74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
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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:
January 04, 2022

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

Report No.: HCT-RF-2201-FC005

FCC ID:	**A3LSMA336M**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model(s):	SM-A336M/DSN
Additional Model(s):	SM-A336M
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	ERP	
				Max. Power (W)	Max. Power (dBm)
LTE – Band12 (1.4)	699.7 – 715.3	1M10G7D	QPSK	0.054	17.29
		1M09W7D	16QAM	0.046	16.58
		1M09W7D	64QAM	0.036	15.55
		1M10W7D	256QAM	0.018	12.51
LTE – Band12 (3)	700.5 – 714.5	2M72G7D	QPSK	0.054	17.30
		2M71W7D	16QAM	0.045	16.56
		2M71W7D	64QAM	0.037	15.66
		2M72W7D	256QAM	0.019	12.67
LTE – Band12/17 (5)	701.5 – 713.5	4M52G7D	QPSK	0.052	17.17
		4M52W7D	16QAM	0.045	16.58
		4M54W7D	64QAM	0.036	15.54
		4M52W7D	256QAM	0.018	12.50
LTE – Band12/17 (10)	704.0 – 711.0	9M00G7D	QPSK	0.052	17.13
		8M98W7D	16QAM	0.044	16.38
		9M00W7D	64QAM	0.035	15.49
		8M98W7D	256QAM	0.018	12.54

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-2201-FC005	January 04, 2022	- First Approval Report

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

Table of Contents

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMA336M
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-A336M/DSN
Additional Model(s):	SM-A336M
Tx Frequency:	699.7 MHz – 715.3 MHz (LTE – Band 12 (1.4 MHz)) 700.5 MHz – 714.5 MHz (LTE – Band 12 (3 MHz)) 701.5 MHz – 713.5 MHz (LTE – Band 12/17 (5 MHz)) 704.0 MHz – 711.0 MHz (LTE – Band 12/17 (10 MHz))
Date(s) of Tests:	November 30, 2021 ~ December 21, 2021
Serial number:	Radiated: R3CRA0TXAKE Conducted: R3CRA0CJCGV

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
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)
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

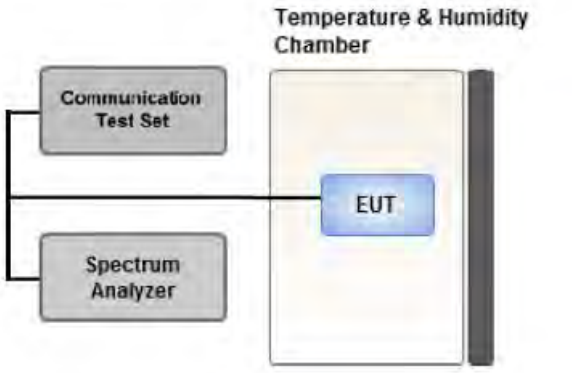
1. Measurements value show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
2. The EUT was tested in three orthogonal planes(X, Y, 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 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.

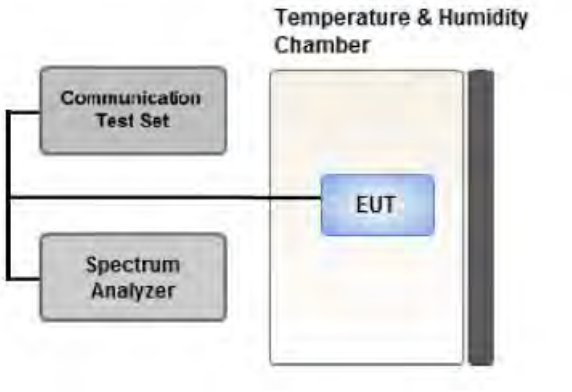
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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

3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

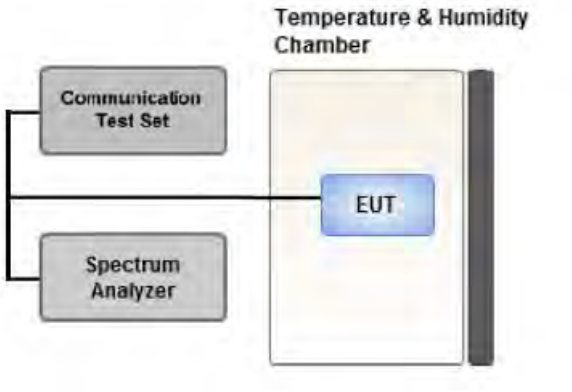
Test Overview

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 * Span / RBW

3.6 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.

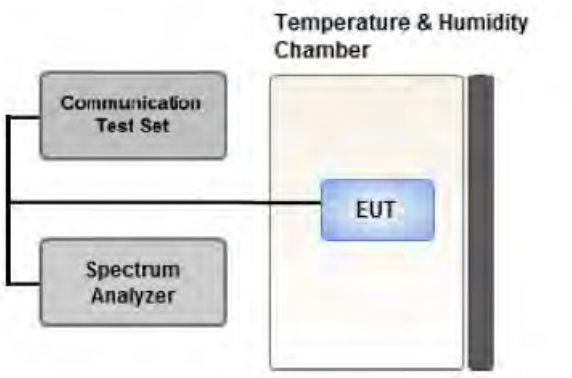
Test Settings

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.

3.7 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.

3.8 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
- In the case of radiated spurious emissions, all bandwidth of operation were investigated and the worst case bandwidth results are reported. (Worst case : 3 MHz)
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- LTE Band 12 (699 – 716 MHz, 5/10 MHz bandwidth) overlaps the entire frequency range of LTE Band 17 (704 - 716 MHz) and they have the same Tune-up power.

  Therefore, test data provided in this report covers Band 17 as well as Band 12.
- Please refer to the table below.
- SM-A336M/DSN & additional models were tested and the worst case results are reported.

(Worst case : SM-A336M/DSN)

[Worst case]

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

3.9 WORST CASE(CONDUCTED TEST)

- All modes of operation were investigated and the worst case configuration results are reported.
- LTE Band 12 (699 – 716 MHz, 5/10 MHz bandwidth) overlaps the entire frequency range of LTE Band 17 (704 - 716 MHz) and they have the same Tune-up power.

  Therefore, test data provided in this report covers Band 17 as well as Band 12.
- SM-A336M/DSN & additional models were tested and the worst case results are reported.

  (Worst case : SM-A336M/DSN)

[Worst case]

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

4. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
H.P.F	FBSR-02B(WHK1.2/15 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
H.P.F	FBSR-02B(WHK3.3/18 G-10EF)	T&M SYSTEM	-	03/02/2022	Annual
Power Splitter(DC ~ 26.5 GHz)	11667B	Hewlett Packard	11275	04/07/2022	Annual
DC Power Supply	E3632A	Agilent	MY40010147	06/28/2022	Annual
Dipole Antenna	UHAP	Schwarzbeck	557	04/05/2023	Biennial
Dipole Antenna	UHAP	Schwarzbeck	558	04/05/2023	Biennial
Chamber	SU-642	ESPEC	93008124	03/15/2022	Annual
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	147	08/30/2022	Biennial
Horn Antenna(1 ~ 18 GHz)	BBHA 9120D	Schwarzbeck	9120D-1298	09/15/2023	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170342	10/13/2022	Biennial
Horn Antenna(15 ~ 40 GHz)	BBHA 9170	Schwarzbeck	BBHA9170124	02/11/2022	Biennial
Signal Analyzer(10 Hz ~ 26.5 GHz)	N9020A	Agilent	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.	6201026545	01/07/2022	Annual
SIGNAL GENERATOR (100 kHz ~ 40 GHz)	SMB100A	REOHDE & SCHWARZ	177633	07/05/2022	Annual
Signal Analyzer(5 Hz ~ 40.0 GHz)	N9030B	KEYSIGHT	MY55480167	06/02/2022	Annual
FCC LTE Mobile Conducted RF Automation Test Software	-	HCT CO., LTD.,	-	-	-

Note:

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

5. MEASUREMENT UNCERTAINTY

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

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05 (Confidence level about 95 %, k=2)

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §27.53(g)	< 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, §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
Effective Radiated Power	§27.50(c)(10)	< 3 Watts max. ERP	PASS
Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(g)	< 43 + 10log10 (P[Watts]) for all out-of band emissions	PASS

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

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

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

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

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

3) Record the field strength meter's level.

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

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

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

7.2 EIRP Sample Calculation

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

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

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

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

3) Record the field strength meter's level.

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

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

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

7.3. Emission Designator

GSM Emission Designator

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

EDGE Emission Designator

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

WCDMA Emission Designator

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

QPSK Modulation

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

QAM Modulation

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

8. TEST DATA

8.1 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
699.7	LTE B12 (1.4 MHz)	QPSK	-31.78	28.36	-9.92	1.28	V	< 3.00	0.052	17.16
		16-QAM	-32.51	27.63	-9.92	1.28	V		0.044	16.43
		64-QAM	-33.48	26.66	-9.92	1.28	V		0.035	15.46
		256-QAM	-36.52	23.62	-9.92	1.28	V		0.017	12.42
707.5		QPSK	-31.57	28.51	-9.93	1.29	V		0.054	17.29
		16-QAM	-32.28	27.80	-9.93	1.29	V		0.046	16.58
		64-QAM	-33.33	26.75	-9.93	1.29	V		0.036	15.53
		256-QAM	-36.36	23.72	-9.93	1.29	V		0.018	12.50
715.3		QPSK	-31.63	28.50	-9.94	1.30	V		0.053	17.26
		16-QAM	-32.37	27.76	-9.94	1.30	V		0.045	16.52
		64-QAM	-33.34	26.79	-9.94	1.30	V		0.036	15.55
		256-QAM	-36.38	23.75	-9.94	1.30	V		0.018	12.51

Freq (MHz)	Mod (Bandwidth)	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
700.5	LTE B12 (3 MHz)	QPSK	-31.98	28.20	-9.92	1.28	V	< 3.00	0.050	17.00
		16-QAM	-32.59	27.59	-9.92	1.28	V		0.044	16.39
		64-QAM	-33.46	26.72	-9.92	1.28	V		0.036	15.52
		256-QAM	-36.41	23.77	-9.92	1.28	V		0.018	12.57
707.5		QPSK	-31.56	28.52	-9.93	1.29	V		0.054	17.30
		16-QAM	-32.37	27.71	-9.93	1.29	V		0.045	16.49
		64-QAM	-33.20	26.88	-9.93	1.29	V		0.037	15.66
		256-QAM	-36.19	23.89	-9.93	1.29	V		0.019	12.67
714.5		QPSK	-31.84	28.32	-9.94	1.30	V		0.051	17.09
		16-QAM	-32.37	27.79	-9.94	1.30	V		0.045	16.56
		64-QAM	-33.30	26.86	-9.94	1.30	V		0.037	15.63
		256-QAM	-36.37	23.79	-9.94	1.30	V		0.018	12.56

Freq (MHz)	Mod (Bandwidth)	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
701.5	LTE B12/17 (5 MHz)	QPSK	-31.98	28.23	-9.92	1.28	V	< 3.00	0.050	17.03
		16-QAM	-32.57	27.64	-9.92	1.28	V		0.044	16.44
		64-QAM	-33.48	26.73	-9.92	1.28	V		0.036	15.53
		256-QAM	-36.57	23.64	-9.92	1.28	V		0.018	12.44
707.5		QPSK	-31.69	28.39	-9.93	1.29	V		0.052	17.17
		16-QAM	-32.45	27.63	-9.93	1.29	V		0.044	16.41
		64-QAM	-33.32	26.76	-9.93	1.29	V		0.036	15.54
		256-QAM	-36.53	23.55	-9.93	1.29	V		0.017	12.33
713.5		QPSK	-31.84	28.31	-9.94	1.29	V		0.051	17.09
		16-QAM	-32.35	27.80	-9.94	1.29	V		0.045	16.58
		64-QAM	-33.42	26.73	-9.94	1.29	V		0.036	15.51
		256-QAM	-36.43	23.72	-9.94	1.29	V		0.018	12.50

Freq (MHz)	Mod (Bandwidth)	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain (dBd)	C.L	Pol	Limit	ERP	
								W	W	dBm
704.0	LTE B12/17 (10 MHz)	QPSK	-31.98	28.16	-9.92	1.28	V	< 3.00	0.050	16.96
		16-QAM	-32.62	27.52	-9.92	1.28	V		0.043	16.32
		64-QAM	-33.59	26.55	-9.92	1.28	V		0.034	15.35
		256-QAM	-36.59	23.55	-9.92	1.28	V		0.017	12.35
707.5		QPSK	-31.73	28.35	-9.93	1.29	V		0.052	17.13
		16-QAM	-32.48	27.60	-9.93	1.29	V		0.043	16.38
		64-QAM	-33.44	26.64	-9.93	1.29	V		0.035	15.42
		256-QAM	-36.44	23.64	-9.93	1.29	V		0.018	12.42
711.0		QPSK	-31.90	28.14	-9.94	1.29	V		0.049	16.91
		16-QAM	-32.43	27.61	-9.94	1.29	V		0.044	16.38
		64-QAM	-33.32	26.72	-9.94	1.29	V		0.035	15.49
		256-QAM	-36.27	23.77	-9.94	1.29	V		0.018	12.54

8.2 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B12

▣ MODULATION SIGNAL: 3 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit
23025 (700.5)	1 401.00	-51.53	7.60	-59.90	1.85	H	-54.15	-13.00
	2 101.50	-55.54	9.60	-59.42	2.27	H	-52.09	-13.00
	2 802.00	-56.18	10.80	-58.33	2.67	H	-50.20	-13.00
23095 (707.5)	1 415.00	-51.61	7.72	-60.33	1.86	V	-54.46	-13.00
	2 122.50	-54.99	9.44	-58.18	2.28	V	-51.02	-13.00
	2 830.00	-56.85	10.80	-58.86	2.65	V	-50.71	-13.00
23165 (714.5)	1 429.00	-50.93	7.84	-59.71	1.86	H	-53.73	-13.00
	2 143.50	-55.45	9.28	-58.23	2.29	H	-51.24	-13.00
	2 858.00	-56.76	10.84	-58.60	2.67	H	-50.43	-13.00

8.3 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
12	1.4 MHz	707.5	QPSK	6	0	1.0985
			16-QAM			1.0915
			64-QAM			1.0932
			256-QAM			1.1013
	3 MHz		QPSK	15		2.7146
			16-QAM			2.7130
			64-QAM			2.7050
			256-QAM			2.7148
12(17)	5 MHz		QPSK	25		4.5191
			16-QAM			4.5217
			64-QAM			4.5350
			256-QAM			4.5150
	10 MHz		QPSK	50		8.9978
			16-QAM			8.9828
			64-QAM			8.9963
			256-QAM			8.9833

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 39 ~ 54.

8.4 CONDUCTED SPURIOUS EMISSIONS

Band	Band Width (MHz)	Frequency (MHz)	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)	Limit (dBm)
12	1.4	699.7	3.6920	27.976	-67.227	-39.251	-13.00
		707.5	3.6830	27.976	-67.300	-39.324	
		715.3	3.6920	27.976	-67.388	-39.412	
	3	700.5	3.6700	27.976	-67.398	-39.422	
		707.5	3.6765	27.976	-67.062	-39.086	
		714.5	3.6760	27.976	-67.207	-39.231	
12(17)	5	701.5	3.7079	27.976	-66.893	-38.917	
		707.5	3.7134	27.976	-67.525	-39.549	
		713.5	3.6925	27.976	-67.171	-39.195	
	10	704.0	3.6790	27.976	-67.461	-39.485	
		707.5	3.7020	27.976	-67.155	-39.179	
		711.0	3.7084	27.976	-67.283	-39.307	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 83 ~ 94.
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

8.5 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 55 ~ 82.

8.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE B12

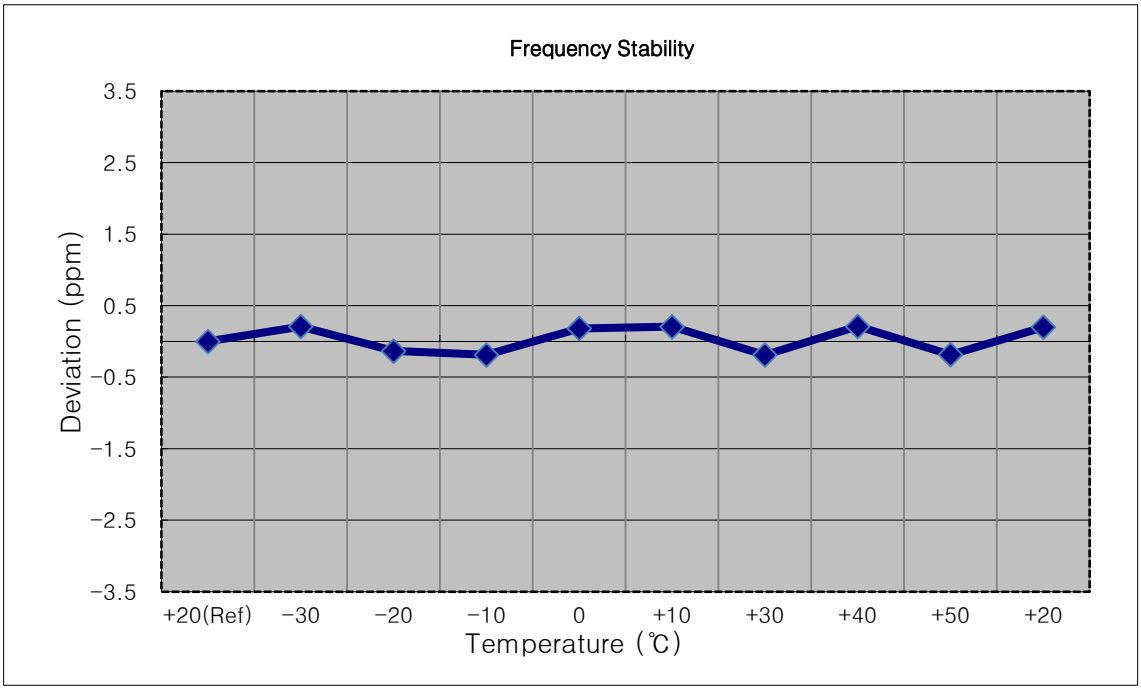
▣ OPERATING FREQUENCY: 699,700,000 Hz

▣ CHANNEL: 23017 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	699 699 894	0.0	0.000 000	0.000
100 %		-30	699 700 040	146.1	0.000 021	0.209
100 %		-20	699 699 801	-93.5	-0.000 013	-0.134
100 %		-10	699 699 763	-131.2	-0.000 019	-0.188
100 %		0	699 700 021	126.9	0.000 018	0.181
100 %		+10	699 700 038	144.1	0.000 021	0.206
100 %		+30	699 699 762	-132.7	-0.000 019	-0.190
100 %		+40	699 700 041	146.9	0.000 021	0.210
100 %		+50	699 699 765	-129.2	-0.000 018	-0.185
Batt. Endpoint	3.400	+20	699 700 034	139.8	0.000 020	0.200



▣ MODE: LTE B12

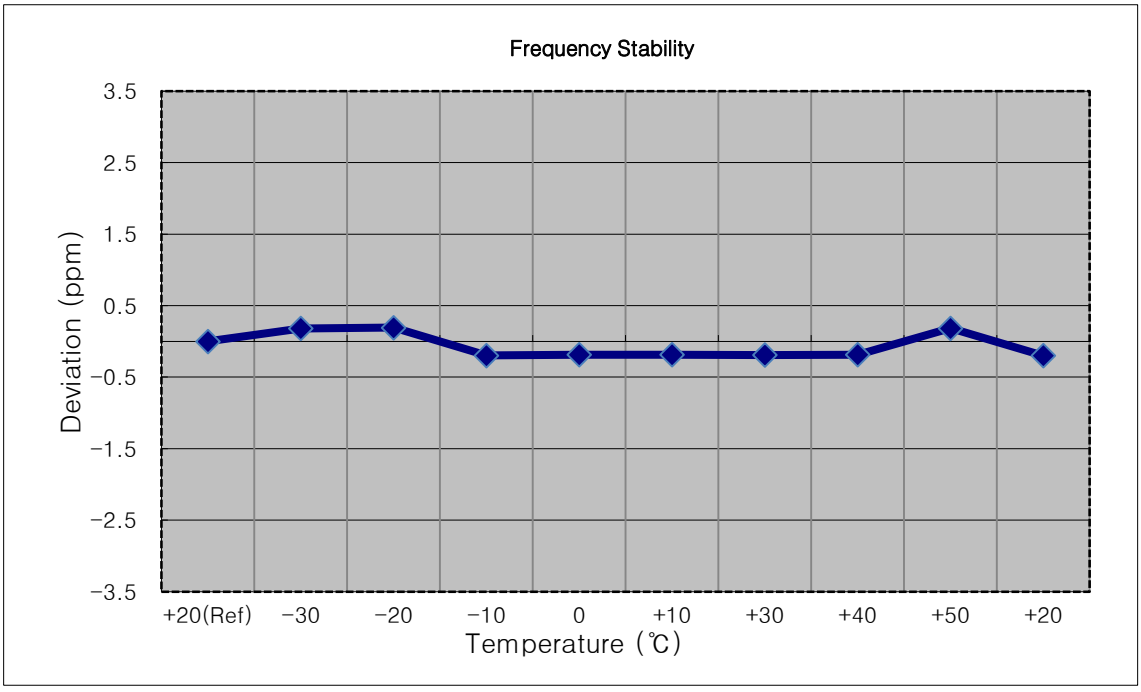
▣ OPERATING FREQUENCY: 700,500,000 Hz

▣ CHANNEL: 23025 (3 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	700 499 910	0.0	0.000 000	0.000
100 %		-30	700 500 037	127.2	0.000 018	0.182
100 %		-20	700 500 045	134.5	0.000 019	0.192
100 %		-10	700 499 773	-137.7	-0.000 020	-0.197
100 %		0	700 499 780	-130.0	-0.000 019	-0.186
100 %		+10	700 499 780	-130.6	-0.000 019	-0.186
100 %		+30	700 499 776	-133.8	-0.000 019	-0.191
100 %		+40	700 499 780	-130.6	-0.000 019	-0.186
100 %		+50	700 500 039	128.4	0.000 018	0.183
Batt. Endpoint	3.400	+20	700 499 771	-138.8	-0.000 020	-0.198



▣ MODE: LTE B12/17

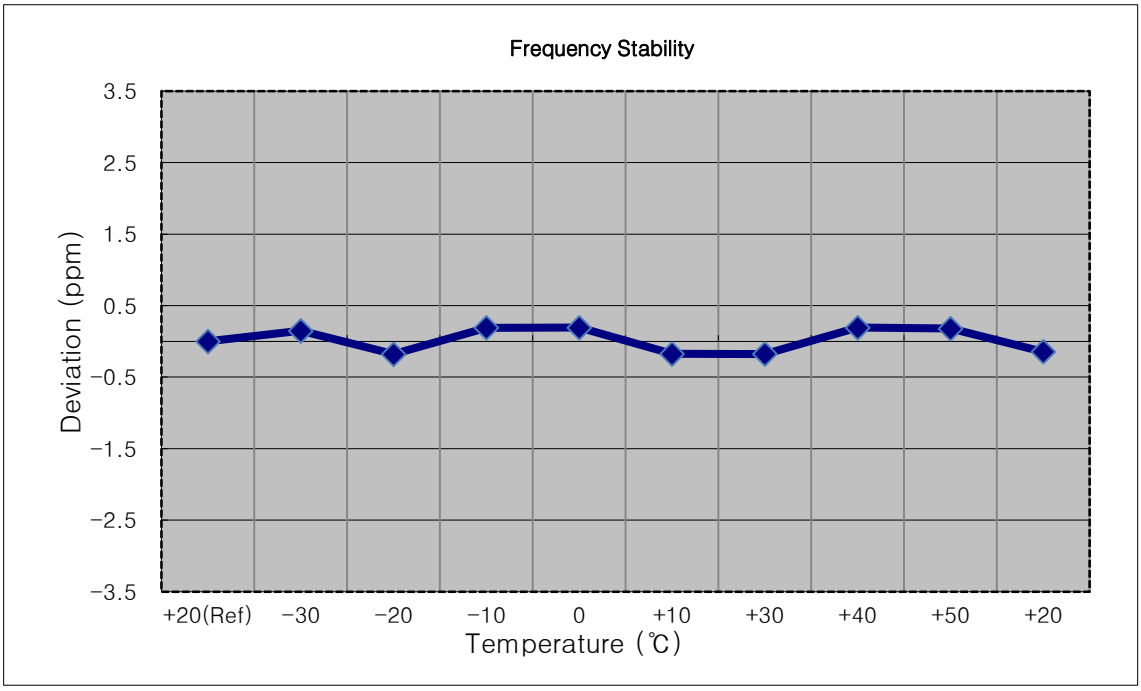
▣ OPERATING FREQUENCY: 701,500,000 Hz

▣ CHANNEL: 23035 (5 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	701 499 882	0.0	0.000 000	0.000
100 %		-30	701 499 985	103.7	0.000 015	0.148
100 %		-20	701 499 756	-125.5	-0.000 018	-0.179
100 %		-10	701 500 016	134.1	0.000 019	0.191
100 %		0	701 500 016	134.5	0.000 019	0.192
100 %		+10	701 499 759	-122.5	-0.000 017	-0.175
100 %		+30	701 499 757	-124.4	-0.000 018	-0.177
100 %		+40	701 500 016	134.6	0.000 019	0.192
100 %		+50	701 500 007	125.6	0.000 018	0.179
Batt. Endpoint	3.400	+20	701 499 780	-101.5	-0.000 014	-0.145



▣ MODE: LTE B12/17

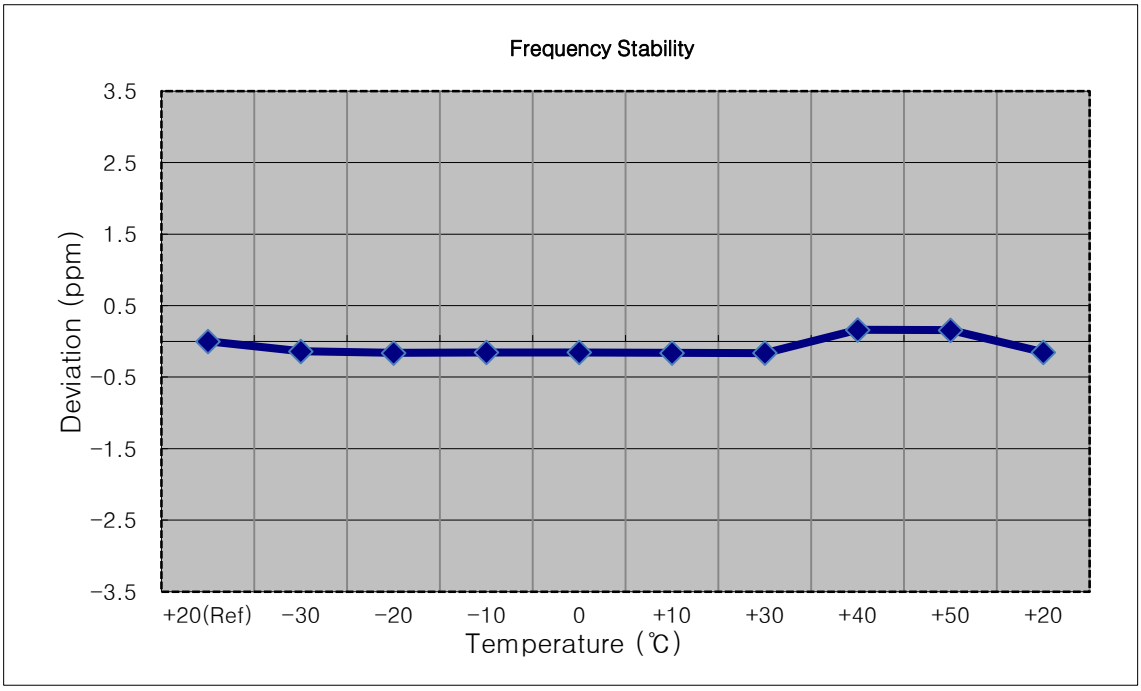
▣ OPERATING FREQUENCY: 704,000,000 Hz

▣ CHANNEL: 23060 (10 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	704 000 116	0.0	0.000 000	0.000
100 %		-30	704 000 018	-98.3	-0.000 014	-0.140
100 %		-20	704 000 003	-112.7	-0.000 016	-0.160
100 %		-10	704 000 007	-108.7	-0.000 015	-0.154
100 %		0	704 000 007	-109.3	-0.000 016	-0.155
100 %		+10	704 000 003	-113.4	-0.000 016	-0.161
100 %		+30	704 000 001	-115.2	-0.000 016	-0.164
100 %		+40	704 000 229	112.8	0.000 016	0.160
100 %		+50	704 000 225	109.5	0.000 016	0.156
Batt. Endpoint	3.400	+20	704 000 010	-106.4	-0.000 015	-0.151



▣ MODE: LTE B12

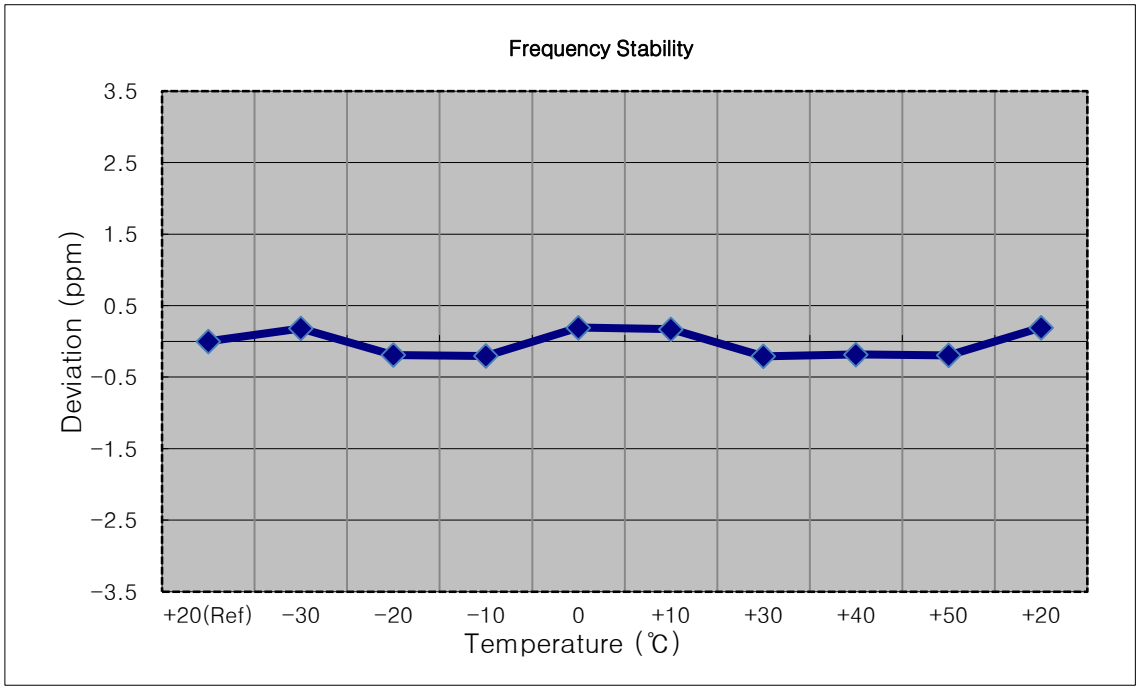
▣ OPERATING FREQUENCY: 707,500,000 Hz

▣ CHANNEL: 23095 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	707 499 861	0.0	0.000 000	0.000
100 %		-30	707 499 989	128.7	0.000 018	0.182
100 %		-20	707 499 727	-133.9	-0.000 019	-0.189
100 %		-10	707 499 716	-144.2	-0.000 020	-0.204
100 %		0	707 499 996	135.5	0.000 019	0.192
100 %		+10	707 499 981	120.4	0.000 017	0.170
100 %		+30	707 499 714	-146.8	-0.000 021	-0.207
100 %		+40	707 499 730	-130.3	-0.000 018	-0.184
100 %		+50	707 499 723	-138.1	-0.000 020	-0.195
Batt. Endpoint	3.400	+20	707 499 997	136.6	0.000 019	0.193



▣ MODE: LTE B12

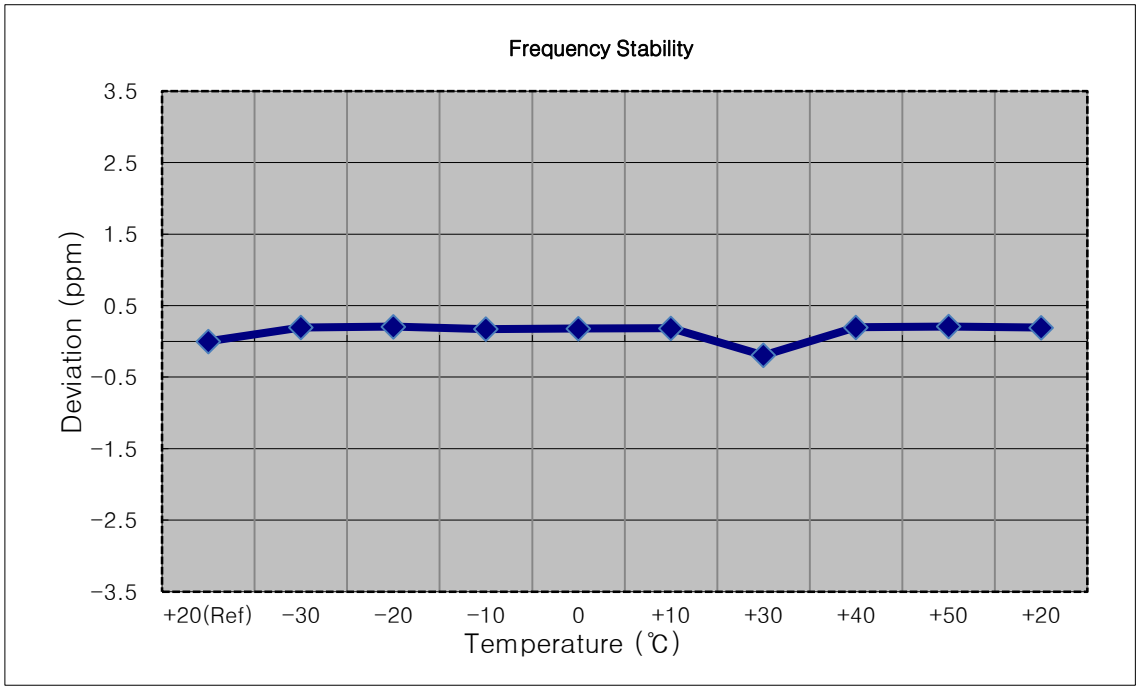
▣ OPERATING FREQUENCY: 707,500,000 Hz

▣ CHANNEL: 23095 (3 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	707 499 865	0.0	0.000 000	0.000
100 %		-30	707 500 003	137.5	0.000 019	0.194
100 %		-20	707 500 011	145.6	0.000 021	0.206
100 %		-10	707 499 987	121.5	0.000 017	0.172
100 %		0	707 499 993	127.3	0.000 018	0.180
100 %		+10	707 499 995	129.9	0.000 018	0.184
100 %		+30	707 499 727	-138.0	-0.000 020	-0.195
100 %		+40	707 500 005	139.3	0.000 020	0.197
100 %		+50	707 500 012	147.0	0.000 021	0.208
Batt. Endpoint	3.400	+20	707 500 002	136.4	0.000 019	0.193



▣ MODE: LTE B12/17

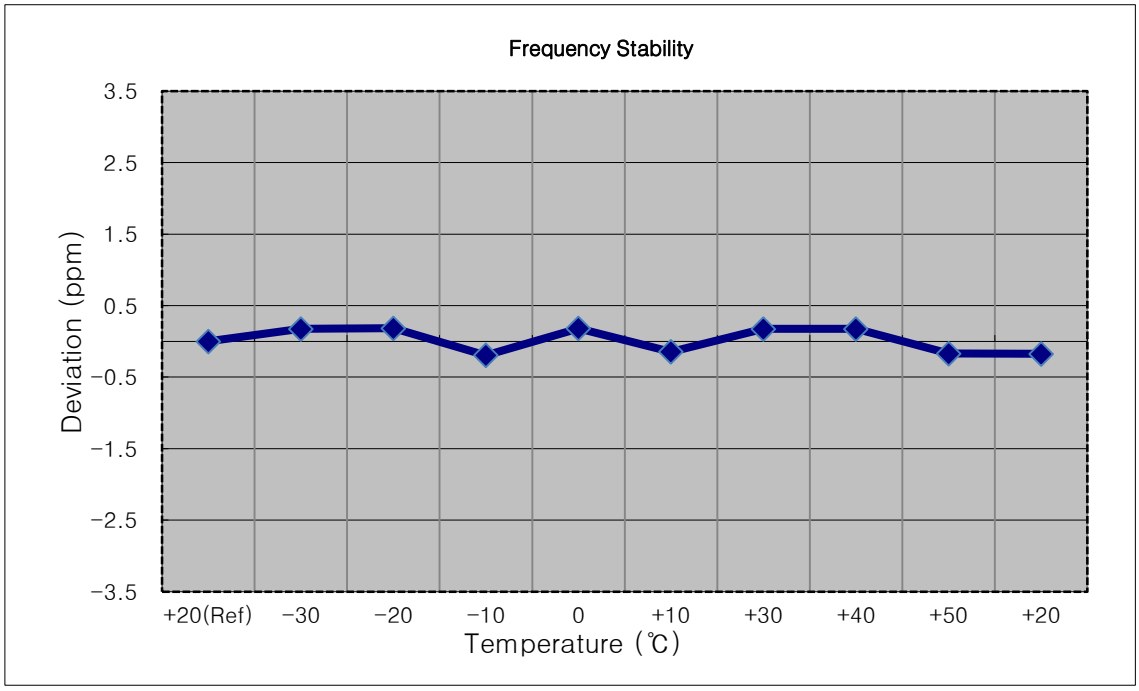
▣ OPERATING FREQUENCY: 707,500,000 Hz

▣ CHANNEL: 23095 (5 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	707 500 118	0.0	0.000 000	0.000
100 %		-30	707 500 243	124.2	0.000 018	0.176
100 %		-20	707 500 248	129.9	0.000 018	0.184
100 %		-10	707 499 980	-138.2	-0.000 020	-0.195
100 %		0	707 500 246	127.6	0.000 018	0.180
100 %		+10	707 500 015	-103.1	-0.000 015	-0.146
100 %		+30	707 500 242	124.0	0.000 018	0.175
100 %		+40	707 500 242	123.2	0.000 017	0.174
100 %		+50	707 499 998	-120.7	-0.000 017	-0.171
Batt. Endpoint	3.400	+20	707 499 995	-123.0	-0.000 017	-0.174



▣ MODE: LTE B12/17

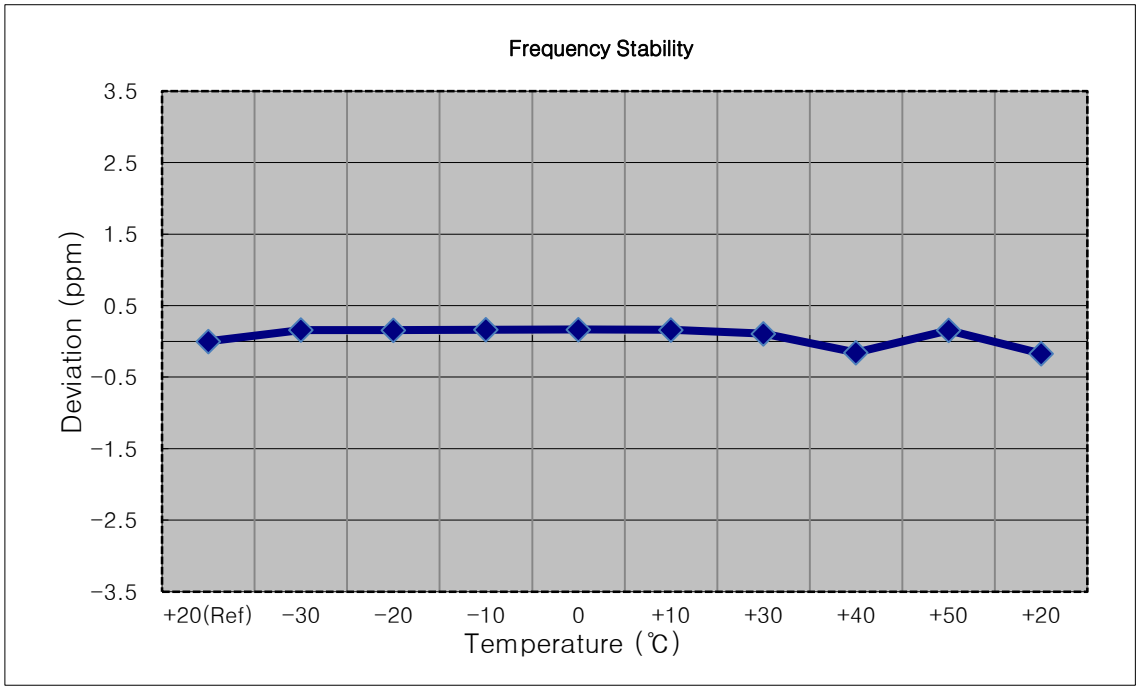
▣ OPERATING FREQUENCY: 707,500,000 Hz

▣ CHANNEL: 23095 (10 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	707 499 896	0.0	0.000 000	0.000
100 %		-30	707 500 008	111.7	0.000 016	0.158
100 %		-20	707 500 006	110.4	0.000 016	0.156
100 %		-10	707 500 011	115.5	0.000 016	0.163
100 %		0	707 500 013	116.8	0.000 017	0.165
100 %		+10	707 500 010	114.6	0.000 016	0.162
100 %		+30	707 499 971	75.6	0.000 011	0.107
100 %		+40	707 499 786	-110.2	-0.000 016	-0.156
100 %		+50	707 500 005	109.4	0.000 015	0.155
Batt. Endpoint	3.400	+20	707 499 776	-119.9	-0.000 017	-0.169



▣ MODE: LTE B12

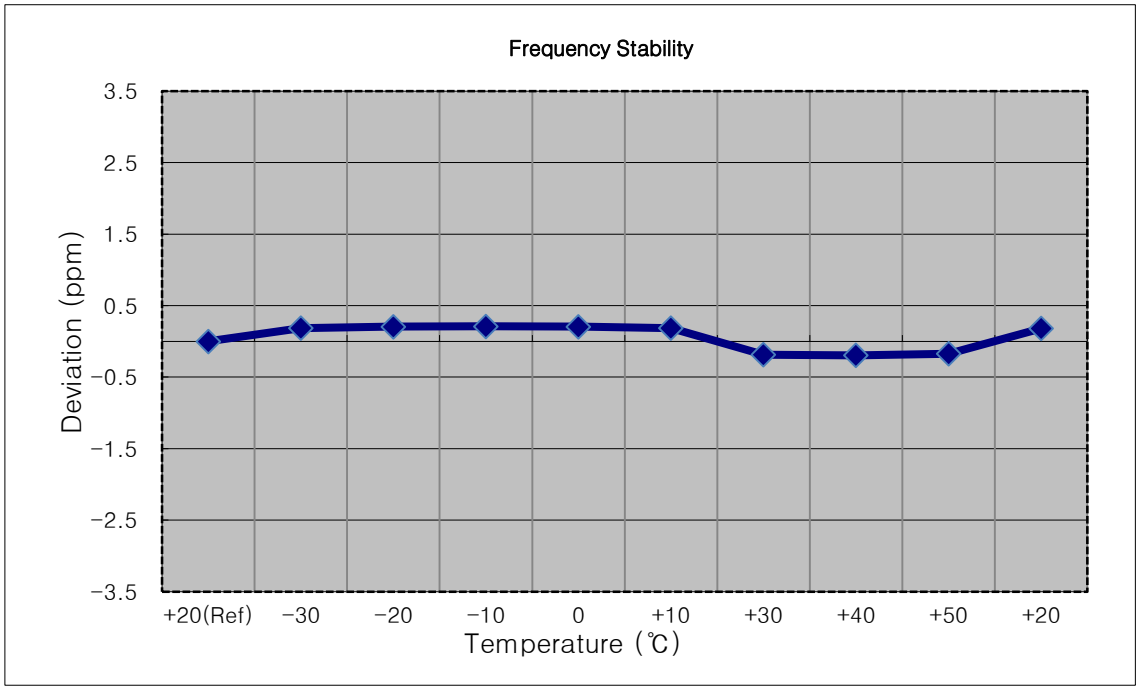
▣ OPERATING FREQUENCY: 715,300,000 Hz

▣ CHANNEL: 23173 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	715 299 862	0.0	0.000 000	0.000
100 %		-30	715 299 996	133.6	0.000 019	0.187
100 %		-20	715 300 010	147.9	0.000 021	0.207
100 %		-10	715 300 012	150.1	0.000 021	0.210
100 %		0	715 300 010	147.6	0.000 021	0.206
100 %		+10	715 299 996	133.5	0.000 019	0.187
100 %		+30	715 299 729	-132.7	-0.000 019	-0.186
100 %		+40	715 299 723	-139.0	-0.000 019	-0.194
100 %		+50	715 299 740	-122.5	-0.000 017	-0.171
Batt. Endpoint	3.400	+20	715 299 992	129.8	0.000 018	0.181



▣ MODE: LTE B12

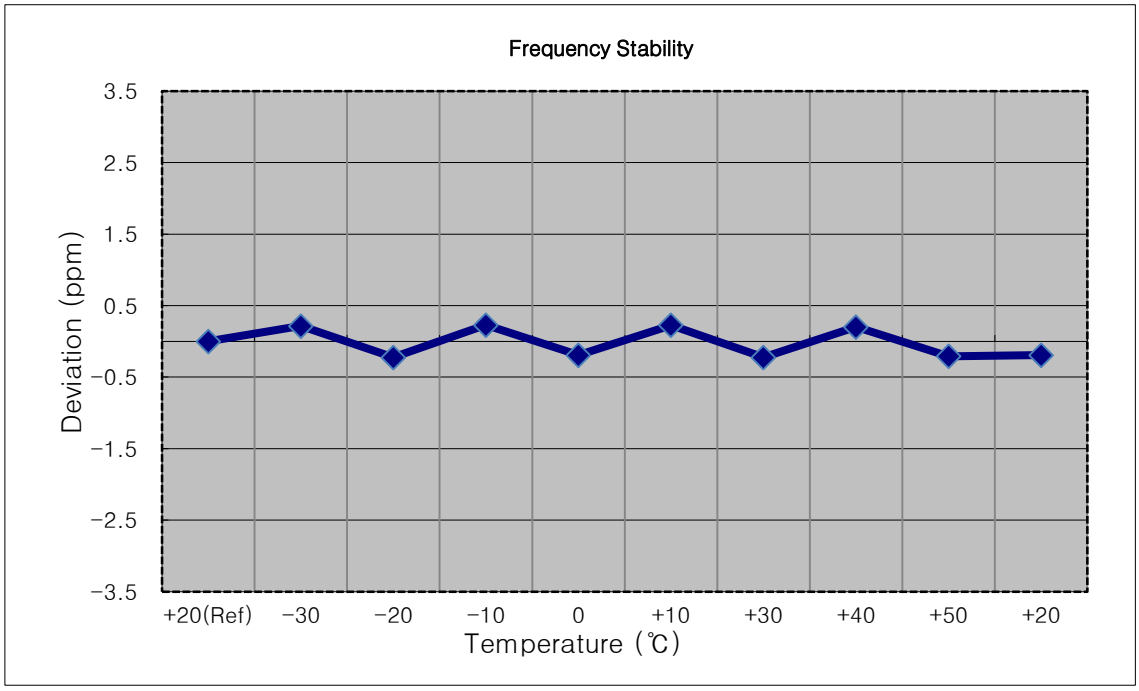
▣ OPERATING FREQUENCY: 714,500,000 Hz

▣ CHANNEL: 23165 (3 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	714 499 839	0.0	0.000 000	0.000
100 %		-30	714 499 992	153.8	0.000 022	0.215
100 %		-20	714 499 678	-160.1	-0.000 022	-0.224
100 %		-10	714 500 001	162.6	0.000 023	0.228
100 %		0	714 499 700	-138.1	-0.000 019	-0.193
100 %		+10	714 500 000	161.9	0.000 023	0.227
100 %		+30	714 499 679	-159.2	-0.000 022	-0.223
100 %		+40	714 499 982	143.4	0.000 020	0.201
100 %		+50	714 499 690	-148.8	-0.000 021	-0.208
Batt. Endpoint	3.400	+20	714 499 701	-137.7	-0.000 019	-0.193



▣ MODE: LTE B12/17

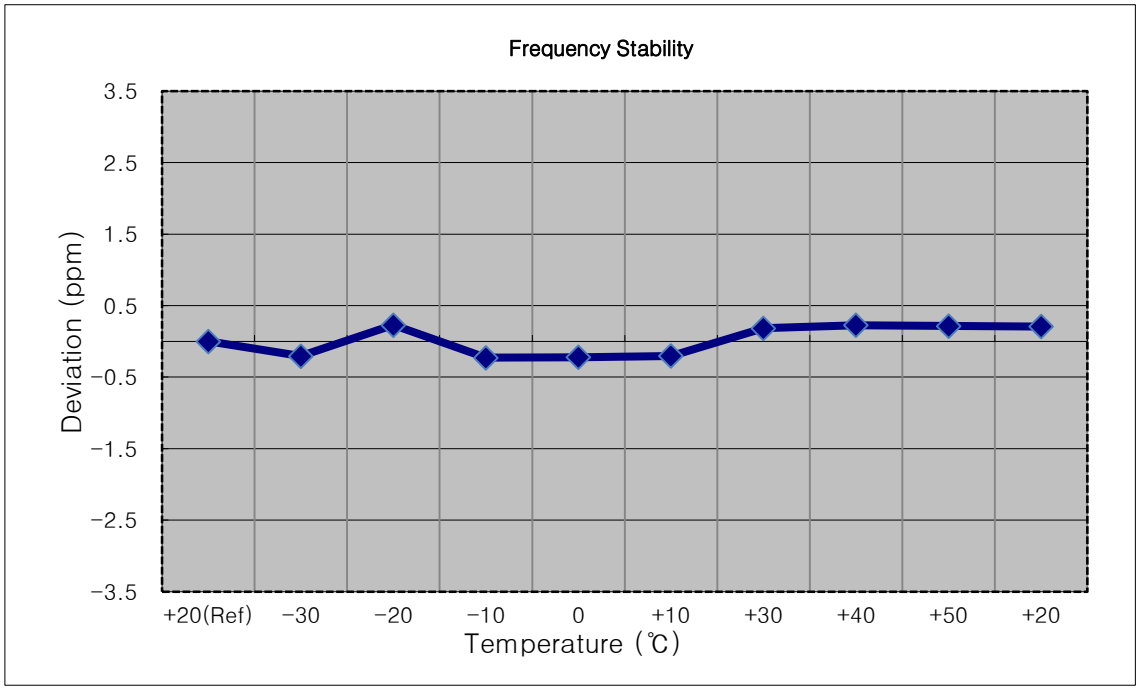
▣ OPERATING FREQUENCY: 713,500,000 Hz

▣ CHANNEL: 23155 (5 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	713 500 148	0.0	0.000 000	0.000
100 %		-30	713 500 002	-146.8	-0.000 021	-0.206
100 %		-20	713 500 311	162.2	0.000 023	0.227
100 %		-10	713 499 986	-162.3	-0.000 023	-0.227
100 %		0	713 499 991	-157.5	-0.000 022	-0.221
100 %		+10	713 500 002	-145.9	-0.000 020	-0.204
100 %		+30	713 500 280	131.4	0.000 018	0.184
100 %		+40	713 500 310	161.5	0.000 023	0.226
100 %		+50	713 500 302	153.7	0.000 022	0.215
Batt. Endpoint	3.400	+20	713 500 296	147.9	0.000 021	0.207



▣ MODE: LTE B12/17

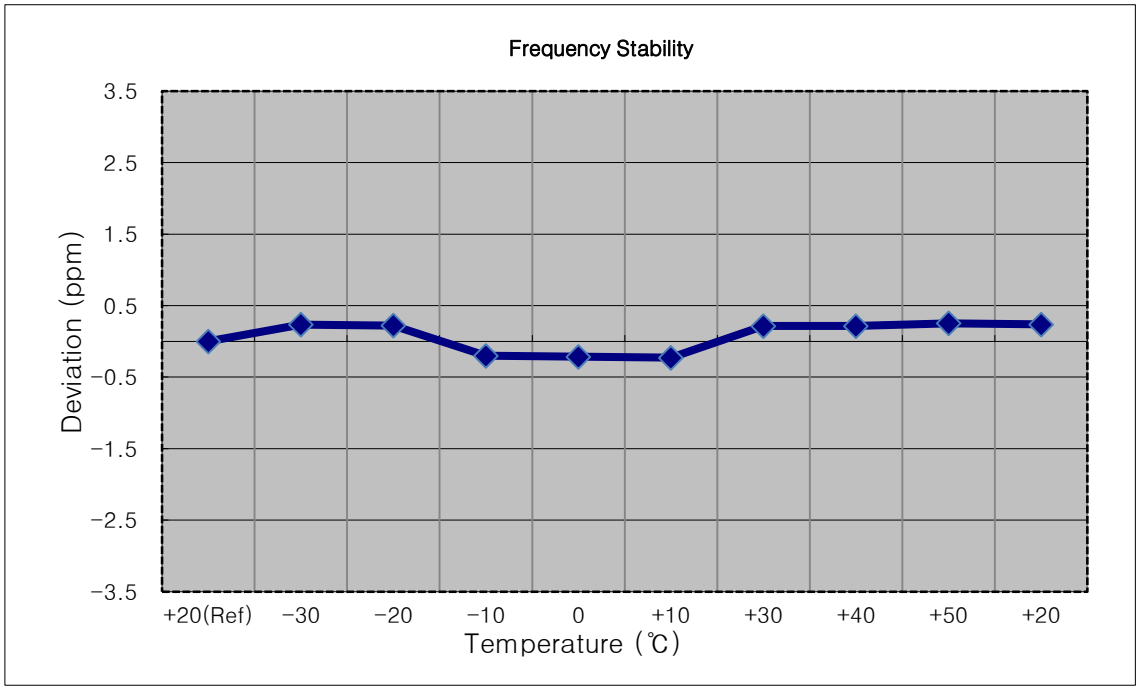
▣ OPERATING FREQUENCY: 711,000,000 Hz

▣ CHANNEL: 23130 (10 MHz)

▣ REFERENCE VOLTAGE: 3.860 VDC

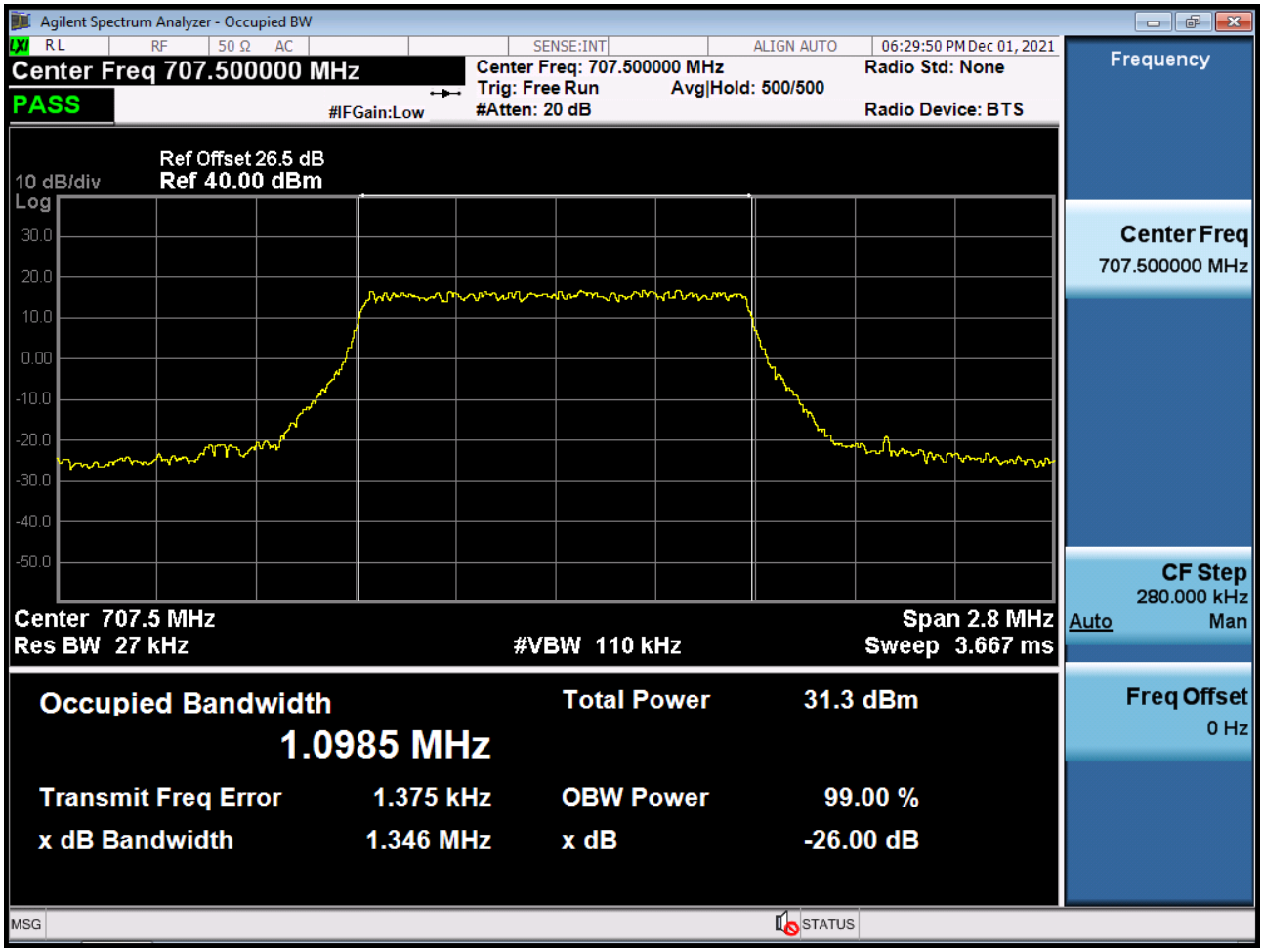
▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100 %	3.860	+20(Ref)	711 000 181	0.0	0.000 000	0.000
100 %		-30	711 000 348	167.3	0.000 024	0.235
100 %		-20	711 000 339	158.2	0.000 022	0.223
100 %		-10	711 000 038	-142.8	-0.000 020	-0.201
100 %		0	711 000 028	-152.2	-0.000 021	-0.214
100 %		+10	711 000 018	-162.2	-0.000 023	-0.228
100 %		+30	711 000 332	151.9	0.000 021	0.214
100 %		+40	711 000 333	152.9	0.000 022	0.215
100 %		+50	711 000 360	179.7	0.000 025	0.253
Batt. Endpoint	3.400	+20	711 000 350	169.2	0.000 024	0.238

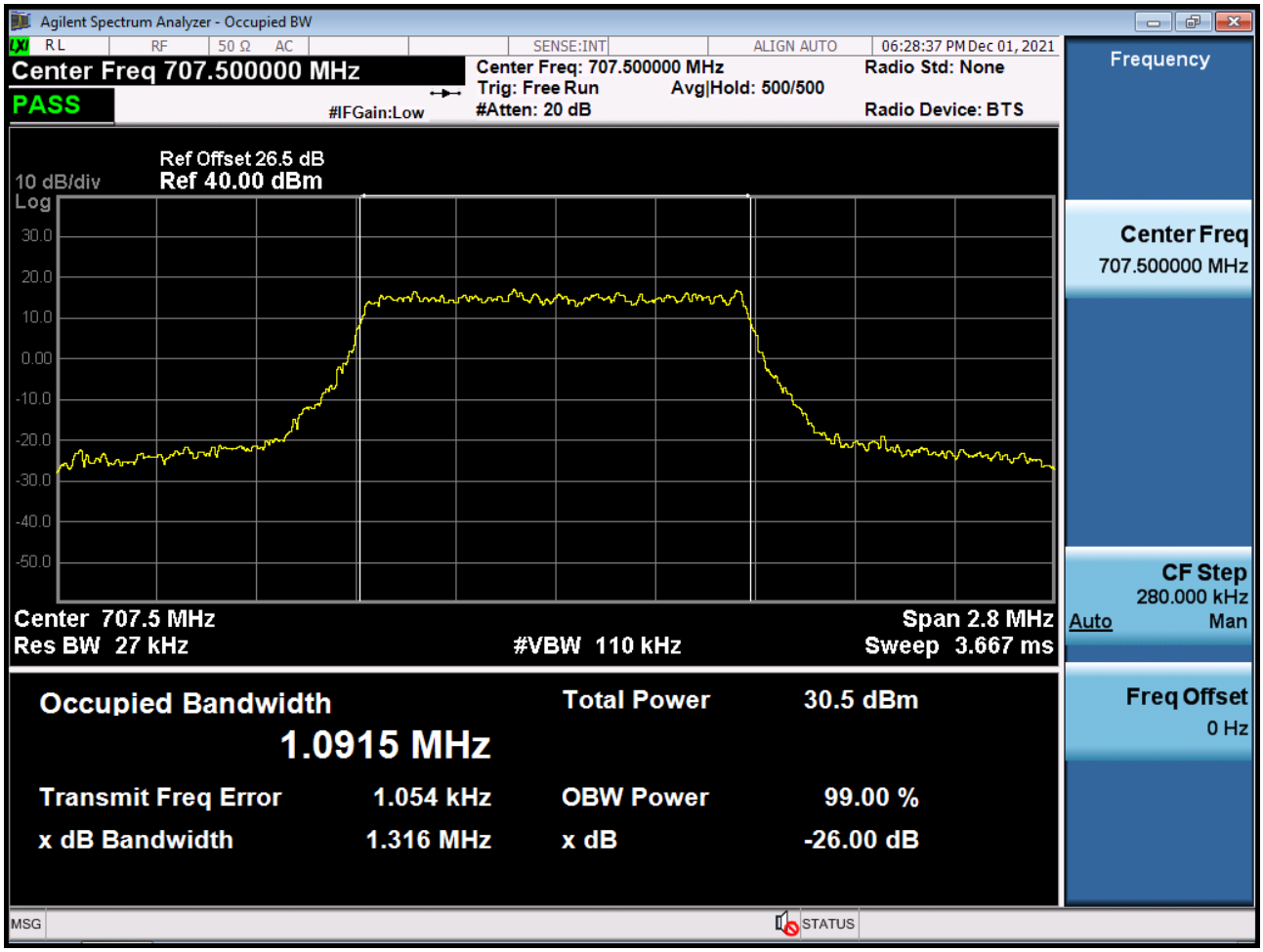


9. TEST PLOTS

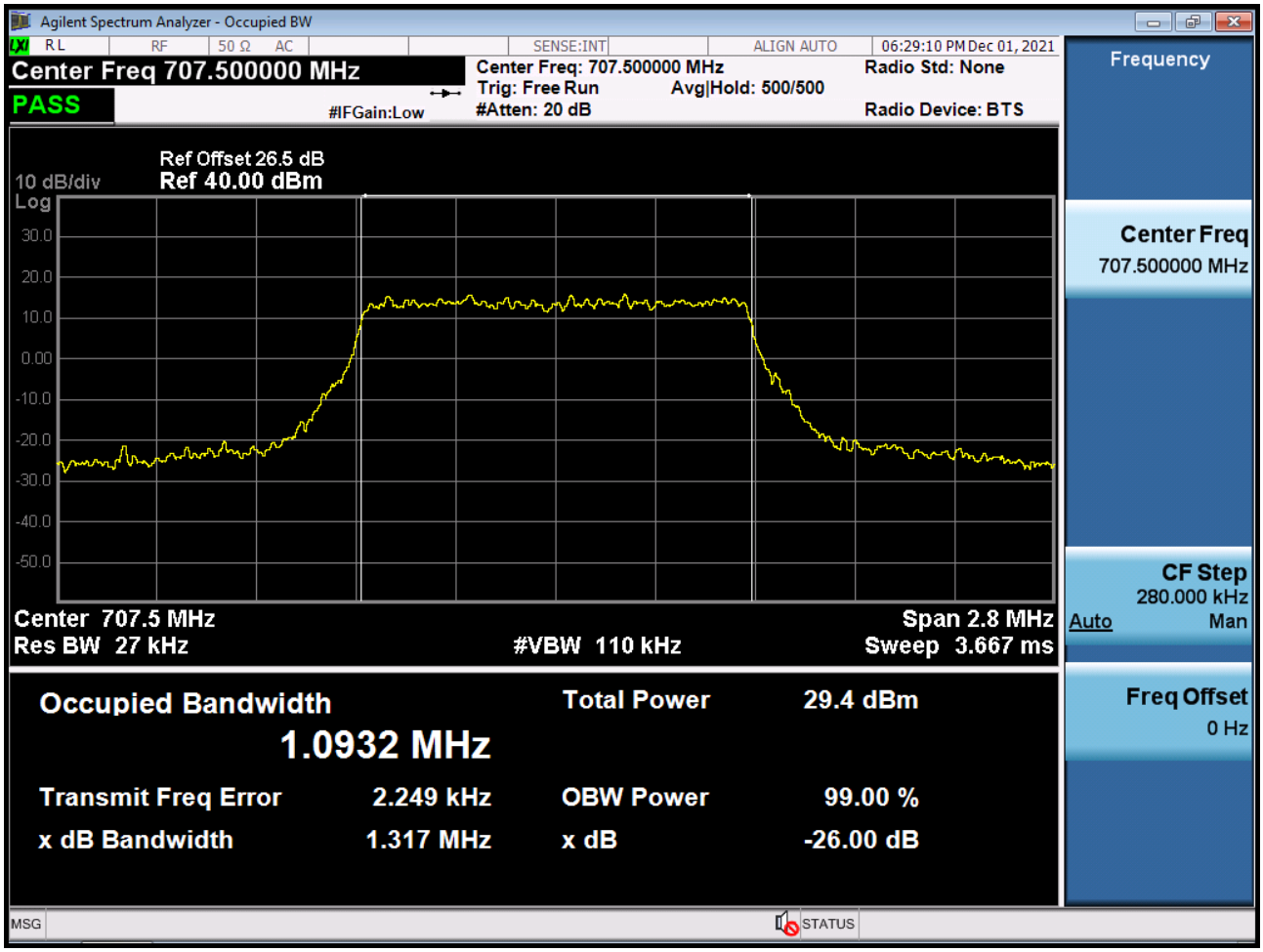
BAND 12. Occupied Bandwidth Plot (1.4 M BW Ch.23095 QPSK_RB6_0)



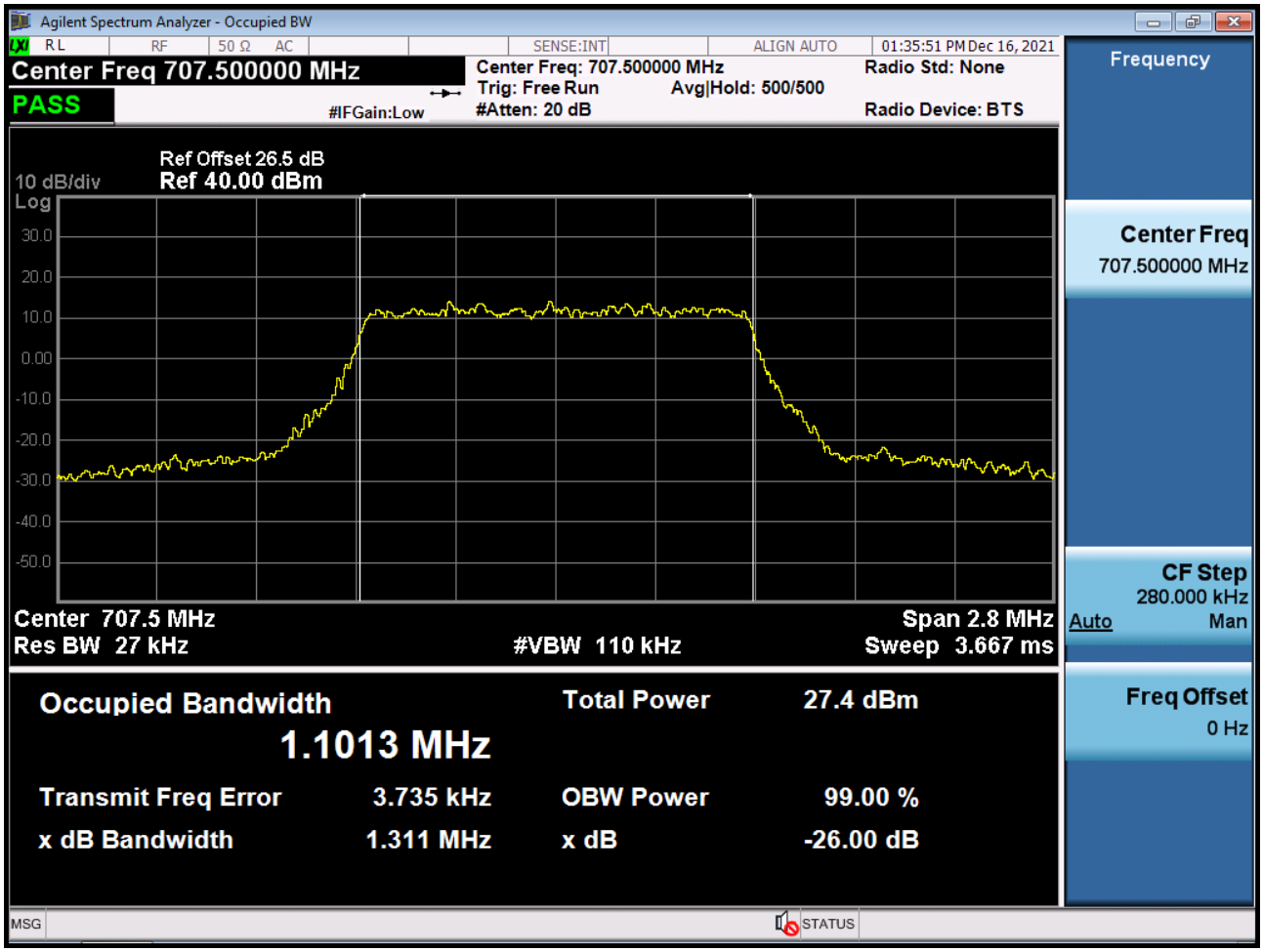
BAND 12. Occupied Bandwidth Plot (1.4 M BW Ch.23095 16QAM_RB6_0)



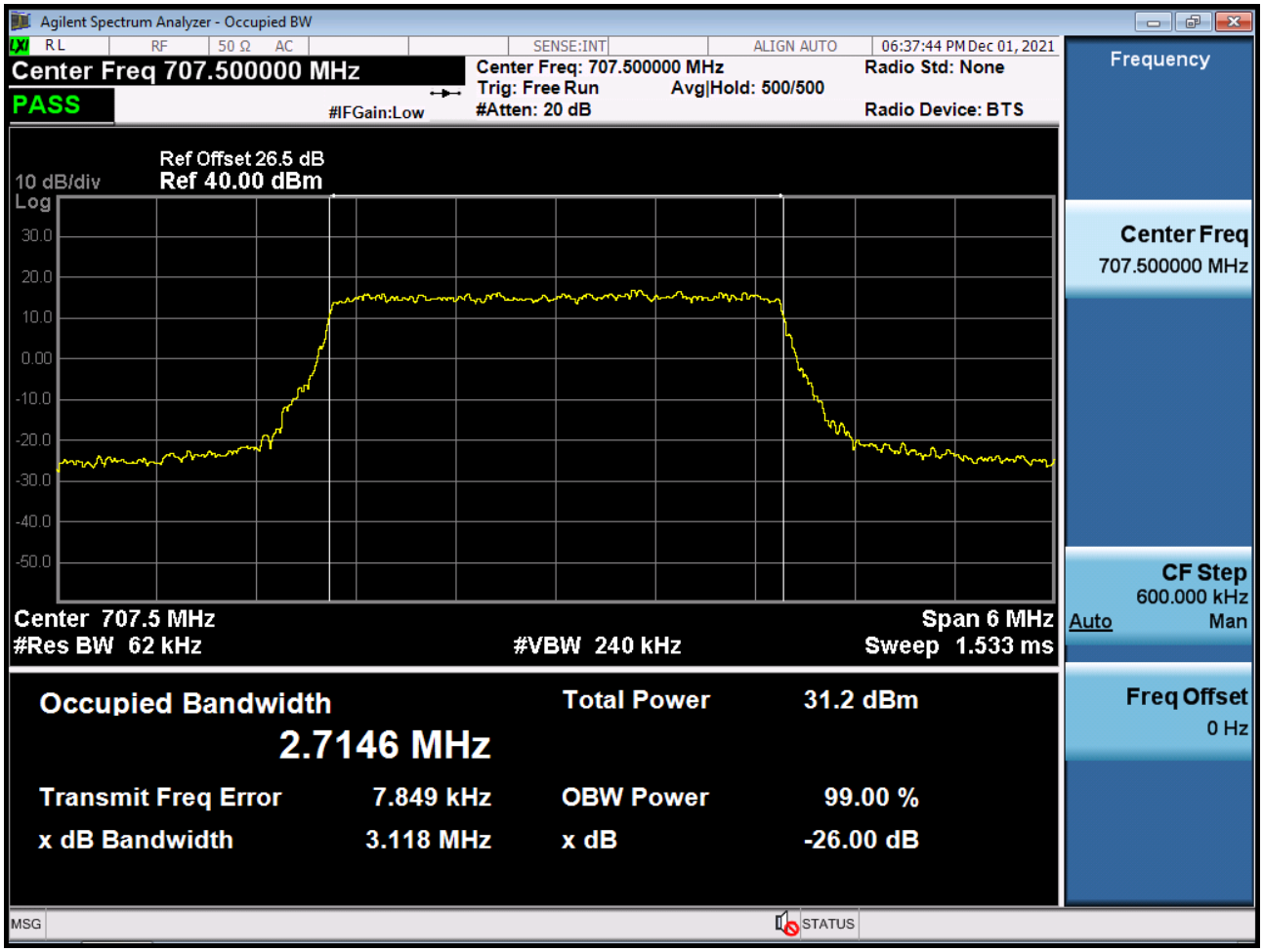
BAND 12. Occupied Bandwidth Plot (1.4 M BW Ch.23095 64QAM_RB6_0)



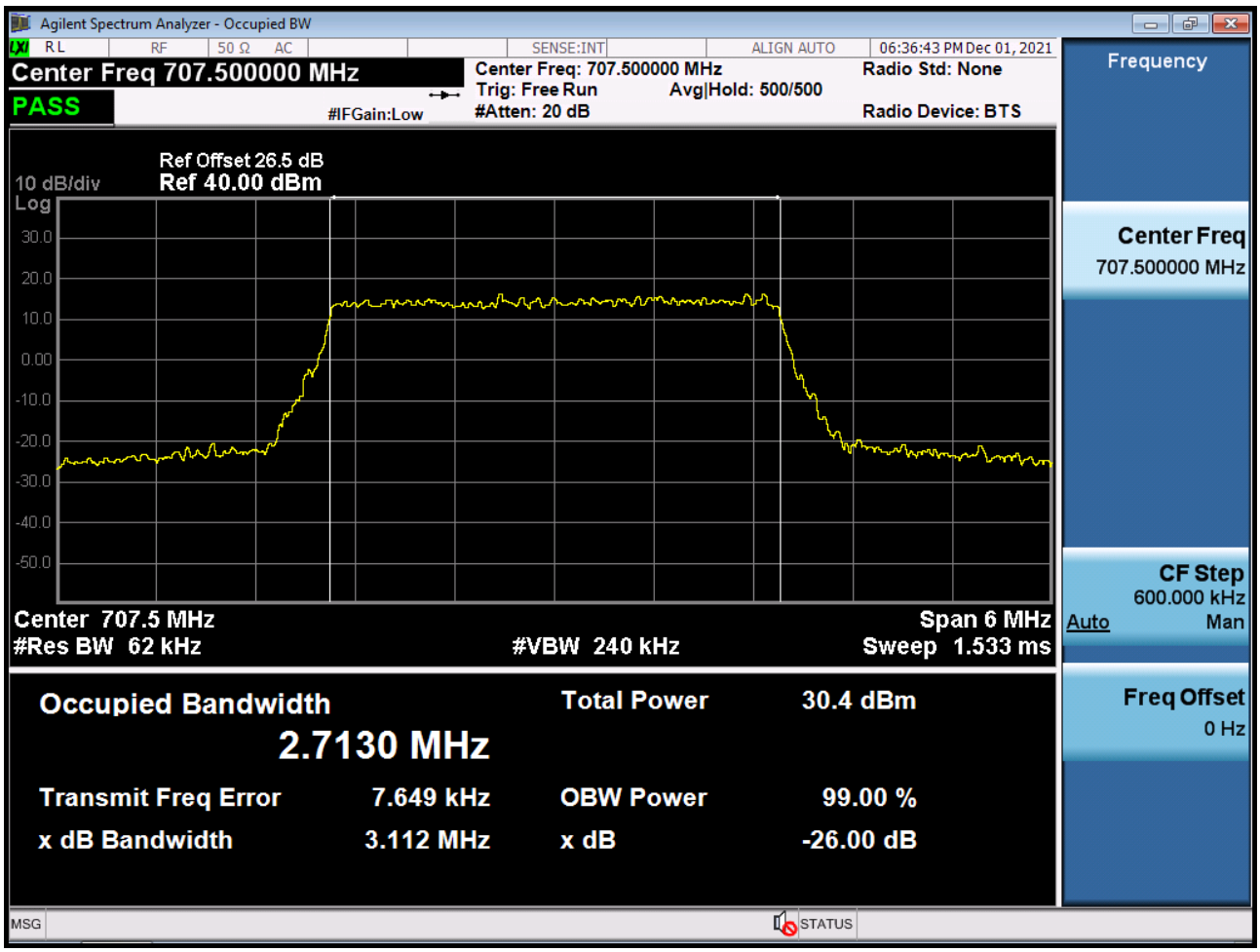
BAND 12. Occupied Bandwidth Plot (1.4 M BW Ch.23095 256QAM_RB6_0)



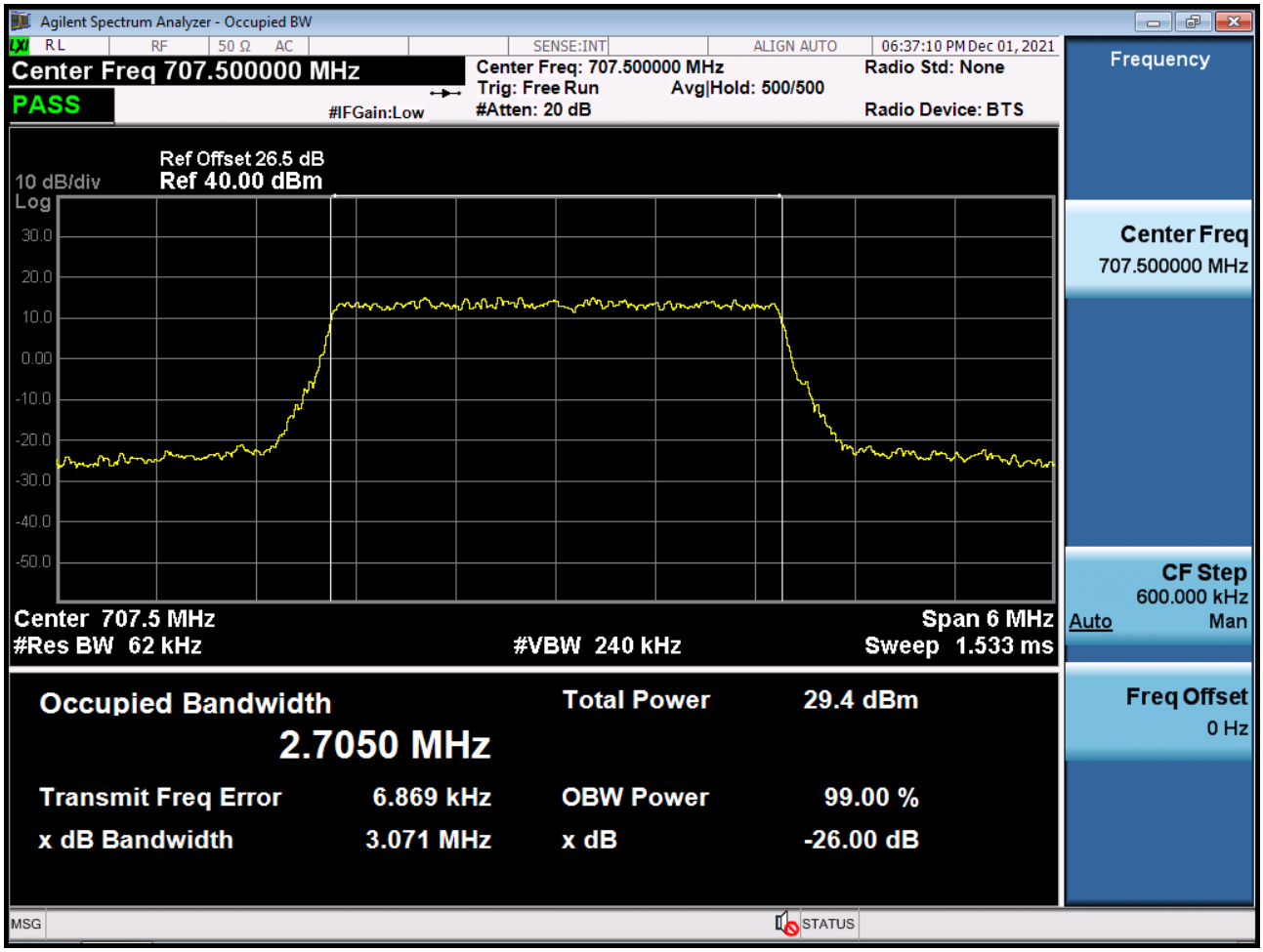
BAND 12. Occupied Bandwidth Plot (3 M BW Ch.23095 QPSK_RB15_0)



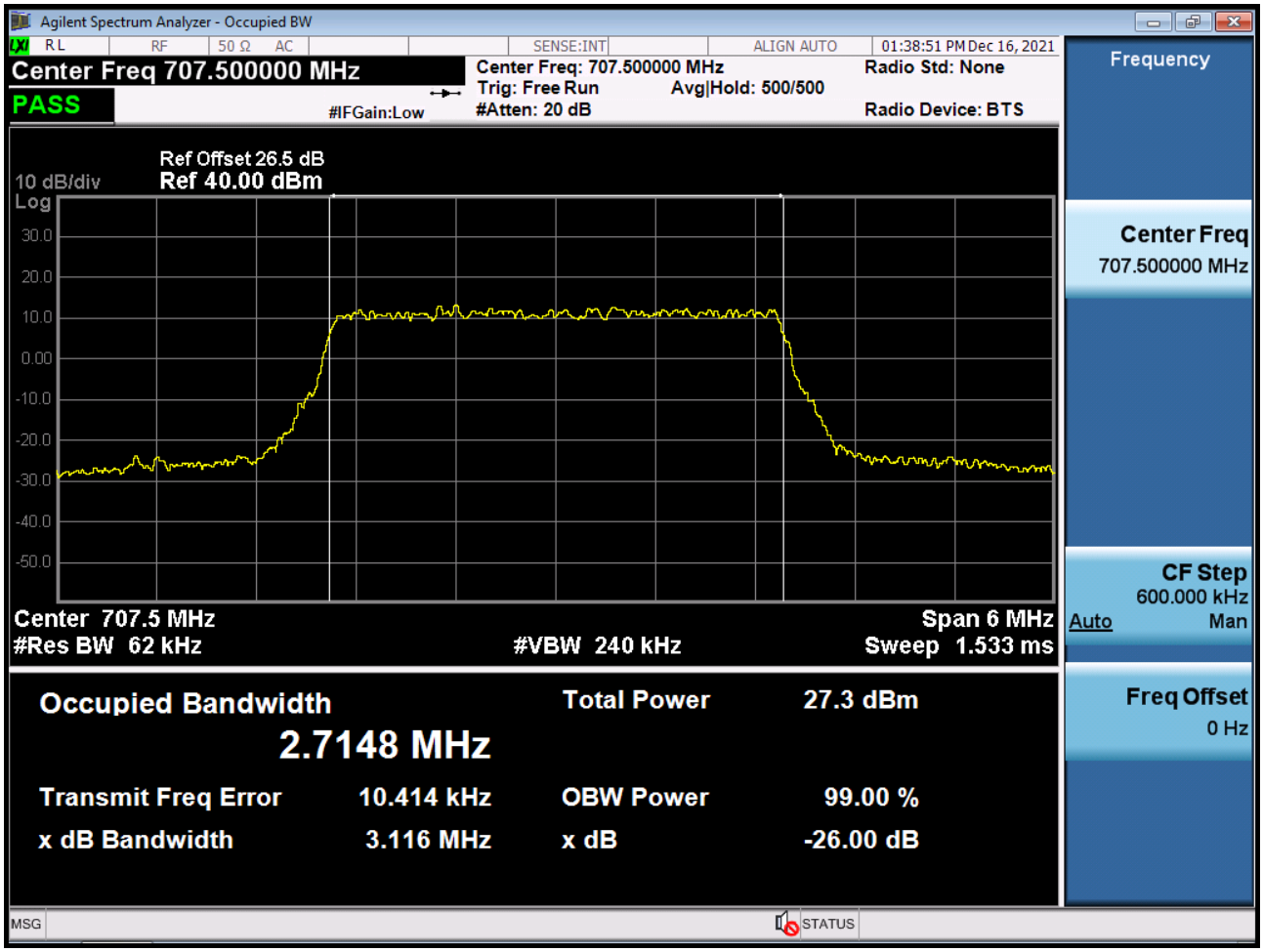
BAND 12. Occupied Bandwidth Plot (3 M BW Ch.23095 16QAM_RB15_0)



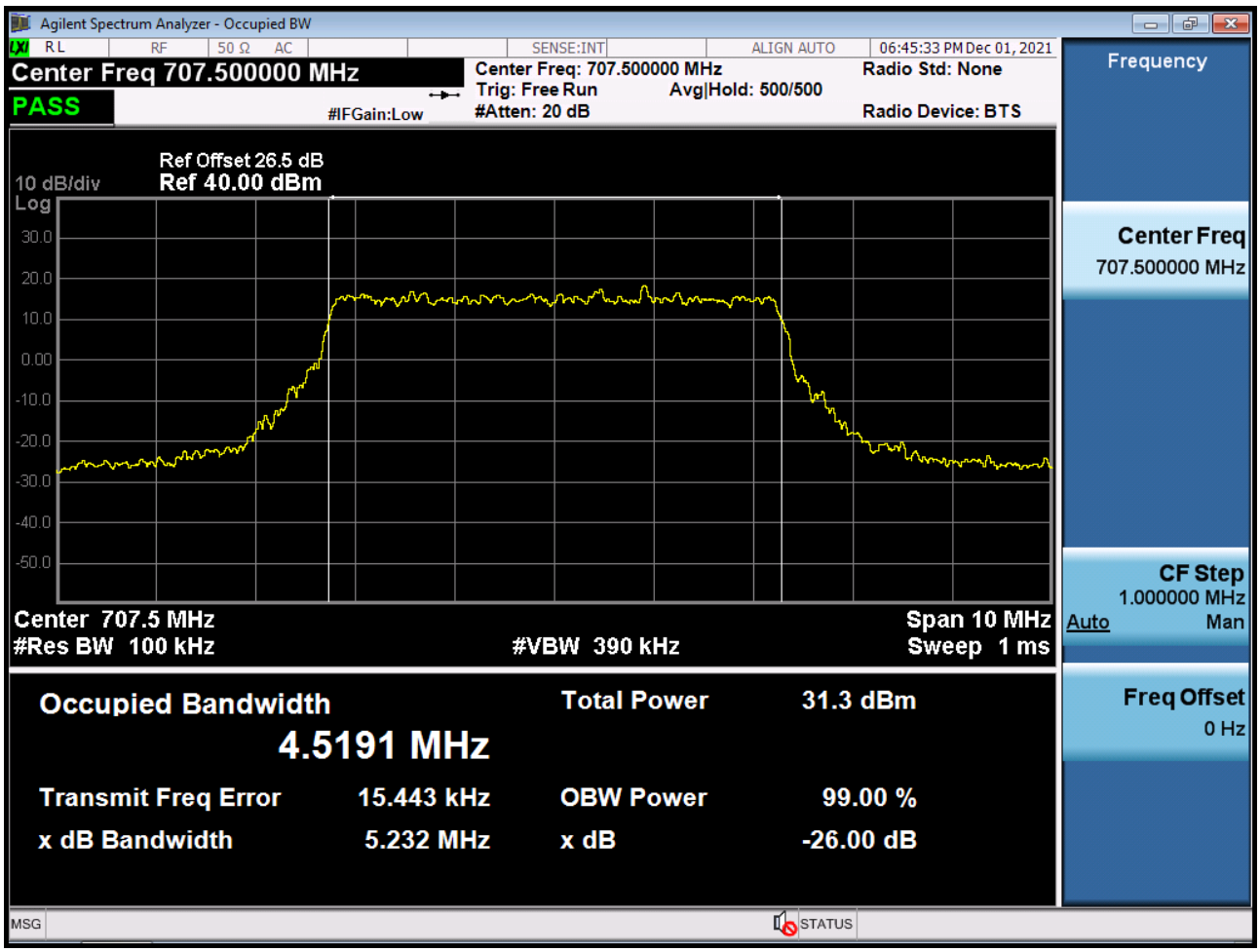
BAND 12. Occupied Bandwidth Plot (3 M BW Ch.23095 64QAM_RB15_0)



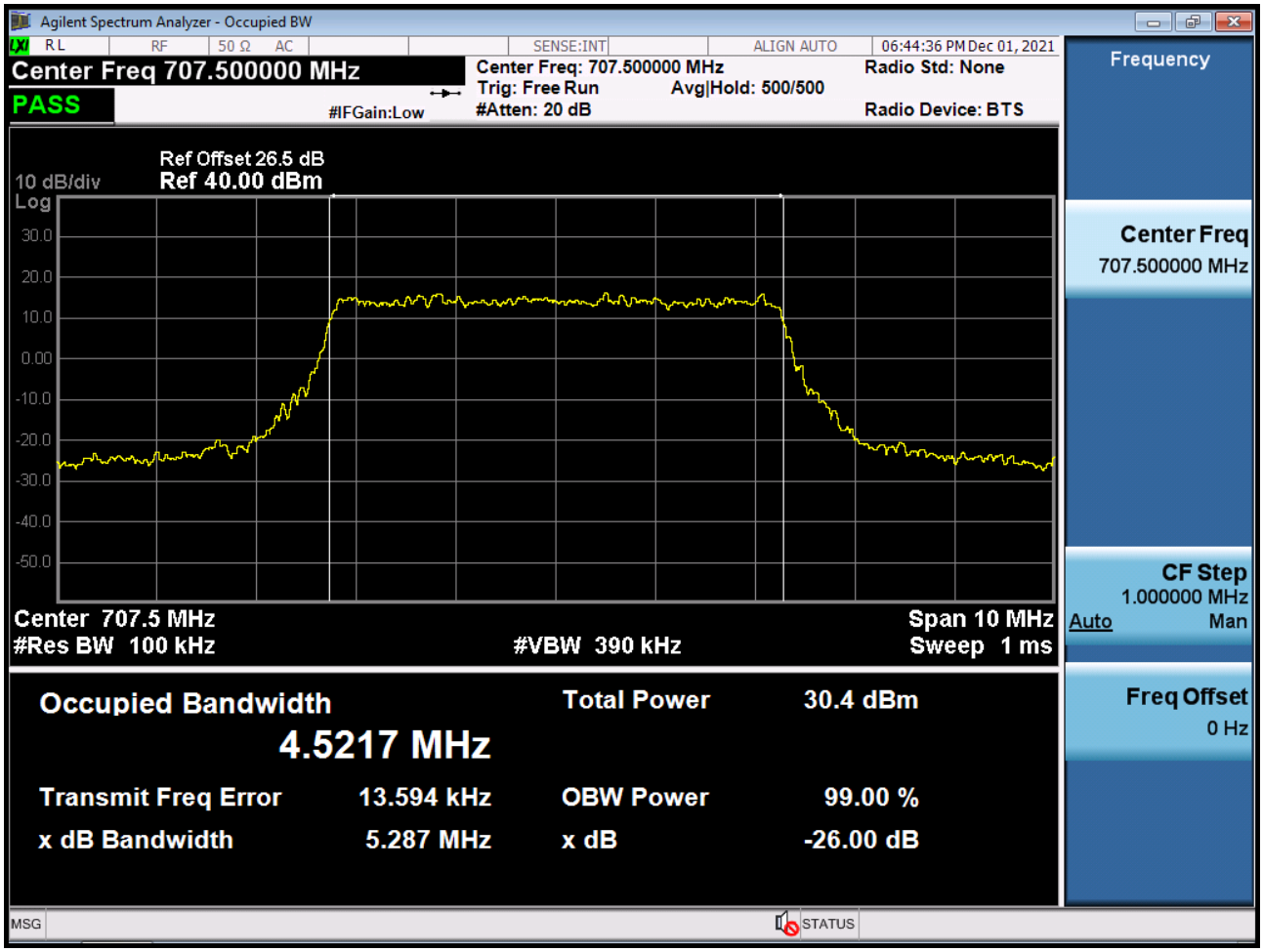
BAND 12. Occupied Bandwidth Plot (3 M BW Ch.23095 256QAM_RB15_0)



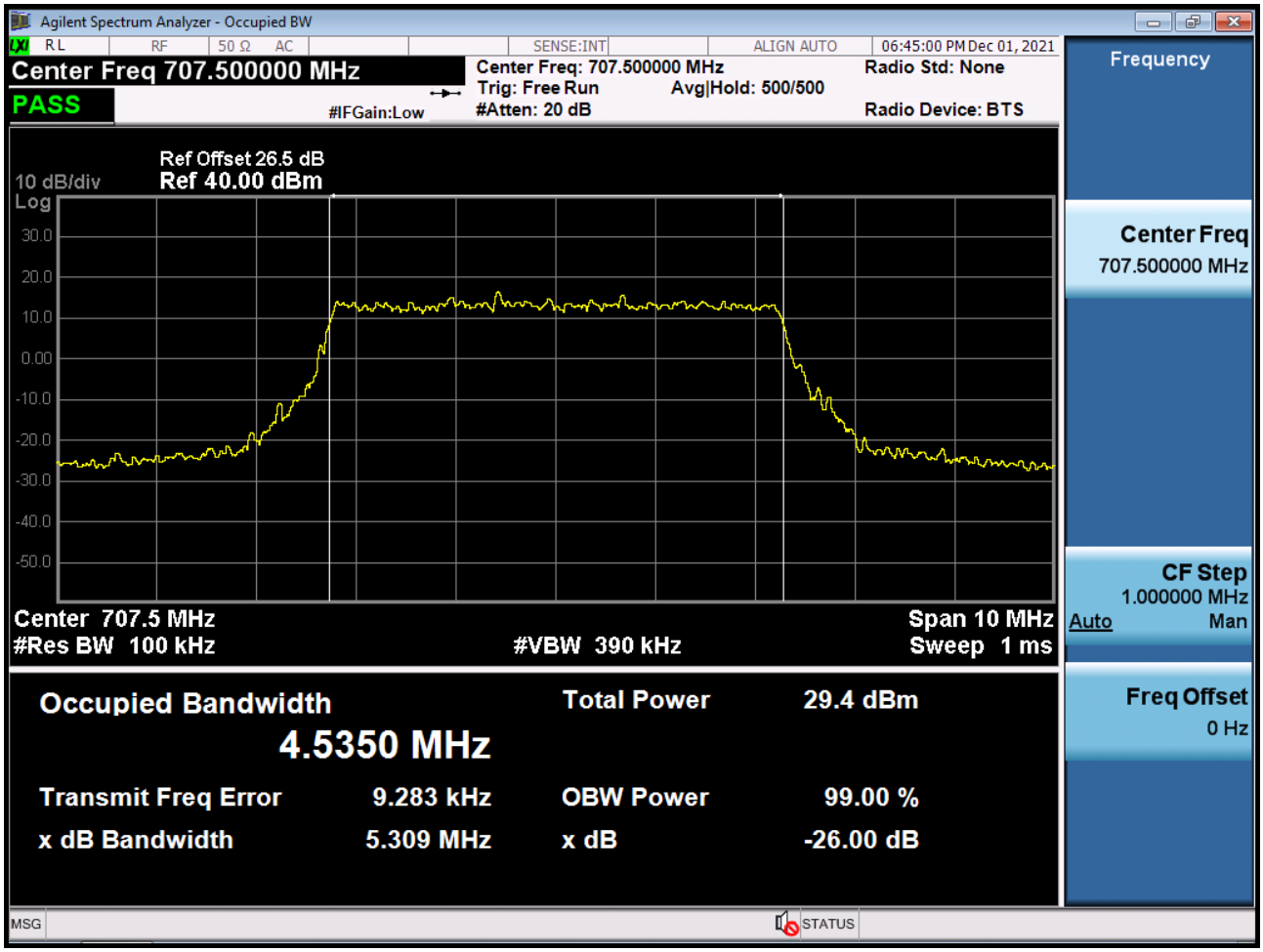
BAND 12/17. Occupied Bandwidth Plot (5 M BW Ch.23095 QPSK_RB25_0)



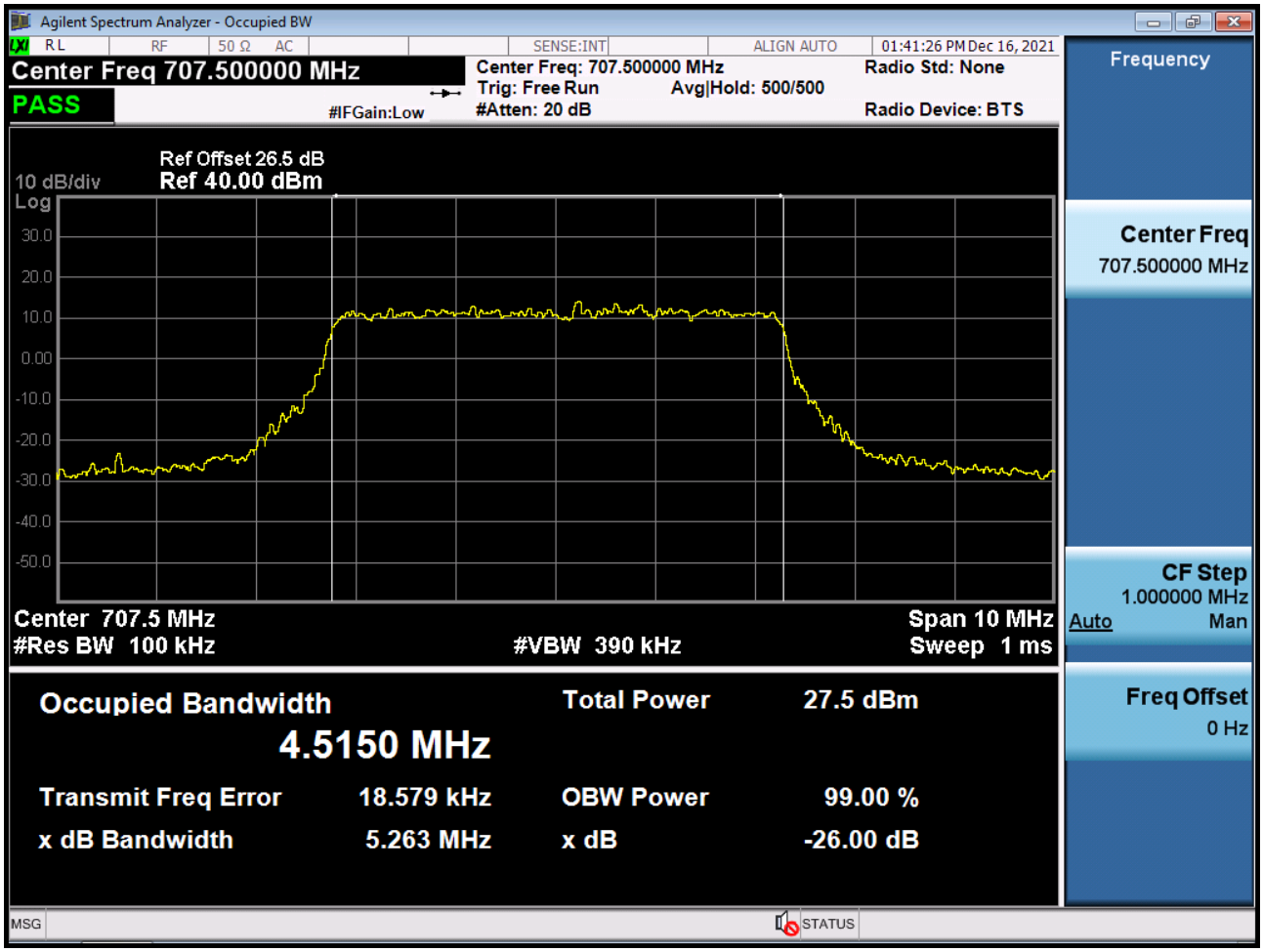
BAND 12/17. Occupied Bandwidth Plot (5 M BW Ch.23095 16QAM_RB25_0)



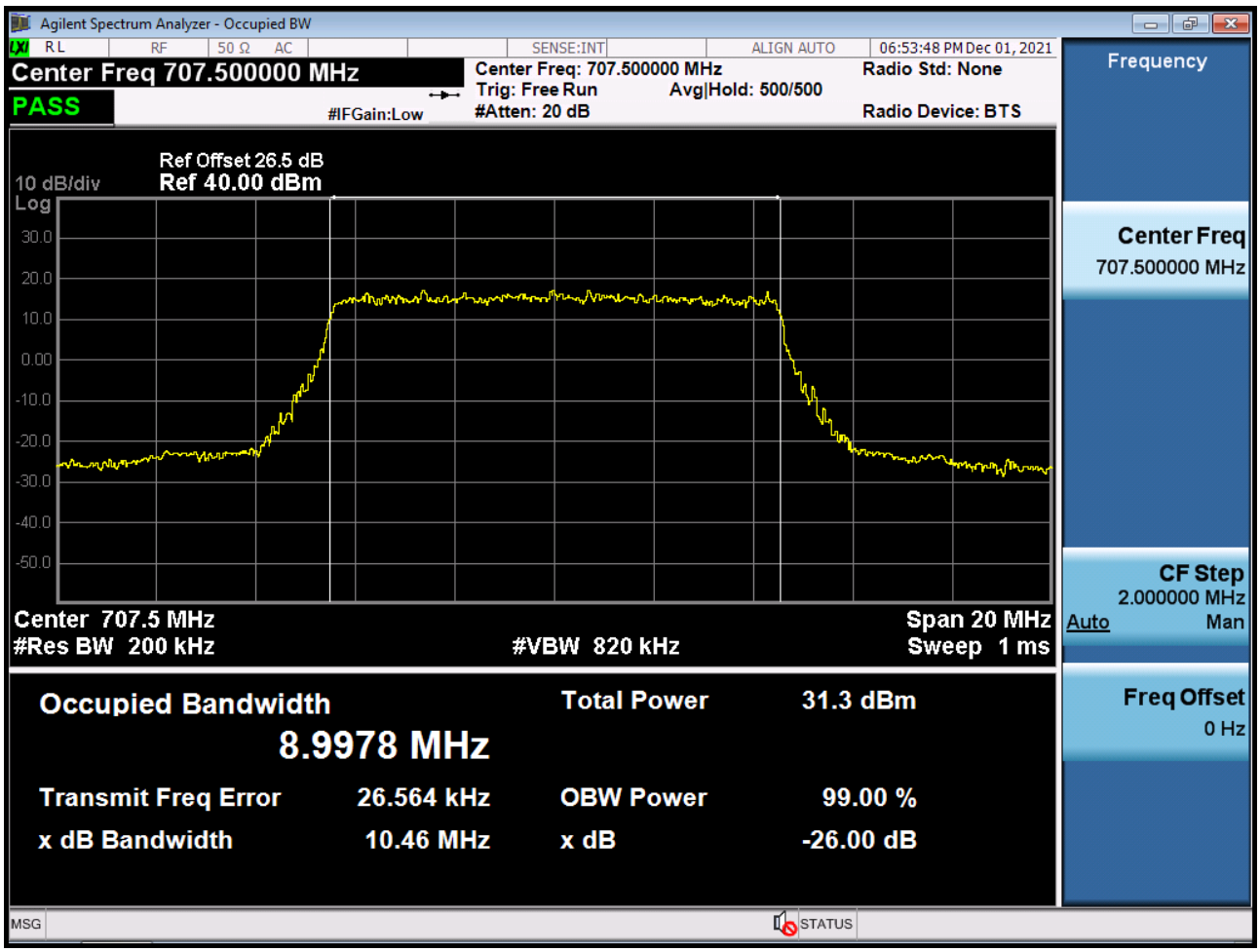
BAND 12/17. Occupied Bandwidth Plot (5 M BW Ch.23095 64QAM_RB25_0)



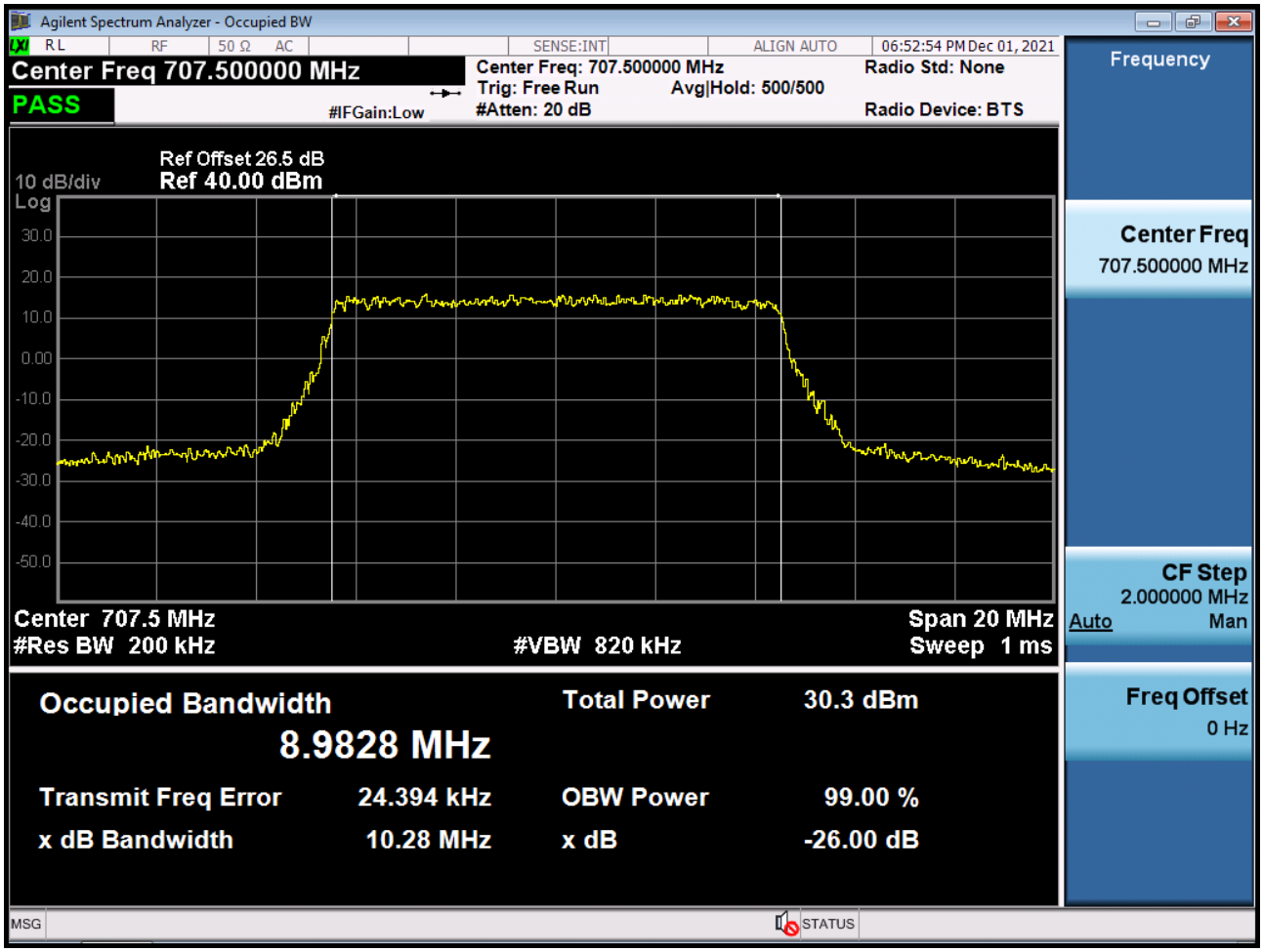
BAND 12/17. Occupied Bandwidth Plot (5 M BW Ch.23095 256QAM_RB25_0)



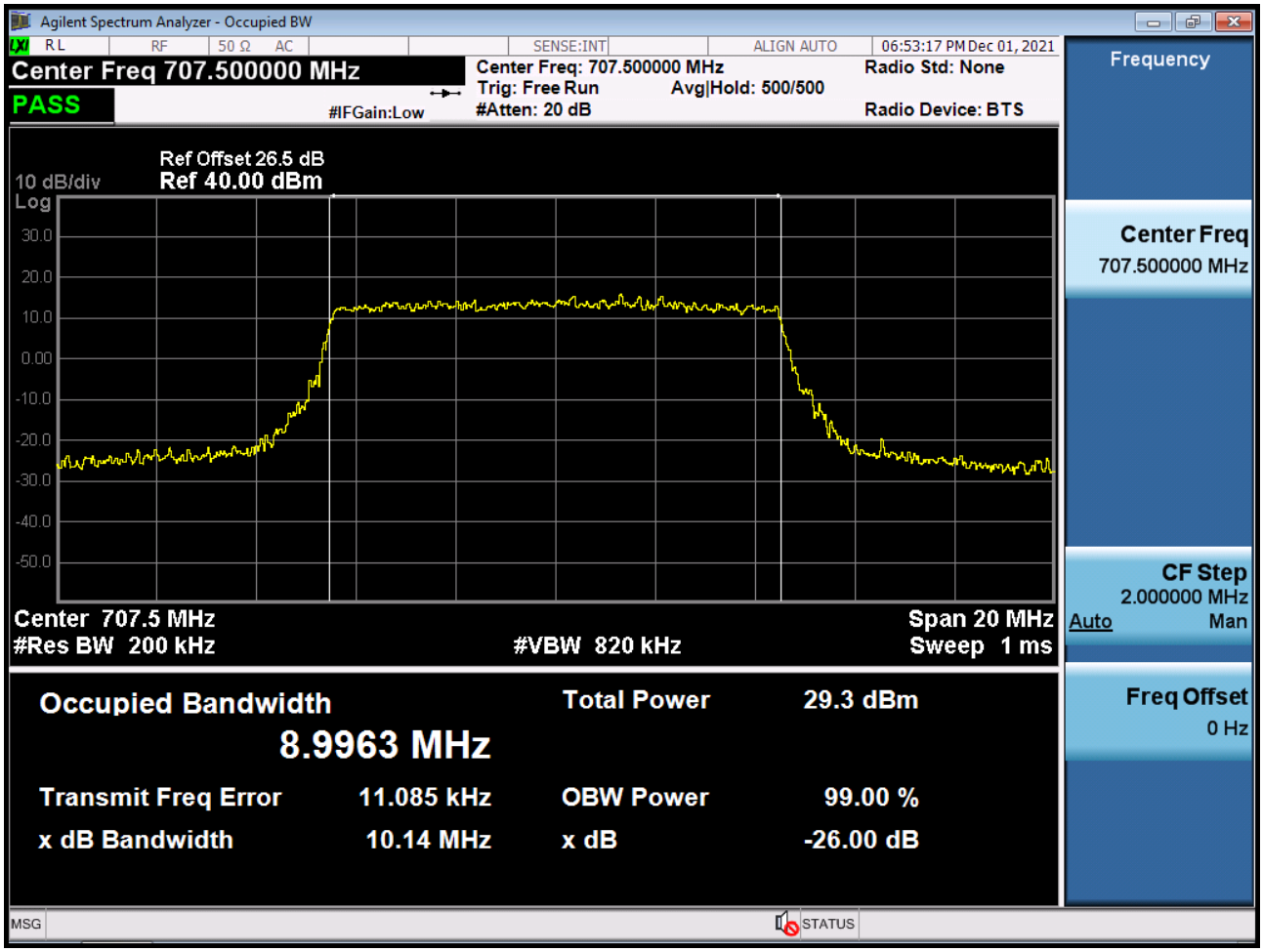
BAND 12/17. Occupied Bandwidth Plot (10 M BW Ch.23095 QPSK_RB50_0)



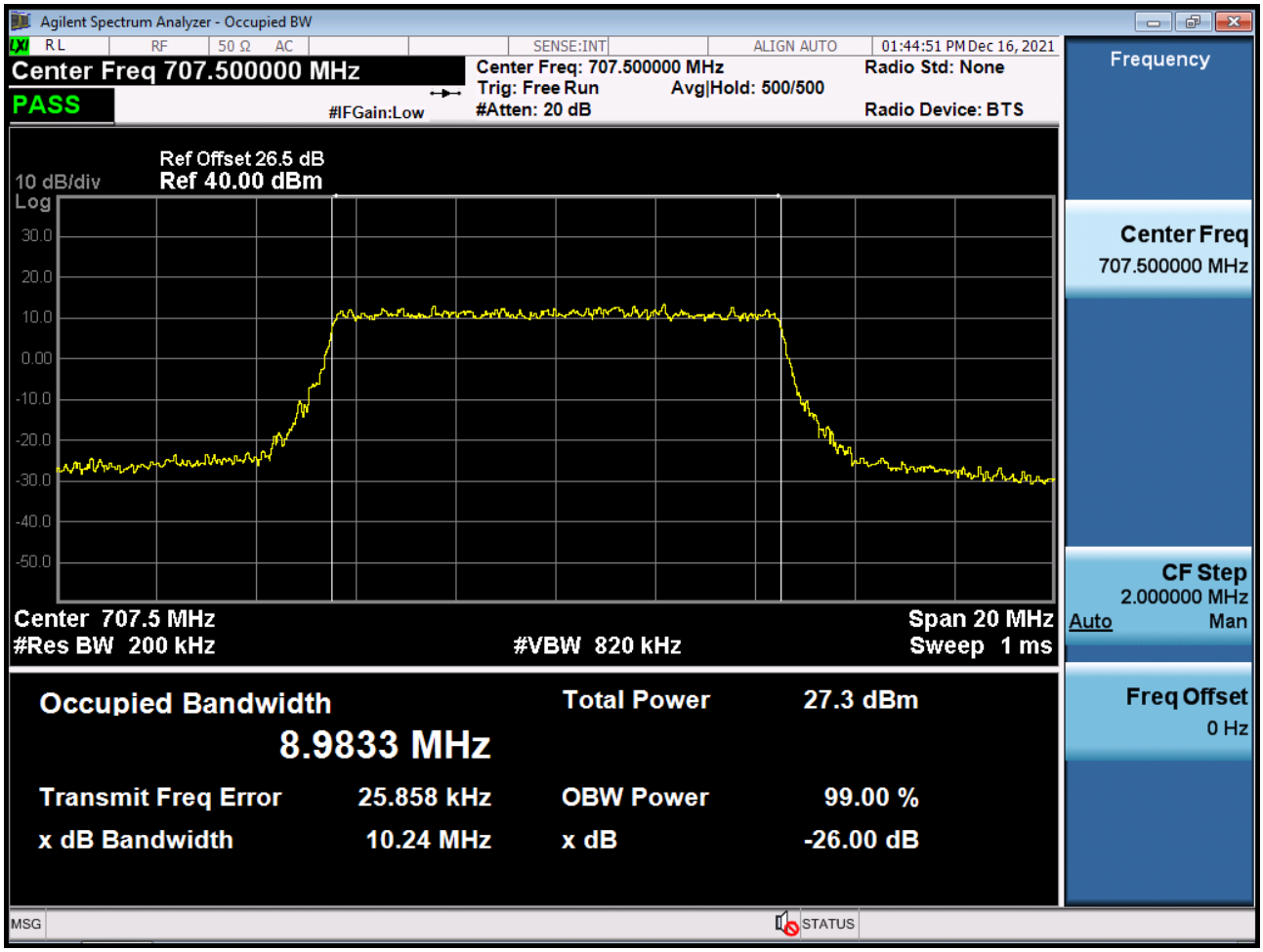
BAND 12/17. Occupied Bandwidth Plot (10 M BW Ch.23095 16QAM_RB50_0)



BAND 12/17. Occupied Bandwidth Plot (10 M BW Ch.23095 64QAM_RB50_0)



BAND 12/17. Occupied Bandwidth Plot (10 M BW Ch.23095 256QAM_RB50_0)

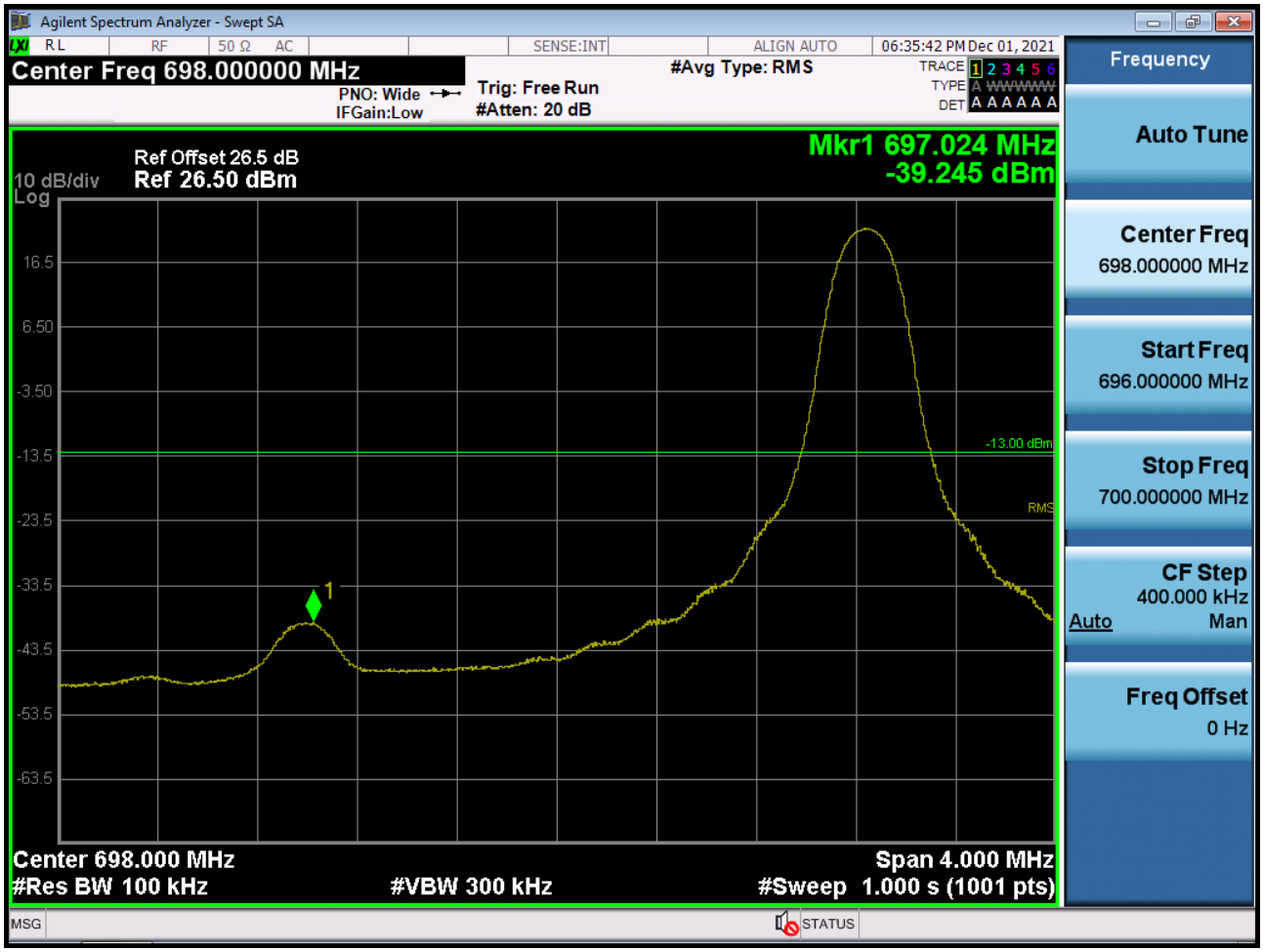


BAND 12. Lower Band Edge Plot (1.4 M BW Ch.23017 QPSK_RB1_Offset 0)

BAND 12. Lower Band Edge Plot (1.4 M BW Ch.23017 QPSK_RB6_Offset 0)

BAND 12. Lower Extended Band Edge Plot (1.4 M BW Ch.23017 QPSK_RB6_0)

BAND 12. Lower Band Edge Plot (3 M BW Ch.23025 QPSK_RB1_Offset 0)



BAND 12. Lower Band Edge Plot (3 M BW Ch.23025 QPSK_RB15_Offset 0)

BAND 12. Lower Extended Band Edge Plot (3 M BW Ch.23025 QPSK_RB15_0)

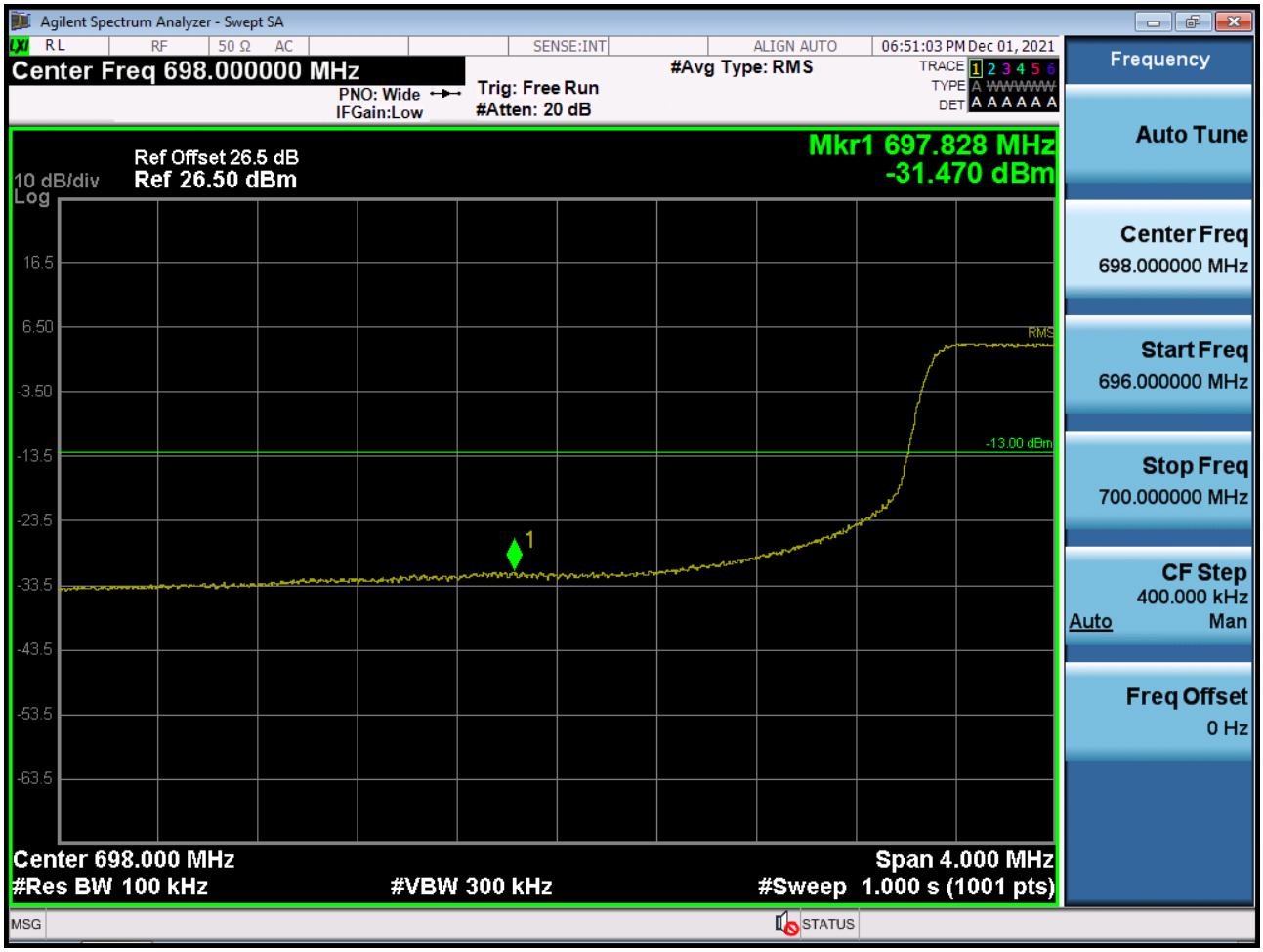
BAND 12/17. Lower Band Edge Plot (5 M BW Ch.23035 QPSK_RB1_Offset 0)

BAND 12/17. Lower Band Edge Plot (5 M BW Ch.23035 QPSK_RB25_Offset 0)

BAND 12/17. Lower Extended Band Edge Plot (5 M BW Ch.23035 QPSK_RB25_0)

BAND 12/17. Lower Band Edge Plot (10 M BW Ch.23060 QPSK_RB1_Offset 0)

BAND 12/17. Lower Band Edge Plot (10 M BW Ch.23060 QPSK_RB50_Offset 0)



BAND 12/17. Lower Extended Band Edge Plot (10 M BW Ch.23060 QPSK_RB50_0)

BAND 12. Upper Band Edge Plot (1.4 M BW Ch.23173 QPSK_RB1_Offset 5)_1

BAND 12. Upper Band Edge Plot (1.4 M BW Ch.23173 QPSK_RB1_Offset 5)_2

BAND 12. Upper Band Edge Plot (1.4 M BW Ch.23173 QPSK_RB6_Offset 0)

BAND 12. Upper Extended Band Edge Plot (1.4 M BW Ch.23173 QPSK_RB6_0)

BAND 12. Upper Band Edge Plot (3 M BW Ch.23165 QPSK_RB1_Offset 14)-1

BAND 12. Upper Band Edge Plot (3 M BW Ch.23165 QPSK_RB1_Offset 14)-2

BAND 12. Upper Band Edge Plot (3 M BW Ch.23165 QPSK_RB15_Offset 0)

BAND 12. Upper Extended Band Edge Plot (3 M BW Ch.23165 QPSK_RB15_0)

BAND 12/17. Upper Band Edge Plot (5 M BW Ch.23155 QPSK_RB1_Offset 24)_1

BAND 12/17. Upper Band Edge Plot (5 M BW Ch.23155 QPSK_RB1_Offset 24)_2

BAND 12/17. Upper Band Edge Plot (5 M BW Ch.23155 QPSK_RB25_Offset 0)

BAND 12/17. Upper Extended Band Edge Plot (5 M BW Ch.23155 QPSK_RB25_0)

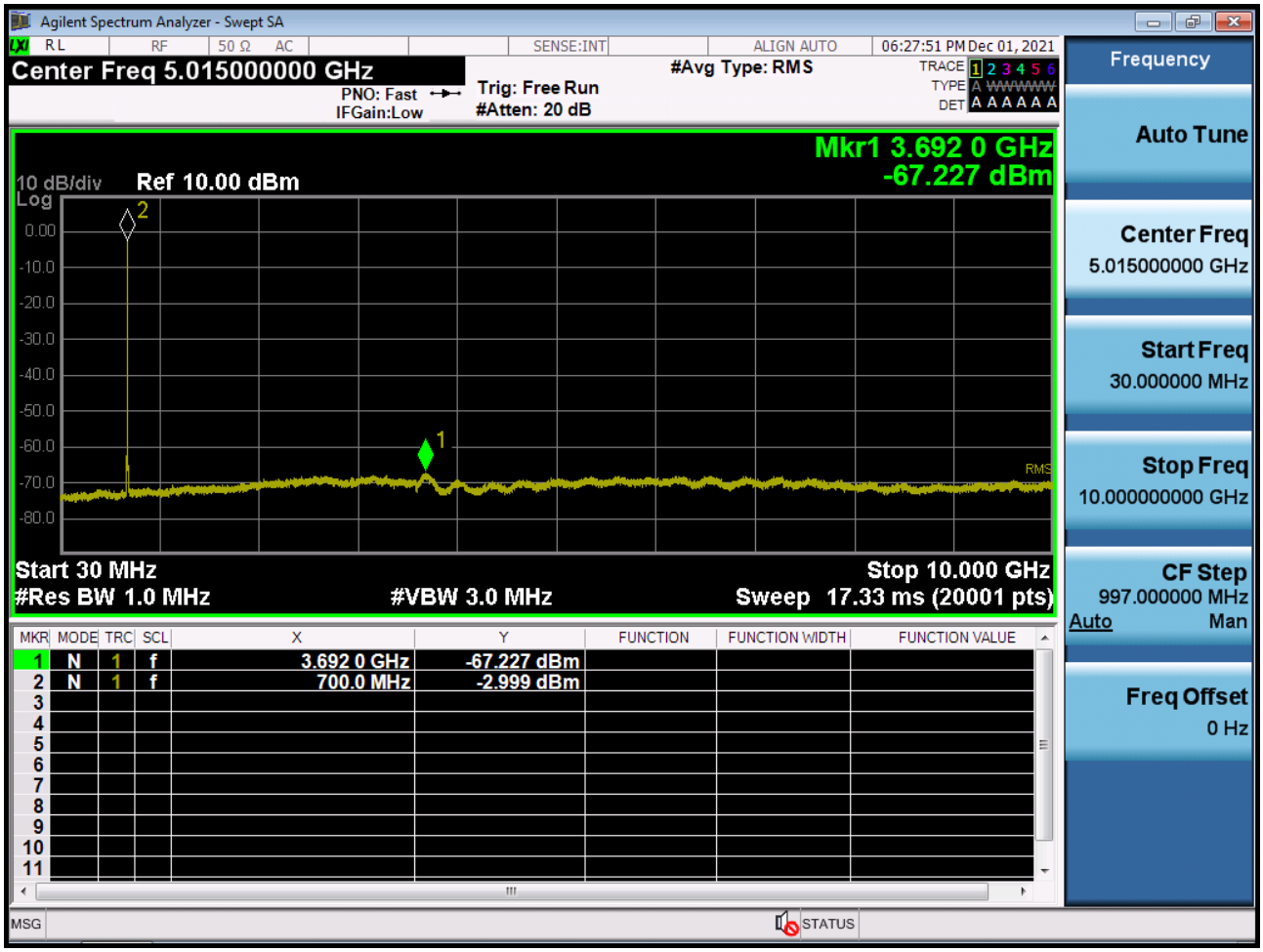
BAND 12/17. Upper Band Edge Plot (10 M BW Ch.23130 QPSK_RB1_Offset 49)_1

BAND 12/17. Upper Band Edge Plot (10 M BW Ch.23130 QPSK_RB1_Offset 49)_2

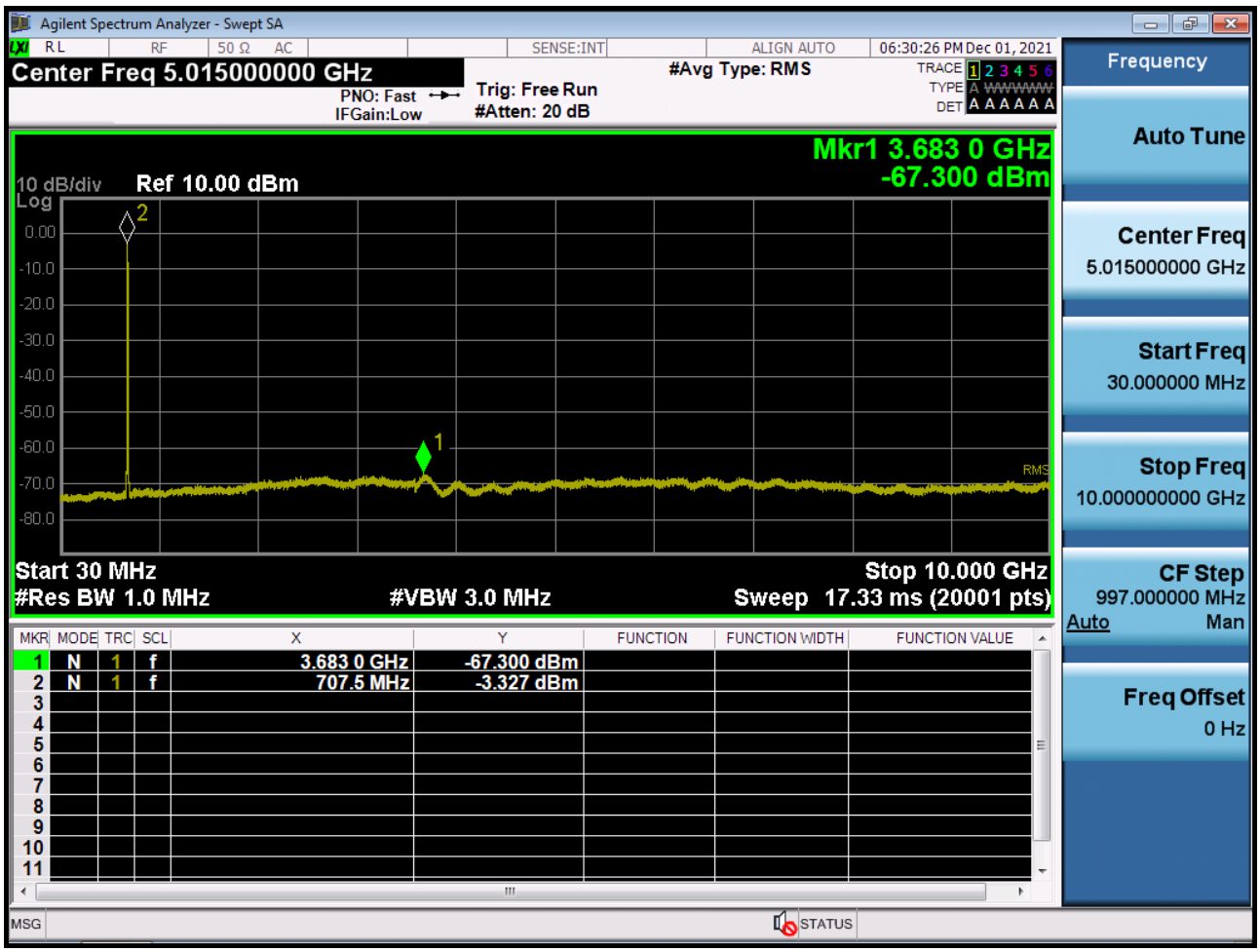
BAND 12/17. Upper Band Edge Plot (10 M BW Ch.23130 QPSK_RB50_Offset 0)

BAND 12/17. Upper Extended Band Edge Plot (10 M BW Ch.23130 QPSK_RB50_0)

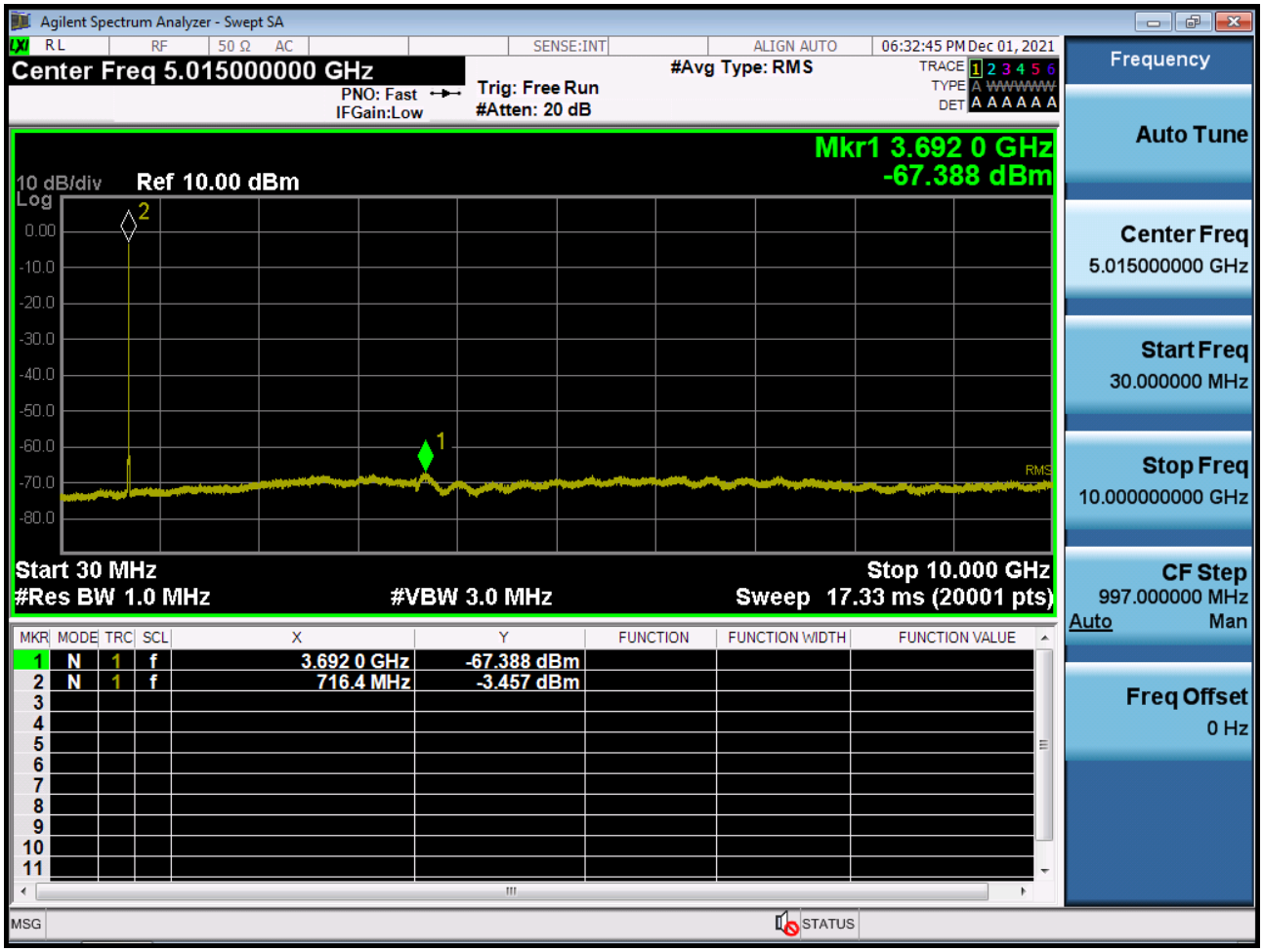
BAND 12. Conducted Spurious Plot _ (23017ch_1.4 MHz_QPSK_RB 1_0)



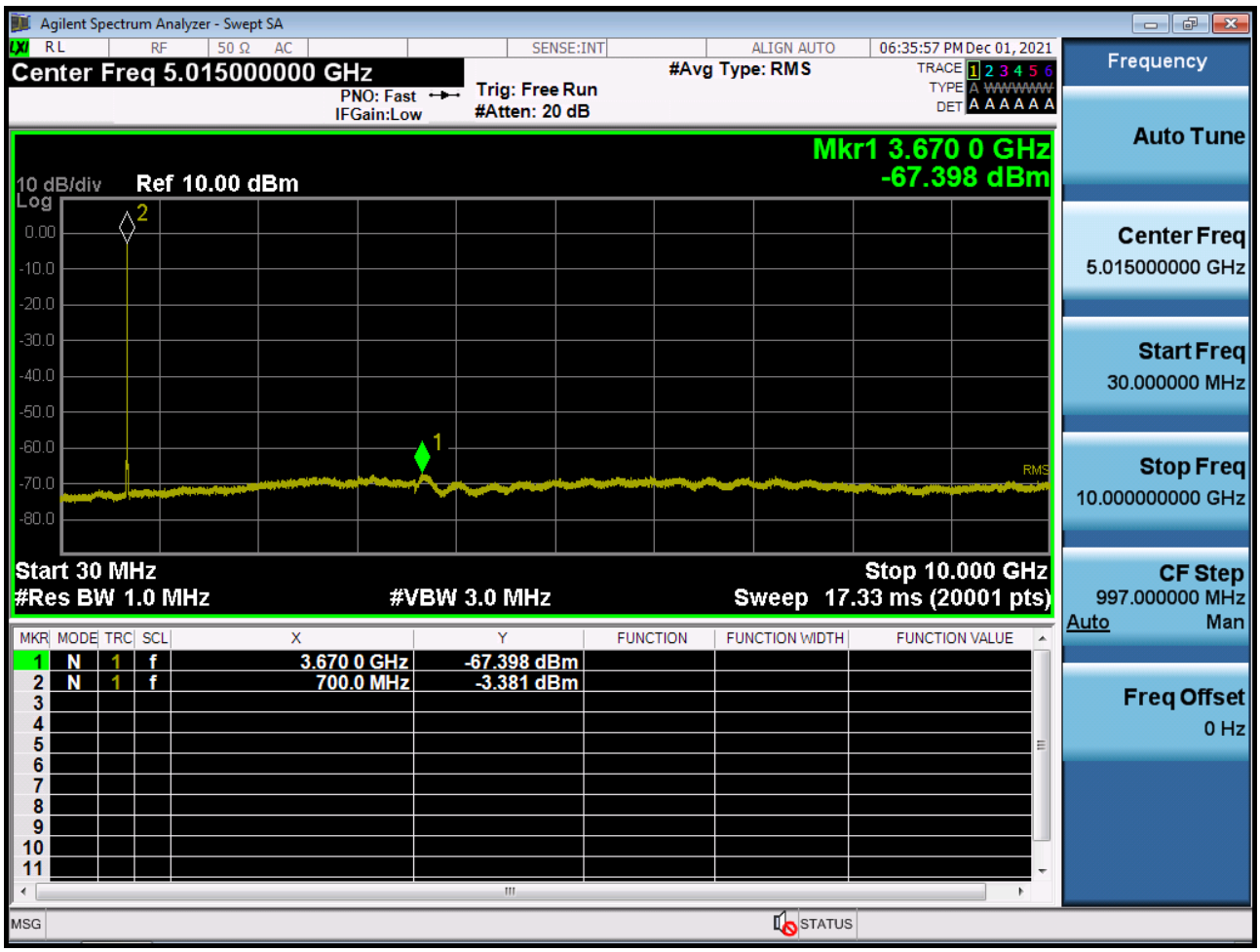
BAND 12. Conducted Spurious Plot _ (23095ch_1.4 MHz_QPSK_RB 1_0)



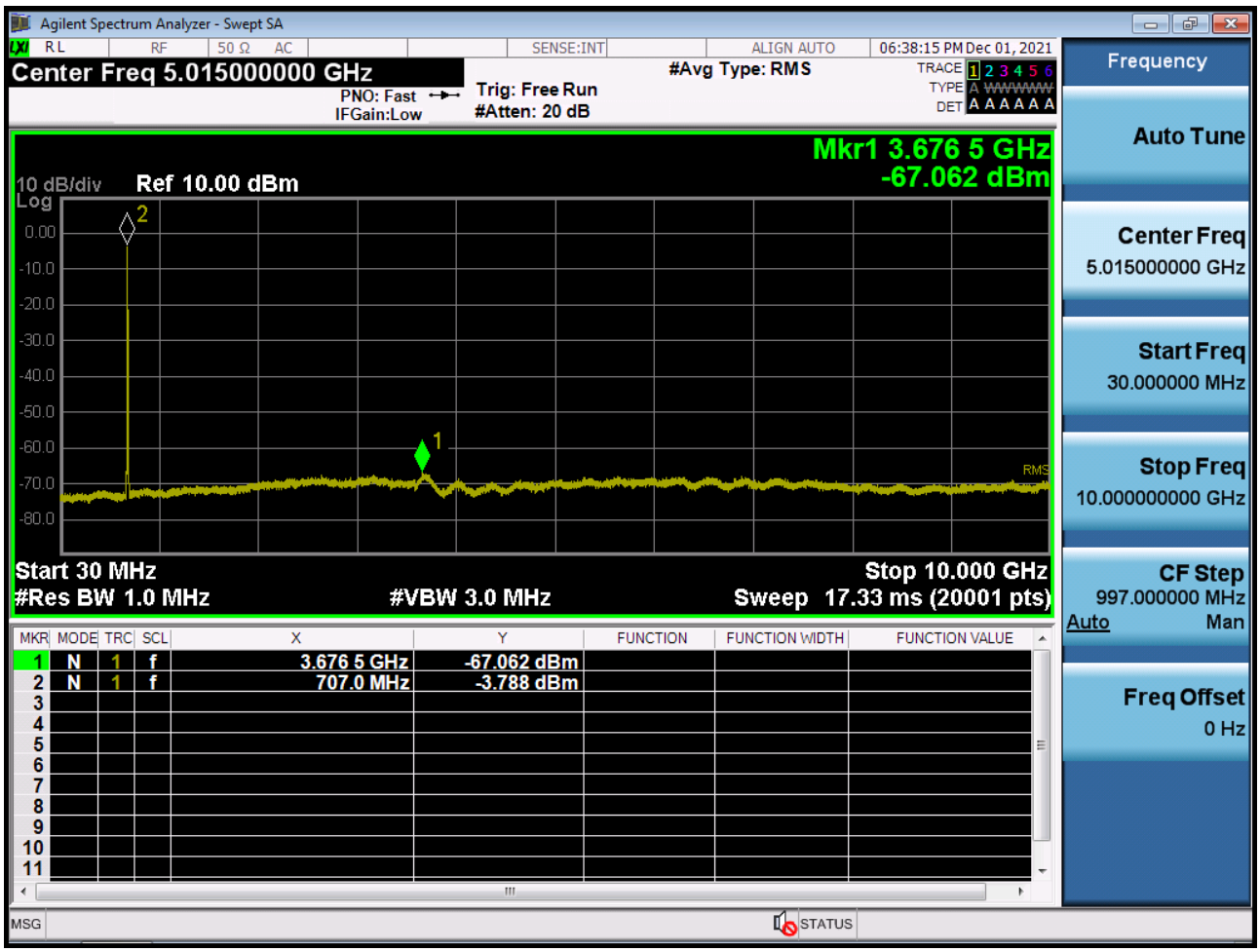
BAND 12. Conducted Spurious Plot _ (23173ch_1.4 MHz_QPSK_RB 1_0)



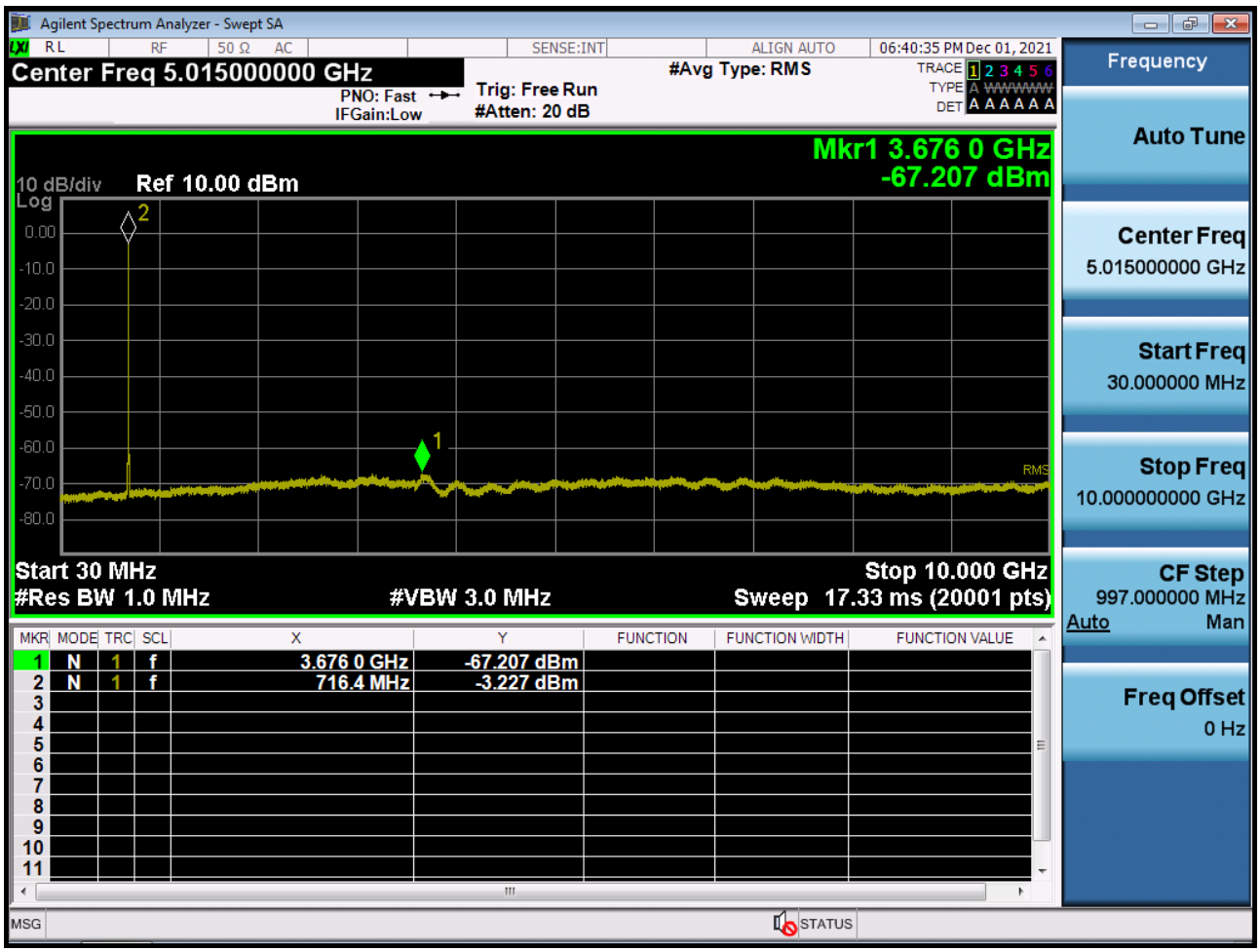
BAND 12. Conducted Spurious Plot _ (23025ch_3 MHz_QPSK_RB 1_0)



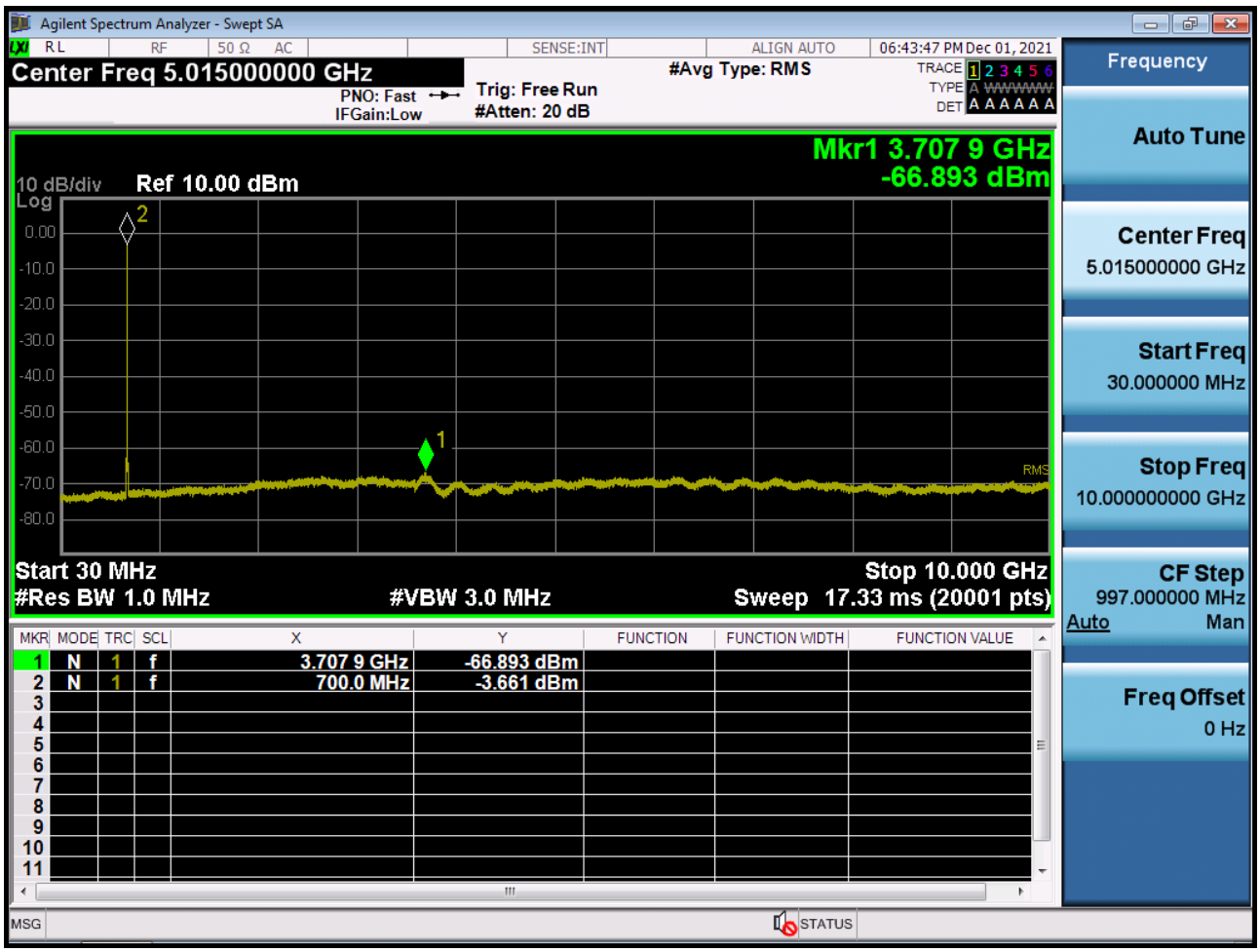
BAND 12. Conducted Spurious Plot _ (23095ch_3 MHz_QPSK_RB 1_0)



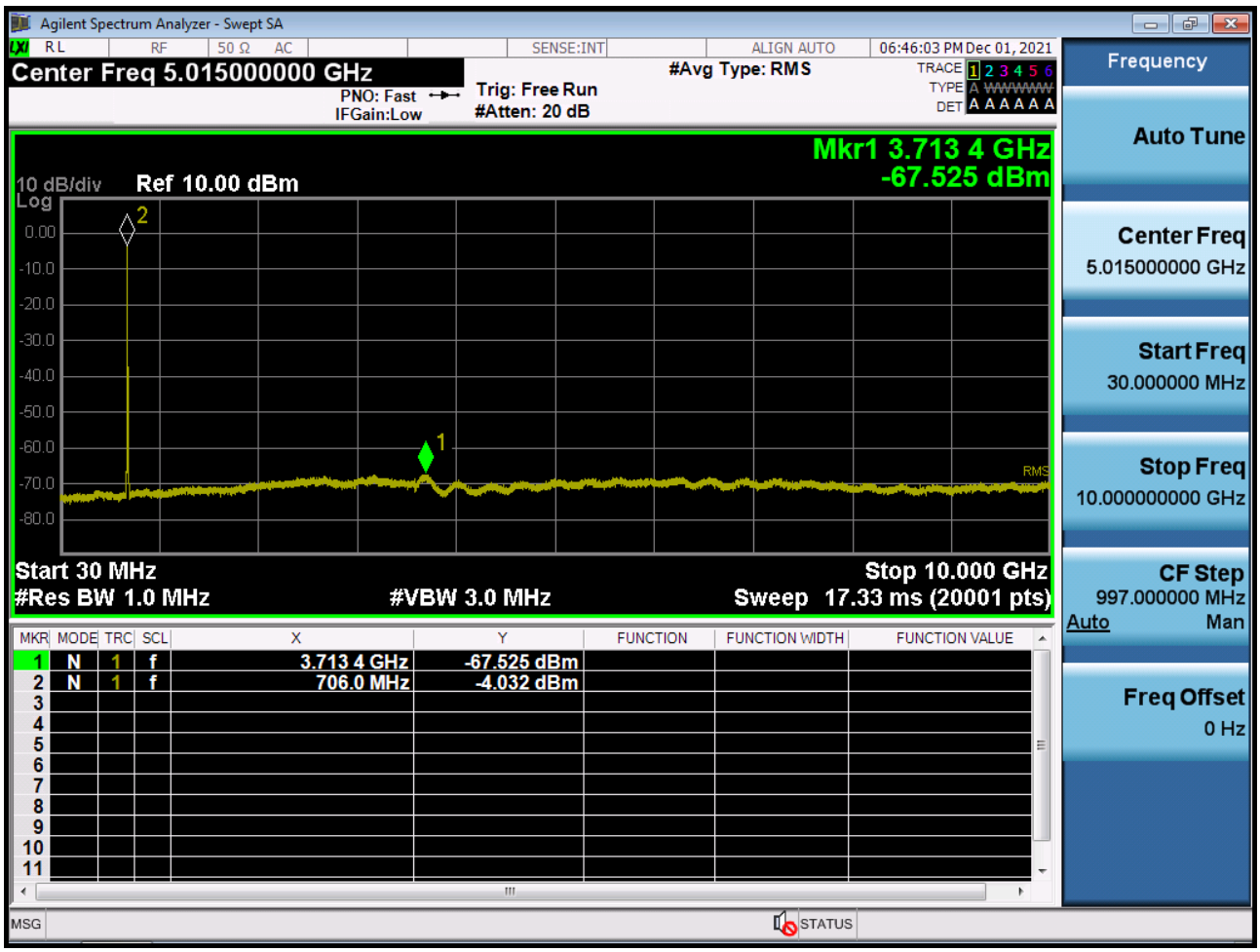
BAND 12. Conducted Spurious Plot _ (23165ch_3 MHz_QPSK_RB 1_0)



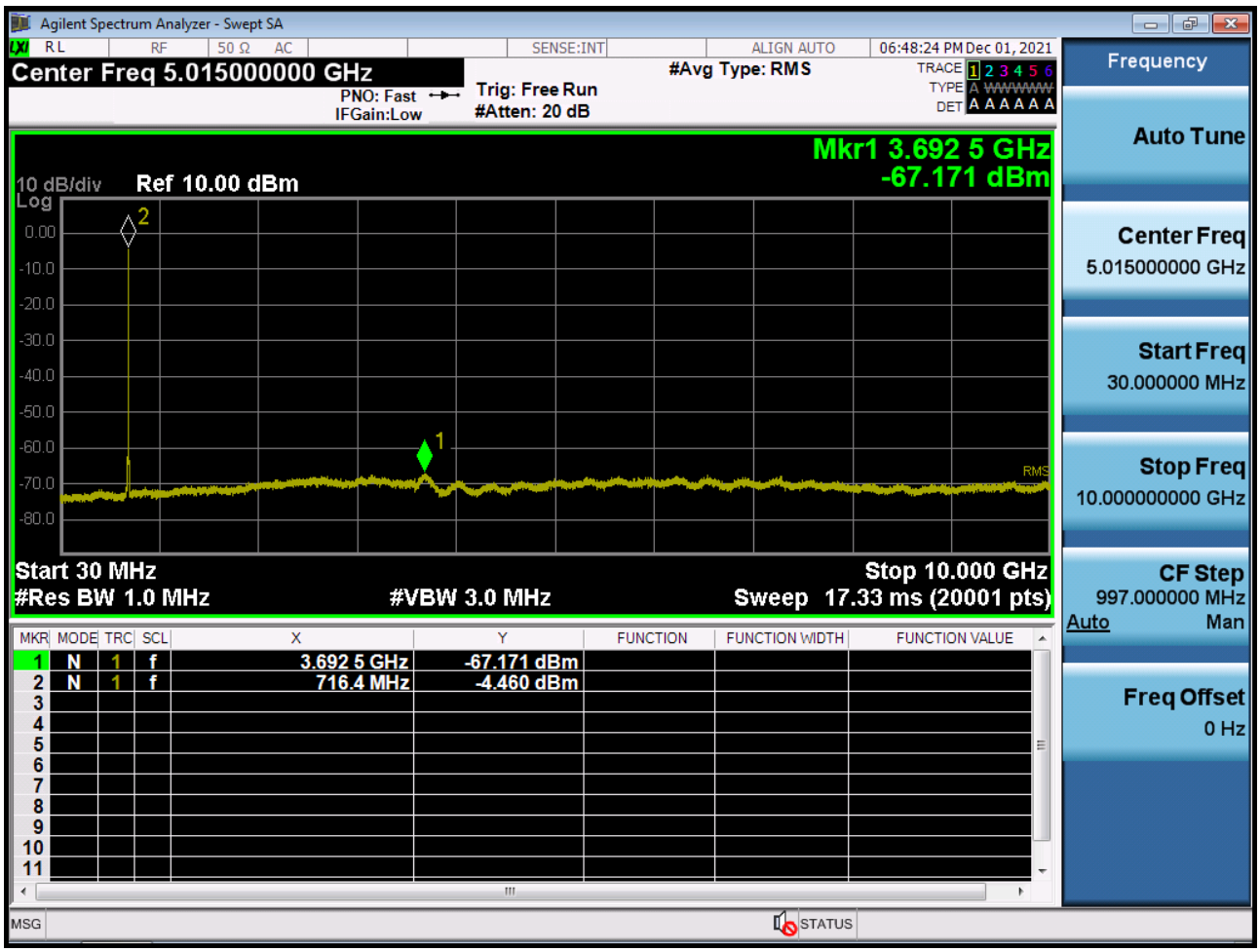
BAND 12/17. Conducted Spurious Plot _ (23035ch_5 MHz_QPSK_RB 1_0)



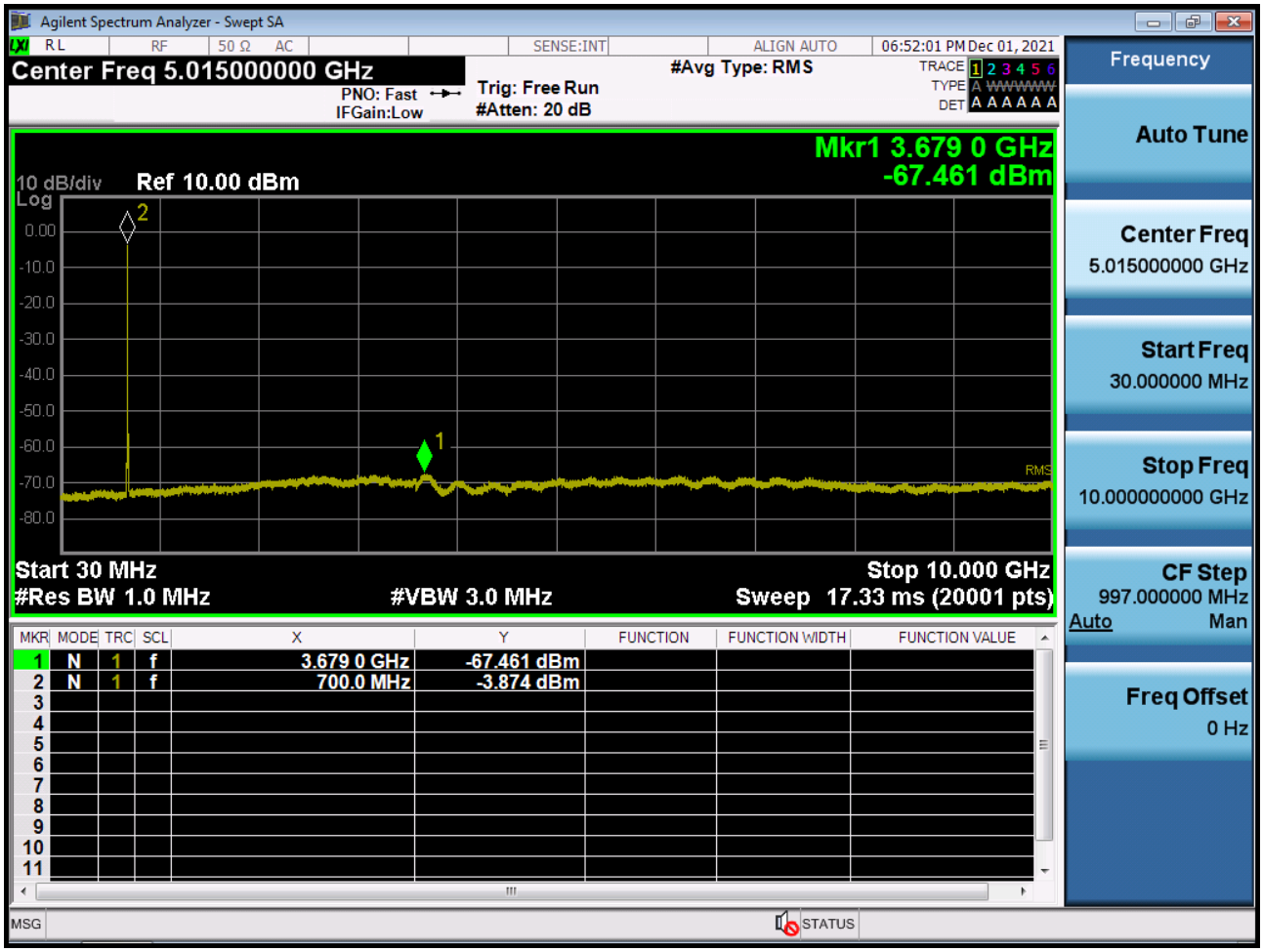
BAND 12/17. Conducted Spurious Plot _ (23095ch_5 MHz_QPSK_RB 1_0)



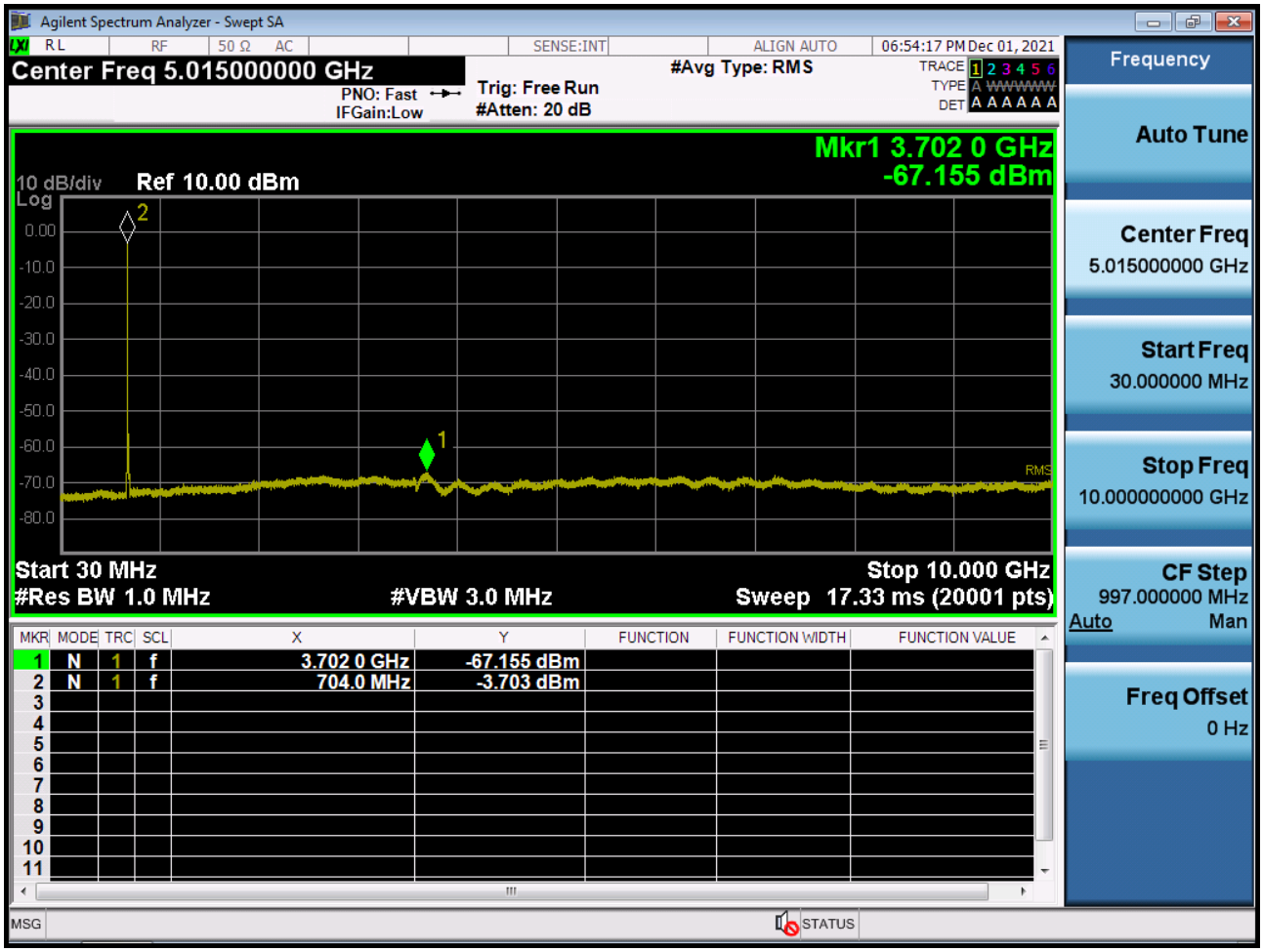
BAND 12/17. Conducted Spurious Plot _ (23155ch_5 MHz_QPSK_RB 1_0)



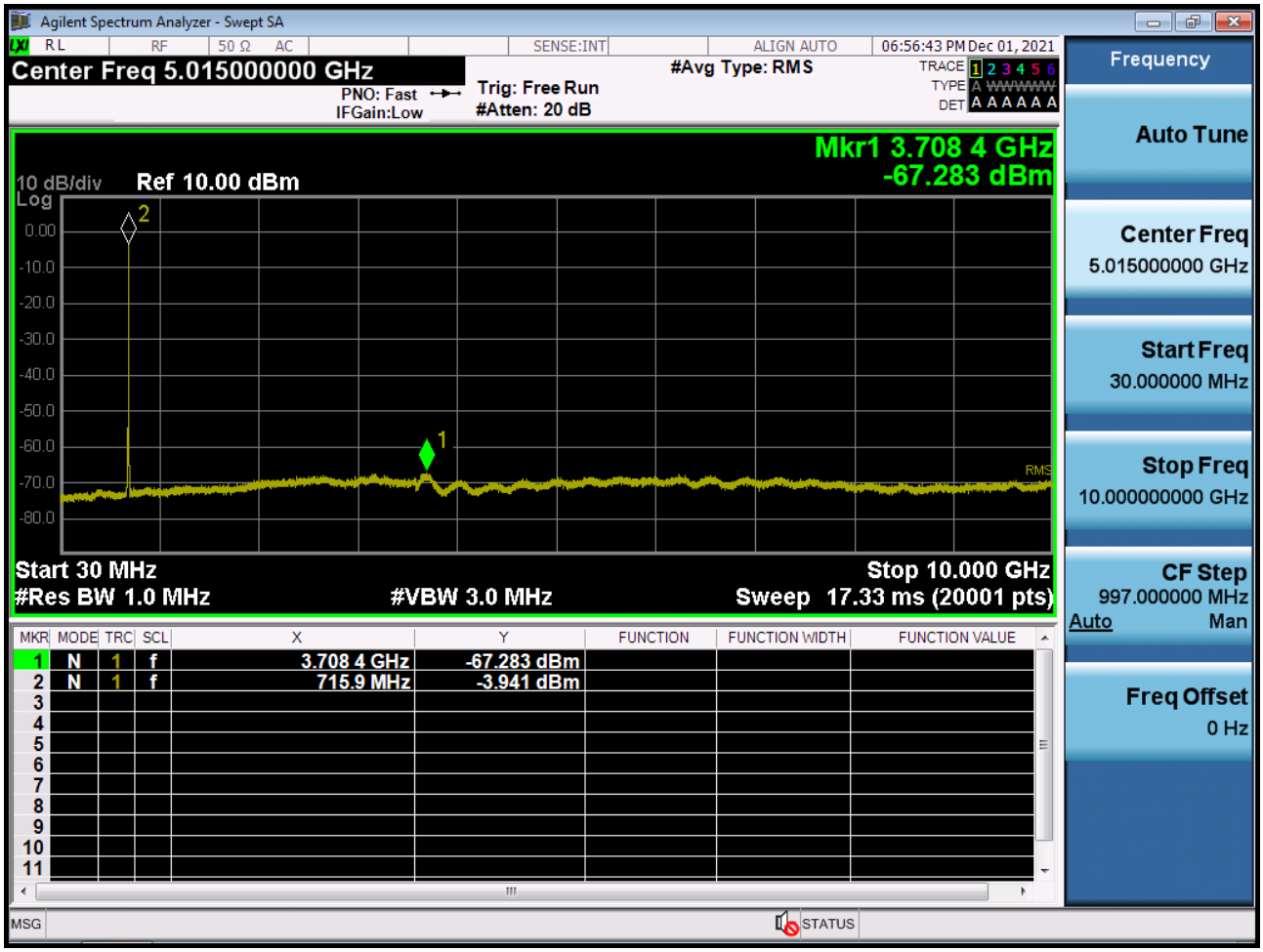
BAND 12/17. Conducted Spurious Plot _ (23060ch_10 MHz_QPSK_RB 1_0)



BAND 12/17. Conducted Spurious Plot _ (23095ch_10 MHz_QPSK_RB 1_0)



BAND 12/17. Conducted Spurious Plot _ (23130ch_10 MHz_QPSK_RB 1_0)



10. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2201-FC005-P