



FCC CFR47 CERTIFICATION

PARTS 22H and 24E

TEST REPORT

FOR

TRI-BAND (850/1800/1900MHZ) VOQ PROFESSIONAL PHONE

MODEL: Voq A11

FCC ID: N7NVOQA11

REPORT NUMBER: 03U2438-1

ISSUE DATE: JANUARY 14, 2004

Prepared for

**SIERRA WIRELESS INC., YW
13811 WIRELESS WAY
RICHMOND, BRITISH COLUMBIA
CANADA**

Prepared by

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1. TEST RESULT CERTIFICATION

COMPANY NAME: SIERRA WIRELESS INC., YW
13811 WIRELESS WAY
RICHMOND, BRISTISH COLUMBIA
CANADA

EUT DESCRIPTION: Tri-band (850/1800/1900MHz) Voq Professional Phone

MODEL NAME: Voq A11

DATE TESTED: JANUARY 14, 2004

TYPE OF EQUIPMENT	INTENTIONAL RADIATOR, CELL PHONE
MEASUREMENT PROCEDURE	ANSI 63.4 / 2001, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 22 SUBPART H AND PART 24 SUBPART E

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 22 Subpart H and PART 24 subpart E Cellular Radiotelephone Service. The equipment in the configuration described in this report, shows the measured emission levels emanating from the equipment do not exceed the specified limit.

Note : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Tested By:




BEN DU
EMC TECHNICIAN
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Tested By:



FRANK IBRAHIM
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Released For CCS By:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

2. EUT DESCRIPTION

800/1800/1900MHz TRIBAND GSM/GPRS SMART PHONE.

The 800MHz band has:

- an output ERP of 29.9 dBm
- a frequency range of 824 – 849 MHz
-

The 1900MHz band has:

- an output EIRP of 27.9 dBm
- a frequency range of 1850 – 1910 MHz

GSM 1800MHz is not in US Region.

3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

4. TEST FACILITY

The sites and measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2))

6. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

7. INSTRUMENTATION LIST

TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
Spectrum Analyzer	HP	E4446A	US42510266	7/23/2004
Preamplifier, 1 ~ 26 GHz	Miteq	NSP10023988	646456	4/25/2004
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	2/4/2004
Communication Tester	R & S	CMU 200	838114/032	11/14/2004
Horn Antenna	ETSLindgren	3117	00029310	12/26/2004
Spectrum Analyzer 20 Hz ~ 44 GHz	Agilent	E4446A	US42070220	1/13/2004
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	2/4/2004
Horn Antenna	ETSLindgren	3117	00029301	12/26/2004
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6739	2/4/2004
Signal Generator, 2 ~ 40 GHz	R & S	SMP04	DE 34210	5/25/2005
EMI Receiver, 9 kHz ~ 2.9 GHz	HP	8542E	3942A00286	11/21/2004
RF Filter Section	HP	85420E	3705A00256	11/21/2004
Signal Generator	R & S	SMY 01	DE 13010	6/2/2005
Dipole Antenna	ETS	DB-4	1629	5/15/2004

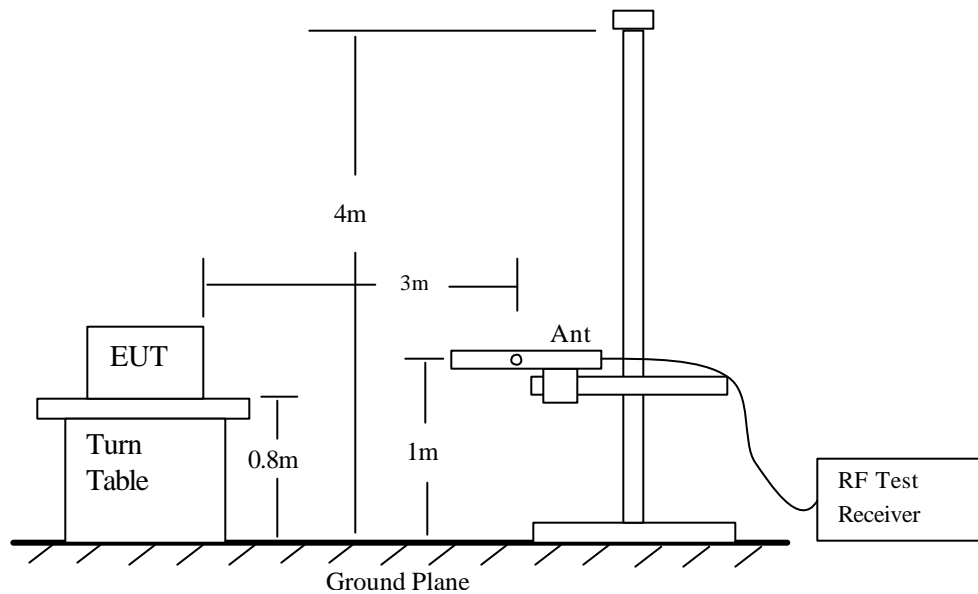
8. TEST SETUP, PROCEDURE AND RESULT

8.1. SECTION 2.1046: RF POWER OUTPUT

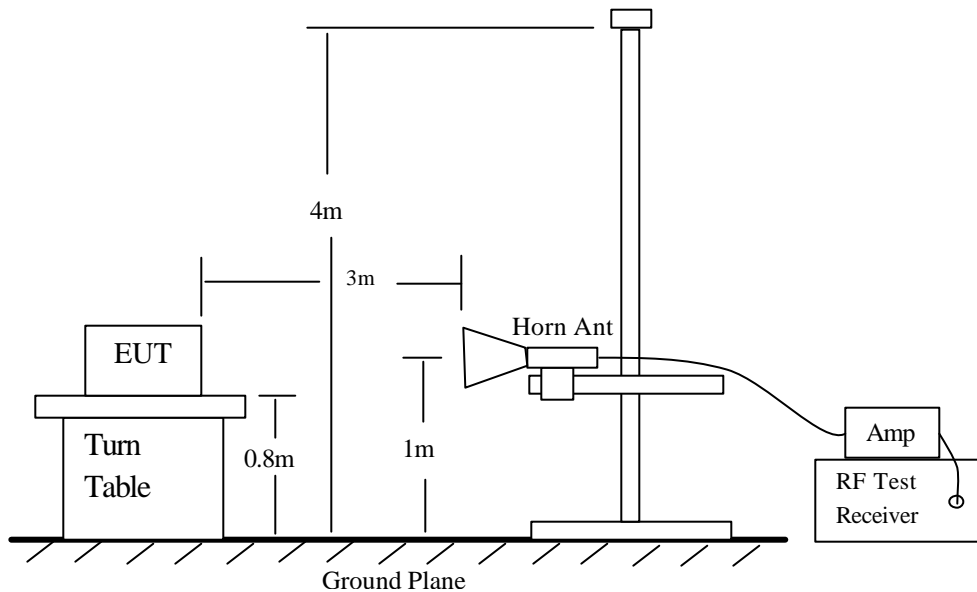
MEASUREMENT PROCEDURE

- 1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
- 2). The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the frequency of the transmitter.
- 3). The output of the test antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4). The transmitter shall be placed 0.80 meter above the ground plane, the X, Y, and Z positions shall be tested and the worst case reported. The transmitter shall be switched on with typical modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.

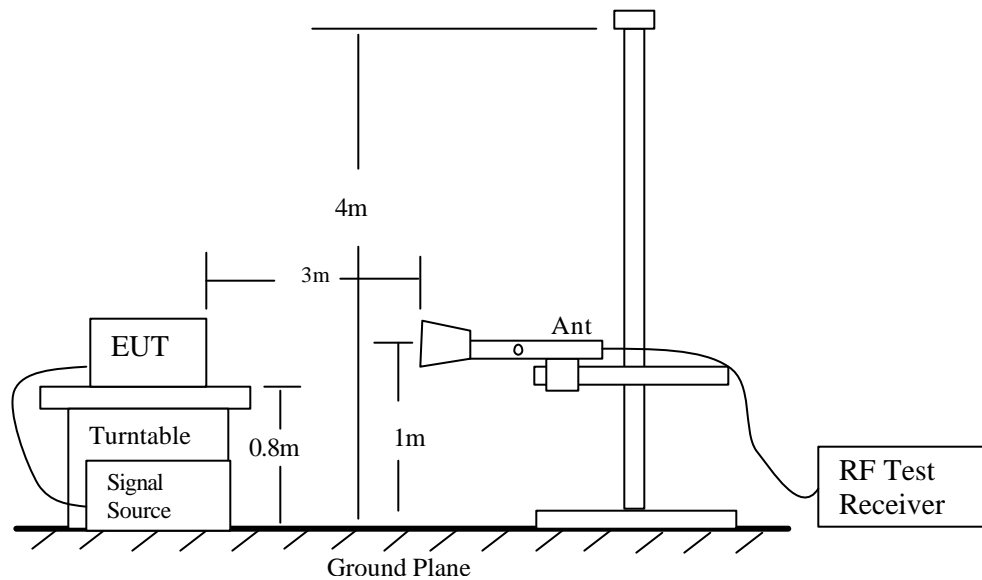
-
- 5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
 - 6). The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
 - 7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
 - 8). The maximum signal level detected by the measuring receiver shall be noted.
 - 9). The transmitter shall be replaced by a tuned dipole or horn antenna (substitution antenna).
 - 10). The substitution antenna shall be oriented for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
 - 11). The substitution antenna shall be connected to a calibrated signal generator.
 - 12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
 - 13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
 - 14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
 - 15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
 - 16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.
 - 17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.



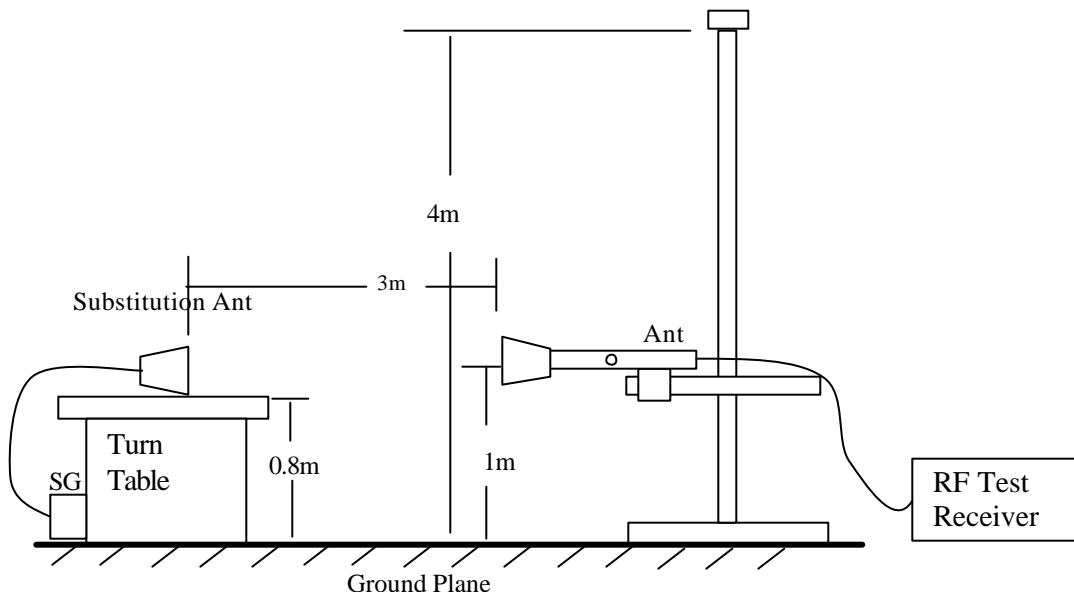
Radiated Emission Measurement 30 to 1000 MHz



Radiated Emission Above 1000 MHz



Radiated Emission Measurement



Radiated Emission – Substitution Method set-u

MEASUREMENT RESULT:

800MHz and 1900MHz Output Power Measurement:

	FREQUENCY	ERP
		PEAK
800 MHz (GSM)	(MHz)	(dBm)
LOW	824.2	29.8
MID	836.1	27.3
HI	848.8	27.8

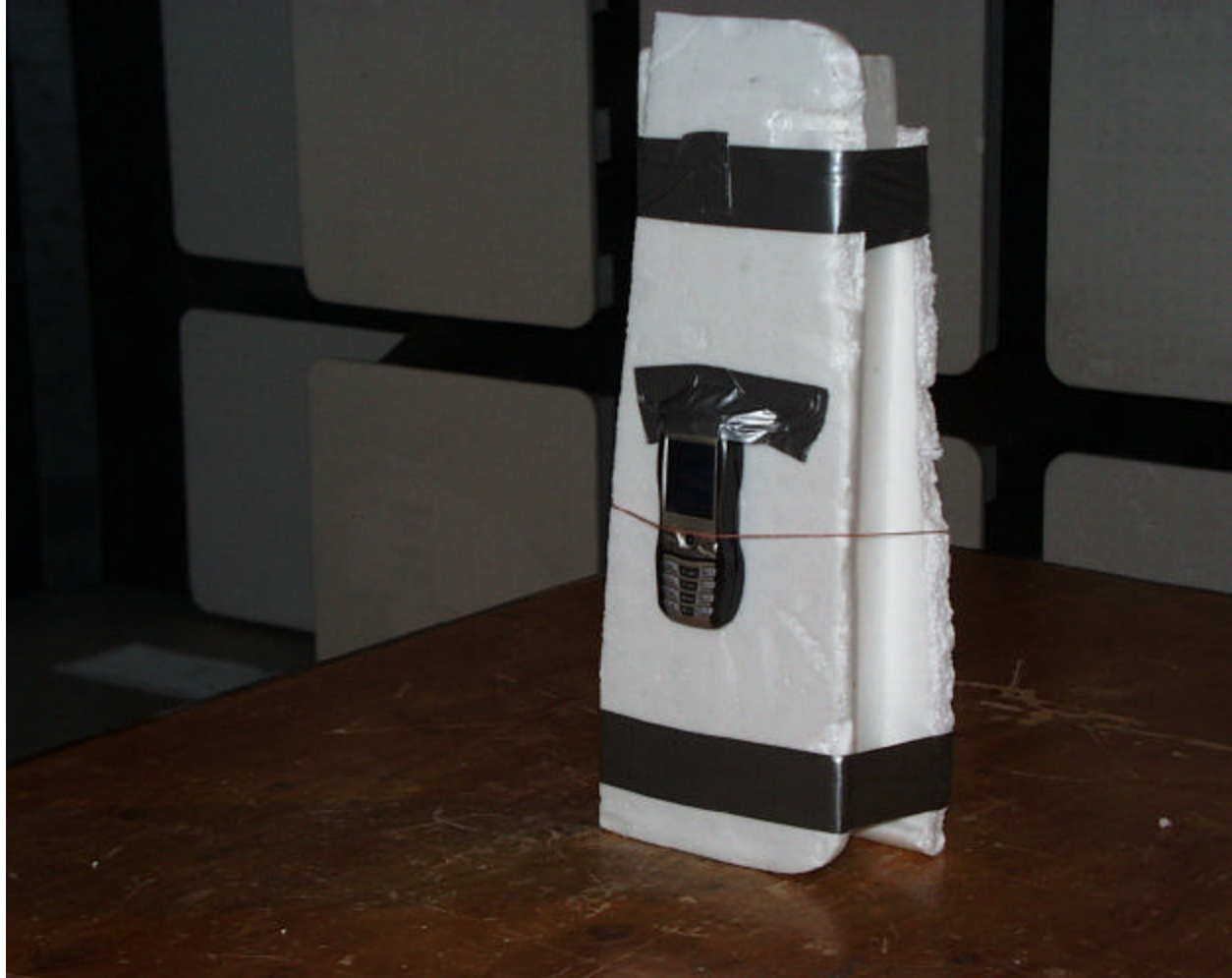
	FREQUENCY	ERP
		PEAK
800 MHz (GPRS)	(MHz)	(dBm)
LOW	824.2	29.9
MID	836.1	28.4
HI	848.8	28.2

	FREQUENCY	EIRP
		PEAK
1900 MHz (GSM)	(MHz)	(dBm)
LOW	1850.2	27.9
MID	1874.2	25.8
HI	1909.9	25.7

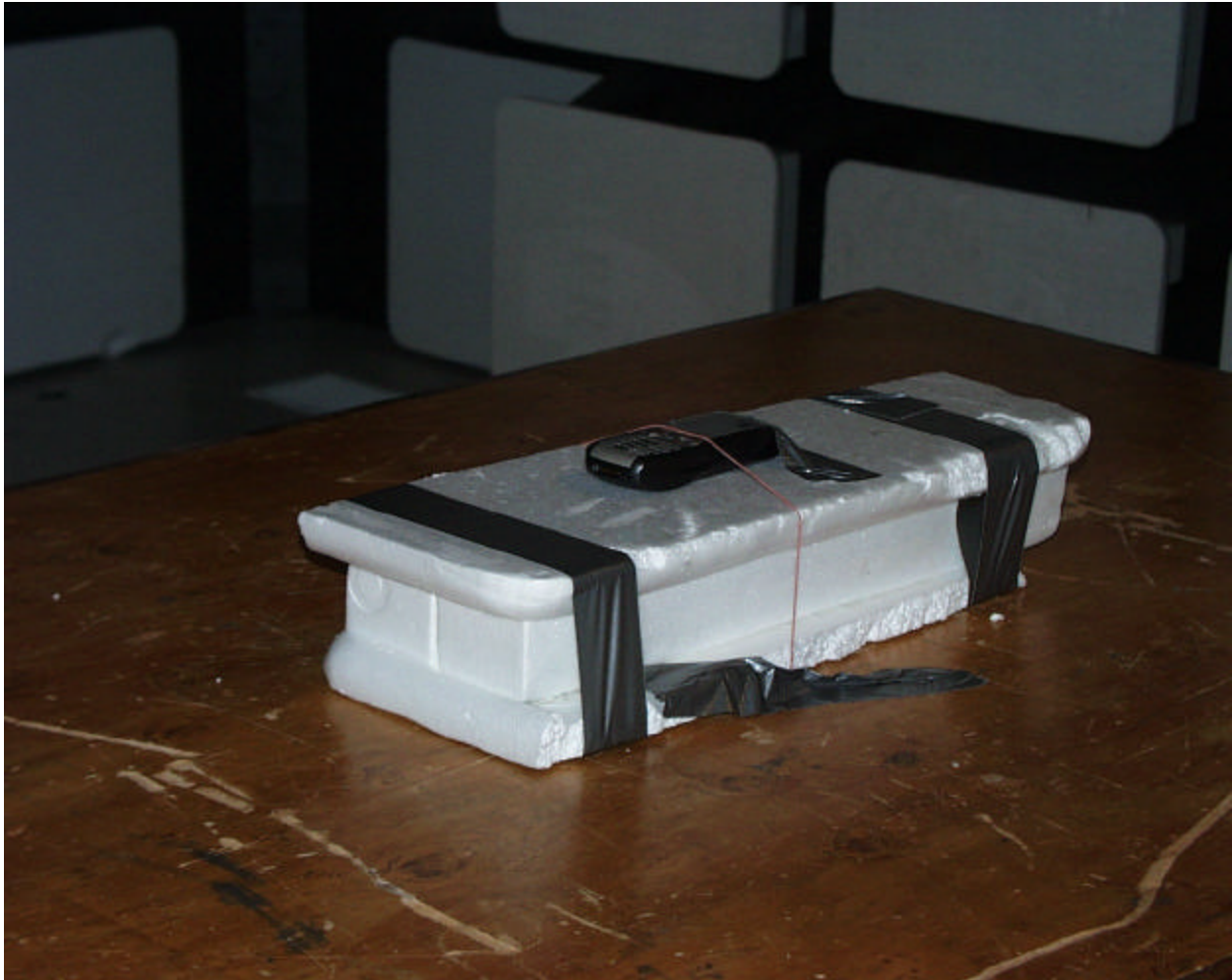
	FREQUENCY	EIRP
		PEAK
1900 MHz (GPRS)	(MHz)	(dBm)
LOW	1850.2	27.7
MID	1874.2	26.0
HI	1909.9	25.8

Radiated Emissions

Worst Orientation when the receiving antenna is vertical, (Y orientation)



Worst Orientation when the receiving antenna is horizontal, (Z orientation)



Output Power (ERP), 800MHZ - Low / Mid / High Channel Fundamental, and Output Power (EIRP),
1900 MHz – Low / Mid/ High Channel Fundamental

12/29/03 **High Frequency Substitution Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 03U2438-1
Company: Sierra Wireless
EUT Descrip.: 850/ 1800/ 1900 MHz GSM/GPRS Smart Phone
EUT M/N: A11
Test Target: FCC Parts 22 and 24
Mode Oper: TX ON (GSM, GPRS) 800MHz, 1900 MHz

Test Equipment:

EMCO Horn 1-18GHz	Pre-amplifier 1-26GHz	Spectrum Analyzer	Horn > 18GHz	Limit
<input type="checkbox"/> (2 ft)	<input type="checkbox"/> (2 ~ 3 ft)	<input type="checkbox"/> (4 ~ 6 ft)	<input type="checkbox"/> (12 ft)	

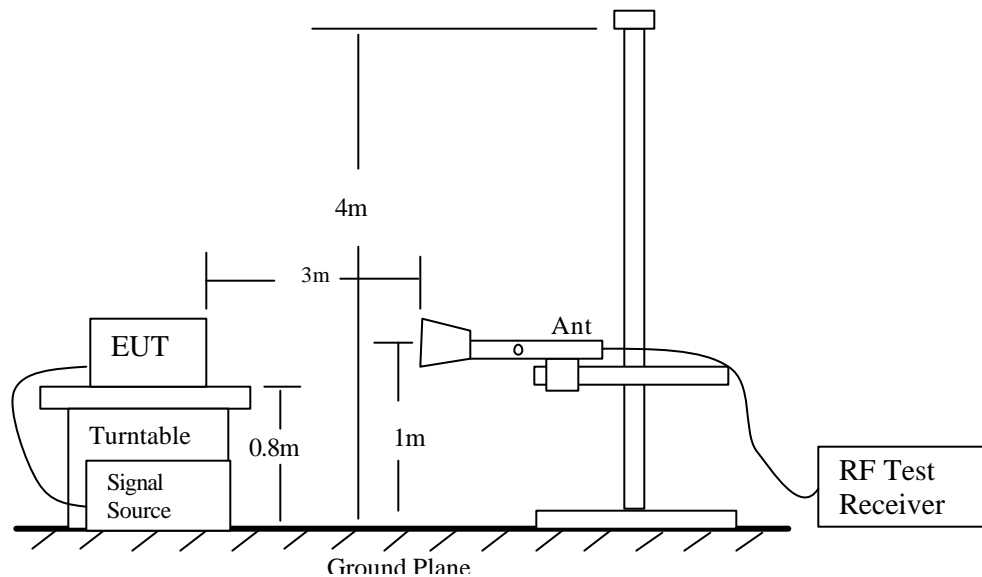
Peak Measurements:
Fundamental: RBW>99% or 26dB Emissions BW
VBW=RBW
Bandedge: RBW=>1% Emissions BW
VBW=> 3*RBW
Sourious: RBW=1MHz
VBW=1MHz

f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	(dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel = 1850.2 MHz (GSM)									
1.8502	96.07								X Orientation, V
1.8502	99.06								X Orientation, H
1.8502	98.27	24.0	0.3	3.9	1.8	25.5	33.0	-7.6	Y Orientation, V
1.8502	95.26								Y Orientation, H
1.8502	97.82								Z Orientation, V
1.8502	100.52	26.4	0.3	3.9	1.8	27.9	33.0	-5.2	Z Orientation, H
Mid Channel = 1874.2 MHz (GSM)									
1.8742	96.79	22.3	0.3	3.9	1.8	23.8	33.0	-9.3	Y Orientation, V
1.8742	98.65	24.3	0.3	3.9	1.8	25.8	33.0	-7.3	Z Orientation, Z
High Channel = 1909.9 MHz (GSM)									
1.9099	96.16	22.1	0.3	3.9	1.8	23.6	33.0	-9.5	Y Orientation, V
1.9099	98.15	24.2	0.3	3.9	1.8	25.7	33.0	-7.4	Z Orientation, Z
Low Channel = 1850.2 MHz (GPRS)									
1.8502	98.36	24.2	0.3	3.9	1.8	25.7	33.0	-7.4	Y Orientation, V
1.8502	100.23	26.2	0.3	3.9	1.8	27.7	33.0	-5.4	Z Orientation, Z
Mid Channel = 1874.2 MHz (GPRS)									
1.8742	96.88	22.5	0.3	3.9	1.8	24.0	33.0	-9.1	Y Orientation, V
1.8742	98.68	24.5	0.3	3.9	1.8	26.0	33.0	-7.1	Z Orientation, Z
High Channel = 1909.9 MHz (GPRS)									
1.9099	96.69	24.3	0.3	3.9	1.8	25.8	33.0	-7.3	Y Orientation, V
1.9099	98.47	24.3	0.3	3.9	1.8	25.8	33.0	-7.3	Z Orientation, Z
Low Channel = 824.2 MHz (GSM)									
0.824	66.0	30.0	0.2	2.2	0.0	29.8	38.5	-8.7	Y Orientation, V
0.824	101.0	28.0	0.2	2.2	0.0	27.8	38.5	-10.7	Z Orientation, Z
Middle Channel = 836.1 MHz (GSM)									
0.836	101.0	27.5	0.2	2.2	0.0	27.3	38.5	-11.2	Y Orientation, V
0.836	69.0	25.8	0.2	2.2	0.0	25.6	38.5	-12.9	Z Orientation, Z
High Channel = 848.8 MHz (GSM)									
0.849	101.0	28.0	0.2	2.2	0.0	27.8	38.5	-10.7	Y Orientation, V
0.849	68.0	24.0	0.2	2.2	0.0	23.8	38.5	-14.7	Z Orientation, Z
Low Channel = 824.2 MHz (GPRS)									
0.824	66.1	30.1	0.2	2.2	0.0	29.9	38.5	-8.6	Y Orientation, V
0.824	101.6	28.3	0.2	2.2	0.0	28.1	38.5	-10.4	Z Orientation, Z
Middle Channel = 836.1 MHz (GPRS)									
0.836	101.6	28.6	0.2	2.2	0.0	28.4	38.5	-10.1	Y Orientation, V
0.836	70.1	26.3	0.2	2.2	0.0	26.1	38.5	-12.4	Z Orientation, Z
High Channel = 848.8 MHz (GPRS)									
0.849	101.3	28.4	0.2	2.2	0.0	28.2	38.5	-10.3	Y Orientation, V
0.849	76.8	23.8	0.2	2.2	0.0	23.6	38.5	-14.9	Z Orientation, Z

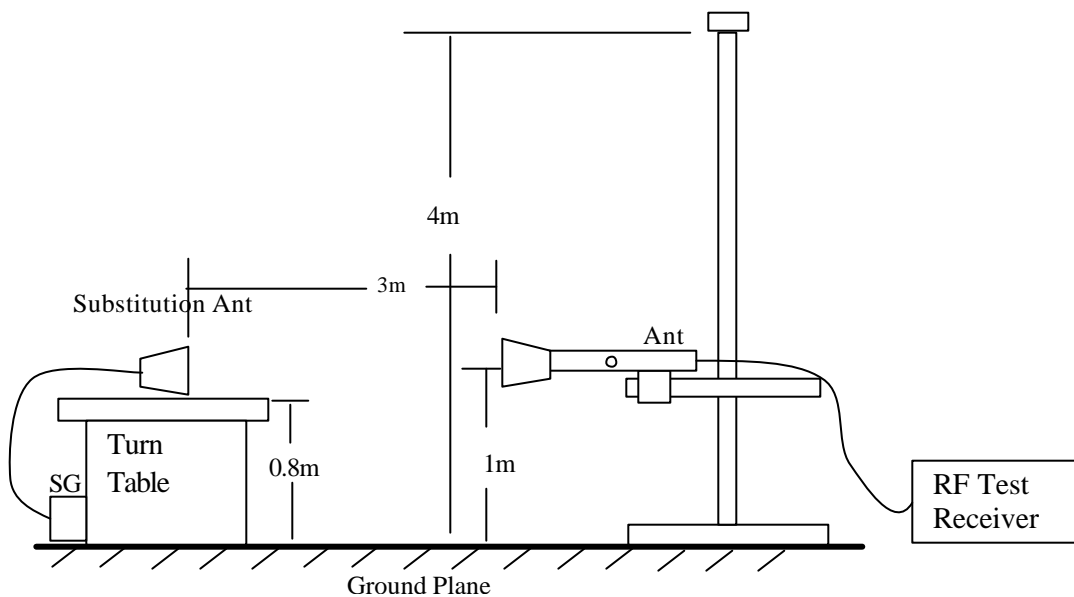
8.2. SECTION 2.1053: FIELD STRENGTH OF SPURIOUS RADIATION

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	<input checked="" type="checkbox"/> Peak <input type="checkbox"/> Average	<input checked="" type="checkbox"/> 1 MHz <input type="checkbox"/> 1 MHz	<input checked="" type="checkbox"/> 1 MHz <input type="checkbox"/> 10 Hz



Radiated Emission Measurement



Radiated Emission – Substitution Method set-up

TEST PROCEDURE

- 1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
- 2). The test antenna shall be oriented initially for vertical polarization located 1m from the EUT to correspond to the frequency of the transmitter.
- 3). The output of the test antenna shall be connected to the measuring receiver and either a peak or average detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- 4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- 5). The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 6). The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- 7). The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- 8). The maximum signal level detected by the measuring receiver shall be noted.
- 9). The transmitter shall be replaced by a substitution antenna.
- 10). The substitution antenna shall be oriented for vertical polarization.
- 11). The substitution antenna shall be connected to a calibrated signal generator.
- 12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- 13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- 14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- 15). The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- 16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.
- 17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

MEASUREMENT RESULT

No non-compliance noted, as shown below

1900MHz Band - Harmonics / Spurious and Substitution Emissions, Low / Mid / High Channels:

01/07/04 High Frequency Measurement												
Test Engr:		Frank Ibrahim										
Project #:		03U2438-1										
Company:		Sierra Wireless										
EUT Descrip.:		850/ 1800/ 1900 MHz GSM/GPRS Smart Phone										
EUT M/N:		A11										
Test Target:		FCC Part 24										
Mode Oper:		TX ON, GSM AND GPRS 1900 MHz										
Test Equipment:												
EMC Horn 1-18 GHz		Pre-amplifier 1-26 GHz		Spectrum Analyzer		Horn > 18 GHz		Limit				
T60 ; S/N: 2238 @3m		T63 Miteq 646456		Agilent E4446 A Analyzer		T87 ; ARA18-26 GHz ; S/N:1049		FCC15209				
Hi Frequency Cables												
<input type="checkbox"/> (2 ft) <input checked="" type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)												
f GHz	Dist feet	Read Pk dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	HPF	Peak dBuV/m	EIRP dBm	Limit dBm	Pk Mar dB	Notes
3.700	9.8	54.2	32.0	2.7	-35.6	0.0	1.0	54.4	-40.8	-13.0	-27.8	V
5.551	9.8	48.8	33.9	3.5	-35.2	0.0	1.0	52.0	-43.2	-13.0	-30.2	V
7.401	9.8	52.8	36.3	4.2	-34.5	0.0	1.0	59.8	-35.4	-13.0	-22.4	V
9.251	9.8	46.7	38.7	4.8	-33.3	0.0	1.0	58.0	-37.2	-13.0	-24.2	V
11.102	9.8	58.2	38.2	5.4	-33.7	0.0	1.0	69.1	-26.1	-13.0	-13.1	V
12.951	9.8	50.1	39.6	5.9	-36.1	0.0	1.0	60.5	-34.7	-13.0	-21.7	V
14.802	9.8	53.3	40.6	6.4	-39.7	0.0	1.0	61.5	-33.7	-13.0	-20.7	V
3.700	9.8	53.9	32.0	2.7	-35.6	0.0	1.0	54.1	-41.1	-13.0	-28.1	H
5.551	9.8	49.6	33.9	3.5	-35.2	0.0	1.0	52.9	-42.3	-13.0	-29.3	H
7.401	9.8	49.7	36.3	4.2	-34.5	0.0	1.0	56.7	-38.5	-13.0	-25.5	H
9.251	9.8	44.6	38.7	4.8	-33.3	0.0	1.0	55.8	-39.4	-13.0	-26.4	H
11.102	9.8	58.6	38.2	5.4	-33.7	0.0	1.0	69.5	-25.7	-13.0	-12.7	H
12.951	9.8	48.7	39.6	5.9	-36.1	0.0	1.0	59.1	-36.1	-13.0	-23.1	H
14.802	9.8	55.1	40.6	6.4	-39.7	0.0	1.0	63.4	-31.8	-13.0	-18.8	H

3.748	9.8	55.2	32.1	2.7	-35.6	0.0	1.0	55.5	-39.7	-13.0	-26.7	V
5.623	9.8	49.8	34.0	3.5	-35.1	0.0	1.0	53.2	-42.0	-13.0	-29.0	V
7.497	9.8	51.3	36.5	4.2	-34.4	0.0	1.0	58.5	-36.7	-13.0	-23.7	V
9.371	9.8	47.8	38.7	4.8	-33.3	0.0	1.0	59.0	-36.2	-13.0	-23.2	V
11.245	9.8	57.6	38.4	5.4	-33.8	0.0	1.0	68.6	-26.6	-13.0	-13.6	V
13.119	9.8	50.3	39.7	5.9	-36.4	0.0	1.0	60.5	-34.7	-13.0	-21.7	V
14.994	9.8	54.3	40.7	6.4	-40.1	0.0	1.0	62.4	-32.8	-13.0	-19.8	V
3.748	9.8	52.8	32.1	2.7	-35.6	0.0	1.0	53.1	-42.1	-13.0	-29.1	H
5.623	9.8	49.5	34.0	3.5	-35.1	0.0	1.0	52.9	-42.3	-13.0	-29.3	H
7.497	9.8	48.7	36.5	4.2	-34.4	0.0	1.0	55.9	-39.3	-13.0	-26.3	H
9.371	9.8	44.5	38.7	4.8	-33.3	0.0	1.0	55.7	-39.5	-13.0	-26.5	H
11.245	9.8	57.2	38.4	5.4	-33.8	0.0	1.0	68.2	-27.0	-13.0	-14.0	H
13.119	9.8	49.1	39.7	5.9	-36.4	0.0	1.0	59.3	-35.9	-13.0	-22.9	H
14.994	9.8	54.3	40.7	6.4	-40.1	0.0	1.0	62.4	-32.8	-13.0	-19.8	H
3.820	9.8	53.1	32.3	2.8	-35.5	0.0	1.0	53.6	-41.6	-13.0	-28.6	V
5.730	9.8	47.6	34.2	3.5	-35.1	0.0	1.0	51.2	-44.0	-13.0	-31.0	V
7.640	9.8	51.5	36.6	4.2	-34.3	0.0	1.0	59.1	-36.1	-13.0	-23.1	V
9.550	9.8	44.8	38.6	4.9	-33.3	0.0	1.0	55.9	-39.3	-13.0	-26.3	V
11.459	9.8	58.1	38.6	5.5	-34.1	0.0	1.0	69.1	-26.1	-13.0	-13.1	V
13.369	9.8	49.3	39.8	6.0	-36.9	0.0	1.0	59.2	-36.0	-13.0	-23.0	V
15.279	9.8	53.1	40.0	6.5	-40.1	0.0	1.0	60.5	-34.7	-13.0	-21.7	V
3.820	9.8	52.6	32.3	2.8	-35.5	0.0	1.0	53.1	-42.1	-13.0	-29.1	H
5.730	9.8	48.5	34.2	3.5	-35.1	0.0	1.0	52.1	-43.1	-13.0	-30.1	H
7.640	9.8	48.2	36.6	4.2	-34.3	0.0	1.0	55.8	-39.4	-13.0	-26.4	H
9.550	9.8	44.7	38.6	4.9	-33.3	0.0	1.0	55.8	-39.4	-13.0	-26.4	H
11.459	9.8	57.2	38.6	5.5	-34.1	0.0	1.0	68.2	-27.0	-13.0	-14.0	H
13.369	9.8	47.1	39.8	6.0	-36.9	0.0	1.0	57.0	-38.2	-13.0	-25.2	H
15.279	9.8	54.1	40.0	6.5	-40.1	0.0	1.0	61.5	-33.7	-13.0	-20.7	H
f	Measurement Frequency		Amp	Preamp Gain		Average Field Strength Limit						
Dist	Distance to Antenna		D Corr	Distance Correct to 3 meters		Peak Field Strength Limit						
Read	Analyzer Reading		Avg	Average Field Strength @ 3 m		Margin vs. Average Limit						
AF	Antenna Factor		Peak	Calculated Peak Field Strength		Margin vs. Peak Limit						
CL	Cable Loss		HPF	High Pass Filter								

NOTE: GPRS 1900MHz DATA ARE ALMOST SAME AS GSM 1900MHz

Note: Completed Scan from 30MHz to 10th Harmonic.

850MHz Band - Harmonics / Spurious and Substitution Emissions, Low / Mid / High Channels

01/19/04 High Frequency Measurement									
Compliance Certification Services, Morgan Hill Open Field Site									
Test Engr: VIEN TRAN									
Project #: 03U2438									
Company: SIERRA WIRELESS									
EUT Descrpt.: 850/1800/1900MHz GSM/GPRS SMART PHONE									
EUT M/N: A11									
Test Target: FCC22_HARMONIC & SPUR SUBSTITUTION									
Mode Oper: TX AT LOW MID HIGH CHANNELS FOR GSM 850MHz									
Test Equipment:									
EMCO Horn 1-18GHz		Pre-amplifier 1-26GHz		Spectrum Analyzer		Horn > 18GHz		Limit	
T72; S/N: 6739 @3m		T63 Miniq 646456		Agilent E4446A Analyzer				ERP	
<div> H Frequency Cables <div> <input type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input checked="" type="checkbox"/> (4 ~ 6 ft) <input type="checkbox"/> (12 ft) </div> </div>									
<div> Peak Measurements: <div> Fundamental: RBW>99% or 26dB Emissions BW VBW=RBW </div> <div> Bandedge: RBW>1% Emissions BW VBW> 3*RBW </div> <div> Spurious RBW=1MHz VBW=1MHz </div> </div>									
f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
LOW CH 824.2MHz									
1.648	50.1	-47.4	0.4	7.5	5.4	-42.4	-13.0	-29.4	
1.648	48.5	-49.0	0.4	7.5	5.4	-44.0	-13.0	-31.0	
NO OTHER EMISSION FOUND AFTER 2ND HARMONIC									
MID CH 836.1MHz									
1.672	49.1	-48.3	0.4	7.6	5.4	-43.3	-13.0	-30.3	
1.672	48.4	-49.2	0.4	7.6	5.4	-44.2	-13.0	-31.2	
NO OTHER EMISSION FOUND AFTER 2ND HARMONIC									
HI CH 848.8MHz									
1.687	48.5	-49.1	0.4	7.6	5.4	-44.0	-13.0	-31.0	
1.687	47.6	-49.8	0.4	7.6	5.4	-44.7	-13.0	-31.7	
NO OTHER EMISSION FOUND AFTER 2ND HARMONIC									

01/19/04 High Frequency Measurement
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: VIEN TRAN
Project #: 03U2438
Company: SIERRA WIRELESS
EUT Descrip.: 850/1800/1900MHz GSM/GPRS SMART PHONE
EUT M/N: A11
Test Target: FCC22_HARMONIC & SPUR SUBSTITUTION
Mode Oper: TX AT LOW MID HIGH CHANNELS FOR GPRS 850MHz

Test Equipment:

EMCO Horn 1-18GHz T72; S/N: 6739 @3m	Pre-amplifier 1-26GHz T63 Mitel 646456	Spectrum Analyzer Agilent E4446A Analyser	Horn > 18GHz	Limit ERP
---	---	--	--------------	--------------

Hi Frequency Cables
☐ (2 ft) ☐ (2 ~ 3 ft) ☒ (4 ~ 6 ft) ☐ (12 ft)

Peak Measurements:
Fundamental: RBW>99% or 26dB Emissions BW VBW=RBW
Bandedge: RBW>1% Emissions BW VBW> 3*RBW
Spurious: RBW=1MHz VBW=1MHz

f GHz	SA reading (dBuV)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
LOW CH 824.2MHz									
1.648	51.4	-47.9	0.4	7.5	5.4	-42.9	-13.0	-29.9	
1.648	48.9	-48.3	0.4	7.5	5.4	-43.3	-13.0	-30.3	
NO OTHER EMISSION FOUND AFTER 2ND HARMONIC									
MID CH 836.1MHz									
1.672	50.3	-48.3	0.4	7.6	5.4	-43.3	-13.0	-30.3	
1.672	49.1	-49.2	0.4	7.6	5.4	-44.2	-13.0	-31.2	
NO OTHER EMISSION FOUND AFTER 2ND HARMONIC									
HI CH 848.8MHz									
1.687	48.9	-49.4	0.4	7.6	5.4	-44.3	-13.0	-31.3	
1.687	48.1	-49.8	0.4	7.6	5.4	-44.7	-13.0	-31.7	
NO OTHER EMISSION FOUND AFTER 2ND HARMONIC									

8.3. RADIATED EMISSION

TEST PERIPHERALS				
Device Type	Manufacturer	Model Number	Serial Number	FCC ID
Laptop	HP	10194130	CAT000069915	DoC
MODEM	ACEEX	1414	9013538	IFAXDM1414
USB MOUSE	LOGITECH	M-UA34	LTC70500299	DZL211087
PRINTER	HP	2225C	2930S52614	DSI6XU2225
MICROPHONE SET	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN

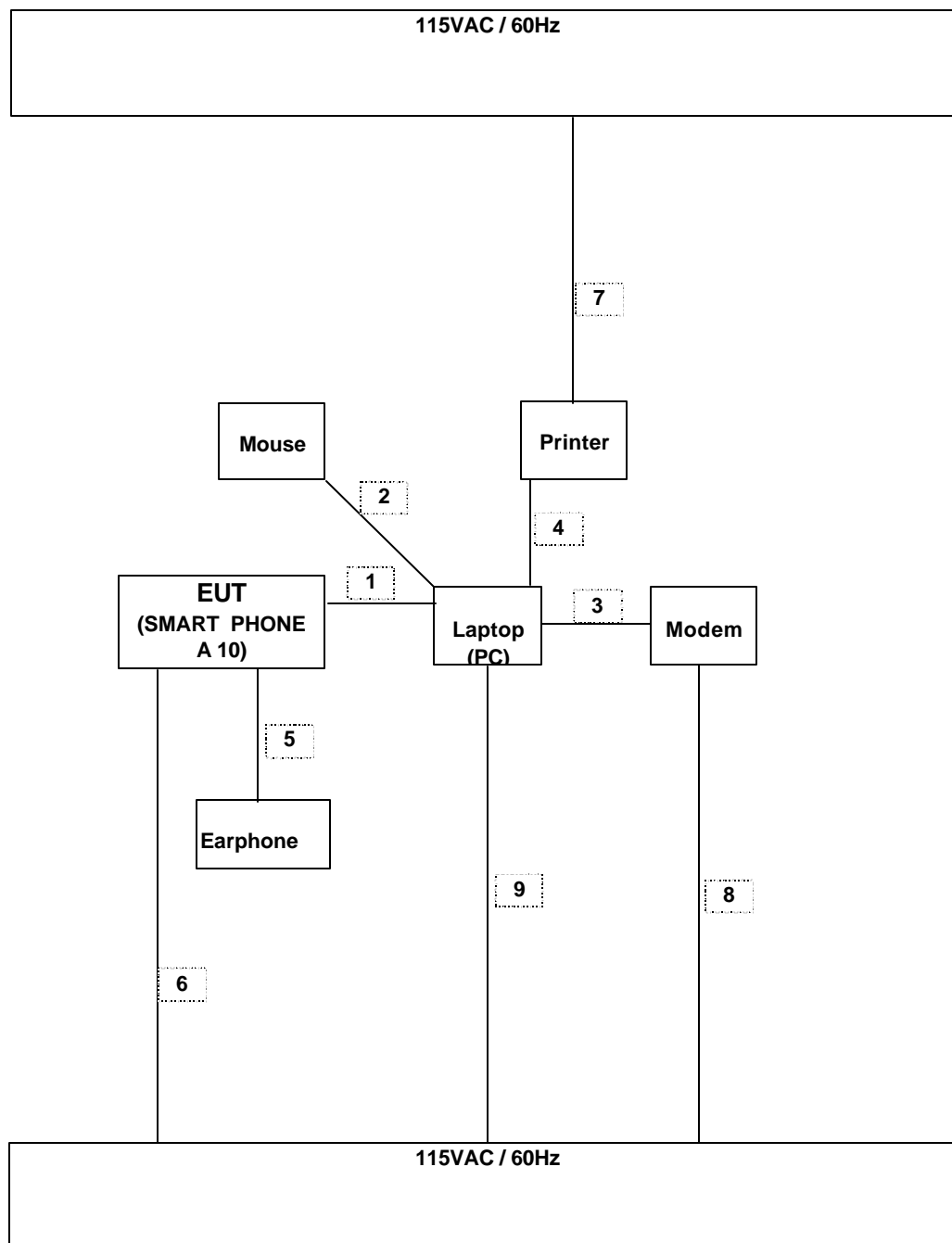
TEST I/O CABLES

TEST I / O CABLES								
Cable No	I/O Port	# of I/O Port	Connector Type	Type of Cable	Cable Length	Data Traffic	Bundled	Remark
1	EUT I/O Port	1	USB	Un-shielded	1 m	Yes	No	EUT: SMART PHONE Fax Modem Printer Microphone set
2	Mouse	1	USB	Un-shielded	1.5	Yes	No	
3	Serial	1	DB9	Shielded	2 m	Yes	Yes	
4	Parallel	1	DB25	Shielded	2 m	Yes	Yes	
5	EUT I/O Port	1	Din	Un-shielded	0.5 m	Yes	No	
9	AC	1	US115V	Un-shielded	2 m	No	Yes	
10	AC	1	US115V	Un-shielded	2 m	No	Yes	
11	AC	1	US115V	Un-shielded	2 m	No	Yes	
12	AC	1	US115V	Un-shielded	2 m	No	Yes	

Detector Setting of Spectrum Analyzer

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	<input checked="" type="checkbox"/> Peak	<input checked="" type="checkbox"/> 100 KHz	<input checked="" type="checkbox"/> 100 KHz
	<input checked="" type="checkbox"/> Quasi Peak	<input checked="" type="checkbox"/> 1 MHz	<input checked="" type="checkbox"/> 1 MHz

TEST SETUP



TEST PROCEDURE

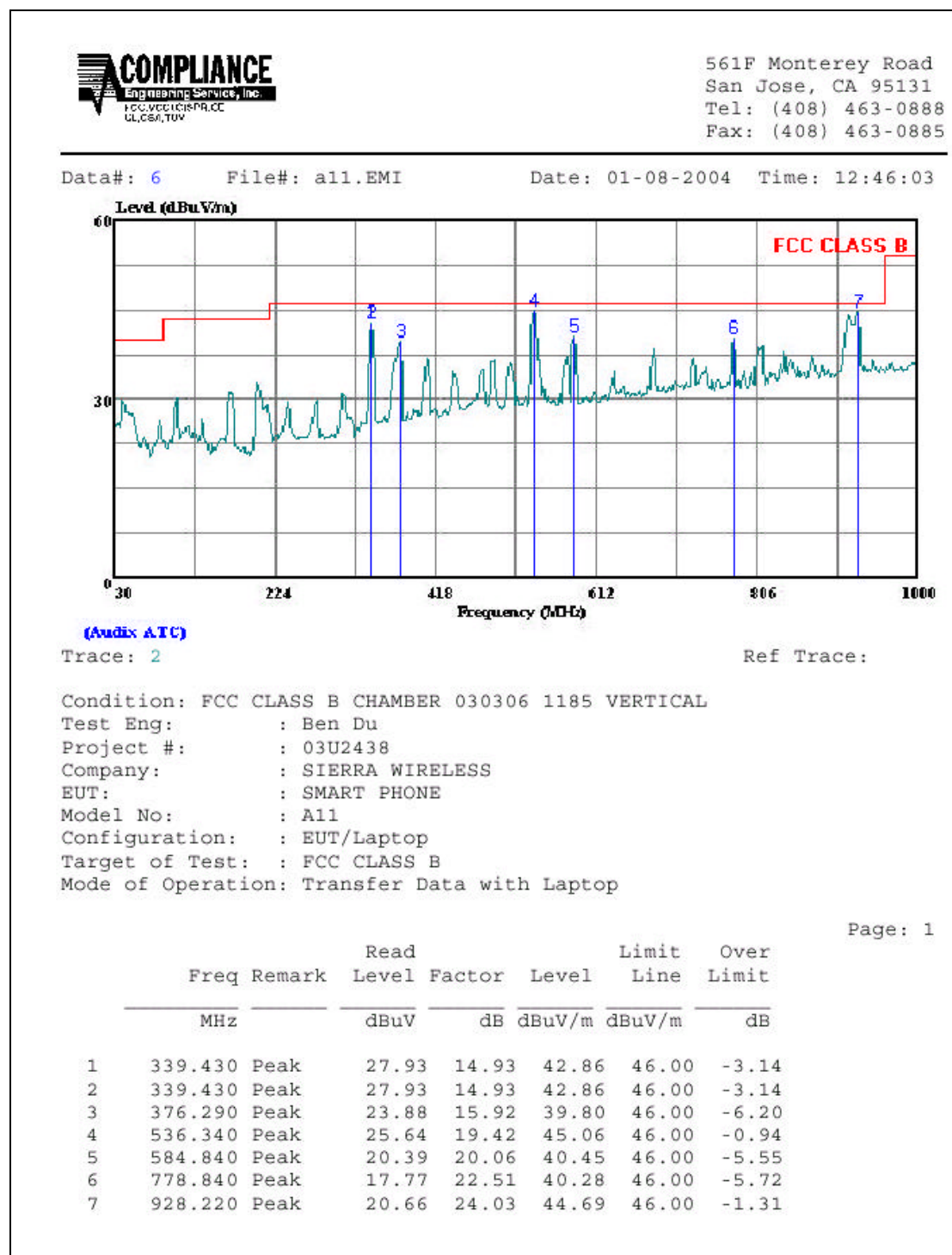
1. The EUT was placed on the turn table 0.8 meter above ground inside 3 meter Anechoic Chamber.
2. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
3. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.
4. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
5. Rotate the turn table and stop at the angle where the measurement device has maximum reading
6. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
7. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures (3)~(6). If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.

MEASUREMENT RESULT

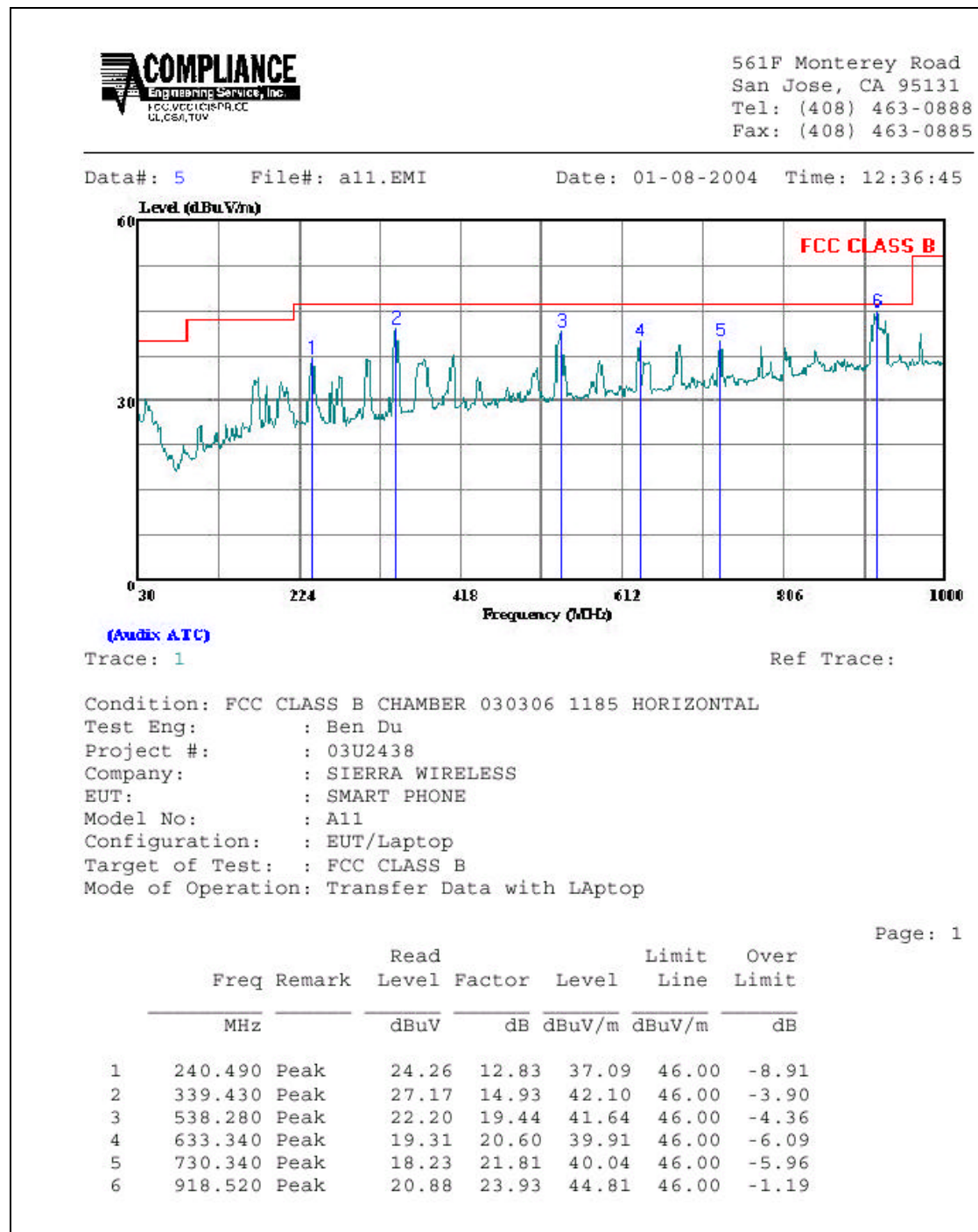
No non-compliance noted, as shown below.

800MHz AND 1900MHz BANDS FROM 30MHz TO 1000MHz

VERTICAL POLARIZATION:

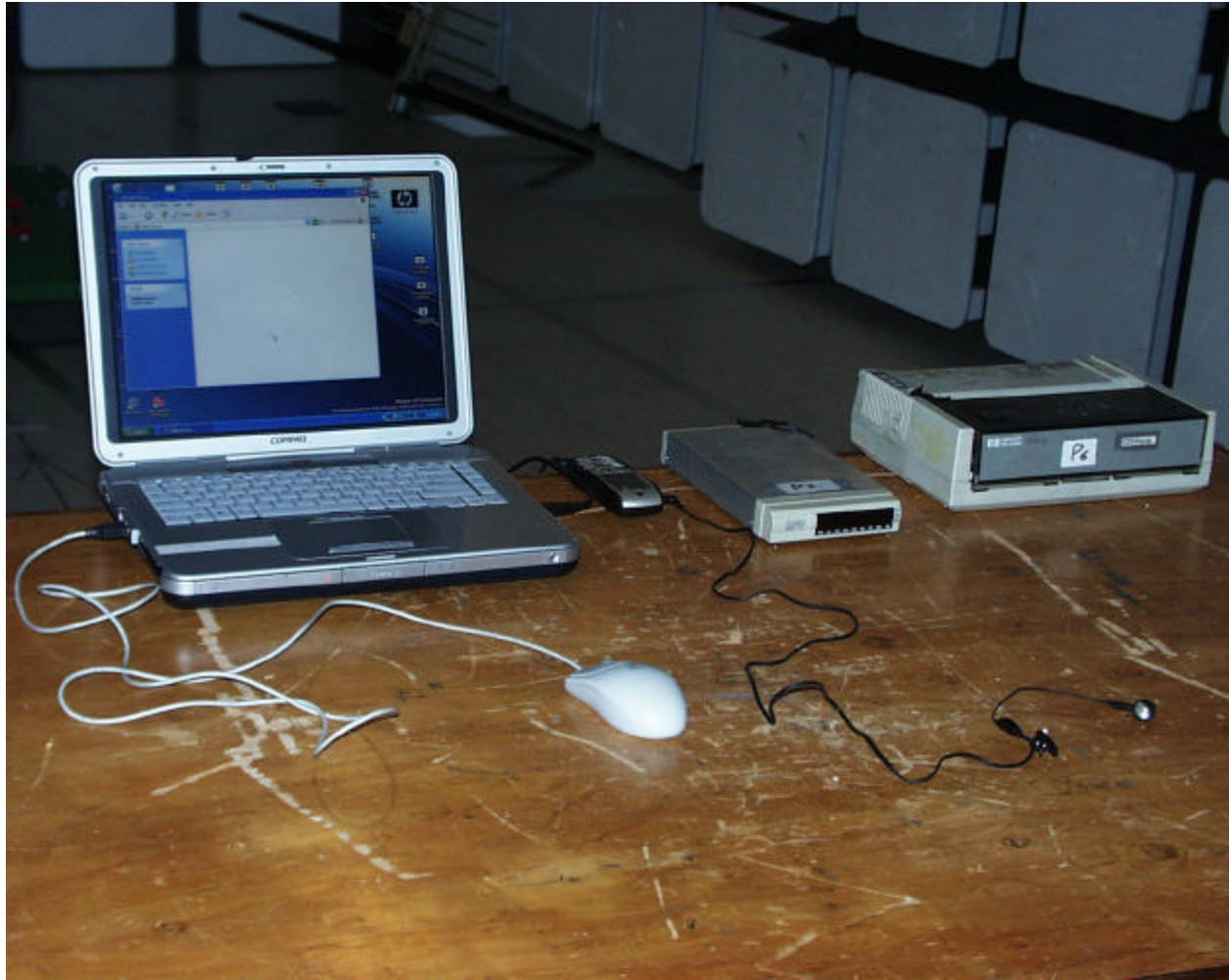


HORIZONTAL POLARIZATION:



Radiated Emission photos

Front view



Back view



8.4. POWERLINE CONDUCTED EMISSION

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
150 KHz to 30 MHz	<input checked="" type="checkbox"/> Peak <input type="checkbox"/> CISPR Quasi Peak	<input checked="" type="checkbox"/> 9 KHz	<input checked="" type="checkbox"/> 9 KHz

TEST PROCEDURE

1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in a continuous mode.
2. Line conducted data was recorded for both NEUTRAL and HOT lines.

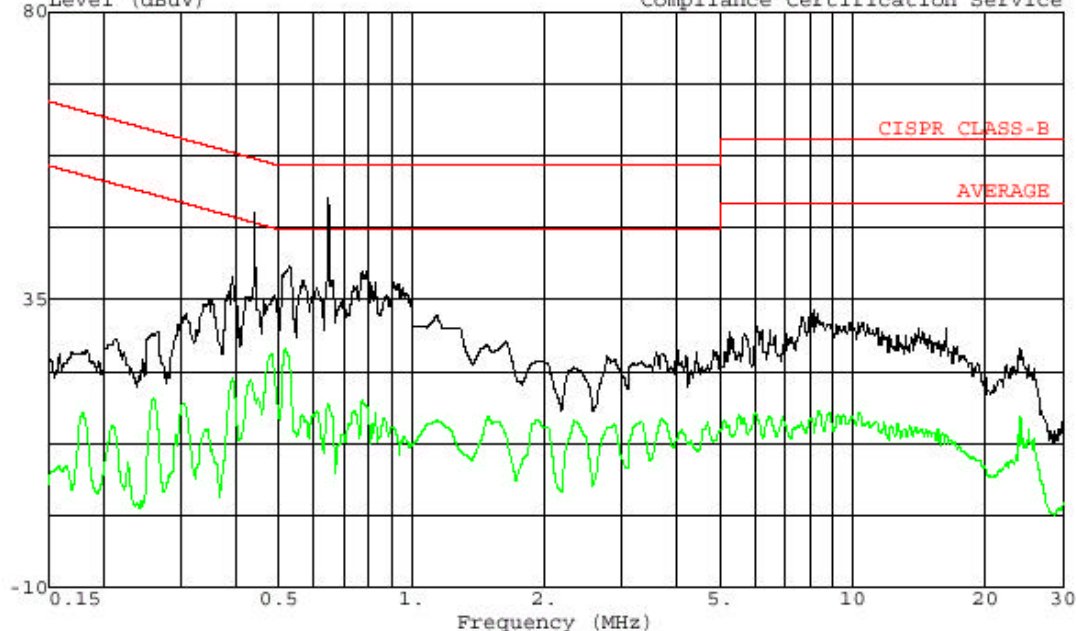
MEASUREMENT RESULT (FOR BOTH 800MHz AND 1900MHz BANDS)

LINE 1



561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 47 File#: 03U2438.EMI Date: 01-07-2004 Time: 16:32:39
Level (dBuV) Compliance Certification Service



Trace: 45
Project # : 03U2438
Test Operator : Ben Du
Company : SIERRA WIRELESS
EUT : GSM/GPRS Smart Phone
Model : Voq A11
Configuration : EUT, Laptop
Mode of Operation: Trans Data between EUT and Laptop
Target of Test : FCC Class B
Voltage : 115Vac/60Hz
Voltage : L1:Peak (BLACK), Average (GREEN)

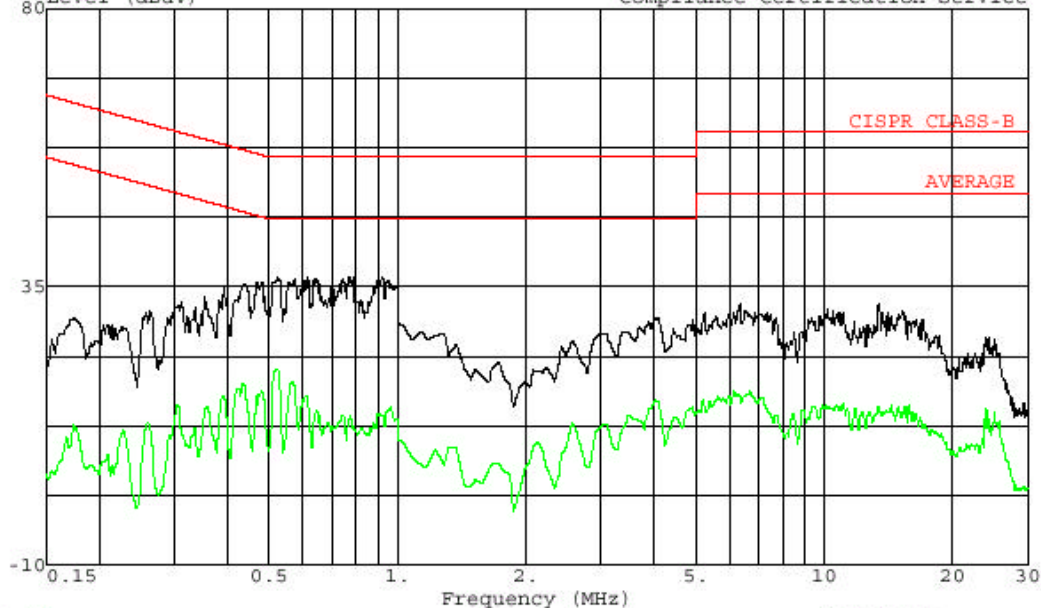
Ref Trace:

LINE 2



561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 54 File#: 03U2438.EMI Date: 01-07-2004 Time: 16:42:01
Level (dBuV) Compliance Certification Service



Trace: 52
Project # : 03U2438
Test Operator : Ben Du
Company : SIERRA WIRELESS
EUT : GSM/GPRS Smart Phone
Model : Voq A11
Configuration : EUT, Laptop
Mode of Operation: Trans Data between EUT and Laptop
Target of Test : FCC Class B
Voltage : 115Vac/60Hz
Voltage : L2:Peak (BLACK), Average (GREEN)

LINE CONDUCTION DATA (FOR BOTH 800MHz AND 1900MHz BANDS)

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit		Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.71	52.30	--	4.59	0.00	56.00	46.00	-3.70	-41.41	L1
0.76	50.98	--	3.95	0.00	56.00	46.00	-5.02	-42.05	L1
4.14	32.48	--	17.72	0.00	56.00	46.00	-23.52	-28.28	L1
0.45	41.40	--	25.70	0.00	57.37	47.37	-15.97	-21.67	L2
0.91	47.66	--	21.86	0.00	56.00	46.00	-8.34	-24.14	L2
19.64	32.02	--	17.45	0.00	60.00	50.00	-27.98	-32.55	L2
6 Worst Data									

LINE CONDUCTION - FRONT



LINE CONDUCTION - BACK



9. APENDIX

- 9.1. EXTERNAL & INTERNAL PHOTOS**
- 9.2. SCHEMATICS**
- 9.3. BLOCK DIAGRAM**
- 9.4. USER MANUAL**

END OF REPORT