HCT CO.,LTD.
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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 21, 2022
Location:
HCT CO., LTD.,
74, Seoicheon-ro 578beon-gil, Majang-myeon,
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
Report No.: HCT-RF-2210-FC012

FCC ID: **A3LSMS911B**

APPLICANT: **SAMSUNG Electronics Co., Ltd.**

Model(s):	SM-S911B/DS
Additional Model(s):	SM-S911B
EUT Type:	Mobile Phone
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§22, §2

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	ERP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band5 (1.4)	824.7 – 848.3	1M10G7D	QPSK	0.097	19.87
		1M10W7D	16QAM	0.082	19.13
		1M10W7D	64QAM	0.064	18.04
		1M10W7D	256QAM	0.032	14.99
LTE – Band5 (3)	825.5 – 847.5	2M71G7D	QPSK	0.096	19.81
		2M72W7D	16QAM	0.081	19.09
		2M72W7D	64QAM	0.064	18.03
		2M70W7D	256QAM	0.031	14.91
LTE – Band5 (5)	826.5 – 846.5	4M50G7D	QPSK	0.096	19.82
		4M53W7D	16QAM	0.081	19.09
		4M52W7D	64QAM	0.064	18.03
		4M51W7D	256QAM	0.031	14.88
LTE – Band5 (10)	829.0 – 844.0	9M00G7D	QPSK	0.097	19.85
		9M02W7D	16QAM	0.082	19.14
		8M98W7D	64QAM	0.064	18.08
		8M98W7D	256QAM	0.031	14.92

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

REVIEWED BY

Report prepared by : Jae Mun Do
Engineer of Telecommunication Testing Center

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

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

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

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2210-FC012	October 21, 2022	- First Approval Report

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

Table of Contents

REVIEWED BY 2

1. GENERAL INFORMATION 5

2. INTRODUCTION 6

2.1. DESCRIPTION OF EUT 6

2.2. MEASURING INSTRUMENT CALIBRATION 6

2.3. TEST FACILITY 6

3. DESCRIPTION OF TESTS 7

3.1 TEST PROCEDURE 7

3.2 RADIATED POWER 8

3.3 RADIATED SPURIOUS EMISSIONS 9

3.4 PEAK- TO- AVERAGE RATIO 10

3.5 OCCUPIED BANDWIDTH. 12

3.6 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL 13

3.7 BAND EDGE 14

3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE 15

3.9 WORST CASE(RADIATED TEST) 16

3.10 WORST CASE(CONDUCTED TEST) 17

4. LIST OF TEST EQUIPMENT 18

5. MEASUREMENT UNCERTAINTY 19

6. SUMMARY OF TEST RESULTS 20

7. SAMPLE CALCULATION 21

8. TEST DATA 23

8.1 EFFECTIVE RADIATED POWER 23

8.2 RADIATED SPURIOUS EMISSIONS 25

8.3 PEAK-TO-AVERAGE RATIO 27

8.4 OCCUPIED BANDWIDTH 28

8.5 CONDUCTED SPURIOUS EMISSIONS 29

8.6 BAND EDGE 29

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE 30

8.8 UPLINK CARRIER AGGREGATION 34

8.8.1 RADIATED SPURIOUS EMISSIONS 35

9. TEST PLOTS 36

10. ANNEX A_ TEST SETUP PHOTO 105

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:	A3LSMS911B
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§22, §2
EUT Type:	Mobile Phone
Model(s):	SM-S911B/DS
Additional Model(s):	SM-S911B
Tx Frequency:	824.7 MHz – 848.3 MHz (LTE – Band 5 (1.4 MHz)) 825.5 MHz – 847.5 MHz (LTE – Band 5 (3 MHz)) 826.5 MHz – 846.5 MHz (LTE – Band 5 (5 MHz)) 829.0 MHz – 844.0 MHz (LTE – Band 5 (10 MHz))
Date(s) of Tests:	August 31, 2022~ September 23, 2022
Serial number:	Radiated: R3CT706PCND Conducted: 64208a01b13f7ece

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

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

It also supports IEEE 802.11 a/b/g/n/ac/ax (20/40/80/160 MHz), Bluetooth, BT LE, NFC, AIT, WPT.

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- N/A (See SAR Report)
Peak- to- Average Ratio	- KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 RADIATED POWER

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

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

Test Settings

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

3.3 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

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

Test Settings

1. RBW = 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;

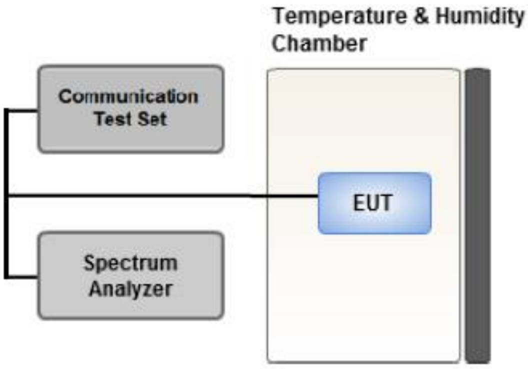
$$\text{Result}_{(dBm)} = \text{Pg}_{(dBm)} - \text{cable loss}_{(dB)} + \text{antenna gain}_{(dBi)}$$

   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.

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

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

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

② **Alternate Procedure for PAPR**

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

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

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

Test Settings(Peak Power)

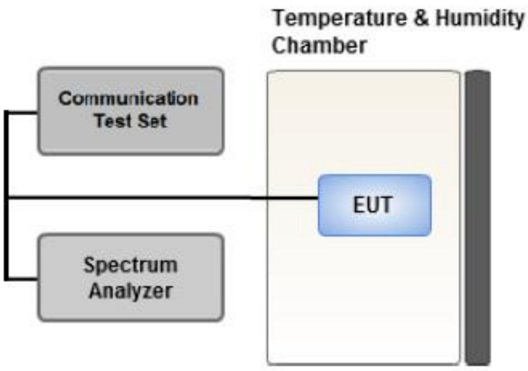
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

Test Settings(Average Power)

1. Set span to 2 × to 3 × the OBW.
2. Set RBW ≥ OBW.
3. Set VBW ≥ 3 × RBW.
4. Set number of measurement points in sweep ≥ 2 × span / RBW.
5. Sweep time:
   Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. The transmission period is the (on + off) time.
6. Detector = power averaging (rms).
7. Set sweep trigger to “free run.”
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
9. Use the peak marker function to determine the maximum amplitude level.
10. Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission. For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is a constant 25 %.

3.5 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.

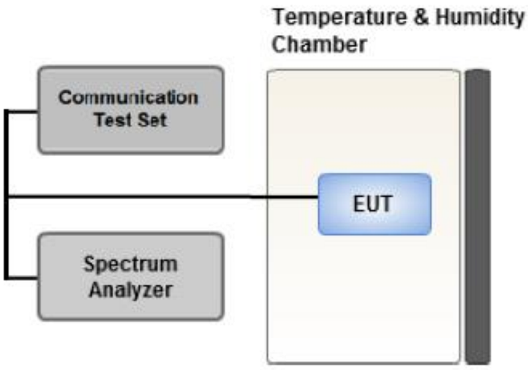
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

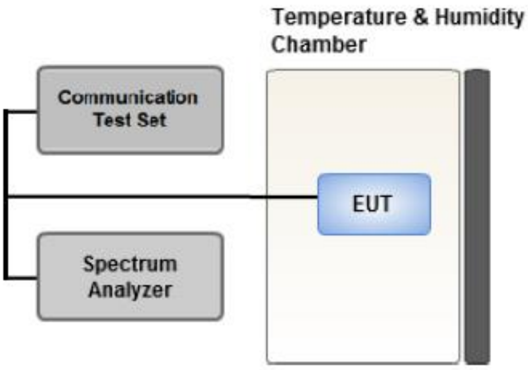
Test Overview

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 BAND EDGE



Test setup

Test Overview

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

Test Settings

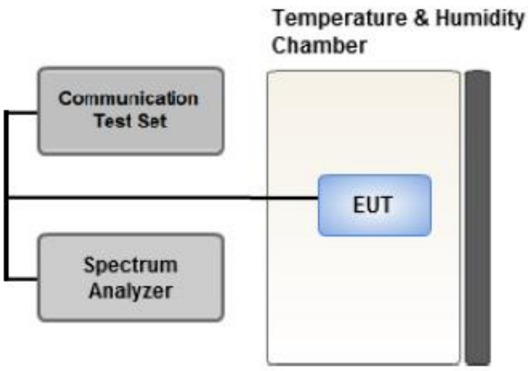
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1 % of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW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

Test Notes

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

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

3.8 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 : 1.4 MHz, 10 MHz)
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- SM-S911B/DS & additional models were tested and the worst case results are reported.
  (Worst case : SM-S911B/DS)

[Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Isotropic Radiated Power	QPSK, 16QAM, 64QAM, 256QAM	1	0	Y
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-S911B/DS & additional models were tested and the worst case results are reported.

(Worst case : SM-S911B/DS)

[Worst case]

<table>
<tr><th>Test Description</th><th>Modulation</th><th>Bandwidth (MHz)</th><th>Frequency</th><th>RB size</th><th>RB offset</th></tr>
<tr><td>Occupied Bandwidth</td><td>QPSK,
16QAM,
64QAM,
256QAM</td><td>1.4, 3, 5, 10</td><td>Mid</td><td>Full RB</td><td>0</td></tr>
<tr><td rowspan="9">Band Edge</td><td rowspan="9">QPSK</td><td rowspan="2">1.4</td><td>Low</td><td>1</td><td>0</td></tr>
<tr><td>High</td><td>1</td><td>5</td></tr>
<tr><td rowspan="2">3</td><td>Low</td><td>1</td><td>0</td></tr>
<tr><td>High</td><td>1</td><td>14</td></tr>
<tr><td rowspan="2">5</td><td>Low</td><td>1</td><td>0</td></tr>
<tr><td>High</td><td>1</td><td>24</td></tr>
<tr><td rowspan="2">10</td><td>Low</td><td>1</td><td>0</td></tr>
<tr><td>High</td><td>1</td><td>49</td></tr>
<tr><td>1.4, 3, 5, 10</td><td>Low,
High</td><td>Full RB</td><td>0</td></tr>
<tr><td>Spurious and Harmonic Emissions at Antenna Terminal</td><td>QPSK</td><td>1.4, 3, 5, 10</td><td>Low,
Mid,
High</td><td>1</td><td>0</td></tr>
</table>

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	-	02/18/2023	Annual
H.P.F	FBSR-02B(WHK3.3/18 G-10EF)	T&M SYSTEM	-	02/18/2023	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	11275	03/11/2023	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/21/2023	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	04/05/2023	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	04/05/2023	Biennial
Chamber	SU-642	ESPEC	93008124	03/04/2023	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/30/2023	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/15/2023	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	09/29/2024	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	04/12/2023	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	05/02/2023	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	05/18/2023	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	08/29/2023	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/18/2023	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/17/2024	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	07/05/2023	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6200863156	12/29/2022	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2023	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	05/30/2023	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. Espectially, 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)	2.00 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.40 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.74 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.51 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.92 (Confidence level about 95 %, *k*=2)
Radiated Disturbance (Above 40 GHz)	5.48 (Confidence level about 95 %, *k*=2)

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §22.917(a)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§2.1046	N/A	See Note1
Frequency stability / variation of ambient temperature	§2.1055, §22.355	< 2.5 ppm	PASS

Note:

1. See SAR Report

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Effective Radiated Power	§22.913(a)(5)	< 7 Watts max. ERP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §22.917(a)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

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

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

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

3) Record the field strength meter's level.

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

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

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

7.2 EIRP Sample Calculation

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

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

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

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

3) Record the field strength meter's level.

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

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

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

7.3. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

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 EFFECTIVE RADIATED POWER

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
824.7	LTE B5/ 1.4 MHz	QPSK	-29.63	31.52	-10.24	1.41	V	< 7.00	0.097	19.87
		16-QAM	-30.37	30.78	-10.24	1.41	V		0.082	19.13
		64-QAM	-31.46	29.69	-10.24	1.41	V		0.064	18.04
		256-QAM	-34.51	26.64	-10.24	1.41	V		0.032	14.99
836.5		QPSK	-29.71	31.37	-10.19	1.43	V		0.094	19.75
		16-QAM	-30.47	30.61	-10.19	1.43	V		0.079	18.99
		64-QAM	-31.55	29.53	-10.19	1.43	V		0.062	17.91
		256-QAM	-34.66	26.42	-10.19	1.43	V		0.030	14.80
848.3		QPSK	-31.55	29.75	-10.14	1.43	V		0.066	18.18
		16-QAM	-32.27	29.03	-10.14	1.43	V		0.056	17.46
		64-QAM	-33.32	27.98	-10.14	1.43	V		0.044	16.41
		256-QAM	-36.42	24.88	-10.14	1.43	V		0.021	13.31

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
825.5	LTE B5/ 3 MHz	QPSK	-29.70	31.46	-10.24	1.42	V	< 7.00	0.096	19.81
		16-QAM	-30.42	30.74	-10.24	1.42	V		0.081	19.09
		64-QAM	-31.48	29.68	-10.24	1.42	V		0.064	18.03
		256-QAM	-34.60	26.56	-10.24	1.42	V		0.031	14.91
836.5		QPSK	-29.73	31.35	-10.19	1.43	V		0.094	19.73
		16-QAM	-30.46	30.62	-10.19	1.43	V		0.079	19.00
		64-QAM	-31.51	29.57	-10.19	1.43	V		0.062	17.95
		256-QAM	-34.63	26.45	-10.19	1.43	V		0.030	14.83
847.5		QPSK	-31.33	29.96	-10.15	1.43	V		0.069	18.38
		16-QAM	-32.07	29.22	-10.15	1.43	V		0.058	17.64
		64-QAM	-33.10	28.19	-10.15	1.43	V		0.046	16.61
		256-QAM	-36.18	25.11	-10.15	1.43	V		0.023	13.53

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
826.5	LTE B5/ 5 MHz	QPSK	-29.69	31.47	-10.24	1.42	V	< 7.00	0.096	19.82
		16-QAM	-30.42	30.74	-10.24	1.42	V		0.081	19.09
		64-QAM	-31.48	29.68	-10.24	1.42	V		0.064	18.03
		256-QAM	-34.63	26.53	-10.24	1.42	V		0.031	14.88
836.5		QPSK	-29.72	31.36	-10.19	1.43	V		0.094	19.74
		16-QAM	-30.45	30.63	-10.19	1.43	V		0.080	19.01
		64-QAM	-31.55	29.53	-10.19	1.43	V		0.062	17.91
		256-QAM	-34.62	26.46	-10.19	1.43	V		0.031	14.84
846.5		QPSK	-31.30	29.94	-10.15	1.43	V		0.069	18.36
		16-QAM	-32.04	29.20	-10.15	1.43	V		0.058	17.62
		64-QAM	-33.10	28.14	-10.15	1.43	V		0.045	16.56
		256-QAM	-36.21	25.03	-10.15	1.43	V		0.022	13.45

Freq (MHz)	Mod/ Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
829.0	LTE B5/ 10 MHz	QPSK	-29.65	31.49	-10.22	1.42	V	< 7.00	0.097	19.85
		16-QAM	-30.44	30.70	-10.22	1.42	V		0.081	19.06
		64-QAM	-31.42	29.72	-10.22	1.42	V		0.064	18.08
		256-QAM	-34.58	26.56	-10.22	1.42	V		0.031	14.92
836.5		QPSK	-29.68	31.40	-10.19	1.43	V		0.095	19.78
		16-QAM	-30.32	30.76	-10.19	1.43	V		0.082	19.14
		64-QAM	-31.40	29.68	-10.19	1.43	V		0.064	18.06
		256-QAM	-34.54	26.54	-10.19	1.43	V		0.031	14.92
844.0		QPSK	-31.16	30.12	-10.14	1.43	V		0.072	18.55
		16-QAM	-31.89	29.39	-10.14	1.43	V		0.061	17.82
		64-QAM	-32.96	28.32	-10.14	1.43	V		0.047	16.75
		256-QAM	-36.04	25.24	-10.14	1.43	V		0.023	13.67

8.2 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B5

▣ 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
20407 (824.7)	1 649.40	-52.79	9.70	-63.38	2.04	V	-55.72	-13.00
	2 474.10	-55.41	10.50	-60.26	2.52	H	-52.27	-13.00
	3 298.80	-57.42	12.10	-58.50	2.97	H	-49.37	-13.00
20525 (836.5)	1 673.00	-53.13	9.82	-63.86	2.06	H	-56.10	-13.00
	2 509.50	-55.03	10.70	-58.66	2.49	V	-50.45	-13.00
	3 346.00	-58.02	12.37	-59.38	3.01	H	-50.02	-13.00
20643 (848.3)	1 696.60	-52.90	9.97	-63.09	2.05	H	-55.17	-13.00
	2 544.90	-55.37	10.70	-59.21	2.55	H	-51.06	-13.00
	3 393.20	-57.92	12.56	-59.05	2.97	V	-49.46	-13.00

▣ MODE: LTE B5

▣ 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
20450 (829.0)	1,658.00	-52.21	9.76	-63.04	2.06	H	-55.34	-13.00
	2,487.00	-54.10	10.62	-58.26	2.46	H	-50.10	-13.00
	3,316.00	-56.78	12.19	-57.51	3.01	V	-48.33	-13.00
	4,145.00	-57.68	12.51	-56.06	3.34	V	-46.89	-13.00
	4,974.00	-57.58	12.65	-51.67	3.67	H	-42.69	-13.00
20525 (836.5)	1,673.00	-52.50	9.82	-63.23	2.06	H	-55.47	-13.00
	2,509.50	-54.23	10.70	-57.86	2.49	V	-49.65	-13.00
	3,346.00	-57.48	12.37	-58.84	3.01	V	-49.48	-13.00
	4,182.50	-57.48	12.62	-54.95	3.31	H	-45.64	-13.00
	5,019.00	-57.51	12.56	-51.50	3.72	H	-42.66	-13.00
20600 (844.0)	1,688.00	-52.43	9.94	-62.78	2.05	H	-54.89	-13.00
	2,532.00	-54.19	10.70	-58.19	2.52	H	-50.01	-13.00
	3,376.00	-57.18	12.50	-58.31	3.00	H	-48.81	-13.00
	4,220.00	-56.83	12.74	-54.35	3.37	H	-44.98	-13.00
	5,064.00	-58.43	12.41	-51.49	3.64	H	-42.72	-13.00

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
5	1.4 MHz	836.5	QPSK	6	0	5.24
			16-QAM			5.96
			64-QAM			6.43
			256-QAM			6.62
	3 MHz		QPSK	15		5.21
			16-QAM			6.02
			64-QAM			6.42
			256-QAM			6.68
	5 MHz		QPSK	25		5.25
			16-QAM			6.04
			64-QAM			6.42
			256-QAM			6.64
	10 MHz		QPSK	50		5.30
			16-QAM			6.01
			64-QAM			6.38
			256-QAM			6.61

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 77 ~ 92.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
5	1.4 MHz	836.5	QPSK	6	0	1.1011
			16-QAM			1.1032
			64-QAM			1.1004
			256-QAM			1.0952
	3 MHz		QPSK	15		2.7084
			16-QAM			2.7157
			64-QAM			2.7162
			256-QAM			2.7044
	5 MHz		QPSK	25		4.4994
			16-QAM			4.5255
			64-QAM			4.5160
			256-QAM			4.5133
	10 MHz		QPSK	50		9.0040
			16-QAM			9.0194
			64-QAM			8.9802
			256-QAM			8.9749

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 61 ~ 76.

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)
5	1.4	824.7	3.7134	27.976	-67.126	-39.150	-13.00
		836.5	3.6875	27.976	-67.312	-39.336	
		848.3	3.6945	27.976	-67.377	-39.401	
	3	825.5	3.7000	27.976	-67.421	-39.445	
		836.5	3.6925	27.976	-67.235	-39.259	
		847.5	2.6785	27.976	-67.384	-39.408	
	5	826.5	3.6790	27.976	-67.408	-39.432	
		836.5	3.6890	27.976	-67.106	-39.130	
		846.5	3.6850	27.976	-67.363	-39.387	
	10	829.0	3.7214	27.976	-67.113	-39.137	
		836.5	3.6990	27.976	-67.283	-39.307	
		844.0	3.1810	27.976	-67.190	-39.214	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 93 ~ 104.
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

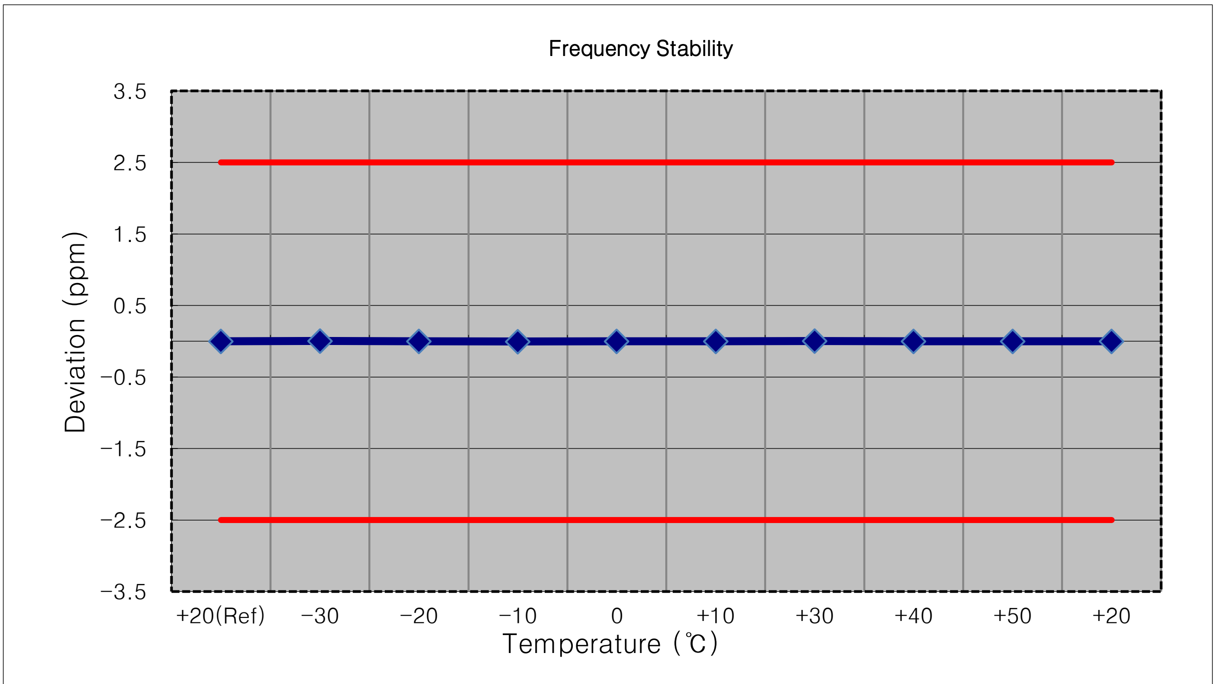
8.6 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 37 ~ 60.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

- ▣ MODE: LTE B5
- ▣ OPERATING FREQUENCY: 836,500,000 Hz
- ▣ CHANNEL: 20525 (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)	836 500 003	0.0	0.000 000	0.000
100 %		-30	836 500 005	2.0	0.000 000	0.002
100 %		-20	836 500 001	-1.3	0.000 000	-0.002
100 %		-10	836 500 000	-2.9	0.000 000	-0.003
100 %		0	836 500 001	-1.5	0.000 000	-0.002
100 %		+10	836 500 001	-2.2	0.000 000	-0.003
100 %		+30	836 500 005	2.1	0.000 000	0.003
100 %		+40	836 500 001	-2.2	0.000 000	-0.003
100 %		+50	836 500 001	-1.5	0.000 000	-0.002
Batt. Endpoint	3.300	+20	836 500 001	-1.8	0.000 000	-0.002



▣ MODE: LTE B5

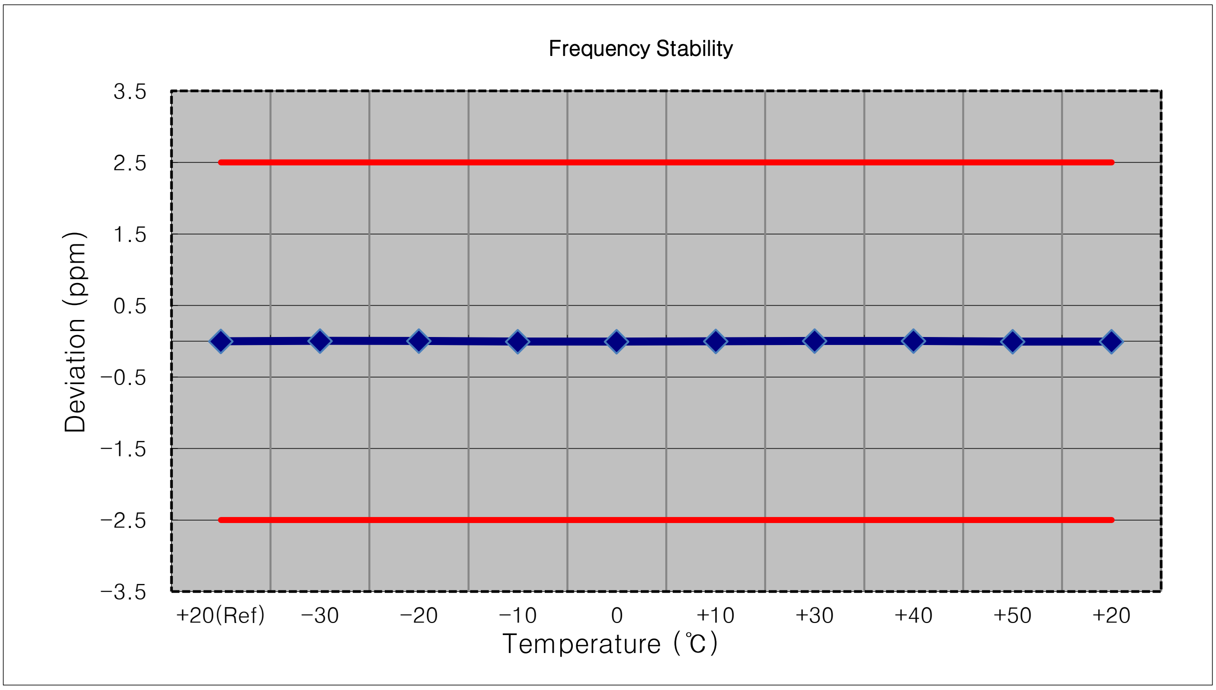
▣ OPERATING FREQUENCY: 836,500,000 Hz

▣ CHANNEL: 20525(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)	836 500 003	0.0	0.000 000	0.000
100 %		-30	836 500 008	4.6	0.000 001	0.005
100 %		-20	836 500 006	2.9	0.000 000	0.003
100 %		-10	836 499 999	-3.9	0.000 000	-0.005
100 %		0	836 500 000	-2.6	0.000 000	-0.003
100 %		+10	836 500 001	-1.6	0.000 000	-0.002
100 %		+30	836 500 006	3.0	0.000 000	0.004
100 %		+40	836 500 006	3.5	0.000 000	0.004
100 %		+50	836 500 000	-2.7	0.000 000	-0.003
Batt. Endpoint	3.300	+20	836 500 000	-2.8	0.000 000	-0.003



▣ MODE: LTE B5

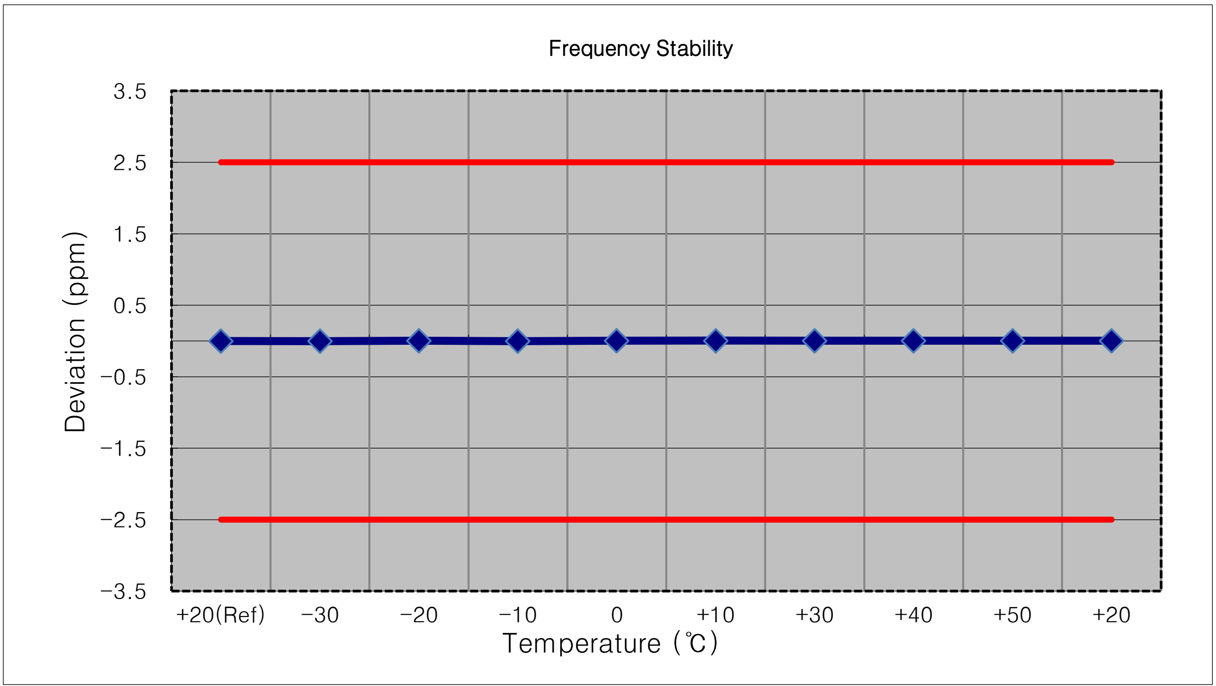
▣ OPERATING FREQUENCY: 836,500,000 Hz

▣ CHANNEL: 20525(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)	836 500 004	0.0	0.000 000	0.000
100 %		-30	836 500 001	-2.5	0.000 000	-0.003
100 %		-20	836 500 007	3.1	0.000 000	0.004
100 %		-10	836 500 001	-2.5	0.000 000	-0.003
100 %		0	836 500 007	2.9	0.000 000	0.003
100 %		+10	836 500 009	4.7	0.000 001	0.006
100 %		+30	836 500 007	2.9	0.000 000	0.003
100 %		+40	836 500 006	2.3	0.000 000	0.003
100 %		+50	836 500 006	2.4	0.000 000	0.003
Batt. Endpoint	3.300	+20	836 500 008	4.2	0.000 001	0.005



▣ MODE: LTE B5

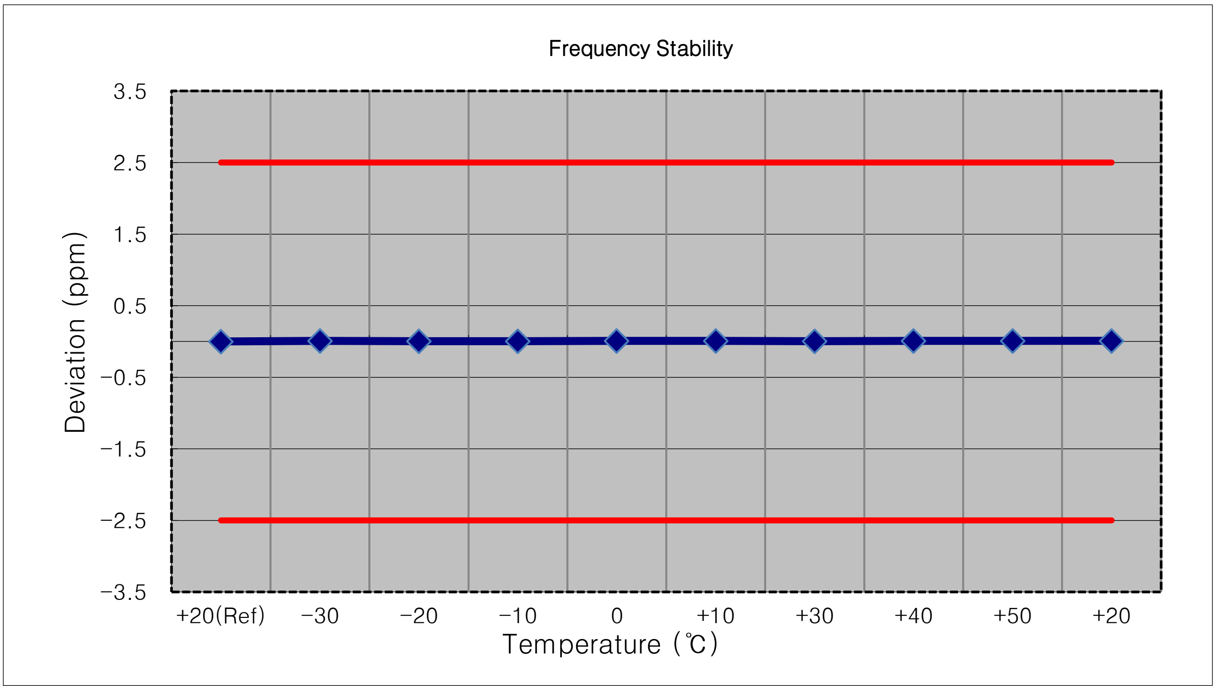
▣ OPERATING FREQUENCY: 836,500,000 Hz

▣ CHANNEL: 20525(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)	836 500 004	0.0	0.000 000	0.000
100 %		-30	836 500 010	6.2	0.000 001	0.007
100 %		-20	836 500 008	4.4	0.000 001	0.005
100 %		-10	836 500 009	4.7	0.000 001	0.006
100 %		0	836 500 010	5.8	0.000 001	0.007
100 %		+10	836 500 010	5.7	0.000 001	0.007
100 %		+30	836 500 008	3.7	0.000 000	0.004
100 %		+40	836 500 010	6.3	0.000 001	0.008
100 %		+50	836 500 010	5.8	0.000 001	0.007
Batt. Endpoint	3.300	+20	836 500 012	7.8	0.000 001	0.009



8.8 UPLINK CARRIER AGGREGATION

Test Note

1. All tests were evaluated for the two bands using various combinations of RB size, RB offset, modulation, and channel bandwidth.
2. All modes of operation were investigated and the worst case configuration results are reported in this section. Please refer to the table below.
3. The worst case is reported with the modulations, RB sizes and offsets. (Modulation: QPSK, RB: 1, RB Offset: 0)

Radiated Spurious Emissions

PCC	SCC	PCC		SCC	
		BW(MHz)	Channel	BW(MHz)	Channel
5A	66A	10	20450	10	132022

8.8.1 RADIATED SPURIOUS EMISSIONS

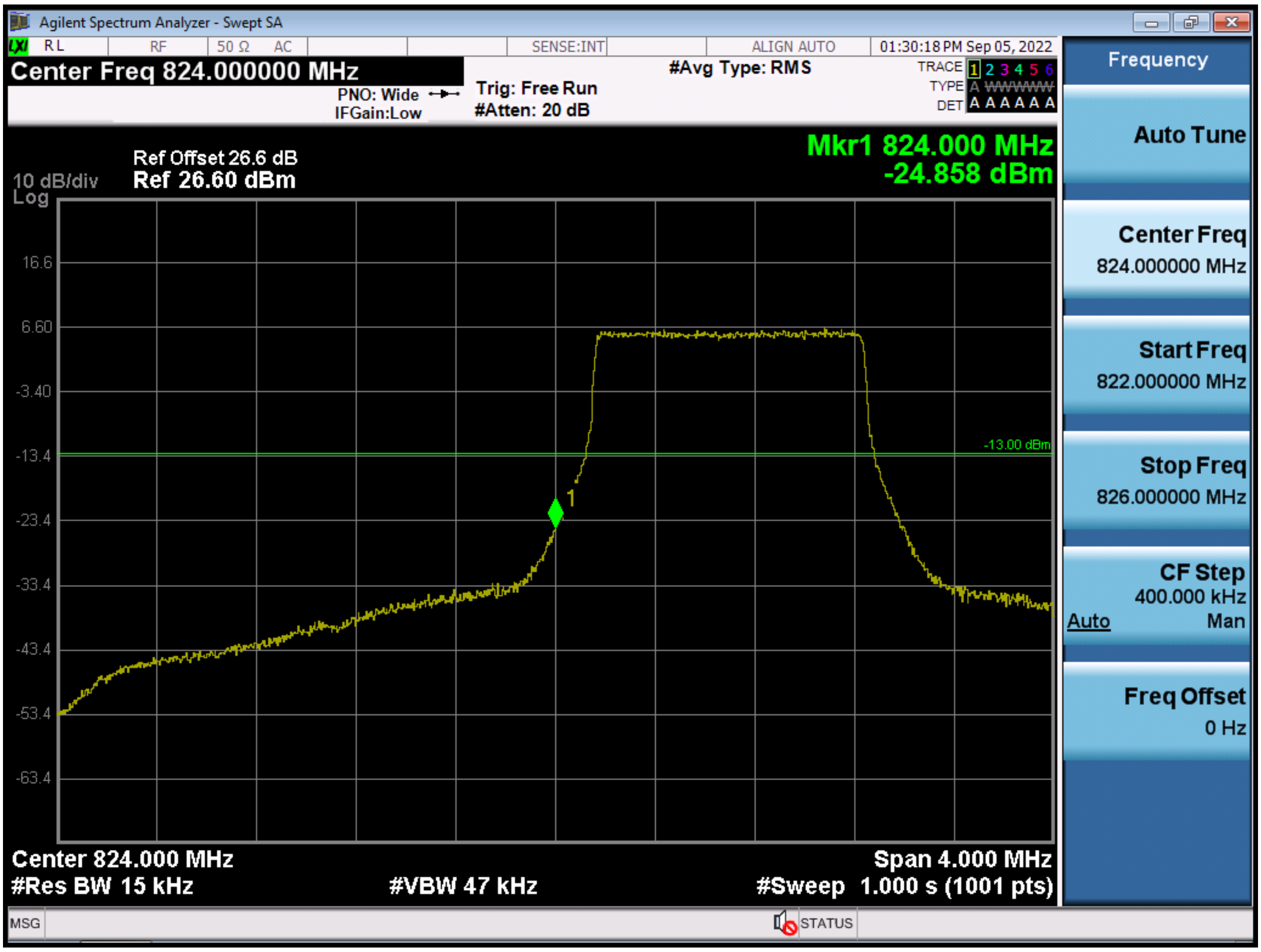
5A(PCC)-66A(SCC)

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
1 658.00	-52.79	9.76	-63.62	2.06	V	-55.92	-13.00
2 487.00	-55.93	10.62	-60.09	2.46	V	-51.93	-13.00
3 316.00	-58.23	12.19	-58.96	3.01	V	-49.78	-13.00
4 145.00	-59.00	12.51	-57.38	3.34	H	-48.21	-13.00
4 974.00	-58.19	12.65	-52.28	3.67	H	-43.30	-13.00

Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	Result (dBm)	Limit (dBm)
3 430.00	-54.73	12.54	-61.13	3.02	H	-51.61	-13.00
5 145.00	-55.68	12.29	-53.43	3.70	V	-44.84	-13.00
6 860.00	-56.84	11.98	-50.27	4.38	V	-42.67	-13.00
8 575.00	-58.51	11.45	-45.87	5.06	H	-39.48	-13.00
10 290.00	-57.48	11.50	-39.47	5.81	H	-33.78	-13.00

9. TEST PLOTS

1.4 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

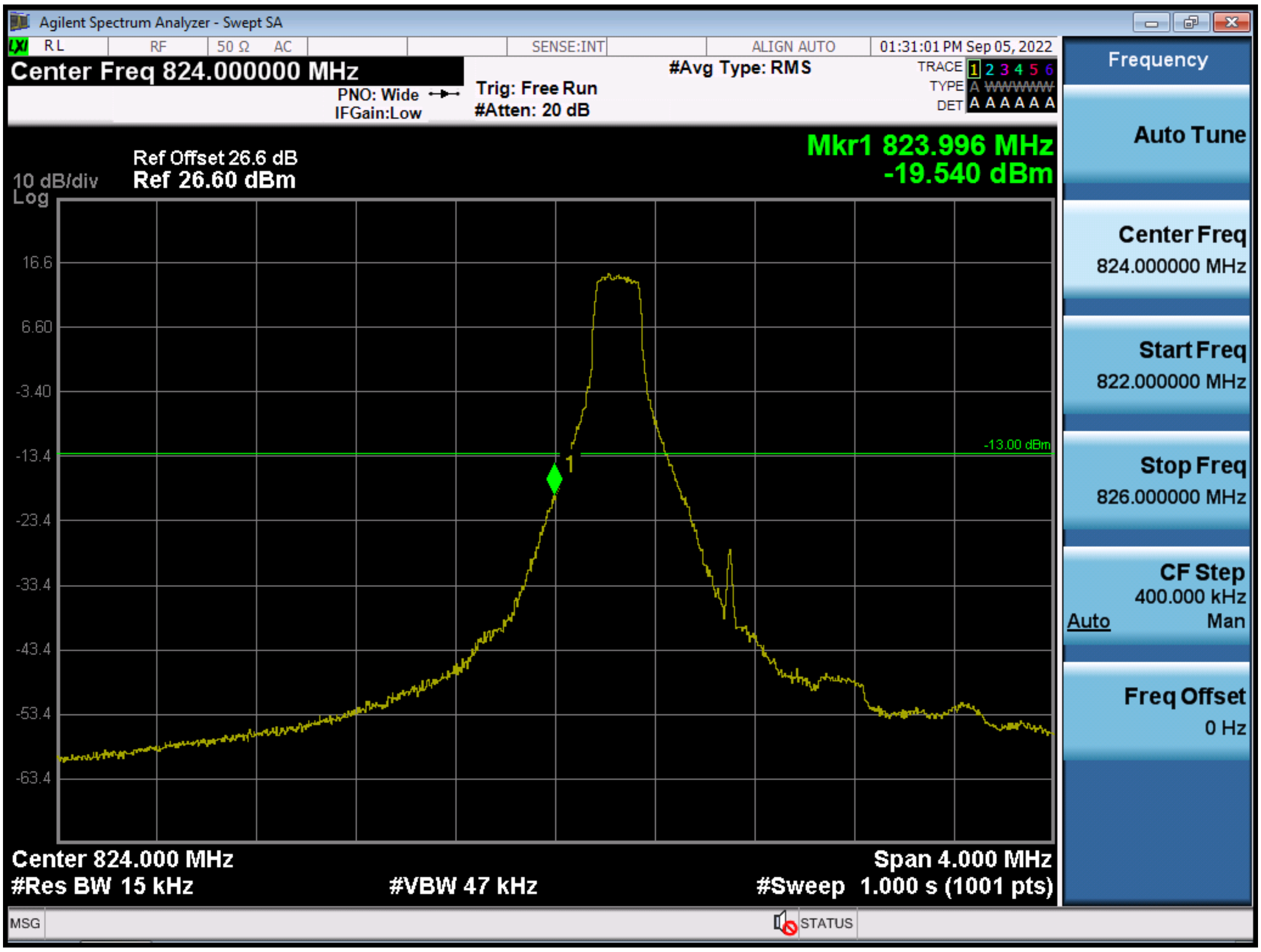


1.4 M_BandEdge_Lowest Channel_QPSK_FullRB(2)

1.4 M_BandEdge_Highest Channel_QPSK_FullRB(1)

1.4 M_BandEdge_Highest Channel_QPSK_FullRB(2)

1.4 M_BandEdge_Lowest Channel_QPSK_1RB



1.4 M_BandEdge_Highest Channel_QPSK_1RB

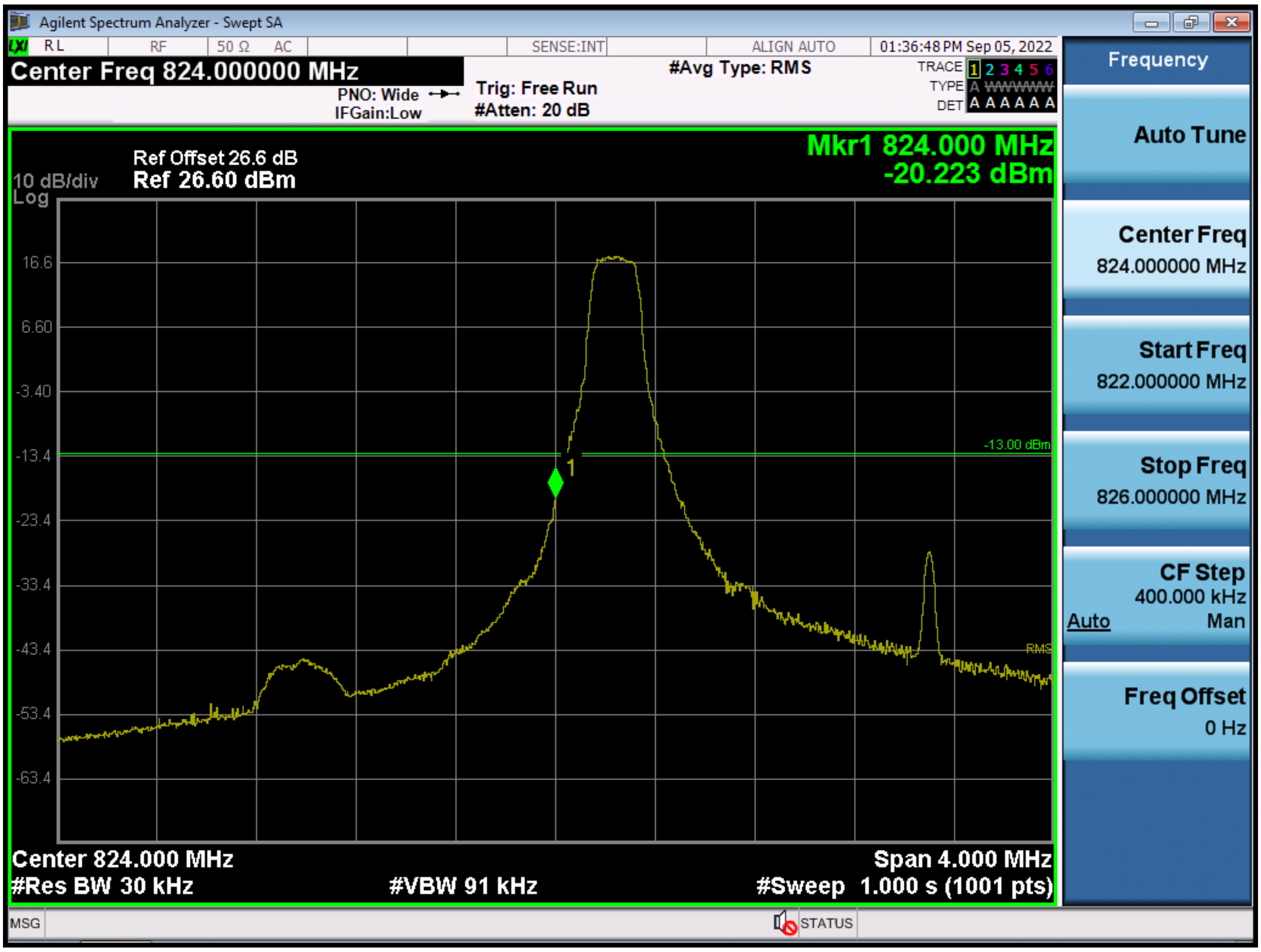
3 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

3 M_BandEdge_Lowest Channel_QPSK_FullRB(2)

3 M_BandEdge_Highest Channel_QPSK_FullRB(1)

3 M_BandEdge_Highest Channel_QPSK_FullRB(2)

3 M_BandEdge_Lowest Channel_QPSK_1RB



3 M_BandEdge_Highest Channel_QPSK_1RB

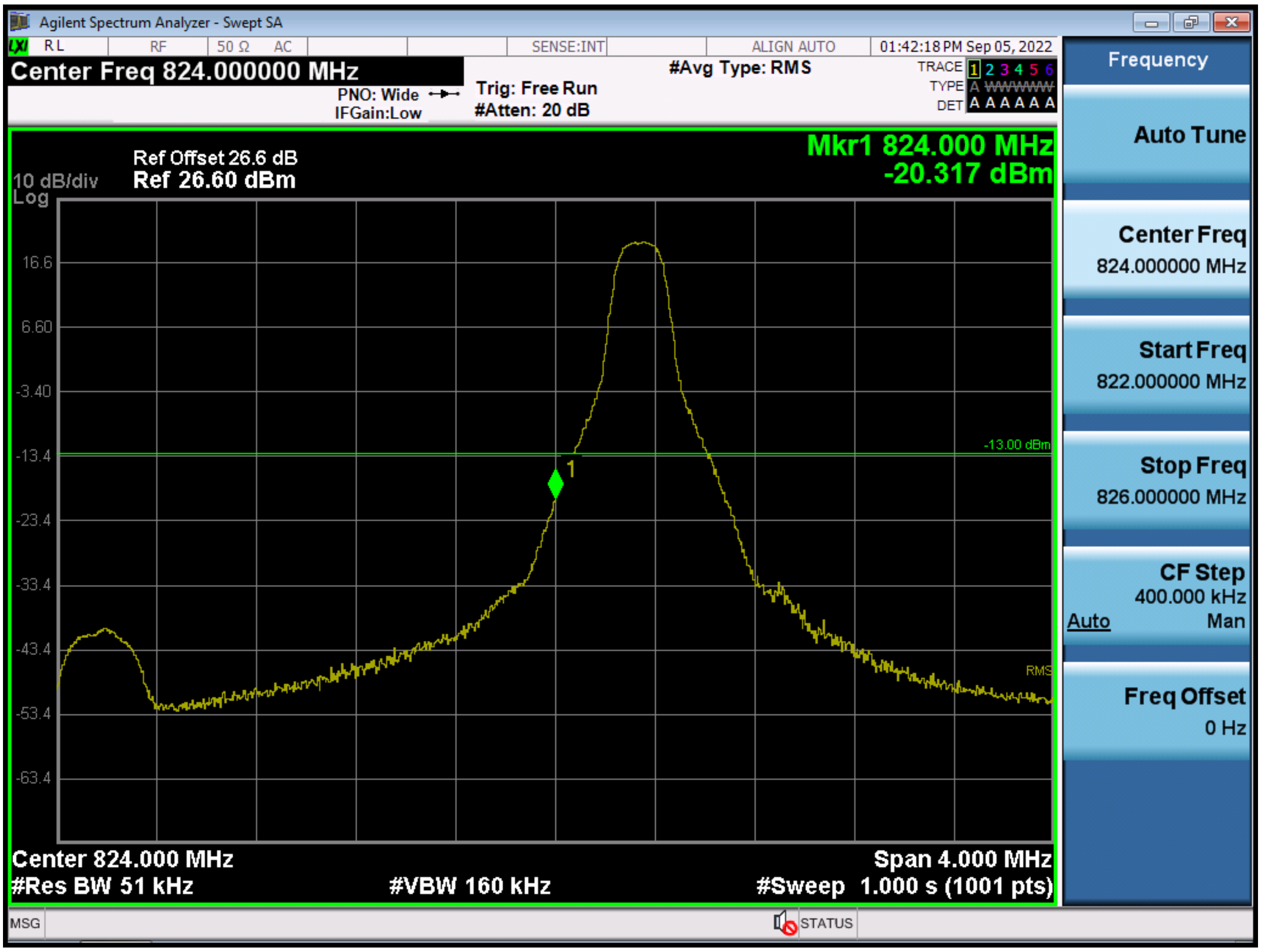
5 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

5 M_BandEdge_Lowest Channel_QPSK_FullRB(2)

5 M_BandEdge_Highest Channel_QPSK_FullRB(1)

5 M_BandEdge_Highest Channel_QPSK_FullRB(2)

5 M_BandEdge_Lowest Channel_QPSK_1RB



5 M_BandEdge_Highest Channel_QPSK_1RB

10 M_BandEdge_Lowest Channel_QPSK_FullRB(1)

10 M_BandEdge_Lowest Channel_QPSK_FullRB(2)

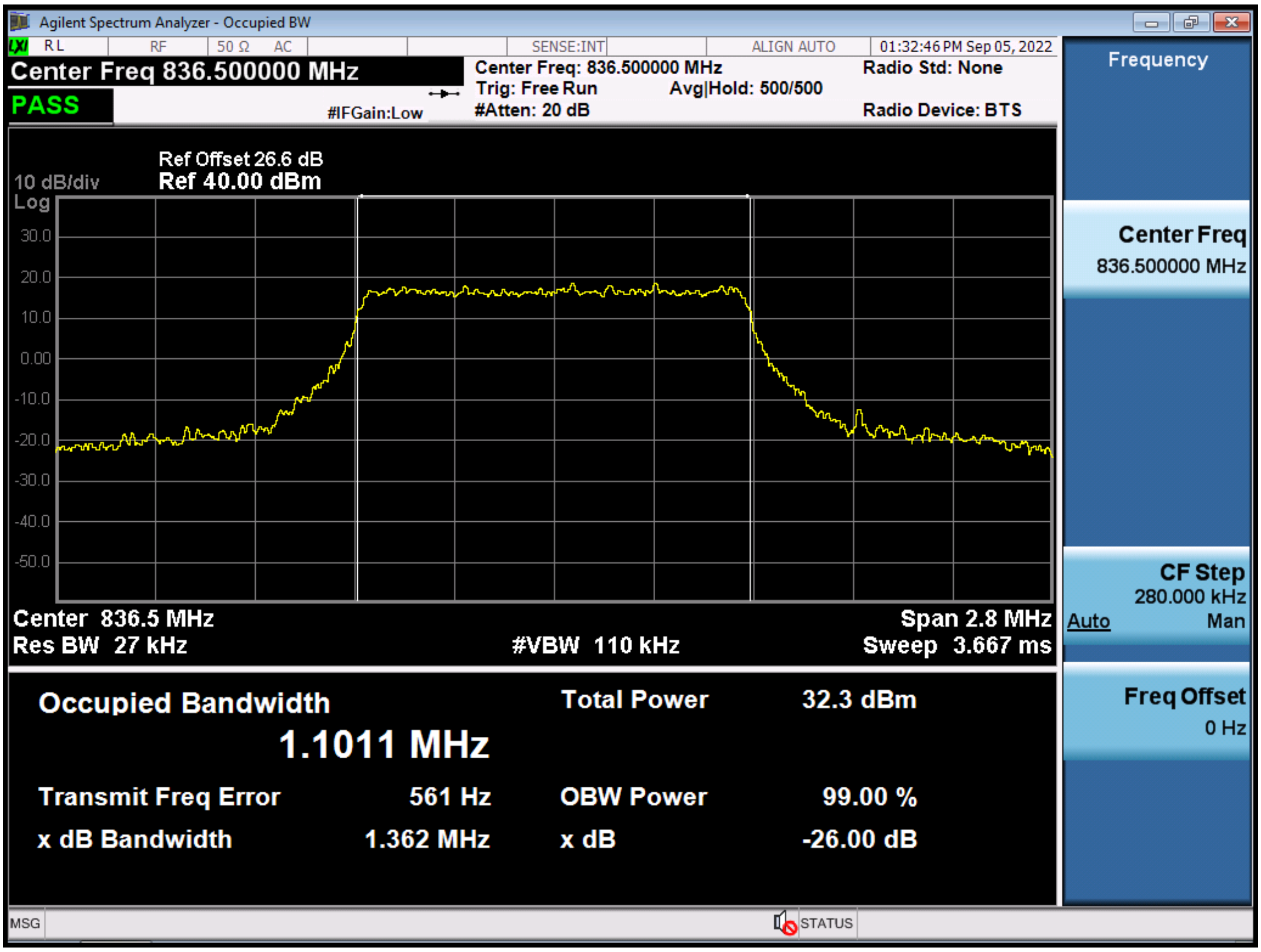
10 M_BandEdge_Highest Channel_QPSK_FullRB(1)

10 M_BandEdge_Highest Channel_QPSK_FullRB(2)

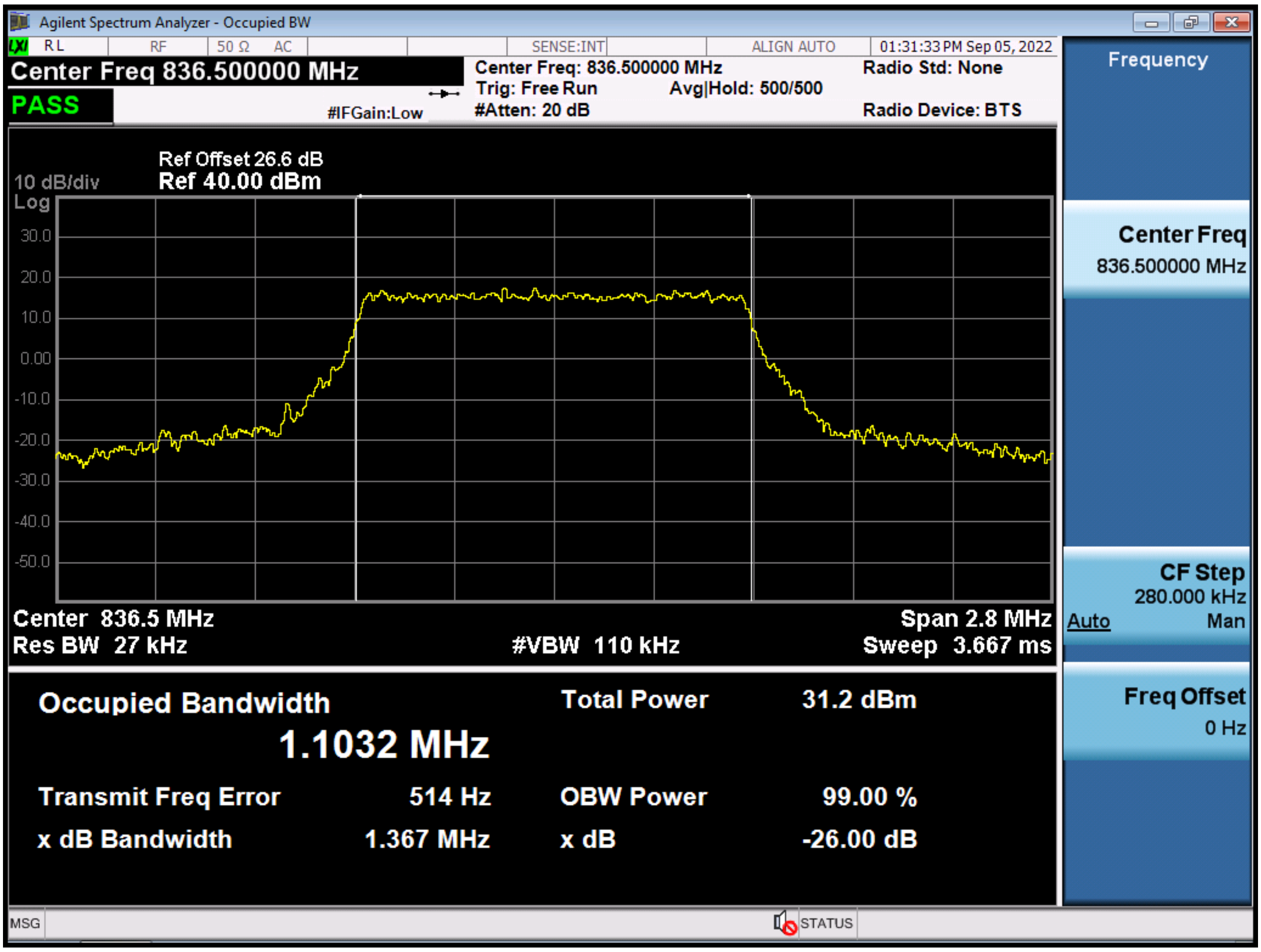
10 M_BandEdge_Lowest Channel_QPSK_1RB

10 M_BandEdge_Highest Channel_QPSK_1RB

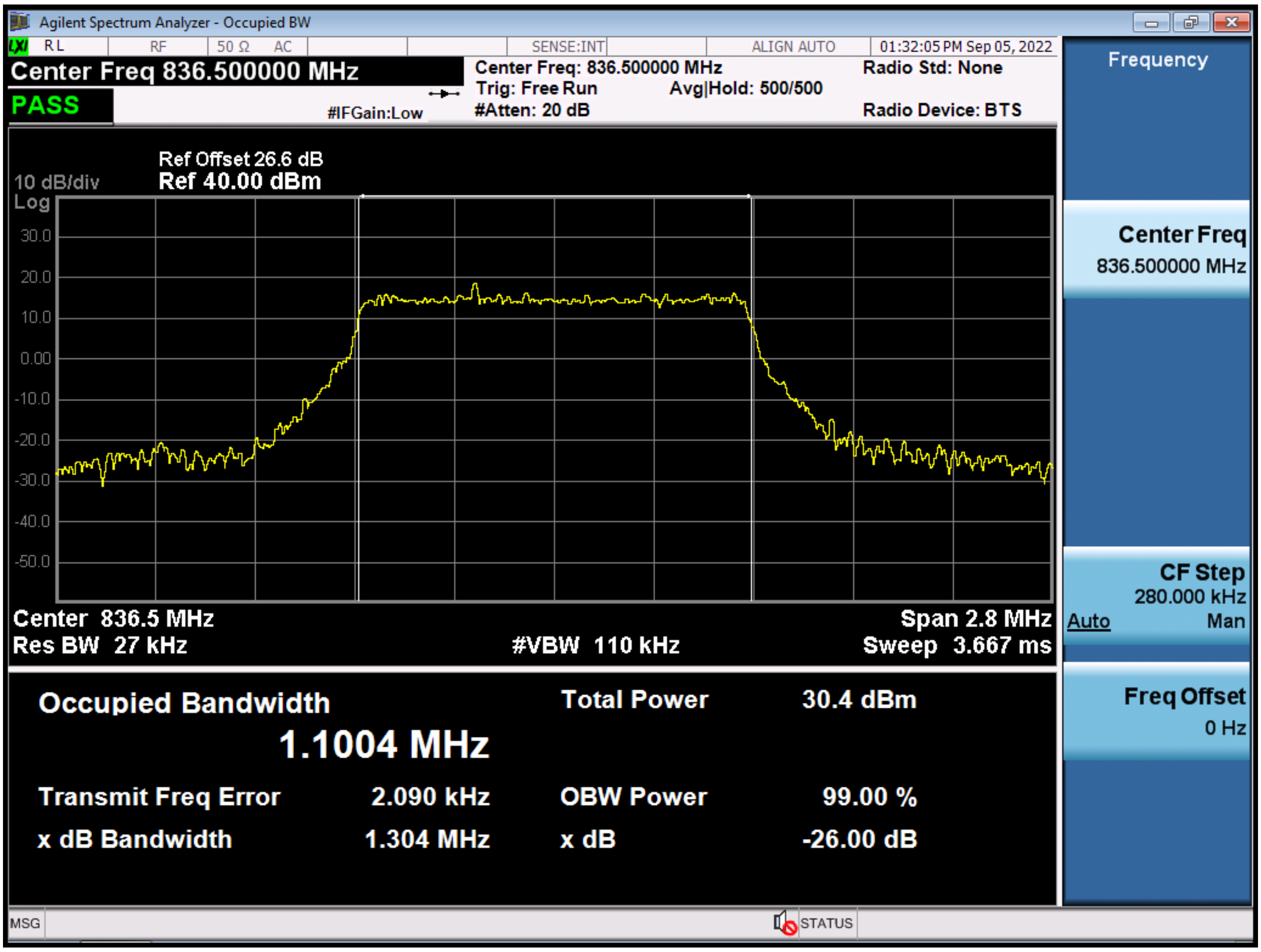
1.4 M_OBW_Mid Channel_QPSK_FullRB



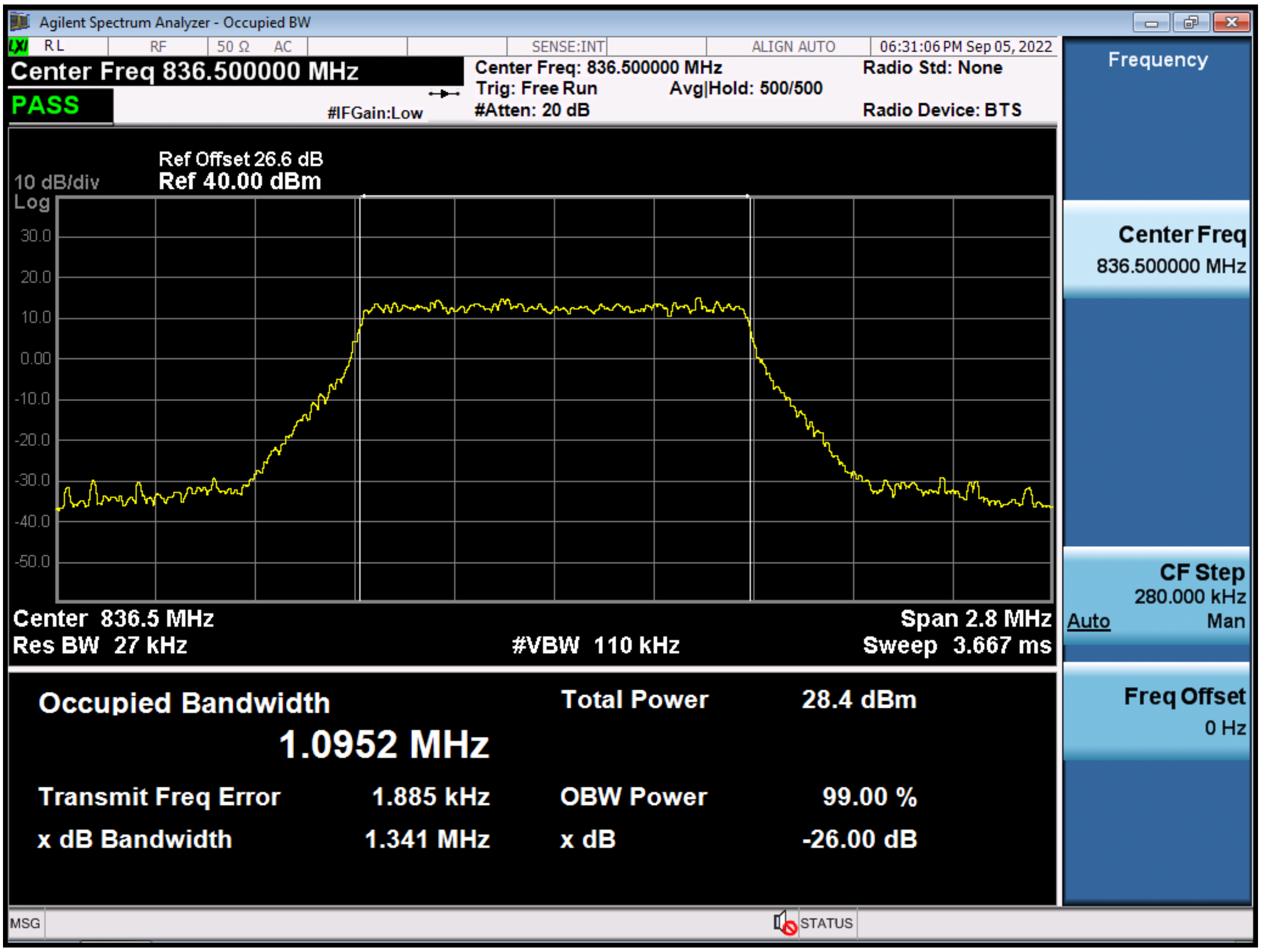
1.4 M_OBW_Mid Channel_16QAM_FullRB



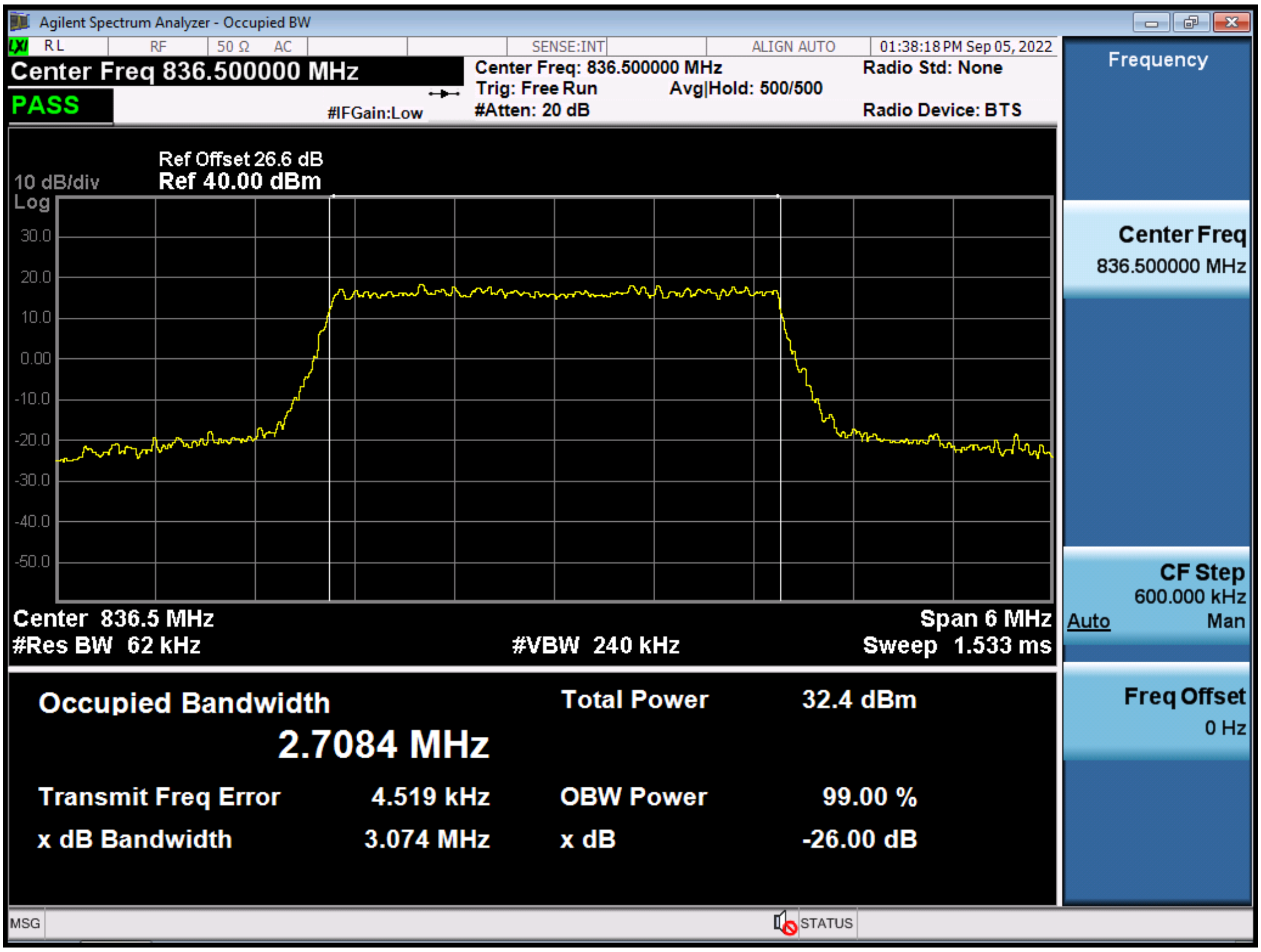
1.4 M_OBW_Mid Channel_64QAM_FullRB



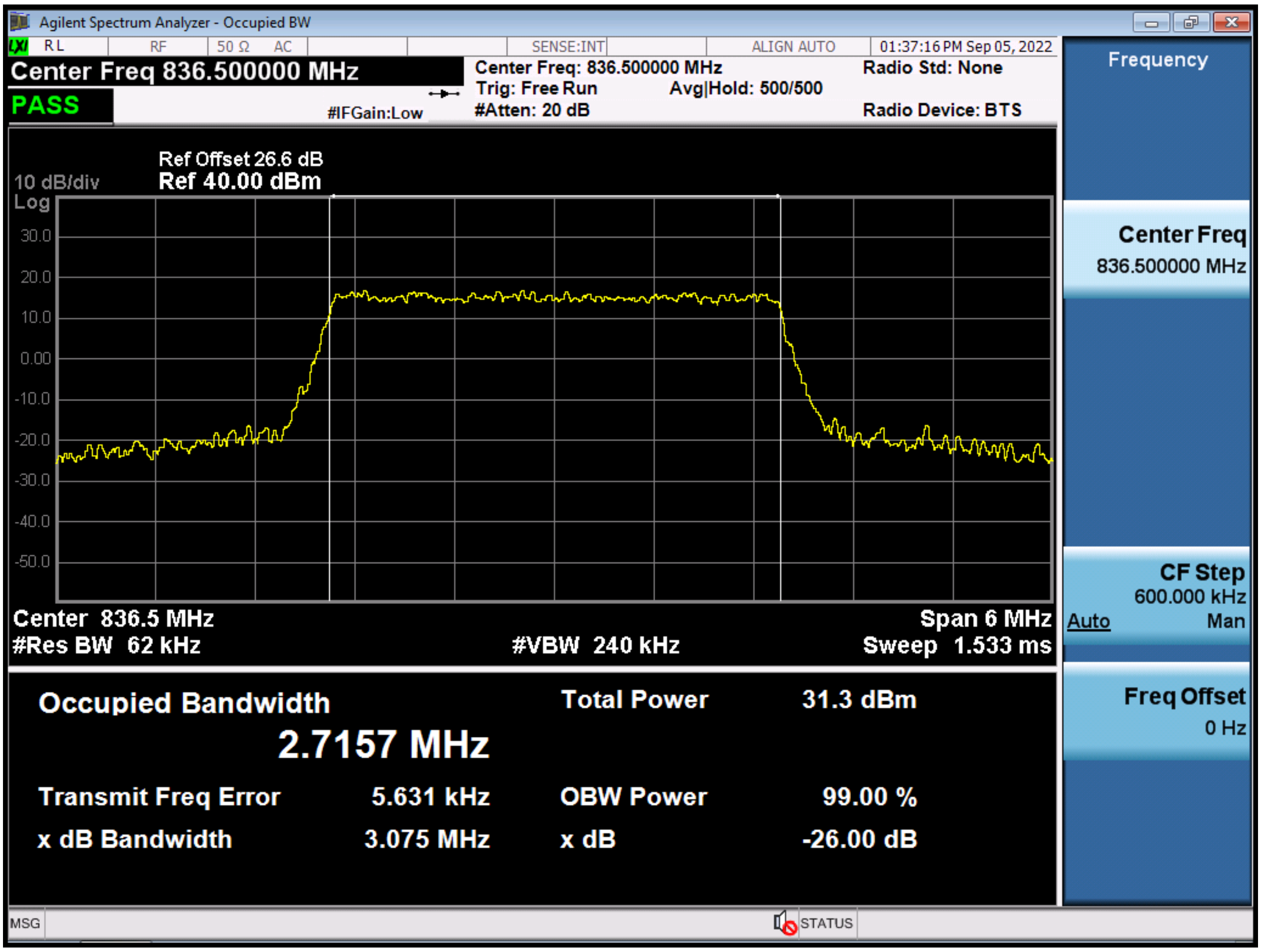
1.4 M_OBW_Mid Channel_256QAM_FullRB



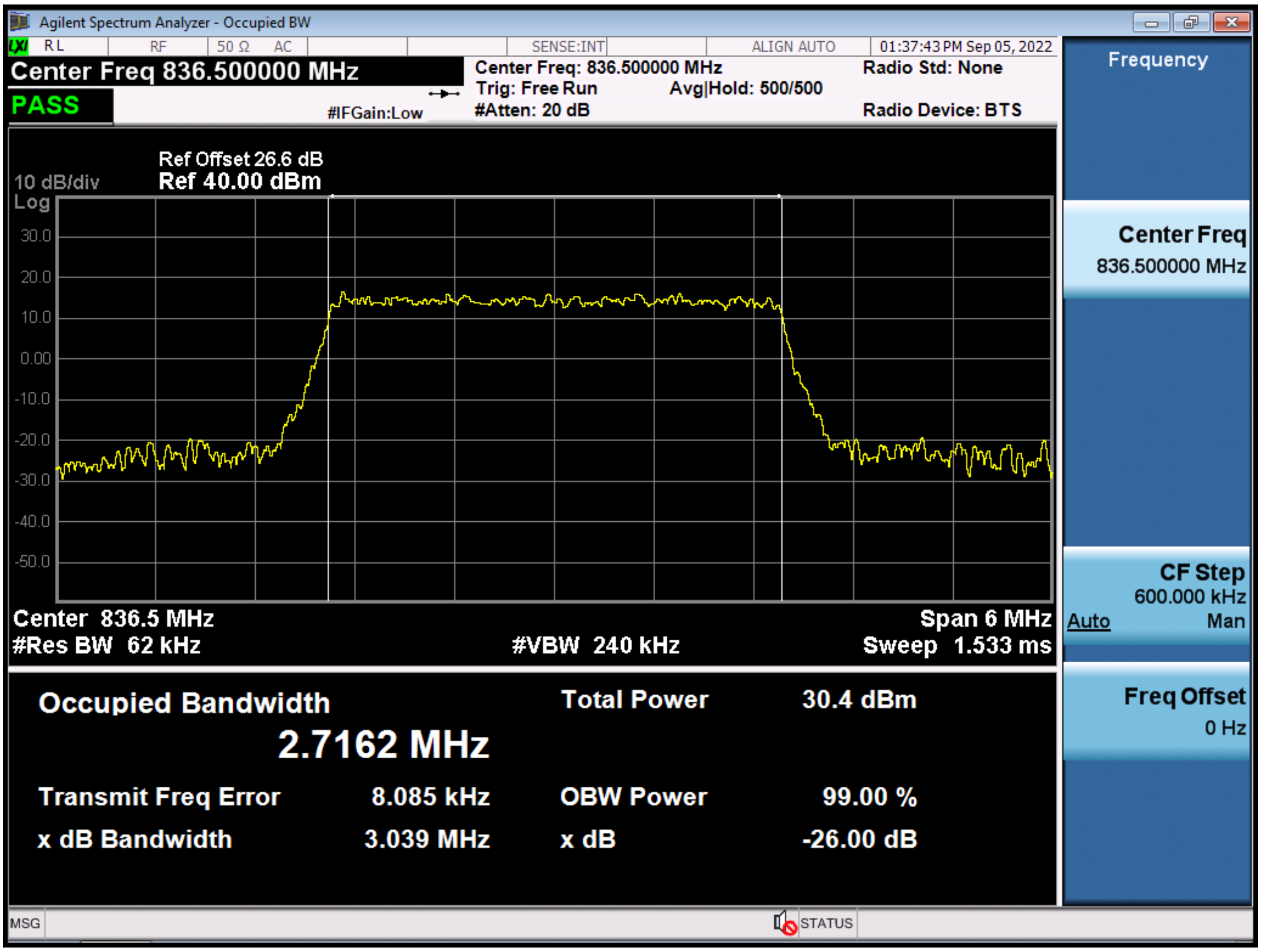
3 M_OBW_Mid Channel_QPSK_FullRB



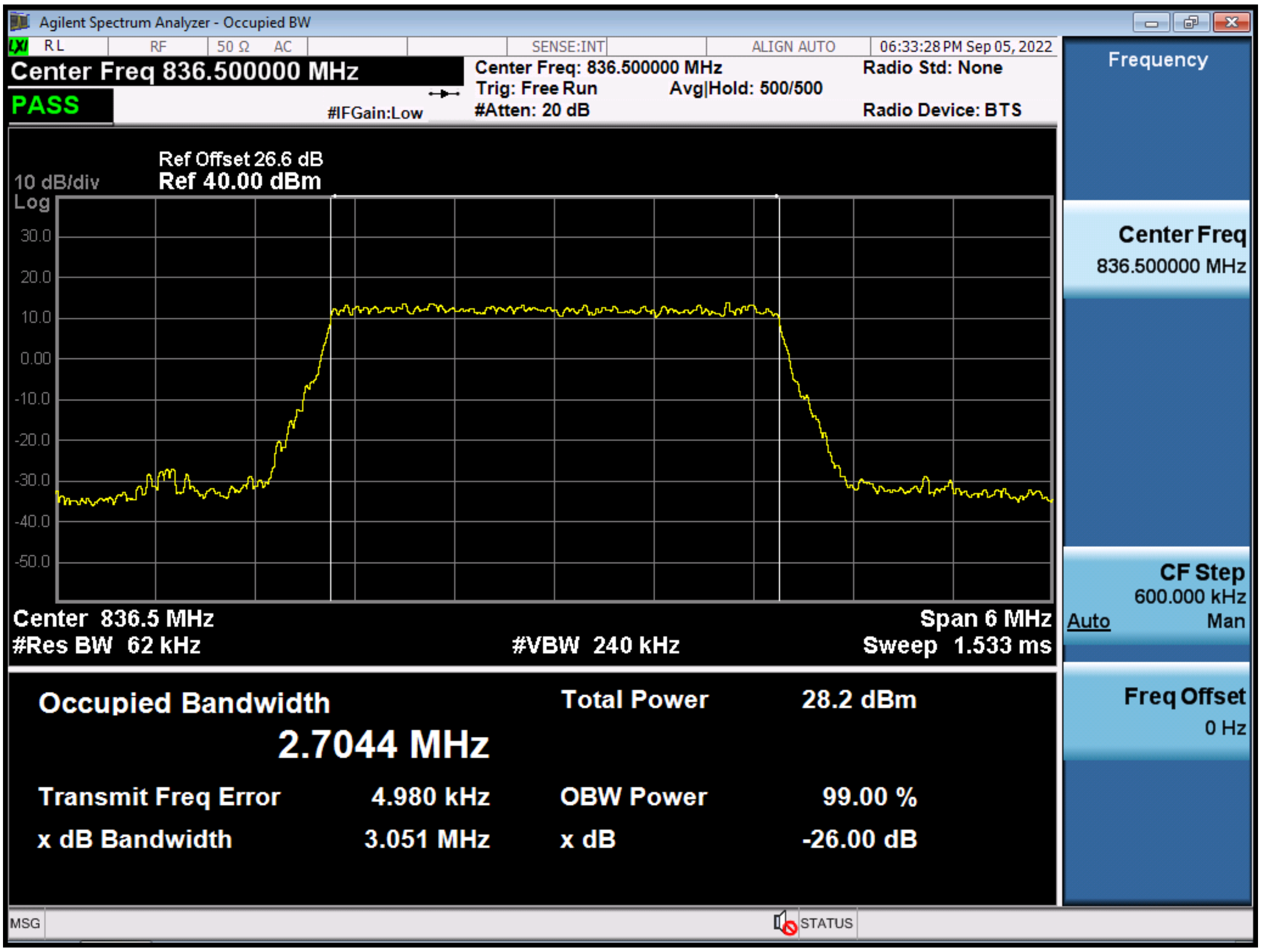
3 M_OBW_Mid Channel_16QAM_FullRB



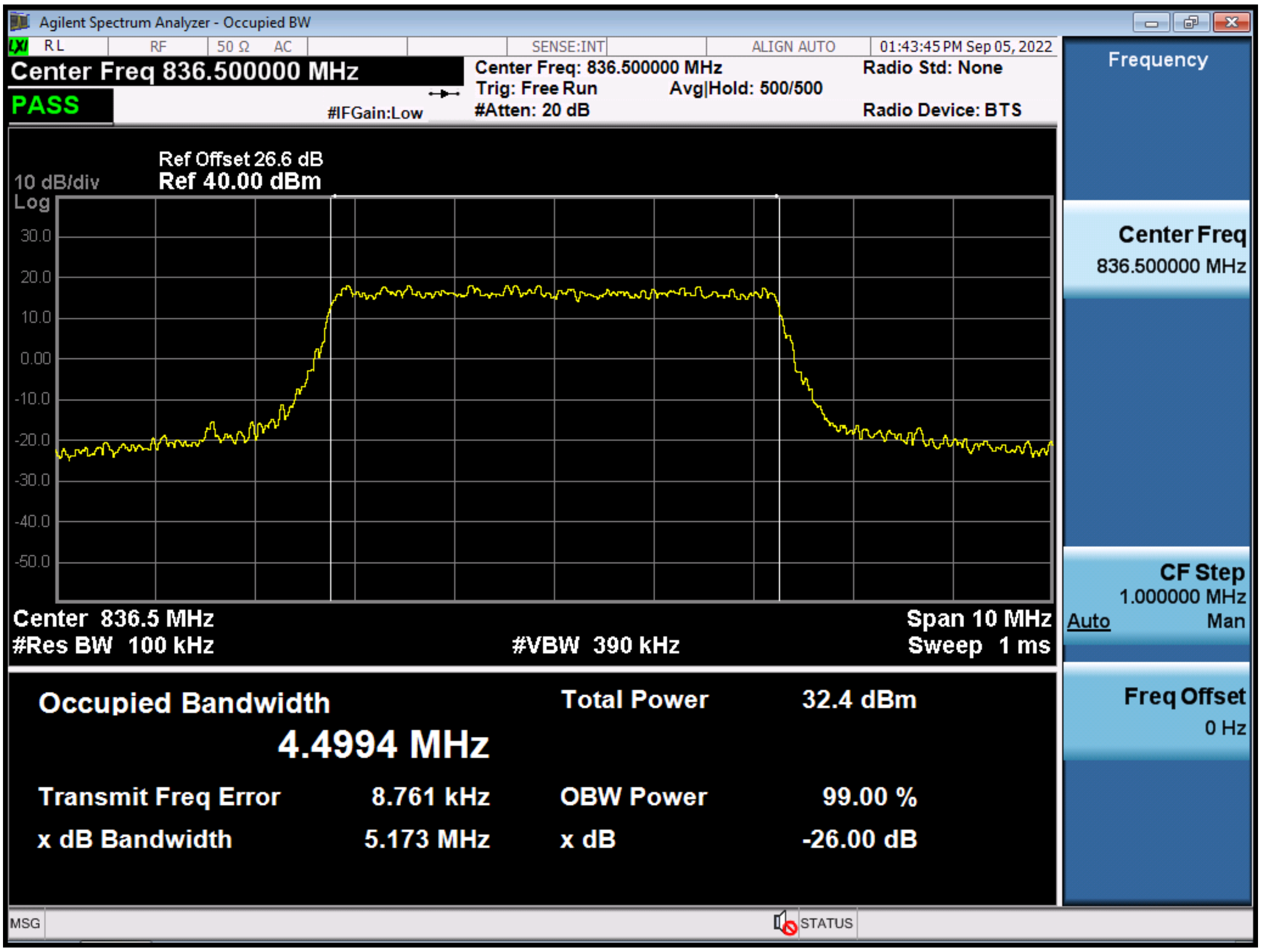
3 M_OBW_Mid Channel_64QAM_FullRB



3 M_OBW_Mid Channel_256QAM_FullRB



5 M_OBW_Mid Channel_QPSK_FullRB



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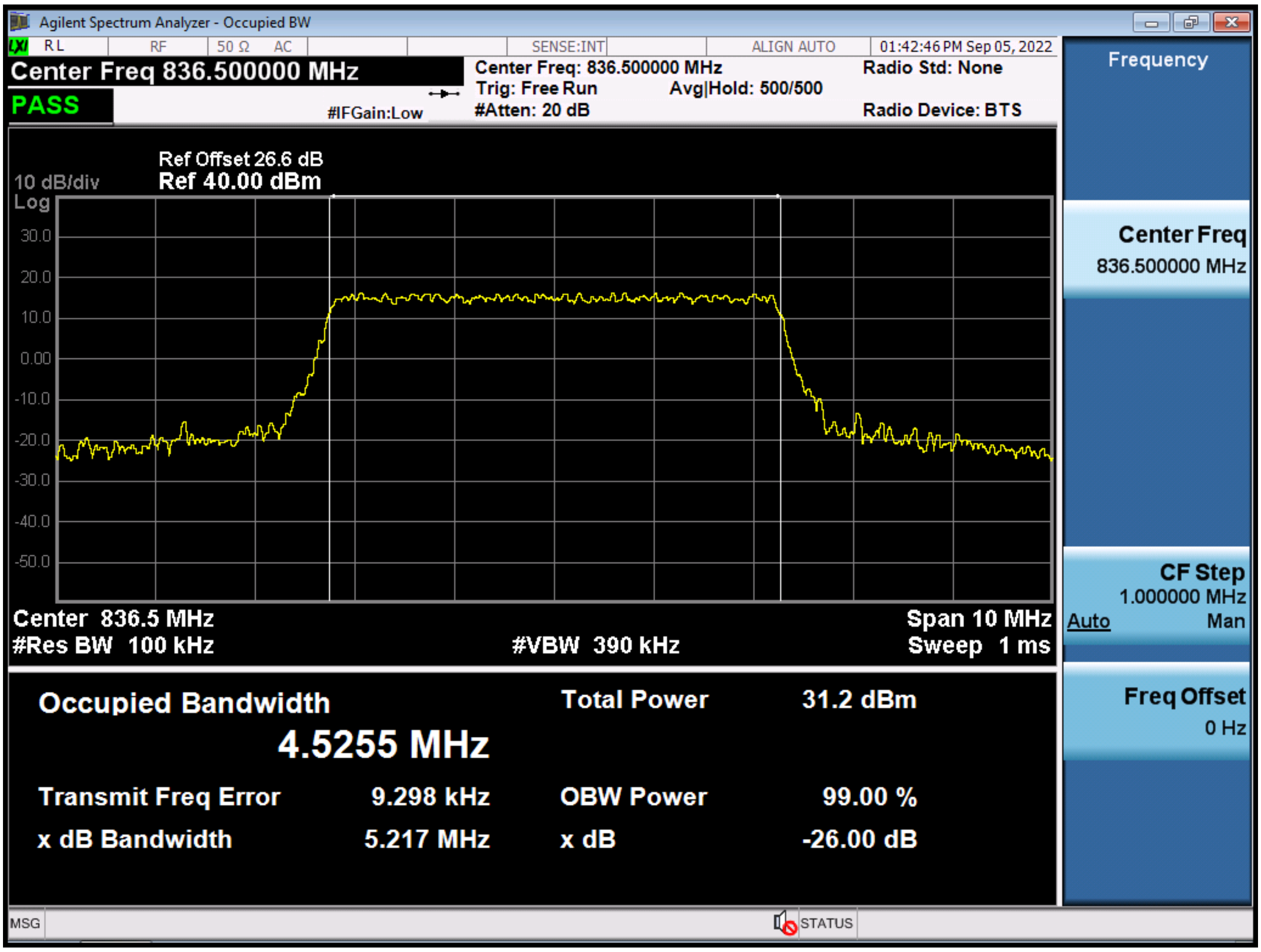

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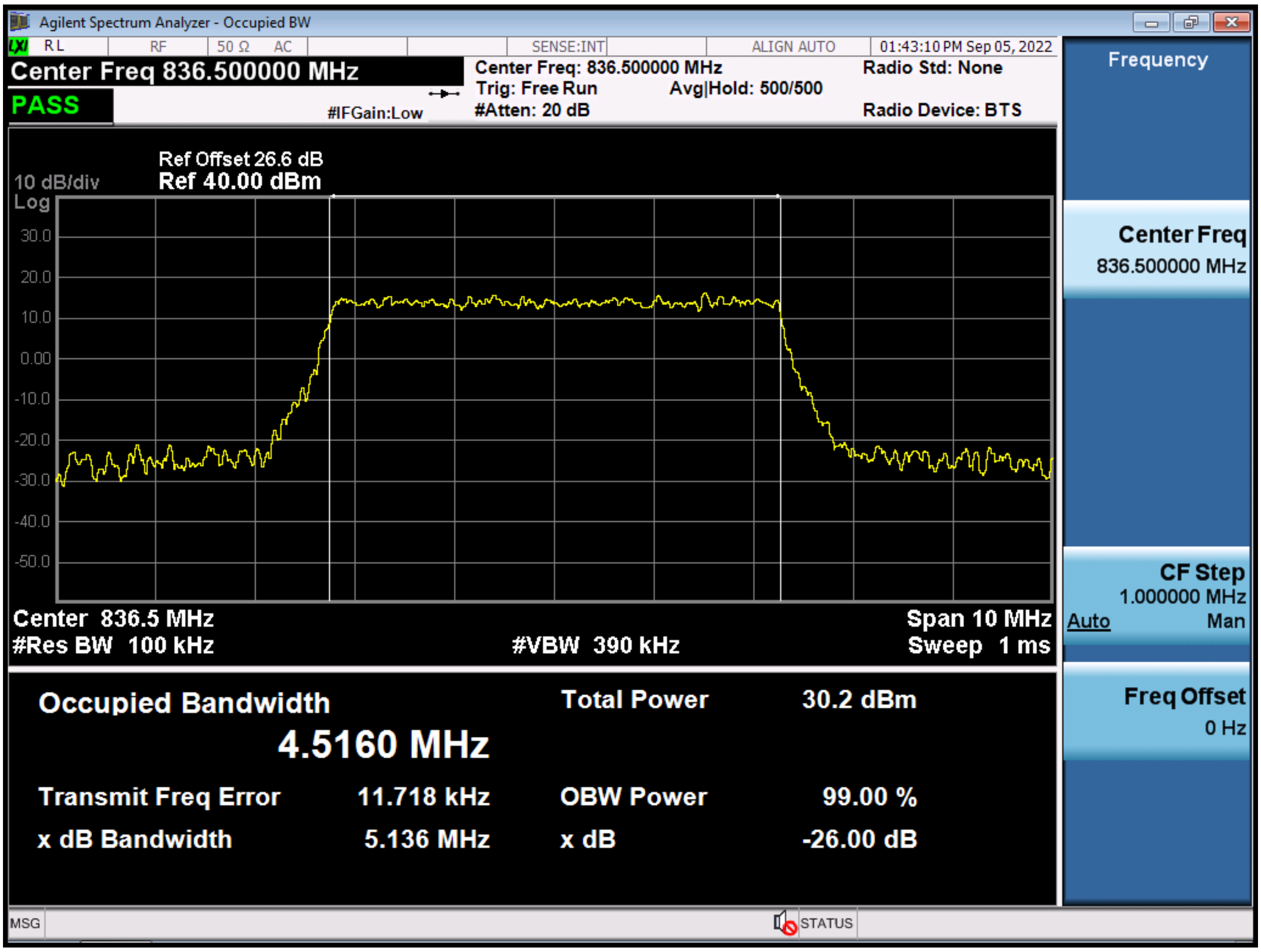

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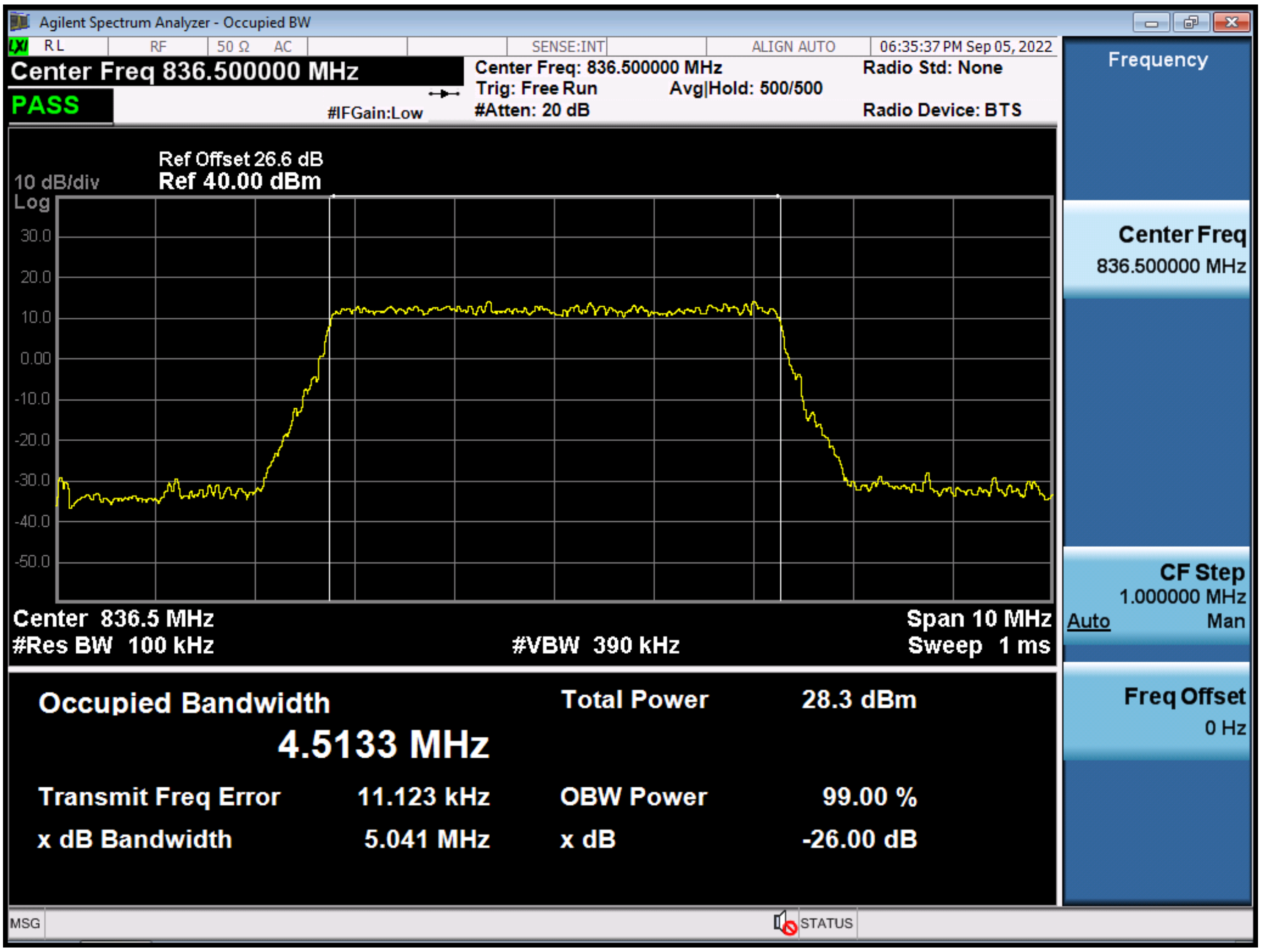
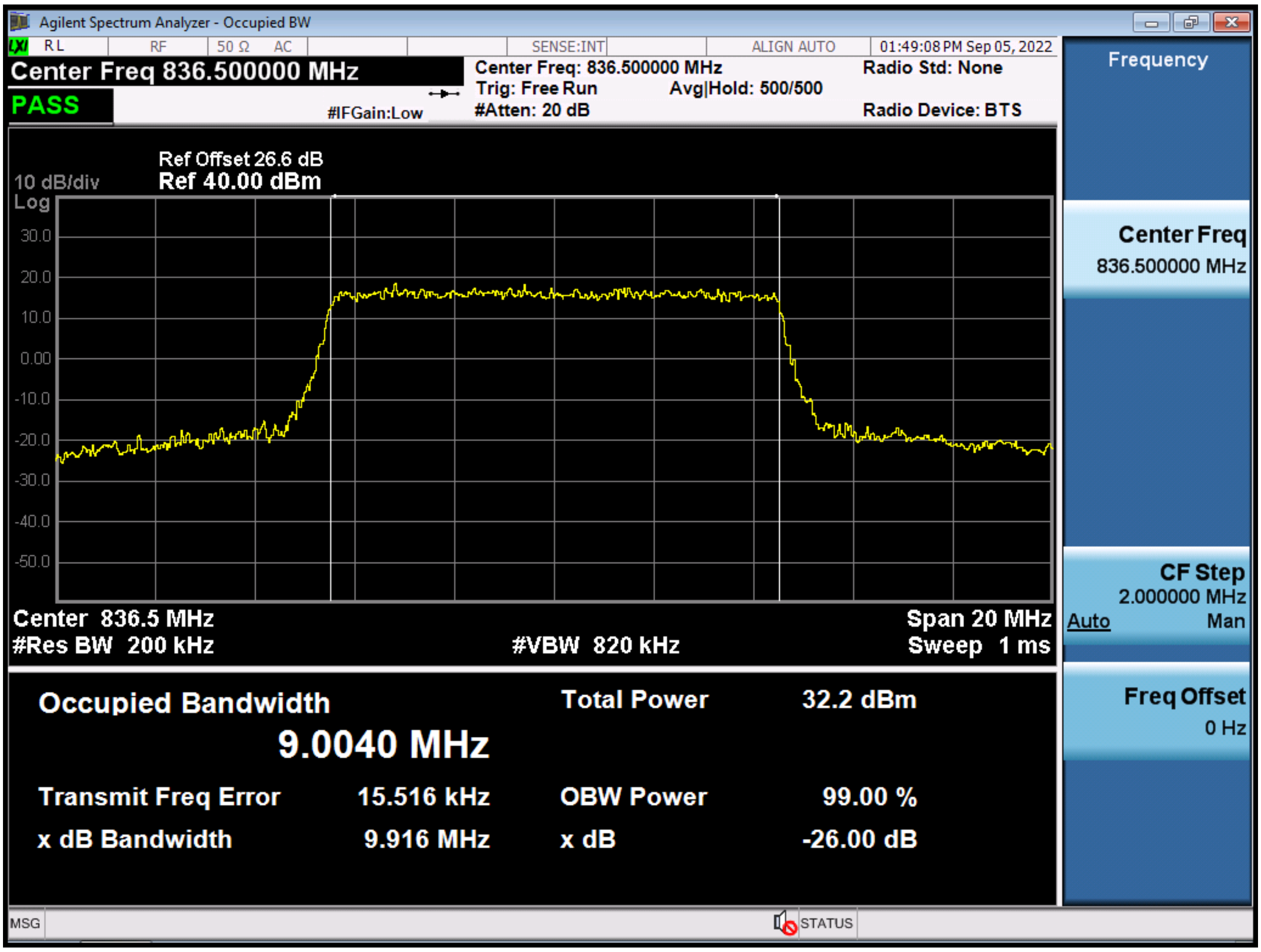


10 M_OBW_Mid Channel_QPSK_FullRB



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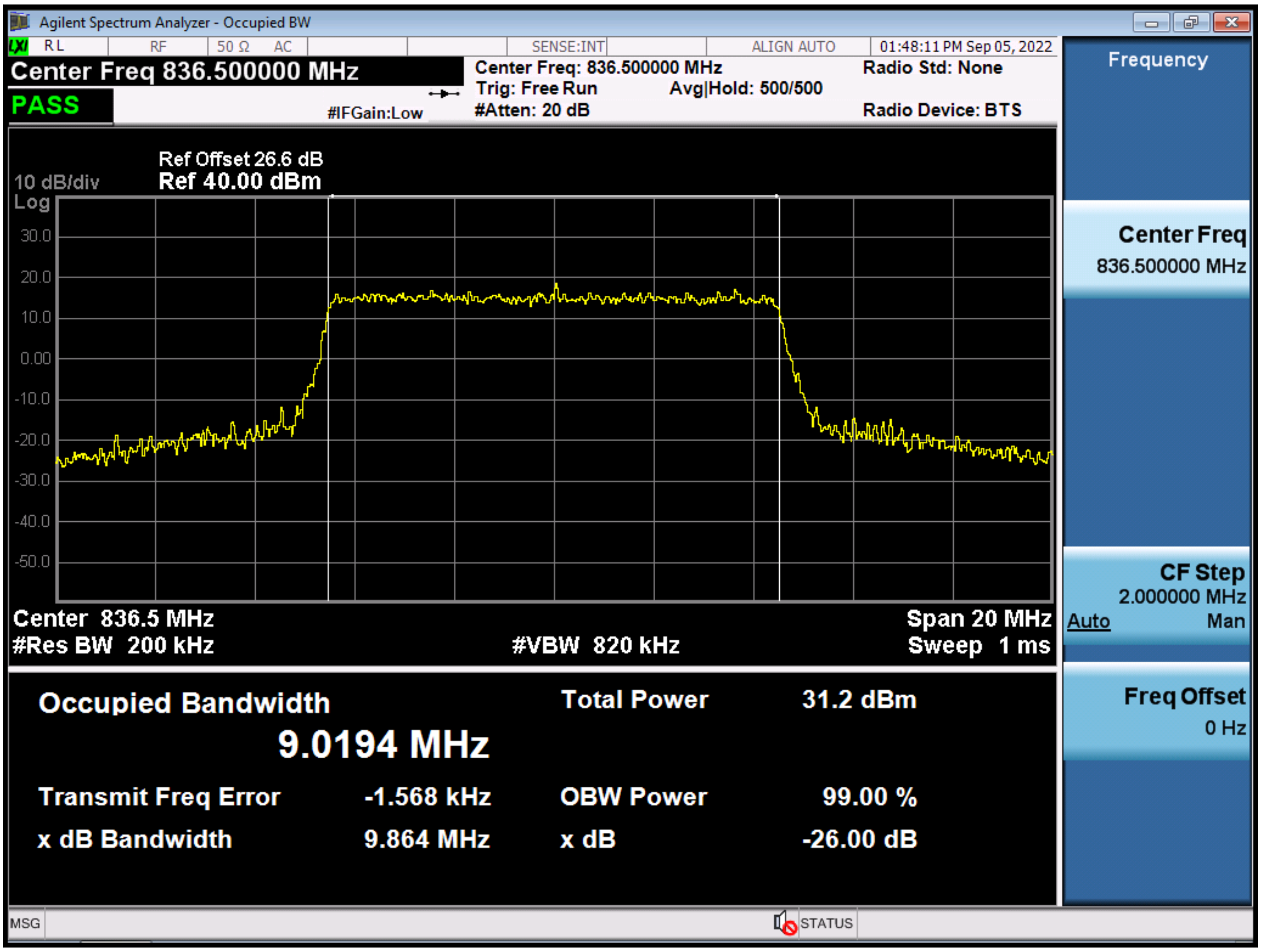

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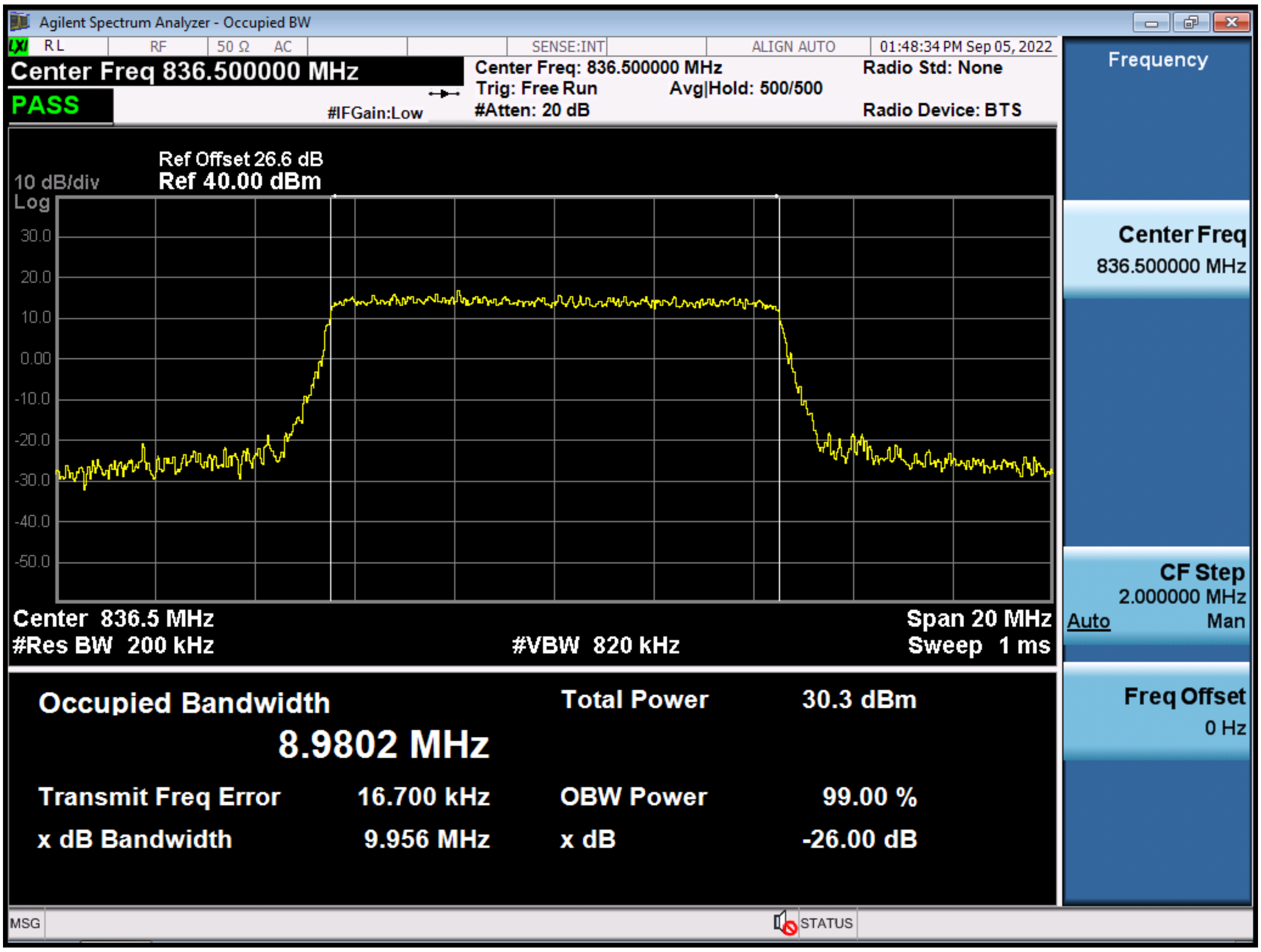

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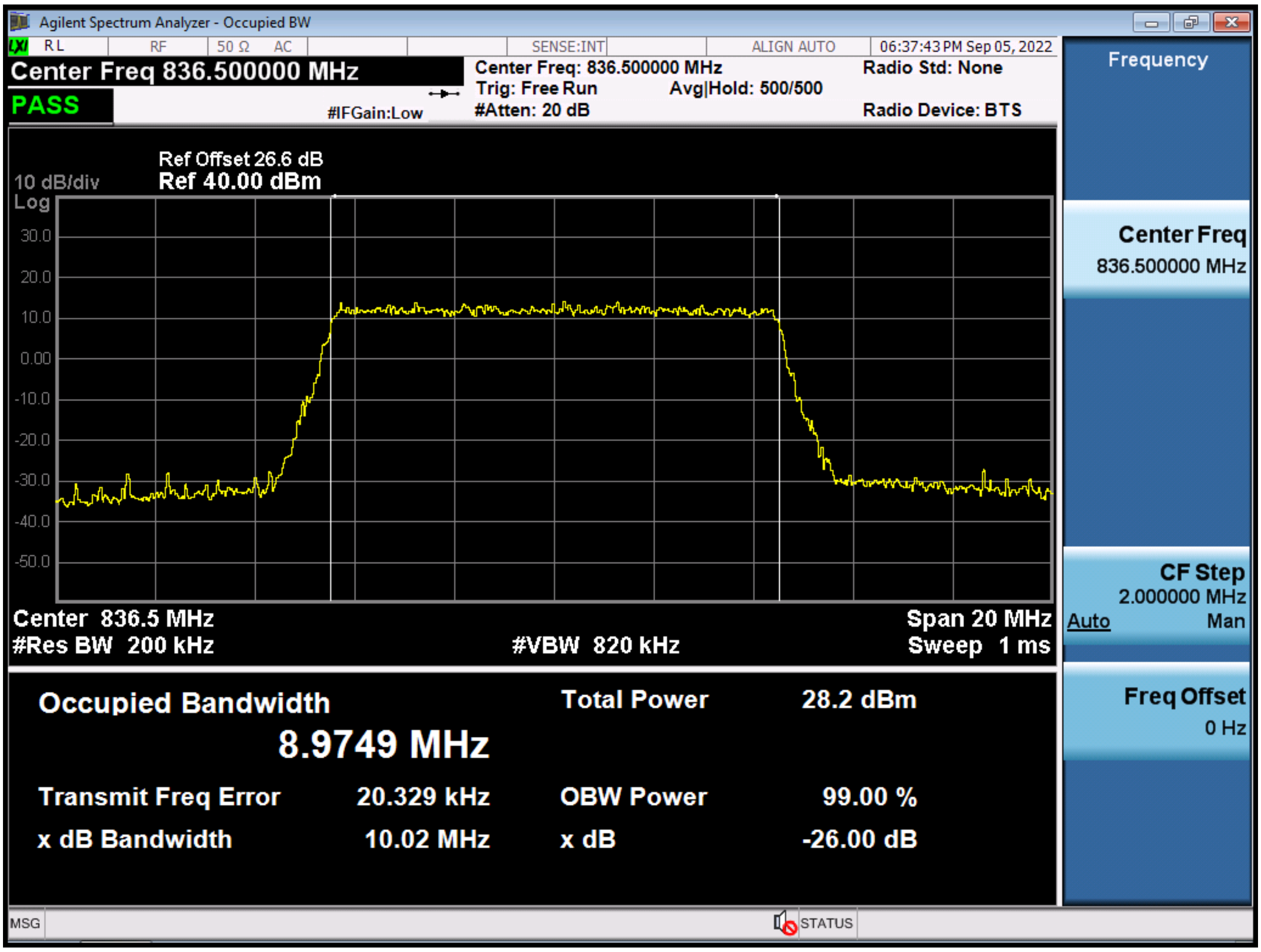
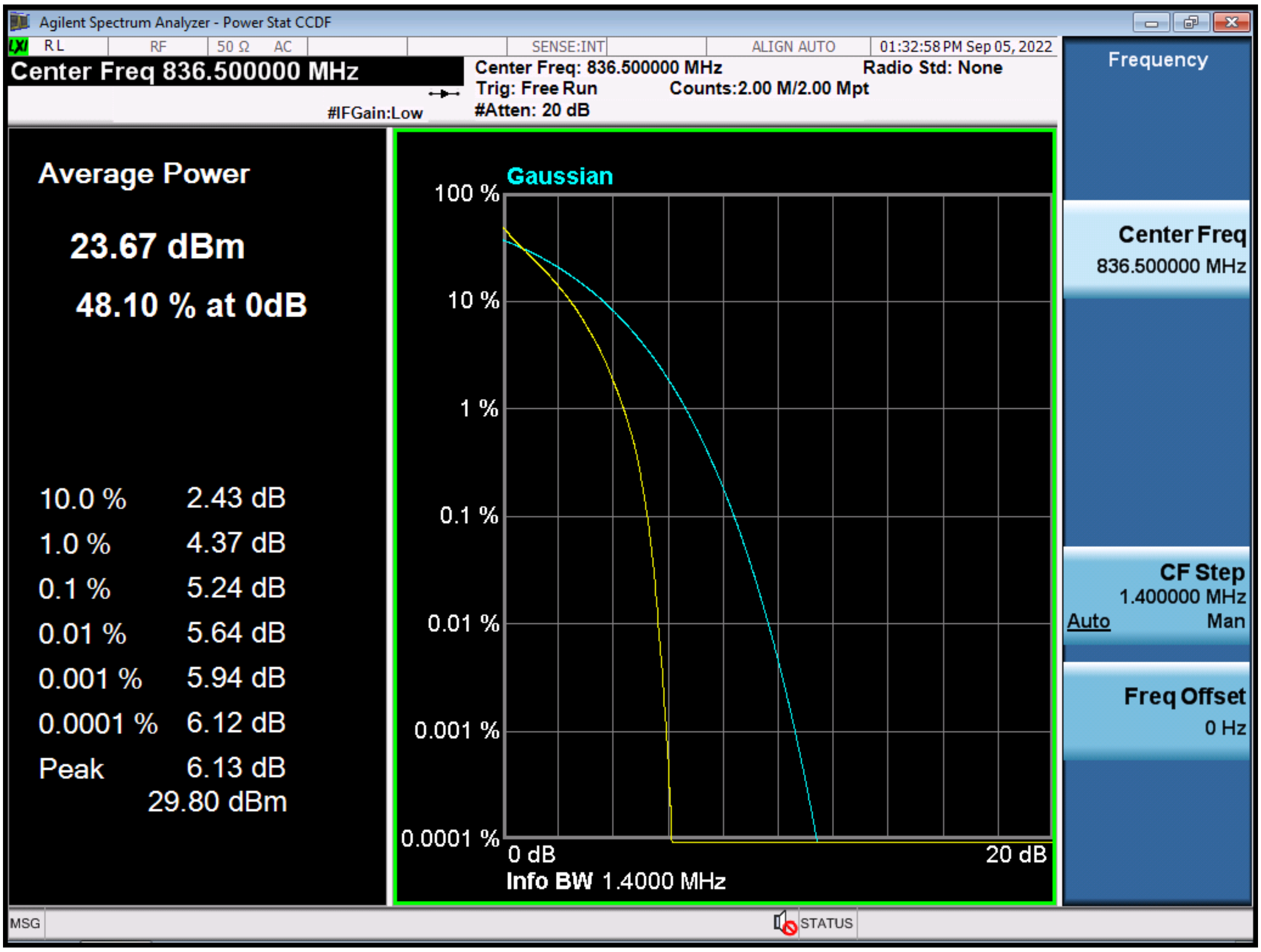
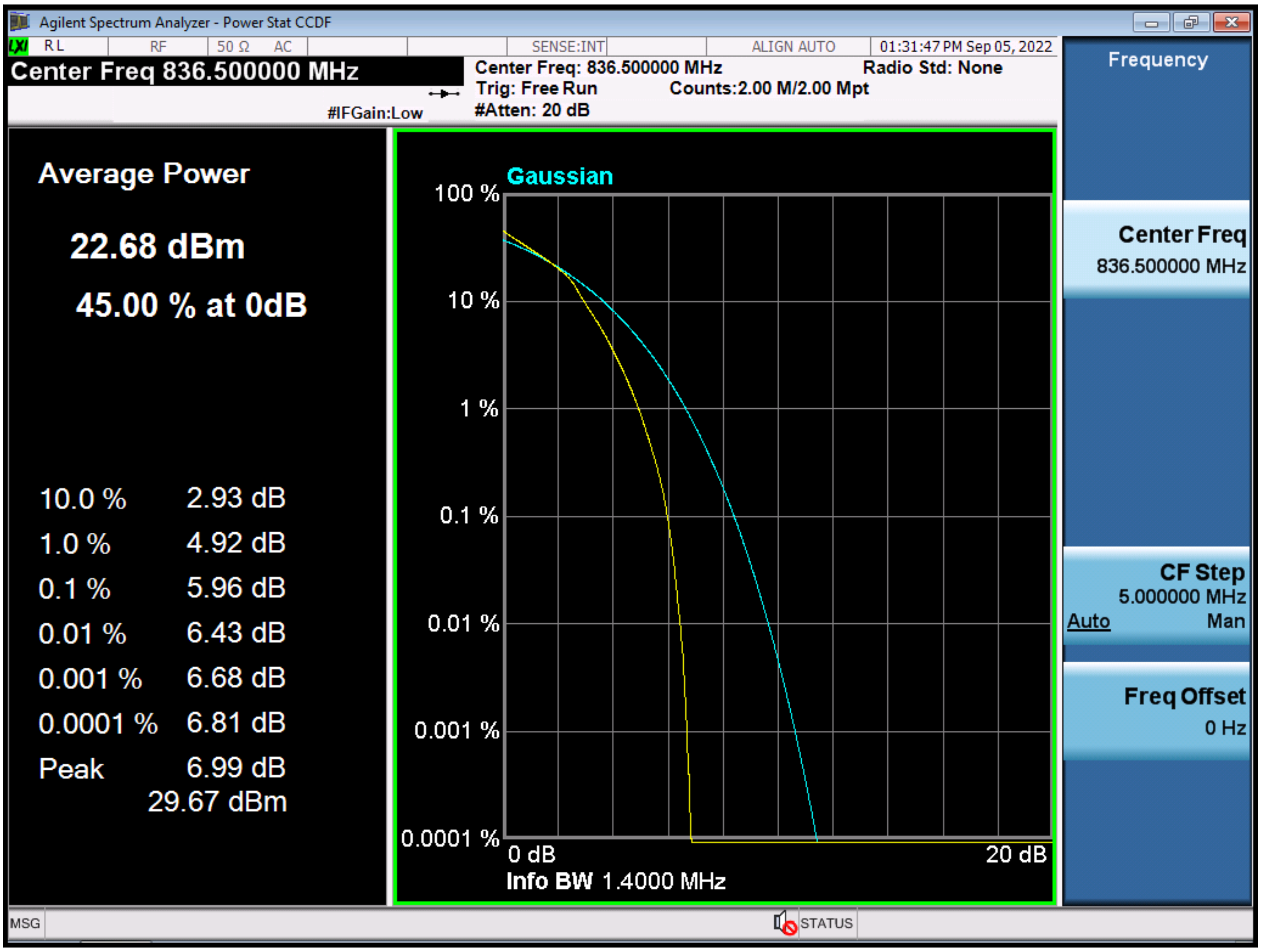


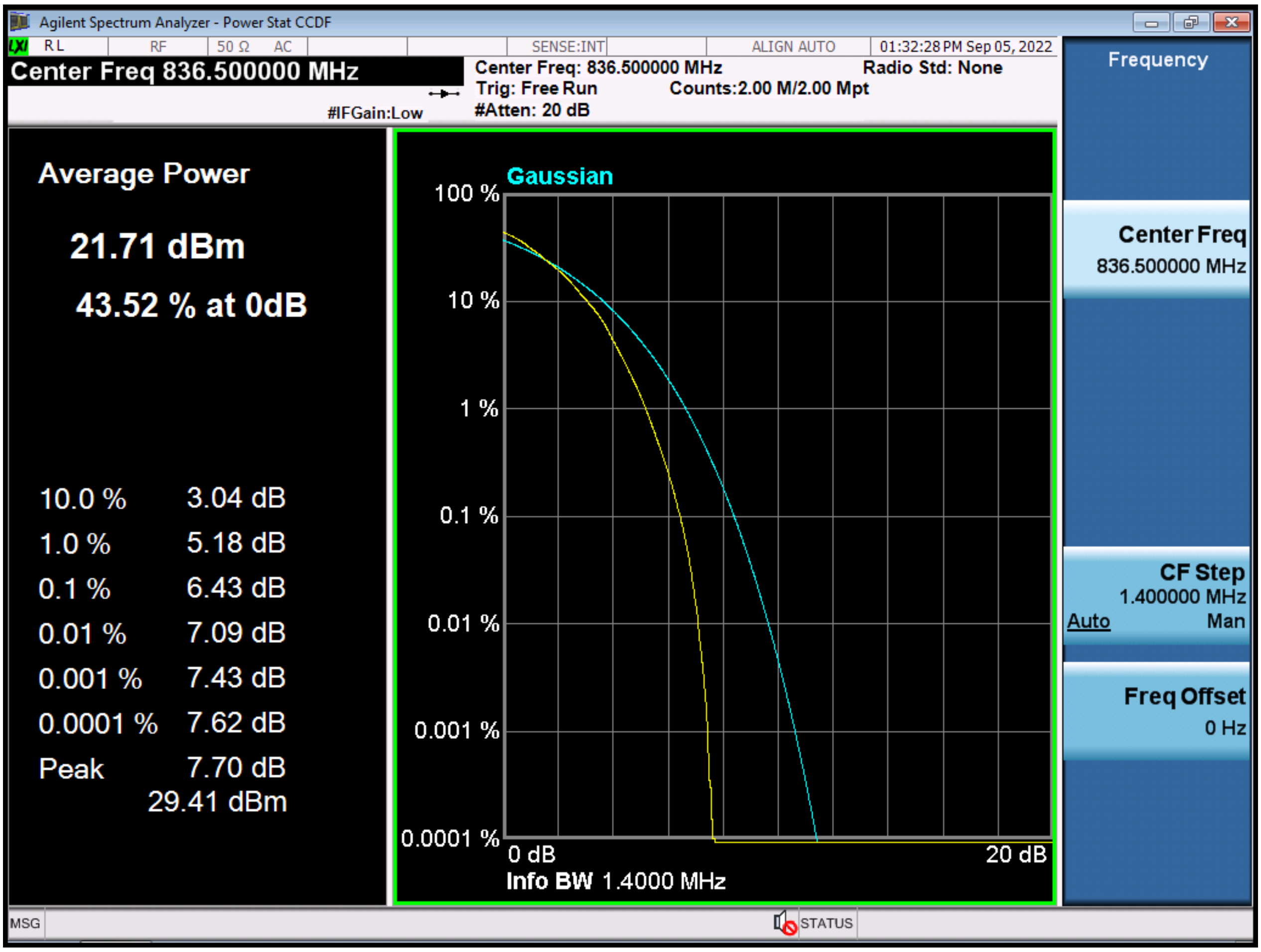
1.4 M_PAR_Mid Channel_QPSK_FullRB



1.4 M_PAR_Mid Channel_16QAM_FullRB



1.4 M_PAR_Mid Channelz_64QAM_FullRB



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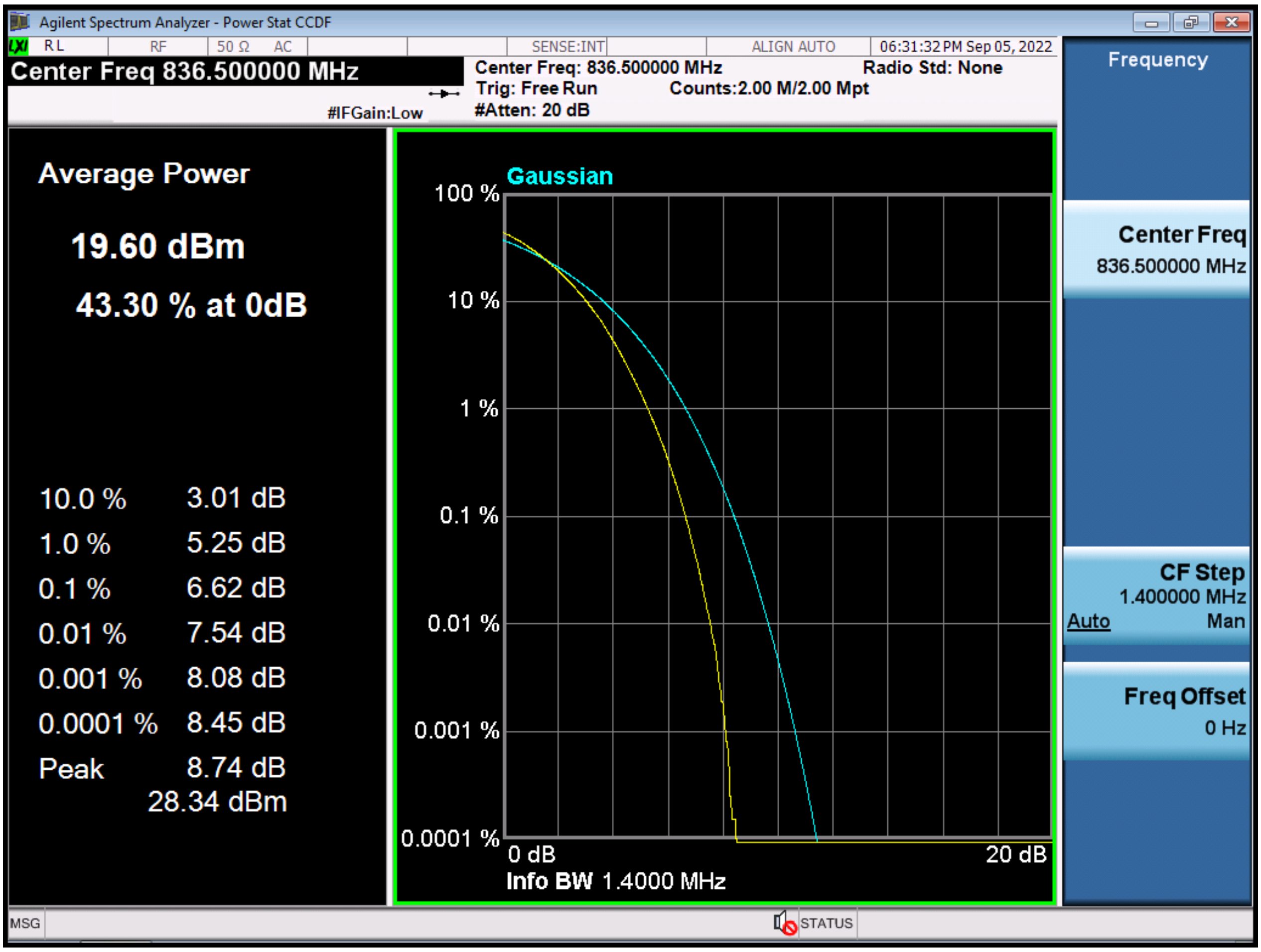
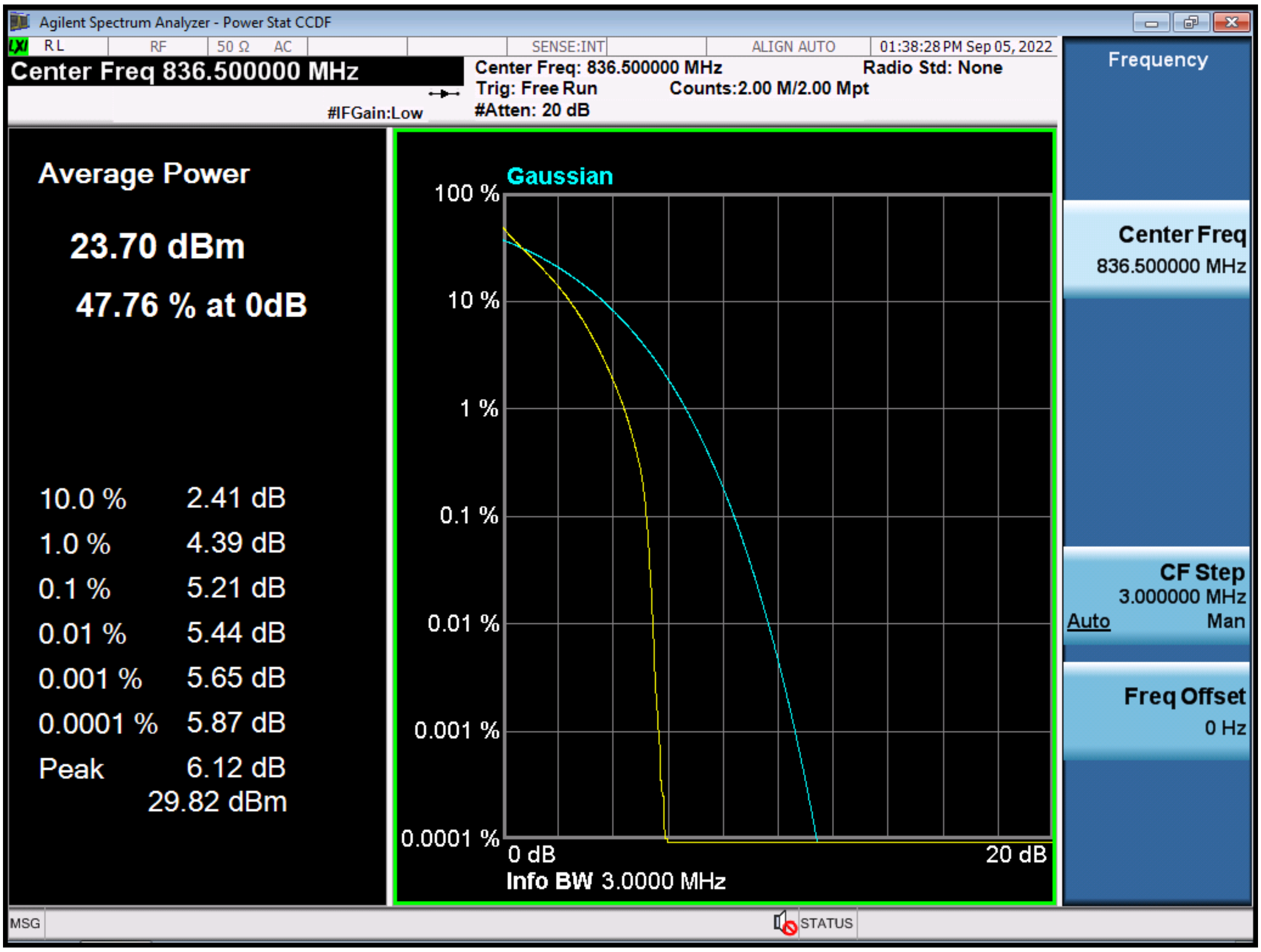


3 M_PAR_Mid Channel_QPSK_FullRB



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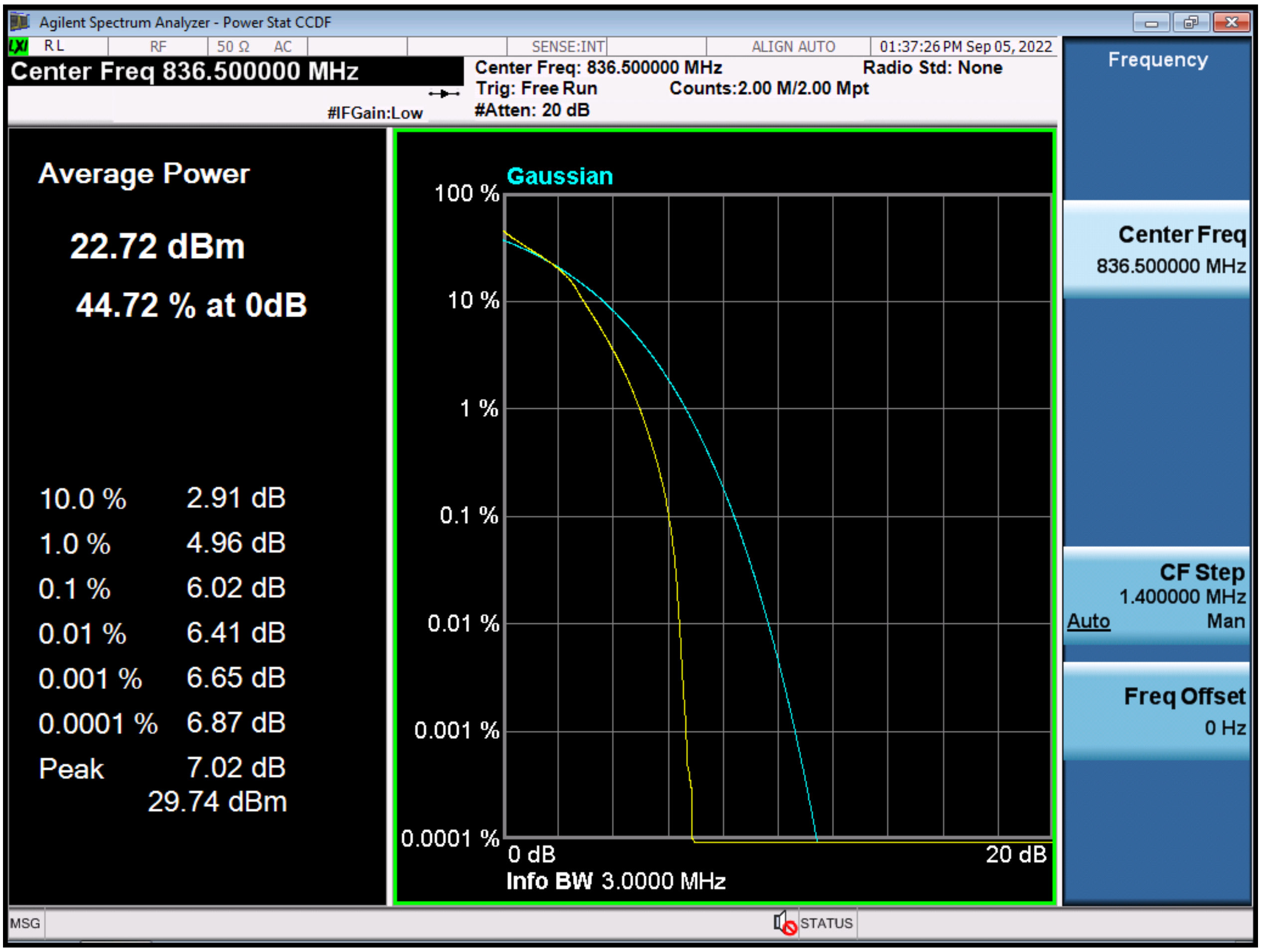

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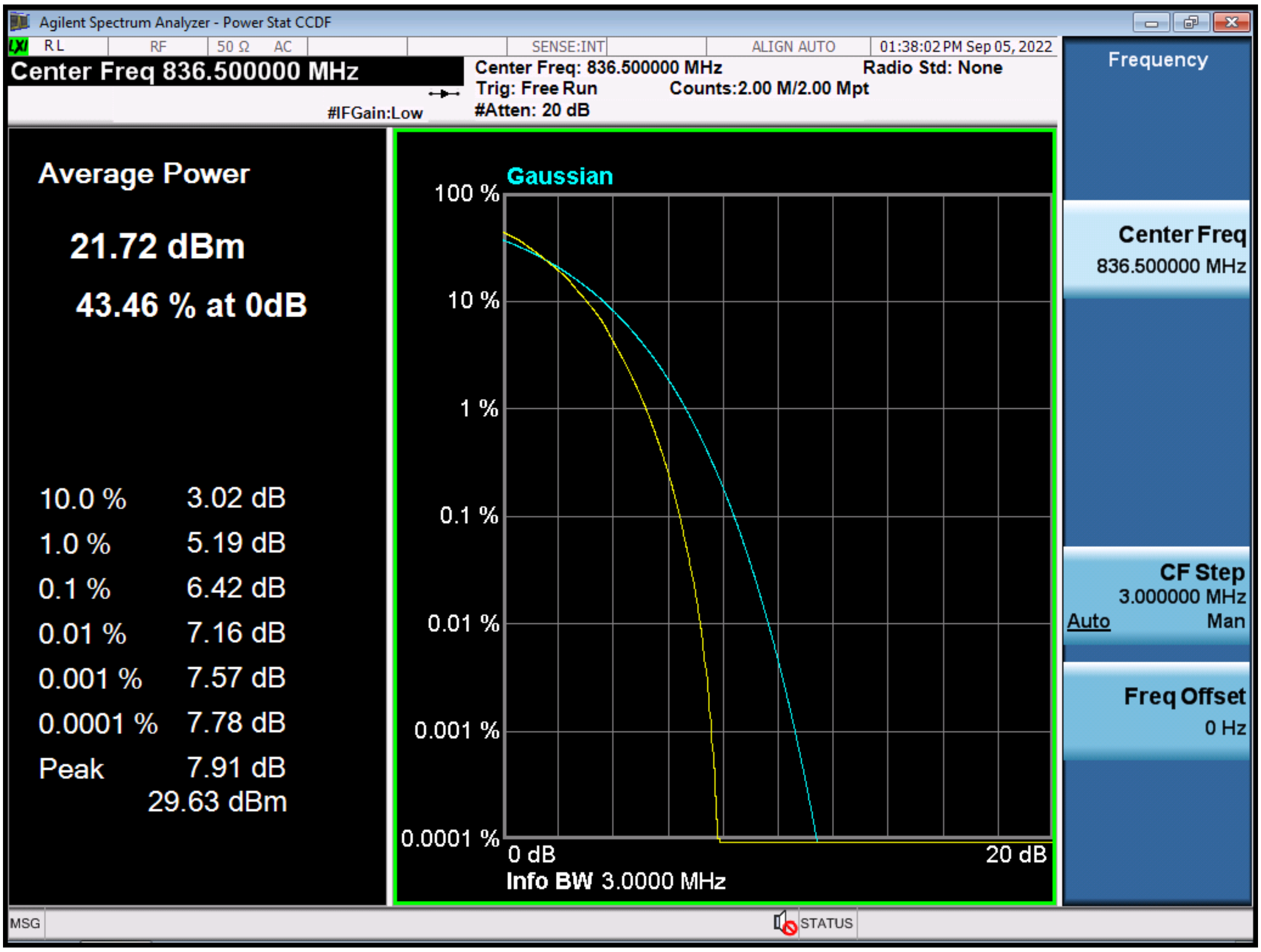

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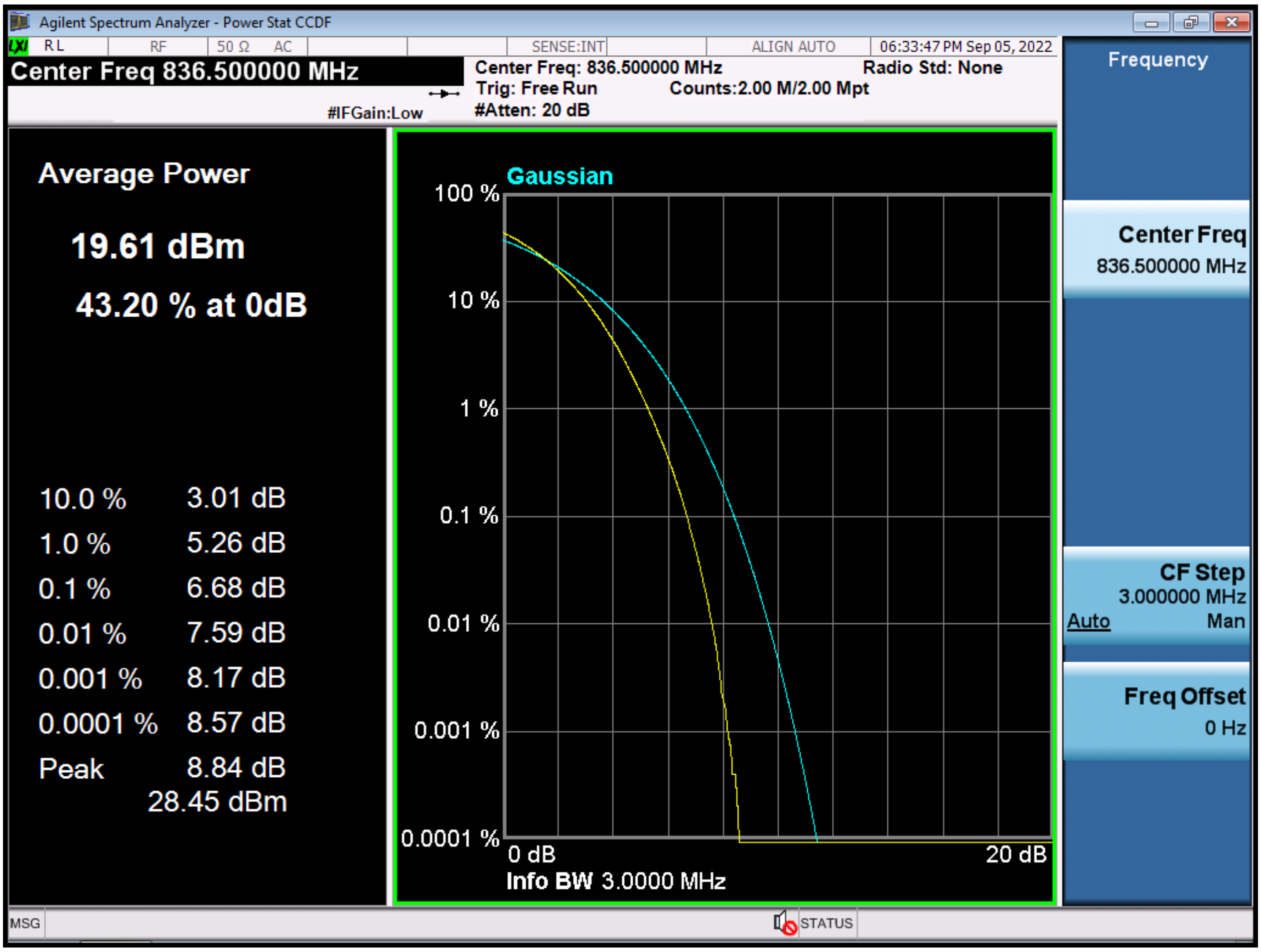

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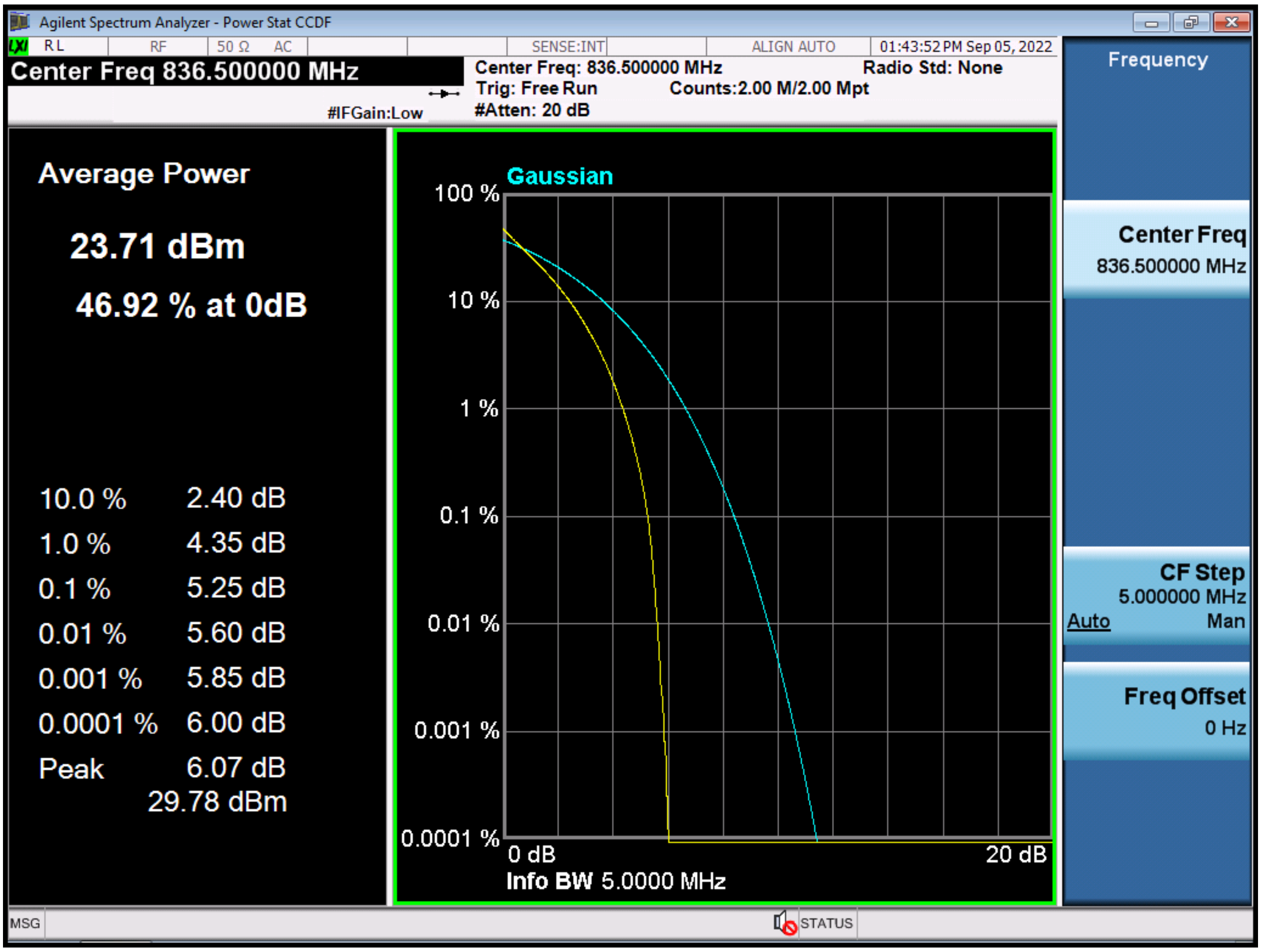

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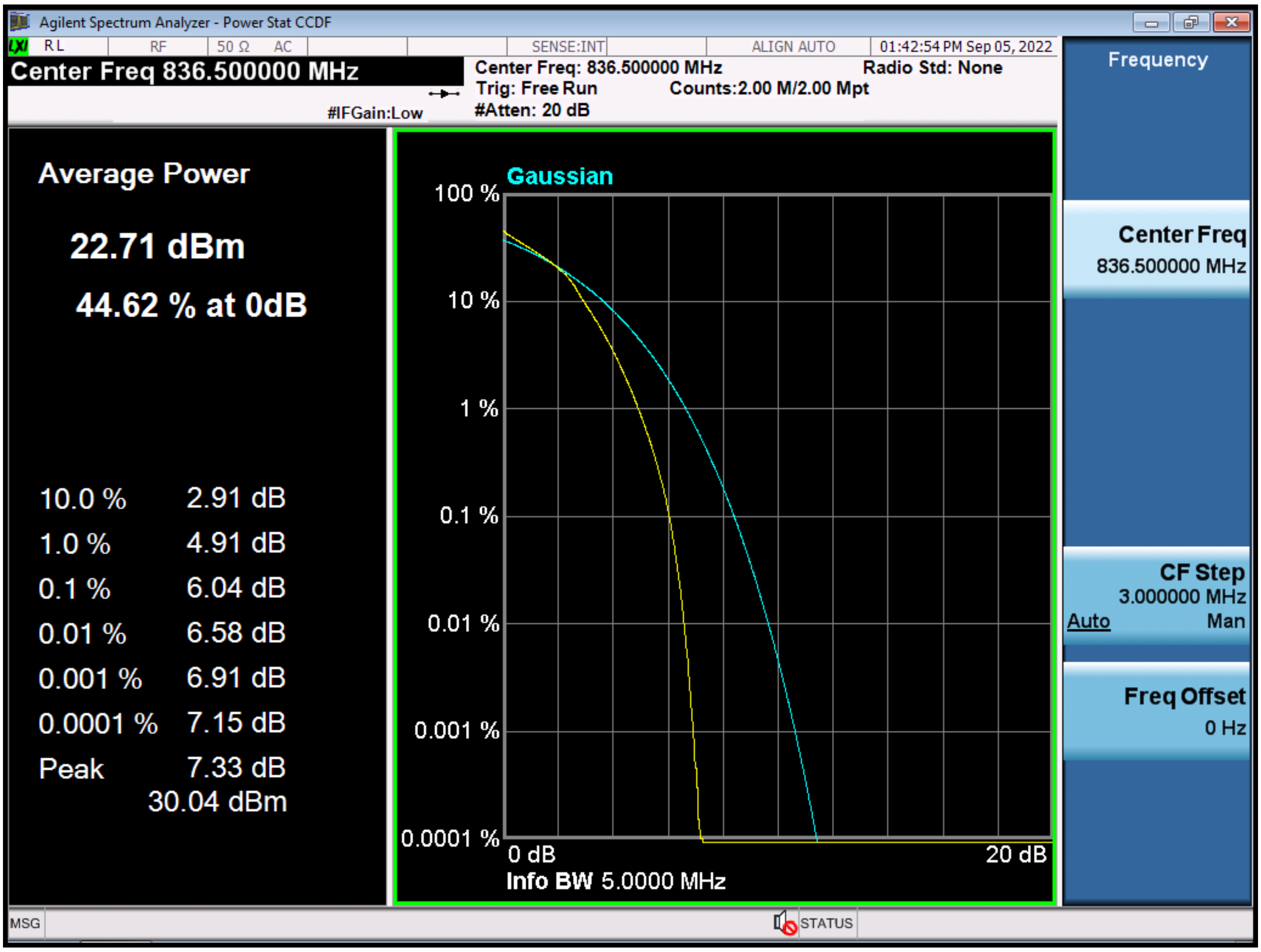

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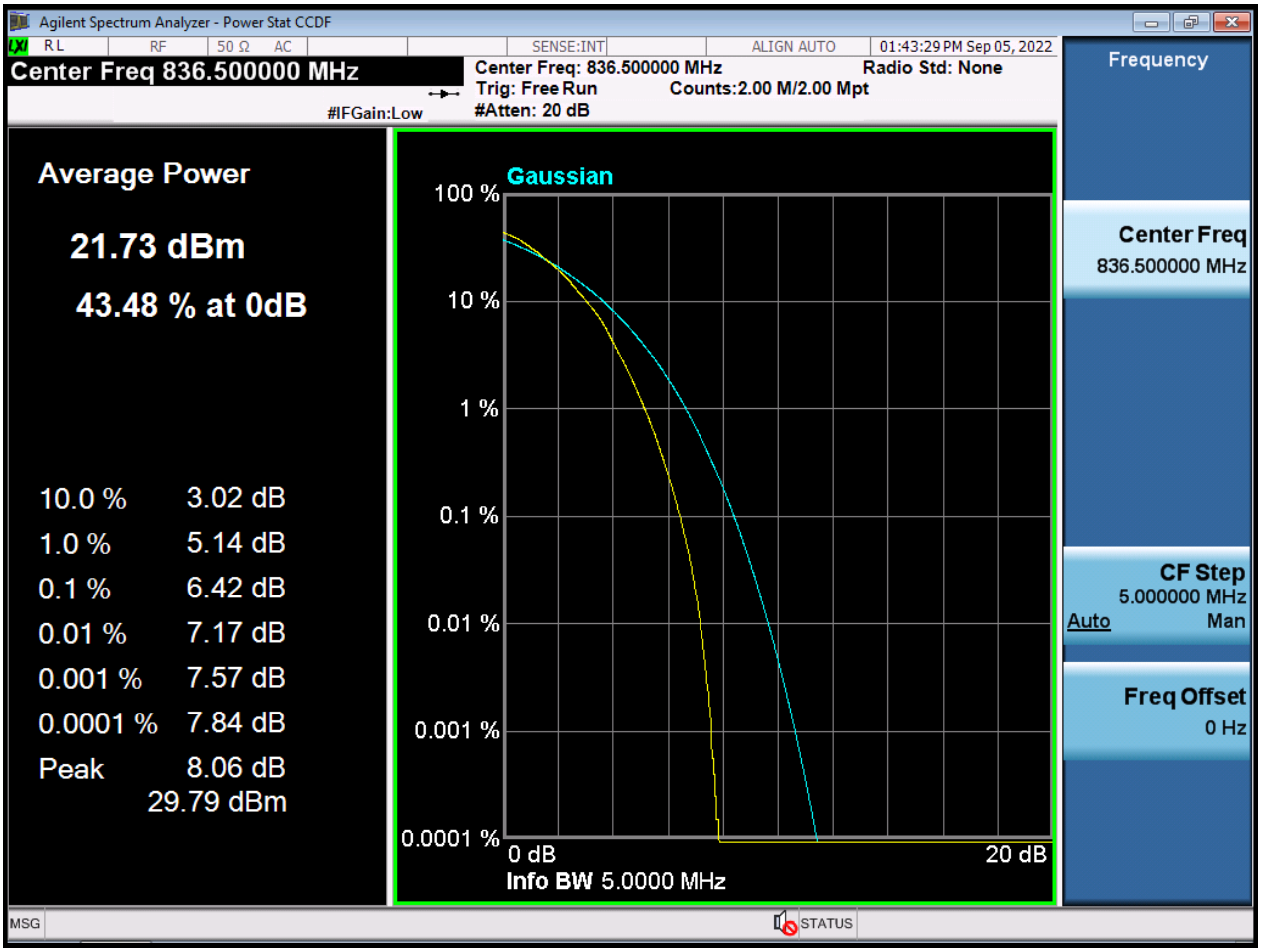

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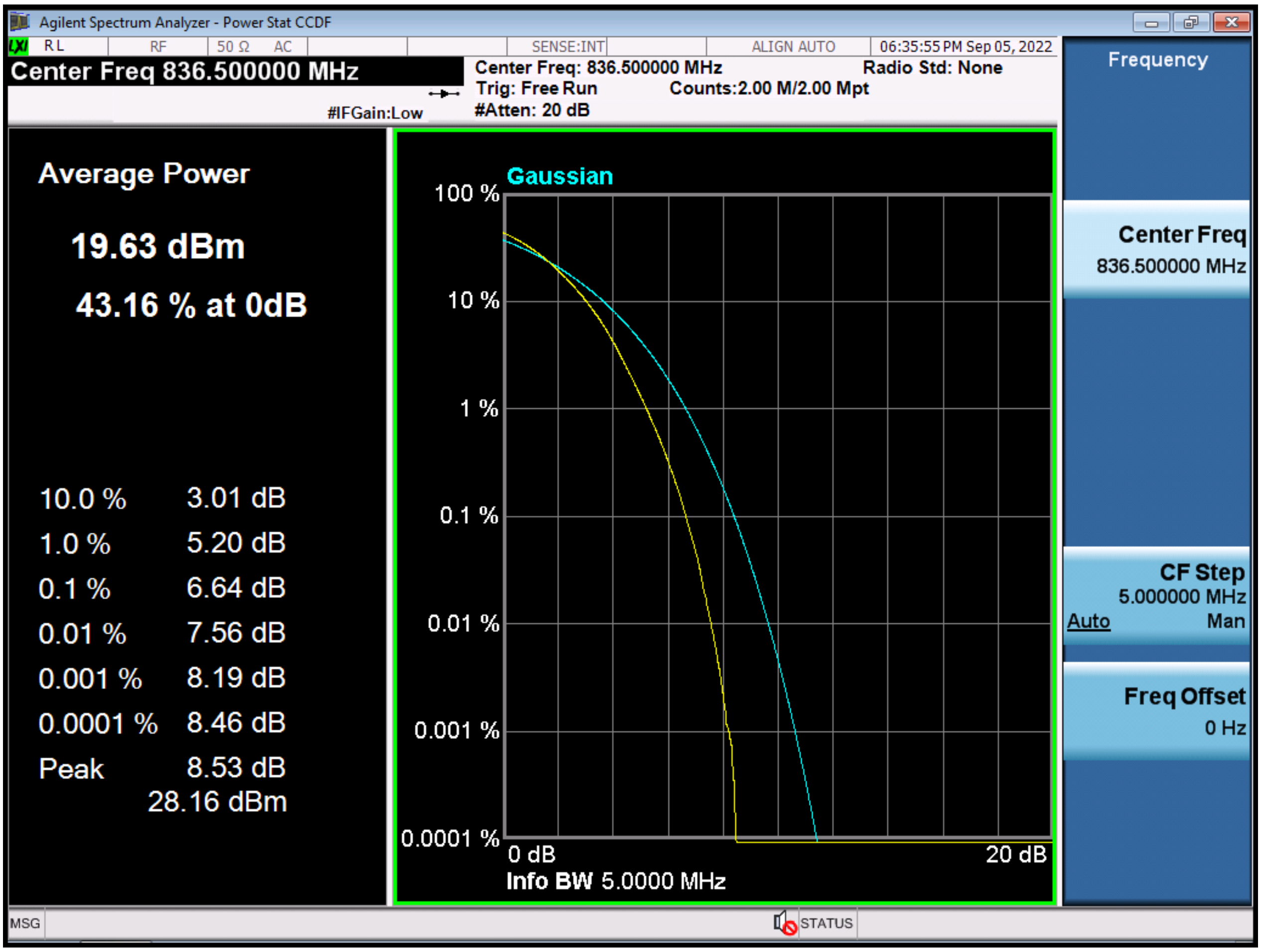
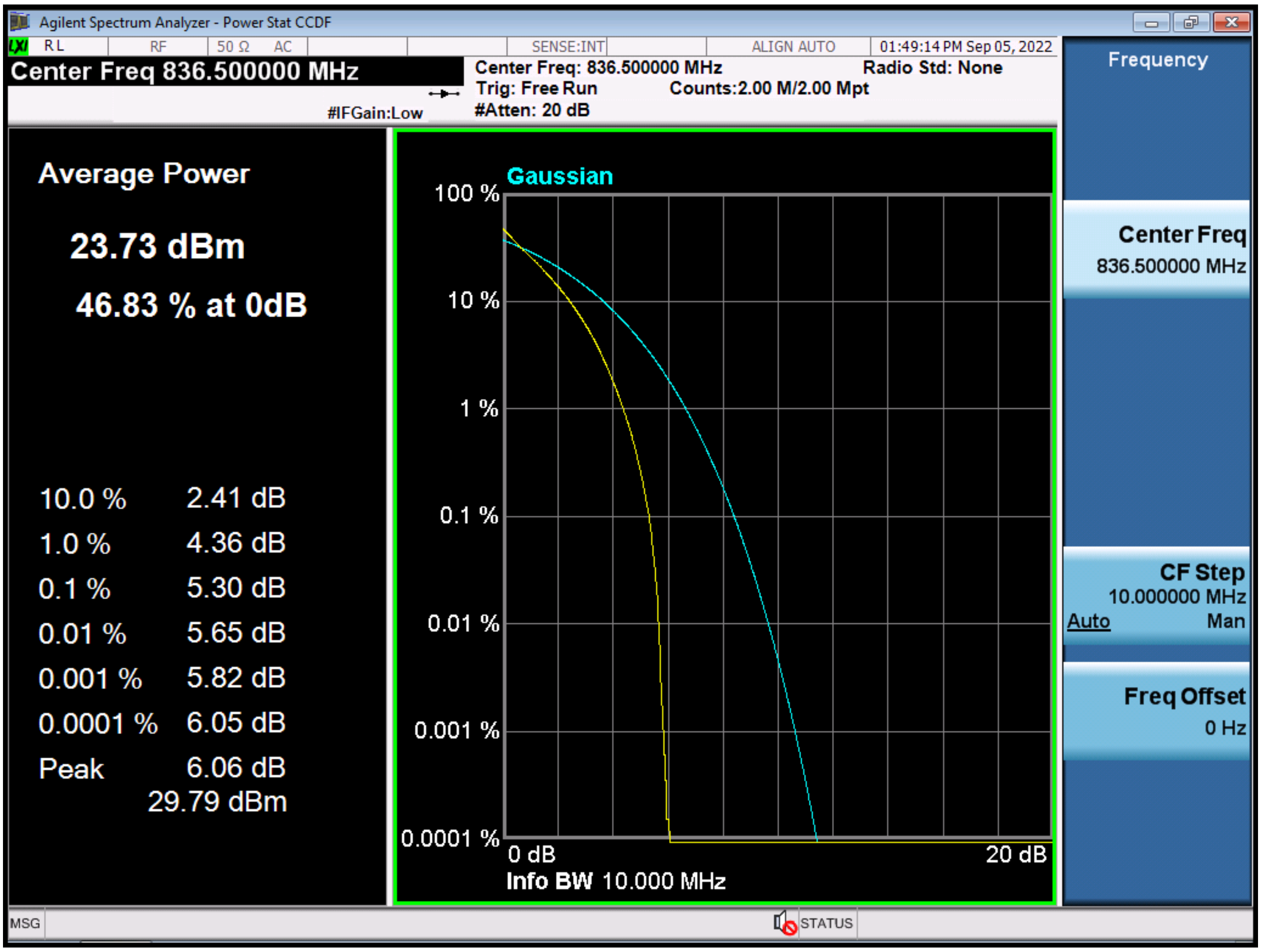


10 M_PAR_Mid Channel_QPSK_FullRB



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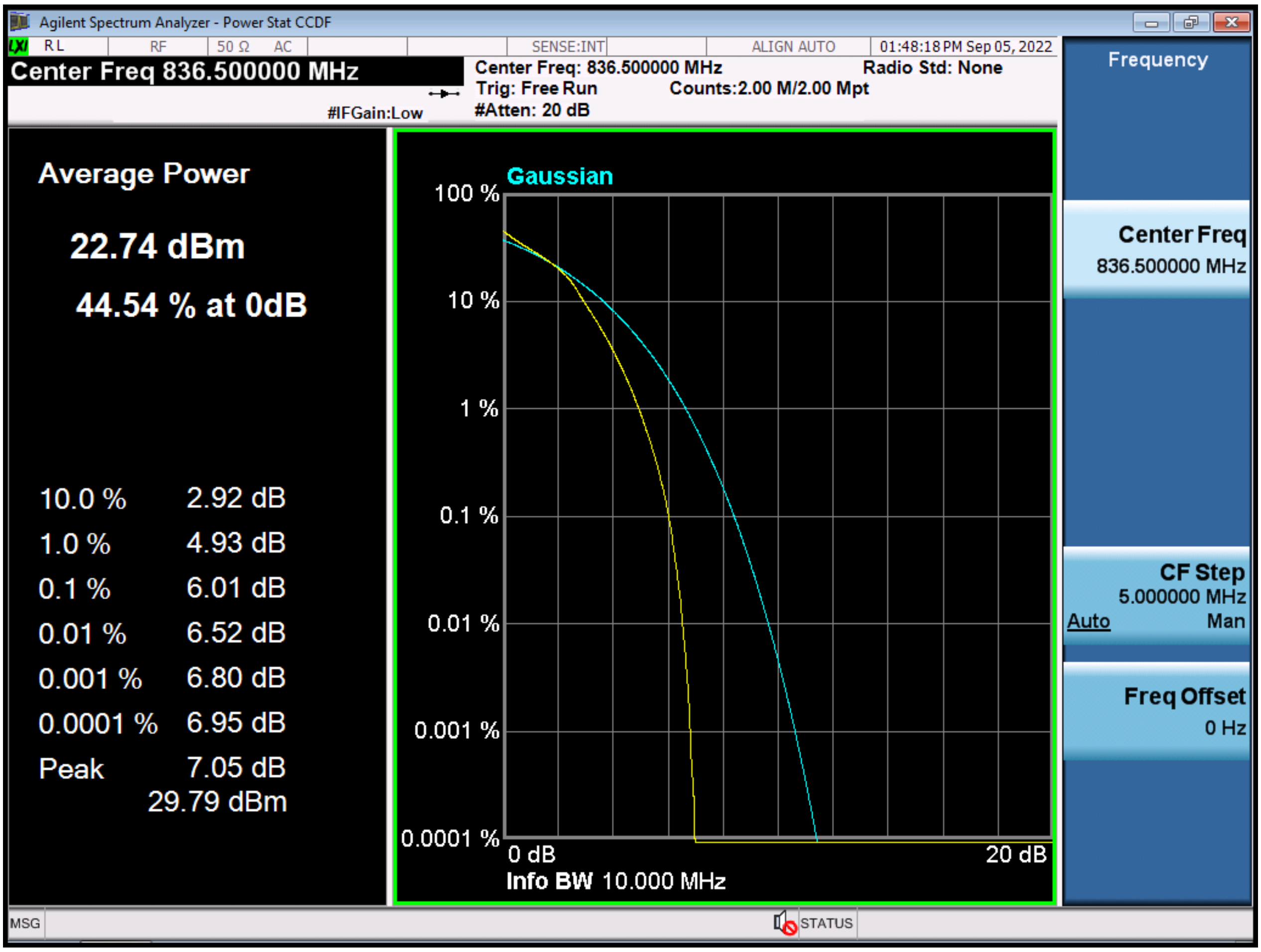

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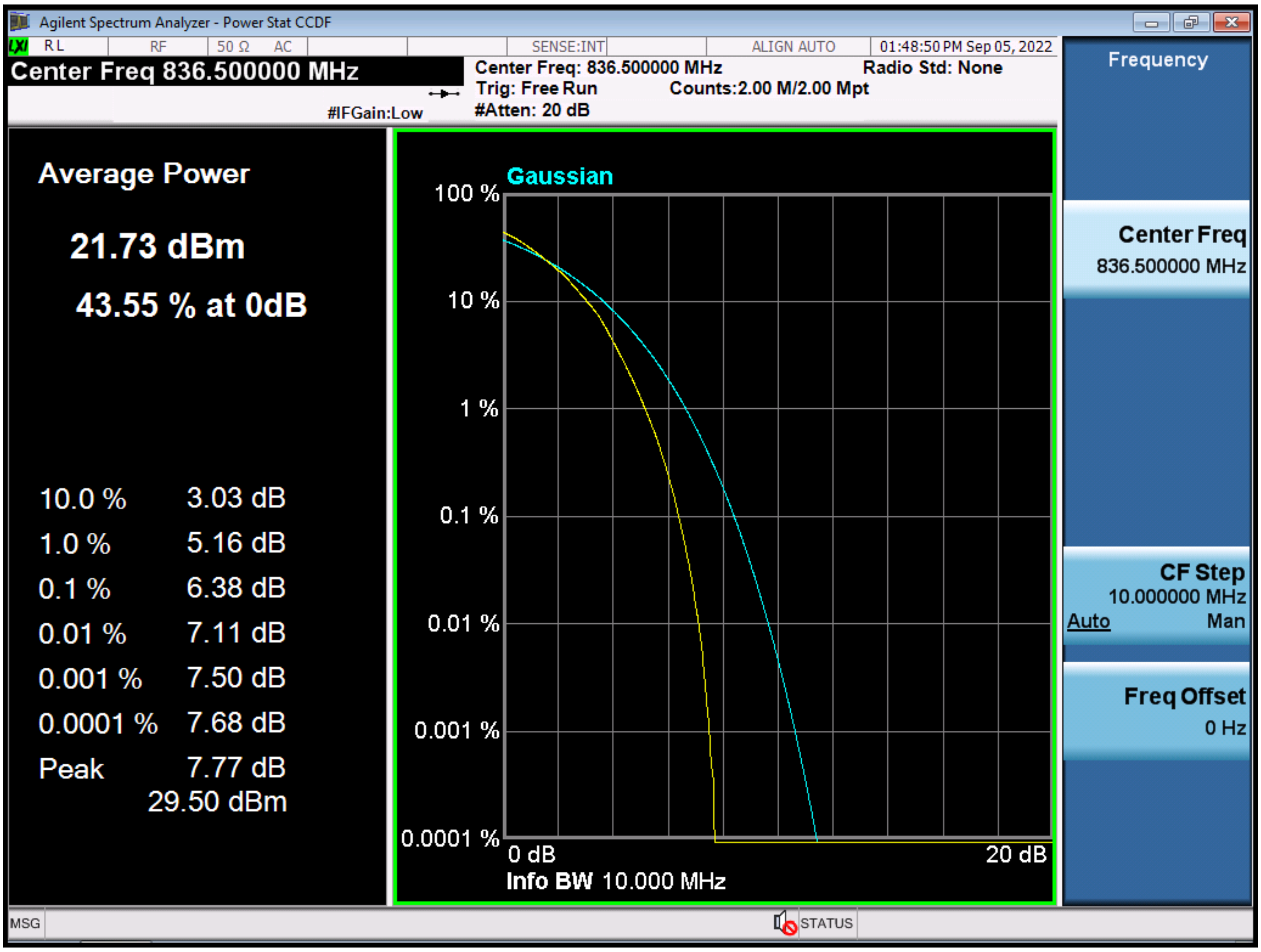
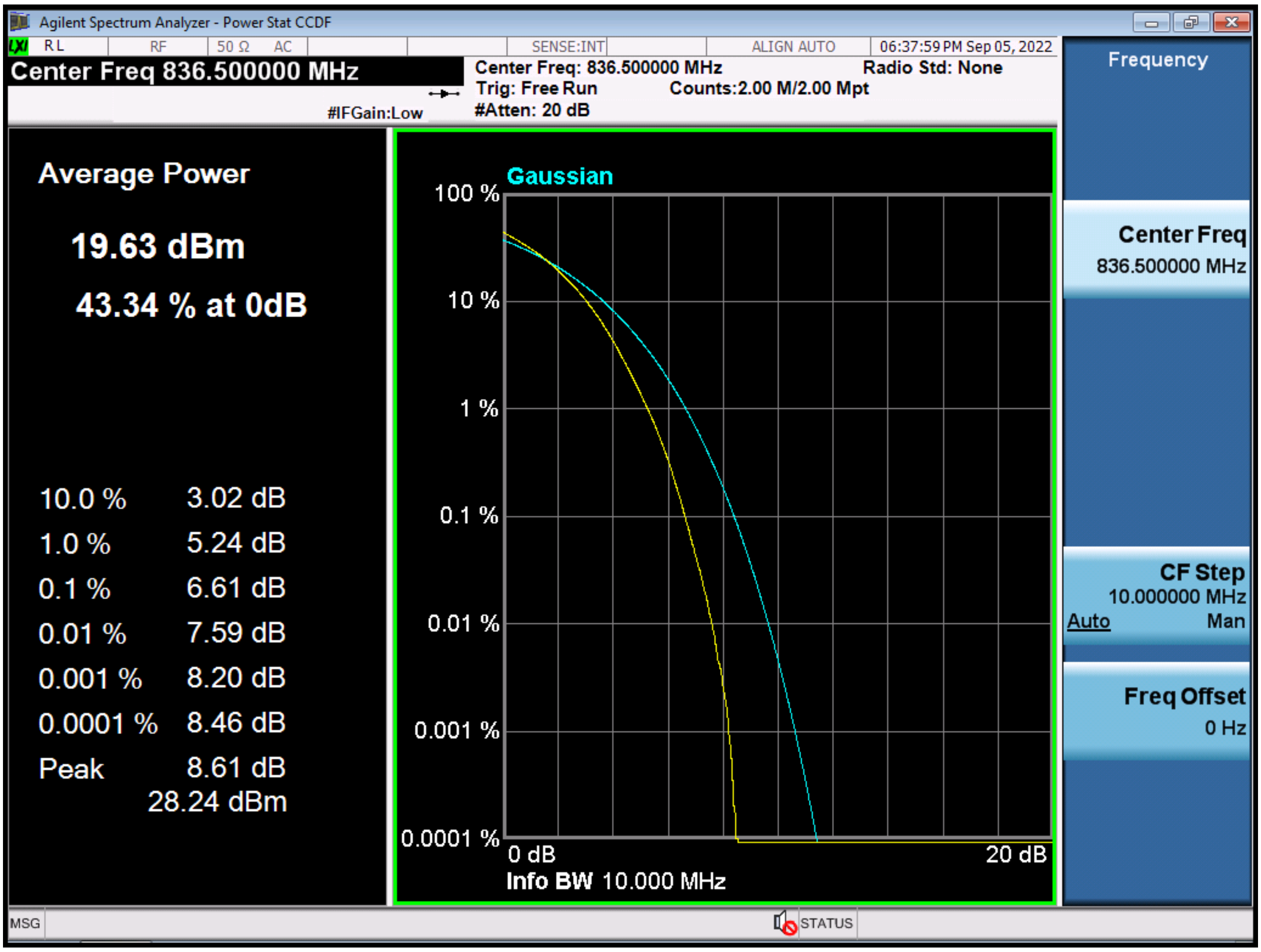
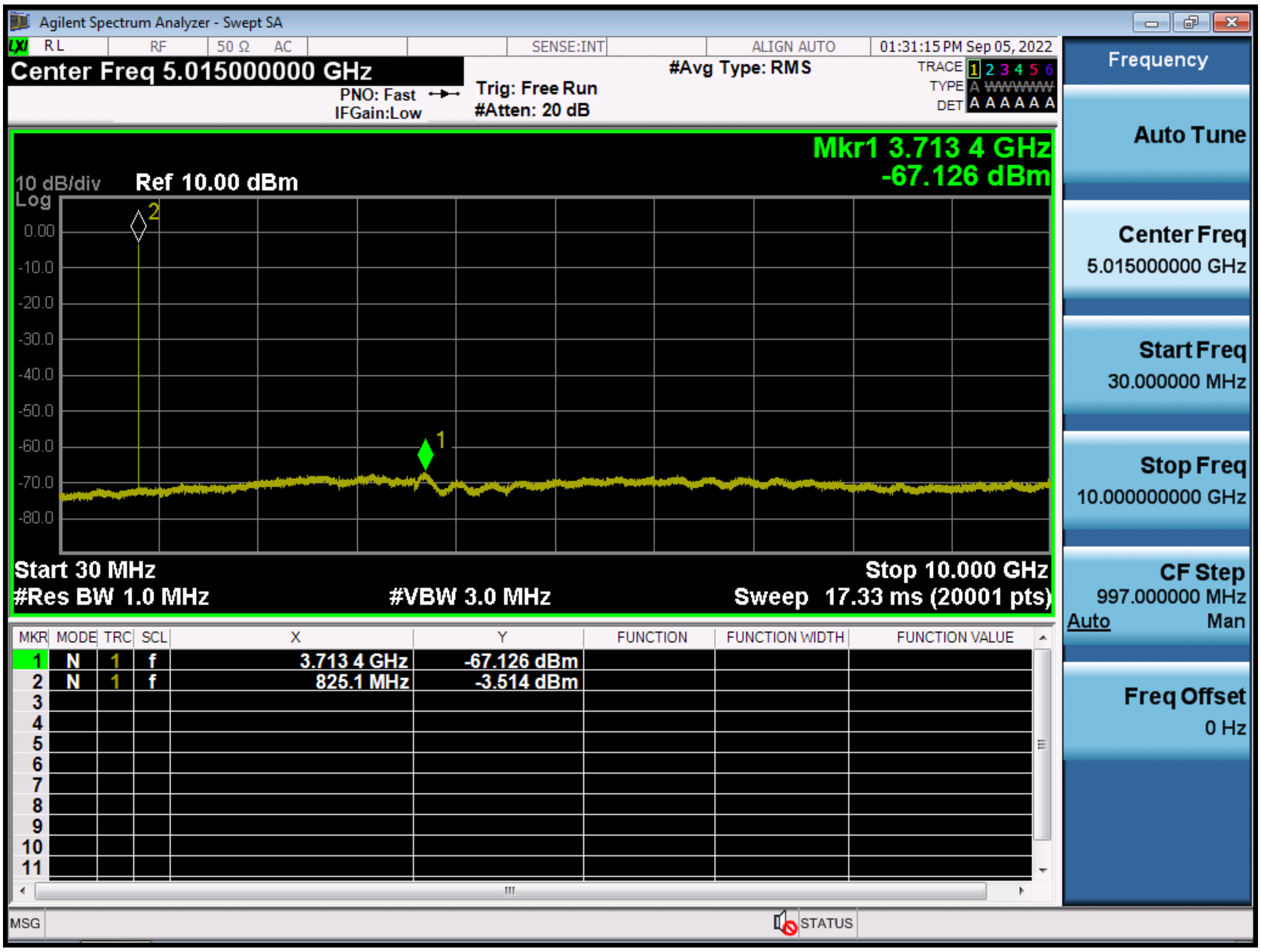


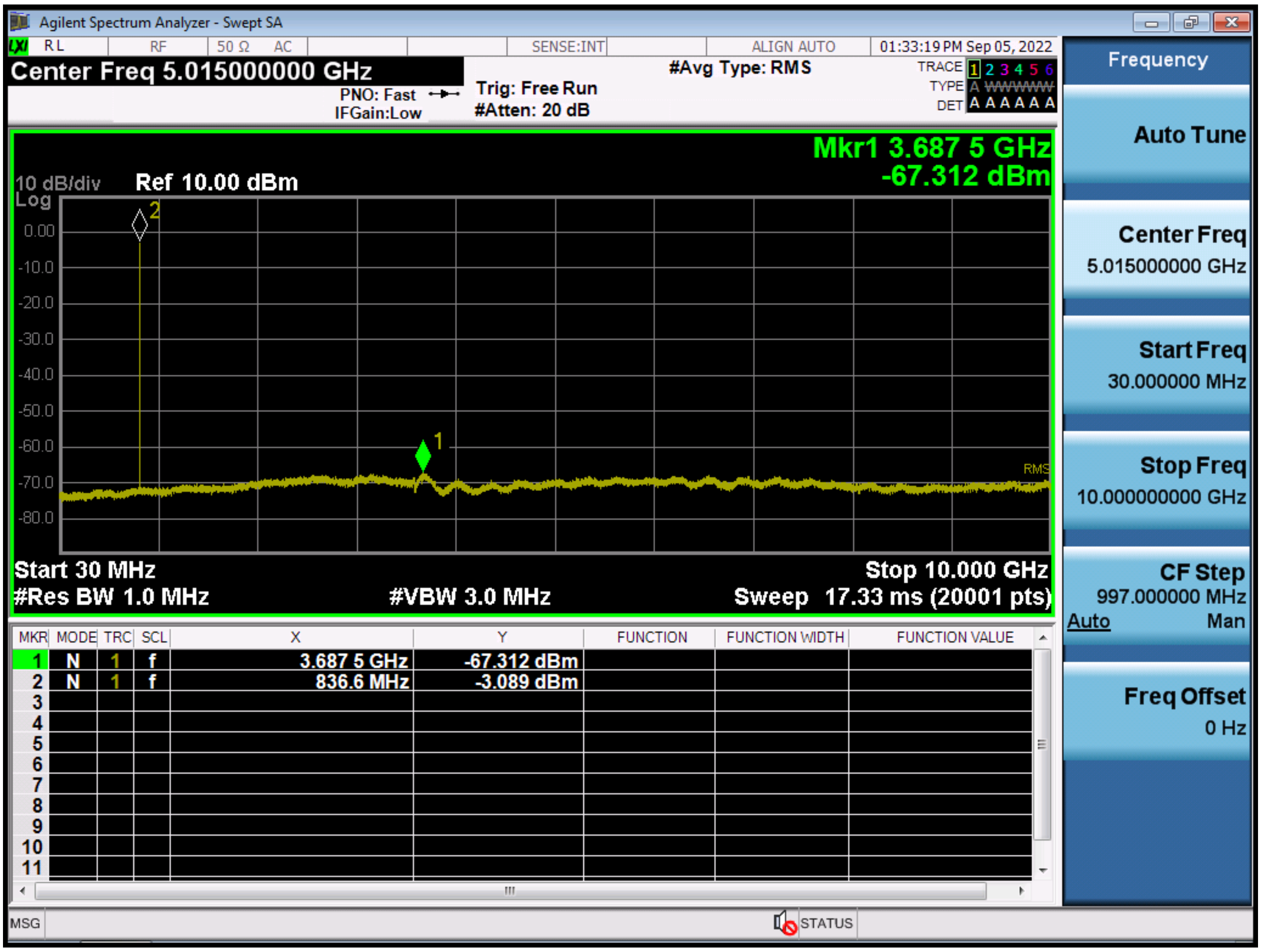
10 M_PAR_Mid Channel_256QAM_FullRB



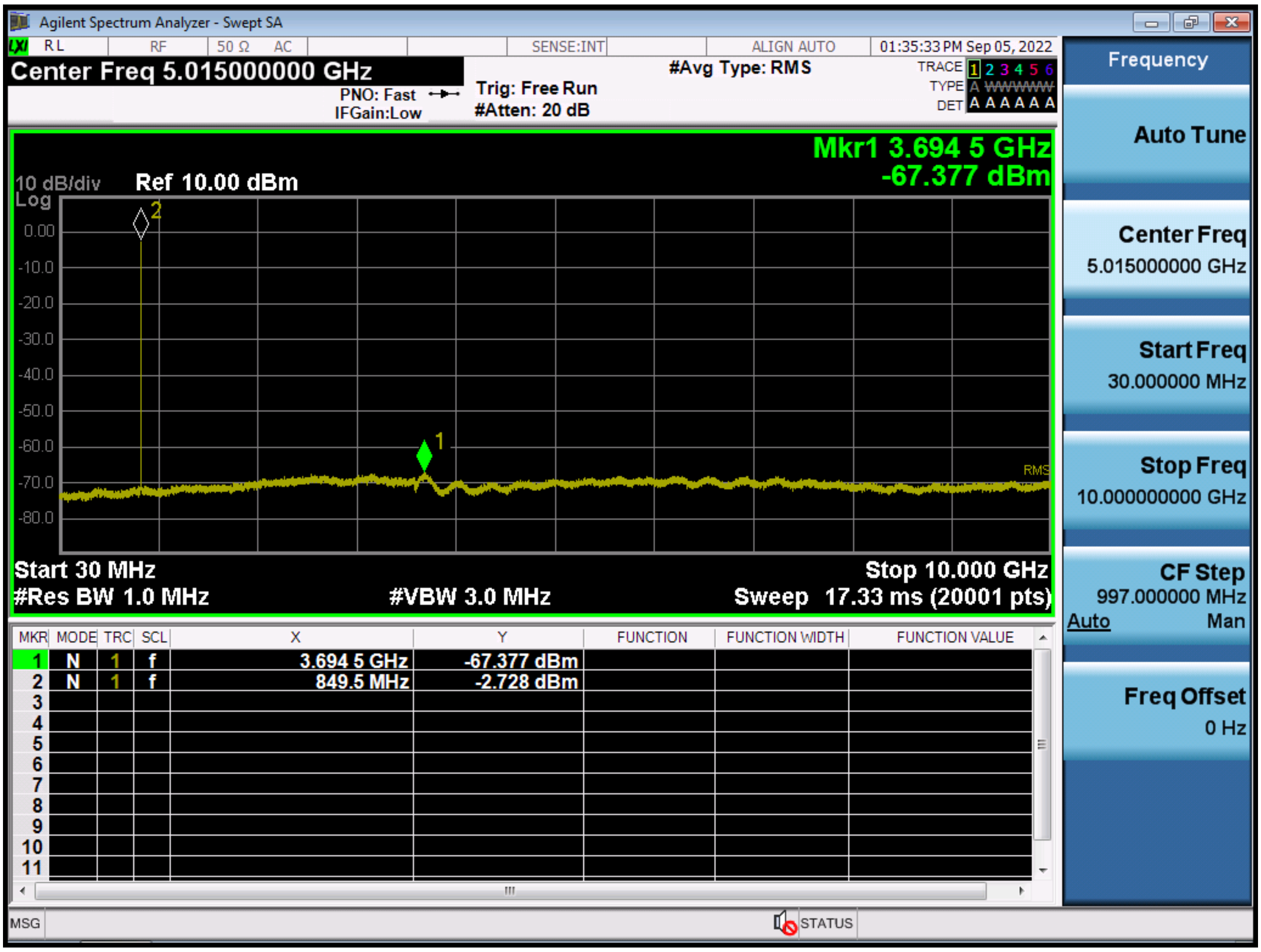
1.4 M_CSE(30 M-10 G)_Lowest Channel_QPSK_1RB



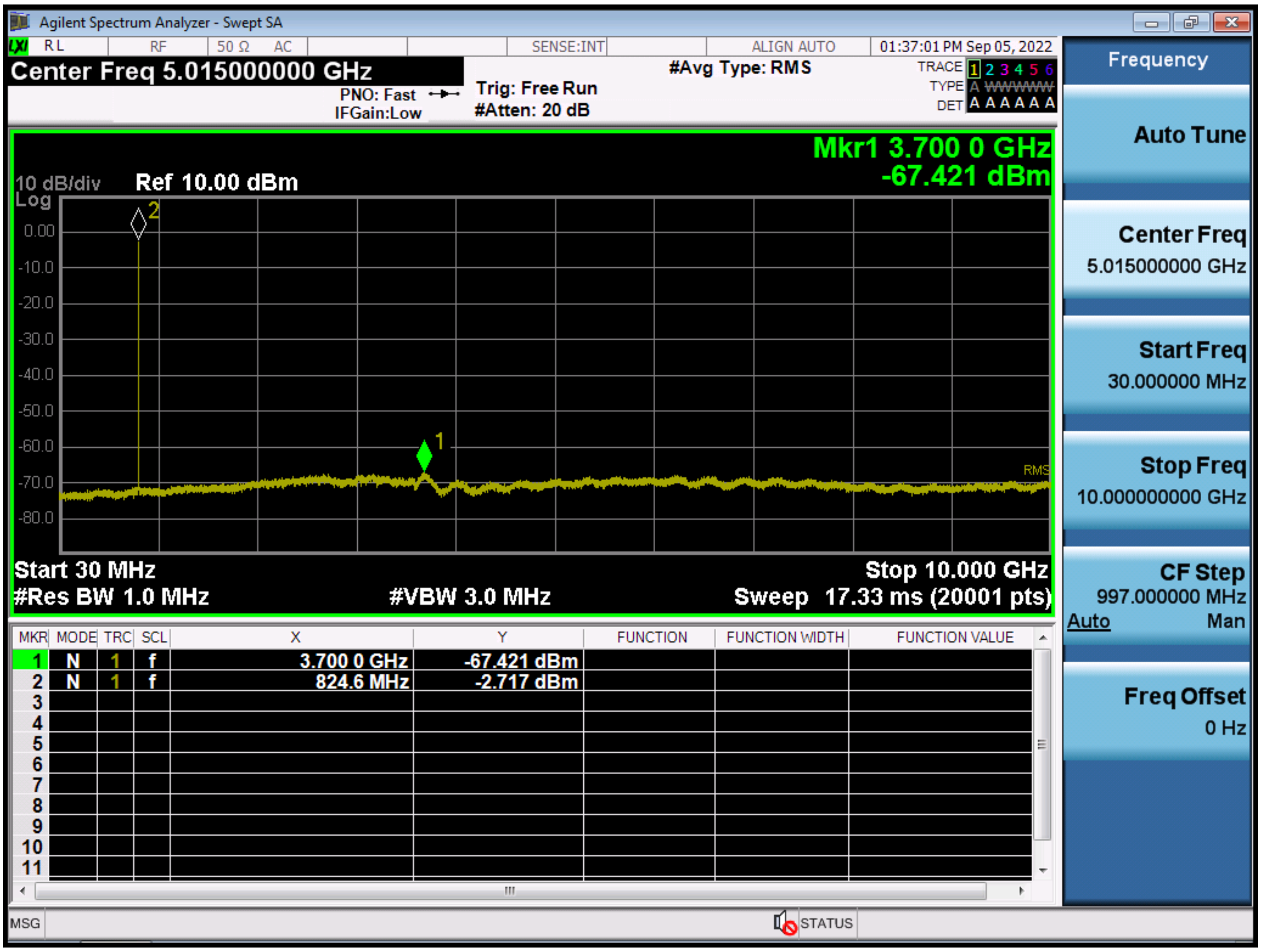
1.4 M_CSE(30 M-10 G)_Mid Channel_QPSK_1RB



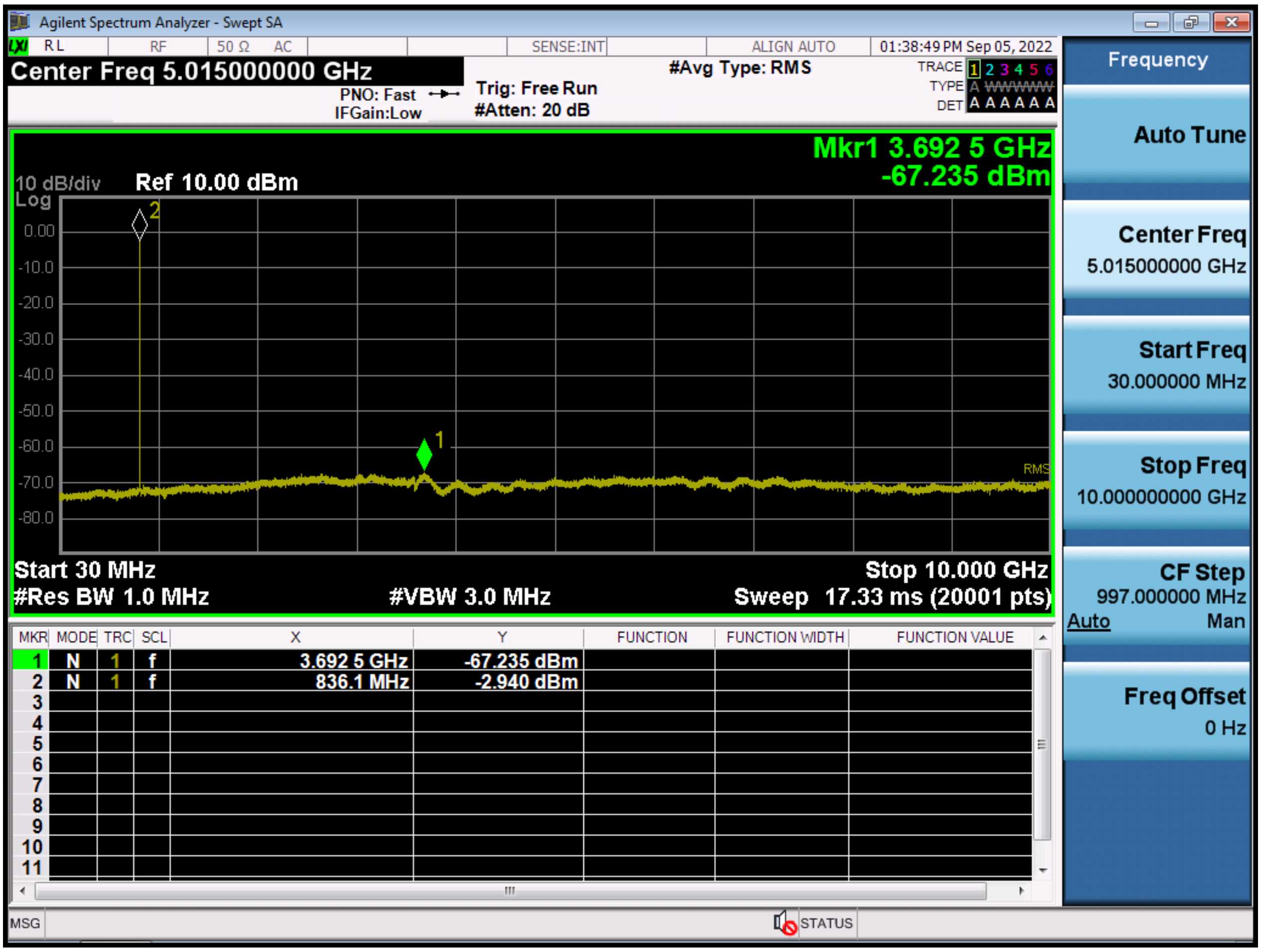
1.4 M_CSE(30 M-10 G)_Highest Channel_QPSK_1RB



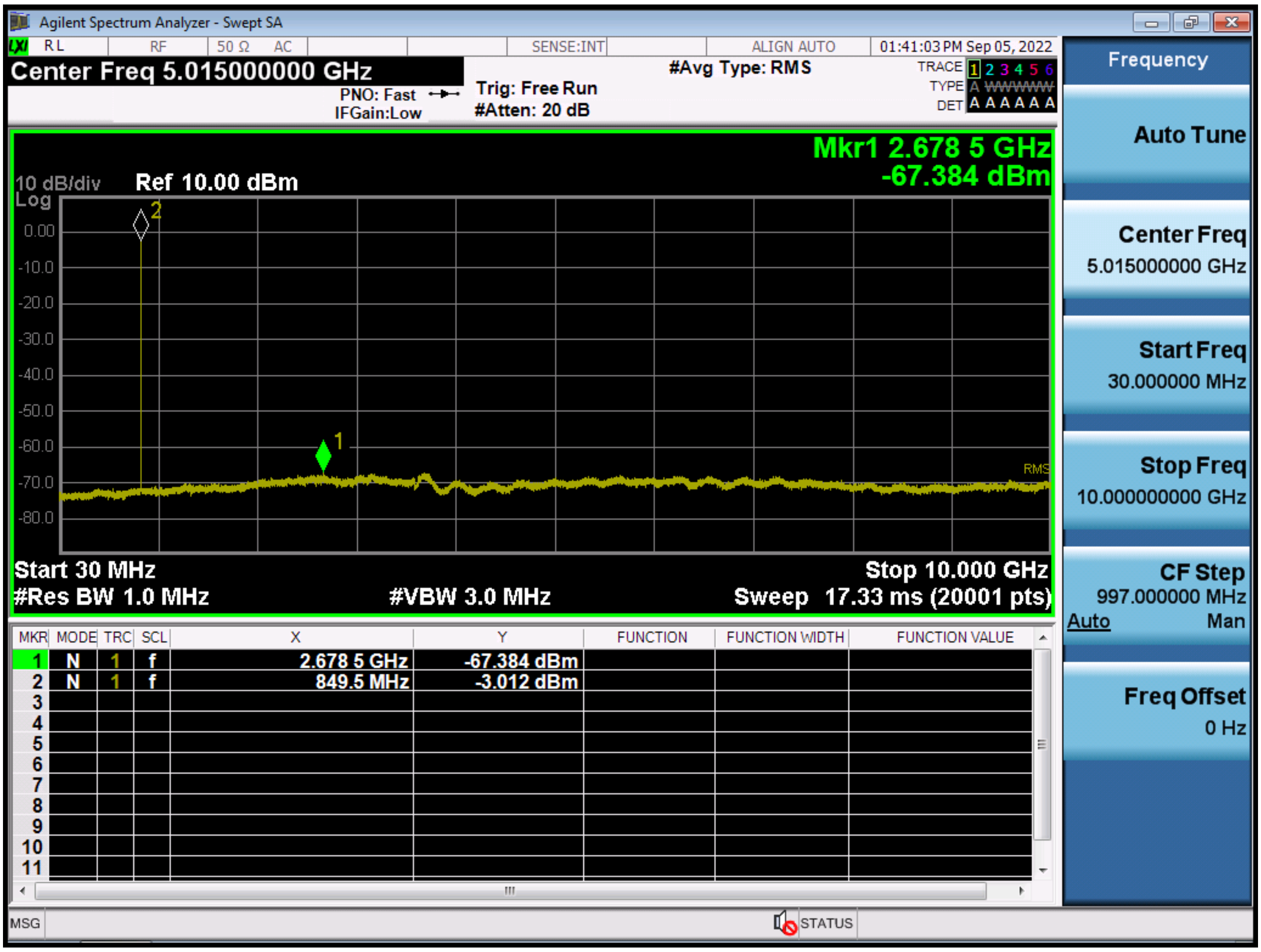
3 M_CSE(30 M-10 G)_Lowest Channel_QPSK_1RB



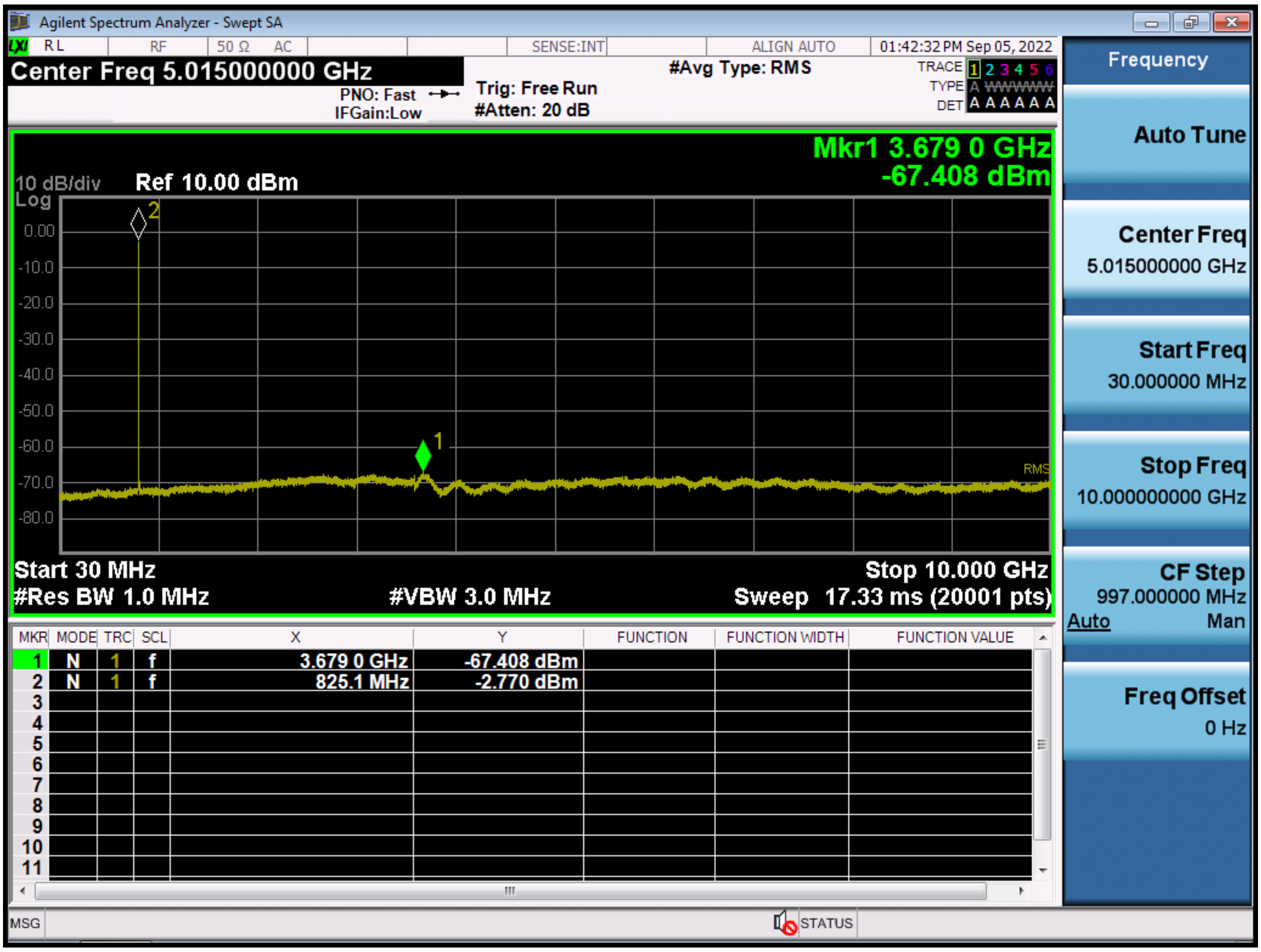
3 M_CSE(30 M-10 G)_Mid Channel_QPSK_1RB



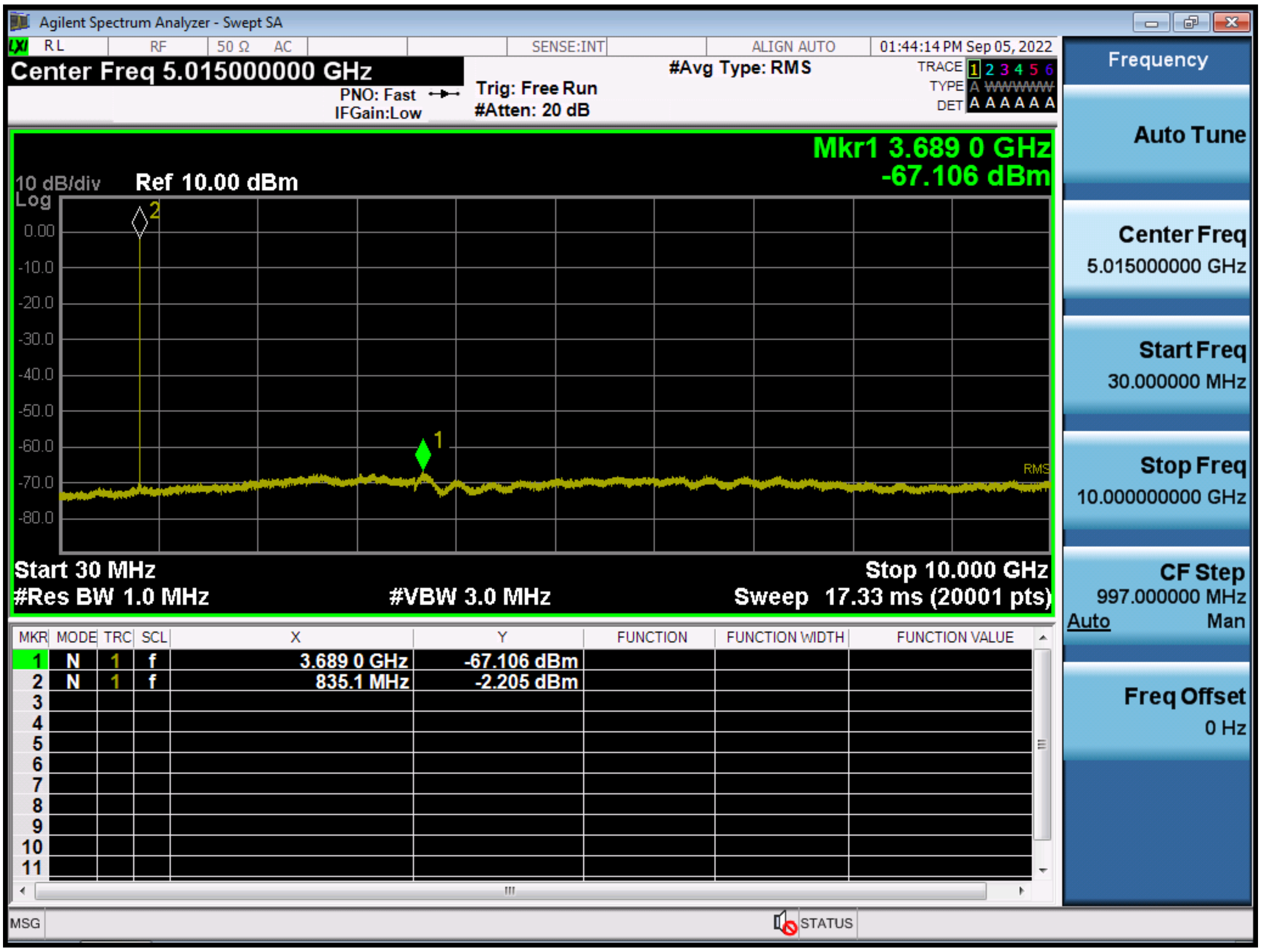
3 M_CSE(30 M-10 G)_Highest Channel_QPSK_1RB



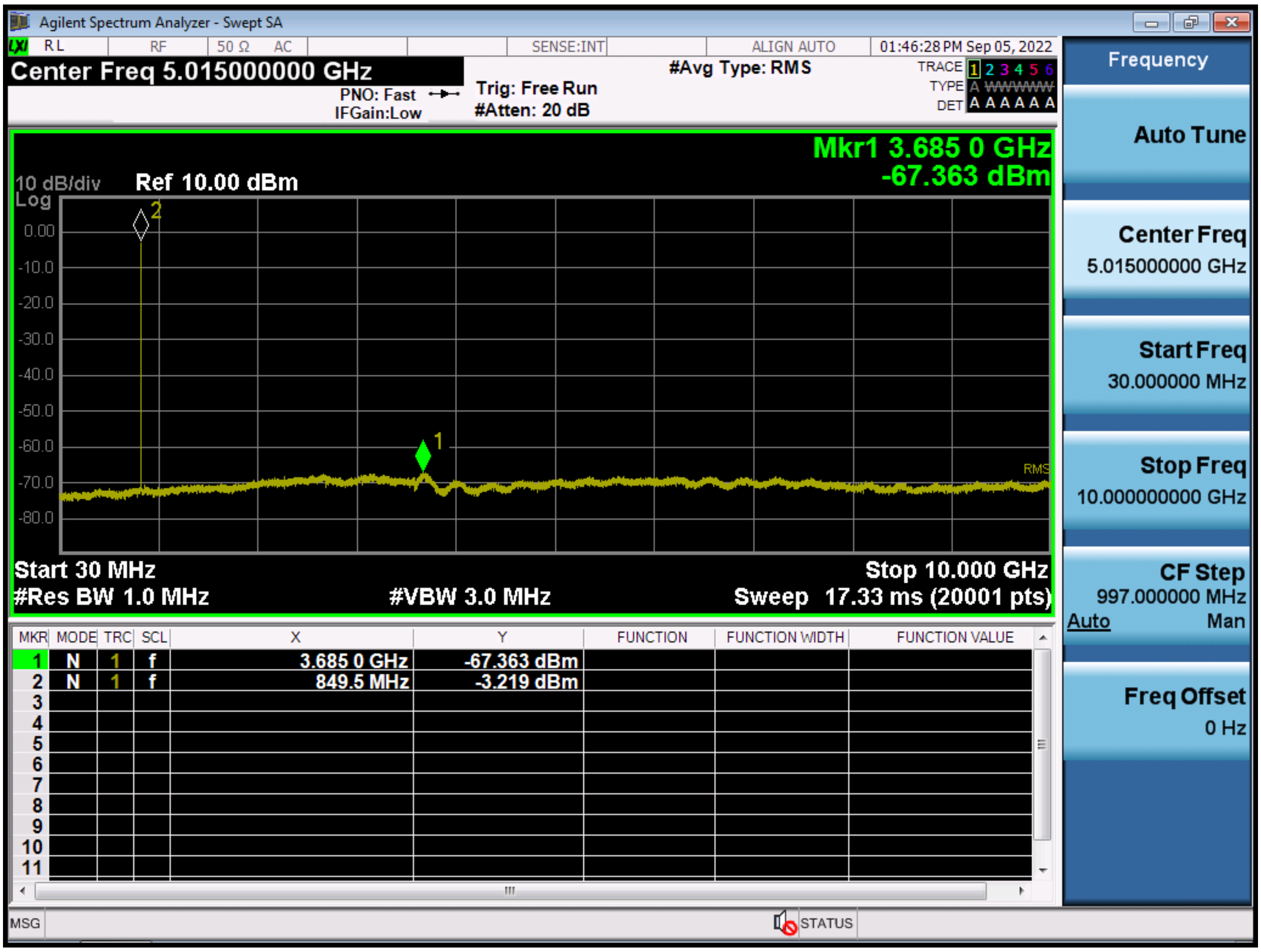
5 M_CSE(30 M-10 G)_Lowest Channel_QPSK_1RB



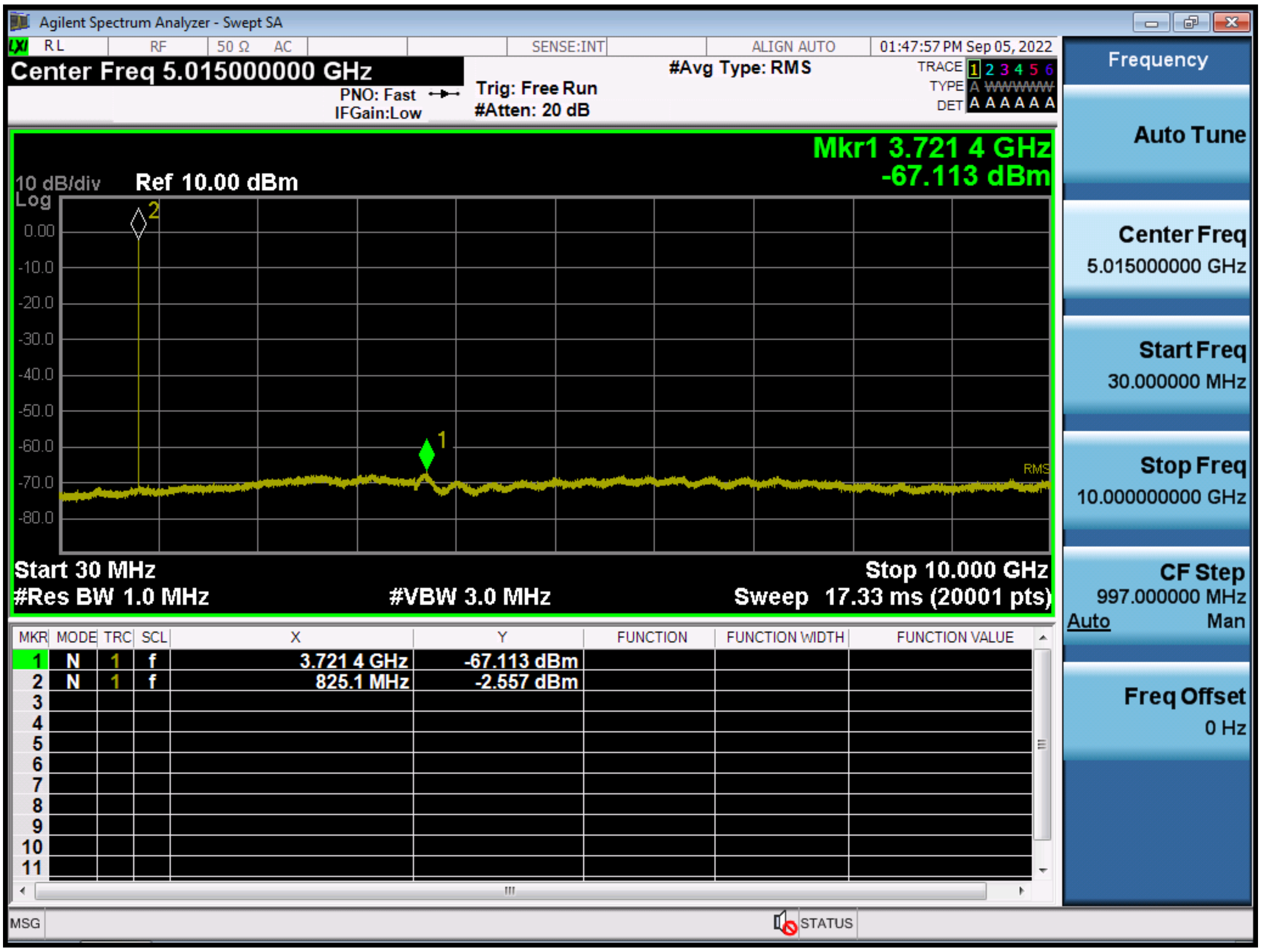
5 M_CSE(30 M-10 G)_Mid Channel_QPSK_1RB



5 M_CSE(30 M-10 G)_Highest Channel_QPSK_1RB



10 M_CSE(30 M-10 G)_Lowest Channel_QPSK_1RB



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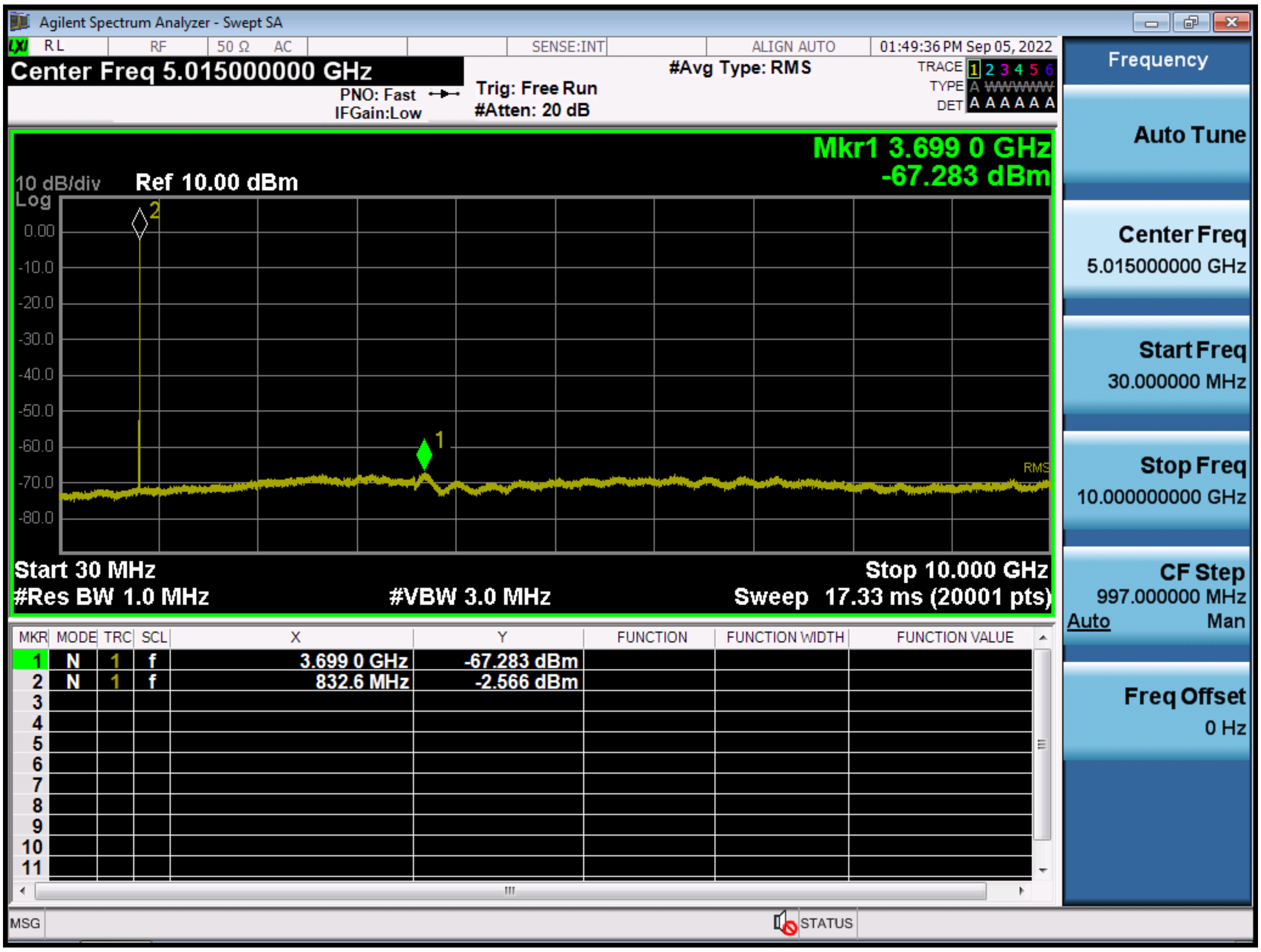
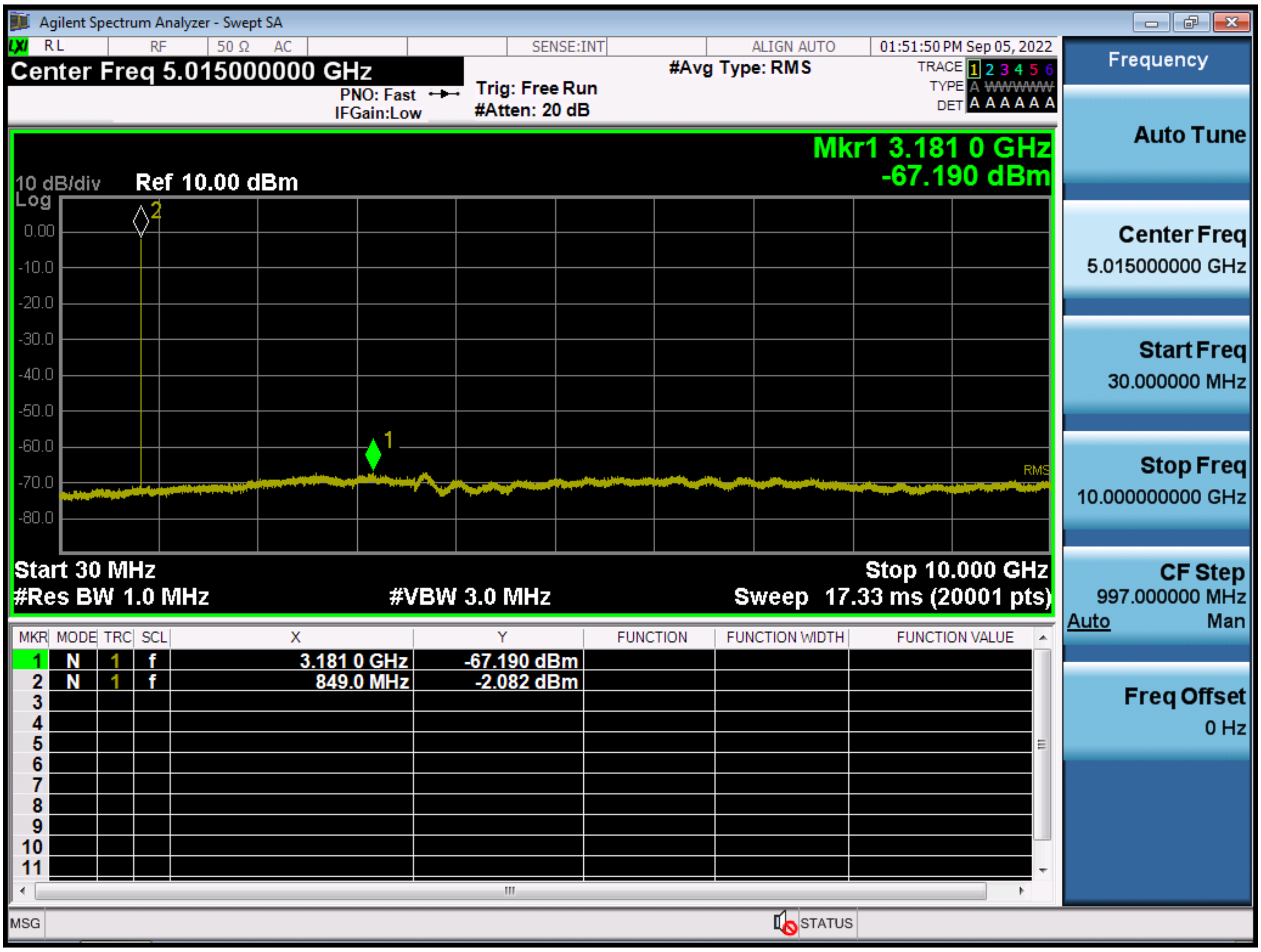


10 M_CSE(30 M-10 G)_Highest Channel_QPSK_1RB



10. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2210-FC012-P