# 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 5-BAND MiniCard MODULE

**MODEL NUMBER: MC8755**

**FCC ID: N7NMC8755**

**REPORT NUMBER: 06U10050-1**

**ISSUE DATE: MARCH 01, 2006**

*Prepared for*
**SIERRA WIRELESS INC.**
**13811 WIRELESS WAY**
**RICHMOND, BC V6V 3A4, CANADA**

*Prepared by*
**COMPLIANCE CERTIFICATION SERVICES**
**561F MONTEREY ROAD**
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**LAB CODE:200065-0**

Revision History

| Rev. | Date | Revisions | Revised By |
|---|---|---|---|
| A | 3/01/06 | Initial Issue | Thu |

# TABLE OF CONTENTS

# 1. ATTESTATION OF TEST RESULTS

| | |
|---|---|
| **COMPANY NAME:** | SIERRA WIRELESS INC.<br>13811 WIRELESS WAY<br>RICHMOND, BC V6V 3A4, CANADA |
| **EUT DESCRIPTION:** | 850/900/1800/1900/2100 MHz 5-BAND MiniCard MODULE |
| **MODEL:** | MC8755 |
| **SERIAL NUMBER:** | AA-GH2YR |
| **DATE TESTED:** | JANUARY 23-24, 2006 |

| 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:

THANH NGUYEN
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 561F Monterey Road, Morgan Hill, 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 850/900/1800/1900/2100MHz 5-band MiniCard module and manufactured by Sierra Wireless, Inc.

## 5.2. CLASS II PERMISSIVE CHANGE DESCRIPTION

Add one Laptop of ThinkPad X60 series.

## 5.3. MAXIMUM OUTPUT POWER

The transmitter has maximum ERP and EIRP output powers 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 | EDGE | 22.40 | 173.78 |
| 824.2 - 848.75 | GSM | 23.60 | 229.09 |

| Frequency Range (MHz) | Modulation | EIRP Peak Power (dBm) | EIRP Peak Power (mW) |
|---|---|---|---|
| 1850.25 - 1909.8 | EDGE | 25.90 | 389.05 |
| 1850.25 - 1909.8 | GSM | 25.90 | 389.05 |

NOTE: RBW=VBW=3MHz

## 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna, with a maximum gain of –0.59 dBi for Cellular band and 1.92 dBi for PCS band.

## 5.5. SOFTWARE AND FIRMWARE

The test utility software used during testing was ProcommPlus for GSM and EDGE modulations.

## 5.6. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power. Please refer to the project 05U37791 of MC8755 FCC Conducted test report REVB.

## 5.7. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| PERIPHERAL SUPPORT EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| AC Adapter | IBM | ThinkPad | 9IW0529000129 | NA |
| Laptop | IBM | Thinkpad X60 | AAGH2YR | DoC |

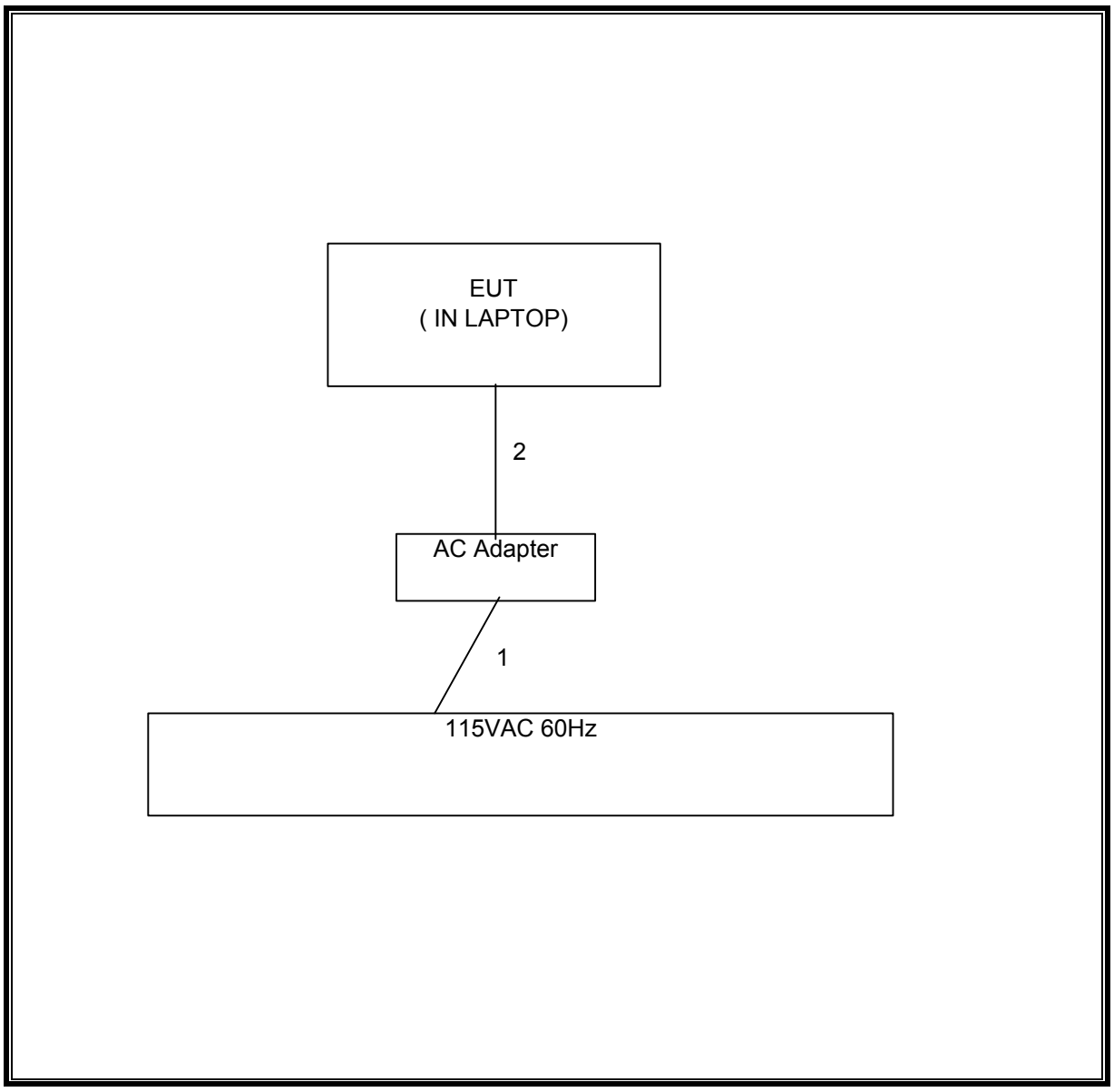
**I/O CABLES**

| I/O CABLE LIST | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No.** | **Port** | **# of Identical Ports** | **Connector Type** | **Cable Type** | **Cable Length** | **Remarks** |
| 1 | AC | 1 | US 115V | Un-shielded | 2m | NA |
| 2 | DC | 1 | DC | Un-shielded | 0.5m | NA |

**TEST SETUP**

The EUT is installed inside the ThinkPad X60 during the tests. The Wireless Communication test set exercised the EUT.

**RADIATED TEST SETUP DIAGRAM**



# 6. 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** |
| Antenna, Bilog 30 MHz ~ 2 Ghz | Sunol Sciences | JB1 | A121003 | 3/3/06 |
| Preamplifier, 1300 MHz | HP | 8447D | 1937A02062 | 1/7/07 |
| Spectrum Analyzer, 26.5 GHz | HP | 8593EM | 3710A00205 | 7/26/06 |
| EMI Test Receiver | R & S | ESHS 20 | 827129/006 | 6/3/06 |
| LISN, 10 kHz ~ 30 MHz | FCC | LISN-50/250-25-2 | 2023 | 8/30/06 |
| Preamplifier, 1 ~ 26.5 GHz | HP | 8449B | 3008A00369 | 8/17/06 |
| Spectrum Analyzer, 26.5 GHz | HP | 8593EM | 3710A00205 | 7/6/06 |
| Dipole | EMCO | 3121C-DB2 | 22435 | 3/25/06 |
| Signal Generator, 1024 MHz | R & S | SMY01 | DE 12311 | 04/11/06 |
| Spectrum Analyzer 3 Hz ~ 44 GHz | Agilent | E4446A | US42510266 | 10/19/06 |
| Antenna, Horn 1 ~ 18 GHz | EMCO | 3115 | 6717 | 04/22/06 |
| Antenna, Horn 1 ~ 18 GHz | EMCO | 3115 | 2238 | 04/22/06 |

# 7. LIMITS AND RESULTS

## 7.1. RADIATED RF 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.

850 MHz EDGE Modulation

| Channel | Frequency (MHz) | ERP Peak Power (dBm) | ERP Peak Power (mW) |
|---|---|---|---|
| Low | 824.2 | 22.40 | 173.78 |
| Middle | 836.5 | 21.80 | 151.36 |
| High | 848.75 | 21.00 | 125.89 |

850 MHz GSM Modulation

| Channel | Frequency (MHz) | ERP Peak Power (dBm) | ERP Peak Power (mW) |
|---|---|---|---|
| Low | 824.2 | 23.50 | 223.87 |
| Middle | 836.5 | 23.60 | 229.09 |
| High | 848.75 | 22.20 | 165.96 |

NOTE: RBW=VBW=3MHz.

1900 MHz EDGE Modulation

| Channel | Frequency (MHz) | EIRP Peak Power (dBm) | EIRP Peak Power (mW) |
|---|---|---|---|
| Low | 1850.25 | 24.00 | 251.19 |
| Middle | 1880 | 23.60 | 229.09 |
| High | 1909.8 | 25.90 | 389.05 |

1900 MHz GSM Modulation

| Channel | Frequency (MHz) | EIRP Peak Power (dBm) | EIRP Peak Power (mW) |
|---|---|---|---|
| Low | 1850.25 | 23.40 | 218.78 |
| Middle | 1880 | 23.70 | 234.42 |
| High | 1909.8 | 25.90 | 389.05 |

## EDGE 850MHz Output Power (ERP)

01/25/06 **High Frequency Substitution Measurement**
**Compliance Certification Services, Morgan Hill 5m Chamber Site**

| | |
|---|---|
| **Test Engr:** | Thanh Nguyen |
| **Project #:** | 06U10050 |
| **Company:** | Sierra Wireless |
| **EUT Descrip.:** | 5 Band Mini Card Module |
| **EUT M/N:** | MC8755-WCDMA/GSM Module |
| **Test Target:** | FCC Part 22/24 |
| **Mode Oper:** | TX ON, EDGE_ 850 MHz_Fundemental |

**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 Channel** | | | | | | | | | |
| **824.20** | **97.8** | **V** | **20.9** | **0.5** | **0.0** | **20.4** | **38.5** | **-18.1** | |
| **824.20** | **101.0** | **H** | **22.7** | **0.5** | **0.0** | **22.2** | **38.5** | **-16.3** | |
| | | | | | | | | | |
| **837.18** | **98.1** | **V** | **22.1** | **0.6** | **0.0** | **21.5** | **38.5** | **-16.9** | |
| **837.18** | **100.6** | **H** | **22.4** | **0.6** | **0.0** | **21.8** | **38.5** | **-16.6** | |
| | | | | | | | | | |
| **849.38** | **97.1** | **V** | **21.7** | **0.7** | **0.0** | **21.0** | **38.5** | **-17.4** | |
| **849.38** | **99.0** | **H** | **20.9** | **0.7** | **0.0** | **20.2** | **38.5** | **-18.2** | |

NOTE: RBW=VBW=3MHz

## GSM 850MHz Output Power (ERP)

01/25/06 **High Frequency Substitution Measurement**
**Compliance Certification Services, Morgan Hill 5m Chamber Site**

| | |
|---|---|
| **Test Engr:** | Thanh Nguyen |
| **Project #:** | 06U10050 |
| **Company:** | Sierra Wireless |
| **EUT Descrip.:** | 5 Band Mini Card Module |
| **EUT M/N:** | MC8755-WCDMA/GSM Module |
| **Test Target:** | FCC Part 22/24 |
| **Mode Oper:** | TX ON, GSM 850 MHz_Fundemental |

**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 Channel | | | | | | | | | |
| 824.20 | 100.9 | V | 24.0 | 0.5 | 0.0 | 23.5 | 38.5 | -15.0 | |
| 824.20 | 97.2 | H | 18.8 | 0.5 | 0.0 | 18.3 | 38.5 | -20.1 | |
| | | | | | | | | | |
| 837.18 | 100.2 | V | 24.2 | 0.6 | 0.0 | 23.6 | 38.5 | -14.9 | |
| 837.18 | 95.4 | H | 17.2 | 0.6 | 0.0 | 16.6 | 38.5 | -21.9 | |
| | | | | | | | | | |
| 849.38 | 98.3 | V | 22.9 | 0.7 | 0.0 | 22.2 | 38.5 | -16.3 | |
| 849.38 | 92.4 | H | 14.3 | 0.7 | 0.0 | 13.6 | 38.5 | -24.9 | |

NOTE: RBW=VBW=3MHz

## EDGE 1900MHz Output Power (EIRP)

01/25/06 **High Frequency Substitution Measurement**
**Compliance Certification Services, Morgan Hill 5m Chamber Site**

| | |
|---|---|
| **Test Engr:** | Thanh Nguyen |
| **Project #:** | 06U10050 |
| **Company:** | Sierra Wireless |
| **EUT Descrip.:** | 5 Band Mini Card Module |
| **EUT M/N:** | MC8755-WCDMA/GSM Module |
| **Test Target:** | FCC Part 22/24 |
| **Mode Oper:** | TX ON, EDGE 1900 MHz, FUNDEMENTAL |

**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 |
|---|---|---|---|---|---|---|---|---|---|
| **Low Channel** | | | | | | | | | |
| 1.850 | 91.1 | V | 13.9 | 0.9 | 8.3 | 21.3 | 33.0 | -11.7 | |
| 1.850 | 93.9 | H | 16.6 | 0.9 | 8.3 | 24.0 | 33.0 | -9.0 | |
| **Mid Channel** | | | | | | | | | |
| 1.880 | 92.6 | V | 15.7 | 0.9 | 8.3 | 23.2 | 33.0 | -9.9 | |
| 1.880 | 93.8 | H | 16.1 | 0.9 | 8.3 | 23.6 | 33.0 | -9.4 | |
| **High Channel** | | | | | | | | | |
| 1.910 | 93.3 | V | 16.7 | 0.9 | 8.4 | 24.2 | 33.0 | -8.8 | |
| 1.910 | 95.5 | H | 18.5 | 0.9 | 8.4 | 25.9 | 33.0 | -7.1 | |
| | | | | | | | | | |

NOTE: RBW=VBW=3MHz

## GSM 1900MHz Output Power (EIRP)

01/25/06 High Frequency Substitution Measurement
Compliance Certification Services, Morgan Hill 5m Chamber Site

| | |
|---|---|
| Test Engr: | Thanh Nguyen |
| Project #: | 06U10050 |
| Company: | Sierra Wireless |
| EUT Descrip.: | 5 Band Mini Card Module |
| EUT M/N: | MC8755-WCDMA/GSM Module |
| Test Target: | FCC Part 22/24 |
| Mode Oper: | TX ON, GSM 1900 MHz, FUNDEMENTAL |

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 |
|---|---|---|---|---|---|---|---|---|---|
| Low Channel | | | | | | | | | |
| 1.850 | 90.0 | V | 12.8 | 0.9 | 8.3 | 20.2 | 33.0 | -12.8 | |
| 1.850 | 93.4 | H | 16.0 | 0.9 | 8.3 | 23.4 | 33.0 | -9.6 | |
| Mid Channel | | | | | | | | | |
| 1.880 | 91.2 | V | 14.4 | 0.9 | 8.3 | 21.8 | 33.0 | -11.2 | |
| 1.880 | 93.9 | H | 16.3 | 0.9 | 8.3 | 23.7 | 33.0 | -9.3 | |
| High Channel | | | | | | | | | |
| 1.910 | 91.8 | V | 15.2 | 0.9 | 8.4 | 22.7 | 33.0 | -10.3 | |
| 1.910 | 95.4 | H | 18.4 | 0.9 | 8.4 | 25.9 | 33.0 | -7.1 | |
| | | | | | | | | | |

NOTE: RBW=VBW=3MHz

## 7.2. FIELD STRENGTH OF SPURIOUS EMISSION

**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 603C Clause 2.2.12, FCC 22.917 (h), & FCC 24.238 (b)

**RESULTS**

No non-compliance noted.

Note: No emissions were found within 30-1000MHz of 20dB below the system noise.

## 850MHz EDGE Spurious & Harmonic (ERP)

01/24/06 **High Frequency Substitution Measurement**
**Compliance Certification Services, Morgan Hill 5m Chamber Site**

| | |
|---|---|
| **Test Engr:** | Thanh Nguyen |
| **Project #:** | 06U10050 |
| **Company:** | Sierra Wireless |
| **EUT Descrip.:** | 5 Band Mini Card Module |
| **EUT M/N:** | MC8755-WCDMA/GSM Module |
| **Test Target:** | FCC Part 22/24 |
| **Mode Oper:** | TX ON, EDGE 850 MHz |

**Test Equipment:**

EMCO Horn 1-18GHz: T120; S/N: 29310 @3m
Horn > 18GHz:
Limit: FCC 22
☑ High Pass Filter
Hi Frequency Cables: ☐ (2 ft) ☑ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T87 Miteq 924342
Pre-amplifer 26-40GHz:

| 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 Channel** | | | | | | | | | | |
| 1.663 | 50.4 | V | -61.0 | 1.6 | 3.9 | 1.8 | -60.9 | -13.0 | -47.9 | |
| 2.525 | 62.2 | V | -49.1 | 1.9 | 6.4 | 4.2 | -46.9 | -13.0 | -33.9 | |
| 2.537 | 60.7 | V | -50.6 | 1.9 | 6.4 | 4.2 | -48.3 | -13.0 | -35.3 | |
| 5.911 | 54.9 | V | -54.0 | 3.3 | 10.5 | 8.4 | -49.0 | -13.0 | -36.0 | |
| 1.718 | 47.6 | H | -63.0 | 1.6 | 4.0 | 1.9 | -62.8 | -13.0 | -49.8 | |
| 2.525 | 50.6 | H | -60.5 | 1.9 | 6.4 | 4.2 | -58.2 | -13.0 | -45.2 | |
| **Mid Channel** | | | | | | | | | | |
| 1.683 | 56.1 | V | -55.3 | 1.6 | 3.9 | 1.8 | -55.1 | -13.0 | -42.1 | |
| 2.525 | 59.8 | V | -51.5 | 1.9 | 6.4 | 4.2 | -49.2 | -13.0 | -36.2 | |
| 2.537 | 55.9 | V | -55.4 | 1.9 | 6.4 | 4.2 | -53.2 | -13.0 | -40.2 | |
| 5.911 | 64.0 | V | -45.0 | 3.3 | 10.5 | 8.4 | -39.9 | -13.0 | -26.9 | |
| 1.718 | 47.5 | H | -63.1 | 1.6 | 4.0 | 1.9 | -62.8 | -13.0 | -49.8 | |
| 2.525 | 49.6 | H | -61.6 | 1.9 | 6.4 | 4.2 | -59.3 | -13.0 | -46.3 | |
| **High Channel** | | | | | | | | | | |
| 1.697 | 53.4 | V | -57.9 | 1.6 | 4.0 | 1.8 | -57.7 | -13.0 | -44.7 | |
| 2.525 | 58.5 | V | -52.9 | 1.9 | 6.4 | 4.2 | -50.6 | -13.0 | -37.6 | |
| 2.546 | 55.8 | V | -55.5 | 2.0 | 6.4 | 4.3 | -53.2 | -13.0 | -40.2 | |
| 1.762 | 57.7 | H | -52.8 | 1.6 | 4.1 | 2.0 | -52.5 | -13.0 | -39.5 | |
| 2.546 | 55.4 | H | -55.7 | 2.0 | 6.4 | 4.3 | -53.4 | -13.0 | -40.4 | |
| | | | | | | | | | | |
| | | | | | | | | | | |

## 850MHz GSM Spurious & Harmonic (ERP)

01/25/06 High Frequency Substitution Measurement
Compliance Certification Services, Morgan Hill 5m Chamber Site

| | |
|---|---|
| Test Engr: | Thanh Nguyen |
| Project #: | 06U10050 |
| Company: | Sierra Wireless |
| EUT Descrip.: | 5 Band Mini Card Module |
| EUT M/N: | MC8755-WCDMA/GSM Module |
| Test Target: | FCC Part 22/24 |
| Mode Oper: | TX ON, GSM 850 MHz |

Test Equipment:

EMCO Horn 1-18GHz: T119; S/N: 29301 @3m
Horn > 18GHz:
Limit: FCC 22
High Pass Filter
Hi Frequency Cables: (2 ft) (2 ~ 3 ft) (4 ~ 6 ft) (12 ft)
Pre-amplifer 1-26GHz: T87 Miteq 924342
Pre-amplifer 26-40GHz:

| 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 Channel | | | | | | | | | | |
| 1.648 | 61.6 | V | -50.2 | 1.6 | 4.0 | 1.9 | -49.9 | -13.0 | -36.9 | |
| 2.473 | 65.4 | V | -45.8 | 1.9 | 6.1 | 4.0 | -43.7 | -13.0 | -30.7 | |
| 3.297 | 52.6 | V | -57.8 | 2.3 | 7.5 | 5.3 | -54.8 | -13.0 | -41.8 | |
| 6.594 | 49.4 | V | -58.4 | 3.5 | 11.2 | 9.1 | -52.8 | -13.0 | -39.8 | |
| 1.648 | 58.9 | H | -52.2 | 1.6 | 4.0 | 1.9 | -51.9 | -13.0 | -38.9 | |
| 2.473 | 68.0 | H | -42.9 | 1.9 | 6.1 | 4.0 | -40.9 | -13.0 | -27.9 | |
| 3.297 | 47.2 | H | -63.2 | 2.3 | 7.5 | 5.3 | -60.1 | -13.0 | -47.1 | |
| 6.594 | 55.1 | H | -52.0 | 3.5 | 11.2 | 9.1 | -46.4 | -13.0 | -33.4 | |
| 7.418 | 58.0 | H | -47.7 | 3.7 | 11.9 | 9.8 | -41.6 | -13.0 | -28.6 | |
| Mid Channel | | | | | | | | | | |
| 1.674 | 58.5 | V | -53.2 | 1.6 | 4.1 | 1.9 | -52.9 | -13.0 | -39.9 | |
| 2.525 | 61.3 | V | -49.7 | 1.9 | 6.2 | 4.1 | -47.6 | -13.0 | -34.6 | |
| 1.674 | 55.7 | H | -55.3 | 1.6 | 4.1 | 1.9 | -55.0 | -13.0 | -42.0 | |
| 2.525 | 58.3 | H | -52.5 | 1.9 | 6.2 | 4.1 | -50.4 | -13.0 | -37.4 | |
| 12.951 | 48.8 | H | -51.5 | 5.2 | 13.7 | 11.6 | -45.1 | -13.0 | -32.1 | |
| High Channel | | | | | | | | | | |
| 1.698 | 56.1 | V | -55.6 | 1.6 | 4.1 | 2.0 | -55.2 | -13.0 | -42.2 | |
| 2.546 | 47.9 | V | -63.1 | 2.0 | 6.2 | 4.1 | -60.9 | -13.0 | -47.9 | |
| 1.698 | 51.4 | H | -59.6 | 1.6 | 4.1 | 2.0 | -59.2 | -13.0 | -46.2 | |
| 2.546 | 46.8 | H | -64.0 | 2.0 | 6.2 | 4.1 | -61.9 | -13.0 | -48.9 | |

## 1900MHz EDGE Spurious & Harmonic (EIRP)

01/24/06 High Frequency Substitution Measurement
Compliance Certification Services, Morgan Hill 5m Chamber Site

| | |
|---|---|
| Test Engr: | Thanh Nguyen |
| Project #: | 06U10050 |
| Company: | Sierra Wireless |
| EUT Descrip.: | 5 Band Mini Card Module |
| EUT M/N: | MC8755-WCDMA/GSM Module |
| Test Target: | FCC Part 22/24 |
| Mode Oper: | TX ON, EDGE 1900 MHz |

Test Equipment:

EMCO Horn 1-18GHz: T120; S/N: 29310 @3m
Horn > 18GHz:
Limit: FCC 22
High Pass Filter
Hi Frequency Cables: (2 ft) (2 ~ 3 ft) (4 ~ 6 ft) (12 ft)
Pre-amplifer 1-26GHz: T87 Miteq 924342
Pre-amplifer 26-40GHz:

| 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 Channel** | | | | | | | | | | |
| 3.735 | 52.3 | V | -59.0 | 2.5 | 8.5 | 6.3 | -55.1 | -13.0 | -42.1 | |
| 5.550 | 53.9 | V | -56.2 | 3.2 | 10.6 | 8.4 | -51.0 | -13.0 | -38.0 | |
| 7.400 | 42.3 | V | -63.7 | 3.7 | 11.7 | 9.5 | -57.9 | -13.0 | -44.9 | |
| 9.251 | 44.6 | V | -58.8 | 4.2 | 12.4 | 10.3 | -52.6 | -13.0 | -39.6 | |
| 11.101 | 46.5 | V | -53.0 | 4.7 | 12.7 | 10.6 | -47.1 | -13.0 | -34.1 | |
| 12.951 | 48.2 | V | -51.0 | 5.2 | 13.7 | 11.5 | -44.6 | -13.0 | -31.6 | |
| 3.730 | 52.2 | H | -58.9 | 2.5 | 8.5 | 6.3 | -55.1 | -13.0 | -42.1 | |
| 5.550 | 47.6 | H | -61.4 | 3.2 | 10.6 | 8.4 | -56.2 | -13.0 | -43.2 | |
| 9.251 | 44.6 | H | -58.7 | 4.2 | 12.4 | 10.3 | -52.6 | -13.0 | -39.6 | |
| **Mid Channel** | | | | | | | | | | |
| 3.760 | 57.6 | V | -53.7 | 2.5 | 8.5 | 6.4 | -49.8 | -13.0 | -36.8 | |
| 5.640 | 47.5 | V | -62.3 | 3.3 | 10.6 | 8.4 | -57.1 | -13.0 | -44.1 | |
| 7.519 | 46.1 | V | -59.7 | 3.7 | 11.8 | 9.6 | -53.8 | -13.0 | -40.8 | |
| 9.400 | 50.9 | V | -51.7 | 4.2 | 12.4 | 10.2 | -45.7 | -13.0 | -32.7 | |
| 11.280 | 48.2 | V | -51.3 | 4.8 | 12.8 | 10.7 | -45.4 | -13.0 | -32.4 | |
| 13.160 | 44.8 | V | -54.2 | 5.2 | 13.7 | 11.6 | -47.8 | -13.0 | -34.8 | |
| 3.760 | 52.8 | H | -58.4 | 2.5 | 8.5 | 6.4 | -54.5 | -13.0 | -41.5 | |
| 5.640 | 45.0 | H | -63.8 | 3.3 | 10.6 | 8.4 | -58.6 | -13.0 | -45.6 | |
| 7.520 | 48.3 | H | -56.8 | 3.7 | 11.8 | 9.6 | -50.9 | -13.0 | -37.9 | |
| 9.400 | 47.1 | H | -55.6 | 4.2 | 12.4 | 10.2 | -49.6 | -13.0 | -36.6 | |
| 11.280 | 48.2 | H | -50.7 | 4.8 | 12.8 | 10.7 | -44.8 | -13.0 | -31.8 | |
| 13.160 | 46.0 | H | -52.2 | 5.2 | 13.7 | 11.6 | -45.8 | -13.0 | -32.8 | |
| **High Channel** | | | | | | | | | | |
| 3.819 | 69.5 | V | -41.8 | 2.5 | 8.6 | 6.5 | -37.8 | -13.0 | -24.8 | |
| 5.729 | 47.7 | V | -61.8 | 3.3 | 10.6 | 8.4 | -56.7 | -13.0 | -43.7 | |
| 7.639 | 44.9 | V | -60.8 | 3.8 | 11.9 | 9.7 | -54.8 | -13.0 | -41.8 | |
| 9.549 | 45.0 | V | -57.0 | 4.3 | 12.3 | 10.2 | -51.1 | -13.0 | -38.1 | |
| 11.458 | 57.4 | V | -42.1 | 4.8 | 12.9 | 10.8 | -36.2 | -13.0 | -23.2 | |
| 13.368 | 47.4 | V | -51.4 | 5.2 | 13.7 | 11.6 | -45.1 | -13.0 | -32.1 | |
| 3.819 | 65.1 | H | -46.1 | 2.5 | 8.6 | 6.5 | -42.1 | -13.0 | -29.1 | |
| 5.729 | 48.5 | H | -60.0 | 3.3 | 10.6 | 8.4 | -54.9 | -13.0 | -41.9 | |
| 7.639 | 47.2 | H | -57.7 | 3.8 | 11.9 | 9.7 | -51.7 | -13.0 | -38.7 | |
| 9.549 | 42.5 | H | -59.5 | 4.3 | 12.3 | 10.2 | -53.6 | -13.0 | -40.6 | |
| 11.458 | 54.7 | H | -44.2 | 4.8 | 12.9 | 10.8 | -38.3 | -13.0 | -25.3 | |
| 13.368 | 46.2 | H | -51.9 | 5.2 | 13.7 | 11.6 | -45.5 | -13.0 | -32.5 | |

## 1900MHz GSM Spurious & Harmonic (EIRP)

01/25/06 High Frequency Substitution Measurement
Compliance Certification Services, Morgan Hill 5m Chamber Site

| | |
|---|---|
| Test Engr: | Thanh Nguyen |
| Project #: | 06U10050 |
| Company: | Sierra Wireless |
| EUT Descrip.: | 5 Band Mini Card Module |
| EUT M/N: | MC8755-WCDMA/GSM Module |
| Test Target: | FCC Part 22/24 |
| Mode Oper: | TX ON, GSM 1900 MHz |

Test Equipment:

EMCO Horn 1-18GHz: T119; S/N: 29301 @3m
Horn > 18GHz:
Limit: FCC 22
High Pass Filter
Hi Frequency Cables: (2 ft) (2 ~ 3 ft) (4 ~ 6 ft) (12 ft)
Pre-amplifer 1-26GHz: T87 Miteq 924342
Pre-amplifer 26-40GHz:

| 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 Channel** | | | | | | | | | | |
| 3.700 | 58.2 | V | -52.7 | 2.4 | 8.3 | 6.1 | -49.0 | -13.0 | -36.0 | |
| 5.550 | 49.6 | V | -60.6 | 3.2 | 10.7 | 8.5 | -55.3 | -13.0 | -42.3 | |
| 7.401 | 47.3 | V | -59.2 | 3.7 | 11.9 | 9.8 | -53.1 | -13.0 | -40.1 | |
| 9.251 | 48.5 | V | -56.0 | 4.2 | 13.0 | 10.9 | -49.3 | -13.0 | -36.3 | |
| 11.101 | 58.9 | V | -42.1 | 4.7 | 13.5 | 11.3 | -35.5 | -13.0 | -22.5 | |
| 12.951 | 52.5 | V | -46.7 | 5.2 | 13.7 | 11.6 | -40.3 | -13.0 | -27.3 | |
| 14.802 | 43.9 | V | -54.5 | 5.4 | 13.9 | 11.8 | -48.2 | -13.0 | -35.2 | |
| 3.700 | 55.1 | H | -55.7 | 2.4 | 8.3 | 6.1 | -52.0 | -13.0 | -39.0 | |
| 5.550 | 52.6 | H | -56.6 | 3.2 | 10.7 | 8.5 | -51.3 | -13.0 | -38.3 | |
| 7.401 | 49.5 | H | -56.3 | 3.7 | 11.9 | 9.8 | -50.2 | -13.0 | -37.2 | |
| 9.250 | 46.2 | H | -58.3 | 4.2 | 13.0 | 10.9 | -51.6 | -13.0 | -38.6 | |
| 11.100 | 52.2 | H | -48.2 | 4.7 | 13.5 | 11.4 | -41.6 | -13.0 | -28.6 | |
| 12.951 | 48.8 | H | -51.5 | 5.2 | 13.7 | 11.6 | -45.1 | -13.0 | -32.1 | |
| **Mid Channel** | | | | | | | | | | |
| 3.759 | 57.1 | V | -53.8 | 2.5 | 8.4 | 6.2 | -50.1 | -13.0 | -37.1 | |
| 5.640 | 47.7 | V | -62.3 | 3.3 | 10.7 | 8.5 | -57.0 | -13.0 | -44.0 | |
| 7.520 | 51.4 | V | -55.0 | 3.7 | 12.0 | 9.9 | -48.8 | -13.0 | -35.8 | |
| 9.400 | 47.8 | V | -56.0 | 4.2 | 12.9 | 10.8 | -49.4 | -13.0 | -36.4 | |
| 11.280 | 56.9 | V | -43.9 | 4.8 | 13.5 | 11.3 | -37.4 | -13.0 | -24.4 | |
| 13.160 | 48.1 | V | -51.0 | 5.2 | 13.8 | 11.6 | -44.6 | -13.0 | -31.6 | |
| 15.040 | 43.2 | V | -54.9 | 5.5 | 13.9 | 11.7 | -48.6 | -13.0 | -35.6 | |
| 3.759 | 54.9 | H | -56.0 | 2.5 | 8.4 | 6.2 | -52.2 | -13.0 | -39.2 | |
| 5.640 | 51.6 | H | -57.4 | 3.3 | 10.7 | 8.5 | -52.1 | -13.0 | -39.1 | |
| 7.520 | 48.3 | H | -57.2 | 3.7 | 12.0 | 9.9 | -51.1 | -13.0 | -38.1 | |
| 9.400 | 45.7 | H | -58.0 | 4.2 | 12.9 | 10.8 | -51.5 | -13.0 | -38.5 | |
| 11.280 | 51.4 | H | -48.8 | 4.8 | 13.5 | 11.3 | -42.3 | -13.0 | -29.3 | |
| **High Channel** | | | | | | | | | | |
| 3.820 | 71.3 | V | -39.7 | 2.5 | 8.5 | 6.3 | -35.8 | -13.0 | -22.8 | |
| 5.730 | 54.1 | V | -55.7 | 3.3 | 10.7 | 8.5 | -50.5 | -13.0 | -37.5 | |
| 9.549 | 47.2 | V | -55.8 | 4.3 | 12.8 | 10.7 | -49.3 | -13.0 | -36.3 | |
| 11.459 | 61.8 | V | -38.8 | 4.8 | 13.5 | 11.3 | -32.3 | -13.0 | -19.3 | |
| 3.820 | 68.6 | H | -42.3 | 2.5 | 8.5 | 6.3 | -38.5 | -13.0 | -25.5 | |
| 5.730 | 52.4 | H | -56.4 | 3.3 | 10.7 | 8.5 | -51.1 | -13.0 | -38.1 | |
| 9.549 | 46.9 | H | -56.1 | 4.3 | 12.8 | 10.7 | -49.7 | -13.0 | -36.7 | |
| 11.459 | 55.9 | H | -44.1 | 4.8 | 13.5 | 11.3 | -37.6 | -13.0 | -24.6 | |

# 8. SETUP PHOTOS

RADIATED FRONT PHOTO

RADIATED BACK PHOTO

## POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO

LINE CONDUCTED BACK PHOTO


# END OF REPORT