HCT CO., LTD.

CERTIFICATE OF COMPLIANCE
FCC Certification

Applicant Name:
LG Electronics MobileComm U.S.A., Inc.

Address:
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue:
September 3, 2014

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

Report No.: HCT-R-1408-F023-1

HCT FRN: 0005866421

FCC ID:	**ZNFD390**
APPLICANT:	**LG Electronics MobileComm U.S.A., Inc.**

FCC Model(s):	LG-D390
Additional FCC Model(s):	LGD390, D390, LG-D392d, LGD392d, D392d
EUT Type:	GSM/WCDMA/LTE phone with Bluetooth/WLAN
FCC Classification:	Licensed Portable Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§24, §2
Tx Frequency:	1850.7 MHz – 1909.3 MHz (LTE – Band2 (1.4 MHz)) 1851.5 MHz – 1908.5 MHz (LTE – Band2 (3 MHz)) 1852.5 MHz – 1907.5 MHz (LTE – Band2 (5 MHz)) 1855.0 MHz – 1905.0 MHz (LTE – Band2 (10 MHz)) 1857.5 MHz – 1902.5 MHz (LTE – Band2 (15 MHz)) 1860.0 MHz – 1900.0 MHz (LTE – Band2 (20 MHz))

Max. RF Output Power:		
	Band 2 (1.4 MHz) :	1.084 W (QPSK) (30.35 dBm)
		1.135 W (16-QAM) (30.55 dBm)
	Band 2 (3 MHz) :	1.040 W (QPSK) (30.17 dBm)
		1.102 W (16-QAM) (30.42 dBm)
	Band 2 (5 MHz) :	0.993 W (QPSK) (29.97 dBm)
		0.995 W (16-QAM) (29.98 dBm)
	Band 2 (10 MHz) :	0.933 W (QPSK) (29.70 dBm)
		1.114 W (16-QAM) (30.47 dBm)
	Band 2 (15 MHz) :	0.914 W (QPSK) (29.61 dBm)
		1.148 W (16-QAM) (30.60 dBm)
	Band 2 (20 MHz) :	1.019 W (QPSK) (30.08 dBm)
		1.007 W (16-QAM) (30.03 dBm)

Emission Designator(s):		
	Band 2 (1.4 MHz) :	1M08G7D (QPSK) / 1M08W7D (16-QAM)
	Band 2 (3 MHz)	2M69G7D (QPSK) / 2M69W7D (16-QAM)
	Band 2 (5 MHz) :	4M49G7D (QPSK) / 4M49W7D (16-QAM)
	Band 2 (10 MHz)	8M94G7D (QPSK) / 8M92W7D (16-QAM)
	Band 2 (15 MHz) :	13M4G7D (QPSK) / 13M4W7D (16-QAM)
	Band 2 (20 MHz)	17M8G7D (QPSK) / 17M8W7D (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
: Kyoung Houn Seo
Manager of RF Team

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1408-F023	August 28, 2014	- First Approval Report
HCT-R-1408-F023-1	September 03, 2014	- Revised Max. RF Output Power on page 1, 4. - Revised the unit (Ant gain: dBd -> dBi) and changed the EIRP form ERP in Section 7.2.

Table of Contents

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	LG Electronics MobileComm U.S.A., Inc.
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Date(s) of Tests:	August 11, 2014 ~ August 25, 2014
Antenna Specification	Manufacturer: Ace Technology Antenna type: Internal Antenna Peak Gain: Band 2: 0.20 dBi

2. INTRODUCTION

2.1. EUT DESCRIPTION

The LG Electronics MobileComm U.S.A., Inc. LG-D390 GSM/WCDMA/LTE phone with Bluetooth/WLAN consists of LTE 2.

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 v02r01, June 7, 2013, 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/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.

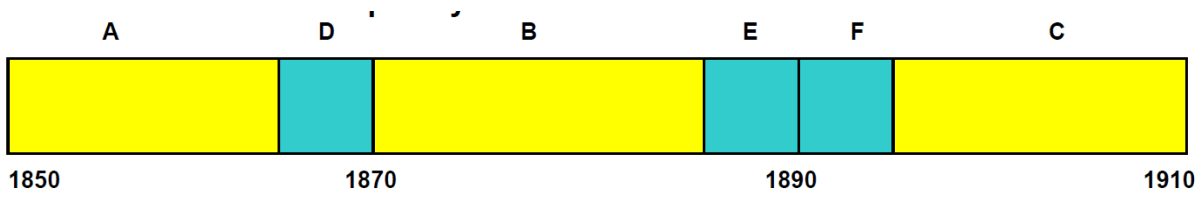
The maximum EIRP is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration

Radiated spurious emissions

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

3.3 FREQUENCY RANGE

§ 24.229: PCS – Mobile Frequency Blocks



BLOCK 1: 1850 – 1865 MHz (A)
BLOCK 2: 1865 – 1870 MHz (D)
BLOCK 3: 1870 – 1885 MHz (B)
BLOCK 4: 1885 – 1890 MHz (E)
BLOCK 5: 1890 – 1895 MHz (F)
BLOCK 6: 1895 – 1910 MHz (C)

3.4 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.

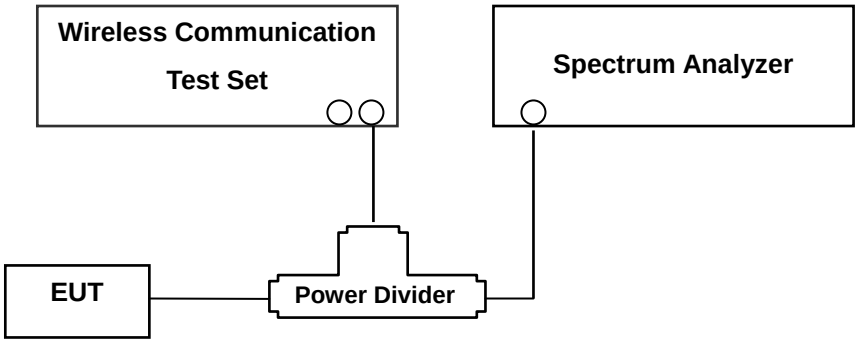
5.2.2.2 Constant burst duty cycle

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%.

3.5 OCCUPIED BANDWIDTH.

Test set-up



(Configuration of conducted Emission measurement)

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

Test Procedure

OBW is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r01, June 7, 2013, Section 4.2..

The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels(low, middle and high operational range.)

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

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

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 EUT was setup to maximum output power at its lowest channel. The Resolution BW of the analyzer is set to 1 % of the emission bandwidth to show compliance with the – 13 dBm limit, in the 1 MHz bands immediately outside and adjacent to the edge of the frequency block. The 1 MHz RBW was used to scan from 30 MHz to 10th Harmonics. A display line was placed at – 13 dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

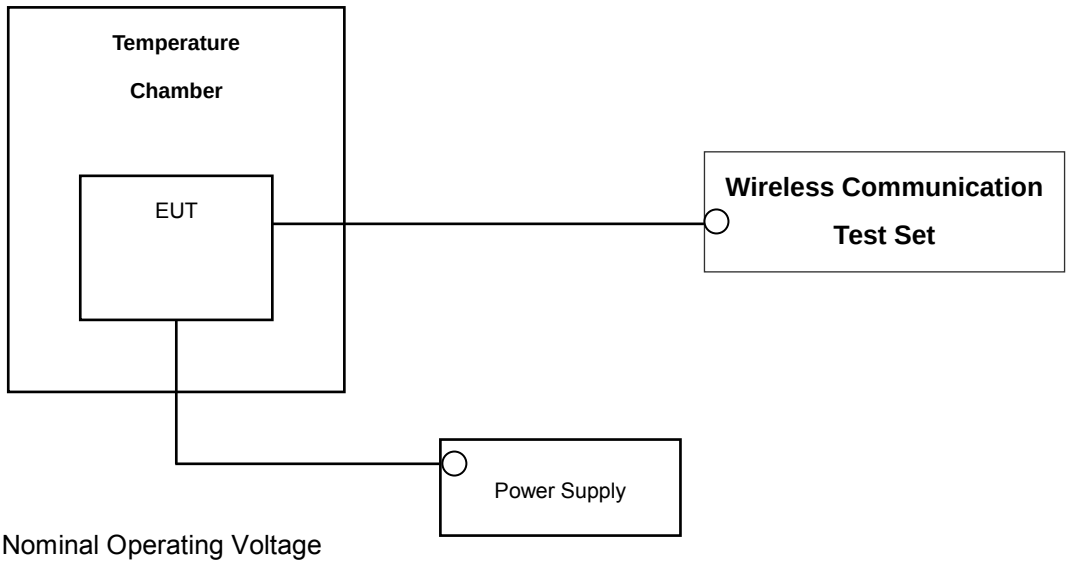
- Band Edge Requirement : In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

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

- For LTE Band 2, total offset 27.4 dBm = 20 dBm attenuator + 6 dBm Divider + 1.4 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 Band2).

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	09/12/2013	Annual	09/12/2014
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	N9020A/Spectrum Analyzer	MY51110020	07/22/2014	Annual	07/22/2015
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 Corp.	MT8820C/ Wideband Radio Communication Tester	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, 24.238(a)	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 24.238(a)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	< 43 + 10log$_{10}$ (P[Watts]) at Band Edge and for all out-of-band emissions		PASS
*2.1046	*Conducted Output Power	N/A		PASS
24.232(d)	Peak- to- Average Ratio	< 13 dB		
2.1055, 24.235	Frequency stability / variation of ambient temperature	< 2.5 ppm		PASS
24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP	RADIATED	PASS
2.1053, 24.238(a)	Radiated Spurious and Harmonic Emissions	< 43 + 10log$_{10}$ (P[Watts]) for all out-of band emissions		PASS

*See SAR Report

6. SAMPLE CALCULATION

A. EIRP Sample Calculation

Mode	Ch./ Freq.		Measured Level(dBm)	Substitude LEVEL(dBm)	Ant. Gain (dBi)	C.L	Pol.	ERP	
	channel	Freq.(MHz)						W	dBm
LTE Band2	18607	1850.7	-15.45	19.20	10.04	1.83	H	0.551	27.41

EIRP = 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 until the maximum signal is found.

3) Record the field strength meter's level.

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

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

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

B. Emission Designator

QPSK Modulation(For example)

Emission Designator = 4M48G7D

LTE BW = 4.48 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission; telemetry; telecommand

16QAM Modulation(For example)

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 EQUIVALENT ISOTROPIC RADIATED POWER OUTPUT

Freq (MHz)	Band Width (MHz)	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1850.7	1.4	QPSK	-13.30	21.35	10.04	1.83	H	0.904	29.56
		16-QAM	-12.85	21.80	10.04	1.83	H	1.002	30.01
1880.0		QPSK	-12.81	22.16	10.04	1.85	H	1.084	30.35
		16-QAM	-12.61	22.36	10.04	1.85	H	1.135	30.55
1909.3		QPSK	-14.36	20.66	10.05	1.88	H	0.764	28.83
		16-QAM	-14.12	20.90	10.05	1.88	H	0.807	29.07

Equivalent Isotropic Radiated Power Output Data (1.4 MHz Band 2 LTE)

Note: Worst case is 1 resource block.

Freq (MHz)	Band Width (MHz)	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1851.5	3	QPSK	-13.03	21.62	10.04	1.83	H	0.962	29.83
		16-QAM	-12.82	21.83	10.04	1.83	H	1.009	30.04
1880.0		QPSK	-12.99	21.98	10.04	1.85	H	1.040	30.17
		16-QAM	-12.74	22.23	10.04	1.85	H	1.102	30.42
1908.5		QPSK	-14.43	20.59	10.05	1.88	H	0.752	28.76
		16-QAM	-14.20	20.82	10.05	1.88	H	0.793	28.99

Equivalent Isotropic Radiated Power Output Data (3 MHz Band 2 LTE)

Note: Worst case is 1 resource block.

Freq (MHz)	Band Width (MHz)	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1852.5	5	QPSK	-13.22	21.43	10.04	1.83	H	0.920	29.64
		16-QAM	-13.07	21.58	10.04	1.83	H	0.953	29.79
1880.0		QPSK	-13.19	21.78	10.04	1.85	H	0.993	29.97
		16-QAM	-13.18	21.79	10.04	1.85	H	0.995	29.98
1907.5		QPSK	-14.27	20.75	10.05	1.88	H	0.780	28.92
		16-QAM	-14.18	20.84	10.05	1.88	H	0.796	29.01

Equivalent Isotropic Radiated Power Output Data (5 MHz Band 2 LTE)

Note: Worst case is 1 resource block.

Freq (MHz)	Band Width (MHz)	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1855.0	10	QPSK	-13.55	21.26	10.04	1.83	H	0.885	29.47
		16-QAM	-13.03	21.78	10.04	1.83	H	0.998	29.99
1880.0		QPSK	-13.46	21.51	10.04	1.85	H	0.933	29.70
		16-QAM	-12.69	22.28	10.04	1.85	H	1.114	30.47
1905.0		QPSK	-13.77	21.25	10.05	1.88	H	0.875	29.42
		16-QAM	-13.03	21.99	10.05	1.88	H	1.038	30.16

Equivalent Isotropic Radiated Power Output Data (10 MHz Band 2 LTE)

Note: Worst case is 1 resource block.

Freq (MHz)	Band Width (MHz)	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1857.5	15	QPSK	-13.72	21.09	10.04	1.83	H	0.851	29.30
		16-QAM	-13.31	21.50	10.04	1.83	H	0.935	29.71
1880.0		QPSK	-13.55	21.42	10.04	1.85	H	0.914	29.61
		16-QAM	-12.56	22.41	10.04	1.85	H	1.148	30.60
1902.5		QPSK	-14.19	20.59	10.05	1.87	H	0.753	28.77
		16-QAM	-13.75	21.03	10.05	1.87	H	0.834	29.21

Equivalent Isotropic Radiated Power Output Data (15 MHz Band 2 LTE)

Note: Worst case is 1 resource block.

Freq (MHz)	Band Width (MHz)	Modulation	Measured Level (dBm)	Substitude Level (dBm)	Ant. Gain(dBi)	C.L	Pol	EIRP	
								W	dBm
1860.0	20	QPSK	-14.06	20.75	10.04	1.83	H	0.787	28.96
		16-QAM	-12.99	21.82	10.04	1.83	H	1.007	30.03
1880.0		QPSK	-13.08	21.89	10.04	1.85	H	1.019	30.08
		16-QAM	-13.19	21.78	10.04	1.85	H	0.993	29.97
1900.0		QPSK	-12.89	21.89	10.05	1.87	H	1.016	30.07
		16-QAM	-13.24	21.54	10.05	1.87	H	0.938	29.72

Equivalent Isotropic Radiated Power Output Data (20 MHz Band 2 LTE)

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. 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.

7.2 RADIATED SPURIOUS EMISSIONS

7.2.1 RADIATED SPURIOUS EMISSIONS (1.4 MHz Band 2 LTE)

▣ OPERATING FREQUENCY : 1880.00 MHz

▣ MEASURED OUTPUT POWER: 30.55 dBm = 1.135 W

▣ MODULATION SIGNAL: 1.4 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 43.55 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
18607 (1850.7)	3701.4	-47.02	12.32	-48.80	2.64	H	-39.12	69.67
	5552.1	-54.86	13.02	-51.32	3.39	H	-41.69	72.24
	7402.8	-56.92	11.06	-44.51	4.08	H	-37.53	68.08
18900 (1880.0)	3760.0	-47.47	12.29	-49.17	2.67	H	-39.55	70.10
	5640.0	-56.87	13.12	-53.46	3.51	H	-43.85	74.40
	7520.0	-55.82	11.09	-44.30	4.38	V	-37.59	68.14
19193 (1909.3)	3818.6	-46.90	12.28	-47.99	2.70	H	-38.41	68.96
	5727.9	-55.39	13.06	-51.77	3.57	V	-42.28	72.83
	7637.2	-56.54	11.38	-44.62	4.04	V	-37.28	67.83

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.

7.2.2 RADIATED SPURIOUS EMISSIONS (3 MHz Band 2 LTE)

▣ OPERATING FREQUENCY : 1880.00 MHz

▣ MEASURED OUTPUT POWER: 30.42 dBm = 1.102 W

▣ MODULATION SIGNAL: 3 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $\log_{10}$ (W) = 43.42 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
18615 (1851.5)	3703.0	-48.21	12.32	-49.99	2.64	H	-40.31	70.73
	5554.5	-55.88	13.02	-52.34	3.39	V	-42.71	73.13
	7406.0	-	-	-	-	-	-	-
18900 (1880.0)	3760.0	-46.63	12.29	-48.33	2.67	H	-38.71	69.13
	5640.0	-55.50	13.12	-52.09	3.51	V	-42.48	72.90
	7520.0	-	-	-	-	-	-	-
19185 (1908.5)	3817.0	-50.53	12.28	-51.62	2.70	H	-42.04	72.46
	5725.5	-55.54	13.06	-51.92	3.57	V	-42.43	72.85
	7634.0	-56.60	11.36	-44.94	4.09	H	-37.67	68.09

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.

7.2.3 RADIATED SPURIOUS EMISSIONS (5 MHz Band 2 LTE)

▣ OPERATING FREQUENCY : 1880.00 MHz

▣ MEASURED OUTPUT POWER: 29.98 dBm = 0.995 W

▣ MODULATION SIGNAL: 5 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 log_{10} (W) = 42.98 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
18625 (1852.5)	3705.0	-49.39	12.31	-51.13	2.67	H	-41.49	71.47
	5557.5	-56.03	13.04	-52.67	3.41	V	-43.04	73.02
	7410.0	-	-	-	-	-	-	-
18900 (1880.0)	3760.0	-47.54	12.29	-49.24	2.67	H	-39.62	69.60
	5640.0	-56.74	13.12	-53.33	3.51	H	-43.72	73.70
	7520.0	-	-	-	-	-	-	-
19175 (1907.5)	3815.0	-50.89	12.28	-51.98	2.70	H	-42.40	72.38
	5722.5	-55.42	13.05	-52.01	3.59	V	-42.55	72.53
	7630.0	-	-	-	-	-	-	-

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.

7.2.4 RADIATED SPURIOUS EMISSIONS (10 MHz Band 2 LTE)

▣ OPERATING FREQUENCY : 1880.00 MHz

▣ MEASURED OUTPUT POWER: 30.47 dBm = 1.114 W

▣ MODULATION SIGNAL: 10 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 $\log_{10}$ (W) = 43.47 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
18650 (1855.0)	3710.0	-48.41	12.31	-50.14	2.70	H	-40.53	71.00
	5565.0	-56.21	13.05	-52.85	3.42	V	-43.22	73.69
	7420.0	-	-	-	-	-	-	-
18900 (1880.0)	3760.0	-47.53	12.29	-49.23	2.67	H	-39.61	70.08
	5640.0	-	-	-	-	-	-	-
	7520.0	-56.45	11.09	-44.93	4.38	H	-38.22	68.69
19150 (1905.0)	3810.0	-45.68	12.29	-47.08	2.68	H	-37.47	67.94
	5715.0	-56.82	13.08	-53.45	3.56	H	-43.93	74.40
	7620.0	-	-	-	-	-	-	-

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.

7.2.5 RADIATED SPURIOUS EMISSIONS (15 MHz Band 2 LTE)

▣ OPERATING FREQUENCY : 1880.00 MHz

▣ MEASURED OUTPUT POWER: 30.60 dBm = 1.148 W

▣ MODULATION SIGNAL: 15 MHz 16-QAM

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 43.60 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
18675 (1857.5)	3715.0	-48.49	12.31	-50.24	2.68	H	-40.61	71.21
	5572.5	-56.17	13.05	-52.80	3.43	H	-43.18	73.78
	7430.0	-58.64	11.04	-46.59	4.30	H	-39.85	70.45
18900 (1880.0)	3760.0	-47.40	12.29	-49.10	2.67	H	-39.48	70.08
	5640.0	-54.86	13.12	-51.45	3.51	V	-41.84	72.44
	7520.0	-58.82	11.09	-47.30	4.38	H	-40.59	71.19
19125 (1902.5)	3805.0	-44.48	12.29	-45.86	2.66	H	-36.23	66.83
	5707.5	-58.76	13.11	-55.28	3.54	H	-45.71	76.31
	7610.0	-59.10	11.31	-47.65	3.97	H	-40.31	70.91

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.

7.2.6 RADIATED SPURIOUS EMISSIONS (20 MHz Band 2 LTE)

▣ OPERATING FREQUENCY : 1880.00 MHz

▣ MEASURED OUTPUT POWER: 30.08 dBm = 1.019 W

▣ MODULATION SIGNAL: 20 MHz QPSK

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 43.08 dBc

Ch	Freq (MHz)	Measured Level (dBm)	Ant. Gain (dBi)	Substitude Level (dBm)	C.L	Pol	EIRP (dBm)	dBc
18700 (1860.0)	3720.0	-49.01	12.31	-50.77	2.67	H	-41.13	71.21
	5580.0	-56.71	13.04	-53.45	3.44	V	-43.85	73.93
	7440.0	-59.02	11.04	-46.59	4.24	H	-39.79	69.87
18900 (1880.0)	3760.0	-48.15	12.29	-49.85	2.67	H	-40.23	70.31
	5640.0	-57.46	13.12	-54.05	3.51	H	-44.44	74.52
	7520.0	-56.72	11.09	-45.20	4.38	V	-38.49	68.57
19100 (1900.0)	3800.0	-47.76	12.30	-49.17	2.64	H	-39.51	69.59
	5700.0	-58.70	13.13	-55.31	3.47	H	-45.65	75.73
	7600.0	-56.24	11.29	-44.53	4.12	H	-37.36	67.44

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.

7.3 PEAK-TO-AVERAGE RATIO

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (dB)
Band 2	1.4 MHz	1880.0	QPSK	6	0	6.10
			16-QAM	6	0	6.89
	3 MHz	1880.0	QPSK	15	0	6.10
			16-QAM	15	0	6.89
	5 MHz	1880.0	QPSK	25	0	6.04
			16-QAM	25	0	6.75
	10 MHz	1880.0	QPSK	50	0	6.02
			16-QAM	50	0	6.74
	15 MHz	1880.0	QPSK	75	0	6.01
			16-QAM	75	0	6.76
	20 MHz	1880.0	QPSK	100	0	5.87
			16-QAM	100	0	6.74

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

7.4 OCCUPIED BANDWIDTH

Band	Band Width	Frequency (MHz)	Modulation	Resource Block Size	Resource Block Offset	Data (MHz)
Band 2	1.4 MHz	1880.0	QPSK	6	0	1.0833
			16-QAM	6	0	1.0825
	3 MHz	1880.0	QPSK	15	0	2.6881
			16-QAM	15	0	2.6899
	5 MHz	1880.0	QPSK	25	0	4.4912
			16-QAM	25	0	4.4880
	10 MHz	1880.0	QPSK	50	0	8.9431
			16-QAM	50	0	8.9162
	15 MHz	1880.0	QPSK	75	0	13.4300
			16-QAM	75	0	13.3960
	20 MHz	1880.0	QPSK	100	0	17.7890
			16-QAM	100	0	17.7820

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

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 2	1.4	1850.7	QPSK	1	0	6.936970	-26.47
		1880.0	QPSK	1	0	6.930980	-24.55
		1909.3	QPSK	1	0	6.989810	-26.29
	3	1851.5	QPSK	1	0	6.822310	-25.51
		1880.0	QPSK	1	0	6.961390	-25.78
		1908.5	QPSK	1	0	5.580550	-26.54
	5	1852.5	QPSK	1	0	6.950920	-25.03
		1880.0	QPSK	1	0	6.994290	-25.51
		1907.5	QPSK	1	0	6.995790	-26.39
	10	1855.0	QPSK	1	0	6.945440	-25.60
		1880.0	QPSK	1	0	6.993800	-26.21
		1905.0	QPSK	1	0	6.419030	-26.22
	15	1857.5	QPSK	1	0	6.951420	-26.44
		1880.0	QPSK	1	0	6.987320	-25.37
		1902.5	QPSK	1	0	6.980830	-24.42
	20	1860.0	QPSK	1	0	6.934470	-26.54
		1880.0	QPSK	1	0	6.859700	-26.00
		1900.0	QPSK	1	0	6.978340	-25.85

- Plots of the EUT's Conducted Spurious Emissions are shown Page 66 ~ 83.

7.5.1 BAND EDGE

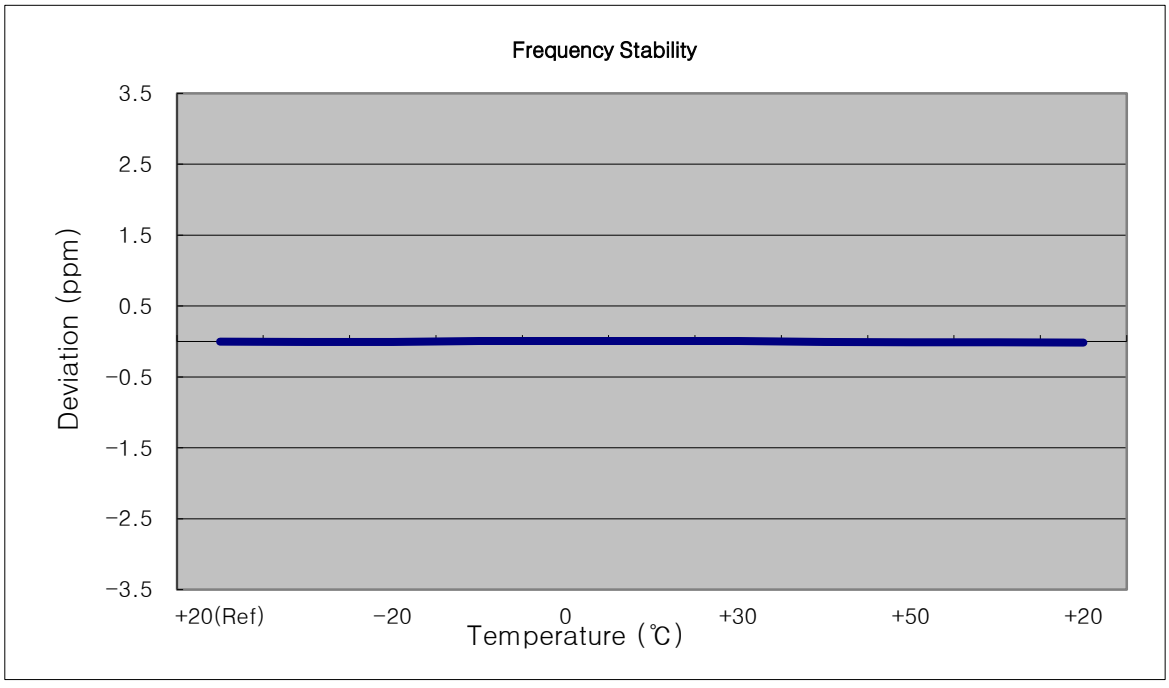
- Plots of the EUT's Band Edge are shown Page 48 ~ 65.

7.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.6.1 FREQUENCY STABILITY (1.4 MHz Band 2 LTE)

- ▣ OPERATING FREQUENCY: 1880,000,000 Hz
- ▣ CHANNEL: 18900 (1.4 MHz)
- ▣ REFERENCE VOLTAGE: 3.8 VDC
- ▣ DEVIATION LIMIT: -

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1879 999 993	0	0.000 000	0.000
100%		-30	1879 999 980	-12.30	-0.000 001	-0.007
100%		-20	1879 999 980	-12.80	-0.000 001	-0.007
100%		-10	1880 000 005	12.00	0.000 001	0.006
100%		0	1880 000 006	13.40	0.000 001	0.007
100%		+10	1880 000 006	13.10	0.000 001	0.007
100%		+30	1880 000 003	10.70	0.000 001	0.006
100%		+40	1879 999 979	-13.30	-0.000 001	-0.007
100%		+50	1879 999 970	-22.60	-0.000 001	-0.012
115%	4.37	+20	1879 999 968	-24.30	-0.000 001	-0.013
Batt. Endpoint	3.23	+20	1879 999 965	-27.30	-0.000 001	-0.015



7.6.2 FREQUENCY STABILITY (3 MHz Band 2 LTE)

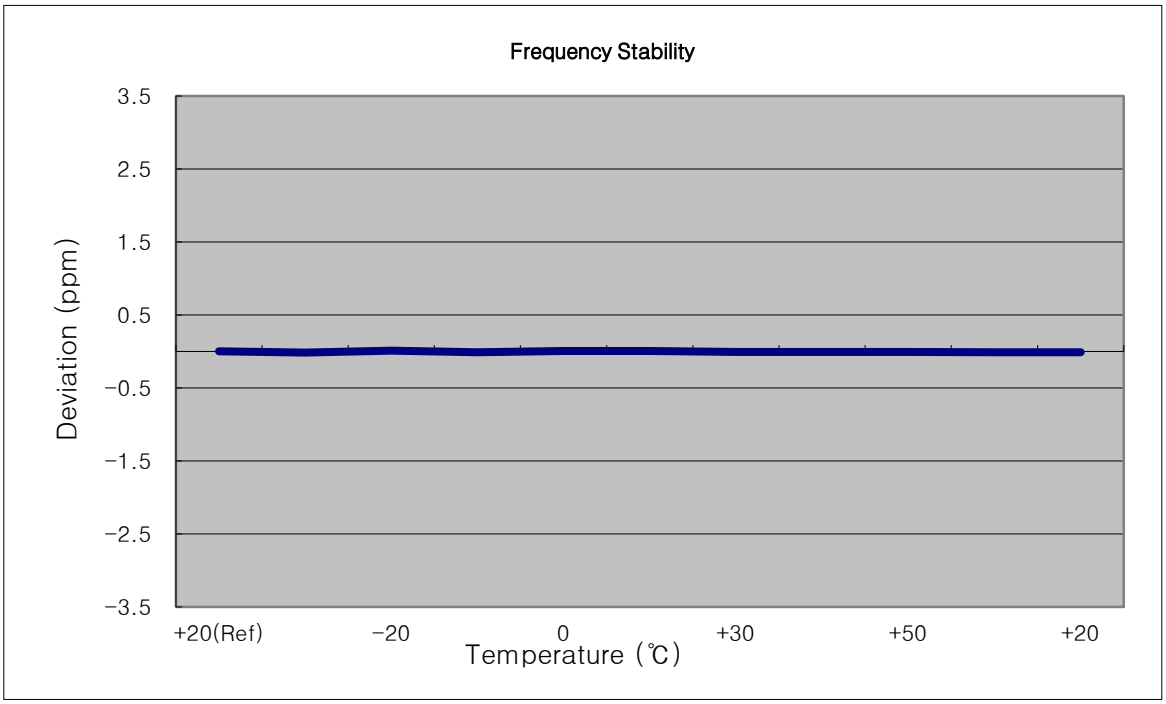
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 18900 (3 MHz)

▣ REFERENCE VOLTAGE: 3.8 VDC

▣ DEVIATION LIMIT: -

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1880 000 020	0	0.000 000	0.000
100%		-30	1879 999 990	-30.80	-0.000 002	-0.016
100%		-20	1880 000 041	20.60	0.000 001	0.011
100%		-10	1879 999 998	-22.50	-0.000 001	-0.012
100%		0	1880 000 032	11.40	0.000 001	0.006
100%		+10	1880 000 031	10.40	0.000 001	0.006
100%		+30	1880 000 004	-16.60	-0.000 001	-0.009
100%		+40	1880 000 005	-15.40	-0.000 001	-0.008
100%		+50	1880 000 002	-17.90	-0.000 001	-0.010
115%	4.37	+20	1879 999 994	-26.30	-0.000 001	-0.014
Batt. Endpoint	3.23	+20	1879 999 998	-22.00	-0.000 001	-0.012



7.6.3 FREQUENCY STABILITY (5 MHz Band 2 LTE)

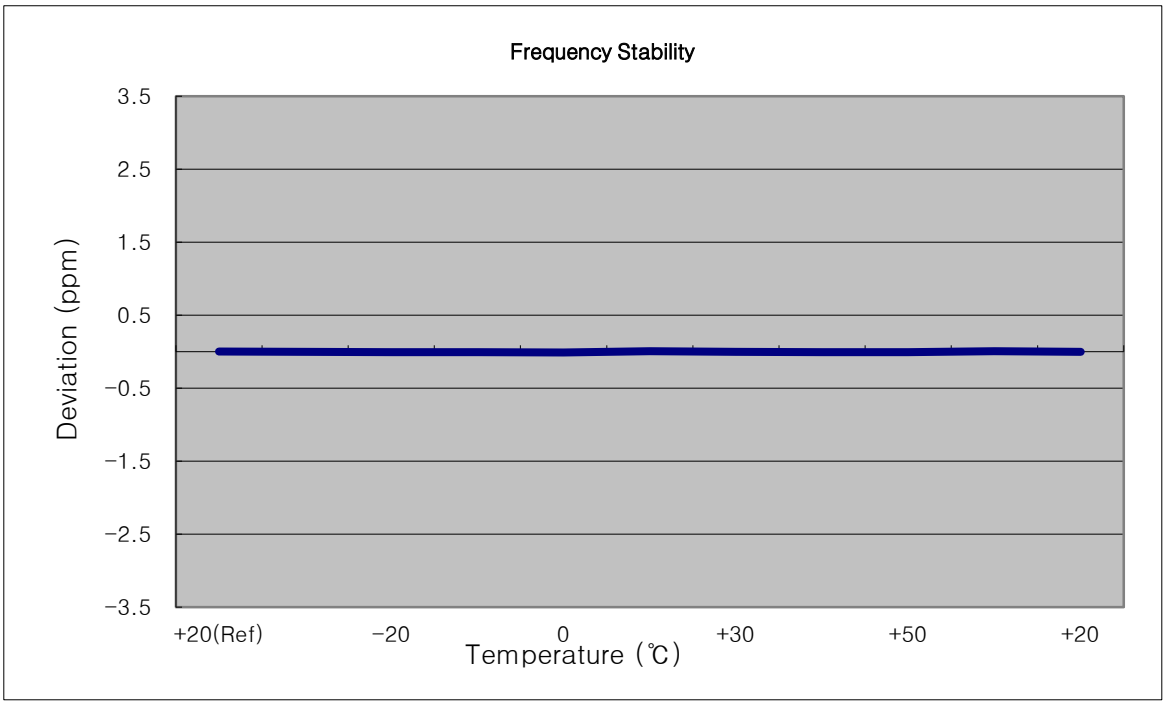
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 18900 (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)	1879 999 994	0	0.000 000	0.000
100%		-30	1879 999 985	-9.20	0.000 000	-0.005
100%		-20	1879 999 979	-15.60	-0.000 001	-0.008
100%		-10	1879 999 977	-17.00	-0.000 001	-0.009
100%		0	1879 999 973	-20.90	-0.000 001	-0.011
100%		+10	1880 000 004	9.40	0.000 001	0.005
100%		+30	1879 999 986	-7.80	0.000 000	-0.004
100%		+40	1879 999 983	-10.80	-0.000 001	-0.006
100%		+50	1879 999 979	-15.60	-0.000 001	-0.008
115%	4.37	+20	1880 000 002	7.60	0.000 000	0.004
Batt. Endpoint	3.23	+20	1879 999 984	-9.70	-0.000 001	-0.005



7.6.4 FREQUENCY STABILITY (10 MHz Band 2 LTE)

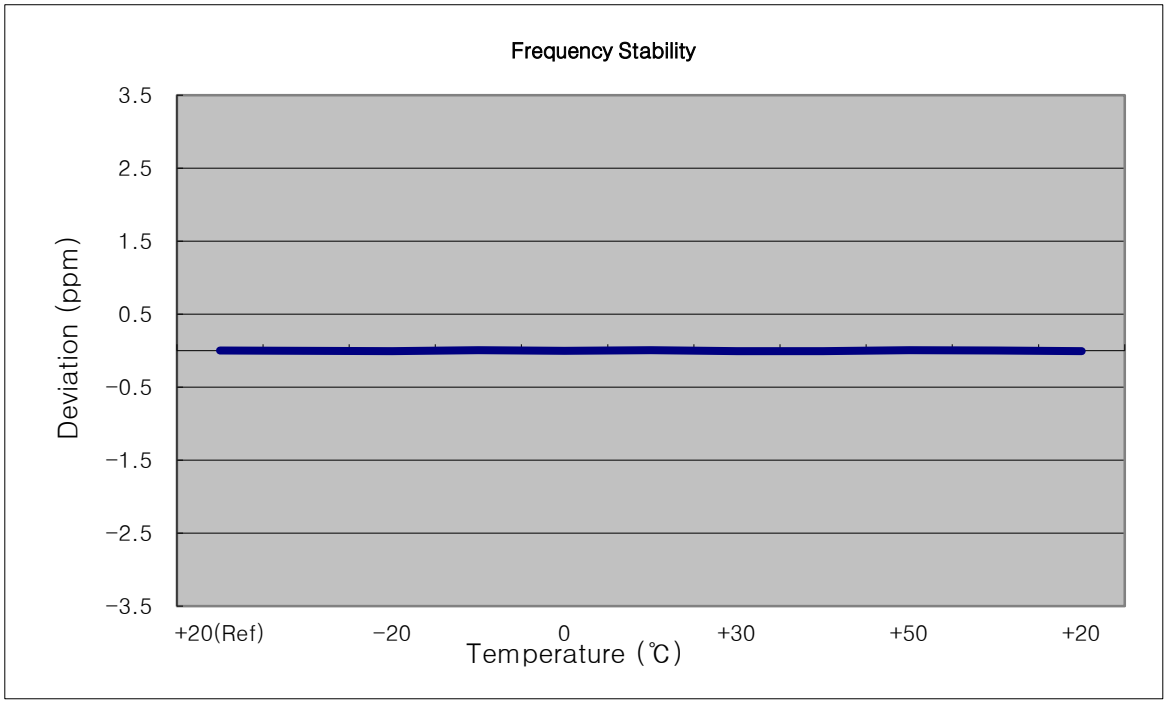
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 18900 (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)	1880 000 017	0	0.000 000	0.000
100%		-30	1880 000 011	-5.70	0.000 000	-0.003
100%		-20	1880 000 002	-15.30	-0.000 001	-0.008
100%		-10	1880 000 027	10.00	0.000 001	0.005
100%		0	1880 000 011	-5.80	0.000 000	-0.003
100%		+10	1880 000 029	12.00	0.000 001	0.006
100%		+30	1880 000 006	-10.70	-0.000 001	-0.006
100%		+40	1879 999 999	-18.10	-0.000 001	-0.010
100%		+50	1880 000 027	10.20	0.000 001	0.005
115%	4.37	+20	1880 000 023	6.00	0.000 000	0.003
Batt. Endpoint	3.23	+20	1880 000 006	-10.90	-0.000 001	-0.006



7.6.5 FREQUENCY STABILITY (15 MHz Band 2 LTE)

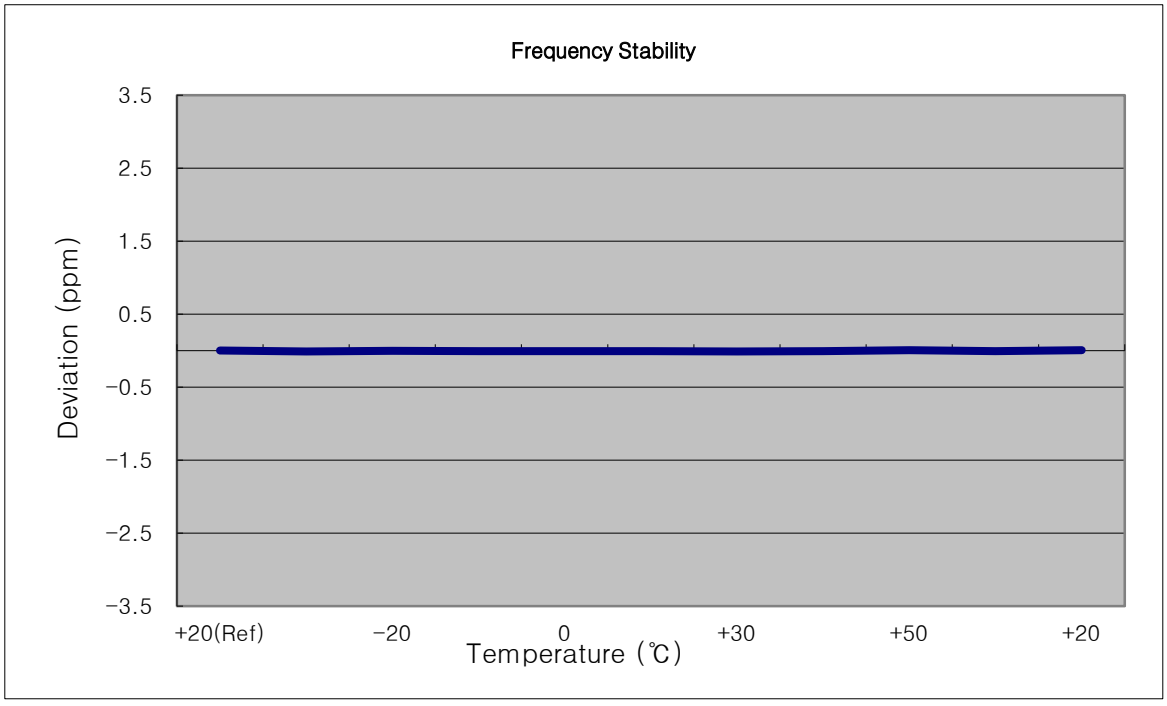
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 18900 (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)	1880 000 024	0	0.000 000	0.000
100%		-30	1880 000 004	-20.70	-0.000 001	-0.011
100%		-20	1880 000 015	-9.20	0.000 000	-0.005
100%		-10	1880 000 011	-13.90	-0.000 001	-0.007
100%		0	1880 000 010	-14.50	-0.000 001	-0.008
100%		+10	1880 000 012	-12.20	-0.000 001	-0.006
100%		+30	1880 000 003	-21.80	-0.000 001	-0.012
100%		+40	1880 000 011	-13.50	-0.000 001	-0.007
100%		+50	1880 000 038	13.20	0.000 001	0.007
115%	4.37	+20	1880 000 012	-12.70	-0.000 001	-0.007
Batt. Endpoint	3.23	+20	1880 000 033	8.90	0.000 000	0.005



7.6.6 FREQUENCY STABILITY (20 MHz Band 2 LTE)

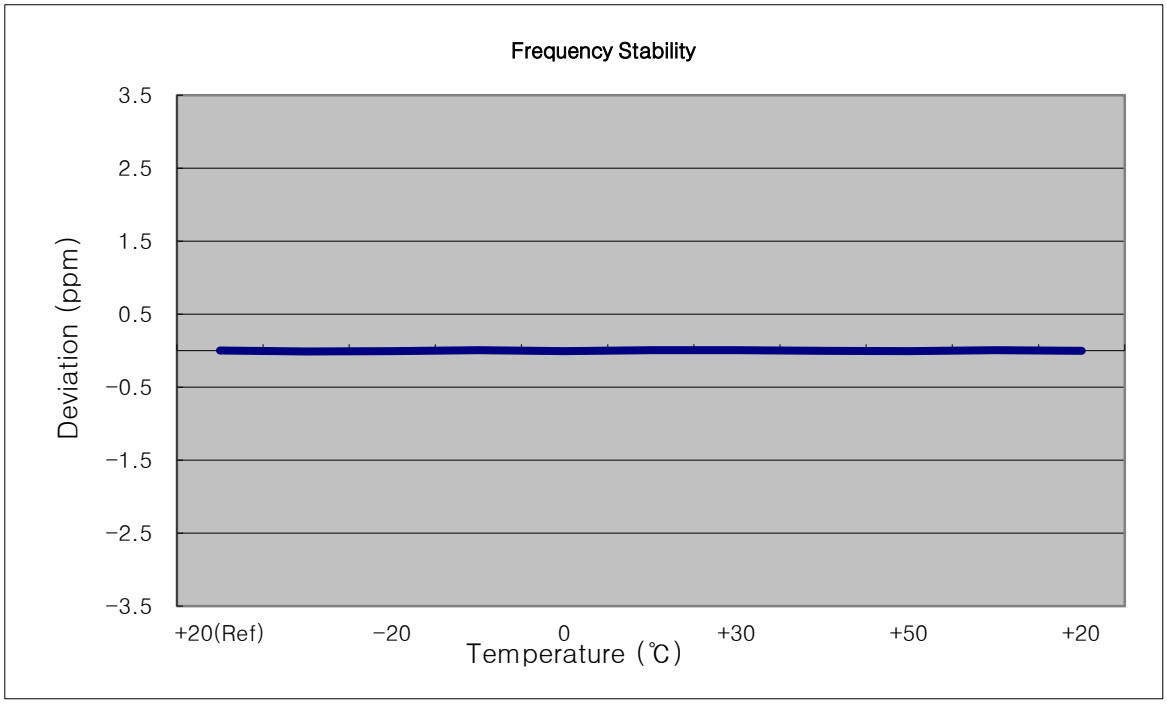
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 18900 (20 MHz)

▣ REFERENCE VOLTAGE: 3.8 VDC

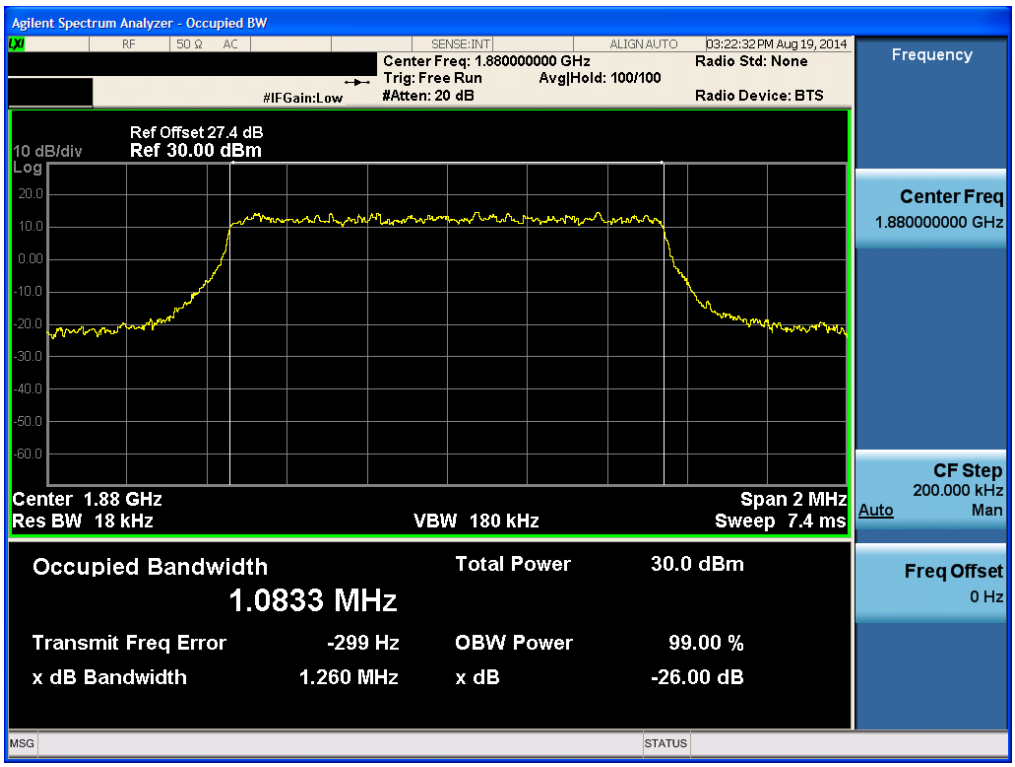
▣ DEVIATION LIMIT: -

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.80	+20(Ref)	1880 000 009	0	0.000 000	0.000
100%		-30	1879 999 983	-25.80	-0.000 001	-0.014
100%		-20	1879 999 997	-12.50	-0.000 001	-0.007
100%		-10	1880 000 020	11.00	0.000 001	0.006
100%		0	1879 999 997	-12.30	-0.000 001	-0.007
100%		+10	1880 000 019	9.80	0.000 001	0.005
100%		+30	1880 000 019	9.60	0.000 001	0.005
100%		+40	1880 000 002	-7.20	0.000 000	-0.004
100%		+50	1879 999 994	-15.30	-0.000 001	-0.008
115%	4.37	+20	1880 000 023	13.90	0.000 001	0.007
Batt. Endpoint	3.23	+20	1880 000 005	-4.20	0.000 000	-0.002



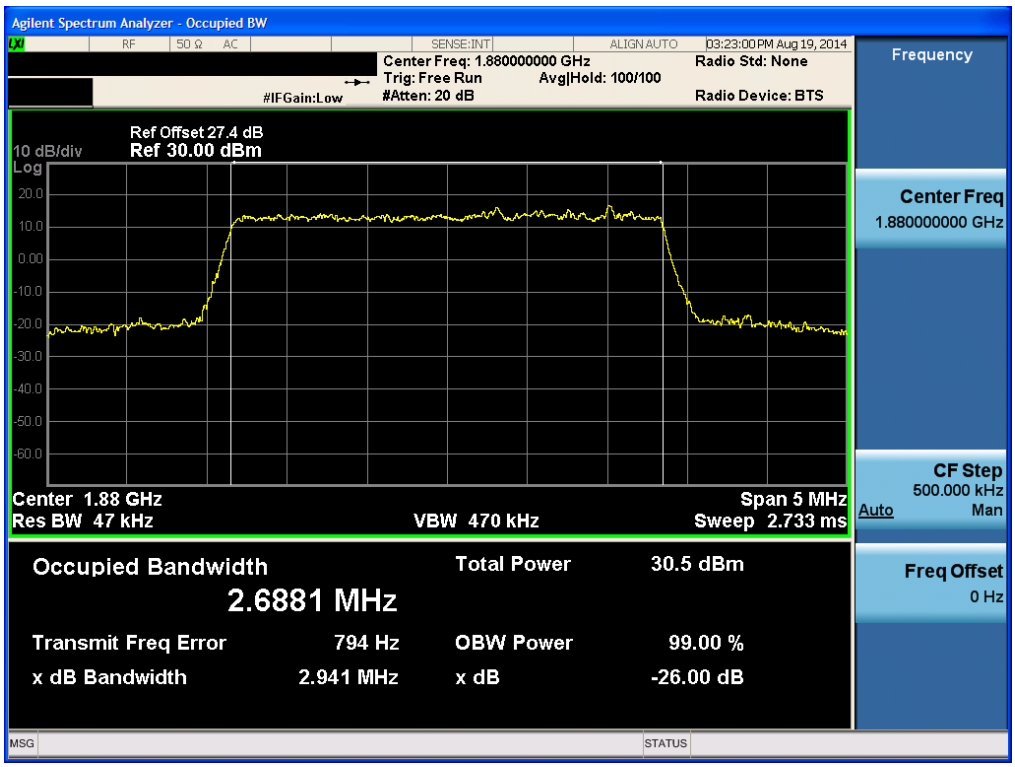
8. TEST PLOTS

BAND 2. Occupied Bandwidth Plot (1.4M BW Ch.18900 QPSK RB 6_0)

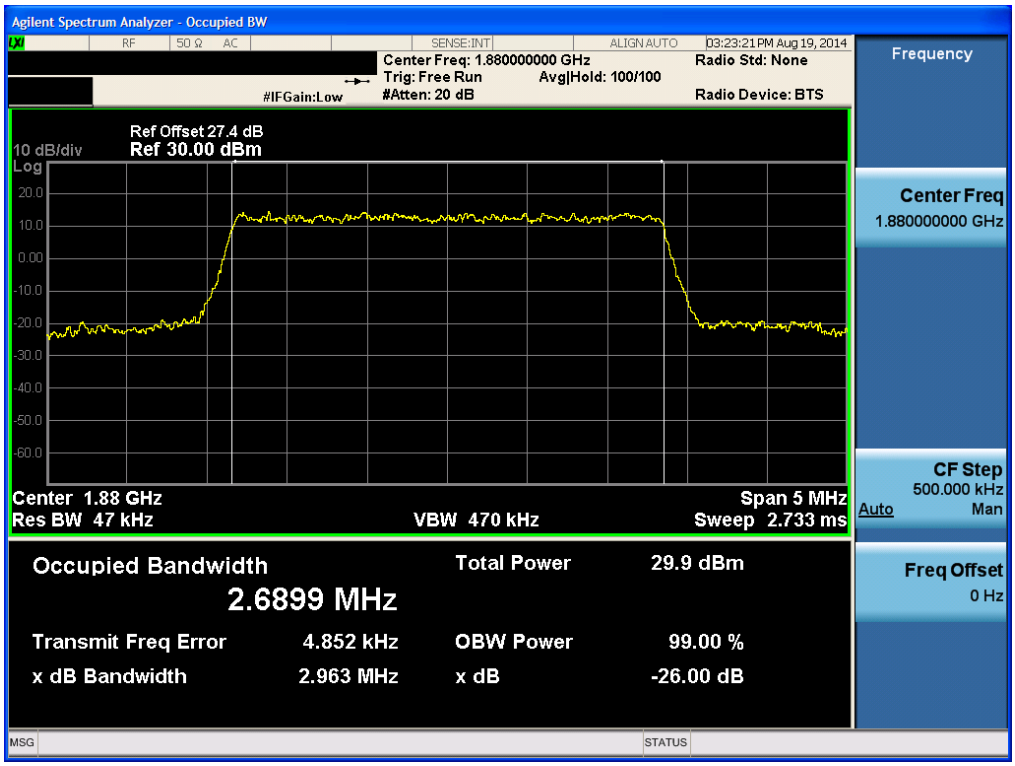


BAND 2. Occupied Bandwidth Plot (1.4M BW Ch.18900 16QAM RB 6_0)

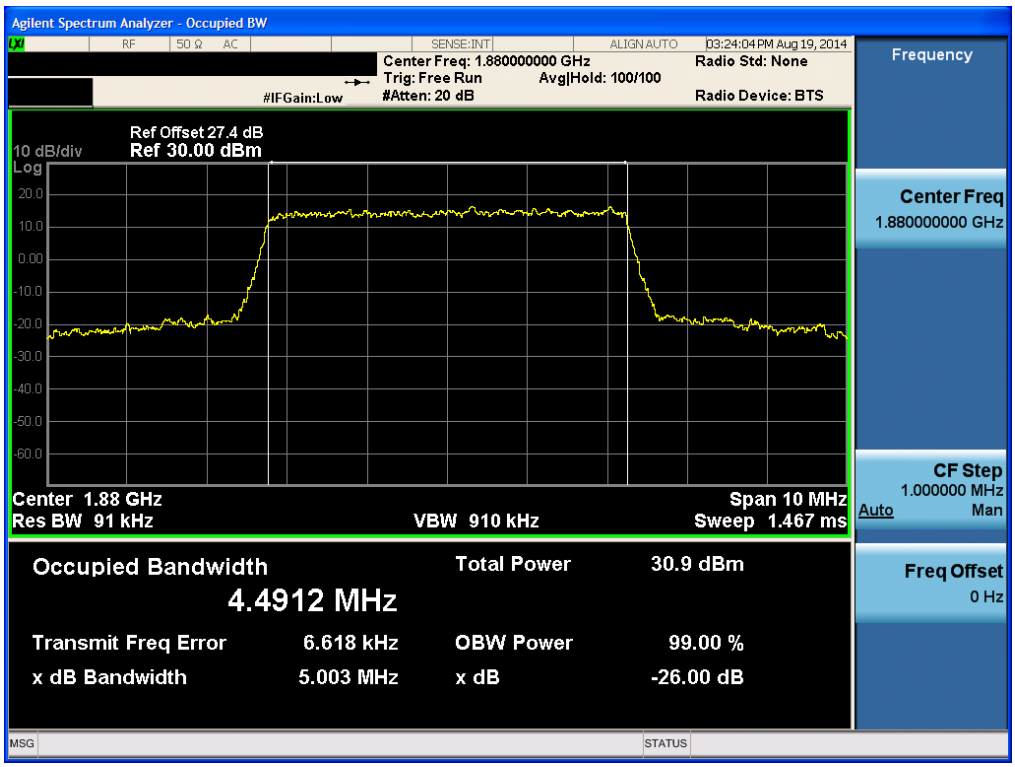
BAND 2. Occupied Bandwidth Plot (3M BW Ch.18900 QPSK RB 15_0)



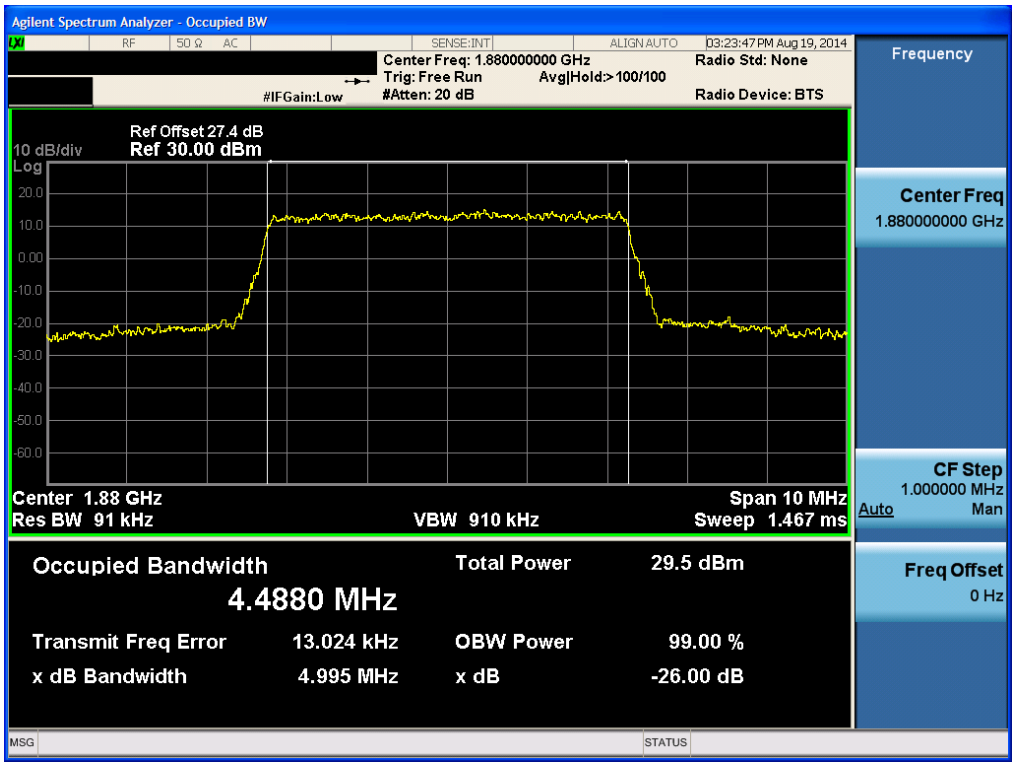
BAND 2. Occupied Bandwidth Plot (3M BW Ch.18900 16QAM RB 15_0)



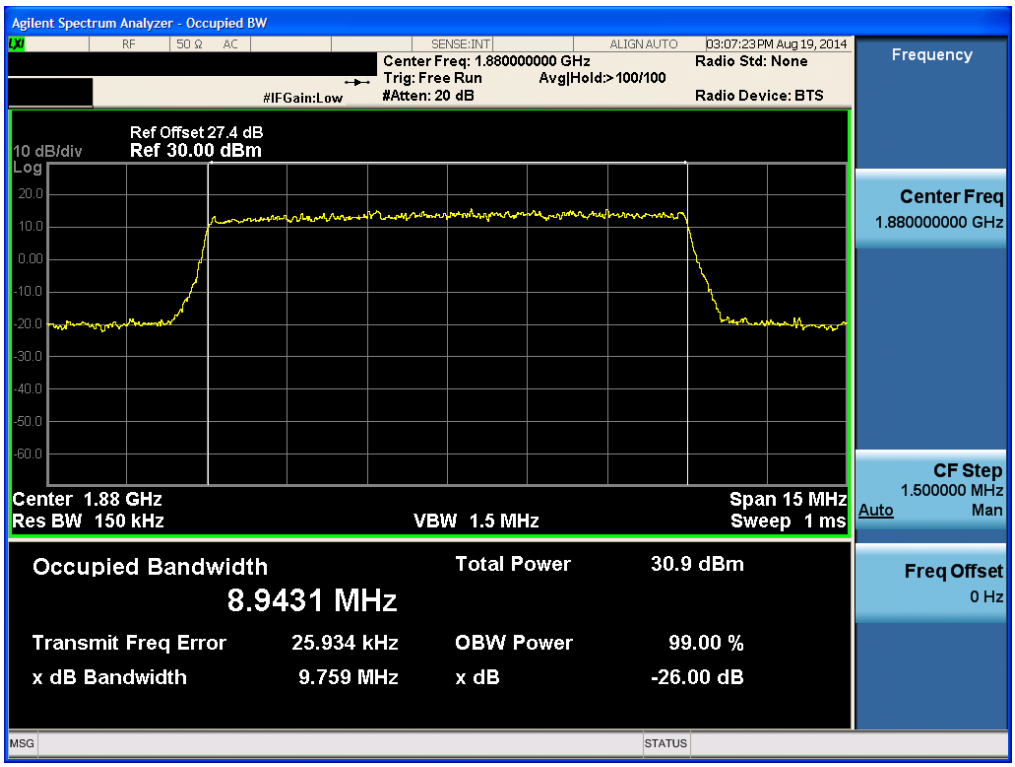
BAND 2. Occupied Bandwidth Plot (5M BW Ch.18900 16QAM RB 25_0)



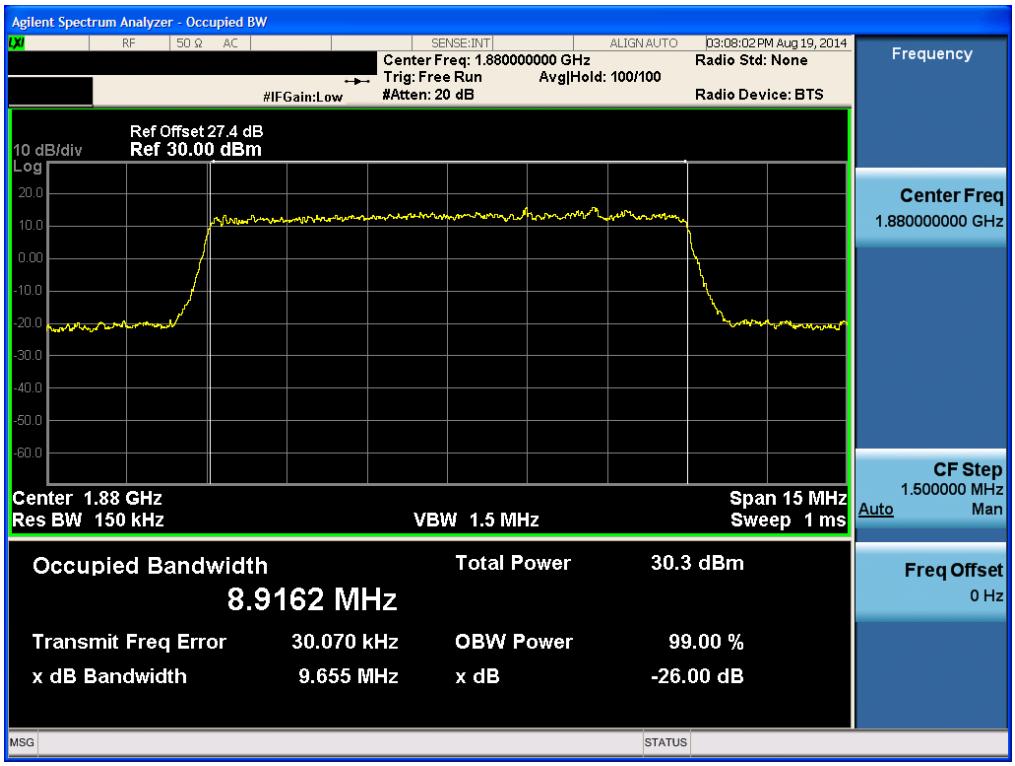
BAND 2. Occupied Bandwidth Plot (5M BW Ch.18900 QPSK RB 25_0)



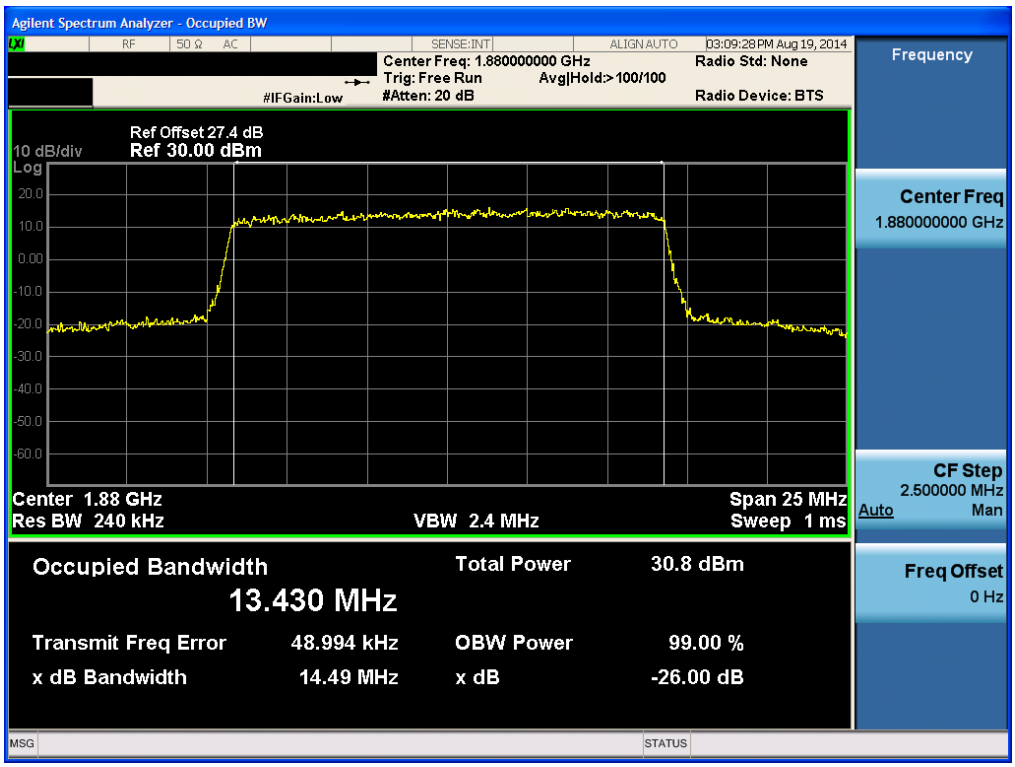
BAND 2. Occupied Bandwidth Plot (10M BW Ch.18900 QPSK RB 50_0)



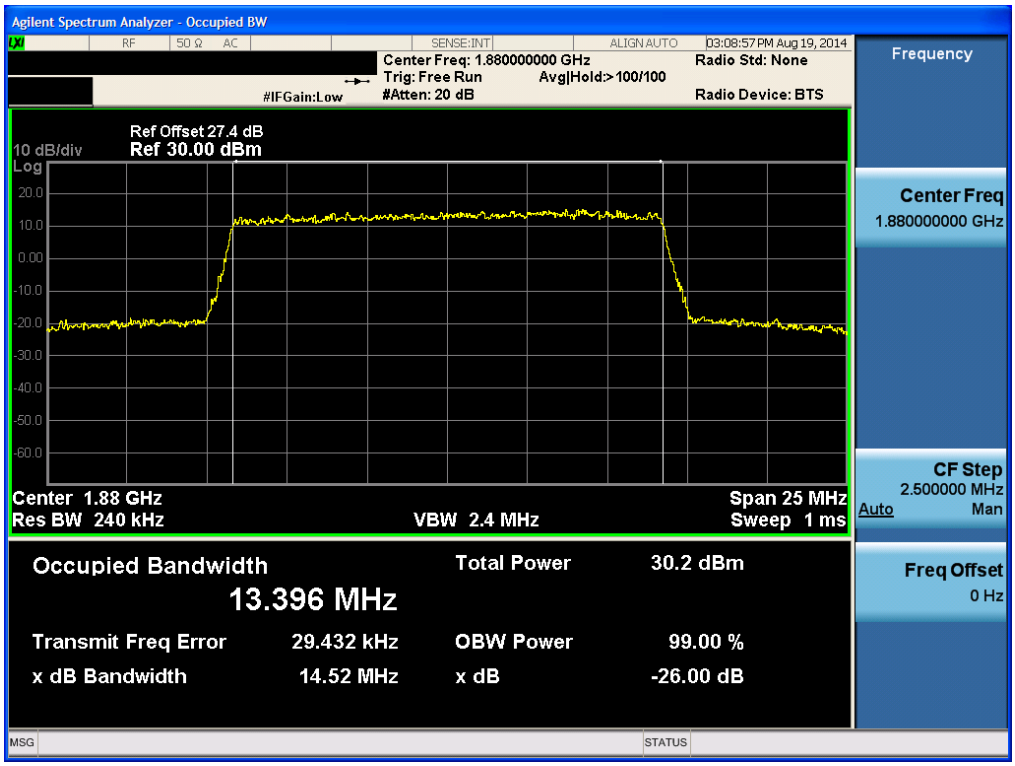
BAND 2. Occupied Bandwidth Plot (10M BW Ch.18900 16QAM RB 50_0)



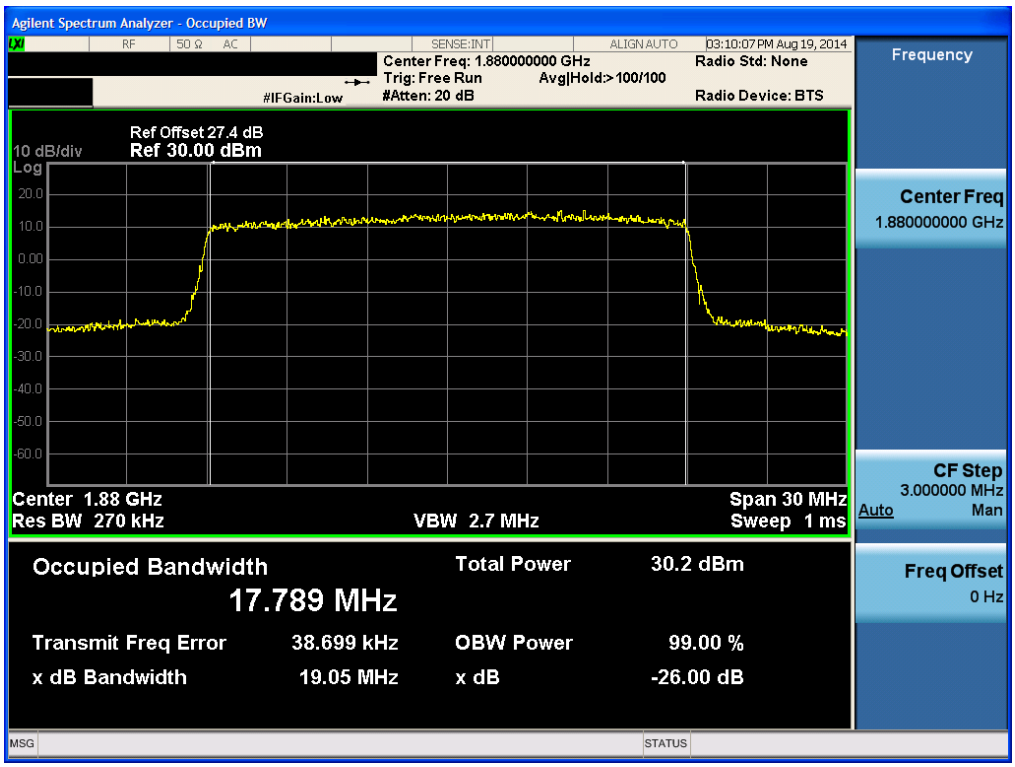
BAND 2. Occupied Bandwidth Plot (15M BW Ch.18900 QPSK RB 75_0)



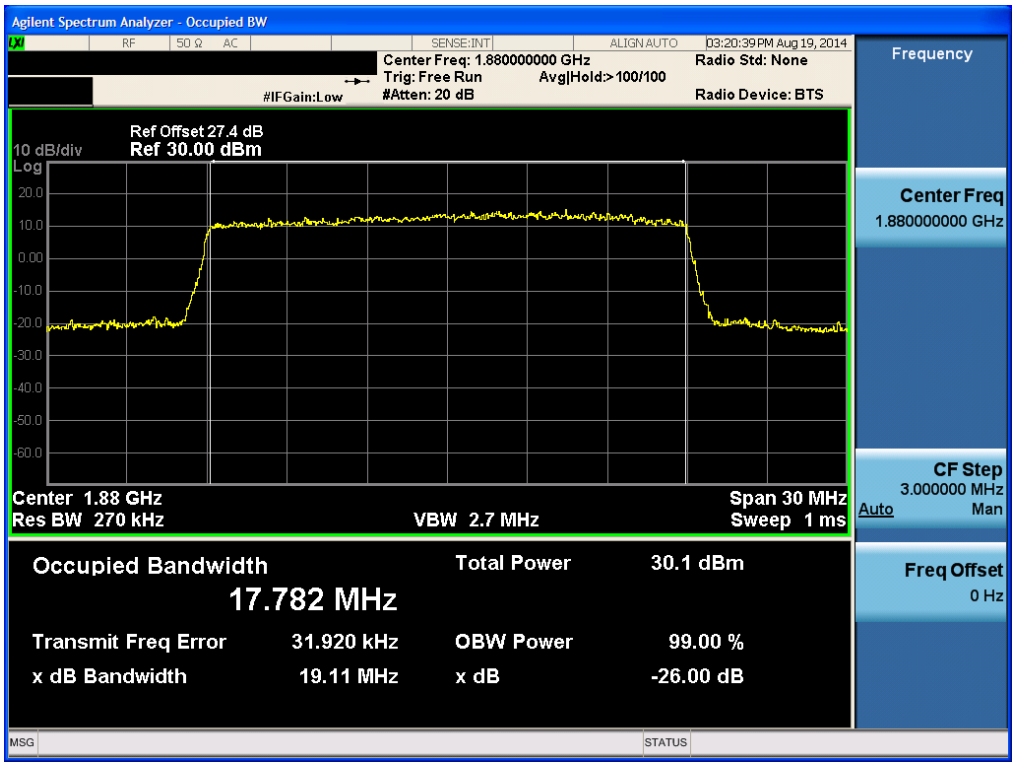
BAND 2. Occupied Bandwidth Plot (15M BW Ch.18900 16QAM RB 75_0)



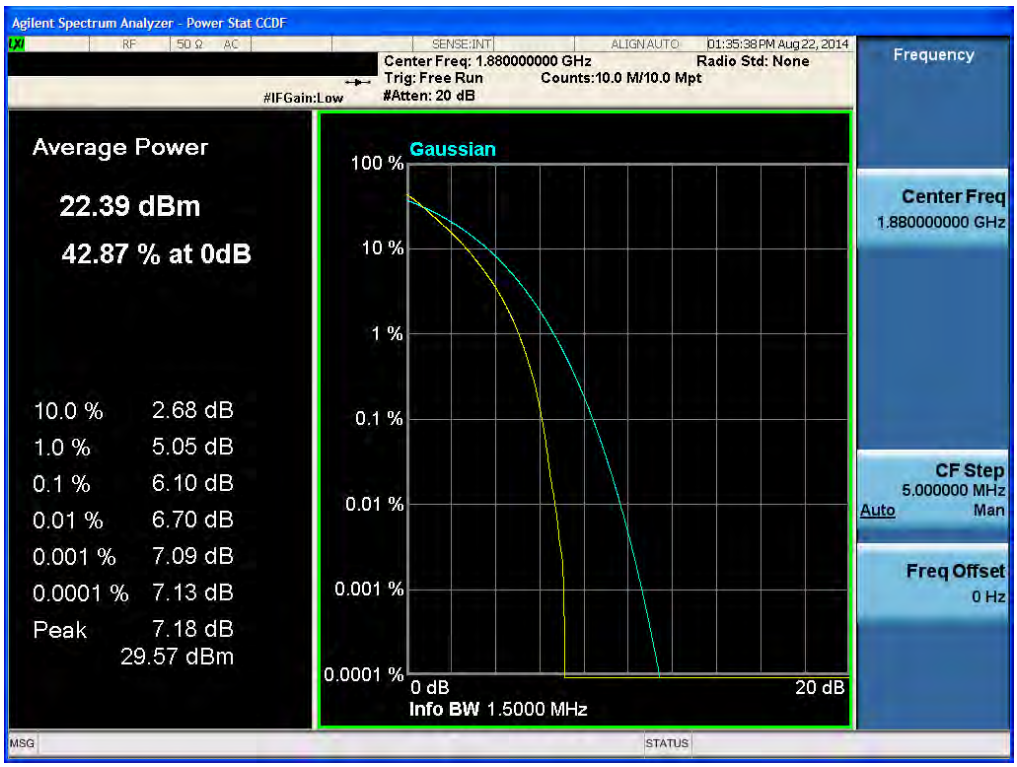
BAND 2. Occupied Bandwidth Plot (20M BW Ch.18900 QPSK RB 100_0)



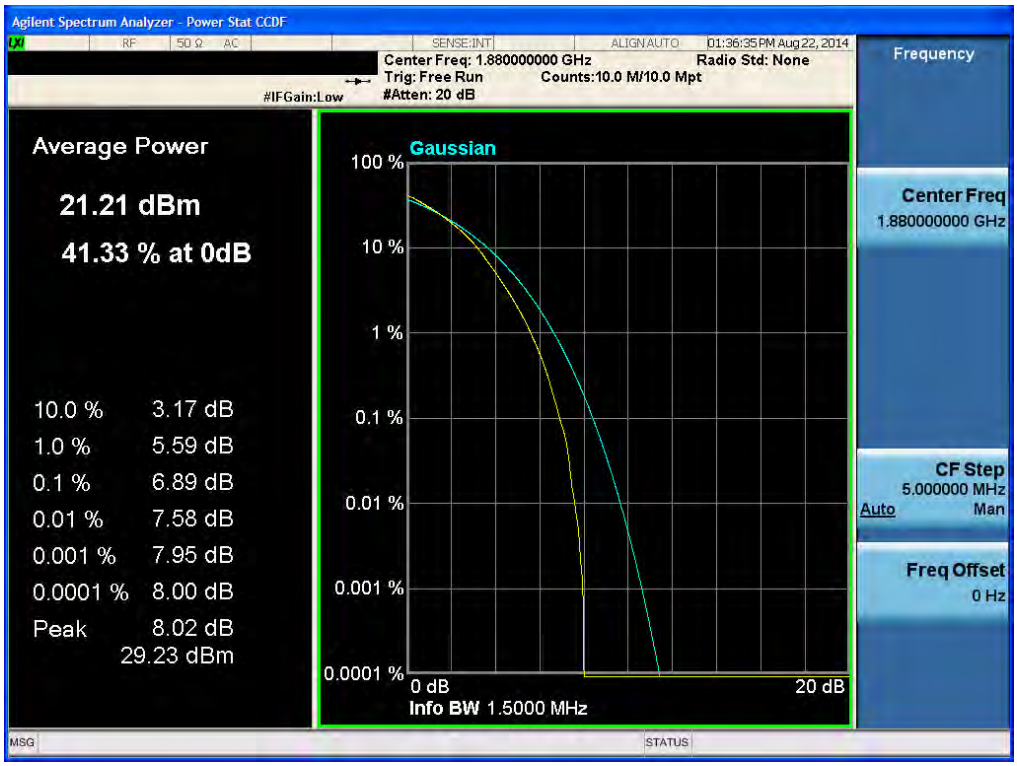
BAND 2. Occupied Bandwidth Plot (20M BW Ch.18900 16QAM RB 100_0)



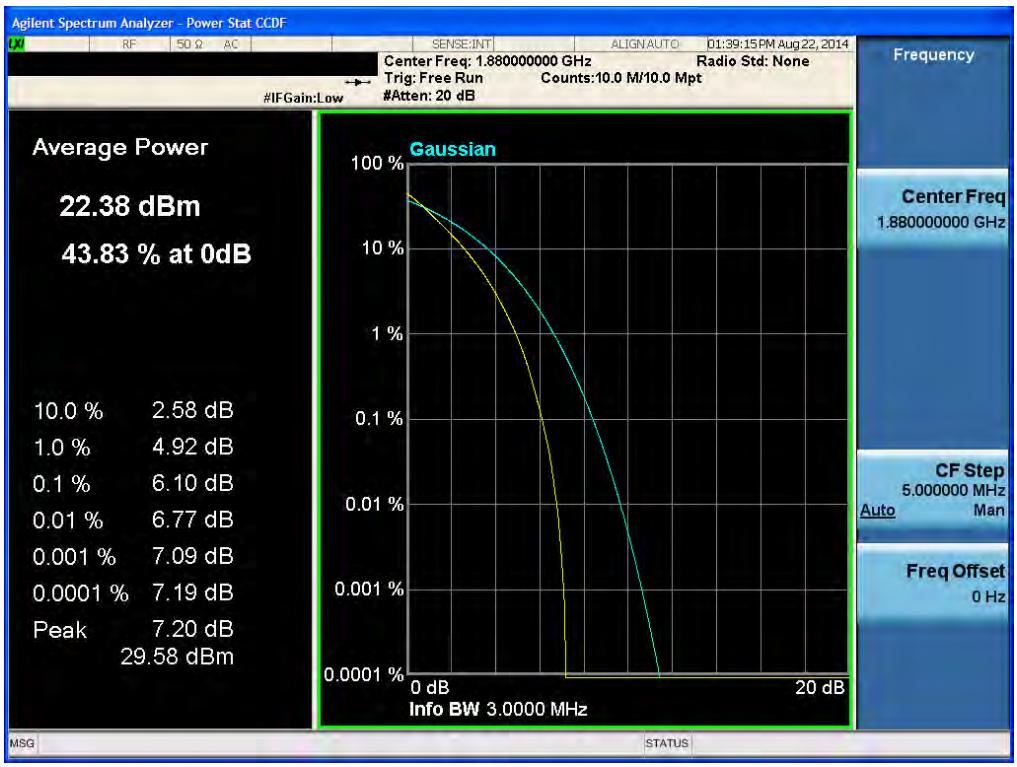
BAND 2. PAR Plot (1.4M BW Ch.18900 QPSK RB 6_0)



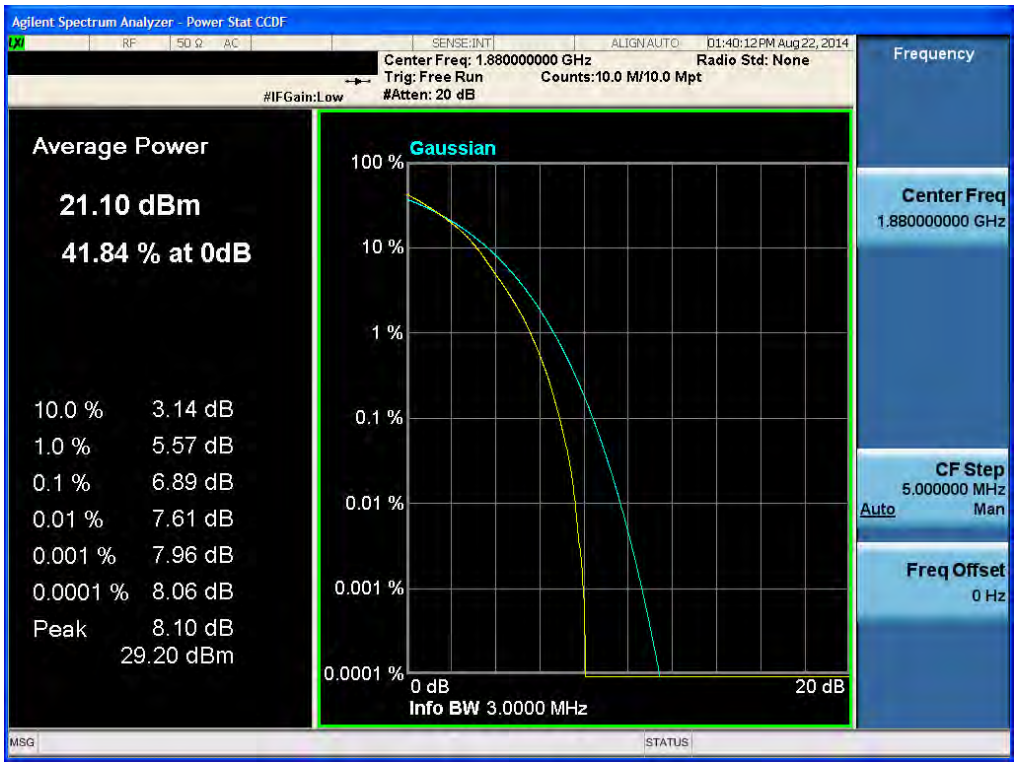
BAND 2. PAR Plot (1.4M BW Ch.18900 16QAM RB 6_0)



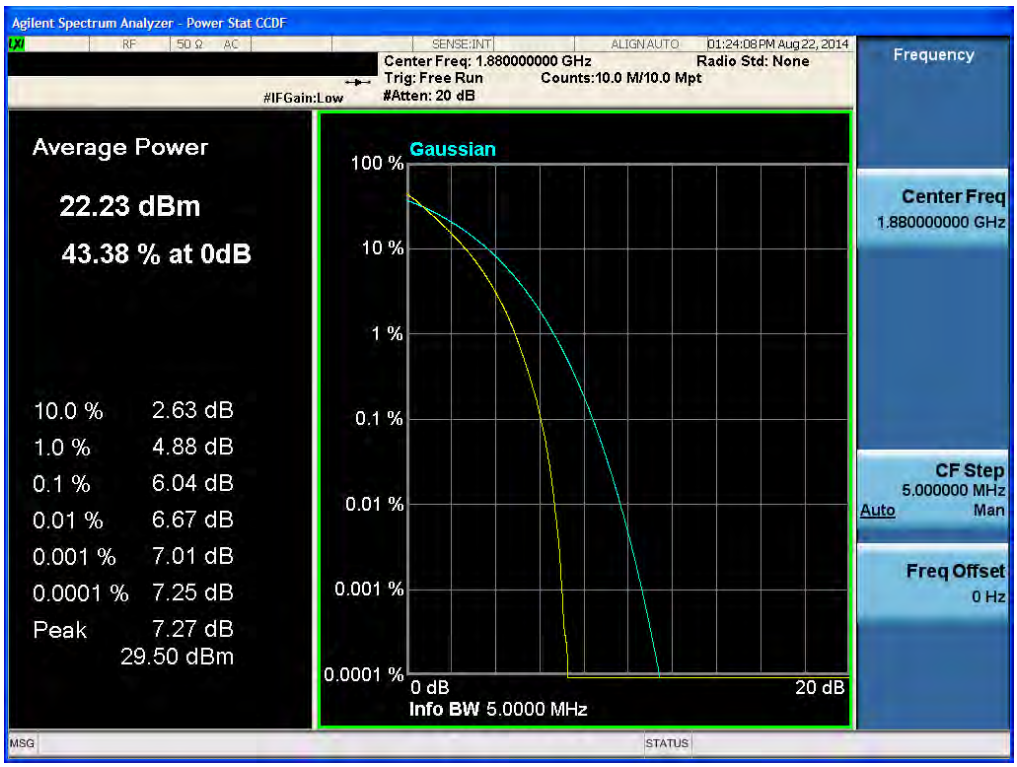
BAND 2. PAR Plot (3M BW Ch.18900 QPSK RB 15_0)



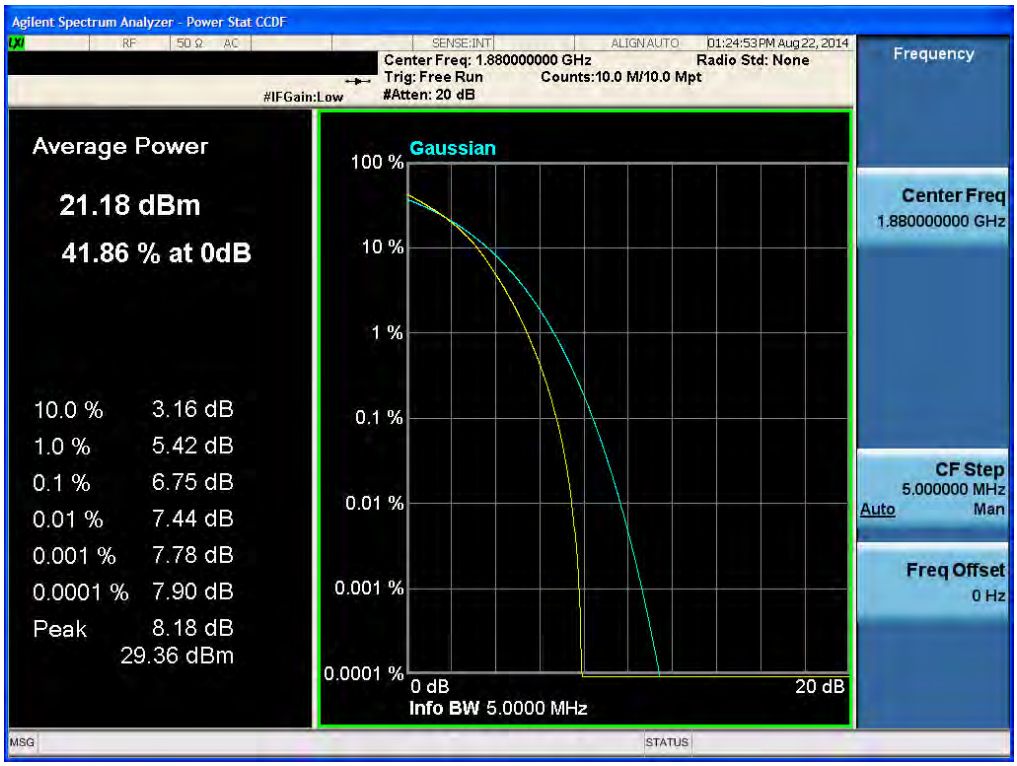
BAND 2. PAR Plot (3M BW Ch.18900 16QAM RB 15_0)



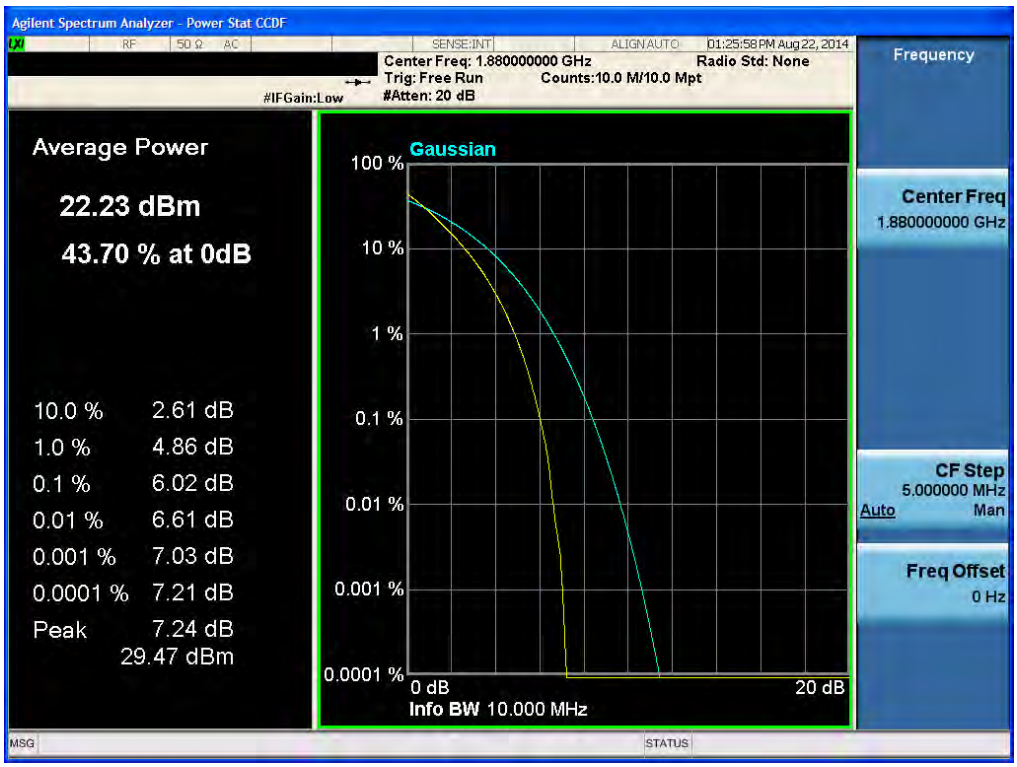
BAND 2. PAR Plot (5M BW Ch.18900 QPSK RB 25_0)



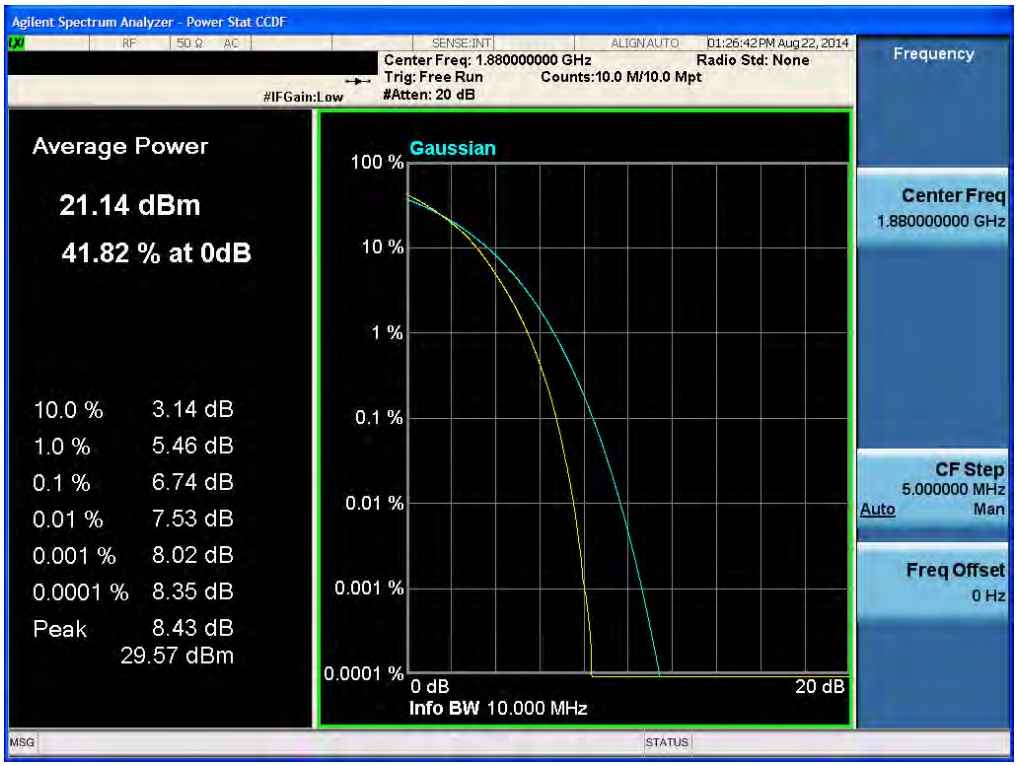
BAND 2. PAR Plot (5M BW Ch.18900 16QAM RB 25_0)



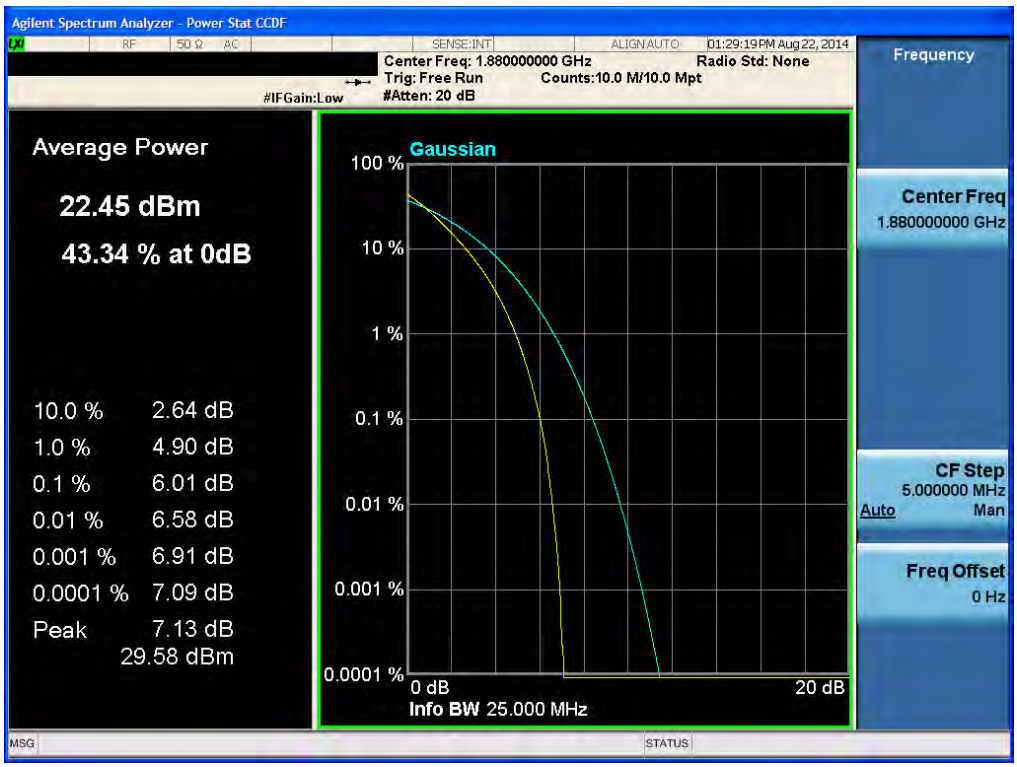
BAND 2. PAR Plot (10M BW Ch.18900 QPSK RB 50_0)



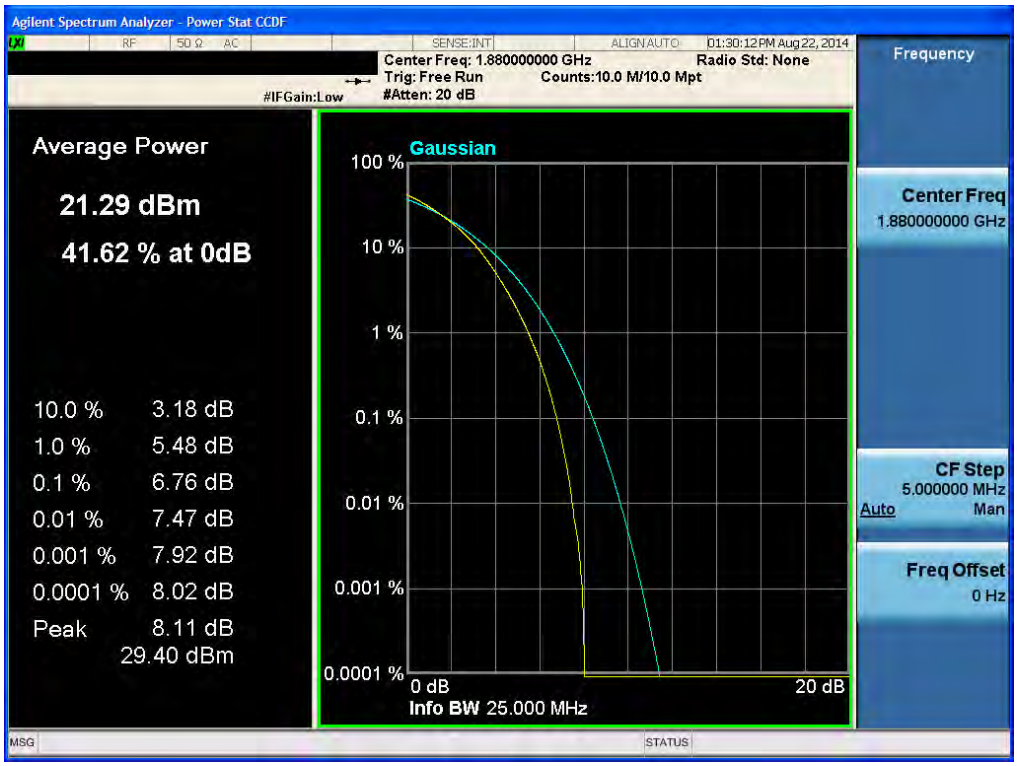
BAND 2. PAR Plot (10M BW Ch.18900 16QAM RB 50_0)



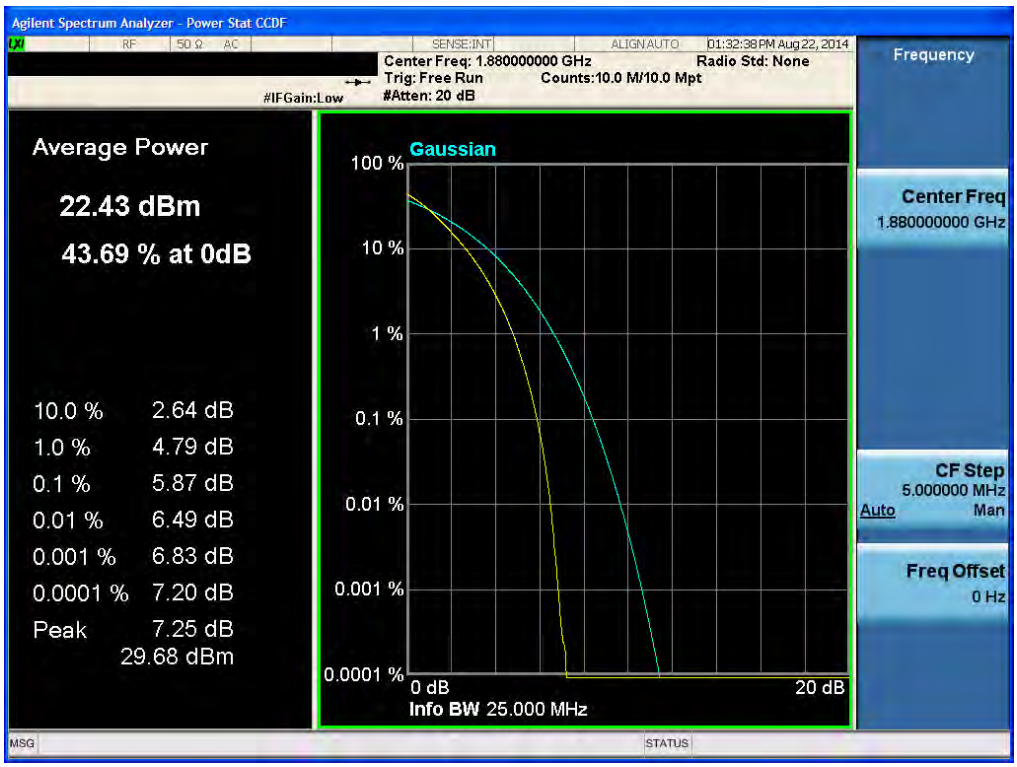
BAND 2. PAR Plot (15M BW Ch.18900 QPSK RB 75_0)



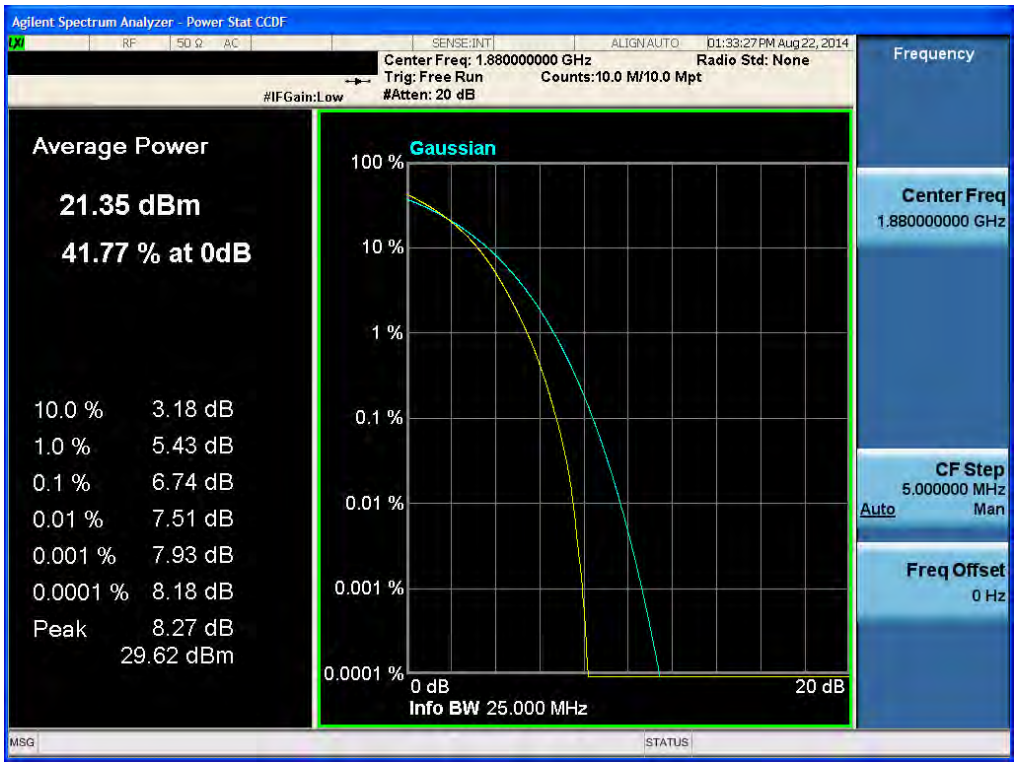
BAND 2. PAR Plot (15M BW Ch.18900 16QAM RB 75_0)



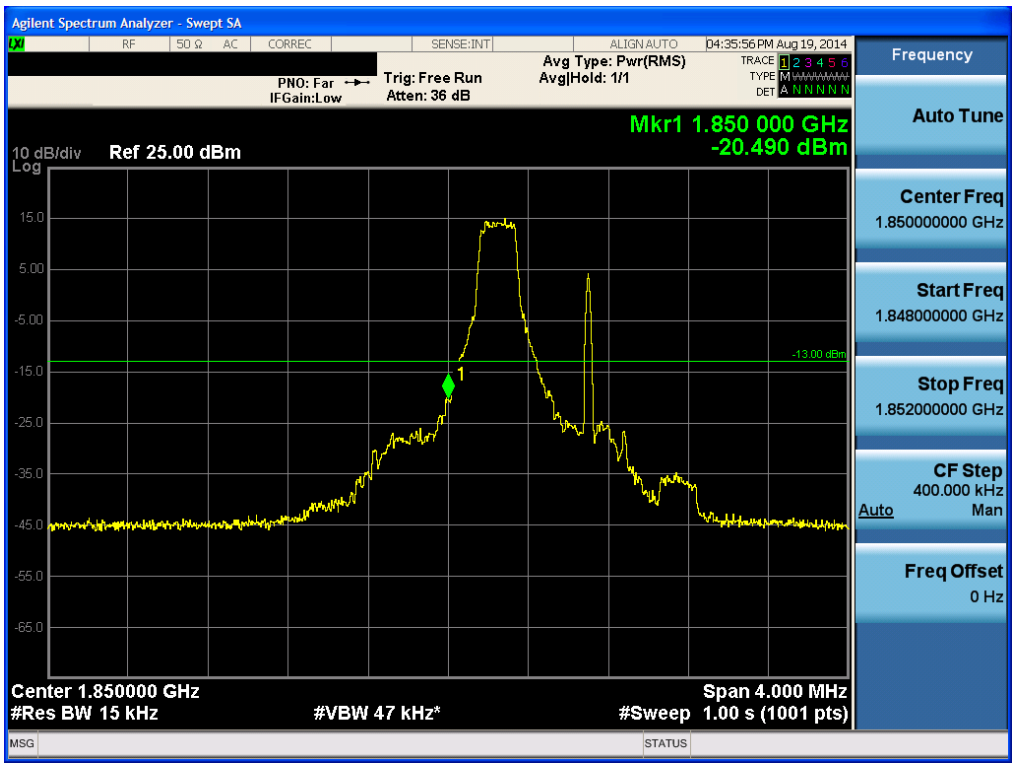
BAND 2. PAR Plot (20M BW Ch.18900 QPSK RB 100_0)



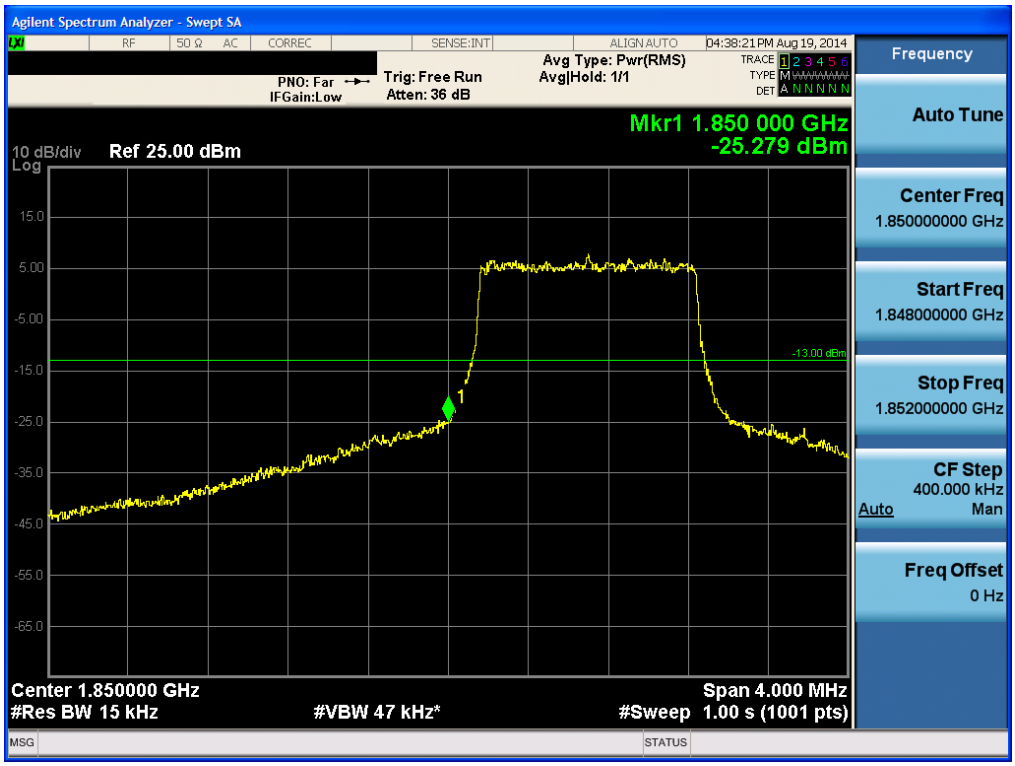
BAND 2. PAR Plot (20M BW Ch.18900 16QAM RB 100_0)



BAND 2. Lower Band Edge Plot (1.4M BW Ch.18607 QPSK RB 1, Offset 0) -1

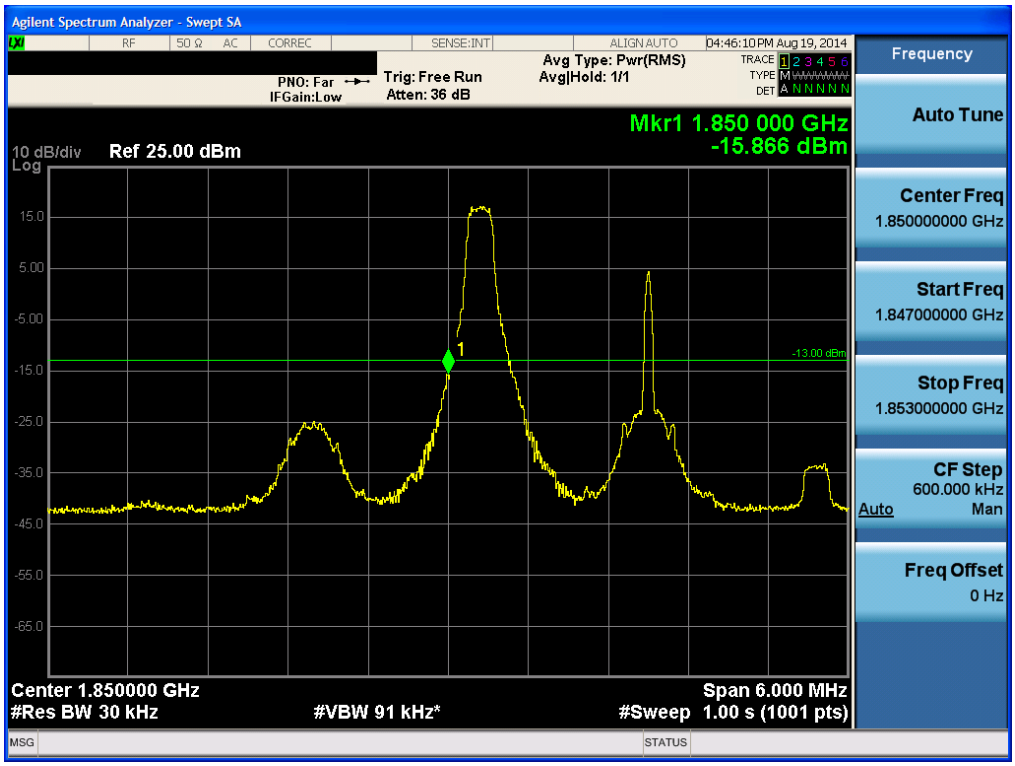


BAND 2. Lower Band Edge Plot (1.4M BW Ch.18607 QPSK RB 6) -2

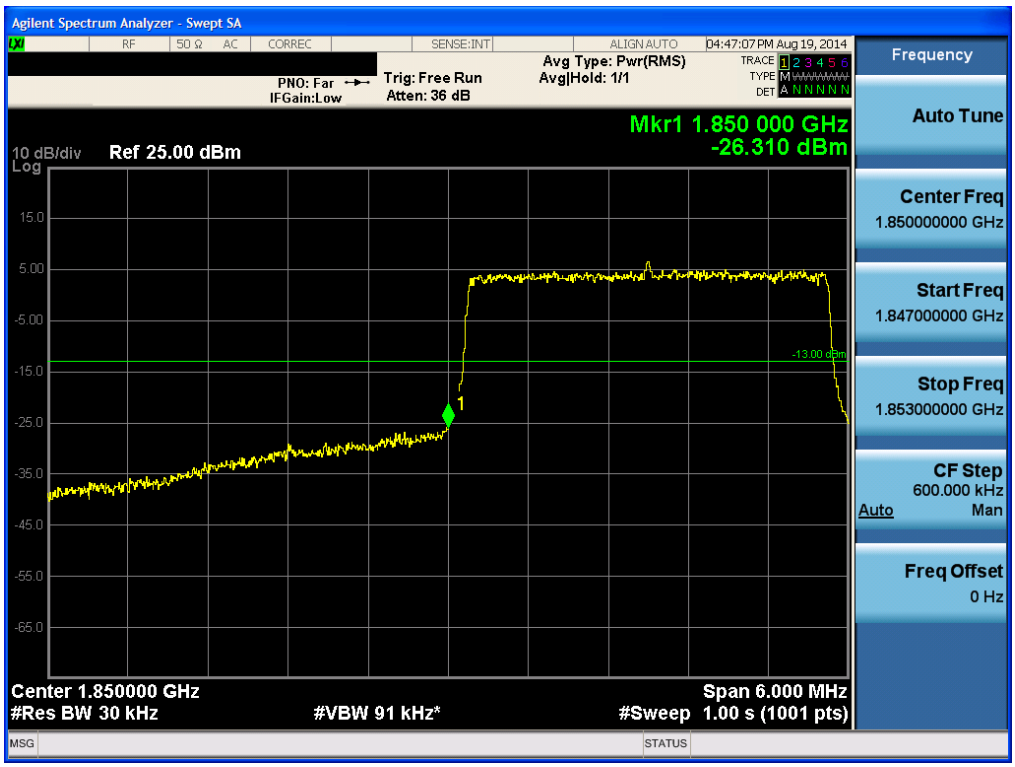


BAND 2. Lower Extended Band Edge Plot (1.4M BW Ch.18607 QPSK RB 6) -3

BAND 2. Lower Band Edge Plot (3M BW Ch.18615 QPSK RB 1, Offset 0) -1

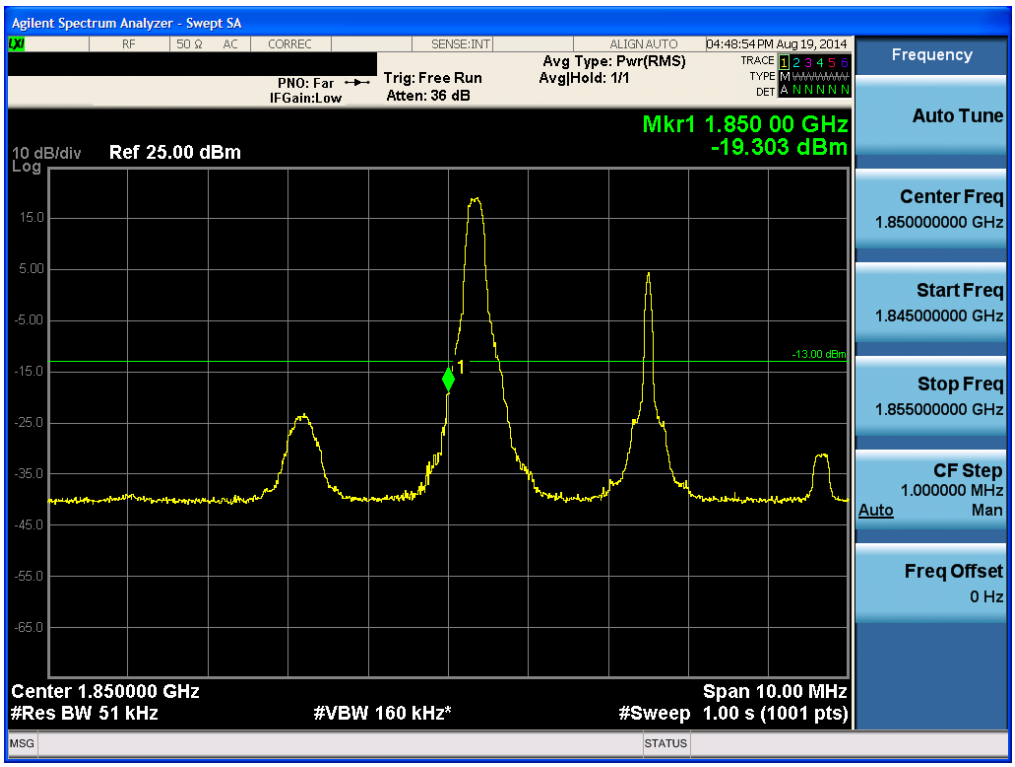


BAND 2. Lower Band Edge Plot (3M BW Ch.18615 QPSK RB 15) -2

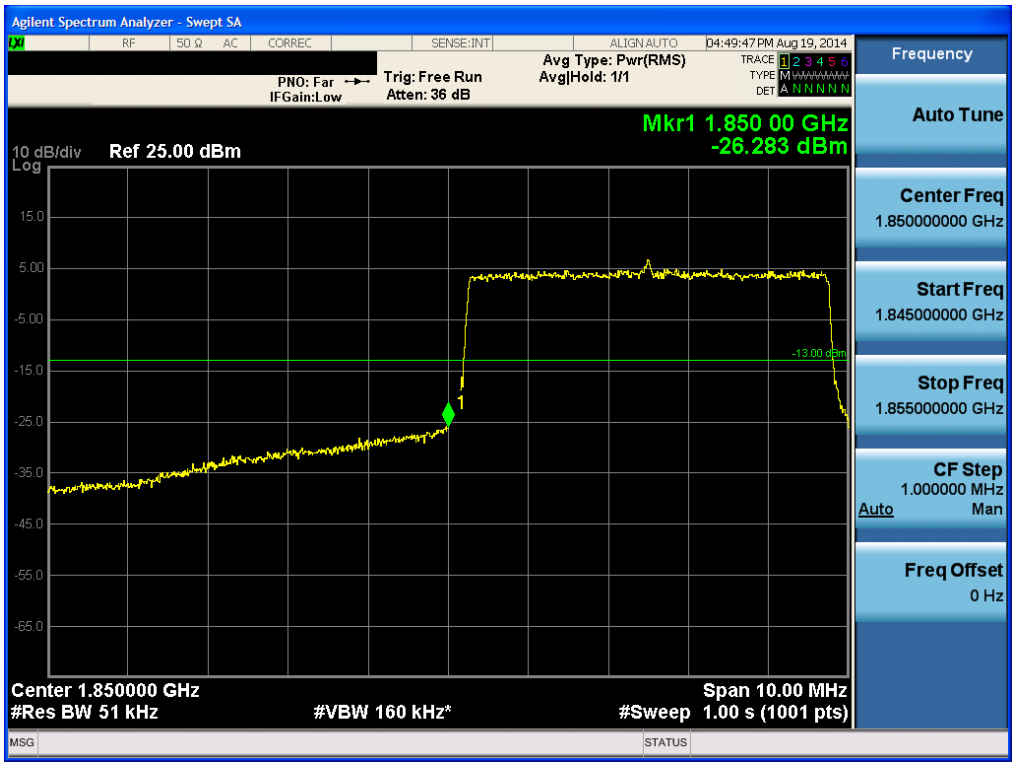


BAND 2. Lower Extended Band Edge Plot (3M BW Ch.18615 QPSK RB 15) -3

BAND 2. Lower Band Edge Plot (5M BW Ch.18625 QPSK RB 1, Offset 0) -1

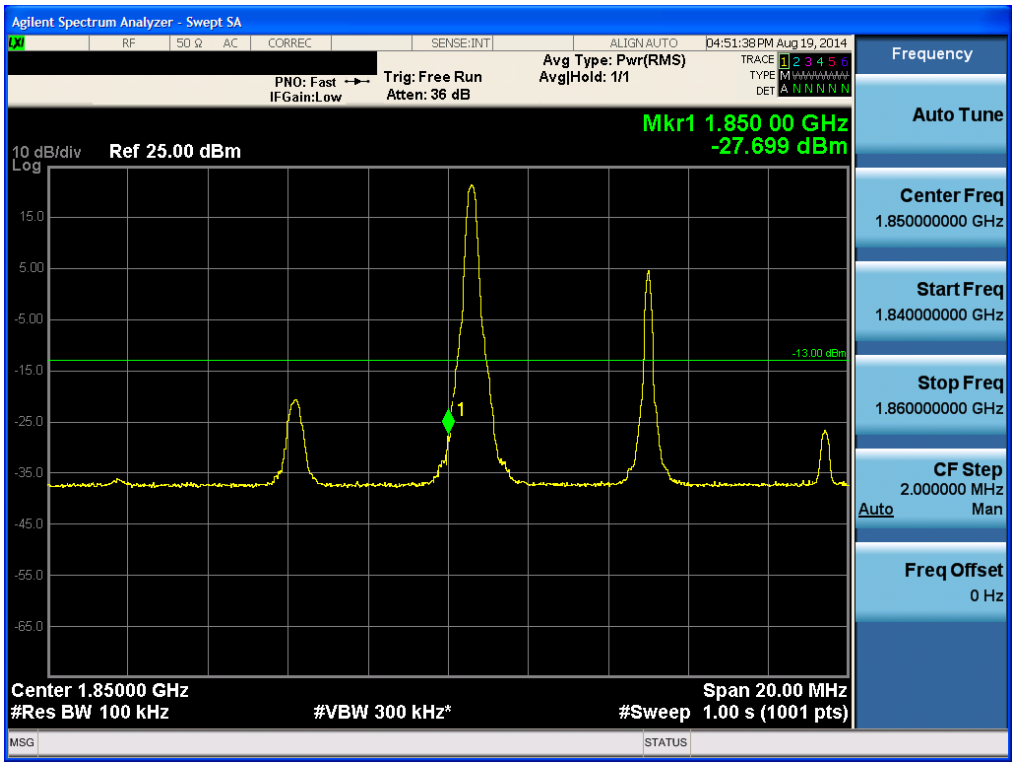


BAND 2. Lower Band Edge Plot (5M BW Ch.18625 QPSK RB 25) -2

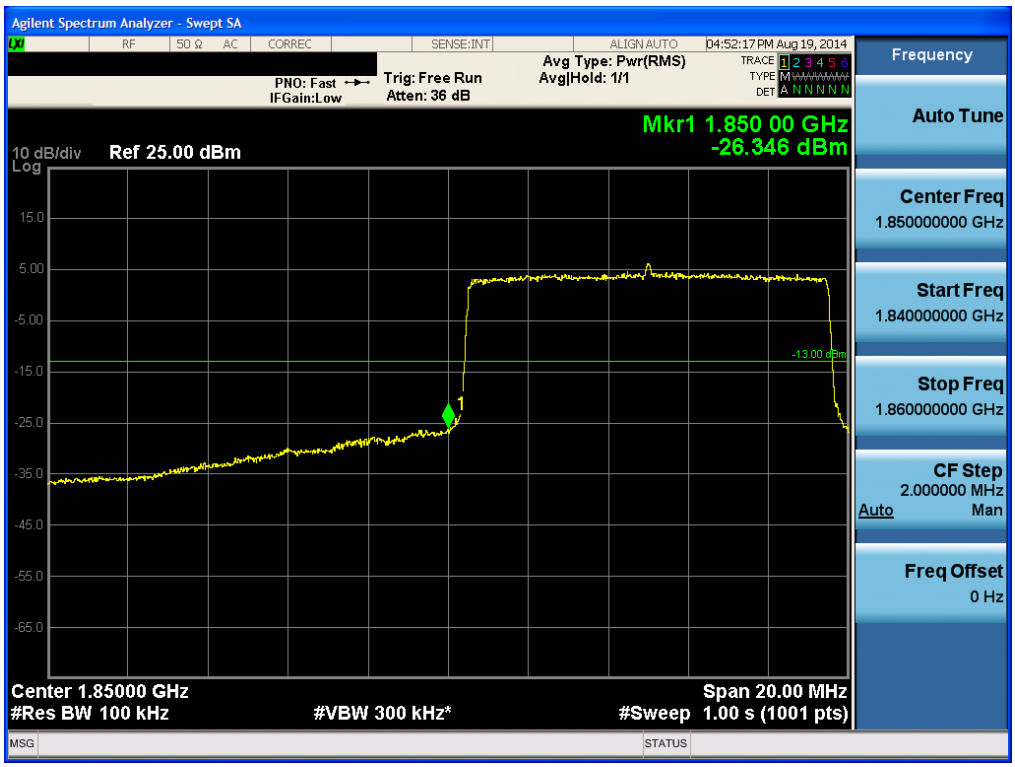


BAND 2. Lower Extended Band Edge Plot (5M BW Ch.18625 QPSK RB 25) -3

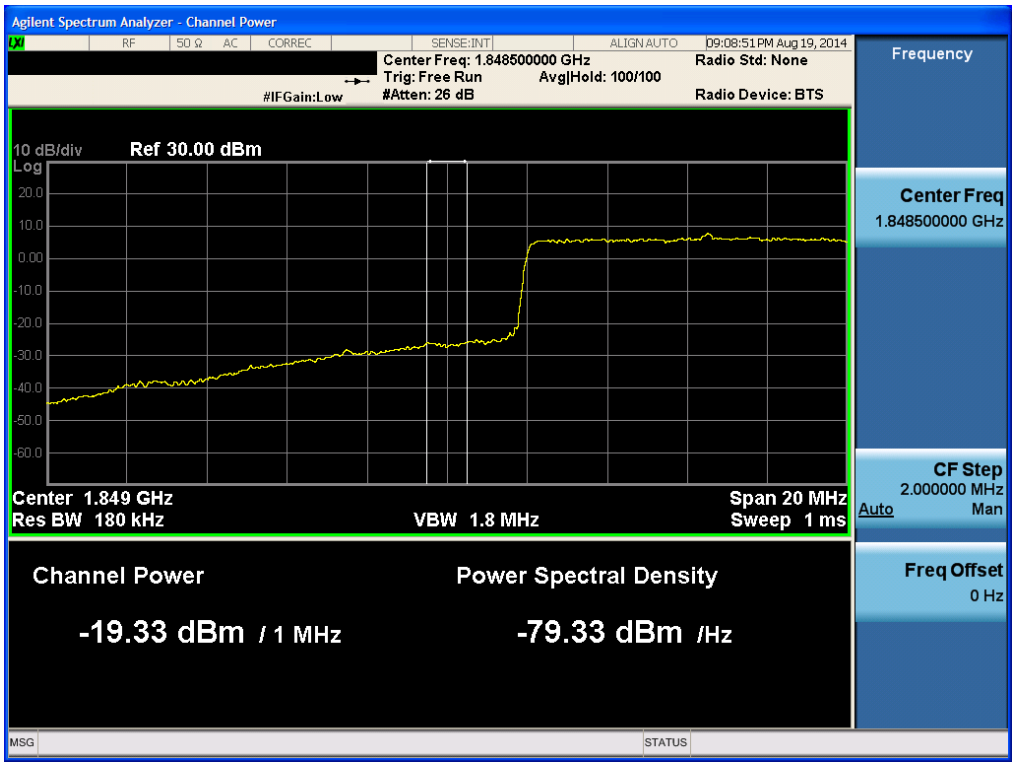
BAND 2. Lower Band Edge Plot (10M BW Ch.18650 QPSK RB 1, Offset 0) -1



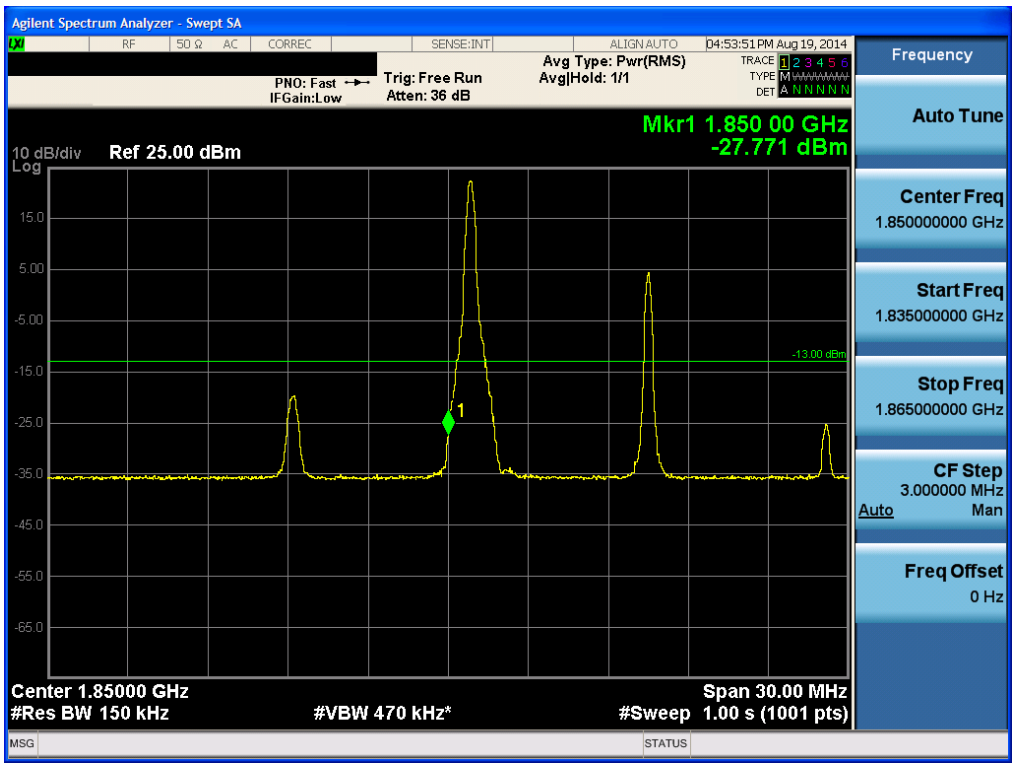
BAND 2. Lower Band Edge Plot (10M BW Ch.18650 QPSK RB 50) -2



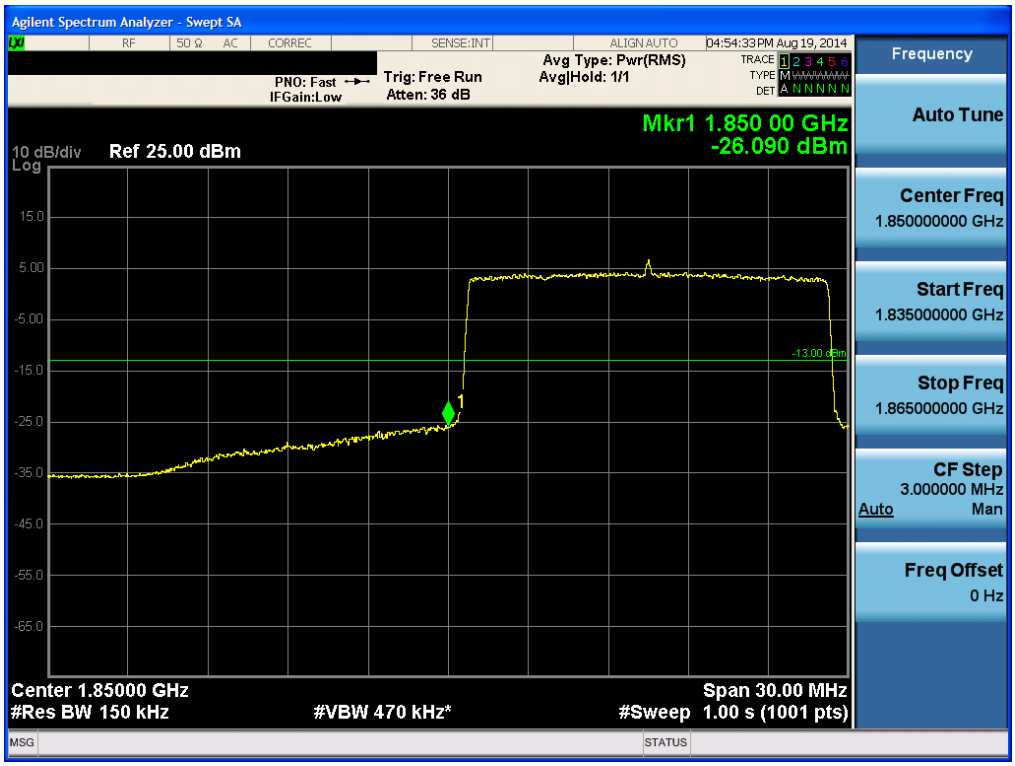
BAND 2. Lower Extended Band Edge Plot (10M BW Ch.18650 QPSK RB 50) -3



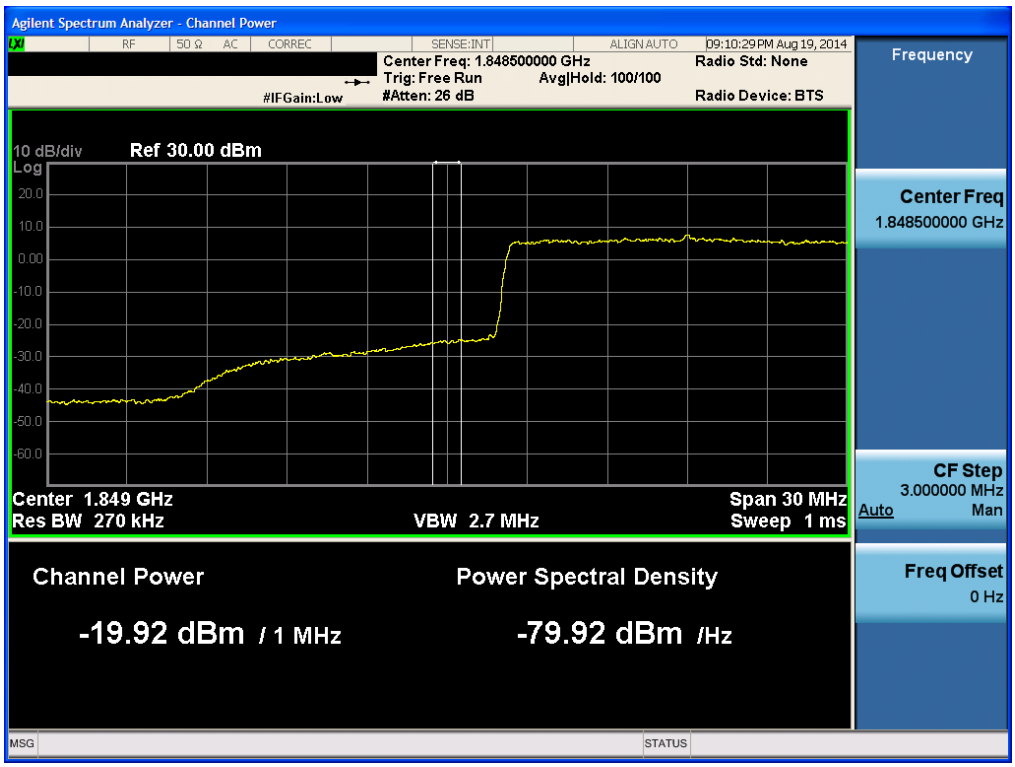
BAND 2. Lower Band Edge Plot (15M BW Ch.18675 QPSK RB 1, Offset 0) -1



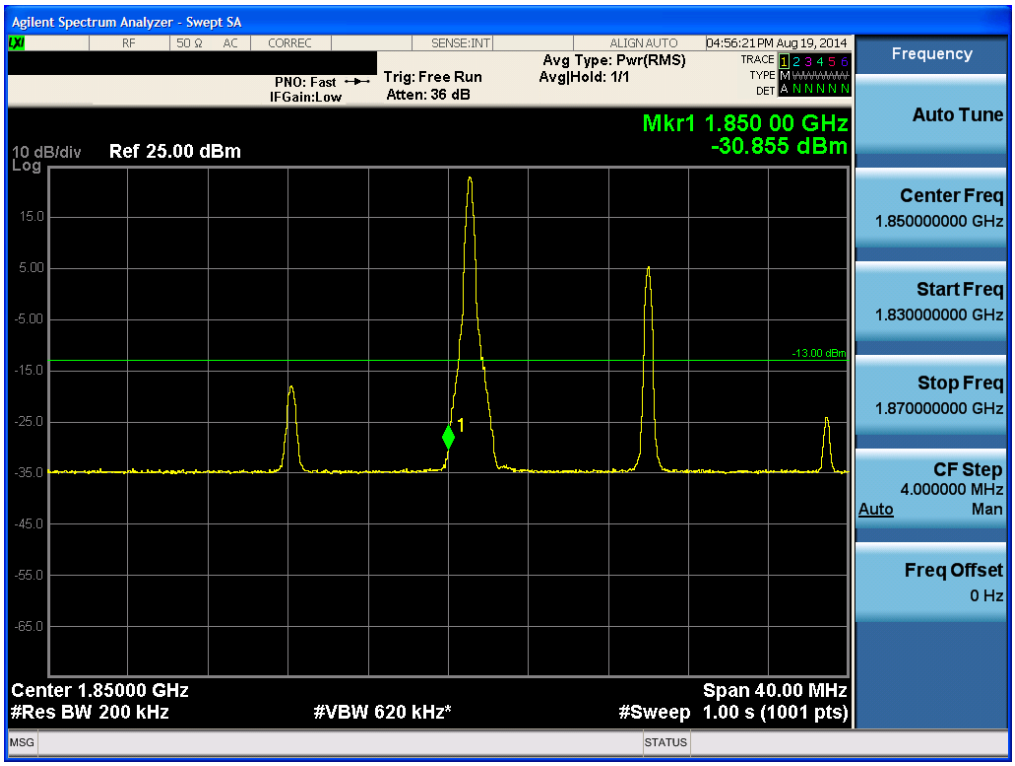
BAND 2. Lower Band Edge Plot (15M BW Ch.18675 QPSK RB 75) -2



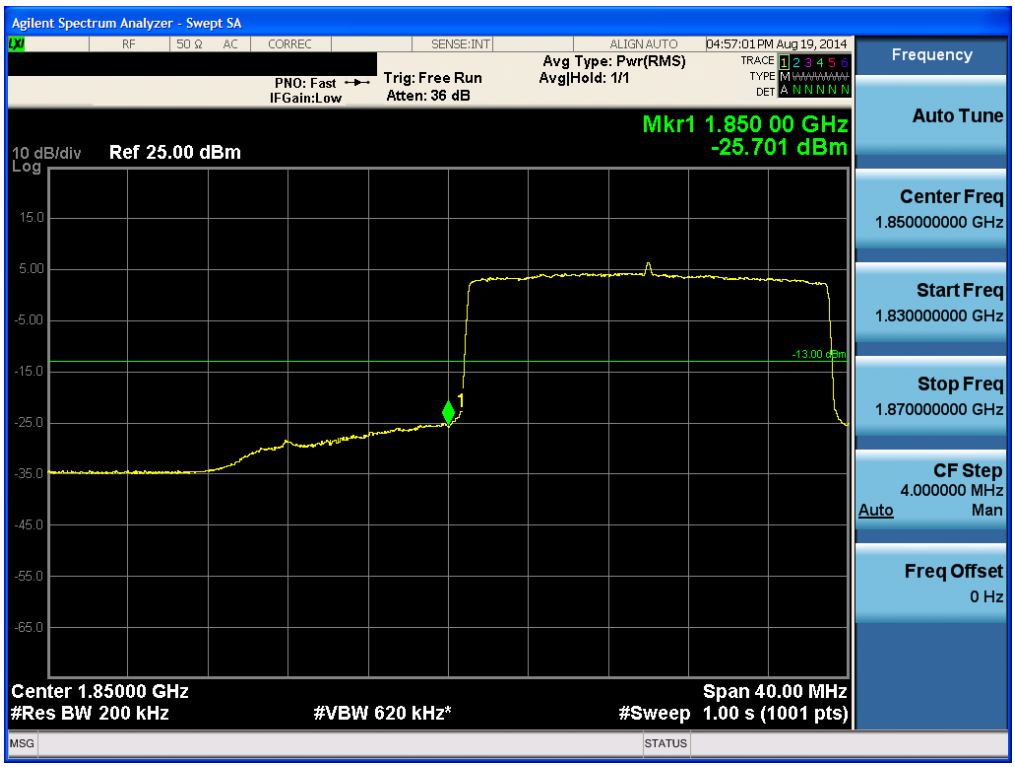
BAND 2. Lower Extended Band Edge Plot (15M BW Ch.18675 QPSK RB 75) -3



BAND 2. Lower Band Edge Plot (20M BW Ch.18700 QPSK RB 1, Offset 0) -1

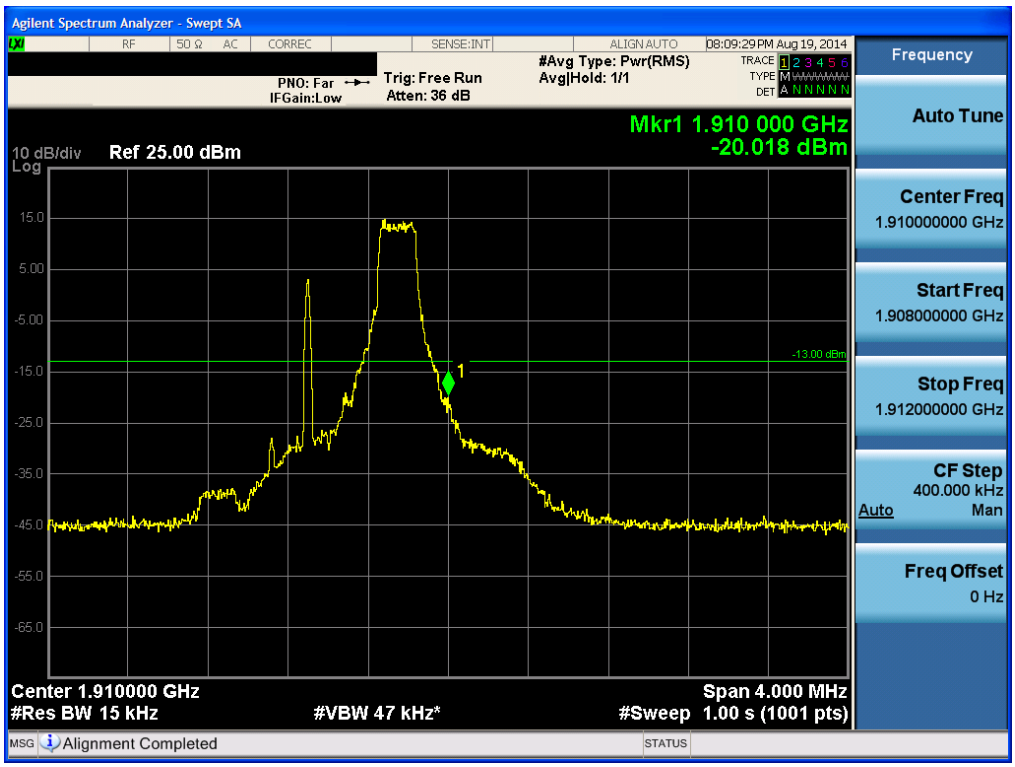


BAND 2. Lower Band Edge Plot (20M BW Ch.18700 QPSK RB 100) -2



BAND 2. Lower Extended Band Edge Plot (20M BW Ch.18700 QPSK RB 100) -3

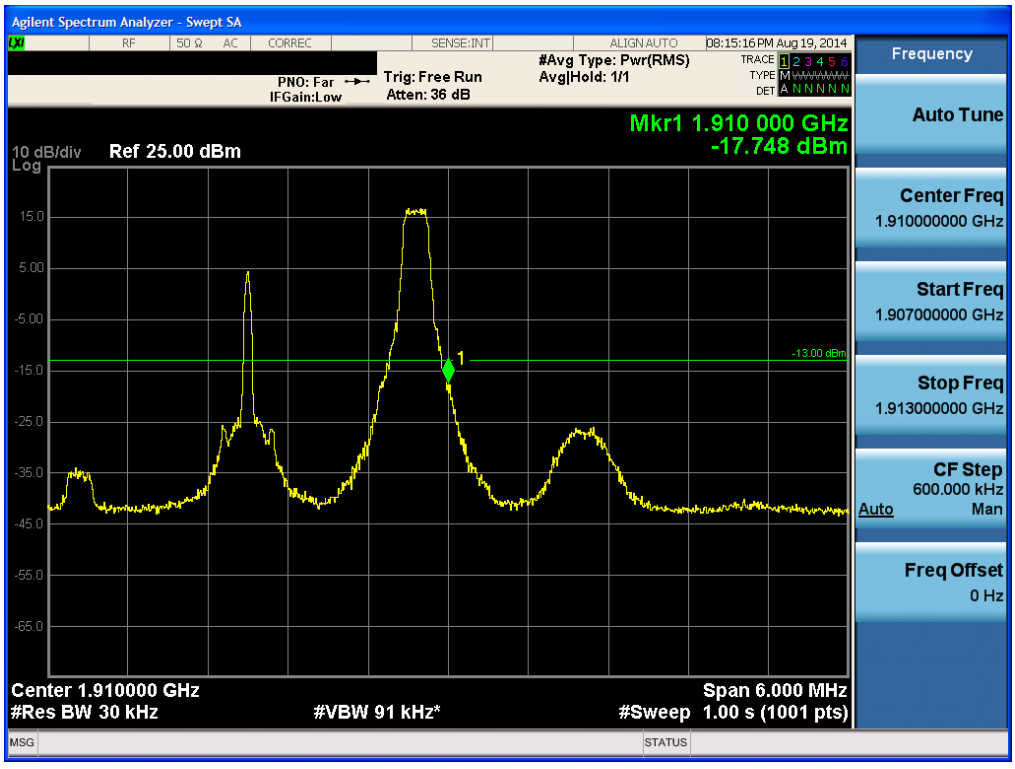
BAND 2. Upper Band Edge Plot (1.4M BW Ch.19193 QPSK RB 1, Offset 5) -1



BAND 2. Upper Band Edge Plot (1.4M BW Ch.19193 QPSK RB 6) -2

BAND 2. Upper Extended Band Edge Plot (1.4M BW Ch.19193 QPSK RB 6) -3

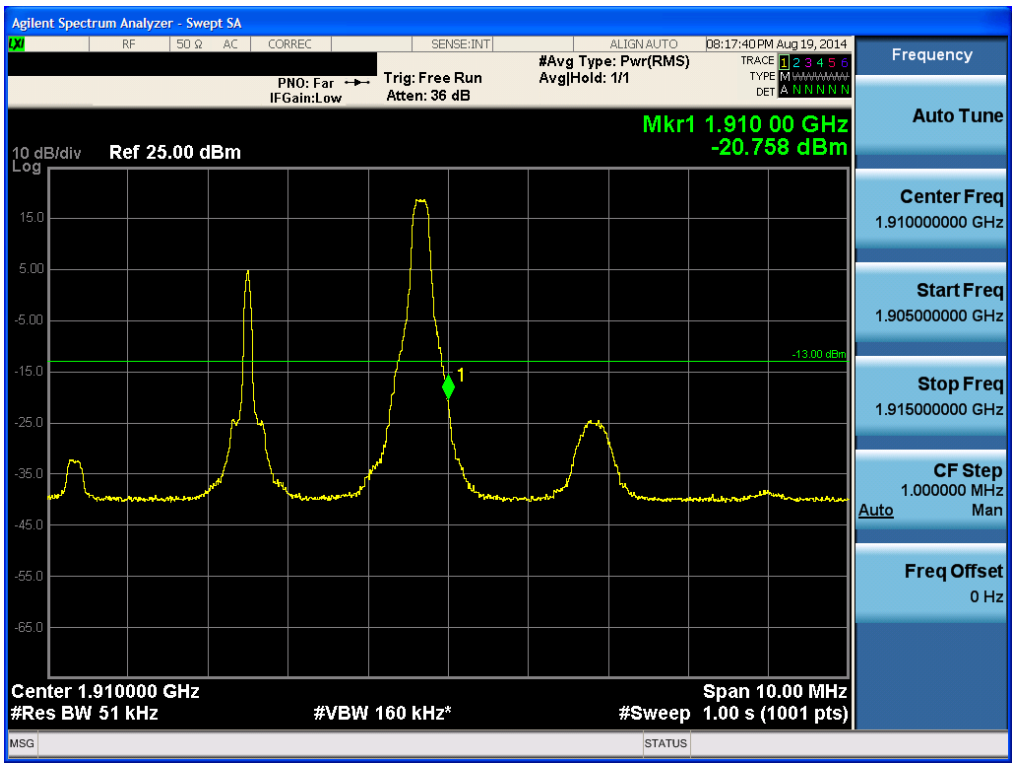
BAND 2. Upper Band Edge Plot (3M BW Ch.19185 QPSK RB 1, Offset 14) -1



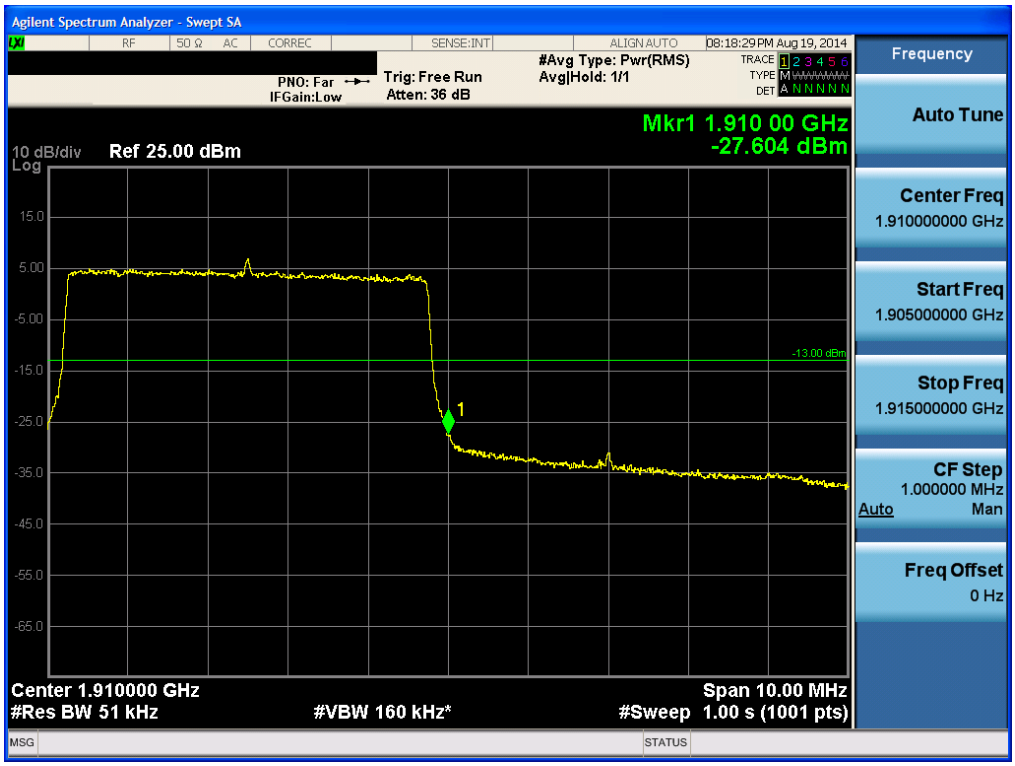
BAND 2. Upper Band Edge Plot (3M BW Ch.19185 QPSK RB 15) -2

BAND 2. Upper Extended Band Edge Plot (3M BW Ch.19185 QPSK RB 15) -3

BAND 2. Upper Band Edge Plot (5M BW Ch.19175 QPSK RB 1, Offset 24) -1

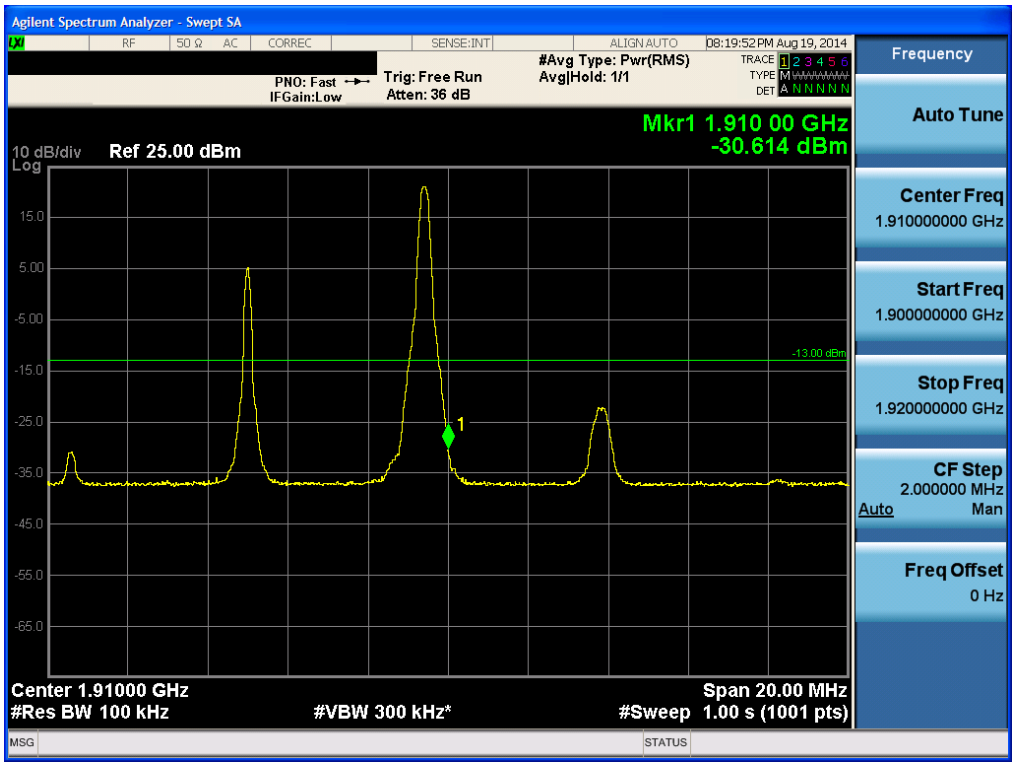


BAND 2. Upper Band Edge Plot (5M BW Ch.19175 QPSK RB 25) -2

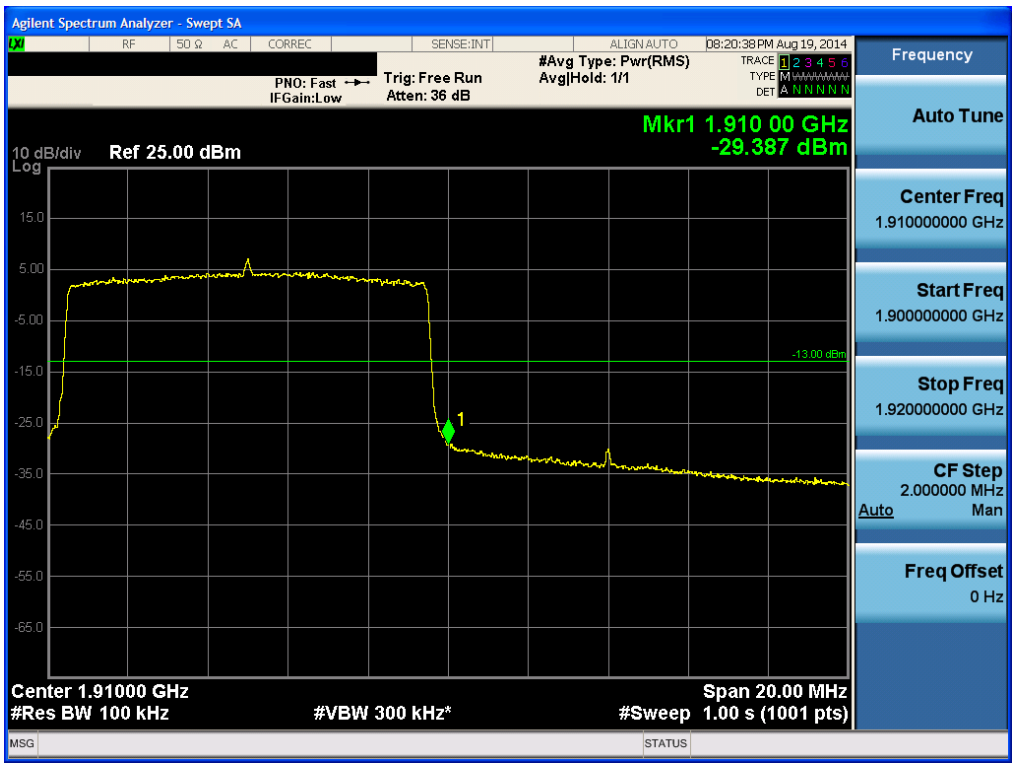


BAND 2. Upper Extended Band Edge Plot (5M BW Ch.19175 QPSK RB 25) -3

BAND 2. Upper Band Edge Plot (10M BW Ch.19150 QPSK RB 1, Offset 49) -1

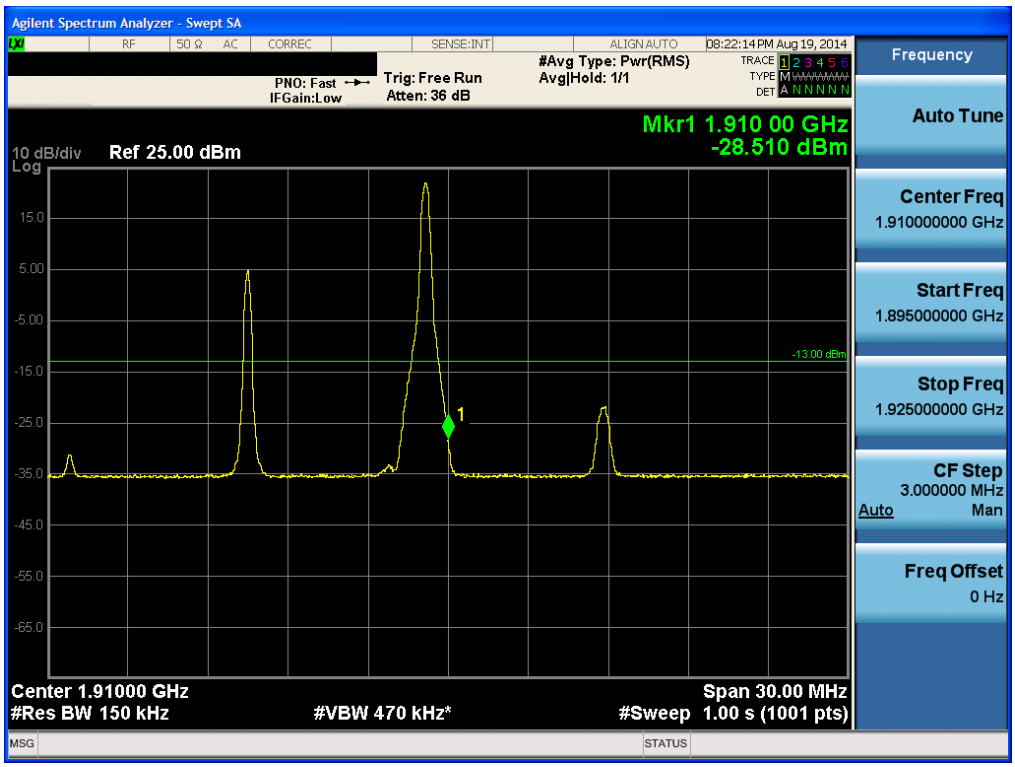


BAND 2. Upper Band Edge Plot (10M BW Ch.19150 QPSK RB 50) -2



BAND 2. Upper Extended Band Edge Plot (10M BW Ch.19150 QPSK RB 50) -3

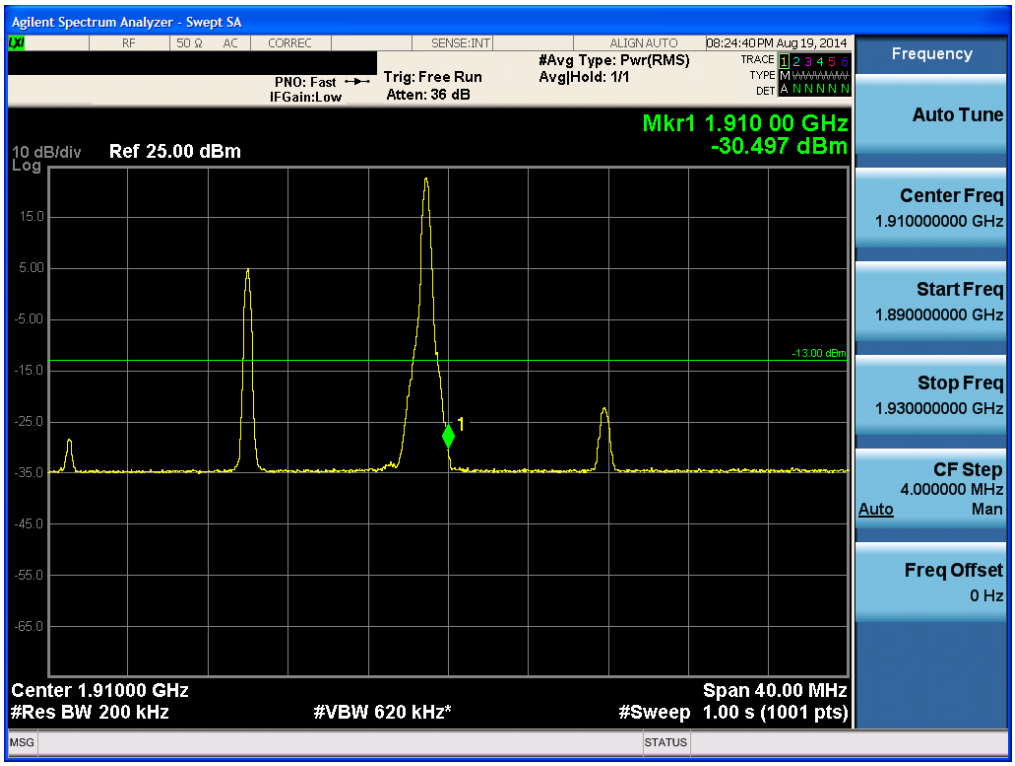
BAND 2. Upper Band Edge Plot (15M BW Ch.19125 QPSK RB 1, Offset 74) -1



BAND 2. Upper Band Edge Plot (15M BW Ch.19125 QPSK RB 75) -2

BAND 2. Upper Extended Band Edge Plot (15M BW Ch.19125 QPSK RB 75) -3

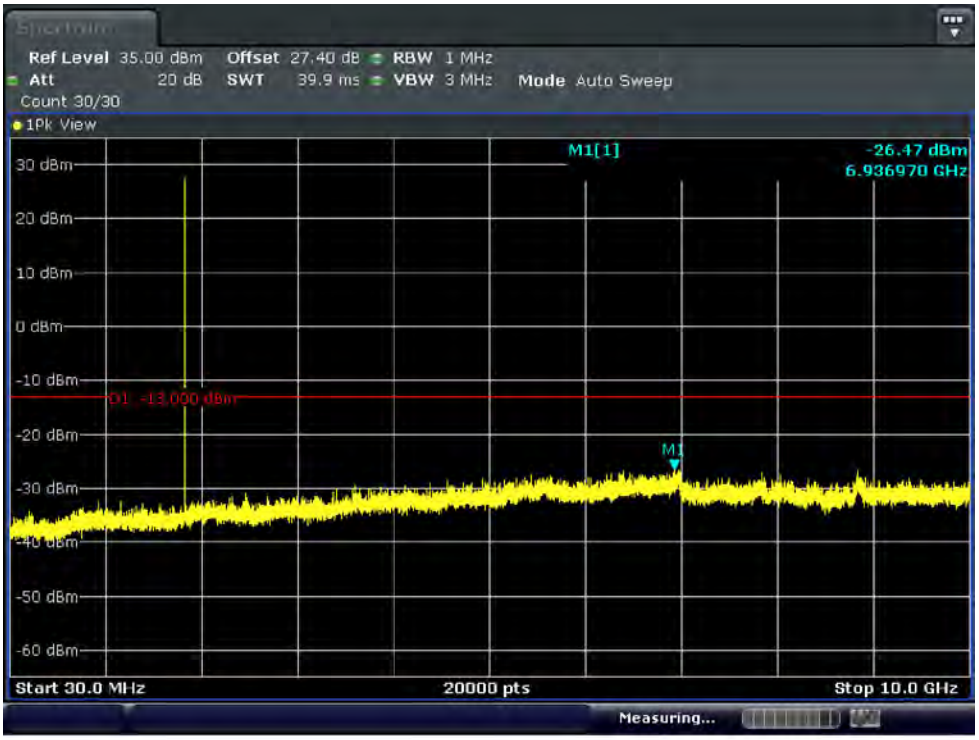
BAND 2. Upper Band Edge Plot (20M BW Ch.19100 QPSK RB 1, Offset 99) -1



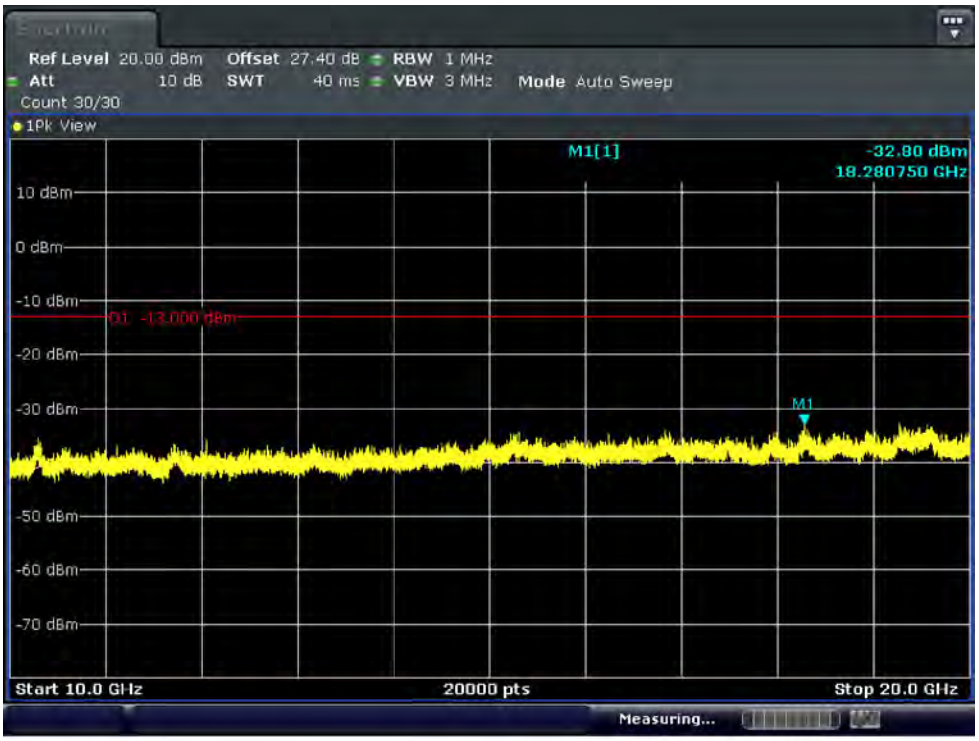
BAND 2. Upper Band Edge Plot (20M BW Ch.19100 QPSK RB 100) -2

BAND 2. Upper Extended Band Edge Plot (20M BW Ch.19100 QPSK RB 100) -3

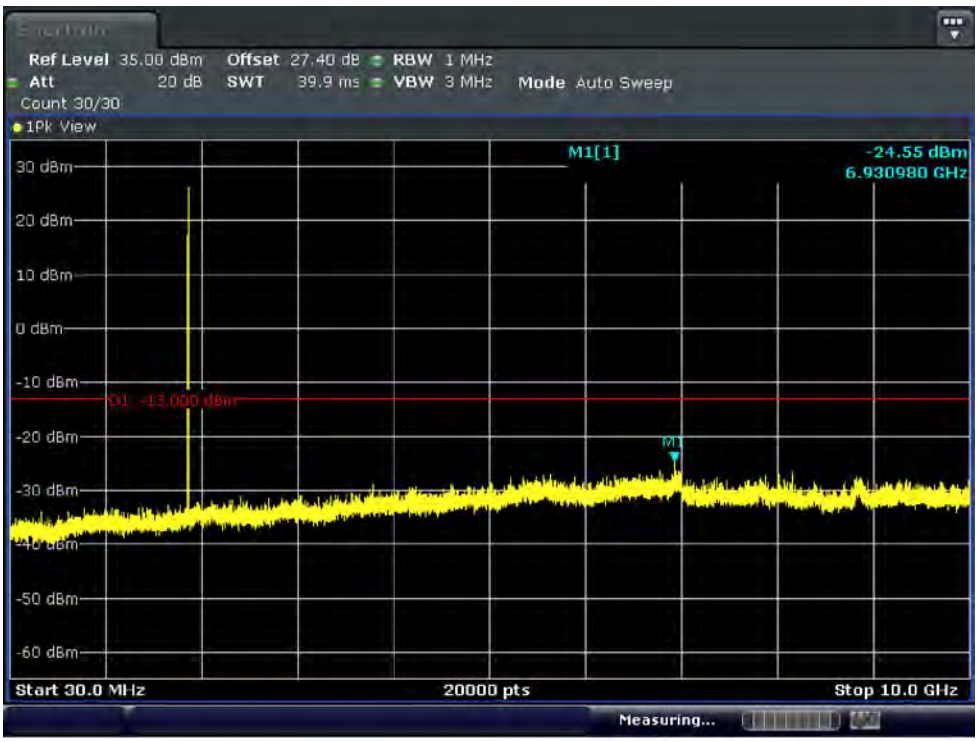
BAND 2. Conducted Spurious (18607ch_1.4MHz_QPSK_RB 1_0)



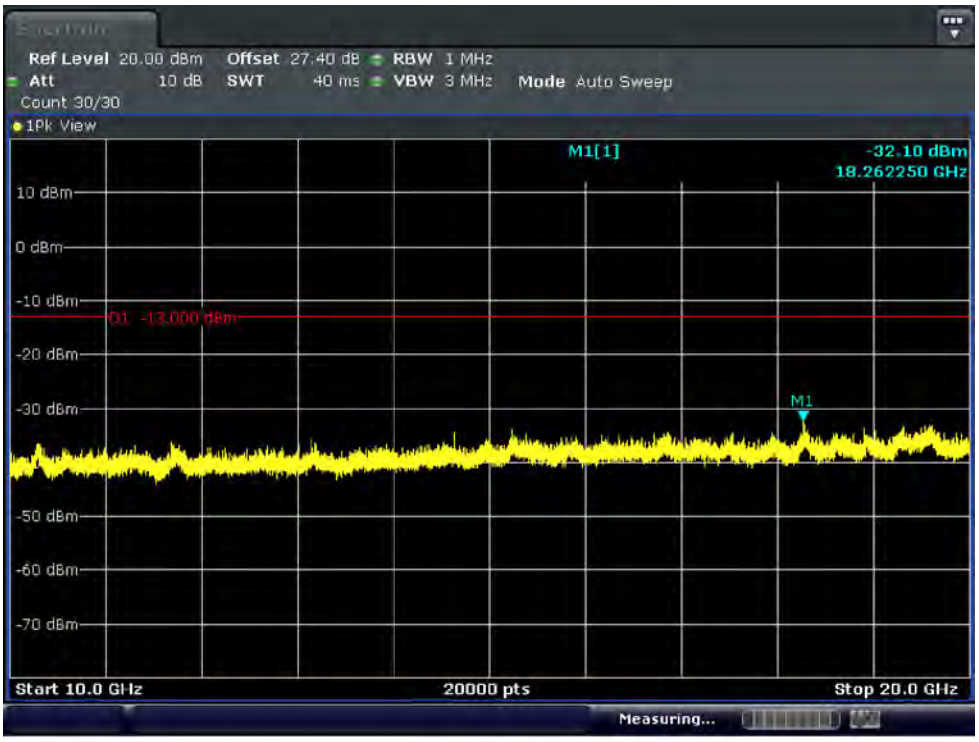
BAND 2. Conducted Spurious (18607ch_1.4MHz_QPSK_RB 1_0)



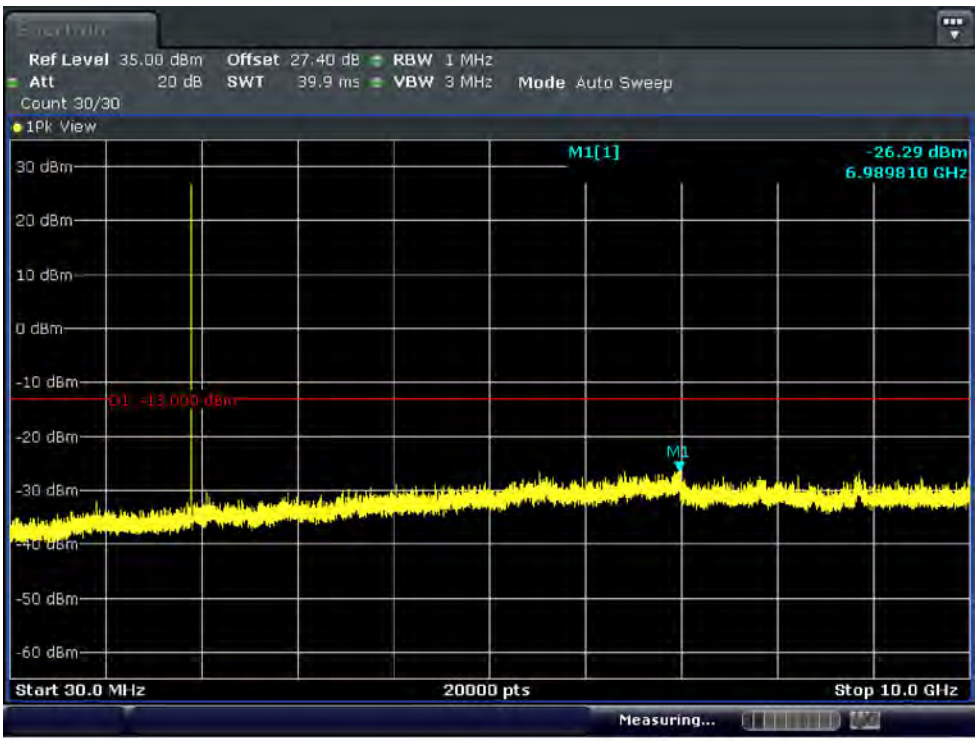
BAND 2. Conducted Spurious_1 (18900ch_1.4MHz_QPSK_RB 1_0)



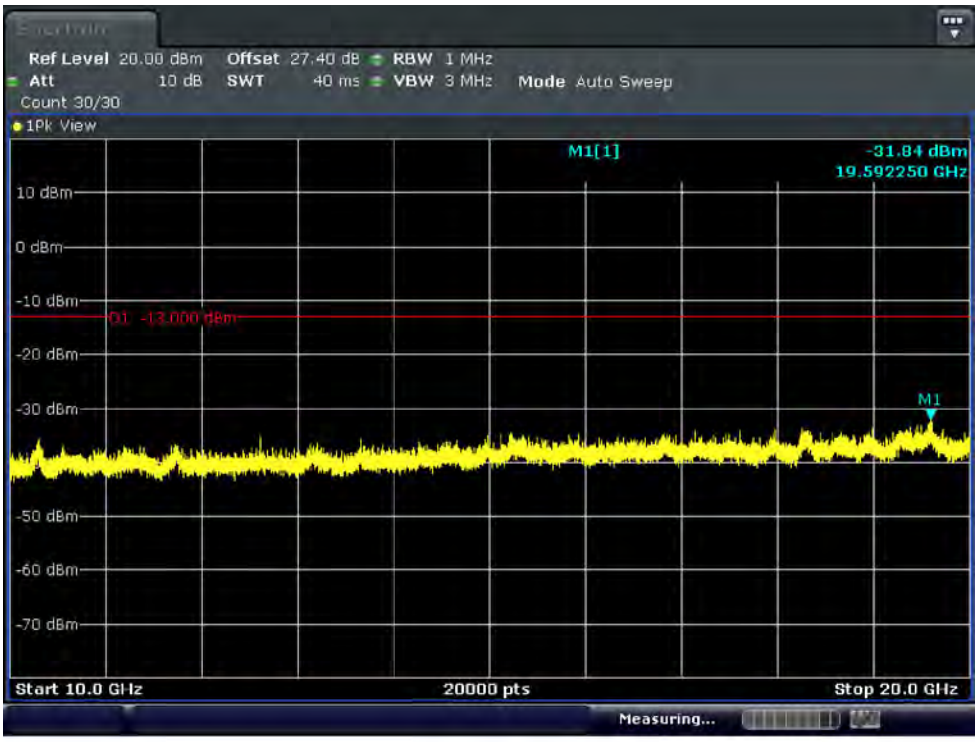
BAND 2. Conducted Spurious_2 (18900ch_1.4MHz_QPSK_RB 1_0)



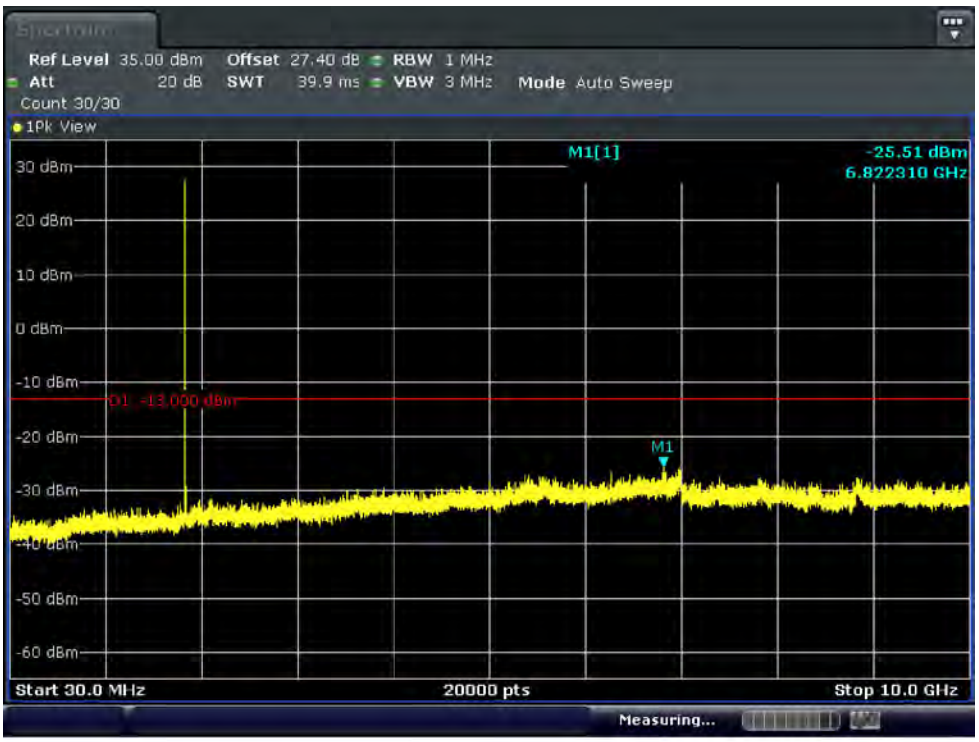
BAND 2. Conducted Spurious_1 (19193ch_1.4MHz_QPSK_RB 1_0)



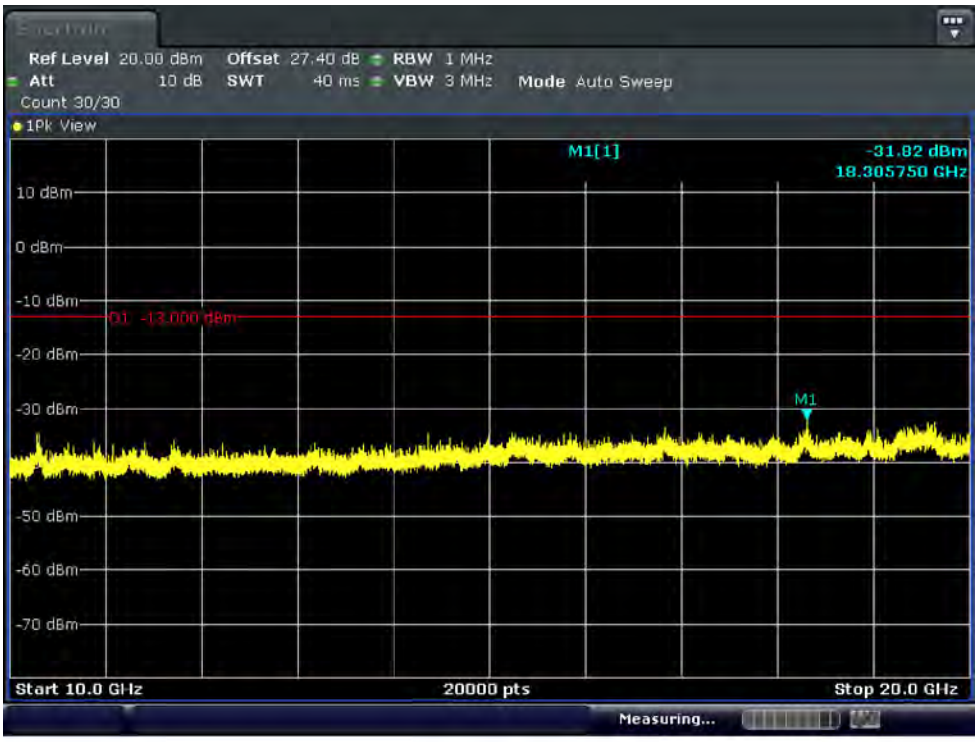
BAND 2. Conducted Spurious_2 (19193ch_1.4MHz_QPSK_RB 1_0)



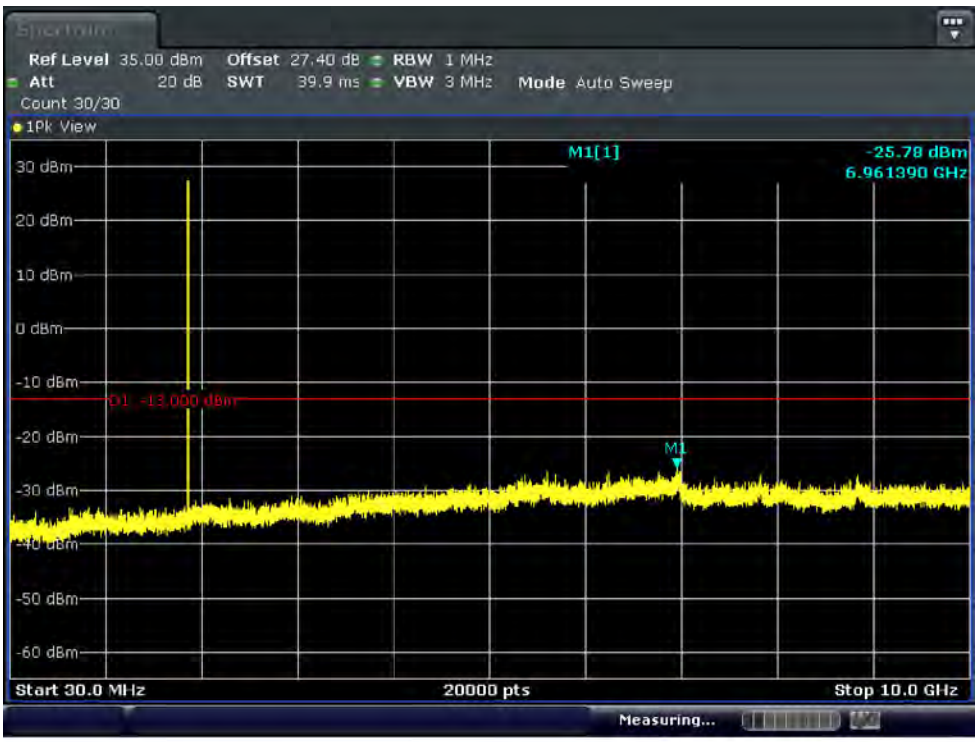
BAND 2. Conducted Spurious (18615ch_3MHz_QPSK_RB 1_0)



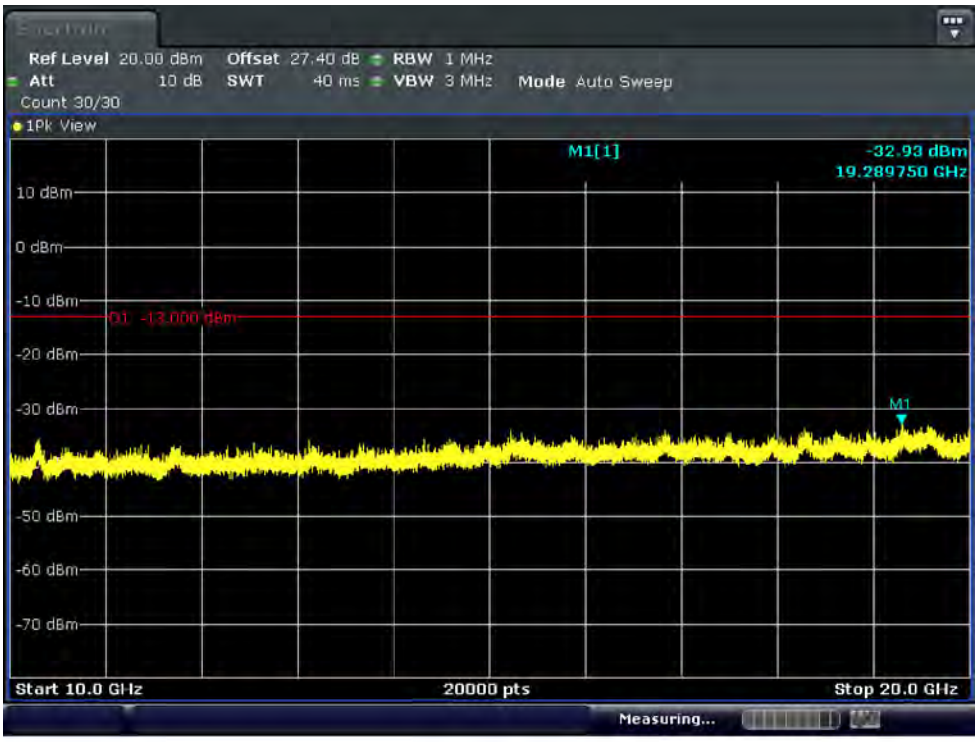
BAND 2. Conducted Spurious (18615ch_3MHz_QPSK_RB 1_0)



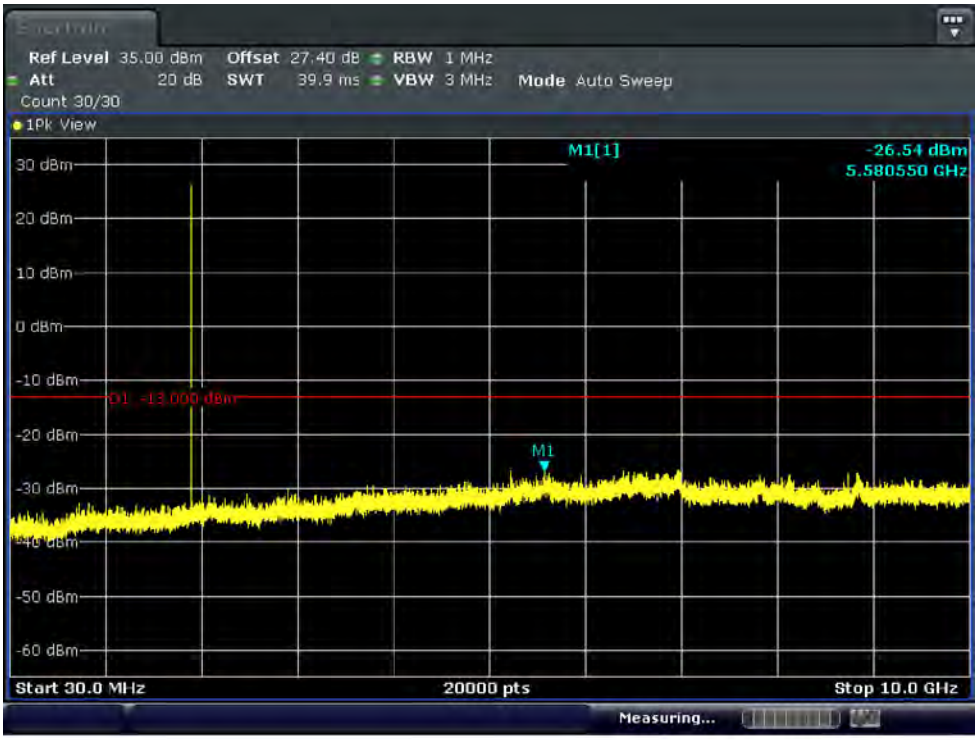
BAND 2. Conducted Spurious_1 (18900ch_3MHz_QPSK_RB 1_0)



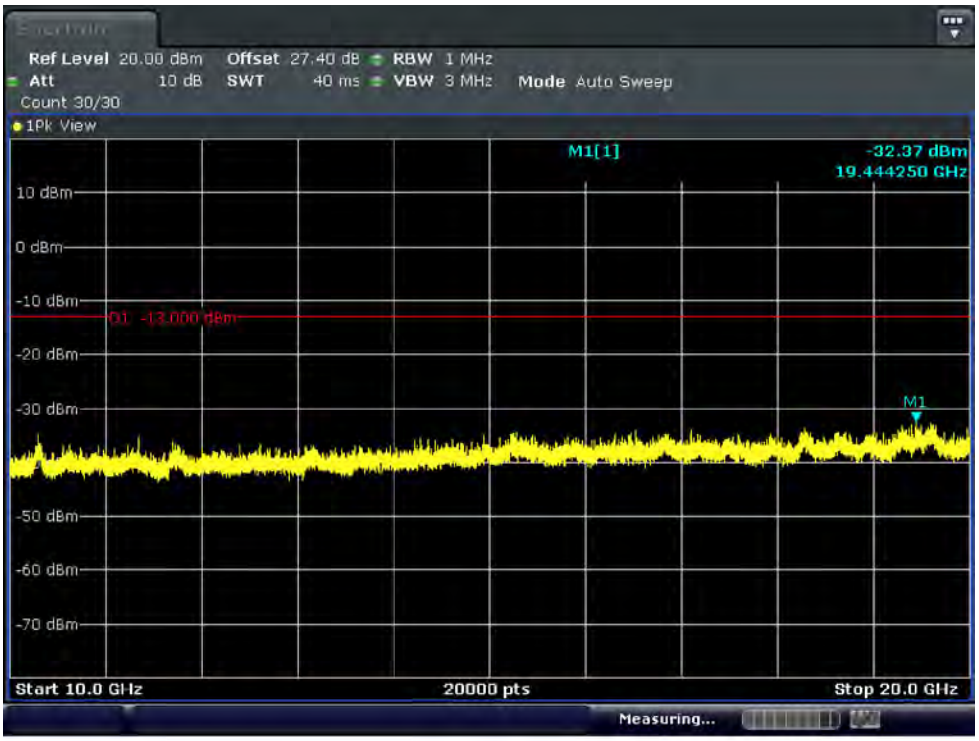
BAND 2. Conducted Spurious_2 (18900ch_3MHz_QPSK_RB 1_0)



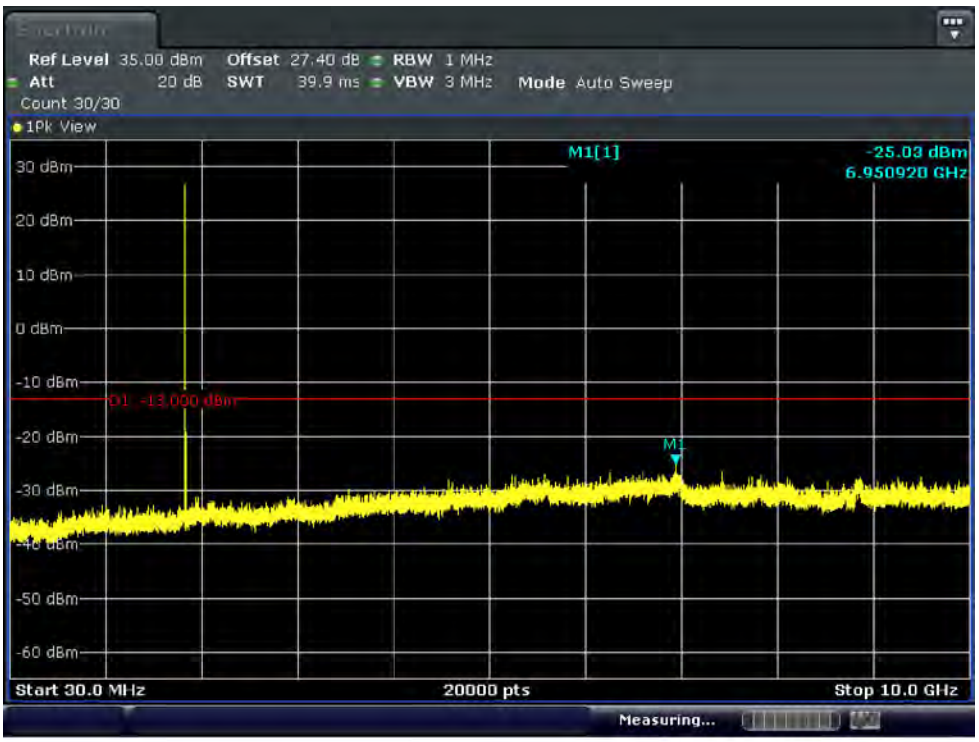
BAND 2. Conducted Spurious_1 (19185ch_3MHz_QPSK_RB 1_0)



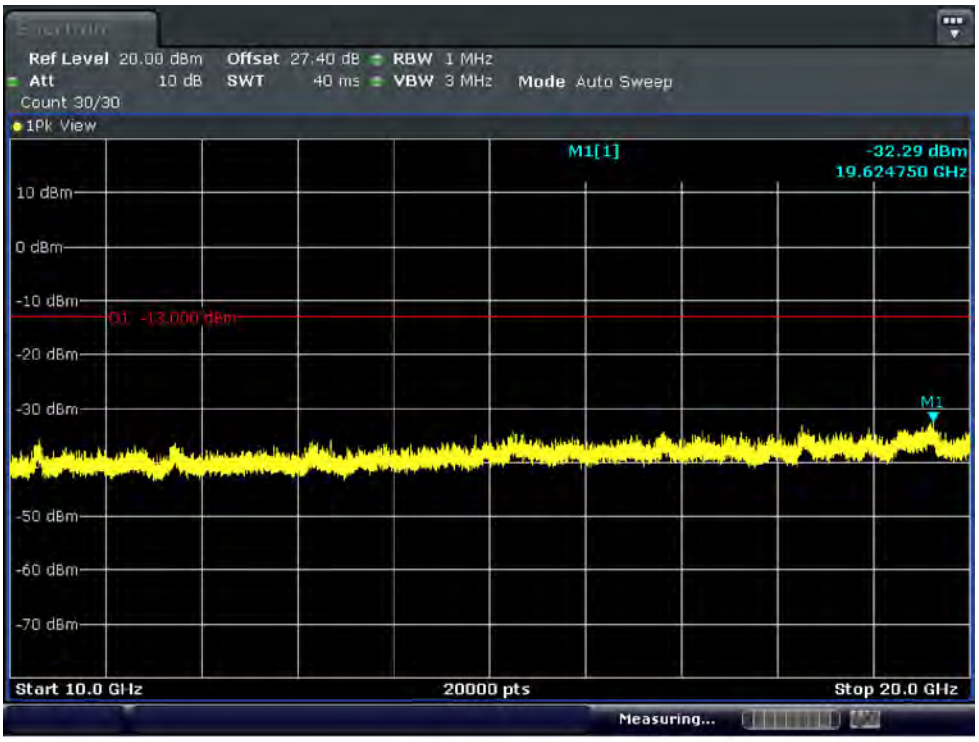
BAND 2. Conducted Spurious_2 (19185ch_3MHz_QPSK_RB 1_0)



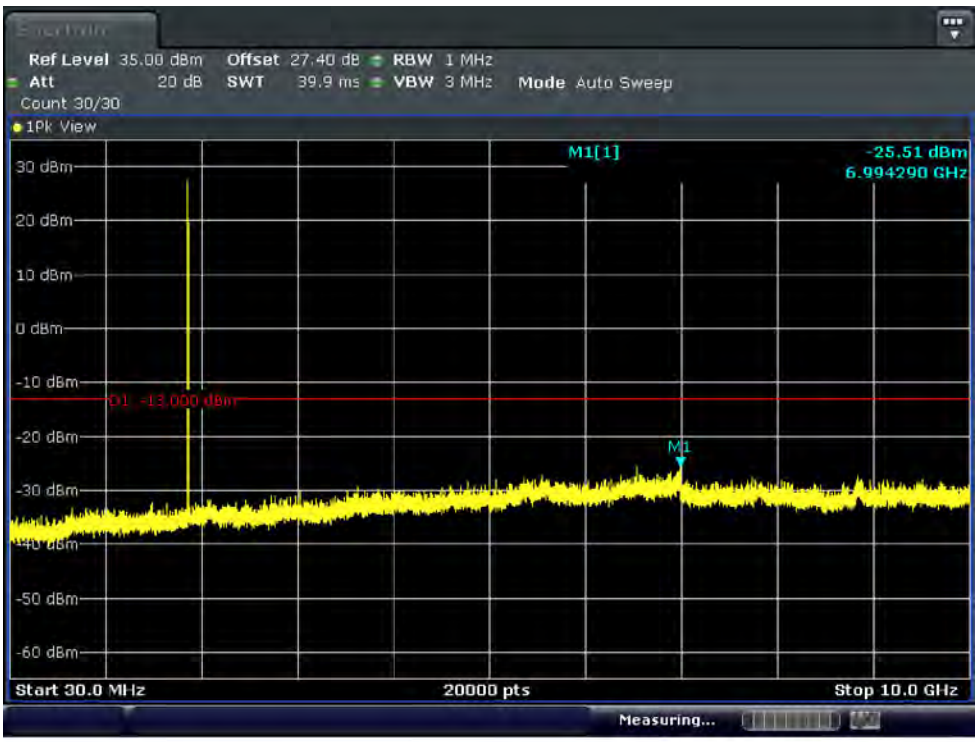
BAND 2. Conducted Spurious (18625ch_5MHz_QPSK_RB 1_0)



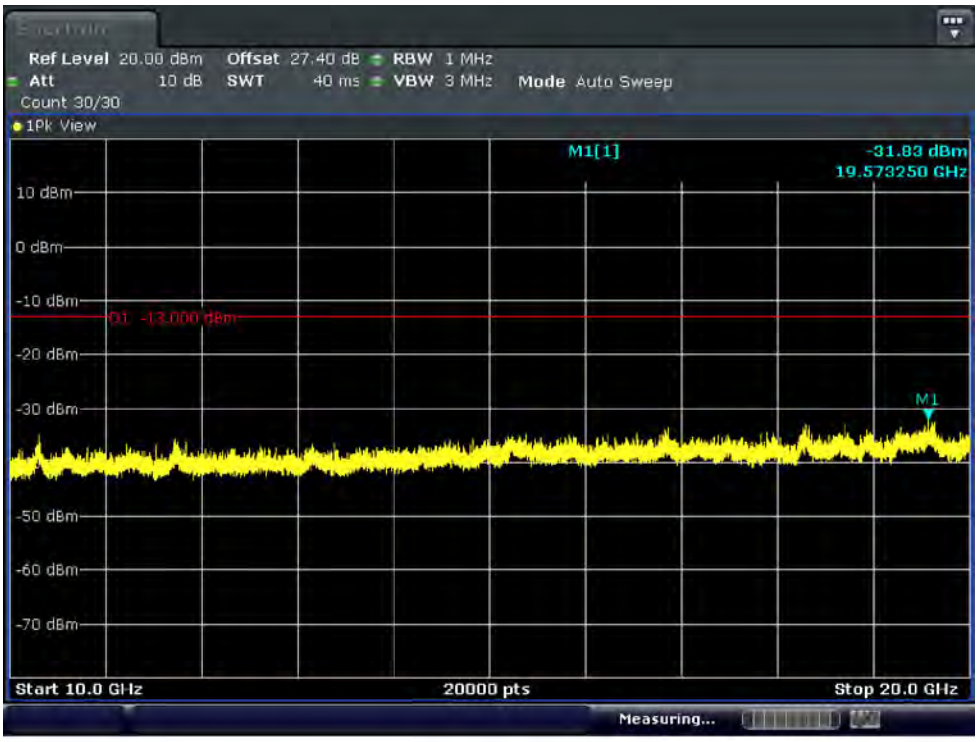
BAND 2. Conducted Spurious (18625ch_5MHz_QPSK_RB 1_0)



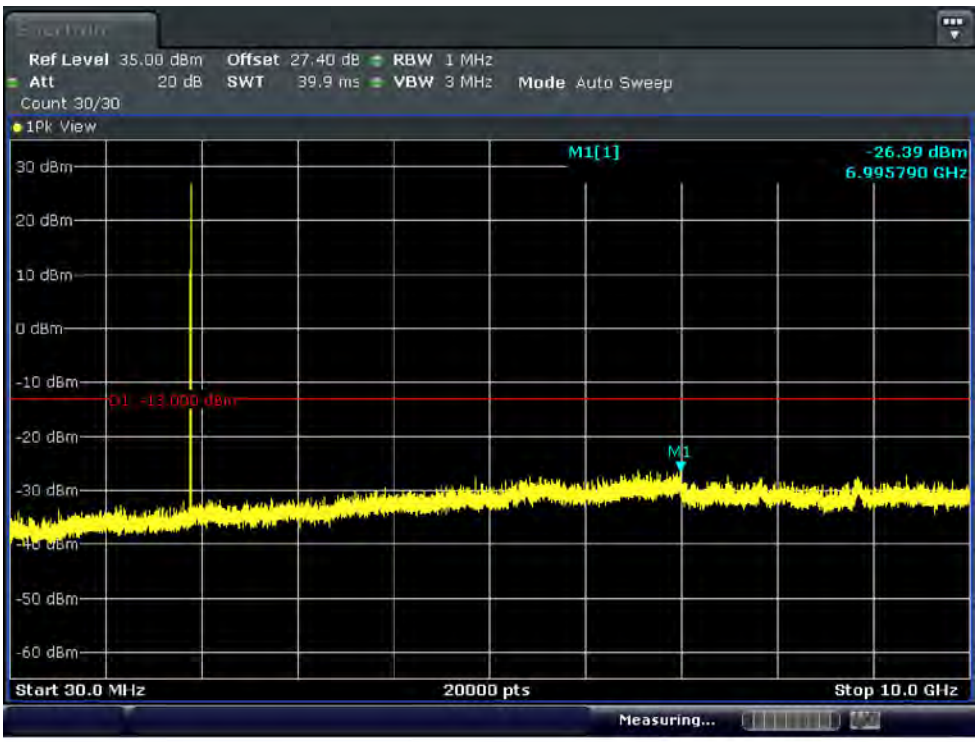
BAND 2. Conducted Spurious_1 (18900ch_5MHz_QPSK_RB 1_0)



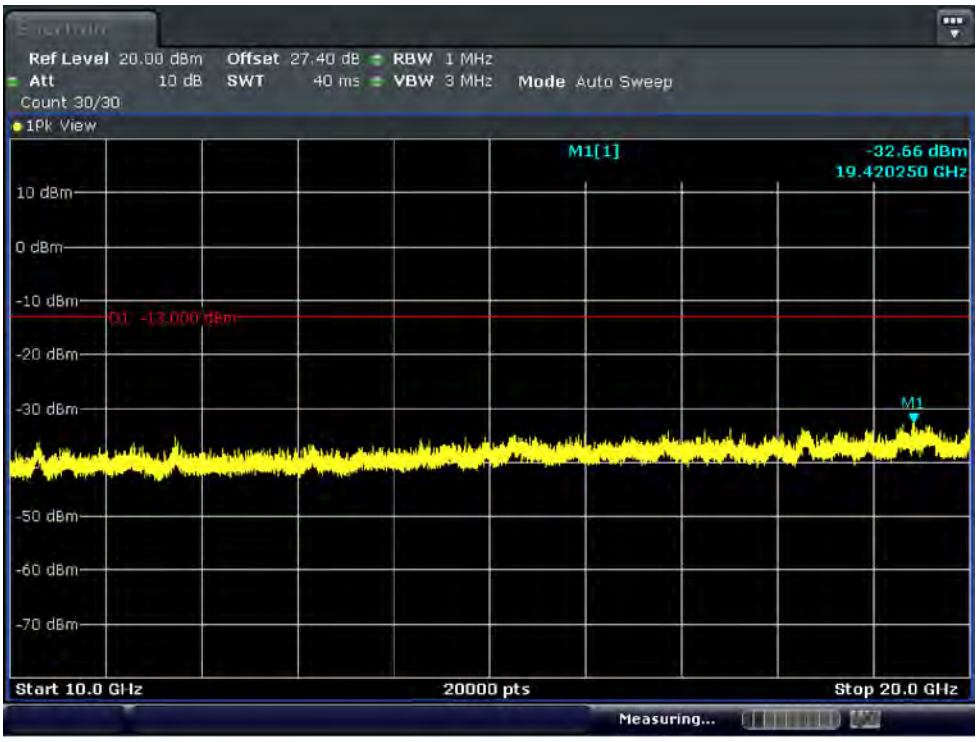
BAND 2. Conducted Spurious_2 (18900ch_5MHz_QPSK_RB 1_0)



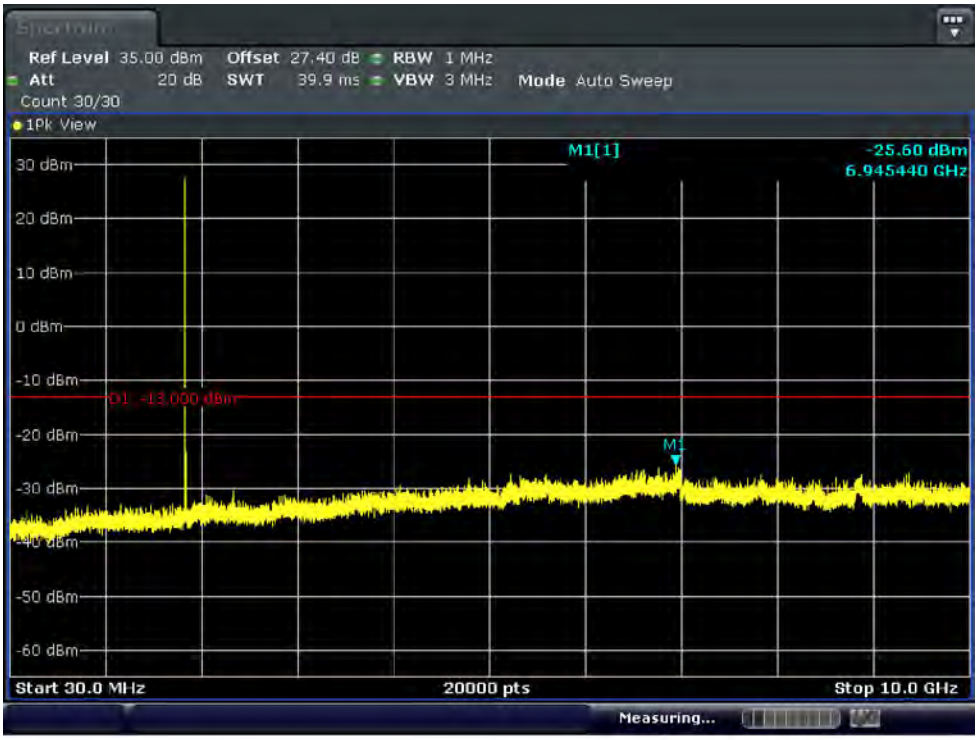
BAND 2. Conducted Spurious_1 (19175ch_5MHz_QPSK_RB 1_0)



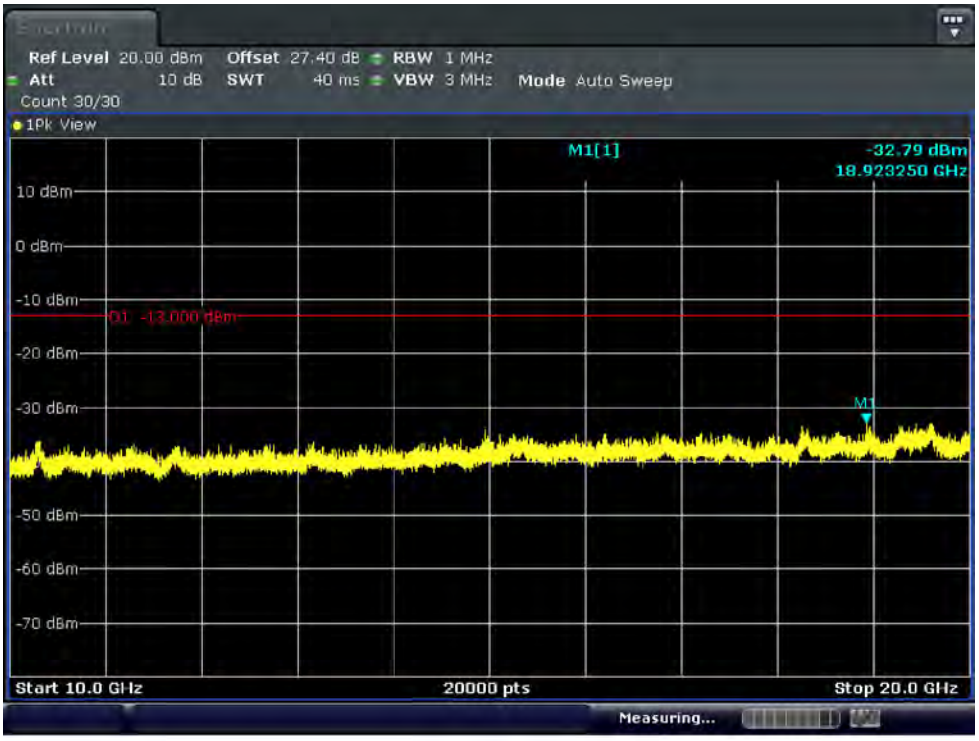
BAND 2. Conducted Spurious_2 (19175ch_5MHz_QPSK_RB 1_0)



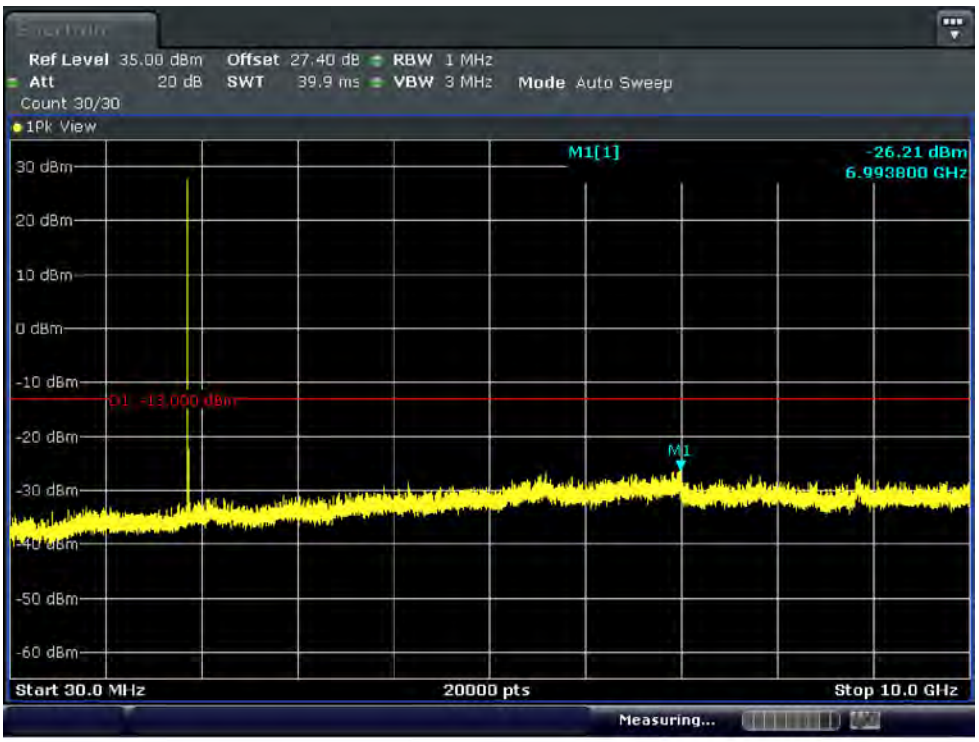
BAND 2. Conducted Spurious_1 (18650ch_10MHz_QPSK_RB 1_0)



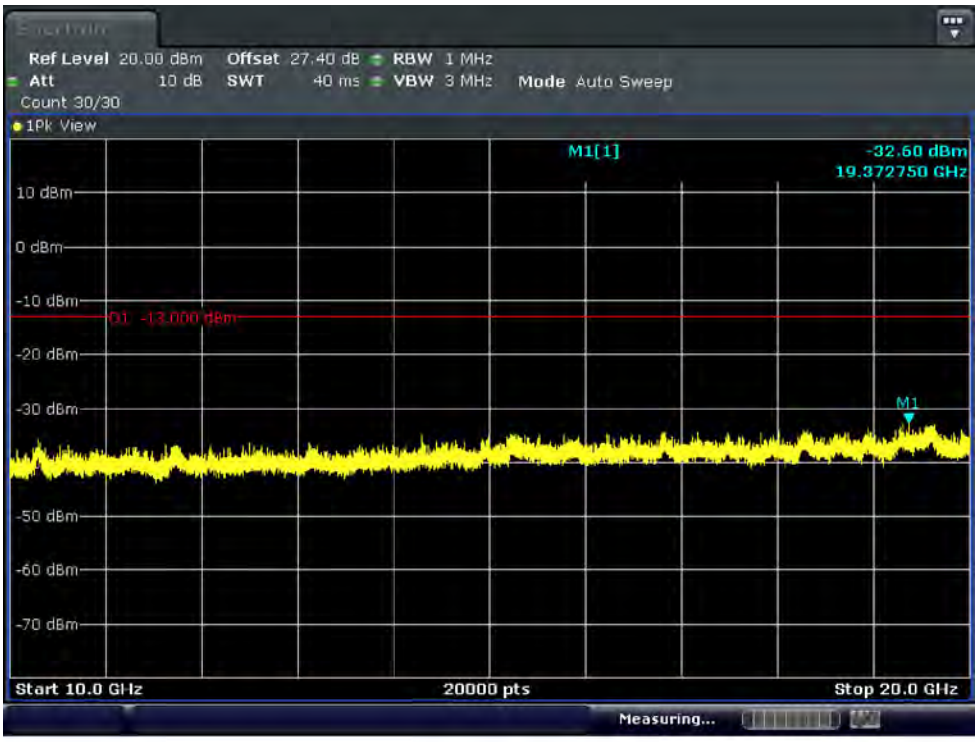
BAND 2. Conducted Spurious_2 (18650ch_10MHz_QPSK_RB 1_0)



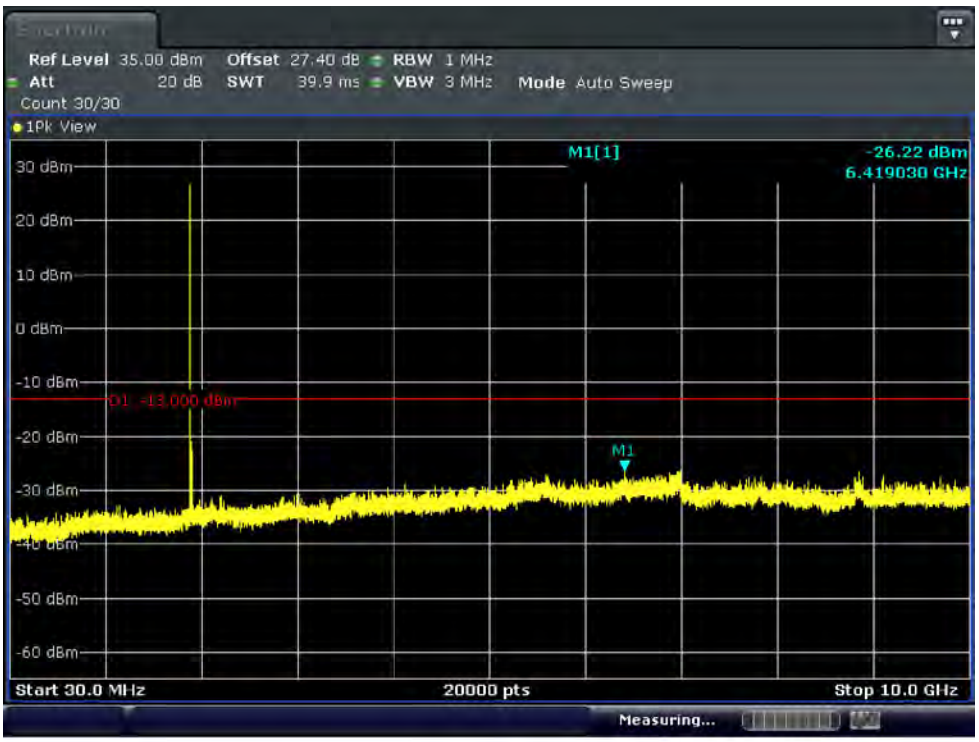
AND 2. Conducted Spurious_1 (18900ch_10MHz_QPSK_RB 1_0)



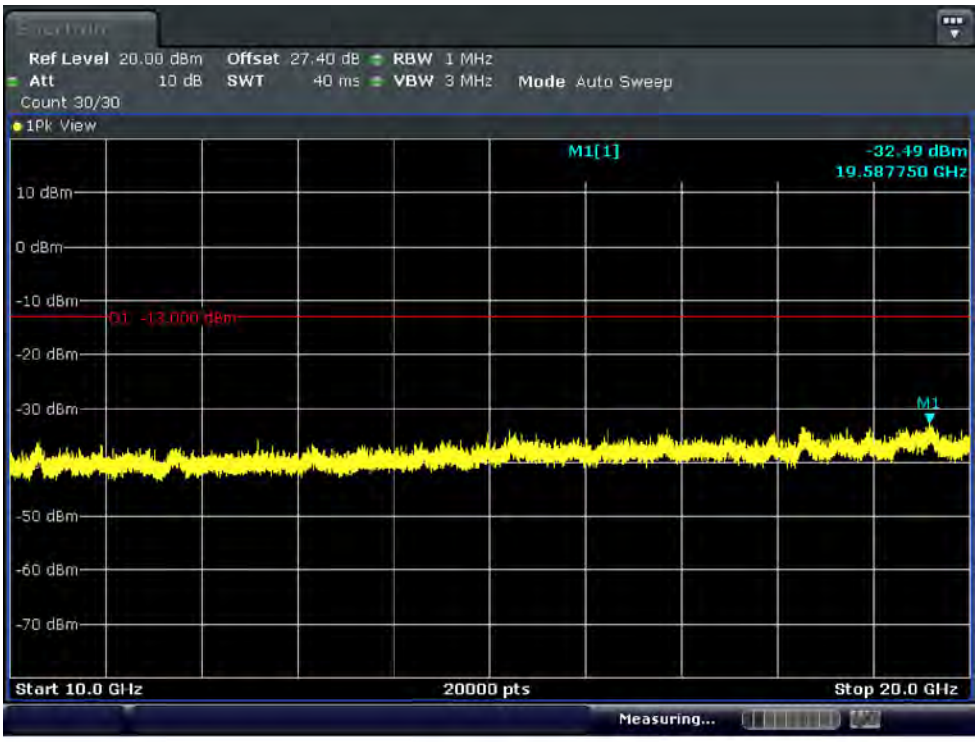
BAND 2. Conducted Spurious_2 (18900ch_10MHz_QPSK_RB 1_0)



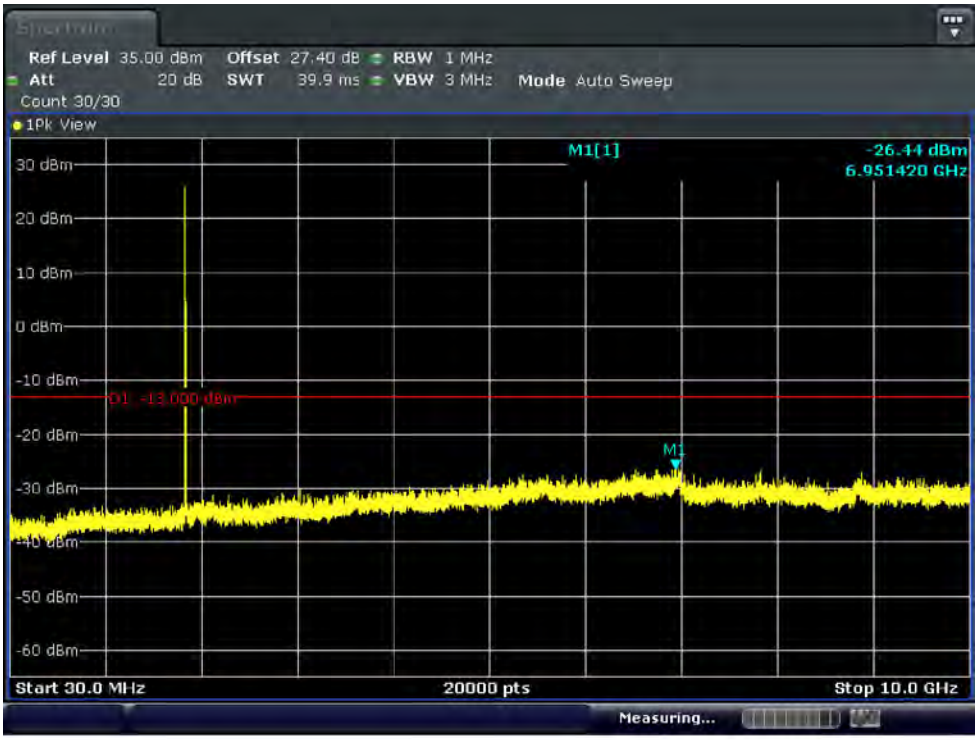
BAND 2. Conducted Spurious_1 (19150ch_10MHz_QPSK_RB 1_0)



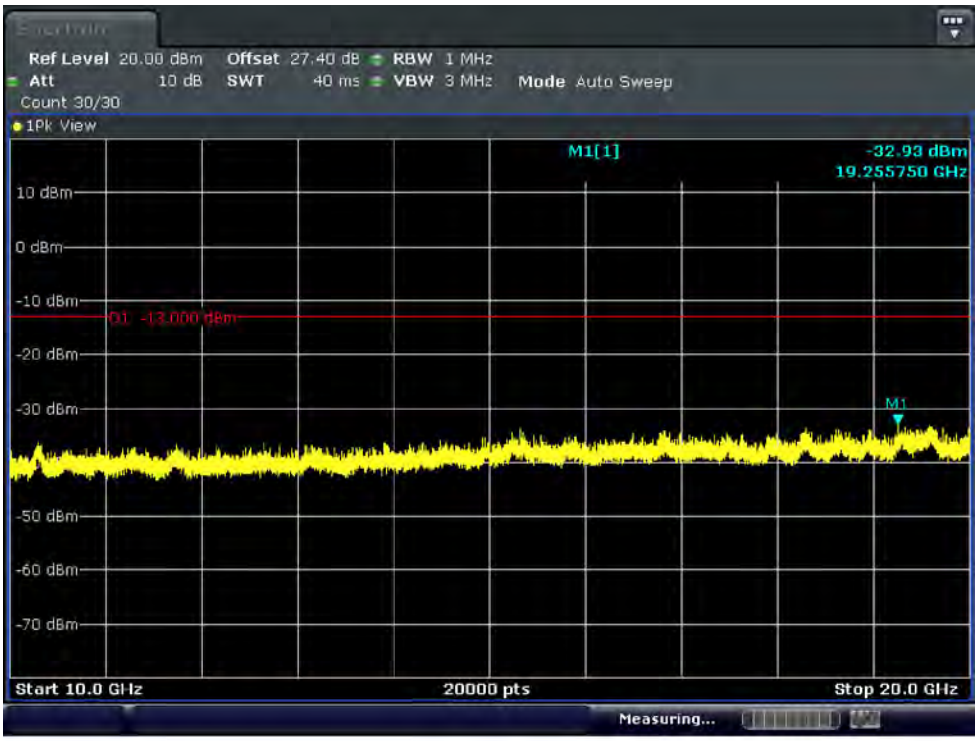
BAND 2. Conducted Spurious_2 (19150ch_10MHz_QPSK_RB 1_0)



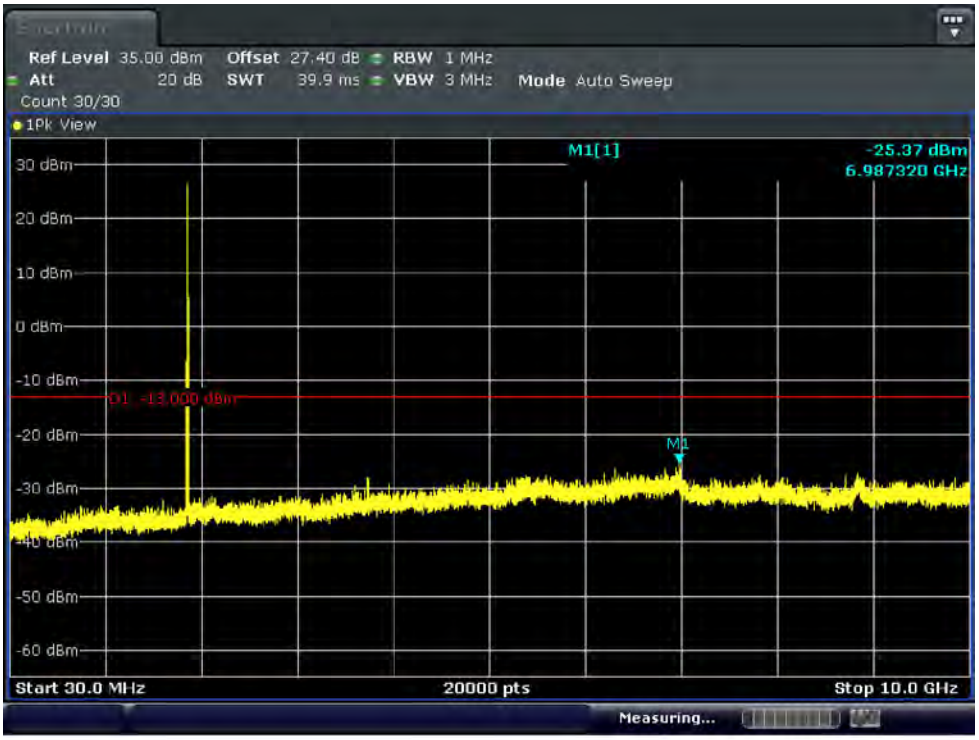
BAND 2. Conducted Spurious_1 (18675ch_15MHz_QPSK_RB 1_0)



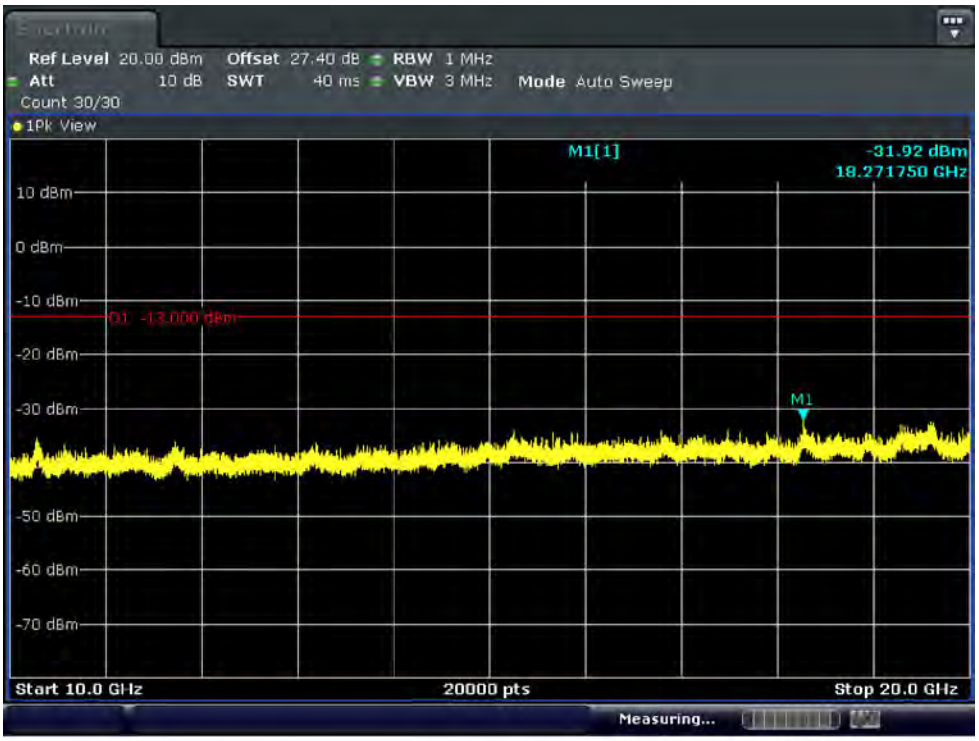
BAND 2. Conducted Spurious_2 (18675ch_15MHz_QPSK_RB 1_0)



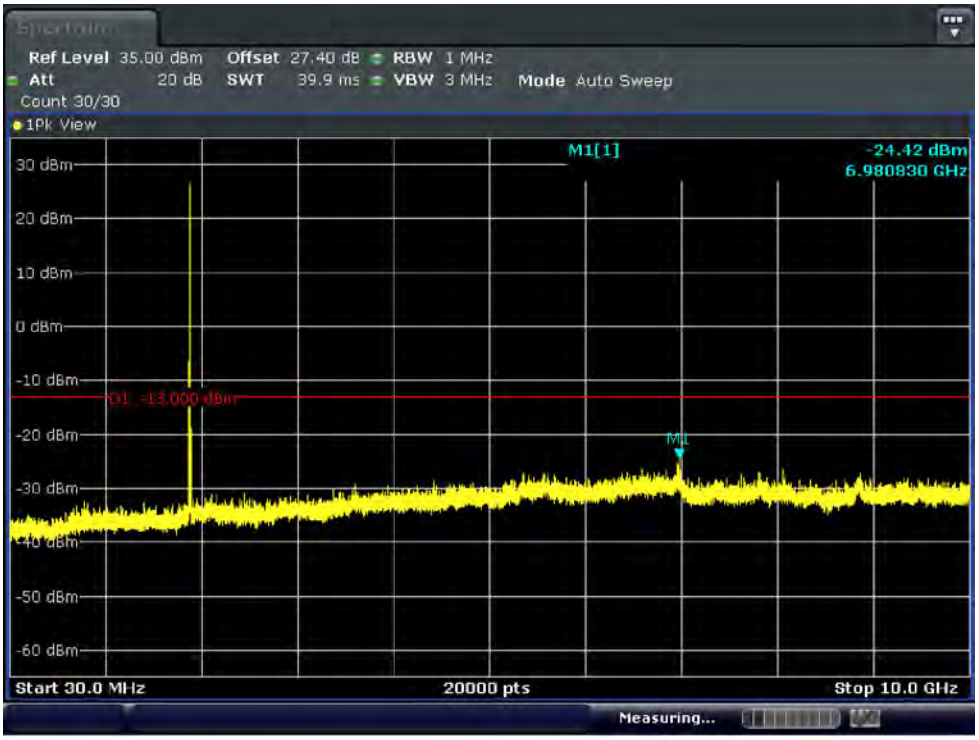
AND 2. Conducted Spurious_1 (18900ch_15MHz_QPSK_RB 1_0)



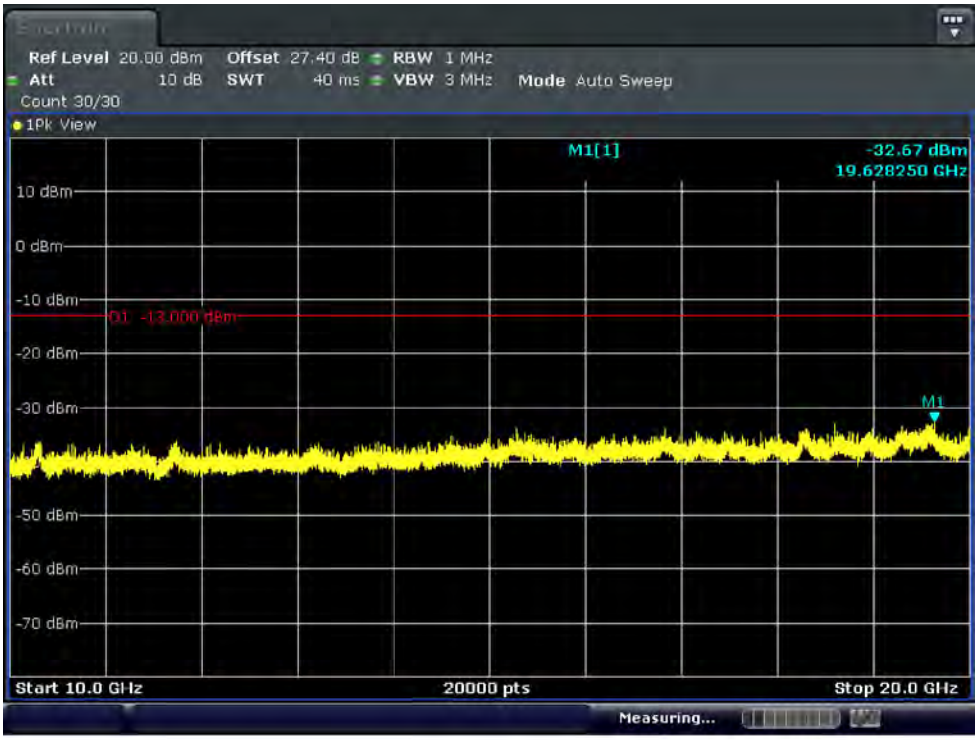
BAND 2. Conducted Spurious_2 (18900ch_15MHz_QPSK_RB 1_0)



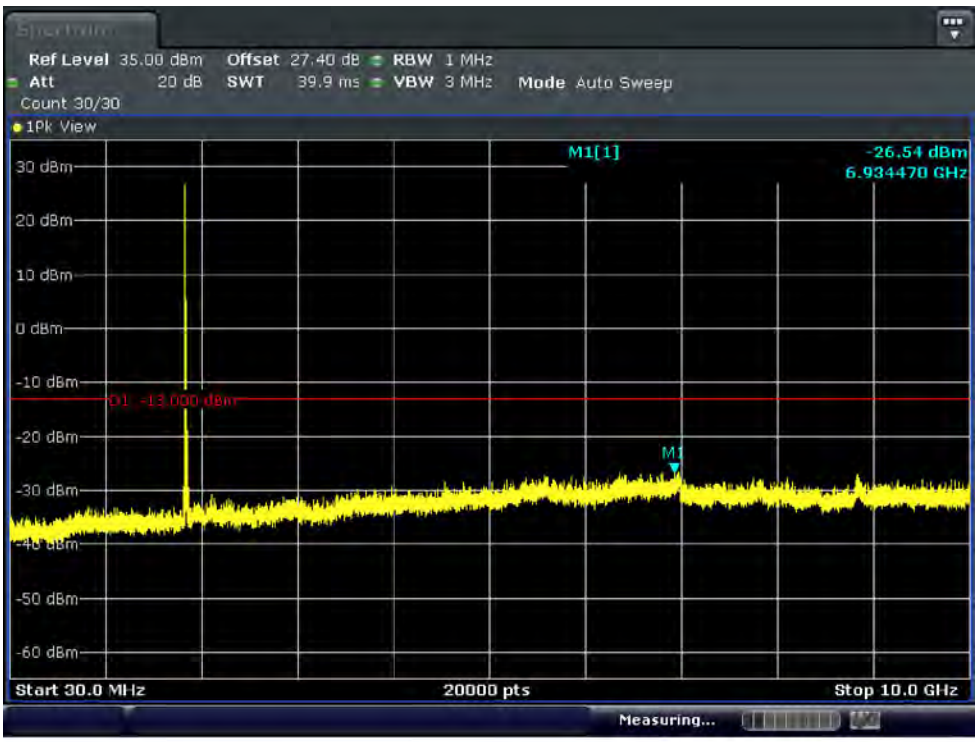
BAND 2. Conducted Spurious_1 (19125ch_15MHz_QPSK_RB 1_0)



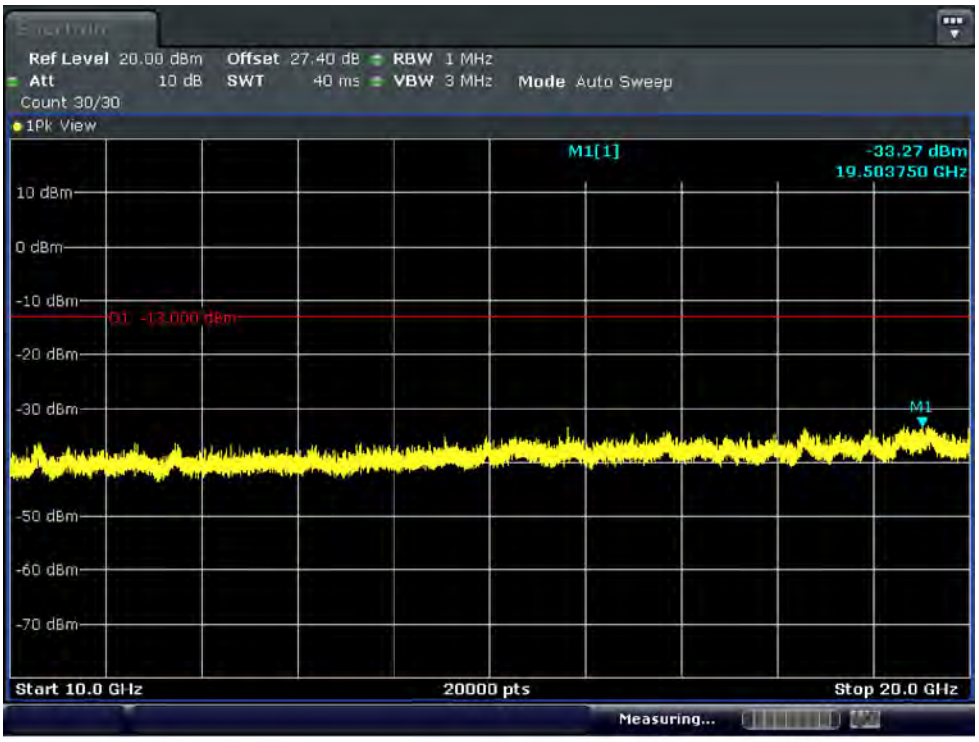
BAND 2. Conducted Spurious_2 (19125ch_15MHz_QPSK_RB 1_0)



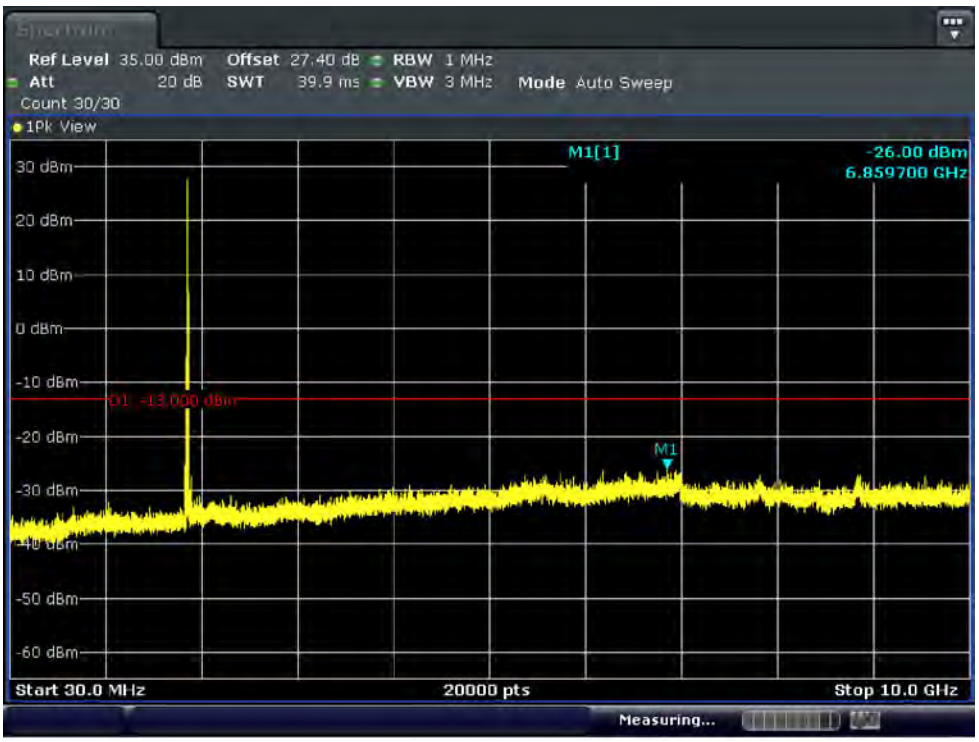
BAND 2. Conducted Spurious_1 (18700ch_20MHz_QPSK_RB 1_0)



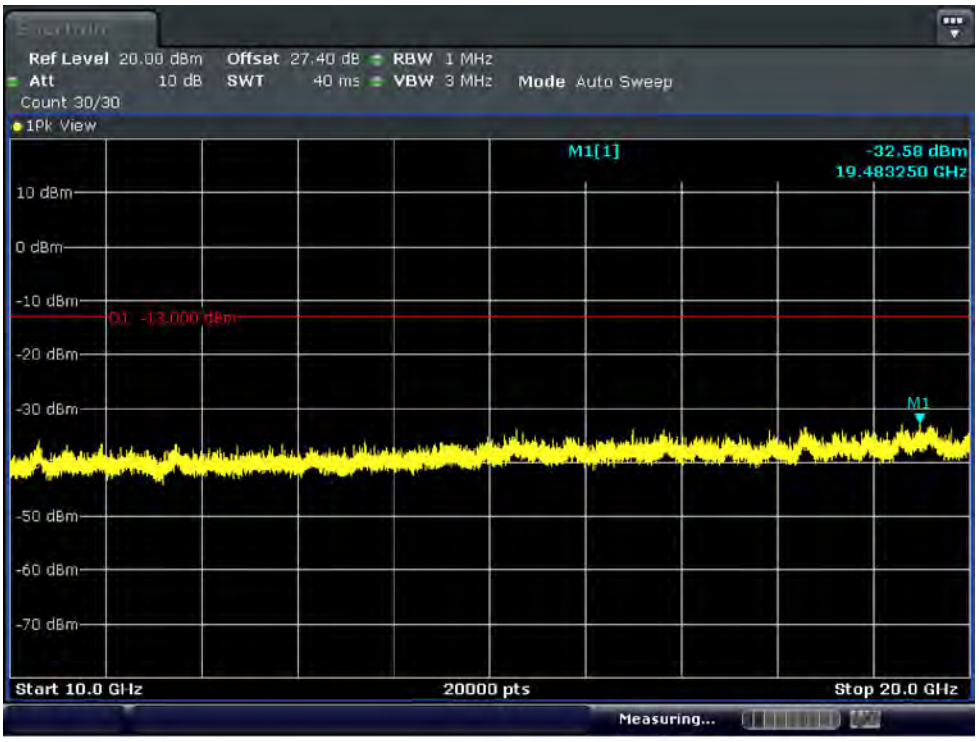
BAND 2. Conducted Spurious_2 (18700ch_20MHz_QPSK_RB 1_0)



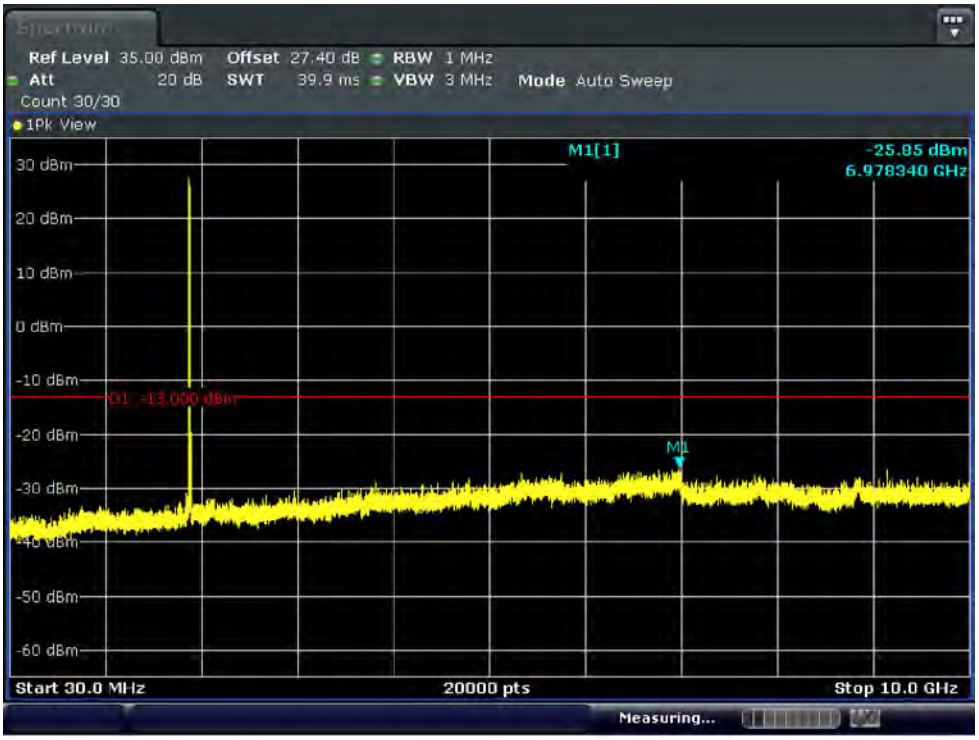
AND 2. Conducted Spurious_1 (18900ch_20MHz_QPSK_RB 1_0)



BAND 2. Conducted Spurious_2 (18900ch_20MHz_QPSK_RB 1_0)



BAND 2. Conducted Spurious_1 (19100ch_20MHz_QPSK_RB 1_0)



BAND 2. Conducted Spurious_2 (19100ch_20MHz_QPSK_RB 1_0)