

**RADIATED EMISSIONS**

**DATA**

**FOR**

**QUALCOMM, INC.  
10300 Campus Point Drive  
San Diego, CA 92121**

**Prepared by**

**TÜV PRODUCT SERVICE  
10040 Mesa Rim Road  
San Diego, CA 92121-2912**

Measurement Requirements (CFR 47 Part 22, Paragraph 22.917(b) and Part 24, Paragraph 24.238(a))

The measurements that follow were performed by TÜV Product Service. To the best of my knowledge these tests were conducted in accordance with the procedures outlined in Part 2 of the Commission's Rules and Regulations. The data presented below demonstrates compliance with the appropriate technical standards.

A handwritten signature in black ink that reads 'F R Fleury'.

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Floyd R. Fleury  
EMC Manager

## Emissions Test Conditions: SPURIOUS RADIATED EMISSIONS

Roof (small open area test site)

The *Spurious Radiated Emissions* measurements were performed using the following equipment:

### Test Equipment Used :

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Due Date
8586B	721	Spectrum Analyzer	Hewlett Packard	2542A12099	06/02
PreAmp 2 – 20 GHz	752	PreAmp	TUV PS	--	N/A*
3115	251	Antenna, Horn	Electro Mechanics Co	2595	06/02
Cable 1	733	30' cable	Universal Microwave Prod	--	N/A*
Cable 2	655	6" cable	Universal Microwave Prod	--	N/A*
FF 6549-1	778	900 MHz High Pass Filter	Sage	5	N/A*
FF 6548-2	782	2000 MHz High Pass Filter	Sage	007	N/A*
<b>For Substitution</b>					
Cable 3	732	30' cable	Universal Microwave Prod	--	N/A*
Cable 4	657	6" cable	Universal Microwave Prod	--	N/A*
HP83640B	791	Signal Generator	Hewlett Packard	3844A00726	03/02
3115	453	Antenna, Horn	Electro Mechanics Co	3564	10/01

Remarks: (\*) Verified

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Report No. SC106141-03



**FCC Testing**

**RADIATED SPURIOUS - EMISSIONS  
SIGNAL SUBSTITUTION METHOD**

SC/06/47

Test Report #: \_\_\_\_\_ Test Area: Room 3M  
 Test Method: FCC 22/24 Date: Sept 18, 2001  
SIGNAL Substitution  
 EUT Model #: KWC 2235 EUT POWER:  230 Vac/50 Hz  120 Vac/60 Hz  
 Other: BATTERY Temperature: 27 °C  
 EUT Description: Cellular Phone Air Pressure: 100.1 kPa  
 NOTES: \_\_\_\_\_ Relative Humidity: 48 %

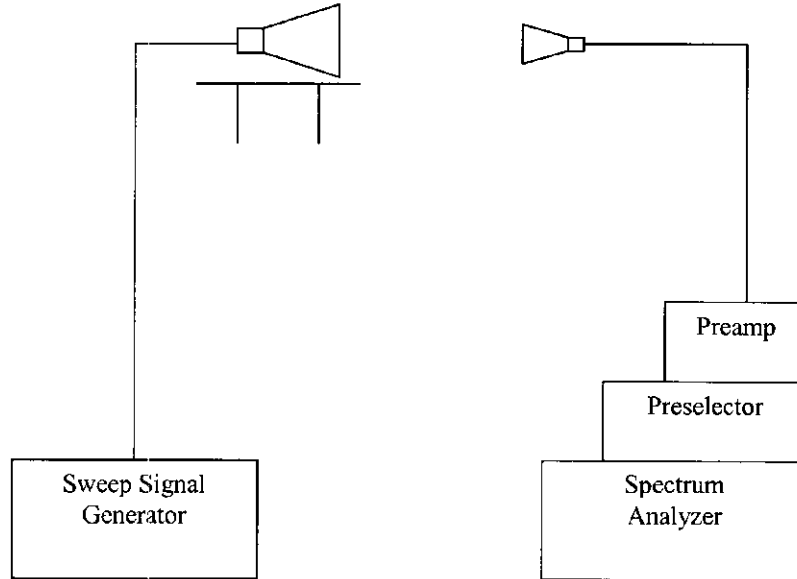


Frequency (MHz)	Signal Generator (dBm)	*Gain of Antenna - CABLE LOSS*	Total (EIRP)	Limit	Margin (dB)
4244.85	-38.4	3.4	-35.0	-13	-22.0
5553.75	-34.8	1.2	-33.6	-13	-20.6
5640	-38.3	1.4	-36.9	-13	-23.9
5726.25	-26.2	0	-26.2	-13	-13.2
5768.28	-41.3	2	-39.3	-13	-26.3
5938.17	-37.3	1.3	-36.0	-13	-23.0
5942.79	-39.8	1.6	-38.2	-13	-25.2
7635	-37.4	0.6	-36.8	-13	-23.8

Tested By: A. Landani Printed A. Landani Signature

NOTES: \_\_\_\_\_  
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**SC106141**  
 REPORT No. **SC106141**      TESTER: Alan Laudani      SPEC: FCC 47 Part 22.917(b)  
 CUSTOMER: Kyocera Wireless      TEST DIST: 3 Meters  
 E U T: KWC-2235      TEST SITE: Roof  
 EUT MODE: Transmit FM Cellular      BICONICAL: N/A  
 DATE: Sept. 17, 2001      LOG: N/A  
 NOTES: OTHER: 251

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG  
 below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG  
 CF = Antenna Factor + Cable Loss - Preamp Gain + Preselector Loss

FREQ (MHz)	VERTICAL (dBuV)		HORIZONTAL (dBuV)		CF (dB/m)	MAX LEVEL (dBm(d))		SPEC LIMIT (dBm)		MARGIN (dB)	EUT Rotation	Antenna Height	Notes	dBuV/m
	pk	av	pk	av		pk	av	pk	av					
824.04	102.9		91.2		22.1								Fundamental	125.0
1648.08	45.5		48.4		6.3	-40.6		-13.0		-27.6	190	1.25		54.7
2472.12	40.4		41.8		11.2	-42.3		-13.0		-29.3	180	1.25		53.0
3296.16	38.1		37.7		14.6	-42.6		-13.0		-29.6	180	1.25		52.7
4120.2	42		44		19.3	-31.9		-13.0		-18.9	180	1.5		63.3
4944.24	37.7		39.6		20.3	-35.4		-13.0		-22.4	180	1.5		59.9
5768.28	40.1		41		22.9	-31.3		-13.0		-18.3	180	1.5		63.9
6592.32	44.7		44.5		22.3	-28.2		-13.0		-15.2			noise floor	67.0
7416.36	42.4		42.1		23.3	-29.5		-13.0		-16.5			noise floor	65.7







*SC106141*  
 REPORT No: TESTER: Alan Laudani SPEC: FCC 47 Part 22.917(b)  
 CUSTOMER: Kyocera Wireless TEST DIST: 3 Meters  
 E U T: KWC-2235 TEST SITE: Roof  
 EUT MODE: Transmit CDMA Cellular BICONICAL: N/A  
 DATE: Sept. 17, 2001 LOG: N/A  
 NOTES: OTHER: 251

above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG  
 below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG  
 CF = Antenna Factor + Cable Loss - Preamp Gain + Preselector Loss

FREQ (MHz)	VERTICAL (dBuv)		HORIZONTAL (dBuv)		CF (dB/m)	MAX LEVEL (dBm(d))		SPEC LIMIT (dBm)		MARGIN (dB)		EUT Rotation	Antenna Height	Notes	dBuV/m
	pk	av	pk	av		pk	av	pk	av	pk	av				
836.49	100.3		88.9		22.1										122.4
1672.98	44.7		44.7		6.5	-44.1		-13.0		-31.1		180	1.5		51.2
2509.47	41.6		42.9		11.3	-41.0		-13.0		-28		180	1		54.2
3345.96	36.8		36.3		14.8	-43.6		-13.0		-30.6				noise floor	51.6
4182.45	44.2		40		19.6	-31.5		-13.0		-18.5		180	1		63.8
5018.94	38		39.4		20.3	-35.6		-13.0		-22.6		180	1		59.7
5855.43	42.5		42.4		23.1	-29.7		-13.0		-16.7				noise floor	65.6
6691.92	44.8		44.3		22.5	-28.0		-13.0		-15				noise floor	67.3
7528.41	42.2		42.8		23.4	-29.0		-13.0		-16				noise floor	66.2





REPORT No: *SC106141* TESTER: Alan Laudani SPEC: FCC 47 Part 22.917(b)  
 CUSTOMER: Kyrocera Wireless TEST DIST: 3 Meters  
 E U T: KWC-2235 TEST SITE: Roof  
 EUT MODE: Transmit CDMA Cellular BICONICAL: N/A  
 DATE: Sept. 17, 2001 LOG: N/A

NOTES: OTHER: 251  
above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG  
below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG  
 CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

FREQ (MHz)	VERTICAL (dBuV)		HORIZONTAL (dBuV)		CF (dB/m)	MAX LEVEL (dBm(d))		SPEC LIMIT (dBm)		MARGIN (dB)		EUT Rotation	Antenna Height	Notes	dBuV/m
	pk	av	pk	av		pk	av	pk	av	pk	av				
848.31	100.7		88.9		22.1										
1896.62	46.1		46.3		6.7	-42.3		-13.0		-29.3		190	1.25	Fundamental	122.8
2544.93	38.8		37.9		11.5	-45.0		-13.0		-32		180	1	noise floor	53.0
3393.24	37.3		41.4		15.0	-38.8		-13.0		-25.8		180	1		56.4
4241.55	46.3		46.1		19.8	-29.2		-13.0		-16.2		180	2		66.1
5089.86	41		46.9		20.6	-27.8		-13.0		-14.8		180	1.5		67.5
5938.17	44.1		45.1		23.3	-26.9		-13.0		-13.9		180	1.5	noise floor	68.4
6786.48	42.2		43.2		22.7	-29.4		-13.0		-16.4				noise floor	65.9
7634.79	42		41.5		23.6	-29.6		-13.0		-16.6				noise floor	65.6



**REPORT No:** SC106141  
**TESTER:** Alan Laudani  
**SPEC:** FCC 47 Part 24.238(a)  
**CUSTOMER:** Kyocera Wireless  
**TEST DIST:** 3 Meters  
**EUT:** KWC-2235  
**TEST SITE:** Roof  
**EUT MODE:** Transmit PCS/CDMA  
**BICONICAL:** N/A  
**DATE:** Sept. 17, 2001  
**LOG:** N/A

**NOTES:** OTHER: 251  
 above 1GHz: RBW & VBW 1 MHz for Pk; RBW 1MHz and VBW 10Hz for AVG  
 below 1GHz: RBW & VBW 100 kHz for Pk; RBW 100kHz and VBW 10Hz for AVG  
 CF = Antenna Factor + Cable Loss - Preamp Gain + Preselector Loss

FREQ (MHz)	VERTICAL (dBuv)		HORIZONTAL (dBuv)		CF (dB/m)	MAX LEVEL (dBm(d))		SPEC LIMIT (dBm)		MARGIN (dB)		EUT Rotation	Antenna Height	Notes	dBuV/m
	pk	av	pk	av		pk	av	pk	av	pk	av				
1851.25	88.7		89.1		32.6									Fundamental	121.7
3702.5	39		40.9		16.9	-37.5	-13.0	-13.0	-24.5	180	1				57.8
5553.75	42.8		41.3		22.5	-30.0	-13.0	-13.0	-17	180	1				65.3
7405	42.2		41		23.3	-29.7	-13.0	-13.0	-16.7					noise floor	65.5
9256.25	42.5		43.1		27.8	-24.3	-13.0	-13.0	-11.3					noise floor	70.9
11107.5	43		42		32.5	-19.7	-13.0	-13.0	-6.72					noise floor	75.5
12958.75	45.6		45.8		29.5	-20.0	-13.0	-13.0	-7.01					noise floor	75.3
14810					34.9									noise floor	34.9
16661.25					40.4									noise floor	40.4

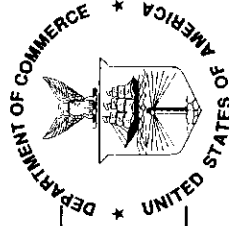




Testing Facilities  
Certificates of Approval



United States Department of Commerce  
National Institute of Standards and Technology



ISO/IEC GUIDE 25:1990  
ISO 9002:1987

**Certificate of Accreditation**

**TUV PRODUCT SERVICE, INC.**  
SAN DIEGO, CA

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

**ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS**

December 31, 2001

Effective through

*David E. Alderman*

For the National Institute of Standards and Technology

NVLAP Lab Code: 100268-0

NVLAP-01C (11-95)



ISO/IEC GUIDE 25:1990  
ISO 9002:1987

## Scope of Accreditation



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**ELECTROMAGNETIC COMPATIBILITY  
AND TELECOMMUNICATIONS**

NVLAP LAB CODE 100268-0

**TUV PRODUCT SERVICE, INC.**

10040 Mesa Rim Road  
San Diego, CA 92121-1034

Mr. R. Barry Wallen

Phone: 619-546-3999 Fax: 619-546-0364

E-Mail: [bwallen@TUVps.com](mailto:bwallen@TUVps.com)

URL: <http://www.tuvps.com>

*NVLAP Code Designation / Description*

**Emissions Test Methods:**

12/CIS22	IEC/CISPR 22:1993: Limits and methods of measurement of radio disturbance characteristics of information technology equipment
12/CIS22a	IEC/CISPR 22:1993: Limits and methods of measurement of radio disturbance characteristics of information technology equipment, Amendment 1:1995, and Amendment 2:1996.
12/CIS22b	CNS 13438:1997: Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment
12/F01	FCC Method - 47 CFR Part 15 - Digital Devices
12/F01a	Conducted Emissions, Power Lines, 450 KHz to 30 MHz
12/F01b	Radiated Emissions

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ISO 9002:1987

## Scope of Accreditation



Page: 2 of 3

**ELECTROMAGNETIC COMPATIBILITY  
AND TELECOMMUNICATIONS**

NVLAP LAB CODE 100268-0

**TUV PRODUCT SERVICE, INC.**

*NVLAP Code    Designation / Description*

12/T51            AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment

**MIL-STD-462 : Conducted Emissions:**

12/A01            MIL-STD-462 Method CE01

12/A04            MIL-STD-462 Method CE02

12/A06            MIL-STD-462 Method CE03

12/A08            MIL-STD-462 Method CE04

12/A10            MIL-STD-462 Method CE06

12/A12            MIL-STD-462 Method CE07

**MIL-STD-462 : Conducted Susceptibility:**

12/B01            MIL-STD-462 Method CS01

12/B02            MIL-STD-462 Method CS02

12/B04            MIL-STD-462 Method CS03/CS04/CS05/CS08


12/B05            MIL-STD-462 Method CS06

December 31, 2001

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*National Institute of Standards and Technology* **NVLAP** <sup>®</sup> *National Voluntary Laboratory Accreditation Program*

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**ISO/IEC GUIDE 25:1990**  
**ISO 9002:1987**

## Scope of Accreditation



DEPARTMENT OF COMMERCE  
UNITED STATES OF AMERICA

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Page: 3 of 3  
NVLAP LAB CODE 100268-0

**ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS**

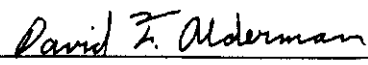
**TUV PRODUCT SERVICE, INC.**

<i>NVLAP Code</i>	<i>Designation / Description</i>
12/B06	MIL-STD-462 Method CS07
12/B07	MIL-STD-462 Method CS09
<b>MIL-STD-462 : Radiated Emissions:</b>	
12/D01	MIL-STD-462 Method RE01
12/D02	MIL-STD-462 Method RE02
12/D03	MIL-STD-462 Method RE03
<b>MIL-STD-462 : Radiated Susceptibility:</b>	
12/E01	MIL-STD-462 Method RS01
12/E02	MIL-STD-462 Method RS02
12/E03	MIL-STD-462 Method RS03 (Consult laboratory for field strengths available)
12/E04	MIL-STD-462 Method RS03 employing RADHAZ procedures for high level testing (Consult laboratory for field strengths available)

December 31, 2001

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*Effective through*




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Photograph of Test Setup



Photograph of Test Setup

