

# FCC LTE REPORT

## Certification

**Applicant Name:**

LG Electronics MobileComm U.S.A., Inc.

**Date of Issue:**

March 20, 2018

**Location:**

HCT CO., LTD.,

**Address:**

1000 Sylvan Avenue, Englewood Cliffs NJ 07632

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

**Report No.:** HCT-RF-1803-FC006

**FCC ID:** ZNFQ610FA

**APPLICANT:** LG Electronics MobileComm U.S.A., Inc.

**Model(s):** LM-Q610FAW

**Additional Model(s):** LMQ610FAW, Q610FAW, LM-Q610FA, LMQ610FA, Q610FA, LM-Q610RM, LMQ610RM, Q610RM, LM-Q610FM, LMQ610FM, Q610FM, LM-Q610RS, LMQ610RS, Q610RS, LM-Q610FS, LMQ610FS, Q610FS, LM-Q610FSW, LMQ610FSW, Q610FSW

**EUT Type:** GSM/WCDMA/LTE Phone with Bluetooth4.2LE, WIFI802.11 b/g/n

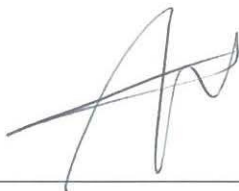
**FCC Classification:** Licensed Portable Transmitter Held to Ear (PCE)

**FCC Rule Part(s):** §27, §2

| Mode<br>(MHz)          | Tx Frequency<br>(MHz) | Emission<br>Designator | Modulation | ERP               |                     |
|------------------------|-----------------------|------------------------|------------|-------------------|---------------------|
|                        |                       |                        |            | Max. Power<br>(W) | Max. Power<br>(dBm) |
| LTE – Band12 (1.4)     | 699.7 – 715.3         | 1M09G7D                | QPSK       | 0.062             | 17.91               |
|                        |                       | 1M09W7D                | 16QAM      | 0.052             | 17.19               |
| LTE – Band12 (3)       | 700.5 – 714.5         | 2M71G7D                | QPSK       | 0.063             | 18.02               |
|                        |                       | 2M71W7D                | 16QAM      | 0.053             | 17.24               |
| LTE – Band12 / 17 (5)  | 701.5 – 713.5         | 4M52G7D                | QPSK       | 0.061             | 17.86               |
|                        |                       | 4M51W7D                | 16QAM      | 0.051             | 17.08               |
| LTE – Band12 / 17 (10) | 704.0 – 711.0         | 9M00G7D                | QPSK       | 0.060             | 17.79               |
|                        |                       | 8M99W7D                | 16QAM      | 0.050             | 16.98               |

The measurements shown in this report were made in accordance with the procedures specified in CFR47 section §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998, 21 U.S.C. 853(a)



**Report prepared by : Jae Ryang Do**  
Engineer of Telecommunication Testing Center



**Report approved by : Kwon Jeong**  
Manager of Telecommunication Testing Center

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

## Version

| TEST REPORT NO.   | DATE           | DESCRIPTION             |
|-------------------|----------------|-------------------------|
| HCT-RF-1803-FC006 | March 20, 2018 | - First Approval Report |
|                   |                |                         |
|                   |                |                         |
|                   |                |                         |

# **Table of Contents**

|                                                                  |    |
|------------------------------------------------------------------|----|
| 1. GENERAL INFORMATION .....                                     | 4  |
| 2. INTRODUCTION .....                                            | 5  |
| 2.1. Description of EUT .....                                    | 5  |
| 2.2. MEASURING INSTRUMENT CALIBRATION .....                      | 5  |
| 2.3. TEST FACILITY .....                                         | 5  |
| 3. DESCRIPTION OF TESTS .....                                    | 6  |
| 3.1 TEST PROCEDURE .....                                         | 6  |
| 3.2 RADIATED POWER .....                                         | 7  |
| 3.3 RADIATED SPURIOUS EMISSIONS .....                            | 8  |
| 3.4 OCCUPIED BANDWIDTH .....                                     | 9  |
| 3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.....     | 10 |
| 3.6 BAND EDGE .....                                              | 11 |
| 3.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE ..... | 12 |
| 4. LIST OF TEST EQUIPMENT .....                                  | 13 |
| 5. MEASUREMENT UNCERTAINTY .....                                 | 14 |
| 6. SUMMARY OF TEST RESULTS .....                                 | 15 |
| 7. SAMPLE CALCULATION .....                                      | 16 |
| 8. TEST DATA .....                                               | 18 |
| 8.1 EFFECTIVE RADIATED POWER .....                               | 18 |
| 8.2 RADIATED SPURIOUS EMISSIONS .....                            | 20 |
| 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.....                                               | 30 |

# MEASUREMENT REPORT

## 1. GENERAL INFORMATION

|                             |                                                                                                                                                                                                               |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Applicant Name:</b>      | LG Electronics MobileComm U.S.A., Inc.                                                                                                                                                                        |
| <b>Address:</b>             | 1000 Sylvan Avenue, Englewood Cliffs NJ 07632                                                                                                                                                                 |
| <b>FCC ID:</b>              | ZNFQ610FA                                                                                                                                                                                                     |
| <b>Application Type:</b>    | Certification                                                                                                                                                                                                 |
| <b>FCC Classification:</b>  | Licensed Portable Transmitter Held to Ear (PCE)                                                                                                                                                               |
| <b>FCC Rule Part(s):</b>    | §27, §2                                                                                                                                                                                                       |
| <b>EUT Type:</b>            | GSM/WCDMA/LTE Phone with Bluetooth4.2LE, WIFI802.11 b/g/n                                                                                                                                                     |
| <b>Model(s):</b>            | LM-Q610FAW                                                                                                                                                                                                    |
| <b>Additional Model(s):</b> | LMQ610FAW, Q610FAW, LM-Q610FA, LMQ610FA, Q610FA, LM-Q610RM, LMQ610RM, Q610RM, LM-Q610FM, LMQ610FM, Q610FM, LM-Q610RS, LMQ610RS, Q610RS, LM-Q610FS, LMQ610FS, Q610FS, LM-Q610FSW, LMQ610FSW, Q610FSW           |
| <b>Tx Frequency:</b>        | 699.7 MHz – 715.3 MHz (LTE – Band 12 (1.4 MHz))<br>700.5 MHz – 714.5 MHz (LTE – Band 12 (3 MHz))<br>701.5 MHz – 713.5 MHz (LTE – Band 12 / 17 (5 MHz))<br>704.0 MHz – 711.0 MHz (LTE – Band 12 / 17 (10 MHz)) |
| <b>Date(s) of Tests:</b>    | March 05, 2018 ~ March 19, 2018                                                                                                                                                                               |

## **2. INTRODUCTION**

### **2.1. Description of EUT**

The EUT supports GSM/WCDMA/LTE Phone with Bluetooth4.2LE, WIFI802.11 b/g/n.

### **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**

| <b>Test Description</b>                                         | <b>Test Procedure Used</b>                                                                                                 |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Occupied Bandwidth                                              | - KDB 971168 D01 v03 – Section 4.2<br>- ANSI C63.26-2015 – Section 5.4.4                                                   |
| Band Edge                                                       | - KDB 971168 D01 v03 – Section 6.0<br>- ANSI C63.26-2015 – Section 5.7                                                     |
| Spurious and Harmonic Emissions at Antenna Terminal             | - KDB 971168 D01 v03 – Section 6.0<br>- ANSI C63.26-2015 – Section 5.7                                                     |
| Conducted Output Power                                          | - N/A (See SAR Report)                                                                                                     |
| Peak- to- Average Ratio                                         | - KDB 971168 D01 v03 – Section 5.7<br>- ANSI C63.26-2015 – Section 5.2.3.4<br>- ANSI C63.26-2015 – Section 5.2.6(only GSM) |
| Frequency stability                                             | - ANSI C63.26-2015 – Section 5.6                                                                                           |
| Effective Radiated Power/<br>Effective Isotropic Radiated Power | - KDB 971168 D01 v03 – Section 5.2<br>- ANSI C63.26-2015 – Section 5.2<br>- ANSI/TIA-603-E-2016 – Section 2.2.17           |
| Radiated Spurious and Harmonic Emissions                        | - KDB 971168 D01 v03 – Section 5.8<br>- 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  $\geq 3 \times$  RBW
4. Span = 1.5 times the OBW
5. No. of sweep points  $> 2 \times$  span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

### Test Note

1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
2. A half wave dipole is then substituted in place of the EUT. For emissions above 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;

$$P_{d(dBm)} = P_{g(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dB)}$$

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.

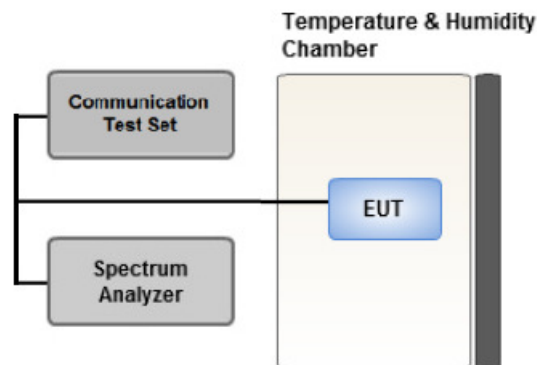
#### **Test Settings**

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW  $\geq 3 \times$  RBW
3. Span = 1.5 times the OBW
4. No. of sweep points  $> 2 \times$  span / RBW
5. Detector = Peak
6. Trace mode = Max Hold
7. The trace was allowed to stabilize
8. Test channel : Low/ Middle/ High
9. Frequency range : We are performed all frequency to 10<sup>th</sup> 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

### 3.4 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.

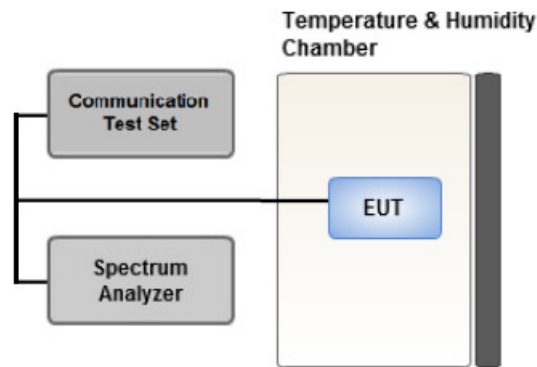
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

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  $\geq 3 \times$  RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

### 3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



**Test setup**

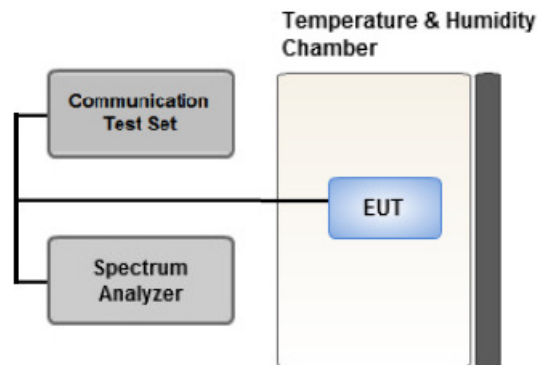
#### **Test Overview**

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

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

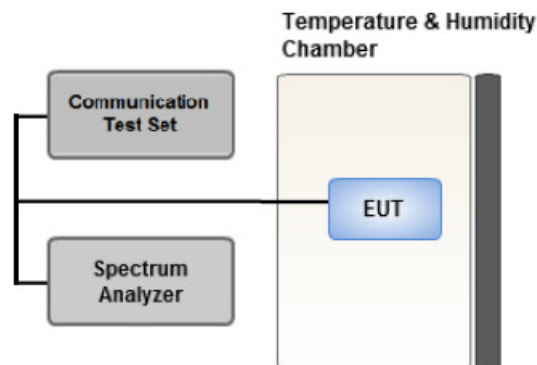
#### Test Notes

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.

## 4. LIST OF TEST EQUIPMENT

| Manufacture      | Model/ Equipment                                     | Serial Number | Calibration Date | Calibration Interval | Calibration Due |
|------------------|------------------------------------------------------|---------------|------------------|----------------------|-----------------|
| REOHDE & SCHWARZ | SCU 18 / AMPLIFIER                                   | 10094         | 04/24/2017       | Annual               | 04/24/2018      |
| Wainwright       | WHK1.2/15G-10EF/H.P.F                                | 4             | 04/10/2017       | Annual               | 04/10/2018      |
| Wainwright       | WHK3.3/18G-10EF/H.P.F                                | 2             | 04/10/2017       | Annual               | 04/10/2018      |
| Hewlett Packard  | 11667B / Power Splitter(DC~26.5 GHz)                 | 11275         | 05/04/2017       | Annual               | 05/04/2018      |
| Agilent          | E3632A/DC Power Supply                               | KR75303243    | 07/18/2017       | Annual               | 07/18/2018      |
| Schwarzbeck      | UHAP/ Dipole Antenna                                 | 557           | 03/31/2017       | Biennial             | 03/31/2019      |
| Schwarzbeck      | UHAP/ Dipole Antenna                                 | 558           | 03/31/2017       | Biennial             | 03/31/2019      |
| ESPEC            | SU-642 / Chamber                                     | 93000718      | 07/21/2017       | Annual               | 07/21/2018      |
| Schwarzbeck      | BBHA 9120D/ Horn Antenna(1~18GHz)                    | 147           | 09/09/2016       | Biennial             | 09/09/2018      |
| Schwarzbeck      | BBHA 9120D/ Horn Antenna(1~18GHz)                    | 9120D-1298    | 10/14/2016       | Biennial             | 10/14/2018      |
| Schwarzbeck      | BBHA 9170/ Horn Antenna(15~40GHz)                    | BBHA9170342   | 04/25/2017       | Biennial             | 04/25/2019      |
| Schwarzbeck      | BBHA 9170/ Horn Antenna(15~40GHz)                    | BBHA9170124   | 04/25/2017       | Biennial             | 04/25/2019      |
| Agilent          | N9020A/Signal Analyzer(10Hz~26.5GHz)                 | MY52090906    | 06/01/2017       | Annual               | 06/01/2018      |
| Hewlett Packard  | 8493C/ATTENUATOR(20dB)                               | 17280         | 06/22/2017       | Annual               | 06/22/2018      |
| REOHDE & SCHWARZ | FSV40/Spectrum Analyzer(10Hz~40GHz)                  | 100931        | 10/30/2017       | Annual               | 10/30/2018      |
| Agilent          | 8960 (E5515C)/ Base Station                          | MY48360800    | 09/26/2017       | Annual               | 09/26/2018      |
| Schwarzbeck      | FMZB1513/ Loop Antenna(9kHz~30MHz)                   | 1513-175      | 04/19/2017       | Biennial             | 04/19/2019      |
| Schwarzbeck      | VULB9160/ Bilog Antenna                              | 3150          | 09/30/2016       | Biennial             | 09/30/2018      |
| Schwarzbeck      | VULB9160/ Bilog Antenna                              | 9360-3368     | 10/14/2016       | Biennial             | 10/14/2018      |
| Anritsu Corp.    | MT8820C/Wideband Radio Communication Tester          | 6200863156    | 02/13/2018       | Annual               | 02/13/2019      |
| Anritsu Corp.    | MT8820C/Wideband Radio Communication Tester          | 6201026545    | 02/08/2018       | Annual               | 02/08/2019      |
| REOHDE & SCHWARZ | SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)             | 177633        | 07/18/2017       | Annual               | 07/18/2018      |
| REOHDE & SCHWARZ | FSV40/Spectrum Analyzer                              | 100931        | 10/30/2017       | Annual               | 10/30/2018      |
| REOHDE & SCHWARZ | ESU40 / EMI TEST RECEIVER                            | 100524        | 08/16/2017       | Annual               | 08/16/2018      |
| HCT CO., LTD.,   | FCC LTE Mobile Conducted RF Automation Test Software | -             | -                | -                    | -               |

## 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  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

| Parameter                                | Expanded Uncertainty ( $\pm$ dB) |
|------------------------------------------|----------------------------------|
| Conducted Disturbance (150 kHz ~ 30 MHz) | 1.82                             |
| Radiated Disturbance (9 kHz ~ 30 MHz)    | 3.40                             |
| Radiated Disturbance (30 MHz ~ 1 GHz)    | 4.80                             |
| Radiated Disturbance (1 GHz ~ 18 GHz)    | 6.07                             |

## 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,<br>§27.53(g) | $< 43 + 10\log_{10} (P[\text{Watts}])$ at Band Edge<br>and for all out-of-band emissions | PASS             |
| Conducted Output Power                                           | §2.1046               | N/A                                                                                      | <u>See Note1</u> |
| Frequency stability / variation of ambient temperature           | §2.1055,<br>§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,<br>§27.53(g) | $< 43 + 10\log_{10} (P[\text{Watts}])$ for<br>all out-of band emissions | PASS        |

## 7. SAMPLE CALCULATION

### 7.1 ERP Sample Calculation

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

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

- 1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
- 2) During the test , the turn table is rotated until the maximum signal is found.
- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power.

### 7.2 EIRP Sample Calculation

| Ch./ Freq. |            | Measured<br>Level(dBm) | Substitute<br>Level(dBm) | Ant. Gain<br>(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 |

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

- 1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
- 2) During the test , the turn table is rotated until the maximum signal is found.
- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.

### 7.3. Emission Designator

#### GSM Emission Designator

**Emission Designator = 249KGXW**

GSM BW = 249 kHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

#### EDGE Emission Designator

**Emission Designator = 249KG7W**

GSM BW = 249 kHz

G = Phase Modulation

7 = Quantized/Digital Info

W = Combination (Audio/Data)

#### WCDMA Emission Designator

**Emission Designator = 4M17F9W**

WCDMA BW = 4.17 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

#### QPSK Modulation

**Emission Designator = 4M48G7D**

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

#### 16QAM 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<br>(MHz) | Mod<br>(Bandwidth)   | Modulation | Measured<br>Level (dBm) | Substitute<br>Level (dBm) | Ant.<br>Gain(dBd) | C.L  | Pol | Limit  | ERP   |       |
|---------------|----------------------|------------|-------------------------|---------------------------|-------------------|------|-----|--------|-------|-------|
|               |                      |            |                         |                           |                   |      |     | W      | W     | dBm   |
| 699.7         | LTE B12<br>(1.4 MHz) | QPSK       | -32.76                  | 29.16                     | -10.16            | 1.20 | H   | < 3.00 | 0.060 | 17.80 |
|               |                      | 16-QAM     | -33.51                  | 28.41                     | -10.16            | 1.20 | H   |        | 0.051 | 17.05 |
| 707.5         |                      | QPSK       | -32.13                  | 29.33                     | -10.21            | 1.21 | H   |        | 0.062 | 17.91 |
|               |                      | 16-QAM     | -32.85                  | 28.61                     | -10.21            | 1.21 | H   |        | 0.052 | 17.19 |
| 715.3         |                      | QPSK       | -31.92                  | 29.23                     | -10.25            | 1.22 | H   |        | 0.060 | 17.76 |
|               |                      | 16-QAM     | -32.65                  | 28.50                     | -10.25            | 1.22 | H   |        | 0.050 | 17.03 |

| Freq<br>(MHz) | Mod<br>(Bandwidth) | Modulation | Measured<br>Level (dBm) | Substitute<br>Level (dBm) | Ant.<br>Gain(dBd) | C.L  | Pol | Limit  | ERP   |       |
|---------------|--------------------|------------|-------------------------|---------------------------|-------------------|------|-----|--------|-------|-------|
|               |                    |            |                         |                           |                   |      |     | W      | W     | dBm   |
| 700.5         | LTE B12<br>(3 MHz) | QPSK       | -32.62                  | 29.26                     | -10.17            | 1.21 | H   | < 3.00 | 0.061 | 17.88 |
|               |                    | 16-QAM     | -33.45                  | 28.43                     | -10.17            | 1.21 | H   |        | 0.051 | 17.05 |
| 707.5         |                    | QPSK       | -32.02                  | 29.44                     | -10.21            | 1.21 | H   |        | 0.063 | 18.02 |
|               |                    | 16-QAM     | -32.80                  | 28.66                     | -10.21            | 1.21 | H   |        | 0.053 | 17.24 |
| 714.5         |                    | QPSK       | -31.84                  | 29.37                     | -10.24            | 1.22 | H   |        | 0.062 | 17.91 |
|               |                    | 16-QAM     | -32.72                  | 28.49                     | -10.24            | 1.22 | H   |        | 0.050 | 17.03 |

| Freq<br>(MHz) | Mod<br>(Bandwidth)    | Modulation | Measured<br>Level (dBm) | Substitute<br>Level (dBm) | Ant.<br>Gain(dBd) | C.L  | Pol | Limit  | ERP   |       |
|---------------|-----------------------|------------|-------------------------|---------------------------|-------------------|------|-----|--------|-------|-------|
|               |                       |            |                         |                           |                   |      |     | W      | W     | dBm   |
| 701.5         | LTE B12/17<br>(5 MHz) | QPSK       | -32.67                  | 29.21                     | -10.18            | 1.21 | H   | < 3.00 | 0.061 | 17.82 |
|               |                       | 16-QAM     | -33.51                  | 28.37                     | -10.18            | 1.21 | H   |        | 0.050 | 16.98 |
| 707.5         |                       | QPSK       | -32.18                  | 29.28                     | -10.21            | 1.21 | H   |        | 0.061 | 17.86 |
|               |                       | 16-QAM     | -32.96                  | 28.50                     | -10.21            | 1.21 | H   |        | 0.051 | 17.08 |
| 713.5         |                       | QPSK       | -31.93                  | 29.30                     | -10.24            | 1.22 | H   |        | 0.061 | 17.84 |
|               |                       | 16-QAM     | -32.83                  | 28.40                     | -10.24            | 1.22 | H   |        | 0.049 | 16.94 |

| Freq<br>(MHz) | Mod<br>(Bandwidth)     | Modulation | Measured<br>Level (dBm) | Substitute<br>Level (dBm) | Ant.<br>Gain(dBd) | C.L  | Pol | Limit  | ERP   |       |
|---------------|------------------------|------------|-------------------------|---------------------------|-------------------|------|-----|--------|-------|-------|
|               |                        |            |                         |                           |                   |      |     | W      | W     | dBm   |
| 704.0         | LTE B12/17<br>(10 MHz) | QPSK       | -32.63                  | 28.96                     | -10.19            | 1.21 | H   | < 3.00 | 0.057 | 17.56 |
|               |                        | 16-QAM     | -33.50                  | 28.09                     | -10.19            | 1.21 | H   |        | 0.047 | 16.69 |
| 707.5         |                        | QPSK       | -32.36                  | 29.10                     | -10.21            | 1.21 | H   |        | 0.059 | 17.68 |
|               |                        | 16-QAM     | -33.19                  | 28.27                     | -10.21            | 1.21 | H   |        | 0.048 | 16.85 |
| 711.0         |                        | QPSK       | -32.04                  | 29.24                     | -10.23            | 1.22 | H   |        | 0.060 | 17.79 |
|               |                        | 16-QAM     | -32.85                  | 28.43                     | -10.23            | 1.22 | H   |        | 0.050 | 16.98 |

## 8.2 RADIATED SPURIOUS EMISSIONS

- OPERATING FREQUENCY: 707.50 MHz
- MEASURED OUTPUT POWER: 17.91 dBm = 0.062 W
- MODE: LTE B12
- MODULATION SIGNAL: 1.4 MHz QPSK
- DISTANCE: 3 meters
- LIMIT:  $43 + 10 \log_{10} (W) =$  30.91 dBc

| Ch               | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L  | Pol | Result (dBm) | dBc   |
|------------------|------------|----------------------|-----------------|------------------------|------|-----|--------------|-------|
| 23017<br>(699.7) | 1,399.40   | -53.54               | 7.96            | -63.78                 | 1.72 | V   | -57.54       | 75.45 |
|                  | 2,099.10   | -39.53               | 10.43           | -49.19                 | 2.14 | H   | -40.90       | 58.81 |
|                  | 2,798.80   | -56.57               | 11.17           | -64.50                 | 2.49 | H   | -55.82       | 73.73 |
| 23095<br>(707.5) | 1,415.00   | -53.76               | 8.06            | -63.91                 | 1.74 | H   | -57.59       | 75.50 |
|                  | 2,122.50   | -39.60               | 10.46           | -48.62                 | 2.15 | H   | -40.31       | 58.22 |
|                  | 2,830.00   | -56.62               | 11.19           | -64.64                 | 2.53 | H   | -55.98       | 73.89 |
| 23173<br>(715.3) | 1,430.60   | -52.78               | 8.15            | -63.22                 | 1.75 | V   | -56.82       | 74.73 |
|                  | 2,145.90   | -39.44               | 10.50           | -47.91                 | 2.17 | H   | -39.58       | 57.49 |
|                  | 2,861.20   | -56.72               | 11.20           | -64.60                 | 2.52 | H   | -55.92       | 73.83 |

- OPERATING FREQUENCY: 707.50 MHz
- MEASURED OUTPUT POWER: 18.02 dBm = 0.063 W
- MODE: LTE B12
- MODULATION SIGNAL: 3 MHz QPSK
- DISTANCE: 3 meters
- LIMIT:  $43 + 10 \log_{10} (W) =$  31.02 dBc

| Ch               | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L  | Pol | Result (dBm) | dBc   |
|------------------|------------|----------------------|-----------------|------------------------|------|-----|--------------|-------|
| 23025<br>(700.5) | 1,401.00   | -54.43               | 7.96            | -64.67                 | 1.73 | H   | -58.44       | 76.46 |
|                  | 2,101.50   | -37.53               | 10.43           | -47.13                 | 2.15 | H   | -38.85       | 56.87 |
|                  | 2,802.00   | -57.06               | 11.17           | -65.00                 | 2.50 | H   | -56.33       | 74.35 |
| 23095<br>(707.5) | 1,415.00   | -53.22               | 8.06            | -63.37                 | 1.74 | H   | -57.05       | 75.07 |
|                  | 2,122.50   | -37.88               | 10.46           | -46.90                 | 2.15 | H   | -38.59       | 56.61 |
|                  | 2,830.00   | -56.37               | 11.19           | -64.39                 | 2.53 | H   | -55.73       | 73.75 |
| 23165<br>(714.5) | 1,429.00   | -53.72               | 8.15            | -64.17                 | 1.74 | H   | -57.76       | 75.78 |
|                  | 2,143.50   | -39.85               | 10.50           | -48.30                 | 2.17 | H   | -39.97       | 57.99 |
|                  | 2,858.00   | -56.77               | 11.20           | -64.65                 | 2.52 | H   | -55.97       | 73.99 |

- OPERATING FREQUENCY: 707.50 MHz
- MEASURED OUTPUT POWER: 17.86 dBm = 0.061 W
- MODE: LTE B12 / B17
- MODULATION SIGNAL: 5 MHz QPSK
- DISTANCE: 3 meters
- LIMIT:  $43 + 10 \log_{10} (W) =$  30.86 dBc

| Ch               | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L  | Pol | Result (dBm) | dBc   |
|------------------|------------|----------------------|-----------------|------------------------|------|-----|--------------|-------|
| 23035<br>(701.5) | 1,403.00   | -55.81               | 7.99            | -66.04                 | 1.73 | H   | -59.78       | 77.64 |
|                  | 2,104.50   | -37.54               | 10.44           | -47.02                 | 2.15 | H   | -38.73       | 56.59 |
|                  | 2,806.00   | -56.31               | 11.18           | -64.24                 | 2.51 | H   | -55.57       | 73.43 |
| 23095<br>(707.5) | 1,415.00   | -54.17               | 8.06            | -64.32                 | 1.74 | H   | -58.00       | 75.86 |
|                  | 2,122.50   | -38.28               | 10.46           | -47.30                 | 2.15 | H   | -38.99       | 56.85 |
|                  | 2,830.00   | -56.66               | 11.19           | -64.68                 | 2.53 | H   | -56.02       | 73.88 |
| 23155<br>(713.5) | 1,427.00   | -54.13               | 8.14            | -64.53                 | 1.74 | H   | -58.13       | 75.99 |
|                  | 2,140.50   | -40.46               | 10.49           | -48.88                 | 2.17 | H   | -40.56       | 58.42 |
|                  | 2,854.00   | -57.14               | 11.20           | -65.05                 | 2.52 | H   | -56.37       | 74.23 |

- OPERATING FREQUENCY: 711.00 MHz
- MEASURED OUTPUT POWER: 17.79 dBm = 0.060 W
- MODE: LTE B12 / B17
- MODULATION SIGNAL: 10 MHz QPSK
- DISTANCE: 3 meters
- LIMIT:  $43 + 10 \log_{10} (W) =$  30.79 dBc

| Ch               | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBi) | Substitute Level (dBm) | C.L  | Pol | Result (dBm) | dBc   |
|------------------|------------|----------------------|-----------------|------------------------|------|-----|--------------|-------|
| 23060<br>(704.0) | 1,408.00   | -54.93               | 8.00            | -65.08                 | 1.73 | H   | -58.81       | 76.60 |
|                  | 2,112.00   | -38.04               | 10.44           | -47.23                 | 2.15 | H   | -38.94       | 56.73 |
|                  | 2,816.00   | -57.70               | 11.18           | -65.70                 | 2.52 | H   | -57.04       | 74.83 |
| 23095<br>(707.5) | 1,415.00   | -54.10               | 8.06            | -64.25                 | 1.74 | H   | -57.93       | 75.72 |
|                  | 2,122.50   | -38.48               | 10.46           | -47.50                 | 2.15 | H   | -39.19       | 56.98 |
|                  | 2,830.00   | -56.70               | 11.19           | -64.72                 | 2.53 | H   | -56.06       | 73.85 |
| 23130<br>(711.0) | 1,422.00   | -53.82               | 8.11            | -64.06                 | 1.74 | H   | -57.69       | 75.48 |
|                  | 2,133.00   | -38.40               | 10.47           | -47.15                 | 2.16 | H   | -38.84       | 56.63 |
|                  | 2,844.00   | -57.75               | 11.19           | -65.65                 | 2.53 | H   | -56.99       | 74.78 |

### 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                     | 1.0917       |
|        |            |                 | 16-QAM     | 6                   | 0                     | 1.0933       |
|        | 3 MHz      |                 | QPSK       | 15                  | 0                     | 2.7064       |
|        |            |                 | 16-QAM     | 15                  | 0                     | 2.7077       |
| 12/ 17 | 5 MHz      |                 | QPSK       | 25                  | 0                     | 4.5215       |
|        |            |                 | 16-QAM     | 25                  | 0                     | 4.5124       |
|        | 10 MHz     |                 | QPSK       | 50                  | 0                     | 9.0034       |
|        |            |                 | 16-QAM     | 50                  | 0                     | 8.9877       |

**Note:**

1. Plots of the EUT's Occupied Bandwidth are shown Page 31 ~ 34.

## 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           | 3.6960                              | 27.976      | -66.983                        | -39.007      | -13.00      |
|        |                  | 707.5           | 3.6770                              | 27.976      | -67.235                        | -39.259      |             |
|        |                  | 715.3           | 3.6940                              | 27.976      | -67.022                        | -39.046      |             |
|        | 3                | 700.5           | 3.7079                              | 27.976      | -67.176                        | -39.200      |             |
|        |                  | 707.5           | 3.6880                              | 27.976      | -66.734                        | -38.758      |             |
|        |                  | 714.5           | 3.7005                              | 27.976      | -66.767                        | -38.791      |             |
| 12/ 17 | 5                | 701.5           | 3.7069                              | 27.976      | -66.669                        | -38.693      |             |
|        |                  | 707.5           | 3.7144                              | 27.976      | -67.293                        | -39.317      |             |
|        |                  | 713.5           | 3.7184                              | 27.976      | -67.163                        | -39.187      |             |
|        | 10               | 704.0           | 3.6990                              | 27.976      | -66.868                        | -38.892      |             |
|        |                  | 707.5           | 3.7139                              | 27.976      | -67.051                        | -39.075      |             |
|        |                  | 711.0           | 3.6900                              | 27.976      | -66.532                        | -38.556      |             |

### Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 48 ~ 54.
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      |

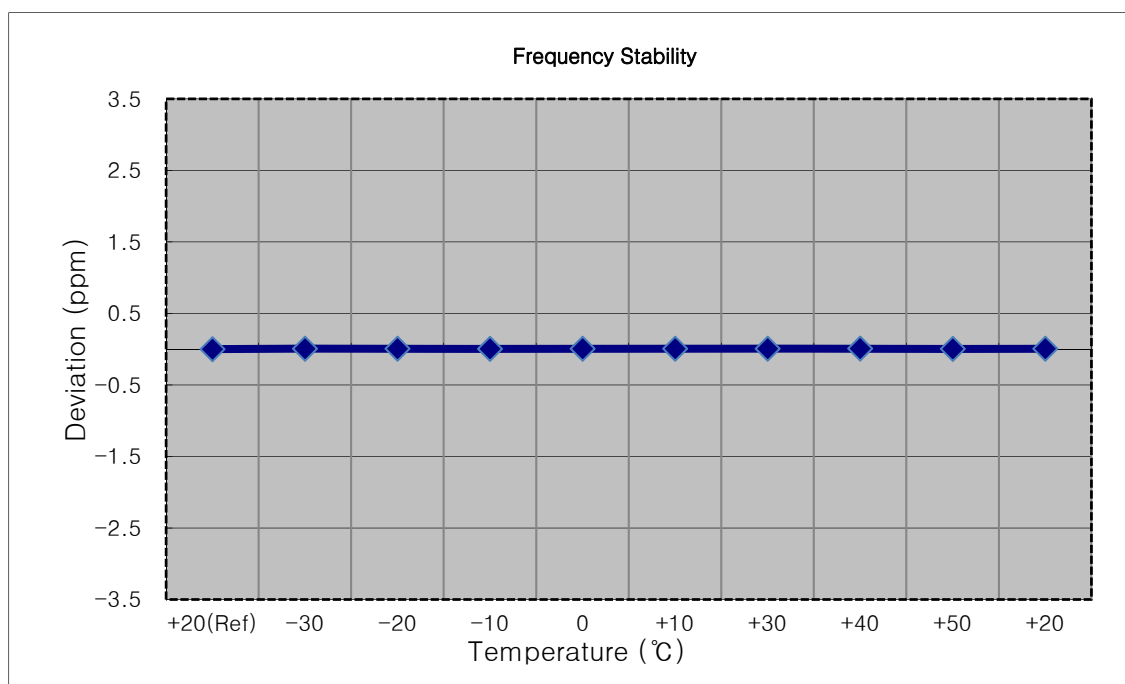
## 8.5 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 35 ~ 48.

## 8.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

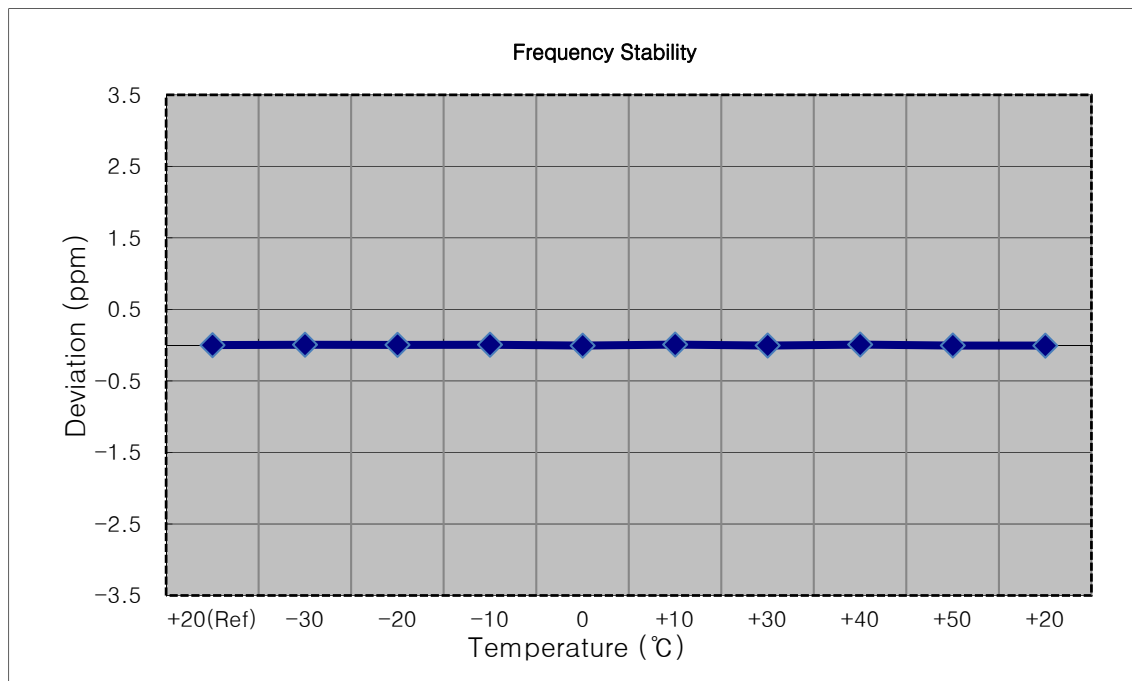
- MODE: LTE B12
- OPERATING FREQUENCY: 707,500,000 Hz
- CHANNEL: 23095 (1.4 MHz)
- REFERENCE VOLTAGE: 4.00 VDC
- DEVIATION LIMIT: Emission must remain in band

| Voltage<br>(%) | Power<br>(VDC) | Temp.<br>(°C) | Frequency<br>(Hz) | Frequency<br>Error (Hz) | Deviation<br>(%) | ppm   |
|----------------|----------------|---------------|-------------------|-------------------------|------------------|-------|
| 100%           | 4.00           | +20(Ref)      | 707 500 005       | 0.0                     | 0.000 000        | 0.000 |
| 100%           |                | -30           | 707 500 010       | 5.0                     | 0.000 001        | 0.007 |
| 100%           |                | -20           | 707 500 009       | 4.7                     | 0.000 001        | 0.007 |
| 100%           |                | -10           | 707 500 008       | 2.9                     | 0.000 000        | 0.004 |
| 100%           |                | 0             | 707 500 010       | 5.4                     | 0.000 001        | 0.008 |
| 100%           |                | +10           | 707 500 009       | 4.7                     | 0.000 001        | 0.007 |
| 100%           |                | +30           | 707 500 009       | 4.5                     | 0.000 001        | 0.006 |
| 100%           |                | +40           | 707 500 010       | 5.6                     | 0.000 001        | 0.008 |
| 100%           |                | +50           | 707 500 008       | 2.8                     | 0.000 000        | 0.004 |
| Batt. Endpoint | 3.70           | +20           | 707 500 009       | 4.0                     | 0.000 001        | 0.006 |



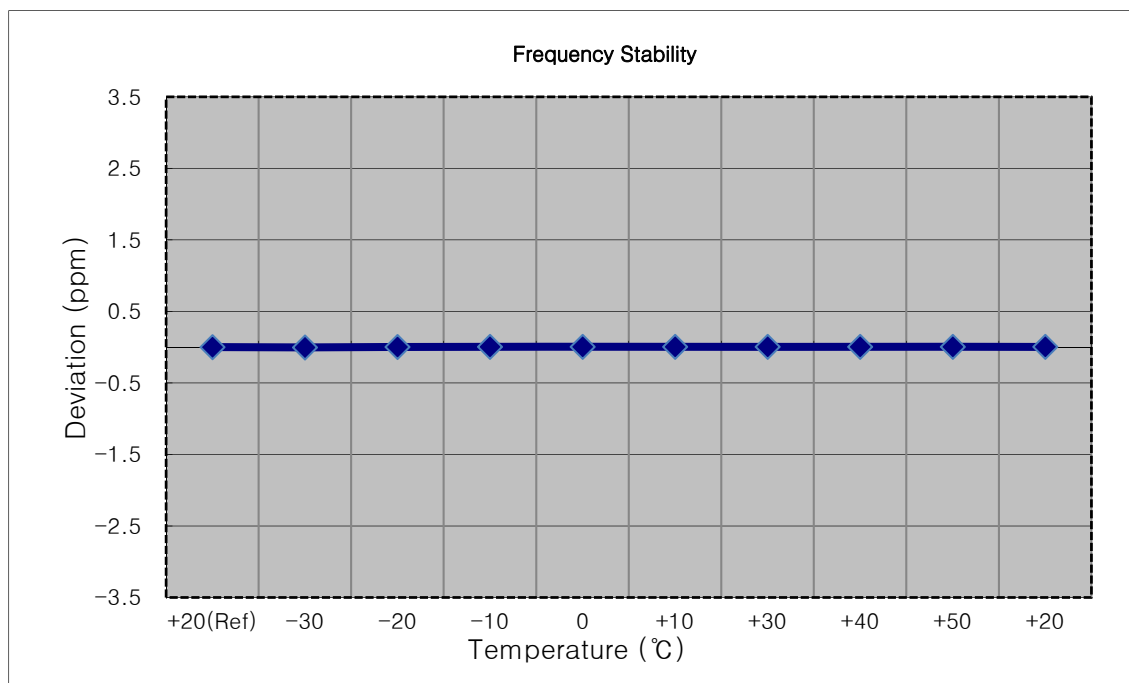
- MODE: LTE B12
- OPERATING FREQUENCY: 707,500,000 Hz
- CHANNEL: 23095 (3 MHz)
- REFERENCE VOLTAGE: 4.00 VDC
- DEVIATION LIMIT: Emission must remain in band

| Voltage<br>(%) | Power<br>(VDC) | Temp.<br>(°C) | Frequency<br>(Hz) | Frequency<br>Error (Hz) | Deviation<br>(%) | ppm    |
|----------------|----------------|---------------|-------------------|-------------------------|------------------|--------|
| 100%           | 4.00           | +20(Ref)      | 707 499 997       | 0.0                     | 0.000 000        | 0.000  |
| 100%           |                | -30           | 707 500 002       | 4.7                     | 0.000 001        | 0.007  |
| 100%           |                | -20           | 707 500 000       | 2.6                     | 0.000 000        | 0.004  |
| 100%           |                | -10           | 707 500 002       | 4.2                     | 0.000 001        | 0.006  |
| 100%           |                | 0             | 707 499 993       | -4.3                    | -0.000 001       | -0.006 |
| 100%           |                | +10           | 707 500 004       | 6.1                     | 0.000 001        | 0.009  |
| 100%           |                | +30           | 707 499 994       | -3.9                    | -0.000 001       | -0.006 |
| 100%           |                | +40           | 707 500 004       | 6.1                     | 0.000 001        | 0.009  |
| 100%           |                | +50           | 707 499 994       | -3.8                    | -0.000 001       | -0.005 |
| Batt. Endpoint | 3.70           | +20           | 707 499 993       | -4.3                    | -0.000 001       | -0.006 |



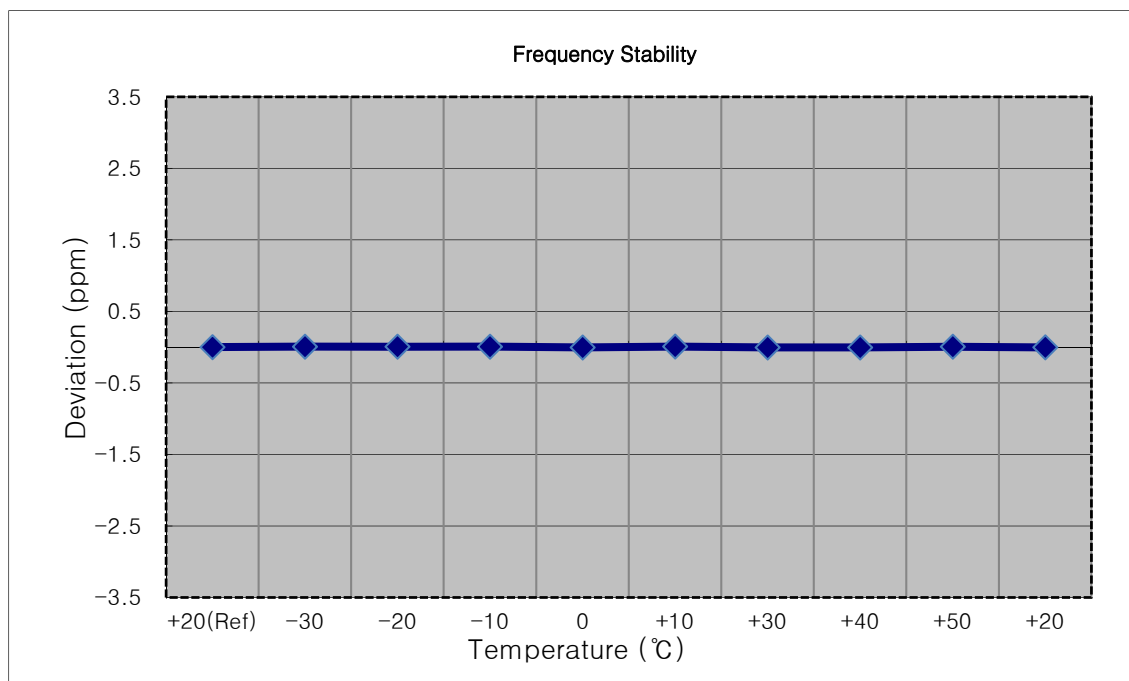
- MODE: LTE B12/ B17
- OPERATING FREQUENCY: 707,500,000 Hz
- CHANNEL: 23095 (5 MHz)
- REFERENCE VOLTAGE: 4.00 VDC
- DEVIATION LIMIT: Emission must remain in band

| Voltage<br>(%) | Power<br>(VDC) | Temp.<br>(°C) | Frequency<br>(Hz) | Frequency<br>Error (Hz) | Deviation<br>(%) | ppm    |
|----------------|----------------|---------------|-------------------|-------------------------|------------------|--------|
| 100%           | 4.00           | +20(Ref)      | 707 500 007       | 0.0                     | 0.000 000        | 0.000  |
| 100%           |                | -30           | 707 500 004       | -3.1                    | 0.000 000        | -0.004 |
| 100%           |                | -20           | 707 500 009       | 2.1                     | 0.000 000        | 0.003  |
| 100%           |                | -10           | 707 500 011       | 3.5                     | 0.000 000        | 0.005  |
| 100%           |                | 0             | 707 500 010       | 3.3                     | 0.000 000        | 0.005  |
| 100%           |                | +10           | 707 500 010       | 2.7                     | 0.000 000        | 0.004  |
| 100%           |                | +30           | 707 500 011       | 3.6                     | 0.000 001        | 0.005  |
| 100%           |                | +40           | 707 500 011       | 3.7                     | 0.000 001        | 0.005  |
| 100%           |                | +50           | 707 500 011       | 3.9                     | 0.000 001        | 0.006  |
| Batt. Endpoint | 3.70           | +20           | 707 500 010       | 3.1                     | 0.000 000        | 0.004  |



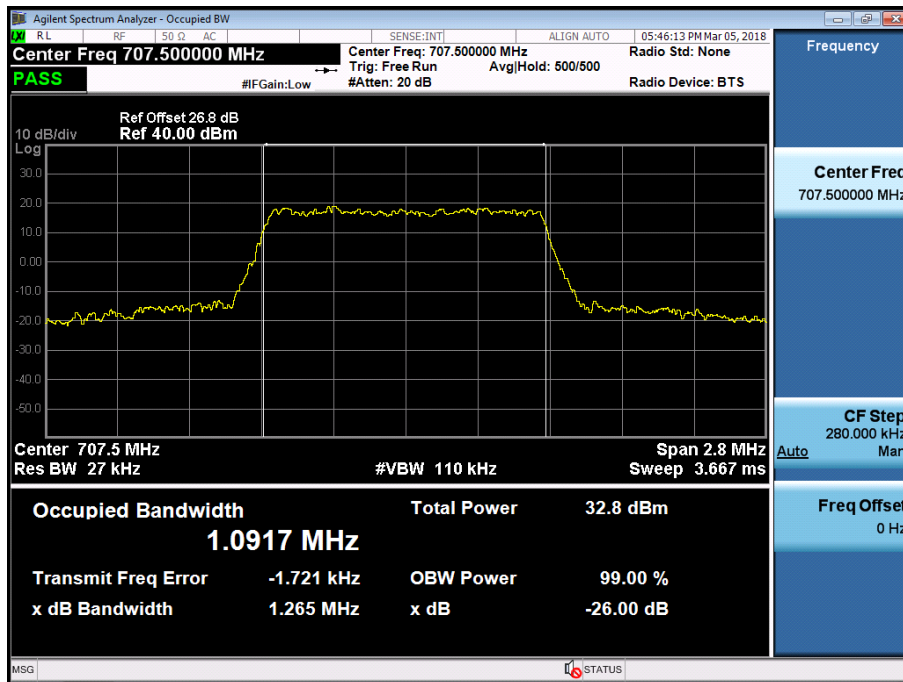
- MODE: LTE B12/ B17
- OPERATING FREQUENCY: 707,500,000 Hz
- CHANNEL: 23095 (10 MHz)
- REFERENCE VOLTAGE: 4.00 VDC
- DEVIATION LIMIT: Emission must remain in band

| Voltage<br>(%) | Power<br>(VDC) | Temp.<br>(°C) | Frequency<br>(Hz) | Frequency<br>Error (Hz) | Deviation<br>(%) | ppm    |
|----------------|----------------|---------------|-------------------|-------------------------|------------------|--------|
| 100%           | 4.00           | +20(Ref)      | 707 500 005       | 0.0                     | 0.000 000        | 0.000  |
| 100%           |                | -30           | 707 500 010       | 5.1                     | 0.000 001        | 0.007  |
| 100%           |                | -20           | 707 500 009       | 4.5                     | 0.000 001        | 0.006  |
| 100%           |                | -10           | 707 500 010       | 4.9                     | 0.000 001        | 0.007  |
| 100%           |                | 0             | 707 500 002       | -2.9                    | 0.000 000        | -0.004 |
| 100%           |                | +10           | 707 500 011       | 6.3                     | 0.000 001        | 0.009  |
| 100%           |                | +30           | 707 500 002       | -2.4                    | 0.000 000        | -0.003 |
| 100%           |                | +40           | 707 500 002       | -2.7                    | 0.000 000        | -0.004 |
| 100%           |                | +50           | 707 500 009       | 4.4                     | 0.000 001        | 0.006  |
| Batt. Endpoint | 3.70           | +20           | 707 500 003       | -1.8                    | 0.000 000        | -0.003 |

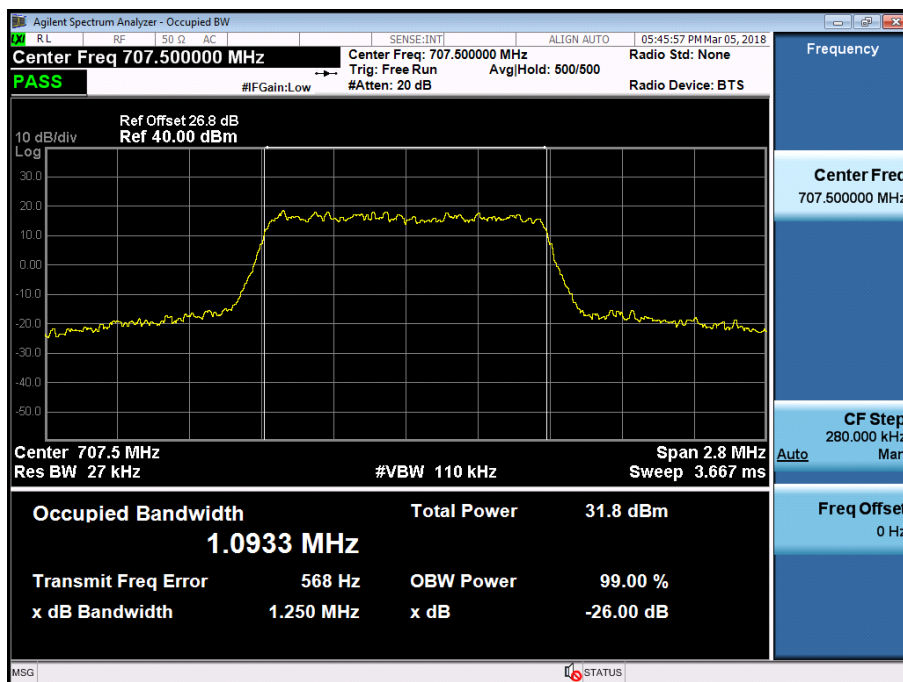


## **9. TEST PLOTS**

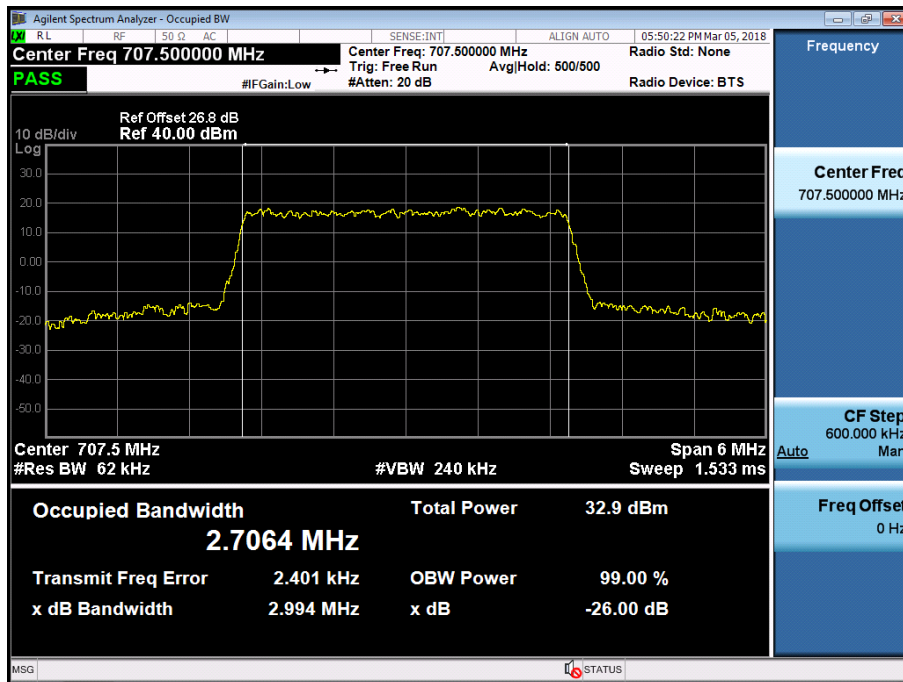
BAND 12. Occupied Bandwidth Plot (1.4M BW Ch.23095 QPSK\_RB6\_0)



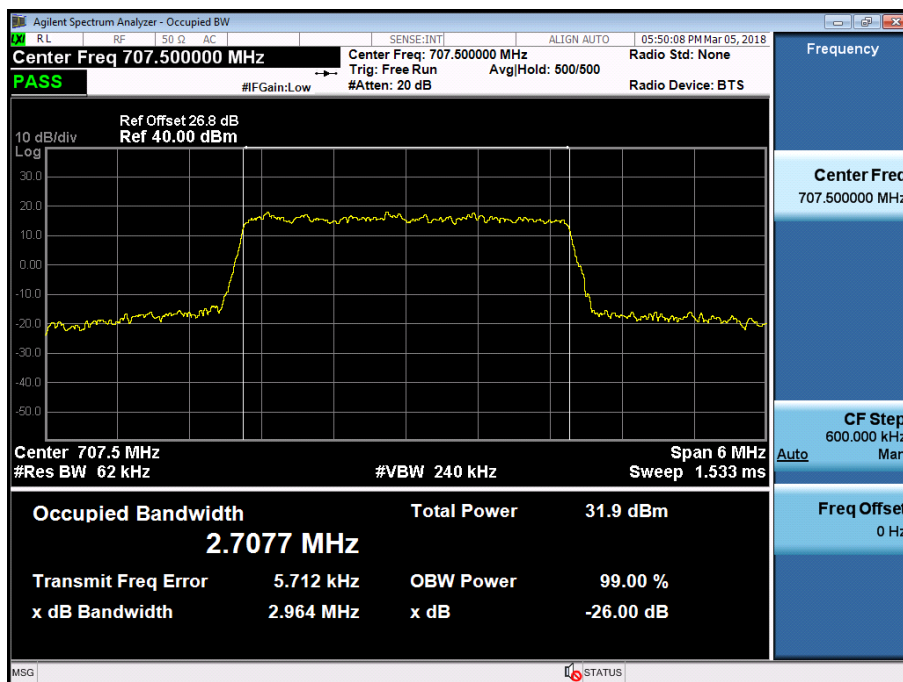
BAND 12. Occupied Bandwidth Plot (1.4M BW Ch.23095 16QAM\_RB6\_0)



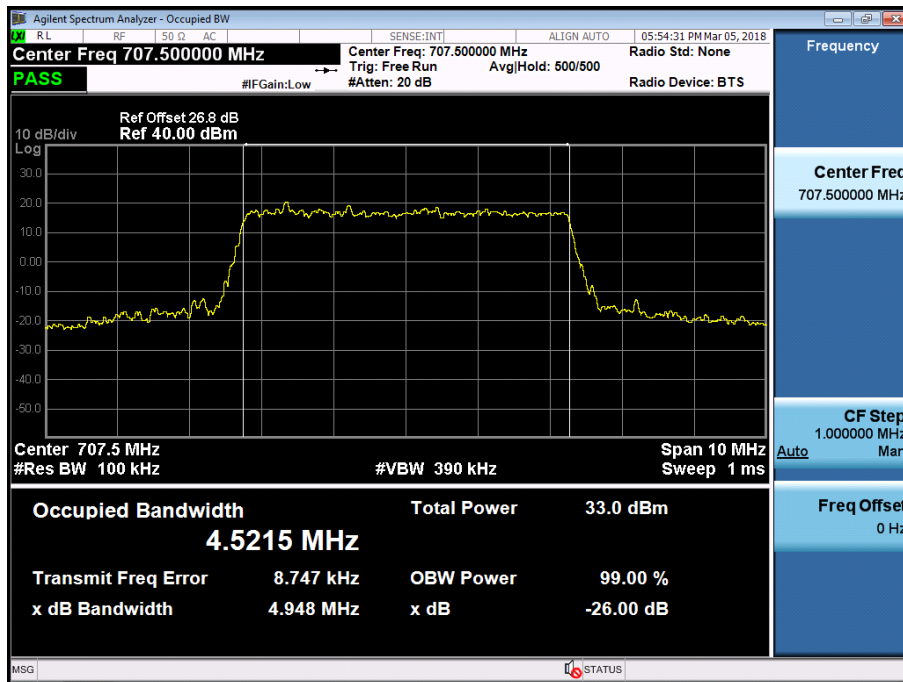
BAND 12. Occupied Bandwidth Plot (3M BW Ch.23095 QPSK\_RB15\_0)



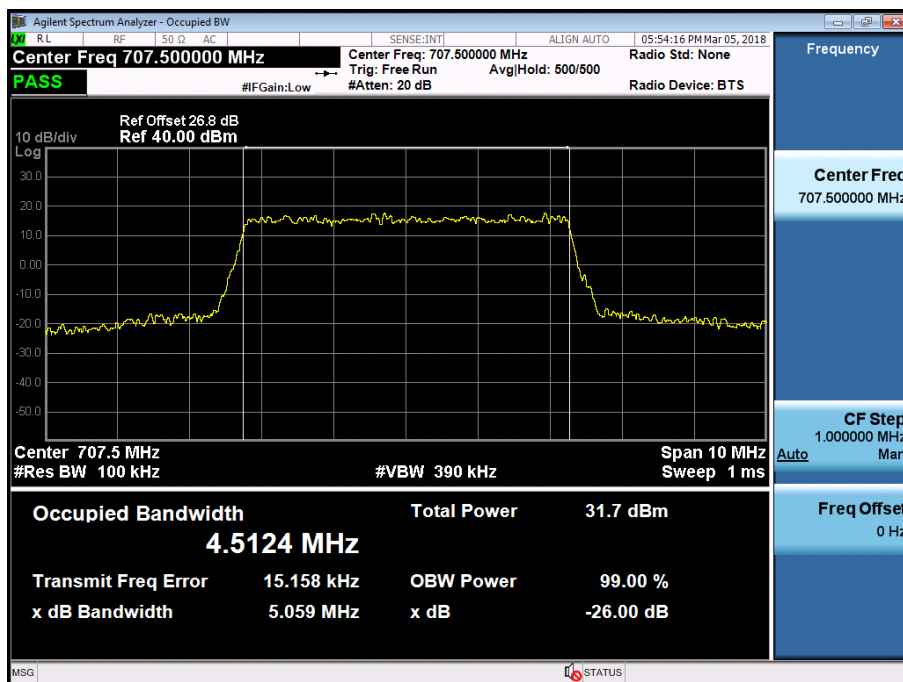
BAND 12. Occupied Bandwidth Plot (3M BW Ch.23095 16QAM\_RB15\_0)



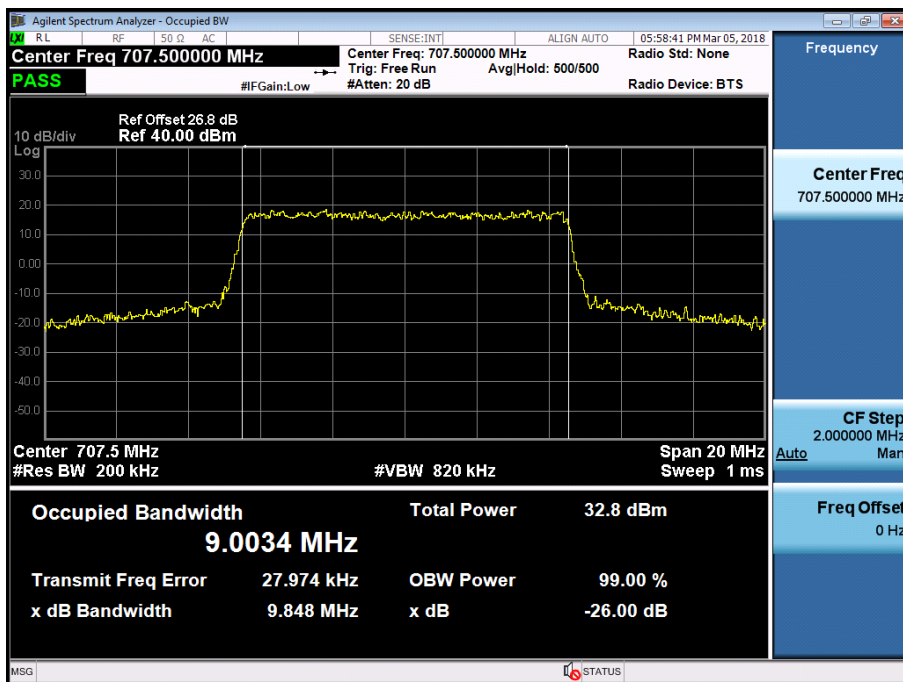
BAND 12. Occupied Bandwidth Plot (5M BW Ch.23095 QPSK\_RB25\_0)



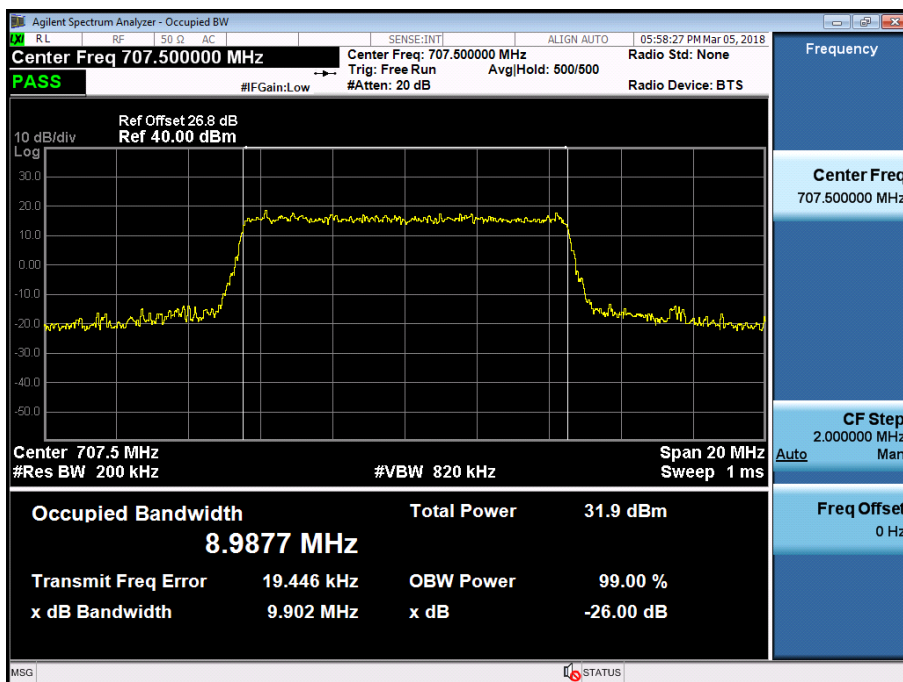
BAND 12. Occupied Bandwidth Plot (5M BW Ch.23095 16QAM\_RB25\_0)



## BAND 12. Occupied Bandwidth Plot (10M BW Ch.23095 QPSK\_RB50\_0)



## BAND 12. Occupied Bandwidth Plot (10M BW Ch.23095 16QAM\_RB50\_0)



BAND 12. Lower Band Edge Plot (1.4M BW Ch.23017 QPSK\_RB1\_Offset 0)



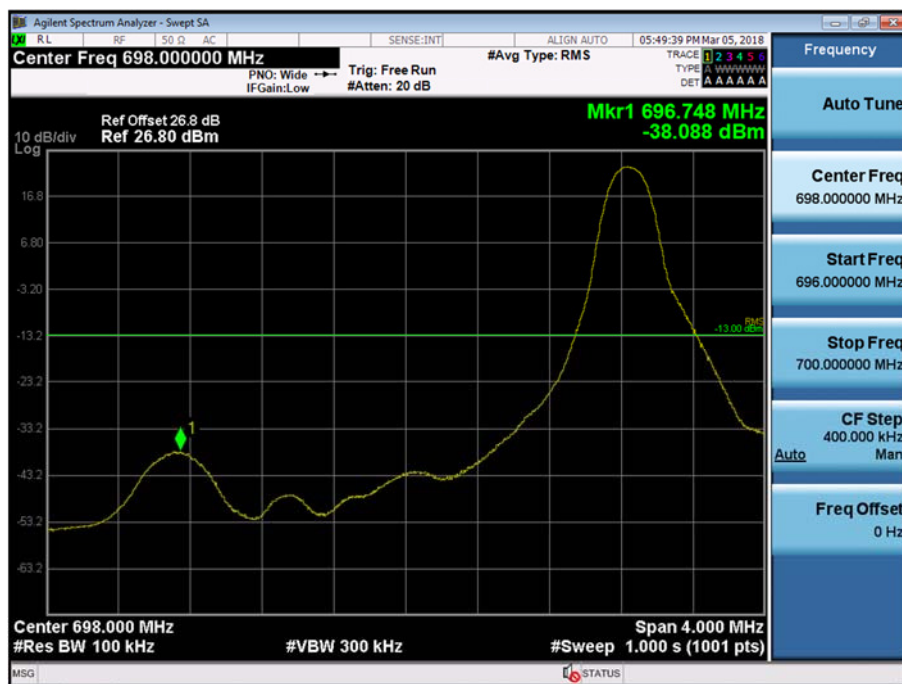
BAND 12. Lower Band Edge Plot (1.4M BW Ch.23017 QPSK\_RB6\_Offset 0)



## 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)



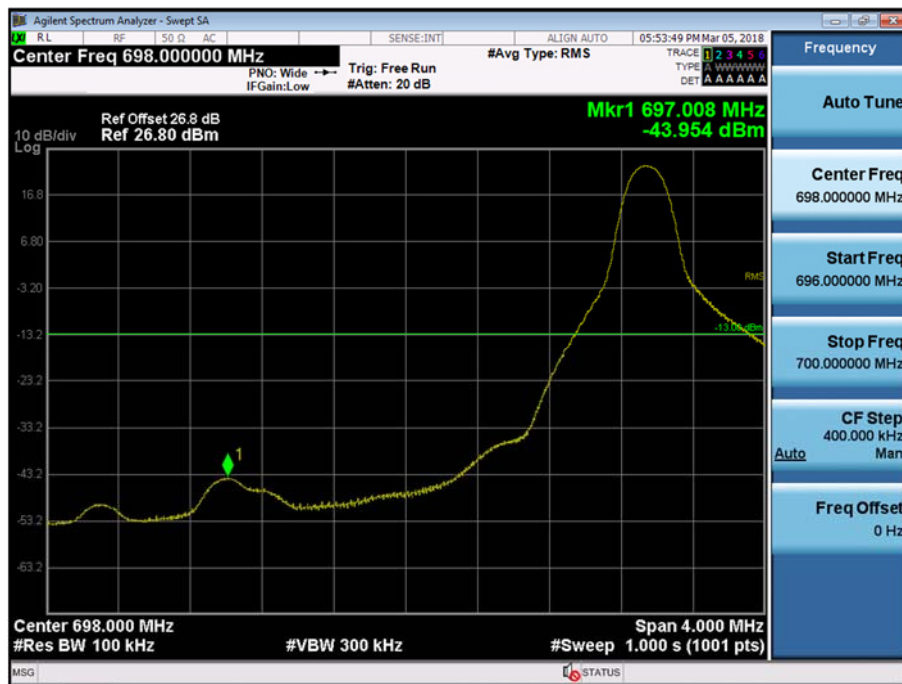
BAND 12. Lower Band Edge Plot (3M BW Ch.23025 QPSK\_RB15\_Offset 0)



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)



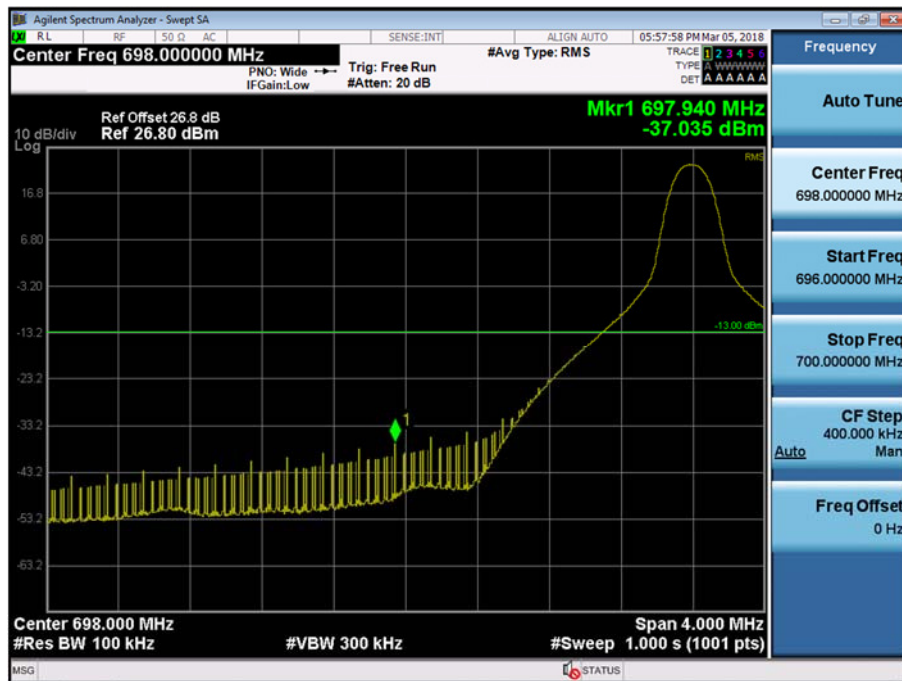
BAND 12 / 17. Lower Band Edge Plot (5M BW Ch.23035 QPSK\_RB25\_Offset 0)



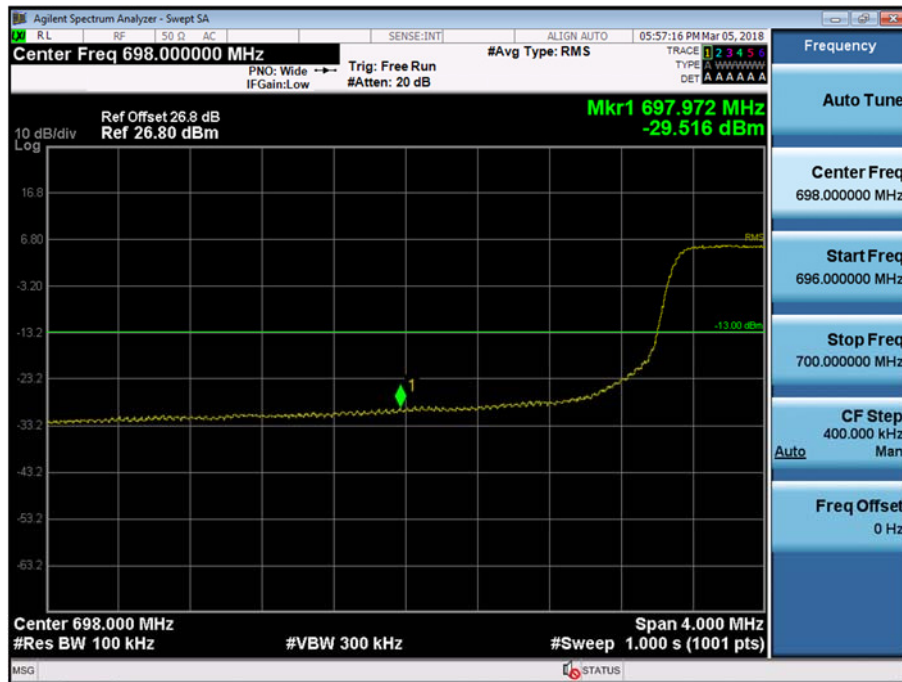
BAND 12 / 17. Lower Extended Band Edge Plot (5M BW Ch.23035 QPSK\_RB25\_0)



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)



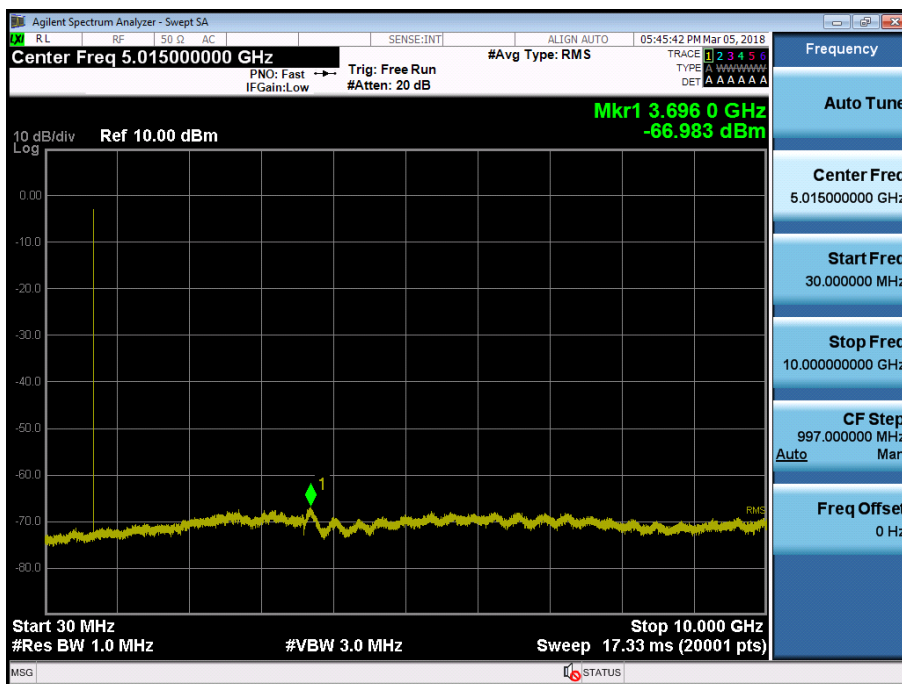
BAND 12 / 17. Upper Band Edge Plot (10M BW Ch.23130 QPSK\_RB50\_Offset 0)



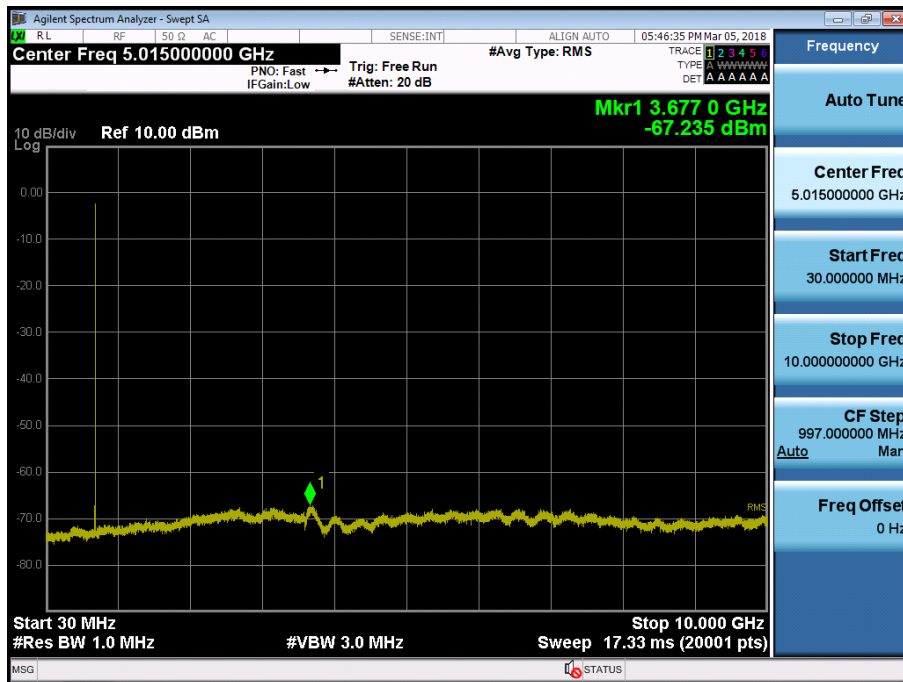
BAND 12 / 17. Upper Extended Band Edge Plot (10M BW Ch.23130 QPSK\_RB50\_0)



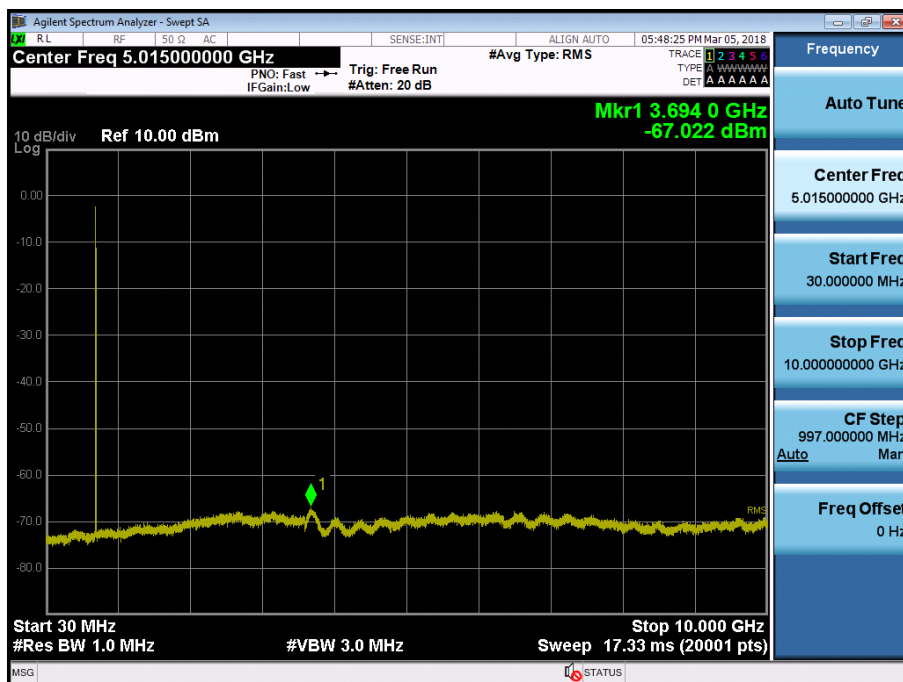
BAND 12. Conducted Spurious Plot \_ (23017ch\_1.4MHz\_QPSK\_RB 1\_0)



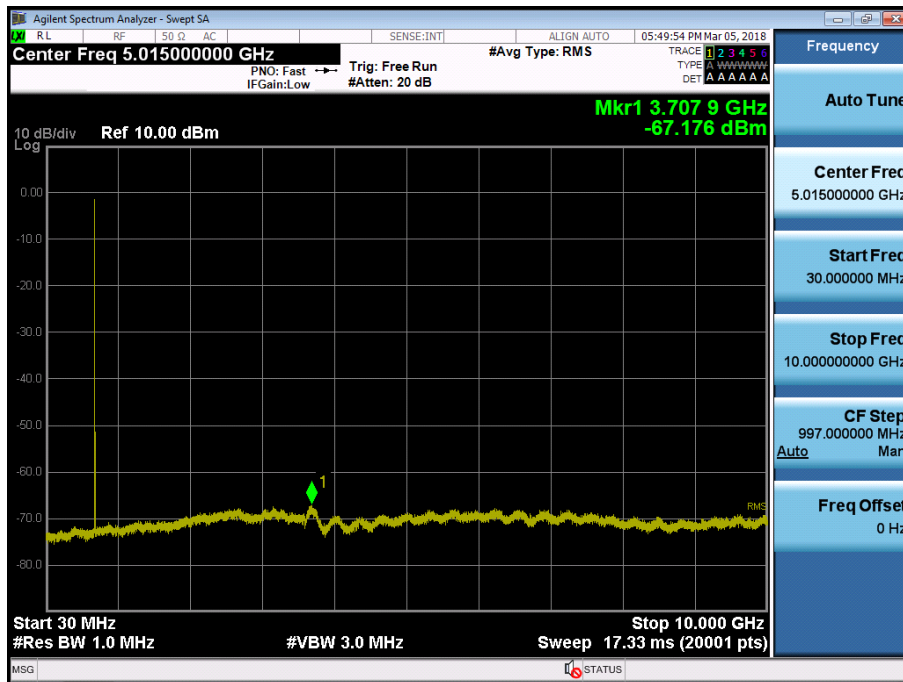
BAND 12. Conducted Spurious Plot \_ (23095ch\_1.4MHz\_QPSK\_RB 1\_0)



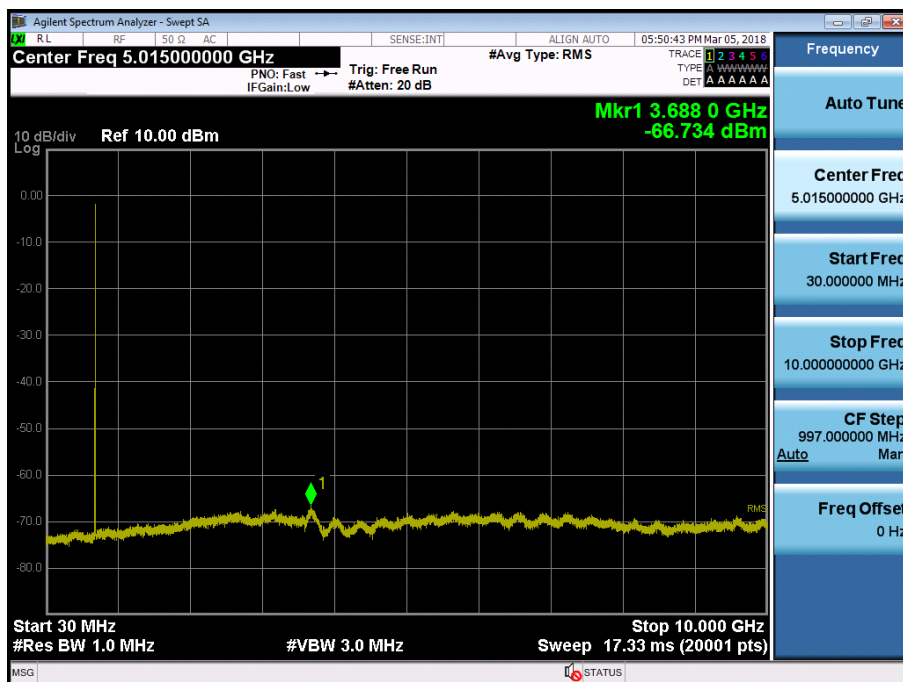
BAND 12. Conducted Spurious Plot \_ (23173ch\_1.4MHz\_QPSK\_RB 1\_0)



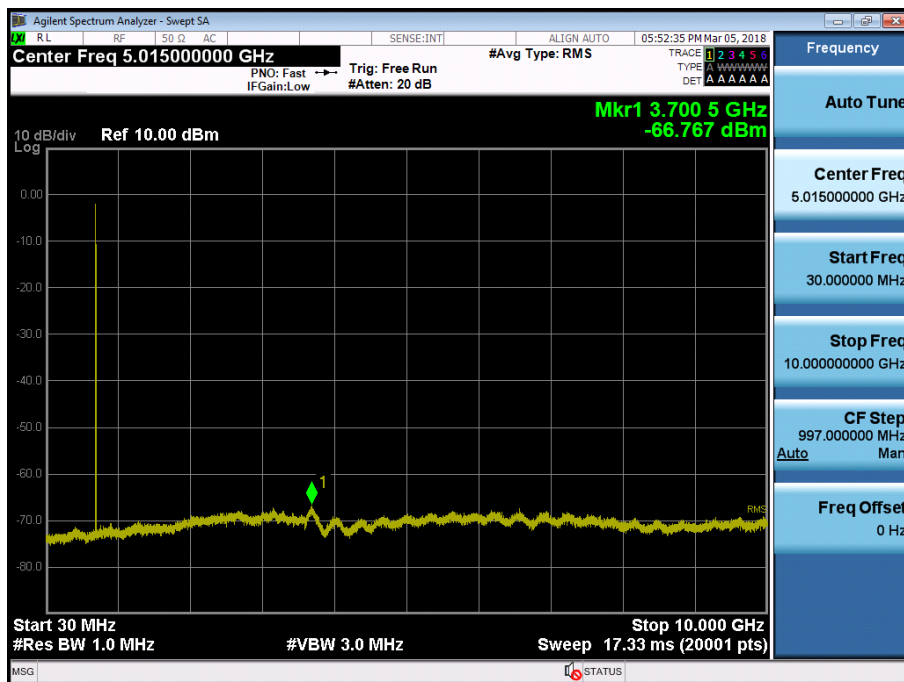
BAND 12. Conducted Spurious Plot \_ (23025ch\_3MHz\_QPSK\_RB 1\_0)



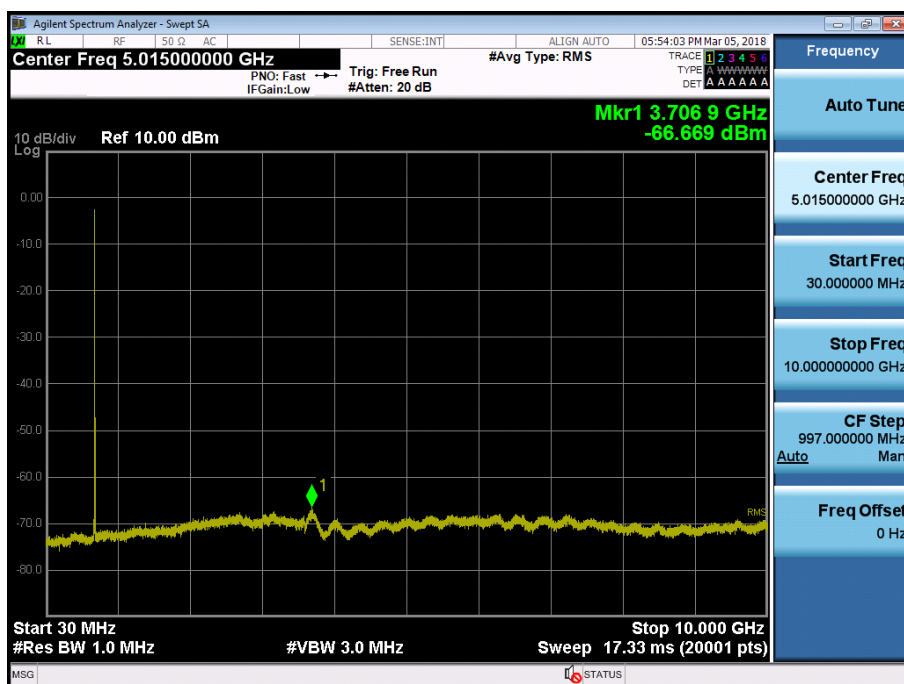
BAND 12. Conducted Spurious Plot \_ (23095ch\_3MHz\_QPSK\_RB 1\_0)



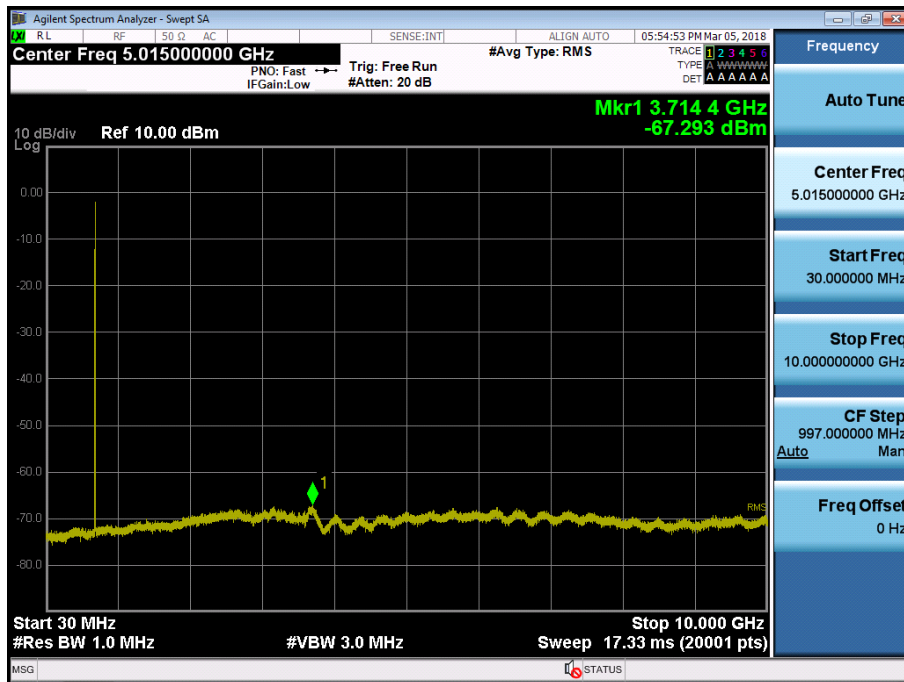
BAND 12. Conducted Spurious Plot \_ (23165ch\_3MHz\_QPSK\_RB 1\_0)



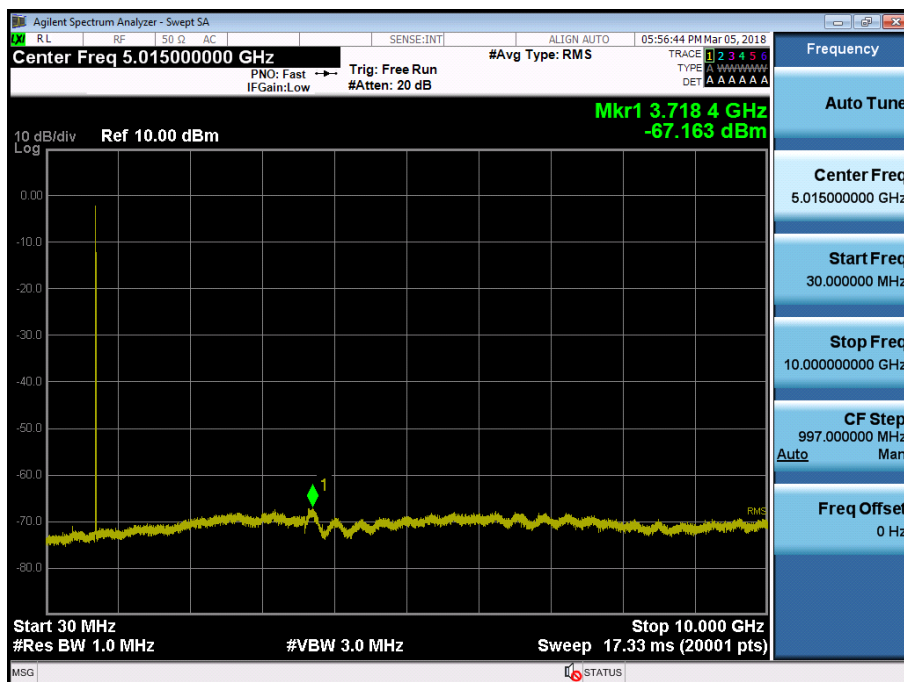
BAND 12. Conducted Spurious Plot \_ (23035ch\_5MHz\_QPSK\_RB 1\_0)



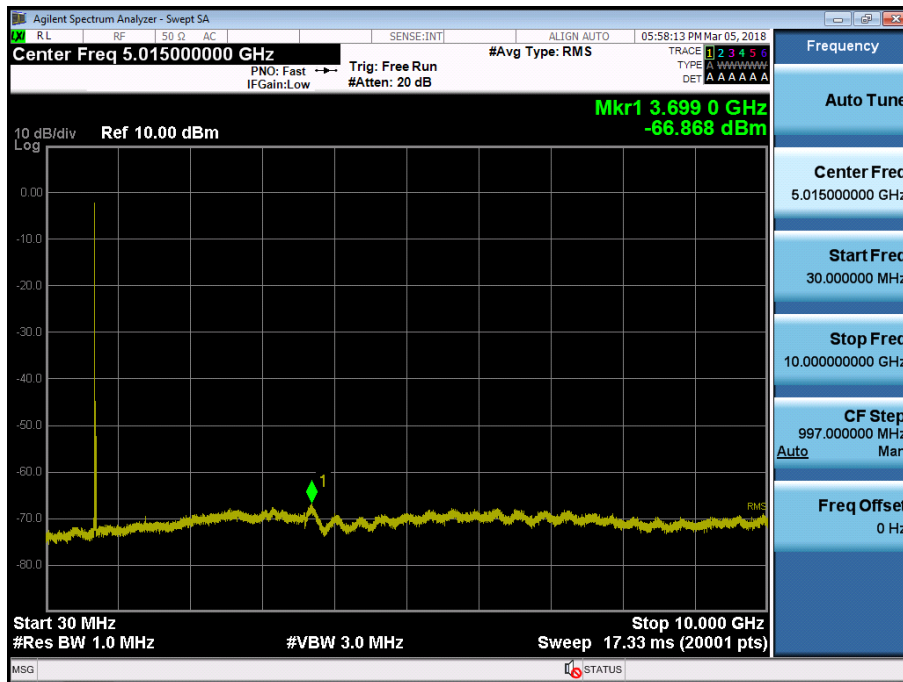
BAND 12. Conducted Spurious Plot \_ (23095ch\_5MHz\_QPSK\_RB 1\_0)



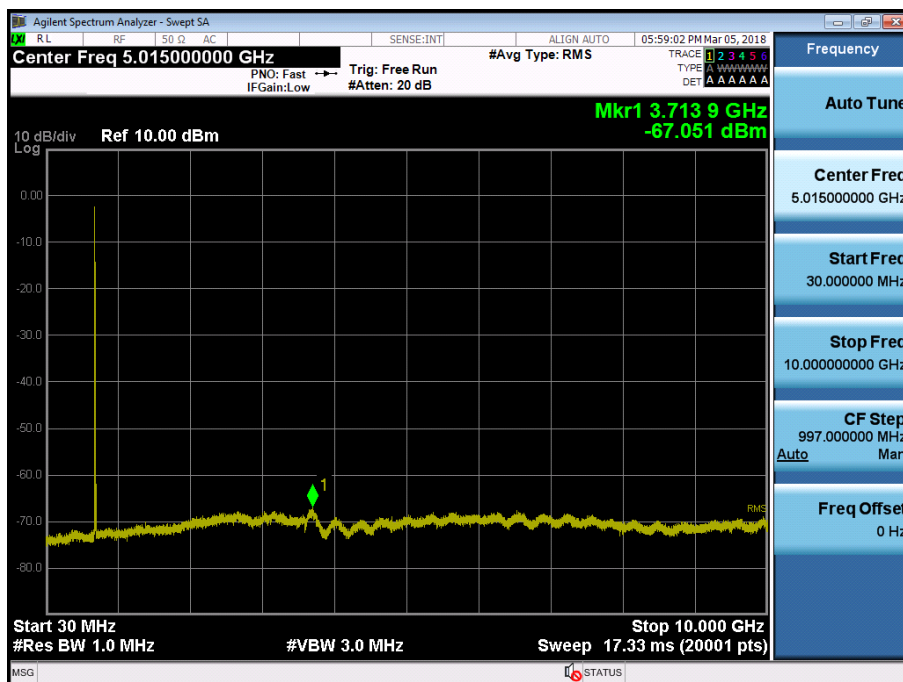
BAND 12. Conducted Spurious Plot \_ (23155ch\_5MHz\_QPSK\_RB 1\_0)



BAND 12. Conducted Spurious Plot \_ (23060ch\_10MHz\_QPSK\_RB 1\_0)



BAND 12. Conducted Spurious Plot \_ (23095ch\_10MHz\_QPSK\_RB 1\_0)



BAND 12. Conducted Spurious Plot \_ (23130ch\_10MHz\_QPSK\_RB 1\_0)

