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

# REPORT

## FCC Certification

**Applicant Name:**
Franklin Technology Inc.

**Address:**
906 JEI Platz, 459-11 Gasan-dong, Gumcheon-gu, Seoul, Korea 153-792

**Date of Issue:**
November 21, 2014

**Location:**
HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

**Test Report No.:** HCT-R-1411-F021

**HCT FRN:** 0005866421

| | |
|---|---|
| **FCC ID:** | **XHG-C774** |
| **APPLICANT:** | **Franklin Technology Inc.** |

| | | |
|---|---|---|
| **FCC Model(s):** | C774 | |
| **EUT Type:** | CPE Router | |
| **FCC Classification:** | PCS Licensed Transmitter (PCB) | |
| **FCC Rule Part(s):** | §2 , §27 | |
| **Tx Frequency:** | 699.7 MHz – 715.3 MHz (LTE – Band12 (1.4 MHz)) | |
| | 700.5 MHz – 714.5 MHz (LTE – Band12 (3 MHz)) | |
| | 701.5 MHz – 713.5 MHz (LTE – Band12 (5 MHz)) | |
| | 704.0 MHz – 711.0 MHz (LTE – Band12 (10 MHz)) | |
| **Max. RF Output Power:** | Band 12 (1.4 MHz): | 0.248 W (QPSK) (23.94 dBm) |
| | | 0.246 W (16-QAM) (23.91 dBm) |
| | Band 12 (3 MHz): | 0.300 W (QPSK) (24.77 dBm) |
| | | 0.310 W (16-QAM) (24.91 dBm) |
| | Band 12 (5 MHz): | 0.429 W (QPSK) (26.32 dBm) |
| | | 0.470 W (16-QAM) (26.72 dBm) |
| | Band 12 (10 MHz): | 0.237 W (QPSK) (23.74 dBm) |
| | | 0.238 W (16-QAM) (23.76 dBm) |
| **Emission esignator(s):** | Band 12 (1.4 MHz): | 1M12G7D (QPSK) / 1M12W7D (16-QAM) |
| | Band 12 (3 MHz): | 2M72G7D (QPSK) / 2M72W7D (16-QAM) |
| | Band 12 (5 MHz): | 4M50G7D (QPSK) / 4M50W7D (16-QAM) |
| | Band 12 (10 MHz): | 8M98G7D (QPSK) / 8M95W7D (16-QAM) |

The measurements shown in this report were made in accordance with the procedures specified in §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**
**: Kyung Houn Seo**
**Test engineer of RF Team**

**Approved by**
**: Chang Seok Choi**
**Manager of RF Team**

# Version

| TEST REPORT NO. | DATE | DESCRIPTION |
|---|---|---|
| HCT-R-1411-F021 | November 21, 2014 | - First Approval Report |
| | | |
| | | |
| | | |
| | | |

# Table of Contents

# MEASUREMENT REPORT

## 1. GENERAL INFORMATION

| | |
|---|---|
| **Applicant Name:** | Franklin Technology Inc. |
| **Address:** | 906 JEI Platz, 459-11 Gasan-dong, Gumcheon-gu, Seoul, Korea 153-792 |
| **FCC ID:** | XHG-C774 |
| **Application Type:** | Certification |
| **FCC Classification:** | PCS Licensed Transmitter (PCB) |
| **FCC Rule Part(s):** | §2 , §27 |
| **EUT Type:** | CPE Router |
| **FCC Model(s):** | C774 |
| **Tx Frequency:** | 699.7 MHz – 715.3 MHz (LTE – Band12 (1.4 MHz))<br>700.5 MHz – 714.5 MHz (LTE – Band12 (3 MHz))<br>701.5 MHz – 713.5 MHz (LTE – Band12 (5 MHz))<br>704.0 MHz – 711.0 MHz (LTE – Band12 (10 MHz)) |
| **Max. RF Output Power:** | Band 12 (1.4 MHz): 0.248 W (QPSK) (23.94 dBm)<br>0.246 W (16-QAM) (23.91 dBm)<br>Band 12 (3 MHz): 0.300 W (QPSK) (24.77 dBm)<br>0.310 W (16-QAM) (24.91 dBm)<br>Band 12 (5 MHz): 0.429 W (QPSK) (26.32 dBm)<br>0.470 W (16-QAM) (26.72 dBm)<br>Band 12 (10 MHz): 0.237 W (QPSK) (23.74 dBm)<br>0.238 W (16-QAM) (23.76 dBm) |
| **Emission Designator(s):** | Band 12 (1.4 MHz): 1M12G7D (QPSK) / 1M12W7D (16-QAM)<br>Band 12 (3 MHz): 2M72G7D (QPSK) / 2M72W7D (16-QAM)<br>Band 12 (5 MHz): 4M50G7D (QPSK) / 4M50W7D (16-QAM)<br>Band 12 (10 MHz): 8M98G7D (QPSK) / 8M95W7D (16-QAM) |
| **Date(s) of Tests:** | November 10, 2014 ~ November 19, 2014 |
| **Antenna Specification** | Manufacturer: INNO-LINK<br>Antenna type: Whip Antenna<br>Peak Gain: Band 12: -3.13 dBi |

# 2. INTRODUCTION

## 2.1. EUT DESCRIPTION

The Franklin Technology Inc. C774 CPE Router consists of LTE 12.

## 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 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, Korea.

# 3. DESCRIPTION OF TESTS

## 3.1 CONDUCTED OUTPUT POWER

Test Procedure

Conducted Output Power is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r02, October 17, 2014, Section 5.2.

**5.2.1 Procedure for use with a spectrum/signal analyzer when EUT can be configured to transmit continuously or when sweep triggering/signal gating can be properly implemented**

The EUT is considered to transmit continuously if it can be configured to transmit at a burst duty cycle of greater than or equal to 98% throughout the duration of the measurement. If this condition can be achieved, then the following procedure can be used to measure the average output power of the EUT.

This procedure can also be used when the EUT cannot be configured to transmit continuously, provided that the measurement instrument can be configured to trigger a sweep at the beginning of each full-power transmission burst, and the sweep time is less than or equal to the minimum transmission time during each burst (*i.e.*, no burst off-time is to be included in the measurement).

a) Set span to at least 1.5 times the OBW.

b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.

c) Set VBW ≥ 3 x RBW.

d) Set number of points in sweep ≥ 2 × span / RBW.

e) Sweep time = auto-couple.

f) Detector = RMS (power averaging).

g) If the EUT can be configured to transmit continuously (*i.e.*, burst duty cycle ≥ 98%), then set the trigger to free run.

h) If the EUT cannot be configured to transmit continuously (*i.e.*, burst duty cycle < 98 %), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Ensure that the sweep time is less than or equal to the transmission burst duration.

i) Trace average at least 100 traces in power averaging (*i.e.*, RMS) mode.

j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with the band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

## 3.2 ERP RADIATED POWER AND RADIATED SPURIOUS EMISSIONS

Note: ERP(Effective Radiated Power)

Test Procedure

Radiated emission measurements 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-C-2004 Clause 2.2.17. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission. The level and position of the maximized emission is recorded with the spectrum analyzer using a positive peak detector.

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.

**Radiated spurious emissions**

: Frequency Range : 30 MHz ~ $10^{th}$ Harmonics of highest channel fundamental frequency.

### 5.1.1 Peak power measurements with a spectrum/signal analyzer or EMI receiver

The following procedure can be used to determine the total peak output power.

a) Set the RBW ≥ OBW.
b) Set VBW ≥ 3 × RBW.
c) Set span ≥ 2 x RBW
d) Sweep time = auto couple.
e) Detector = peak.
f) Ensure that the number of measurement points ≥ span/RBW.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the peak amplitude level.

**5.2.2 Procedures for use with a spectrum/signal analyzer when EUT cannot be configured to transmit continuously and sweep triggering/signal gating cannot be properly implemented**

If the EUT cannot be configured to transmit continuously (burst duty cycle < 98%), then one of the following procedures can be used. The selection of the applicable procedure will depend on the characteristics of the measured burst duty cycle.

Measure the burst duty cycle with a spectrum/signal analyzer or EMC receiver can be used in zero-span mode if the response time and spacing between bins on the sweep are sufficient to permit accurate measurement of the burst on/off time of the transmitted signal.

**5.2.2.2 Constant burst duty cycle**

If the measured burst duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent), then:

a) Set span to at least 1.5 times the OBW.

b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.

c) Set VBW ≥ 3 x RBW.

d) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)

e) Sweep time = auto.

f) Detector = RMS (power averaging).

g) Set sweep trigger to “free run”.

h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

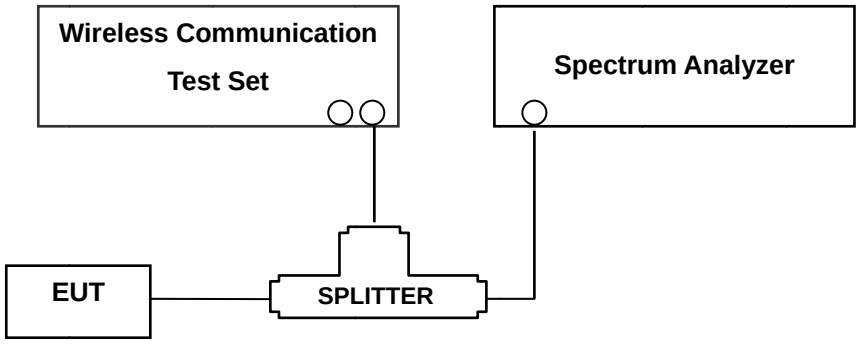
i) Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

j) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission).

For example, add 10 log (1/0.25) = 6 dB if the duty cycle is a constant 25%.

## 3.3 OCCUPIED BANDWIDTH.

Test set-up




(Configuration of conducted Emission measurement)

**Test Procedure**

OBW is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r02, October 17, 2014, Section 4.2..

The EUT was setup to maximum output power at its lowest channel. The occupied bandwidth was measured using a spectrum analyzer. The measurements are repeated for the highest and a middle channel. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Plots of the EUT's occupied bandwidth are shown herein.

## 3.4 BLOCK B FREQUENCY RANGE (704 – 710 and 734 – 740 MHz, 777 – 792 MHz)

§27.5(c)

698-746 MHz Band. The following frequencies are available for licensing pursuant to this part in the 698–746 MHz band: (1) Three paired channel blocks of 12 MHz each are available for assignment as follows :

Block A : 698 – 704 MHz and 728 – 734 MHz ;

Block B : 704 – 710 MHz and 734 – 740 MHz ; and

Block C : 710 – 716 MHz and 740 – 746 MHz.

## 3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.

**Test Procedure**

Spurious and harmonic emissions at antenna terminal is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r02, October 17, 2014, Section 6.0.

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer.

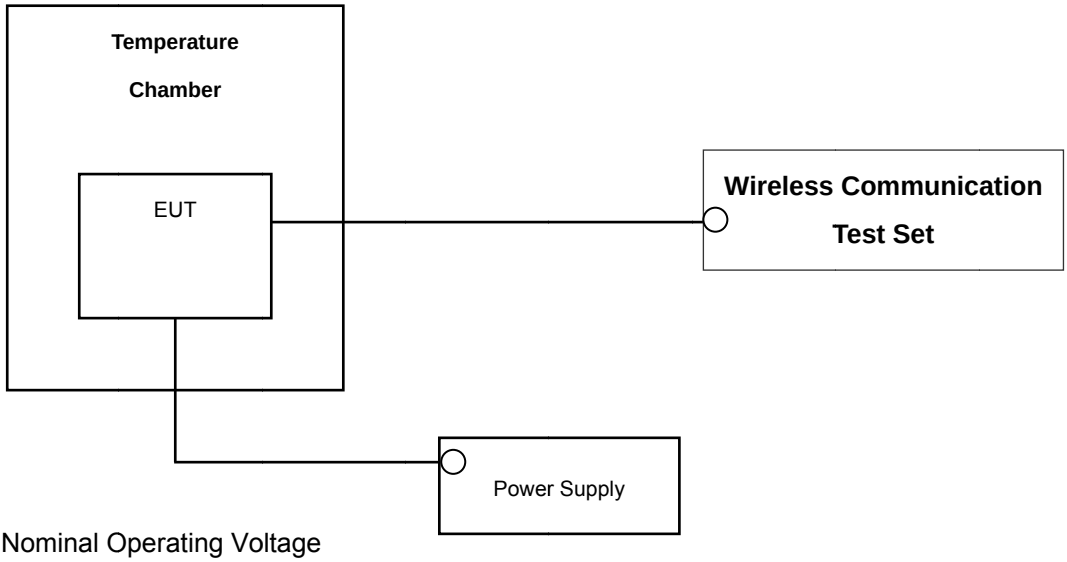
The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30kHz bandwidth may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency

**NOTES:** The analyzer plot offsets were determined by below conditions.

- For LTE Band 12, total offset 26.3 dBm = 20 dBm attenuator + 6 dBm Divider + 0.3 dBm RF cables.

## 3.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

Test Set-up




* Nominal Operating Voltage

**Test Procedure**

Frequency stability is tested in accordance with ANSI/TIA-603-C-2004 section 2.2.2

The frequency stability of the transmitter is measured by:
a.) **Temperature:** The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from the end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification — the frequency stability of the transmitter shall be maintained within ± 0.000 25 %(± 2.5 ppm) of the center frequency.

**Time Period and Procedure:**

The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
1. The equipment is turned on in a “standby” condition for one minute 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.

2. 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 Interval | Calibration Due |
|---|---|---|---|---|
| Agilent | N1921A/ Power Sensor | MY45241059 | Annual | 07/09/2015 |
| Agilent | N1911A/ Power Meter | MY45100523 | Annual | 01/24/2015 |
| MITEQ | AMF-6D-001180-35-20P/AMP | 1081666 | Annual | 09/04/2015 |
| Wainwright | WHK1.2/15G-10EF/H.P.F | 4 | Annual | 06/17/2015 |
| Wainwright | WRCJV2400/2483.5-2370/2520-60/12SS / B.R.F. | 1 | Annual | 06/17/2015 |
| Wainwright | WHK3.3/18G-10EF/H.P.F | 2 | Annual | 06/17/2015 |
| Hewlett Packard | 11667B / Power Splitter | 10545 | Annual | 02/22/2015 |
| Hewlett Packard | 11667B / Power Splitter | 11275 | Annual | 05/19/2015 |
| Digital | EP-3010/ Power Supply | 3110117 | Annual | 10/29/2015 |
| Schwarzbeck | UHAP/ Dipole Antenna | 557 | Biennial | 03/05/2015 |
| Schwarzbeck | UHAP/ Dipole Antenna | 558 | Biennial | 05/03/2015 |
| Korea Engineering | KR-1005L / Chamber | KRAC05063-3CH | Annual | 10/29/2015 |
| Schwarzbeck | BBHA 9120D/ Horn Antenna | 147 | Biennial | 09/01/2016 |
| Schwarzbeck | BBHA 9120D/ Horn Antenna | 1151 | Biennial | 10/05/2015 |
| Schwarzbeck | BBHA 9170/ Horn Antenna(15~40GHz) | BBHA9170541 | Biennial | 07/05/2015 |
| Agilent | E4440A/Spectrum Analyzer | US45303008 | Annual | 04/09/2015 |
| WEINSCHEL | ATTENUATOR | BR0592 | Annual | 10/22/2015 |
| REOHDE&SCHWARZ | FSV40/Spectrum Analyzer | 1307.9002K40-100931-NK | Annual | 06/09/2015 |
| Agilent | 8960 (E5515C)/ Base Station | MY48360222 | Annual | 08/26/2015 |
| Anritsu Corp. | MT8820C/Wideband Radio Communication Tester | 6200863156 | Annual | 04/01/2015 |

# 5. SUMMARY OF TEST RESULTS

| FCC Part Section(s) | Test Description | Test Limit | Test Condition | Test Result |
|---|---|---|---|---|
| 2.1049, 27.53 | Occupied Bandwidth | N/A | CONDUCTED | PASS |
| 2.1051, 27.53(g) | Band Edge / Spurious and Harmonic Emissions at Antenna Terminal. | < 43 +10 $\log_{10}$ (P[Watts]) at Band Edge and for all-of-band emissions | | PASS |
| 2.1046 | Conducted Output Power | N/A | | PASS |
| 2.1055, 27.54 | Frequency stability / variation of ambient temperature | < 2.5 ppm | | PASS |
| 27.50(c)(10) | Effective Radiated Power (Band 12) | < 3 Watts max. ERP | RADIATED | PASS |
| 2.1053, 27.53(g) | Undesirable Out-of-Band Emissions | < 43 +10 $\log_{10}$ (P[Watts]) for all out-of-band emissions | | PASS |

# 6. SAMPLE CALCULATION

## A. ERP Sample Calculation

| Mode | Ch./ Freq. | | Measured Level(dBm) | Substitude LEVEL(dBm) | Ant. Gain (dBd) | C.L | Pol. | ERP | |
|---|---|---|---|---|---|---|---|---|---|
| | channel | Freq.(MHz) | | | | | | W | dBm |
| LTE | 23095 | 707.50 | -28.85 | 31.95 | -10.21 | 1.08 | H | 0.116 | 20.66 |

**ERP = SubstitudeLEVEL(dBm) + Ant. Gain – CL(Cable Loss)**

1) The EUT mounted on a wooden tripod is 0.8 meter above test site ground level.
2) During the test , the turn table is rotated and the antenna height 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 (**ERP**).

## B. Emission Designator

### 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 = main carrier modulated in a combination of two
or more of the following modes;
amplitude, angle, pulse

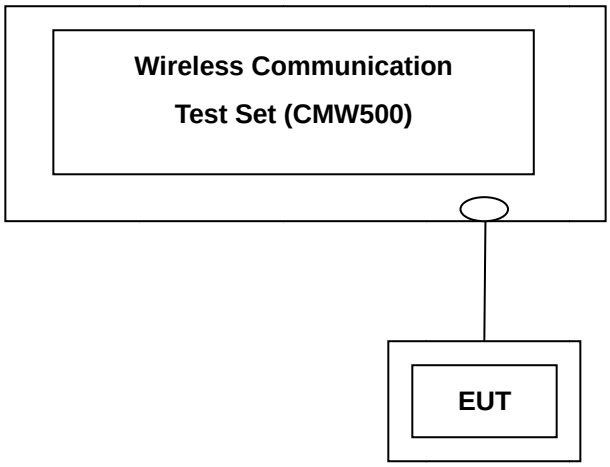
7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

# 7. TEST DATA

## 7.1 CONDUCTED OUTPUT POWER

A base station simulator was used to establish communication with the EUT. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.




Test Result

| Bandwidth | Modulation | RB Size | RB Offset | Max.Average Power (dBm) | | | Target MPR (dB) |
|---|---|---|---|---|---|---|---|
| | | | | 23017ch 699.7MHz | 23095ch 707.5MHz | 23173ch 715.3MHz | |
| 1.4MHz | QPSK | 1 | 0 | 22.44 | 22.71 | 22.27 | 0 |
| | | 1 | 3 | 22.45 | 22.72 | 22.13 | 0 |
| | | 1 | 5 | 22.43 | 22.78 | 22.06 | 0 |
| | | 3 | 0 | 22.26 | 22.61 | 21.99 | 0 |
| | | 3 | 1 | 22.31 | 22.63 | 21.98 | 0 |
| | | 3 | 3 | 22.26 | 22.67 | 21.96 | 0 |
| | | 6 | 0 | 21.28 | 21.58 | 21.26 | 1 |
| | 16QAM | 1 | 0 | 21.17 | 21.88 | 21.38 | 1 |
| | | 1 | 3 | 21.27 | 22.03 | 21.27 | 1 |
| | | 1 | 5 | 21.16 | 21.58 | 21.28 | 1 |
| | | 3 | 0 | 21.17 | 21.67 | 21.08 | 1 |
| | | 3 | 1 | 21.17 | 21.72 | 21.06 | 1 |
| | | 3 | 3 | 21.12 | 21.88 | 21.05 | 1 |
| | | 6 | 0 | 20.14 | 20.67 | 21.12 | 2 |

LTE Conducted Average Output Powers (1.4 MHz Band 12 LTE)

| Bandwidth | Modulation | RB Size | RB Offset | Max.Average Power (dBm) | | | Target MPR (dB) |
|---|---|---|---|---|---|---|---|
| | | | | 23025ch 700.5MHz | 23095ch 707.5MHz | 23165ch 714.5MHz | |
| 3MHz | QPSK | 1 | 0 | 22.31 | 22.88 | 22.06 | 0 |
| | | 1 | 7 | 22.34 | 22.83 | 22.28 | 0 |
| | | 1 | 14 | 22.52 | 22.82 | 22.71 | 0 |
| | | 8 | 0 | 21.06 | 21.57 | 21.01 | 1 |
| | | 8 | 4 | 21.11 | 21.71 | 21.19 | 1 |
| | | 8 | 7 | 21.15 | 21.58 | 21.32 | 1 |
| | | 15 | 0 | 20.96 | 21.60 | 21.15 | 1 |
| | 16QAM | 1 | 0 | 21.92 | 21.66 | 20.97 | 1 |
| | | 1 | 7 | 21.91 | 21.79 | 21.29 | 1 |
| | | 1 | 14 | 21.76 | 21.75 | 21.69 | 1 |
| | | 8 | 0 | 20.77 | 20.56 | 19.89 | 2 |
| | | 8 | 4 | 20.60 | 20.67 | 20.10 | 2 |
| | | 8 | 7 | 20.65 | 20.61 | 20.21 | 2 |
| | | 15 | 0 | 20.58 | 20.60 | 20.09 | 2 |

LTE Conducted Average Output Powers (3 MHz Band 12 LTE)

| Bandwidth | Modulation | RB Size | RB Offset | Max.Average Power (dBm) | | | Target MPR (dB) |
|---|---|---|---|---|---|---|---|
| | | | | 23035ch 701.5MHz | 23095ch 707.5MHz | 23155ch 713.5MHz | |
| 5MHz | QPSK | 1 | 0 | 21.82 | 22.65 | 22.14 | 0 |
| | | 1 | 12 | 22.21 | 22.94 | 22.10 | 0 |
| | | 1 | 24 | 22.30 | 22.46 | 22.75 | 0 |
| | | 12 | 0 | 20.76 | 21.51 | 20.90 | 1 |
| | | 12 | 6 | 20.86 | 21.67 | 20.97 | 1 |
| | | 12 | 11 | 21.04 | 21.48 | 21.07 | 1 |
| | | 25 | 0 | 20.72 | 21.32 | 20.76 | 1 |
| | 16QAM | 1 | 0 | 20.70 | 21.88 | 21.33 | 1 |
| | | 1 | 12 | 21.17 | 22.30 | 21.23 | 1 |
| | | 1 | 24 | 21.20 | 21.37 | 21.62 | 1 |
| | | 12 | 0 | 19.79 | 20.62 | 20.61 | 2 |
| | | 12 | 6 | 19.90 | 20.61 | 20.43 | 2 |
| | | 12 | 11 | 20.09 | 20.60 | 20.51 | 2 |
| | | 25 | 0 | 19.66 | 20.30 | 20.20 | 2 |

LTE Conducted Average Output Powers (5 MHz Band 12 LTE)

| Bandwidth | Modulation | RB Size | RB Offset | Max.Average Power (dBm) | | | Target MPR (dB) |
|---|---|---|---|---|---|---|---|
| | | | | 23060ch 704MHz | 23095ch 707.5MHz | 23130ch 711MHz | |
| 10MHz | QPSK | 1 | 0 | 22.16 | 21.77 | 22.13 | 0 |
| | | 1 | 24 | 22.80 | 22.53 | 21.65 | 0 |
| | | 1 | 49 | 21.69 | 21.57 | 21.96 | 0 |
| | | 25 | 0 | 21.11 | 21.04 | 21.01 | 1 |
| | | 25 | 12 | 21.41 | 21.34 | 21.53 | 1 |
| | | 25 | 24 | 20.90 | 20.82 | 21.46 | 1 |
| | | 50 | 0 | 20.79 | 20.76 | 21.28 | 1 |
| | 16QAM | 1 | 0 | 21.40 | 21.01 | 21.59 | 1 |
| | | 1 | 24 | 22.12 | 21.73 | 21.49 | 1 |
| | | 1 | 49 | 20.64 | 20.38 | 21.62 | 1 |
| | | 25 | 0 | 20.00 | 20.03 | 20.33 | 2 |
| | | 25 | 12 | 20.39 | 20.32 | 20.03 | 2 |
| | | 25 | 24 | 19.85 | 19.83 | 20.00 | 2 |
| | | 50 | 0 | 19.78 | 19.71 | 19.97 | 2 |

LTE Conducted Average Output Powers (10 MHz Band 12 LTE)

Note : Detecting mode is average.

## 7.2 EFFECTIVE RADIATED POWER OUTPUT

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitude Level (dBm) | Ant. Gain(dBd) | C.L | Pol | ERP | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | dBm |
| 699.7 | 1.4 MHz | QPSK | -25.49 | 35.29 | -10.17 | 1.18 | H | 0.248 | 23.94 |
| | | 16-QAM | -25.52 | 35.26 | -10.17 | 1.18 | H | 0.246 | 23.91 |
| 707.5 | | QPSK | -26.83 | 33.97 | -10.21 | 1.08 | H | 0.185 | 22.68 |
| | | 16-QAM | -26.30 | 34.50 | -10.21 | 1.08 | H | 0.209 | 23.21 |
| 715.3 | | QPSK | -27.23 | 33.35 | -10.25 | 1.08 | H | 0.159 | 22.02 |
| | | 16-QAM | -26.65 | 33.93 | -10.25 | 1.08 | H | 0.182 | 22.60 |

**Effective Radiated Power Data (Band 12 – 1.4 MHz)**

Note: Worst case is 1 resource block.

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitude Level (dBm) | Ant. Gain(dBd) | C.L | Pol | ERP | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | dBm |
| 700.5 | 3 MHz | QPSK | -24.92 | 35.98 | -10.17 | 1.18 | H | 0.290 | 24.63 |
| | | 16-QAM | -24.64 | 36.26 | -10.17 | 1.18 | H | 0.310 | 24.91 |
| 707.5 | | QPSK | -26.80 | 34.00 | -10.21 | 1.08 | H | 0.187 | 22.71 |
| | | 16-QAM | -27.52 | 33.28 | -10.21 | 1.08 | H | 0.158 | 21.99 |
| 714.5 | | QPSK | -24.58 | 36.09 | -10.24 | 1.08 | H | 0.300 | 24.77 |
| | | 16-QAM | -24.97 | 35.70 | -10.24 | 1.08 | H | 0.274 | 24.38 |

**Effective Radiated Power Data (Band 12 – 3 MHz)**

Note: Worst case is 1 resource block.

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitude Level (dBm) | Ant. Gain(dBd) | C.L | Pol | ERP | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | dBm |
| 701.5 | 5 MHz | QPSK | -25.13 | 35.86 | -10.18 | 1.15 | H | 0.284 | 24.53 |
| | | 16-QAM | -25.21 | 35.78 | -10.18 | 1.15 | H | 0.279 | 24.45 |
| 707.5 | | QPSK | -27.26 | 33.54 | -10.21 | 1.08 | H | 0.168 | 22.25 |
| | | 16-QAM | -27.27 | 33.53 | -10.21 | 1.08 | H | 0.167 | 22.24 |
| 713.5 | | QPSK | -23.17 | 37.64 | -10.24 | 1.08 | H | 0.429 | 26.32 |
| | | 16-QAM | -22.77 | 38.04 | -10.24 | 1.08 | H | 0.470 | 26.72 |

**Effective Radiated Power Data (Band 12 – 5 MHz)**

Note: Worst case is 1 resource block.

| Freq (MHz) | Bandwidth | Modulation | Measured Level (dBm) | Substitude Level (dBm) | Ant. Gain(dBd) | C.L | Pol | ERP | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | W | dBm |
| 704.0 | 10 MHz | QPSK | -25.90 | 35.03 | -10.19 | 1.10 | H | 0.237 | 23.74 |
| | | 16-QAM | -25.88 | 35.05 | -10.19 | 1.10 | H | 0.238 | 23.76 |
| 707.5 | | QPSK | -27.29 | 33.51 | -10.21 | 1.08 | H | 0.167 | 22.22 |
| | | 16-QAM | -27.38 | 33.42 | -10.21 | 1.08 | H | 0.163 | 22.13 |
| 711.0 | | QPSK | -26.24 | 34.35 | -10.23 | 1.08 | H | 0.201 | 23.04 |
| | | 16-QAM | -26.16 | 34.43 | -10.23 | 1.08 | H | 0.205 | 23.12 |

**Effective Radiated Power Data (Band 12 – 10 MHz)**

Note: Worst case is 1 resource block.

**NOTES:**

Effective Radiated Power Output Measurements by Substitution Method

according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a non-conductive styrofoam resin table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer.
A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

Also, we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna. The worst case of the EUT is z plane in LTE mode. Also worst case of detecting Antenna is horizontal polarization in LTE mode.

## 7.3 RADIATED SPURIOUS EMISSIONS

### 7.3.1 RADIATED SPURIOUS EMISSIONS (Band 12)

▣ MEASURED OUTPUT POWER: 23.94 dBm = 0.248 W

▣ MODULATION SIGNAL: 1.4 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $\log_{10}$ (W) = 36.94 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBd) | Substitude Level (dBm) | C.L | Pol | ERP (dBm) | dBc |
|---|---|---|---|---|---|---|---|---|
| 23017 (699.7) | 1,399.4 | -47.93 | 7.74 | -51.37 | 1.58 | V | -45.21 | 69.15 |
| | 2,099.1 | -54.14 | 9.69 | -58.32 | 1.98 | H | -50.61 | 74.55 |
| | 2,798.8 | -48.64 | 10.74 | -51.50 | 2.30 | V | -43.06 | 67.00 |
| 23095 (707.5) | 1,415.0 | -47.51 | 7.83 | -51.52 | 1.58 | V | -45.27 | 69.21 |
| | 2,122.5 | -53.93 | 9.54 | -57.34 | 1.99 | V | -49.79 | 73.73 |
| | 2,830.0 | -48.88 | 10.86 | -51.53 | 2.30 | V | -42.97 | 66.91 |
| 23173 (715.3) | 1,450.6 | -47.80 | 8.04 | -52.28 | 1.60 | V | -45.84 | 69.78 |
| | 2,175.9 | -54.77 | 9.24 | -57.14 | 2.02 | H | -49.92 | 73.86 |
| | 2,901.2 | -49.90 | 11.03 | -52.00 | 2.32 | V | -43.29 | 67.23 |

**NOTES:** 1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

2. We are performed all frequency to 10$^{th}$ harmonics from 30 MHz. Measurements above 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.

3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

4. Worst case is 1 resource block.

▣ MEASURED OUTPUT POWER: 24.91 dBm = 0.310 W

▣ MODULATION SIGNAL: 3 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $lo_{g10}$ (W) = 37.91 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBd) | Substitude Level (dBm) | C.L | Pol | ERP (dBm) | dBc |
|---|---|---|---|---|---|---|---|---|
| 23025 (700.5) | 1,401.0 | -47.65 | 7.74 | -51.09 | 1.58 | V | -44.93 | 69.84 |
| | 2,101.5 | -54.62 | 9.69 | -58.80 | 1.98 | H | -51.09 | 76.00 |
| | 2,802.0 | -49.16 | 10.74 | -52.02 | 2.30 | V | -43.58 | 68.49 |
| 23095 (707.5) | 1,415.0 | -48.15 | 7.83 | -52.16 | 1.58 | V | -45.91 | 70.82 |
| | 2,122.5 | -55.50 | 9.54 | -58.91 | 1.99 | V | -51.36 | 76.27 |
| | 2,830.0 | -49.67 | 10.86 | -52.32 | 2.30 | V | -43.76 | 68.67 |
| 23165 (714.5) | 1,429.0 | -48.25 | 7.92 | -51.81 | 1.61 | V | -45.50 | 70.41 |
| | 2,143.5 | -55.48 | 9.40 | -58.70 | 1.67 | H | -50.97 | 75.88 |
| | 2,858.0 | -50.21 | 10.96 | -52.95 | 2.31 | V | -44.30 | 69.21 |

**NOTES:** 1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

2. We are performed all frequency to 10$^{th}$ harmonics from 30 MHz. Measurements above 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.

3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

4. Worst case is 1 resource block.

▣ MEASURED OUTPUT POWER: 26.72 dBm = 0.470 W

▣ MODULATION SIGNAL: 5 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $lo_{g10}$ (W) = 39.72 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBd) | Substitude Level (dBm) | C.L | Pol | ERP (dBm) | dBc |
|---|---|---|---|---|---|---|---|---|
| 23035 (701.5) | 1,403.0 | -48.24 | 7.75 | -51.69 | 1.58 | V | -45.52 | 72.24 |
| | 2,104.5 | -55.86 | 9.66 | -59.91 | 1.97 | V | -52.22 | 78.94 |
| | 2,806.0 | -49.70 | 10.76 | -52.48 | 2.30 | V | -44.02 | 70.74 |
| 23095 (707.5) | 1,415.0 | -47.77 | 7.83 | -51.78 | 1.58 | V | -45.53 | 72.25 |
| | 2,122.5 | -56.86 | 9.54 | -60.27 | 1.99 | V | -52.72 | 79.44 |
| | 2,830.0 | -49.92 | 10.86 | -52.57 | 2.30 | V | -44.01 | 70.73 |
| 23155 (713.5) | 1,427.0 | -46.46 | 7.91 | -50.92 | 1.60 | V | -44.61 | 71.33 |
| | 2,140.5 | -52.06 | 9.42 | -55.00 | 1.98 | V | -47.56 | 74.28 |
| | 2,854.0 | -49.77 | 10.94 | -52.49 | 2.31 | V | -43.86 | 70.58 |

**NOTES:** 1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

2. We are performed all frequency to 10$^{th}$ harmonics from 30 MHz. Measurements above 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.

3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

4. Worst case is 1 resource block.

▣ MEASURED OUTPUT POWER: 23.76 dBm = 0.238 W

▣ MODULATION SIGNAL: 10 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $lo_{g10}$ (W) = 36.76 dBc

| Ch | Freq (MHz) | Measured Level (dBm) | Ant. Gain (dBd) | Substitude Level (dBm) | C.L | Pol | ERP (dBm) | dBc |
|---|---|---|---|---|---|---|---|---|
| 23060 (704.0) | 1,408.0 | -48.44 | 7.79 | -51.98 | 1.58 | V | -45.77 | 69.53 |
| | 2,112.0 | -57.69 | 9.60 | -61.58 | 1.96 | V | -53.94 | 77.70 |
| | 2,816.0 | -50.31 | 10.80 | -53.10 | 2.31 | V | -44.61 | 68.37 |
| 23095 (707.5) | 1,415.0 | -48.78 | 7.83 | -52.79 | 1.58 | V | -46.54 | 70.30 |
| | 2,122.5 | -58.07 | 9.54 | -61.48 | 1.99 | V | -53.93 | 77.69 |
| | 2,830.0 | -51.39 | 10.86 | -54.04 | 2.30 | V | -45.48 | 69.24 |
| 23130 (711.0) | 1,422.0 | -48.88 | 7.87 | -52.95 | 1.59 | V | -46.67 | 70.43 |
| | 2,133.0 | -58.63 | 9.47 | -61.71 | 1.99 | V | -54.23 | 77.99 |
| | 2,844.0 | -48.83 | 10.92 | -51.44 | 2.31 | V | -42.83 | 66.59 |

**NOTES:** 1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

2. We are performed all frequency to 10$^{th}$ harmonics from 30 MHz. Measurements above 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.

3. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

4. Worst case is 1 resource block.

## 7.4 OCCUPIED BANDWIDTH

| Band | Band Width (MHz) | Frequency (MHz) | Modulation | Resource Block Size | Resource Block Offset | Data ( MHz ) |
|---|---|---|---|---|---|---|
| Band 12 | 1.4 | 707.5 | QPSK | 6 | 0 | 1.1185 |
| | | | 16-QAM | 6 | 0 | 1.1220 |
| | 3 | 707.5 | QPSK | 15 | 0 | 2.7196 |
| | | | 16-QAM | 15 | 0 | 2.7178 |
| | 5 | 707.5 | QPSK | 25 | 0 | 4.4992 |
| | | | 16-QAM | 25 | 0 | 4.5010 |
| | 10 | 707.5 | QPSK | 50 | 0 | 8.9835 |
| | | | 16-QAM | 50 | 0 | 8.9524 |

- Plots of the EUT's Occupied Bandwidth are shown Page 32 ~ 35.

## 7.5 CONDUCTED SPURIOUS EMISSIONS

| Band | Band Width (MHz) | Frequency (MHz) | Modulation | Resource Block Size | Resource Block Offset | Frequency of Maximum Harmonic (GHz) | Maximum Data [dBm] |
|---|---|---|---|---|---|---|---|
| Band 12 | 1.4 | 699.7 | QPSK | 1 | 0 | 4.936140 | -28.66 |
| | | 707.5 | | 1 | 0 | 4.971920 | -29.14 |
| | | 715.3 | | 1 | 0 | 4.970930 | -29.61 |
| | 3 | 700.5 | | 1 | 0 | 4.830270 | -30.16 |
| | | 707.5 | | 1 | 0 | 4.623520 | -29.73 |
| | | 714.5 | | 1 | 0 | 4.727400 | -29.84 |
| | 5 | 701.5 | | 1 | 0 | 4.601650 | -29.38 |
| | | 707.5 | | 1 | 0 | 4.739320 | -30.15 |
| | | 713.5 | | 1 | 0 | 4.982360 | -29.42 |
| | 10 | 704.0 | | 1 | 0 | 4.825800 | -29.49 |
| | | 707.5 | | 1 | 0 | 4.770140 | -29.88 |
| | | 711.0 | | 1 | 0 | 4.389930 | -29.88 |

- Plots of the EUT's Conducted Spurious Emissions are shown Page 48~ 59.

### 7.5.1 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 36 ~ 47

## 7.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

### 7.6.1 FREQUENCY STABILITY (LTE Band 12)

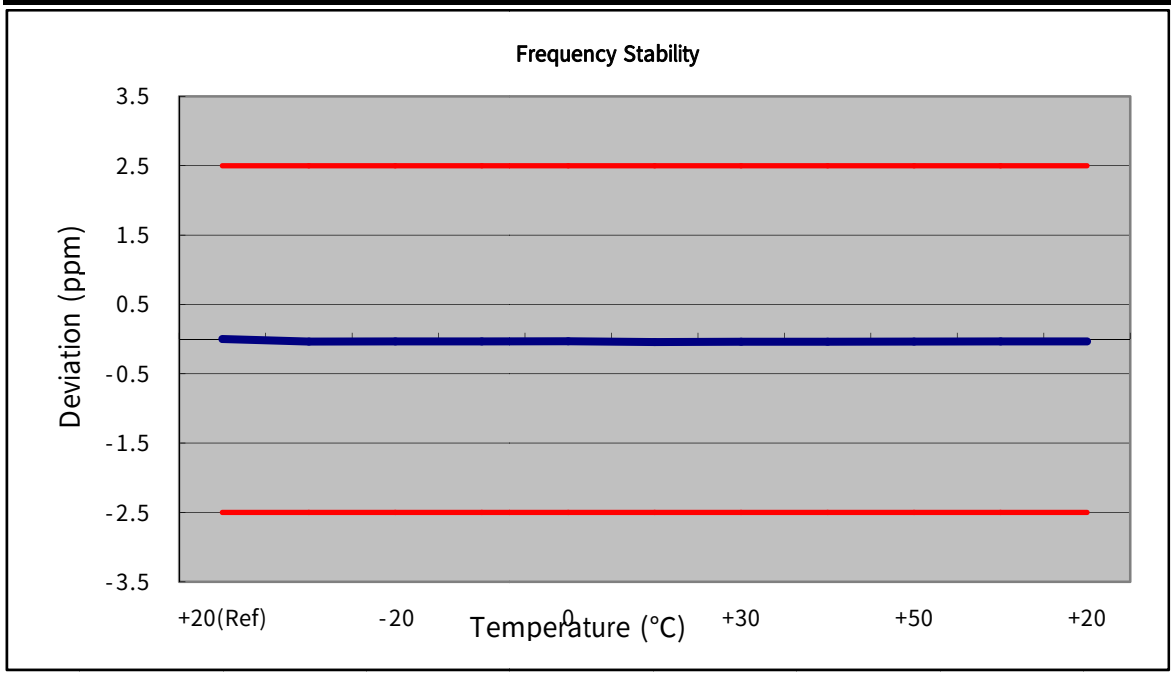
▣ OPERATING FREQUENCY: 707.500,000 Hz

▣ CHANNEL: 23095 (1.4 MHz)

▣ REFERENCE VOLTAGE: 12.0 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

| Voltage (%) | Power (VDC) | Temp. (°C) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 12.0 | +20(Ref) | 707 500 026 | 0 | 0.000 000 | 0.000 |
| 100% | | -30 | 707 500 001 | -25.80 | -0.000 004 | -0.036 |
| 100% | | -20 | 707 500 002 | -24.00 | -0.000 003 | -0.034 |
| 100% | | -10 | 707 500 002 | -24.50 | -0.000 003 | -0.035 |
| 100% | | 0 | 707 500 005 | -21.80 | -0.000 003 | -0.031 |
| 100% | | +10 | 707 499 996 | -30.40 | -0.000 004 | -0.043 |
| 100% | | +30 | 707 500 000 | -26.90 | -0.000 004 | -0.038 |
| 100% | | +40 | 707 499 999 | -27.10 | -0.000 004 | -0.038 |
| 100% | | +50 | 707 500 002 | -24.70 | -0.000 003 | -0.035 |
| 115% | 13.8 | +20 | 707 500 002 | -24.50 | -0.000 003 | -0.035 |
| Batt. Endpoint | 10.2 | +20 | 707 500 002 | -24.00 | -0.000 003 | -0.034 |



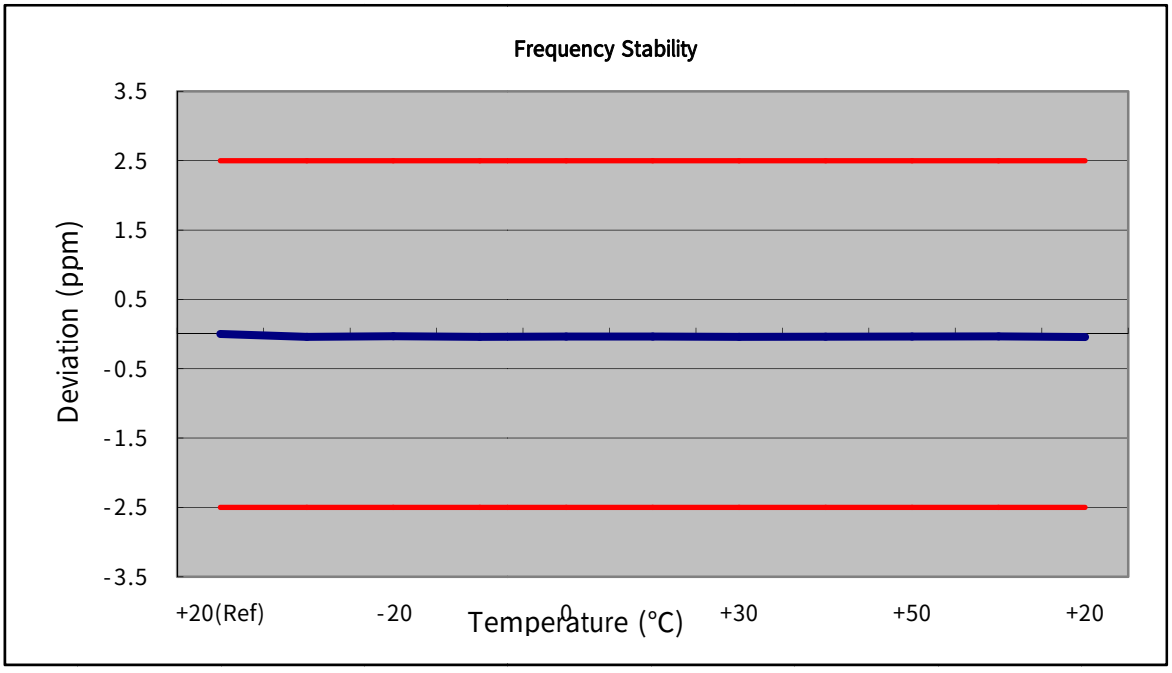
▣ OPERATING FREQUENCY: 707.500,000 Hz

▣ CHANNEL: 23095 (3 MHz)

▣ REFERENCE VOLTAGE: 12.0 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

| Voltage (%) | Power (VDC) | Temp. (°C) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 12.0 | +20(Ref) | 707 500 024 | 0 | 0.000 000 | 0.000 |
| 100% | | -30 | 707 499 995 | -29.00 | -0.000 004 | -0.041 |
| 100% | | -20 | 707 500 003 | -21.40 | -0.000 003 | -0.030 |
| 100% | | -10 | 707 499 995 | -29.30 | -0.000 004 | -0.041 |
| 100% | | 0 | 707 499 999 | -25.30 | -0.000 004 | -0.036 |
| 100% | | +10 | 707 499 999 | -25.10 | -0.000 004 | -0.035 |
| 100% | | +30 | 707 499 996 | -28.30 | -0.000 004 | -0.040 |
| 100% | | +40 | 707 499 997 | -26.70 | -0.000 004 | -0.038 |
| 100% | | +50 | 707 499 999 | -25.60 | -0.000 004 | -0.036 |
| 115% | 13.8 | +20 | 707 500 000 | -23.70 | -0.000 003 | -0.033 |
| Batt. Endpoint | 10.2 | +20 | 707 499 995 | -29.60 | -0.000 004 | -0.042 |



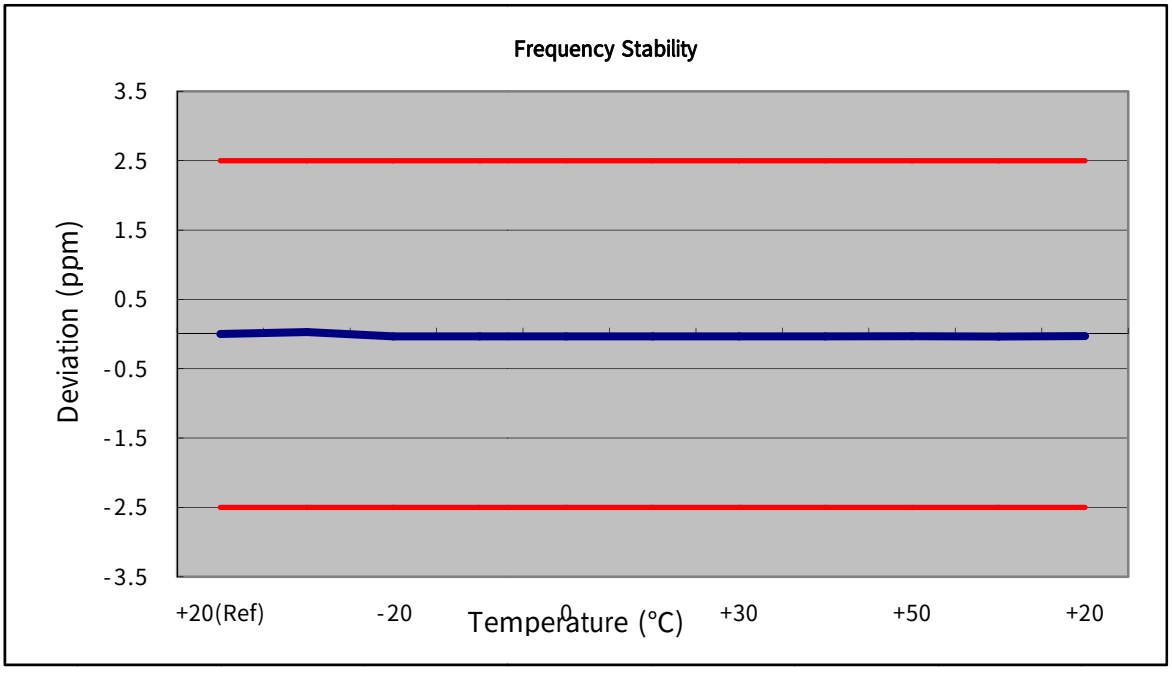
▣ OPERATING FREQUENCY: 707.500,000 Hz

▣ CHANNEL: 23095 (5 MHz)

▣ REFERENCE VOLTAGE: 12.0 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

| Voltage (%) | Power (VDC) | Temp. (°C) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 12.0 | +20(Ref) | 707 500 025 | 0 | 0.000 000 | 0.000 |
| 100% | | -30 | 707 500 045 | 20.60 | 0.000 003 | 0.029 |
| 100% | | -20 | 707 500 001 | -23.40 | -0.000 003 | -0.033 |
| 100% | | -10 | 707 500 001 | -23.60 | -0.000 003 | -0.033 |
| 100% | | 0 | 707 500 002 | -23.20 | -0.000 003 | -0.033 |
| 100% | | +10 | 707 500 002 | -23.00 | -0.000 003 | -0.033 |
| 100% | | +30 | 707 500 001 | -23.60 | -0.000 003 | -0.033 |
| 100% | | +40 | 707 500 000 | -24.50 | -0.000 003 | -0.035 |
| 100% | | +50 | 707 500 003 | -21.80 | -0.000 003 | -0.031 |
| 115% | 13.8 | +20 | 707 499 999 | -25.50 | -0.000 004 | -0.036 |
| Batt. Endpoint | 10.2 | +20 | 707 500 004 | -20.90 | -0.000 003 | -0.030 |



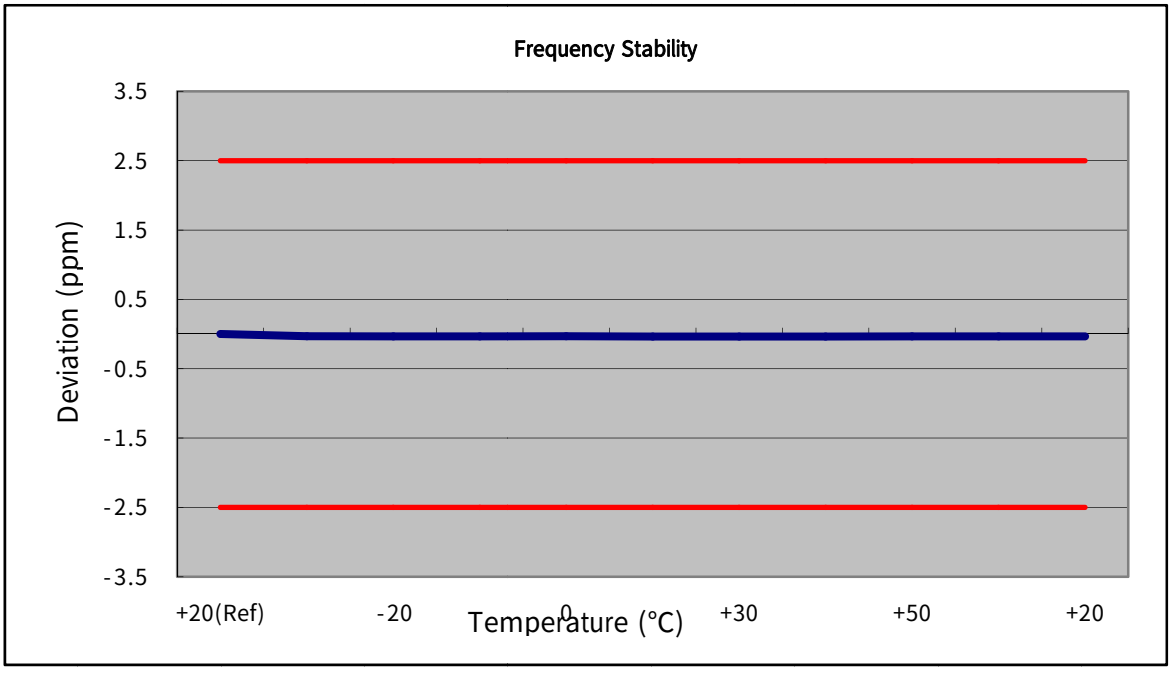
▣ OPERATING FREQUENCY: 707.500,000 Hz

▣ CHANNEL: 23095 (10 MHz)

▣ REFERENCE VOLTAGE: 12.0 VDC

▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

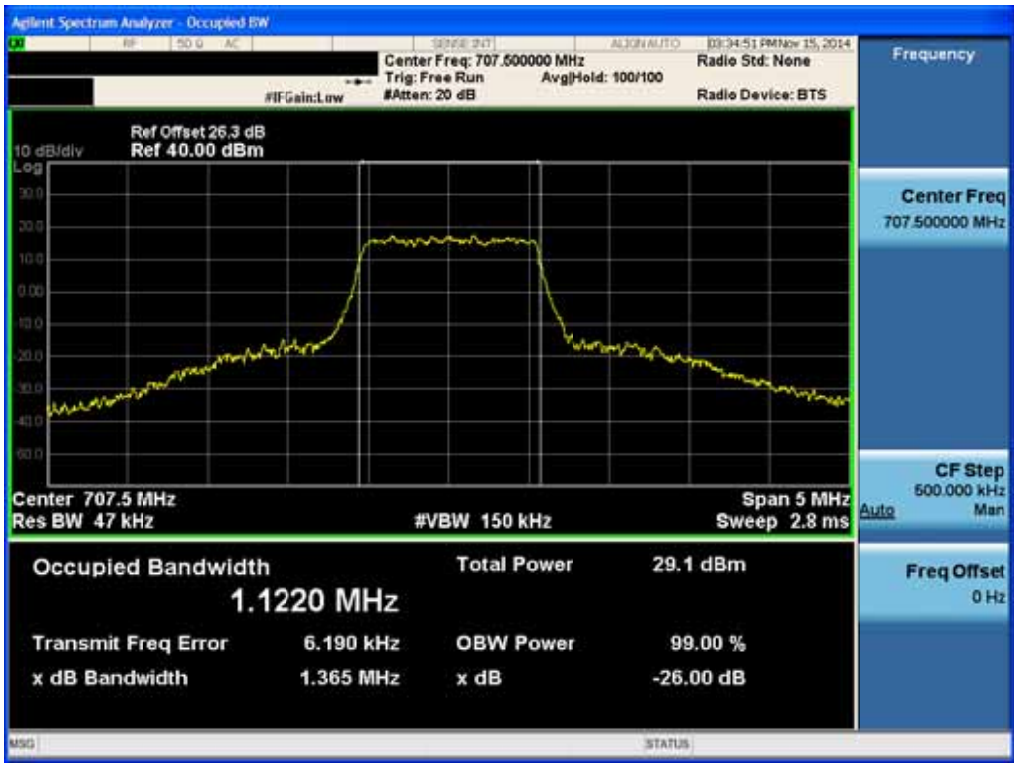
| Voltage (%) | Power (VDC) | Temp. (°C) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 12.0 | +20(Ref) | 707 500 028 | 0 | 0.000 000 | 0.000 |
| 100% | | -30 | 707 500 006 | -22.00 | -0.000 003 | -0.031 |
| 100% | | -20 | 707 500 004 | -24.10 | -0.000 003 | -0.034 |
| 100% | | -10 | 707 500 004 | -23.80 | -0.000 003 | -0.034 |
| 100% | | 0 | 707 500 006 | -22.20 | -0.000 003 | -0.031 |
| 100% | | +10 | 707 500 003 | -24.60 | -0.000 003 | -0.035 |
| 100% | | +30 | 707 500 003 | -25.30 | -0.000 004 | -0.036 |
| 100% | | +40 | 707 500 003 | -24.90 | -0.000 004 | -0.035 |
| 100% | | +50 | 707 500 004 | -23.60 | -0.000 003 | -0.033 |
| 115% | 13.8 | +20 | 707 500 004 | -24.10 | -0.000 003 | -0.034 |
| Batt. Endpoint | 10.2 | +20 | 707 500 003 | -24.40 | -0.000 003 | -0.034 |



# 8. TEST PLOTS

BAND 12. Occupied Bandwidth Plot (1.4M BW Ch.23095 QPSK RB 6)

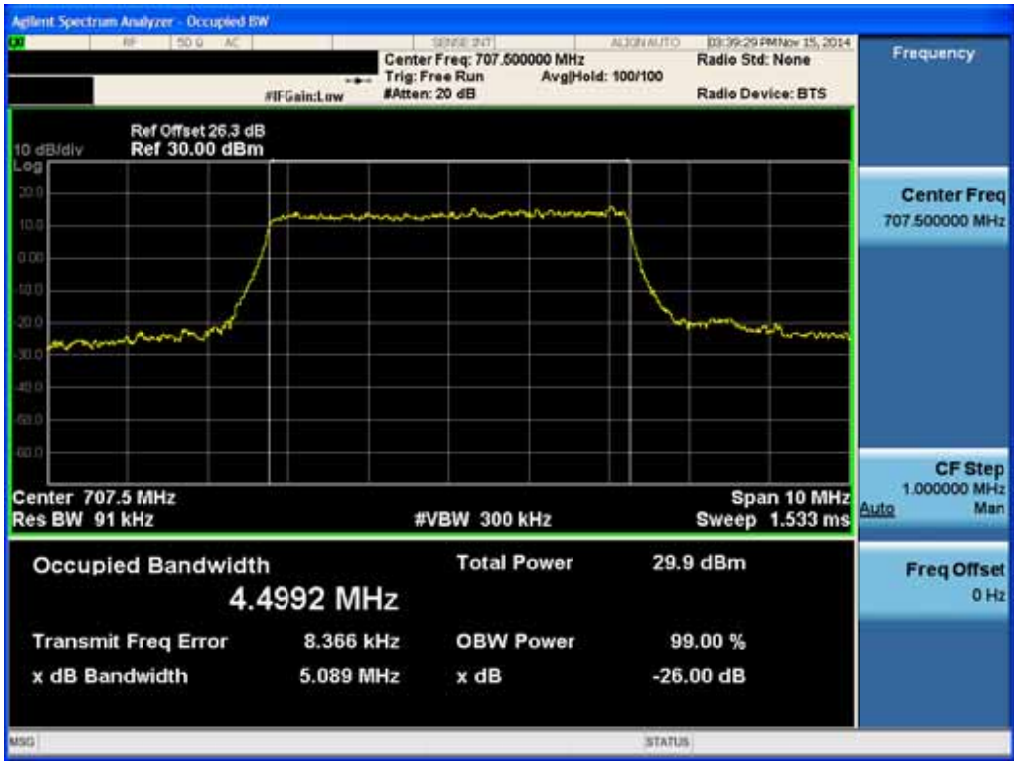

BAND 12. Occupied Bandwidth Plot (1.4M BW Ch.23095 16QAM RB 6)



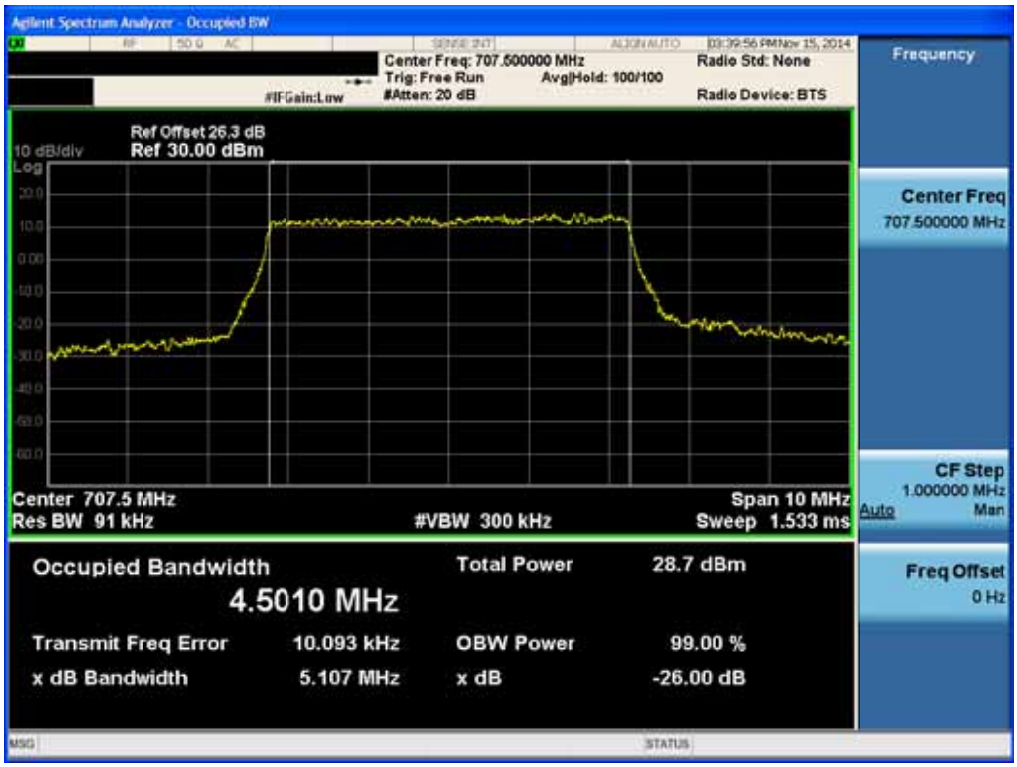
BAND 12. Occupied Bandwidth Plot (3M BW Ch.23095 QPSK RB 15)


BAND 12. Occupied Bandwidth Plot (3M BW Ch.23095 16QAM RB 15)

BAND 12. Occupied Bandwidth Plot (5M BW Ch.23095 QPSK RB 25)



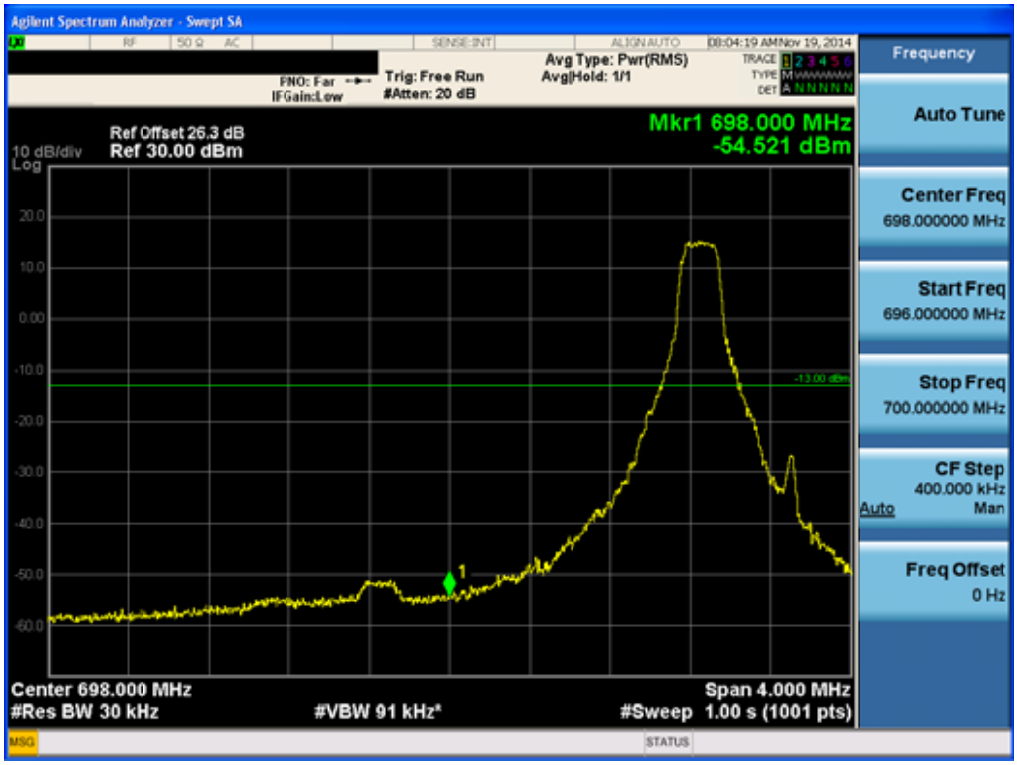

BAND 12. Occupied Bandwidth Plot (5M BW Ch.23095 16QAM RB 25)



BAND 12. Occupied Bandwidth Plot (10M BW Ch.23095 QPSK RB 50)

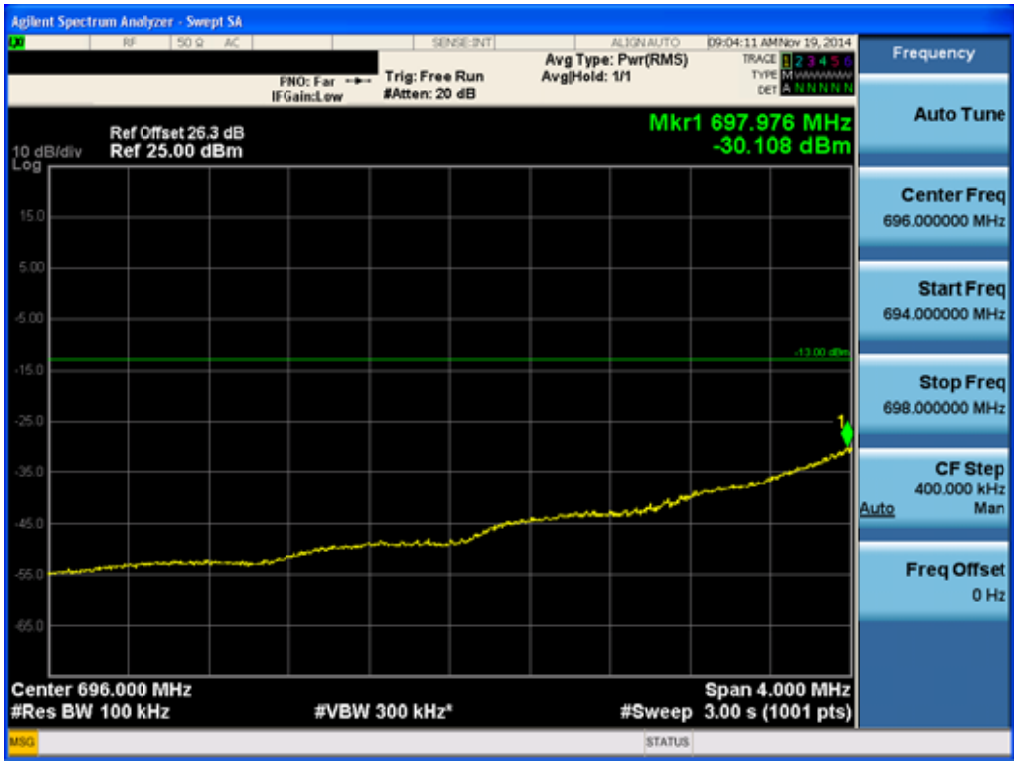

BAND 12. Occupied Bandwidth Plot (10M BW Ch.23095 16QAM RB 50)

BAND 12. [Lower Band Edge] - 1.4M BW Ch.23017 QPSK RB (1, 0) -1

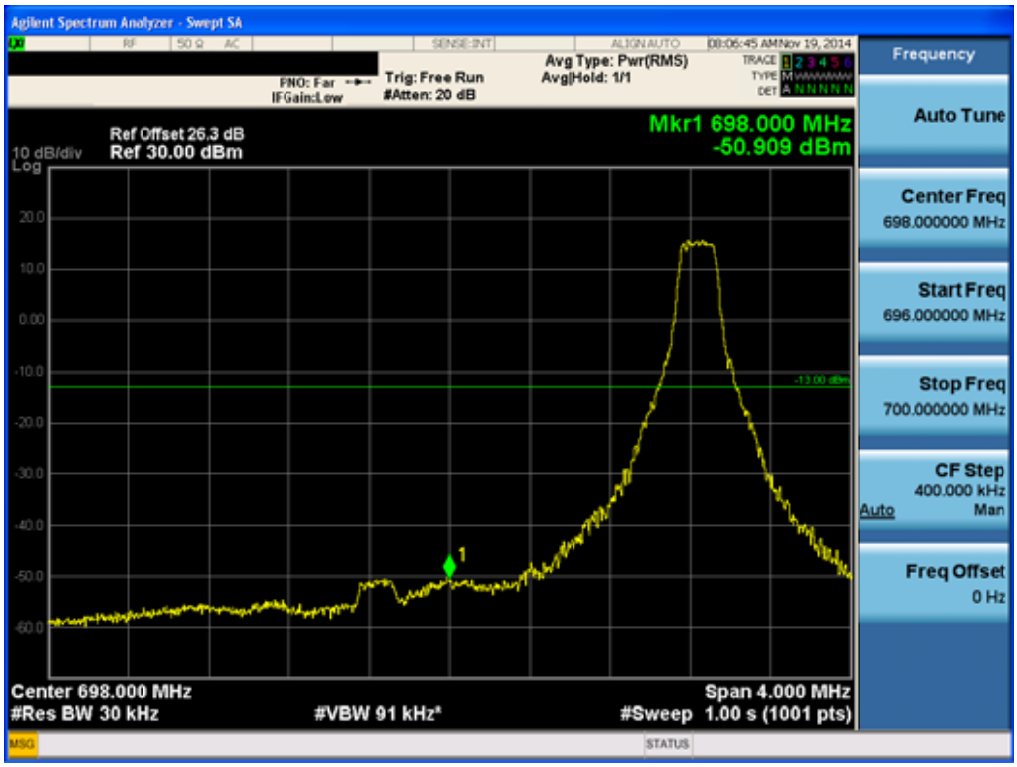



BAND 12. [Lower Band Edge] - 1.4M BW Ch.23017 QPSK RB (6, 0) -2

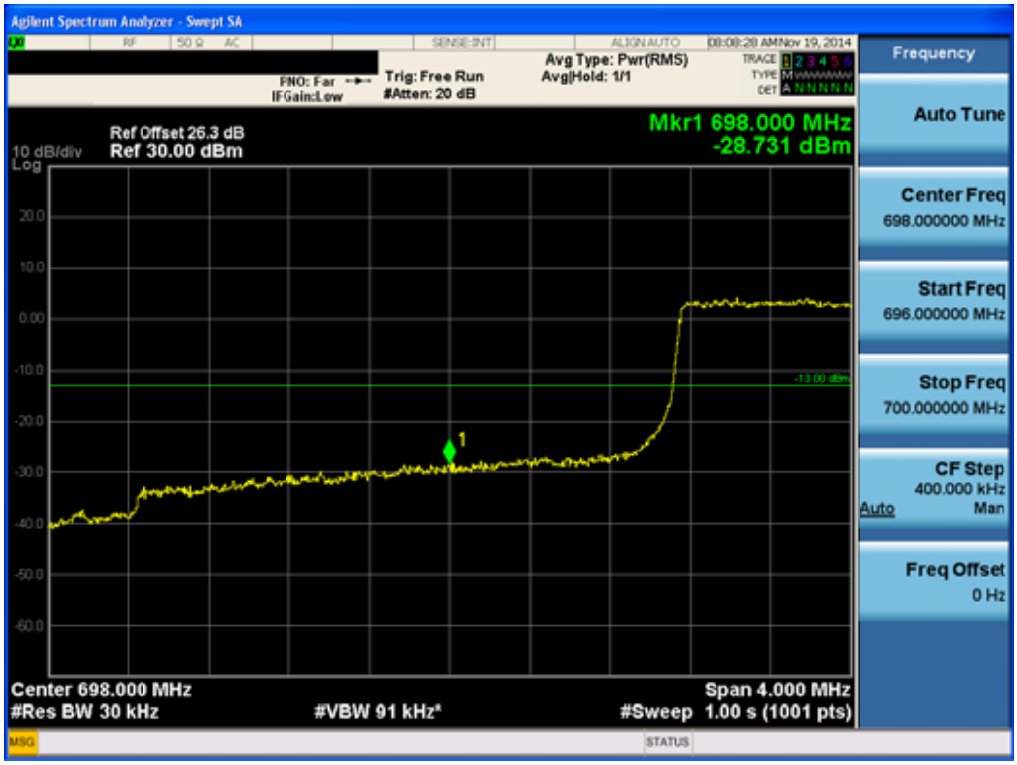
BAND 12. [Lower Extended Band Edge] - 1.4M BW Ch.23017 QPSK RB (6, 0) -3



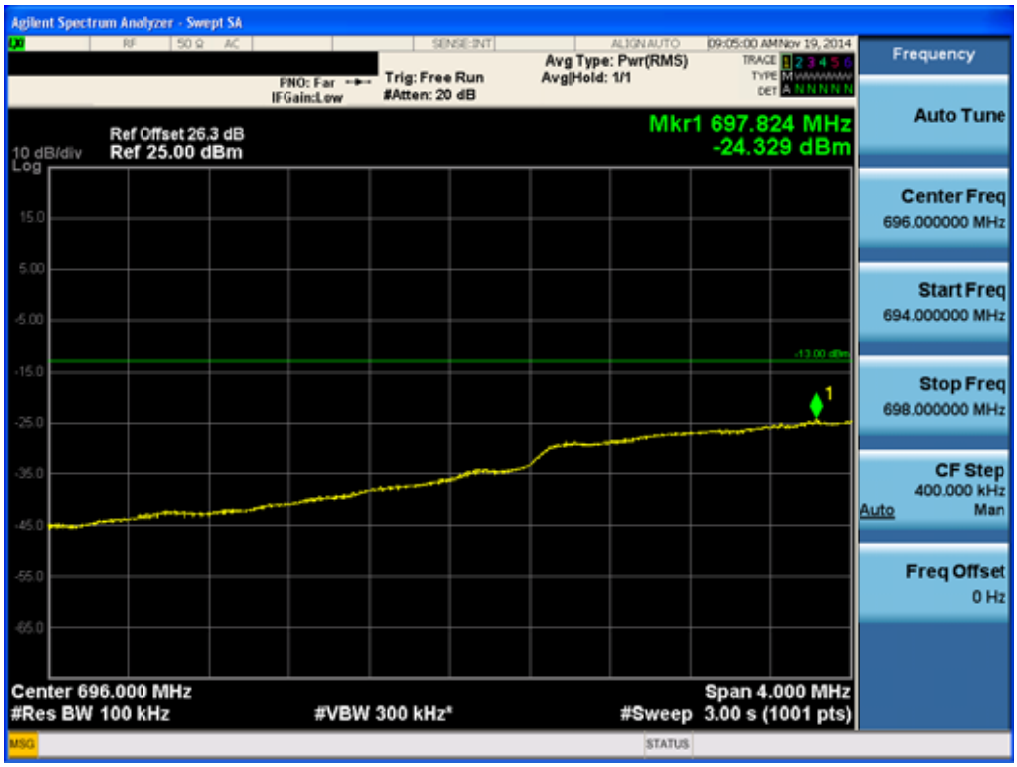

BAND 12. [Lower Band Edge] - 3M BW Ch.23025 QPSK RB (1, 0) -1



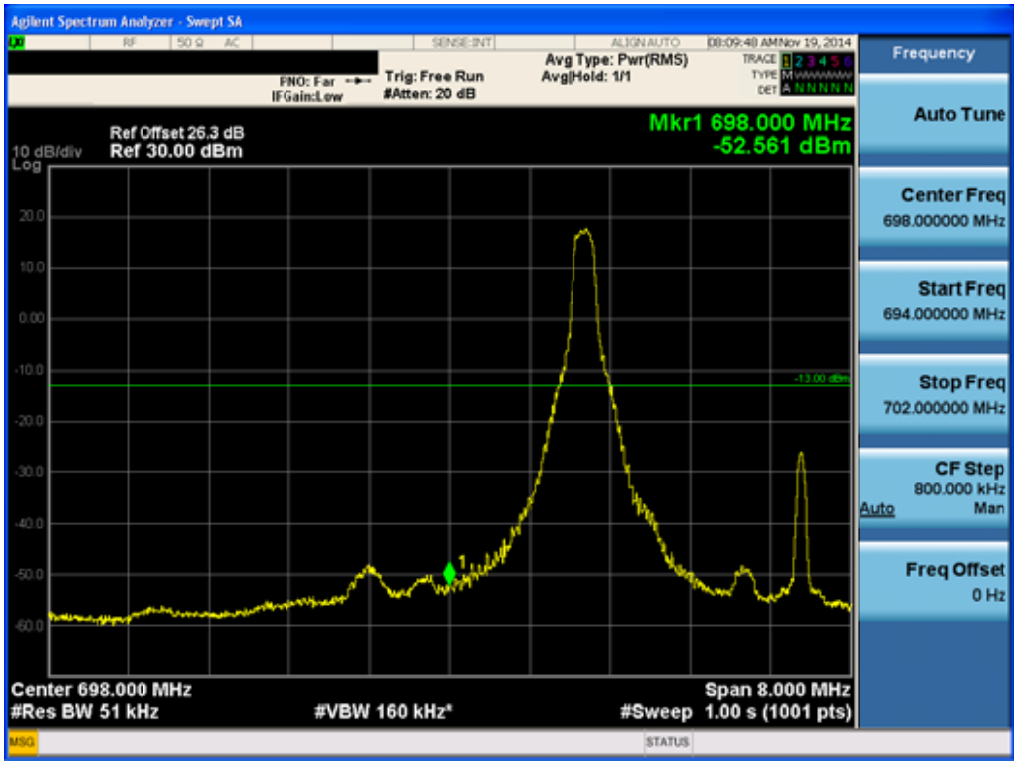
BAND 12. [Lower Band Edge] - 3M BW Ch.23025 QPSK RB (15, 0) -2



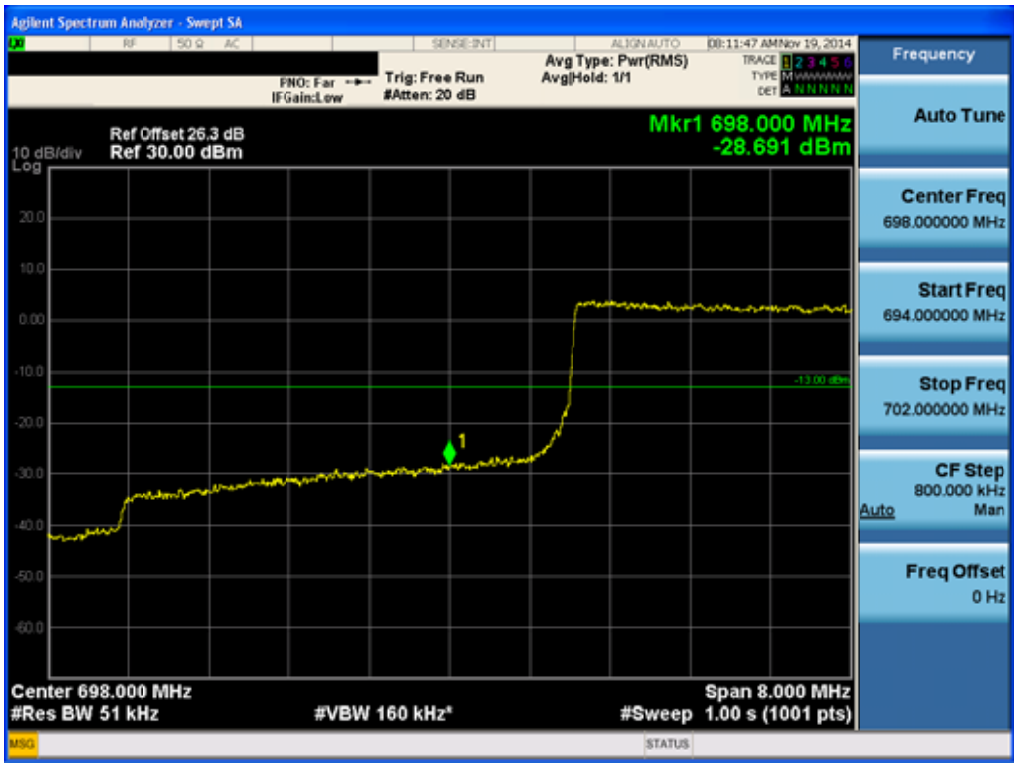

BAND 12. [Lower Extended Band Edge] - 3M BW Ch.23025 QPSK RB (15, 0) -3



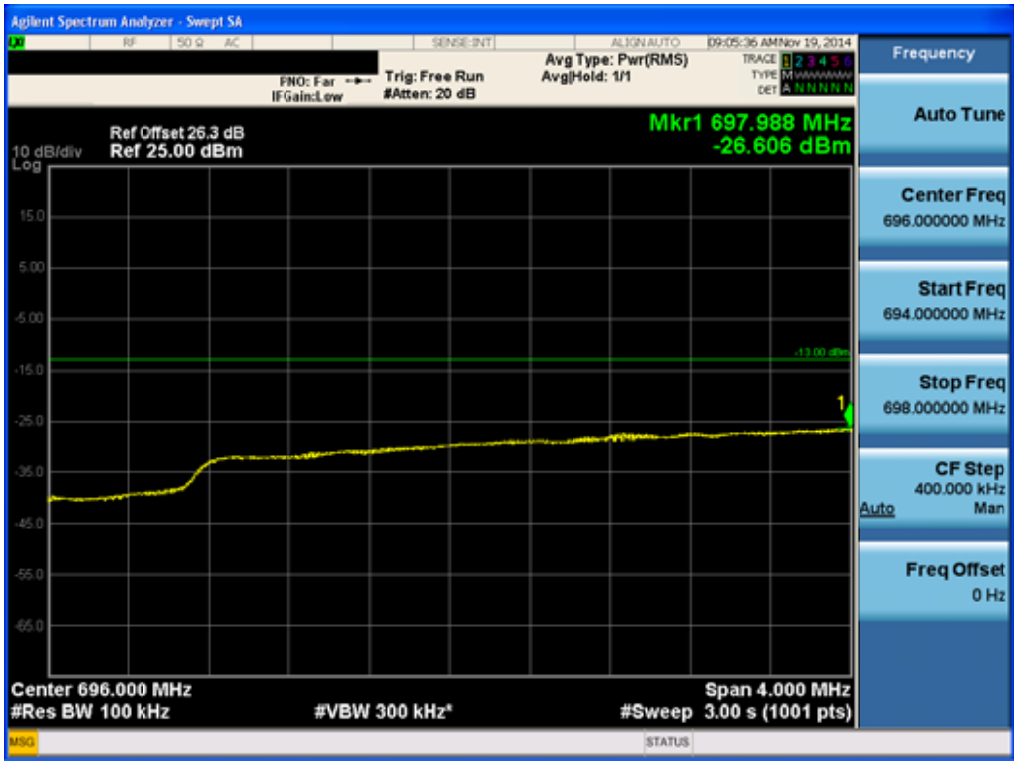
BAND 12. [Lower Band Edge] - 5M BW Ch.23035 QPSK RB (1, 0) -1



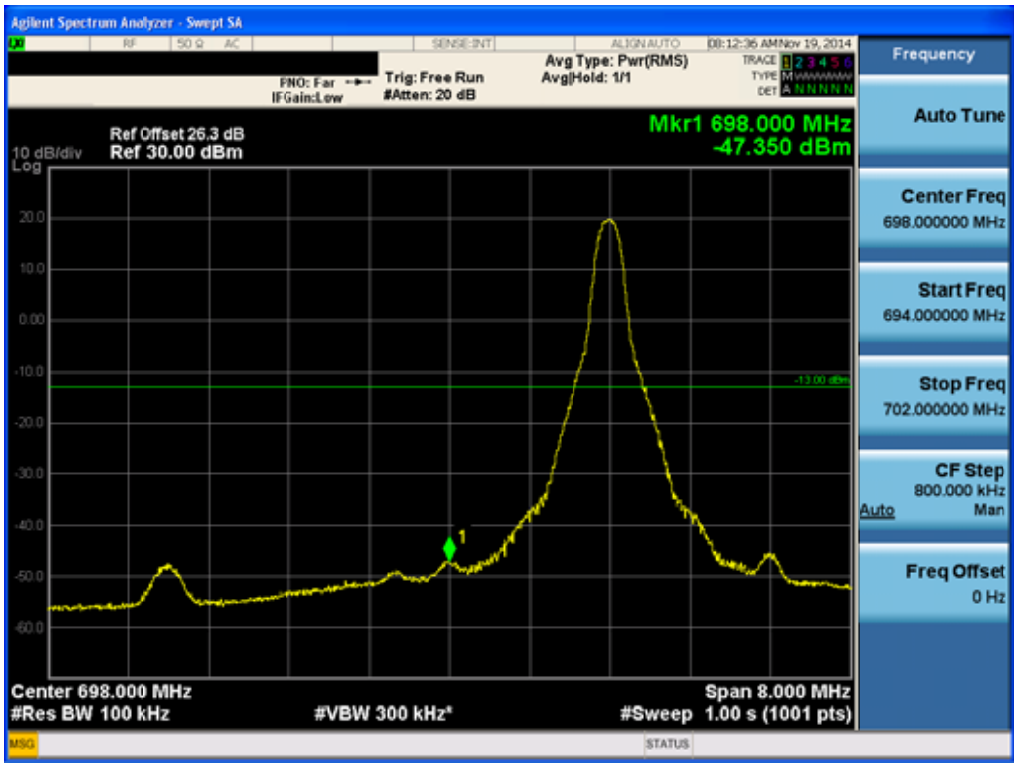

BAND 12. [Lower Band Edge] - 5M BW Ch.23035 QPSK RB (25, 0) -2



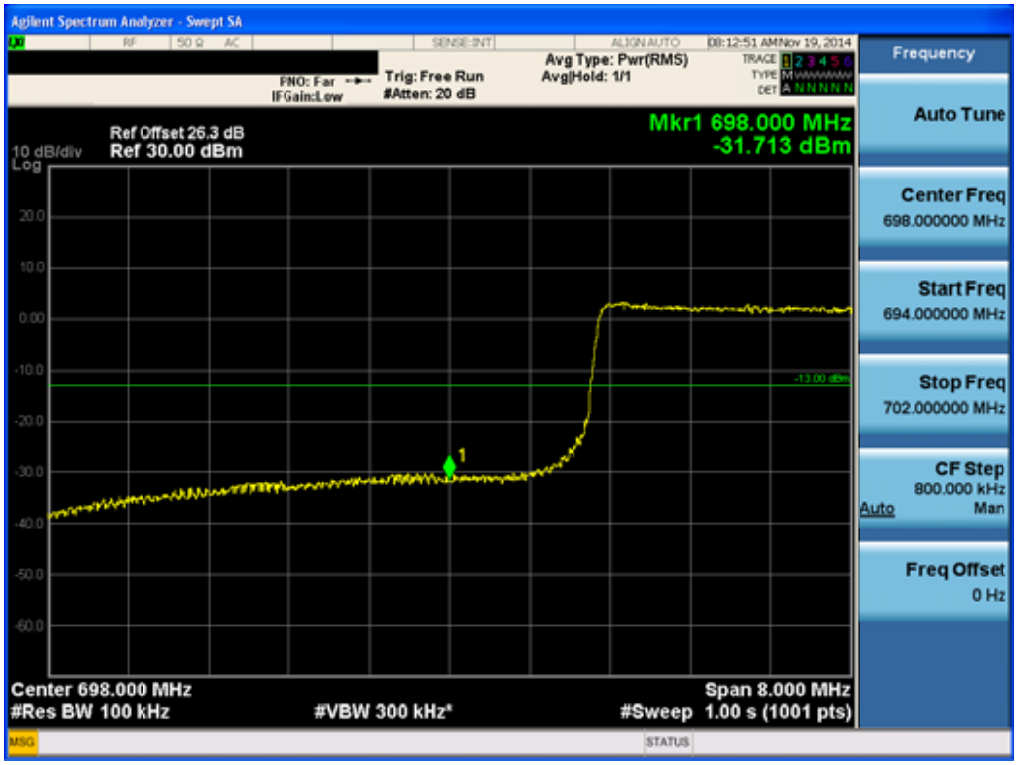
BAND 12. [Lower Extended Band Edge] - 5M BW Ch.23035 QPSK RB (25, 0) -3



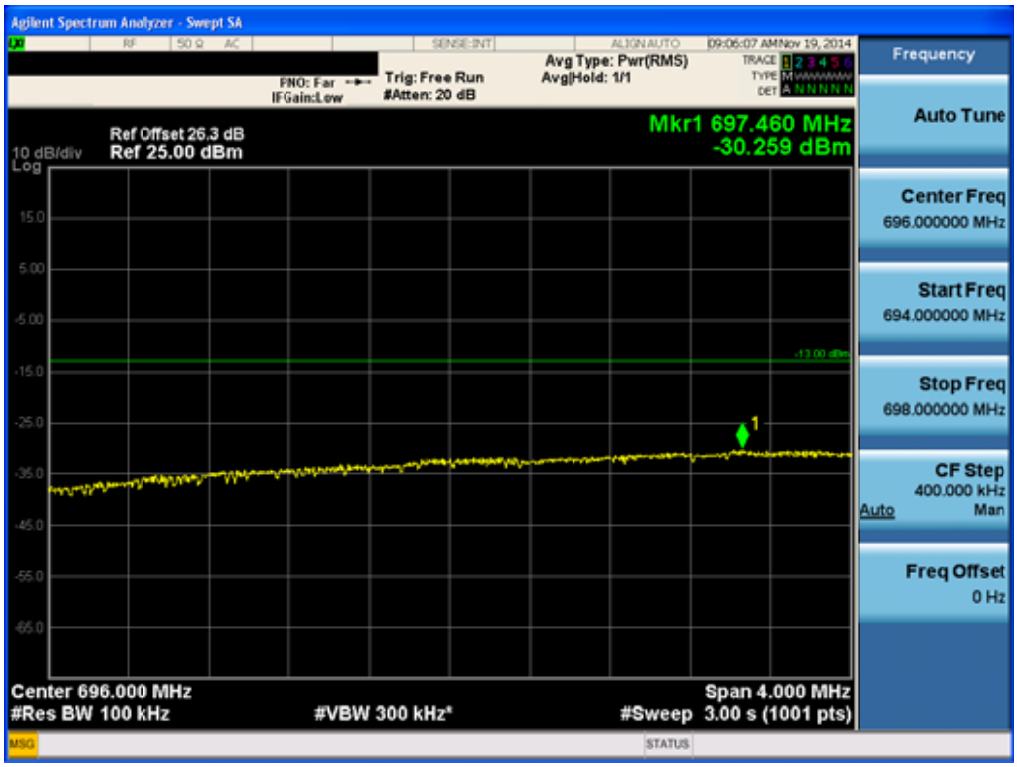

BAND 12. [Lower Band Edge] - 10M BW Ch.23060 QPSK RB (1, 0) -1



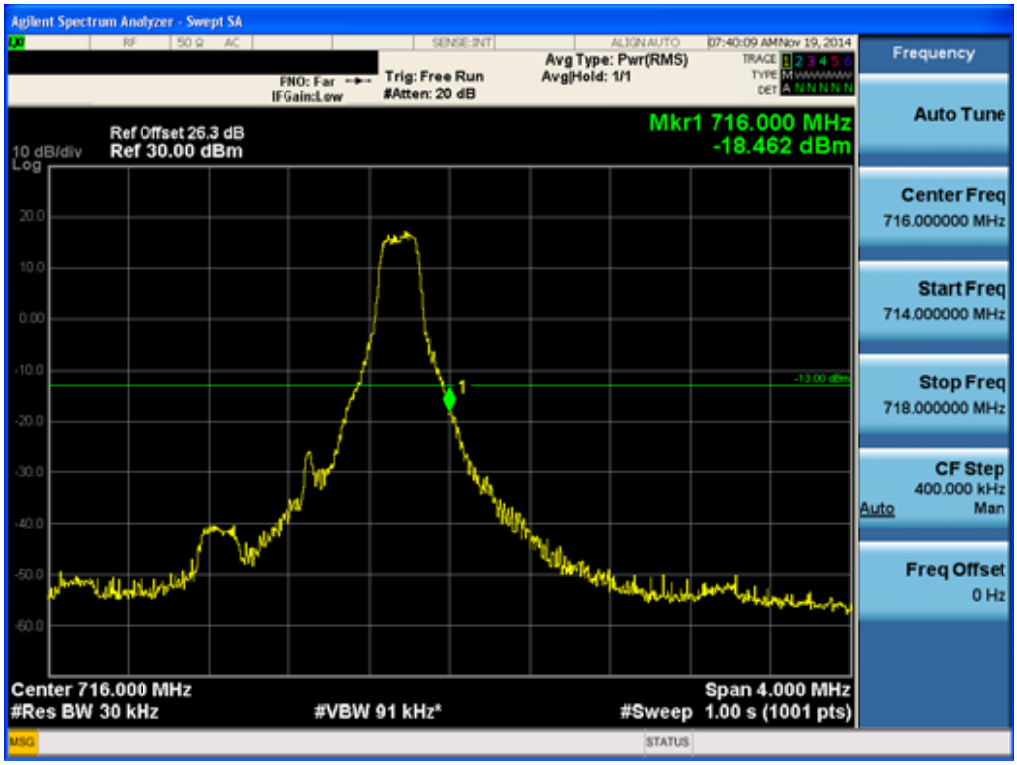
BAND 12. [Lower Band Edge] - 10M BW Ch.23060 QPSK RB (50, 0) -2



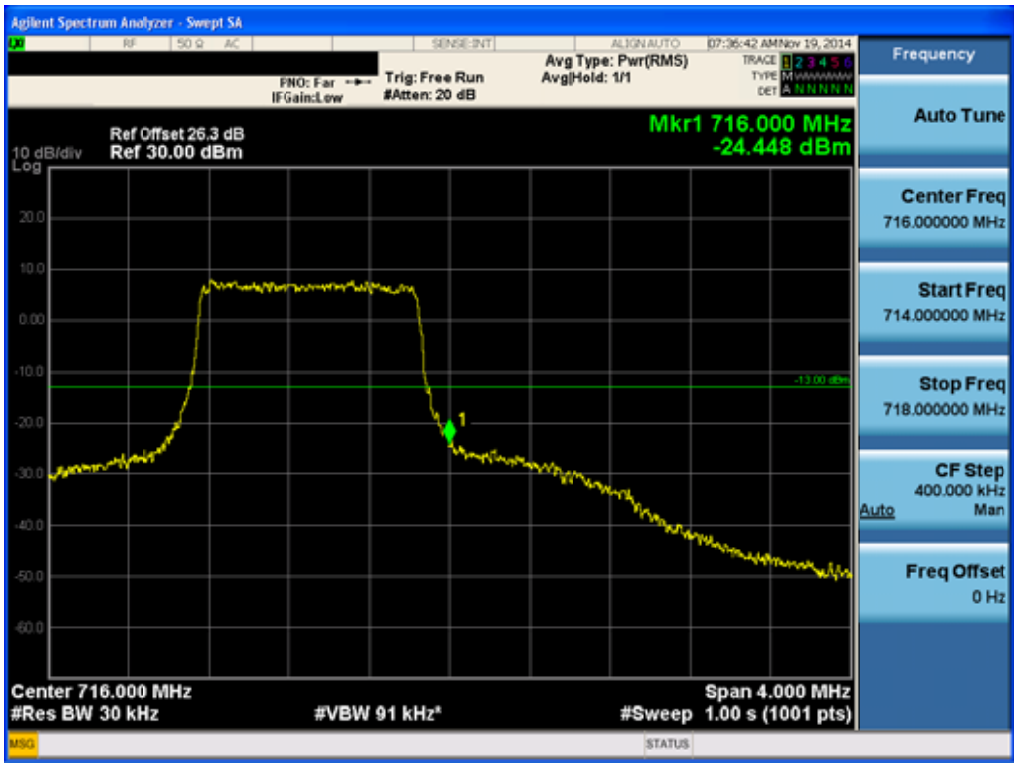

BAND 12. [Lower Extended Band Edge] - 10M BW Ch.23060 QPSK RB (50, 0) -3



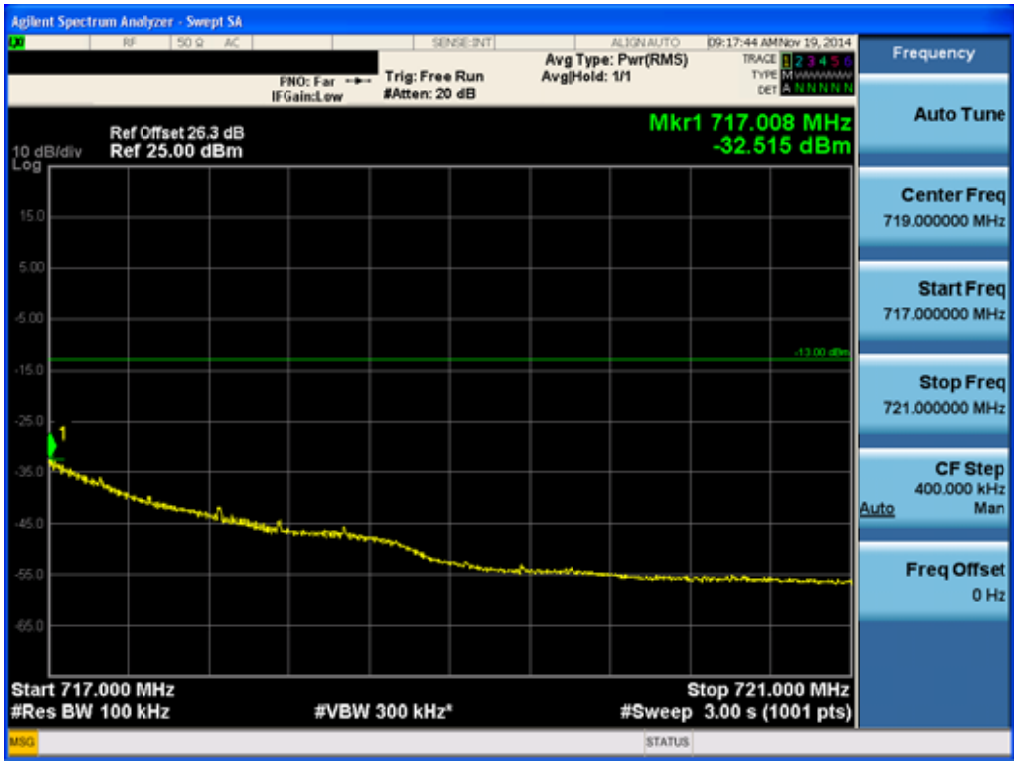
BAND 12. [Upper Band Edge] - 1.4M BW Ch.23173 QPSK RB (1, 5) -1



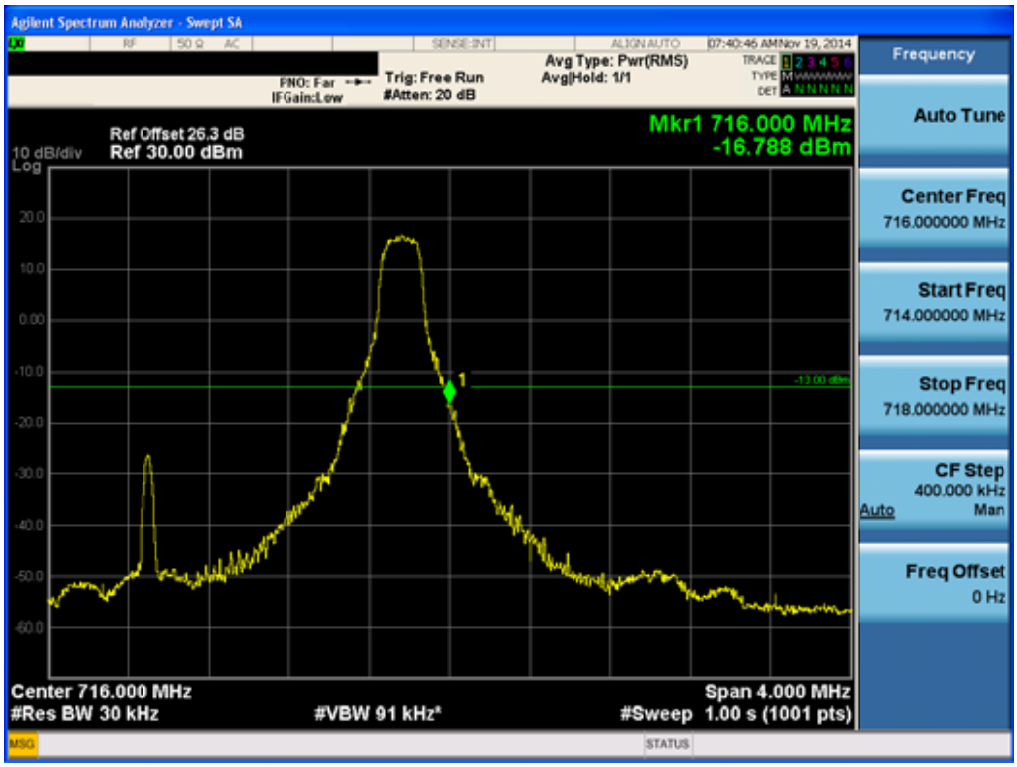

BAND 12. [Upper Band Edge] - 1.4M BW Ch.23173 QPSK RB (6, 0) -2



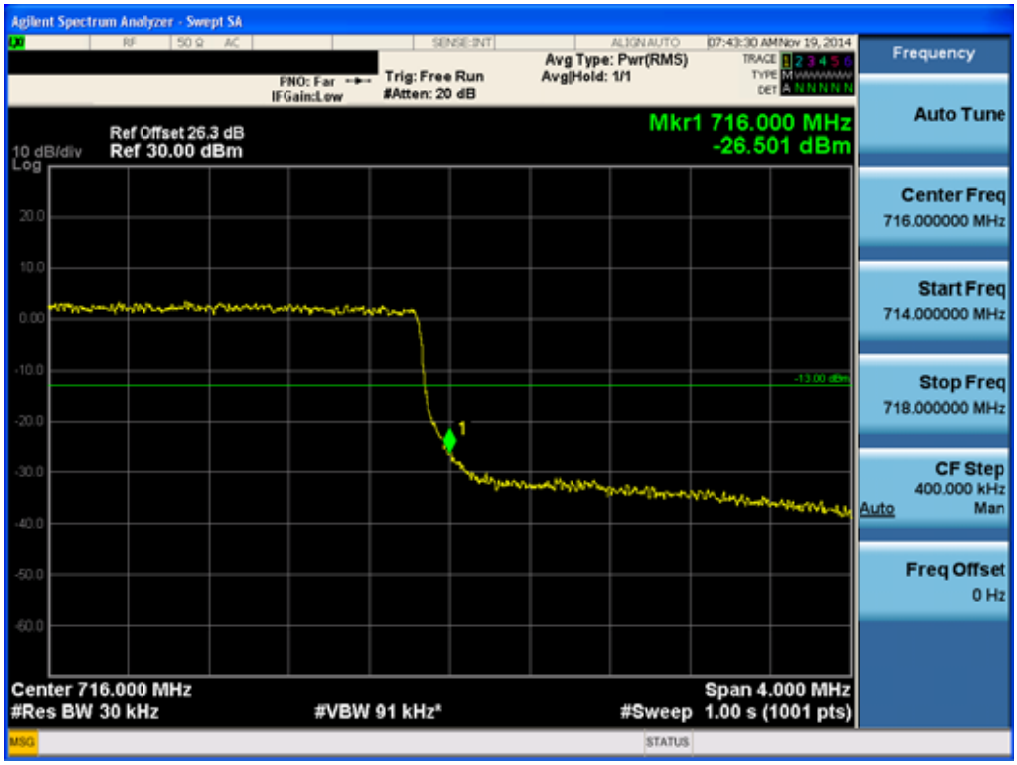
BAND 12. [Upper Extended Band Edge] - 1.4M BW Ch.23173 QPSK RB (1, 0) -3



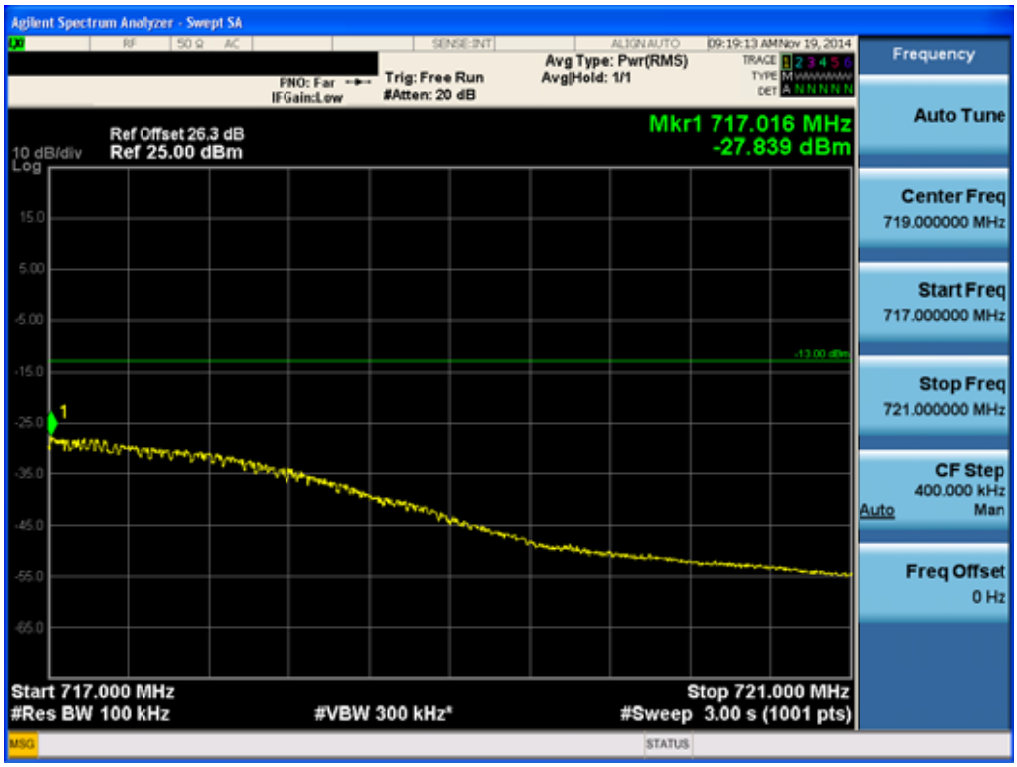

BAND 12. [Upper Band Edge] - 3M BW Ch.23165 QPSK RB (1, 14) -1



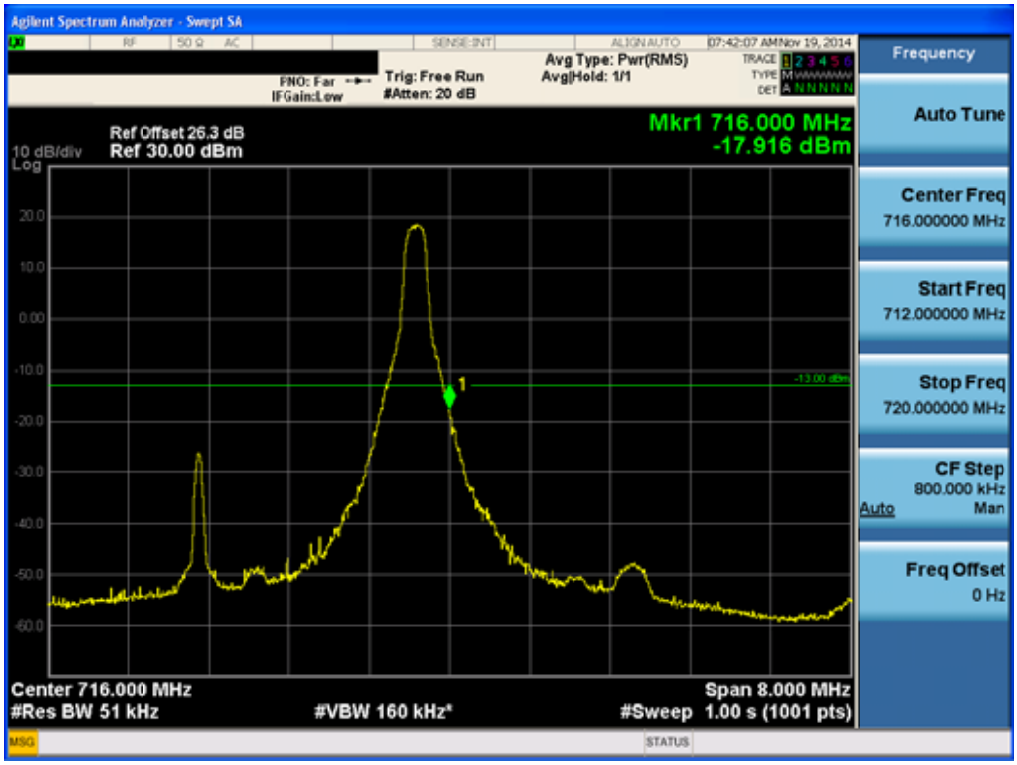
BAND 12. [Upper Band Edge] - 3M BW Ch.23165 QPSK RB (15, 0) -2



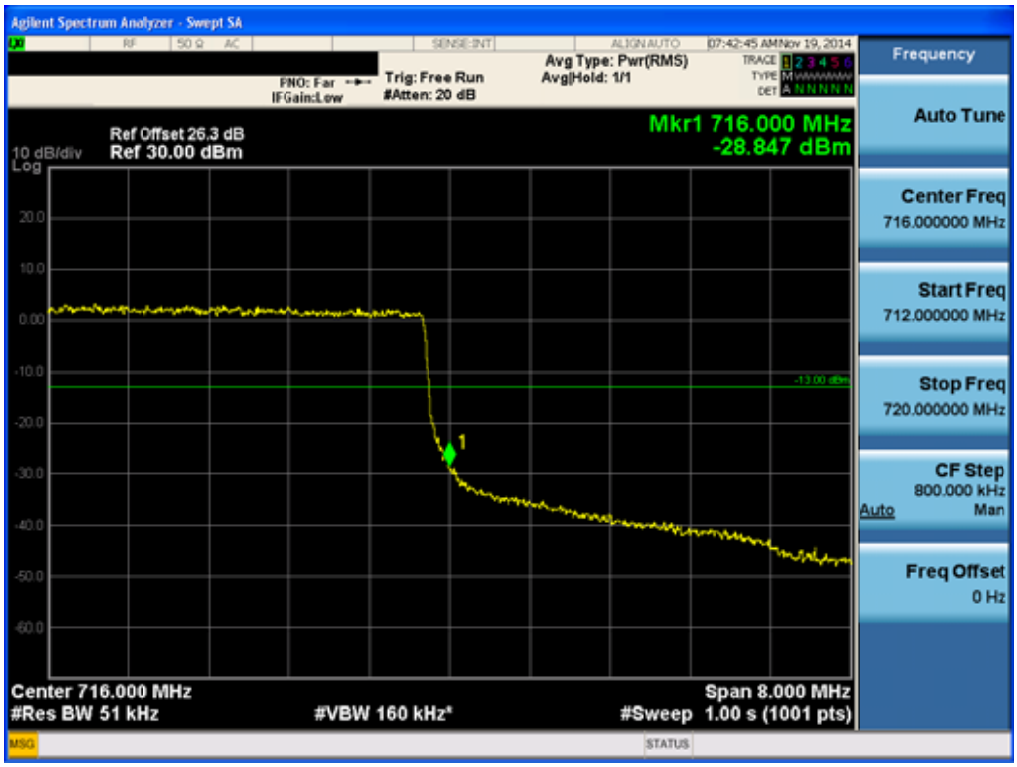

BAND 12. [Upper Extended Band Edge] - 3M BW Ch.23165 QPSK RB (15, 0) -3



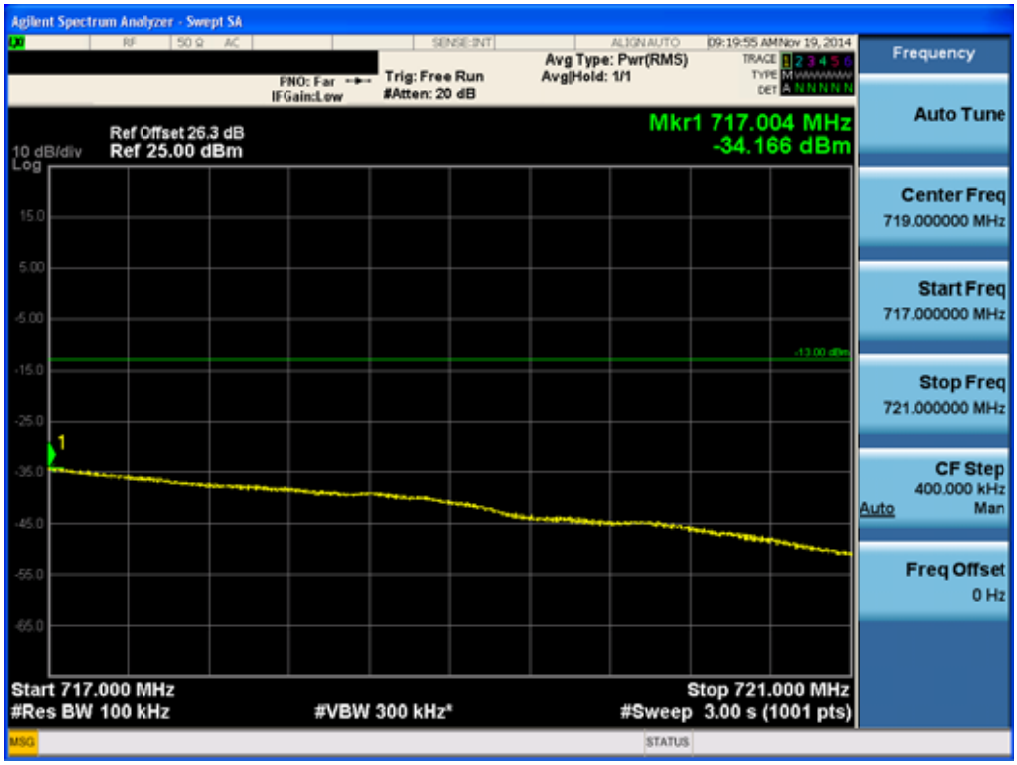
BAND 12. [Upper Band Edge] - 5M BW Ch.23155 QPSK RB (1, 24) -1



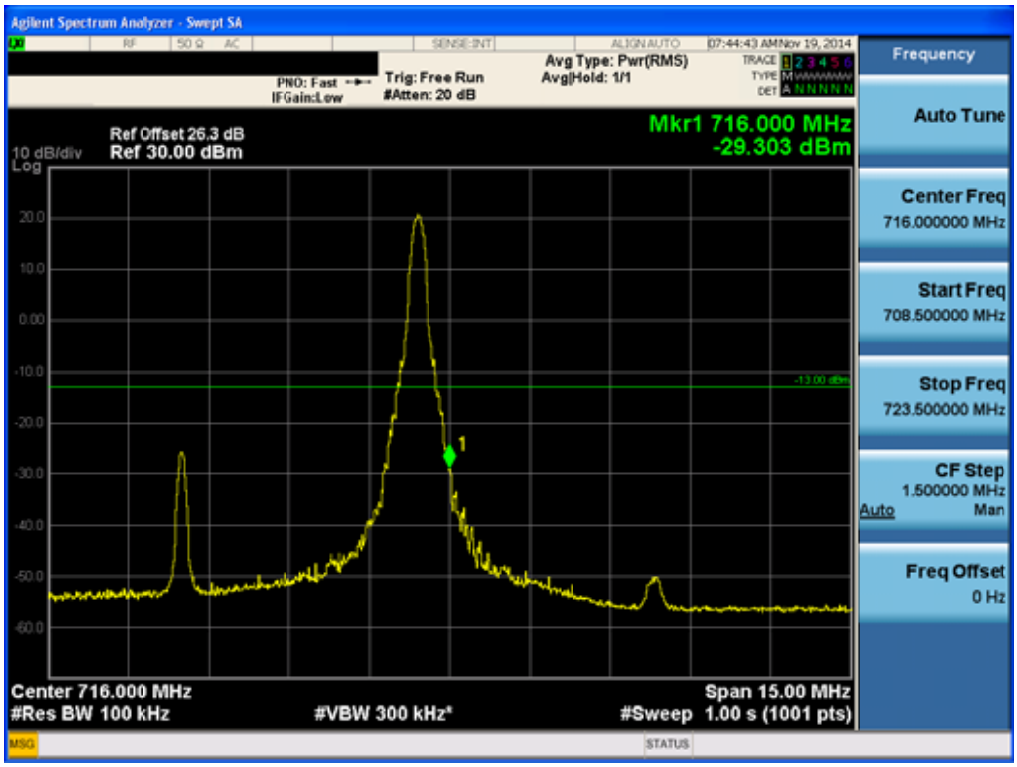

BAND 12. [Upper Band Edge] - 5M BW Ch.23155 QPSK RB (25, 0) -2



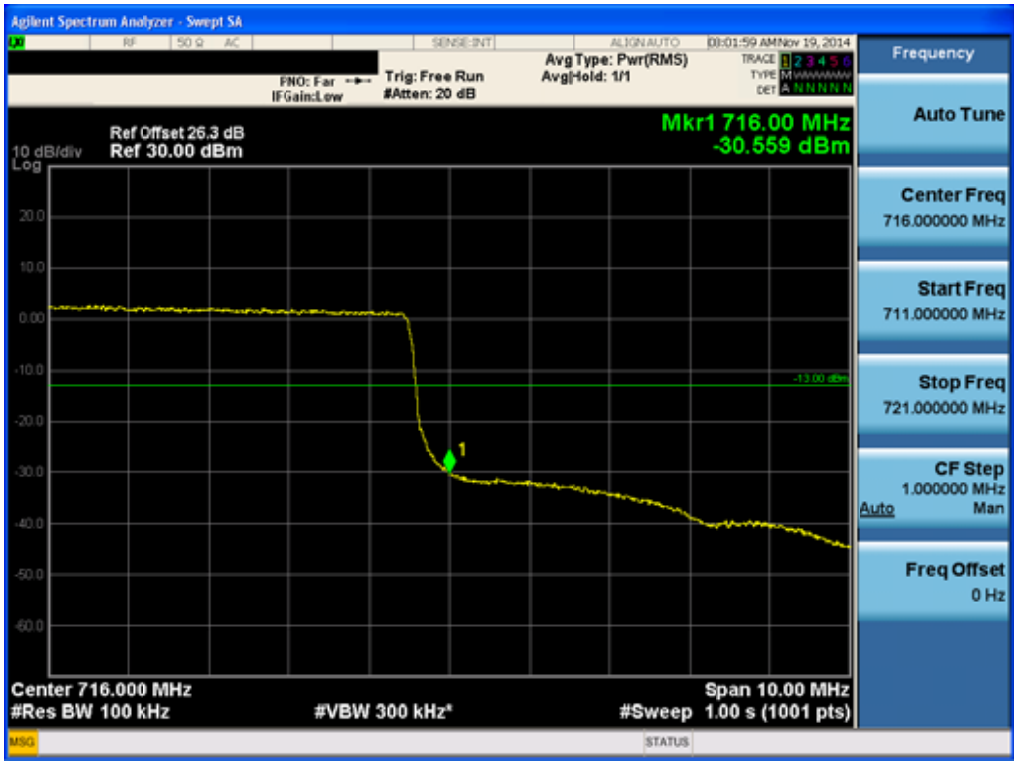
BAND 12. [Upper Extended Band Edge] - 5M BW Ch.23155 QPSK RB (25, 0) -3



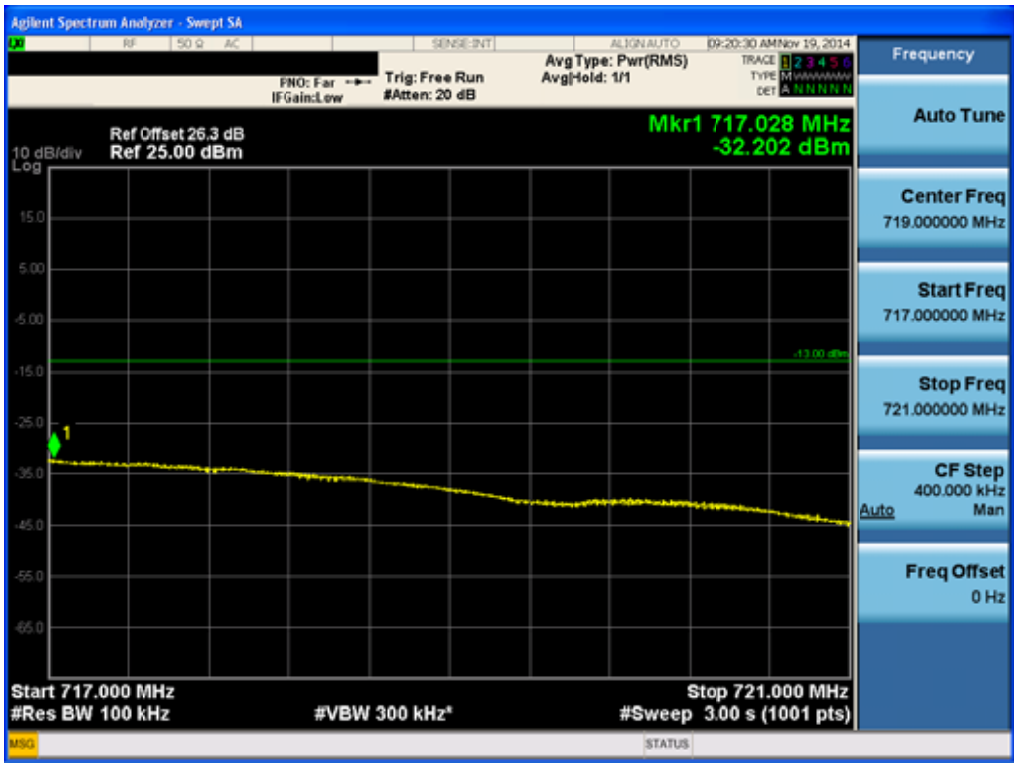

BAND 12. [Upper Band Edge] - 10M BW Ch.23130 QPSK RB (1, 49) -1



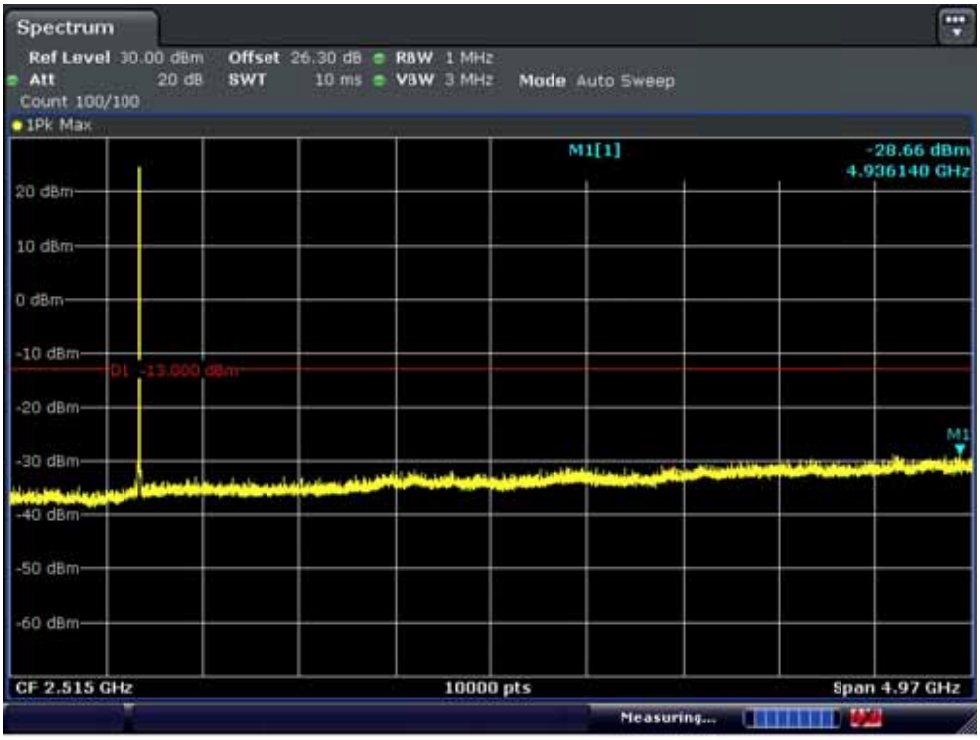
BAND 12. [Upper Band Edge] - 10M BW Ch.23130 QPSK RB (50, 0) -2



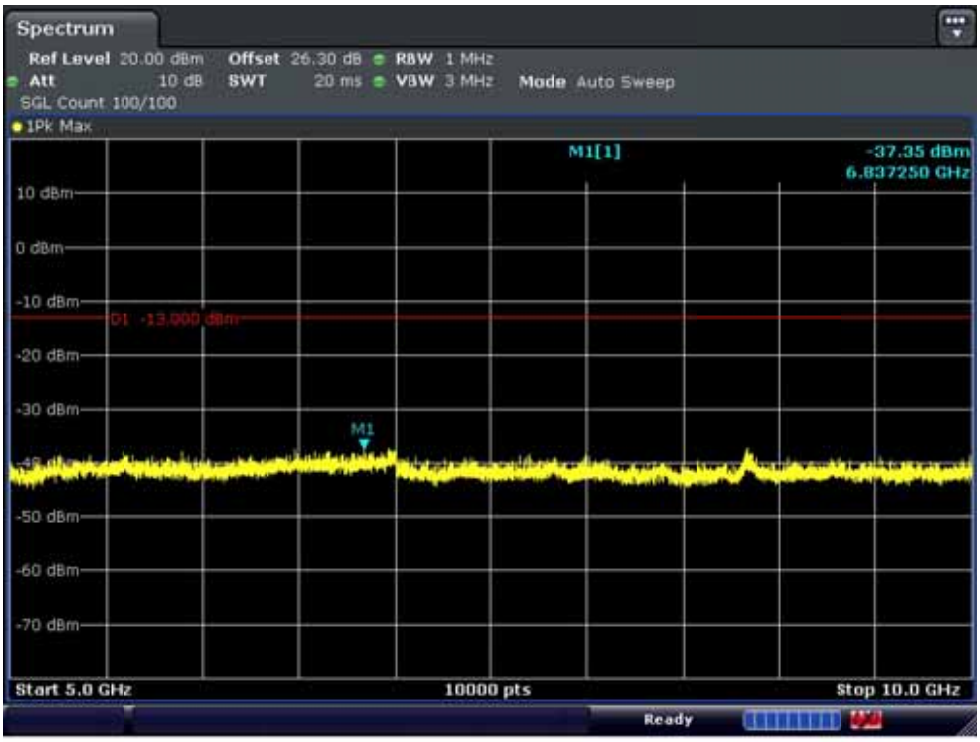

BAND 12. [Upper Extended Band Edge] - 10M BW Ch.23130 QPSK RB (50, 0) -3



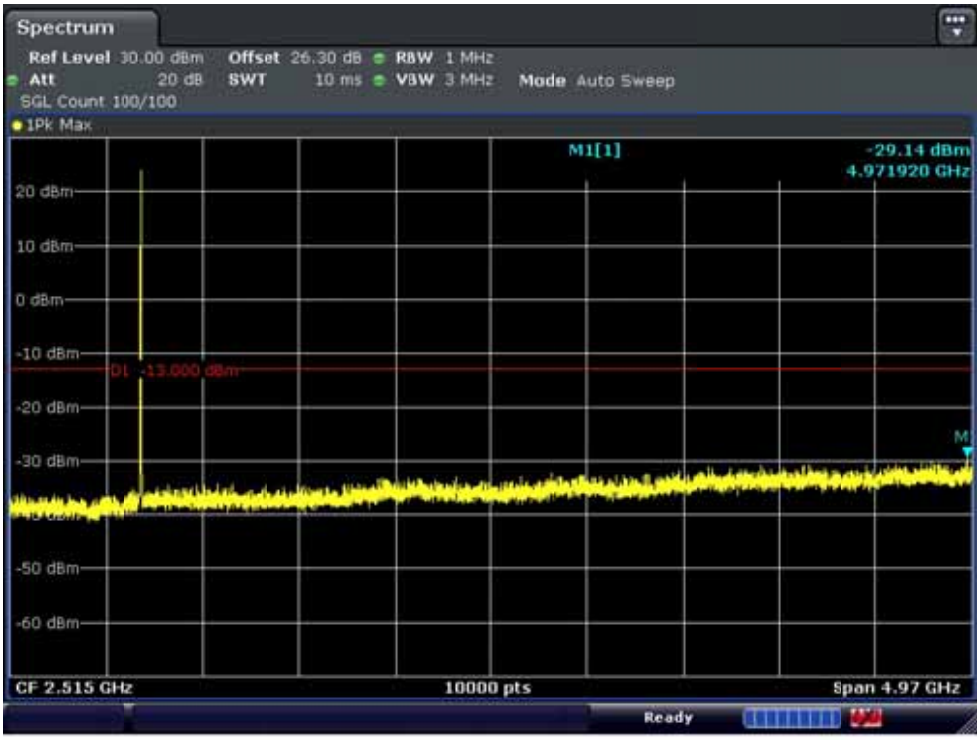
BAND 12. Conducted Spurious Plot_1 (23017ch_1.4MHz_QPSK_RB 1_0)



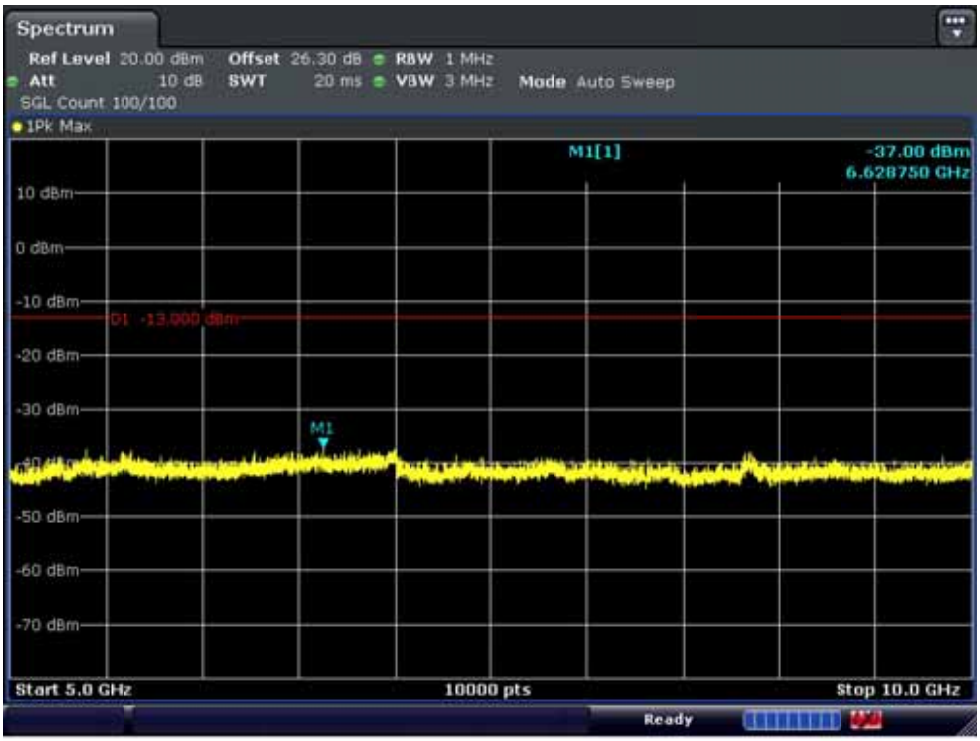

BAND 12. Conducted Spurious Plot_2 (23017ch_1.4MHz_QPSK_ RB 1_0)



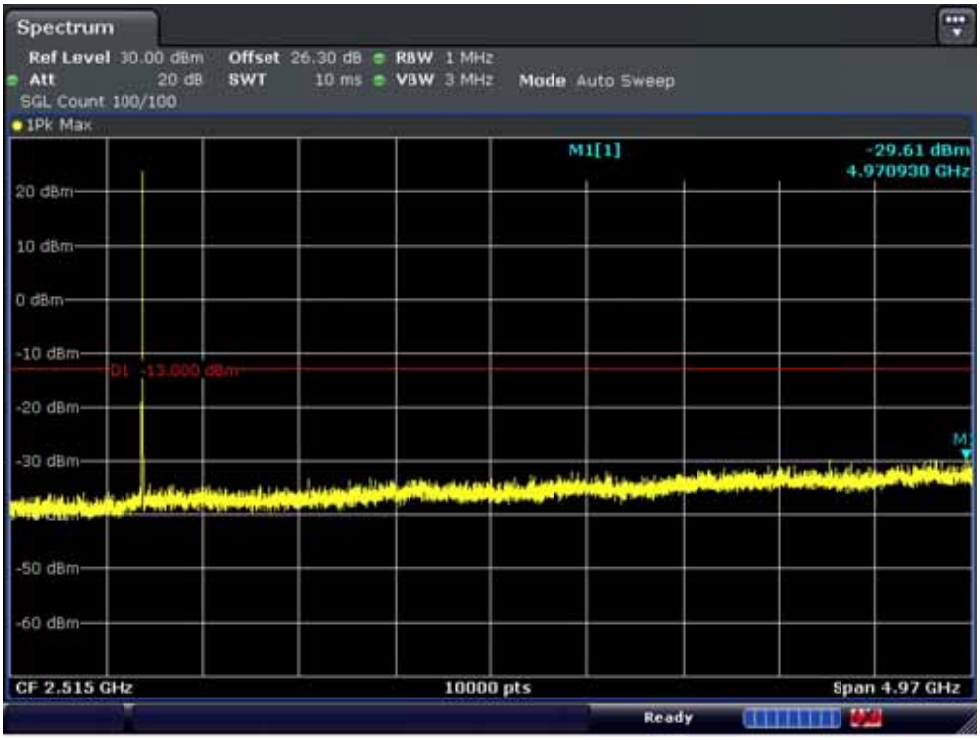
BAND 12. Conducted Spurious Plot_1 (23095ch_1.4MHz_QPSK_ RB 1_0)



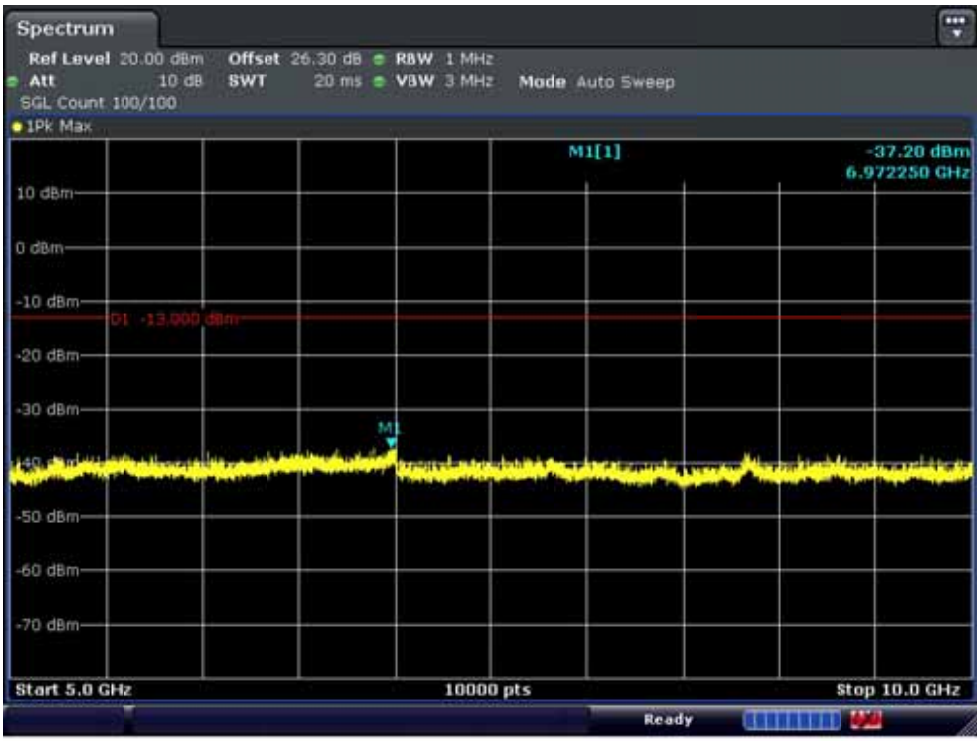

BAND 12. Conducted Spurious Plot_2 (23095ch_1.4MHz_QPSK_ RB 1_0)



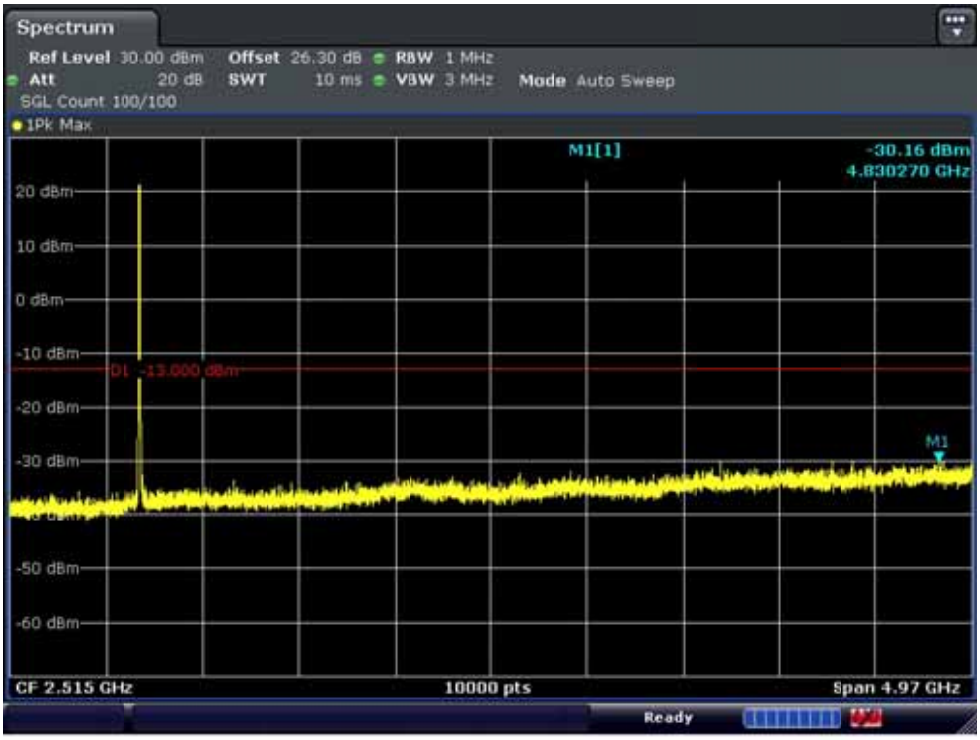
BAND 12. Conducted Spurious Plot_1 (23173ch_1.4MHz_QPSK_ RB 1_0)



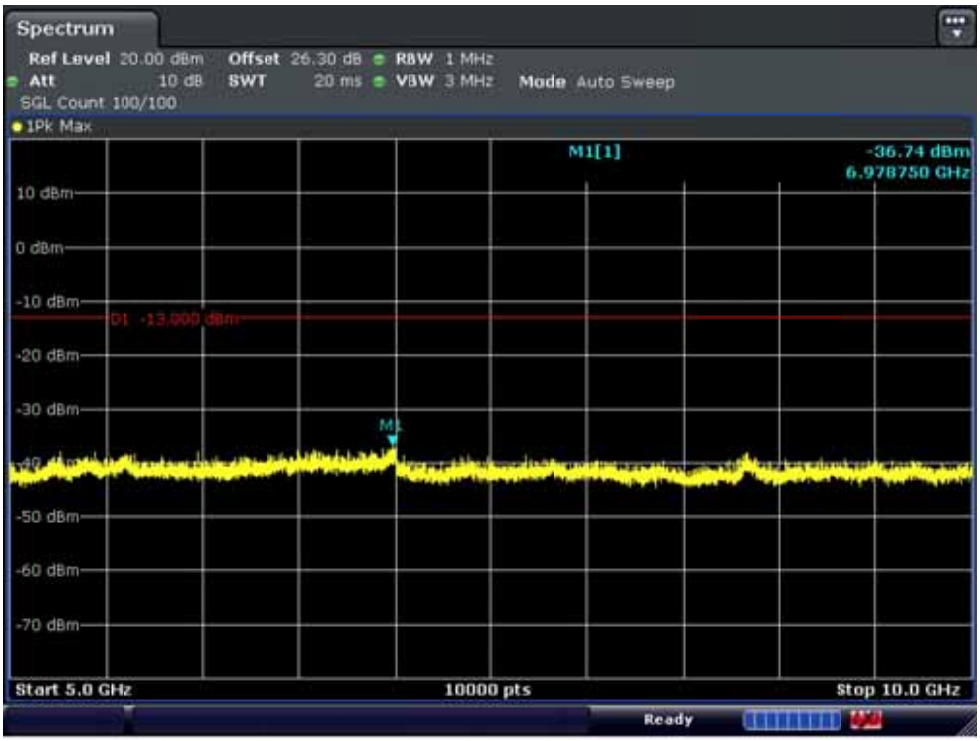

BAND 12 . Conducted Spurious Plot_2 (23173ch_1.4MHz_QPSK_ RB 1_0)



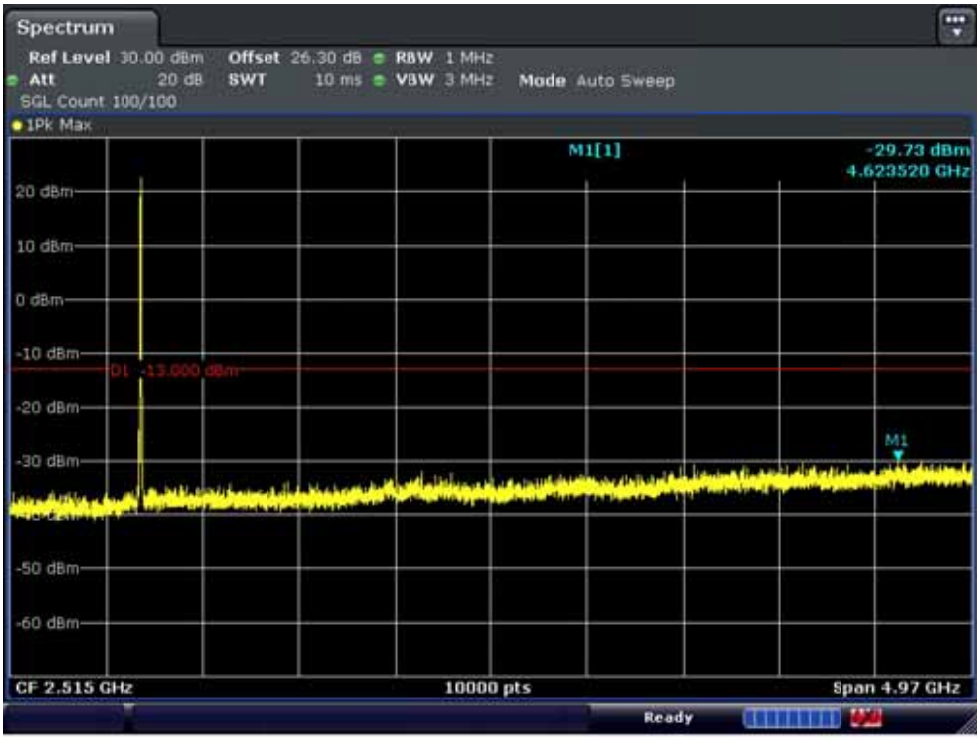
BAND 12. Conducted Spurious Plot_1 (23025ch_3MHz_QPSK_ RB 1_0)



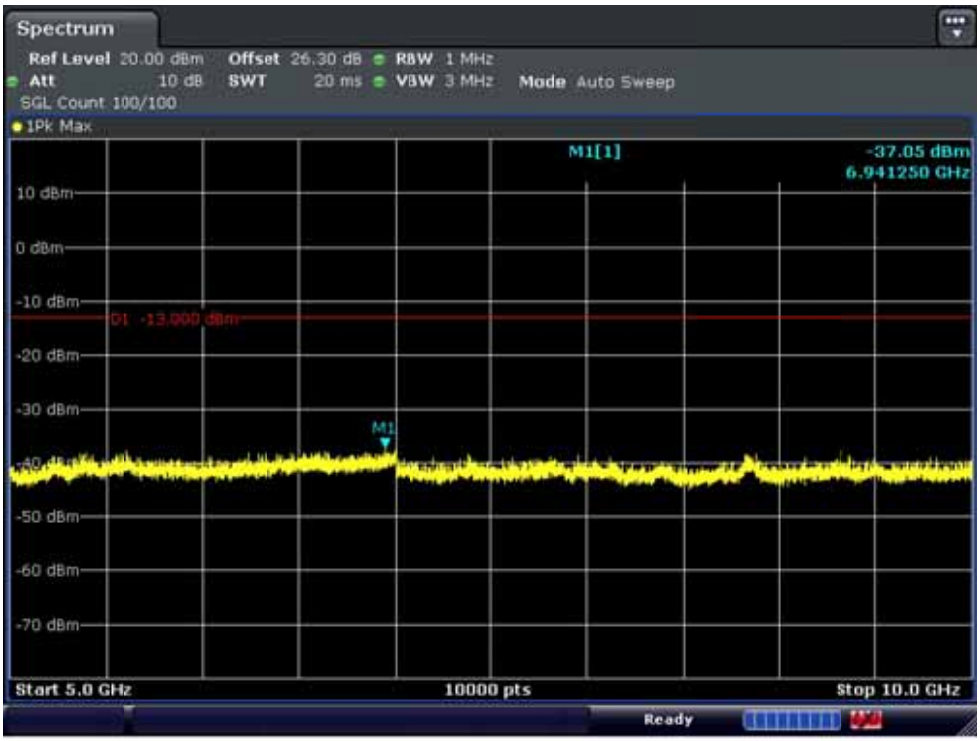

BAND 12. Conducted Spurious Plot_2 (23025ch_3MHz_QPSK_ RB 1_0)



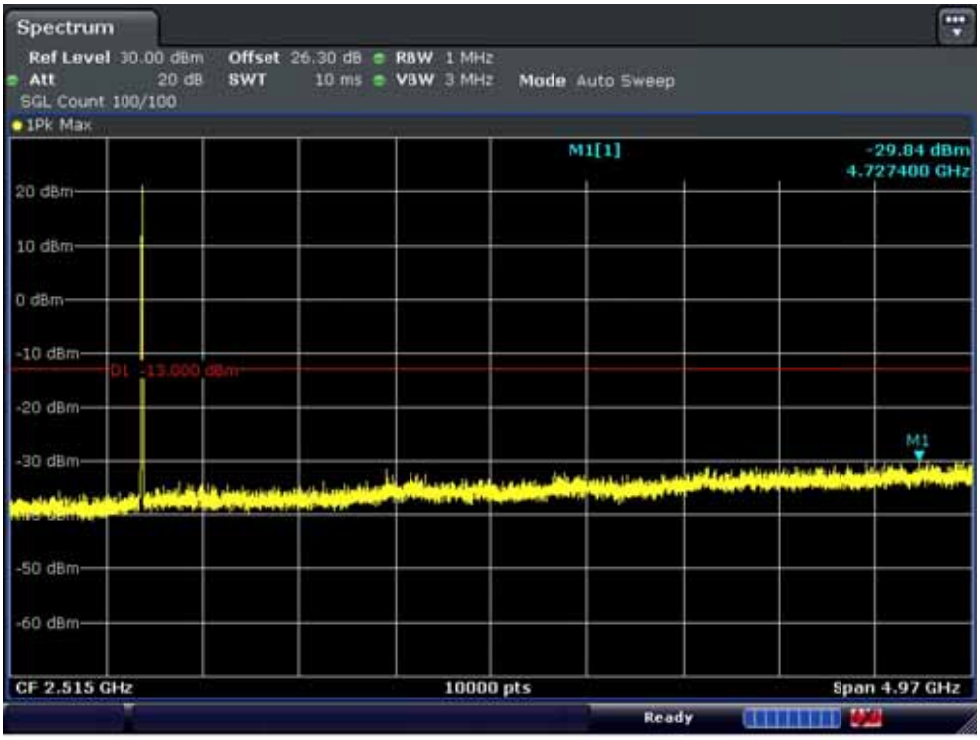
BAND 12. Conducted Spurious Plot_1 (23095ch_3MHz_QPSK_ RB 1_0)



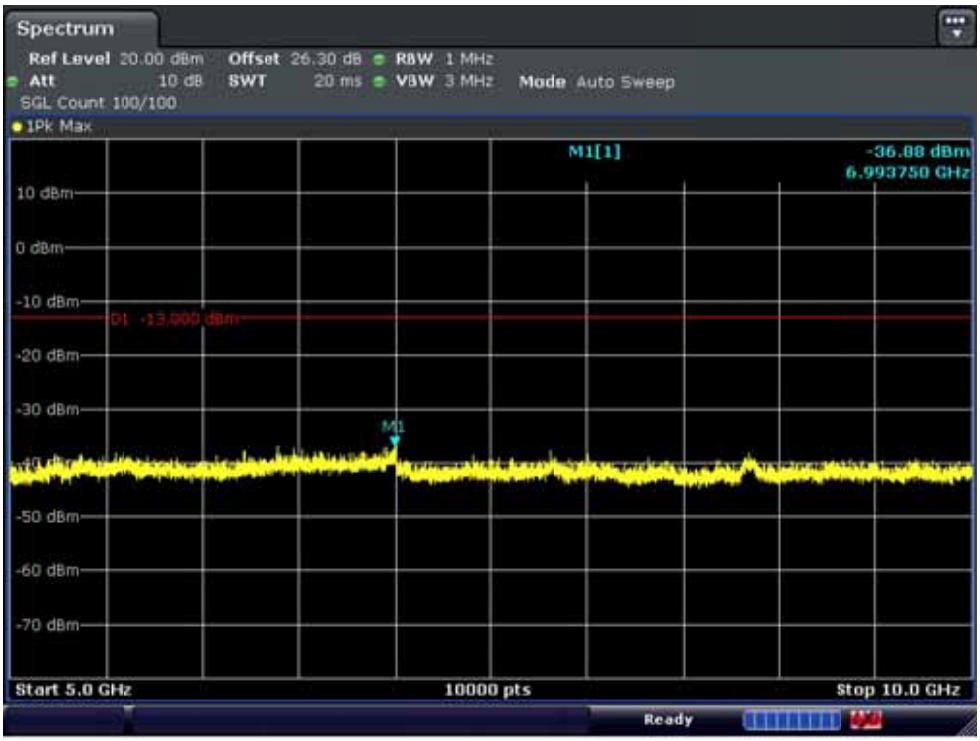

BAND 12. Conducted Spurious Plot_2 (23095ch_3MHz_QPSK_ RB 1_0)



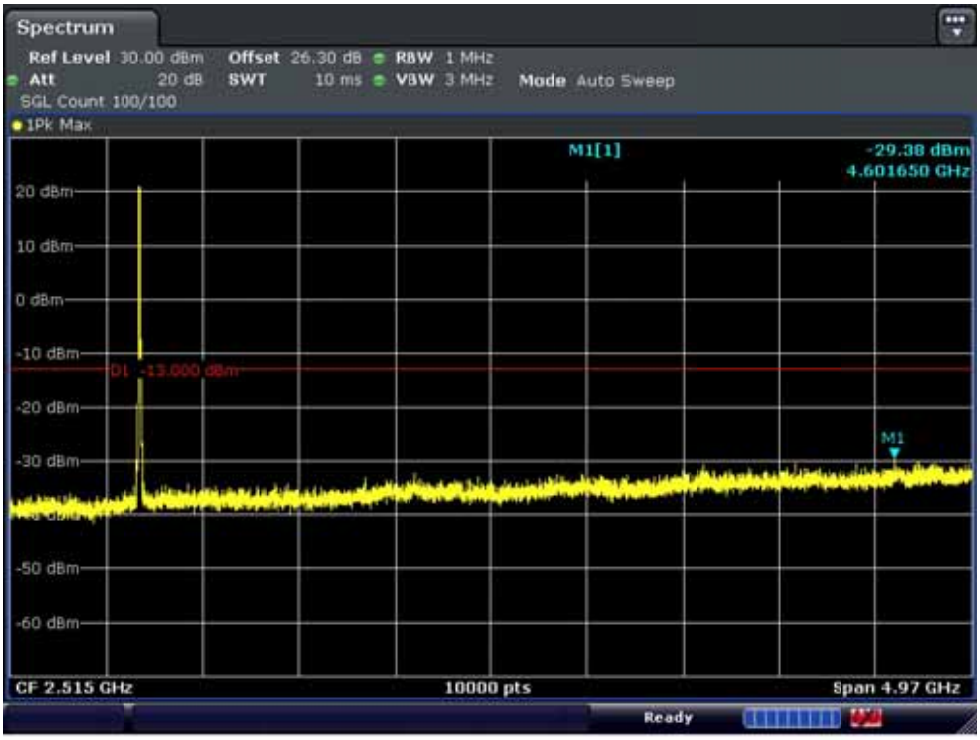
BAND 12. Conducted Spurious Plot_1 (23165ch_3MHz_QPSK_ RB 1_0)



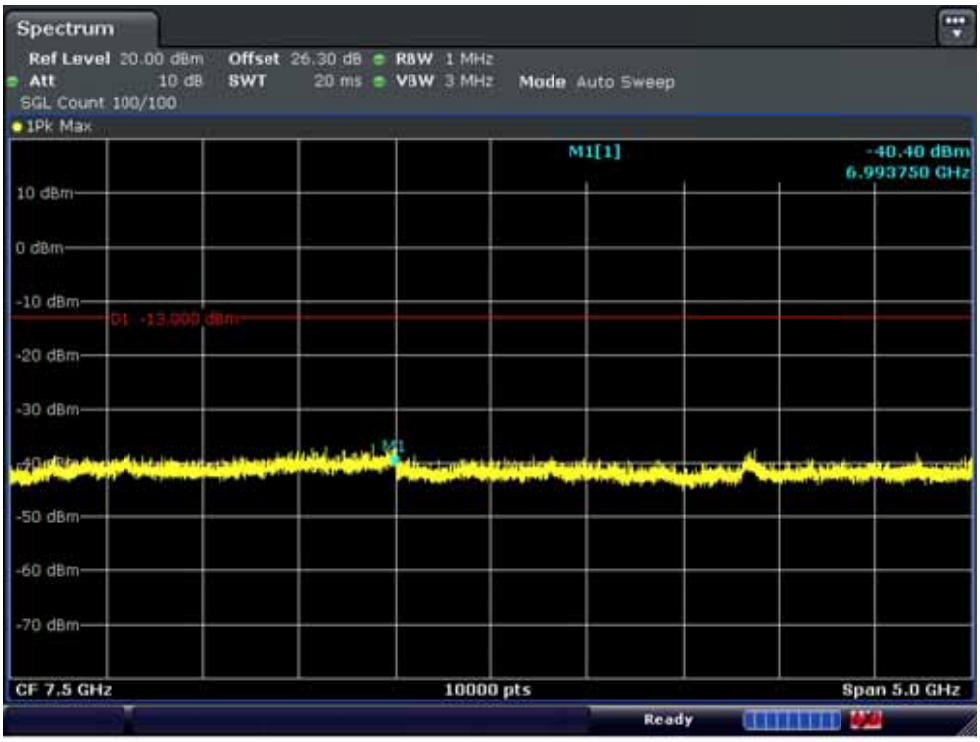

BAND 12. Conducted Spurious Plot_2 (23165ch_3MHz_QPSK_ RB 1_0)



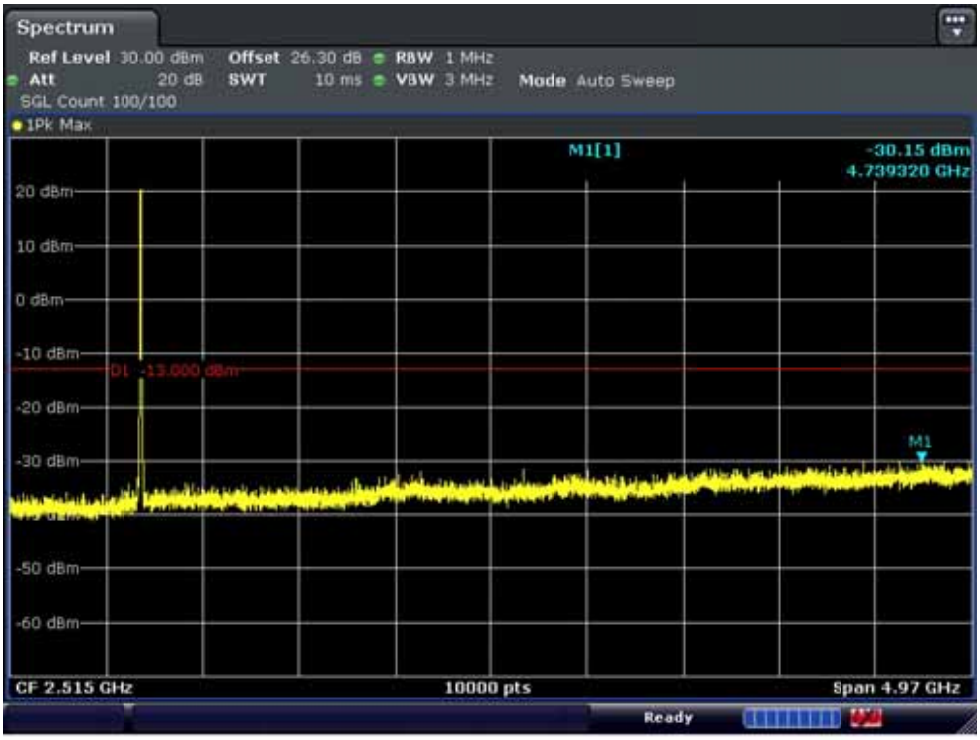
BAND 12. Conducted Spurious Plot_1 (23035ch_5MHz_QPSK_ RB 1_0)



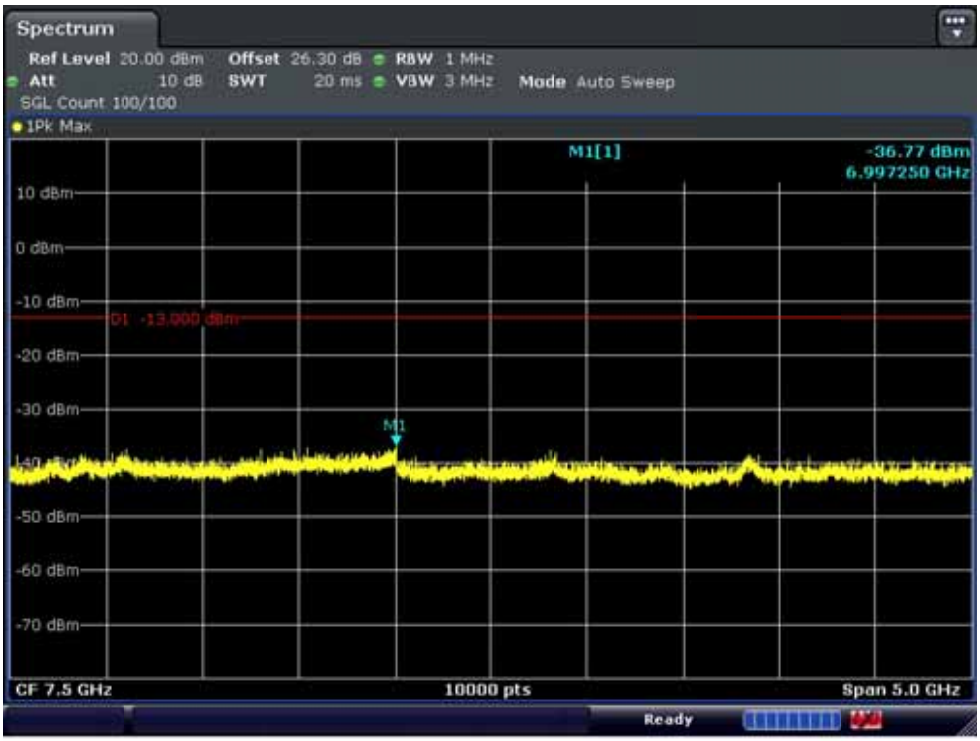

BAND 12. Conducted Spurious Plot_2 (23035ch_5MHz_QPSK_ RB 1_0)



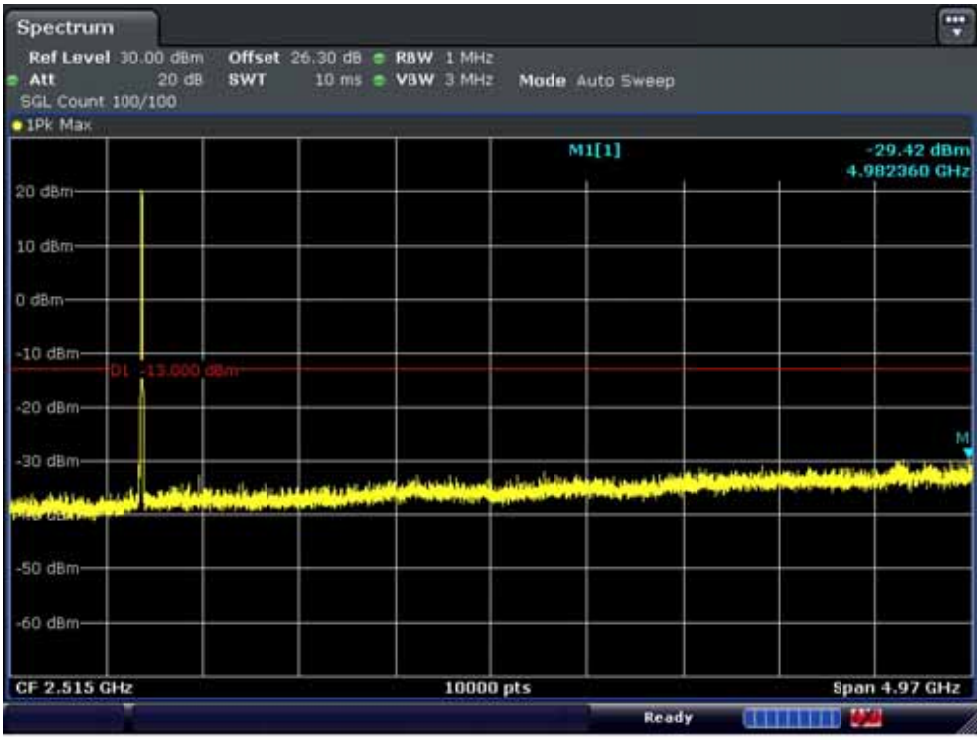
BAND 12. Conducted Spurious Plot_1 (23095ch_5MHz_QPSK_ RB 1_0)



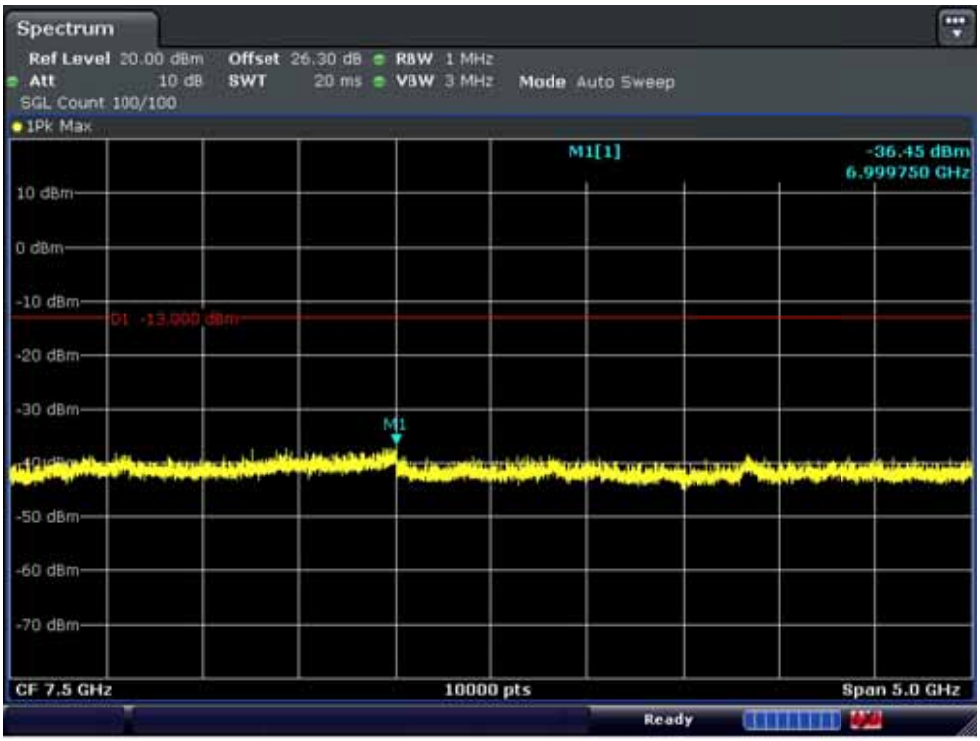

BAND 12. Conducted Spurious Plot_2 (23095ch_5MHz_QPSK_ RB 1_0)



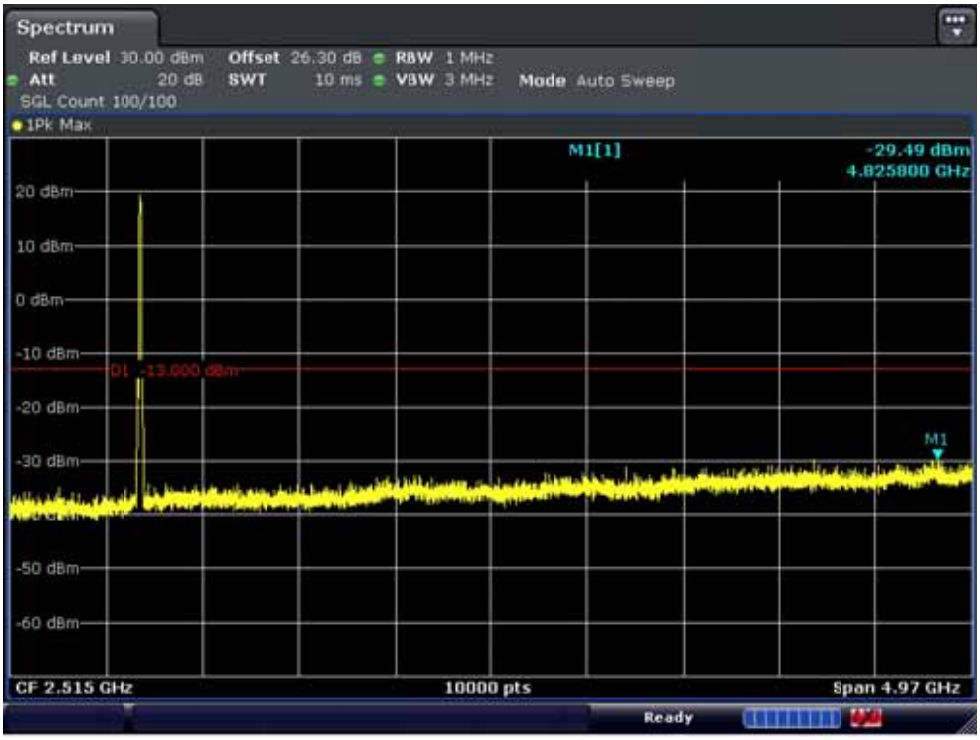
BAND 12. Conducted Spurious Plot_1 (23155ch_5MHz_QPSK_ RB 1_0)



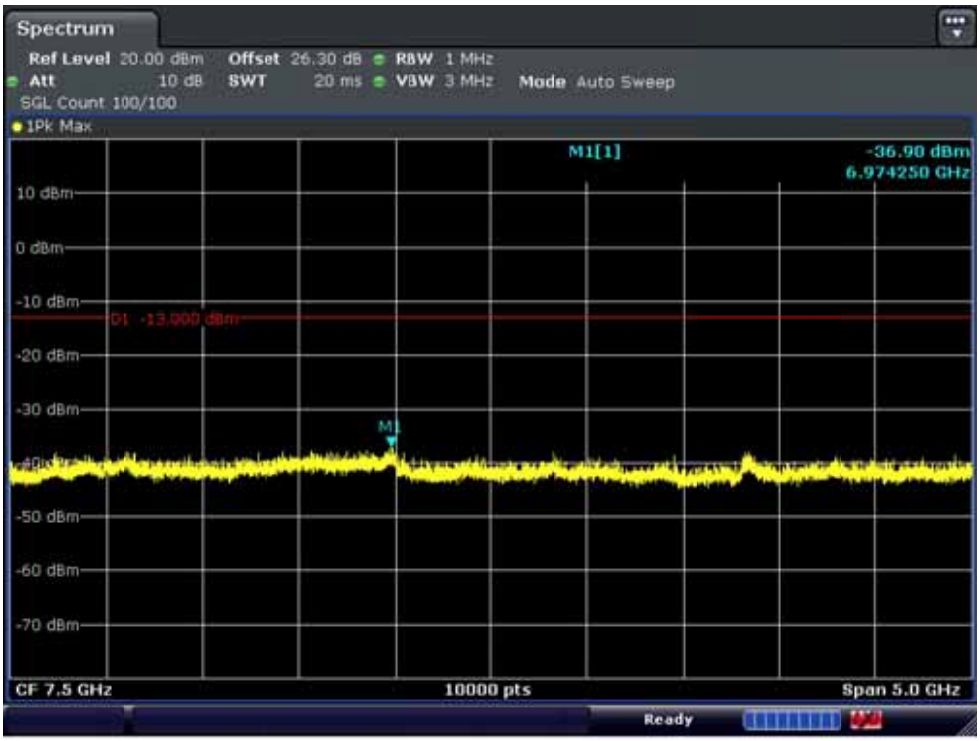

BAND 12 . Conducted Spurious Plot_2 (23155ch_5MHz_QPSK_ RB 1_0)



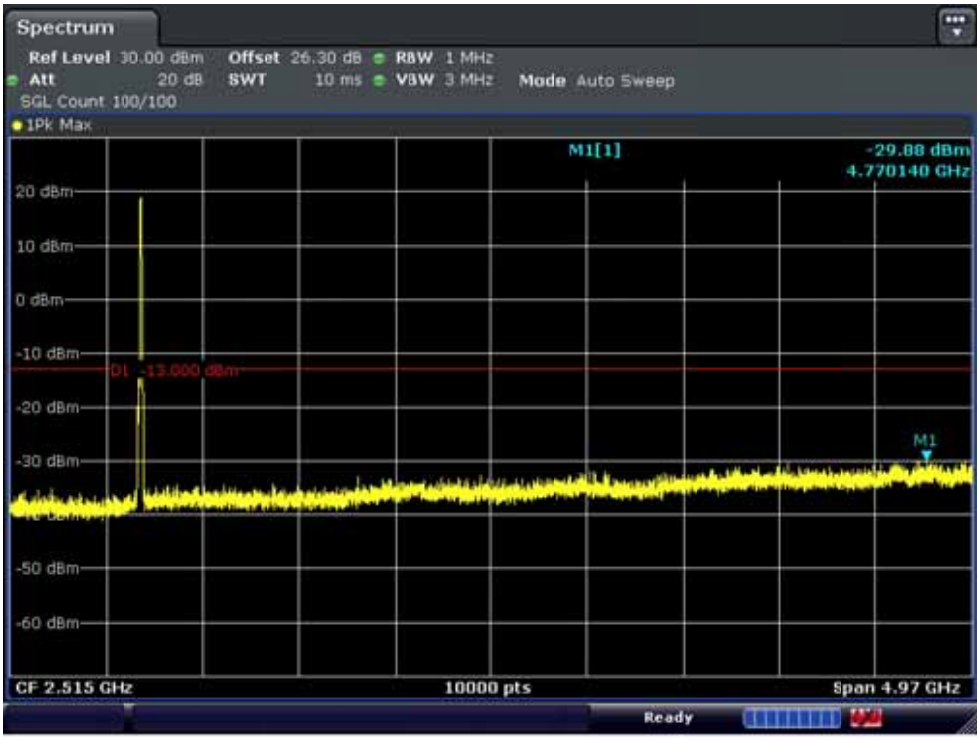
BAND 12. Conducted Spurious Plot_1 (23060ch_10MHz_QPSK_ RB 1_0)



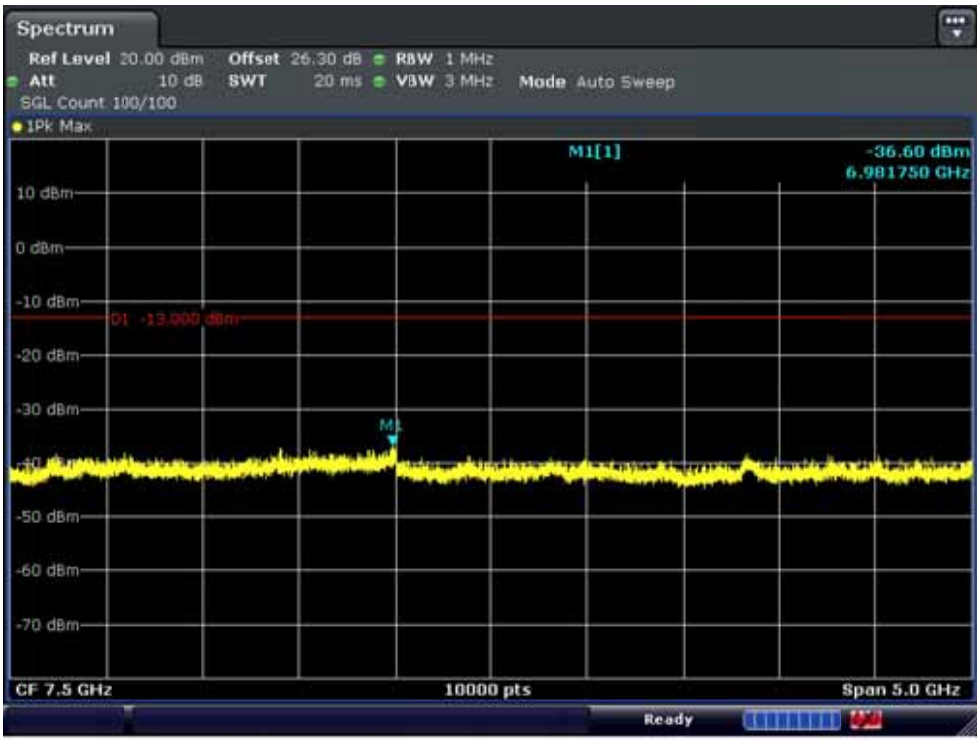

BAND 12. Conducted Spurious Plot_2 (23060ch_10MHz_QPSK_ RB 1_0)



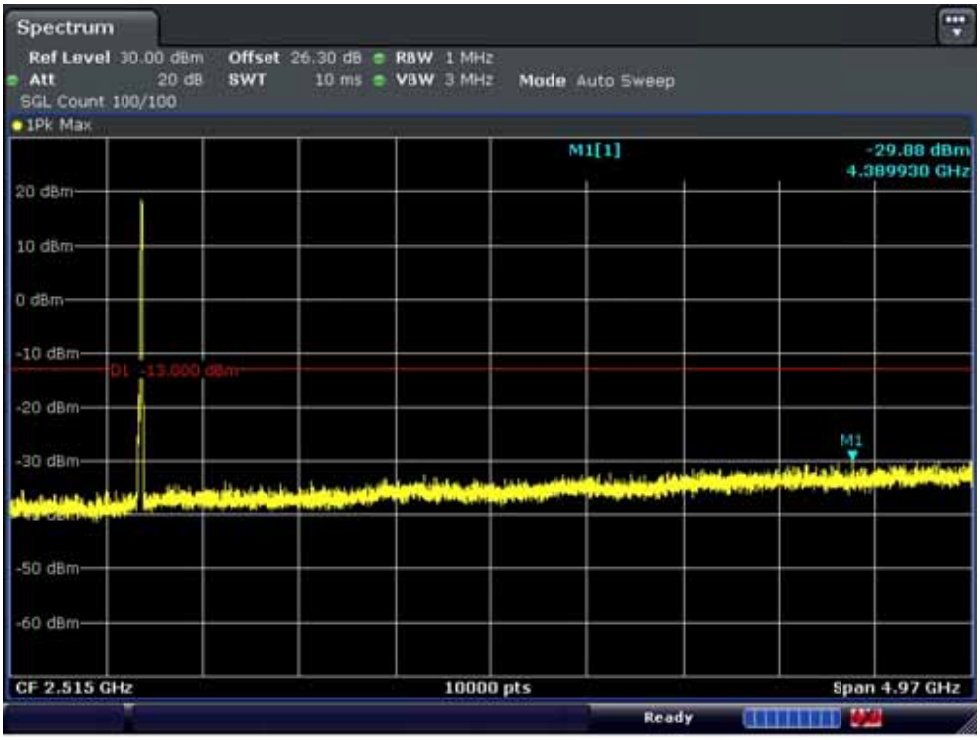
BAND 12. Conducted Spurious Plot_1 (23095ch_10MHz_QPSK_ RB 1_0)




BAND 12. Conducted Spurious Plot_2 (23095ch_10MHz_QPSK_ RB 1_0)



BAND 12. Conducted Spurious Plot_1 (23130ch_10MHz_QPSK_ RB 1_0)




BAND 12. Conducted Spurious Plot_2 (23130ch_10MHz_QPSK_ RB 1_0)