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74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea
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REPORT

FCC Certification

Applicant Name:
Franklin Technology Inc.

Address:
906 JEI Platz, 459-11, Gasan-dong, Gumcheon-gu, Seoul, 152-803 South Korea

Date of Issue:
October 17, 2014

Location:
HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, Korea

Test Report No.: HCT-R-1410-F009

HCT FRN: 0005866421

FCC ID:	**XHG-R800**
APPLICANT:	**Franklin Technology Inc.**

FCC Model(s):	MHS800L	
EUT Type:	Mobile Router	
FCC Classification:	PCS Licensed Transmitter (PCB)	
FCC Rule Part(s):	§2 , §27	
Tx Frequency:	1712.5 MHz – 1752.5 MHz (LTE – Band 4) 779.5 MHz – 784.5 MHz (LTE–Band 13)	
Max. RF Output Power:	Band 4 (5 MHz) :	0.424 W (QPSK) (26.27 dBm) 0.403 W (16-QAM) (26.05 dBm)
	Band 4 (10 MHz) :	0.378 W (QPSK) (25.77 dBm) 0.385 W (16-QAM) (25.85 dBm)
	Band 4 (15 MHz) :	0.328 W (QPSK) (25.16 dBm) 0.321 W (16-QAM) (25.07 dBm)
	Band 4 (20 MHz) :	0.397 W (QPSK) (25.99 dBm) 0.365 W (16-QAM) (25.62 dBm)
	Band 13 (5 MHz) :	0.301 W (QPSK) (24.78 dBm) 0.247 W (16-QAM) (23.92 dBm)
	Band 13 (10 MHz) :	0.262 W (QPSK) (24.19 dBm) 0.220 W (16-QAM) (23.42 dBm)
Emission Designator(s):	Band 4 (5 MHz) :	4M52G7D (QPSK) / 4M53W7D (16-QAM)
	Band 4 (10 MHz) :	9M01G7D (QPSK) / 9M02W7D (16-QAM)
	Band 4 (15 MHz) :	13M5G7D (QPSK) / 13M5W7D (16-QAM)
	Band 4 (20 MHz) :	18M0G7D (QPSK) / 18M0W7D (16-QAM)
	Band 13 (5 MHz) :	4M52G7D (QPSK) / 4M53W7D (16-QAM)
	Band 13 (10 MHz) :	9M03G7D (QPSK) / 9M02W7D (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 Soo Kang
Test engineer of RF Team

Approved by
: Chang Seok Choi
Manager of RF Team

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1410-F009	October 17, 2014	- First Approval Report

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	Franklin Technology Inc.
Address:	906 JEI Platz, 459-11, Gasan-dong, Gumcheon-gu, Seoul, 152-803 South Korea
FCC ID:	XHG-R800
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	Band 13 (5 MHz) : 4M52G7D (QPSK) / 4M53W7D (16-QAM)
	Band 13 (10 MHz) : 9M03G7D (QPSK) / 9M02W7D (16-QAM)
Date(s) of Tests:	October 08, 2014 ~ October 16, 2014
Antenna Specification	Manufacturer: KWANG HYUN AIRTECH CO.,LTD Antenna type: PIFA Antenna Peak Gain: Band 4: 0.3 dBi Band 13: -2.2 dBi

2. INTRODUCTION

2.1. EUT DESCRIPTION

The Franklin Technology Inc. MHS800L Mobile Router consists of LTE 4 and 13.

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 ERP/EIRP RADIATED POWER AND RADIATED SPURIOUS EMISSIONS

Note: ERP(Effective Radiated Power), EIRP(Effective Isotropic 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.

The maximum EIRP 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

Radiated spurious emissions

: Frequency Range : 30 MHz ~ 10th Harmonics of highest channel fundamental frequency.

3.2 PEAK-AVERAGE RATIO.

Test Procedure

Peak to Average Power Ratio is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r01, June 7, 2013, Section 5.7.

- Section 5.7.1 CCDF Procedure

a) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
b) Set the number of counts to a value that stabilizes the measured CCDF curve;
c) Set the measurement interval as follows:
   1) for continuous transmissions, set to 1 ms,
   2) for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
d) Record the maximum PAPR level associated with a probability of 0.1%.

- Section 5.7.2 Alternate Procedure

Use one of the procedures presented in 5.1 to measure the total peak power and record as P_{Pk}. Use one of the applicable procedures presented 5.2 to measure the total average power and record as P_{Avg}. Determine the P.A.R. from: $P.A.R_{(dB)} = P_{Pk\ (dBm)} - P_{Avg\ (dBm)}$ (P_{Avg} = Average Power + Duty cycle Factor)

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.

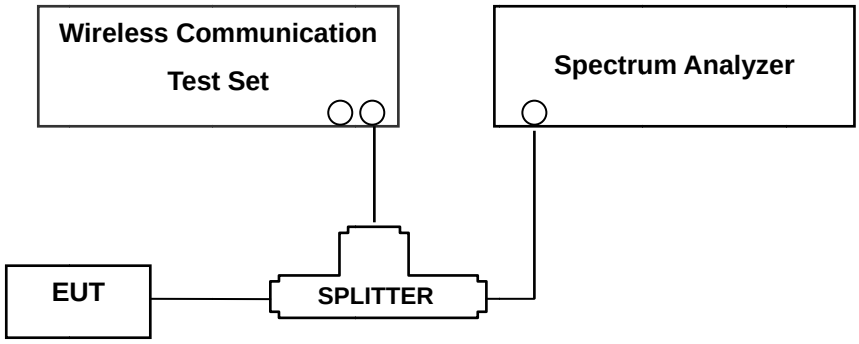
i) Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the 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 v02r01, June 7, 2013, 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 (775 – 788 MHz)

§27.5(b)

746-758 MHz, 775-788 MHz, and 805-806 MHz bands. The following frequencies are available for licensing pursuant to this part in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands:

(1) Two paired channels of 1 megahertz each are available for assignment in Block A in the 757-758 MHz and 787-788 MHz bands.

(2) Two paired channels of 1 megahertz each are available for assignment in Block B in the 775-776 MHz and 805-806 MHz bands.

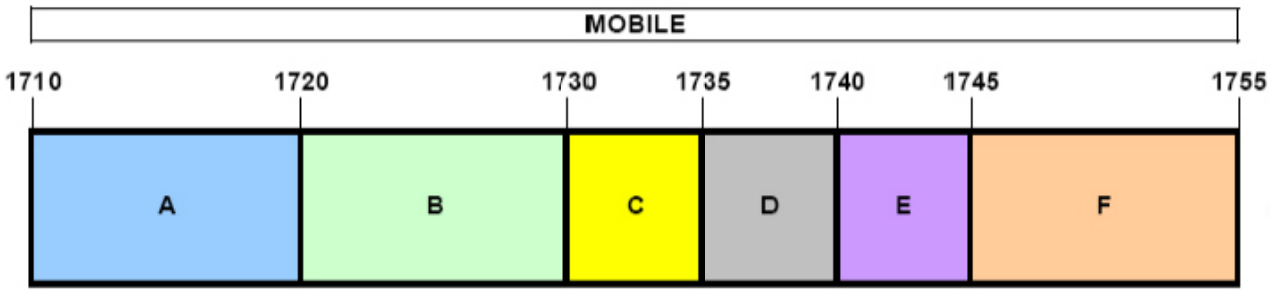
(3) Two paired channels of 11 megahertz each are available for assignment in Block C in the 746-757 MHz and 776-787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results do not satisfy the applicable reserve price, the spectrum in the 746-757 MHz and 776-787 MHz bands will instead be made available for assignment at a subsequent auction as follows:

(i) Two paired channels of 6 megahertz each available for assignment in Block C1 in the 746-752 MHz and 776-782 MHz bands.

(ii) Two paired channels of 5 megahertz each available for assignment in Block C2 in the 752-757 MHz and 782-787 MHz band.

3.5 AWS – MOBILE FREQUENCY BLOCKS (1710 – 1755 MHz)

§27.5(h)



BLOCK 1: 1710 – 1720 MHz (A)
BLOCK 2: 1720 – 1730 MHz (B)
BLOCK 3: 1730 – 1735 MHz (C)
BLOCK 4: 1735 – 1740 MHz (D)
BLOCK 5: 1740 – 1745 MHz (E)
BLOCK 6: 1745 – 1755 MHz (F)

3.6 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 v02r01, June 7, 2013, 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 30 kHz 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

Additionally, for operations in the 776-788MHz band, the power of any emission outside the licensee's frequency band of operation shall be attenuated below the transmitted power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 776-788MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43+10log(P)dB.

(2) On all frequencies between 763-775 and 793-805MHz, by a factor not less than 65+10log(P)dB in a 6.25kHz band segment.

For operations in the 788–793 MHz band, the power of any emission outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

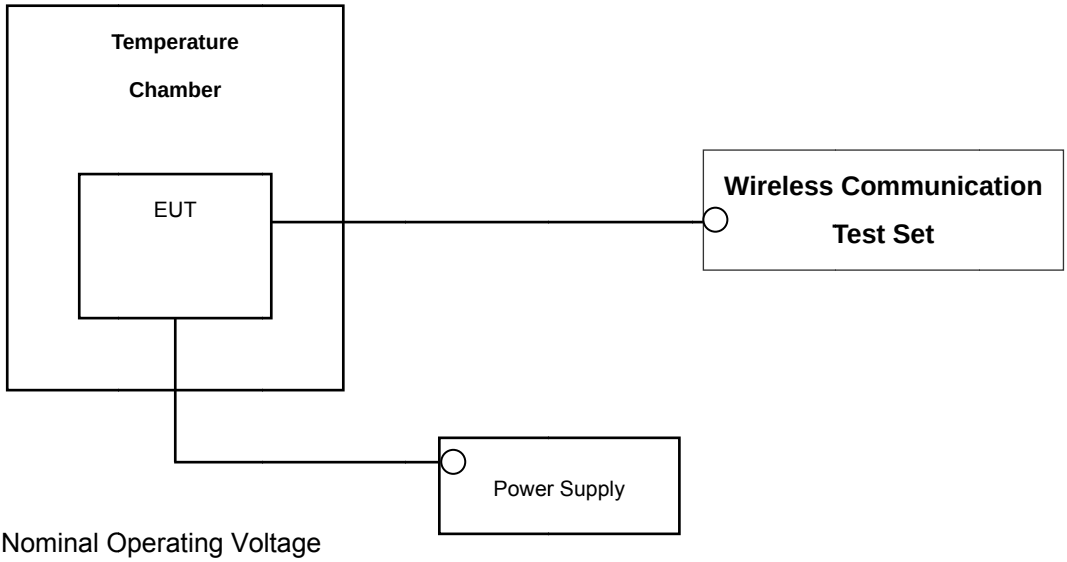
(2) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB

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

- For LTE Band 4, total offset 26.75 dB = 20 dB attenuator + 6 dB Splitter + 0.75 dB RF cables.
- For LTE Band 13, total offset 26.30 dB = 20 dBm attenuator + 6 dBm Splitter + 0.3 dBm RF cables.

3.7 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 shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block(LTE Band4). The frequency stability of the transmitter shall be maintained within ± 0.000 25 %(± 2.5 ppm) of the center frequency(LTE Band13).

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 Date	Calibration Interval	Calibration Due
Agilent	N1921A/ Power Sensor	MY45241059	07/09/2014	Annual	07/09/2015
Agilent	N1911A/ Power Meter	MY45100523	01/24/2014	Annual	01/24/2015
MITEQ	AMF-6D-001180-35-20P/AMP	1081666	09/04/2014	Annual	09/04/2015
Wainwright	WHK1.2/15G-10EF/H.P.F	4	06/17/2014	Annual	06/17/2015
Wainwright	WHK3.3/18G-10EF/H.P.F	2	06/17/2014	Annual	06/17/2015
Hewlett Packard	11667B / Power Splitter	10545	02/22/2014	Annual	02/22/2015
Digital	EP-3010/ Power Supply	3110117	10/29/2013	Annual	10/29/2014
Schwarzbeck	UHAP/ Dipole Antenna	557	03/05/2013	Biennial	03/05/2015
Schwarzbeck	UHAP/ Dipole Antenna	558	05/03/2013	Biennial	05/03/2015
Korea Engineering	KR-1005L / Chamber	KRAB05063-3CH	10/30/2013	Annual	10/30/2014
Schwarzbeck	BBHA 9120D/ Horn Antenna	1191	12/03/2013	Biennial	12/03/2015
Schwarzbeck	BBHA 9120D/ Horn Antenna	1151	10/05/2013	Biennial	10/05/2015
Agilent	E9020A/Spectrum Analyzer	US46220219	04/16/2014	Annual	04/16/2015
WEINSCHEL	ATTENUATOR	BR0592	10/28/2013	Annual	10/28/2014
REOHDE&SCHWARZ	FSV40/Spectrum Analyzer	1307.9002K40-100931-NK	06/09/2014	Annual	06/09/2015
Anritsu	MT8820C / Radio Communication Analyzer	SN 6200863156	04/01/2014	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(m)(6)	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 27.53(c), 27.53(h)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	< 43 +10 $\log_{10}$ (P[Watts]) at Band Edge and for all-of-band emissions <65 + 10 log (P[Watts]) in a 6.25kHz bandwidth for emissions in the 776–788 MHz bands		PASS
27.50(d)(5)	Peak-Average Ratio	< 13 dB		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(b)(10)	Effective Radiated Power (Band 13)	< 3 Watts max. ERP	RADIATED	PASS
27.50(d)(4)	Equivalent Isotropic Radiated Powe (Band 4)	< 1 Watts max. EIRP		PASS
				PASS
2.1053, 27.53(c), 27.53(h)	Undesirable Out-of-Band Emissions	< 43 +10 $\log_{10}$ (P[Watts]) for all out-of-band emissions		PASS

*: See SAR Report

Note regarding all Emission Mask test plots:

The FCC limit is 65 + 10$\log_{10}$($P_{[Watts]}$) = -35dBm in a 6.25kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25kHz with the available equipment, a bandwidth of 10kHz was used instead to show compliance. By using a 10kHz bandwidth, the limit was adjusted by 10$\log_{10}$(10kHz/6.25kHz) = 2.04dB. Thus, the limit shown in all emission mask plots for all available modulation types was -35dBm + 2.04dB = -32.96dBm.

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	23230	782.00	-28.75	34.73	-10.60	1.14	H	0.199	22.99

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 EFFECTIVE RADIATED POWER OUTPUT

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBd)	C.L	Pol	ERP	
								W	dBm
779.5	5 MHz	QPSK	-27.29	35.84	-10.20	1.13	H	0.282	24.51
		16-QAM	-27.88	35.25	-10.20	1.13	H	0.247	23.92
782.0		QPSK	-28.38	35.10	-10.60	1.14	H	0.217	23.36
		16-QAM	-29.37	34.11	-10.60	1.14	H	0.173	22.37
784.5		QPSK	-27.32	36.53	-10.61	1.14	H	0.301	24.78
		16-QAM	-28.24	35.61	-10.61	1.14	H	0.243	23.86

Effective Radiated Power Data (Band 13 – 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
782.0	10 MHz	QPSK	-27.55	35.93	-10.60	1.14	H	0.262	24.19
		16-QAM	-28.32	35.16	-10.60	1.14	H	0.220	23.42

Effective Radiated Power Data (Band 13 – 10 MHz)

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 x plane in LTE mode. Also worst case of detecting Antenna is horizontal polarization in LTE mode.

7.2 EQUIVALENT ISOTROPIC RADIATED POWER OUTPUT

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1712.5	5 MHz	QPSK	-17.32	16.77	9.87	1.77	H	0.307	24.87
		16-QAM	-17.84	16.25	9.87	1.77	H	0.272	24.35
1732.5		QPSK	-16.09	18.11	9.90	1.76	H	0.422	26.25
		16-QAM	-16.29	17.91	9.90	1.76	H	0.403	26.05
1752.5		QPSK	-16.03	18.07	10.01	1.81	H	0.424	26.27
		16-QAM	-16.48	17.62	10.01	1.81	H	0.382	25.82

Effective Radiated Power Data (Band 4 – 5 MHz)

Note: Worst case is 1 resource block.

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1715.0	10 MHz	QPSK	-16.56	17.67	9.87	1.77	H	0.378	25.77
		16-QAM	-16.96	17.27	9.87	1.77	H	0.344	25.37
1732.5		QPSK	-16.62	17.58	9.90	1.76	H	0.373	25.72
		16-QAM	-16.49	17.71	9.90	1.76	H	0.385	25.85
1750.0		QPSK	-17.01	17.09	10.01	1.81	H	0.338	25.29
		16-QAM	-17.51	16.59	10.01	1.81	H	0.301	24.79

Effective Radiated Power Data (Band 4 – 10 MHz)

Note: Worst case is 1 resource block.

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1717.5	15 MHz	QPSK	-17.92	16.30	9.88	1.77	H	0.276	24.41
		16-QAM	-17.68	16.54	9.88	1.77	H	0.292	24.65
1732.5		QPSK	-17.18	17.02	9.90	1.76	H	0.328	25.16
		16-QAM	-17.27	16.93	9.90	1.76	H	0.321	25.07
1747.5		QPSK	-18.44	15.67	9.99	1.80	H	0.243	23.86
		16-QAM	-17.35	16.76	9.99	1.80	H	0.313	24.95

Effective Radiated Power Data (Band 4 – 15 MHz)

Note: Worst case is 1 resource block.

Freq (MHz)	Bandwidth	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1720.0	20 MHz	QPSK	-16.96	17.26	9.88	1.77	H	0.344	25.37
		16-QAM	-16.83	17.39	9.88	1.77	H	0.355	25.50
1732.5		QPSK	-16.66	17.52	9.90	1.76	H	0.368	25.66
		16-QAM	-16.79	17.39	9.90	1.76	H	0.357	25.53
1745.0		QPSK	-16.48	17.82	9.96	1.79	H	0.397	25.99
		16-QAM	-16.85	17.45	9.96	1.79	H	0.365	25.62

Effective Radiated Power Data (Band 4 – 20 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 Horn antenna was substituted in place of the EUT. This Horn 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 Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP 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 x 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 4)

▣ OPERATING FREQUENCY : 1732.50 MHz

▣ MEASURED OUTPUT POWER: 26.27 dBm = 0.424 W

▣ MODULATION SIGNAL: 5 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 39.27 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
19975 (1712.5)	3425.0	-50.96	12.35	-54.38	2.54	H	-44.57	70.84
	5137.5	-48.74	12.36	-44.89	3.21	V	-35.74	62.01
	6850.0	-56.32	12.15	-47.64	3.85	V	-39.34	65.61
20175 (1732.5)	3465.0	-46.78	12.27	-49.63	2.56	H	-39.92	66.19
	5197.5	-47.52	12.63	-43.83	3.23	H	-34.43	60.70
	6930.0	-52.22	11.87	-42.39	4.02	V	-34.54	60.81
20375 (1752.5)	3505.0	-51.27	12.15	-53.42	2.60	V	-43.87	70.14
	5257.5	-52.26	12.90	-46.06	3.27	V	-36.43	62.70
	7010.0	-53.85	11.61	-43.64	4.09	H	-36.12	62.39

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 10th 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.

▣ OPERATING FREQUENCY : 1732.50 MHz

▣ MEASURED OUTPUT POWER: 25.85 dBm = 0.385 W

▣ MODULATION SIGNAL: 10 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $\log_{10}$ (W) = 38.85 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20000 (1715.0)	3430.00	-51.26	12.34	-57.43	2.55	H	-47.64	73.49
	5145.00	-48.62	12.38	-52.68	1.97	V	-42.27	68.12
	6860.00	-54.30	12.11	-45.56	3.76	V	-37.21	63.06
20175 (1732.5)	3465.00	-48.75	12.27	-51.60	2.56	V	-41.89	67.74
	5197.50	-47.24	12.63	-43.55	3.23	H	-34.15	60.00
	6930.00	-53.02	11.87	-43.19	4.02	V	-35.34	61.19
20350 (1750.0)	3500.00	-53.01	12.15	-55.17	2.59	H	-45.61	71.46
	5250.00	-49.93	12.87	-44.72	3.28	H	-35.13	60.98
	7000.00	-60.07	11.65	-50.25	4.03	V	-42.63	68.48

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 10th 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.

▣ OPERATING FREQUENCY : 1732.50 MHz

▣ MEASURED OUTPUT POWER: 25.16 dBm = 0.328 W

▣ MODULATION SIGNAL: 15 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $\log_{10}$ (W) = 38.16 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20025 (1717.5)	3435.0	-50.25	12.34	-52.43	3.55	H	-43.64	68.80
	5152.5	-49.30	12.40	-45.84	3.24	H	-36.68	61.84
	6870.0	-53.74	12.08	-44.70	3.90	V	-36.52	61.68
20175 (1732.5)	3465.0	-46.39	12.27	-49.24	2.56	H	-39.53	64.69
	5197.5	-47.31	12.63	-43.62	3.23	H	-34.22	59.38
	6930.0	-51.97	11.87	-42.14	4.02	V	-34.29	59.45
20325 (1747.5)	3495.0	-53.42	12.17	-55.61	2.58	H	-46.02	71.18
	5242.5	-49.45	12.83	-44.68	3.29	H	-35.14	60.30
	6990.0	-57.18	11.68	-46.86	4.03	V	-39.21	64.37

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 10th 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.

▣ OPERATING FREQUENCY : 1732.50 MHz

▣ MEASURED OUTPUT POWER: 25.99 dBm = 0.397 W

▣ MODULATION SIGNAL: 20 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $\log_{10}$ (W) = 38.99 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
20050 (1720.0)	3440.0	-48.28	12.33	-51.44	2.56	H	-41.67	67.66
	5160.0	-49.20	12.44	-45.66	3.20	H	-36.42	62.41
	6880.0	-52.68	12.04	-43.46	3.91	V	-35.33	61.32
20175 (1732.5)	3465.0	-44.35	12.27	-47.20	2.56	H	-37.49	63.48
	5197.5	-49.17	12.63	-45.48	3.23	H	-36.08	62.07
	6930.0	-51.90	11.87	-42.07	4.02	V	-34.22	60.21
20300 (1745.0)	3490.0	-50.44	12.18	-53.15	2.57	H	-43.54	69.53
	5235.0	-49.73	12.81	-44.96	3.27	H	-35.42	61.41
	6980.0	-57.05	11.71	-47.04	4.05	H	-39.38	65.37

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 10th 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.

7.3.2 RADIATED SPURIOUS EMISSIONS (Band 13)

▣ OPERATING FREQUENCY : 782.00 MHz

▣ MEASURED OUTPUT POWER: 24.78 dBm = 0.301 W

▣ MODULATION SIGNAL: 5 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $\log_{10}$ (W) = 37.78 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitude Level (dBm)	C.L	Pol	ERP (dBm)	dBc
23205 (779.5)	2338.50	-49.72	9.82	-52.80	2.06	H	-45.04	69.82
	3118.00	-48.70	11.34	-50.63	2.42	V	-41.71	66.49
	3897.50	-47.59	12.28	-48.85	2.76	V	-39.33	64.11
23230 (782.0)	2346.00	-47.98	9.88	-51.04	2.06	V	-43.22	68.00
	3128.00	-46.40	11.33	-48.44	2.45	H	-39.56	64.34
	3910.00	-46.46	12.30	-47.40	2.72	H	-37.82	62.60
23255 (784.5)	2353.50	-49.40	9.93	-52.51	2.06	V	-44.64	69.42
	3138.00	-46.88	11.33	-48.92	2.45	H	-40.04	64.82
	3922.50	-44.91	12.31	-46.14	2.82	V	-36.65	61.43

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 10th 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.

▣ OPERATING FREQUENCY : 782.00 MHz

▣ MEASURED OUTPUT POWER: 24.19 dBm = 0.262 W

▣ MODULATION SIGNAL: 10 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 37.19 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBd)	Substitude Level (dBm)	C.L	Pol	ERP (dBm)	dBc
23230 (782.00)	2346.00	-49.11	9.24	-51.22	2.03	H	-44.01	68.20
	3128.00	-46.46	11.33	-48.50	2.45	H	-39.62	63.81
	3910.00	-45.15	12.30	-46.09	2.72	V	-36.51	60.70

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 10th 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.

7.3.2.1 RADIATED SPURIOUS EMISSIONS (1559 ~ 1610 MHz Band)

▣ OPERATING FREQUENCY : 779.5 MHz, 782.0 MHz, 784.5 MHz

▣ MODULATION SIGNAL: 5 MHz QPSK

▣ DISTANCE: 3 meters

▣ WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Operating Frequency (MHz)	Measured Frequency (MHz)	EMISSION TYPE	Measured Level (dBm)	Ant. Gain (dBd)	Substitude Level (dBm)	C.L	Pol	ERP (dBm)	MARGIN (dB)
779.5	1586.7	WIDEBAND	-56.92	9.35	-62.84	1.72	V	-55.21	15.21
782.0	1588.9		-50.70	9.35	-56.62	1.72	V	-48.99	8.99
784.5	1589.9		-44.78	9.35	-50.70	1.72	V	-43.07	3.07

▣ OPERATING FREQUENCY : 782.0 MHz

▣ MODULATION SIGNAL: 10 MHz QPSK

▣ DISTANCE: 3 meters

▣ WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Operating Frequency (MHz)	Measured Frequency (MHz)	EMISSION TYPE	Measured Level (dBm)	Ant. Gain (dBd)	Substitude Level (dBm)	C.L	Pol	ERP (dBm)	MARGIN (dB)
782.0	1585.5	WIDEBAND	-56.91	9.35	-62.83	1.72	H	-55.20	15.20

7.4 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Band 4	5 MHz	1732.5	QPSK	25	0	5.62
			16-QAM	25	0	6.01
	10 MHz	1732.5	QPSK	50	0	5.66
			16-QAM	50	0	6.04
	15 MHz	1732.5	QPSK	75	0	5.54
			16-QAM	75	0	5.92
	20 MHz	1732.5	QPSK	100	0	5.55
			16-QAM	100	0	6.02

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Band 13	10 MHz	782.0	QPSK	25	0	5.19
			16-QAM	25	0	5.43
	5 MHz	782.0	QPSK	50	0	5.18
			16-QAM	50	0	5.47

- Plots of the EUT's Peak- to- Average Ratio are shown Page 42 ~ 47

7.5 OCCUPIED BANDWIDTH

Band	Band Width (MHz)	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Band 4	5	1732.5	QPSK	25	0	4.5219
			16-QAM	25	0	4.5262
	10	1732.5	QPSK	50	0	9.0115
			16-QAM	50	0	9.0155
	15	1732.5	QPSK	75	0	13.4870
			16-QAM	75	0	13.4690
	20	1732.5	QPSK	100	0	18.0210
			16-QAM	100	0	18.0130

Band	Band Width (MHz)	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Band 13	5	782	QPSK	25	0	4.5185
			16-QAM	25	0	4.5309
	10		QPSK	50	0	9.0323
			16-QAM	50	0	9.0159

- Plots of the EUT's Occupied Bandwidth are shown Page 36 ~ 41.

7.6 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 4	5	1712.5	QPSK	1	0	6.984300	-26.79
		1732.5		1	0	6.803480	-26.45
		1752.5		1	0	6.968440	-26.73
	10	1715.0		1	0	6.794870	-26.53
		1732.5		1	0	6.994270	-26.50
		1750.0		1	0	6.998800	-26.80
	15	1717.5		1	0	6.990190	-26.32
		1732.5		1	0	6.409210	-26.31
		1747.5		1	0	6.949410	-26.10
	20	1720.0		1	0	6.953940	-26.23
		1732.5		1	0	6.993370	-26.25
		1745.0		1	0	6.935360	-26.52

Band	Band Width (MHz)	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Frequency of Maximum Harmonic (GHz)	Maximum Data [dBm]
Band 13	5	782	QPSK	1	0	6.819750	-27.35
						6.971750	-26.49
						6.796250	-27.34
	10	782	QPSK			6.983250	-26.92

- Plots of the EUT's Conducted Spurious Emissions are shown Page 66~ 81.

7.6.1 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 48 ~ 65

7.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.7.1 FREQUENCY STABILITY (LTE Band 4)

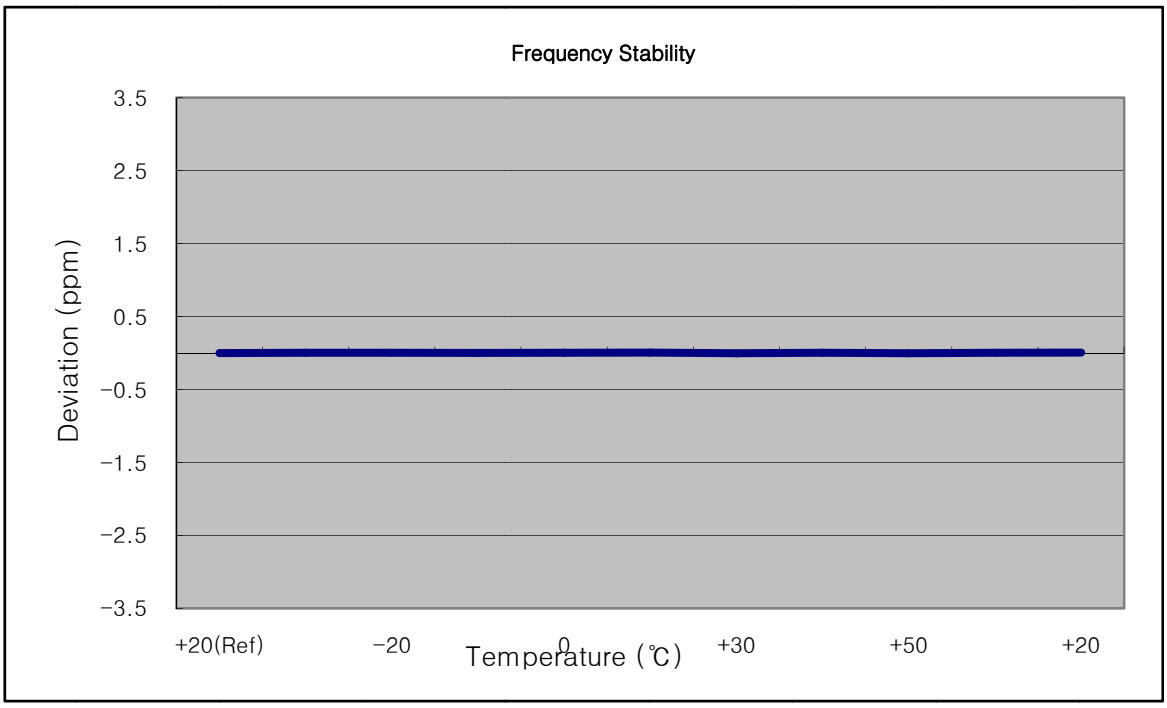
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (5 MHz)

▣ REFERENCE VOLTAGE: 3.8 VDC

▣ DEVIATION LIMIT: -

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 499 992	0	0.000 000	0.000
100%		-30	1732 499 999	7.30	0.000 000	0.004
100%		-20	1732 499 998	6.10	0.000 000	0.004
100%		-10	1732 499 996	3.90	0.000 000	0.002
100%		0	1732 499 998	6.40	0.000 000	0.004
100%		+10	1732 500 002	10.50	0.000 001	0.006
100%		+30	1732 499 988	-3.80	0.000 000	-0.002
100%		+40	1732 499 998	6.00	0.000 000	0.003
100%		+50	1732 499 988	-3.50	0.000 000	-0.002
115%	4.37	+20	1732 499 996	4.50	0.000 000	0.003
Batt. Endpoint	3.23	+20	1732 500 004	11.60	0.000 001	0.007



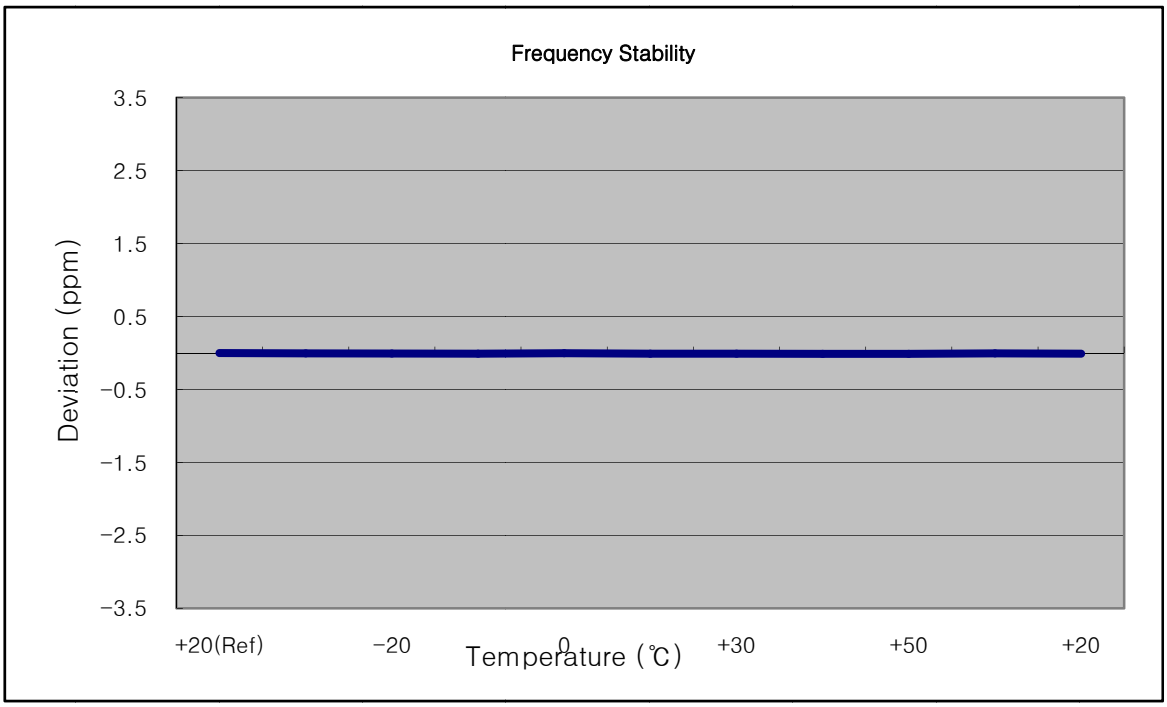
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (10 MHz)

▣ REFERENCE VOLTAGE: 3.8 VDC

▣ DEVIATION LIMIT: -

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 500 008	0	0.000 000	0.000
100%		-30	1732 499 997	-10.20	-0.000 001	-0.006
100%		-20	1732 499 994	-13.50	-0.000 001	-0.008
100%		-10	1732 499 992	-15.90	-0.000 001	-0.009
100%		0	1732 500 000	-7.20	0.000 000	-0.004
100%		+10	1732 499 991	-16.60	-0.000 001	-0.010
100%		+30	1732 499 989	-18.10	-0.000 001	-0.010
100%		+40	1732 499 989	-19.00	-0.000 001	-0.011
100%		+50	1732 499 987	-20.40	-0.000 001	-0.012
115%	4.37	+20	1732 499 997	-10.80	-0.000 001	-0.006
Batt. Endpoint	3.23	+20	1732 499 989	-18.30	-0.000 001	-0.011



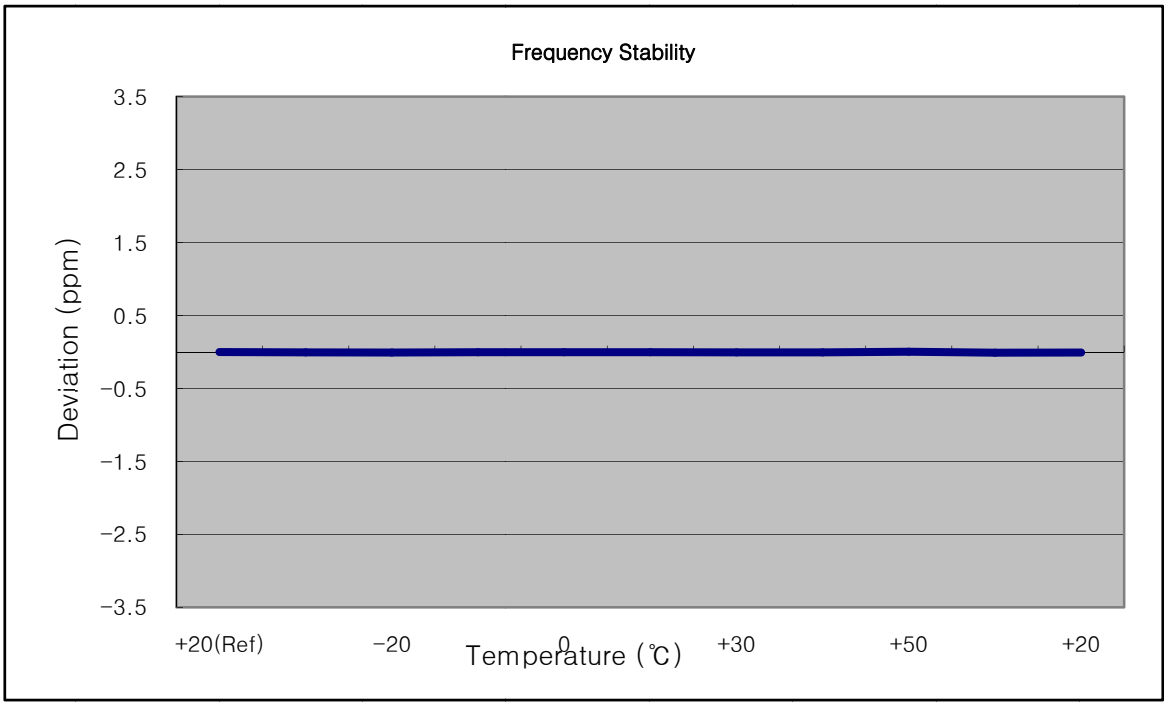
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (15 MHz)

▣ REFERENCE VOLTAGE: 3.8 VDC

▣ DEVIATION LIMIT: -

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 500 010	0	0.000 000	0.000
100%		-30	1732 499 999	-11.00	-0.000 001	-0.006
100%		-20	1732 499 996	-14.20	-0.000 001	-0.008
100%		-10	1732 500 003	-7.20	0.000 000	-0.004
100%		0	1732 500 003	-6.80	0.000 000	-0.004
100%		+10	1732 500 005	-5.50	0.000 000	-0.003
100%		+30	1732 500 002	-7.70	0.000 000	-0.004
100%		+40	1732 500 002	-7.80	0.000 000	-0.005
100%		+50	1732 500 015	4.80	0.000 000	0.003
115%	4.37	+20	1732 499 995	-15.40	-0.000 001	-0.009
Batt. Endpoint	3.23	+20	1732 499 996	-14.00	-0.000 001	-0.008



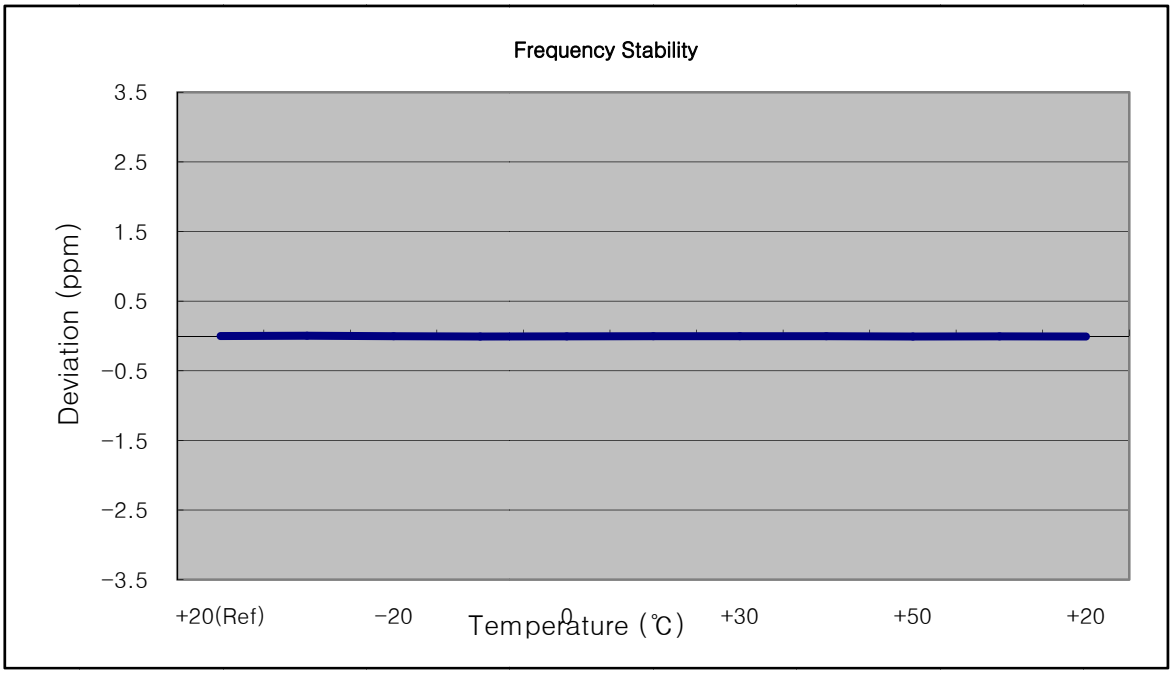
▣ OPERATING FREQUENCY: 1732,500,000 Hz

▣ CHANNEL: 20175 (20 MHz)

▣ REFERENCE VOLTAGE: 3.8 VDC

▣ DEVIATION LIMIT: -

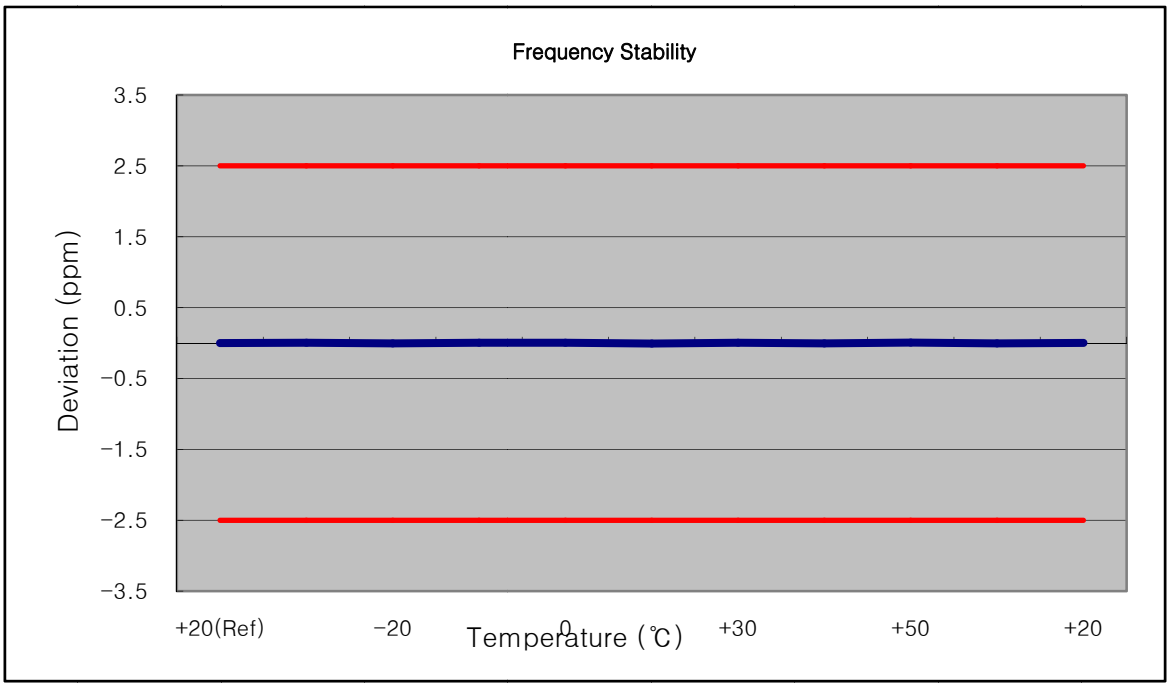
Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1732 500 011	0	0.000 000	0.000
100%		-30	1732 500 017	6.10	0.000 000	0.004
100%		-20	1732 500 006	-4.80	0.000 000	-0.003
100%		-10	1732 499 998	-13.00	-0.000 001	-0.008
100%		0	1732 500 001	-10.00	-0.000 001	-0.006
100%		+10	1732 500 005	-5.50	0.000 000	-0.003
100%		+30	1732 500 005	-5.60	0.000 000	-0.003
100%		+40	1732 500 005	-5.80	0.000 000	-0.003
100%		+50	1732 499 996	-14.30	-0.000 001	-0.008
115%	4.37	+20	1732 500 000	-10.60	-0.000 001	-0.006
Batt. Endpoint	3.23	+20	1732 499 997	-13.40	-0.000 001	-0.008



7.7.2 FREQUENCY STABILITY (LTE Band 13)

▣ OPERATING FREQUENCY: 782.000,000 Hz
▣ CHANNEL: 23230 (5 MHz)
▣ REFERENCE VOLTAGE: 3.8 VDC
▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	782 000 004	0	0.000 000	0.000
100%		-30	782 000 008	-5.70	0.000 001	0.005
100%		-20	782 000 000	6.20	-0.000 001	-0.005
100%		-10	782 000 007	8.00	0.000 000	0.005
100%		0	782 000 007	3.60	0.000 000	0.004
100%		+10	781 999 998	-4.60	-0.000 001	-0.007
100%		+30	782 000 008	-4.40	0.000 000	0.005
100%		+40	782 000 000	5.70	-0.000 001	-0.005
100%		+50	782 000 008	-5.90	0.000 001	0.006
115%	4.37	+20	782 000 001	4.10	0.000 000	-0.004
Batt. Endpoint	3.23	+20	782 000 006	1.40	0.000 000	0.003



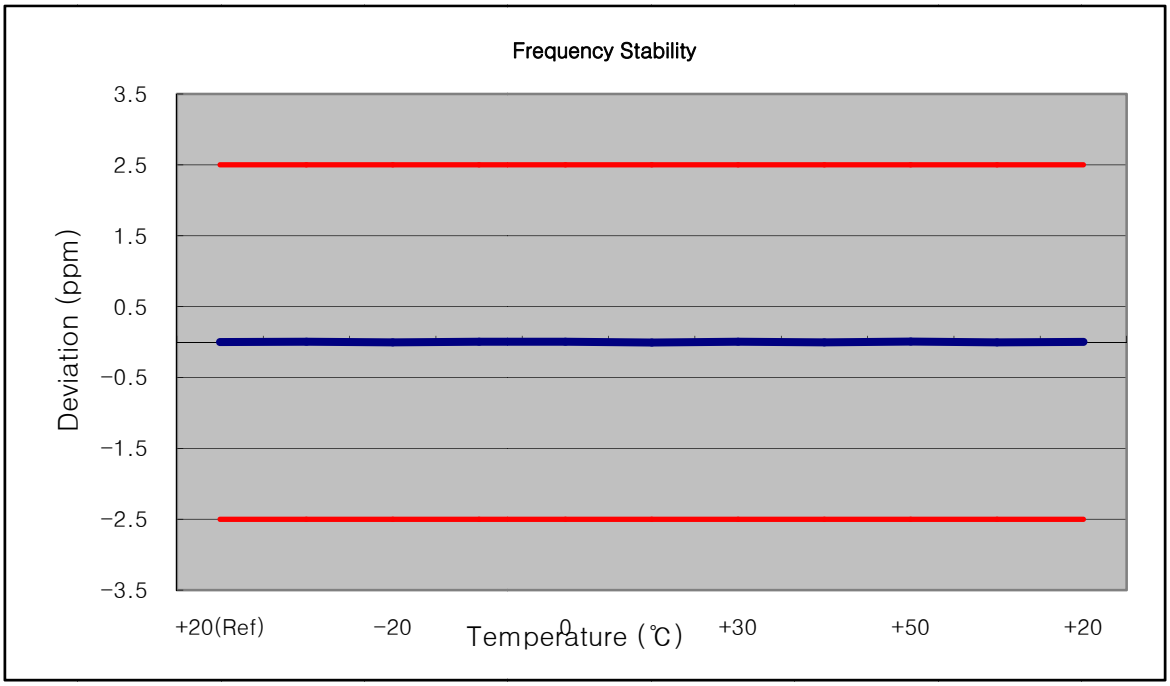
▣ OPERATING FREQUENCY: 782.000,000 Hz

▣ CHANNEL: 23230 (10 MHz)

▣ REFERENCE VOLTAGE: 3.8 VDC

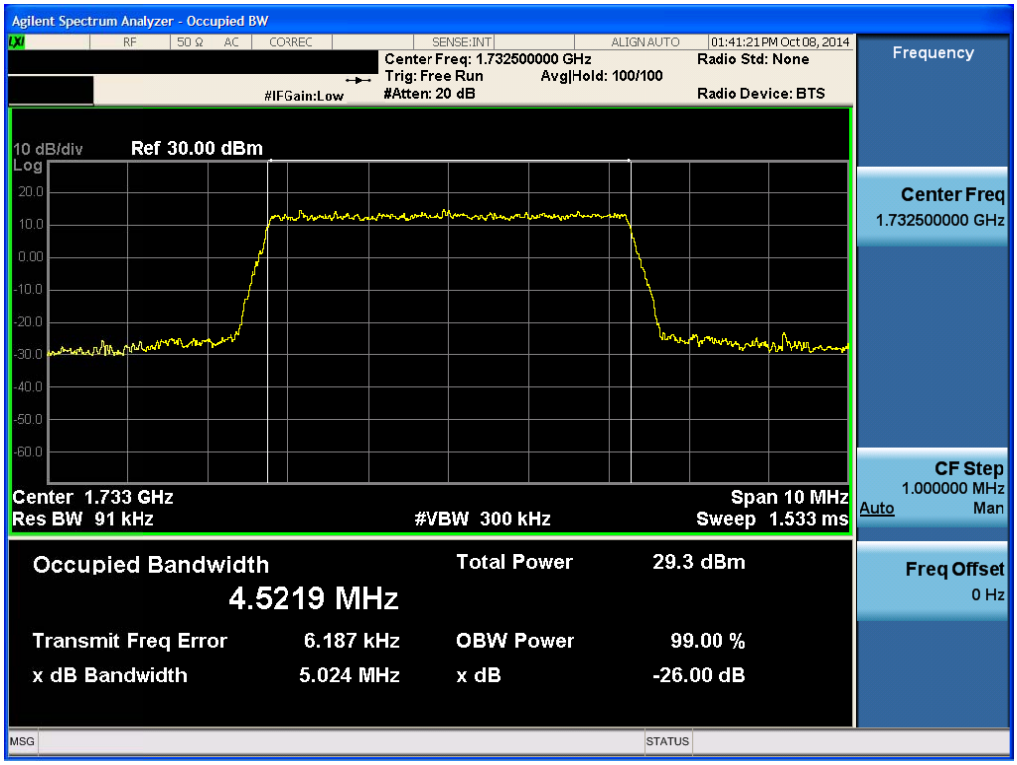
▣ DEVIATION LIMIT: ± 0.000 25 % or 2.5 ppm

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	782 000 004	0	0.000 000	0.000
100%		-30	782 000 008	3.10	0.000 001	0.005
100%		-20	782 000 000	5.60	-0.000 001	-0.005
100%		-10	782 000 007	4.90	0.000 000	0.005
100%		0	782 000 007	-3.70	0.000 000	0.004
100%		+10	781 999 998	-3.00	-0.000 001	-0.007
100%		+30	782 000 008	-7.30	0.000 000	0.005
100%		+40	782 000 000	-3.90	-0.000 001	-0.005
100%		+50	782 000 008	-5.10	0.000 001	0.006
115%	4.37	+20	782 000 001	-4.10	0.000 000	-0.004
Batt. Endpoint	3.23	+20	782 000 006	-5.60	0.000 000	0.003

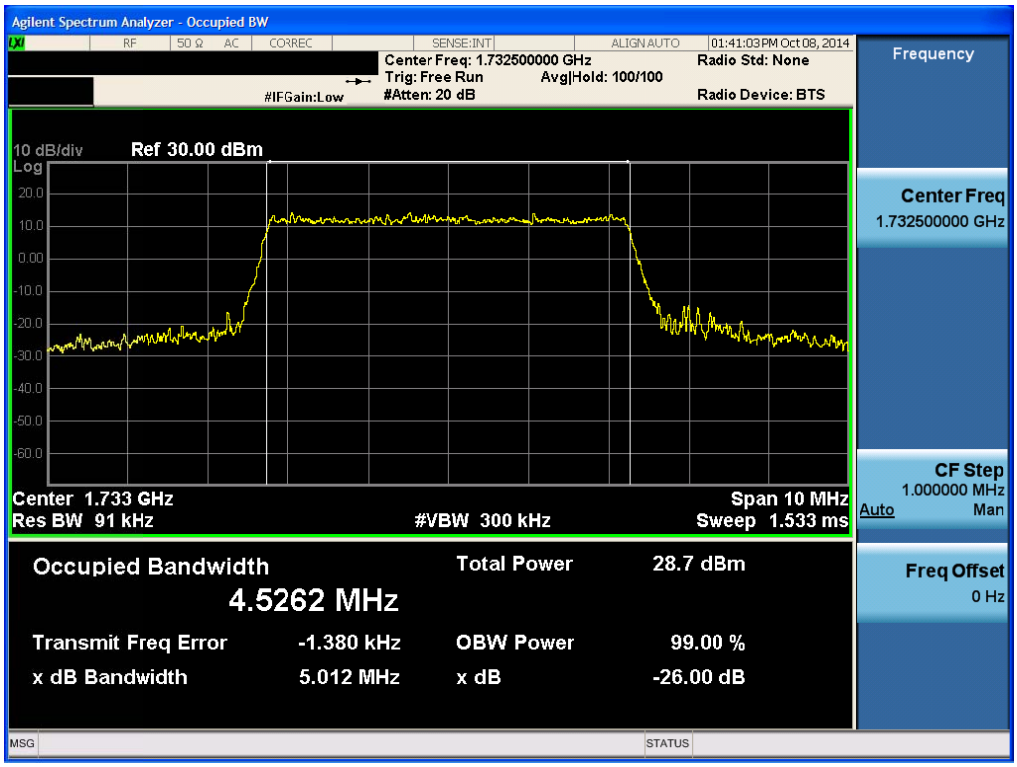


8. TEST PLOTS

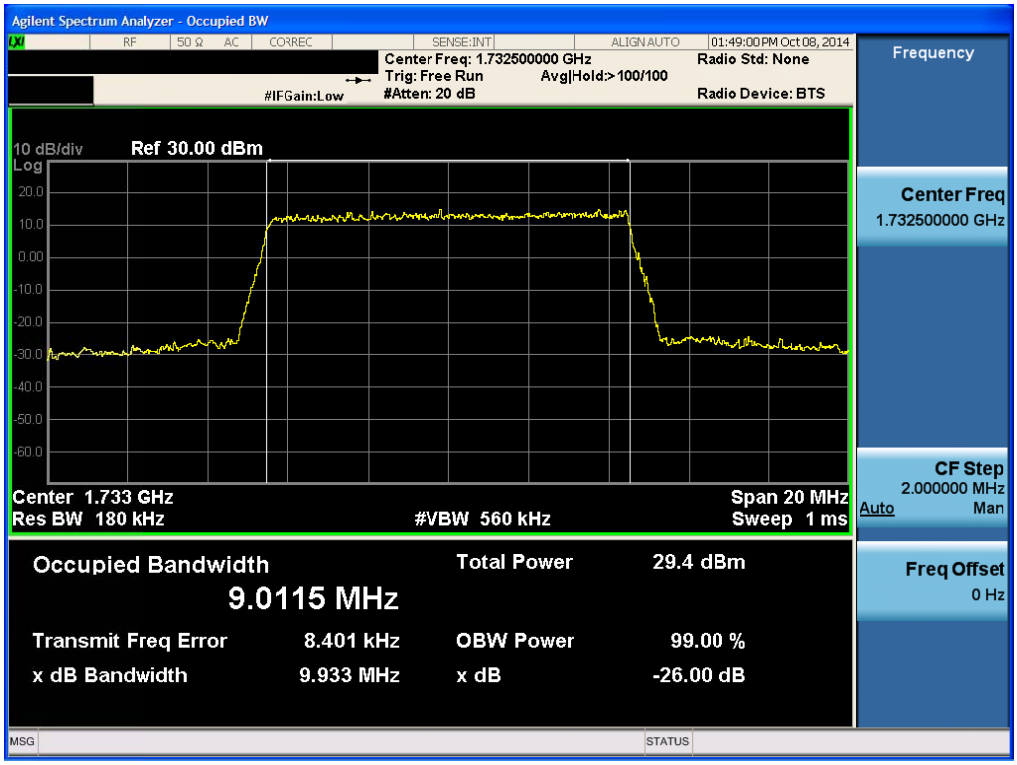
BAND 4. Occupied Bandwidth Plot (5M BW Ch.20175 QPSK RB 25)



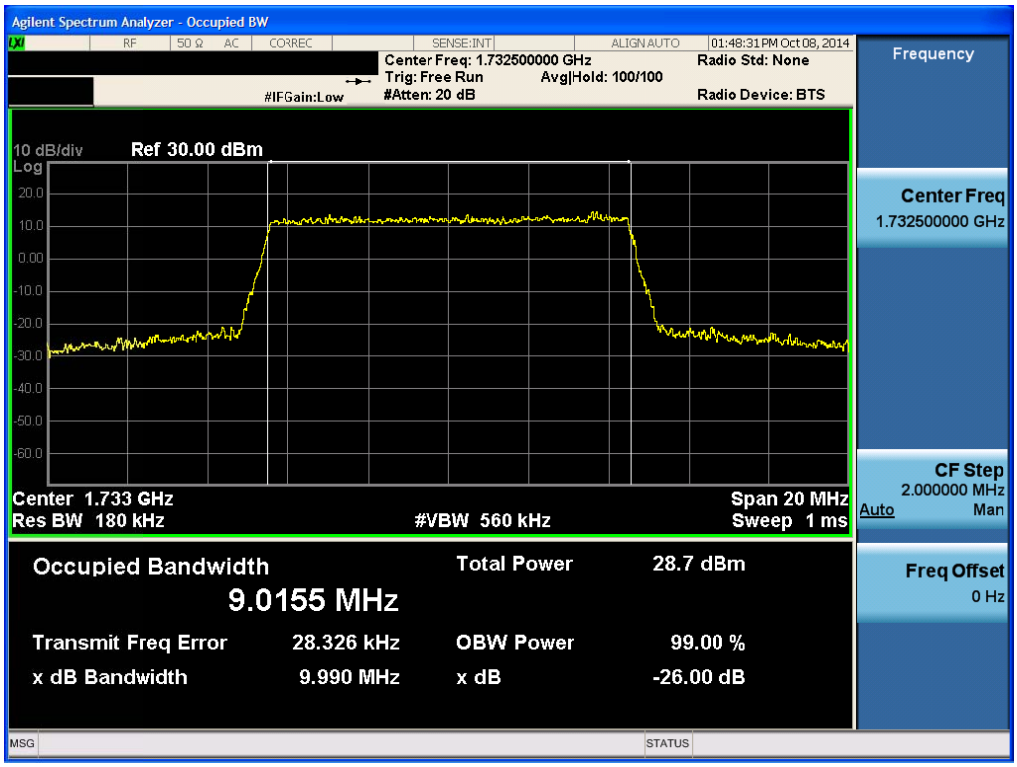
BAND 4. Occupied Bandwidth Plot (5M BW Ch.20175 16QAM RB 25)



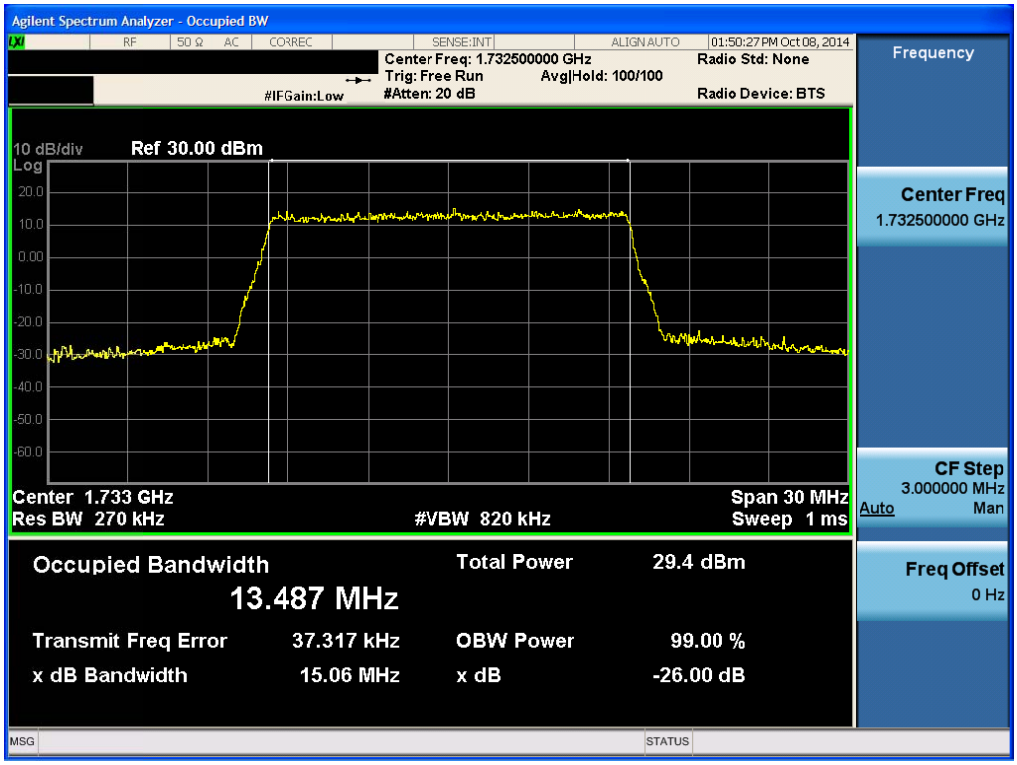
BAND 4. Occupied Bandwidth Plot (10M BW Ch.20175 QPSK RB 50)



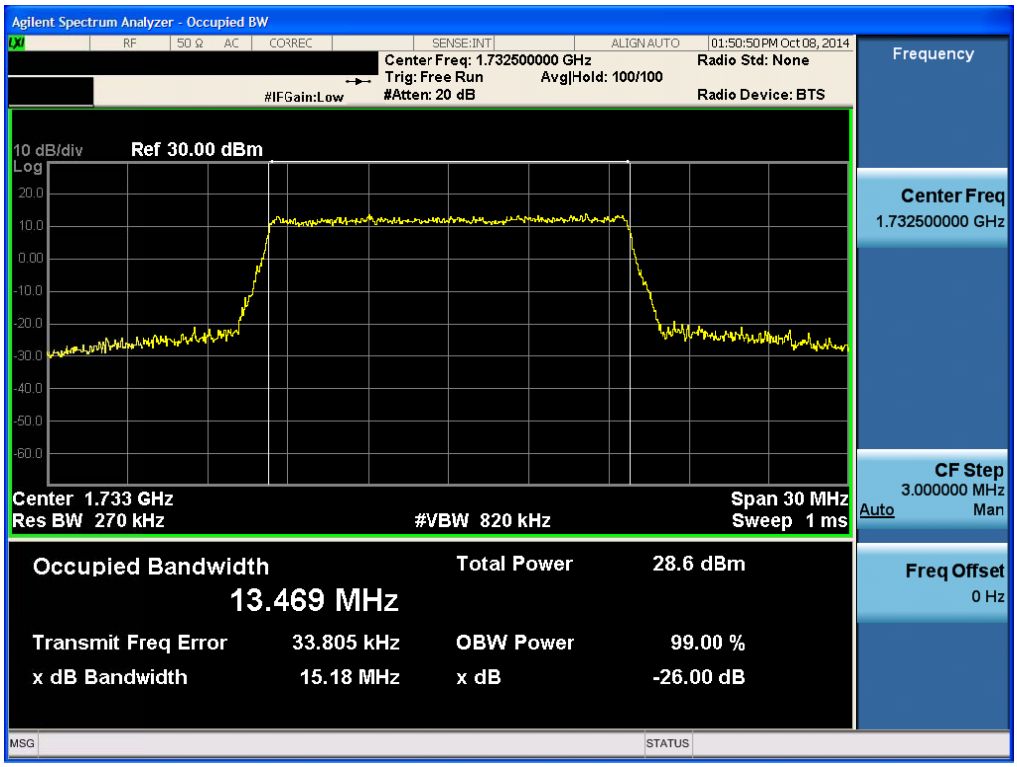
BAND 4. Occupied Bandwidth Plot (10M BW Ch.20175 16QAM RB 50)



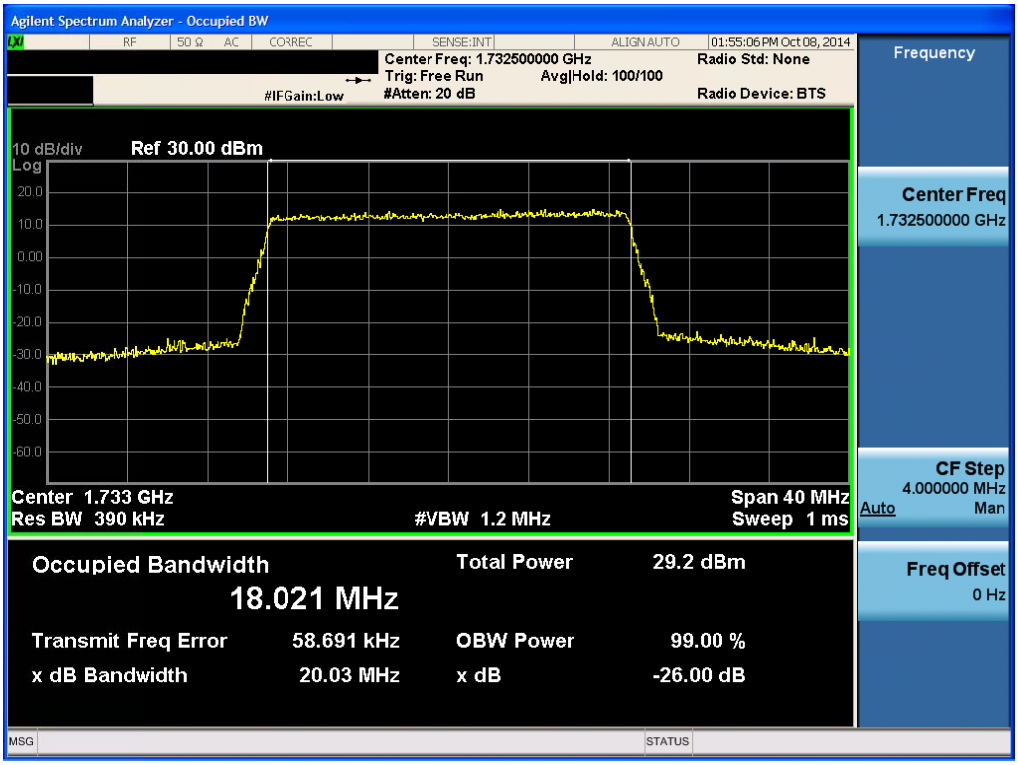
BAND 4. Occupied Bandwidth Plot (15M BW Ch.20175 QPSK RB 75)



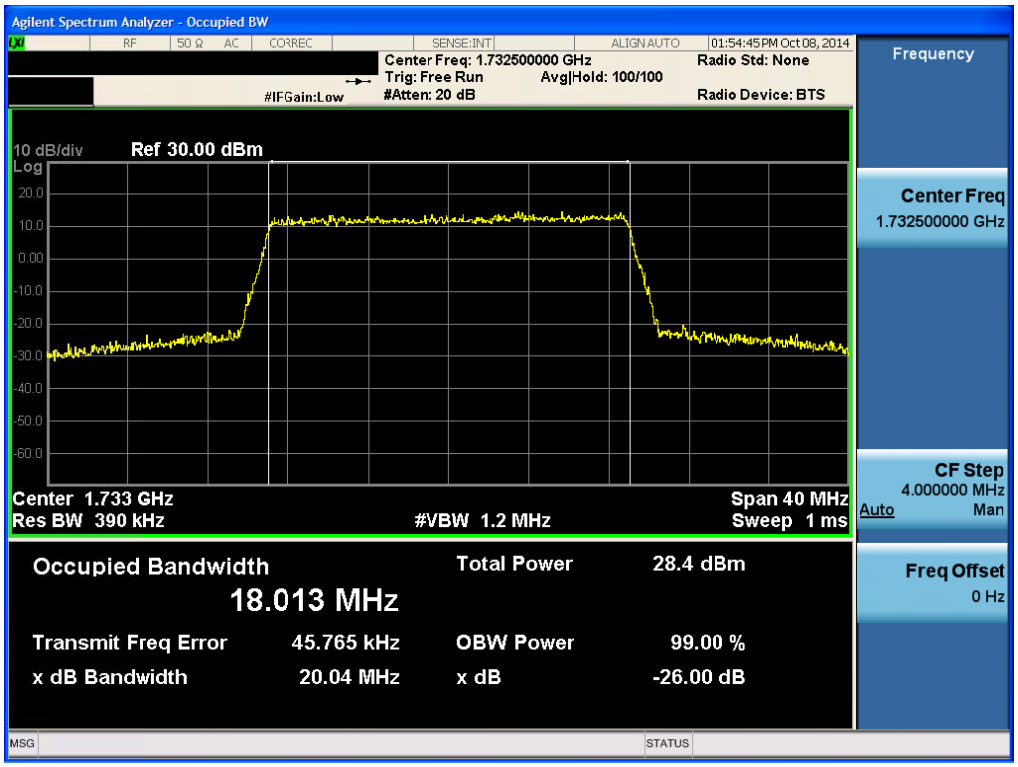
BAND 4. Occupied Bandwidth Plot (15M BW Ch.20175 16QAM RB 75)



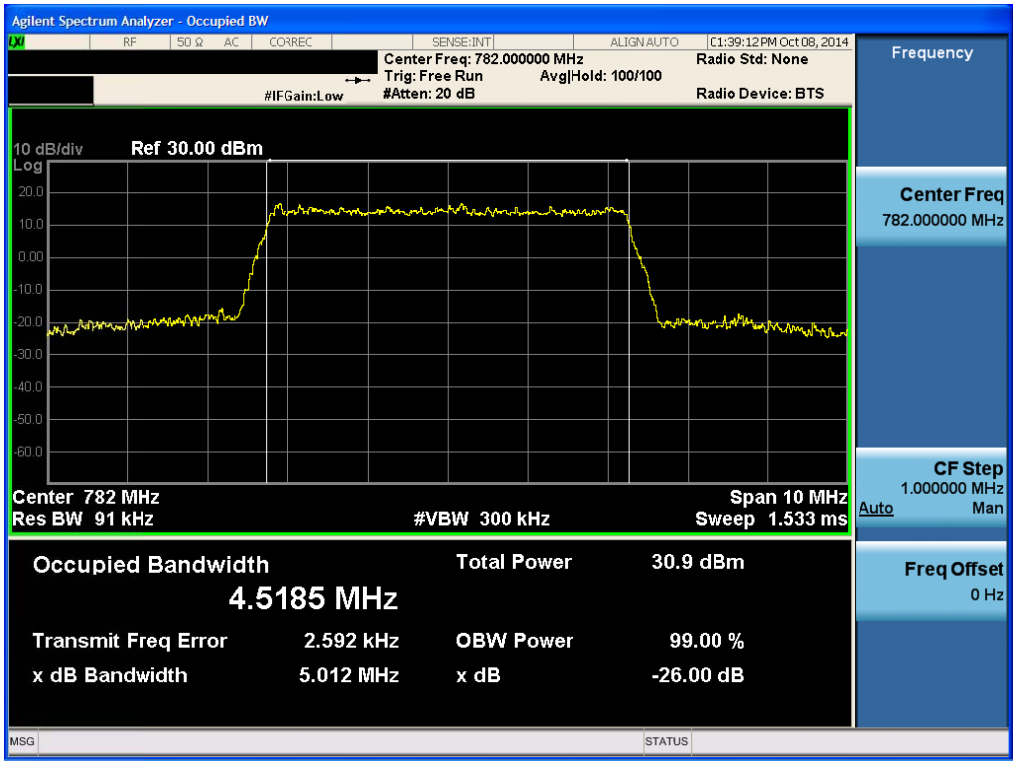
BAND 4. Occupied Bandwidth Plot (20M BW Ch.20175 QPSK RB 100)



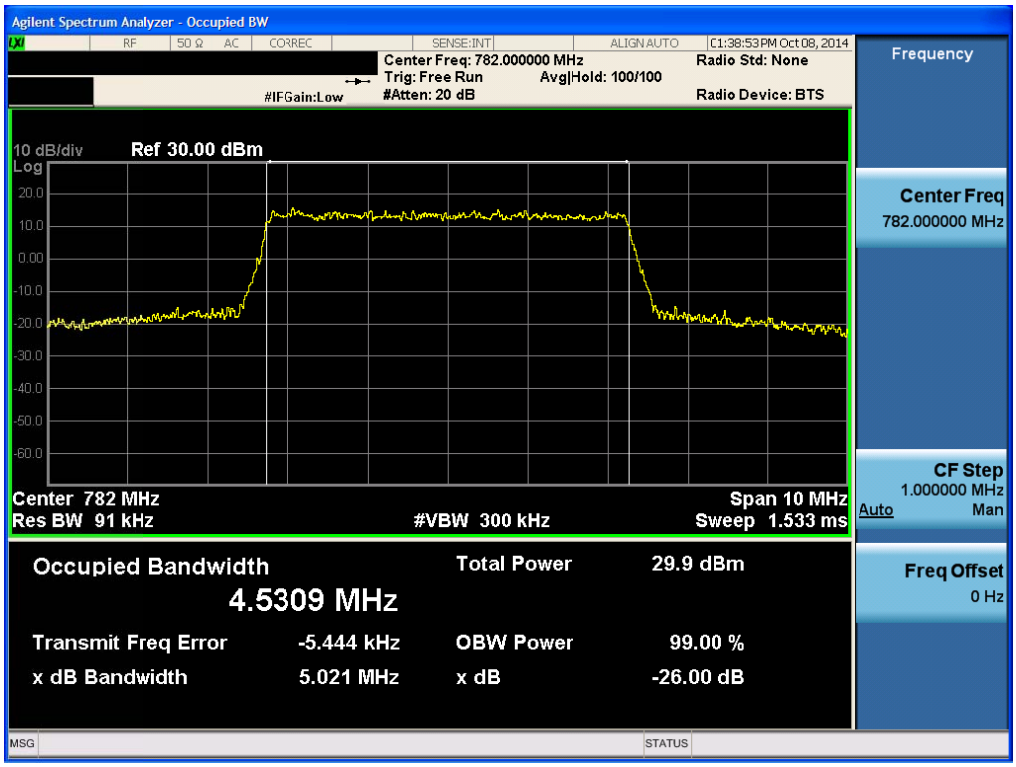
BAND 4. Occupied Bandwidth Plot (20M BW Ch.20175 16QAM RB 100)



BAND 13. Occupied Bandwidth Plot (5M BW Ch.23230 QPSK RB 25)

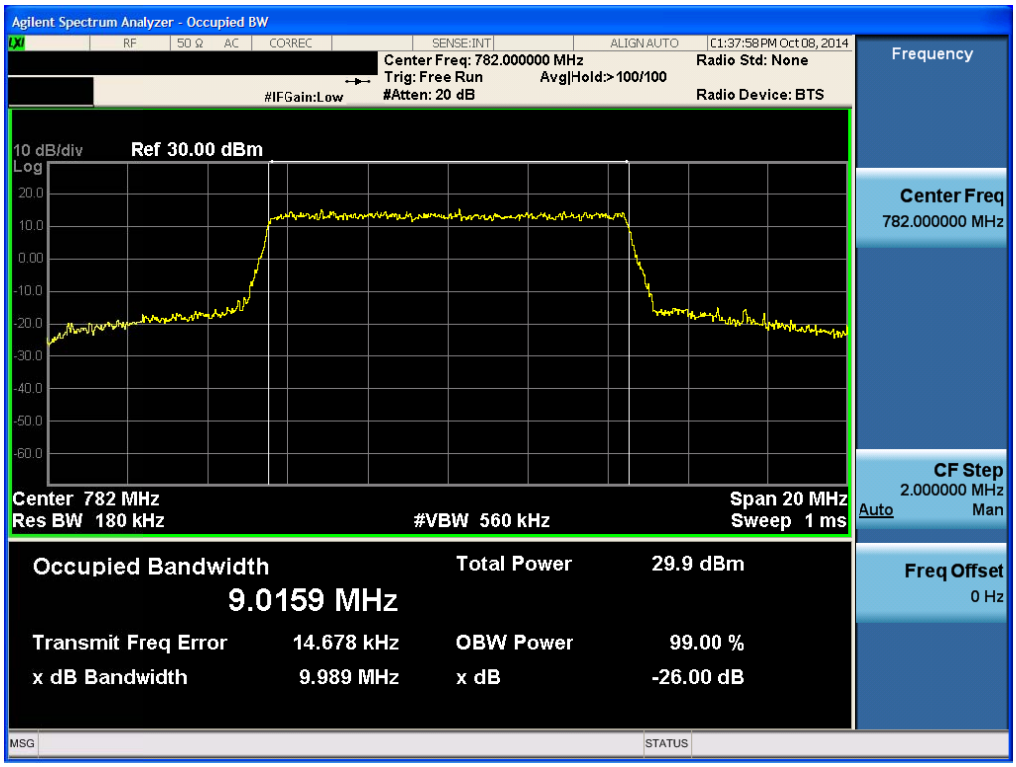


BAND 13. Occupied Bandwidth Plot (5M BW Ch.23230 16-QAM RB 25)

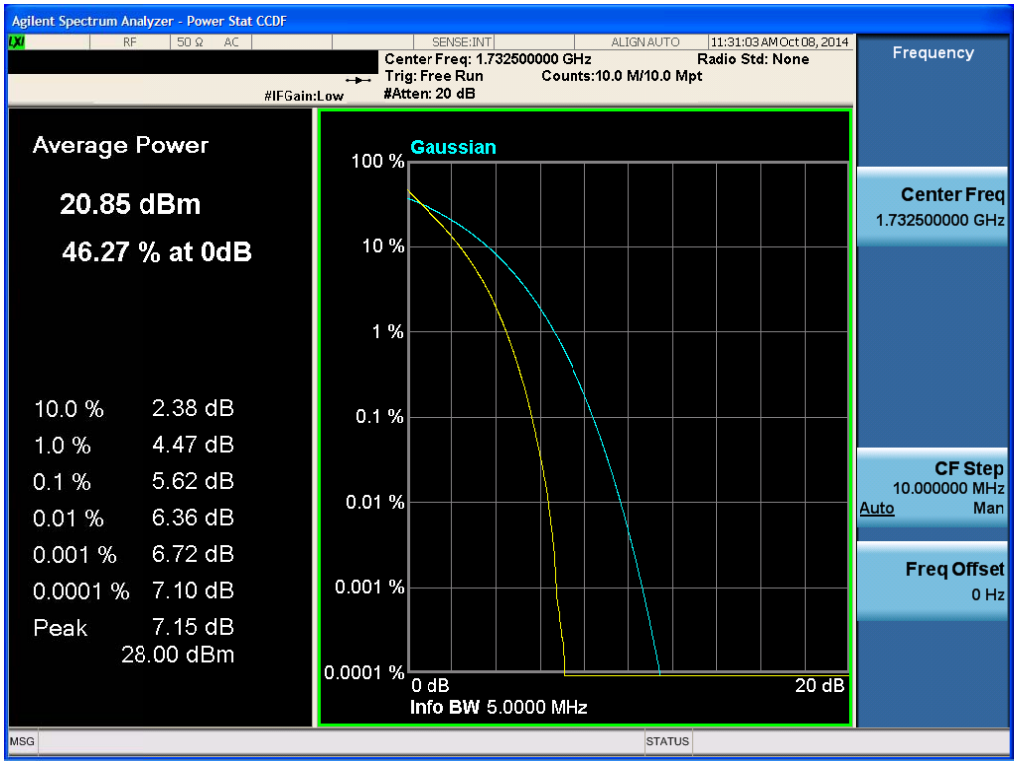


BAND 13. Occupied Bandwidth Plot (10M BW Ch. 23230 QPSK RB 50)

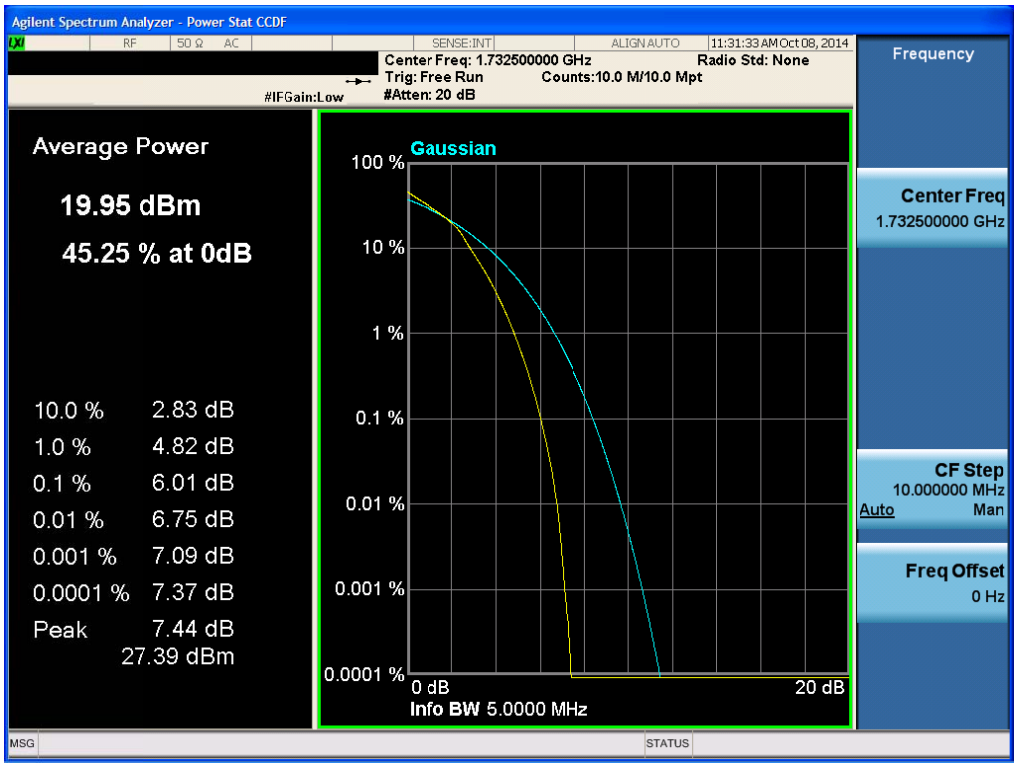
BAND 13. Occupied Bandwidth Plot (10M BW Ch. 23230 16-QAM RB 50)



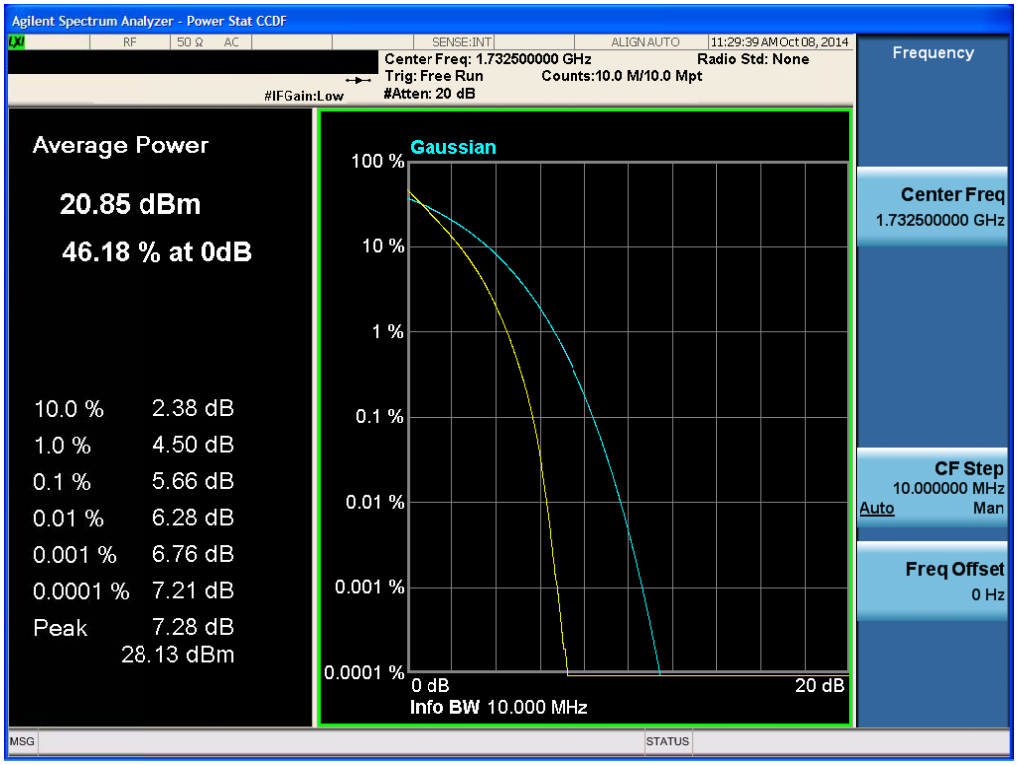
BAND 4. PAR Plot (5M BW Ch.20175 QPSK RB 25)



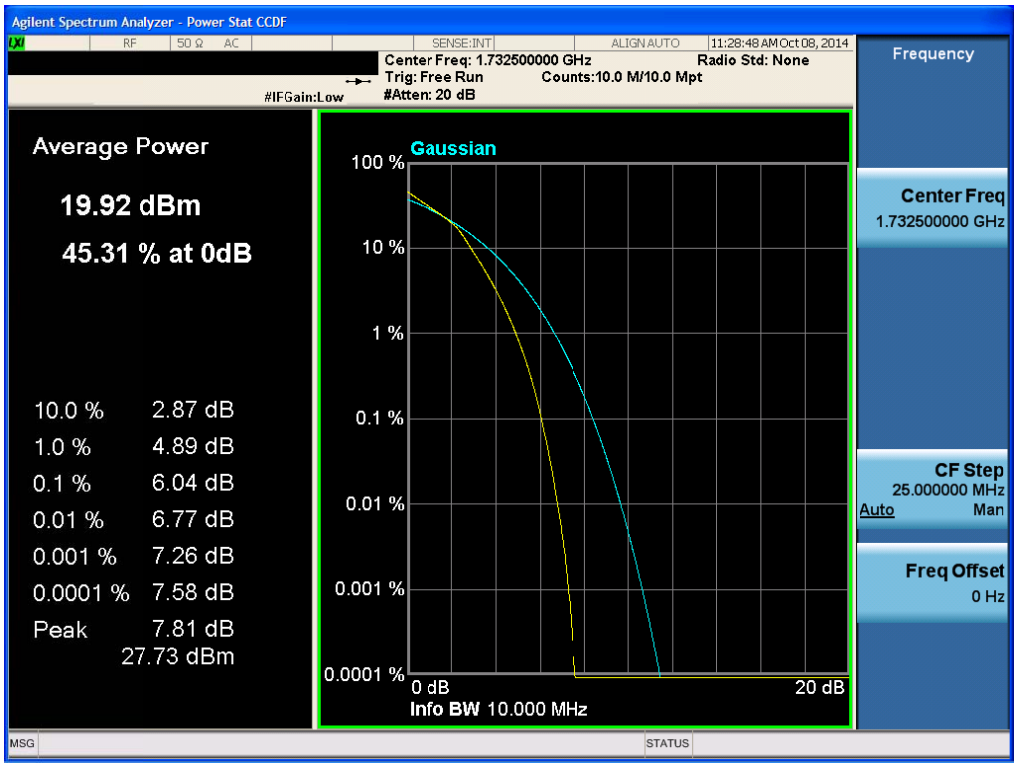
BAND 4. PAR Plot (5M BW Ch.20175 16QAM RB 25)



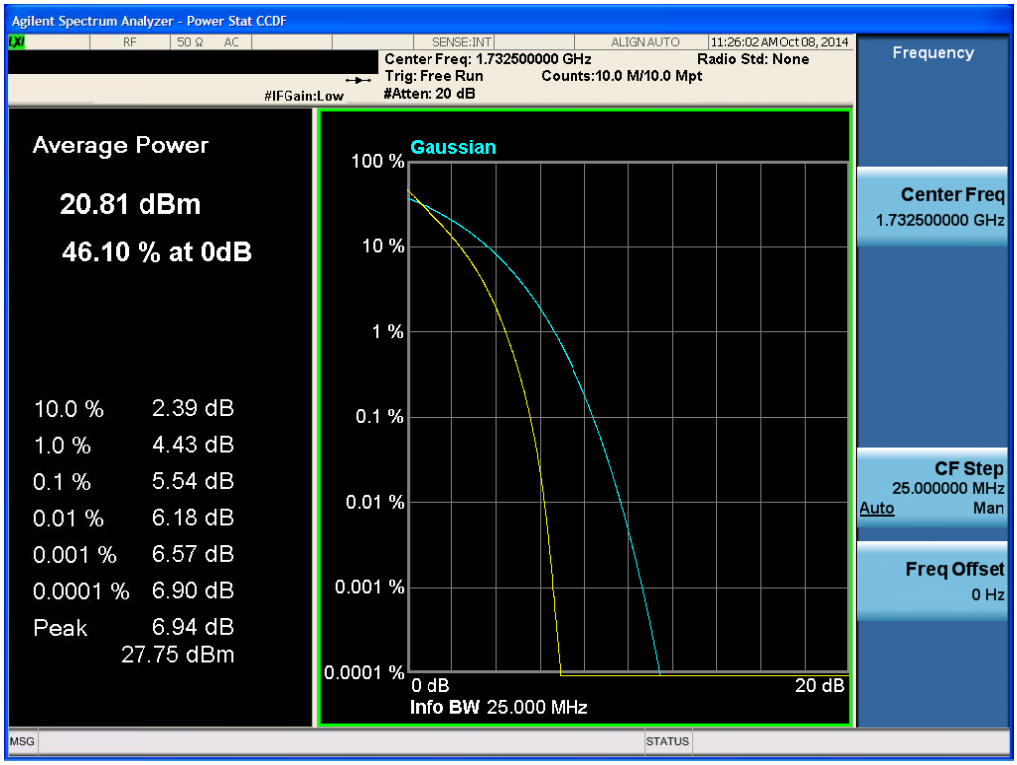
BAND 4. PAR Plot (10M BW Ch.20175 QPSK RB 50)



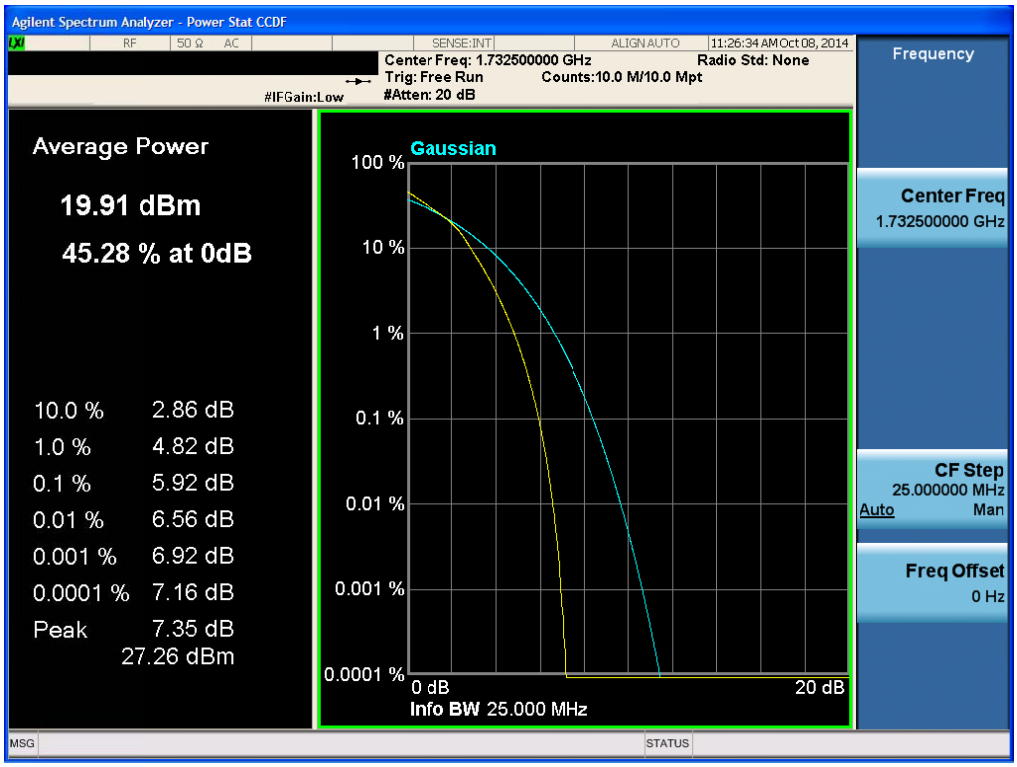
BAND 4. PAR Plot (10M BW Ch.20175 16QAM RB 50)



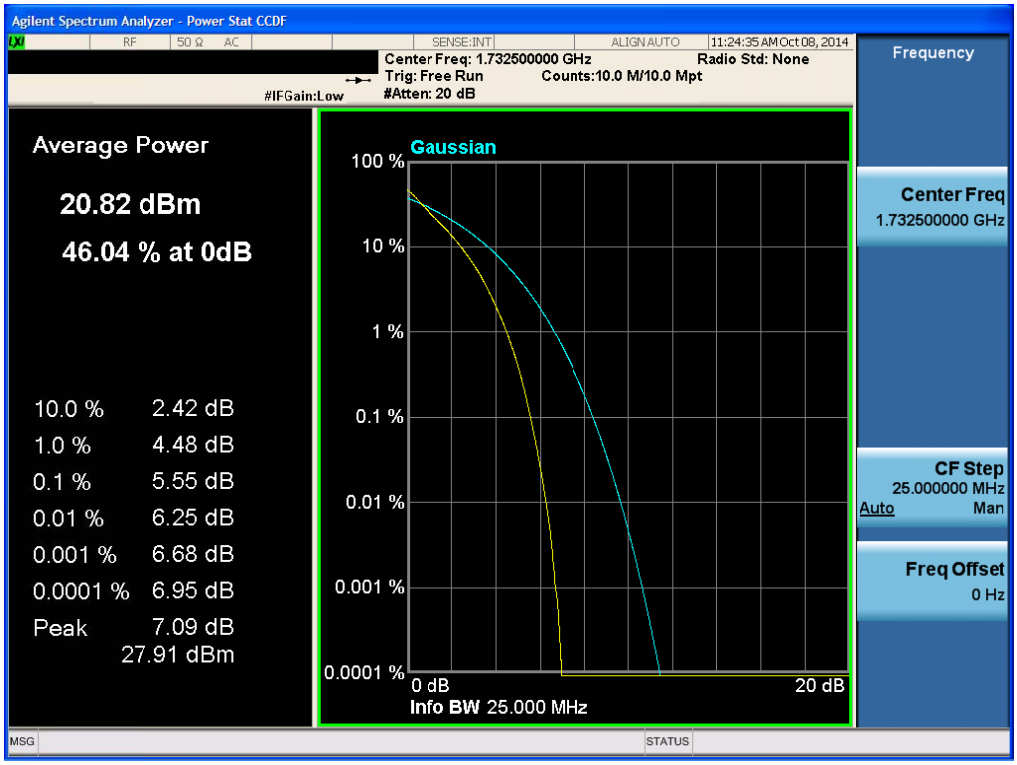
BAND 4. PAR Plot (15M BW Ch.20175 QPSK RB 75)



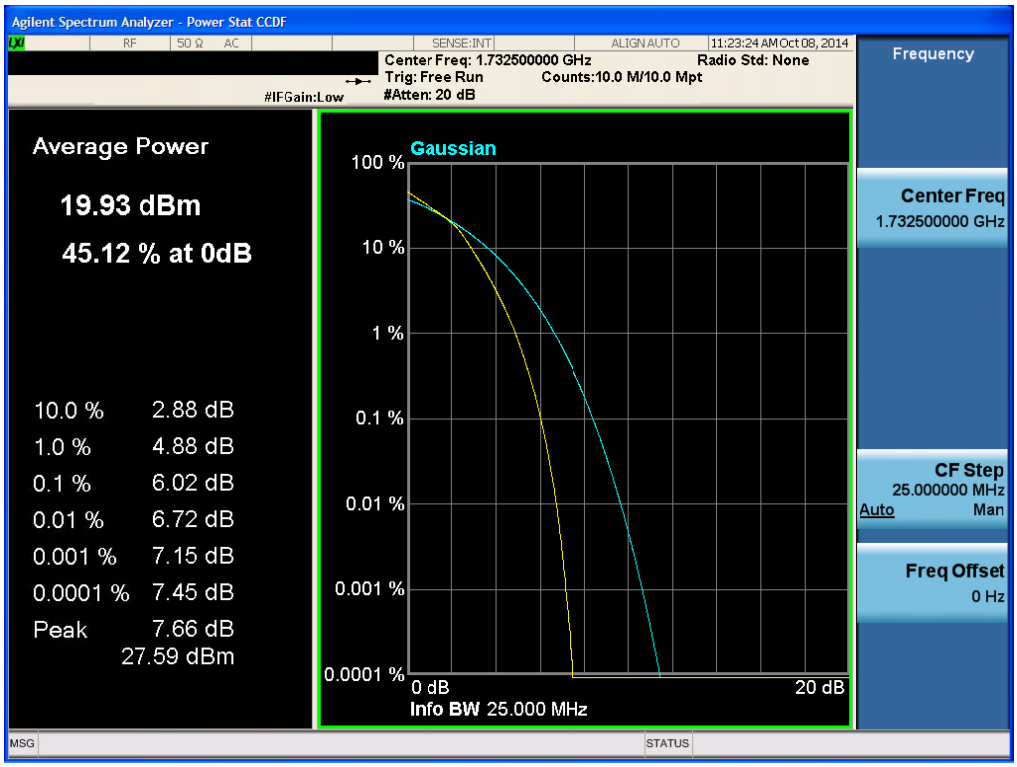
BAND 4. PAR Plot (15M BW Ch.20175 16QAM RB 75)



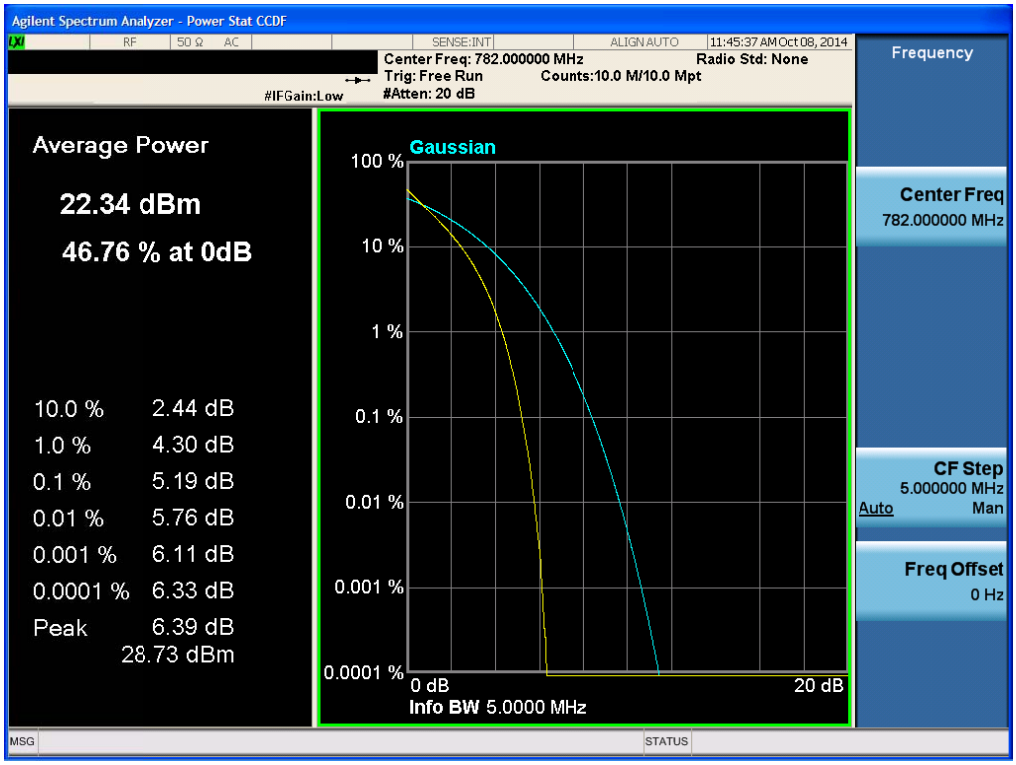
BAND 4. PAR Plot (20M BW Ch.20175 QPSK RB 100)



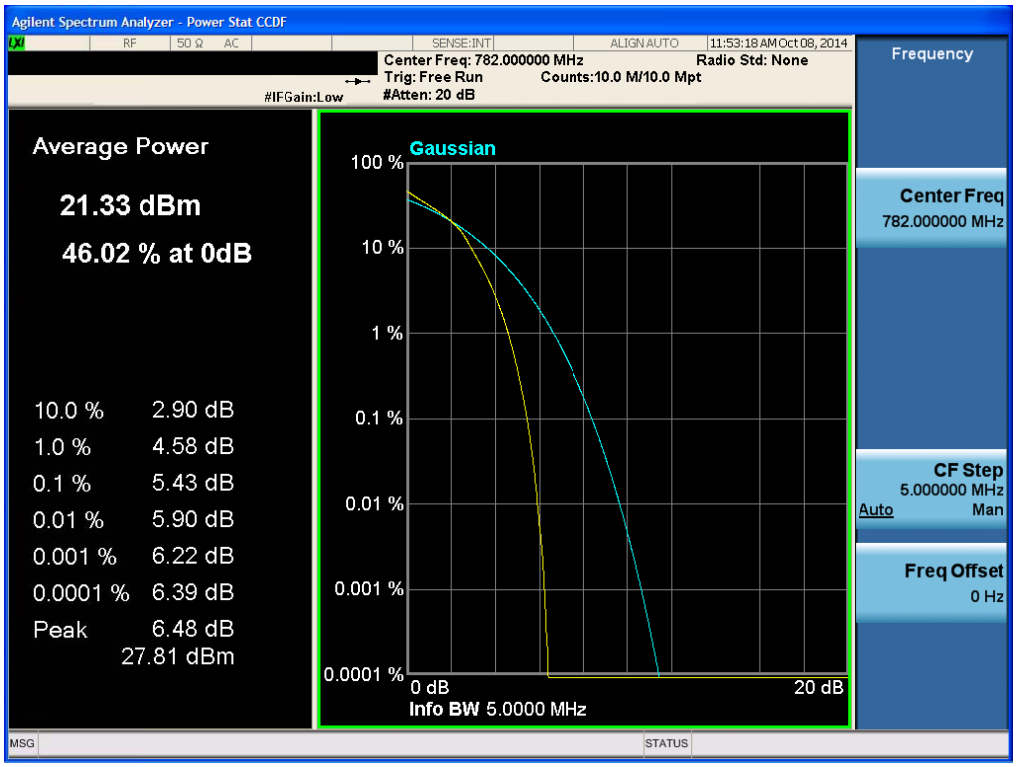
BAND 4. PAR Plot (20M BW Ch.20175 16QAM RB 100)



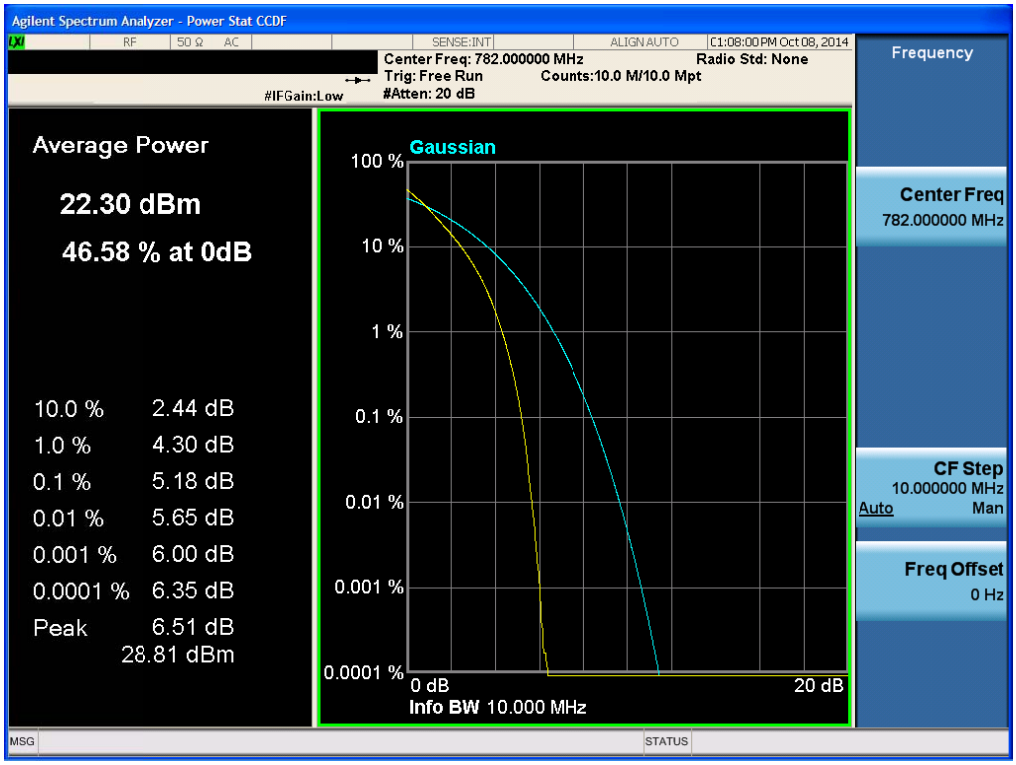
BAND 13. PAR Plot (23230ch_5MHz_QPSK_RB 25)



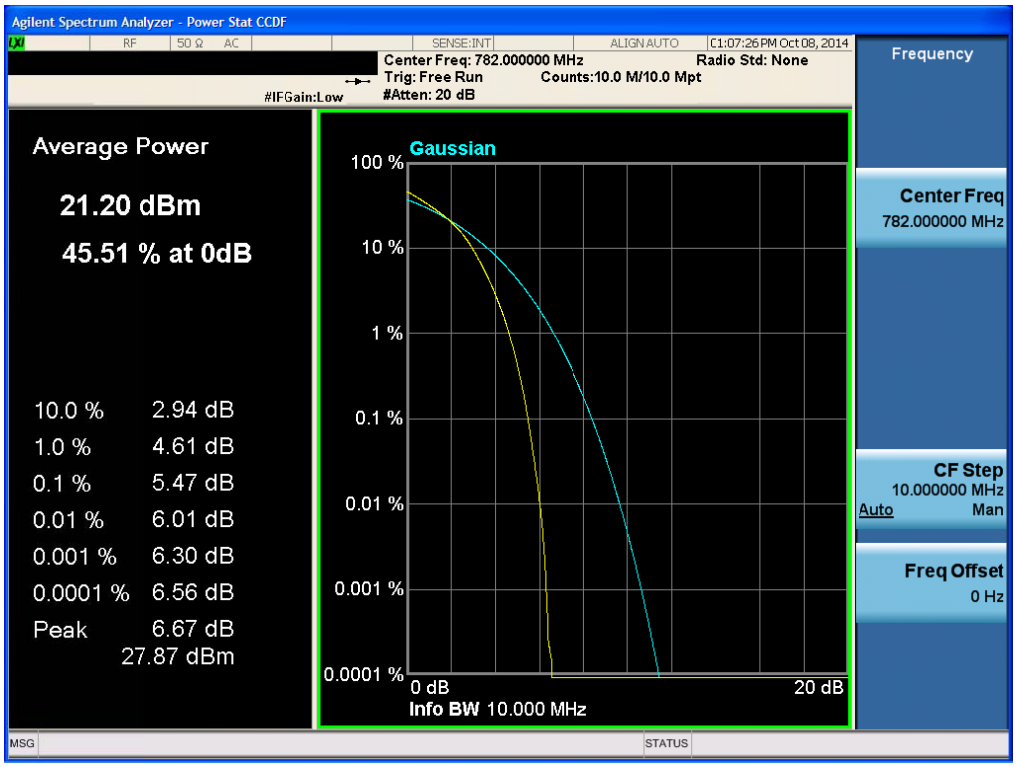
BAND 13. PAR Plot (23230ch_5MHz_16-QAM _RB 25)



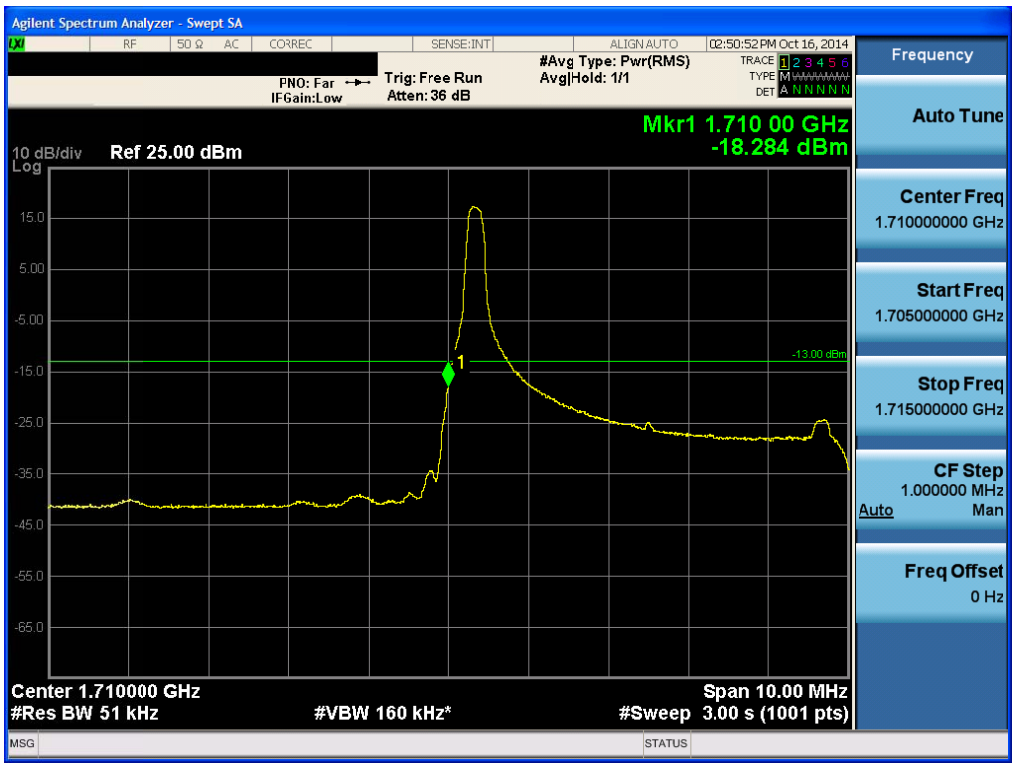
BAND 13. PAR Plot (23230ch_10MHz_QPSK_RB 50)



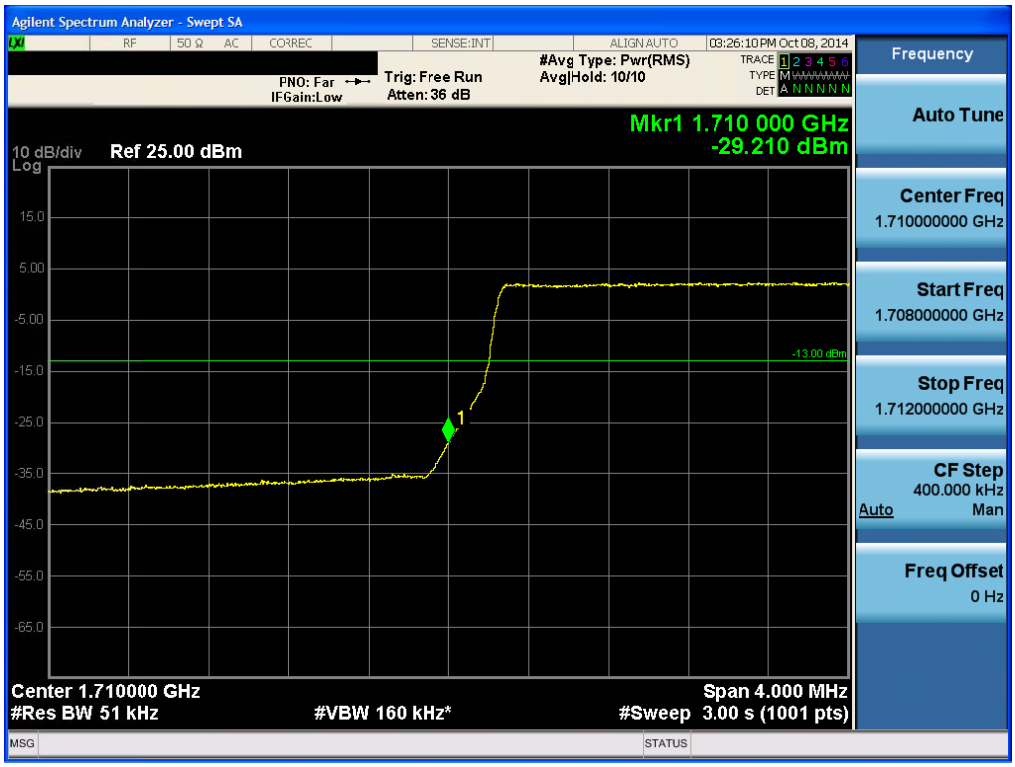
BAND 13. PAR Plot (23230ch_10MHz_16-QAM _RB 50)



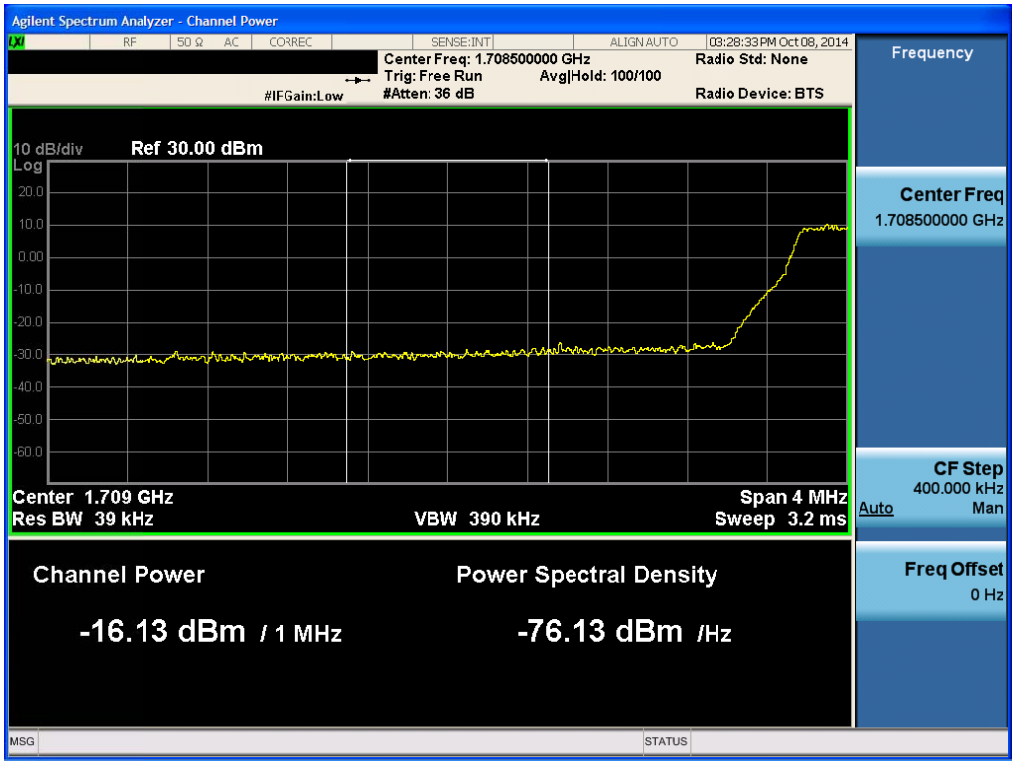
BAND 4. Lower Band Edge Plot (5M BW Ch.19975 QPSK RB 1, Offset 0) -1



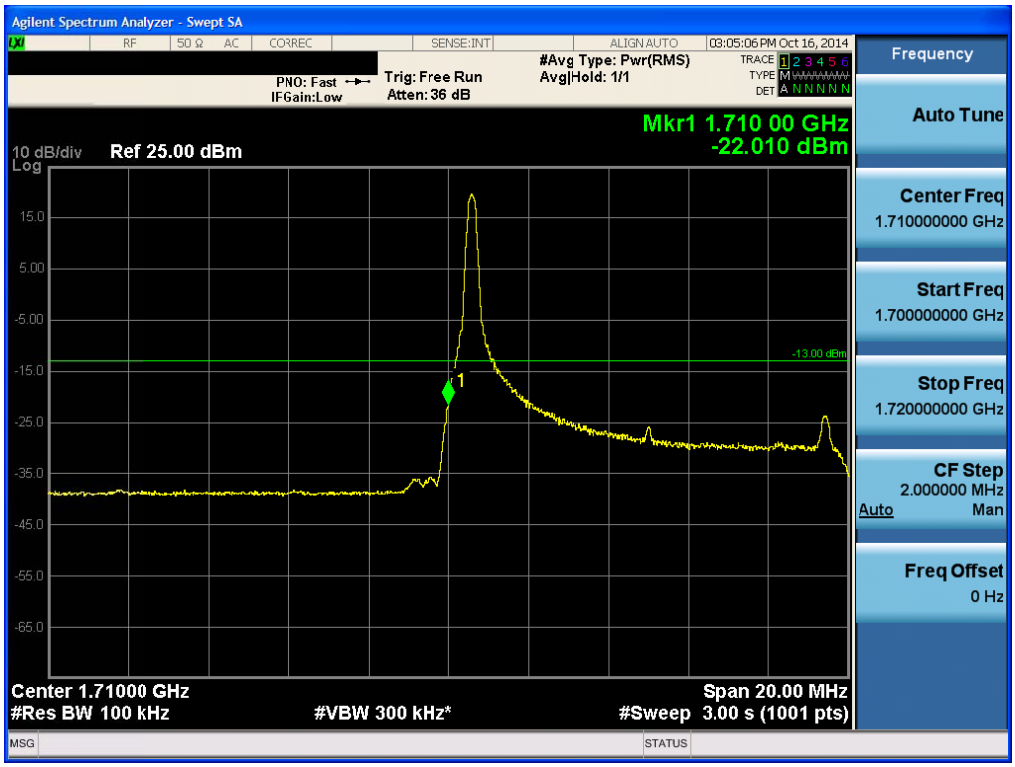
BAND 4. Lower Band Edge Plot (5M BW Ch.19975 QPSK RB 25) -2



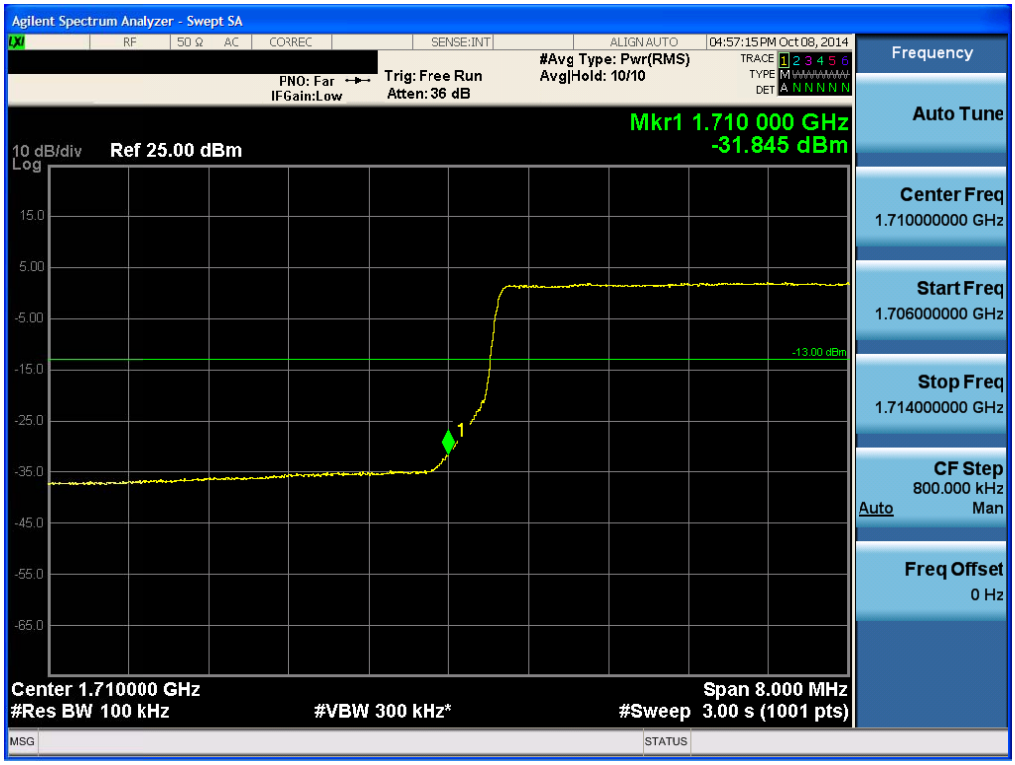
BAND 4. Lower Extended Band Edge Plot (5M BW Ch.19975 QPSK RB 25) -3



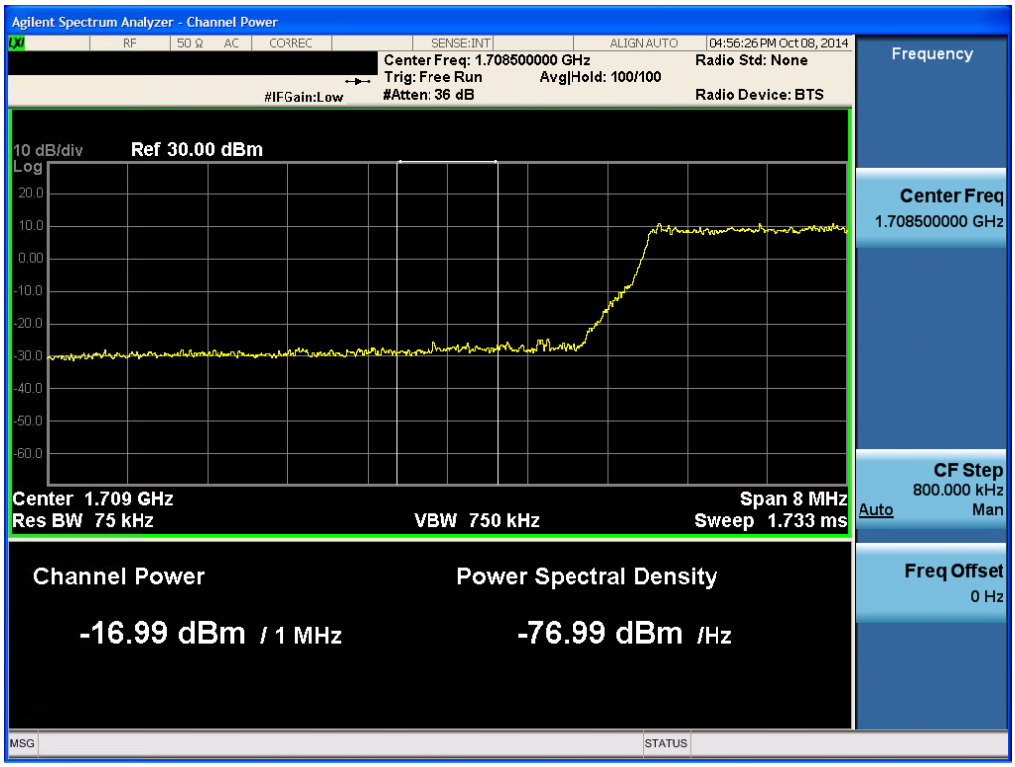
BAND 4. Lower Band Edge Plot (10M BW Ch.20000 QPSK RB 1, Offset 0) -1



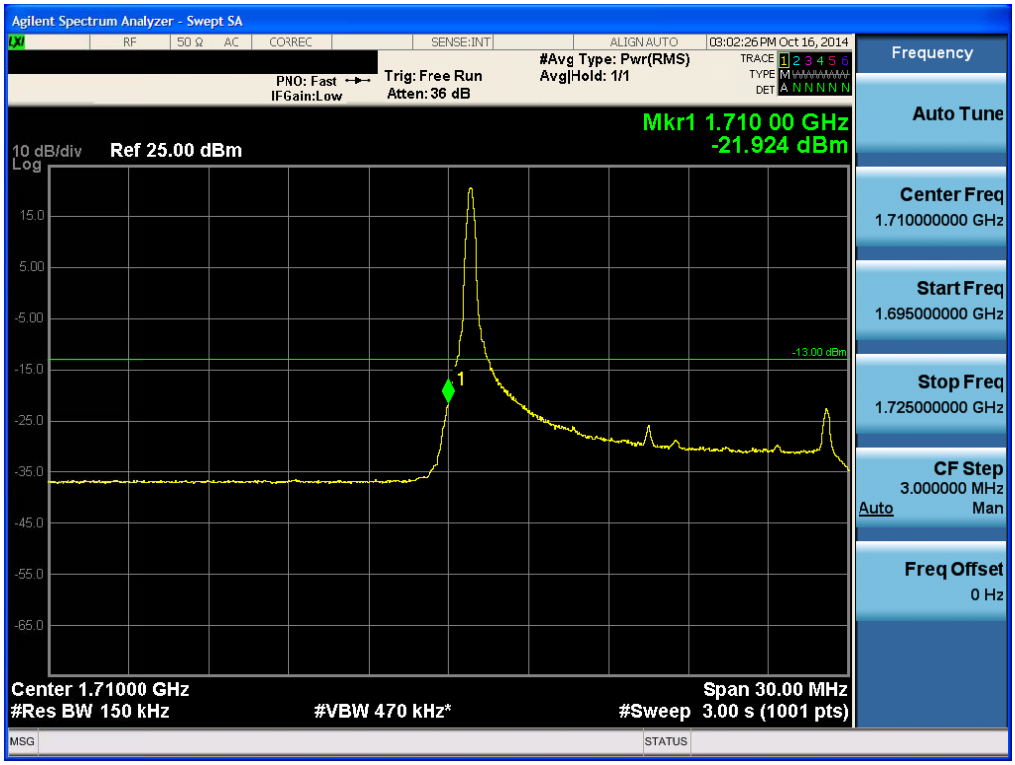
BAND 4. Lower Band Edge Plot (10M BW Ch.20000 QPSK RB 50) -2



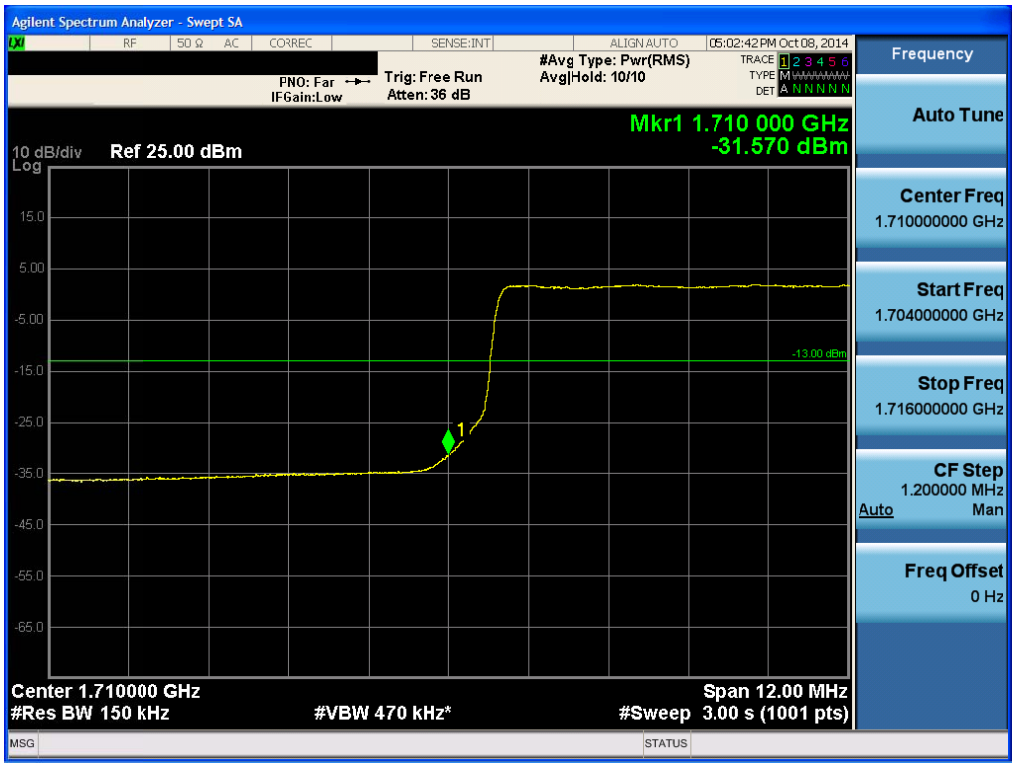
BAND 4. Lower Extended Band Edge Plot (10M BW Ch.20000 QPSK RB 50) -3



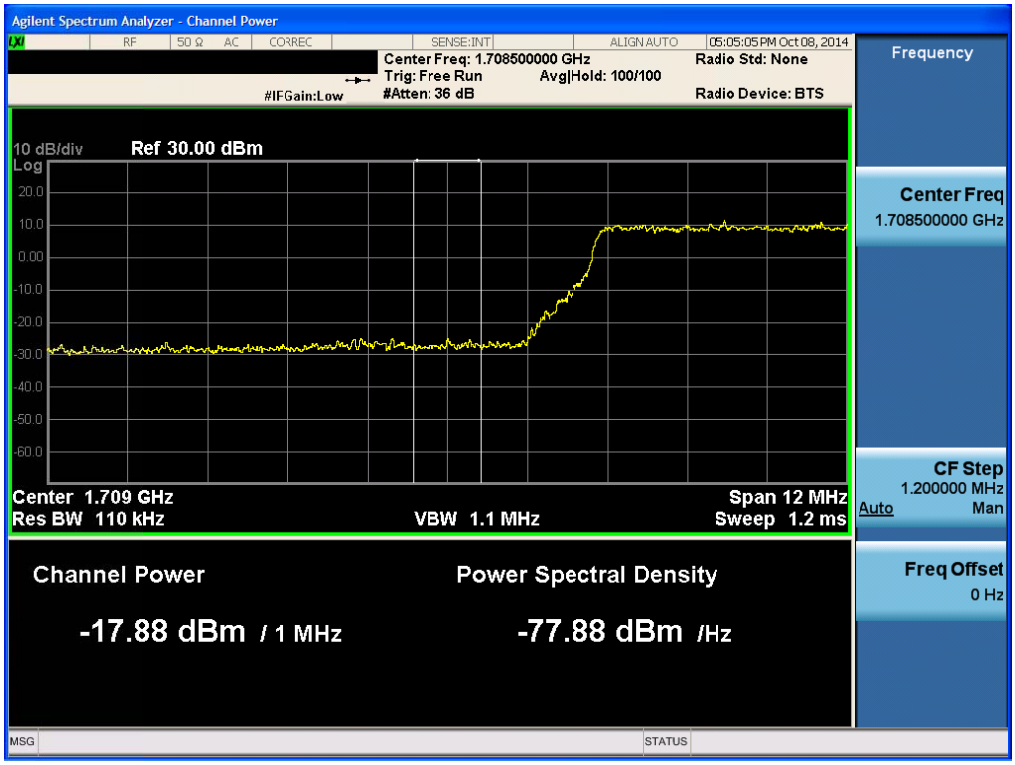
BAND 4. Lower Band Edge Plot (15M BW Ch.20025 QPSK RB 1, Offset 0) -1



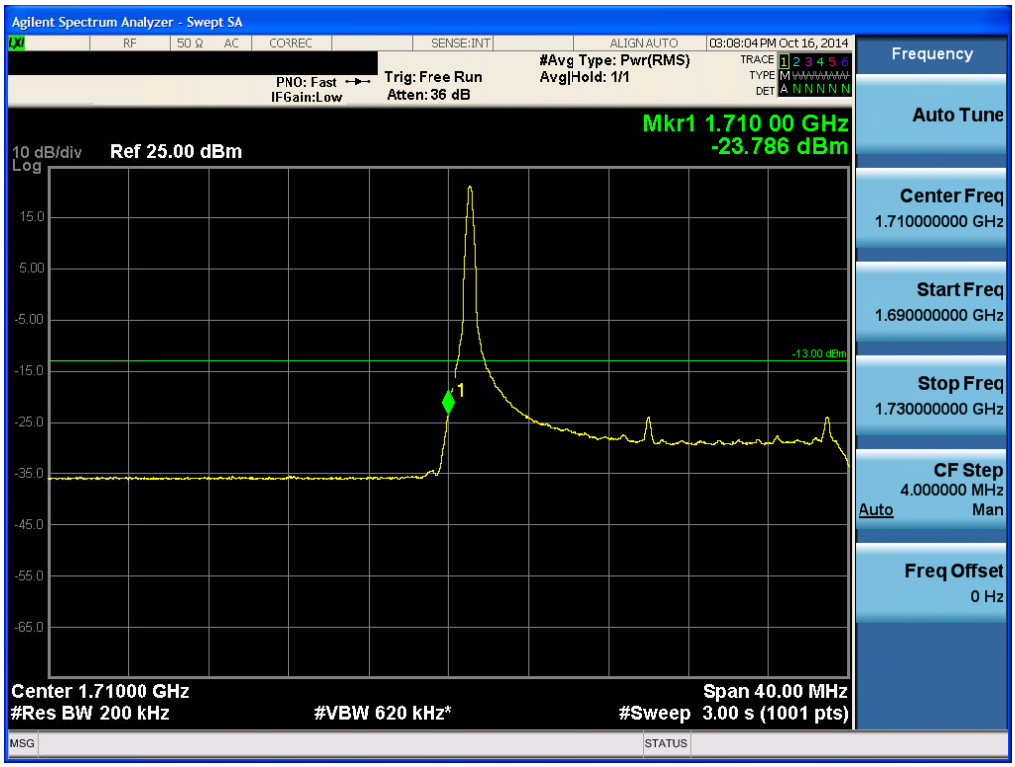
BAND 4. Lower Band Edge Plot (15M BW Ch.20025 QPSK RB 75) -2



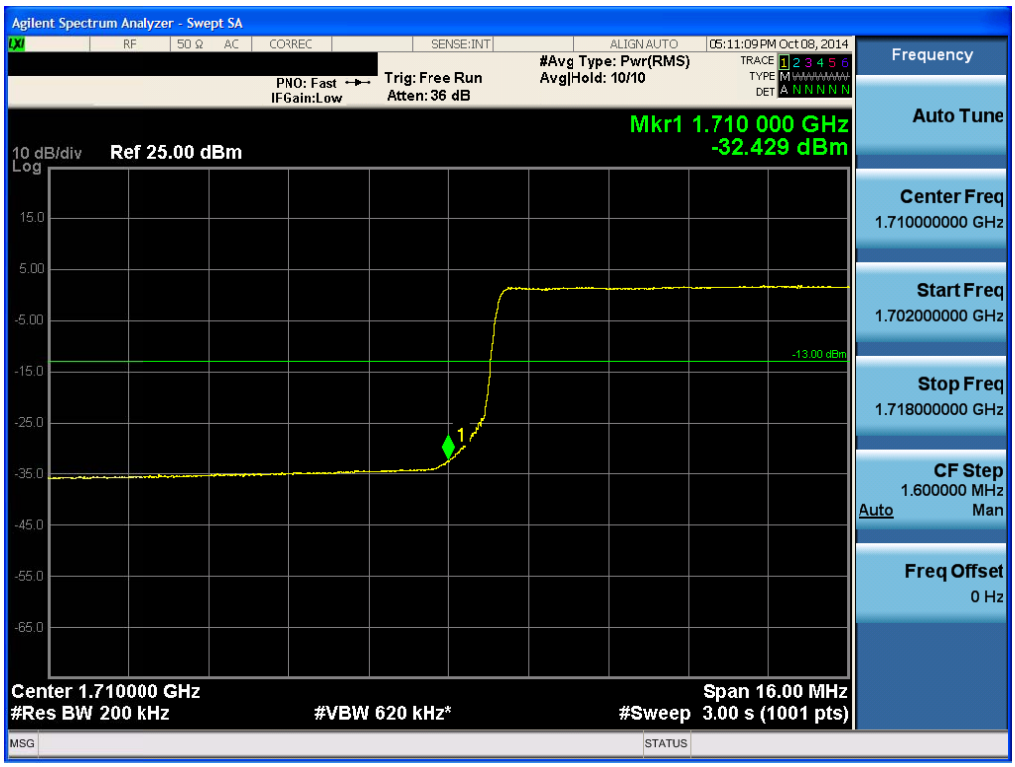
BAND 4. Lower Extended Band Edge Plot (15M BW Ch.20025 QPSK RB 75) -3



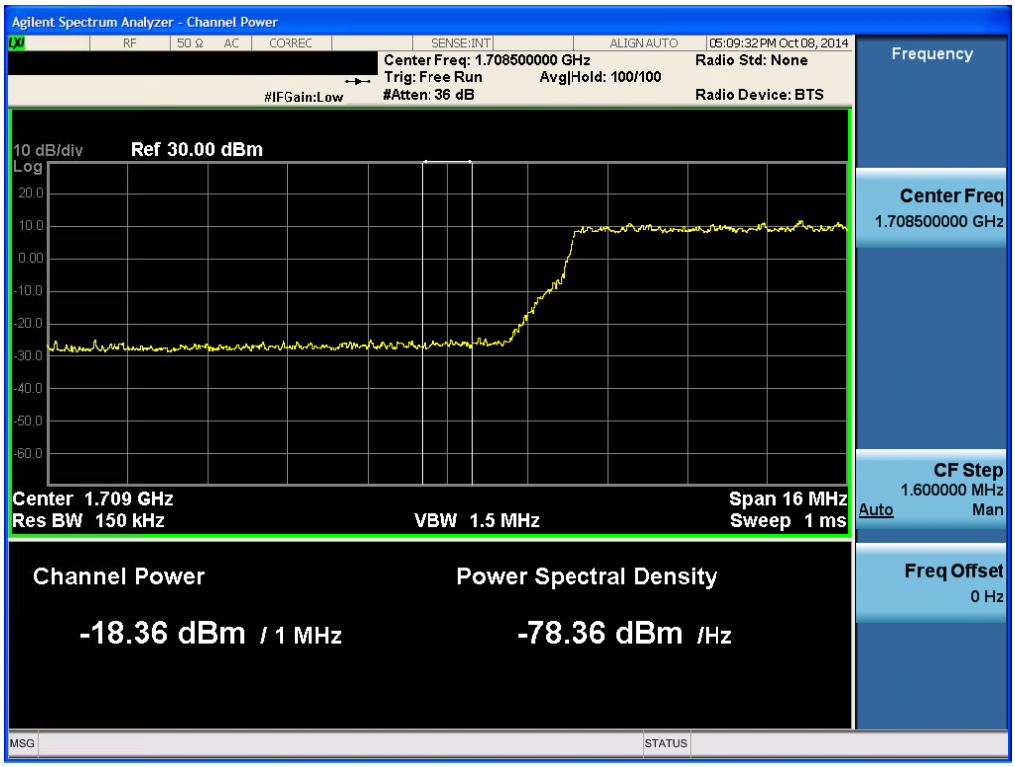
BAND 4. Lower Band Edge Plot (20M BW Ch.20050 QPSK RB 1, Offset 0) -1



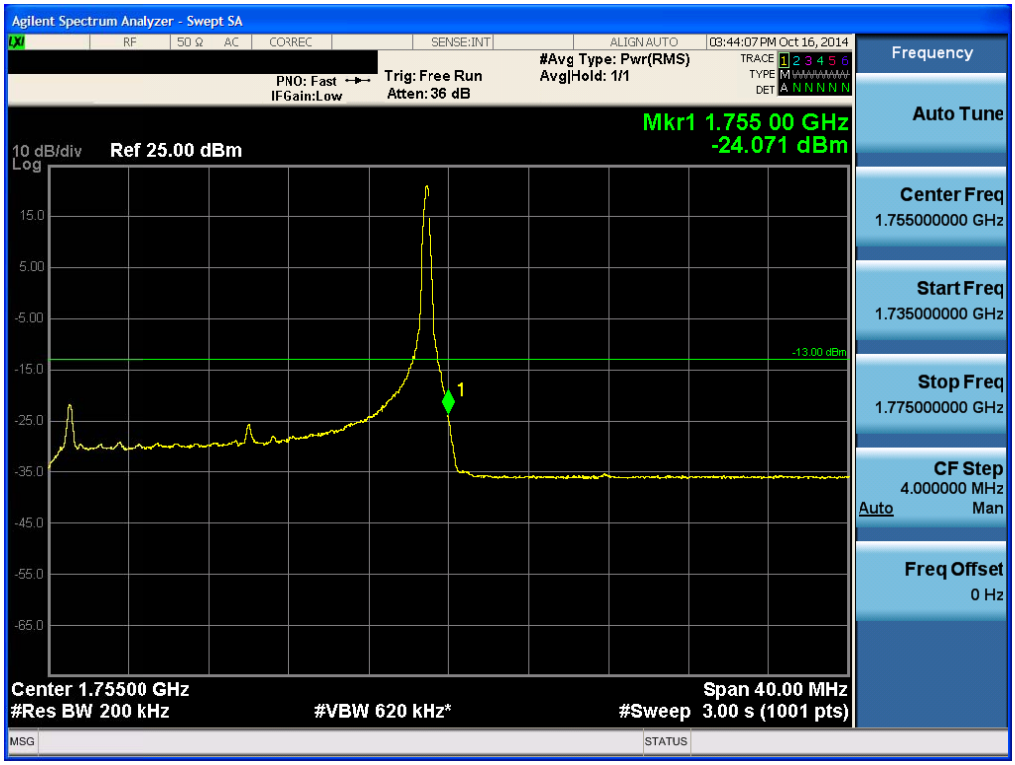
BAND 4. Lower Band Edge Plot (20M BW Ch.20050 QPSK RB 100) -2



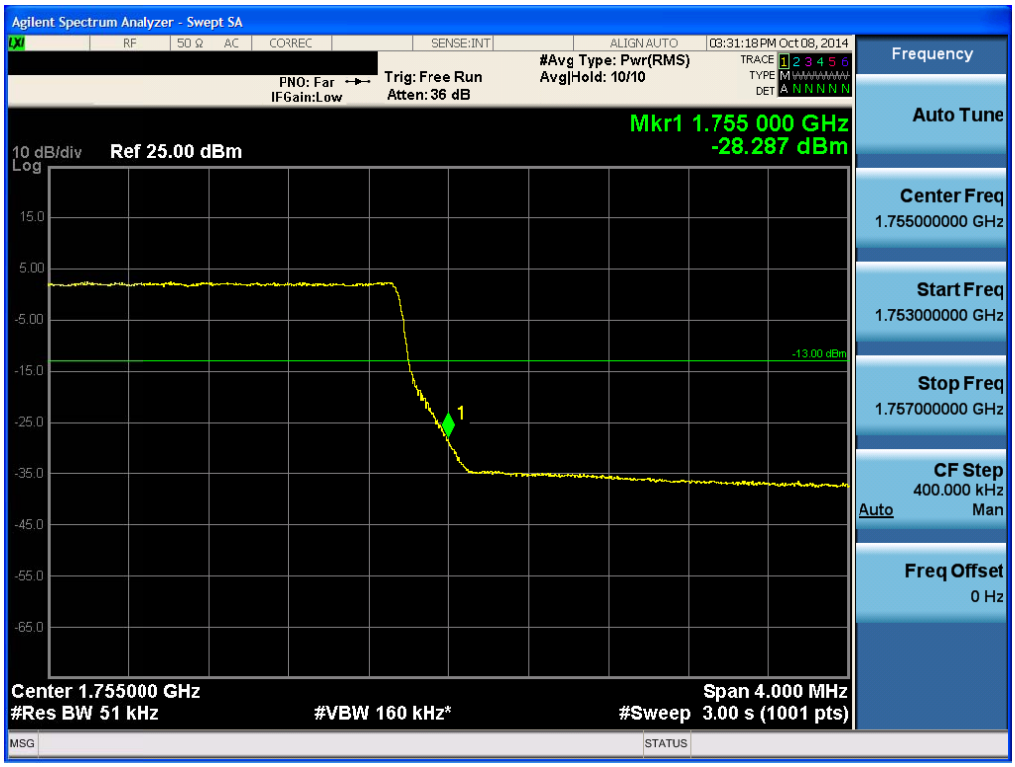
BAND 4. Lower Extended Band Edge Plot (20M BW Ch.20050 QPSK RB 100) -3



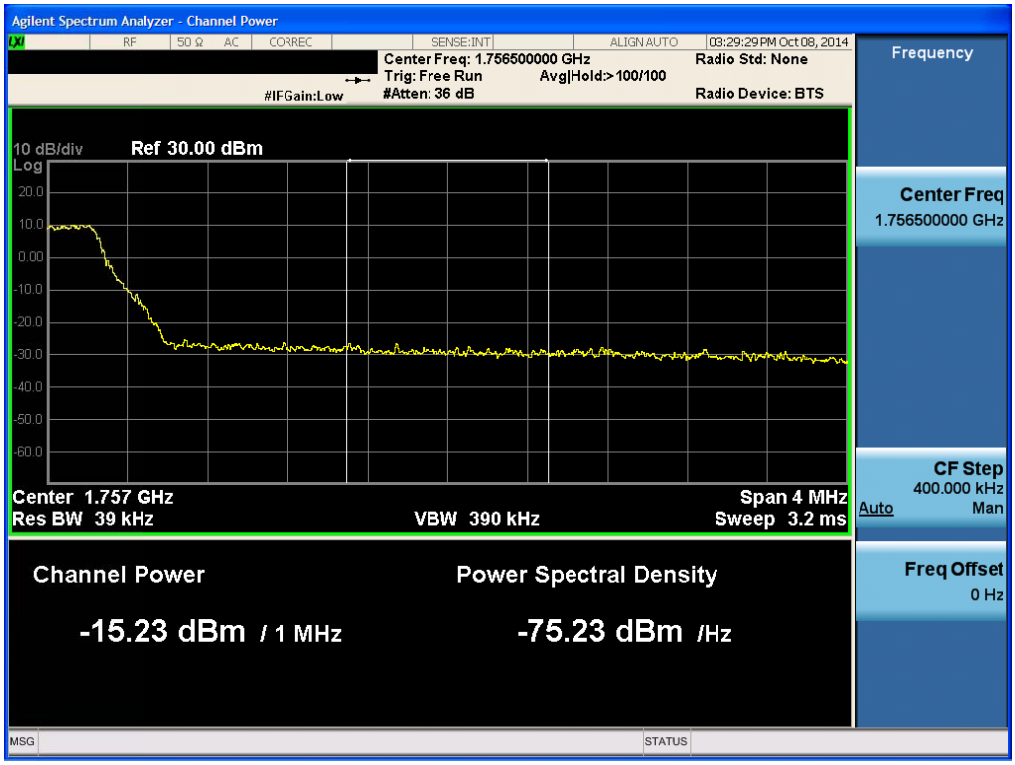
BAND 4. Upper Band Edge Plot (5M BW Ch.20375 QPSK RB 1, Offset 24) -1



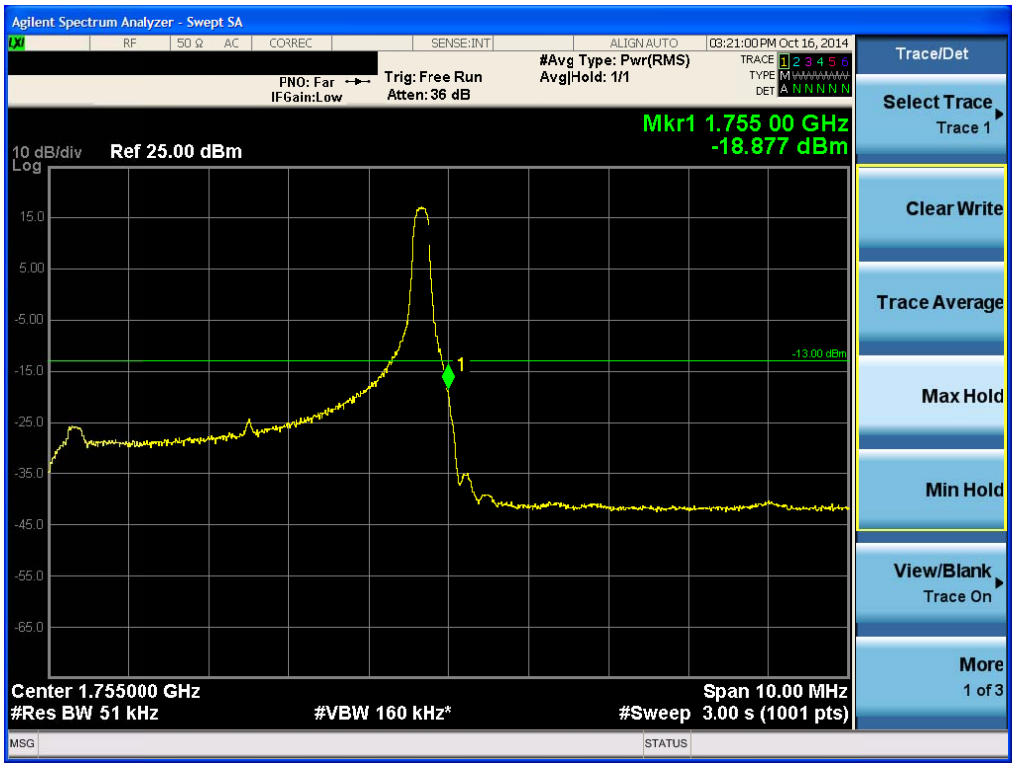
BAND 4. Upper Band Edge Plot (5M BW Ch.20375 QPSK RB 25) -2



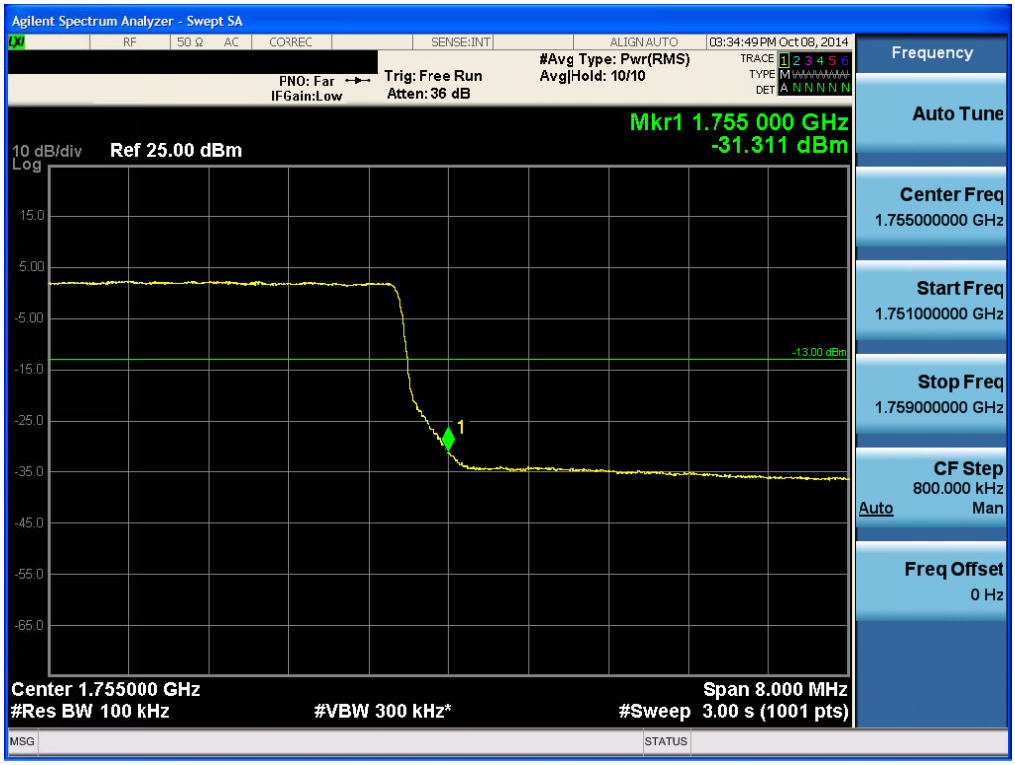
BAND 4. Upper Extended Band Edge Plot (5M BW Ch.20375 QPSK RB 25) -3



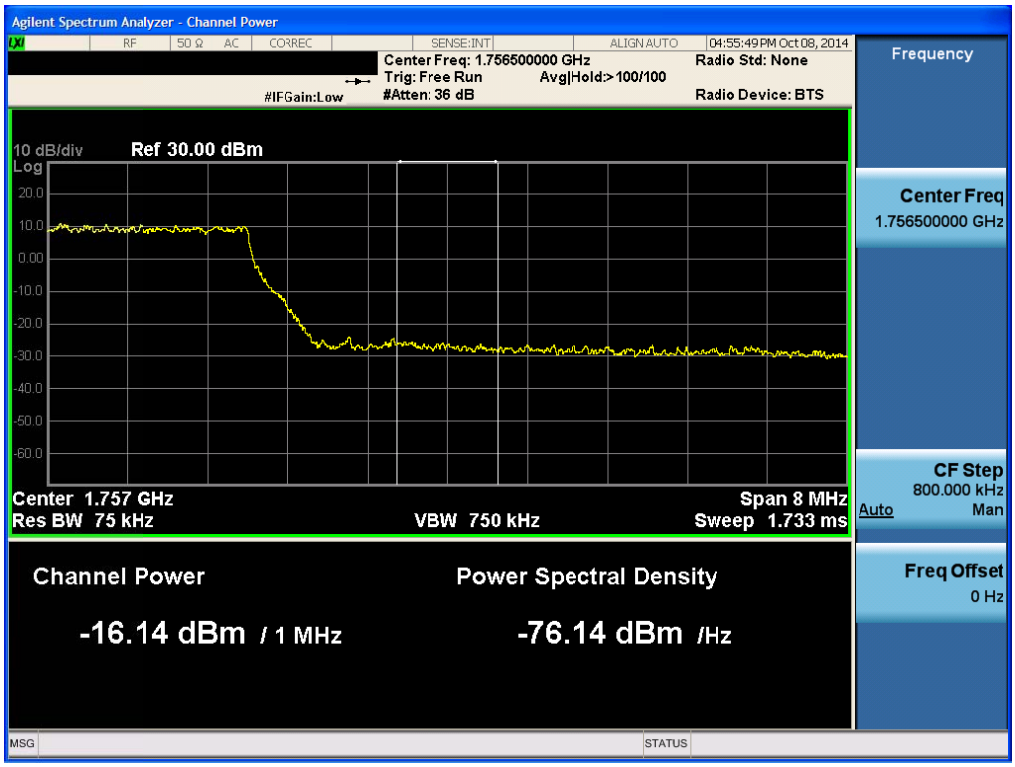
BAND 4. Upper Band Edge Plot (10M BW Ch.20350 QPSK RB 1, Offset 49) -1



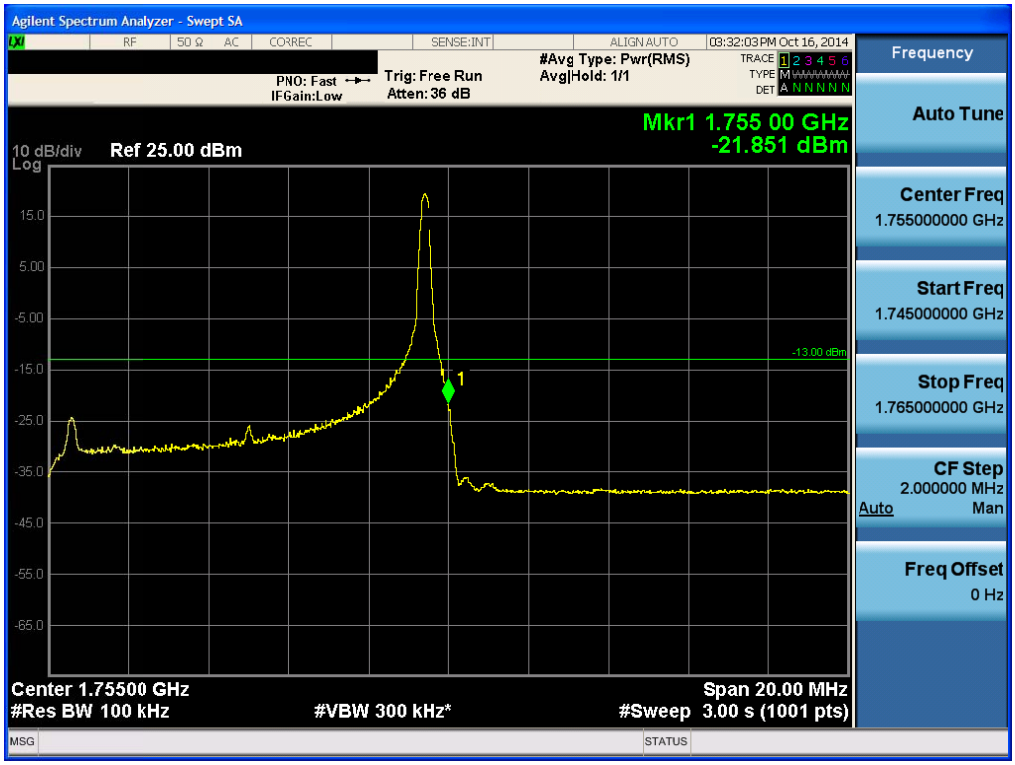
BAND 4. Upper Band Edge Plot (10M BW Ch.20350 QPSK RB 50) -2



BAND 4. Upper Extended Band Edge Plot (10M BW Ch.20350 QPSK RB 50) -3

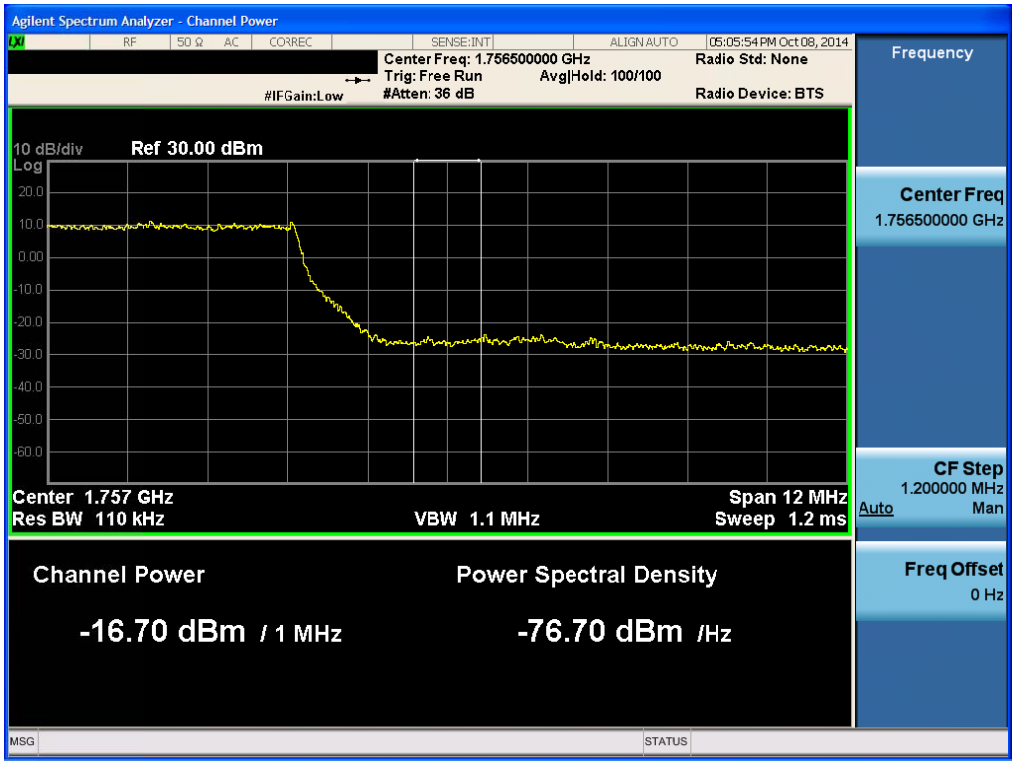


BAND 4. Upper Band Edge Plot (15M BW Ch.20325 QPSK RB 1, Offset 74) -1

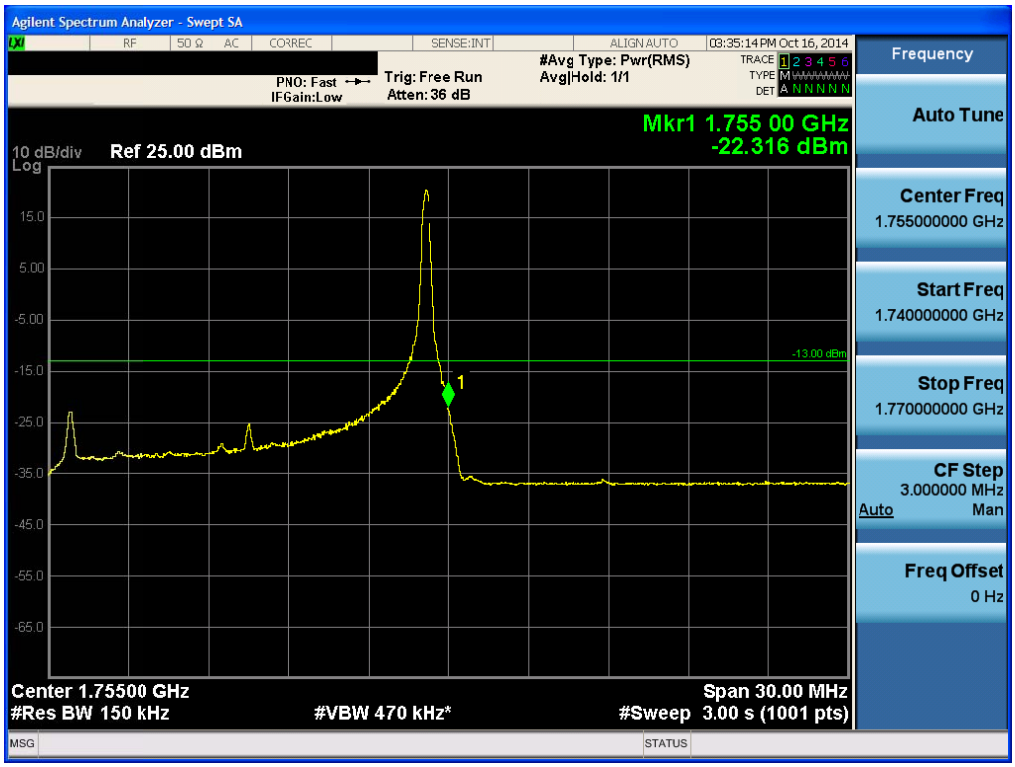


BAND 4. Upper Band Edge Plot (15M BW Ch.20325 QPSK RB 75) -2

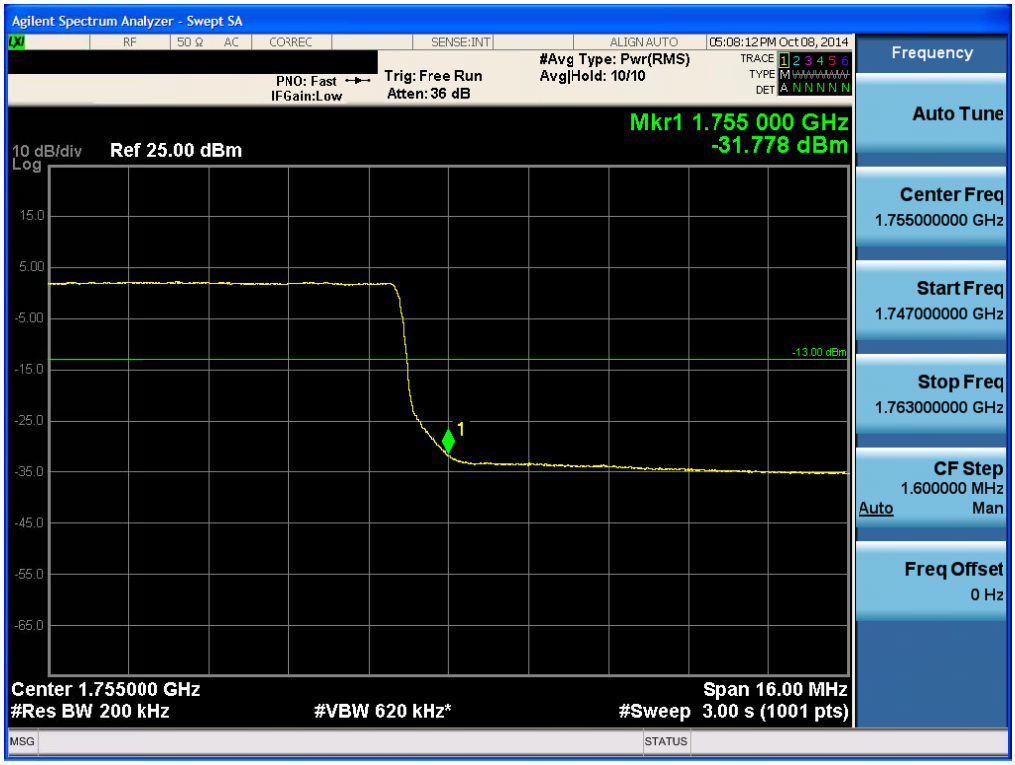
BAND 4. Upper Extended Band Edge Plot (15M BW Ch.20325 QPSK RB 75) -3



BAND 4. Upper Band Edge Plot (20M BW Ch.20300 QPSK RB 1, Offset 99) -1

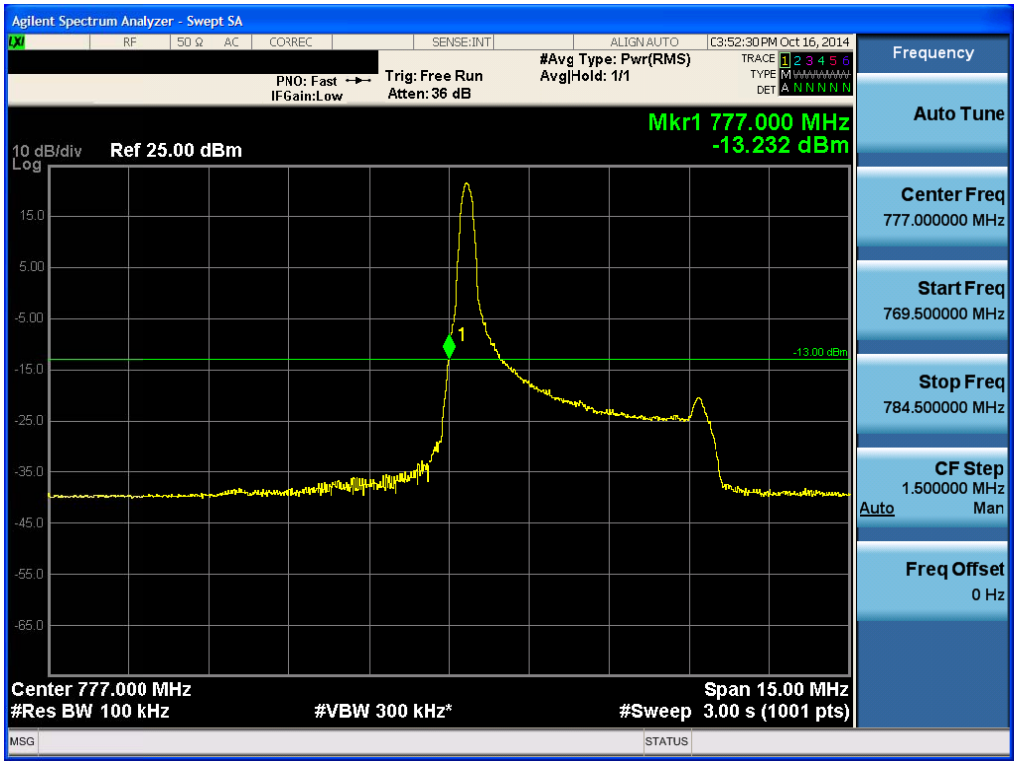


BAND 4. Upper Band Edge Plot (20M BW Ch.20300 QPSK RB 100) -2

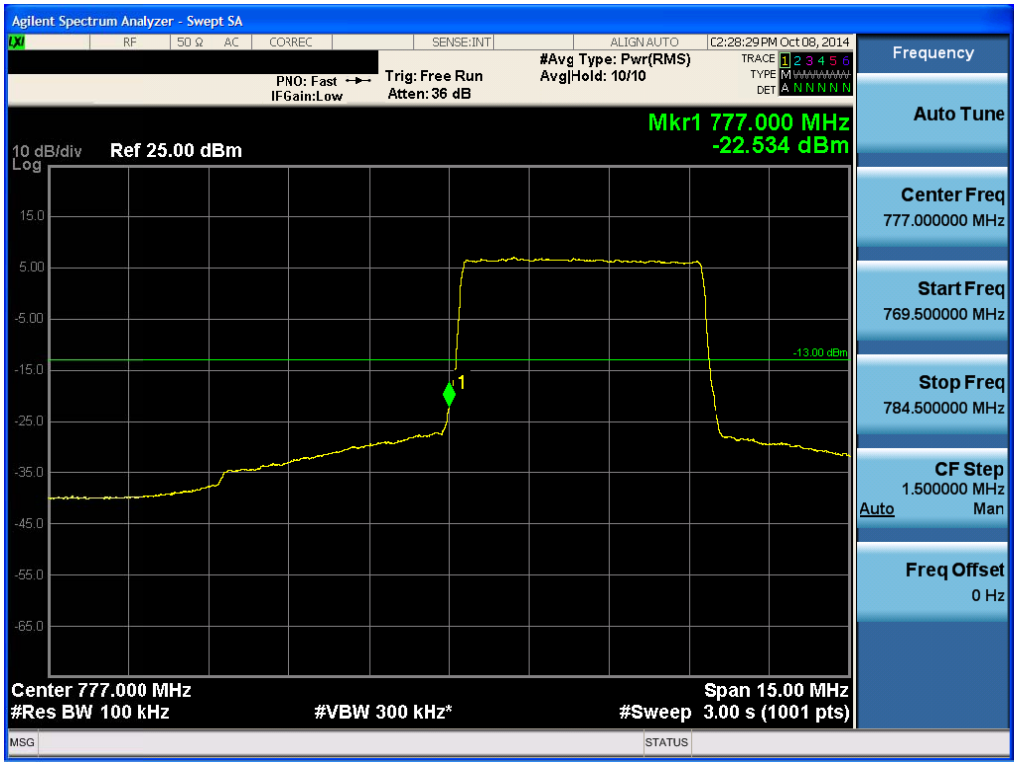


BAND 4. Upper Extended Band Edge Plot (20M BW Ch.20300 QPSK RB 100) -3

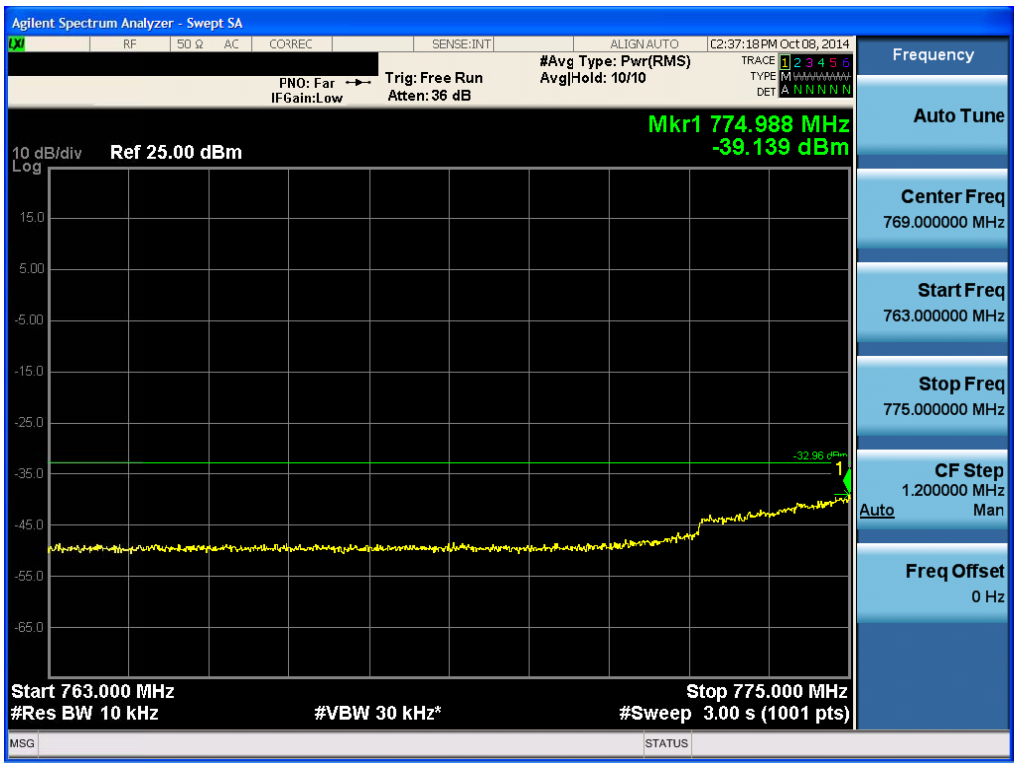
BAND 13. Lower Band Edge Plot (5M BW Ch.23230 QPSK RB 1, Offset 0) -1



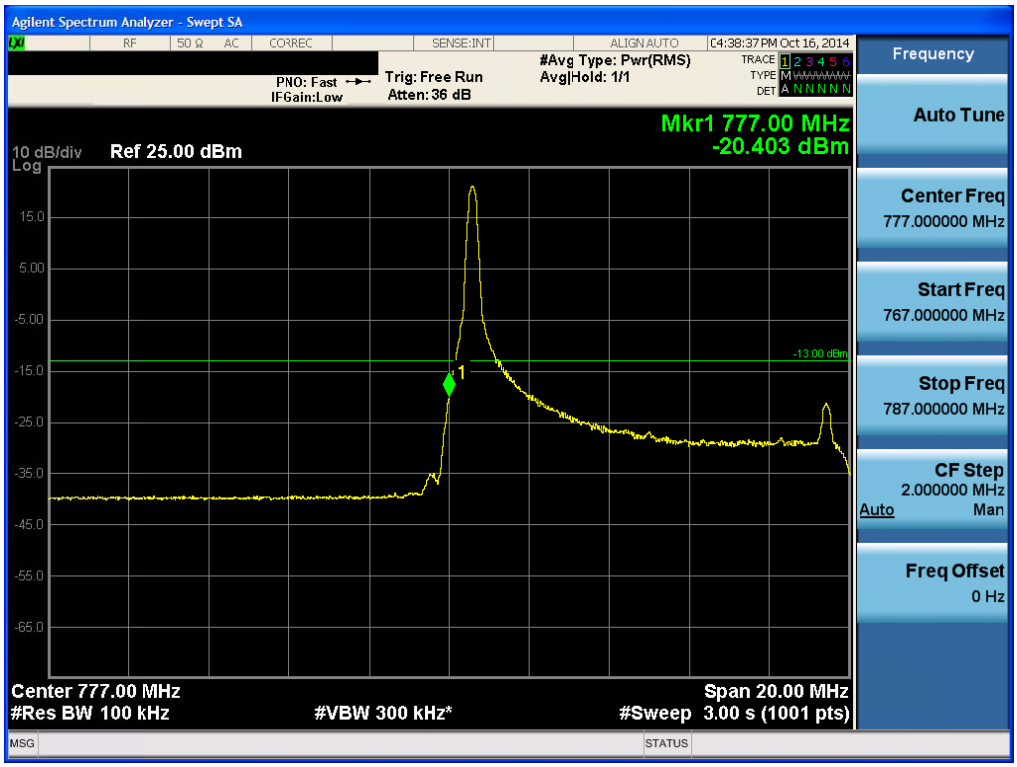
BAND 13. Lower Band Edge Plot (5M BW Ch.23230 QPSK RB 25) -2



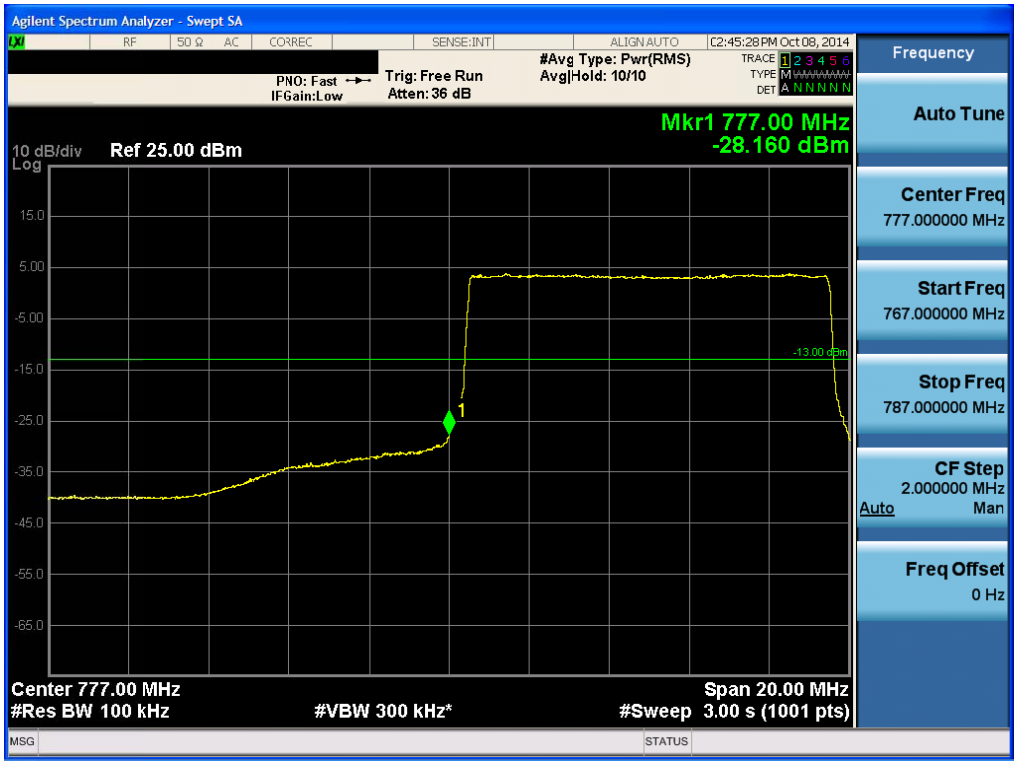
BAND 13. Lower Emission Mask Plot (5M BW Ch.23230 QPSK RB 25) -3



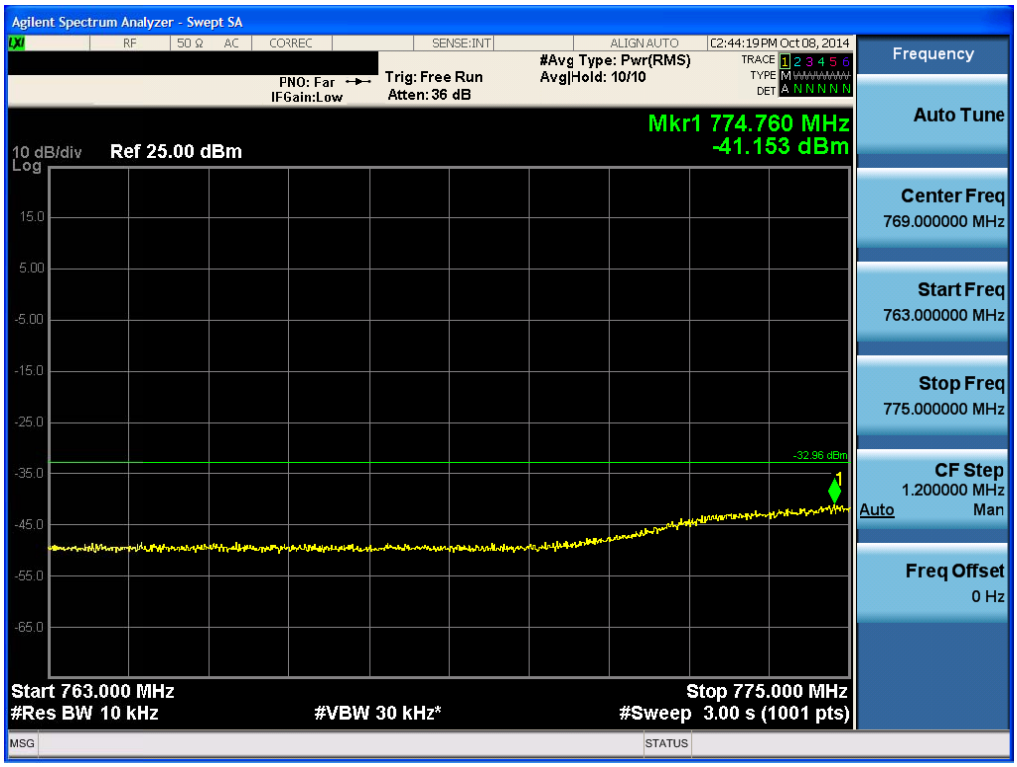
BAND 13. Lower Band Edge Plot (10M BW Ch.23230 QPSK RB 1, Offset 0) -1



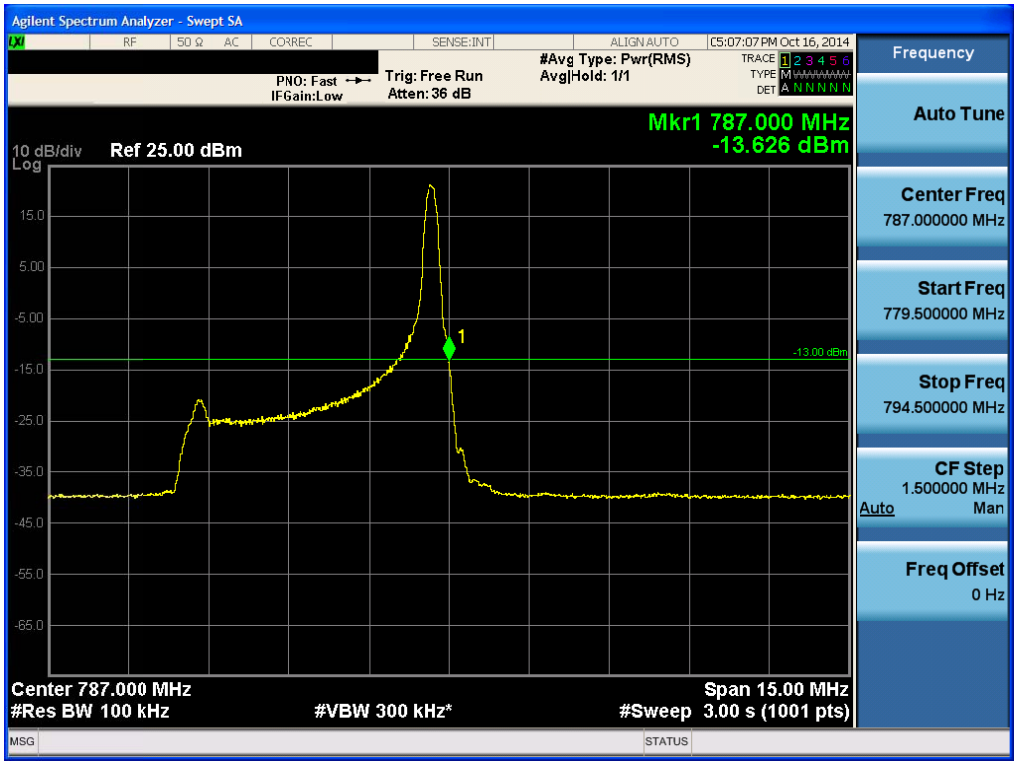
BAND 13. Lower Band Edge Plot (10M BW Ch.23230 QPSK RB 50) -2



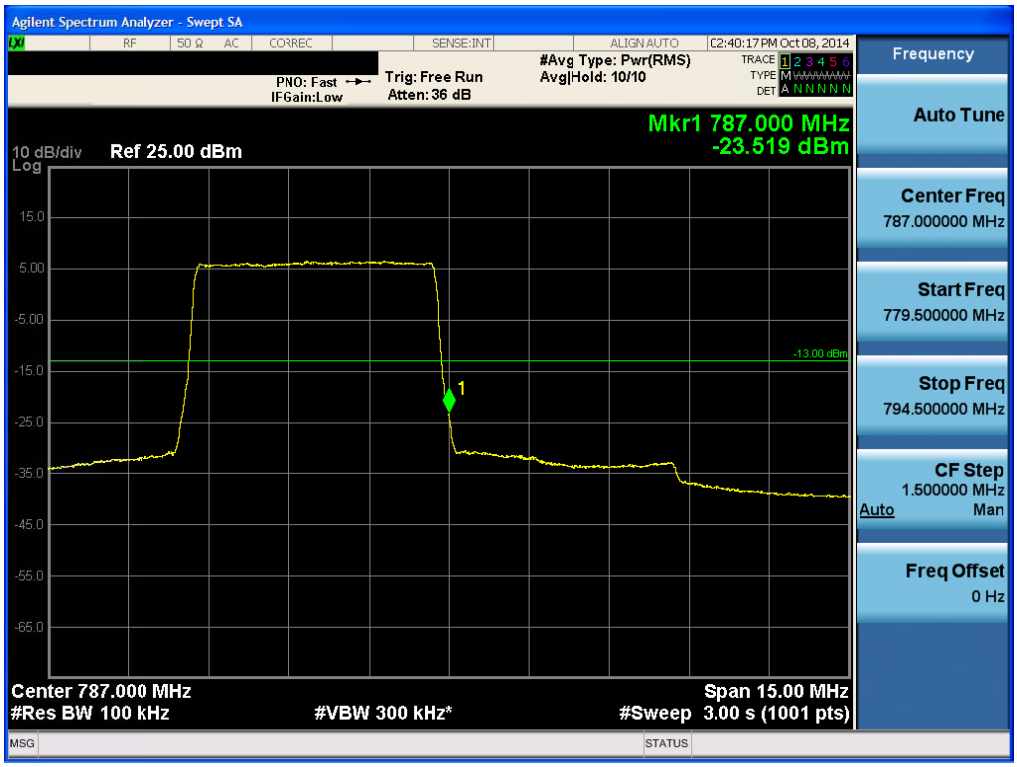
BAND 13. Lower Emission Mask Plot (10M BW Ch.23230 QPSK RB 50) -3



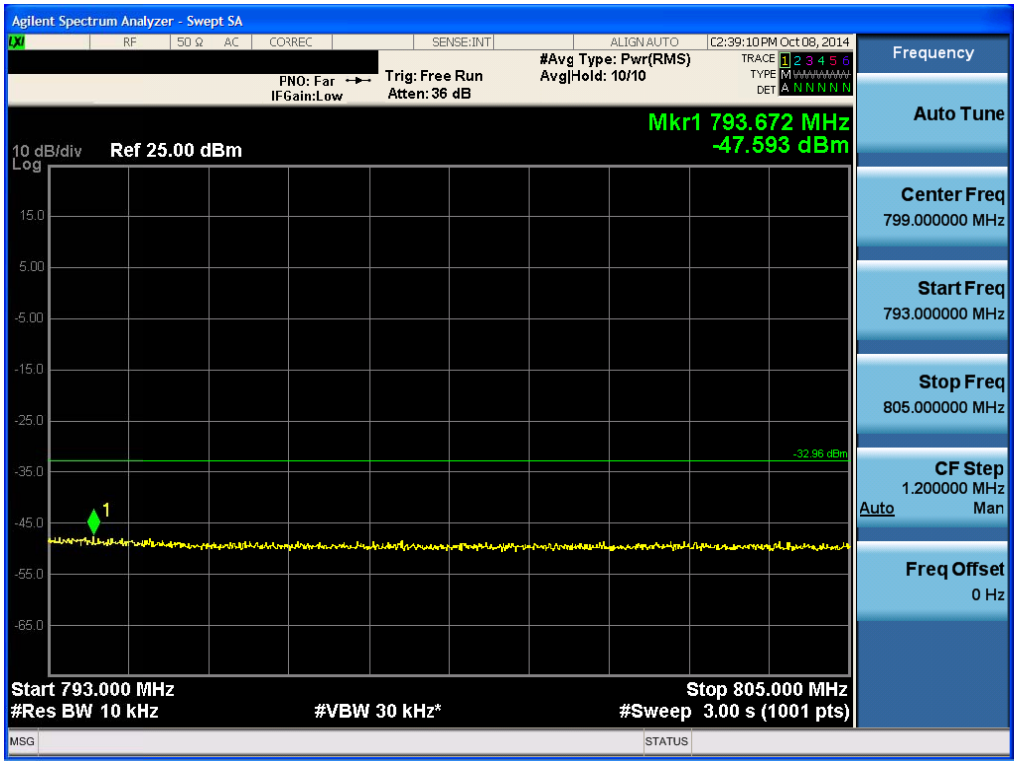
BAND 13. Upper Band Edge Plot (5M BW Ch.23230 QPSK RB 1, Offset 24) -1



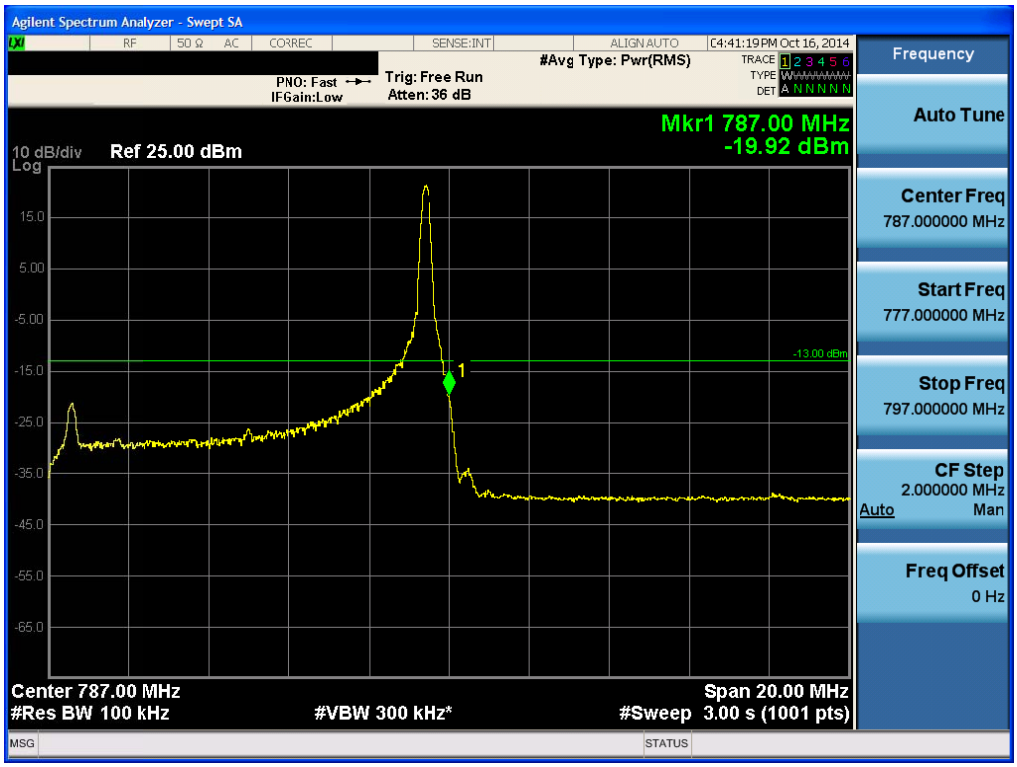
BAND 13. Upper Band Edge Plot (5M BW Ch.23230 QPSK RB 25) -2



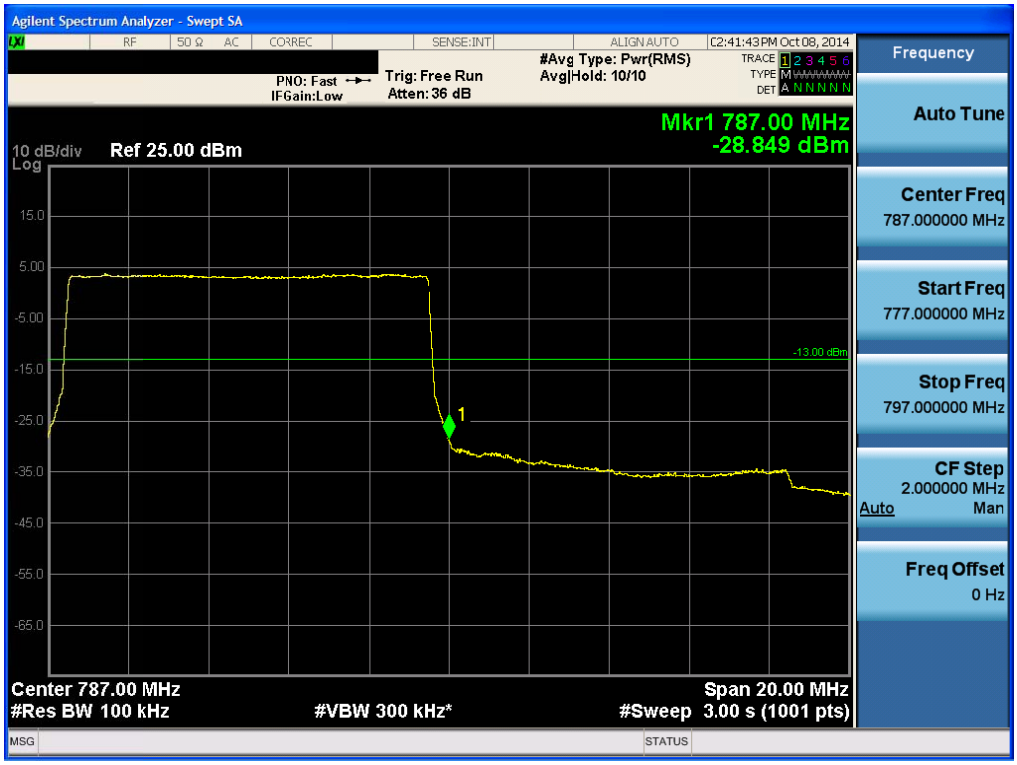
BAND 13. Upper Emission Mask Plot (5M BW Ch.23230 QPSK RB 25) -3



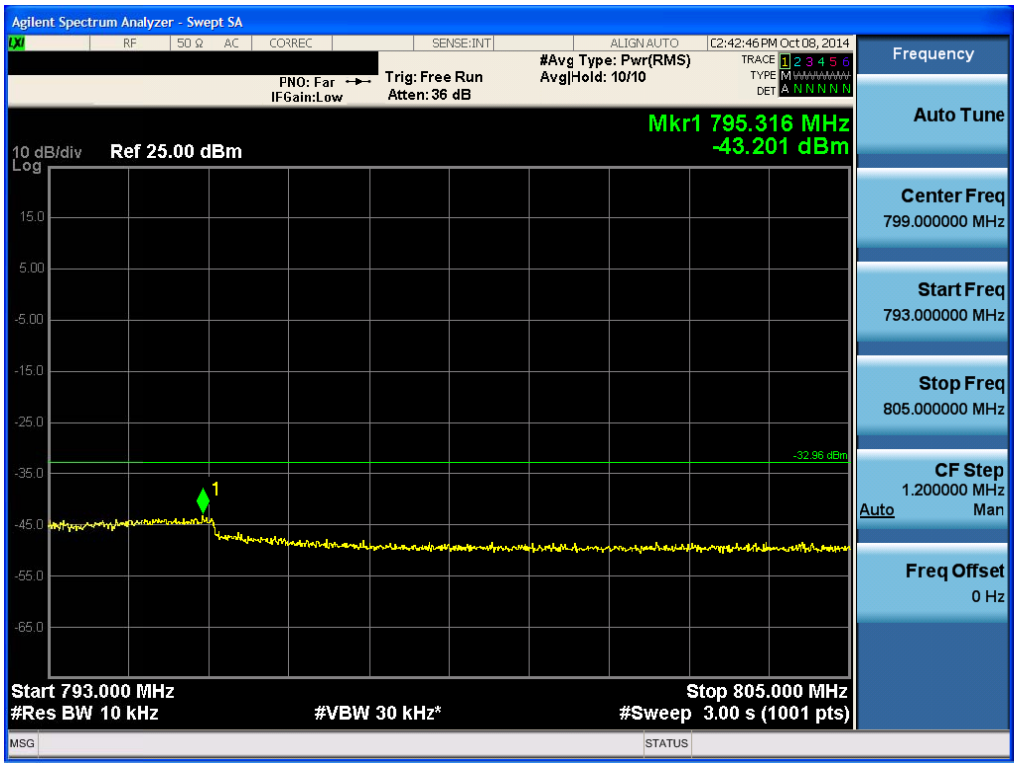
BAND 13. Upper Band Edge Plot (10M BW Ch.23230 QPSK RB 1, Offset 49) -1



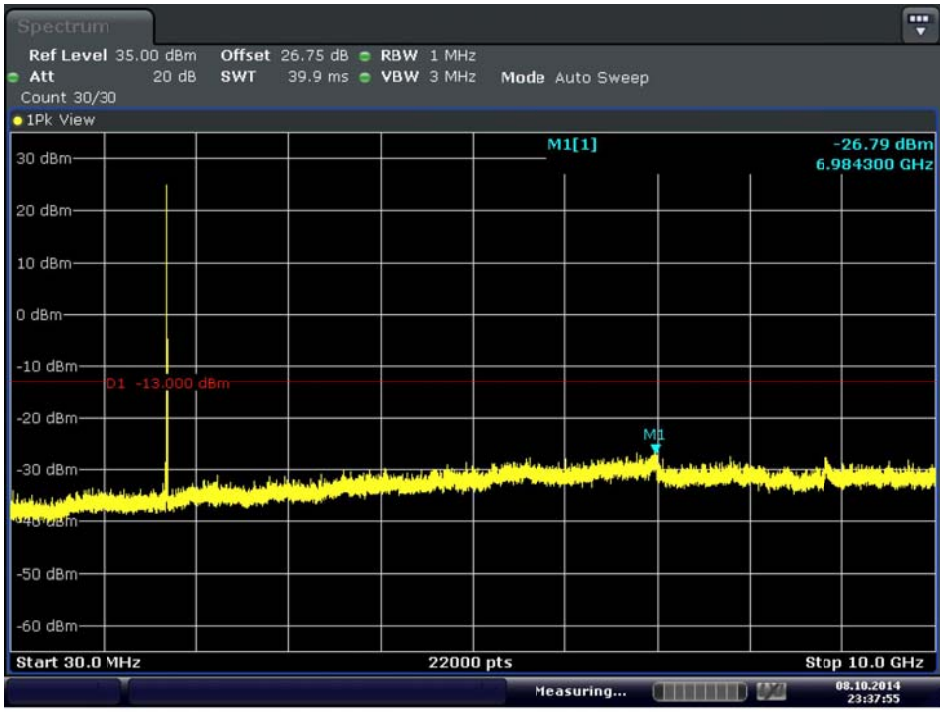
BAND 13. Upper Band Edge Plot (10M BW Ch.23230 QPSK RB 50) -2



BAND 13. Upper Emission Mask Plot (10M BW Ch.23230 QPSK RB 50) -3

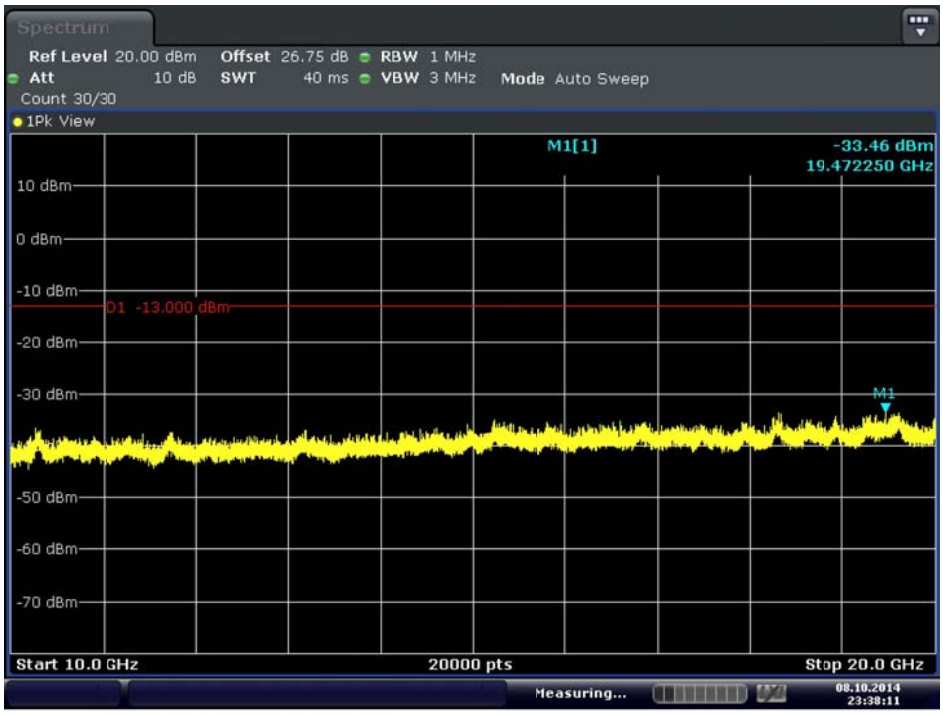


BAND 4. Conducted Spurious Plot_1 (19975ch_5MHz_QPSK_ RB 1_0)



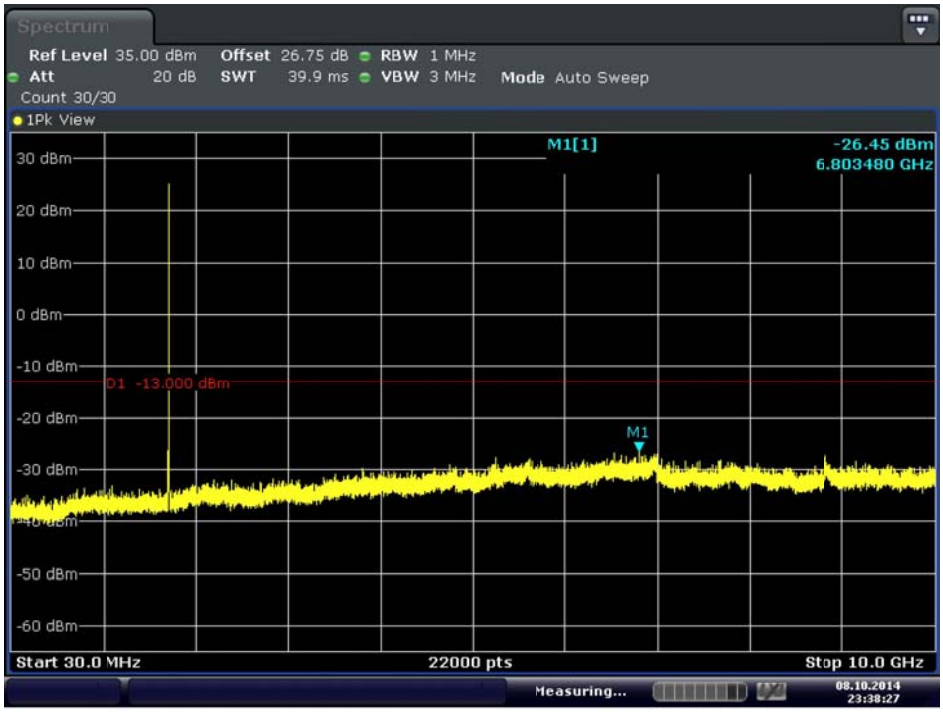
Date: 8.OCT.2014 23:37:55

BAND 4. Conducted Spurious Plot_2 (19975ch_5MHz_QPSK_ RB 1_0)



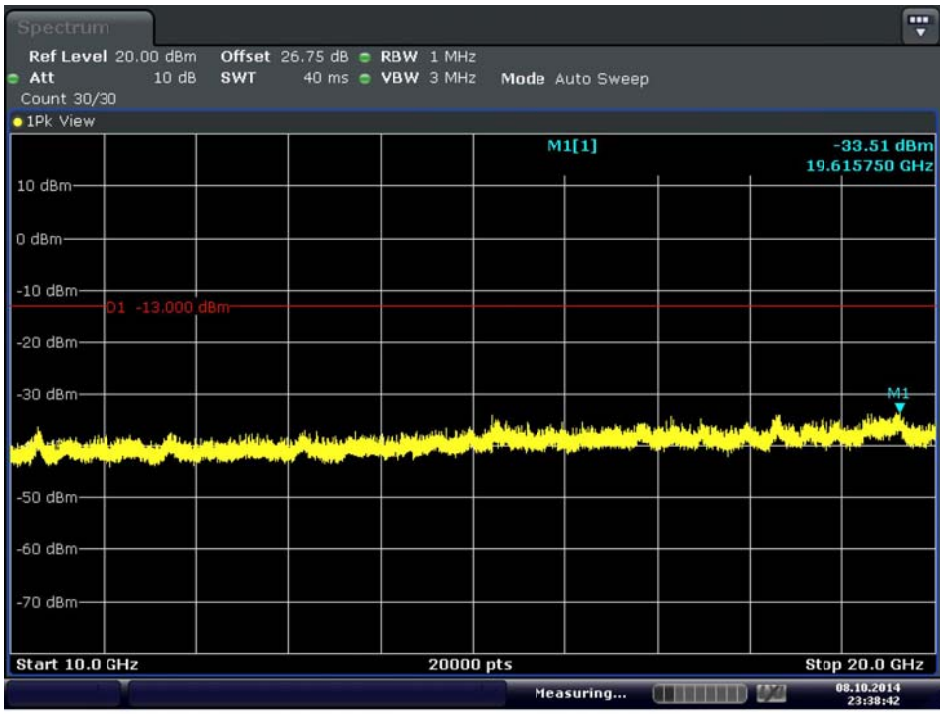
Date: 8.OCT.2014 23:38:11

BAND 4. Conducted Spurious Plot_1 (20175ch_5MHz_QPSK_ RB 1_0)



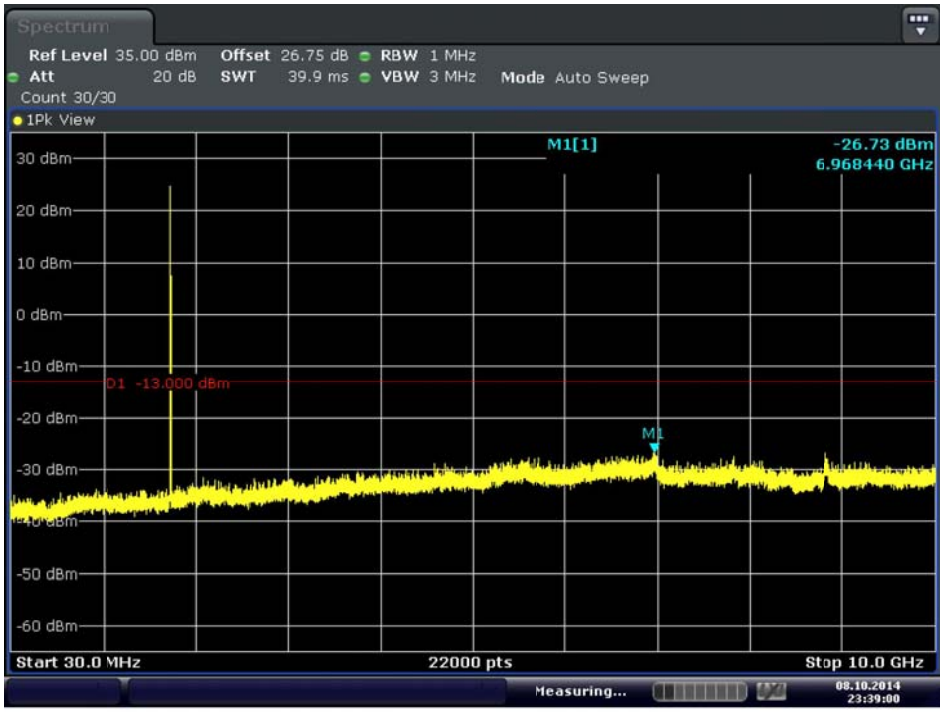
Date: 8.OCT.2014 23:38:27

BAND 4. Conducted Spurious Plot_2 (20175ch_5MHz_QPSK_ RB 1_0)



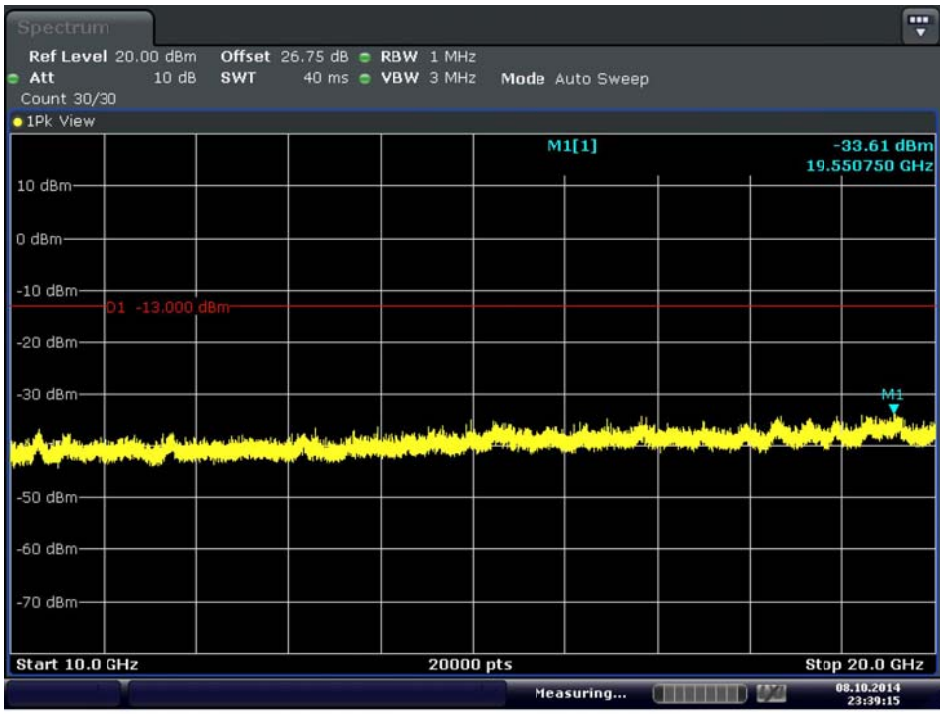
Date: 8.OCT.2014 23:38:42

BAND 4. Conducted Spurious Plot_1 (20375ch_5MHz_QPSK_ RB 1_0)



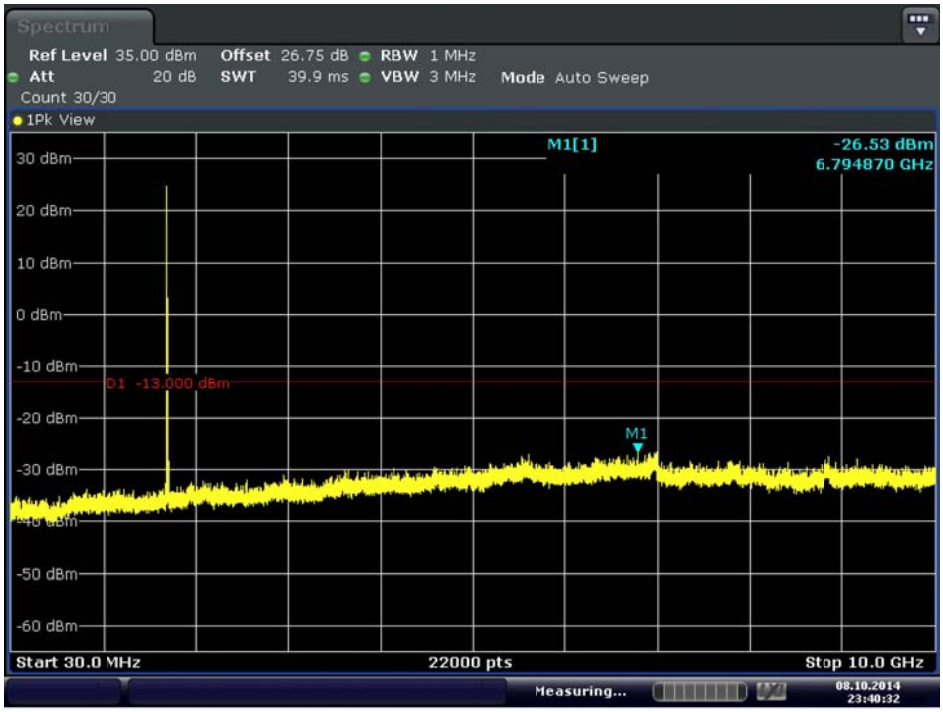
Date: 8.OCT.2014 23:39:00

BAND 4 . Conducted Spurious Plot_2 (20375ch_5MHz_QPSK_ RB 1_0)



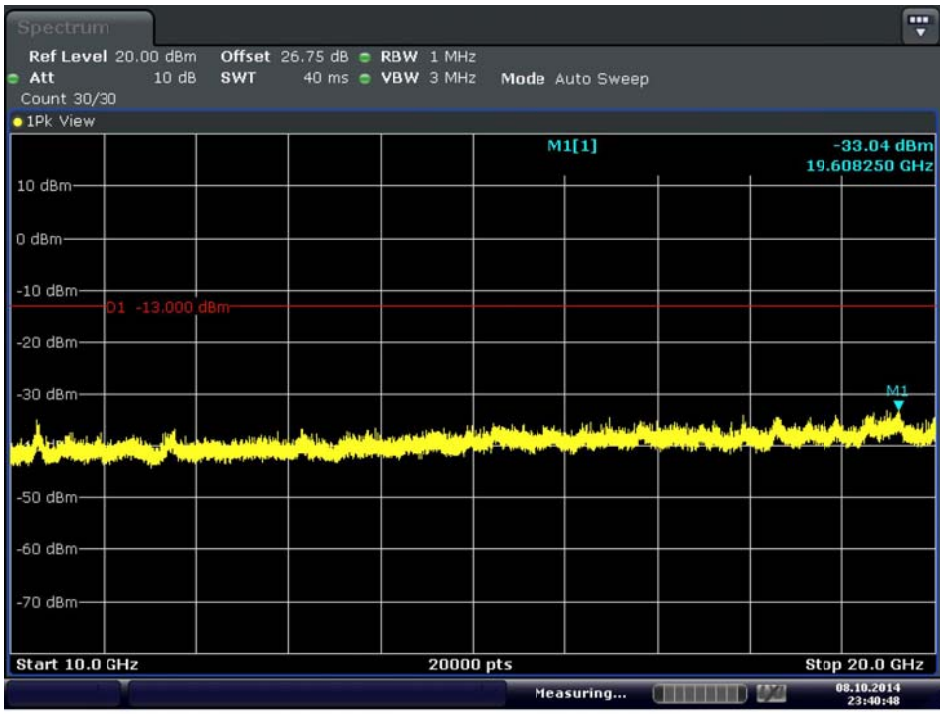
Date: 8.OCT.2014 23:39:15

BAND 4. Conducted Spurious Plot_1 (20000ch_10MHz_QPSK_ RB 1_0)



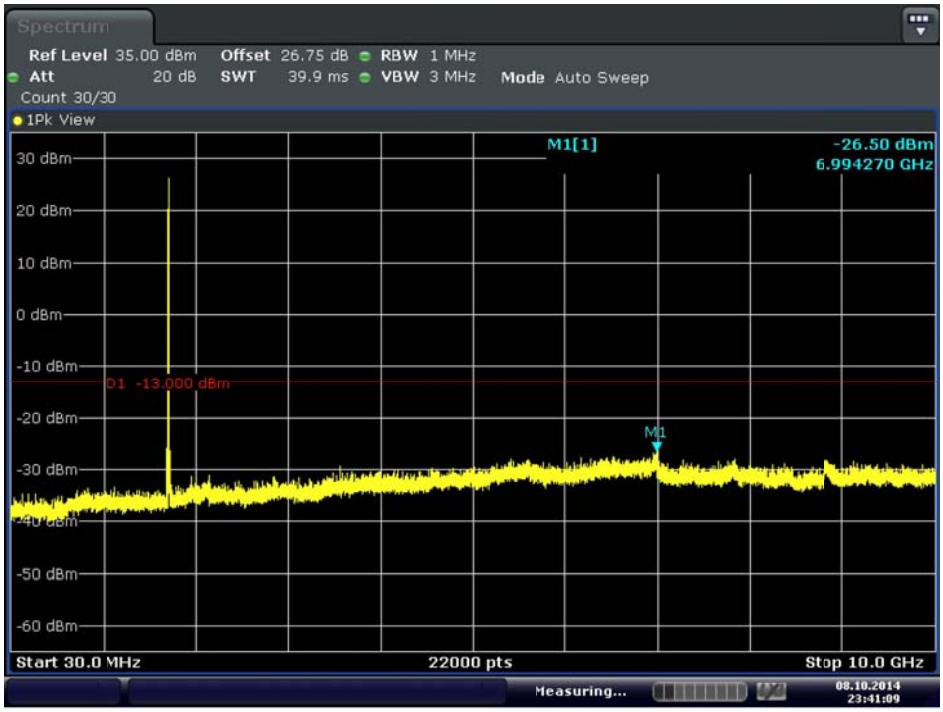
Date: 8.OCT.2014 23:40:32

BAND 4. Conducted Spurious Plot_2 (20000ch_10MHz_QPSK_ RB 1_0)



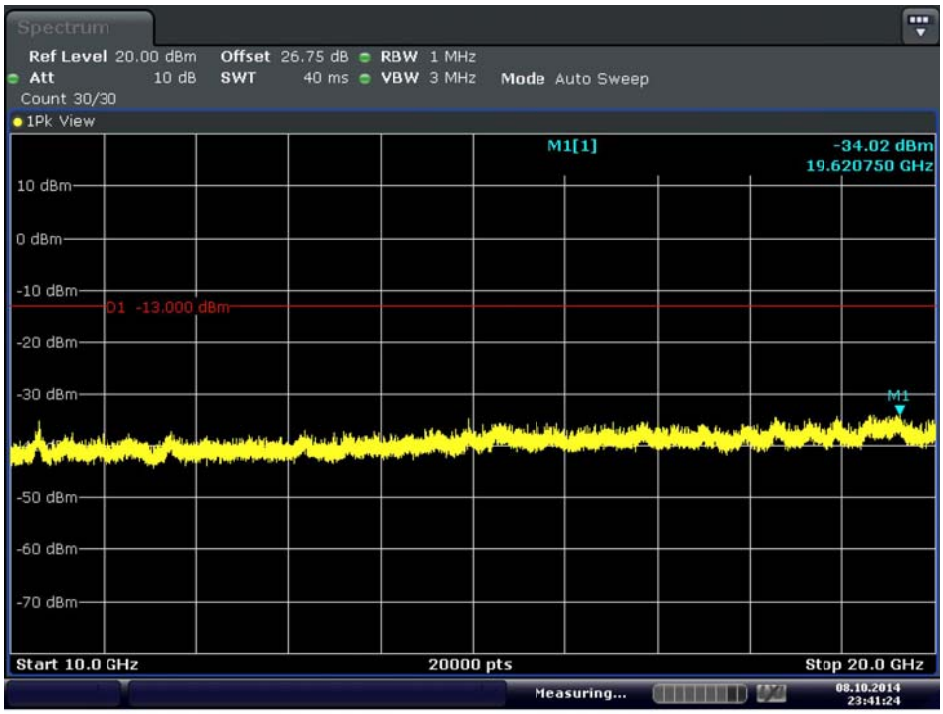
Date: 8.OCT.2014 23:40:48

BAND 4. Conducted Spurious Plot_1 (20175ch_10MHz_QPSK_ RB 1_0)



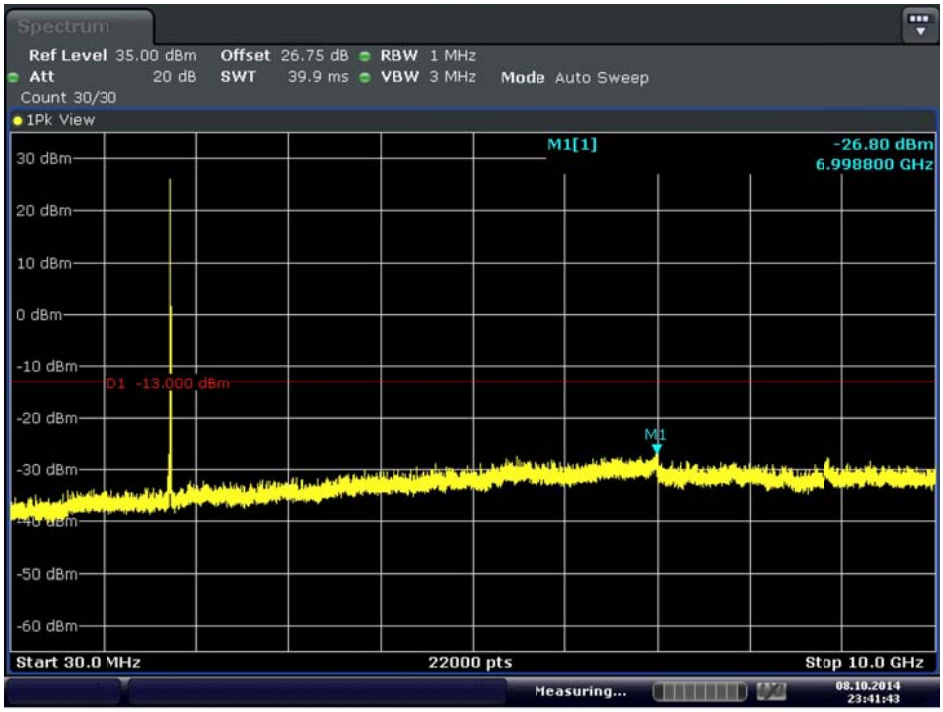
Date: 8.OCT.2014 23:41:09

BAND 4. Conducted Spurious Plot_2 (20175ch_10MHz_QPSK_ RB 1_0)



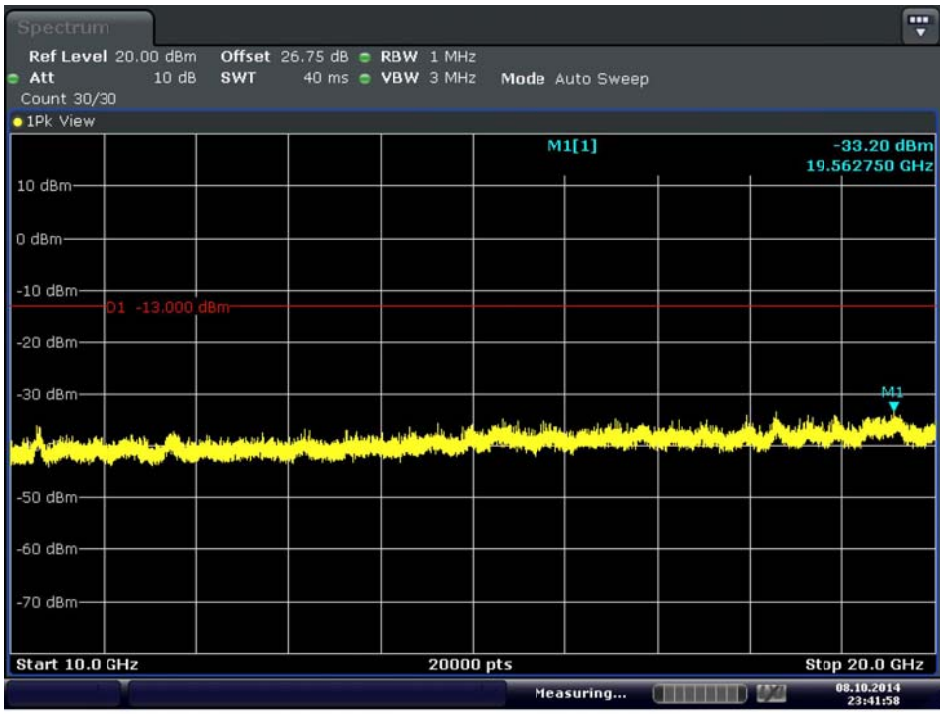
Date: 8.OCT.2014 23:41:24

BAND 4. Conducted Spurious Plot_1 (20350ch_10MHz_QPSK_ RB 1_0)



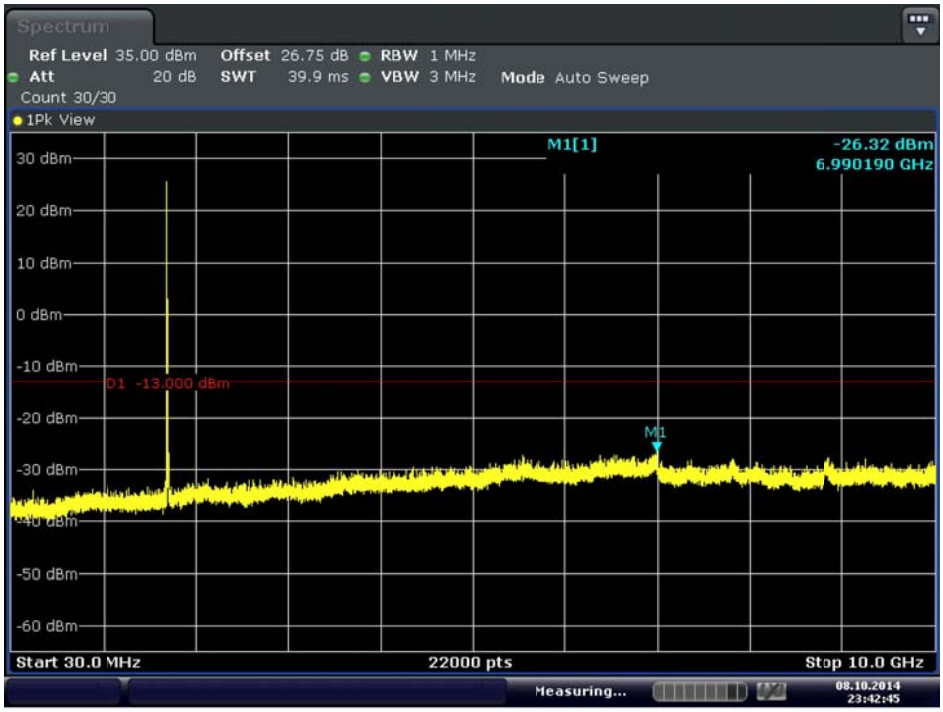
Date: 8.OCT.2014 23:41:43

BAND 4. Conducted Spurious Plot_2 (20350ch_10MHz_QPSK_ RB 1_0)



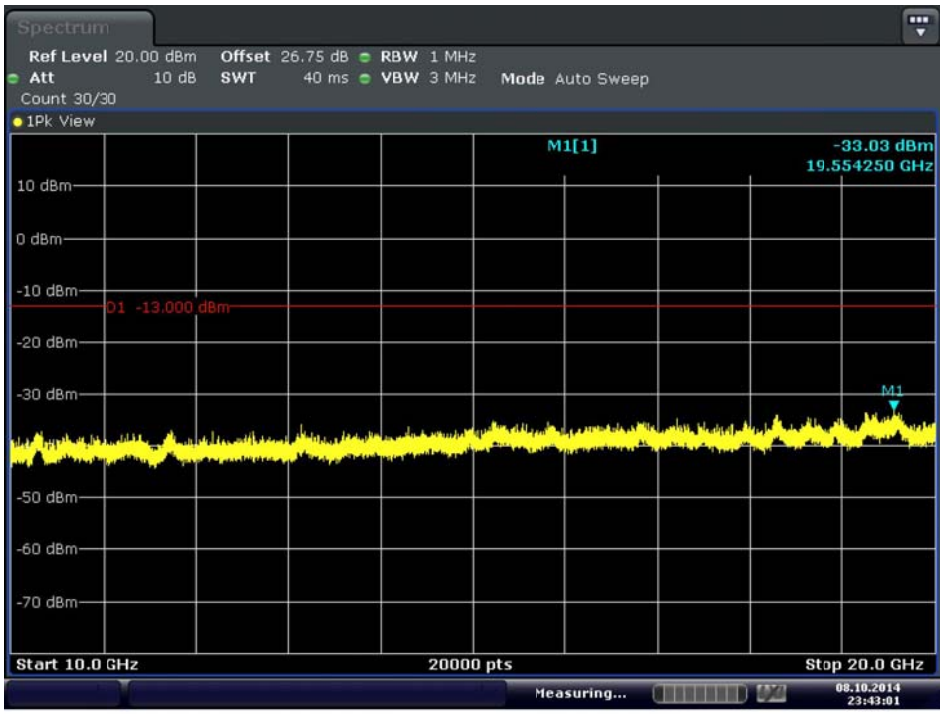
Date: 8.OCT.2014 23:41:58

BAND 4. Conducted Spurious Plot_1 (20025ch_15MHz_QPSK_ RB 1_0)



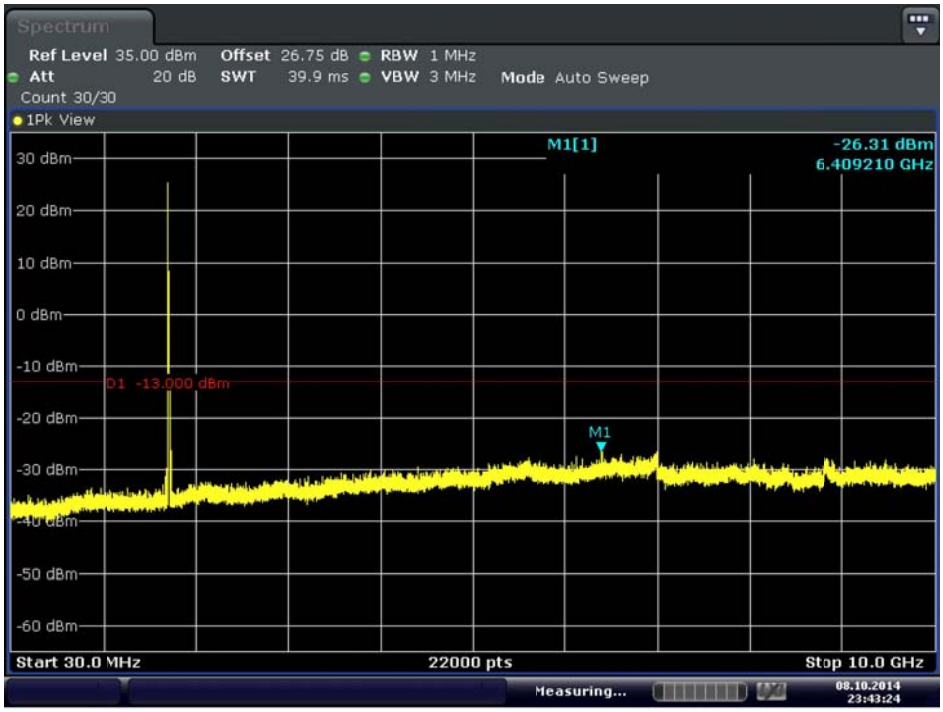
Date: 8.OCT.2014 23:42:45

BAND 4. Conducted Spurious Plot_2 (20025ch_15MHz_QPSK_ RB 1_0)



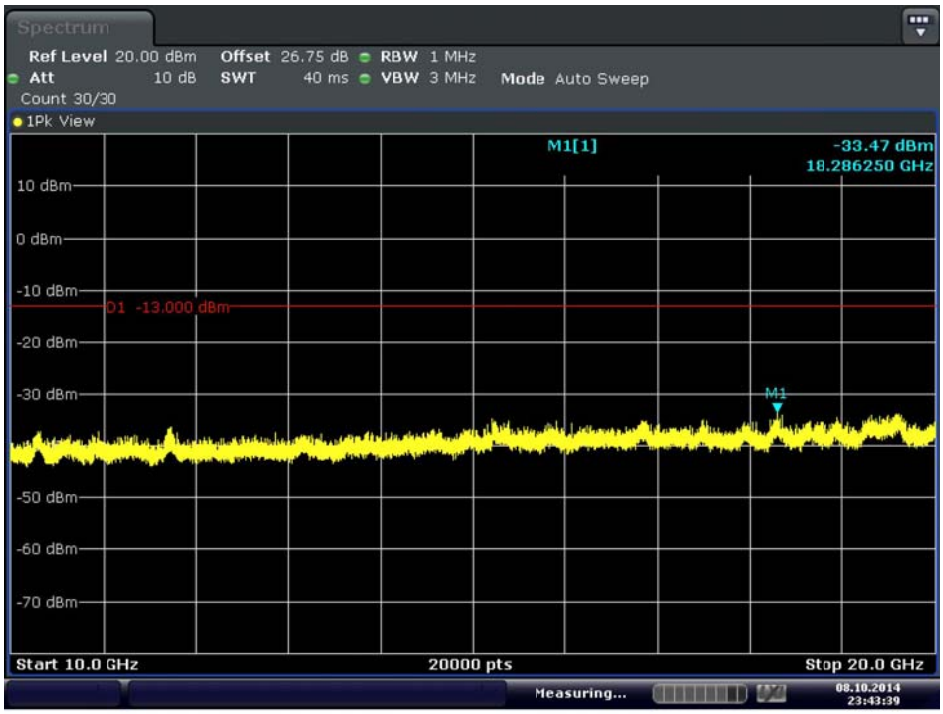
Date: 8.OCT.2014 23:43:00

BAND 4. Conducted Spurious Plot_1 (20175ch_15MHz_QPSK_ RB 1_0)



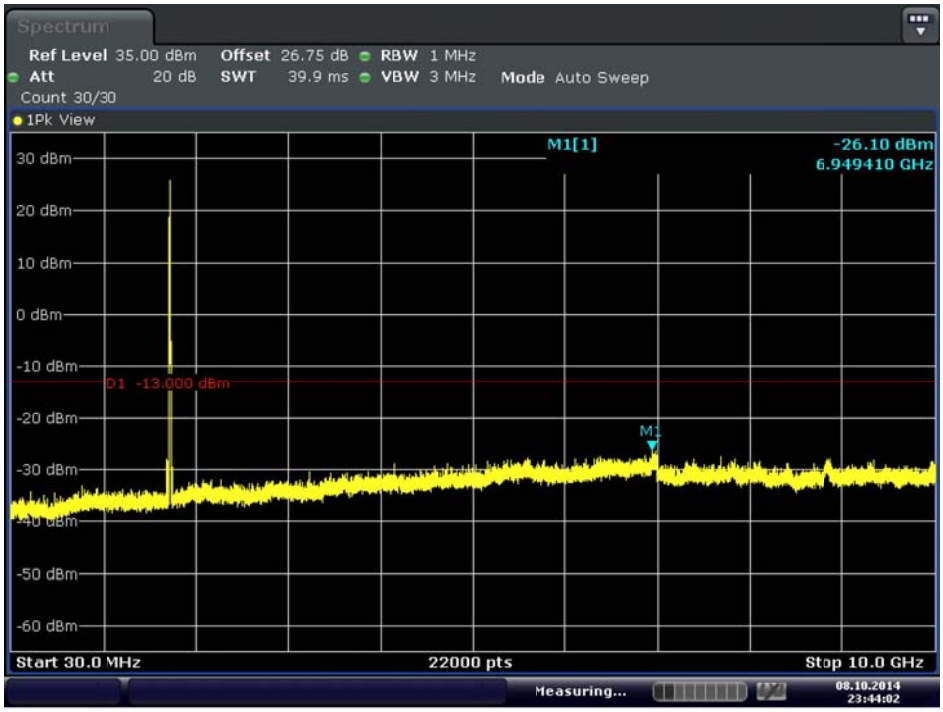
Date: 8.OCT.2014 23:43:24

BAND 4. Conducted Spurious Plot_2 (20175ch_15MHz_QPSK_ RB 1_0)



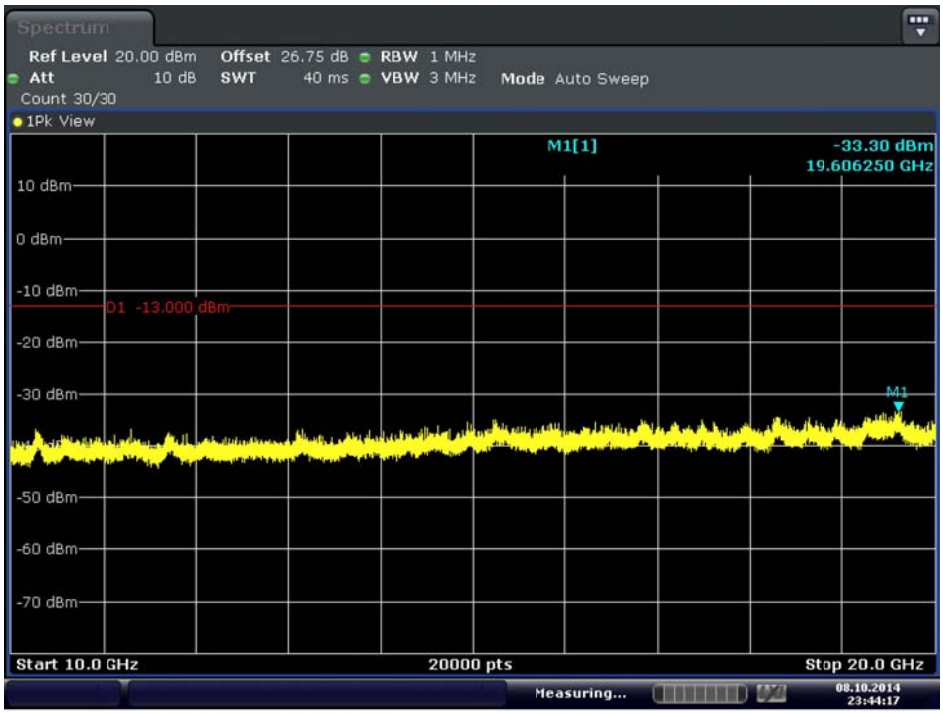
Date: 8.OCT.2014 23:43:39

BAND 4. Conducted Spurious Plot_1 (20325ch_15MHz_QPSK_ RB 1_0)



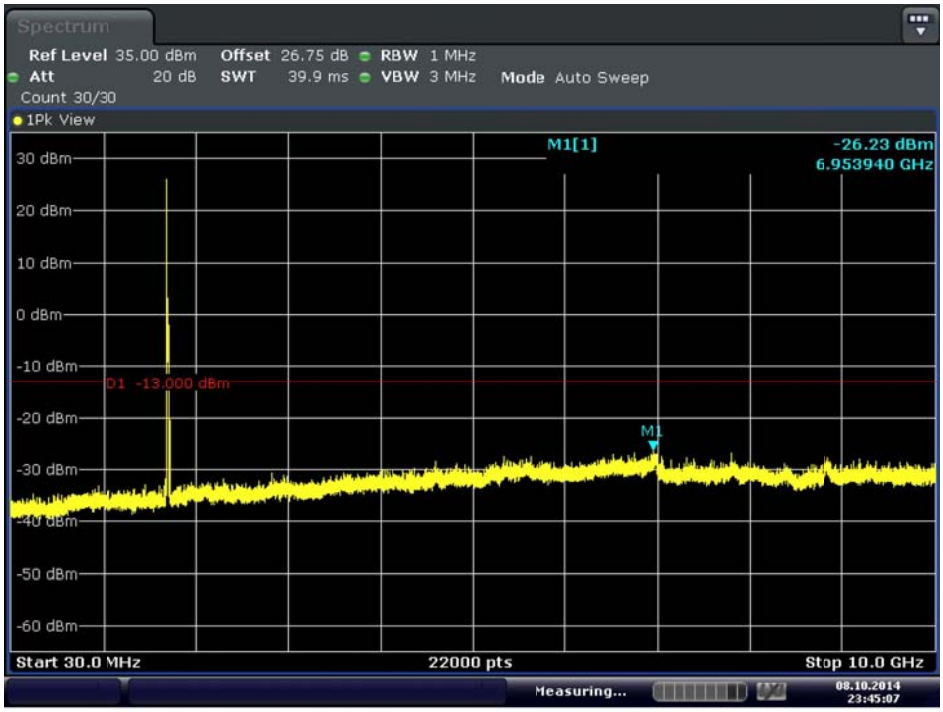
Date: 8.OCT.2014 23:44:02

BAND 4 . Conducted Spurious Plot_2 (20325ch_15MHz_QPSK_ RB 1_0)



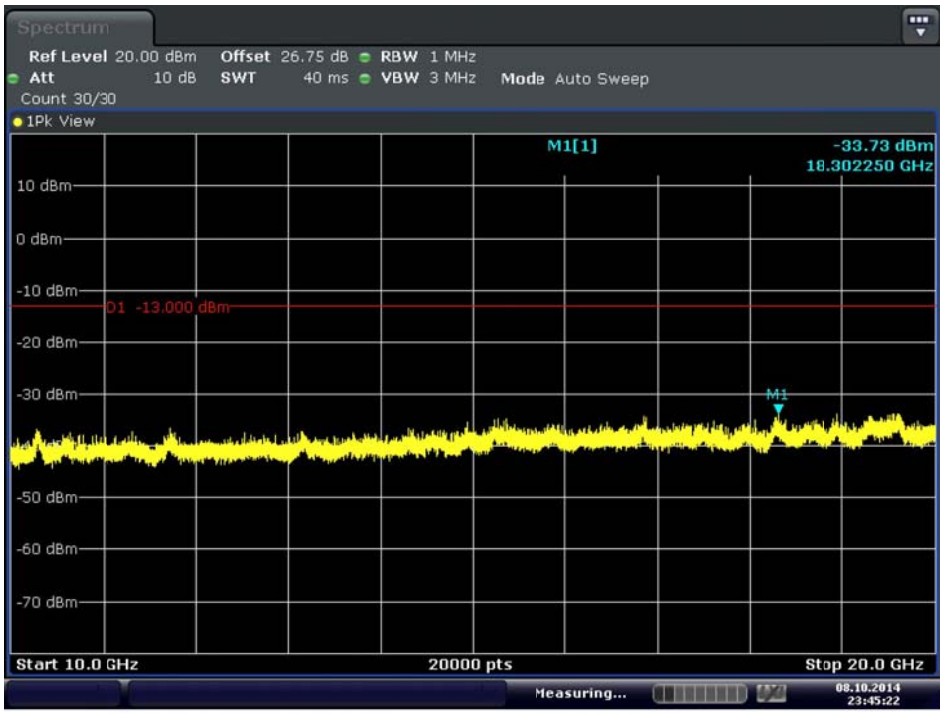
Date: 8.OCT.2014 23:44:17

BAND 4. Conducted Spurious Plot_1 (20050ch_20MHz_QPSK_ RB 1_0)



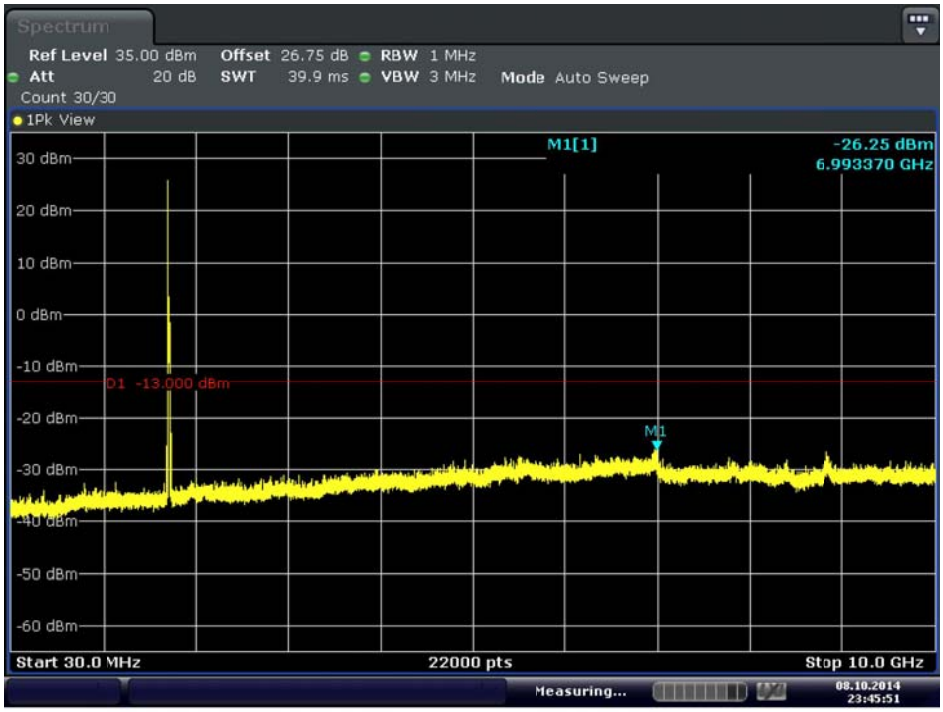
Date: 8.OCT.2014 23:45:07

BAND 4. Conducted Spurious Plot_2 (20050ch_20MHz_QPSK_ RB 1_0)



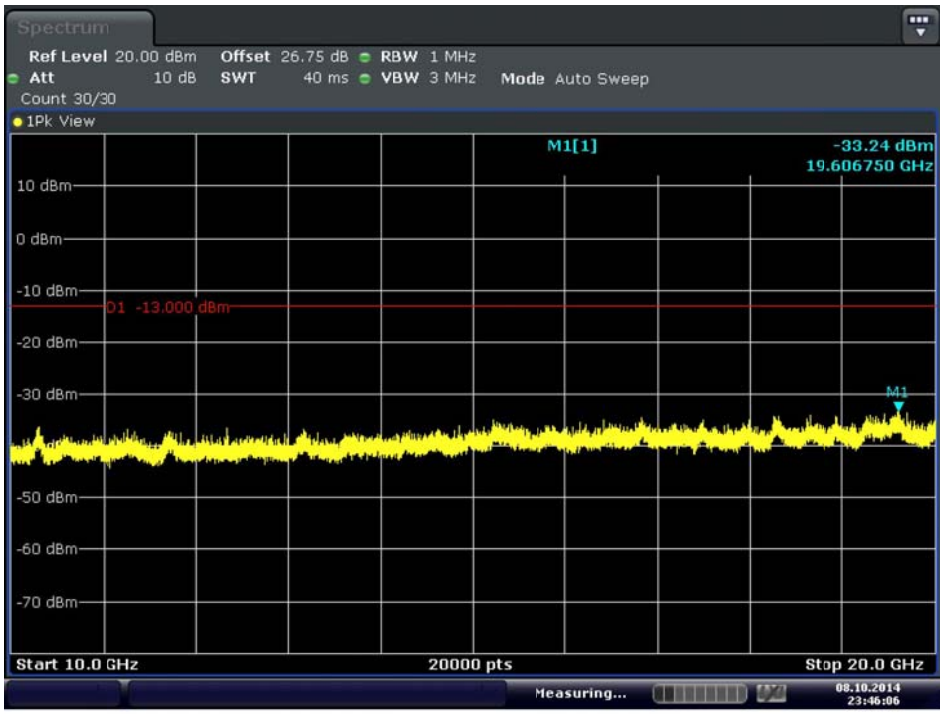
Date: 8.OCT.2014 23:45:22

BAND 4. Conducted Spurious Plot_1 (20175ch_20MHz_QPSK_ RB 1_0)



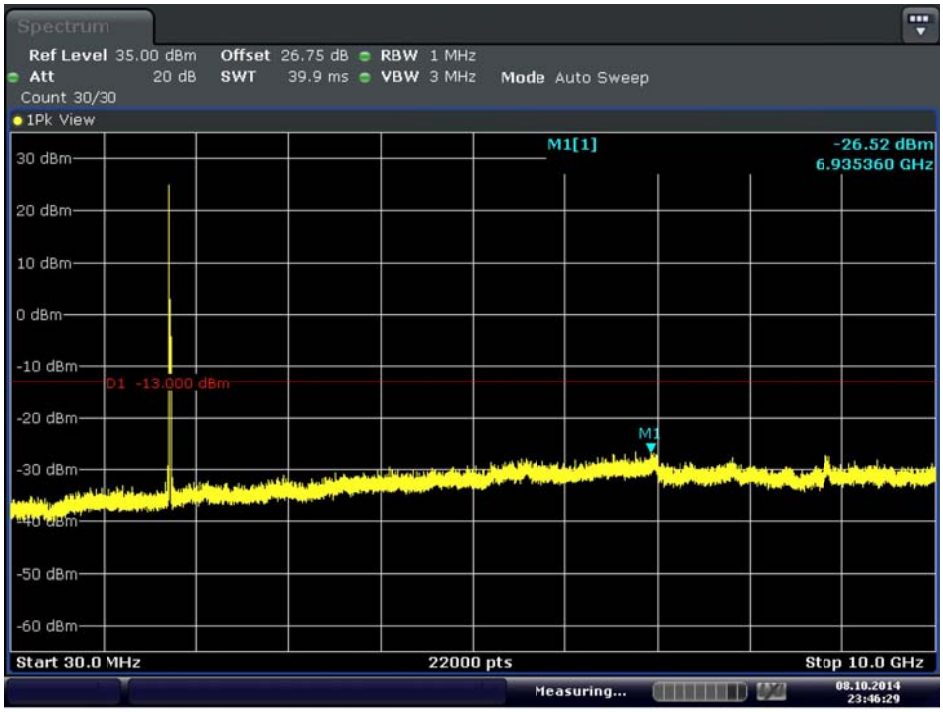
Date: 8.OCT.2014 23:45:51

BAND 4. Conducted Spurious Plot_2 (20175ch_20MHz_QPSK_ RB 1_0)



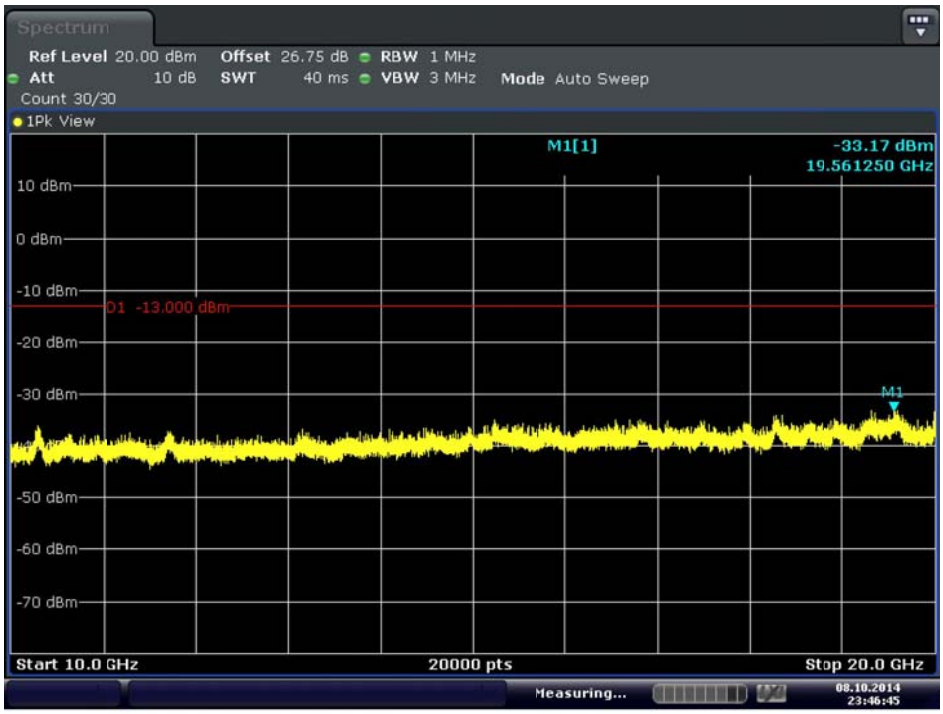
Date: 8.OCT.2014 23:46:06

BAND 4. Conducted Spurious Plot_1 (20300ch_20MHz_QPSK_ RB 1_0)



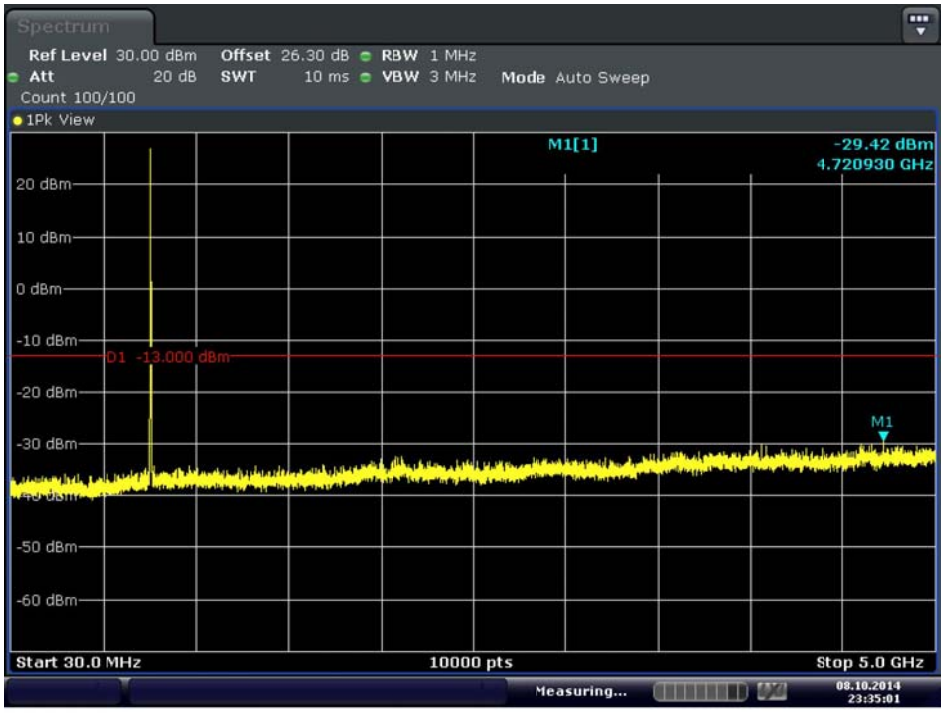
Date: 8.OCT.2014 23:46:29

BAND 4. Conducted Spurious Plot_2 (20300ch_20MHz_QPSK_ RB 1_0)



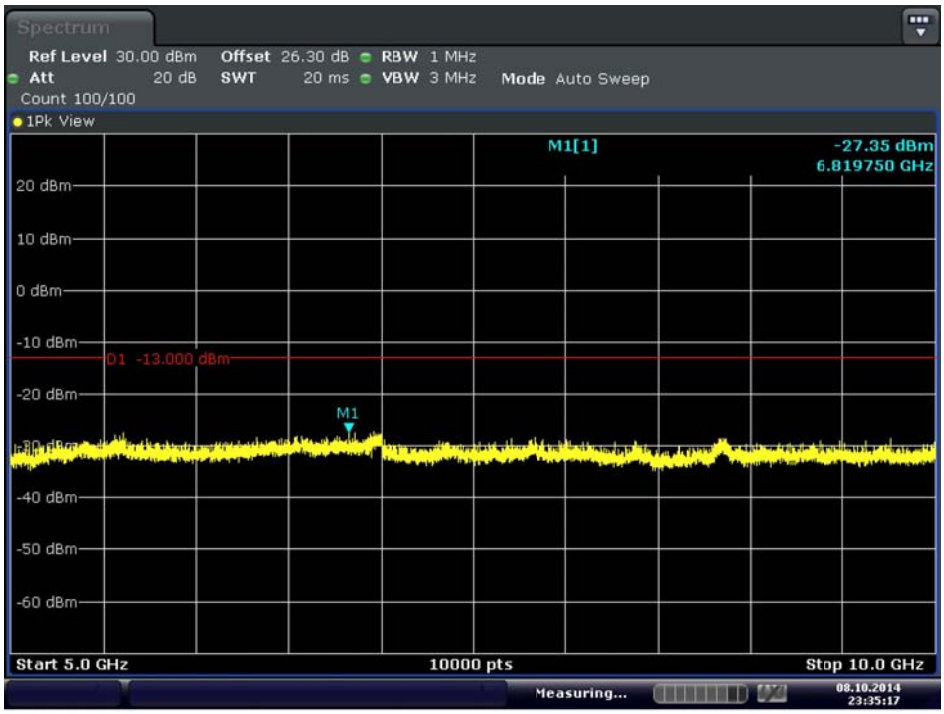
Date: 8.OCT.2014 23:46:45

BAND 13. Conducted Spurious Plot 1 (Ch.23205 _5 MHz_QPSK RB 1, Offset 0)



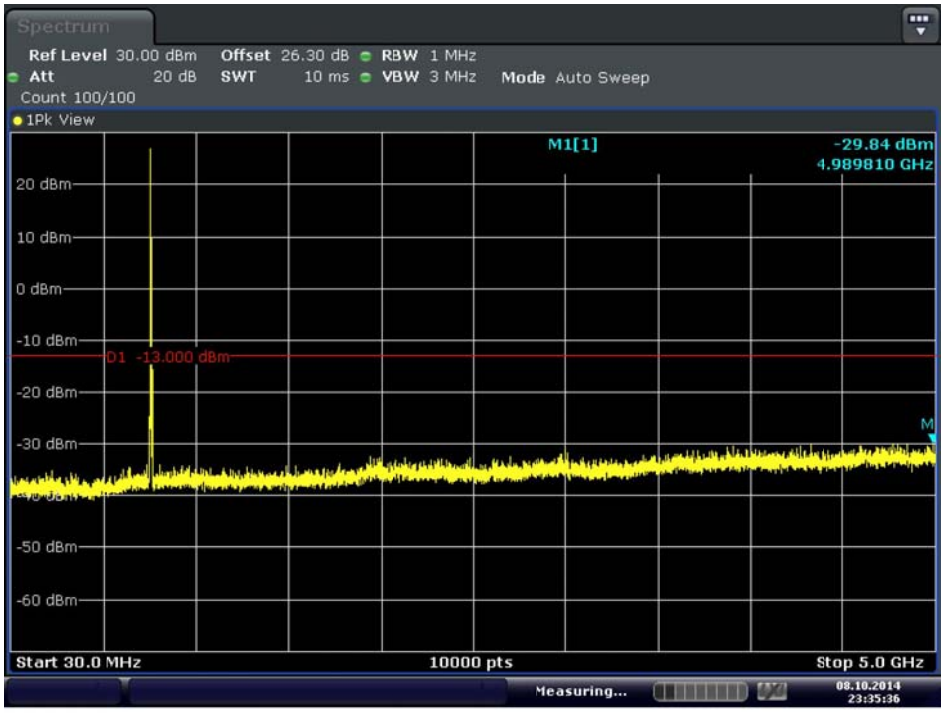
Date: 8.OCT.2014 23:35:01

BAND 13. Conducted Spurious Plot 2 (Ch.23205 _5 MHz_ QPSK RB 1, Offset 0)



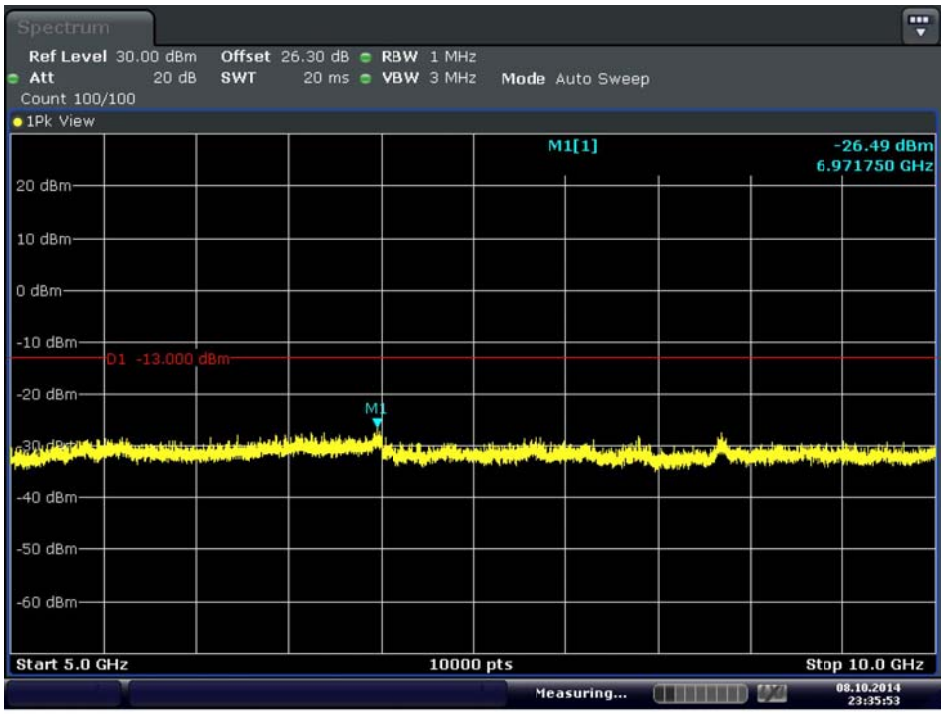
Date: 8.OCT.2014 23:35:17

BAND 13. Conducted Spurious Plot 1 (Ch.23230 _5 MHz_QPSK RB 1, Offset 0)



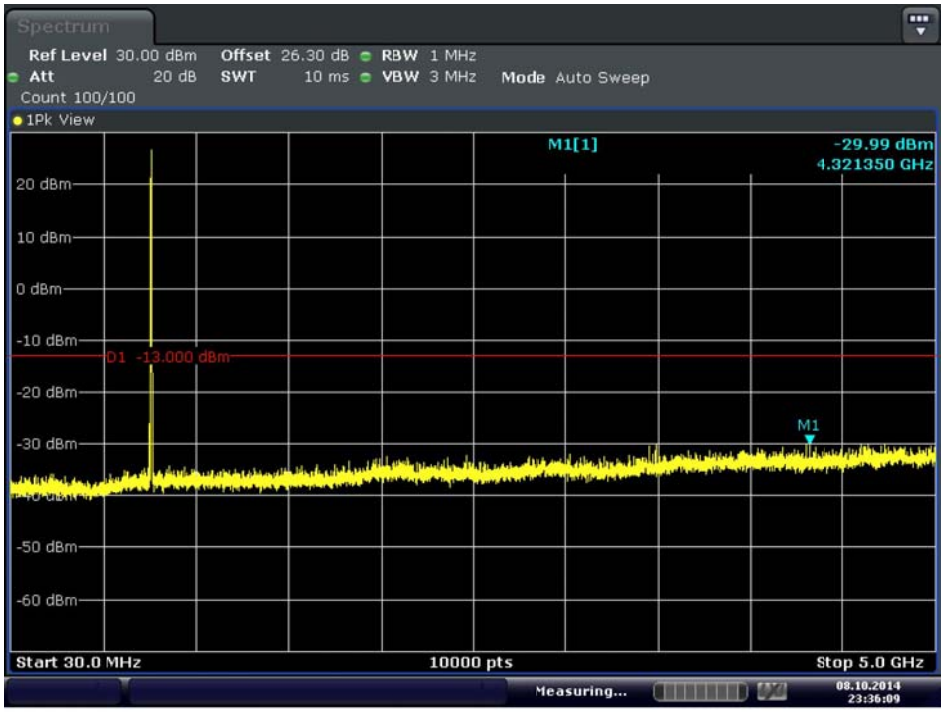
Date: 8.OCT.2014 23:35:36

BAND 13. Conducted Spurious Plot 2 (Ch.23230 _5 MHz_ QPSK RB 1, Offset 0)



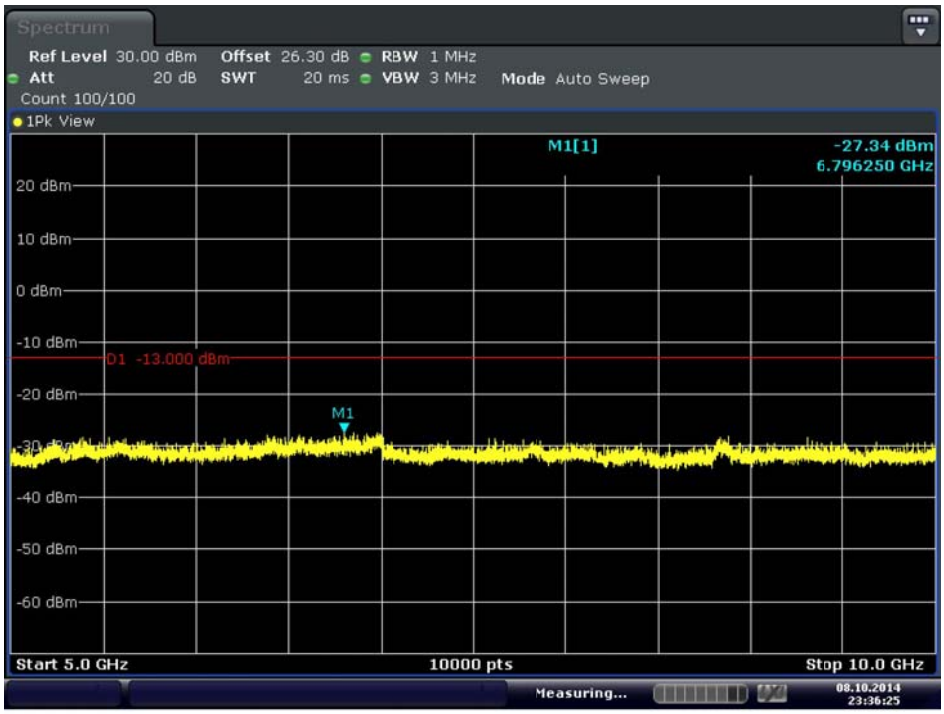
Date: 8.OCT.2014 23:35:53

BAND 13. Conducted Spurious Plot 1 (Ch.23255 _5 MHz_QPSK RB 1, Offset 0)



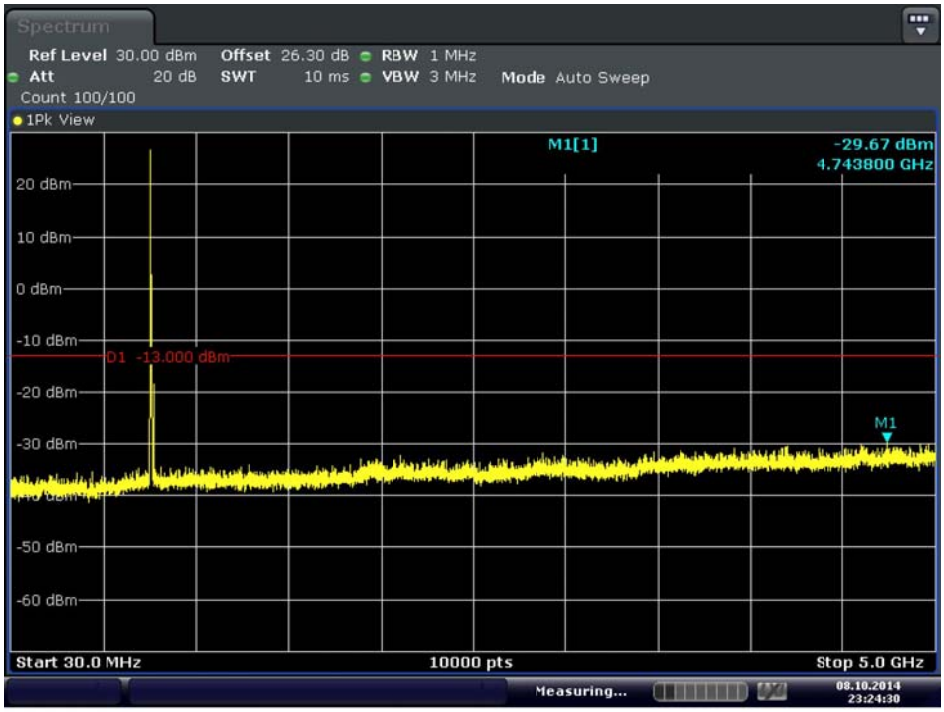
Date: 8.OCT.2014 23:36:09

BAND 13. Conducted Spurious Plot 2 (Ch.23255 _5 MHz_ QPSK RB 1, Offset 0)



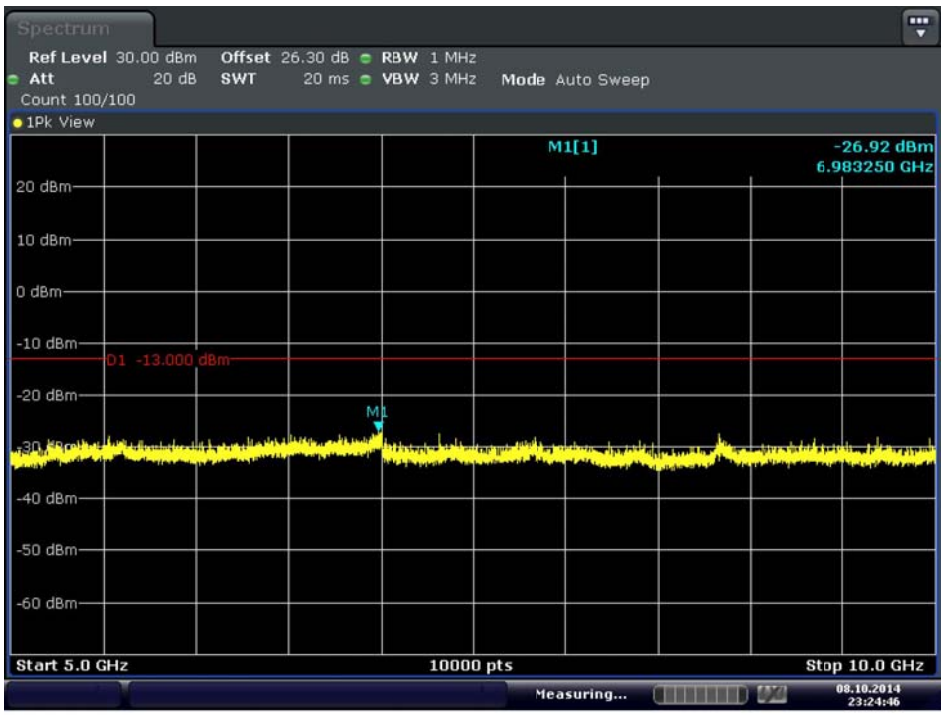
Date: 8.OCT.2014 23:36:25

BAND 13. Conducted Spurious Plot 1 (Ch.23230 _10 MHz_QPSK RB 1, Offset 0)



Date: 8.OCT.2014 23:24:30

BAND 13. Conducted Spurious Plot 2 (Ch.23230 _10 MHz_QPSK RB 1, Offset 0)



Date: 8.OCT.2014 23:24:46