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Tel: +82-31-321-2664 Fax: +82-31-321-1664

<http://www.digitalemcc.com>**CERTIFICATE OF COMPLIANCE**  
**FCC Part 22 & 24 Certification**

Dates of Tests: November 6. ~ 15, 2007

Test Report S/N:DR50110711L

Test Site : DIGITAL EMC CO., LTD.

FCC ID.

**VP3GD30TF**

APPLICANT

**Questlabs Corp.**

<b>Classification</b>	<b>:</b>	<b>Licensed Non-Broadcast Station Transmitter(TNB)</b>
<b>FCC Rule Part(s)</b>	<b>:</b>	<b>§22(H), §24(E), §2</b>
<b>EUT Type</b>	<b>:</b>	<b>Quad Band GSM Fixed Wireless Terminal</b>
<b>Model name</b>	<b>:</b>	<b>GD850T</b>
<b>Brand name</b>	<b>:</b>	<b>Avvio</b>
<b>Serial number</b>	<b>:</b>	<b>Identical prototype</b>
<b>TX Frequency Range</b>	<b>:</b>	<b>824.2 ~ 848.8 MHz (GSM850) / 1850.2 ~ 1909.8 MHz (PCS1900)</b>
<b>RX Frequency Range</b>	<b>:</b>	<b>869.2 ~ 893.8 MHz (GSM850) / 1930.2 ~ 1989.8 MHz (PCS1900)</b>
<b>Max. RF Output Power</b>	<b>:</b>	<b>2.005 W ERP GSM850</b>
	<b>:</b>	<b>0.951 W EIRP PCS1900</b>
<b>Date of Issue</b>	<b>:</b>	<b>November 20, 2007</b>

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## MEASUREMENT REPORT

### 1. Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

### §2.1033 General Information

**Applicant:** Questlabs Corp.

**Address:** 6<sup>th</sup> Floor Uniquet Bldg., 271-2 Seohyeon-Dong, Sungnam-Shi, Gyeonggi-Do, Korea 463-824

**Attention:** Joon Kim (General Manager)

- **FCC ID:** VP3GD30TF
- **Quantity:** Pre-product
- **Tx Freq. Range:** 824.2 ~ 848.8 MHz (GSM850) / 1850.2 ~ 1909.8 MHz (PCS1900)
- **Rx Freq. Range:** 869.2 ~ 893.8 MHz (GSM850) / 1930.2 ~ 1989.8 MHz (PCS1900)
- **Max. Power Rating:** 2.005W ERP GSM850  
0.951W EIRP PCS1900
- **FCC Classification(s):** Licensed Non-broadcast Station Transmitter(TNB)
- **Equipment (EUT) Type:** Quad Band GSM Fixed Wireless Terminal
- **Modulation(s):** GMSK
- **Frequency Tolerance:**  $\pm 0.00025$  % (2.5ppm)
- **FCC Rule Part(s):** §22(H), §24(E), §2
- **Dates of Tests:** November 6 ~ 15, 2007
- **Place of Tests:** DIGITAL EMC
- **Test Report S/N:** DR50110711L

## 2. General Information

This report contains the result of tests performed by:

DIGITAL EMC CO., LTD.

Address : 683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080

<http://www.digitalemc.com> E-mail : demc@unitel.co.kr

Tel: +82-31-321-2664 Fax: +82-31-321-1664

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competents of calibration and testing laboratory".

This laboratory is accredited by NVLAP for NVLAP Lab. Code : 200559-0.

**Test operator: engineer**

November 20, 2007

Won-Jung LEE

Data

Name

Signature

**Report Reviewed By: manager**

November 20, 2007

Harvey Sung

Data

Name

Signature

Ordering party:

Company name : Questlabs Corp.

Address : 6<sup>th</sup> Floor Uniquet Bldg., 271-2 Seohyeon-Dong

Zipcode : 463-824

City/town : Sungnam-Shi, Gyeonggi-Do

Country : KOREA

Date of order : October 24, 2007

### 3. Test Report

#### 3.1 Summary of test

FCC Part Section(s)	Parameter	Status (note 1)
22.913(a) / 24.232(b), 2.1046	Power Output	C
22.917 / 24.238, 2.1049(h)(i)	Occupied Bandwidth	C
22.917(b) / 24.238(b)	Emission Bandwidth	C
22.917 / 24.238 2.1051	Emission Limits Transmitter	C
2.1053 (a)	Field Strength of Spurious Radiation	C
2.1055	Frequency Stability	C
Note 1: C= Complies    NC=Not Complies    NT=Not Tested    NA=Not Applicable		

The sample was tested according to the following specification:

FCC Parts §22(H), §24(E), §2; ANSI C-63.4-2003

### 3.2 Power Output

FCC ID	: <b>VP3GD30TF</b>
Specification	: 47 CFR 2.1046 (a)
Tested Frequency	: 824.2MHz, 836.6MHz and 848.8MHz for GSM850 1850.2MHz, 1880.0MHz and 1909.8MHz for PCS1900

#### Measurement Procedure:

- During the process of testing, the EUT was controlled via Radio Communication tester to ensure max. Power transmission and proper modulation.
- Power output was measured at the RF output terminals when the transmitter is adjusted in accordance with Communication tester (or the tune-up procedure).

#### Measurement Data:

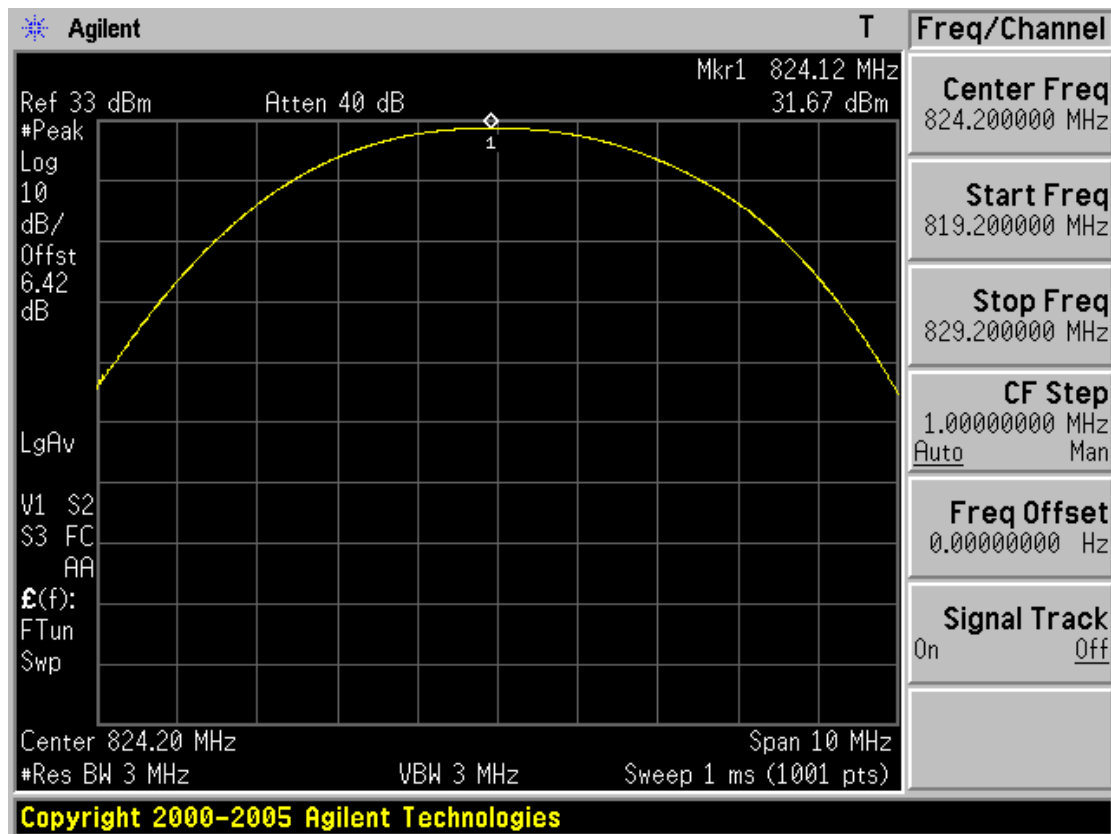
##### GSM850

Channel	Frequency (MHz)	TEST CONDITIONS Power Step: 5
		(dBm)
128	824.2	<b>31.67</b>
190	836.6	<b>31.69</b>
251	848.8	<b>31.62</b>

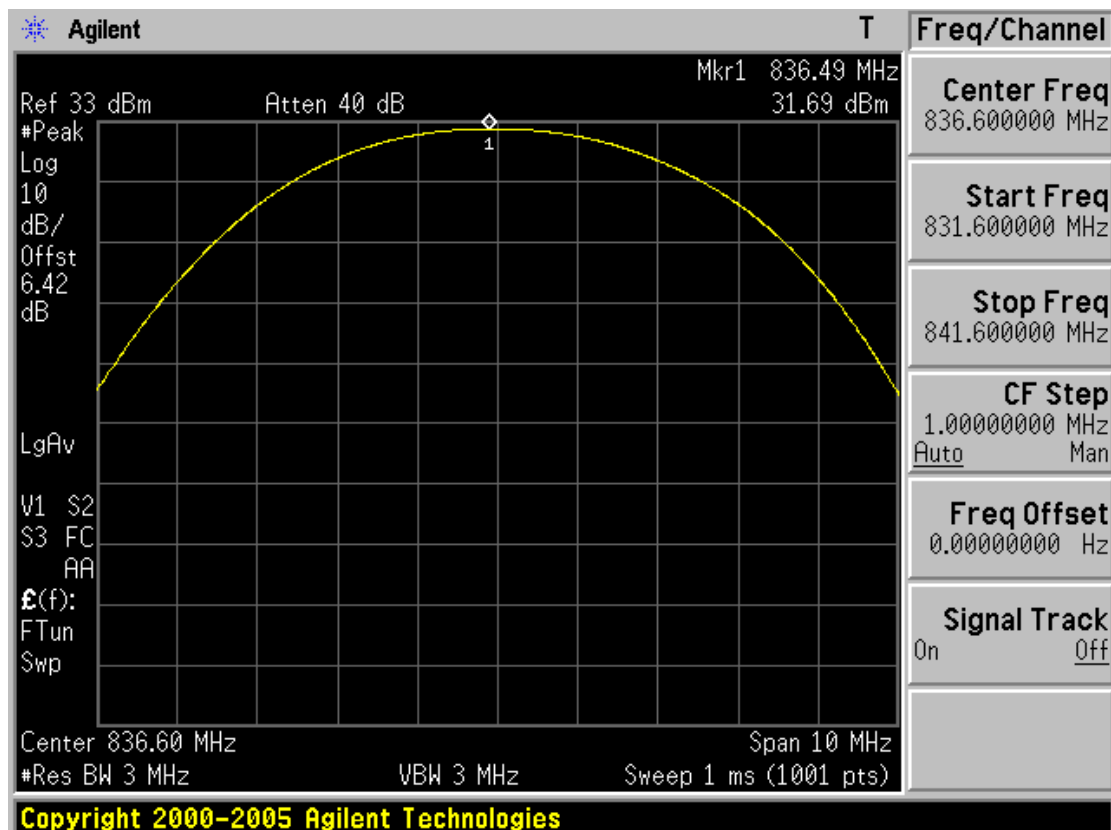
##### PCS1900

Channel	Frequency (MHz)	TEST CONDITIONS Power Step: 0
		(dBm)
512	1850.2	<b>30.02</b>
661	1880.0	<b>30.11</b>
810	1909.8	<b>30.28</b>

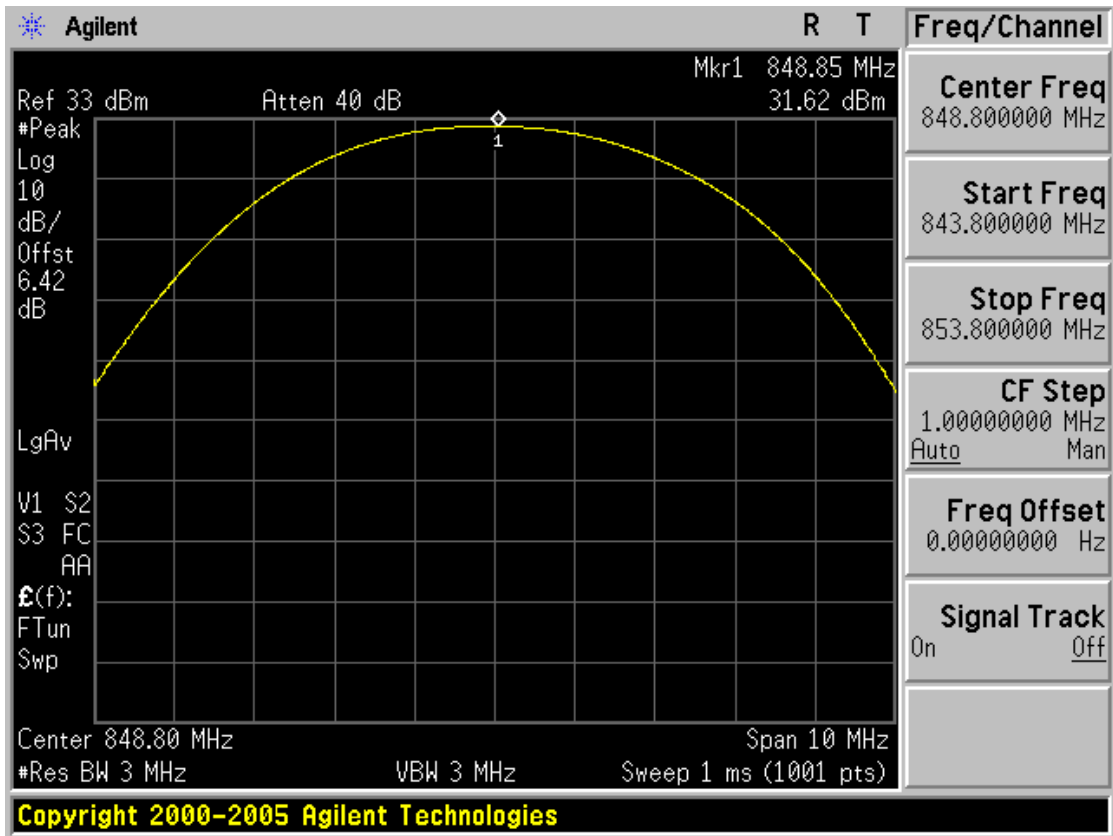
POWER OUT. GSM850 Ch.128



POWER OUT. GSM850 Ch.190

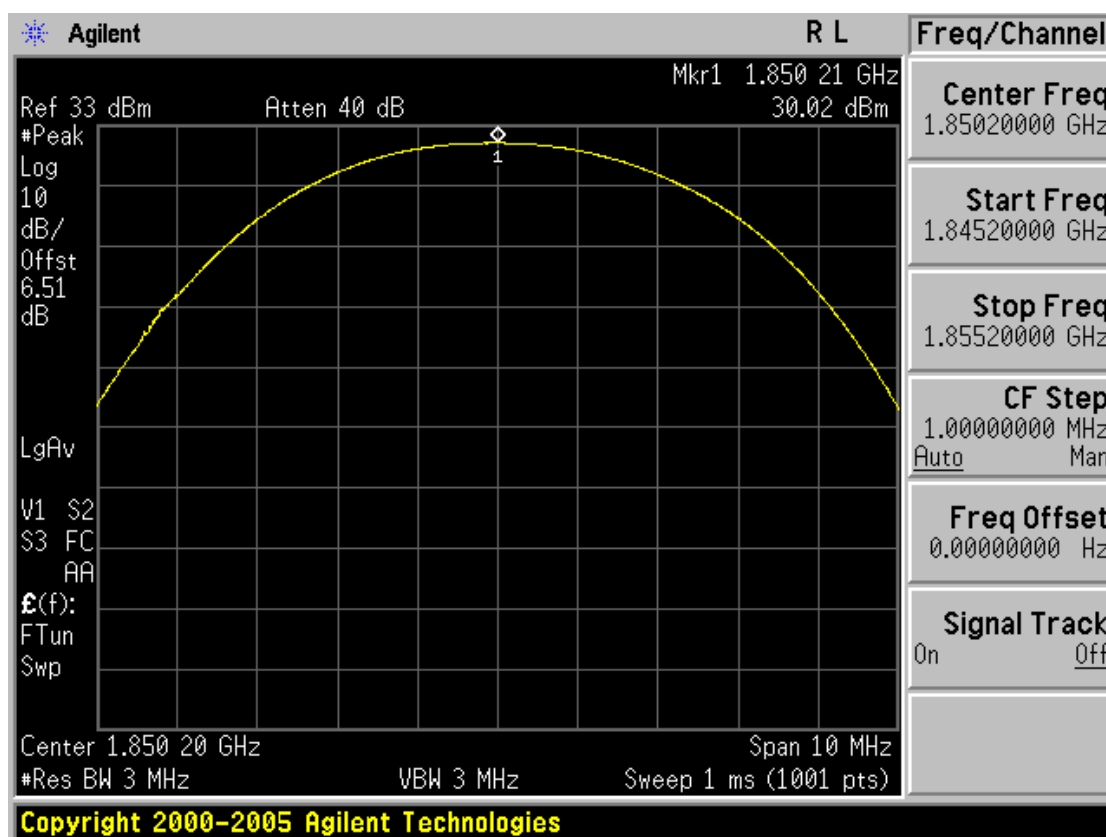


POWER OUT. GSM850 Ch.251

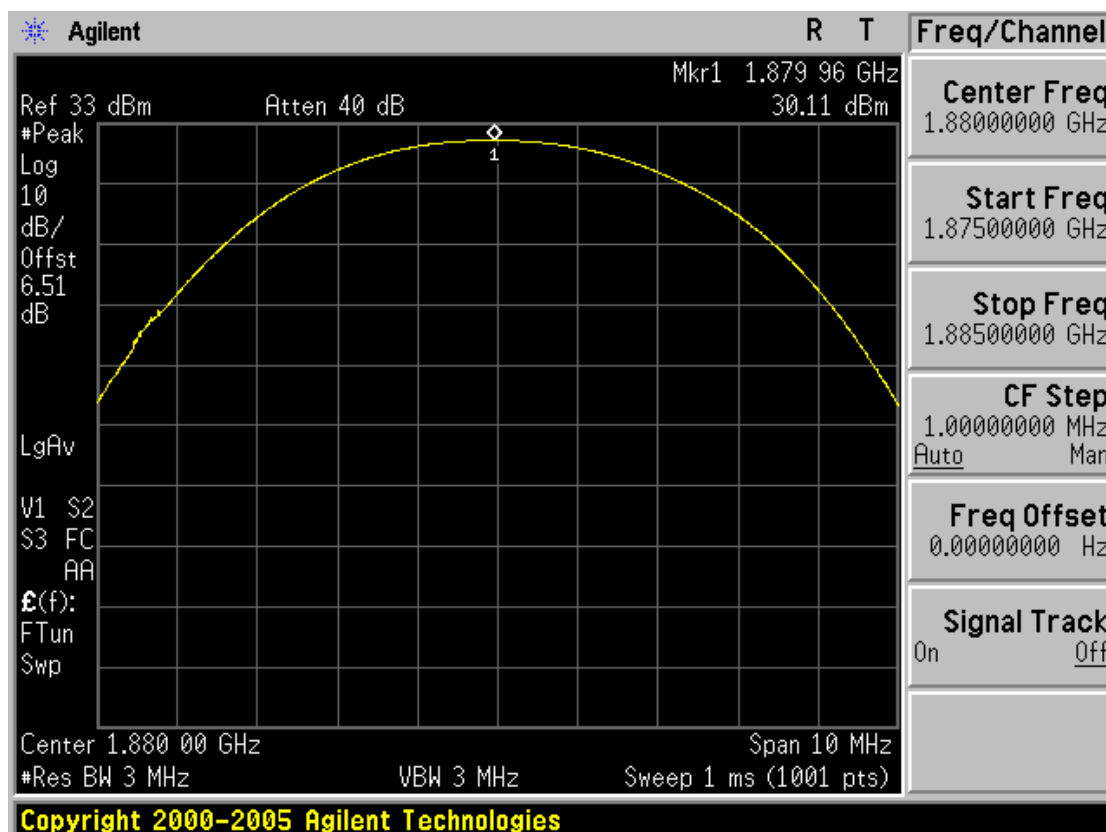




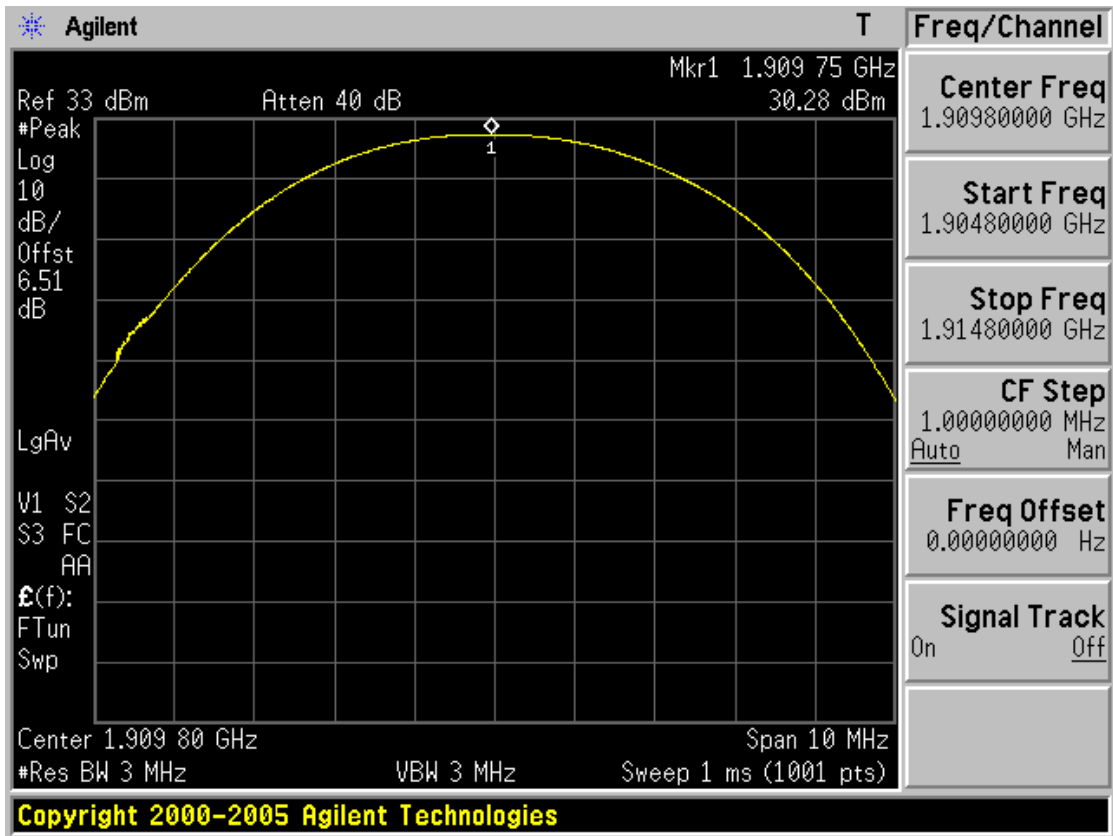
POWER OUT. PCS1900 Ch.512



POWER OUT. PCS1900 Ch.661



POWER OUT. PCS1900 Ch.810



**ERP (GSM850)**

FCC ID : **VP3GD30TF**  
 Specification : 47 CFR 22.913(a)  
 Tested Frequency : 824.2MHz, 836.6MHz and 848.8MHz for GSM850  
 RBW=VBW : 3MHz

**Measurement Procedure:****Effective Radiated Power Output Measurements by Substitution Method**

according to ANSI/TIA/EIA-603-C 2004

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

**Measurement Data:**

Channel	Frequency (MHz)	TEST CONDITIONS Power Step: 5				
		Ref. level (dBm)	Pol. (H/V)	ERP (dBm)	ERP (W)	Power Supply
<b>128</b>	<b>824.2</b>	<b>-4.76</b>	<b>H</b>	<b>33.02</b>	<b>2.005</b>	<b>Adaptor</b>
190	836.6	-6.91	H	30.69	1.172	Adaptor
251	848.8	-4.50	H	32.92	1.960	Adaptor

**EIRP (PCS1900)**

FCC ID : **VP3GD30TF**  
 Specification : 47 CFR 24.232(b)  
 Tested Frequency : 1850.2MHz, 1880.0MHz and 1909.8MHz for PCS1900  
 RBW=VBW : 3MHz

**Measurement Procedure:**

Effective Radiated Power Output Measurements by Substitution Method

according to ANSI/TIA/EIA-603-C 2004

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

**Measurement Data:**

Channel	Frequency (MHz)	TEST CONDITIONS Power Step: 0					
		Ref. level (dBm)	Pol. (H/V)	ANT GAIN	EIRP (dBm)	EIRP (W)	Battery
512	1850.2	-17.80	V	8.75	27.53	0.567	Adaptor
661	1880.0	-16.12	V	8.47	28.05	0.638	Adaptor
<b>810</b>	<b>1909.8</b>	<b>-14.38</b>	<b>V</b>	<b>8.66</b>	<b>29.78</b>	<b>0.951</b>	<b>Adaptor</b>

### 3.3 Occupied Bandwidth

FCC ID	:	<b>VP3GD30TF</b>
Specification	:	47 CFR 2.1049 (h)(i)
Tested Frequency	:	824.2MHz, 836.6MHz and 848.8MHz for GSM850 1850.2MHz, 1880.0MHz and 1909.8MHz for PCS1900

#### Measurement Procedure:

- The 99% power bandwidth was measured with a calibrated spectrum analyzer.
- Spectrum analyzer plots are included on the following pages.

#### Measurement Data:

##### GSM850

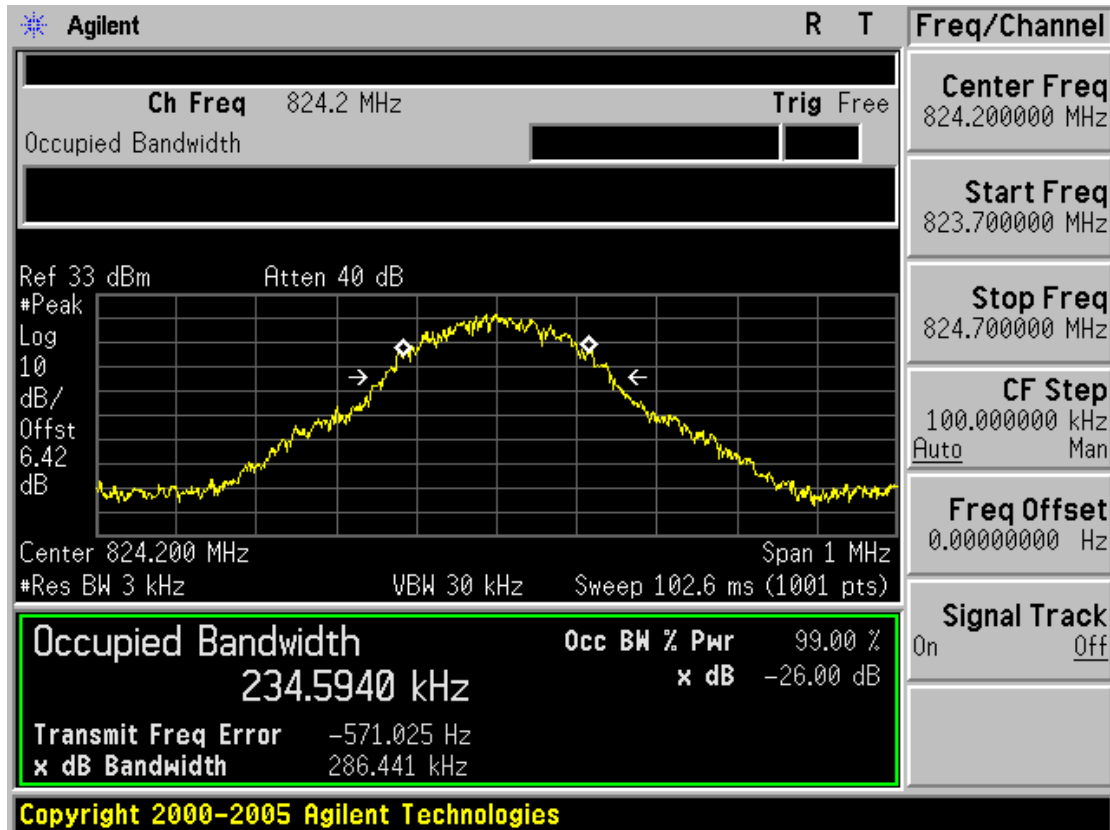
Channel	Frequency (MHz)	99% Bandwidth
		(kHz)
128	824.2	<b>234.5940</b>
190	836.6	<b>233.8016</b>
251	848.8	<b>231.9213</b>

##### PCS1900

Channel	Frequency (MHz)	99% Bandwidth
		(kHz)
512	1850.2	<b>235.1174</b>
661	1880.0	<b>231.8141</b>
810	1909.8	<b>234.5217</b>

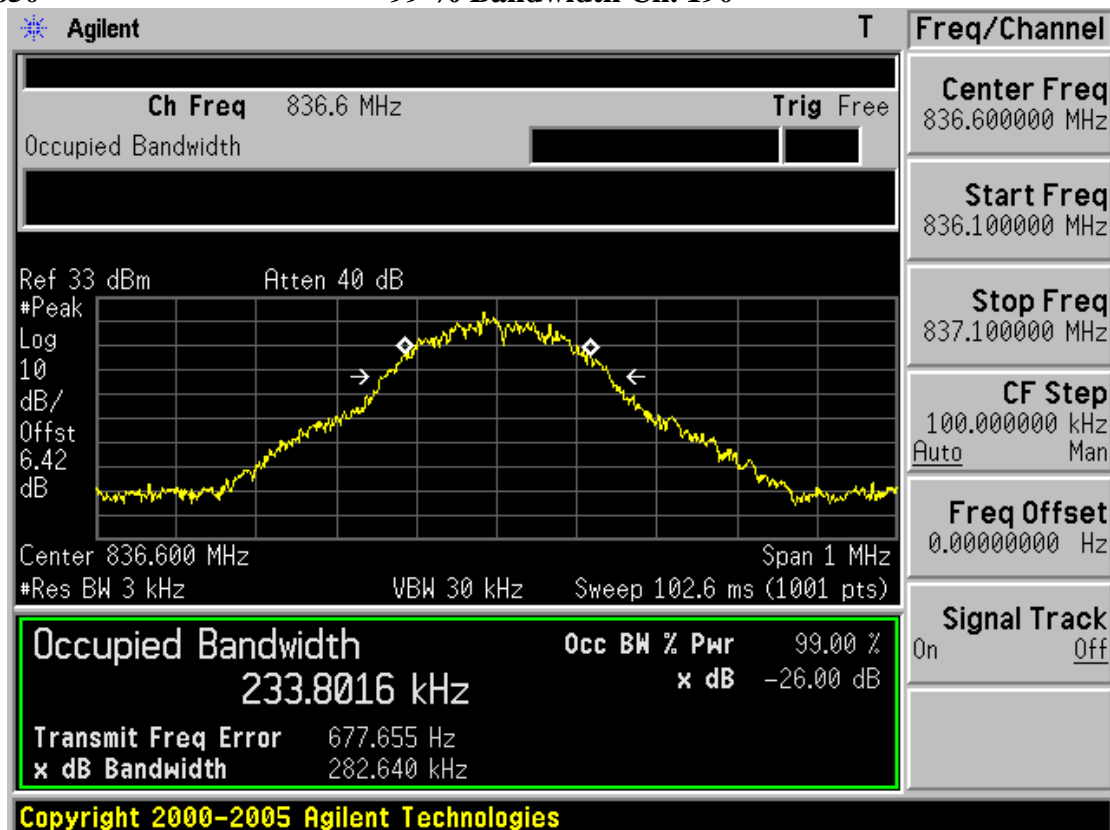
GSM850

99 % Bandwidth Ch. 128



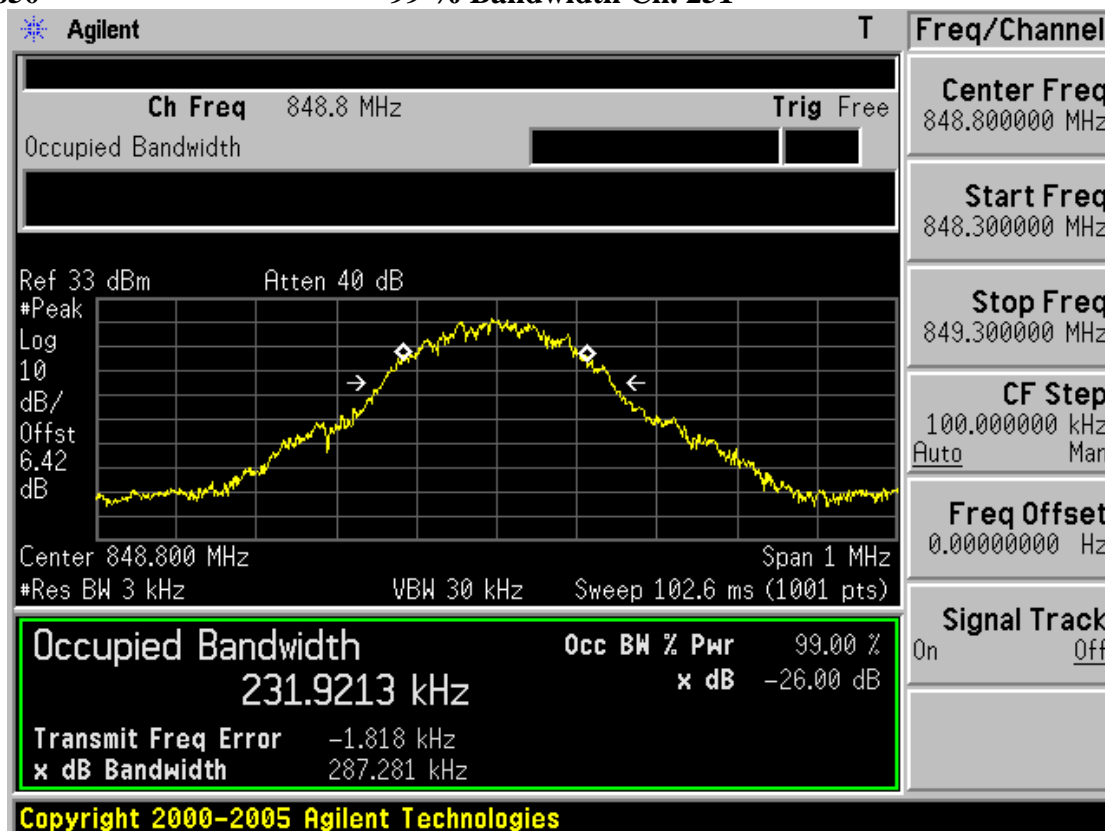
GSM850

99 % Bandwidth Ch. 190



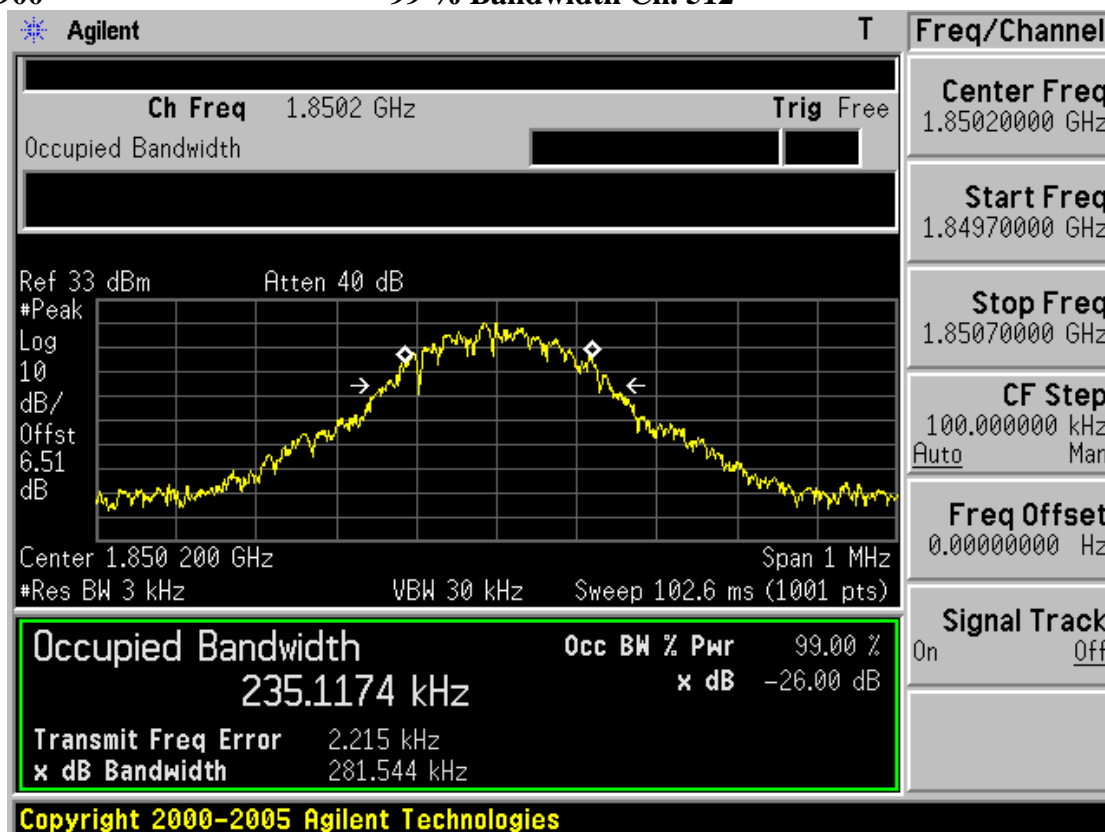
# GSM850

## 99 % Bandwidth Ch. 251



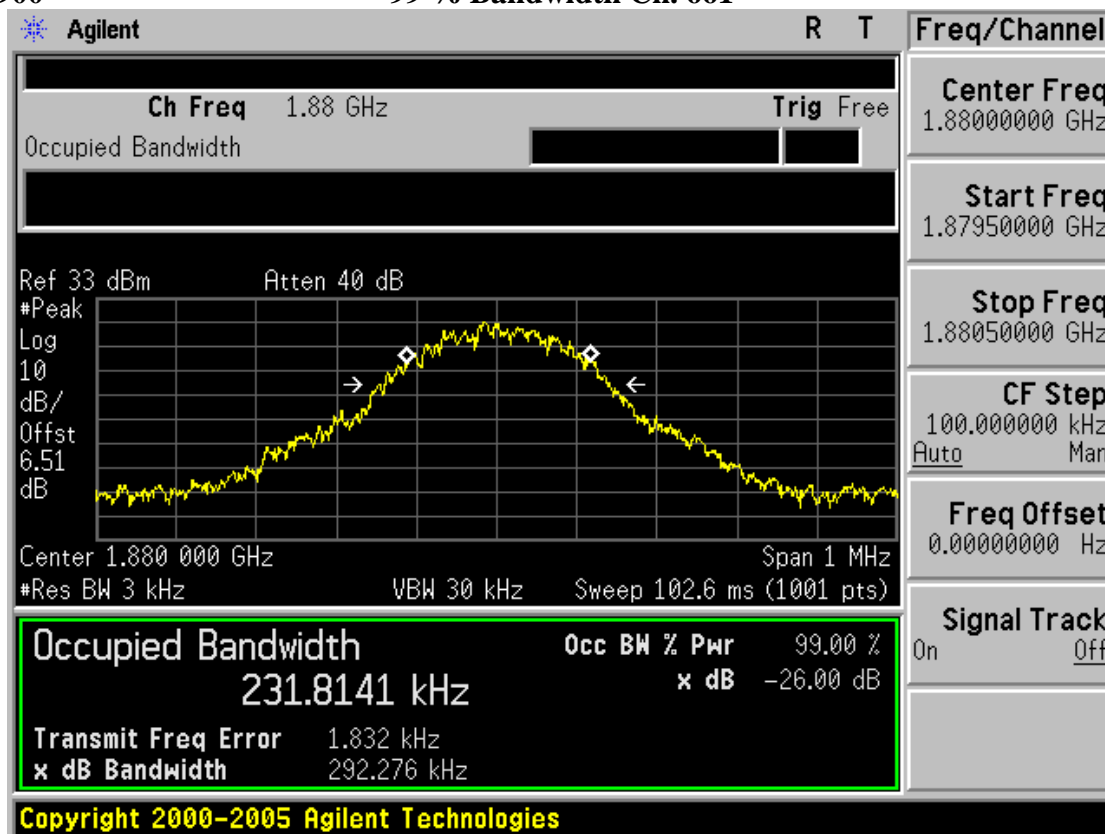
# PCS1900

## 99 % Bandwidth Ch. 512



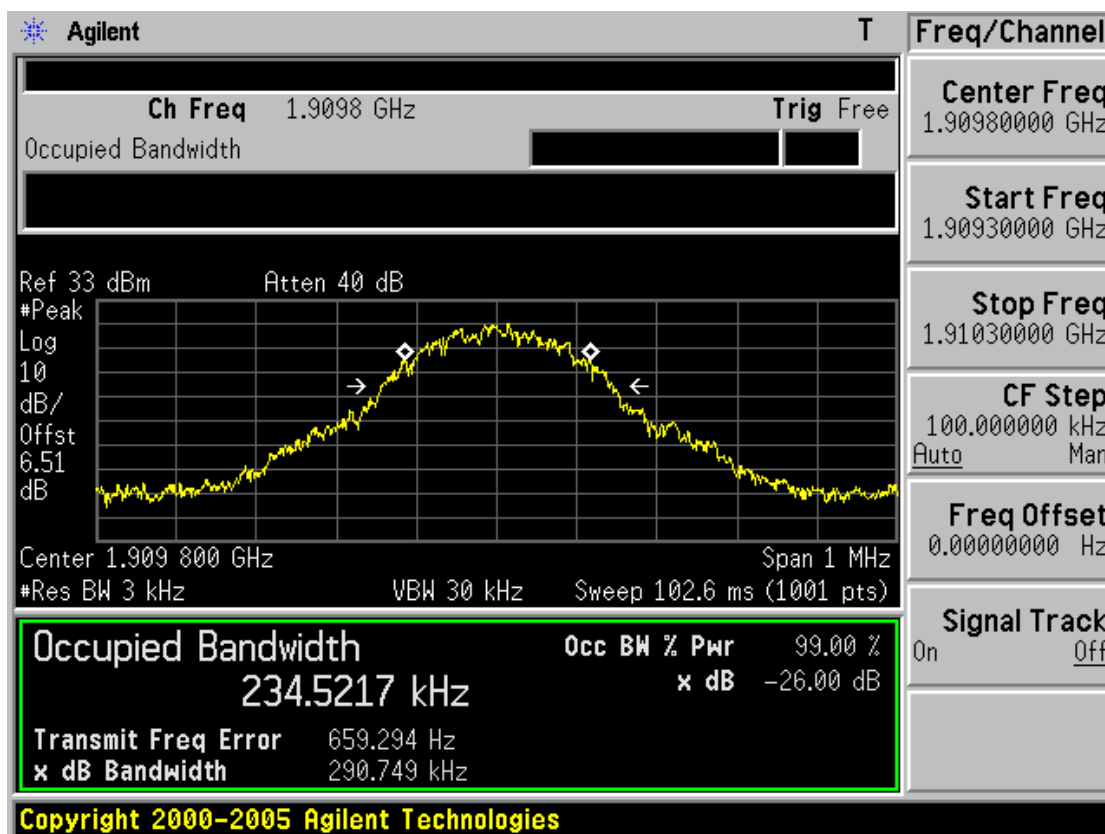
PCS1900

99 % Bandwidth Ch. 661



PCS1900

99 % Bandwidth Ch. 810





### 3.4 Occupied Bandwidth Emission Limit

FCC ID	: <b>VP3GD30TF</b>
Specification	: 47 CFR 24.238(b)
Tested Frequency	: 824.2MHz, 836.6MHz and 848.8MHz for GSM850 1850.2MHz, 1880.0MHz and 1909.8MHz for PCS1900

#### Measurement Procedure:

- (a) 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.
- (b) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1MHz or greater. However, in the 1MHz 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. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26dB below the transmitter power.
- (c) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
- The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.
- Spectrum analyzer plots are included on the following pages.

#### Measurement Data:

##### GSM850

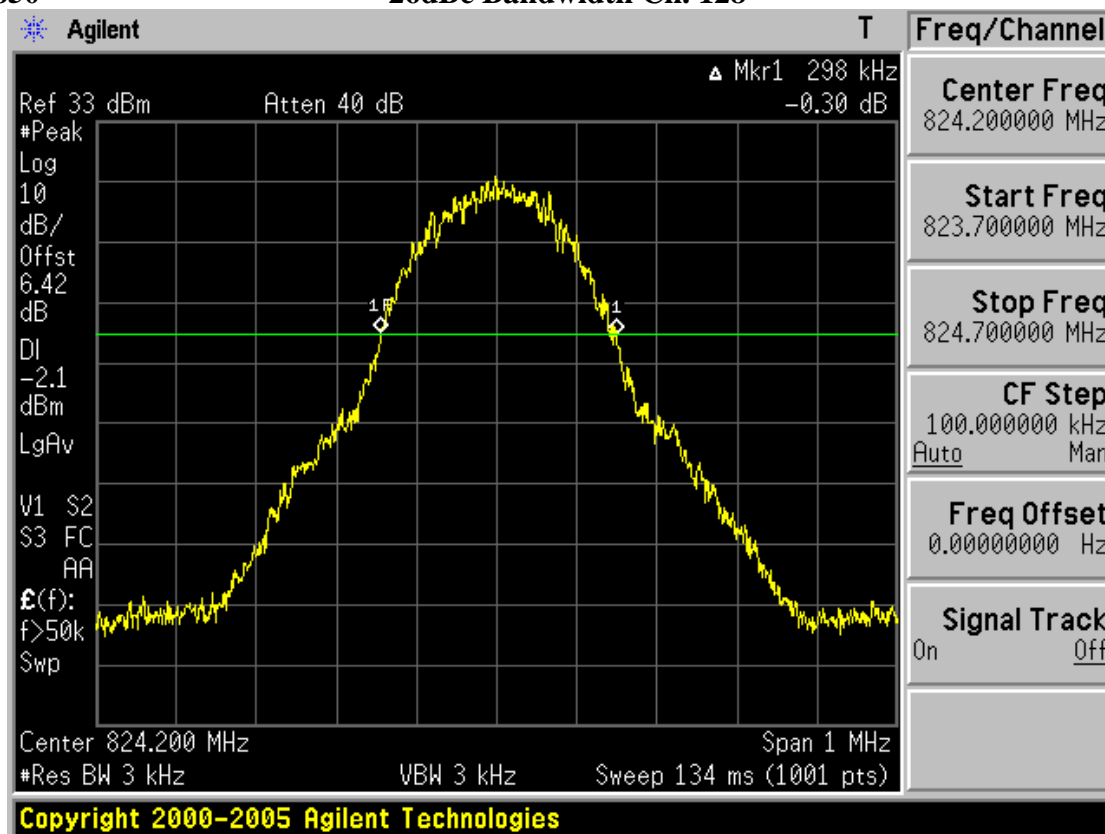
Channel	Frequency (MHz)	-26dBc Bandwidth
		(kHz)
128	824.2	<b>298</b>
190	836.6	<b>291</b>
251	848.8	<b>300</b>

##### PCS1900

Channel	Frequency (MHz)	-26dBc Bandwidth
		(kHz)
512	1850.2	<b>303</b>
661	1880.0	<b>300</b>
810	1909.8	<b>300</b>

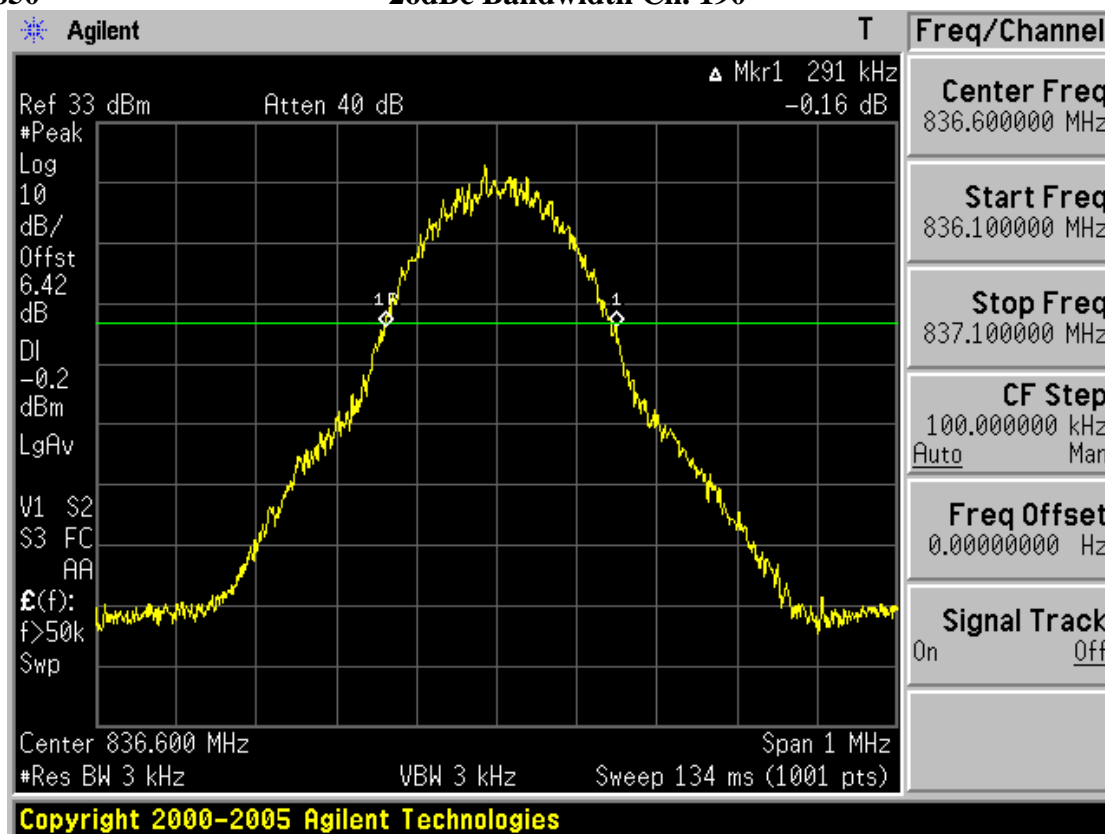
GSM850

-26dBc Bandwidth Ch. 128



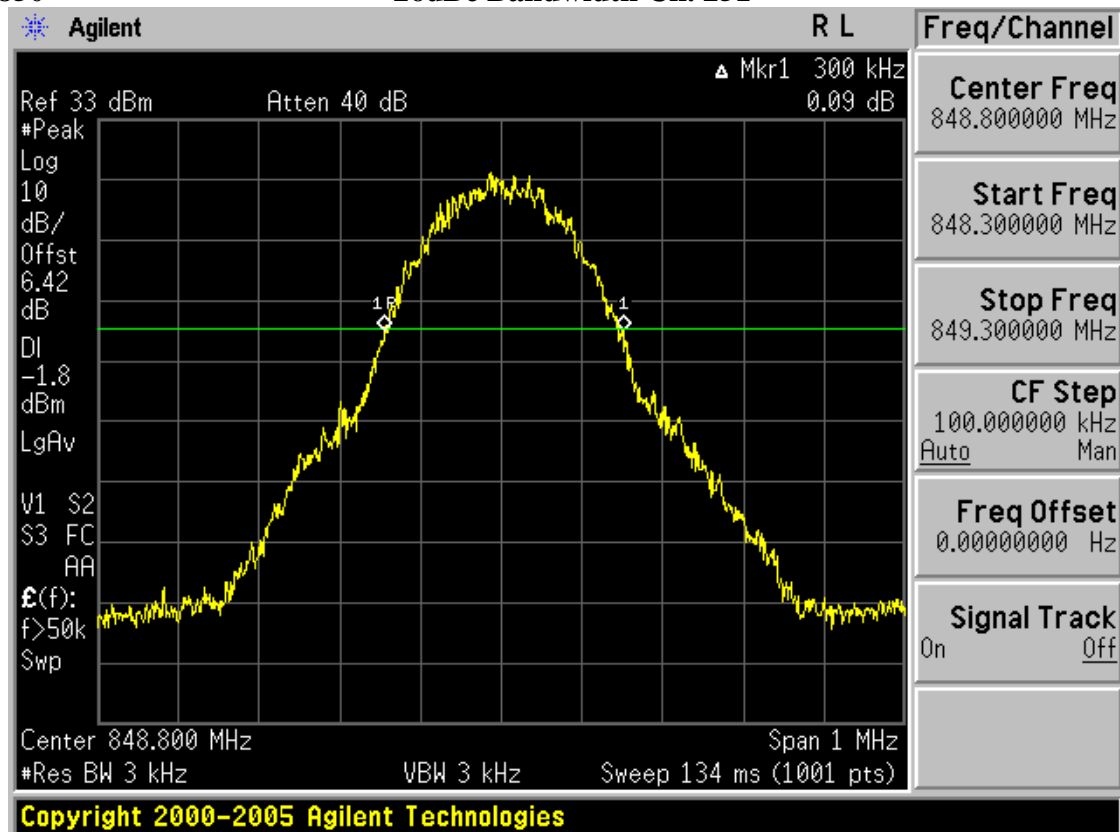
GSM850

-26dBc Bandwidth Ch. 190



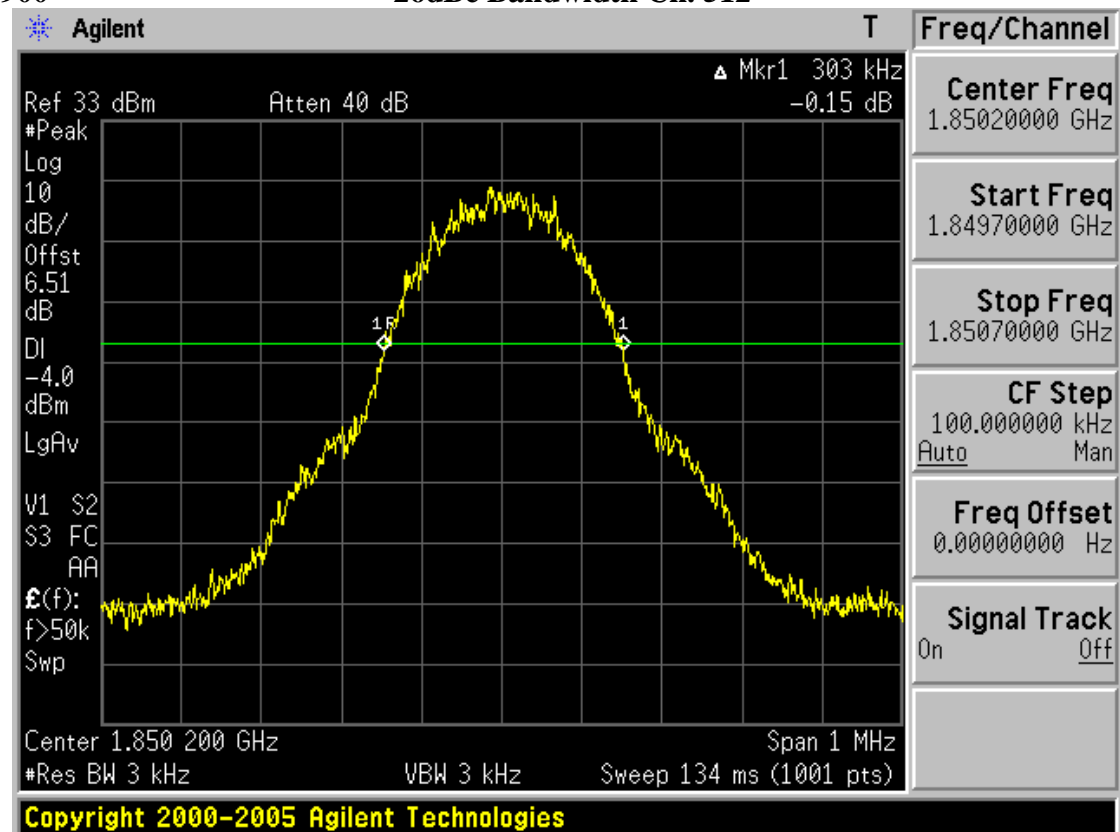
# GSM850

## -26dBc Bandwidth Ch. 251

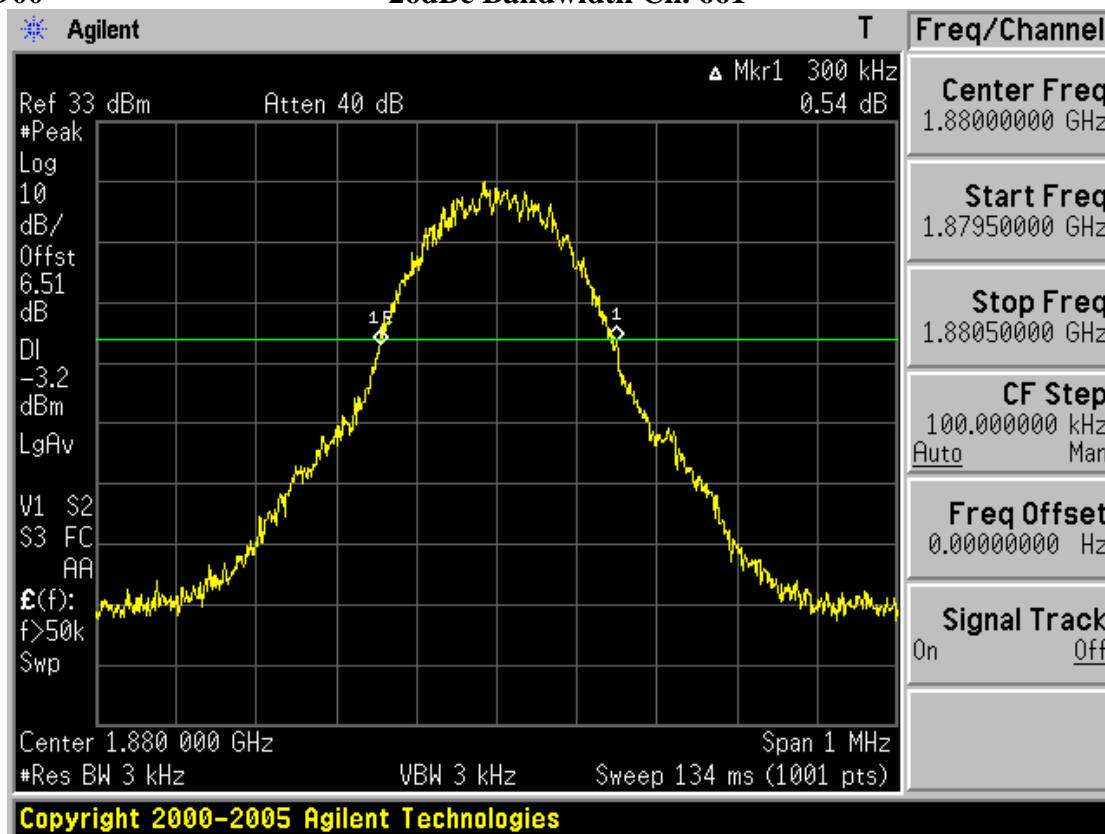


# PCS1900

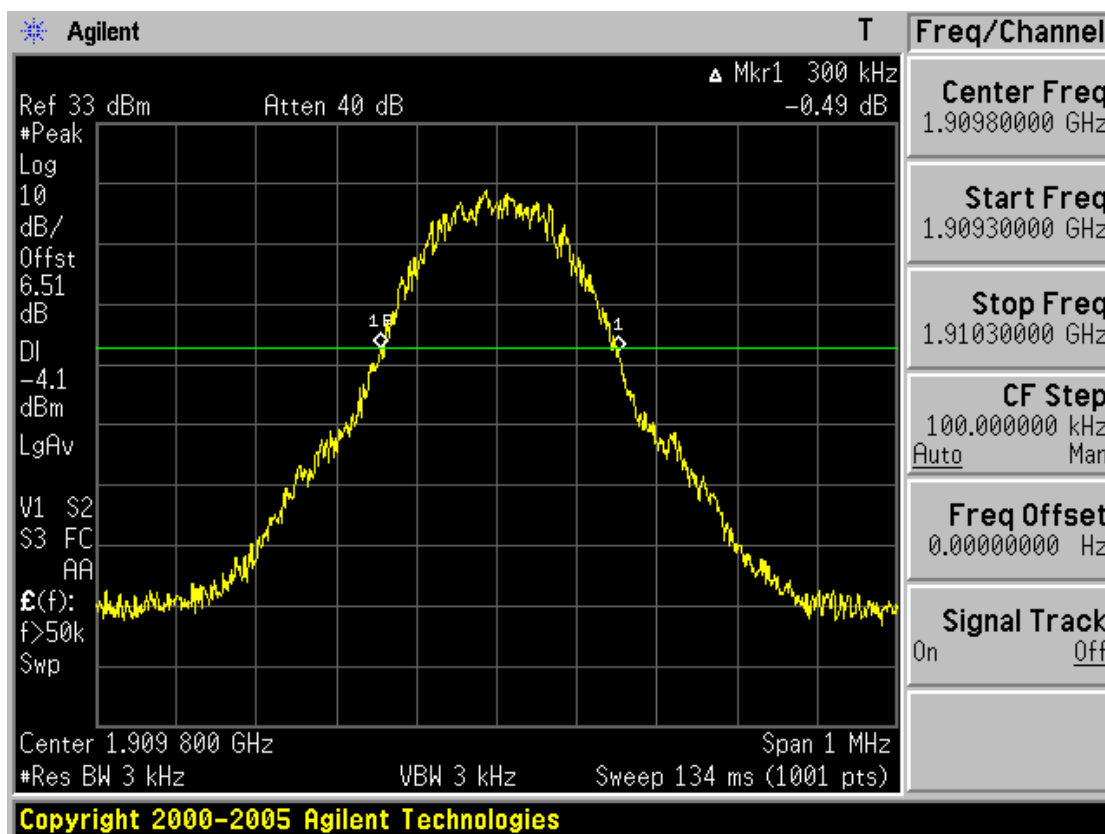
## -26dBc Bandwidth Ch. 512



## -26dBc Bandwidth Ch. 661

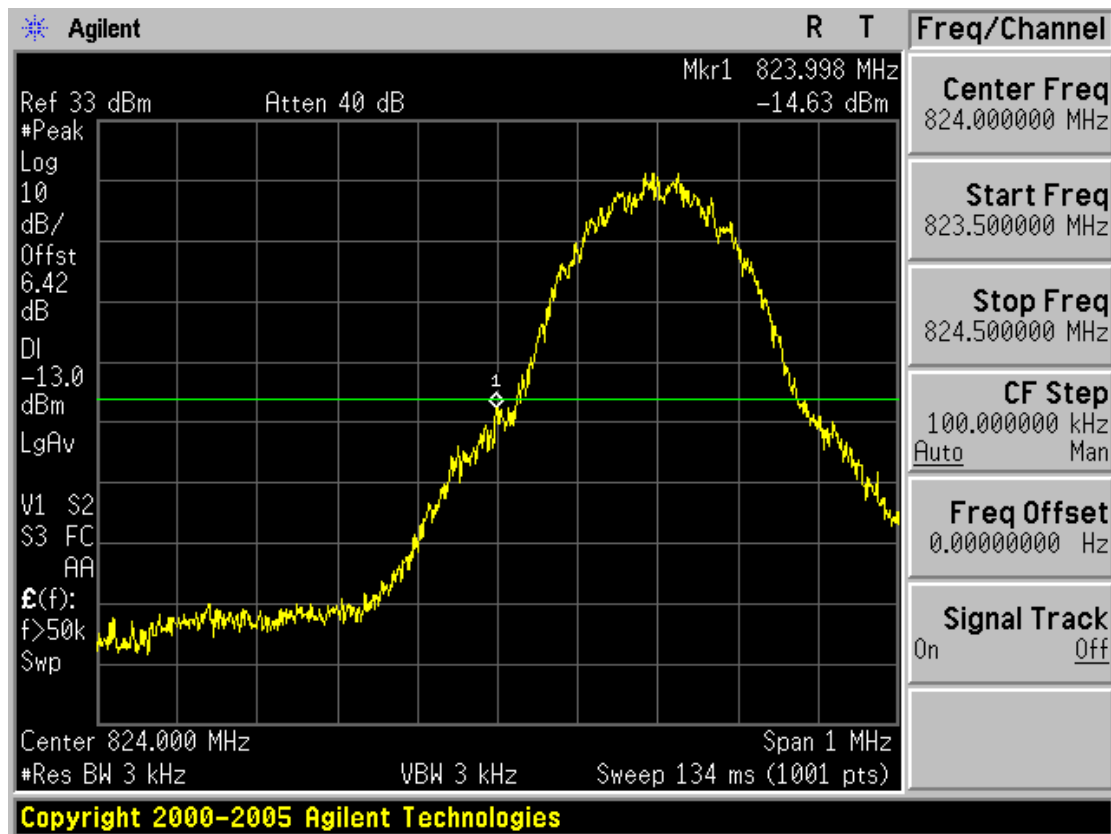


## -26dBc Bandwidth Ch. 810



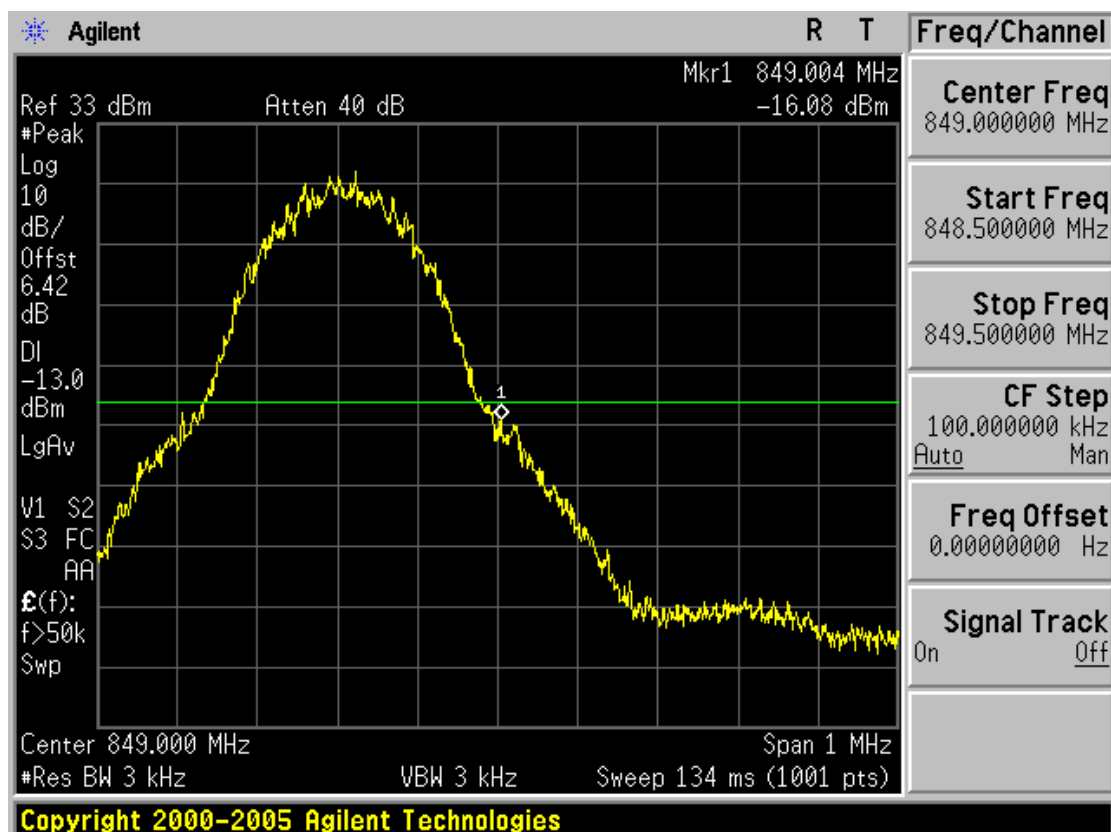
GSM850

Band Edge Ch. 128



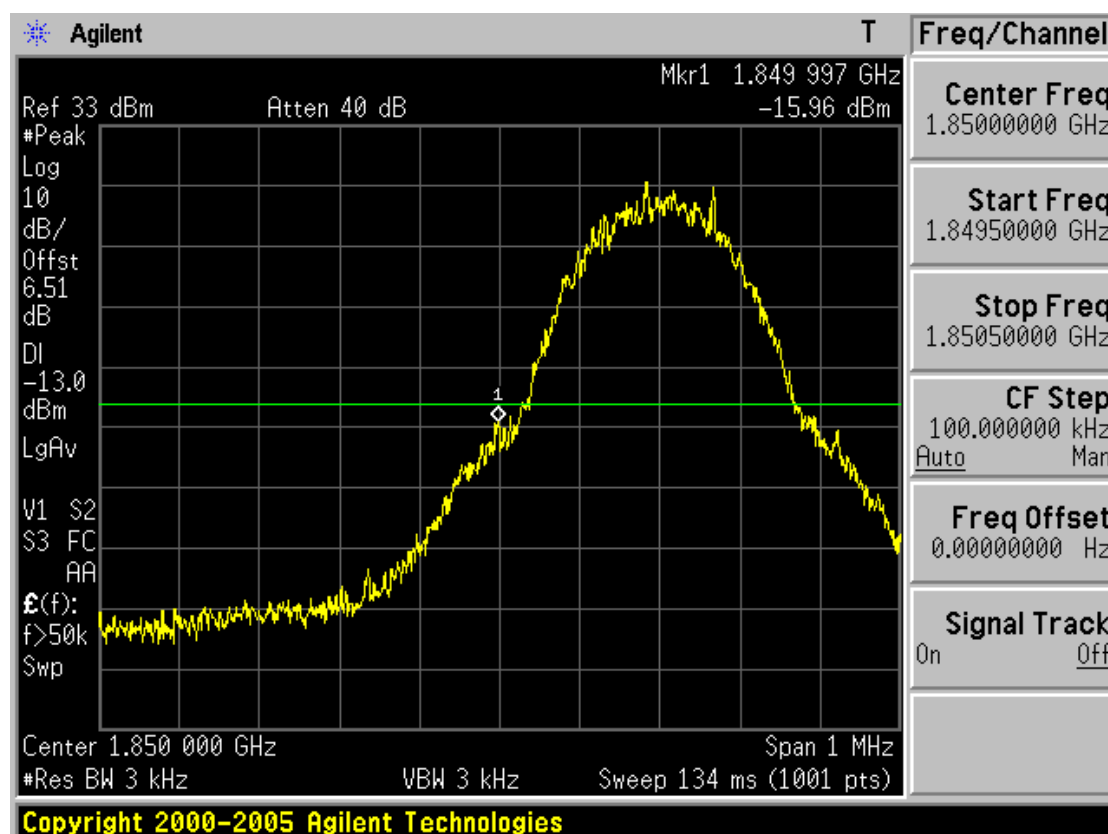
GSM850

Band Edge Ch. 251



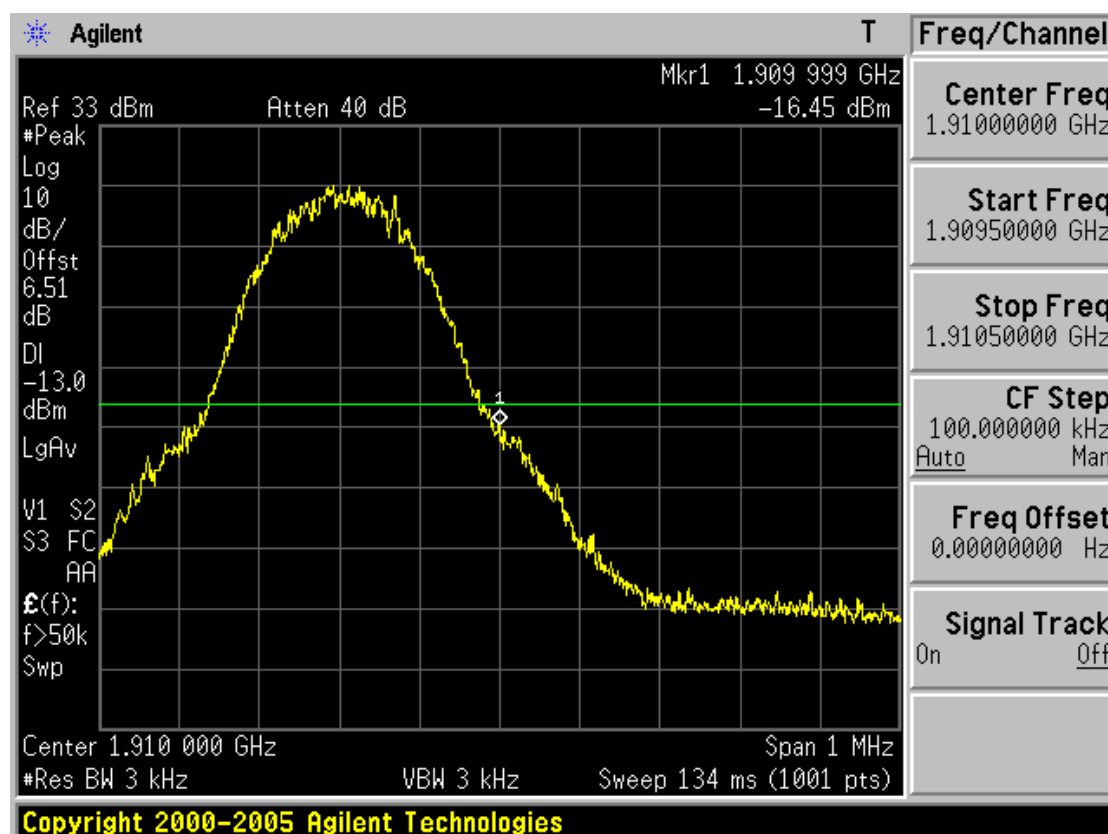
PCS1900

Band Edge Ch. 512



PCS1900

Band Edge Ch. 810



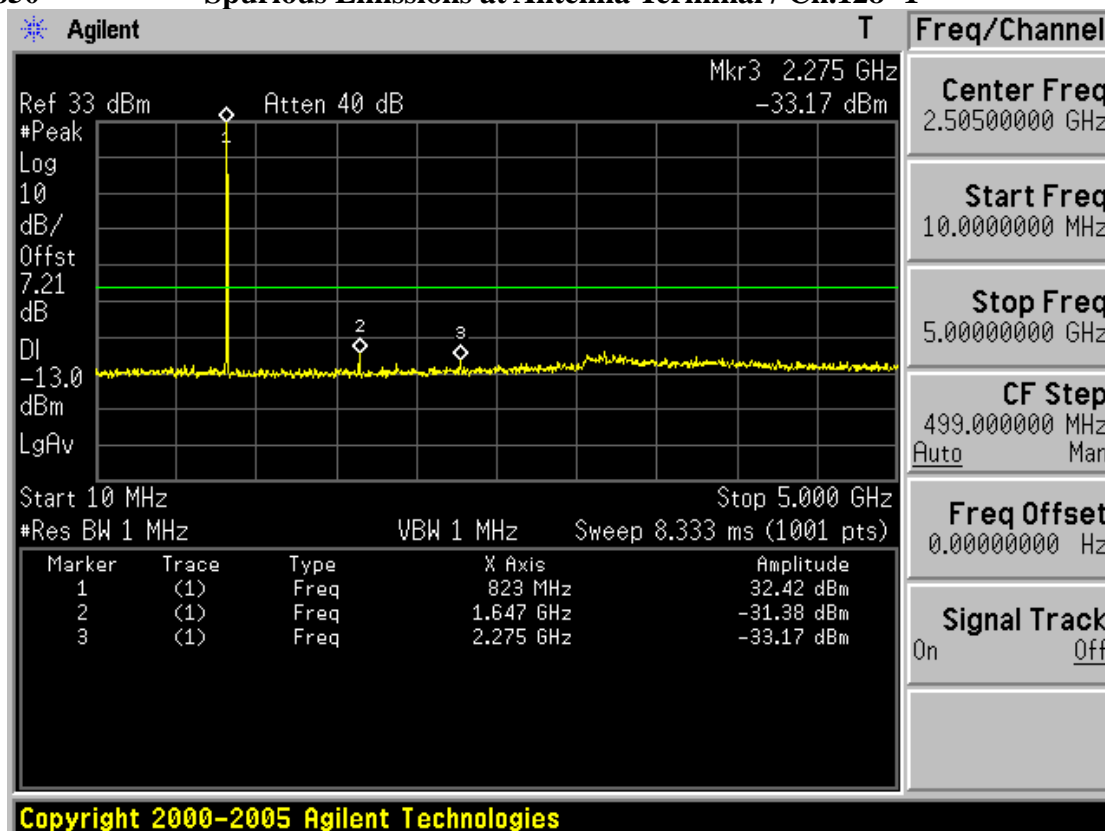
### 3.5 Spurious and Harmonic Emissions at Antenna Terminal

FCC ID	: <b>VP3GD30TF</b>
Specification	: 47 CFR 2.1051, 24.238(a)
Tested Frequency	: 824.2MHz, 836.6MHz and 848.8MHz for GSM850 1850.2MHz, 1880.0MHz and 1909.8MHz for PCS1900

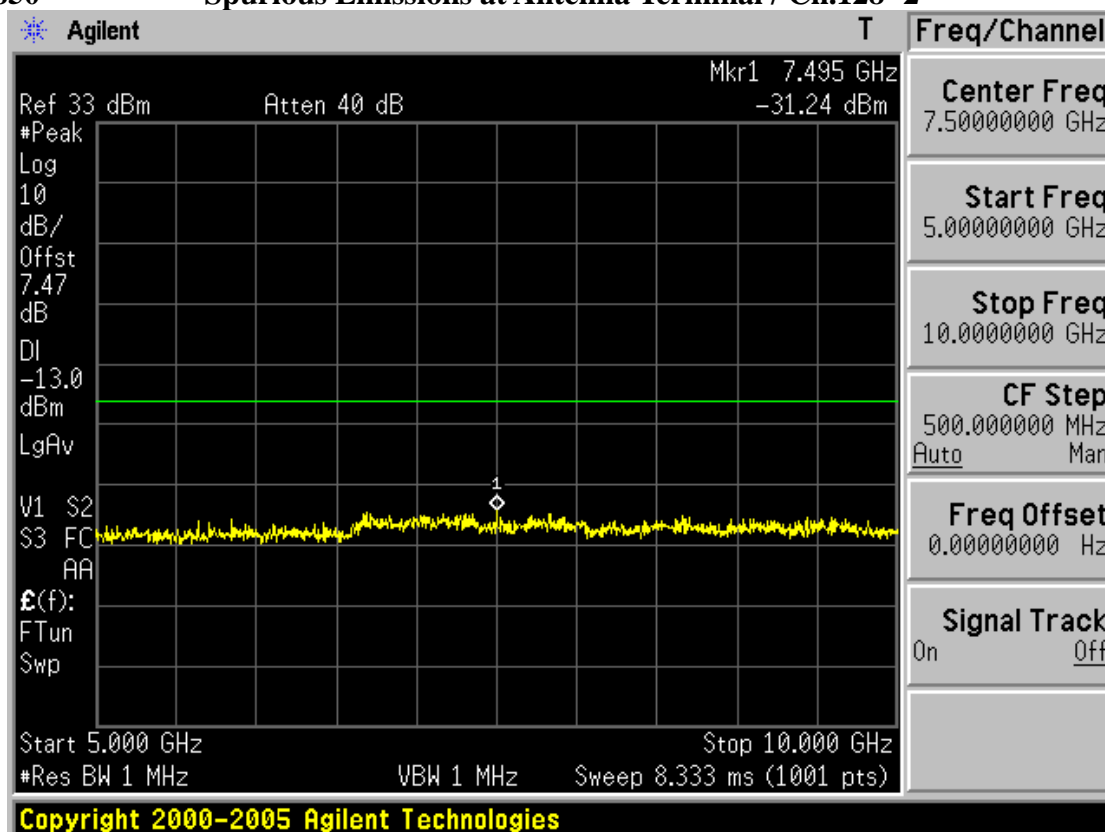
#### Measurement Procedure:

- The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer.
- The spectrum is scanned from the lowest frequency generated in the equipment up to 10'th harmonics of the highest frequency.
- Spectrum analyzer plots are included on the following pages.

# GSM850 Spurious Emissions at Antenna Terminal / Ch.128 -1

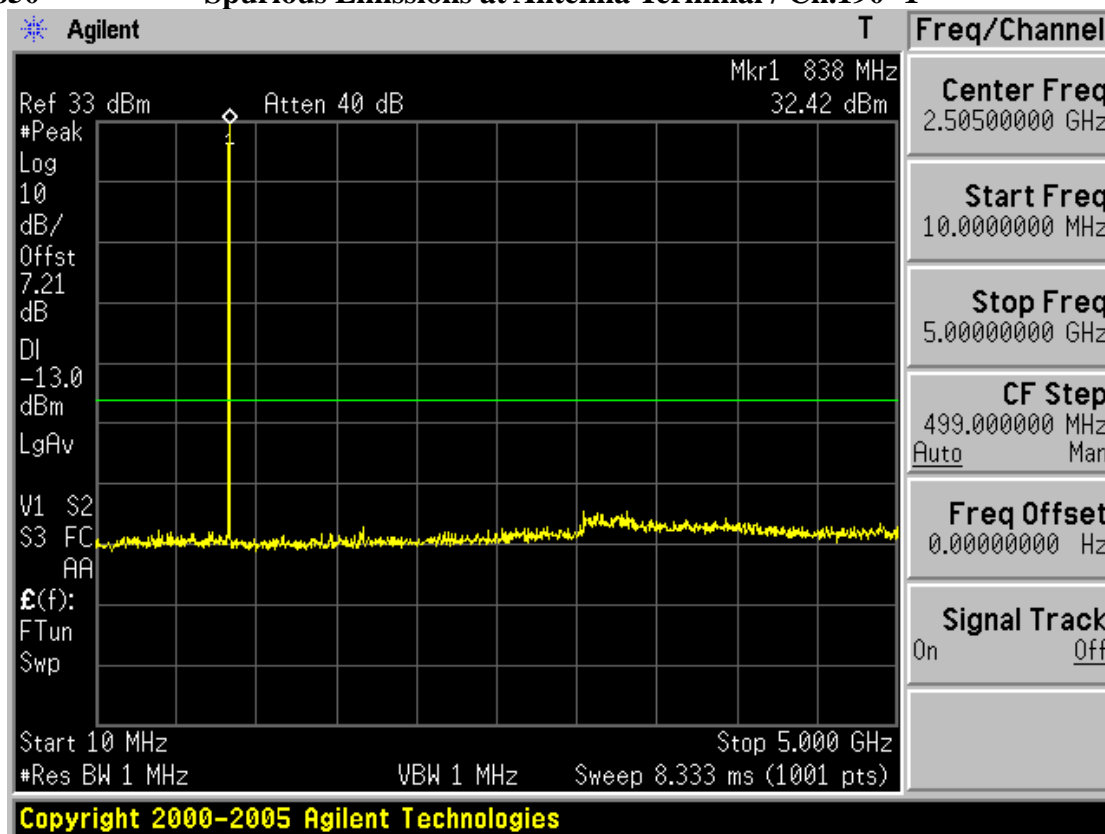


# GSM850 Spurious Emissions at Antenna Terminal / Ch.128 -2

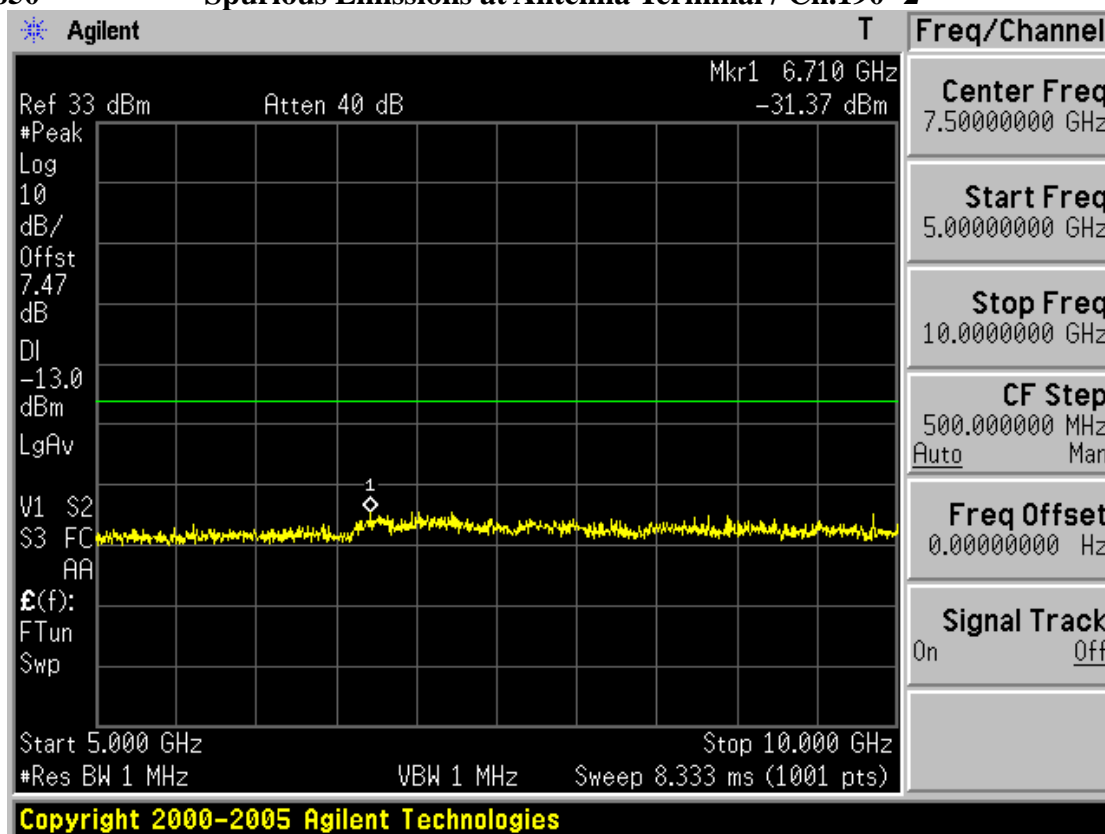




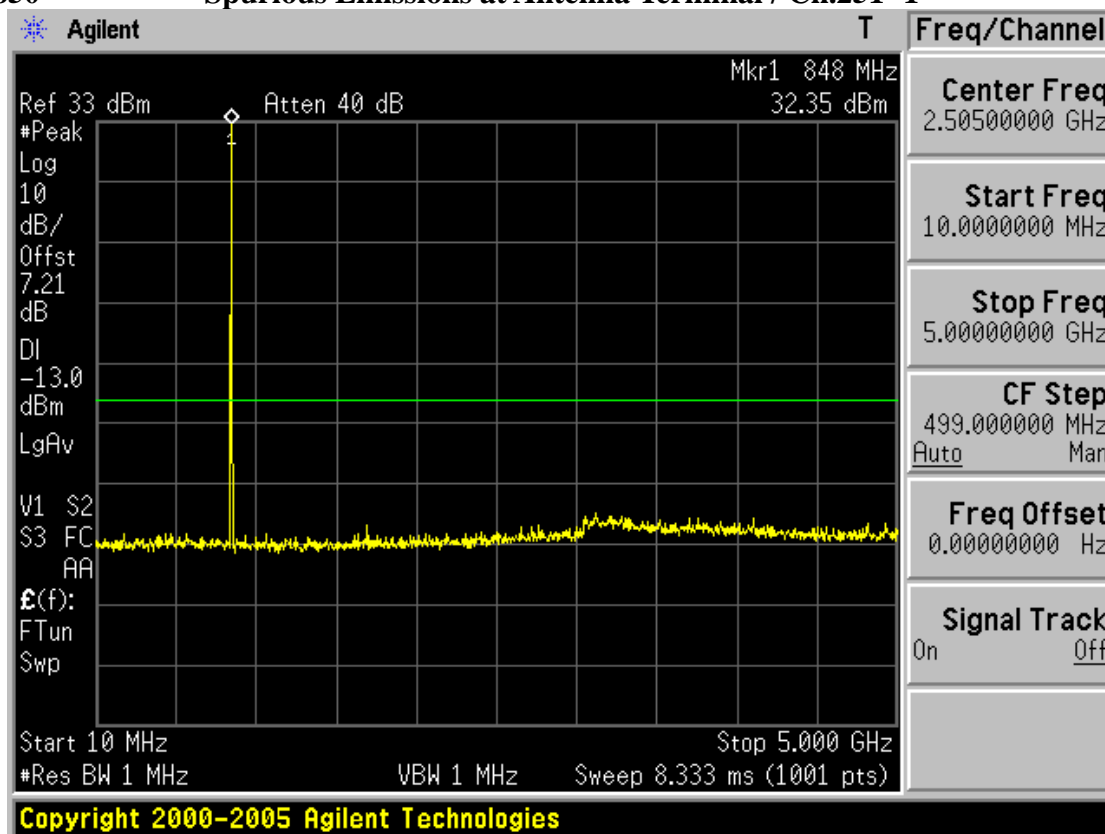
# GSM850 Spurious Emissions at Antenna Terminal / Ch.190 -1



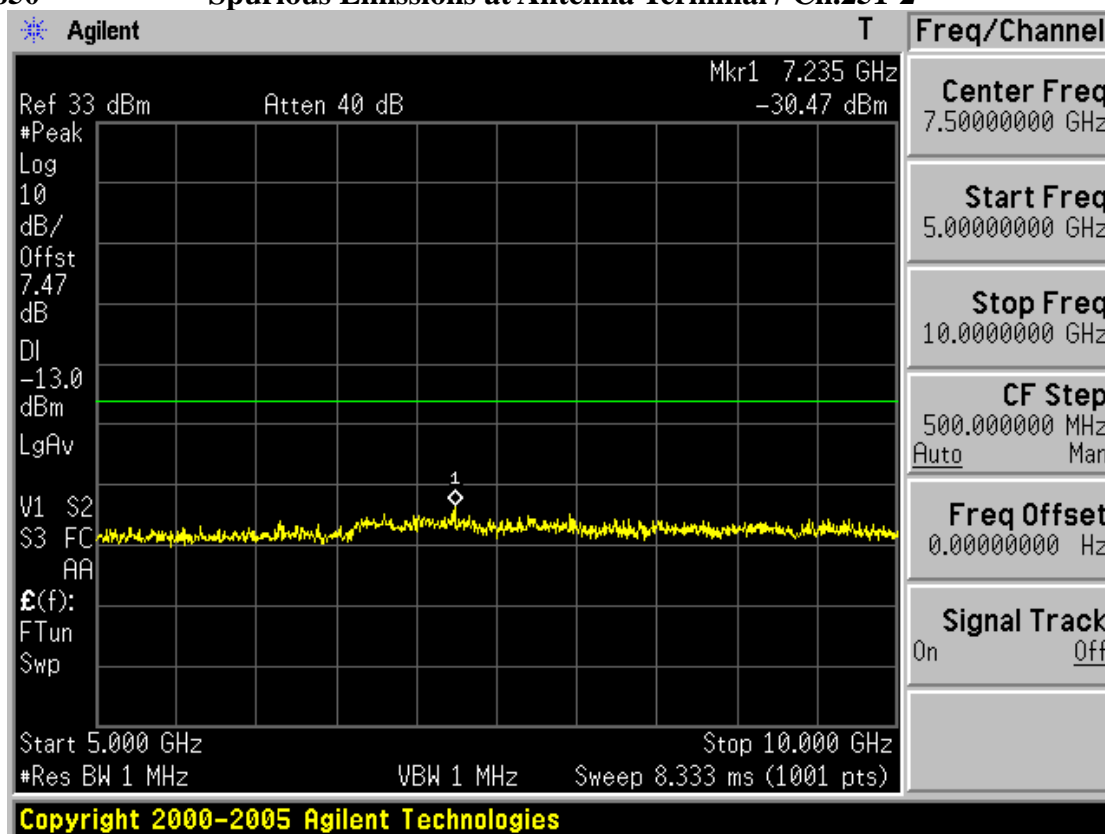
# GSM850 Spurious Emissions at Antenna Terminal / Ch.190 -2



# GSM850 Spurious Emissions at Antenna Terminal / Ch.251 -1

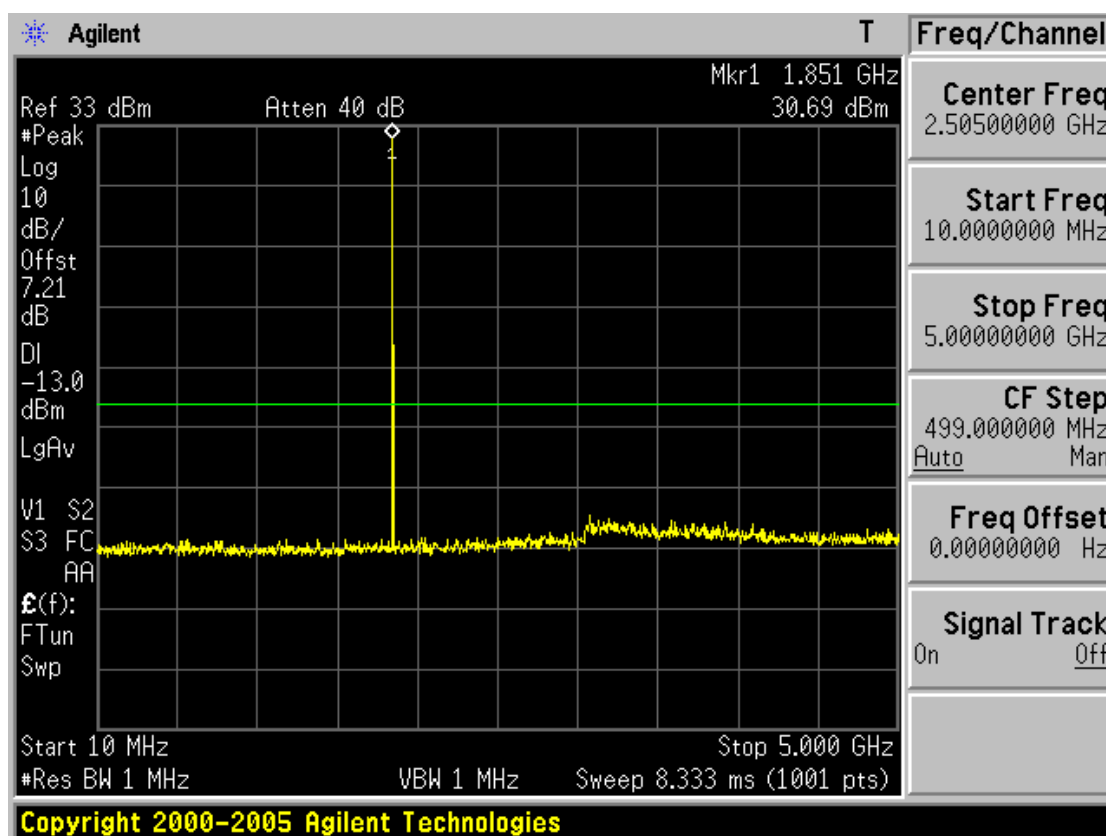


# GSM850 Spurious Emissions at Antenna Terminal / Ch.251-2



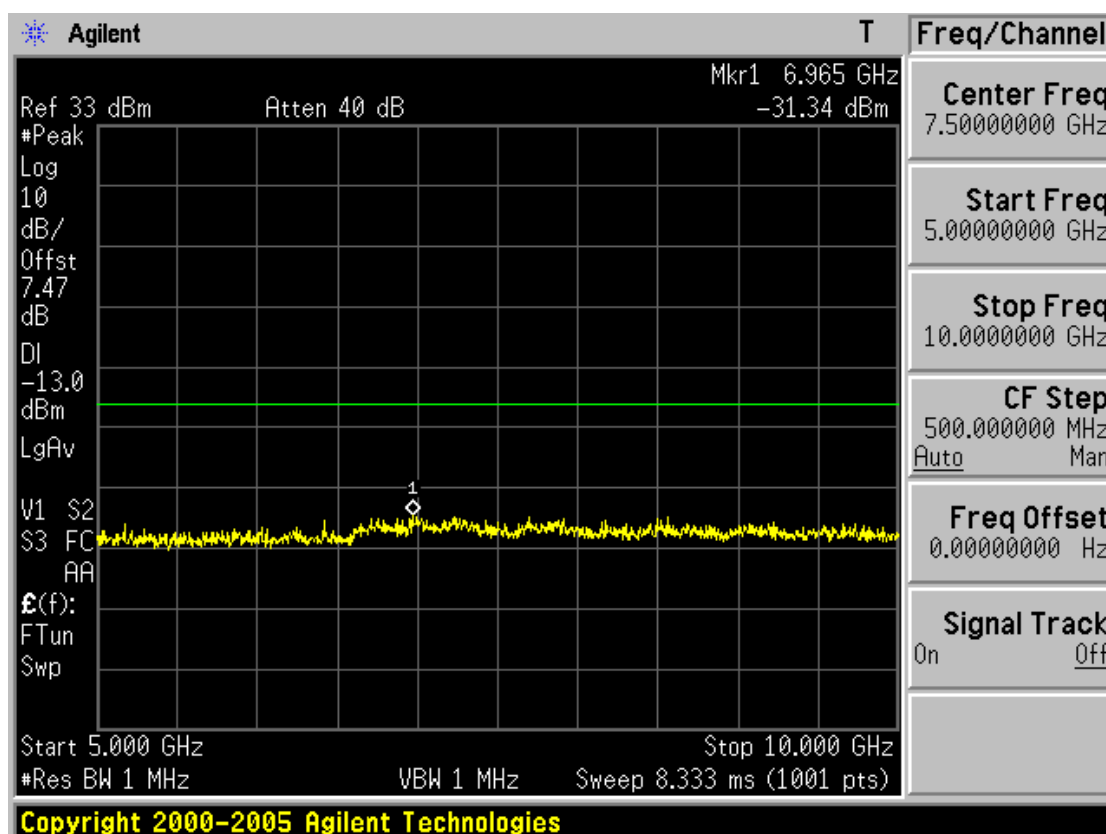
PCS1900

Spurious Emissions at Antenna Terminal / Ch.512 -1



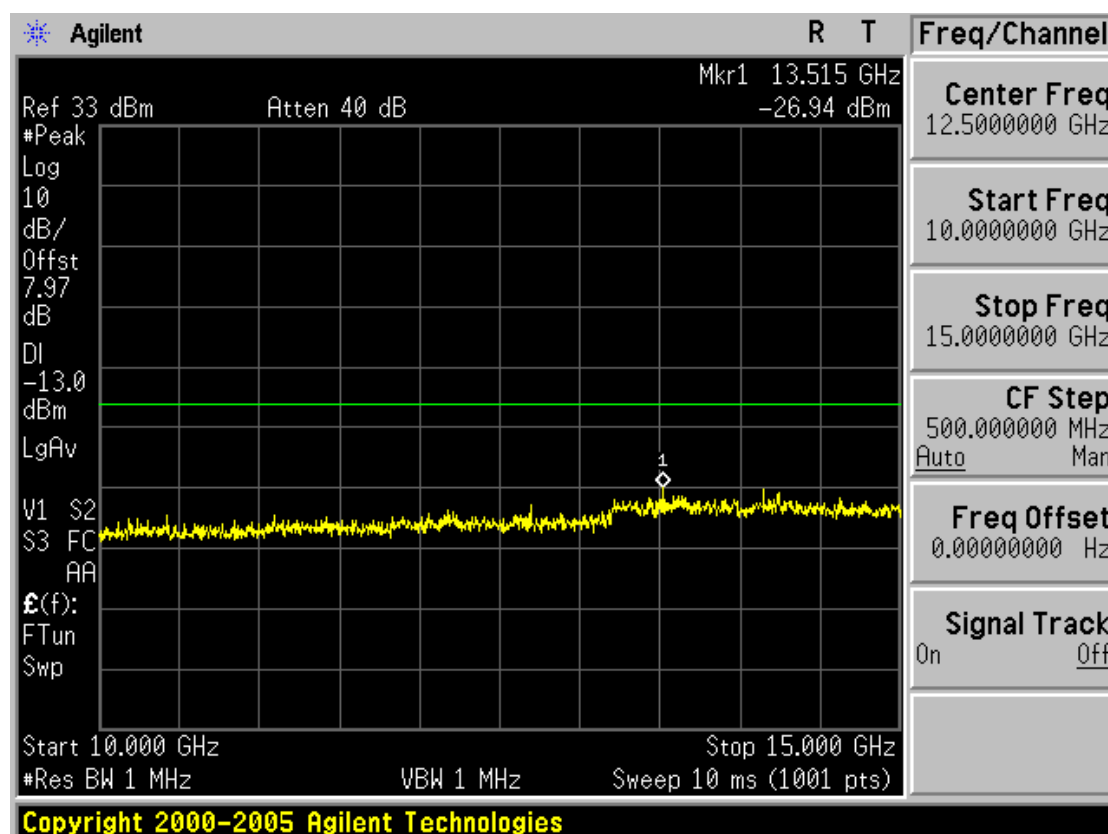
PCS1900

Spurious Emissions at Antenna Terminal / Ch.512 -2



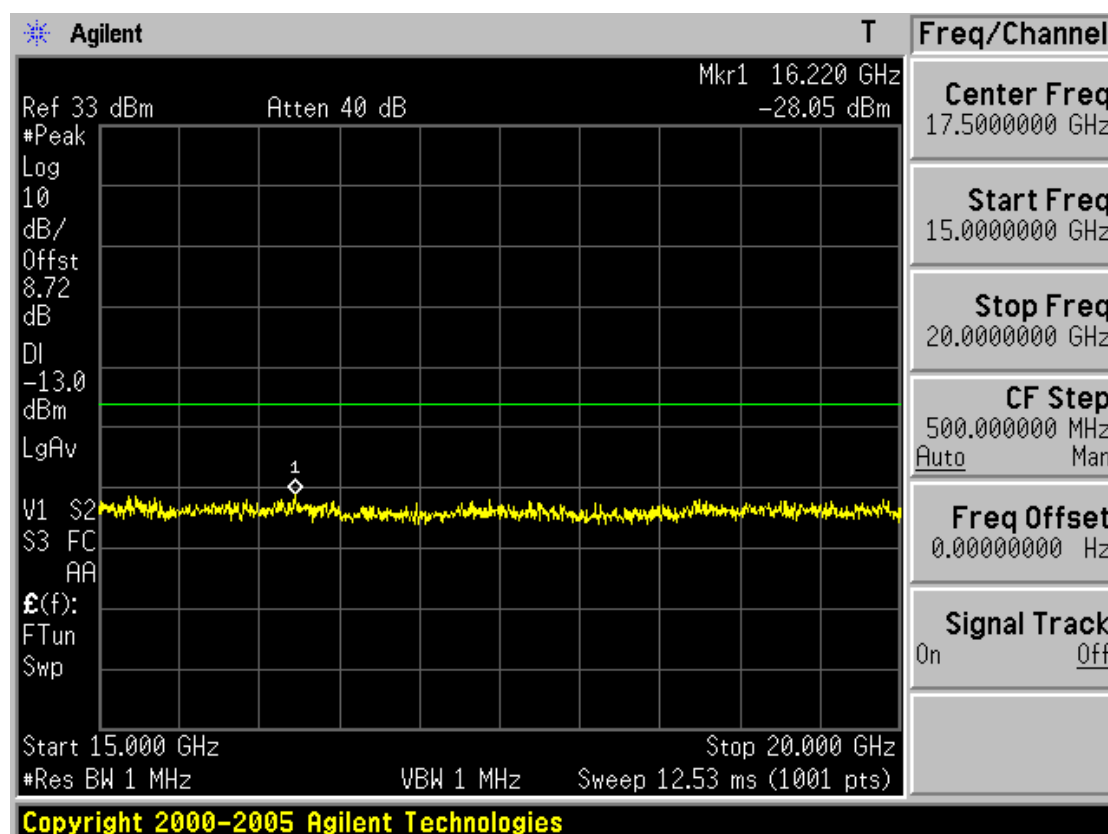
PCS1900

Spurious Emissions at Antenna Terminal / Ch.512 -3



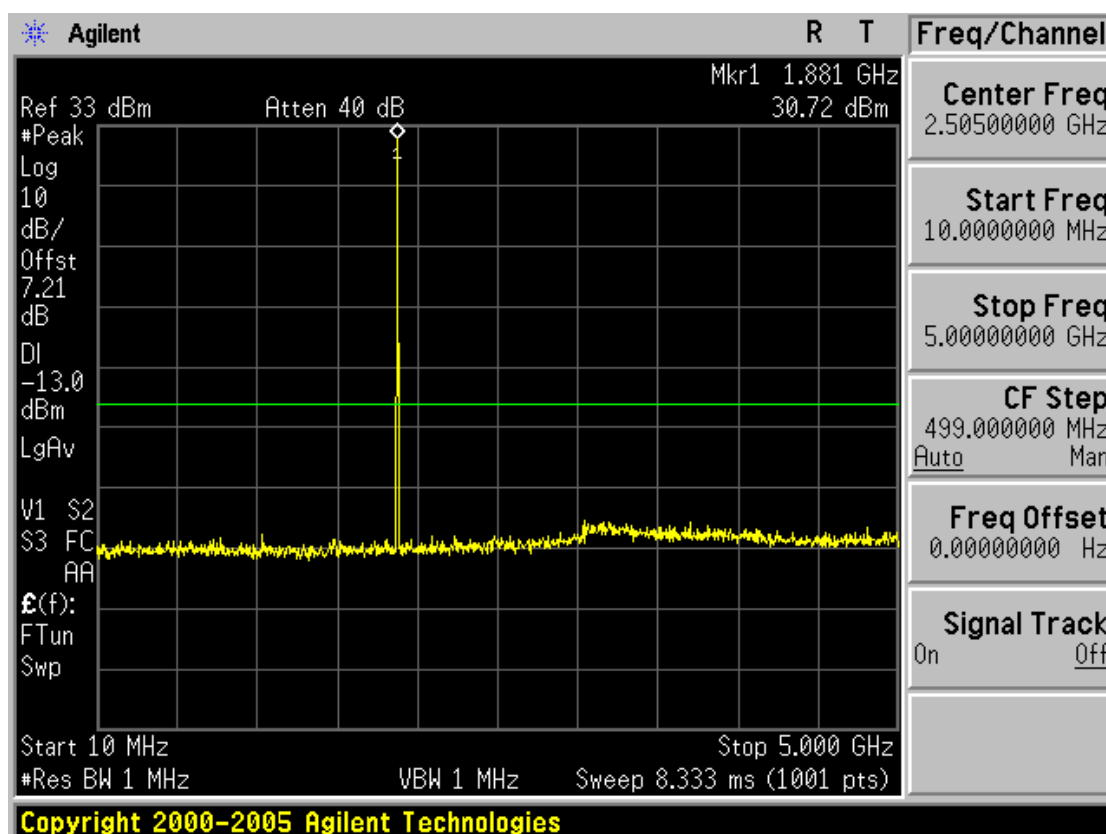
PCS1900

Spurious Emissions at Antenna Terminal / Ch.512 -4



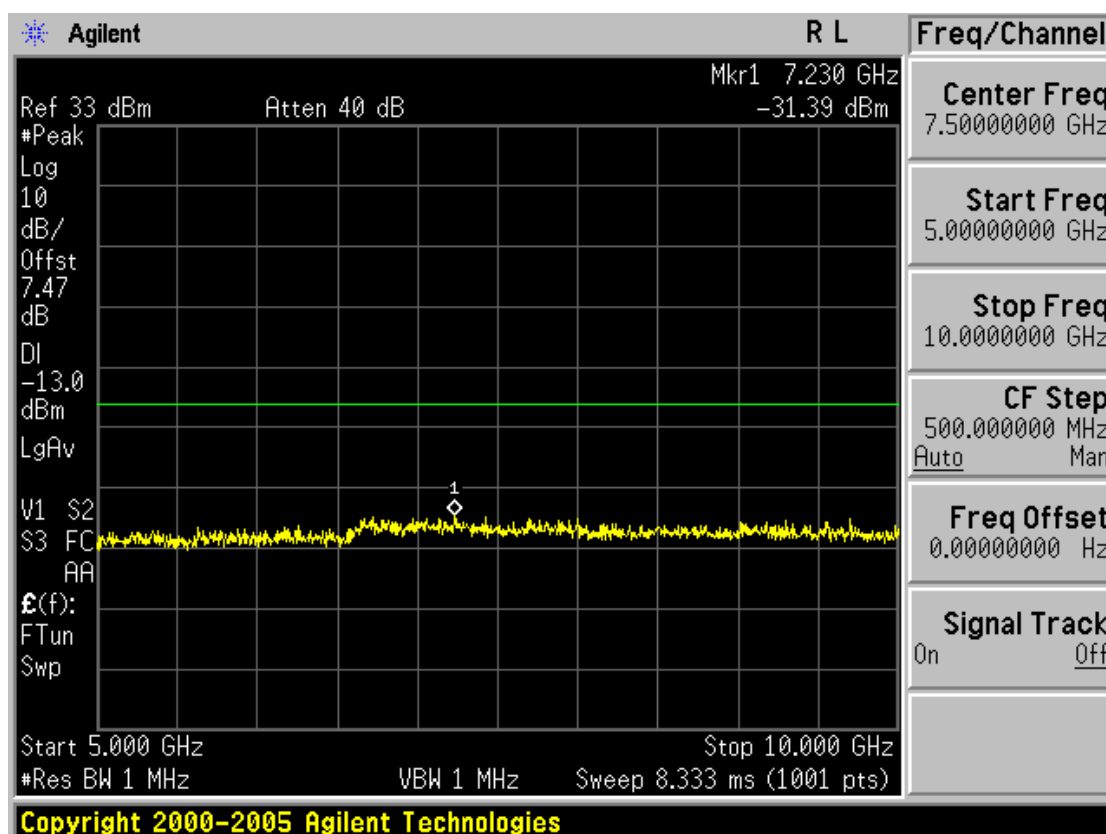
PCS1900

Spurious Emissions at Antenna Terminal / Ch.661 -1



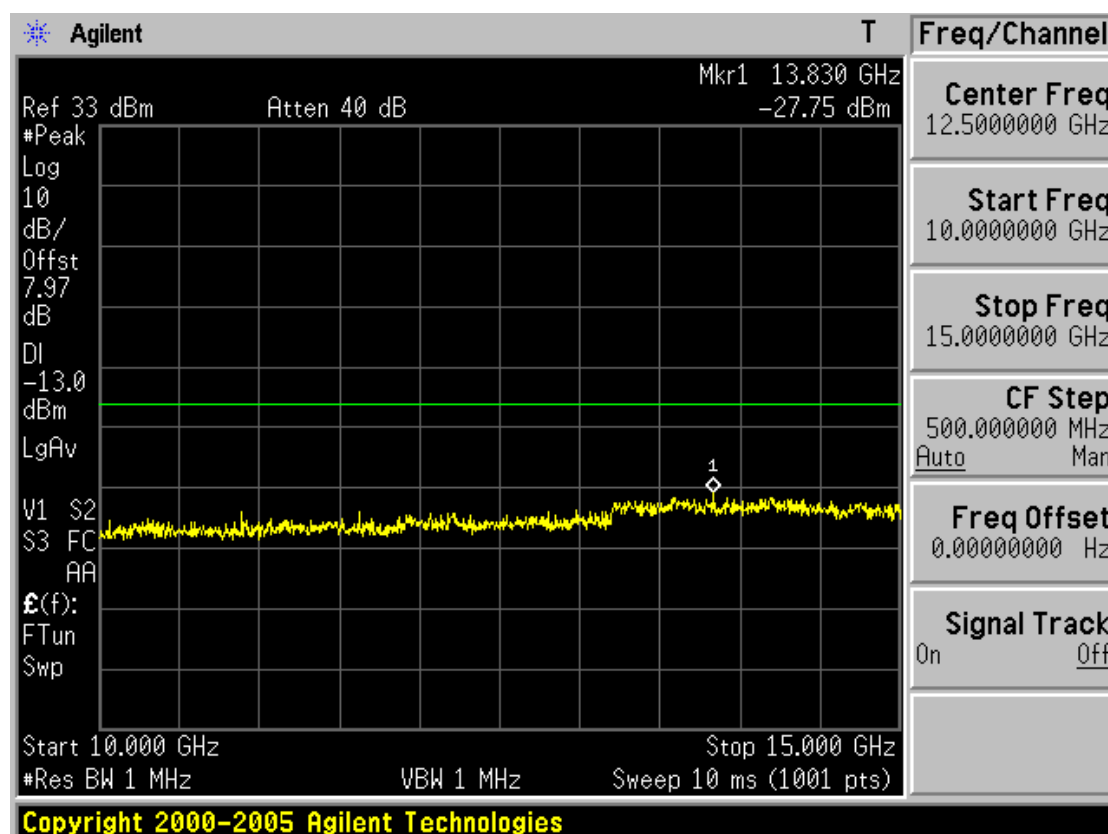
PCS1900

Spurious Emissions at Antenna Terminal / Ch.661 -2



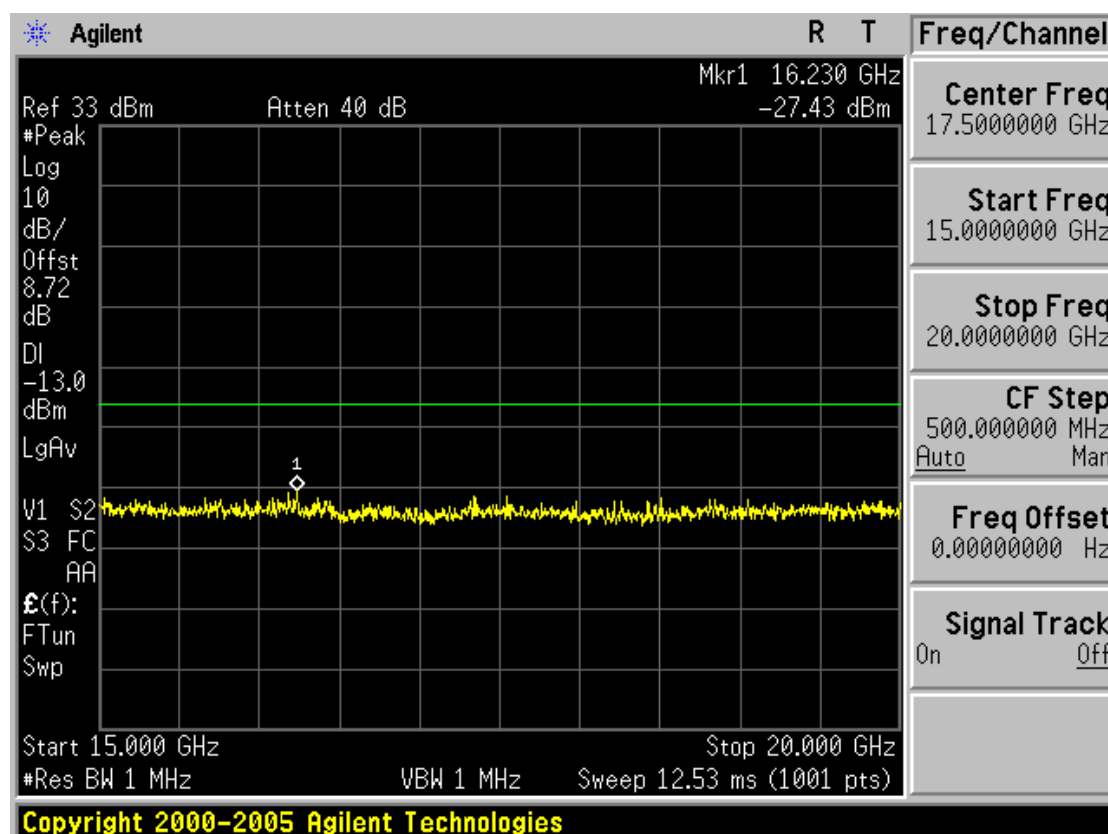
PCS1900

Spurious Emissions at Antenna Terminal / Ch.661 -3



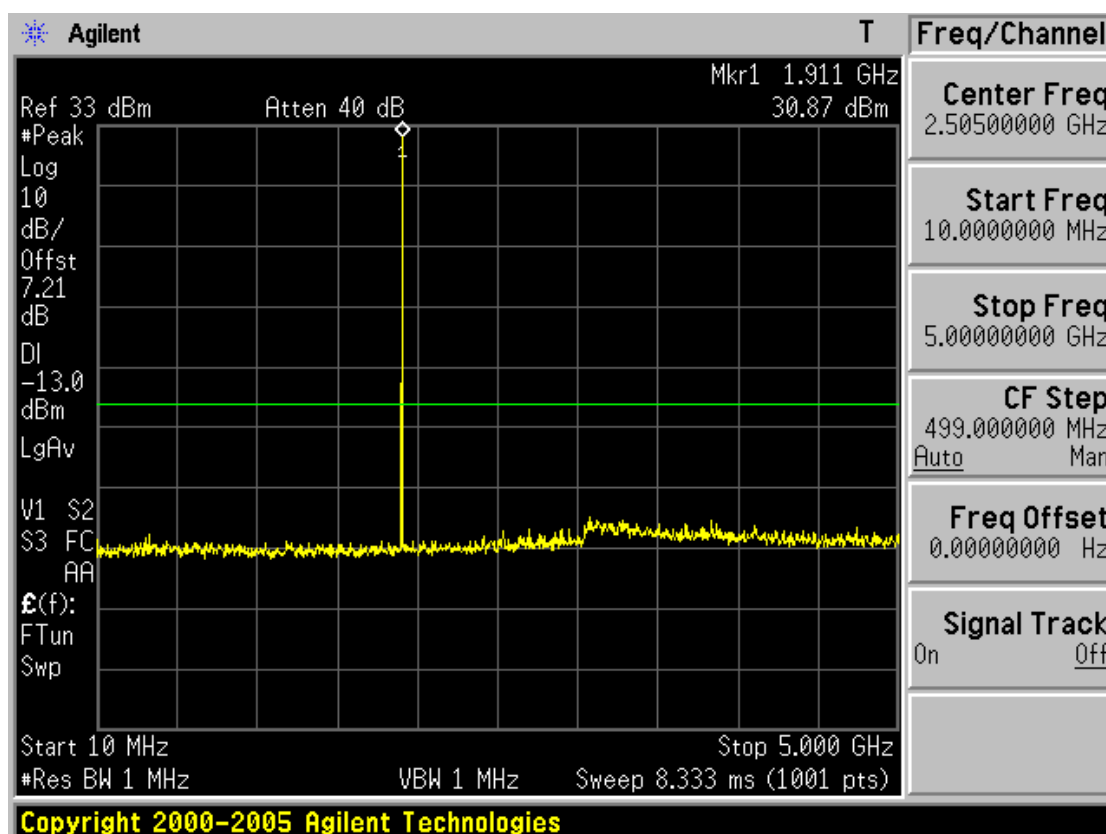
PCS1900

Spurious Emissions at Antenna Terminal / Ch.661 -4



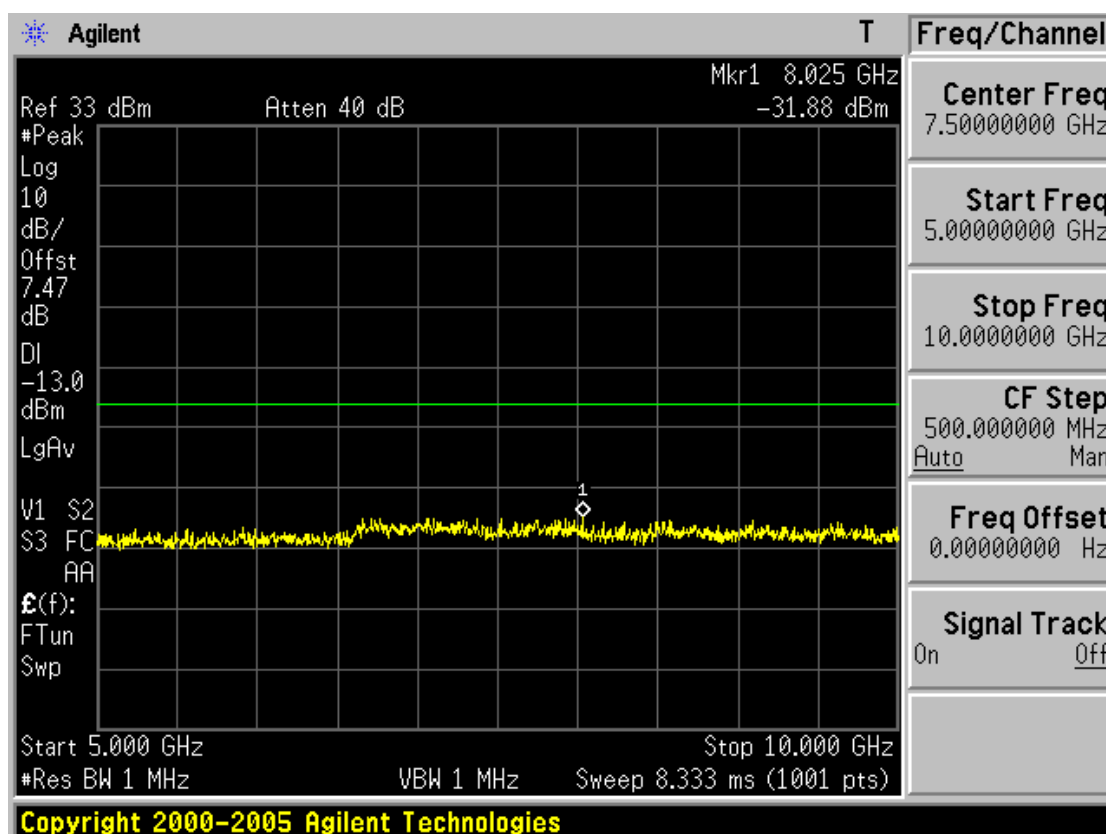
PCS1900

Spurious Emissions at Antenna Terminal / Ch.810 -1



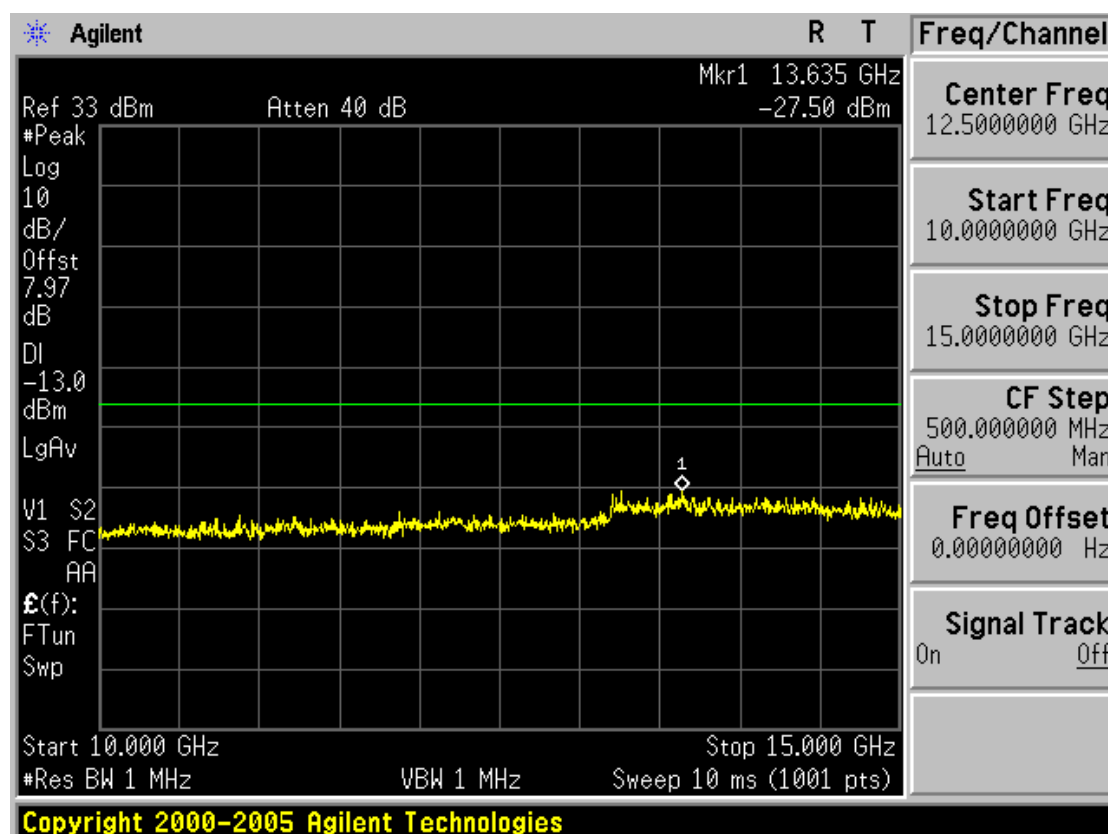
PCS1900

Spurious Emissions at Antenna Terminal / Ch.810 -2



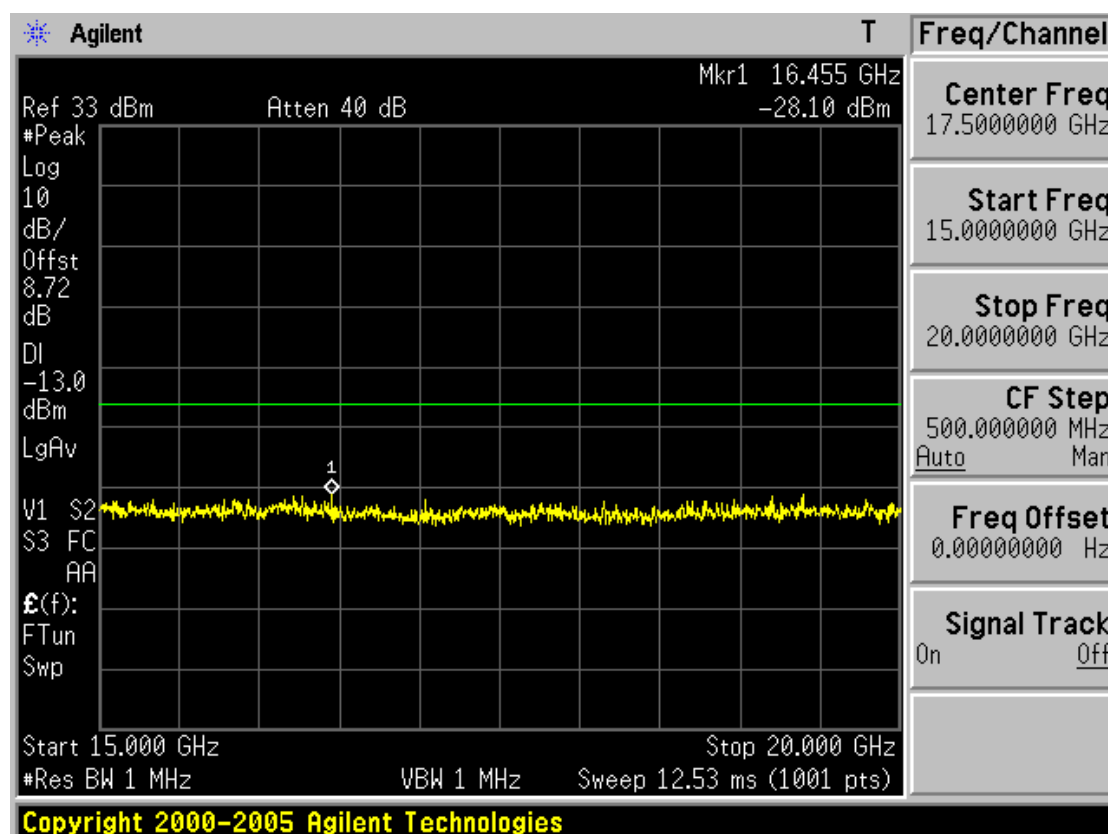
PCS1900

Spurious Emissions at Antenna Terminal / Ch.810 -3



PCS1900

Spurious Emissions at Antenna Terminal / Ch.810 -4





### 3.6 Field Strength of Spurious Radiation

FCC ID	: <b>VP3GD30TF</b>
Specification	: 47 CFR 2.1053(a)
Tested Frequency	: 824.2MHz, 836.6MHz and 848.8MHz for GSM850 1850.2MHz, 1880.0MHz and 1909.8MHz for PCS1900

#### Measurement Procedure:

- Radiation and harmonic emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer reading. This level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

**GSM850 Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY : 824.2 MHz  
CHANNEL : 128(Low)  
MEASURED OUTPUT POWER : 33.02 dBm = 2.005 W  
MODULATION SIGNAL : GSM (Internal)  
DISTANCE : 3 meters  
LIMIT :  $43 + 10 \log_{10} (W) =$  46.02 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
4121.0	-40.17	8.20	-31.97	H	64.99
-	-	-	-	-	-
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

**NOTE**

Radiated Spurious Emission Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

**GSM850 Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY : 836.6 MHz  
 CHANNEL : 190(Mid)  
 MEASURED OUTPUT POWER : 30.69 dBm = 1.172 W  
 MODULATION SIGNAL : GSM (Internal)  
 DISTANCE : 3 meters  
 LIMIT :  $43 + 10 \log_{10} (W) =$  43.69 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3346.4	-40.98	7.43	-33.55	H	64.24
-	-	-	-	-	-
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

**NOTE**

Radiated Spurious Emission Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

**GSM850 Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY : 848.8 MHz  
 CHANNEL : 251(High)  
 MEASURED OUTPUT POWER : 32.92 dBm = 1.960 W  
 MODULATION SIGNAL : GSM (Internal)  
 DISTANCE : 3 meters  
 LIMIT :  $43 + 10 \log_{10} (W)$  = 45.92 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1697.6	-38.78	6.57	-32.21	H	65.13
-	-	-	-	-	-
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

**NOTE**

Radiated Spurious Emission Measurements by Substitution Method  
 according to ANSI/TIA/EIA-603-C 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

**GSM1900 Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY : 1850.2 MHz  
 CHANNEL : 512(Low)  
 MEASURED OUTPUT POWER : 27.53 dBm = 0.567 W  
 MODULATION SIGNAL : GSM (Internal)  
 DISTANCE : 3 meters  
 LIMIT :  $43 + 10 \log_{10} (W) =$  40.53 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3700.4	-50.74	9.37	-41.37	V	68.90
-	-	-	-	-	-
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

**NOTE**

Radiated Spurious Emission Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

**GSM1900 Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY : 1880.0 MHz  
 CHANNEL : 661(Mid)  
 MEASURED OUTPUT POWER : 28.05 dBm = 0.638 W  
 MODULATION SIGNAL : GSM (Internal)  
 DISTANCE : 3 meters  
 LIMIT :  $43 + 10 \log_{10} (W) =$  41.05 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3760.0	-48.46	9.25	-39.21	V	67.26
-	-	-	-	-	-
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

**NOTE**

Radiated Spurious Emission Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

**GSM1900 Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY : 1909.8 MHz  
 CHANNEL : 810(High)  
 MEASURED OUTPUT POWER : 29.78 dBm = 0.951 W  
 MODULATION SIGNAL : GSM (Internal)  
 DISTANCE : 3 meters  
 LIMIT :  $43 + 10 \log_{10} (W) =$  42.78 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3819.6	-45.22	9.15	-36.07	H	65.85
-	-	-	-	-	-
-	-	-	-	-	-

- No other emissions were detected at a level greater than 20dB below limit.

**NOTE**

Radiated Spurious Emission Measurements by Substitution Method  
according to ANSI/TIA/EIA-603-C 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

### 3.7 Frequency Stability/Temperature Variation.

FCC ID	: <b>VP3GD30TF</b>
Specification	: 47 CFR 2.1055
Tested Frequency	: 836.6MHz for GSM850 1880.0MHz for PCS1900

#### Measurement Procedure:

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 85% 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 minimum frequency stability shall be +/- 0.00025% at any time during normal operation.

Specification — The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025 (\pm 2.5 \text{ ppm})$  of the center frequency.

#### Time Period and Procedure:

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (25°C to 27 °C to provide a reference)
2. The equipment is subjected to an overnight “soak” at -30°C without any power applied.
3. After the overnight ”soak” at -30°C(usually 14-16 hours),the equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency to the transmitter and the individual oscillators is made within a three minute interval after applying power to the transmitter.
4. Frequency measurements is made at 10°C interval up to room temperature. At least a period of one and one half hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency were made at 10intervals starting at -30°C up to +50°C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.



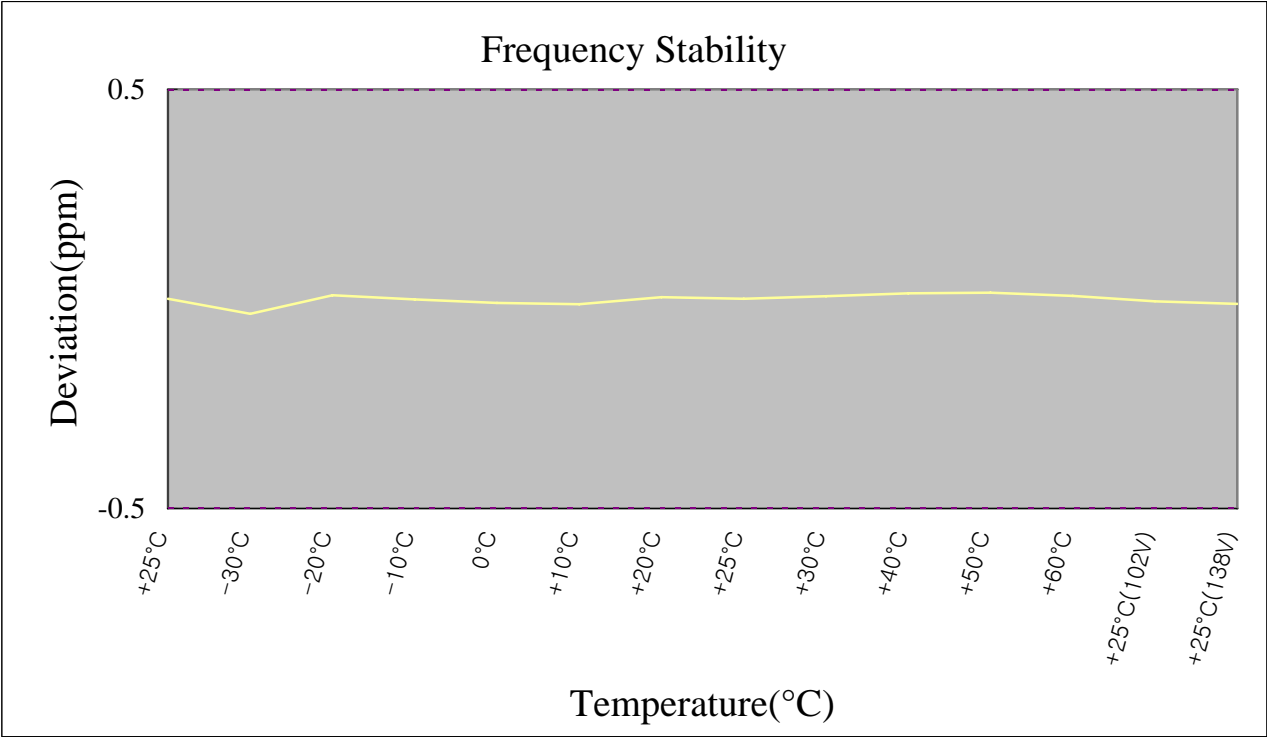
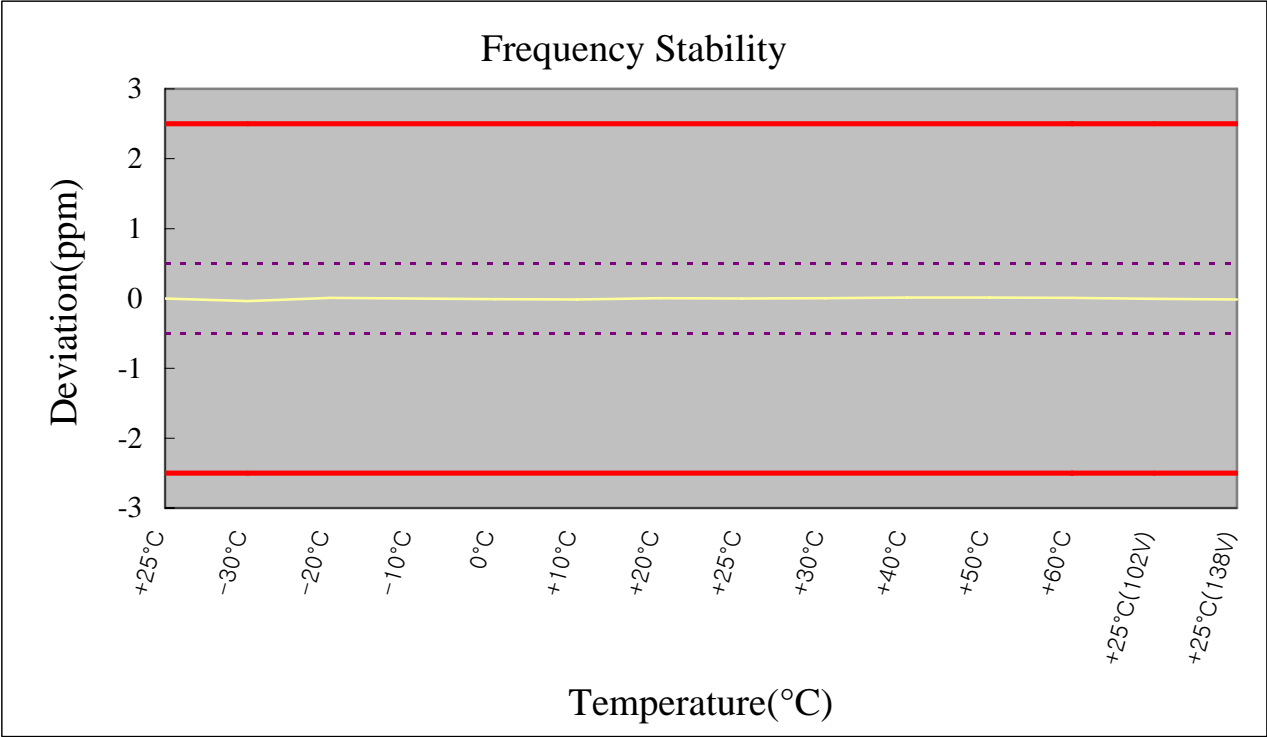
### Frequency Stability (GSM850)

OPERATING FREQUENCY : 836,599,973 Hz  
 CHANNEL : 190(Mid)  
 REFERENCE VOLTAGE : 120 VAC  
 DEVIATION LIMIT :  $\pm 0.00025$  % or 2.5 ppm

VOLTAGE (%)	POWER (VAC)	TEMP (dB)	FREQ (Hz)	Deviation (%)
100%	120	+25(Ref)	836,599,973	0.000000
100%		-30	836,599,943	-0.000004
100%		-20	836,599,980	0.000001
100%		-10	836,599,972	0.000000
100%		0	836,599,965	-0.000001
100%		+10	836,599,962	-0.000001
100%		+20	836,599,976	0.000000
100%		+25	836,599,973	0.000000
100%		+30	836,599,978	0.000001
100%		+40	836,599,984	0.000001
100%		+50	836,599,985	0.000001
100%		+60	836,599,979	0.000001
85%	102	+25	836,599,968	-0.000001
115%	138	+25	836,599,963	-0.000001
BATT.ENDPOINT	-	+25	-	-

Frequency Stability(GSM850)

(Continued...)



### Frequency Stability (PCS1900)

OPERATING FREQUENCY : 1,879,999,951 Hz

CHANNEL : 0661(Mid)

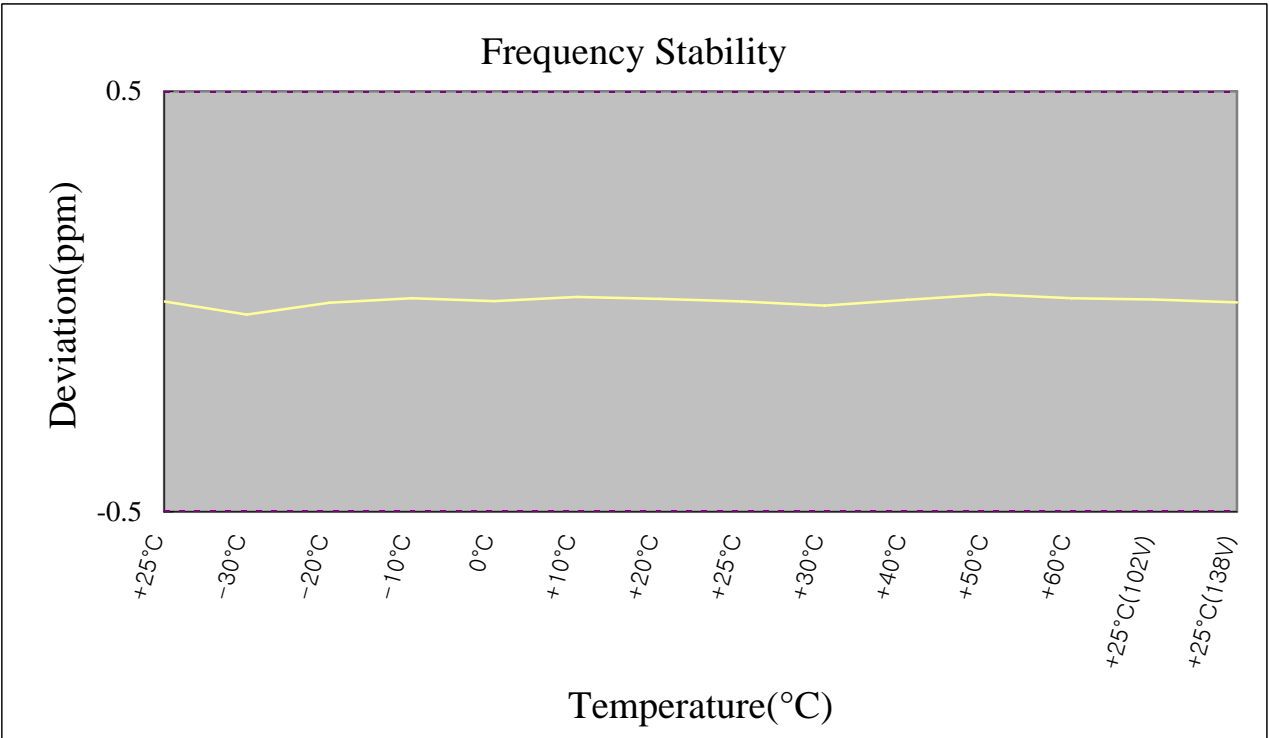
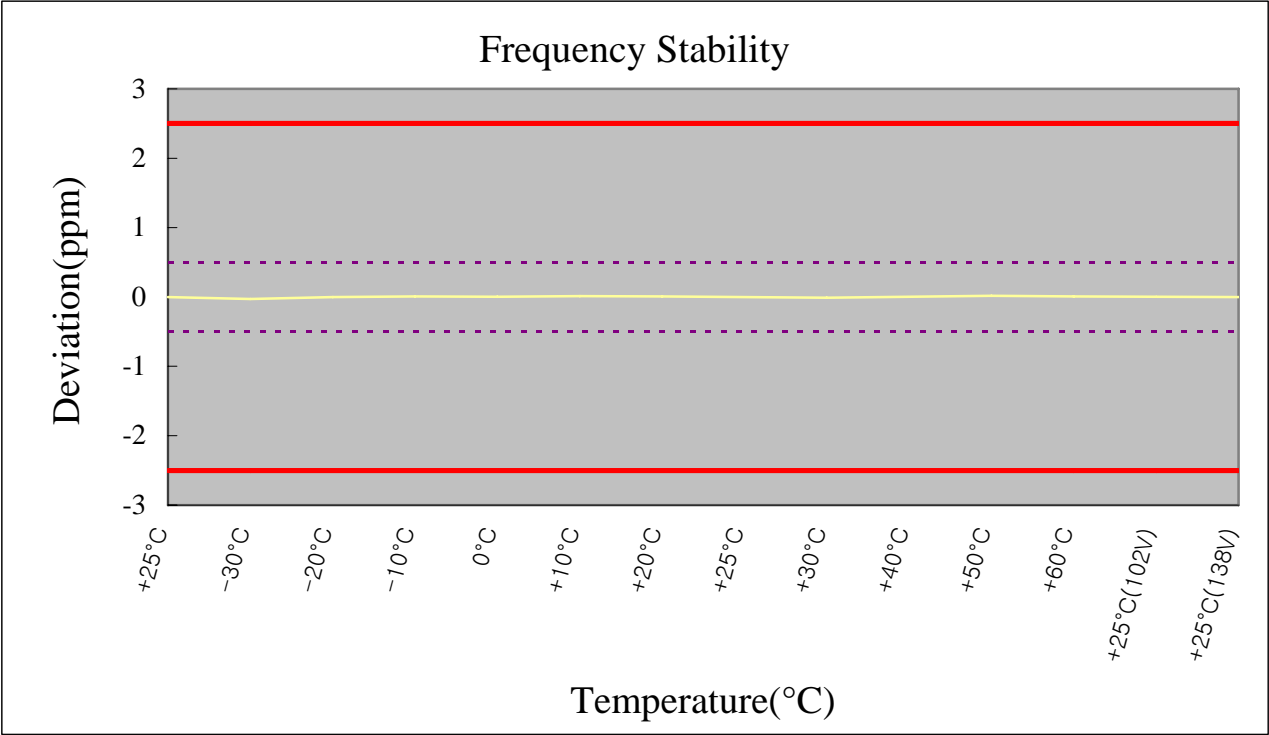
REFERENCE VOLTAGE : 120 VAC

DEVIATION LIMIT : ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VAC)	TEMP (dB)	FREQ (Hz)	Deviation (%)
100%	120	+25(Ref)	1,879,999,951	0.000000
100%		-30	1,879,999,892	-0.000003
100%		-20	1,879,999,945	0.000000
100%		-10	1,879,999,965	0.000001
100%		0	1,879,999,953	0.000000
100%		+10	1,879,999,971	0.000001
100%		+20	1,879,999,963	0.000001
100%		+25	1,879,999,951	0.000000
100%		+30	1,879,999,933	-0.000001
100%		+40	1,879,999,958	0.000000
100%		+50	1,879,999,982	0.000002
100%		+60	1,879,999,965	0.000001
85%	102	+25	1,879,999,959	0.000000
115%	138	+25	1,879,999,947	0.000000
BATT.ENDPOINT	-	+25	-	-

Frequency Stability (PCS1900)

(continued...)



## 4. TEST EQUIPMENT

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	Next.Due.Date (dd/mm/yy)	S/N
01	Spectrum Analyzer	Agilent	E4404B	17/04/07	17/04/08	US41061134
02	Spectrum Analyzer	Agilent	E4440A	15/11/07	15/11/08	MY45304199
03	Spectrum Analyzer	H.P	8563E	09/10/07	09/10/09	3551A04634
04	Spectrum Analyzer	Rohde Schwarz	FSP	06/09/07	06/09/08	100385
05	Power Meter	H.P	EMP-442A	23/03/07	23/03/08	GB37170413
06	Power Sensor	H.P	8481A	23/03/07	23/03/08	3318A96566
07	Frequency Counter	H.P	5342A	06/09/07	06/09/08	2119A04450
08	Signal Generator	Rohde Schwarz	SMR20	21/03/07	21/03/08	101251
09	Signal Generator	H.P	ESG-3000A	10/07/07	10/07/08	US37230529
10	Vector Signal Generator	Rohde Schwarz	SMJ100A	25/06/07	25/06/08	100148
11	Audio Analyzer	H.P	8903B	10/07/07	10/07/08	3011A09448
12	Modulation Analyzer	H.P	8901B	14/07/07	14/07/08	3028A03029
13	Oscilloscope	Tektronix	TDS3052	02/11/07	02/11/08	B016821
14	Universal Radio Communication tester	Rohde Schwarz	CMU200	24/04/07	24/04/08	107631
15	8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	18/07/07	18/07/09	GB43461134
16	Bluetooth Tester	TESCOM	TC-3000A	28/03/07	28/03/08	3000A4A0121
17	Multisystem Ue Tester	Japan Radio Co.,Ltd	NJZ-2000	20/11/06	20/11/07	ET00095
18	Power Splitter	WEINSCHL	1593	05/10/07	05/10/08	332
19	BAND Reject Filter	Microwave Circuits	N0308372	18/10/07	18/10/08	3125-01DC0312
20	BAND Reject Filter	Wainwright	WRCG1750	18/10/07	18/10/08	SN2
21	AC Power supply	DAEKWANG	5KVA	20/03/07	20/03/08	N/A
22	DC Power Supply	H.P	6622A	20/03/07	20/03/08	465487
23	Attenuator (10dB)	WEINSCHL	23-10-34	26/01/07	26/01/08	BP4387
24	HORN ANT	EMCO	3115	10/08/07	10/08/08	6419
25	HORN ANT	EMCO	3115	09/10/07	09/10/08	21097
26	HORN ANT	A.H.Systems	SAS-574	20/08/07	20/08/08	154
27	HORN ANT	A.H.Systems	SAS-574	20/08/07	20/08/08	155
28	Dipole Antenna	Schwarzbeck	VHA9103	27/11/06	27/11/07	2116
29	Dipole Antenna	Schwarzbeck	VHA9103	27/11/06	27/11/07	2117
30	Dipole Antenna	Schwarzbeck	UHA9105	27/11/06	27/11/07	2261
31	Dipole Antenna	Schwarzbeck	UHA9105	27/11/06	27/11/07	2262

#### 4. TEST EQUIPMENT (CONTINUED)

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	Next.Due.Date (dd/mm/yy)	S/N
32	EMI TEST RECEIVER	Rohde Schwarz	ESU	25/01/07	25/01/08	100014
33	RFI/FIELD Intensity Meter	Kyorits	KNM-504D	06/09/07	06/09/08	SN-161-4
34	Frequency Converter	Kyorits	KCV-604C	21/07/07	21/07/08	4-230-3
35	TEMP & HUMIDITY Chamber	JISCO	J-RHC2	02/10/07	02/10/08	021031
36	Log Periodic Antenna	Schwarzbeck	UHALP9108 A1	08/06/07	08/06/08	1098
37	Biconical Antenna	Schwarzbeck	VHA9103	08/06/07	08/06/08	2233
38	Digital Multimeter	H.P	34401A	20/03/07	20/03/08	3146A13475
39	Attenuator (10dB)	WEINSCHL	23-10-34	05/10/07	05/10/08	BP4386
40	High-Pass Filter	ANRITSU	MP526D	08/10/07	08/10/08	MP27756
41	Attenuator (3dB)	Agilent	8491B	12/07/07	12/07/08	58177
42	Amplifier (25dB)	Agilent	8447D	08/08/07	08/08/08	2944A10144
43	Amplifier (30dB)	Agilent	8449B	25/10/07	25/10/08	3008A01590
44	Position Controller	TOKIN	5901T	N/A	N/A	14173
45	Driver	TOKIN	5902T2	N/A	N/A	14174
46	Spectrum Analyzer	H.P	8591E	16/04/07	16/04/08	3649A05889
47	RFI/FIELD Intensity Meter	Kyorits	KNW-2402	06/10/07	06/10/08	4N-170-3
48	LISN	Kyorits	KNW-407	30/08/07	30/08/08	8-317-8
49	LISN	Kyorits	KNW-242	06/10/07	06/10/08	8-654-15
50	CVCFC	NF Electronic	4400	N/A	N/A	344536 4420064
51	Software	ToYo EMI	EP5/RE	N/A	N/A	Ver 2.0.800
52	Software	ToYo EMI	EP5/CE	N/A	N/A	Ver 2.0.801
53	Software	AUDIX	e3	N/A	N/A	Ver 3.0
54	Software	Agilent	Benchlink	N/A	N/A	A.01.09 021211

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## 5. EMISSION DESIGNATOR

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### GSM850

Emission Designator = 235KGXW

GSM BW = 234.5940 KHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

(Measured at the 99.75% power bandwidth)

### PCS1900

Emission Designator = 235KGXW

GSM BW = 235.1174 KHz

G = Phase Modulation

X = Cases not otherwise covered

W = Combination (Audio/Data)

(Measured at the 99.75% power bandwidth)

## 6. CONCLUSION

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The data collected shows that the **Questlabs Corp.** Dual band GPRS Terminal with Bluetooth Equipment **FCC ID: VP3GD30TF** complies with all the requirements of Parts 2, 22 and 24 of the FCC rules.