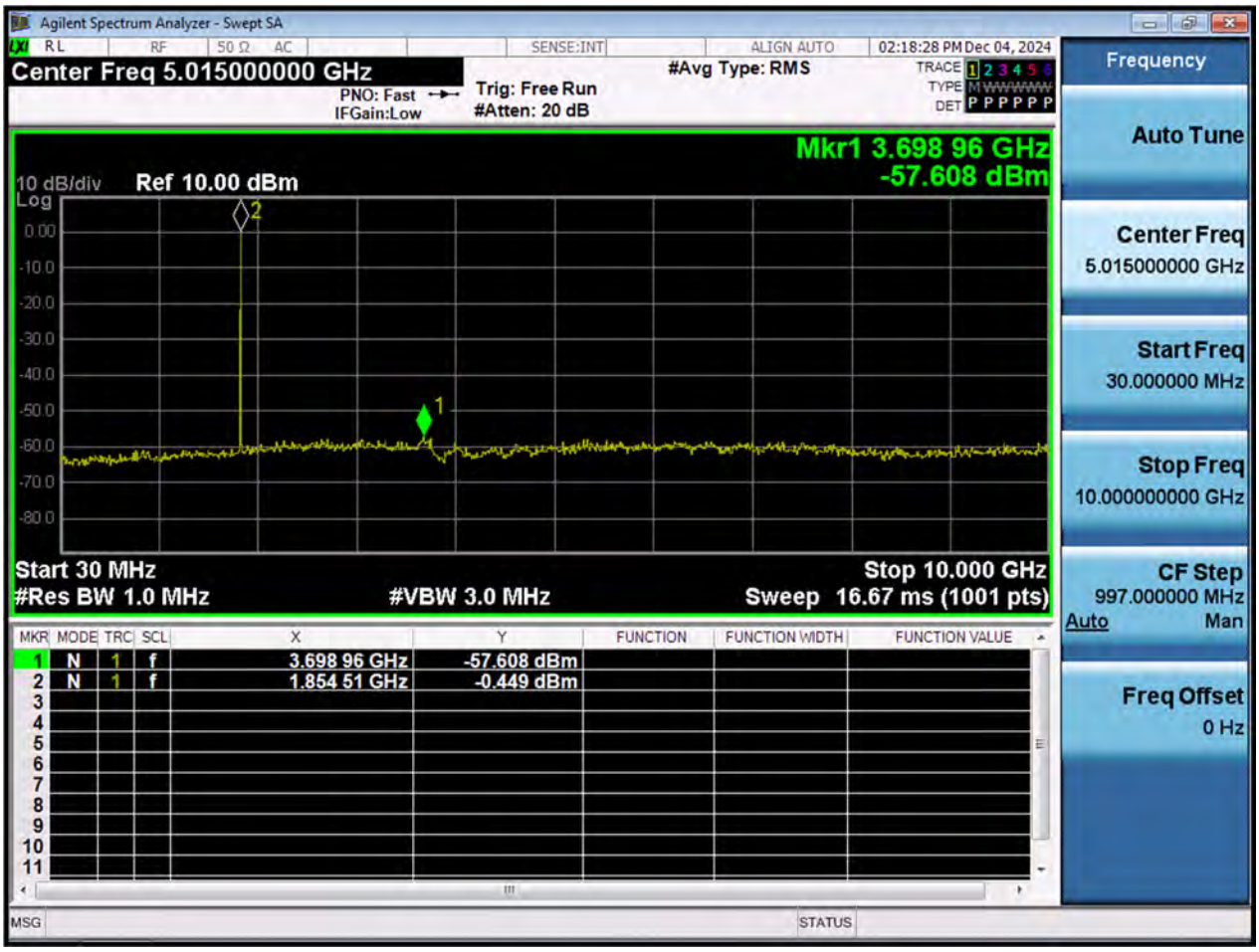


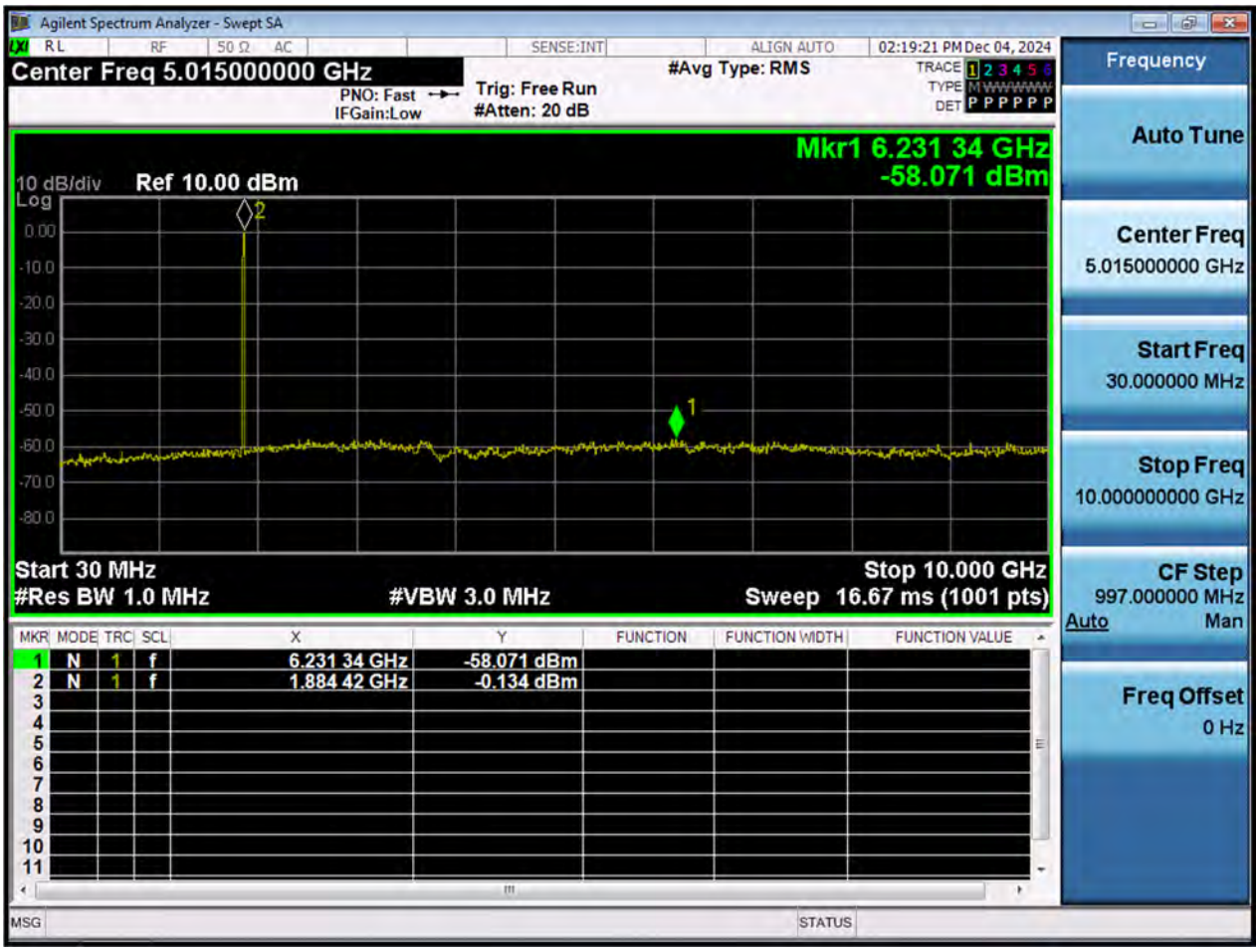
LTE2_20 M_PAR_Middle Channel_256QAM_FullRB



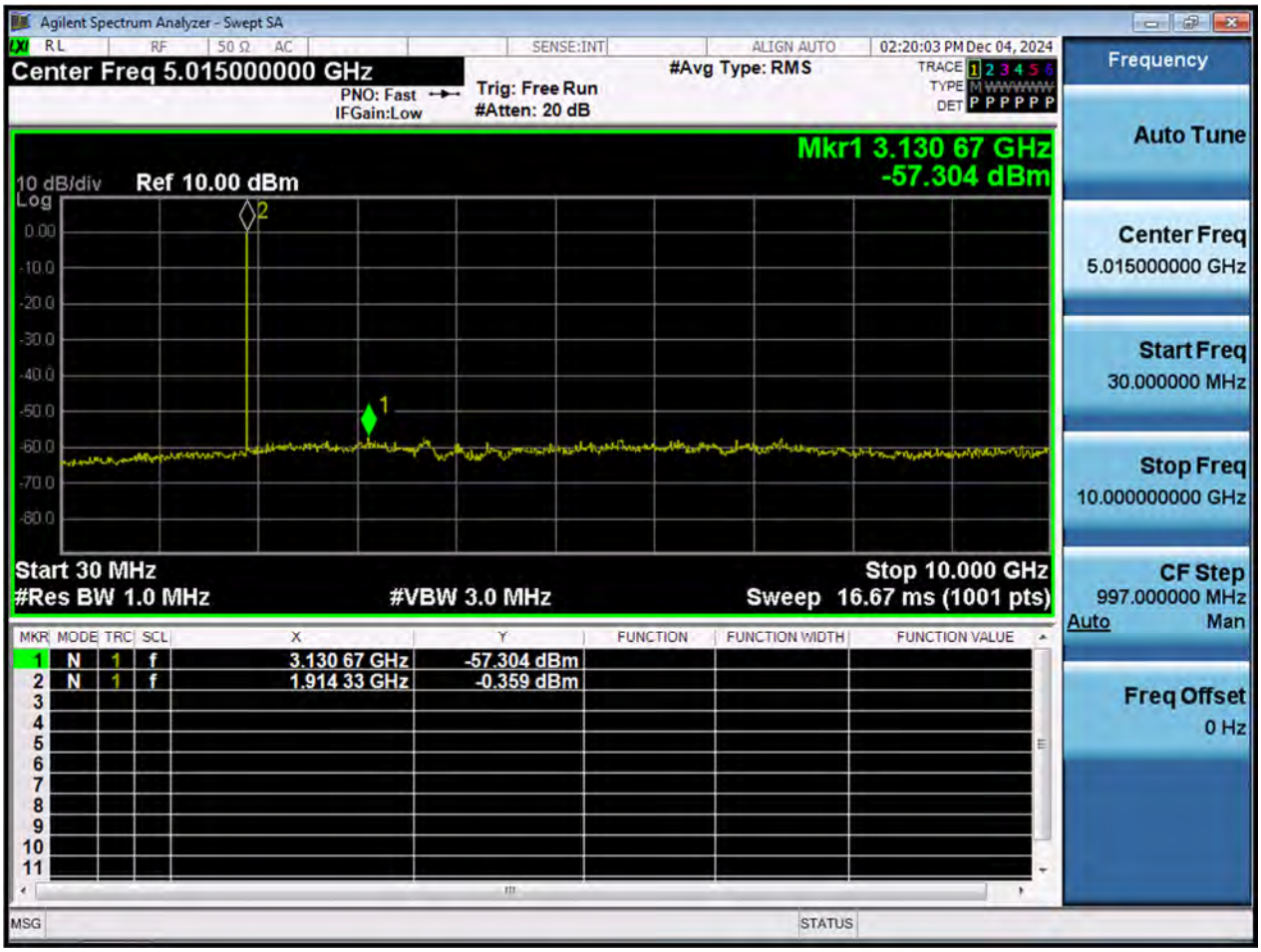
LTE2_1.4 M_CSE(30 M-10 G)_Lowest Channel_QPSK_1RB



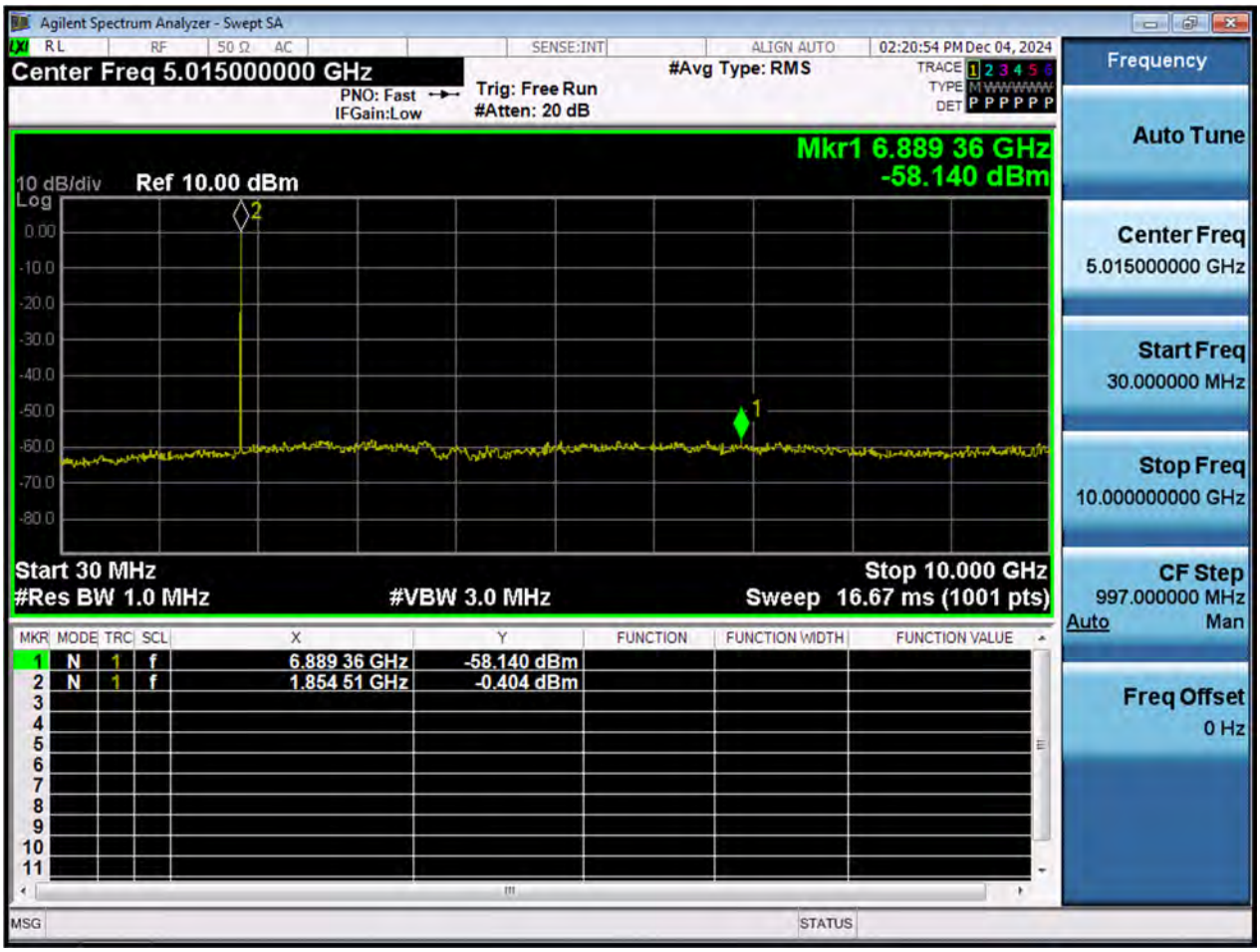
LTE2_1.4 M_CSE(30 M-10 G)_Middle Channel_QPSK_1RB



LTE2_1.4 M_CSE(30 M-10 G)_Highest Channel_QPSK_1RB



LTE2_3 M_CSE(30 M-10 G)_Lowest Channel_QPSK_1RB



LTE2_3 M_CSE(30 M-10 G)_Middle Channel_QPSK_1RB