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FCC GSM/WCDMA REPORT

FCC Certification

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

Address:
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue:
January 13, 2016

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

Report No.: HCT-R-1601-F030
HCT FRN: 0005866421

FCC ID: ZNFK430H

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

FCC Model(s):	LG-K430H
Additional FCC Model(s):	LGK430H, K430H
EUT Type:	GSM WCDMA LTE Phone with BT & WLAN
FCC Classification:	Licensed Portable Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§22, §24, §27, §2

Mode	Tx Frequency (MHz)	Rx Frequency (MHz)	Emission Designator	ERP	
				Max. Power (W)	Max. Power (dBm)
GSM850	824.2 – 848.8	869.2 – 893.8	246 KGXW	0.758	28.80
GSM850 EDGE			255 KG7W	0.104	20.17
WCDMA850	826.4 – 846.6	871.4 – 891.6	4M22F9W	0.078	18.91

Mode	Tx Frequency (MHz)	Rx Frequency (MHz)	Emission Designator	EIRP	
				Max. Power (W)	Max. Power (dBm)
GSM1900	1850.2 – 1909.8	1930.2 – 1989.8	249 KGXW	0.655	28.16
GSM1900 EDGE			251 KG7W	0.188	22.75
WCDMA1900	1852.4 – 1907.6	1932.4 – 1987.6	4M20F9W	0.164	22.14
WCDMA1700	1712.4 – 1752.6	2112.4 – 2152.6	4M21F9W	0.142	21.51

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

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

Report prepared by
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Approved by
: Sang Jun Lee
Manager of RF Team

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1601-F030	January 13, 2016	- First Approval Report

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MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	LG Electronics MobileComm U.S.A., Inc.
Address:	1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID:	ZNFK430H
Application Type:	Certification
FCC Classification:	Licensed Portable Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§22, §24, §27, §2
EUT Type:	GSM WCDMA LTE Phone with BT & WLAN
FCC Model(s):	LG-K430H
Additional FCC Model(s):	LGK430H, K430H
Tx Frequency:	824.20 - 848.80 MHz (GSM850) 826.40 - 846.60 MHz (WCDMA850) 1 850.20 - 1 909.80 MHz (GSM1900) 1 852.4 – 1 907.6 MHz (WCDMA1900) 1 712.4 – 1 752.6 MHz (WCDMA1700)
Rx Frequency:	869.20 - 893.80 MHz (GSM850) 871.40 - 891.60 MHz (WCDMA850) 1 930.20 - 1 989.80 MHz (GSM1900) 1 932.4 – 1 987.6 MHz (WCDMA1900) 2 112.4 – 2 152.6 MHz (WCDMA1700)
Max. RF Output Power:	0.758 W GSM850 (28.80 dBm) / 0.655 W GSM1900 (28.16 dBm) 0.104 W GSM850 EDGE (20.17 dBm) / 0.188 W GSM1900 EDGE (22.75 dBm) 0.078 W WCDMA850 (18.91 dBm) / 0.164 W WCDMA1900 (22.14 dBm) 0.142 W WCDMA1700 (21.51 dBm)
Emission Designator(s):	246 KGXW (GSM850) 249 KGXW (GSM1900) 255 KG7W (GSM850 EDGE) 251 KG7W (GSM1900 EDGE) 4M22F9W (WCDMA850) 4M20F9W (WCDMA1900) 4M21F9W (WCDMA1700)
Date(s) of Tests:	December 08, 2015 ~ January 05, 2016
Antenna Specification	Manufacturer: AT&C Co.LTD. Antenna type: Internal Antenna Peak Gain: GSM850/ WCDMA850 : -7.07 dBi GSM1900/ WCDMA1900 : -2.48 dBi WCDMA1700 : -5.71 dBi
Note:	The device, LG-K430H (FCC ID: ZNFK430H) is electrically identical compare to LG-K430T (FCC ID: ZNFK430T), confirmed by spot-check tests. Therefore, the test result data of LG-K430T (FCC ID: ZNFK430T) shall be reused. Simply enable software to LTE Band 17. So LTE Band 17 was Test.

2. INTRODUCTION

2.1. EUT DESCRIPTION

The LG Electronics MobileComm U.S.A., Inc. LG-K430H GSM WCDMA LTE Phone with BT & WLAN consists of GPRS Class12, EDGE12, GSM850, GSM1900, WCDMA850, WCDMA1900, WCDMA1700, HSDPA, HSUPA, DC-HSDPA and HSPA+.

2.2. MEASURING INSTRUMENT CALIBRATION

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

2.3. TEST FACILITY

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

3. DESCRIPTION OF TESTS

3.1 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-D-2010 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 RMS 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

1. Frequency Range : 30 MHz ~ 10th Harmonics of highest channel fundamental frequency.
2. The EUT was setup to maximum output power. The 100 kHz RBW was used to scan from 30 MHz to 1 GHz. Also, the 1 MHz RBW was used to scan from 1 GHz to 10 GHz(GSM850/WCDMA850) or 20 GHz(GSM1900/WCDMA1900/WCDMA1700). The high, low and a middle channel were tested for out of band measurements.

3.2 PEAK- TO- AVERAGE RATIO

Test Procedure

Peak to Average Power Ratio is tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r02, October 17, 2014, Section 5.7.

- Section 5.7.1 CCDF Procedure for PAPR

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 for PAPR

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”.

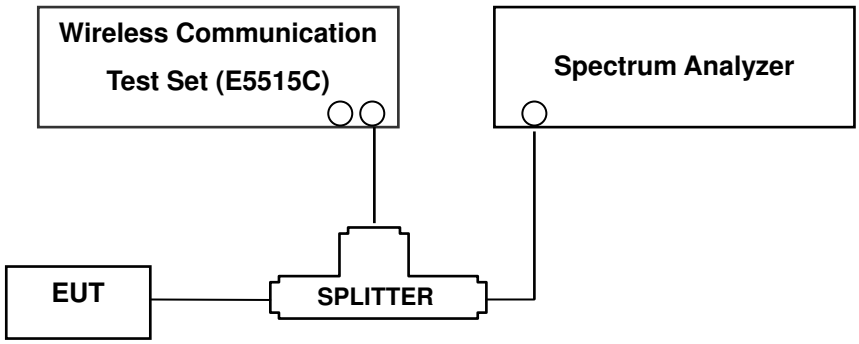
h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.

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)

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 v02r02, October 17, 2014, 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

3.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.

Test Procedure

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

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

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. The RBW settings used in the testing are greater than 1 % of the occupied bw. The 1 MHz RBW was used to scan from 10 MHz to 10 GHz. (GSM1900 Mode: 10 MHz to 20 GHz). 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.

Measurements of all out of band are made on RBW = 1MHz and VBW ≥ 3 MHz in the worst case despite RBW = 100 kHz and VBW ≥ 300 kHz upon 1 GHz.

- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Trace Mode = max hold
- Sweep time = auto
- Number of points in sweep ≥ 2 * Span / RBW

- Band Edge Requirement : According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

All measurements were done at 2 channels(low and high operational frequency range.)

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

In GSM mode, the center frequency of spectrum setto the band edge frequency.The span is 1MHz

(RBW = at least 1 % of the EBW, VBW ≥ 3*RBW, Detector = Average).

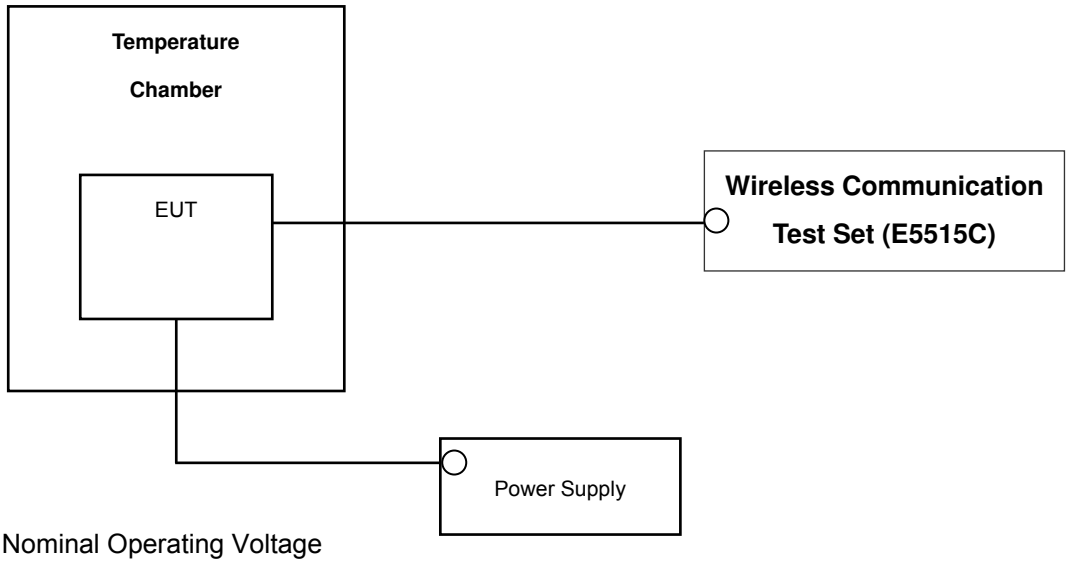
In WCDMA mode, the center frequency of spectrum set to the band edge frequency. The span is 7MHz (RBW = at least 1% of the EBW, ≥ 3*RBW, Detector = Average).

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

- For GSM850 and WCDMA850, total offset 26.9 dB = 20 dB attenuator + 6 dB Splitter + 0.9 dB RF cables.
- For GSM1900 and WCDMA1900, total offset 27.8 dB = 20 dB attenuator + 6 dB Splitter + 1.8 dB RF cables.
- For WCDMA1700, total offset 27.7 dB = 20 dB attenuator + 6 dB Splitter + 1.7 dB RF cables.

3.5 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

Test Set-up



* Nominal Operating Voltage

Test Procedure

Frequency stability is tested in accordance with ANSI/TIA-603-D-2010 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 battery end point to 100 % 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(GSM1900/WCDMA1900/WCDMA1700). The frequency stability of the transmitter shall be maintained within ± 0.000 25 %(± 2.5 ppm) of the center frequency(GSM850/WCDMA850).

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.
NOTE: The EUT is tested down to the battery endpoint.

4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Interval	Calibration Due
Agilent	N1921A/ Power Sensor	MY45241059	Annual	07/09/2016
Agilent	N1911A/ Power Meter	MY45100523	Annual	07/09/2016
MITEQ	AMF-6D-001180-35-20P/AMP	1081666	Annual	09/03/2016
Wainwright	WHK1.2/15G-10EF/H.P.F	4	Annual	04/27/2016
Wainwright	WHK3.3/18G-10EF/H.P.F	2	Annual	04/27/2016
Hewlett Packard	11667B / Power Splitter	10545	Annual	02/16/2016
Hewlett Packard	11667B / Power Splitter	11275	Annual	04/29/2016
ITECH	IT6720/ Power Supply	0100215626700119	Annual	11/02/2016
Schwarzbeck	UHAP/ Dipole Antenna	557	Biennial	03/23/2017
Schwarzbeck	UHAP/ Dipole Antenna	558	Biennial	03/23/2017
EXP	EX-TH400/ Chamber	None	Annual	05/29/2016
Schwarzbeck	BBHA 9120D/ Horn Antenna	147	Biennial	09/01/2016
Schwarzbeck	BBHA 9120D/ Horn Antenna	1299	Biennial	05/15/2017
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	Biennial	04/30/2017
Schwarzbeck	BBHA 9170/ Horn Antenna(15~35GHz)	BBHA9170124	Biennial	04/30/2017
Agilent	E4440A/Spectrum Analyzer	US45303008	Annual	03/18/2016
Agilent	N9020A/Signal Analyzer	MY52090906	Annual	05/15/2016
Hewlett Packard	8493C/ATTENUATOR	17280	Annual	06/29/2016
REOHDE&SCHWARZ	FSV40/Spectrum Analyzer	1307.9002K40-100931-NK	Annual	06/04/2016
Agilent	8960 (E5515C)/ Base Station	MY48360800	Annual	10/30/2016

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS
2.1051, 22.917(a), 24.238(a), 27.53(h)	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions		PASS
* 2.1046	Conducted Output Power	-		PASS
24.232(d), 27.50(d)(5	Peak- to- Average Ratio	< 13 dB		PASS
2.1055, 22.355	Frequency stability / variation of ambient temperature	< 2.5 ppm (Part22)		PASS
24.235, 27.54		Emission must remain in band (Part24, 27)		PASS
22.913(a)(2)	Effective Radiated Power	< 7 Watts max. ERP	RADIATED	PASS
24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS
27.50(d)(4)	Equivalent Isotropic Radiated Power	<1 Watts max. EIRP		PASS
2.1053, 22.917(a), 24.238(a), 27.53(h)	Radiated Spurious and Harmonic Emissions	< 43 + 10log10 (P[Watts]) for all out-of band emissions		PASS

*: See SAR Report

6. SAMPLE CALCULATION

A. ERP Sample Calculation

Mode	Ch./ Freq.		Measured Level(dBm)	Substitute LEVEL(dBm)	Ant. Gain (dBd)	C.L	Pol.	ERP	
	channel	Freq.(MHz)						W	dBm
GSM850	128	824.20	-21.37	38.40	-10.61	0.95	H	0.483	26.84

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

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

B. Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW
GSM BW = 249 kHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W
GSM BW = 249 kHz
G = Phase Modulation
7 = Quantized/Digital Info
W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W
WCDMA BW = 4.17 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data)

7. TEST DATA

7.1 EFFECTIVE RADIATED POWER

(GSM850 Mode)

Ch./ Freq.		Measured Level(dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBd)	C.L	Pol.	ERP	
channel	Freq.(MHz)						W	dBm
128	824.20	-21.67	40.27	-10.59	0.88	V	0.758	28.80
190	836.60	-22.16	39.49	-10.53	0.89	V	0.642	28.07
251	848.80	-22.71	38.24	-10.48	0.89	V	0.487	26.87
EDGE 128	824.20	-30.30	31.64	-10.59	0.88	V	0.104	20.17

(WCDMA850 Mode)

Ch./ Freq.		Measured Level(dBm)	Substitute LEVEL (dBm)	Ant. Gain (dBd)	C.L	Pol.	ERP	
channel	Freq.(MHz)						W	dBm
4132	826.40	-31.75	30.37	-10.58	0.88	V	0.078	18.91
4183	836.60	-32.53	29.12	-10.53	0.89	V	0.059	17.70
4233	846.60	-32.48	28.56	-10.49	0.89	V	0.052	17.18

Note: Standard batteries are the only options for this phone.

NOTES:

Effective Radiated Power Output Measurements by Substitution Method

according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:

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. For WCDMA, GSM signals, RBW = 1-5% of the OBW, not to exceed 1MHz, VBW ≥ 3 x RBW, Detector = RMS. 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.

This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to “1” and in GSM mode using a Power Control Level of “0” in the PCS Band and “5” in the Cellular Band. This unit was tested with its standard battery. 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 y plane in GSM850 and WCDMA850 mode. Also worst case of detecting Antenna is in vertical polarization in GSM850 and WCDMA850 mode.

The EDGE mode testing were performed using 1Tx because 1Tx is highest power in EDGE mode.

7.2 EQUIVALENT ISOTROPIC RADIATED POWER

(GSM1900 Mode)

Ch./ Freq.		Measured	Substitute	Ant. Gain	C.L	Pol.	EIRP	
channel	Freq.(MHz)	Level(dBm)	LEVEL (dBm)	(dBi)			W	dBm
512	1,850.20	-13.69	19.00	10.04	1.36	H	0.585	27.68
661	1,880.00	-13.84	19.12	10.05	1.37	H	0.603	27.80
810	1,909.80	-13.74	19.48	10.06	1.38	H	0.655	28.16
EDGE 810	1909.80	-19.15	14.07	10.06	1.38	H	0.188	22.75

Note: Standard batteries are the only options for this phone.

NOTES:

Equivalent Isotropic Radiated Power Measurements by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:

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. For GSM signals, RBW = 1-5% of the OBW, not to exceed 1MHz, VBW ≥ 3 x RBW, Detector = RMS. 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.
This device was tested under all configurations and the highest power is reported in GSM mode using a Power Control Level of “0” in the PCS Band and “5” in the Cellular Band. This unit was tested with its standard battery. 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 GSM1900 mode. Also worst case of detecting Antenna is in horizontal polarization in GSM1900 mode.

The EDGE mode testing were performed using 1Tx because 1Tx is highest power in EDGE mode.

(WCDMA1900 Mode)

Ch./ Freq.		Measured	Substitute	Ant. Gain	C.L	Pol.	EIRP	
channel	Freq.(MHz)	Level(dBm)	LEVEL (dBm)	(dBi)			W	dBm
9262	1,852.40	-19.24	13.46	10.04	1.36	H	0.164	22.14
9400	1,880.00	-19.72	13.24	10.05	1.37	H	0.156	21.92
9538	1,907.60	-20.35	12.83	10.06	1.38	H	0.142	21.51

(WCDMA1700 Mode)

Ch./ Freq.		Measured	Substitute	Ant. Gain	C.L	Pol.	EIRP	
channel	Freq.(MHz)	Level(dBm)	LEVEL (dBm)	(dBi)			W	dBm
1312	1,712.40	-19.66	12.82	9.88	1.31	H	0.138	21.39
1412	1,732.40	-19.62	12.87	9.96	1.32	H	0.142	21.51
1513	1,752.60	-19.99	12.45	10.01	1.33	H	0.130	21.13

Note: Standard batteries are the only options for this phone.

NOTES:

Equivalent Isotropic Radiated Power Measurements by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:

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. For WCDMA signals, rotation was adjusted for the highest reading on the receive spectrum analyzer. For WCDMA signals, RBW = 1-5% of the OBW, not to exceed 1MHz, VBW ≥ 3 x RBW, Detector = RMS. 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.

This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to “1”. This unit was tested with its standard battery. 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 WCDMA1900 and WCDMA1700 mode. Also worst case of detecting Antenna is in horizontal polarization in WCDMA1900 and WCDMA1700 mode.

7.3 RADIATED SPURIOUS EMISSIONS

7.3.1 RADIATED SPURIOUS EMISSIONS (GSM850)

▣ MEASURED OUTPUT POWER: 28.80 dBm = 0.758 W

▣ MODULATION SIGNAL: GSM850

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 41.80 dBc

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBd)	Substitute Level [dBm]	C.L	Pol.	ERP (dBm)	dBc
128 (824.2)	1,648.40	-51.52	9.71	-59.55	1.29	H	-51.13	79.93
	2,472.60	-32.49	10.54	-37.67	1.60	V	-28.73	57.53
	3,296.80	-50.69	12.21	-55.76	1.85	H	-45.40	74.20
190 (836.6)	1,673.20	-46.69	9.77	-54.88	1.28	H	-46.39	75.19
	2,509.80	-26.39	10.65	-31.37	1.61	V	-22.33	51.13
	3,346.40	-51.37	12.41	-56.86	1.86	H	-46.31	75.11
251 (848.8)	1,697.60	-45.21	9.85	-53.40	1.30	H	-44.85	73.65
	2,546.40	-23.23	10.72	-28.11	1.64	V	-19.03	47.83
	3,395.20	-54.35	12.39	-59.66	1.88	H	-49.15	77.95

NOTES: 1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:

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.

7.3.2 RADIATED SPURIOUS EMISSIONS(GSM1900)

▣ MEASURED OUTPUT POWER: 28.16 dBm = 0.655 W

▣ MODULATION SIGNAL: GSM1900

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 41.16 dBc

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	EIRP (dBm)	dBc
512 (1850.2)	3,700.40	-57.21	12.32	-60.87	2.03	H	-50.58	78.74
	5,550.60	-55.69	13.02	-54.58	2.52	H	-44.08	72.24
	7,400.80	-58.23	11.06	-48.91	2.91	H	-40.76	68.92
661 (1880.0)	3,760.00	-57.15	12.29	-60.75	1.93	H	-50.39	78.55
	5,640.00	-55.34	13.12	-54.41	2.57	H	-43.86	72.02
	7,520.00	-56.69	11.09	-47.85	3.03	H	-39.79	67.95
810 (1909.8)	3,819.60	-59.54	12.28	-62.51	2.04	V	-52.27	80.43
	5,729.40	-54.52	13.06	-53.33	2.55	H	-42.82	70.98
	7,639.20	-58.51	11.38	-49.09	3.11	V	-40.82	68.98

NOTES:
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
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.

7.3.3 RADIATED SPURIOUS EMISSIONS (WCDMA850)

▣ MEASURED OUTPUT POWER: 18.91 dBm = 0.078 W

▣ MODULATION SIGNAL: WCDMA850

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 31.91 dBc

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBd)	Substitute Level [dBm]	C.L	Pol.	ERP (dBm)	dBc
4,132 (826.4)	1,652.80	-59.45	9.71	-67.49	1.29	H	-59.07	77.98
	2,479.20	-56.42	10.54	-61.44	1.61	V	-52.51	71.42
	3,305.60	-58.73	12.26	-63.91	1.86	V	-53.51	72.42
4,183 (836.6)	1,673.20	-59.72	9.77	-67.90	1.28	V	-59.41	78.32
	2,509.80	-56.25	10.65	-61.23	1.61	V	-52.19	71.10
	3,346.40	-59.70	12.41	-65.19	1.86	V	-54.64	73.55
4,233 (846.6)	1,693.20	-59.61	9.83	-67.86	1.30	V	-59.33	78.24
	2,539.80	-56.29	10.71	-61.11	1.63	V	-52.03	70.94
	3,386.40	-59.50	12.40	-64.95	1.84	H	-54.39	73.30

NOTES:
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
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.

7.3.4 RADIATED SPURIOUS EMISSIONS (WCDMA1900)

▣ MEASURED OUTPUT POWER: 22.14 dBm = 0.164 W

▣ MODULATION SIGNAL: WCDMA1900

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 35.14 dBc

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	EIRP (dBm)	dBc
9262 (1852.4)	3,704.80	-47.97	12.32	-51.59	2.01	H	-41.28	63.42
	5,557.20	-52.26	13.03	-51.14	2.53	H	-40.64	62.78
	7,409.60	-51.72	11.05	-42.22	2.92	H	-34.09	56.23
9400 (1880.0)	3,760.00	-51.79	12.29	-55.40	1.93	H	-45.04	67.18
	5,640.00	-50.91	13.12	-49.97	2.57	H	-39.42	61.56
	7,520.00	-58.77	11.09	-49.93	3.03	H	-41.87	64.01
9538 (1907.6)	3,815.20	-49.51	12.28	-52.71	2.04	H	-42.47	64.61
	5,722.80	-49.11	13.80	-48.63	2.57	H	-37.40	59.54
	7,630.40	-54.43	11.36	-44.96	3.19	V	-36.79	58.93

NOTES:
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
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.

7.3.5 RADIATED SPURIOUS EMISSIONS (WCDMA1700)

▣ MEASURED OUTPUT POWER: 21.51 dBm = 0.142 W

▣ MODULATION SIGNAL: WCDMA1700

▣ DISTANCE: 3 meters

▣ LIMIT: 43 + 10 lo_{g10} (W) = 34.51 dBc

Ch.	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBi)	Substitute Level [dBm]	C.L	Pol.	EIRP (dBm)	dBc
1312 (1712.4)	3,424.80	-46.74	12.36	-51.90	1.94	V	-41.48	62.99
	5,137.20	-52.21	12.35	-50.26	2.38	H	-40.29	61.80
	6,849.60	-52.84	12.15	-46.36	2.80	V	-37.01	58.52
1412 (1732.4)	3,464.80	-49.28	12.27	-53.85	1.86	V	-43.44	64.95
	5,197.20	-53.53	12.62	-51.84	2.44	H	-41.66	63.17
	6,929.60	-58.30	11.87	-50.70	2.84	V	-41.67	63.18
1513 (1752.6)	3,505.20	-47.05	12.15	-51.18	1.98	V	-41.01	62.52
	5,257.80	-54.25	12.89	-53.42	2.41	H	-42.94	64.45
	7,010.40	-58.54	11.61	-51.25	2.91	V	-42.55	64.06

NOTES:
1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-D-2010 June 24, 2010:
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.

7.4 PEAK-TO-AVERAGE RATIO

Band	Ch.	Measured P_{Pk} (dBm)	Measured P_{Avg} (dBm)	P_{Avg} (Duty Cycle)			P.A.R. = P_{Pk} - P_{Avg} (dB)	Limit (dB)	Pass / Fail
				Tx_{Total} (ms)	Tx_{On} (ms)	Factor (dB)			
GSM1900	661	29.94	20.55	4.6232	0.5507	9.24	0.15	13	Pass
GSM1900 EDGE	661	28.37	15.55				3.58		
WCDMA1900	9400	CCDF Procedure					2.84		
WCDMA1700	1412						2.84		

- Plots of the EUT's Peak- to- Average Ratio are shown Page 40 ~ 43.

NOTES:

Peak to Average Power Ratio was tested in accordance with KDB971168 D01 Power Meas License Digital Systems v02r02, October 17, 2014, Section 5.7.

Only GSM(include EDGE) Mode was tested by Section 5.7.2 Alternate Procedure

$P.A.R_{(dB)} = P_{Pk\ (dBm)} - P_{Avg\ (dBm)}$ (P_{Avg} = Average Power + Duty cycle Factor)

Duty cycle Factor = 10 log (1/x), x = Tx_{On} / Tx_{Total}

7.5 OCCUPIED BANDWIDTH

Band	Channel	Frequency(MHz)	Data (GSM: kHz / WCDMA : MHz)
GSM850	128	824.20	245.0754
	190	836.60	246.1102
	251	848.80	246.1043
GSM850 EDGE	190	836.60	255.2222
GSM1900	512	1,850.20	249.1396
	661	1,880.00	248.3748
	810	1,909.80	242.0904
GSM1900 EDGE	512	1,850.20	250.9056
WCDMA850	4132	826.40	4.2040
	4183	836.60	4.2084
	4233	846.60	4.2168
WCDMA1900	9262	1852.40	4.2034
	9400	1880.00	4.2013
	9538	1907.60	4.1983
WCDMA1700	1312	1712.40	4.1942
	1412	1732.40	4.1932
	1513	1752.60	4.2089

- Plots of the EUT's Occupied Bandwidth are shown Page 32 ~ 40.

7.6 CONDUCTED SPURIOUS EMISSIONS

▣ FACTORS FOR FREQUENCY

Frequency Range (GHz)	Factor [dB]
0.03 – 1	27.145
1 – 5	26.960
5 – 10	27.542
10 – 15	28.439
15 – 20	29.144
Above 20	30.148

NOTES:

Factor(dB) = Cable Loss + Attenuator + Power Splitter

Band	Channel	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result (dBm)
GSM850	128	3.704818	27.145	-59.240	-32.095
	190	3.695375	27.145	-60.118	-32.973
	251	3.718237	27.145	-60.181	-33.036
GSM1900	512	6.115700	27.542	-59.253	-31.711
	661	3.714400	27.542	-59.063	-31.521
	810	5.666000	27.542	-59.145	-31.603
WCDMA850	4132	2.477725	27.145	-69.970	-42.825
	4183	2.506551	27.145	-67.674	-40.529
	4233	2.536868	27.145	-66.292	-39.147
WCDMA1900	9262	19.395500	29.144	-66.061	-36.917
	9400	19.852500	29.144	-65.730	-36.586
	9538	16.670000	29.144	-66.208	-37.064
WCDMA1700	1312	16.455000	29.144	-65.887	-36.743
	1412	18.913500	29.144	-64.764	-35.620
	1513	19.912000	29.144	-65.882	-36.738

NOTES:

1. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)

- Plots of the EUT's Conducted Spurious Emissions are shown Page 62 ~ 76.

7.6.1 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 44 ~ 61.

7.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

7.7.1 FREQUENCY STABILITY (GSM850)

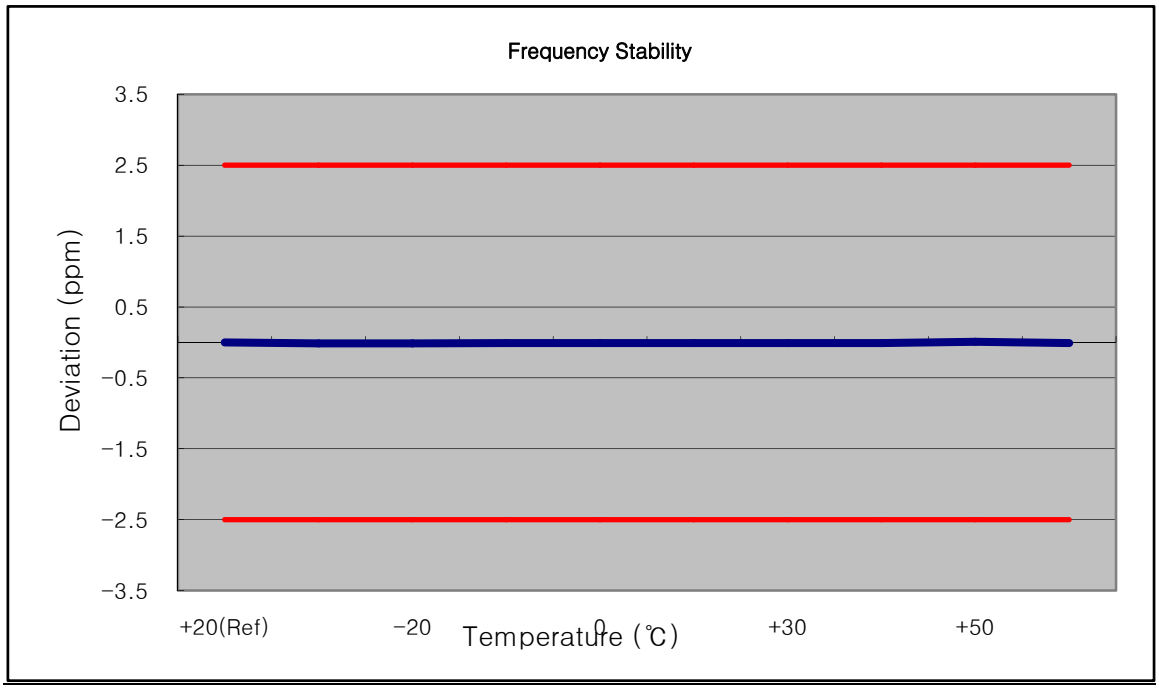
▣ OPERATING FREQUENCY: 836,600,000 Hz

▣ CHANNEL: 190

▣ 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%	3.8	+20(Ref)	836 600 034	0	0.000 000	0.000
100%		-30	836 600 023	-10.71	-0.000 001	-0.013
100%		-20	836 600 023	-10.85	-0.000 001	-0.013
100%		-10	836 600 027	-6.62	-0.000 001	-0.008
100%		0	836 600 027	-7.04	-0.000 001	-0.008
100%		+10	836 600 027	-7.45	-0.000 001	-0.009
100%		+30	836 600 027	-7.32	-0.000 001	-0.009
100%		+40	836 600 027	-7.09	-0.000 001	-0.008
100%		+50	836 600 042	8.44	0.000 001	0.010
Batt. Endpoint	3.6	+20	836 600 026	-8.33	-0.000 001	-0.010



7.7.2 FREQUENCY STABILITY (GSM1900)

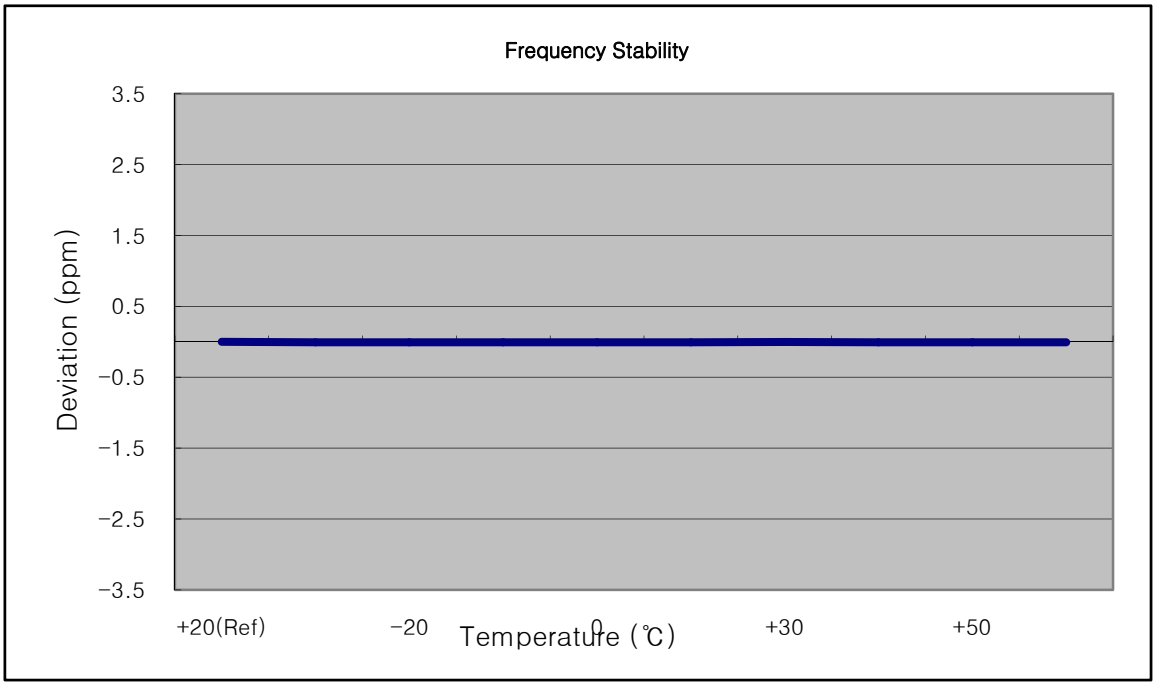
▣ OPERATING FREQUENCY: 1880,000,000 Hz

▣ CHANNEL: 661

▣ REFERENCE VOLTAGE: 3.8 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.8	+20(Ref)	1880 000 059	0	0.000 000	0.000
100%		-30	1880 000 046	-13.05	-0.000 001	-0.007
100%		-20	1880 000 048	-10.65	-0.000 001	-0.006
100%		-10	1880 000 047	-11.93	-0.000 001	-0.006
100%		0	1880 000 047	-12.46	-0.000 001	-0.007
100%		+10	1880 000 047	-12.00	-0.000 001	-0.006
100%		+30	1880 000 053	-5.56	0.000 000	-0.003
100%		+40	1880 000 048	-10.71	-0.000 001	-0.006
100%		+50	1880 000 047	-11.68	-0.000 001	-0.006
Batt. Endpoint	3.6	+20	1880 000 048	-10.65	-0.000 001	-0.006



7.7.3 FREQUENCY STABILITY (WCDMA850)

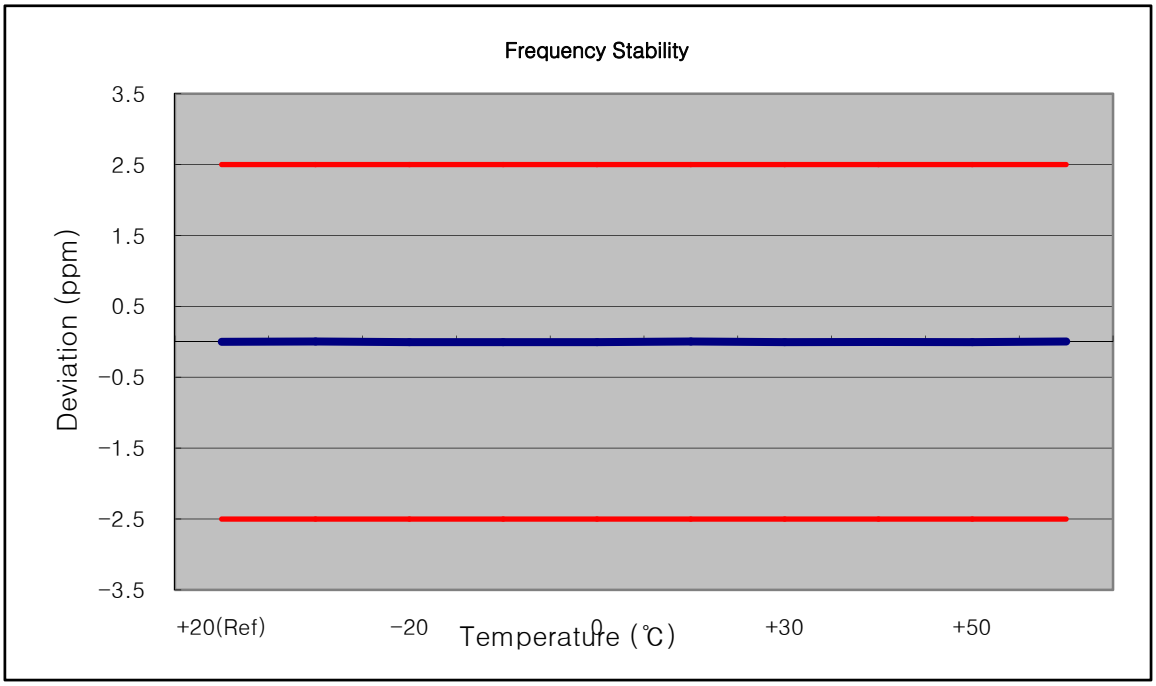
▣ OPERATING FREQUENCY: 836,600,000 Hz

▣ CHANNEL: 4183

▣ 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%	3.8	+20(Ref)	836 600 008	0	0.000 000	0.000
100%		-30	836 600 011	2.98	0.000 000	0.004
100%		-20	836 600 004	-4.17	0.000 000	-0.005
100%		-10	836 600 004	-4.30	-0.000 001	-0.005
100%		0	836 600 004	-3.80	0.000 000	-0.005
100%		+10	836 600 011	2.87	0.000 000	0.003
100%		+30	836 600 003	-4.60	-0.000 001	-0.005
100%		+40	836 600 006	-2.41	0.000 000	-0.003
100%		+50	836 600 004	-3.89	0.000 000	-0.005
Batt. Endpoint	3.6	+20	836 600 012	3.64	0.000 000	0.004



7.7.4 FREQUENCY STABILITY (WCDMA1900)

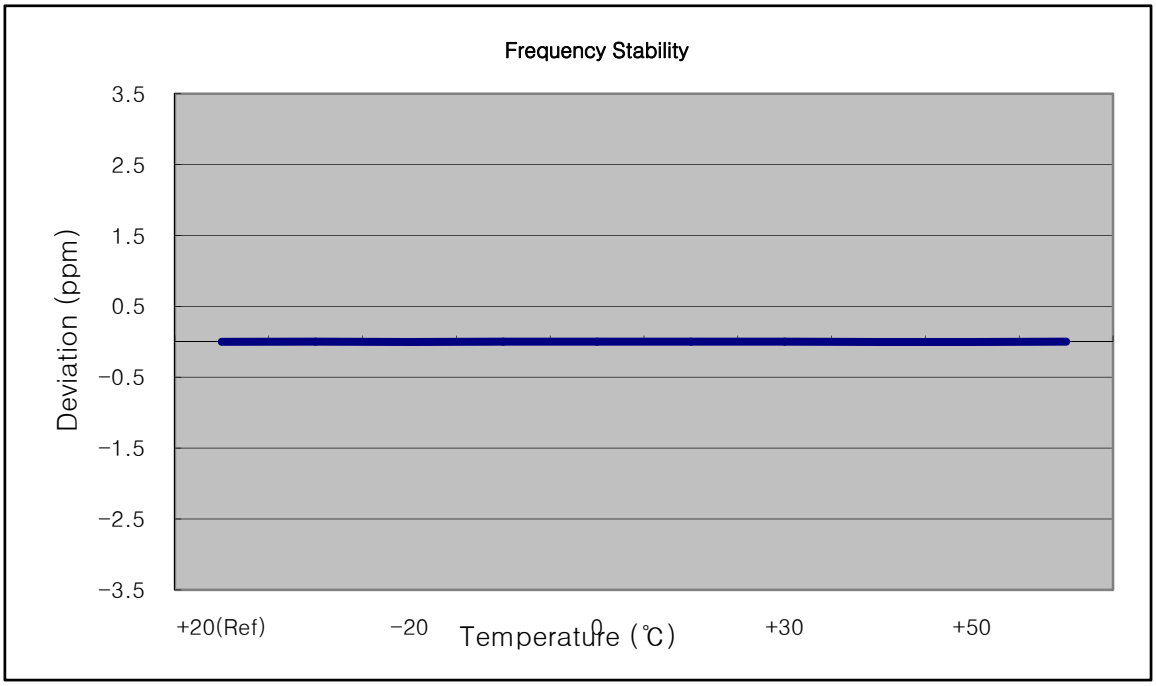
▣ OPERATING FREQUENCY: 1,880,000,000 Hz

▣ CHANNEL: 9400

▣ REFERENCE VOLTAGE: 3.8 VDC

▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.8	+20(Ref)	1879 999 995	0	0.000 000	0.000
100%		-30	1880 000 001	6.37	0.000 000	0.003
100%		-20	1879 999 989	-5.80	0.000 000	-0.003
100%		-10	1880 000 000	5.00	0.000 000	0.003
100%		0	1880 000 001	5.75	0.000 000	0.003
100%		+10	1880 000 001	5.65	0.000 000	0.003
100%		+30	1880 000 000	4.57	0.000 000	0.002
100%		+40	1879 999 990	-4.77	0.000 000	-0.003
100%		+50	1879 999 991	-4.19	0.000 000	-0.002
Batt. Endpoint	3.6	+20	1880 000 000	5.31	0.000 000	0.003



7.7.5 FREQUENCY STABILITY (WCDMA1700)

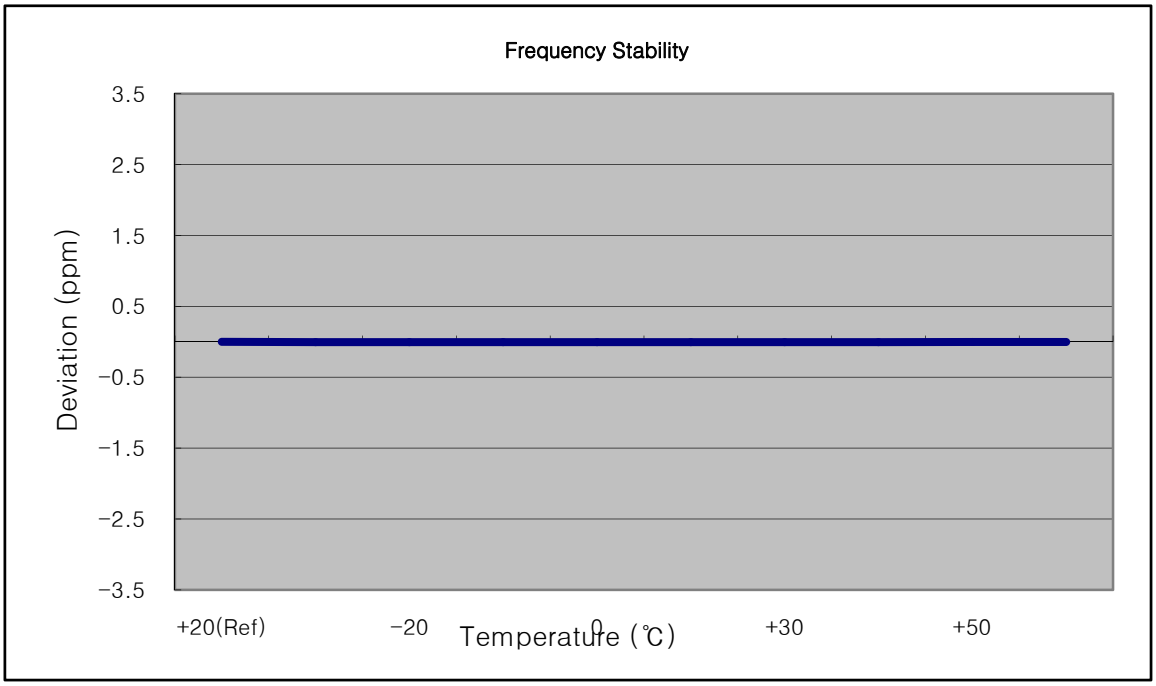
▣ OPERATING FREQUENCY: 1,732,400,000 Hz

▣ CHANNEL: 1412

▣ REFERENCE VOLTAGE: 3.8 VDC

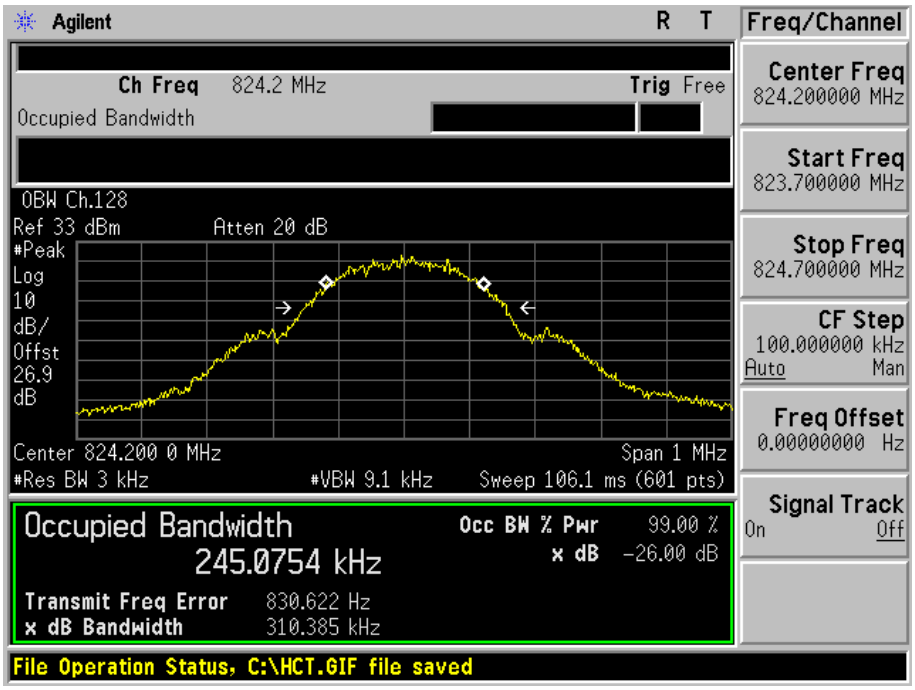
▣ DEVIATION LIMIT: Emission must remain in band

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	3.8	+20(Ref)	1731 999 992	0	0.000 000	0.000
100%		-30	1731 999 985	-6.74	0.000 000	-0.004
100%		-20	1731 999 985	-6.99	0.000 000	-0.004
100%		-10	1731 999 985	-6.39	0.000 000	-0.004
100%		0	1731 999 985	-6.81	0.000 000	-0.004
100%		+10	1731 999 985	-7.30	0.000 000	-0.004
100%		+30	1731 999 986	-6.28	0.000 000	-0.004
100%		+40	1731 999 984	-7.74	0.000 000	-0.004
100%		+50	1731 999 986	-5.69	0.000 000	-0.003
Batt. Endpoint	3.6	+20	1731 999 987	-4.58	0.000 000	-0.003

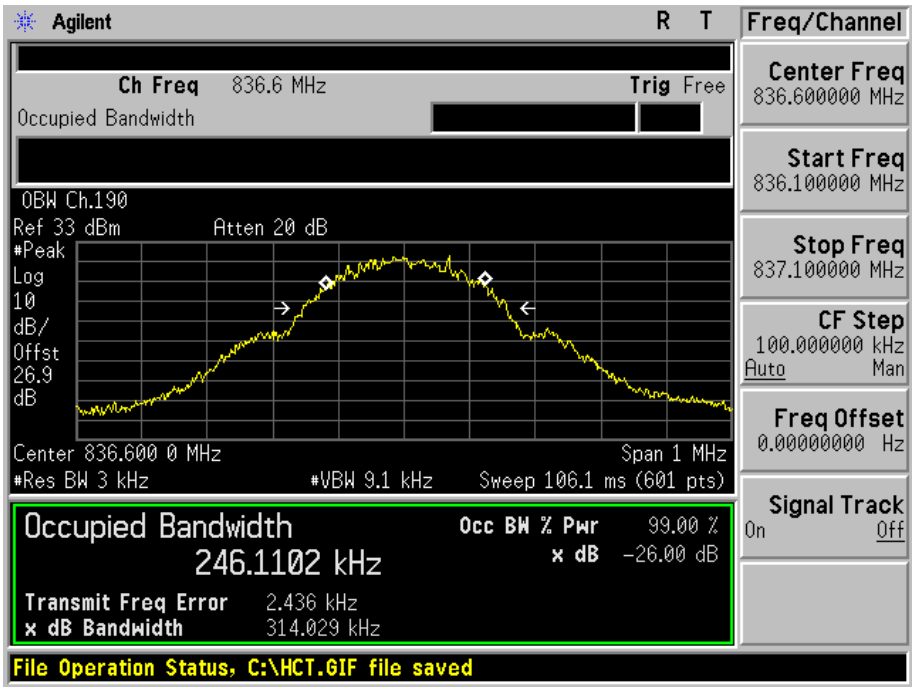


8. TEST PLOTS

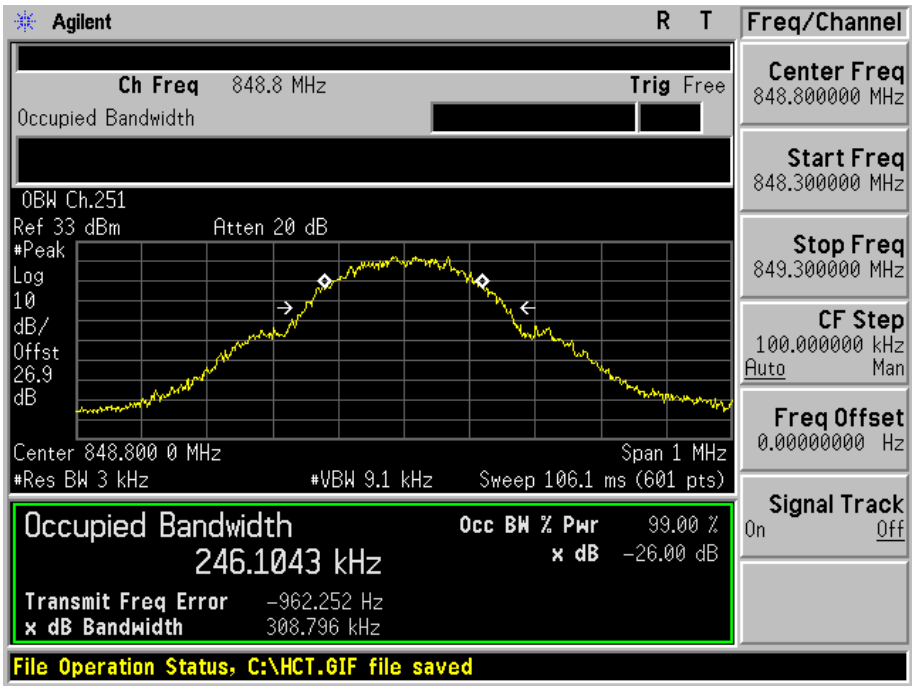
■ GSM850 MODE (128 CH.) Occupied Bandwidth



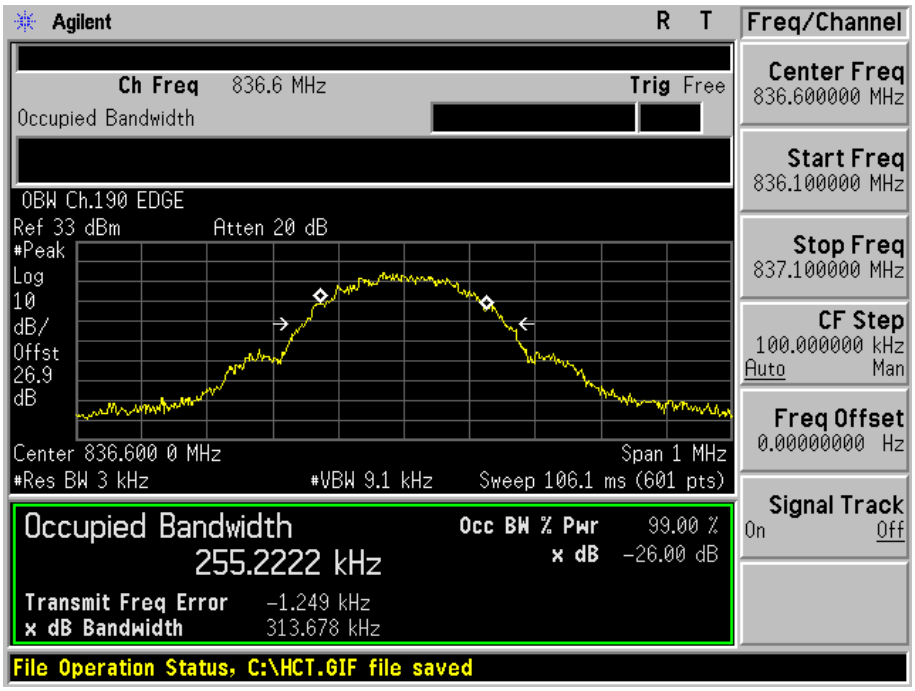
■ GSM850 MODE (190 CH.) Occupied Bandwidth



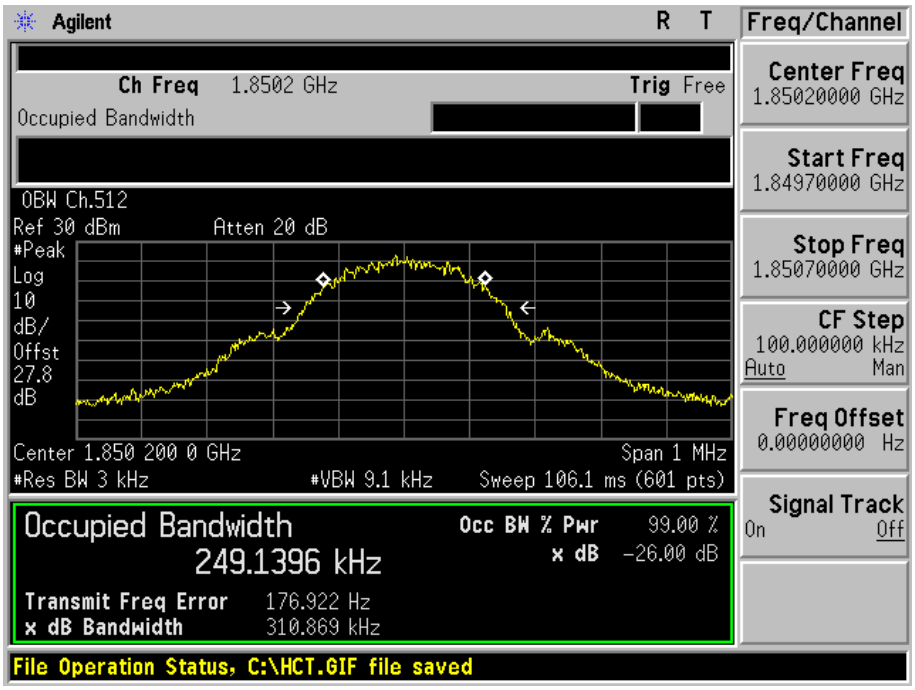
■ GSM850 MODE (251 CH.) Occupied Bandwidth



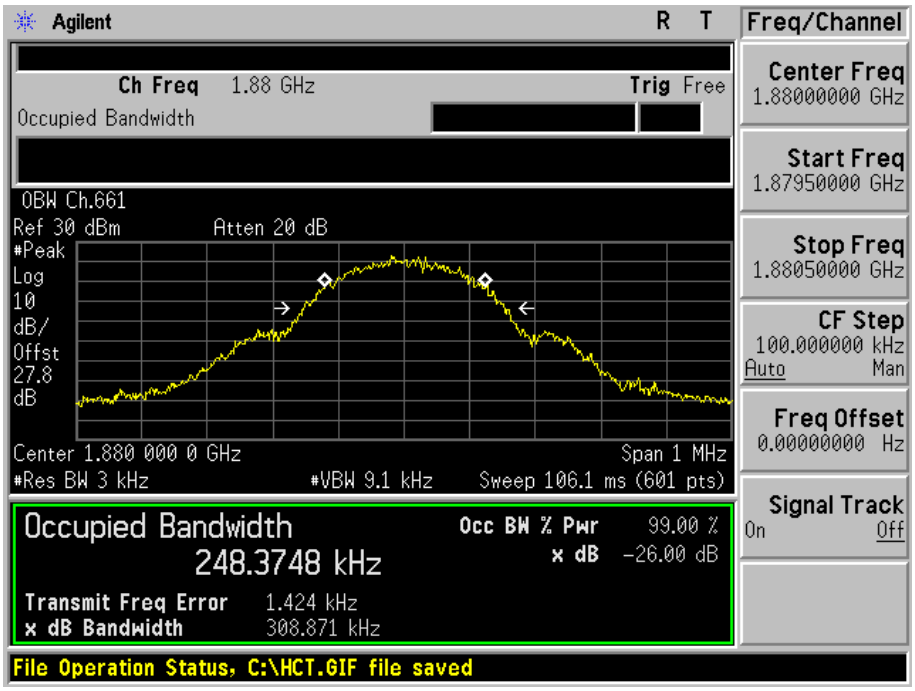
■ GSM850 EDGE (190 CH.) Occupied Bandwidth



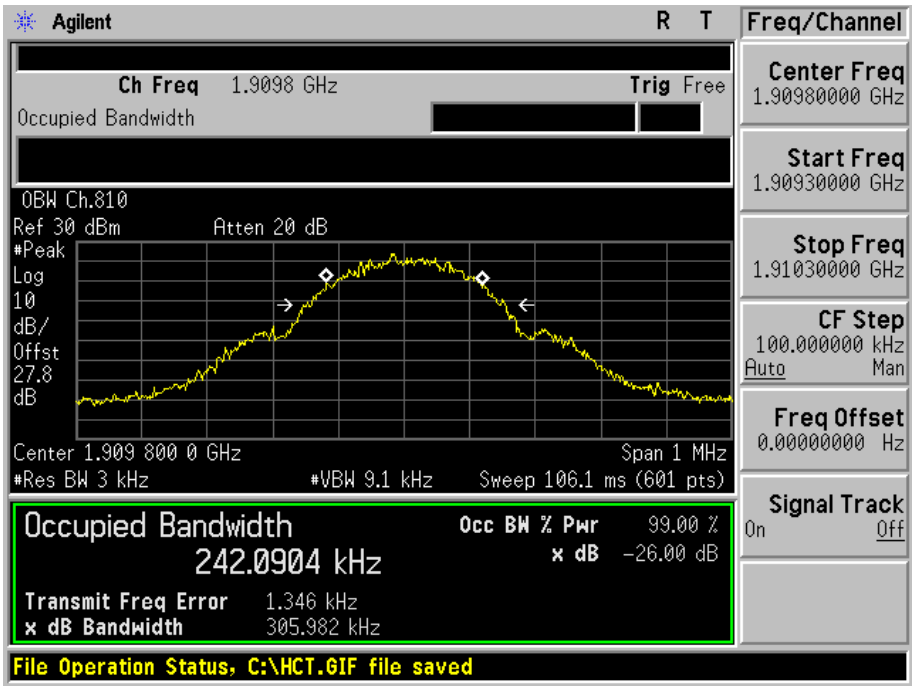
■ GSM1900 MODE (512 CH.) Occupied Bandwidth



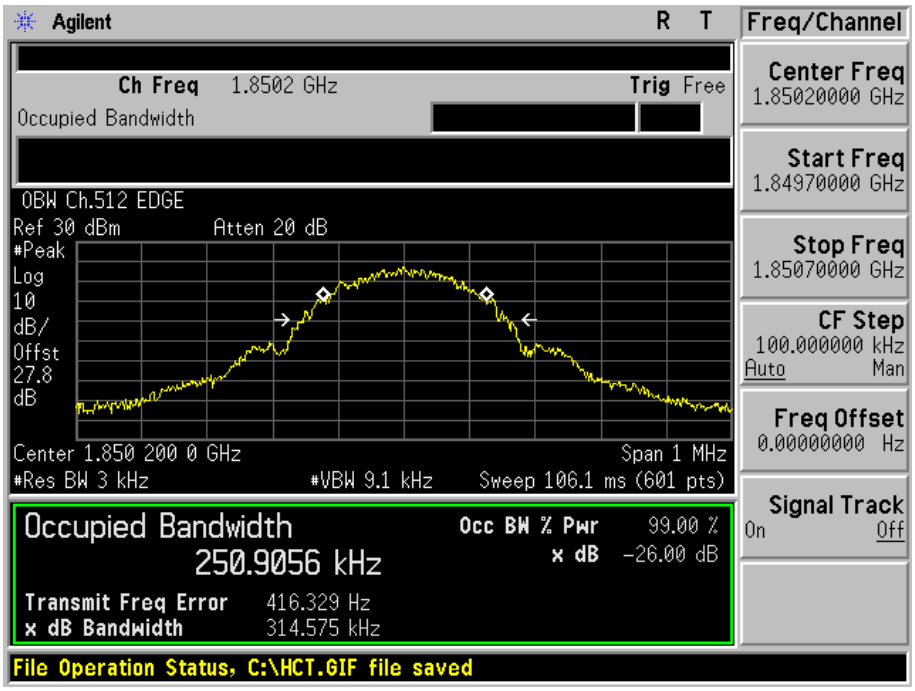
■ GSM1900 MODE (661 CH.) Occupied Bandwidth



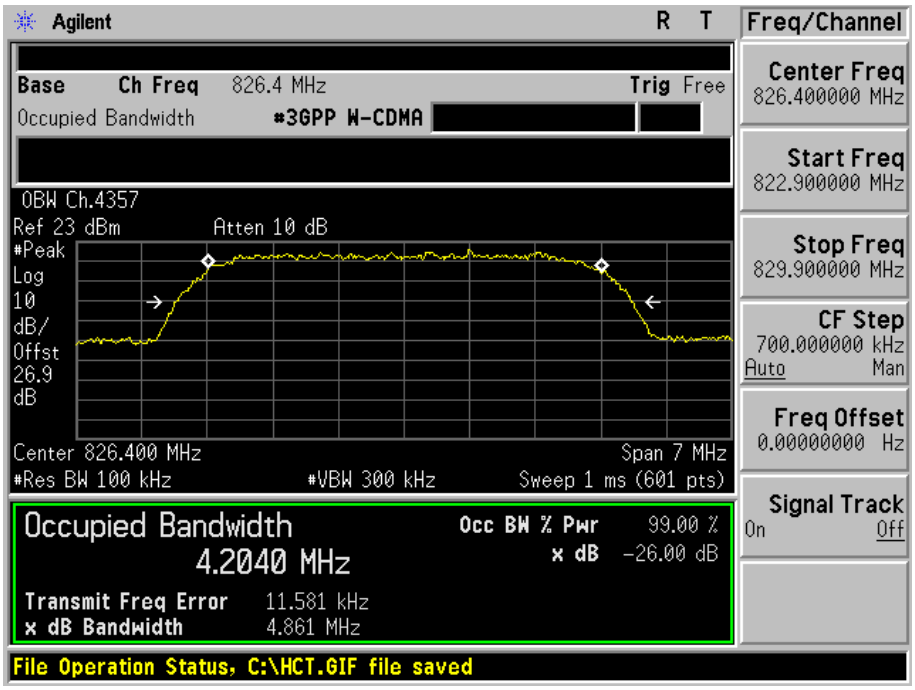
■ GSM1900 MODE (810 CH.) Occupied Bandwidth



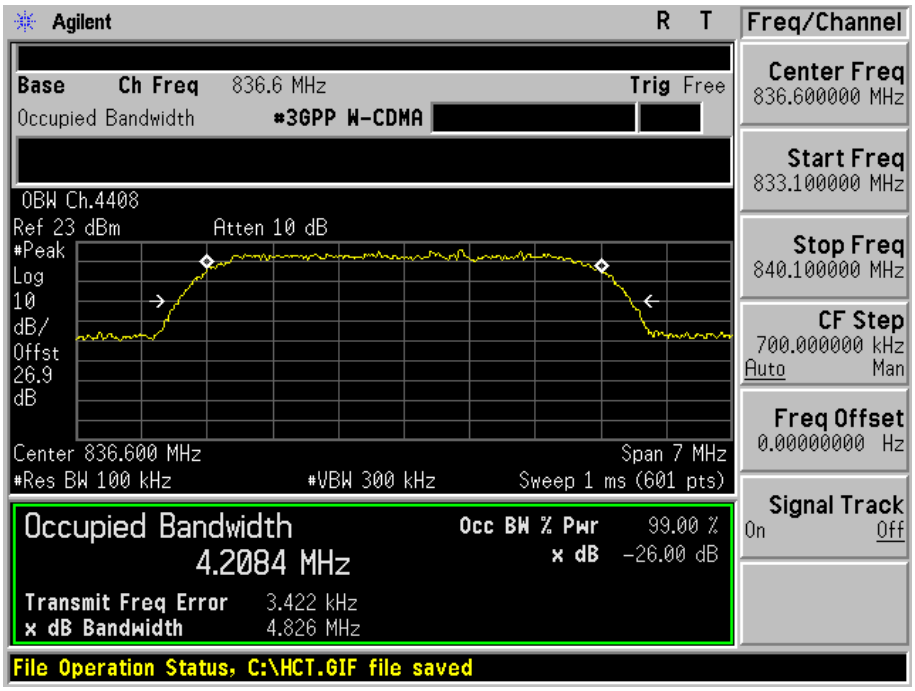
■ GSM1900 EDGE (512 CH.) Occupied Bandwidth



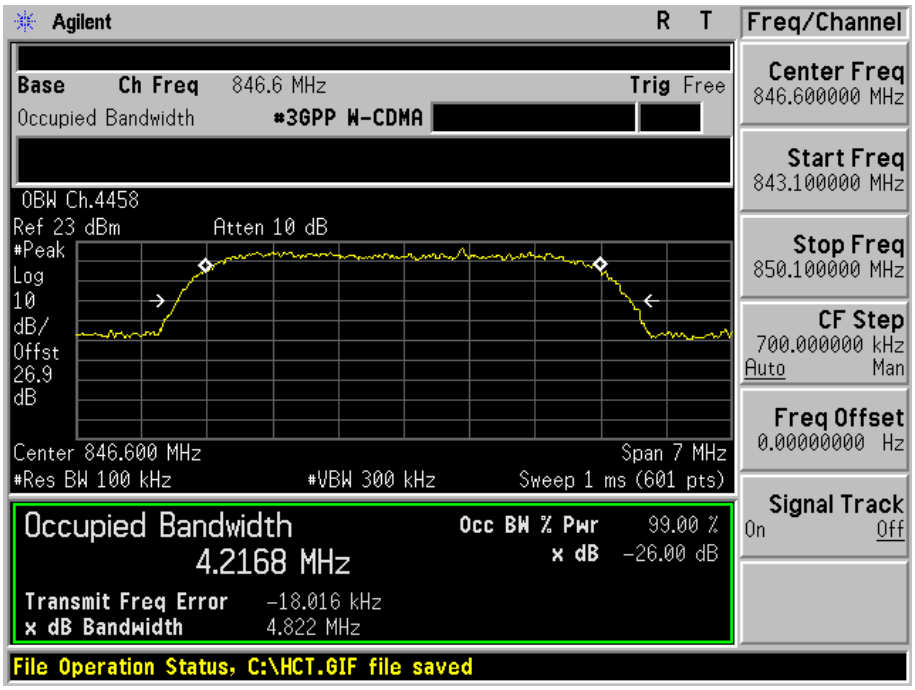
■ WCDMA850 MODE (4132 CH.) Occupied Bandwidth



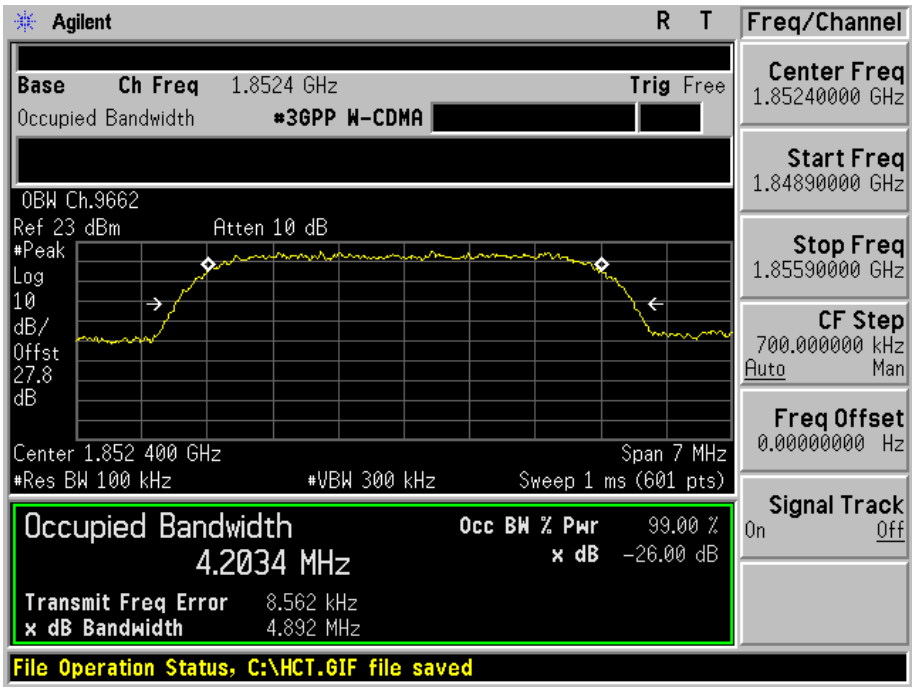
■ WCDMA850 MODE (4183 CH.) Occupied Bandwidth



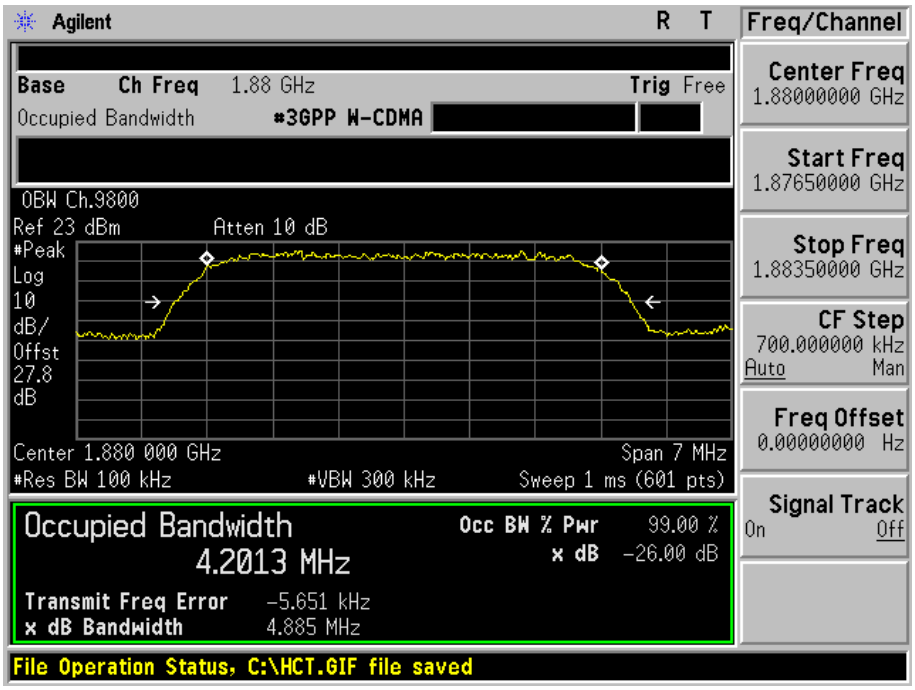
■ WCDMA850MODE (4233 CH.) Occupied Bandwidth



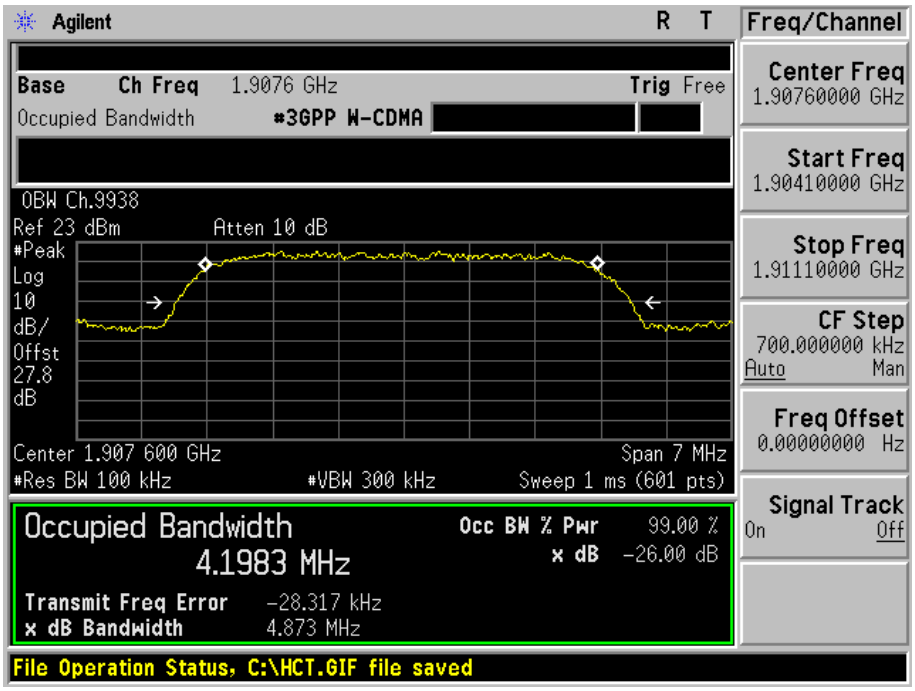
■ WCDMA1900 MODE (9262 CH.) Occupied Bandwidth



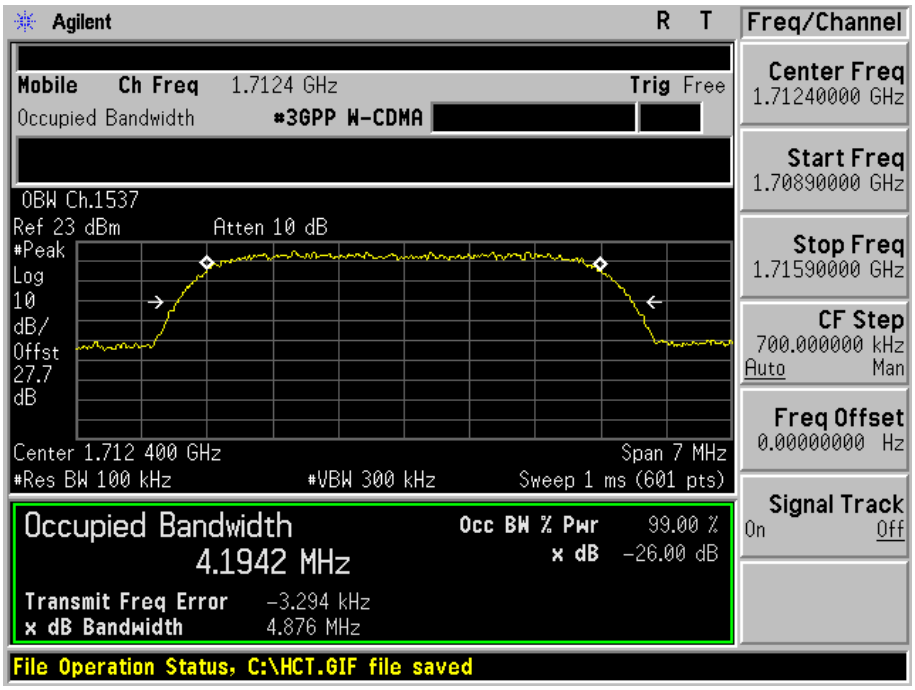
■ WCDMA1900 MODE (9400 CH.) Occupied Bandwidth



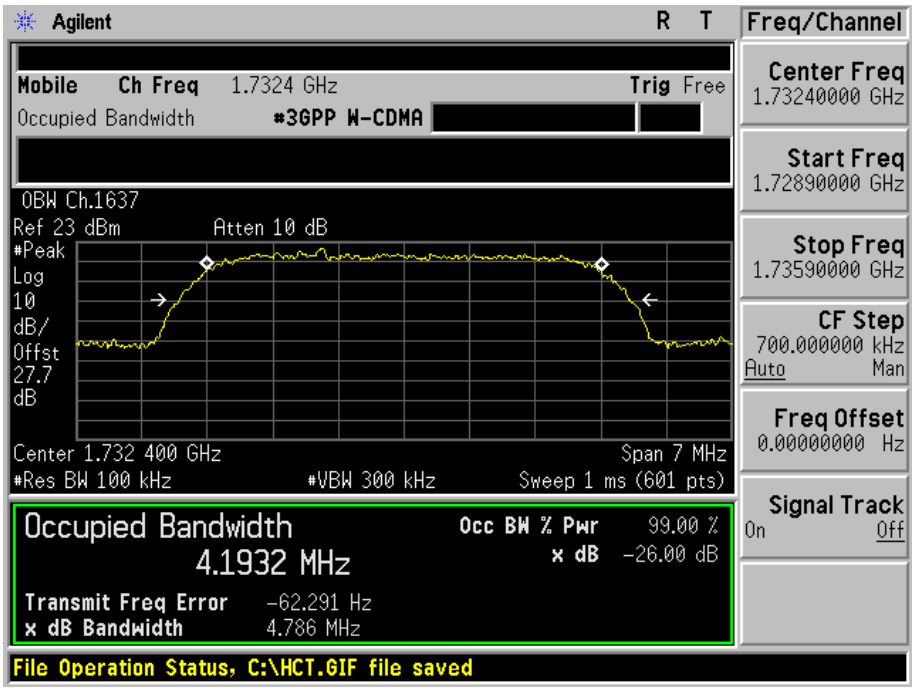
■ WCDMA1900 MODE (9538 CH.) Occupied Bandwidth



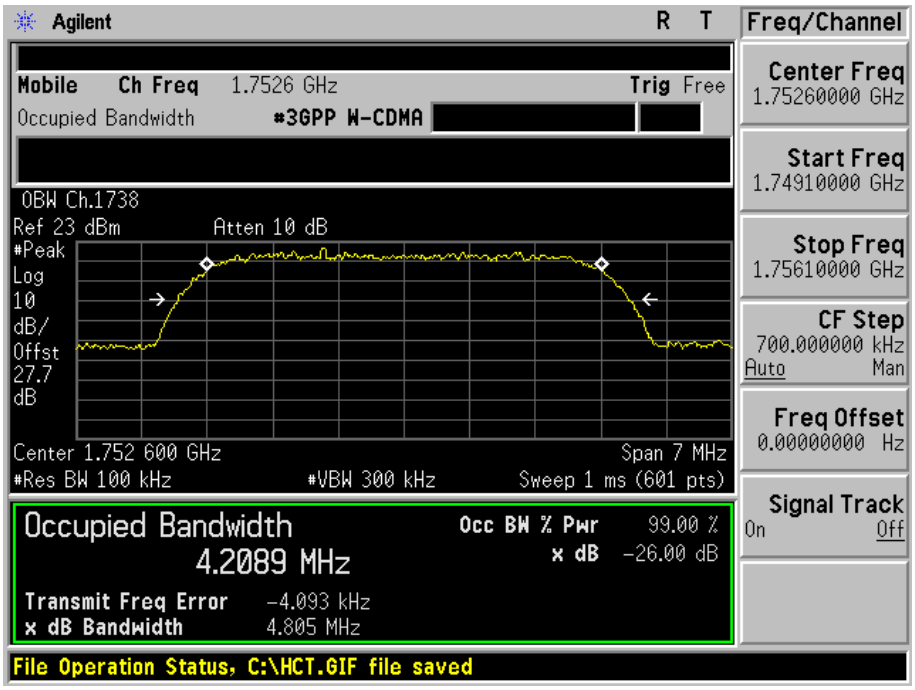
■ WCDMA1700 MODE (1312 CH.) Occupied Bandwidth



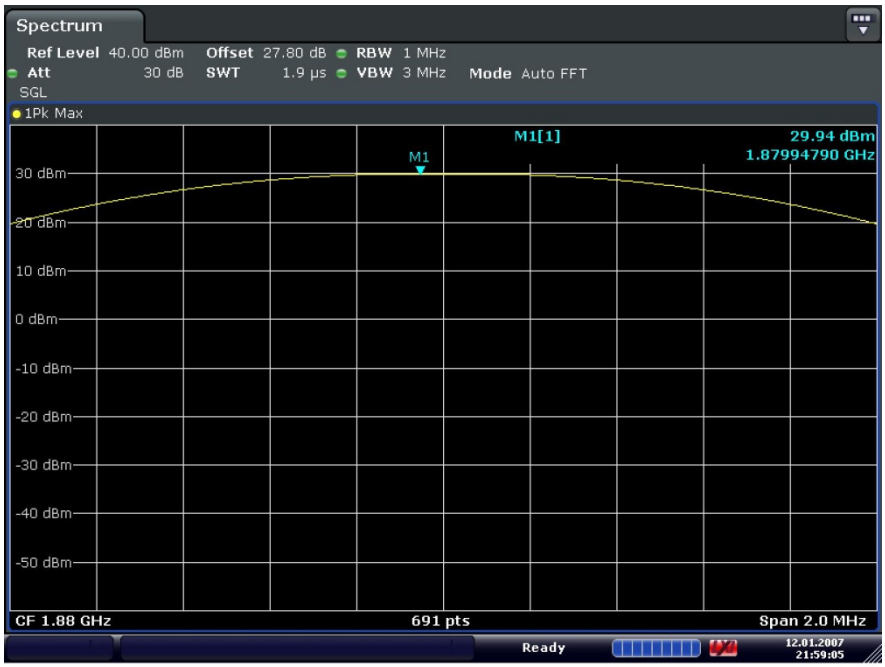
■ WCDMA1700 MODE (1412 CH.) Occupied Bandwidth



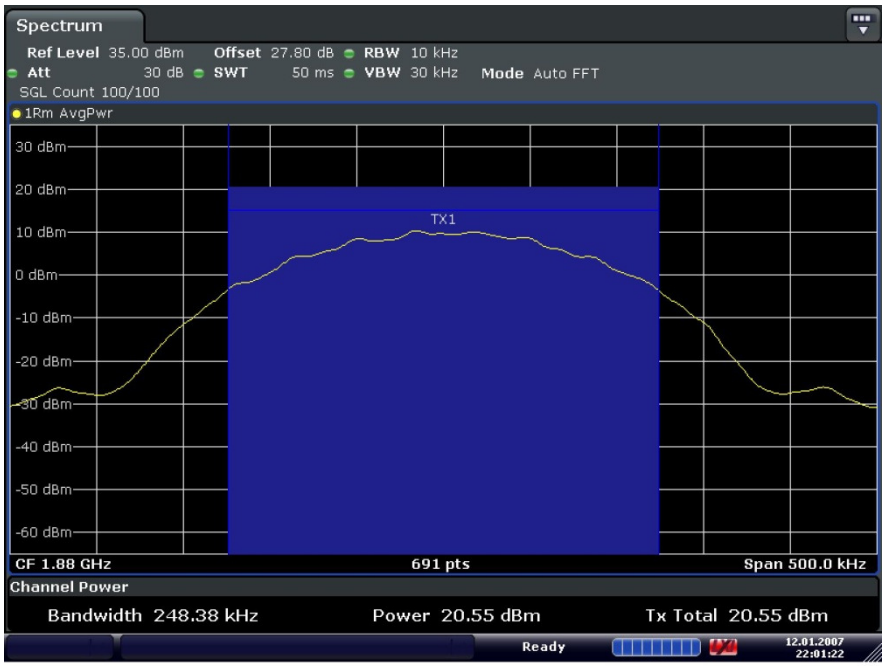
■ WCDMA1700 MODE (1513 CH.) Occupied Bandwidth



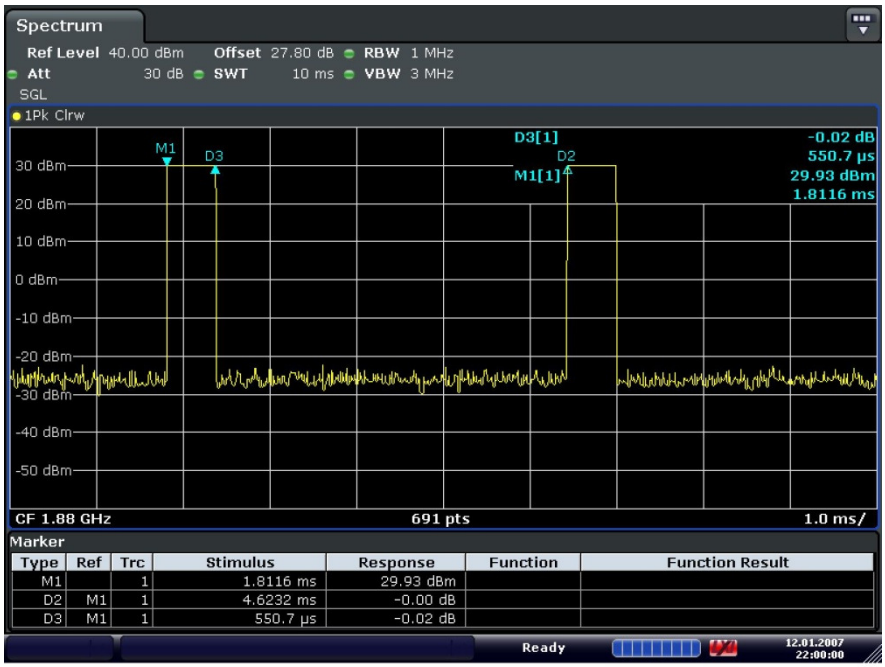
■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio P_{Pk}



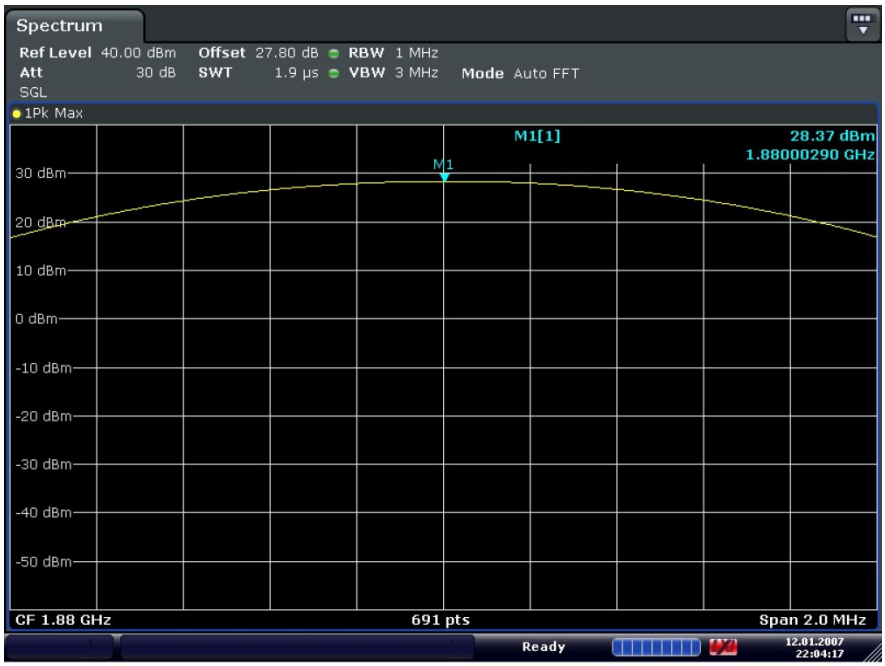
■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio P_{Avg}



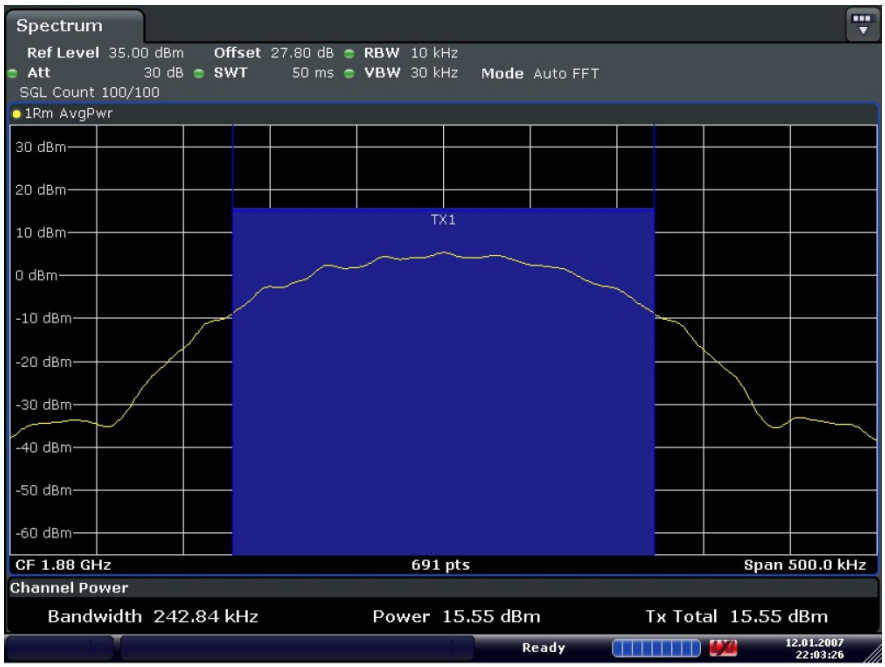
■ GSM1900 MODE (661 CH.) Peak-to-Average Ratio P_{Avg}



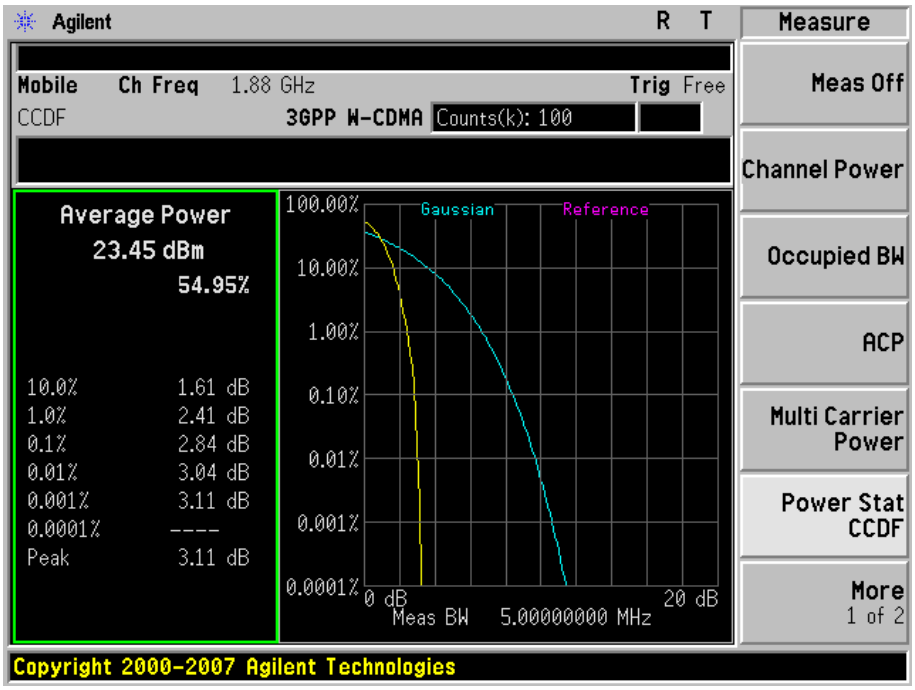
■ GSM1900 EDGE (661 CH.) Peak-to-Average Ratio P_{Pk}



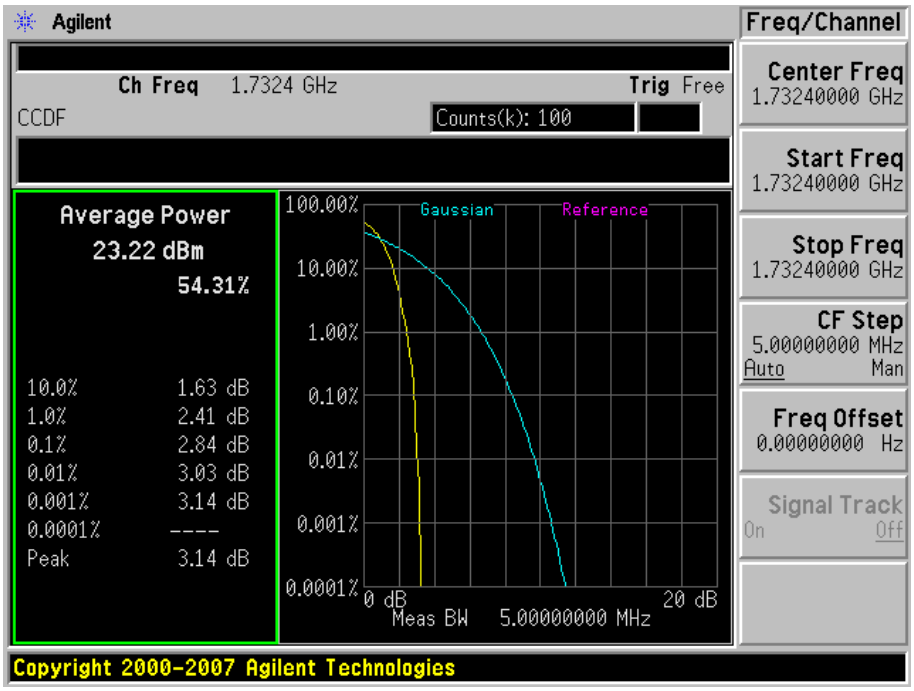
■ GSM1900 EDGE (661 CH.) Peak-to-Average Ratio P_{Avg}



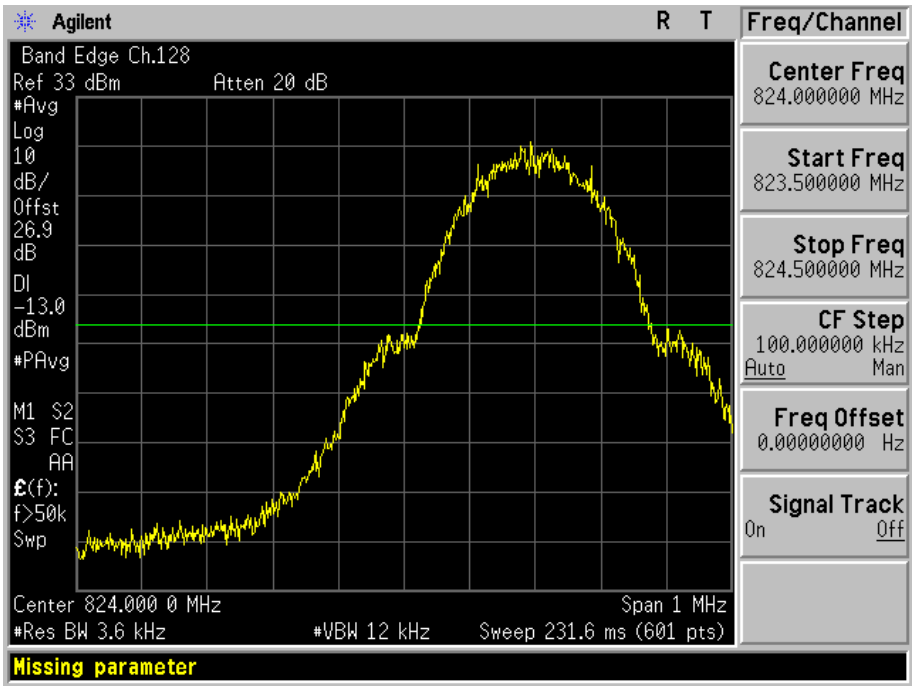
■ WCDMA1900 MODE (9400 CH.) Peak-to-Average Ratio



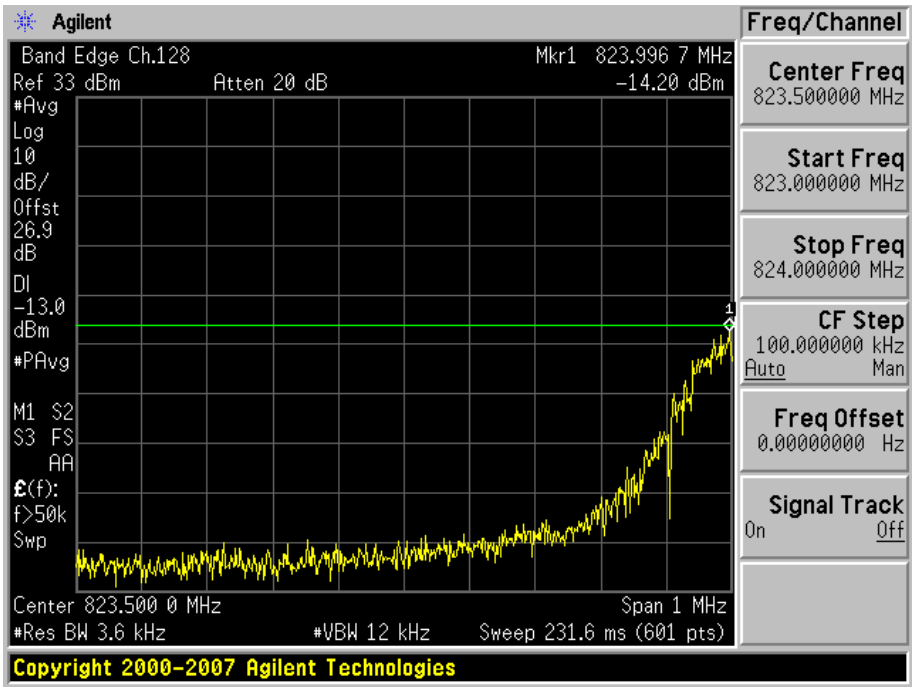
■ WCDMA1700 MODE (1412 CH.) Peak-to-Average Ratio



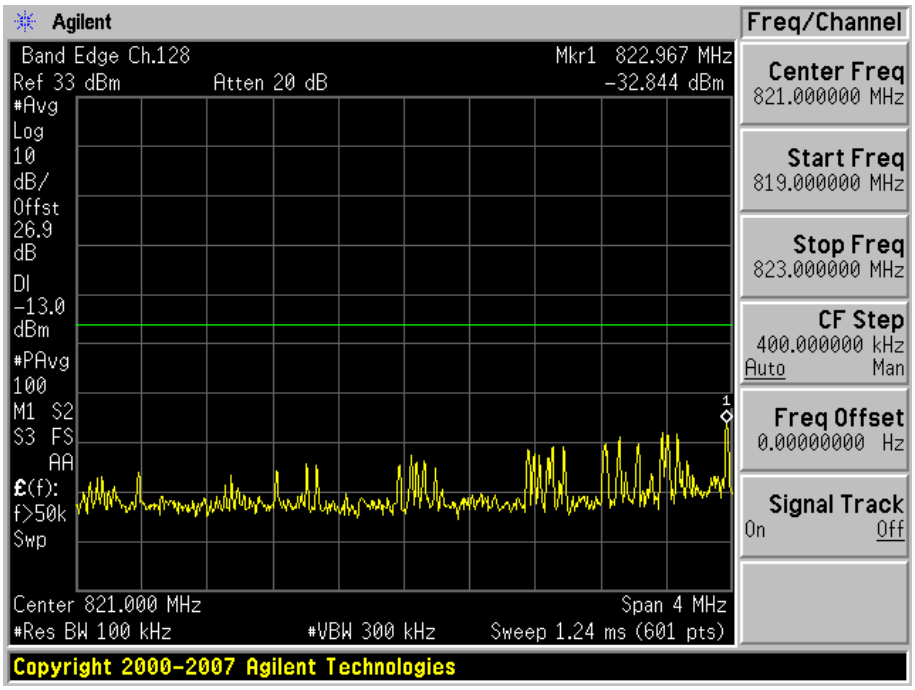
■ GSM850 MODE (128 CH.) Block Edge 1



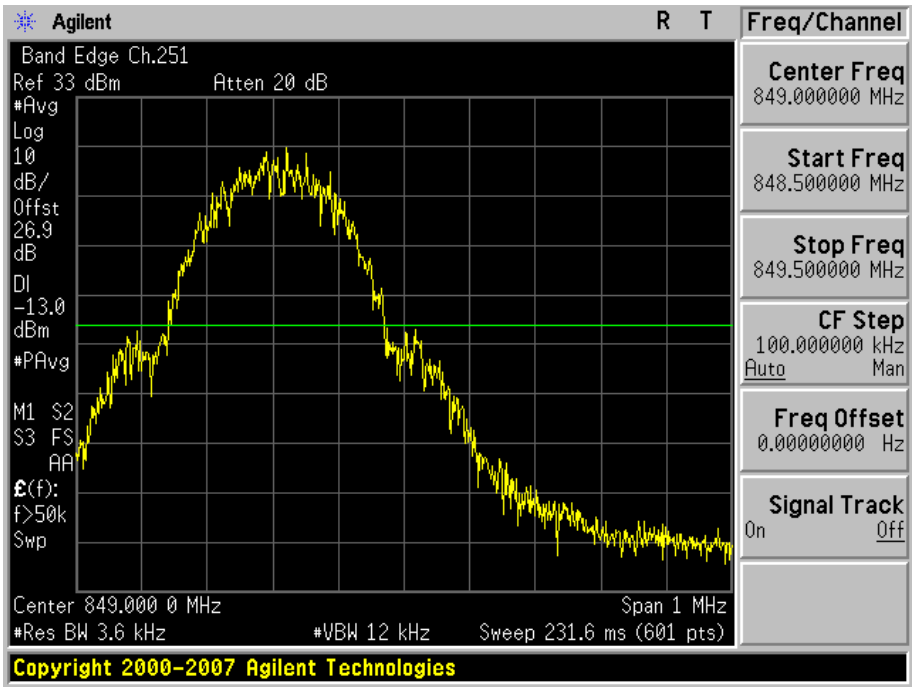
■ GSM850 MODE (128 CH.) Block Edge 2



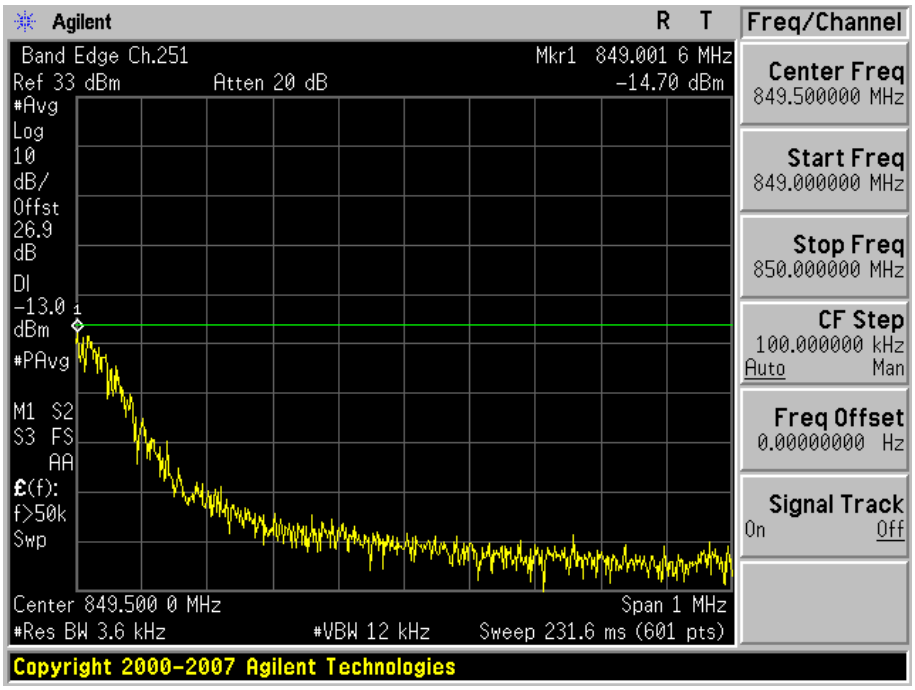
■ GSM850 MODE (128 CH.) Block Edge 3



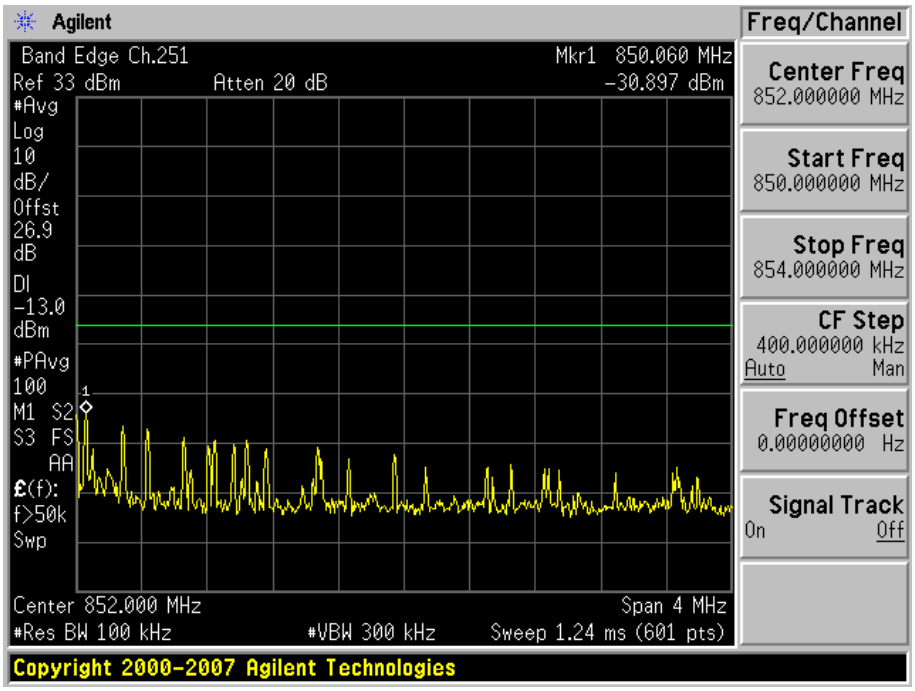
■ GSM850 MODE (251 CH.) Block Edge 1



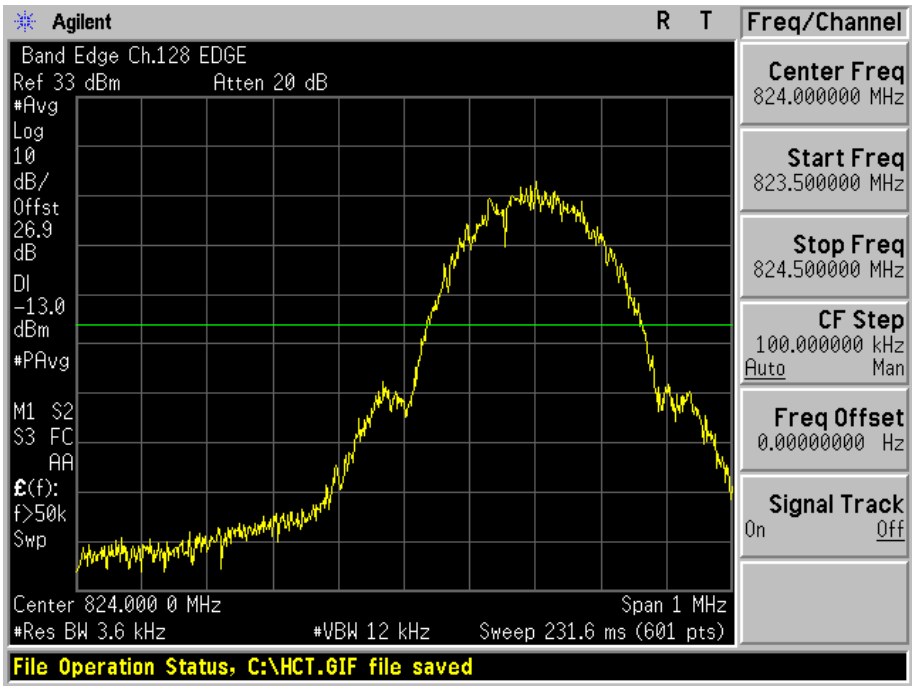
■ GSM850 MODE (251 CH.) Block Edge 2



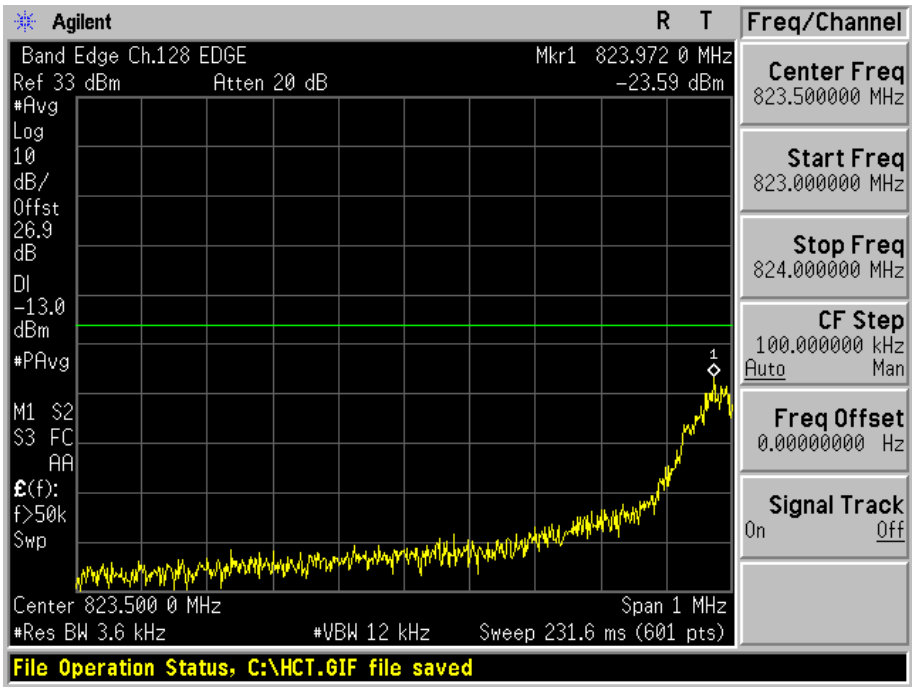
■ GSM850 MODE (251 CH.) Block Edge 3



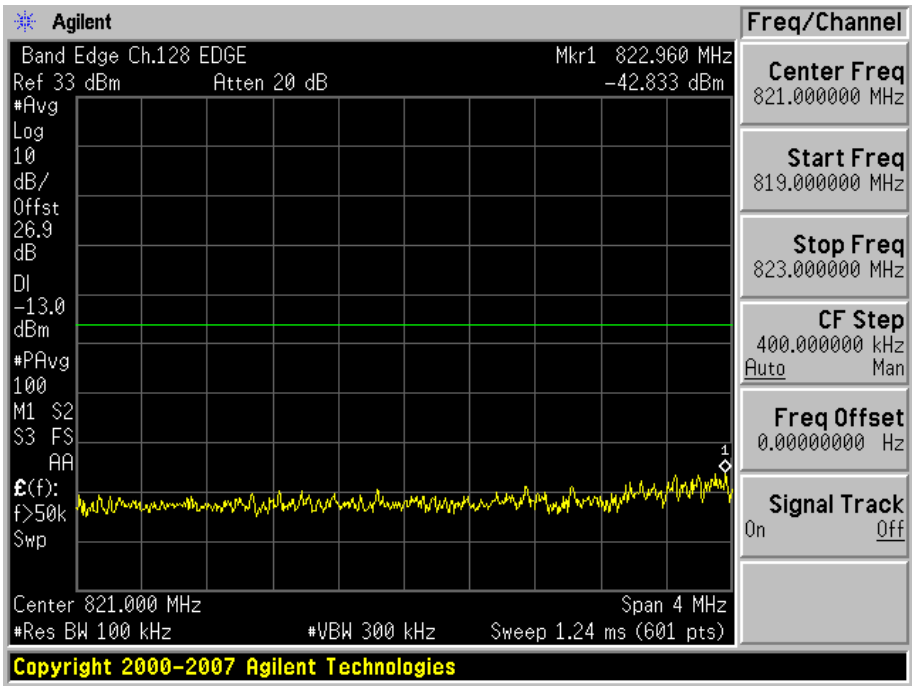
■ EDGE MODE (128 CH.) Block Edge 1



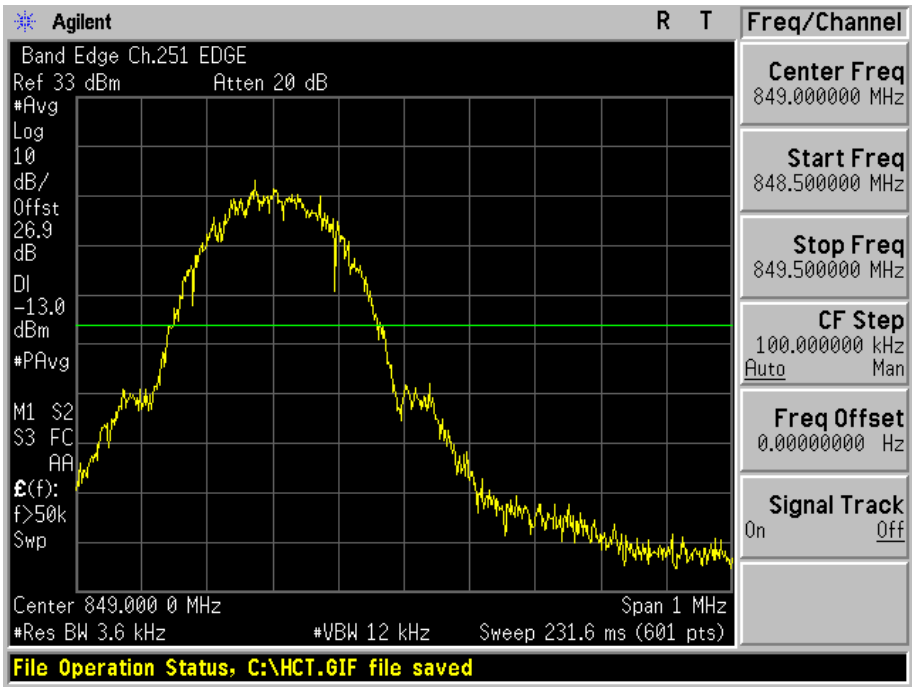
■ EDGE MODE (128 CH.) Block Edge 2



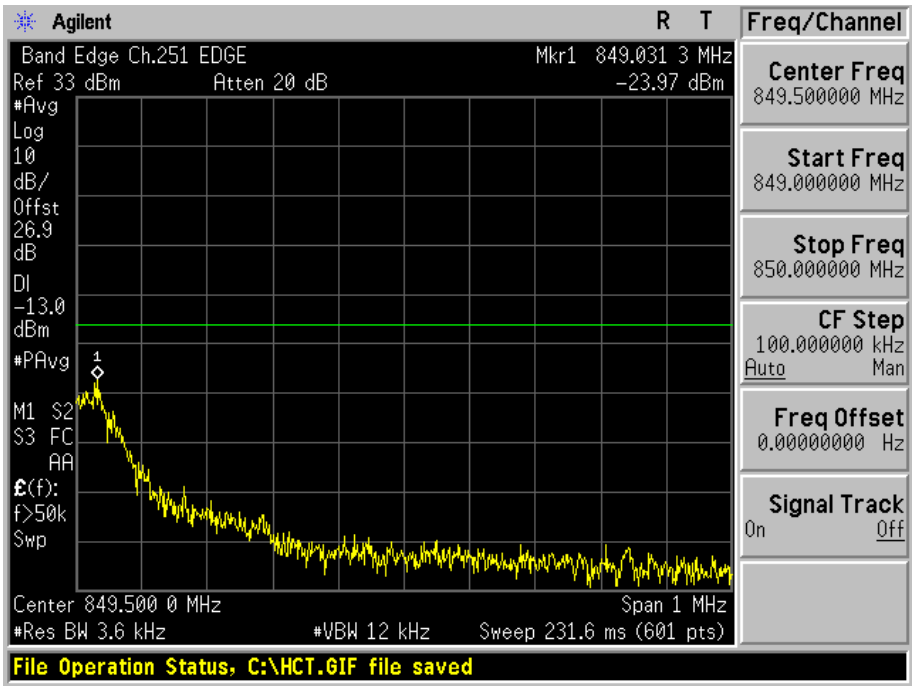
■ EDGE MODE (128 CH.) Block Edge 3



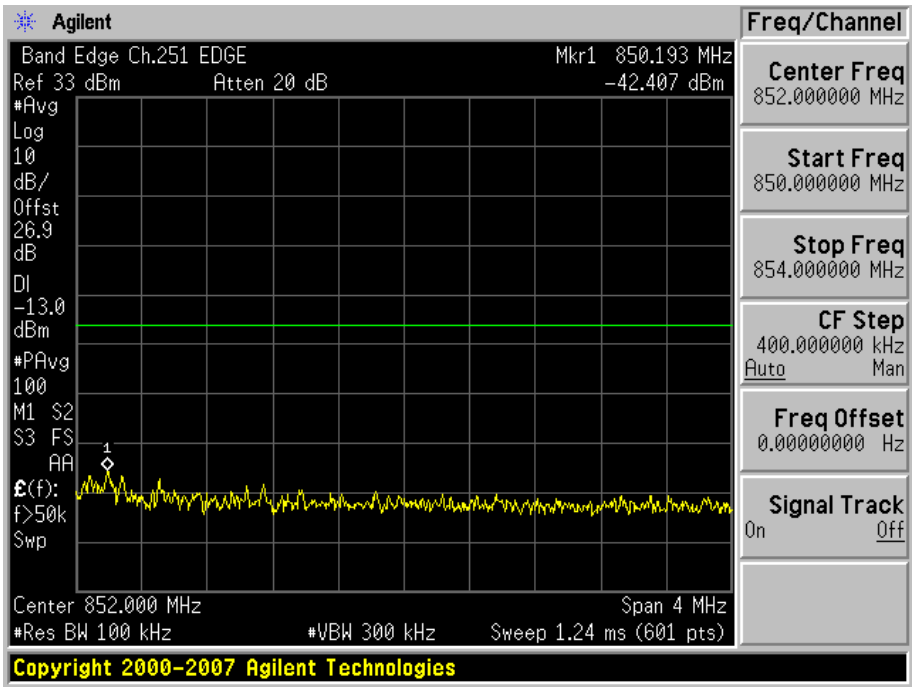
■ EDGE MODE (251 CH.) Block Edge 1



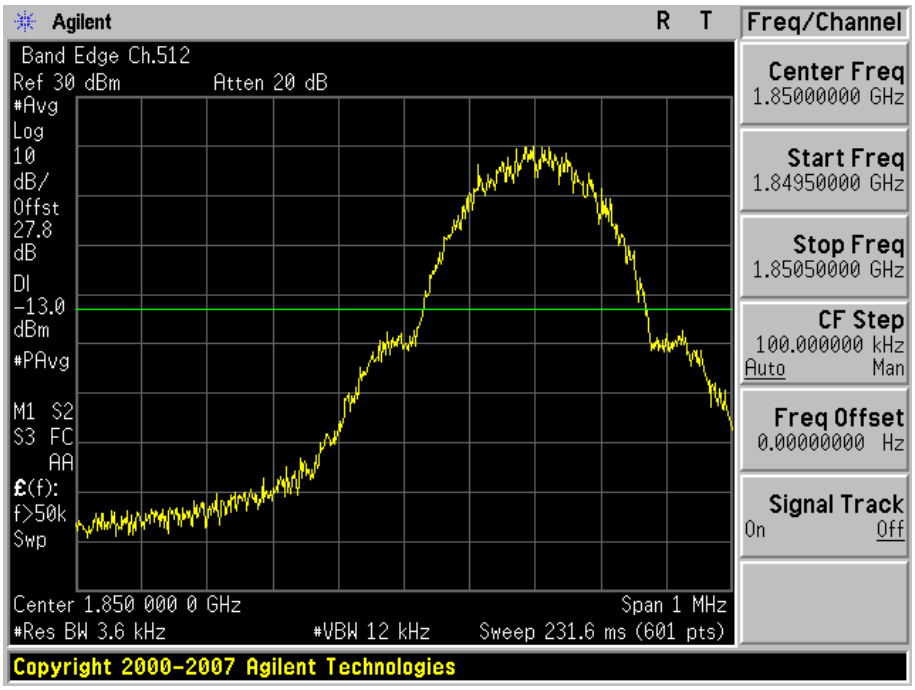
■ EDGE MODE (251 CH.) Block Edge 2



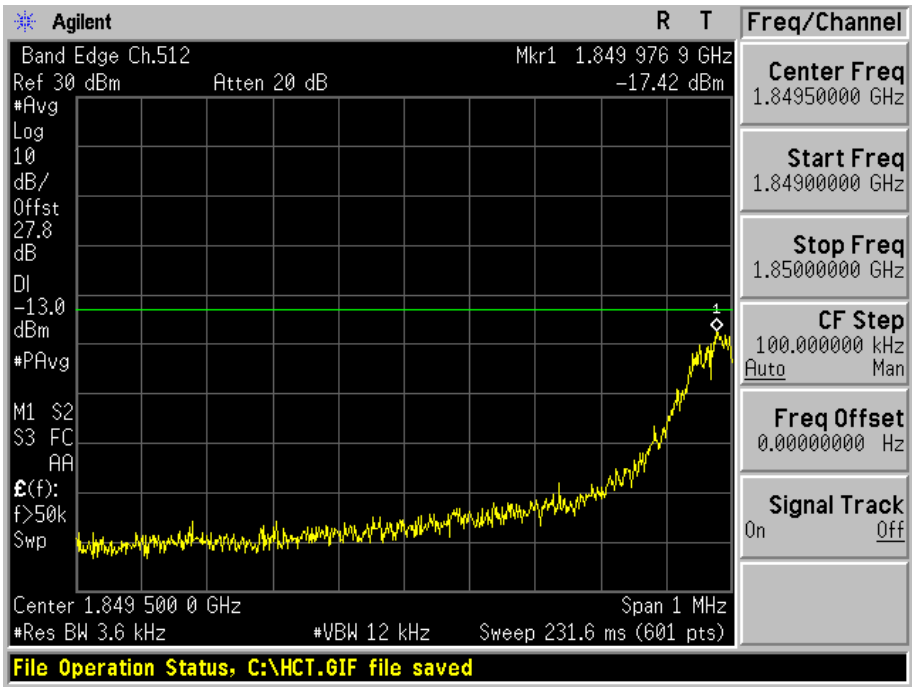
■ EDGE MODE (251 CH.) Block Edge 3



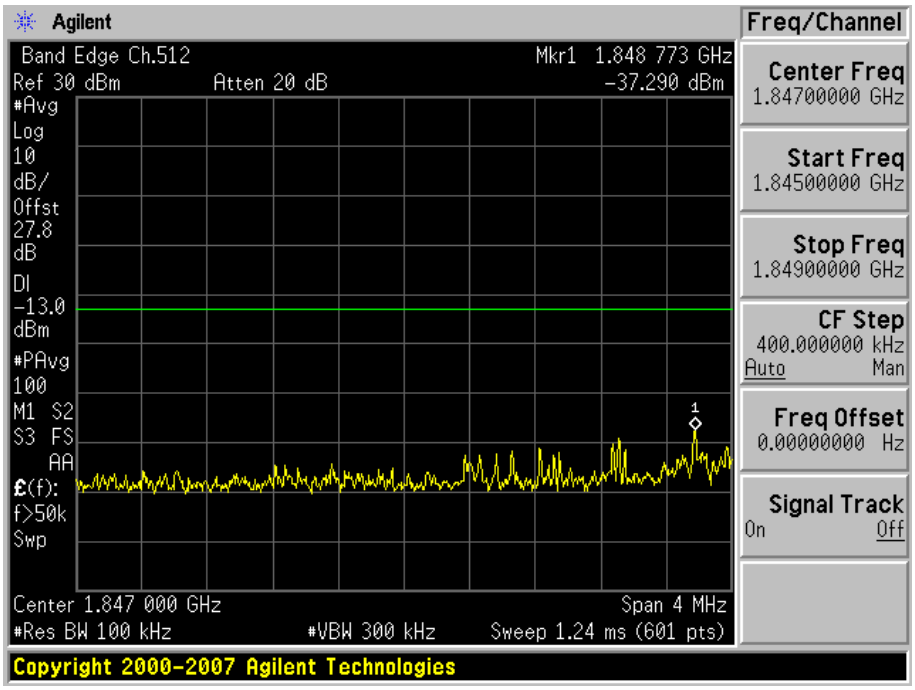
■ GSM1900 MODE (512 CH.) Block Edge 1



■ GSM1900 MODE (512 CH.) Block Edge 2



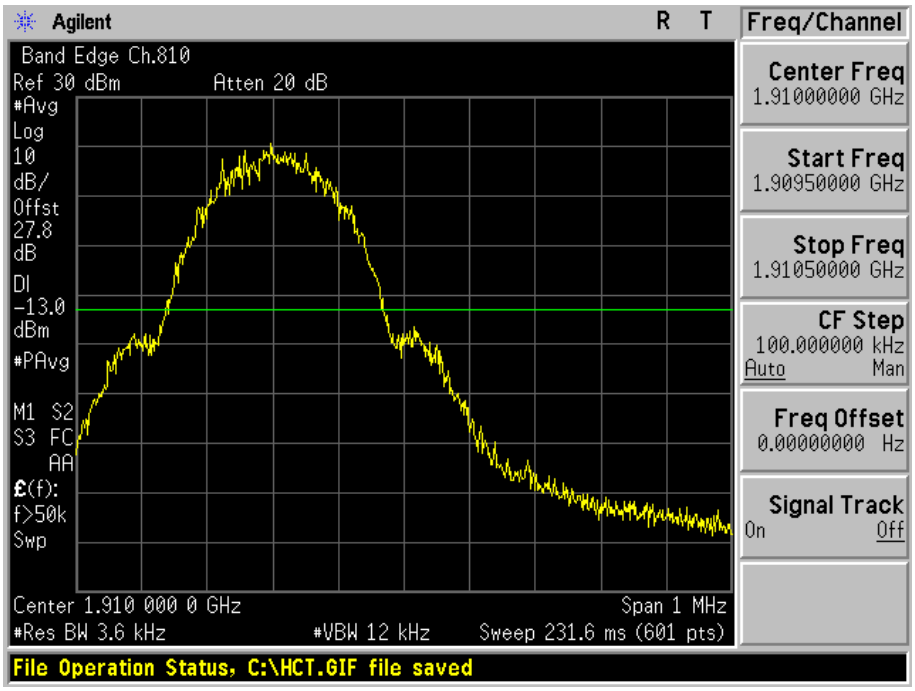
■ GSM1900 MODE (512 CH.) Block Edge 3



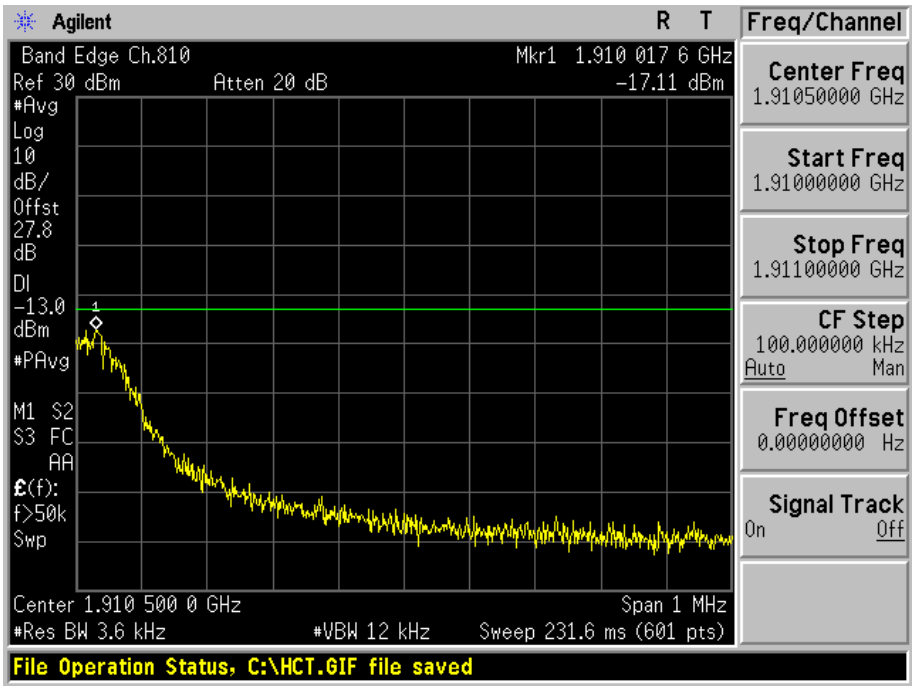
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10*log(1 MHz/100 kHz) dB = -37.290 dBm + 10 dB = **-27.290 dBm**

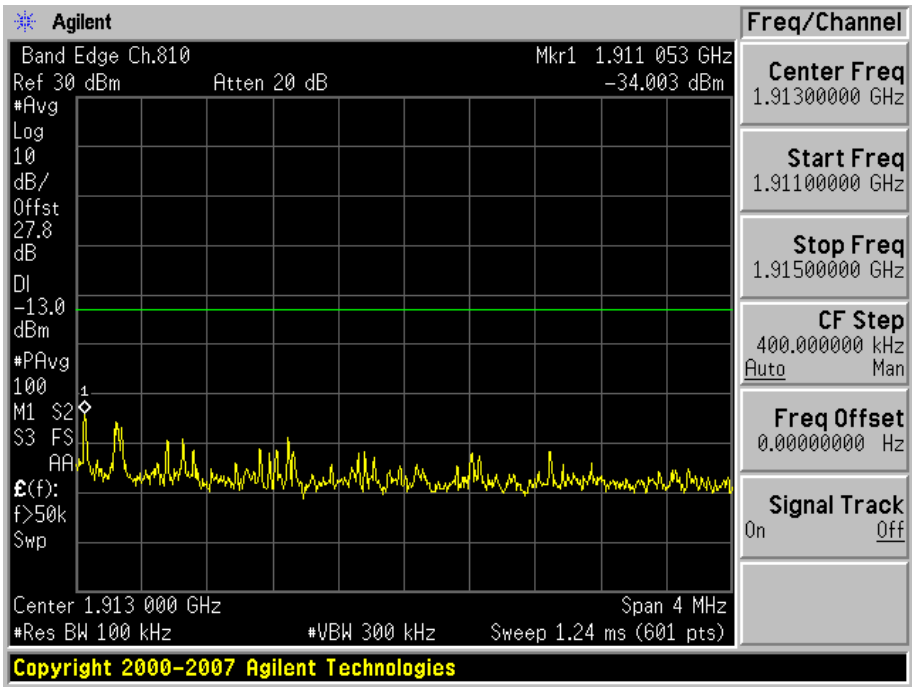
■ GSM1900 MODE (810 CH.) Block Edge 1



■ GSM1900 MODE (810 CH.) Block Edge 2



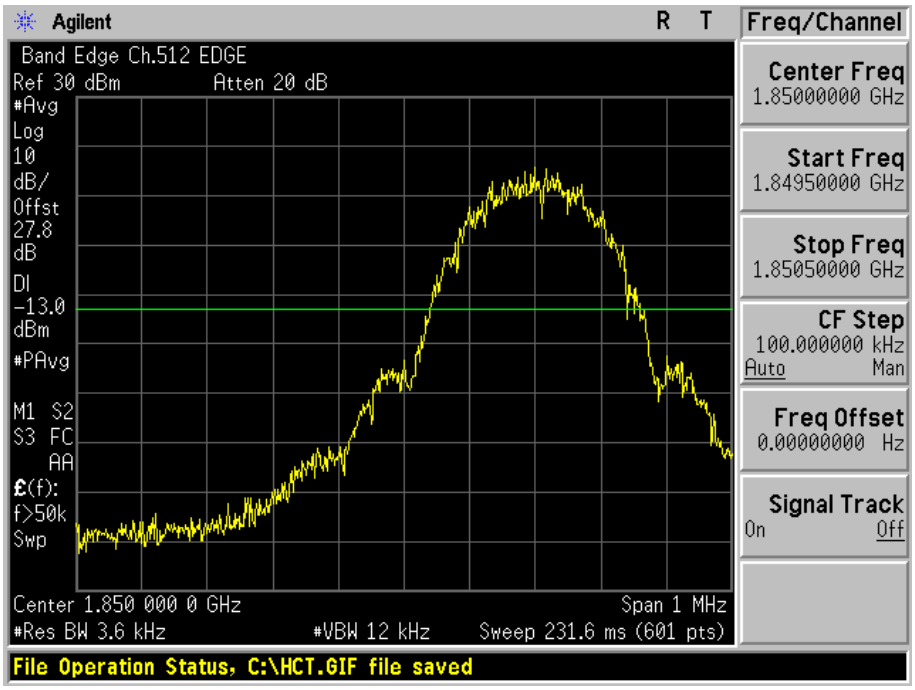
■ GSM1900 MODE (810 CH.) Block Edge 3



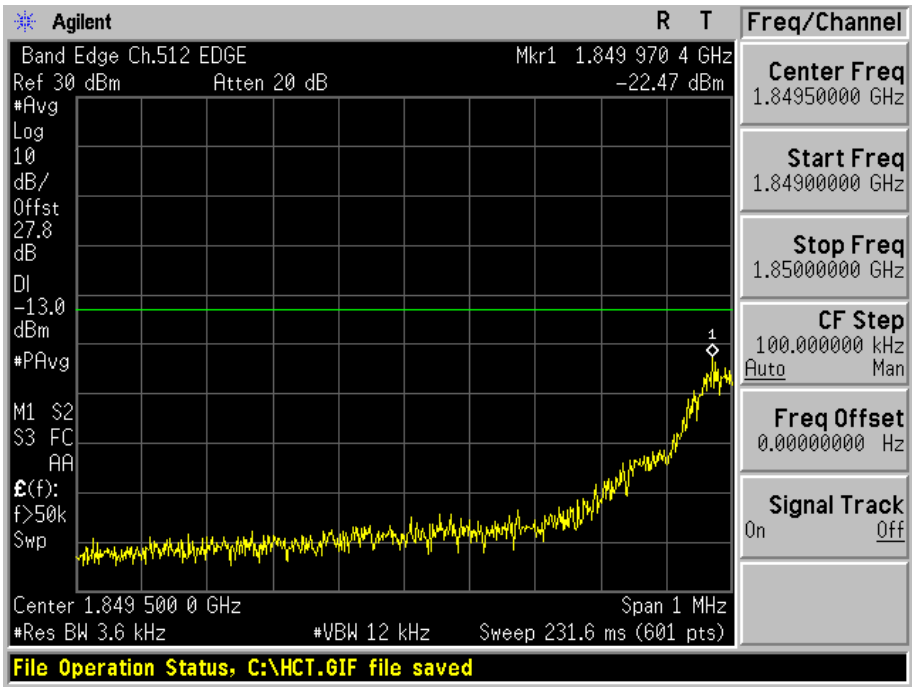
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10*log(1 MHz/100 kHz) dB = -34.003 dBm + 10 dB = **-24.003 dBm**

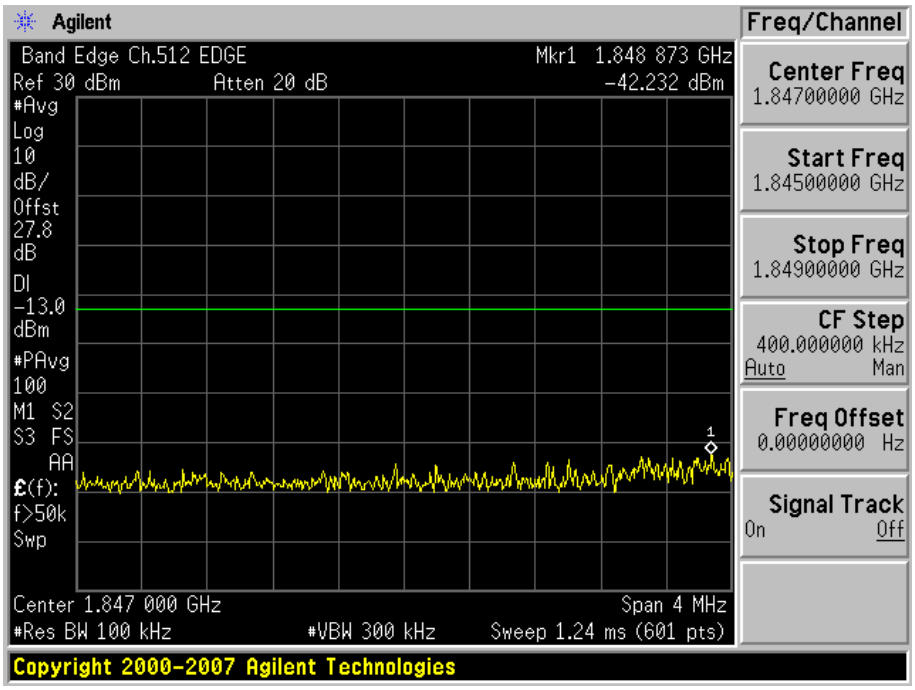
■ EDGE MODE (512 CH.) Block Edge 1



■ EDGE MODE (512 CH.) Block Edge 2



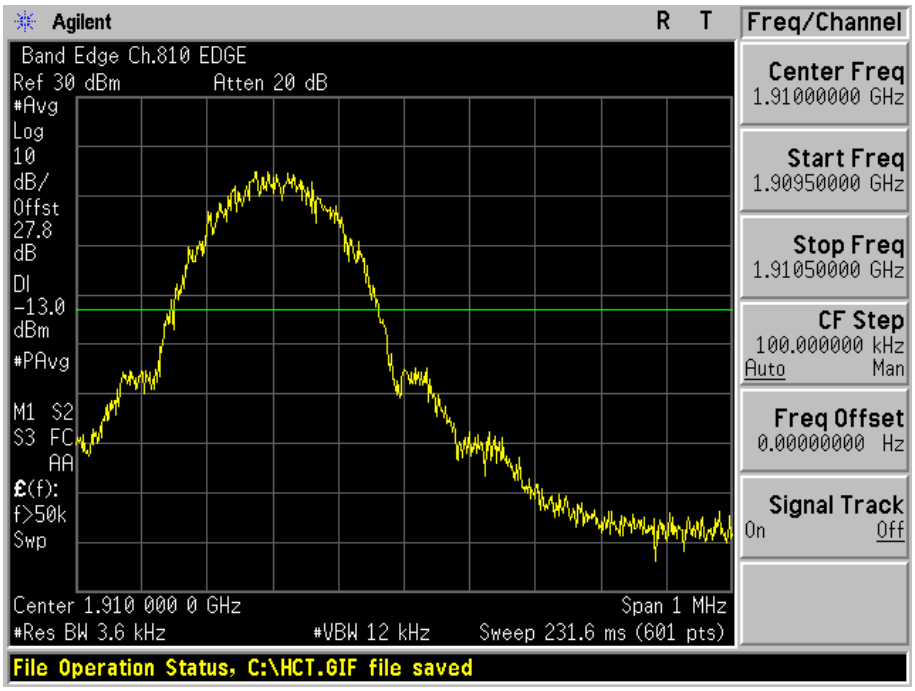
■ EDGE MODE (512 CH.) Block Edge 3



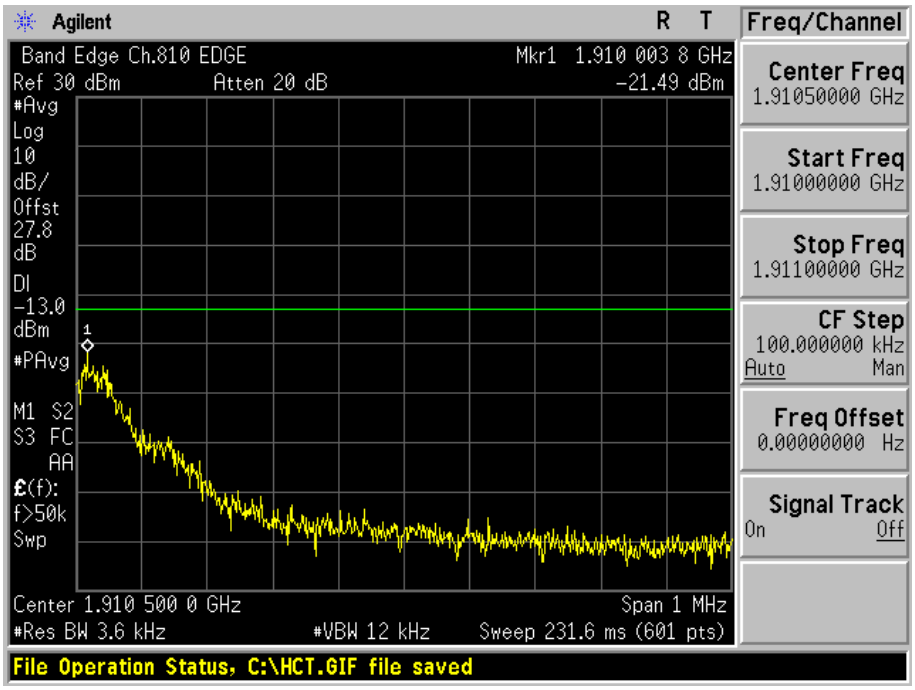
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10*log(1 MHz/100 kHz) dB = -42.232 dBm + 10 dB = **-32.232 dBm**

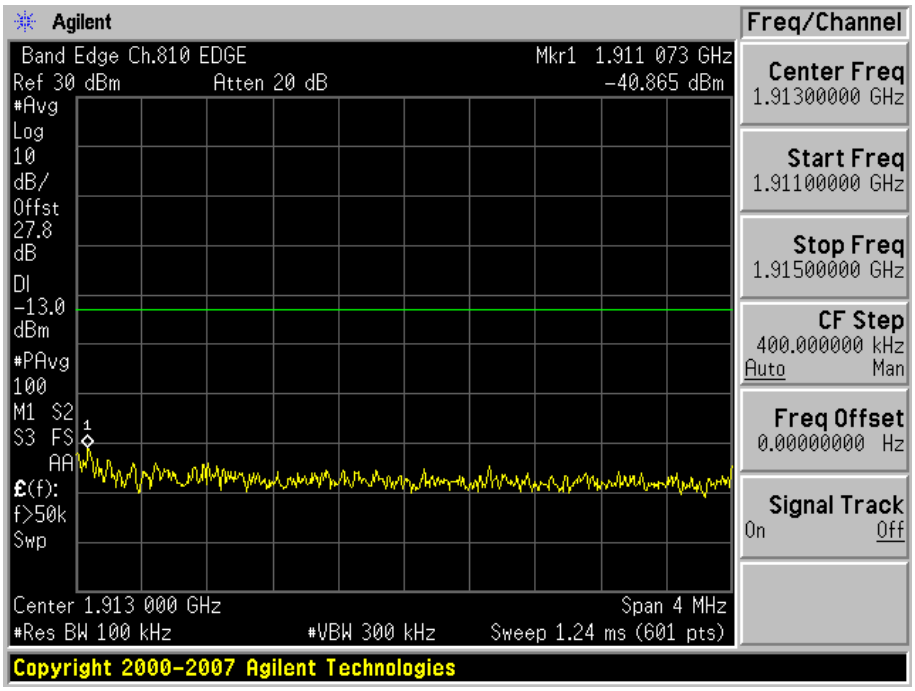
■ EDGE MODE (810 CH.) Block Edge 1



■ EDGE MODE (810 CH.) Block Edge 2



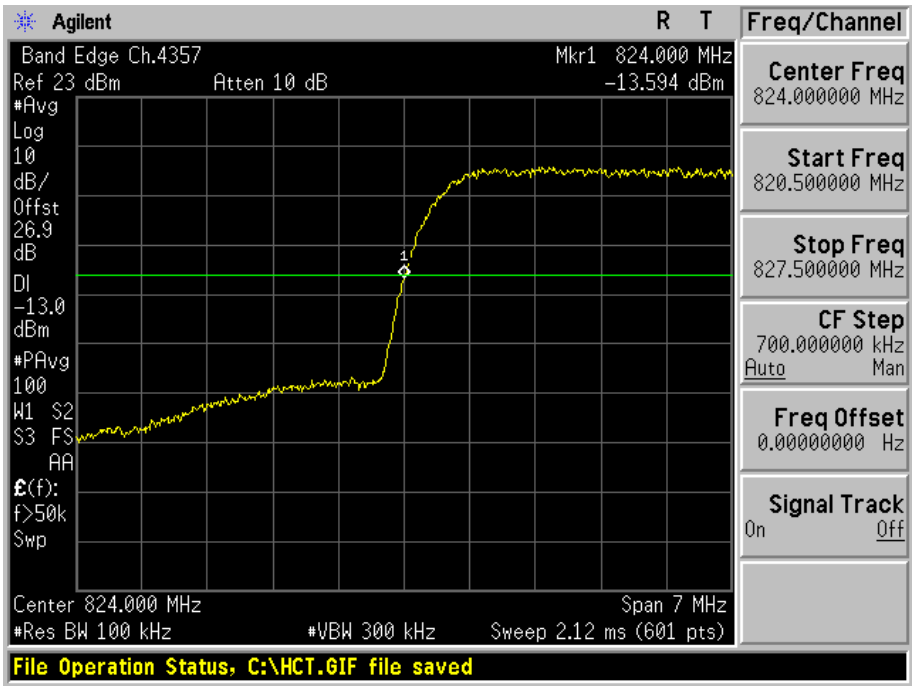
■ EDGE MODE (810 CH.) Block Edge 3



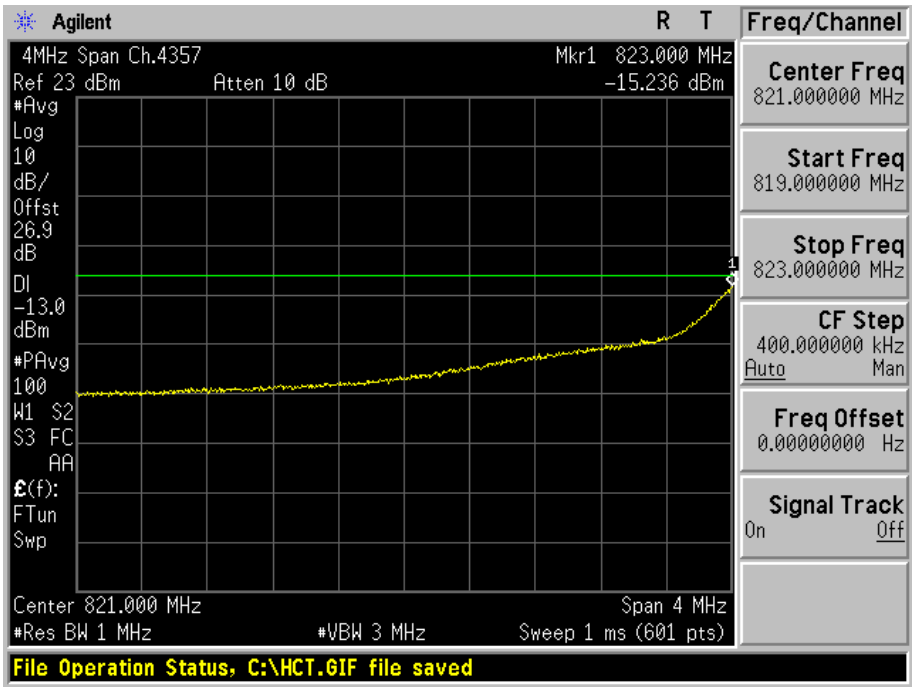
Note : We used a narrower RBW in order to increase accuracy.

Calculation = Reading Value + 10*log(1 MHz/100 kHz) dB = -40.865 dBm + 10 dB = **-30.865 dBm**

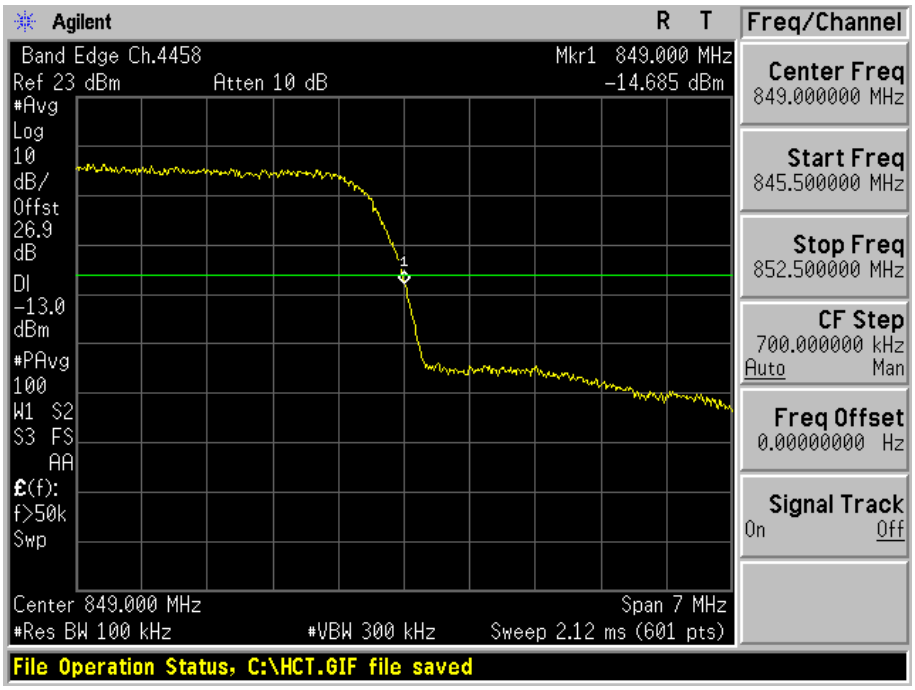
■ WCDMA850 MODE (4132 CH.) Block Edge



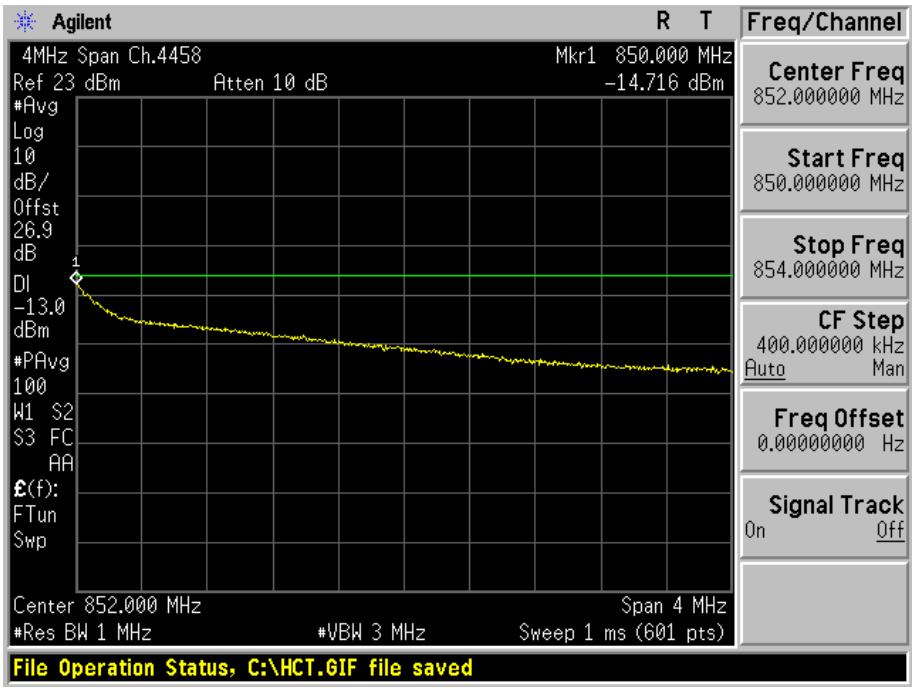
■ WCDMA850 MODE (4132 CH.) – 4 MHz Span



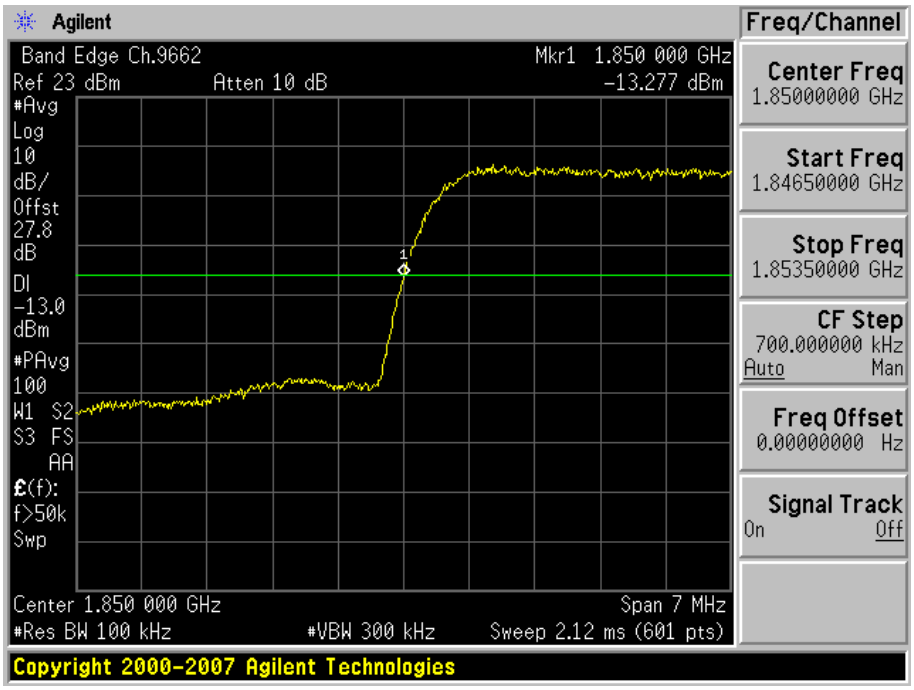
■ WCDMA850MODE (4233 CH.) Block Edge



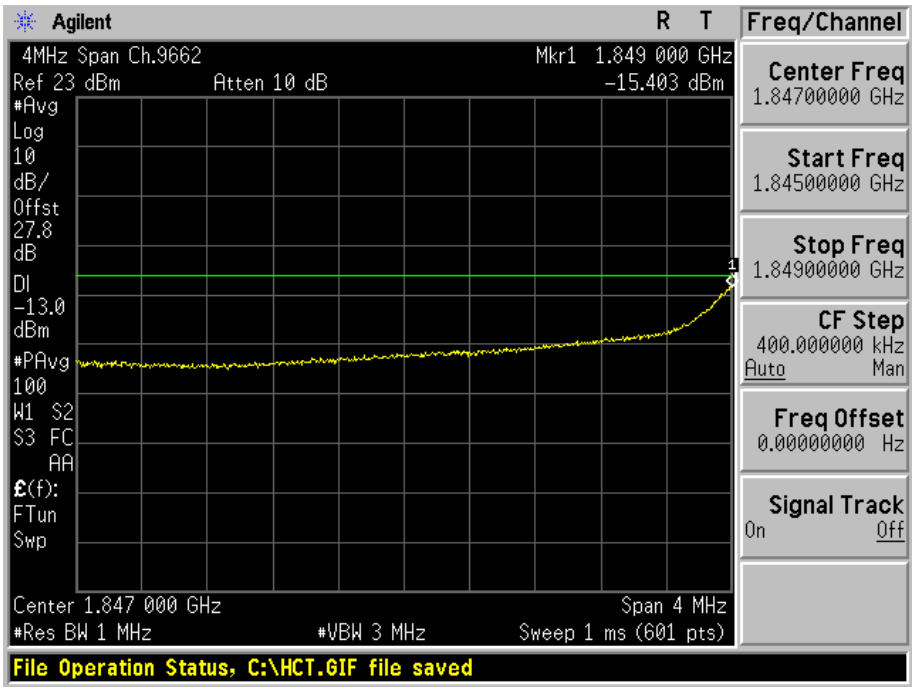
■ WCDMA850MODE (4233 CH.) – 4 MHz Span



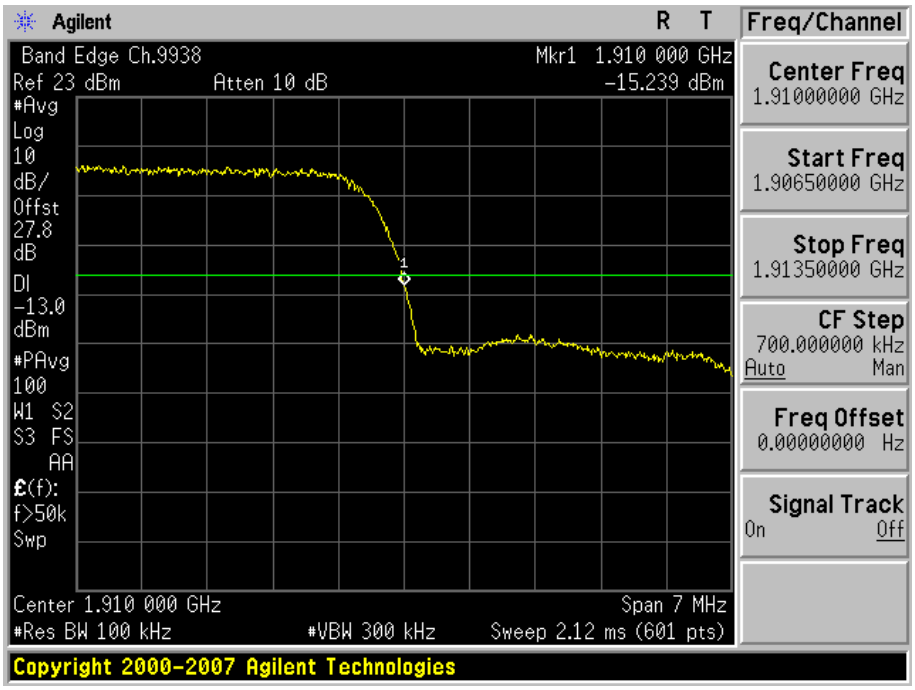
■ WCDMA1900 MODE (9262 CH.) Block Edge



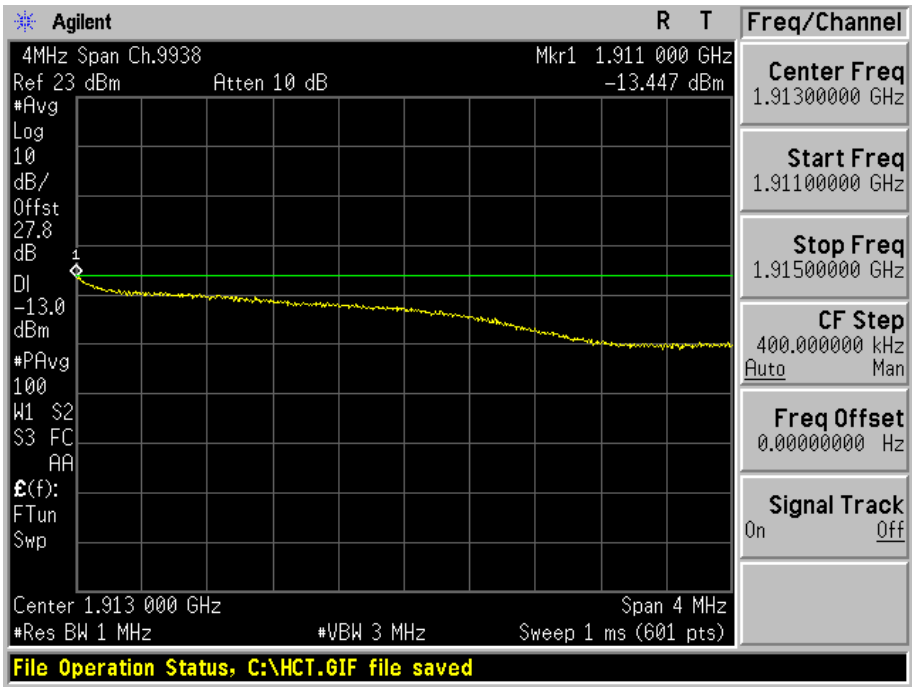
■ WCDMA1900 MODE (9262 CH.) – 4 MHz Span



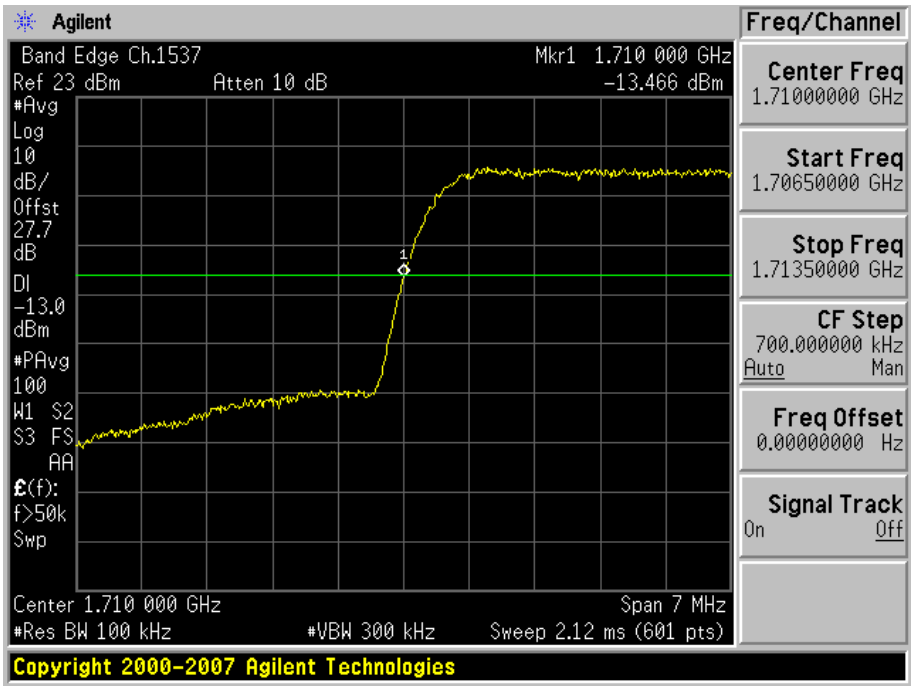
■ WCDMA1900 MODE (9538 CH.) Block Edge



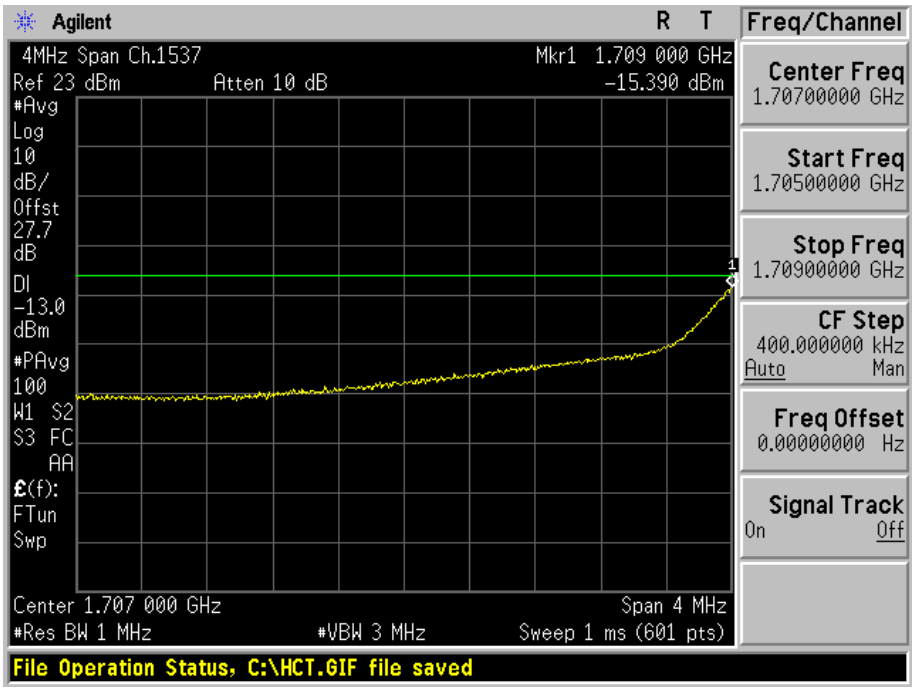
■ WCDMA1900 MODE (9538 CH.) – 4 MHz Span



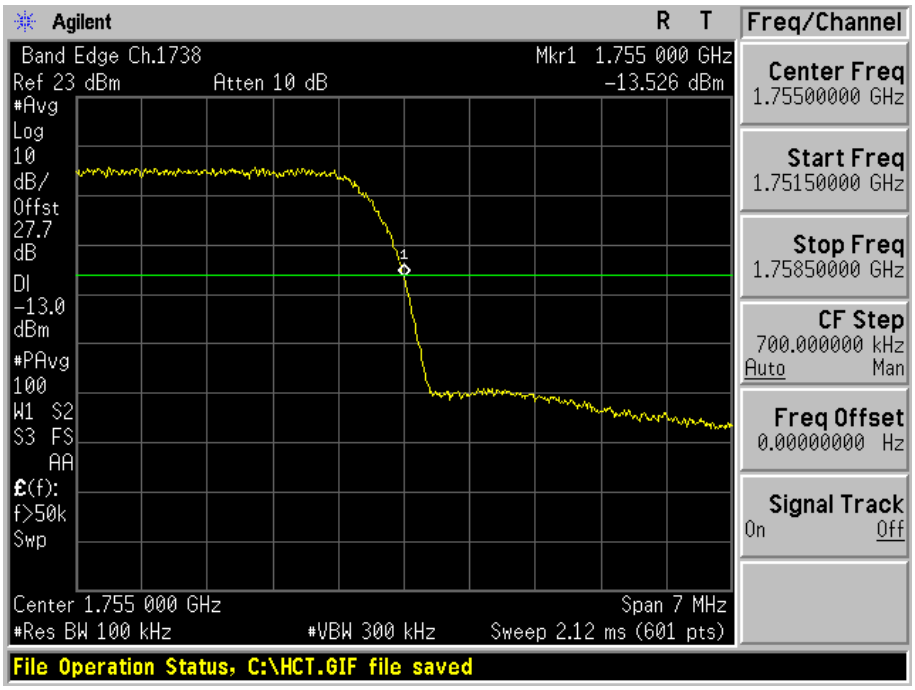
■ WCDMA1700 MODE (1312 CH.) Block Edge



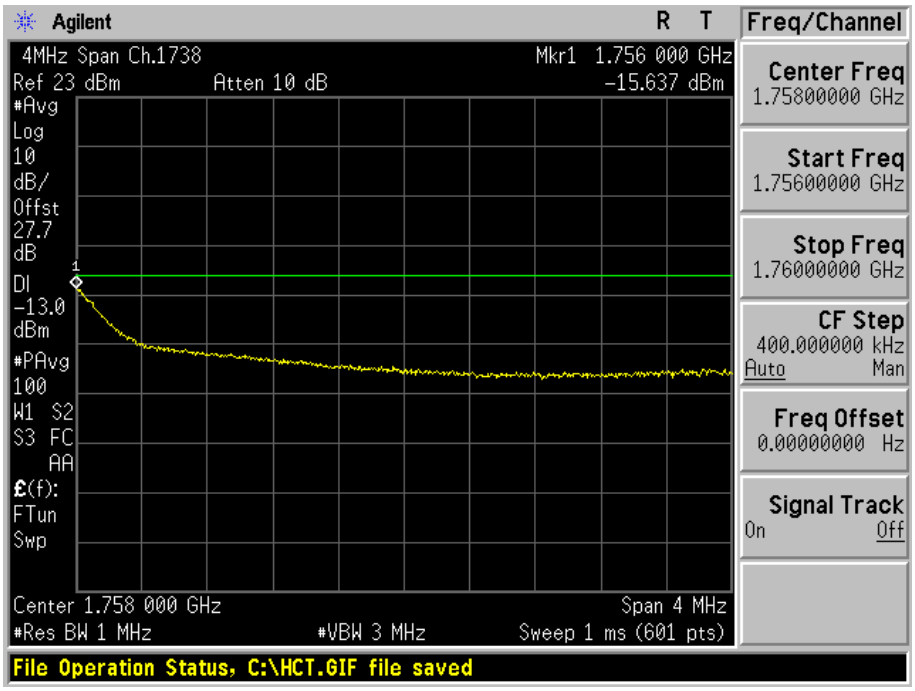
■ WCDMA1700 MODE (1312 CH.) – 4 MHz Span



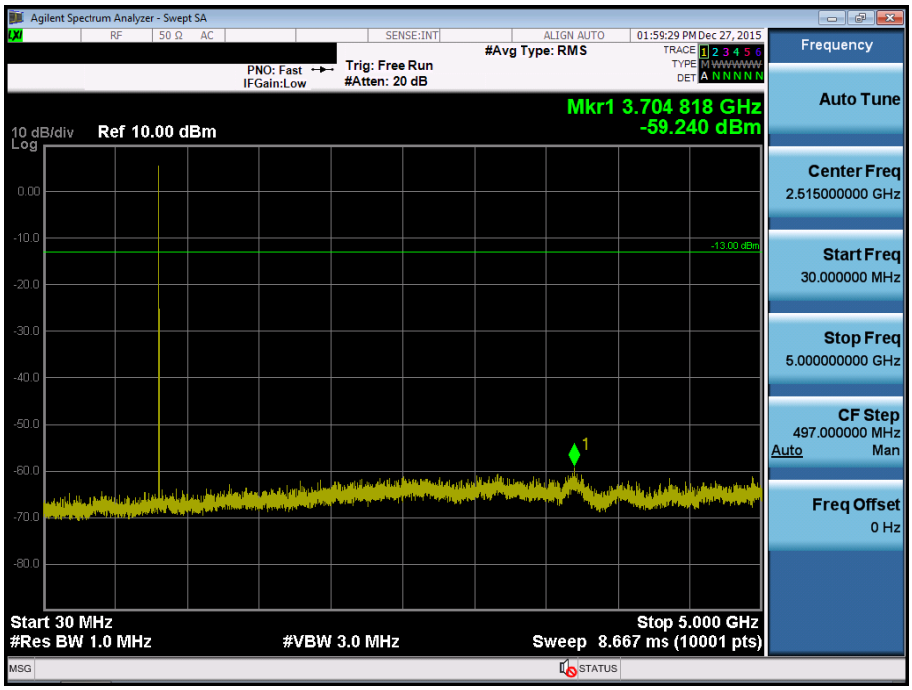
■ WCDMA1700 MODE (1513 CH.) Block Edge



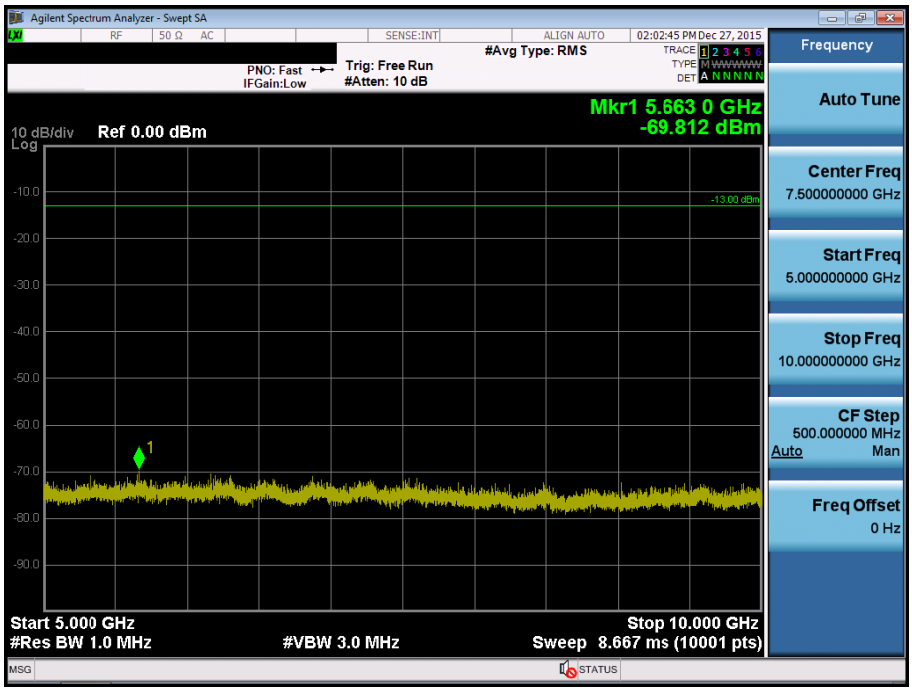
■ WCDMA1700 MODE (1513 CH.) – 4 MHz Span



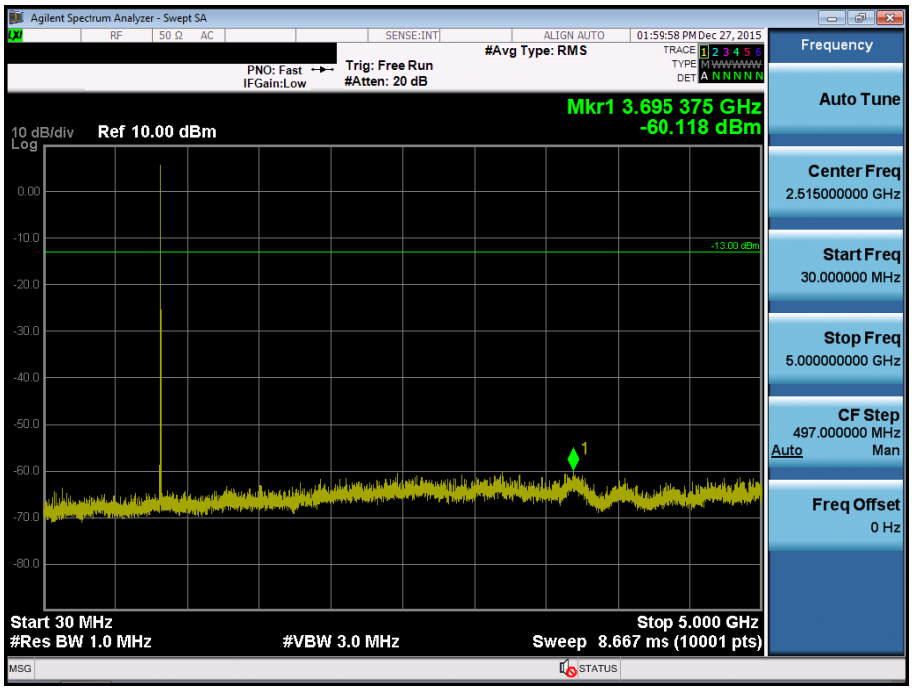
■ GSM850 MODE (128 CH.) Conducted Spurious Emissions1



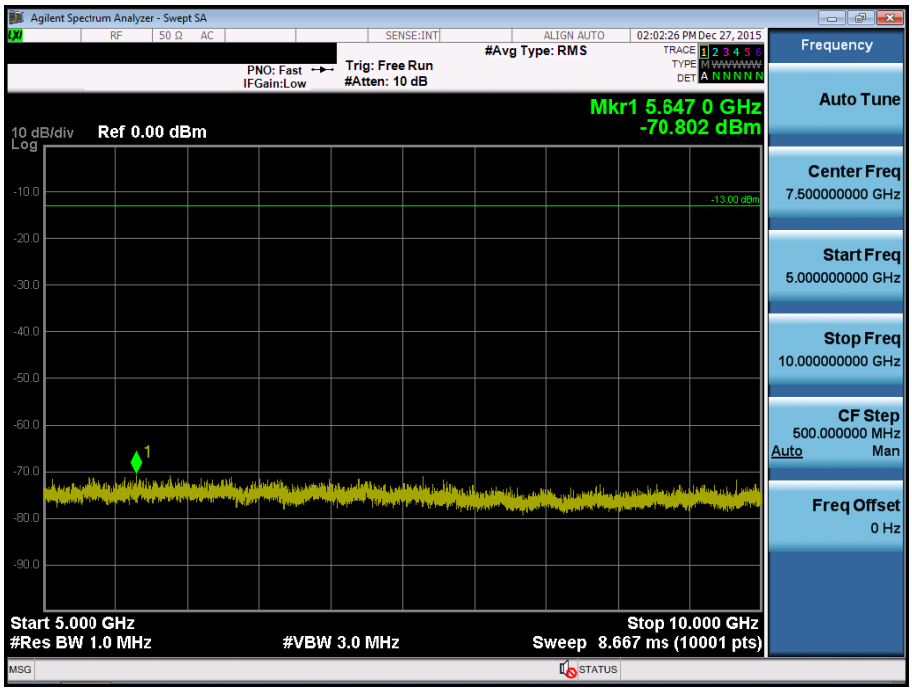
■ GSM850 MODE (128 CH.) Conducted Spurious Emissions2



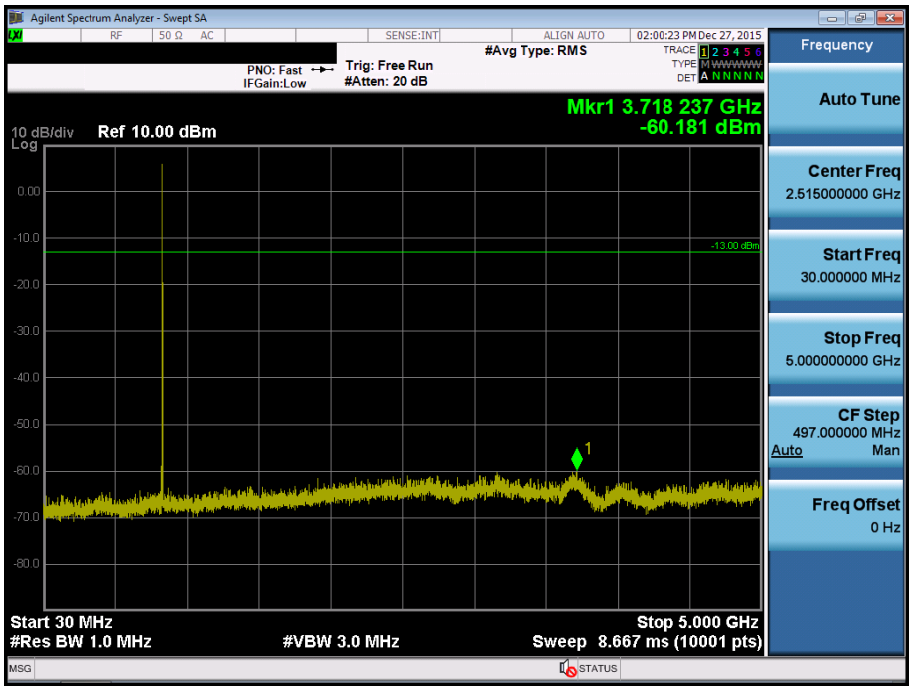
■ GSM850 MODE (190 CH.) Conducted Spurious Emissions1



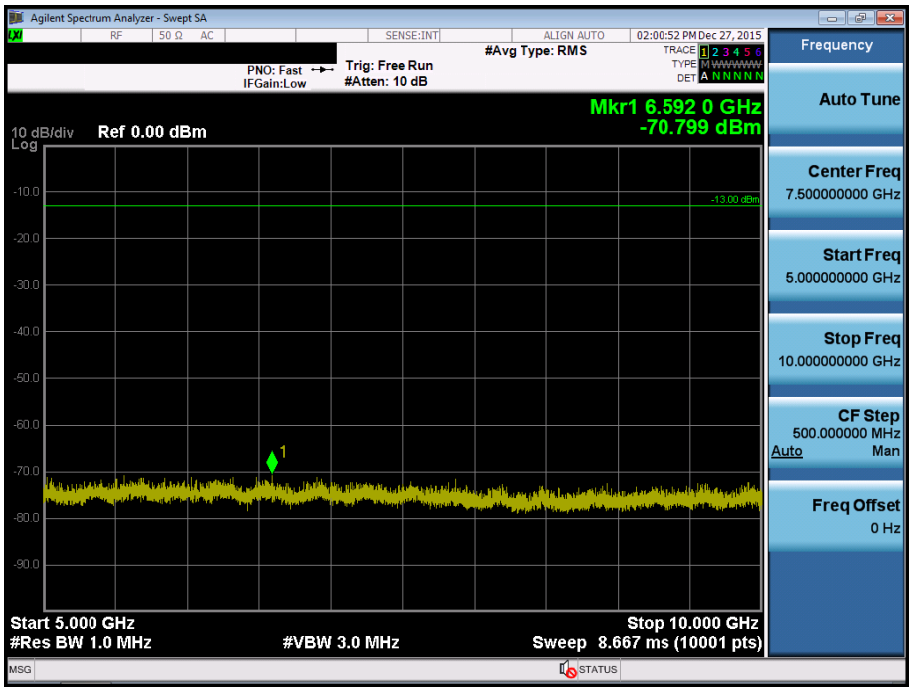
■ GSM850 MODE (190 CH.) Conducted Spurious Emissions2



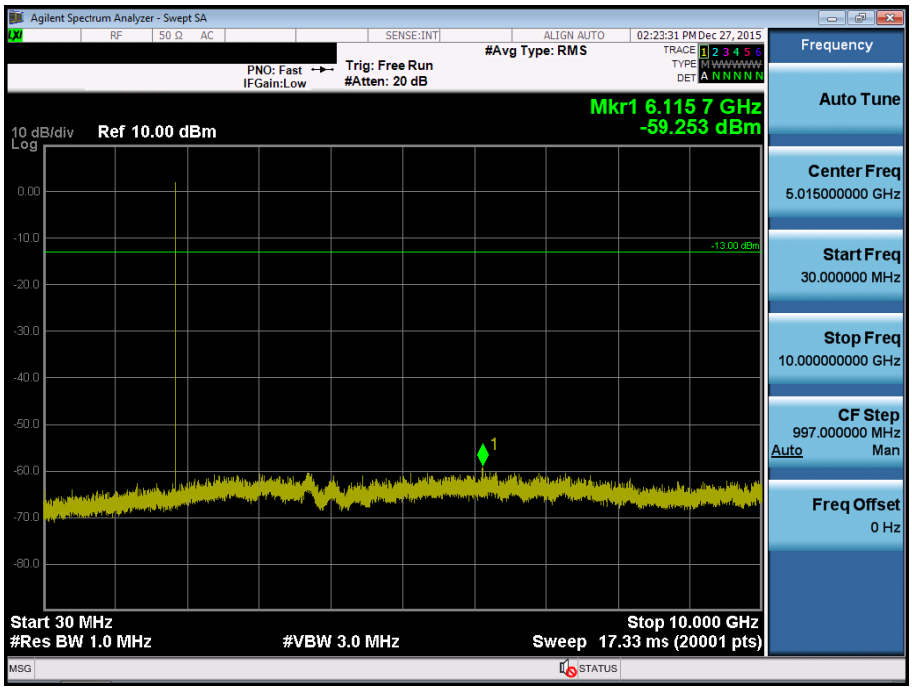
■ GSM850 MODE (251 CH.) Conducted Spurious Emissions1



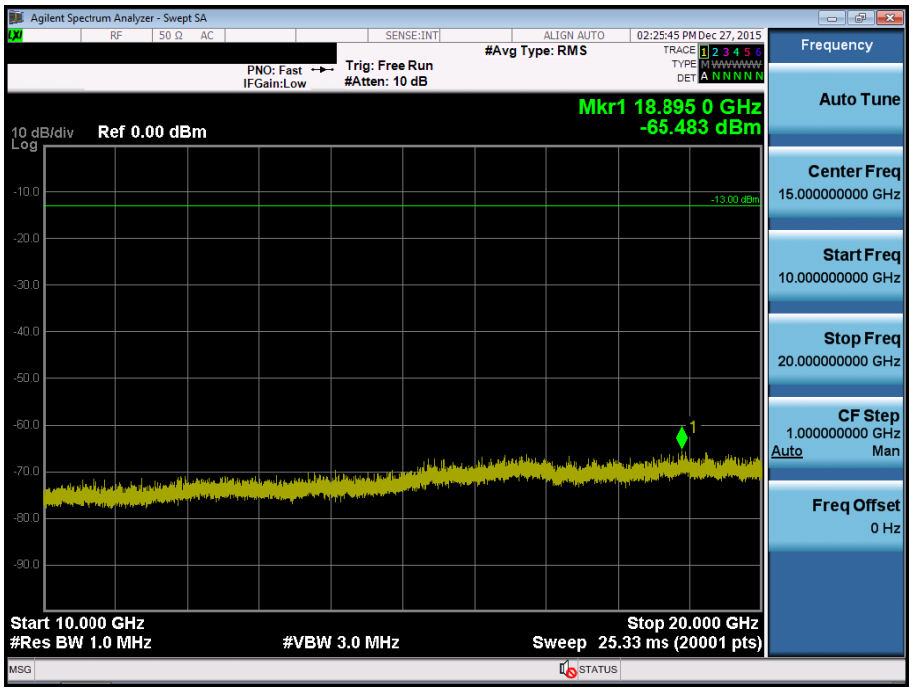
■ GSM850 MODE (251 CH.) Conducted Spurious Emissions2



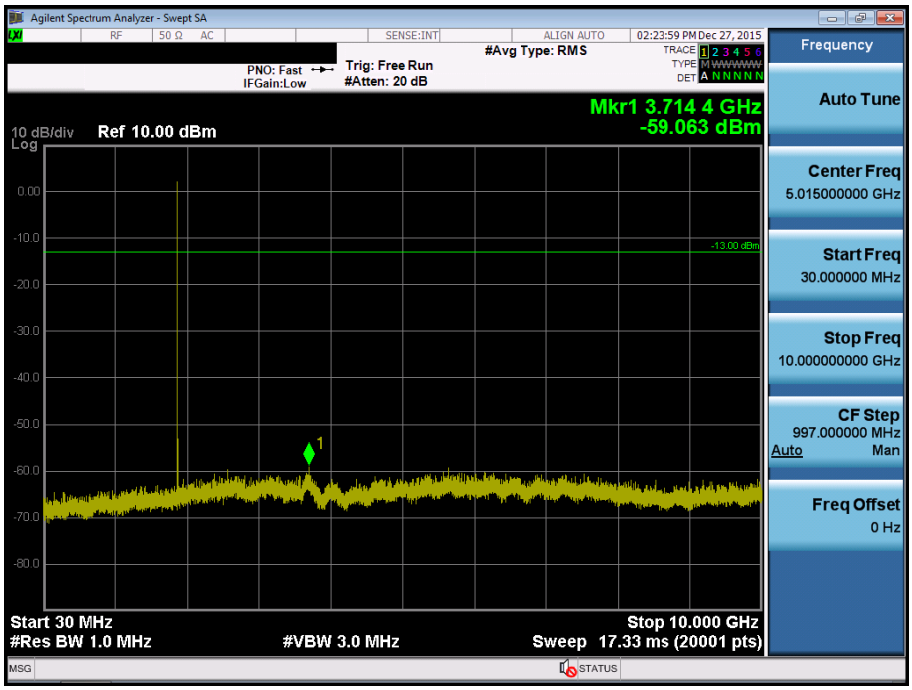
■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions1



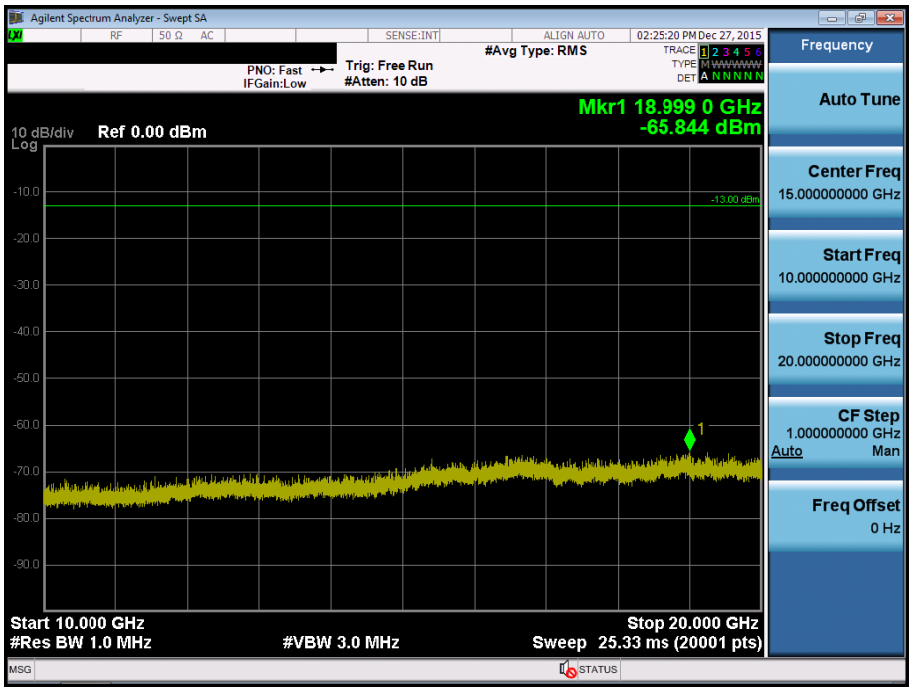
■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions2



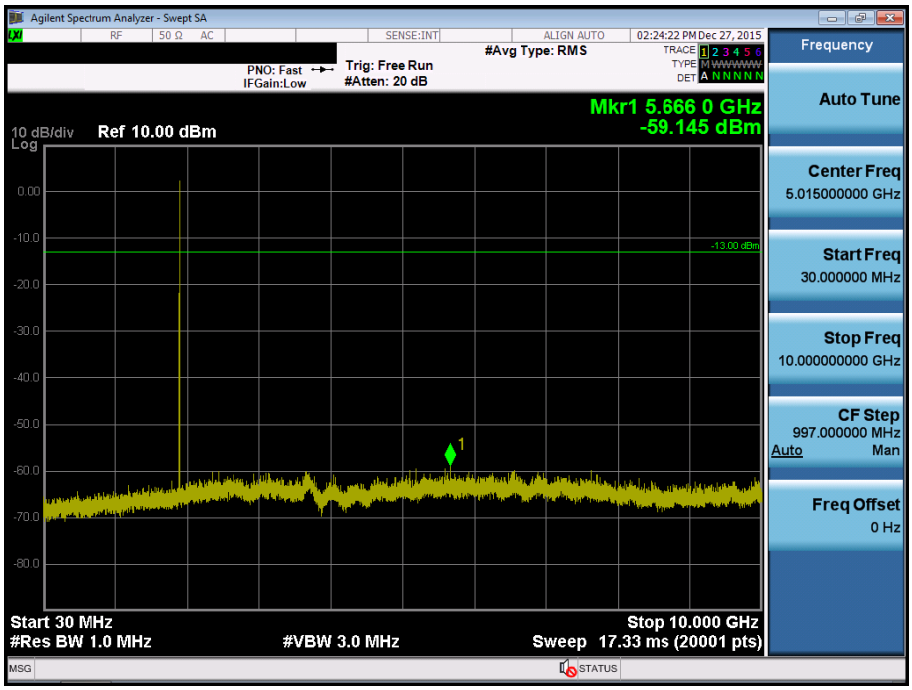
■ GSM1900 MODE (661 CH) Conducted Spurious Emissions1



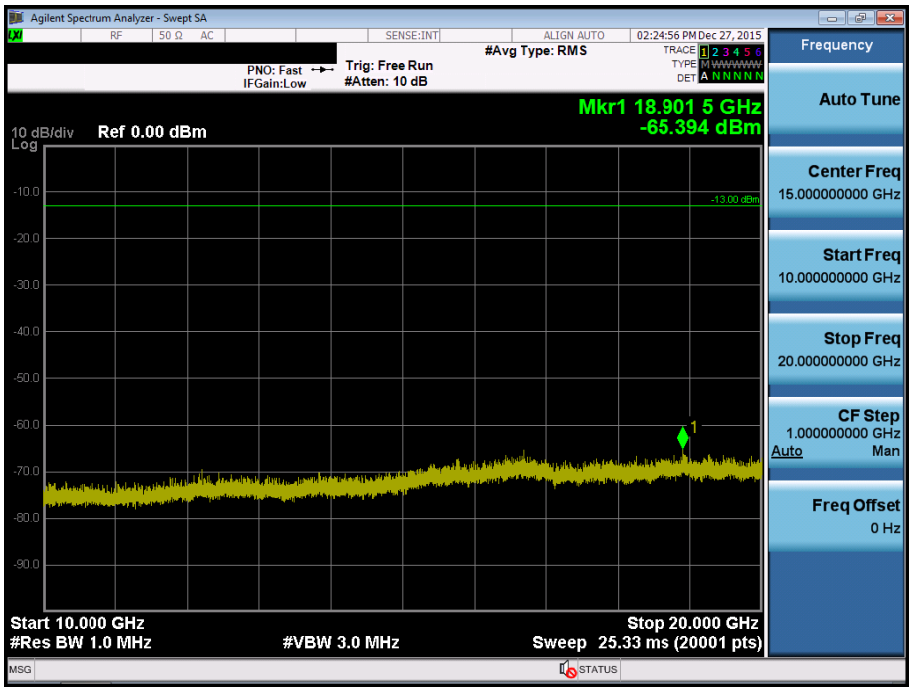
■ GSM1900 MODE (661 CH.) Conducted Spurious Emissions2



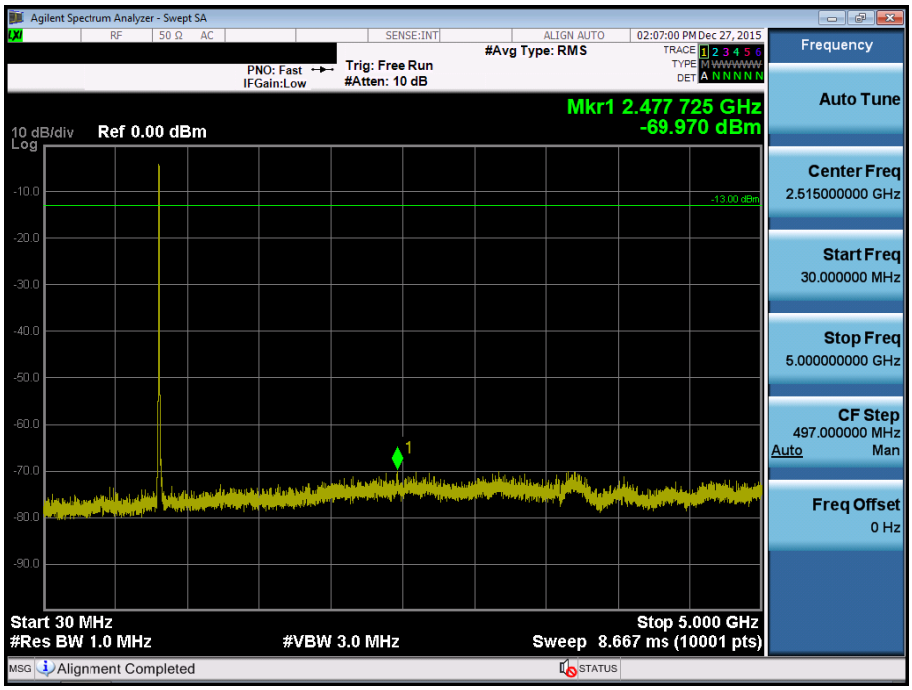
■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions1



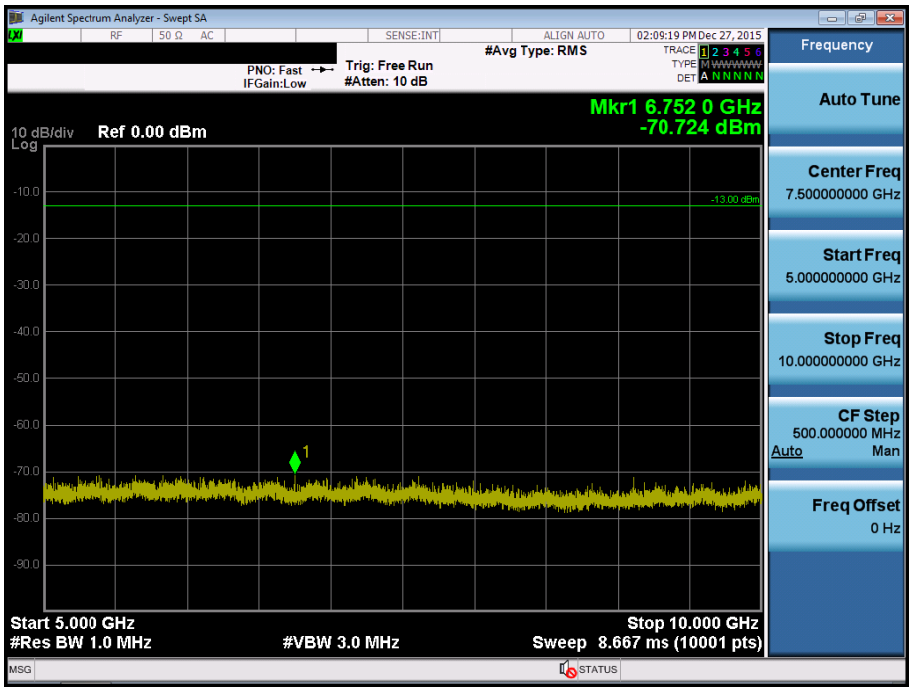
■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions2



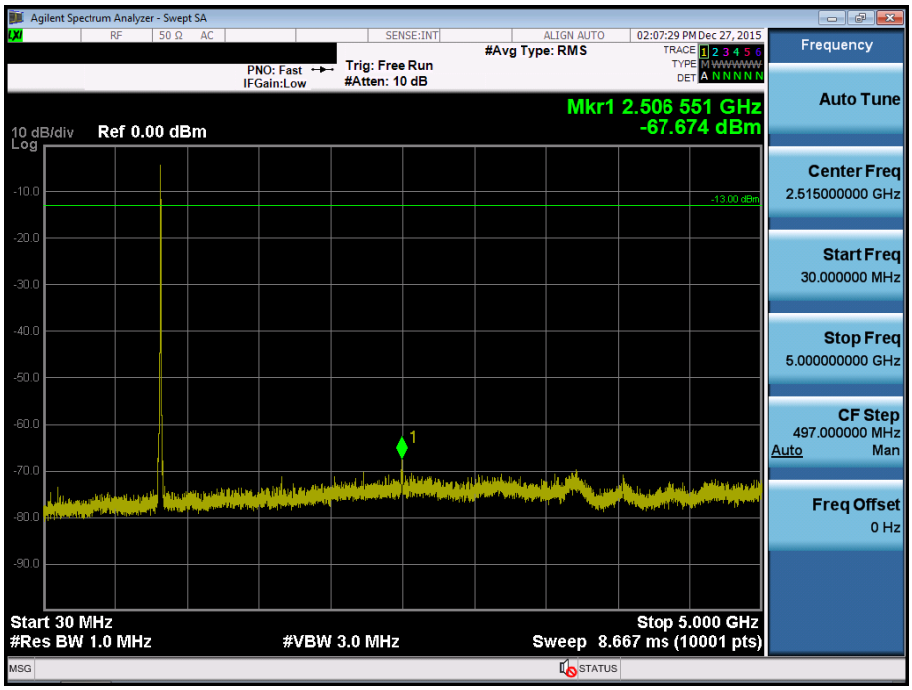
■ WCDMA850 MODE (4132 CH.) Conducted Spurious Emissions1



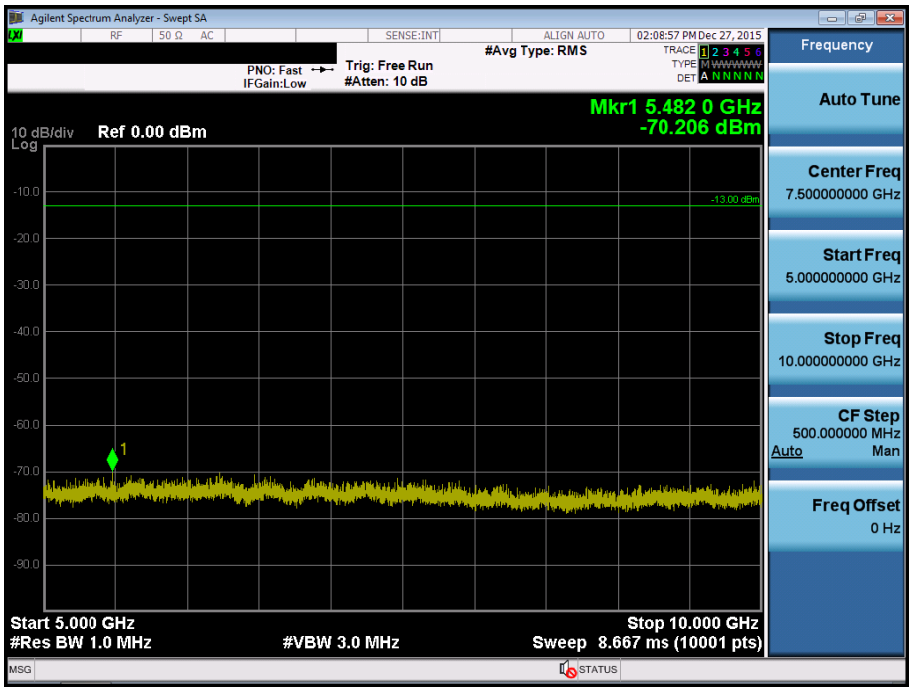
■ WCDMA850 MODE (4132 CH.) Conducted Spurious Emissions2



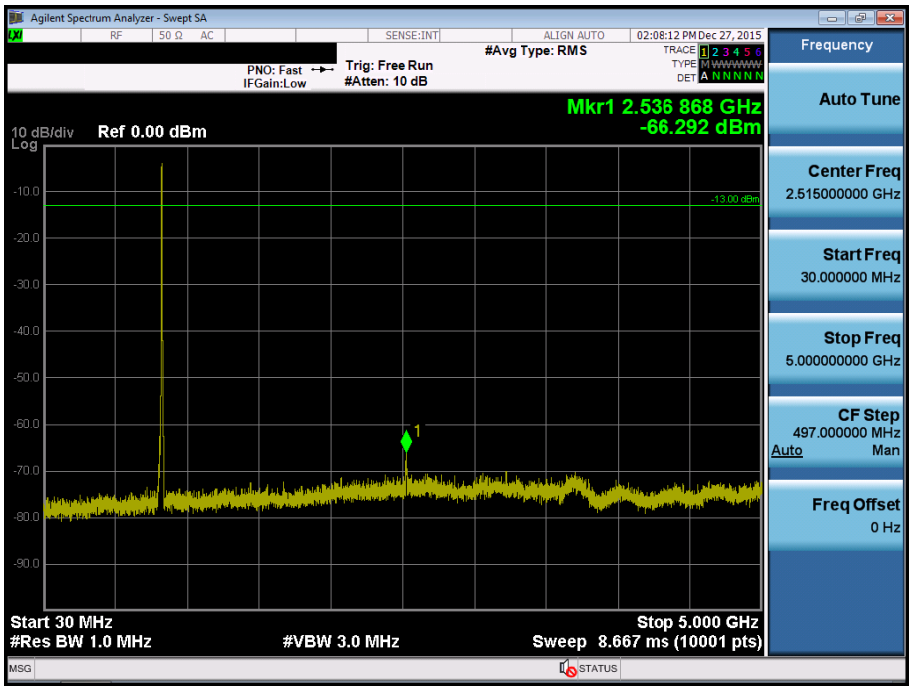
■ WCDMA850 MODE (4183 CH.) Conducted Spurious Emissions1



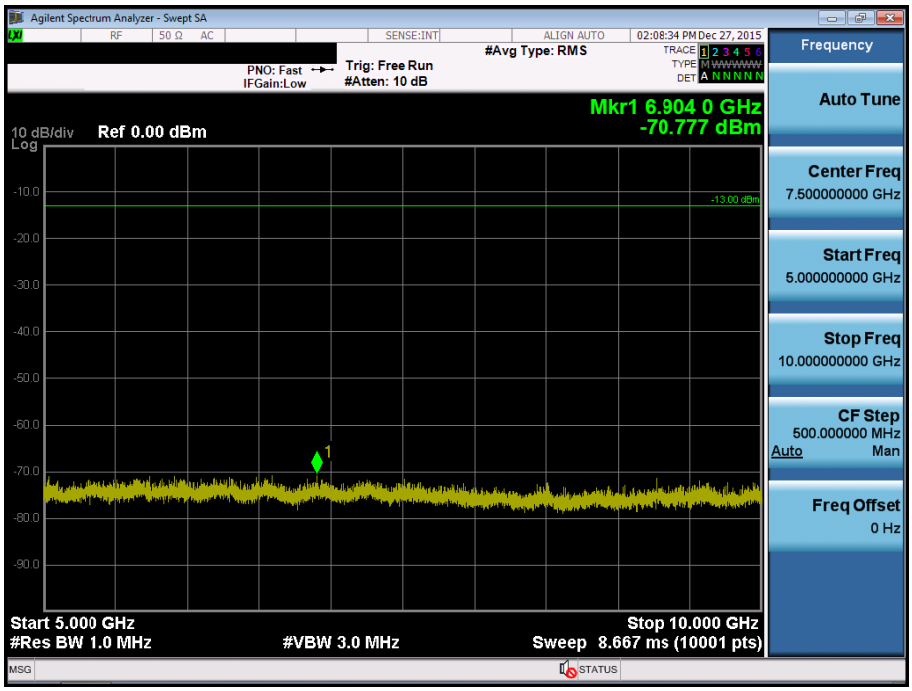
■ WCDMA850 MODE (4183 CH.) Conducted Spurious Emissions2



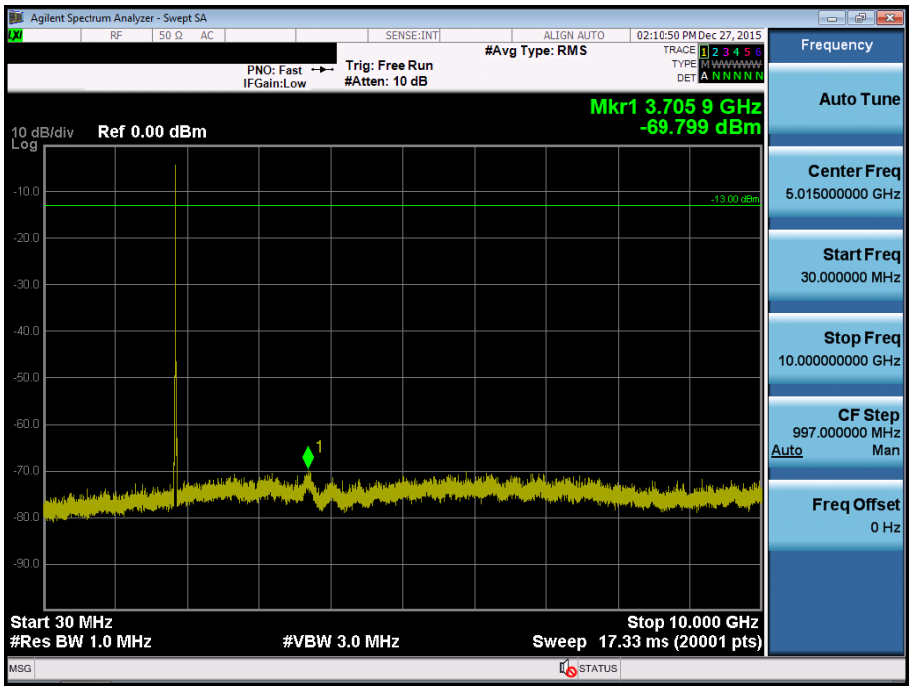
■ WCDMA850MODE (4233 CH.) Conducted Spurious Emissions1



■ WCDMA850MODE (4233 CH.) Conducted Spurious Emissions2

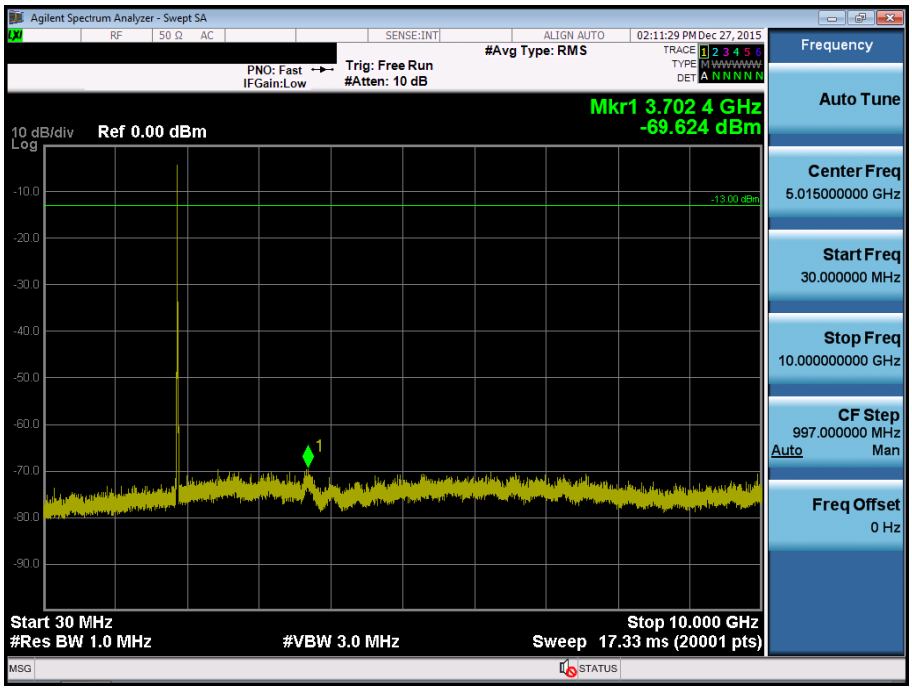


■ WCDMA1900 MODE (9262 CH.) Conducted Spurious Emissions1

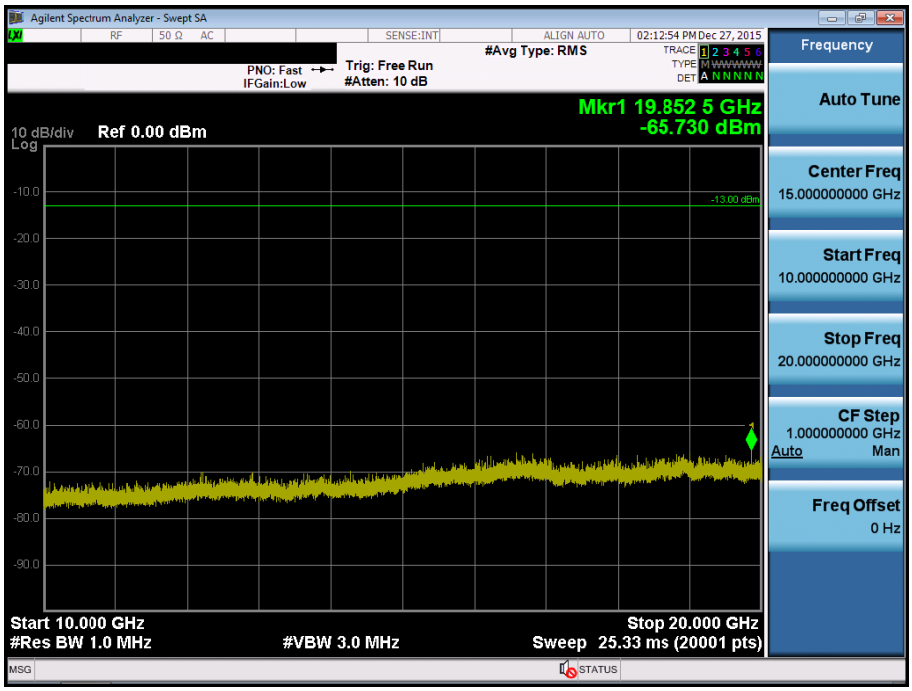


■ WCDMA1900 MODE (9262 CH.) Conducted Spurious Emissions2

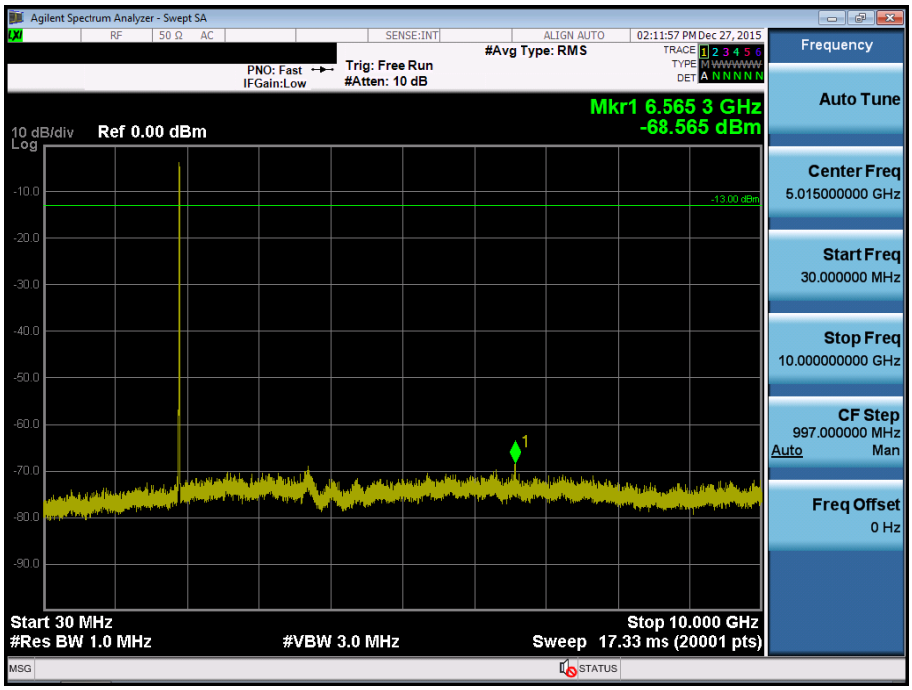
■ WCDMA1900 MODE (9400 CH.) Conducted Spurious Emissions1



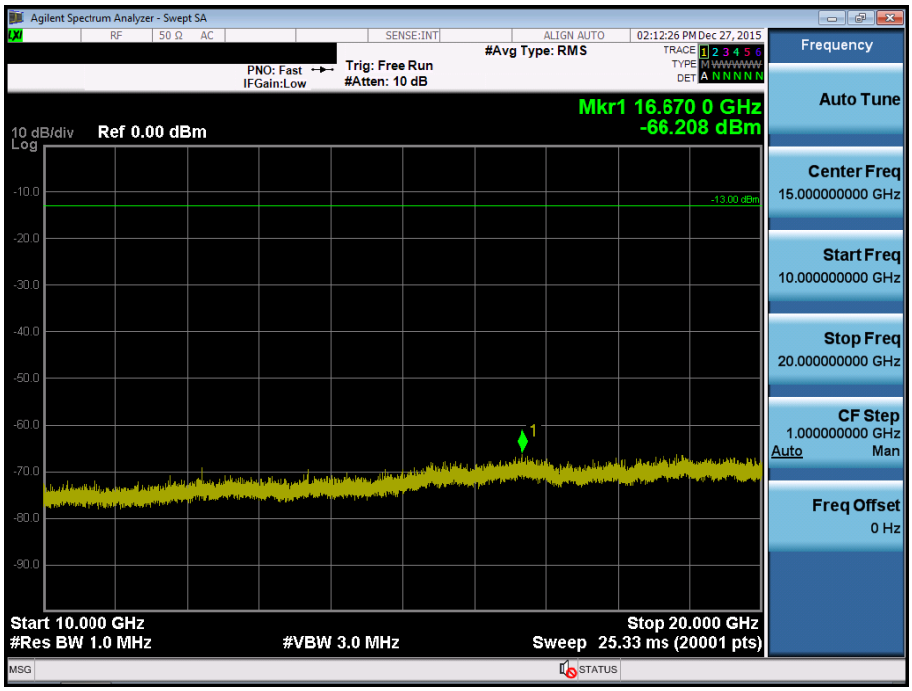
■ WCDMA1900 MODE (9400 CH.) Conducted Spurious Emissions2



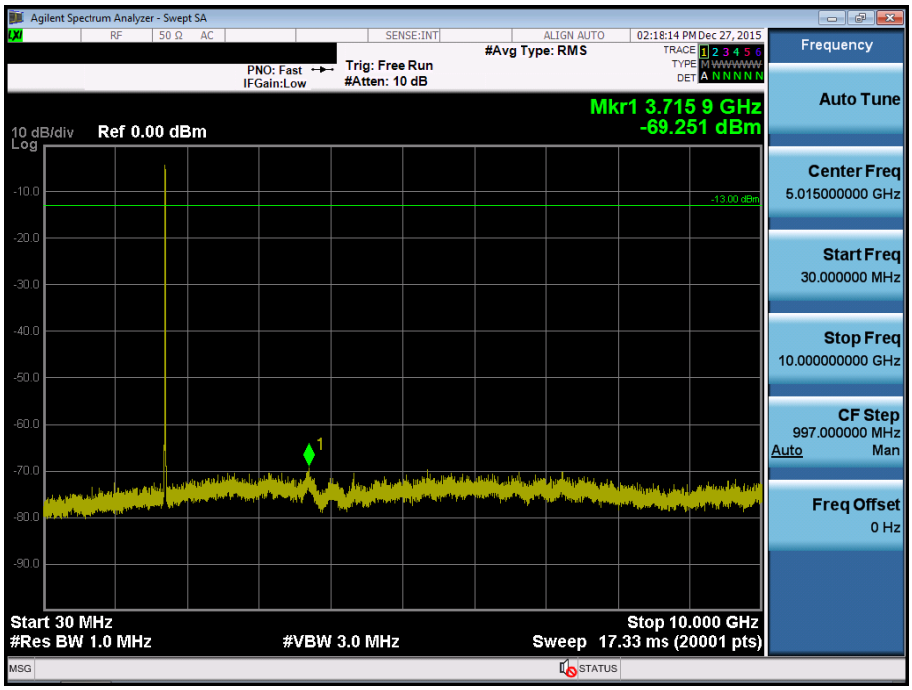
■ WCDMA1900 MODE (9538 CH.) Conducted Spurious Emissions1



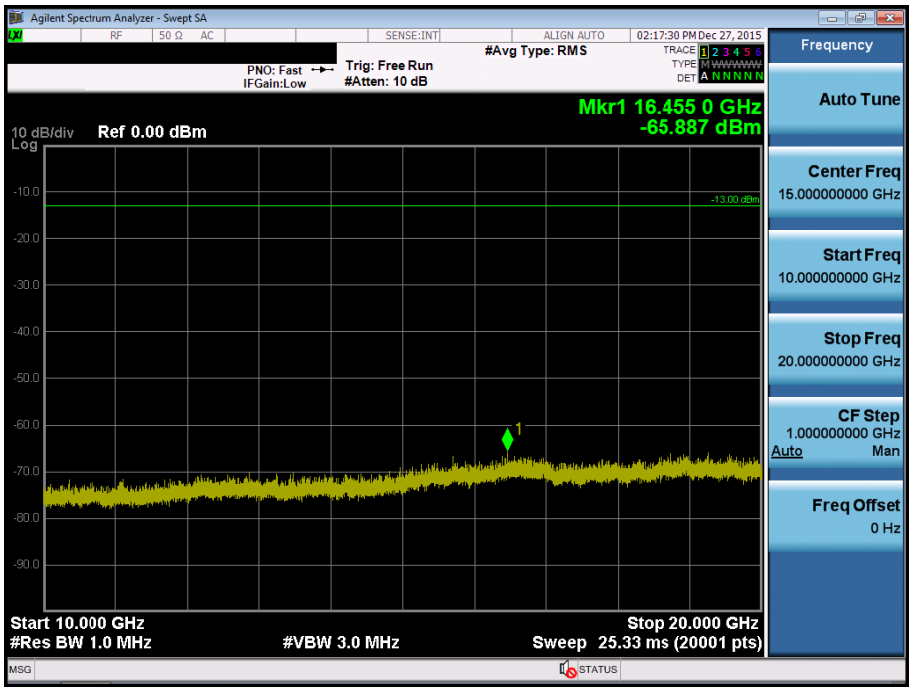
■ WCDMA1900 MODE (9538 CH.) Conducted Spurious Emissions2



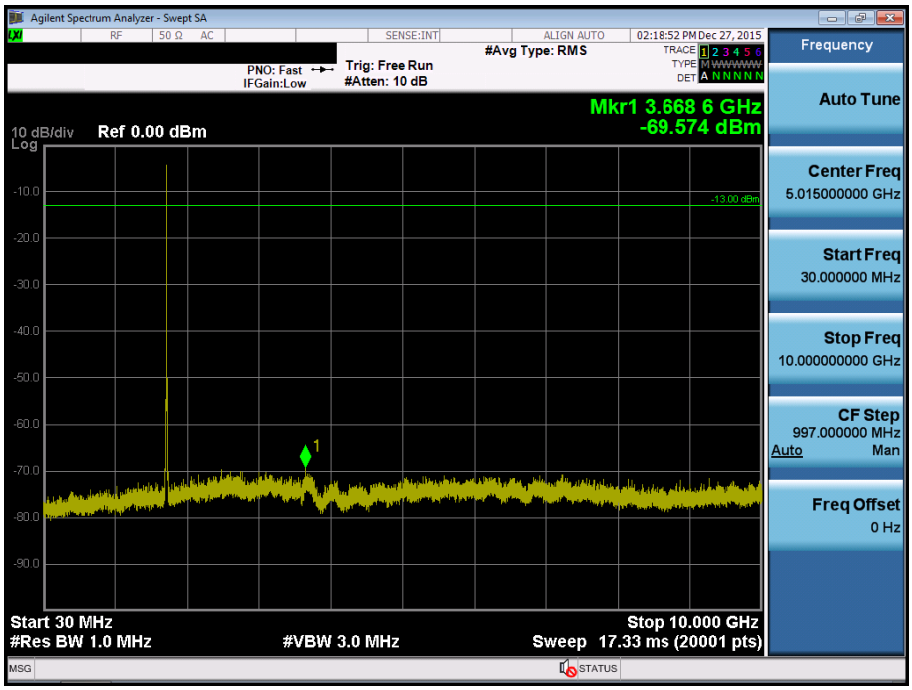
■ WCDMA1700 MODE (1312 CH.) Conducted Spurious Emissions1



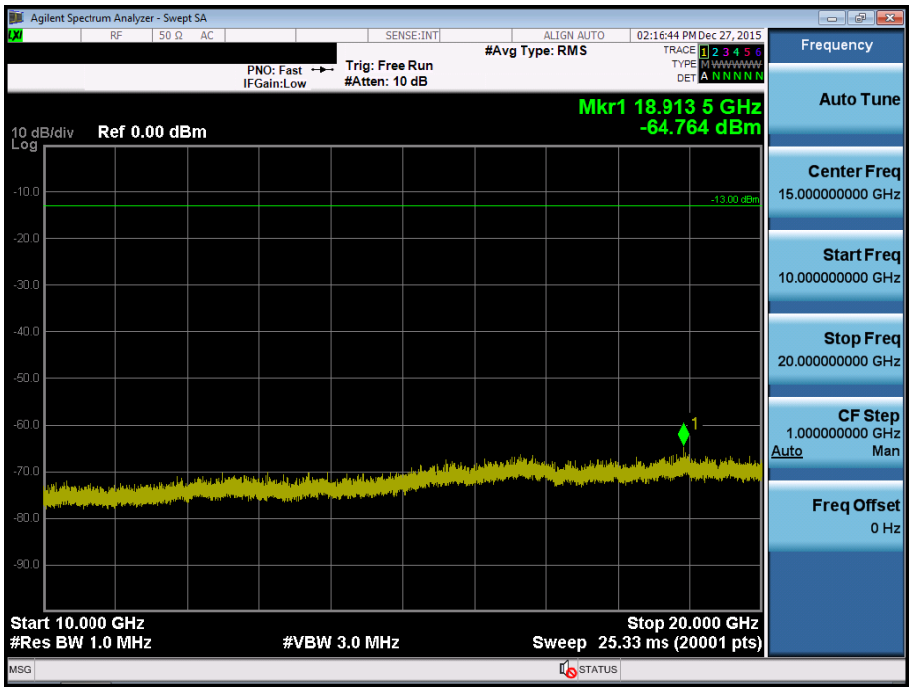
■ WCDMA1700 MODE (1312 CH.) Conducted Spurious Emissions2



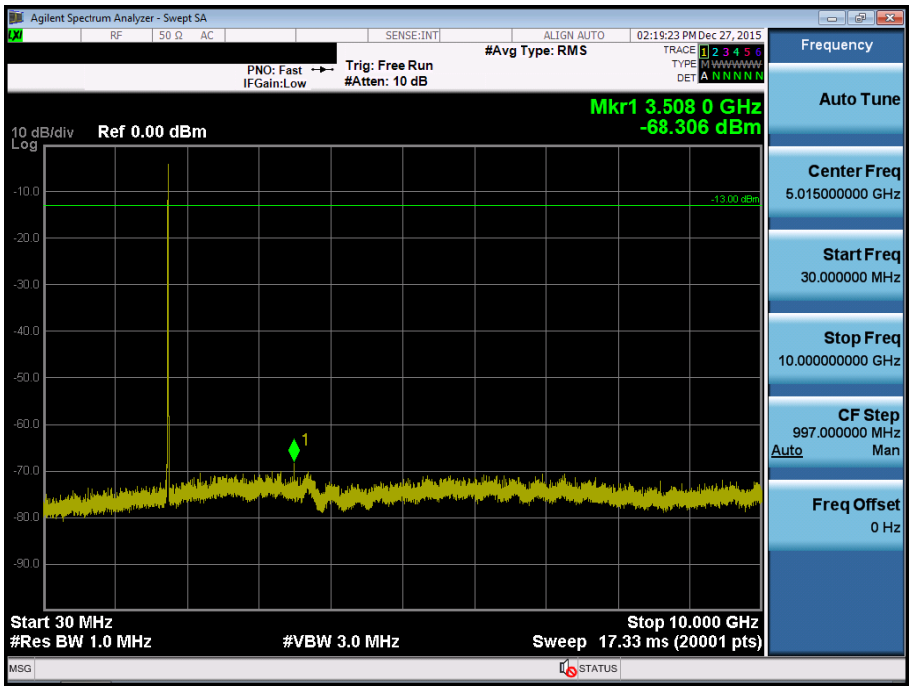
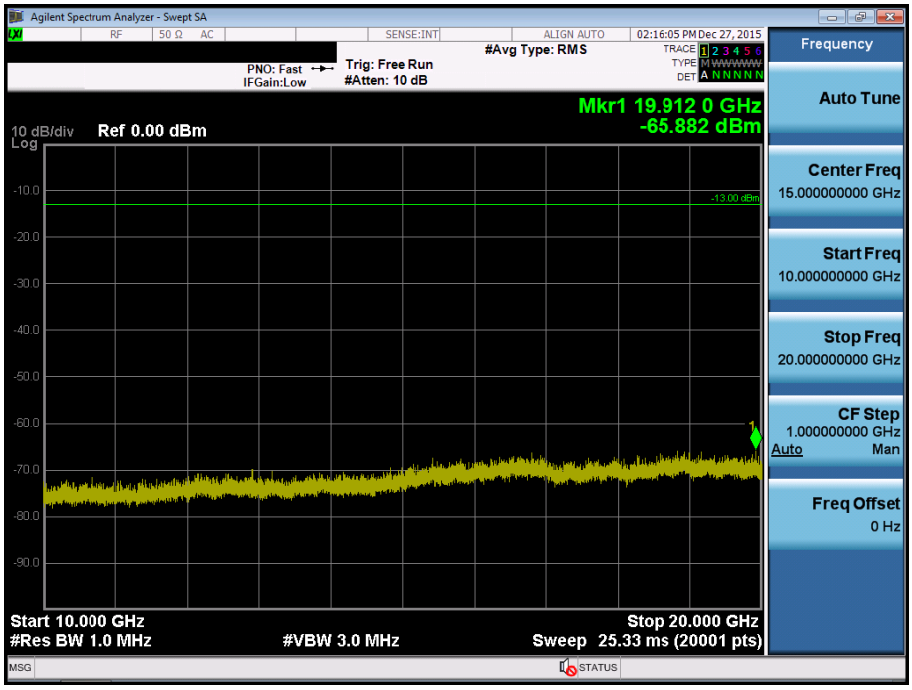
■ WCDMA1700 MODE (1412 CH.) Conducted Spurious Emissions1



■ WCDMA1700 MODE (1412 CH.) Conducted Spurious Emissions2



■ WCDMA1700 MODE (1513 CH.) Conducted Spurious Emissions1



■ WCDMA1700 MODE (1513 CH.) Conducted Spurious Emissions2