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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:
July 09, 2020

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

Report No.: HCT-RF-2006-FC077-R1

FCC ID:	**A3LSMN980F**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

According to the Evaluation report, all of the data contained herein is reused from the reference FCC ID : A3LSMN981B report.

Model(s):	SM-N980F/DS
Additional Model(s):	SM-N980F
EUT Type:	Mobile Phone
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§22, §2

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	ERP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band5/26 (1.4)	824.7 – 848.3	1M10G7D	QPSK	0.061	17.85
		1M10W7D	16QAM	0.051	17.05
		1M10W7D	64QAM	0.040	15.97
		1M10W7D	256QAM	0.020	12.94
LTE – Band5/26 (3)	825.5 – 847.5	2M72G7D	QPSK	0.064	18.03
		2M72W7D	16QAM	0.052	17.18
		2M70W7D	64QAM	0.041	16.15
		2M71W7D	256QAM	0.020	13.07
LTE – Band5/26 (5)	826.5 – 846.5	4M51G7D	QPSK	0.065	18.12
		4M51W7D	16QAM	0.053	17.27
		4M51W7D	64QAM	0.042	16.21
		4M52W7D	256QAM	0.021	13.14
LTE – Band5/26 (10)	829.0 – 844.0	8M98G7D	QPSK	0.075	18.76
		9M02W7D	16QAM	0.062	17.92
		9M04W7D	64QAM	0.049	16.88
		8M98W7D	256QAM	0.024	13.78
LTE – Band26 (15)	831.5 – 841.5	13M4G7D	QPSK	0.073	18.61
		13M4W7D	16QAM	0.059	17.71
		13M4W7D	64QAM	0.047	16.71
		13M4W7D	256QAM	0.023	13.67

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

REVIEWED BY

Report prepared by : Se Wook Park
Engineer of Telecommunication Testing Center

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

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

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

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2006-FC077	July 03, 2020	- First Approval Report
HCT-RF-2006-FC077-R1	July 09, 2020	- Added the Calibration date on page 17 - Added the WPS on page 6

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

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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:	A3LSMN980F
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§22, §2
EUT Type:	Mobile Phone
Model(s):	SM-N980F/DS
Additional Model(s):	SM-N980F
Tx Frequency:	824.7 MHz – 848.3 MHz (LTE – Band5 / 26 (1.4 MHz)) 825.5 MHz – 847.5 MHz (LTE – Band5 / 26 (3 MHz)) 826.5 MHz – 846.5 MHz (LTE – Band5 / 26 (5 MHz)) 829.0 MHz – 844.0 MHz (LTE – Band5 / 26 (10 MHz)) 831.5 MHz – 841.5 MHz (LTE – Band 26 (15 MHz))
Date(s) of Tests:	May 07, 2020 ~ June 23, 2020

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

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

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

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- N/A (See SAR Report)
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 RADIATED POWER

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-E-2016 Clause 2.2.17.

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
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 1MHz 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;

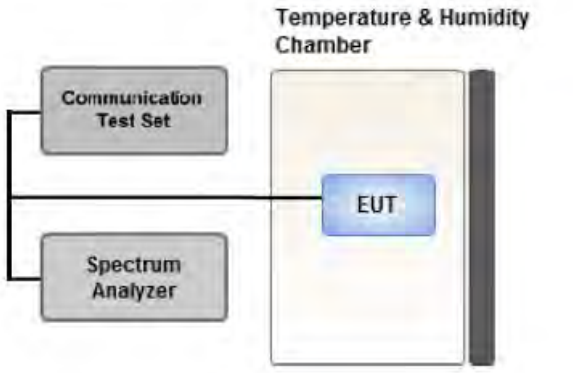
$$Result_{(dBm)} = Pg_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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 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.

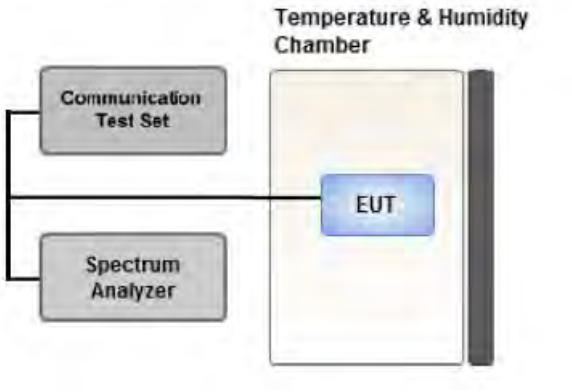
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

Test Overview

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

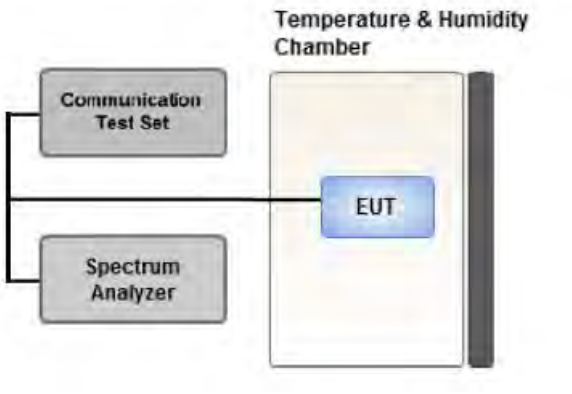
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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

Test Settings

1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = RMS
4. Trace Mode = trace average
5. Sweep time = auto
6. Number of points in sweep ≥ 2 x Span / RBW

3.6 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

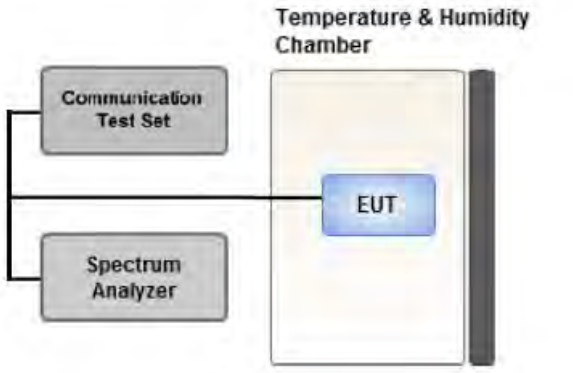
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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.

3.7 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.

3.8 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, and paging service configurations shown in the test data.
- LTE Band 26(1.4M/3M/5M/10M) overlaps the entire frequency range of LTE Band 5(1.4M/3M/5M/10M) and they have the same Tune-up power.
  Therefore, test data provided in this report covers Band 5 as well as Band 26.

-SM-N980F/DS & additional models were tested and the worst case results are reported.

(Worst case : SM-N980F/DS)

[Worst case]

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

3.9 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.
- LTE Band 26(1.4M/3M/5M/10M) overlaps the entire frequency range of LTE Band 5(1.4M/3M/5M/10M) and they have the same Tune-up power.
  Therefore, test data provided in this report covers Band 5 as well as Band 26.
-SM-N980F/DS & additional models were tested and the worst case results are reported.
(Worst case : SM-N980F/DS)

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth	QPSK, 16QAM, 64QAM, 256QAM	1.4, 3, 5, 10, 15	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
		1.4, 3, 5, 10, 15	Low, High	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	QPSK	1.4, 3, 5, 10, 15	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	-	03/09/2020	Annual	03/09/2021
T&M SYSTEM	FBSR-02B(WHK3.3/18G-10EF)/H.P.F	-	03/09/2020	Annual	03/09/2021
WAINWRIGHT INSTRUMENT	WHNX6.0/26.5G-6SS/H.P.F	1	03/19/2020	Annual	03/19/2021
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	04/27/2020	Annual	04/27/2021
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	02/11/2020	Biennial	02/11/2022
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY51110063	04/27/2020	Annual	04/27/2021
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/04/2020	Annual	06/04/2021
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	04/26/2019	Biennial	04/26/2021
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	01/22/2020	Annual	01/22/2021
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/15/2019	Annual	07/15/2020
KEYSIGHT	E7515B / 5G Wireless Tester	MY58300756	01/07/2020	Annual	01/07/2021
KEYSIGHT	N9030B / Signal Analyzer(5Hz~40.0GHz)	MY55480167	06/04/2020	Annual	06/04/2021
Mini-Circuits	ZC4PD-K1844+ / 4-Way Divider	942907	09/05/2019	Annual	09/05/2020
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).
3. Model : 8493C(S/N: 17280)
   - Use date of Equipment : May 07, 2020 ~ June 03, 2020
   - Previous Calibration date : June 04, 2019 ~ June 04, 2020
4. Model : N9030B(S/N: MY55480167)
   - Use date of Equipment : June 07, 2020 ~ June 18, 2020

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, §22.917(a)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§2.1046	N/A	See Note1
Frequency stability / variation of ambient temperature	§2.1055, §22.355	< 2.5 ppm	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
Effective Radiated Power	§22.913(a)(5)	< 7 Watts max. ERP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §22.917(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

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 EFFECTIVE RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
824.7	LTE B5/ 26 (1.4 MHz)	QPSK	-34.24	29.37	-10.24	1.28	H	< 7.00	0.061	17.85
		16-QAM	-35.04	28.57	-10.24	1.28	H		0.051	17.05
		64-QAM	-36.12	27.49	-10.24	1.28	H		0.040	15.97
		256-QAM	-39.15	24.46	-10.24	1.28	H		0.020	12.94
836.5		QPSK	-35.07	29.11	-10.19	1.29	H		0.058	17.63
		16-QAM	-35.79	28.39	-10.19	1.29	H		0.049	16.91
		64-QAM	-36.88	27.30	-10.19	1.29	H		0.038	15.82
		256-QAM	-39.88	24.30	-10.19	1.29	H		0.019	12.82
848.3		QPSK	-36.73	27.26	-10.14	1.30	H		0.038	15.82
		16-QAM	-37.53	26.46	-10.14	1.30	H		0.032	15.02
		64-QAM	-38.61	25.38	-10.14	1.30	H		0.025	13.94
		256-QAM	-41.58	22.41	-10.14	1.30	H		0.012	10.97

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
825.5	LTE B5/ 26 (3 MHz)	QPSK	-34.09	29.55	-10.24	1.28	H	< 7.00	0.064	18.03
		16-QAM	-34.94	28.70	-10.24	1.28	H		0.052	17.18
		64-QAM	-35.97	27.67	-10.24	1.28	H		0.041	16.15
		256-QAM	-39.05	24.59	-10.24	1.28	H		0.020	13.07
836.5		QPSK	-34.94	29.24	-10.19	1.29	H		0.060	17.76
		16-QAM	-35.72	28.46	-10.19	1.29	H		0.050	16.98
		64-QAM	-36.76	27.42	-10.19	1.29	H		0.039	15.94
		256-QAM	-39.81	24.37	-10.19	1.29	H		0.019	12.89
847.5		QPSK	-36.65	27.38	-10.15	1.30	H		0.039	15.93
		16-QAM	-37.49	26.54	-10.15	1.30	H		0.032	15.09
		64-QAM	-38.47	25.56	-10.15	1.30	H		0.026	14.11
		256-QAM	-41.60	22.43	-10.15	1.30	H		0.013	10.98

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
826.5	LTE B5/ 26 (5 MHz)	QPSK	-34.08	29.63	-10.24	1.28	H	< 7.00	0.065	18.12
		16-QAM	-34.93	28.78	-10.24	1.28	H		0.053	17.27
		64-QAM	-35.99	27.72	-10.24	1.28	H		0.042	16.21
		256-QAM	-39.06	24.65	-10.24	1.28	H		0.021	13.14
836.5		QPSK	-34.81	29.37	-10.19	1.29	H		0.062	17.89
		16-QAM	-35.54	28.64	-10.19	1.29	H		0.052	17.16
		64-QAM	-36.64	27.54	-10.19	1.29	H		0.040	16.06
		256-QAM	-39.69	24.49	-10.19	1.29	H		0.020	13.01
846.5		QPSK	-36.46	27.77	-10.15	1.30	H		0.043	16.32
		16-QAM	-37.31	26.92	-10.15	1.30	H		0.035	15.47
		64-QAM	-38.38	25.85	-10.15	1.30	H		0.028	14.40
		256-QAM	-41.51	22.72	-10.15	1.30	H		0.013	11.27

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
829.0	LTE B5/ 26 (10 MHz)	QPSK	-33.55	30.26	-10.22	1.28	H	< 7.00	0.075	18.76
		16-QAM	-34.39	29.42	-10.22	1.28	H		0.062	17.92
		64-QAM	-35.43	28.38	-10.22	1.28	H		0.049	16.88
		256-QAM	-38.53	25.28	-10.22	1.28	H		0.024	13.78
836.5		QPSK	-34.55	29.63	-10.19	1.29	H		0.065	18.15
		16-QAM	-35.37	28.81	-10.19	1.29	H		0.054	17.33
		64-QAM	-36.38	27.80	-10.19	1.29	H		0.043	16.32
		256-QAM	-39.42	24.76	-10.19	1.29	H		0.021	13.28
844.0		QPSK	-35.88	28.26	-10.16	1.30	H		0.048	16.80
		16-QAM	-36.70	27.44	-10.16	1.30	H		0.040	15.98
		64-QAM	-37.76	26.38	-10.16	1.30	H		0.031	14.92
		256-QAM	-40.84	23.30	-10.16	1.30	H		0.015	11.84

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
831.5	LTE B26 (15 MHz)	QPSK	-33.26	30.74	-10.21	1.29	H	< 7.00	0.073	18.61
		16-QAM	-34.05	29.95	-10.21	1.29	H		0.059	17.71
		64-QAM	-35.79	28.21	-10.21	1.29	H		0.047	16.71
		256-QAM	-38.83	25.17	-10.21	1.29	H		0.023	13.67
836.5		QPSK	-33.37	30.81	-10.19	1.29	H		0.070	18.43
		16-QAM	-34.17	30.01	-10.19	1.29	H		0.058	17.61
		64-QAM	-36.10	28.08	-10.19	1.29	H		0.046	16.60
		256-QAM	-39.13	25.05	-10.19	1.29	H		0.023	13.57
841.5		QPSK	-33.85	30.31	-10.17	1.30	H		0.056	17.46
		16-QAM	-34.69	29.47	-10.17	1.30	H		0.047	16.73
		64-QAM	-36.94	27.22	-10.17	1.30	H		0.038	15.75
		256-QAM	-40.02	24.14	-10.17	1.30	H		0.019	12.67

8.2 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B5/ 26

▣ MODULATION SIGNAL: 1.4 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit
26797 (824.7)	1,649.40	-50.96	9.50	-61.72	1.84	V	-54.06	-13.00
	2,474.10	-54.64	10.60	-59.57	2.29	V	-51.26	-13.00
	3,298.80	-56.10	12.30	-58.04	2.69	H	-48.43	-13.00
26915 (836.5)	1,673.00	-52.32	9.65	-63.08	1.86	V	-55.29	-13.00
	2,509.50	-53.52	10.75	-58.63	2.32	H	-50.20	-13.00
	3,346.00	-57.28	12.48	-58.93	2.70	V	-49.16	-13.00
27033 (848.3)	1,696.60	-51.23	9.77	-61.66	1.87	H	-53.77	-13.00
	2,544.90	-54.47	10.88	-58.58	2.32	H	-50.02	-13.00
	3,393.20	-57.64	12.65	-59.59	2.71	H	-49.65	-13.00

▣ MODE: LTE B5/ 26

▣ MODULATION SIGNAL: 3 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit
26805 (825.5)	1,651.00	-52.13	9.50	-62.89	1.84	H	-55.23	-13.00
	2,476.50	-53.76	10.60	-58.69	2.29	H	-50.38	-13.00
	3,302.00	-56.53	12.30	-58.47	2.69	H	-48.86	-13.00
26915 (836.5)	1,673.00	-53.12	9.65	-63.88	1.86	H	-56.09	-13.00
	2,509.50	-54.40	10.75	-59.51	2.32	H	-51.08	-13.00
	3,346.00	-56.63	12.48	-58.28	2.70	V	-48.51	-13.00
27025 (847.5)	1,695.00	-52.36	9.77	-62.80	1.87	H	-54.90	-13.00
	2,542.50	-54.40	10.85	-58.26	2.32	H	-49.73	-13.00
	3,390.00	-57.41	12.65	-59.36	2.71	V	-49.42	-13.00

▣ MODE: LTE B5/ 26

▣ MODULATION SIGNAL: 5 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit
26815 (826.5)	1,653.00	-52.70	9.54	-63.50	1.85	V	-55.81	-13.00
	2,479.50	-55.80	10.60	-60.61	2.30	H	-52.31	-13.00
	3,306.00	-57.25	12.33	-59.24	2.69	V	-49.60	-13.00
26915 (836.5)	1,673.00	-52.37	9.65	-63.13	1.86	V	-55.34	-13.00
	2,509.50	-55.28	10.75	-60.39	2.32	V	-51.96	-13.00
	3,346.00	-57.76	12.48	-59.41	2.70	V	-49.64	-13.00
27015 (846.5)	1,693.00	-52.20	9.73	-62.82	1.87	V	-54.96	-13.00
	2,539.50	-55.17	10.85	-59.03	2.32	H	-50.50	-13.00
	3,386.00	-58.23	12.63	-60.23	2.72	H	-50.32	-13.00

▣ MODE: LTE B5/ 26

▣ MODULATION SIGNAL: 10 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit
26840 (829.0)	1658.00	-52.26	9.58	-63.10	1.85	V	-55.37	-13.00
	2487.00	-54.21	10.65	-59.35	2.30	H	-51.00	-13.00
	3316.00	-57.35	12.38	-59.20	2.68	H	-49.50	-13.00
26915 (836.5)	1673.00	-52.66	9.65	-63.42	1.86	V	-55.63	-13.00
	2509.50	-53.84	10.75	-58.95	2.32	H	-50.52	-13.00
	3346.00	-57.03	12.48	-58.68	2.70	V	-48.91	-13.00
26990 (844.0)	1688.00	-52.58	9.73	-63.20	1.87	H	-55.34	-13.00
	2532.00	-55.22	10.80	-59.96	2.33	V	-51.49	-13.00
	3376.00	-57.83	12.60	-59.84	2.72	H	-49.96	-13.00

▣ MODE: LTE B26

▣ MODULATION SIGNAL: 15 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit
26865 (831.5)	1663.00	-51.13	9.58	-61.97	1.85	H	-54.24	-13.00
	2494.50	-54.28	10.68	-59.39	2.31	H	-51.02	-13.00
	3326.00	-57.71	12.40	-59.58	2.69	H	-49.86	-13.00
26915 (836.5)	1673.00	-52.96	9.65	-63.72	1.86	H	-55.93	-13.00
	2509.50	-54.33	10.75	-59.44	2.32	H	-51.01	-13.00
	3346.00	-56.89	12.48	-58.54	2.70	V	-48.77	-13.00
26965 (841.5)	1683.00	-51.99	9.65	-62.67	1.86	V	-54.88	-13.00
	2524.50	-54.48	10.80	-59.15	2.33	H	-50.67	-13.00
	3366.00	-55.42	12.58	-57.23	2.72	V	-47.38	-13.00

8.3 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
5/ 26	1.4 MHz	836.5	QPSK	6	0	1.0968
			16-QAM			1.0983
			64-QAM			1.0980
			256-QAM			1.0961
	3 MHz		QPSK	15		2.7216
			16-QAM			2.7202
			64-QAM			2.7041
			256-QAM			2.7061
	5 MHz		QPSK	25		4.5117
			16-QAM			4.5098
			64-QAM			4.5102
			256-QAM			4.5205
	10 MHz		QPSK	50		8.9838
			16-QAM			9.0189
			64-QAM			9.0371
			256-QAM			8.9820
26	15 MHz		QPSK	75		13.437
			16-QAM			13.438
			64-QAM			13.425
			256-QAM			13.436

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 38 ~ 57.

8.4 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
5/ 26	1.4	824.7	3.6750	27.976	-67.444	-39.468	-13.00
		836.5	3.6890	27.976	-67.368	-39.392	
		848.3	3.6730	27.976	-67.245	-39.269	
	3	825.5	3.7214	27.976	-66.939	-38.963	
		836.5	3.7089	27.976	-66.829	-38.853	
		847.5	3.6980	27.976	-67.231	-39.255	
	5	826.5	3.7304	27.976	-67.415	-39.439	
		836.5	3.6780	27.976	-67.402	-39.426	
		846.5	3.7164	27.976	-67.302	-39.326	
	10	829.0	3.6740	27.976	-67.452	-39.476	
		836.5	3.7114	27.976	-67.311	-39.335	
		844.0	3.6810	27.976	-67.418	-39.442	
26	15	831.5	3.6920	27.976	-67.538	-39.562	
		836.5	3.7154	27.976	-67.214	-39.238	
		841.5	3.6870	27.976	-67.507	-39.531	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 88 ~ 102.
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 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 58 ~ 87.

8.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE B5/ 26

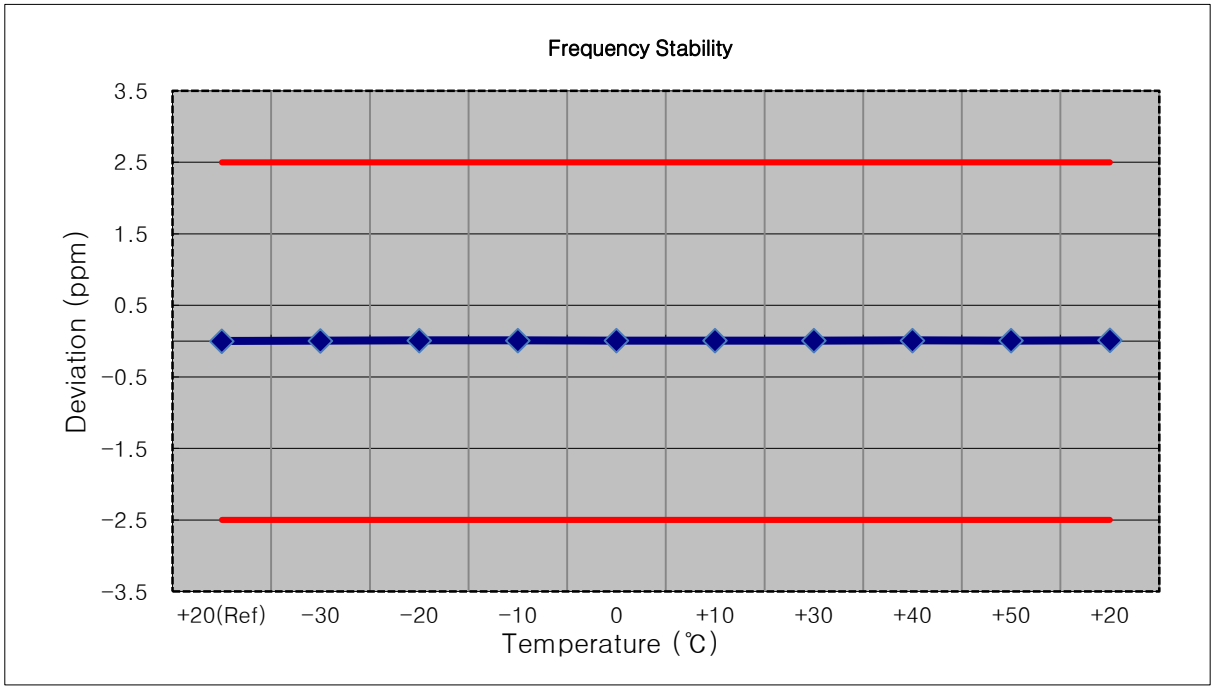
▣ OPERATING FREQUENCY: 836,500,000 Hz

▣ CHANNEL: 26915 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.88 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	836 500 006	0.0	0.000 000	0.000
100%		-30	836 500 011	4.7	0.000 001	0.006
100%		-20	836 500 013	7.4	0.000 001	0.009
100%		-10	836 500 013	7.4	0.000 001	0.009
100%		0	836 500 013	6.6	0.000 001	0.008
100%		+10	836 500 013	6.6	0.000 001	0.008
100%		+30	836 500 012	5.9	0.000 001	0.007
100%		+40	836 500 013	6.9	0.000 001	0.008
100%		+50	836 500 013	6.6	0.000 001	0.008
Batt. Endpoint	3.400	+20	836 500 016	10.0	0.000 001	0.012



▣ MODE: LTE B5/ 26

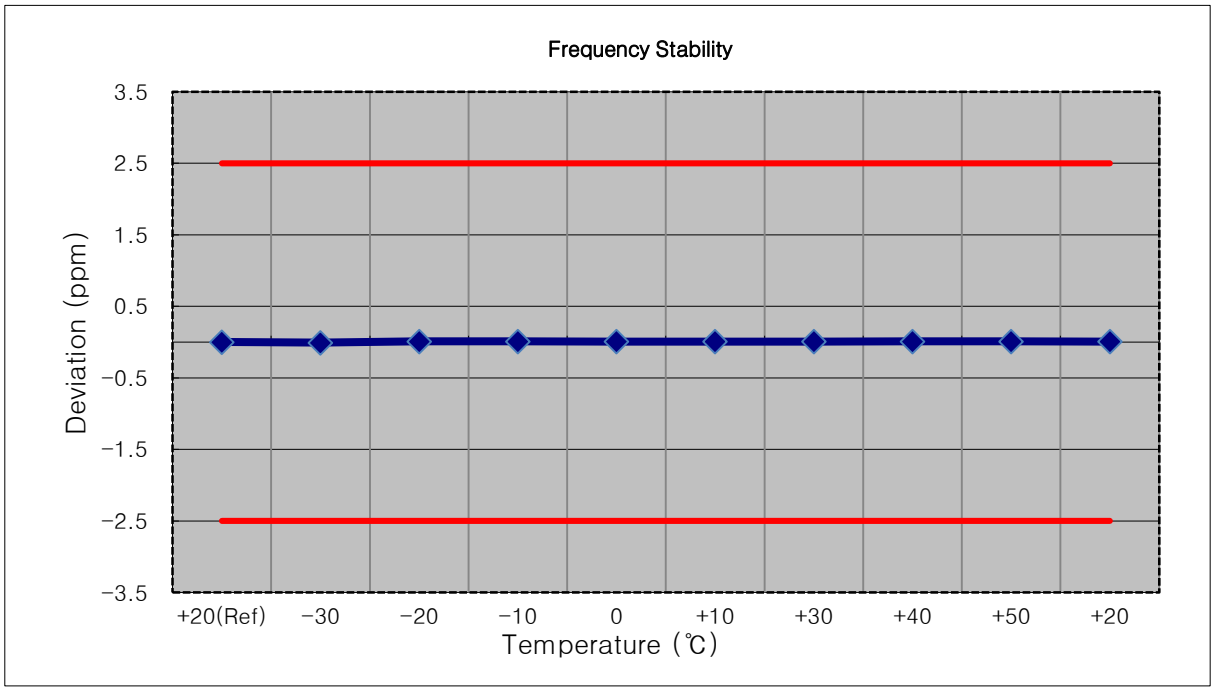
▣ OPERATING FREQUENCY: 836,500,000 Hz

▣ CHANNEL: 26915 (3 MHz)

▣ REFERENCE VOLTAGE: 3.88 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	836 500 006	0.0	0.000 000	0.000
100%		-30	836 500 000	-6.8	-0.000 001	-0.008
100%		-20	836 500 014	7.4	0.000 001	0.009
100%		-10	836 500 013	7.0	0.000 001	0.008
100%		0	836 500 013	6.5	0.000 001	0.008
100%		+10	836 500 013	6.8	0.000 001	0.008
100%		+30	836 500 013	6.4	0.000 001	0.008
100%		+40	836 500 014	8.1	0.000 001	0.010
100%		+50	836 500 015	8.4	0.000 001	0.010
Batt. Endpoint	3.400	+20	836 500 013	6.8	0.000 001	0.008



▣ MODE: LTE B5/ 26

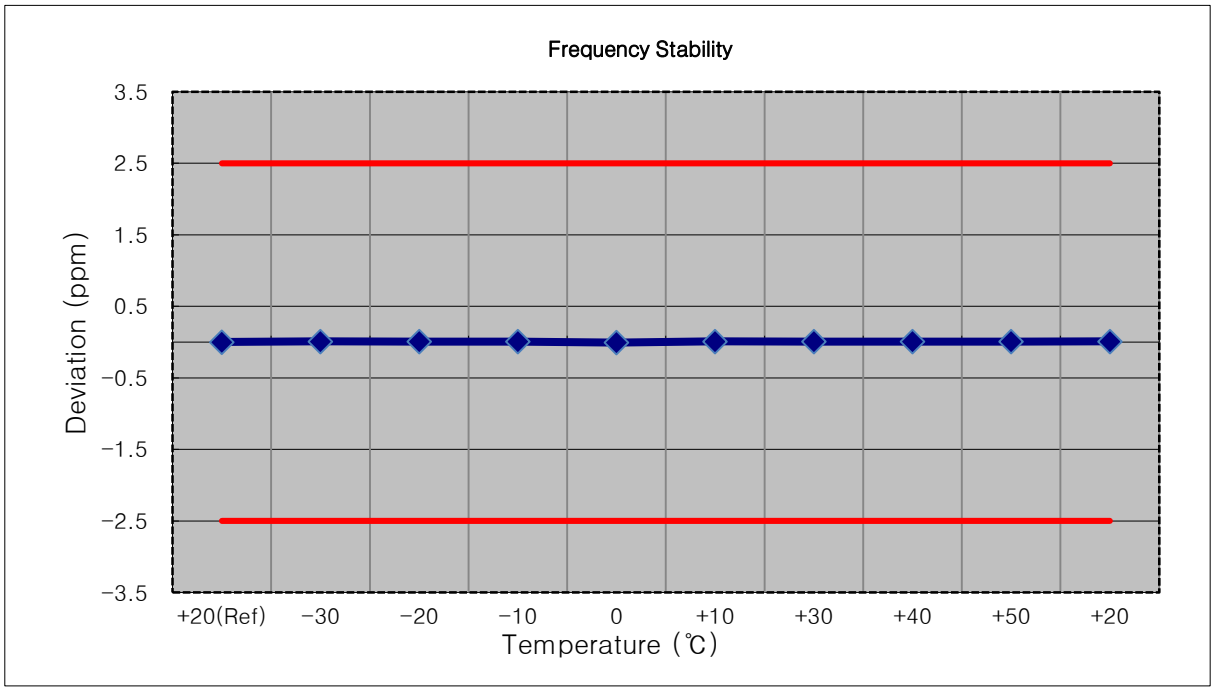
▣ OPERATING FREQUENCY: 836,500,000 Hz

▣ CHANNEL: 26915 (5 MHz)

▣ REFERENCE VOLTAGE: 3.88 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	836 500 006	0.0	0.000 000	0.000
100%		-30	836 500 013	7.4	0.000 001	0.009
100%		-20	836 500 012	5.9	0.000 001	0.007
100%		-10	836 500 012	6.5	0.000 001	0.008
100%		0	836 500 000	-5.8	-0.000 001	-0.007
100%		+10	836 500 013	7.3	0.000 001	0.009
100%		+30	836 500 011	5.1	0.000 001	0.006
100%		+40	836 500 011	5.4	0.000 001	0.006
100%		+50	836 500 012	6.2	0.000 001	0.007
Batt. Endpoint	3.400	+20	836 500 013	7.3	0.000 001	0.009



▣ MODE: LTE B5/ 26

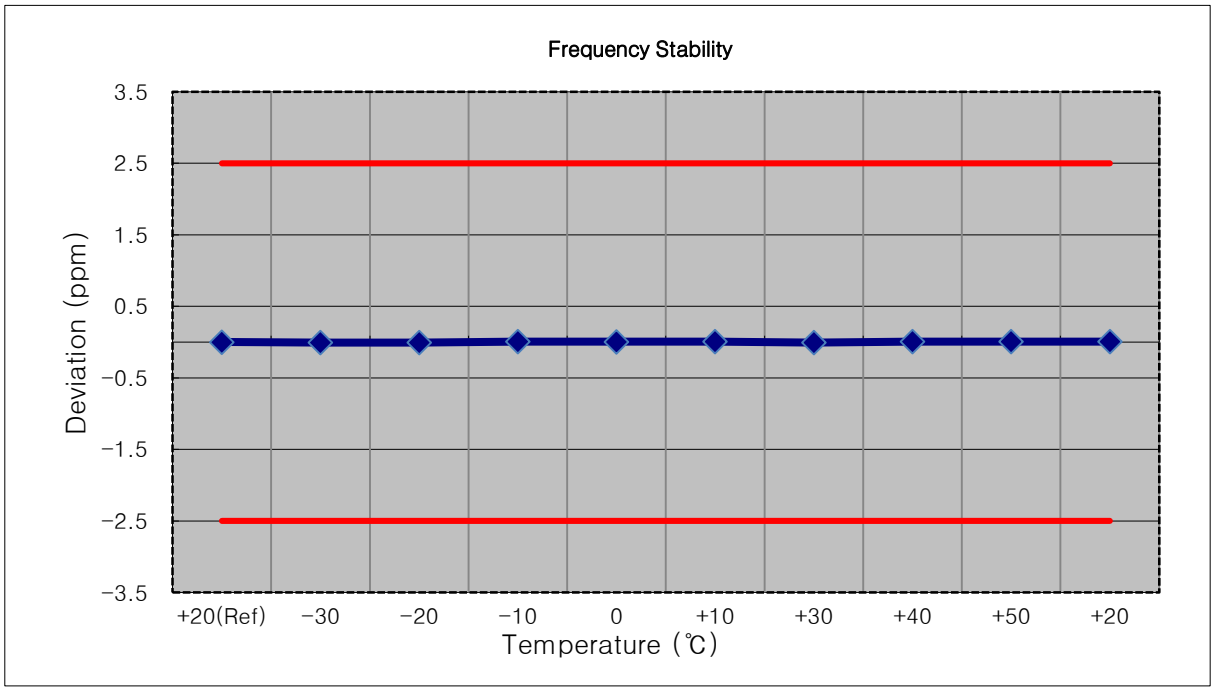
▣ OPERATING FREQUENCY: 836,500,000 Hz

▣ CHANNEL: 26915 (10 MHz)

▣ REFERENCE VOLTAGE: 3.88 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	836 500 006	0.0	0.000 000	0.000
100%		-30	836 500 000	-5.3	-0.000 001	-0.006
100%		-20	836 500 001	-4.6	-0.000 001	-0.005
100%		-10	836 500 012	6.3	0.000 001	0.008
100%		0	836 500 010	4.5	0.000 001	0.005
100%		+10	836 500 011	5.4	0.000 001	0.006
100%		+30	836 500 000	-6.2	-0.000 001	-0.007
100%		+40	836 500 012	6.1	0.000 001	0.007
100%		+50	836 500 011	5.5	0.000 001	0.007
Batt. Endpoint	3.400	+20	836 500 012	6.7	0.000 001	0.008



▣ MODE: LTE B26

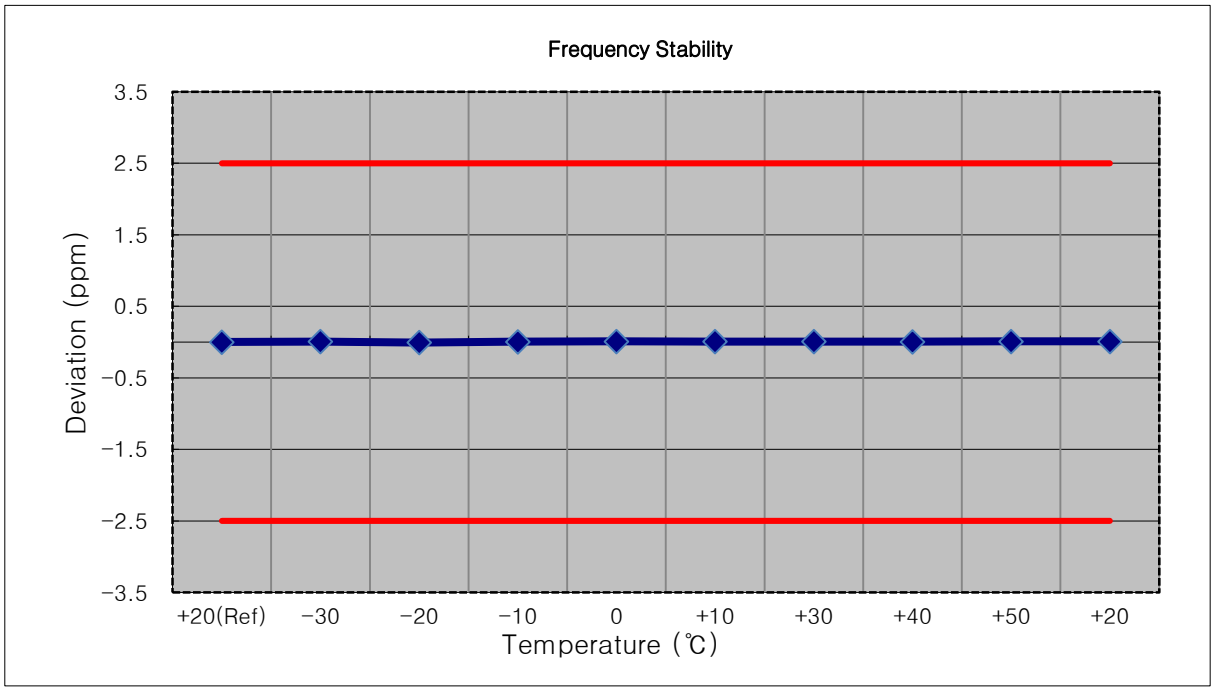
▣ OPERATING FREQUENCY: 836,500,000 Hz

▣ CHANNEL: 26915 (15 MHz)

▣ REFERENCE VOLTAGE: 3.85 VDC

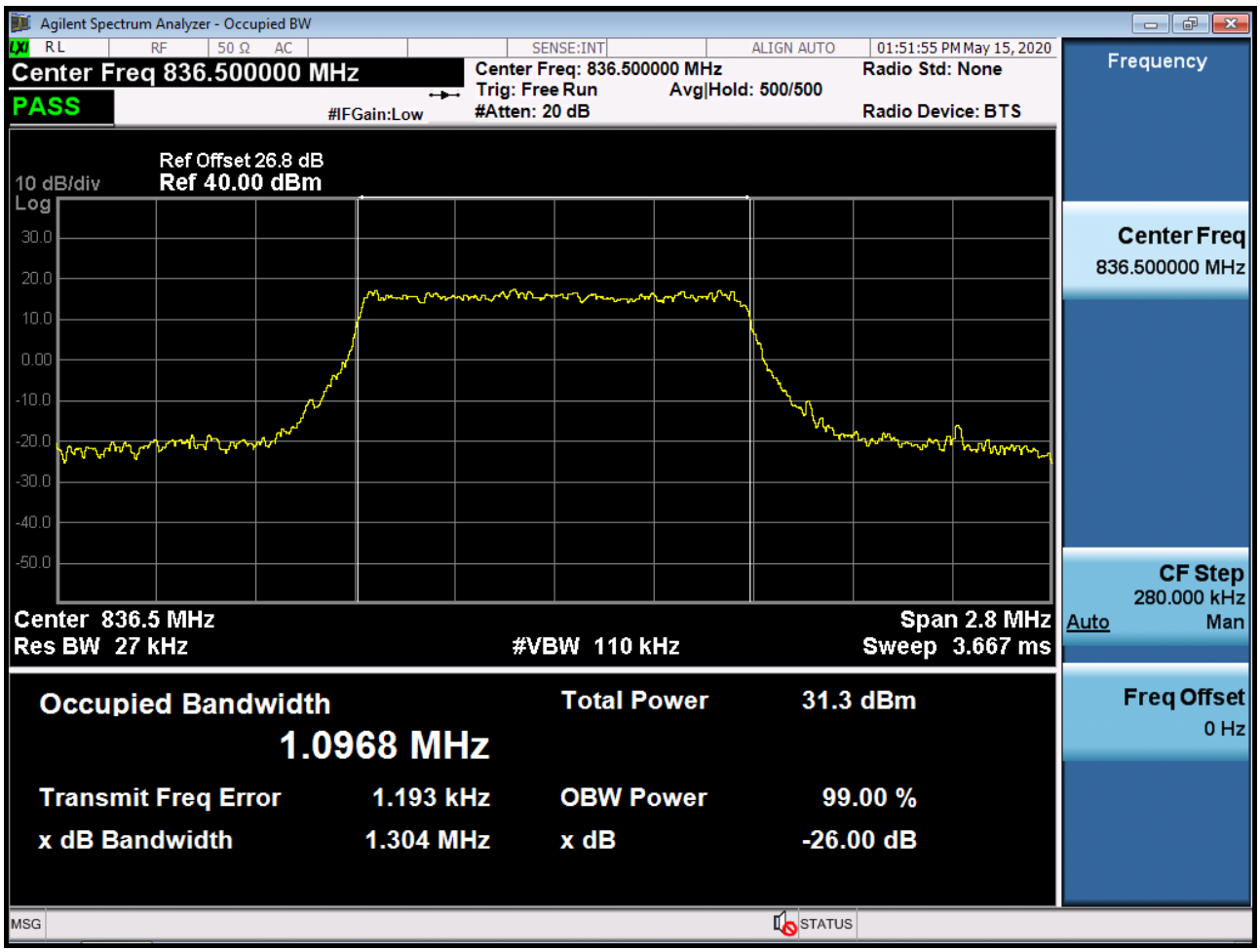
▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.880	+20(Ref)	836 500 007	0.0	0.000 000	0.000
100%		-30	836 500 012	6.1	0.000 001	0.007
100%		-20	836 500 000	-5.5	-0.000 001	-0.007
100%		-10	836 500 010	4.3	0.000 001	0.005
100%		0	836 500 013	7.6	0.000 001	0.009
100%		+10	836 500 011	5.3	0.000 001	0.006
100%		+30	836 500 012	6.7	0.000 001	0.008
100%		+40	836 500 010	4.7	0.000 001	0.006
100%		+50	836 500 013	7.3	0.000 001	0.009
Batt. Endpoint	3.400	+20	836 500 014	7.8	0.000 001	0.009

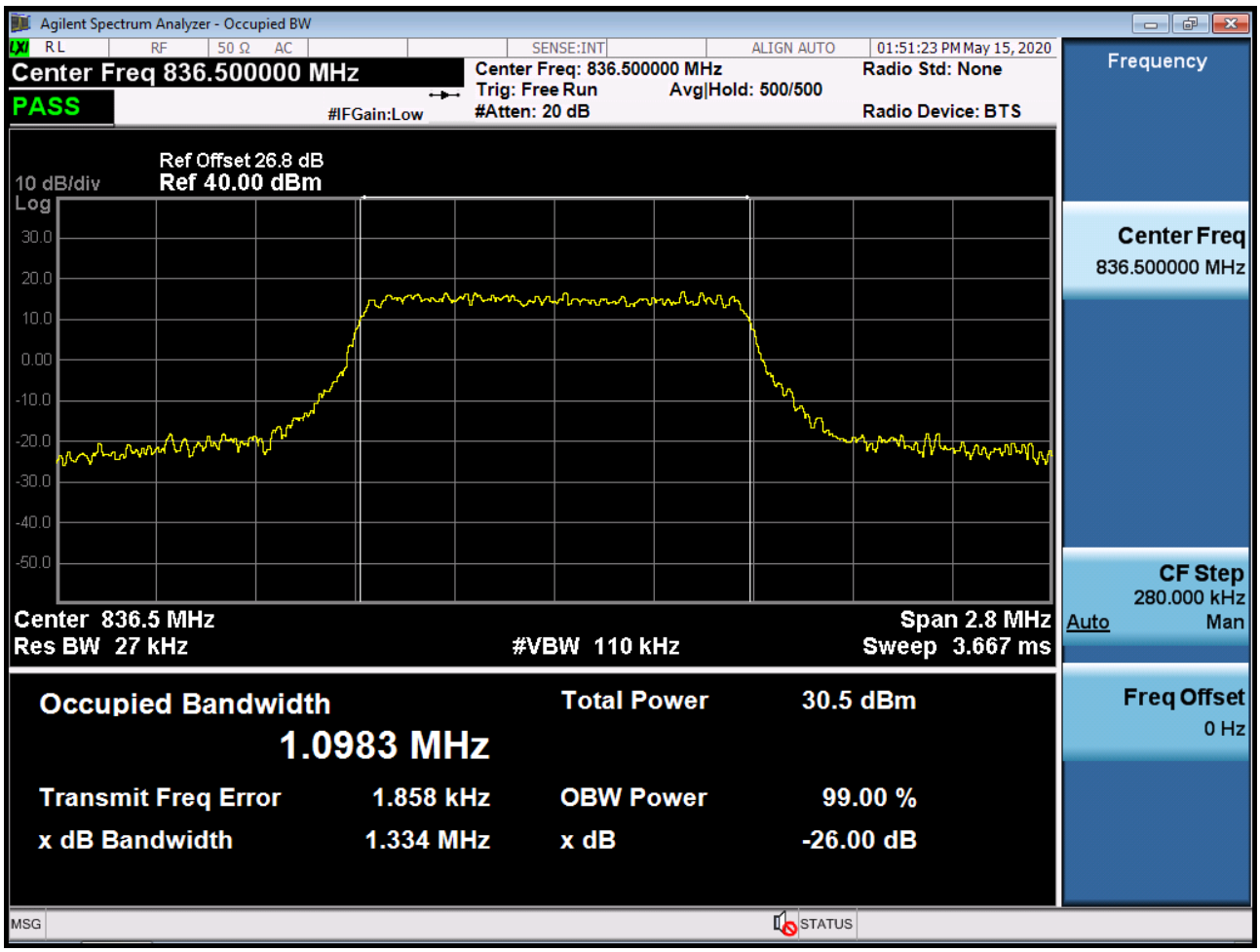


9. TEST PLOTS

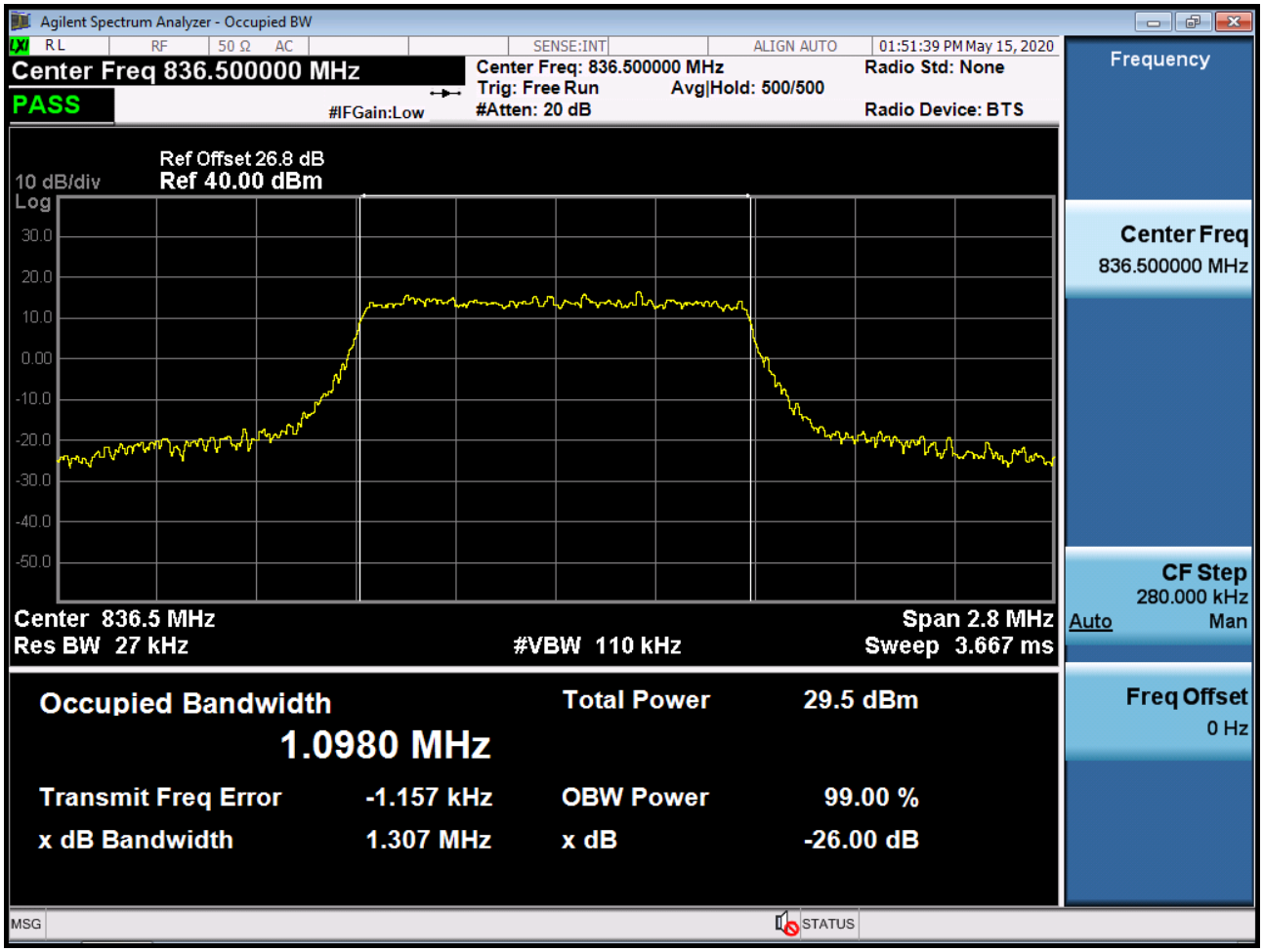
BAND5/ 26. Occupied Bandwidth Plot (1.4M BW Ch.26915 QPSK_RB6_0)



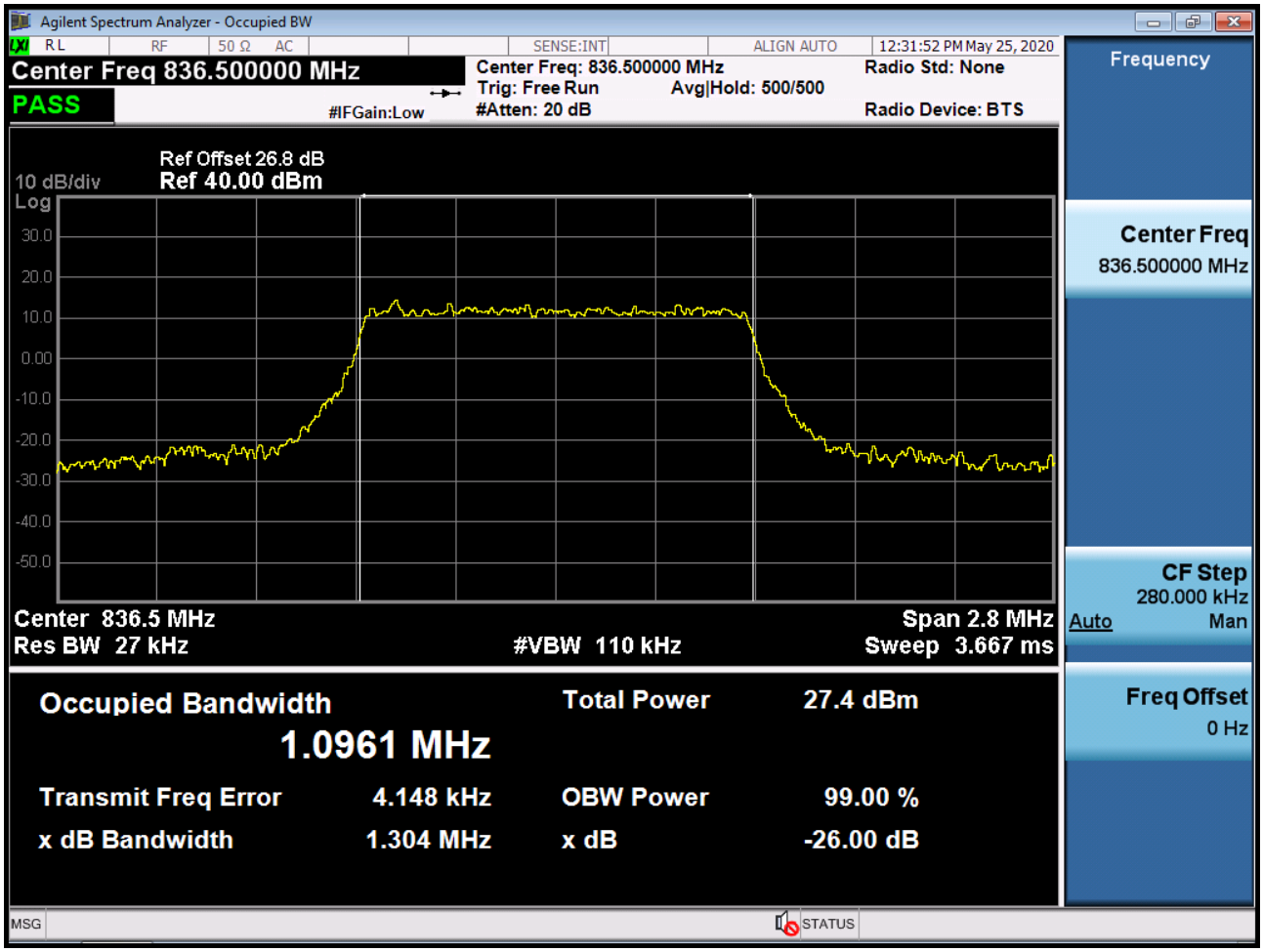
BAND5/ 26. Occupied Bandwidth Plot (1.4M BW Ch.26915 16QAM_RB6_0)



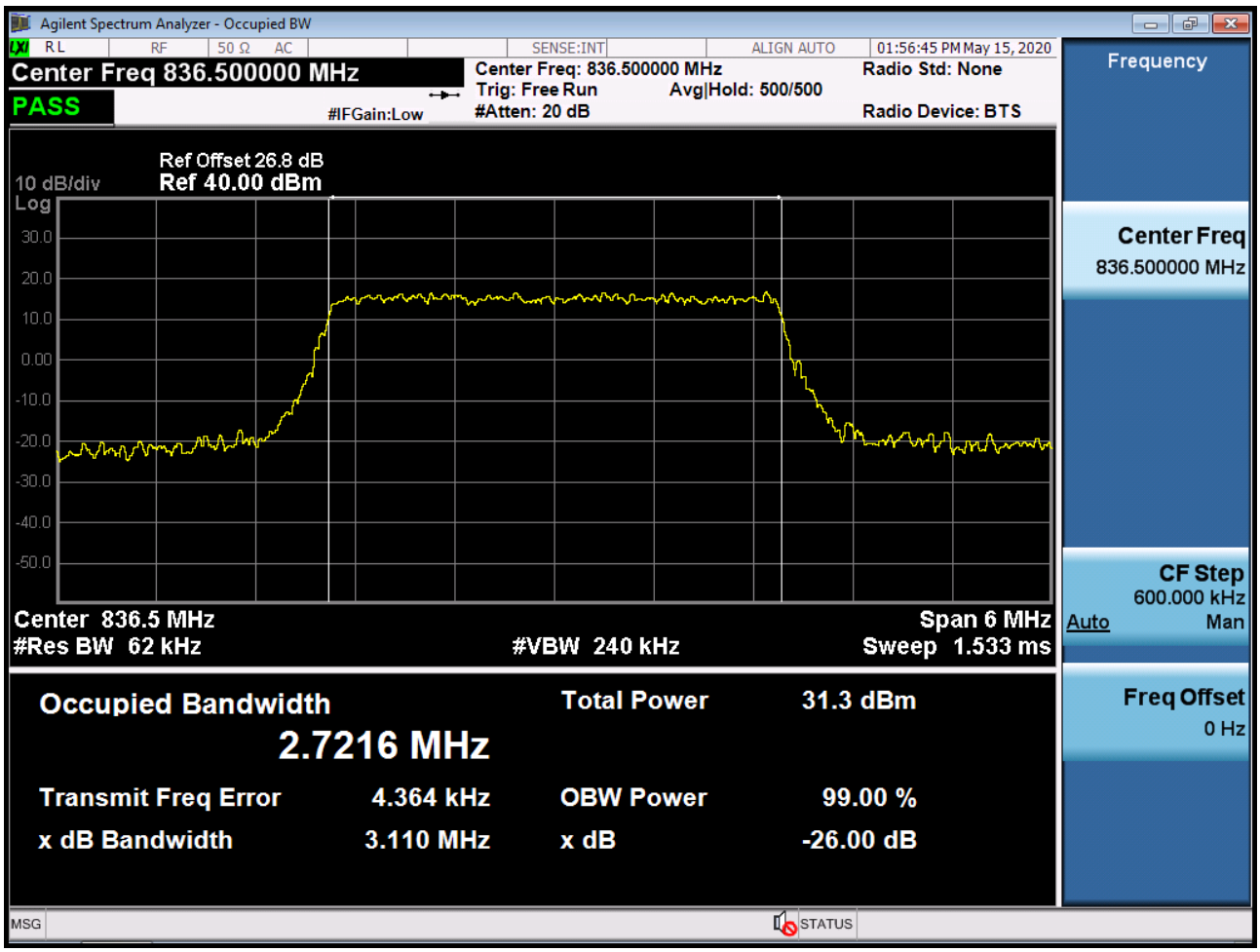
BAND5/ 26. Occupied Bandwidth Plot (1.4M BW Ch.26915 64QAM_RB6_0)



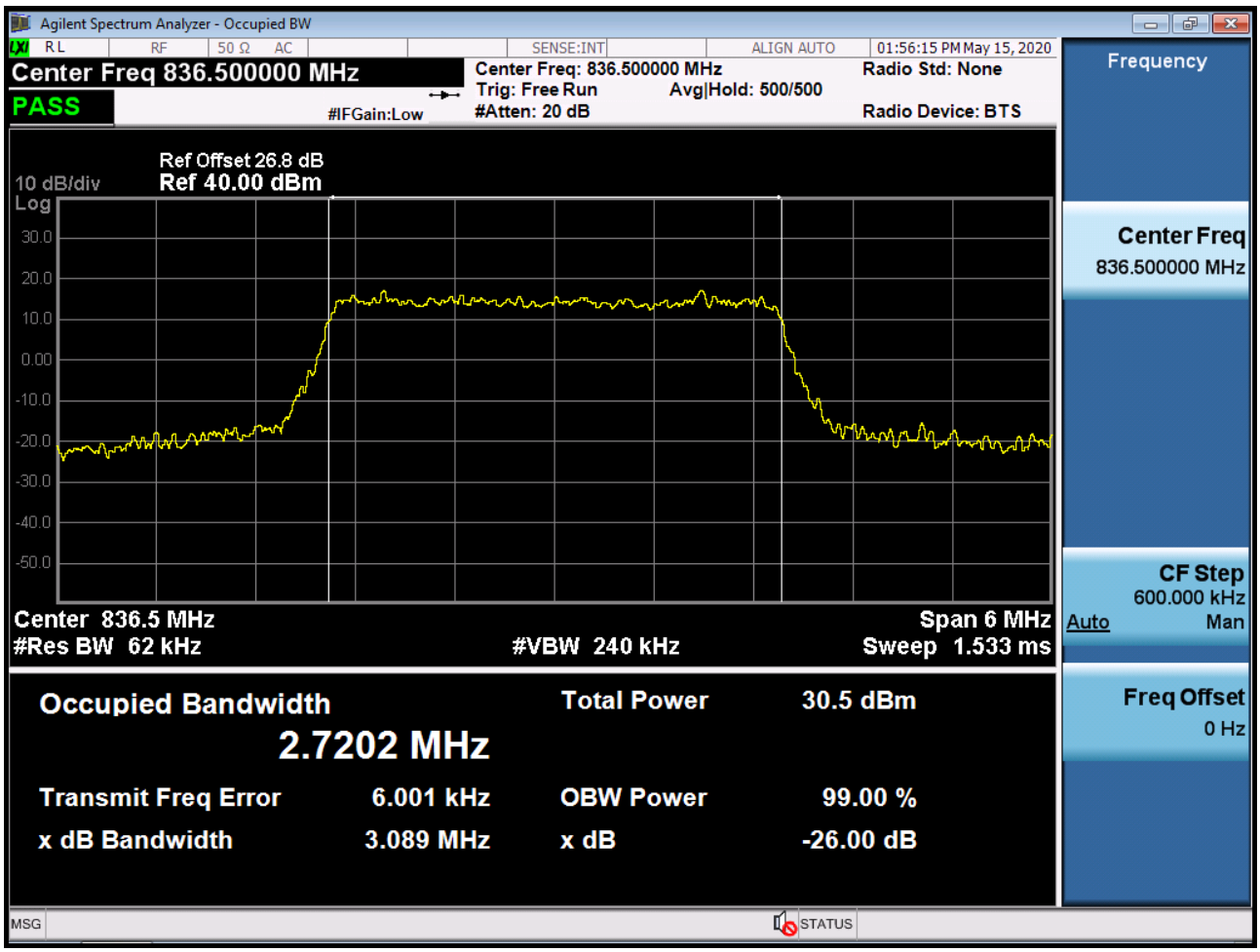
BAND5/ 26. Occupied Bandwidth Plot (1.4M BW Ch.26915 256QAM_RB6_0)



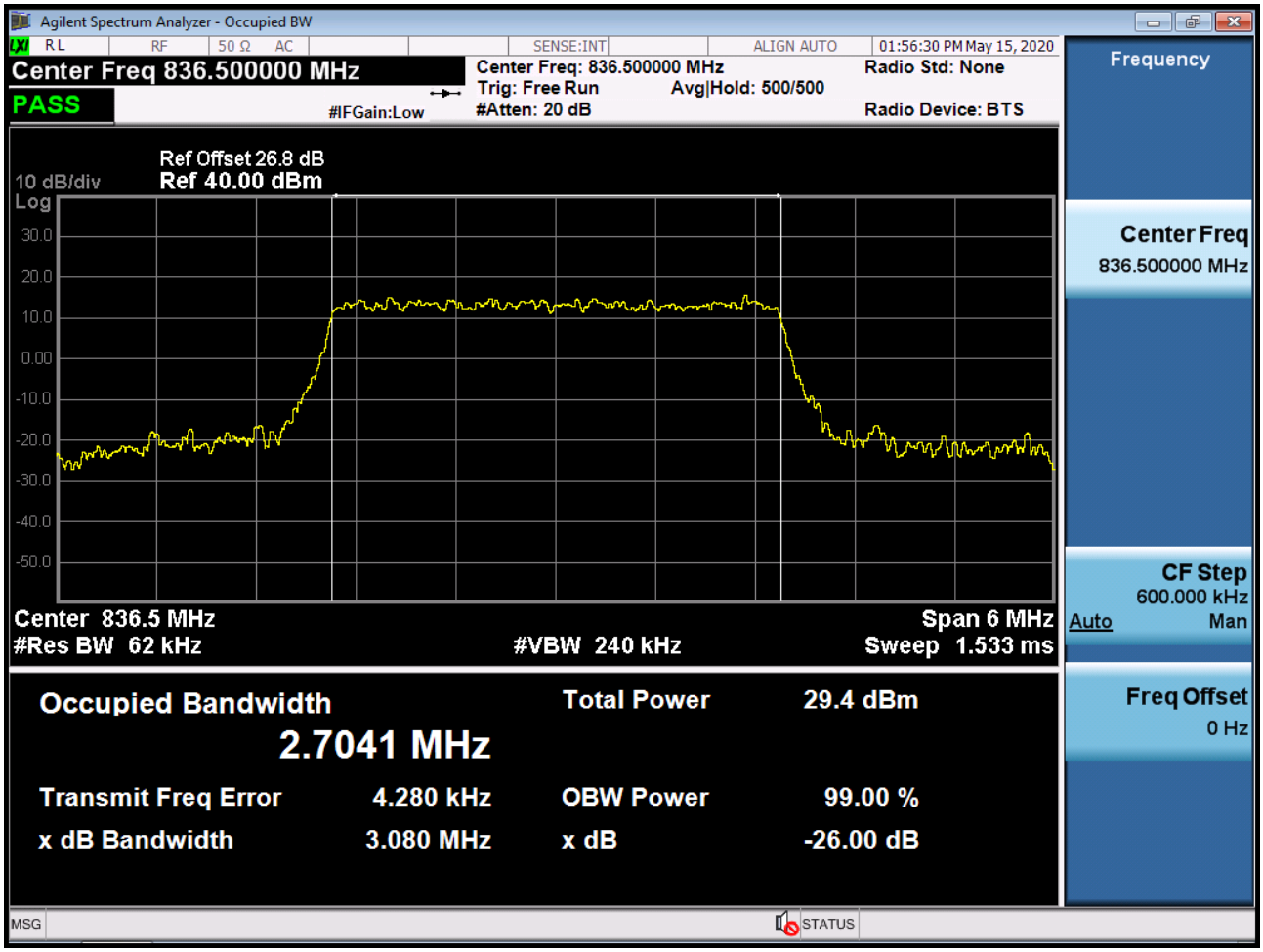
BAND5/ 26. Occupied Bandwidth Plot (3M BW Ch.26915 QPSK_RB15_0)



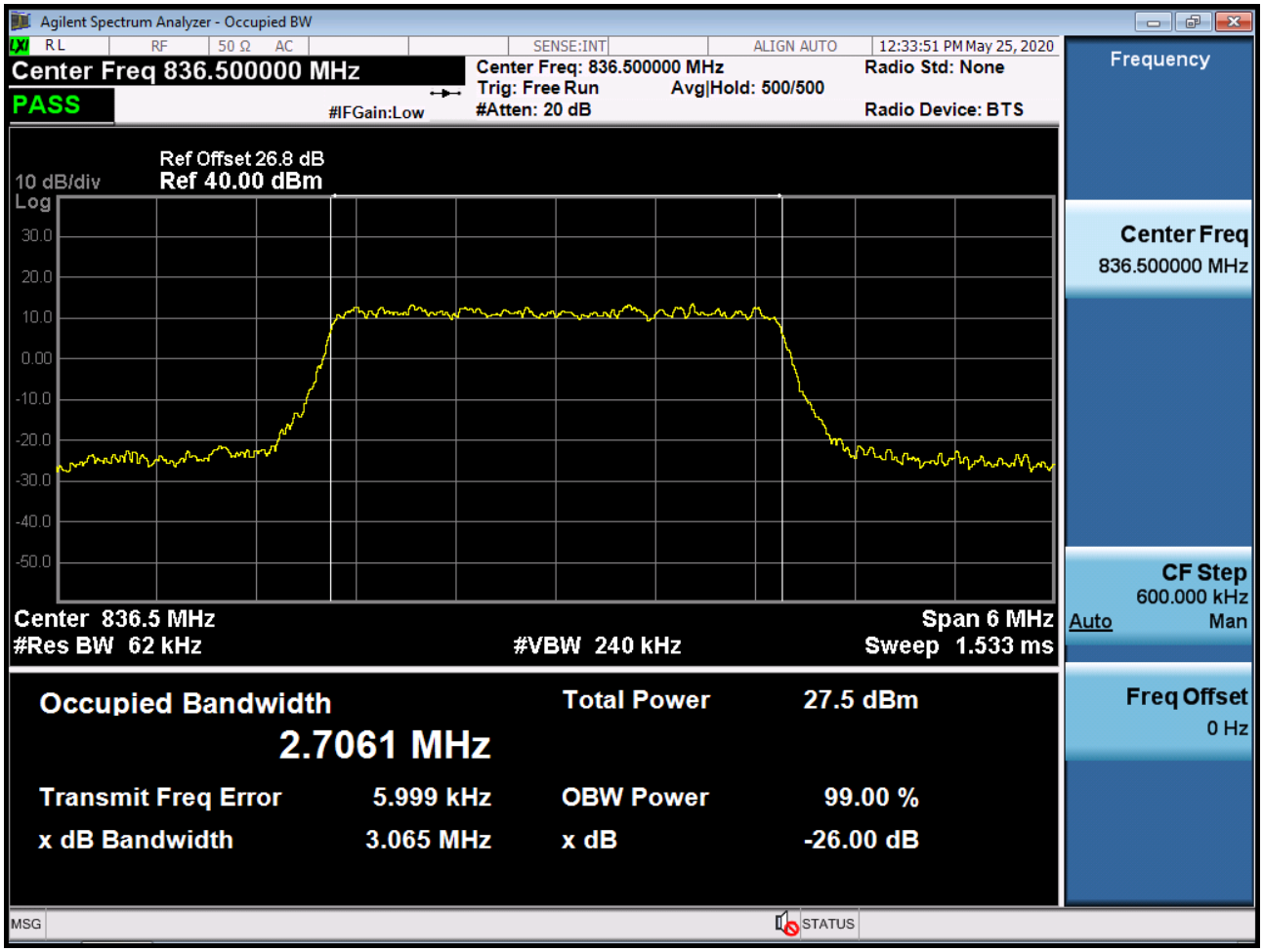
BAND5/ 26. Occupied Bandwidth Plot (3M BW Ch.26915 16QAM_RB15_0)



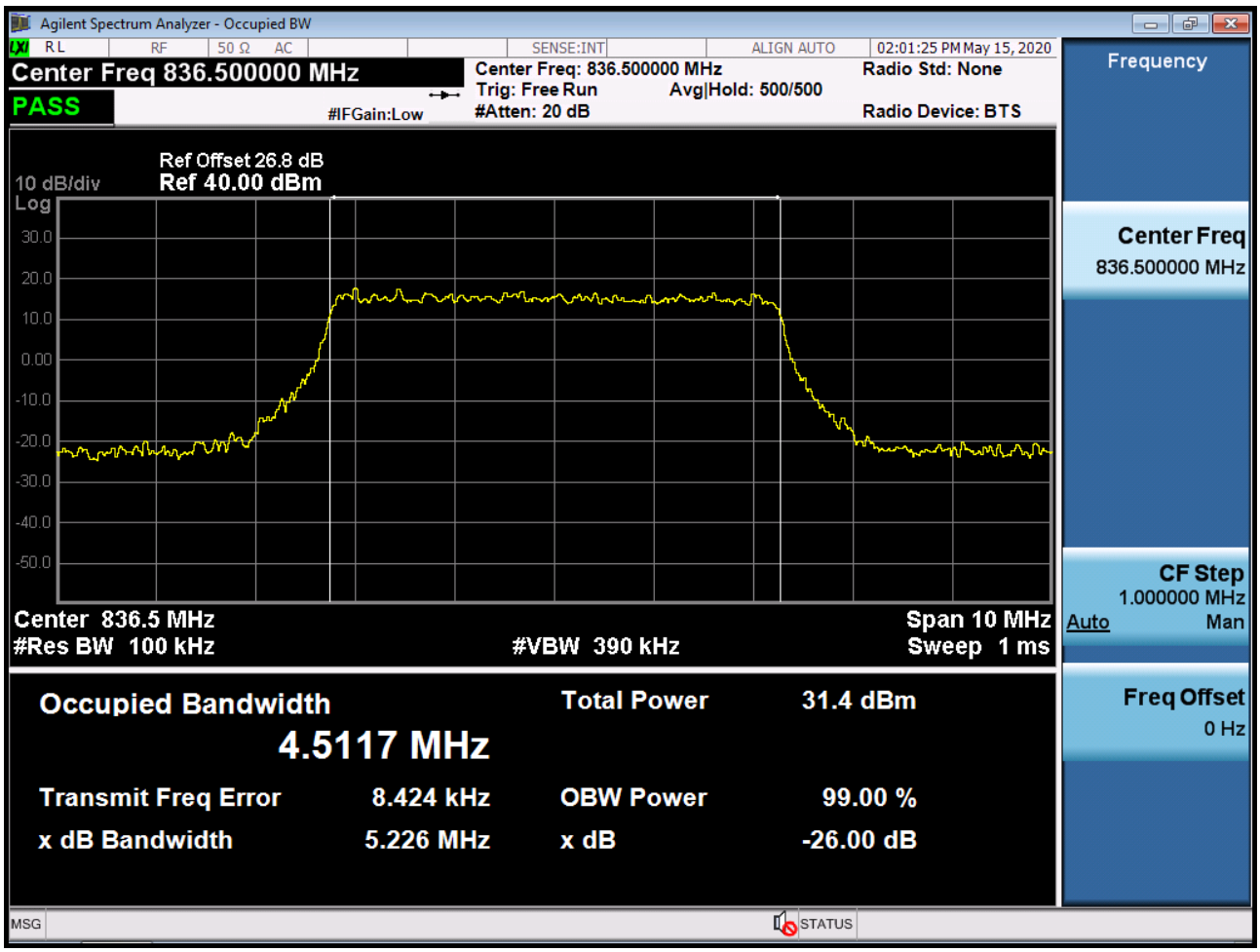
BAND5/ 26. Occupied Bandwidth Plot (3M BW Ch.26915 64QAM_RB15_0)



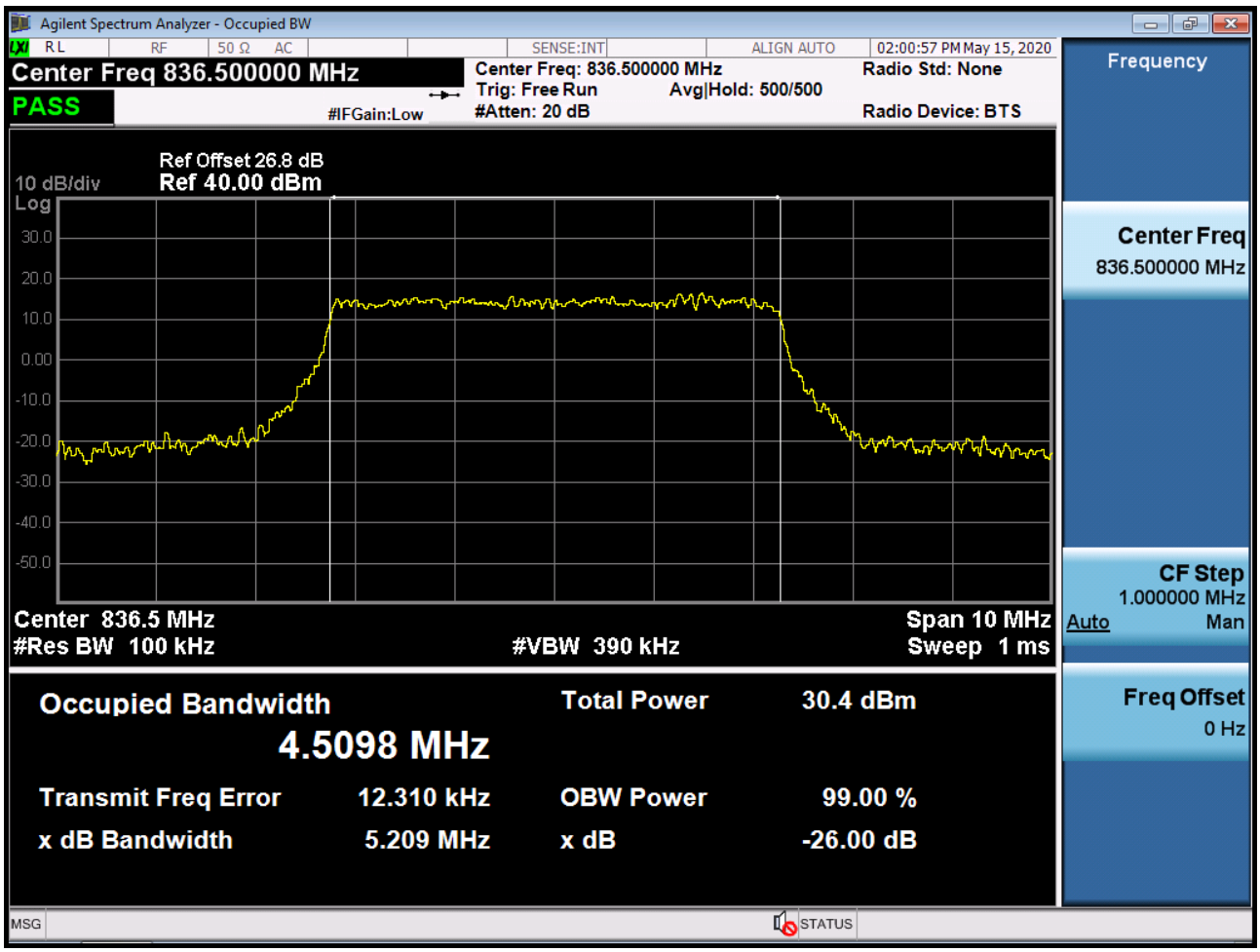
BAND5/ 26. Occupied Bandwidth Plot (3M BW Ch.26915 256QAM_RB15_0)



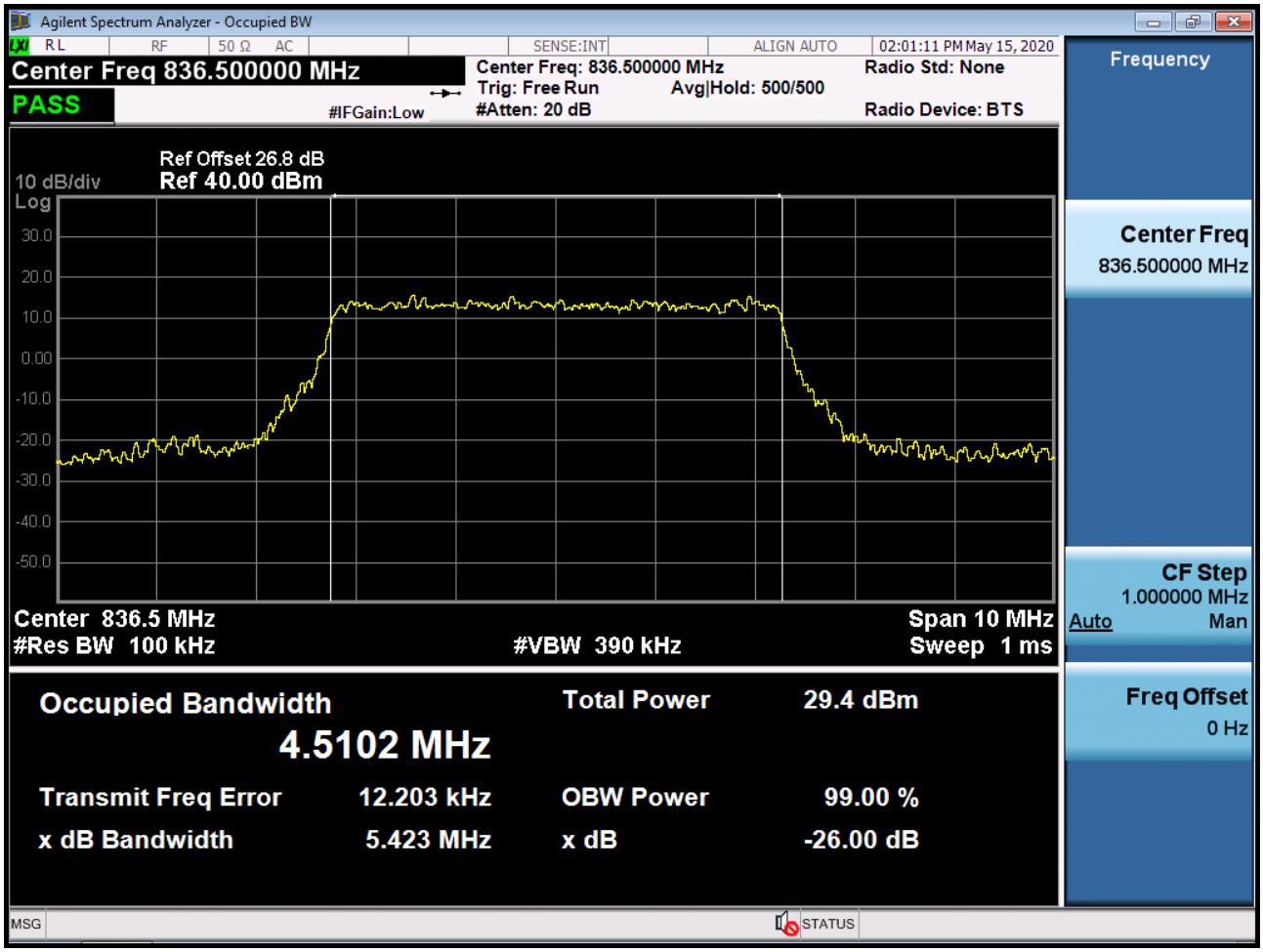
BAND5/ 26. Occupied Bandwidth Plot (5M BW Ch.26915 QPSK_RB25_0)



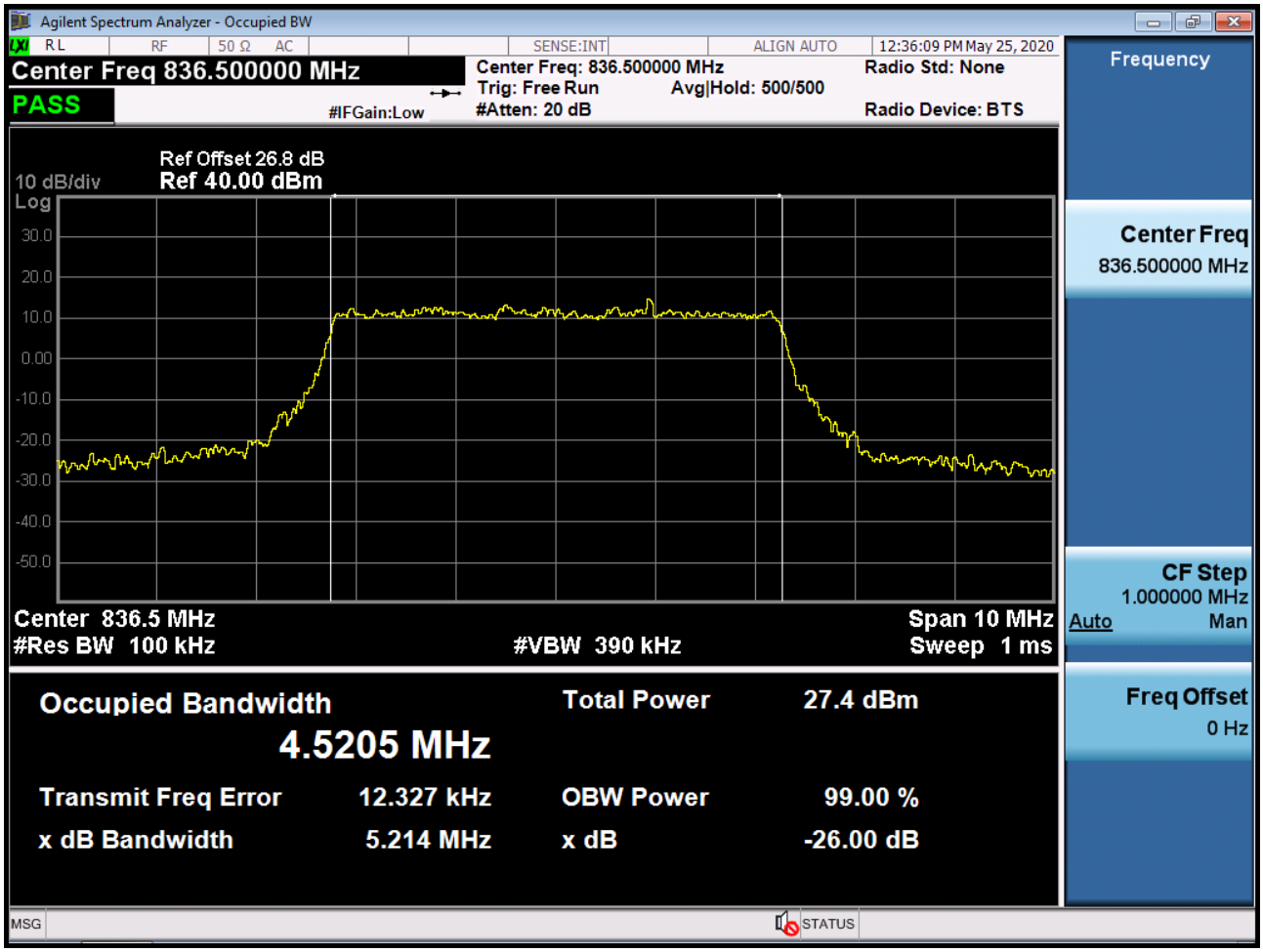
BAND5/ 26. Occupied Bandwidth Plot (5M BW Ch.26915 16QAM_RB25_0)



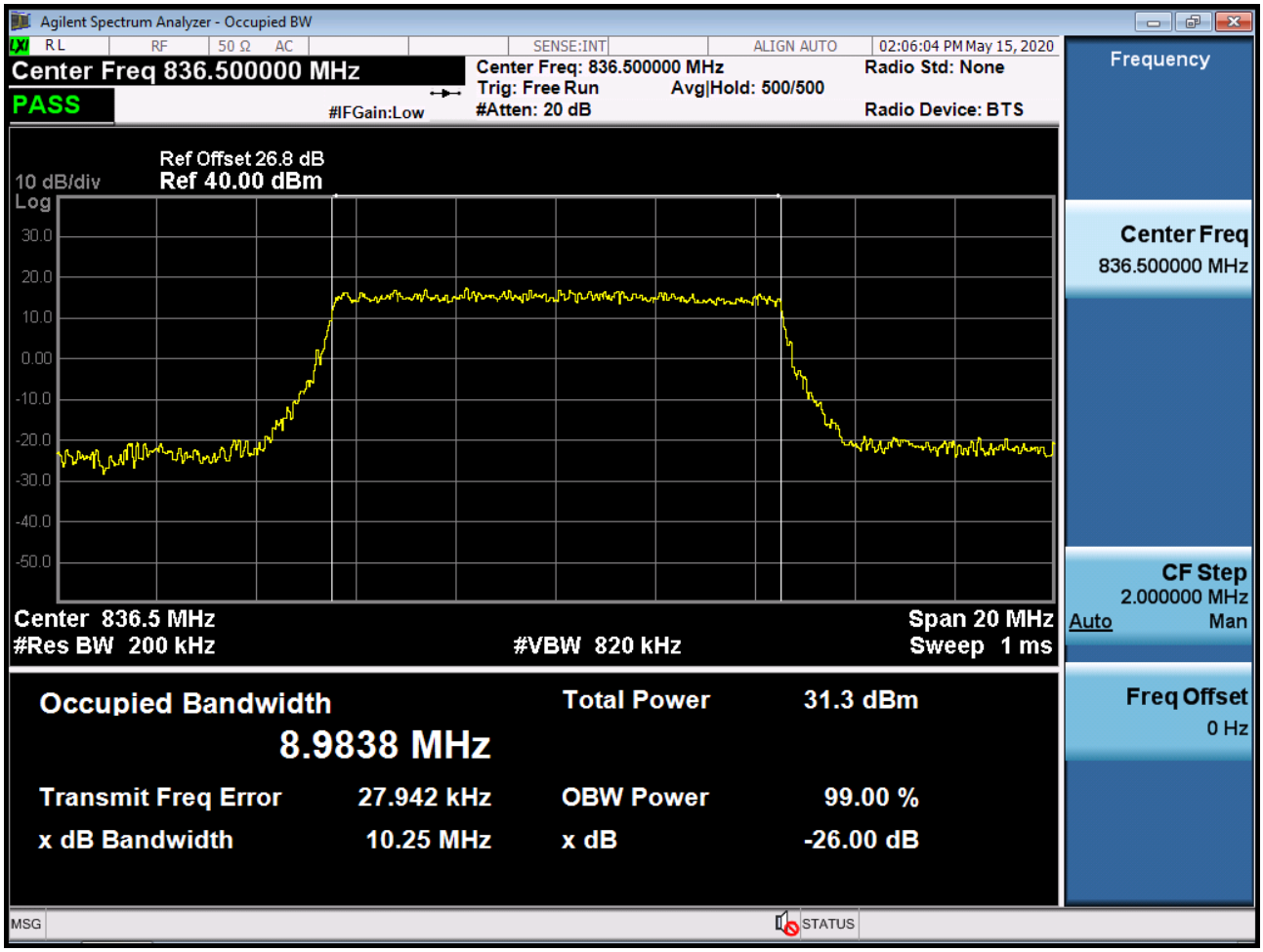
BAND5/ 26. Occupied Bandwidth Plot (5M BW Ch.26915 64QAM_RB25_0)



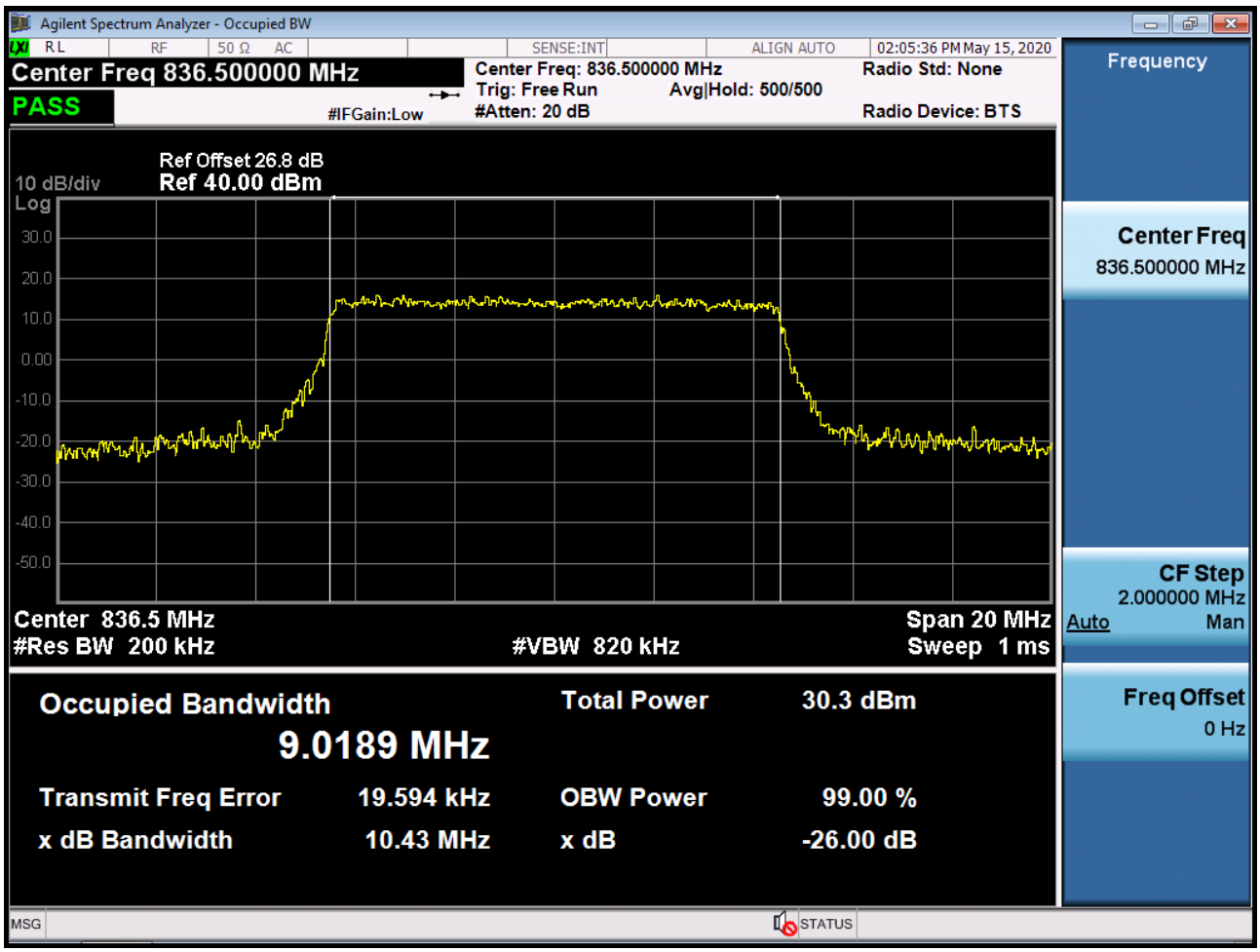
BAND5/ 26. Occupied Bandwidth Plot (5M BW Ch.26915 256QAM_RB25_0)



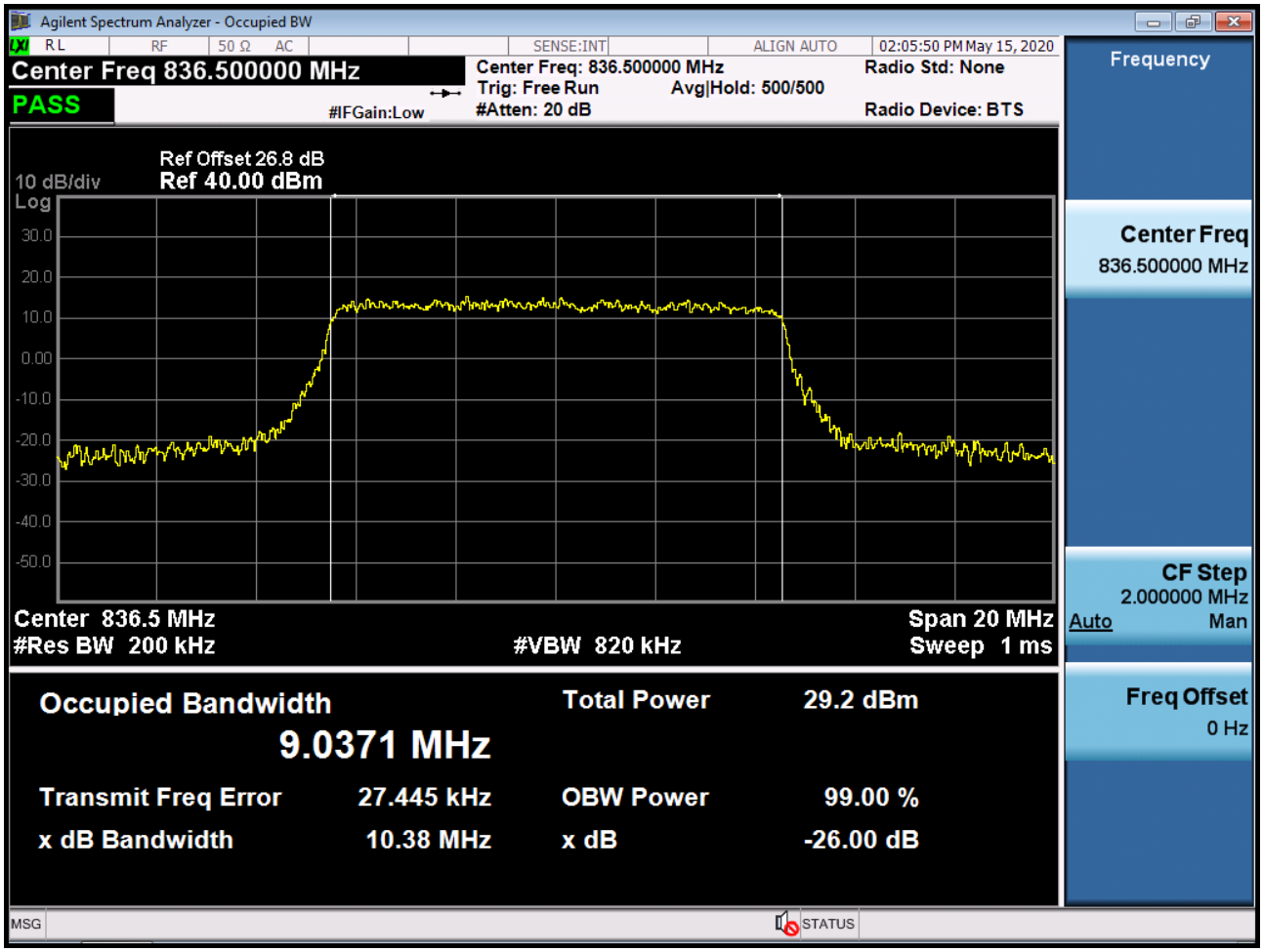
BAND5/ 26. Occupied Bandwidth Plot (10M BW Ch.26915 QPSK_RB50_0)



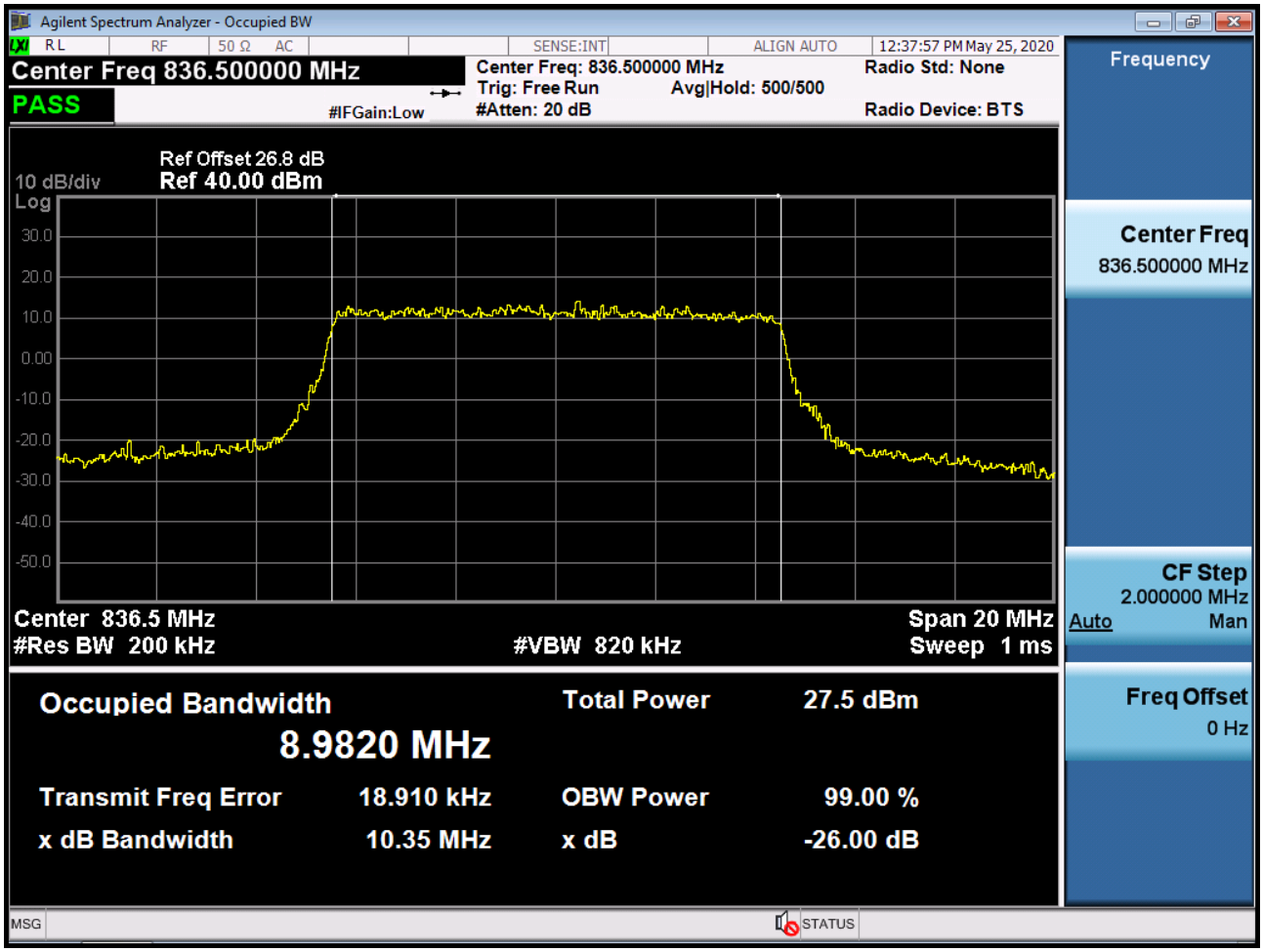
BAND5/ 26. Occupied Bandwidth Plot (10M BW Ch.26915 16QAM_RB50_0)



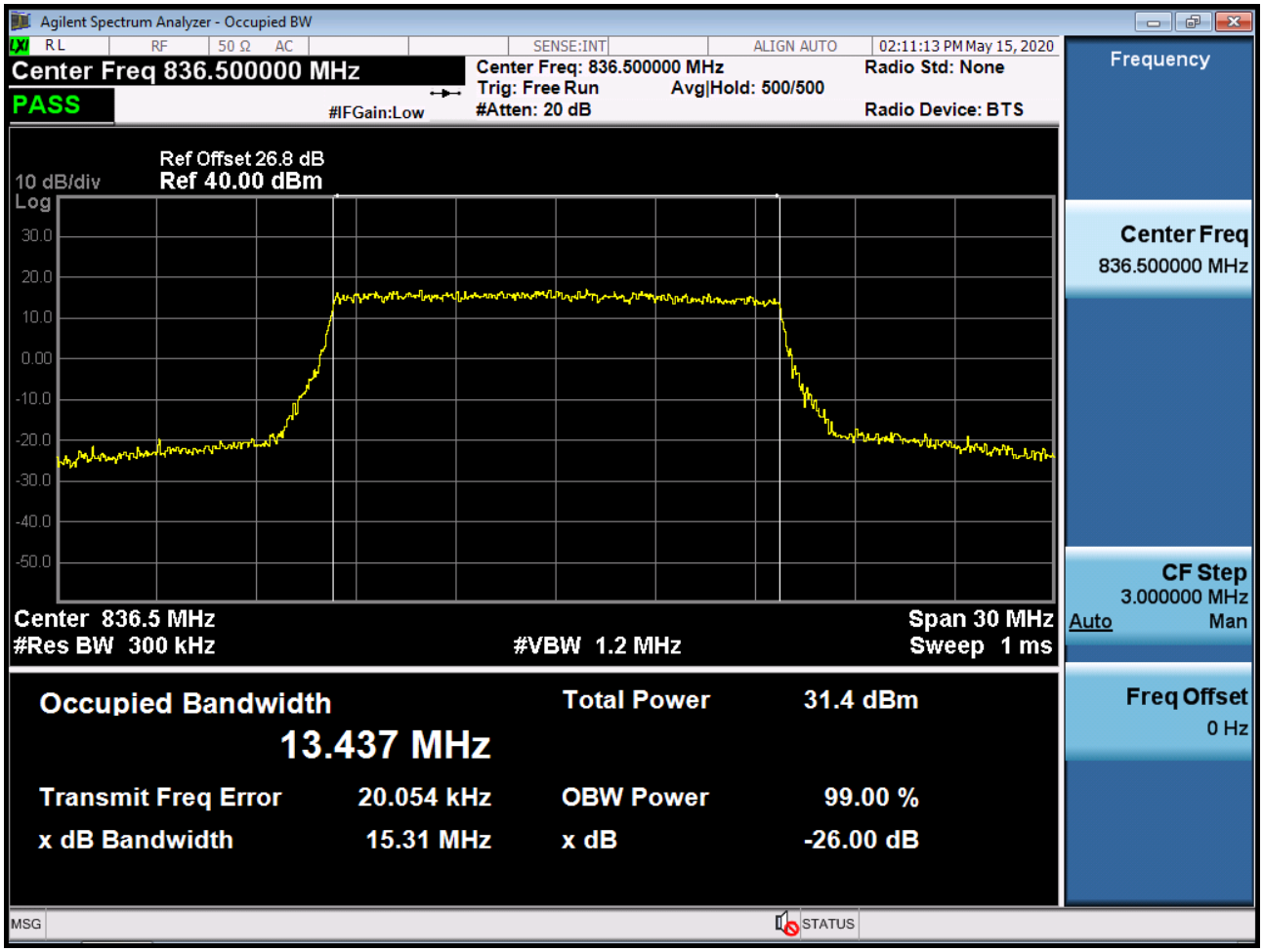
BAND5/ 26. Occupied Bandwidth Plot (10M BW Ch.26915 64QAM_RB50_0)



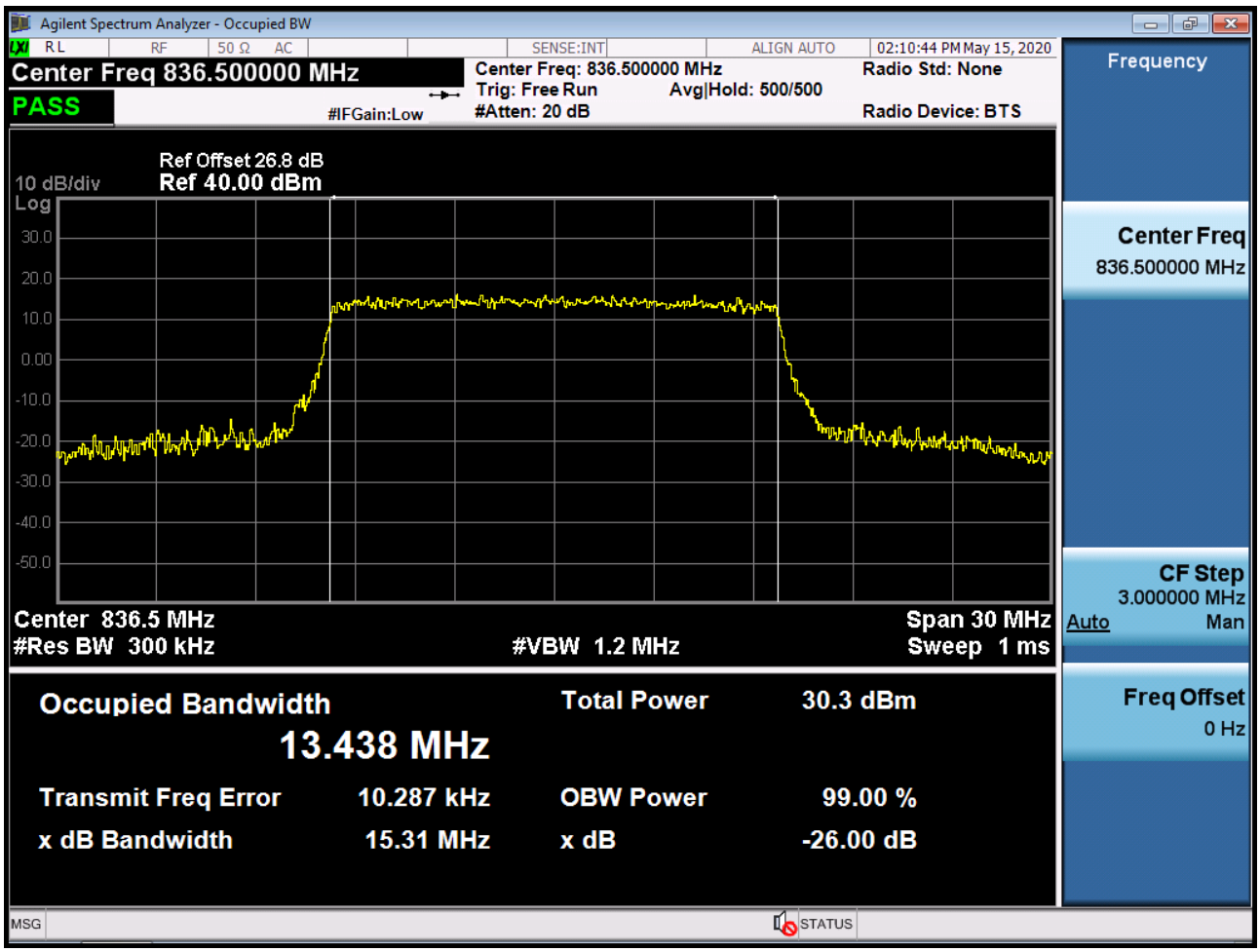
BAND5/ 26. Occupied Bandwidth Plot (10M BW Ch.26915 256QAM_RB50_0)



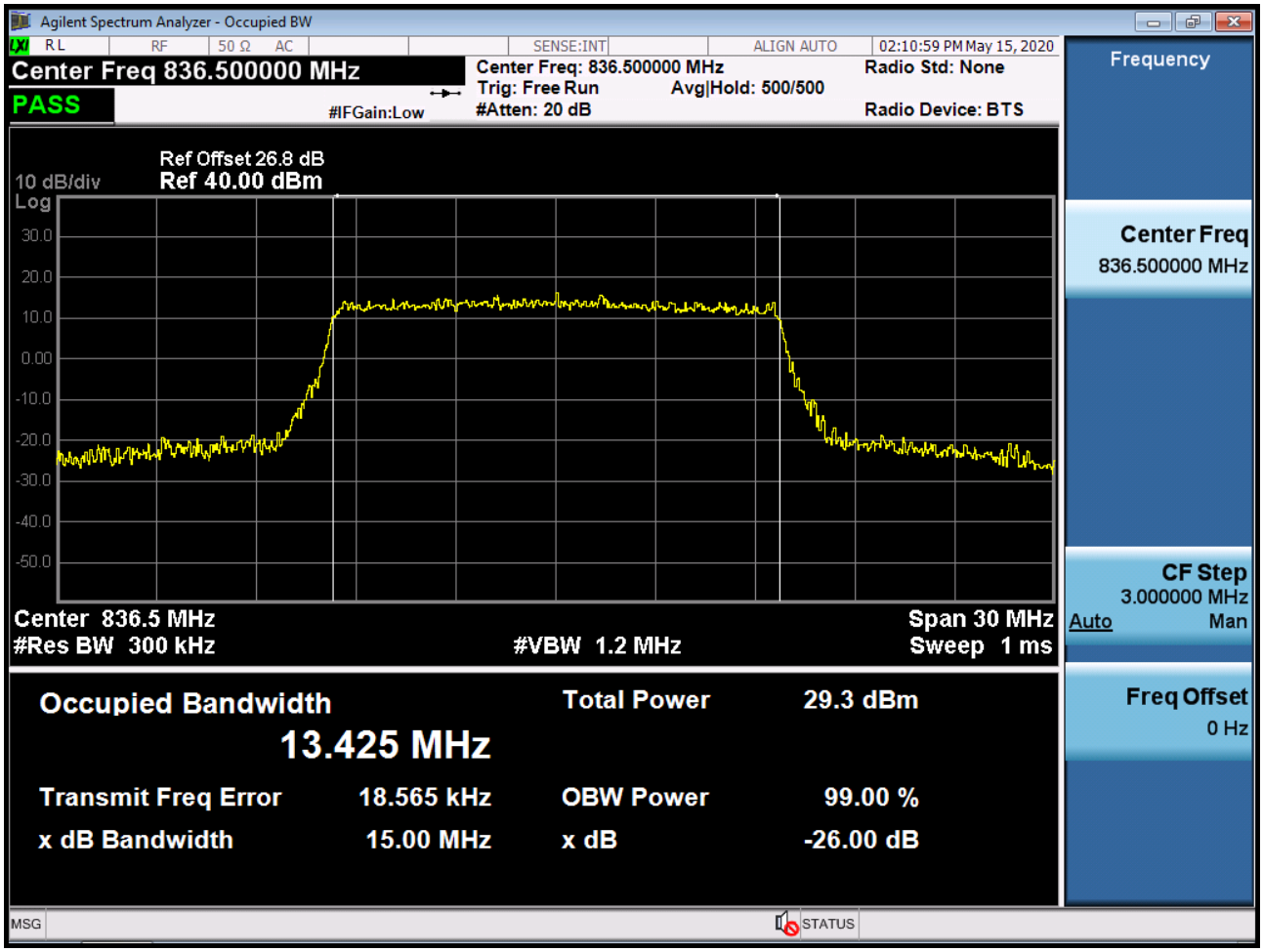
BAND 26. Occupied Bandwidth Plot (15M BW Ch.26915 QPSK RB 75_0)



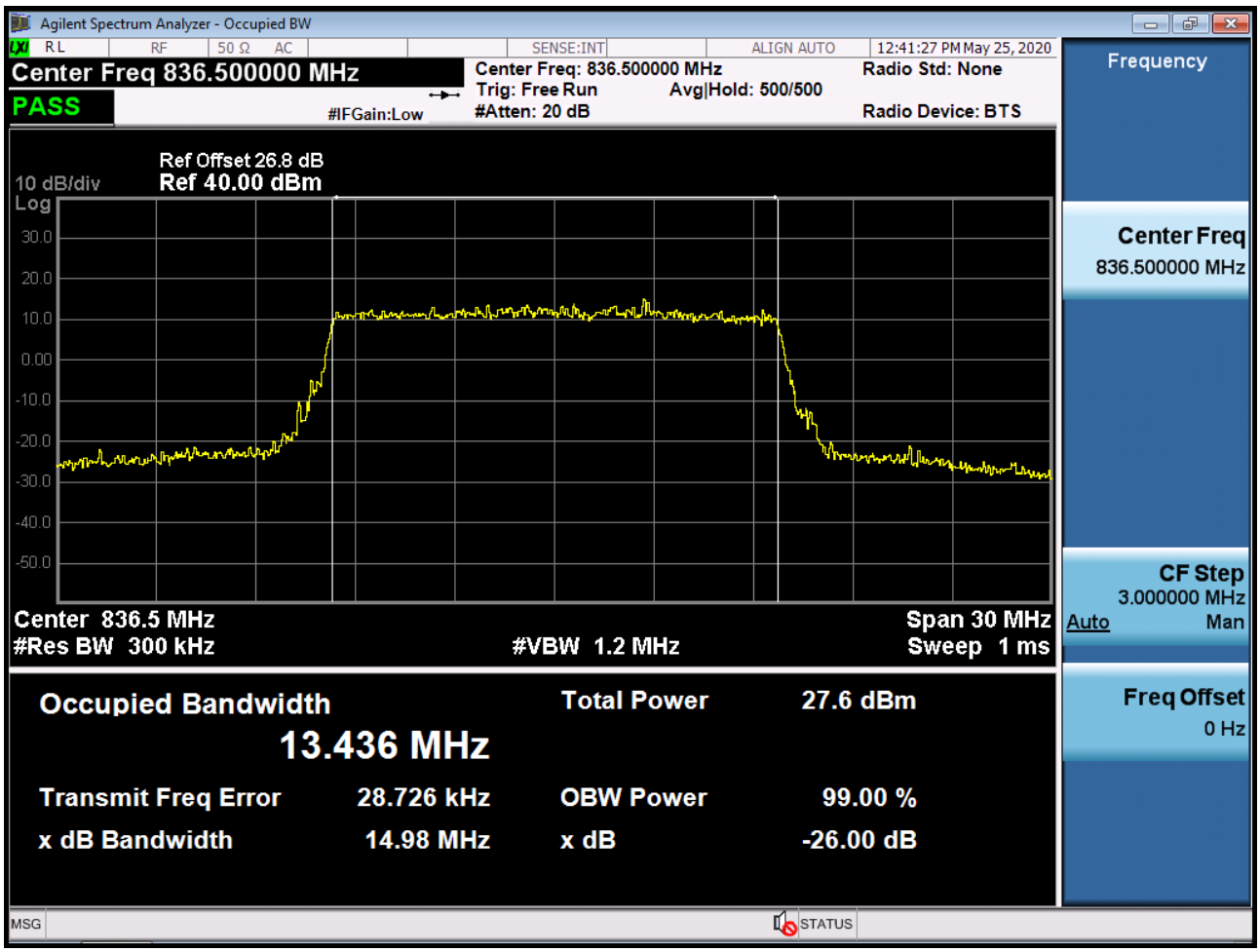
BAND 26. Occupied Bandwidth Plot (15M BW Ch.26915 16QAM RB 75_0)



BAND 26. Occupied Bandwidth Plot (15M BW Ch.26915 64QAM RB 75_0)



BAND 26. Occupied Bandwidth Plot (15M BW Ch.26915 256QAM RB 75_0)



BAND5/ 26. Lower Band Edge Plot (1.4M BW Ch.26797 QPSK_RB1_Offset 0)

BAND5/ 26. Lower Band Edge Plot (1.4M BW Ch.26797 QPSK_RB6_Offset 0)

BAND5/ 26. Lower Extended Band Edge Plot (1.4M BW Ch.26797 QPSK_RB6_0)

BAND5/ 26. Lower Band Edge Plot (3M BW Ch.26805 QPSK_RB1_Offset 0)

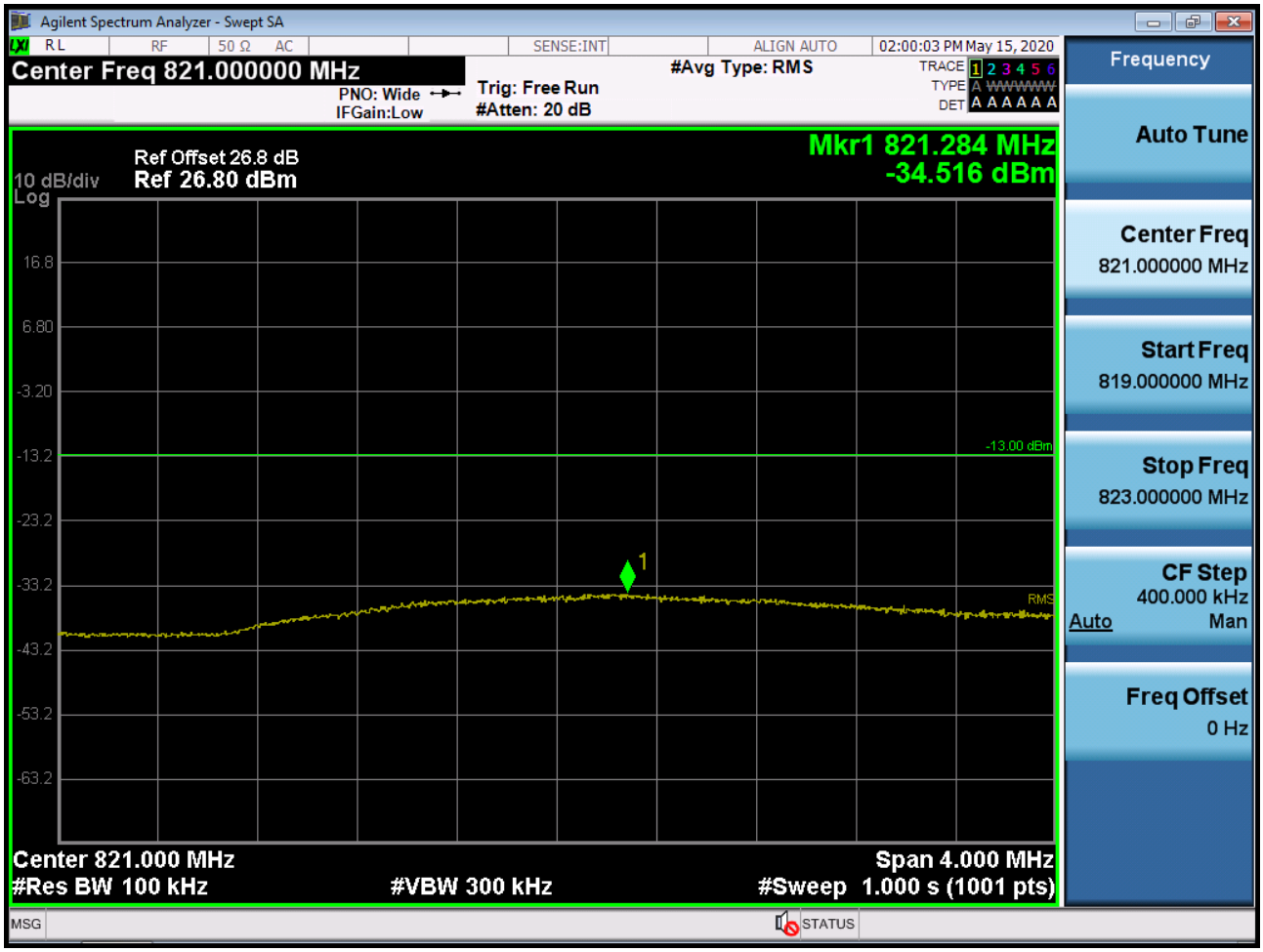
BAND5/ 26. Lower Band Edge Plot (3M BW Ch.26805 QPSK_RB15_Offset 0)

BAND5/ 26. Lower Extended Band Edge Plot (3M BW Ch.26805 QPSK_RB15_0)

BAND5/ 26. Lower Band Edge Plot (5M BW Ch.26815 QPSK_RB1_Offset 0)

BAND5/ 26. Lower Band Edge Plot (5M BW Ch.26815 QPSK_RB25_Offset 0)

BAND5/ 26. Lower Extended Band Edge Plot (5M BW Ch.26815 QPSK_RB25_0)



BAND5/ 26. Lower Band Edge Plot (10M BW Ch.26840 QPSK_RB1_Offset 0)

BAND5/ 26. Lower Band Edge Plot (10M BW Ch.26840 QPSK_RB50_Offset 0)

BAND5/ 26. Lower Extended Band Edge Plot (10M BW Ch.26840 QPSK_RB50_0)

BAND 26. Lower Band Edge Plot (15M BW Ch.26865 QPSK_RB1_Offset 0)

BAND 26. Lower Band Edge Plot (15M BW Ch.26865 QPSK_RB75_Offset 0)

BAND 26. Lower Extended Band Edge Plot (15M BW Ch.26865 QPSK_RB75_0)

BAND5/ 26. Upper Band Edge Plot (1.4M BW Ch.27033 QPSK_RB1_Offset 5)

BAND5/ 26. Upper Band Edge Plot (1.4M BW Ch.27033 QPSK_RB6_Offset 0)

BAND5/ 26. Upper Extended Band Edge Plot (1.4M BW Ch.27033 QPSK_RB6_0)

BAND5/ 26. Upper Band Edge Plot (3M BW Ch.27025 QPSK_RB1_Offset 14)

BAND5/ 26. Upper Band Edge Plot (3M BW Ch.27025 QPSK_RB15_Offset 0)

BAND5/ 26. Upper Extended Band Edge Plot (3M BW Ch.27025 QPSK_RB15_0)

BAND5/ 26. Upper Band Edge Plot (5M BW Ch.27015 QPSK_RB1_Offset 24)

BAND5/ 26. Upper Band Edge Plot (5M BW Ch.27015 QPSK_RB25_Offset 0)

BAND5/ 26. Upper Extended Band Edge Plot (5M BW Ch.27015 QPSK_RB25_0)

BAND5/ 26. Upper Band Edge Plot (10M BW Ch.26990 QPSK_RB1_Offset 49)

BAND5/ 26. Upper Band Edge Plot (10M BW Ch.26990 QPSK_RB50_Offset 0)

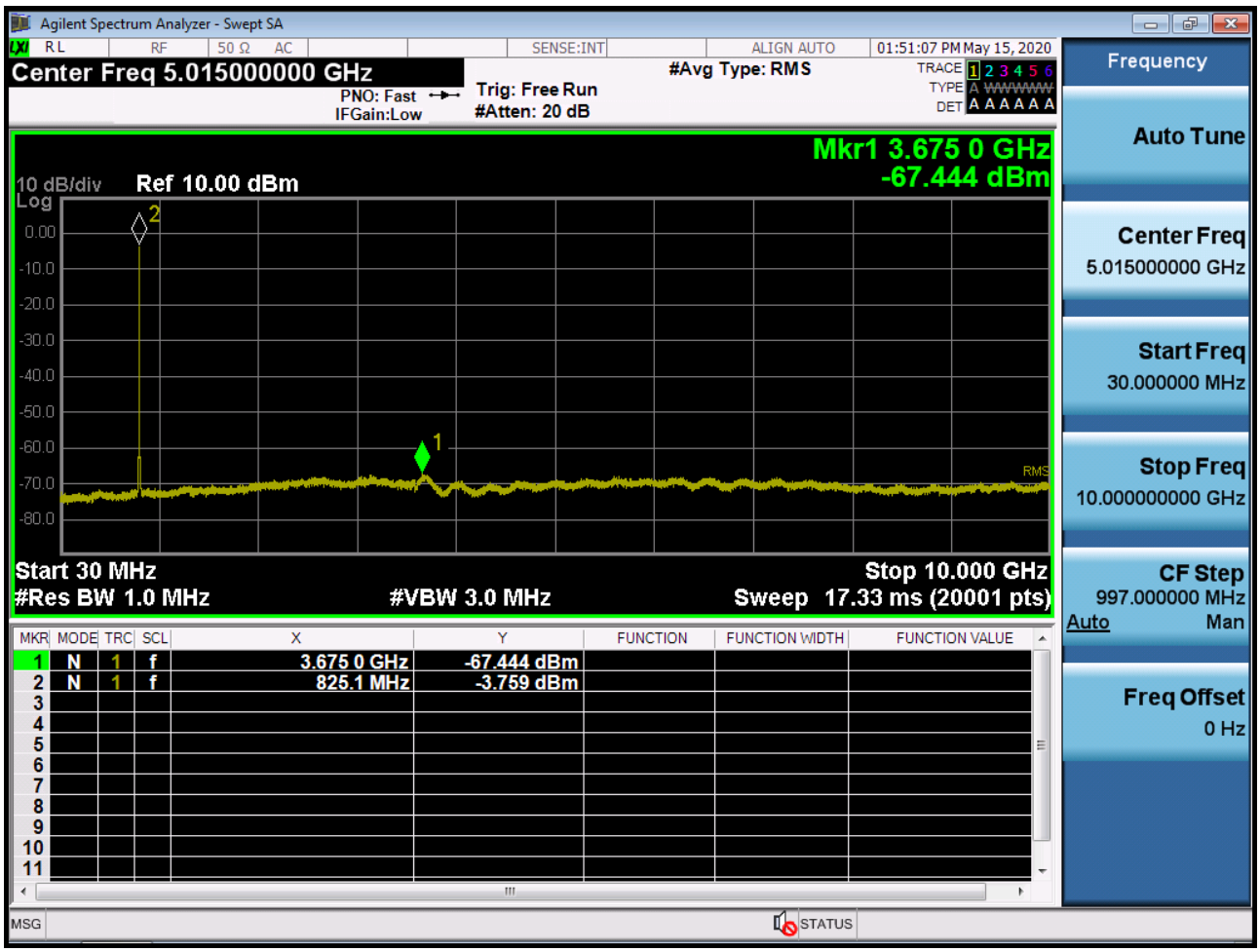
BAND5/ 26. Upper Extended Band Edge Plot (10M BW Ch.26990 QPSK_RB50_0)

BAND 26. Upper Band Edge Plot (15M BW Ch.26965 QPSK_RB1_Offset 74)

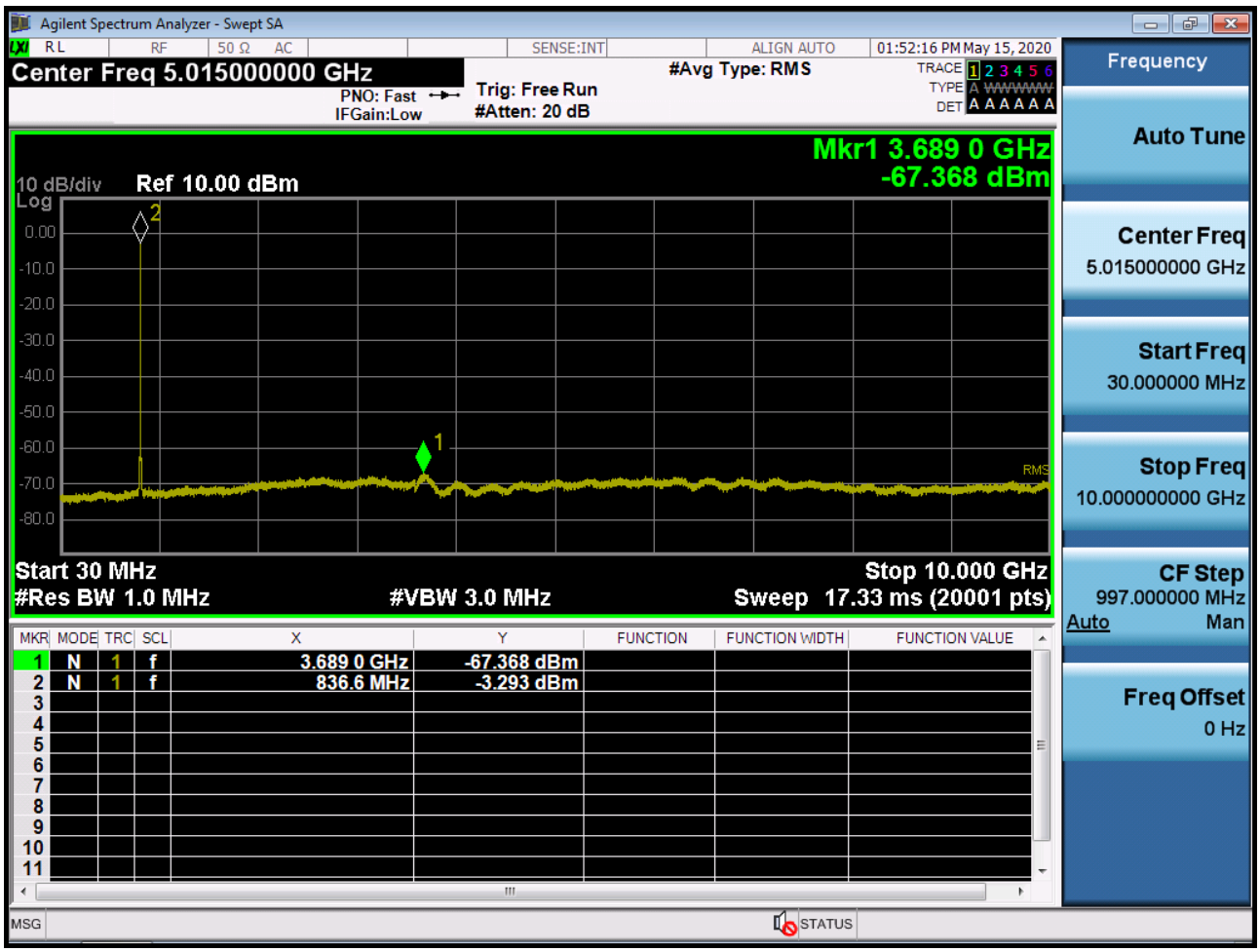
BAND 26. Upper Band Edge Plot (15M BW Ch.26965 QPSK_RB75_Offset 0)

BAND 26. Upper Extended Band Edge Plot (15M BW Ch.26965 QPSK_RB75_0)

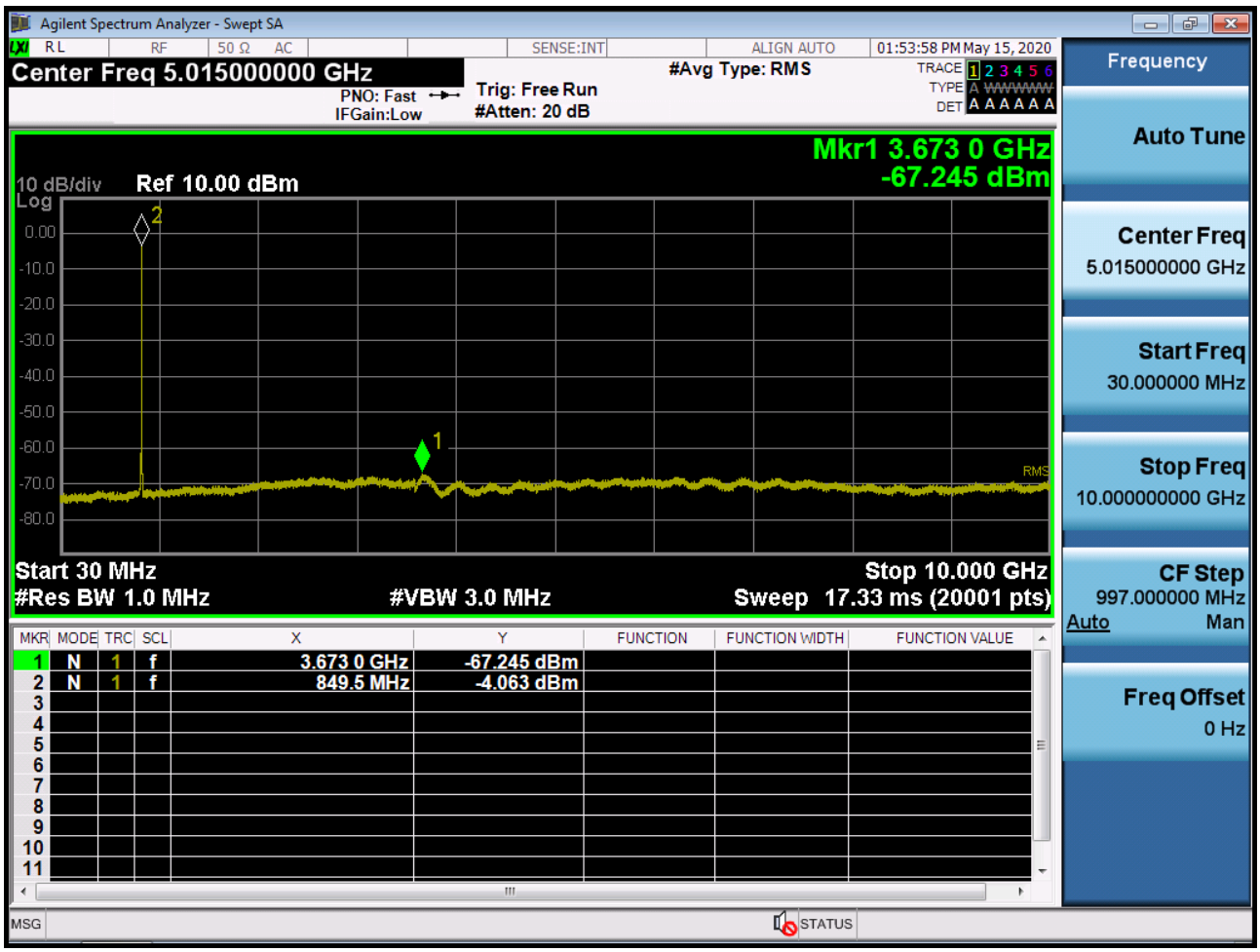
BAND5/ 26. Conducted Spurious Plot (26797ch_1.4MHz_QPSK_RB 1_0)



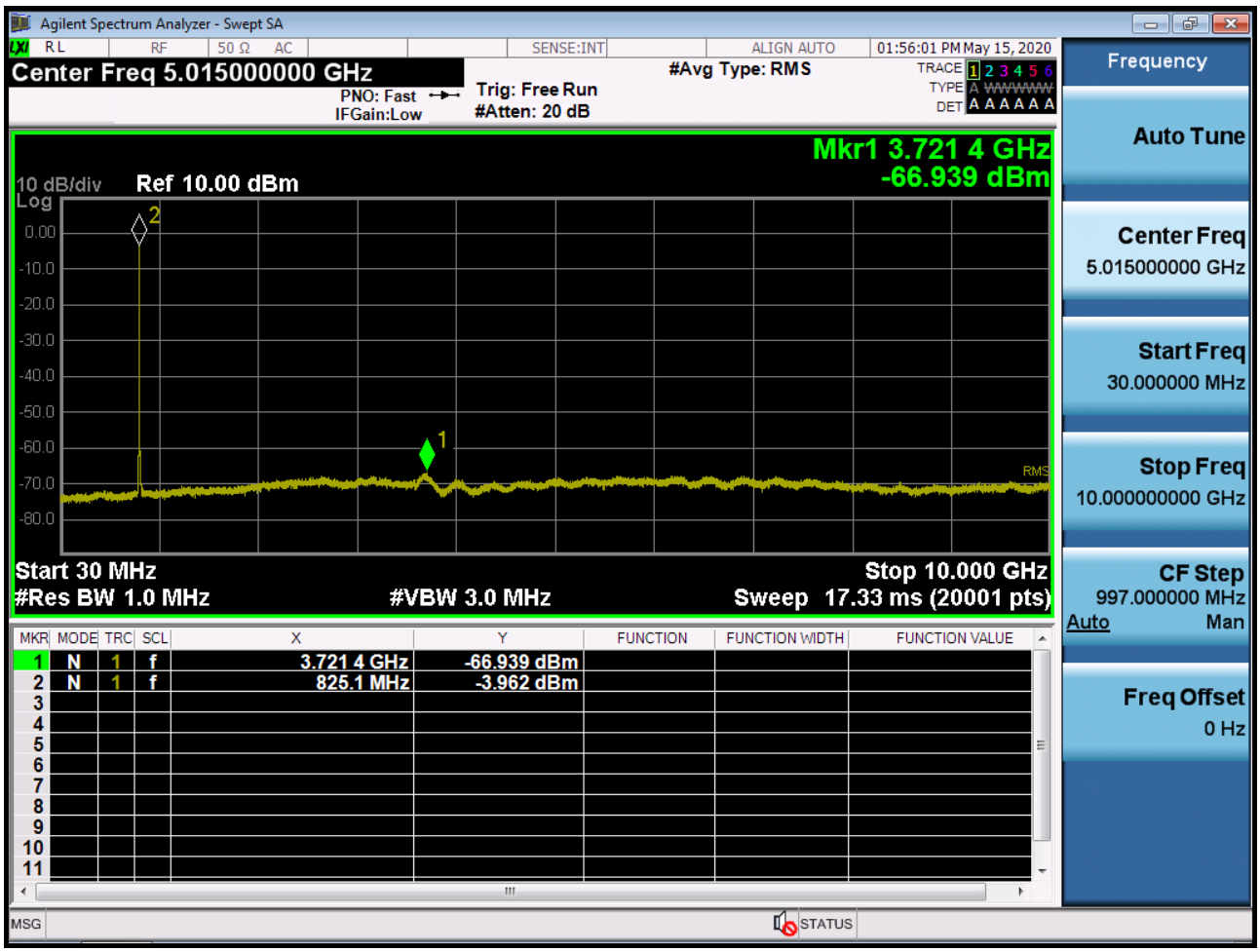
BAND5/ 26. Conducted Spurious Plot (26915ch_1.4MHz_QPSK_RB 1_0)



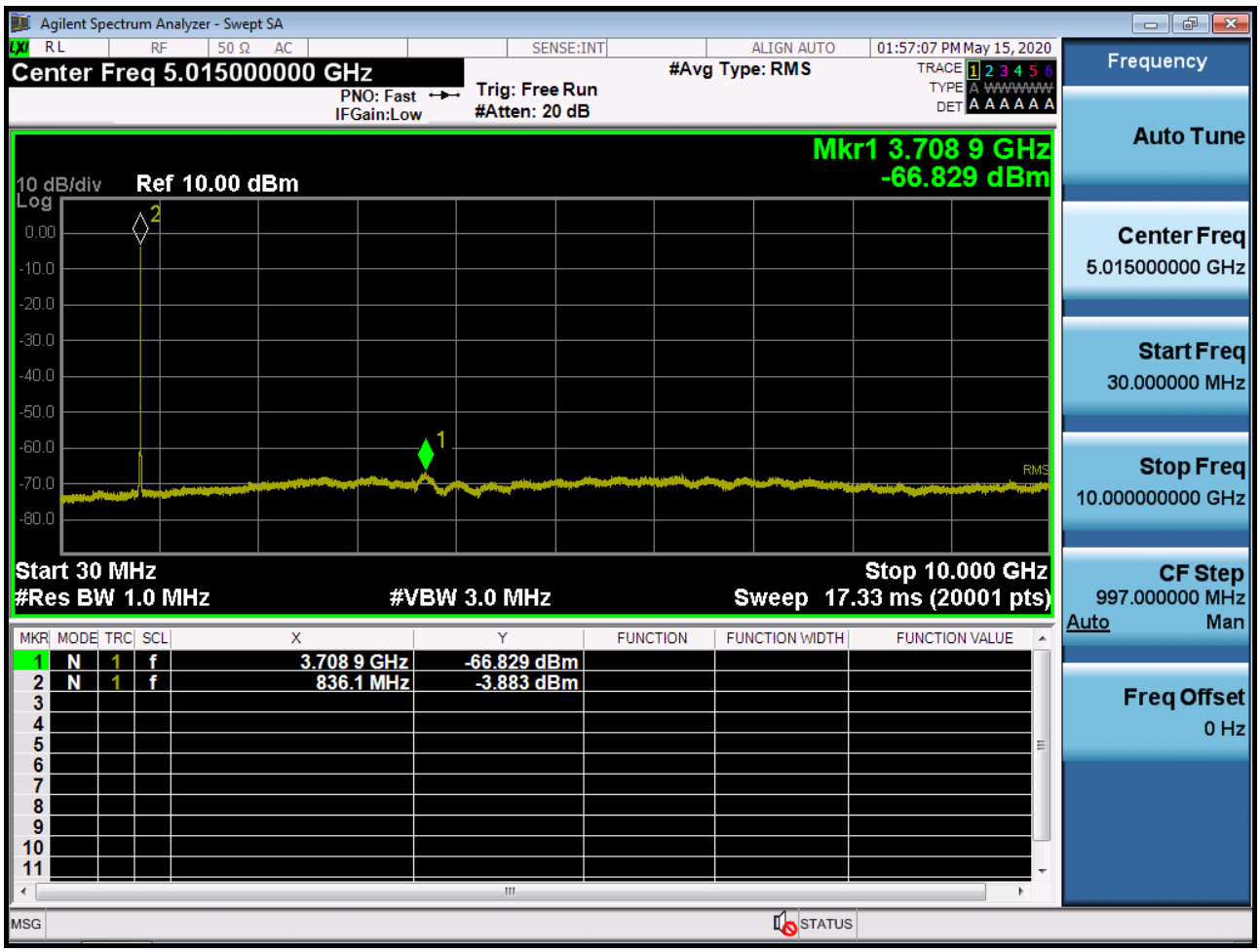
BAND5/ 26. Conducted Spurious Plot (27033ch_1.4MHz_QPSK_RB 1_0)



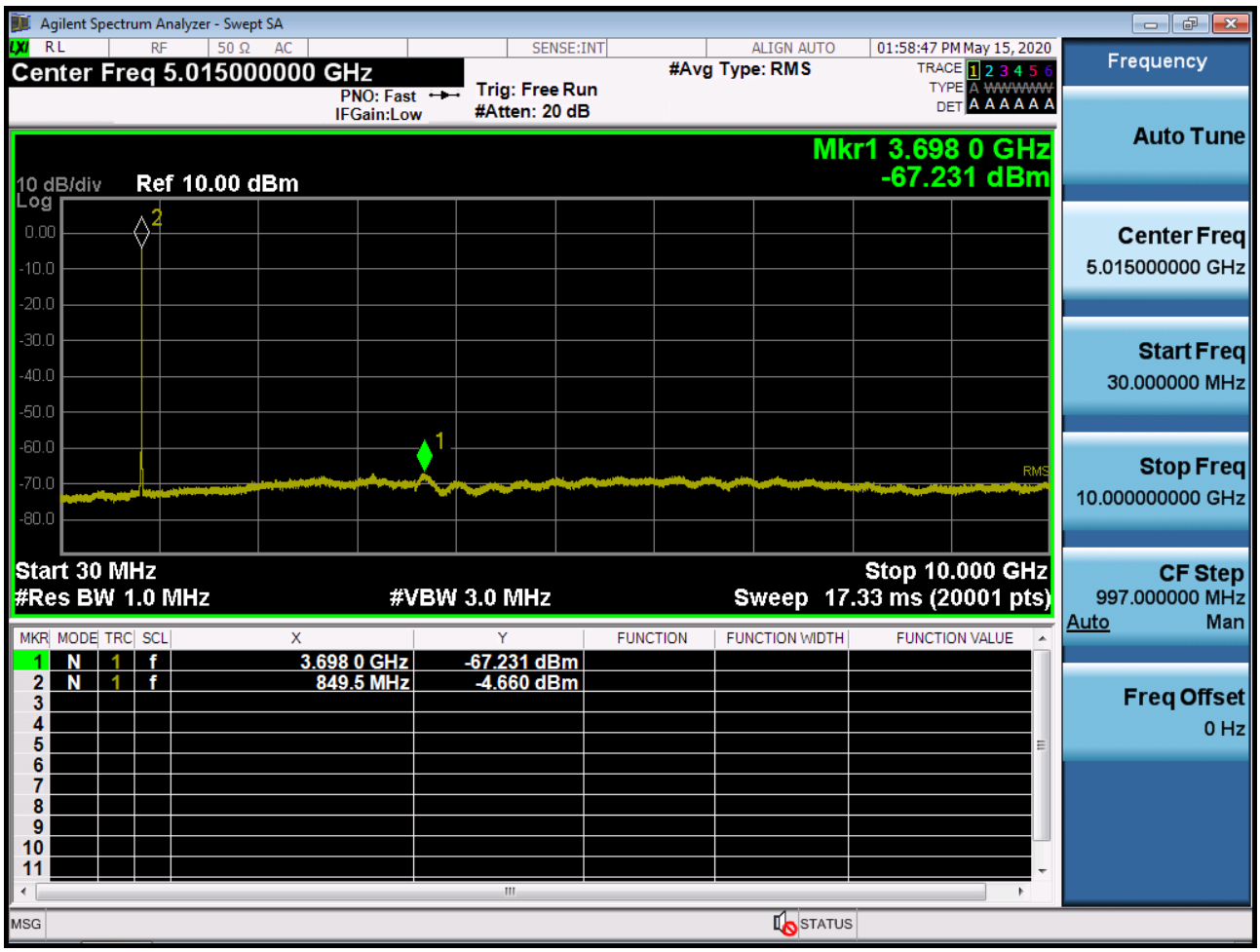
BAND5/ 26. Conducted Spurious Plot (26805ch_3MHz_QPSK_RB 1_0)



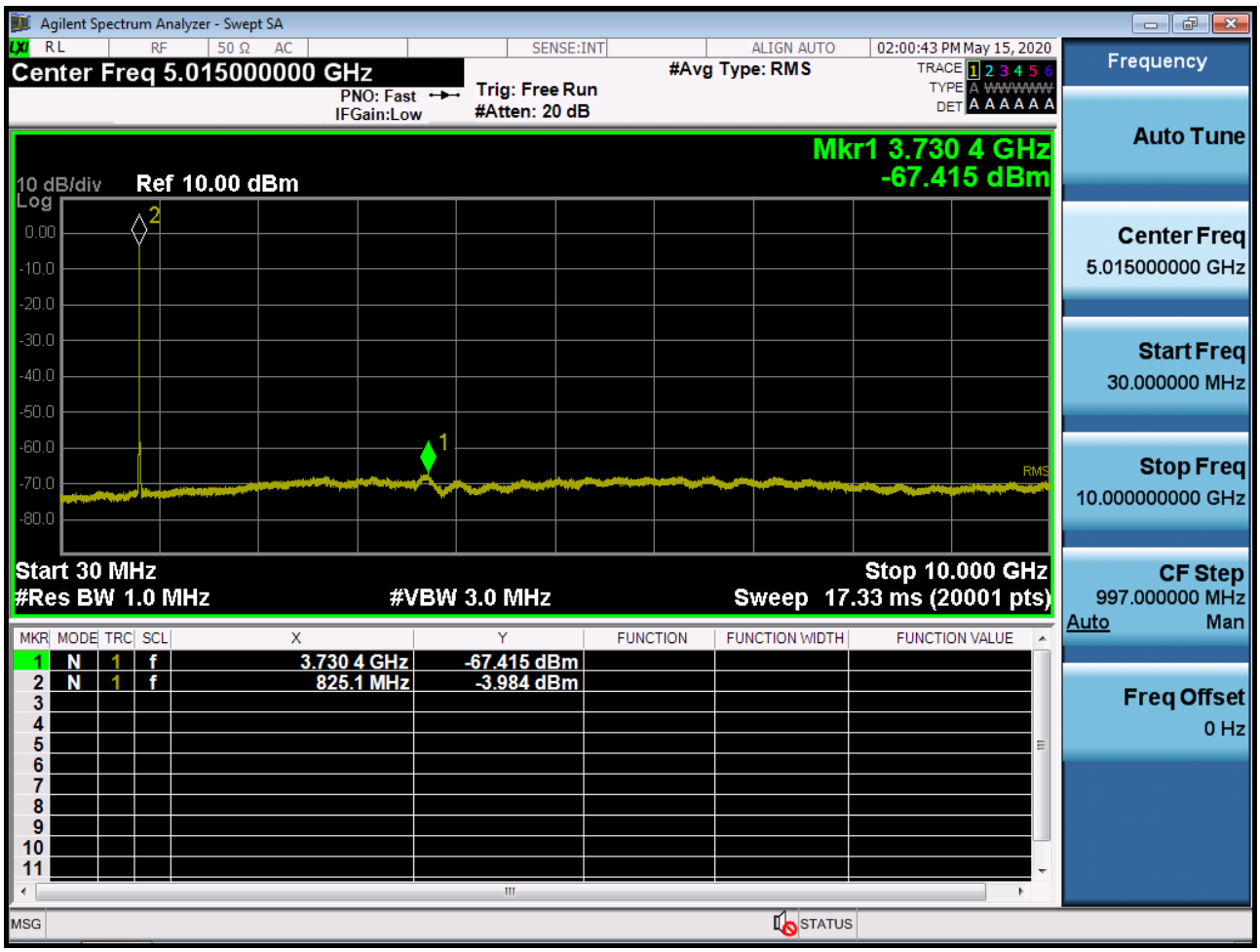
BAND5/ 26. Conducted Spurious Plot (26915ch_3MHz_QPSK_RB 1_0)



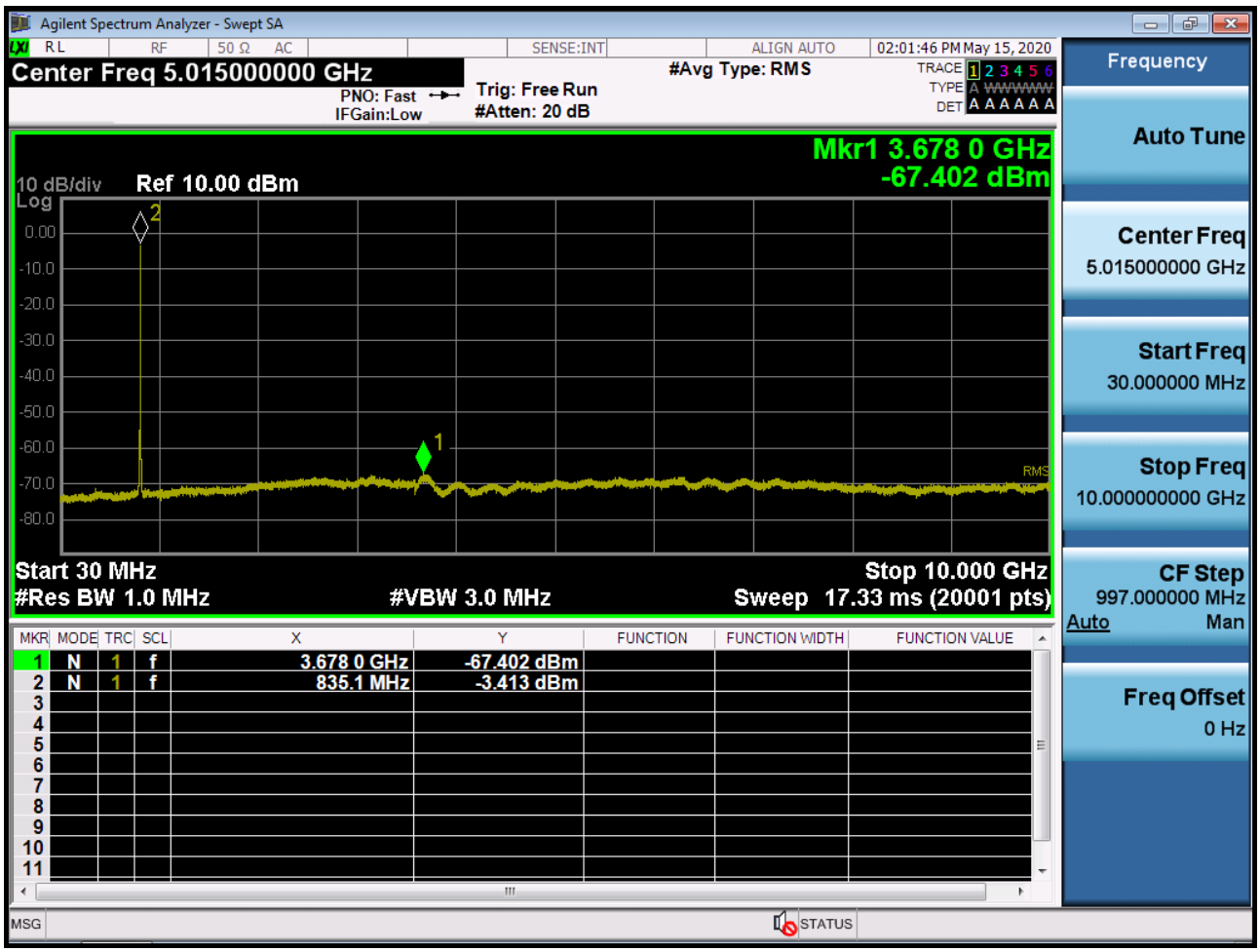
BAND5/ 26. Conducted Spurious Plot (27025ch_3MHz_QPSK_RB 1_0)



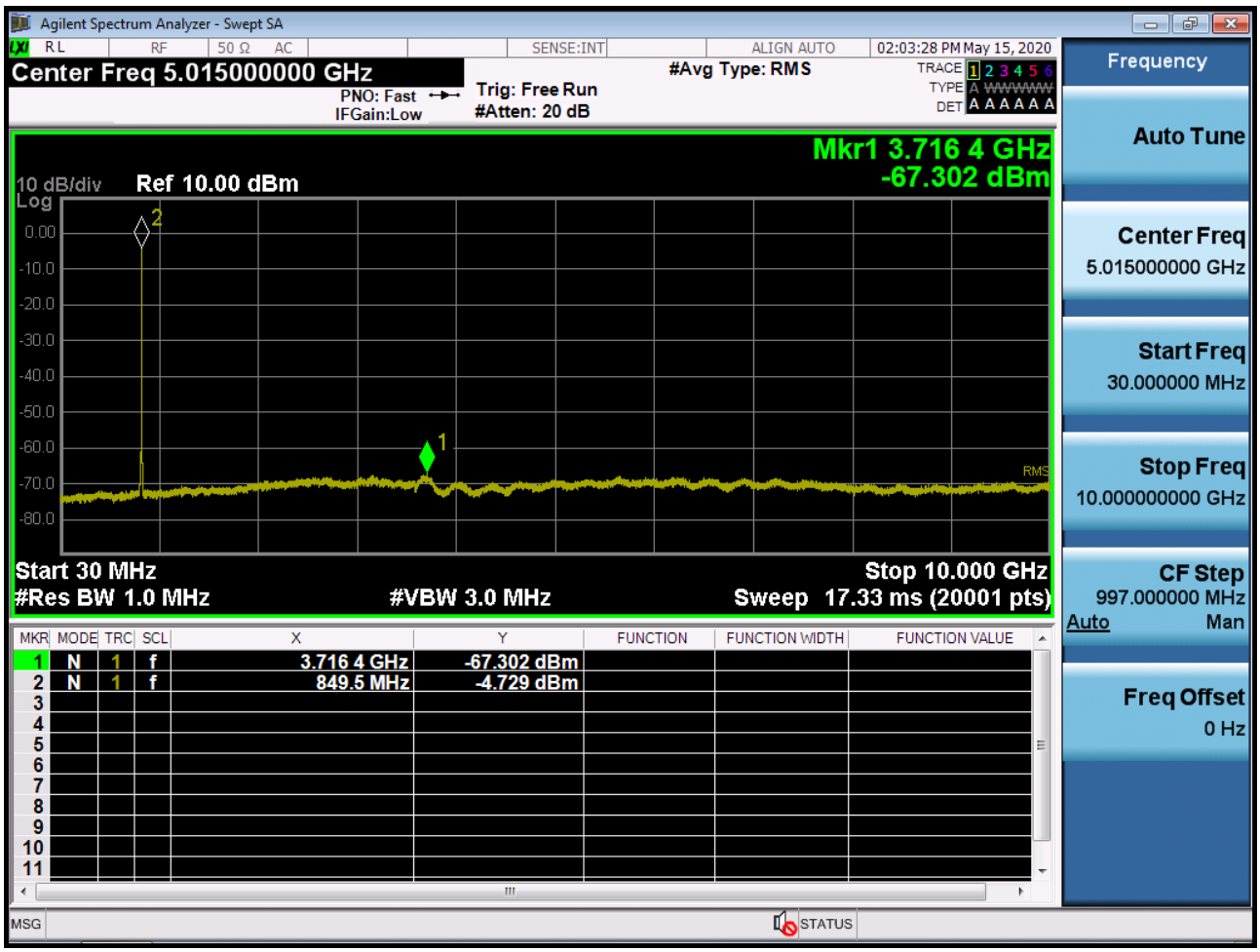
BAND5/ 26. Conducted Spurious Plot (26815ch_5MHz_QPSK_RB 1_0)



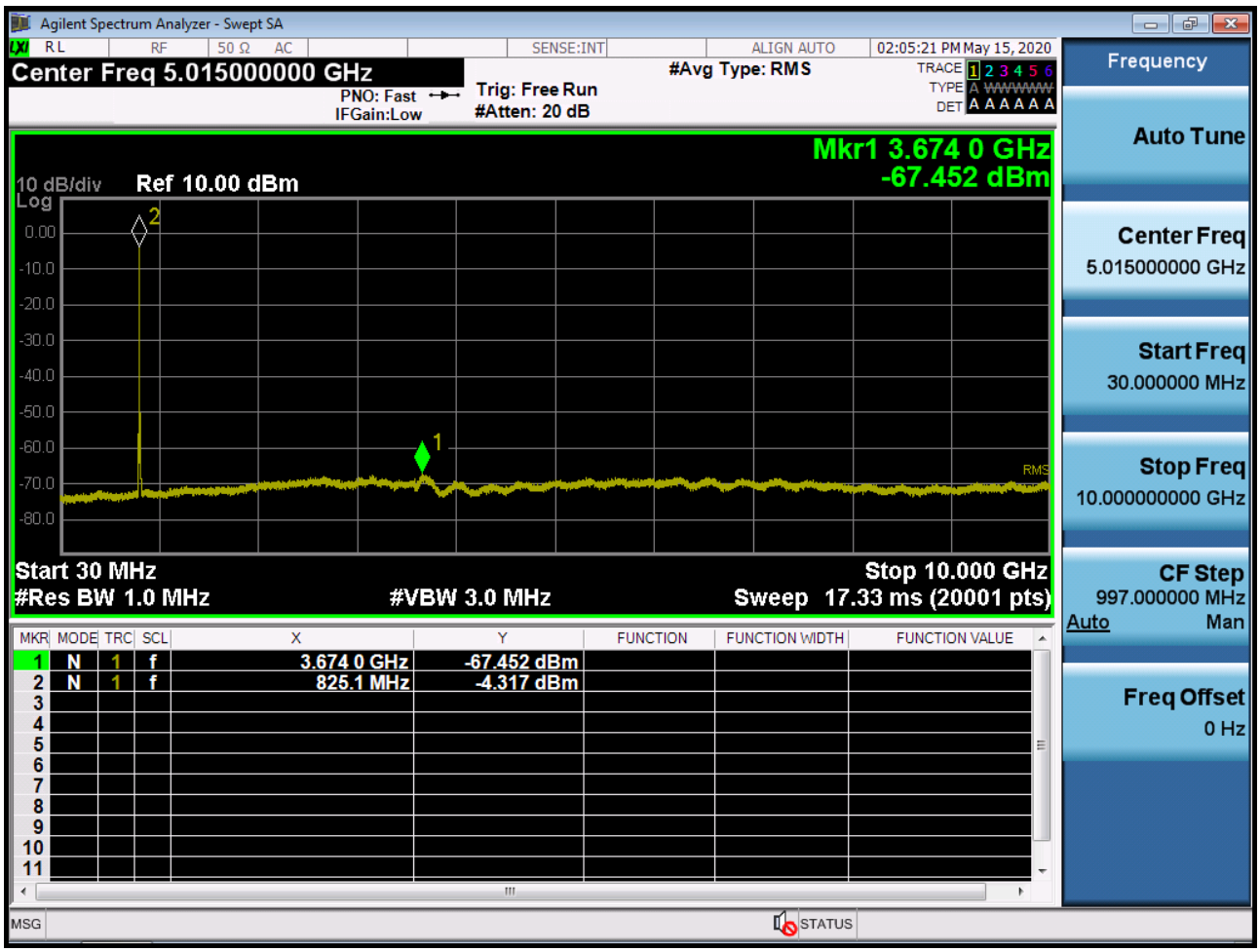
BAND5/ 26. Conducted Spurious Plot (26915ch_5MHz_QPSK_RB 1_0)



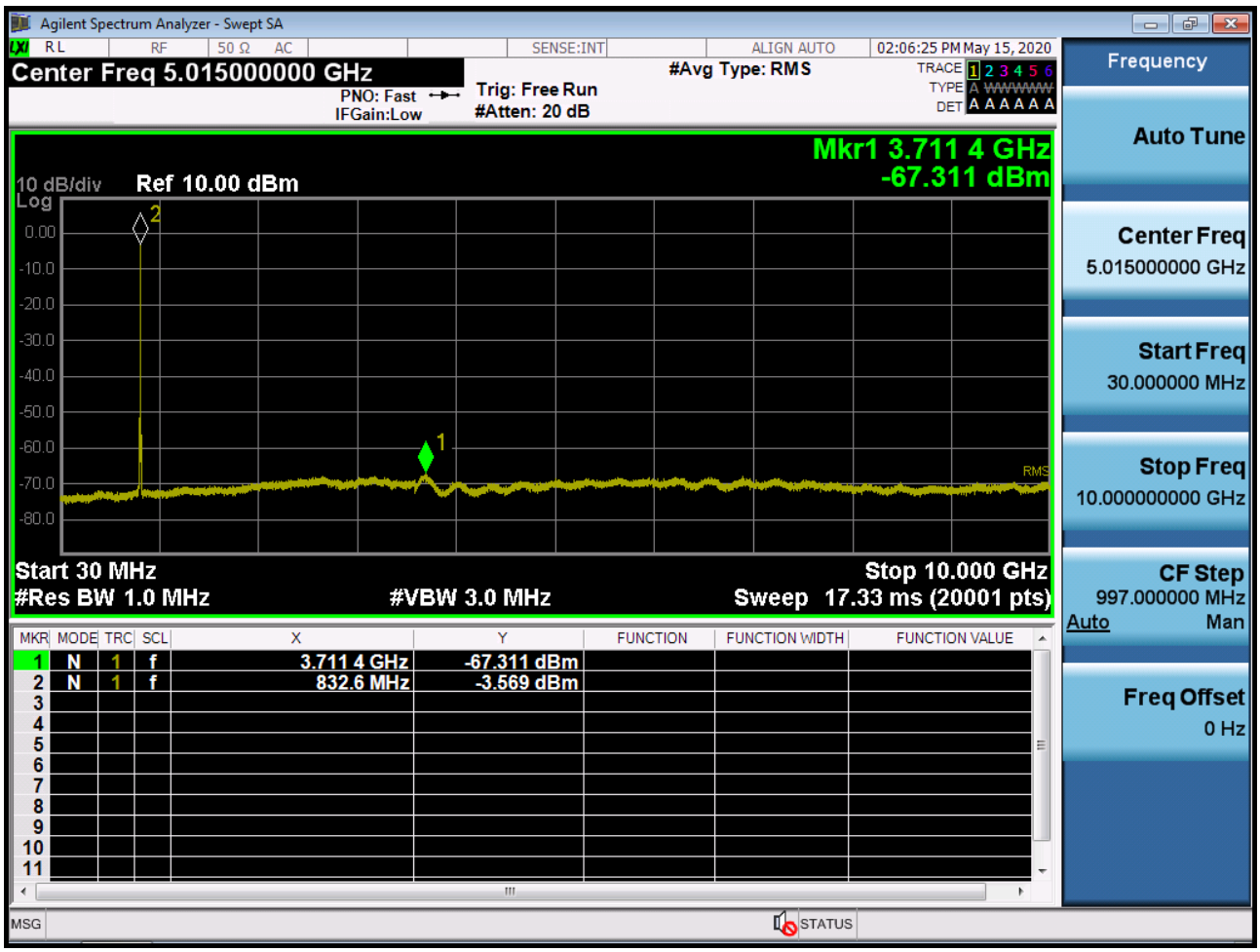
BAND5/ 26. Conducted Spurious Plot (27015ch_5MHz_QPSK_RB 1_0)



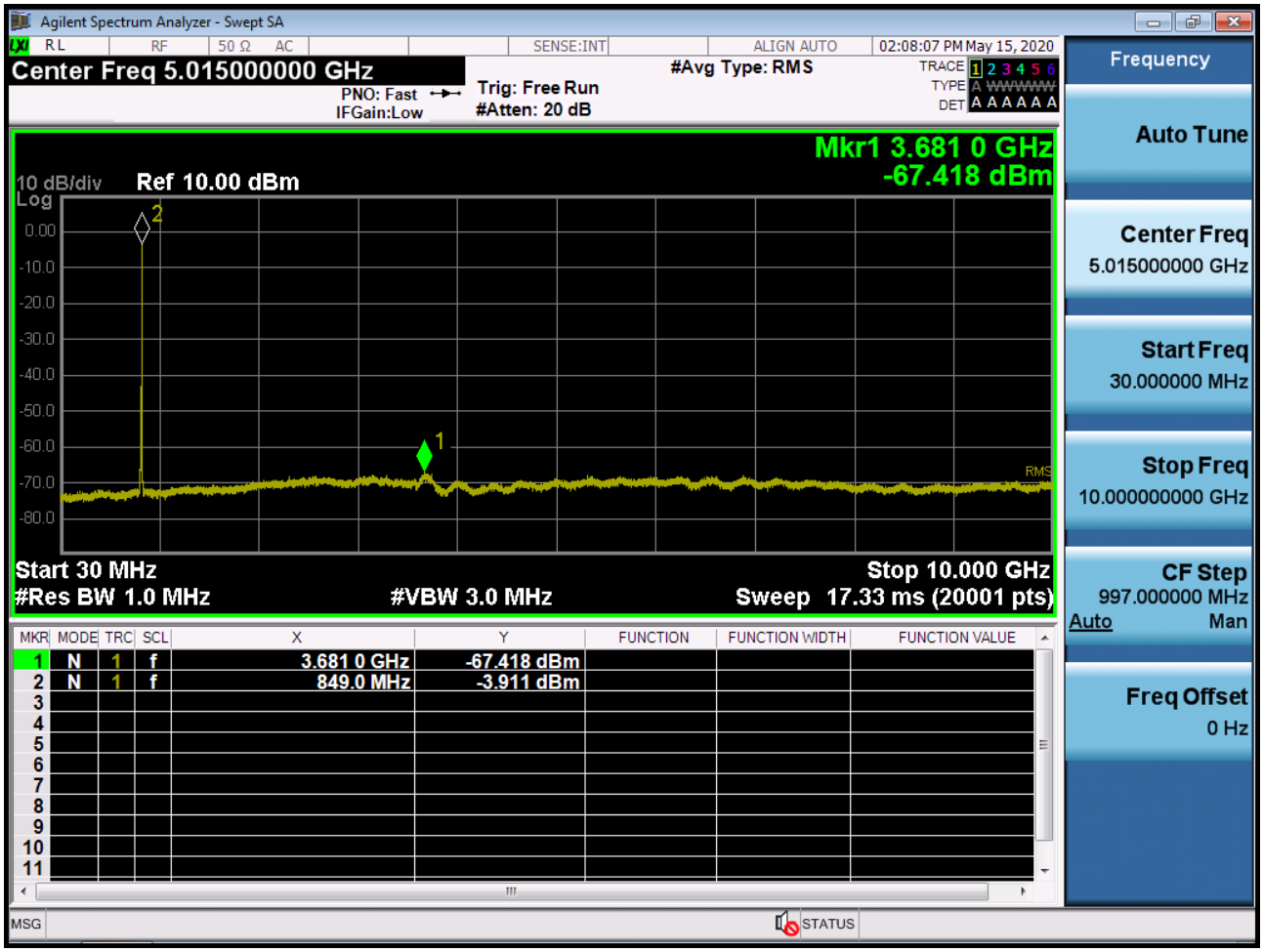
BAND5/ 26. Conducted Spurious Plot (26840ch_10MHz_QPSK_RB 1_0)



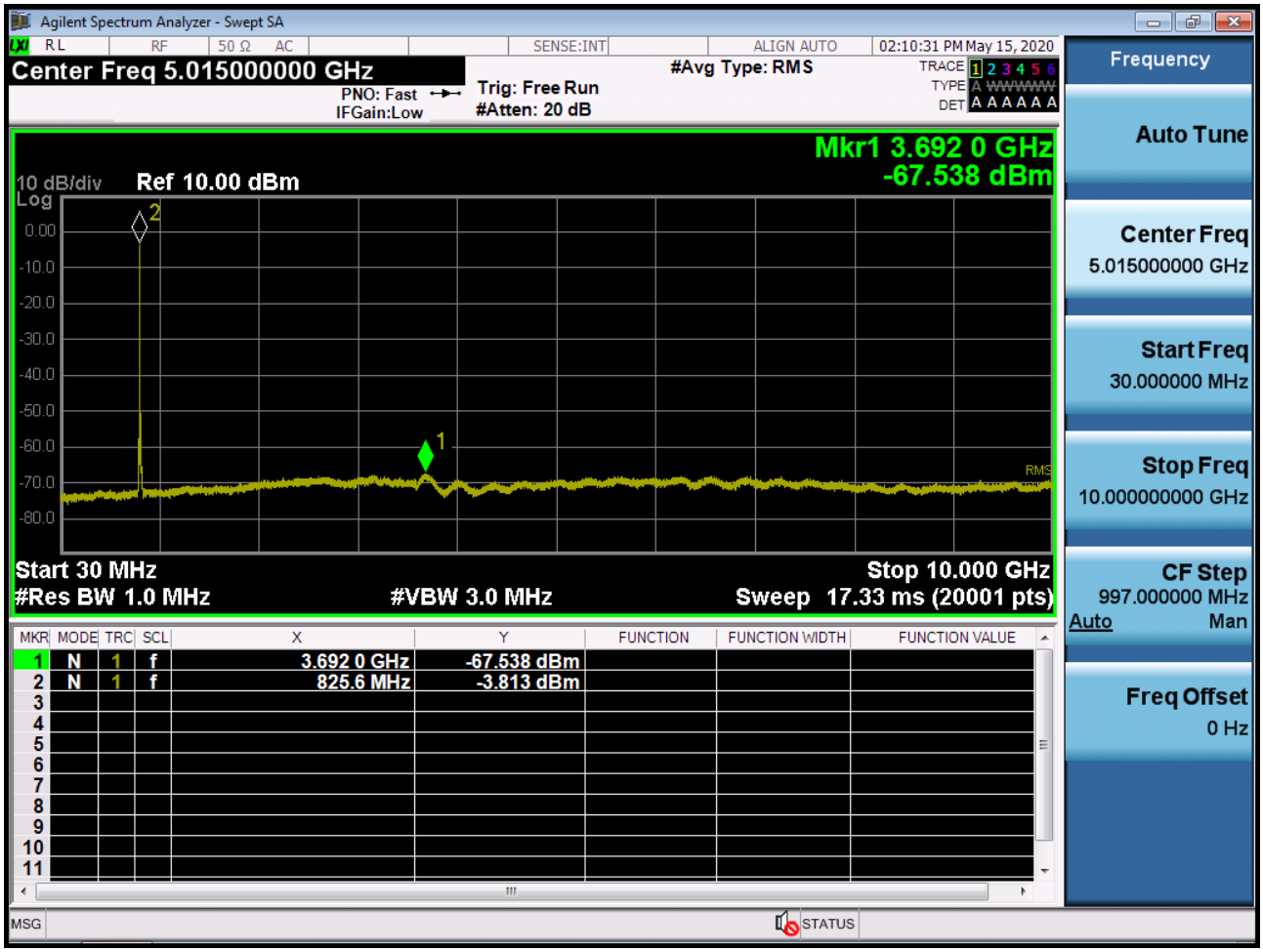
BAND5/ 26. Conducted Spurious Plot (26915ch_10MHz_QPSK_RB 1_0)



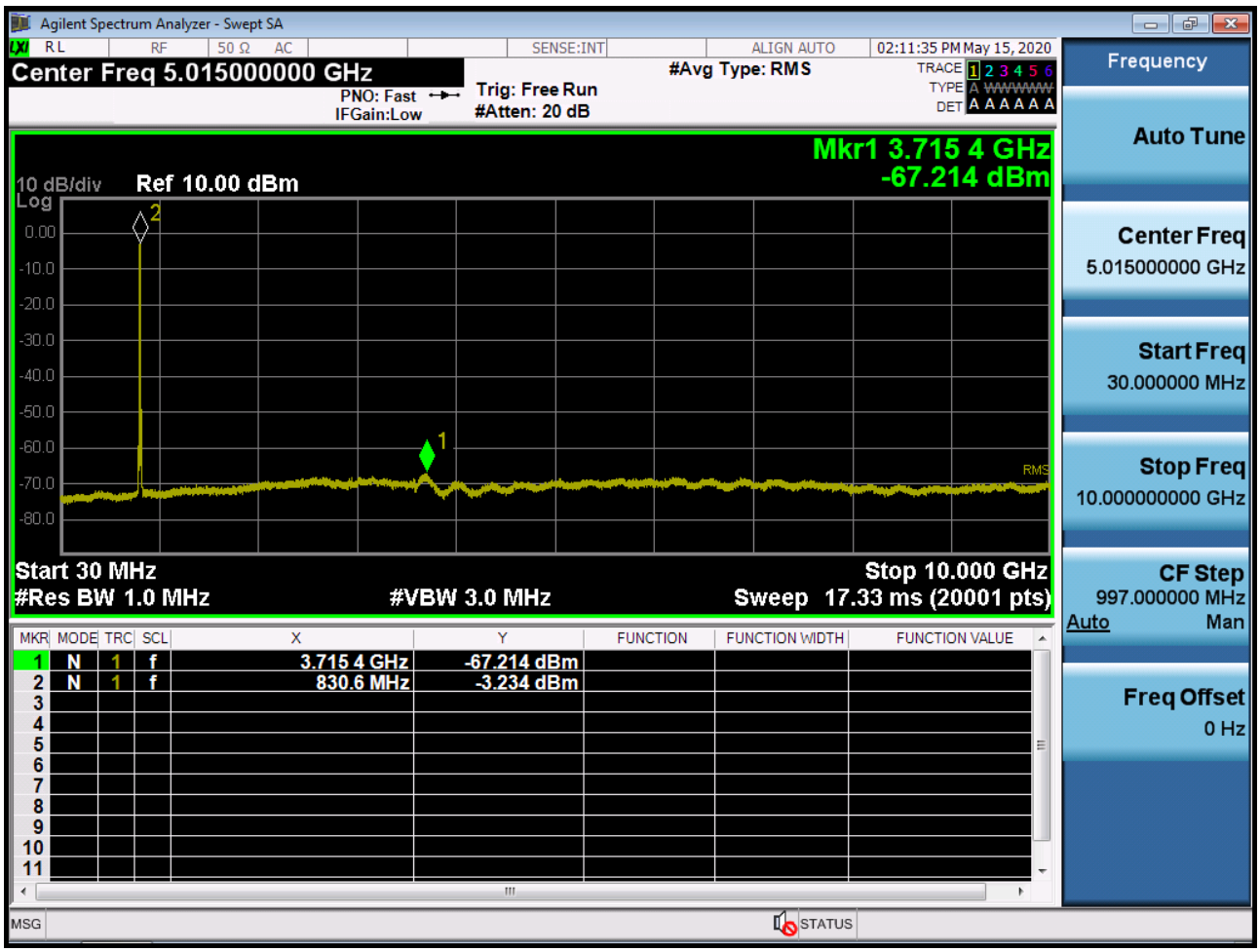
BAND5/ 26. Conducted Spurious Plot (26990ch_10MHz_QPSK_RB 1_0)



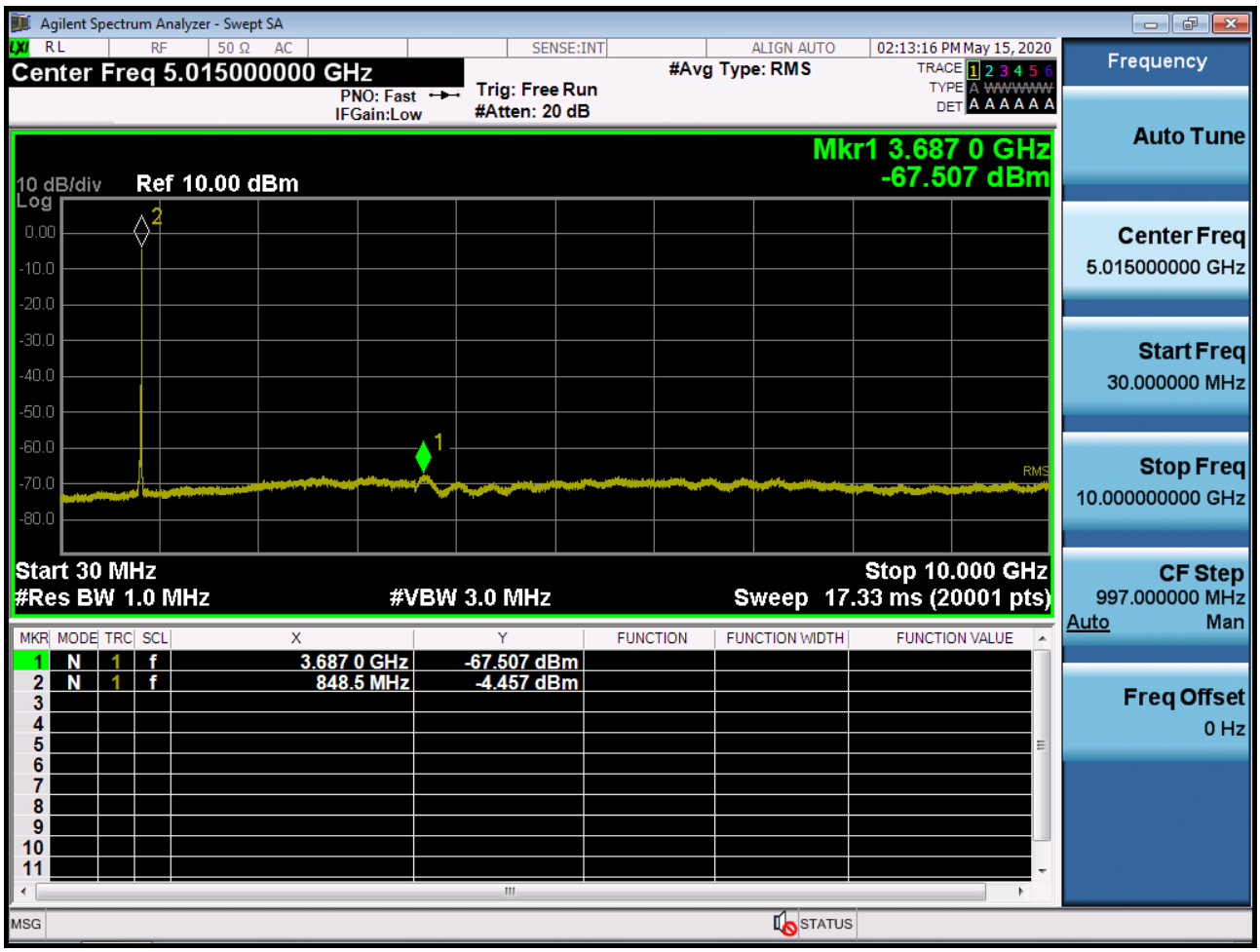
BAND 26. Conducted Spurious (26865ch_15MHz_QPSK_RB 1_0)



BAND 26. Conducted Spurious (26915ch_15MHz_QPSK_RB 1_0)



BAND 26. Conducted Spurious (26965ch_15MHz_QPSK_RB 1_0)



10. ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2006-FC077-P