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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:
February 18, 2022

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

Report No.: HCT-RF-2202-FC011-R1

FCC ID:	**A3LSMA736B**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s):	SM-A736B/DS
Additional Model(s):	SM-A736B
EUT Type:	Mobile phone
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§90, §22, §2

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	Conducted Output Power	
				Max. Power (W)	Max. Power (dBm)
LTE – Band26 (1.4)	814.7 – 824.0	1M09G7D	QPSK	0.275	24.39
		1M09W7D	16QAM	0.240	23.81
		1M09W7D	64QAM	0.195	22.89
		1M09W7D	256QAM	0.100	19.99
LTE – Band26 (3)	815.5 – 824.0	2M71G7D	QPSK	0.282	24.51
		2M70W7D	16QAM	0.240	23.81
		2M70W7D	64QAM	0.192	22.83
		2M70W7D	256QAM	0.094	19.74
LTE – Band26 (5)	816.5 – 824.0	4M51G7D	QPSK	0.286	24.57
		4M50W7D	16QAM	0.242	23.84
		4M52W7D	64QAM	0.188	22.75
		4M51W7D	256QAM	0.093	19.68
LTE – Band26 (10)	819.0 – 824.0	8M97G7D	QPSK	0.277	24.43
		8M99W7D	16QAM	0.237	23.75
		8M98W7D	64QAM	0.188	22.74
		8M98W7D	256QAM	0.091	19.60
LTE – Band26 (15)	821.5	13M4G7D	QPSK	0.275	24.39
		13M5W7D	16QAM	0.238	23.76
		13M4W7D	64QAM	0.179	22.54
		13M5W7D	256QAM	0.088	19.44

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 : Jae Mun Do
Engineer of Telecommunication Testing Center

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

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

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

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2202-FC011	February 15, 2022	- First Approval Report
HCT-RF-2202-FC011-R1	February 18, 2022	- Revised the Conducted output power (page 1)

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:	A3LSMA736B
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§90, §22, §2
EUT Type:	Mobile phone
Model(s):	SM-A736B/DS
Additional Model(s):	SM-A736B
Tx Frequency:	814.7 MHz – 823.3 MHz (LTE – Band 26 (1.4 MHz)) 815.5 MHz – 822.5 MHz (LTE – Band 26 (3 MHz)) 816.5 MHz – 821.5 MHz (LTE – Band 26 (5 MHz)) 819.0 MHz (LTE – Band 26 (10 MHz)) 821.5 MHz (LTE – Band 26 (15 MHz))
Date(s) of Tests:	January 10, 2022 ~ February 10, 2022
Serial number:	Radiated: R3CRB0BP4PA Conducted: 5a1ad468e1347ece

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

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

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

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
Channel 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
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 CONDUCTED OUTPUT POWER

Test Overview

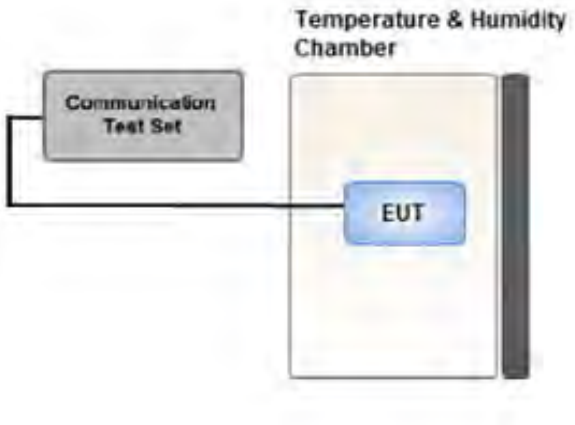
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base 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 in accordance with ANSI/TIA-603-E-2016 Clause 2.2.17.

Test Settings

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

Test Note

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

   The power is calculated by the following formula;

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

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

3.4 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

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

Test Settings

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

Test Note

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

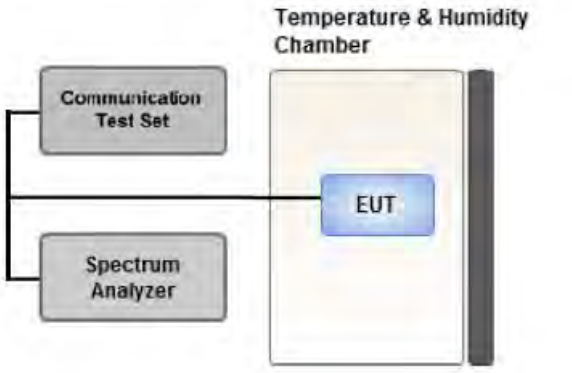
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

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

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

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

3.5 OCCUPIED BANDWIDTH.



Test setup

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

The EUT makes a call to the communication simulator.

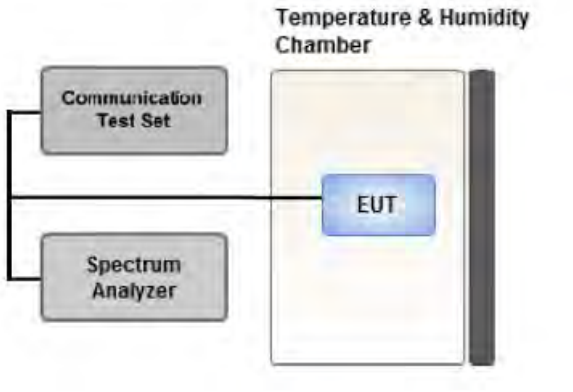
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

Test Settings

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

3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

Test Overview

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

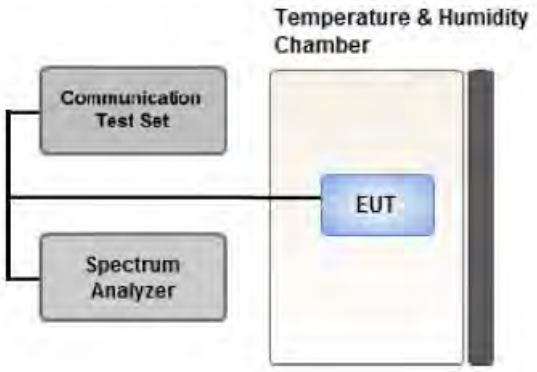
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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

Test Settings

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

3.7 CHANNEL EDGE



Test setup

Test Overview

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

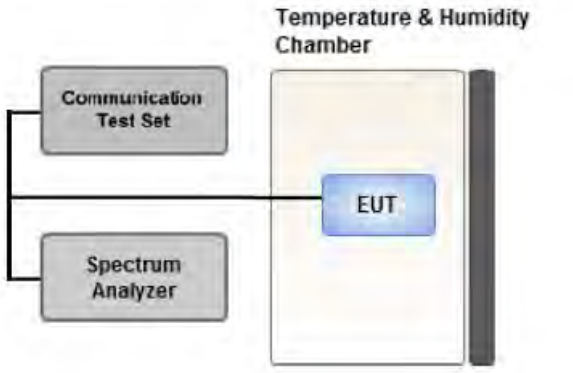
Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW :
   .- EA licensee's frequency block by up to and including 37.5 kHz : 300 Hz
   .- EA licensee's frequency block greater than 37.5 kHz : 100 kHz
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

For 90.691(a), RBW=300 Hz for offset less than 37.5 kHz from channel edge and RBW=100 kHz for offsets greater than 37.5 kHz is allowed.

3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

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

The frequency stability of the transmitter is measured by:

1. Temperature:

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

2. Primary Supply Voltage:

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

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

Test Settings

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

3.9 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.
  Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc)
  Worst case : Stand alone
- We were performed the RSE test in condition of co-location. There has no significant emission raised.
- WWAN + WLAN 5 GHz + BT (Worst case : Stand alone)
- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported. (Worst case : 3 MHz)
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- All modes of operation were tested and the worst case results are reported.
- Please refer to the table below.
- SM-A736B/DS & additional models were tested and the worst case results are reported.

(Worst case : SM-A736B/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

3.10 WORST CASE(CONDUCTED TEST)

-Worst case : Of all modulation, We have tested modulation of the high Conducted Output Power.

- SM-A736B/DS & additional models were tested and the worst case results are reported.

(Worst case : SM-A736B/DS)

[Worst case]

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

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
H.P.F	FBSR-02B(WHK1.2/15 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
H.P.F	FBSR-02B(WHK3.3/18 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	11275	04/07/2022	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/28/2022	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	04/05/2023	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	04/05/2023	Biennial
Chamber	SU-642	ESPEC	93008124	03/15/2022	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/30/2022	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/15/2023	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	10/13/2022	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	04/12/2023	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	05/18/2022	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	06/01/2022	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	09/29/2022	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/18/2022	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/19/2022	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/03/2023	Biennial
Hybrid Antenna	VULB9168	Schwarzbeck	760	02/22/2023	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262116770	07/12/2022	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6200863156	12/29/2022	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2022	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	06/02/2022	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)	1.82 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05 (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
Channel Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §90.691	< 50 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions within 37.5 kHz of Block Edge	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 §90.635	< 100 Watts	PASS
Frequency stability / variation of ambient temperature	§2.1055, §90.213 §22.355	< 2.5 ppm	PASS

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 (Only 15 MHz B.W)	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §90.691 §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	Substitute	Ant. Gain	C.L	Pol.	ERP	
channel	Freq.(MHz)	Level (dBm)	Level (dBm)	(dBd)			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	Substitute	Ant. Gain	C.L	Pol.	EIRP	
channel	Freq.(MHz)	Level (dBm)	Level (dBm)	(dBi)			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

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)				Limit (W)
				814.7 MHz		823.3 MHz		
				dBm	W	dBm	W	
1.4	QPSK	1	0	24.33	0.271	24.31	0.270	100
		1	3	24.39	0.275	24.37	0.274	100
		1	5	24.38	0.274	24.38	0.274	100
		3	0	24.35	0.272	24.33	0.271	100
		3	1	24.36	0.273	24.33	0.271	100
		3	3	24.31	0.270	24.28	0.268	100
		6	0	23.49	0.223	23.45	0.221	100
	16QAM	1	0	23.73	0.236	23.70	0.234	100
		1	3	23.70	0.234	23.65	0.232	100
		1	5	23.62	0.230	23.60	0.229	100
		3	0	23.81	0.240	23.78	0.239	100
		3	1	23.73	0.236	23.70	0.234	100
		3	3	23.56	0.227	23.48	0.223	100
		6	0	22.55	0.180	22.51	0.178	100
	64QAM	1	0	22.72	0.187	22.70	0.186	100
		1	3	22.89	0.195	22.87	0.194	100
		1	5	22.64	0.184	22.61	0.182	100
		3	0	22.63	0.183	22.58	0.181	100
		3	1	22.64	0.184	22.59	0.182	100
		3	3	22.46	0.176	22.41	0.174	100
		6	0	21.56	0.143	21.53	0.142	100
	256QAM	1	0	19.99	0.100	19.95	0.099	100
		1	3	19.70	0.093	19.68	0.093	100
		1	5	19.61	0.091	19.60	0.091	100
		3	0	19.72	0.094	19.70	0.093	100
		3	1	19.63	0.092	19.61	0.091	100
		3	3	19.65	0.092	19.63	0.092	100
		6	0	19.49	0.089	19.47	0.089	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)				Limit (W)
				815.5 MHz		822.5 MHz		
				dBm	W	dBm	W	
3	QPSK	1	0	24.42	0.277	24.40	0.275	100
		1	7	24.51	0.282	24.51	0.282	100
		1	14	24.41	0.276	24.40	0.275	100
		8	0	23.60	0.229	23.48	0.223	100
		8	3	23.56	0.227	23.54	0.226	100
		8	7	23.55	0.226	23.53	0.225	100
		15	0	23.52	0.225	23.51	0.224	100
	16QAM	1	0	23.80	0.240	23.78	0.239	100
		1	7	23.62	0.230	23.60	0.229	100
		1	14	23.81	0.240	23.80	0.240	100
		8	0	22.61	0.182	22.58	0.181	100
		8	3	22.61	0.182	22.59	0.182	100
		8	7	22.65	0.184	22.61	0.182	100
		15	0	22.54	0.179	22.51	0.178	100
	64QAM	1	0	22.83	0.192	22.81	0.191	100
		1	7	22.57	0.181	22.56	0.180	100
		1	14	22.58	0.181	22.54	0.179	100
		8	0	21.74	0.149	21.71	0.148	100
		8	3	21.65	0.146	21.63	0.146	100
		8	7	21.67	0.147	21.65	0.146	100
		15	0	21.63	0.146	21.61	0.145	100
	256QAM	1	0	19.74	0.094	19.71	0.094	100
		1	7	19.63	0.092	19.60	0.091	100
		1	14	19.62	0.092	19.59	0.091	100
		8	0	19.60	0.091	19.58	0.091	100
		8	3	19.60	0.091	19.58	0.091	100
		8	7	19.65	0.092	19.63	0.092	100
		15	0	19.60	0.091	19.59	0.091	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)				Limit (W)
				816.5 MHz		821.5 MHz		
				dBm	W	dBm	W	
5	QPSK	1	0	24.28	0.268	24.30	0.269	100
		1	12	24.57	0.286	24.55	0.285	101
		1	24	24.34	0.272	24.37	0.274	102
		12	0	23.56	0.227	23.55	0.226	103
		12	6	23.60	0.229	23.54	0.226	104
		12	11	23.48	0.223	23.48	0.223	105
		25	0	23.54	0.226	23.51	0.224	106
	16QAM	1	0	23.71	0.235	23.84	0.242	107
		1	12	23.75	0.237	23.81	0.240	108
		1	24	23.81	0.240	23.78	0.239	109
		12	0	22.48	0.177	22.46	0.176	110
		12	6	22.64	0.184	22.61	0.182	111
		12	11	22.52	0.179	22.51	0.178	112
		25	0	22.48	0.177	22.49	0.177	113
	64QAM	1	0	22.71	0.187	22.68	0.185	114
		1	12	22.75	0.188	22.74	0.188	115
		1	24	22.60	0.182	22.60	0.182	116
		12	0	21.58	0.144	21.56	0.143	117
		12	6	21.56	0.143	21.54	0.143	118
		12	11	21.54	0.143	21.53	0.142	119
		25	0	21.49	0.141	21.48	0.141	120
	256QAM	1	0	19.60	0.091	19.58	0.091	121
		1	12	19.56	0.090	19.68	0.093	122
		1	24	19.46	0.088	19.33	0.086	123
		12	0	19.51	0.089	19.50	0.089	124
		12	6	19.56	0.090	19.53	0.090	125
		12	11	19.52	0.090	19.51	0.089	126
		25	0	19.52	0.090	19.51	0.089	127

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				819 MHz		
				dBm	W	
10	QPSK	1	0	24.43	0.277	100
		1	24	24.38	0.274	100
		1	49	24.42	0.277	100
		25	0	23.33	0.215	100
		25	12	23.48	0.223	100
		25	24	23.42	0.220	100
		50	0	23.44	0.221	100
	16QAM	1	0	23.75	0.237	100
		1	24	23.57	0.228	100
		1	49	23.66	0.232	100
		25	0	22.38	0.173	100
		25	12	22.53	0.179	100
		25	24	22.52	0.179	100
		50	0	22.47	0.177	100
	64QAM	1	0	22.65	0.184	100
		1	24	22.68	0.185	100
		1	49	22.74	0.188	100
		25	0	21.41	0.138	100
		25	12	21.59	0.144	100
		25	24	21.45	0.140	100
		50	0	21.48	0.141	100
	256QAM	1	0	19.30	0.085	100
		1	24	19.60	0.091	100
		1	49	19.26	0.084	100
		25	0	19.38	0.087	100
		25	12	19.52	0.090	100
		25	24	19.42	0.087	100
		50	0	19.38	0.087	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				821.5 MHz		
				dBm	W	
15	QPSK	1	0	24.28	0.268	100
		1	36	24.39	0.275	100
		1	74	24.05	0.254	100
		36	0	23.23	0.210	100
		36	18	23.33	0.215	100
		36	39	23.30	0.214	100
		75	0	23.36	0.217	100
	16QAM	1	0	23.68	0.233	100
		1	36	23.54	0.226	100
		1	74	23.76	0.238	100
		36	0	22.24	0.167	100
		36	18	22.42	0.175	100
		36	39	22.34	0.171	100
		75	0	22.34	0.171	100
	64QAM	1	0	22.53	0.179	100
		1	36	22.54	0.179	100
		1	74	22.47	0.177	100
		36	0	21.34	0.136	100
		36	18	21.46	0.140	100
		36	39	21.35	0.136	100
		75	0	21.34	0.136	100
	256QAM	1	0	19.20	0.083	100
		1	36	19.44	0.088	100
		1	74	19.37	0.086	100
		36	0	19.30	0.085	100
		36	18	19.44	0.088	100
		36	39	19.33	0.086	100
		75	0	19.30	0.085	100

8.2 EFFECTIVE RADIATED POWER

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
814.7	LTE B26/ 1.4 MHz	QPSK	-32.64	29.90	-10.29	1.38	H	< 100	0.067	18.23
		16QAM	-33.23	29.31	-10.29	1.38	H		0.058	17.64
		64QAM	-34.24	28.30	-10.29	1.38	H		0.046	16.63
		256QAM	-37.26	25.28	-10.29	1.38	H		0.023	13.61
823.3		QPSK	-32.52	30.53	-10.25	1.39	H		0.077	18.89
		16QAM	-33.07	29.98	-10.25	1.39	H		0.068	18.34
		64QAM	-34.13	28.92	-10.25	1.39	H		0.053	17.28
		256QAM	-37.15	25.90	-10.25	1.39	H		0.027	14.26

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
815.5	LTE B26/ 3 MHz	QPSK	-32.36	30.22	-10.29	1.39	H	< 100	0.072	18.55
		16QAM	-33.04	29.54	-10.29	1.39	H		0.061	17.87
		64QAM	-34.04	28.54	-10.29	1.39	H		0.049	16.87
		256QAM	-37.07	25.51	-10.29	1.39	H		0.024	13.84
822.5		QPSK	-32.29	30.82	-10.26	1.39	H		0.083	19.18
		16QAM	-32.94	30.17	-10.26	1.39	H		0.071	18.53
		64QAM	-34.09	29.02	-10.26	1.39	H		0.055	17.38
		256QAM	-37.15	25.96	-10.26	1.39	H		0.027	14.32

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
816.5	LTE B26/ 5 MHz	QPSK	-32.32	30.37	-10.28	1.39	H	< 100	0.074	18.70
		16QAM	-33.12	29.57	-10.28	1.39	H		0.062	17.90
		64QAM	-34.15	28.54	-10.28	1.39	H		0.049	16.87
		256QAM	-37.20	25.49	-10.28	1.39	H		0.024	13.82
821.5		QPSK	-32.33	30.71	-10.26	1.39	H		0.081	19.06
		16QAM	-32.93	30.11	-10.26	1.39	H		0.070	18.46
		64QAM	-34.08	28.96	-10.26	1.39	H		0.054	17.31
		256QAM	-37.21	25.83	-10.26	1.39	H		0.026	14.18

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
819.0	LTE B26/ 10 MHz	QPSK	-32.11	30.77	-10.27	1.39	H	< 100	0.081	19.11
		16QAM	-32.75	30.13	-10.27	1.39	H		0.070	18.47
		64QAM	-33.77	29.11	-10.27	1.39	H		0.056	17.45
		256QAM	-37.16	25.72	-10.27	1.39	H		0.025	14.06

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
821.5	LTE B26/ 15 MHz	QPSK	-32.53	30.51	-10.26	1.39	H	< 7.00	0.077	18.86
		16QAM	-33.04	30.00	-10.26	1.39	H		0.068	18.35
		64QAM	-34.22	28.82	-10.26	1.39	H		0.052	17.17
		256QAM	-37.57	25.47	-10.26	1.39	H		0.024	13.82

Note

1. Limit: None (for reporting purposes only)

8.3 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B26

▣ MODULATION SIGNAL: 3 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit
26705 (815.5)	1 631.00	-52.39	9.50	-62.35	1.98	V	-54.83	-13.00
	2 446.50	-50.30	10.28	-54.78	2.47	H	-46.96	-13.00
	3 262.00	-57.21	11.86	-58.42	2.88	H	-49.44	-13.00
26775 (822.5)	1 645.00	-51.93	9.65	-62.28	1.99	V	-54.61	-13.00
	2 467.50	-54.08	10.46	-58.73	2.47	V	-50.74	-13.00
	3 290.00	-56.91	12.04	-58.31	2.88	V	-49.15	-13.00

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Band 26	1.4 MHz	823.3	QPSK	6	0	1.0915
			16QAM			1.0920
			64QAM			1.0916
			256QAM			1.0901
	3 MHz	822.5	QPSK	15		2.7083
			16QAM			2.6965
			64QAM			2.7014
			256QAM			2.6972
	5 MHz	821.5	QPSK	25		4.5116
			16QAM			4.4966
			64QAM			4.5172
			256QAM			4.5060
	10 MHz	819.0	QPSK	50		8.9649
			16QAM			8.9913
			64QAM			8.9784
			256QAM			8.9772
	15 MHz	821.5	QPSK	75		13.420
			16QAM			13.469
			64QAM			13.422
			256QAM			13.458

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 45 ~ 64.

8.5 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
26	1.4	814.7	3.1800	27.976	-67.248	-39.272	-13.00
		823.3	3.7094	27.976	-67.342	-39.366	
	3	815.5	3.6850	27.976	-66.978	-39.002	
		822.5	3.7144	27.976	-67.172	-39.196	
	5	816.5	3.1651	27.976	-67.094	-39.118	
		821.5	3.6805	27.976	-67.317	-39.341	
	10	819.0	3.7104	27.976	-67.033	-39.057	
	15	821.5	3.6775	27.976	-67.214	-39.238	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 85 ~ 92.
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 + Ext. Attenuator + Power Splitter

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

8.6 CHANNEL EDGE

- Plots of the EUT's Band Edge are shown Page 65 ~ 84.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE 26

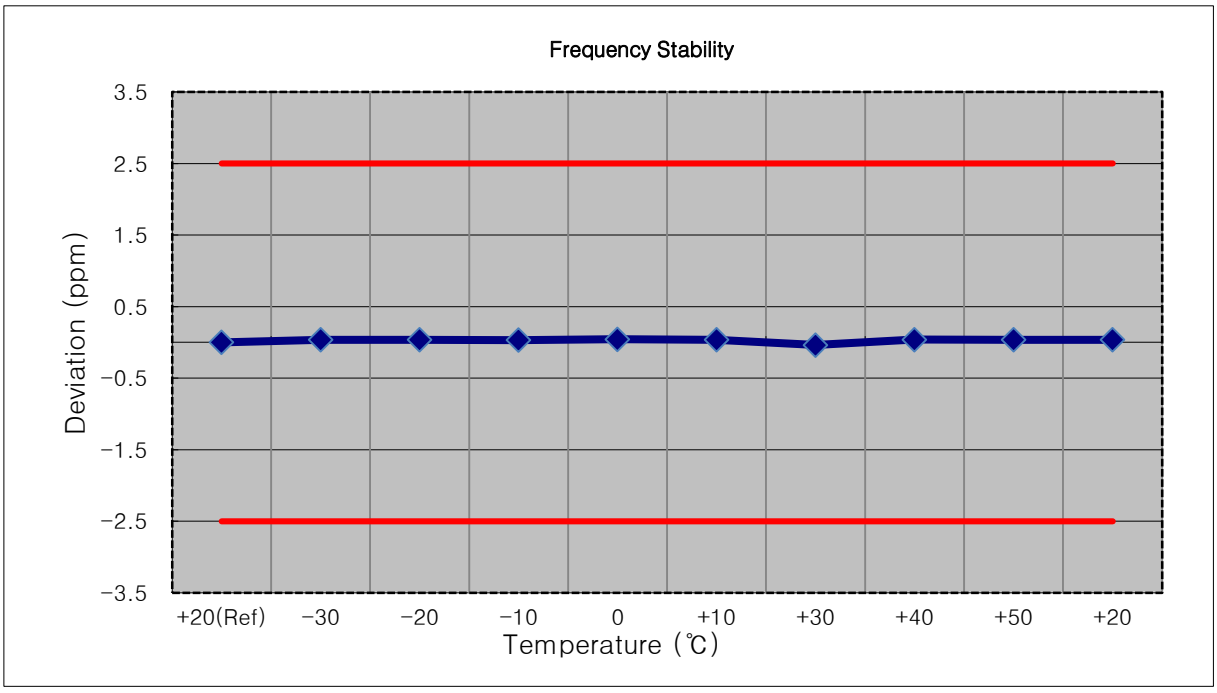
▣ OPERATING FREQUENCY: 814,700,000 Hz

▣ CHANNEL: 26697(1.4 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	814 700 036	0.0	0.000 000	0.000
100 %		-30	814 700 065	29.5	0.000 004	0.036
100 %		-20	814 700 066	30.1	0.000 004	0.037
100 %		-10	814 700 062	26.6	0.000 003	0.033
100 %		0	814 700 071	35.1	0.000 004	0.043
100 %		+10	814 700 067	30.8	0.000 004	0.038
100 %		+30	814 700 005	-30.8	-0.000 004	-0.038
100 %		+40	814 700 067	31.5	0.000 004	0.039
100 %		+50	814 700 066	30.0	0.000 004	0.037
Batt. Endpoint	3.550	+20	814 700 067	31.0	0.000 004	0.038



▣ MODE: LTE 26

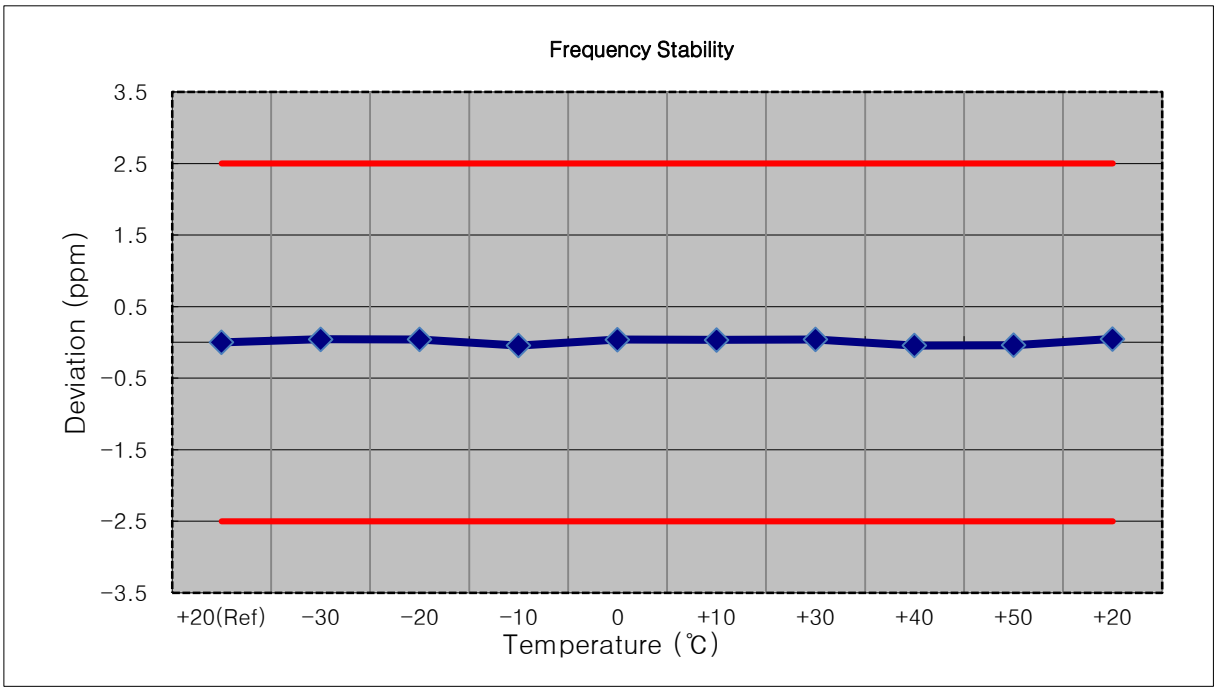
▣ OPERATING FREQUENCY: 815,500,000 Hz

▣ CHANNEL: 26705(3 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	815 500 036	0.0	0.000 000	0.000
100 %		-30	815 500 072	35.9	0.000 004	0.044
100 %		-20	815 500 071	34.7	0.000 004	0.043
100 %		-10	815 500 001	-35.9	-0.000 004	-0.044
100 %		0	815 500 069	32.6	0.000 004	0.040
100 %		+10	815 500 065	29.0	0.000 004	0.036
100 %		+30	815 500 071	34.8	0.000 004	0.043
100 %		+40	815 500 000	-36.8	-0.000 005	-0.045
100 %		+50	815 500 005	-31.9	-0.000 004	-0.039
Batt. Endpoint	3.550	+20	815 500 077	40.2	0.000 005	0.049



▣ MODE: LTE 26

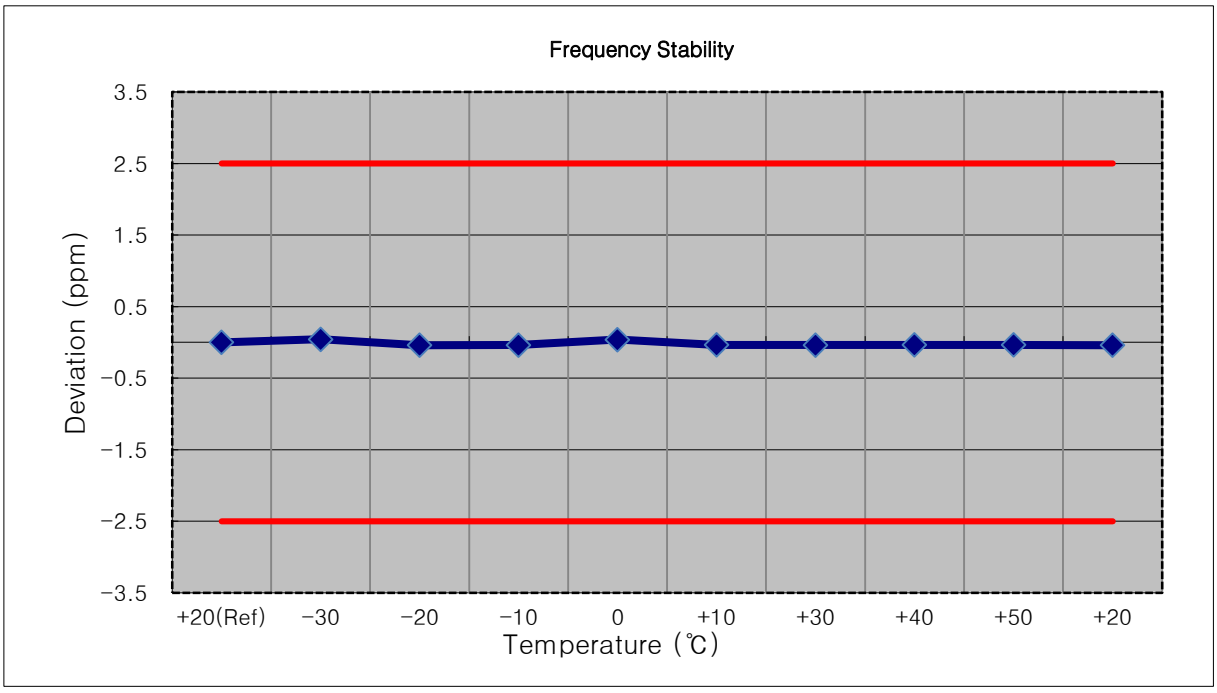
▣ OPERATING FREQUENCY: 816,500,000 Hz

▣ CHANNEL: 26715(5 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	816 500 035	0.0	0.000 000	0.000
100 %		-30	816 500 070	35.5	0.000 004	0.043
100 %		-20	816 500 003	-31.4	-0.000 004	-0.038
100 %		-10	816 500 004	-30.9	-0.000 004	-0.038
100 %		0	816 500 068	32.9	0.000 004	0.040
100 %		+10	816 500 006	-29.0	-0.000 004	-0.036
100 %		+30	816 500 004	-31.0	-0.000 004	-0.038
100 %		+40	816 500 007	-27.8	-0.000 003	-0.034
100 %		+50	816 500 006	-29.2	-0.000 004	-0.036
Batt. Endpoint	3.550	+20	816 500 003	-31.3	-0.000 004	-0.038



▣ MODE: LTE 26

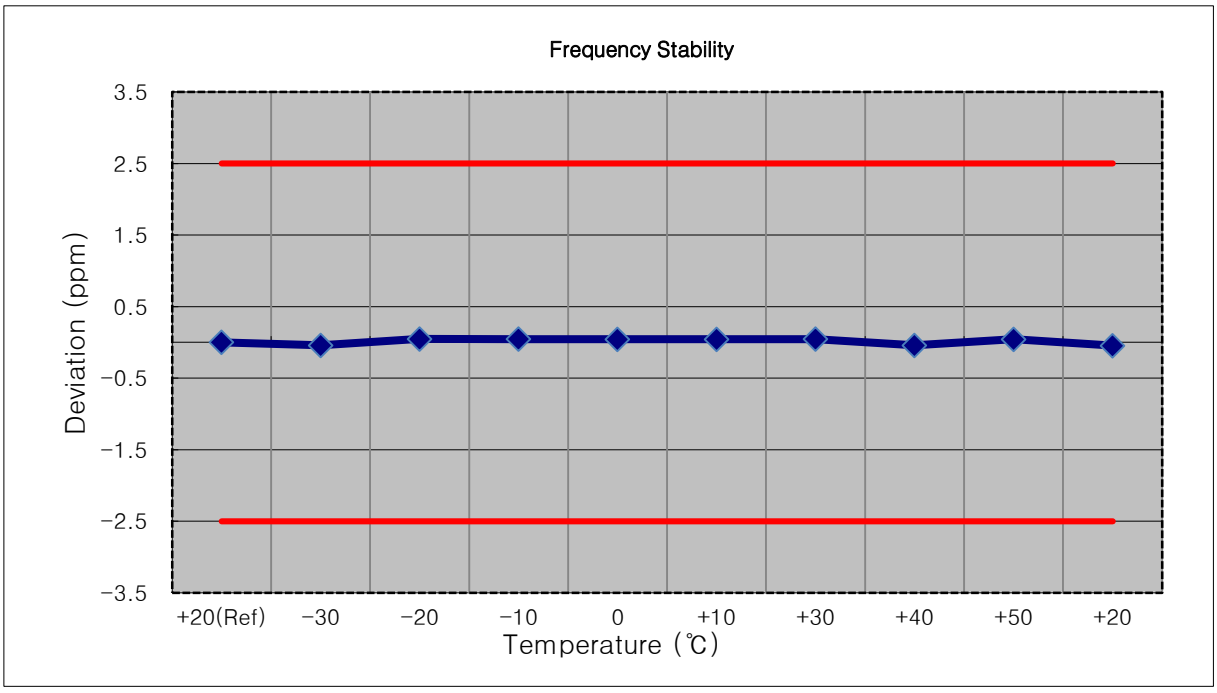
▣ OPERATING FREQUENCY: 819,000,000 Hz

▣ CHANNEL: 26740(10 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	819 000 037	0.0	0.000 000	0.000
100 %		-30	819 000 004	-33.2	-0.000 004	-0.041
100 %		-20	819 000 077	39.3	0.000 005	0.048
100 %		-10	819 000 074	36.8	0.000 004	0.045
100 %		0	819 000 074	36.3	0.000 004	0.044
100 %		+10	819 000 074	36.4	0.000 004	0.044
100 %		+30	819 000 075	37.8	0.000 005	0.046
100 %		+40	819 000 003	-34.5	-0.000 004	-0.042
100 %		+50	819 000 072	34.8	0.000 004	0.042
Batt. Endpoint	3.550	+20	819 000 000	-37.8	-0.000 005	-0.046



▣ MODE: LTE 26

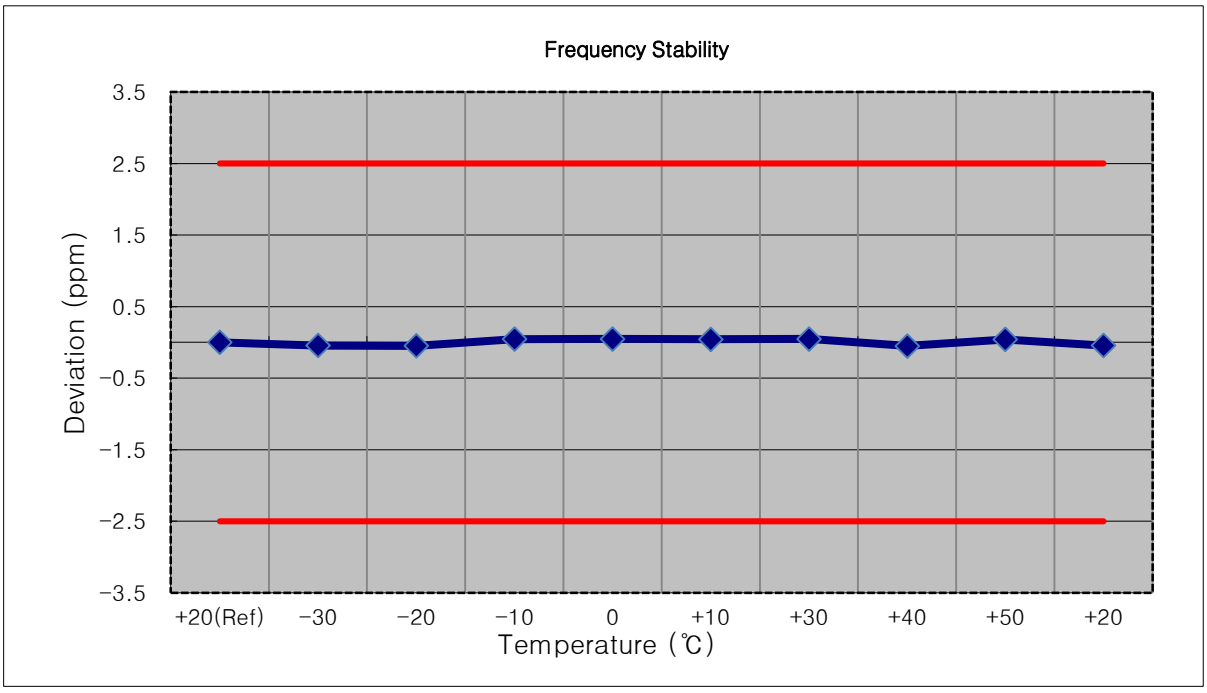
▣ OPERATING FREQUENCY: 821,500,000 Hz

▣ CHANNEL: 26765(15 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	821 500 038	0.0	0.000 000	0.000
100 %		-30	821 500 001	-36.6	-0.000 004	-0.045
100 %		-20	821 499 998	-39.1	-0.000 005	-0.048
100 %		-10	821 500 075	37.0	0.000 005	0.045
100 %		0	821 500 077	39.0	0.000 005	0.047
100 %		+10	821 500 074	36.5	0.000 004	0.044
100 %		+30	821 500 076	38.9	0.000 005	0.047
100 %		+40	821 499 997	-41.0	-0.000 005	-0.050
100 %		+50	821 500 072	34.6	0.000 004	0.042
Batt. Endpoint	3.550	+20	821 500 002	-35.9	-0.000 004	-0.044



8.8 STADDLE CHANNEL

8.8.1 CONDUCTED OUTPUT POWER

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
1.4	QPSK	1	0	23.55	0.226	100
		1	3	24.30	0.269	100
		1	5	24.31	0.270	100
		3	0	24.30	0.269	100
		3	1	24.33	0.271	100
		3	3	24.30	0.269	100
		6	0	23.31	0.214	100
	16QAM	1	0	23.72	0.236	100
		1	3	23.65	0.232	100
		1	5	23.61	0.230	100
		3	0	23.68	0.233	100
		3	1	23.63	0.231	100
		3	3	23.51	0.224	100
		6	0	22.42	0.175	100
	64QAM	1	0	22.58	0.181	100
		1	3	22.73	0.187	100
		1	5	22.62	0.183	100
		3	0	22.49	0.177	100
		3	1	22.61	0.182	100
		3	3	22.43	0.175	100
		6	0	21.38	0.137	100
	256QAM	1	0	19.68	0.093	100
		1	3	19.47	0.089	100
		1	5	19.53	0.090	100
		3	0	19.59	0.091	100
		3	1	19.56	0.090	100
		3	3	19.51	0.089	100
		6	0	19.37	0.086	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
3	QPSK	1	0	24.40	0.275	100
		1	7	24.50	0.282	100
		1	14	24.39	0.275	100
		8	0	23.45	0.221	100
		8	3	23.51	0.224	100
		8	7	23.42	0.220	100
		15	0	23.48	0.223	100
	16QAM	1	0	23.75	0.237	100
		1	7	23.61	0.230	100
		1	14	23.55	0.226	100
		8	0	21.75	0.150	100
		8	3	21.79	0.151	100
		8	7	22.31	0.170	100
		15	0	22.35	0.172	100
	64QAM	1	0	22.67	0.185	100
		1	7	22.55	0.180	100
		1	14	22.54	0.179	100
		8	0	21.64	0.146	100
		8	3	21.56	0.143	100
		8	7	21.47	0.140	100
		15	0	21.53	0.142	100
	256QAM	1	0	19.54	0.090	100
		1	7	19.61	0.091	100
		1	14	19.48	0.089	100
		8	0	19.45	0.088	100
		8	3	19.53	0.090	100
		8	7	19.59	0.091	100
		15	0	19.51	0.089	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
5	QPSK	1	0	24.15	0.260	100
		1	12	24.50	0.282	100
		1	24	24.26	0.267	100
		12	0	23.51	0.224	100
		12	6	23.47	0.222	100
		12	11	23.41	0.219	100
		25	0	23.42	0.220	100
	16QAM	1	0	23.70	0.234	100
		1	12	23.74	0.237	100
		1	24	23.65	0.232	100
		12	0	22.46	0.176	100
		12	6	22.59	0.182	100
		12	11	22.50	0.178	100
		25	0	22.41	0.174	100
	64QAM	1	0	22.61	0.182	100
		1	12	22.71	0.187	100
		1	24	22.58	0.181	100
		12	0	21.38	0.137	100
		12	6	21.50	0.141	100
		12	11	21.48	0.141	100
		25	0	21.45	0.140	100
	256QAM	1	0	19.42	0.087	100
		1	12	19.53	0.090	100
		1	24	19.30	0.085	100
		12	0	19.45	0.088	100
		12	6	19.52	0.090	100
		12	11	19.47	0.089	100
		25	0	19.48	0.089	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
10	QPSK	1	0	24.38	0.274	100
		1	24	24.33	0.271	100
		1	49	24.37	0.274	100
		25	0	23.30	0.214	100
		25	12	23.45	0.221	100
		25	24	23.38	0.218	100
		50	0	23.40	0.219	100
	16QAM	1	0	23.71	0.235	100
		1	24	23.53	0.225	100
		1	49	23.61	0.230	100
		25	0	22.33	0.171	100
		25	12	22.48	0.177	100
		25	24	22.47	0.177	100
		50	0	22.43	0.175	100
	64QAM	1	0	22.61	0.182	100
		1	24	22.63	0.183	100
		1	49	22.70	0.186	100
		25	0	21.37	0.137	100
		25	12	21.57	0.144	100
		25	24	21.41	0.138	100
		50	0	21.44	0.139	100
	256QAM	1	0	19.26	0.084	100
		1	24	19.56	0.090	100
		1	49	19.22	0.084	100
		25	0	19.33	0.086	100
		25	12	19.48	0.089	100
		25	24	19.36	0.086	100
		50	0	19.34	0.086	100

8.8.2 EFFECTIVE RADIATED POWER

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
824.0	LTE B26/ 1.4 MHz	QPSK	-32.36	30.57	-10.25	1.39	H	< 7.00	0.078	18.93
		16QAM	-32.97	29.96	-10.25	1.39	H		0.068	18.32
		64QAM	-34.06	28.87	-10.25	1.39	H		0.053	17.23
		256QAM	-37.04	25.89	-10.25	1.39	H		0.027	14.25

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
824.0	LTE B26/ 3 MHz	QPSK	-32.28	30.65	-10.25	1.39	H	< 7.00	0.080	19.01
		16QAM	-32.90	30.03	-10.25	1.39	H		0.069	18.39
		64QAM	-34.06	28.87	-10.25	1.39	H		0.053	17.23
		256QAM	-37.11	25.82	-10.25	1.39	H		0.026	14.18

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
824.0	LTE B26/ 5 MHz	QPSK	-32.33	30.60	-10.25	1.39	H	< 7.00	0.079	18.96
		16QAM	-32.96	29.97	-10.25	1.39	H		0.068	18.33
		64QAM	-34.13	28.80	-10.25	1.39	H		0.052	17.16
		256QAM	-37.26	25.67	-10.25	1.39	H		0.025	14.03

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
824.0	LTE B26/ 10 MHz	QPSK	-32.02	30.91	-10.25	1.39	H	< 7.00	0.084	19.27
		16QAM	-32.66	30.27	-10.25	1.39	H		0.073	18.63
		64QAM	-33.78	29.15	-10.25	1.39	H		0.056	17.51
		256QAM	-37.14	25.79	-10.25	1.39	H		0.026	14.15

8.8.3 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B26

▣ MODULATION SIGNAL: 10 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit
26790 (824.0)	1 648.00	-52.01	9.70	-62.33	1.99	H	-54.62	-13.00
	2 472.00	-54.20	10.46	-58.85	2.47	V	-50.86	-13.00
	3 296.00	-55.99	12.07	-57.48	2.89	V	-48.29	-13.00

8.8.4 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
26	1.4	824.0	3.6840	27.976	-67.170	-39.194	-13.00
	3		3.6850	27.976	-67.086	-39.110	
	5		3.7084	27.976	-67.011	-39.035	
	10		3.6880	27.976	-67.317	-39.341	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 94 ~ 97.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor (dB) = Cable Loss + Attenuator + Power Splitter

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

8.8.5 CHANNEL EDGE(Part90)

- Test Channel : 26790(824.0MHz)

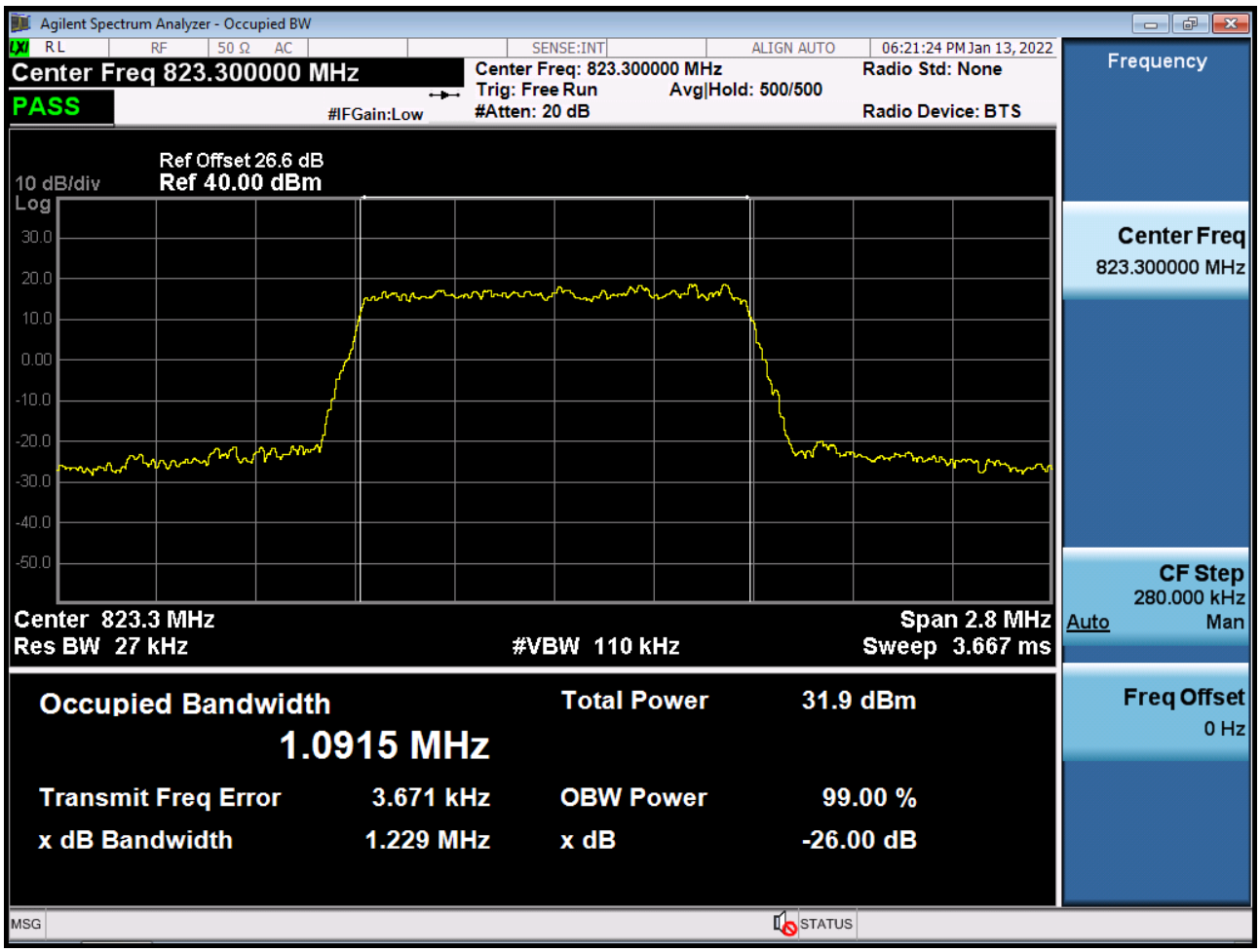
Plots of the EUT's Band Edge are shown Page 98 ~ 109.

8.8.6 BAND EDGE(Part22)

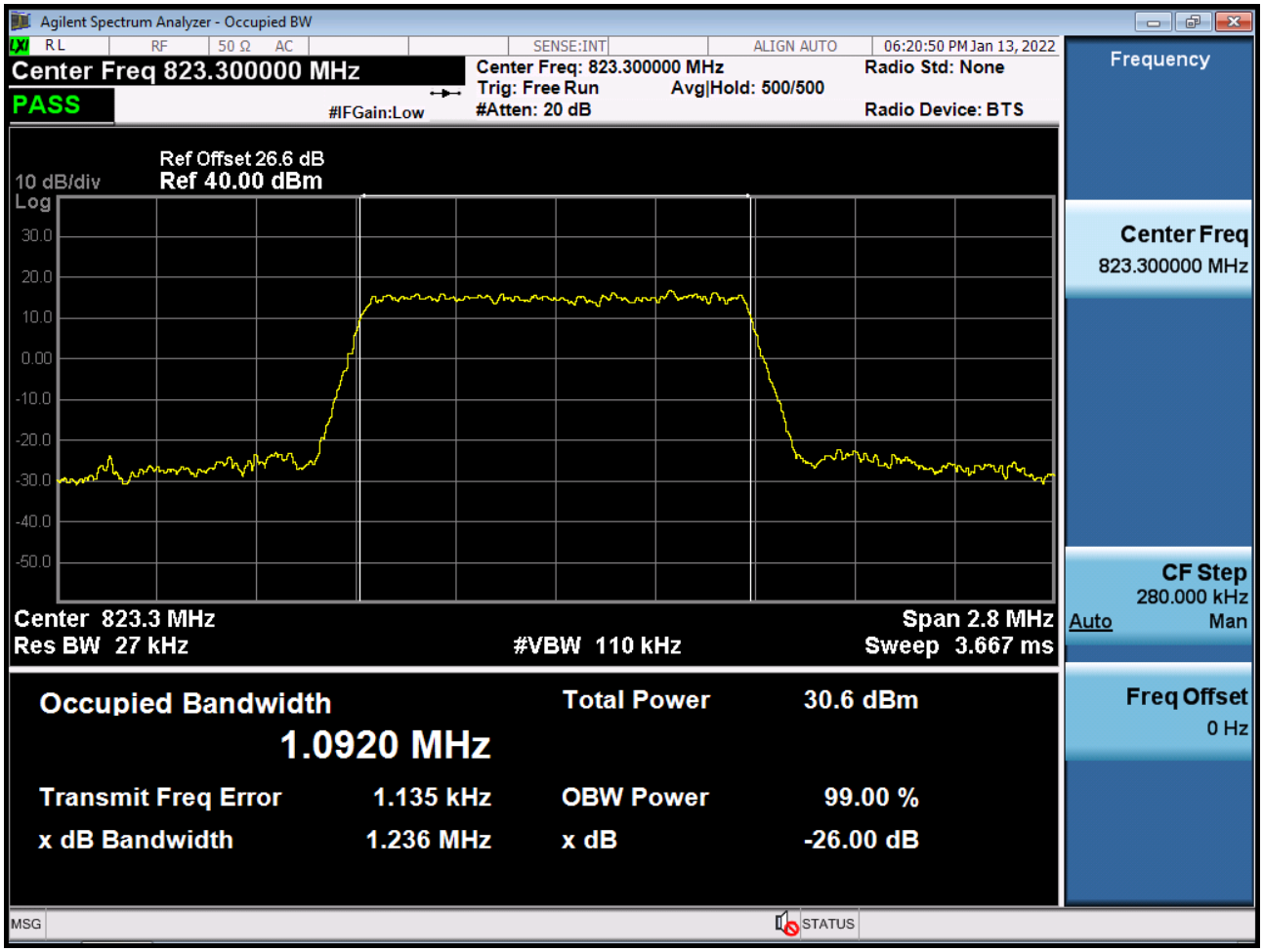
- Test Channel : 26790(824.0 MHz)
- Plots of the EUT's Band Edge are shown Page 110 ~ 117.

9. TEST PLOTS

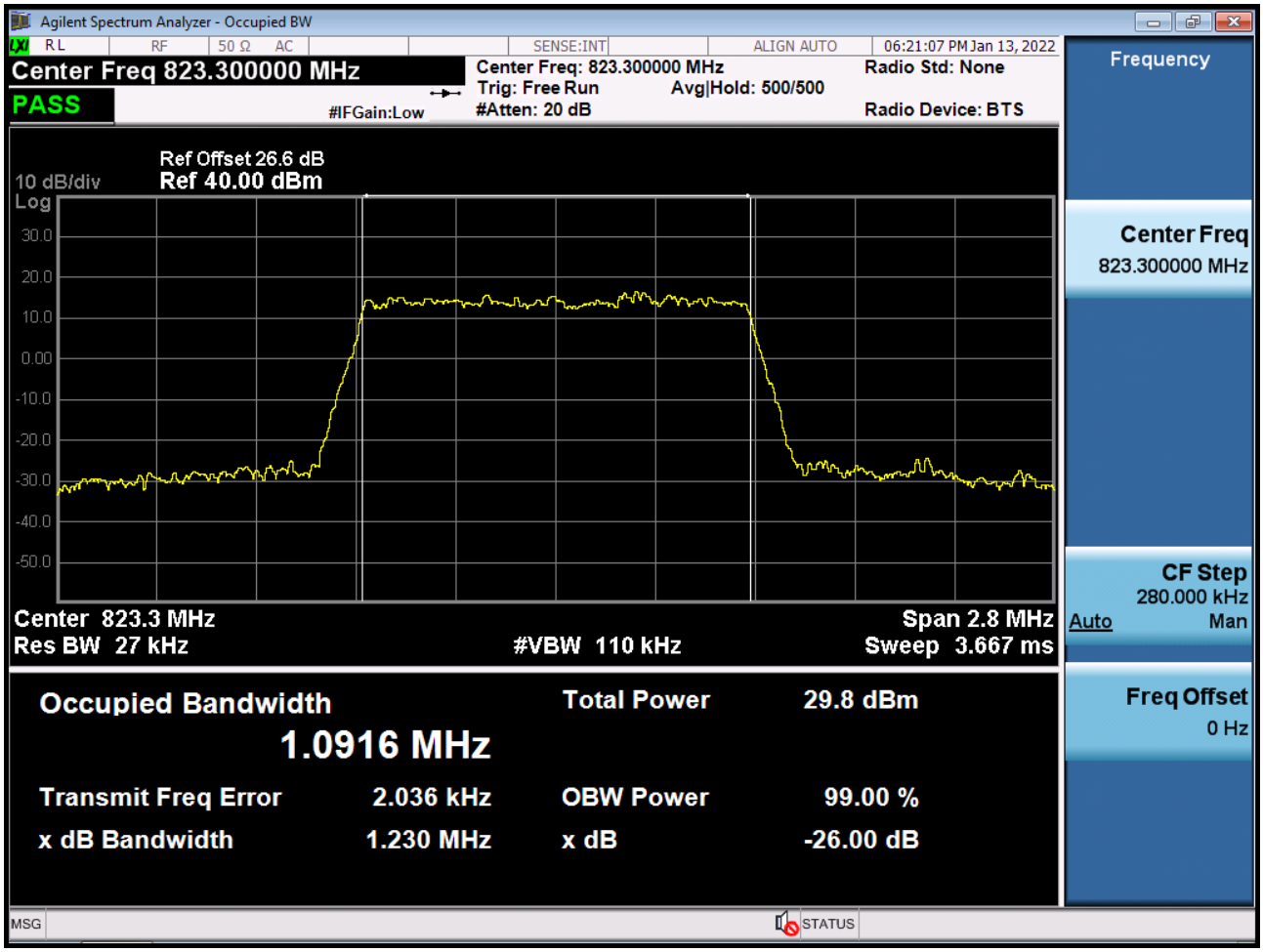
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 QPSK RB 6_0)



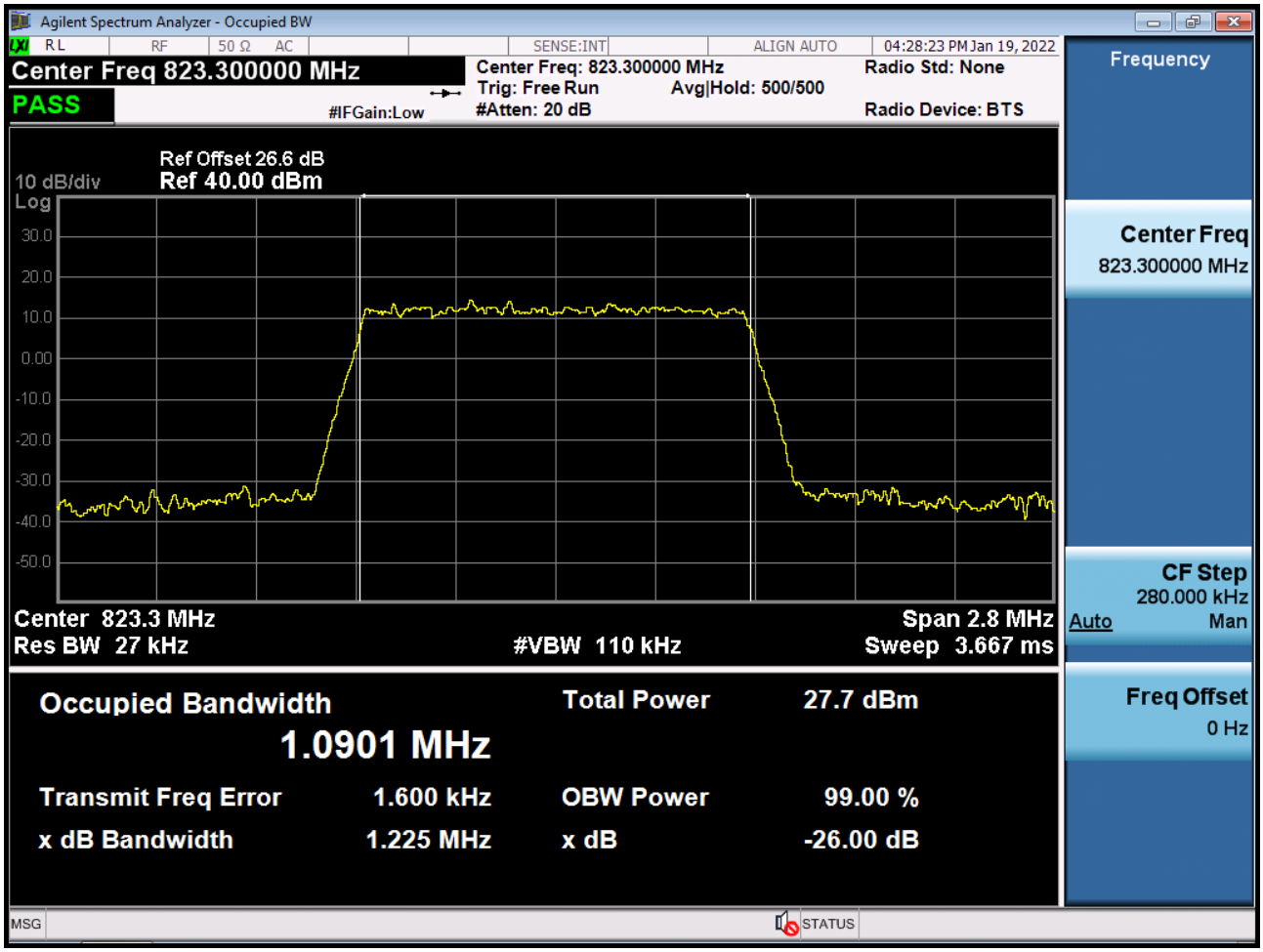
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 16QAM RB 6_0)



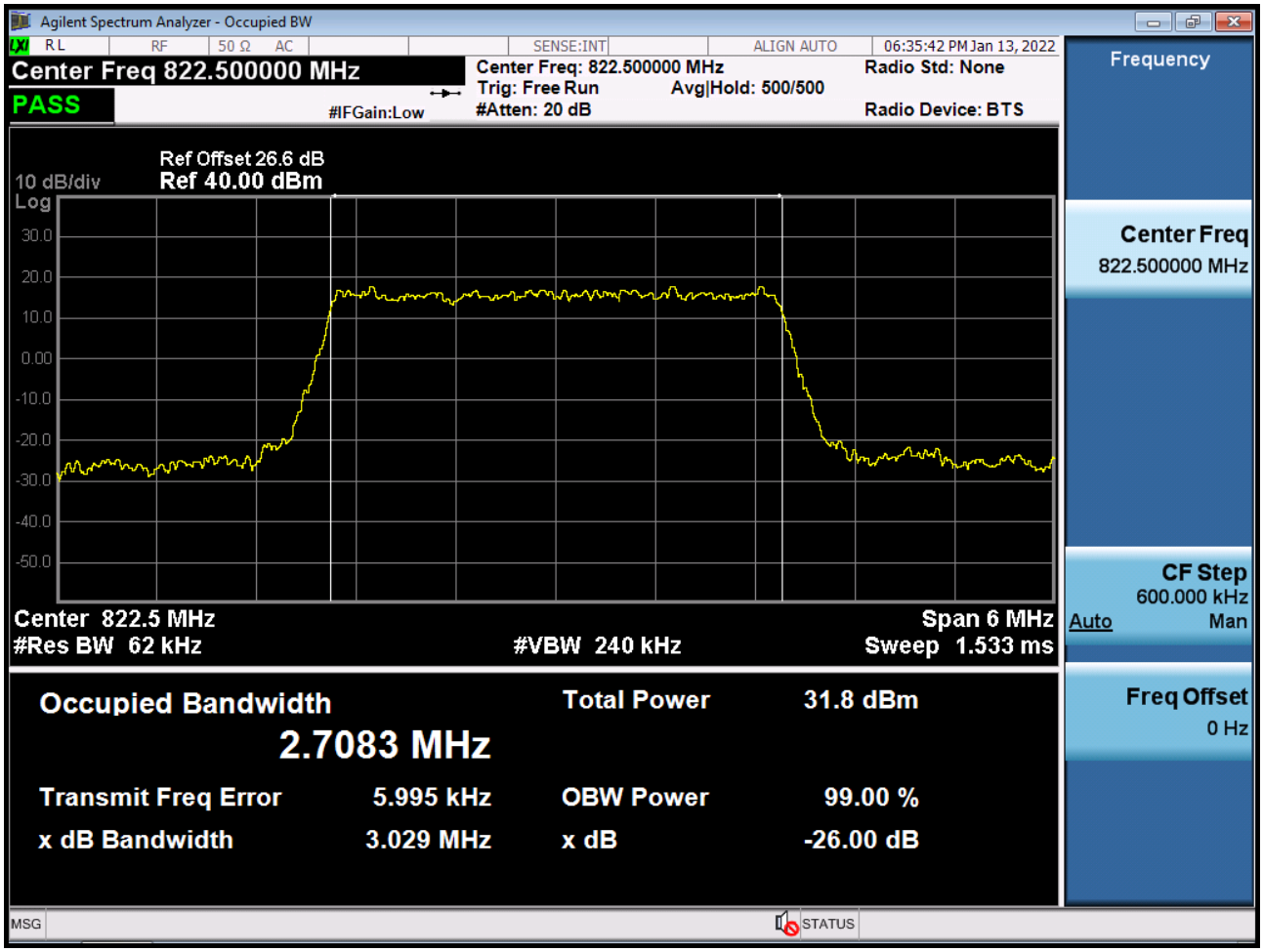
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 64QAM RB 6_0)



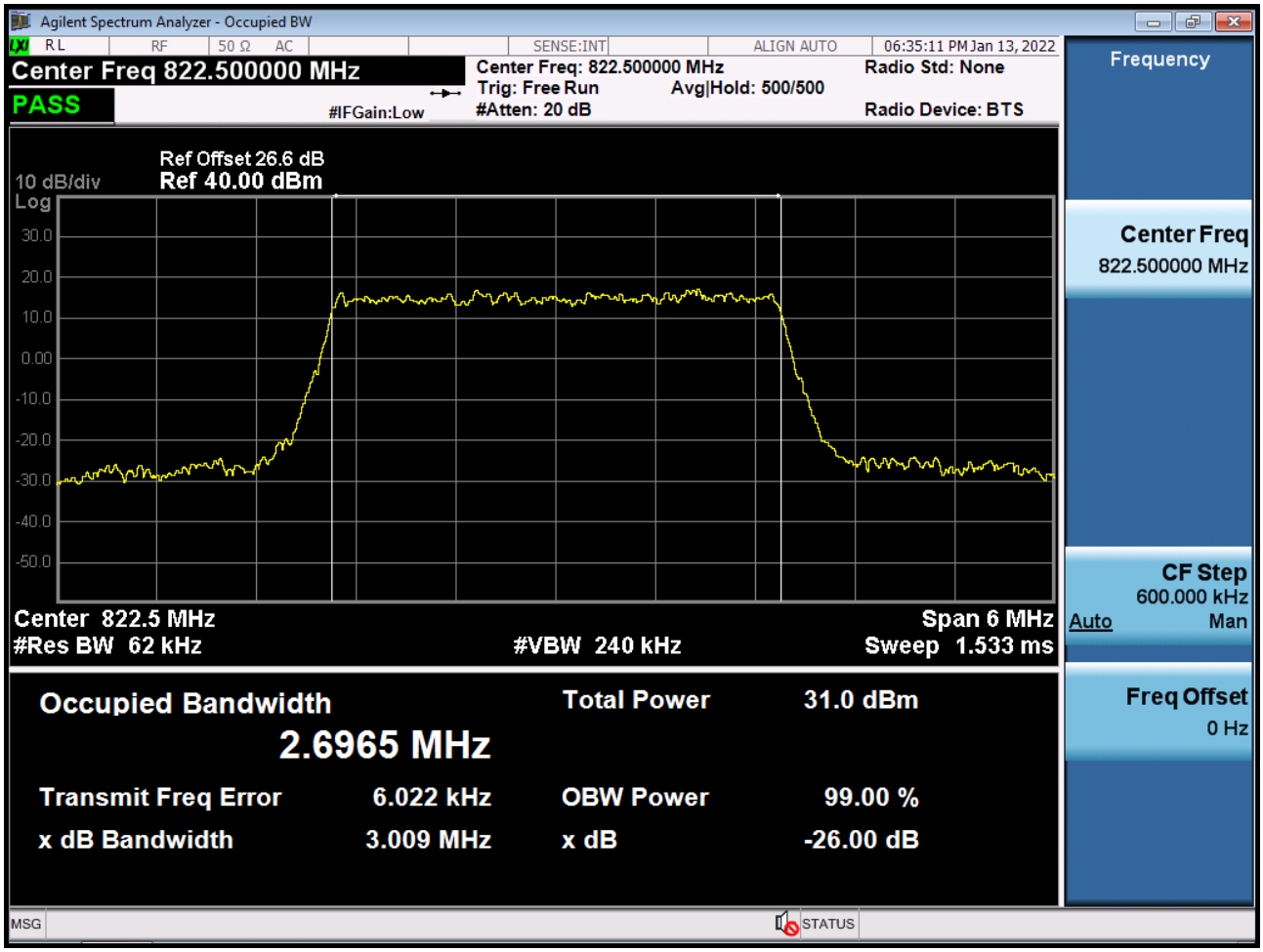
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 256QAM RB 6_0)



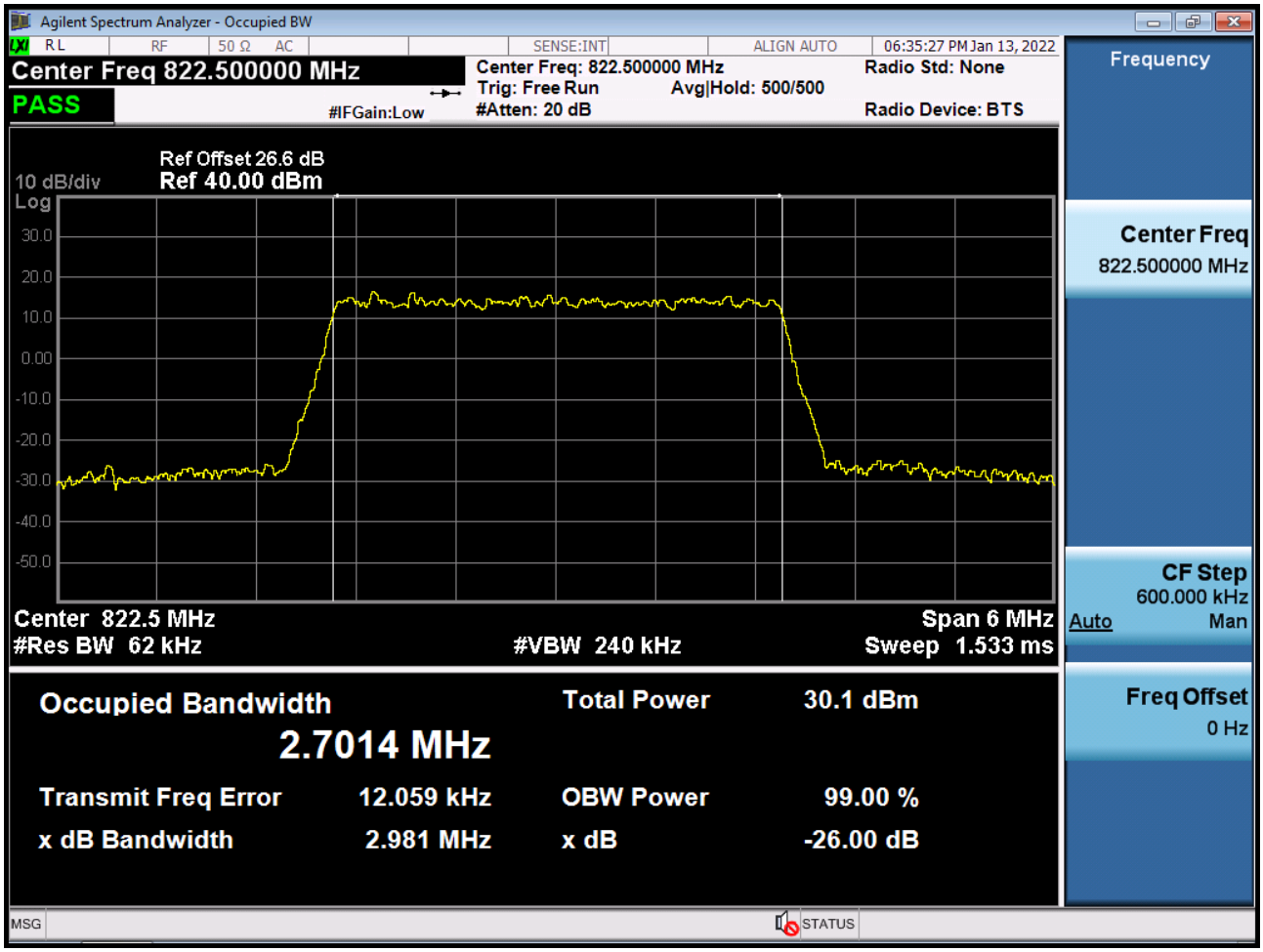
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 QPSK RB 15_0)



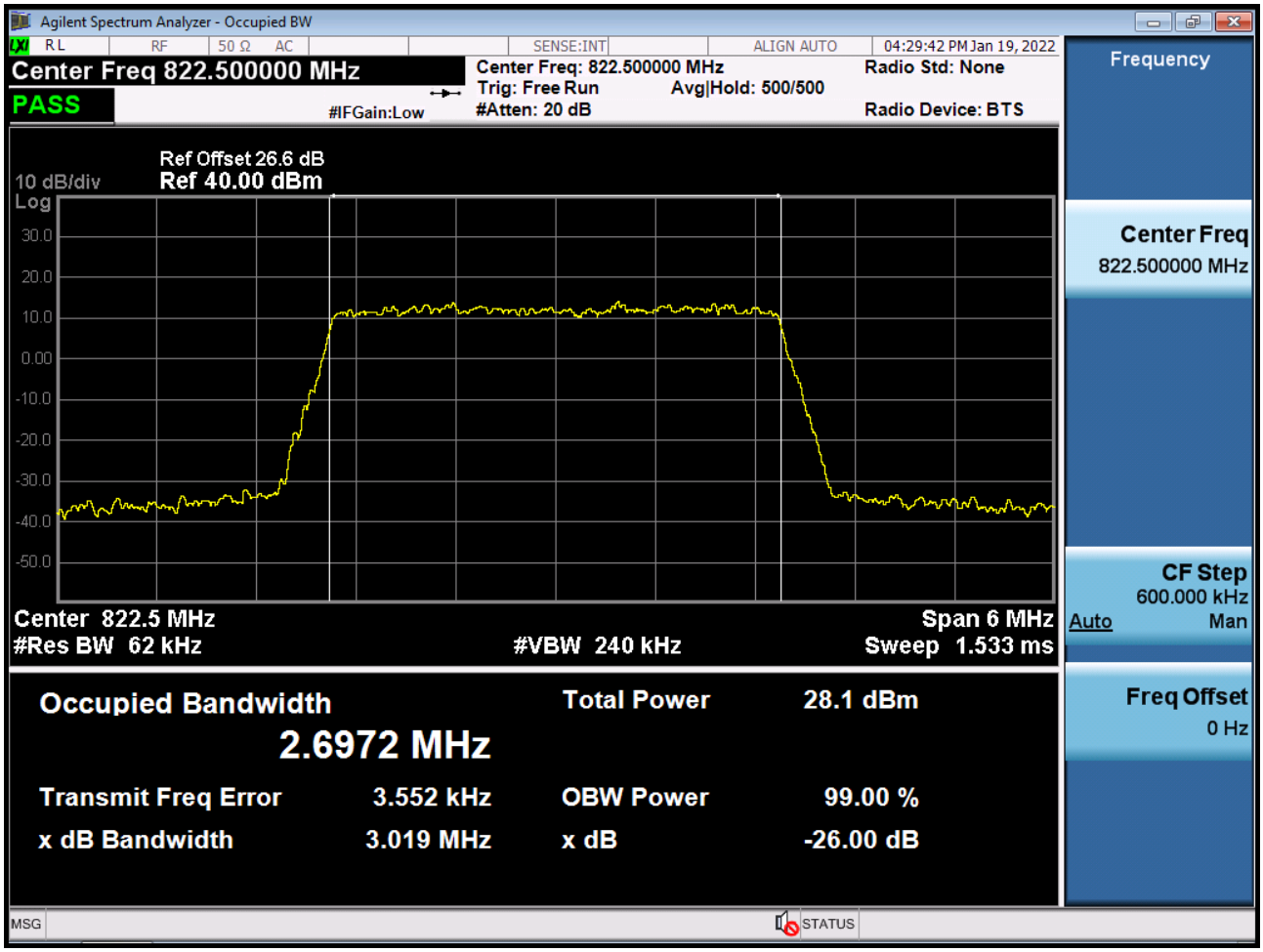
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 16QAM RB 15_0)



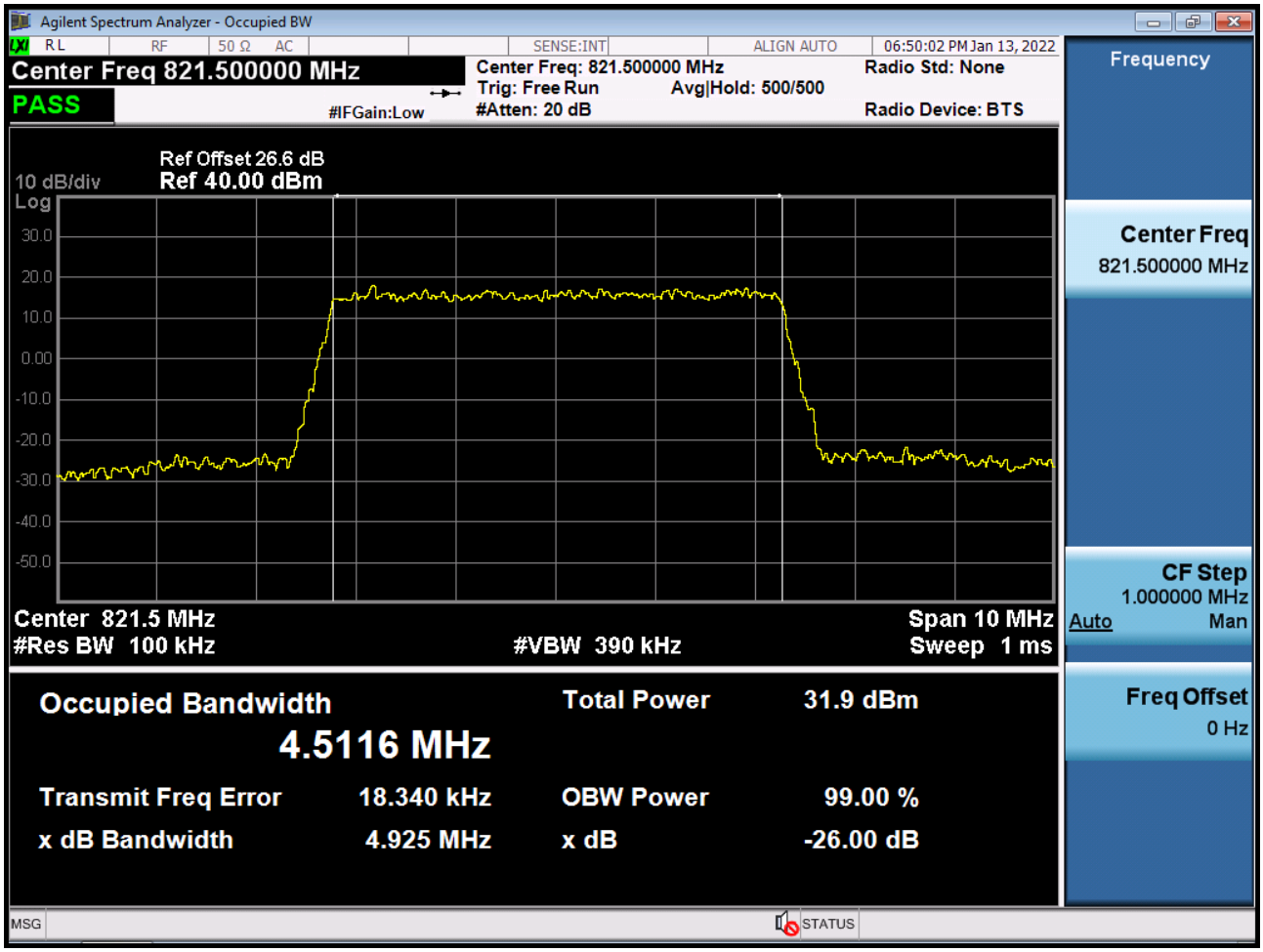
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 64QAM RB 15_0)



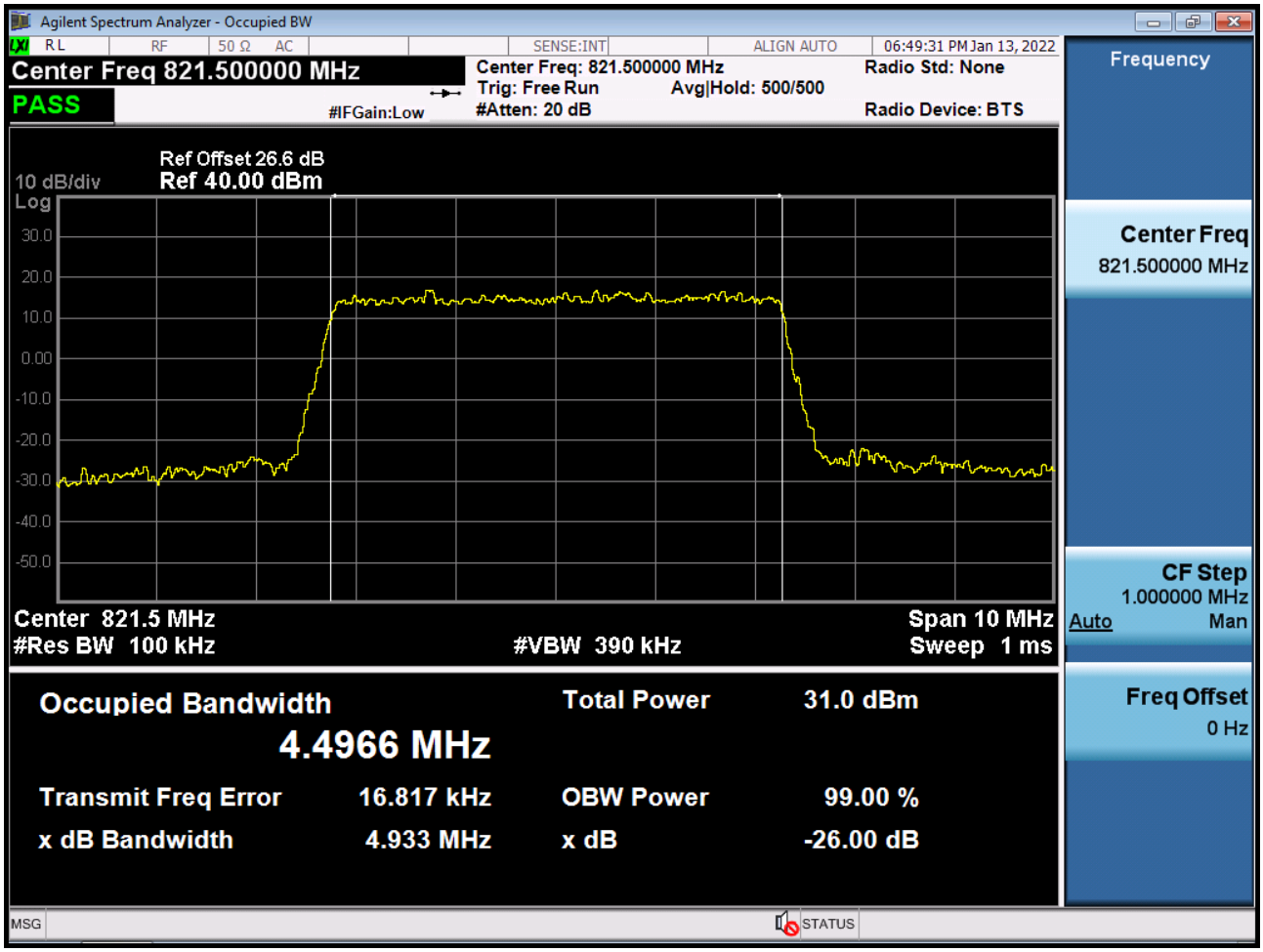
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 256QAM RB 15_0)



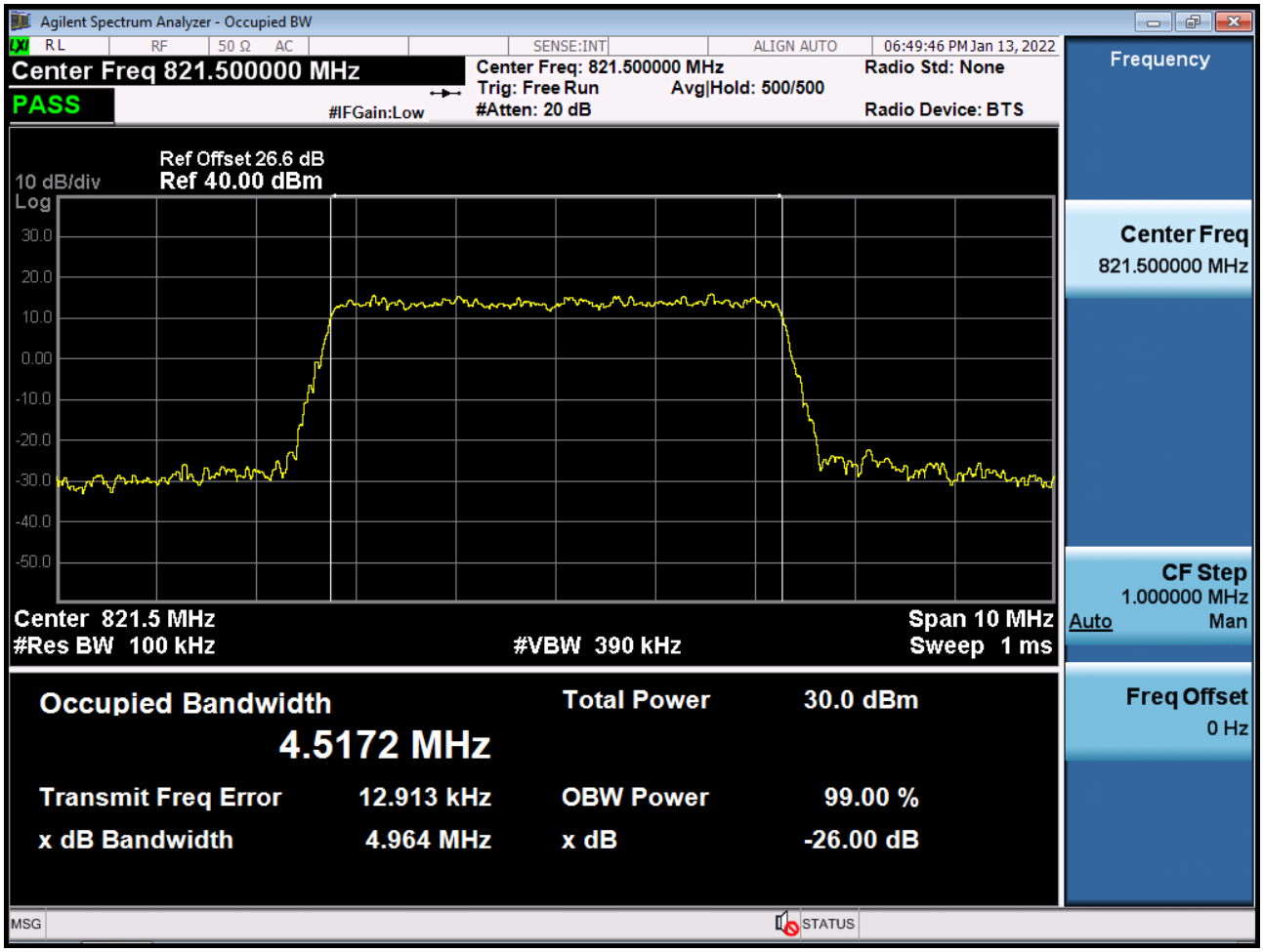
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 QPSK RB 25_0)



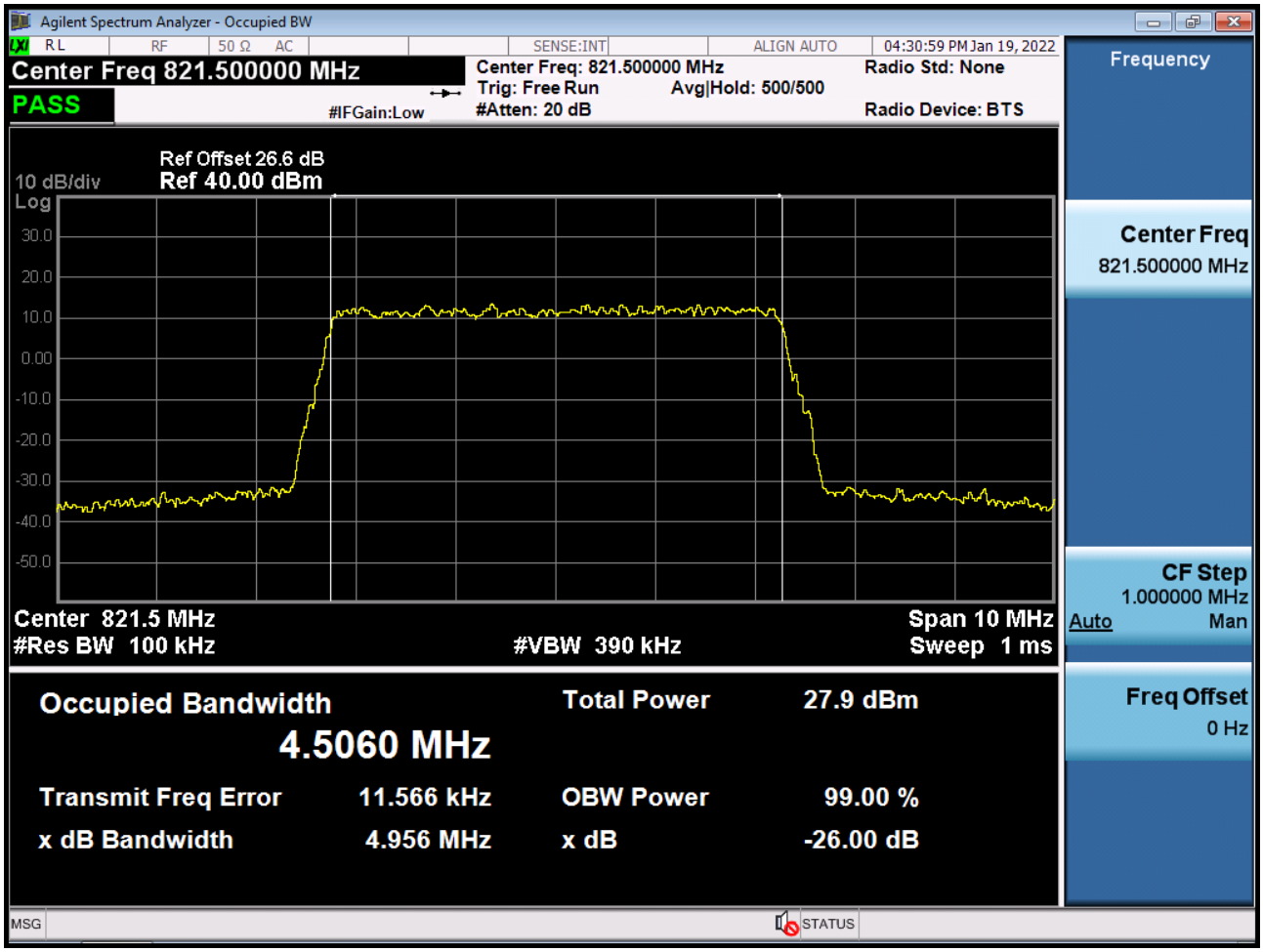
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 16QAM RB 25_0)



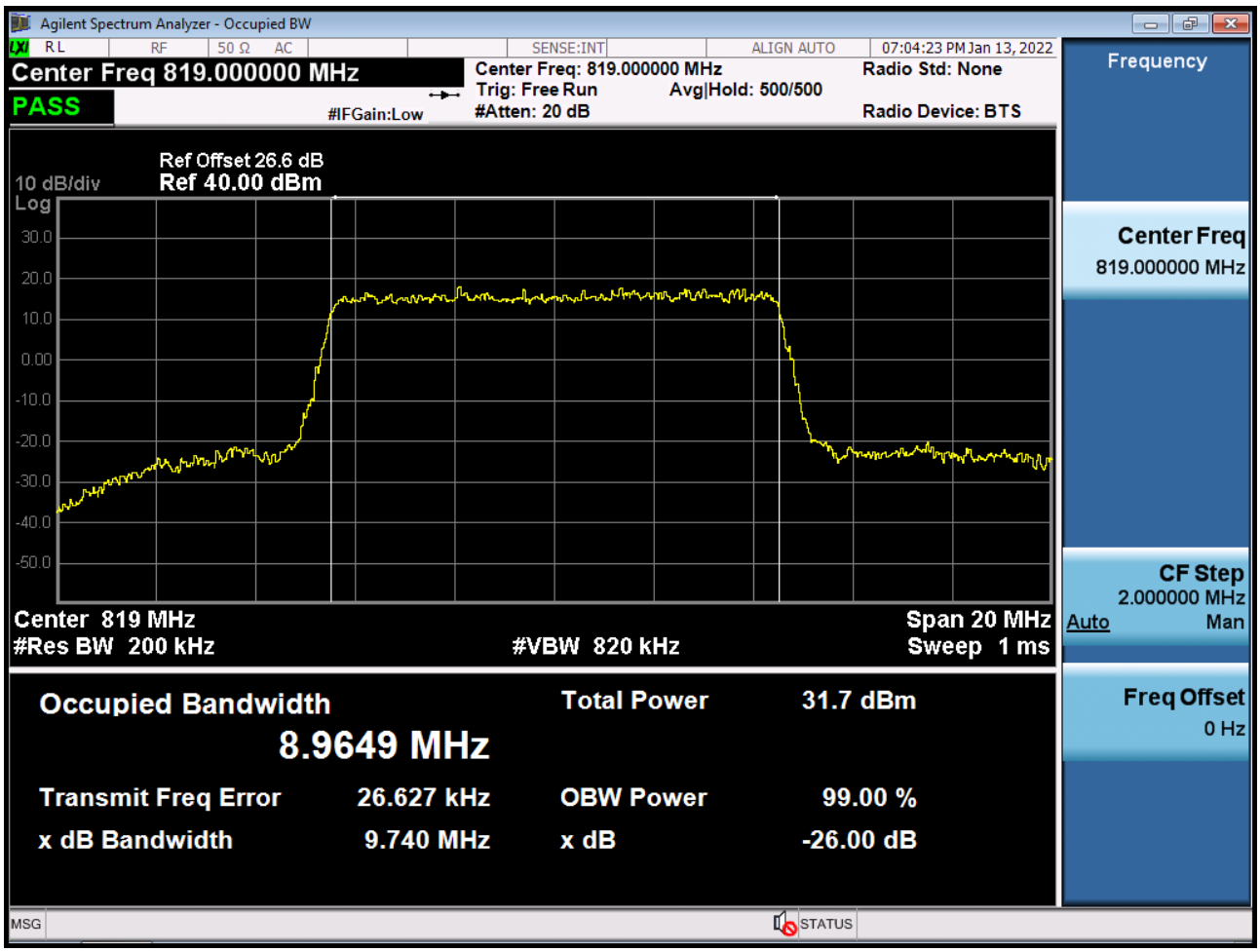
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 64QAM RB 25_0)



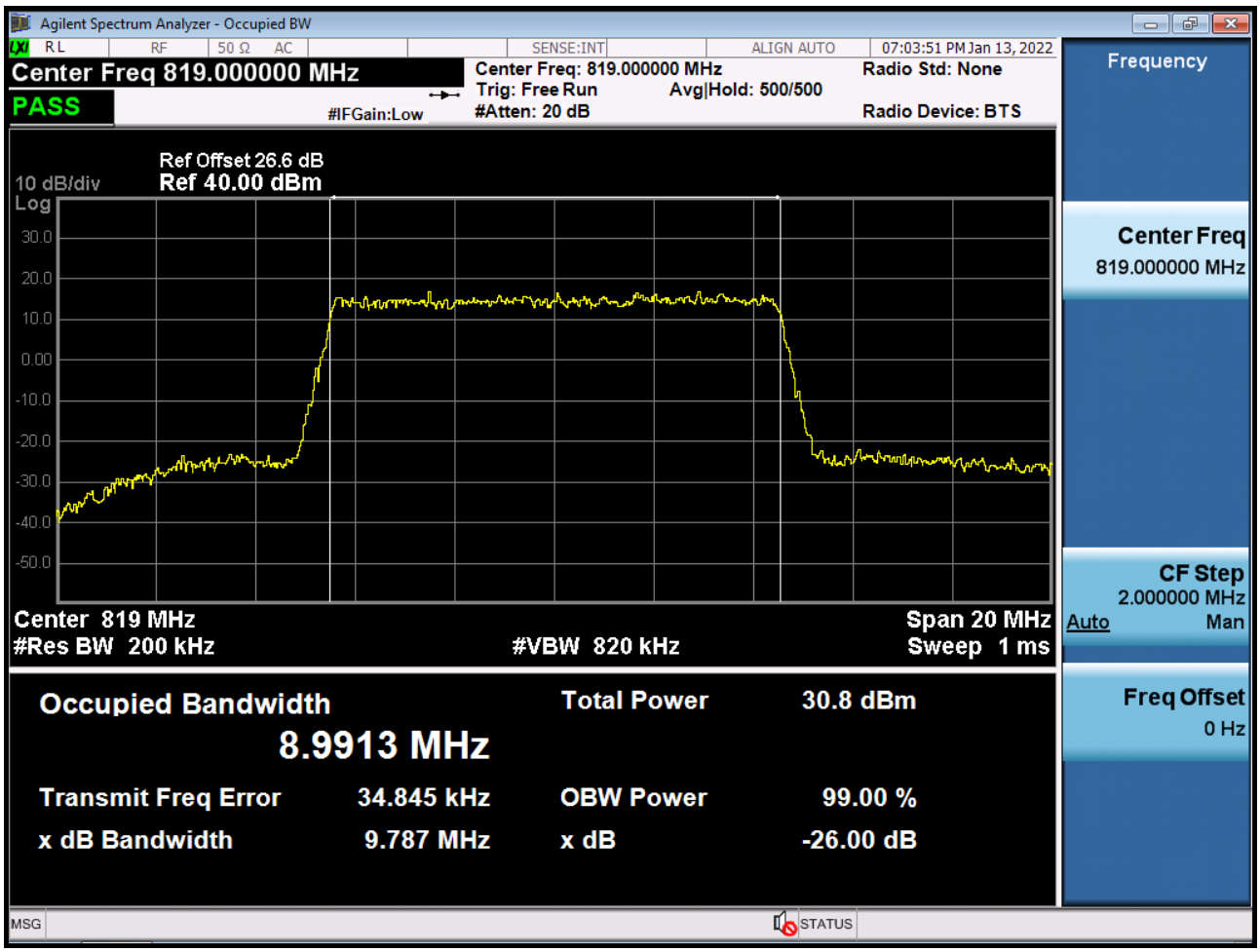
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 256QAM RB 25_0)



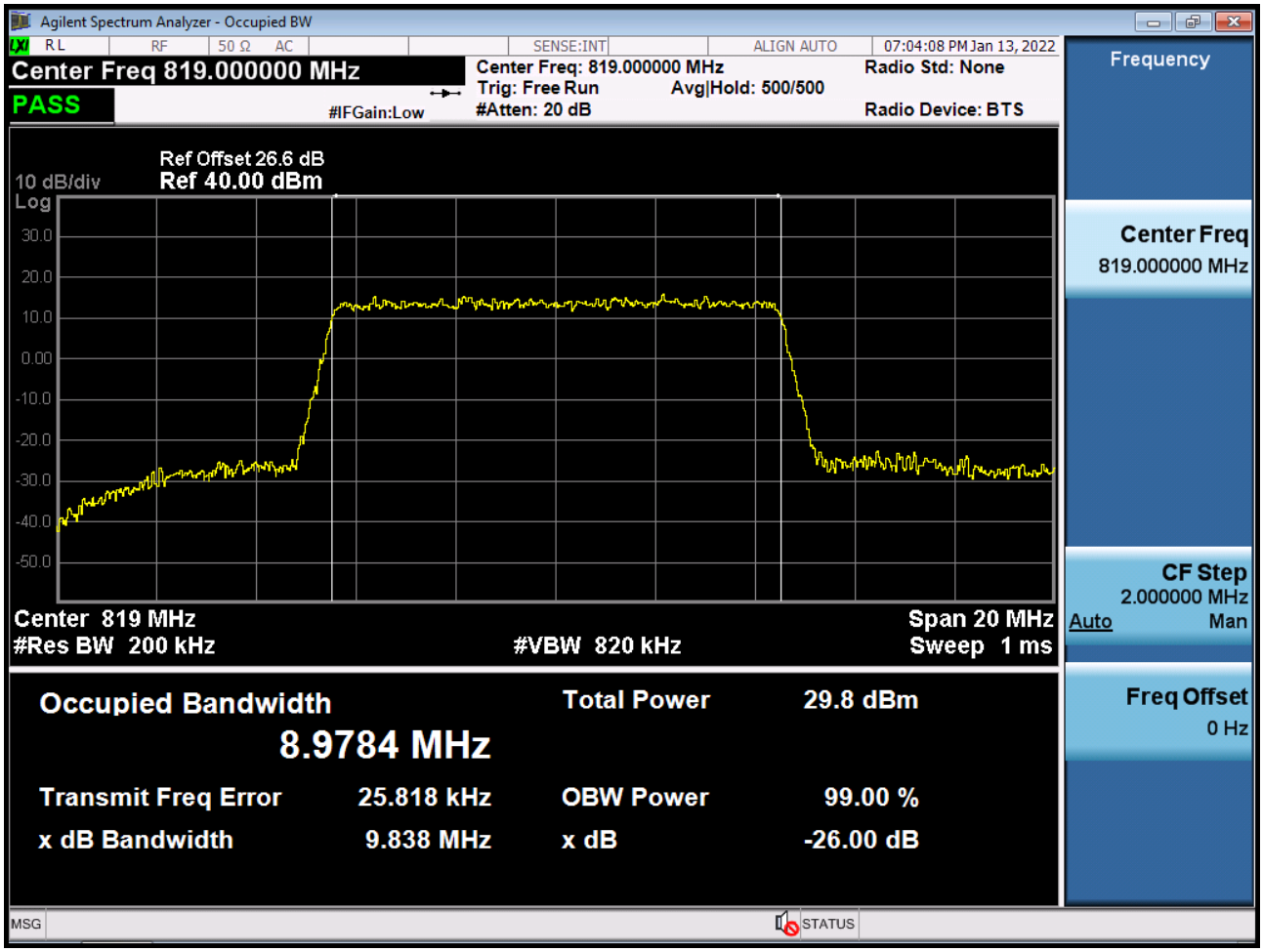
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 QPSK RB 50_0)



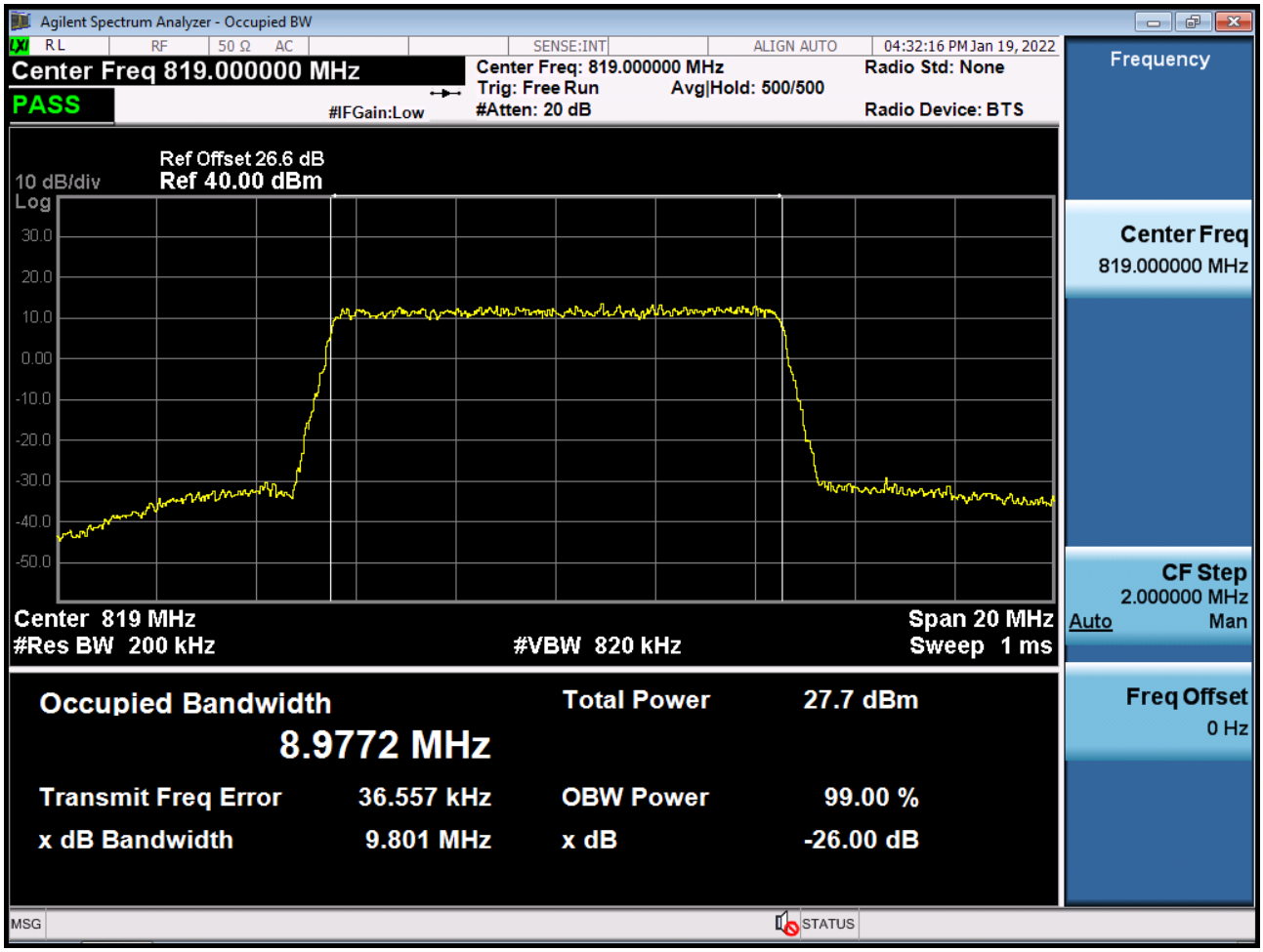
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 16QAM RB 50_0)



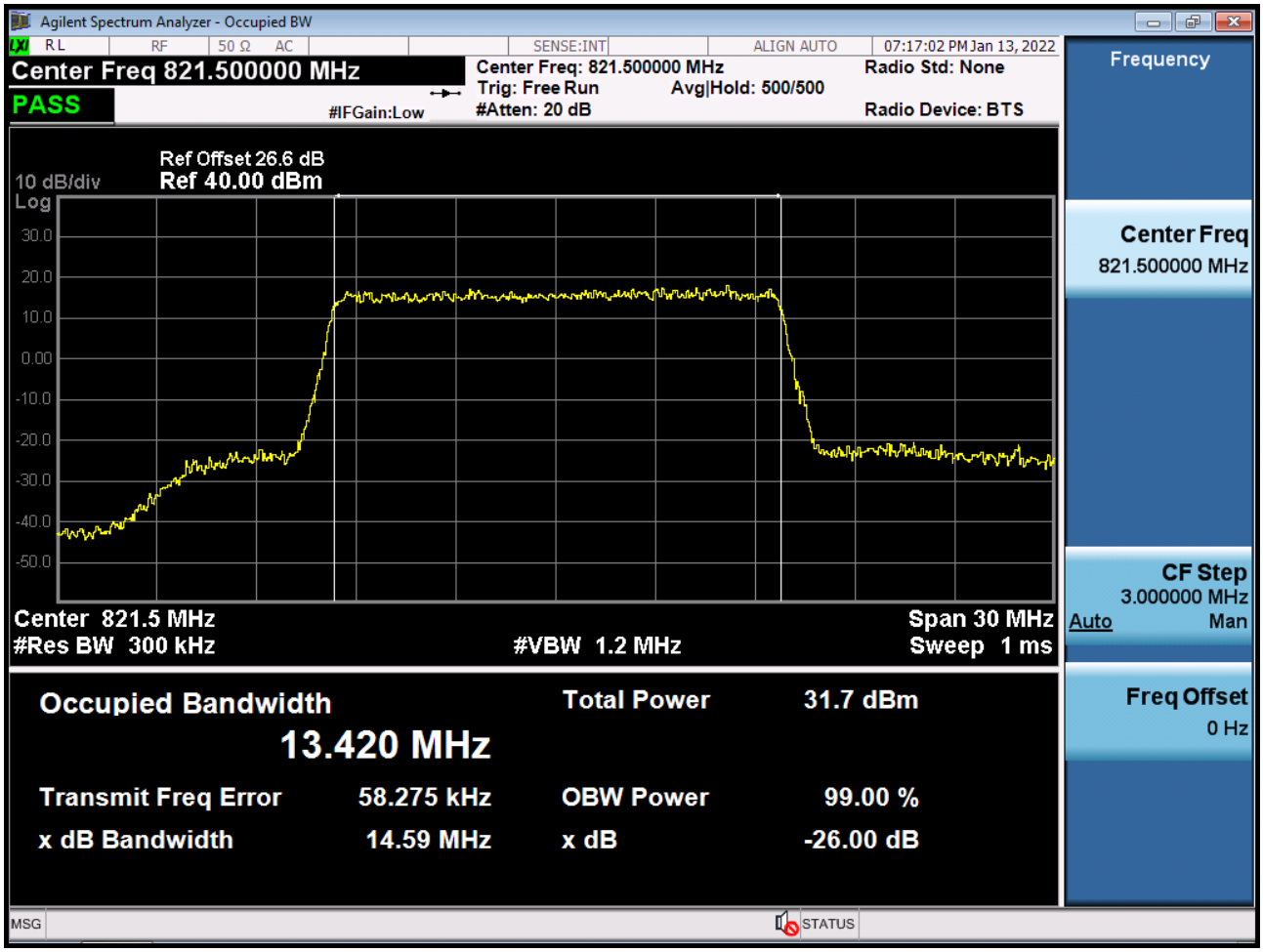
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 64QAM RB 50_0)



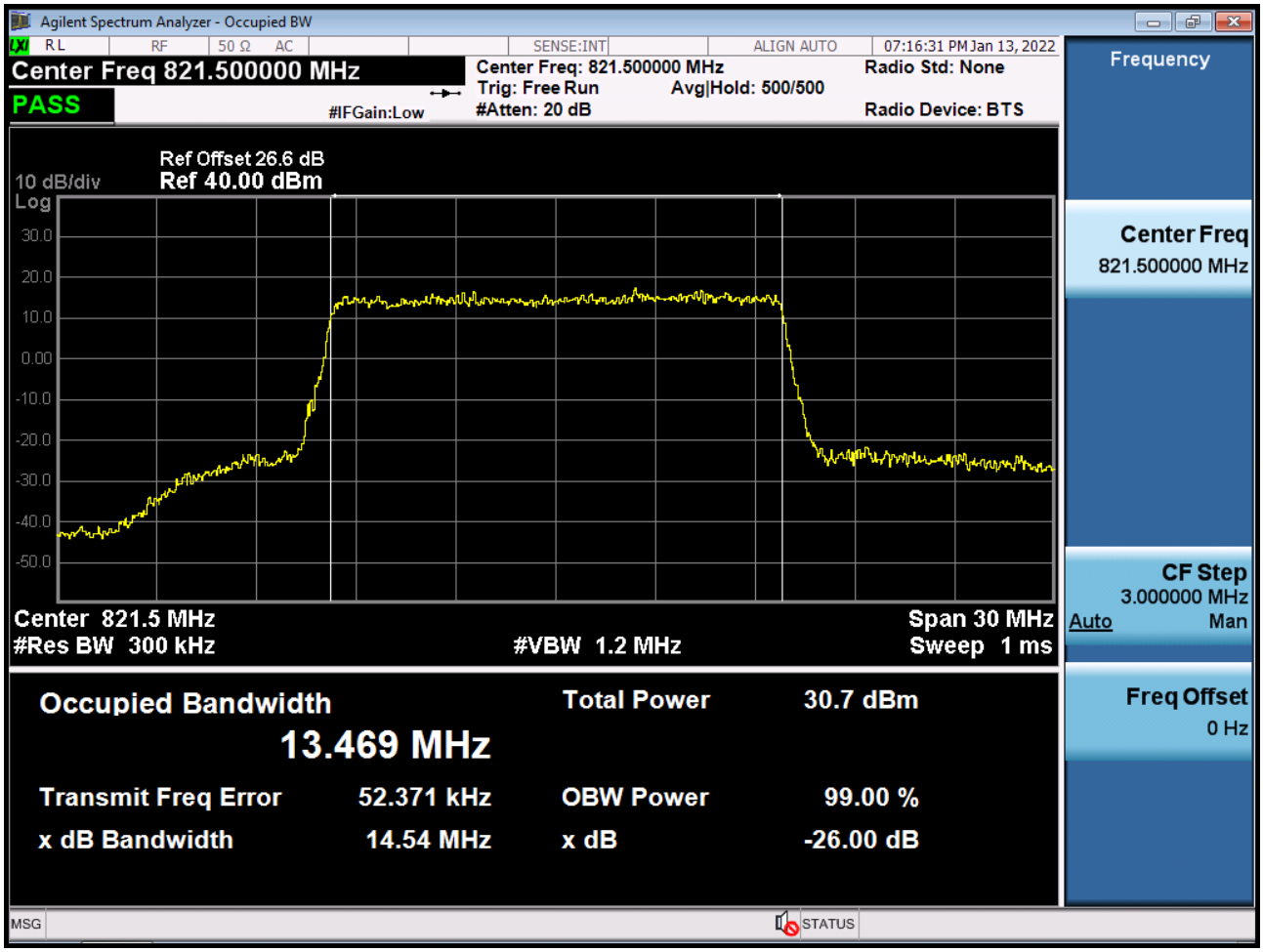
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 256QAM RB 50_0)



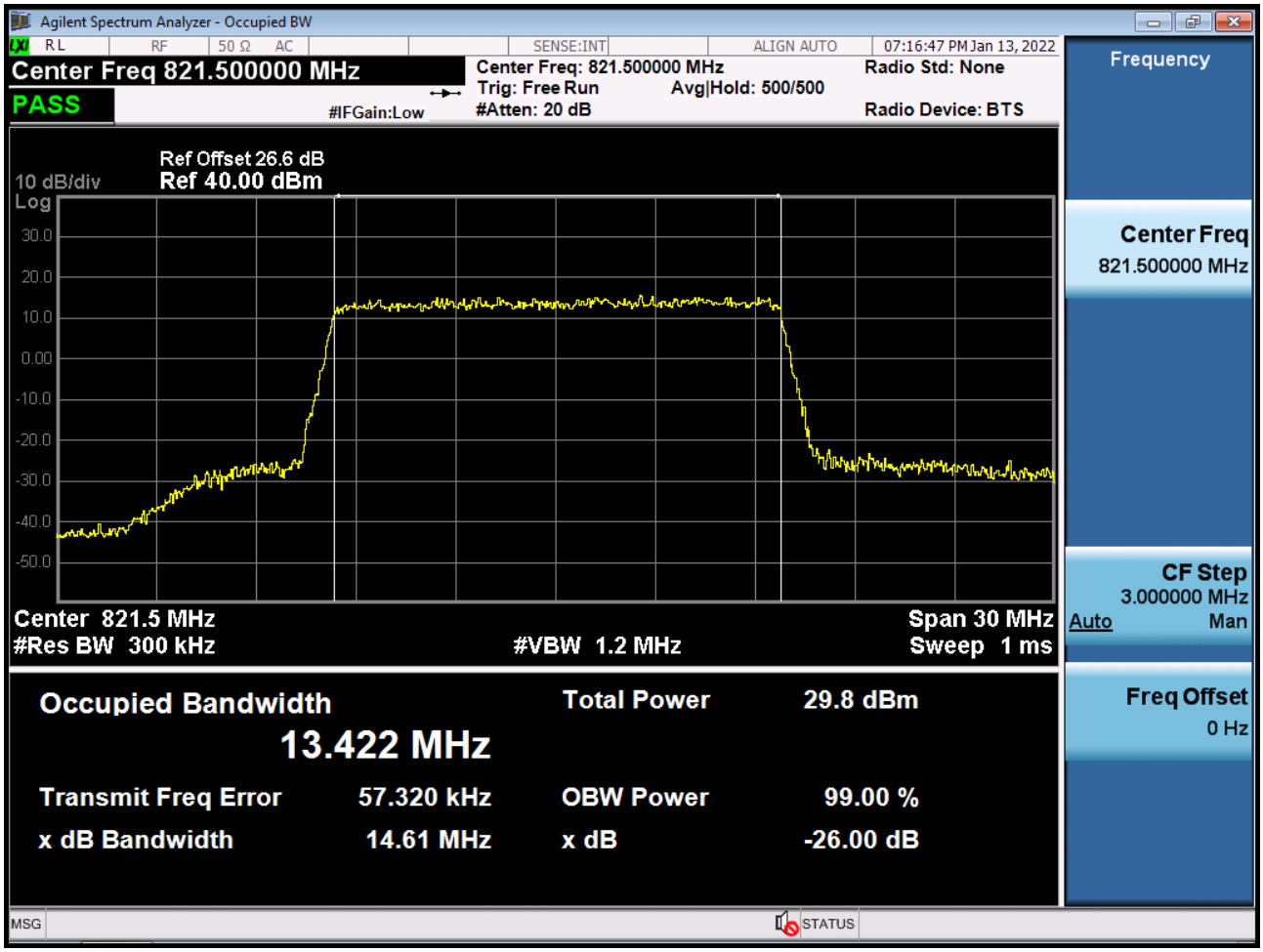
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 QPSK RB 75_0)



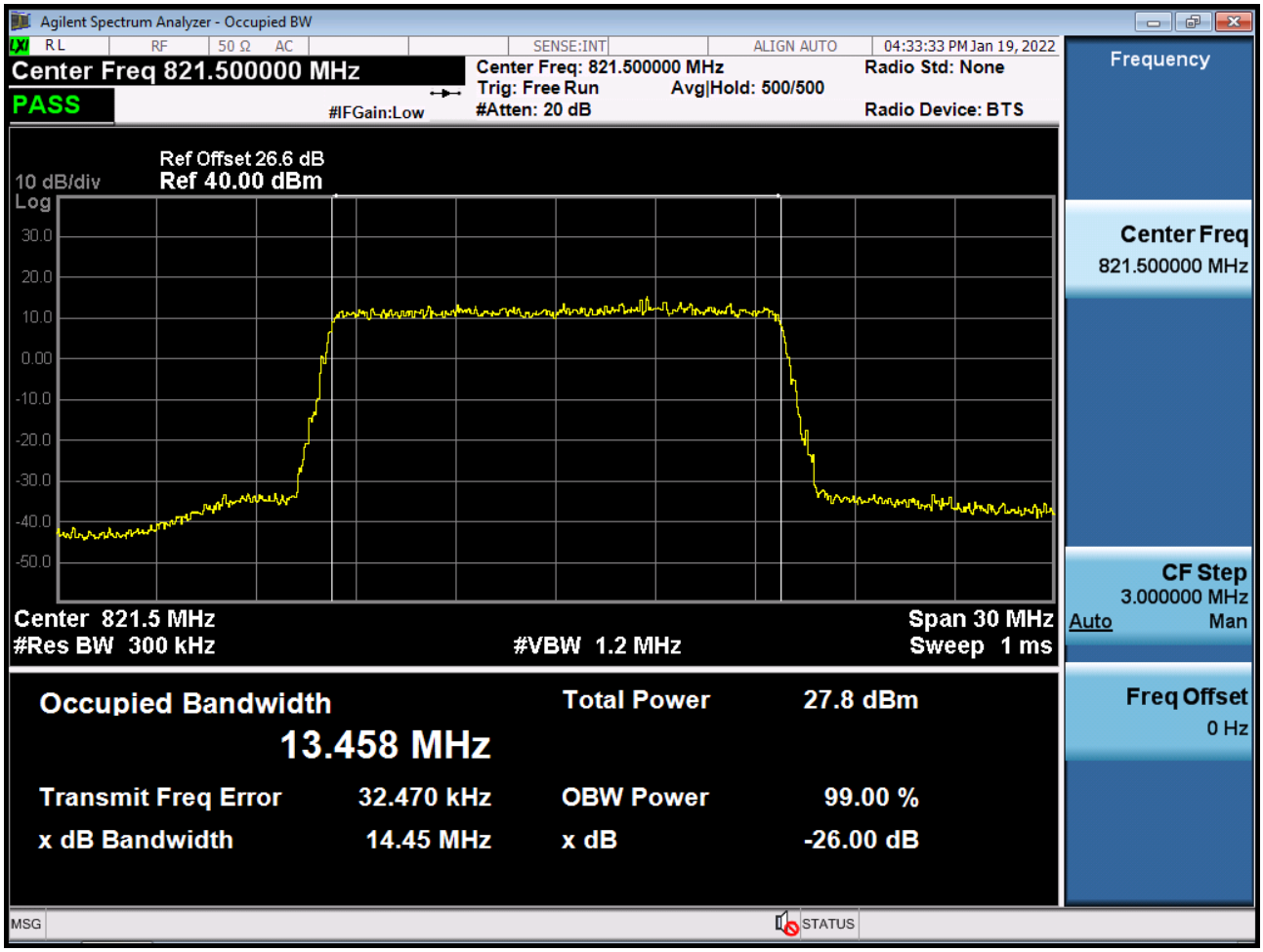
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 16QAM RB 75_0)



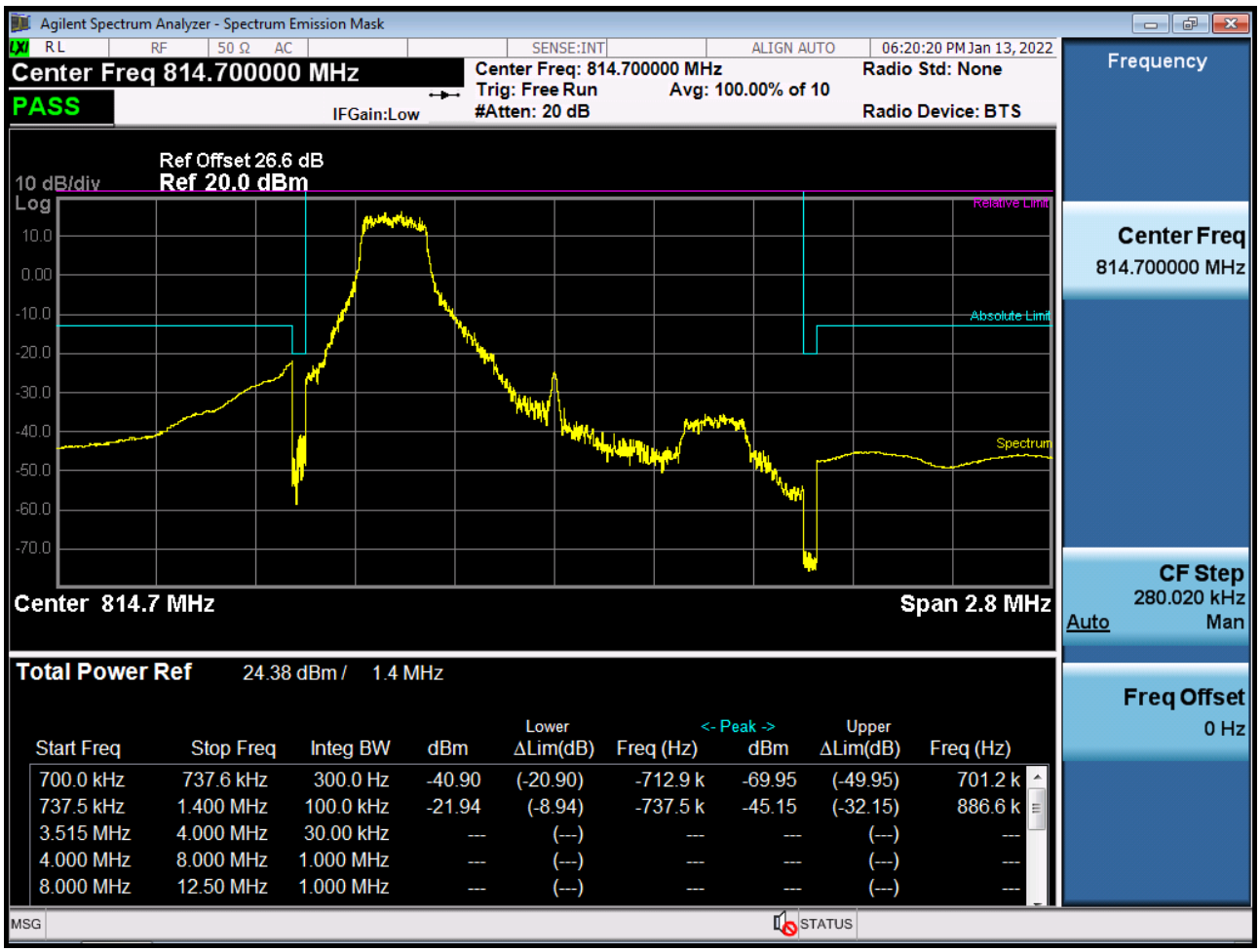
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 64QAM RB 75_0)



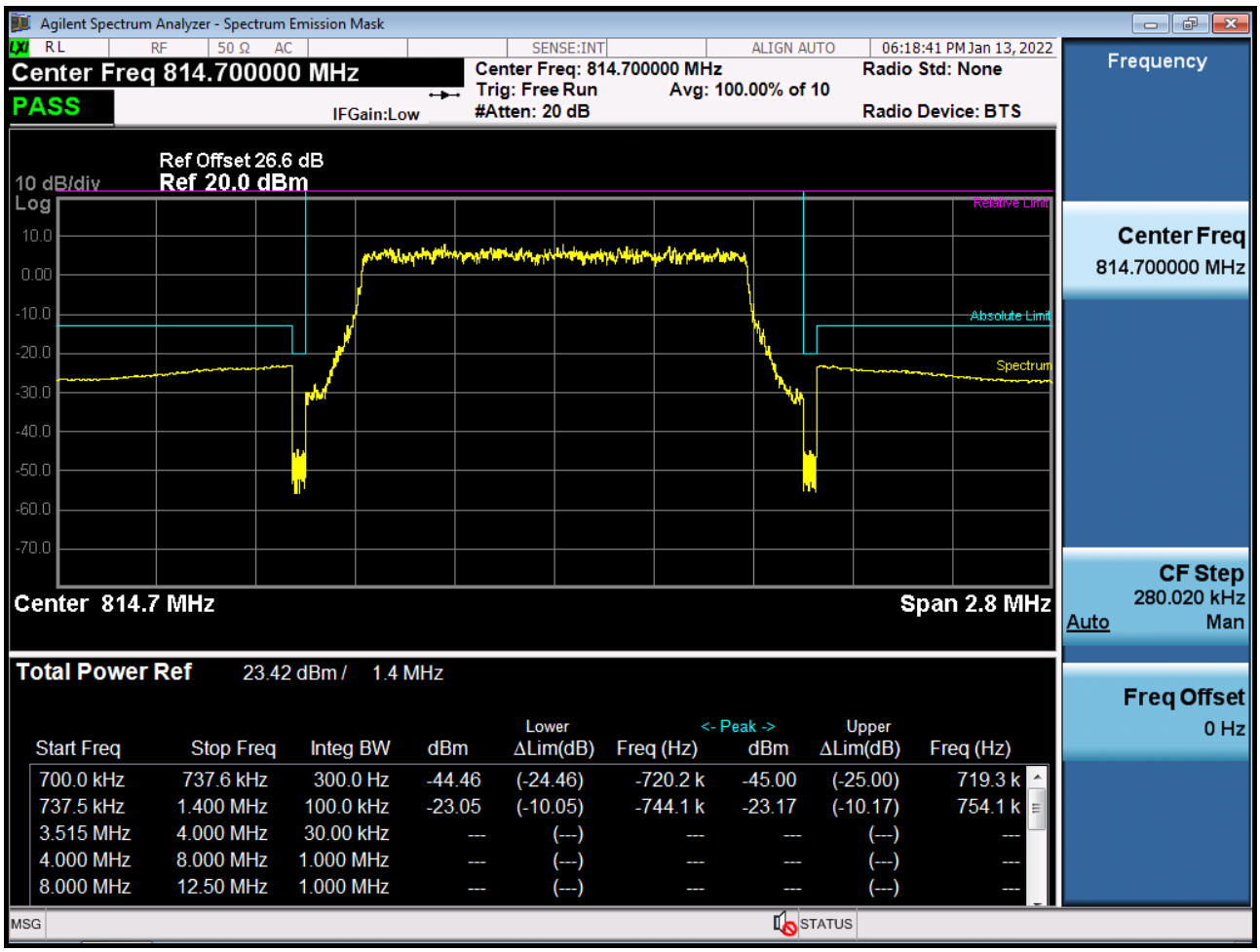
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 256QAM RB 75_0)



BAND 26. Lower Channel Edge Plot (1.4 M BW Ch.26697 QPSK RB 1, Offset 0)



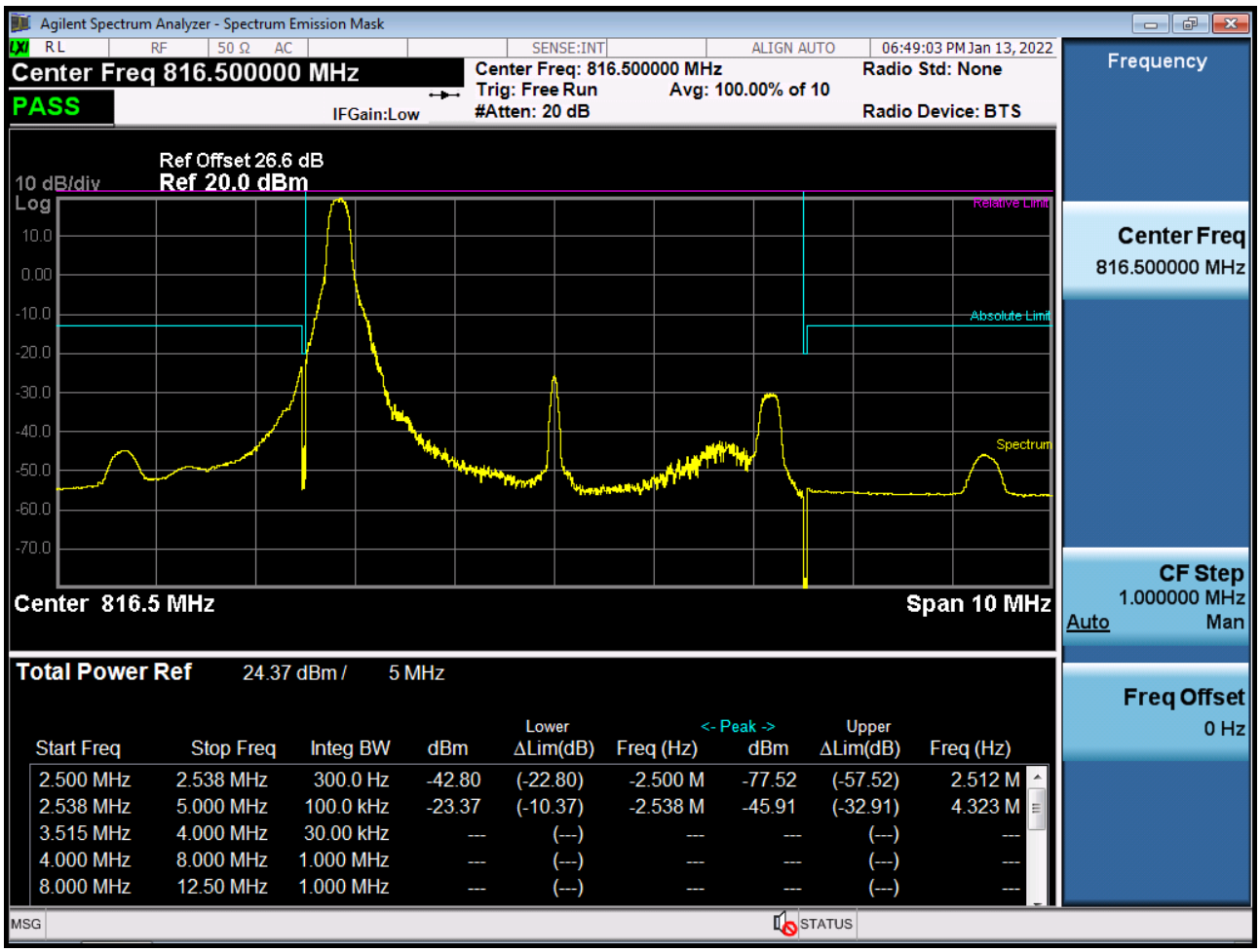
BAND 26. Lower Channel Edge Plot (1.4 M BW Ch.26697 QPSK_RB6_Offset 0)



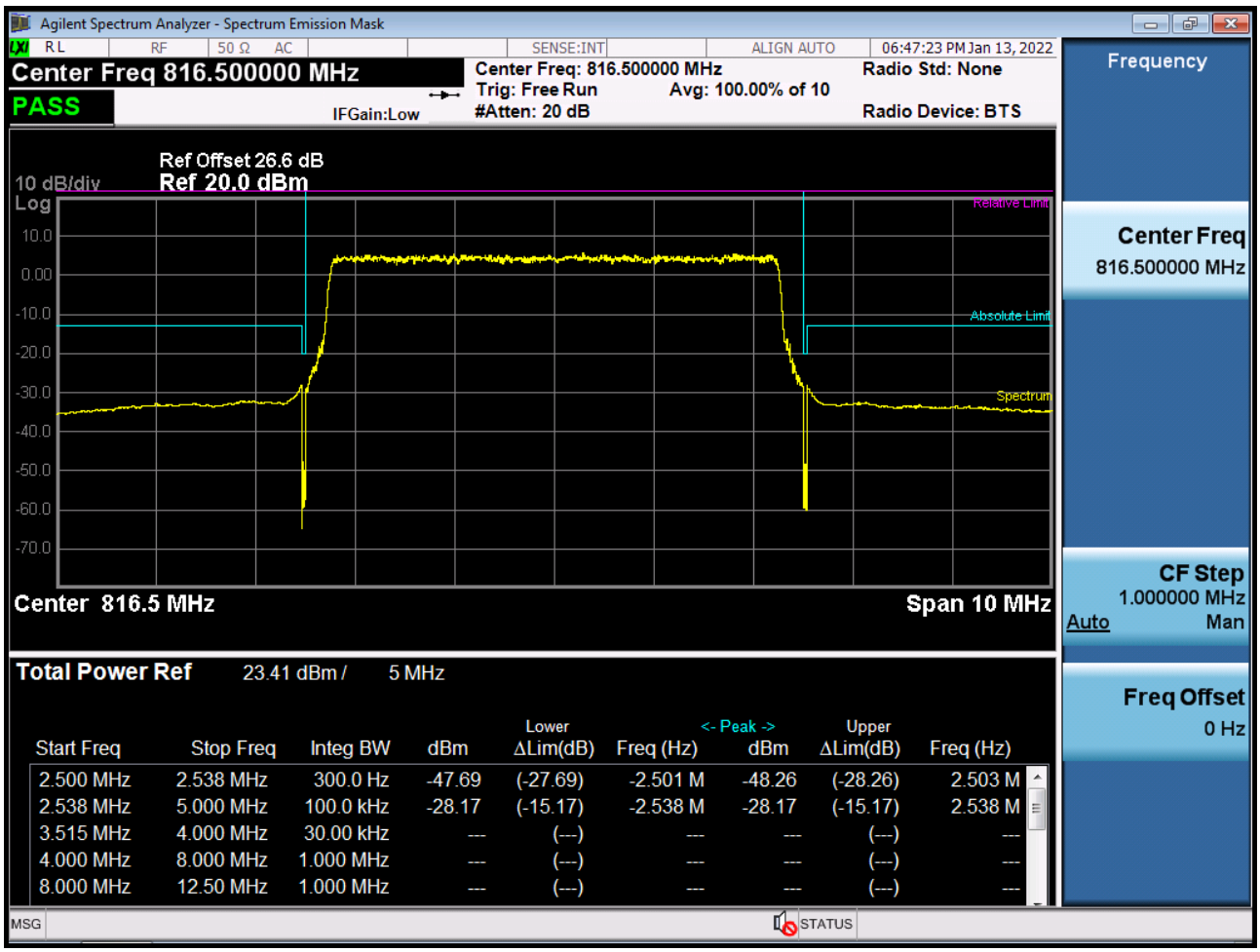
BAND 26. Lower Channel Edge Plot (3 M BW Ch.26705 QPSK RB 1, Offset 0)

BAND 26. Lower Channel Edge Plot (3 M BW Ch.26705 QPSK_RB15_Offset 0)

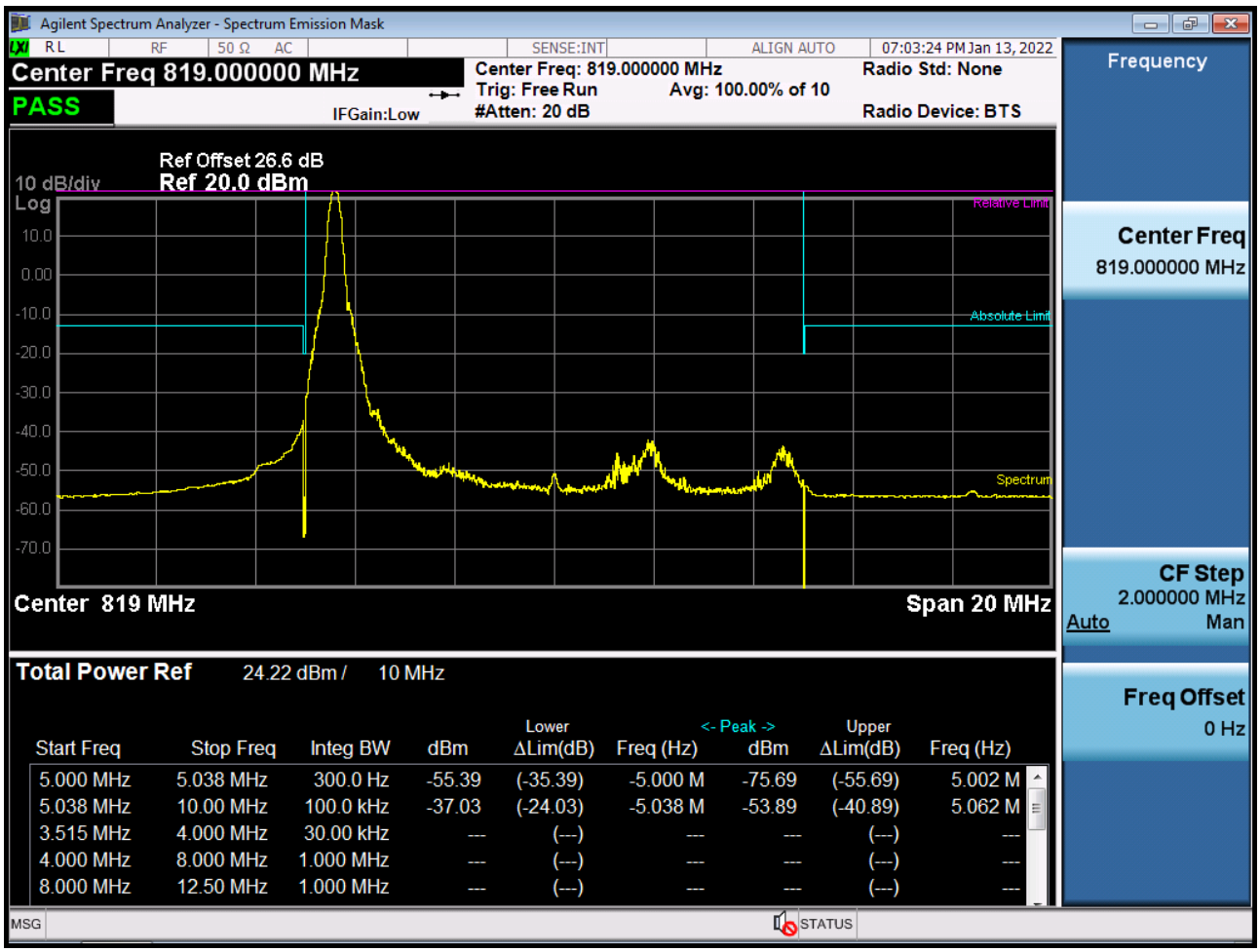
BAND 26. Lower Channel Edge Plot (5 M BW Ch.26715 QPSK RB 1, Offset 0)



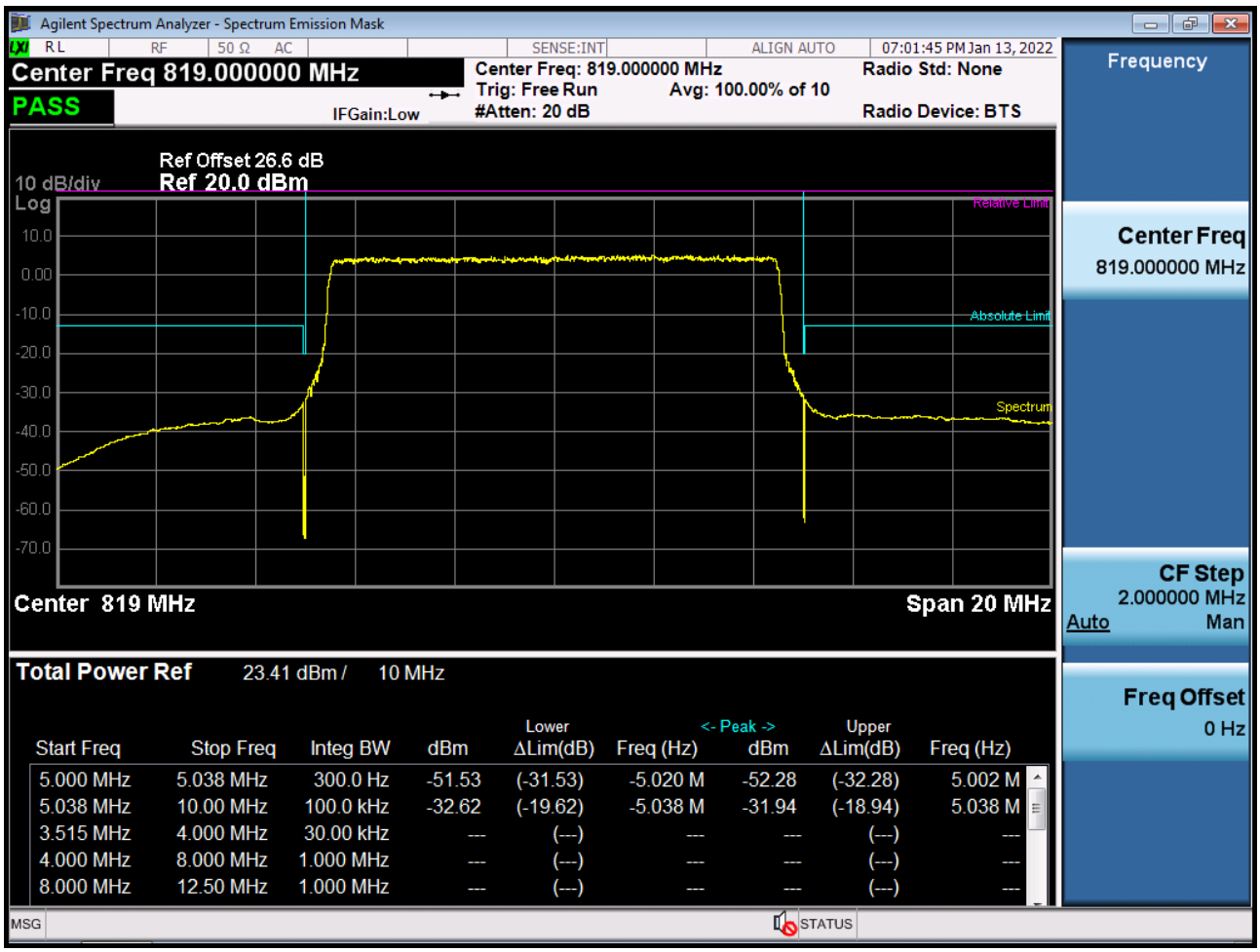
BAND 26. Lower Channel Edge Plot (5 M BW Ch.26715 QPSK_RB25_Offset 0)



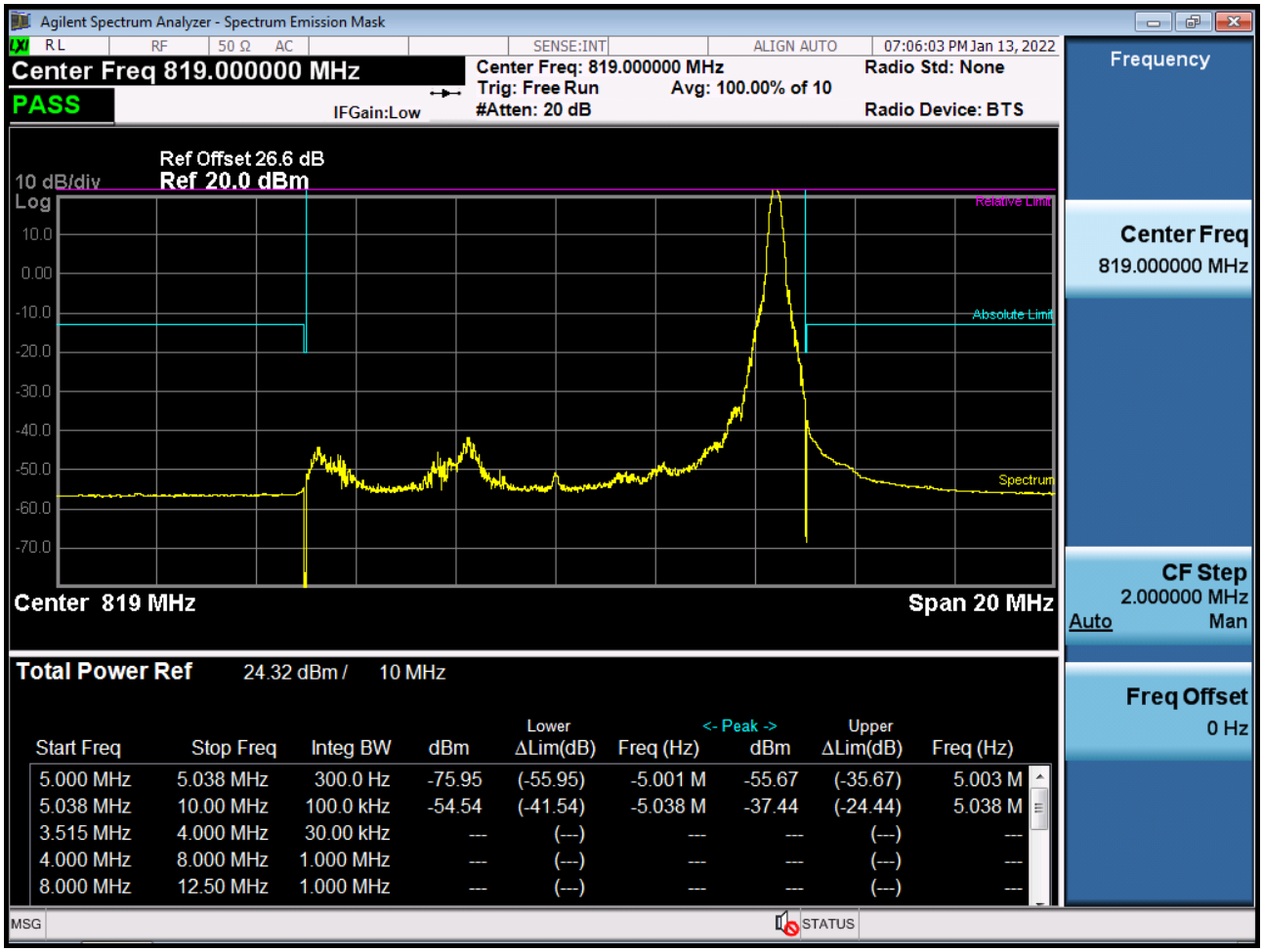
BAND 26. Low Channel Edge Plot (10 M BW Ch.26740 QPSK RB 1, Offset 0)



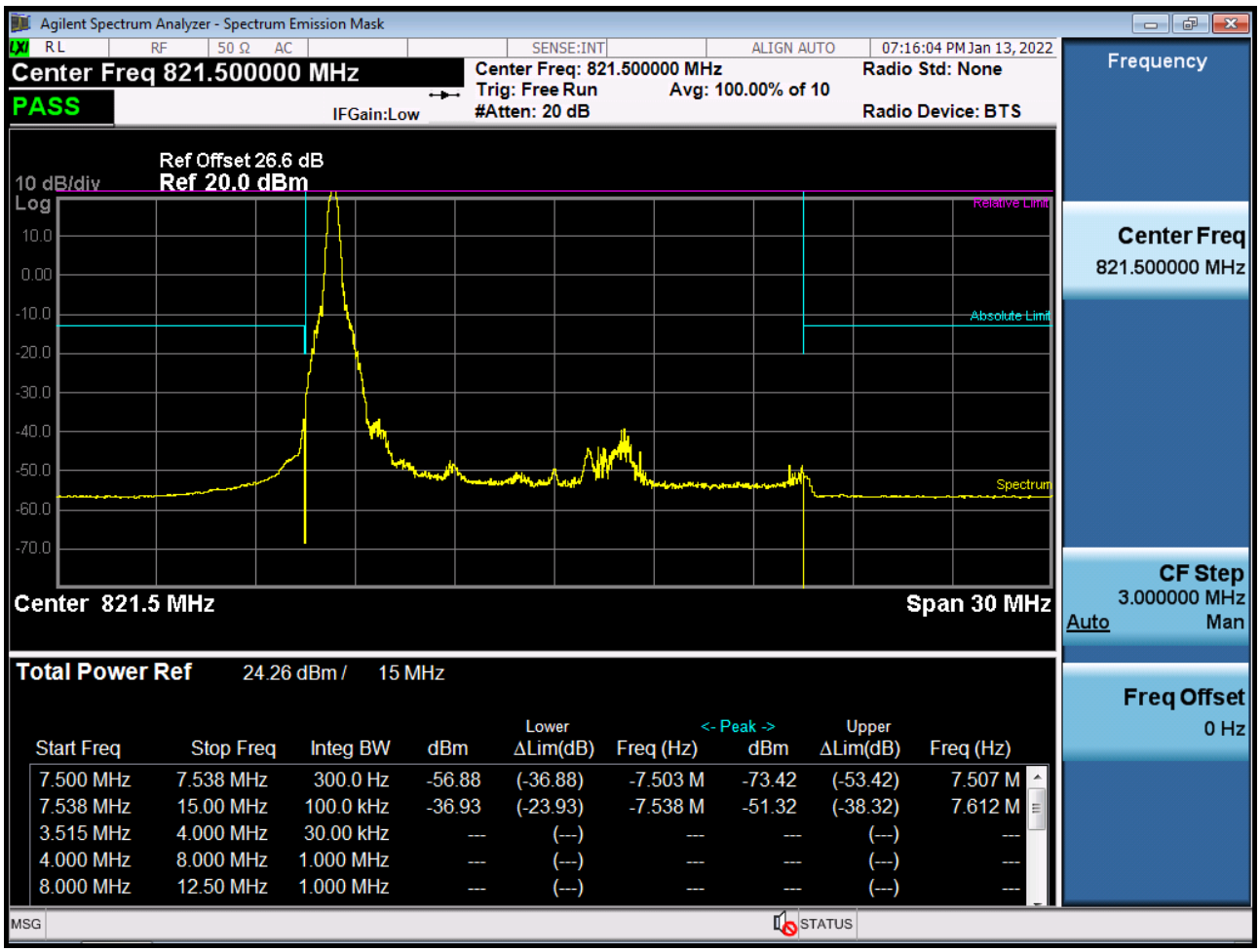
BAND 26. Low Channel Edge Plot (10 M BW Ch.26740 QPSK_RB50_Offset 0)



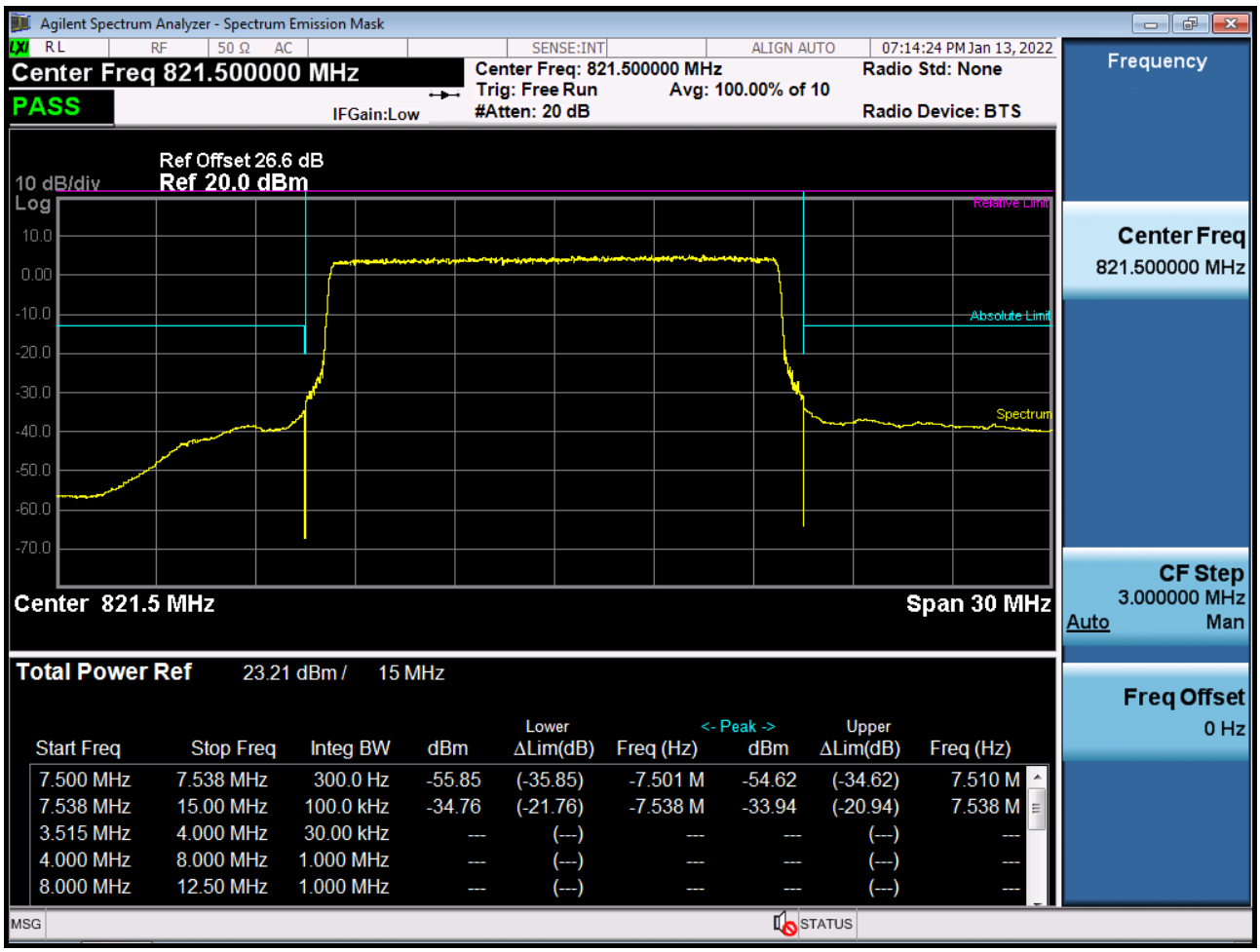
BAND 26. Mid Channel Edge Plot (10 M BW Ch. 26740 QPSK_RB1_Offset 49)



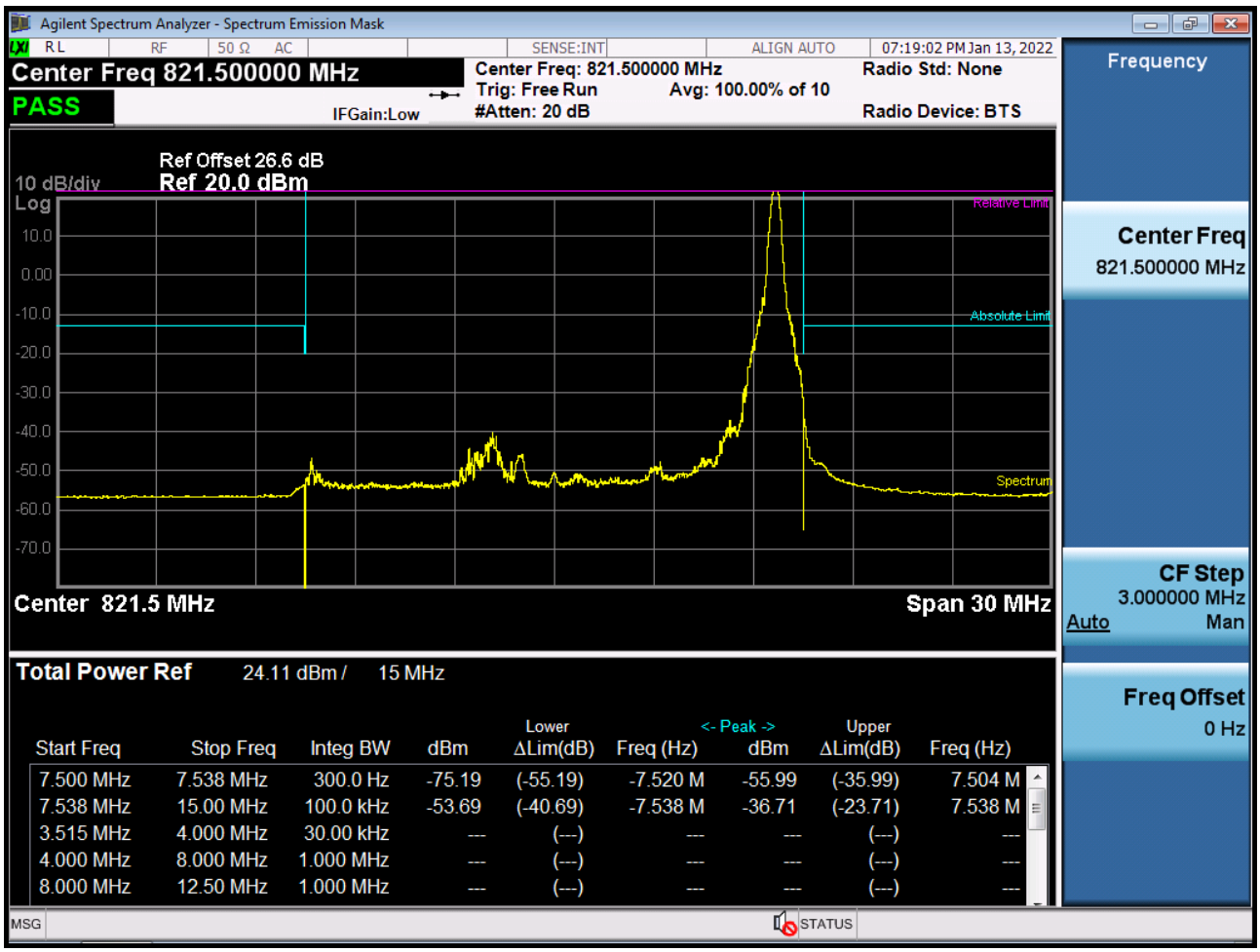
BAND 26. Low Channel Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset 0)



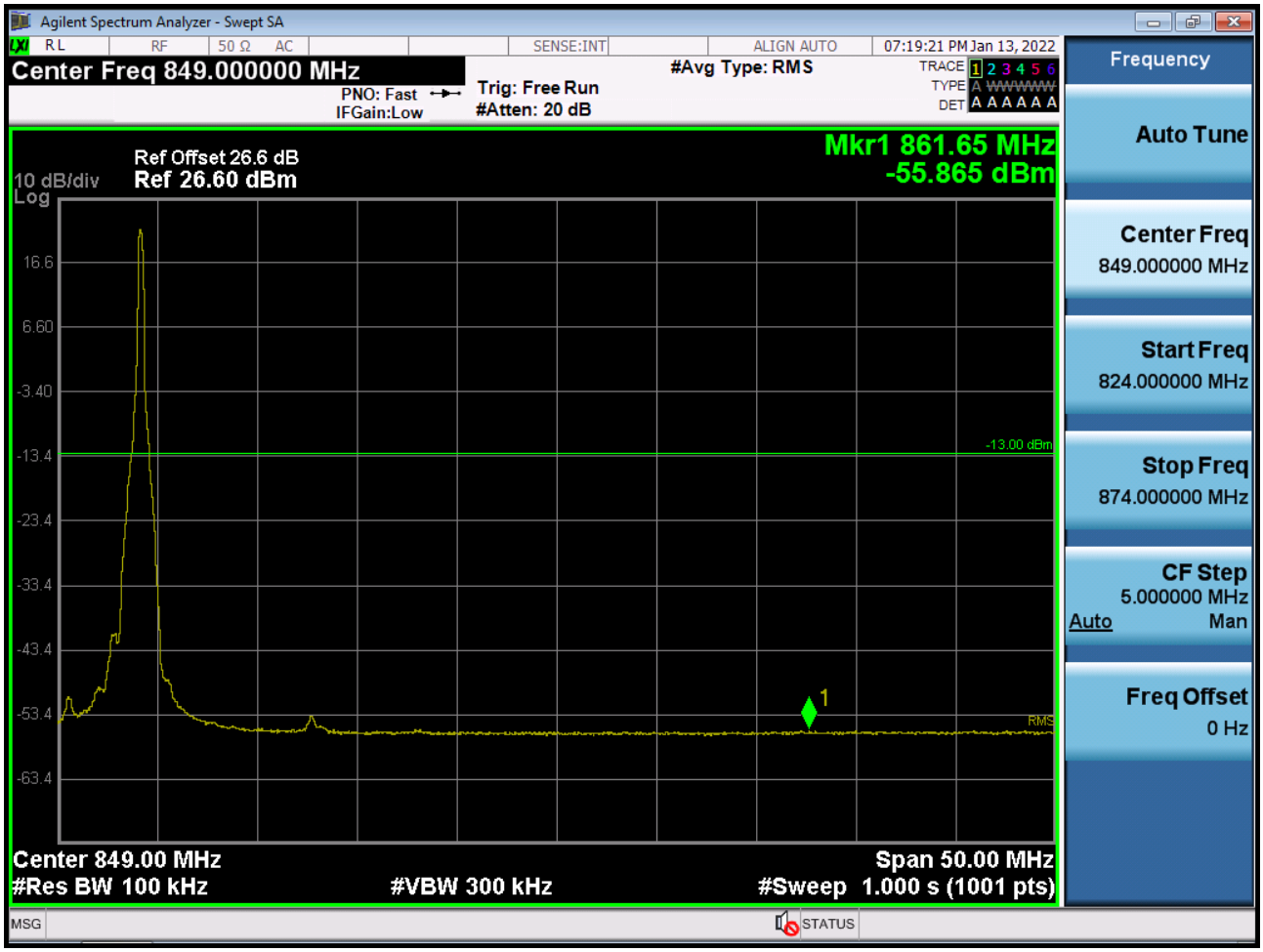
BAND 26. Low Channel Edge Plot (15 M BW Ch.26765 QPSK RB 75, Offset0)



BAND 26. Mid Channel Edge Plot (15 M BW Ch.26765 QPSK_RB1_Offset 74)

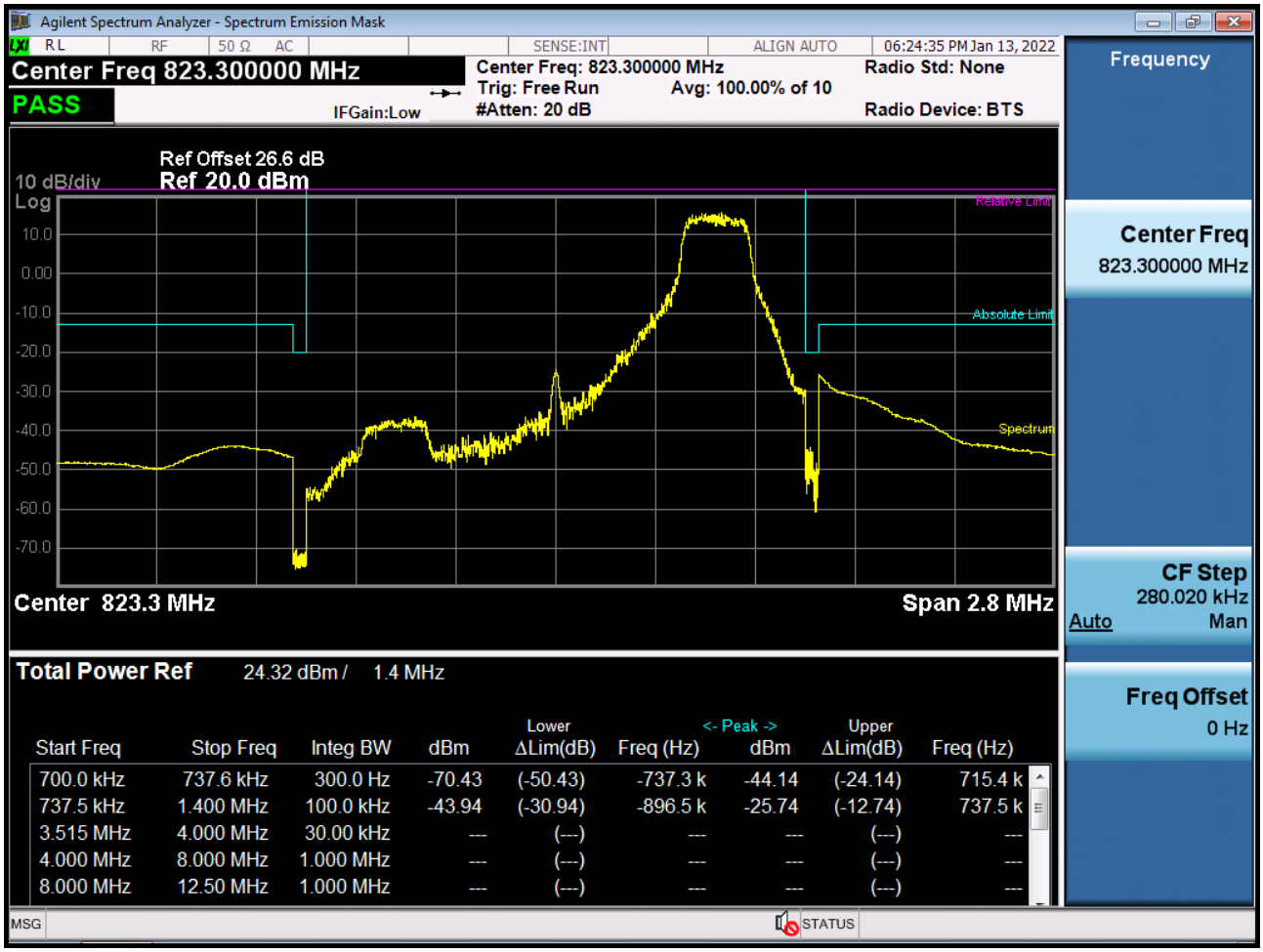


BAND 26. Mid Band Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset74)

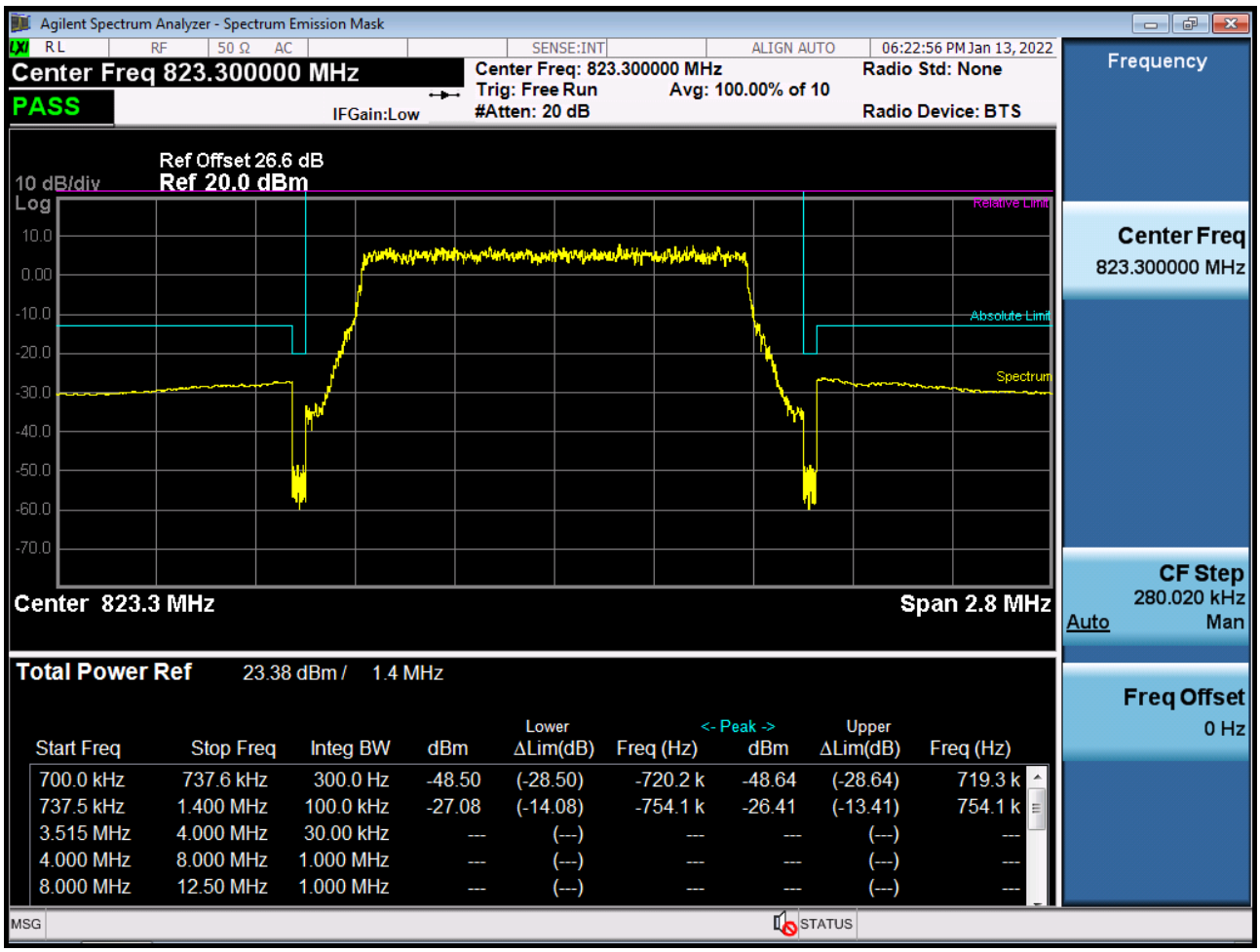


BAND 26. Mid Band Edge Plot (15 M BW Ch.26765 QPSK_RB75_Offset 0)

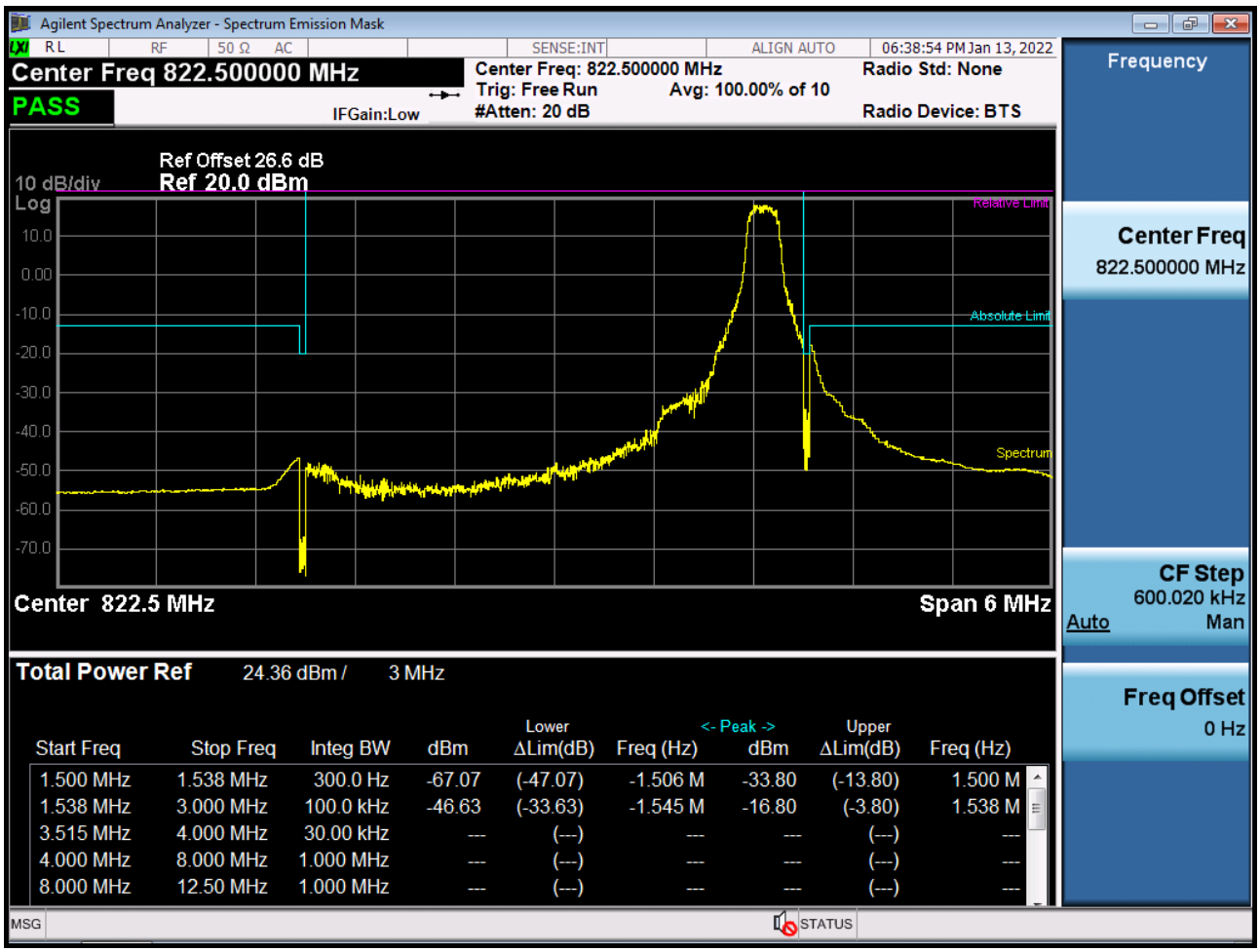
BAND 26. Upper Channel Edge Plot (1.4 M BW Ch.26783 QPSK_RB1_Offset 5)



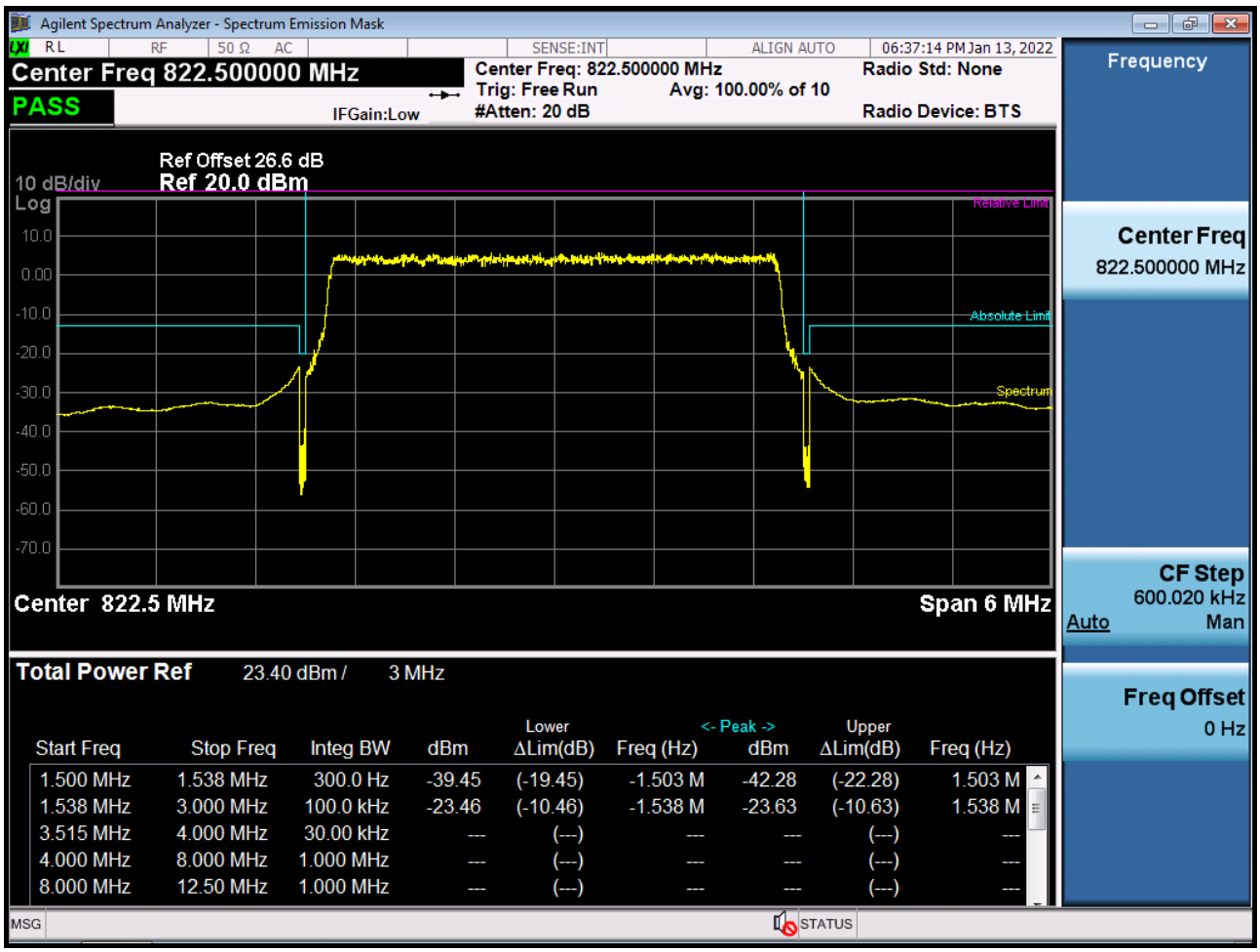
BAND 26. Upper Channel Edge Plot (1.4 M BW Ch.26783 QPSK_RB6_Offset 0)



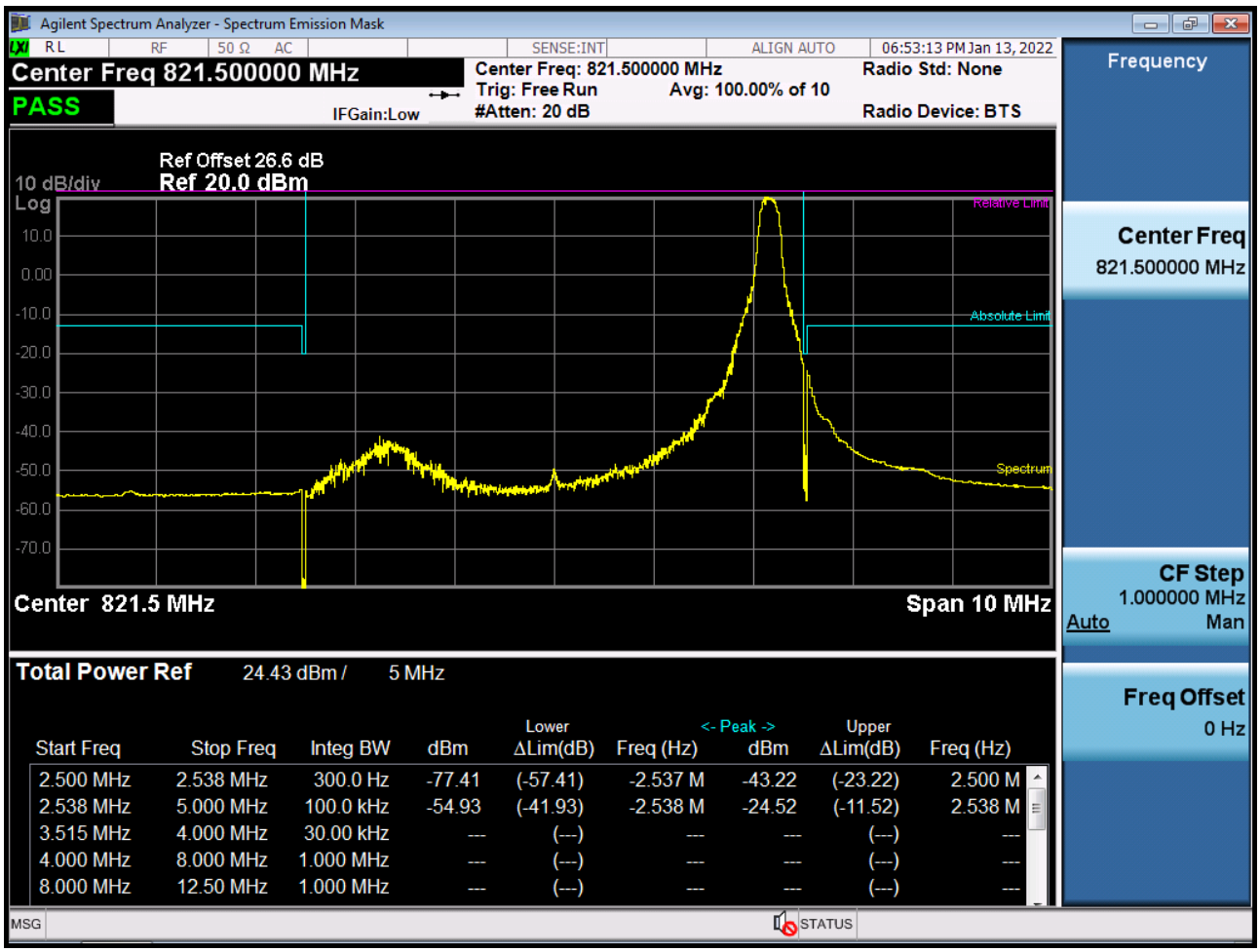
BAND 26. Upper Channel Edge Plot (3 M BW Ch.26775 QPSK_RB1_Offset 14)



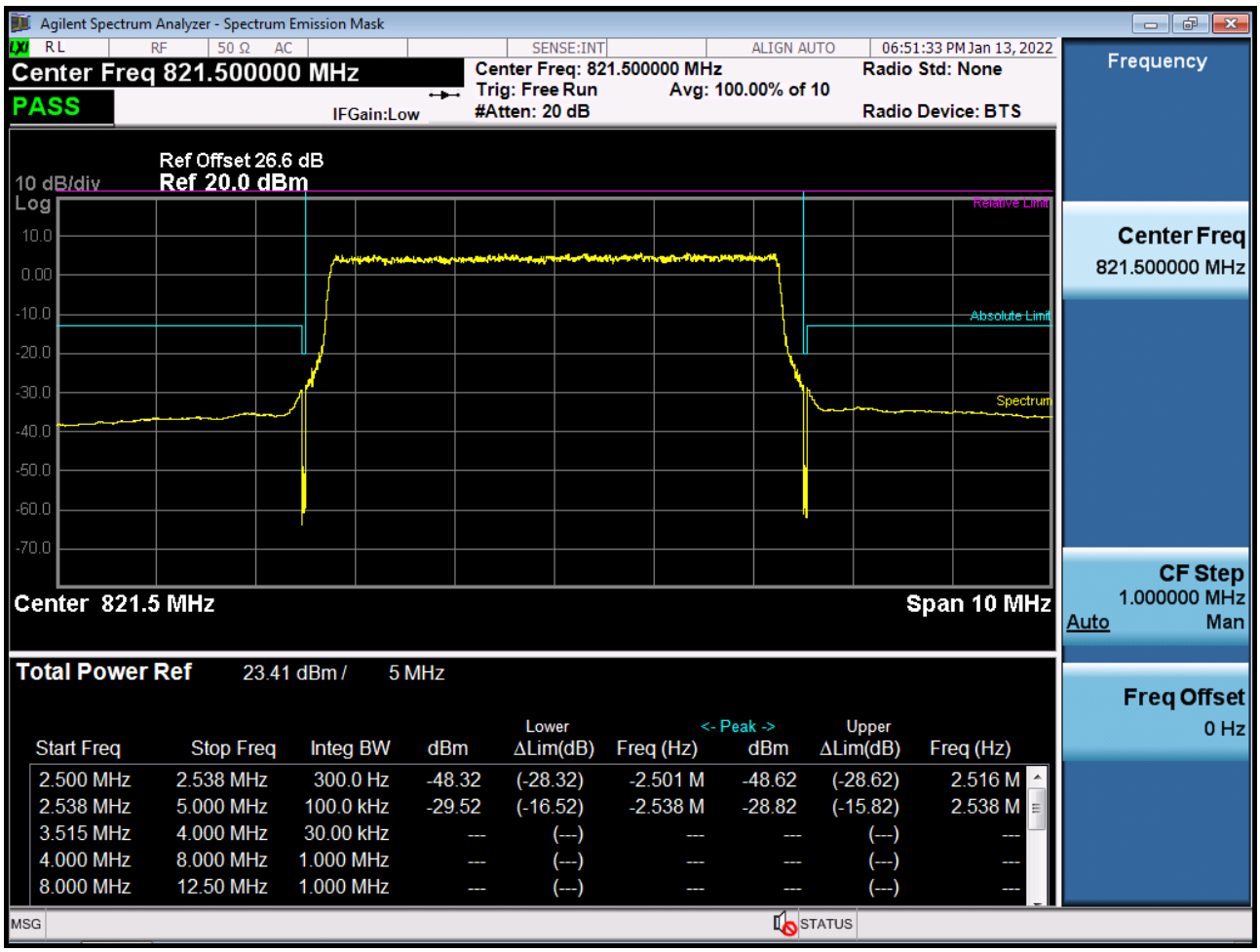
BAND 26. Upper Channel Edge Plot (3 M BW Ch.26775 QPSK_RB15_Offset 0)



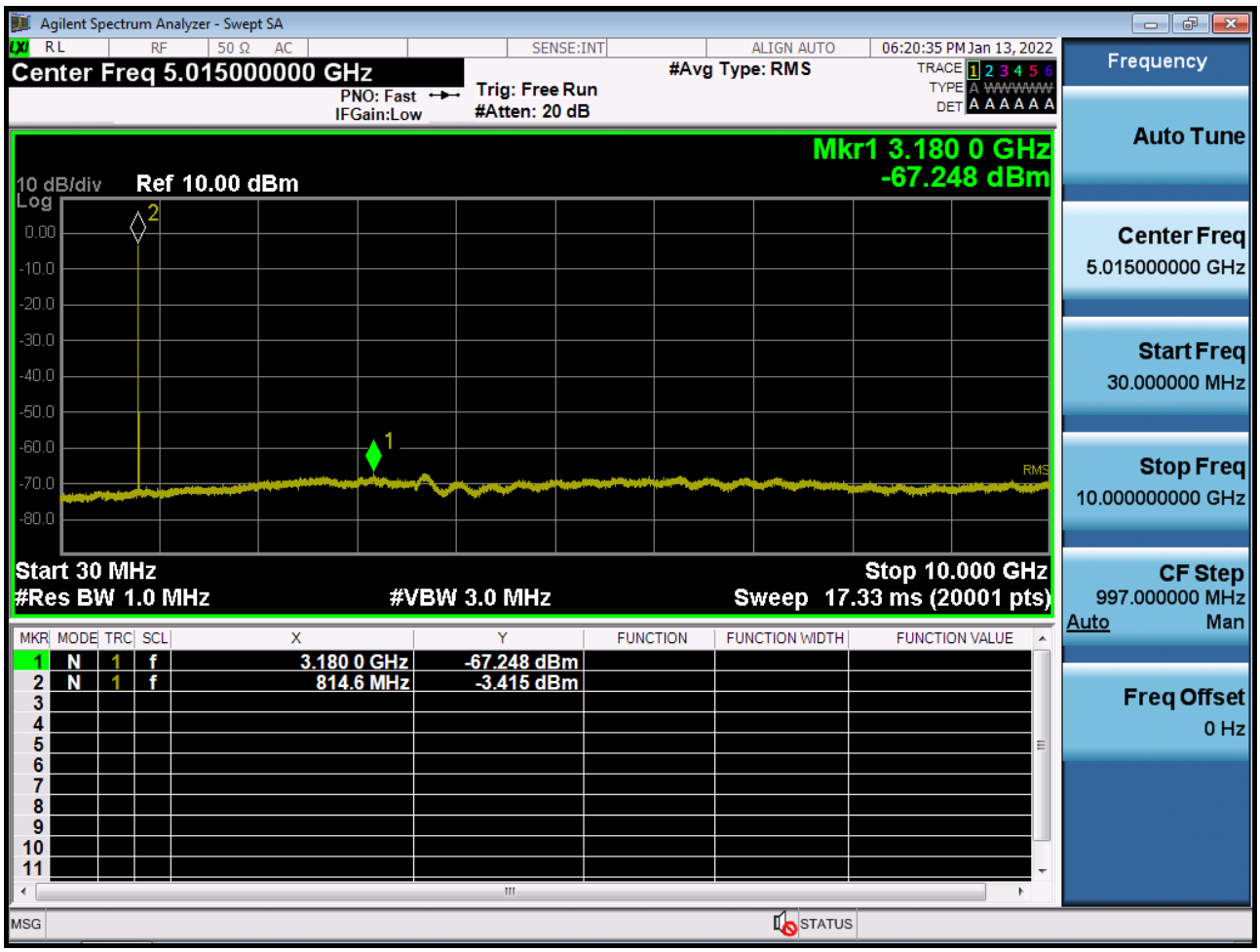
BAND 26. Upper Channel Edge Plot (5 M BW Ch.26765 QPSK_RB1_Offset 24)



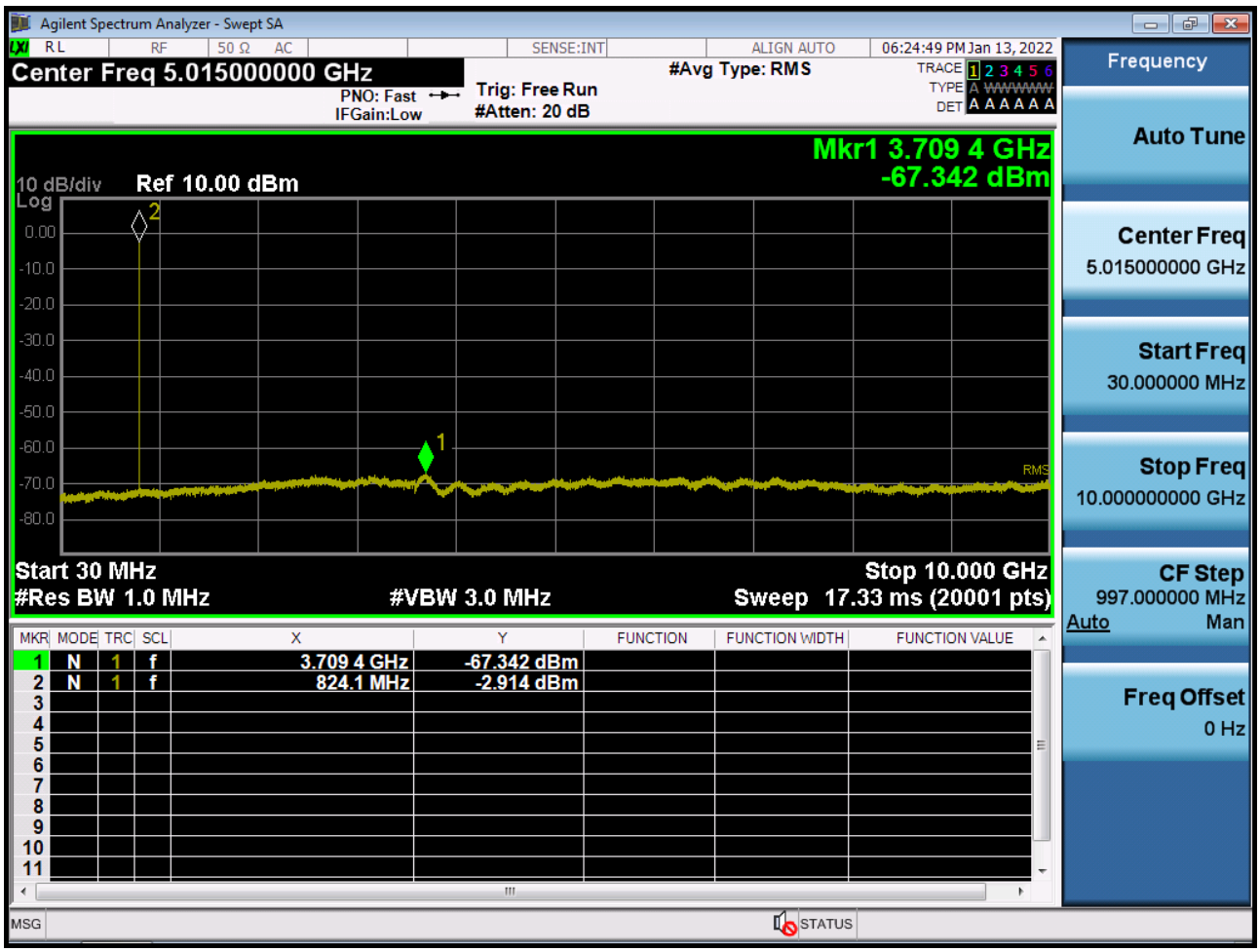
BAND 26. Upper Channel Edge Plot (5 M BW Ch.26765 QPSK_RB25_Offset 0)



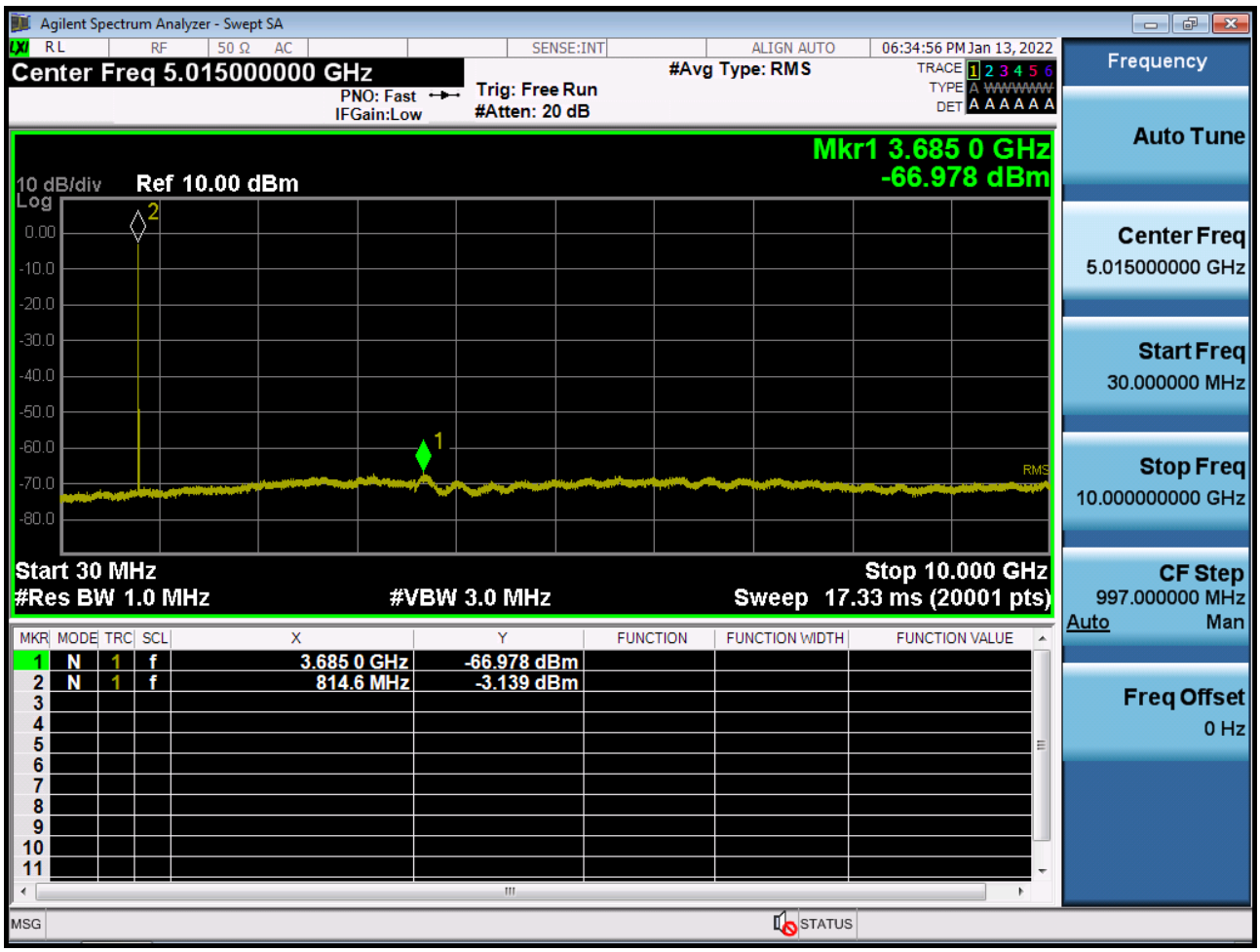
BAND 26. Conducted Spurious (26697 ch_1.4 MHz_QPSK_RB 1_0)



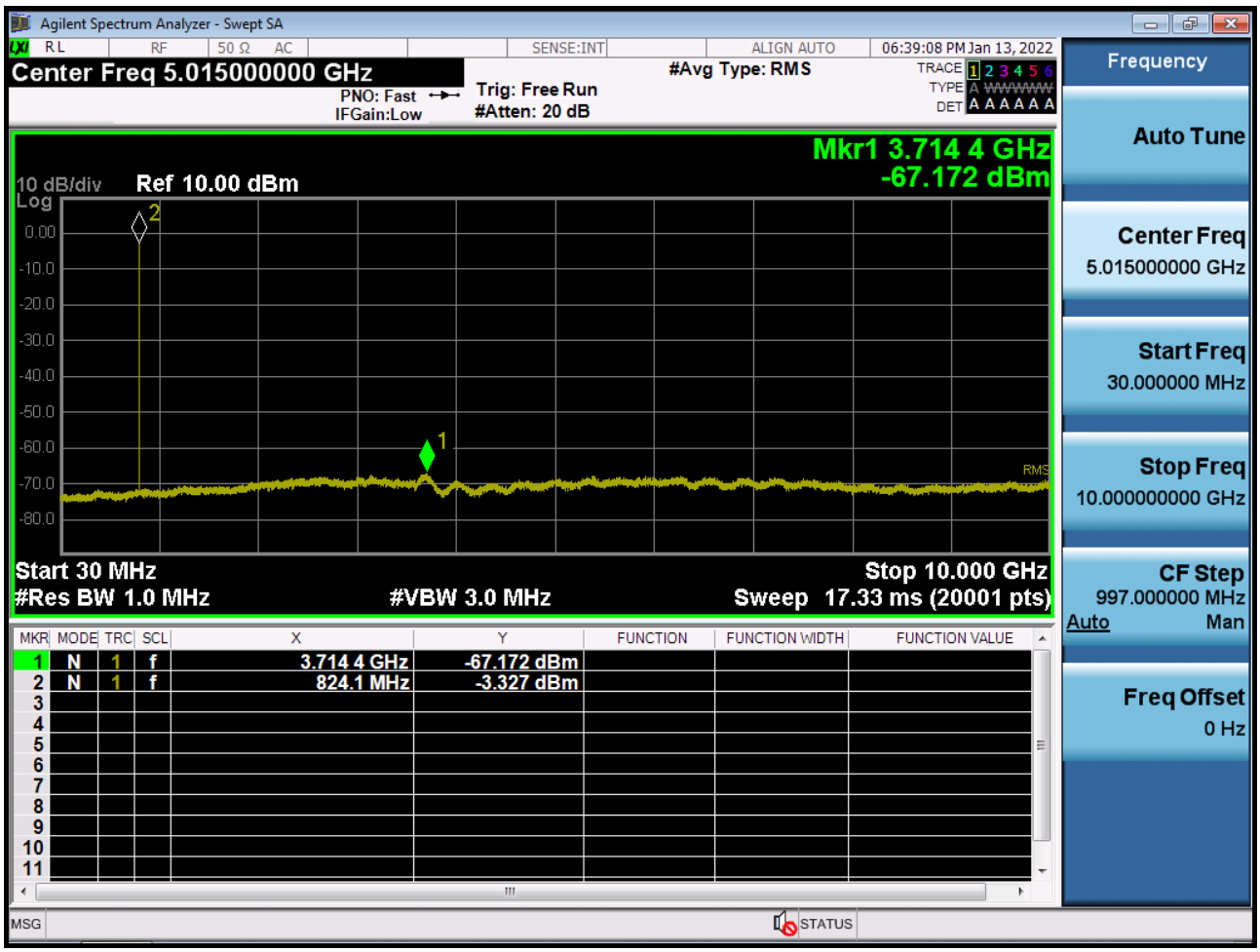
BAND 26. Conducted Spurious (26783 ch_1.4 MHz_QPSK_RB 1_0)



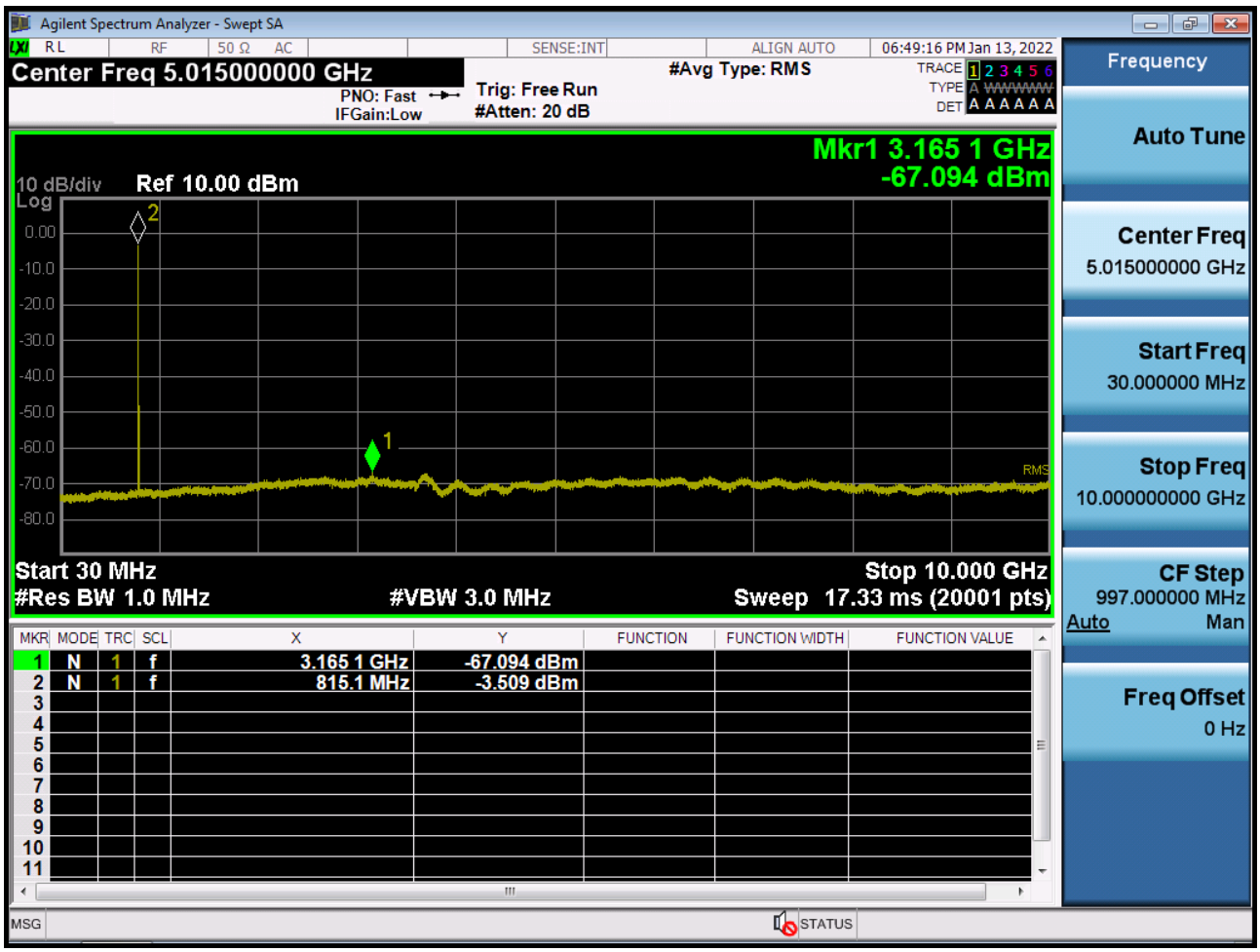
BAND 26. Conducted Spurious (26705 ch_3 MHz_QPSK_RB 1_0)



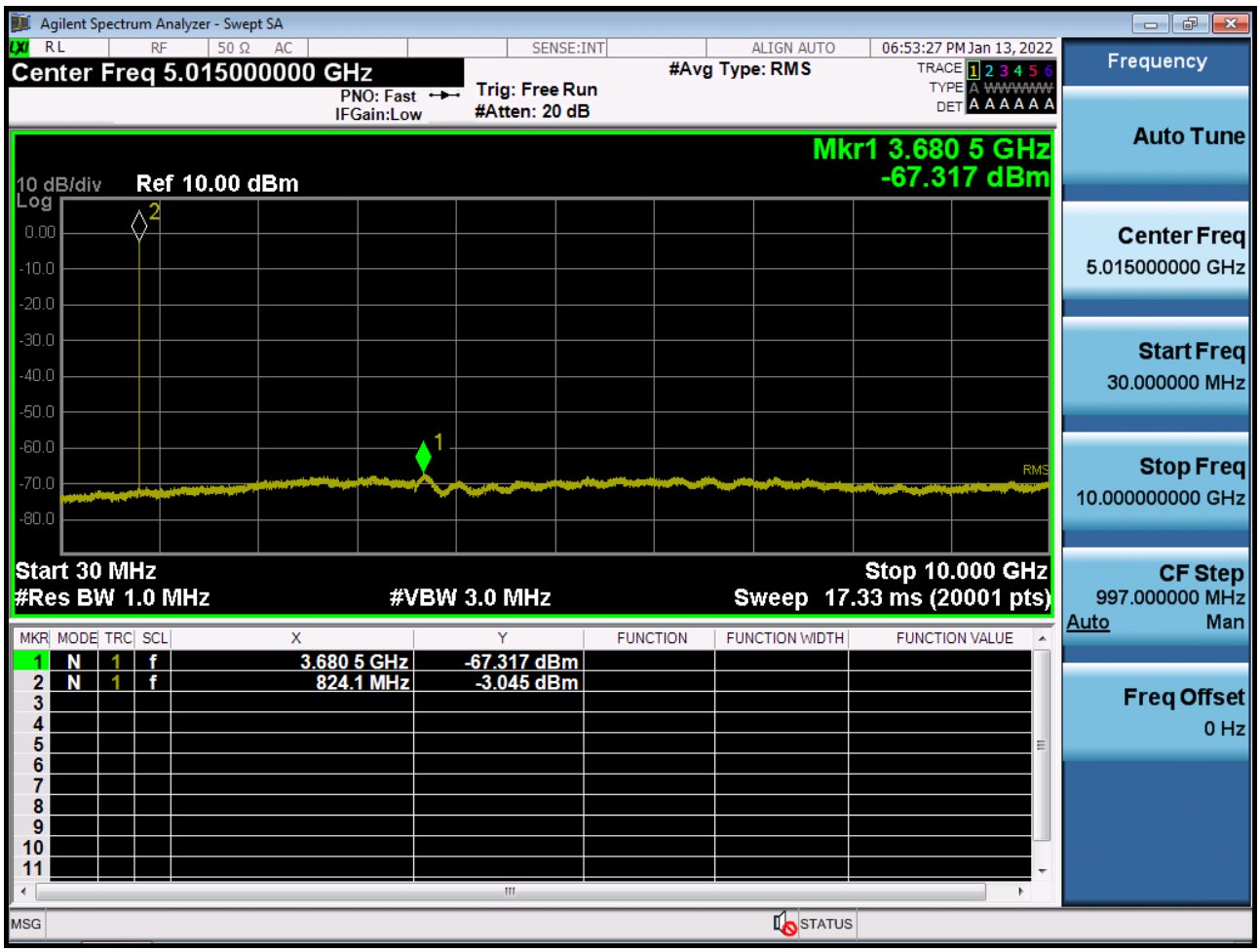
BAND 26. Conducted Spurious (26775 ch_3 MHz_QPSK_RB 1_0)



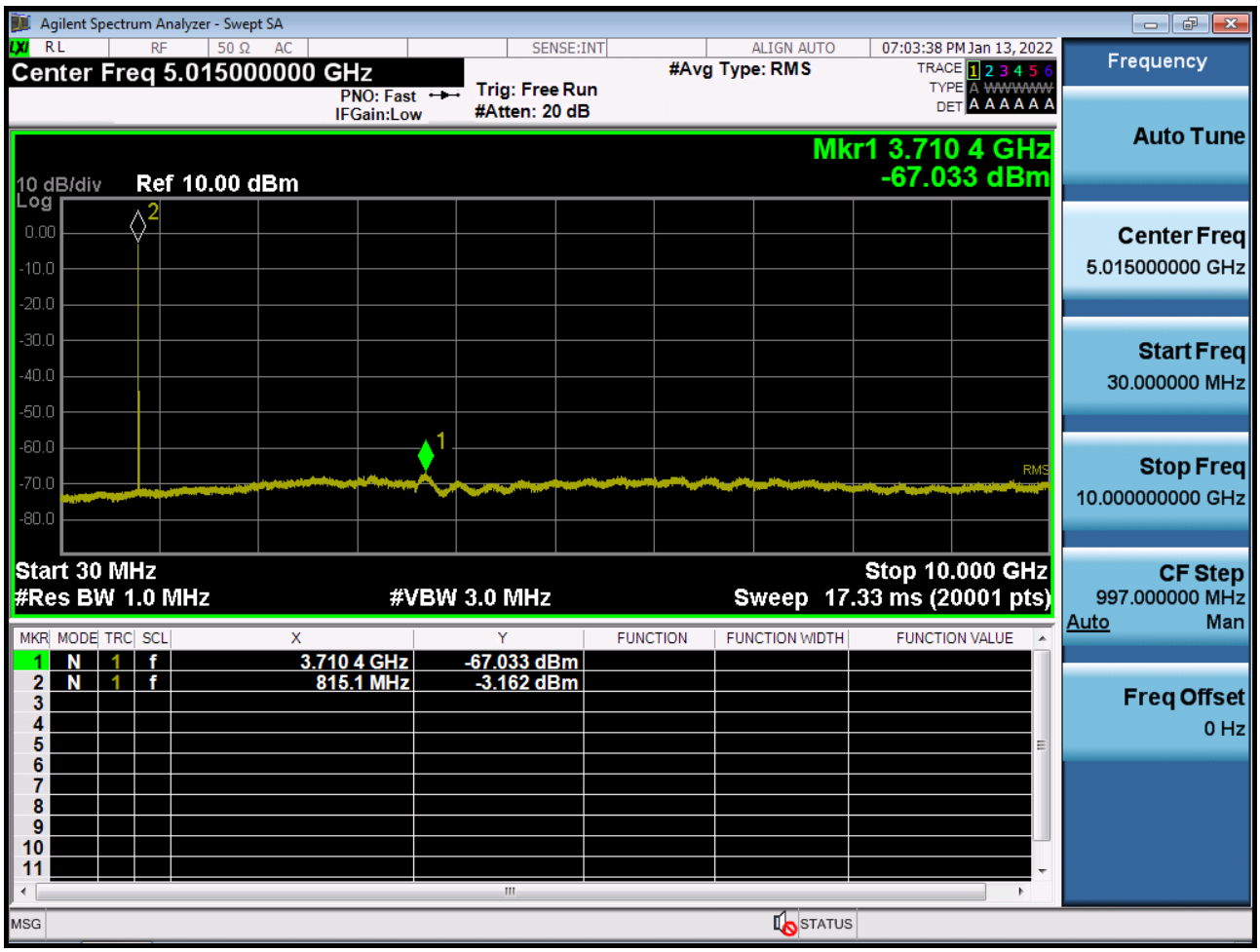
BAND 26. Conducted Spurious (26715 ch_5 MHz_QPSK_RB 1_0)



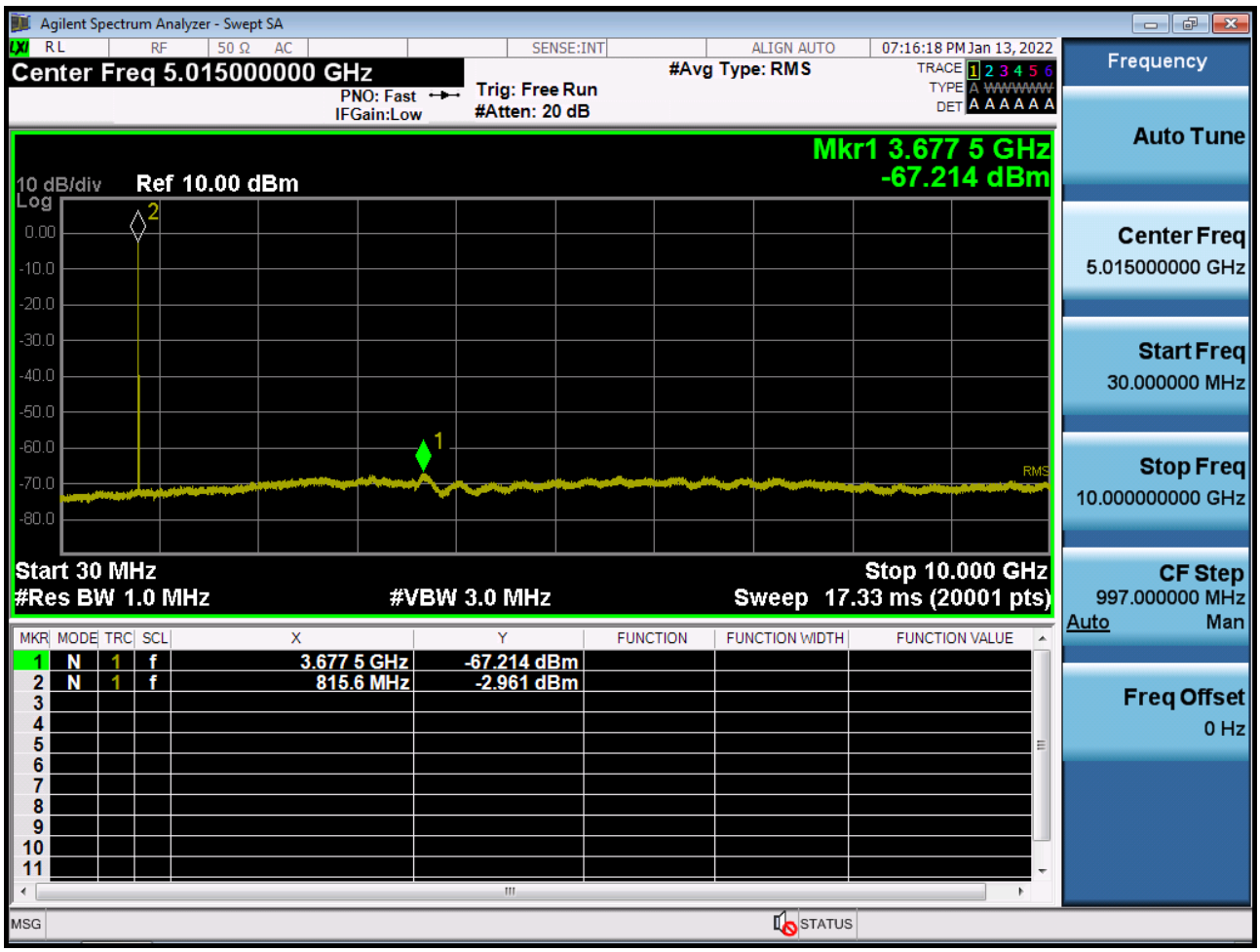
BAND 26. Conducted Spurious (26765 ch_5 MHz_QPSK_RB 1_0)



BAND 26. Conducted Spurious (26740 ch_10 MHz_QPSK_RB 1_0)

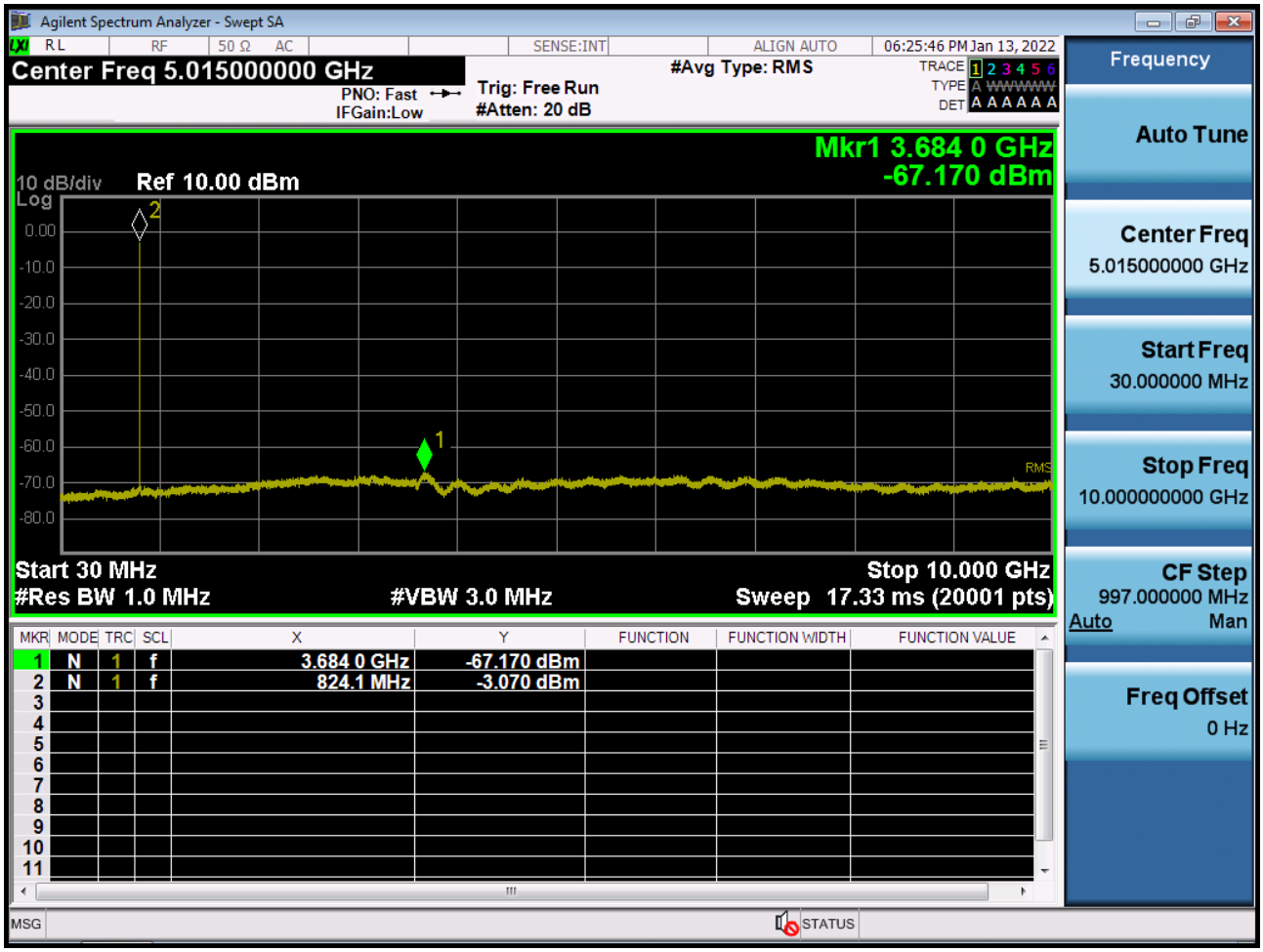


BAND 26. Conducted Spurious (26765 ch_15 MHz_QPSK_RB 1_0)

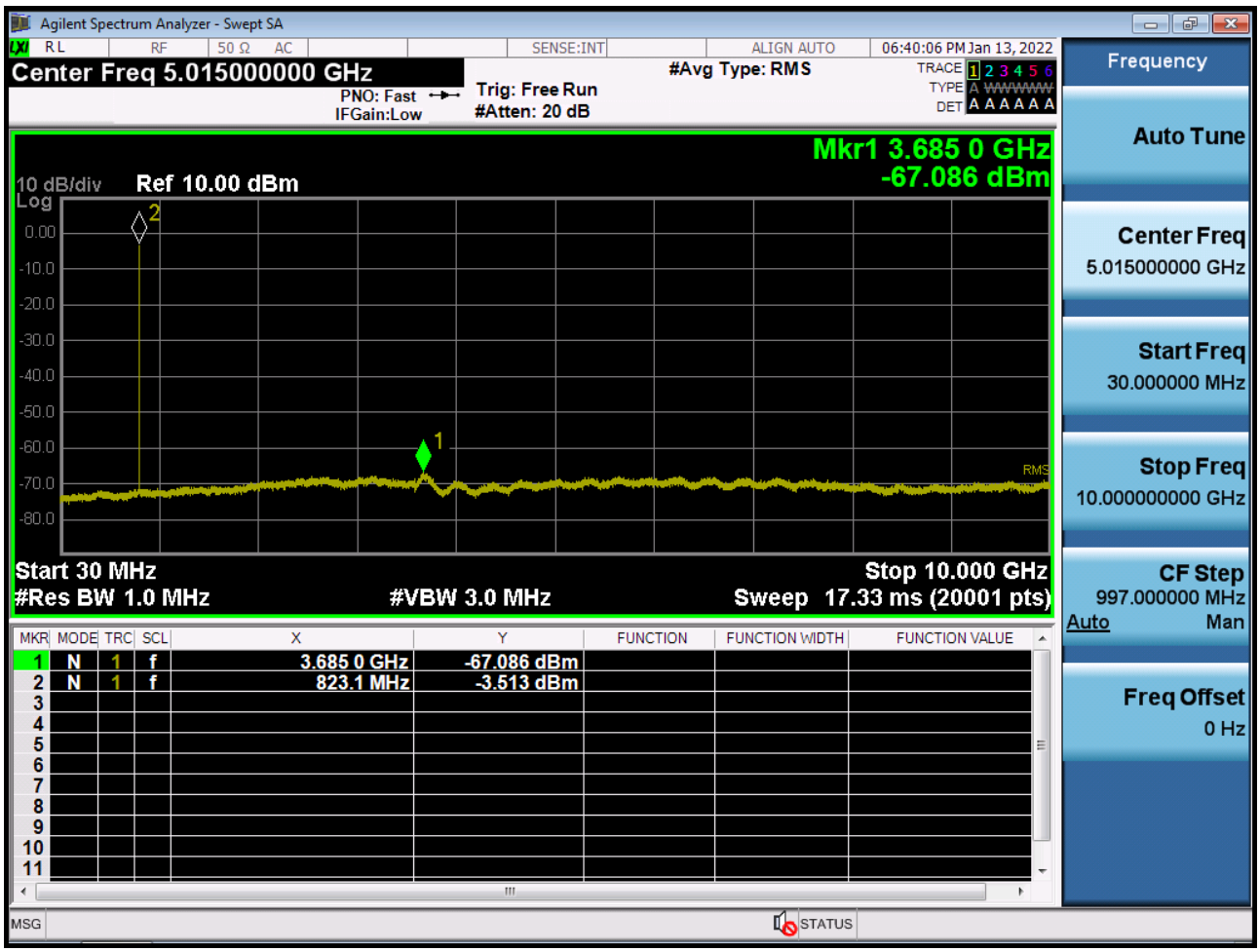


10. TEST PLOTS (STRADDLE CHANNEL)

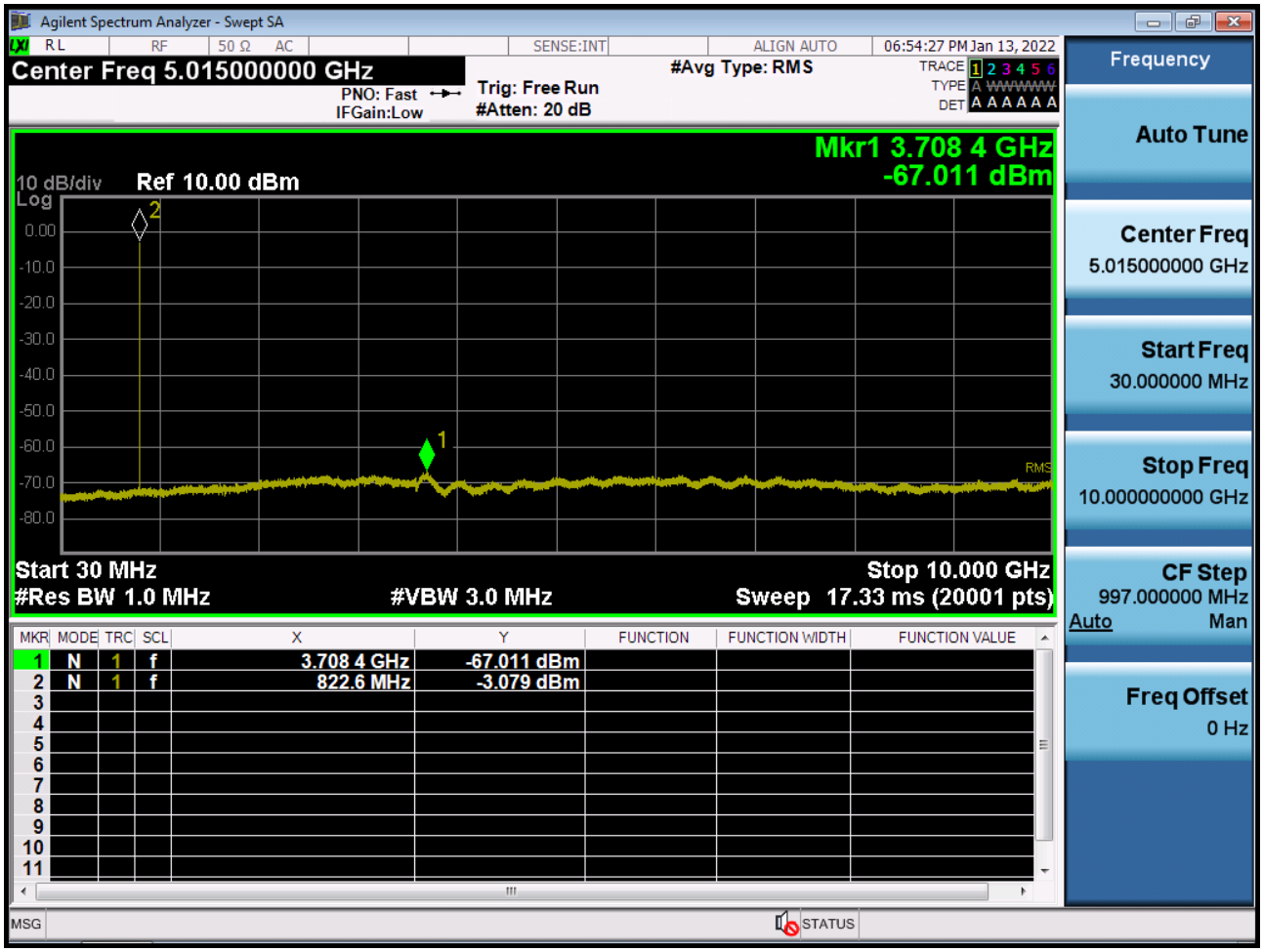
BAND 26. Conducted Spurious (1.4 MHz_QPSK_RB 1_0)



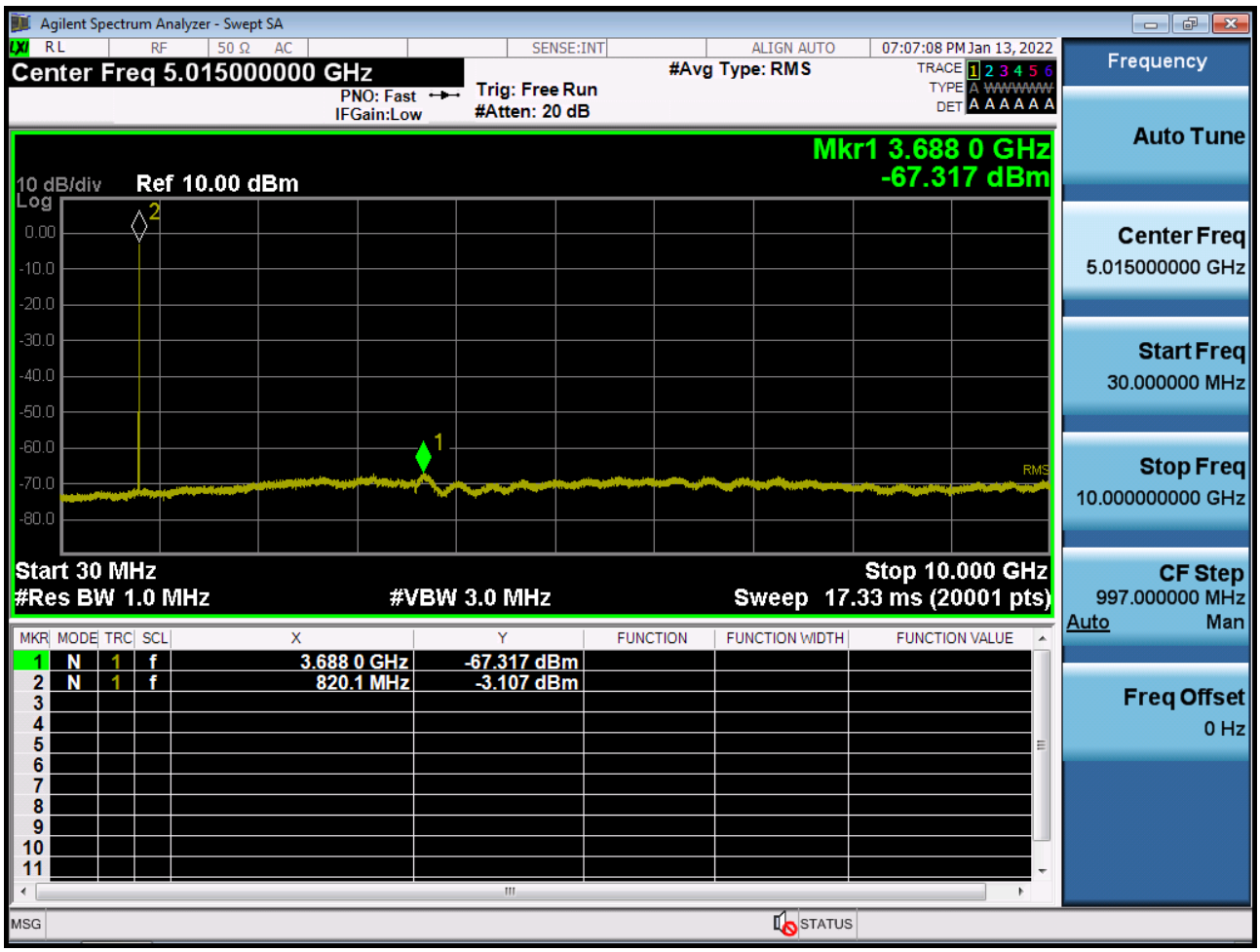
BAND 26. Conducted Spurious (3 MHz_QPSK_RB 1_0)



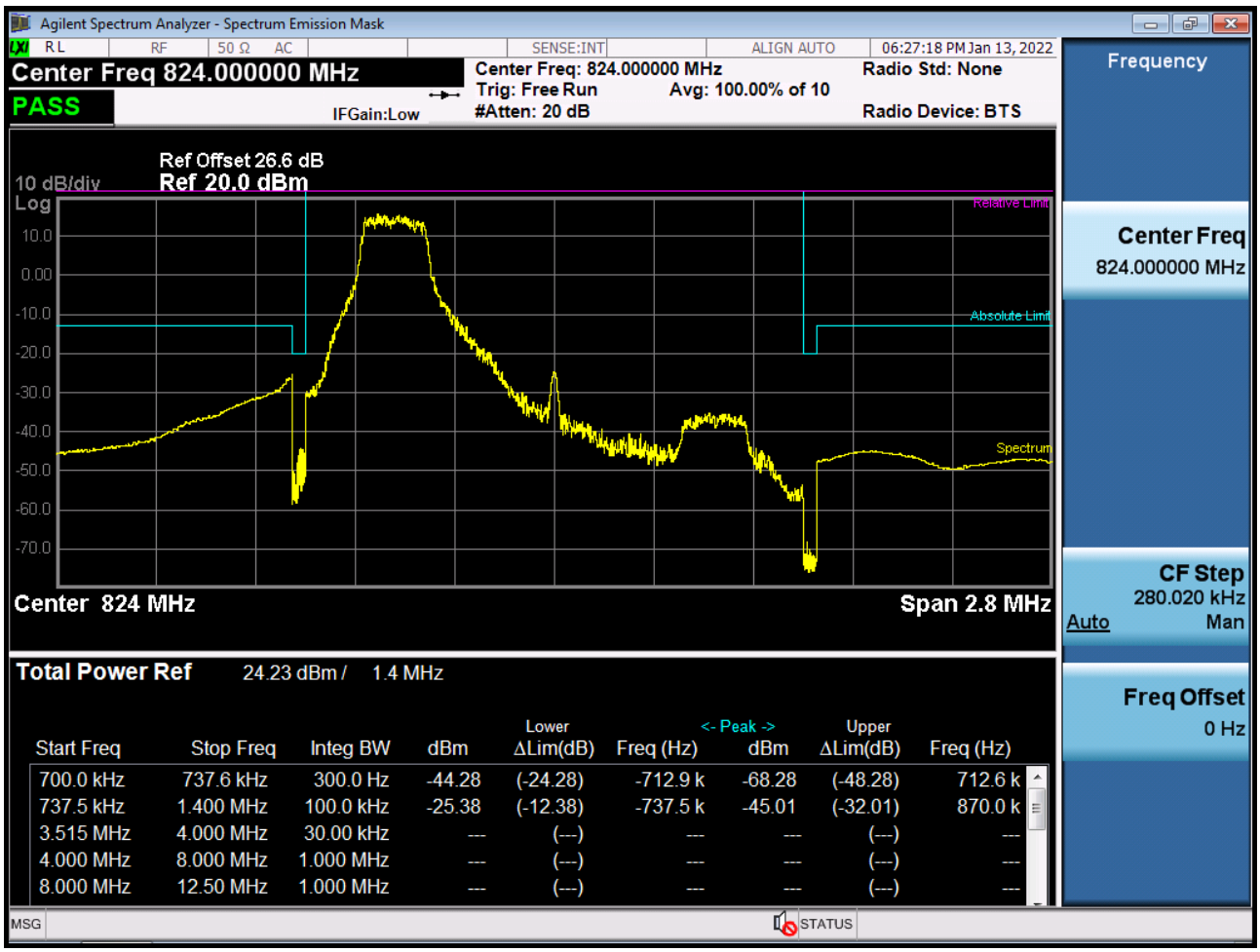
BAND 26. Conducted Spurious (5 MHz_QPSK_RB 1_0)



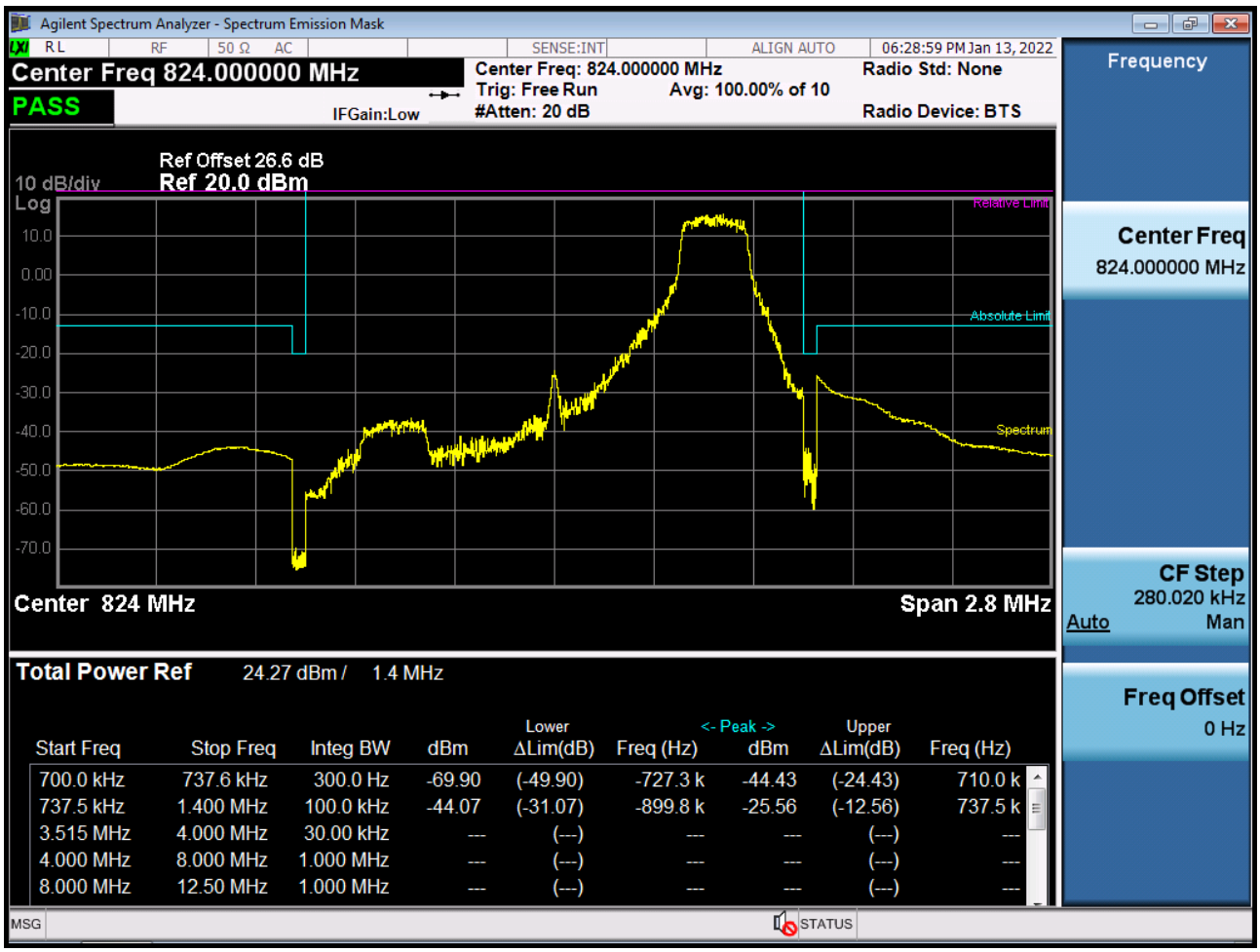
BAND 26. Conducted Spurious (10 MHz_QPSK_RB 1_0)



BAND 26. Channel Edge (1.4 MHz_QPSK_RB 1_0)

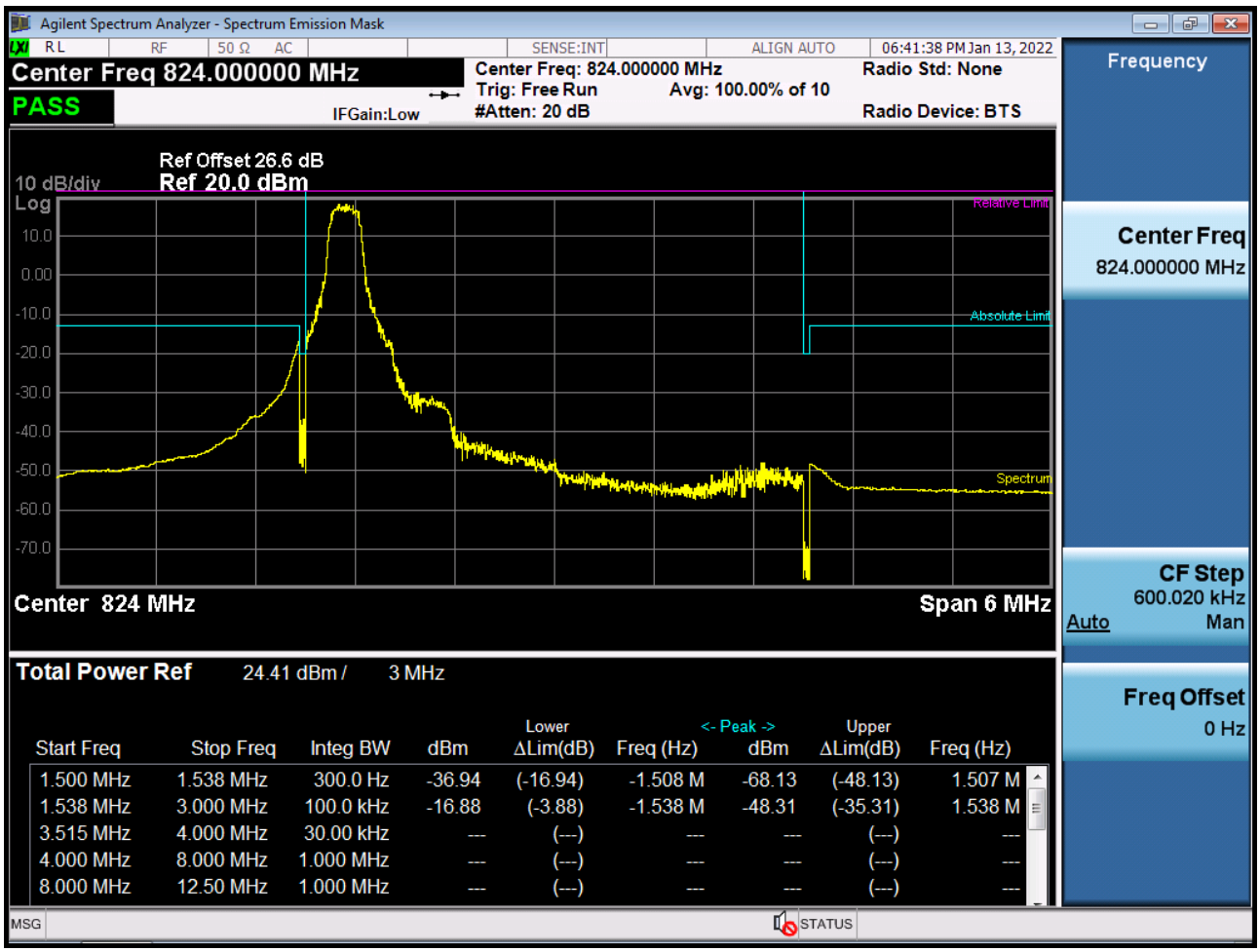


BAND 26. Channel Edge (1.4 MHz_QPSK_RB 1_5)

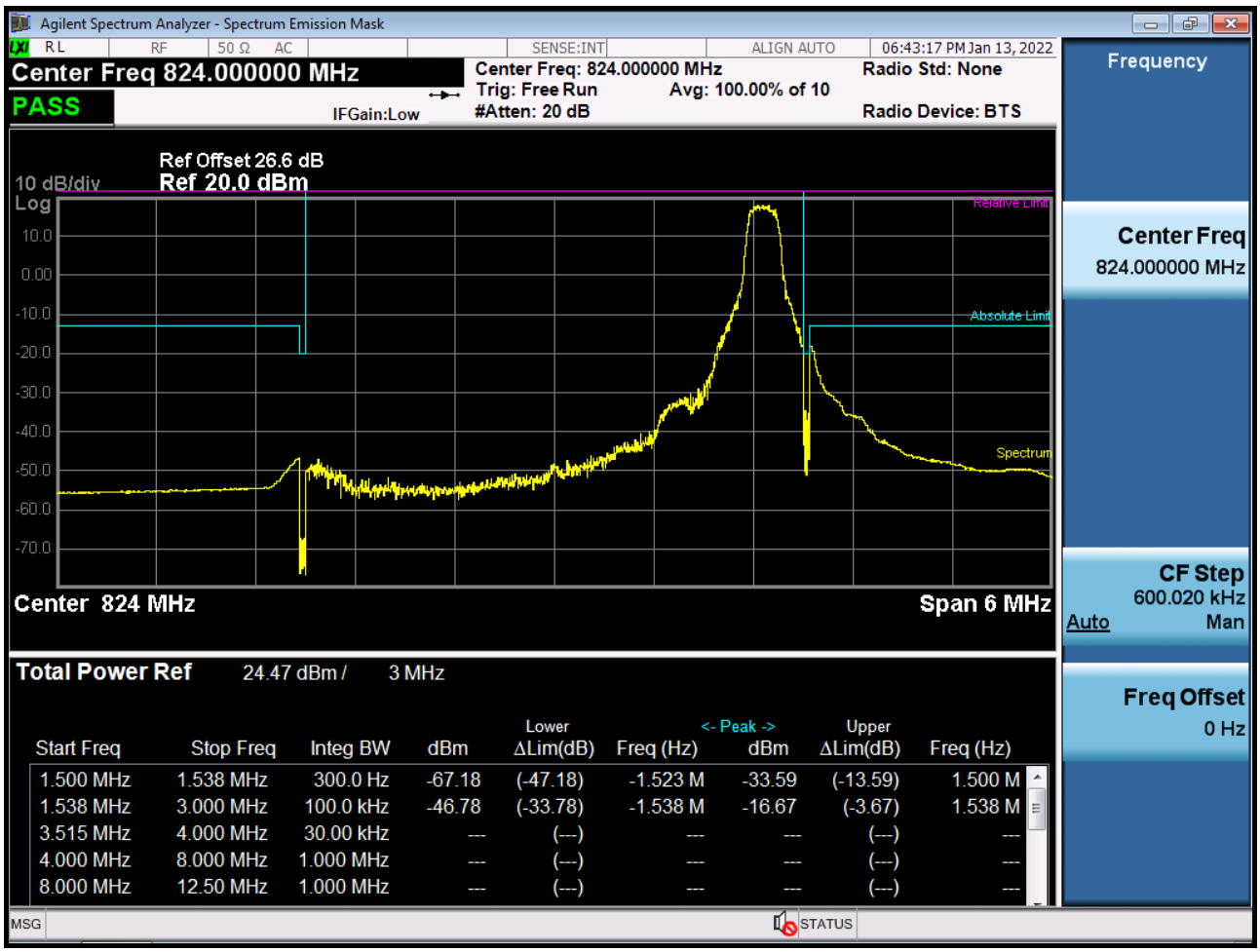


BAND 26. Channel Edge (1.4 MHz_QPSK_Full RB)

BAND 26. Channel Edge (3 MHz_QPSK_RB 1_0)

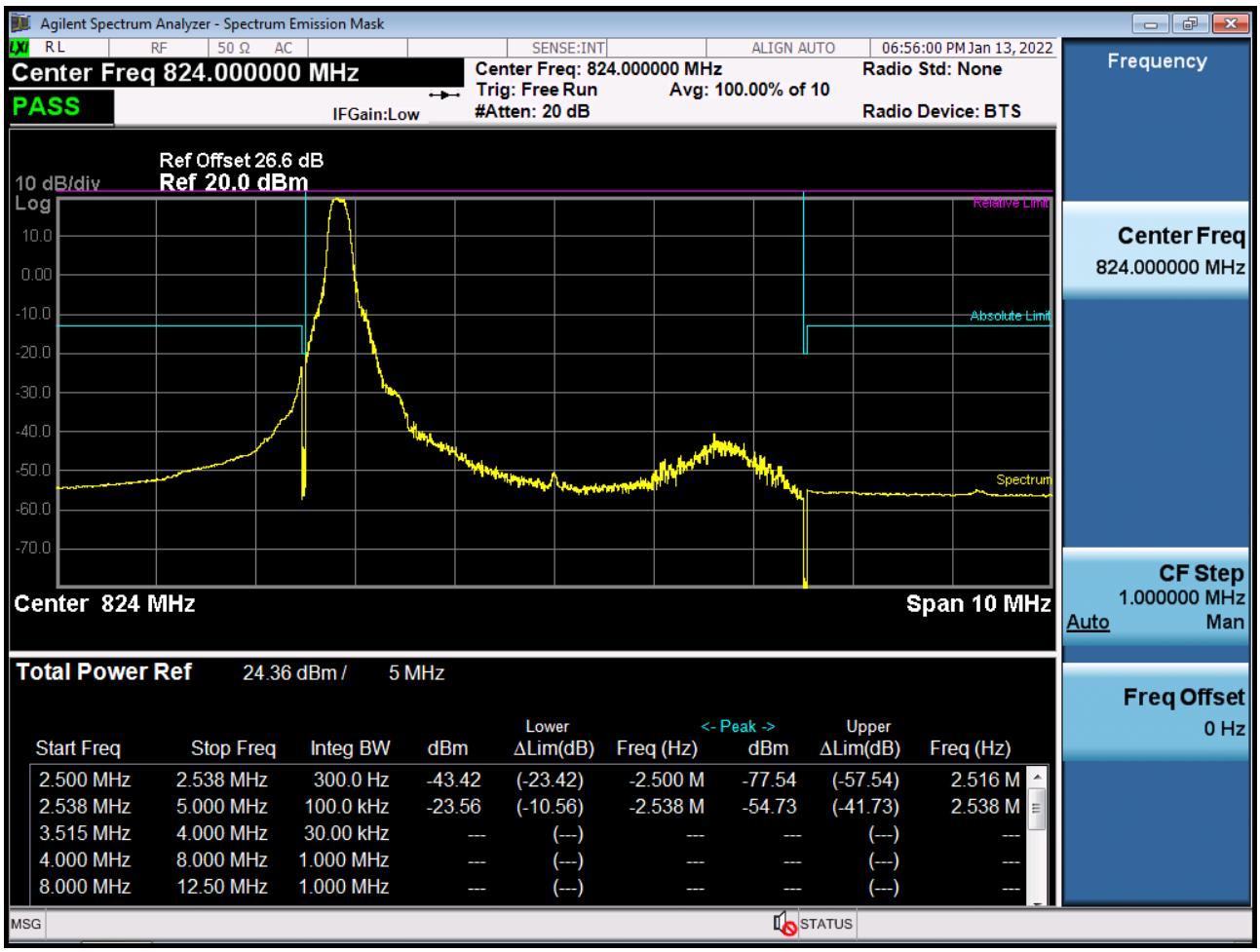


BAND 26. Channel Edge (3 MHz_QPSK_RB 1_14)

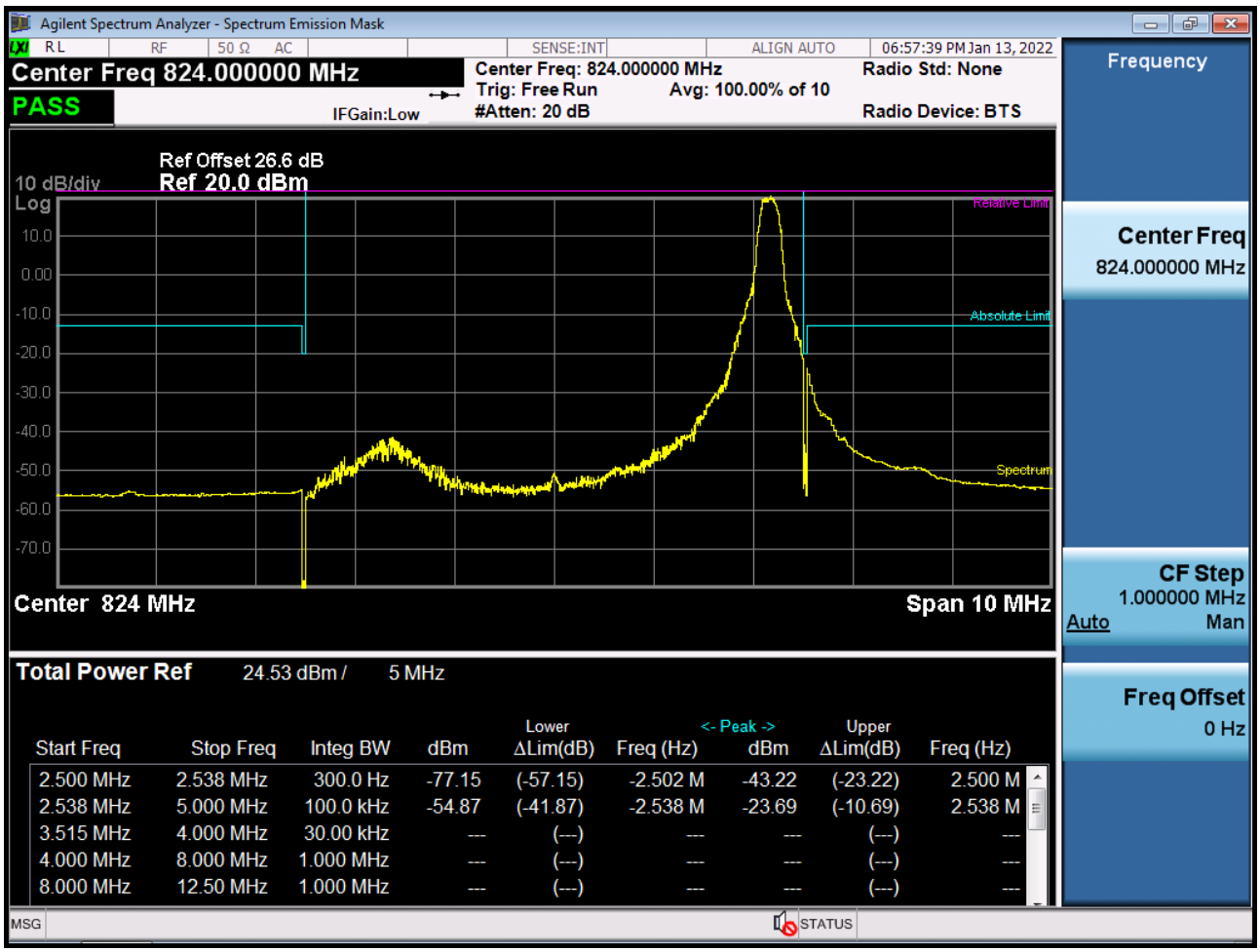


BAND 26. Channel Edge (3 MHz_QPSK_Full RB)

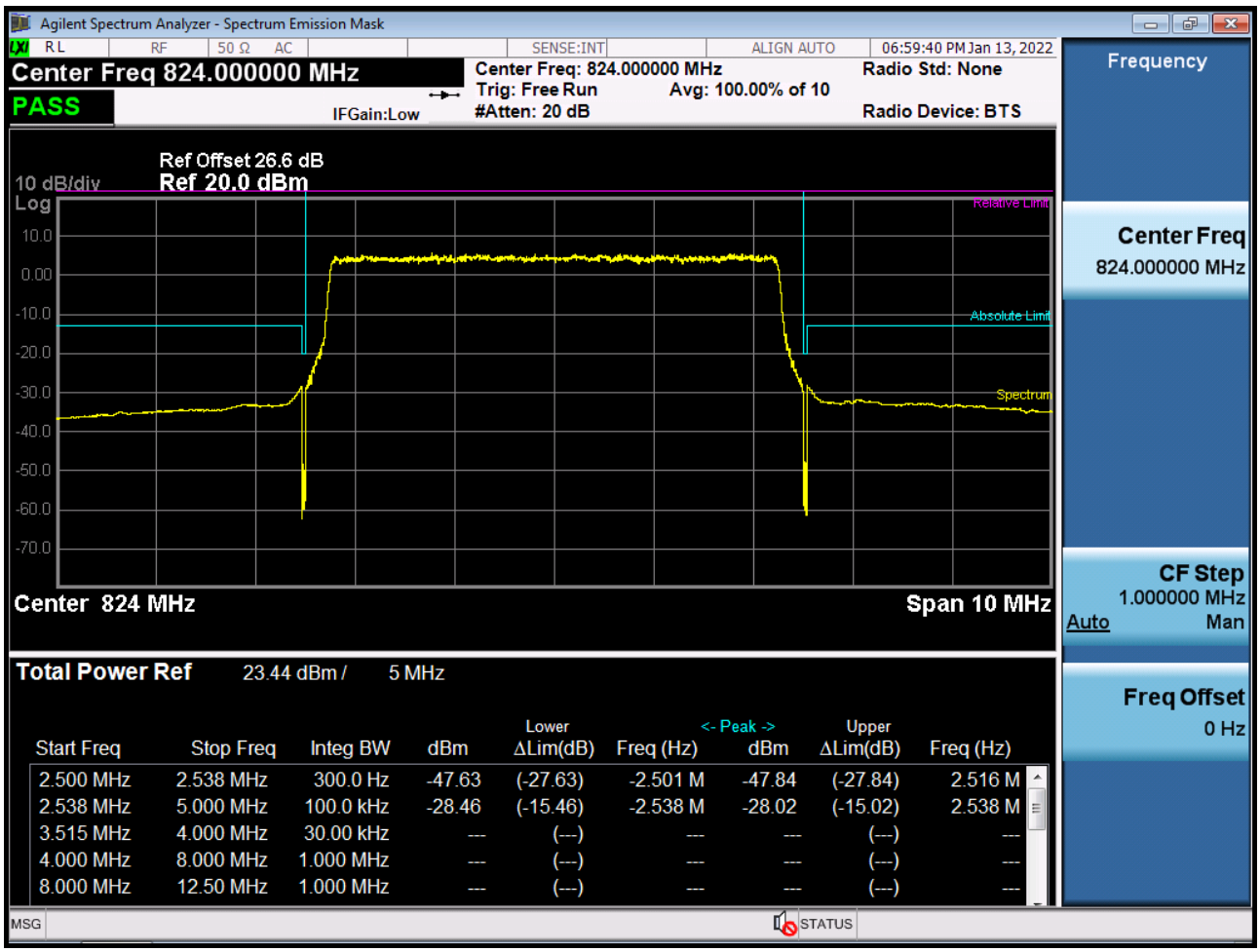
BAND 26. Channel Edge (5 MHz_QPSK_RB 1_0)



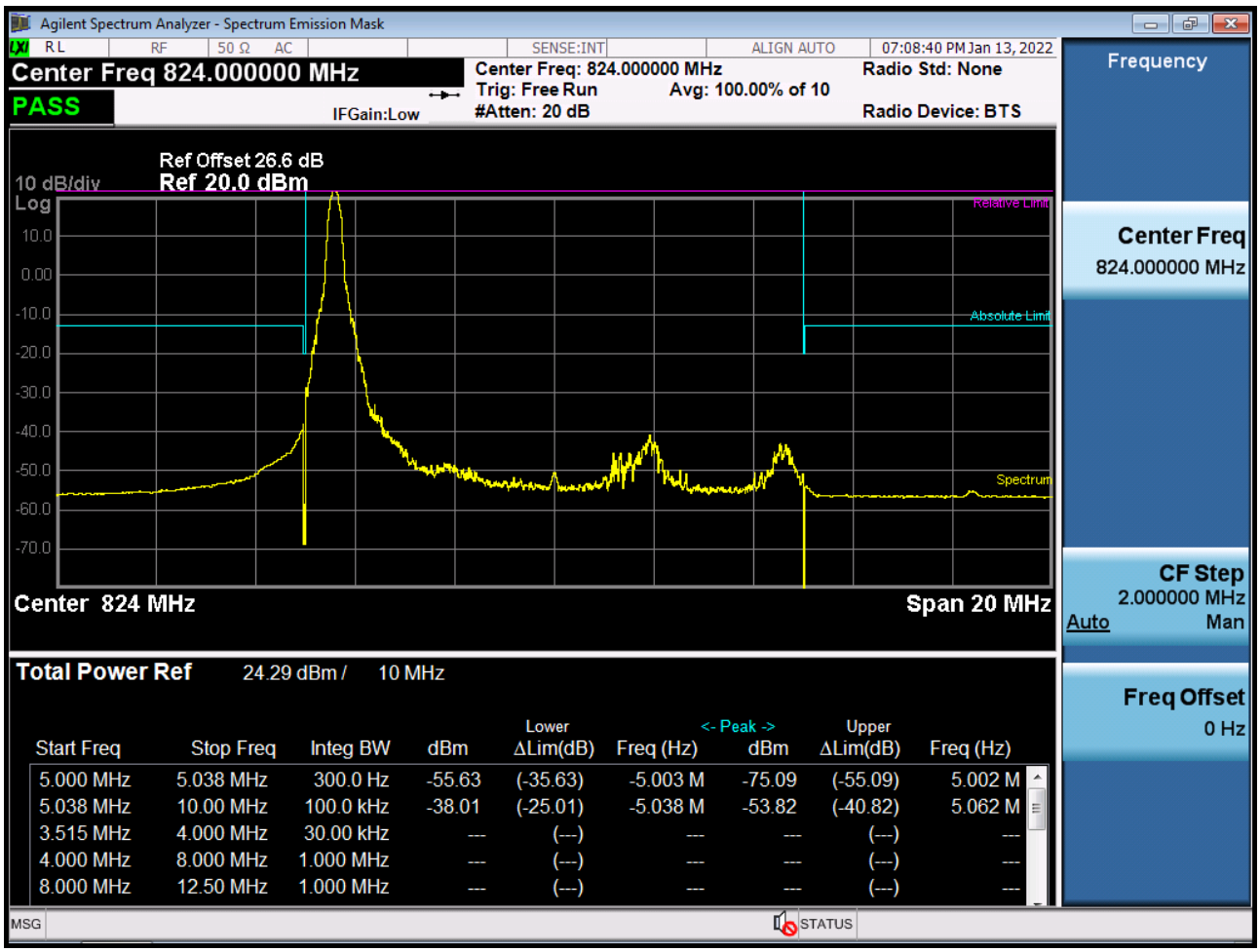
BAND 26. Channel Edge (5 MHz_QPSK_RB 1_24)



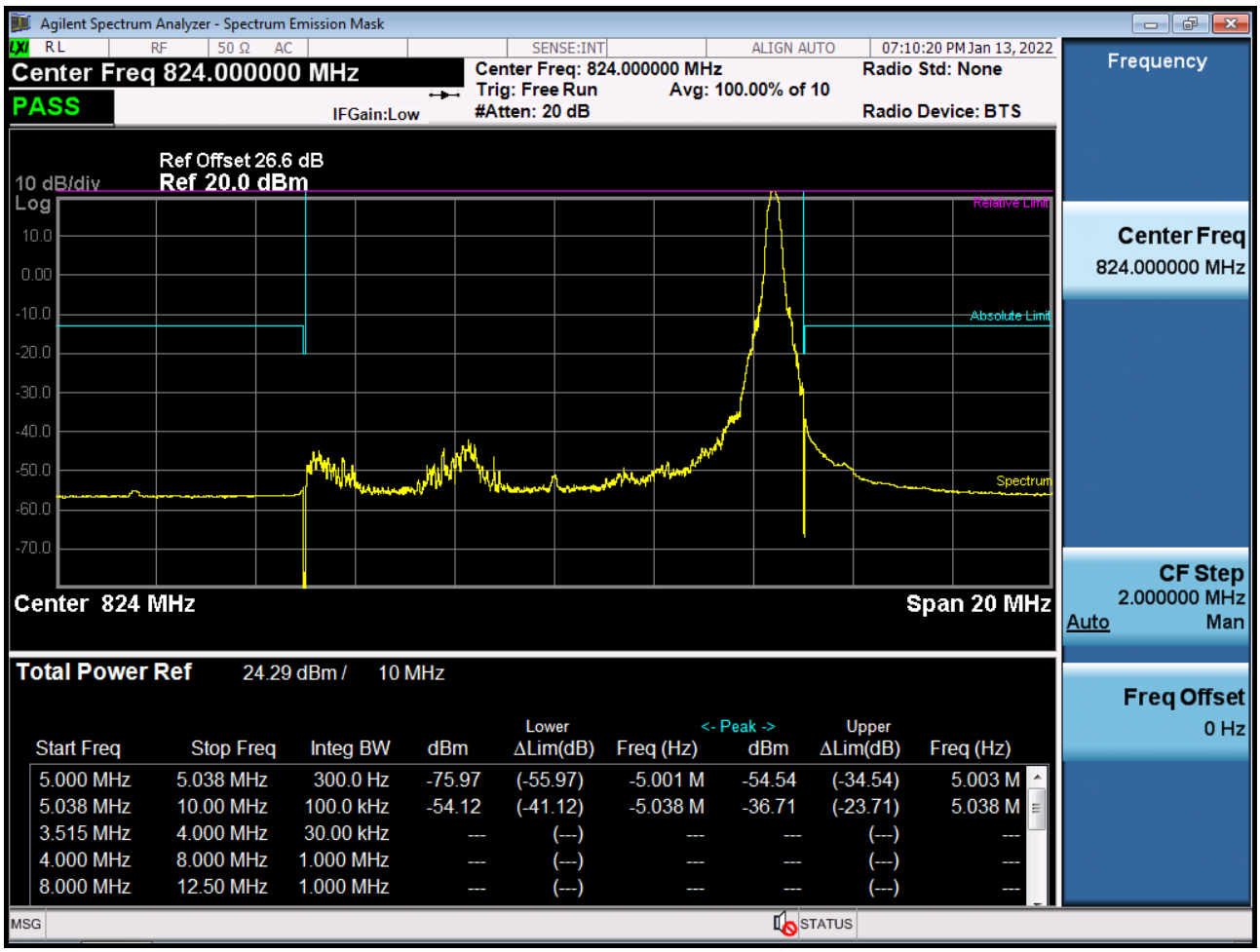
BAND 26. Channel Edge (5 MHz_QPSK_Full RB)



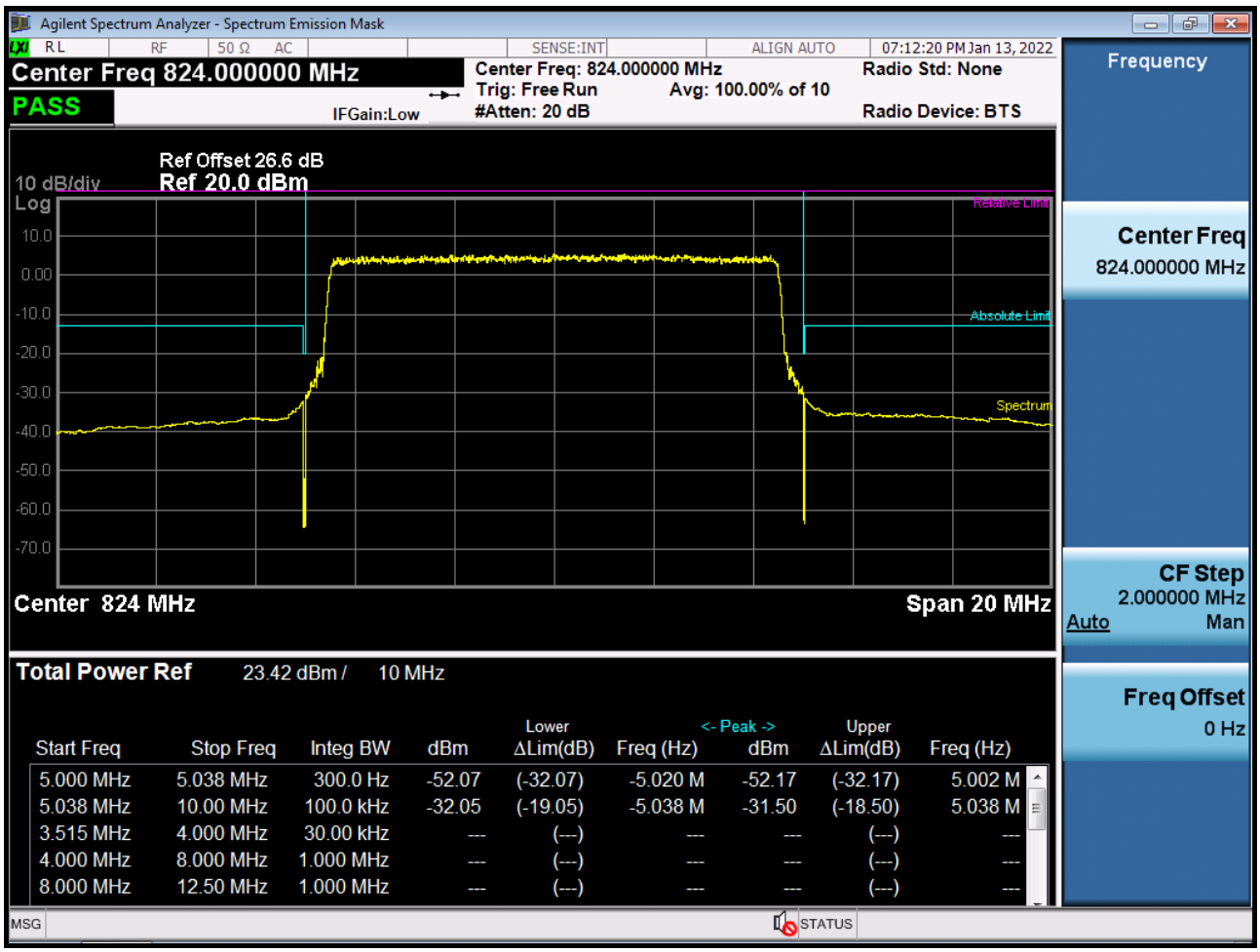
BAND 26. Channel Edge (10 MHz_QPSK_RB 1_0)



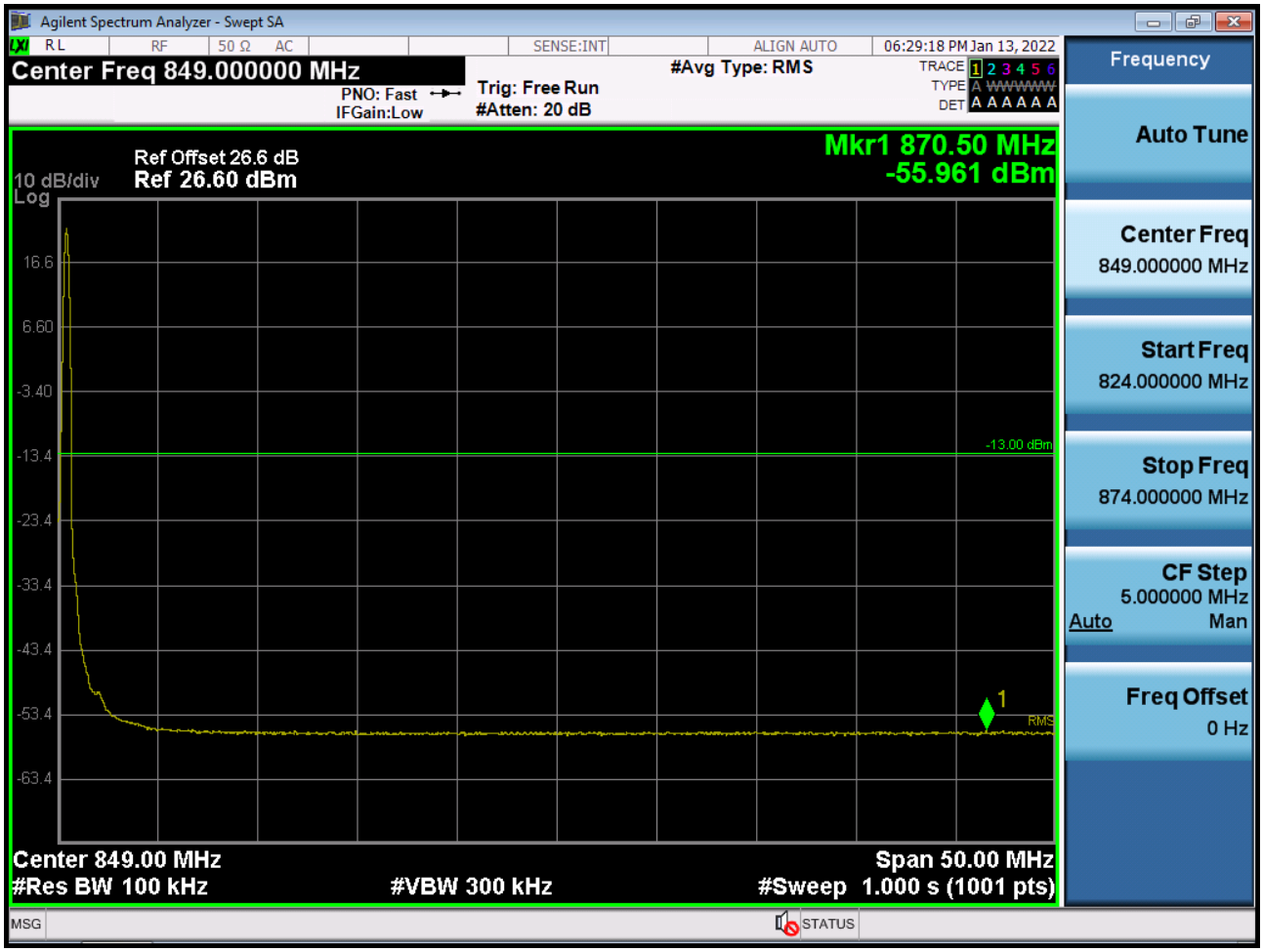
BAND 26. Channel Edge (10 MHz_QPSK_RB 1_49)



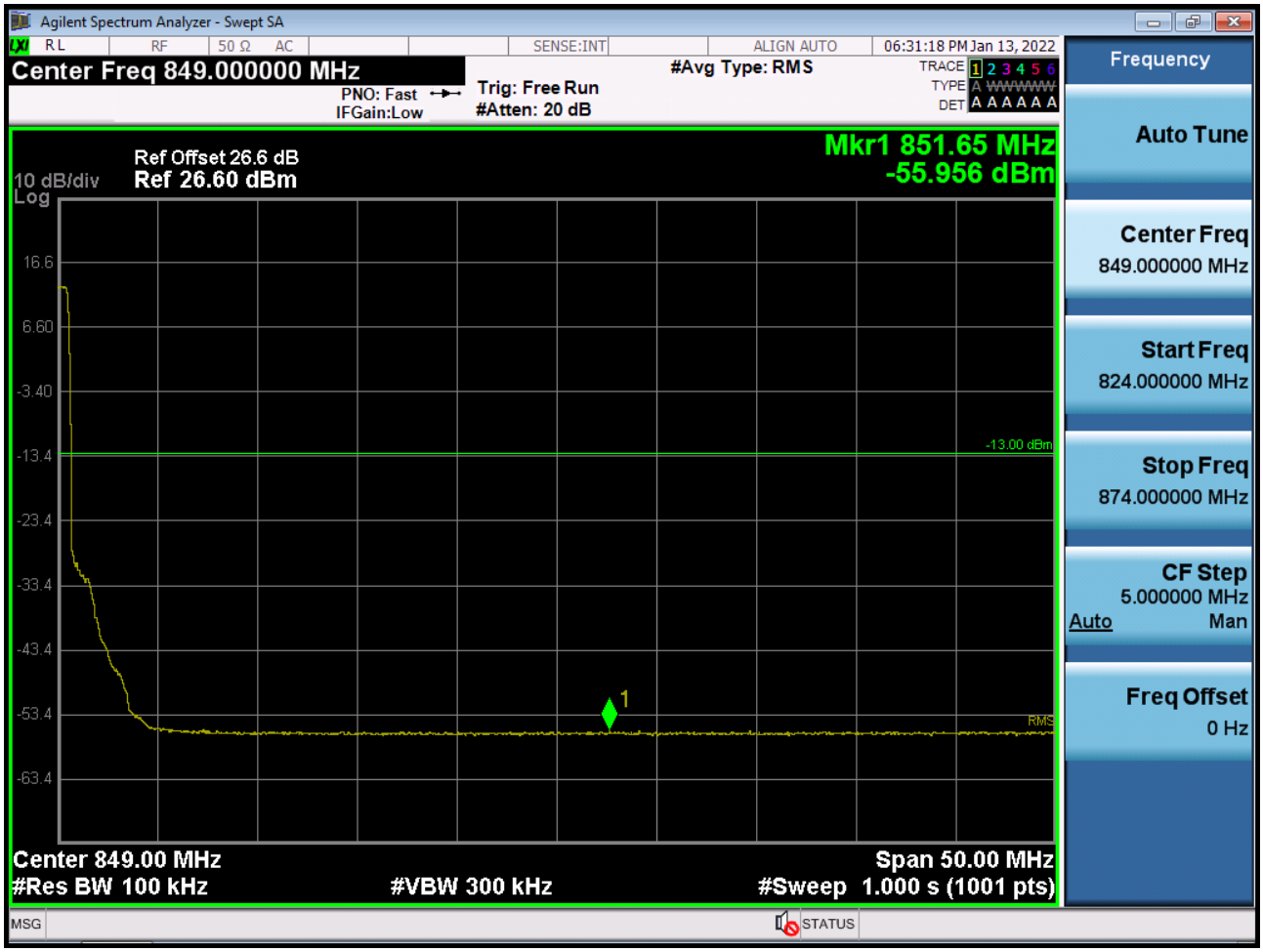
BAND 26. Channel Edge (10 MHz_QPSK_Full RB)



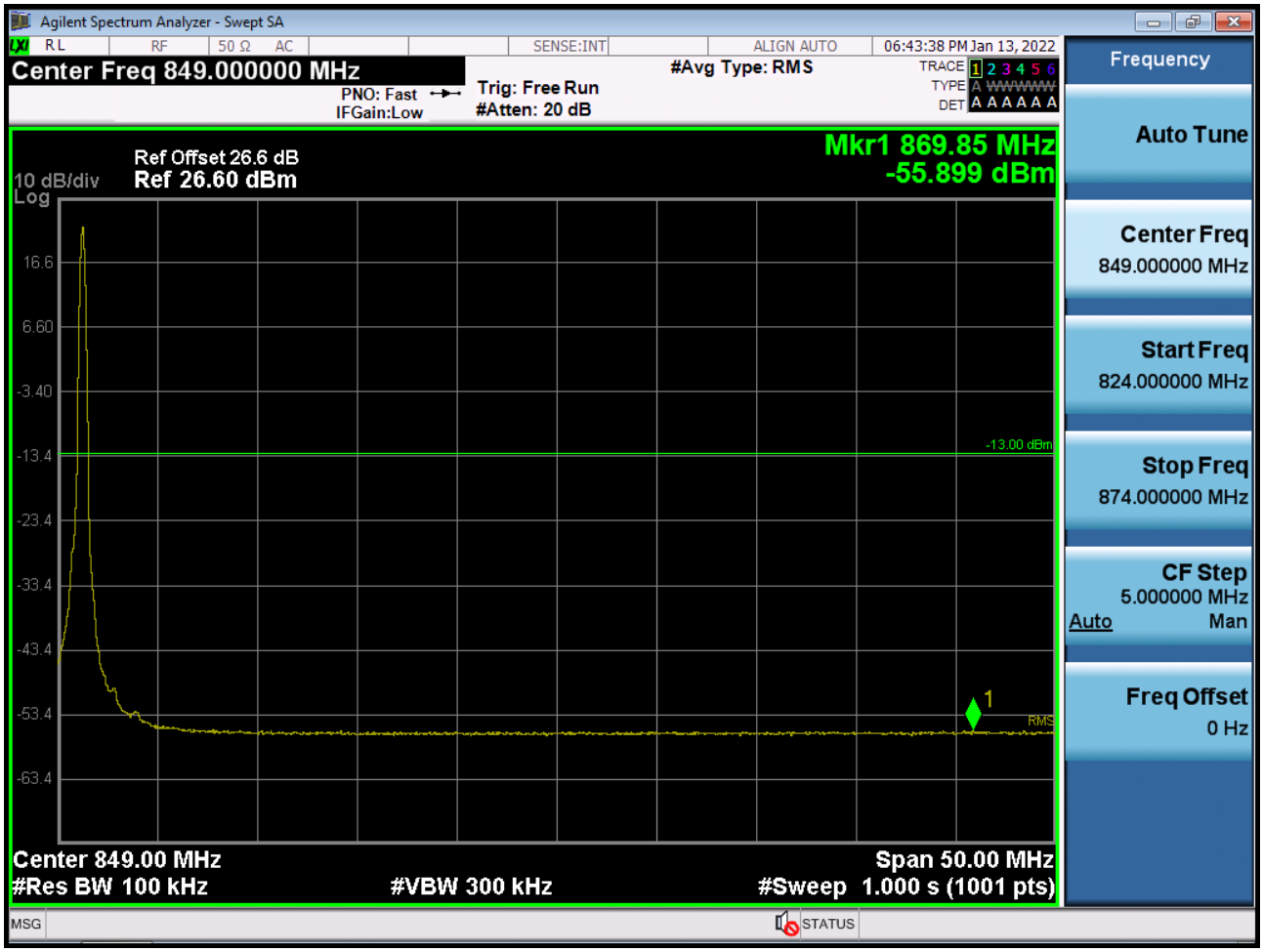
BAND 26. Band Edge (1.4 MHz_QPSK_RB 1_5)



BAND 26. Band Edge (1.4 MHz_QPSK_FullRB)



BAND 26. Band Edge (3 MHz_QPSK_RB 1_14)

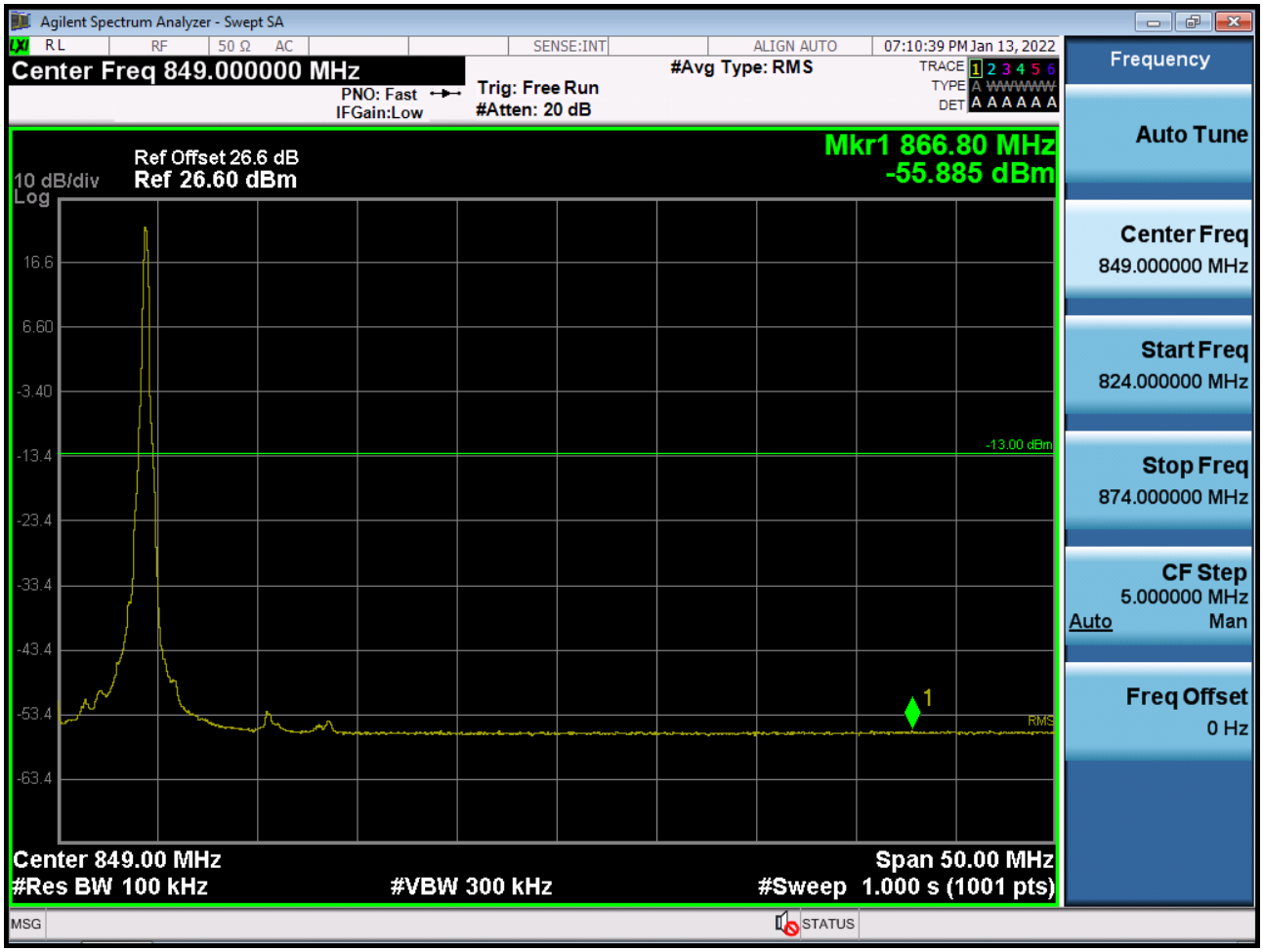


BAND 26. Band Edge (3 MHz_QPSK_ Full RB)

BAND 26. Band Edge (5 MHz_QPSK_RB 1_24)

BAND 26. Band Edge (5 MHz_QPSK_ Full RB)

BAND 26. Band Edge (10 MHz_QPSK_RB 1_49)



BAND 26. Band Edge (10 MHz_QPSK_ Full RB)

11 ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2202-FC011-P