



**FCC CFR47 PART 22 SUBPART H  
AND PART 24 SUBPART E  
CLASS II PERMISSIVE CHANGE  
CERTIFICATION TEST REPORT**

**FOR**

**850/900/1800/1900/2100 MHZ MULTI-BAND MODULE**

**MODEL NUMBER: MC8775**

**FCC ID: N7NMC8775-L**

**REPORT NUMBER: 07U10899-1**

**ISSUE DATE: MARCH 15, 2007**

*Prepared for*  
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Revision History

Rev.	Issue Date	Revisions	Revised By
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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SIERRA WIRELESS  
13811 WIRELESS WAY  
RICHMOND, BC V6V 3A4, CANADA

**EUT DESCRIPTION:** 850/900/1800/1900/2100 MHZ MULTI-BAND MODULE

**MODEL:** MC8775

**SERIAL NUMBER:** LV-01418

**DATE TESTED:** FEBRUARY 26-28, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22 SUBPART H	NO NON-COMPLIANCE NOTED
FCC PART 24 SUBPART E	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:



THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

Tested By:



YU-CHIEN HO  
EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603C (2004), ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and FCC CFR 47 Part 22H and 24E.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is an 850/900/1800/1900/2100 MHz multi-band module installed in a Lenovo ThinkPad X61 series laptop and manufactured by Sierra Wireless, Inc.

The module supports GSM, GPRS, EGPRS and WCDMA, WCDMA+HSPDA. Device capabilities are documented in the theory of operation

Only the 850/1900 MHz frequency bands were investigated under this project, and the test result documented in this report only applies to EUT operating in the 850/1900 MHz frequency bands. This device contains 900 MHz /1800 MHz/2100 MHz functions but these frequency bands are not operational in the U.S. territories.

### 5.2. CLASS II PERMISSIVE CHANGE DESCRIPTION

Add 1 ThinkPad X61 series.

### 5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power and ERP as follows:

#### Part 22 (824 - 849MHz) & Part 24 (1850 - 1910MHz) Authorized Band:

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
824.2 - 848.75	GPRS	29.00	794.33
824.2 - 848.75	EGPRS	26.60	457.09
826.5 - 846.6	WCDMA	23.60	229.09
826.5 - 846.6	WCDMA+HSPDA	25.00	316.23

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
1850.25 - 1909.8	GPRS	26.10	407.38
1850.25 - 1909.8	EGPRS	22.00	158.49
1852.4 - 1907.6	WCDMA	27.60	575.44
1852.4 - 1907.6	WCDMA+HSPDA	29.50	891.25

## 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a rod antenna with a maximum gain of 0.08dBi for Cell band and 1.15dBi for PCS band when antenna is Pull-up. However, the maximum gain of the antenna is -5.82dBi for Cell band and -3.44dBi for PCS band when rod antenna is retracted.

## 5.5. SOFTWARE AND FIRMWARE

The test utility software used during testing was ProcommPlus 4.8 @ Copyright 1999 by Symantec Corporation, Build 71 for GSM and EDGE modulations, and the communication test set is used for WCDMA modulation to configure as below:

The following settings were used to configure the Wireless Communications Test Set, Agilent 8960 Series 10, E5515C.

### **Instrument information:** (by press SYSTEM CONFIG)

Application: WCDMA Lap App C  
E6703C C.03.11  
Format: WCDMA

### **Call Control:** (by press CALL SETUP)

2 of 4 Cell Parameters: PS Domain Information > Present  
ATT (IMSI Attach) Flag State > Set  
4 of 4 Security Info: Security Parameter - System Operations > None

### **Call Params:** (by press CALL SETUP)

1 of 3  
Channel Type: 12.2k RMC  
Paging Service: RB Test Mode

### **HSDPA Parameters:**

1 of 2  
HSDPA RB Test Mode Setup  
FRC Type > H-Set 5 QPSK  
CN Domain > PS Domain  
Uplink 64k DTCH for HSDPA Loopback State > On  
HS-DSCH Data Pattern > CCITT PRBS15  
RLC Header on HS-DSCH > Present

Channel (UARFCN) Params: DL Channel: 4357 / 4407 / 4458  
UL Channel: 4132 / 4182 / 4233  
UL Sep (Band) > 400MHz (Band 4)  
Freq Bnad Ind > On

2 of 3  
DL DTCH Data: ALL ONES  
RLC Reestablish: Off  
Call Limit State: Off  
Call Drop Timer: Off  
SRB Config.: 13.6k DCCH  
3 of 3  
UE Target Power: -5 dBm

UL CL Pwr CtrlParms: Active bits (Select "All Up bits" after linked to get maximum power)

DL Channel: 9662 / 9800 / 9938 / 4357 / 4407 / 4458

UL Channel: 9262 / 9400 / 9538 / 4132 / 4182 / 4233

## 5.6. WORST-CASE CONFIGURATION AND MODE

Based on the above results from the different modulations, GSM850, GPRS, and WCDMA+HSPDA are the worst-case scenario for all measurements.

The worst-case channel is determined with the highest output power. The highest measured output power was at low channel for both GSM cell band GSM PCS band. For WCDMA+HSPDA modulation, the highest power was at high channel for cell band and low channel for PCS band.

For the worst case position, EUT with rod antenna Pull-up position is determined to be the worst case for the Cell and PCS band.

## 5.7. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

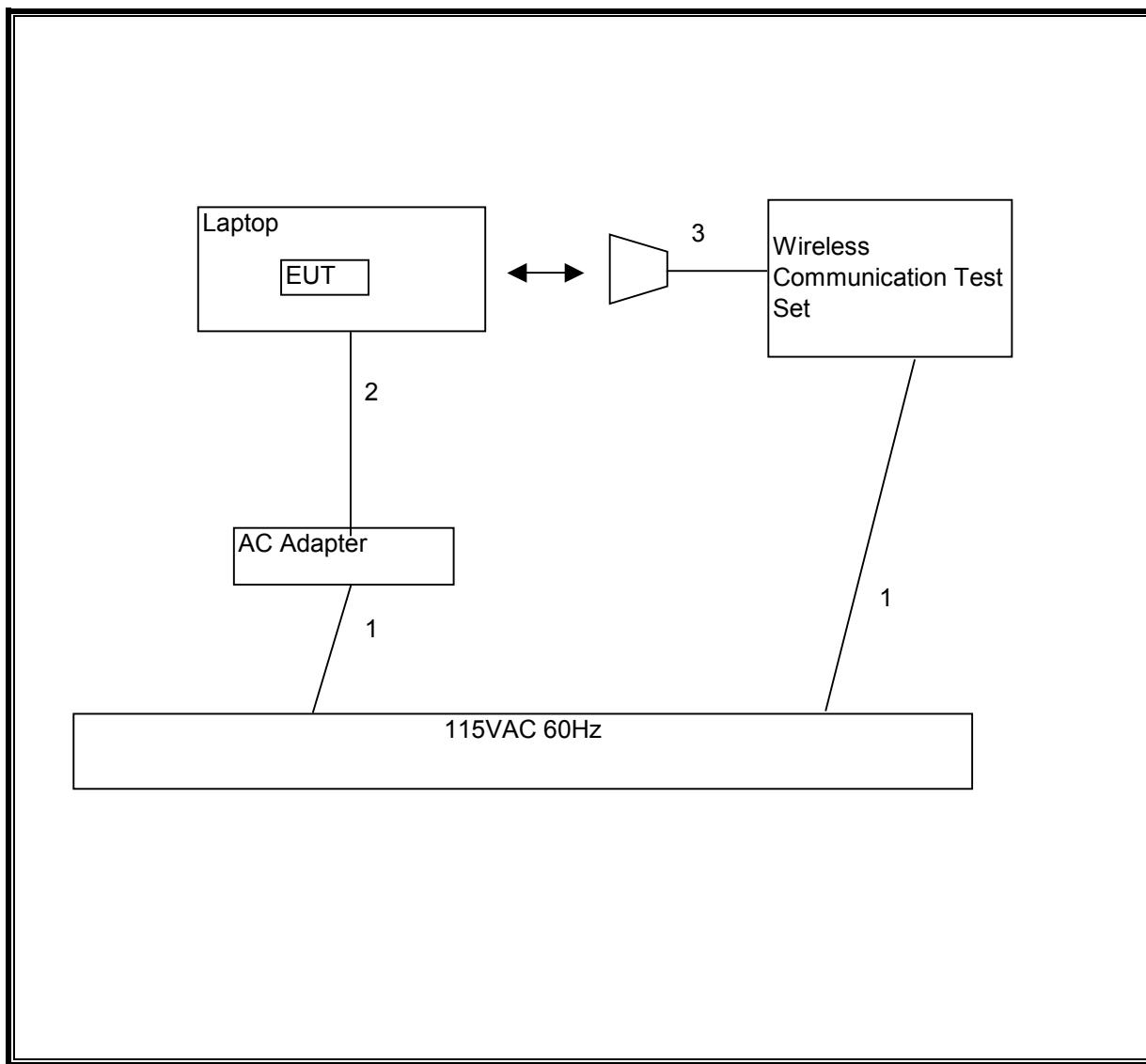
PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	IBM	Thinkpad X61S	LV-01418	DoC
AC Adapter	IBM	92P1156	11S92P1156Z1ZBGF6A607V	DoC
Wireless Communications Test Set	Agilent	E5515C	10092	DoC

### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	2	US 115V	Un-shielded	2m	NA
2	DC	1	D C	Un-shielded	2m	NA
3	RF In/Out	1	N-Type	Un-shielded	2m	To link EUT

### TEST SETUP

The EUT is installed in a IBM laptop during the tests. The Wireless Communication test set exercised the EUT.

**SETUP DIAGRAM FOR TESTS**

## TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY43360112	05/03/07
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	04/22/07
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	04/22/07
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00369	08/17/07
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	09/03/07
EMI Receiver, 9 kHz ~ 2.9 GHz	Agilent / HP	8542E	3942A00286	05/04/07
RF Filter Section	Agilent / HP	85420E	3705A00256	05/04/07
Communications Test Set	Agilent	E5515C	US41070176	10/19/07
Wireless Communications Test Set	Agilent	E5515C	10092	10/19/07
2.7GHz HPF	MicroTronic	HPM13194	2	CNR
1.5GHz HPF	MicroTronic	HPM13195	1	CNR
Signal Generator 2 -40 GHz	R & S	SMP04	DE 34210	06/02/07
Signal Generator 1024 MHz	R & S	SMY01	DE 12311	05/11/07
Dipole	EMCO	3121C-DB2	22435	03/25/07

## 6. LIMITS AND RESULTS

### 6.1. RADIATED POWER OUTPUT

#### LIMIT

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.  
24.232(b) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

#### TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17

#### RESULTS

No non-compliance noted.

GSM850MHz, GPRS Modulation, Antenna Pull-up

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	824.2	29.00	794.33
Middle	837.0	28.10	645.65
High	848.8	28.00	630.96

GSM850MHz, GPRS Modulation, Antenna Retracted

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	824.2	20.90	123.03
Middle	837.0	19.80	95.50
High	848.8	20.20	104.71

GSM850MHz, EGPRS Modulation, Antenna Pull-up

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	824.2	26.60	457.09
Middle	837.0	26.60	457.09
High	848.8	25.90	389.05

GSM1900MHz, GPRS Modulation, Antenna Pull-up

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1850.20	26.10	407.38
Middle	1880.00	24.30	269.15
High	1909.80	25.70	371.54

GSM1900MHz, EGPRS Modulation, Antenna Pull-up

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1850.20	22.00	158.49
Middle	1880.00	20.60	114.82
High	1909.80	22.00	158.49

WCDMA CELL CDMA Modulation, Antenna Pull-up

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	826.4	23.10	204.17
Middle	836.4	23.10	204.17
High	848.6	23.60	229.09

WCDMA PCS CDMA Modulation, Antenna Pull-up

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1852.40	29.00	794.33
Middle	1880.00	27.60	575.44
High	1907.60	27.40	549.54

WCDMA+HSPDA CELL CDMA Modulation, Antenna Pull-up

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	826.4	24.80	302.00
Middle	836.4	23.70	234.42
High	848.6	25.00	316.23

WCDMA+HSPDA PCS CDMA Modulation, Antenna Pull-up

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1852.40	29.50	891.25
Middle	1880.00	28.00	630.96
High	1907.60	27.70	588.84

**GSM850 GPRS Output Power (ERP)**

**Antenna Pull-up**

High Frequency Substitution Measurement  
Compliance Certification Services, Fremont Chamber B

Company:Sierra Wireless  
Project #:07U10899  
Date: 3/2/2007  
Test Engineer: William Zhuang  
Configuration:EUT only  
Mode:GSM850 GPRS, Ant. extend

**Test Equipment:**

Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)  
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	103.1	V	29.5	0.5	0.0	29.0	38.5	-9.4	
824.20	102.3	H	27.0	0.5	0.0	26.5	38.5	-11.9	
837.00	101.7	V	28.7	0.6	0.0	28.1	38.5	-10.3	
837.00	101.1	H	26.0	0.6	0.0	25.4	38.5	-13.0	
848.80	101.9	V	28.7	0.7	0.0	28.0	38.5	-10.4	
848.80	104.0	H	28.5	0.7	0.0	27.8	38.5	-10.7	

Rev. 1.24.7

**GSM850 GPRS Output Power (ERP)**

Antenna Retracted

**High Frequency Substitution Measurement**  
**Compliance Certification Services, Fremont Chamber B**

Company:Sierra Wireless  
Project #:07U10899  
Date: 3/2/2007  
Test Engineer: William Zhuang  
Configuration:EUT only  
Mode:GSM850 GPRS, Ant. retract

**Test Equipment:**

Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)

Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	95.0	V	21.4	0.5	0.0	20.9	38.5	-17.6	
824.20	93.7	H	18.4	0.5	0.0	17.9	38.5	-20.6	
837.00	93.4	V	20.4	0.6	0.0	19.8	38.5	-18.7	
837.00	92.7	H	17.6	0.6	0.0	17.0	38.5	-21.4	
848.80	94.1	V	20.9	0.7	0.0	20.2	38.5	-18.2	
848.80	93.1	H	17.6	0.7	0.0	16.9	38.5	-21.6	

Rev. 1.24.7

**GSM850 EGPRS Output Power (ERP)**

**Antenna Pull-up**

**High Frequency Substitution Measurement  
Compliance Certification Services, Fremont Chamber B**

Company:Sierra Wireless  
Project #:07U10899  
Date: 3/2/2007  
Test Engineer: William Zhuang  
Configuration:EUT only  
Mode:GSM850 EGPRS, worst case: Ant extend

**Test Equipment:**

Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)

Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	100.6	V	27.0	0.5	0.0	26.5	38.5	-11.9	
824.20	102.4	H	27.1	0.5	0.0	26.6	38.5	-11.8	
837.00	100.2	V	27.2	0.6	0.0	26.6	38.5	-11.8	
837.00	99.7	H	24.6	0.6	0.0	24.0	38.5	-14.4	
848.80	99.1	V	25.9	0.7	0.0	25.2	38.5	-13.2	
848.80	102.1	H	26.6	0.7	0.0	25.9	38.5	-12.5	

Rev. 1.24.7

**Cell Band WCDMA Output Power (ERP)****High Frequency Substitution Measurement****Compliance Certification Services, Fremont Chamber B****Company: Sierra Wireless Inc.****Project #:07U10899****Date: 3/2/2007****Test Engineer:Yu-Chien Ho****Configuration:EUT only****Mode:WCDMA850 (WCDMA)****Test Equipment:****Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)****Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002**

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch</b>									
826.40	97.2	V	23.6	0.5	0.0	23.1	38.5	-15.3	
826.40	94.9	H	19.6	0.5	0.0	19.1	38.5	-19.4	
<b>Mid Ch</b>									
836.40	96.7	V	23.7	0.6	0.0	23.1	38.5	-15.3	
836.40	93.7	H	18.6	0.6	0.0	18.0	38.5	-20.4	
<b>High Ch</b>									
846.60	97.5	V	24.3	0.7	0.0	23.6	38.5	-14.9	
846.60	92.3	H	16.8	0.7	0.0	16.1	38.5	-22.3	

Rev. 1.24.7

**Cell Band WCDMA+HSPDA Output Power (ERP)****High Frequency Substitution Measurement  
Compliance Certification Services, Fremont Chamber B**

Company: Sierra Wireless Inc.

Project #:07U10899

Date: 3/2/2007

Test Engineer: Yu-Chien Ho

Configuration:EUT only

Mode:WCDMA850 (HSPDA)

**Test Equipment:**

Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)

Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch</b>									
826.40	98.9	V	25.3	0.5	0.0	24.8	38.5	-13.7	
826.40	95.4	H	20.1	0.5	0.0	19.6	38.5	-18.8	
<b>Mid Ch</b>									
836.40	97.3	V	24.3	0.6	0.0	23.7	38.5	-14.8	
836.40	95.7	H	20.6	0.6	0.0	20.0	38.5	-18.4	
<b>High Ch</b>									
846.60	98.9	V	25.7	0.7	0.0	25.0	38.5	-13.5	
846.60	96.7	H	21.2	0.7	0.0	20.5	38.5	-18.0	

Rev. 1.24.7

**GSM1900 Band GPRS Output Power (EIRP)**

Antenna retract

**High Frequency Fundamental Measurement  
Compliance Certification Services, Fremont Chamber B**

Company:Sierra Wireless  
 Project #:07U10899  
 Date: 3/2/2007  
 Test Engineer: William Zhuang  
 Configuration:EUT only  
 Mode:GSM1900 GPRS, Ant extend

**Test Equipment:**

Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)

Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
1.850	91.5	V	18.1	0.9	8.3	25.5	33.0	-7.5	
1.850	92.6	H	18.7	0.9	8.3	26.1	33.0	-6.9	
1.880	91.2	V	16.9	0.9	8.3	24.3	33.0	-8.7	
1.880	91.5	H	16.7	0.9	8.3	24.1	33.0	-8.9	
1.910	91.5	V	18.2	0.9	8.4	25.7	33.0	-7.3	
1.910	90.9	H	18.0	0.9	8.4	25.5	33.0	-7.5	

Rev. 1.24.7

**GSM1900 Band EGPRS Output Power (EIRP)**

Antenna extend

**High Frequency Fundamental Measurement  
Compliance Certification Services, Fremont Chamber B**

Company:Sierra Wireless  
Project #:07U10899  
Date: 3/2/2007  
Test Engineer: William Zhuang  
Configuration:EUT only  
Mode:GSM1900 EGPRS, worst cae: Ant extend

**Test Equipment:**

Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)

Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch</b>									
1.850	88.0	V	14.6	0.9	8.3	22.0	33.0	-11.0	
1.850	88.2	H	14.3	0.9	8.3	21.7	33.0	-11.3	
<b>Mid Ch</b>									
1.880	86.7	V	12.4	0.9	8.3	19.8	33.0	-13.2	
1.880	88.0	H	13.2	0.9	8.3	20.6	33.0	-12.4	
<b>High Ch</b>									
1.910	87.0	V	13.7	0.9	8.4	21.2	33.0	-11.8	
1.910	87.3	H	14.5	0.9	8.4	22.0	33.0	-11.1	

Rev. 1.24.7

**PCS Band WCDMA Output Power (ERP)**

**High Frequency Fundamental Measurement**  
**Compliance Certification Services, Fremont Chamber B**

Company:Sierra Wireless Inc.

Project #:07U10899

Date: 3/2/2007

Test Engineer: Yu-Chien Ho

Configuration:EUT only

Mode:WCDMA1900 (WCDMA)

**Test Equipment:**

Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)

Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch</b>									
1.852	94.8	V	21.4	0.9	8.3	28.8	33.0	-4.2	
1.852	95.5	H	21.6	0.9	8.3	29.0	33.0	-4.0	
<b>Mid Ch</b>									
1.880	94.2	V	19.9	0.9	8.3	27.3	33.0	-5.7	
1.880	95.0	H	20.2	0.9	8.3	27.6	33.0	-5.4	
<b>High Ch Ch</b>									
1.908	93.0	V	19.7	0.9	8.4	27.2	33.0	-5.8	
1.908	92.8	H	19.9	0.9	8.4	27.4	33.0	-5.6	

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**Cell Band WCDMA+HSPDA Output Power (ERP)**

**High Frequency Substitution Measurement  
Compliance Certification Services, Fremont Chamber B**

Company: Sierra Wireless Inc.  
Project #:07U10899  
Date: 3/2/2007  
Test Engineer: Yu-Chien Ho  
Configuration:EUT only  
Mode:WCDMA850 (HSPDA)

**Test Equipment:**

Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)  
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch									
826.40	98.9	V	25.3	0.5	0.0	24.8	38.5	-13.7	
826.40	95.4	H	20.1	0.5	0.0	19.6	38.5	-18.8	
Mid Ch									
836.40	97.3	V	24.3	0.6	0.0	23.7	38.5	-14.8	
836.40	95.7	H	20.6	0.6	0.0	20.0	38.5	-18.4	
High Ch									
846.60	98.9	V	25.7	0.7	0.0	25.0	38.5	-13.5	
846.60	96.7	H	21.2	0.7	0.0	20.5	38.5	-18.0	

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**PCS Band WCDMA + HSPDA Output Power (EIRP)**

**High Frequency Fundamental Measurement**  
**Compliance Certification Services, Fremont Chamber B**

Company:Lenovo  
 Project #:07U10899  
 Date: 3/2/2007  
 Test Engineer: Yu-Chien Ho  
 Configuration:EUT only  
 Mode:WCDMA1900 (HSPDA)

**Test Equipment:**

Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)

Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch</b>									
1.852	94.6	V	21.2	0.9	8.3	28.6	33.0	-4.5	
1.852	96.0	H	22.1	0.9	8.3	29.5	33.0	-3.5	
<b>Mid Ch</b>									
1.880	94.9	V	20.6	0.9	8.3	28.0	33.0	-5.0	
1.880	95.4	H	20.6	0.9	8.3	28.0	33.0	-5.0	
<b>High Ch</b>									
1.908	93.5	V	20.2	0.9	8.4	27.7	33.0	-5.3	
1.908	93.1	H	20.2	0.9	8.4	27.7	33.0	-5.3	

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## 6.2. MAXIMUM PERMISSIBLE EXPOSURE

### LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
30–300 .....	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

f = frequency in MHz

\* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

## **CALCULATIONS**

Given

$$E = \sqrt{(30 * P * G) / d}$$

and

$$S = E^2 / 3770$$

where

E = Field Strength in Volts/meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$$d = \sqrt{(30 * P * G) / (3770 * S)}$$

Changing to units of Power to mW and Distance to cm, using:

$$P (\text{mW}) = P (\text{W}) / 1000 \text{ and}$$

$$d (\text{cm}) = 100 * d (\text{m})$$

yields

$$d = 100 * \sqrt{(30 * (P / 1000) * G) / (3770 * S)}$$

$$d = 0.282 * \sqrt{(P * G / S)}$$

where

d = distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power Density in mW/cm<sup>2</sup>

Substituting the logarithmic form of power and gain using:

$$P (\text{mW}) = 10^{(P (\text{dBm}) / 10)} \text{ and}$$

$$G (\text{numeric}) = 10^{(G (\text{dBi}) / 10)}$$

yields

$$d = 0.282 * 10^{(P + G) / 20} / \sqrt{S} \quad \text{Equation (1)}$$

where

d = MPE distance in cm

P = Power in dBm

G = Antenna Gain in dBi

S = Power Density Limit in mW/cm<sup>2</sup>

Equation (1) and the measured peak power is used to calculate the MPE distance.

**LIMITS**

From §1.1310 Table 1 (B), S = 1.0 mW/cm<sup>2</sup>

**RESULTS**

No non-compliance noted: (MPE distance equals 20 cm)

Mode	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm <sup>2</sup> )
GSM850 GPRS	20.0	29.50	0.08	0.18
GSM1900 GPRS	20.0	30.20	1.15	0.27
WCDMA+HSPDA Cellar	20.0	25.40	0.08	0.07
WCDMA+HSPDA PCS	20.0	27.40	1.15	0.14

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

### 6.3. FIELD STRENGTH OF SPURIOUS RADIATION

#### LIMIT

§22.917 (e) and §24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

#### TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12, FCC 22.917 (h), & FCC 24.238 (b)

#### RESULTS

No non-compliance noted.

**GSM850 GPRS Spurious & Harmonic (ERP)**
**High Frequency Substitution Measurement**  
**Compliance Certification Services, B- 5m Chamber Fremont Site**

**Company:** Sierra Wireless Inc.  
**Project #:** 07U10899  
**Date:** 3/4/2007  
**Test Engineer:** Frank Ibrahim  
**Configuration:** EUT installed in a host laptop PC  
**Mode:** GSM850, GPRS

**Test Equipment:**

EMCO Horn 1-18GHz	Horn > 18GHz	Limit	<input checked="" type="checkbox"/> High Pass Filter
T73; S/N: 6717 @3m		FCC 22	

Hi Frequency Cables	<input checked="" type="checkbox"/> (2 ft)	<input type="checkbox"/> (2 ~ 3 ft)	<input type="checkbox"/> (4 ~ 6 ft)	<input checked="" type="checkbox"/> (12 ft)	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz
				T144 Miteq 3008A00		

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch (824.2 MHz)</b>										
1.648	67.67	V	-40.61	4.2	8.0	5.8	-38.94	-13.0	-25.94	
2.473	65.15	V	-39.00	5.2	9.5	7.4	-36.81	-13.0	-23.81	
4.121	52.78	V	-43.31	6.8	9.8	7.7	-42.47	-13.0	-29.47	
7.418	47.39	V	-42.97	9.0	12.6	10.4	-41.55	-13.0	-28.55	
1.648	68.11	H	-39.46	4.2	8.0	5.8	-37.79	-13.0	-24.79	
2.473	63.47	H	-40.48	5.2	9.5	7.4	-38.29	-13.0	-25.29	
4.121	46.73	H	-49.03	6.8	9.8	7.7	-48.19	-13.0	-35.19	
7.418	46.41	H	-43.15	9.0	12.6	10.4	-41.73	-13.0	-28.73	
<b>Mid Ch (837 MHz)</b>										
1.674	64.38	V	-43.76	4.2	8.0	5.9	-42.06	-13.0	-29.06	
2.511	58.66	V	-45.32	5.2	9.6	7.4	-43.15	-13.0	-30.15	
4.185	46.94	V	-49.03	6.9	9.9	7.7	-48.18	-13.0	-35.18	
1.674	65.52	H	-41.91	4.2	8.0	5.9	-40.21	-13.0	-27.21	
2.511	53.95	H	-49.83	5.2	9.6	7.4	-47.66	-13.0	-34.66	
<b>High Ch (848.8 MHz)</b>										
1.698	63.25	V	-44.77	4.2	8.1	5.9	-43.04	-13.0	-30.04	
2.546	55.74	V	-48.09	5.3	9.6	7.4	-45.93	-13.0	-32.93	
4.244	48.11	V	-47.75	6.9	9.9	7.8	-46.89	-13.0	-33.89	
1.698	64.57	H	-42.74	4.2	8.1	5.9	-41.01	-13.0	-28.01	
2.546	54.08	H	-49.55	5.3	9.6	7.4	-47.39	-13.0	-34.39	

**GSM850 EGPRS Spurious & Harmonic (ERP)**

High Frequency Substitution Measurement Compliance Certification Services, B- 5m Chamber Fremont Site										
Company:	Sierra Wireless Inc.									
Project #:	07U10899									
Date:	3/4/2007									
Test Engineer:	Frank Ibrahim									
Configuration:	EUT installed in a host laptop PC									
Mode:	GSM850, EGPRS									
<u>Test Equipment:</u>										
EMCO Horn 1-18GHz			Horn > 18GHz			Limit		High Pass Filter		
T73; S/N: 6717 @3m						FCC 22		<input checked="" type="checkbox"/>		
Hi Frequency Cables										
<input checked="" type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)				Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			
T144 Miteq 3008A00										
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch (824.2 MHz)										
1.648	68.34	V	-39.94	4.2	8.0	5.8	-38.27	-13.0	-25.27	
2.473	64.99	V	-39.16	5.2	9.5	7.4	-36.97	-13.0	-23.97	
4.121	52.23	V	-43.86	6.8	9.8	7.7	-43.02	-13.0	-30.02	
7.418	46.79	V	-43.57	9.0	12.6	10.4	-42.15	-13.0	-29.15	
1.648	67.88	H	-39.69	4.2	8.0	5.8	-38.02	-13.0	-25.02	
2.473	63.54	H	-40.41	5.2	9.5	7.4	-38.22	-13.0	-25.22	
4.121	46.51	H	-49.25	6.8	9.8	7.7	-48.41	-13.0	-35.41	
7.418	46.78	H	-42.78	9.0	12.6	10.4	-41.36	-13.0	-28.36	
Mid Ch (837 MHz)										
1.674	65.34	V	-42.80	4.2	8.0	5.9	-41.10	-13.0	-28.10	
2.511	59.03	V	-44.95	5.2	9.6	7.4	-42.78	-13.0	-29.78	
4.185	47.68	V	-48.29	6.9	9.9	7.7	-47.44	-13.0	-34.44	
1.674	65.30	H	-42.13	4.2	8.0	5.9	-40.43	-13.0	-27.43	
2.511	52.56	H	-51.22	5.2	9.6	7.4	-49.05	-13.0	-36.05	
High Ch (848.8 MHz)										
1.698	64.72	V	-43.30	4.2	8.1	5.9	-41.57	-13.0	-28.57	
2.546	56.95	V	-46.88	5.3	9.6	7.4	-44.72	-13.0	-31.72	
4.244	46.66	V	-49.20	6.9	9.9	7.8	-48.34	-13.0	-35.34	
1.698	64.52	H	-42.79	4.2	8.1	5.9	-41.06	-13.0	-28.06	
2.546	53.42	H	-50.21	5.3	9.6	7.4	-48.05	-13.0	-35.05	

**CELL Band WCDMA Spurious & Harmonic (ERP)**

High Frequency Substitution Measurement										
Compliance Certification Services, B- 5m Chamber Fremont Site										
Company: Sierra Wireless Inc. Project #: 07U10899 Date: 3/6/2007 Test Engineer: Chin Pang Configuration: EUT with Antenna Extend Mode: WCDMA, Cell, 12.2k RMC.										
<b>Test Equipment:</b>										
<b>EMCO Horn 1-18GHz</b> T60; S/N: 2238 @3m			<b>Horn &gt; 18GHz</b>			<b>Limit</b> FCC 22		<input checked="" type="checkbox"/> <b>High Pass Filter</b>		
Hi Frequency Cables <input type="checkbox"/> (2 ft) <input checked="" type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)										
<b>Pre-amplifier 1-26GHz</b> T34 HP 8449B			<b>Pre-amplifier 26-40GHz</b>							
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch (826.4 MHz)										
1.653	57.3	V	-47.9	4.2	7.1	4.9	-47.2	-13.0	-34.2	
2.479	52.0	V	-50.4	5.2	9.3	7.1	-48.4	-13.0	-35.4	
3.306	49.0	V	-49.1	6.0	9.4	7.3	-47.8	-13.0	-34.8	
1.653	54.6	H	-49.9	4.2	7.1	4.9	-49.1	-13.0	-36.1	
2.479	50.3	H	-51.9	5.2	9.3	7.1	-49.9	-13.0	-36.9	
3.306	47.8	H	-50.2	6.0	9.4	7.3	-48.9	-13.0	-35.9	
Mid Ch (836.4 MHz)										
1.673	55.0	V	-50.2	4.2	7.2	5.0	-49.4	-13.0	-36.4	
2.509	50.0	V	-52.2	5.2	9.3	7.1	-50.3	-13.0	-37.3	
3.346	49.1	V	-48.8	6.0	9.5	7.3	-47.5	-13.0	-34.5	
1.673	52.0	H	-52.5	4.2	7.2	5.0	-51.6	-13.0	-38.6	
2.509	48.3	H	-53.7	5.2	9.3	7.1	-51.8	-13.0	-38.8	
3.346	48.0	H	-49.8	6.0	9.5	7.3	-48.5	-13.0	-35.5	
High Ch (846.6 MHz)										
1.693	56.0	V	-49.1	4.2	7.2	5.1	-48.2	-13.0	-35.2	
2.540	49.4	V	-52.6	5.3	9.3	7.1	-50.8	-13.0	-37.8	
3.386	47.6	V	-50.1	6.1	9.5	7.3	-48.9	-13.0	-35.9	
1.693	53.2	H	-51.2	4.2	7.2	5.1	-50.3	-13.0	-37.3	
2.540	48.6	H	-53.2	5.3	9.3	7.1	-51.4	-13.0	-38.4	
3.386	48.3	H	-49.3	6.1	9.5	7.3	-48.1	-13.0	-35.1	
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**CELL Band WCDMA+HSPDA Spurious & Harmonic (ERP)**

High Frequency Substitution Measurement Compliance Certification Services, B- 5m Chamber Fremont Site										
Company: Sierra Wireless Inc. Project #: 07U10899 Date: 3/2/07 Test Engineer: Yu-Chien Ho Configuration: Laptop only. Mode: WCDMA850 (HSDPA)										
<u>Test Equipment:</u>										
EMCO Horn 1-18GHz			Horn > 18GHz			Limit			High Pass Filter	
T73; S/N: 6717 @3m						FCC 22			<input checked="" type="checkbox"/>	
Hi Frequency Cables <input type="checkbox"/> (2 ft) <input checked="" type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)										
			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz				
			T144 Miteq 3008A00							
f GHz	SA reading (dBuV/m)	Aut. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch (826.4 MHz)										
1.653	48.9	V	-59.3	4.2	8.0	5.8	-57.7	-13.0	-44.7	
2.479	45.5	V	-58.6	5.2	9.6	7.4	-56.5	-13.0	-43.5	
3.306	45.4	V	-54.8	6.0	9.8	7.6	-53.2	-13.0	-40.2	
4.132	44.3	V	-51.8	6.8	9.8	7.7	-51.0	-13.0	-38.0	
4.958	45.9	V	-48.7	7.6	10.7	8.5	-47.8	-13.0	-34.8	
1.653	49.4	H	-58.1	4.2	8.0	5.8	-56.5	-13.0	-43.5	
2.479	46.2	H	-57.7	5.2	9.6	7.4	-55.5	-13.0	-42.5	
3.306	45.8	H	-54.3	6.0	9.8	7.6	-52.7	-13.0	-39.7	
4.132	44.3	H	-51.5	6.8	9.8	7.7	-50.6	-13.0	-37.6	
Mid Ch (836.4 MHz)										
1.673	45.0	V	-63.1	4.2	8.0	5.9	-61.4	-13.0	-48.4	
2.509	45.8	V	-58.2	5.2	9.6	7.4	-56.0	-13.0	-43.0	
3.346	45.7	V	-54.3	6.0	9.8	7.6	-52.8	-13.0	-39.8	
4.182	45.8	V	-50.2	6.8	9.9	7.7	-49.4	-13.0	-36.4	
1.673	44.9	H	-62.5	4.2	8.0	5.9	-60.8	-13.0	-47.8	
2.509	44.5	H	-59.3	5.2	9.6	7.4	-57.2	-13.0	-44.2	
3.346	45.3	H	-54.6	6.0	9.8	7.6	-53.1	-13.0	-40.1	
4.182	44.8	H	-50.9	6.8	9.9	7.7	-50.0	-13.0	-37.0	
High Ch (846.6 MHz)										
1.693	44.9	V	-63.1	4.2	8.1	5.9	-61.4	-13.0	-48.4	
2.540	44.8	V	-59.1	5.3	9.6	7.4	-56.9	-13.0	-43.9	
3.386	45.7	V	-54.1	6.1	9.7	7.6	-52.6	-13.0	-39.6	
4.233	46.5	V	-49.5	6.9	9.9	7.8	-48.6	-13.0	-35.6	
1.693	44.8	H	-62.5	4.2	8.1	5.9	-60.8	-13.0	-47.8	
2.540	44.7	H	-58.9	5.3	9.6	7.4	-56.8	-13.0	-43.8	
3.386	45.3	H	-54.4	6.1	9.7	7.6	-52.9	-13.0	-39.9	
4.233	45.3	H	-50.3	6.9	9.9	7.8	-49.4	-13.0	-36.4	

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**GSM1900 Band GPRS & Harmonic (EIRP)**

High Frequency Substitution Measurement Compliance Certification Services, B- 5m Chamber Fremont Site										
Company:	Sierra Wireless Inc.									
Project #:	07U10899									
Date:	3/4/2007									
Test Engineer:	Frank Ibrahim									
Configuration:	EUT installed in a host laptop PC									
Mode:	PCS1900, GPRS									
<u>Test Equipment:</u>										
EMCO Horn 1-18GHz			Horn > 18GHz			Limit		High Pass Filter		
T73; S/N: 6717 @3m			T87; ARA 18-26GHz; S/N:1049			FCC 24		<input checked="" type="checkbox"/>		
Hi Frequency Cables										
<input checked="" type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)				Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz			
T144 Miteq 3008A00										
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch (1.8502 GHz)										
3.700	46.50	V	-51.58	6.4	9.7	7.6	-48.27	-13.0	-35.27	
5.551	44.30	V	-48.20	8.1	11.3	9.1	-45.01	-13.0	-32.01	
3.700	46.87	H	-51.11	6.4	9.7	7.6	-47.80	-13.0	-34.80	
5.551	44.23	H	-47.27	8.1	11.3	9.1	-44.08	-13.0	-31.08	
Mid Ch (1.880 GHz)										
3.760	45.52	V	-52.23	6.5	9.7	7.6	-48.99	-13.0	-35.99	
5.640	45.60	V	-47.08	8.1	11.5	9.3	-43.75	-13.0	-30.75	
3.760	46.10	H	-51.55	6.5	9.7	7.6	-48.31	-13.0	-35.31	
5.640	45.63	H	-46.05	8.1	11.5	9.3	-42.72	-13.0	-29.72	
High Ch (1.9098 GHz)										
3.820	46.32	V	-51.11	6.5	9.7	7.5	-47.93	-13.0	-34.93	
5.729	45.78	V	-47.07	8.2	11.7	9.5	-43.61	-13.0	-30.61	
3.820	46.12	H	-51.21	6.5	9.7	7.5	-48.03	-13.0	-35.03	
5.729	45.34	H	-46.51	8.2	11.7	9.5	-43.05	-13.0	-30.05	

**GSM1900 Band EGPRS Spurious & Harmonic (EIRP)**

High Frequency Substitution Measurement Compliance Certification Services, B- 5m Chamber Fremont Site										
Company:	Sierra Wireless Inc.									
Project #:	07U10899									
Date:	3/4/2007									
Test Engineer:	Frank Ibrahim									
Configuration:	EUT installed in a host laptop PC									
Mode:	PCS1900, EGPRS									
<b>Test Equipment:</b>										
EMCO Horn 1-18GHz			Horn > 18GHz			Limit		High Pass Filter		
T73; S/N: 6717 @3m			T87; ARA 18-26GHz; S/N:1049			FCC 24		<input checked="" type="checkbox"/>		
Hi Frequency Cables										
<input checked="" type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz				
			T144 Miteq 3008A00							
<b>f</b> GHz	<b>SA reading</b> (dBuV/m)	<b>Ant. Pol.</b> (H/V)	<b>SG reading</b> (dBm)	<b>CL</b> (dB)	<b>Gain</b> (dBi)	<b>Gain</b> (dBd)	<b>EIRP</b> (dBm)	<b>Limit</b> (dBm)	<b>Margin</b> (dB)	<b>Notes</b>
Low Ch (1.8502 GHz)										
3.700	47.22	V	-50.86	6.4	9.7	7.6	-47.55	-13.0	-34.55	
5.551	45.54	V	-46.96	8.1	11.3	9.1	-43.77	-13.0	-30.77	
3.700	46.24	H	-51.74	6.4	9.7	7.6	-48.43	-13.0	-35.43	
5.551	44.78	H	-46.72	8.1	11.3	9.1	-43.53	-13.0	-30.53	
Mid Ch (1.880 GHz)										
3.760	46.53	V	-51.22	6.5	9.7	7.6	-47.98	-13.0	-34.98	
5.640	44.38	V	-48.30	8.1	11.5	9.3	-44.97	-13.0	-31.97	
3.760	46.29	H	-51.36	6.5	9.7	7.6	-48.12	-13.0	-35.12	
5.640	45.98	H	-45.70	8.1	11.5	9.3	-42.37	-13.0	-29.37	
High Ch (1.9098 GHz)										
3.820	47.12	V	-50.31	6.5	9.7	7.5	-47.13	-13.0	-34.13	
5.729	46.23	V	-46.62	8.2	11.7	9.5	-43.16	-13.0	-30.16	
3.820	46.64	H	-50.69	6.5	9.7	7.5	-47.51	-13.0	-34.51	
5.729	45.00	H	-46.85	8.2	11.7	9.5	-43.39	-13.0	-30.39	

**PCS Band WCDMA Spurious & Harmonic (EIRP)**

High Frequency Substitution Measurement Compliance Certification Services, B- 5m Chamber Fremont Site										
Company: Sierra Wireless Inc Project #: 07U10899 Date: 3/6/07 Test Engineer: Chin Pang Configuration: EUT with antenna extend. Mode: WCDMA, PCS, TX										
<u>Test Equipment:</u>										
EMCO Horn 1-18GHz			Horn > 18GHz			Limit		High Pass Filter		
T73; S/N: 6717 @3m						FCC 24		<input checked="" type="checkbox"/> High Pass Filter		
Hi Frequency Cables <input type="checkbox"/> (2 ft) <input checked="" type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)										
			Pre-amplifier 1-26GHz			Pre-amplifier 26-40GHz				
			T145 Agilent 3008A							
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch (1.8524 GHz)</b>										
3.705	56.3	V	-39.9	6.4	9.7	7.6	-36.5	-13.0	-23.5	
5.557	52.0	V	-39.3	8.0	11.3	9.1	-36.0	-13.0	-23.0	
7.410	49.4	V	-39.4	9.0	12.6	10.4	-35.8	-13.0	-22.8	
3.705	54.3	H	-41.8	6.4	9.7	7.6	-38.4	-13.0	-25.4	
5.557	48.6	H	-41.7	8.0	11.3	9.1	-38.4	-13.0	-25.4	
7.410	47.4	H	-40.6	9.0	12.6	10.4	-37.0	-13.0	-24.0	
<b>Mid Ch (1.88 GHz)</b>										
3.760	60.6	V	-35.3	6.4	9.7	7.6	-32.0	-13.0	-19.0	
5.640	55.2	V	-36.2	8.1	11.5	9.3	-32.8	-13.0	-19.8	
7.520	50.0	V	-38.7	9.1	12.6	10.5	-35.1	-13.0	-22.1	
3.760	56.0	H	-39.8	6.4	9.7	7.6	-36.5	-13.0	-23.5	
5.640	50.0	H	-40.4	8.1	11.5	9.3	-37.0	-13.0	-24.0	
7.520	48.6	H	-39.3	9.1	12.6	10.5	-35.7	-13.0	-22.7	
<b>High Ch (1.9076 GHz)</b>										
3.815	73.0	V	-22.6	6.5	9.7	7.5	-19.4	-13.0	-6.4	
5.723	53.2	V	-38.4	8.1	11.6	9.5	-34.9	-13.0	-21.9	
7.630	49.0	V	-39.5	9.1	12.7	10.5	-36.0	-13.0	-23.0	
3.815	68.0	H	-27.5	6.5	9.7	7.5	-24.3	-13.0	-11.3	
5.723	51.3	H	-39.3	8.1	11.6	9.5	-35.8	-13.0	-22.8	
9.538	48.0	H	-38.1	10.5	13.1	11.0	-35.5	-13.0	-22.5	

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**PCS Band WCDMA+HSPDA Spurious & Harmonic (EIRP)**

High Frequency Substitution Measurement Compliance Certification Services, B- 5m Chamber Fremont Site										
Company: Sierra Wireless Inc Project #: 07U10899 Date: 3/6/07 Test Engineer: Chin Pang Configuration: EUT with antenna extend. Mode: WCDMA+HSPDA, PCS, TX										
<u>Test Equipment:</u>										
EMCO Horn 1-18GHz			Horn > 18GHz			Limit			High Pass Filter	
T73; S/N: 6717 @3m						FCC 24			<input checked="" type="checkbox"/>	
Hi Frequency Cables <input type="checkbox"/> (2 ft) <input checked="" type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)										
Pre-amplifier 1-26GHz			T145 Agilent 3008A			Pre-amplifier 26-40GHz				
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
<b>Low Ch (1.8524 GHz)</b>										
3.705	57.2	V	-39.0	6.4	9.7	7.6	-35.6	-13.0	-22.6	
5.557	53.4	V	-37.9	8.0	11.3	9.1	-34.6	-13.0	-21.6	
7.410	48.3	V	-40.5	9.0	12.6	10.4	-36.9	-13.0	-23.9	
3.705	55.2	H	-40.9	6.4	9.7	7.6	-37.5	-13.0	-24.5	
5.557	48.7	H	-41.6	8.0	11.3	9.1	-38.3	-13.0	-25.3	
7.410	48.2	H	-39.8	9.0	12.6	10.4	-36.2	-13.0	-23.2	
<b>Mid Ch (1.88 GHz)</b>										
3.760	61.0	V	-34.9	6.4	9.7	7.6	-31.6	-13.0	-18.6	
5.640	52.7	V	-38.7	8.1	11.5	9.3	-35.3	-13.0	-22.3	
7.520	49.4	V	-39.3	9.1	12.6	10.5	-35.7	-13.0	-22.7	
3.760	56.6	H	-39.2	6.4	9.7	7.6	-35.9	-13.0	-22.9	
5.640	51.3	H	-39.1	8.1	11.5	9.3	-35.7	-13.0	-22.7	
7.520	49.4	H	-38.5	9.1	12.6	10.5	-34.9	-13.0	-21.9	
<b>High Ch (1.9076 GHz)</b>										
3.815	73.3	V	-22.3	6.5	9.7	7.5	-19.1	-13.0	-6.1	
5.723	54.5	V	-37.1	8.1	11.6	9.5	-33.6	-13.0	-20.6	
7.630	48.2	V	-40.3	9.1	12.7	10.5	-36.8	-13.0	-23.8	
3.815	69.6	H	-25.9	6.5	9.7	7.5	-22.7	-13.0	-9.7	
5.723	52.7	H	-37.9	8.1	11.6	9.5	-34.4	-13.0	-21.4	
9.538	48.6	H	-37.5	10.5	13.1	11.0	-34.9	-13.0	-21.9	

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