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

FCC LTE REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
January 21, 2021

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

Report No.: HCT-RF-2101-FC073

FCC ID: **A3LSMA325M**

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

Model(s): SM-A325M/DS
Additional Model(s): SM-A325M
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	0.051	17.04
		1M09W7D	16QAM	0.042	16.24
		1M10W7D	64QAM	0.033	15.23
LTE – Band12 (3)	700.5 – 714.5	2M70G7D	QPSK	0.051	17.04
		2M69W7D	16QAM	0.042	16.27
		2M69W7D	64QAM	0.033	15.21
LTE – Band12/17 (5)	701.5 – 713.5	4M52G7D	QPSK	0.048	16.85
		4M50W7D	16QAM	0.041	16.11
		4M52W7D	64QAM	0.032	15.04
LTE – Band12/17 (10)	704.0 – 711.0	9M00G7D	QPSK	0.046	16.60
		8M98W7D	16QAM	0.038	15.78
		8M98W7D	64QAM	0.030	14.73

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

REVIEWED BY

Report prepared by : Jae Mun Do Engineer of Telecommunication Testing Center	Report approved by : Jong Seok Lee Manager of Telecommunication Testing Center

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

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

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

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2101-FC073	January 21, 2021	- First Approval Report

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

Table of Contents

REVIEWED BY 2
1. GENERAL INFORMATION 5
2. INTRODUCTION 6
2.1. DESCRIPTION OF EUT 6
2.2. MEASURING INSTRUMENT CALIBRATION 6
2.3. TEST FACILITY 6
3. DESCRIPTION OF TESTS 7
3.1 TEST PROCEDURE 7
3.2 RADIATED POWER 8
3.3 RADIATED SPURIOUS EMISSIONS 9
3.4 OCCUPIED BANDWIDTH. 10
3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL 11
3.6 BAND EDGE 12
3.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE 13
3.8 WORST CASE(RADIATED TEST) 14
3.9 WORST CASE(CONDUCTED TEST) 15
4. LIST OF TEST EQUIPMENT 16
5. MEASUREMENT UNCERTAINTY 17
6. SUMMARY OF TEST RESULTS 18
7. SAMPLE CALCULATION 19
8. TEST DATA 21
8.1 EFFECTIVE RADIATED POWER 21
8.2 RADIATED SPURIOUS EMISSIONS 23
8.3 OCCUPIED BANDWIDTH 24
8.4 CONDUCTED SPURIOUS EMISSIONS 25
8.5 BAND EDGE 25
8.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE 26
9. TEST PLOTS 38
10. ANNEX A_ TEST SETUP PHOTO 91

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:	A3LSMA325M
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-A325M/DS
Additional Model(s):	SM-A325M
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:	December 16, 2020 ~ January 12, 2021
Serial number:	Radiated: R38NB02J7SE Conducted: R38NC01F5SF

2. INTRODUCTION

2.1. DESCRIPTION OF EUT

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

It also supports IEEE 802.11 a/b/g/n/ac (HT20/40/80), Bluetooth, BT LE, NFC.

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
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 1MHz
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 1GHz, 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 = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
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 10th harmonics from 9 kHz.

Test Note

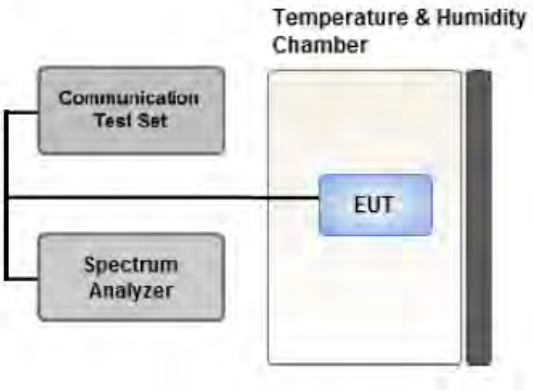
1. Measurements value show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
2. The EUT was tested in three orthogonal planes(X, Y,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

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

   Where: P_g is the generator output power into the substitution antenna.
   If the fundamental frequency is below 1GHz, RF output power has been converted to EIRP.

$$EIRP_{(dBm)} = ERP_{(dBm)} + 2.15$$

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.

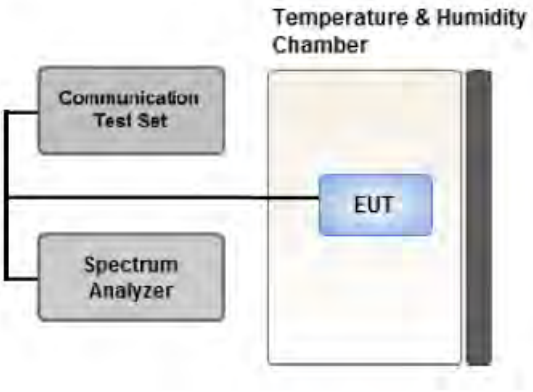
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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 26dB 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

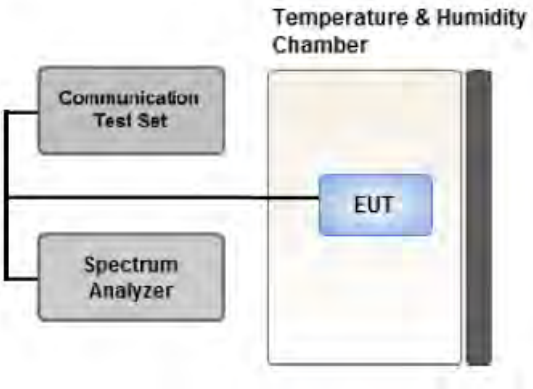
Test Overview

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

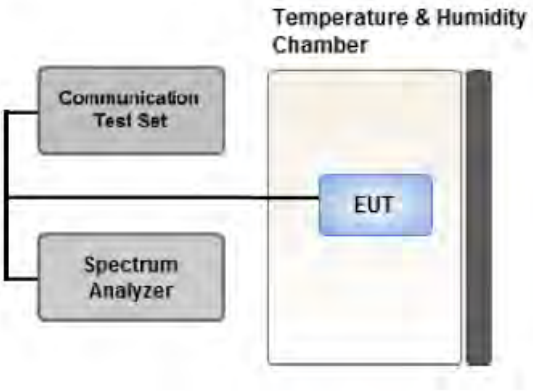
Test Notes

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.

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

- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- LTE Band 12 (699 – 716 MHz, 5/10MHzbandwidth) 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-A325M/DS & additional models were tested and the worst case results are reported.

(Worst case : SM-A325M/DS)

[Worst case]

Test Description	Modulation	RB size	RB offset	Axis
Effective Radiated Power	QPSK, 16QAM, 64QAM,	1	0	Z
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, 5/10MHzbandwidth) 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-A325M/DS & additional models were tested and the worst case results are reported.

(Worst case : SM-A325M/DS)

[Worst case]

Test Description	Modulation	Bandwidth (MHz)	Frequency	RB size	RB offset
Occupied Bandwidth	QPSK, 16QAM, 64QAM,	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

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
T&M SYSTEM	FBSR-02B(WHK1.2/15G-10EF)/H.P.F	-	03/09/2020	Annual	03/09/2021
T&M SYSTEM	FBSR-02B(WHK3.3/18G-10EF)/H.P.F	-	03/09/2020	Annual	03/09/2021
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	11275	04/27/2020	Annual	04/27/2021
Hewlett Packard	E3632A/DC Power Supply	MY40004427	09/16/2020	Annual	09/16/2021
Schwarzbeck	UHAP/ Dipole Antenna	557	03/29/2019	Biennial	03/29/2021
Schwarzbeck	UHAP/ Dipole Antenna	558	03/29/2019	Biennial	03/29/2021
ESPEC	SU-642 / Chamber	93008124	03/18/2020	Annual	03/18/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	08/29/2019	Biennial	08/29/2021
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1298	09/25/2019	Biennial	09/25/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/29/2019	Biennial	04/29/2021
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	02/11/2020	Biennial	02/11/2022
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY51110063	04/27/2020	Annual	04/27/2021
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/04/2020	Annual	06/04/2021
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	100931	10/14/2020	Annual	10/14/2021
Agilent	8960 (E5515C)/ Base Station	MY48360800	08/26/2020	Annual	08/26/2021
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	04/26/2019	Biennial	04/26/2021
Schwarzbeck	VULB9160/ Bilog Antenna	3150	03/12/2019	Biennial	03/12/2021
Schwarzbeck	VULB9160/ Hybrid Antenna	760	03/22/2019	Biennial	03/22/2021
Anritsu Corp.	MT8821C/Wideband Radio Communication Tester	6262116770	07/22/2020	Annual	07/22/2021
Anritsu Corp.	MT8820C/Wideband Radio Communication Tester	6201026545	01/07/2021	Annual	01/07/2022
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/13/2020	Annual	07/13/2021
KEYSIGHT	N9030B / Signal Analyzer(5Hz~40.0GHz)	MY55480167	06/04/2020	Annual	06/04/2021
HCT CO., LTD.,	FCC LTE Mobile Conducted RF Automation Test Software	-	-	-	-

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
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

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

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

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

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

3) Record the field strength meter's level.

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

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

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

7.2 EIRP Sample Calculation

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

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

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

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

3) Record the field strength meter's level.

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

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

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

7.3. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4M48W7D

LTE BW = 4.48 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

8. TEST DATA

8.1 EFFECTIVE RADIATED POWER

Freq (MHz)	Mod (Bandwidth)	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	Limit W	ERP W	ERP dBm
699.7	LTE B12 (1.4 MHz)	QPSK	-33.58	27.32	-9.92	1.28	H	< 3.00	0.041	16.12
		16-QAM	-34.32	26.58	-9.92	1.28	H		0.035	15.38
		64-QAM	-35.38	25.52	-9.92	1.28	H		0.027	14.32
707.5		QPSK	-32.91	27.92	-9.93	1.29	H		0.047	16.70
		16-QAM	-33.70	27.13	-9.93	1.29	H		0.039	15.91
		64-QAM	-34.73	26.10	-9.93	1.29	H		0.031	14.88
715.3		QPSK	-32.35	28.28	-9.94	1.30	H		0.051	17.04
		16-QAM	-33.15	27.48	-9.94	1.30	H		0.042	16.24
		64-QAM	-34.16	26.47	-9.94	1.30	H		0.033	15.23

Freq (MHz)	Mod (Bandwidth)	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	Limit W	ERP W	ERP dBm
700.5	LTE B12 (3 MHz)	QPSK	-33.52	27.39	-9.92	1.28	H	< 3.00	0.042	16.19
		16-QAM	-34.27	26.64	-9.92	1.28	H		0.035	15.44
		64-QAM	-35.35	25.56	-9.92	1.28	H		0.027	14.36
707.5		QPSK	-32.93	27.90	-9.93	1.29	H		0.047	16.68
		16-QAM	-33.75	27.08	-9.93	1.29	H		0.039	15.86
		64-QAM	-34.80	26.03	-9.93	1.29	H		0.030	14.81
714.5		QPSK	-32.35	28.28	-9.94	1.30	H		0.051	17.04
		16-QAM	-33.12	27.51	-9.94	1.30	H		0.042	16.27
		64-QAM	-34.18	26.45	-9.94	1.30	H		0.033	15.21

Freq (MHz)	Mod (Bandwidth)	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	Limit W	ERP W	ERP dBm
701.5	LTE B12/17 (5 MHz)	QPSK	-33.64	27.28	-9.92	1.28	H	< 3.00	0.041	16.08
		16-QAM	-34.39	26.53	-9.92	1.28	H		0.034	15.33
		64-QAM	-35.45	25.47	-9.92	1.28	H		0.027	14.27
707.5		QPSK	-33.14	27.69	-9.93	1.29	H		0.044	16.47
		16-QAM	-34.00	26.83	-9.93	1.29	H		0.036	15.61
		64-QAM	-35.01	25.82	-9.93	1.29	H		0.029	14.60
713.5		QPSK	-32.59	28.08	-9.94	1.29	H		0.048	16.85
		16-QAM	-33.33	27.34	-9.94	1.29	H		0.041	16.11
		64-QAM	-34.40	26.27	-9.94	1.29	H		0.032	15.04

Freq (MHz)	Mod (Bandwidth)	Modulation	Measured Level (dBm)	Substitute Level (dBm)	Ant. Gain(dBd)	C.L	Pol	Limit W	ERP W	ERP dBm
704.0	LTE B12/17 (10 MHz)	QPSK	-33.56	27.35	-9.92	1.28	H	< 3.00	0.041	16.15
		16-QAM	-34.31	26.60	-9.92	1.28	H		0.035	15.40
		64-QAM	-35.40	25.51	-9.92	1.28	H		0.027	14.31
707.5		QPSK	-33.34	27.49	-9.93	1.29	H		0.042	16.27
		16-QAM	-34.21	26.62	-9.93	1.29	H		0.035	15.40
		64-QAM	-35.24	25.59	-9.93	1.29	H		0.027	14.37
711.0		QPSK	-32.98	27.83	-9.94	1.29	H		0.046	16.60
		16-QAM	-33.80	27.01	-9.94	1.29	H		0.038	15.78
		64-QAM	-34.85	25.96	-9.94	1.29	H		0.030	14.73

8.2 RADIATED SPURIOUS EMISSIONS

▣ MODE: LTE B12/17

▣ MODULATION SIGNAL: 1.4 MHz QPSK

▣ DISTANCE: 3 meters

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitute Level (dBm)	C.L	Pol	Result (dBm)	Limit
23017 (699.7)	1 399.40	-50.13	7.60	-58.39	1.85	H	-52.64	-13.00
	2 099.10	-55.65	9.80	-59.26	2.27	V	-51.73	-13.00
	2 798.80	-56.28	10.90	-57.70	2.67	V	-49.47	-13.00
23095 (707.5)	1 415.00	-52.08	7.72	-60.48	1.86	H	-54.62	-13.00
	2 122.50	-56.38	9.55	-59.37	2.28	V	-52.10	-13.00
	2 830.00	-56.81	10.95	-58.09	2.65	H	-49.79	-13.00
23173 (715.3	1 430.60	-50.88	7.75	-59.19	1.86	H	-53.30	-13.00
	2 145.90	-55.57	9.37	-58.34	2.29	H	-51.27	-13.00
	2 861.20	-55.72	11.03	-56.81	2.67	H	-48.45	-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	1.0949
			16-QAM			1.0907
			64-QAM			1.0951
	3 MHz		QPSK	15		2.6992
			16-QAM			2.6854
			64-QAM			2.6984
12(17)	5 MHz		QPSK	25		4.5229
			16-QAM			4.4980
			64-QAM			4.5183
	10 MHz		QPSK	50		8.9998
			16-QAM			8.9824
			64-QAM			8.9745

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 39 ~ 50.

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	3.7029	27.976	-67.040	-39.064	-13.00
		707.5	3.6905	27.976	-67.346	-39.370	
		715.3	3.6955	27.976	-67.426	-39.450	
	3	700.5	3.6975	27.976	-67.287	-39.311	
		707.5	3.7169	27.976	-67.270	-39.294	
		714.5	3.7119	27.976	-67.110	-39.134	
12(17)	5	701.5	3.6820	27.976	-67.445	-39.469	
		707.5	3.7064	27.976	-67.059	-39.083	
		713.5	3.7194	27.976	-67.137	-39.161	
	10	704.0	3.6945	27.976	-67.219	-39.243	
		707.5	3.6845	27.976	-67.278	-39.302	
		711.0	3.7099	27.976	-67.097	-39.121	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 79 ~ 90.
2. Conducted Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0
3. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)
4. Factor(dB) = Cable Loss + Attenuator + Power Splitter

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

8.5 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 51 ~ 78.

8.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

▣ MODE: LTE B12

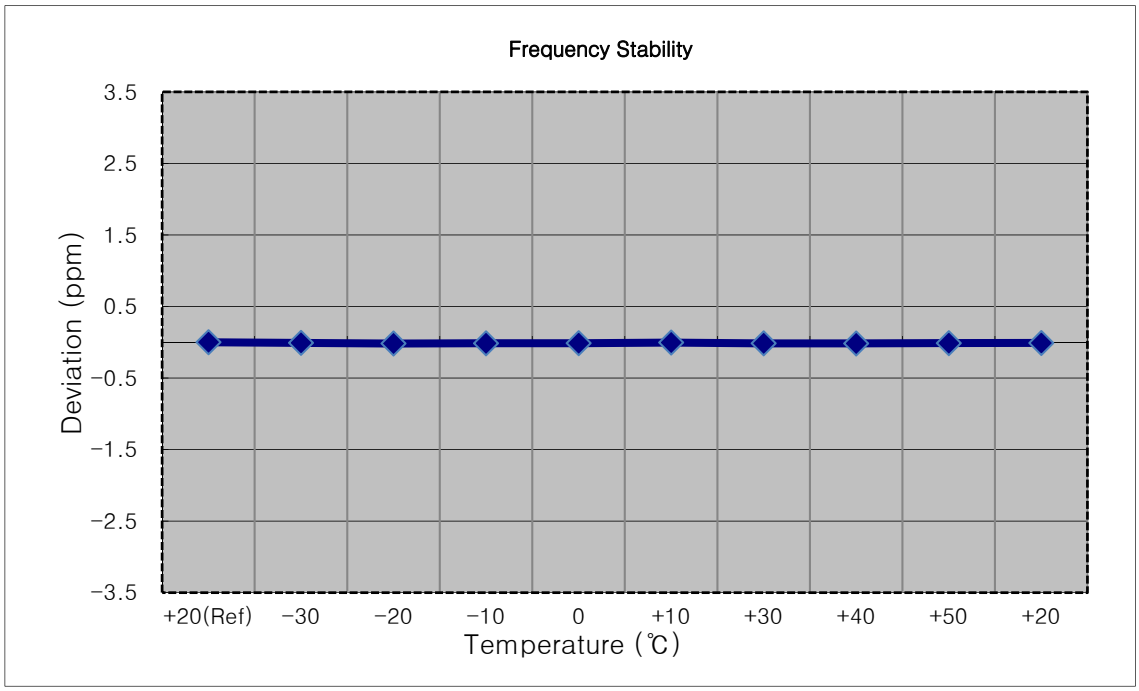
▣ OPERATING FREQUENCY: 699,700,000 Hz

▣ CHANNEL: 23017 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	699 699 994	0.0	0.000 000	0.000
100%		-30	699 699 987	-6.9	-0.000 001	-0.010
100%		-20	699 699 981	-12.9	-0.000 002	-0.018
100%		-10	699 699 983	-10.9	-0.000 002	-0.016
100%		0	699 699 984	-9.9	-0.000 001	-0.014
100%		+10	699 699 990	-3.7	-0.000 001	-0.005
100%		+30	699 699 982	-11.6	-0.000 002	-0.017
100%		+40	699 699 982	-12.1	-0.000 002	-0.017
100%		+50	699 699 985	-9.0	-0.000 001	-0.013
Batt. Endpoint	3.400	+20	699 699 986	-7.7	-0.000 001	-0.011



▣ MODE: LTE B12

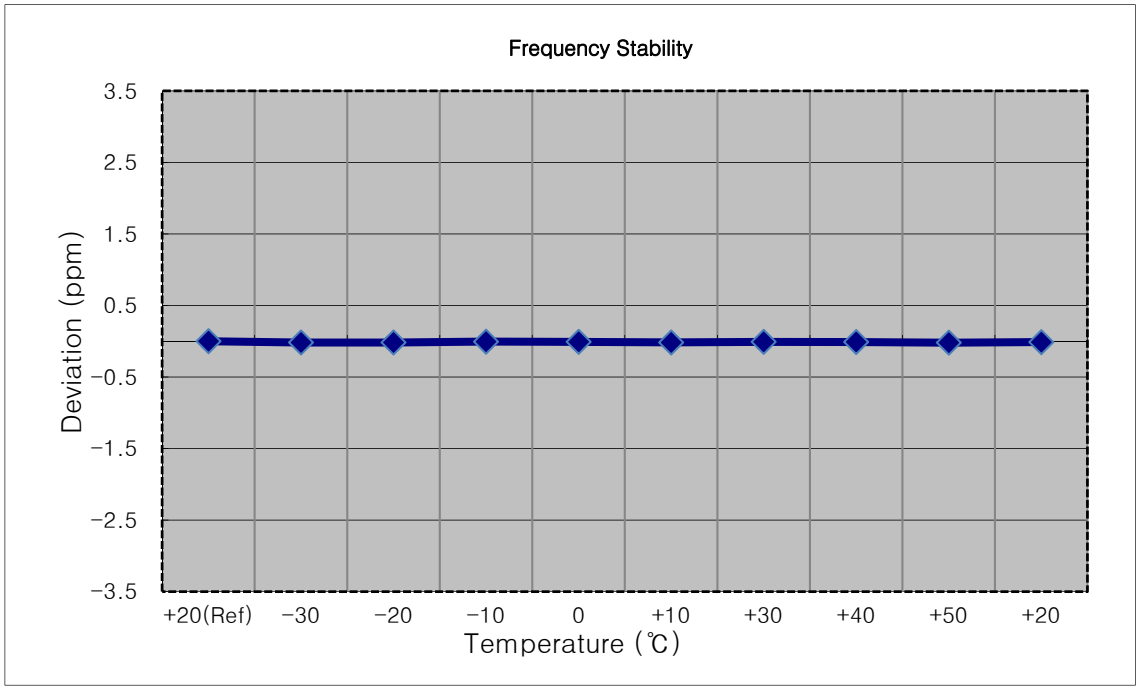
▣ OPERATING FREQUENCY: 700,500,000 Hz

▣ CHANNEL: 23025 (3 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	700 499 991	0.0	0.000 000	0.000
100%		-30	700 499 978	-13.2	-0.000 002	-0.019
100%		-20	700 499 978	-13.0	-0.000 002	-0.019
100%		-10	700 499 986	-4.3	-0.000 001	-0.006
100%		0	700 499 984	-7.0	-0.000 001	-0.010
100%		+10	700 499 979	-12.1	-0.000 002	-0.017
100%		+30	700 499 984	-6.7	-0.000 001	-0.010
100%		+40	700 499 983	-8.1	-0.000 001	-0.012
100%		+50	700 499 977	-13.7	-0.000 002	-0.020
Batt. Endpoint	3.400	+20	700 499 982	-8.7	-0.000 001	-0.012



▣ MODE: LTE B12/17

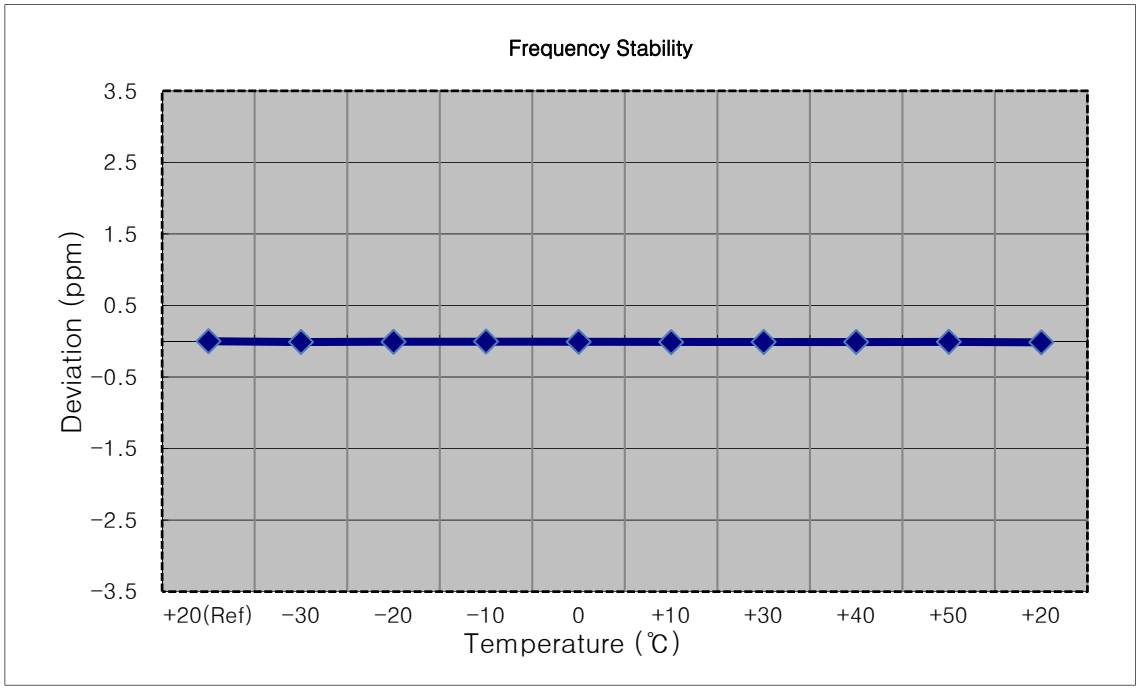
▣ OPERATING FREQUENCY: 701,500,000 Hz

▣ CHANNEL: 23035 (5 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	701 499 989	0.0	0.000 000	0.000
100%		-30	701 499 981	-8.3	-0.000 001	-0.012
100%		-20	701 499 983	-6.3	-0.000 001	-0.009
100%		-10	701 499 986	-3.1	0.000 000	-0.004
100%		0	701 499 983	-6.6	-0.000 001	-0.009
100%		+10	701 499 981	-8.9	-0.000 001	-0.013
100%		+30	701 499 981	-8.4	-0.000 001	-0.012
100%		+40	701 499 982	-7.7	-0.000 001	-0.011
100%		+50	701 499 983	-6.9	-0.000 001	-0.010
Batt. Endpoint	3.400	+20	701 499 979	-10.5	-0.000 001	-0.015



▣ MODE: LTE B12/17

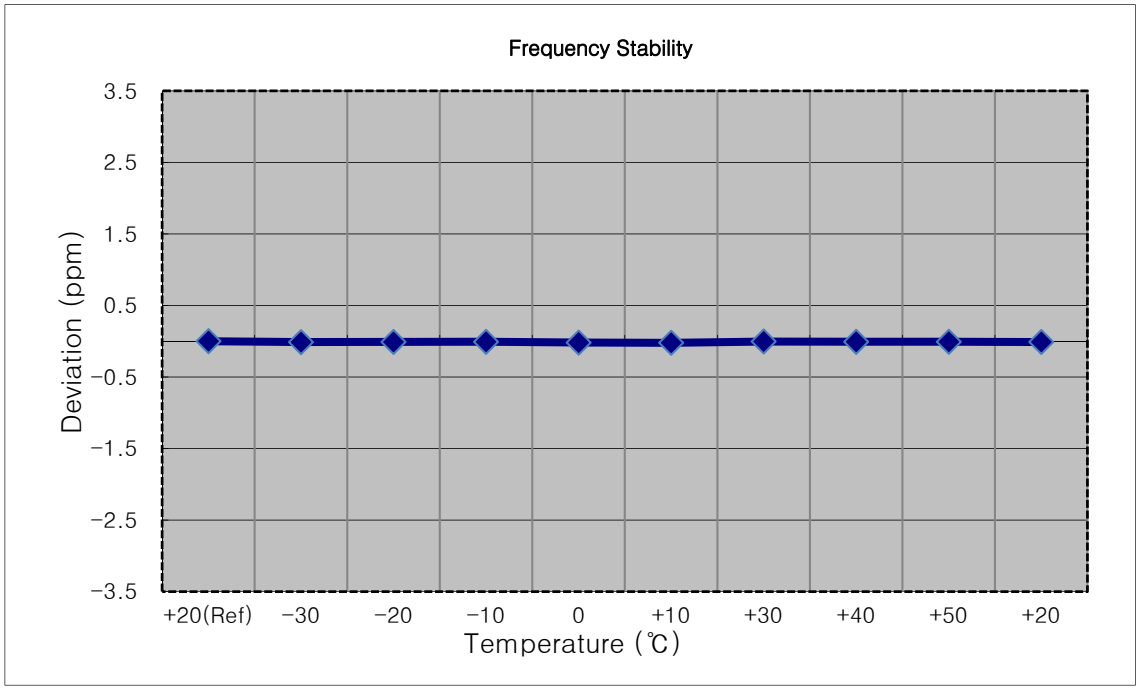
▣ OPERATING FREQUENCY: 704,000,000 Hz

▣ CHANNEL: 23060 (10 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	703 999 994	0.0	0.000 000	0.000
100%		-30	703 999 985	-9.0	-0.000 001	-0.013
100%		-20	703 999 987	-7.5	-0.000 001	-0.011
100%		-10	703 999 988	-6.0	-0.000 001	-0.009
100%		0	703 999 980	-13.9	-0.000 002	-0.020
100%		+10	703 999 978	-15.9	-0.000 002	-0.023
100%		+30	703 999 991	-3.4	0.000 000	-0.005
100%		+40	703 999 988	-6.3	-0.000 001	-0.009
100%		+50	703 999 988	-6.0	-0.000 001	-0.009
Batt. Endpoint	3.400	+20	703 999 986	-7.9	-0.000 001	-0.011



▣ MODE: LTE B12

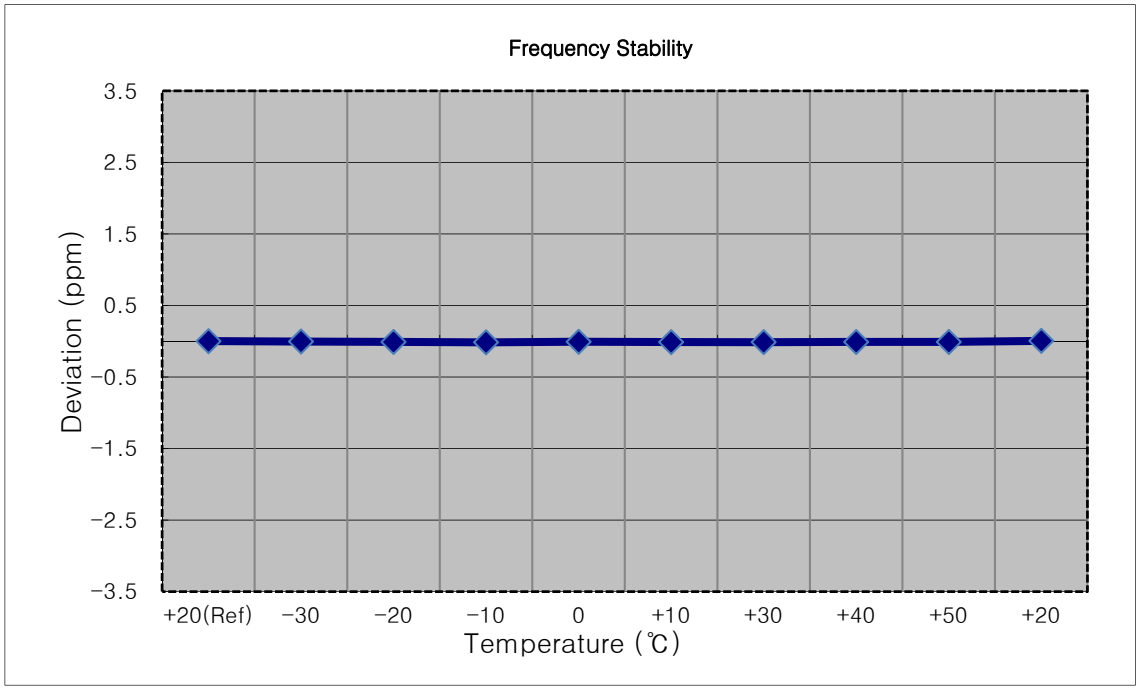
▣ OPERATING FREQUENCY: 707,500,000 Hz

▣ CHANNEL: 23095 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	707 499 993	0.0	0.000 000	0.000
100%		-30	707 499 990	-3.3	0.000 000	-0.005
100%		-20	707 499 985	-7.9	-0.000 001	-0.011
100%		-10	707 499 981	-11.5	-0.000 002	-0.016
100%		0	707 499 987	-6.2	-0.000 001	-0.009
100%		+10	707 499 984	-9.1	-0.000 001	-0.013
100%		+30	707 499 983	-10.0	-0.000 001	-0.014
100%		+40	707 499 985	-7.4	-0.000 001	-0.010
100%		+50	707 499 985	-7.5	-0.000 001	-0.011
Batt. Endpoint	3.400	+20	707 499 995	2.5	0.000 000	0.004



▣ MODE: LTE B12

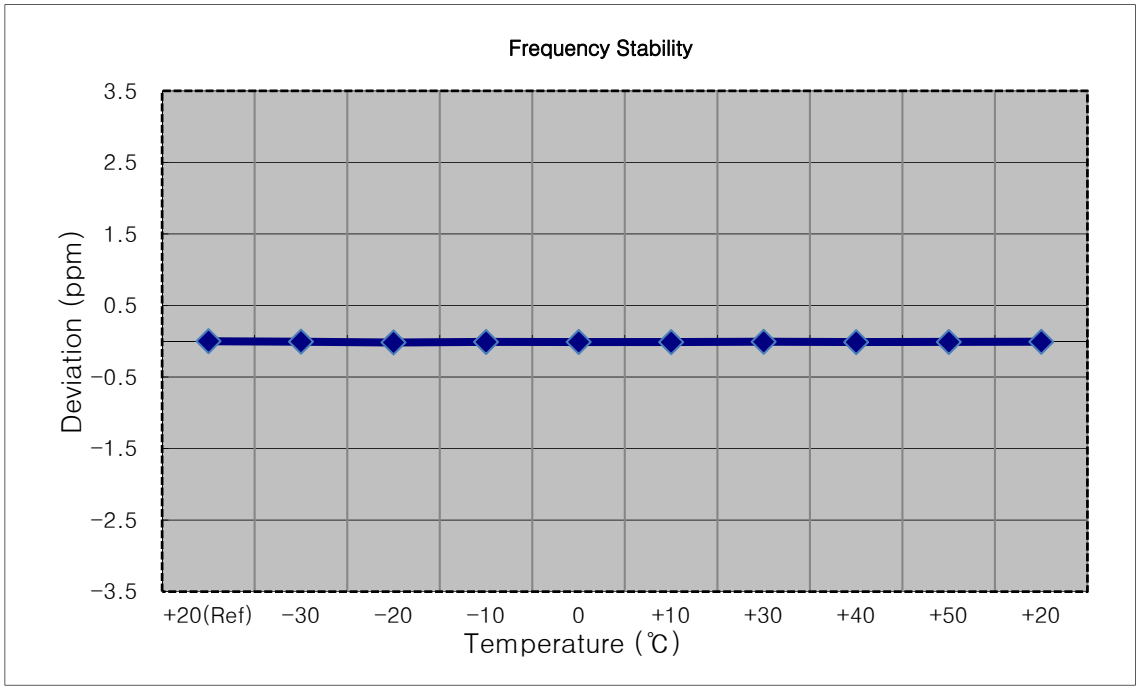
▣ OPERATING FREQUENCY: 707,500,000 Hz

▣ CHANNEL: 23095 (3 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	707 499 996	0.0	0.000 000	0.000
100%		-30	707 499 991	-5.2	-0.000 001	-0.007
100%		-20	707 499 984	-12.3	-0.000 002	-0.017
100%		-10	707 499 989	-7.4	-0.000 001	-0.010
100%		0	707 499 987	-8.7	-0.000 001	-0.012
100%		+10	707 499 987	-9.2	-0.000 001	-0.013
100%		+30	707 499 990	-6.1	-0.000 001	-0.009
100%		+40	707 499 987	-9.0	-0.000 001	-0.013
100%		+50	707 499 988	-7.7	-0.000 001	-0.011
Batt. Endpoint	3.400	+20	707 499 990	-5.9	-0.000 001	-0.008



▣ MODE: LTE B12/17

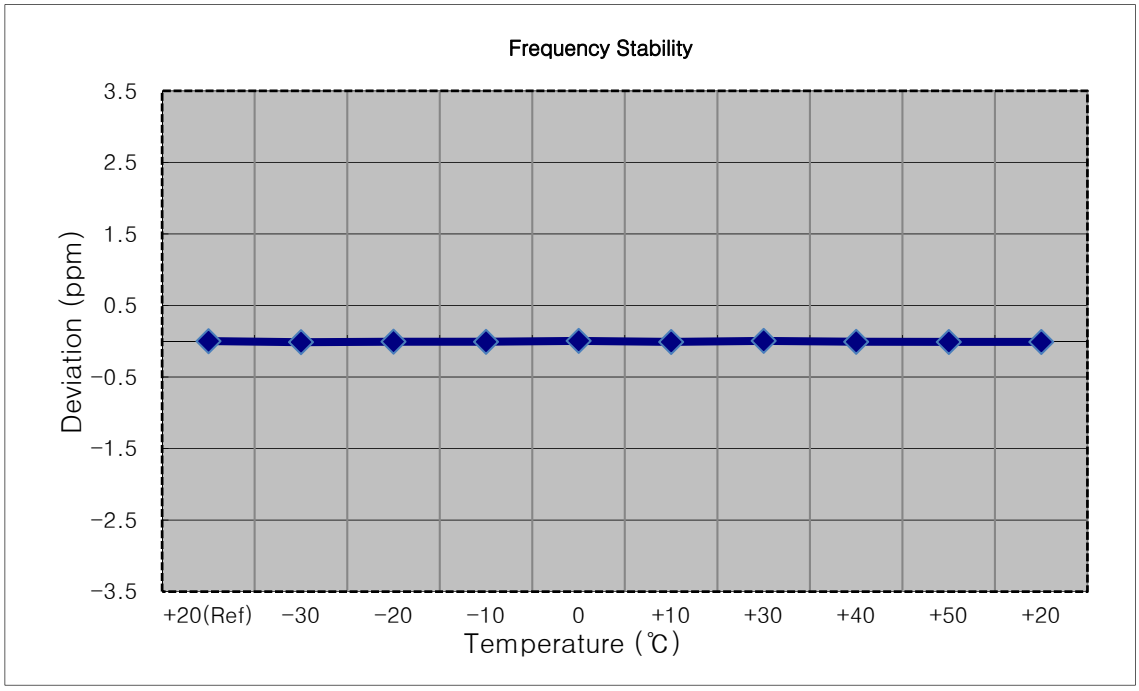
▣ OPERATING FREQUENCY: 707,500,000 Hz

▣ CHANNEL: 23095 (5 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	707 499 995	0.0	0.000 000	0.000
100%		-30	707 499 986	-9.1	-0.000 001	-0.013
100%		-20	707 499 990	-4.8	-0.000 001	-0.007
100%		-10	707 499 989	-5.6	-0.000 001	-0.008
100%		0	707 499 998	3.0	0.000 000	0.004
100%		+10	707 499 987	-7.5	-0.000 001	-0.011
100%		+30	707 499 998	3.1	0.000 000	0.004
100%		+40	707 499 989	-6.0	-0.000 001	-0.008
100%		+50	707 499 987	-7.9	-0.000 001	-0.011
Batt. Endpoint	3.400	+20	707 499 988	-7.3	-0.000 001	-0.010



▣ MODE: LTE B12/17

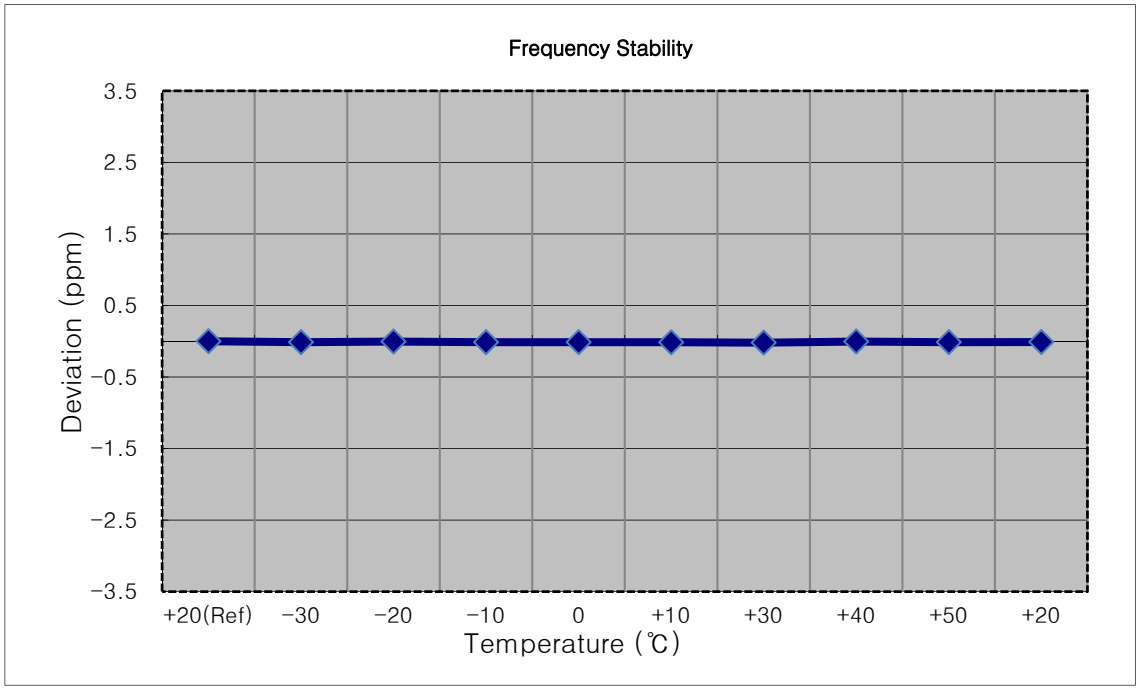
▣ OPERATING FREQUENCY: 707,500,000 Hz

▣ CHANNEL: 23095 (10 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	707 499 991	0.0	0.000 000	0.000
100%		-30	707 499 981	-9.8	-0.000 001	-0.014
100%		-20	707 499 987	-3.7	-0.000 001	-0.005
100%		-10	707 499 981	-9.8	-0.000 001	-0.014
100%		0	707 499 981	-9.6	-0.000 001	-0.014
100%		+10	707 499 980	-10.5	-0.000 001	-0.015
100%		+30	707 499 976	-14.7	-0.000 002	-0.021
100%		+40	707 499 987	-3.7	-0.000 001	-0.005
100%		+50	707 499 981	-10.1	-0.000 001	-0.014
Batt. Endpoint	3.400	+20	707 499 983	-8.0	-0.000 001	-0.011



▣ MODE: LTE B12

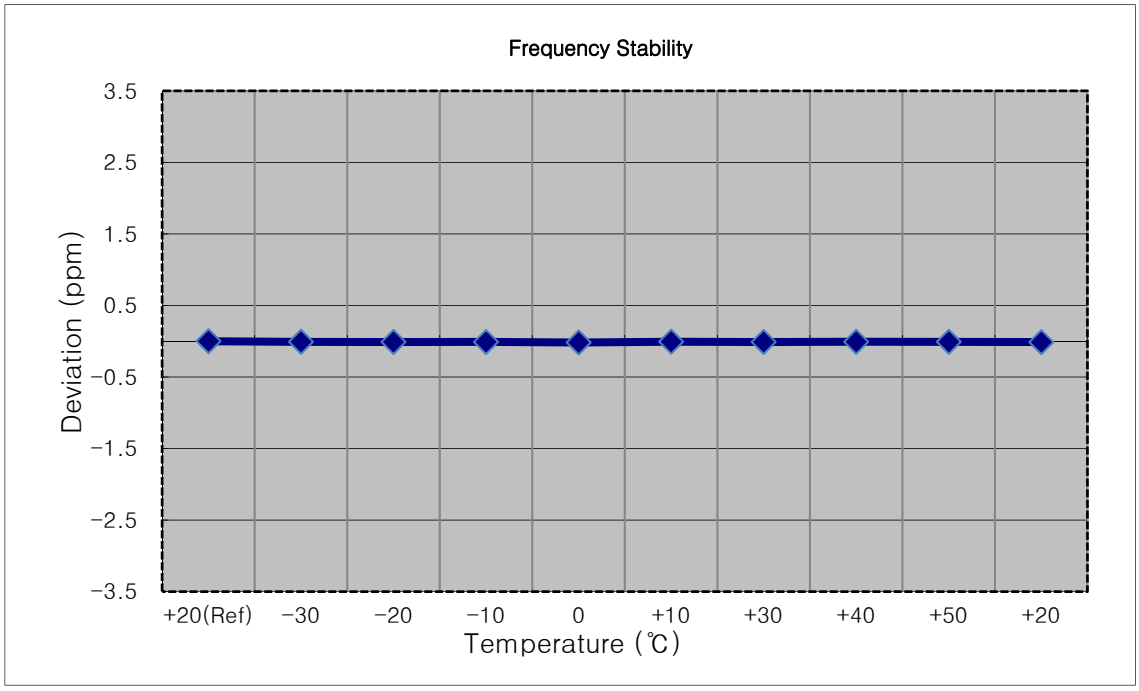
▣ OPERATING FREQUENCY: 715,300,000 Hz

▣ CHANNEL: 23173 (1.4 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	715 299 989	0.0	0.000 000	0.000
100%		-30	715 299 982	-6.9	-0.000 001	-0.010
100%		-20	715 299 980	-8.7	-0.000 001	-0.012
100%		-10	715 299 982	-7.5	-0.000 001	-0.010
100%		0	715 299 977	-12.4	-0.000 002	-0.017
100%		+10	715 299 984	-5.2	-0.000 001	-0.007
100%		+30	715 299 981	-8.1	-0.000 001	-0.011
100%		+40	715 299 983	-6.4	-0.000 001	-0.009
100%		+50	715 299 982	-7.0	-0.000 001	-0.010
Batt. Endpoint	3.400	+20	715 299 980	-9.3	-0.000 001	-0.013



▣ MODE: LTE B12

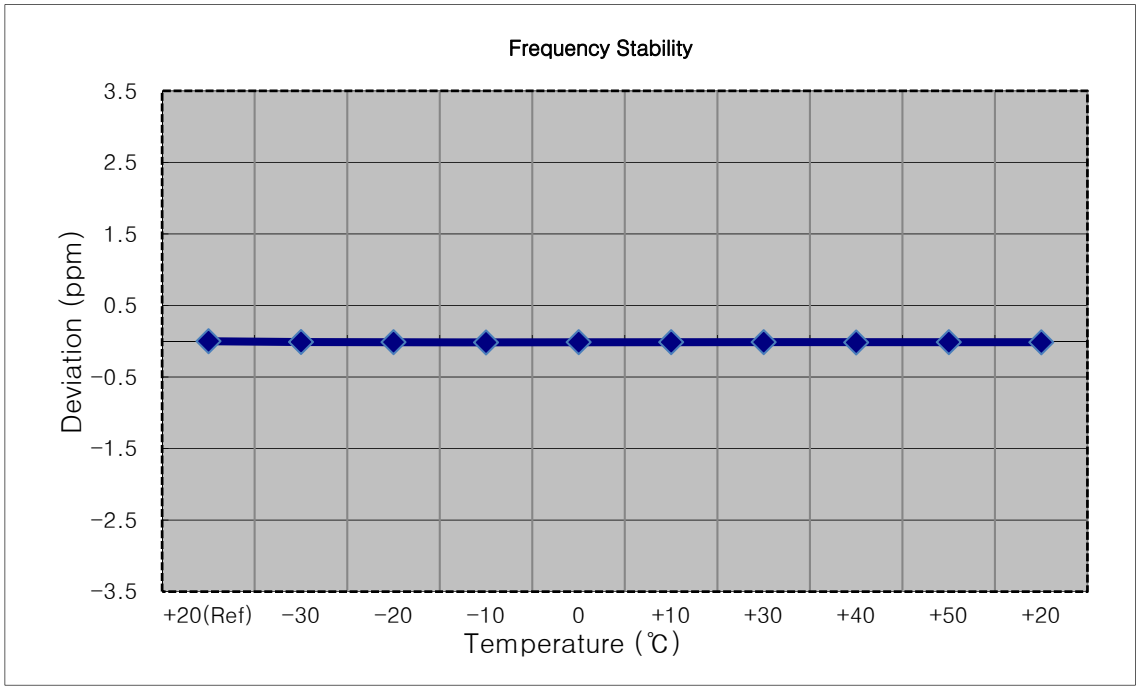
▣ OPERATING FREQUENCY: 714,500,000 Hz

▣ CHANNEL: 23165 (3 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	714 499 990	0.0	0.000 000	0.000
100%		-30	714 499 982	-8.1	-0.000 001	-0.011
100%		-20	714 499 980	-10.0	-0.000 001	-0.014
100%		-10	714 499 978	-12.2	-0.000 002	-0.017
100%		0	714 499 980	-9.8	-0.000 001	-0.014
100%		+10	714 499 980	-10.0	-0.000 001	-0.014
100%		+30	714 499 981	-9.5	-0.000 001	-0.013
100%		+40	714 499 978	-12.1	-0.000 002	-0.017
100%		+50	714 499 980	-10.1	-0.000 001	-0.014
Batt. Endpoint	3.400	+20	714 499 979	-10.8	-0.000 002	-0.015



▣ MODE: LTE B12/17

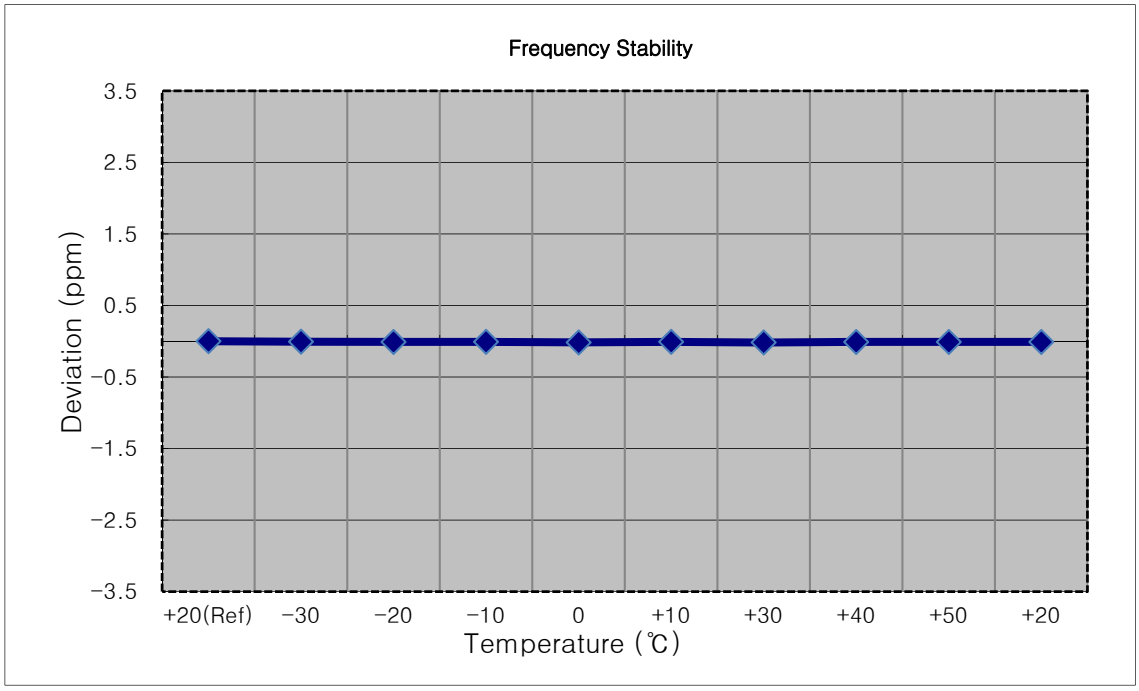
▣ OPERATING FREQUENCY: 713,500,000 Hz

▣ CHANNEL: 23155 (5 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	713 499 994	0.0	0.000 000	0.000
100%		-30	713 499 989	-5.0	-0.000 001	-0.007
100%		-20	713 499 986	-7.6	-0.000 001	-0.011
100%		-10	713 499 987	-7.1	-0.000 001	-0.010
100%		0	713 499 982	-12.1	-0.000 002	-0.017
100%		+10	713 499 987	-6.5	-0.000 001	-0.009
100%		+30	713 499 981	-12.3	-0.000 002	-0.017
100%		+40	713 499 986	-7.8	-0.000 001	-0.011
100%		+50	713 499 986	-7.9	-0.000 001	-0.011
Batt. Endpoint	3.400	+20	713 499 986	-7.9	-0.000 001	-0.011



▣ MODE: LTE B12/17

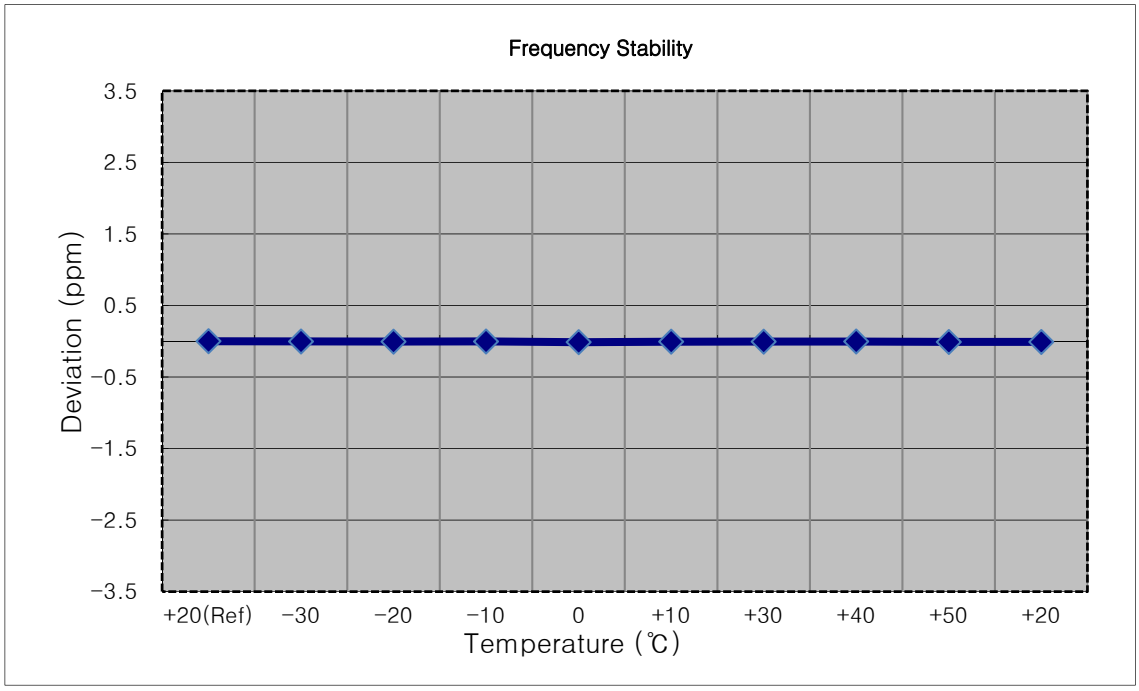
▣ OPERATING FREQUENCY: 711,000,000 Hz

▣ CHANNEL: 23130 (10 MHz)

▣ REFERENCE VOLTAGE: 3.86 VDC

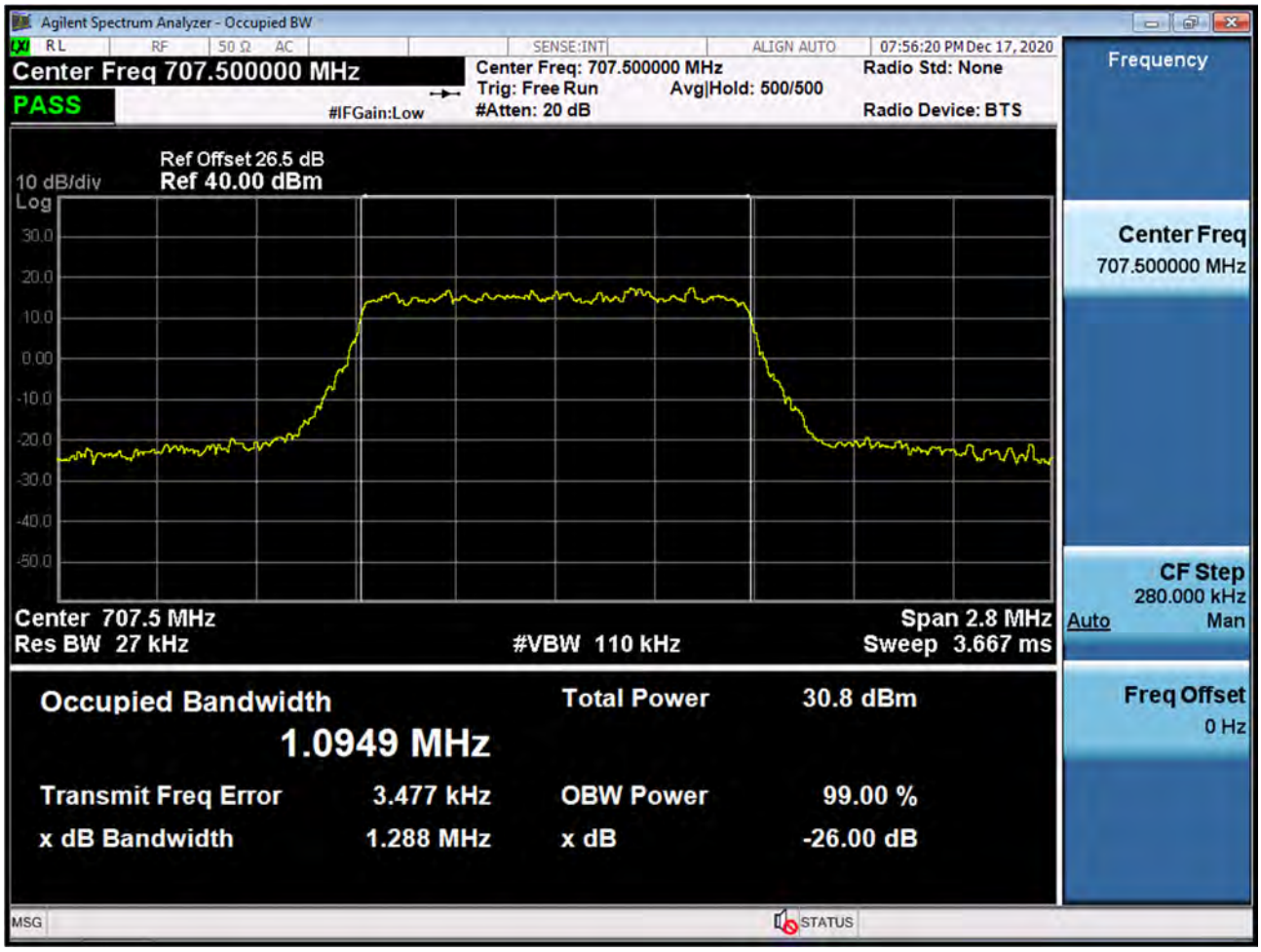
▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.860	+20(Ref)	710 999 988	0.0	0.000 000	0.000
100%		-30	710 999 985	-2.8	0.000 000	-0.004
100%		-20	710 999 983	-4.6	-0.000 001	-0.006
100%		-10	710 999 985	-3.2	0.000 000	-0.005
100%		0	710 999 979	-8.9	-0.000 001	-0.013
100%		+10	710 999 983	-4.9	-0.000 001	-0.007
100%		+30	710 999 984	-4.1	-0.000 001	-0.006
100%		+40	710 999 984	-3.7	-0.000 001	-0.005
100%		+50	710 999 980	-7.5	-0.000 001	-0.011
Batt. Endpoint	3.400	+20	710 999 980	-7.3	-0.000 001	-0.010

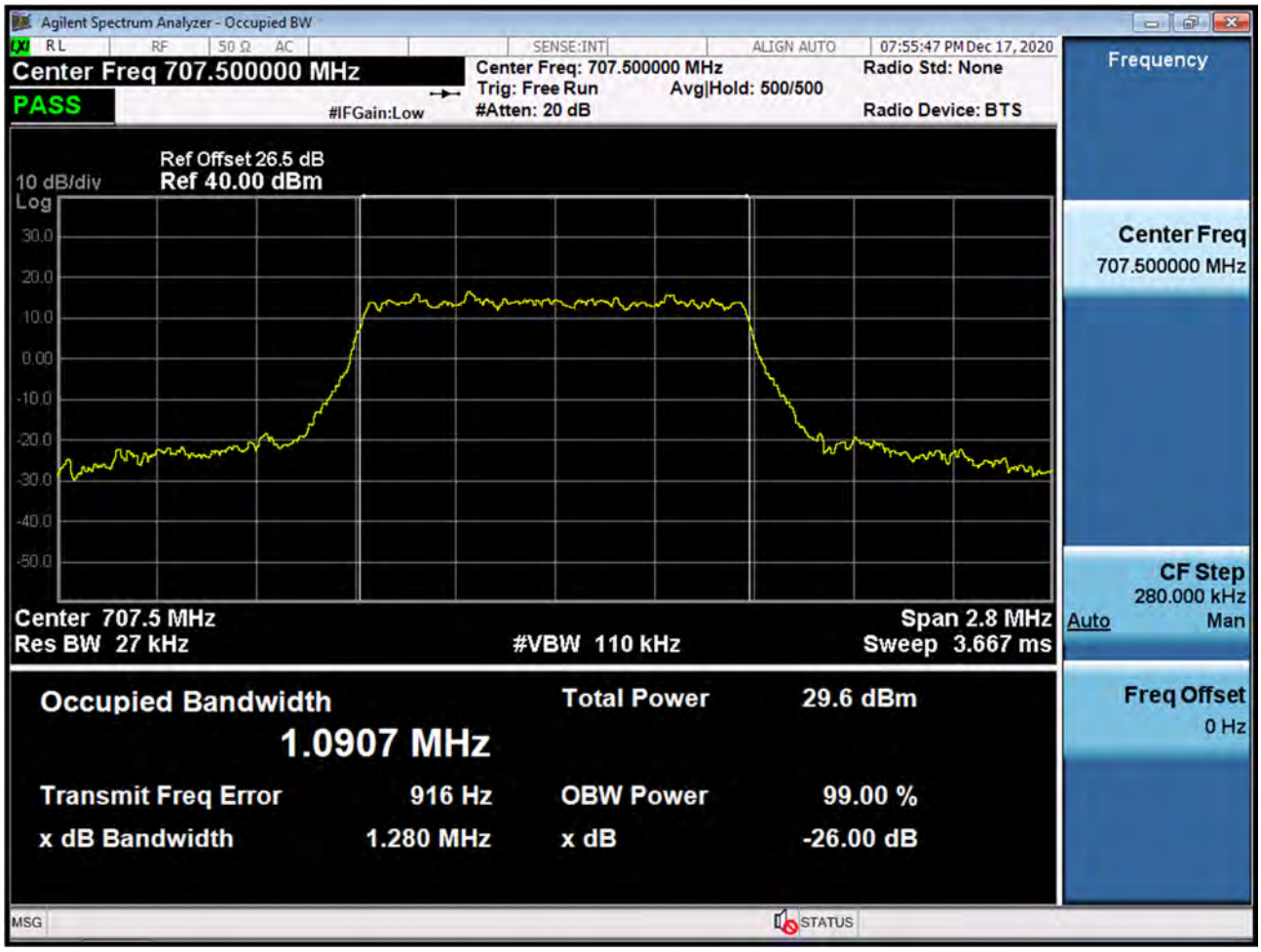


9. TEST PLOTS

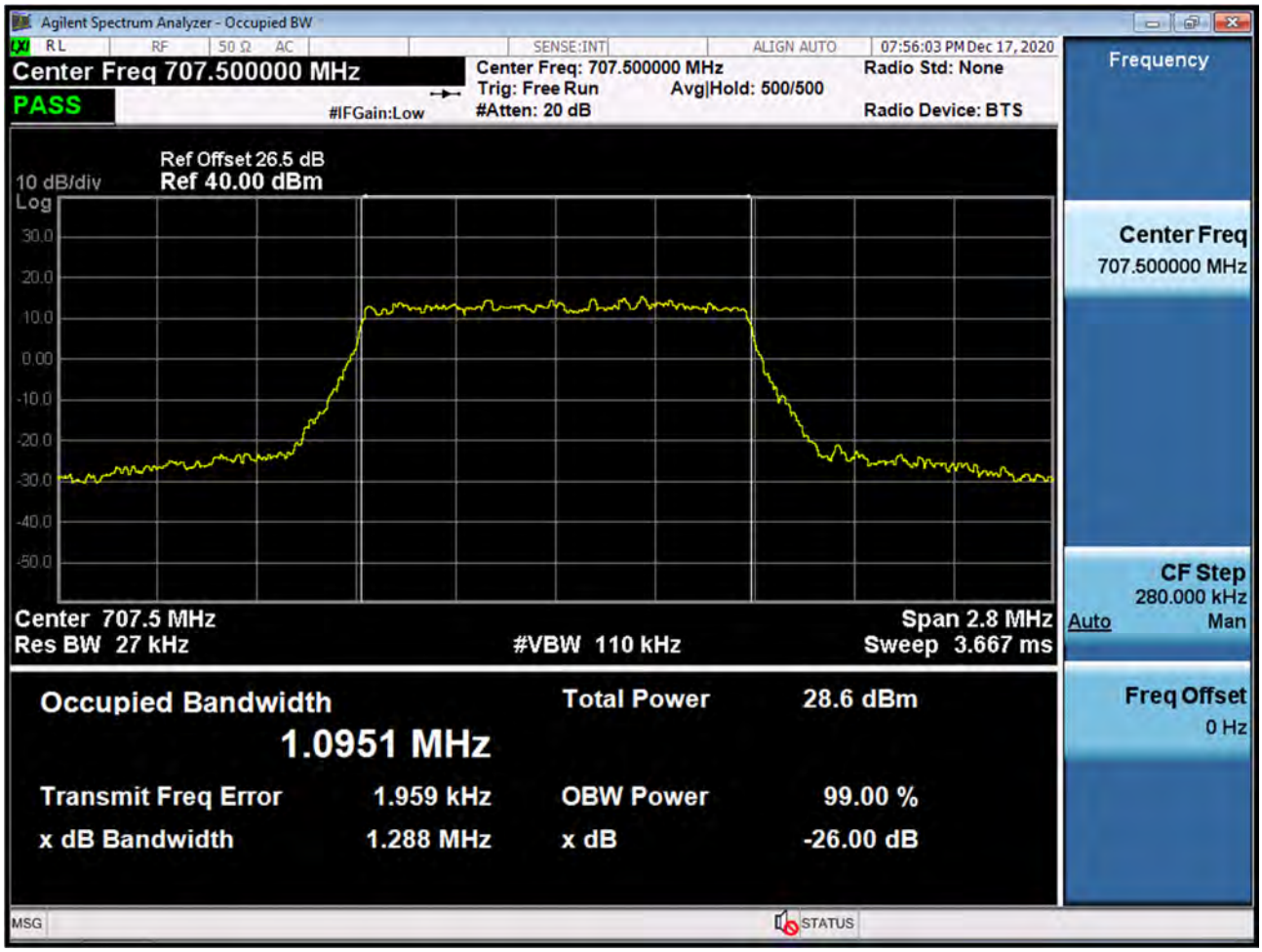
BAND 12. Occupied Bandwidth Plot (1.4M BW Ch.23095 QPSK_RB6_0)



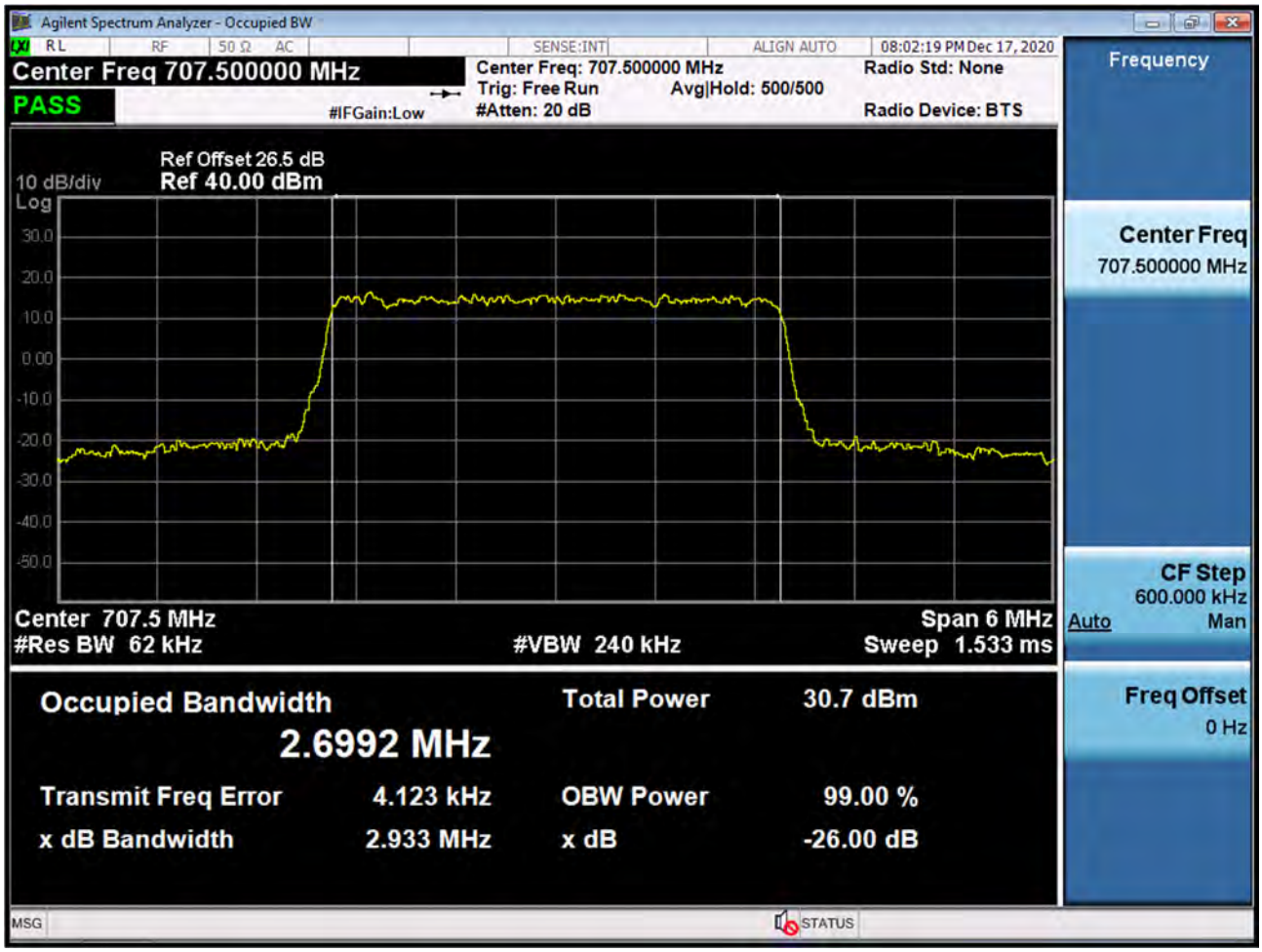
BAND 12. Occupied Bandwidth Plot (1.4M BW Ch.23095 16QAM_RB6_0)



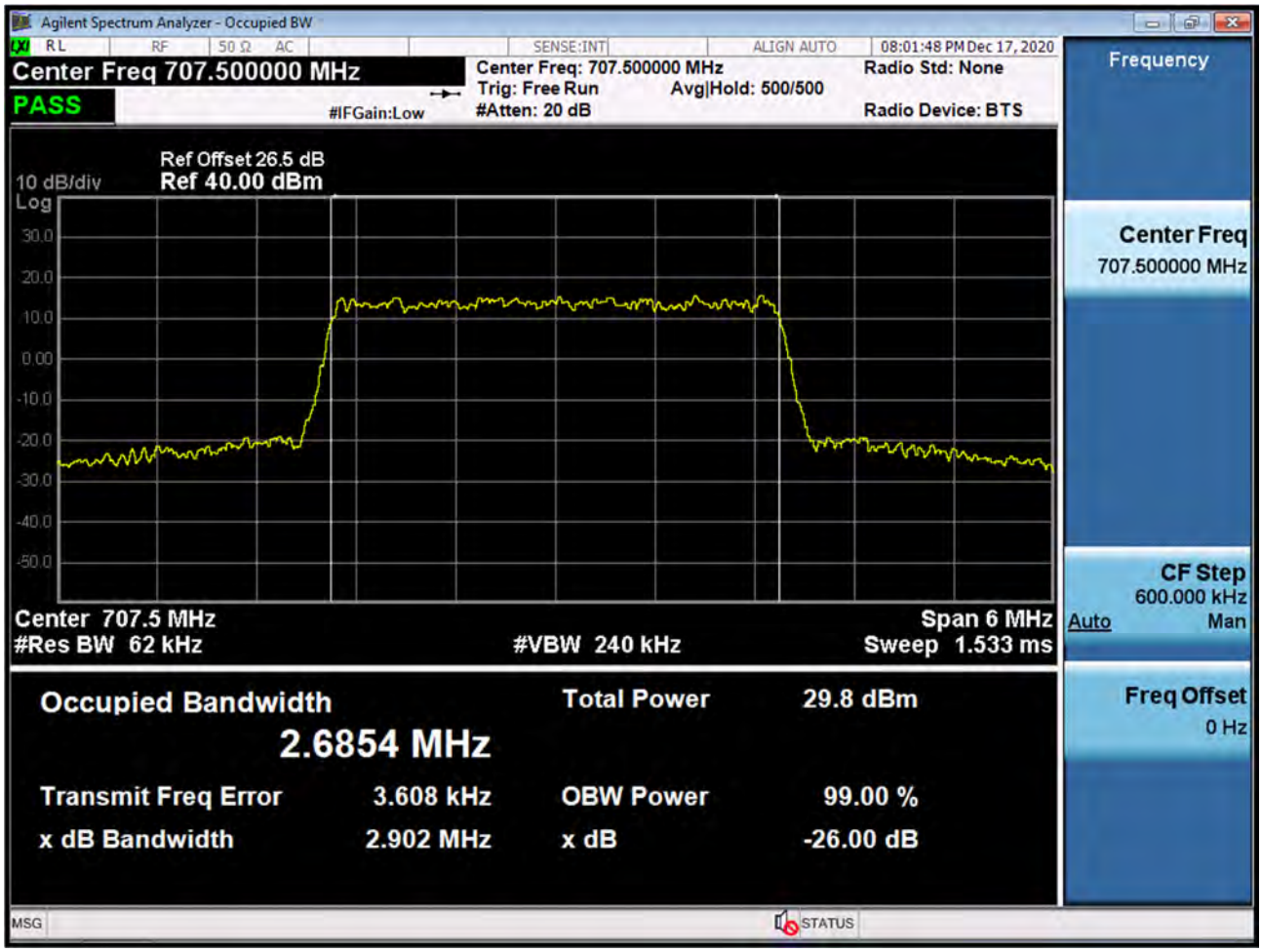
BAND 12. Occupied Bandwidth Plot (1.4M BW Ch.23095 64QAM_RB6_0)



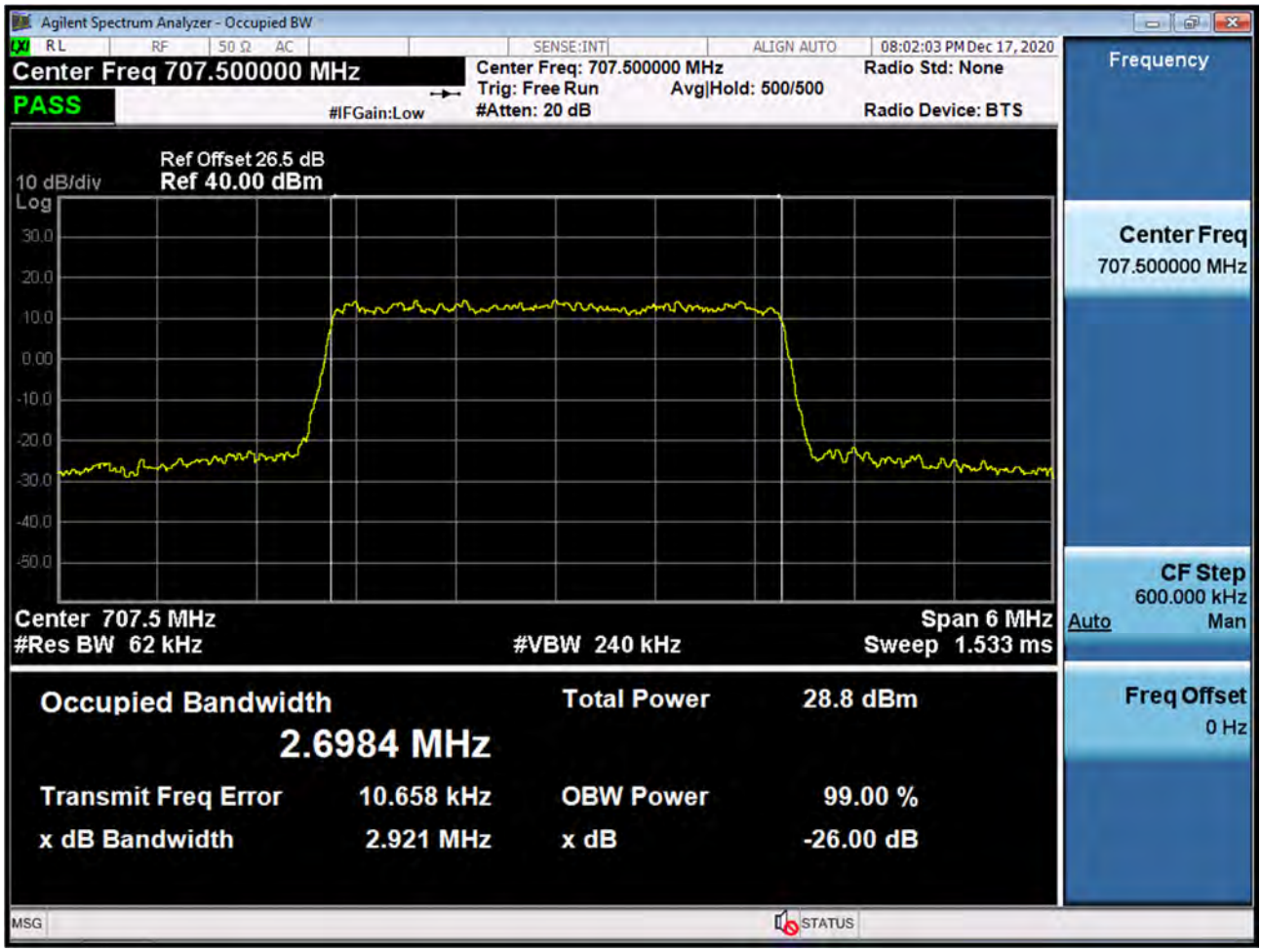
BAND 12. Occupied Bandwidth Plot (3M BW Ch.23095 QPSK_RB15_0)



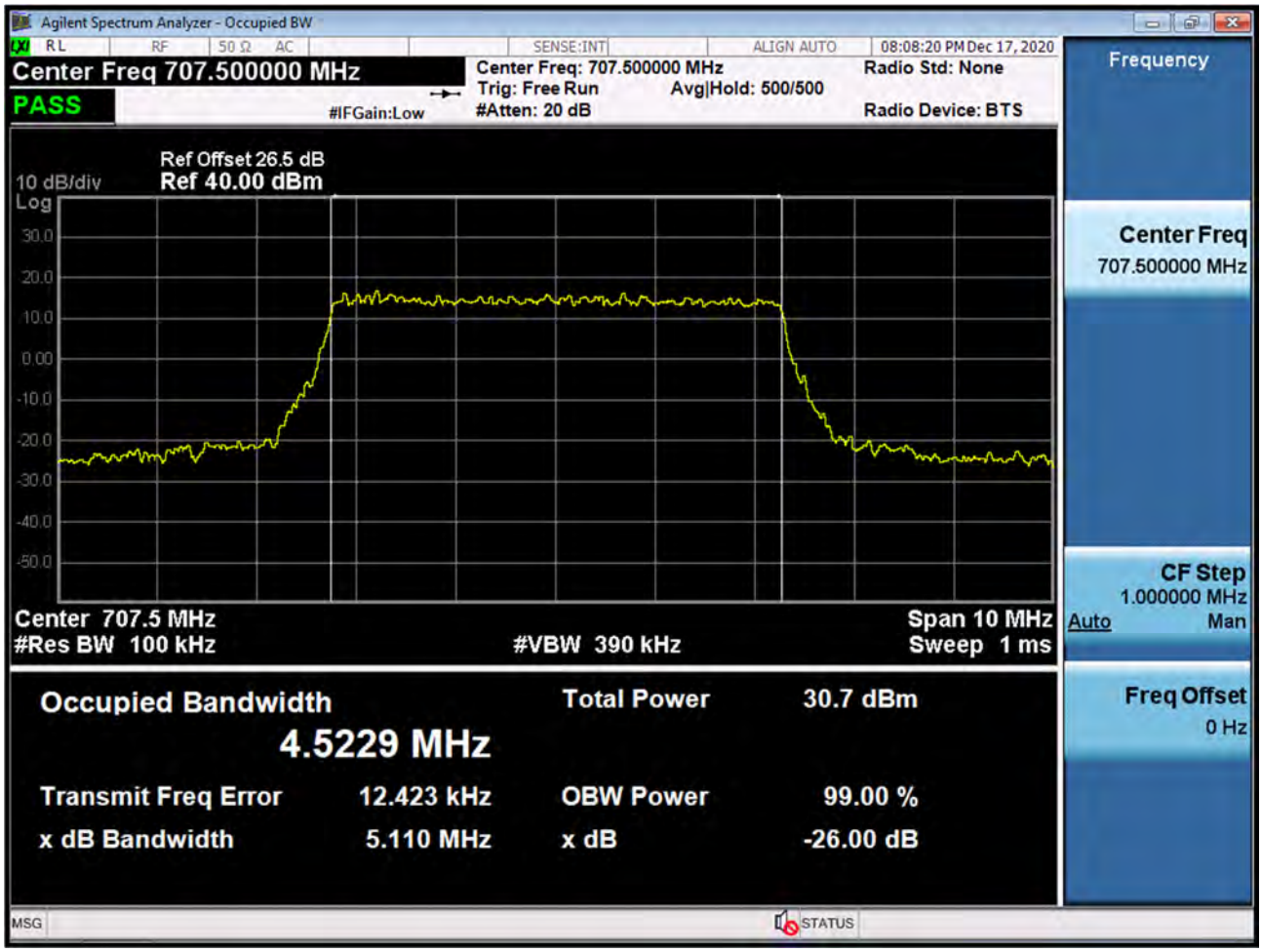
BAND 12. Occupied Bandwidth Plot (3M BW Ch.23095 16QAM_RB15_0)



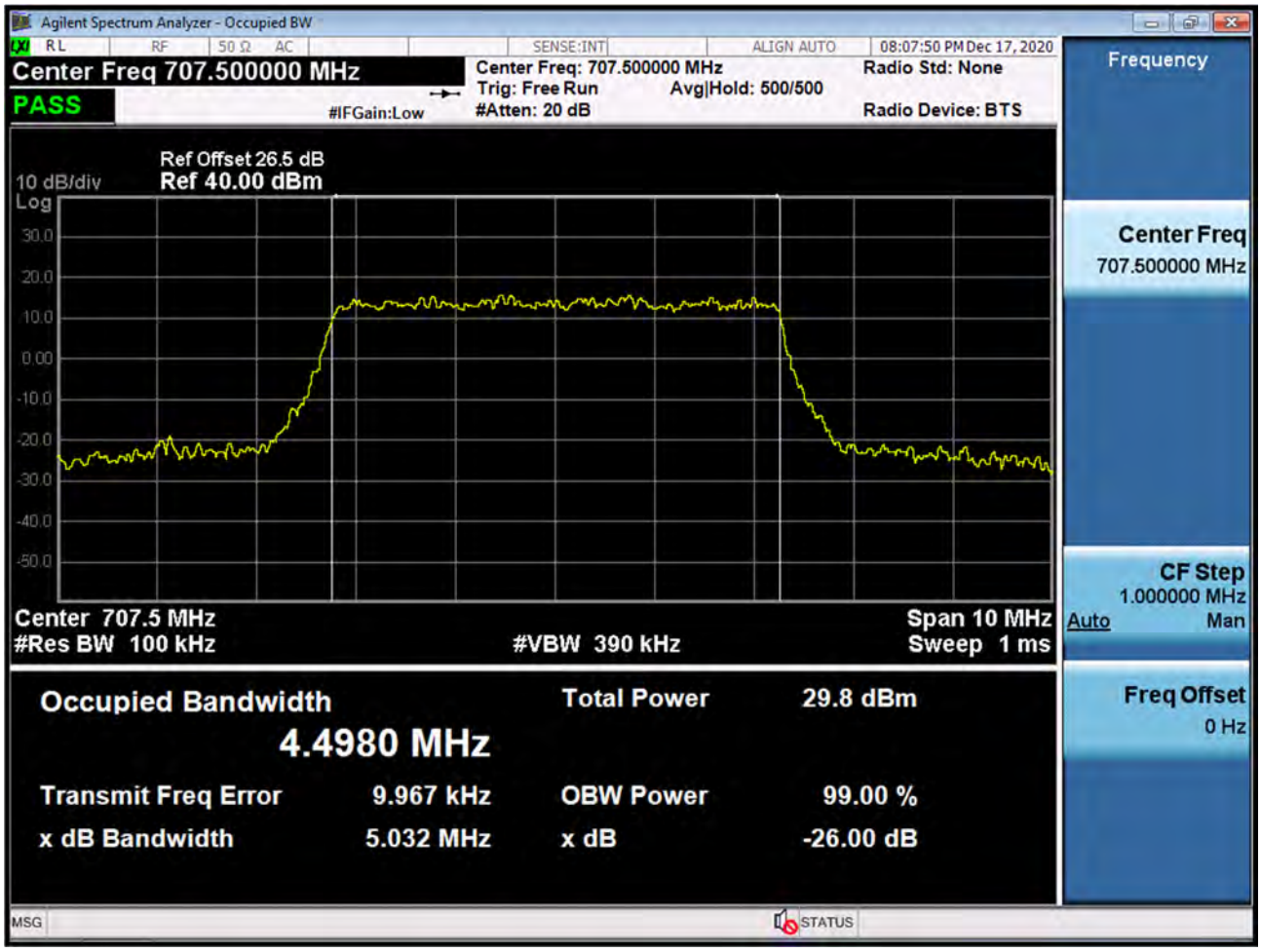
BAND 12. Occupied Bandwidth Plot (3M BW Ch.23095 64QAM_RB15_0)



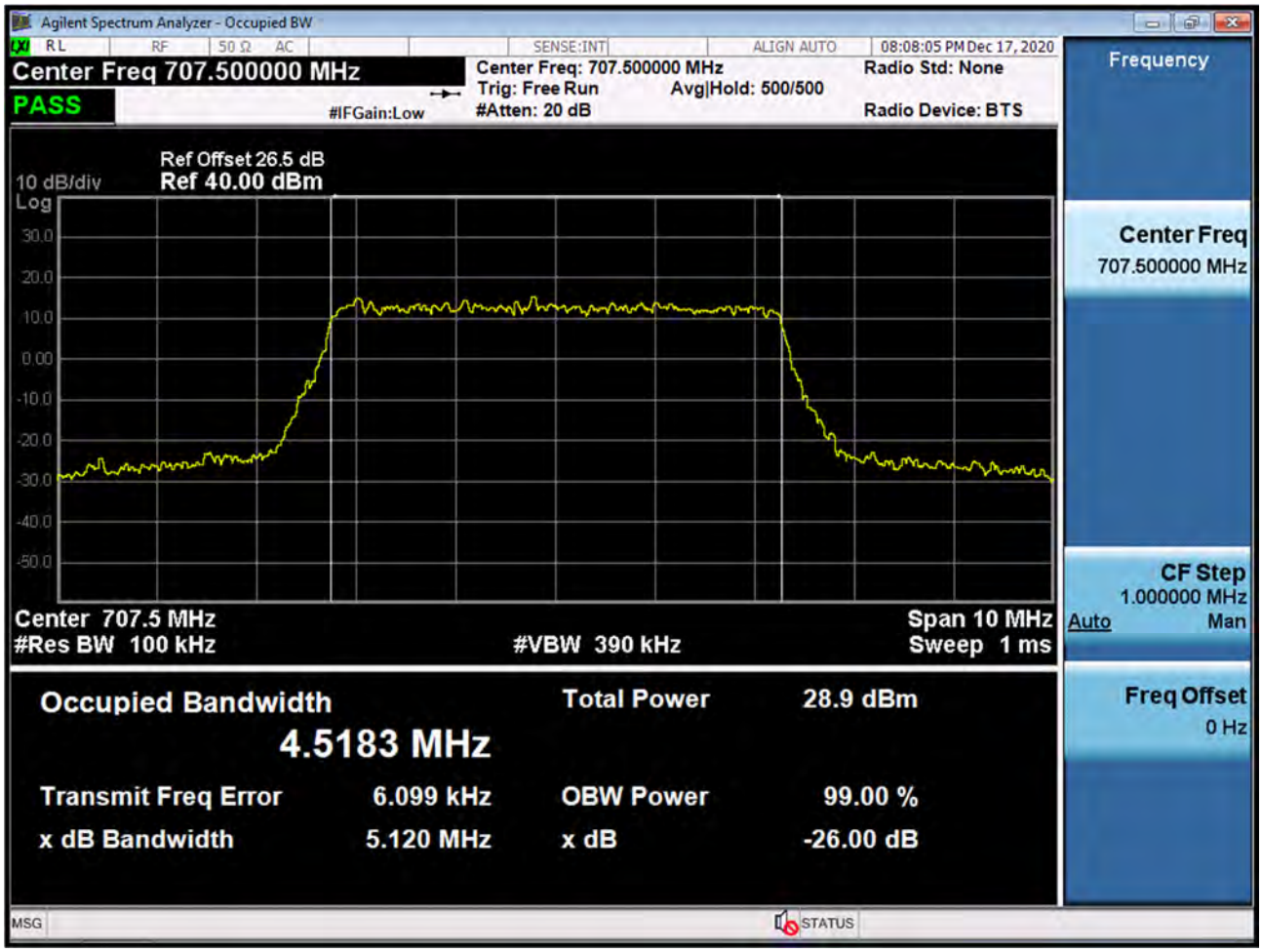
BAND 12/17. Occupied Bandwidth Plot (5M BW Ch.23095 QPSK_RB25_0)



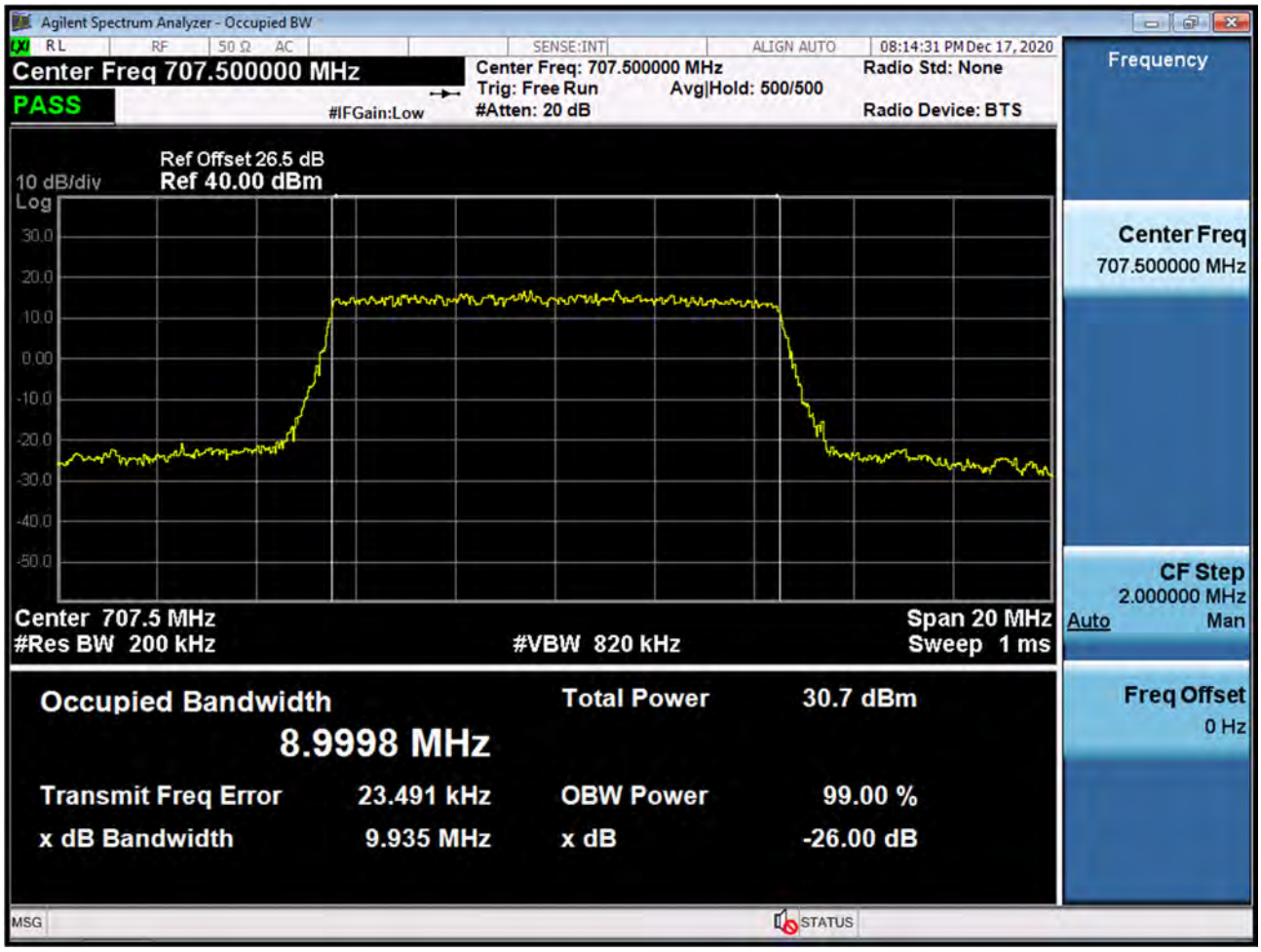
BAND 12/17. Occupied Bandwidth Plot (5M BW Ch.23095 16QAM_RB25_0)



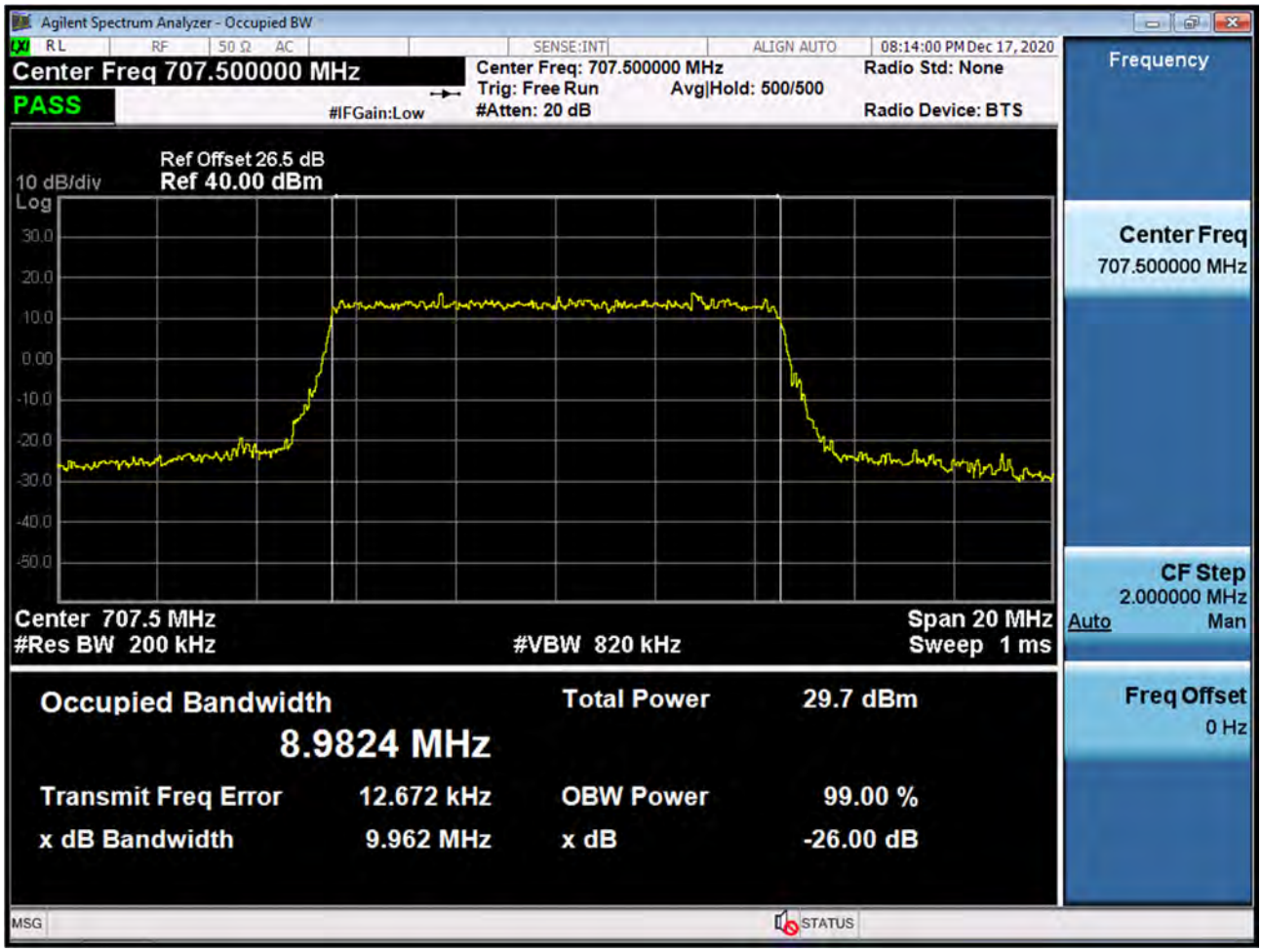
BAND 12/17. Occupied Bandwidth Plot (5M BW Ch.23095 64QAM_RB25_0)



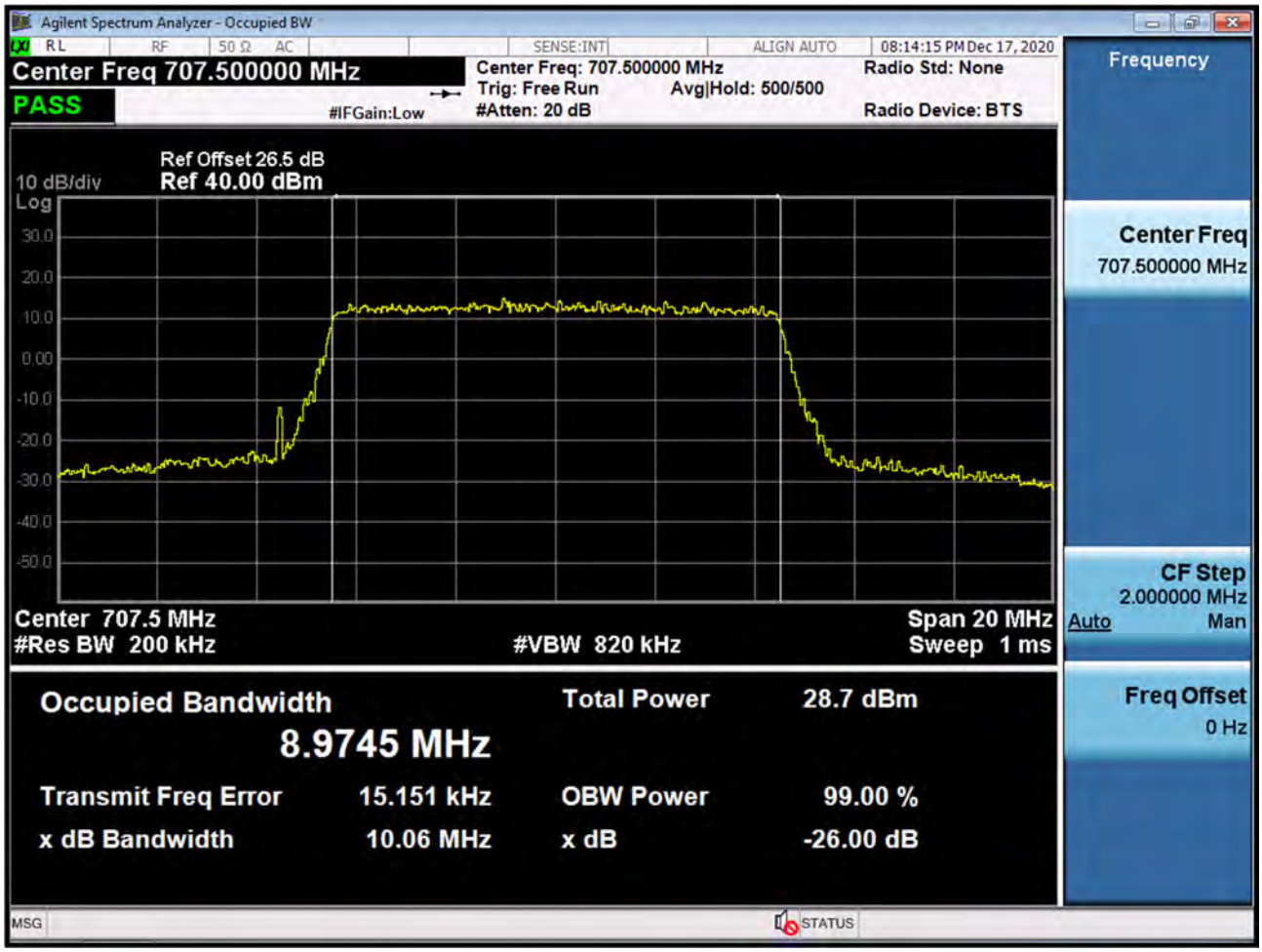
BAND 12/17. Occupied Bandwidth Plot (10M BW Ch.23095 QPSK_RB50_0)



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



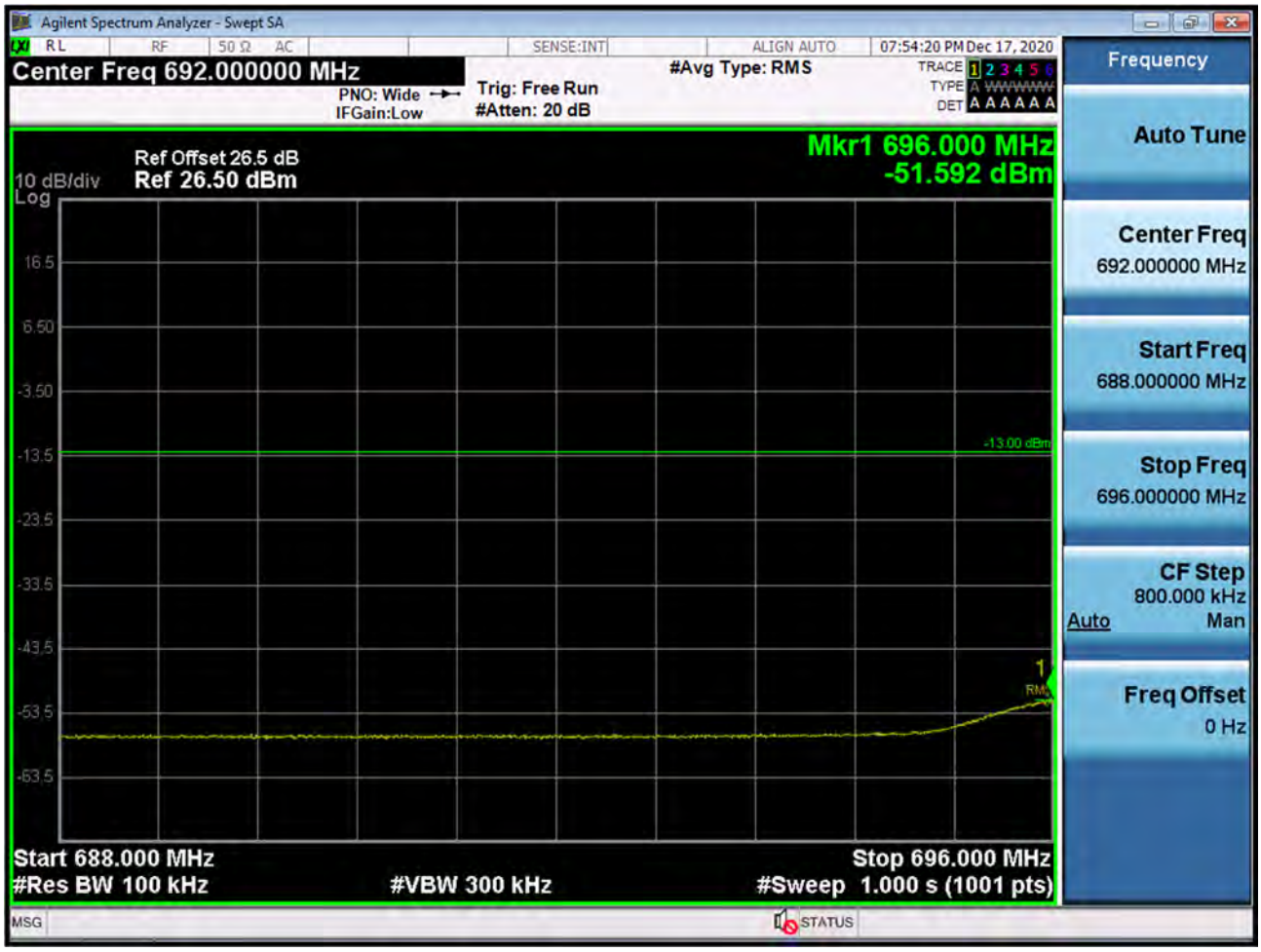
BAND 12/17. Occupied Bandwidth Plot (10M BW Ch.23095 64QAM_RB50_0)



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

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

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



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

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

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

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

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

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

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

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

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

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

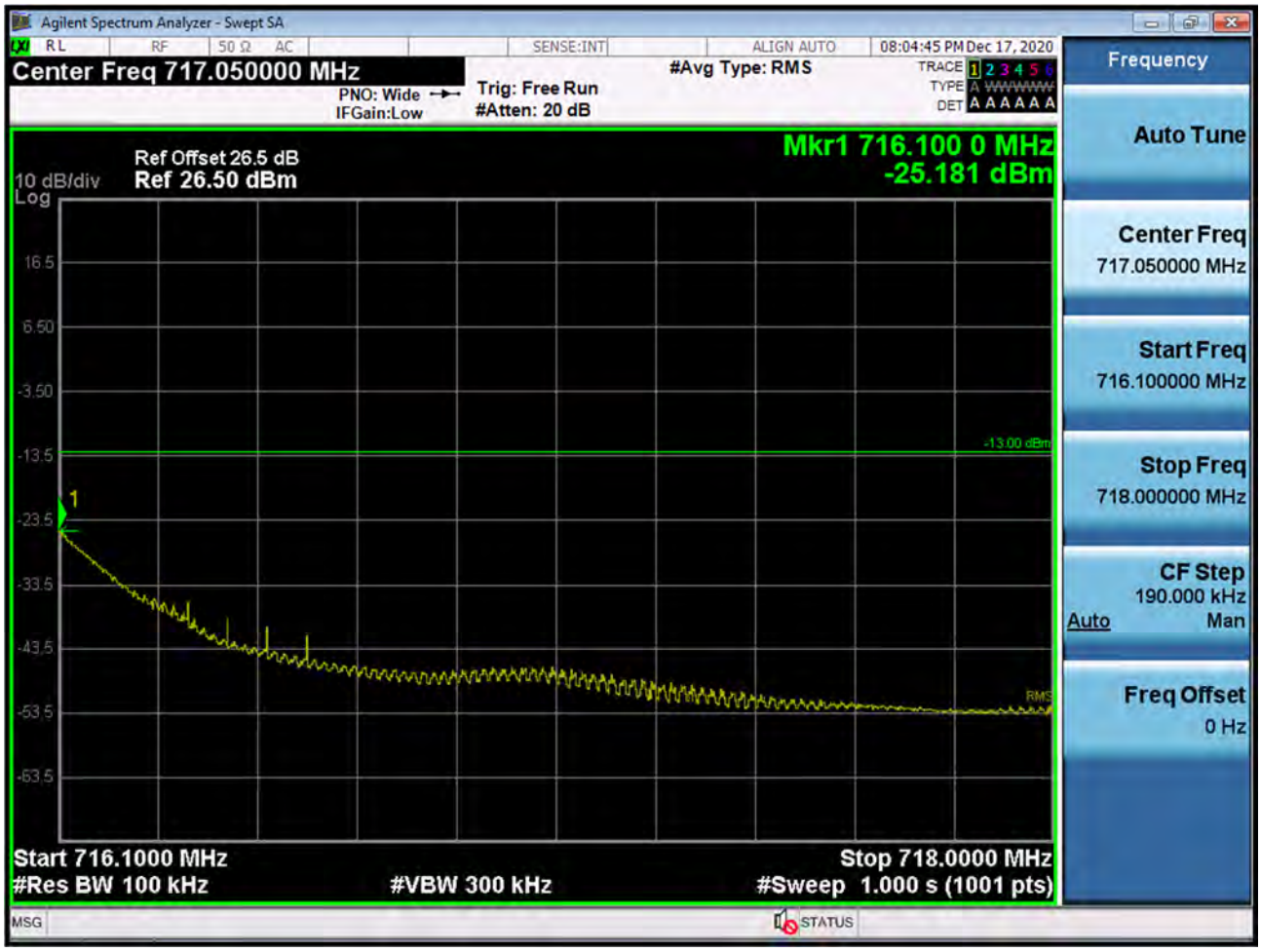
BAND 12. Upper Band Edge Plot (1.4M BW Ch.23173 QPSK_RB1_Offset 5)_2

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

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

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

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



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

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

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

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

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

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

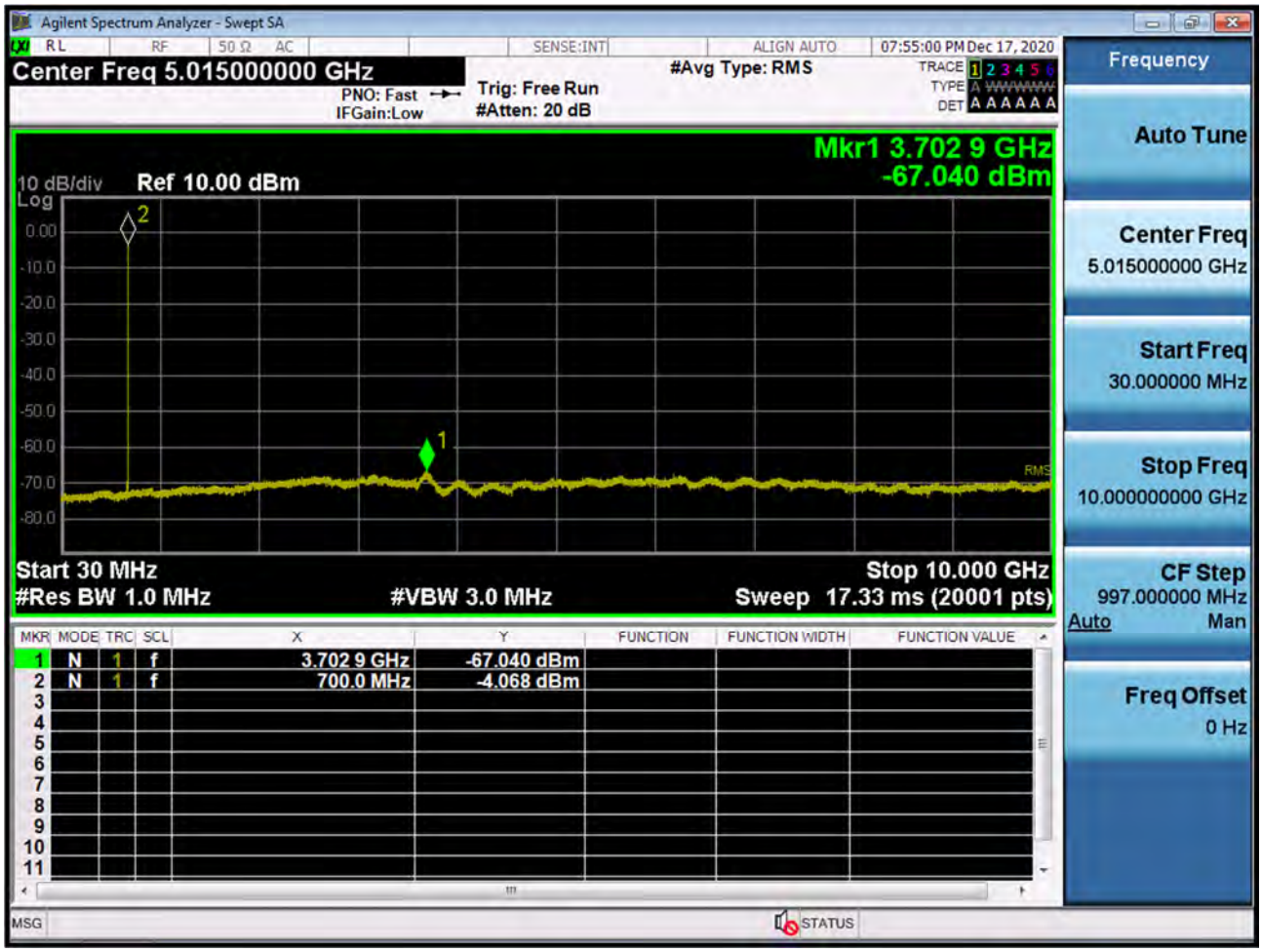
BAND 12/17. Upper Band Edge Plot (10M BW Ch.23130 QPSK_RB1_Offset 49)_1

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

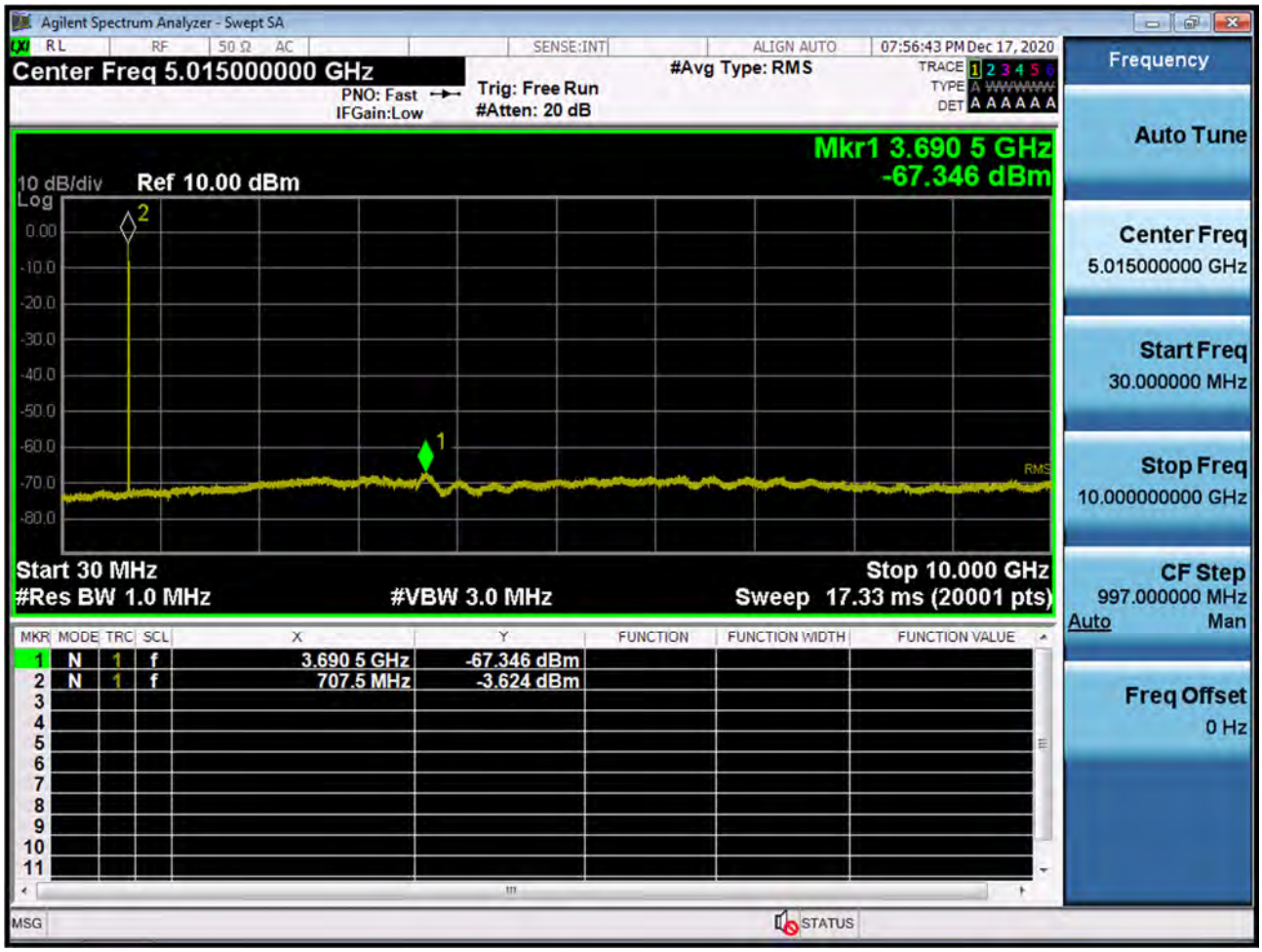
BAND 12/17. Upper Band Edge Plot (10M BW Ch.23130 QPSK_RB50_Offset 0)

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

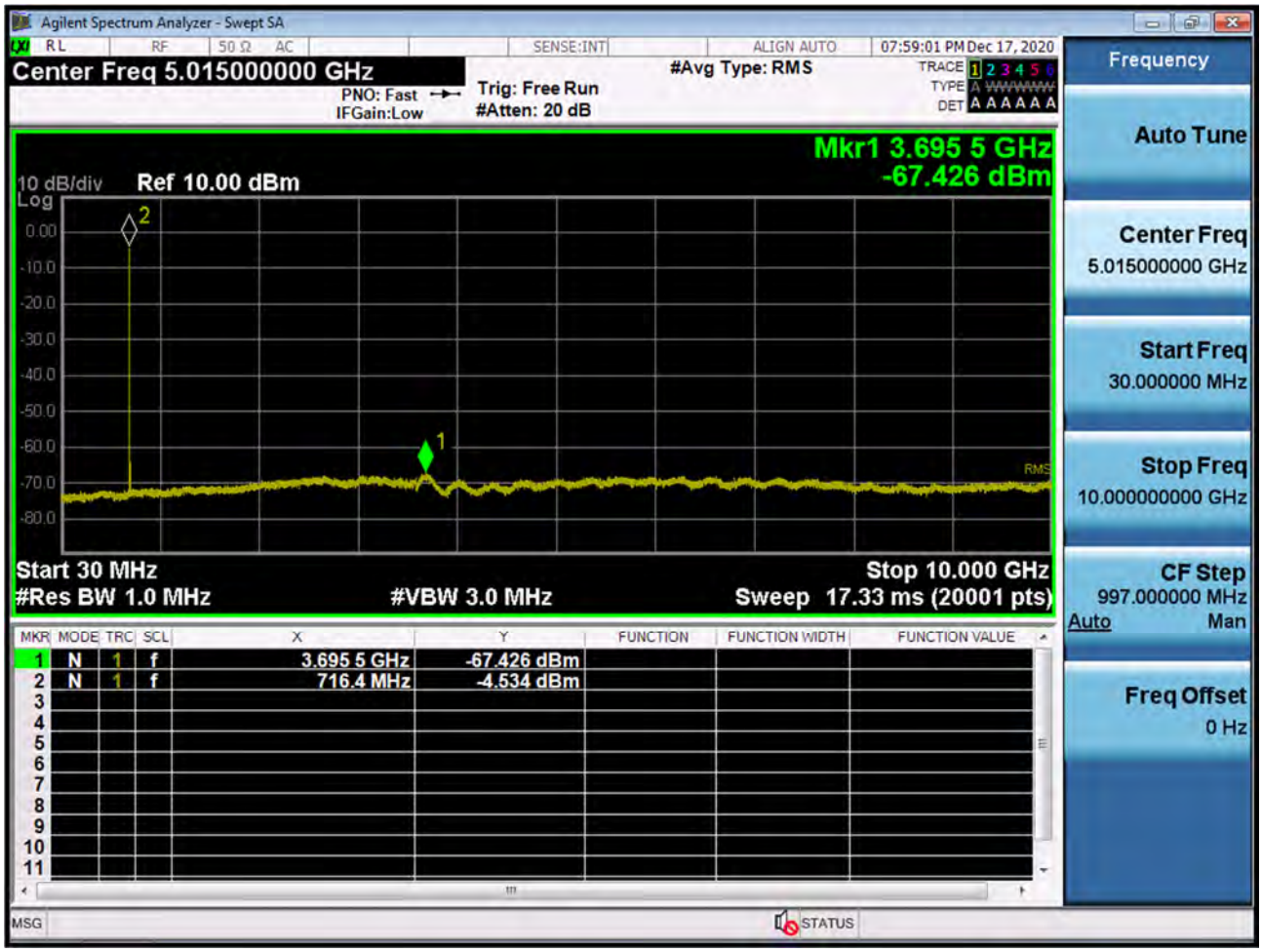
BAND 12. Conducted Spurious Plot _ (23017ch_1.4MHz_QPSK_RB 1_0)



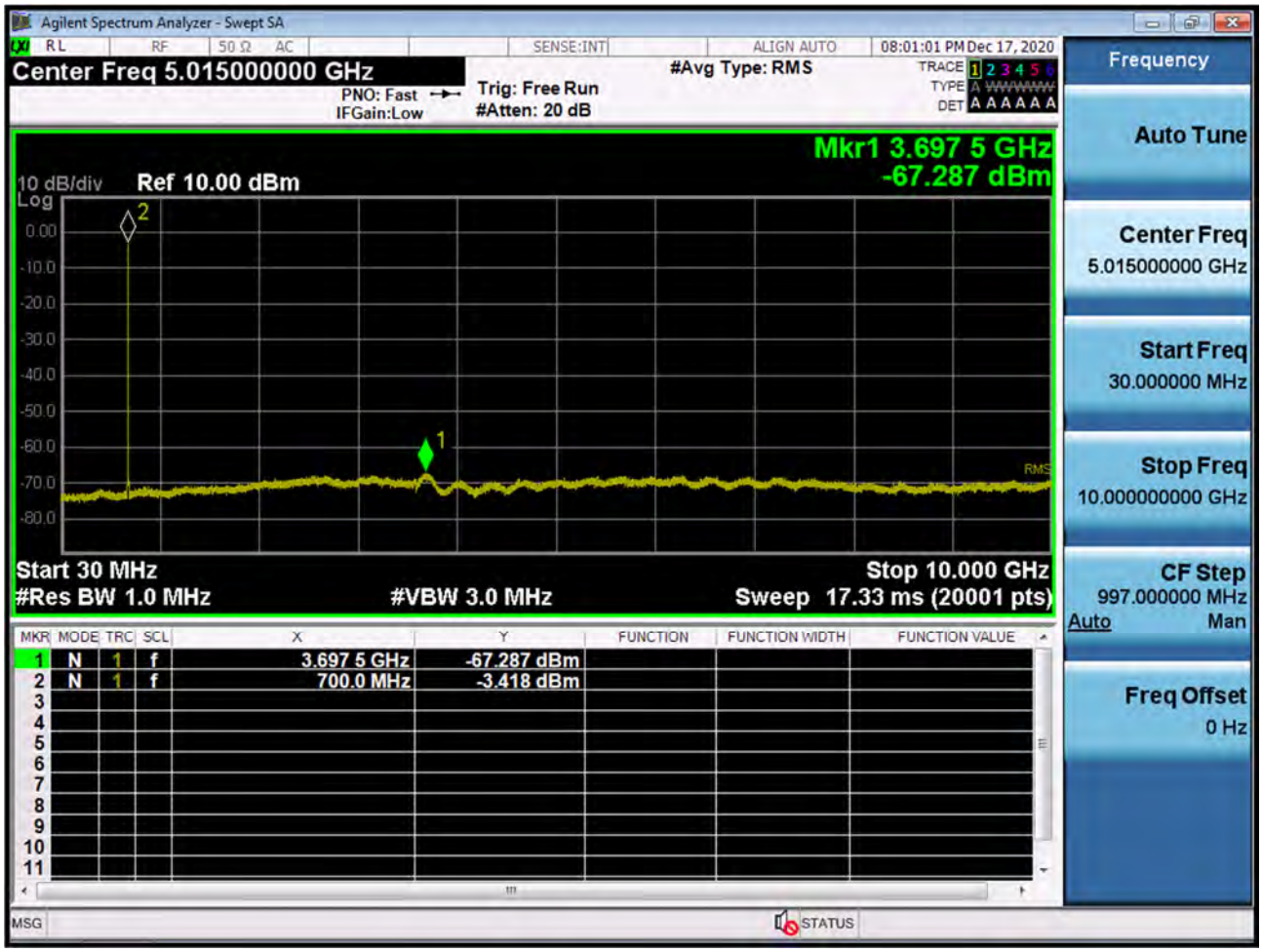
BAND 12. Conducted Spurious Plot _ (23095ch_1.4MHz_QPSK_RB 1_0)



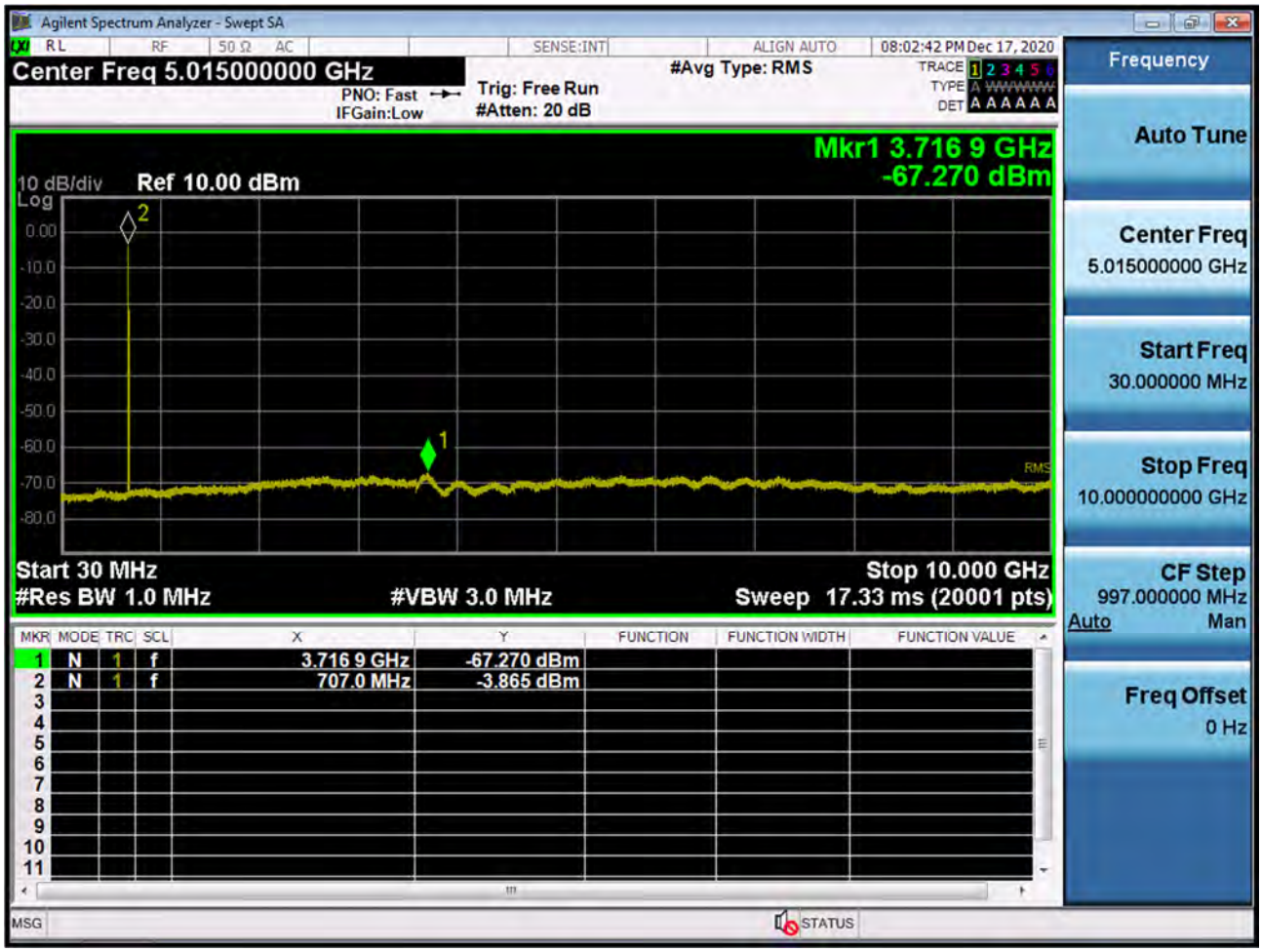
BAND 12. Conducted Spurious Plot _ (23173ch_1.4MHz_QPSK_RB 1_0)



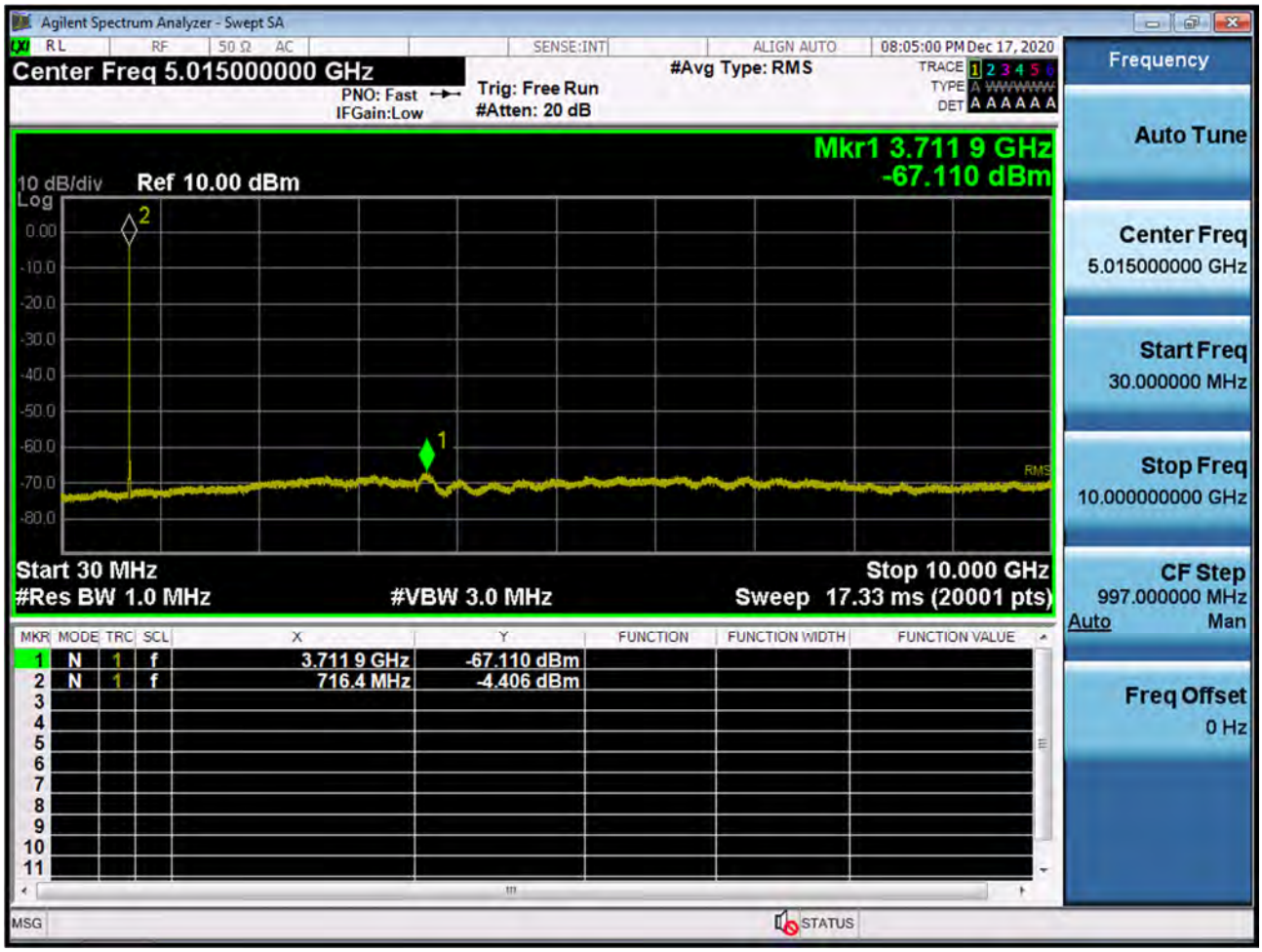
BAND 12. Conducted Spurious Plot _ (23025ch_3MHz_QPSK_RB 1_0)



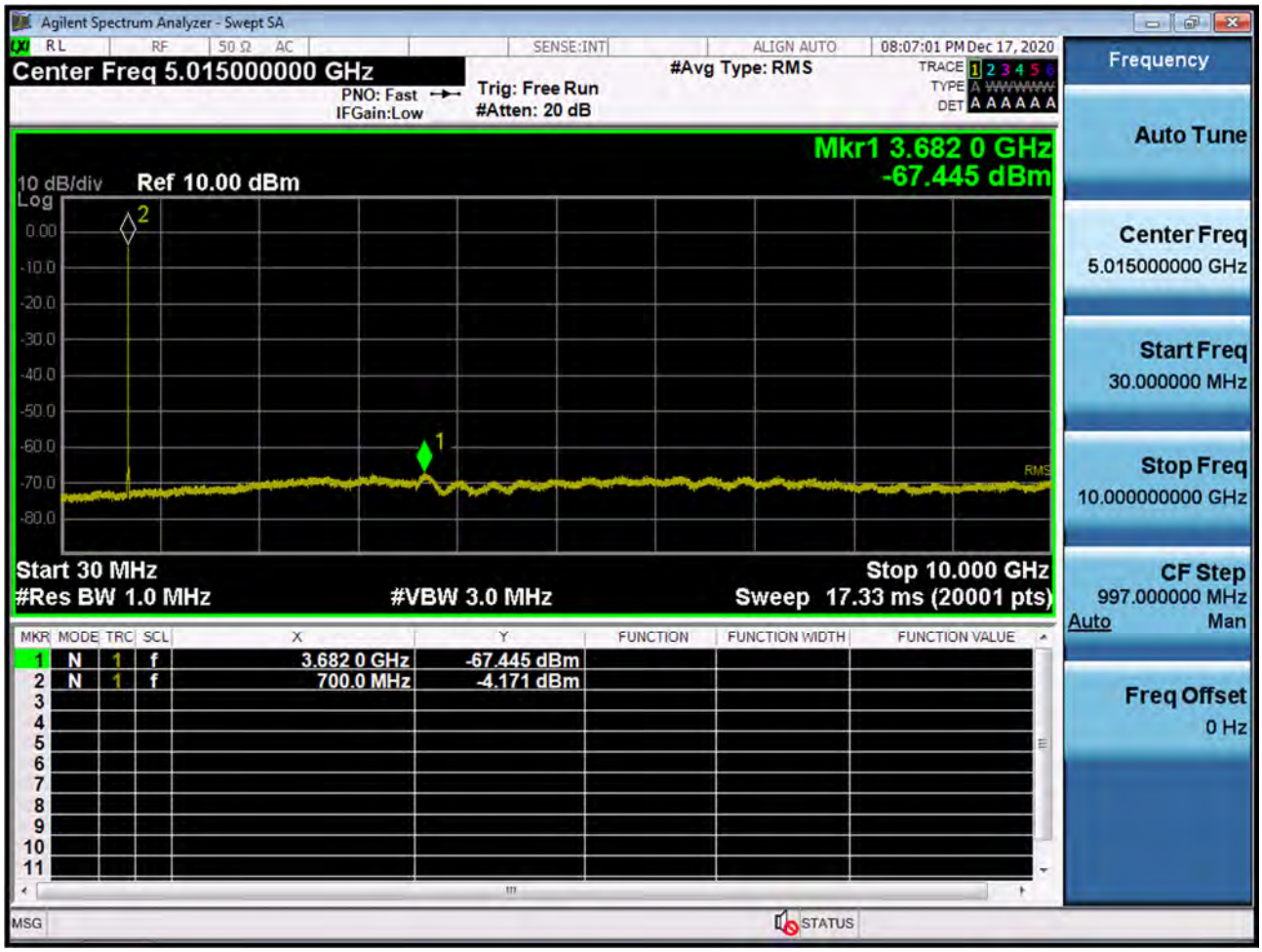
BAND 12. Conducted Spurious Plot _ (23095ch_3MHz_QPSK_RB 1_0)



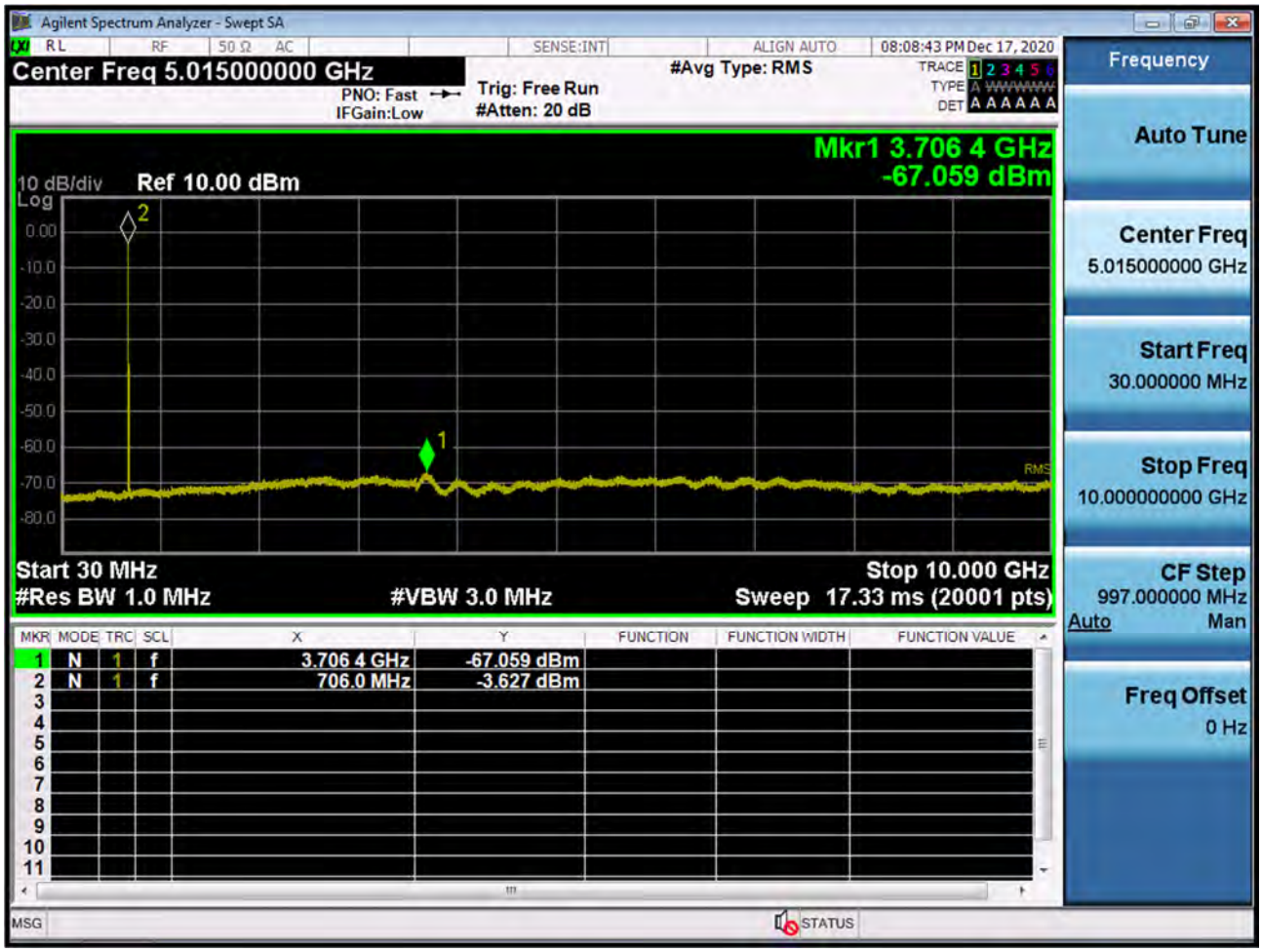
BAND 12. Conducted Spurious Plot _ (23165ch_3MHz_QPSK_RB 1_0)



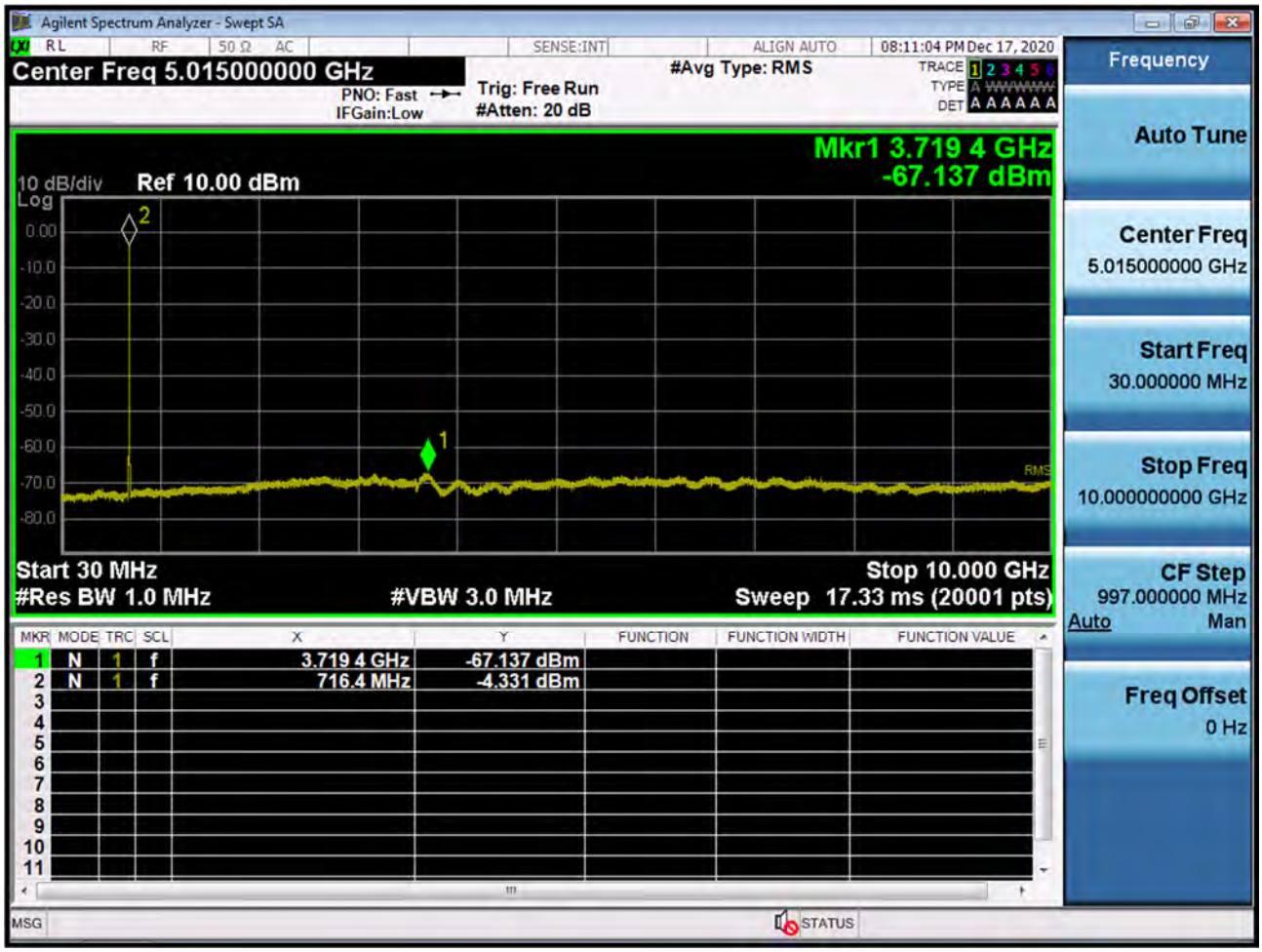
BAND 12/17. Conducted Spurious Plot _ (23035ch_5MHz_QPSK_RB 1_0)



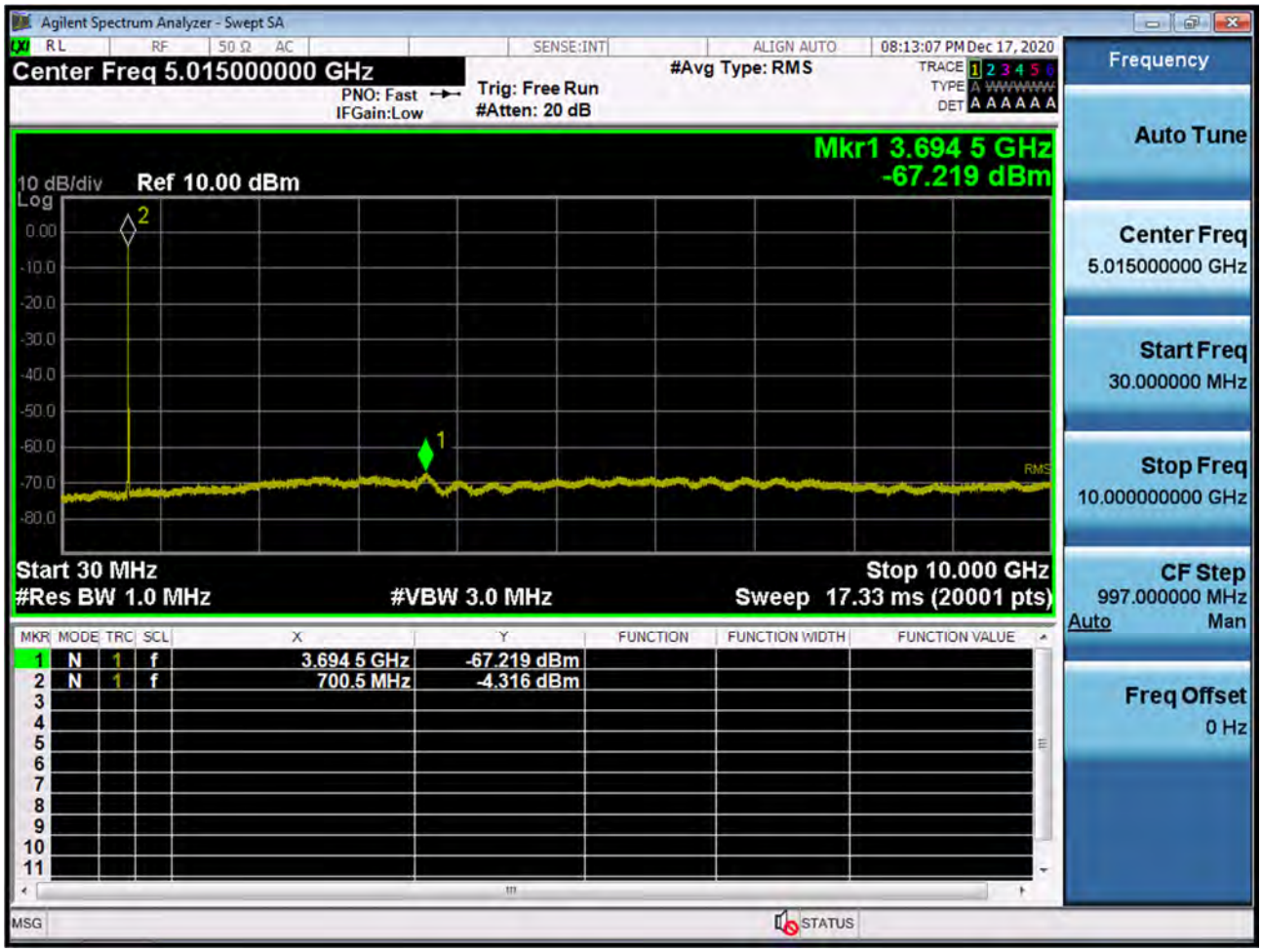
BAND 12/17. Conducted Spurious Plot _ (23095ch_5MHz_QPSK_RB 1_0)



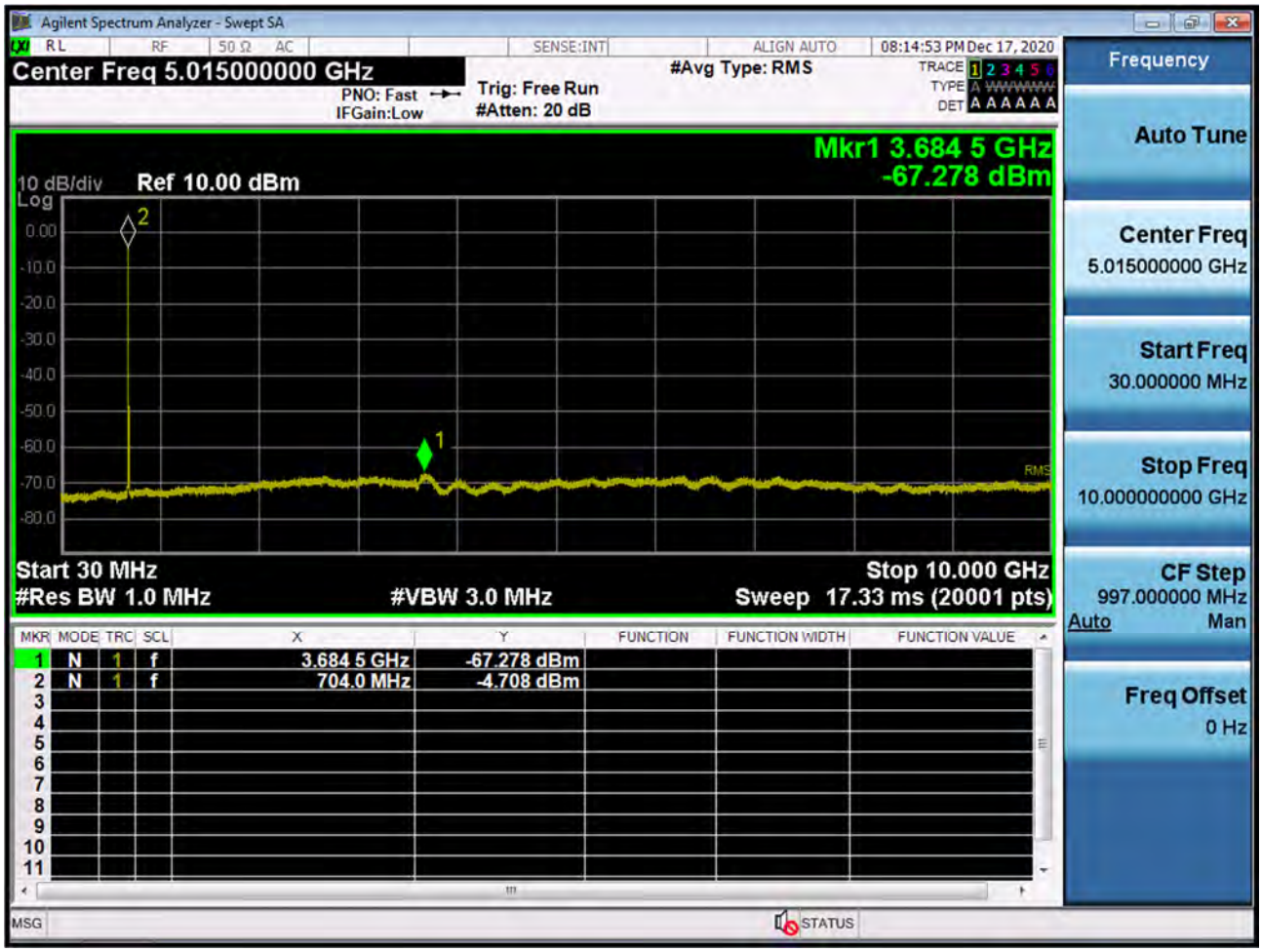
BAND 12/17. Conducted Spurious Plot _ (23155ch_5MHz_QPSK_RB 1_0)



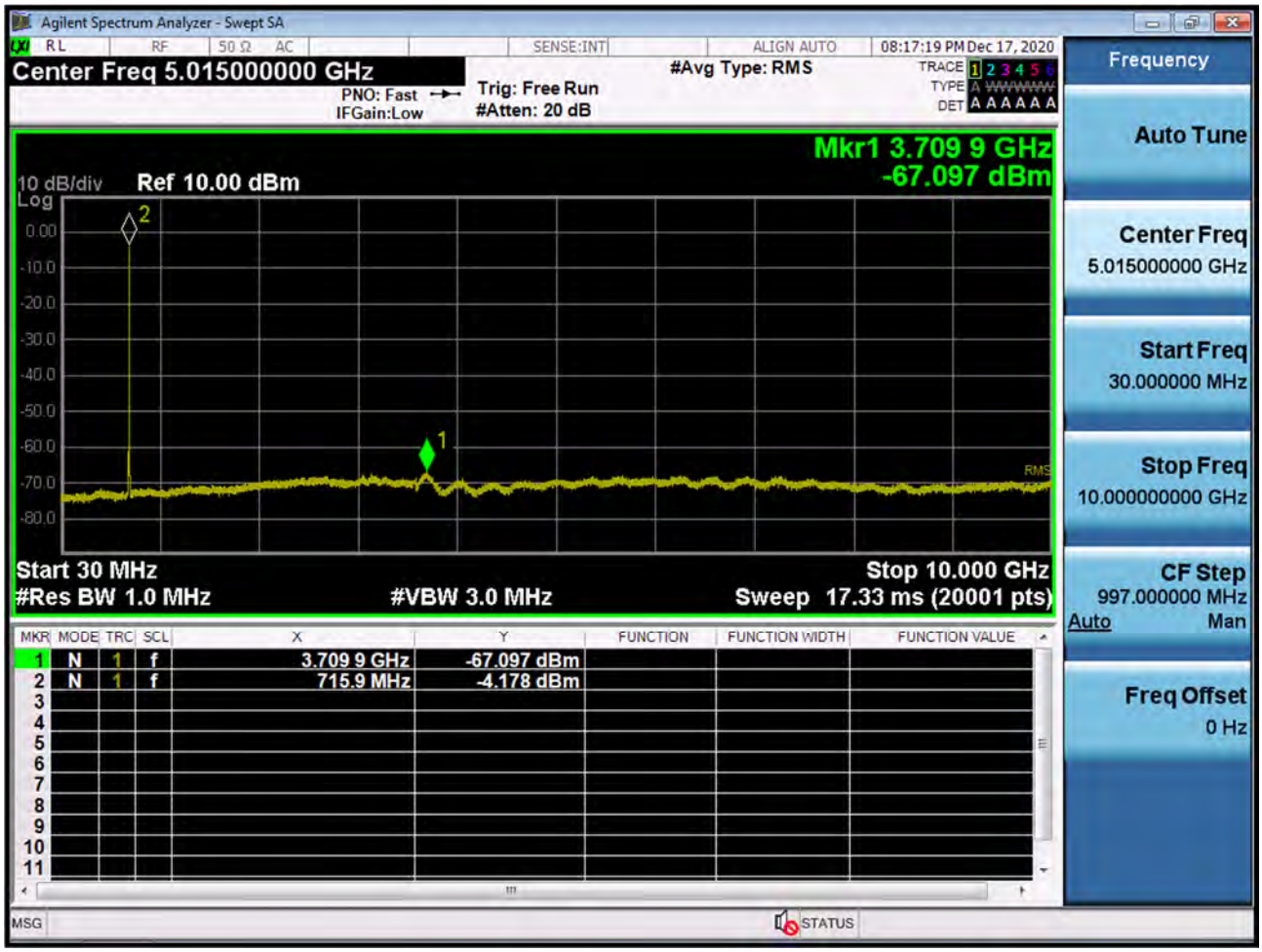
BAND 12/17. Conducted Spurious Plot _ (23060ch_10MHz_QPSK_RB 1_0)



BAND 12/17. Conducted Spurious Plot _ (23095ch_10MHz_QPSK_RB 1_0)



BAND 12/17. Conducted Spurious Plot _ (23130ch_10MHz_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-2101-FC073-P