

588 West Jindu Road, Songjiang District, Shanghai, China

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# FCC Partial Test Report

Application No. :	SHEMO10110145904
Applicant:	Sierra Wireless Inc.
FCC ID:	N7NAC319U
IC ID:	2417C-AC319U
Equipment Under Tes	t (EUT):
Product Name:	USB Wireless Modem
Brand Name:	Sierra Wireless
Model Name:	AirCard 319U
Standards:	FCC part 2, 22H & 24E / IC RSS 132 Issue 2, RSS 133 Issue 5
Date of Receipt:	Nov. 24, 2010
Date of Test:	Nov. 26, 2010 to Dec. 07, 2010
Date of Issue:	Dec. 21, 2010
Test Result :	PASS *

\* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 2 of this report for further details.

1 at

Tino Pan E&E Section Manager SGS-CSTC (Shanghai)Co., Ltd.

Jim Xu Project Engineer SGS-CSTC (Shanghai)Co., Ltd.



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# 2 Test Summary

Description of Test	FCC Rules	IC Standards	Result
Effective Radiated Power (ERP) / Effective Isotropic Radiated Power (EIRP)	2.1046(a) 22.913(a) 24.232(c)	RSS-132,4.4 RSS-133,6.4	Compliant
Out of Band Emissions at antenna Terminals and Band Edge	2.1051 22.917(a) 24.238(a)	RSS-132,4.5 RSS-133,6.5	Compliant
Field Strength of Spurious Emissions	2.1053 22.917(a) 24.238(a)	RSS-132,4.5 RSS-133,6.5	Compliant
Receiver Spurious Emissions	N/A	RSS-132,4.6 RSS-133,6.6 RSS-Gen 6	Compliant

Note: Selected test(s) as requested by applicant.

N/A -Not Applicable



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# 4 General Information

### 4.1 Client Information

Applicant:	Sierra Wireless Inc.
Address of Applicant:	13811 Wireless Way Richmond, British Columbia, Canada, V6V 3A4.
Manufacturer:	Sierra Wireless Inc.
Address of Manufacturer:	13811 Wireless Way Richmond, British Columbia, Canada, V6V 3A4.

	-
Product Name:	USB Wireless Modem
Brand Name:	Sierra Wireless
Model Name:	AirCard 319U
Power Supply:	5VDC (USB port supply)
Support Frequency Band:	GSM 850/900/1800/1900, WCDMA Band I/II/V/VIII
Test Frequency Bands:	GSM 850/1900, WCDMA Band II/V
Hardware Version:	V1.0
Software Version:	T2.0.1.0
IMEI:	354089040000312

### 4.2 General Description of E.U.T.

### 4.3 Details of support units

Name / Function	Model No.	Remark		
Laptop	ThinkPad X100e	N/A		

### 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612. Tel: +86 21 6191 5666 Fax: +86 21 6191 5655



### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

### CNAS (No. CNAS L0599)

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2011-07-29.

### • FCC – Registration No.: 402683

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

### • Industry Canada (IC) – IC Assigned Code: 8617A

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2011-09-29.

### • VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3172 and C-3514 respectively. Date of Registration: 2009-11-30. Date of Expiry: 2012-03-17.

### 4.6 Test Methodogy

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA-603-C-2004 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.



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Cal. Date

Cal. Due date

# Equipments Used during Test Item Test Equipment Manufacturer Model No. Serial No. 1 Spectrum Analyzer Rohde & Schwarz FSP-30 100324

1	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100324	2010-4-19	2011-4-18
2	EMI test receiver	Rohde & Schwarz	ESU40	100109	2010-6-3	2011-6-2
4	Horn Antenna	Rohde & Schwarz	HF906	100284	2010-4-9	2011-4-8
5	Horn Antenna	Rohde & Schwarz	HF906	100285	2010-10-9	2011-10-8
6	ANTENNA	SCHWARZBECK	BBHA9120D	9120D-679	2010-6-3	2011-6-2
7	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2010-10-09	2011-10-08
8	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY-2003P		2010-10-15	2011-10-14
9	CLAMP METER	FLUKE	316	86080010	2010-04-28	2011-04-27
10	Thermo- Hygrometer	ZHICHEN	ZC1-2	01050033	2010-10-21	2011-10-20
11	Digital illuminance meter	TES electrical electronic Corp.	TES-1330A	050602219	2010-10-16	2011-10-15
12	TEMPERATURE& HUMIDITY BOX	KSON	THS-D2C-100	K40723	2010-11-18	2011-11-17
13	High-low temperature Shanghai Yuanz cabinet		GW2050		2010-6-27	2011-6-26
14	DC power	KIKUSUI	PMC35-3	NF100260	2010-1-16	2011-1-15
15	Power meter	Rohde & Schwarz	NRP	101641	2010-5-4	2011-5-3
16	UNIVERSAL RADIO COMMUNICATION TESTER		CMU 200	112012	2010-08-25	2011-08-24
17	Tunable Notch Filter	WRCT800.0/880.0- 0.2/40-5SSK	Wainwright instruments Gmbh	9	2010-1-27	2011-1-26



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18	Tunable Notch Filter	WRCT1800.0/2000.0- 0.2/40-5SSK	Wainwright instruments Gmbh	11	2010-1-27	2011-1-26
19	Band Reject Filter	WRCG 824/849- 814/859-40/8SS	Amiden,Ireland	1	2010-1-27	2011-1-26
20	Band Reject Filter	WRCG 1850/1910- 1835/1925-40/8SS	Amiden,Ireland	13	2010-1-27	2011-1-26

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# 6 Test Results

### 6.1 E.U.T. test conditions

Power supply:

Operating Environment: Temperature: Humidity: Atmospheric Pressure: Configuration of Tested System:

38-48 % RH 992 -1006 mbar	

DC 5V

20.0 -25.0 °C

Laptop	EUT

Remote Side

CMU200



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## 6.2 Effective Radiated Power & Effective Isotropic Radiated Power

Test Requirement:Part 2.1046<br/>Part 22.913(a) Mobile station are limited to 7W ERP.<br/>Part 24.232(b) Mobile station are Limited to 2W EIRP.<br/>RSS 132,4.4 The maximum EIRP shall be 11.5 watts for mobile stations.<br/>RSS 133,6.4 Mobile stations and hand-held portables are limited to<br/>2 watts maximum EIRP.Test Date:Dec. 01, 2010 to Dec. 07, 2010Test Setup:

(A) Radiated emission Test setup, Below Frequency 1000MHz:



(B) Radiated emission Test setup frequency over 1GHz:





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(C) Substituted Method Test setup:



### **Test Procedure:**

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength(E in dBuV/m) was calculated.

ERP in frequency band 824.2-848.8MHz were measured using substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follow:

EIRP in frequency band 1850.2-1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

ERP=S.G. output (dBm) + Antenna Gain (dBd) - Cable Loss(dB) EIRP= S.G. output (dBm) + Antenna Gain (dBi) - Cable Loss(dB)



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### Measurement result:

The RBW, VBW of SPA for frequency Below 1GHz was RBW= 300KHz, VBW=1MHz; Above 1GHz was RBW= 1MHz, VBW=3MHz

EUT mode	Freque ncy (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. output (dBm)	Antenna Gain (dBd)	Cable loss (dB)	ERP (dBm)	Limit (dBm)
	824.2	128	н	V	105.62	20.41	8.4	2.89	25.92	38.45
0.014				Н	104.32	20.21	8.4	2.89	25.72	38.45
GSM	836.6	190	н	V	105.09	20.40	8.45	2.93	25.92	38.45
(GMSK)	000.0	100		Н	105.65	21.42	8.45	2.93	26.94	38.45
	848.8	251	251 H	V	103.68	18.85	8.76	2.97	24.64	38.45
				Н	104.81	20.40	8.79	2.97	26.22	38.45
	824.2	128	н	V	103.10	17.89	8.4	2.89	23.40	38.45
GSM 850				Н	101.81	17.70	8.4	2.89	23.21	38.45
	836.6	36.6 190	н	V	105.08	20.39	8.45	2.93	25.91	38.45
				Н	103.28	19.05	8.45	2.93	24.57	38.45
(8PSK)	848.8	251	Н	V	103.74	18.91	8.76	2.97	24.70	38.45
				Н	103.92	19.53	8.76	2.97	25.32	38.45

EUT mode	Freque ncy(M Hz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV	S.G. output (dBm)	Antenna Gain (dBi)	Cable loss (dB)	EIRP (dBm)	Limit (dBm)
WCDMA Band V	826.4	.4 4132	н	V	97.07	10.90	8.4	3.32	15.98	38.45
				Н	102.4	16.40	8.4	3.32	21.48	38.45
	836.6	4183	4183 H	V	94.97	12.42	8.42	3.40	17.44	38.45
				Н	102.87	17.75	8.42	3.40	22.77	38.45
	846.6	4233	н	V	100.05	12.39	8.47	3.43	17.43	38.45
	0.010	00		Н	102.96	18.01	8.47	3.43	23.05	38.45



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EUT mode	Freque ncy(M Hz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV	S.G. output (dBm)	Antenna Gain (dBi)	Cable loss (dB)	EIRP (dBm)	Limit (dBm)
	1850.2	512	н	V	104.11	21.07	7.05	4.45	23.67	33
				Н	105.20	23.32	7.05	4.45	25.92	33
PCS	1880.0	661	н	V	105.79	22.86	7.13	4.57	25.42	33
1900				Н	106.27	23.76	7.13	4.57	26.32	33
(GIVISK)	1909.8	8 810	310 H	V	106.24	23.86	7.25	4.48	26.63	33
				Н	104.77	22.12	7.25	4.48	24.89	33
		- 10	н	V	106.56	22.76	7.05	4.45	25.36	33
	1850.2	512		Н	103.69	20.07	7.05	4.45	22.67	33
PCS				V	105.65	22.00	7.13	4.57	24.56	33
1900 (8PSK)	1880.0	661	Н	Н	103.92	20.58	7.13	4.57	23.14	33
	1000 5			V	103.30	19.40	7.25	4.48	22.17	33
	1909.8	810	Н	Н	100.70	17.12	7.25	4.48	19.89	33

EUT mode	Freque ncy(M Hz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV	S.G. output (dBm)	Antenna Gain (dBi)	Cable loss (dB)	EIRP (dBm)	Limit (dBm)																				
				V	102.33	14.80	9.15	4.15	19.80	33																				
	1852.4	9262	Н	Н	100.54	17.18	9.15	4.15	22.18	33																				
WCDMA				V	101.75	16.15	9.22	4.28	21.09	33																				
Band II	1880.0	0 9400	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400 H	00 H	) H	9400 H	Н	105.66	17.37	9.22	4.28	22.31	33
			V	101.57	13.23	9.25	4.41	18.07	33																					
	1907.6	9538	Н	Н	102.81	17.33	9.25	4.41	22.17	33																				

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### 6.3 Out of band emissions at antenna Terminals

### 6.3.1 Band edges emissions

Test Requirement: RSS 132, 4.5.1;RSS 133, 6.5.1(a)(i),(b) Part 2.1051.

FCC part 22.917(a), 24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specification in the instruction manual and/or alignment procedure, shall not be less than 43+10log(Mean power in watts) dBc below the mean power output outside a license's frequency block(-13dBm).

Test Date: Dec. 02, 2010 to Dec. 06, 2010

Test Procedure:

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emission is any up to 10<sup>th</sup> harmonic.

For the out of band: set RBW, VBW=1MHz, start=30MHz, stop= 10 th harmonic. Limit= -13dBm

Band Edge requirements: In 1Mhz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 % of bandwidth of fundamental emission of the transmitter any be employed to measure the out of band emission. Limit= -13dBm.



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### Measurement result:





Date: 2.DEC.2010 16:16:52



Date: 2.DEC.2010 16:17:18



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Date: 2.DEC.2010 16:16:05



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Date: 2.DEC.2010 16:15:14



Date: 2.DEC.2010 16:15:37



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Date: 2.DEC.2010 14:47:12



### Band Edge emission GSM 850 GMSK Channel high

Date: 2.DEC.2010 14:51:58



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Date: 2.DEC.2010 16:05:56



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Date: 2.DEC.2010 16:07:48



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Date: 2.DEC.2010 16:13:08



Date: 2.DEC.2010 16:12:30



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### Band Edge emission GSM 850 8-PSK Channel Low



Date: 2.DEC.2010 15:05:00



### Band Edge emission GSM 850 8-PSK Channel high

Date: 2.DEC.2010 15:06:35



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Date: 2.DEC.2010 15:30:06



Date: 2.DEC.2010 15:31:22



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Date: 2.DEC.2010 15:33:23



Date: 2.DEC.2010 15:33:59



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Date: 2.DEC.2010 15:35:22



Date: 2.DEC.2010 15:35:53



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### Band Edge emission PCS 1900 GMSK Channel Low



Date: 2.DEC.2010 15:20:55



### Band Edge emission PCS 1900 GMSK Channel high

Date: 2.DEC.2010 15:37:32



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Date: 2.DEC.2010 15:45:38



Date: 2.DEC.2010 15:46:07



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Date: 2.DEC.2010 15:44:46



Date: 2.DEC.2010 15:43:57



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Date: 2.DEC.2010 15:42:09



Date: 2.DEC.2010 15:42:42



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Date: 2.DEC.2010 15:47:16



### Band Edge emission PCS 1900 8-PSK Channel high

Date: 2.DEC.2010 15:41:19



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### WCDMA Band V Channel Low



Date: 6.DEC.2010 09:30:39



Date: 6.DEC.2010 09:23:44



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### WCDMA Band V Channel Mid



Date: 6.DEC.2010 09:22:17



Date: 6.DEC.2010 09:21:49



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### WCDMA Band V Channel High



Date: 6.DEC.2010 09:15:30



Date: 6.DEC.2010 09:16:06



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### Band Edge emission WCDMA Band V Channel Low



Date: 6.DEC.2010 09:24:39

### Band Edge emission WCDMA Band V Channel high



Date: 6.DEC.2010 09:17:25



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### WCDMA Band II Channel Low



Date: 6.DEC.2010 09:05:30



Date: 6.DEC.2010 09:05:52



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### WCDMA Band II Channel Mid



Date: 6.DEC.2010 09:08:45



Date: 6.DEC.2010 09:08:31



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### WCDMA Band II Channel High



Date: 6.DEC.2010 09:10:01



Date: 6.DEC.2010 09:31:30



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### Band Edge emission WCDMA Band II Channel Low



Date: 6.DEC.2010 09:05:00

### Band Edge emission WCDMA Band II Channel high



Date: 6.DEC.2010 09:11:28



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### 6.4 Field Strength of Radiated Spurious Emissions

Test Requirement:

RSS 132, 4.5.1;RSS 133, 6.5.1(a)(i),(b) Part 2.1053

FCC part 22.917(a), 24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specification in the instruction manual and/or alignment procedure, shall not be less than 43+10log(Mean power in watts) dBc below the mean power output outside a license's frequency block(-13dBm).

Test Date:

Dec. 01, 2010 to Dec. 07, 2010

Test Setup:

(A) Radiated emission Test setup, Below Frequency 1000MHz:



(B) Radiated emission Test setup frequency over 1GHz:





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(C) Substituted Method Test setup:



### Test Procedure:

The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824.2-848.8MHz were measured using substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follow:

EIRP in frequency band 1850.5-1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

ERP=S.G. output (dBm) + Antenna Gain (dBd)-Cable Loss (dB) EIRP=S.G. output (dBm) + Antenna Gain (dBi)-Cable Loss (dB)



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### Radiated spurious Emission Measurement Result: GSM 850 mode

### Operation mode: TX CH Low mode

Frequen cy (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dBm)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	Н	-67.21	8.9	2.14	-60.45	-13	47.45
800.00	Н	-55.73	8.7	2.86	-49.89	-13	36.89
1648.40	Н	-33.01	6.95	4.17	-30.23	-13	17.23
2472.60	Н	-45.09	8.35	5.24	-41.98	-13	28.98
3296.80	Н	-45.38	8.15	6.11	-43.34	-13	30.34
4121.00	Н	-44.11	8.45	6.94	-42.60	-13	29.60
500.00	V	-65.55	8.90	2.14	-58.79	-13	45.79
800.00	V	-47.29	8.70	2.86	-41.45	-13	28.45
1648.40	V	-33.73	6.95	4.17	-30.95	-13	17.95
2472.60	V	-40.44	8.35	5.24	-37.33	-13	24.33
3296.80	V	-47.47	8.15	6.11	-45.43	-13	32.43
4121.00	V	-46.88	8.45	6.94	-45.37	-13	32.37

Fundamental Frequency: 824.2MHz

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### Radiated spurious Emission Measurement Result: GSM 850 mode

### Operation mode: TX CH Mid mode

Fundamental	Frea	uencv:	836.	60MHz
		ao		

Frequency (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dBm)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	Н	-68.48	8.9	2.14	-61.72	-13	48.72
800.00	Н	-57.36	8.7	2.86	-51.52	-13	38.52
1673.20	Н	-31.35	6.95	4.20	-28.60	-13	15.60
2509.80	Н	-42.78	8.35	5.36	-39.79	-13	26.79
3346.40	н	-42.35	8.15	6.25	-40.45	-13	27.45
4183.00	Н	-44.54	8.45	6.98	-43.07	-13	30.07
500.00	V	-67.26	8.90	2.14	-60.50	-13	47.50
800.00	V	-45.84	8.70	2.86	-40.00	-13	27.00
1673.20	V	-34.18	6.95	4.20	-31.43	-13	18.43
2509.80	V	-39.83	8.35	5.36	-36.84	-13	23.84
3346.40	V	-50.88	8.15	6.25	-48.98	-13	35.98
4183.00	V	-49.13	8.45	6.98	-47.66	-13	34.66

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### Radiated spurious Emission Measurement Result: GSM 850 mode

### Operation mode: TX CH High mode

Frequen cy (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dBm)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	Н	-69.20	8.9	2.14	-62.44	-13	49.44
800.00	Н	-58.96	8.7	2.86	-53.12	-13	40.12
1697.60	Н	-32.08	6.95	4.22	-29.35	-13	16.35
2546.40	Н	-41.48	8.35	5.39	-38.52	-13	25.52
3395.20	Н	-43.32	8.15	6.35	-41.52	-13	28.52
4244.00	Н	-45.76	8.45	7.04	-44.35	-13	31.35
500.00	V	-68.00	8.90	2.14	-61.24	-13	48.24
800.00	V	-45.62	8.70	2.86	-39.78	-13	26.78
1697.60	V	-34.81	6.95	4.22	-32.08	-13	19.08
2546.40	V	-39.52	8.35	5.39	-36.56	-13	23.56
3395.20	V	-49.05	8.15	6.35	-47.25	-13	34.25
4244.00	V	-48.38	8.45	7.04	-46.97	-13	33.97

Fundamental Frequency: 848.8MHz

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### Radiated spurious Emission Measurement Result: PCS 1900 mode

### Operation mode: TX CH Low mode

Frequen cy (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dBm)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	Н	-77.84	8.9	2.14	-71.08	-13	58.08
800.00	Н	-71.07	8.7	2.86	-65.23	-13	52.23
1800.00	Н	-48.50	7	4.38	-45.88	-13	32.88
3700.40	Н	-39.91	8.35	6.77	-38.33	-13	25.33
5550.60	Н	-39.23	9.55	8.1	-37.78	-13	24.78
7400.80	Н	-42.80	9.75	9.51	-42.56	-13	29.56
9251.00	Н	-38.84	10.55	11.08	-39.37	-13	26.37
500.00	V	-79.02	8.9	2.14	-72.26	-13	59.26
800.00	V	-69.60	8.7	2.86	-63.76	-13	50.76
1800.00	V	-48.09	7	4.38	-45.47	-13	32.47
3700.40	V	-43.40	8.35	6.77	-41.82	-13	28.82
5550.60	V	-37.10	9.55	8.10	-35.65	-13	22.65
7400.80	V	-44.80	9.75	9.51	-44.56	-13	31.56
9251.00	V	-42.63	10.55	11.08	-43.16	-13	30.16

Fundamental Frequency: 1850.2MHz

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

EIRP(dBm)=S.G. Output(dBm) + Antenna Gain(dBi)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### Radiated spurious Emission Measurement Result: PCS 1900 mode

### Operation mode: TX CH mid mode

Frequen cy (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dBm)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	н	-79.86	8.9	2.14	-73.10	-13	60.10
800.00	Н	-72.18	8.7	2.86	-66.34	-13	53.34
1800.00	Н	-48.77	7	4.38	-46.15	-13	33.15
3760.00	Н	-39.36	8.42	6.84	-37.78	-13	24.78
5640.00	н	-40.76	9.5	8.31	-39.57	-13	26.57
7520.00	н	-41.43	9.78	9.6	-41.25	-13	28.25
9400.00	Н	-38.25	10.61	11.32	-38.96	-13	25.96
500.00	V	-79.71	8.9	2.14	-72.95	-13	59.95
800.00	V	-70.92	8.7	2.86	-65.08	-13	52.08
1800.00	V	-47.57	7	4.38	-44.95	-13	31.95
3760.00	V	-44.04	8.42	6.84	-42.46	-13	29.46
5640.00	V	-41.22	9.5	8.31	-40.03	-13	27.03
7520.00	V	-42.53	9.78	9.6	-42.35	-13	29.35
9400.00	V	-39.31	10.61	11.32	-40.02	-13	27.02

### Fundamental Frequency: 1880.0MHz

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

EIRP(dBm)=S.G. Output(dBm) + Antenna Gain(dBi)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### Radiated spurious Emission Measurement Result: PCS 1900 mode

### Operation mode: TX CH High mode

Frequen cy (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dBm)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	Н	-77.21	8.9	2.14	-70.45	-13	57.45
800.00	Н	-70.51	8.7	2.86	-64.67	-13	51.67
1800.00	Н	-48.00	7	4.38	-45.38	-13	32.38
3819.60	Н	-37.47	8.42	6.88	-35.93	-13	22.93
5729.80	Н	-41.27	9.5	8.48	-40.25	-13	27.25
7639.20	Н	-42.84	9.78	9.7	-42.76	-13	29.76
9549.00	Н	-39.57	10.61	11.64	-40.60	-13	27.60
500.00	V	-78.20	8.9	2.14	-71.44	-13	58.44
800.00	V	-69.97	8.7	2.86	-64.13	-13	51.13
1800.00	V	-49.29	7	4.38	-46.67	-13	33.67
3819.60	V	-41.29	8.42	6.88	-39.75	-13	26.75
5729.80	V	-40.18	9.5	8.48	-39.16	-13	26.16
7639.20	V	-40.40	9.78	9.7	-40.32	-13	27.32
9549.00	V	-40.75	10.61	11.64	-41.78	-13	28.78

### Fundamental Frequency: 1909.8MHz

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

EIRP(dBm)=S.G. Output(dBm) + Antenna Gain(dBi)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### Radiated spurious Emission Measurement Result: WCDMA Band V mode

### Operation mode: TX CH Low mode

Frequen cy (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dBm)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	Н	-70.07	8.9	2.14	-63.31	-13	50.31
800.00	Н	-57.18	8.7	2.86	-51.34	-13	38.34
1652.8	Н	-37.18	6.95	4.17	-34.40	-13	21.40
2479.2	Н	-45.76	8.35	5.26	-42.67	-13	29.67
3305.6	Н	-53.31	8.15	6.14	-51.30	-13	38.30
4132.0	Н	-56.17	8.45	6.95	-54.67	-13	41.67
500.00	V	-67.16	8.90	2.14	-60.40	-13	47.40
800.00	V	-55.02	8.7	2.86	-49.18	-13	36.18
1652.8	V	-37.88	6.95	4.17	-35.10	-13	22.10
2479.2	V	-46.97	8.35	5.26	-43.88	-13	30.88
3305.6	V	-56.98	8.15	6.14	-54.97	-13	41.97
4132.0	V	-54.17	8.45	6.95	-52.67	-13	39.67

Fundamental Frequency: 826.4MHz

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### Radiated spurious Emission Measurement Result: WCDMA Band V mode

### Operation mode: TX CH Mid mode

Frequen cy (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dBm)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	Н	-69.10	8.9	2.14	-62.34	-13	49.34
800.00	Н	-56.82	8.7	2.86	-50.98	-13	37.98
1673.20	Н	-35.31	6.95	4.2	-32.56	-13	19.56
2509.80	Н	-44.50	8.35	5.36	-41.51	-13	28.51
3346.40	Н	-55.57	8.15	6.25	-53.67	-13	40.67
4183.00	Н	-54.71	8.45	6.98	-53.24	-13	40.24
500.00	V	-68.04	8.90	2.14	-61.28	-13	48.28
800.00	V	-54.13	8.7	2.86	-48.29	-13	35.29
1673.20	V	-36.35	6.95	4.2	-33.60	-13	20.60
2509.80	V	-45.35	8.35	5.36	-42.36	-13	29.36
3346.40	V	-55.30	8.15	6.25	-53.40	-13	40.40
4183.00	V	-52.89	8.45	6.98	-51.42	-13	38.42

Fundamental Frequency: 836.6MHz

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### Radiated spurious Emission Measurement Result: WCDMA Band V mode

### Operation mode: TX CH High mode

Frequen cy (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBd)	Cable Loss (dBm)	ERP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	Н	-70.07	8.9	2.14	-63.31	-13	50.31
800.00	Н	-57.18	8.7	2.86	-51.34	-13	38.34
1693.2	н	-37.13	6.95	4.22	-34.40	-13	21.40
2539.8	Н	-45.64	8.35	5.38	-42.67	-13	29.67
3386.4	Н	-53.12	8.15	6.33	-51.30	-13	38.30
4233.0	Н	-56.09	8.45	7.03	-54.67	-13	41.67
500.00	V	-67.16	8.90	2.14	-60.40	-13	47.40
800.00	V	-55.02	8.7	2.86	-49.18	-13	36.18
1693.2	V	-37.83	6.95	4.22	-35.10	-13	22.10
2539.8	V	-46.85	8.35	5.38	-43.88	-13	30.88
3386.4	V	-56.79	8.15	6.33	-54.97	-13	41.97
4233.0	V	-54.09	8.45	7.03	-52.67	-13	39.67

Fundamental Frequency: 846.6MHz

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

ERP (dBm)=S.G. Output(dBm) + Antenna Gain(dBd)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### Radiated spurious Emission Measurement Result: WCDMA Band II mode

### Operation mode: TX CH Low mode

Frequen cy (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dBm)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	Н	-78.20	8.9	2.14	-71.44	-13	58.44
800.00	Н	-71.63	8.7	2.86	-65.79	-13	52.79
1800.00	Н	-46.98	7	4.38	-44.36	-13	31.36
3704.80	Н	-47.89	8.35	6.77	-46.31	-13	33.31
5557.20	Н	-53.31	9.55	8.11	-51.87	-13	38.87
7409.60	Н	-48.38	9.75	9.51	-48.14	-13	35.14
9262.00	Н	-43.30	10.55	11.10	-43.85	-13	30.85
500.00	V	-79.25	8.9	2.14	-72.49	-13	59.49
800.00	V	-70.09	8.7	2.86	-64.25	-13	51.25
1800.00	V	-48.43	7	4.38	-45.81	-13	32.81
3704.80	V	-51.96	8.35	6.77	-50.38	-13	37.38
5557.20	V	-54.17	9.55	8.11	-52.73	-13	39.73
7409.60	V	-47.66	9.75	9.51	-47.42	-13	34.42
9262.00	V	-46.20	10.55	11.10	-46.75	-13	33.75

Fundamental Frequency: 1852.4MHz

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

EIRP(dBm)=S.G. Output(dBm) + Antenna Gain(dBi)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### Radiated spurious Emission Measurement Result: WCDMA Band II mode

### Operation mode: TX CH mid mode

Frequen cy (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dBm)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	Н	-78.99	8.9	2.14	-72.23	-13	59.23
800.00	Н	-71.26	8.7	2.86	-65.42	-13	52.42
1800.00	Н	-49.27	7	4.38	-46.65	-13	33.65
3760.00	Н	-46.37	8.42	6.84	-44.79	-13	31.79
5640.00	Н	-53.23	9.5	8.31	-52.04	-13	39.04
7520.00	Н	-48.16	9.78	9.6	-47.98	-13	34.98
9400.00	Н	-43.56	10.61	11.32	-44.27	-13	31.27
500.00	V	-78.41	8.9	2.14	-71.65	-13	58.65
800.00	V	-72.56	8.7	2.86	-66.72	-13	53.72
1800.00	V	-49.10	7	4.38	-46.48	-13	33.48
3760.00	V	-53.74	8.42	6.84	-52.16	-13	39.16
5640.00	V	-52.64	9.5	8.31	-51.45	-13	38.45
7520.00	V	-48.42	9.78	9.6	-48.24	-13	35.24
9400.00	V	-44.61	10.61	11.32	-45.32	-13	32.32

### Fundamental Frequency: 1880.0MHz

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

EIRP(dBm)=S.G. Output(dBm) + Antenna Gain(dBi)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### Radiated spurious Emission Measurement Result: WCDMA Band II mode

### Operation mode: TX CH High mode

Frequen cy (MHz)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dBi)	Cable Loss (dBm)	EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
500.00	Н	-77.22	8.9	2.14	-70.46	-13	57.46
800.00	Н	-69.83	8.7	2.86	-63.99	-13	50.99
1800.00	Н	-48.09	7	4.38	-45.47	-13	32.47
3815.20	Н	-48.85	8.42	6.88	-47.31	-13	34.31
5722.80	Н	-54.57	9.5	8.47	-53.54	-13	40.54
7630.40	Н	-48.44	9.78	9.69	-48.35	-13	35.35
9538.00	Н	-44.32	10.61	11.62	-45.33	-13	32.33
500.00	V	-79.21	8.9	2.14	-72.45	-13	59.45
800.00	V	-71.10	8.7	2.86	-65.26	-13	52.26
1800.00	V	-48.00	7	4.38	-45.38	-13	32.38
3815.20	V	-55.18	8.42	6.88	-53.64	-13	40.64
5722.80	V	-53.80	9.5	8.47	-52.77	-13	39.77
7630.40	V	-47.22	9.78	9.69	-47.13	-13	34.13
9538.00	V	-45.68	10.61	11.62	-46.69	-13	33.69

Fundamental Frequency: 1907.6MHz

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 The result basic equation calculation is as follow:

EIRP(dBm)=S.G. Output(dBm) + Antenna Gain(dBi)-Cable Loss

3 The emission level of 6<sup>th</sup> to 10<sup>th</sup> harmonic is too low to be measured.



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### 6.5 Receiver Spurious Emissions

Test I	Requirement:
Limit:	

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### Table 1 - Spurious Emission Limits for Receivers

Spurious Frequency (MHz)	Field Strength (microvolt/m at 3 metres)		
30-88	100		
88-216	150		
216-960	200		
Above 960	500		

40.0 dB $\mu$ V/m between 30MHz to 88MHz 43.5 dB $\mu$ V/m between 88MHz to 216MHz 46.0 dB $\mu$ V/m between 216MHz to 960MHz 54.0 dB $\mu$ V/m above 960MHz Nov. 29, 2010

Test Date:

Test Setup:

(A) Radiated emission Test setup, Below Frequency 1000MHz:







### (B) Radiated emission Test setup frequency over 1GHz:

### **Test Procedure:**

The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and lowering of the test antenna from 4m to 1m. For emissions below 1 GHz, measurements shall be performed using QP detector. Above 1 GHz, measurements shall be performed using an average detector.

Note: All test modes have been tested. Below is the worst case for receiver mode.



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### Measurement Result:

Note: Red limit line - Quasi-peak limit; Blue plots - Peak detector scan plots.

Test in receiver mode. Horizontal (30MHz -1GHz)



Frequency	Actual Lecel QP (dBuV/m)	Limit (dBuV/m)	Margin
(191112)	(ubu V/III)	(upu V/III)	(uD)
30.00	*	40.0	*
100.00	*	43.5	*
160.00	*	43.5	*
200.00	*	43.5	*
800.00	*	46.0	*
1000.00	*	54.0	*

"\*" means the emission level is 6dB lower than the relevant limit.



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### Vertical (30MHz -1GHz):



Frequency	Actual Lecel QP	Limit	Margin
(MHz)	(dBuV/m)	(dBuV/m)	( <b>dB</b> )
30.00	*	40.0	*
100.00	*	43.5	*
160.00	*	43.5	*
200.00	*	43.5	*
800.00	*	46.0	*
1000.00	*	54.0	*

"\*" means the emission level is 6dB lower than the relevant limit.

~End of Report~