74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEL: +82-31-645-6300 FAX: +82-31-645-6401

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 20, 2021

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

Report No.: HCT-RF-2109-FC055

FCC ID:	**A3LSMA136U**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s):	SM-A136U
Additional Model(s):	SM-A136U1, SM-S136DL
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 – 823.3	1M09G7D	QPSK	0.226	23.55
		1M09W7D	16QAM	0.191	22.80
		1M10W7D	64QAM	0.146	21.65
LTE – Band26 (3)	815.5 – 822.5	2M70G7D	QPSK	0.227	23.56
		2M69W7D	16QAM	0.190	22.79
		2M70W7D	64QAM	0.147	21.68
LTE – Band26 (5)	816.5 – 821.5	4M51G7D	QPSK	0.227	23.56
		4M50W7D	16QAM	0.192	22.83
		4M50W7D	64QAM	0.147	21.67
LTE – Band26 (10)	819.0	9M00G7D	QPSK	0.225	23.53
		8M98W7D	16QAM	0.193	22.86
		8M99W7D	64QAM	0.147	21.67
LTE – Band26 (15)	821.5	13M5G7D	QPSK	0.220	23.42
		13M5W7D	16QAM	0.187	22.72
		13M4W7D	64QAM	0.144	21.59

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)

* The report shall not be reproduced except in full(only partly) without approval of the laboratory.

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2109-FC055	October 20, 2021	- First Approval Report

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:	A3LSMA136U
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-A136U
Additional Model(s):	SM-A136U1, SM-S136DL
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:	August 30, 2021 ~ September 29, 2021
Serial number:	Radiated: 420015e6dca788ff Conducted: R3CR807JS3X

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 (HT20/40/80), 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

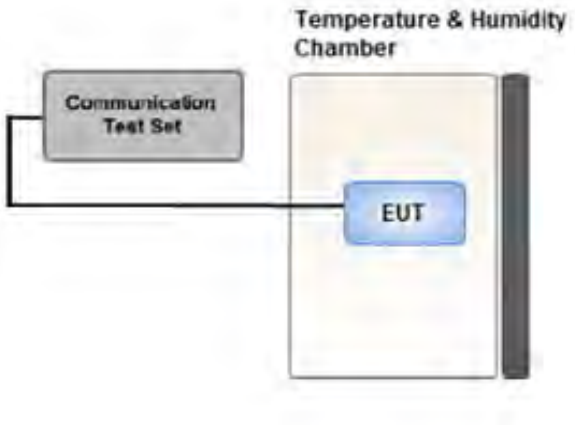
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base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

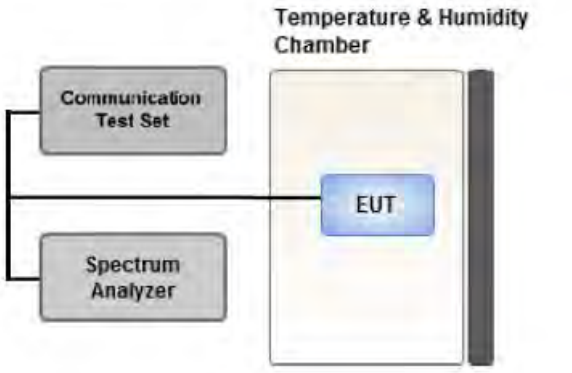
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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

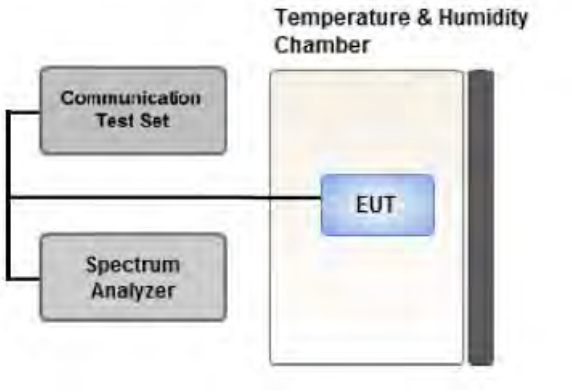
The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

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

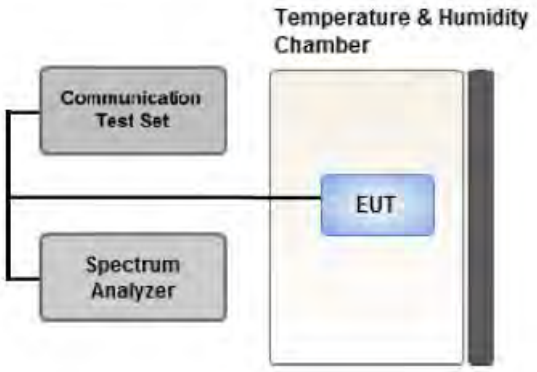
Test Overview

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.

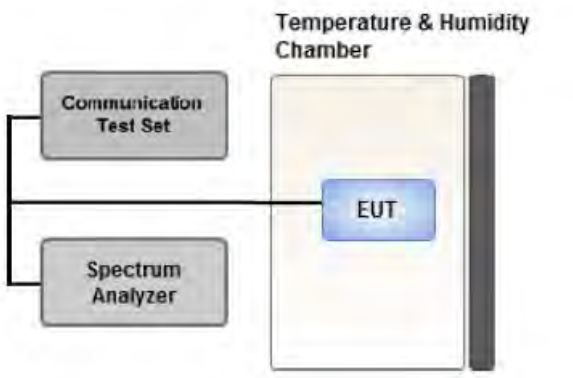
Test Settings

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.

(In the case of radiated spurious emissions, only the B.W result that confirmed the maximum radiated power was reported.)

- 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-A136U & additional models were tested and the worst case results are reported.

(Worst case : SM-A136U)

[Worst case]

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

3.10 WORST CASE(CONDUCTED TEST)

- All modes of operation were investigated and the worst case configuration results are reported.
- SM-A136U & additional models were tested and the worst case results are reported.

(Worst case : SM-A136U)

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth	QPSK, 16QAM, 64QAM	1.4, 3, 5	High	Full RB	0
	QPSK, 16QAM, 64QAM	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
		15	Mid	1	74
		1.4, 3, 5 10,15	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	02/11/2022	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY50200093	11/17/2021	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.	6201026545	01/07/2022	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	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 Level(dBm)	Substitute Level(dBm)	Ant. Gain (dBd)	C.L	Pol.	ERP	
channel	Freq.(MHz)						W	dBm
128	824.20	-21.37	38.40	-10.61	0.95	H	0.483	26.84

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

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.

2) During the test , the turn table is rotated until the maximum signal is found.

3) Record the field strength meter's level.

4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.

5) Increase the signal generator output till the field strength meter's level is equal to the item (3).

6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power.

7.2 EIRP Sample Calculation

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

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

1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.

2) During the test , the turn table is rotated until the maximum signal is found.

3) Record the field strength meter's level.

4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.

5) Increase the signal generator output till the field strength meter's level is equal to the item (3).

6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.

7.3. Emission Designator

GSM Emission Designator

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

EDGE Emission Designator

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

WCDMA Emission Designator

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

QPSK Modulation

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

QAM Modulation

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

8. TEST DATA

8.1 CONDUCTED OUTPUT POWER

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	23.54	0.226	23.48	0.223	100
		1	3	23.51	0.224	23.47	0.222	100
		1	5	23.49	0.223	23.45	0.221	100
		3	0	23.52	0.225	23.46	0.222	100
		3	1	23.50	0.224	23.45	0.221	100
		3	3	23.55	0.226	23.51	0.224	100
		6	0	22.54	0.179	22.52	0.179	100
	16QAM	1	0	22.80	0.191	22.74	0.188	100
		1	3	22.77	0.189	22.74	0.188	100
		1	5	22.77	0.189	22.71	0.187	100
		3	0	22.49	0.177	22.45	0.176	100
		3	1	22.53	0.179	22.50	0.178	100
		3	3	22.56	0.180	22.52	0.179	100
		6	0	21.57	0.144	21.54	0.143	100
	64QAM	1	0	21.61	0.145	21.53	0.142	100
		1	3	21.65	0.146	21.63	0.146	100
		1	5	21.63	0.146	21.60	0.145	100
		3	0	21.59	0.144	21.55	0.143	100
		3	1	21.59	0.144	21.55	0.143	100
		3	3	21.59	0.144	21.52	0.142	100
		6	0	20.45	0.111	20.41	0.110	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	23.56	0.227	23.53	0.225	100
		1	7	23.50	0.224	23.48	0.223	100
		1	14	23.44	0.221	23.41	0.219	100
		8	0	22.52	0.179	22.50	0.178	100
		8	3	22.49	0.177	22.47	0.177	100
		8	7	22.47	0.177	22.44	0.175	100
		15	0	22.53	0.179	22.50	0.178	100
	16QAM	1	0	22.74	0.188	22.70	0.186	100
		1	7	22.78	0.190	22.75	0.188	100
		1	14	22.79	0.190	22.76	0.189	100
		8	0	21.57	0.144	21.54	0.143	100
		8	3	21.56	0.143	21.52	0.142	100
		8	7	21.50	0.141	21.46	0.140	100
		15	0	21.51	0.142	21.44	0.139	100
	64QAM	1	0	21.68	0.147	21.61	0.145	100
		1	7	21.64	0.146	21.58	0.144	100
		1	14	21.60	0.145	21.59	0.144	100
		8	0	20.52	0.113	20.50	0.112	100
		8	3	20.50	0.112	20.47	0.111	100
		8	7	20.48	0.112	20.43	0.110	100
		15	0	20.50	0.112	20.47	0.111	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	23.56	0.227	23.53	0.225	100
		1	12	23.52	0.225	23.50	0.224	100
		1	24	23.51	0.224	23.48	0.223	100
		12	0	22.60	0.182	22.55	0.180	100
		12	6	22.54	0.179	22.51	0.178	100
		12	11	22.53	0.179	22.50	0.178	100
		25	0	22.55	0.180	22.51	0.178	100
	16QAM	1	0	22.79	0.190	22.77	0.189	100
		1	12	22.67	0.185	22.64	0.184	100
		1	24	22.83	0.192	22.80	0.191	100
		12	0	21.58	0.144	21.55	0.143	100
		12	6	21.49	0.141	21.46	0.140	100
		12	11	21.49	0.141	21.46	0.140	100
		25	0	21.56	0.143	21.52	0.142	100
	64QAM	1	0	21.67	0.147	21.63	0.146	100
		1	12	21.63	0.146	21.60	0.145	100
		1	24	21.56	0.143	21.52	0.142	100
		12	0	20.55	0.114	20.53	0.113	100
		12	6	20.50	0.112	20.47	0.111	100
		12	11	20.47	0.111	20.44	0.111	100
		25	0	20.52	0.113	20.50	0.112	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				819 MHz		
				dBm	W	
10	QPSK	1	0	23.53	0.225	100
		1	24	23.49	0.223	100
		1	49	23.42	0.220	100
		25	0	22.51	0.178	100
		25	12	22.46	0.176	100
		25	24	22.55	0.180	100
		50	0	22.51	0.178	100
	16QAM	1	0	22.75	0.188	100
		1	24	22.86	0.193	100
		1	49	22.62	0.183	100
		25	0	21.44	0.139	100
		25	12	21.46	0.140	100
		25	24	21.55	0.143	100
		50	0	21.47	0.140	100
	64QAM	1	0	21.67	0.147	100
		1	24	21.55	0.143	100
		1	49	21.49	0.141	100
		25	0	20.48	0.112	100
		25	12	20.42	0.110	100
		25	24	20.52	0.113	100
		50	0	20.45	0.111	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				821.5 MHz		
				dBm	W	
15	QPSK	1	0	23.40	0.219	100
		1	36	23.42	0.220	100
		1	74	23.25	0.211	100
		36	0	22.46	0.176	100
		36	18	22.41	0.174	100
		36	39	22.31	0.170	100
		75	0	22.41	0.174	100
	16QAM	1	0	22.72	0.187	100
		1	36	22.63	0.183	100
		1	74	22.51	0.178	100
		36	0	21.48	0.141	100
		36	18	21.38	0.137	100
		36	39	21.29	0.135	100
		75	0	21.39	0.138	100
	64QAM	1	0	21.59	0.144	100
		1	36	21.51	0.142	100
		1	74	21.22	0.132	100
		36	0	20.48	0.112	100
		36	18	20.39	0.109	100
		36	39	20.31	0.107	100
		75	0	20.42	0.110	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	-32.47	30.07	-10.29	1.38	H	< 100	0.069	18.40
		16QAM	-33.19	29.35	-10.29	1.38	H		0.059	17.68
		64QAM	-34.33	28.21	-10.29	1.38	H		0.045	16.54
823.3		QPSK	-31.81	31.24	-10.25	1.39	H		0.091	19.60
		16QAM	-32.55	30.50	-10.25	1.39	H		0.077	18.86
		64QAM	-33.66	29.39	-10.25	1.39	H		0.060	17.75

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	-32.47	30.11	-10.29	1.39	H	< 100	0.070	18.44
		16QAM	-33.21	29.37	-10.29	1.39	H		0.059	17.70
		64QAM	-34.34	28.24	-10.29	1.39	H		0.045	16.57
822.5		QPSK	-31.82	31.29	-10.26	1.39	H		0.092	19.65
		16QAM	-32.58	30.53	-10.26	1.39	H		0.077	18.89
		64QAM	-33.67	29.44	-10.26	1.39	H		0.060	17.80

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	-32.45	30.24	-10.28	1.39	H	< 100	0.072	18.57
		16QAM	-33.20	29.49	-10.28	1.39	H		0.060	17.82
		64QAM	-34.33	28.36	-10.28	1.39	H		0.047	16.69
821.5		QPSK	-31.91	31.13	-10.26	1.39	H		0.089	19.48
		16QAM	-32.68	30.36	-10.26	1.39	H		0.074	18.71
		64QAM	-33.79	29.25	-10.26	1.39	H		0.058	17.60

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	-32.46	30.42	-10.27	1.39	H	< 100	0.075	18.76
		16QAM	-33.21	29.67	-10.27	1.39	H		0.063	18.01
		64QAM	-34.37	28.51	-10.27	1.39	H		0.048	16.85

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	-32.45	30.59	-10.26	1.39	H	< 7.00	0.078	18.94
		16QAM	-33.18	29.86	-10.26	1.39	H		0.066	18.21
		64QAM	-34.31	28.73	-10.26	1.39	H		0.051	17.08

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	-53.53	9.50	-63.49	1.98	H	-55.97	-13.00
	2 446.50	-51.89	10.28	-56.37	2.47	H	-48.55	-13.00
	3 262.00	-56.75	11.86	-57.96	2.88	V	-48.98	-13.00
26775 (822.5)	1 645.00	-52.38	9.65	-62.73	1.99	H	-55.06	-13.00
	2 467.50	-51.21	10.46	-55.86	2.47	H	-47.87	-13.00
	3 290.00	-56.70	12.04	-58.10	2.88	H	-48.94	-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	1.0943
			16QAM			1.0918
			64QAM			1.0955
	3 MHz	822.5	QPSK	15		2.6987
			16QAM			2.6919
			64QAM			2.6974
	5 MHz	821.5	QPSK	25		4.5072
			16QAM			4.4968
			64QAM			4.4962
	10 MHz	819.0	QPSK	50		8.9957
			16QAM			8.9841
			64QAM			8.9854
	15 MHz	821.5	QPSK	75		13.452
			16QAM			13.465
			64QAM			13.425

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 45 ~ 59.

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	3.6865	27.976	-67.274	-39.298	-13.00
		823.3	3.7069	27.976	-66.995	-39.019	
	3	815.5	3.7034	27.976	-67.090	-39.114	
		822.5	3.6950	27.976	-67.279	-39.303	
	5	816.5	3.6905	27.976	-67.178	-39.202	
		821.5	3.7119	27.976	-67.328	-39.352	
	10	819.0	3.7044	27.976	-66.971	-38.995	
	15	821.5	3.6925	27.976	-67.312	-39.336	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 80 ~ 87.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor(dB) = Cable Loss + Attenuator + Power Splitter

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

8.6 CHANNEL EDGE

- Plots of the EUT's Band Edge are shown Page 60 ~ 79.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE 26

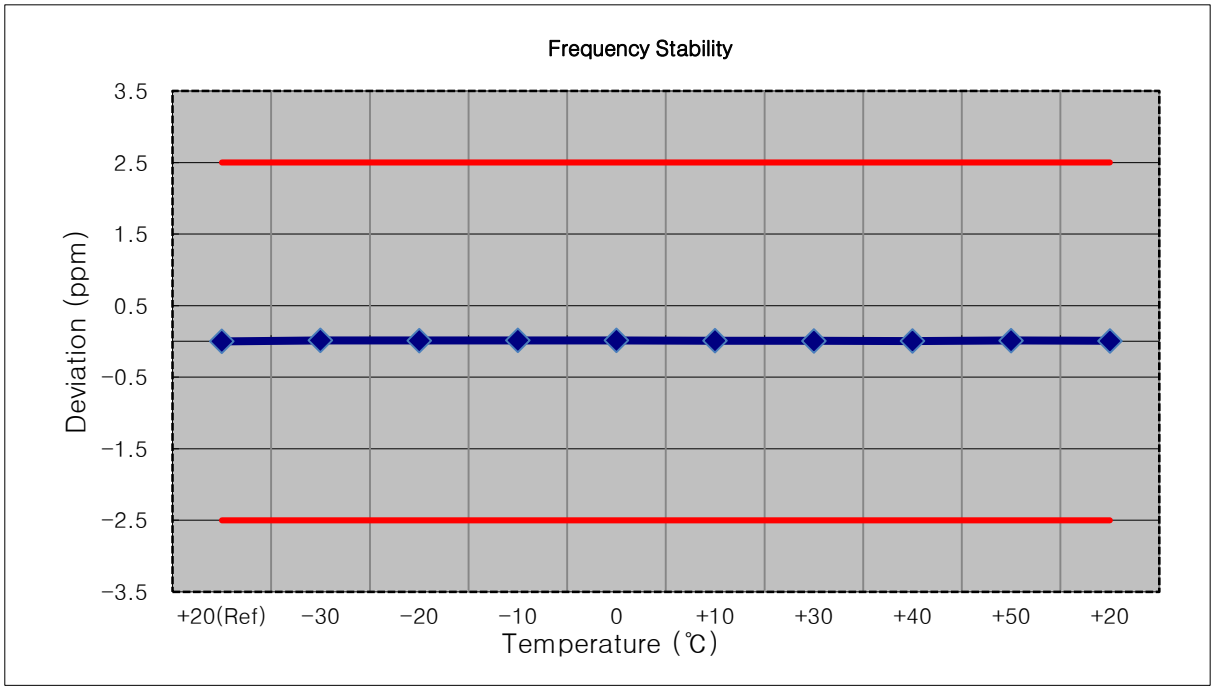
▣ OPERATING FREQUENCY: 814,700,000 Hz

▣ CHANNEL: 26697(1.4 MHz)

▣ REFERENCE VOLTAGE: 3.850 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.850	+20(Ref)	814 700 007	0.0	0.000 000	0.000
100 %		-30	814 700 020	12.4	0.000 002	0.015
100 %		-20	814 700 018	10.6	0.000 001	0.013
100 %		-10	814 700 019	11.2	0.000 001	0.014
100 %		0	814 700 020	12.6	0.000 002	0.015
100 %		+10	814 700 016	8.7	0.000 001	0.011
100 %		+30	814 700 013	6.0	0.000 001	0.007
100 %		+40	814 700 012	4.7	0.000 001	0.006
100 %		+50	814 700 018	11.0	0.000 001	0.014
Batt. Endpoint	3.400	+20	814 700 013	5.8	0.000 001	0.007



▣ MODE: LTE 26

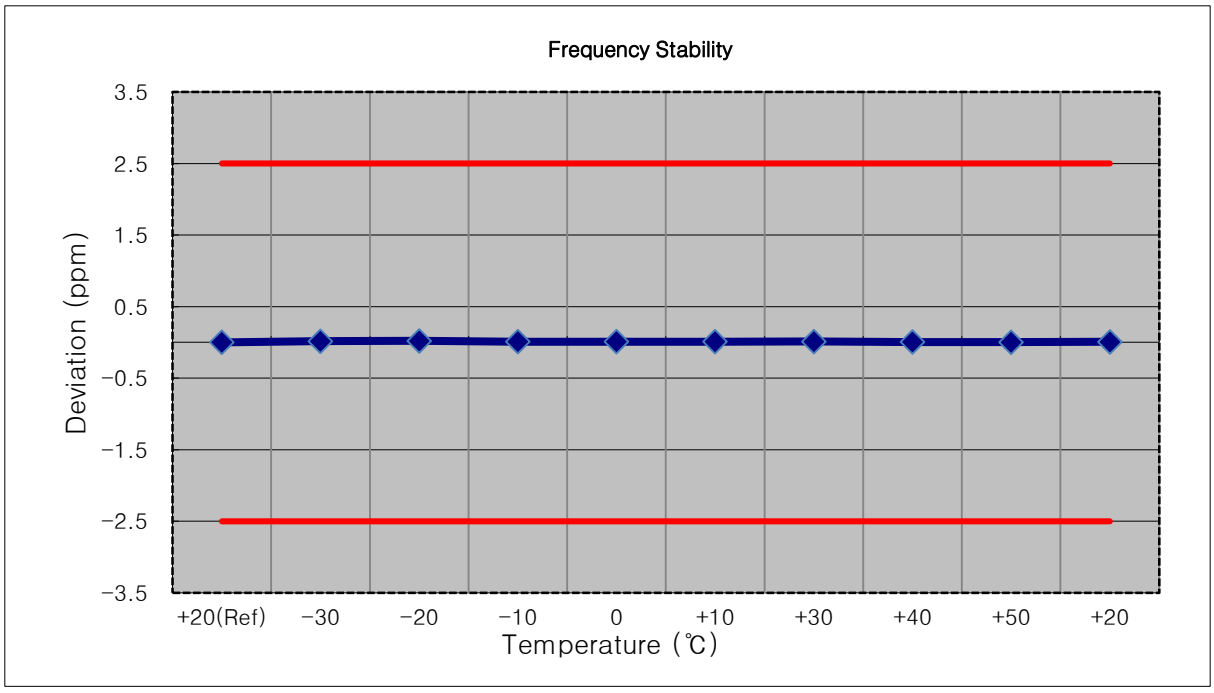
▣ OPERATING FREQUENCY: 815,500,000 Hz

▣ CHANNEL: 26705(3 MHz)

▣ REFERENCE VOLTAGE: 3.850 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.850	+20(Ref)	815 500 008	0.0	0.000 000	0.000
100 %		-30	815 500 021	13.3	0.000 002	0.016
100 %		-20	815 500 025	17.0	0.000 002	0.021
100 %		-10	815 500 015	7.4	0.000 001	0.009
100 %		0	815 500 016	7.9	0.000 001	0.010
100 %		+10	815 500 016	8.7	0.000 001	0.011
100 %		+30	815 500 017	9.6	0.000 001	0.012
100 %		+40	815 500 013	5.2	0.000 001	0.006
100 %		+50	815 500 011	3.5	0.000 000	0.004
Batt. Endpoint	3.400	+20	815 500 014	6.2	0.000 001	0.008



▣ MODE: LTE 26

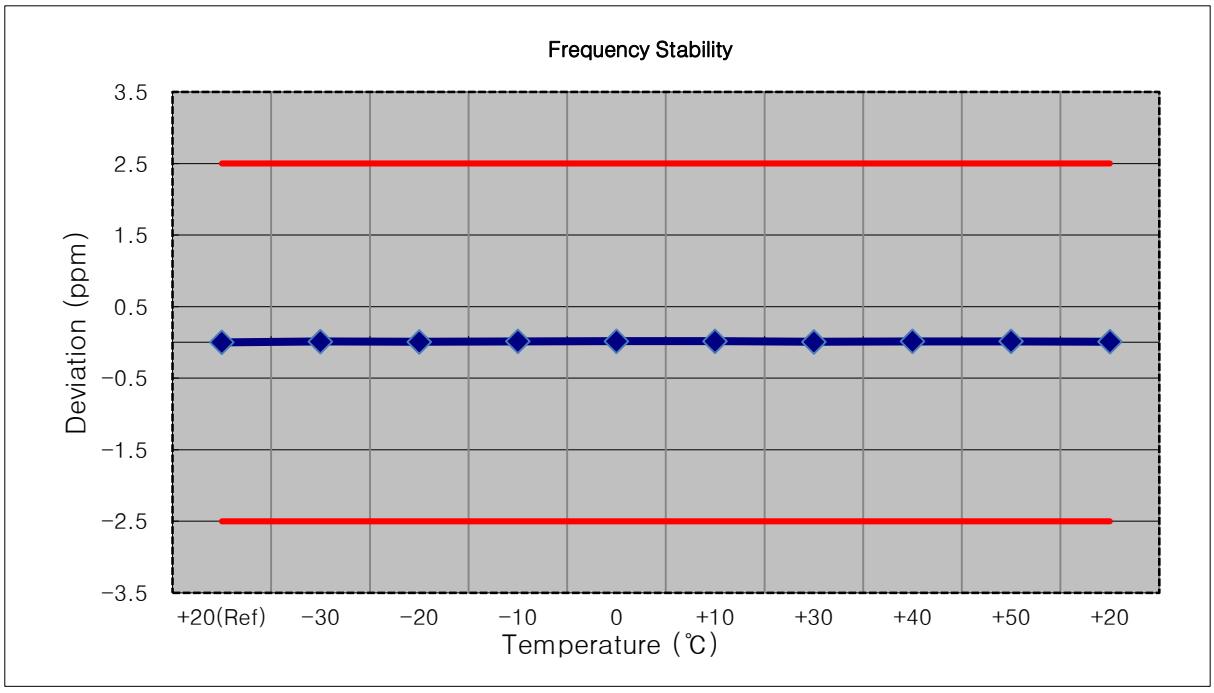
▣ OPERATING FREQUENCY: 816,500,000 Hz

▣ CHANNEL: 26715(5 MHz)

▣ REFERENCE VOLTAGE: 3.850 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.850	+20(Ref)	816 500 015	0.0	0.000 000	0.000
100 %		-30	816 500 025	9.7	0.000 001	0.012
100 %		-20	816 500 022	7.1	0.000 001	0.009
100 %		-10	816 500 026	11.1	0.000 001	0.014
100 %		0	816 500 028	12.9	0.000 002	0.016
100 %		+10	816 500 028	13.2	0.000 002	0.016
100 %		+30	816 500 022	6.9	0.000 001	0.008
100 %		+40	816 500 027	12.0	0.000 001	0.015
100 %		+50	816 500 027	12.4	0.000 002	0.015
Batt. Endpoint	3.400	+20	816 500 024	8.7	0.000 001	0.011



▣ MODE: LTE 26

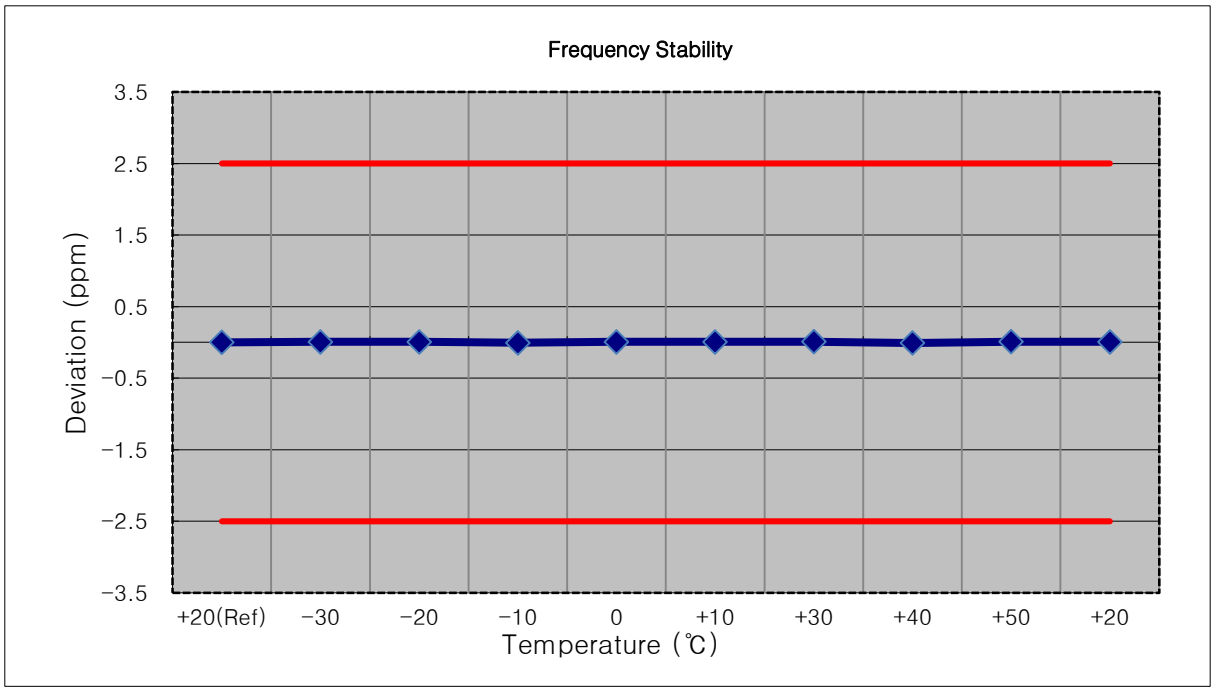
▣ OPERATING FREQUENCY: 819,000,000 Hz

▣ CHANNEL: 26740(10 MHz)

▣ REFERENCE VOLTAGE: 3.850 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.850	+20(Ref)	818 999 995	0.0	0.000 000	0.000
100 %		-30	819 000 002	6.2	0.000 001	0.008
100 %		-20	819 000 002	6.9	0.000 001	0.008
100 %		-10	818 999 990	-5.1	-0.000 001	-0.006
100 %		0	819 000 003	7.3	0.000 001	0.009
100 %		+10	819 000 003	7.2	0.000 001	0.009
100 %		+30	819 000 003	7.6	0.000 001	0.009
100 %		+40	818 999 990	-5.9	-0.000 001	-0.007
100 %		+50	819 000 003	8.0	0.000 001	0.010
Batt. Endpoint	3.400	+20	819 000 002	6.8	0.000 001	0.008



▣ MODE: LTE 26

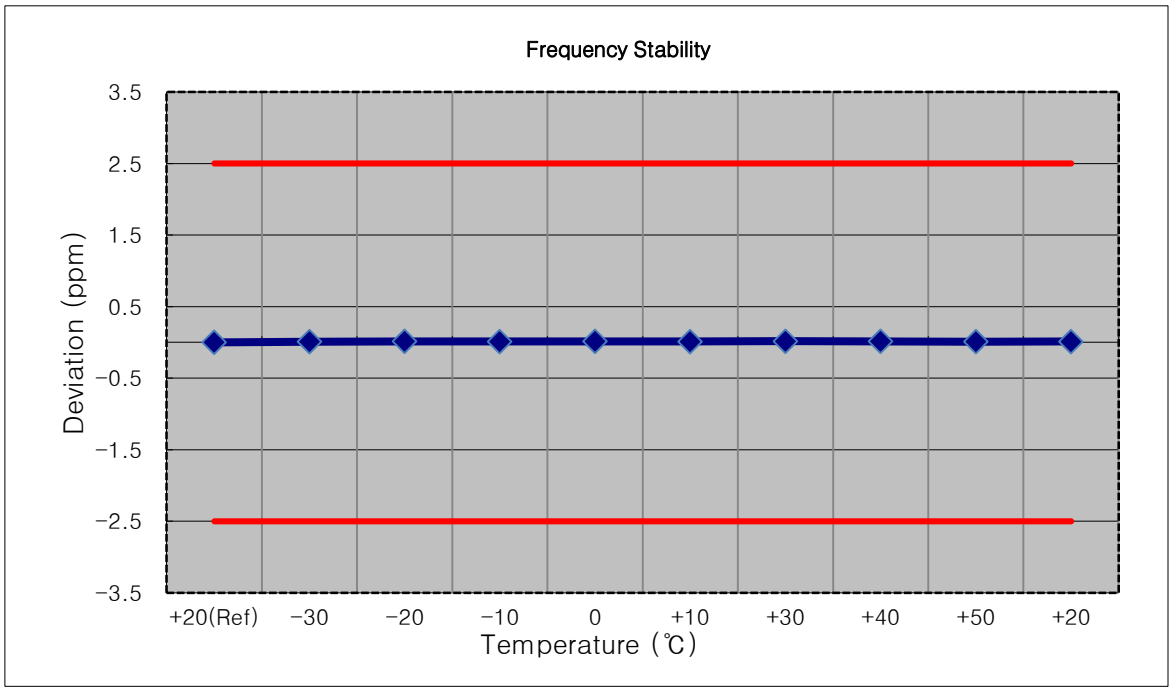
▣ OPERATING FREQUENCY: 821,500,000 Hz

▣ CHANNEL: 26765(15 MHz)

▣ REFERENCE VOLTAGE: 3.850 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.850	+20(Ref)	821 500 008	0.0	0.000 000	0.000
100 %		-30	821 500 016	7.9	0.000 001	0.010
100 %		-20	821 500 020	11.9	0.000 001	0.014
100 %		-10	821 500 018	10.0	0.000 001	0.012
100 %		0	821 500 020	11.9	0.000 001	0.014
100 %		+10	821 500 018	10.1	0.000 001	0.012
100 %		+30	821 500 022	14.4	0.000 002	0.018
100 %		+40	821 500 021	12.8	0.000 002	0.016
100 %		+50	821 500 016	7.6	0.000 001	0.009
Batt. Endpoint	3.400	+20	821 500 018	9.8	0.000 001	0.012



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	23.37	0.217	100
		1	3	23.38	0.218	100
		1	5	23.33	0.215	100
		3	0	23.38	0.218	100
		3	1	23.39	0.218	100
		3	3	23.40	0.219	100
		6	0	22.41	0.174	100
	16QAM	1	0	22.68	0.185	100
		1	3	22.63	0.183	100
		1	5	22.63	0.183	100
		3	0	22.41	0.174	100
		3	1	22.38	0.173	100
		3	3	22.36	0.172	100
		6	0	21.47	0.140	100
	64QAM	1	0	21.49	0.141	100
		1	3	21.52	0.142	100
		1	5	21.39	0.138	100
		3	0	21.48	0.141	100
		3	1	21.48	0.141	100
		3	3	21.46	0.140	100
		6	0	20.31	0.107	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
3	QPSK	1	0	23.33	0.215	100
		1	7	23.38	0.218	100
		1	14	23.27	0.212	100
		8	0	22.36	0.172	100
		8	3	22.34	0.171	100
		8	7	22.26	0.168	100
		15	0	22.34	0.171	100
	16QAM	1	0	22.58	0.181	100
		1	7	22.56	0.180	100
		1	14	22.59	0.182	100
		8	0	21.43	0.139	100
		8	3	21.39	0.138	100
		8	7	21.30	0.135	100
		15	0	21.38	0.137	100
	64QAM	1	0	21.52	0.142	100
		1	7	21.47	0.140	100
		1	14	21.39	0.138	100
		8	0	20.37	0.109	100
		8	3	20.33	0.108	100
		8	7	20.23	0.105	100
		15	0	20.29	0.107	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
5	QPSK	1	0	23.41	0.219	100
		1	12	23.37	0.217	100
		1	24	23.33	0.215	100
		12	0	22.44	0.175	100
		12	6	22.38	0.173	100
		12	11	22.26	0.168	100
		25	0	22.37	0.173	100
	16QAM	1	0	22.61	0.182	100
		1	12	22.60	0.182	100
		1	24	22.54	0.179	100
		12	0	21.48	0.141	100
		12	6	21.38	0.137	100
		12	11	21.26	0.134	100
		25	0	21.33	0.136	100
	64QAM	1	0	21.48	0.141	100
		1	12	21.56	0.143	100
		1	24	21.48	0.141	100
		12	0	20.42	0.110	100
		12	6	20.36	0.109	100
		12	11	20.25	0.106	100
		25	0	20.31	0.107	100

Band Width	Modulation	RB Size	RB Offset	Max. output power(dBm)		Limit (W)
				824 MHz		
				dBm	W	
10	QPSK	1	0	23.37	0.217	100
		1	24	23.38	0.218	100
		1	49	23.23	0.210	100
		25	0	22.48	0.177	100
		25	12	22.36	0.172	100
		25	24	22.31	0.170	100
		50	0	22.40	0.174	100
	16QAM	1	0	22.68	0.185	100
		1	24	22.55	0.180	100
		1	49	22.54	0.179	100
		25	0	21.48	0.141	100
		25	12	21.38	0.137	100
		25	24	21.26	0.134	100
		50	0	21.38	0.137	100
	64QAM	1	0	21.52	0.142	100
		1	24	21.51	0.142	100
		1	49	21.28	0.134	100
		25	0	20.48	0.112	100
		25	12	20.29	0.107	100
		25	24	20.28	0.107	100
		50	0	20.33	0.108	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	-31.75	31.18	-10.25	1.39	H	< 7.00	0.090	19.54
		16QAM	-32.49	30.44	-10.25	1.39	H		0.076	18.80
		64QAM	-33.60	29.33	-10.25	1.39	H		0.059	17.69

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	-31.83	31.10	-10.25	1.39	H	< 7.00	0.088	19.46
		16QAM	-32.57	30.36	-10.25	1.39	H		0.074	18.72
		64QAM	-33.65	29.28	-10.25	1.39	H		0.058	17.64

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	-31.77	31.16	-10.25	1.39	H	< 7.00	0.089	19.52
		16QAM	-32.54	30.39	-10.25	1.39	H		0.075	18.75
		64QAM	-33.66	29.27	-10.25	1.39	H		0.058	17.63

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	-31.94	30.99	-10.25	1.39	H	< 7.00	0.086	19.35
		16QAM	-32.70	30.23	-10.25	1.39	H		0.072	18.59
		64QAM	-33.84	29.09	-10.25	1.39	H		0.056	17.45

8.8.3 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B26

▣ MODULATION SIGNAL: 1.4 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	-52.70	9.70	-63.02	1.99	H	-55.31	-13.00
	2 472.00	-50.62	10.46	-55.27	2.47	H	-47.28	-13.00
	3 296.00	-57.52	12.07	-59.01	2.89	V	-49.82	-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	3.6905	27.976	-66.942	-38.966	-13.00
	3		3.1780	27.976	-67.266	-39.290	
	5		3.6795	27.976	-67.241	-39.265	
	10		3.7124	27.976	-67.242	-39.266	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 89 ~ 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 + Attenuator + Power Splitter

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

8.8.5 CHANNEL EDGE(Part90)

- Test Channel : 26790(824.0 MHz)

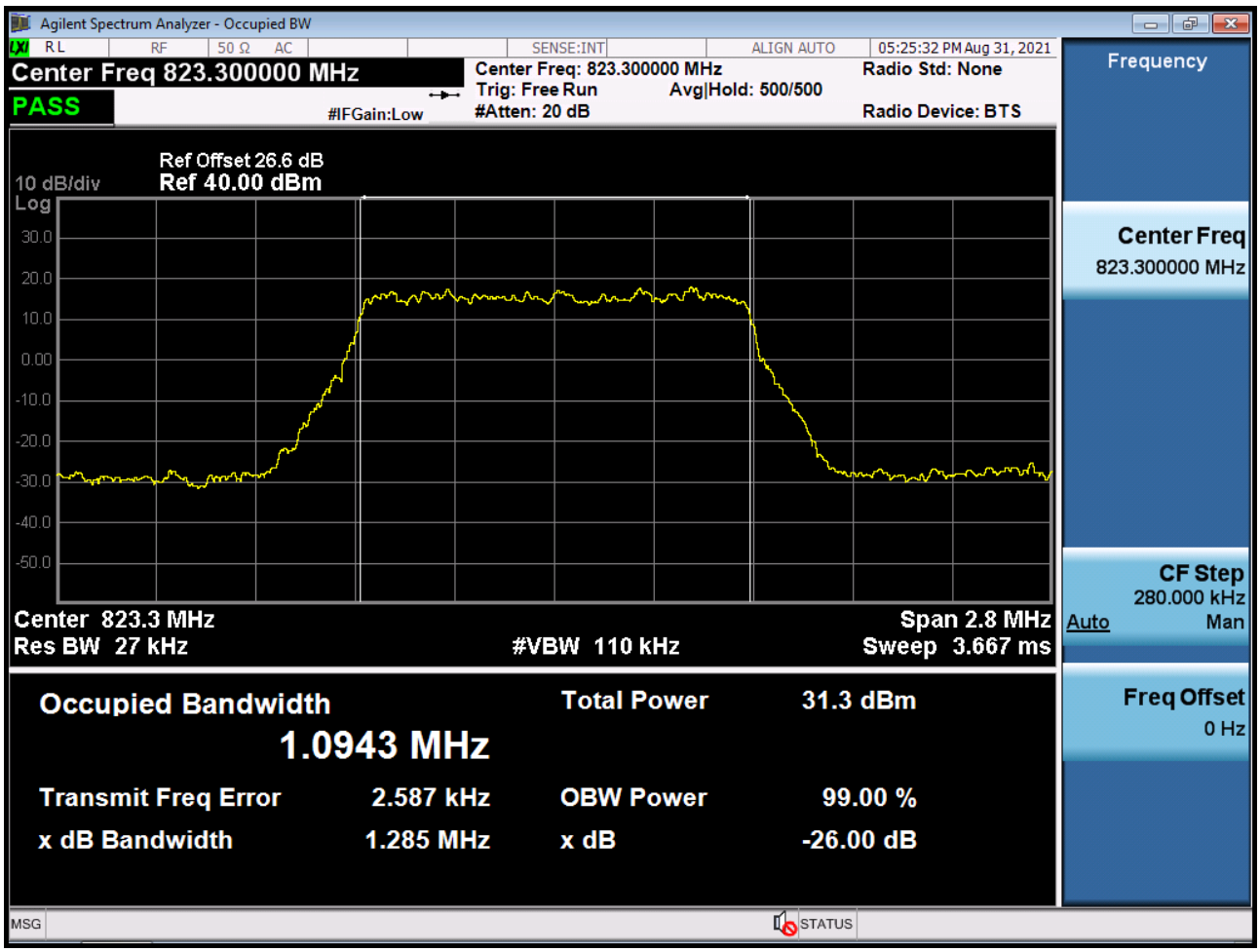
Plots of the EUT's Band Edge are shown Page 93 ~ 104.

8.8.6 BAND EDGE(Part22)

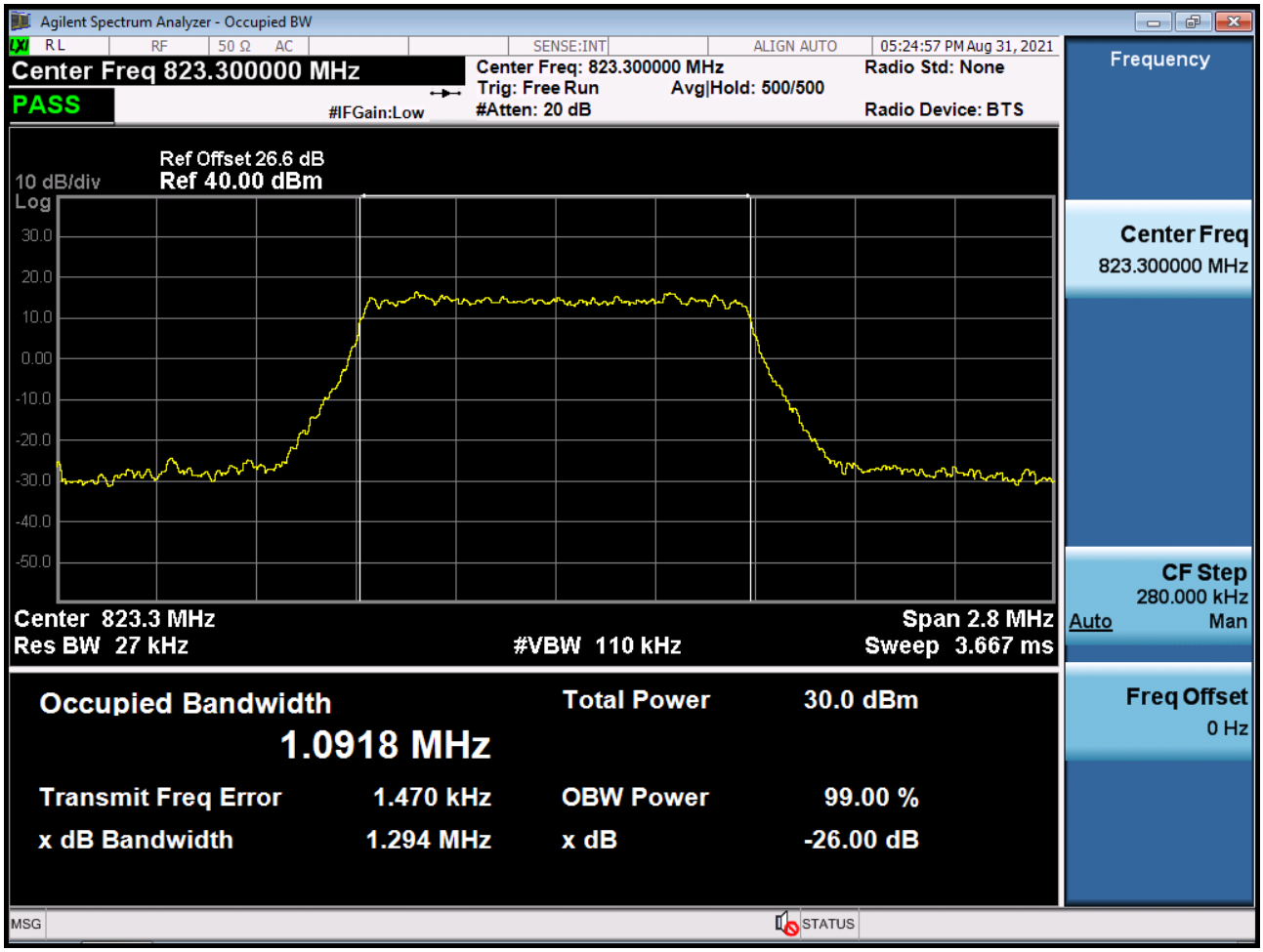
- Test Channel : 26790(824.0 MHz)
- Plots of the EUT's Band Edge are shown Page 105 ~ 112.

9. TEST PLOTS

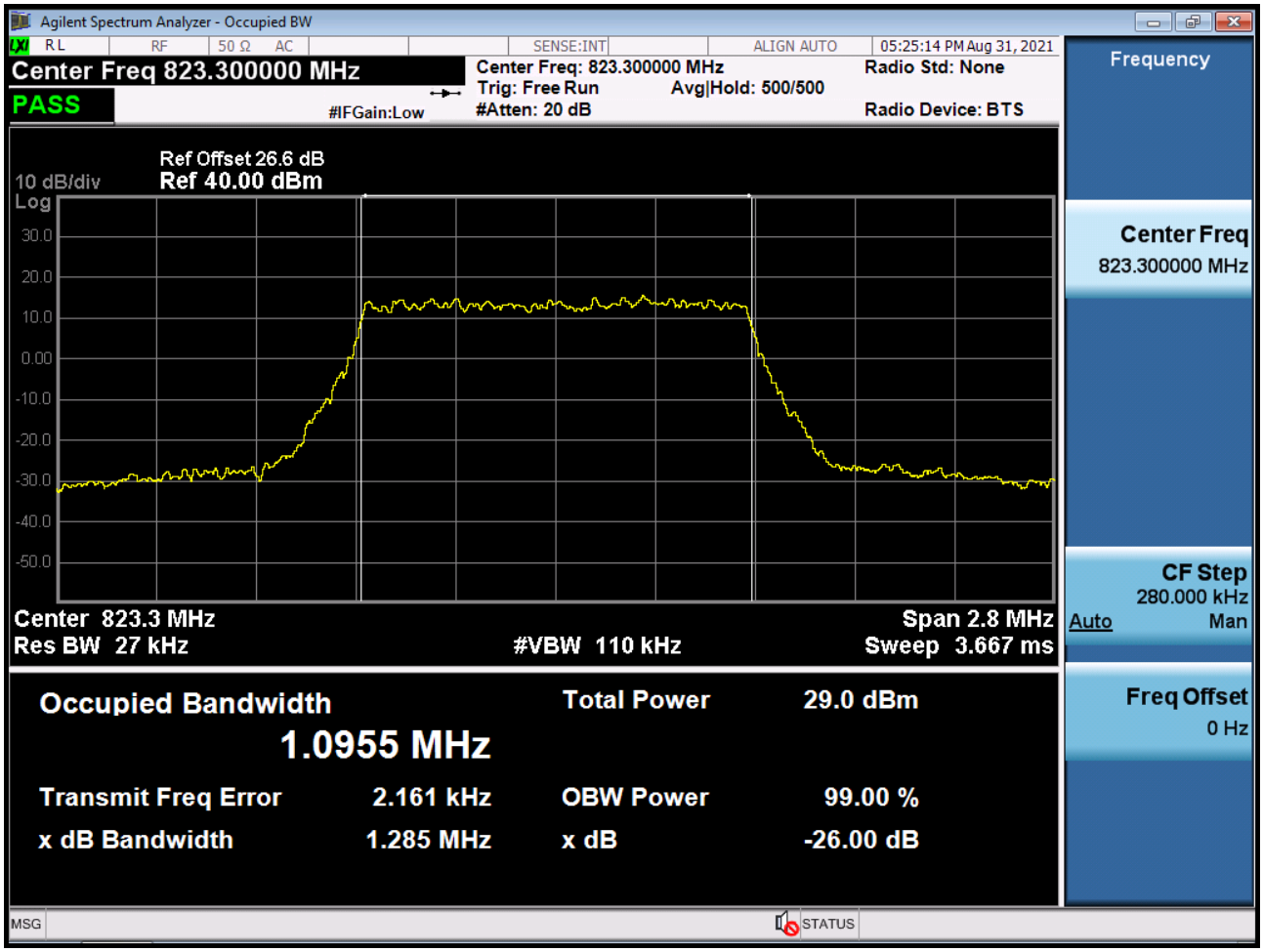
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 QPSK RB 6_0)



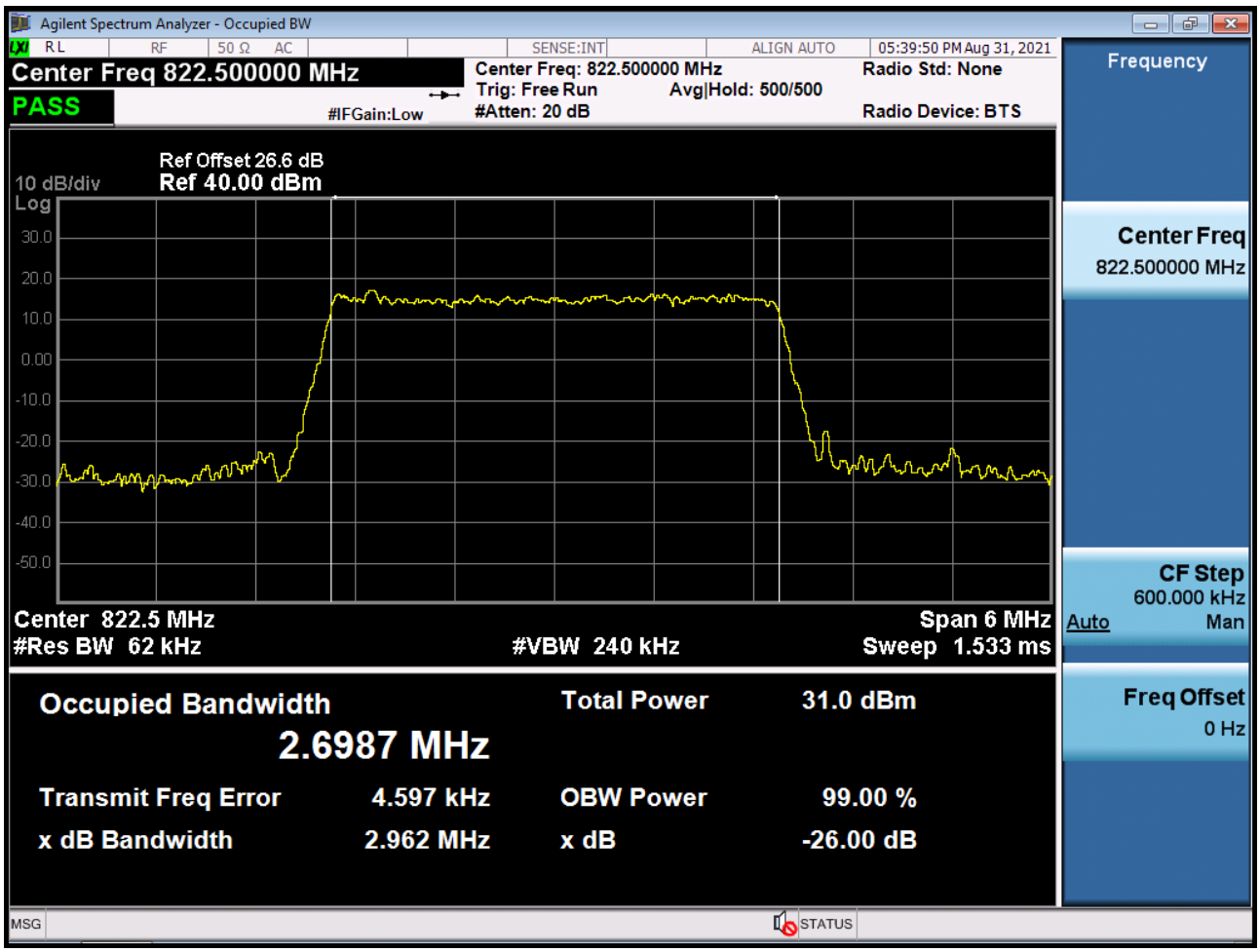
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 16QAM RB 6_0)



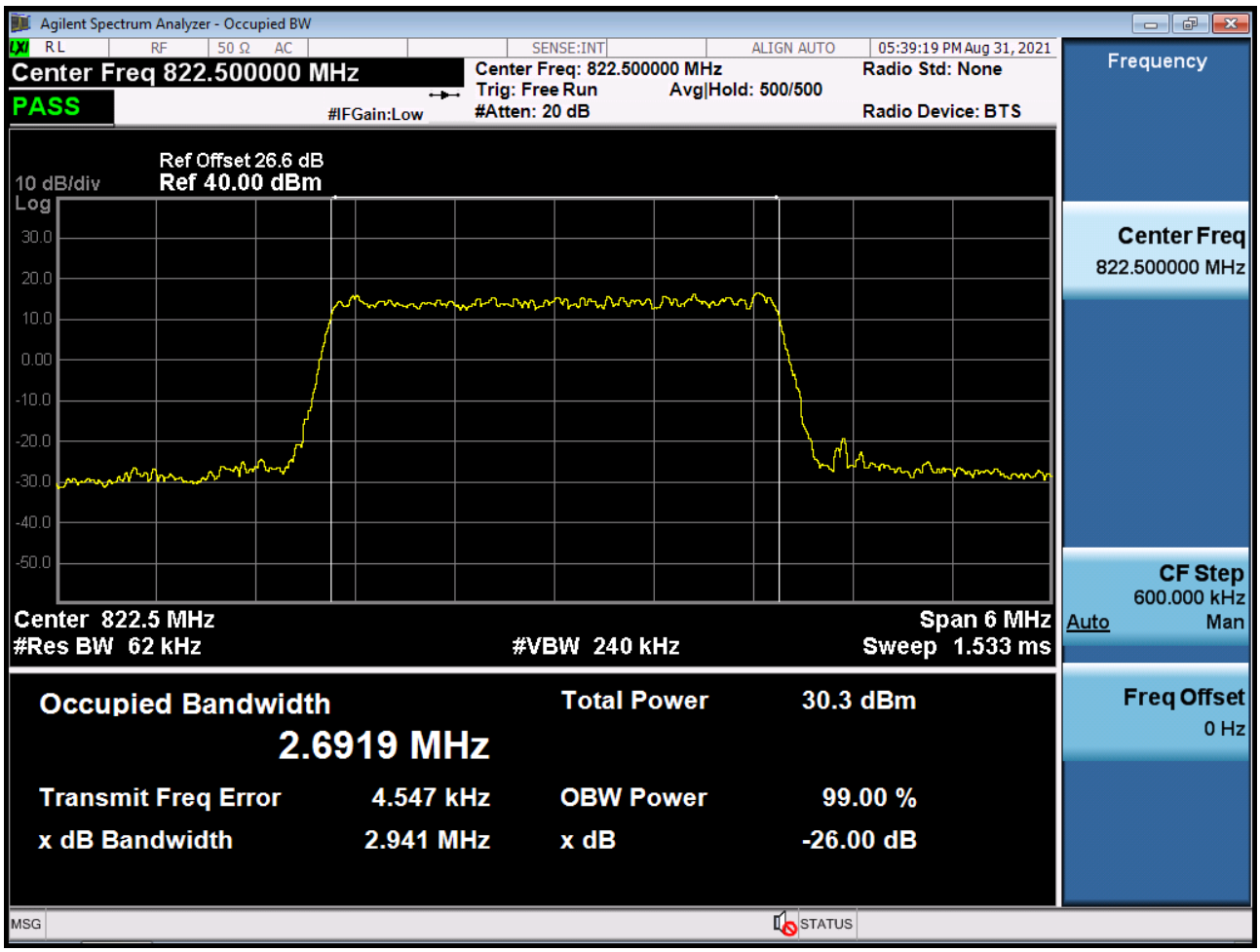
BAND 26. Occupied Bandwidth Plot (1.4 M BW Ch.26783 64QAM RB 6_0)



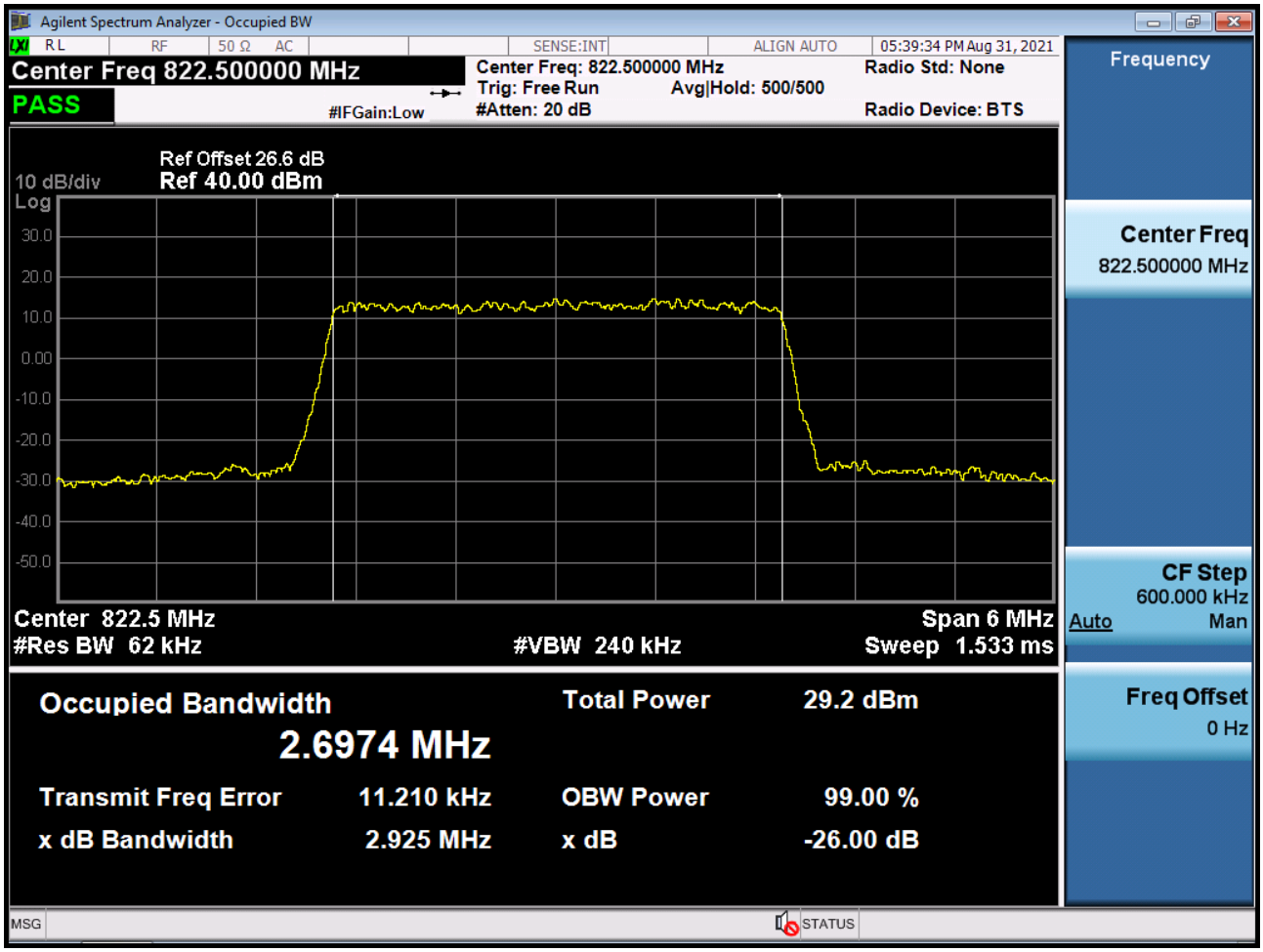
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 QPSK RB 15_0)



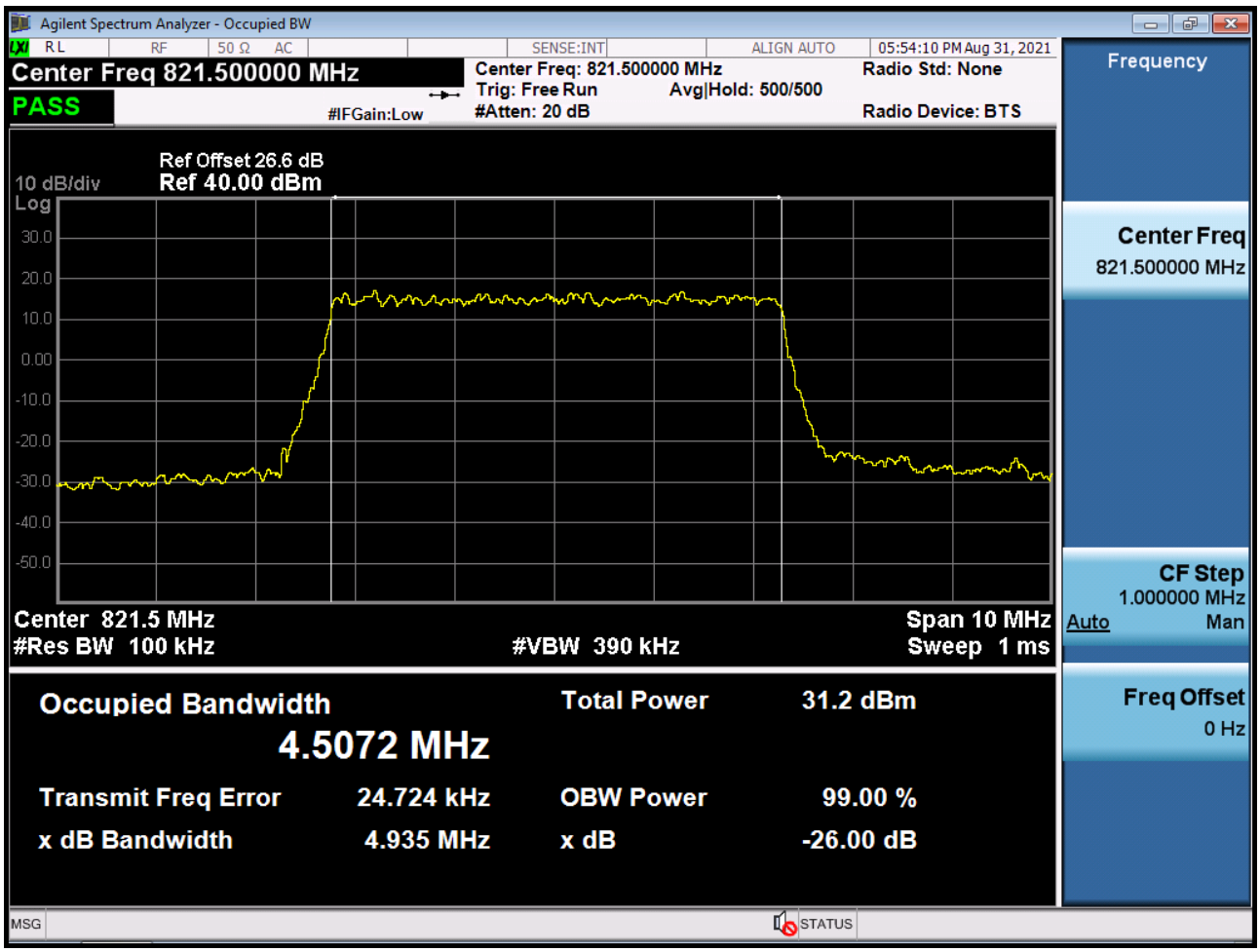
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 16QAM RB 15_0)



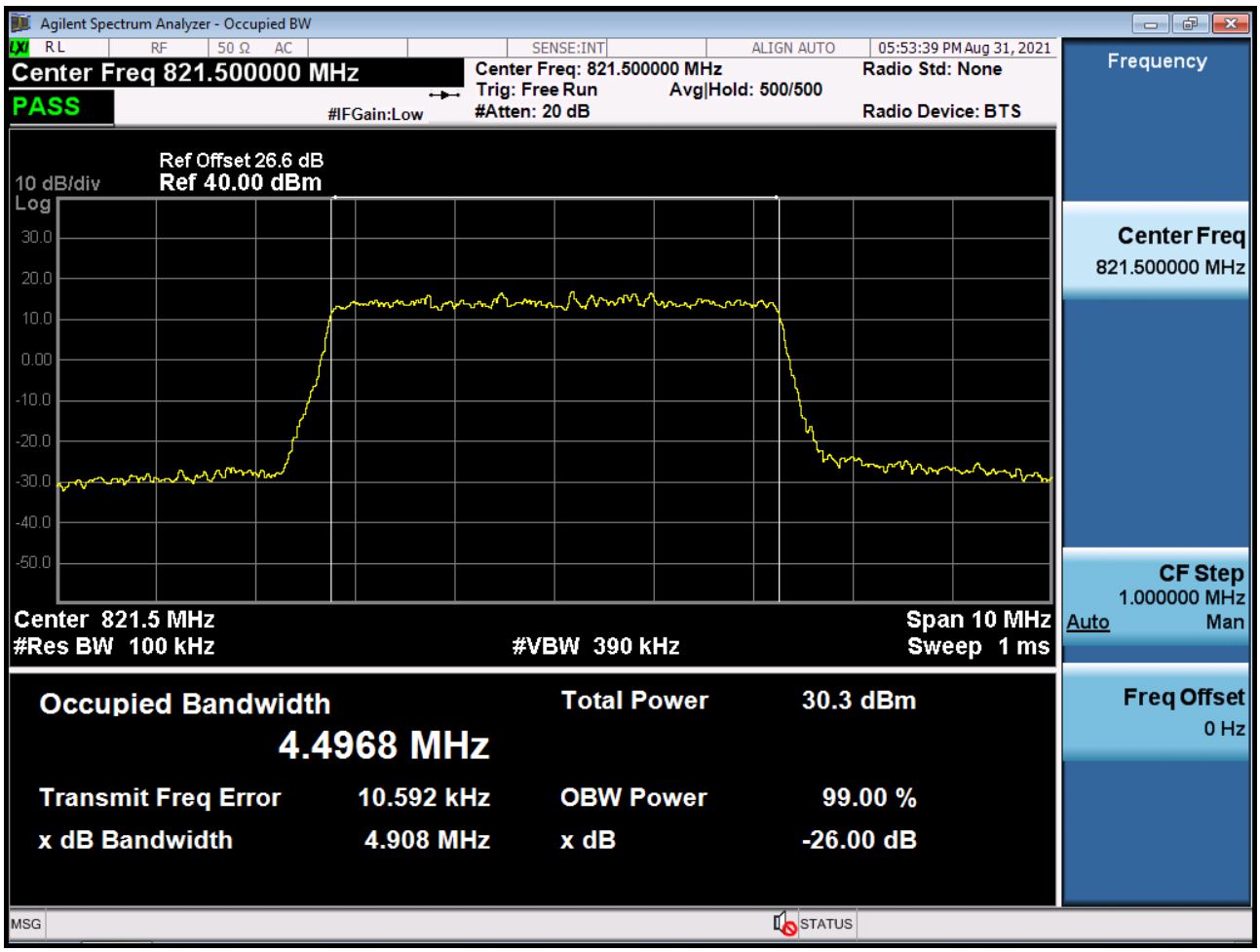
BAND 26. Occupied Bandwidth Plot (3 M BW Ch.26775 64QAM RB 15_0)



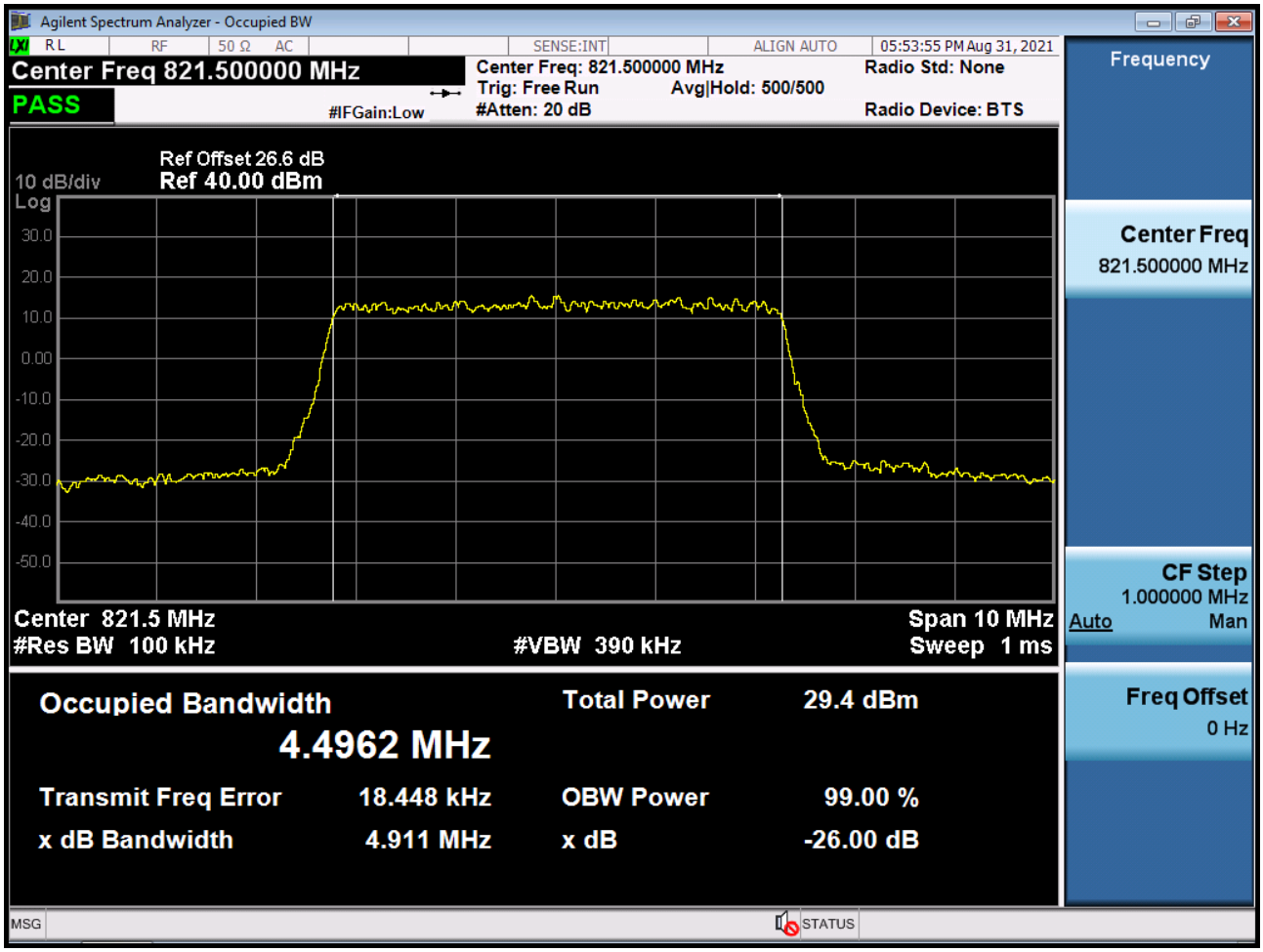
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 QPSK RB 25_0)



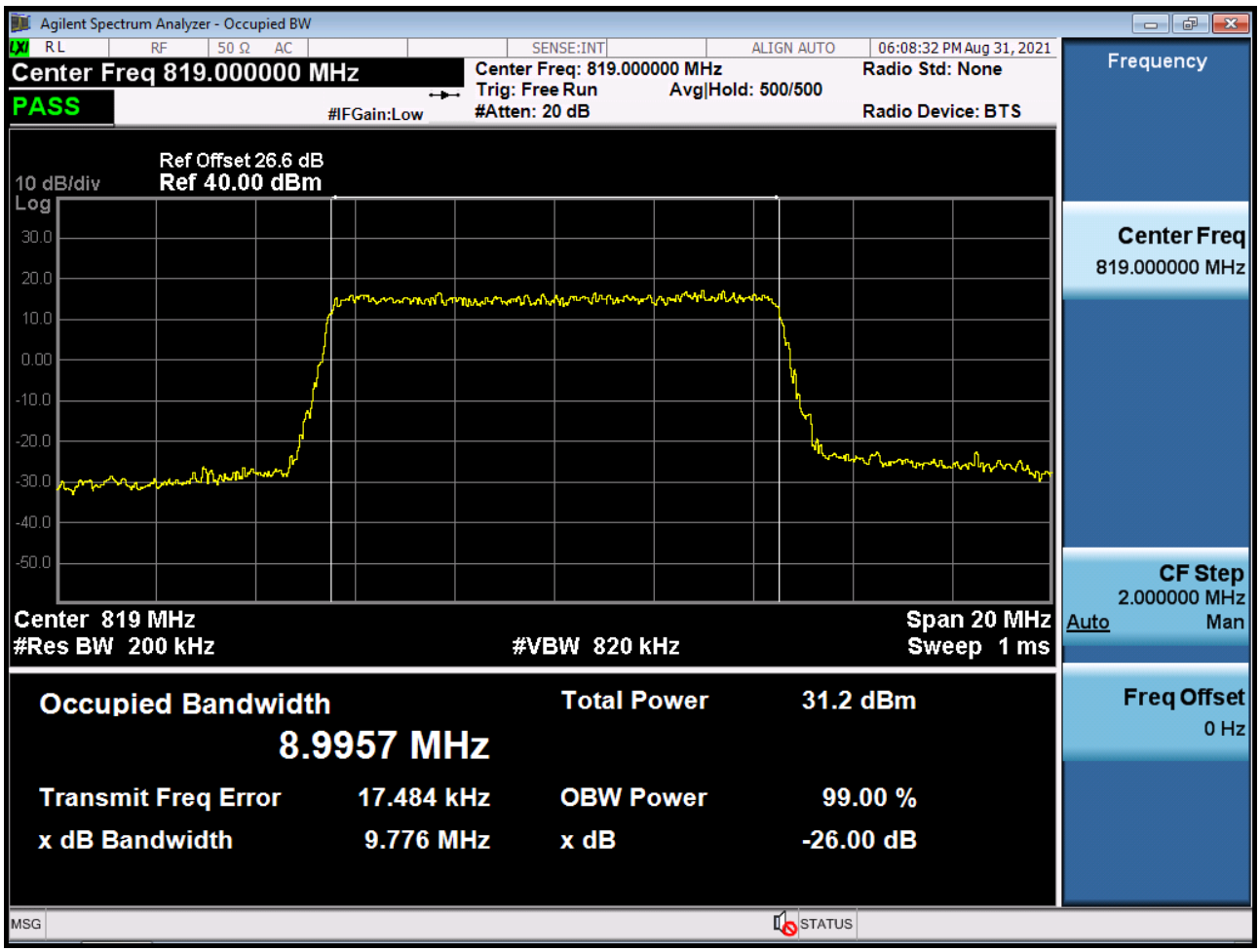
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 16QAM RB 25_0)



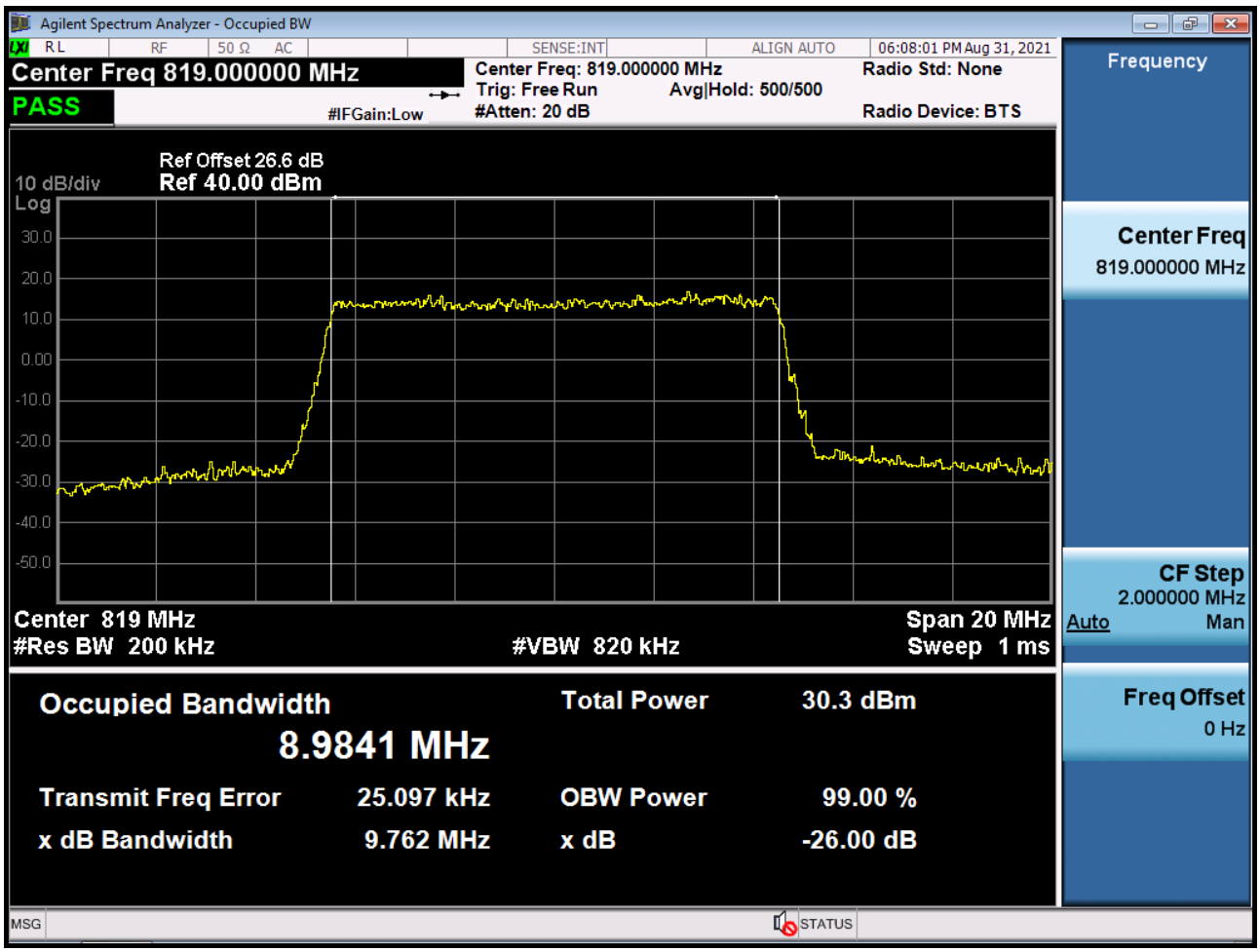
BAND 26. Occupied Bandwidth Plot (5 M BW Ch.26765 64QAM RB 25_0)



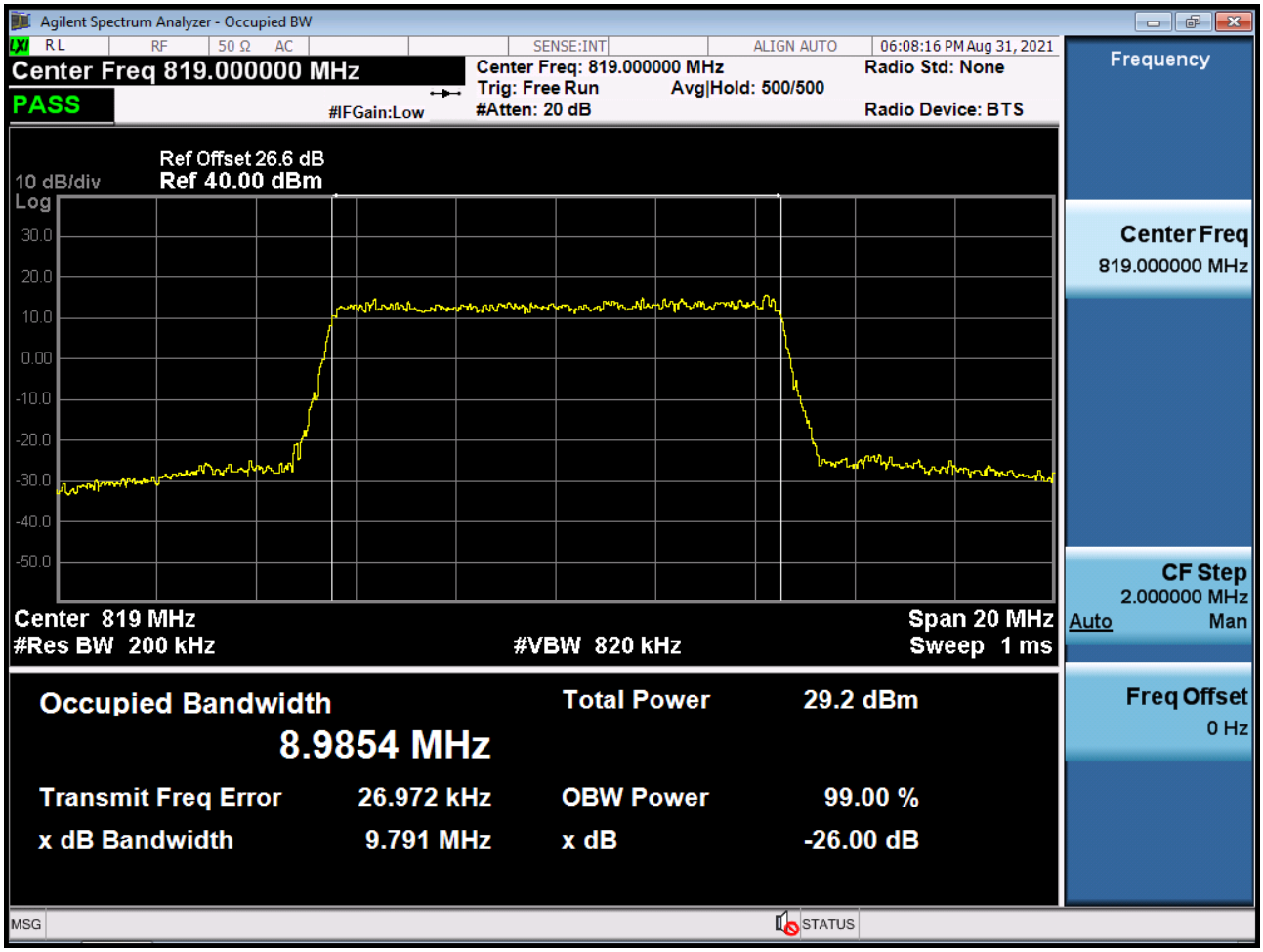
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 QPSK RB 50_0)



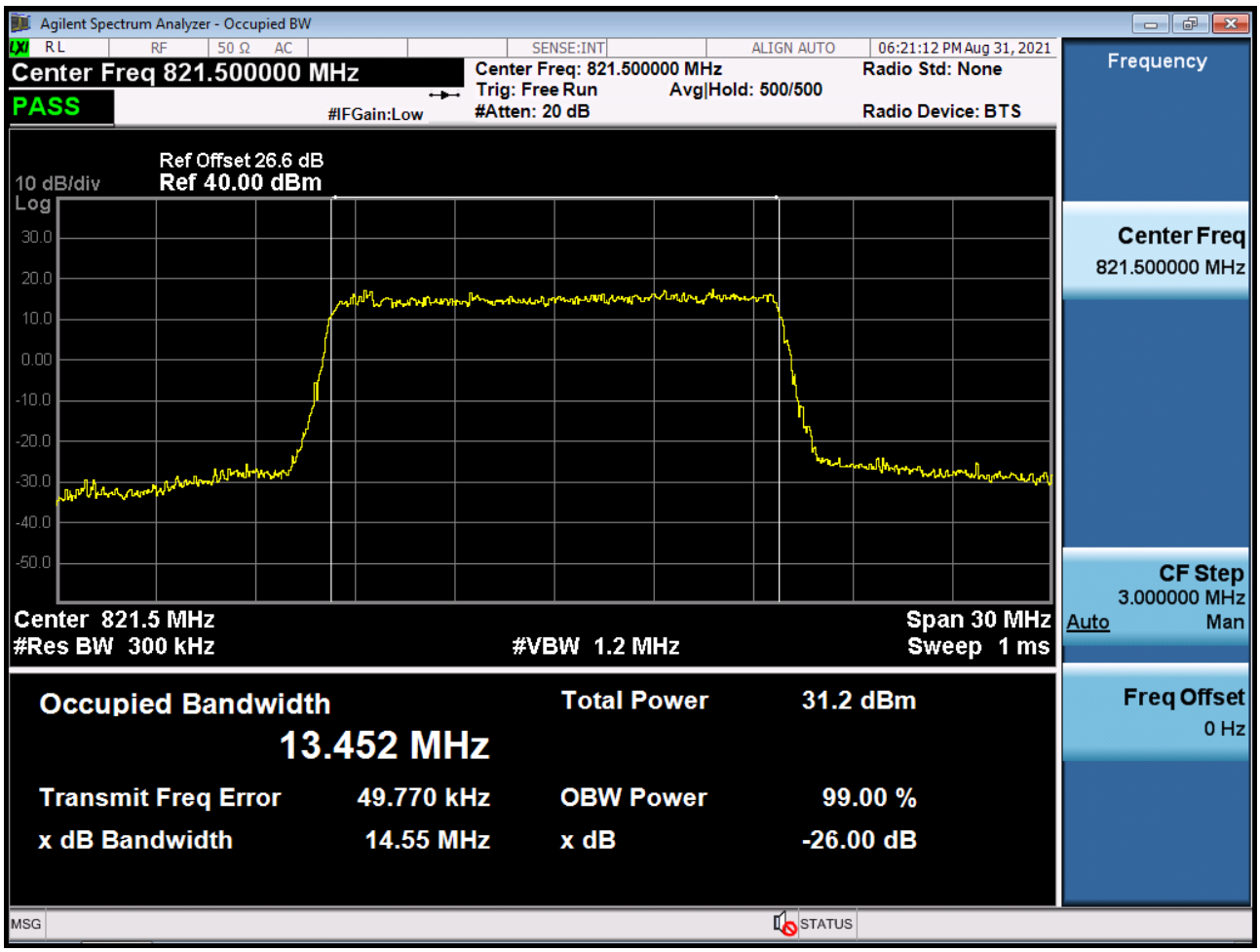
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 16QAM RB 50_0)



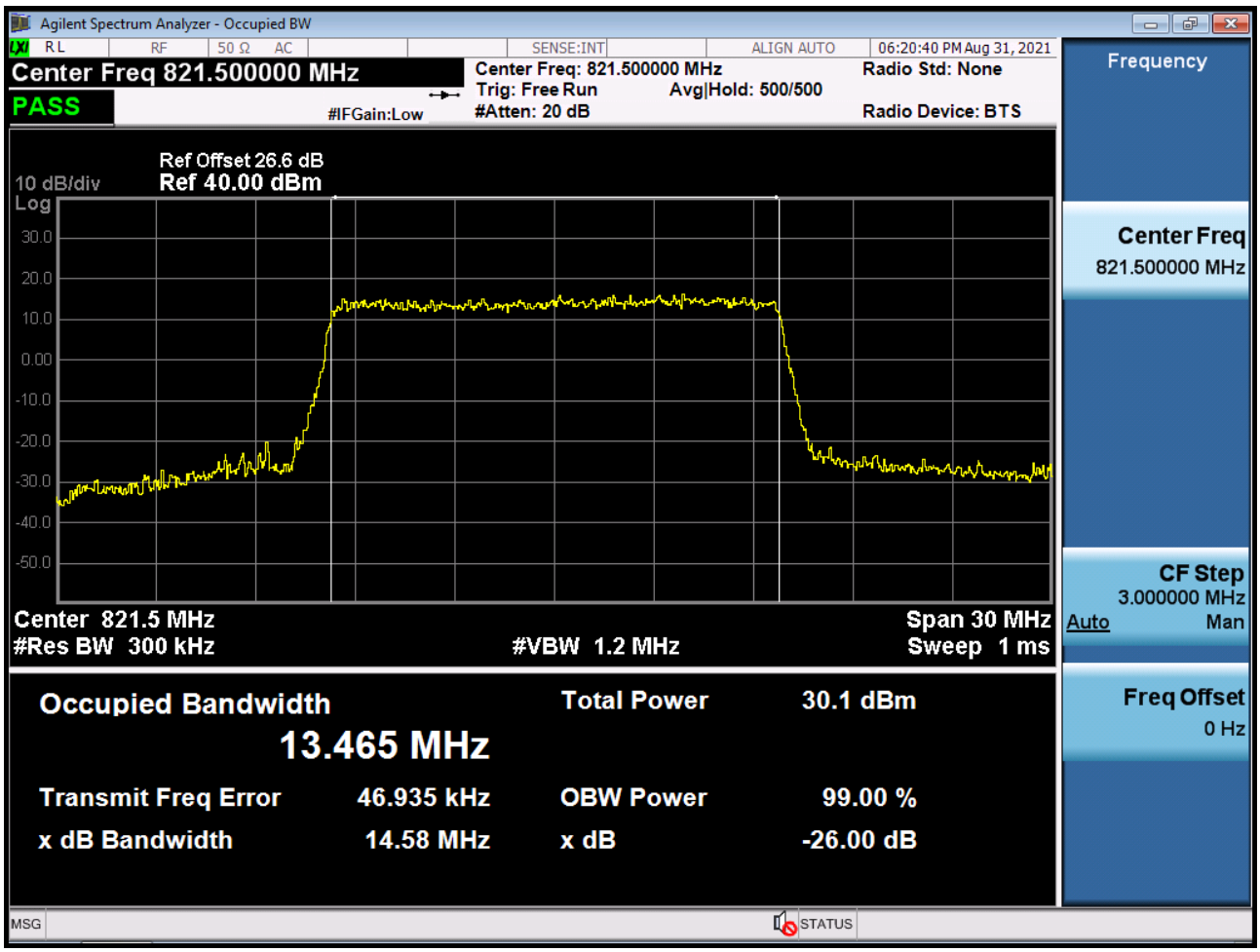
BAND 26. Occupied Bandwidth Plot (10 M BW Ch.26740 64QAM RB 50_0)



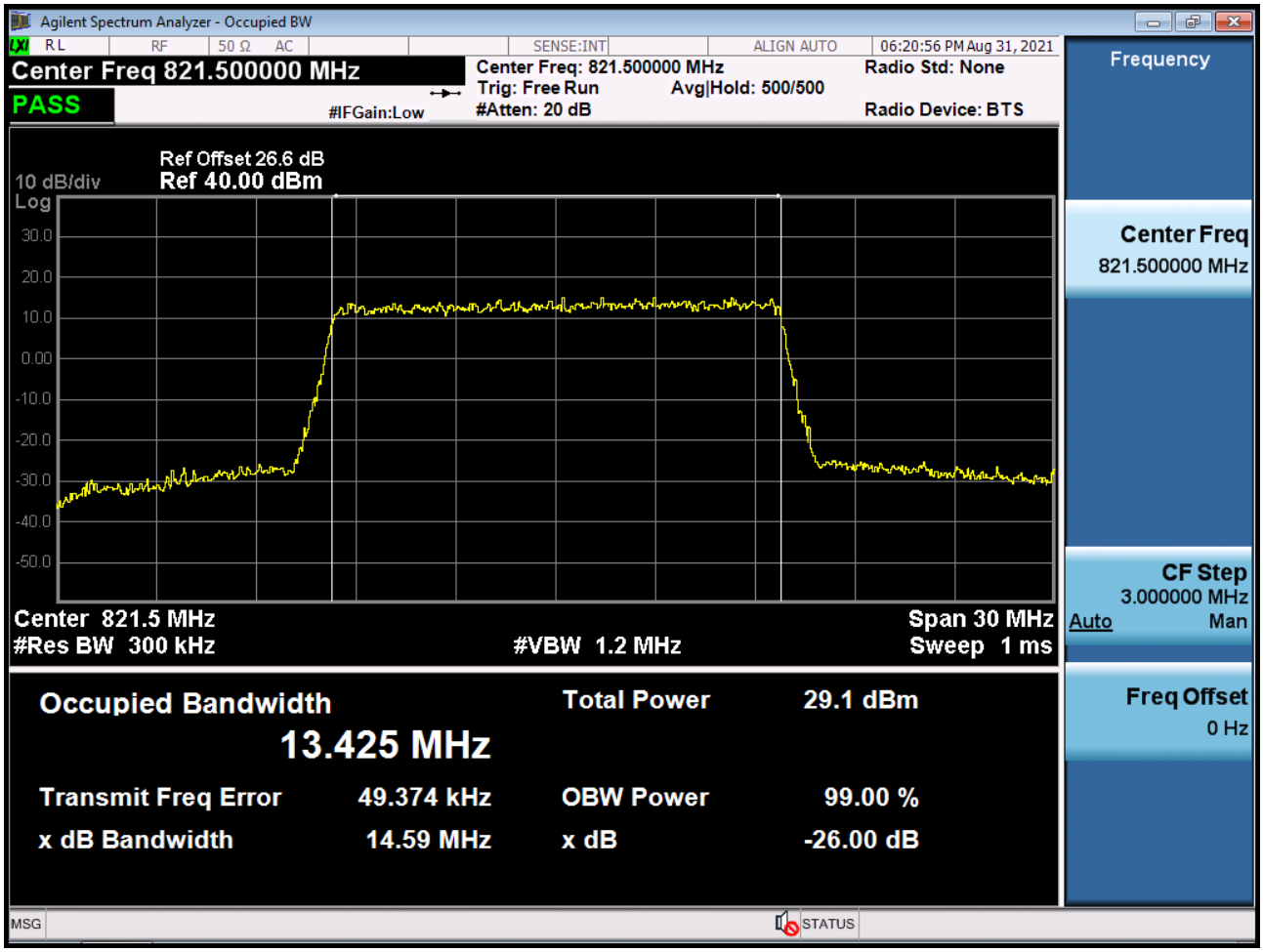
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 QPSK RB 75_0)



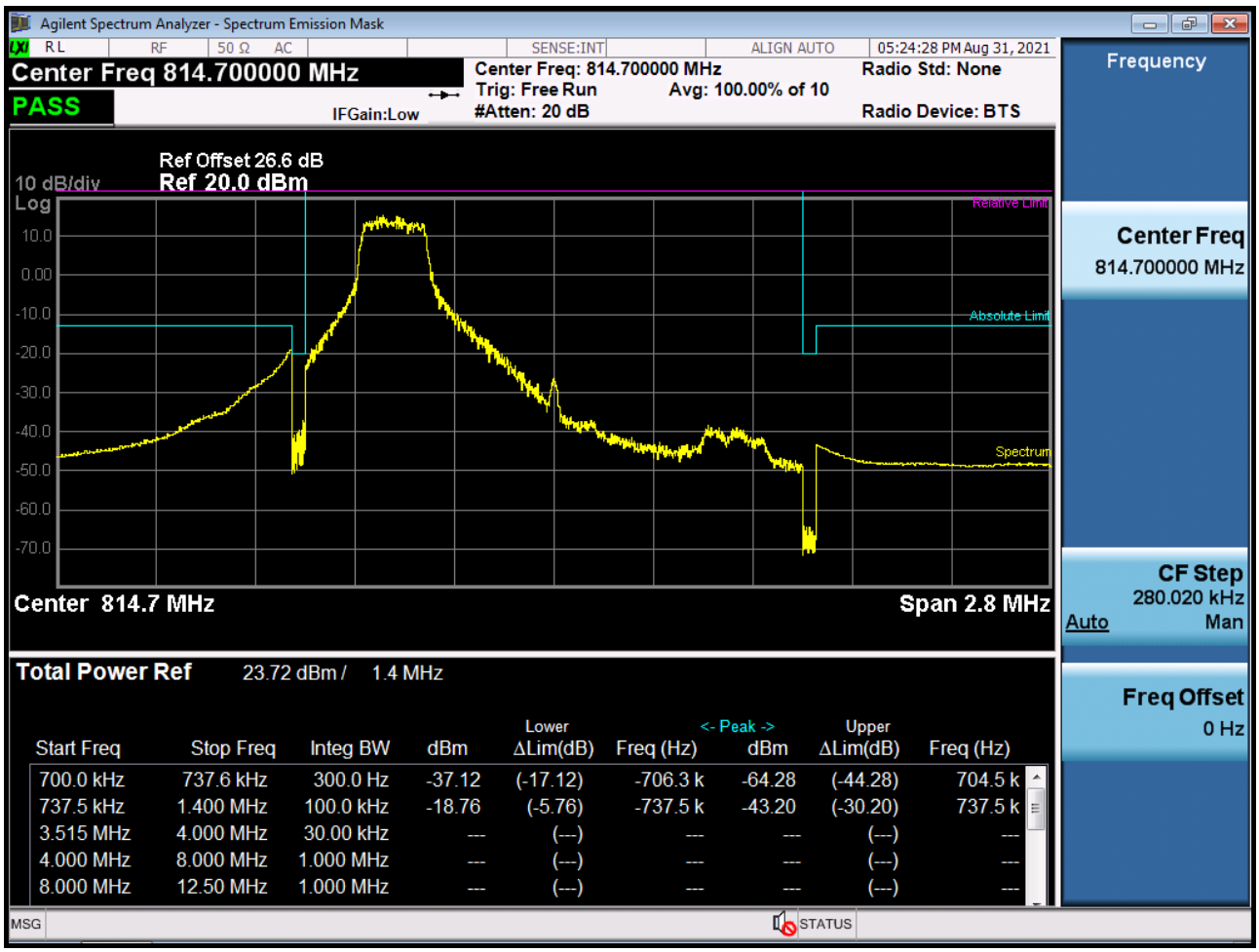
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 16QAM RB 75_0)



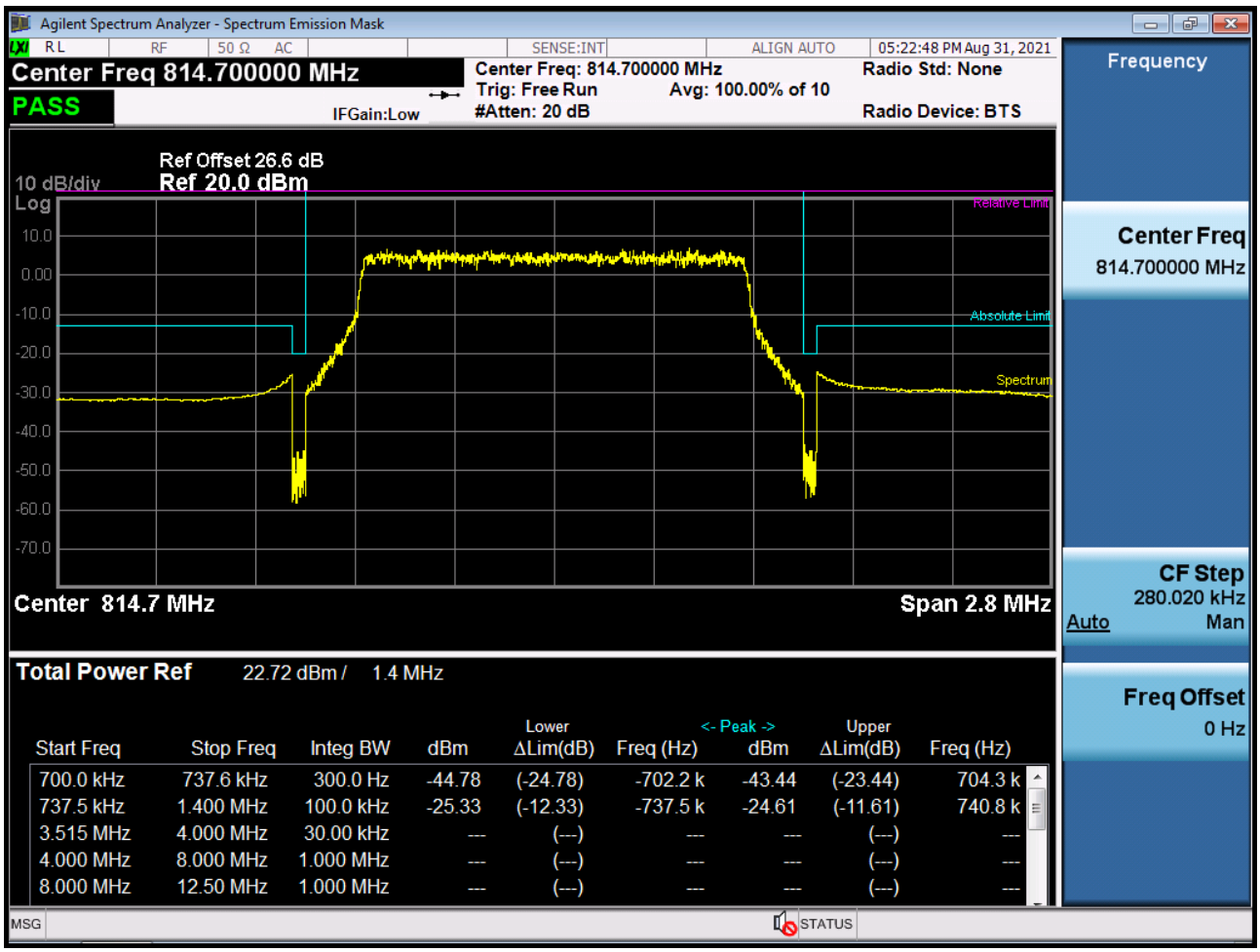
BAND 26. Occupied Bandwidth Plot (15 M BW Ch.26765 64QAM RB 75_0)



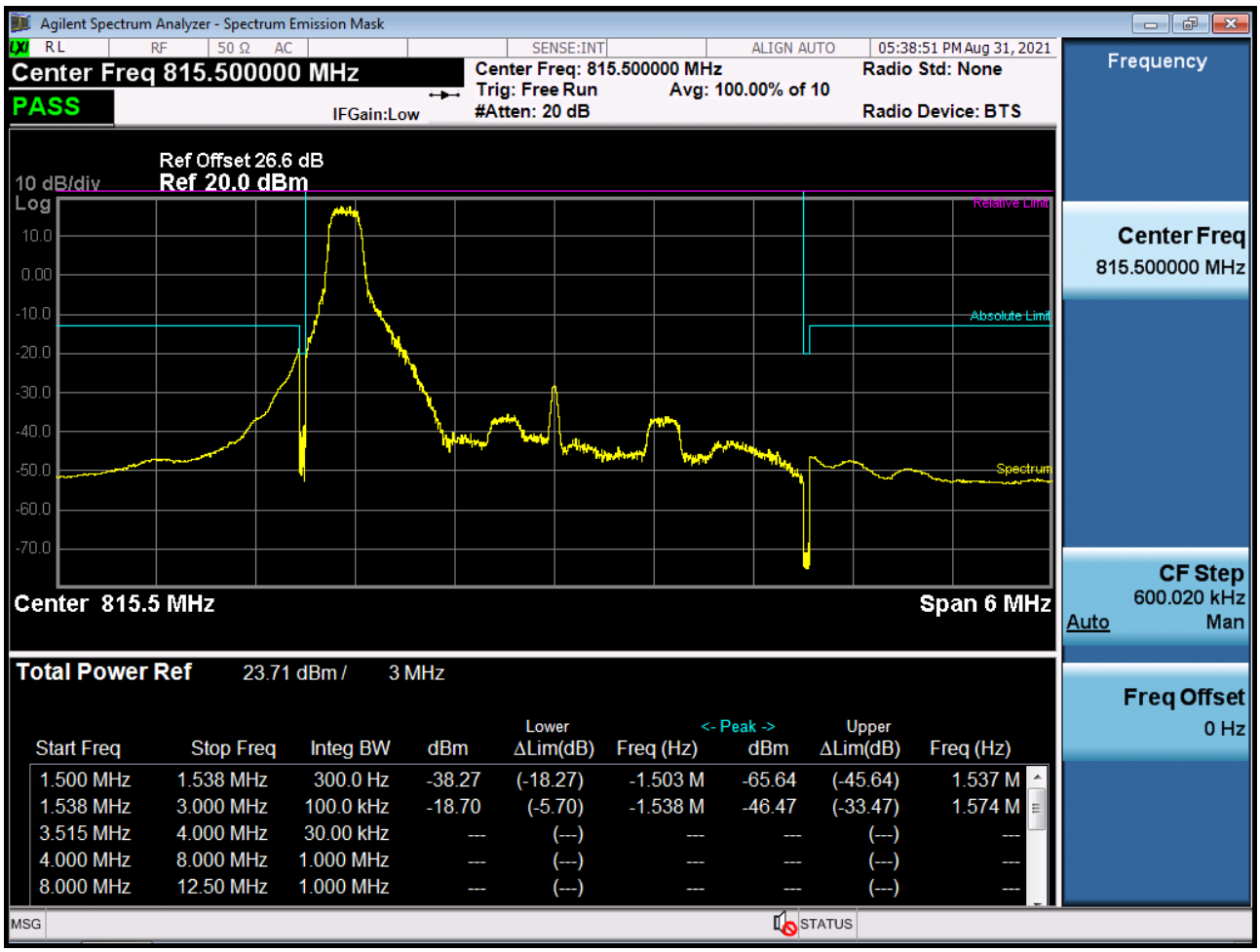
BAND 26. Lower Channel Edge Plot (1.4 M BW Ch.26697 QPSK RB 1, Offset 0)



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

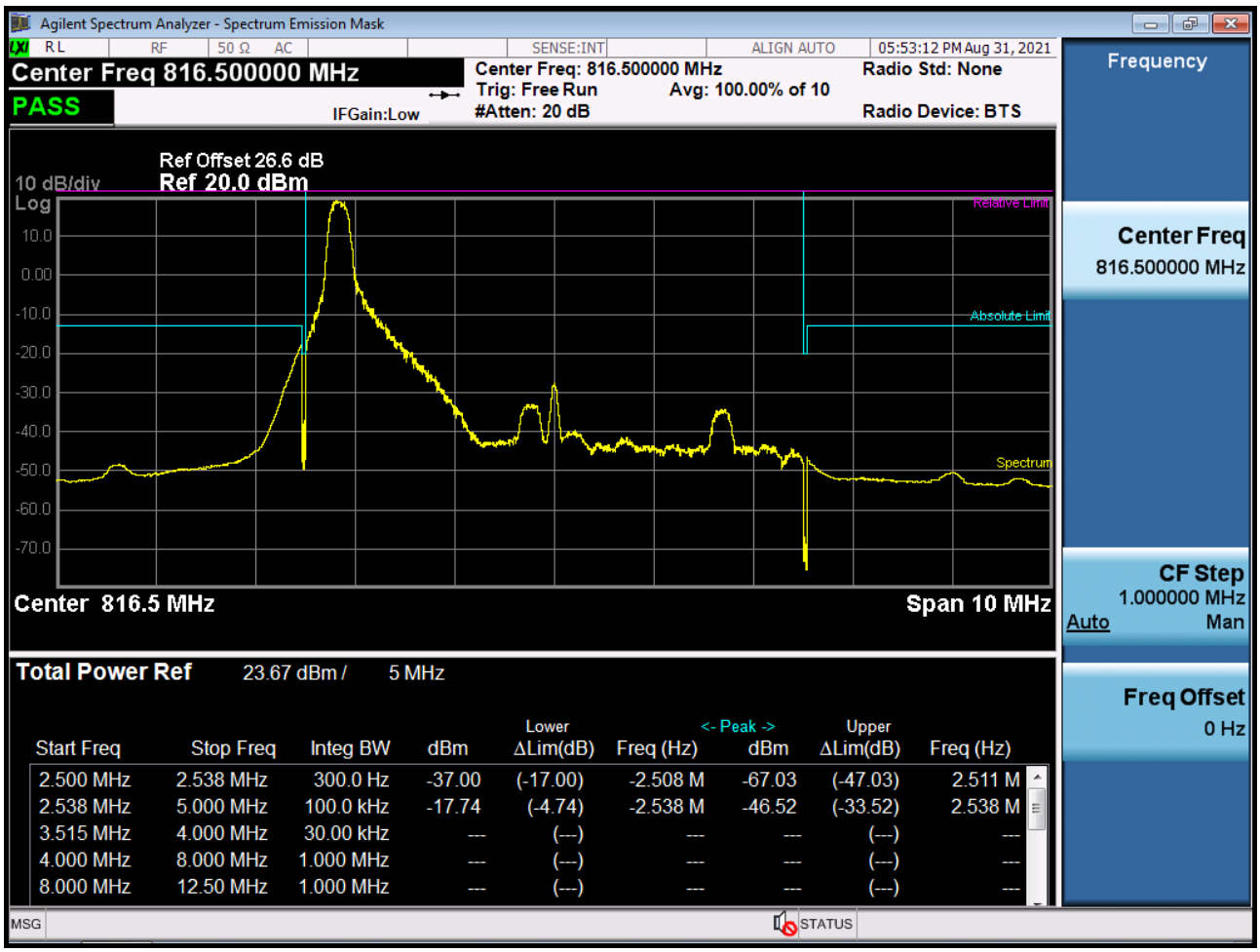


BAND 26. Lower Channel Edge Plot (3 M BW Ch.26705 QPSK RB 1, Offset 0)

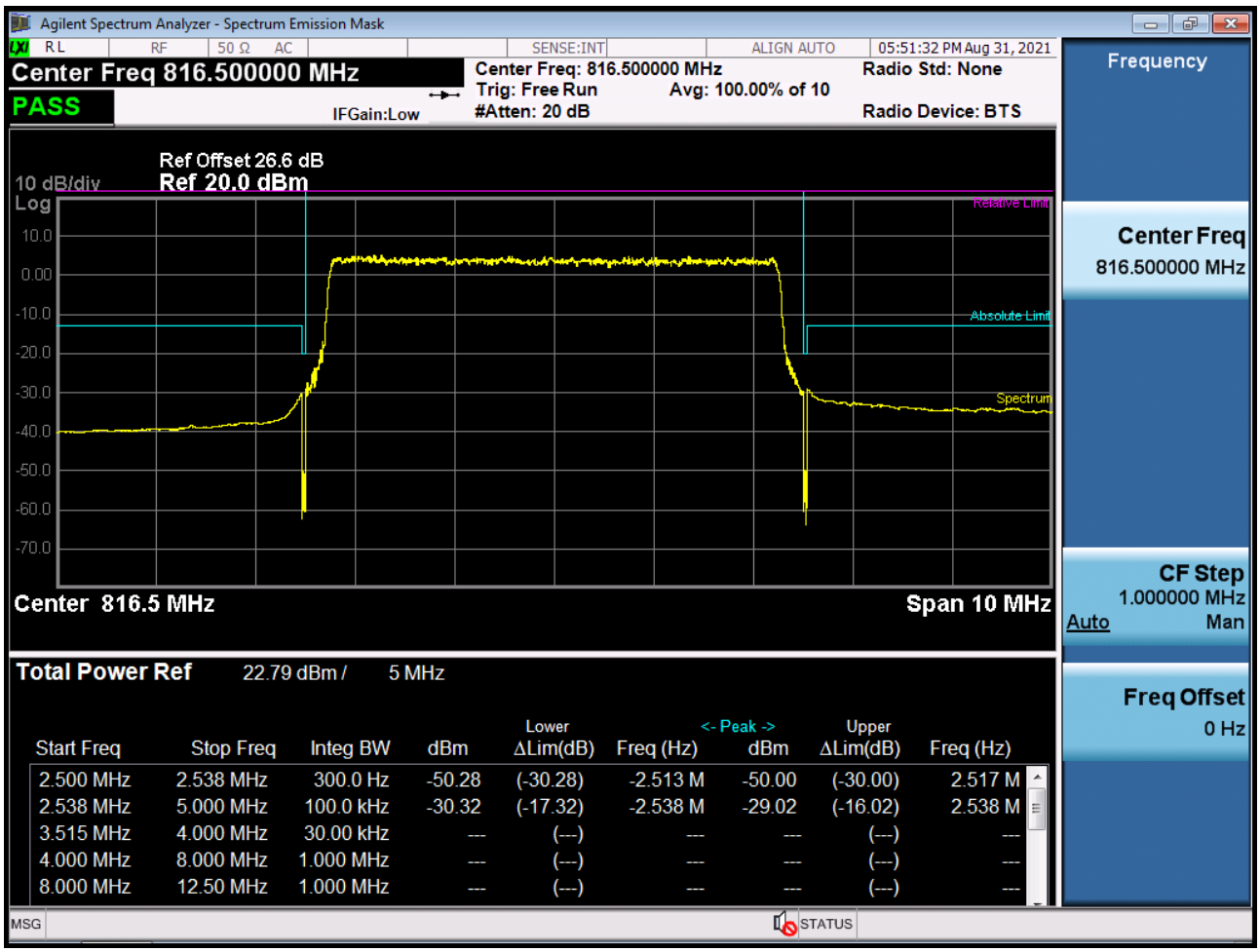


BAND 26. Lower Channel Edge Plot (3 M BW Ch.26705 QPSK_RB15_Offset 0)

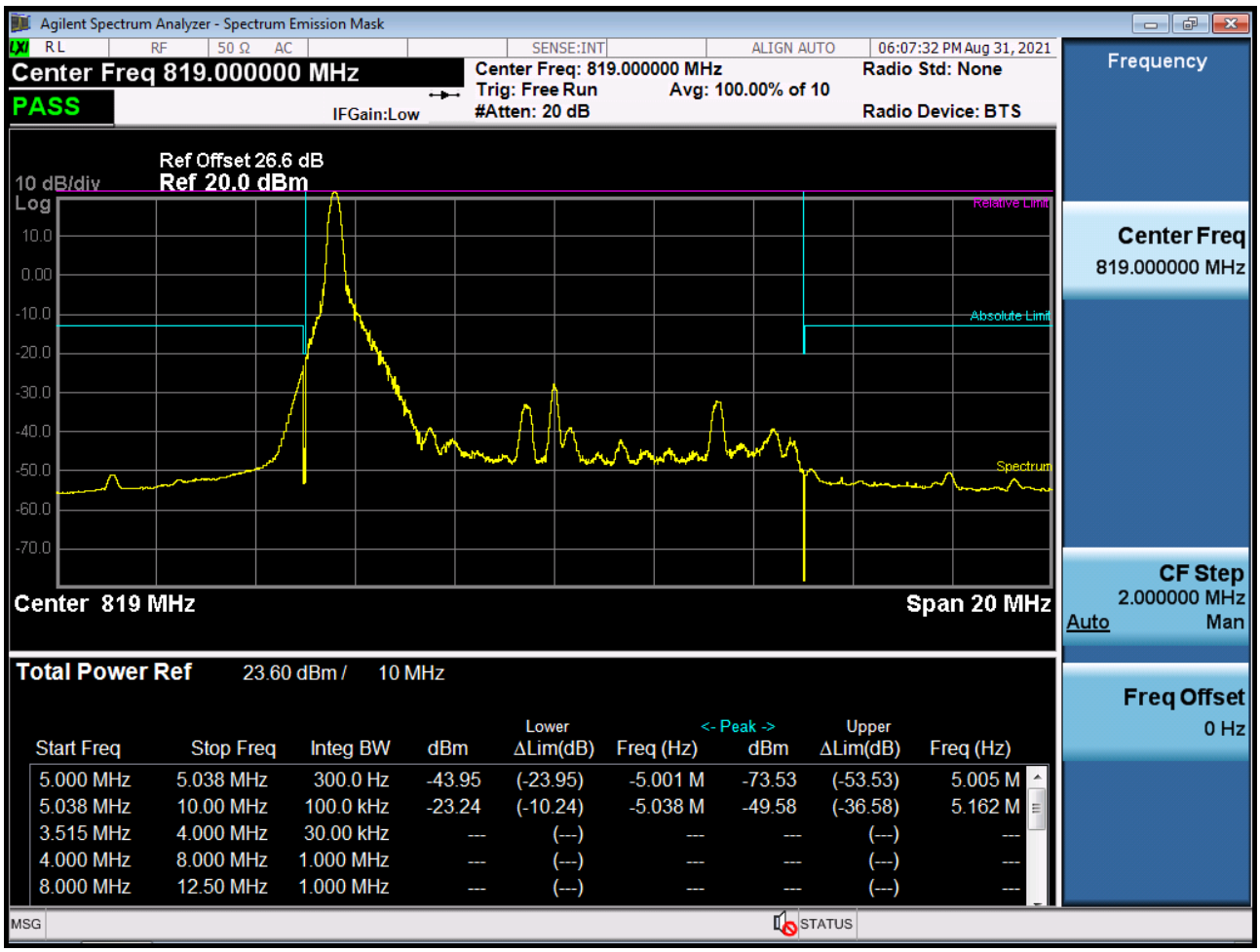
BAND 26. Lower Channel Edge Plot (5 M BW Ch.26715 QPSK RB 1, Offset 0)



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

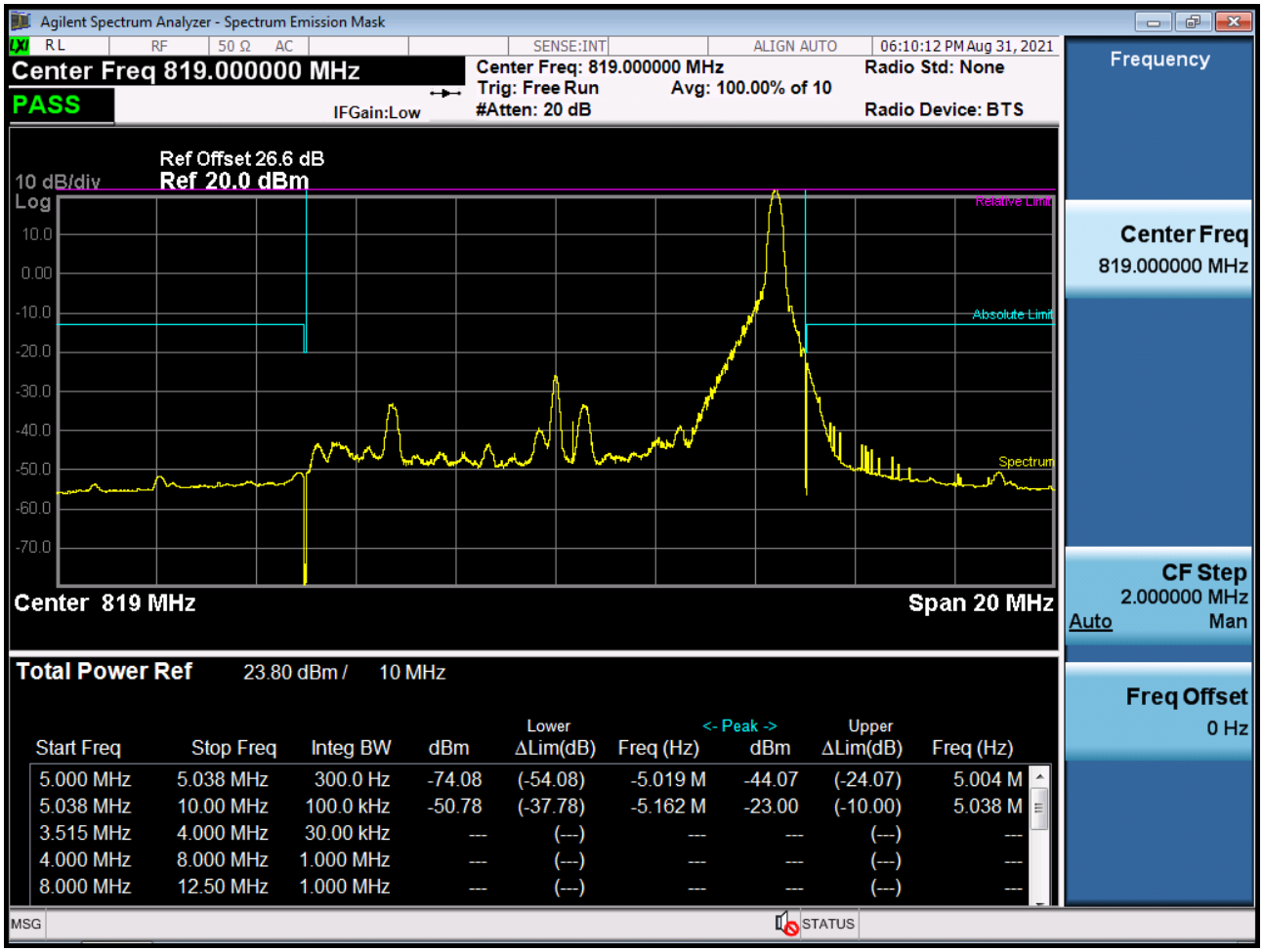


BAND 26. Low Channel Edge Plot (10 M BW Ch.26740 QPSK RB 1, Offset 0)

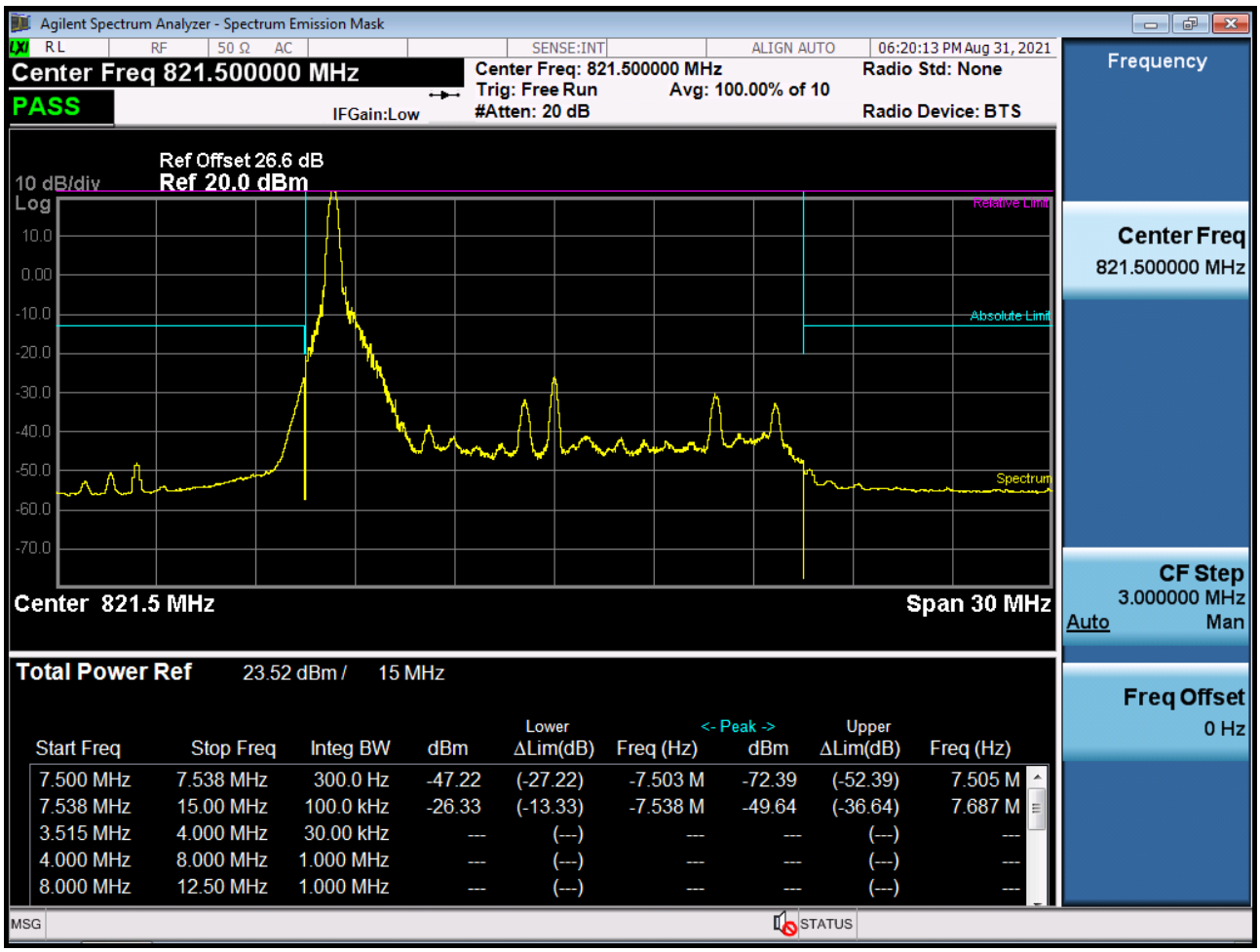


BAND 26. Low Channel Edge Plot (10 M BW Ch.26740 QPSK_RB50_Offset 0)

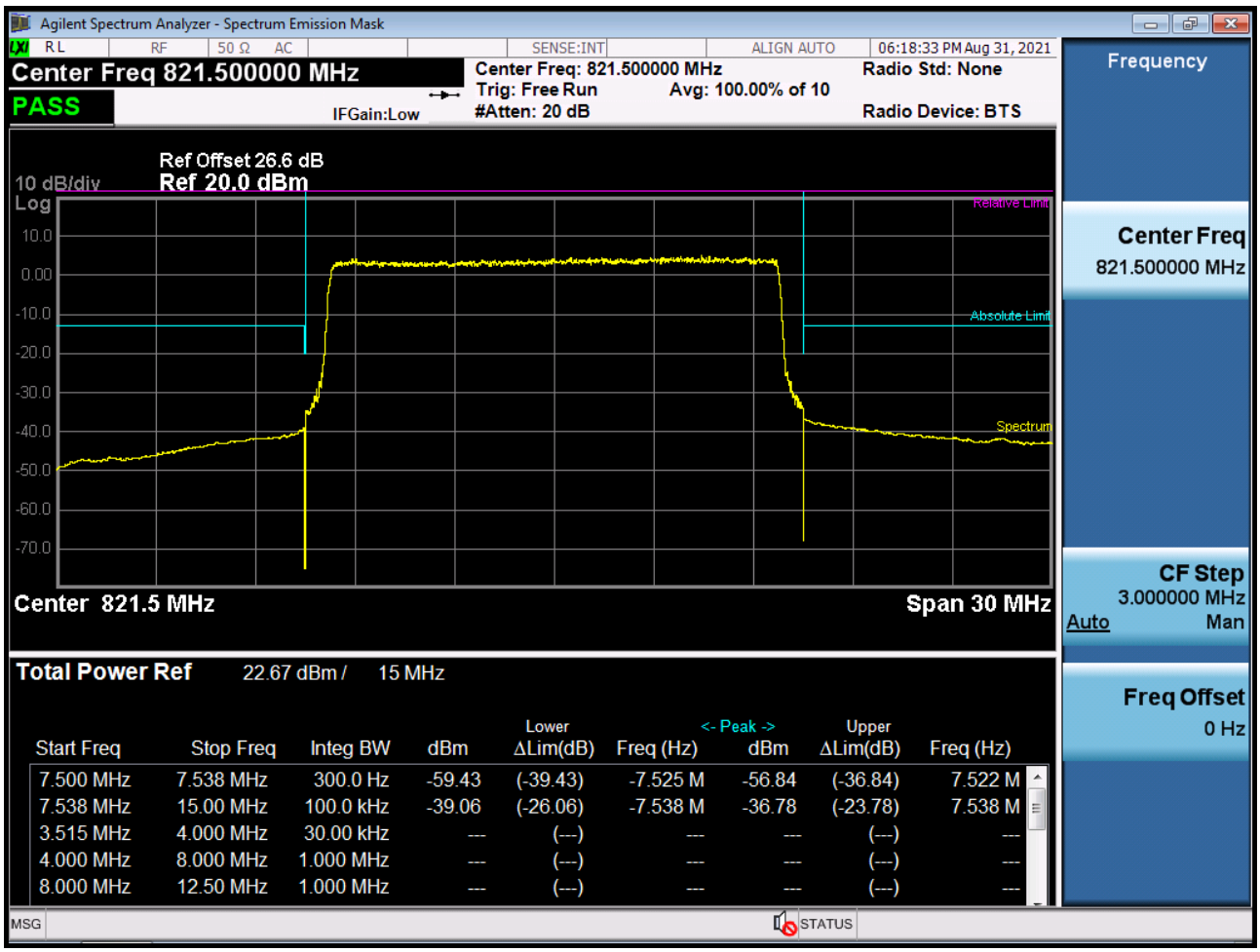
BAND 26. Mid Channel Edge Plot (10 M BW Ch. 26740 QPSK_RB1_Offset 49)



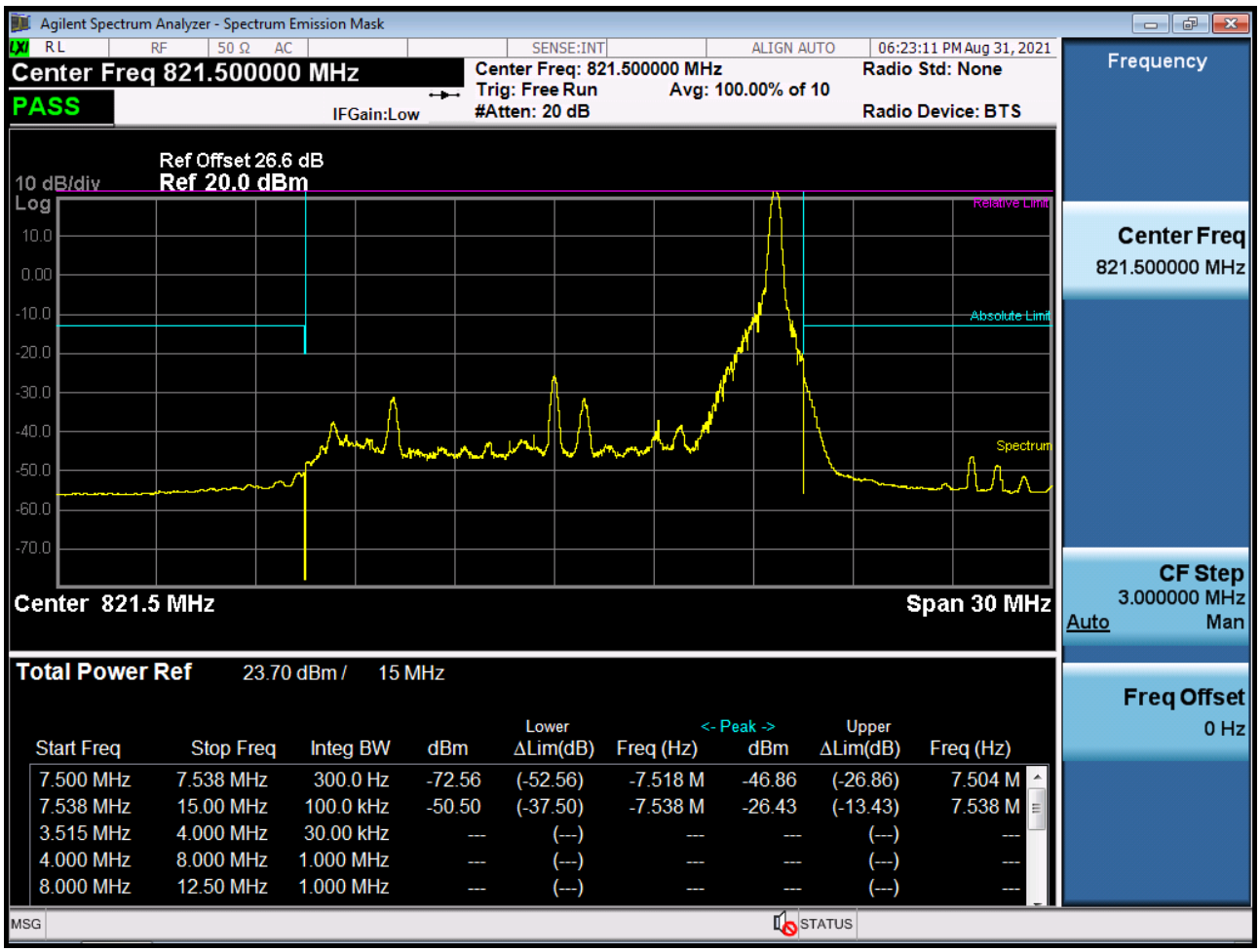
BAND 26. Low Channel Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset 0)



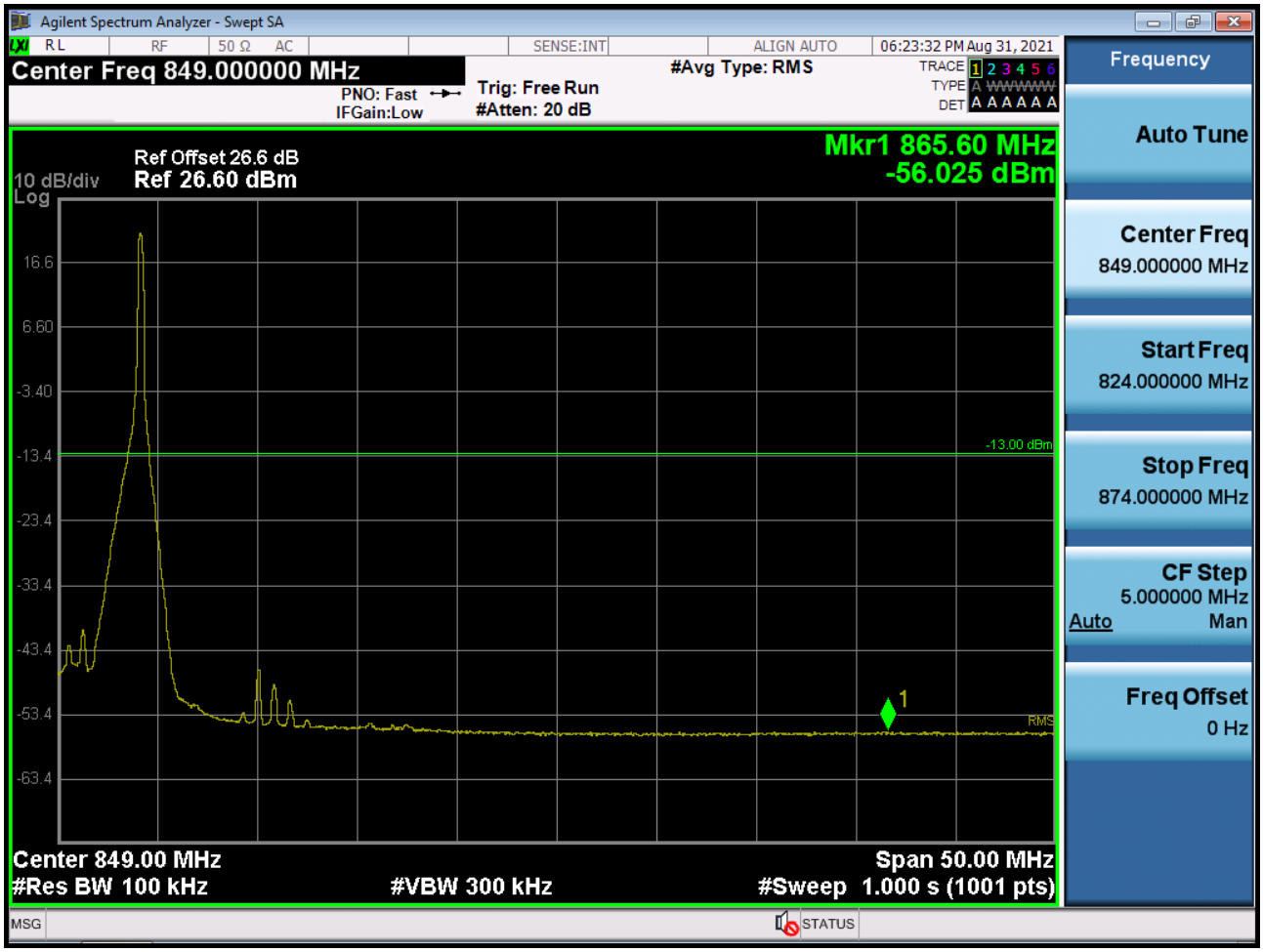
BAND 26. Low Channel Edge Plot (15 M BW Ch.26765 QPSK RB 75, Offset0)



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

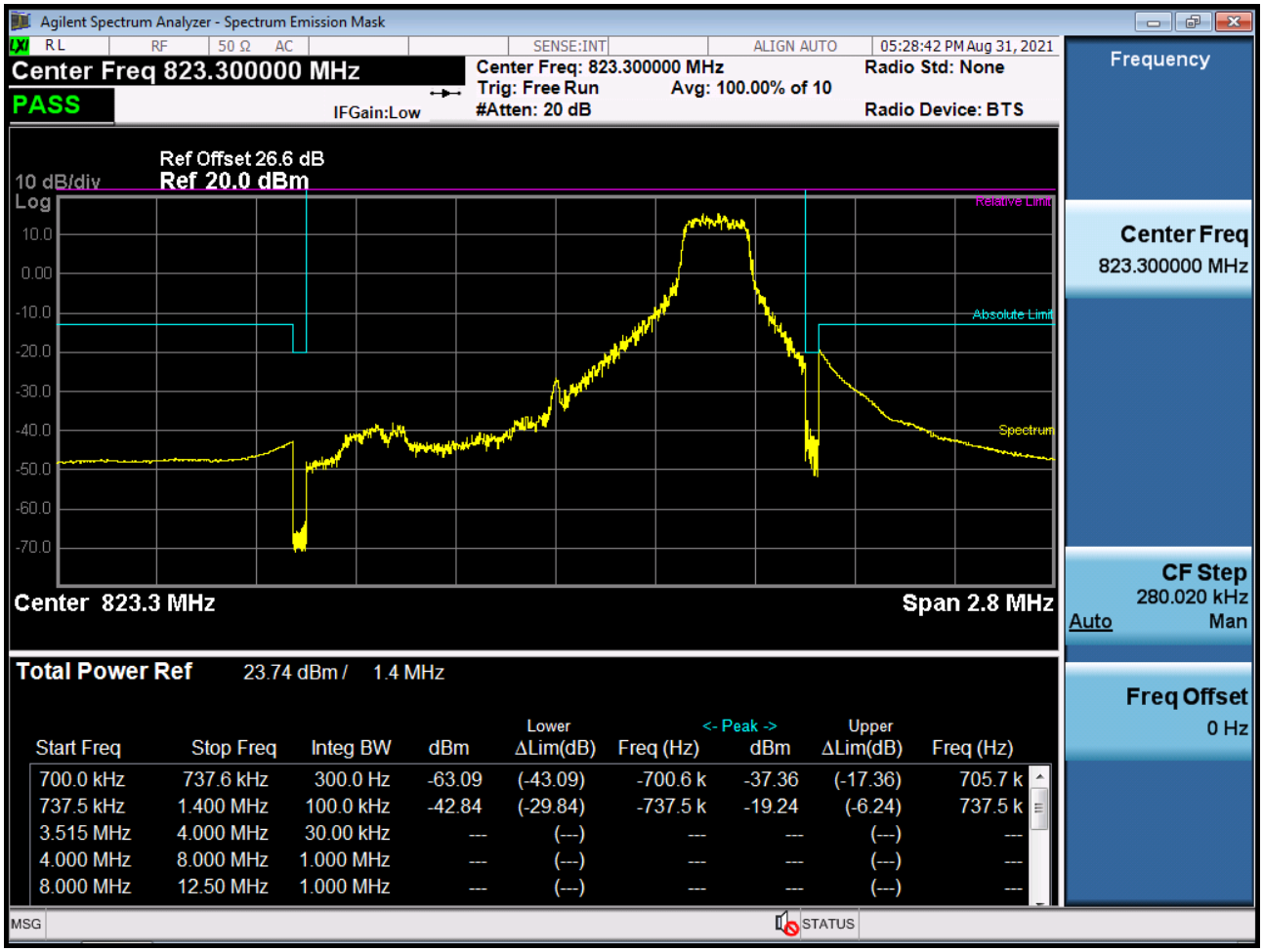


BAND 26. Mid Band Edge Plot (15 M BW Ch.26765 QPSK RB 1, Offset74)

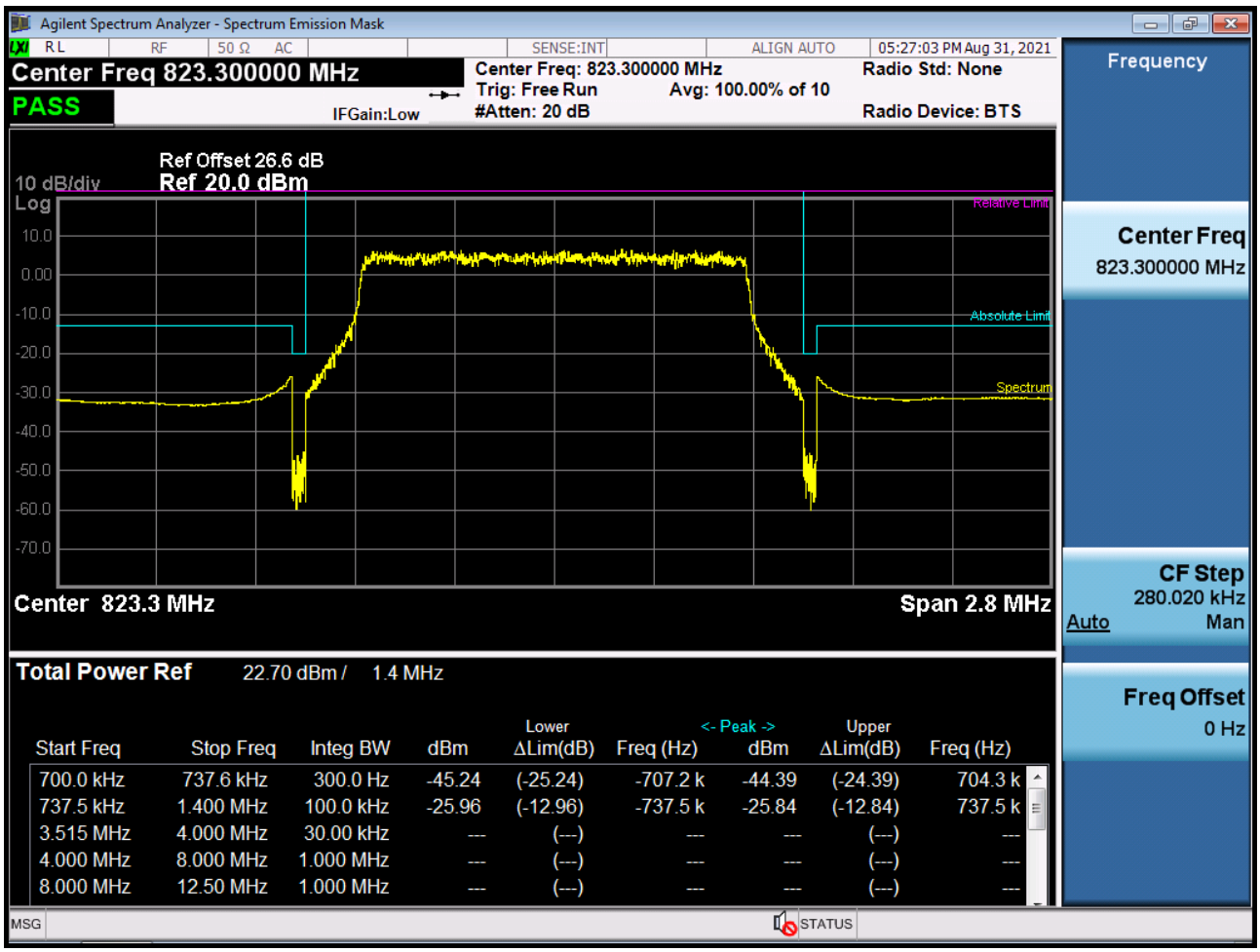


BAND 26. Mid Band Edge Plot (15 M BW Ch.26765 QPSK_RB75_Offset 0)

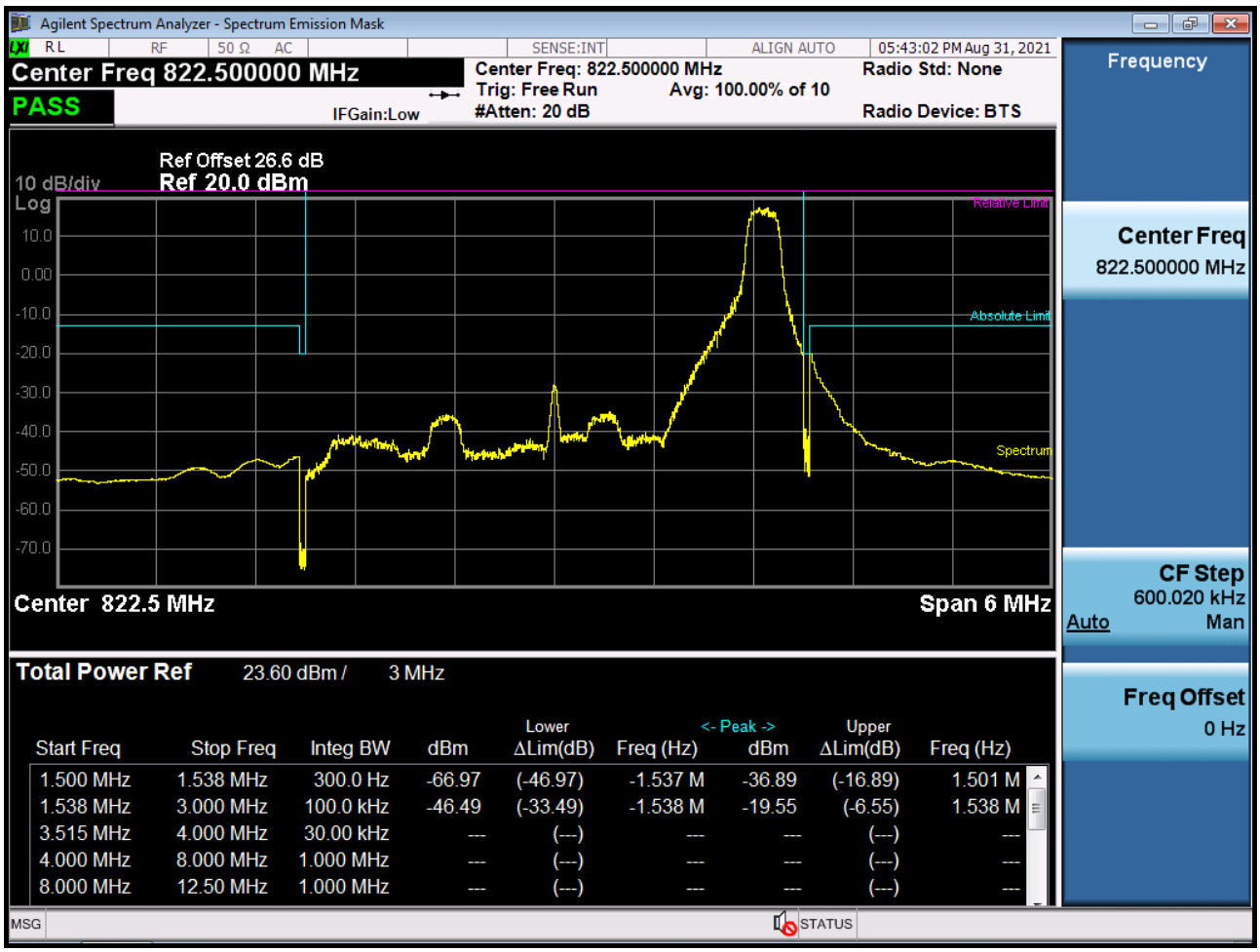
BAND 26. Upper Channel Edge Plot (1.4 M BW Ch.26783 QPSK_RB1_Offset 5)



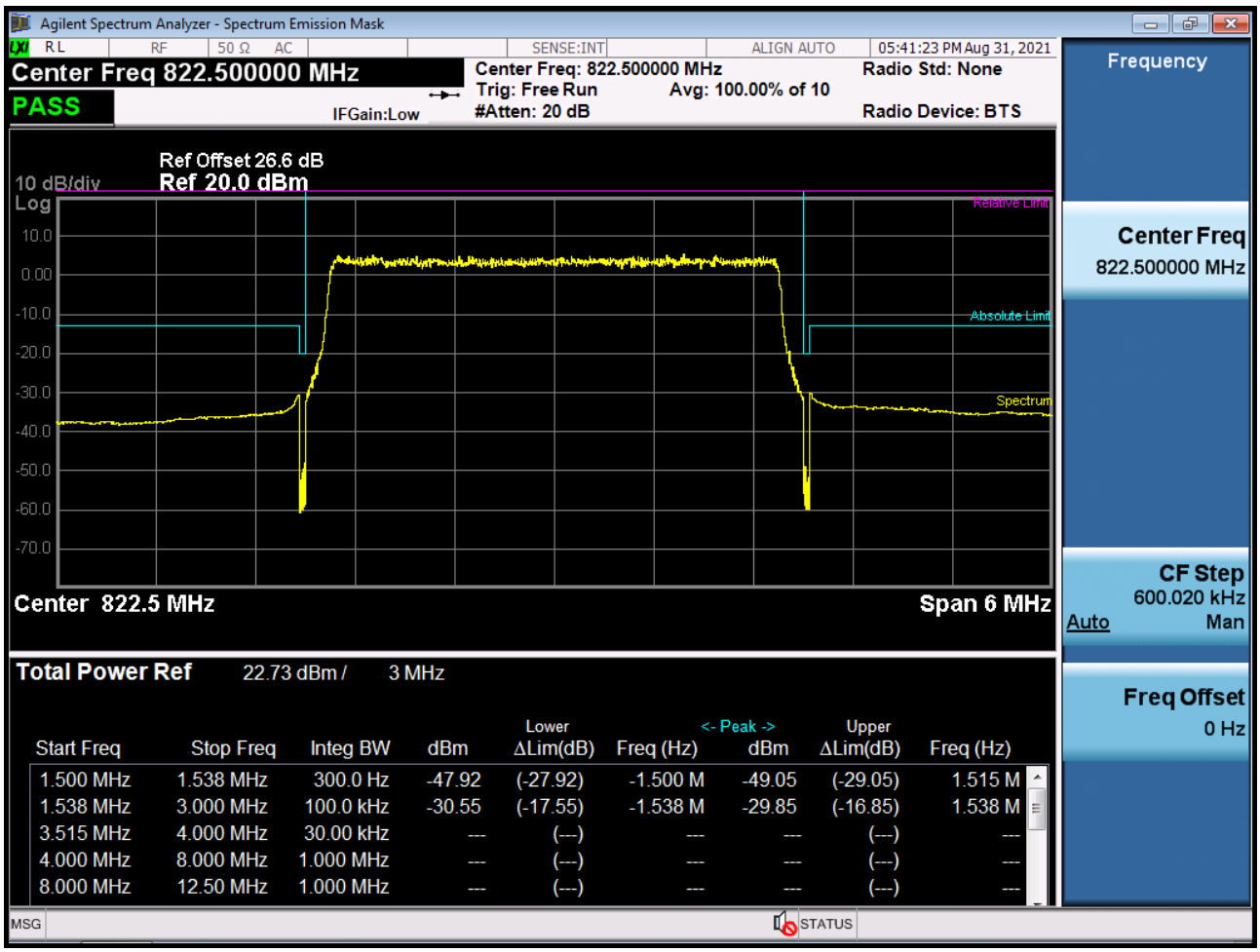
BAND 26. Upper Channel Edge Plot (1.4 M BW Ch.26783 QPSK_RB6_Offset 0)



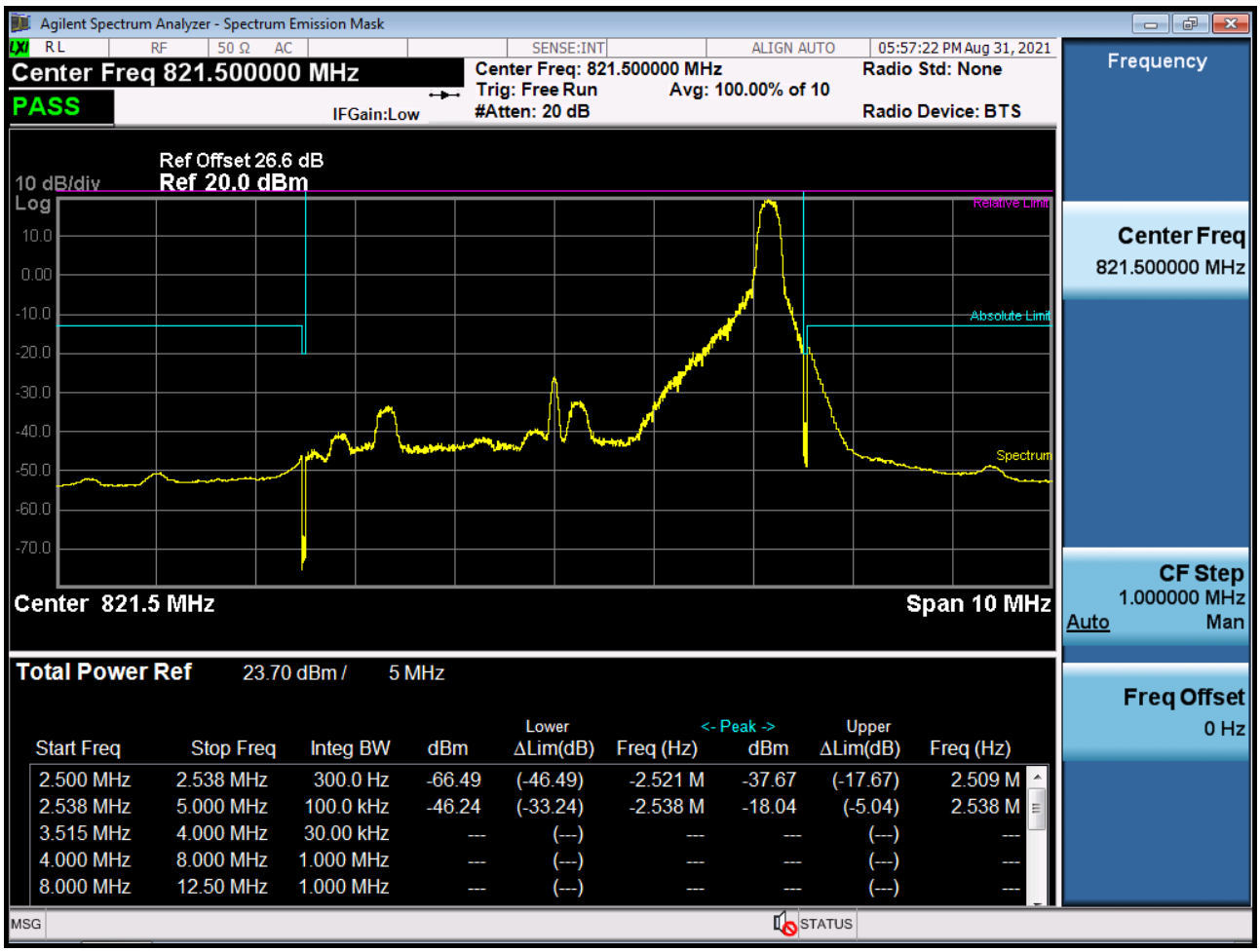
BAND 26. Upper Channel Edge Plot (3 M BW Ch.26775 QPSK_RB1_Offset 14)



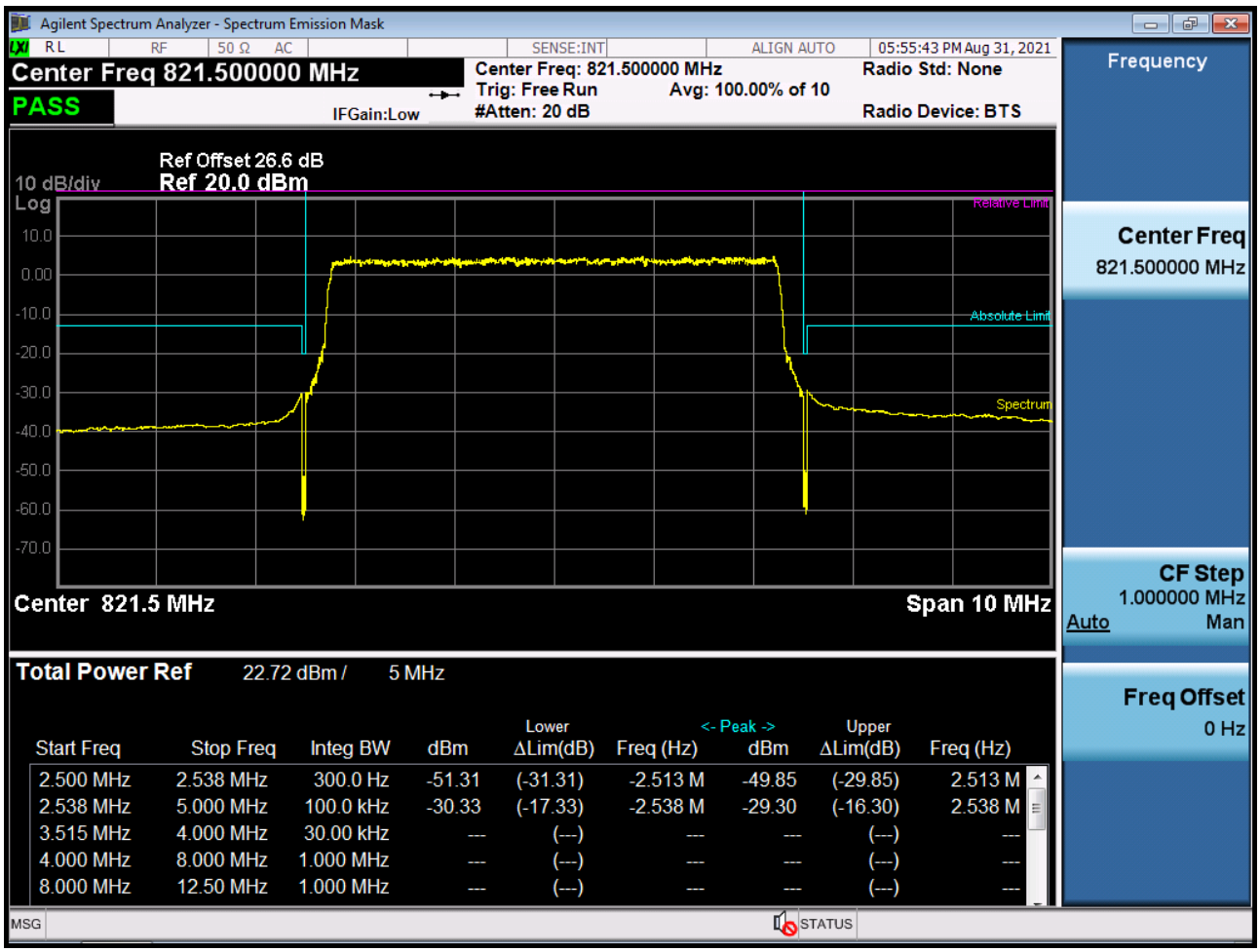
BAND 26. Upper Channel Edge Plot (3 M BW Ch.26775 QPSK_RB15_Offset 0)



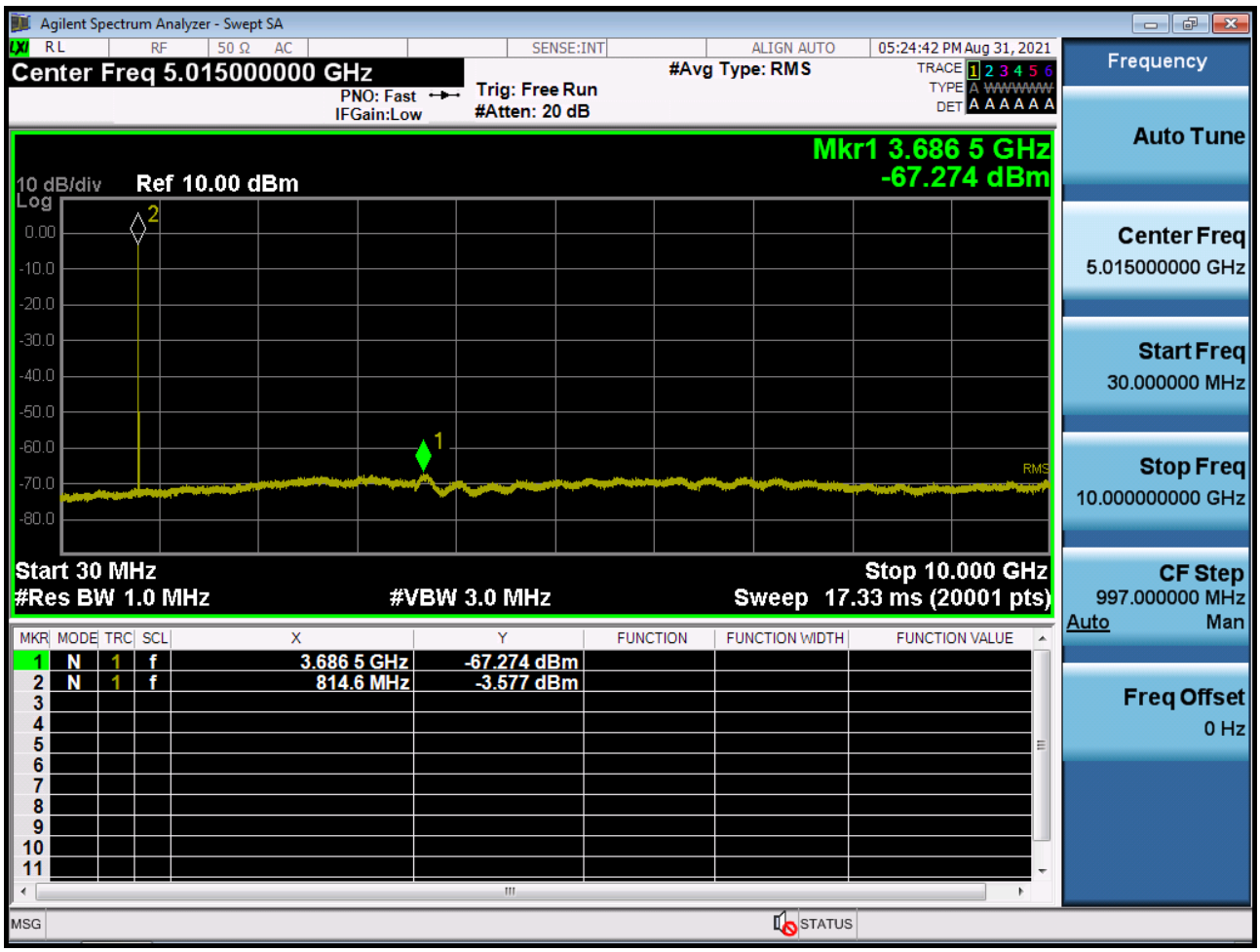
BAND 26. Upper Channel Edge Plot (5 M BW Ch.26765 QPSK_RB1_Offset 24)



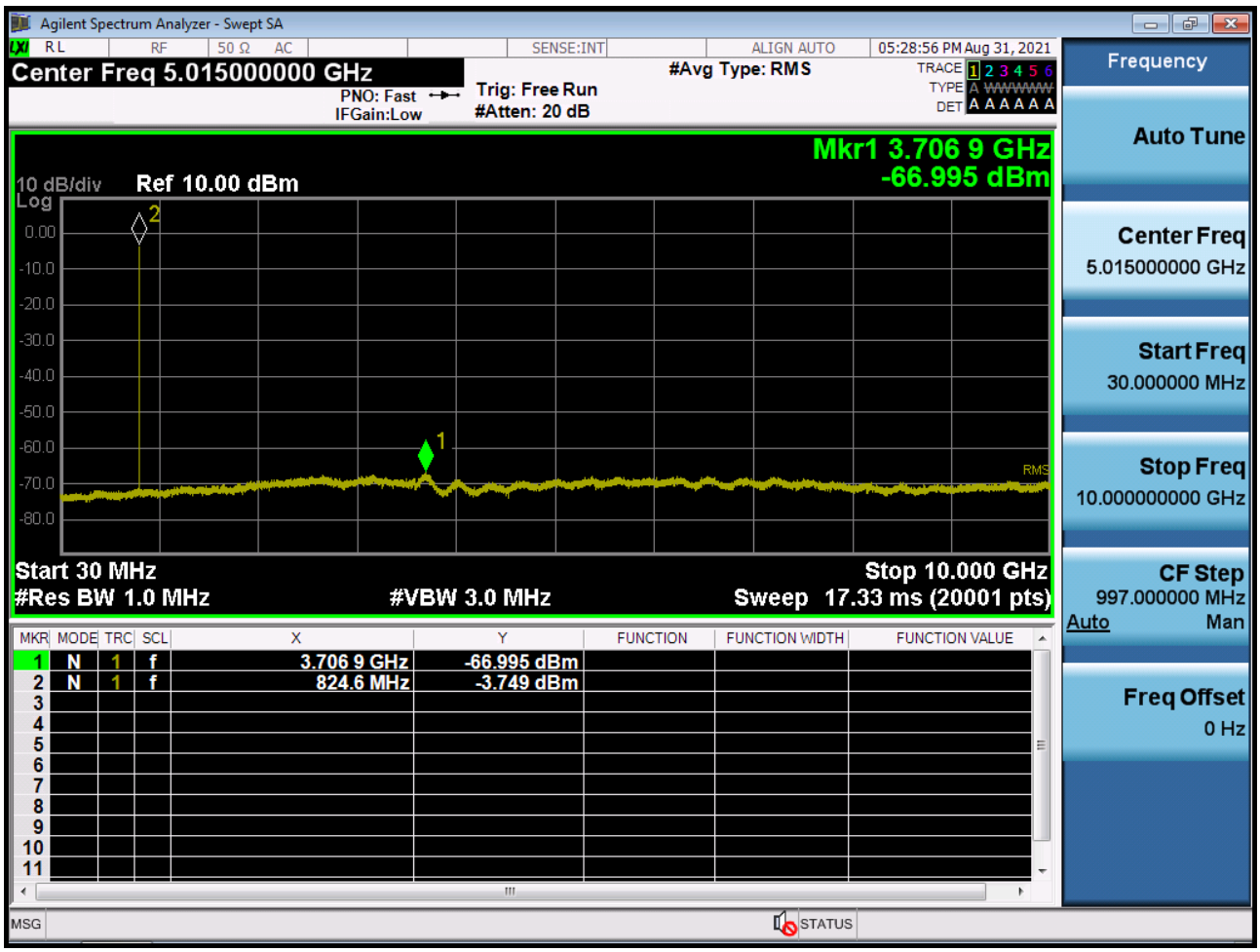
BAND 26. Upper Channel Edge Plot (5 M BW Ch.26765 QPSK_RB25_Offset 0)



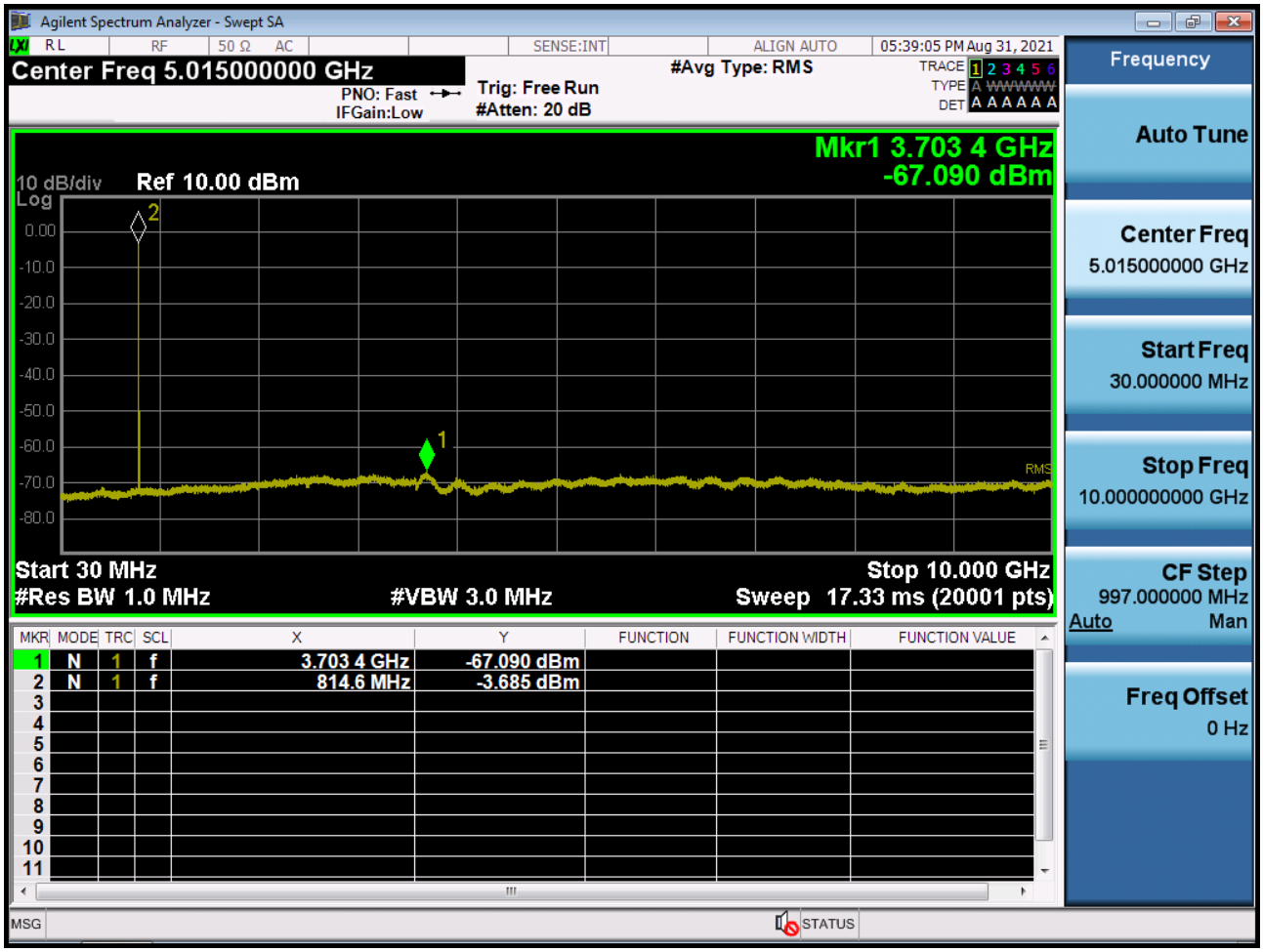
BAND 26. Conducted Spurious (26697 ch_1.4 MHz_QPSK_RB 1_0)



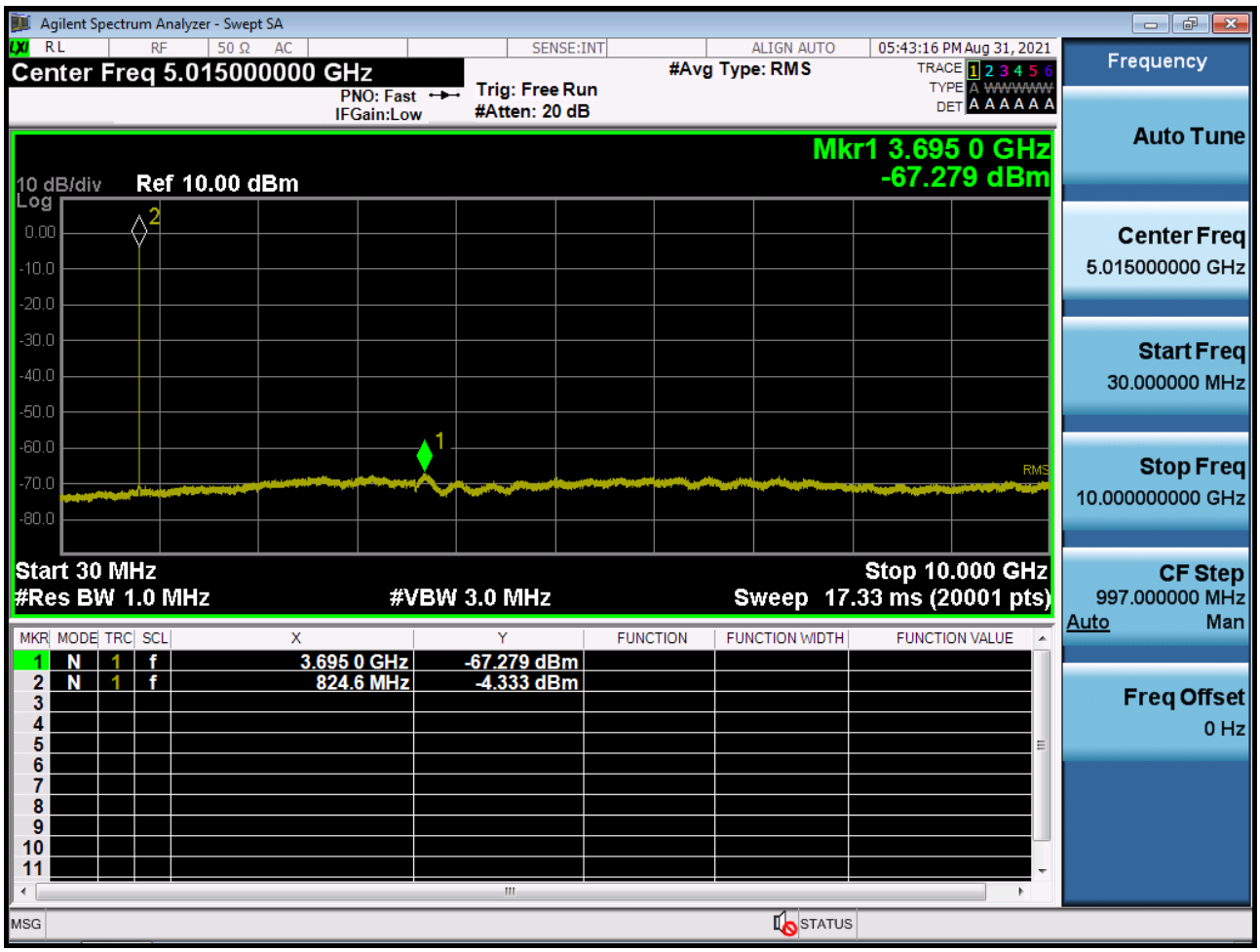
BAND 26. Conducted Spurious (26783 ch_1.4 MHz_QPSK_RB 1_0)



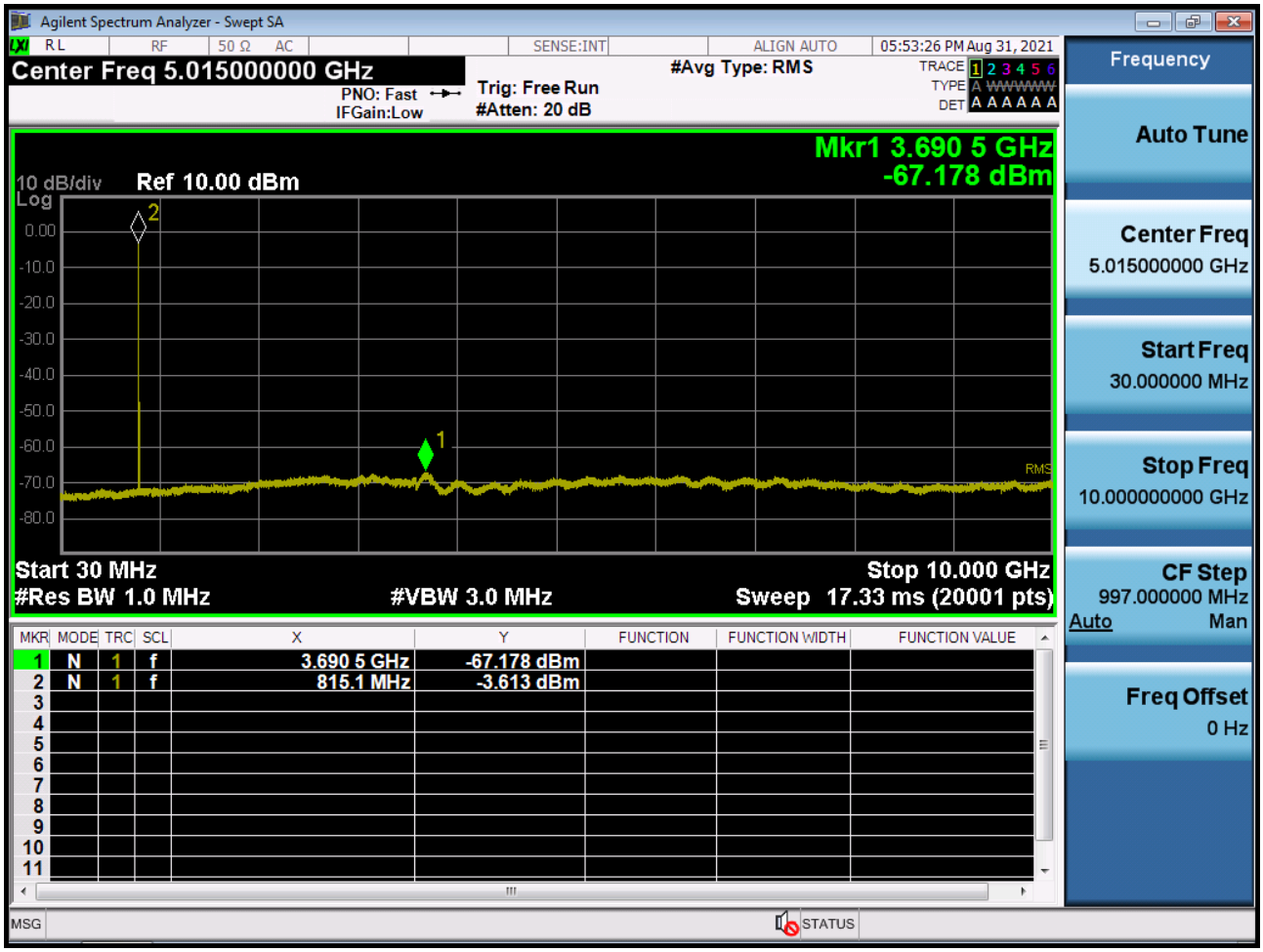
BAND 26. Conducted Spurious (26705 ch_3 MHz_QPSK_RB 1_0)



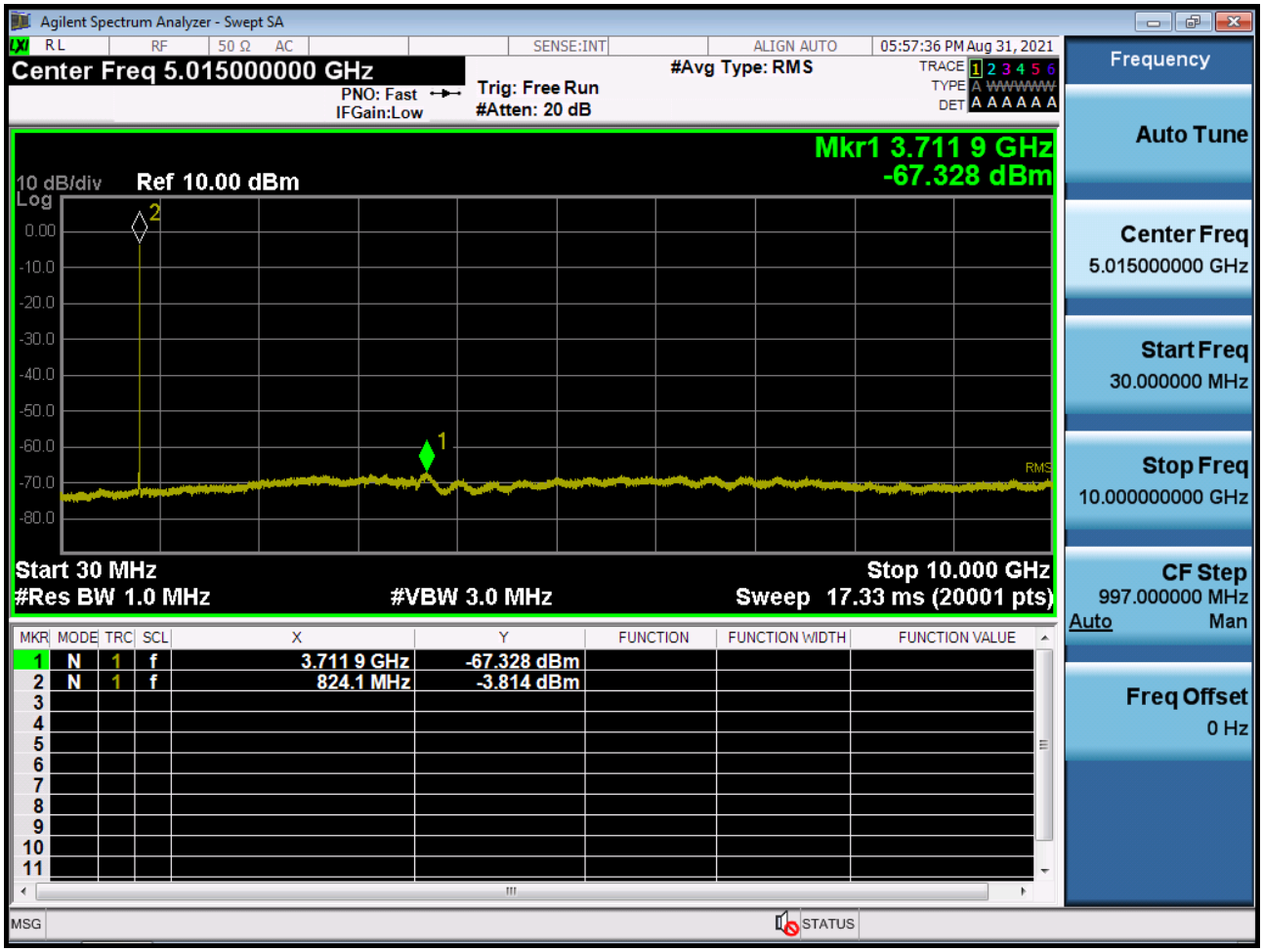
BAND 26. Conducted Spurious (26775 ch_3 MHz_QPSK_RB 1_0)



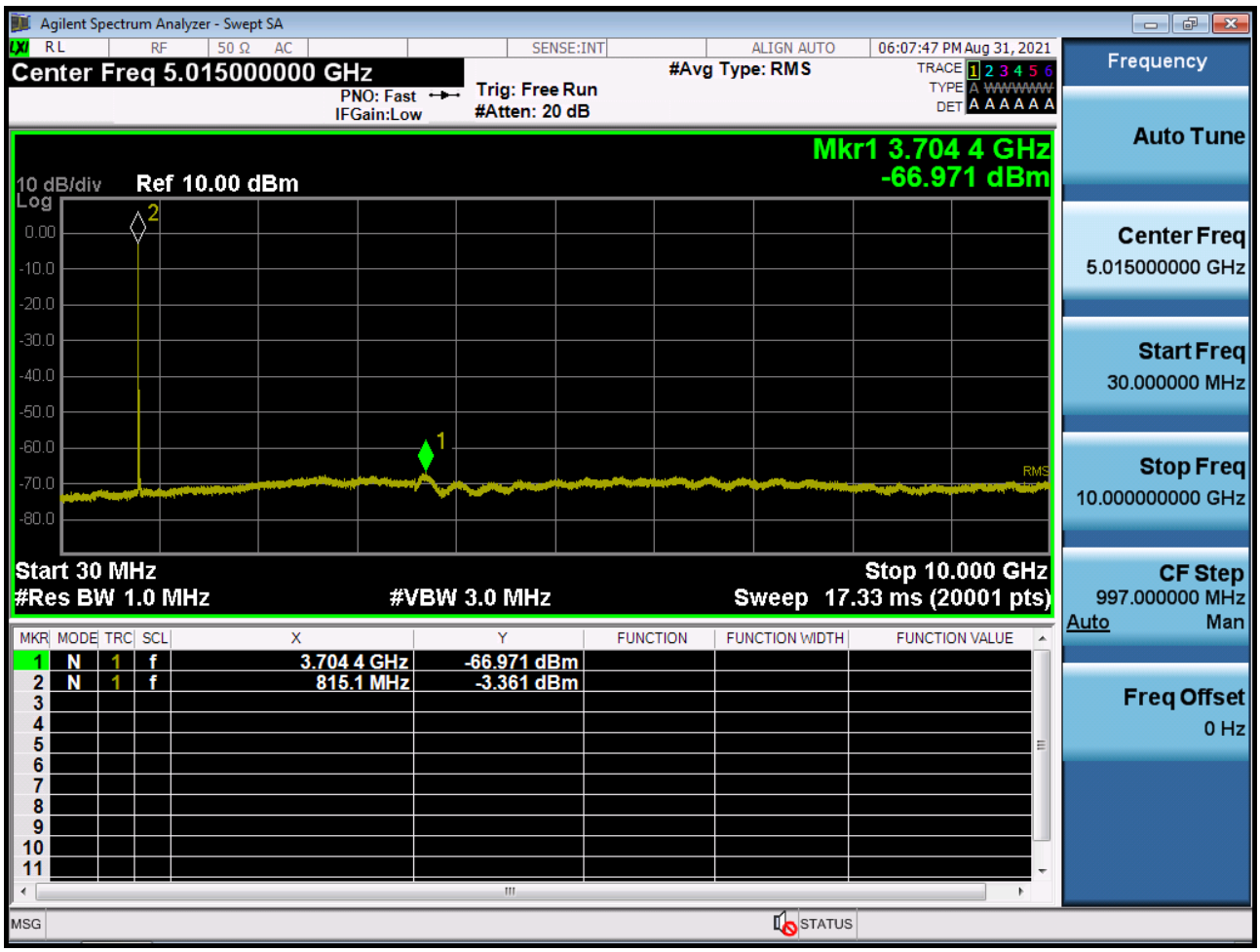
BAND 26. Conducted Spurious (26715 ch_5 MHz_QPSK_RB 1_0)



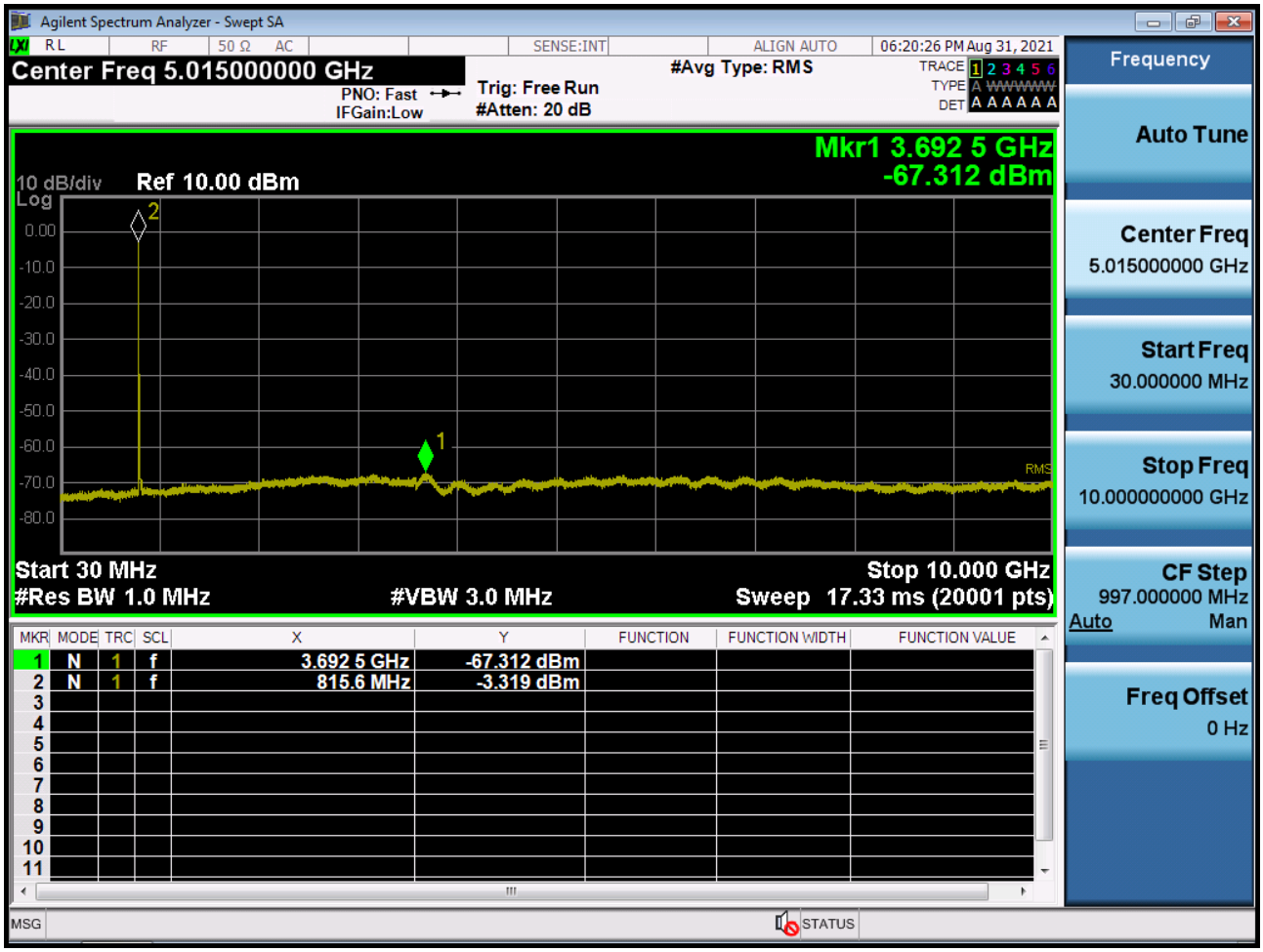
BAND 26. Conducted Spurious (26765 ch_5 MHz_QPSK_RB 1_0)



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

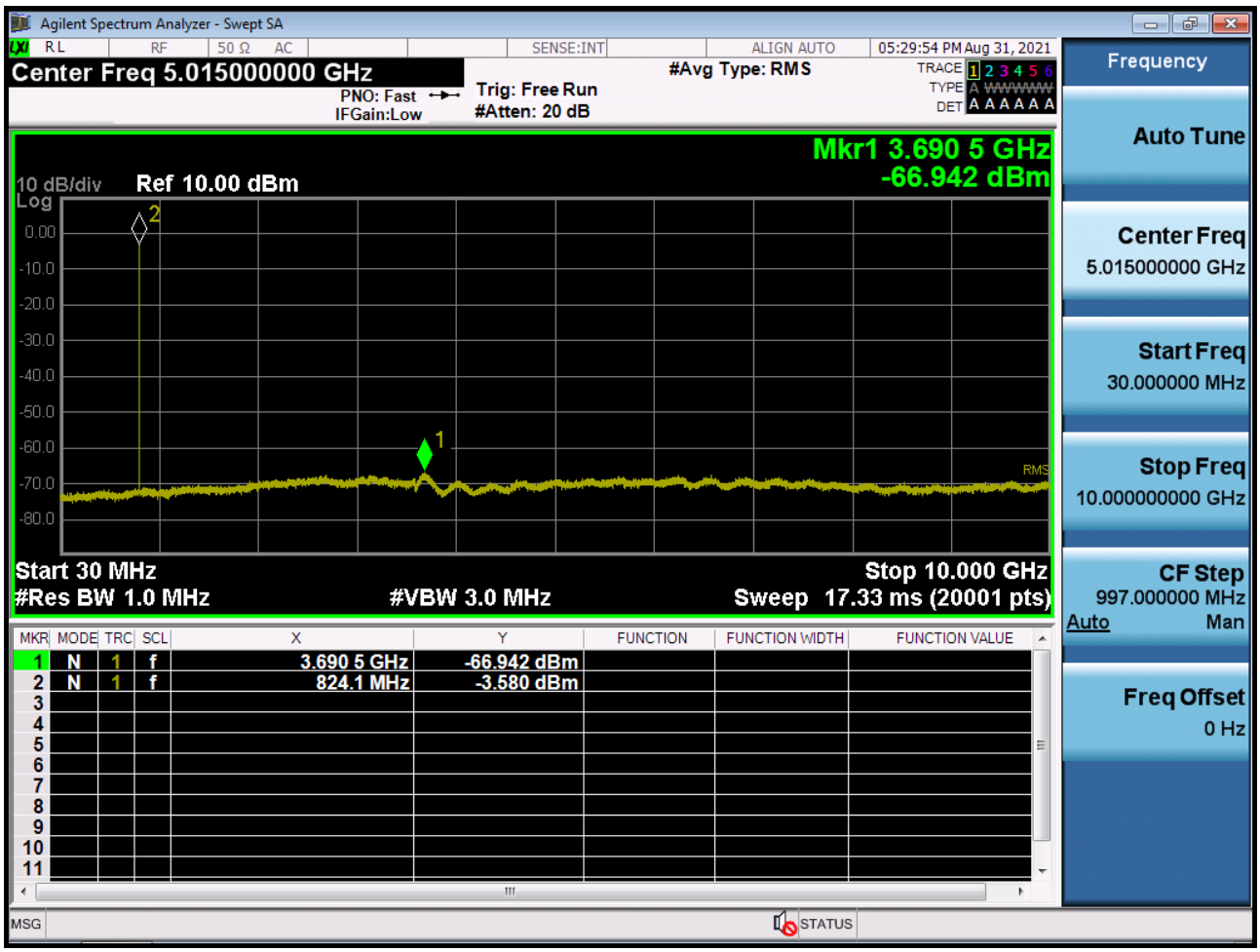


BAND 26. Conducted Spurious (26765 ch_15 MHz_QPSK_RB 1_0)

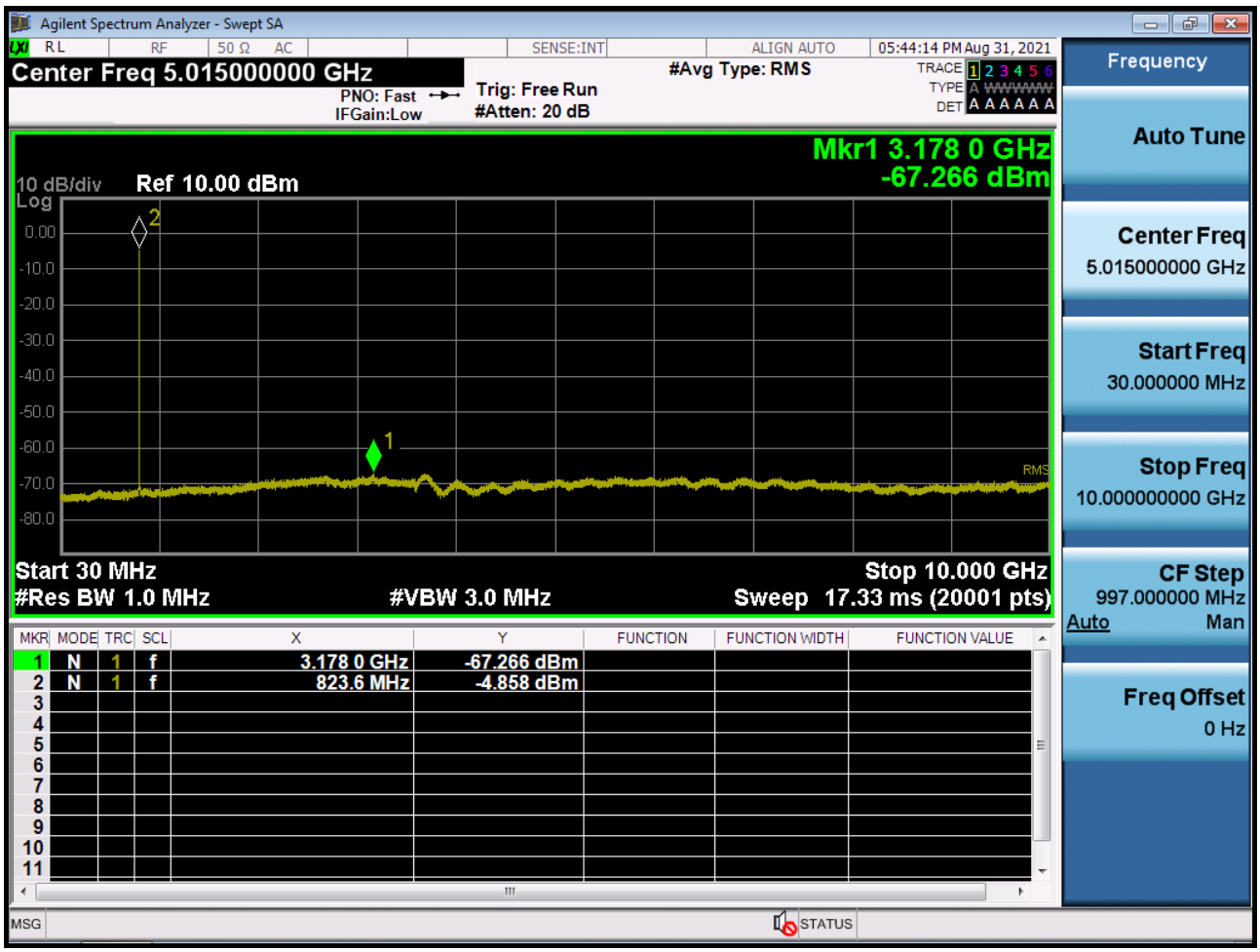


10. TEST PLOTS (STRADDLE CHANNEL)

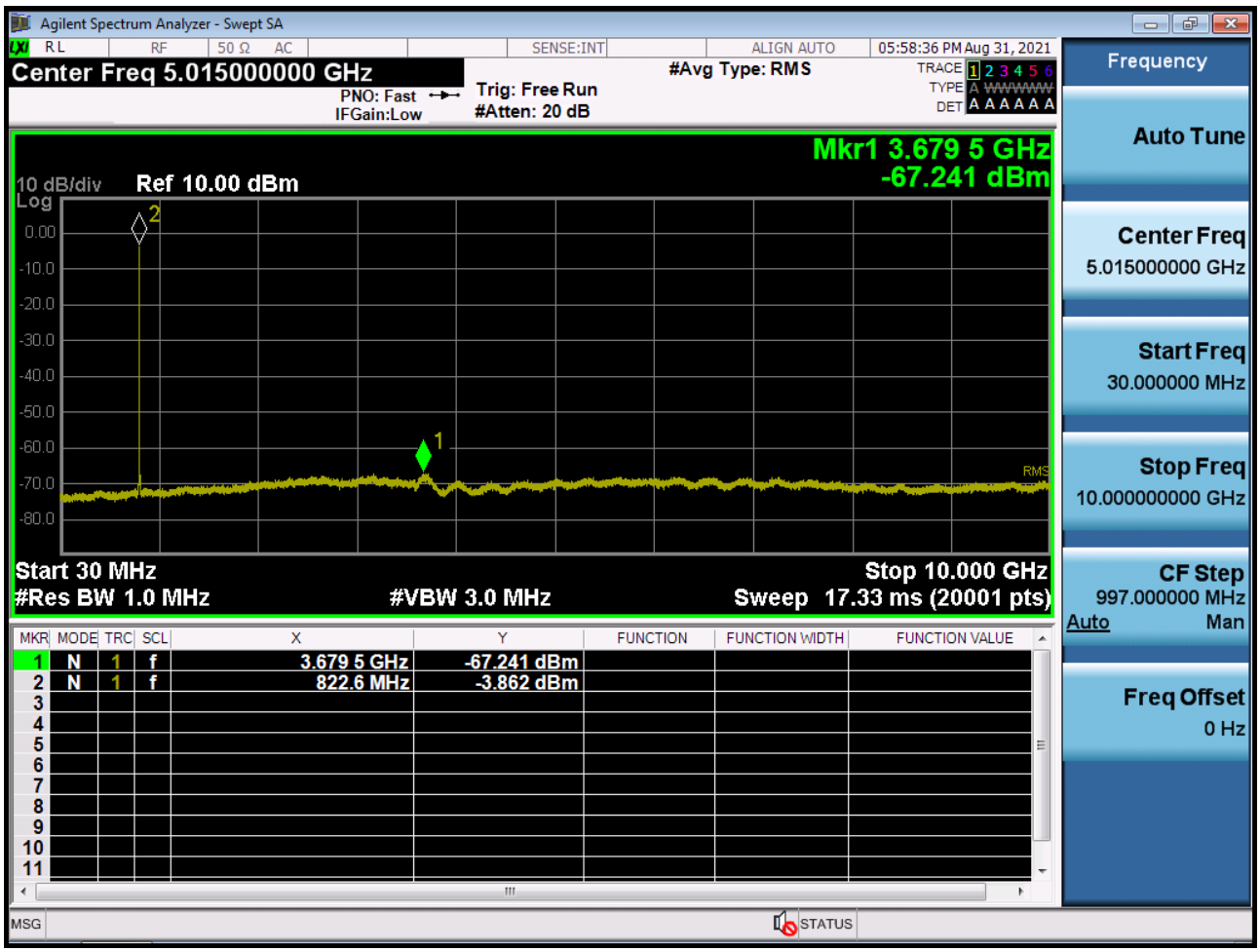
BAND 26. Conducted Spurious (1.4 MHz_QPSK_RB 1_0)



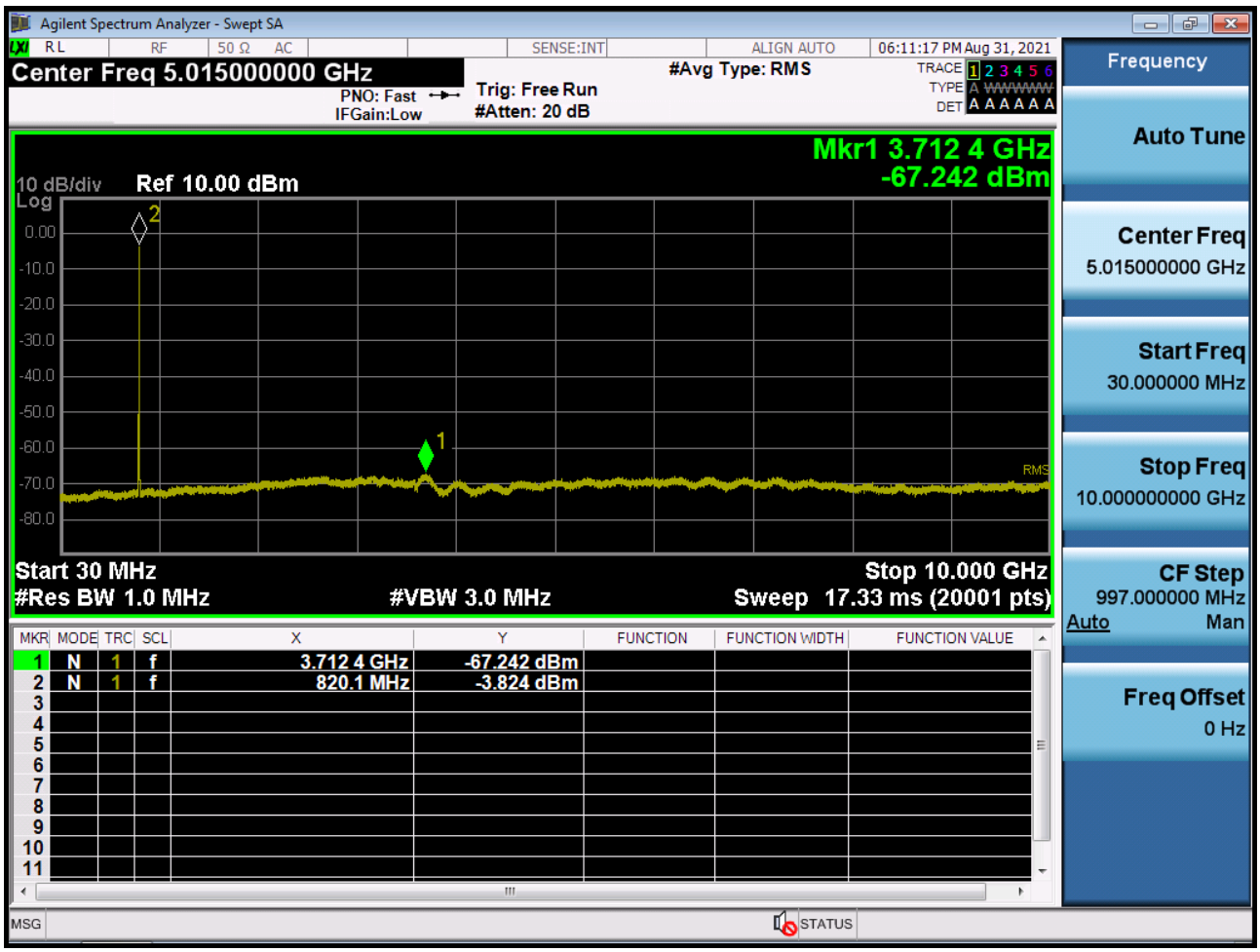
BAND 26. Conducted Spurious (3 MHz_QPSK_RB 1_0)



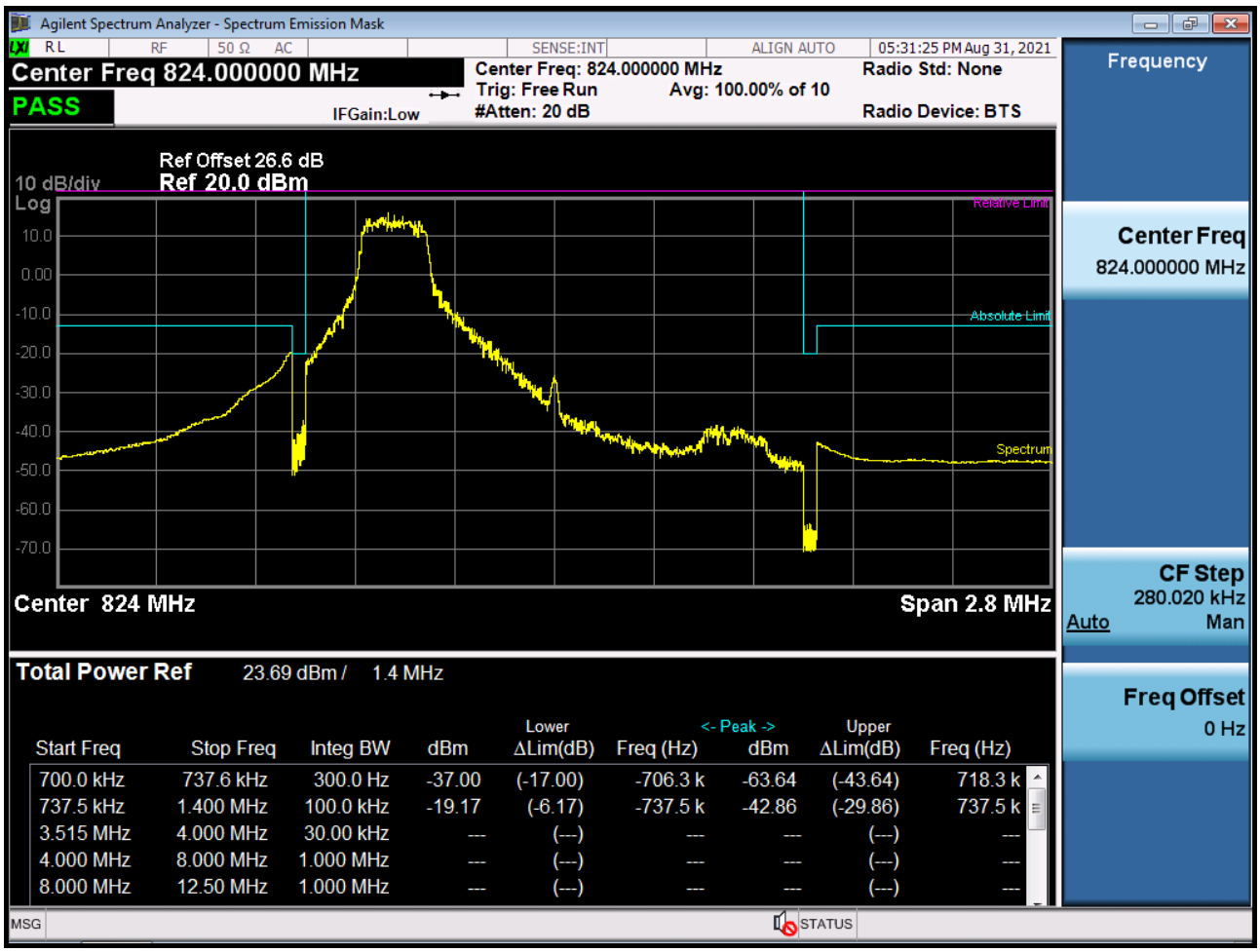
BAND 26. Conducted Spurious (5 MHz_QPSK_RB 1_0)



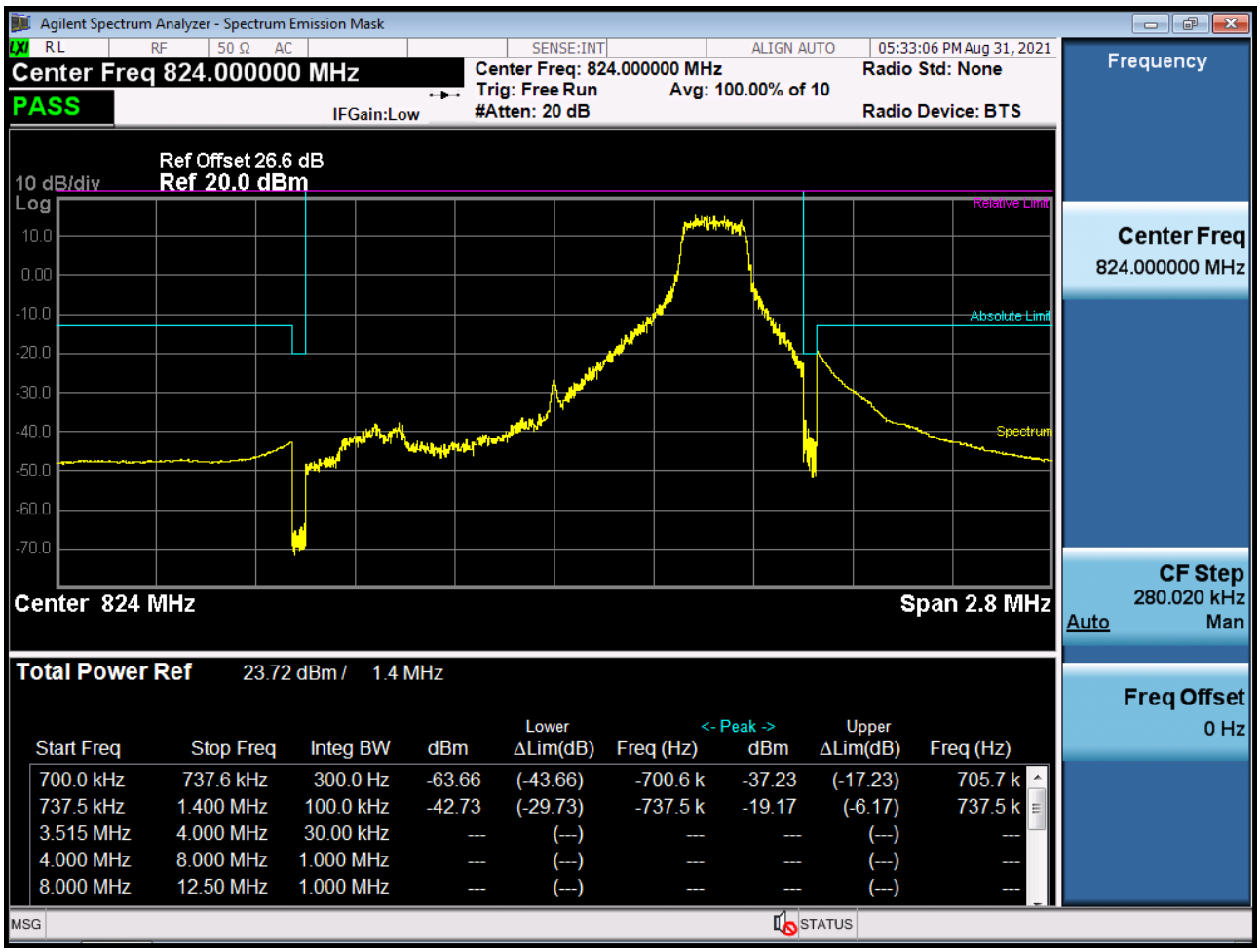
BAND 26. Conducted Spurious (10 MHz_QPSK_RB 1_0)



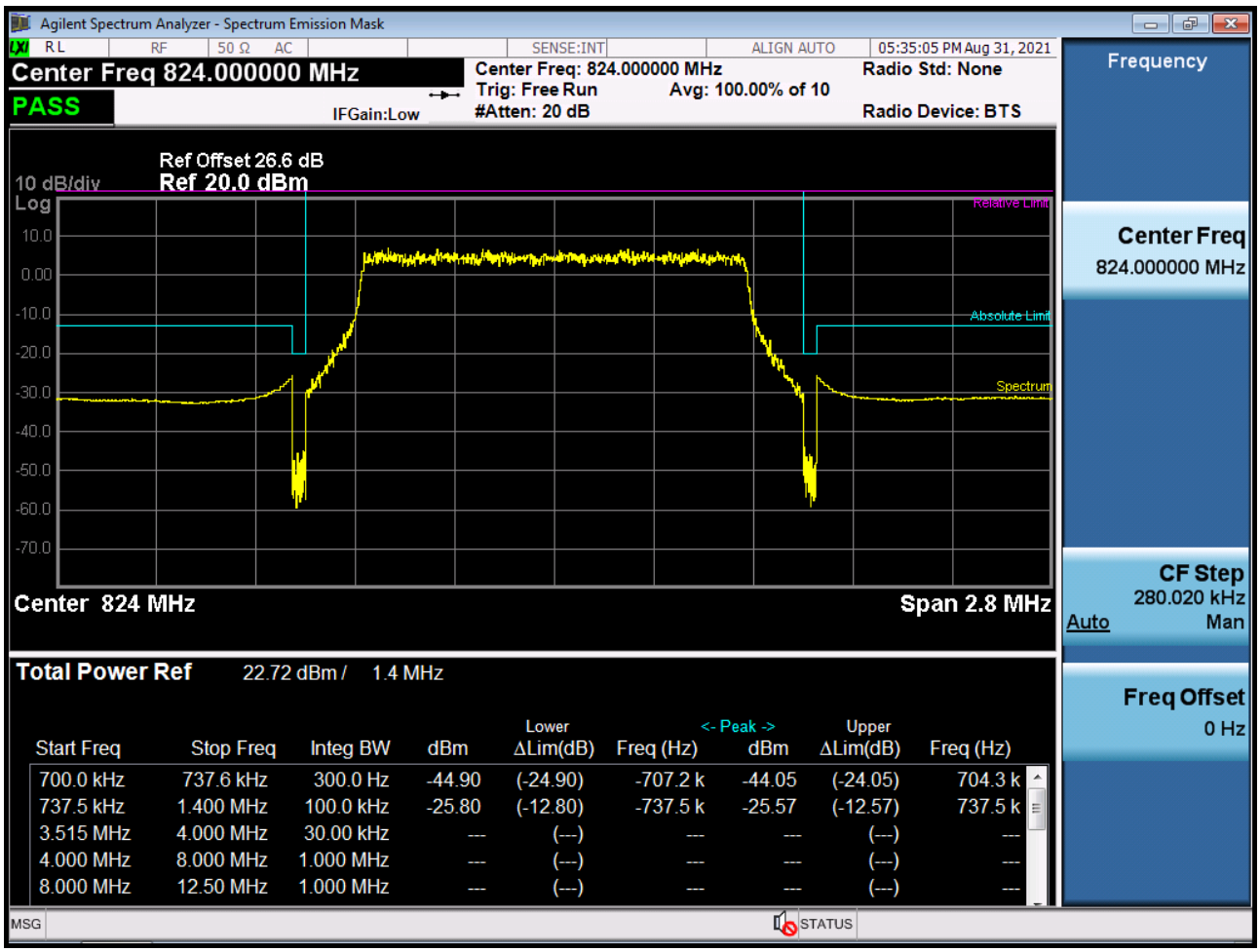
BAND 26. Channel Edge (1.4 MHz_QPSK_RB 1_0)



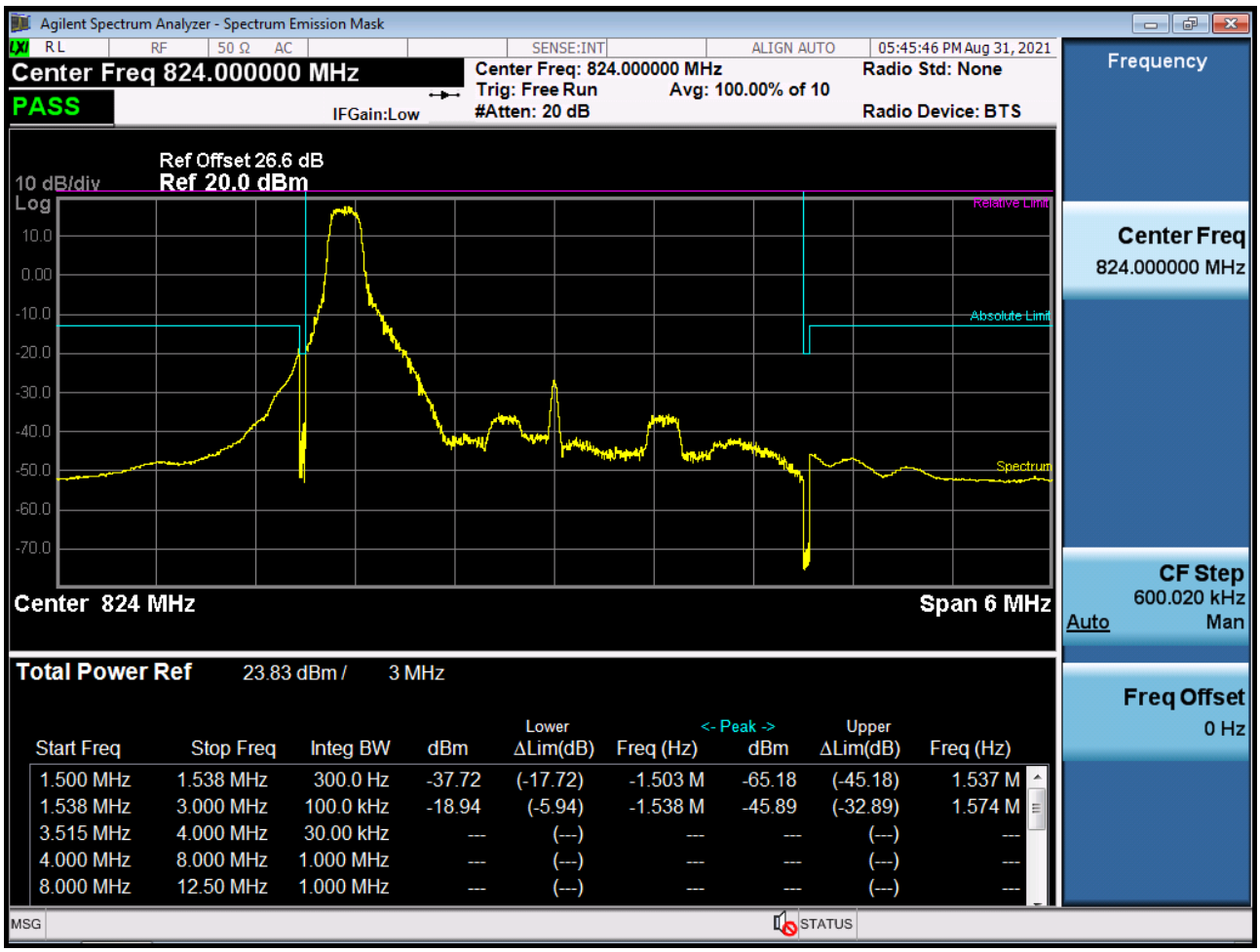
BAND 26. Channel Edge (1.4 MHz_QPSK_RB 1_5)



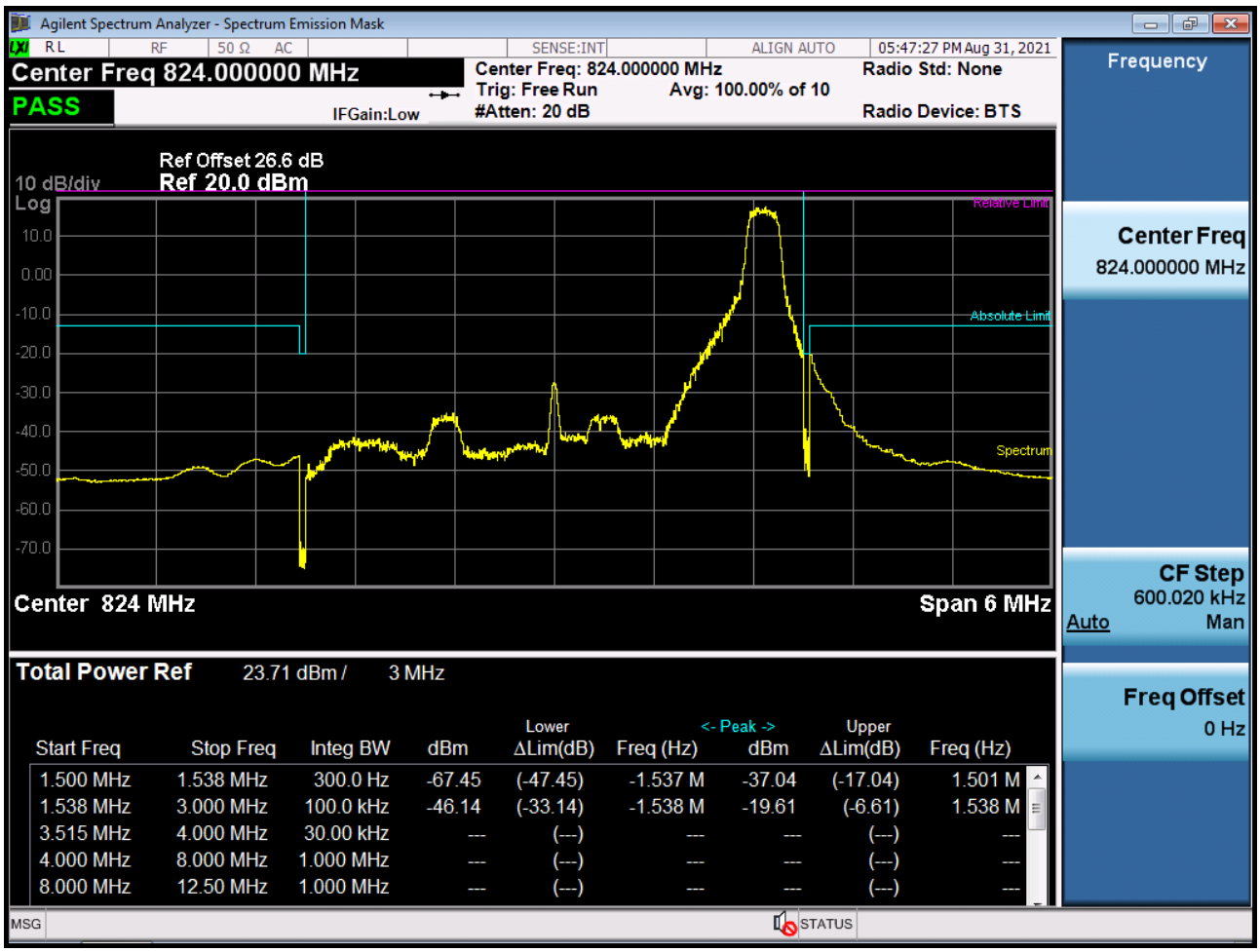
BAND 26. Channel Edge (1.4 MHz_QPSK_Full RB)



BAND 26. Channel Edge (3 MHz_QPSK_RB 1_0)

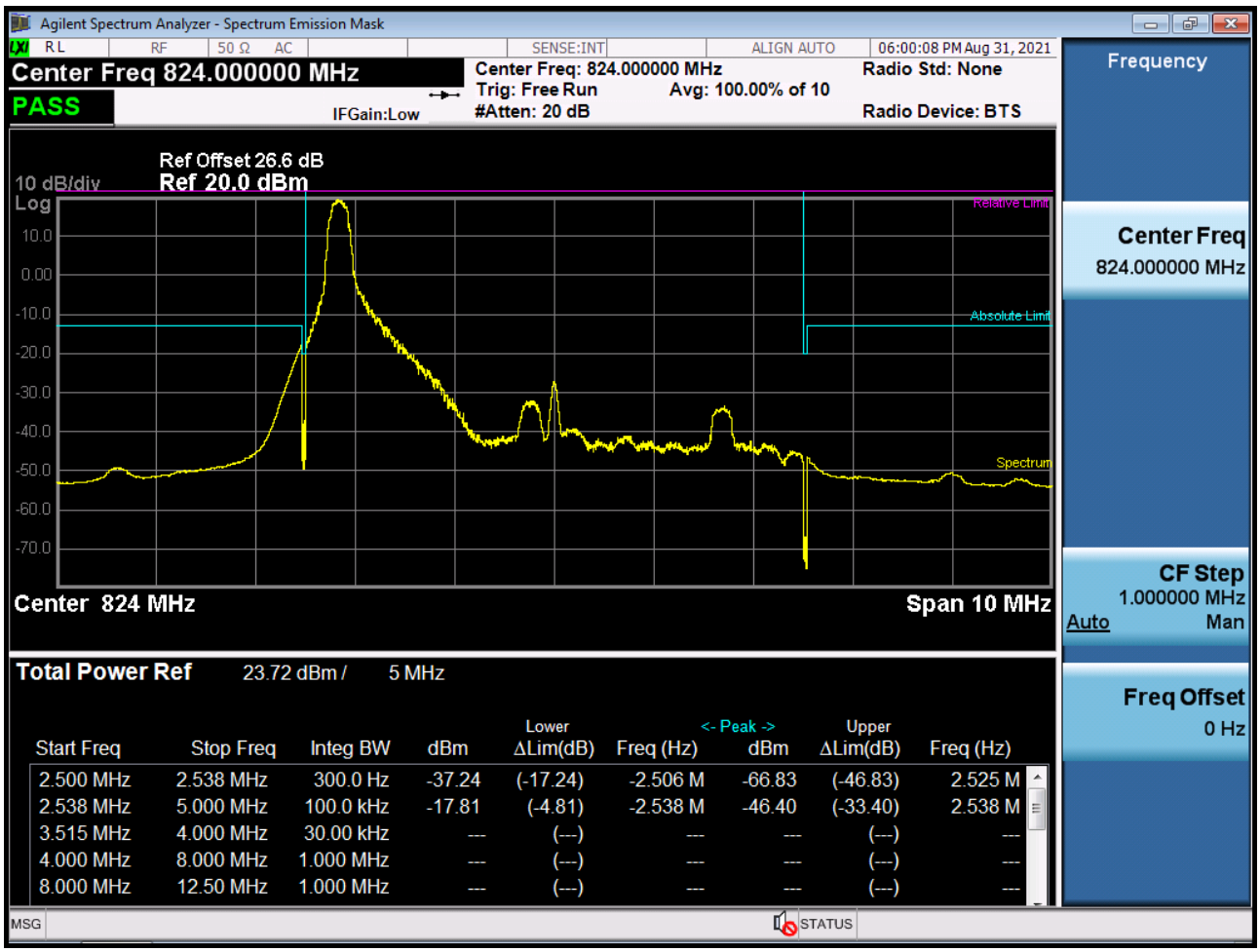


BAND 26. Channel Edge (3 MHz_QPSK_RB 1_14)

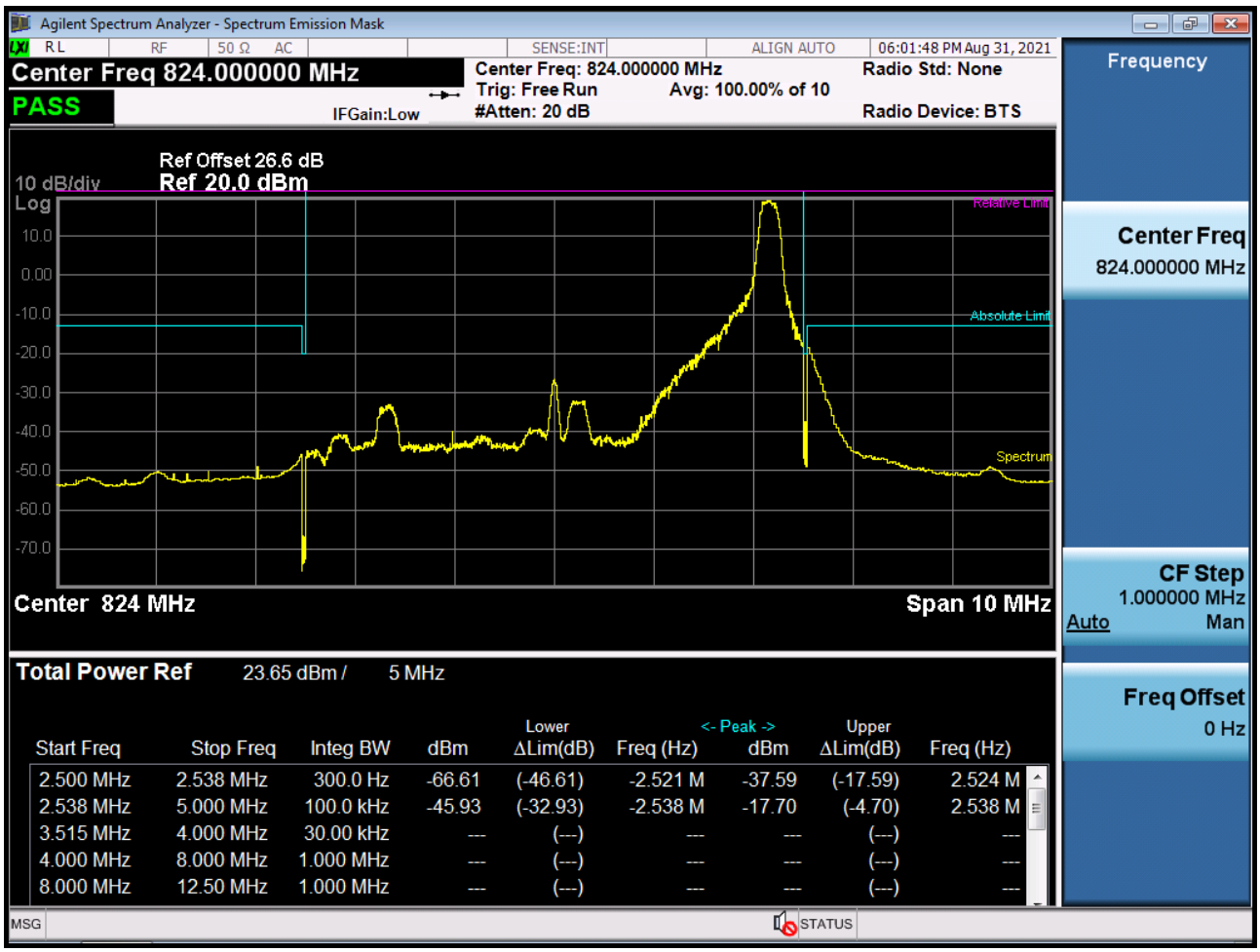


BAND 26. Channel Edge (3 MHz_QPSK_Full RB)

BAND 26. Channel Edge (5 MHz_QPSK_RB 1_0)

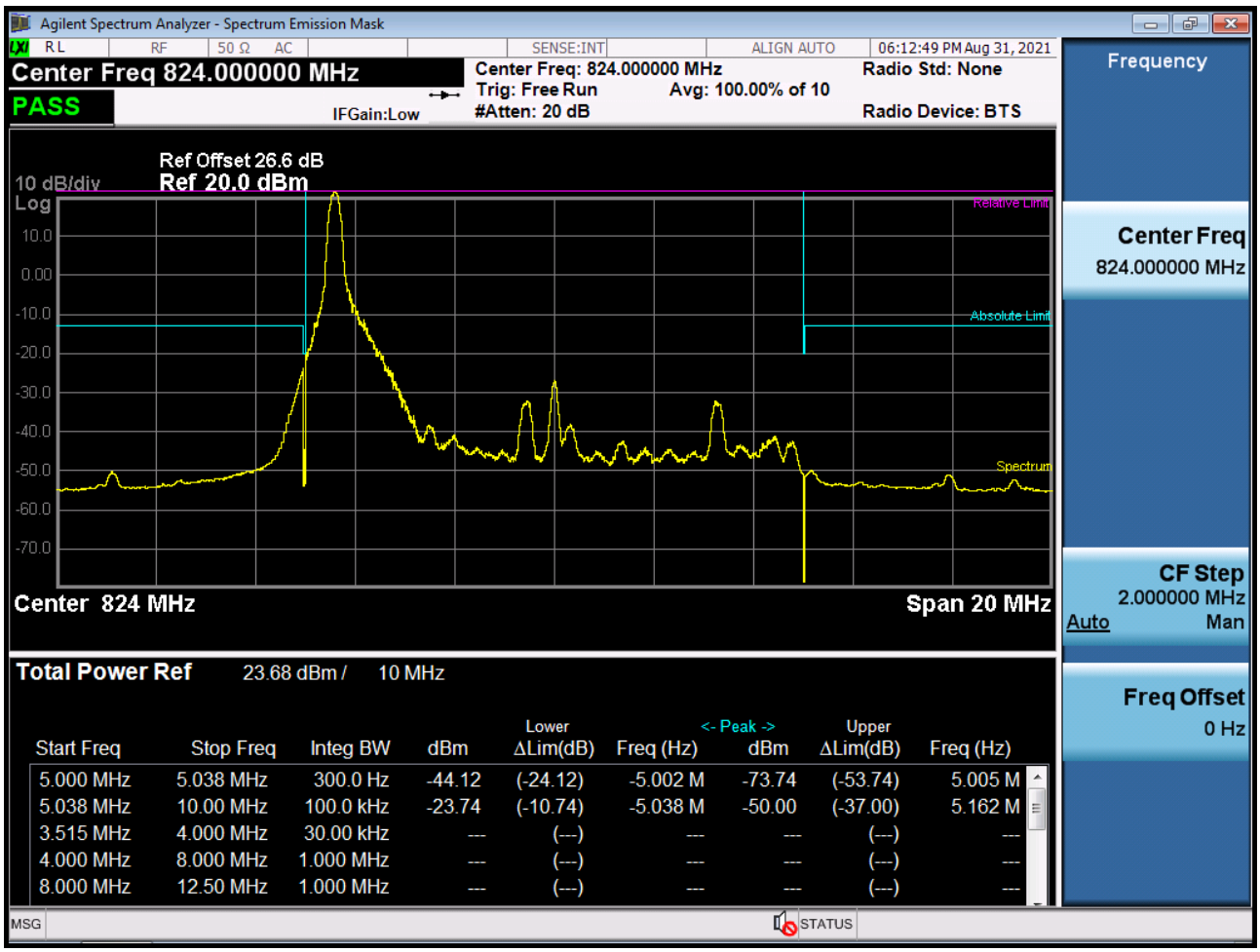


BAND 26. Channel Edge (5 MHz_QPSK_RB 1_24)

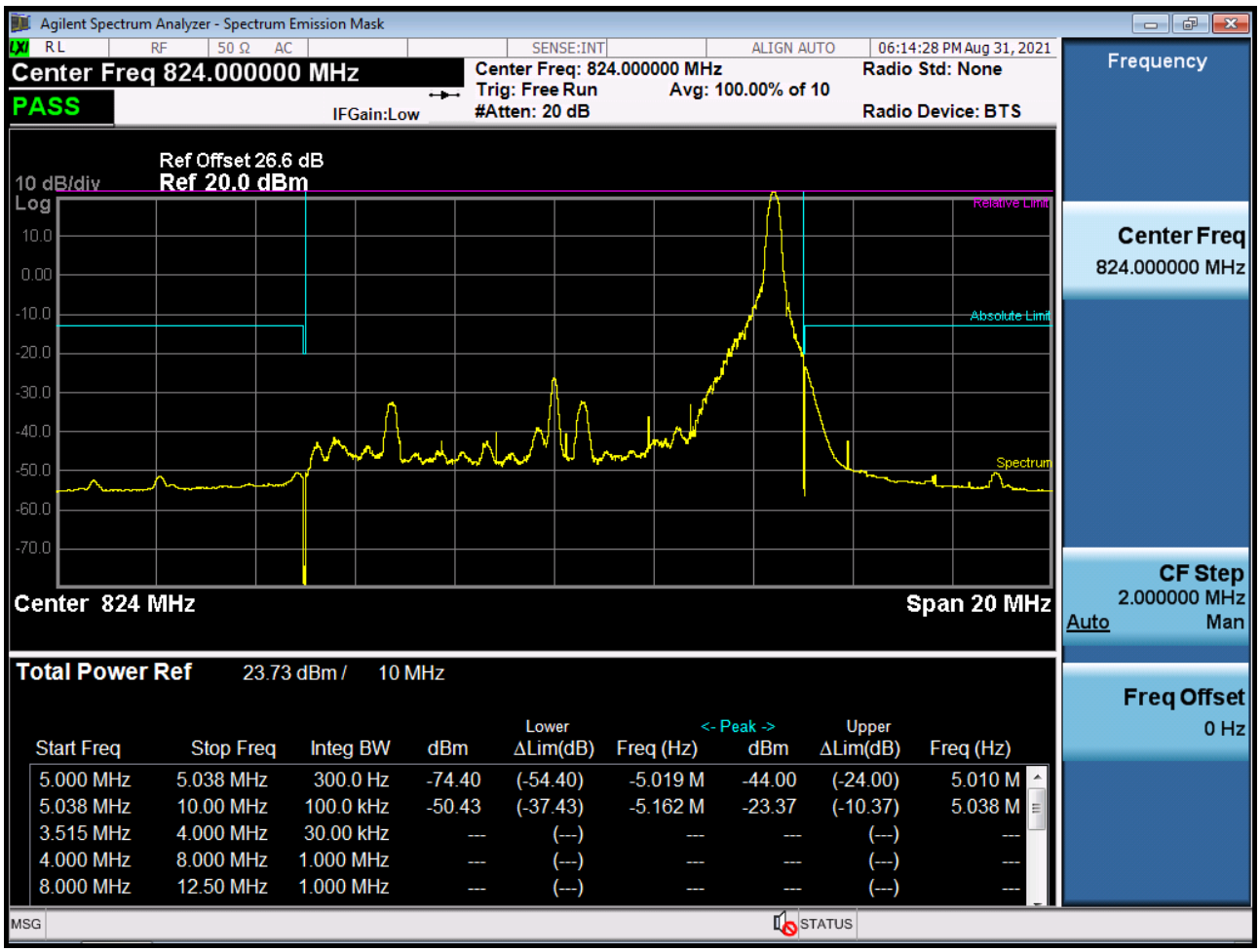


BAND 26. Channel Edge (5 MHz_QPSK_Full RB)

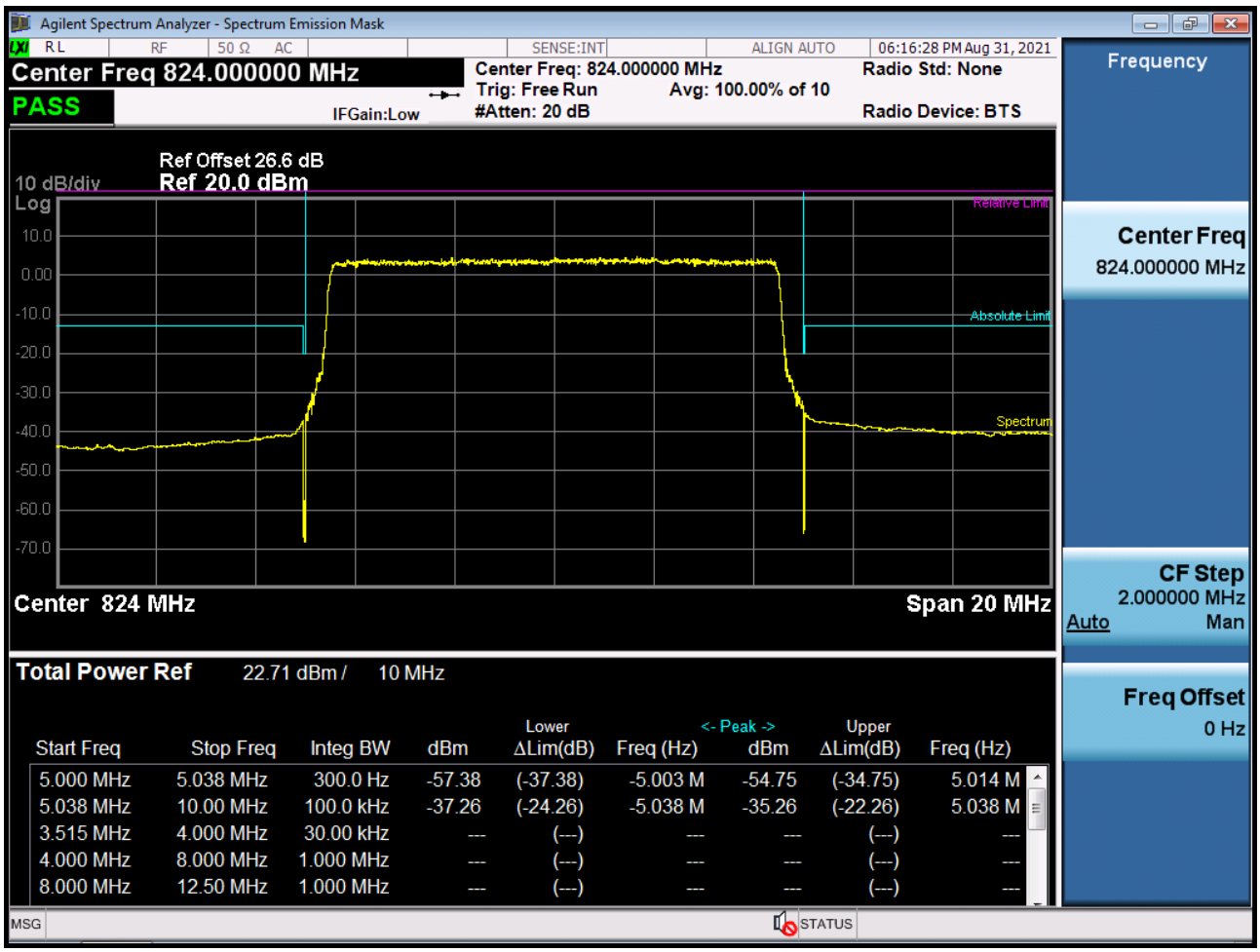
BAND 26. Channel Edge (10 MHz_QPSK_RB 1_0)



BAND 26. Channel Edge (10 MHz_QPSK_RB 1_49)

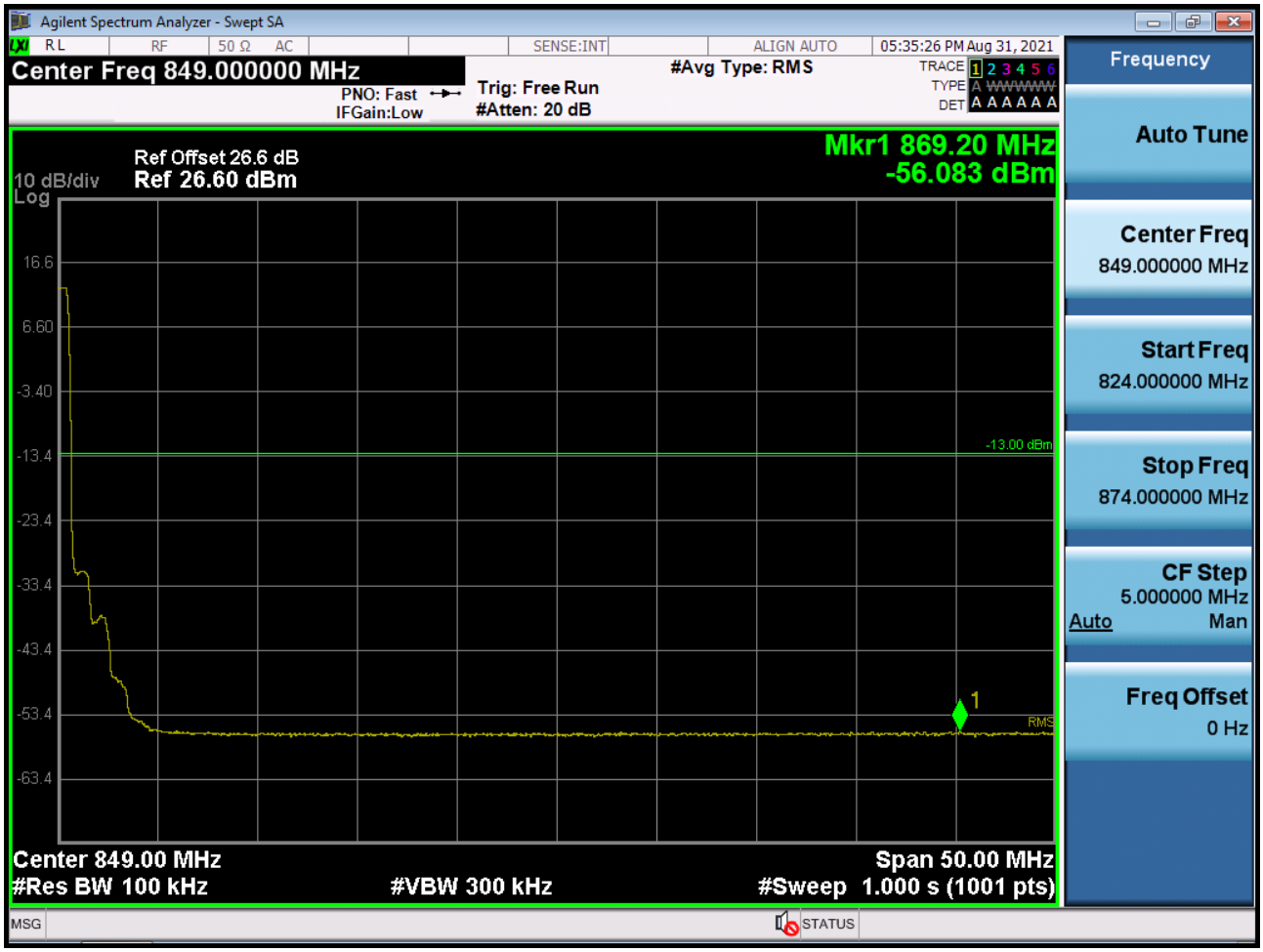


BAND 26. Channel Edge (10 MHz_QPSK_Full RB)



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-2109-FC055-P