



**RADIATED SPURIOUS EMISSIONS PORTIONS OF**

**FCC CFR47 PART 22 SUBPART H**

**FCC CFR47 PART 24 SUBPART E**

**FCC CFR47 PART 27 SUBPART L**

**CERTIFICATION TEST REPORT  
FOR**

**USB MODEM**

**FCC MODEL NUMBER: AIRCARD 313U**

**FCC ID: N7NAC313U**

**REPORT NUMBER: 10U13021-3**

**ISSUE DATE: JANUARY 03, 2011**

*Prepared for*

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

*Prepared by*

**COMPLIANCE CERTIFICATION SERVICES (UL CCS)  
47173 BENICIA STREET  
FREMONT, CA 94538, U.S.A.  
TEL: (510) 771-1000  
FAX: (510) 661-0888**



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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SIERRA WIRELESS INC.  
3811 WIRELESS WAY  
RICHMOND; BC V6V 3A4; CANADA

**EUT DESCRIPTION:** USB MODEM

**MODEL:** AIRCARD313U

**SERIAL NUMBER:** 2

**DATE TESTED:** DECEMBER 13 TO 23, 2010

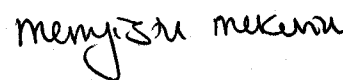
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22H, 24E, AND 27L	PASS (Radiated Portion)

Compliance Certification Services, Inc. (UL 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 UL 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 UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS 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 UL CCS By:

Tested By:



THU CHAN  
ENGINEERING MANAGER  
UL CCS

MENGISTU MEKURIA  
EMC ENGINEER  
UL CCS

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24, FCC Part 27, RSS-132 Issue 2, RSS-133 Issue 5 and RSS-139 Issue 2.

## 3. FACILITIES AND ACCREDITATION

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

UL 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:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

### 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 GSM/EDGE quad-band, UMTS tri-band, and LTE dual-band USB Modem that is manufactured by Sierra Wireless.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum ERP & EIRP output powers as follows:

#### GPRS

824 to 849 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low CH - 824.2	GPRS	27.9	616.6
Mid CH - 836.6		28.9	776.2
High CH - 848.8		28.9	776.2

1850 to 1910 MHz Authorized Band

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low CH - 1850.2	GPRS	29.6	912.0
Mid CH - 1880.00		29.6	912.0
High CH - 1909.8		31.1	1288.2

**EGPRS**

824 to 849 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low CH - 824.2	EGPRS	25.7	371.5
Mid CH - 836.6		26.6	457.1
High CH - 848.8		26.7	467.7

1850 to 1910 MHz Authorized Band

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low CH - 1850.2	EGPRS	26.6	457.1
Mid CH - 1880.00		28.6	724.4
High CH - 1909.8		28.3	676.1

**WCDMA**

824 to 849 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low CH - 826.4	WCDMA	20.6	114.8
Mid CH - 836.6		21.3	134.9
High CH - 846.6		21.7	147.9

1850 to 1910 MHz Authorized Band

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low CH - 1854.2	WCDMA	25.6	363.1
Mid CH - 1880.00		26.8	478.6
High CH - 1907.6		27.8	602.6



**LTE BAND 17**

706.5 to 713.5 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low CH - 706.5	5 MHz BAND-QPSK	25.8	380.2
Mid CH - 710.0		24.0	251.2
High CH - 713.5		24.0	251.2

709.0 to 711.0 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low CH - 709.0	10 MHz BAND-QPSK	25.3	338.8
Mid CH - 710.0		24.2	263.0
High CH - 711.0		25.6	363.1

706.5 to 713.5 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low CH - 706.5	5 MHz BAND-16QAM	26.0	398.1
Mid CH - 710.0		24.3	269.2
High CH - 713.5		24.5	281.8

709.0 to 711.0 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low CH - 709.0	10 MHz BAND-16QAM	25.4	346.7
Mid CH - 710.0		25.2	331.1
High CH - 711.0		25.5	354.8

**LTE BAND 4**

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low CH - 1712.5	5 MHz BAND-QPSK	25.9	389.0
Mid CH - 1732.5		25.8	380.2
High CH - 1752.5		25.0	316.2

1715.1 to 1749.9 MHz Authorized Band

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low CH - 1715.1	10 MHz BAND-QPSK	27.2	524.8
Mid CH - 1732.5		25.6	363.1
High CH - 1749.9		25.8	380.2

1712.5 to 1752.5 MHz Authorized Band

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low CH - 1712.5	5 MHz BAND-16QAM	25.3	338.8
Mid CH - 1732.5		26.2	416.9
High CH - 1752.5		25.1	323.6

1715.1 to 1749.9 MHz Authorized Band

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low CH - 1715.1	10 MHz BAND-16QAM	26.6	457.1
Mid CH - 1732.5		26.0	398.1
High CH - 1749.9		26.0	398.1

### **5.3. SOFTWARE AND FIRMWARE**

The EUT is linked with Agilent /HP E5515C and R&S CMW500 Communication Test Sets.

### **5.4. WORST-CASE CONFIGURATION AND MODE**

The worst-position is the EUT with highest emissions. To determine the worst-case, the EUT was investigated for horizontal and vertical-Positions, after the investigations, the worst-position was turned out to be horizontal-position for Cell band and band 17 and vertical-position PCS band and band 4.

Based on the conducted output power measurement date GPRS, EGPRS, WCDMA, and LTE are chosen as worst case from each modulation group.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
LAPTOP	LENOVO	T60L3-AE514	936S-001Y	DoC
AC/DC Adapter	IBM	92P1111	11S92P1111Z1ZACV5C5OZX	DoC

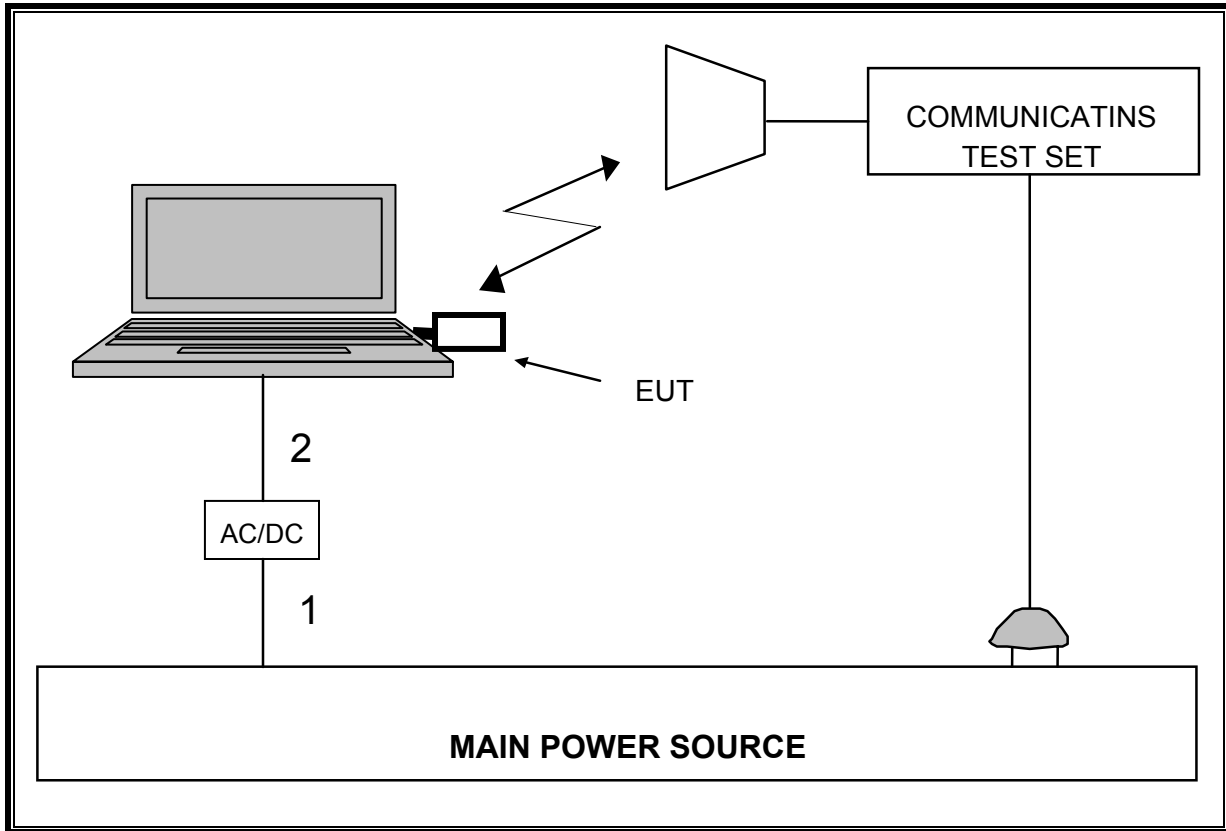
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC Input	1	AC	Un-Shielded	1.0 m	N/A
2	DC output	1	DC	Un-Shielded	2.0 m	Ferrite at one end

### TEST SETUP

The EUT is a USB Modem that is plugged into the support laptop, and Communications Test Set is used to link the device under test.

**SETUP DIAGRAM FOR 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	07/14/11
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07/14/11
Antenna, Horn, 18 GHz	EMCO	3115	C00783	06/29/11
Antenna, Horn, 18 GHz	EMCO	3115	C00943	CNR
Antenna, Horn, 18 GHz	EMCO	3115	C00945	06/29/11
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07/12/11
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01016	07/12/11
Dipole	Speag	D900V2	NA	11/16/11
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689	CNR
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Communications Test Set	Agilent / HP	E5515C	C01086	06/17/11
Communications Test Set	R&S	CMW500		10/21/11
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/30/11
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	03/05/11
Signal Generator, 20 GHz	Agilent / HP	83732B	C00774	07/14/12

## **7. LIMITS AND RESULTS**

### **7.1. RADIATED OUTPUT POWER**

#### **LIMITS**

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.

27.50 (c)(10) The following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band: Portable stations (hand-held devices) are limited to 3 watts ERP.

27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

#### **TEST PROCEDURE**

ANSI / TIA / EIA 603 Clause 2.2.17.

#### **RESULTS**

**GPRS**

**CELL OUTPUT POWER (ERP)**

High Frequency Substitution Measurement Compliance Certification Services Chamber A							
<b>Company:</b>	SIERRA WIRELESS						
<b>Project #:</b>	10U13530						
<b>Date:</b>	12/21/2010						
<b>Test Engineer:</b>	MENGISTU MEKURIA						
<b>Configuration:</b>	EUT WITH SUPPORT LAPTOP						
<b>Mode:</b>	TX, GPRS CELL BAND						
<b><u>Test Equipment:</u></b>							
Receiving: Sunol T122, and 3m Chamber N-type Cable (Setup this one for testing EUT)							
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.							
f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	-12.0	V	34.8	22.8	38.5	-15.7	
824.20	-2.7	H	30.5	27.9	38.5	-10.6	
836.60	-11.4	V	33.1	21.7	38.5	-16.7	
836.60	-2.3	H	31.2	28.9	38.5	-9.6	
848.80	-11.1	V	32.1	21.1	38.5	-17.4	
848.80	-2.3	H	31.2	28.9	38.5	-9.5	
Rev. 1.24.7							



**PCS OUTPUT POWER (EIRP)**

<b>Company:</b>	SIERRA WIRELESS						
<b>Project #:</b>	10U13530						
<b>Date:</b>	12/21/2010						
<b>Test Engineer:</b>	MENGISTU MEKURIA						
<b>Configuration:</b>	EUT WITH SUPPORT LAPTOP						
<b>Mode:</b>	TX, GPRS PCS BAND						
<b><u>Test Equipment:</u></b>							
Receiving: Horn T73, and Camber A SMA Cables							
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse							
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	-12.6	V	36.5	23.9	33.0	-9.1	
1.850	-6.3	H	35.8	29.6	33.0	-3.4	
1.880	-13.3	V	36.7	23.4	33.0	-9.6	
1.880	-6.9	H	36.5	29.6	33.0	-3.4	
1.910	-11.6	V	36.8	25.3	33.0	-7.7	
1.910	-5.6	H	36.7	31.1	33.0	-1.9	
Rev. 1.24.7							

**EGPRS**

**CELL OUTPUT POWER (ERP)**

High Frequency Substitution Measurement Compliance Certification Services Chamber A							
<b>Company:</b>	SIERRA WIRELESS						
<b>Project #:</b>	10U13530						
<b>Date:</b>	12/21/2010						
<b>Test Engineer:</b>	MENGISTU MEKURIA						
<b>Configuration:</b>	EUT WITH SUPPORT LAPTOP						
<b>Mode:</b>	TX, EGPRS CELL BAND						
<b>Test Equipment:</b>							
Receiving: Sunol T122, and 3m Chamber N-type Cable (Setup this one for testing EUT)							
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.							
f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	-13.6	V	34.8	21.2	38.5	-17.2	
824.20	-4.9	H	30.5	25.7	38.5	-12.8	
836.60	-12.8	V	33.1	20.3	38.5	-18.1	
836.60	-4.6	H	31.2	26.6	38.5	-11.9	
848.80	-12.6	V	32.1	19.6	38.5	-18.9	
848.80	-4.5	H	31.2	26.7	38.5	-11.7	
Rev. 1.24.7							

**PCS OUTPUT POWER (EIRP)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber A							
<b>Company:</b>		SIERRA WIRELESS					
<b>Project #:</b>		10U13530					
<b>Date:</b>		12/21/2010					
<b>Test Engineer:</b>		MENGISTU MEKURIA					
<b>Configuration:</b>		EUT WITH SUPPORT LAPTOP					
<b>Mode:</b>		TX, EGPRS PCS BAND					
<b>Test Equipment:</b>							
Receiving: Horn T73, and Camber B SMA Cables							
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse							
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	-12.6	V	36.5	23.9	33.0	-9.1	
1.850	-9.3	H	35.8	26.6	33.0	-6.4	
	2.1						
1.880	-13.3	V	36.7	23.4	33.0	-9.6	
1.880	-7.9	H	36.5	28.6	33.0	-4.4	
	2.1						
1.910	-13.7	V	36.8	23.1	33.0	-9.9	
1.910	-8.4	H	36.7	28.3	33.0	-4.7	
Rev. 1.24.7							

**WCDMA**

**CELL OUTPUT POWER (ERP)**

High Frequency Substitution Measurement Compliance Certification Services Chamber A							
<b>Company:</b>	SIERRA WIRELESS						
<b>Project #:</b>	10U13530						
<b>Date:</b>	12/27/2010						
<b>Test Engineer:</b>	MENGISTU MEKURIA						
<b>Configuration:</b>	EUT WITH SUPPORT LAPTOP						
<b>Mode:</b>	TX, WCDMA CELL BAND						
<b>Test Equipment:</b>							
Receiving: Sunol T122, and 3m Chamber N-type Cable (Setup this one for testing EUT)							
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.							
f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
826.40	-16.6	V	34.8	18.2	38.5	-20.3	
826.40	-10.0	H	30.5	20.6	38.5	-17.9	
836.60	-16.0	V	33.1	17.1	38.5	-21.3	
836.60	-9.8	H	31.2	21.3	38.5	-17.1	
846.60	-16.3	V	32.1	15.9	38.5	-22.6	
846.60	-9.5	H	31.2	21.7	38.5	-16.7	
Rev. 1.24.7							

**PCS OUTPUT POWER (EIRP)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber A							
<b>Company:</b>		SIERRA WIRELESS					
<b>Project #:</b>		10U13530					
<b>Date:</b>		12/21/2010					
<b>Test Engineer:</b>		MENGISTU MEKURIA					
<b>Configuration:</b>		EUT WITH SUPPORT LAPTOP					
<b>Mode:</b>		TX, WCDMA PCS BAND					
<b>Test Equipment:</b>							
Receiving: Horn T73, and Camber B SMA Cables							
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse							
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.852	-16.5	V	39.8	23.3	33.0	-9.7	
1.852	-13.5	H	39.1	25.6	33.0	-7.4	
1.880	-17.3	V	40.0	22.7	33.0	-10.3	
1.880	-13.0	H	39.8	26.8	33.0	-6.2	
1.908	-17.1	V	40.1	23.0	33.0	-10.0	
1.908	-12.2	H	40.0	27.8	33.0	-5.2	
Rev. 1.24.7							

**LTE**

**BAND 17, QPSK 5 MHz BANDWIDTH (ERP)**

High Frequency Substitution Measurement Compliance Certification Services Chamber A							
<b>Company:</b>		SIERRA WIRELESS					
<b>Project #:</b>		10U13530					
<b>Date:</b>		12/20/2010					
<b>Test Engineer:</b>		MENGISTU MEKURIA					
<b>Configuration:</b>		EUT WITH SUPPORT LAPTOP					
<b>Mode:</b>		TX, QPSK_5MHZ BW_RB1_LTE BAND					
<b>Test Equipment:</b>							
Receiving: Sunol T122, and 3m Chamber N-type Cable (Setup this one for testing EUT)							
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.							
f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
706.50	-10.7	V	34.8	24.0	34.8	-10.8	
706.50	-4.8	H	30.5	25.8	34.8	-9.0	
710.00	-12.7	V	33.1	20.4	34.8	-14.4	
710.00	-7.2	H	31.2	24.0	34.8	-10.8	
713.50	-11.8	V	32.1	20.3	34.8	-14.5	
713.50	-7.2	H	31.2	24.0	34.8	-10.8	
Rev. 1.24.7							

**BAND 17, QPSK 10 MHz BANDWIDTH (ERP)**

High Frequency Substitution Measurement Compliance Certification Services Chamber A							
<b>Company:</b>	SIERRA WIRELESS						
<b>Project #:</b>	10U13530						
<b>Date:</b>	12/20/2010						
<b>Test Engineer:</b>	MENGISTU MEKURIA						
<b>Configuration:</b>	EUT WITH SUPPORT LAPTOP						
<b>Mode:</b>	TX, QPSK_10MHZ BW_RB12_LTE BAND						
<b>Test Equipment:</b>							
Receiving: Sunol T122, and 3m Chamber N-type Cable (Setup this one for testing EUT)							
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.							
f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
709.00	-9.9	V	34.8	24.8	34.8	-10.0	
709.00	-5.3	H	30.5	25.3	34.8	-9.5	
710.00	-12.2	V	33.1	20.9	34.8	-13.9	
710.00	-7.0	H	31.2	24.2	34.8	-10.6	
711.00	-10.5	V	32.1	21.6	34.8	-13.2	
711.00	-5.7	H	31.2	25.6	34.8	-9.2	
Rev. 1.24.7							

**BAND 17, 16QAM 5 MHz BANDWIDTH (ERP)**

High Frequency Substitution Measurement Compliance Certification Services Chamber A							
<b>Company:</b>	SIERRA WIRELESS						
<b>Project #:</b>	10U13530						
<b>Date:</b>	12/20/2010						
<b>Test Engineer:</b>	MENGISTU MEKURIA						
<b>Configuration:</b>	EUT WITH SUPPORT LAPTOP						
<b>Mode:</b>	TX, 16QAM_5MHZ BW_RB1_LTE BAND						
<b>Test Equipment:</b>							
Receiving: Suno1 T122, and 3m Chamber N-type Cable (Setup this one for testing EUT)							
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.							
f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
706.50	-10.5	V	34.8	24.3	34.8	-10.5	
706.50	-4.5	H	30.5	26.0	34.8	-8.8	
710.00	-12.3	V	33.1	20.8	34.8	-14.0	
710.00	-6.8	H	31.2	24.3	34.8	-10.5	
713.50	-11.6	V	32.1	20.5	34.8	-14.3	
713.50	-6.7	H	31.2	24.5	34.8	-10.3	
Rev. 1.24.7							



**BAND 17, 16QAM 10 MHz BANDWIDTH (ERP)**

High Frequency Substitution Measurement Compliance Certification Services Chamber A							
<b>Company:</b>	SIERRA WIRELESS						
<b>Project #:</b>	10U13530						
<b>Date:</b>	12/20/2010						
<b>Test Engineer:</b>	MENGISTU MEKURIA						
<b>Configuration:</b>	EUT WITH SUPPORT LAPTOP						
<b>Mode:</b>	TX, 16QAM_10MHZ BW_RB12_LTE BAND						
<b>Test Equipment:</b>							
Receiving: Sunol T122, and 3m Chamber N-type Cable (Setup this one for testing EUT)							
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.							
f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
709.00	-10.1	V	34.8	24.7	34.8	-10.1	
709.00	-5.2	H	30.5	25.4	34.8	-9.4	
710.00	-11.2	V	33.1	21.9	34.8	-12.9	
710.00	-6.0	H	31.2	25.2	34.8	-9.6	
711.00	-10.4	V	32.1	21.7	34.8	-13.1	
711.00	-5.7	H	31.2	25.5	34.8	-9.3	
Rev. 1.24.7							

**BAND 4, QPSK 5 MHz BANDWIDTH (EIRP)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber A							
<b>Company:</b>		SIERRA WIRELESS					
<b>Project #:</b>		10U13530					
<b>Date:</b>		12/19/2010					
<b>Test Engineer:</b>		MENGISTU MEKURIA					
<b>Configuration:</b>		EUT WITH SUPPORT LAPTOP					
<b>Mode:</b>		TX, QPSK_5MHZ BW_RB1_LTE BAND					
<b><u>Test Equipment:</u></b>							
Receiving: Horn T73, and Camber B SMA Cables							
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse							
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.713	-14.6	V	36.5	21.9	30.0	-8.1	
1.713	-9.9	H	35.8	25.9	30.0	-4.1	
1.733	-15.5	V	36.7	21.2	30.0	-8.9	
1.733	-10.7	H	36.5	25.8	30.0	-4.2	
1.753	-16.0	V	36.8	20.9	30.0	-9.2	
1.753	-11.7	H	36.7	25.0	30.0	-5.0	
Rev. 1.24.7							

**BAND 4, QPSK 10 MHz BANDWIDTH (EIRP)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber A							
<b>Company:</b>		SIERRA WIRELESS					
<b>Project #:</b>		10U13530					
<b>Date:</b>		12/19/2010					
<b>Test Engineer:</b>		MENGISTU MEKURIA					
<b>Configuration:</b>		EUT WITH SUPPORT LAPTOP					
<b>Mode:</b>		TX, QPSK_10MHZ BW_RB12_LTE BAND					
<b><u>Test Equipment:</u></b>							
Receiving: Horn T73, and Camber B SMA Cables							
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse							
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.715	-13.9	V	36.5	22.6	30.0	-7.4	
1.715	-8.6	H	35.8	27.2	30.0	-2.8	
1.733	-15.0	V	36.7	21.6	30.0	-8.4	
1.733	-10.9	H	36.5	25.6	30.0	-4.4	
1.750	-15.4	V	36.8	21.4	30.0	-8.6	
1.750	-10.9	H	36.7	25.8	30.0	-4.2	
Rev. 1.24.7							

**BAND 4, 16QAM 5 MHz BANDWIDTH (EIRP)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber A							
<b>Company:</b>	SIERRA WIRELESS						
<b>Project #:</b>	10U13530						
<b>Date:</b>	12/19/2010						
<b>Test Engineer:</b>	MENGISTU MEKURIA						
<b>Configuration:</b>	EUT WITH SUPPORT LAPTOP						
<b>Mode:</b>	TX, 16QAM_5MHZ BW_RB1_LTE BAND						
<b><u>Test Equipment:</u></b>							
Receiving: Horn T73, and Camber B SMA Cables							
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse							
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.713	-14.1	V	36.5	22.4	30.0	-7.6	
1.713	-10.5	H	35.8	25.3	30.0	-4.7	
1.733	-15.0	V	36.7	21.6	30.0	-8.4	
1.733	-10.3	H	36.5	26.2	30.0	-3.8	
1.753	-15.8	V	36.8	21.1	30.0	-9.0	
1.753	-11.6	H	36.7	25.1	30.0	-4.9	
Rev. 1.24.7							

**BAND 4, 16QAM 10 MHz BANDWIDTH (EIRP)**

High Frequency Fundamental Measurement Compliance Certification Services Chamber A							
<b>Company:</b>		SIERRA WIRELESS					
<b>Project #:</b>		10U13530					
<b>Date:</b>		12/19/2010					
<b>Test Engineer:</b>		MENGISTU MEKURIA					
<b>Configuration:</b>		EUT WITH SUPPORT LAPTOP					
<b>Mode:</b>		TX, 16QAM_10MHZ BW_RB12_LTE BAND					
<b>Test Equipment:</b>							
Receiving: Horn T73, and Camber B SMA Cables							
Substitution: Horn T72 Substitution, 6ft SMA Cable (208947003) Warehouse							
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Path Loss (dBm)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.715	-13.4	V	36.5	23.1	30.0	-6.9	
1.715	-9.2	H	35.8	26.6	30.0	-3.4	
1.733	-14.5	V	36.7	22.1	30.0	-7.9	
1.733	-10.5	H	36.5	26.0	30.0	-4.1	
1.750	-15.2	V	36.8	21.6	30.0	-8.4	
1.750	-10.7	H	36.7	26.0	30.0	-4.1	
Rev. 1.24.7							

## 7.2. 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.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log_{10}(P)$  dB.

### TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 22.917 (b), FCC 24.238 (b), & FCC 27.53 (g), (h)(1)(2)(3).

### RESULTS

**GPRS**

**CELL SPURIOUS & HARMONIC (ERP)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement											
Company:		SIERRA WIRELESS									
Project #:		10U13530									
Date:		12/29/2010									
Test Engineer:		MENGISTU MEKURIA									
Configuration:		EUT WITH SUPPORT LAPTOP									
Mode:		TX, CELL BAND, GPRS MODE									
Chamber		Pre-amplifier			Filter			Limit			
5m Chamber A		T144 8449B			Filter 1			FCC PART 22			
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	
<b>Low Channel (824.20 MHz)</b>											
1.648	-39.6	V	3.0	36.8	38.2	1.0	-39.9	-13.0	-26.9		
2.473	-39.1	V	3.0	41.7	37.5	1.0	-33.9	-13.0	-20.9		
3.297	-61.7	V	3.0	44.0	37.1	1.0	-53.8	-13.0	-40.8		
4.121	-61.1	V	3.0	45.9	36.5	1.0	-50.8	-13.0	-37.8		
1.648	-42.3	H	3.0	36.5	38.2	1.0	-42.9	-13.0	-29.9		
2.473	-41.5	H	3.0	40.0	37.5	1.0	-38.1	-13.0	-25.1		
3.297	-61.2	H	3.0	43.9	37.1	1.0	-53.5	-13.0	-40.5		
4.121	-61.8	H	3.0	46.2	36.5	1.0	-51.2	-13.0	-38.2		
<b>Mid Channel (836.60 MHz)</b>											
1.673	-46.2	V	3.0	37.1	38.1	1.0	-46.2	-13.0	-33.2		
2.510	-40.6	V	3.0	41.9	37.5	1.0	-35.2	-13.0	-22.2		
3.346	-57.2	V	3.0	44.1	37.1	1.0	-49.2	-13.0	-36.2		
4.183	-59.4	V	3.0	46.1	36.5	1.0	-48.8	-13.0	-35.8		
1.673	-40.4	H	3.0	36.8	38.1	1.0	-40.7	-13.0	-27.7		
2.510	-39.1	H	3.0	40.1	37.5	1.0	-35.4	-13.0	-22.4		
3.346	-59.2	H	3.0	44.0	37.1	1.0	-51.2	-13.0	-38.2		
4.183	-61.3	H	3.0	46.4	36.5	1.0	-50.4	-13.0	-37.4		
<b>Hi Channel (848.80 MHz)</b>											
1.698	-47.8	V	3.0	37.4	38.1	1.0	-47.5	-13.0	-34.5		
2.546	-41.3	V	3.0	42.0	37.5	1.0	-35.8	-13.0	-22.8		
3.395	-61.8	V	3.0	44.2	37.1	1.0	-53.6	-13.0	-40.6		
4.244	-63.9	V	3.0	46.2	36.5	1.0	-53.2	-13.0	-40.2		
1.698	-43.7	H	3.0	37.0	38.1	1.0	-43.7	-13.0	-30.7		
2.546	-51.4	H	3.0	40.4	37.5	1.0	-47.5	-13.0	-34.5		
3.395	-62.1	H	3.0	44.1	37.1	1.0	-54.0	-13.0	-41.0		
4.244	-61.4	H	3.0	46.6	36.5	1.0	-50.3	-13.0	-37.3		
Rev. 03.03.09											

**PCS Spurious & Harmonic (EIRP)**

Compliance Certification Services										
Above 1GHz High Frequency Substitution Measurement										
<b>Company:</b>		SIERRA WIRELESS								
<b>Project #:</b>		10U13530								
<b>Date:</b>		12/29/2010								
<b>Test Engineer:</b>		MENGISTU MEKURIA								
<b>Configuration:</b>		EUT WITH SUPPORT LAPTOP								
<b>Mode:</b>		TX, PCS BAND, GPRS MODE								
<b>Chamber</b>		<b>Pre-amplifier</b>			<b>Filter</b>			<b>Limit</b>		
5m Chamber B		T145 8449B			Filter 1			FCC PART 24		
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
<b>Low Channel (1850.20 MHz)</b>										
3.700	-55.3	H	3.0	45.3	35.4	1.0	-44.3	-13.0	-31.3	
5.551	-47.6	H	3.0	50.0	35.4	1.0	-32.0	-13.0	-19.0	
7.401	-66.3	H	3.0	53.0	35.7	1.0	-48.1	-13.0	-35.1	
3.700	-54.0	V	3.0	45.1	35.4	1.0	-43.3	-13.0	-30.3	
5.551	-44.1	V	3.0	49.2	35.4	1.0	-29.3	-13.0	-16.3	
7.401	-67.9	V	3.0	51.3	35.7	1.0	-51.3	-13.0	-38.3	
<b>Mid Channel (1880.00 MHz)</b>										
3.760	-56.9	H	3.0	45.5	35.3	1.0	-45.7	-13.0	-32.7	
5.640	-47.9	H	3.0	50.2	35.4	1.0	-32.2	-13.0	-19.2	
7.520	-64.7	H	3.0	53.1	35.7	1.0	-46.3	-13.0	-33.3	
3.760	-56.3	V	3.0	45.3	35.3	1.0	-45.3	-13.0	-32.3	
5.640	-43.9	V	3.0	49.3	35.4	1.0	-29.0	-13.0	-16.0	
7.520	-67.3	V	3.0	51.4	35.7	1.0	-50.5	-13.0	-37.5	
<b>Hi Channel (1909.80 MHz)</b>										
3.820	-62.8	H	3.0	45.7	35.3	1.0	-51.3	-13.0	-38.3	
5.729	-54.0	H	3.0	50.3	35.4	1.0	-38.2	-13.0	-25.2	
7.639	-66.3	H	3.0	53.2	35.7	1.0	-47.7	-13.0	-34.7	
3.820	-59.3	V	3.0	45.4	35.3	1.0	-48.2	-13.0	-35.2	
5.729	-46.2	V	3.0	49.4	35.4	1.0	-31.2	-13.0	-18.2	
7.639	-67.2	V	3.0	51.6	35.7	1.0	-50.3	-13.0	-37.3	
Rev. 03.03.09										



**EGPRS**

**CELL SPURIOUS & HARMONIC (ERP)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** SIERRA WIRELESS  
**Project #:** 10U13530  
**Date:** 12/29/2010  
**Test Engineer:** MENGISTU MEKURIA  
**Configuration:** EUT WITH SUPPORT LAPTOP  
**Mode:** TX, CELL BAND, EGPRS MODE

Chamber

Pre-amplifier

Filter

Limit

5m Chamber A

T144 8449B

Filter 1

FCC PART 22

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Channel (824.20 MHz)</b>										
1.648	-47.1	V	3.0	36.8	38.2	1.0	-47.5	-13.0	-34.5	
2.473	-53.1	V	3.0	41.7	37.5	1.0	-47.8	-13.0	-34.8	
1.648	-43.3	H	3.0	36.5	38.2	1.0	-43.9	-13.0	-30.9	
2.473	-55.4	H	3.0	40.0	37.5	1.0	-51.9	-13.0	-38.9	
<b>Mid Channel (836.60 MHz)</b>										
1.673	-50.3	V	3.0	37.1	38.1	1.0	-50.3	-13.0	-37.3	
2.510	-57.6	V	3.0	41.9	37.5	1.0	-52.2	-13.0	-39.2	
1.673	-46.4	H	3.0	36.8	38.1	1.0	-46.8	-13.0	-33.8	
2.510	-56.2	H	3.0	40.1	37.5	1.0	-52.5	-13.0	-39.5	
<b>Hi Channel (848.80 MHz)</b>										
1.698	-46.9	V	3.0	37.4	38.1	1.0	-46.6	-13.0	-33.6	
2.546	-51.6	V	3.0	42.0	37.5	1.0	-46.1	-13.0	-33.1	
1.698	-42.3	H	3.0	37.0	38.1	1.0	-42.4	-13.0	-29.4	
2.546	-53.1	H	3.0	40.4	37.5	1.0	-49.2	-13.0	-36.2	

Rev. 03.03.09

**PCS Spurious & Harmonic (EIRP)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** SIERRA WIRELESS  
**Project #:** 10U13530  
**Date:** 12/29/2010  
**Test Engineer:** MENGISTU MEKURIA  
**Configuration:** EUT WITH SUPPORT LAPTOP  
**Mode:** TX, PCS BAND, EGPRS MODE

Chamber

5m Chamber B

Pre-amplifier

T145 8449B

Filter

Filter 1

Limit

FCC PART 24

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
<b>Low Channel (1850.20 MHz)</b>										
3.700	-62.1	H	3.0	45.3	35.4	1.0	-51.1	-13.0	-38.1	
5.551	-50.4	H	3.0	50.0	35.4	1.0	-34.8	-13.0	-21.8	
3.700	-60.0	V	3.0	45.1	35.4	1.0	-49.2	-13.0	-36.2	
5.551	-47.8	V	3.0	49.2	35.4	1.0	-33.0	-13.0	-20.0	
<b>Mid Channel (1880.00 MHz)</b>										
3.760	-58.4	H	3.0	45.5	35.3	1.0	-47.2	-13.0	-34.2	
5.640	-50.8	H	3.0	50.2	35.4	1.0	-35.1	-13.0	-22.1	
3.760	-56.7	V	3.0	45.3	35.3	1.0	-45.8	-13.0	-32.8	
5.640	-44.7	V	3.0	49.3	35.4	1.0	-29.9	-13.0	-16.9	
<b>Hi Channel (1909.80 MHz)</b>										
3.820	-58.5	H	3.0	45.7	35.3	1.0	-47.1	-13.0	-34.1	
5.729	-52.4	H	3.0	50.3	35.4	1.0	-36.5	-13.0	-23.5	
3.820	-61.0	V	3.0	45.4	35.3	1.0	-49.9	-13.0	-36.9	
5.729	-49.9	V	3.0	49.4	35.4	1.0	-35.0	-13.0	-22.0	

Rev. 03.03.09

**WCDMA**

**CELL SPURIOUS & HARMONIC (ERP)**

**Compliance Certification Services**  
 Above 1GHz High Frequency Substitution Measurement

**Company:** SIERRA WIRELESS  
**Project #:** 10U13530  
**Date:** 12/28/2010  
**Test Engineer:** MENGISTU MEKURIA  
**Configuration:** EUT WITH SUPPORT LAPTOP  
**Mode:** TX, CELL BAND, WCDMA MODE

**Chamber**

5m Chamber B

**Pre-amplifier**

T145 8449B

**Filter**

Filter 1

**Limit**

FCC PART 22

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Channel (826.40 MHz)</b>										
1.653	-48.4	H	3.0	37.3	35.5	1.0	-45.7	-13.0	-32.7	
2.479	-56.0	H	3.0	39.8	35.4	1.0	-50.5	-13.0	-37.5	
1.653	-51.4	V	3.0	36.8	35.5	1.0	-49.1	-13.0	-36.1	
2.479	-60.6	V	3.0	41.7	35.4	1.0	-53.3	-13.0	-40.3	
<b>Mid Channel (836.40 MHz)</b>										
1.673	-51.8	H	3.0	37.5	35.5	1.0	-48.9	-13.0	-35.9	
2.509	-55.0	H	3.0	39.9	35.4	1.0	-49.5	-13.0	-36.5	
1.673	-54.8	V	3.0	37.1	35.5	1.0	-52.2	-13.0	-39.2	
2.509	-59.6	V	3.0	41.8	35.4	1.0	-52.2	-13.0	-39.2	
<b>Hi Channel (846.60 MHz)</b>										
1.693	-49.4	H	3.0	37.7	35.5	1.0	-46.3	-13.0	-33.3	
2.540	-53.7	H	3.0	40.1	35.4	1.0	-48.0	-13.0	-35.0	
1.693	-52.4	V	3.0	37.4	35.5	1.0	-49.5	-13.0	-36.5	
2.540	-58.3	V	3.0	41.9	35.4	1.0	-50.8	-13.0	-37.8	

Rev. 03.03.09

**PCS Spurious & Harmonic (EIRP)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** SIERRA WIRELESS  
**Project #:** 10U13530  
**Date:** 12/28/2010  
**Test Engineer:** MENGISTU MEKURIA  
**Configuration:** EUT WITH SUPPORT LAPTOP  
**Mode:** TX, PCS BAND, WCDMA MODE

**Chamber**  
 5m Chamber B

**Pre-amplifier**  
 T145 8449B

**Filter**  
 Filter 1

**Limit**  
 FCC PART 24

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
<b>Low Channel (1852.40 MHz)</b>										
3.705	-61.0	H	3.0	45.3	35.4	1.0	-50.0	-13.0	-37.0	
5.557	-64.8	H	3.0	50.0	35.4	1.0	-49.2	-13.0	-36.2	
3.705	-58.9	V	3.0	45.1	35.4	1.0	-48.1	-13.0	-35.1	
5.557	-63.9	V	3.0	49.2	35.4	1.0	-49.1	-13.0	-36.1	
<b>Mid Channel (1880.00 MHz)</b>										
3.760	-60.6	H	3.0	45.5	35.3	1.0	-49.4	-13.0	-36.4	
5.640	-64.8	H	3.0	50.2	35.4	1.0	-49.1	-13.0	-36.1	
3.760	-57.7	V	3.0	45.3	35.3	1.0	-46.8	-13.0	-33.8	
5.640	-63.1	V	3.0	49.3	35.4	1.0	-48.2	-13.0	-35.2	
<b>Hi Channel (1907.60 MHz)</b>										
3.815	-59.5	H	3.0	45.7	35.3	1.0	-48.1	-13.0	-35.1	
5.723	-62.3	H	3.0	50.3	35.4	1.0	-46.4	-13.0	-33.4	
3.815	-57.0	V	3.0	45.4	35.3	1.0	-45.9	-13.0	-32.9	
5.723	-61.0	V	3.0	49.4	35.4	1.0	-46.1	-13.0	-33.1	

Rev. 03.03.09

**LTE**

**BAND 17, QPSK 5 MHz BANDWIDTH (ERP)**

Compliance Certification Services										
Above 1GHz High Frequency Substitution Measurement										
Company:		SIERRA WIRELESS								
Project #:		10U13530								
Date:		12/19/2010								
Test Engineer:		MENGISTU MEKURIA								
Configuration:		EUT WITH SUPPORT LAPTOP								
Mode:		TX, QPSK_5MHZ BW_RB1_LTE BAND								
Chamber		Pre-amplifier			Filter			Limit		
5m Chamber A		T144 8449B			Filter 1			FCC PART 27		
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Channel (706.5 MHz)</b>										
1.413	-56.1	H	3.0	34.5	38.6	1.0	-59.1	-13.0	-46.1	
2.120	-58.3	H	3.0	39.9	37.6	1.0	-55.0	-13.0	-42.0	
4.239	-59.9	H	3.0	46.5	36.5	1.0	-48.8	-13.0	-35.8	
1.413	-58.3	V	3.0	34.4	38.6	1.0	-61.5	-13.0	-48.5	
2.120	-59.1	V	3.0	40.9	37.6	1.0	-54.8	-13.0	-41.8	
4.239	-62.3	V	3.0	46.2	36.5	1.0	-51.6	-13.0	-38.6	
<b>Mid Channel</b>										
1.420	-55.8	H	3.0	34.6	38.5	1.0	-58.8	-13.0	-45.8	
2.130	-58.2	H	3.0	39.9	37.6	1.0	-54.9	-13.0	-41.9	
4.260	-59.5	H	3.0	46.6	36.5	1.0	-48.4	-13.0	-35.4	
1.420	-56.0	V	3.0	34.5	38.5	1.0	-59.1	-13.0	-46.1	
2.130	-59.3	V	3.0	41.0	37.6	1.0	-55.0	-13.0	-42.0	
4.260	-65.2	V	3.0	46.3	36.5	1.0	-54.4	-13.0	-41.4	
<b>Hi Channel</b>										
1.427	-53.0	H	3.0	34.6	38.5	1.0	-55.9	-13.0	-42.9	
2.141	-55.7	H	3.0	39.9	37.6	1.0	-52.4	-13.0	-39.4	
4.281	-60.3	H	3.0	46.7	36.5	1.0	-49.1	-13.0	-36.1	
1.427	-58.8	V	3.0	34.5	38.5	1.0	-61.8	-13.0	-48.8	
2.141	-61.8	V	3.0	41.0	37.6	1.0	-57.4	-13.0	-44.4	
4.281	-64.4	V	3.0	46.3	36.5	1.0	-53.6	-13.0	-40.6	

Rev. 03.03.09

**BAND 17, QPSK 10 MHz BANDWIDTH (ERP)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company:		SIERRA WIRELESS								
Project #:		10U13530								
Date:		12/20/2010								
Test Engineer:		MENGISTU MEKURIA								
Configuration:		EUT WITH SUPPORT LAPTOP								
Mode:		TX, QPSK_10MHz BW_RB12_LTE BAND								
<b>Chamber</b>		<b>Pre-amplifier</b>			<b>Filter</b>			<b>Limit</b>		
5m Chamber B		T145 8449B			Filter 1			FCC PART 27		
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Channel (709.0 MHz)</b>										
1.418	-57.4	H	3.0	35.2	35.7	1.0	-56.9	-13.0	-43.9	
2.127	-59.9	H	3.0	40.4	35.4	1.0	-53.9	-13.0	-40.9	
4.254	-61.5	H	3.0	47.0	35.2	1.0	-48.8	-13.0	-35.8	
1.418	-59.2	V	3.0	34.1	35.7	1.0	-59.9	-13.0	-46.9	
2.127	-62.1	V	3.0	41.5	35.4	1.0	-55.0	-13.0	-42.0	
4.254	-64.1	V	3.0	46.5	35.2	1.0	-51.8	-13.0	-38.8	
<b>Mid Channel (710.0 MHz)</b>										
1.420	-57.1	H	3.0	35.2	35.7	1.0	-56.6	-13.0	-43.6	
2.130	-61.1	H	3.0	40.4	35.4	1.0	-55.1	-13.0	-42.1	
4.260	-62.1	H	3.0	47.0	35.2	1.0	-49.3	-13.0	-36.3	
1.420	-59.5	V	3.0	34.1	35.7	1.0	-60.1	-13.0	-47.1	
2.130	-60.9	V	3.0	41.5	35.4	1.0	-53.8	-13.0	-40.8	
4.260	-63.5	V	3.0	46.5	35.2	1.0	-51.3	-13.0	-38.3	
<b>Hi Channel (711.0 MHz)</b>										
1.422	-56.3	H	3.0	35.2	35.7	1.0	-55.9	-13.0	-42.9	
2.133	-60.6	H	3.0	40.3	35.4	1.0	-54.6	-13.0	-41.6	
4.266	-62.4	H	3.0	47.0	35.2	1.0	-49.6	-13.0	-36.6	
1.422	-57.9	V	3.0	34.1	35.7	1.0	-58.5	-30.0	-28.5	
2.133	-61.3	V	3.0	41.5	35.4	1.0	-54.2	-13.0	-41.2	
4.266	-65.6	V	3.0	46.5	35.2	1.0	-53.4	-13.0	-40.4	
Rev. 03.03.09										

**BAND 17, 16QAM 5 MHz BANDWIDTH (ERP)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company:		SIERRA WIRELESS								
Project #:		10U13530								
Date:		12/19/2010								
Test Engineer:		MENGISTU MEKURIA								
Configuration:		EUT WITH SUPPORT LAPTOP								
Mode:		TX, 16QAM_5MHZ BW_RB1_LTE BAND								
<b>Chamber</b>		<b>Pre-amplifier</b>			<b>Filter</b>			<b>Limit</b>		
5m Chamber A		T144 8449B			Filter 1			FCC PART 27		
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Channel (706.5 MHz)</b>										
1.413	-54.7	H	3.0	34.5	38.6	1.0	-57.7	-13.0	-44.7	
2.120	-57.1	H	3.0	39.9	37.6	1.0	-53.8	-13.0	-40.8	
4.239	-61.6	H	3.0	46.5	36.5	1.0	-50.5	-13.0	-37.5	
1.413	-59.7	V	3.0	34.4	38.6	1.0	-62.9	-13.0	-49.9	
2.120	-60.4	V	3.0	40.9	37.6	1.0	-56.1	-13.0	-43.1	
4.239	-63.2	V	3.0	46.2	36.5	1.0	-52.5	-13.0	-39.5	
<b>Mid Channel (710.0 MHz)</b>										
1.420	-57.5	H	3.0	34.6	38.5	1.0	-60.5	-13.0	-47.5	
2.130	-59.6	H	3.0	39.9	37.6	1.0	-56.3	-13.0	-43.3	
4.260	-60.8	H	3.0	46.6	36.5	1.0	-49.7	-13.0	-36.7	
1.420	-56.9	V	3.0	34.5	38.5	1.0	-60.0	-13.0	-47.0	
2.130	-57.9	V	3.0	41.0	37.6	1.0	-53.6	-13.0	-40.6	
4.260	-64.0	V	3.0	46.3	36.5	1.0	-53.2	-13.0	-40.2	
<b>Hi Channel (713.5 MHz)</b>										
1.427	-54.4	H	3.0	34.6	38.5	1.0	-57.3	-13.0	-44.3	
2.141	-57.0	H	3.0	39.9	37.6	1.0	-53.7	-13.0	-40.7	
4.281	-61.2	H	3.0	46.7	36.5	1.0	-50.0	-13.0	-37.0	
1.427	-57.4	V	3.0	34.5	38.5	1.0	-60.4	-13.0	-47.4	
2.141	-60.6	V	3.0	41.0	37.6	1.0	-56.2	-13.0	-43.2	
4.281	-66.1	V	3.0	46.3	36.5	1.0	-55.3	-13.0	-42.3	
Rev. 03.03.09										

**BAND 17, 16QAM 10 MHz BANDWIDTH (ERP)**

Compliance Certification Services										
Above 1GHz High Frequency Substitution Measurement										
Company:		SIERRA WIRELESS								
Project #:		10U13530								
Date:		12/20/2010								
Test Engineer:		MENGISTU MEKURIA								
Configuration:		EUT WITH SUPPORT LAPTOP								
Mode:		TX, 16QAM_10MHZ BW_RB12_LTE BAND								
Chamber		Pre-amplifier		Filter		Limit				
5m Chamber B		T145 8449B		Filter 1		FCC PART 27				
f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Channel (709.0 MHz)</b>										
1.418	-56.2	H	3.0	35.2	35.7	1.0	-55.7	-13.0	-42.7	
2.127	-58.2	H	3.0	40.4	35.4	1.0	-52.2	-13.0	-39.2	
4.254	-62.9	H	3.0	47.0	35.2	1.0	-50.2	-13.0	-37.2	
1.418	-58.2	V	3.0	34.1	35.7	1.0	-58.9	-13.0	-45.9	
2.127	-59.4	V	3.0	41.5	35.4	1.0	-52.3	-13.0	-39.3	
4.254	-64.5	V	3.0	46.5	35.2	1.0	-52.2	-13.0	-39.2	
<b>Mid Channel (710.0 MHz)</b>										
1.420	-56.1	H	3.0	35.2	35.7	1.0	-55.6	-13.0	-42.6	
2.130	-58.4	H	3.0	40.4	35.4	1.0	-52.4	-13.0	-39.4	
4.260	-62.5	H	3.0	47.0	35.2	1.0	-49.7	-13.0	-36.7	
1.420	-58.3	V	3.0	34.1	35.7	1.0	-58.9	-13.0	-45.9	
2.130	-59.2	V	3.0	41.5	35.4	1.0	-52.1	-13.0	-39.1	
4.260	-64.9	V	3.0	46.5	35.2	1.0	-52.7	-13.0	-39.7	
<b>Hi Channel (711.0 MHz)</b>										
1.422	-54.6	H	3.0	35.2	35.7	1.0	-54.2	-13.0	-41.2	
2.133	-62.0	H	3.0	40.3	35.4	1.0	-56.0	-13.0	-43.0	
4.266	-61.4	H	3.0	47.0	35.2	1.0	-48.6	-13.0	-35.6	
1.422	-55.2	V	3.0	34.1	35.7	1.0	-55.8	-30.0	-25.8	
2.133	-61.7	V	3.0	41.5	35.4	1.0	-54.6	-13.0	-41.6	
4.266	-64.4	V	3.0	46.5	35.2	1.0	-52.2	-13.0	-39.2	
Rev. 03.03.09										



**BAND 4, QPSK 5 MHz BANDWIDTH (EIRP)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

Company: SIERRA WIRELESS  
 Project #: 10U13530  
 Date: 12/19/2010  
 Test Engineer: MENGISTU MEKURIA  
 Configuration: EUT WITH SUPPORT LAPTOP  
 Mode: TX, QPSK\_5MHZ BW\_RB1\_LTE BAND

Chamber

Pre-amplifier

Filter

Limit

5m Chamber A

T144 8449B

Filter 1

FCC 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
<b>Low Channel (1712.5 MHz)</b>										
3.425	-63.1	H	3.0	44.2	37.0	1.0	-54.9	-30.0	-24.9	
5.138	-62.5	H	3.0	49.2	36.3	1.0	-48.6	-30.0	-18.6	
3.425	-67.2	V	3.0	44.3	37.0	1.0	-58.9	-30.0	-28.9	
5.138	-60.3	V	3.0	48.6	36.3	1.0	-47.0	-30.0	-17.0	
<b>Mid Channel (1732.5 MHz)</b>										
3.465	-62.1	H	3.0	44.3	37.0	1.0	-53.8	-13.0	-40.8	
5.198	-62.0	H	3.0	49.3	36.2	1.0	-47.9	-13.0	-34.9	
3.465	-66.5	V	3.0	44.4	37.0	1.0	-58.1	-13.0	-45.1	
5.198	-59.4	V	3.0	48.8	36.2	1.0	-45.9	-13.0	-32.9	
<b>Hi Channel (1752.5 MHz)</b>										
3.505	-61.5	H	3.0	44.4	37.0	1.0	-53.0	-13.0	-40.0	
5.258	-61.1	H	3.0	49.4	36.3	1.0	-46.9	-13.0	-33.9	
3.505	-65.3	V	3.0	44.5	37.0	1.0	-56.8	-13.0	-43.8	
5.258	-59.8	V	3.0	48.9	36.3	1.0	-46.1	-13.0	-33.1	

Rev. 03.03.09

**BAND 4, QPSK 10 MHz BANDWIDTH (EIRP)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** SIERRA WIRELESS  
**Project #:** 10U13530  
**Date:** 12/19/2010  
**Test Engineer:** MENGISTU MEKURIA  
**Configuration:** EUT WITH SUPPORT LAPTOP  
**Mode:** TX, QPSK\_10MHZ BW\_RB12\_LTE BAND

**Chamber**

5m Chamber A

**Pre-amplifier**

T144 8449B

**Filter**

Filter 1

**Limit**

FCC 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
<b>Low Channel (1715.1 MHz)</b>										
3.430	-63.9	H	3.0	44.2	37.0	1.0	-55.7	-13.0	-42.7	
5.145	-65.3	H	3.0	49.2	36.3	1.0	-51.4	-13.0	-38.4	
3.430	-63.8	V	3.0	44.3	37.0	1.0	-55.6	-13.0	-42.6	
5.145	-64.2	V	3.0	48.6	36.3	1.0	-50.8	-13.0	-37.8	
<b>Mid Channel (1732.5 MHz)</b>										
3.465	-63.5	H	3.0	44.3	37.0	1.0	-55.1	-13.0	-42.1	
5.198	-64.5	H	3.0	49.3	36.2	1.0	-50.4	-13.0	-37.4	
3.465	-63.5	V	3.0	44.4	37.0	1.0	-55.2	-13.0	-42.2	
5.198	-64.7	V	3.0	48.8	36.2	1.0	-51.2	-13.0	-38.2	
<b>Hi Channel (1749.9 MHz)</b>										
3.500	-61.4	H	3.0	44.4	37.0	1.0	-53.0	-13.0	-40.0	
5.250	-62.0	H	3.0	49.4	36.3	1.0	-47.9	-13.0	-34.9	
3.500	-61.0	V	3.0	44.5	37.0	1.0	-52.5	-13.0	-39.5	
5.250	-62.9	V	3.0	48.9	36.3	1.0	-49.3	-13.0	-36.3	

Rev. 03.03.09

**BAND 4, 16QAM 5 MHz BANDWIDTH (EIRP)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

Company: SIERRA WIRELESS  
 Project #: 10U13530  
 Date: 12/19/2010  
 Test Engineer: MENGISTU MEKURIA  
 Configuration: EUT WITH SUPPORT LAPTOP  
 Mode: TX, 16QAM\_5MHZ BW\_RB1\_LTE BAND

Chamber

Pre-amplifier

Filter

Limit

5m Chamber A

T144 8449B

Filter 1

FCC 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
<b>Low Channel (1712.5 MHz)</b>										
3.425	-62.6	H	3.0	44.2	37.0	1.0	-54.4	-13.0	-41.4	
5.138	-62.0	H	3.0	49.2	36.3	1.0	-48.1	-13.0	-35.1	
3.425	-61.2	V	3.0	44.3	37.0	1.0	-52.9	-13.0	-39.9	
5.138	-60.3	V	3.0	48.6	36.3	1.0	-46.9	-13.0	-33.9	
<b>Mid Channel (1732.5 MHz)</b>										
3.465	-61.9	H	3.0	44.3	37.0	1.0	-53.6	-13.0	-40.6	
5.198	-61.8	H	3.0	49.3	36.2	1.0	-47.7	-13.0	-34.7	
3.465	-60.5	V	3.0	44.4	37.0	1.0	-52.1	-13.0	-39.1	
5.198	-60.6	V	3.0	48.8	36.2	1.0	-47.1	-13.0	-34.1	
<b>Hi Channel (1752.5 MHz)</b>										
3.505	-61.2	H	3.0	44.4	37.0	1.0	-52.8	-13.0	-39.8	
5.258	-61.2	H	3.0	49.4	36.3	1.0	-47.0	-13.0	-34.0	
3.505	-59.4	V	3.0	44.5	37.0	1.0	-50.9	-13.0	-37.9	
5.258	-59.4	V	3.0	48.9	36.3	1.0	-45.7	-13.0	-32.7	
		V								
		V								

Rev. 03.03.09

**BAND 4, 16QAM 10 MHz BANDWIDTH (EIRP)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

Company: SIERRA WIRELESS  
 Project #: 10U13530  
 Date: 12/19/2010  
 Test Engineer: MENGISTU MEKURIA  
 Configuration: EUT WITH SUPPORT LAPTOP  
 Mode: TX, 16QAM\_10MHZ BW\_RB12\_LTE BAND

Chamber

Pre-amplifier

Filter

Limit

5m Chamber A

T144 8449B

Filter 1

FCC 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
<b>Low Channel (1715.1 MHz)</b>										
3.430	-63.9	H	3.0	44.2	37.0	1.0	-55.7	-13.0	-42.7	
5.145	-64.3	H	3.0	49.2	36.3	1.0	-50.4	-13.0	-37.4	
3.430	-63.6	V	3.0	44.3	37.0	1.0	-55.3	-13.0	-42.3	
5.145	-64.6	V	3.0	48.6	36.3	1.0	-51.2	-13.0	-38.2	
<b>Mid Channel (1732.5 MHz)</b>										
3.465	-63.3	H	3.0	44.3	37.0	1.0	-54.9	-13.0	-41.9	
5.198	-65.1	H	3.0	49.3	36.2	1.0	-51.0	-13.0	-38.0	
3.465	-62.8	V	3.0	44.4	37.0	1.0	-54.4	-13.0	-41.4	
5.198	-64.1	V	3.0	48.8	36.2	1.0	-50.6	-13.0	-37.6	
<b>Hi Channel (1749.9 MHz)</b>										
3.500	-62.5	H	3.0	44.4	37.0	1.0	-54.0	-13.0	-41.0	
5.250	-64.0	H	3.0	49.4	36.3	1.0	-49.8	-13.0	-36.8	
3.500	-61.2	V	3.0	44.5	37.0	1.0	-52.7	-13.0	-39.7	
5.250	-63.0	V	3.0	48.9	36.3	1.0	-49.4	-13.0	-36.4	

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