

FCC LTE REPORT

Certification

Applicant Name:

SAMSUNG Electronics Co., Ltd.

Date of Issue:

January 25, 2022

Location:

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Report No.: HCT-RF-2201-FC074-R1

FCC ID: A3LSMA536U

APPLICANT: SAMSUNG Electronics Co., Ltd.

Model(s): SM-A536U
 Additional Model(s): SM-A536U1/DS, SM-S536DL, SM-A536W
 EUT Type: Mobile phone
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 FCC Rule Part(s): §27, §2

Mode (MHz)	Tx Frequency (MHz)	Emission Designator	Modulation	EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band 30 (5)	2307.5 – 2312.5	4M54G7D	QPSK	0.114	20.56
		4M53W7D	16QAM	0.098	19.93
		4M53W7D	64QAM	0.078	18.94
		4M52W7D	256QAM	0.048	16.84
LTE – Band 30 (10)	2310.0	9M01G7D	QPSK	0.119	20.75
		8M99W7D	16QAM	0.089	19.49
		9M02W7D	64QAM	0.075	18.75
		9M00W7D	256QAM	0.048	16.82

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)

Report No.: HCT-RF-2201-FC074-R1

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-2201-FC074	January 21, 2022	- First Approval Report
HCT-RF-2201-FC074-R1	January 25, 2022	- Revised the E.I.R.P result. (1 pages, 24 pages)

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

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMA536U
Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§27, §2
EUT Type:	Mobile phone
Model(s):	SM-A536U
Additional Model(s):	SM-A536U1/DS, SM-S536DL, SM-A536W
Tx Frequency:	2307.5 MHz – 2312.5 MHz (LTE – Band30 (5 MHz)) 2310.0 MHz (LTE – Band30 (10 MHz))
Date(s) of Tests:	November 29, 2021 ~ January 18, 2022
Serial number:	Radiated: R3CRA0XAS5M Conducted: R3CRA0XACQX

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

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

It also supports IEEE 802.11 a/b/g/n/ac (20/40/80), 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	- 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 - ANSI C63.26-2015 – Section 5.2.6(only GSM)
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 $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $> 2 \times$ 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;

$$P_d \text{ (dBm)} = P_g \text{ (dBm)} - \text{cable loss (dB)} + \text{antenna gain (dB)}$$

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 $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $> 2 \times$ 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 10th 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;

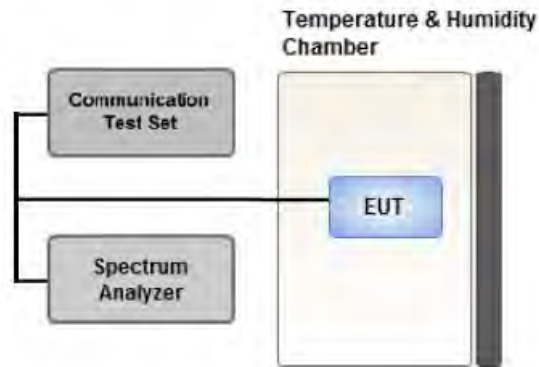
$$\text{Result}_{(\text{dBm})} = P_g_{(\text{dBm})} - \text{cable loss}_{(\text{dB})} + \text{antenna gain}_{(\text{dBi})}$$

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.

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

3.4 PEAK- TO- AVERAGE RATIO



Test setup

① CCDF Procedure for PAPR

Test Settings

1. Set resolution/measurement bandwidth $\geq$ 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 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)

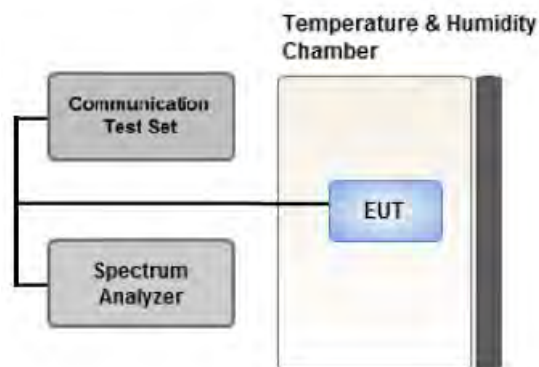
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW $\geq 3 \times$ RBW.

1. Set the RBW $\geq$ OBW.
2. Set VBW $\geq 3 \times$ RBW.
3. Set span $\geq 2 \times$ OBW.
4. Sweep time $\geq 10 \times$ (number of points in sweep) $\times$ (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 $2 \times$ to $3 \times$ the OBW.
2. Set RBW $\geq$ OBW.
3. Set VBW $\geq 3 \times$ RBW.
4. Set number of measurement points in sweep $\geq 2 \times$ span / RBW.
5. Sweep time:
Set $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission period})]$ 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 $[10 \log (1/\text{duty cycle})]$ 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.

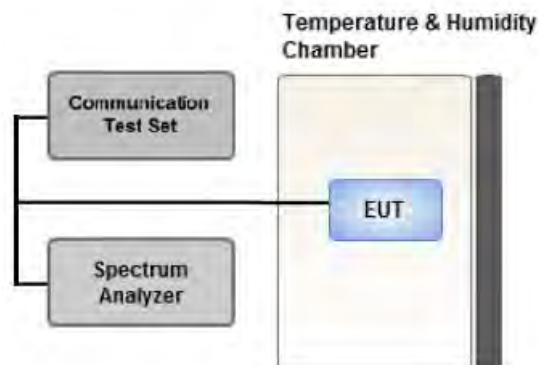
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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 $\geq 3 \times$ 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

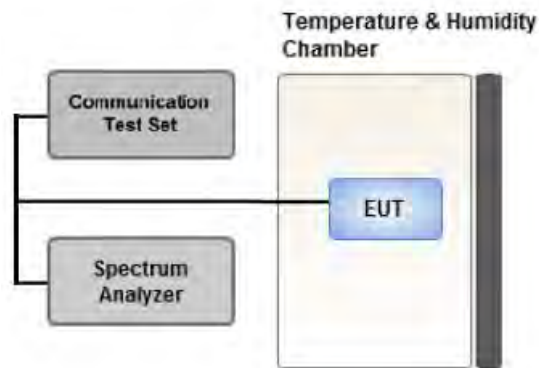
Test Overview

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 $\geq$ 3 MHz
3. Detector = RMS
4. Trace Mode = Average
5. Sweep time = auto
6. Number of points in sweep $\geq 2 \times \text{Span} / \text{RBW}$

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 $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Limit

§27.53(a)

(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

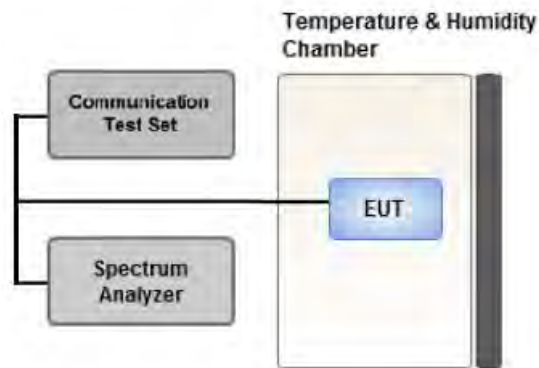
- (i) By a factor of not less than: $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz;
- (ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log (P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log (P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log (P)$ dB below 2288 MHz;
- (iii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log (P)$ dB above 2365 MHz

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.

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

3.8 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

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

The frequency stability of the transmitter is measured by:

1. Temperature:

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

2. Primary Supply Voltage:

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

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

Test Settings

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

3.9 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.
Mode : Stand alone, Stand alone + External accessories (Earphone, AC adapter, etc)
Worst case : Stand alone
- We were performed the RSE test in condition of co-location. There has no significant emission raised.
- WWAN + WLAN 5 GHz + BT (Worst case : Stand alone)
- The worst case is reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data.
- Please refer to the table below.
- All modes of operation were investigated and the worst case configuration results are reported.
- SM-A536U & additional models were tested and the worst case results are reported.
(Worst case : SM-A536U)

[Worst case]

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

3.10 WORST CASE(CONDUCTED TEST)

- All modes of operation were investigated and the worst case configuration results are reported.
- SM-A536U & additional models were tested and the worst case results are reported.

(Worst case : SM-A536U)

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth	QPSK, 16QAM, 64QAM, 256QAM	5, 10	Mid	Full RB	0
Peak-To-Average Ratio	QPSK, 16QAM, 64QAM, 256QAM	5, 10	Mid	Full RB	0
Band Edge	QPSK	5	Low, Mid, High	1	0, 24
		10	Mid	1	0, 49
		5	Low, Mid, High	Full RB	0
		10	Mid	Full RB	0
Spurious and Harmonic Emissions at Antenna Terminal	QPSK	5	Low, Mid, High	1	0
		10	Mid	1	0

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
H.P.F	FBSR-02B(WHK1.2/15 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
H.P.F	FBSR-02B(WHK3.3/18 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	11275	04/07/2022	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/28/2022	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	04/05/2023	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	04/05/2023	Biennial
Chamber	SU-642	ESPEC	93008124	03/15/2022	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/30/2022	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/15/2023	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	10/13/2022	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	04/12/2023	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	MY52090906	05/18/2022	Annual
ATTENUATOR(20 dB)	8493C	Hewlett Packard	17280	06/01/2022	Annual
Spectrum Analyzer(10 Hz ~ 40 GHz)	FSV40	REOHDE & SCHWARZ	100931	09/29/2022	Annual
Base Station	8960 (E5515C)	Agilent	MY48360800	08/18/2022	Annual
Loop Antenna(9 kHz ~ 30 MHz)	FMZB1513	Schwarzbeck	1513-333	03/19/2022	Biennial
Bilog Antenna	VULB9160	Schwarzbeck	3150	03/03/2023	Biennial
Hybrid Antenna	VULB9168	Schwarzbeck	760	02/22/2023	Biennial
Wideband Radio Communication Tester	MT8821C	Anritsu Corp.	6262116770	07/12/2022	Annual
Wideband Radio Communication Tester	MT8820C	Anritsu Corp.	6200863156	12/29/2022	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2022	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	06/02/2022	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

Note:

- Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
- 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 ($\pm$ 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
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §27.53(a)	Section 3.7	PASS
Conducted Output Power	§2.1046	N/A	<u>See Note1</u>
Frequency stability / variation of ambient temperature	§2.1055, §27.54	Emission must remain in band	PASS

Note:

1. See SAR Report

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Equivalent Isotropic Radiated Power	§27.50(a)(3)	< 0.25 Watts max. EIRP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(a)	< 70 + 10log10 (P[Watts])	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

$$\text{ERP} = \text{Substitute LEVEL(dBm)} + \text{Ant. Gain} - \text{CL(Cable Loss)}$$

- 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
27710	2310.0	-15.75	18.45	9.90	1.76	H	0.456	26.59

$$\text{EIRP} = \text{Substitute LEVEL(dBm)} + \text{Ant. Gain} - \text{CL(Cable Loss)}$$

- 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 EQUIVALENT ISOTROPIC RADIATED POWER

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2307.5	LTE B30/ 5 MHz	QPSK	-24.74	13.18	9.54	2.38	V	< 0.25	0.108	20.34
		16-QAM	-25.39	12.53	9.54	2.38	V		0.093	19.69
		64-QAM	-26.27	11.65	9.54	2.38	H		0.076	18.81
		256-QAM	-28.46	9.46	9.54	2.38	H		0.046	16.62
2310.0		QPSK	-24.52	13.40	9.54	2.38	V		0.114	20.56
		16-QAM	-25.28	12.64	9.54	2.38	V		0.096	19.80
		64-QAM	-26.40	11.52	9.54	2.38	H		0.074	18.68
		256-QAM	-28.24	9.68	9.54	2.38	H		0.048	16.84
2312.5		QPSK	-24.64	13.28	9.54	2.38	V		0.111	20.44
		16-QAM	-25.15	12.77	9.54	2.38	V		0.098	19.93
		64-QAM	-26.14	11.78	9.54	2.38	H		0.078	18.94
		256-QAM	-28.31	9.61	9.54	2.38	H		0.048	16.77

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBi)	C.L	Pol	Limit	EIRP	
								W	W	dBm
2310.0	LTE B30/ 10 MHz	QPSK	-24.33	13.59	9.54	2.38	V	< 0.25	0.119	20.75
		16-QAM	-25.59	12.33	9.54	2.38	V		0.089	19.49
		64-QAM	-26.33	11.59	9.54	2.38	H		0.075	18.75
		256-QAM	-28.26	9.66	9.54	2.38	H		0.048	16.82

8.2 RADIATED SPURIOUS EMISSIONS

- ▣ OPERATING FREQUENCY : 2310.0 MHz
- ▣ MEASURED OUTPUT POWER: 20.56 dBm = 0.114 W
- ▣ MODE: LTE B30
- ▣ MODULATION SIGNAL: 5 MHz QPSK
- ▣ DISTANCE: 1 meters
- ▣ LIMIT: -40 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
27685 (2307.5)	4 615.00	-52.25	12.57	-63.38	3.47	H	-54.28	-40.00
	6 922.50	-49.52	11.82	-51.34	4.29	H	-43.81	-40.00
	9 230.00	-57.18	10.58	-54.02	5.06	V	-48.50	-40.00
27710 (2310.0)	4 620.00	-52.88	12.56	-63.94	3.47	H	-54.85	-40.00
	6 930.00	-49.55	11.78	-51.87	4.28	H	-44.37	-40.00
	9 240.00	-57.84	10.54	-54.44	5.07	V	-48.97	-40.00
27735 (2312.5)	4 625.00	-52.84	12.55	-63.88	3.47	H	-54.80	-40.00
	6 937.50	-49.44	11.74	-52.62	4.28	H	-45.16	-40.00
	9 250.00	-55.90	10.50	-52.15	5.06	H	-46.71	-40.00

☐ OPERATING FREQUENCY : 2310.00 MHz
☐ MEASURED OUTPUT POWER: 20.75 dBm = 0.119 W
☐ MODE: LTE B30
☐ MODULATION SIGNAL: 10 MHz QPSK
☐ DISTANCE: 1 meters
☐ LIMIT: -40 dBm

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit (dBm)
27710 (2310.0)	4 620.00	-52.58	12.56	-63.64	3.47	H	-54.55	-40.00
	6 930.00	-52.11	11.78	-54.43	4.28	H	-46.93	-40.00
	9 240.00	-58.21	10.54	-54.81	5.07	H	-49.34	-40.00

8.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
30	5 MHz	2310.0	QPSK	25	0	5.26
			16-QAM			5.99
			64-QAM			6.31
			256-QAM			6.41
	10 MHz		QPSK	50		5.34
			16-QAM			5.96
			64-QAM			6.32
			256-QAM			6.45

Note:

1. Plots of the EUT's Peak- to- Average Ratio are shown Page 47 ~ 54.

8.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
30	5 MHz	2310.0	QPSK	25	0	4.5367
			16-QAM			4.5310
			64-QAM			4.5246
			256-QAM			4.5170
	10 MHz		QPSK	50		9.0134
			16-QAM			8.9893
			64-QAM			9.0196
			256-QAM			9.0023

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 39 ~ 46.

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)
30	5	2307.5	2.4263	27.976	-71.418	-43.442	-40.00
		2310.0	26.1262	30.131	-76.769	-46.638	
		2312.5	26.1245	30.131	-76.656	-46.525	
	10	2310.0	26.1330	30.131	-76.774	-46.643	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 167 ~ 174.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor(dB) = Cable Loss + Ext. Attenuator + Power Splitter

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

8.6 BAND EDGE

Band Width (MHz)	Frequency (MHz)	Modulation	RB (Size/ Offset)	Frequency Range (MHz)	Maximum Data (dBm)	Limit (dBm)
5	2307.5	QPSK	25/0	Below 2288	-53.359	-40
				2288 - 2292	-51.478	-37
				2292 - 2296	-41.699	-31
				2296 - 2300	-53.321	-25
				2300 - 2304	-25.557	-13
				2304 - 2305	-27.231	-13
				2315 - 2320	-39.631	-13
				2320 - 2324	-53.156	-25
				2324 - 2328	-53.153	-31
				2328 - 2337	-52.054	-37
				2337 - 2341	-53.021	-31
				2341 - 2345	-53.075	-25
				2345 - 2365	-53.012	-13
				Above 2365	-53.043	-40
	2310.0	QPSK	25/0	Below 2288	-53.250	-40
				2288 - 2292	-51.760	-37
				2292 - 2296	-43.491	-31
				2296 - 2300	-36.680	-25
				2300 - 2305	-25.097	-13
				2315 - 2320	-26.282	-13
				2320 - 2324	-37.893	-25
				2324 - 2328	-43.784	-31
				2328 - 2337	-51.073	-37
				2337 - 2341	-52.959	-31
				2341 - 2345	-52.969	-25
				2345 - 2365	-52.605	-13
				Above 2365	-52.962	-40
	2312.5	QPSK	25/0	Below 2288	-53.265	-40
				2288 - 2292	-53.082	-37
				2292 - 2296	-47.878	-31
				2296 - 2300	-43.133	-25
				2300 - 2305	-32.309	-13
				2315 - 2316	-26.244	-13

10	2310.0	QPSK	50/0	2316 - 2320	-24.529	-13
				2320 - 2324	-33.744	-25
				2324 - 2328	-41.234	-31
				2328 - 2337	-49.271	-37
				2337 - 2341	-52.973	-31
				2341 - 2345	-52.966	-25
				2345 - 2365	-52.609	-13
				Above 2365	-52.996	-40
				Below 2288	-53.228	-40
				2288 - 2292	-53.372	-37
				2292 - 2296	-35.977	-31
				2296 - 2300	-29.791	-25
				2300 - 2304	-25.832	-13
				2304 - 2305	-29.200	-13
				2315 - 2316	-29.799	-13
				2316 - 2320	-26.654	-13
				2320 - 2324	-32.495	-25
				2324 - 2328	-36.192	-31
				2328 - 2337	-44.927	-37
				2337 - 2341	-52.554	-31
				2341 - 2345	-52.984	-25
				2345 - 2365	-52.614	-13
				Above 2365	-53.079	-40

Band Width (MHz)	Frequency (MHz)	Modulation	RB (Size/ Offset)	Frequency Range (MHz)	Maximum Data (dBm)	Limit (dBm)
5	2307.5	QPSK	1/0	Below 2288	-53.122	-40
				2288 - 2292	-50.700	-37
				2292 - 2296	-46.152	-31
				2296 - 2300	-40.587	-25
				2300 - 2304	-36.283	-13
				2304 - 2305	-26.360	-13
			1/24	2315 - 2320	-41.244	-13
				2320 - 2324	-44.357	-25
				2324 - 2328	-52.638	-31
				2328 - 2337	-53.097	-37
				2337 - 2341	-52.951	-31
				2341 - 2345	-53.002	-25
				2345 - 2365	-52.869	-13
				Above 2365	-53.085	-40
	2310.0	QPSK	1/0	Below 2288	-53.200	-40
				2288 - 2292	-52.265	-37
				2292 - 2296	-45.180	-31
				2296 - 2300	-41.310	-25
				2300 - 2305	-39.073	-13
			1/24	2315 - 2320	-39.576	-13
				2320 - 2324	-41.868	-25
				2324 - 2328	-44.919	-31
				2328 - 2337	-51.658	-37
				2337 - 2341	-52.935	-31
				2341 - 2345	-52.918	-25
				2345 - 2365	-52.610	-13
				Above 2365	-52.986	-40
	2312.5	QPSK	1/0	Below 2288	-53.266	-40
				2288 - 2292	-52.743	-37
				2292 - 2296	-49.616	-31
				2296 - 2300	-43.907	-25
				2300 - 2305	-40.529	-13
			1/24	2315 - 2316	-22.038	-13

10	2310.0	QPSK		2316 - 2320	-32.270	-13
				2320 - 2324	-41.370	-25
				2324 - 2328	-44.170	-31
				2328 - 2337	-50.225	-37
				2337 - 2341	-52.943	-31
				2341 - 2345	-52.927	-25
				2345 - 2365	-52.577	-13
				Above 2365	-52.965	-40
			1/0	Below 2288	-53.359	-40
				2288 - 2292	-52.072	-37
				2292 - 2296	-49.186	-31
				2296 - 2300	-40.497	-25
				2300 - 2304	-35.535	-13
				2304 - 2305	-30.698	-13
			1/49	2315 - 2316	-30.416	-13
				2316 - 2320	-34.901	-13
				2320 - 2324	-42.049	-25
				2324 - 2328	-45.897	-31
				2328 - 2337	-51.503	-37
				2337 - 2341	-52.932	-31
				2341 - 2345	-52.908	-25
				2345 - 2365	-52.564	-13
				Above 2365	-52.938	-40

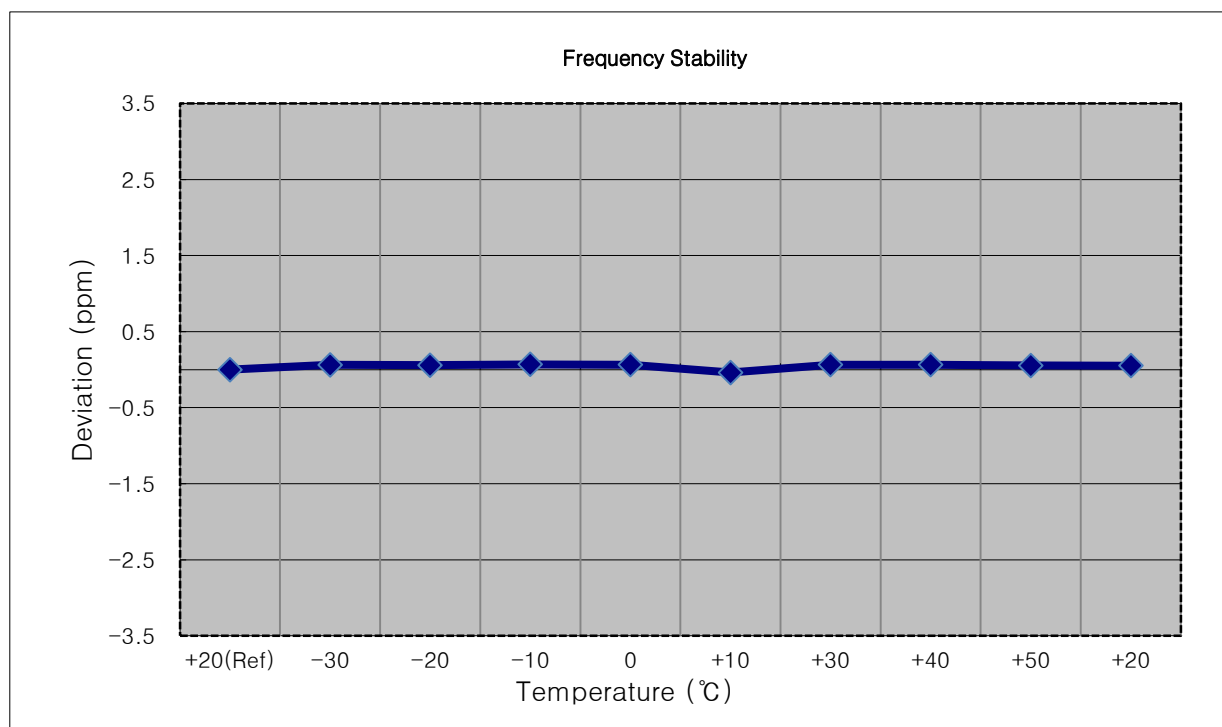
Note:

- Plots of the EUT's Band Edge are shown Page 55 ~ 166.

8.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

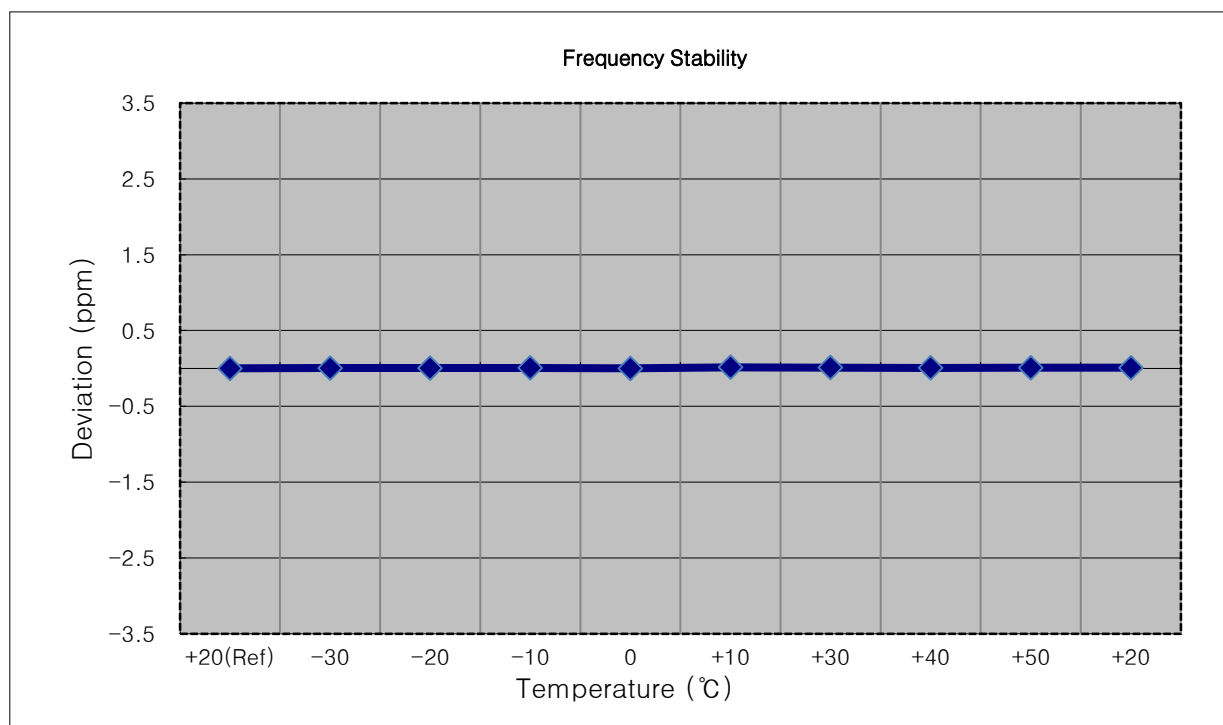
- MODE: LTE 30
- OPERATING FREQUENCY: 2307,500,000 Hz
- BANDWIDTH: 27685 (5 MHz)
- REFERENCE VOLTAGE: 4.200 VDC
- DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	2307 500 153	0.00	0.000 000	0.0000
100 %		-30	2307 500 300	146.20	0.000 006	0.0634
100 %		-20	2307 500 286	132.60	0.000 006	0.0575
100 %		-10	2307 500 311	157.20	0.000 007	0.0681
100 %		0	2307 500 304	150.30	0.000 007	0.0651
100 %		+10	2307 500 065	-88.40	-0.000 004	-0.0383
100 %		+30	2307 500 302	148.60	0.000 006	0.0644
100 %		+40	2307 500 302	148.30	0.000 006	0.0643
100 %		+50	2307 500 280	127.00	0.000 006	0.0550
Batt. Endpoint	3.400	+20	2307 500 271	117.90	0.000 005	0.0511



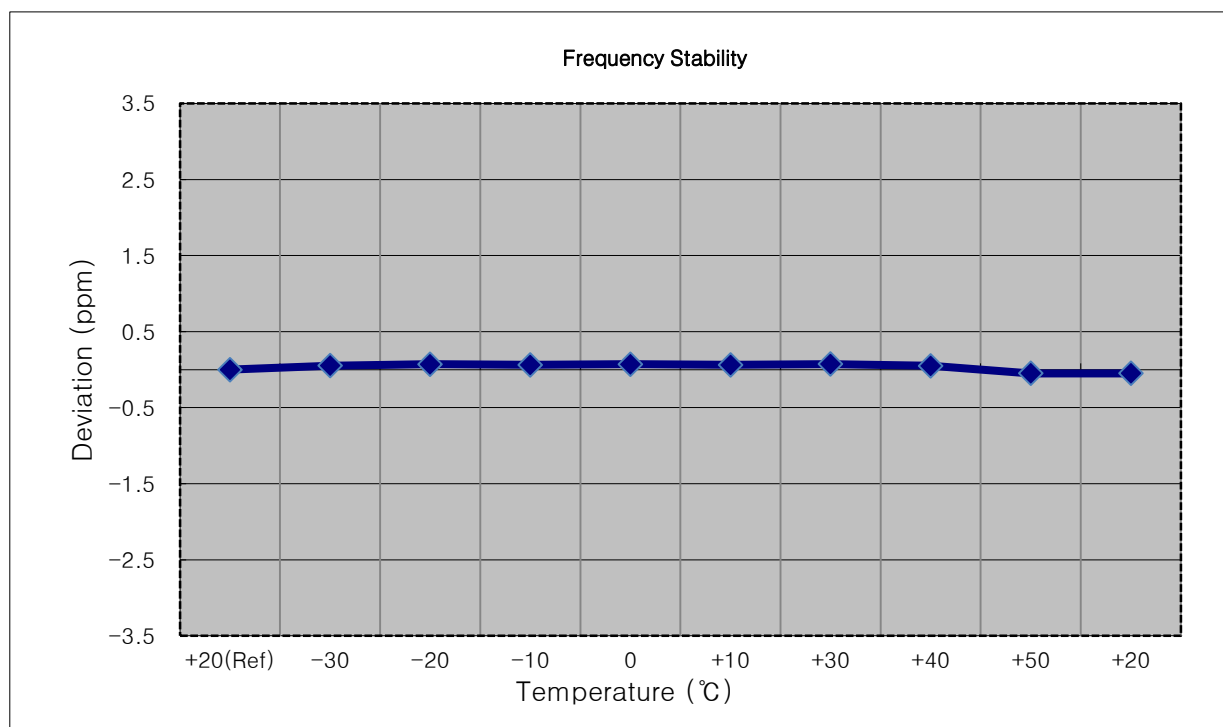
- ▣ MODE: LTE 30
- ▣ OPERATING FREQUENCY: 2310,000,000 Hz
- ▣ BANDWIDTH: 27710 (5 MHz)
- ▣ REFERENCE VOLTAGE: 4.200 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	2309 999 999	0.00	0.000 000	0.0000
100 %		-30	2310 000 011	12.00	0.000 001	0.0052
100 %		-20	2310 000 012	13.00	0.000 001	0.0056
100 %		-10	2310 000 016	17.00	0.000 001	0.0074
100 %		0	2310 000 001	2.00	0.000 000	0.0009
100 %		+10	2310 000 034	35.00	0.000 002	0.0152
100 %		+30	2310 000 025	26.00	0.000 001	0.0113
100 %		+40	2310 000 013	14.00	0.000 001	0.0061
100 %		+50	2310 000 022	23.00	0.000 001	0.0100
Batt. Endpoint	3.400	+20	2310 000 020	21.00	0.000 001	0.0091



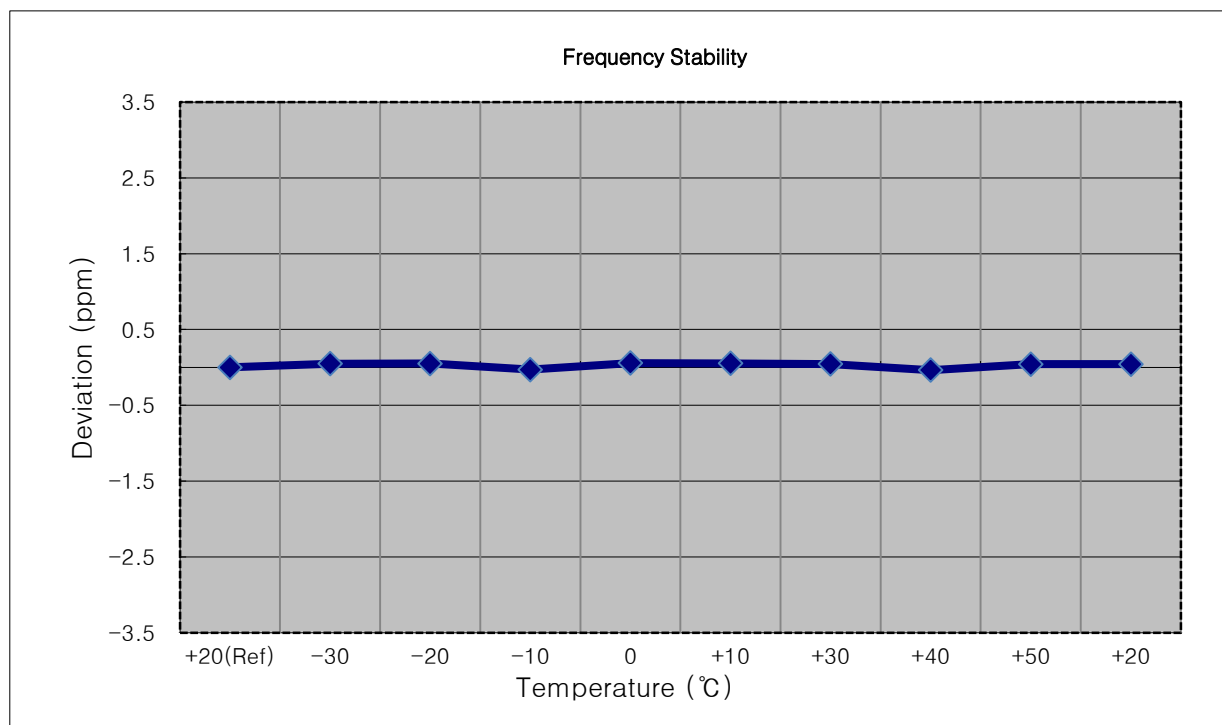
- ▣ MODE: LTE 30
- ▣ OPERATING FREQUENCY: 2312,500,000 Hz
- ▣ BANDWIDTH: 27735 (5 MHz)
- ▣ REFERENCE VOLTAGE: 4.200 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	2312 500 122	0.00	0.000 000	0.0000
100 %		-30	2312 500 241	119.00	0.000 005	0.0515
100 %		-20	2312 500 284	161.70	0.000 007	0.0699
100 %		-10	2312 500 266	143.90	0.000 006	0.0622
100 %		0	2312 500 286	163.50	0.000 007	0.0707
100 %		+10	2312 500 269	146.50	0.000 006	0.0634
100 %		+30	2312 500 291	169.00	0.000 007	0.0731
100 %		+40	2312 500 239	116.90	0.000 005	0.0506
100 %		+50	2312 500 008	-113.60	-0.000 005	-0.0491
Batt. Endpoint	3.400	+20	2312 500 009	-113.40	-0.000 005	-0.0490



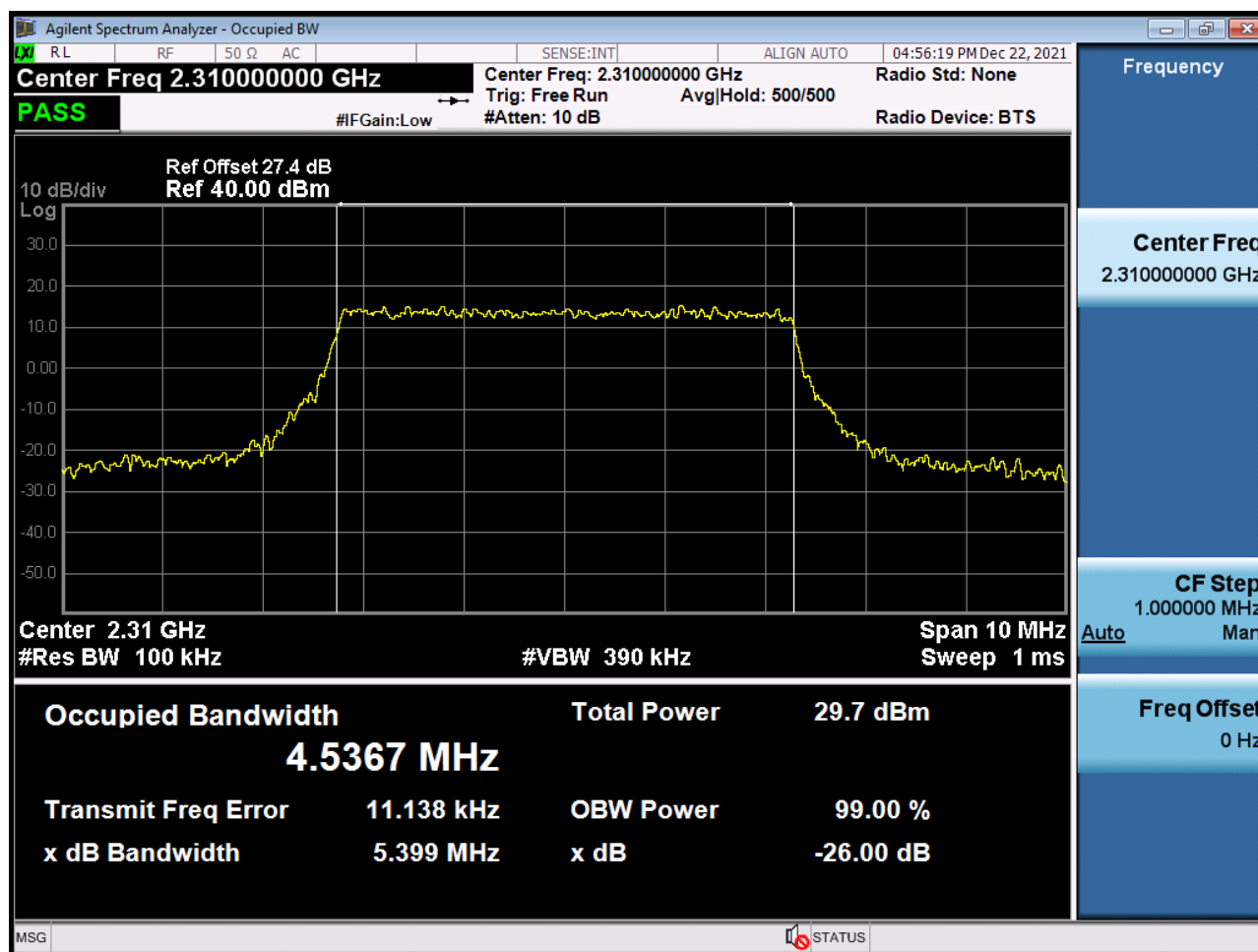
- ▣ MODE: LTE 30
- ▣ OPERATING FREQUENCY: 2310,000,000 Hz
- ▣ BANDWIDTH: 27710 (10 MHz)
- ▣ REFERENCE VOLTAGE: 4.200 VDC
- ▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	4.200	+20(Ref)	2310 000 112	0.00	0.000 000	0.0000
100 %		-30	2310 000 227	115.00	0.000 005	0.0498
100 %		-20	2310 000 232	119.70	0.000 005	0.0518
100 %		-10	2310 000 047	-65.30	-0.000 003	-0.0283
100 %		0	2310 000 246	134.20	0.000 006	0.0581
100 %		+10	2310 000 235	122.50	0.000 005	0.0530
100 %		+30	2310 000 218	105.70	0.000 005	0.0458
100 %		+40	2310 000 029	-82.80	-0.000 004	-0.0358
100 %		+50	2310 000 212	100.20	0.000 004	0.0434
Batt. Endpoint	3.400	+20	2310 000 212	100.20	0.000 004	0.0434

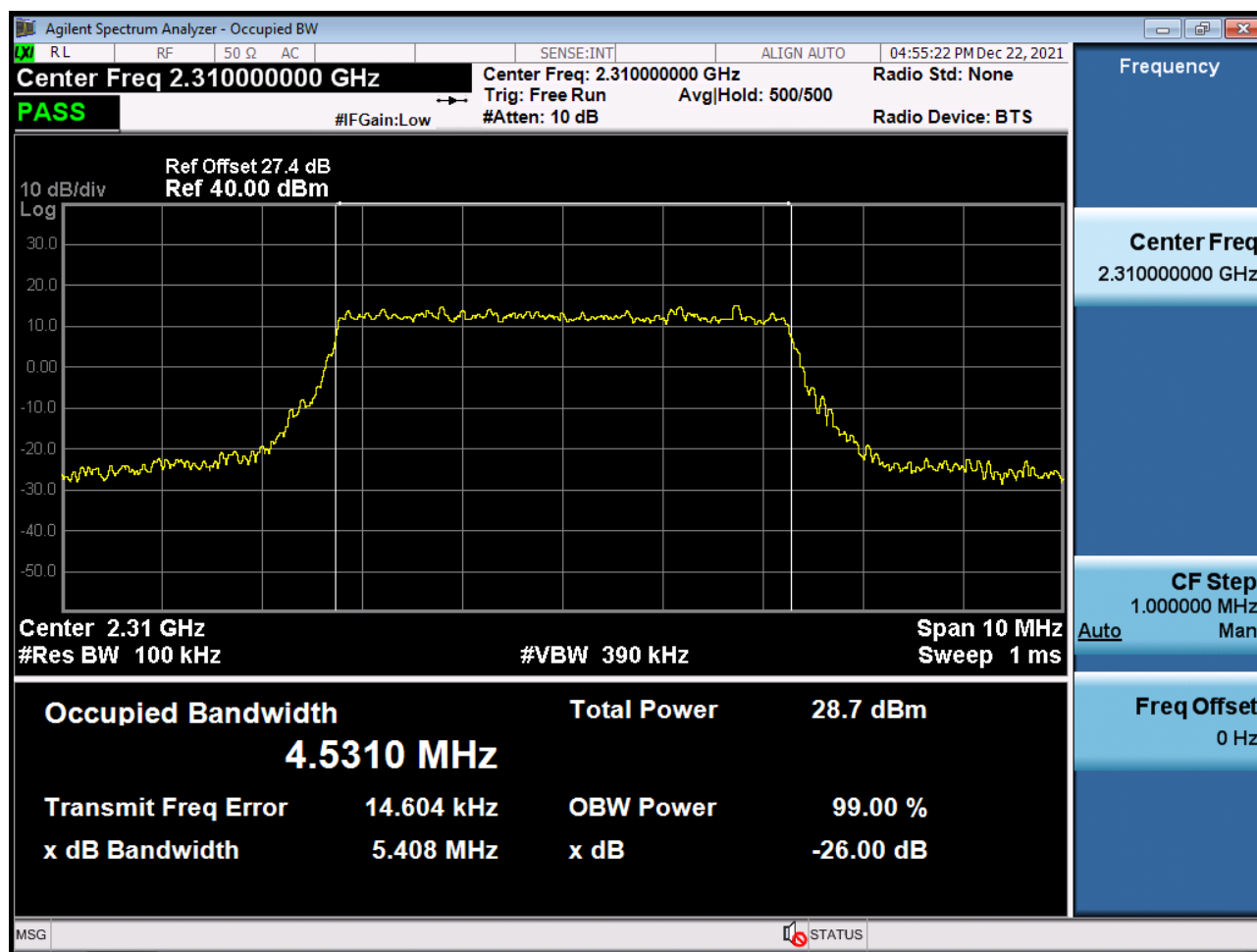


9. TEST PLOTS

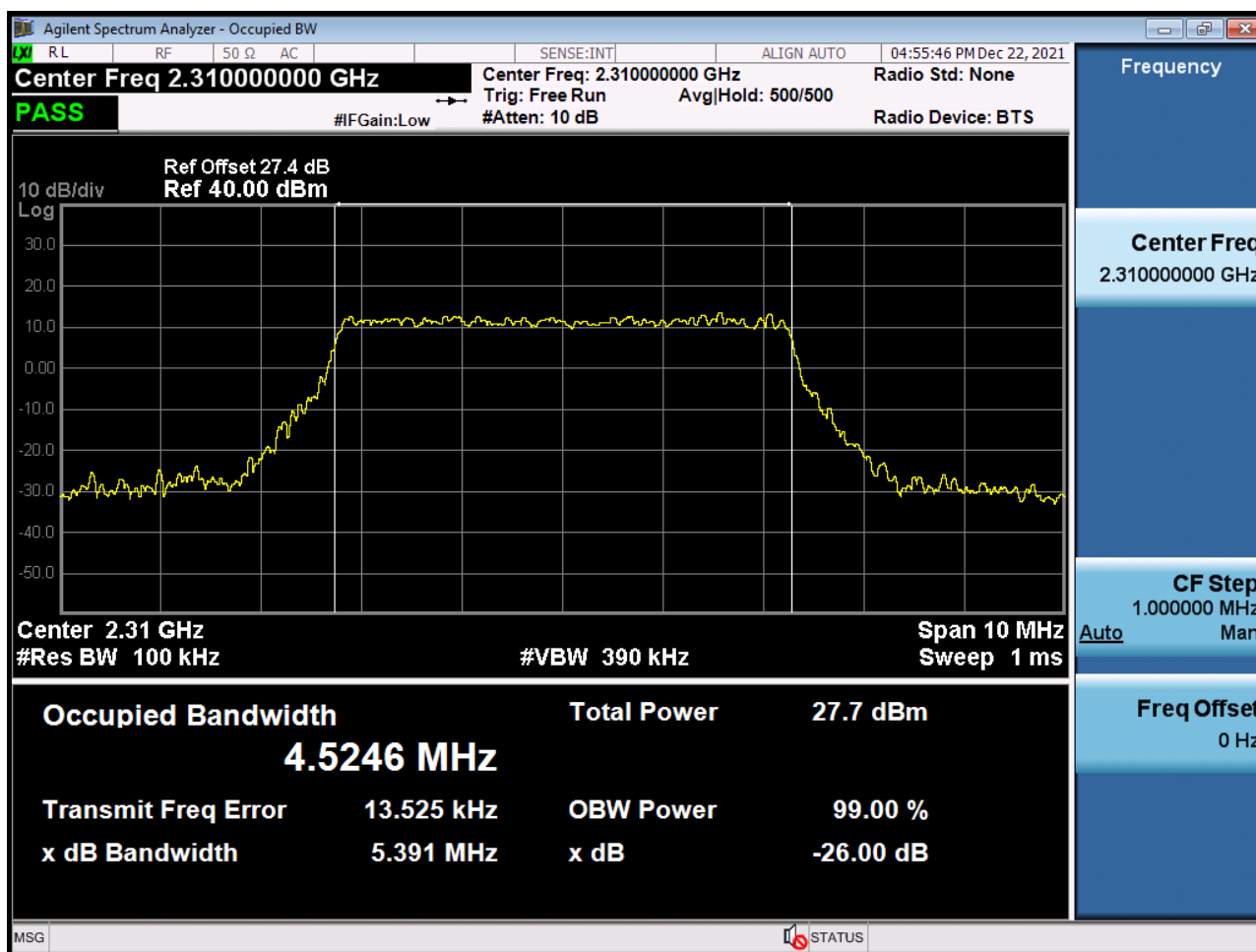
BAND 30. Occupied Bandwidth Plot (5 MHz Ch.27710 QPSK RB 25)



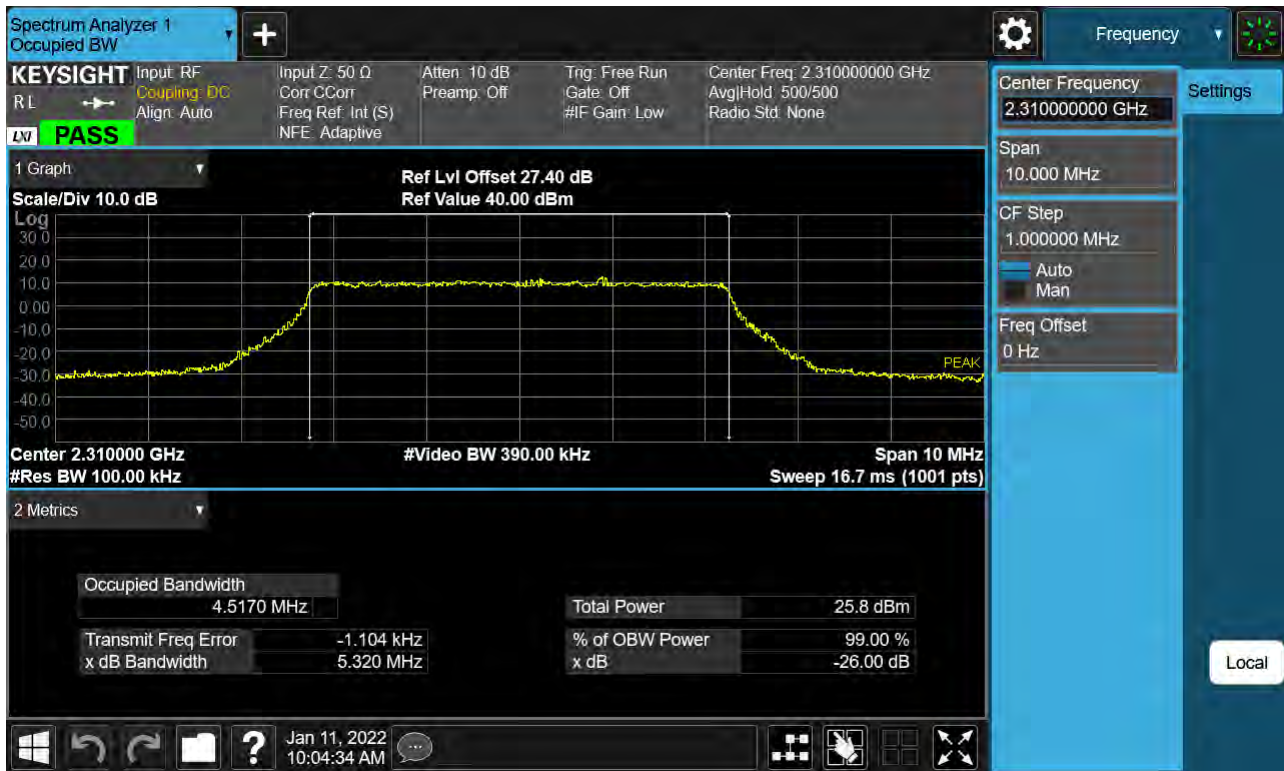
BAND 30. Occupied Bandwidth Plot (5 MHz Ch.27710 16-QAM RB 25)



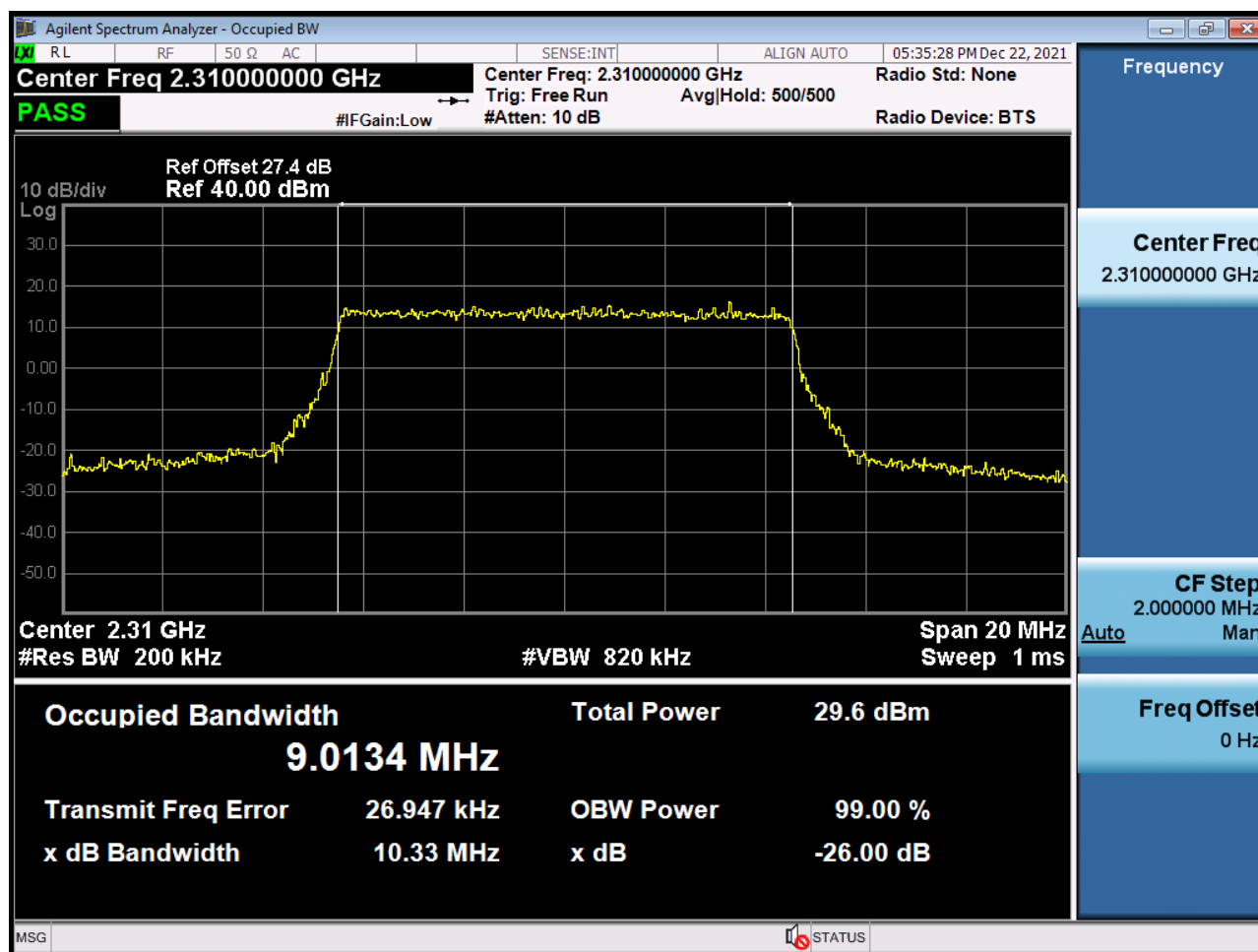
BAND 30. Occupied Bandwidth Plot (5 MHz Ch.27710 64-QAM RB 25)



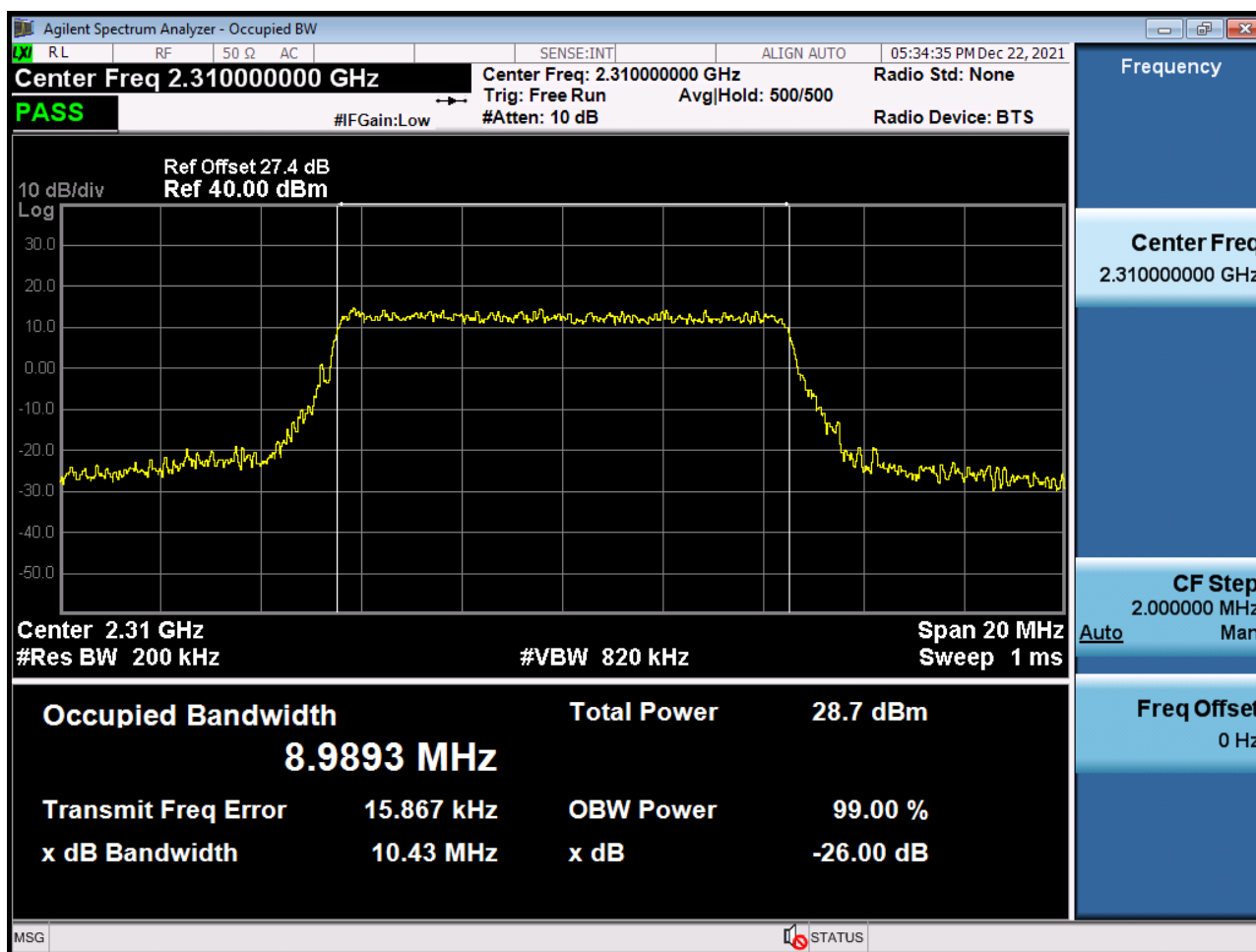
BAND 30. Occupied Bandwidth Plot (5 MHz Ch.27710 256-QAM RB 25)



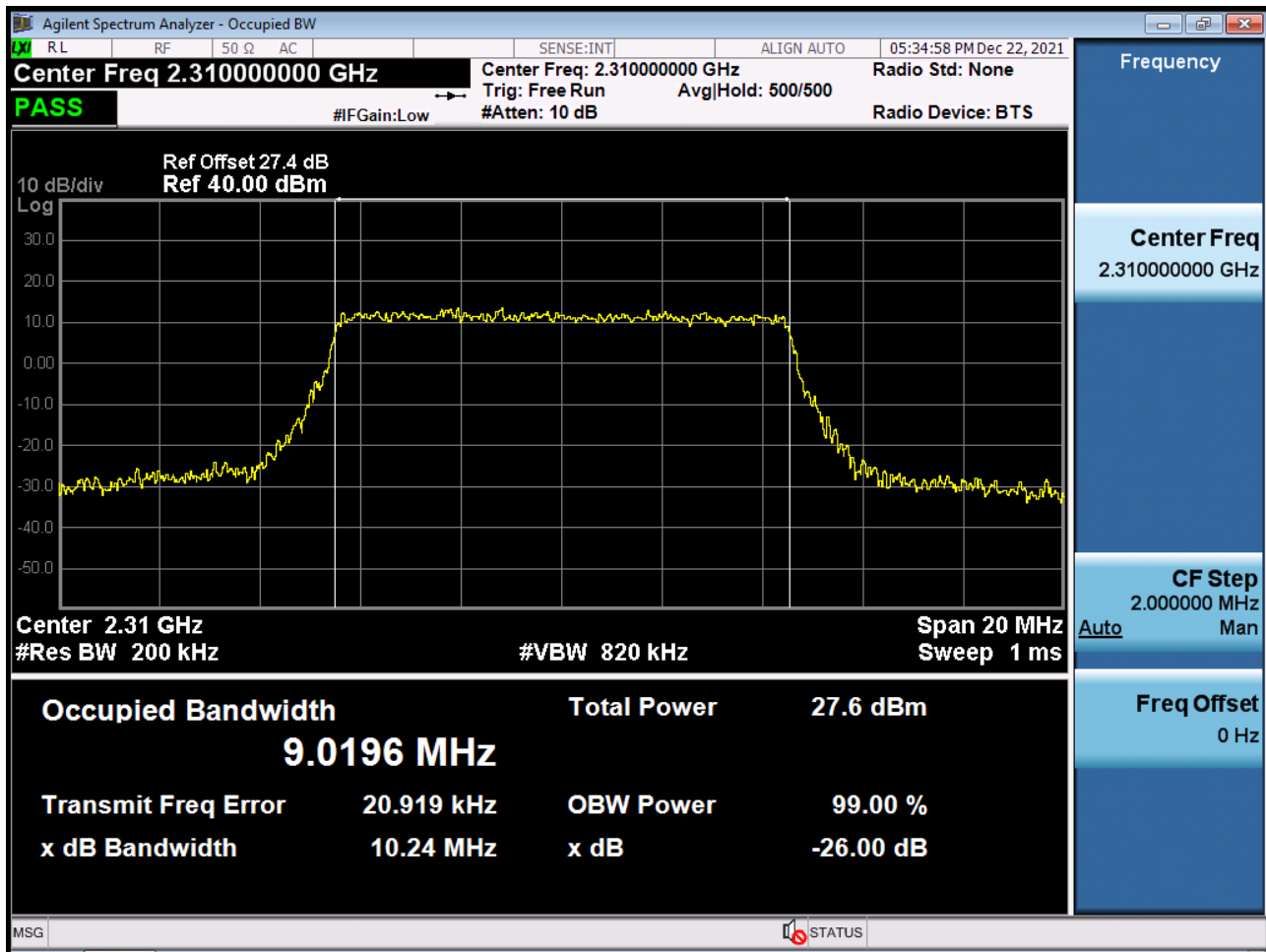
BAND 30. Occupied Bandwidth Plot (10 MHz Ch.27710 QPSK RB 50)



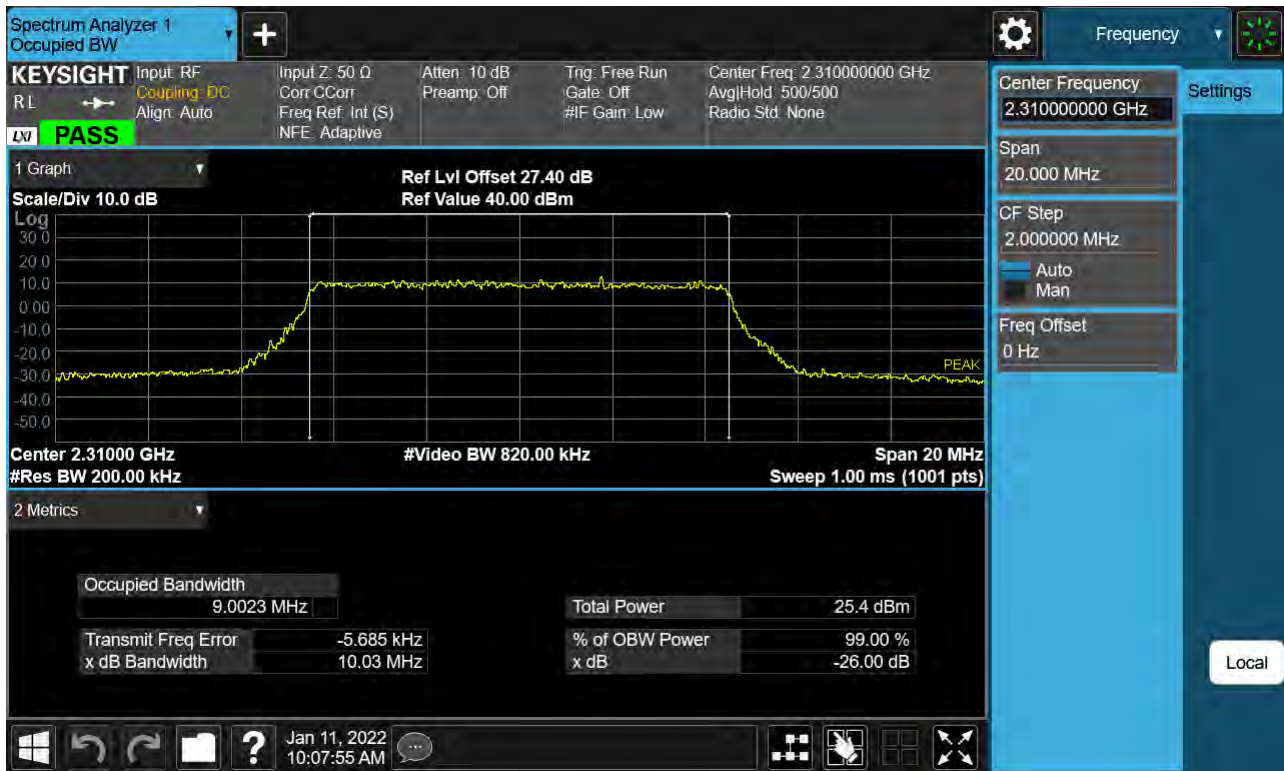
BAND 30. Occupied Bandwidth Plot (10 MHz Ch.27710 16-QAM RB 50)



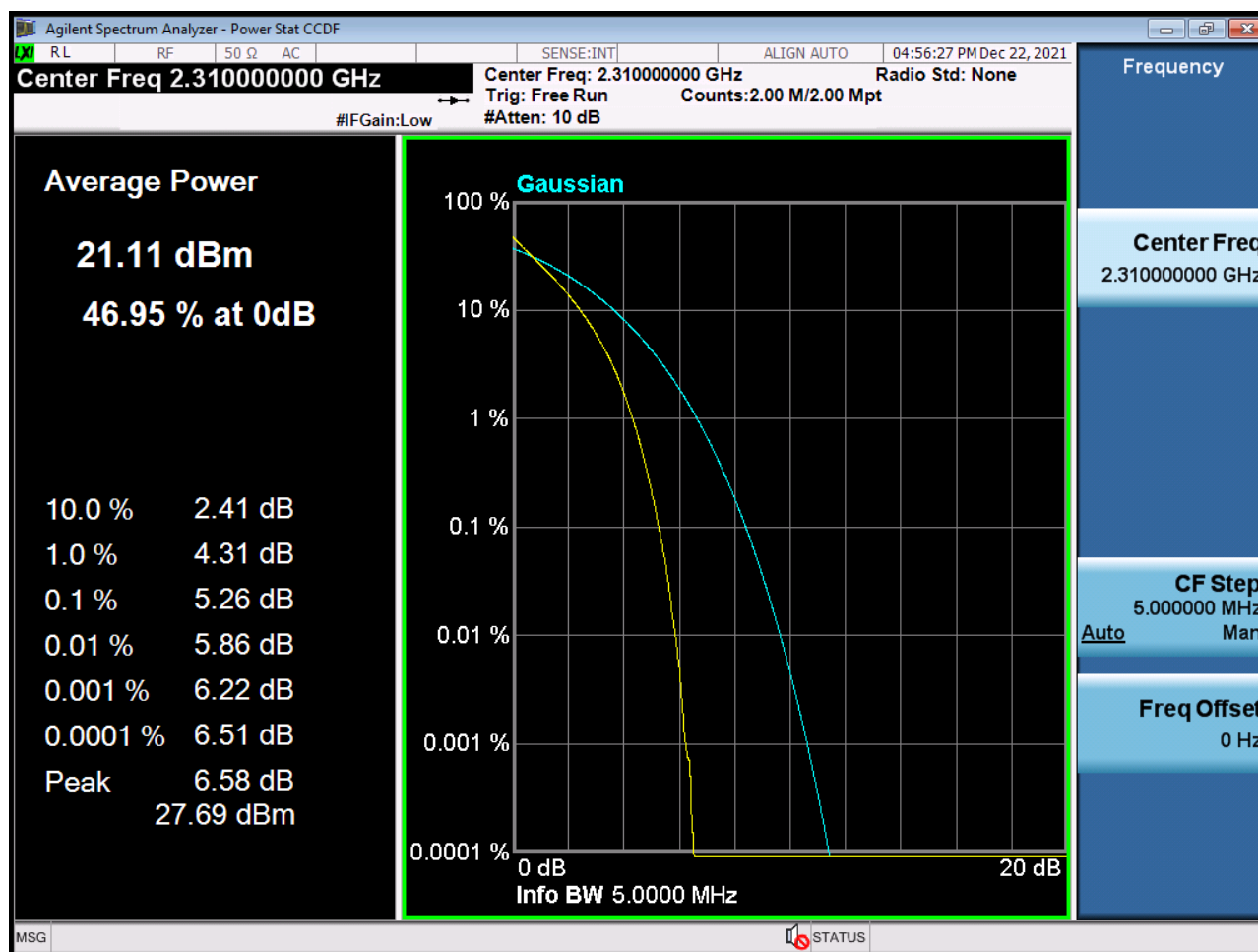
BAND 30. Occupied Bandwidth Plot (10 MHz Ch.27710 64-QAM RB 50)



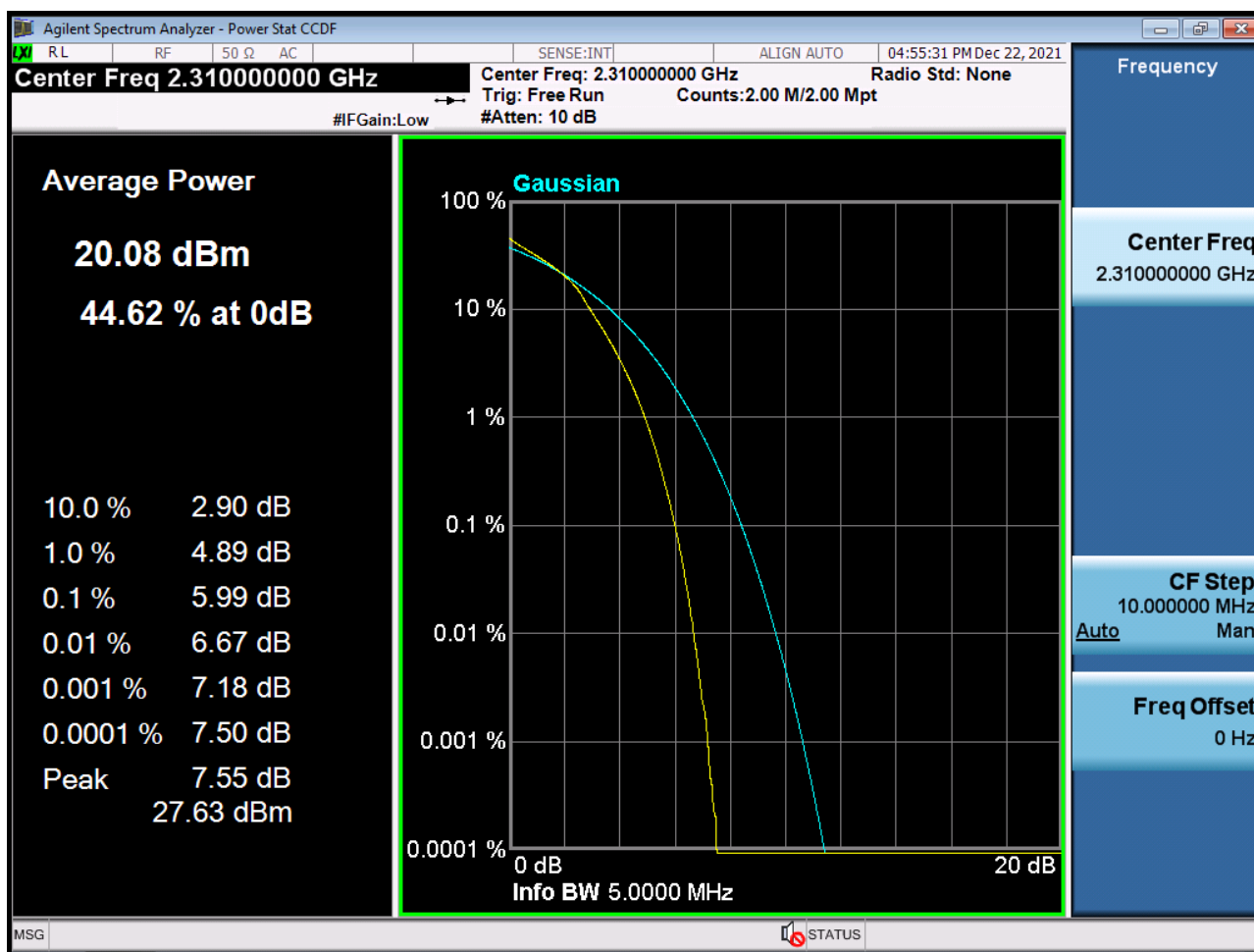
BAND 30. Occupied Bandwidth Plot (10 MHz Ch.27710 256-QAM RB 50)



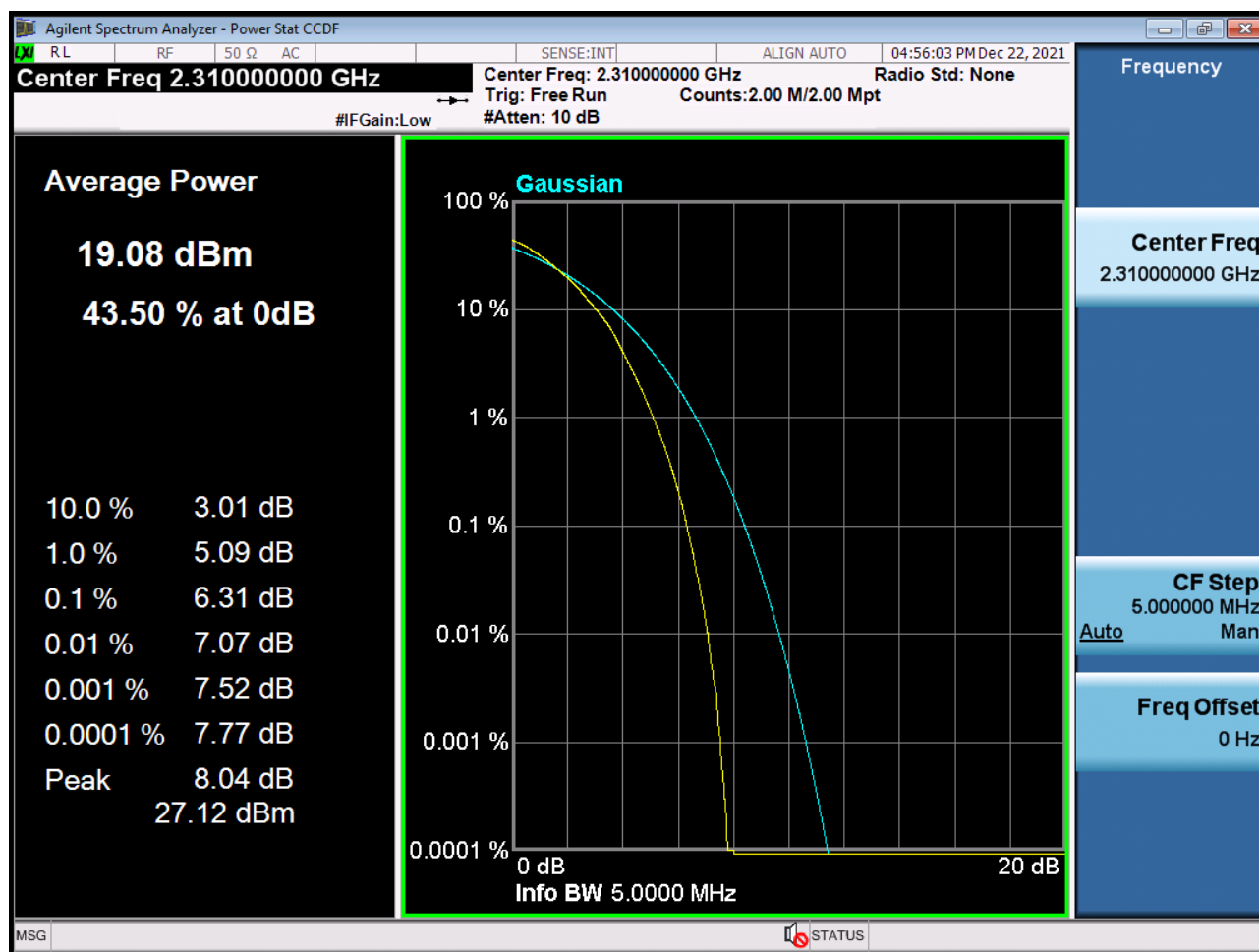
BAND 30. PAR Plot (5 M BW_Ch.27710_QPSK_RB25_0)



BAND 30. PAR Plot (5 M BW_Ch.27710_16QAM_RB25_0)



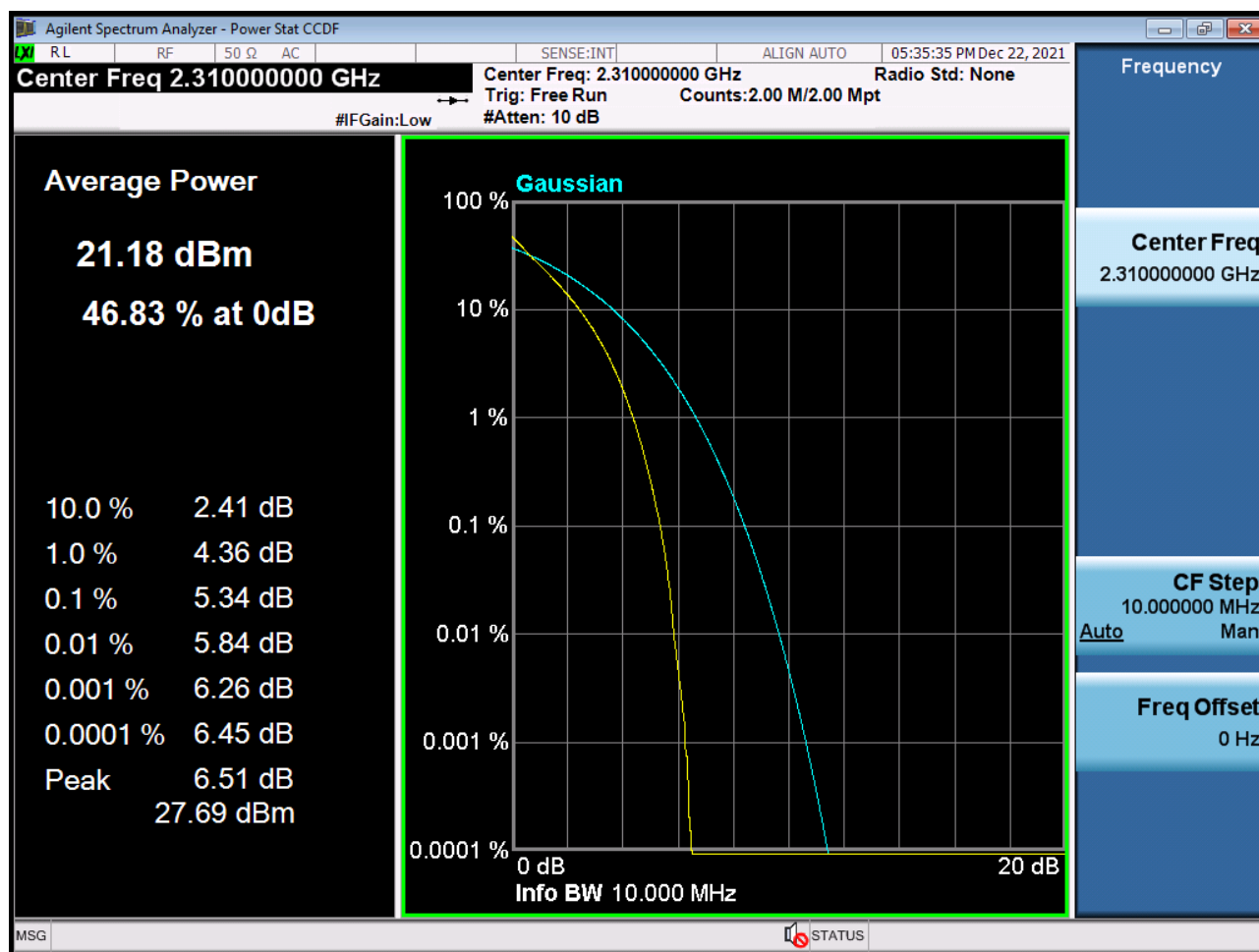
BAND 30. PAR Plot (5 M BW_Ch.27710_64QAM_RB25_0)



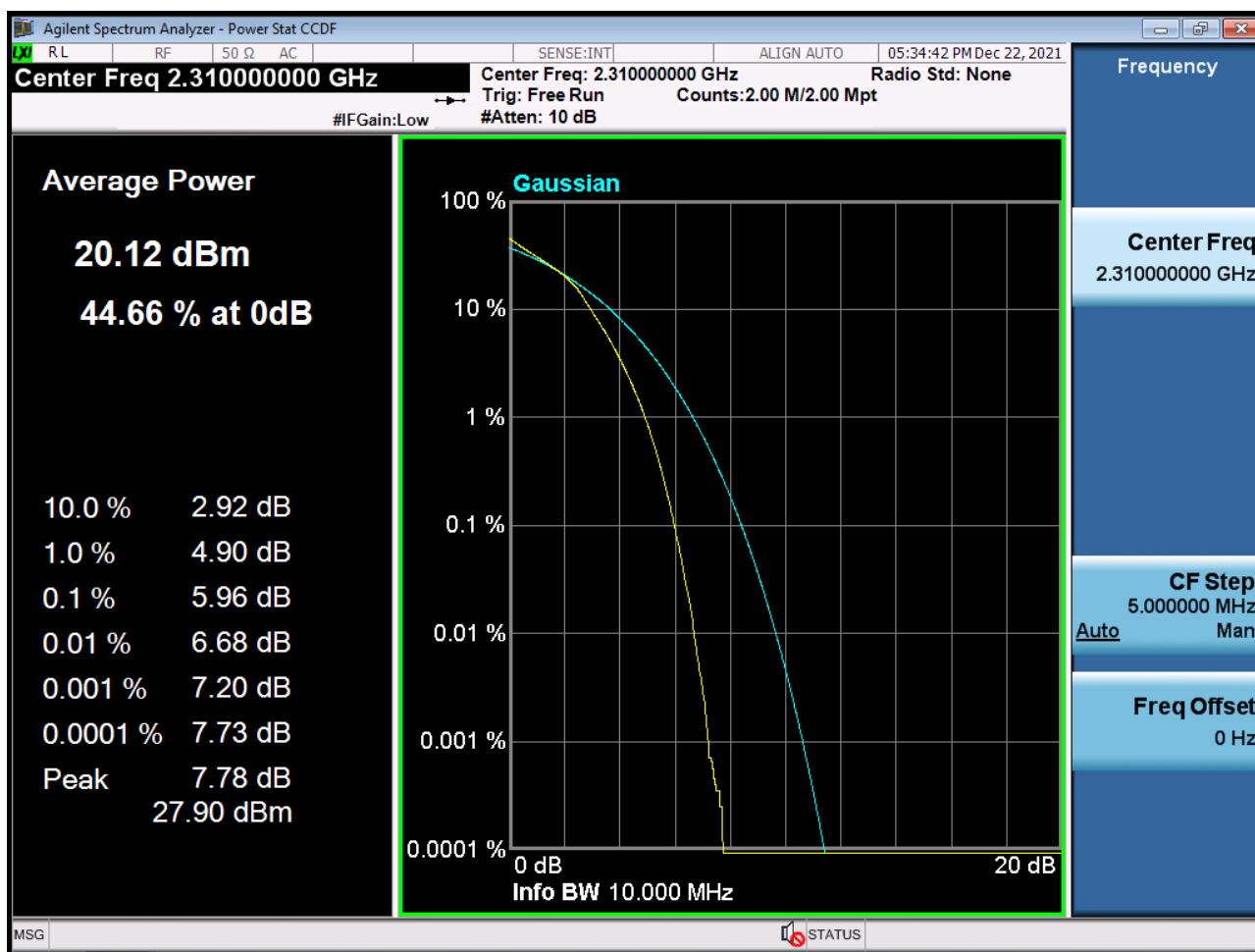
BAND 30. PAR Plot (5 M BW_Ch.27710_256QAM_RB25_0)



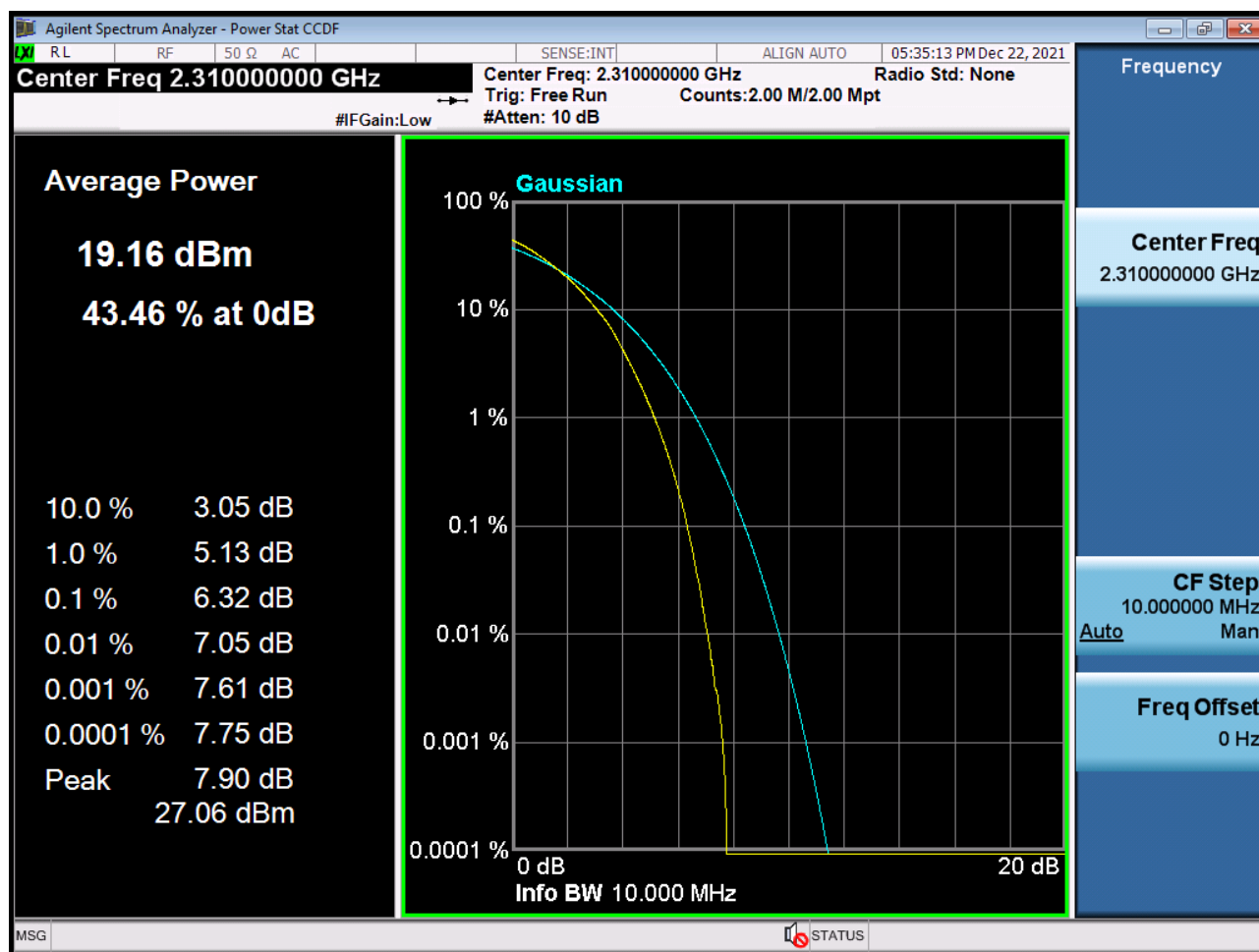
BAND 30. PAR Plot (10 M BW_Ch.27710_QPSK_RB50_0)



BAND 30. PAR Plot (10 M BW_Ch.27710_16QAM_RB50_0)



BAND 30. PAR Plot (10 M BW_Ch.27710_64QAM_RB50_0)



BAND 30. PAR Plot (10 M BW_Ch.27710_256QAM_RB50_0)



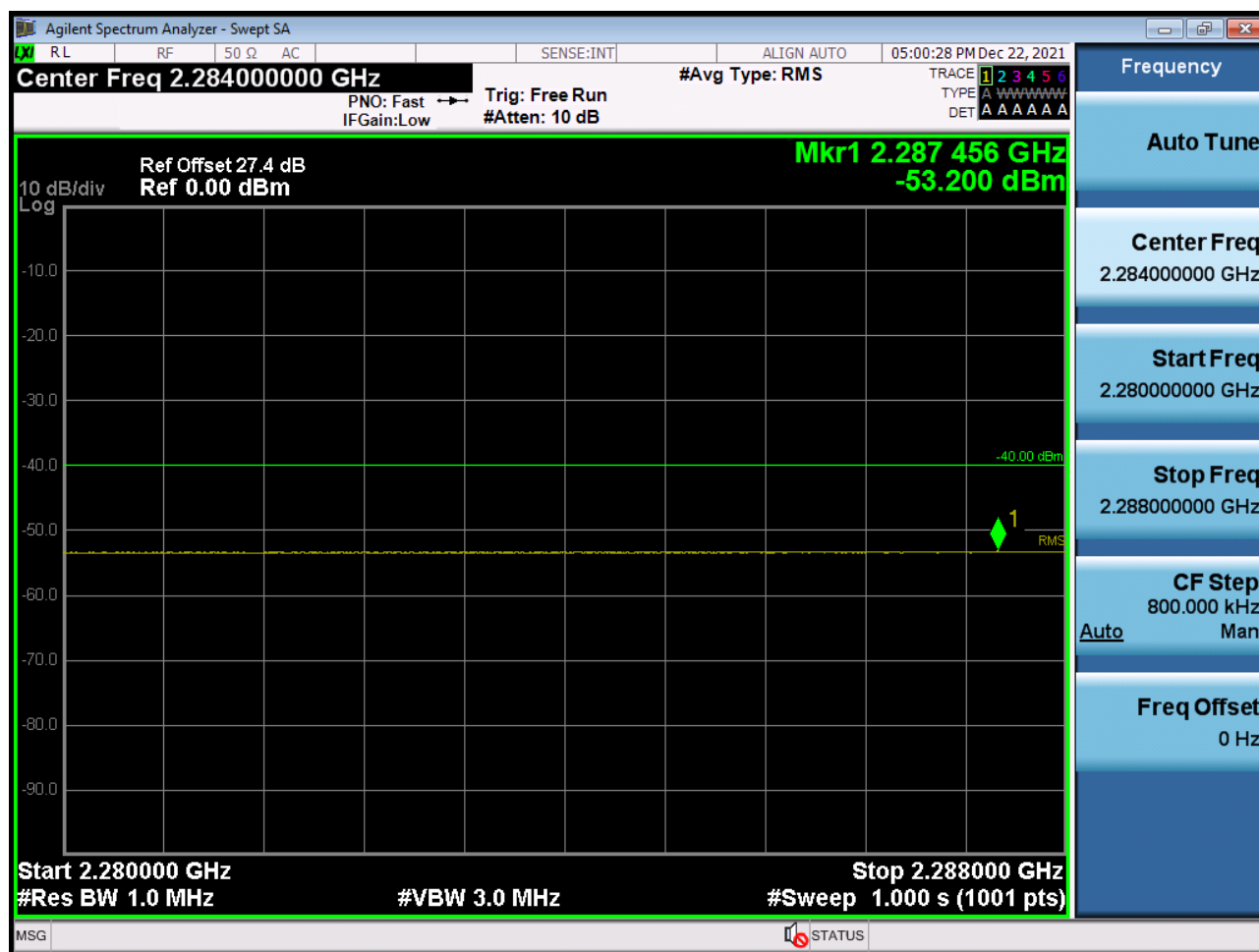
BAND 30. 5 M_BandEdge(2280 MHz-2288 MHz)_Low_2307.5 MHz_QPSK_1RB



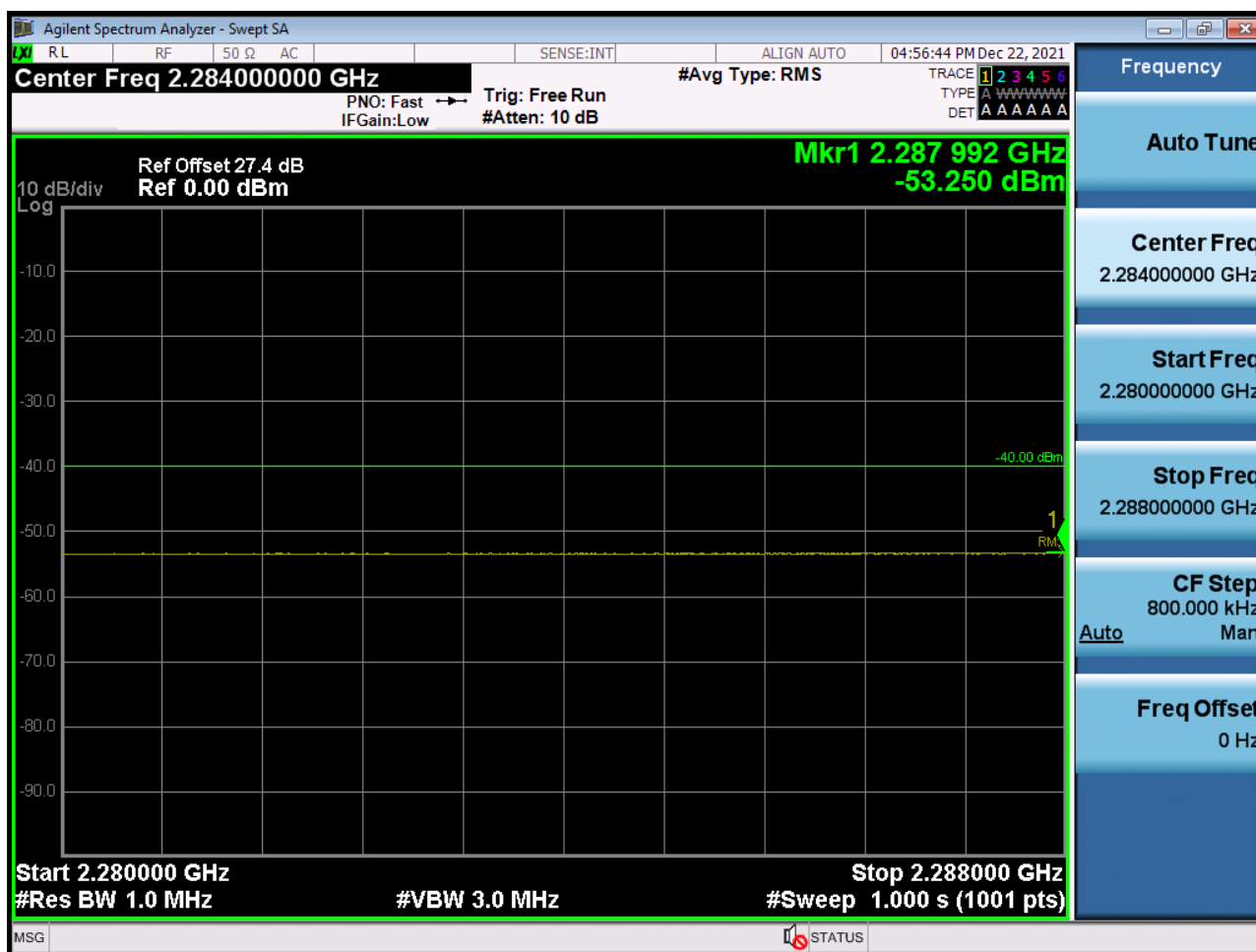
BAND 30. 5 M_BandEdge(2280 MHz-2288 MHz)_Low_2307.5 MHz_QPSK_FullIRB



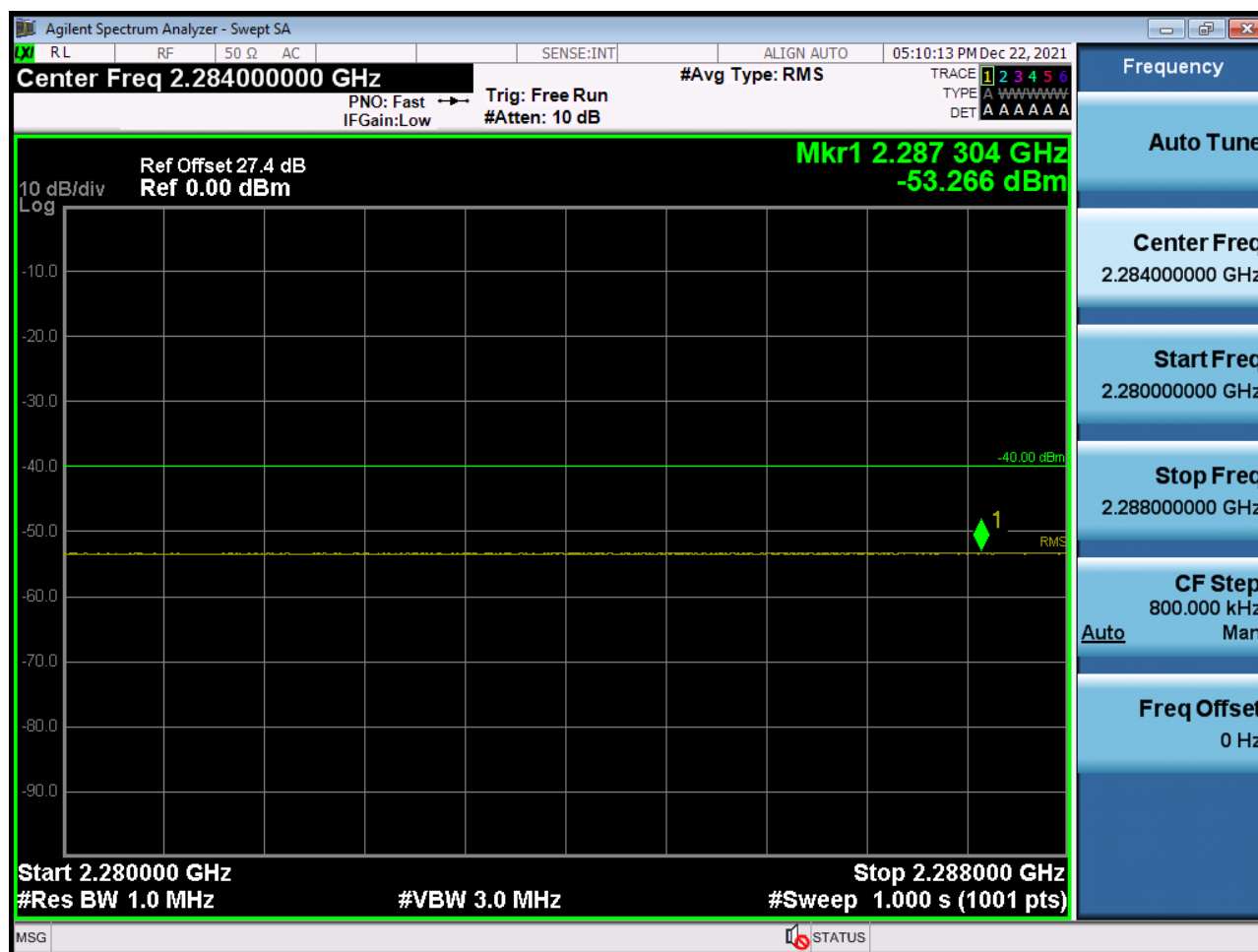
BAND 30. 5 M_BandEdge(2280 MHz-2288 MHz)_Mid_2310 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2280 MHz-2288 MHz)_Mid_2310 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2280 MHz-2288 MHz)_High_2312.5 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2280 MHz-2288 MHz)_High_2312.5 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2288 MHz-2292 MHz)_Low_2307.5 MHz_QPSK_1RB



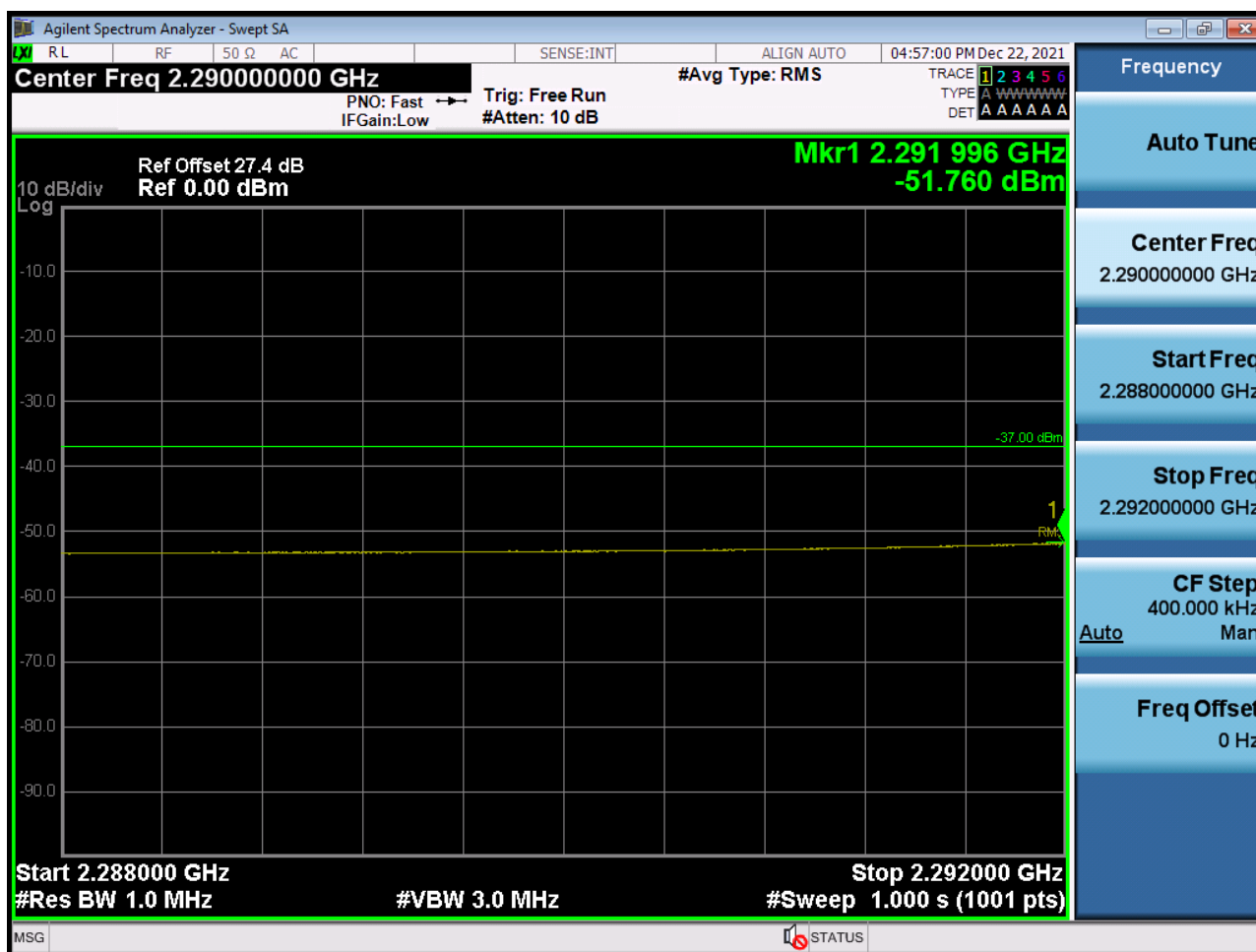
BAND 30.5 M_BandEdge(2288 MHz-2292 MHz)_Low_2307.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2288 MHz-2292 MHz)_Mid_2310 MHz_QPSK_1RB



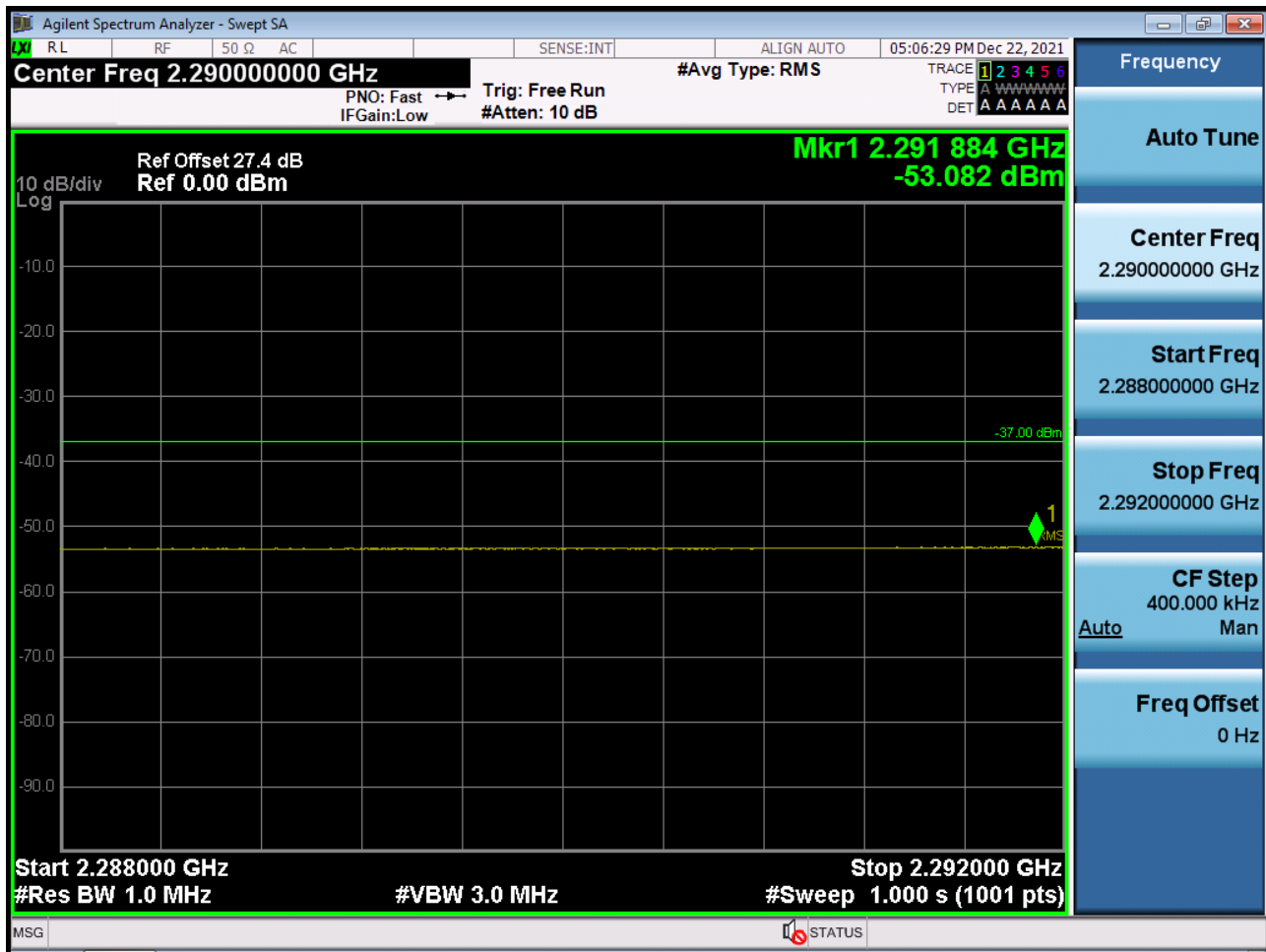
BAND 30. 5 M_BandEdge(2288 MHz-2292 MHz)_Mid_2310 MHz_QPSK_FullRB



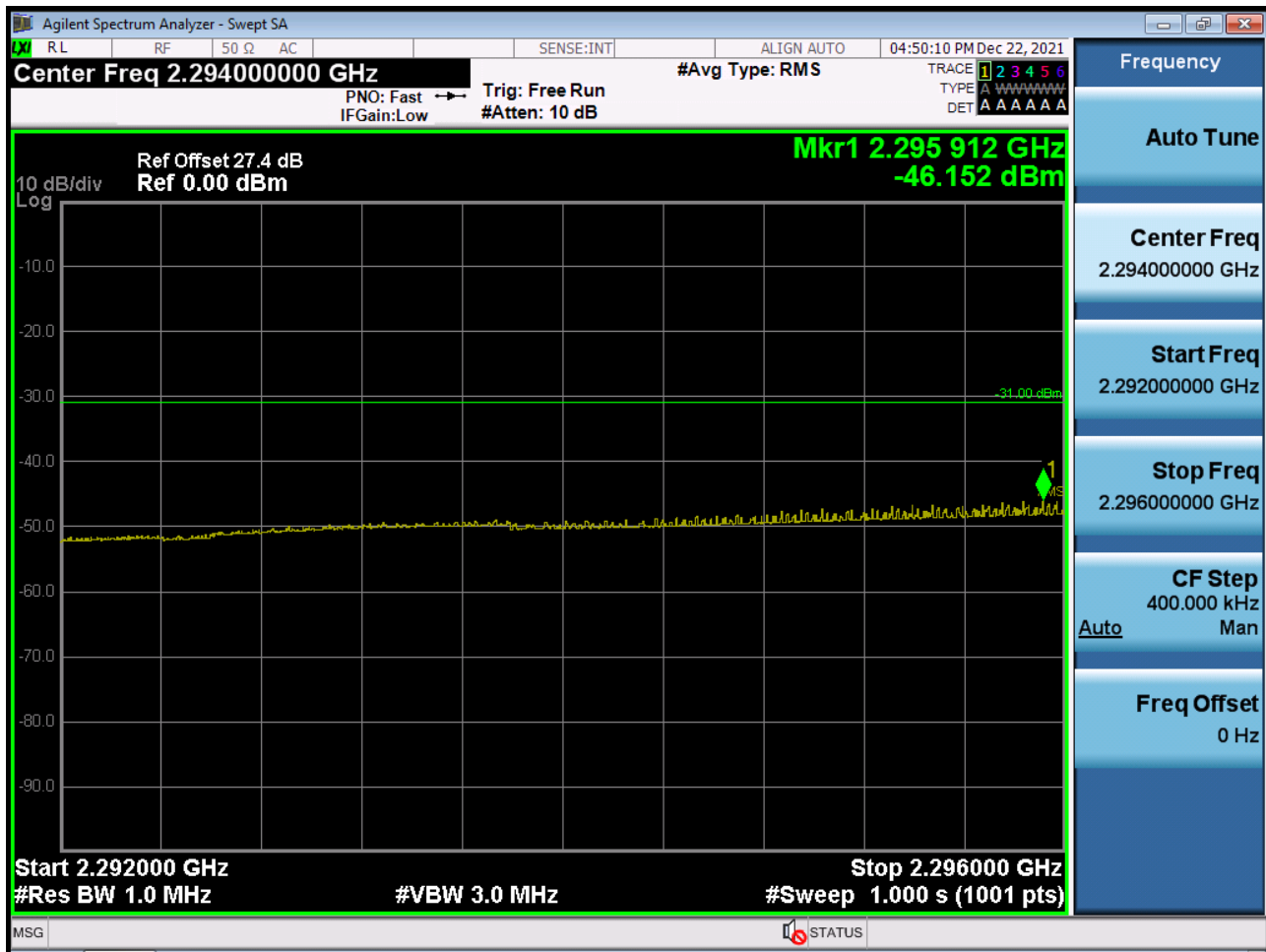
BAND 30. 5 M_BandEdge(2288 MHz-2292 MHz)_High_2312.5 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2288 MHz-2292 MHz)_High_2312.5 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2292 MHz-2296 MHz)_Low_2307.5 MHz_QPSK_1RB



BAND 30.5 M_BandEdge(2292 MHz-2296 MHz)_Low_2307.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2292 MHz-2296 MHz)_Mid_2310 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2292 MHz-2296 MHz)_Mid_2310 MHz_QPSK_FullRB



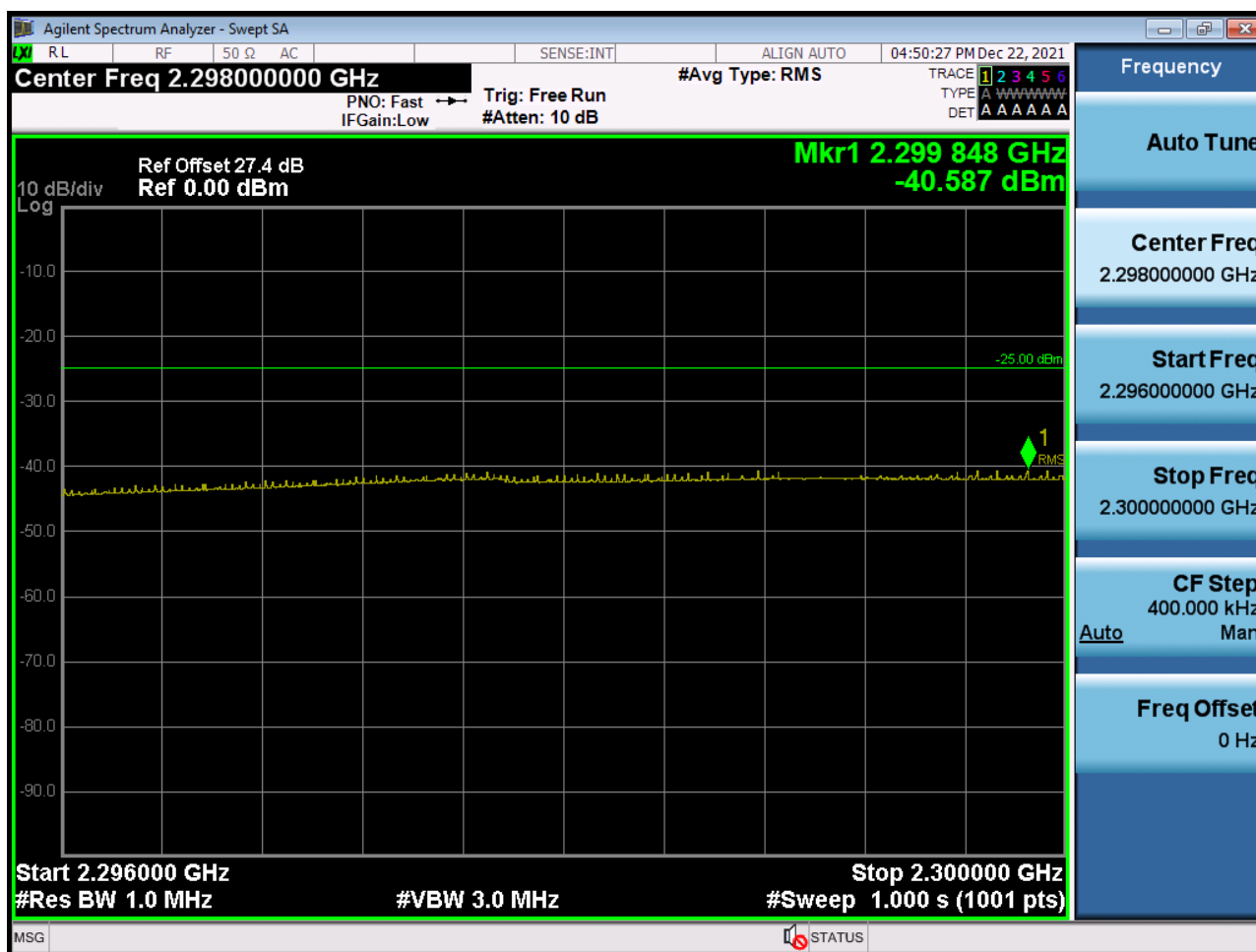
BAND 30. 5 M_BandEdge(2292 MHz-2296 MHz)_High_2312.5 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2292 MHz-2296 MHz)_High_2312.5 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2296 MHz-2300 MHz)_Low_2307.5 MHz_QPSK_1RB



BAND 30.5 M_BandEdge(2296 MHz-2300 MHz)_Low_2307.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2296 MHz-2300 MHz)_Mid_2310 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2296 MHz-2300 MHz)_Mid_2310 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2296 MHz-2300 MHz)_High_2312.5 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2296 MHz-2300 MHz)_High_2312.5 MHz_QPSK_FullRB



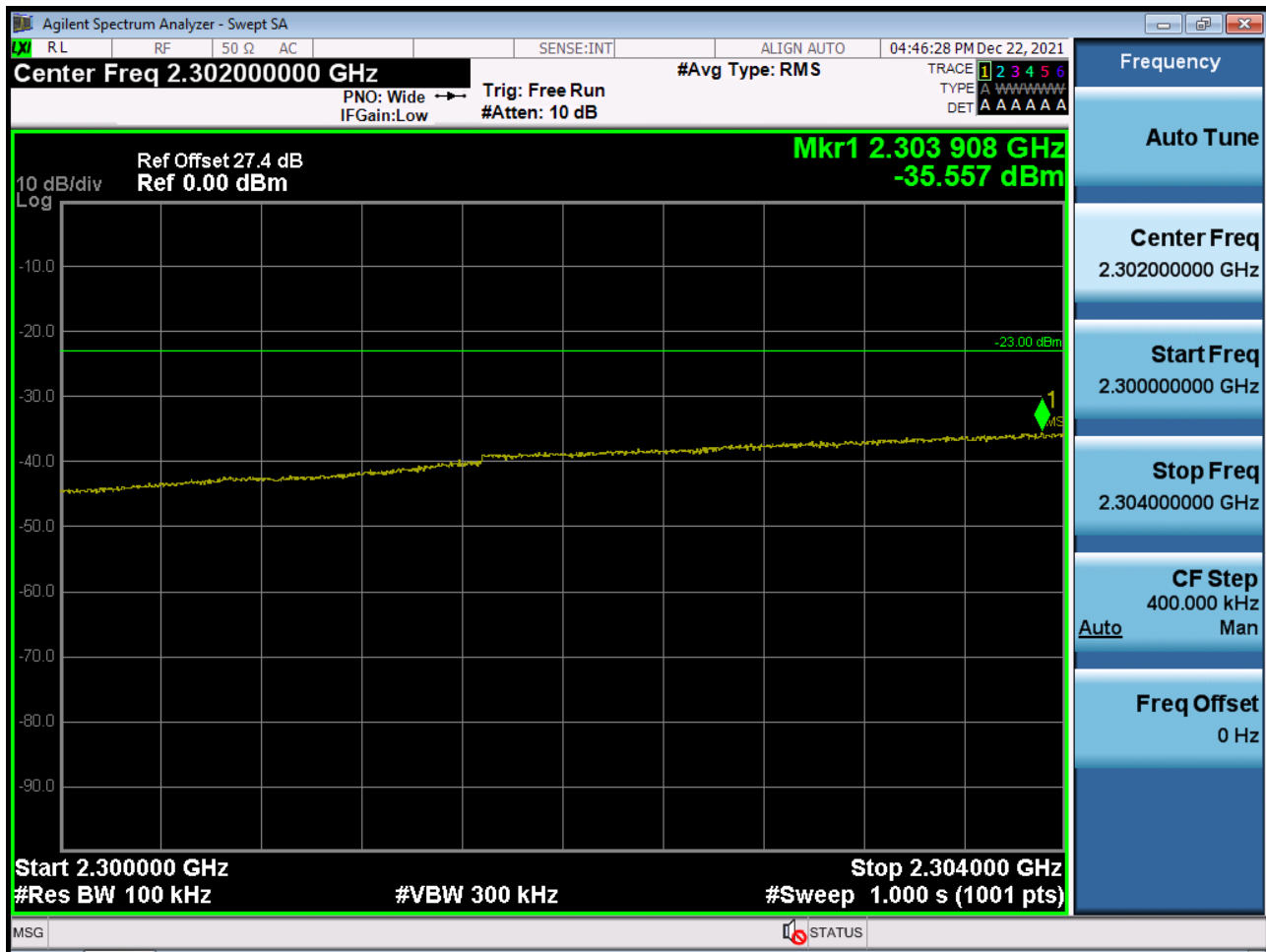
BAND 30. 5 M_BandEdge(2300 MHz-2304 MHz)_Low_2307.5 MHz_QPSK_1RB



Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -46.283 dBm + 10 dB = -36.283 dBm

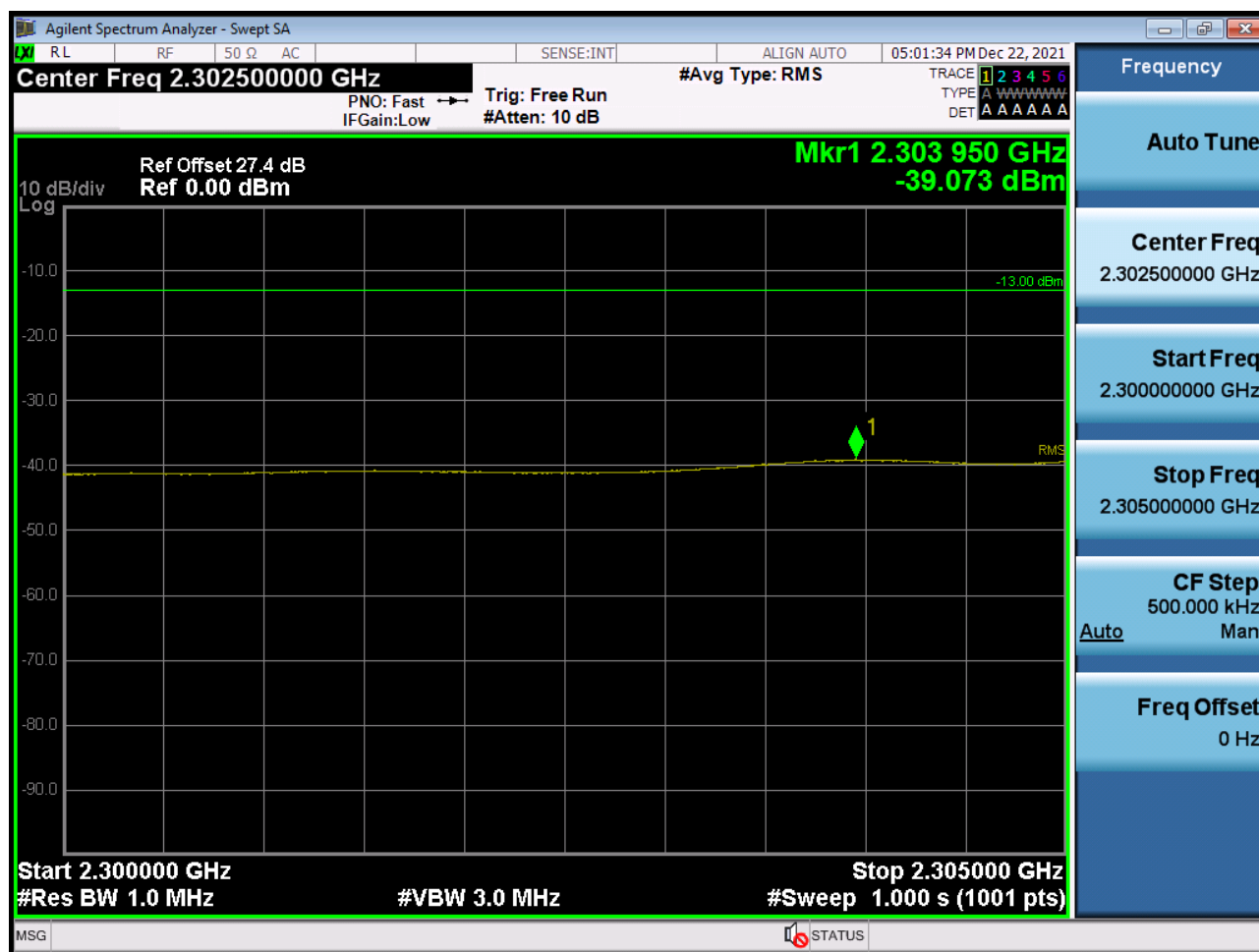
BAND 30.5 M_BandEdge(2300 MHz-2304 MHz)_Low_2307.5 MHz_QPSK_FullIRB



Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -35.557 dBm + 10 dB = -25.557 dBm

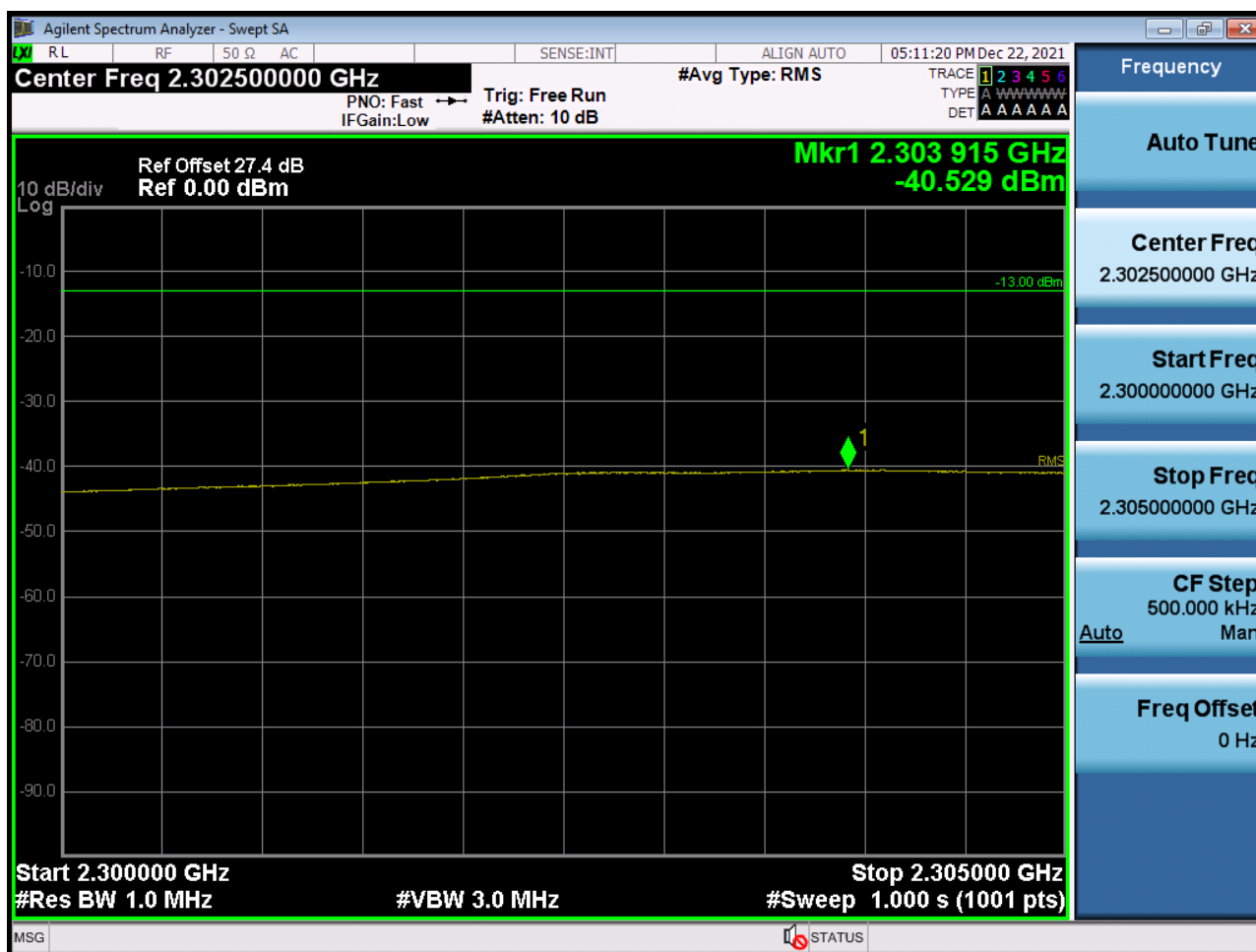
BAND 30. 5 M_BandEdge(2300 MHz-2305 MHz)_Mid_2310 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2300 MHz-2305 MHz)_Mid_2310 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2300 MHz-2305 MHz)_High_2312.5 MHz_QPSK_1RB



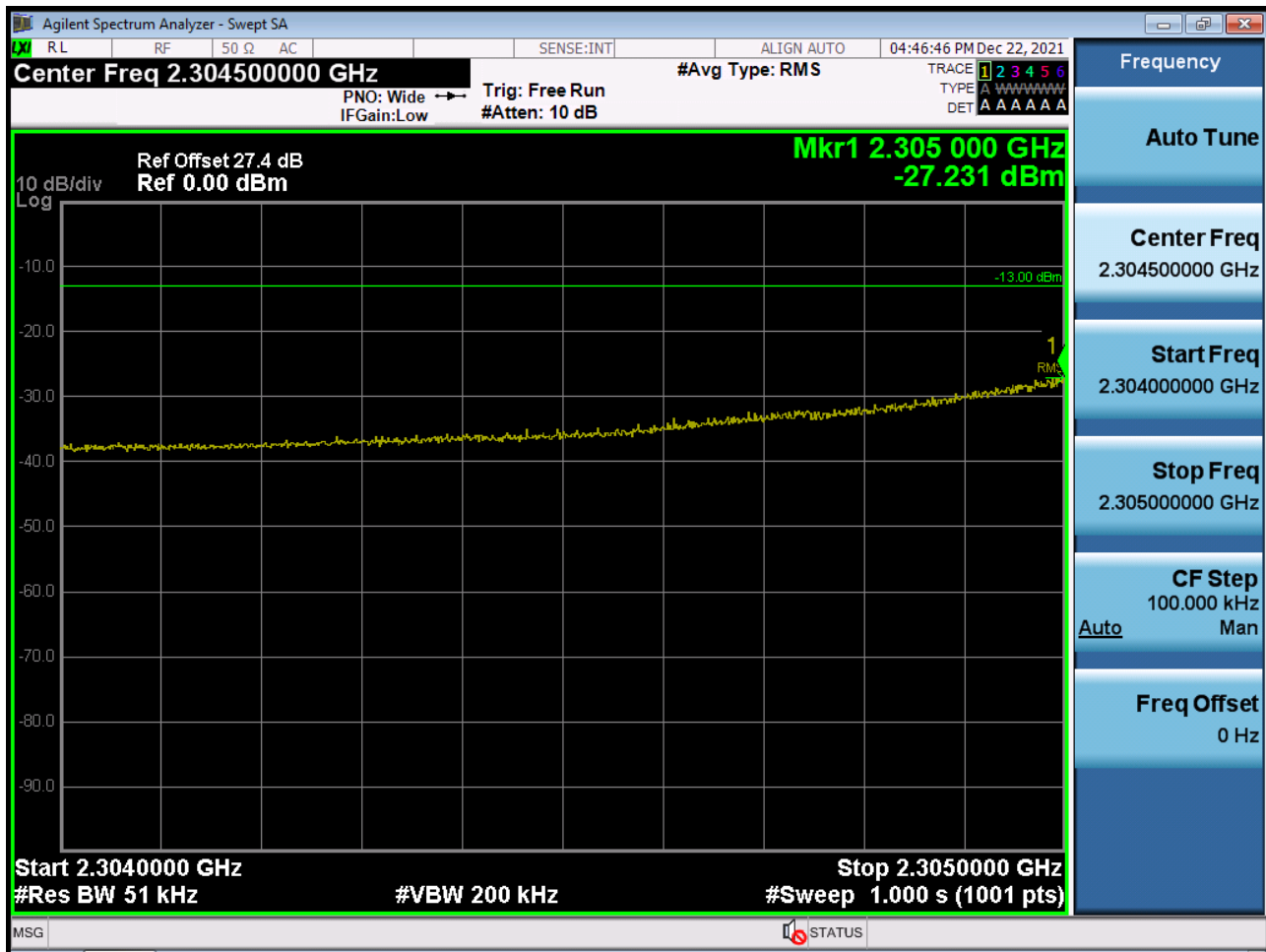
BAND 30. 5 M_BandEdge(2300 MHz-2305 MHz)_High_2312.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2304 MHz-2305 MHz)_Low_2307.5 MHz_QPSK_1RB



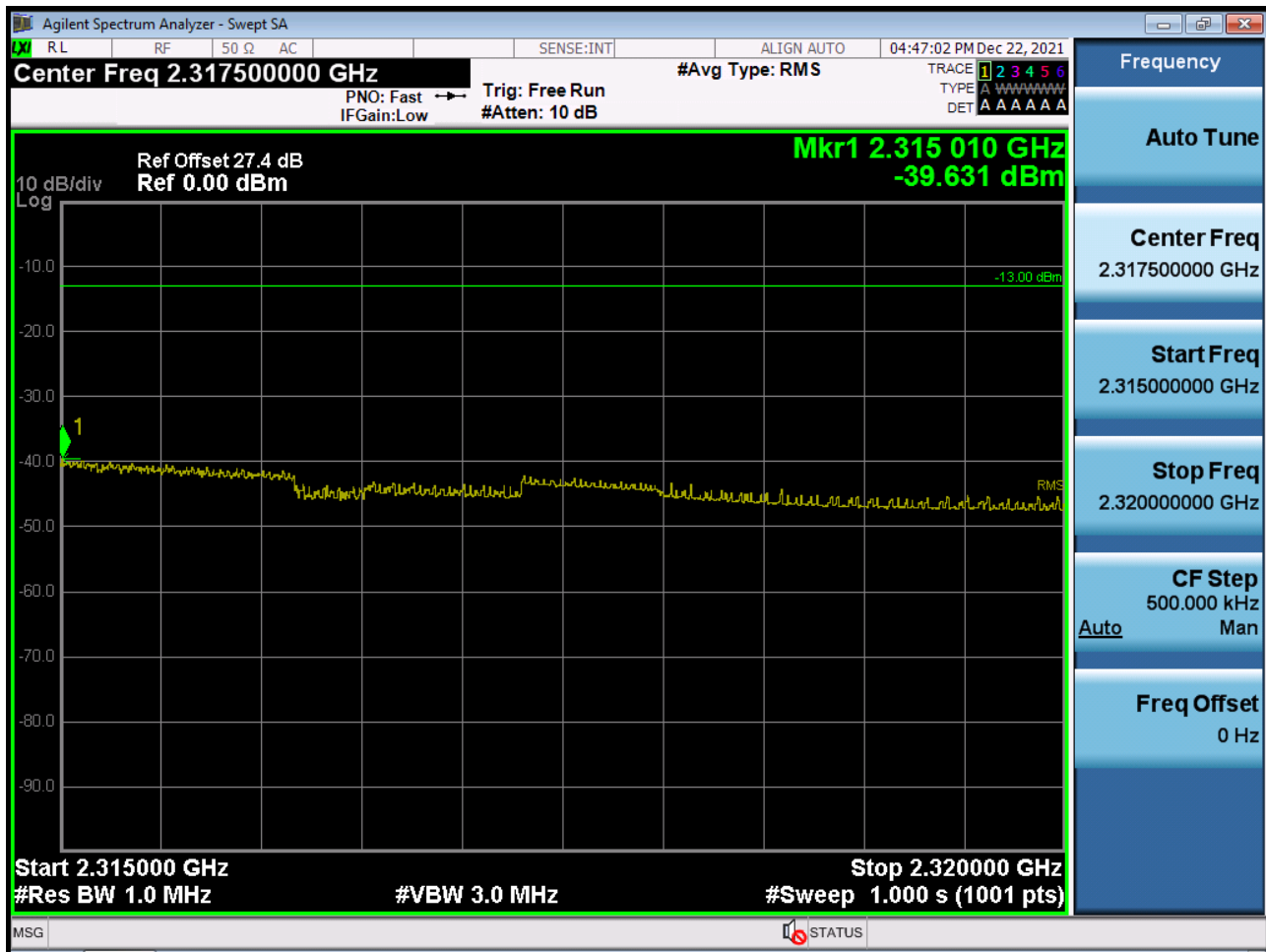
BAND 30.5 M_BandEdge(2304 MHz-2305 MHz)_Low_2307.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2315 MHz-2320 MHz)_Low_2307.5 MHz_QPSK_1RB



BAND 30.5 M_BandEdge(2315 MHz-2320 MHz)_Low_2307.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2315 MHz-2320 MHz)_Mid_2310 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2315 MHz-2320 MHz)_Mid_2310 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2315 MHz-2316 MHz)_High_2312.5 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2315 MHz-2316 MHz)_High_2312.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2316 MHz-2320 MHz)_High_2312.5 MHz_QPSK_1RB



Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -42.270 dBm + 10 dB = -32.270 dBm

BAND 30.5 M_BandEdge(2316 MHz-2320 MHz)_High_2312.5 MHz_QPSK_FullRB



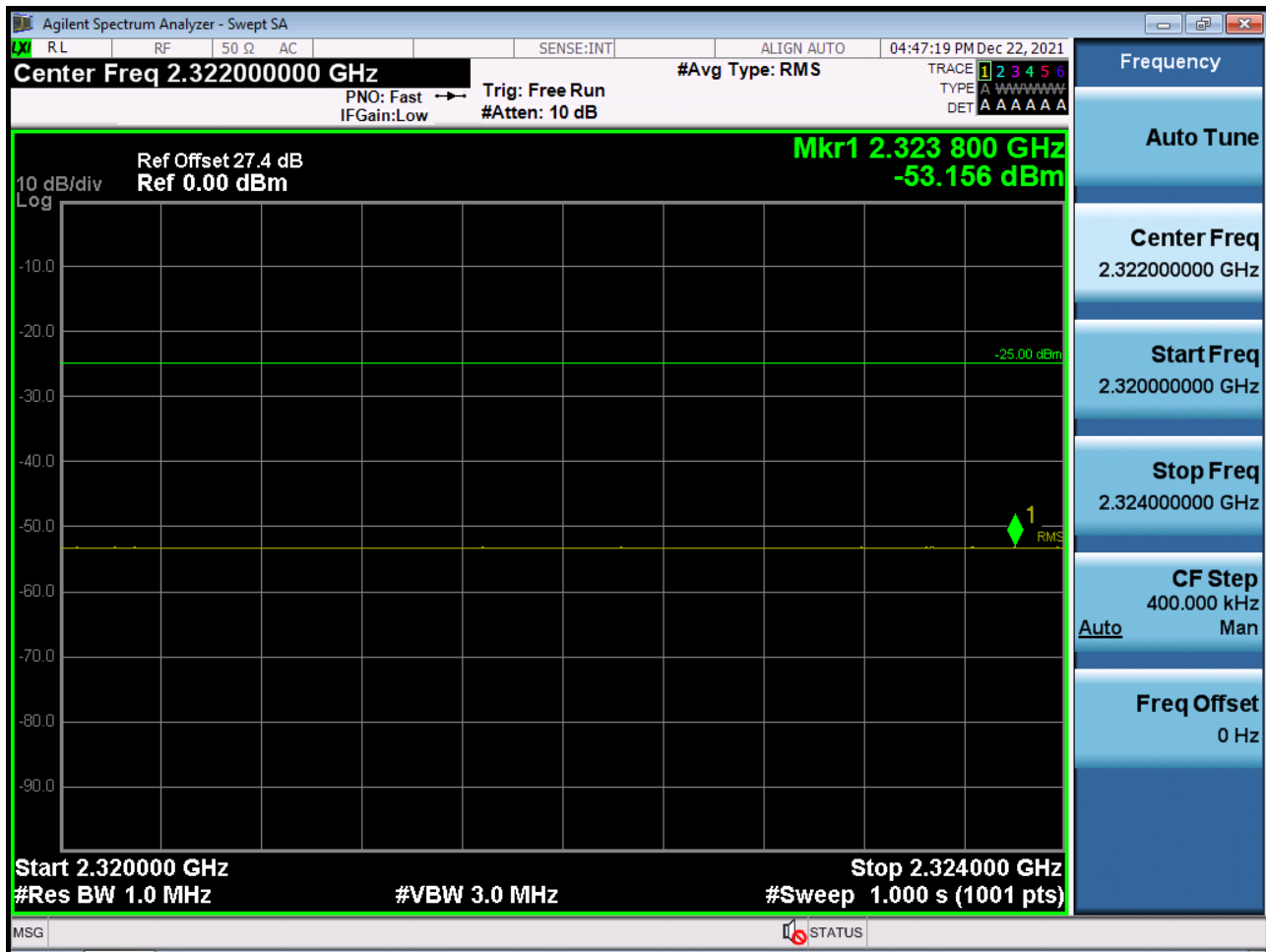
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10 x log(1 MHz/100 kHz) dB = -34.529 dBm + 10 dB = -24.529 dBm

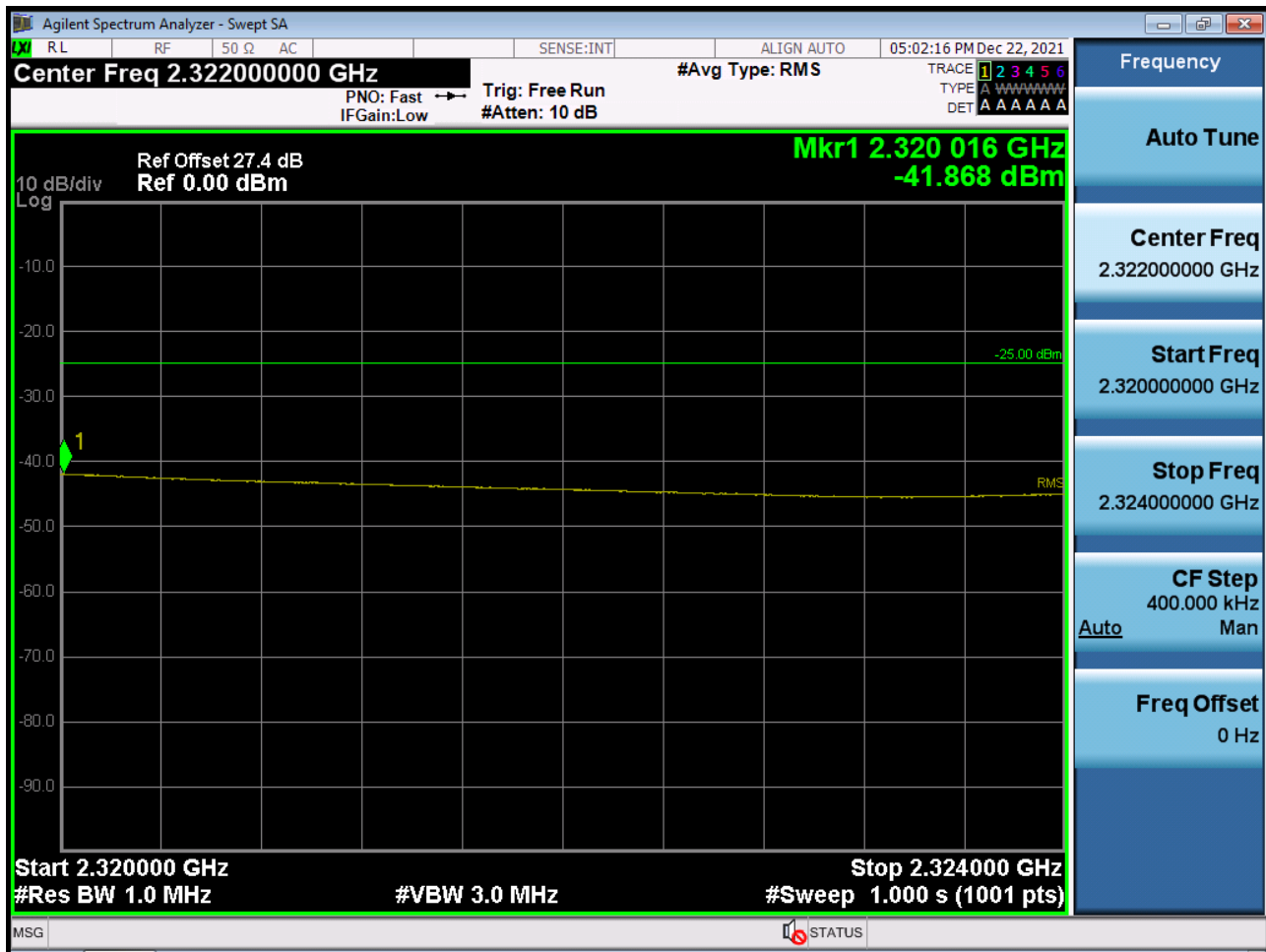
BAND 30. 5 M_BandEdge(2320 MHz-2324 MHz)_Low_2307.5 MHz_QPSK_1RB



BAND 30.5 M_BandEdge(2320 MHz-2324 MHz)_Low_2307.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2320 MHz-2324 MHz)_Mid_2310 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2320 MHz-2324 MHz)_Mid_2310 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2320 MHz-2324 MHz)_High_2312.5 MHz_QPSK_1RB



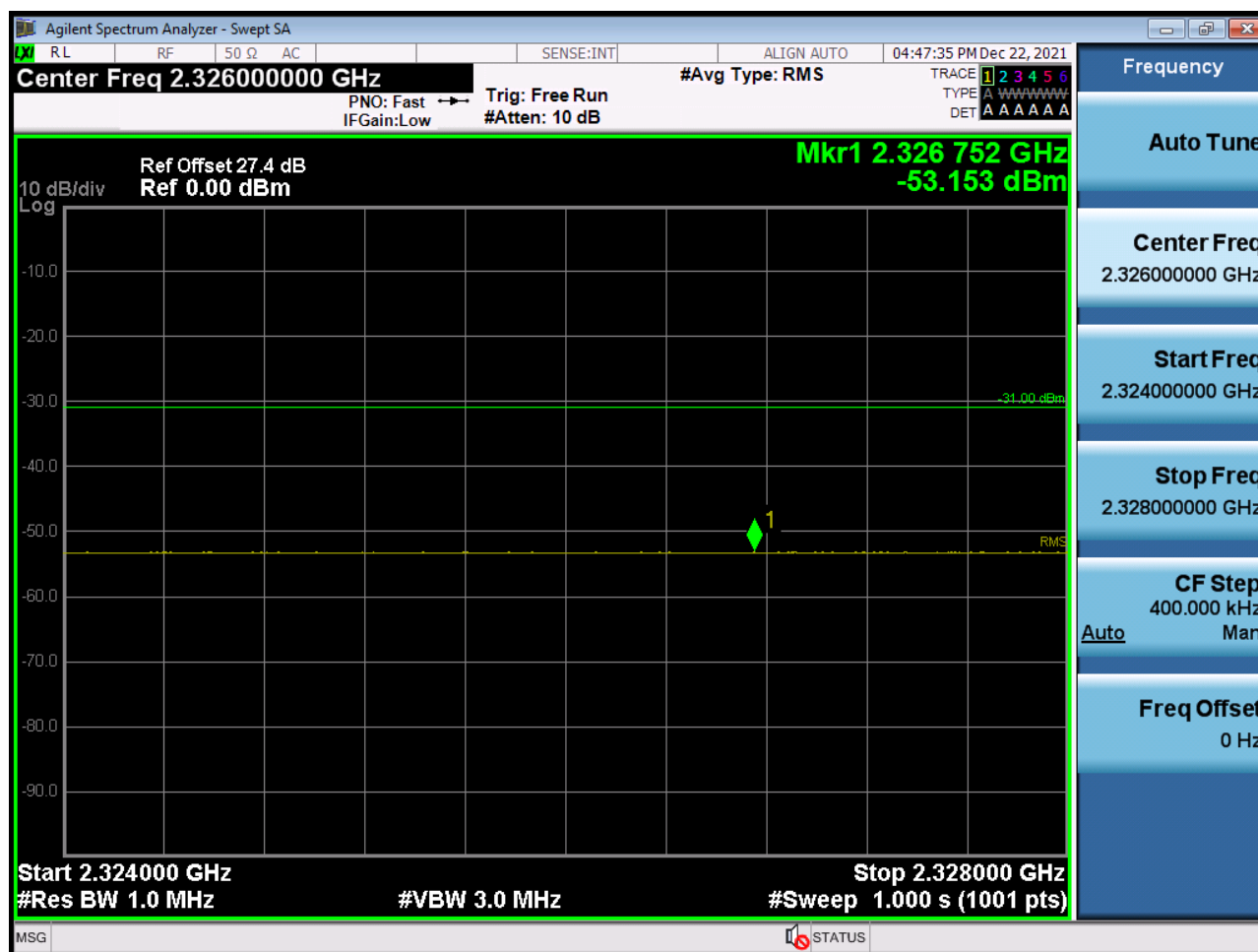
BAND 30. 5 M_BandEdge(2320 MHz-2324 MHz)_High_2312.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2324 MHz-2328 MHz)_Low_2307.5 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2324 MHz-2328 MHz)_Low_2307.5 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2324 MHz-2328 MHz)_Mid_2310 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2324 MHz-2328 MHz)_Mid_2310 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2324 MHz-2328 MHz)_High_2312.5 MHz_QPSK_1RB



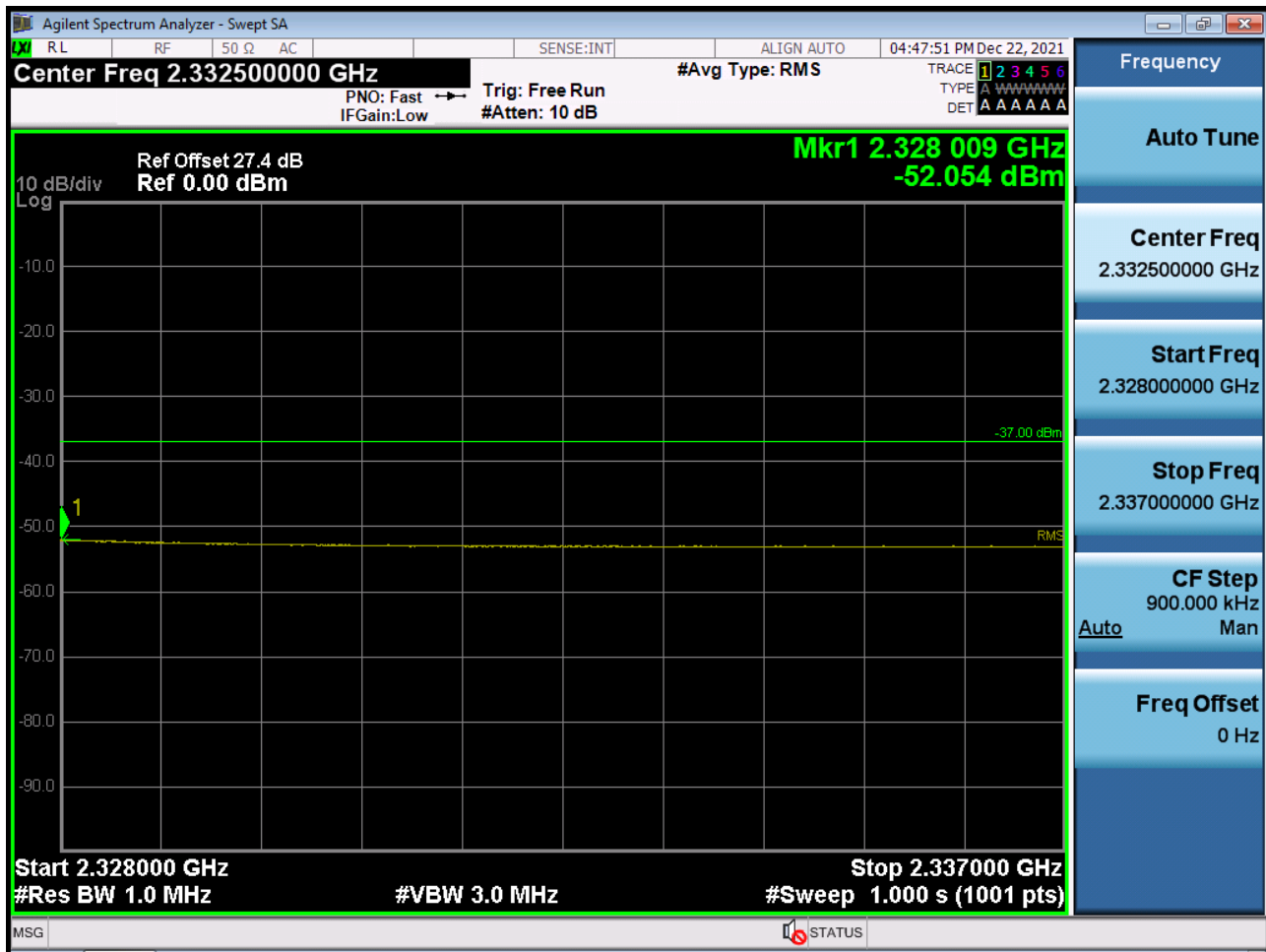
BAND 30. 5 M_BandEdge(2324 MHz-2328 MHz)_High_2312.5 MHz_QPSK_FullRB



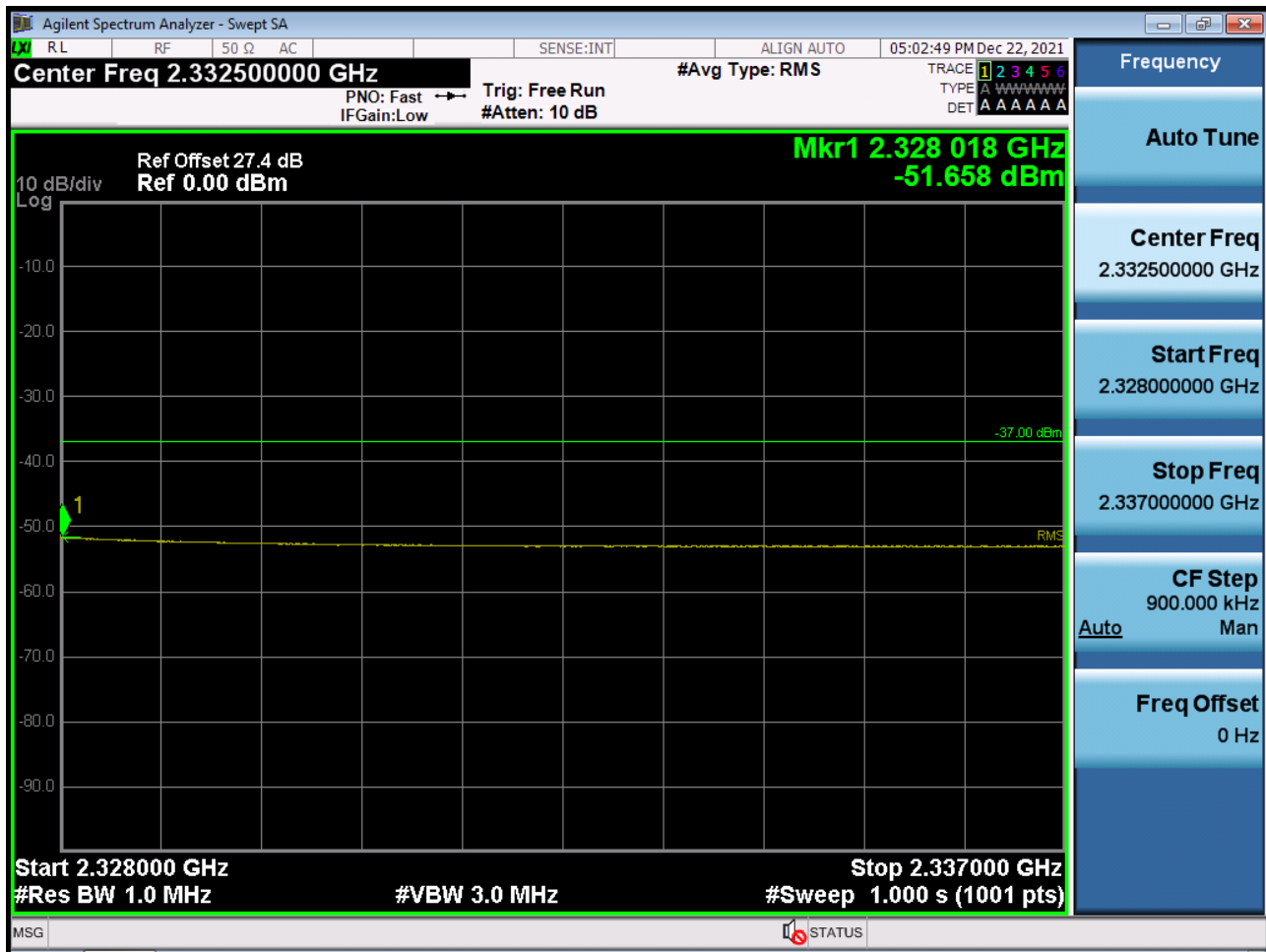
BAND 30. 5 M_BandEdge(2328 MHz-2337 MHz)_Low_2307.5 MHz_QPSK_1RB



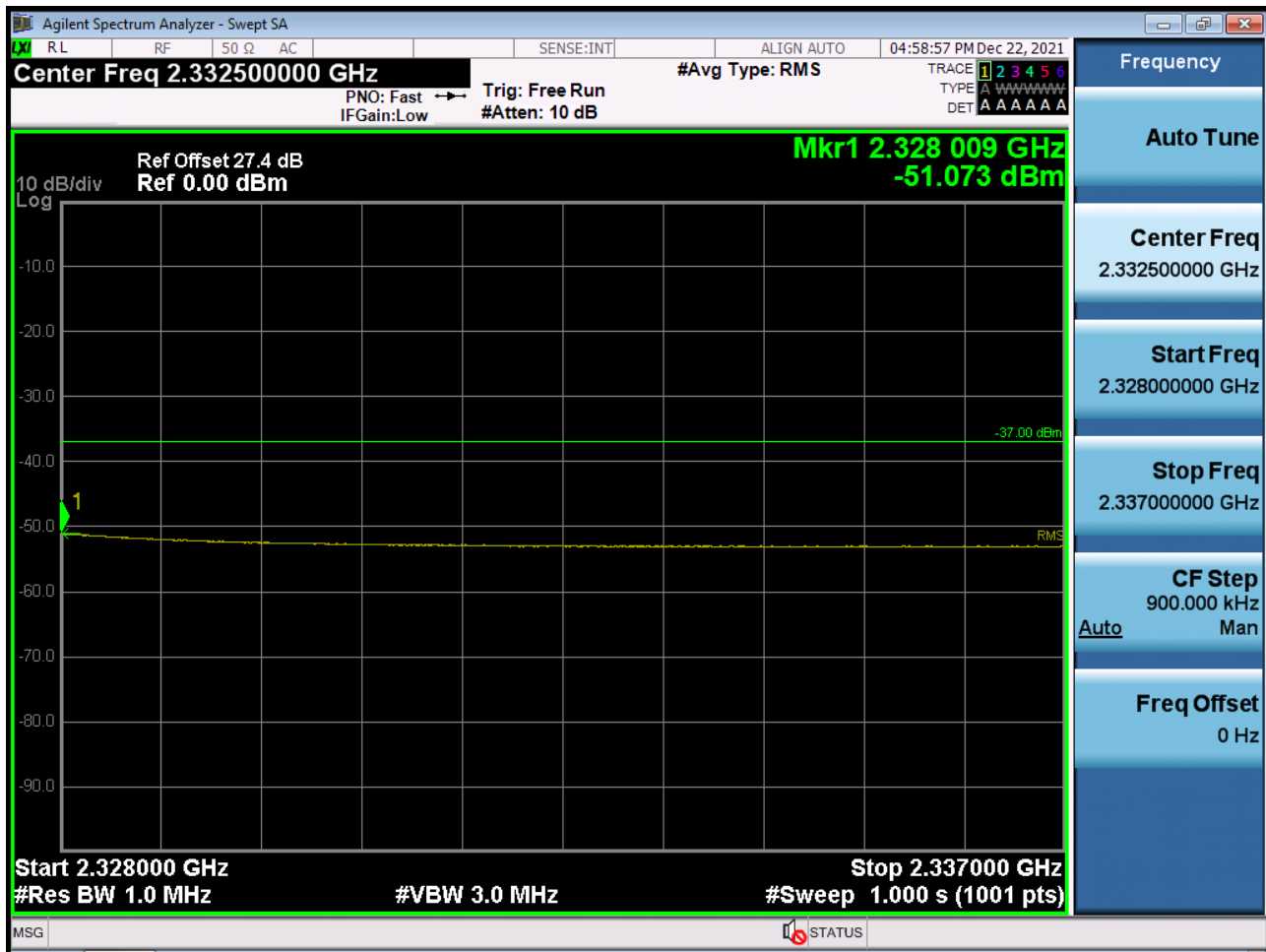
BAND 30.5 M_BandEdge(2328 MHz-2337 MHz)_Low_2307.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2328 MHz-2337 MHz)_Mid_2310 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2328 MHz-2337 MHz)_Mid_2310 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2328 MHz-2337 MHz)_High_2312.5 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2328 MHz-2337 MHz)_High_2312.5 MHz_QPSK_FullRB



BAND 30. 5 M_BandEdge(2337 MHz-2341 MHz)_Low_2307.5 MHz_QPSK_1RB



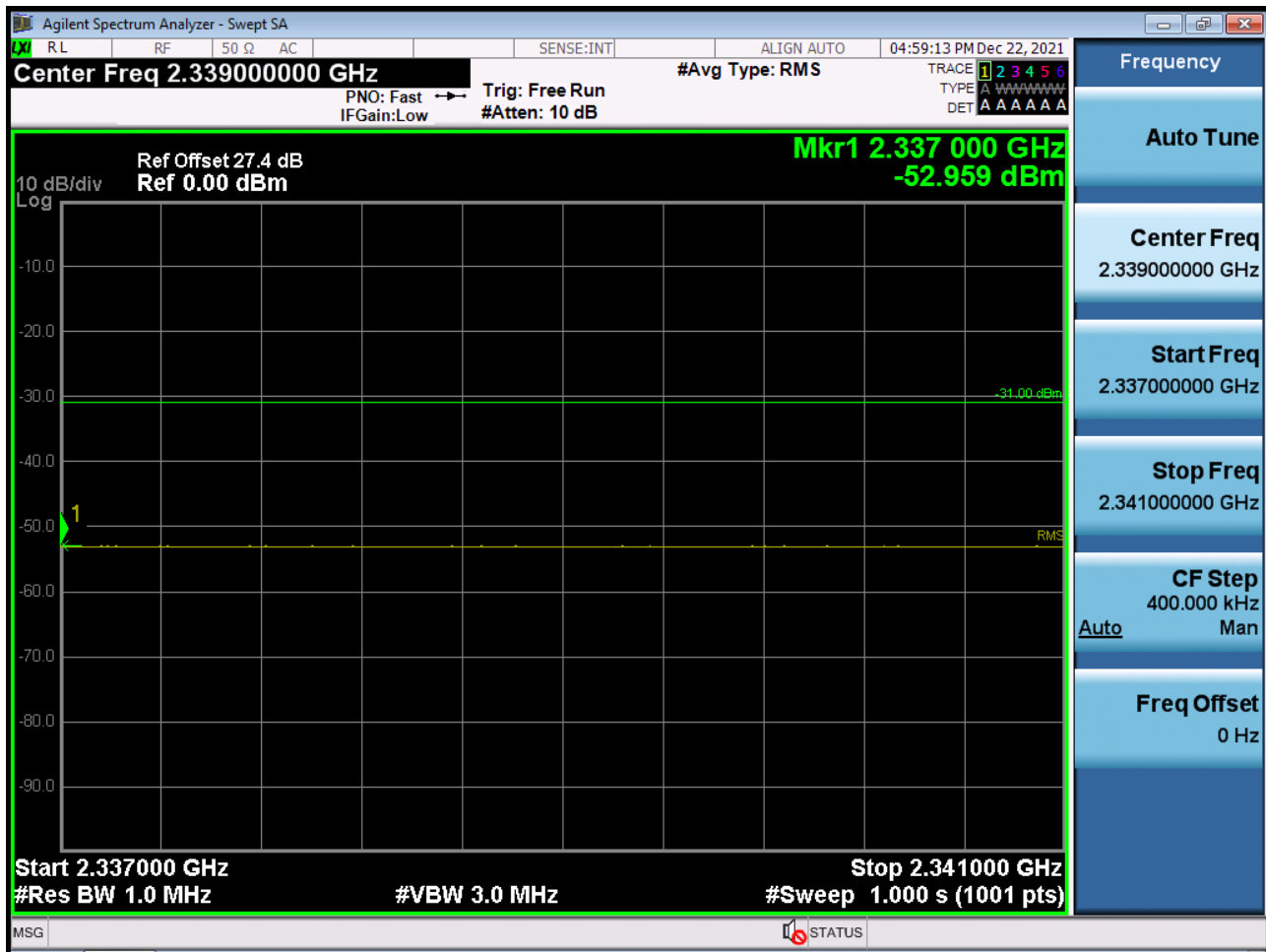
BAND 30.5 M_BandEdge(2337 MHz-2341 MHz)_Low_2307.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2337 MHz-2341 MHz)_Mid_2310 MHz_QPSK_1RB



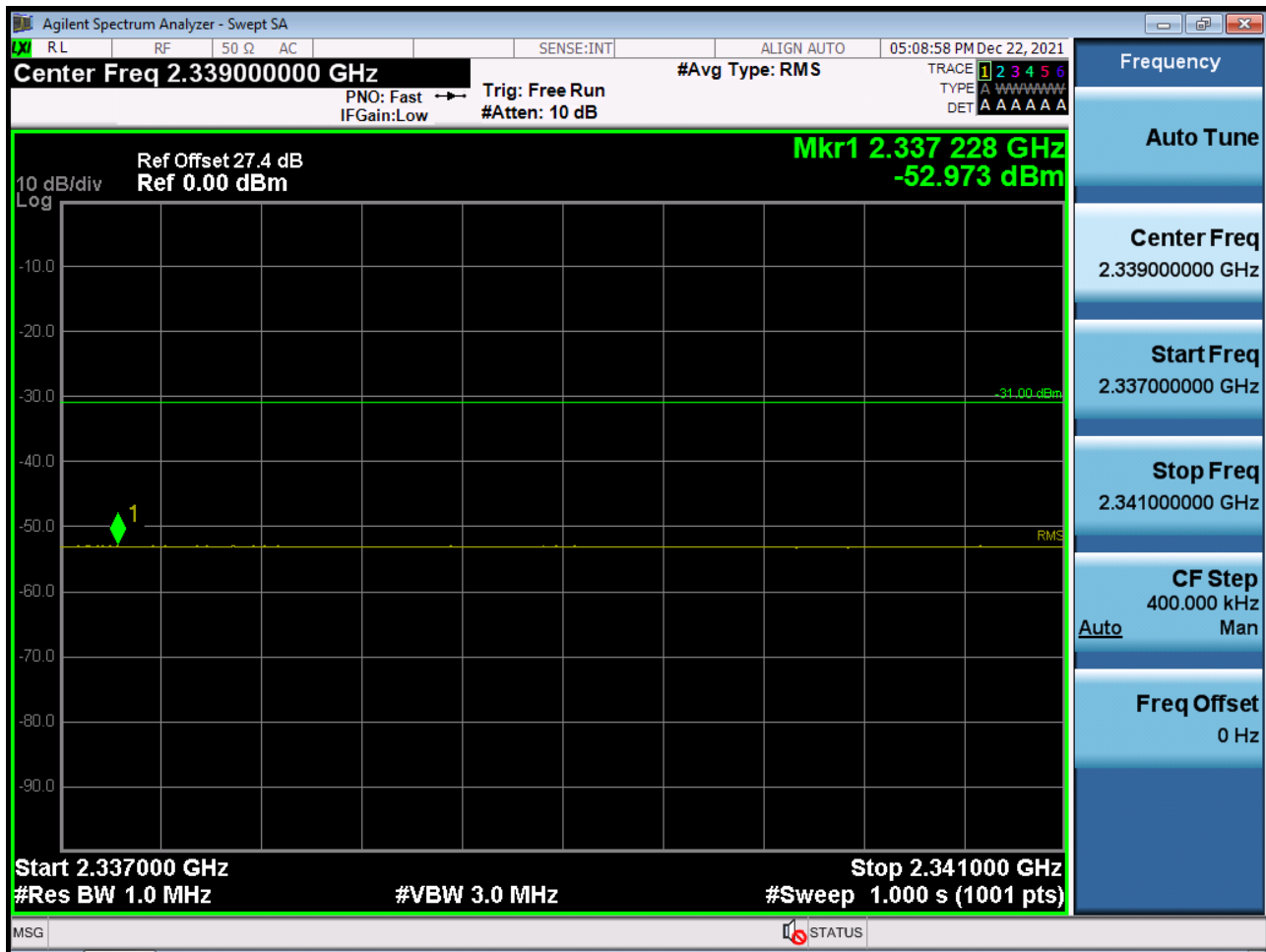
BAND 30. 5 M_BandEdge(2337 MHz-2341 MHz)_Mid_2310 MHz_QPSK_FullRB



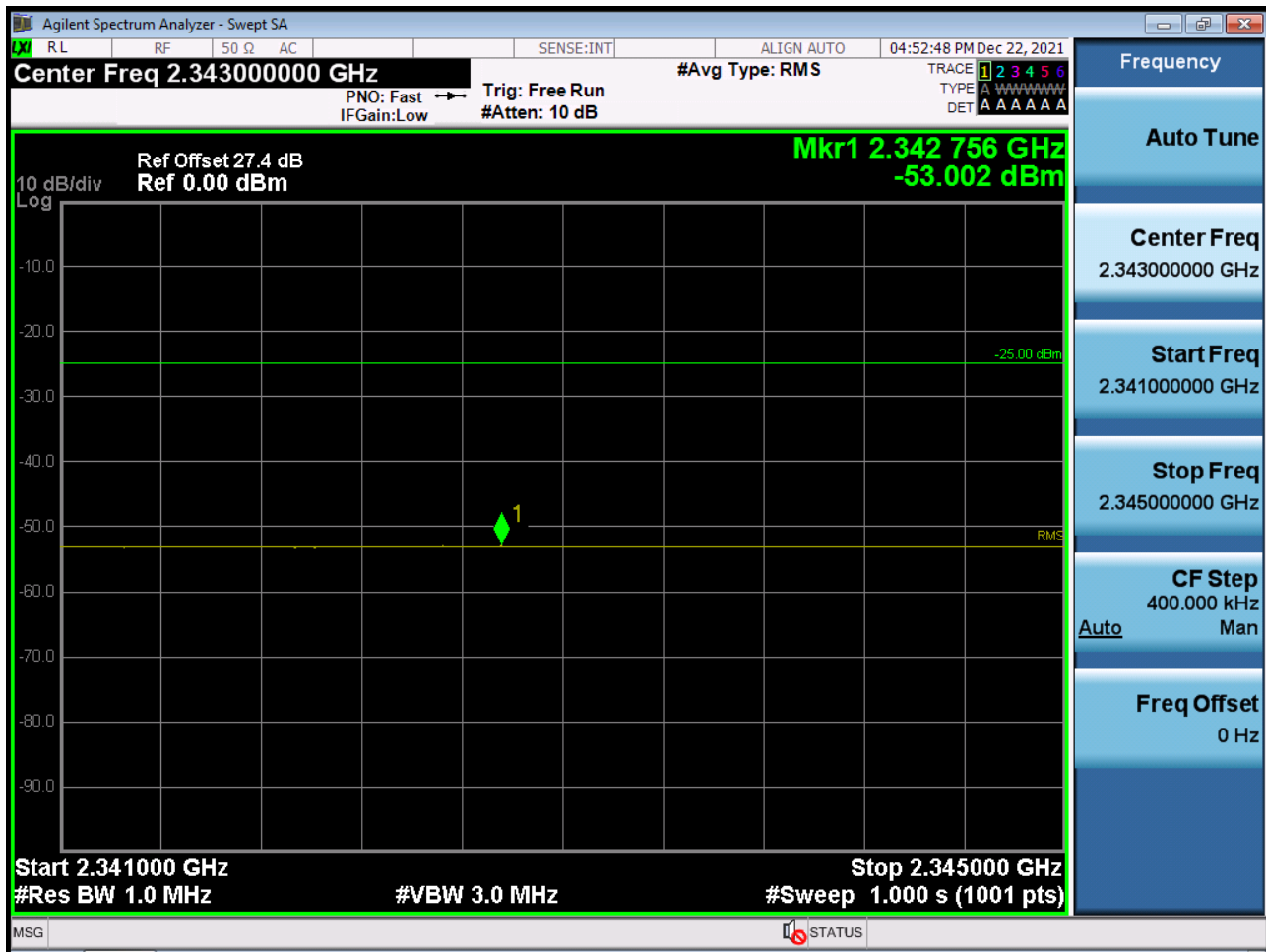
BAND 30. 5 M_BandEdge(2337 MHz-2341 MHz)_High_2312.5 MHz_QPSK_1RB



BAND 30.5 M_BandEdge(2337 MHz-2341 MHz)_High_2312.5 MHz_QPSK_FullIRB



BAND 30.5 M_BandEdge(2341 MHz-2345 MHz)_Low_2307.5 MHz_QPSK_1RB



BAND 30.5 M_BandEdge(2341 MHz-2345 MHz)_Low_2307.5 MHz_QPSK_FullIRB



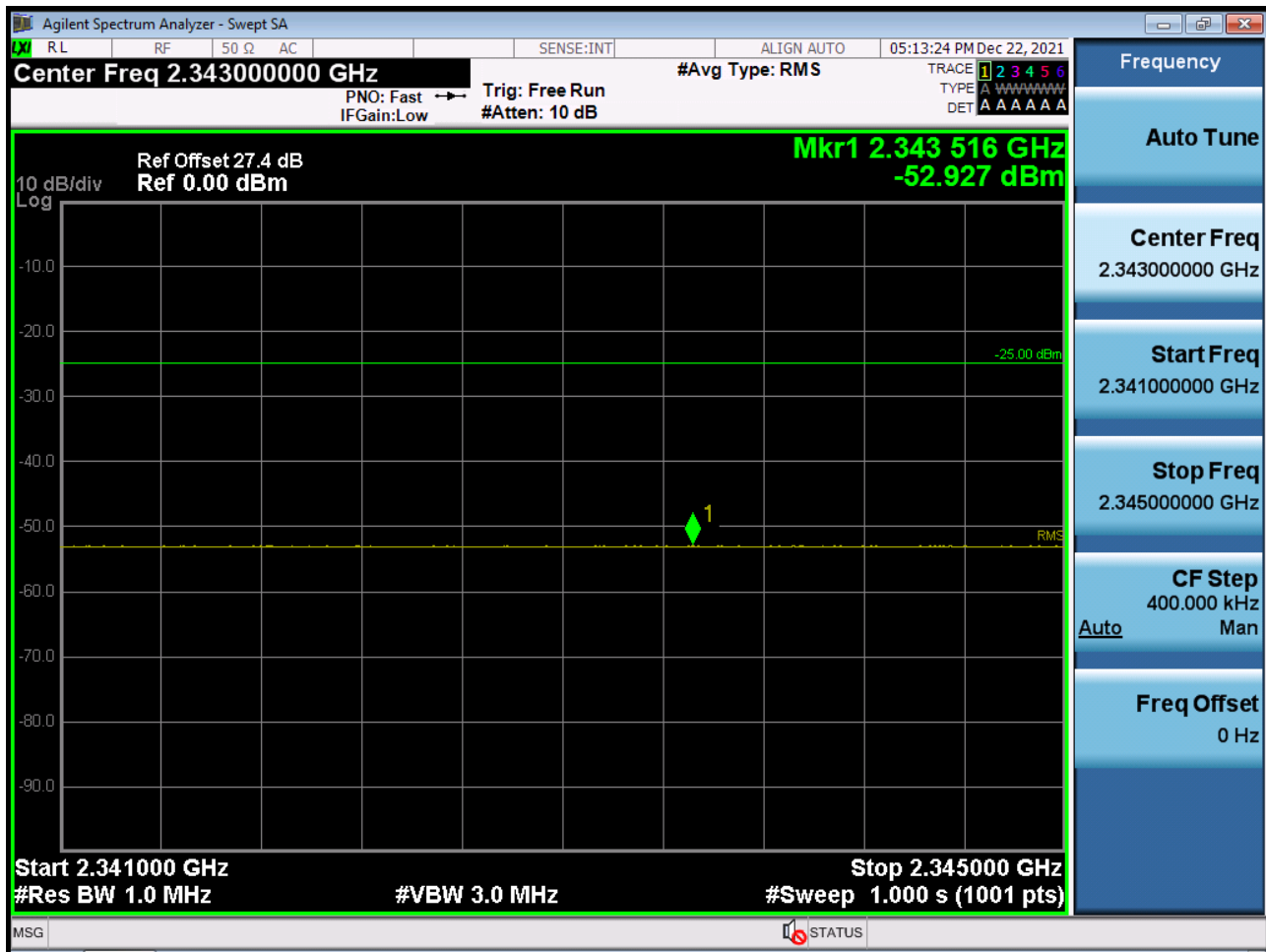
BAND 30.5 M_BandEdge(2341 MHz-2345 MHz)_Mid_2310 MHz_QPSK_1RB



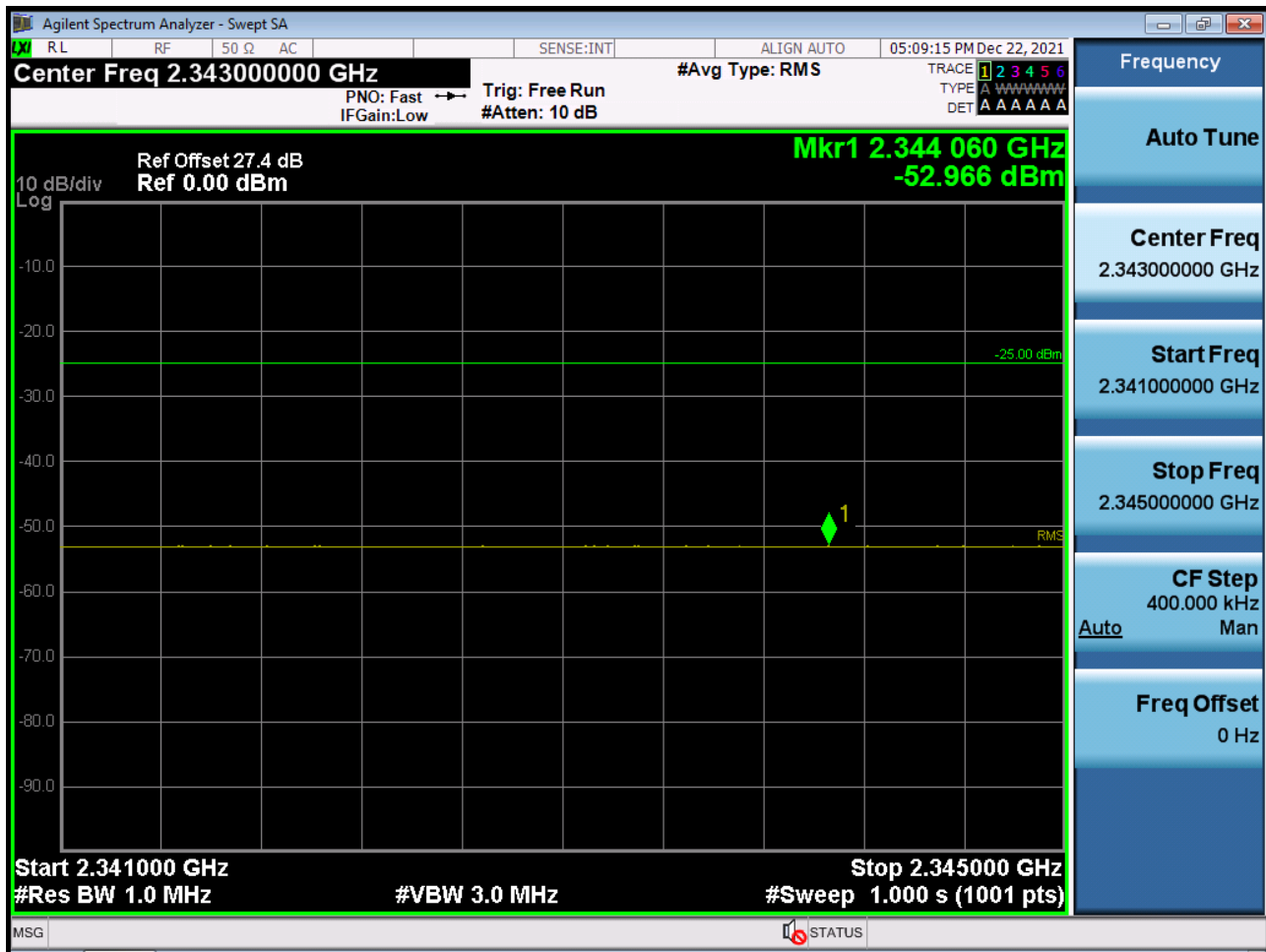
BAND 30. 5 M_BandEdge(2341 MHz-2345 MHz)_Mid_2310 MHz_QPSK_FullRB



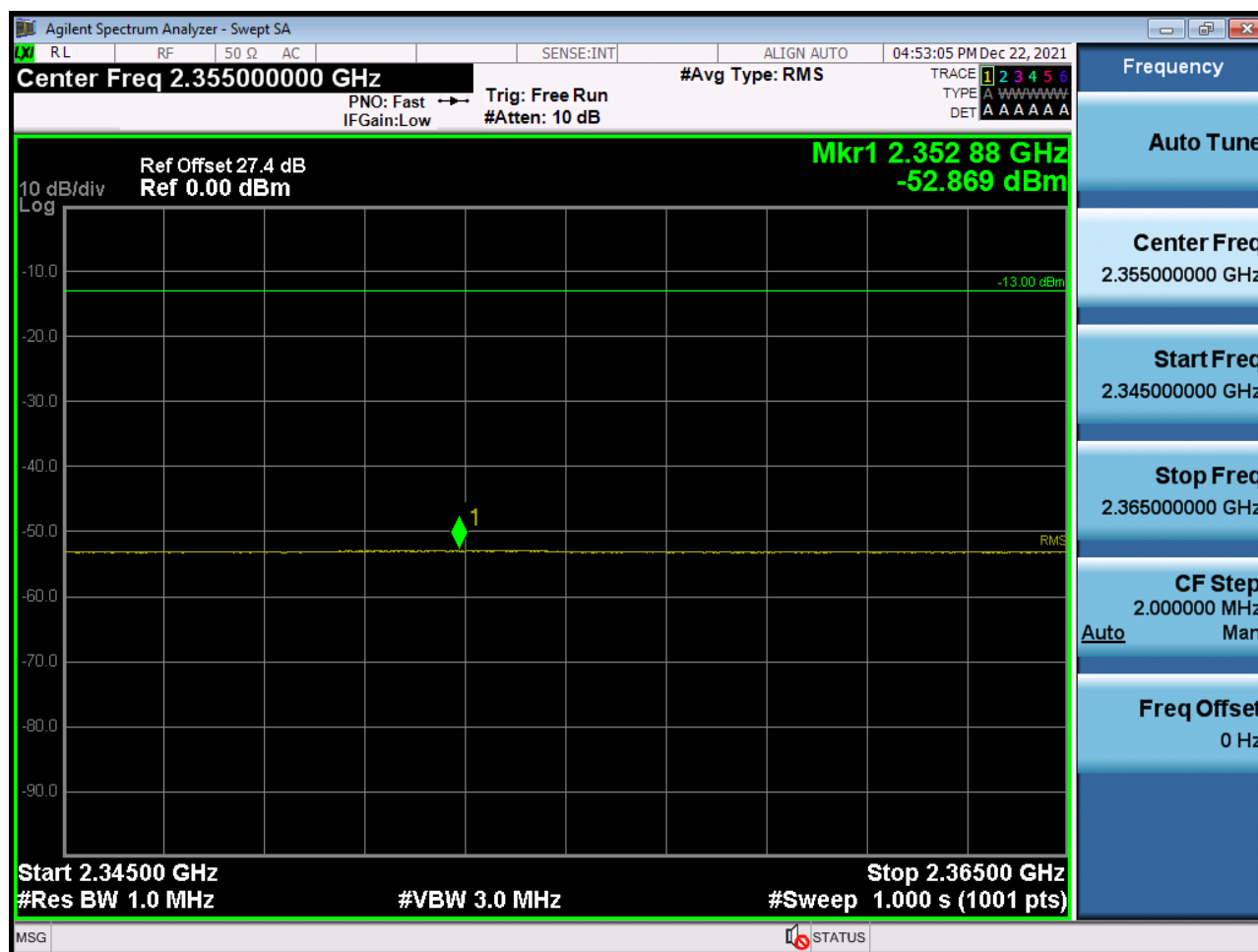
BAND 30. 5 M_BandEdge(2341 MHz-2345 MHz)_High_2312.5 MHz_QPSK_1RB



BAND 30.5 M_BandEdge(2341 MHz-2345 MHz)_High_2312.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2345 MHz-2365 MHz)_Low_2307.5 MHz_QPSK_1RB



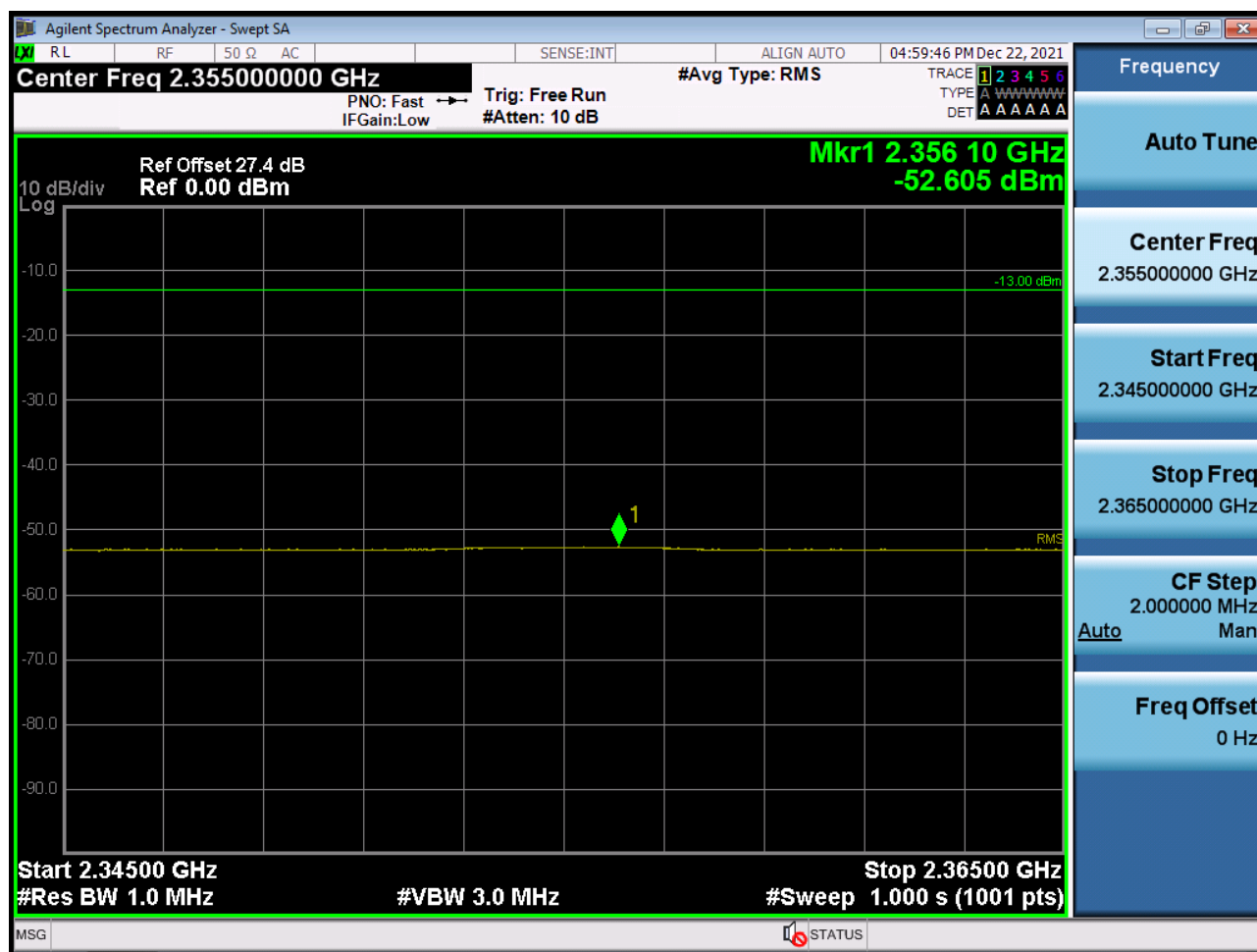
BAND 30. 5 M_BandEdge(2345 MHz-2365 MHz)_Low_2307.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2345 MHz-2365 MHz)_Mid_2310 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2345 MHz-2365 MHz)_Mid_2310 MHz_QPSK_FullRB



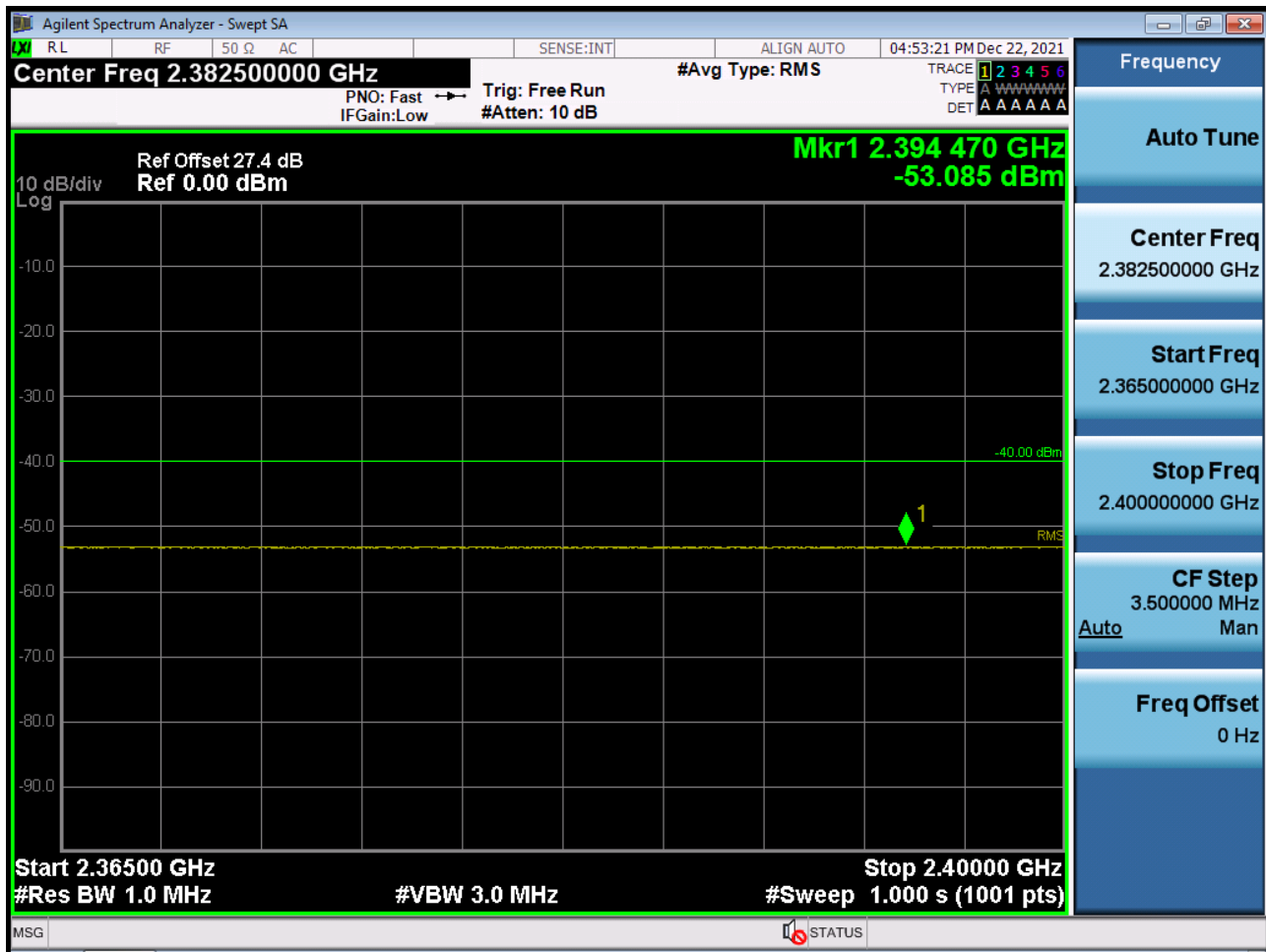
BAND 30. 5 M_BandEdge(2345 MHz-2365 MHz)_High_2312.5 MHz_QPSK_1RB



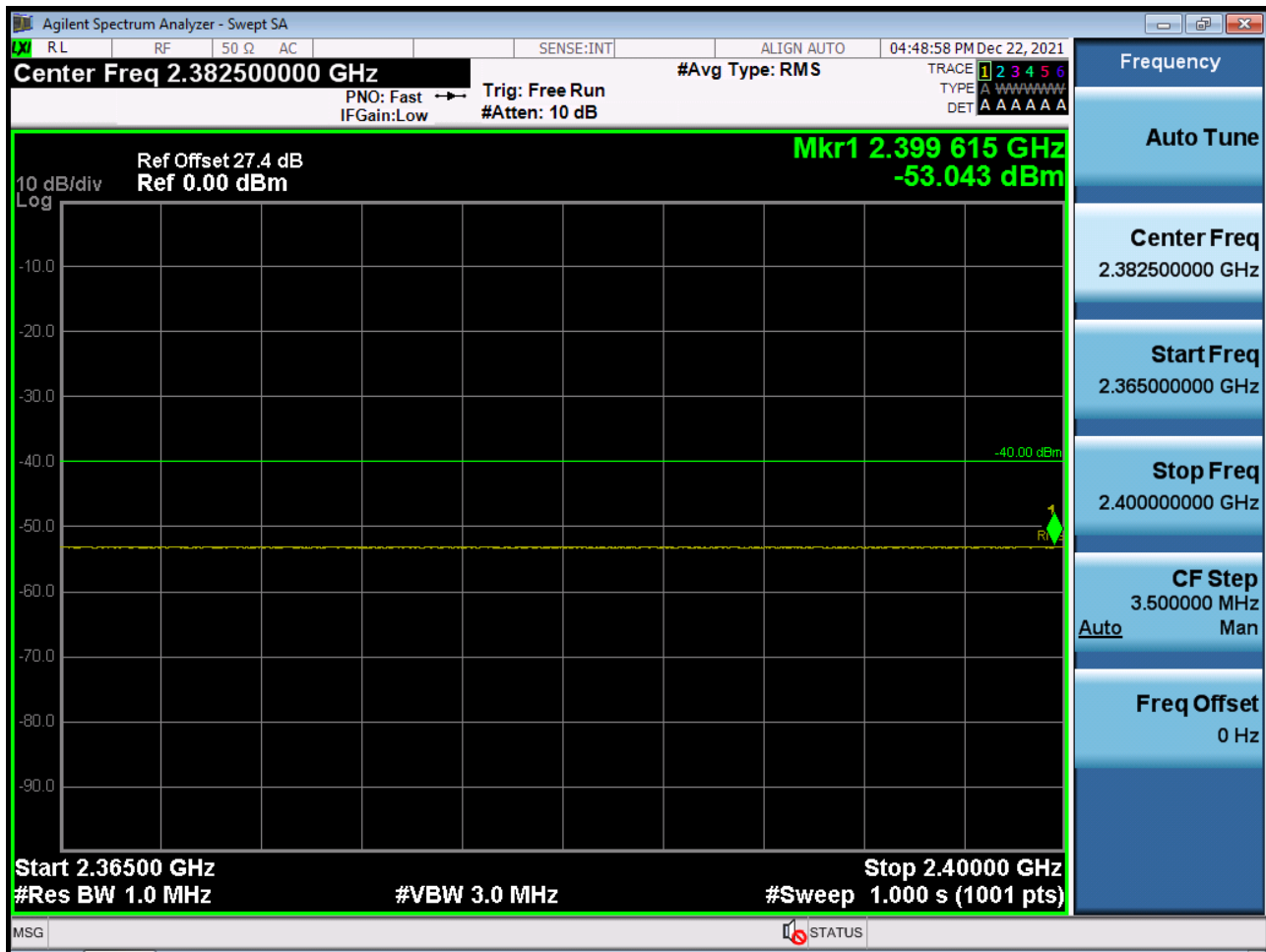
BAND 30. 5 M_BandEdge(2345 MHz-2365 MHz)_High_2312.5 MHz_QPSK_FullIRB



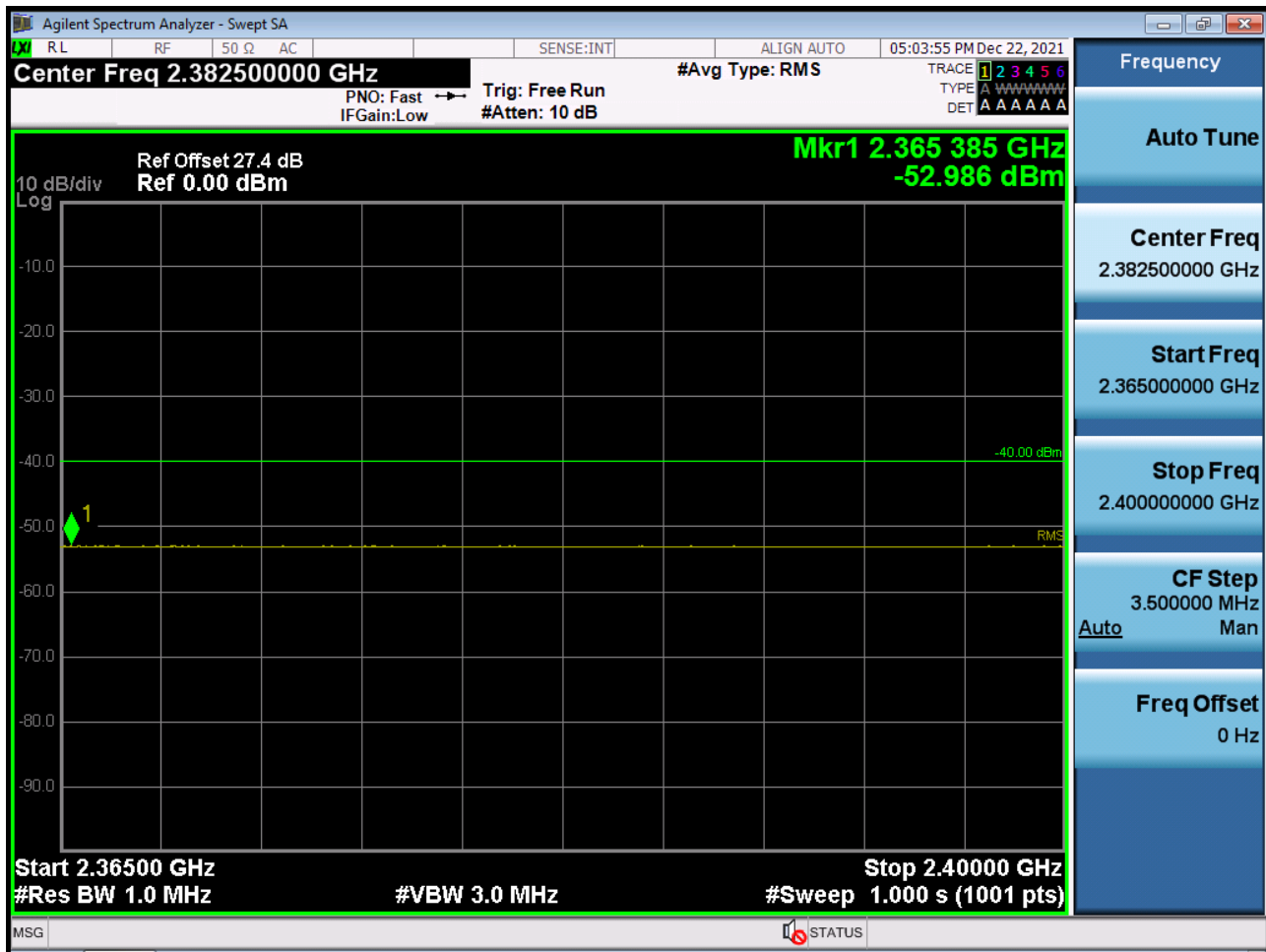
BAND 30. 5 M_BandEdge(2365 MHz-2400 MHz)_Low_2307.5 MHz_QPSK_1RB



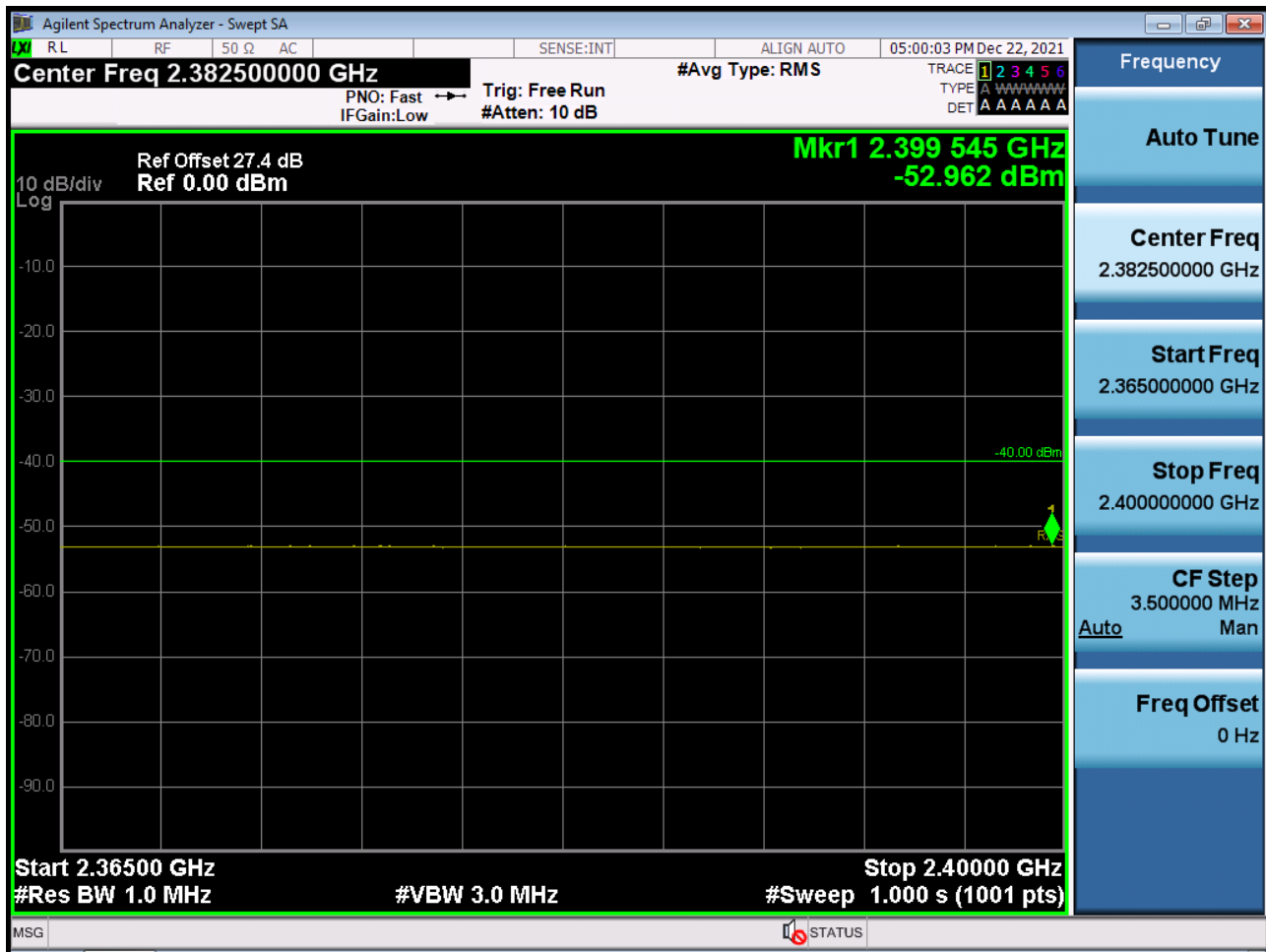
BAND 30. 5 M_BandEdge(2365 MHz-2400 MHz)_Low_2307.5 MHz_QPSK_FullIRB



BAND 30. 5 M_BandEdge(2365 MHz-2400 MHz)_Mid_2310 MHz_QPSK_1RB



BAND 30. 5 M_BandEdge(2365 MHz-2400 MHz)_Mid_2310 MHz_QPSK_FullRB



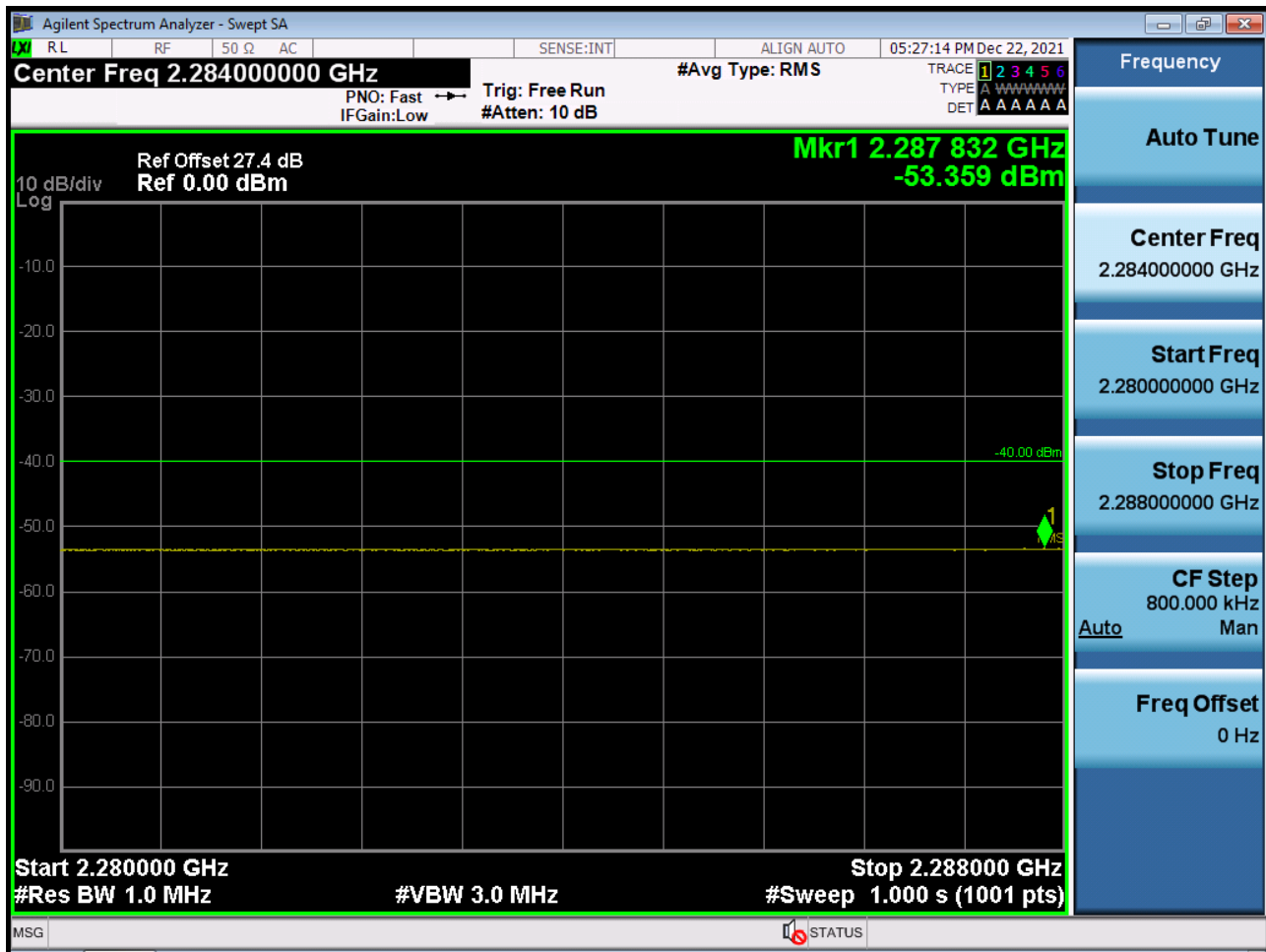
BAND 30. 5 M_BandEdge(2365 MHz-2400 MHz)_High_2312.5 MHz_QPSK_1RB



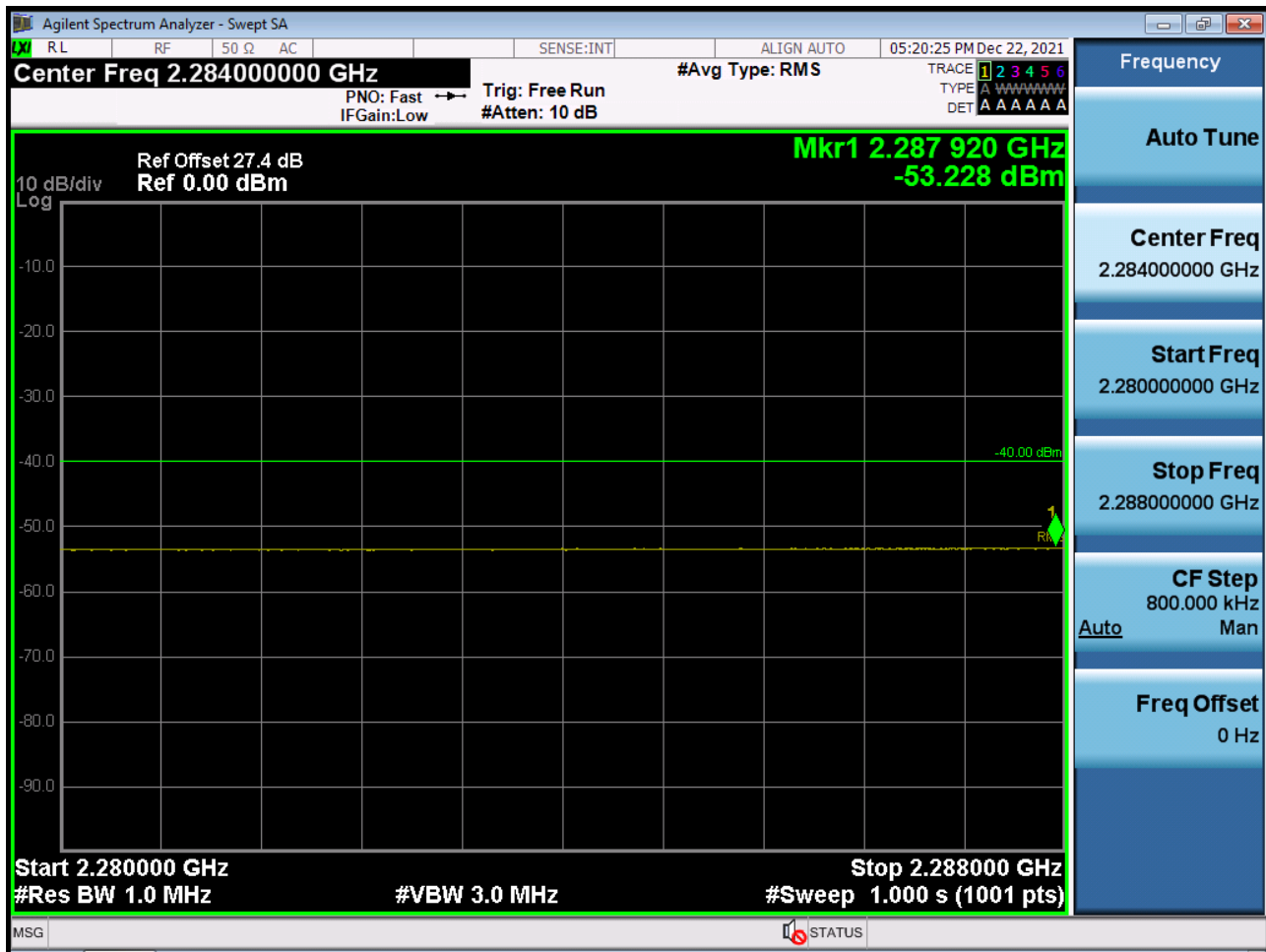
BAND 30. 5 M_BandEdge(2365 MHz-2400 MHz)_High_2312.5 MHz_QPSK_FullIRB



BAND 30. 10 M_BandEdge(2280 MHz-2288 MHz)_Low_2310 MHz_QPSK_1RB



BAND 30. 10 M_BandEdge(2280 MHz-2288 MHz)_Low_2310 MHz_QPSK_FullIRB



BAND 30. 10 M_BandEdge(2288 MHz-2292 MHz)_Low_2310 MHz_QPSK_1RB

