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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:
October 30, 2023

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

Report No.: HCT-RF-2309-FC024-R1

FCC ID:	**A3LSMA256U**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s):	SM-A256U
Additional Model(s):	SM-A256U1/DS, SM-S256VL
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	0.301	24.78
		1M10W7D	16QAM	0.252	24.01
		1M09W7D	64QAM	0.203	23.07
		1M10W7D	256QAM	0.099	19.96
LTE – Band26 (3)	815.5 – 824.0	2M72G7D	QPSK	0.304	24.83
		2M72W7D	16QAM	0.252	24.02
		2M70W7D	64QAM	0.207	23.15
		2M71W7D	256QAM	0.100	20.00
LTE – Band26 (5)	816.5 – 824.0	4M54G7D	QPSK	0.305	24.85
		4M55W7D	16QAM	0.259	24.13
		4M53W7D	64QAM	0.206	23.14
		4M52W7D	256QAM	0.101	20.04
LTE – Band26 (10)	819.0 – 824.0	9M02G7D	QPSK	0.320	25.05
		9M03W7D	16QAM	0.270	24.32
		9M02W7D	64QAM	0.213	23.28
		9M02W7D	256QAM	0.103	20.14
LTE – Band26 (15)	821.5	13M5G7D	QPSK	0.310	24.92
		13M4W7D	16QAM	0.255	24.07
		13M5W7D	64QAM	0.247	23.92
		13M4W7D	256QAM	0.103	20.13

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

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

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

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2309-FC024	September 26, 2023	- First Approval Report
HCT-RF-2309-FC024-R1	October 30, 2023	- Revised the ERP result.(re-test)

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

Table of Contents

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:	A3LSMA256U
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-A256U
Additional Model(s):	SM-A256U1/DS, SM-S256VL
Tx Frequency:	814.7 MHz – 824.0 MHz (LTE – Band 26 (1.4 MHz)) 815.5 MHz – 824.0 MHz (LTE – Band 26 (3 MHz)) 816.5 MHz – 824.0 MHz (LTE – Band 26 (5 MHz)) 819.0 MHz – 824.0 MHz (LTE – Band 26 (10 MHz)) 821.5 MHz (LTE – Band 26 (15 MHz))
Date(s) of Tests:	May 22, 2023 ~ October 25, 2023
Serial number:	Radiated: 7994a3ac65357ece Conducted: 74530c3036337ece

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 (20/40/80 MHz), 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

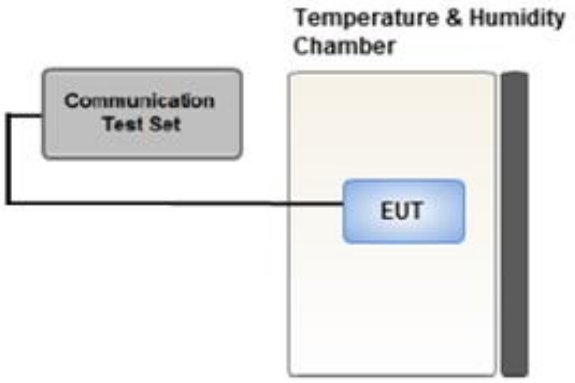
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base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

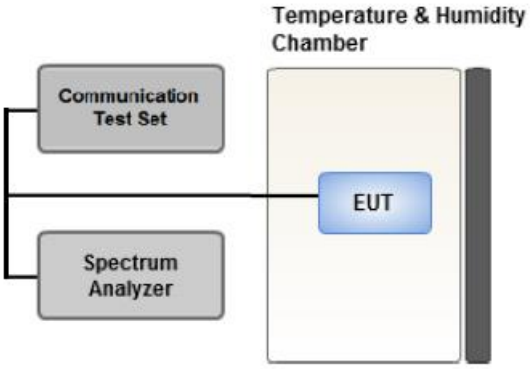
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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.

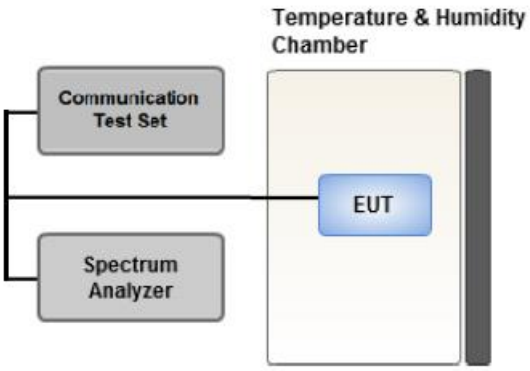
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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.

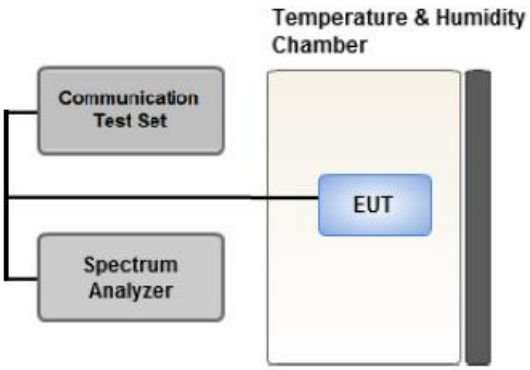
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

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

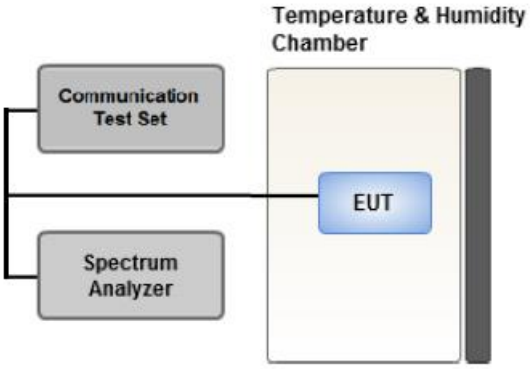
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW :
   .- EA licensee's frequency block by up to and including 37.5 kHz : 300 Hz
   .- EA licensee's frequency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

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

3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

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

The frequency stability of the transmitter is measured by:

1. Temperature:

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

2. Primary Supply Voltage:

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

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

Test Settings

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

3.9 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.
  Mode : 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.
  Mode : Stand alone, Simultaneous transmission scenarios
  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-A256U & additional models were tested and the worst case results are reported.
  (Worst case : SM-A256U)

[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-A256U & additional models were tested and the worst case results are reported.
(Worst case : SM-A256U)

[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 (Straddle 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
RF Switching System	FBSR-02B(1.2G HPF+LNA)	T&M SYSTEM	F1L1	01/19/2024	Annual
RF Switching System	FBSR-02B(3.3G HPF+LNA)	T&M SYSTEM	F1L2	01/19/2024	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	5001	04/19/2024	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/23/2024	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	03/09/2025	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	03/09/2025	Biennial
Chamber	SU-642	ESPEC	93008124	02/22/2024	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/17/2025	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/11/2025	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	03/28/2025	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	04/20/2024	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	04/19/2024	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	08/17/2024	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/10/2024	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/17/2024	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	895	08/16/2024	Biennial
Trilog Broadband Antenna	VULB9168	Schwarzbeck	1135	03/21/2024	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262094331	12/01/2023	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6201026545	01/05/2024	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	06/22/2024	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/24/2024	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

Note:

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

5. MEASUREMENT UNCERTAINTY

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

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.90 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.14 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.16 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.57 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.76 (Confidence level about 95 %, k=2)
Radiated Disturbance (Above 40 GHz)	5.52 (Confidence level about 95 %, k=2)

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
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	24.72	0.296	24.64	0.291	100
		1	3	24.65	0.292	24.62	0.290	100
		1	5	24.74	0.298	24.68	0.294	100
		3	0	24.76	0.299	24.74	0.298	100
		3	1	24.78	0.301	24.72	0.296	100
		3	3	24.77	0.300	24.70	0.295	100
		6	0	23.87	0.244	23.82	0.241	100
	16QAM	1	0	24.01	0.252	23.91	0.246	100
		1	3	23.83	0.242	23.86	0.243	100
		1	5	23.94	0.248	24.00	0.251	100
		3	0	23.87	0.244	23.78	0.239	100
		3	1	23.91	0.246	23.83	0.242	100
		3	3	23.85	0.243	23.80	0.240	100
		6	0	22.90	0.195	22.80	0.191	100
	64QAM	1	0	22.96	0.198	23.00	0.200	100
		1	3	23.02	0.200	22.90	0.195	100
		1	5	23.07	0.203	22.91	0.195	100
		3	0	22.91	0.195	22.84	0.192	100
		3	1	22.96	0.198	22.89	0.195	100
		3	3	22.92	0.196	22.80	0.191	100
		6	0	21.82	0.152	21.77	0.150	100
	256QAM	1	0	19.96	0.099	19.72	0.094	100
		1	3	19.84	0.096	19.74	0.094	100
		1	5	19.92	0.098	19.81	0.096	100
		3	0	19.81	0.096	19.78	0.095	100
		3	1	19.92	0.098	19.76	0.095	100
		3	3	19.86	0.097	19.84	0.096	100
		6	0	19.81	0.096	19.71	0.094	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	24.81	0.303	24.77	0.300	100
		1	7	24.82	0.303	24.74	0.298	100
		1	14	24.83	0.304	24.72	0.296	100
		8	0	23.89	0.245	23.82	0.241	100
		8	3	23.91	0.246	23.80	0.240	100
		8	7	23.89	0.245	23.84	0.242	100
		15	0	23.91	0.246	23.88	0.244	100
	16QAM	1	0	23.94	0.248	23.96	0.249	100
		1	7	23.86	0.243	23.85	0.243	100
		1	14	24.02	0.252	24.00	0.251	100
		8	0	22.97	0.198	22.86	0.193	100
		8	3	23.00	0.200	22.91	0.195	100
		8	7	22.97	0.198	22.89	0.195	100
		15	0	22.97	0.198	22.88	0.194	100
	64QAM	1	0	23.15	0.207	23.02	0.200	100
		1	7	23.04	0.201	22.95	0.197	100
		1	14	23.01	0.200	22.97	0.198	100
		8	0	21.89	0.155	21.79	0.151	100
		8	3	21.94	0.156	21.80	0.151	100
		8	7	21.93	0.156	21.83	0.152	100
		15	0	21.89	0.155	21.85	0.153	100
	256QAM	1	0	19.99	0.100	20.00	0.100	100
		1	7	19.94	0.099	19.90	0.098	100
		1	14	20.00	0.100	19.82	0.096	100
		8	0	19.86	0.097	19.80	0.095	100
		8	3	19.91	0.098	19.80	0.095	100
		8	7	19.93	0.098	19.80	0.095	100
		15	0	19.83	0.096	19.75	0.094	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	24.85	0.305	24.79	0.301	100
		1	12	24.69	0.294	24.70	0.295	100
		1	24	24.85	0.305	24.81	0.303	100
		12	0	23.96	0.249	23.92	0.247	100
		12	6	23.97	0.249	23.94	0.248	100
		12	11	23.99	0.251	23.95	0.248	100
		25	0	24.08	0.256	24.03	0.253	100
	16QAM	1	0	24.13	0.259	24.10	0.257	100
		1	12	23.91	0.246	24.00	0.251	100
		1	24	24.07	0.255	24.05	0.254	100
		12	0	23.02	0.200	22.98	0.199	100
		12	6	23.02	0.200	22.94	0.197	100
		12	11	23.05	0.202	22.97	0.198	100
		25	0	23.00	0.200	22.99	0.199	100
	64QAM	1	0	23.12	0.205	23.11	0.205	100
		1	12	23.00	0.200	22.99	0.199	100
		1	24	23.14	0.206	23.08	0.203	100
		12	0	21.98	0.158	21.94	0.156	100
		12	6	21.96	0.157	21.89	0.155	100
		12	11	21.94	0.156	21.90	0.155	100
		25	0	21.97	0.157	21.92	0.156	100
	256QAM	1	0	19.99	0.100	20.00	0.100	100
		1	12	20.00	0.100	19.99	0.100	100
		1	24	20.04	0.101	19.97	0.099	100
		12	0	19.88	0.097	19.86	0.097	100
		12	6	19.91	0.098	19.88	0.097	100
		12	11	19.91	0.098	19.86	0.097	100
		25	0	19.92	0.098	19.89	0.097	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				819 MHz		
				dBm	W	
10	QPSK	1	0	25.05	0.320	100
		1	24	24.99	0.316	100
		1	49	25.01	0.317	100
		25	0	24.19	0.262	100
		25	12	24.14	0.259	100
		25	24	24.15	0.260	100
		50	0	24.18	0.262	100
	16QAM	1	0	24.32	0.270	100
		1	24	24.28	0.268	100
		1	49	24.29	0.269	100
		25	0	23.16	0.207	100
		25	12	23.11	0.205	100
		25	24	23.09	0.204	100
		50	0	23.12	0.205	100
	64QAM	1	0	23.26	0.212	100
		1	24	23.22	0.210	100
		1	49	23.28	0.213	100
		25	0	22.08	0.161	100
		25	12	22.10	0.162	100
		25	24	22.07	0.161	100
		50	0	22.13	0.163	100
	256QAM	1	0	20.11	0.103	100
		1	24	20.14	0.103	100
		1	49	20.14	0.103	100
		25	0	20.09	0.102	100
		25	12	20.10	0.102	100
		25	24	20.07	0.102	100
		50	0	20.11	0.103	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm) 821.5 MHz		Limit (W)
				dBm	W	
15	QPSK	1	0	24.92	0.310	100
		1	36	24.68	0.294	100
		1	74	24.85	0.305	100
		36	0	23.94	0.248	100
		36	18	23.92	0.247	100
		36	39	23.89	0.245	100
		75	0	23.95	0.248	100
	16QAM	1	0	24.07	0.255	100
		1	36	23.92	0.247	100
		1	74	24.05	0.254	100
		36	0	22.93	0.196	100
		36	18	22.88	0.194	100
		36	39	22.90	0.195	100
		75	0	22.91	0.195	100
	64QAM	1	0	23.11	0.205	100
		1	36	23.05	0.202	100
		1	74	23.10	0.204	100
		36	0	21.94	0.156	100
		36	18	23.92	0.247	100
		36	39	21.93	0.156	100
		75	0	21.92	0.156	100
	256QAM	1	0	20.13	0.103	100
		1	36	19.98	0.100	100
		1	74	19.99	0.100	100
		36	0	19.92	0.098	100
		36	18	19.88	0.097	100
		36	39	19.88	0.097	100
		75	0	19.89	0.097	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	-29.50	31.34	-10.05	1.38	H	< 100	0.098	19.91
		16QAM	-30.24	30.60	-10.05	1.38	H		0.083	19.17
		64QAM	-31.26	29.58	-10.05	1.38	H		0.065	18.15
		256QAM	-34.35	26.49	-10.05	1.38	H		0.032	15.06
823.3		QPSK	-29.24	31.66	-10.05	1.38	H		0.106	20.23
		16QAM	-30.01	30.89	-10.05	1.38	H		0.088	19.46
		64QAM	-30.98	29.92	-10.05	1.38	H		0.071	18.49
		256QAM	-34.10	26.80	-10.05	1.38	H		0.035	15.37

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	-29.42	31.39	-10.05	1.38	H	< 100	0.099	19.96
		16QAM	-30.21	30.60	-10.05	1.38	H		0.083	19.17
		64QAM	-31.24	29.57	-10.05	1.38	H		0.065	18.14
		256QAM	-34.29	26.52	-10.05	1.38	H		0.032	15.09
822.5		QPSK	-29.15	31.75	-10.05	1.38	H		0.108	20.32
		16QAM	-29.93	30.97	-10.05	1.38	H		0.090	19.54
		64QAM	-30.92	29.98	-10.05	1.38	H		0.072	18.55
		256QAM	-34.01	26.89	-10.05	1.38	H		0.035	15.46

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	-29.46	31.28	-10.05	1.38	H	< 100	0.097	19.85
		16QAM	-30.25	30.49	-10.05	1.38	H		0.081	19.06
		64QAM	-31.20	29.54	-10.05	1.38	H		0.065	18.11
		256QAM	-34.30	26.44	-10.05	1.38	H		0.032	15.01
821.5		QPSK	-29.25	31.67	-10.05	1.38	H		0.106	20.24
		16QAM	-30.03	30.89	-10.05	1.38	H		0.088	19.46
		64QAM	-30.99	29.93	-10.05	1.38	H		0.071	18.50
		256QAM	-34.05	26.87	-10.05	1.38	H		0.035	15.44

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	-29.41	31.33	-10.05	1.38	H	< 100	0.098	19.90
		16QAM	-30.23	30.51	-10.05	1.38	H		0.081	19.08
		64QAM	-31.16	29.58	-10.05	1.38	H		0.065	18.15
		256QAM	-34.26	26.48	-10.05	1.38	H		0.032	15.05

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	-29.42	31.50	-10.05	1.38	H	< 7.00	0.102	20.07
		16QAM	-30.17	30.75	-10.05	1.38	H		0.085	19.32
		64QAM	-31.15	29.77	-10.05	1.38	H		0.068	18.34
		256QAM	-34.27	26.65	-10.05	1.38	H		0.033	15.22

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	-54.00	8.70	-61.92	1.93	V	-55.15	77.62
	2,446.50	-55.81	10.20	-60.58	2.50	V	-52.88	75.35
	3,262.00	-58.53	10.60	-59.96	2.85	V	-52.21	74.68
26775 (822.5)	1,645.00	-52.49	9.20	-61.51	2.04	V	-54.34	76.81
	2,467.50	-54.44	10.20	-58.58	2.49	V	-50.87	73.33
	3,290.00	-57.92	10.60	-60.41	2.90	H	-52.71	75.18

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	1.0933
			16QAM			1.0969
			64QAM			1.0901
			256QAM			1.0961
	3 MHz	822.5	QPSK	15		2.7207
			16QAM			2.7194
			64QAM			2.7032
			256QAM			2.7128
	5 MHz	821.5	QPSK	25		4.5347
			16QAM			4.5456
			64QAM			4.5279
			256QAM			4.5214
	10 MHz	819.0	QPSK	50		9.0172
			16QAM			9.0337
			64QAM			9.0234
			256QAM			9.0185
	15 MHz	821.5	QPSK	75		13.467
			16QAM			13.433
			64QAM			13.461
			256QAM			13.440

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	3.7064	27.976	-67.320	-39.344	-13.00
		823.3	3.7174	27.976	-67.096	-39.120	
	3	815.5	3.6950	27.976	-67.241	-39.265	
		822.5	3.6950	27.976	-67.057	-39.081	
	5	816.5	3.6910	27.976	-67.120	-39.144	
		821.5	3.6900	27.976	-67.277	-39.301	
	10	819.0	3.7099	27.976	-67.131	-39.155	
	15	821.5	3.7049	27.976	-67.419	-39.443	

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

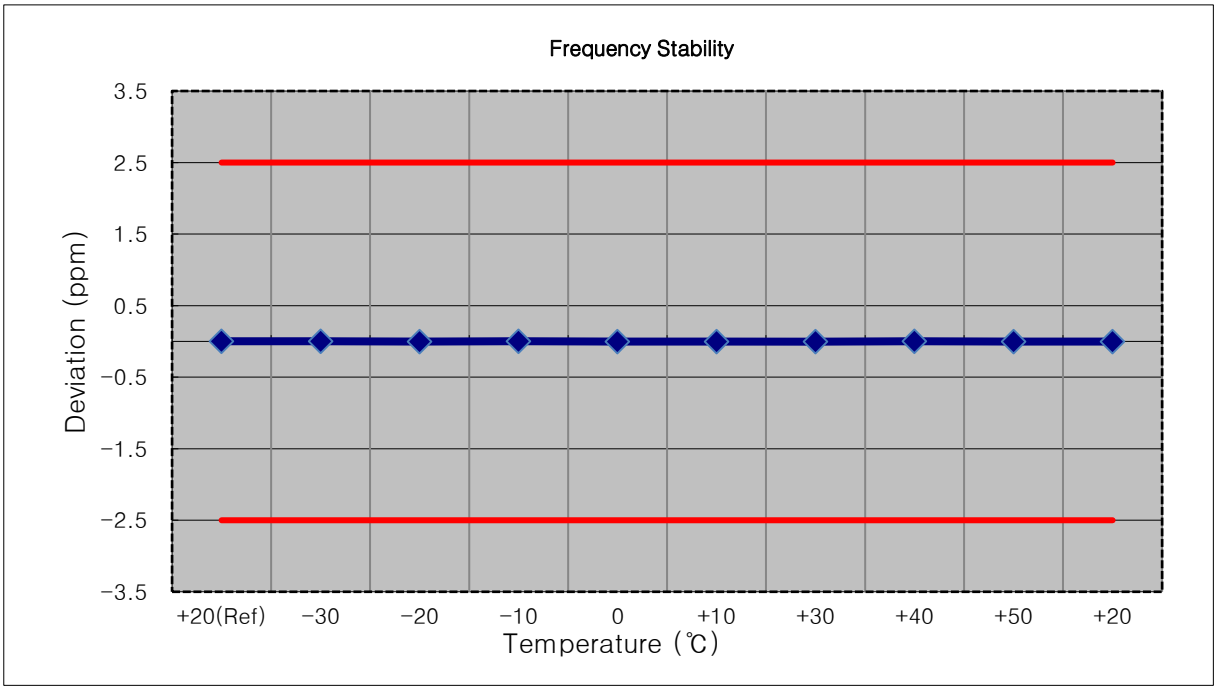
▣ OPERATING FREQUENCY: 814,700,000 Hz

▣ CHANNEL: 26697(1.4 MHz)

▣ REFERENCE VOLTAGE: 3.880 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)	814 699 996	0.0	0.000 000	0.000
100 %		-30	814 699 997	1.7	0.000 000	0.002
100 %		-20	814 699 994	-2.0	0.000 000	-0.002
100 %		-10	814 699 998	2.1	0.000 000	0.003
100 %		0	814 699 994	-1.7	0.000 000	-0.002
100 %		+10	814 699 993	-2.9	0.000 000	-0.004
100 %		+30	814 699 993	-3.1	0.000 000	-0.004
100 %		+40	814 699 997	1.6	0.000 000	0.002
100 %		+50	814 699 993	-2.5	0.000 000	-0.003
Batt. Endpoint	3.550	+20	814 699 993	-2.2	0.000 000	-0.003



▣ MODE: LTE 26

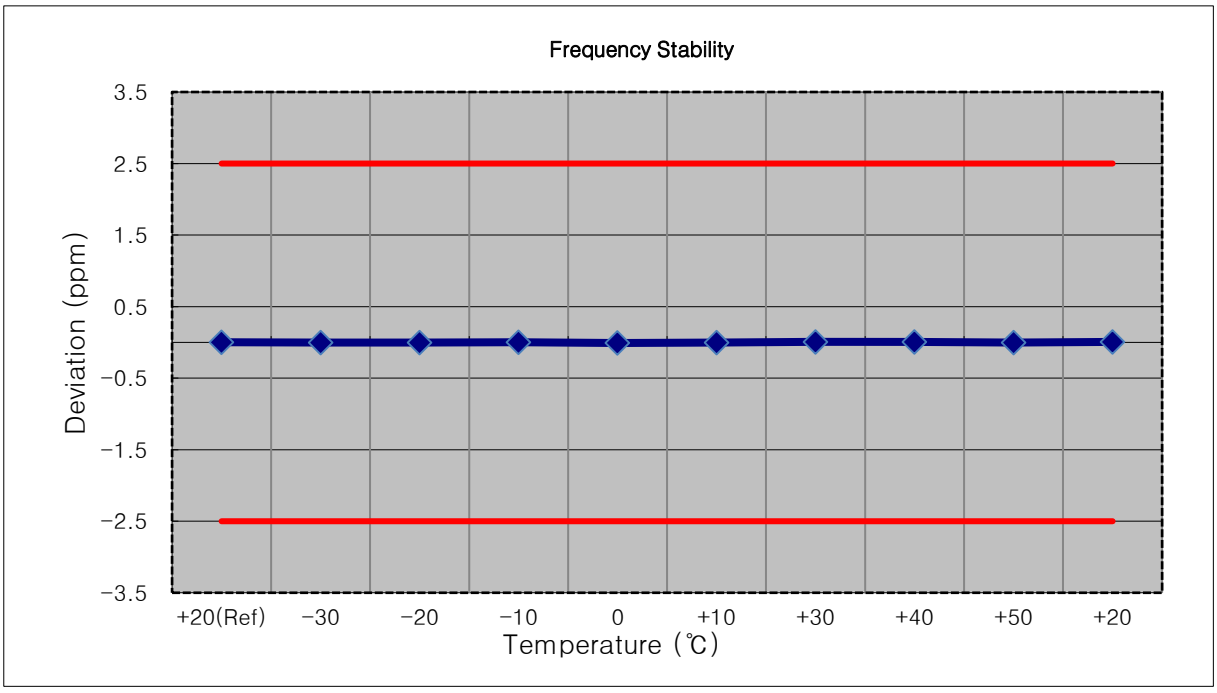
▣ OPERATING FREQUENCY: 815,500,000 Hz

▣ CHANNEL: 26705(3 MHz)

▣ REFERENCE VOLTAGE: 3.880 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)	815 500 005	0.0	0.000 000	0.000
100 %		-30	815 500 002	-3.0	0.000 000	-0.004
100 %		-20	815 500 002	-3.1	0.000 000	-0.004
100 %		-10	815 500 008	3.0	0.000 000	0.004
100 %		0	815 499 997	-7.2	-0.000 001	-0.009
100 %		+10	815 500 001	-3.2	0.000 000	-0.004
100 %		+30	815 500 011	6.5	0.000 001	0.008
100 %		+40	815 500 010	5.8	0.000 001	0.007
100 %		+50	815 500 001	-3.7	0.000 000	-0.005
Batt. Endpoint	3.550	+20	815 500 010	5.6	0.000 001	0.007



▣ MODE: LTE 26

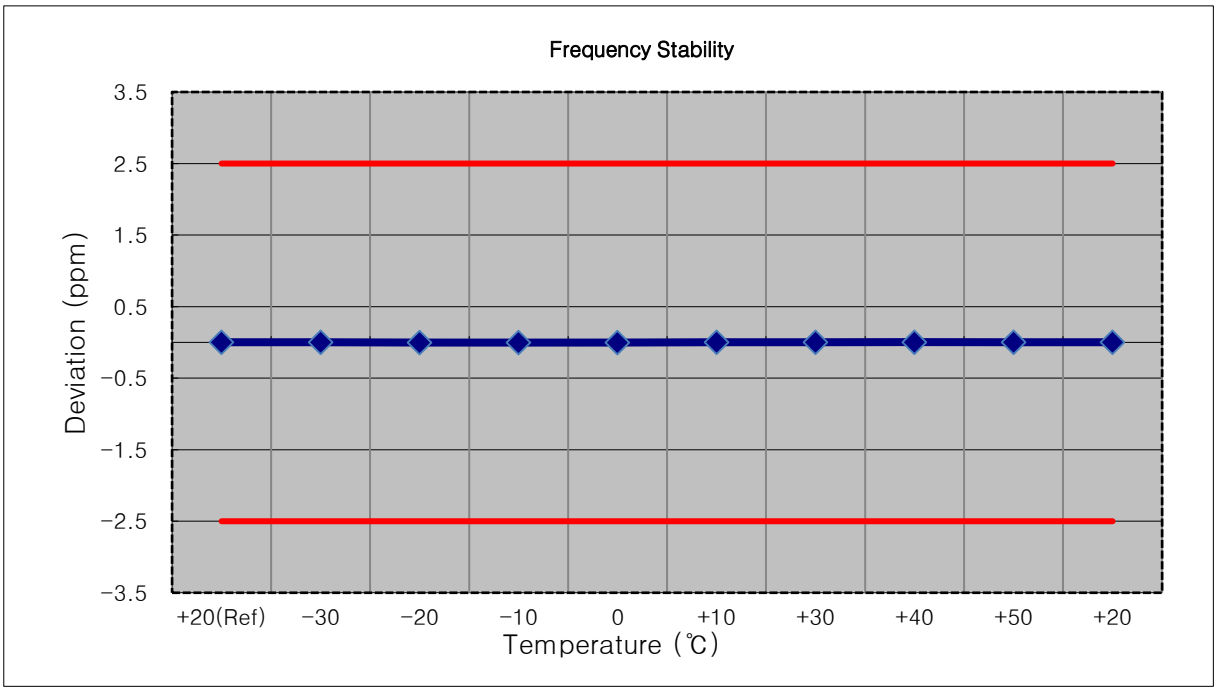
▣ OPERATING FREQUENCY: 816,500,000 Hz

▣ CHANNEL: 26715(5 MHz)

▣ REFERENCE VOLTAGE: 3.880 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)	816 500 004	0.0	0.000 000	0.000
100 %		-30	816 500 006	2.6	0.000 000	0.003
100 %		-20	816 500 002	-1.6	0.000 000	-0.002
100 %		-10	816 500 002	-2.3	0.000 000	-0.003
100 %		0	816 500 002	-1.4	0.000 000	-0.002
100 %		+10	816 500 006	2.5	0.000 000	0.003
100 %		+30	816 500 006	2.6	0.000 000	0.003
100 %		+40	816 500 007	3.2	0.000 000	0.004
100 %		+50	816 500 006	2.2	0.000 000	0.003
Batt. Endpoint	3.550	+20	816 500 007	2.7	0.000 000	0.003



▣ MODE: LTE 26

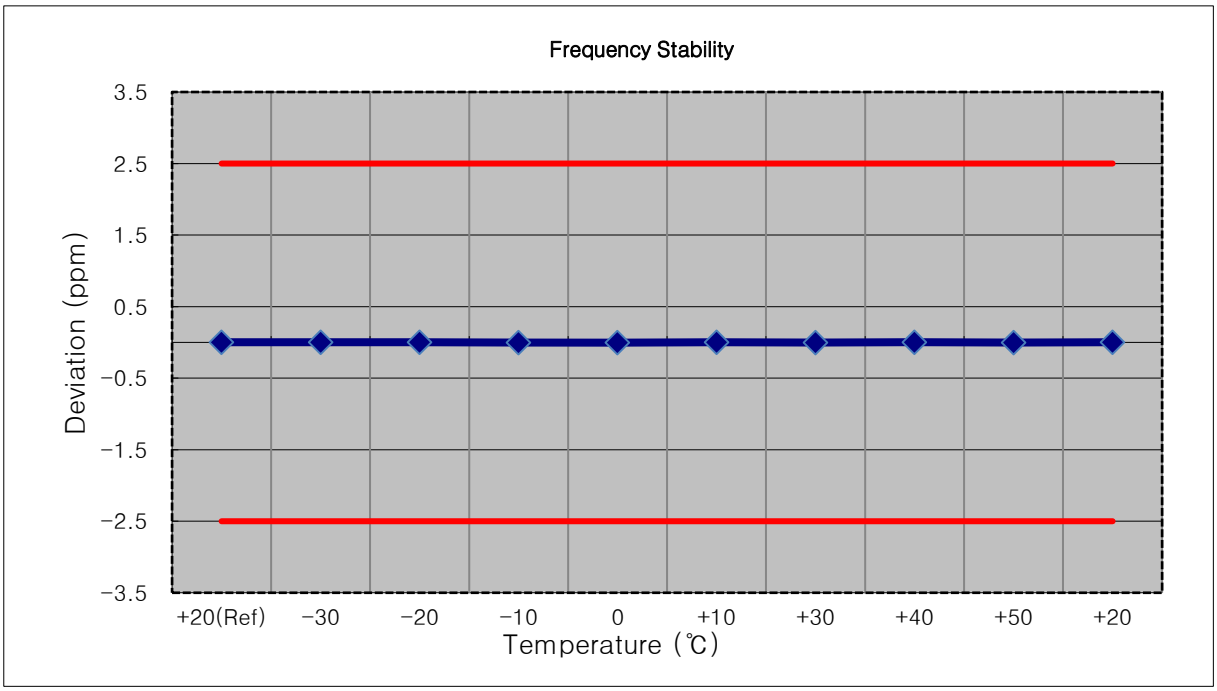
▣ OPERATING FREQUENCY: 819,000,000 Hz

▣ CHANNEL: 26740(10 MHz)

▣ REFERENCE VOLTAGE: 3.880 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)	819 000 002	0.0	0.000 000	0.000
100 %		-30	819 000 004	2.2	0.000 000	0.003
100 %		-20	819 000 004	2.3	0.000 000	0.003
100 %		-10	818 999 999	-2.4	0.000 000	-0.003
100 %		0	818 999 999	-3.0	0.000 000	-0.004
100 %		+10	819 000 004	2.2	0.000 000	0.003
100 %		+30	819 000 000	-1.9	0.000 000	-0.002
100 %		+40	819 000 004	2.4	0.000 000	0.003
100 %		+50	819 000 000	-1.3	0.000 000	-0.002
Batt. Endpoint	3.550	+20	819 000 003	1.7	0.000 000	0.002



▣ MODE: LTE 26

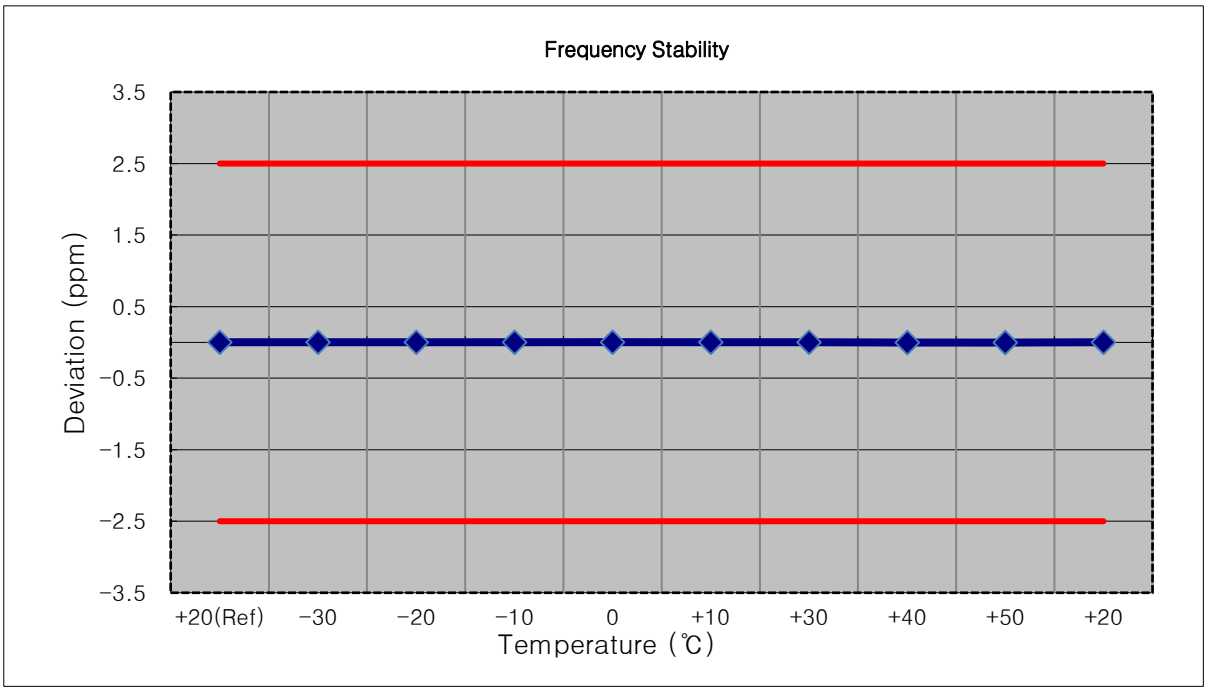
▣ OPERATING FREQUENCY: 821,500,000 Hz

▣ CHANNEL: 26765(15 MHz)

▣ REFERENCE VOLTAGE: 3.880 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)	821 500 002	0.0	0.000 000	0.000
100 %		-30	821 500 004	1.9	0.000 000	0.002
100 %		-20	821 500 004	1.7	0.000 000	0.002
100 %		-10	821 500 004	2.0	0.000 000	0.002
100 %		0	821 500 005	2.8	0.000 000	0.003
100 %		+10	821 500 004	2.1	0.000 000	0.003
100 %		+30	821 500 004	2.5	0.000 000	0.003
100 %		+40	821 500 001	-1.3	0.000 000	-0.002
100 %		+50	821 500 000	-2.3	0.000 000	-0.003
Batt. Endpoint	3.550	+20	821 500 004	2.3	0.000 000	0.003



8.8 STRADDLE 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	24.68	0.294	100
		1	3	24.64	0.291	100
		1	5	24.71	0.296	100
		3	0	24.75	0.299	100
		3	1	24.75	0.299	100
		3	3	24.74	0.298	100
		6	0	23.85	0.242	100
	16QAM	1	0	23.96	0.249	100
		1	3	23.85	0.242	100
		1	5	23.97	0.249	100
		3	0	23.83	0.241	100
		3	1	23.87	0.244	100
		3	3	23.83	0.241	100
		6	0	22.85	0.193	100
	64QAM	1	0	22.98	0.199	100
		1	3	22.96	0.198	100
		1	5	22.99	0.199	100
		3	0	22.88	0.194	100
		3	1	22.93	0.196	100
		3	3	22.86	0.193	100
		6	0	21.80	0.151	100
	256QAM	1	0	19.84	0.096	100
		1	3	19.79	0.095	100
		1	5	19.87	0.097	100
		3	0	19.80	0.095	100
		3	1	19.84	0.096	100
		3	3	19.85	0.097	100
		6	0	19.76	0.095	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
3	QPSK	1	0	24.79	0.301	100
		1	7	24.78	0.301	100
		1	14	24.78	0.300	100
		8	0	23.86	0.243	100
		8	3	23.86	0.243	100
		8	7	23.87	0.244	100
		15	0	23.90	0.245	100
	16QAM	1	0	23.95	0.248	100
		1	7	23.86	0.243	100
		1	14	24.01	0.252	100
		8	0	22.92	0.196	100
		8	3	22.96	0.197	100
		8	7	22.93	0.196	100
		15	0	22.93	0.196	100
	64QAM	1	0	23.09	0.203	100
		1	7	23.00	0.199	100
		1	14	22.99	0.199	100
		8	0	21.84	0.153	100
		8	3	21.87	0.154	100
		8	7	21.88	0.154	100
		15	0	21.87	0.154	100
	256QAM	1	0	20.00	0.100	100
		1	7	19.92	0.098	100
		1	14	19.91	0.098	100
		8	0	19.83	0.096	100
		8	3	19.86	0.097	100
		8	7	19.87	0.097	100
		15	0	19.79	0.095	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
5	QPSK	1	0	24.82	0.303	100
		1	12	24.70	0.295	100
		1	24	24.83	0.304	100
		12	0	23.94	0.248	100
		12	6	23.96	0.249	100
		12	11	23.97	0.249	100
		25	0	24.06	0.254	100
	16QAM	1	0	24.12	0.258	100
		1	12	23.96	0.249	100
		1	24	24.06	0.255	100
		12	0	23.00	0.200	100
		12	6	22.98	0.199	100
		12	11	23.01	0.200	100
		25	0	23.00	0.199	100
	64QAM	1	0	23.12	0.205	100
		1	12	23.00	0.199	100
		1	24	23.11	0.205	100
		12	0	21.96	0.157	100
		12	6	21.93	0.156	100
		12	11	21.92	0.156	100
		25	0	21.95	0.156	100
	256QAM	1	0	20.00	0.100	100
		1	12	20.00	0.100	100
		1	24	20.01	0.100	100
		12	0	19.87	0.097	100
		12	6	19.90	0.098	100
		12	11	19.89	0.097	100
		25	0	19.91	0.098	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
10	QPSK	1	0	25.01	0.317	100
		1	24	24.95	0.313	100
		1	49	24.98	0.315	100
		25	0	24.15	0.260	100
		25	12	24.10	0.257	100
		25	24	24.11	0.258	100
		50	0	24.14	0.259	100
	16QAM	1	0	24.28	0.268	100
		1	24	24.24	0.265	100
		1	49	24.25	0.266	100
		25	0	23.10	0.204	100
		25	12	23.05	0.202	100
		25	24	23.05	0.202	100
		50	0	23.08	0.203	100
	64QAM	1	0	23.22	0.210	100
		1	24	23.18	0.208	100
		1	49	23.23	0.210	100
		25	0	22.05	0.160	100
		25	12	22.06	0.161	100
		25	24	22.03	0.160	100
		50	0	22.08	0.161	100
	256QAM	1	0	20.07	0.102	100
		1	24	20.10	0.102	100
		1	49	20.09	0.102	100
		25	0	20.04	0.101	100
		25	12	20.05	0.101	100
		25	24	20.03	0.101	100
		50	0	20.06	0.101	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	-29.25	31.65	-10.05	1.38	H	< 7.00	0.105	20.22
		16QAM	-30.02	30.88	-10.05	1.38	H		0.088	19.45
		64QAM	-31.05	29.85	-10.05	1.38	H		0.070	18.42
		256QAM	-34.09	26.81	-10.05	1.38	H		0.035	15.38

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	-29.18	31.72	-10.05	1.38	H	< 7.00	0.107	20.29
		16QAM	-29.98	30.92	-10.05	1.38	H		0.089	19.49
		64QAM	-30.93	29.97	-10.05	1.38	H		0.072	18.54
		256QAM	-34.01	26.89	-10.05	1.38	H		0.035	15.46

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	-29.19	31.71	-10.05	1.38	H	< 7.00	0.107	20.28
		16QAM	-29.87	31.03	-10.05	1.38	H		0.091	19.60
		64QAM	-30.94	29.96	-10.05	1.38	H		0.071	18.53
		256QAM	-33.95	26.95	-10.05	1.38	H		0.036	15.52

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	-29.18	31.72	-10.05	1.38	H	< 7.00	0.107	20.29
		16QAM	-29.97	30.93	-10.05	1.38	H		0.089	19.50
		64QAM	-31.02	29.88	-10.05	1.38	H		0.070	18.45
		256QAM	-34.05	26.85	-10.05	1.38	H		0.035	15.42

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	-52.92	9.70	-63.51	2.04	V	-55.85	-13.00
	2 472.00	-55.36	10.46	-60.38	2.54	H	-52.46	-13.00
	3 296.00	-58.08	12.07	-59.13	2.95	H	-50.01	-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	3.7015	27.976	-67.432	-39.456	-13.00
	3		3.6950	27.976	-67.102	-39.126	
	5		3.6945	27.976	-67.158	-39.182	
	10		3.6965	27.976	-67.106	-39.130	

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)

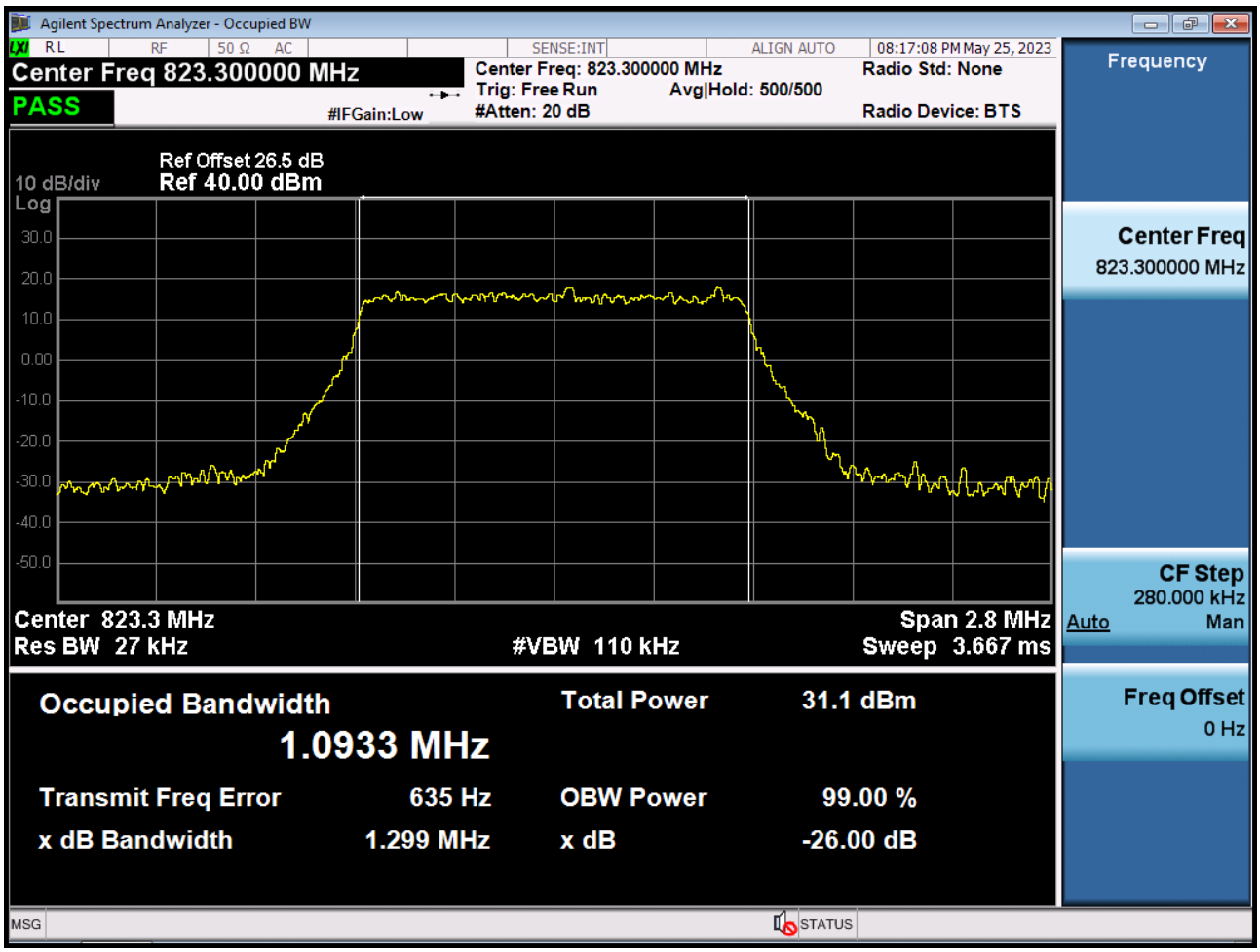
- Test Channel : 26790(824.0MHz)
- Plots of the EUT's Band Edge are shown Page 98 ~ 109.

8.8.6 BAND EDGE(Part22)

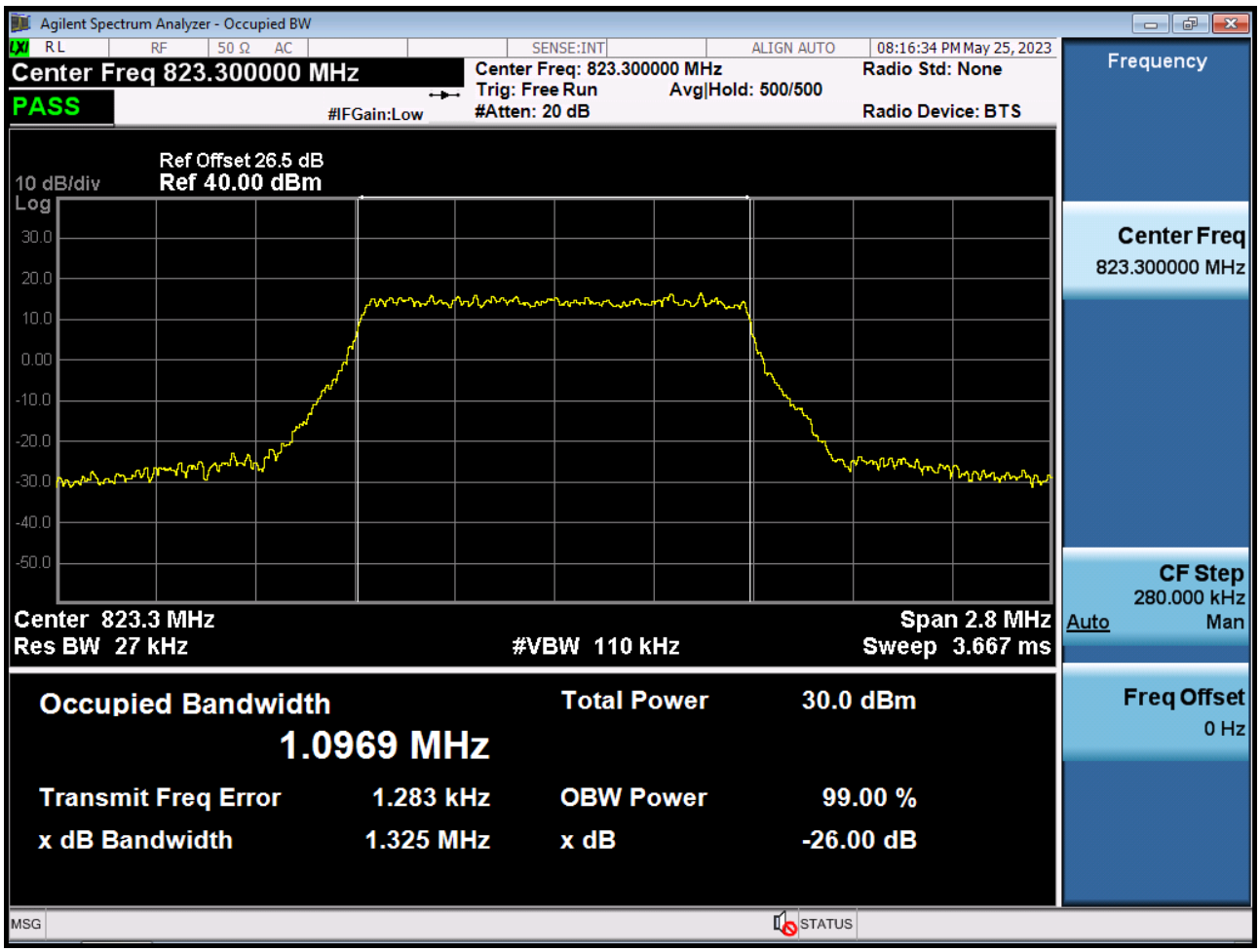
- Test Channel : 26790(824.0 MHz)
- Plots of the EUT's Band Edge are shown Page 110 ~ 117.

9. TEST PLOTS

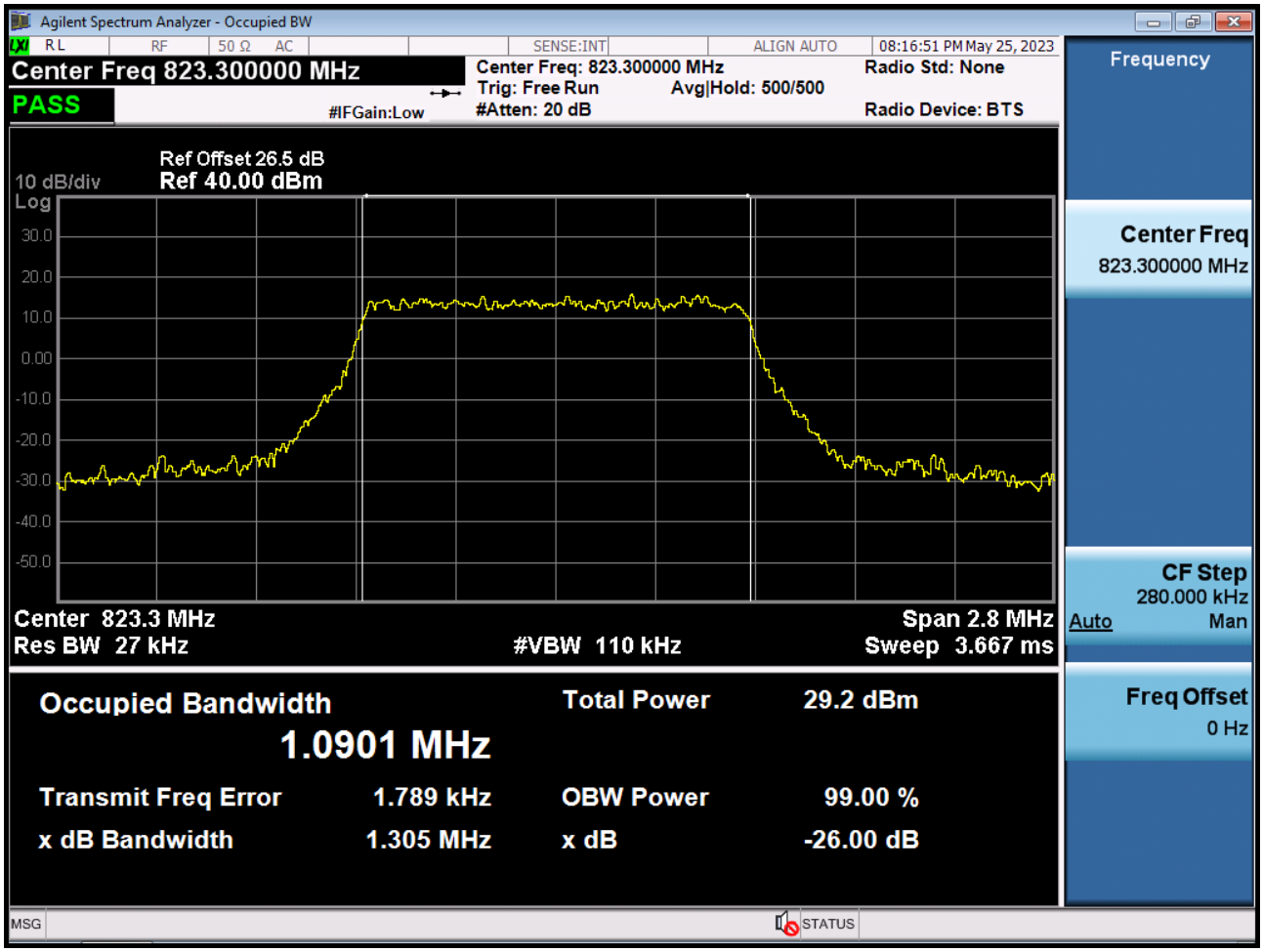
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 QPSK RB 6_0)



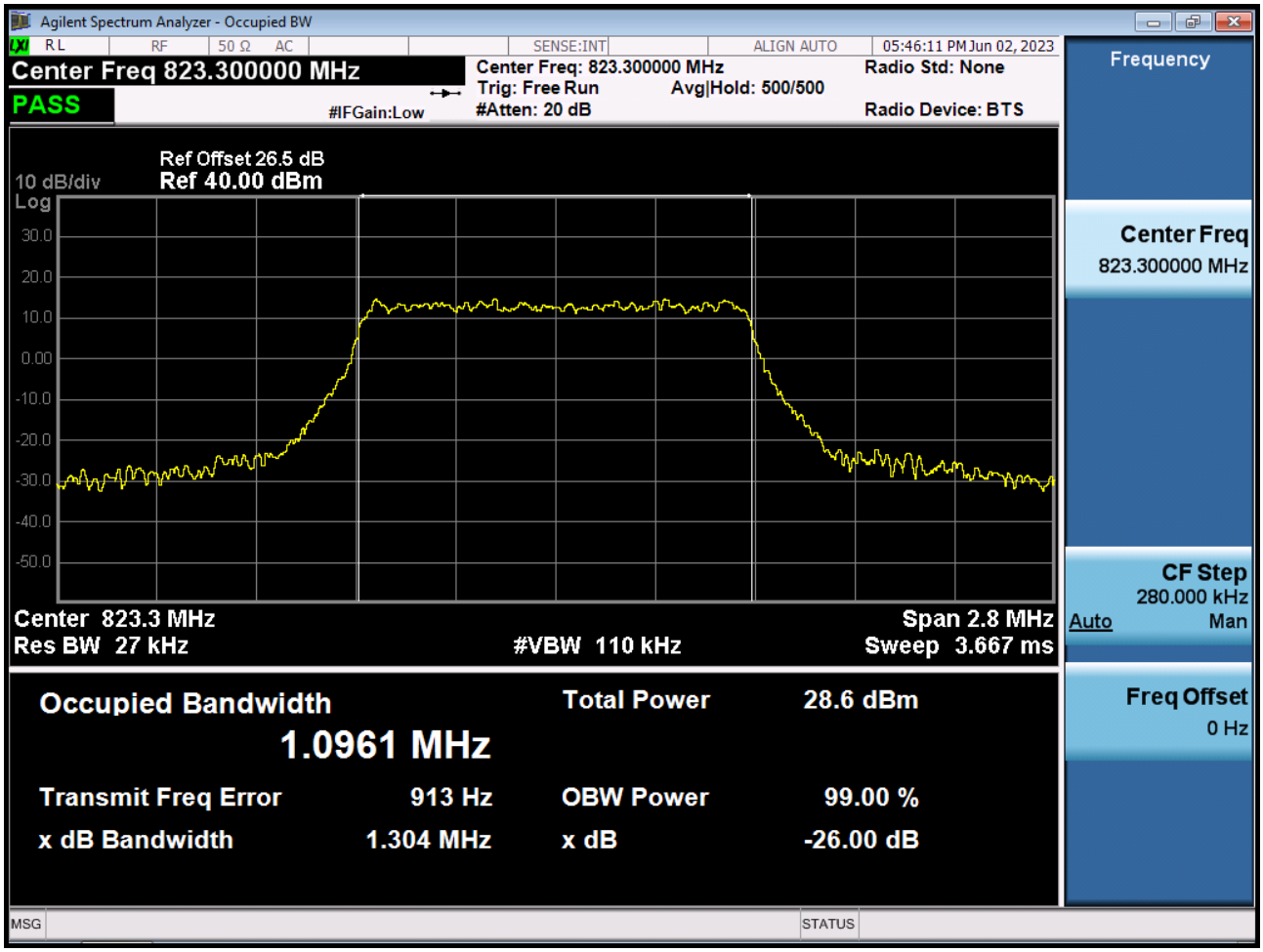
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 16QAM RB 6_0)



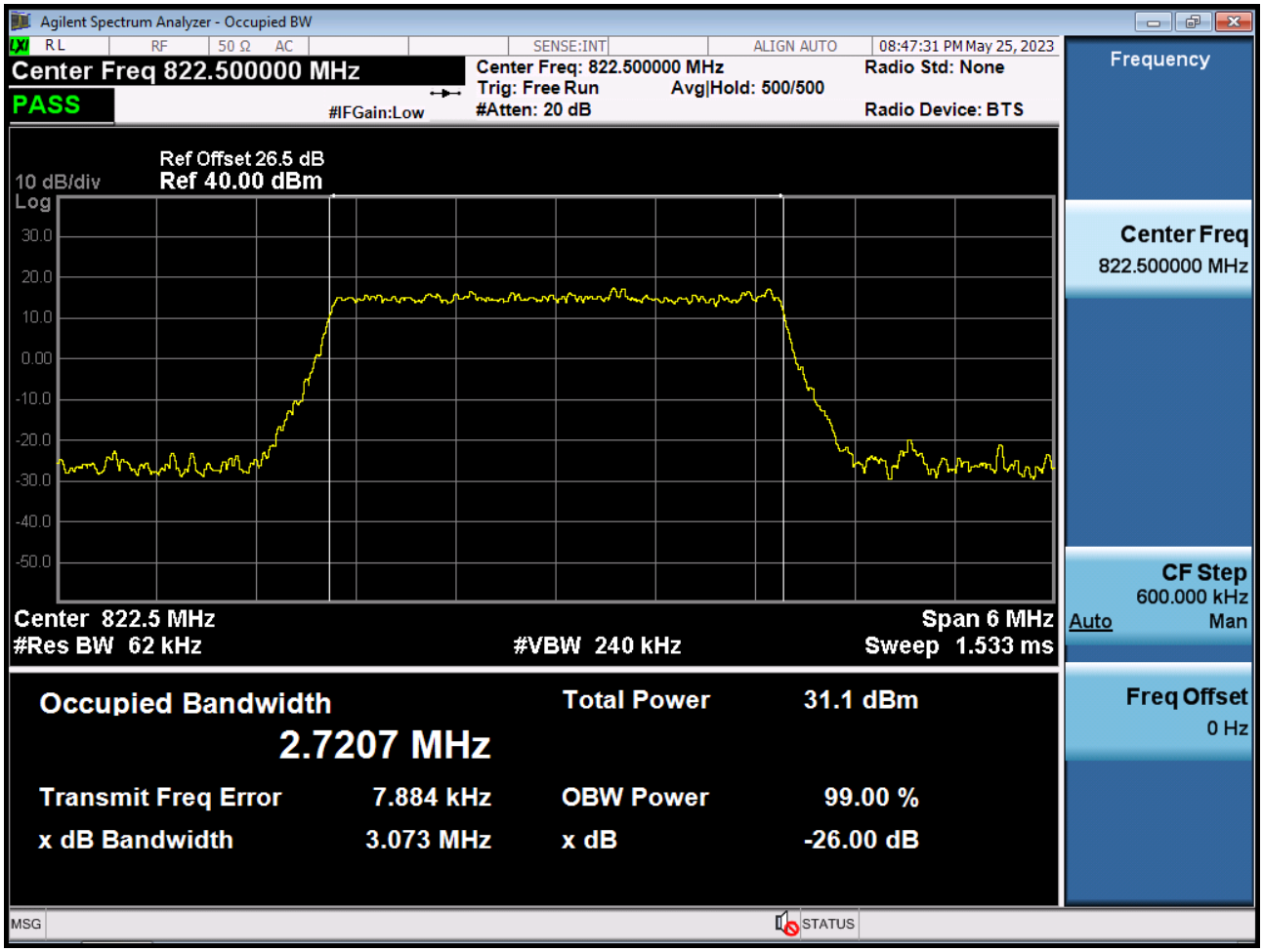
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 64QAM RB 6_0)



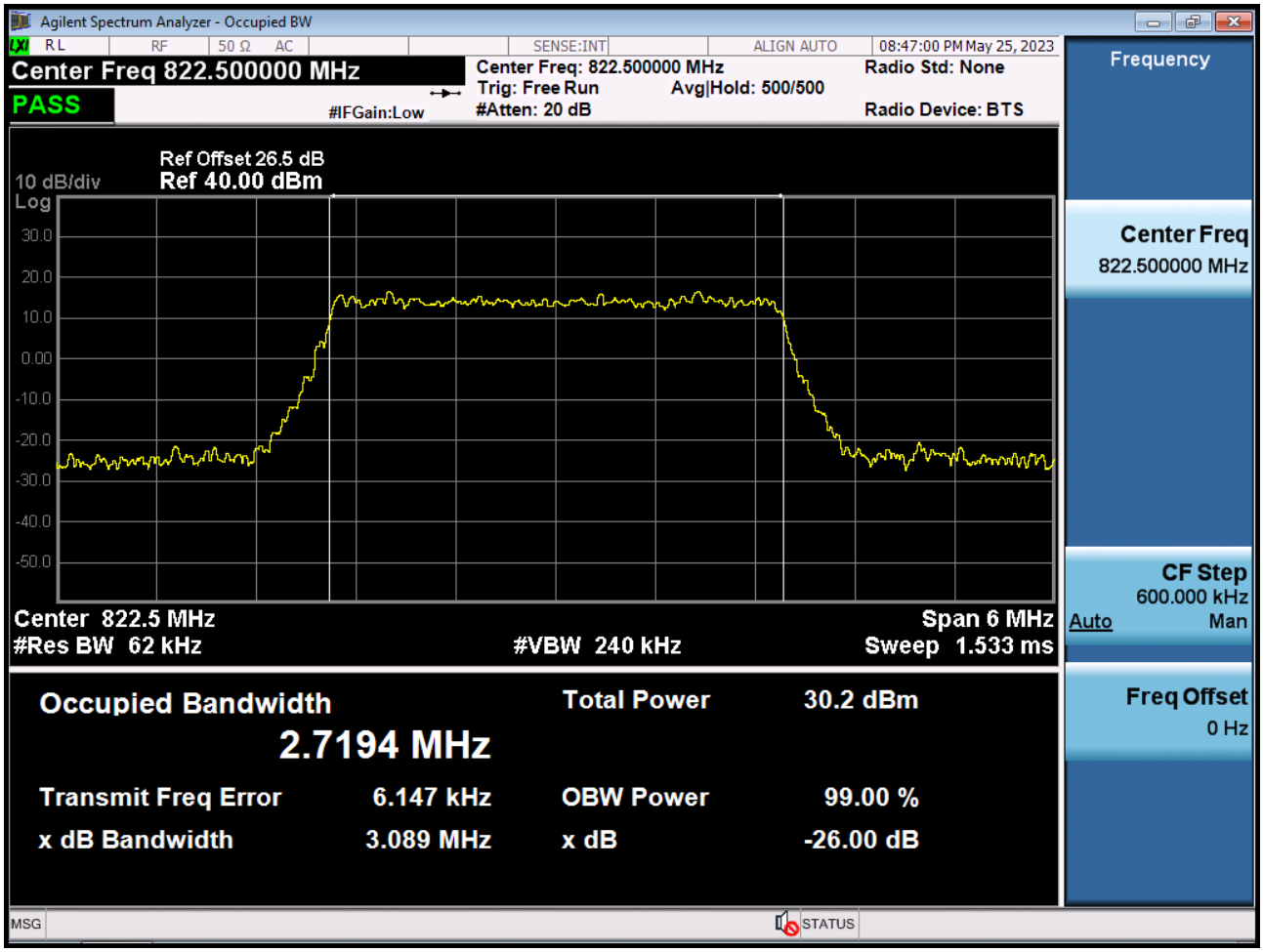
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 256QAM RB 6_0)



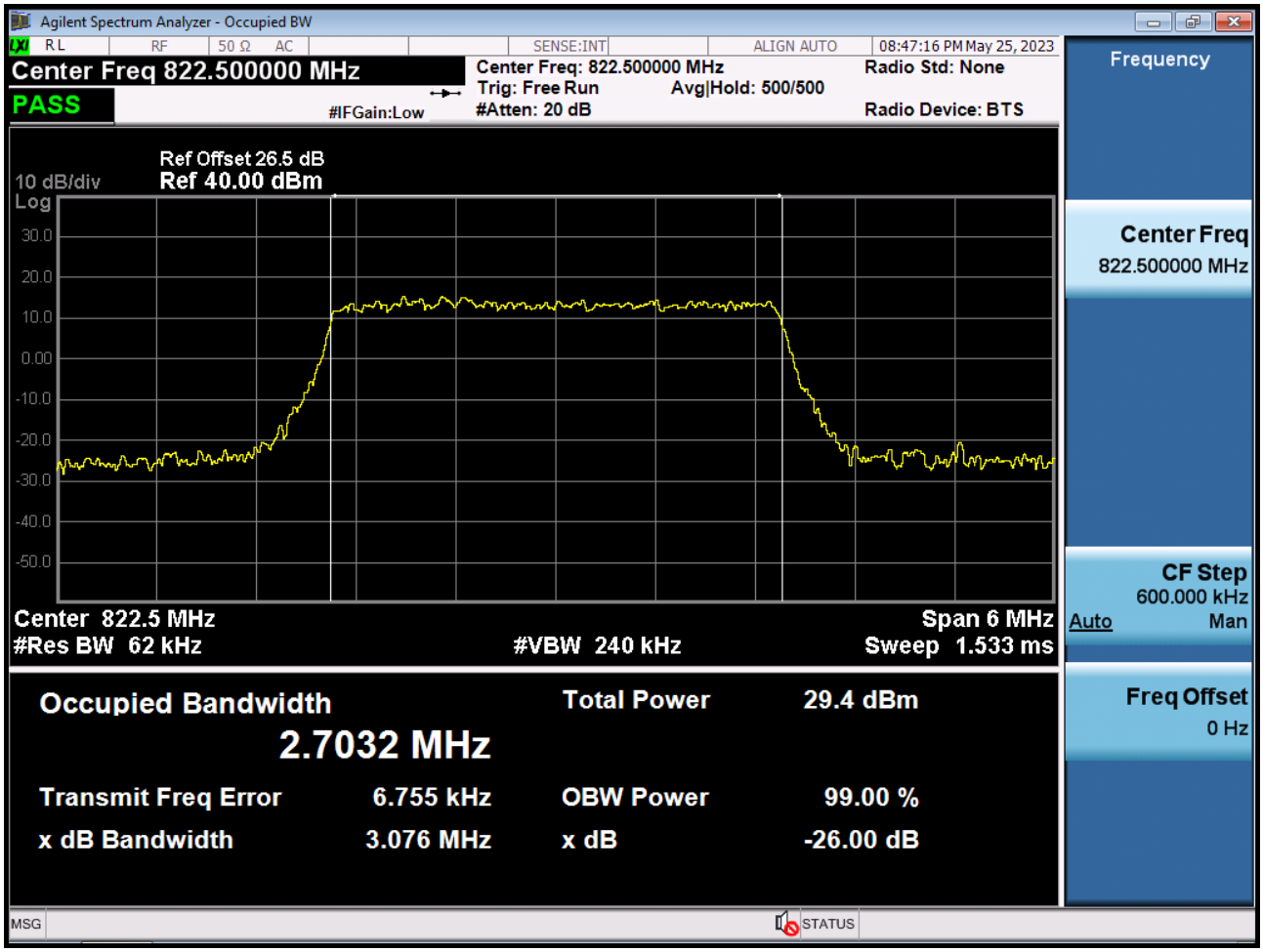
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 QPSK RB 15_0)



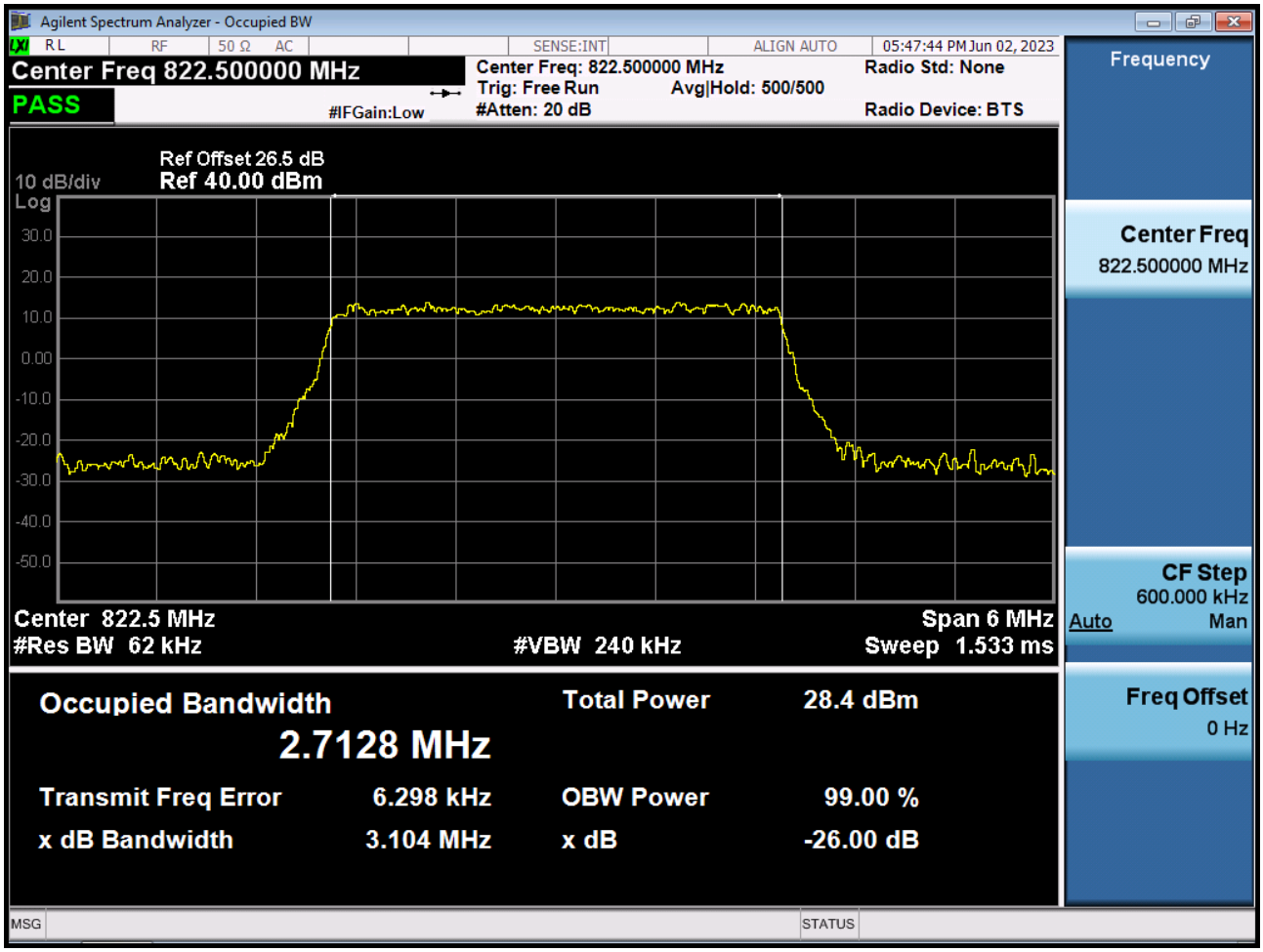
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 16QAM RB 15_0)



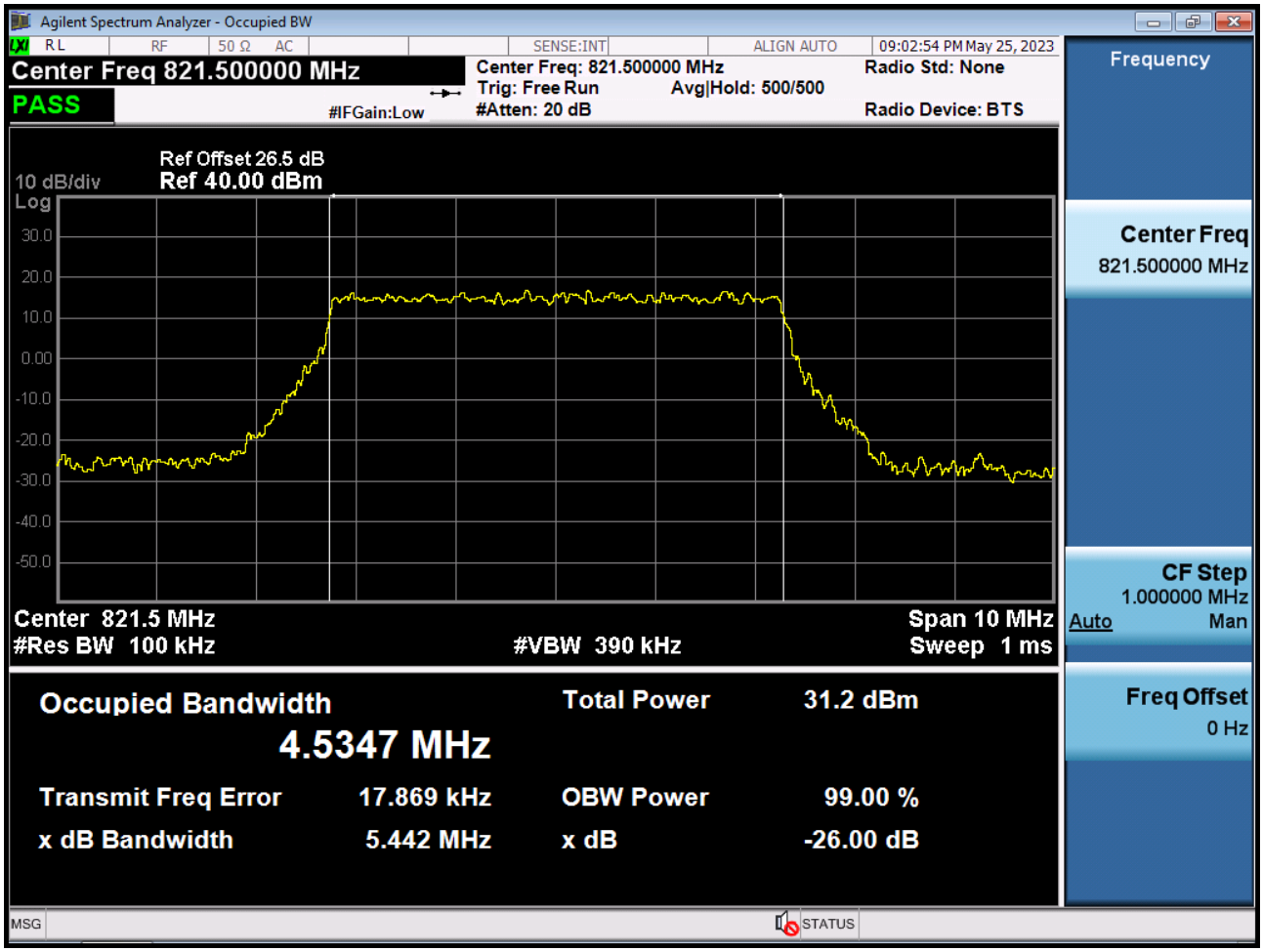
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 64QAM RB 15_0)



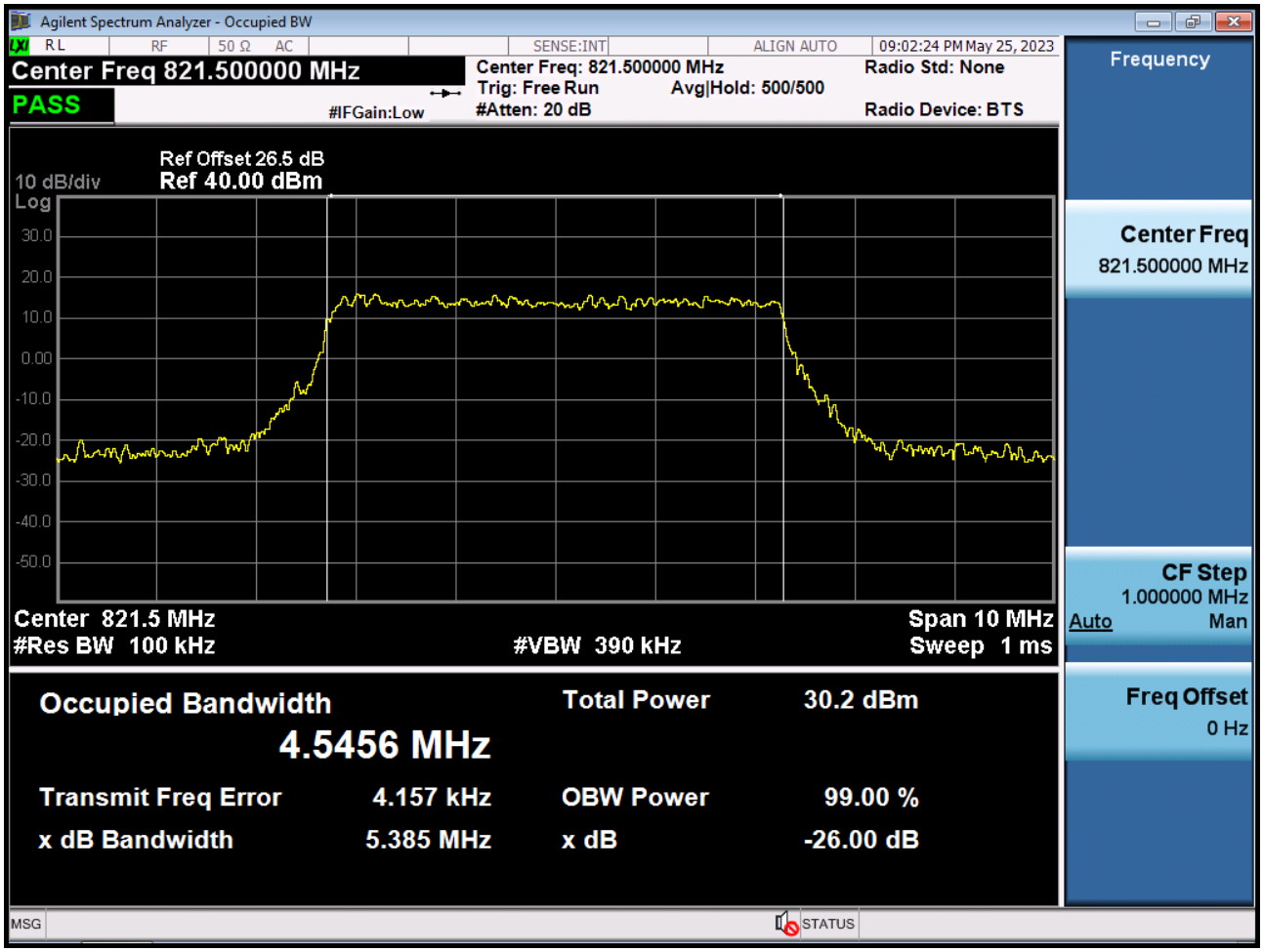
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 256QAM RB 15_0)



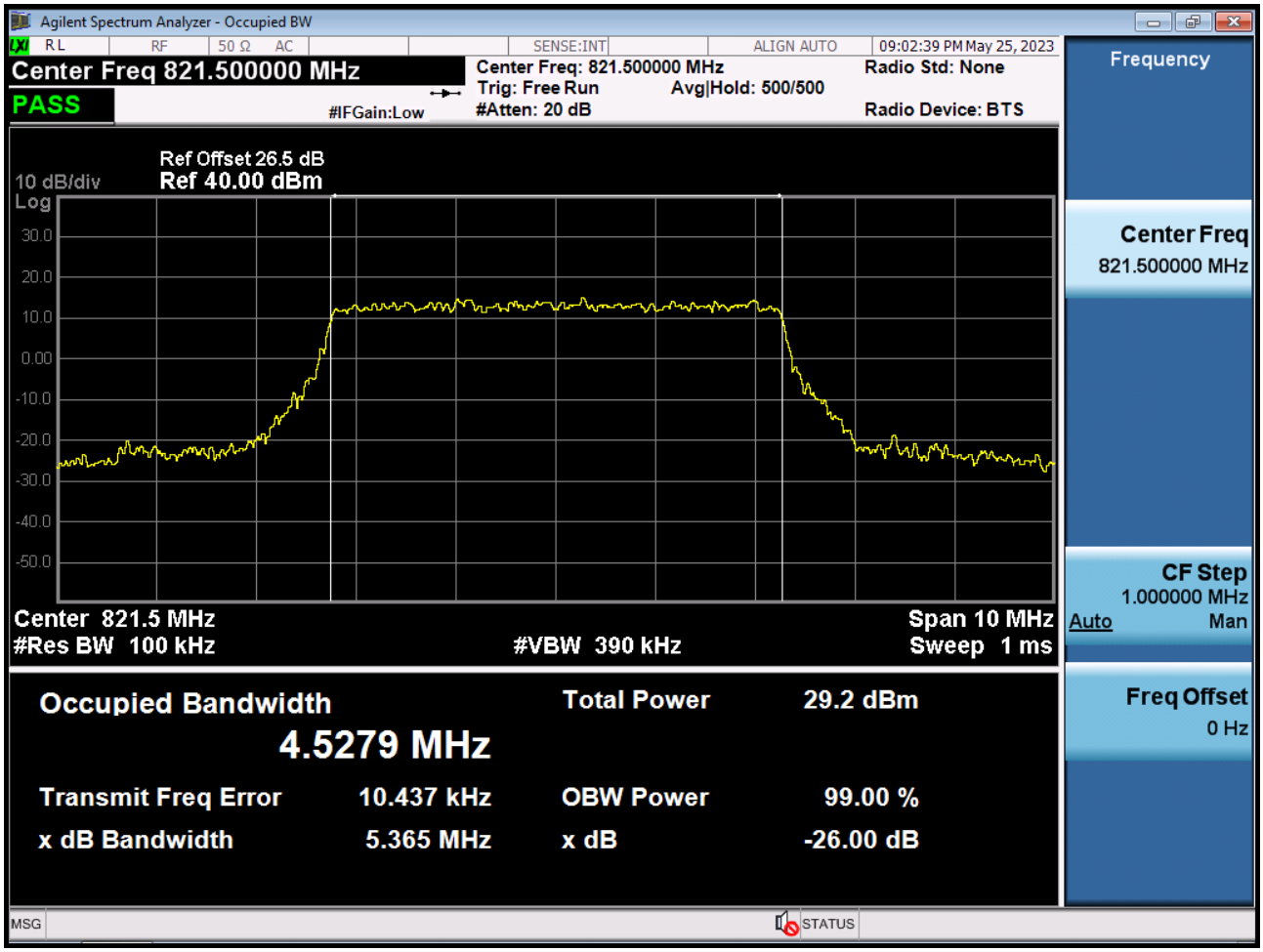
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 QPSK RB 25_0)



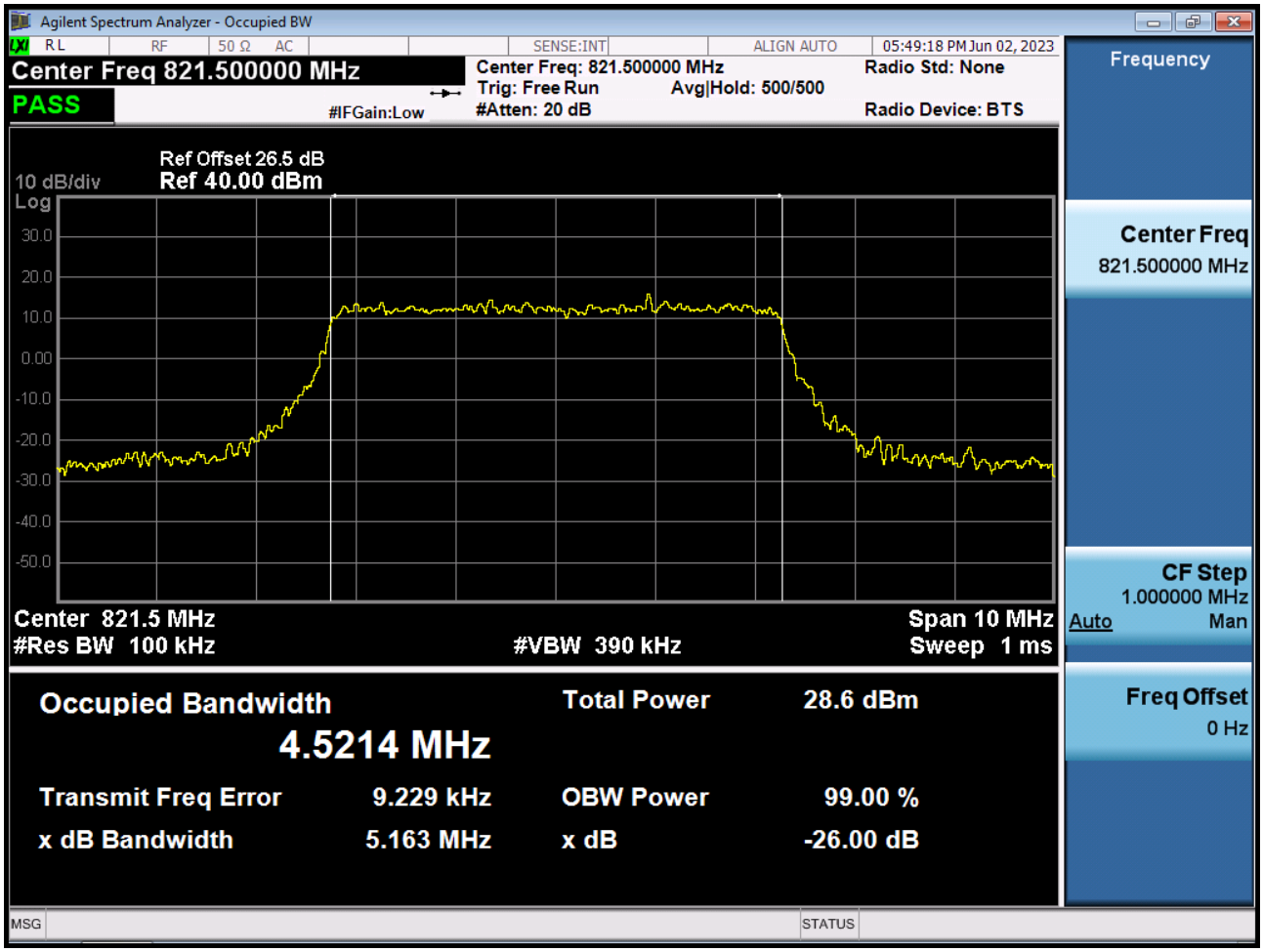
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 16QAM RB 25_0)



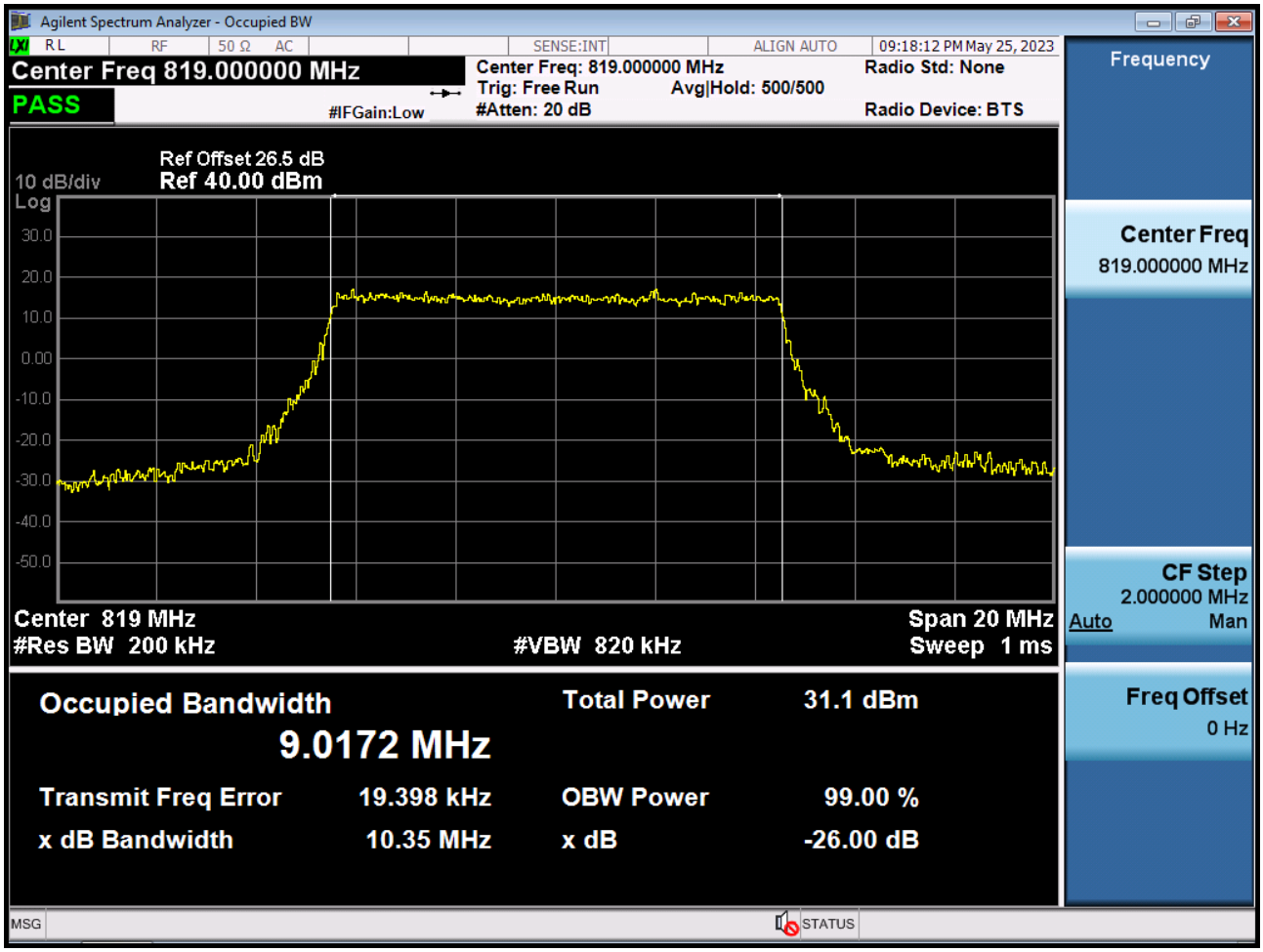
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 64QAM RB 25_0)



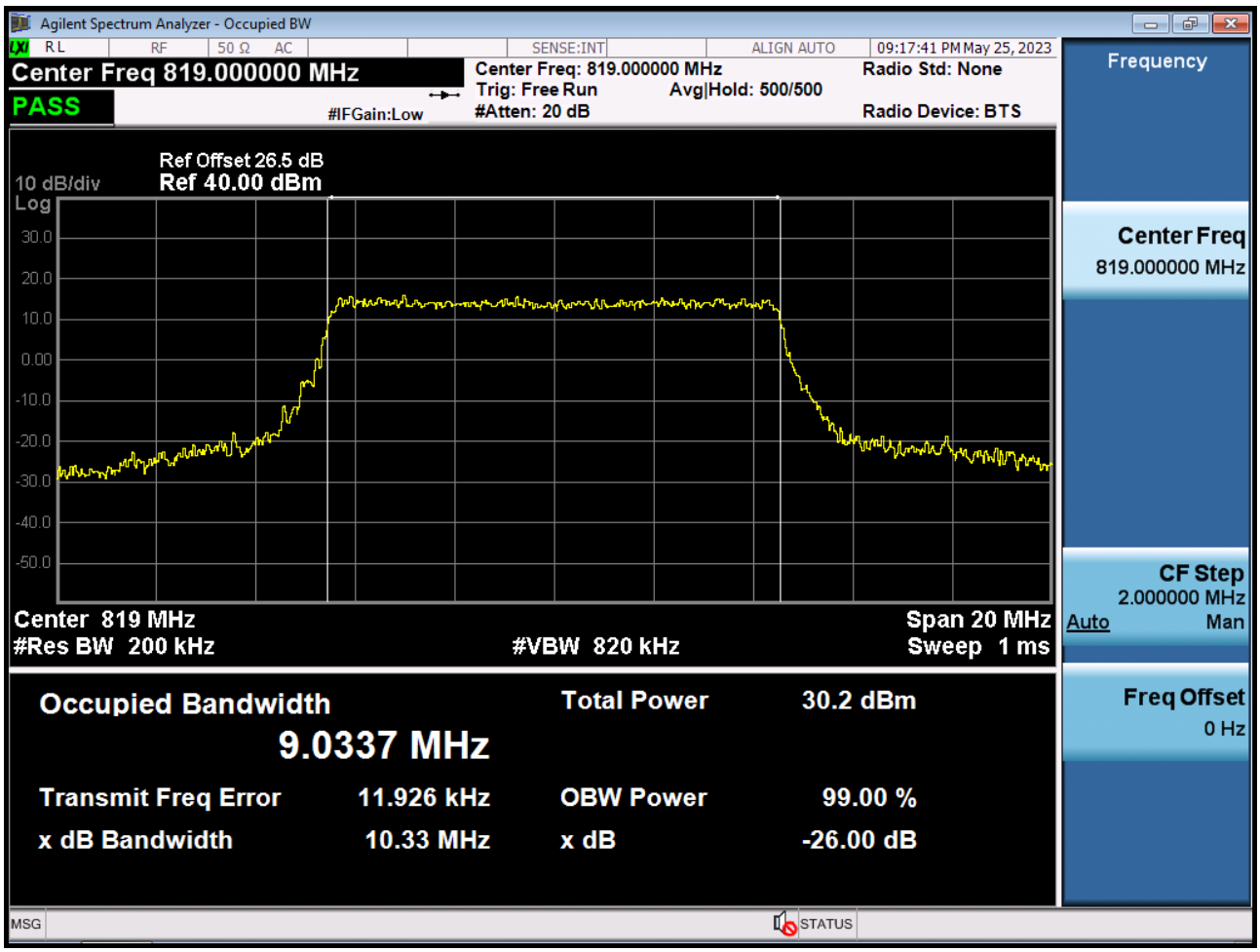
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 256QAM RB 25_0)



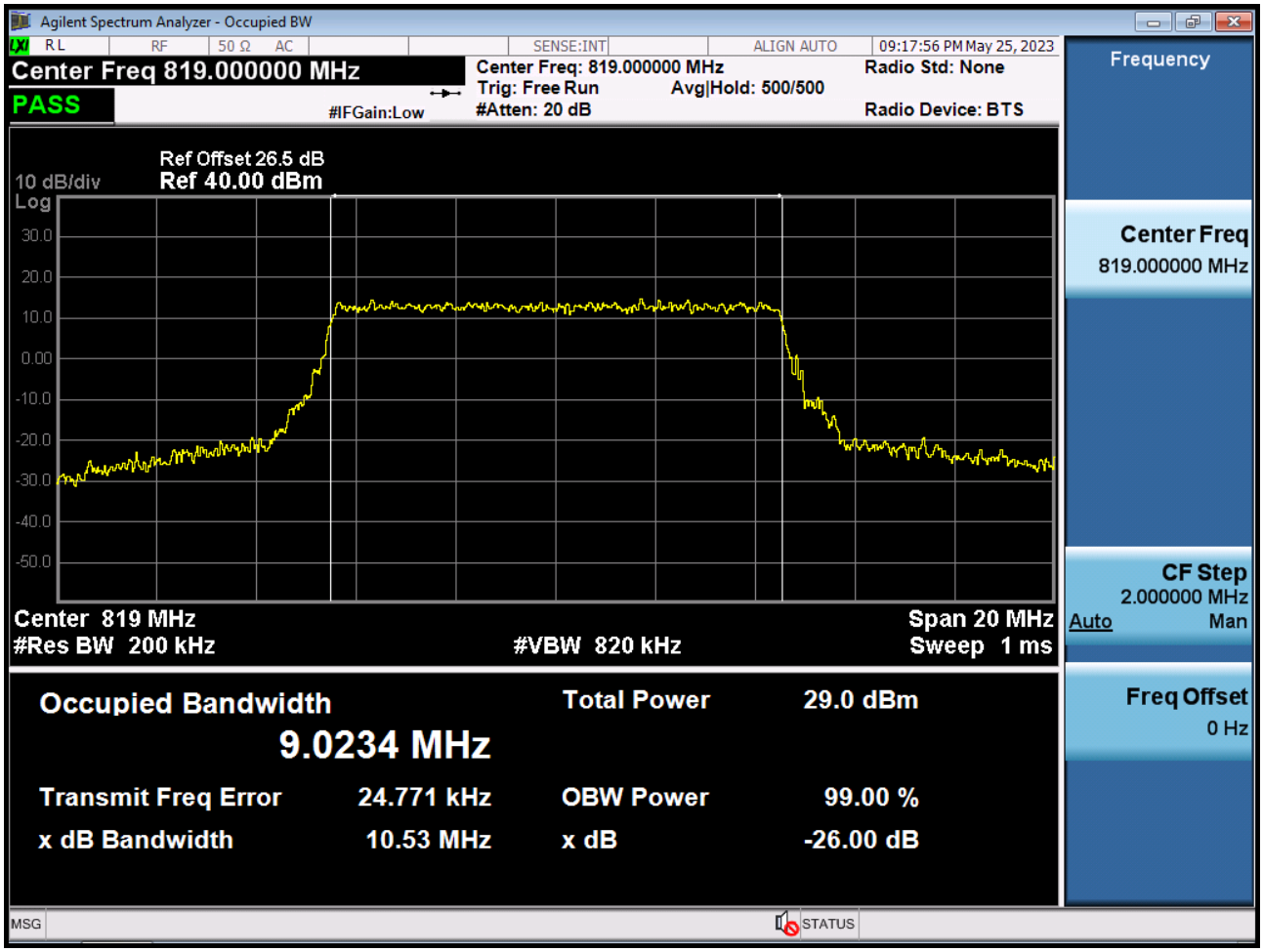
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 QPSK RB 50_0)



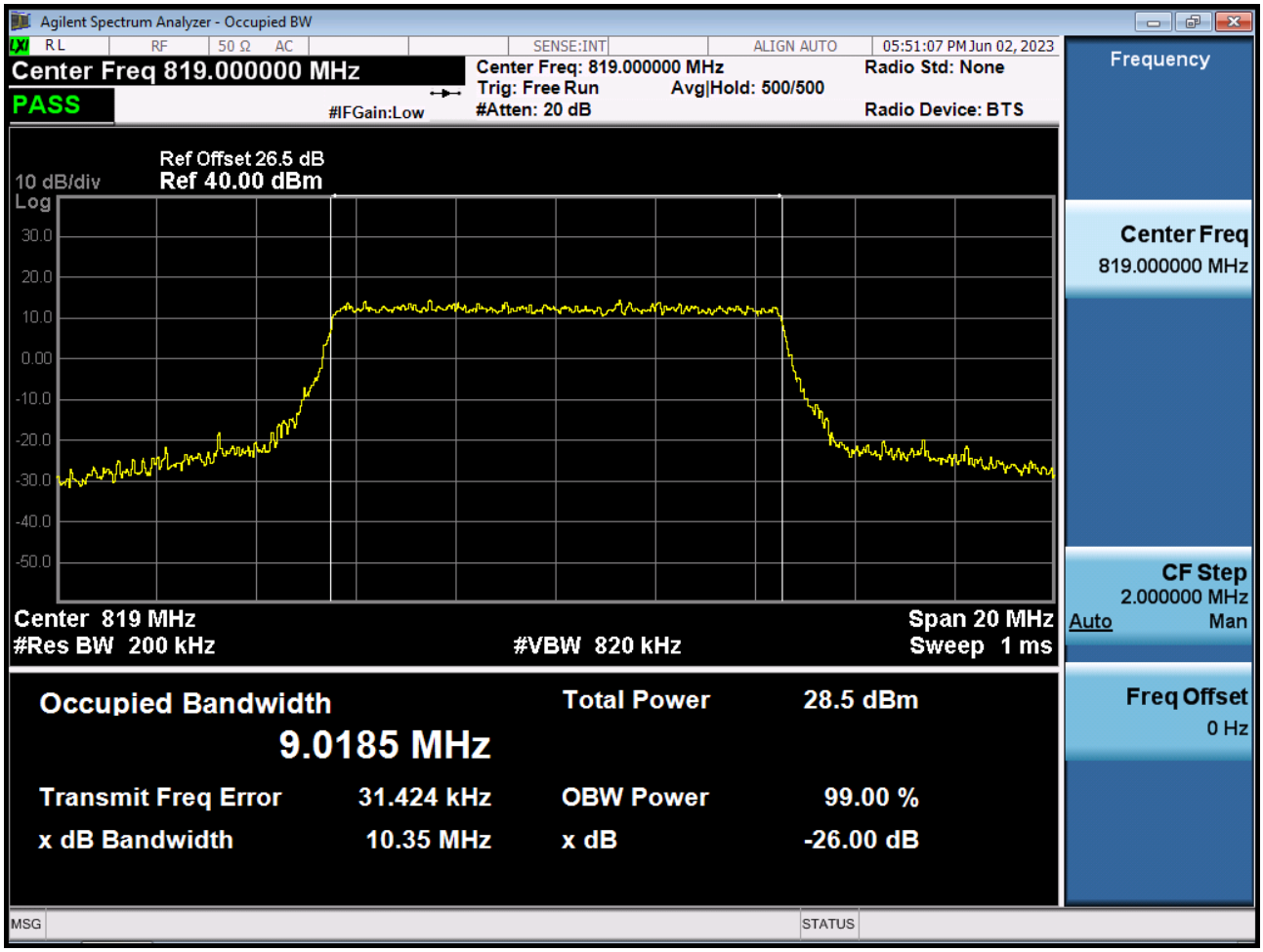
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 16QAM RB 50_0)



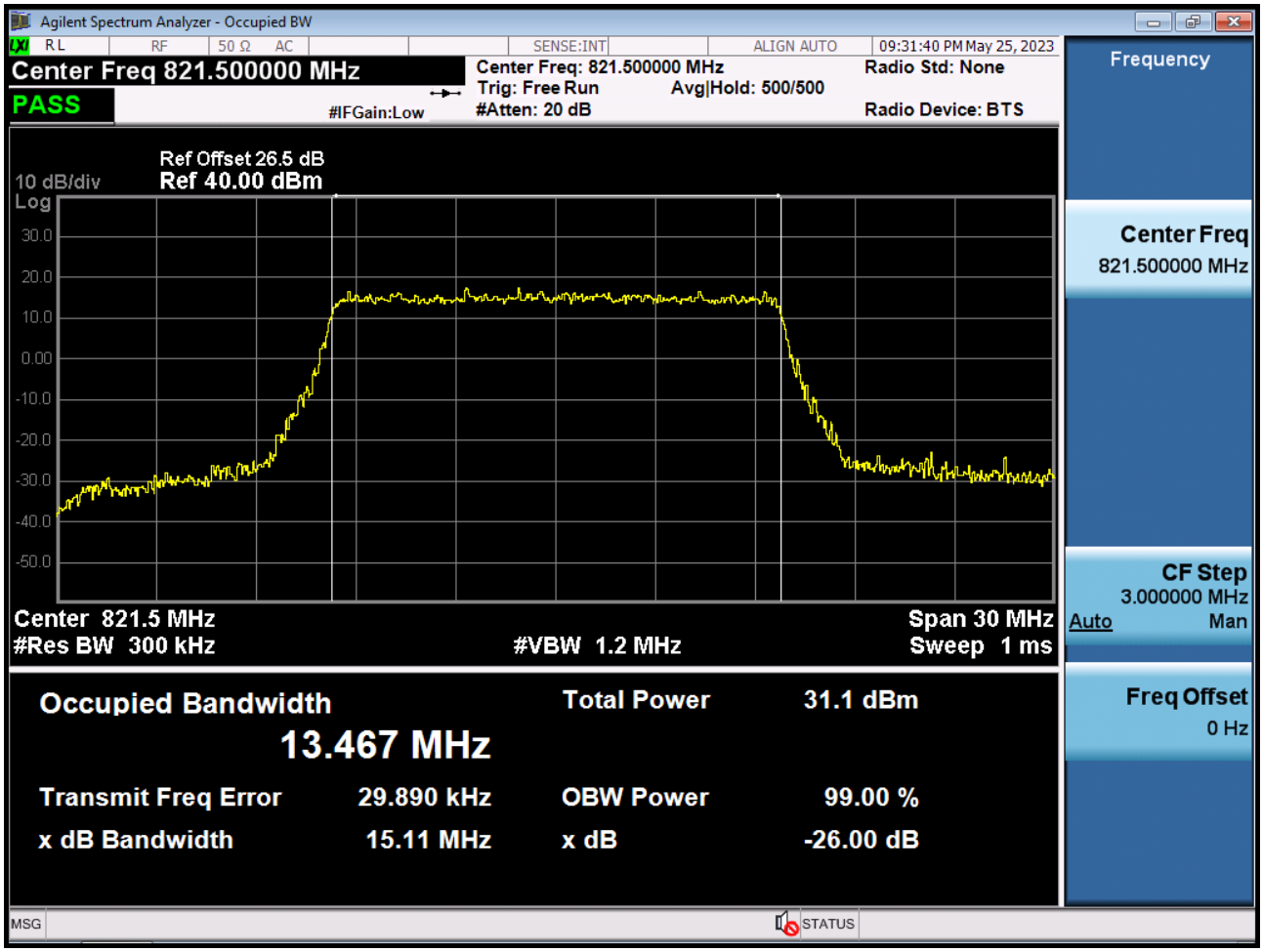
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 64QAM RB 50_0)



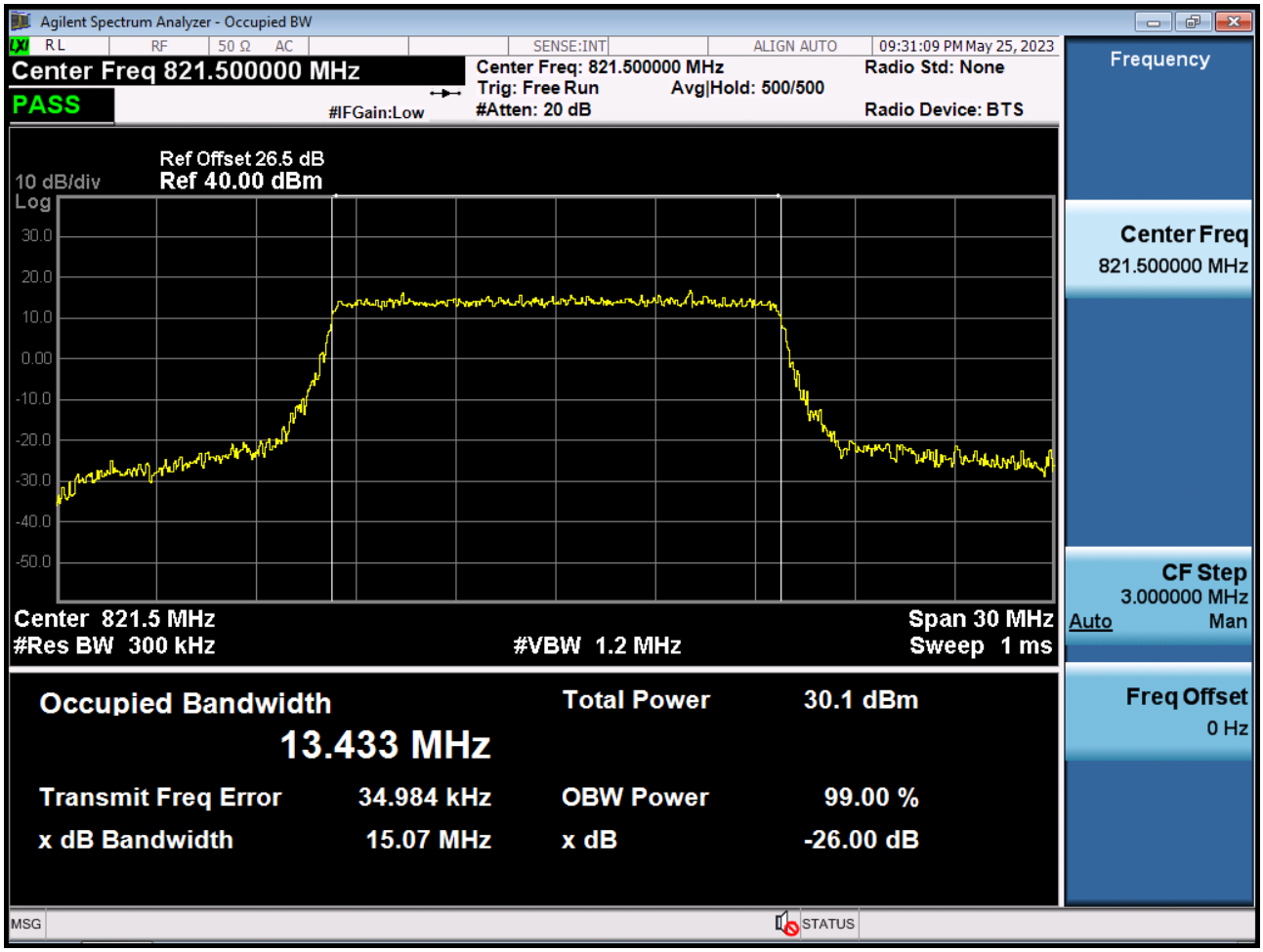
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 256QAM RB 50_0)



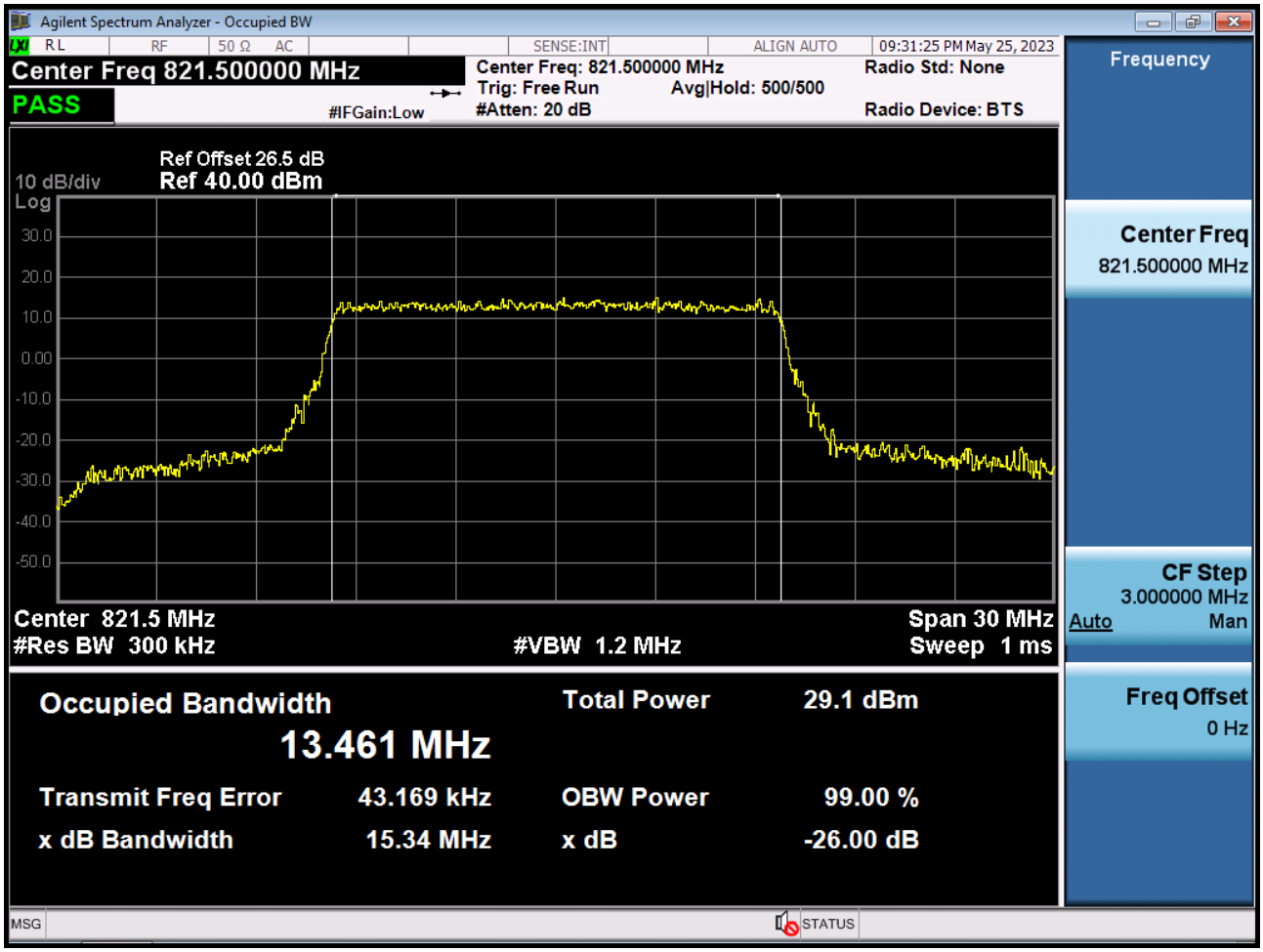
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 QPSK RB 75_0)



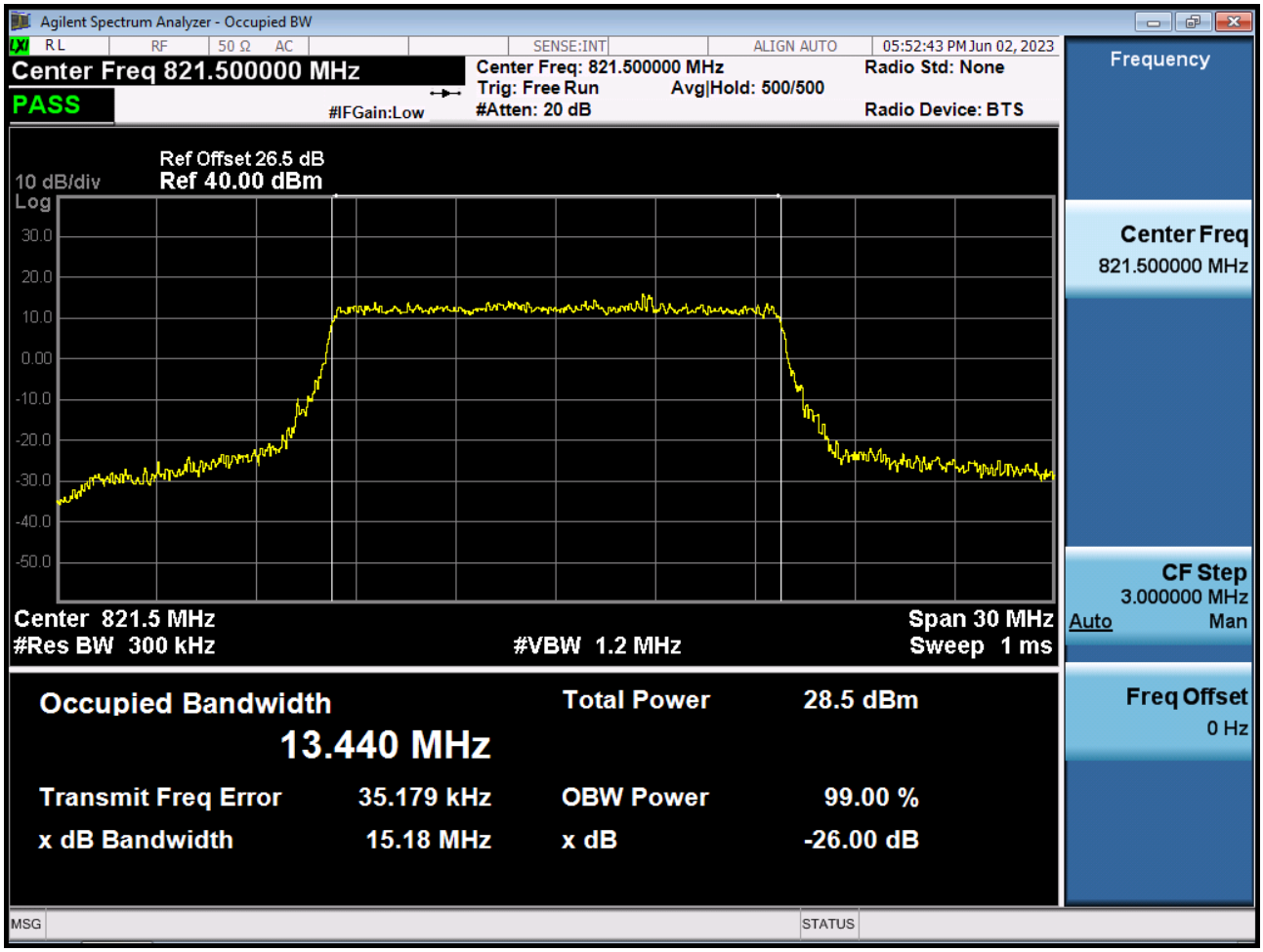
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 16QAM RB 75_0)



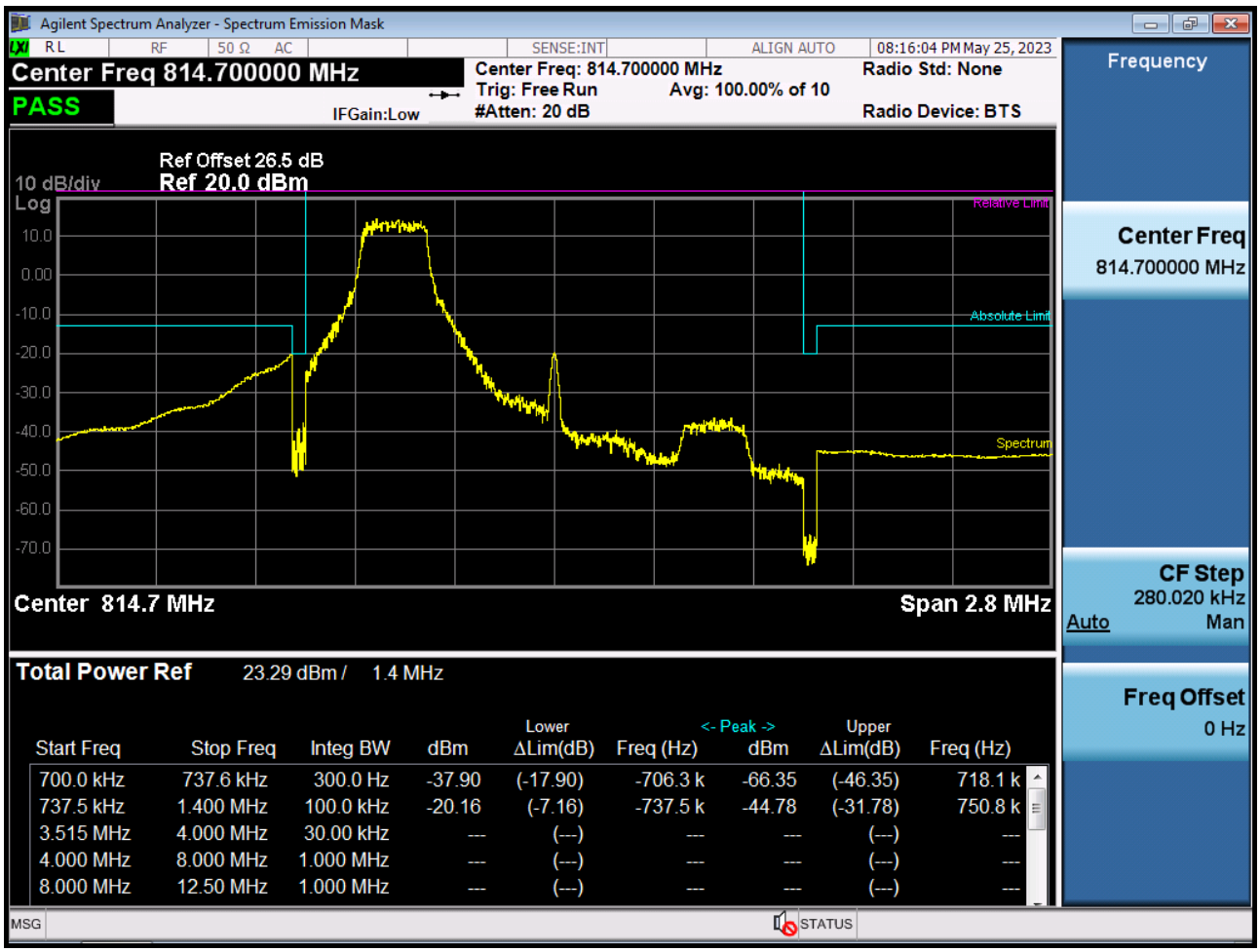
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 64QAM RB 75_0)



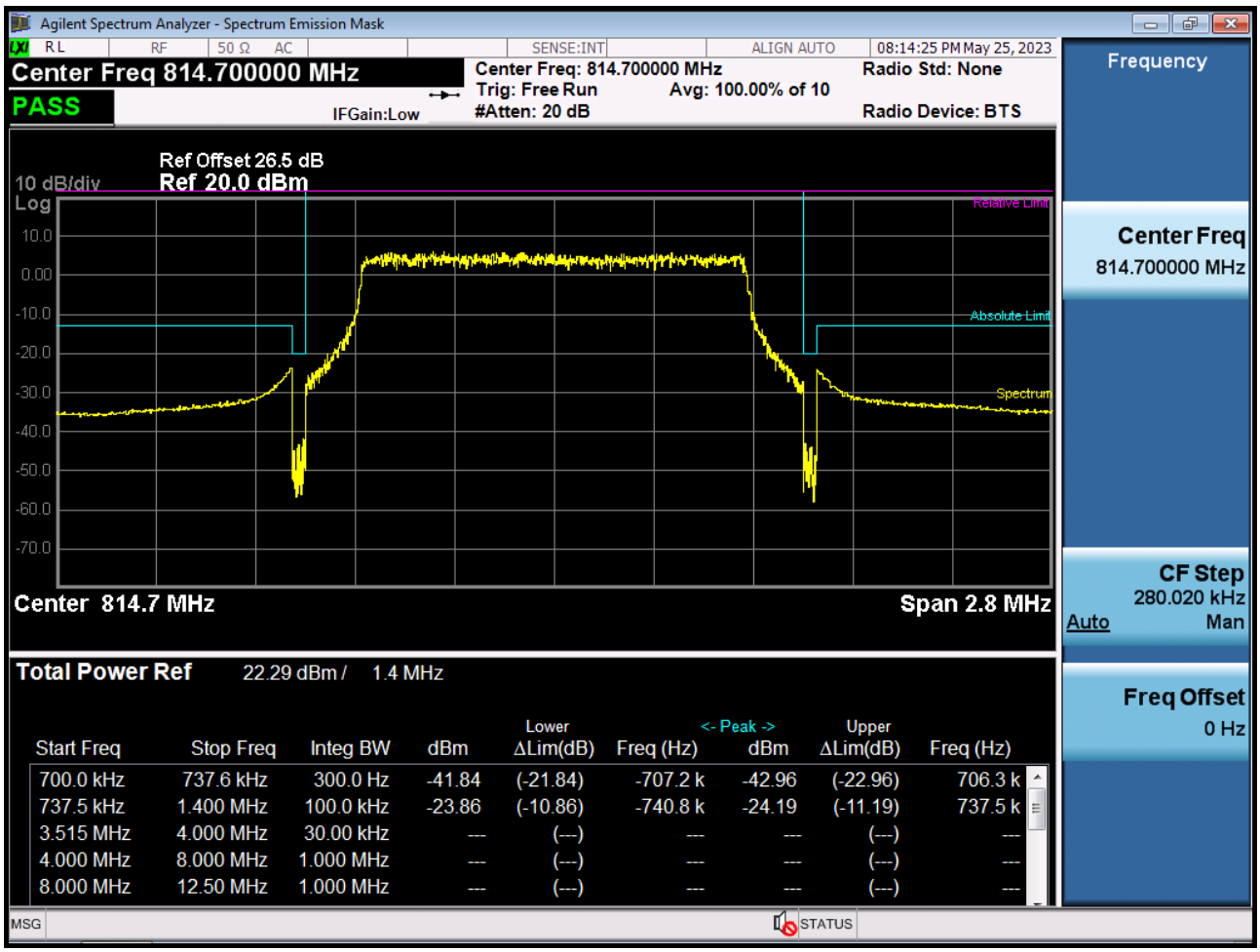
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 256QAM RB 75_0)



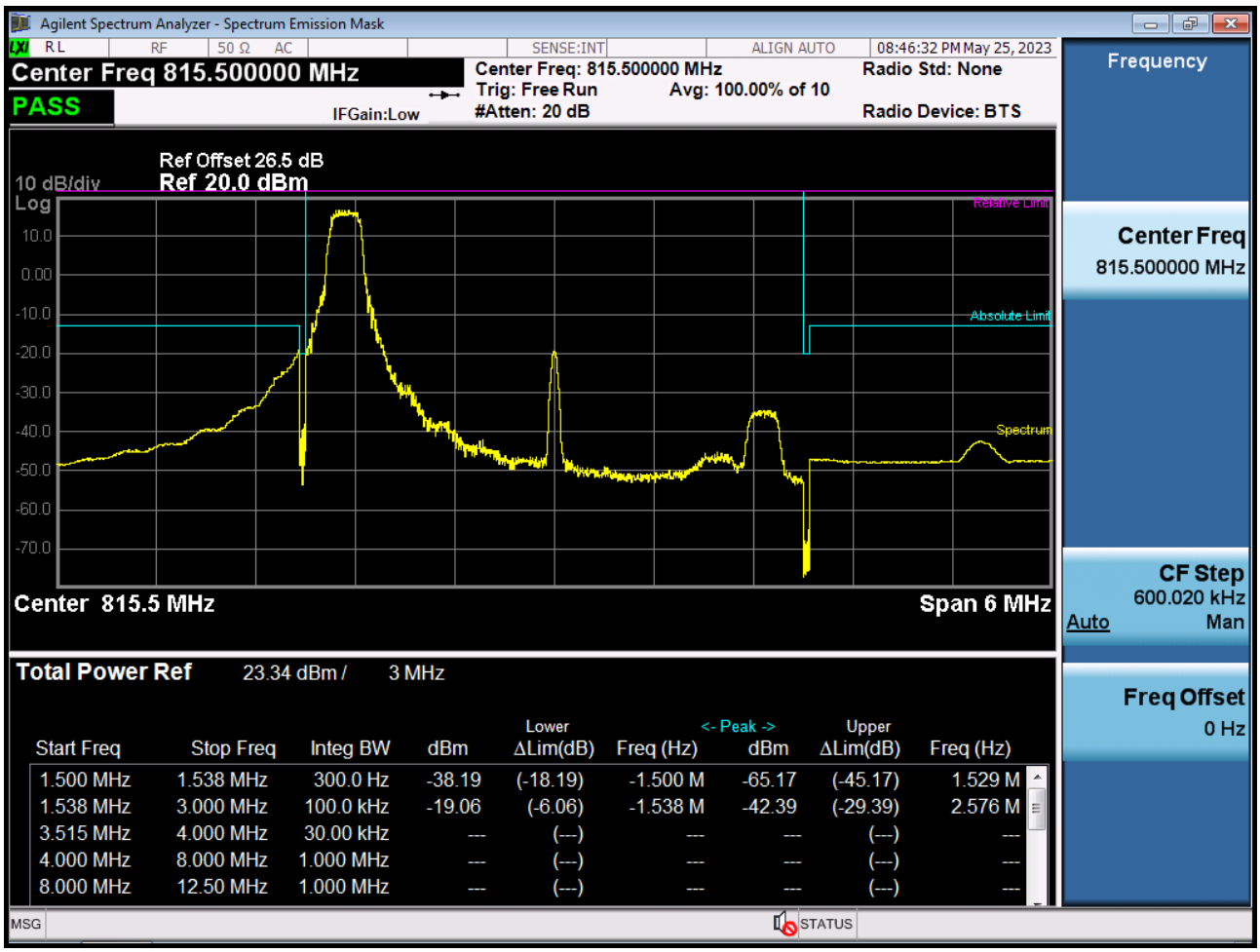
BAND 26. Lower Channel Edge Plot (1.4 M BW Ch.26697 QPSK RB 1, Offset 0)



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

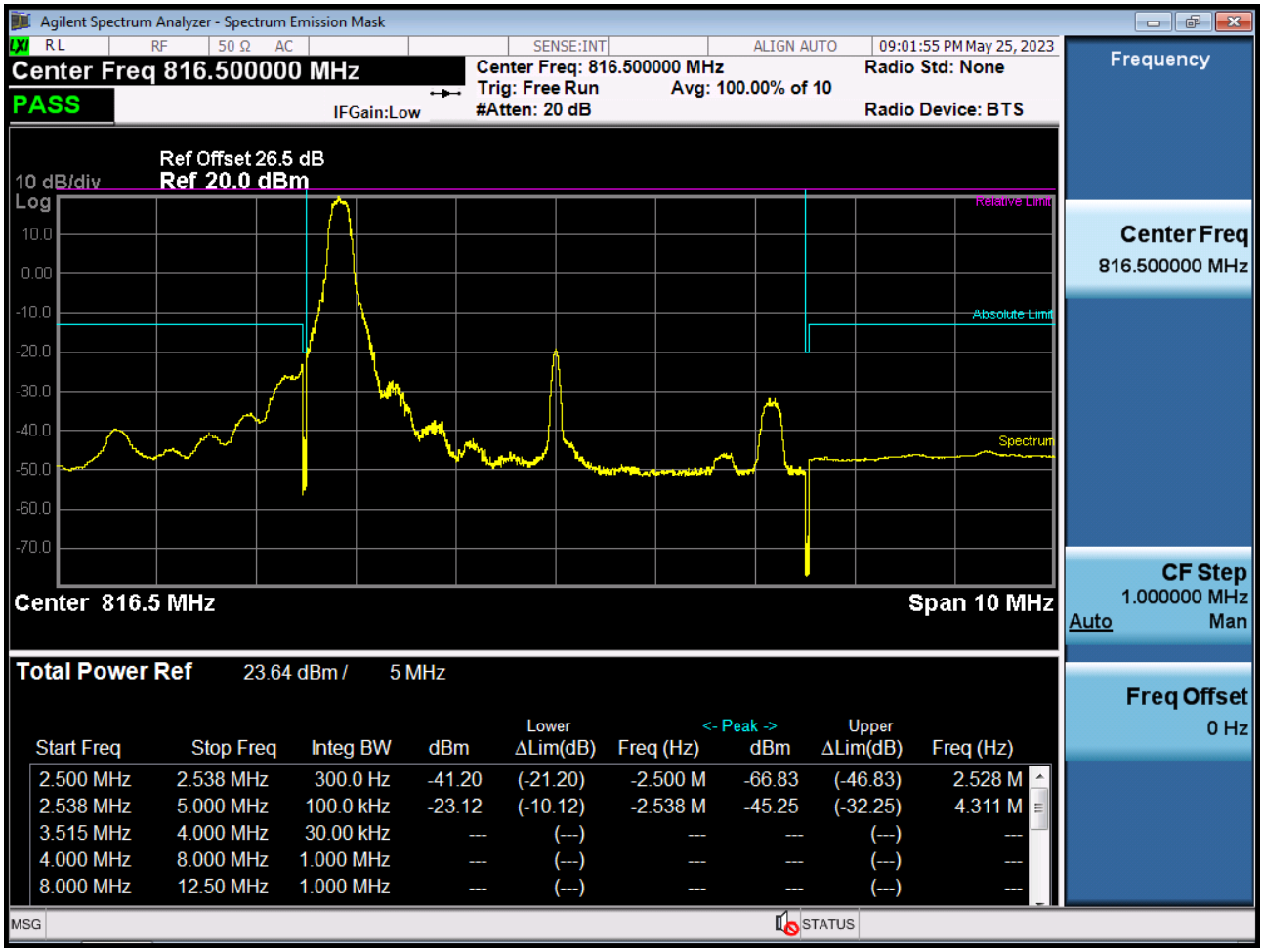


BAND 26. Lower Channel Edge Plot (3 M BW Ch.26705 QPSK RB 1, Offset 0)

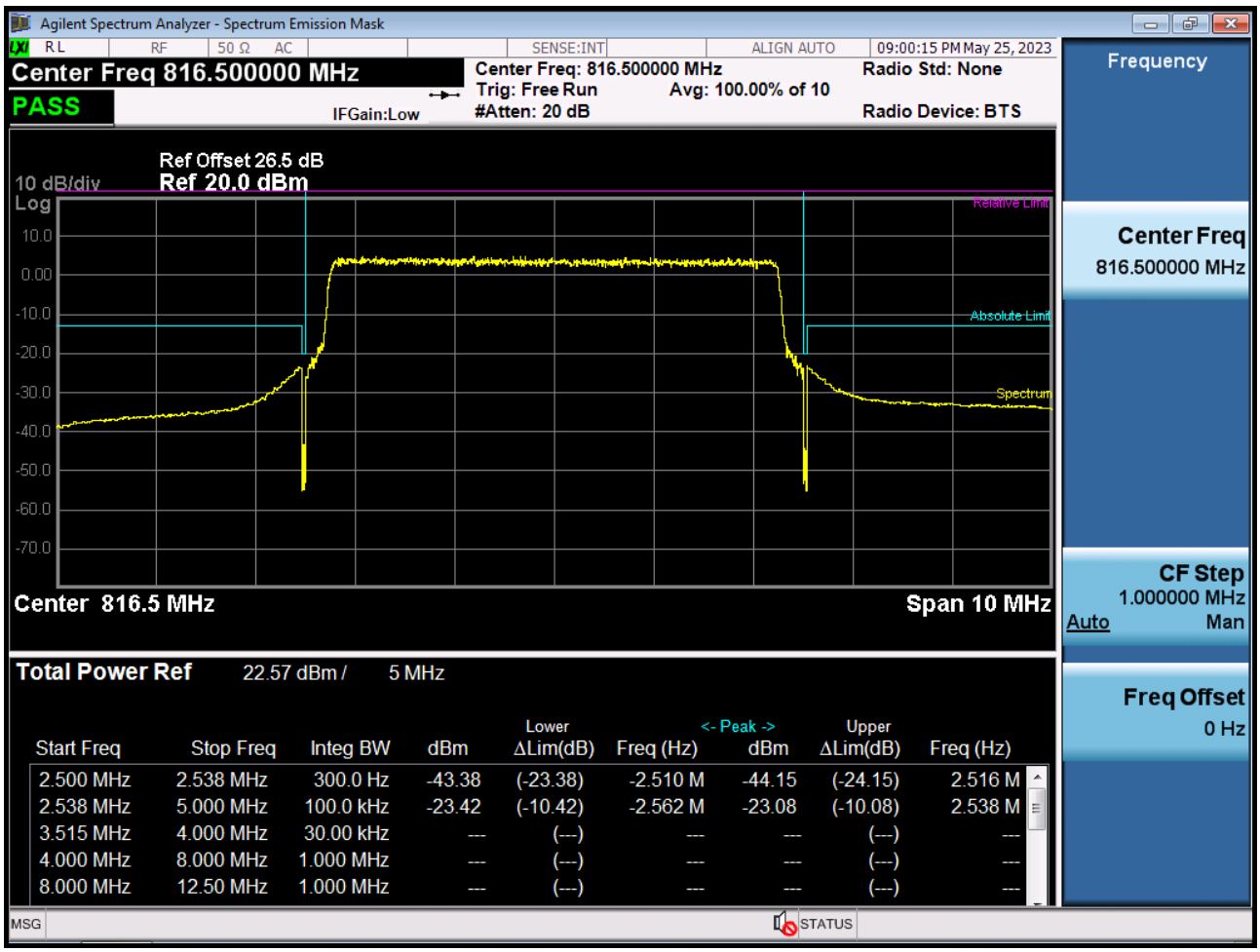


BAND 26. Lower Channel Edge Plot (3 M BW Ch.26705 QPSK_RB15_Offset 0)

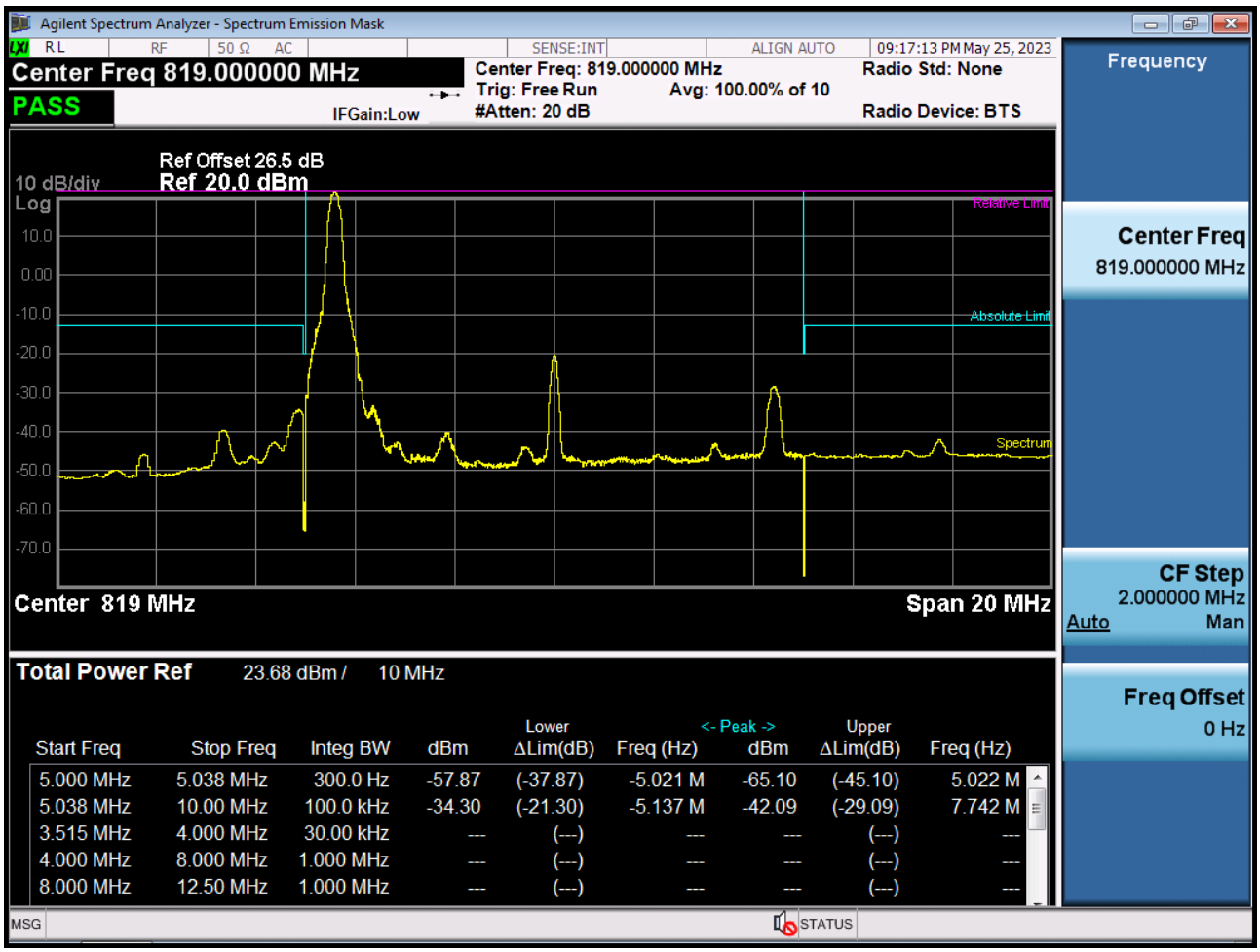
BAND 26. Lower Channel Edge Plot (5 M BW Ch.26715 QPSK RB 1, Offset 0)



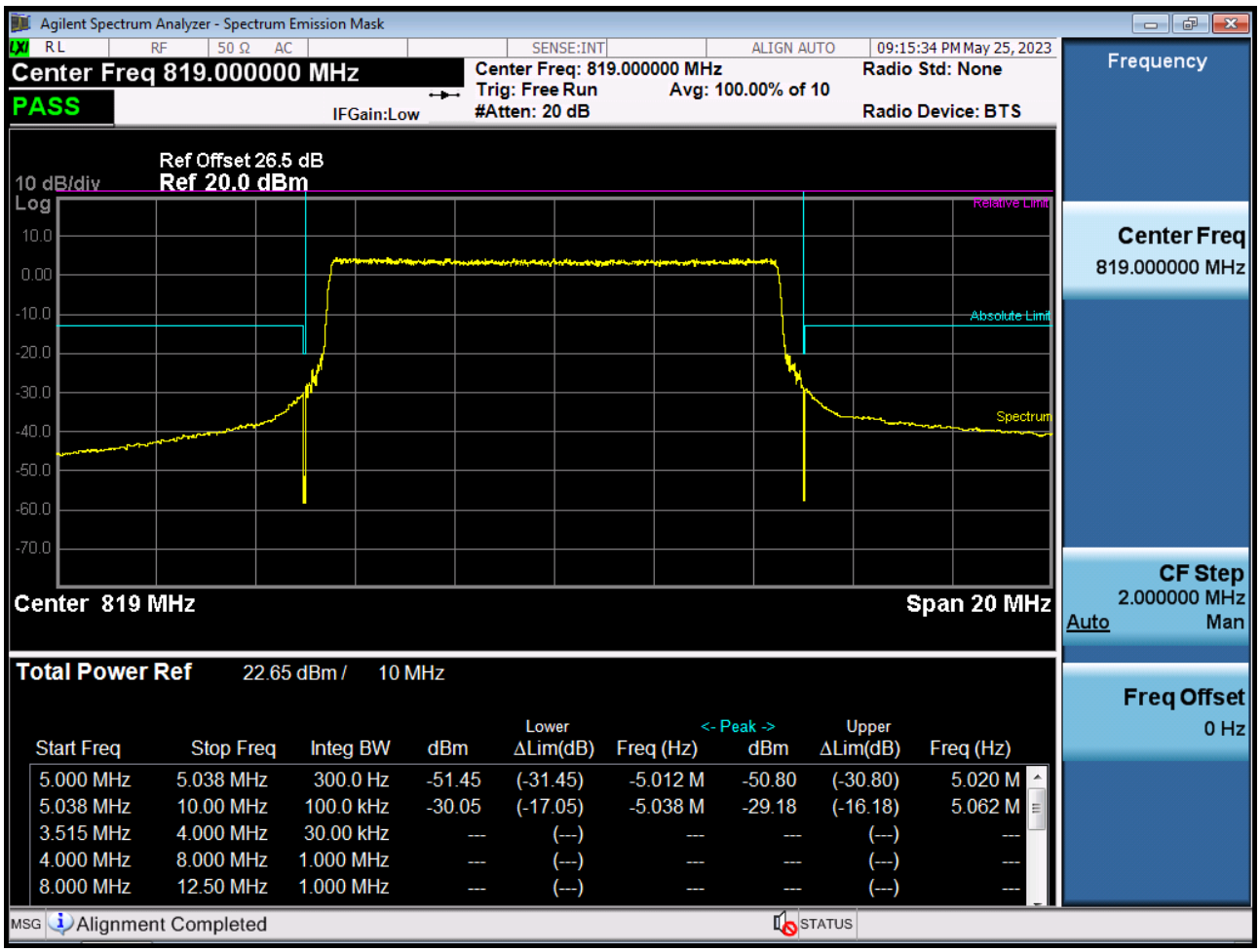
BAND 26. Lower Channel Edge Plot (5 M BW Ch.26715 QPSK_RB25_Offset 0)



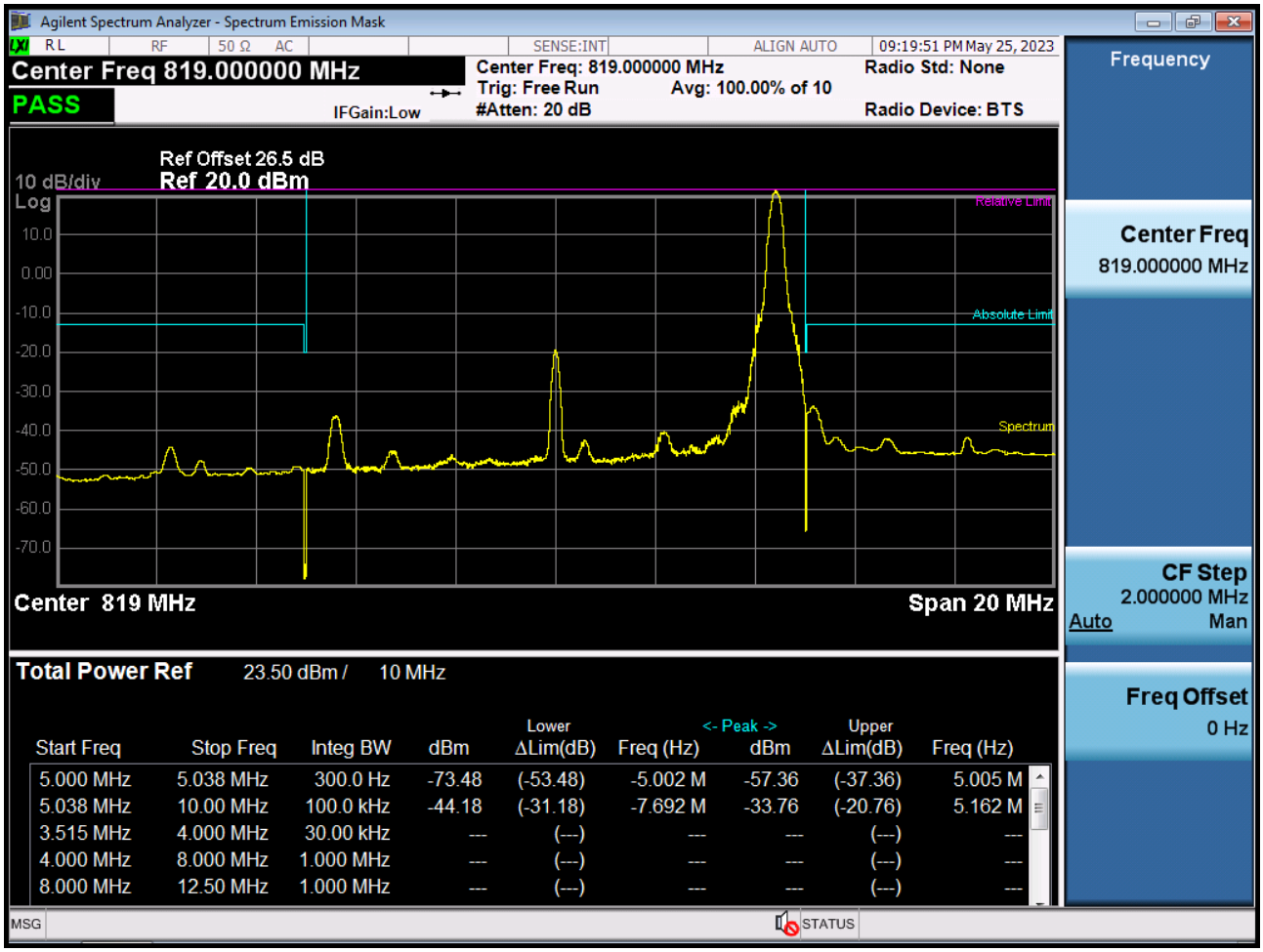
BAND 26. Low Channel Edge Plot (10 M BW Ch.26740 QPSK RB 1, Offset 0)



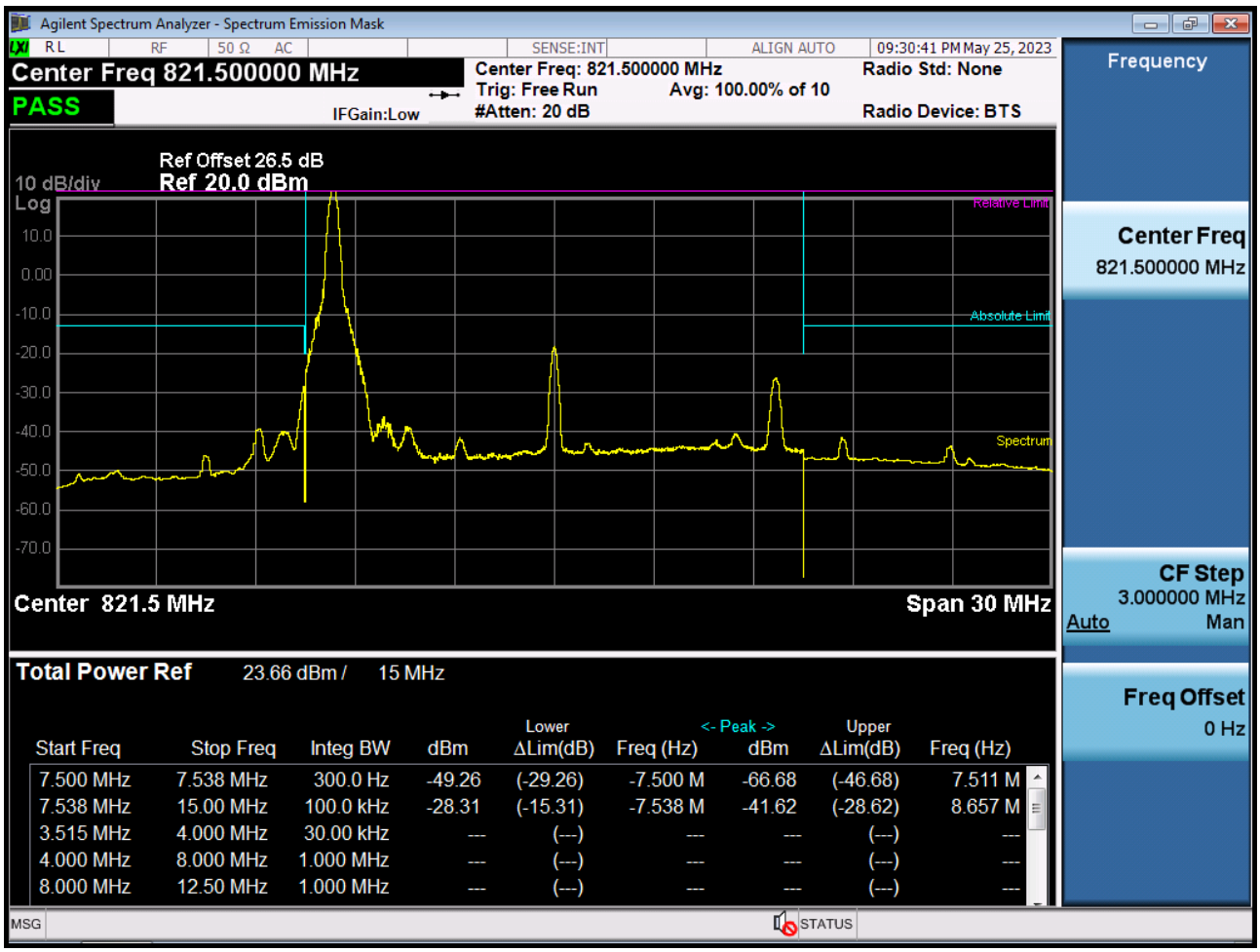
BAND 26. Low Channel Edge Plot (10 M BW Ch.26740 QPSK_RB50_Offset 0)



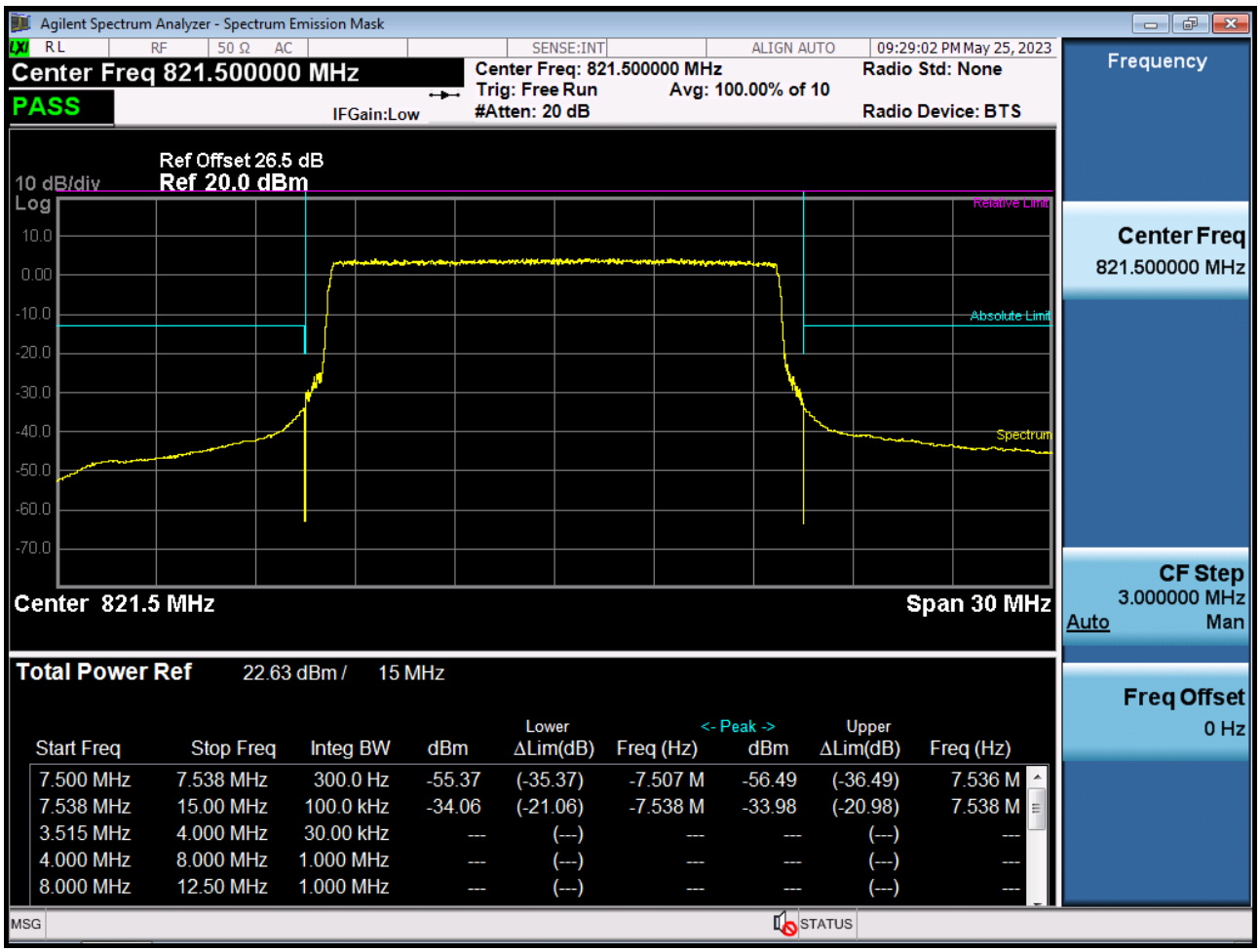
BAND 26. Mid Channel Edge Plot (10 M BW Ch. 26740 QPSK_RB1_Offset 49)



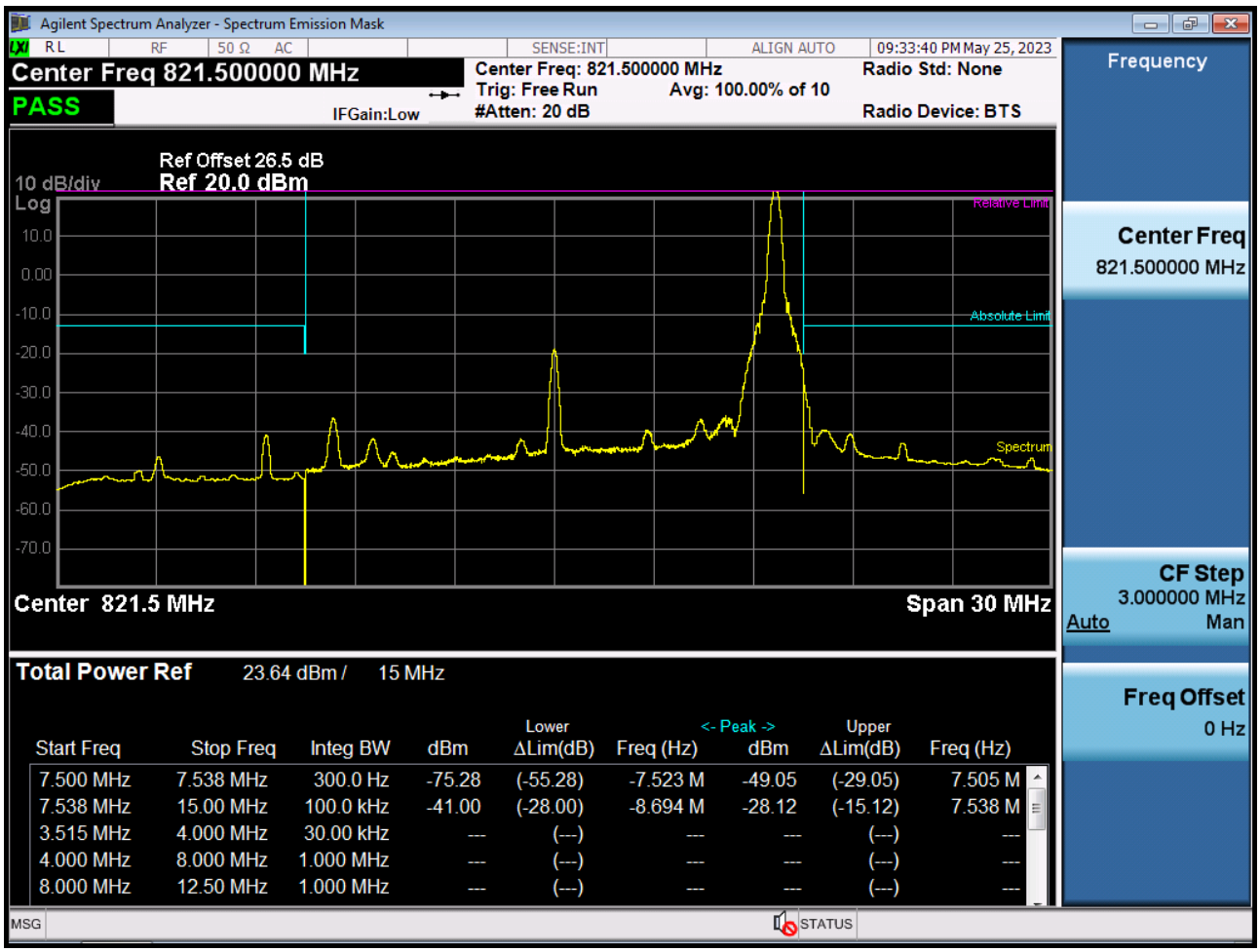
BAND 26. Low Channel Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset 0)



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



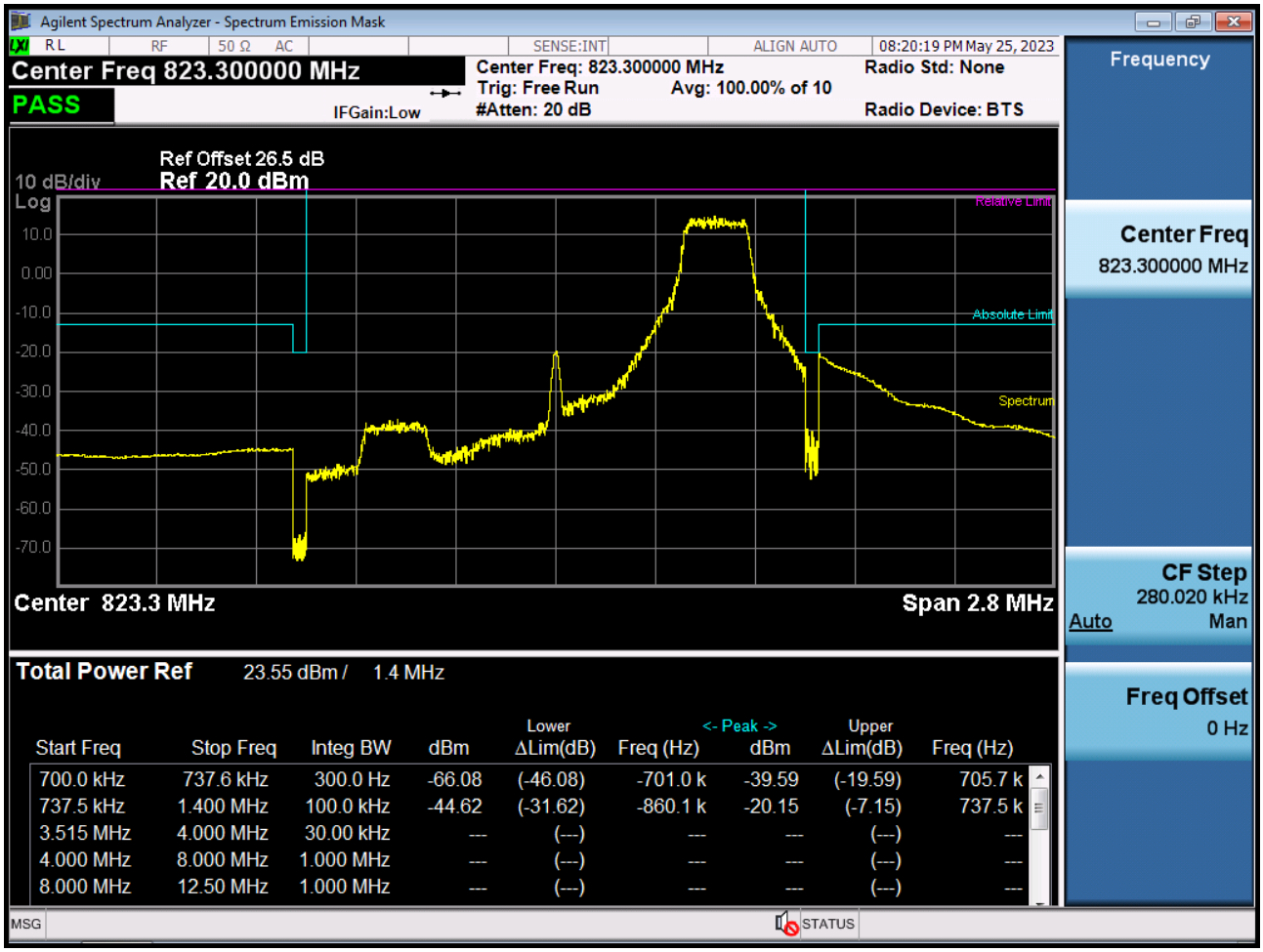
BAND 26. Mid Channel Edge Plot (15 M BW Ch.26765 QPSK_RB1_Offset 74)



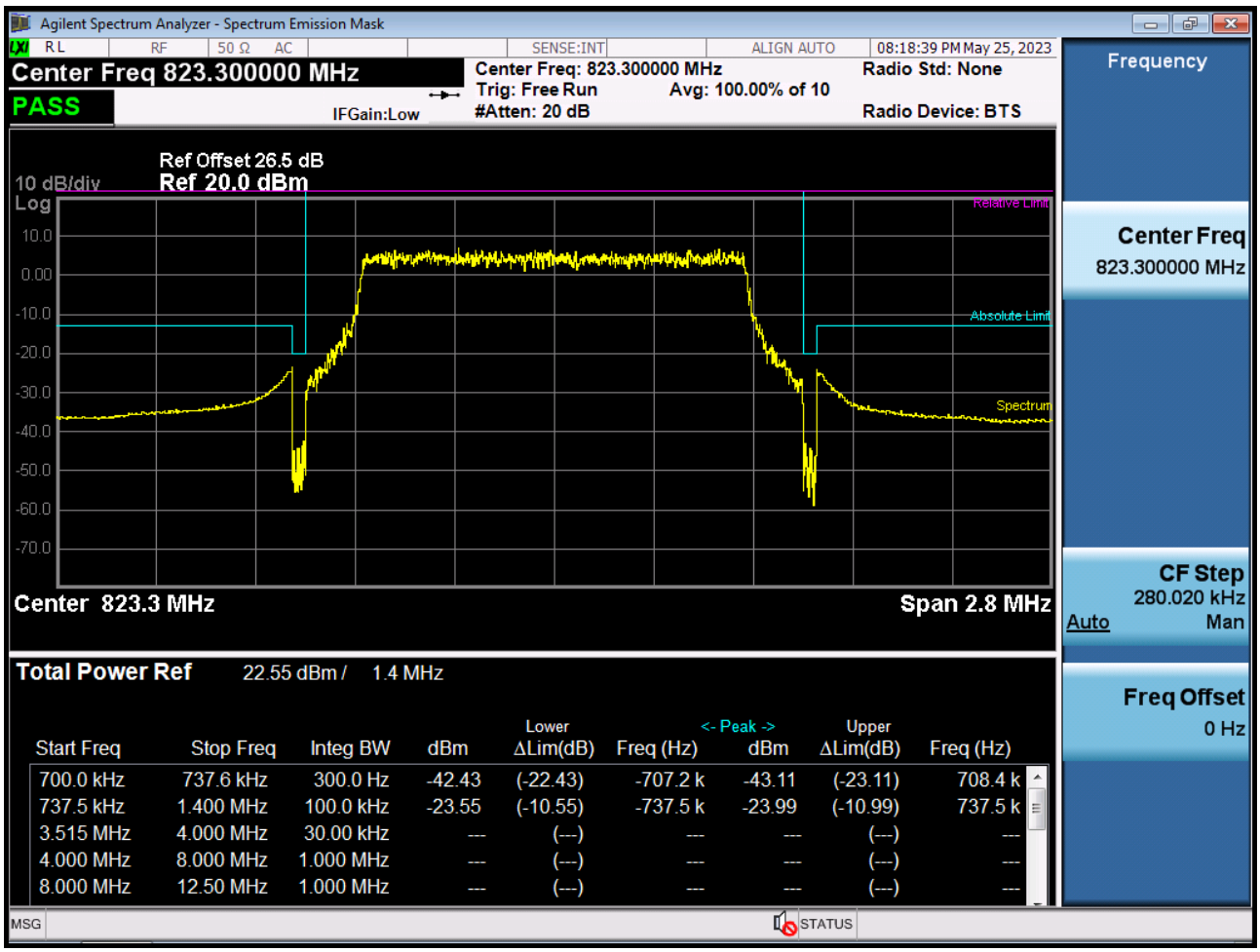
BAND 26. Mid Band Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset74)

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

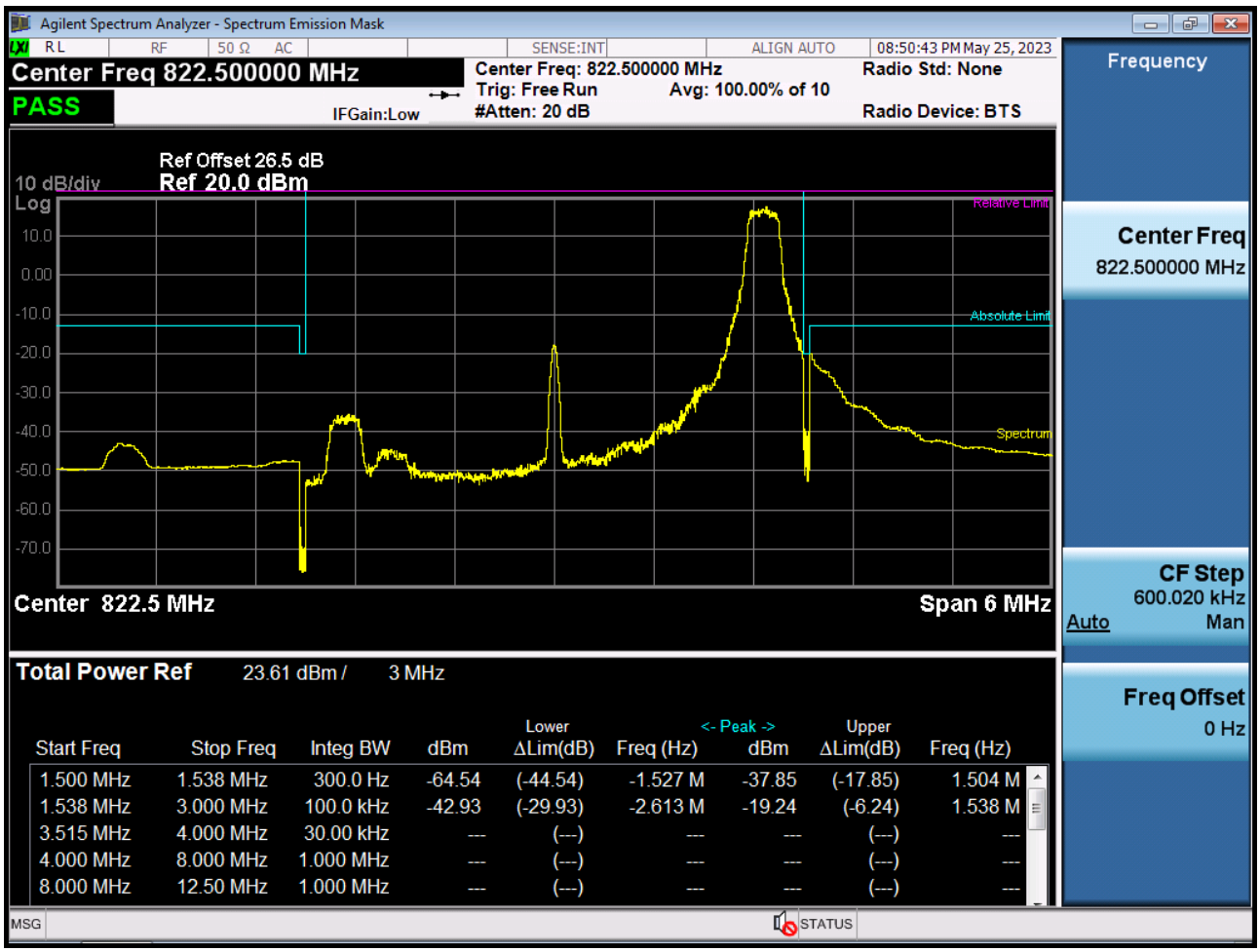
BAND 26. Upper Channel Edge Plot (1.4 M BW Ch.26783 QPSK_RB1_Offset 5)



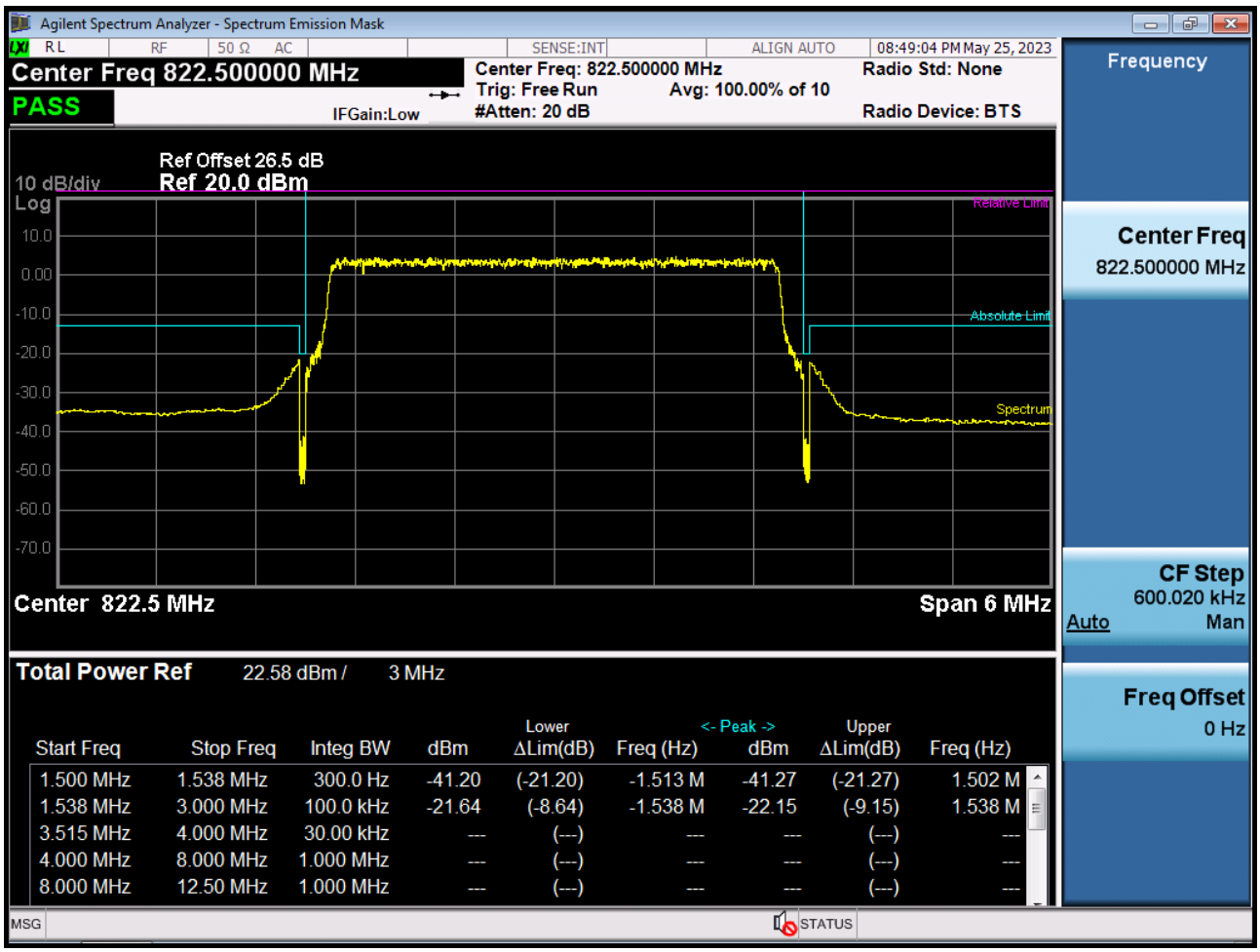
BAND 26. Upper Channel Edge Plot (1.4 M BW Ch.26783 QPSK_RB6_Offset 0)



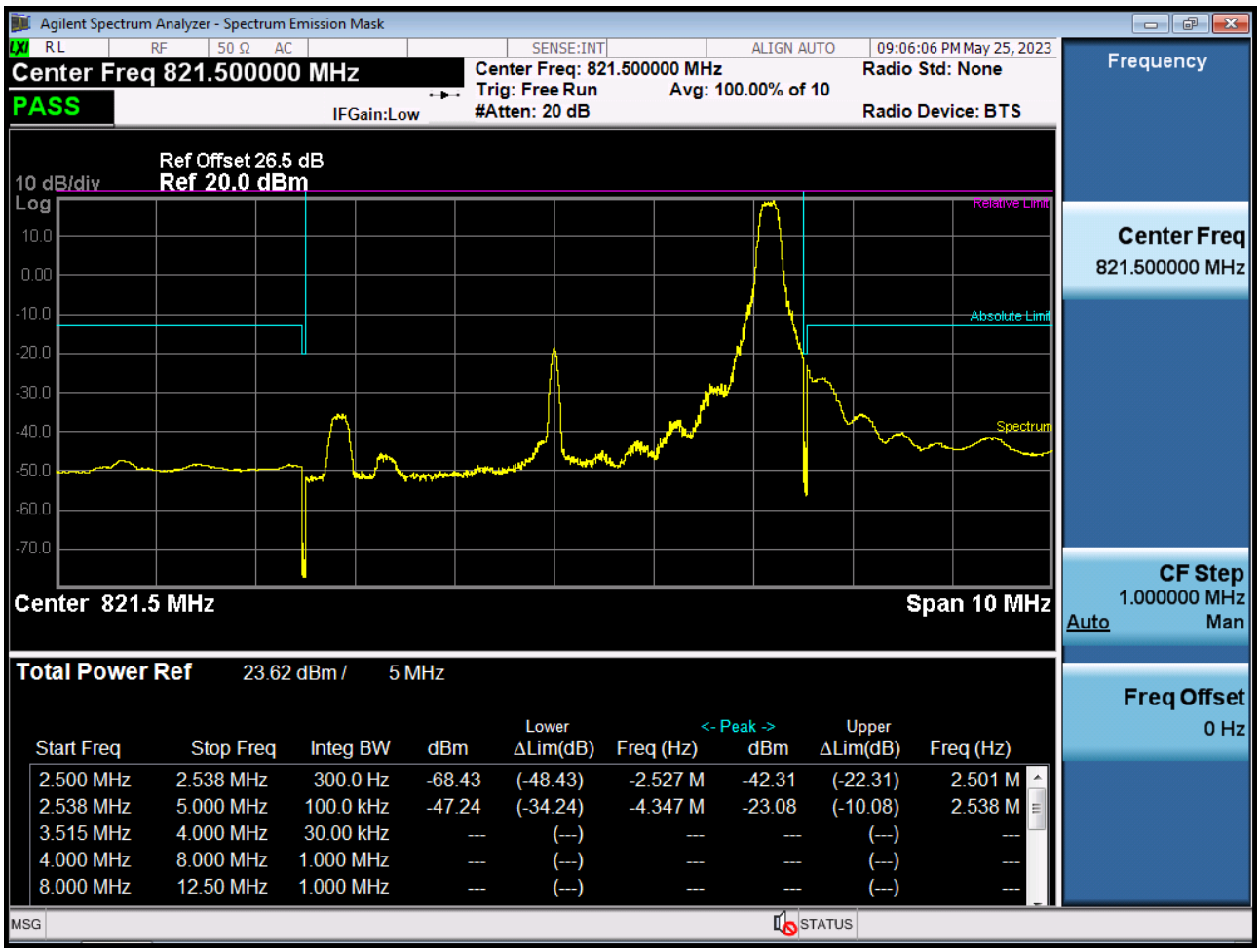
BAND 26. Upper Channel Edge Plot (3 M BW Ch.26775 QPSK_RB1_Offset 14)



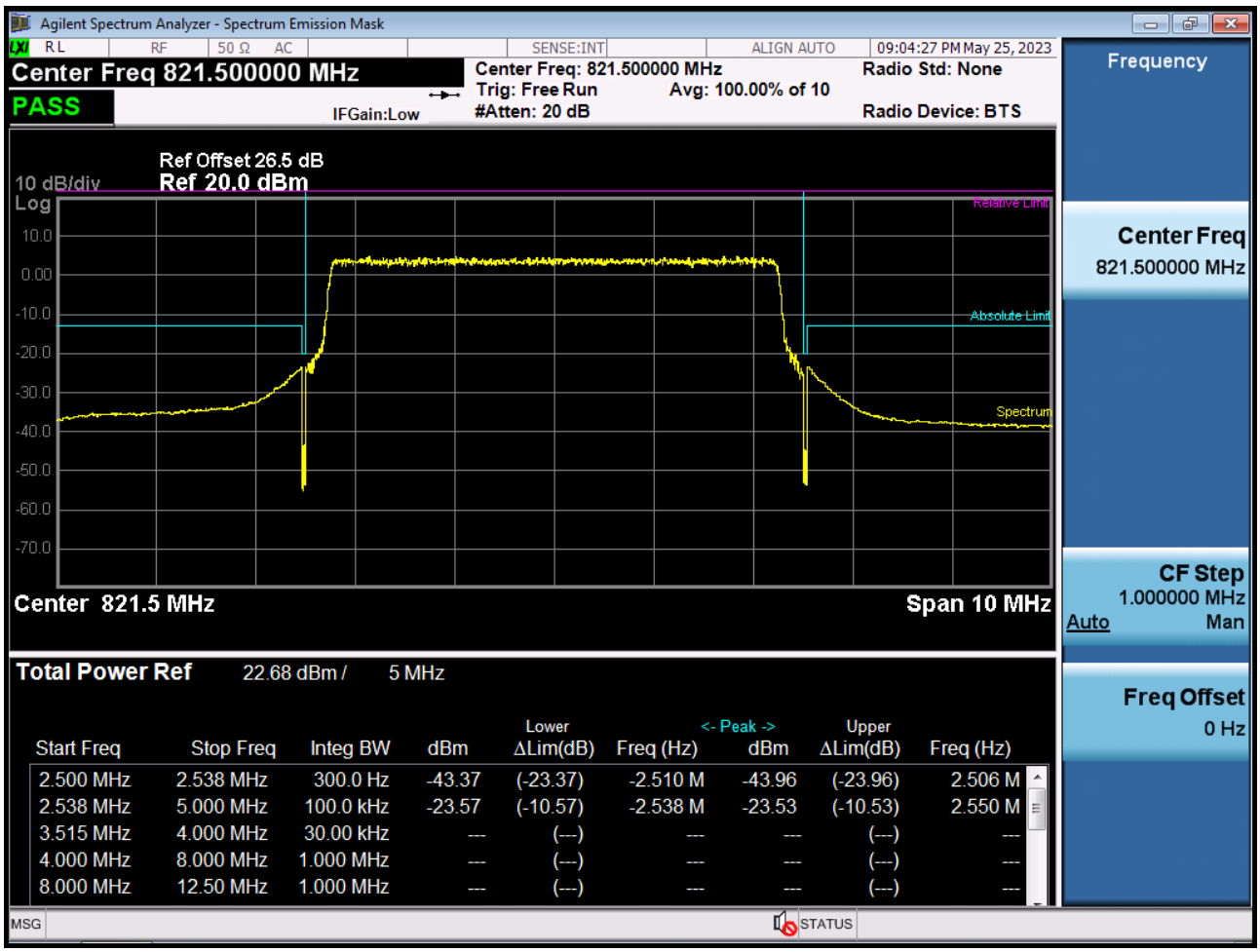
BAND 26. Upper Channel Edge Plot (3 M BW Ch.26775 QPSK_RB15_Offset 0)



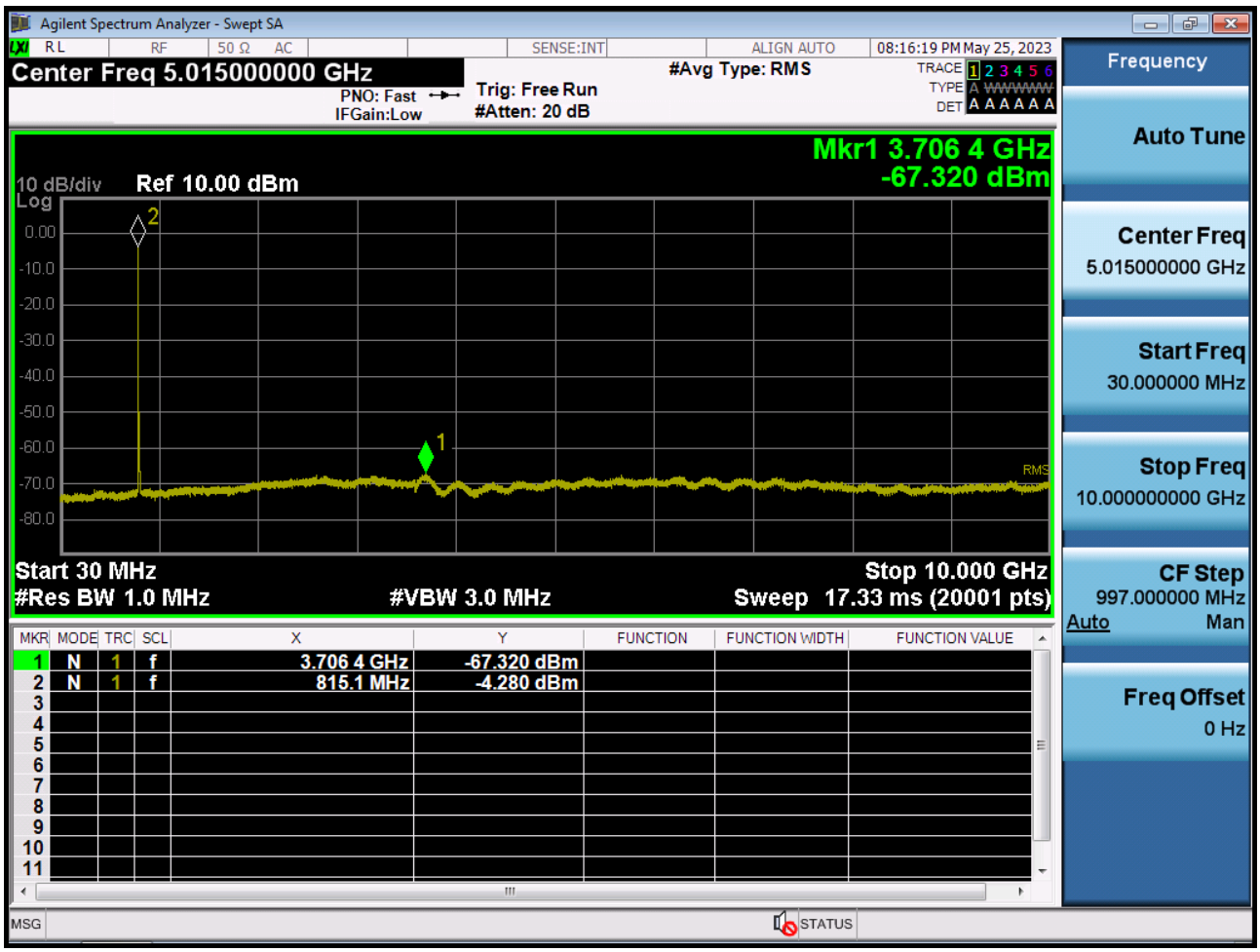
BAND 26. Upper Channel Edge Plot (5 M BW Ch.26765 QPSK_RB1_Offset 24)



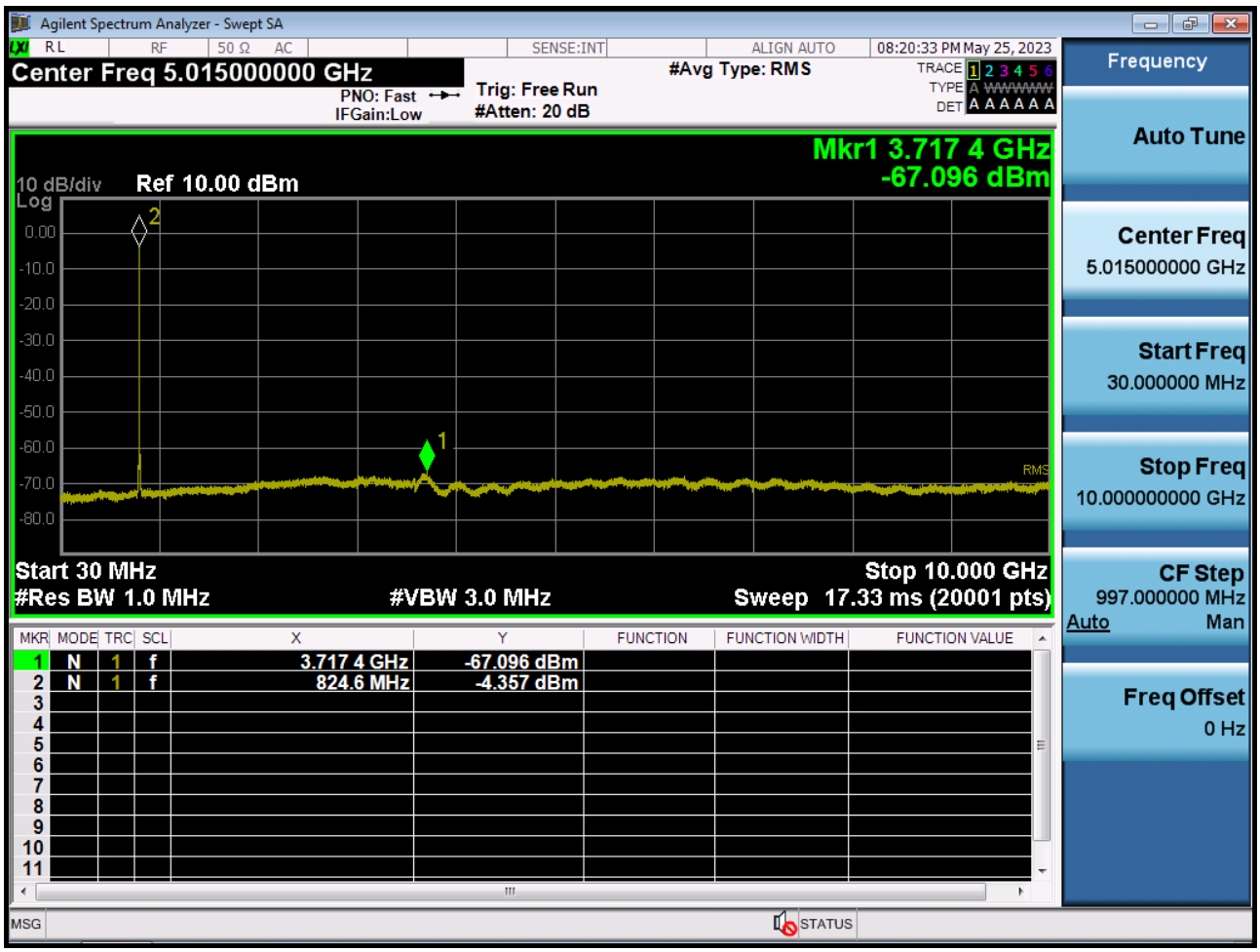
BAND 26. Upper Channel Edge Plot (5 M BW Ch.26765 QPSK_RB25_Offset 0)



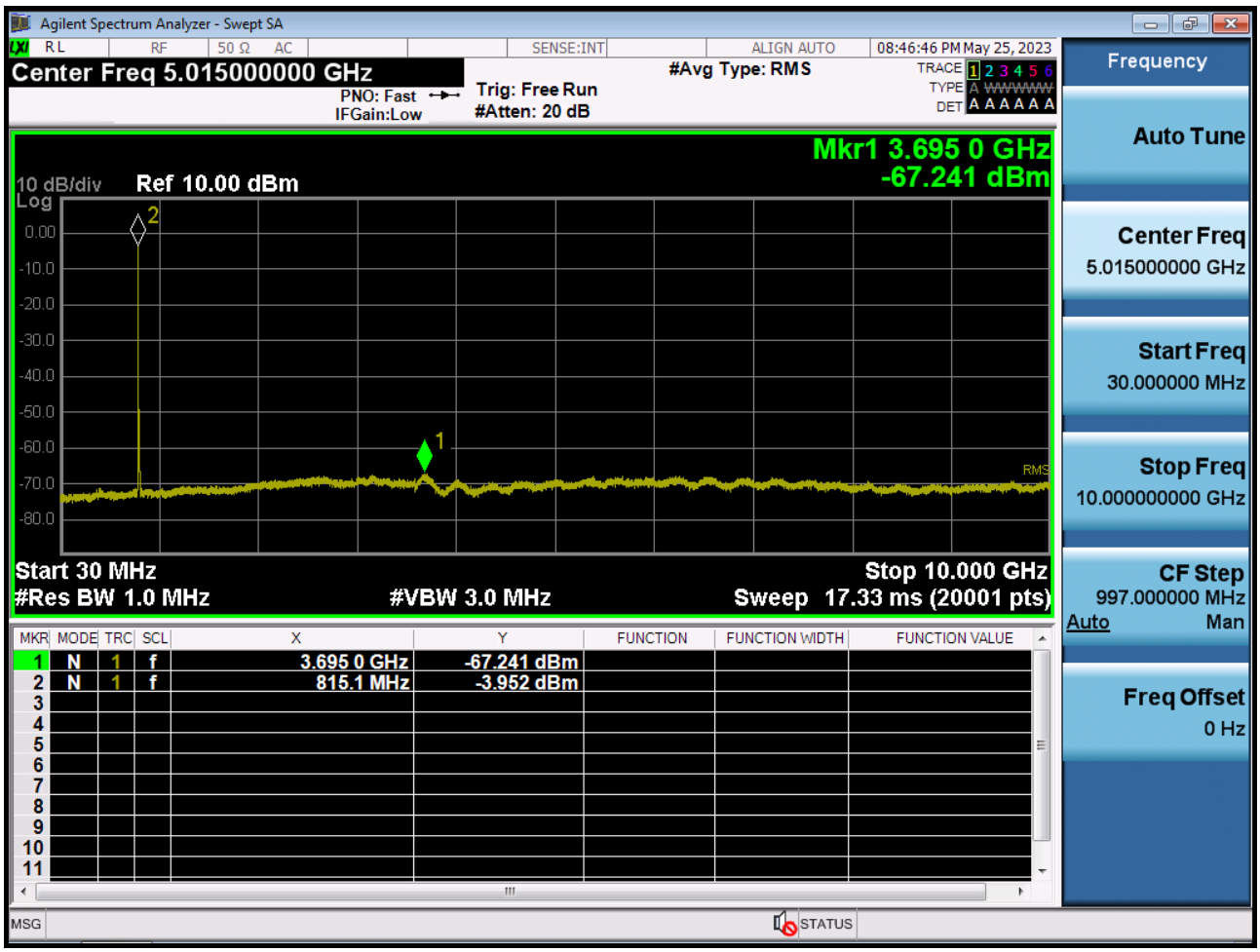
BAND 26. Conducted Spurious (26697 ch_1.4 MHz_QPSK_RB 1_0)



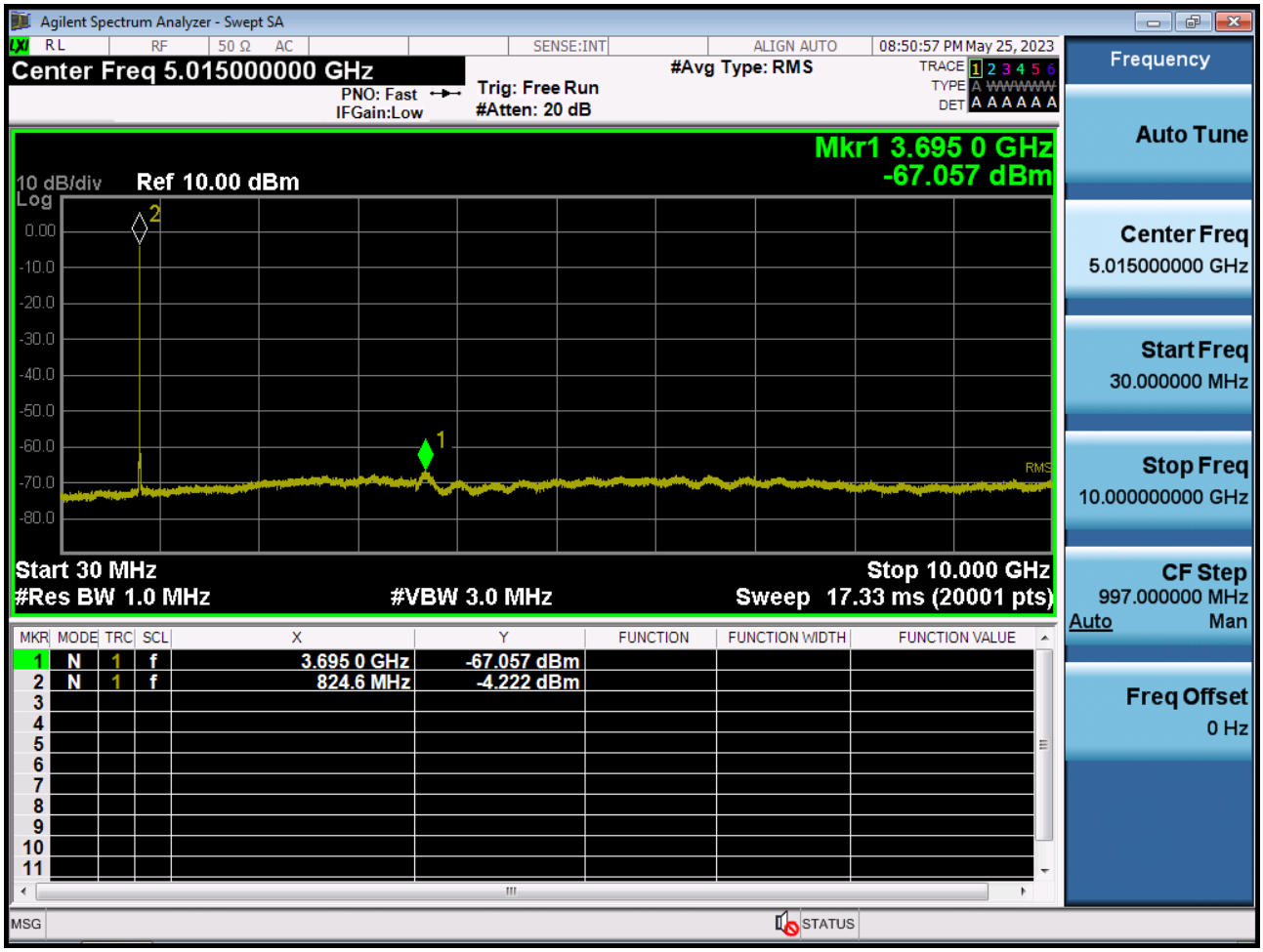
BAND 26. Conducted Spurious (26783 ch_1.4 MHz_QPSK_RB 1_0)



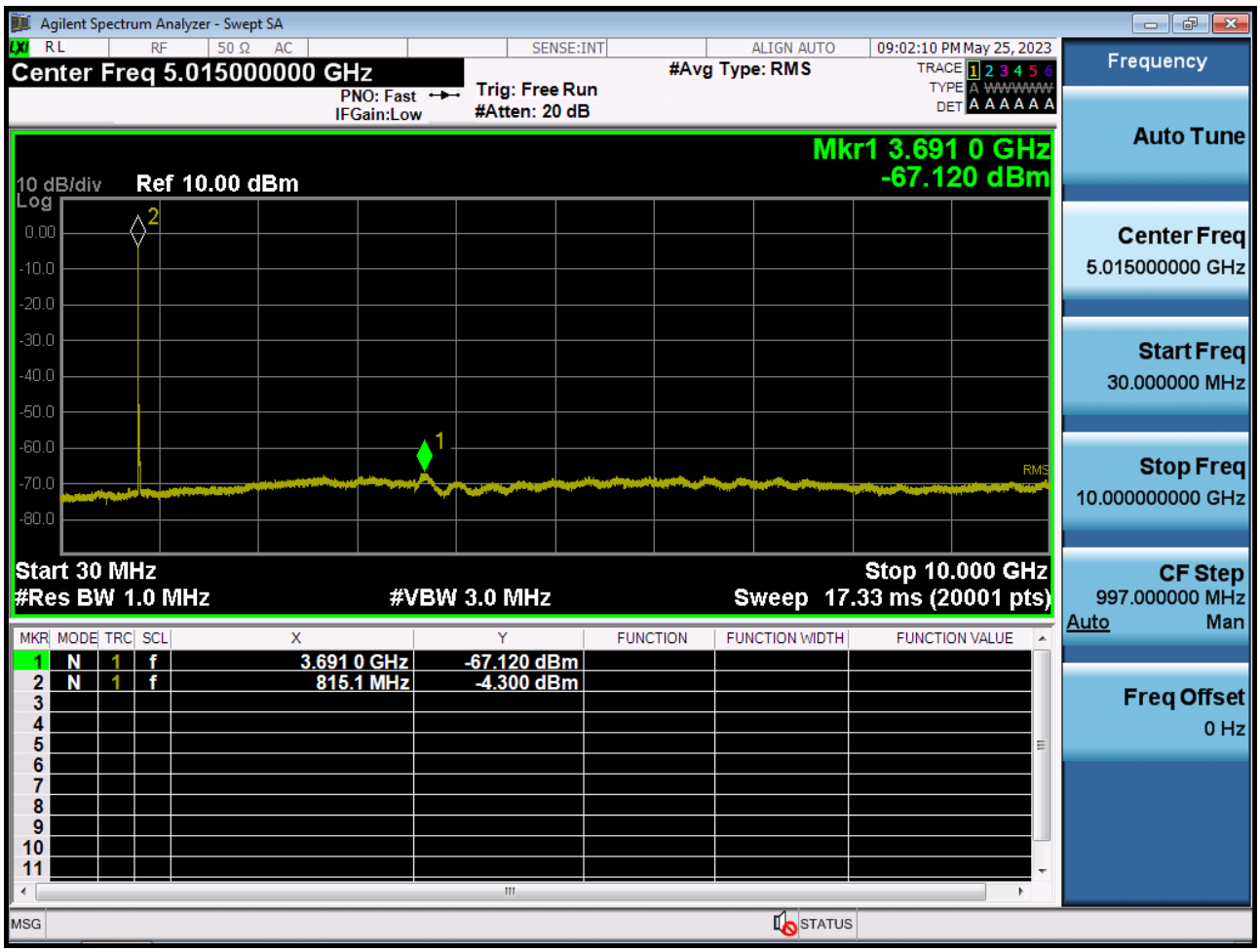
BAND 26. Conducted Spurious (26705 ch_3 MHz_QPSK_RB 1_0)



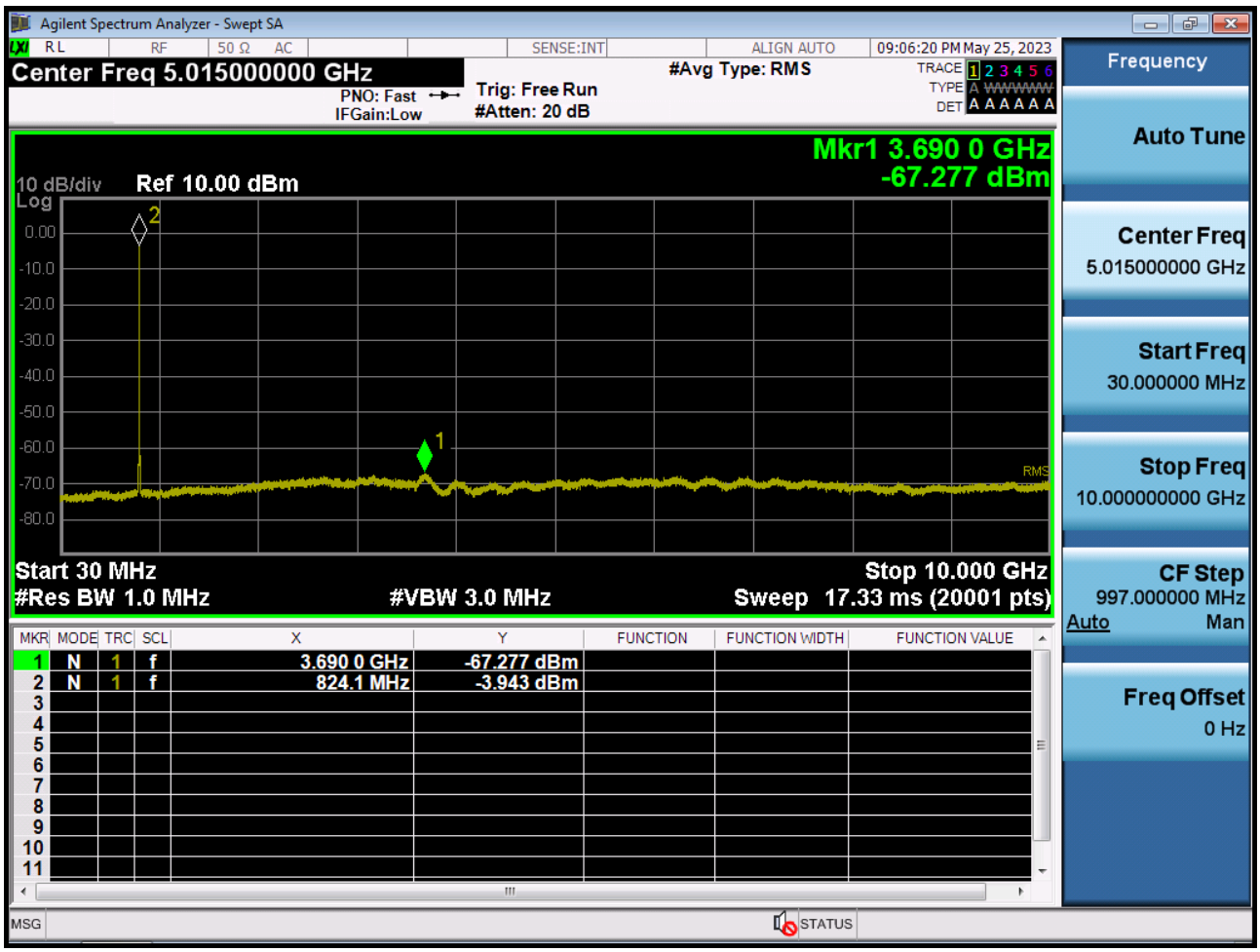
BAND 26. Conducted Spurious (26775 ch_3 MHz_QPSK_RB 1_0)



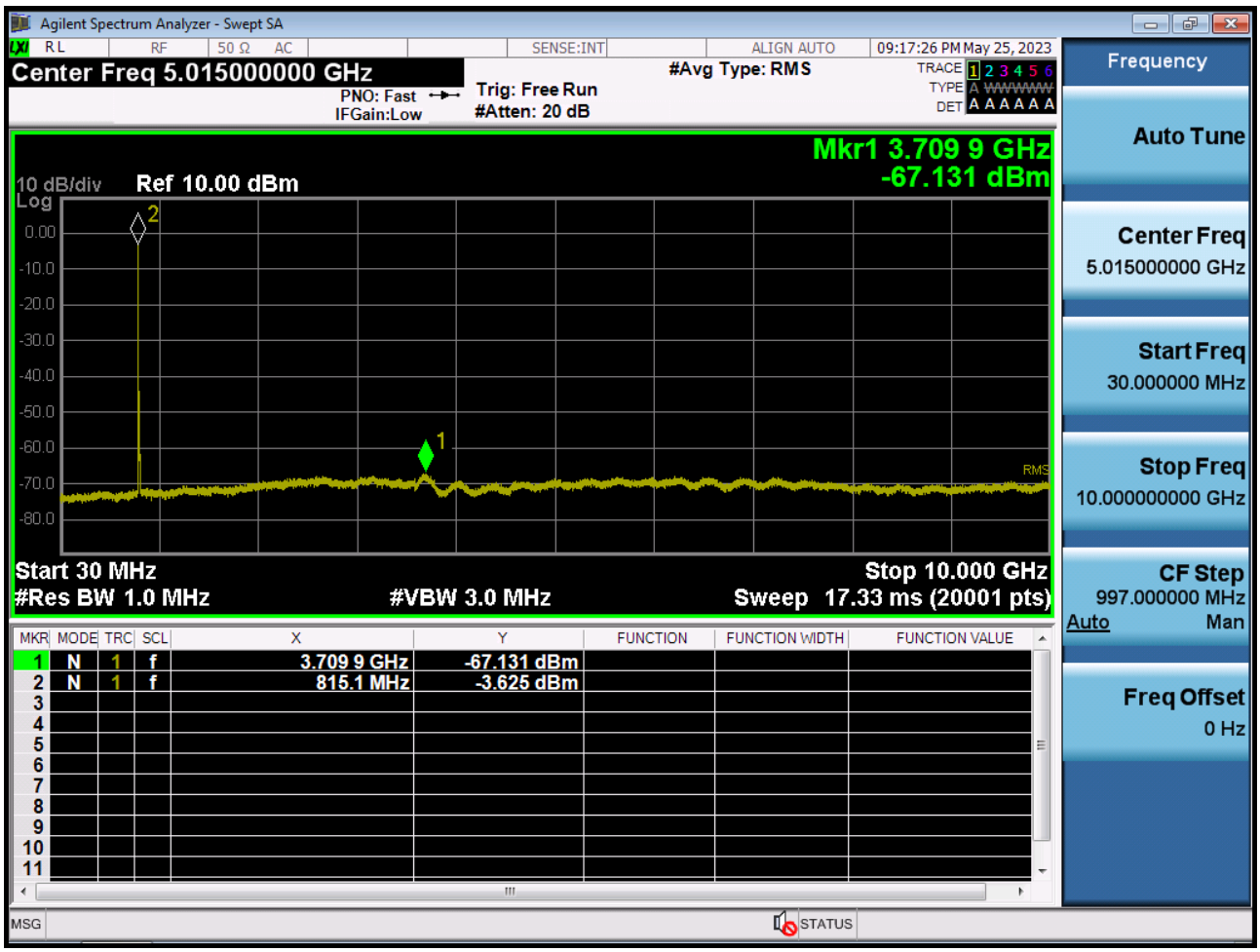
BAND 26. Conducted Spurious (26715 ch_5 MHz_QPSK_RB 1_0)



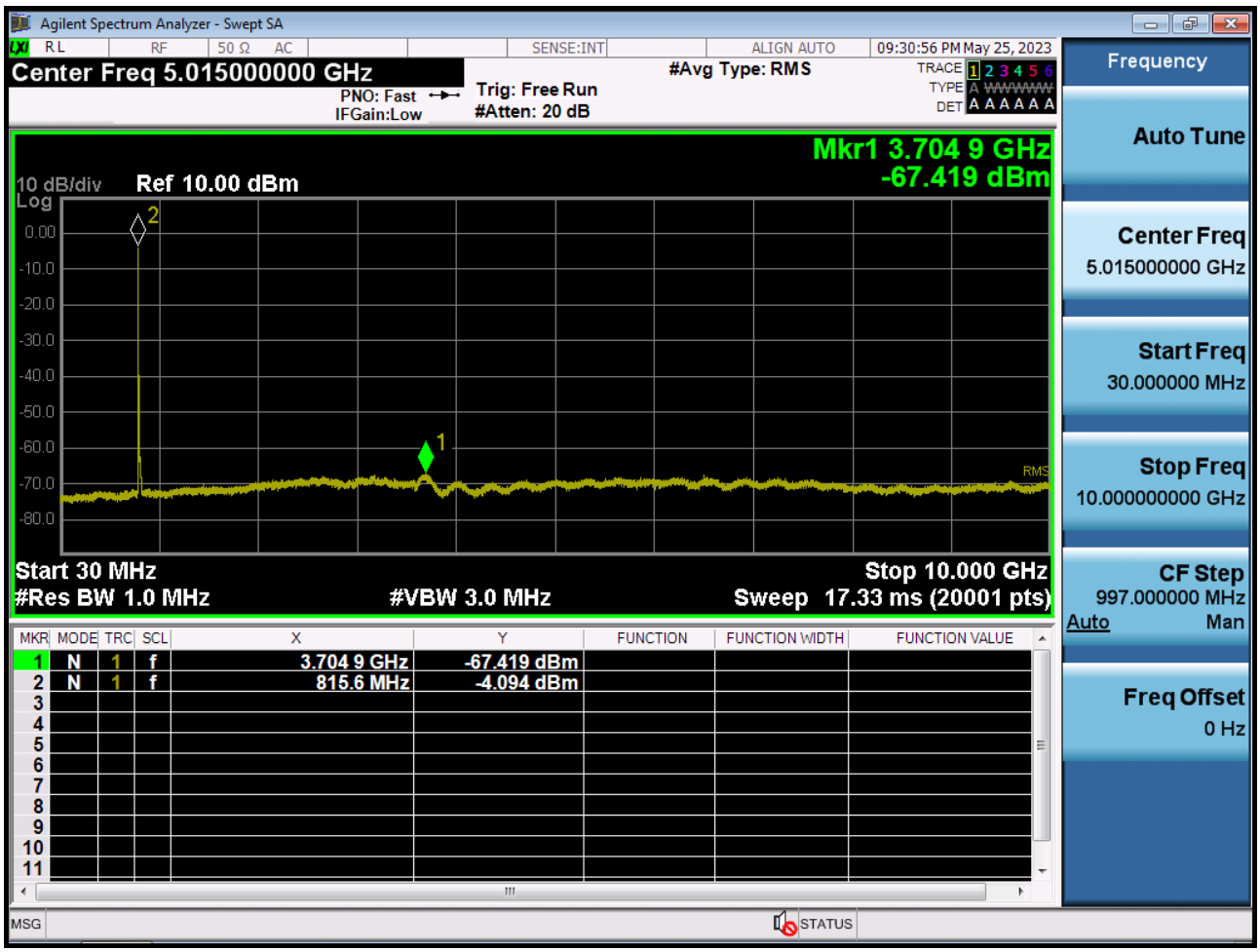
BAND 26. Conducted Spurious (26765 ch_5 MHz_QPSK_RB 1_0)



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

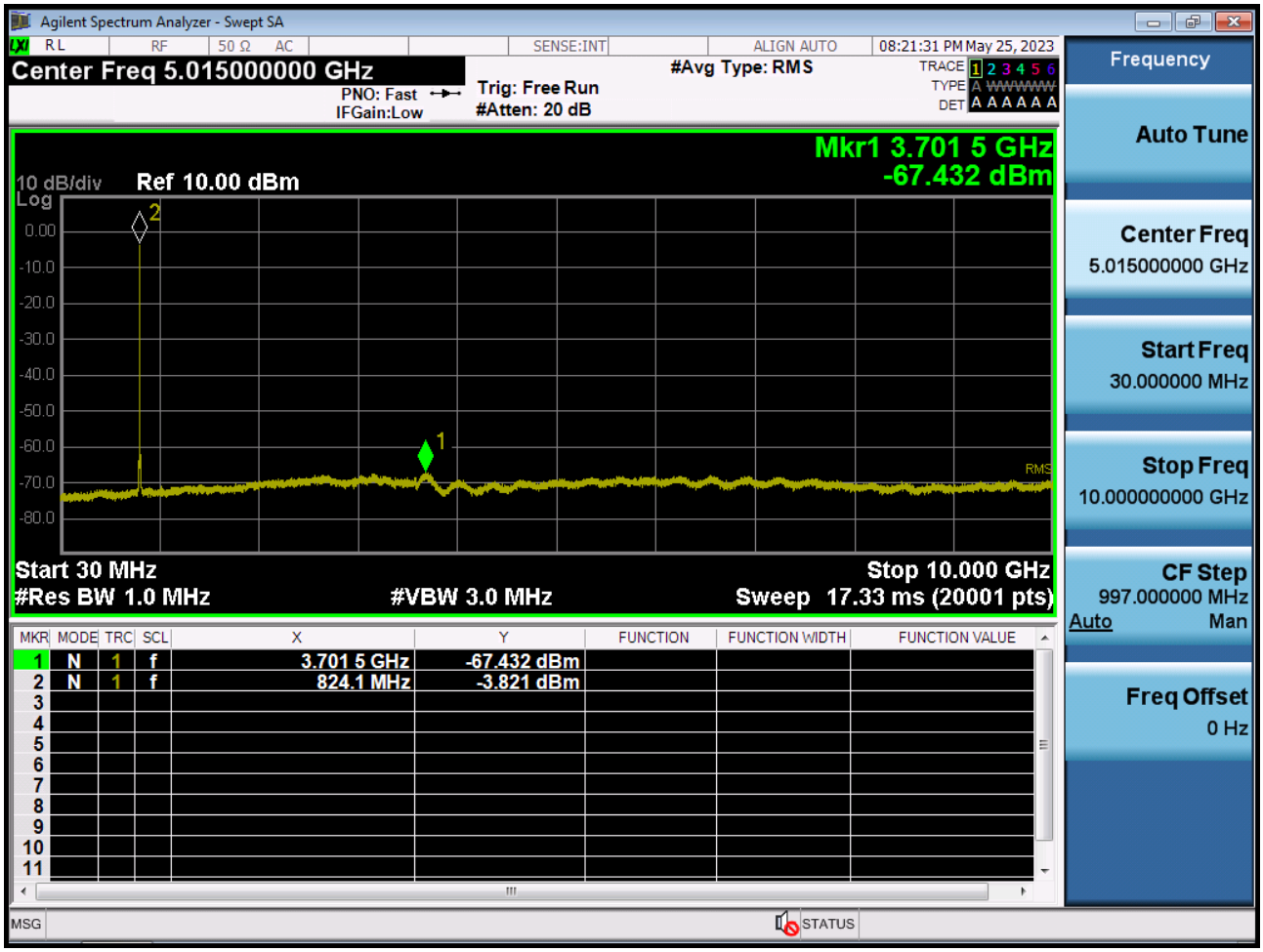


BAND 26. Conducted Spurious (26765 ch_15 MHz_QPSK_RB 1_0)

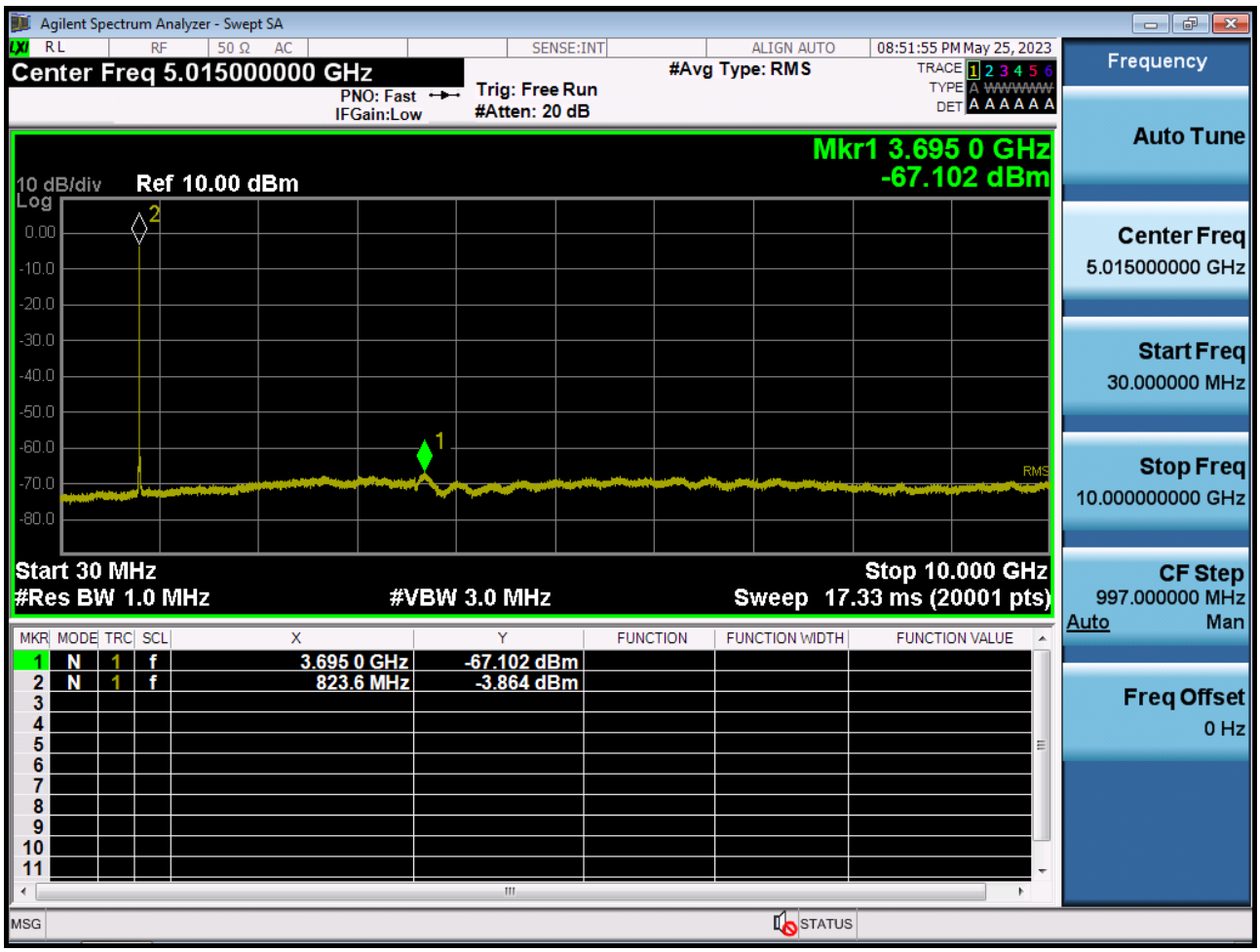


10. TEST PLOTS (STRADDLE CHANNEL)

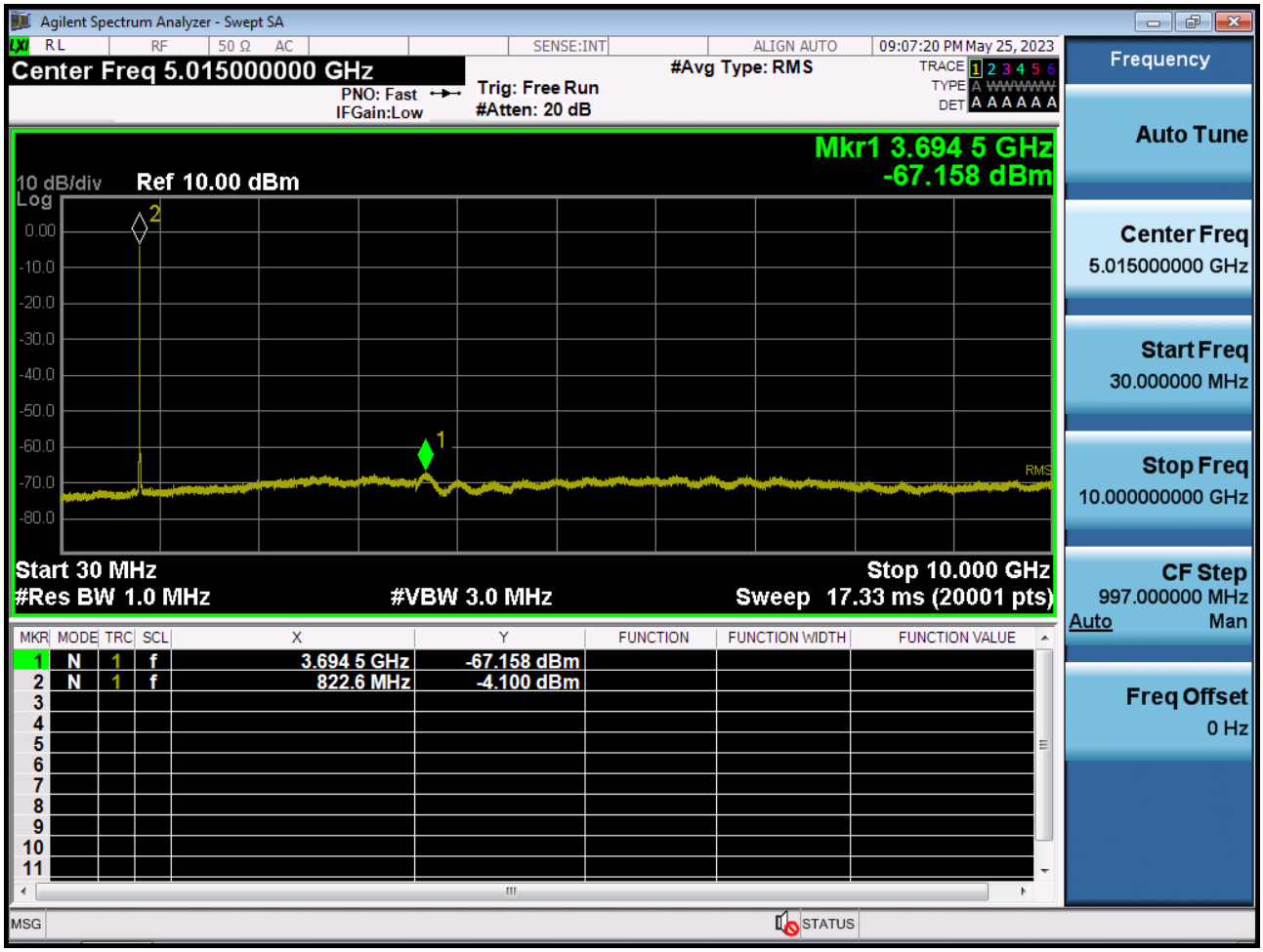
BAND 26. Conducted Spurious (1.4 MHz_QPSK_RB 1_0)



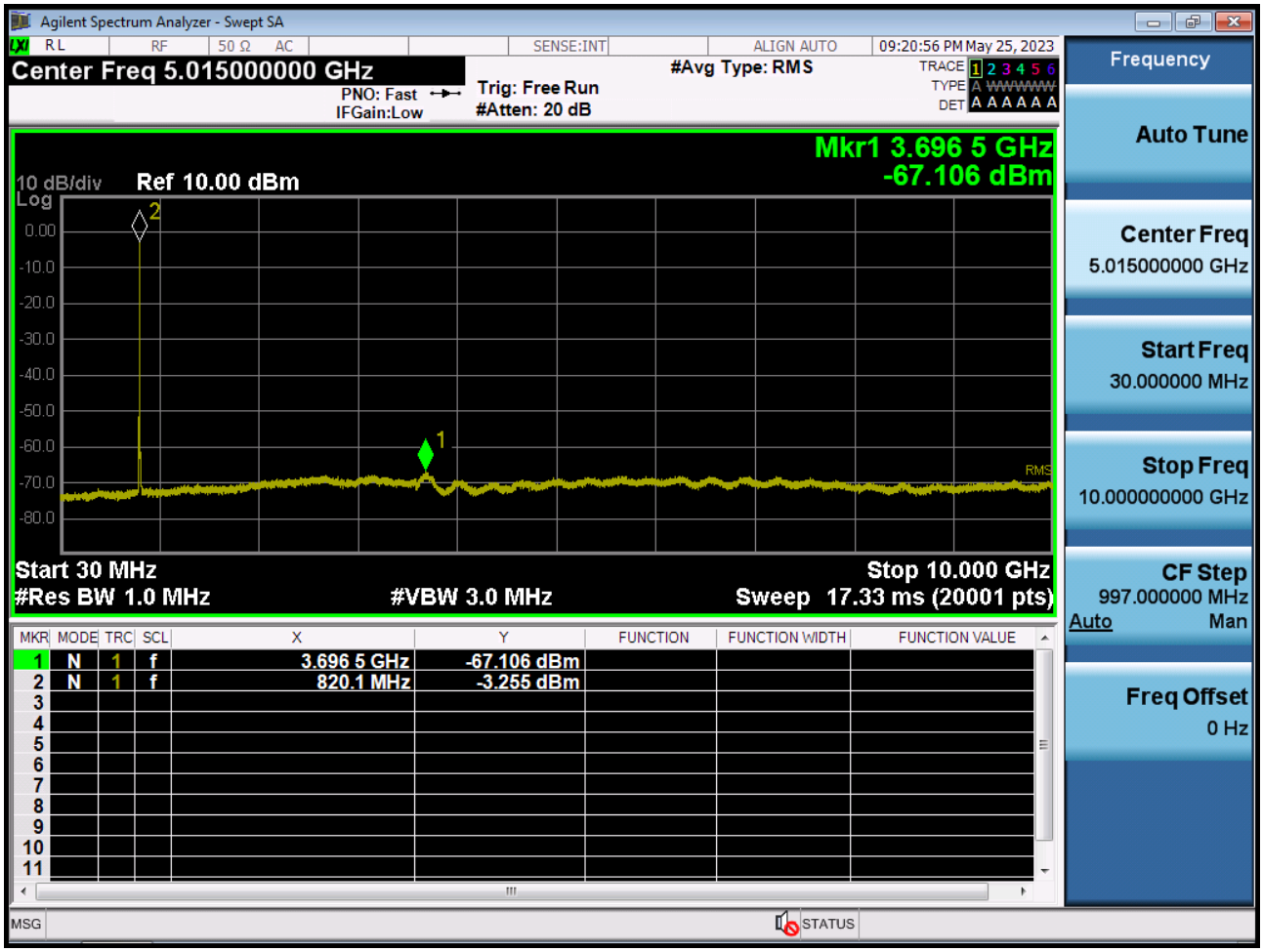
BAND 26. Conducted Spurious (3 MHz_QPSK_RB 1_0)



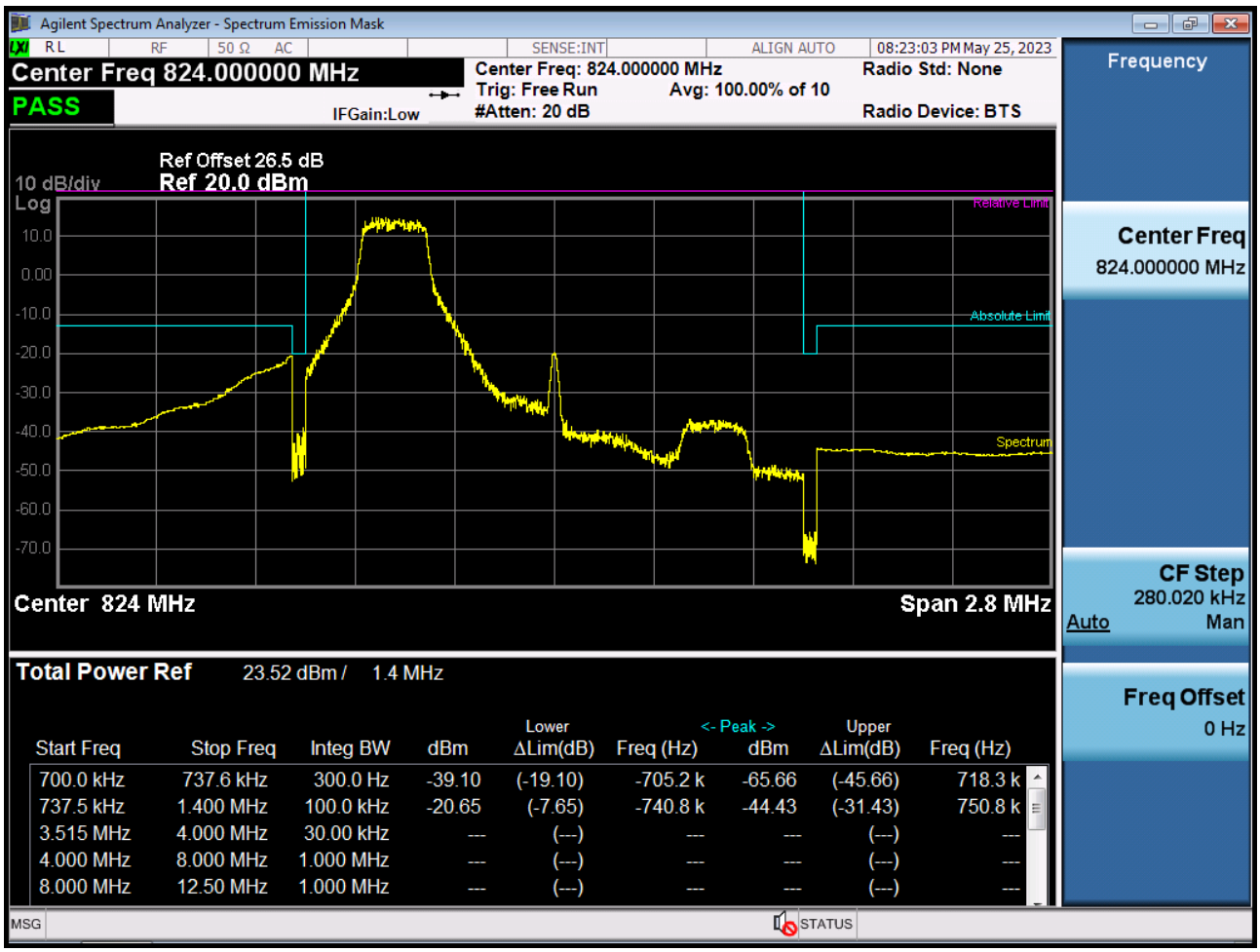
BAND 26. Conducted Spurious (5 MHz_QPSK_RB 1_0)



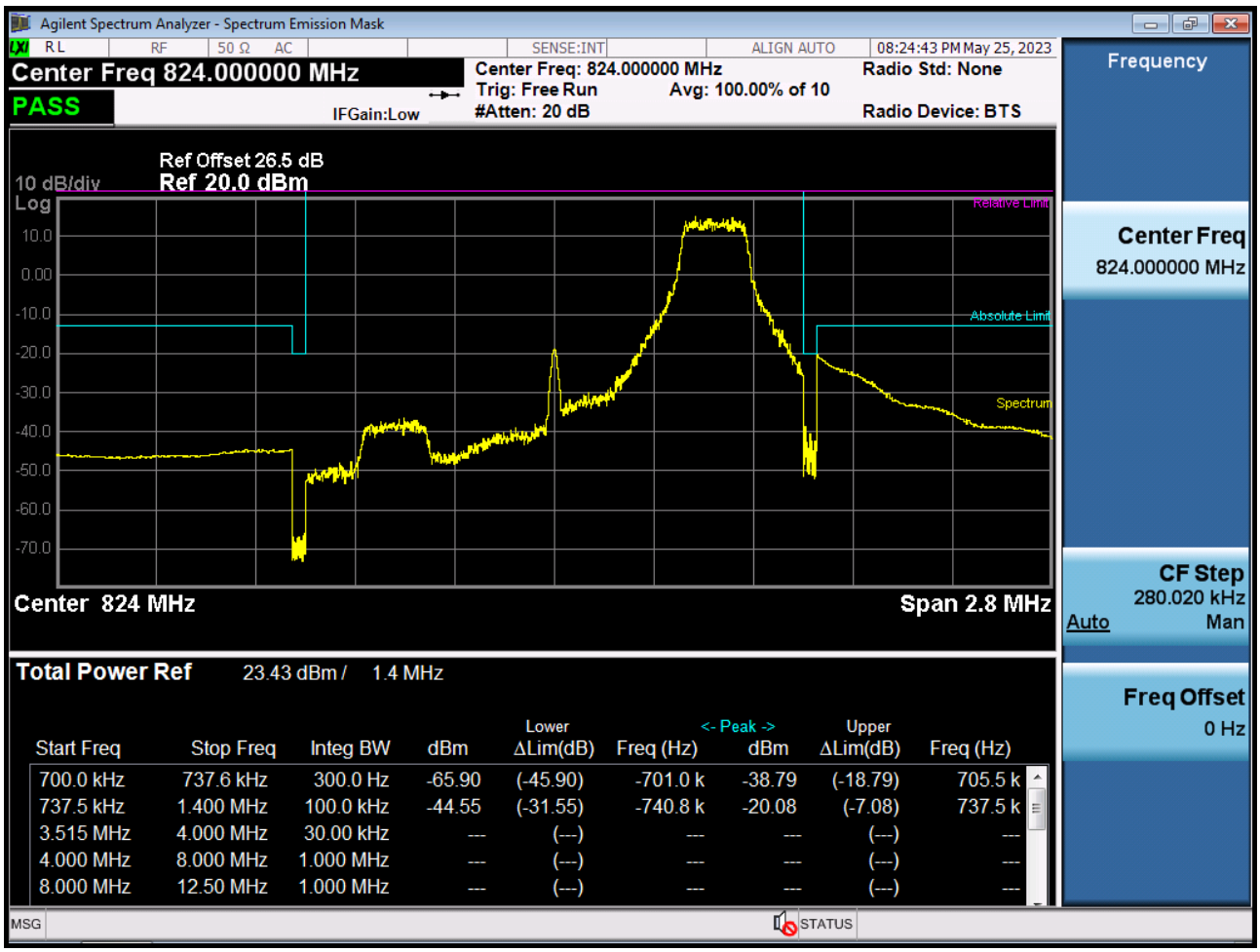
BAND 26. Conducted Spurious (10 MHz_QPSK_RB 1_0)



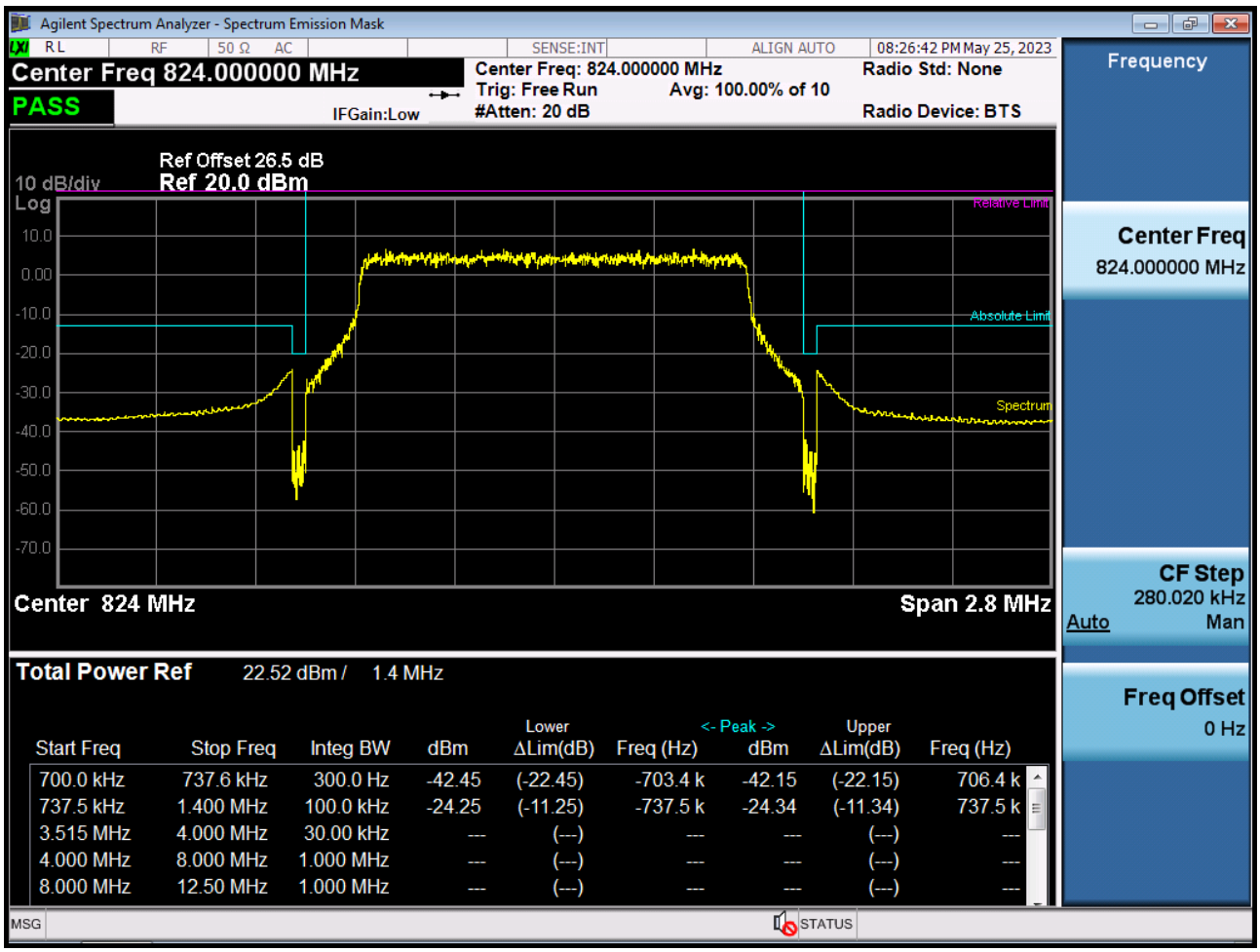
BAND 26. Channel Edge (1.4 MHz_QPSK_RB 1_0)



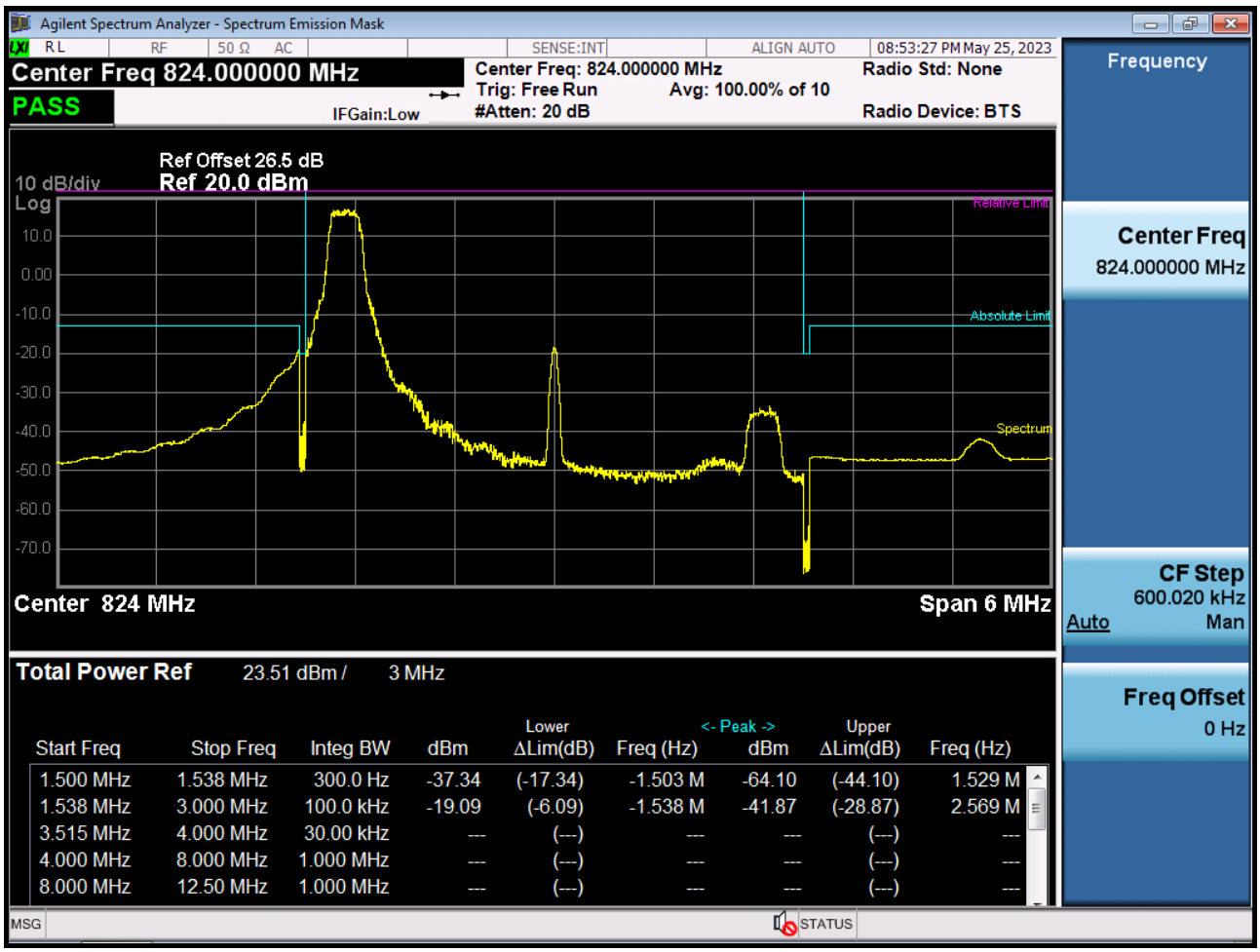
BAND 26. Channel Edge (1.4 MHz_QPSK_RB 1_5)



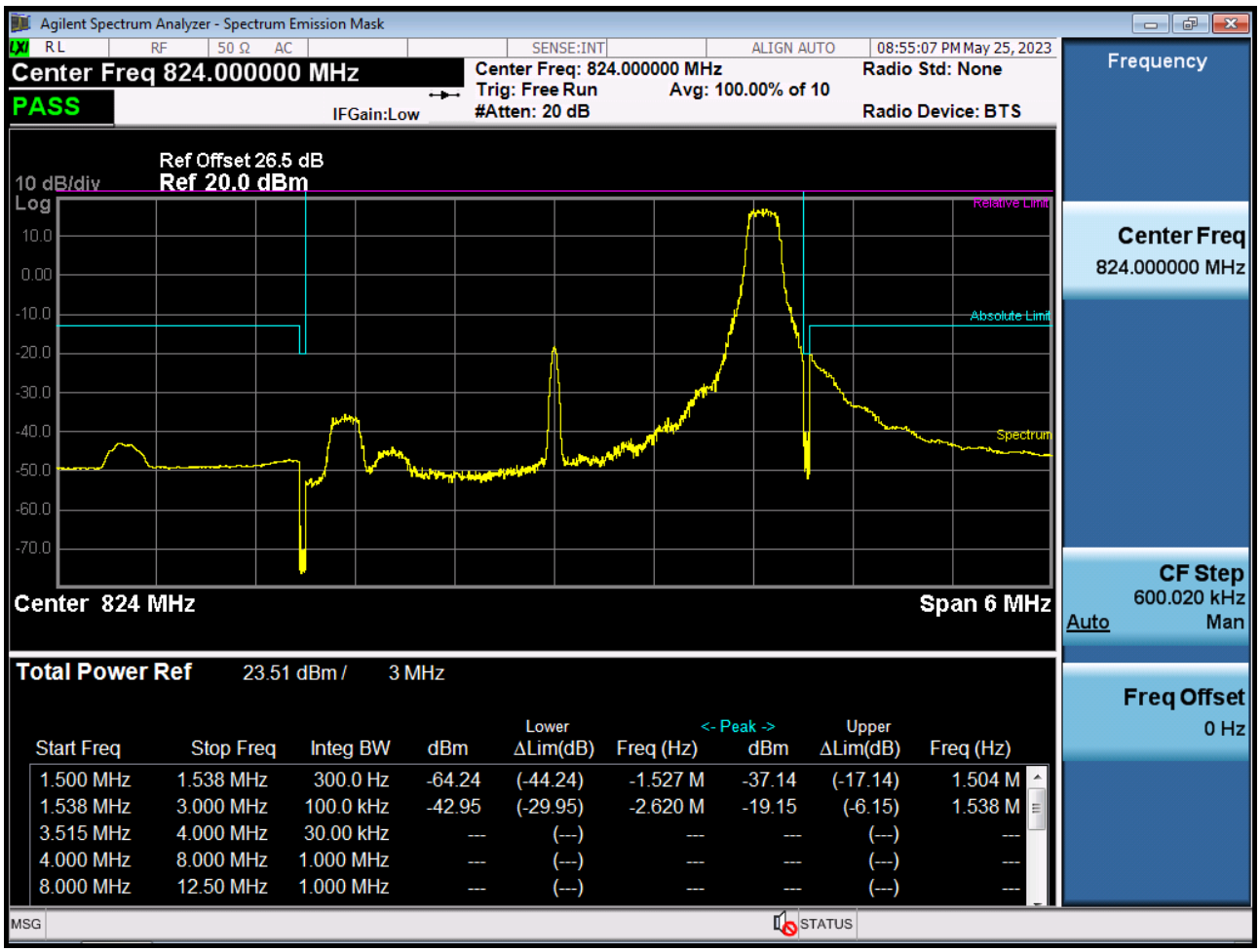
BAND 26. Channel Edge (1.4 MHz_QPSK_Full RB)



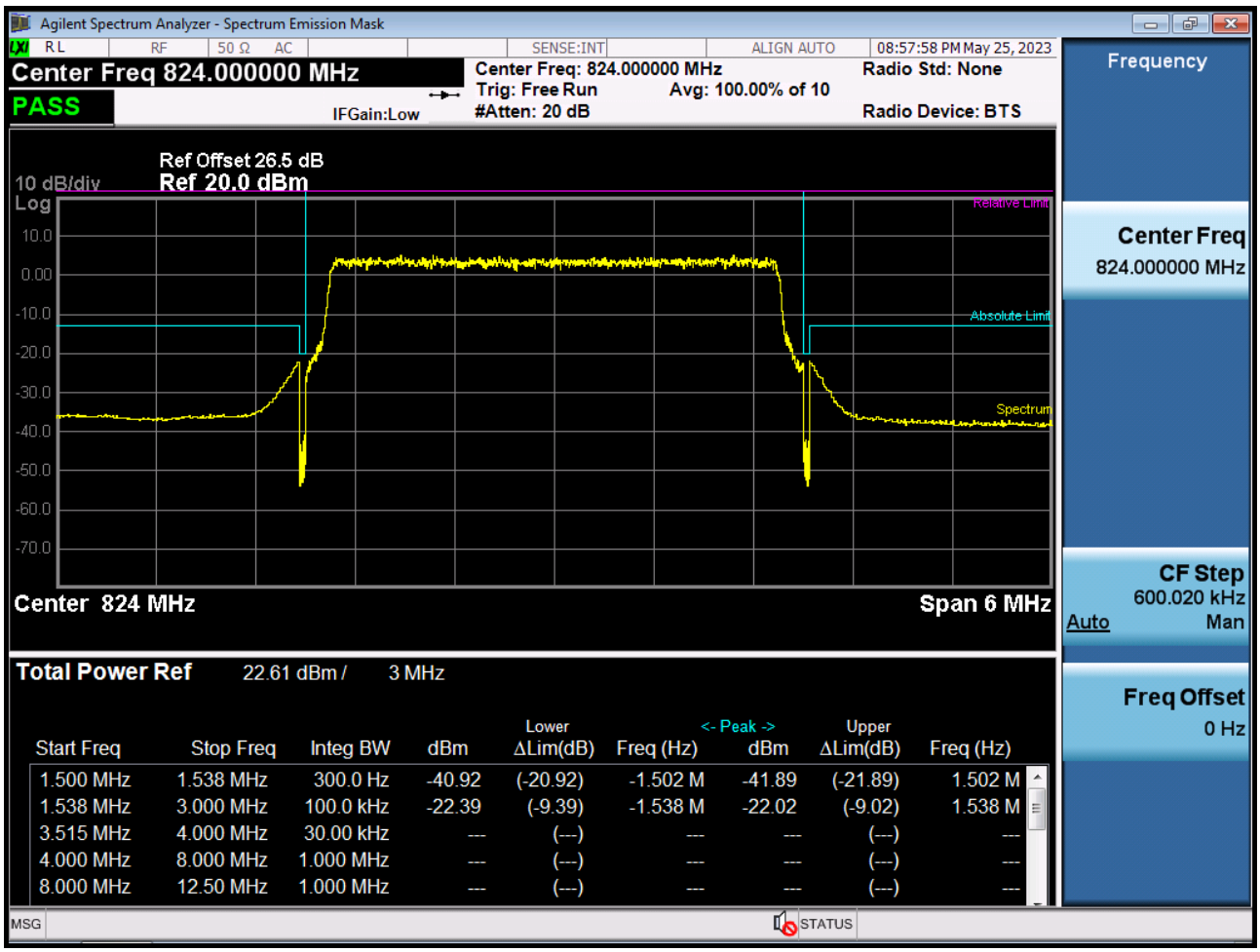
BAND 26. Channel Edge (3 MHz_QPSK_RB 1_0)



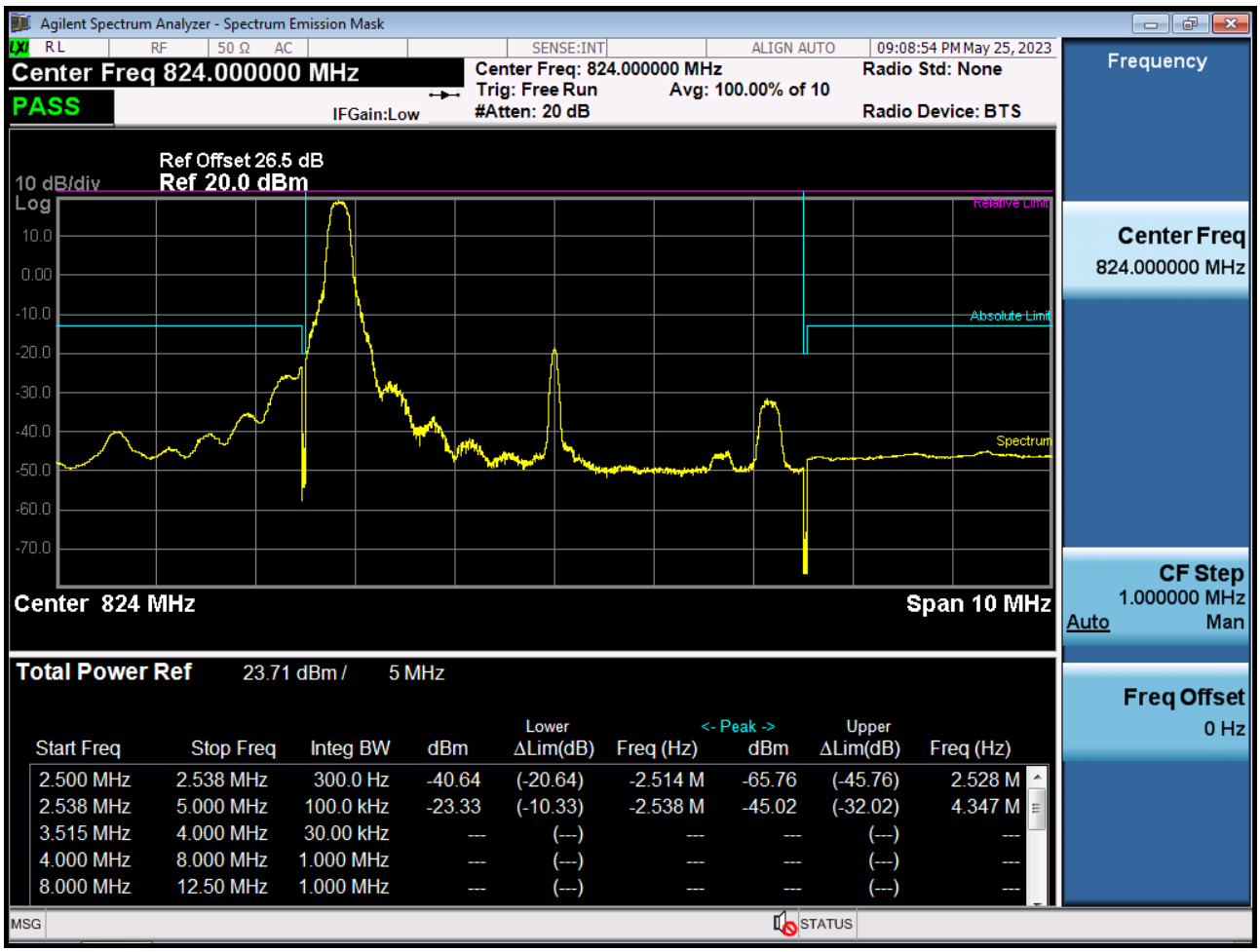
BAND 26. Channel Edge (3 MHz_QPSK_RB 1_14)



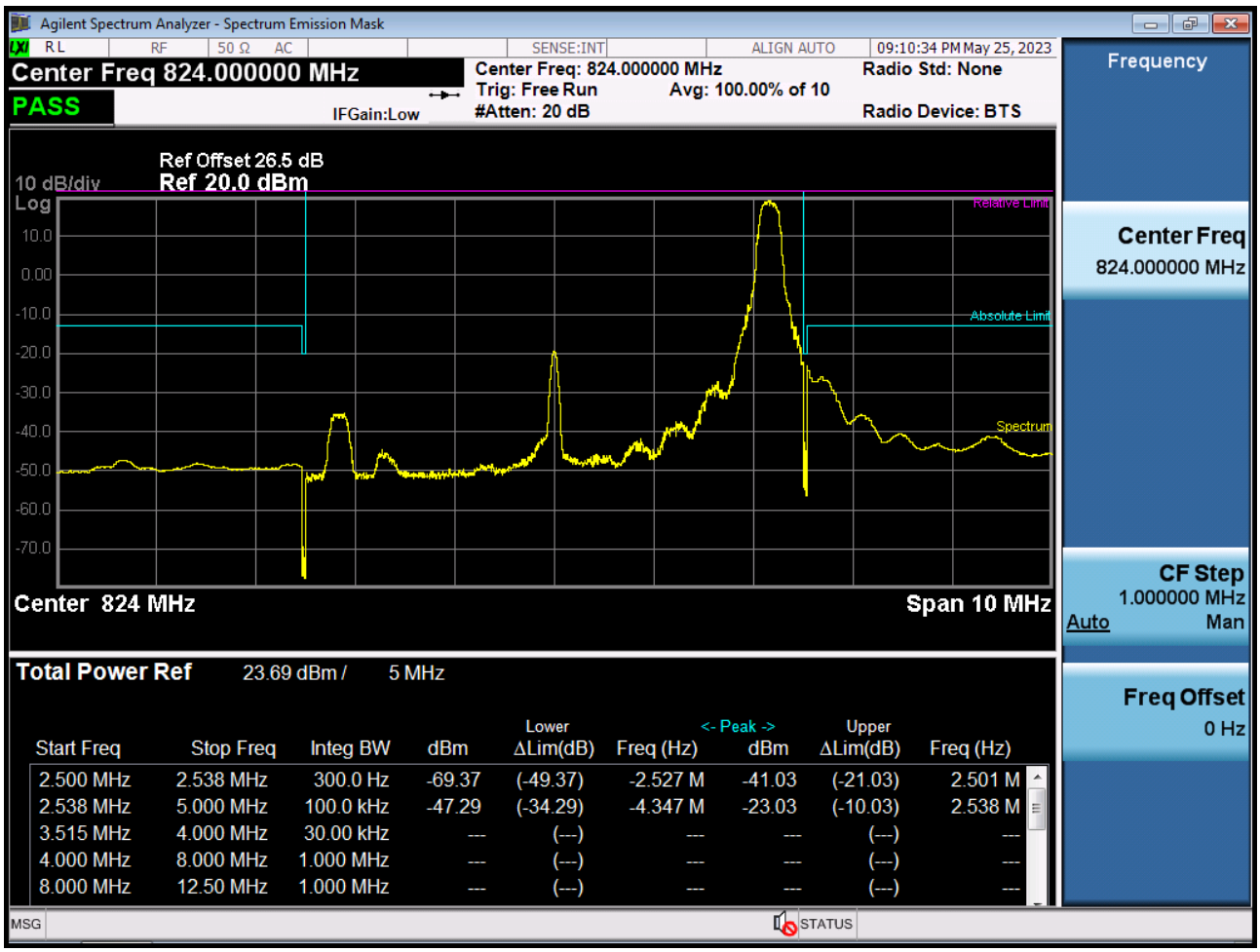
BAND 26. Channel Edge (3 MHz_QPSK_Full RB)



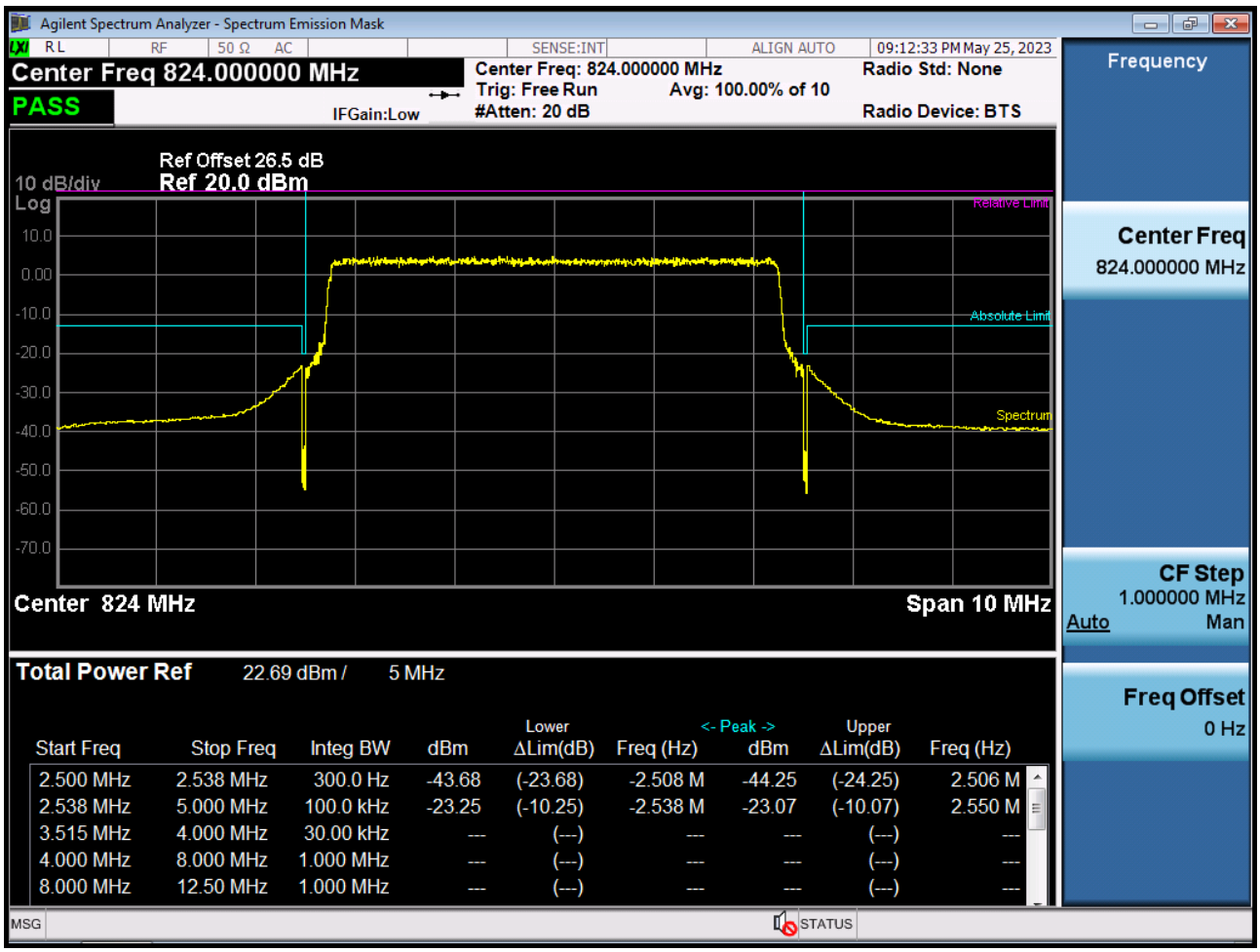
BAND 26. Channel Edge (5 MHz_QPSK_RB 1_0)



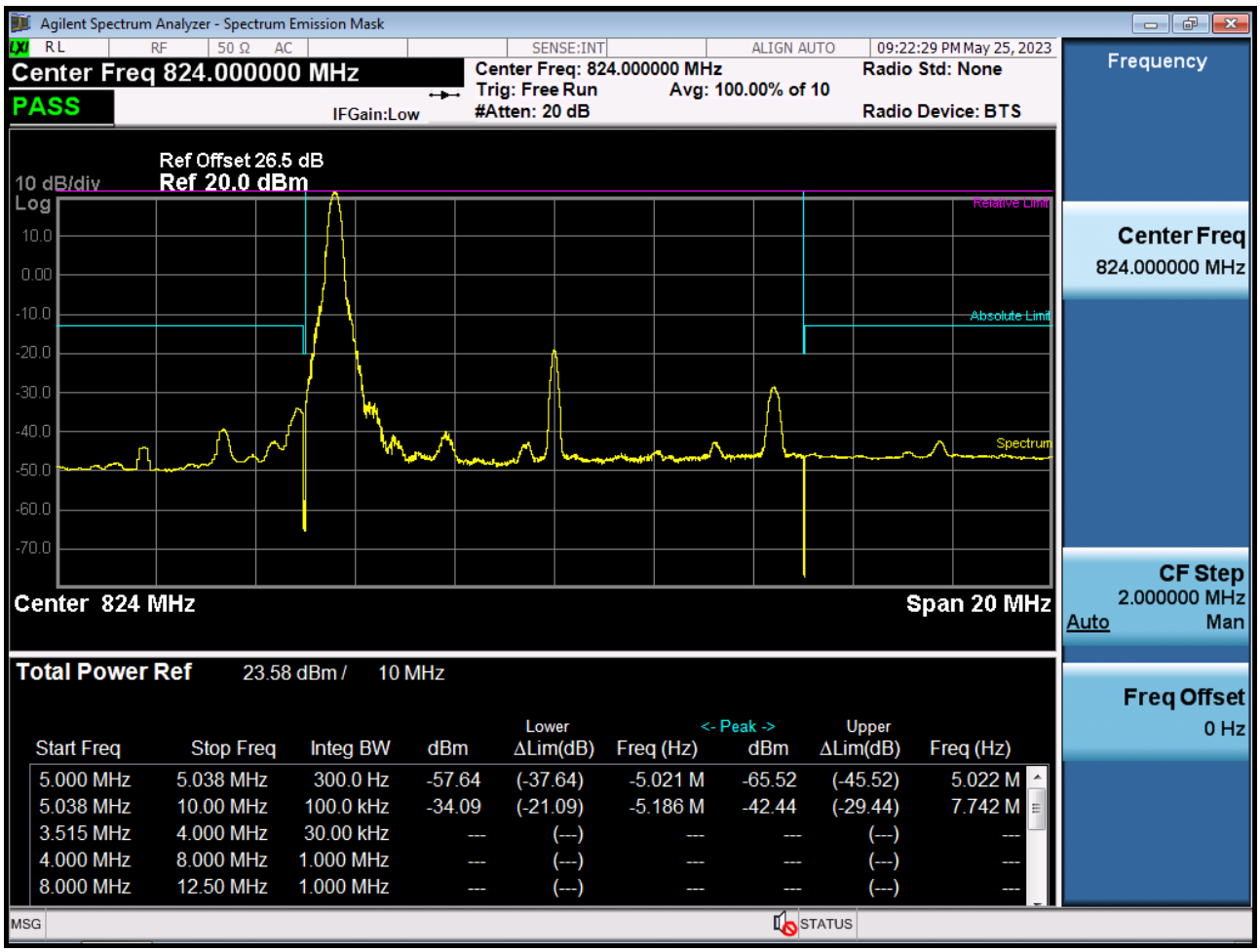
BAND 26. Channel Edge (5 MHz_QPSK_RB 1_24)



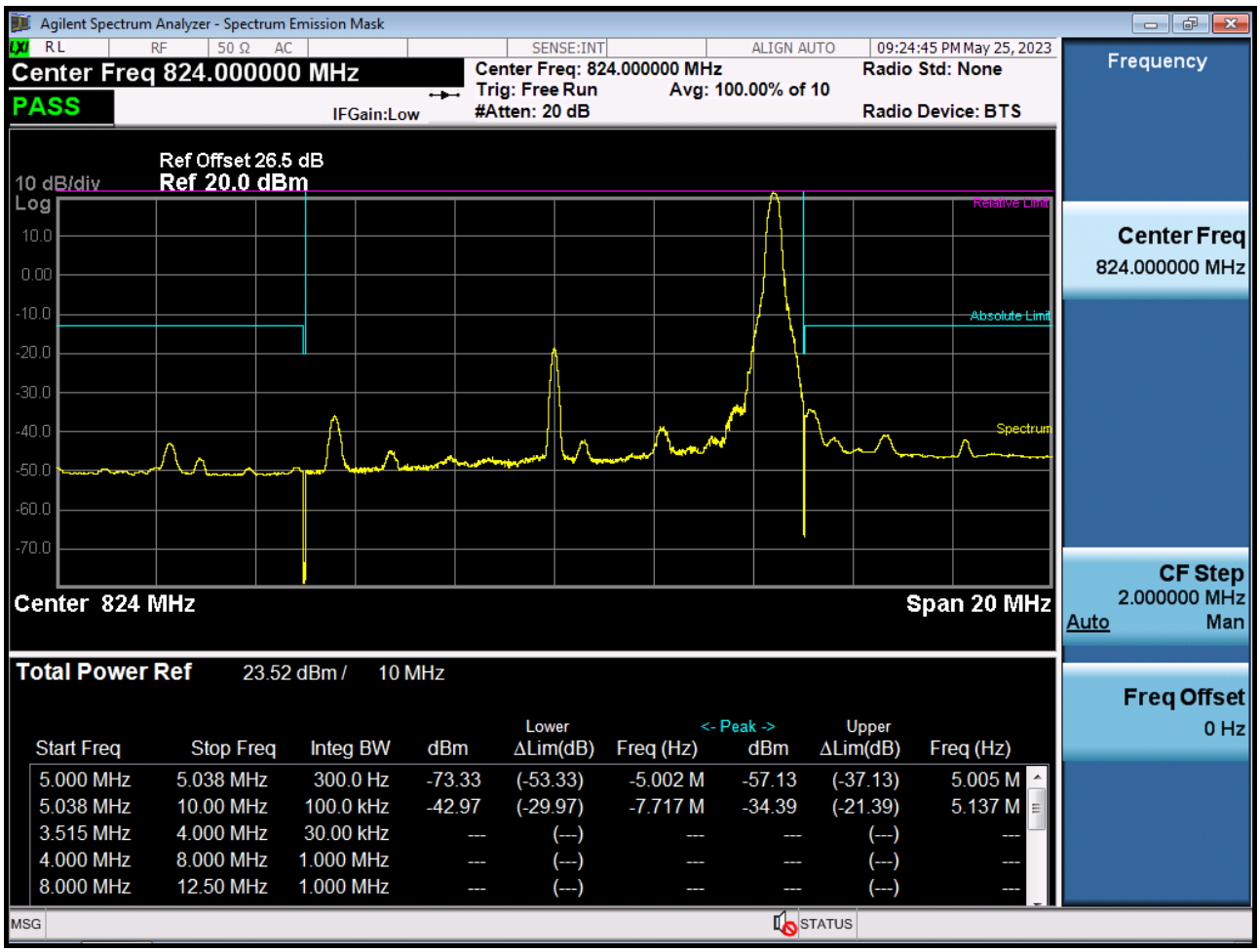
BAND 26. Channel Edge (5 MHz_QPSK_Full RB)



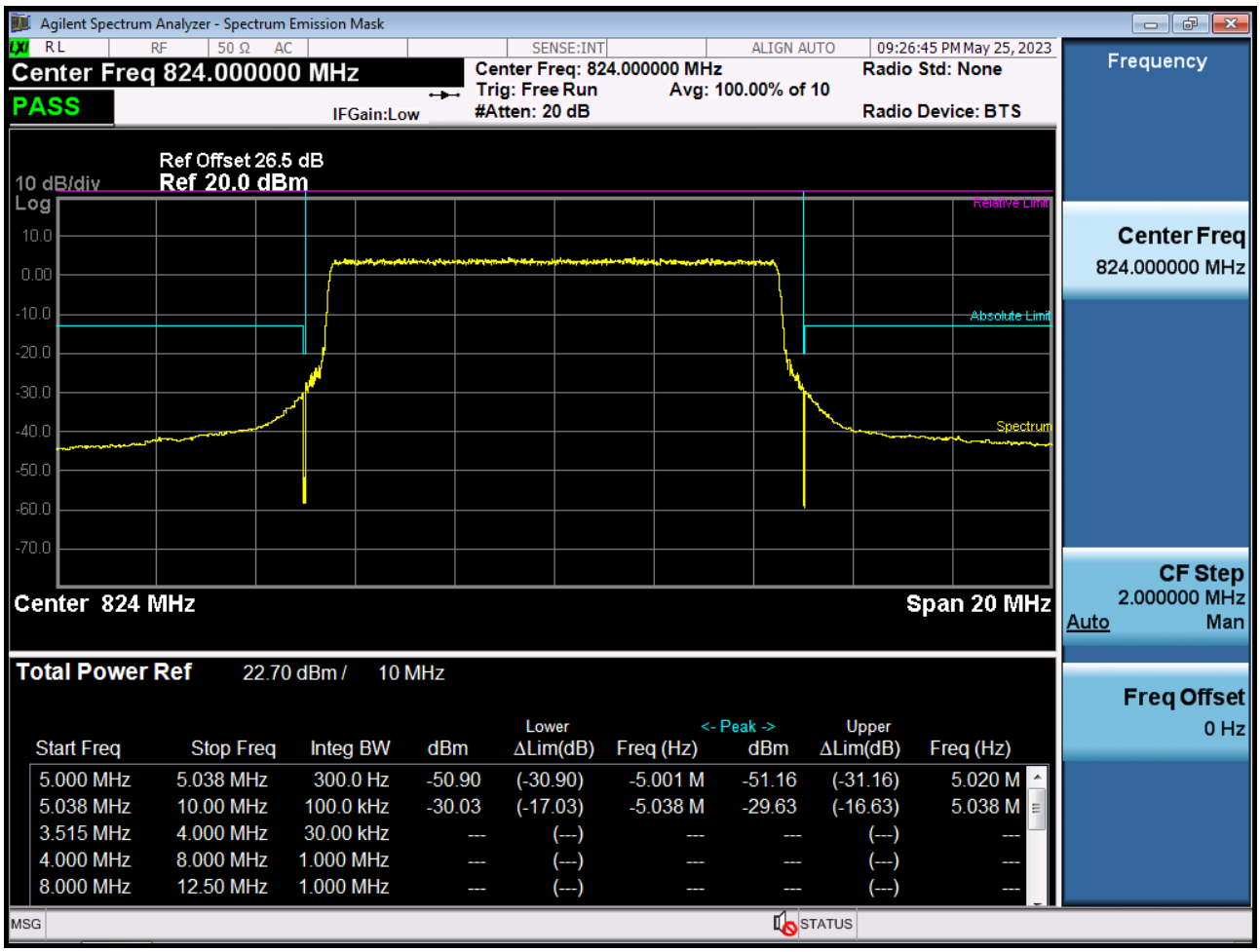
BAND 26. Channel Edge (10 MHz_QPSK_RB 1_0)



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-2309-FC024-P