# FCC CFR47 PART 27 SUBPART M
# CLASS II PERMISSIVE CHANGE

# CERTIFICATION TEST REPORT

**FOR**

**USB MODEM WITH EXTERNAL MONOPOLE ANTENNA**

**MODEL NUMBER: AC250U**

**FCC ID: N7NAC250U**

**REPORT NUMBER: 10U13334-2**

**ISSUE DATE: AUGUST 10, 2010**

*Prepared for*
**SIERRA WIRELESS INC.**
**2200 FARADAY AVENUE, SUITE 150**
**CALIFORNIA 92008, USA**

*Prepared by*
**COMPLIANCE CERTIFICATION SERVICES**
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NVLAP LAB CODE 200065-0

Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| --- | 08/10/10 | Initial Issue | T. Chan |

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SIERRA WIRELESS INC.
2200 FARADAY AVENUE, SUITE 150.
CARLSBAD, CA 92008, U.S.A.

**EUT DESCRIPTION:** USB MODEM WITH EXTERNAL MONOPOLE ANTENNA

**MODEL:** AC250U

**SERIAL NUMBER:** 3

**DATE TESTED:** AUGUST 04-09, 2010

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| FCC PART 27 SUBPART M | PASS |

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. 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 CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For CCS By:

THU CHAN
ENGINEERING MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

CHIN PANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603C (2004), FCC CFR 47 Part 2, and FCC CFR 47 Part 27M.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

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. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

## 4.3. MEASUREMENT UNCERTAINTY

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

| PARAMETER | UNCERTAINTY |
|---|---|
| Conducted Disturbance, 0.15 to 30 MHz | 3.52 dB |
| Radiated Disturbance, 30 to 1000 MHz | 4.94 dB |

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

# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

The EUT is a Multi band wireless modem operating on CDMA2000 1xRTT, EVDO and WiMax networks. The USB modem is manufactured by Sierra Wireless.

## 5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application is adding an external multi-band Monopole antenna for AC250U.

## 5.3. MAXIMUM RF CONDUCTED OUTPUT POWER

The test measurement passed within ± 0.5dBm of the original output power.

## 5.4. MAXIMUM RF RADIATED OUTPUT POWER

The transmitter has a maximum EIRP as follows:

| Mode | Channel | Frequency (MHz) | EIRP (dBm) | EIRP (mW) |
|---|---|---|---|---|
| 5MHz QPSK | Mid | 2593 | 26.40 | 436.52 |
| 5MHz 16QAM | Mid | 2593 | 26.20 | 416.87 |
| 10MHz QPSK | Mid | 2593 | 26.00 | 398.11 |
| 10MHz 16QAM | Mid | 2593 | 25.70 | 371.54 |

## 5.5. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an external multi-band monopole antenna for the 2500MHz band with a maximum peak gain of 3.7dBi.

## 5.6. SOFTWARE AND FIRMWARE

The test utility software used during testing was 4.0 Beceem Diagnostic Control Panel Version 3.4.0.

## 5.7. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

There are two ports as indicated antenna1 and antenna2. Antenna 1 and 2 has been investigated with external blade antenna, the higher output power was at antenna 2, and therefore, all radiated emissions were tested on antenna 2.

## 5.8. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| PERIPHERAL SUPPORT EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| Laptop | IBM | Thinkpad T60 | ZZ89085 | DoC |
| AC Adapter | IBM | 92P1158 | 570002150B | DoC |

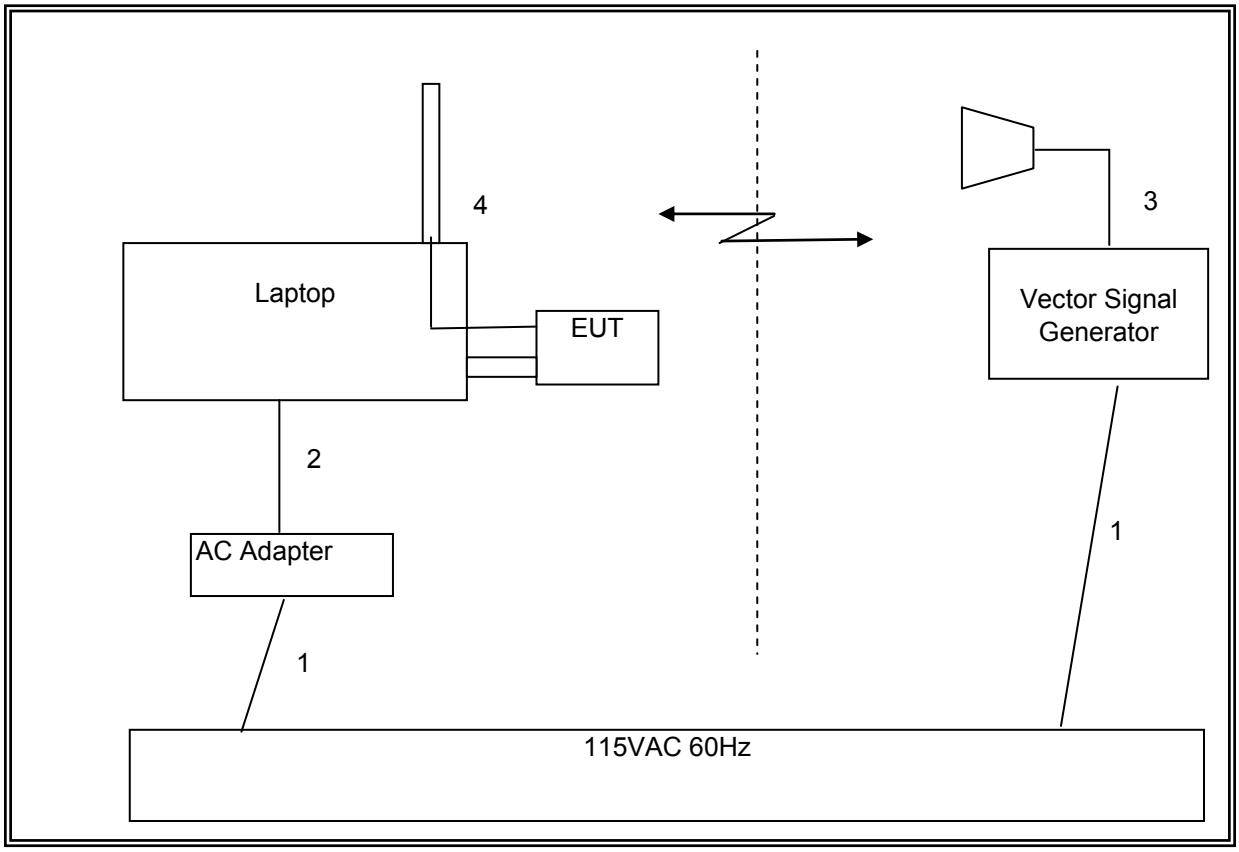
**I/O CABLES**

| I/O CABLE LIST | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No.** | **Port** | **# of Identica Ports** | **Connector Type** | **Cable Type** | **Cable Length** | **Remarks** |
| 1 | AC | 1 | US 115V | Un-shielded | 1.2m | NA |
| 2 | DC | 1 | DC | Un-shielded | 2m | NA |
| 3 | USB | 1 | EUT | Un-shielded | None | NA |
| 4 | RF In/Out | 1 | Antenna | Un-shielded | None | NA |

**TEST SETUP**

The EUT is inserted to the Laptop USB port during the tests. A Vector Signal Generator is used to establish link.

**SETUP DIAGRAM FOR RDIATED TESTS**



# 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** | **Asset** | **Cal Due** |
| Preamplifier, 26.5 GHz | Agilent / HP | 8449B | C01052 | 07/06/11 |
| Antenna, Horn, 18 GHz | EMCO | 3115 | C00945 | 08/04/11 |
| Preamplifier, 1300 MHz | Agilent / HP | 8447D | C00885 | 07/29/11 |
| Spectrum Analyzer, 26.5 GHz | Agilent / HP | E4440A | C01179 | 08/24/10 |
| Highpass Filter, 4.0 GHz | Micro-Tronics | HPM13351 | N02708 | N/A |
| Vector Signal Generator | Agilent / HP | E4438C | None | 09/28/11 |

# 7. RADIATED TEST RESULTS

## 7.1.1. RADIATED OUTPUT POWER (EIRP)

**LIMITS**

§2.1046 & §27.50 (h)(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

**TEST PROCEDURE**

ANSI / TIA / EIA 603 Clause 2.2.17& FCC 27

**RESULTS**

| Mode | Channel | Frequency (MHz) | EIRP (dBm) | EIRP (mW) |
|---|---|---|---|---|
| 5MHz QPSK | Low | 2498.5 | 26.00 | 398.11 |
| | Middle | 2593 | 26.40 | 436.52 |
| | High | 2687.5 | 26.00 | 398.11 |
| 5MHz 16QAM | Low | 2498.5 | 25.60 | 363.08 |
| | Middle | 2593 | 26.20 | 416.87 |
| | High | 2687.5 | 26.00 | 398.11 |
| 10MHz QPSK | Low | 2501 | 25.60 | 363.08 |
| | Middle | 2593 | 26.00 | 398.11 |
| | High | 2685 | 25.70 | 371.54 |
| 10MHz 16QAM | Low | 2501 | 25.60 | 363.08 |
| | Middle | 2593 | 25.70 | 371.54 |
| | High | 2685 | 25.70 | 371.54 |

**OUTPUT POWER (EIRP)**

5MHz_QPSK

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless
Project #: 10U13334
Date: 8/10/2010
Test Engineer: Chin Pang
Configuration: EUT and Laptop with external monopole antenna
Mode: QPSK_5MHz

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| 5m Chamber B | | | Part 27 |

| f GHz | SA reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Path Loss (dB) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | | | |
| 2.4985 | -15.8 | V | 3.0 | 41.8 | | | 26.0 | 33.0 | -7.0 | |
| 2.4985 | -22.3 | H | 3.0 | 39.8 | | | 17.5 | 33.0 | -15.5 | |
| | | | | | | | | | | |
| Mid Ch | | | | | | | | | | |
| 2.5930 | -15.7 | V | 3.0 | 42.1 | | | 26.4 | 33.0 | -6.6 | |
| 2.5930 | -22.6 | H | 3.0 | 40.4 | | | 17.8 | 33.0 | -15.2 | |
| | | | | | | | | | | |
| High Ch | | | | | | | | | | |
| 2.6875 | -16.5 | V | 3.0 | 42.4 | | | 26.0 | 33.0 | -7.0 | |
| 2.6875 | -23.8 | H | 3.0 | 41.0 | | | 17.2 | 33.0 | -15.8 | |
| | | | | | | | | | | |

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5MHz _16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless
Project #: 10U13334
Date: 8/10/10
Test Engineer: Chin Pang
Configuration: EUT and Laptop with external monopole antenna
Mode: 16QAM_5MHz

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| 5m Chamber B | | | Part 27 |

| f GHz | SA reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Path Loss (dB) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | | | |
| 2.4985 | -16.2 | V | 3.0 | 41.8 | | | 25.6 | 33.0 | -7.4 | |
| 2.4985 | -20.5 | H | 3.0 | 39.8 | | | 19.3 | 33.0 | -13.7 | |
| | | | | | | | | | | |
| Mid Ch | | | | | | | | | | |
| 2.5930 | -15.9 | V | 3.0 | 42.1 | | | 26.2 | 33.0 | -6.8 | |
| 2.5930 | -20.9 | H | 3.0 | 40.4 | | | 19.5 | 33.0 | -13.5 | |
| | | | | | | | | | | |
| High Ch | | | | | | | | | | |
| 2.6875 | -16.4 | V | 3.0 | 42.4 | | | 26.0 | 33.0 | -7.0 | |
| 2.6875 | -22.0 | H | 3.0 | 41.0 | | | 19.0 | 33.0 | -14.0 | |
| | | | | | | | | | | |

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10MHz_QPSK

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless
Project #: 10U13334
Date: 8/10/10
Test Engineer: Chin Pang
Configuration: EUT and Laptop with extenal monopole antenna
Mode: QPSK_10MHz

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| 5m Chamber B | | | Part 27 |

| f GHz | SA reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Path Loss (dB) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | | | |
| 2.501 | -16.2 | V | 3.0 | 41.8 | | | 25.6 | 33.0 | -7.4 | |
| 2.501 | -20.8 | H | 3.0 | 39.8 | | | 19.0 | 33.0 | -14.0 | |
| | | | | | | | | | | |
| Mid Ch | | | | | | | | | | |
| 2.593 | -16.1 | V | 3.0 | 42.1 | | | 26.0 | 33.0 | -7.0 | |
| 2.593 | -21.3 | H | 3.0 | 40.4 | | | 19.1 | 33.0 | -13.9 | |
| | | | | | | | | | | |
| High Ch | | | | | | | | | | |
| 2.685 | -16.7 | V | 3.0 | 42.4 | | | 25.7 | 33.0 | -7.3 | |
| 2.685 | -22.0 | H | 3.0 | 41.0 | | | 19.0 | 33.0 | -14.0 | |
| | | | | | | | | | | |

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10MHz _16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless
Project #: 10U13334
Date: 8/10/10
Test Engineer: Chin Pang
Configuration: EUT and Laptop with external monopole antenna
Mode: 16QAM_10MHz

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| 5m Chamber B | | | Part 27 |

| f GHz | SA reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Path Loss (dB) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| Low Ch | | | | | | | | | | |
| 2.501 | -16.2 | V | 3.0 | 41.8 | | | 25.6 | 33.0 | -7.4 | |
| 2.501 | -20.8 | H | 3.0 | 39.8 | | | 19.0 | 33.0 | -14.0 | |
| | | | | | | | | | | |
| Mid Ch | | | | | | | | | | |
| 2.593 | -16.4 | V | 3.0 | 42.1 | | | 25.7 | 33.0 | -7.3 | |
| 2.593 | -21.2 | H | 3.0 | 40.4 | | | 19.2 | 33.0 | -13.8 | |
| | | | | | | | | | | |
| High Ch | | | | | | | | | | |
| 2.685 | -16.7 | V | 3.0 | 42.4 | | | 25.7 | 33.0 | -7.3 | |
| 2.685 | -21.6 | H | 3.0 | 41.0 | | | 19.4 | 33.0 | -13.6 | |
| | | | | | | | | | | |

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## 7.1.2. FIELD STRENGTH OF SPURIOUS RADIATION

**LIMIT**

§2.1053

§27.53 (m)(4) For mobile digital stations, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge and 55 + 10 log (P) dB at 5.5 megahertz from the channel edges.

**TEST PROCEDURE**

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 27

**RESULTS**

**SPURIOUS & HARMONIC**

**Below 1GHz at 5MHZ Bandwidth (Worst Case)**

Compliance Certification Services
30 - 1000MHz Substitution Measurement

Company: Sierra Wireless
Project #: 10U13334
Date: 8/9/10
Test Engineer: Chin Pang
Configuration: EUT and Laptop with external monopole antenna
Mode: QPSK_5MHz (T5D29U184Q34S85)

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| 5m Chamber B | T10 8447D | | Part 27 |

| f MHz | SA reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Path Loss (dB) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| 232.80 | -50.0 | V | 3.0 | 21.4 | 29.0 | | -55.5 | -25.0 | -30.5 | |
| 233.70 | -54.0 | V | 3.0 | 21.4 | 29.0 | | -59.5 | -25.0 | -34.5 | |
| 298.70 | -52.1 | V | 3.0 | 23.2 | 28.8 | | -55.5 | -25.0 | -30.5 | |
| 433.30 | -50.1 | V | 3.0 | 26.2 | 29.4 | | -51.2 | -25.0 | -26.2 | |
| 233.00 | -52.0 | H | 3.0 | 18.5 | 29.0 | | -60.3 | -25.0 | -35.3 | |
| 300.00 | -44.9 | H | 3.0 | 22.2 | 28.8 | | -49.4 | -25.0 | -24.4 | |
| 335.00 | -54.0 | H | 3.0 | 22.4 | 28.9 | | -58.4 | -25.0 | -33.4 | |
| 430.00 | -55.0 | H | 3.0 | 23.5 | 29.4 | | -58.8 | -25.0 | -33.8 | |

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**Below 1GHz at 10MHZ Bandwidth (Worst Case)**

Compliance Certification Services
30 - 1000MHz Substitution Measurement

Company: Sierra Wireless
Project #: 10U13334
Date: 8/9/10
Test Engineer: Chin Pang
Configuration: EUT and Laptop with external monopole antenna
Mode: QPSK_10MHz (T10D29U184Q34175)

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| 5m Chamber B | T10 8447D | | Part 27 |

| f MHz | SA reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Path Loss (dB) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| 55.78 | -63.1 | V | 3.0 | 32.7 | 29.6 | | -57.8 | -25.0 | -32.8 | |
| 89.78 | -55.0 | V | 3.0 | 18.9 | 29.5 | | -63.5 | -25.0 | -38.5 | |
| 232.00 | -52.0 | V | 3.0 | 21.4 | 29.0 | | -57.5 | -25.0 | -32.5 | |
| 300.00 | -50.4 | V | 3.0 | 23.3 | 28.8 | | -53.7 | -25.0 | -28.7 | |
| 365.00 | -52.2 | V | 3.0 | 24.7 | 29.1 | | -54.4 | -25.0 | -29.4 | |
| 233.30 | -55.0 | H | 3.0 | 18.6 | 29.0 | | -63.3 | -25.0 | -38.3 | |
| 298.70 | -50.0 | H | 3.0 | 22.1 | 28.8 | | -54.6 | -25.0 | -29.6 | |
| 365.00 | -52.3 | H | 3.0 | 22.7 | 29.1 | | -56.6 | -25.0 | -31.6 | |
| 433.30 | -48.0 | H | 3.0 | 23.6 | 29.4 | | -51.7 | -25.0 | -26.7 | |
| | | | | | | | | | | |
| | | | | | | | | | | |

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**Above 1GHz**

**QPSK_5MHz**

5MHz_QPSK

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

**Company: Sierra Wireless**
**Project #: 10U13334**
**Date: 8/4/10**
**Test Engineer: Chin Pang**
**Configuration: EUT and Laptop with external monopole antenna**
**Mode: QPSK_5MHz (T5D29U184Q34S85)**

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| 5m Chamber B | T145 8449B | Filter 1 | Part 27 |

| f GHz | SA reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Path Loss (dB) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| 2498.5MHz | | | | | | | | | | |
| 4.997 | -50.7 | H | 3.0 | 48.9 | 35.3 | 1.0 | -36.1 | -25.0 | -11.1 | |
| 7.495 | -51.5 | H | 3.0 | 53.1 | 35.7 | 1.0 | -33.1 | -25.0 | -8.1 | |
| 4.997 | -51.7 | V | 3.0 | 48.3 | 35.3 | 1.0 | -37.7 | -25.0 | -12.7 | |
| 7.495 | -56.0 | V | 3.0 | 51.4 | 35.7 | 1.0 | -39.3 | -25.0 | -14.3 | |
| | | | | | | | | | | |
| 2593MHz | | | | | | | | | | |
| 5.186 | -54.0 | H | 3.0 | 49.4 | 35.3 | 1.0 | -39.0 | -25.0 | -14.0 | |
| 7.779 | -52.7 | H | 3.0 | 53.4 | 35.7 | 1.0 | -34.0 | -25.0 | -9.0 | |
| 5.186 | -53.8 | V | 3.0 | 48.8 | 35.3 | 1.0 | -39.4 | -25.0 | -14.4 | |
| 7.779 | -52.9 | V | 3.0 | 51.8 | 35.7 | 1.0 | -35.8 | -25.0 | -10.8 | |
| | | | | | | | | | | |
| 2687.5MHz | | | | | | | | | | |
| 5.375 | -50.8 | H | 3.0 | 49.7 | 35.4 | 1.0 | -35.5 | -25.0 | -10.5 | |
| 8.062 | -51.8 | H | 3.0 | 53.7 | 35.7 | 1.0 | -32.7 | -25.0 | -7.7 | |
| 10.750 | -62.5 | H | 3.0 | 56.0 | 35.0 | 1.0 | -40.5 | -25.0 | -15.5 | |
| 5.375 | -53.8 | V | 3.0 | 49.0 | 35.4 | 1.0 | -39.2 | -25.0 | -14.2 | |
| 8.062 | -46.8 | V | 3.0 | 52.1 | 35.7 | 1.0 | -29.4 | -25.0 | -4.4 | |
| 10.750 | -61.0 | V | 3.0 | 55.4 | 35.0 | 1.0 | -39.6 | -25.0 | -14.6 | |
| | | | | | | | | | | |

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

**16QAM_5MHz**

5MHz_16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless
Project #: 10u13334
Date: 8/6/10
Test Engineer: Chin Pang
Configuration: EUT AND Laptop with external monopole antenna
Mode: 16QAM_5MHz (T5D29U1816Q34S85)

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| 5m Chamber B | T145 8449B | Filter 1 | Part 27 |

| f GHz | SA reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Path Loss (dB) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| 2498.5MHz | | | | | | | | | | |
| 4.997 | -53.7 | H | 3.0 | 48.9 | 35.3 | 1.0 | -39.1 | -25.0 | -14.1 | |
| 7.495 | -51.0 | H | 3.0 | 53.1 | 35.7 | 1.0 | -32.6 | -25.0 | -7.6 | |
| 4.997 | -48.9 | V | 3.0 | 48.3 | 35.3 | 1.0 | -34.9 | -25.0 | -9.9 | |
| 7.495 | -55.8 | V | 3.0 | 51.4 | 35.7 | 1.0 | -39.1 | -25.0 | -14.1 | |
| | | | | | | | | | | |
| 2593MHz | | | | | | | | | | |
| 5.186 | -56.0 | H | 3.0 | 49.4 | 35.3 | 1.0 | -41.0 | -25.0 | -16.0 | |
| 7.779 | -56.6 | H | 3.0 | 53.4 | 35.7 | 1.0 | -37.9 | -25.0 | -12.9 | |
| 5.186 | -53.4 | V | 3.0 | 48.8 | 35.3 | 1.0 | -39.0 | -25.0 | -14.0 | |
| 7.779 | -52.6 | V | 3.0 | 51.8 | 35.7 | 1.0 | -35.5 | -25.0 | -10.5 | |
| | | | | | | | | | | |
| 2687.5MHz | | | | | | | | | | |
| 5.375 | -54.0 | H | 3.0 | 49.7 | 35.4 | 1.0 | -38.7 | -25.0 | -13.7 | |
| 8.062 | -51.3 | H | 3.0 | 53.7 | 35.7 | 1.0 | -32.2 | -25.0 | -7.2 | |
| 5.375 | -56.0 | V | 3.0 | 49.0 | 35.4 | 1.0 | -41.4 | -25.0 | -16.4 | |
| 8.062 | -48.0 | V | 3.0 | 52.1 | 35.7 | 1.0 | -30.6 | -25.0 | -5.6 | |
| | | | | | | | | | | |

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

10MHz_QPSK

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless
Project #: 10U13334
Date: 8/6/10
Test Engineer: Chin Pang
Configuration: EUT and Laptop with external monopole antenna
Mode: QPSK_10MHz (T10D29U184Q34S175)

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| 5m Chamber B | T145 8449B | Filter 1 | Part 27 |

| f GHz | SA reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Path Loss (dB) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| 2501MHz | | | | | | | | | | |
| 5.002 | -48.1 | H | 3.0 | 48.9 | 35.3 | 1.0 | -33.5 | -25.0 | -8.5 | |
| 7.503 | -53.2 | H | 3.0 | 53.1 | 35.7 | 1.0 | -34.8 | -25.0 | -9.8 | |
| 5.002 | -53.3 | V | 3.0 | 48.3 | 35.3 | 1.0 | -39.3 | -25.0 | -14.3 | |
| 7.503 | -56.0 | V | 3.0 | 51.4 | 35.7 | 1.0 | -39.3 | -25.0 | -14.3 | |
| | | | | | | | | | | |
| 2593MHz | | | | | | | | | | |
| 5.186 | -52.4 | H | 3.0 | 49.4 | 35.3 | 1.0 | -37.4 | -25.0 | -12.4 | |
| 7.779 | -58.6 | H | 3.0 | 53.4 | 35.7 | 1.0 | -39.9 | -25.0 | -14.9 | |
| 5.186 | -54.5 | V | 3.0 | 48.8 | 35.3 | 1.0 | -40.1 | -25.0 | -15.1 | |
| 7.779 | -60.0 | V | 3.0 | 51.8 | 35.7 | 1.0 | -42.9 | -25.0 | -17.9 | |
| | | | | | | | | | | |
| 2685MHz | | | | | | | | | | |
| 5.370 | -49.7 | H | 3.0 | 49.7 | 35.4 | 1.0 | -34.4 | -25.0 | -9.4 | |
| 8.055 | -55.6 | H | 3.0 | 53.7 | 35.7 | 1.0 | -36.6 | -25.0 | -11.6 | |
| 5.370 | -56.1 | V | 3.0 | 49.0 | 35.4 | 1.0 | -41.5 | -25.0 | -16.5 | |
| 8.055 | -55.7 | V | 3.0 | 52.1 | 35.7 | 1.0 | -38.3 | -25.0 | -13.3 | |
| | | | | | | | | | | |

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

10MHz_16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Sierra Wireless
Project #: 10U13334
Date: 8/6/10
Test Engineer: Chin Pang
Configuration: EUT and Laptop with external monopole antenna
Mode: 16QAM_10MHz (T10D29U1816Q12S175)

| Chamber | Pre-amplifer | Filter | Limit |
|---|---|---|---|
| 5m Chamber B | T145 8449B | Filter 1 | Part 27 |

| f GHz | SA reading (dBm) | Ant. Pol. (H/V) | Distance (m) | Path Loss (dB) | Preamp (dB) | Filter (dB) | EIRP (dBm) | Limit (dBm) | Delta (dB) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| 2501MHz | | | | | | | | | | |
| 5.002 | -56.0 | H | 3.0 | 48.9 | 35.3 | 1.0 | -41.4 | -25.0 | -16.4 | |
| 7.503 | -54.0 | H | 3.0 | 53.1 | 35.7 | 1.0 | -35.6 | -25.0 | -10.6 | |
| 5.002 | -53.2 | V | 3.0 | 48.3 | 35.3 | 1.0 | -39.2 | -25.0 | -14.2 | |
| 7.503 | -56.8 | V | 3.0 | 51.4 | 35.7 | 1.0 | -40.1 | -25.0 | -15.1 | |
| | | | | | | | | | | |
| 2593MHz | | | | | | | | | | |
| 5.186 | -51.4 | H | 3.0 | 49.4 | 35.3 | 1.0 | -36.4 | -25.0 | -11.4 | |
| 7.779 | -56.0 | H | 3.0 | 53.4 | 35.7 | 1.0 | -37.3 | -25.0 | -12.3 | |
| 5.186 | -57.6 | V | 3.0 | 48.8 | 35.3 | 1.0 | -43.2 | -25.0 | -18.2 | |
| 7.779 | -59.0 | V | 3.0 | 51.8 | 35.7 | 1.0 | -41.9 | -25.0 | -16.9 | |
| | | | | | | | | | | |
| 2685MHz | | | | | | | | | | |
| 5.370 | -52.8 | H | 3.0 | 49.7 | 35.4 | 1.0 | -37.5 | -25.0 | -12.5 | |
| 8.055 | -53.3 | H | 3.0 | 53.7 | 35.7 | 1.0 | -34.3 | -25.0 | -9.3 | |
| 5.370 | -56.8 | V | 3.0 | 49.0 | 35.4 | 1.0 | -42.2 | -25.0 | -17.2 | |
| 8.055 | -55.5 | V | 3.0 | 52.1 | 35.7 | 1.0 | -38.1 | -25.0 | -13.1 | |
| | | | | | | | | | | |

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