



## **Compass 885 Test Report**

FOR

FCC and IC Certifications

**IC: 2417C-C885**  
**FCC ID: N7NC885**

Prepared by  
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FCC Part 22, 24 / RSS 132, 133	Compass 885	April 17, 2008	Page 2 of 71
--------------------------------	-------------	----------------	--------------

**Table of Contents**

1	Introduction and Purpose.....	3
2	Test Summary .....	3
3	Description of Equipment Under Test .....	4
4	RF Power Output .....	4
4.1	<i>Test Procedure</i> .....	4
4.2	<i>Test Equipment</i> .....	5
4.3	<i>Test Results GSM/EDGE</i> .....	5
4.4	<i>Test Results UMTS</i> .....	5
4.4.1	<i>Test 1: RF Output Power Results for WCDMA R99</i> .....	5
4.4.2	<i>Test 2: RF Output Power Results for HSDPA Rel6</i> .....	6
4.4.3	<i>Test 3: RF Output Power Results for HSPA (HSDPA &amp; HSUPA) Rel6</i> .....	8
4.5	<i>Test Settings for UMTS Mode on CMU200</i> .....	10
5	Occupied Bandwidth.....	14
5.1	<i>Test Procedure</i> .....	14
5.2	<i>Test Results</i> .....	14
5.3	<i>Test Plots</i> .....	15
6	Out of Band Emissions at Antenna Terminals .....	24
6.1	<i>Test Procedure</i> .....	24
6.2	<i>Test Equipment</i> .....	24
6.3	<i>Test Results</i> .....	24
6.4	<i>Test Plots</i> .....	26
7	Block Edge Compliance.....	62
7.1	<i>Test Procedure</i> .....	62
7.2	<i>Test Equipment</i> .....	62
7.3	<i>Test Results</i> .....	62
7.4	<i>Test Plots</i> .....	63
8	Frequency Stability Versus Temperature.....	69
8.1	<i>Summary of Results</i> .....	69
8.2	<i>Test Procedure</i> .....	69
8.3	<i>Test Equipment</i> .....	69
8.4	<i>Test Results</i> .....	70
9	Frequency Stability Versus Voltage .....	70
9.1	<i>Summary of Results</i> .....	70
9.2	<i>Test Procedure</i> .....	70
9.3	<i>Test Equipment</i> .....	71
9.4	<i>Test Results</i> .....	71

## SIERRA WIRELESS, INC.

FCC Part 22, 24 / RSS 132, 133	Compass 885	April 17, 2008	Page 3 of 71
--------------------------------	-------------	----------------	--------------

### 1 Introduction and Purpose

This document provides the C885 wireless USB modem test data for the FCC and Industry Canada certifications. The tests included in this report are limited to all conducted tests required. The radiated tests were performed at an external test facility.

### 2 Test Summary

FCC RULE	DESCRIPTION OF TEST	RESULT	PAGE
2.1046	RF Power Output	Complies	5
2.1049	Occupied Bandwidth	Complies	14
2.1051, 22.901(d) 22.917, 24.238(a)	Out of Band Emissions at Antenna Terminals	Complies	24
FCC Part 22H/24E	Block Edge Requirements	Complies	62
2.1053	Field Strength of Spurious Radiation	Complies	See CCS Report
2.1055	Frequency Stability versus Temperature	Complies	69
2.1055	Frequency Stability versus Voltage	Complies	70

The tests described in this report were performed by Mr. Hari Shankar Shukla at:

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## 3 Description of Equipment Under Test

The Sierra Wireless Inc. model C885 is a multi-band wireless modem operating on the GSM/GPRS/EDGE/UMTS network. In the US and Canada, only cellular and PCS bands are used for GSM/GPRS/UMTS operation, so this test report only contains data for these two bands (850MHz and 1900MHz).

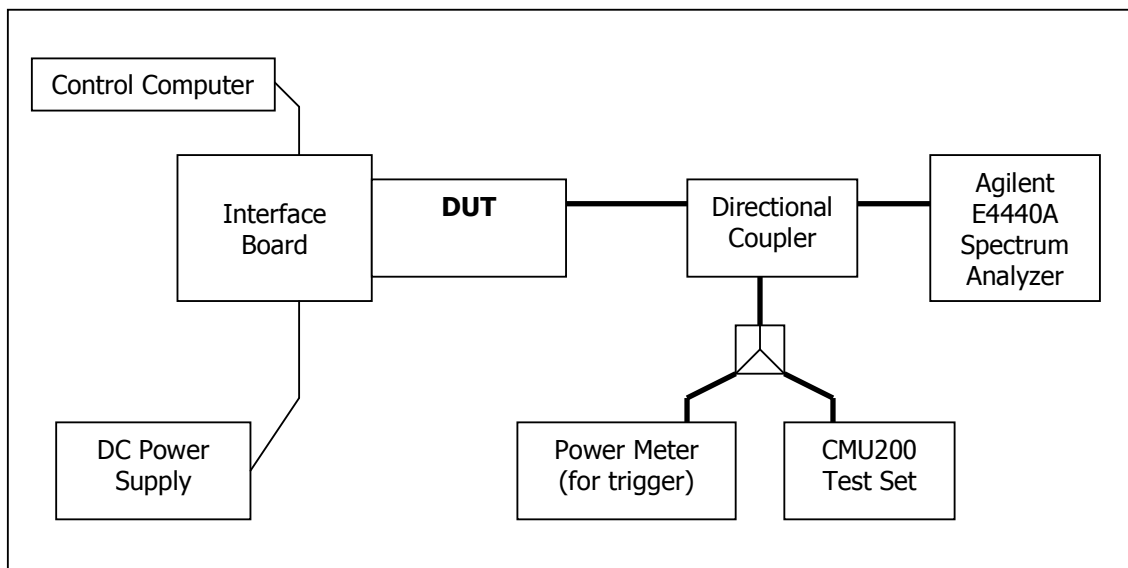
## 4 RF Power Output

FCC 2.1046

### 4.1 Test Procedure

The transmitter output was connected to a Rohde & Schwarz CMU200 Test Set and configured to operate at maximum power in a call. The power was measured using the spectrum analyzer at three equally spaced operating frequencies for each band. The RBW was set to 300 KHz for the GSM and EDGE measurements, and 5MHz for the WCDMA measurements. The spectrum analyzer was set to measure the RF output power with the cable and coupler losses accounted for.

### Test Setup



## SIERRA WIRELESS, INC.

FCC Part 22, 24 / RSS 132, 133	Compass 885	April 17, 2008	Page 5 of 71
--------------------------------	-------------	----------------	--------------

### 4.2 Test Equipment

#### Instrument List

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	111682	November 18, 2008
Spectrum Analyzer	Agilent	PSA E4440A	US41421268	March 11, 2008
DC Power Supply	HP	E3631A	3530A	N/A
Interface Board	Shop built	Minnow	N/A	N/A
Directional Coupler	Mini-Circuits	ZA3PD-2	N/A	N/A

### 4.3 Test Results GSM/EDGE

Frequency (MHz)	Channel	Power (dBm)	
		GMSK Mode	8-PSK Mode
824.2	128	31.76	26.79
836.6	190	31.77	26.88
848.8	251	31.81	26.95
1850.2	512	28.81	26.07
1880.0	661	28.76	26.01
1909.8	810	28.69	25.93

### 4.4 Test Results UMTS

#### 4.4.1 Test 1: RF Output Power Results for WCDMA R99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V7.5.0 specification. The C885 supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

The test was performed according to section 5.2 of the 3GPP TS34.121-1 V7.5.

Frequency (MHz)	Channel	WCDMA R99	
		RMS Power (dBm)	Peak Power (dBm)
826.4	4132	22.18	26.02
836.4	4182	22.62	26.53
846.6	4233	22.19	25.95
1852.4	9262	22.69	26.25
1880.0	9400	22.64	26.31
1907.6	9538	22.73	26.39

Note: The results above reflect max power with all up bits.

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FCC Part 22, 24 / RSS 132, 133	Compass 885	April 17, 2008	Page 6 of 71
--------------------------------	-------------	----------------	--------------

### 4.4.2 Test 2: RF Output Power Results for HSDPA Rel6

The C885 supports Category 8 FDD HS-DSCH physical layer. As stated in the 3GPP TS25.306 V7.3.0 Table 5.1a, the details of Category 8 are as follows:

- Maximum of 10 E-DSCH received codes
- Minimum 1 inter-TTI interval
- Maximum 14411bits in an E-DSCH transport block received within an E-DSCH TTI
- Total number of soft channel bits is 134400
- Support of QPSK and 16QAM

A detailed list of all settings used is included at the end of this report in section 6.0

The following Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V7.5.0 specification. All TX RMS and Peak power requirements for Power Class 3 were met according to table 5.2AA.5 and achieved through the outlined test procedure in section 5.2AA.4.2. All UE channels and power ratio's are set according to table C10.1.4 in the 3GPP TS34.121-1 V7.5.0 specification. A summary of these settings are illustrated below:

Subtest	Mode	Call Type	RMC (kbps)	HSDPA FRC	Power Class 3 Max Limit dBm	$\beta_c/\beta_d$	$\beta_{hs}$	CM (db)	MPR (db)
1	HSDPA	PS	12.2	H-Set 1 QPSK	24 (+1.7/-3.7 db)	2 /15	4/15	0.0	0.0
2	HSDPA	PS	12.2	H-Set 1 QPSK	24 (+1.7/-3.7 db)	12 /15	24/15	1.0	0.0
3	HSDPA	PS	12.2	H-Set 1 QPSK	23.5 (+2.2/-3.7 db)	15 /8	30/15	1.5	0.5
4	HSDPA	PS	12.2	H-Set 1 QPSK	23.5 (+2.2/-3.7 db)	15 /4	30/15	1.5	0.5

#### 4.4.2.1 Sub-Test 1

$\beta_c=2/15$ ,  $\beta_d=15/15$ ,  $\beta_{hs}=4/15$

Frequency (MHz)	Channel	Power (dBm)	
		RMS	Peak
826.4	4132	21.91	25.57
836.4	4182	22.27	26.04
846.6	4233	21.84	25.54
1852.4	9262	22.23	25.84
1880.0	9400	22.18	25.85
1907.6	9538	22.41	26.02

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4.4.2.2 *Sub-Test 2*

$\beta_c=12/15$ ,  $\beta_d=15/15$ ,  $\beta_{hs}=24/15$

Frequency (MHz)	Channel	Power (dBm)	
		RMS	Peak
826.4	4132	21.85	25.31
836.4	4182	22.23	25.83
846.6	4233	21.88	25.14
1852.4	9262	22.26	25.56
1880.0	9400	22.09	25.81
1907.6	9538	22.06	25.85

4.4.2.3 *Sub-Test 3*

$\beta_c=15/15$ ,  $\beta_d=15/8$ ,  $\beta_{hs}=30/15$

Frequency (MHz)	Channel	Power (dBm)	
		RMS	Peak
826.4	4132	21.76	25.52
836.4	4182	22.18	25.87
846.6	4233	21.66	25.18
1852.4	9262	22.05	25.74
1880.0	9400	22.16	25.95
1907.6	9538	22.15	25.86

4.4.2.4 *Sub-Test 4*

$\beta_c=15/15$ ,  $\beta_d=4/15$ ,  $\beta_{hs}=30/15$

Frequency (MHz)	Channel	Power (dBm)	
		RMS	Peak
826.4	4132	21.84	25.46
836.4	4182	22.22	25.78
846.6	4233	20.99	25.35
1852.4	9262	22.09	25.79
1880.0	9400	21.99	25.83
1907.6	9538	22.22	25.99

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FCC Part 22, 24 / RSS 132, 133	Compass 885	April 17, 2008	Page 8 of 71
--------------------------------	-------------	----------------	--------------

### 4.4.3 Test 3: RF Output Power Results for HSPA (HSDPA & HSUPA) Rel6

The C885 supports Category 5 FDD E-DCH physical layer. As stated in the 3GPP TS25.306 V7.3.0 Table 5.1g, the details of Category 5 are as follows:

- Maximum of 2 E-DCH transmitted codes
- Minimum spreading factor of SF2
- Support for only 10 ms TTI E-DCH
- Maximum 20000 bits in an E-DCH transport block within a 10 ms E-DCH TTI
- Data rate of 2 Mbps
- Support of QPSK only

A detailed list of all settings used is included at the end of this report in section 6.0

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2B of the 3GPP TS34.121-1 V7.5.0 specification. All TX RMS and Peak power requirements were met according to table 5.2B.5 and achieved through the outlined test procedure in section 5.2B.4.2. All UE channels and power ratio's are set according to table C11.1.3 in the 3GPP TS34.121-1 V7.5.0 specification. A summary of these settings are illustrated below:

Subtest	Mode	Call Type	RMC (kbps)	HSDPA FRC	Power Class 3 Max Limit dBm	$\beta_c/\beta_d$	$\beta_{hs}$	$\beta_{ed}$	CM (db)	MPR (db)
1	HSPA	PS	12.2	H-Set 1 QPSK	24 (+1.7/-5.2 db)	11 /15	22/15	209/225	1.0	0.0
2	HSPA	PS	12.2	H-Set 1 QPSK	22 (+3.7/-5.2 db)	6 /15	12/15	12/15	3.0	2.0
3	HSPA	PS	12.2	H-Set 1 QPSK	23 (+2.7/-5.2 db)	15 /15	30/15	30/15	2.0	1.0
4	HSPA	PS	12.2	H-Set 1 QPSK	22 (+1.7/-5.2 db)	15 /9	4/15	2/15	3.0	2.0
5	HSPA	PS	12.2	H-Set 1 QPSK	24 (+1.7/-5.2 db)	15/15	30/15	24/15	1.0	0.0

#### 4.4.3.1 Sub-Test 1:

$\beta_c=11/15$ ,  $\beta_d=15/15$ ,  $\beta_{hs}=22/15$ ,  $\beta_{ec}=209/225$ ,  $\beta_{ed}=1039/225$ , AG=20, 1xSF4, E-TFCI=75.

Frequency (MHz)	Channel	Power (dBm)	
		RMS	Peak
826.4	4132	21.79	25.47
836.4	4182	22.16	25.98
846.6	4233	21.86	25.44
1852.4	9262	22.24	25.94
1880.0	9400	22.02	25.97
1907.6	9538	22.39	25.92

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4.4.3.2 *Sub-Test 2:*

$\beta_c=6/15$ ,  $\beta_d=15/15$ ,  $\beta_{hs}=12/15$ ,  $\beta_{ec}=12/15$ ,  $\beta_{ed}=94/75$ , AG=12, 1xSF4, E-TFCI=67.

Frequency (MHz)	Channel	Power (dBm)	
		RMS	Peak
826.4	4132	21.43	25.58
836.4	4182	21.99	25.93
846.6	4233	21.58	25.35
1852.4	9262	22.01	25.86
1880.0	9400	22.07	26.05
1907.6	9538	22.07	25.96

4.4.3.3 *Sub-Test 3:*

$\beta_c=15/15$ ,  $\beta_d=15/15$ ,  $\beta_{hs}=30/15$ ,  $\beta_{ec}=30/15$ ,  $\beta_{ed}=47/15$ , AG=15, 2xSF4. E-TFCI=92,  
Note: # of Reference E-TFCI=2.

Frequency (MHz)	Channel	Power (dBm)	
		RMS	Peak
826.4	4132	21.66	25.43
836.4	4182	21.86	25.85
846.6	4233	21.54	25.33
1852.4	9262	22.03	25.79
1880.0	9400	22.01	25.84
1907.6	9538	22.14	25.97

4.4.3.4 *Sub-Test 4:*

$\beta_c=2/15$ ,  $\beta_d=15/15$ ,  $\beta_{hs}=4/15$ ,  $\beta_{ec}=2/15$ ,  $\beta_{ed}=56/75$ , AG=17, 1xSF4, E-TFCI=71.

Frequency (MHz)	Channel	Power (dBm)	
		RMS	Peak
826.4	4132	21.51	25.32
836.4	4182	21.78	25.71
846.6	4233	21.53	25.25
1852.4	9262	22.07	25.82
1880.0	9400	21.92	25.77
1907.6	9538	22.33	26.02

4.4.3.5 *Sub-Test 5:*

$\beta_c=15/15$ ,  $\beta_d=15/15$ ,  $\beta_{hs}=30/15$ ,  $\beta_{ec}=24/15$ ,  $\beta_{ed}=134/15$ , AG=21, 1xSF4, E-TFCI=81.

Frequency (MHz)	Channel	Power (dBm)	
		RMS	Peak
826.4	4132	21.41	25.34
836.4	4182	21.74	25.78
846.6	4233	21.44	25.27
1852.4	9262	22.09	25.93
1880.0	9400	22.05	25.91
1907.6	9538	22.26	25.94

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FCC Part 22, 24 / RSS 132, 133	Compass 885	April 17, 2008	Page 10 of 71
--------------------------------	-------------	----------------	---------------

### *4.5 Test Settings for UMTS Mode on CMU200*

#### UE Power Control Settings

Maximum allowable UE-Power = 24.0 dBm

UL Target Power = 24.0 dBm

#### Node B Settings

Primary Scrambling Code = 9

Output Channel Power = -51.7 dBm

OCNS = Off

Total Output Power (Ior+Ioc) = -51.7 dBm

#### RMC Settings

Reference Channel Type: 12.2 kbps Downlink/Uplink

DL DTCH Transport Format: 12.2 kbps

DL Resources in Use: 100 %

UL CRC (Sym. Loop Mode 2): Off

Test Mode: Loop Mode 2

Channel Data Source DTCH: PRBS9

#### Voice Settings

Voice Source: Echo

Loopback Type: Off

#### Adaptive Multirate Settings

Active Code Set: Selection A

Codec Mode: 12.2 kbps

#### Signaling RAB Settings

SRB Cell DCH: 3.4 kbps

#### BS Down Link Physical Channels Settings

Ior = -51.7 dBm

P-CPICH = -3.3 dB

P-SCH = -8.3 dB

S-SCH = -8.3 dB

P-CCPCH = -5.3 dB

S-CCPCH = -5.3 dB

S-CCPCH Channel Code = 2

PICH = -8.3 dB

PICH Channel Code = 3

AICH = -8.3 dB

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FCC Part 22, 24 / RSS 132, 133	Compass 885	April 17, 2008	Page 11 of 71
--------------------------------	-------------	----------------	---------------

AICH Channel Code = 6  
DPDCH = -10.3 dB  
DPDCH Channel Code = 96  
Power Offset (DPCCH/DPDCH) = 0.0 dB  
DL DPCH Timing Offset = 0  
Secondary Scrambling Code = 0  
Secondary Scrambling Code (HSDPA) = 0  
HSDPA Channels = On

TPC Settings

Algorithm = 2  
TPC Step Size = 1dB  
TPC Pattern Setup = Set 1 (All 1, after linked to get maximum power)

**HSDPA Mode Settings:**

Node B Settings

Primary Scrambling Code = 9  
Output Channel Power = -86 dBm  
OCNS = Off  
Total Output Power (Ior+Ioc) = -86 dBm

Network Settings

Packet Switched Domain = ON

HSDPA Test Mode Settings

Radiobearer Setup = RMC 12.2 kbps + HSPDA  
RMC Test Loop = Loop Mode 1 RLC TM

HSDPA HS-DSCH

CQI Feedback Cycle = 4ms  
CQI Repetition Factor = 2  
ACK/NACK Repetition Factor = 3  
UE Category = 8  
Channel Configuration Type = FRC  
H-Set Selection = H-Set 1 QPSK  
RV Coding Sequence {0,2,5,6}

HSDPA Gain Factors are set according to each specific sub-test in table C.10.1.4 of 3GPP TS 34.121.

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FCC Part 22, 24 / RSS 132, 133	Compass 885	April 17, 2008	Page 12 of 71
--------------------------------	-------------	----------------	---------------

### HSPA Mode Settings:

#### UE Power Control Settings

Maximum allowable UE-Power = 24.0 dBm

UL Target Power: Set according to each specific sub-test in table 5.2B.5 of 3GPP TS 34.121 less 5db for starting point.

#### UE Packet Data Gain Factors

Bc and Bd: \*

$\Delta\text{ACK}, \Delta\text{NACK}, \Delta\text{CQI}=8$

### HSUPA

E-DCH Physical Layer Category = 5

E-TFCI Table Index = 1

Minimum Set E-TFCI = 1\*

Maximum Channelisation Code: 1xSF4 or 2xSF4\*

Initial Service Grant: \*

#### UE Gain Factors

$\Delta\text{E-DPCCH}$ : \*

Number of Reference E-TFCIs: \*\*

Reference E-TFCI's: \*\*

E-TFCI Power offsets: \*\*

#### Node B Settings

Primary Scrambling Code = 9

Output Channel Power = -86 dBm

OCNS = Off

Total Output Power (Ior+Ioc) = -86 dBm

#### Paket Switched

DCH Type: HSUPA Test Mode

Data Rate: HSDPA/HSUPA

#### HSDPA Test Mode Settings

Radiobearer Setup = RMC 12.2kbps + HSDPA

RMC Test Loop = Loop Mode 1 RLC TM

#### HSDPA HS-DSCH

CQI Feedback Cycle = 4ms

CQI Repetition Factor = 2

ACK/NACK Repetition Factor = 3

UE Category = 8

Channel Configuration Type = FRC

H-Set Selection = H-Set 1 QPSK

RV Coding Sequence {0,2,5,6}

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FCC Part 22, 24 / RSS 132, 133	Compass 885	April 17, 2008	Page 13 of 71
--------------------------------	-------------	----------------	---------------

HSUPA Test Mode Settings

Radiobearer Setup = SRB 3.4 + HSPA

HSUPA Settings

TTI mode: 10ms

E-AGCH

Pattern Length: 1

AG Value: \*

Downlink Physical Channels

HSUPA Channels: On

E-AGCH: -6.0db

E-AGCH Chan. Code: 6

E-RGCH/E-HICH: -5.0db

E-RGCH Active: Off

E-RGCH/E-HICH Chan. Code: 6

\*Set according to each specific sub-test in table C.11.1.3 of 3GPP TS 34.121.

\*\* Set according to each specific sub-test in table 5.2B.2/3 of 3GPP TS 34.121.

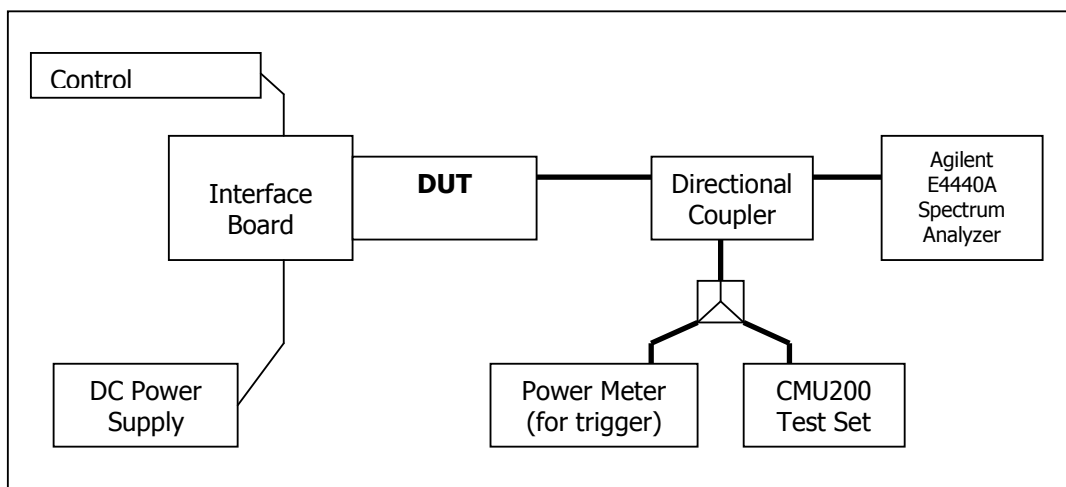
## 5 Occupied Bandwidth

FCC 2.1049

### 5.1 Test Procedure

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth (defined as the 99% Power Bandwidth) was measured with the spectrum analyzer at the 3 frequencies in each band. The -26dB bandwidth was also measured and recorded.

#### Test Setup



### 5.2 Test Results

The performance of the GSM 850 MHz Cellular band is shown in plots 5.3.1 to 5.3.6.

Performance of the GSM 1900 MHz PCS band is shown in plots 5.3.7 to 5.3.12.

Performance of the UMTS 850 Cellular band is shown in plots 5.3.13 to 5.3.15

Performance of the UMTS 1900 PCS band is shown in plots 5.3.16 to 5.3.18

Frequency (MHz)	Channel	99% Occupied Bandwidth (kHz)		-26dBc Occupied Bandwidth (kHz)	
		GMSK Mode	8-PSK Mode	GMSK Mode	8-PSK Mode
824.2	128	247.6	243.6	313.0	302.9
836.6	190	244.5	244.2	311.6	298.6
848.8	251	247.5	244.6	312.9	302.9
1850.2	512	246.6	245.5	311.4	305.9
1880.0	661	245.8	245.0	311.5	305.7
1909.8	810	245.8	242.3	311.4	302.6
Frequency (MHz)	Channel	99% Occupied Bandwidth (MHz)		-26dBc Occupied Bandwidth (MHz)	
826.4	4132	4.1533		4.6070	
836.4	4182	4.1720		4.6150	
846.6	4233	4.1710		4.5970	
1852.4	9262	4.1773		4.6190	
1880.0	9400	4.1496		4.6040	
1907.6	9538	4.1577		4.5950	

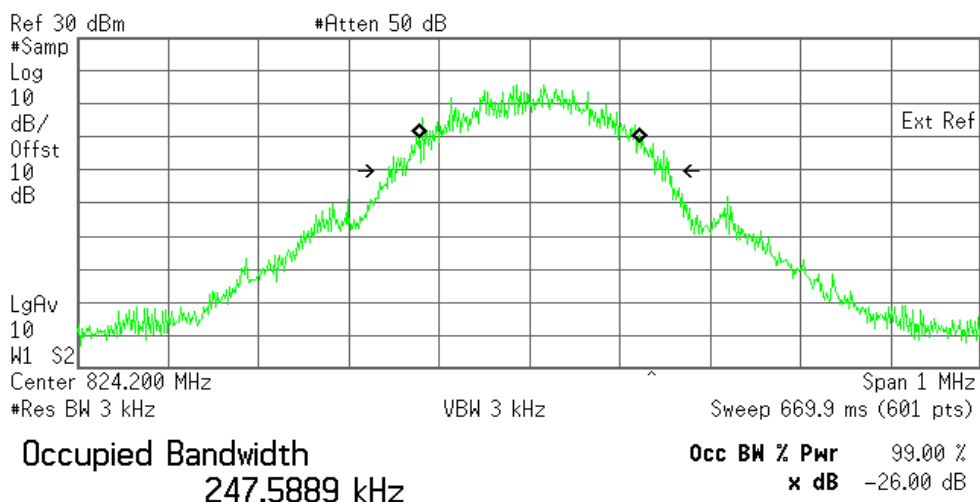
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## 5.3 Test Plots

### 5.3.1) GMSK Occupied Bandwidth, Cellular Low channel, 824.2 MHz, 99% bandwidth

Agilent 09:24:37 Mar 4, 2008

L

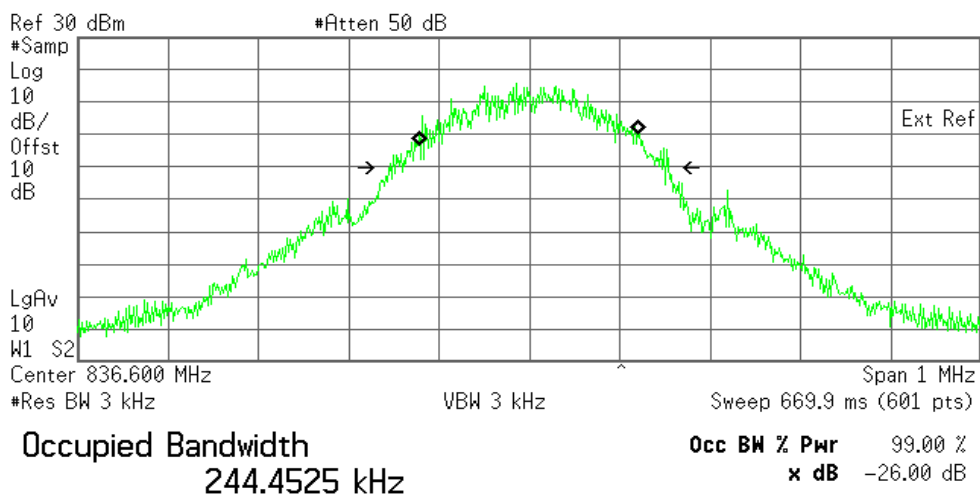


Transmit Freq Error 166.983 Hz  
 x dB Bandwidth 312.981 kHz\*

### 5.3.2) GMSK Occupied Bandwidth, Middle channel, 836.6 MHz, 99% bandwidth

Agilent 09:28:24 Mar 4, 2008

L



Transmit Freq Error -31.908 Hz  
 x dB Bandwidth 311.602 kHz\*

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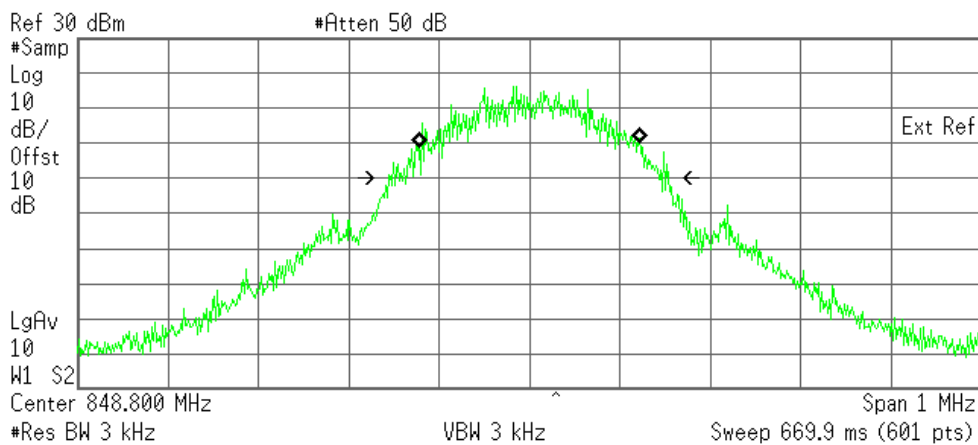
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### 5.3.3) GMSK Occupied Bandwidth, High channel, 848.8 MHz, 99% bandwidth

Agilent 09:31:42 Mar 4, 2008

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**Occupied Bandwidth**  
247.5220 kHz

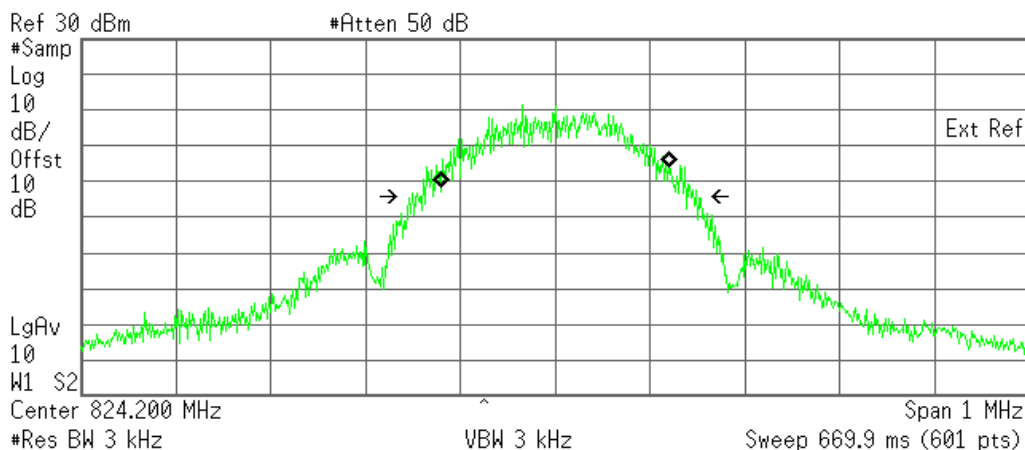
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 46.296 Hz  
**x dB Bandwidth** 312.959 kHz\*

### 5.3.4) 8-PSK Occupied Bandwidth, Cellular Low channel, 824.2 MHz, 99% bandwidth

Agilent 09:38:06 Mar 4, 2008

L



**Occupied Bandwidth**  
243.5754 kHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 97.976 Hz  
**x dB Bandwidth** 302.886 kHz\*

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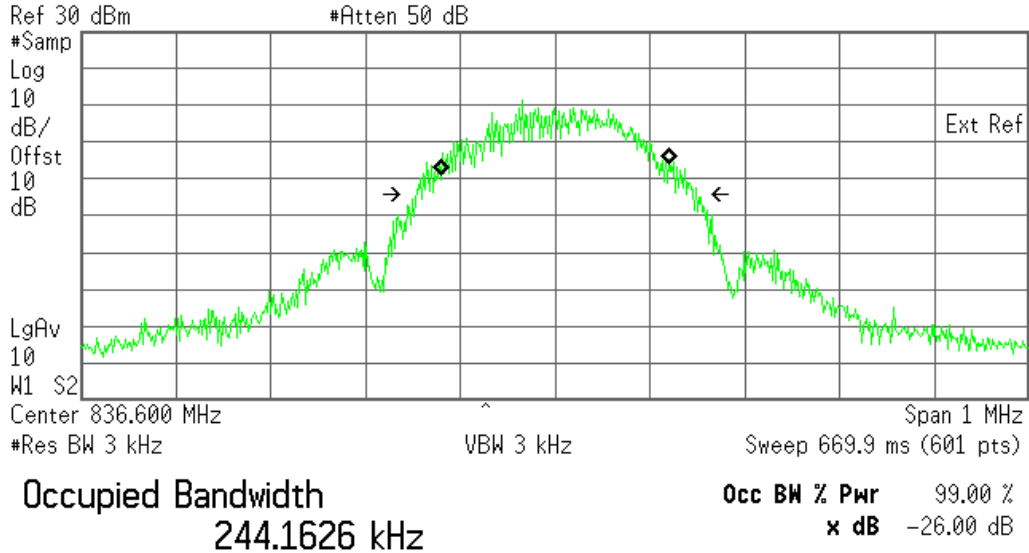


**SIERRA WIRELESS, INC.**

**5.3.5) 8-PSK Occupied Bandwidth, Middle channel, 836.6 MHz, 99% bandwidth**

\* Agilent 09:41:01 Mar 4, 2008

L

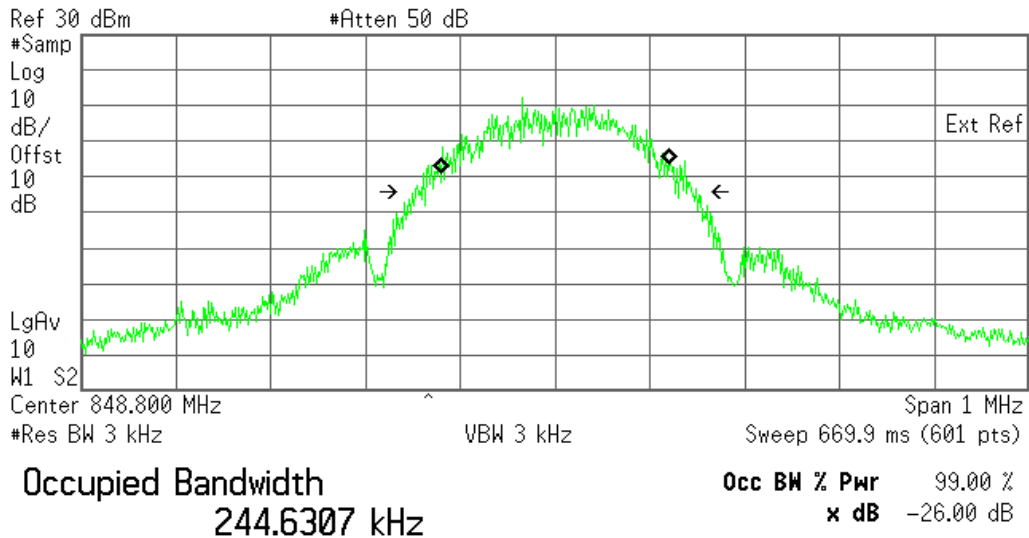


**Transmit Freq Error** 66.646 Hz  
**x dB Bandwidth** 298.623 kHz\*

**5.3.6) 8-PSK Occupied Bandwidth, High channel, 848.8 MHz, 99% bandwidth**

\* Agilent 09:44:57 Mar 4, 2008

L



**Transmit Freq Error** -33.605 Hz  
**x dB Bandwidth** 302.908 kHz\*

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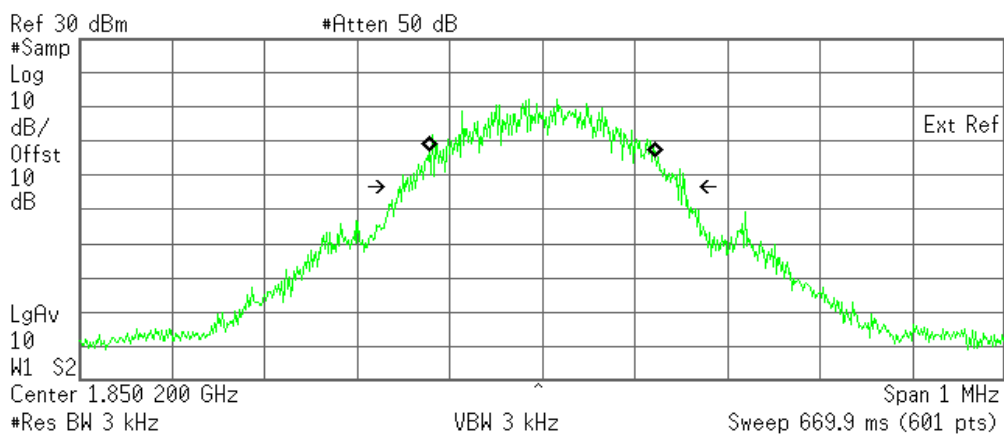
The contents of this page are subject to the confidentiality information on page one.

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**5.3.7) GMSK Occupied Bandwidth, PCS Low channel, 1850.2 MHz, 99% bandwidth**

\* Agilent 09:51:13 Mar 4, 2008

L



**Occupied Bandwidth**  
246.5807 kHz

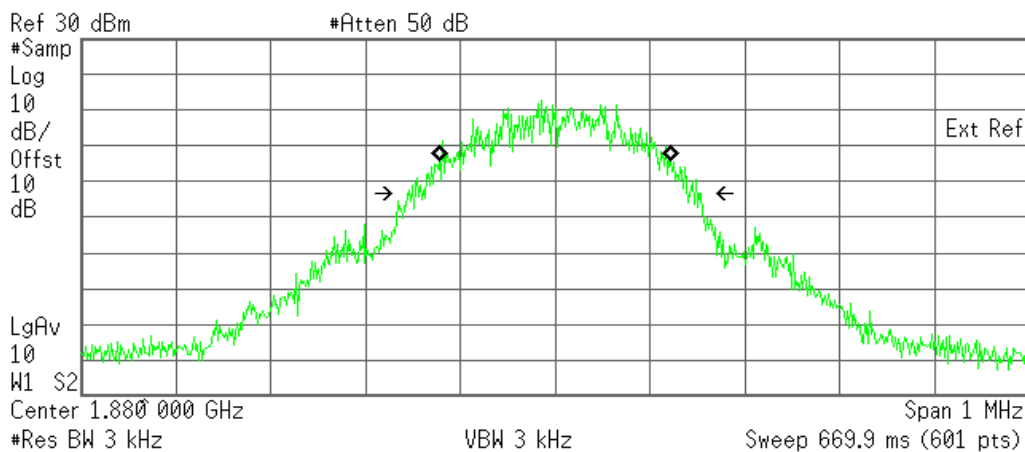
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** -98.212 Hz  
**x dB Bandwidth** 311.369 kHz\*

**5.3.8) GMSK Occupied Bandwidth, PCS Middle channel, 1880.0 MHz, 99% bandwidth**

\* Agilent 09:52:42 Mar 4, 2008

L



**Occupied Bandwidth**  
245.7772 kHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** -187.717 Hz  
**x dB Bandwidth** 311.485 kHz\*

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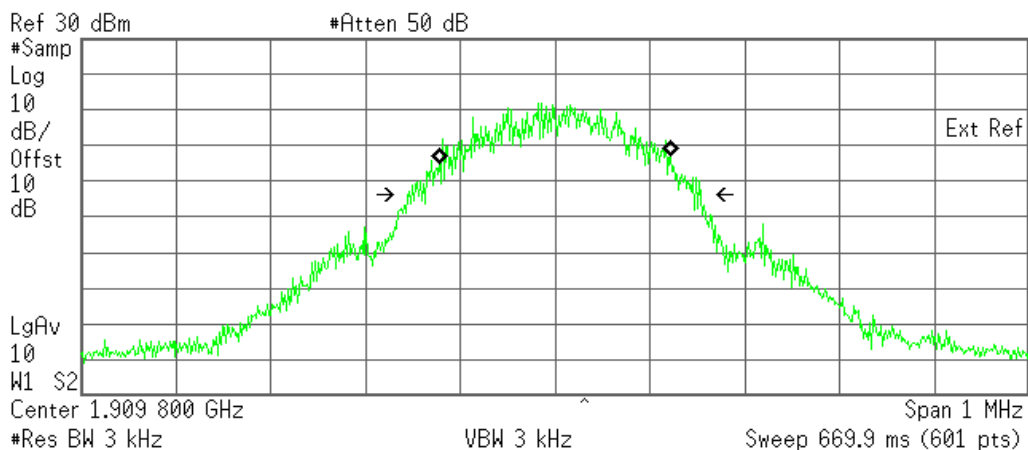
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**5.3.9) GMSK Occupied Bandwidth, PCS High channel, 1909.8 MHz, 99% bandwidth**

Agilent 10:01:22 Mar 4, 2008

L



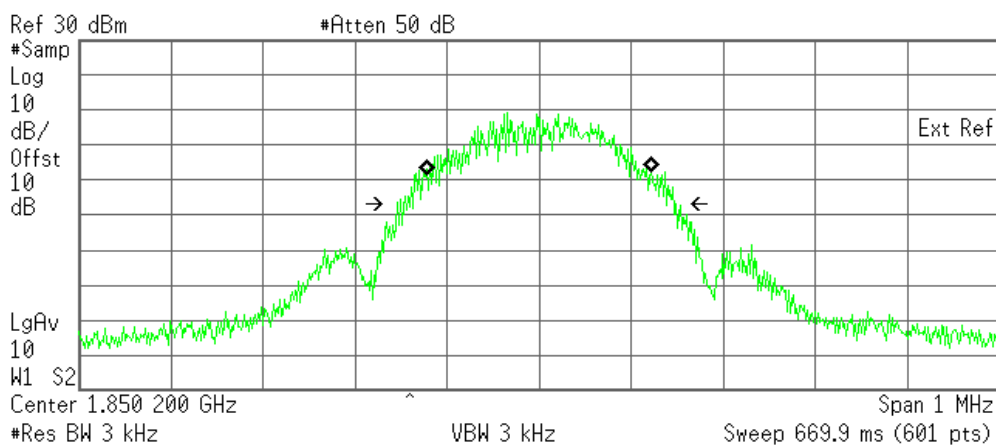
**Occupied Bandwidth** **Occ BW % Pwr** 99.00 %  
 245.8232 kHz **x dB** -26.00 dB

**Transmit Freq Error** -72.497 Hz  
**x dB Bandwidth** 311.394 kHz\*

**5.3.10) 8-PSK Occupied Bandwidth, PCS Low channel, 1850.2 MHz, 99% bandwidth**

Agilent 10:04:49 Mar 4, 2008

L



**Occupied Bandwidth** **Occ BW % Pwr** 99.00 %  
 245.4943 kHz **x dB** -26.00 dB

**Transmit Freq Error** 29.035 Hz  
**x dB Bandwidth** 305.888 kHz\*

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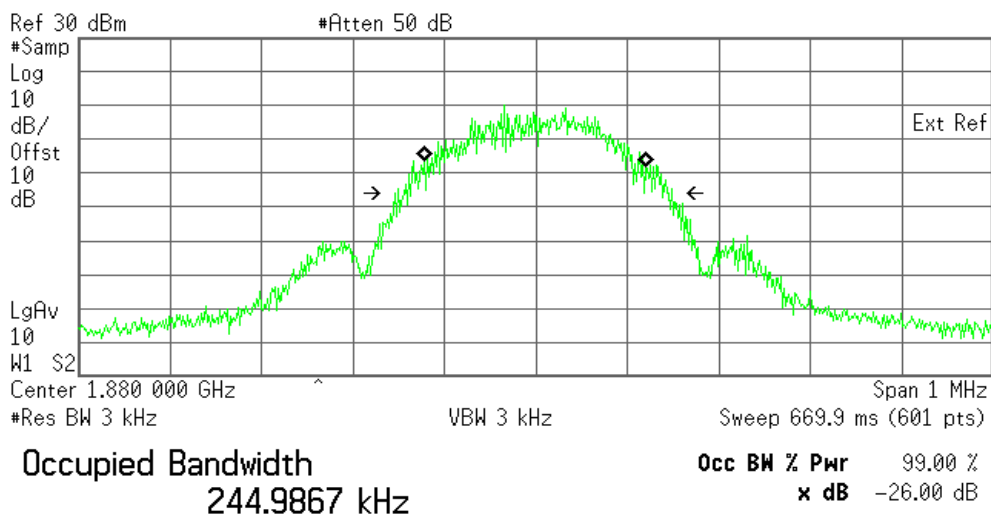
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**5.3.11) 8-PSK Occupied Bandwidth, PCS Middle channel, 1880.0 MHz, 99% bandwidth**

\* Agilent 10:09:09 Mar 4, 2008

L

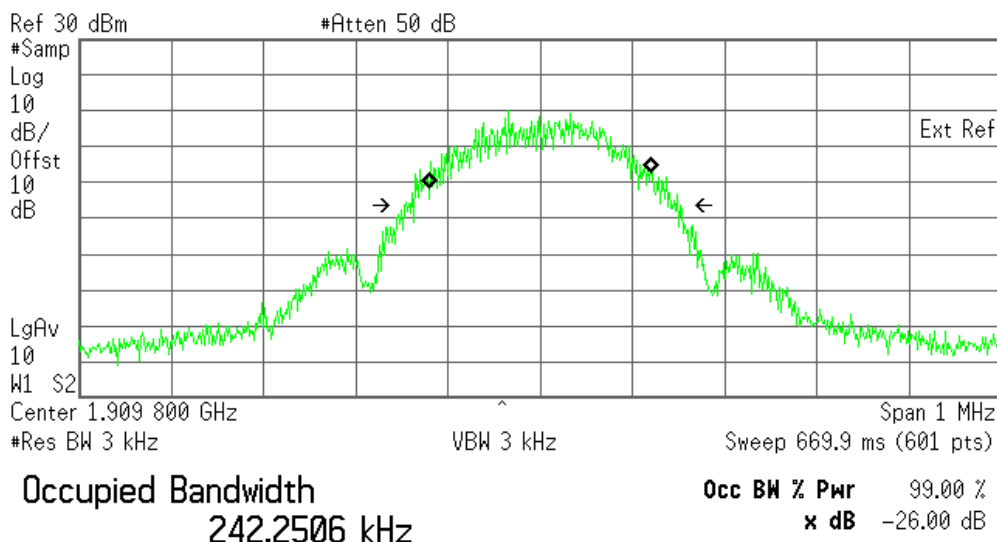


Transmit Freq Error -543.514 Hz  
x dB Bandwidth 305.697 kHz\*

**5.3.12) 8-PSK Occupied Bandwidth, PCS High channel, 1909.8 MHz, 99% bandwidth**

\* Agilent 10:18:19 Mar 4, 2008

L



Transmit Freq Error -17.809 Hz  
x dB Bandwidth 302.627 kHz\*

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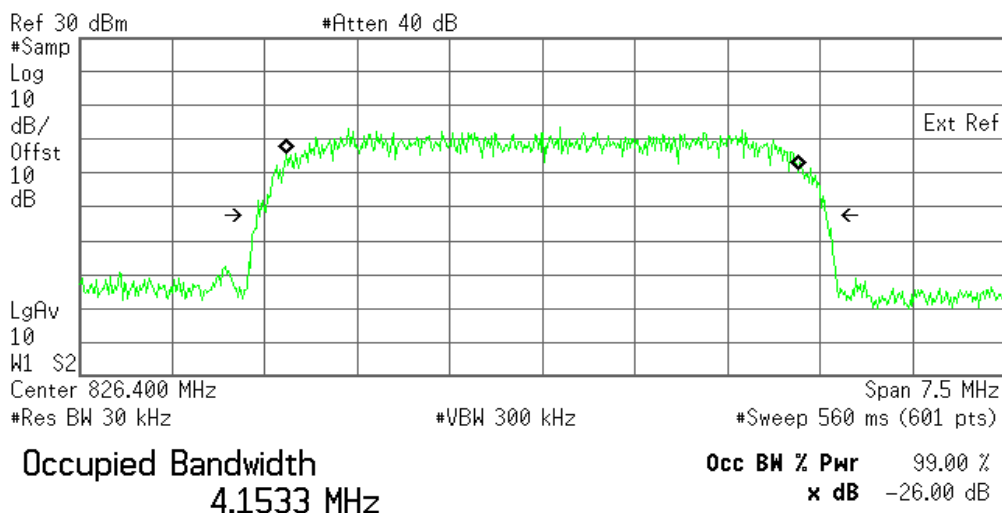
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**5.3.13) WCDMA Occupied Bandwidth, Cellular Low channel, 826.4 MHz, 99% bandwidth**

Agilent 10:46:29 Mar 4, 2008

L

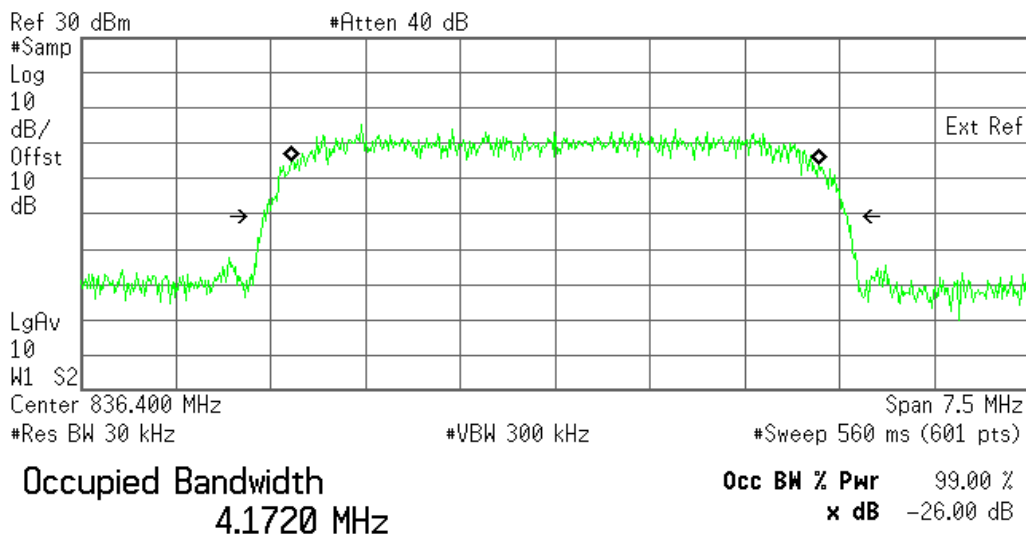


**Transmit Freq Error** 2.935 kHz  
**x dB Bandwidth** 4.607 MHz\*

**5.3.14) WCDMA Occupied Bandwidth, Cellular Middle channel, 836.4 MHz, 99% bandwidth**

Agilent 10:49:24 Mar 4, 2008

L



**Transmit Freq Error** -373.357 Hz  
**x dB Bandwidth** 4.615 MHz\*

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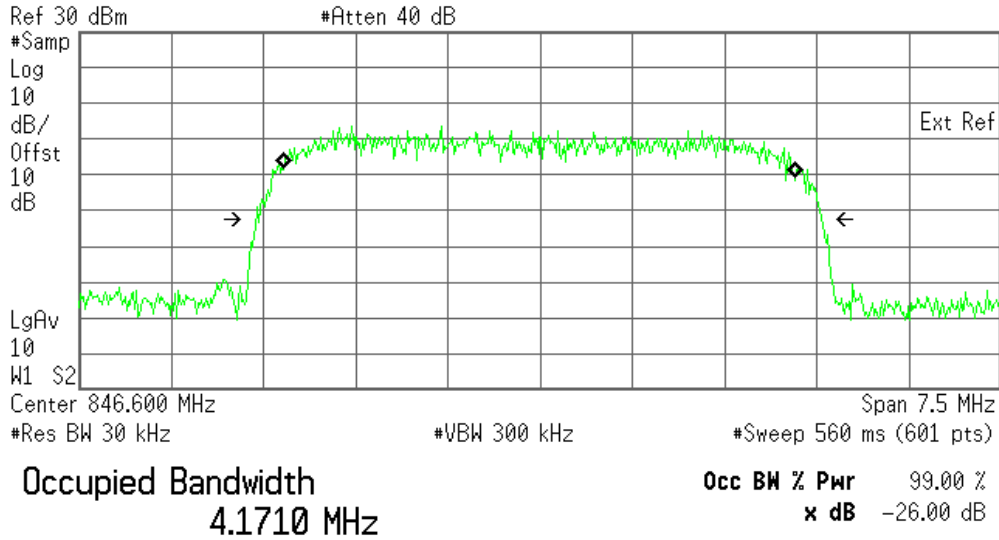
The contents of this page are subject to the confidentiality information on page one.

**SIERRA WIRELESS, INC.**

**5.3.15) WCDMA Occupied Bandwidth, Cellular High channel, 846.6 MHz, 99% bandwidth**

\* Agilent 10:57:03 Mar 4, 2008

L

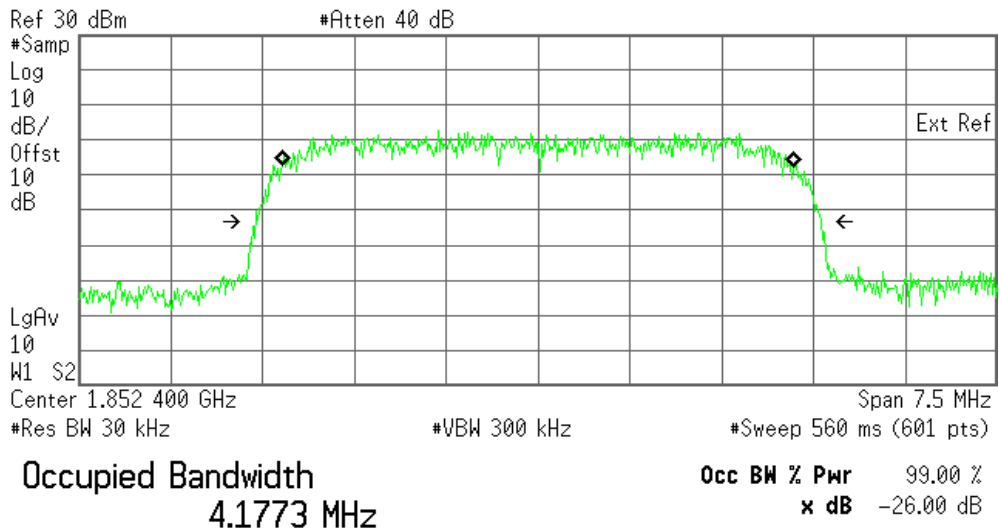


**Transmit Freq Error** -7.600 kHz  
**x dB Bandwidth** 4.597 MHz\*

**5.3.16) WCDMA Occupied Bandwidth, PCS Low channel, 1852.4 MHz, 99% bandwidth**

\* Agilent 11:03:25 Mar 4, 2008

L



**Transmit Freq Error** -170.560 Hz  
**x dB Bandwidth** 4.619 MHz\*

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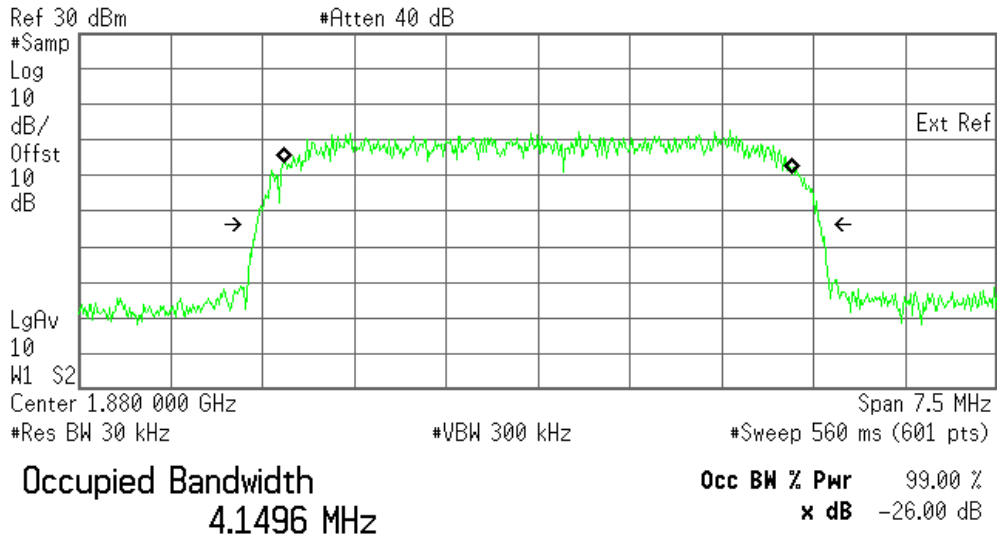
The contents of this page are subject to the confidentiality information on page one.

**SIERRA WIRELESS, INC.**

**5.3.17) WCDMA Occupied Bandwidth, PCS Middle channel, 1880 MHz, 99% bandwidth**

\* Agilent 11:04:27 Mar 4, 2008

L

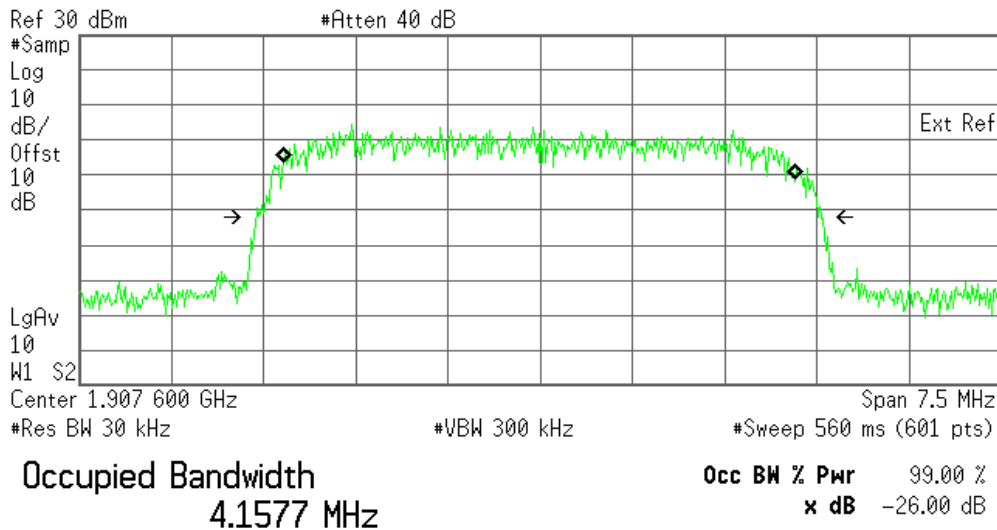


**Transmit Freq Error** -220.546 Hz  
**x dB Bandwidth** 4.604 MHz\*

**5.3.18) WCDMA Occupied Bandwidth, PCS High channel, 1907.6 MHz, 99% bandwidth**

\* Agilent 11:16:09 Mar 4, 2008

L



**Transmit Freq Error** -8.428 kHz  
**x dB Bandwidth** 4.595 MHz\*

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# SIERRA WIRELESS, INC.

## 6 Out of Band Emissions at Antenna Terminals

FCC 22.901(d), 22.917, 24.238(a)

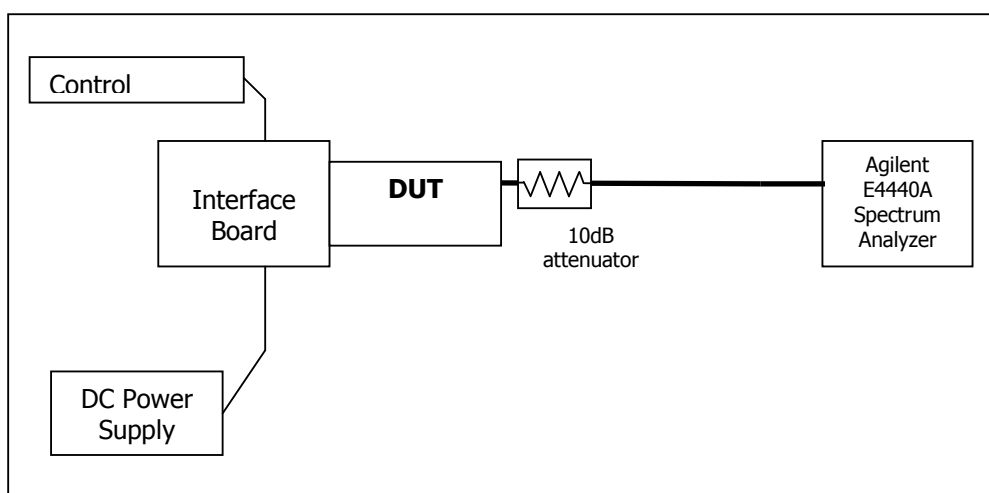
### Out of Band Emissions:

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least  $(43 + 10 \log P)$  dB, in this case, -13dBm.

### 6.1 Test Procedure

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10<sup>th</sup> harmonic. The EUT was scanned for spurious emissions from 1MHz to 20GHz with sufficient bandwidth and video resolution. Data plots are included. The measurement cable path loss at 20GHz (including an attenuator) was 10dB. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

### Test Setup



### 6.2 Test Equipment

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	111682	November 18, 2008
Spectrum Analyzer	Agilent	PSA E4440A	US41421268	March 11, 2008
DC Power Supply	HP	E3631A	3530A	N/A
Interface Board	Shop built	Minnow	N/A	N/A
Directional Coupler	Mini-Circuits	ZA3PD-2	N/A	N/A

### 6.3 Test Results

Refer to the following plots.

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## SIERRA WIRELESS, INC.

- **Cellular Band**

Plot Number	Description
6.4.1 – 6.4.3	GMSK Mode, Low channel, 824.20 MHz
6.4.4 – 6.4.6	GMSK Mode, Middle Channel, 836.6 MHz
6.4.7 – 6.4.9	GMSK Mode, High Channel, 848.8 MHz
6.4.10 – 6.4.12	8-PSK Mode, Low channel, 824.20 MHz
6.4.13 – 6.4.15	8-PSK Mode, Middle Channel, 836.6 MHz
6.4.16 – 6.4.18	8-PSK Mode, High Channel, 848.8 MHz

- **PCS Band**

Plot Number	Description
6.4.19 – 6.4.21	GMSK Mode, Low Channel, 1850.2 MHz
6.4.22 – 6.4.24	GMSK Mode, Middle Channel, 1880.0 MHz
6.4.25 – 6.4.27	GMSK Mode, High Channel, 1909.8 MHz
6.4.28 – 6.4.30	8-PSK, Mode, Low Channel, 1850.2 MHz
6.4.31 – 6.4.33	8-PSK Mode, Middle Channel, 1880.0 MHz
6.4.34 – 6.4.36	8-PSK Mode, High Channel, 1909.8 MHz

- **UMTS Cellular Band**

Plot Number	Description
6.4.37 – 6.4.39	WCDMA Mode, Low Channel, 826.4 MHz
6.4.40 – 6.4.42	WCDMA Mode, Middle Channel, 836.4 MHz
6.4.43 – 6.4.45	WCDMA Mode, High Channel, 846.6 MHz

- **UMTS PCS Band**

Plot Number	Description
6.4.46 – 6.4.48	WCDMA Mode, Low Channel, 1852.4 MHz
6.4.49 – 6.4.51	WCDMA Mode, Middle Channel, 1880.0 MHz
6.4.52 – 6.4.54	WCDMA Mode, High Channel, 1907.6 MHz

These plots show that the conducted emission limits requirements are met.

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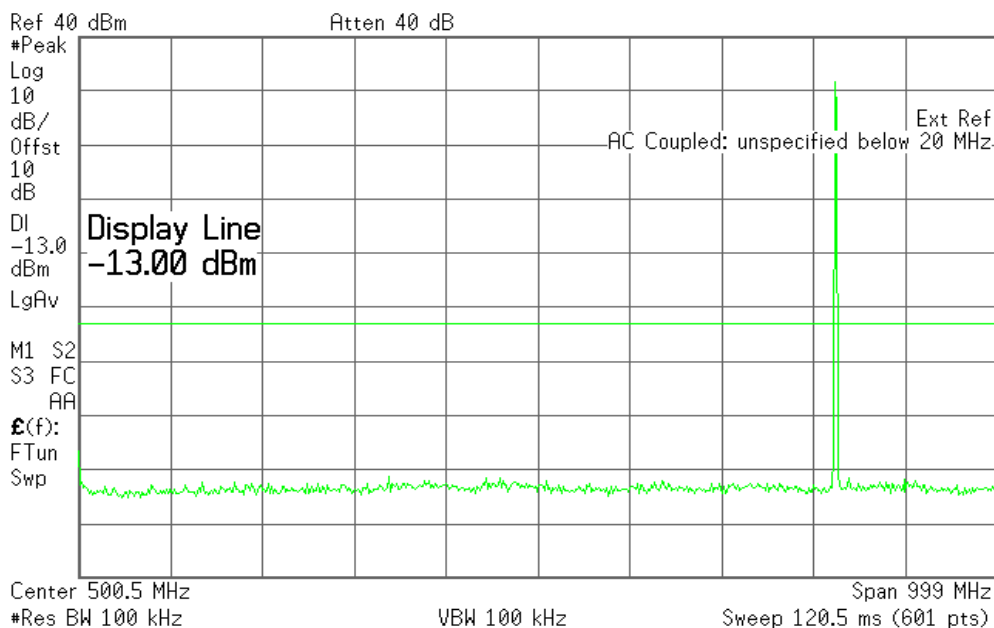
**6.4 Test Plots**

**Plot 6.4.1) Out of Band Emissions at Antenna Terminals**

GMSK, Low channel, 824.200 MHz, 1 MHz to 1 GHz

Agilent 11:22:06 Mar 4, 2008

L

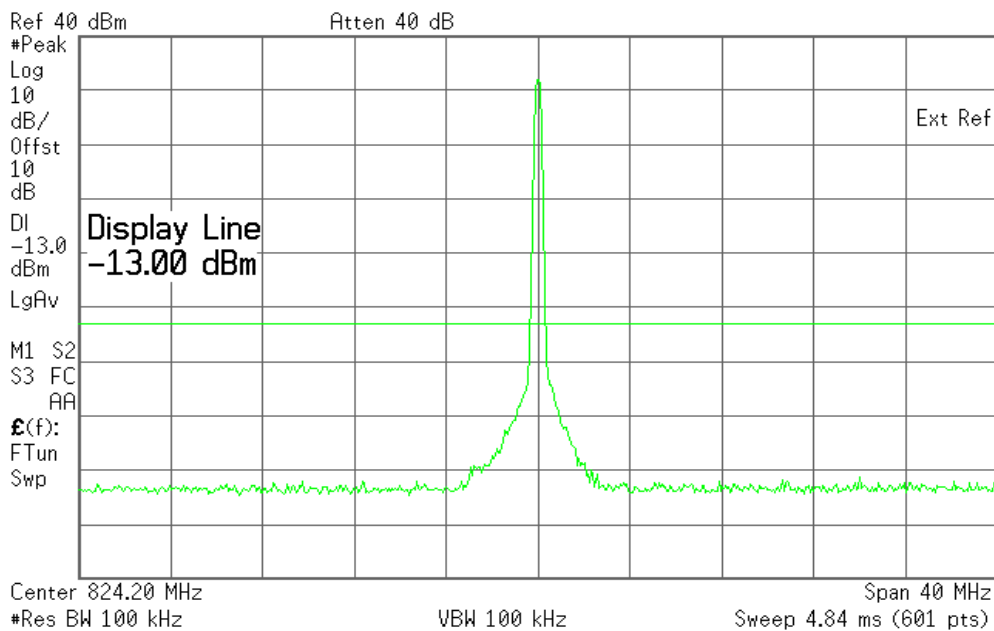


**Plot 6.4.2) Out of Band Emissions at Antenna Terminals**

GMSK, Low channel, 824.200 MHz, TX signal +/- 20 MHz

Agilent 11:23:47 Mar 4, 2008

L



**The strong emission shown in each case is the carrier signal.**

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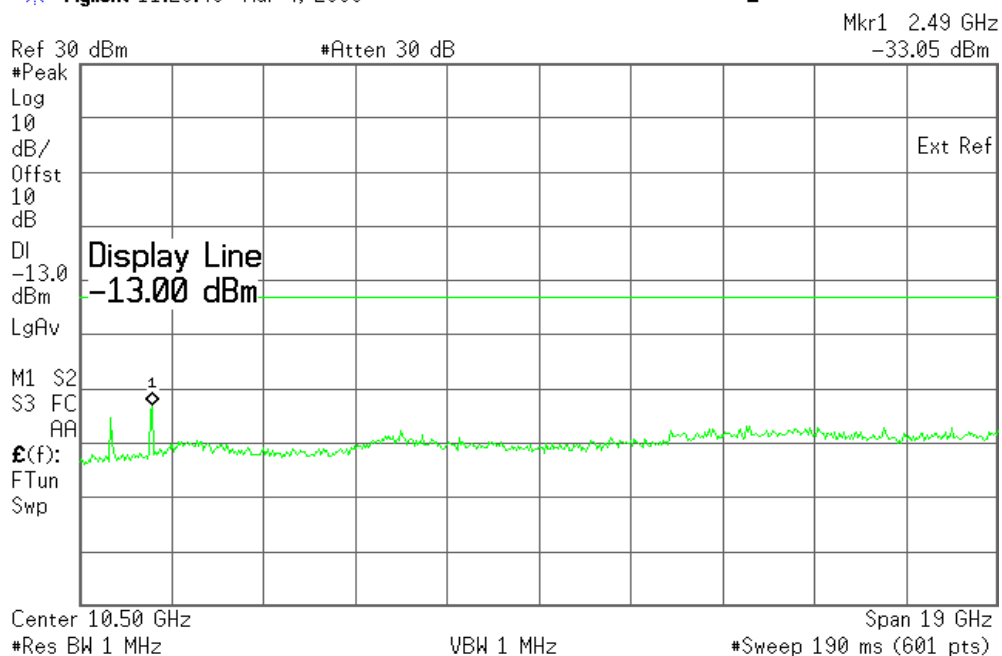
**SIERRA WIRELESS, INC.**

**Plot 6.4.3) Out of Band Emissions at Antenna Terminals**

GMSK, Low channel, 824.200 MHz, 1 GHz to 20 GHz

Agilent 11:26:48 Mar 4, 2008

L



Cellular Harmonics for Ch. 128 (824.2 MHz)	Level (dBm)
Second	-35.21 dBm
Third	-33.05 dBm
All others	< -35 dBm up to 20GHz

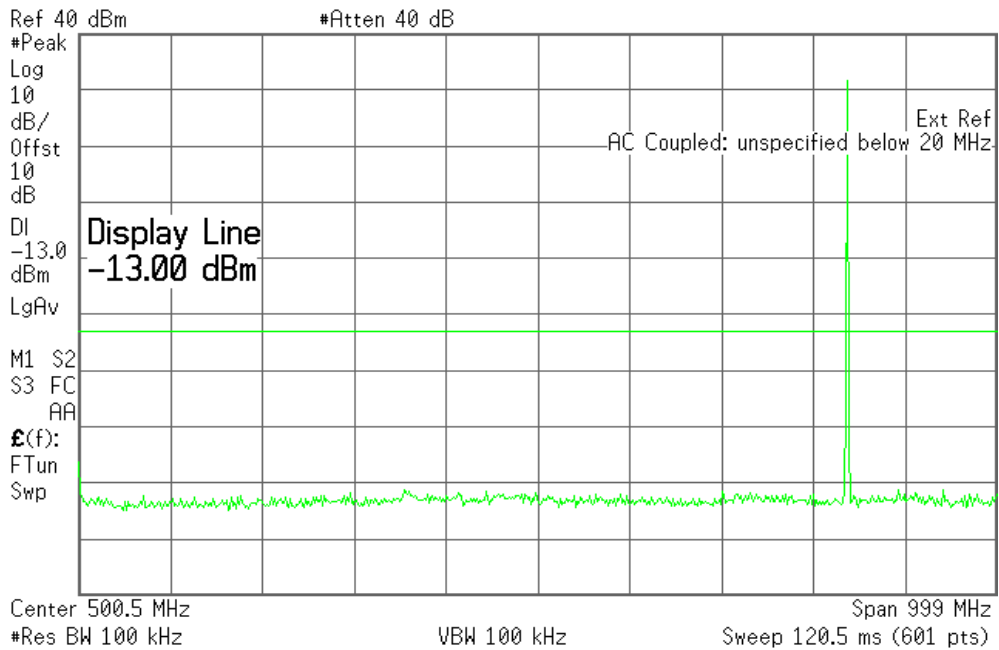
# SIERRA WIRELESS, INC.

## Plot 6.4.4) Out of Band Emissions at Antenna Terminals

GMSK, Mid Channel, 836.6 MHz, 1 MHz to 1 GHz

Agilent 11:29:40 Mar 4, 2008

L

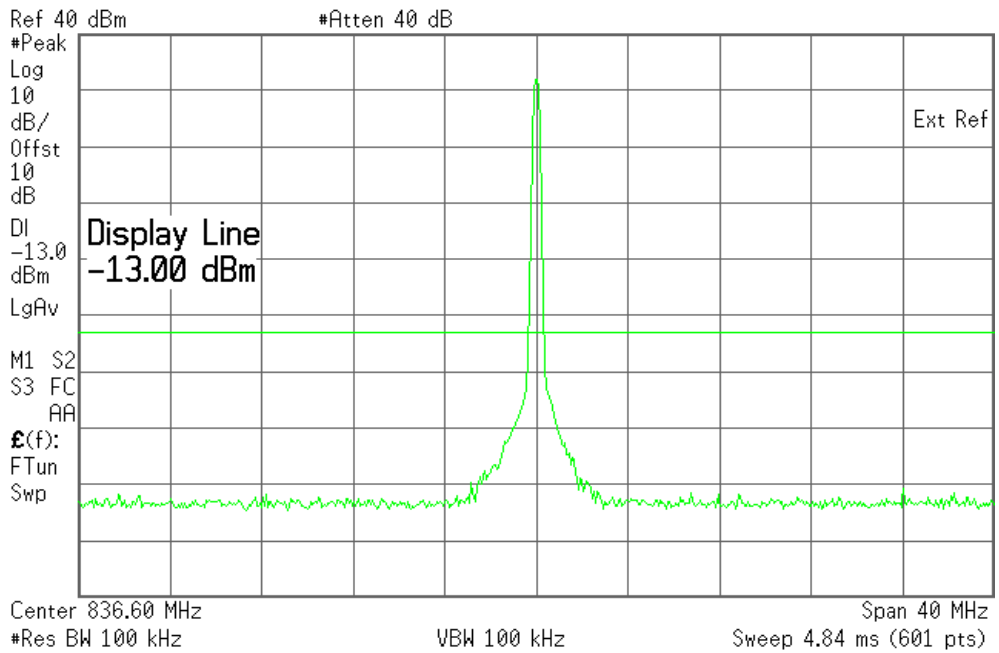


## Plot 6.4.5) Out of Band Emissions at Antenna Terminals

GMSK, Mid Channel, 836.6 MHz, TX signal +/- 20 MHz

Agilent 11:31:28 Mar 4, 2008

L



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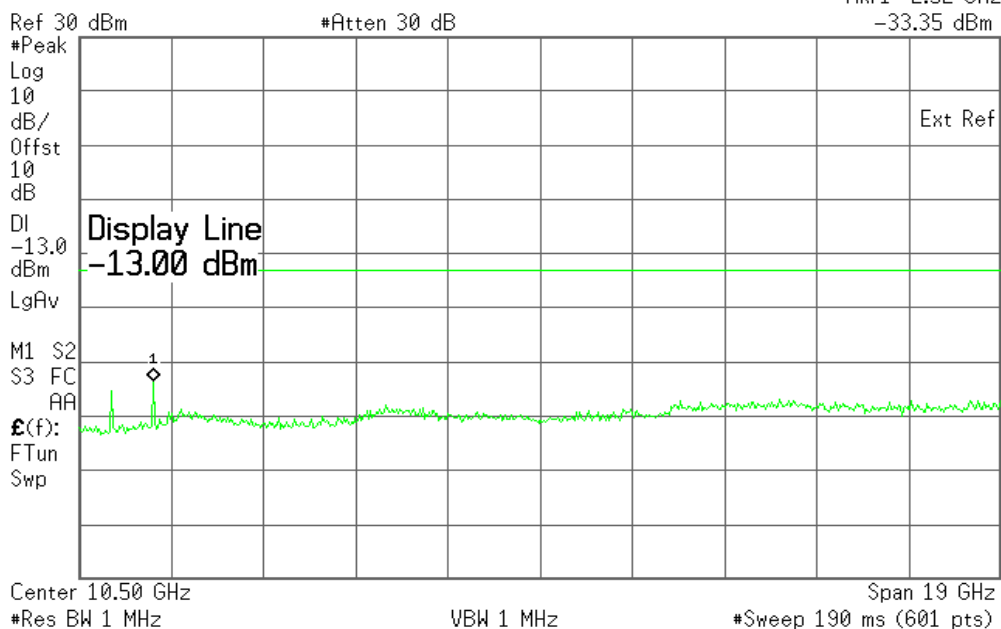
**Plot 6.4.6) Out of Band Emissions at Antenna Terminals**

GMSK, Mid Channel, 836.6 MHz, 1 GHz to 20 GHz

Agilent 11:34:10 Mar 4, 2008

L

Mkr1 2.52 GHz  
-33.35 dBm



Cellular Harmonics for Ch. 190 (836.6 MHz)	Level (dBm)
Second	-34.96 dBm
Third	-33.35 dBm
All others	< -35 dBm up to 20GHz

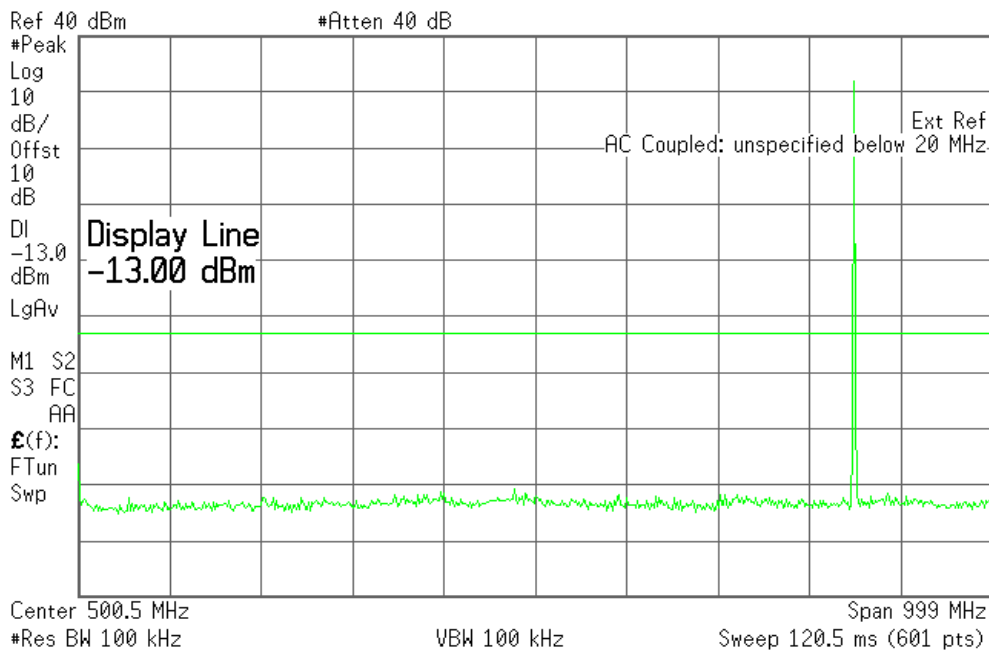
**SIERRA WIRELESS, INC.**

**Plot 6.4.7) Out of Band Emissions at Antenna Terminals**

GMSK, High Channel, 848.8 MHz, 1 MHz to 1 GHz

Agilent 11:37:19 Mar 4, 2008

L

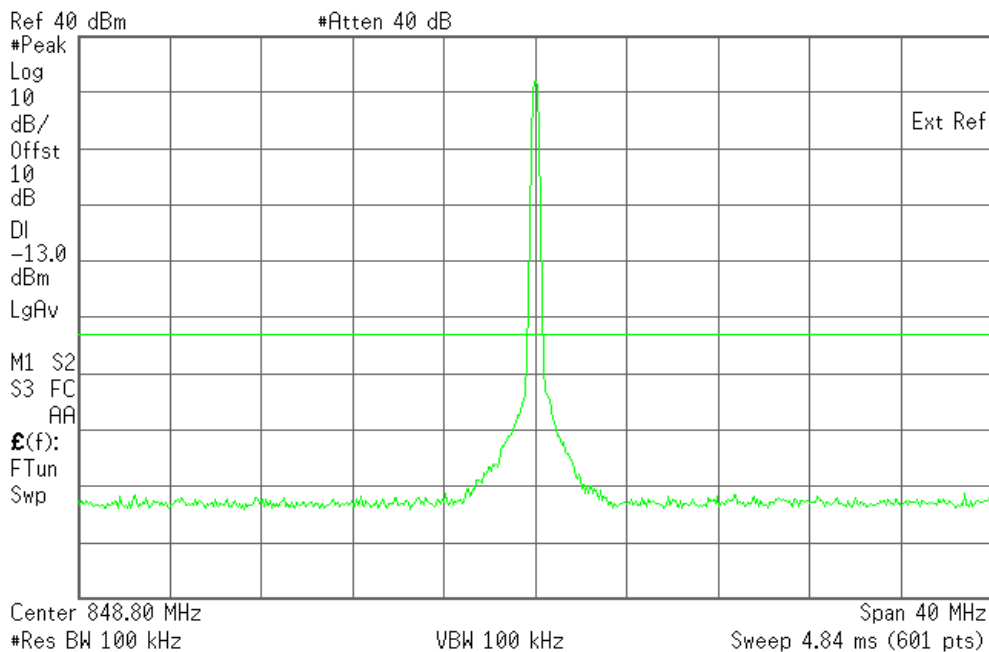


**Plot 6.4.8) Out of Band Emissions at Antenna Terminals**

GMSK, High Channel, 848.8 MHz, TX signal +/- 20 MHz

Agilent 11:40:42 Mar 4, 2008

L



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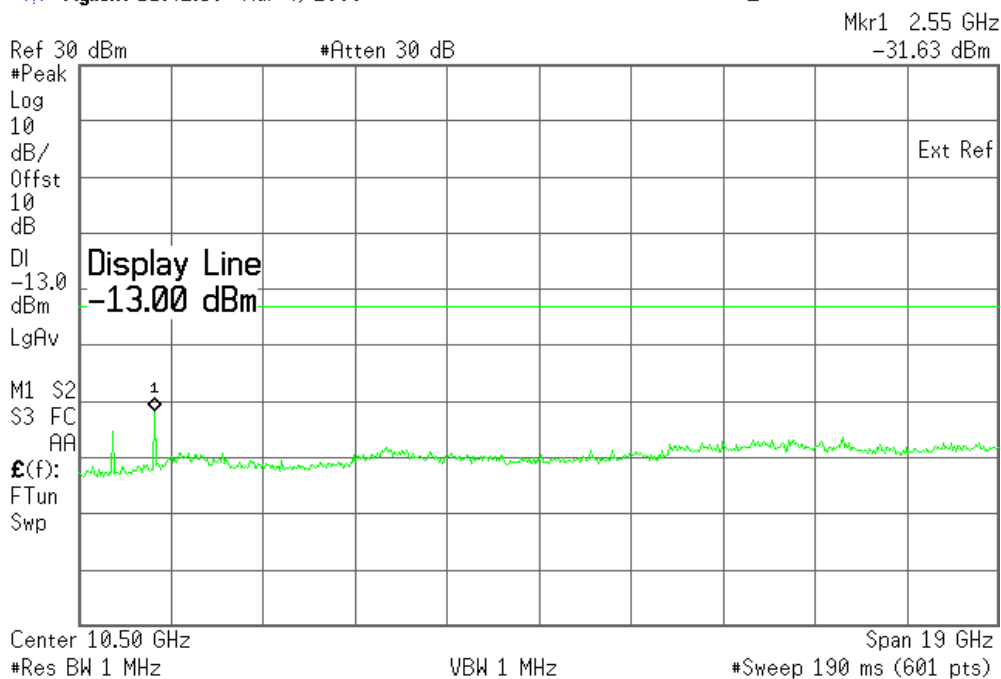
**SIERRA WIRELESS, INC.**

**Plot 6.4.9) Out of Band Emissions at Antenna Terminals**

GMSK, High Channel, 848.8 MHz, 1 GHz to 20 GHz

Agilent 11:42:56 Mar 4, 2008

L



Cellular Harmonics for Ch. 251 (848.8 MHz)	Level (dBm)
Second	-35.37 dBm
Third	-31.63 dBm
All others	< -35 dBm up to 20GHz

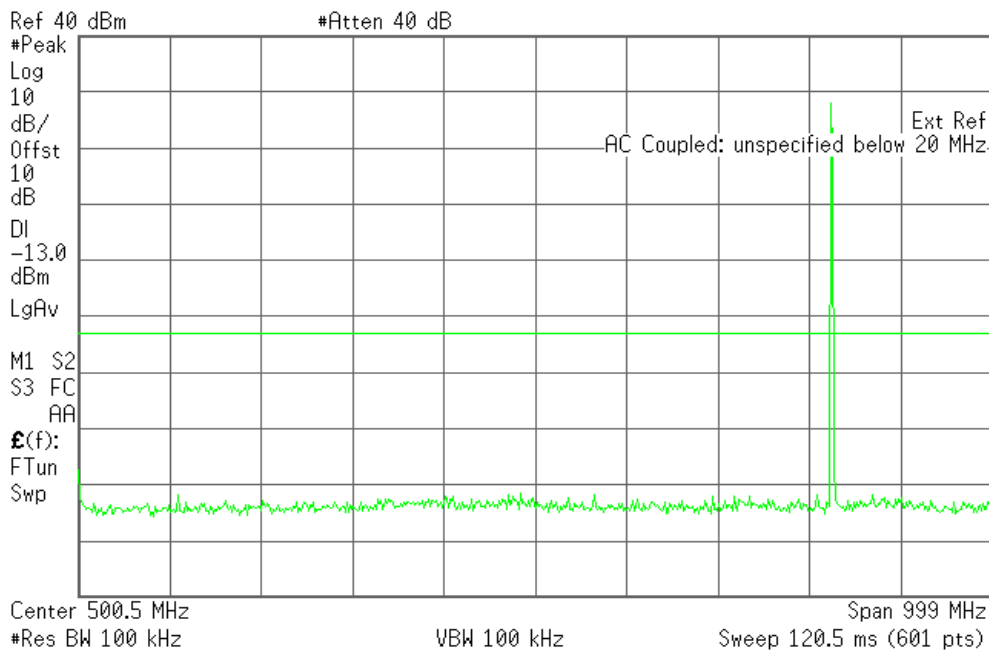
# SIERRA WIRELESS, INC.

## Plot 6.4.10) Out of Band Emissions at Antenna Terminals

8-PSK, Low channel, 824.200 MHz, 1 MHz to 1 GHz

Agilent 11:45:38 Mar 4, 2008

L

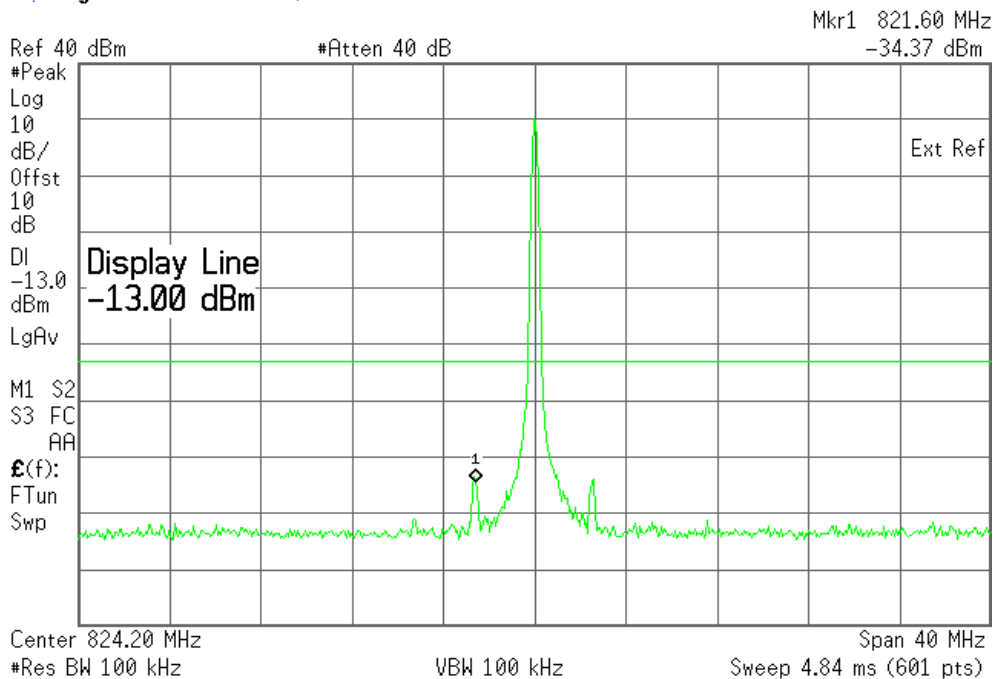


## Plot 6.4.11) Out of Band Emissions at Antenna Terminals

8-PSK, Low channel, 824.200 MHz, TX signal +/- 20 MHz

Agilent 11:48:19 Mar 4, 2008

L



**The strong emission shown in each case is the carrier signal.**

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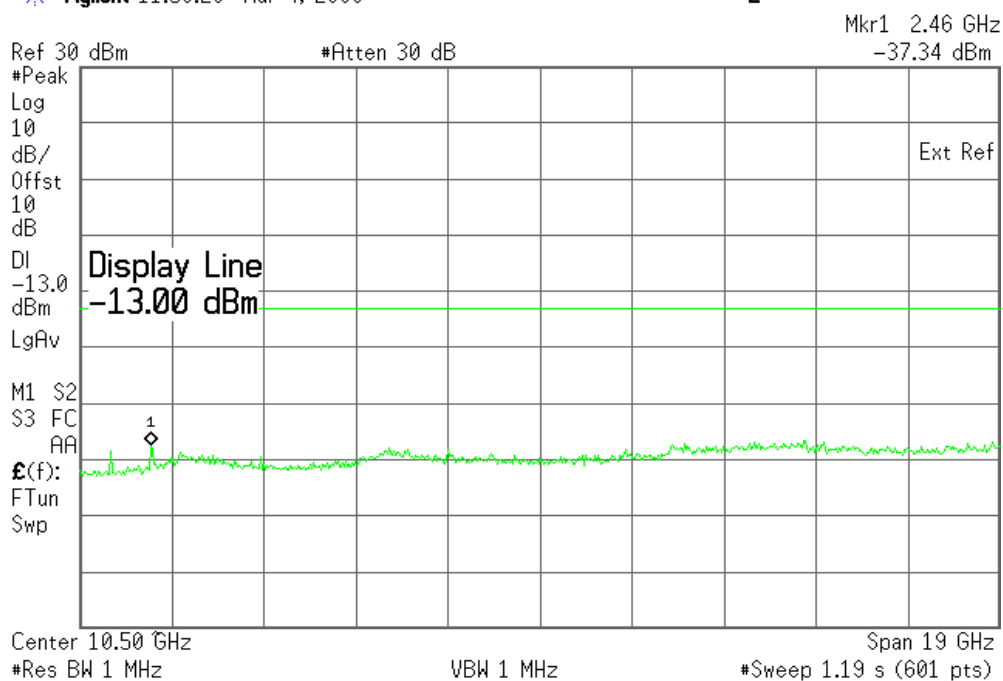
**SIERRA WIRELESS, INC.**

**Plot 6.4.12) Out of Band Emissions at Antenna Terminals**

8-PSK, Low channel, 824.200 MHz, 1 GHz to 20 GHz

Agilent 11:50:26 Mar 4, 2008

L



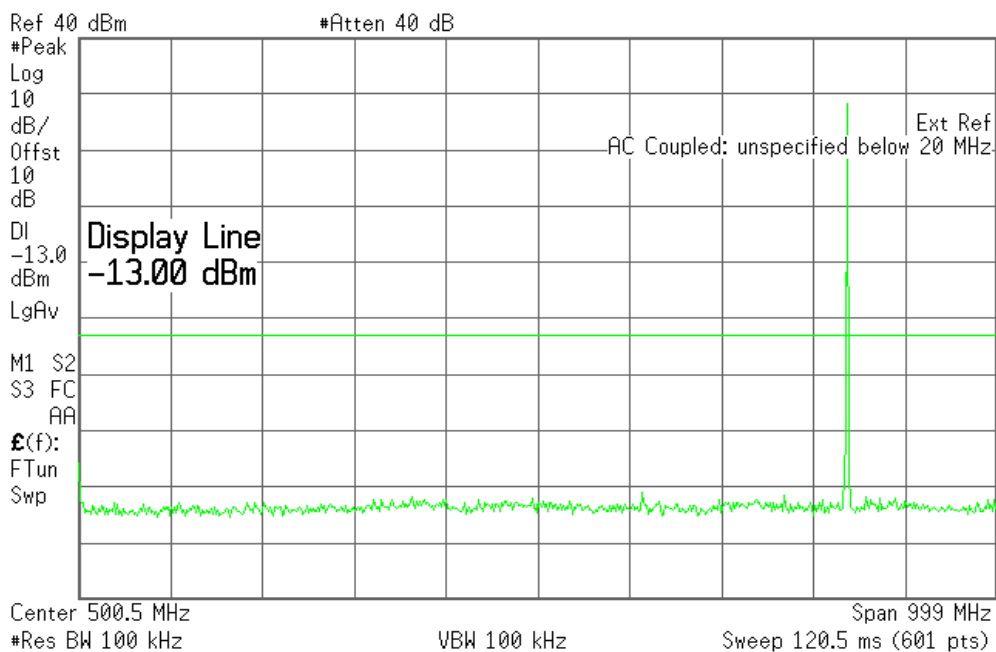
Cellular Harmonics for Ch. 128 (824.2 MHz)	Level (dBm)
Second	-38.74dBm
Third	-37.32 dBm
All others	< -35 dBm up to 20GHz

**SIERRA WIRELESS, INC.**

**Plot 6.4.13) Out of Band Emissions at Antenna Terminals**

8-PSK, Mid Channel, 836.6 MHz, 1 MHz to 1 GHz

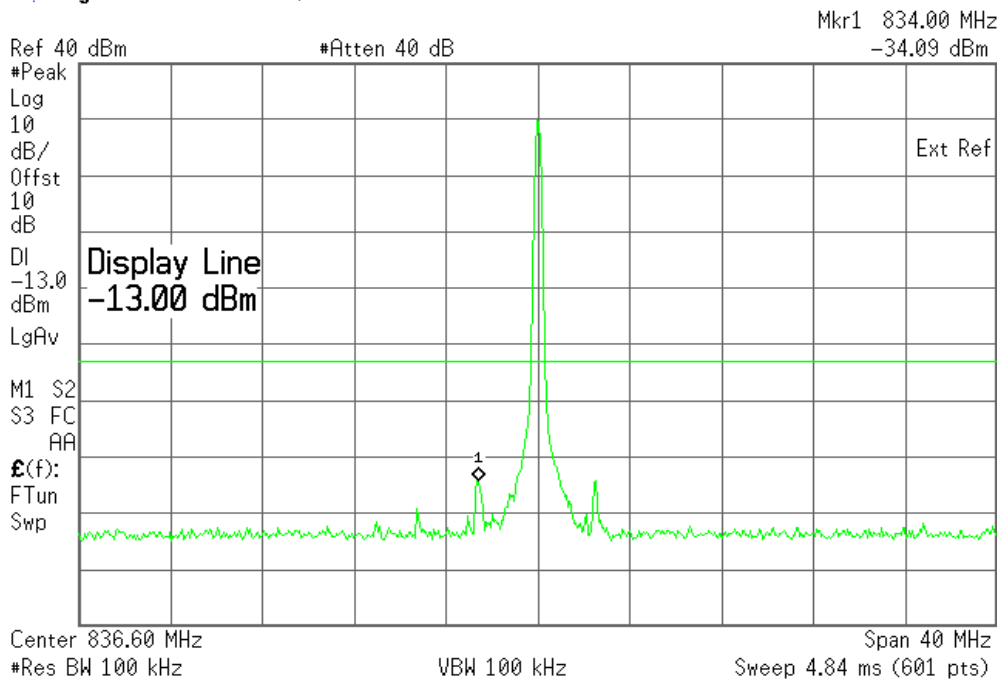
Agilent 11:53:39 Mar 4, 2008 L



**Plot 6.4.14) Out of Band Emissions at Antenna Terminals**

8-PSK, Mid Channel, 836.6 MHz, TX signal +/- 20 MHz

Agilent 11:55:05 Mar 4, 2008 L



**The strong emission shown in each case is the carrier signal.**

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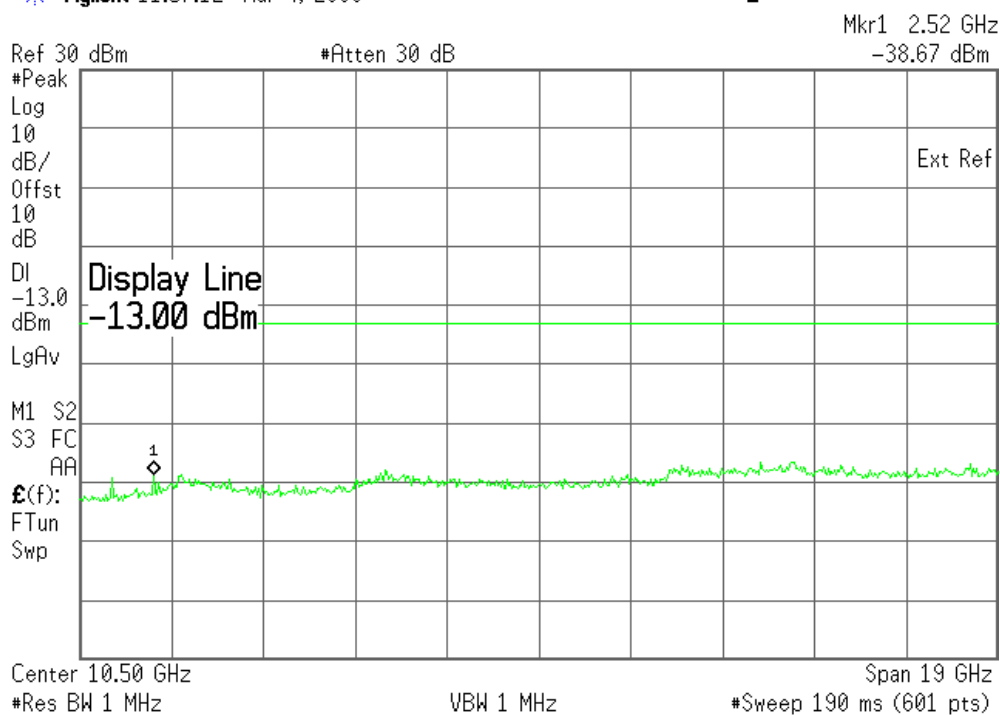
**SIERRA WIRELESS, INC.**

**Plot 6.4.15) Out of Band Emissions at Antenna Terminals**

8-PSK, Mid Channel, 836.6 MHz, 1 GHz to 20 GHz

Agilent 11:57:12 Mar 4, 2008

L



Cellular Harmonics for Ch. 190 (836.6 MHz)	Level (dBm)
<b>Second</b>	<b>-38.93 dBm</b>
<b>Third</b>	<b>-38.67 dBm</b>
<b>All others</b>	<b>&lt; -35 dBm up to 20GHz</b>

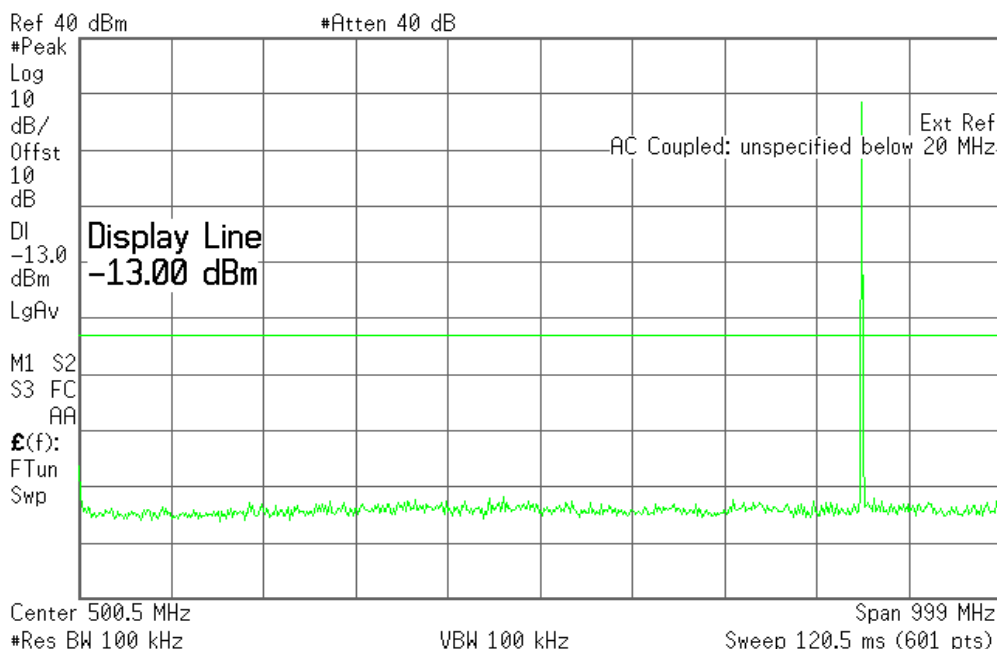
**SIERRA WIRELESS, INC.**

**Plot 6.4.16) Out of Band Emissions at Antenna Terminals**

8-PSK, High Channel, 848.8 MHz, 1 MHz to 1 GHz

Agilent 12:00:00 Mar 4, 2008

L

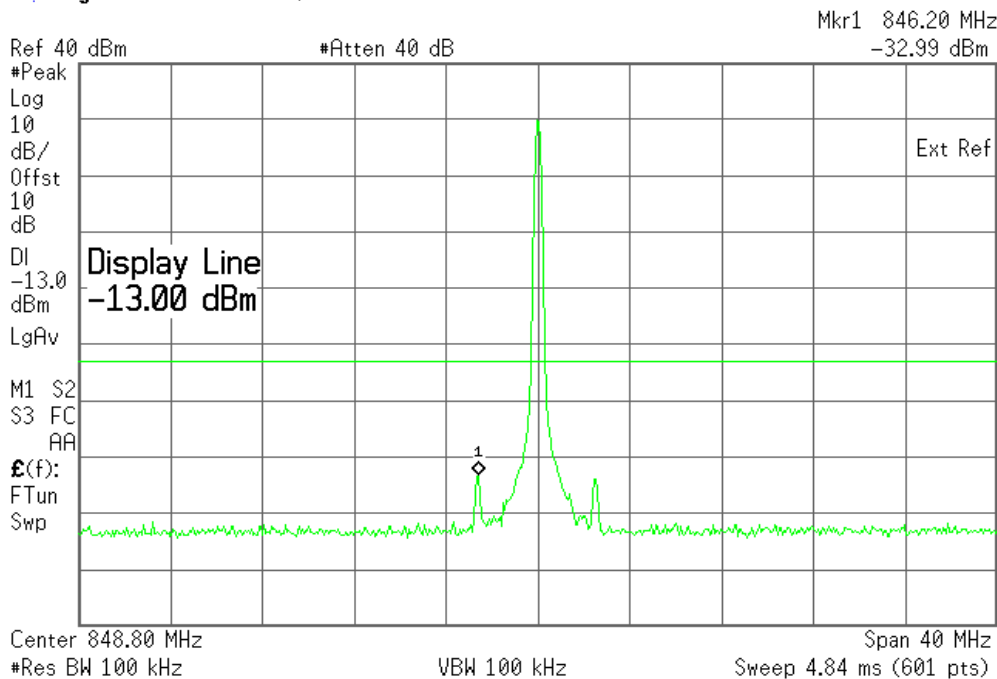


**Plot 6.4.17) Out of Band Emissions at Antenna Terminals**

8-PSK, High Channel, 848.8 MHz, TX signal +/- 20 MHz

Agilent 12:02:07 Mar 4, 2008

L



**The strong emission shown in each case is the carrier signal.**

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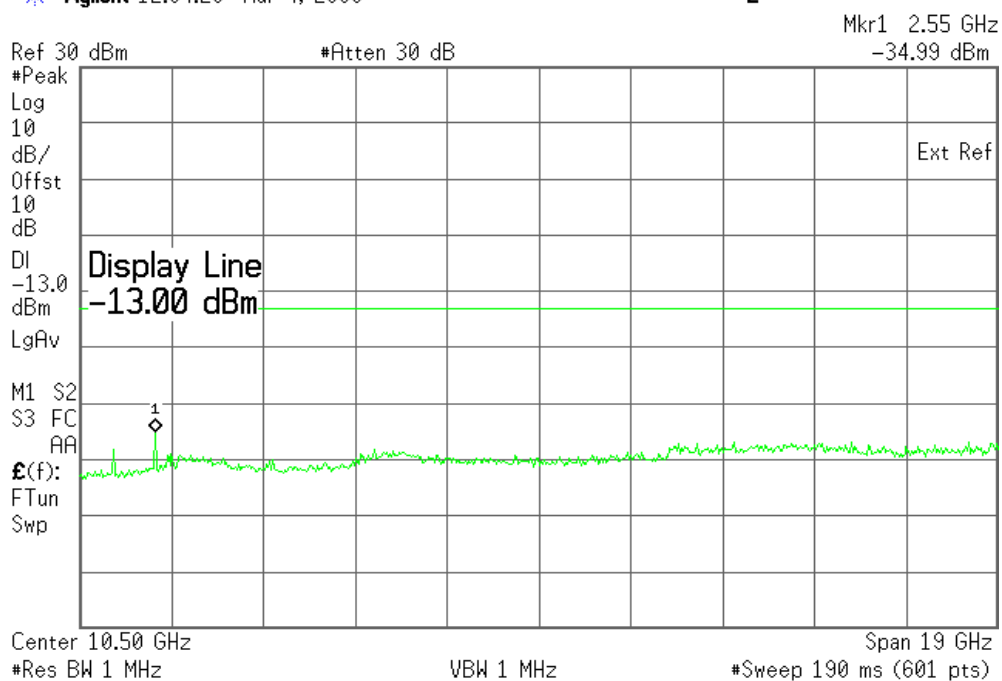
**SIERRA WIRELESS, INC.**

**Plot 6.4.18) Out of Band Emissions at Antenna Terminals**

8-PSK, High Channel, 848.8 MHz, 1 GHz to 20 GHz

Agilent 12:04:20 Mar 4, 2008

L



Cellular Harmonics for Ch. 251 (848.8 MHz)	Level (dBm)
<b>Second</b>	<b>-38.63 dBm</b>
<b>Third</b>	<b>-34.99 dBm</b>
<b>All others</b>	<b>&lt; -35 dBm up to 20GHz</b>

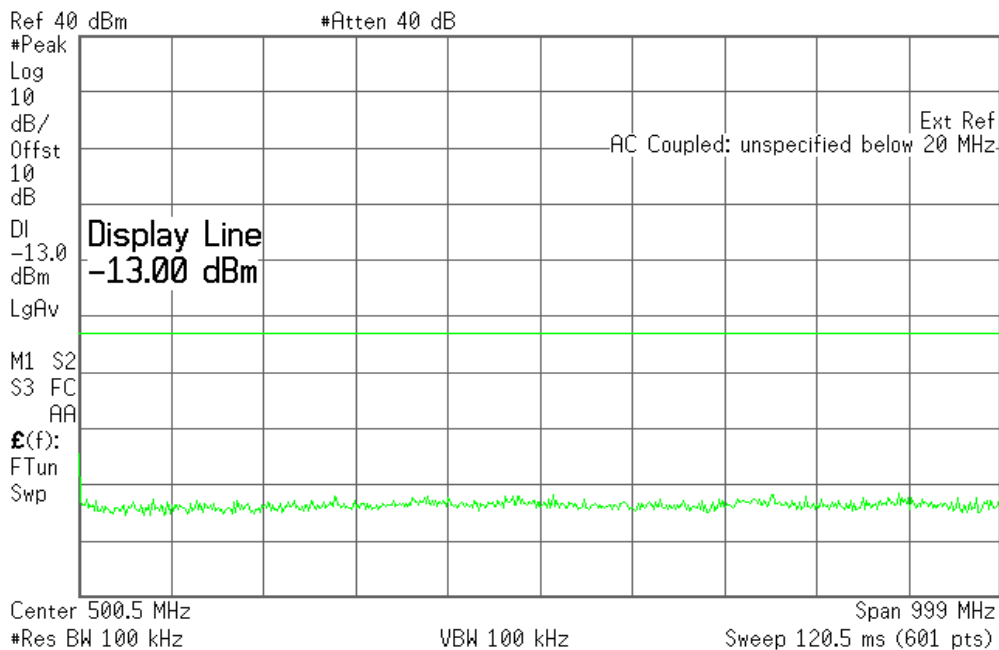
**SIERRA WIRELESS, INC.**

**Plot 6.4.19) Out of Band Emissions at Antenna Terminals**

GMSK, Low channel, 1850.2 MHz, 1 MHz to 1 GHz

Agilent 13:11:00 Mar 4, 2008

L

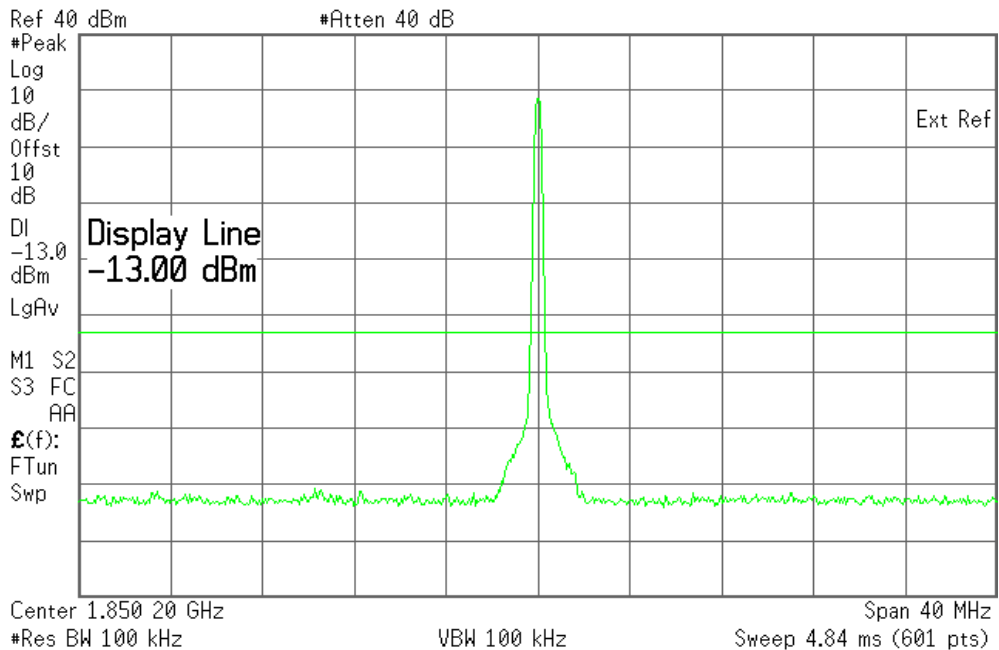


**Plot 6.4.20) Out of Band Emissions at Antenna Terminals**

GMSK, Low channel, 1850.2 MHz, TX signal +/- 20 MHz

Agilent 13:13:14 Mar 4, 2008

L



**The strong emission shown is the carrier signal.**

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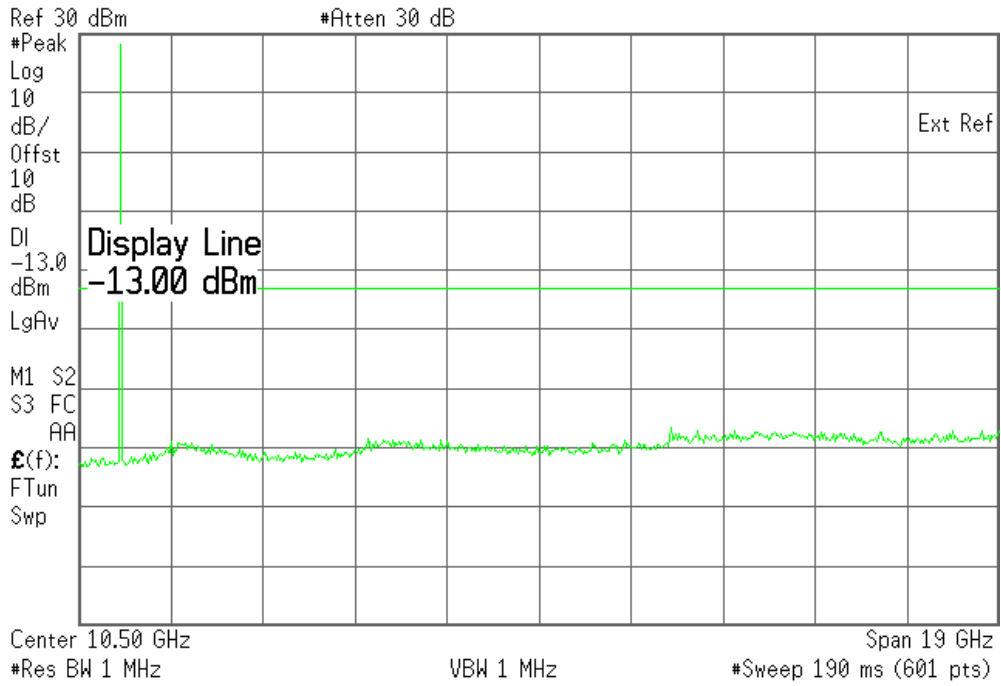
SIERRA WIRELESS, INC.

**Plot 6.4.21) Out of Band Emissions at Antenna Terminals**

GMSK, Low channel, 1850.2 MHz, 1 GHz to 20 GHz

Agilent 13:15:20 Mar 4, 2008

L



**The strong emission shown is the carrier signal.**

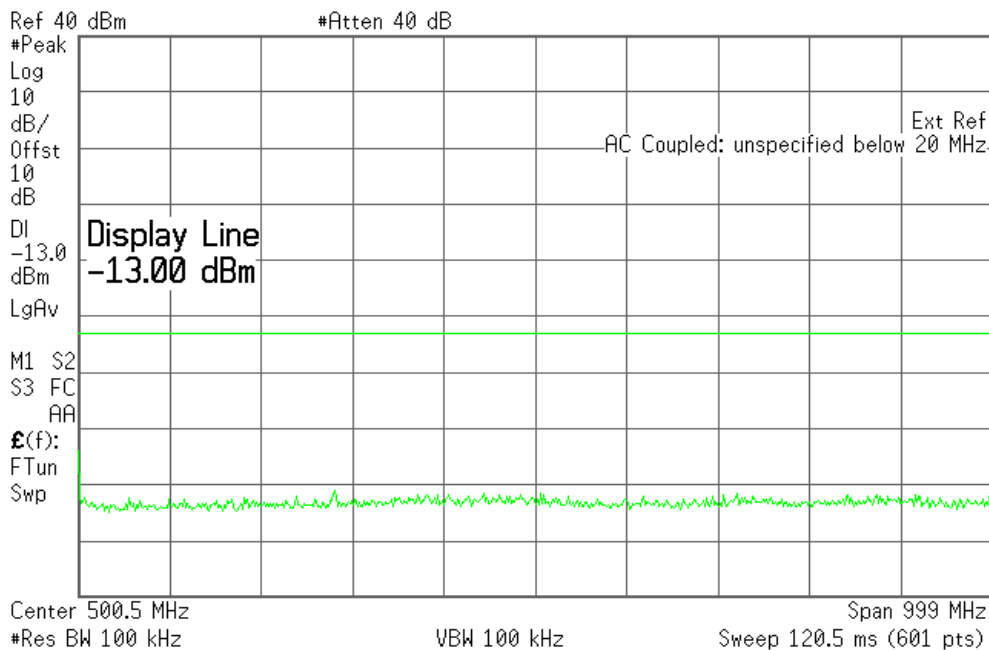
**SIERRA WIRELESS, INC.**

**Plot 6.4.22) Out of Band Emissions at Antenna Terminals**

GMSK, Middle channel, 1880.0 MHz, 1 MHz to 1 GHz

Agilent 13:18:06 Mar 4, 2008

L

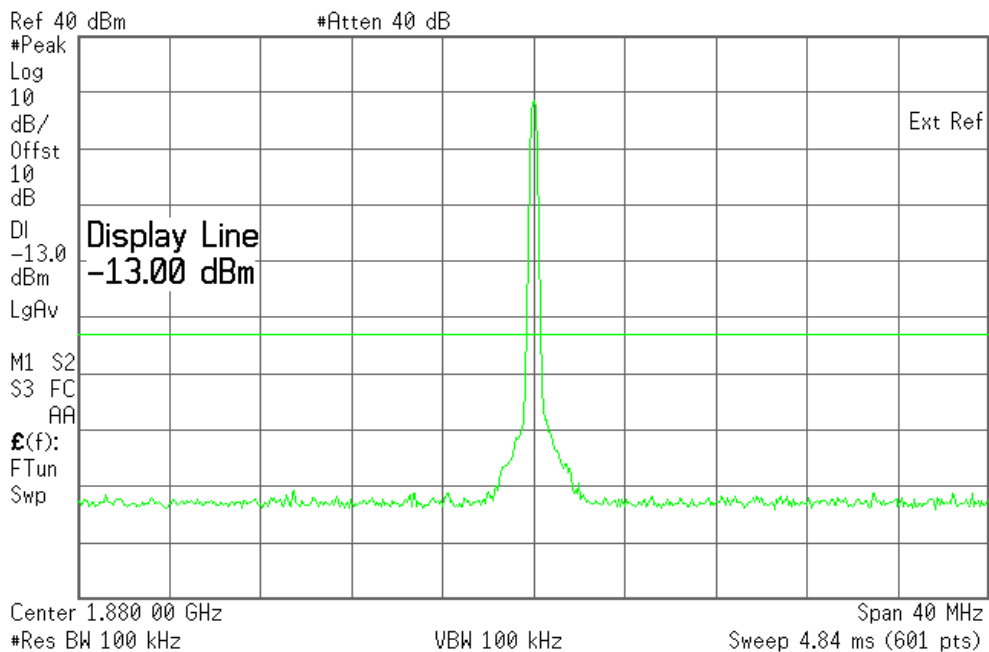


**Plot 6.4.23) Out of Band Emissions at Antenna Terminals**

GMSK, Middle channel, 1880.0 MHz, TX signal +/- 20 MHz

Agilent 13:20:10 Mar 4, 2008

L



**The strong emission shown is the carrier signal.**

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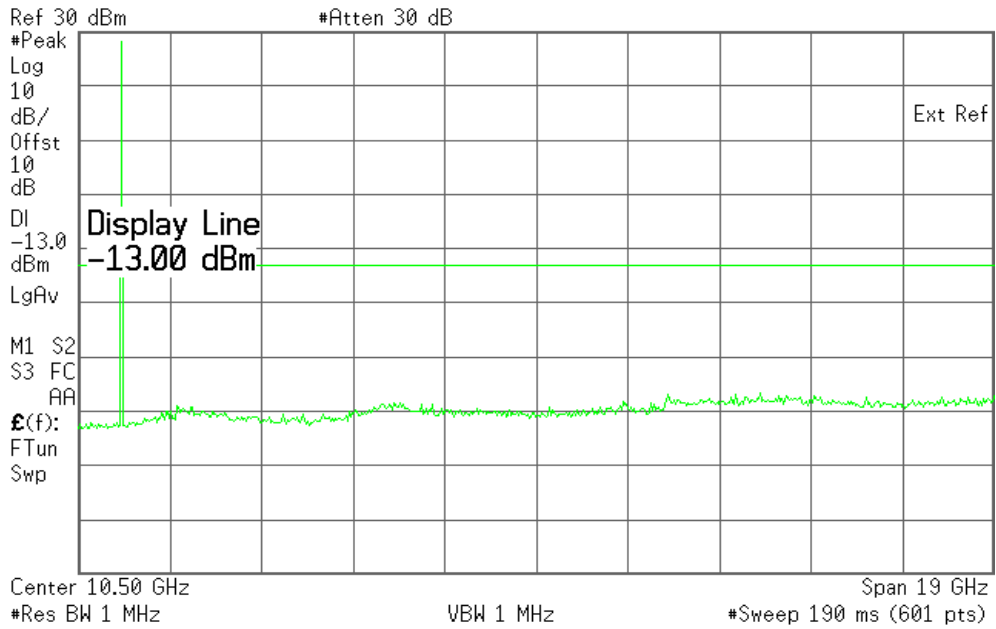


SIERRA WIRELESS, INC.

**Plot 6.4.24) Out of Band Emissions at Antenna Terminals**  
GMSK, Middle channel, 1880.0 MHz, 1 GHz to 20 GHz

Agilent 13:22:17 Mar 4, 2008

L



**The strong emission shown is the carrier signal.**

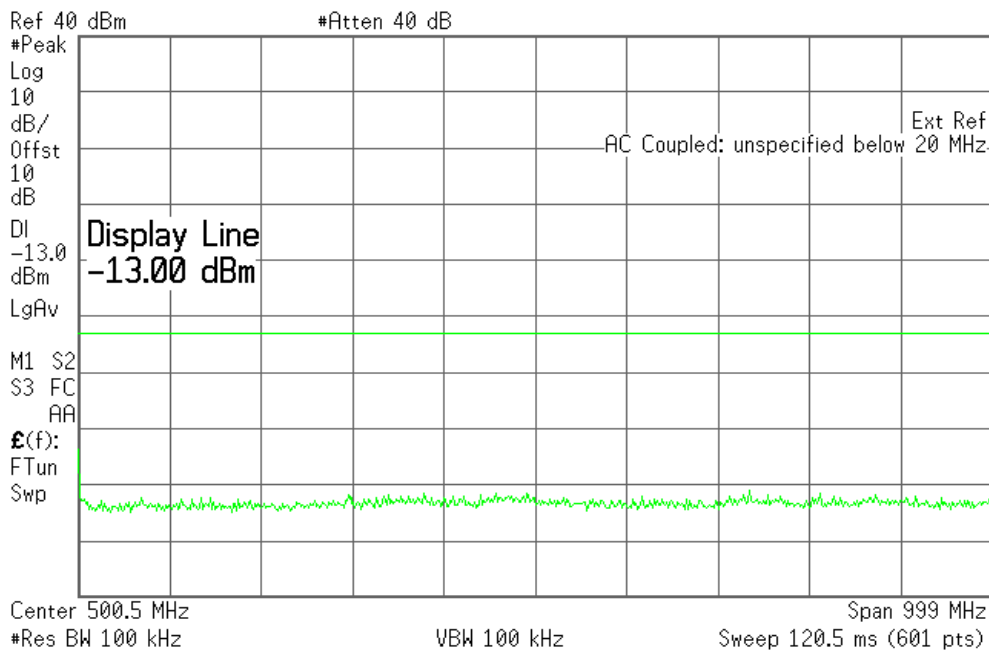
**SIERRA WIRELESS, INC.**

**Plot 6.4.25) Out of Band Emissions at Antenna Terminals**

GMSK, High channel, 1909.8 MHz, 1 MHz to 1 GHz

Agilent 13:25:04 Mar 4, 2008

L

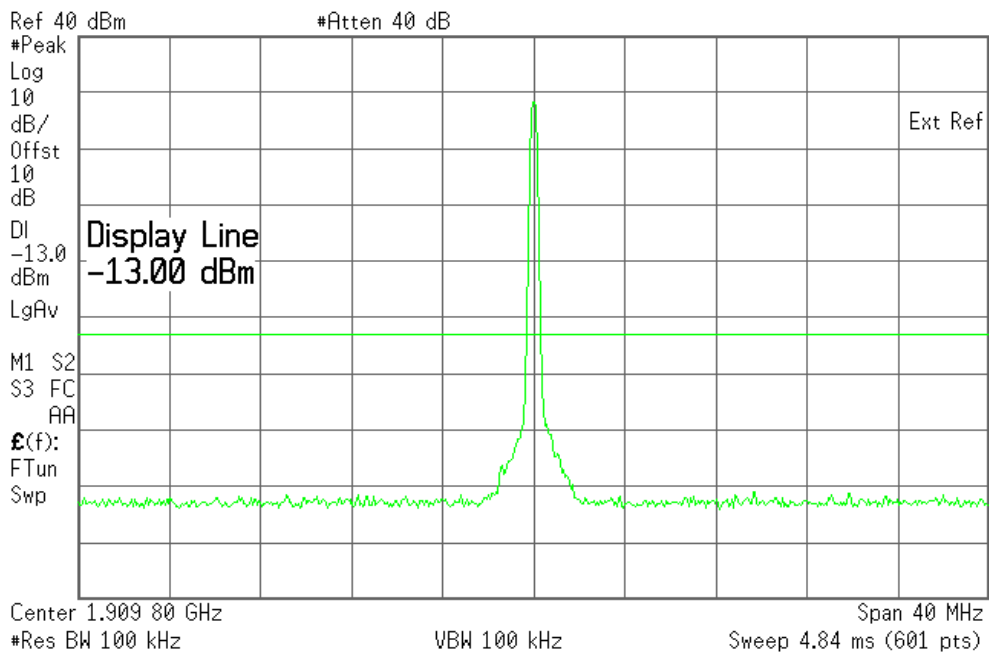


**Plot 6.4.26) Out of Band Emissions at Antenna Terminals**

GMSK, High channel, 1909.8 MHz, TX signal +/- 20 MHz

Agilent 13:27:22 Mar 4, 2008

L



**The strong emission shown is the carrier signal.**

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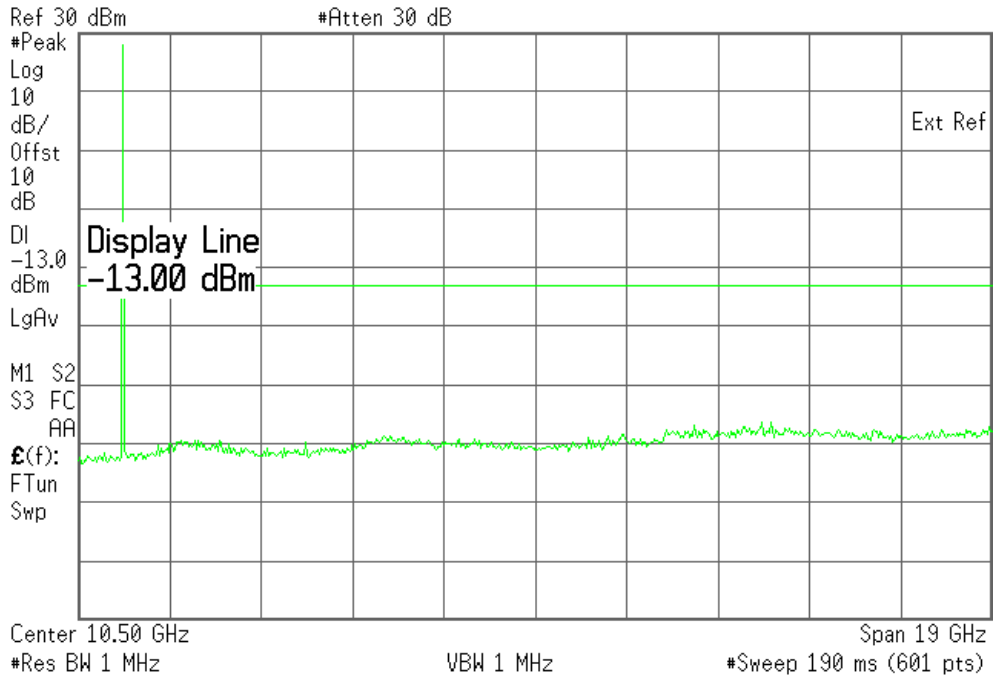
SIERRA WIRELESS, INC.

**Plot 6.4.27) Out of Band Emissions at Antenna Terminals**

GMSK, High channel, 1909.8 MHz, 1 GHz to 20 GHz

Agilent 13:29:29 Mar 4, 2008

L



**The strong emission shown is the carrier signal.**

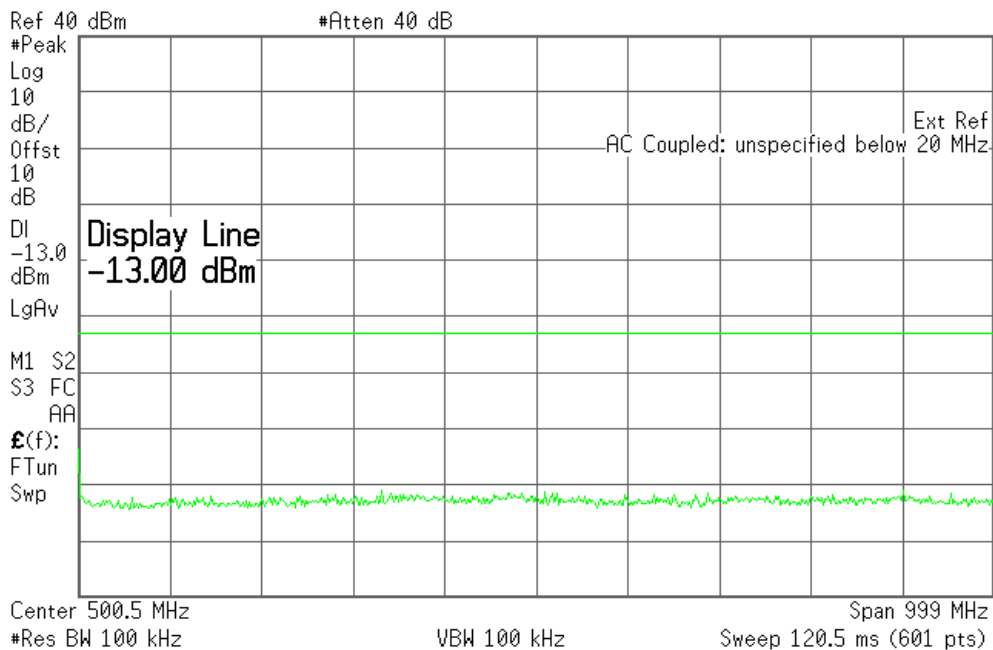
**SIERRA WIRELESS, INC.**

**Plot 6.4.28) Out of Band Emissions at Antenna Terminals**

8-PSK, Low channel, 1850.2 MHz, 1 MHz to 1 GHz

Agilent 13:32:48 Mar 4, 2008

L



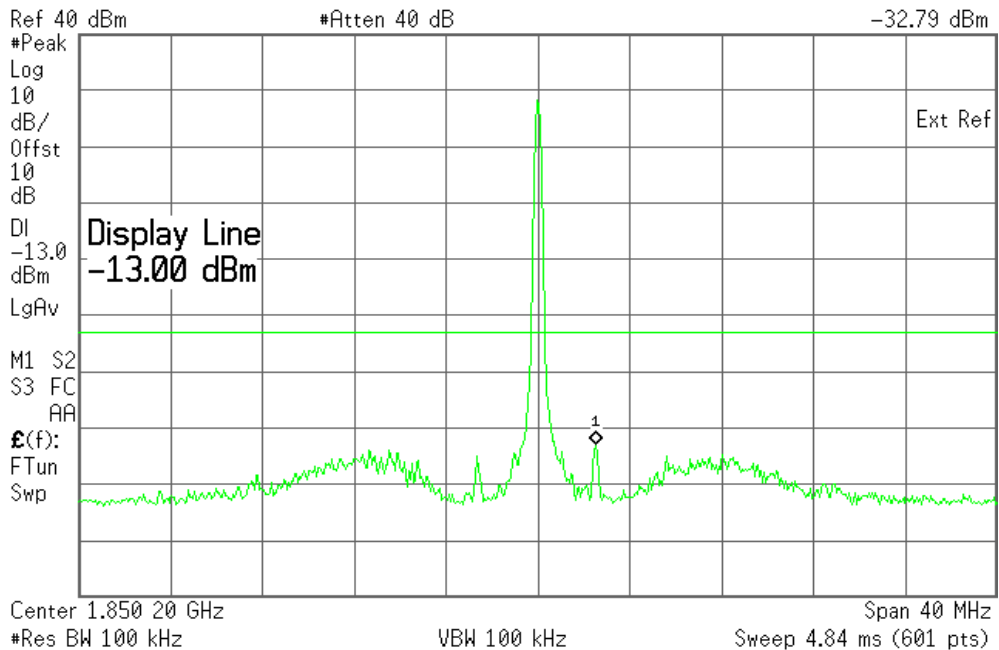
**Plot 6.4.29) Out of Band Emissions at Antenna Terminals**

8-PSK, Low channel, 1850.2 MHz, TX signal +/- 20 MHz

Agilent 13:34:35 Mar 4, 2008

L

Mkr1 1.852 73 GHz  
-32.79 dBm



**The strong emission shown is the carrier signal.**

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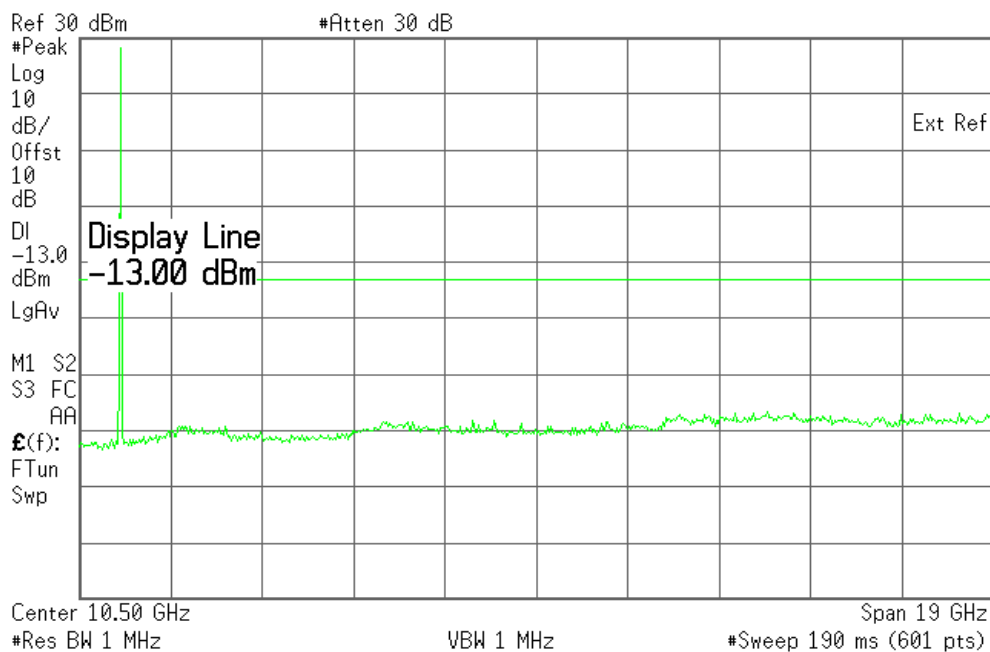
# SIERRA WIRELESS, INC.

## Plot 6.4.30) Out of Band Emissions at Antenna Terminals

8-PSK, Low channel, 1850.2 MHz, 1 GHz to 20 GHz

Agilent 13:37:54 Mar 4, 2008

L



The strong emission shown is the carrier signal.

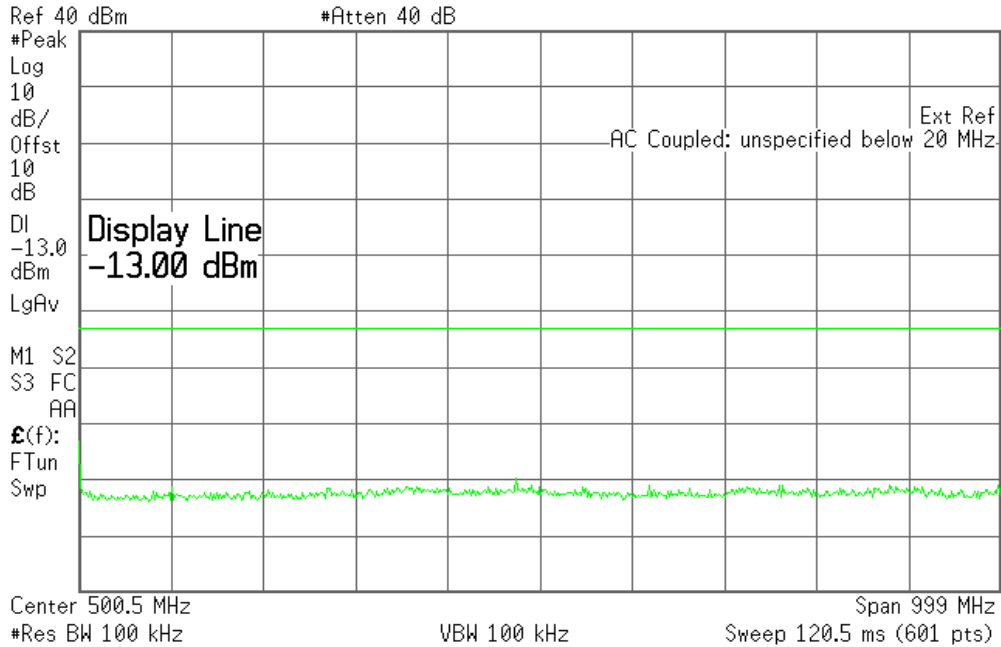
**SIERRA WIRELESS, INC.**

**Plot 6.4.31) Out of Band Emissions at Antenna Terminals**

8-PSK, Middle channel, 1880.0 MHz, 1 MHz to 1 GHz

Agilent 13:43:38 Mar 4, 2008

L



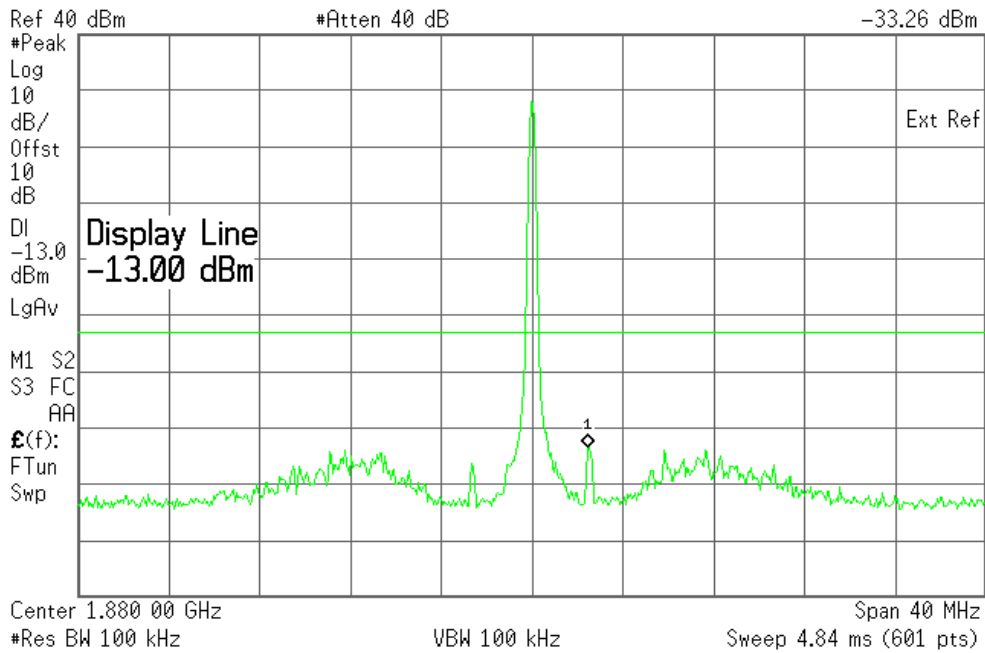
**Plot 6.4.32) Out of Band Emissions at Antenna Terminals**

8-PSK, Middle channel, 1880.0 MHz, TX signal +/- 20 MHz

Agilent 13:48:00 Mar 4, 2008

L

Mkr1 1.882 47 GHz  
-33.26 dBm



**The strong emission shown is the carrier signal.**

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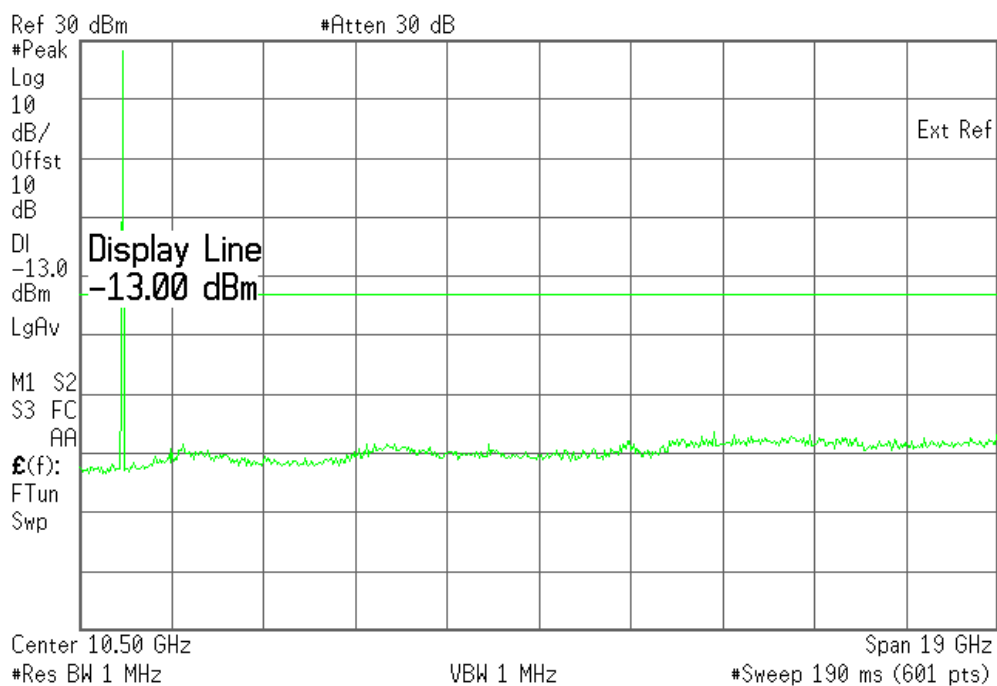
SIERRA WIRELESS, INC.

**Plot 6.4.33) Out of Band Emissions at Antenna Terminals**

8-PSK, Middle channel, 1880.0 MHz, 1 GHz to 20 GHz

Agilent 13:50:12 Mar 4, 2008

L



**The strong emission shown is the carrier signal.**

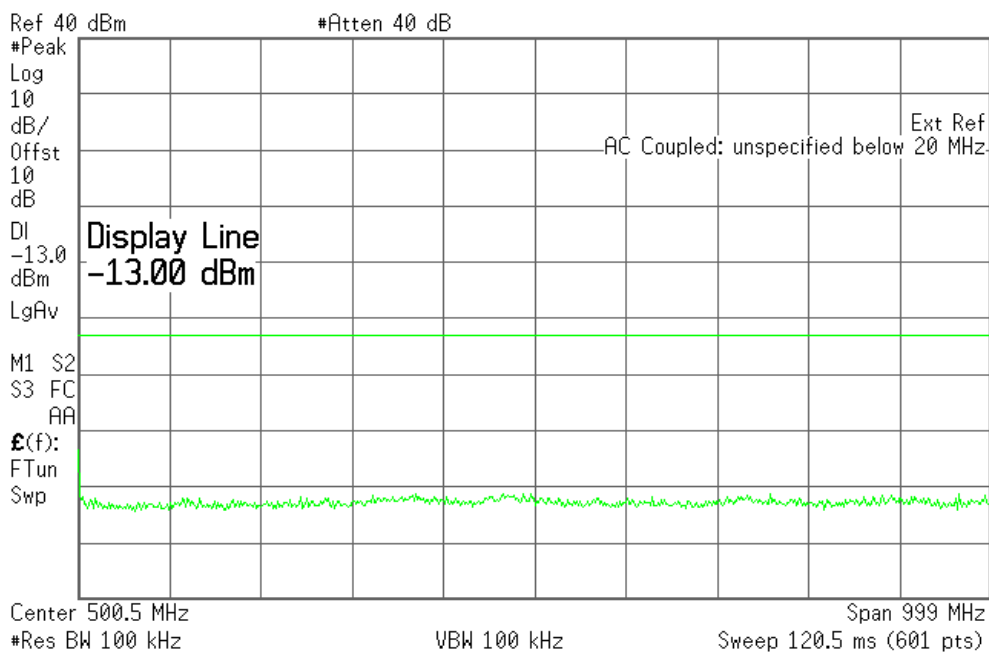
**SIERRA WIRELESS, INC.**

**Plot 6.4.34) Out of Band Emissions at Antenna Terminals**

8-PSK, High channel, 1909.8 MHz, 1 MHz to 1 GHz

\* Agilent 13:53:11 Mar 4, 2008

L



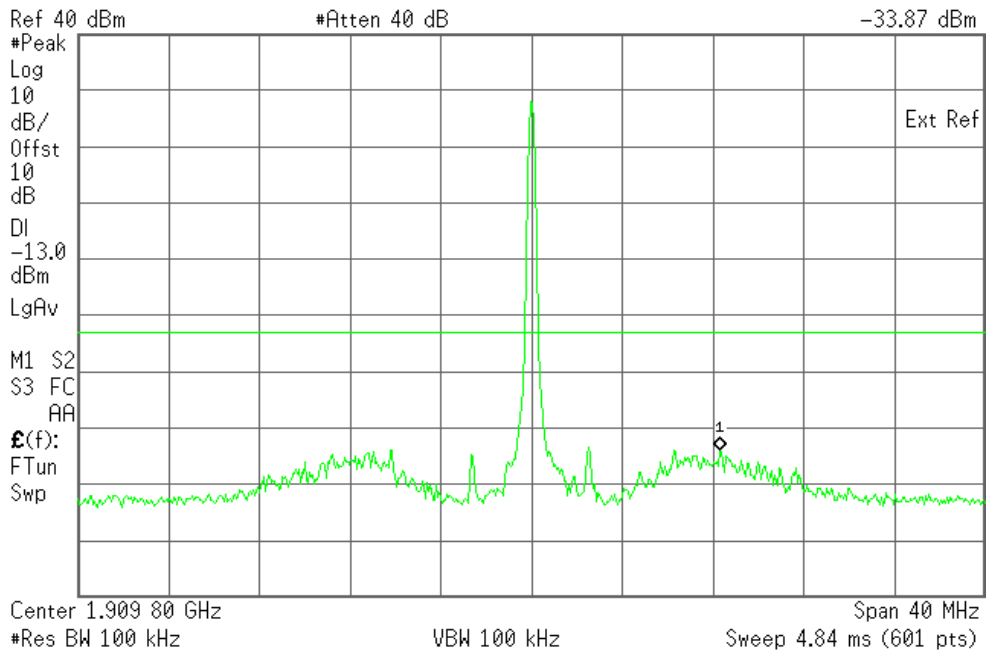
**Plot 6.4.35) Out of Band Emissions at Antenna Terminals**

8-PSK, High channel, 1909.8 MHz, TX signal +/- 20 MHz

\* Agilent 13:56:07 Mar 4, 2008

L

Mkr1 1.918 13 GHz  
-33.87 dBm



**The strong emission shown is the carrier signal.**

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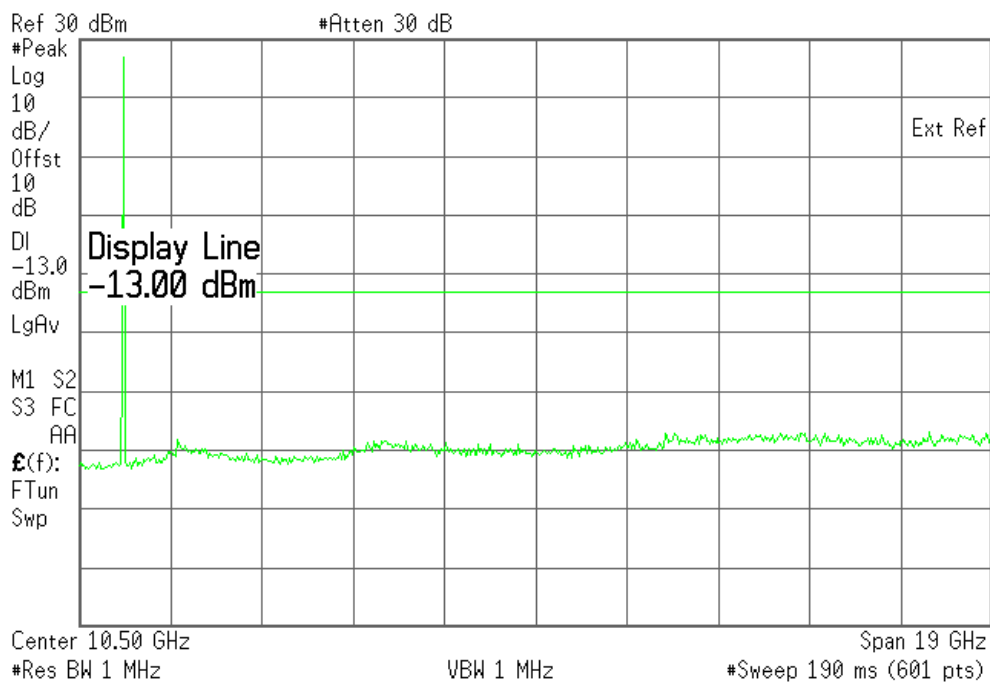


**SIERRA WIRELESS, INC.**

Plot 6.4.36) Out of Band Emissions at Antenna Terminals  
8-PSK, High channel, 1909.8 MHz, 1 GHz to 20 GHz

✱ Agilent 13:58:17 Mar 4, 2008

L



**The strong emission shown is the carrier signal.**

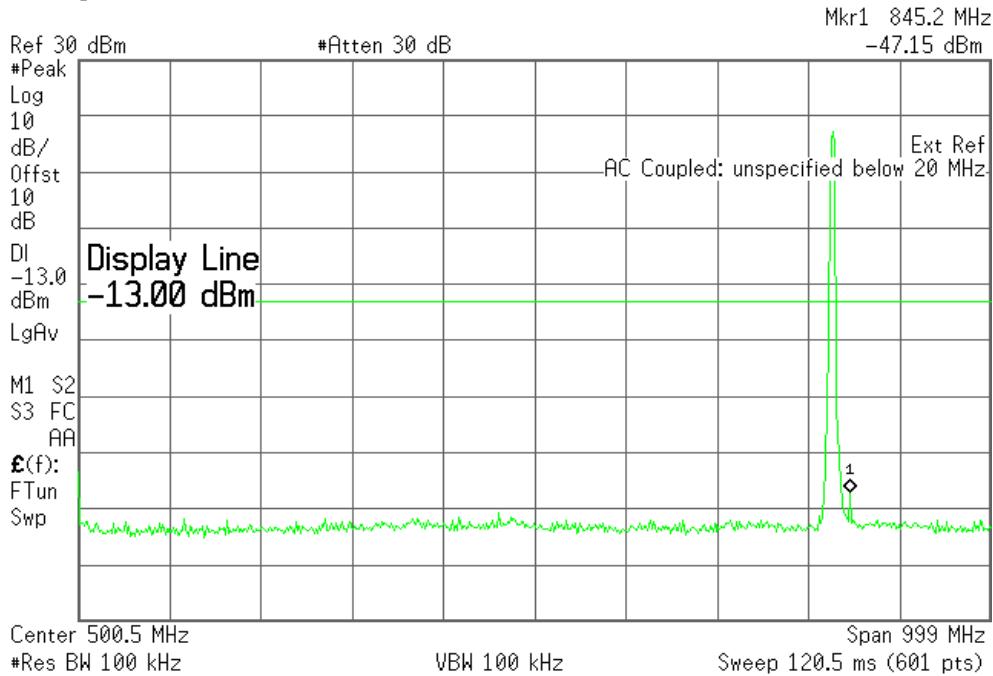
**SIERRA WIRELESS, INC.**

**Plot 6.4.37) Out of Band Emissions at Antenna Terminals**

WCDMA, Low channel, 826.4 MHz, 1 MHz to 1 GHz

\* Agilent 14:29:12 Mar 4, 2008

L

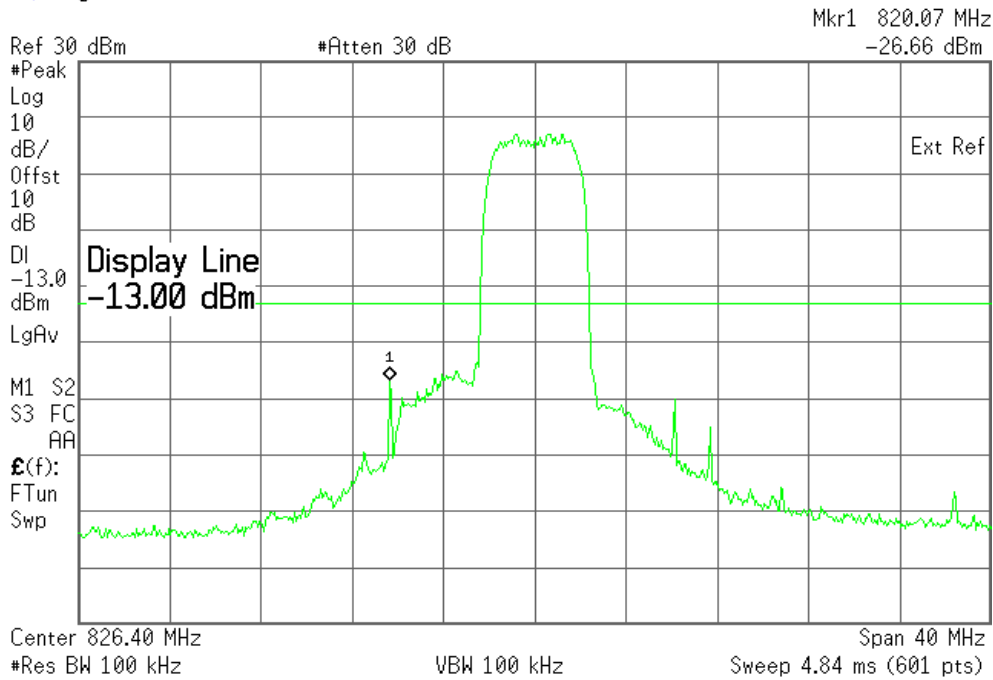


**Plot 6.4.38) Out of Band Emissions at Antenna Terminals**

WCDMA, Low channel, 826.4 MHz, TX signal +/- 20 MHz

\* Agilent 14:33:27 Mar 4, 2008

L



**The strong emission shown in each case is the carrier signal.**

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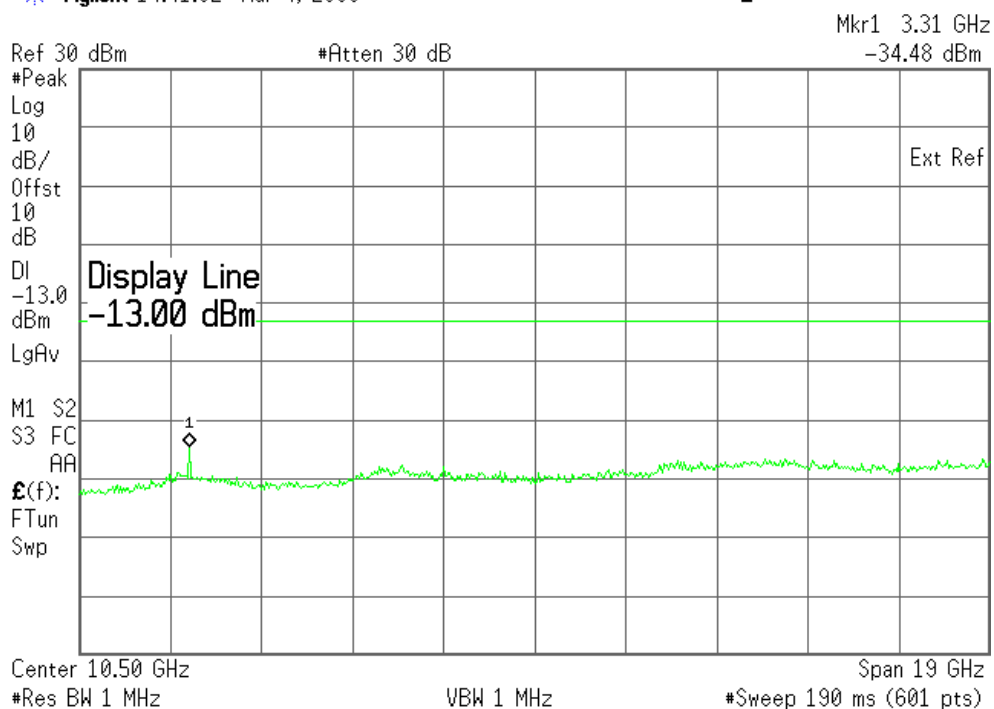
**SIERRA WIRELESS, INC.**

**Plot 6.4.39) Out of Band Emissions at Antenna Terminals**

WCDMA, Low channel, 826.4 MHz, 1 GHz to 20 GHz

Agilent 14:41:02 Mar 4, 2008

L



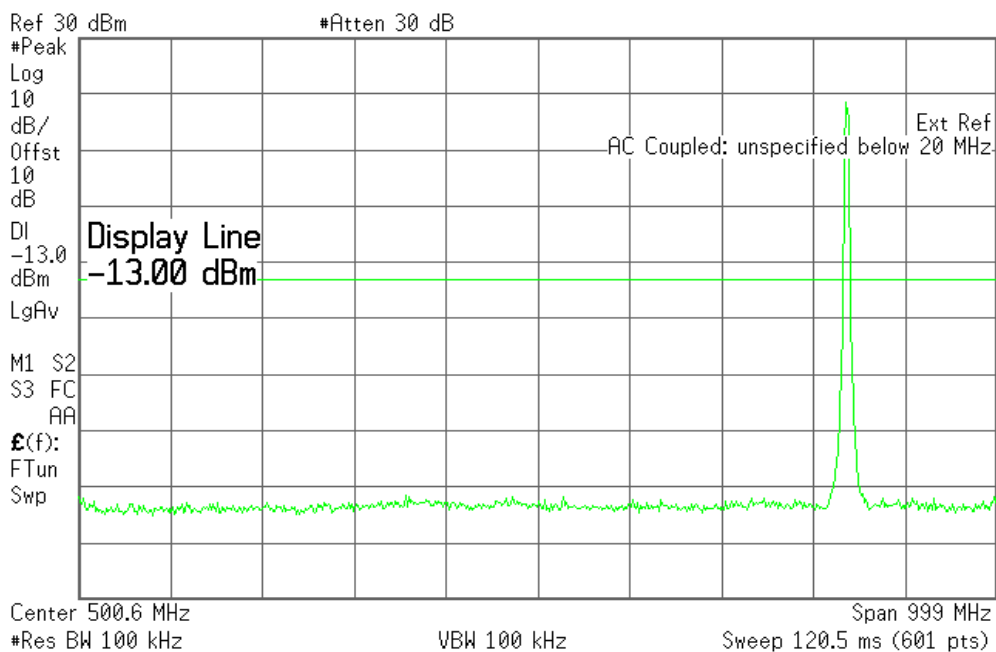
Cellular Harmonics for Ch. 4132 (826.4 MHz)	Level (dBm)
Second	--
Third	--
All others	< -34 dBm up to 20GHz

**SIERRA WIRELESS, INC.**

**Plot 6.4.40) Out of Band Emissions at Antenna Terminals**

WCDMA, Middle channel, 836.4 MHz, 1 MHz to 1 GHz

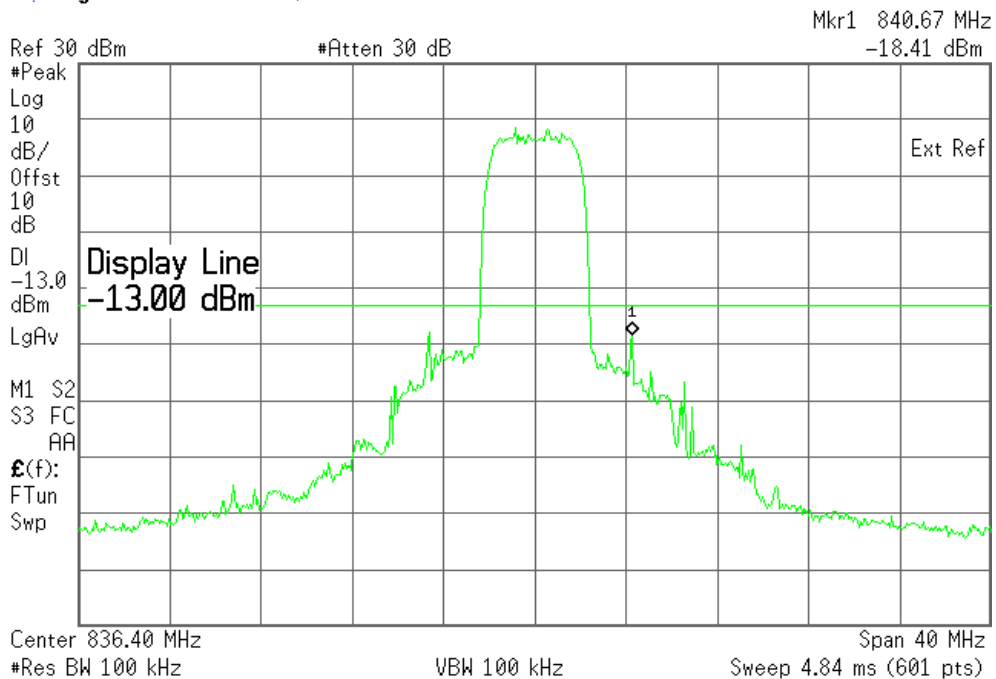
\* Agilent 14:43:41 Mar 4, 2008 L



**Plot 6.4.41) Out of Band Emissions at Antenna Terminals**

WCDMA, Middle channel, 836.4 MHz, TX signal +/- 20 MHz

\* Agilent 14:48:57 Mar 4, 2008 L



**The strong emission shown in each case is the carrier signal.**

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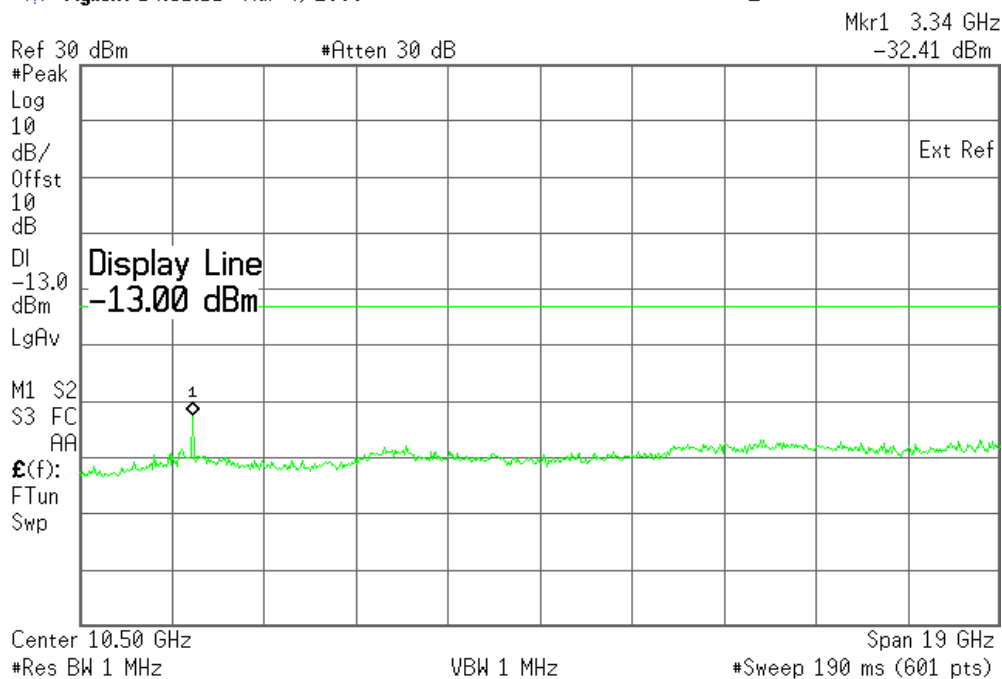
**SIERRA WIRELESS, INC.**

**Plot 6.4.42) Out of Band Emissions at Antenna Terminals**

WCDMA, Middle channel, 836.4 MHz, 1 GHz to 20 GHz

\* Agilent 14:51:11 Mar 4, 2008

L



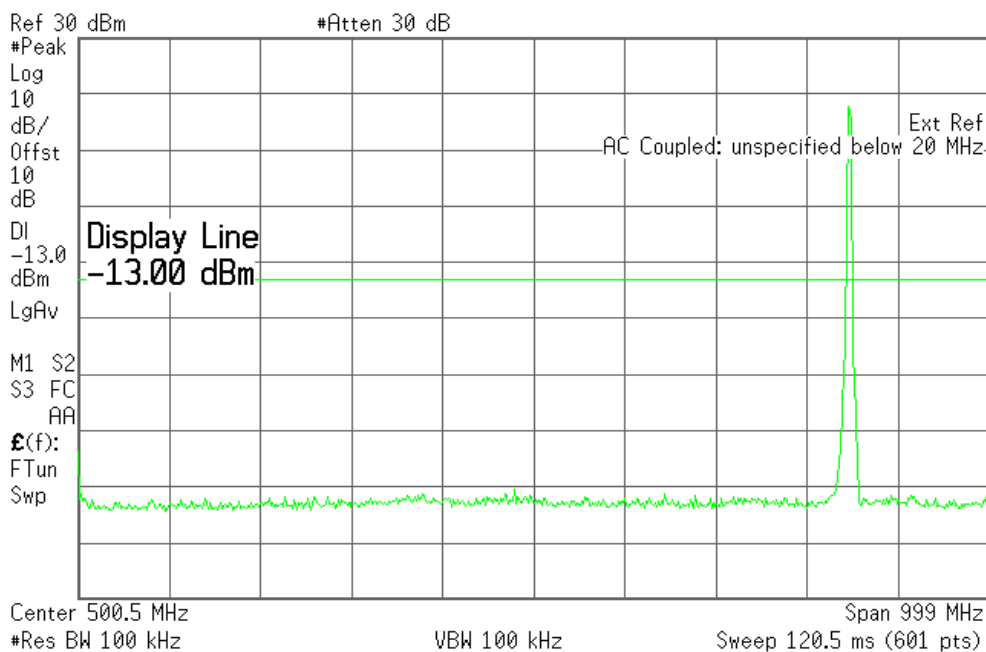
Cellular Harmonics for Ch. 4182 (836.4 MHz)	Level (dBm)
<b>Second</b>	--
<b>Third</b>	--
<b>All others</b>	< -32 dBm up to 20GHz

**SIERRA WIRELESS, INC.**

**Plot 6.4.43) Out of Band Emissions at Antenna Terminals**

WCDMA, High Channel, 846.6 MHz, 1 MHz to 1 GHz

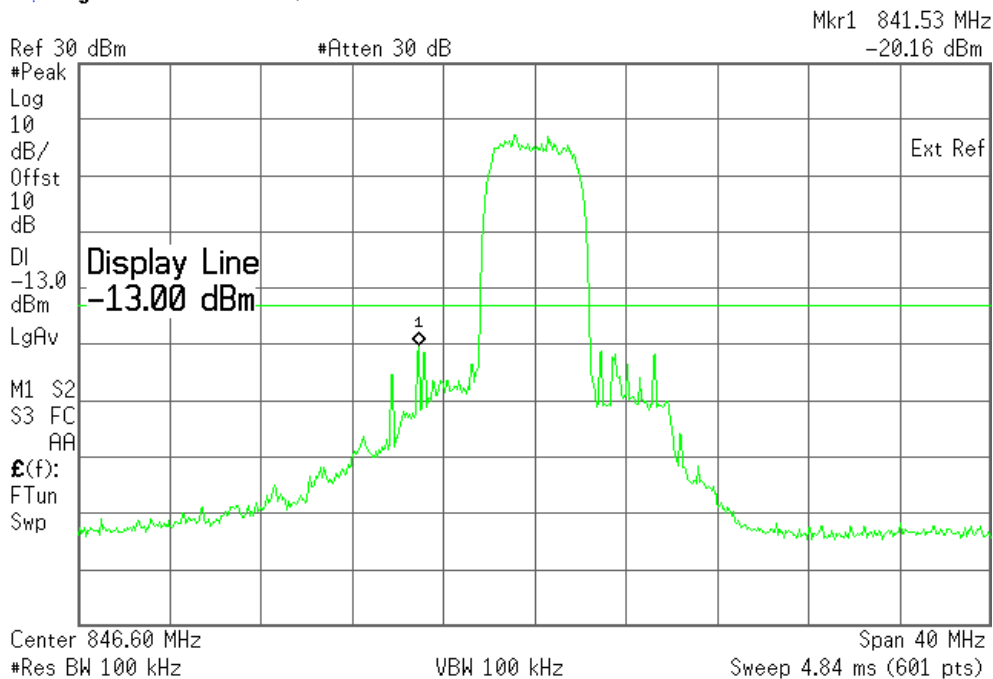
\* Agilent 14:53:30 Mar 4, 2008 L



**Plot 6.4.44) Out of Band Emissions at Antenna Terminals**

WCDMA, High Channel, 846.6 MHz, TX signal +/- 20 MHz

\* Agilent 14:56:11 Mar 4, 2008 L



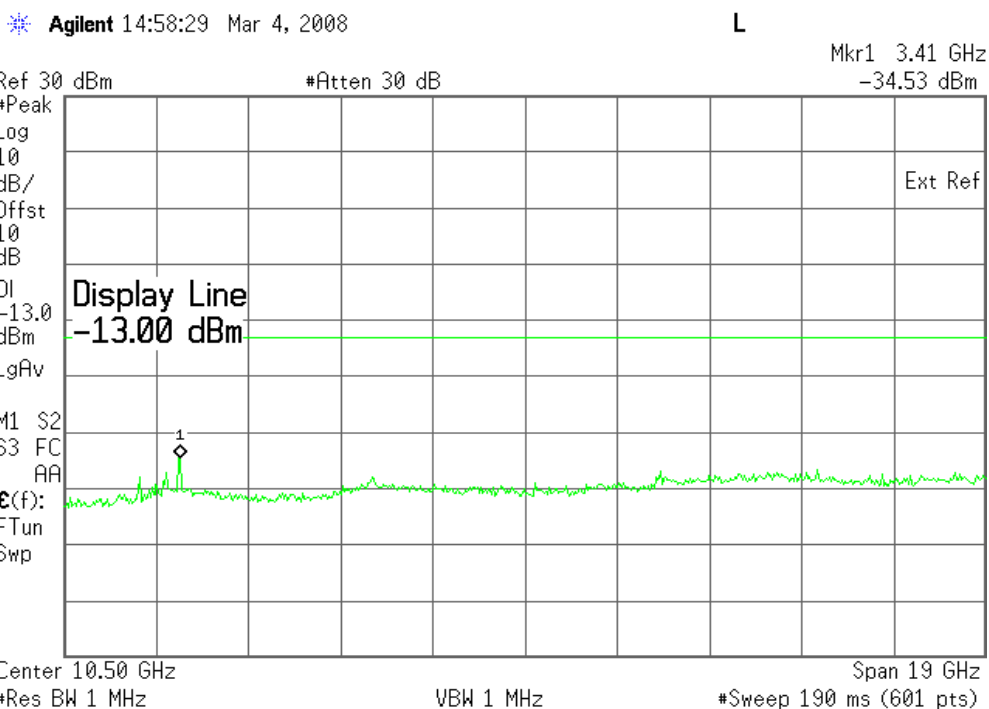
**The strong emission shown in each case is the carrier signal.**

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**SIERRA WIRELESS, INC.**

**Plot 6.4.45) Out of Band Emissions at Antenna Terminals**  
WCDMA, High Channel, 846.6 MHz, 1 GHz to 20 GHz



Cellular Harmonics for Ch. 4233 (846.6 MHz)	Level (dBm)
Second	--
Third	--
All others	< -34 dBm up to 20GHz

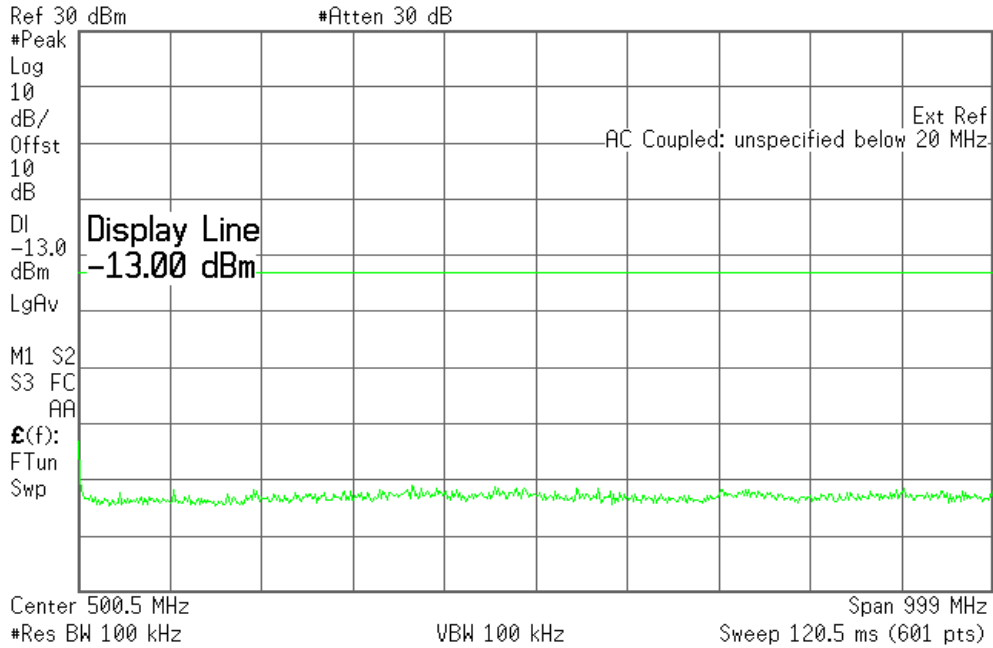
**SIERRA WIRELESS, INC.**

**Plot 6.4.46) Out of Band Emissions at Antenna Terminals**

WCDMA, Low channel, 1852.4 MHz, 1 MHz to 1 GHz

\* Agilent 15:48:21 Mar 4, 2008

L

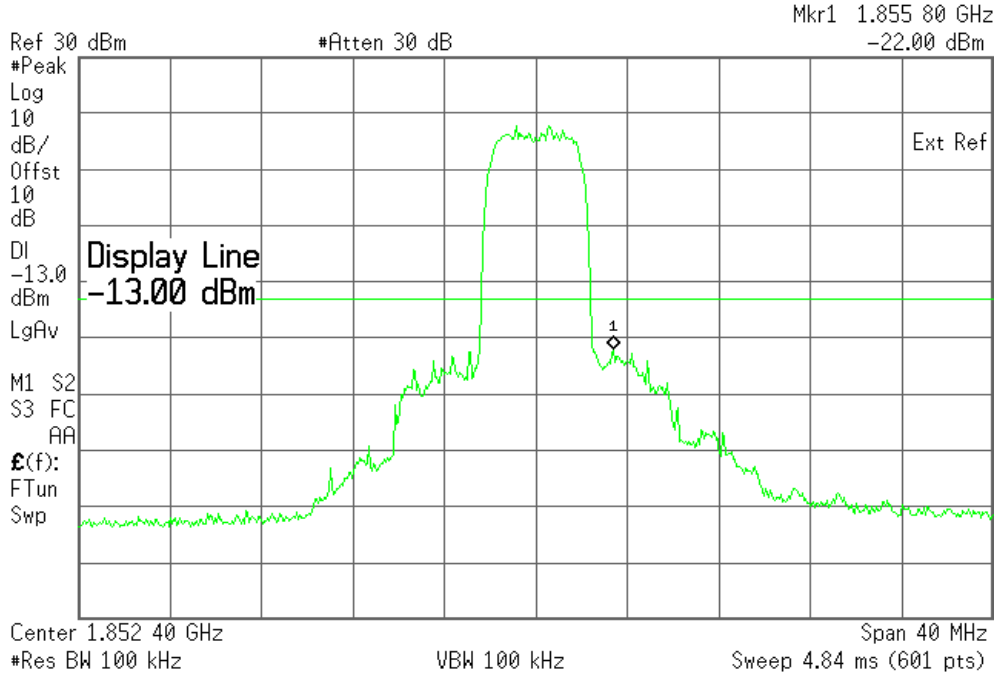


**Plot 6.4.47) Out of Band Emissions at Antenna Terminals**

WCDMA, Low channel, 1852.4 MHz, TX signal +/- 20 MHz

\* Agilent 15:50:36 Mar 4, 2008

L



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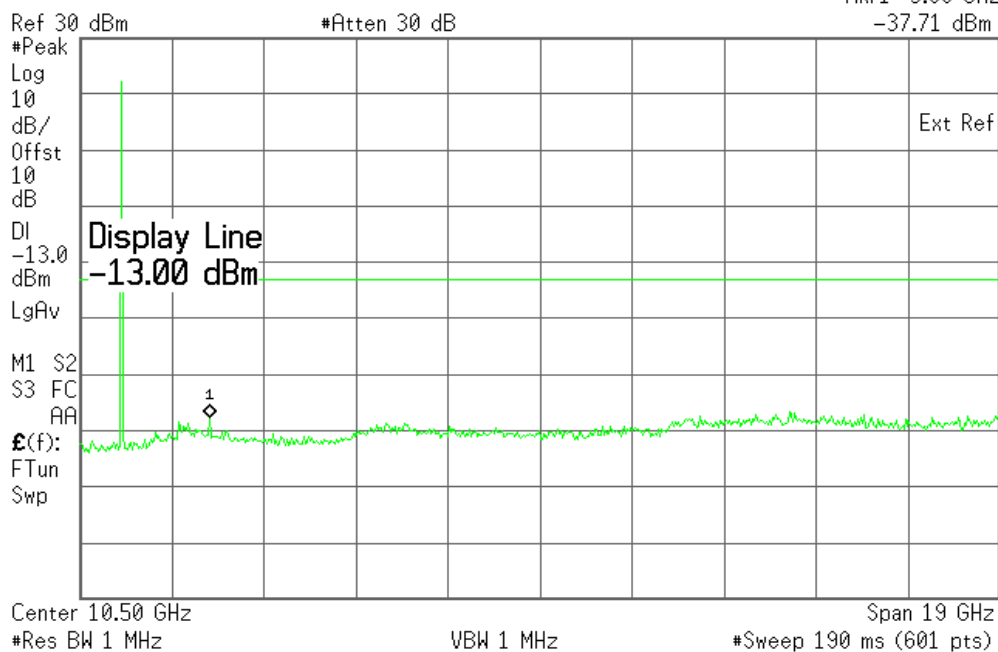
**Plot 6.4.48) Out of Band Emissions at Antenna Terminals**

WCDMA, Low channel, 1852.4 MHz, 1 GHz to 20 GHz

Agilent 15:52:51 Mar 4, 2008

L

Mkr1 3.69 GHz  
-37.71 dBm



The strong emission shown is the carrier signal.

PCS Harmonics for Ch. 9262 (1852.4 MHz)	Level (dBm)
Second	- 37.71 dBm
Third	--
All others	< -35 dBm up to 20GHz

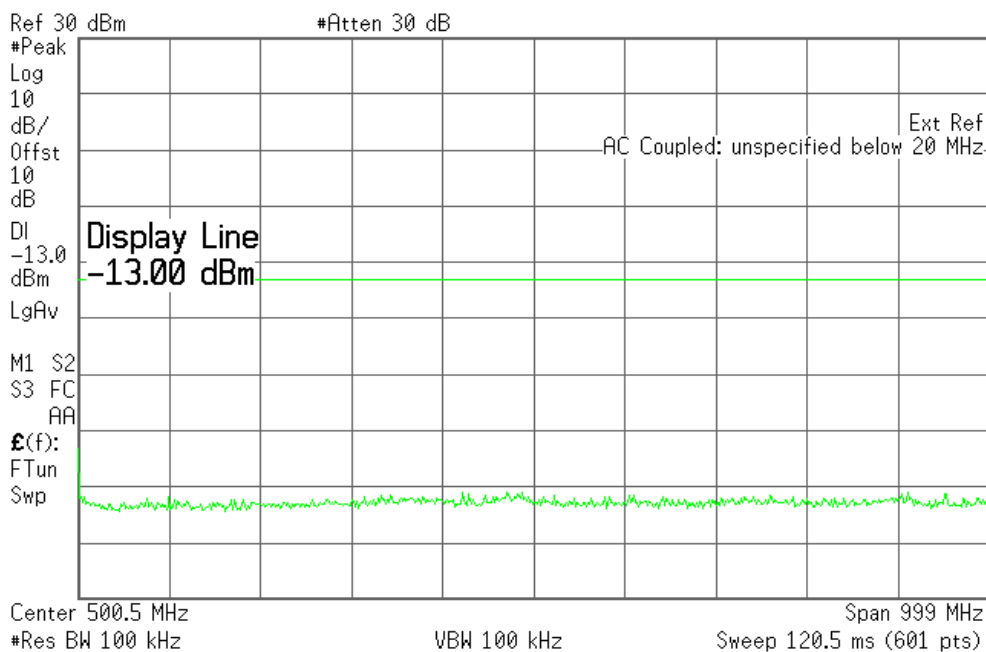
**SIERRA WIRELESS, INC.**

**Plot 6.4.49) Out of Band Emissions at Antenna Terminals**

WCDMA, Middle channel, 1880 MHz, 1 MHz to 1 GHz

\* Agilent 16:02:40 Mar 4, 2008

L



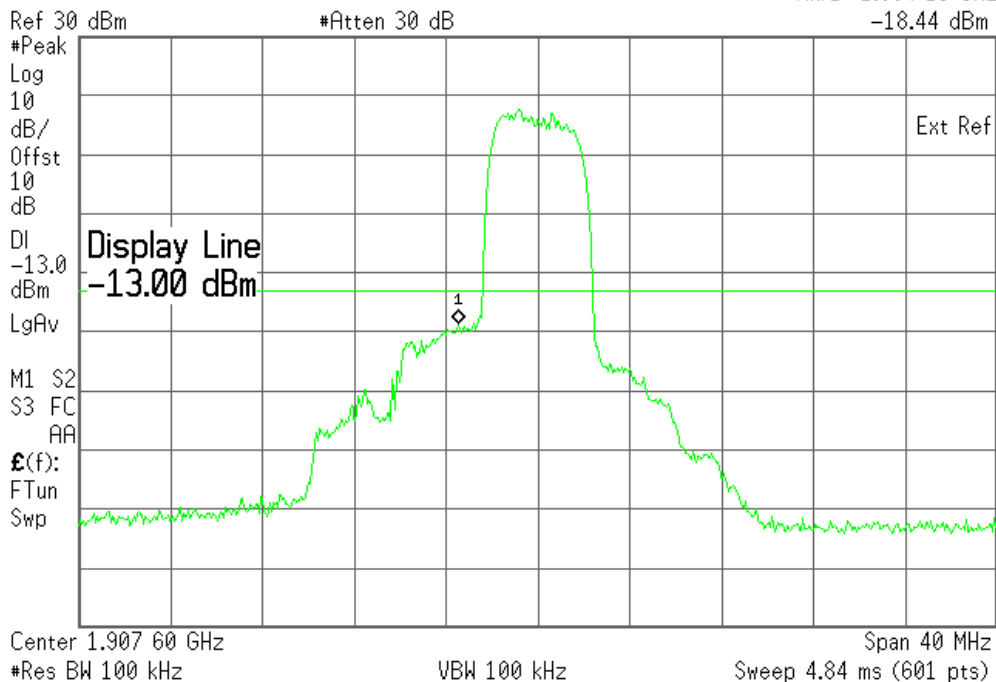
**Plot 6.4.50) Out of Band Emissions at Antenna Terminals**

WCDMA, Middle channel, 1880 MHz, TX signal +/- 20 MHz

\* Agilent 16:07:21 Mar 4, 2008

L

Mkr1 1.904 13 GHz  
-18.44 dBm



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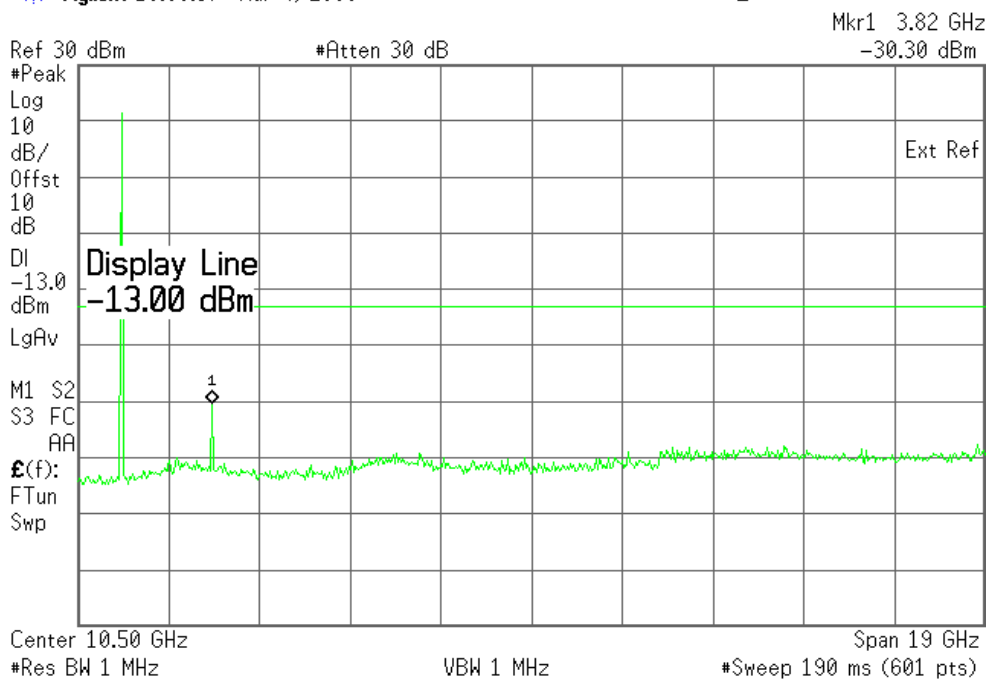
**SIERRA WIRELESS, INC.**

**Plot 6.4.51) Out of Band Emissions at Antenna Terminals**

WCDMA, Middle channel, 1880 MHz, 1 GHz to 20 GHz

Agilent 16:09:37 Mar 4, 2008

L



**The strong emission shown is the carrier signal.**

PCS Harmonics for Ch. 9400 (1880.0 MHz)	Level (dBm)
Second	- 30.30 dBm
Third	--
All others	< -35 dBm up to 20GHz

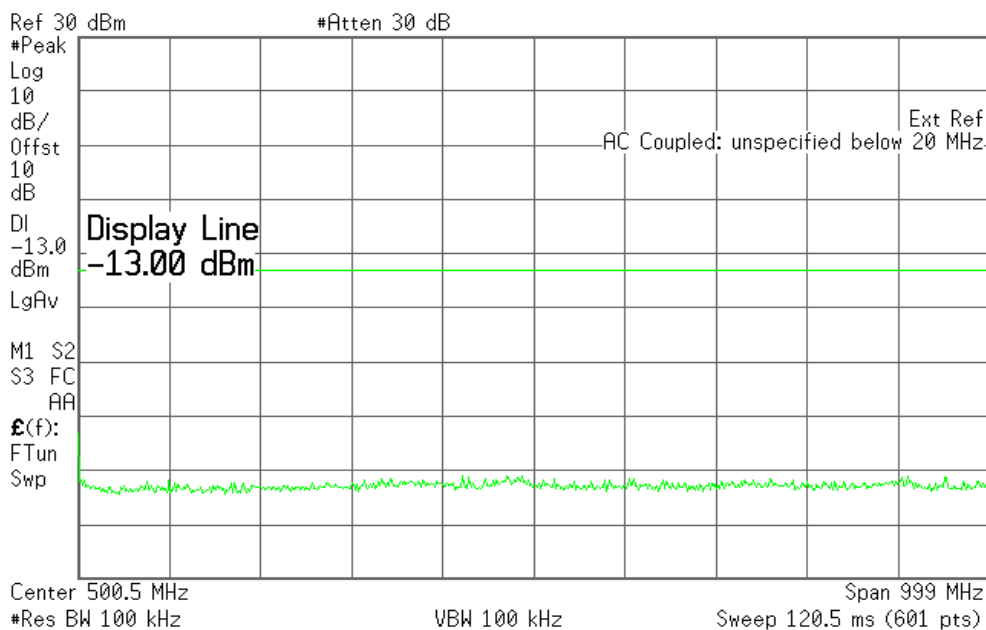
**SIERRA WIRELESS, INC.**

**Plot 6.4.52) Out of Band Emissions at Antenna Terminals**

WCDMA, High channel, 1907.6 MHz, 1 MHz to 1 GHz

Agilent 16:02:40 Mar 4, 2008

L

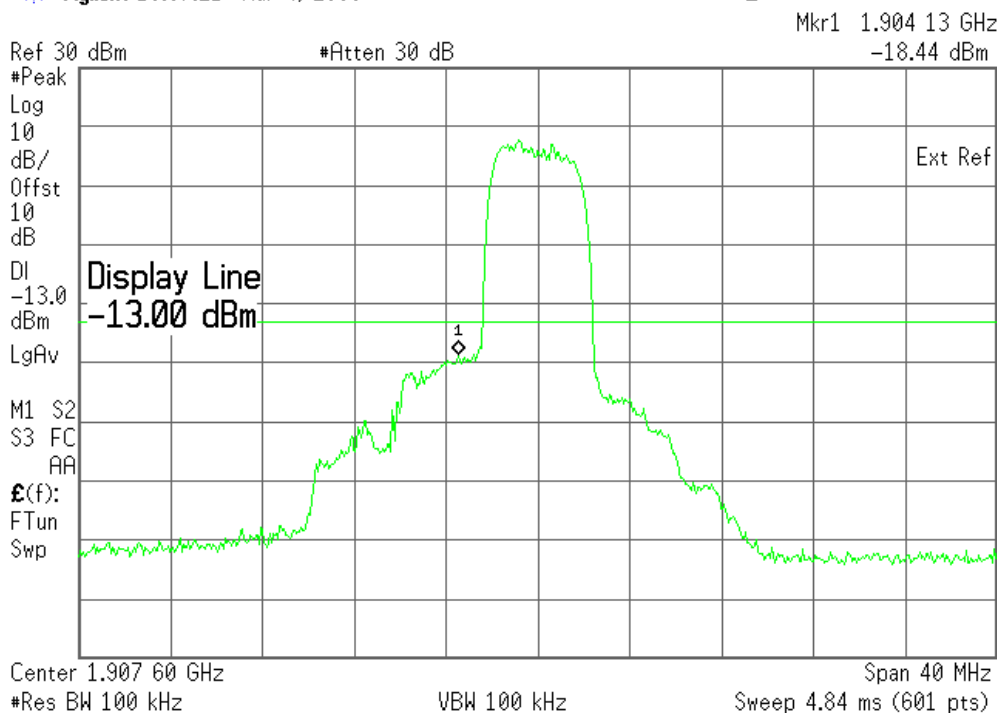


**Plot 6.4.53) Out of Band Emissions at Antenna Terminals**

WCDMA, High channel, 1907.6 MHz, TX signal +/- 20 MHz

Agilent 16:07:21 Mar 4, 2008

L



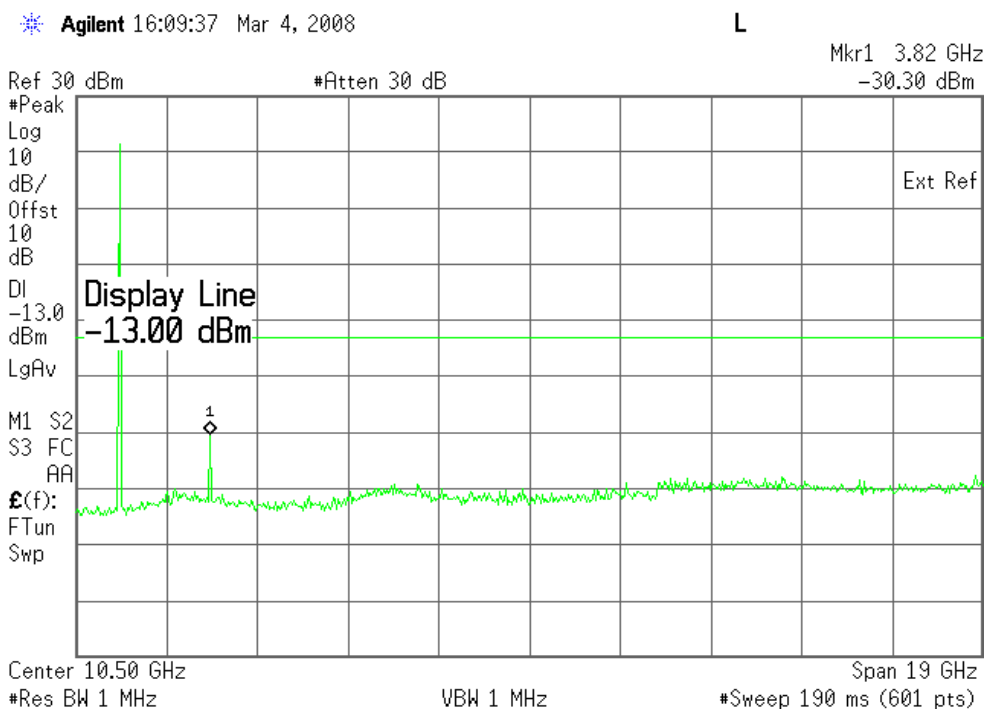
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**SIERRA WIRELESS, INC.**

**Plot 6.4.54) Out of Band Emissions at Antenna Terminals**

WCDMA, High channel, 1907.6 MHz, 1 GHz to 20 GHz



**The strong emission shown is the carrier signal.**

PCS Harmonics for Ch. 9538 (1907.6 MHz)	Level (dBm)
Second	- 30.30 dBm
Third	--
All others	< -35 dBm up to 20GHz

# SIERRA WIRELESS, INC.

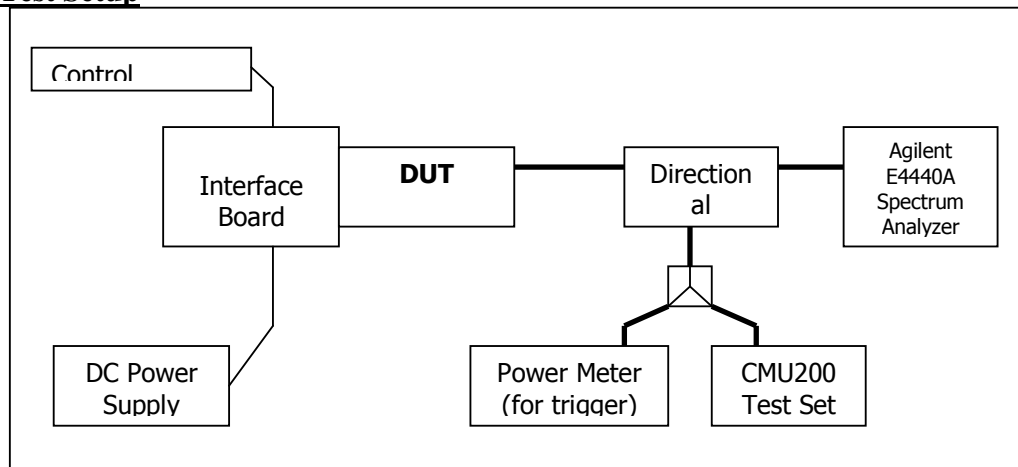
## 7 Block Edge Compliance

FCC Part 22H/24E

### 7.1 Test Procedure

The transmitter output was connected to a Rohde & Schwarz CMU200 Test Set and configured to operate at maximum power. The block edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

#### Test Setup



### 7.2 Test Equipment

#### Instrument List

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	111682	November 18, 2008
Spectrum Analyzer	Agilent	PSA E4440A	US41421268	March 11, 2008
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	Minnow	N/A	N/A
Directional Coupler	Mini-Circuits	ZA3PD-2	N/A	N/A

### 7.3 Test Results

Block Test	Frequency Boundaries (MHz)	Channels Tested	Corresponding Plots	Result
1	GMSK: Below 824 MHz, above 849 MHz	128, 251	7.4.1, 7.4.2	Complies
2	8PSK: Below 824 MHz, above 849 MHz	128, 251	7.4.3, 7.4.4	Complies
3	GMSK: Below 1850MHz, above 1910MHz	512, 810	7.4.5, 7.4.6	Complies
4	8PSK: Below 1850MHz, above 1910MHz	512, 810	7.4.7, 7.4.8	Complies
Block Test	Frequency Boundaries (MHz)	Channels Tested	Corresponding Plots	Result
1	WCDMA: Below 824MHz, above 849MHz	4132, 4233	7.4.9, 7.4.10	Complies
2	WCDMA: Below 1850MHz, above 1910MHz	9262, 9538	7.4.11, 7.4.12	Complies

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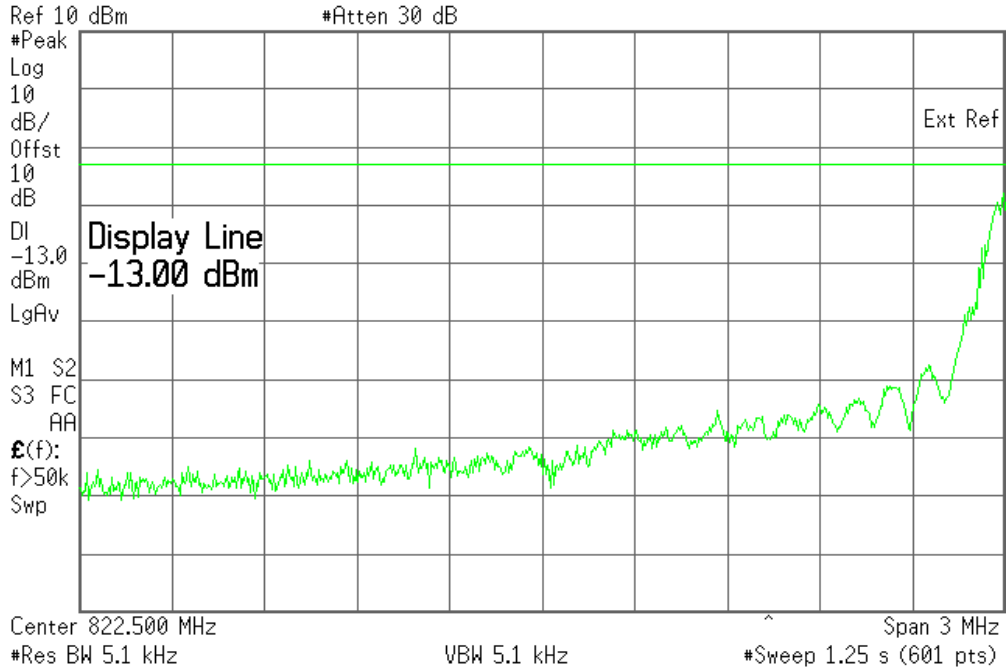
# SIERRA WIRELESS, INC.

## 7.4 Test Plots

### Plot 7.4.1) GSMK; Cellular low channel, below 824 MHz

Agilent 16:43:13 Mar 4, 2008

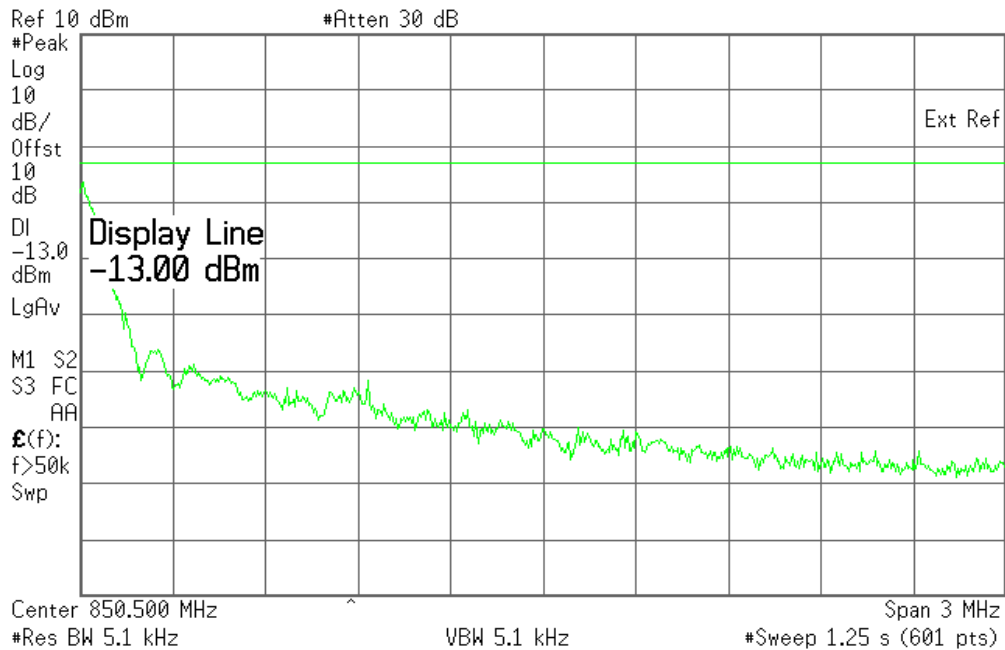
L



### Plot 7.4.2) GSMK; Cellular high channel, above 849 MHz

Agilent 16:45:52 Mar 4, 2008

L



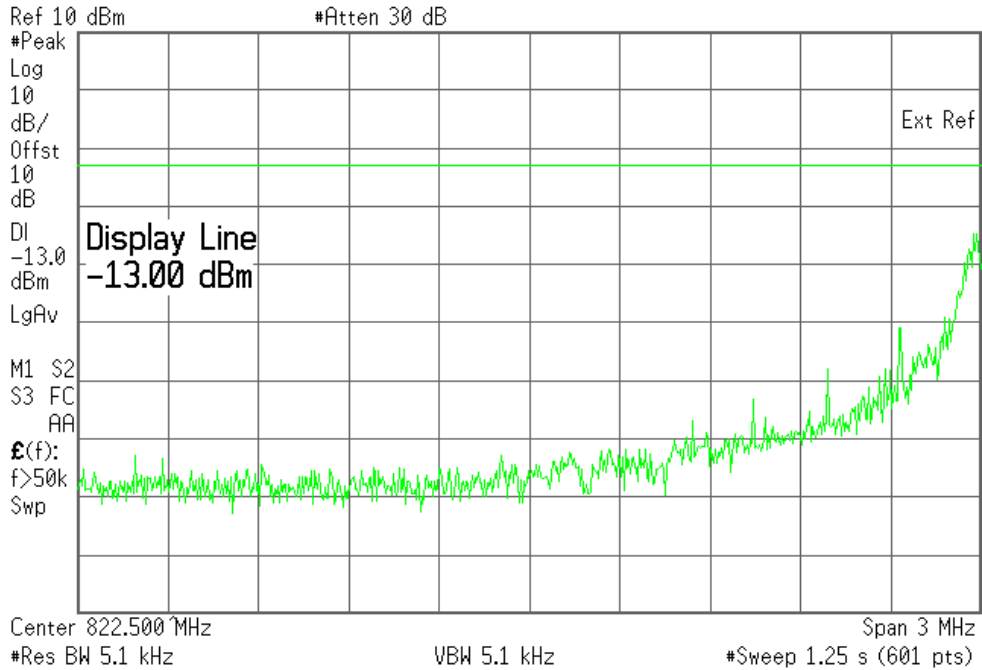
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**SIERRA WIRELESS, INC.**

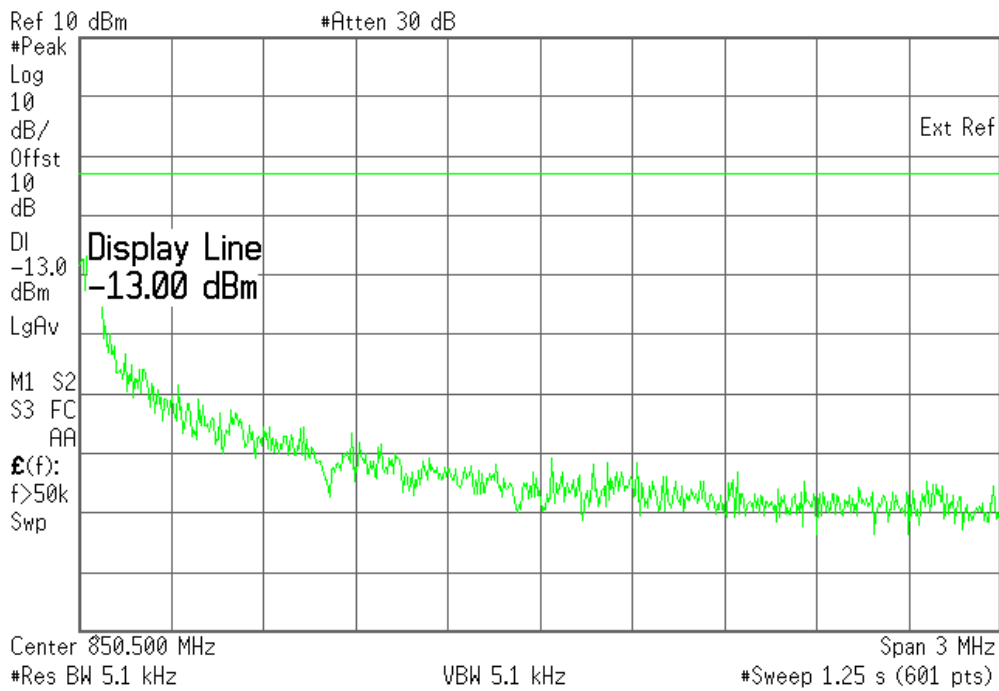
**Plot 7.4.3) 8-PSK; Cellular low channel, below 824 MHz**

Agilent 16:47:38 Mar 4, 2008 L



**Plot 7.4.4) 8-PSK; Cellular high channel, above 849 MHz**

Agilent 16:50:12 Mar 4, 2008 L



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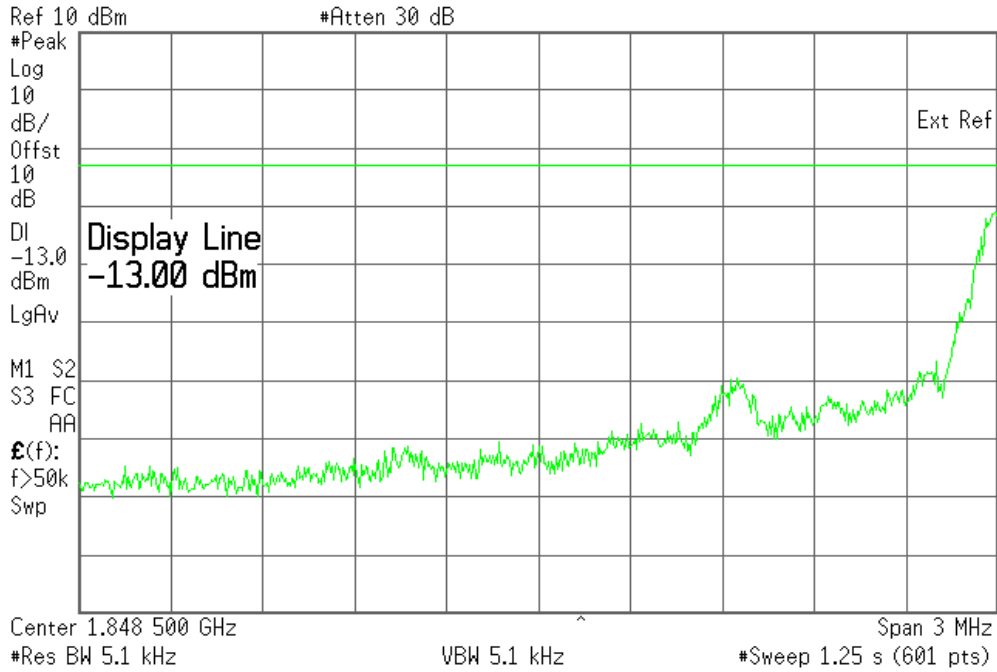
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SIERRA WIRELESS, INC.

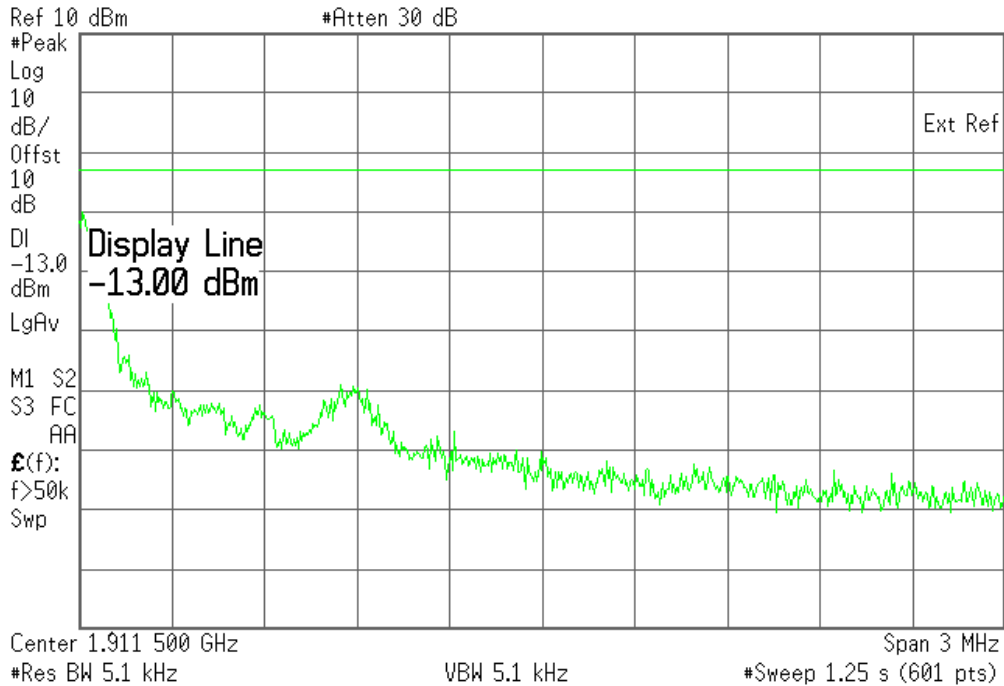
Plot 7.4.5) GMSK; PCS low channel, below 1850 MHz

Agilent 16:52:31 Mar 4, 2008 L



Plot 7.4.6) GMSK; PCS high channel, above 1910 MHz

Agilent 16:54:32 Mar 4, 2008 L



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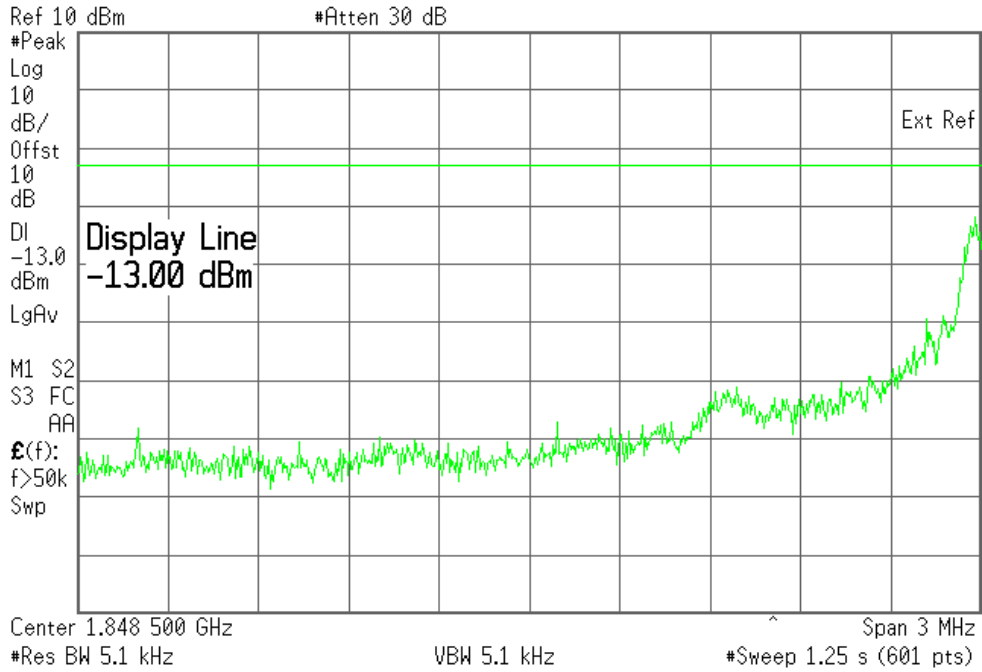
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# SIERRA WIRELESS, INC.

## Plot 7.4.7) 8-PSK; PCS low channel, below 1850 MHz

Agilent 16:56:24 Mar 4, 2008

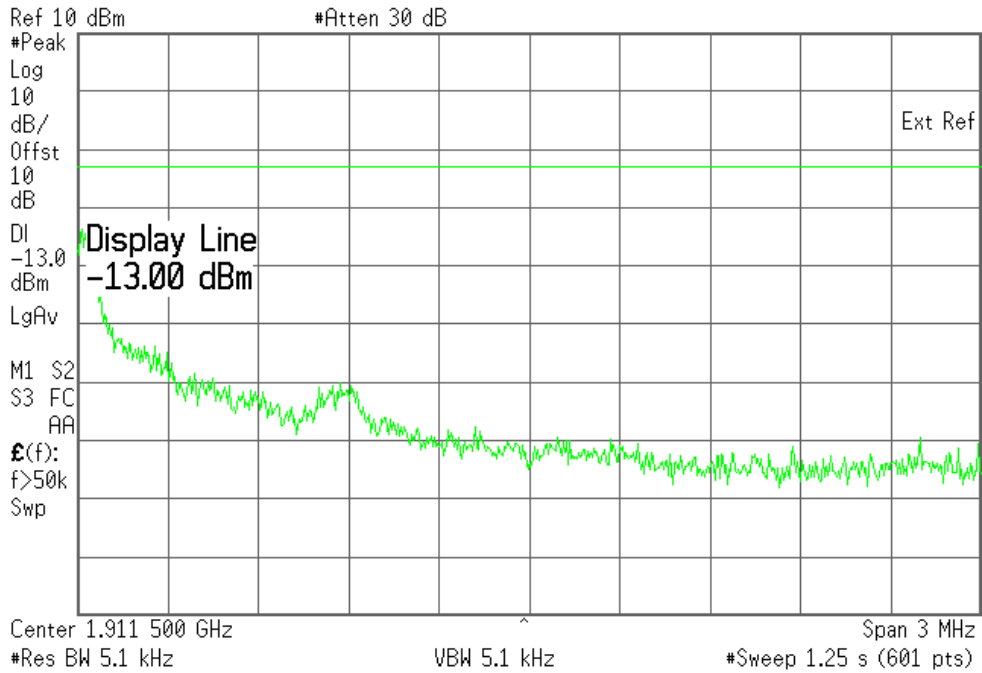
L



## Plot 7.4.8) 8-PSK; PCS high channel, above 1910 MHz

Agilent 16:58:02 Mar 4, 2008

L



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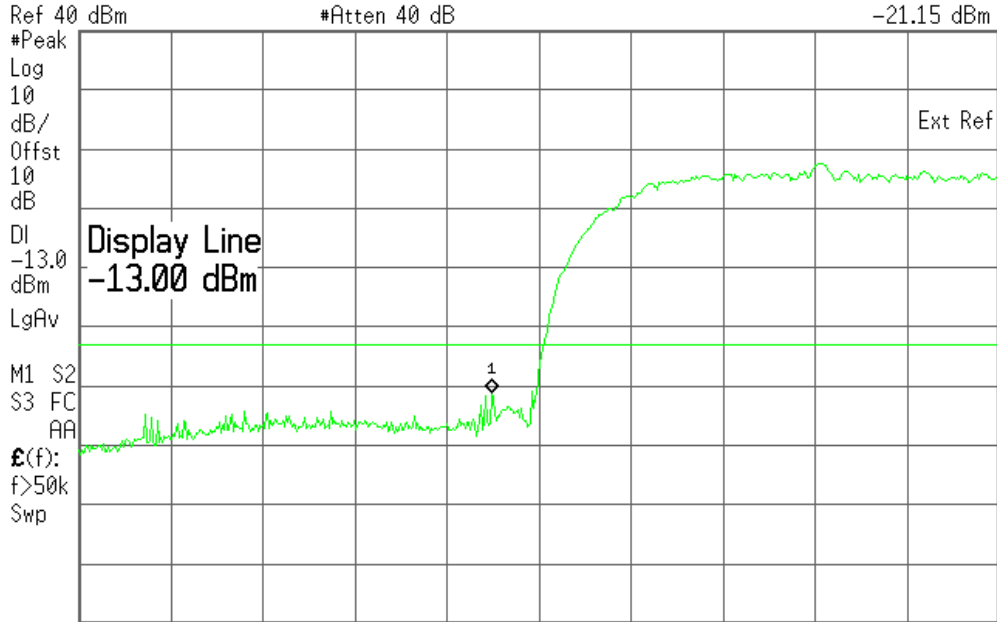
SIERRA WIRELESS, INC.

Plot 7.4.9) WCDMA; Cellular low channel, below 824 MHz

Agilent 17:05:10 Mar 4, 2008

L

Mkr1 823.742 MHz  
-21.15 dBm



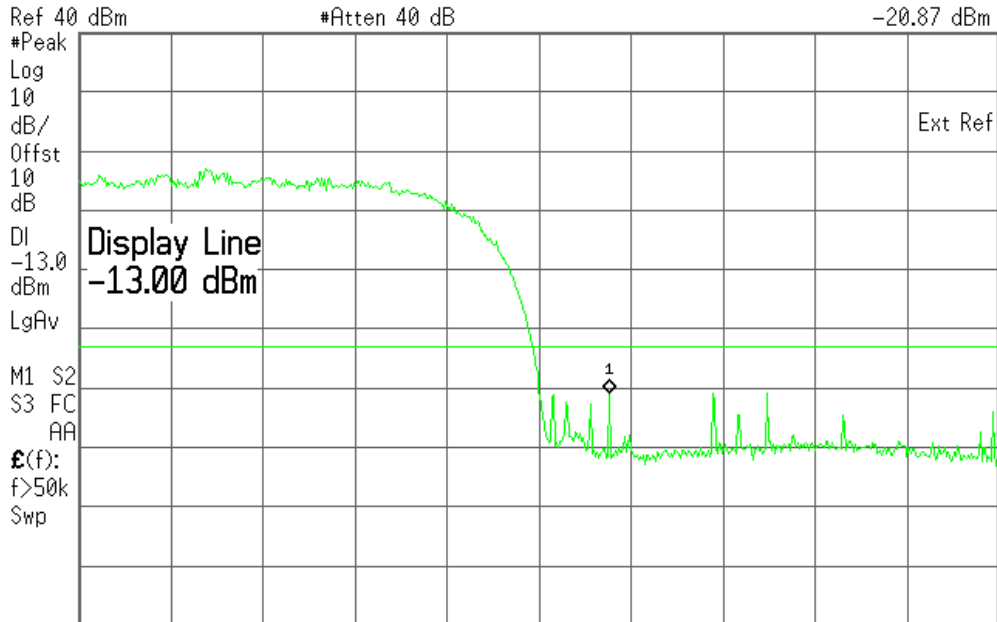
Center 824.000 MHz Span 5 MHz  
#Res BW 100 kHz VBW 100 kHz #Sweep 9.6 ms (601 pts)

Plot 7.4.10) WCDMA; Cellular high channel, above 849 MHz

Agilent 17:07:27 Mar 4, 2008

L

Mkr1 849.383 MHz  
-20.87 dBm



Center 849.000 MHz Span 5 MHz  
#Res BW 100 kHz VBW 100 kHz #Sweep 9.6 ms (601 pts)

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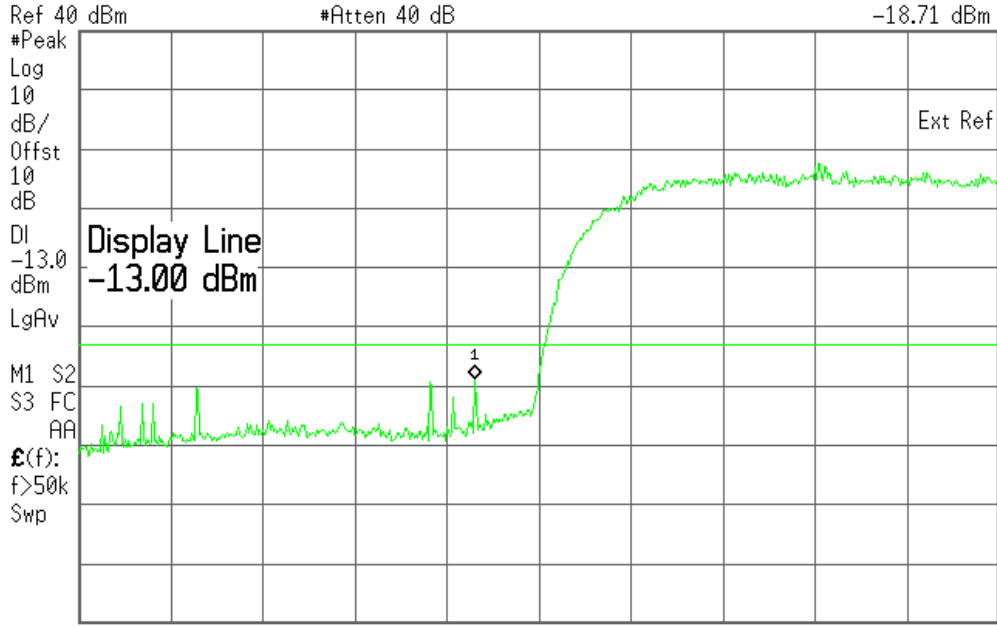
**SIERRA WIRELESS, INC.**

**Plot 7.4.11) WCDMA; PCS low channel, below 1850 MHz**

Agilent 17:11:39 Mar 4, 2008

L

Mkr1 1.849 650 GHz  
-18.71 dBm

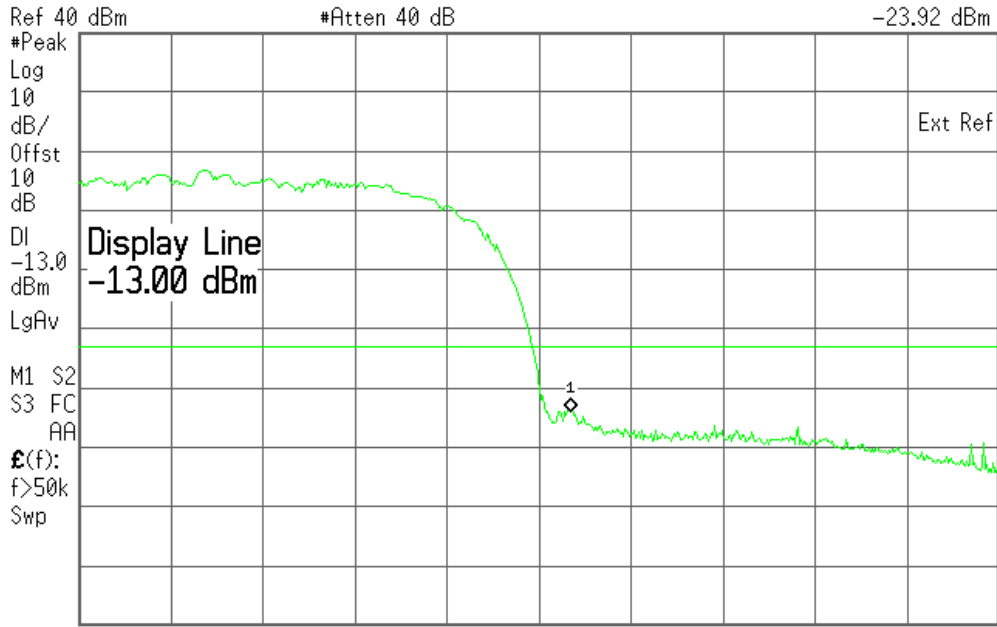


**Plot 7.4.12) WCDMA; PCS high channel, above 1910 MHz**

Agilent 17:14:08 Mar 4, 2008

L

Mkr1 1.910 175 GHz  
-23.92 dBm



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## 8 Frequency Stability Versus Temperature

FCC 2.1055, FCC 22.355, FCC 24.235

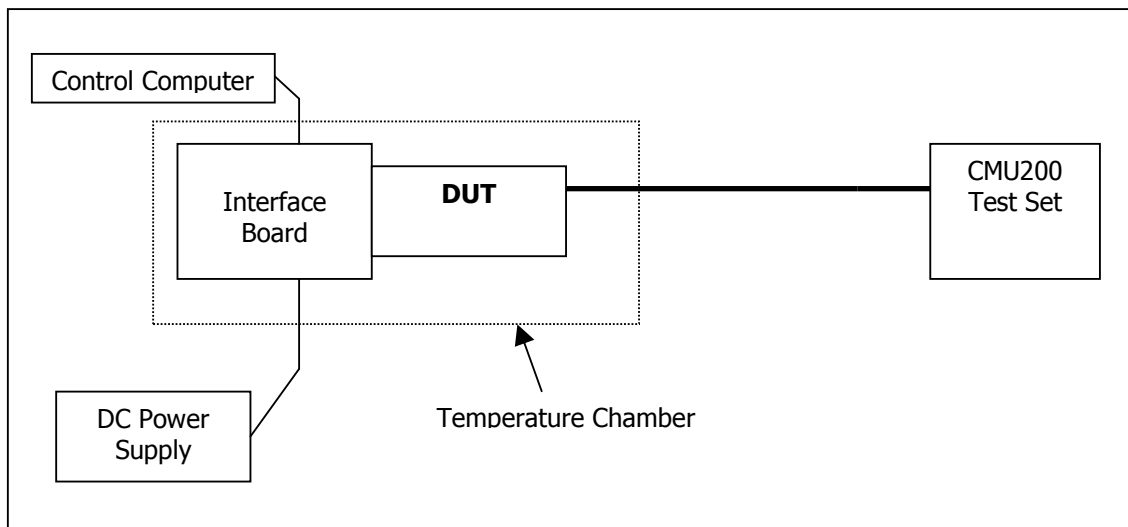
### 8.1 Summary of Results

The MC8785V Frequency Stability versus temperature meets the requirements of less than 2.5ppm when temperature varies from -30°C to +50°C.

### 8.2 Test Procedure

The MC8785V was placed inside a temperature chamber. The temperature is set to -30°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, then the measurement is repeated. This is repeated until +50°C is reached. Frequency metering included internal averaging of the CMU200 to stabilize the reading. Reference power supply voltage for these tests is 5.0 volts.

### Test Setup



### 8.3 Test Equipment

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	111682	November 18, 2008
Spectrum Analyzer	Agilent	PSA E4440A	US41421268	March 11, 2008
DC Power Supply	HP	6632A	3530A	N/A
Interface Board	Shop built	Minnow	N/A	N/A
Directional Coupler	Mini-Circuits	ZA3PD-2	N/A	N/A

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### 8.4 Test Results

#### Frequency Error Over Temperature

Temp (°C)	Cellular Band: 824MHz to 848MHz		PCS Band: 1850MHz to 1910MHz	
	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)
-30	-44	-0.0534	-56	-0.0305
-20	-46	-0.0559	-69	-0.0374
-10	-42	-0.0508	-73	-0.0396
0	-38	-0.0462	-70	-0.0379
10	-31	-0.0370	-66	-0.0358
20	-34	-0.0416	-53	-0.0288
30	-26	-0.0319	-57	-0.0306
40	-31	-0.0379	-64	-0.0347
50	-34	-0.0418	-58	-0.0312

## 9 Frequency Stability Versus Voltage

FCC 2.1055, FCC 22.355, FCC 24.235

### 9.1 Summary of Results

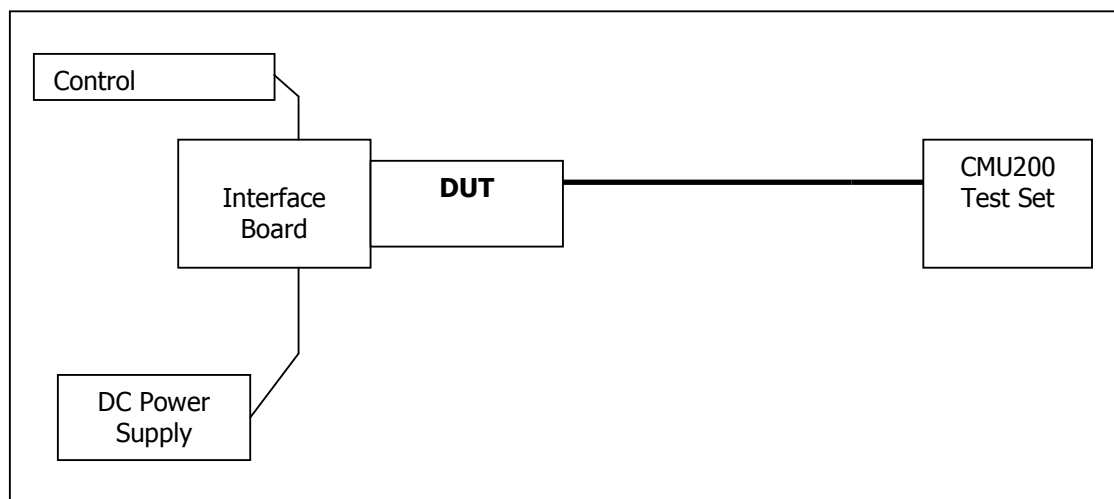
The EUT is specified to operate with a supply voltage of between 4.2VDC and 5.8VDC with a nominal voltage of 5.0 VDC. It meets the frequency stability limit of less than 2.5ppm when supply voltage varies within the specified limits. Operation above or below these voltage limits is prohibited by firmware in order to prevent improper operation.

### 9.2 Test Procedure

The MC8785V was connected to a DC Power Supply and a UMTS test set (CMU 200) with frequency error measurement capability. The power supply output is adjusted to the test voltage as measured at the input terminals to the module while transmitting. A voltmeter was used to confirm the terminal voltage. The peak frequency error is recorded (worst case). The test voltages are 4.2 volts to 5.8 volts.

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### Test Setup



### 9.3 Test Equipment

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DATE
Control Computer	TC	Generic PC	100488	N/A
Wireless Test Set	Rohde & Schwarz	CMU200	111682	November 18, 2008
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Interface Board	Shop built	Minnow	N/A	N/A
Directional Coupler	Mini-Circuits	ZA3PD-2	N/A	N/A

### 9.4 Test Results

#### Frequency Error Over Voltage

Voltage (V)	Cellular Band: 824MHz to 848MHz		PCS Band: 1850MHz to 1910MHz	
	Offset (Hz)	Offset (ppm)	Offset (Hz)	Offset (ppm)
4.2	-32	-0.0387	-47	-0.0254
5.0	-35	-0.0427	-45	-0.0242
5.8	-28	-0.0342	-55	-0.0300

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