Nemko USA, Inc
11696 Sorrento Valley Rd., Suite F
San Diego, CA 92121-1024

EMC TEST REPORT

Kyocera Wireless Corp.

PCMCIA Device

Model: **KPC650**

RADIATED AND CONDUCTED EMISSIONS

FCC, PART 2.1053

FCC, PART 22 SUBPART H

FCC, PART 24 SUBPART D

INDUSTRY CANADA, RSS-129

INDUSTRY CANADA, RSS-133

TEST REPORT # 2004 120403 FCC

24-403-KYO

NEMKO USA, INC.
11696 SORRENTO VALLEY ROAD SUITE F
SAN DIEGO, CA 92121
PHONE: 858-755-5525

TABLE OF CONTENTS

TEST SETUP DIAGRAMS

TEST CONFIGURATION PHOTOGRAPHS

APPENDICES

EMC Test Report
For
Kyocera Wireless Corp.

Test Number : 24-731-EMC

Product Name : **PCMCIA Device**

Regulation : FCC, Part 22, Subpart H
: FCC, Part 24, Subpart D
: Industry Canada, RSS-129
: Industry Canada, RSS-133

Date : 12/13/04
Report Reviewed
Accepted by: _____

Kyocera Wireless Corp.
10300 Campus Point Drive
San Diego, CA 92121
Phone: **858 882-2879**
Fax: **858 882-2010**

Report Issued By: *FR Fleury*
For Ricky Hill, Senior EMC Engineer

Tested By: *Mike Krumweide*
Mike Krumweide, EMC Test Engineer

Administrative Data

Regulation	: FCC, Part 22, Subpart H
	: FCC, Part 24, Subpart D
	: Industry Canada, RSS-129
	: Industry Canada, RSS-133
Level	: Not Applicable
Test Method	: ANSI C63.4 – 2002
	: CSA C108. - M1983
Test Type	: Verification
Manufacturer	: **Kyocera Wireless Corp.**
EUT Type/:Model #	: **KPC650**
Date(s) of Test	: **December 6, 2004 to** December 8, 2004
Customer Personnel	: John Turner, Engineer
Nemko Personnel	: R. Hill, Senior EMC Engineer
	: Mike Krumweide, EMC Test Engineer
Test Location	: OPEN Area Test Site Nemko USA, Inc. 11696 Sorrento Valley Road, Suite F San Diego, CA 92121

EUT Description

The KPC650 is a **PCMCIA Device**.

The tests were run in a typical configuration including the following support equipment and cable connections.

DEVICE	MANUFACTURER MODEL # SERIAL #	POWER CABLE
EUT - PCMCIA Device	Kyocera Wireless Corp. Model: KPC650 SN: HN-V----14SHY5 Design Build: D064937	N/A
Support Laptop	Manufacturer: Dell Model # PP01L Serial # CN-06P823-48155-271-7341	Standard Laptop DC Cable
Laptop power supply	Manufacturer: Dell Model#: ADP-70EB Serial # TH-09364U-17971-31L-1B9T	Standard 120VAC 60 Hz

CONNECTION	I/O CABLE
No connections	

REASON FOR TEST

The EUT was tested to qualify current hardware build deviation D064937, for the KPC650 PCMCIA device.

CHANGES MADE DURING TEST

The following design modifications were made to the EUT during testing.

No design modifications were made to the EUT during testing.

DEVIATIONS FROM STANDARD TEST METHOD

-- None

CERTIFICATION AND TEST SUMMARY

Test Type	***In Accordance with Document***	***Frequency Range Investigated***	***EUT Complies***
Radiated Emissions	EN 55022 (1998)A1 Class "B" FCC 15.109	30 MHz to 1000 MHz	NA
Radiated Spurious Emissions	FCC, Part 22, Subpart H Industry Canada, RSS-129	824 – 849 MHz	PASS
Radiated Spurious Emissions	FCC, Part 24, Subpart D Industry Canada, RSS-133	1851 – 1909 MHz	PASS

The **PCMCIA Device** complied with FCC Parts 22 & 24, Industry Canada, RSS-129, RSS-133 when tested in the system configuration defined herein.

1. DESCRIPTION OF TEST SITE AND EQUIPMENT

1.1. Description of Test Site

The test site is located at 11696 Sorrento Valley Road, Suite F, San Diego, CA 92121. The site is physically located 18 miles Northwest of downtown San Diego. The general area is a valley 1.5 miles east of the Pacific Ocean. This particular part of the valley tends to minimize ambient levels, i.e. radio and TV broadcast stations and land mobile communications. The three and ten-meter Open Area Test Site (OATS) is located behind the office/lab building. It conforms to the normalized site attenuation limits and construction specifications as set in the EN 55022 (1998), CISPR 16 (2000) and 22 (1997) and ANSI C63.4-2002 documents. The OATS normalized site attenuation characteristics are verified for compliance every.

DESCRIPTION OF TESTING METHODS

1.2. Introduction

As required in 47 CFR, Parts 2 and 15, the methods employed to test the radiated and conducted emissions (as applicable) of the EUT are those contained within the American National Standards Institute (ANSI) document C63.4-2002, titled "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz." All applicable FCC Rule Sections that provide further guidance for performance of such testing are also observed.

For General Test Configuration please refer to Figure 1 on the following page.

Digital devices sold in Canada are required to comply with the Interference Causing Equipment Standard for Digital Apparatus, ICES-003. These test methods and limits are specified in the Canadian Standards Association's (CSA) Standard C108.8-M1983 (1-1-94 version) and are "essentially equivalent" with FCC, Part 15 and CISPR 22 (EN55022) rules for unintentional radiators per EMCAB-3, Issue 3 (May 1998). No further testing is required for compliance to ICES-003.

Figure 1. General EUT Test Setup Picture

CONFIGURATION LEGEND

1. EUT: **PCMCIA Device**
2. 80cm Non-Conductive Support Table
3. Support Laptop

1.3. Configuration and Methods of Measurements for Conducted Emissions

Section 7 of ANSI C63.4 determines the general configuration of the EUT and associated equipment, as well as the test platform for conducted emissions testing. Tabletop devices are placed on a non-conducting surface 80 centimeters above the ground plane floor and 40 centimeters from the ground plane wall. The EUT and associated system are configured to operate continuously, representing a "normally operating" mode. The EUT is powered via a Line Impedance Stabilization Network (LISN). The emissions are recorded using the required bandwidth of 9 kHz in the quasi-peak mode. The average amplitude is also observed employing a 10 kHz bandwidth to determine the presence of broadband RFI. When such interference is caused by broadband sources (as defined by the FCC and ANSI Rules), the deviation guidelines contained in Section 11.3.1 of ANSI C63.4 are employed, which allows a correction factor of 13 dB to be subtracted from the quasi-peak reading. The emission levels are then compared to the applicable FCC limits to determine compliance.

For Conducted Emissions Test Configuration please refer to Figure 2 on the following page.

1.4. Configuration and Methods of Measurements for Radiated Emissions

Section 8 of ANSI C63.4 determines the general configuration and procedures for measuring the radiated emissions of equipment under test. Initially, the primary emission frequencies are identified inside the test lab by positioning a broadband receive antenna one meter from the EUT to locate frequencies of significant radiation. Next, the EUT and associated system are placed on a turntable on a ten meter open area test site (registered with the FCC in accord with its Rules and ANSI C63.4) and the receive antenna is located at a distance of ten meters from the EUT.

The EUT and associated system are configured to operate continuously, representing a "normally operating" mode. All significant radiated emissions are recorded when maximum radiation on each frequency is observed, in accordance with part 8 of ANSI C63.4-1992 and Section 15.33 of the FCC Rules. To ensure that the maximum emission at each discrete frequency of interest is observed, the receive antenna is varied in height from one to four meters and rotated to horizontal and vertical polarities, and the turntable is also rotated to determine the worst emitting configuration. The numerical results of the test are included herein to demonstrate compliance.

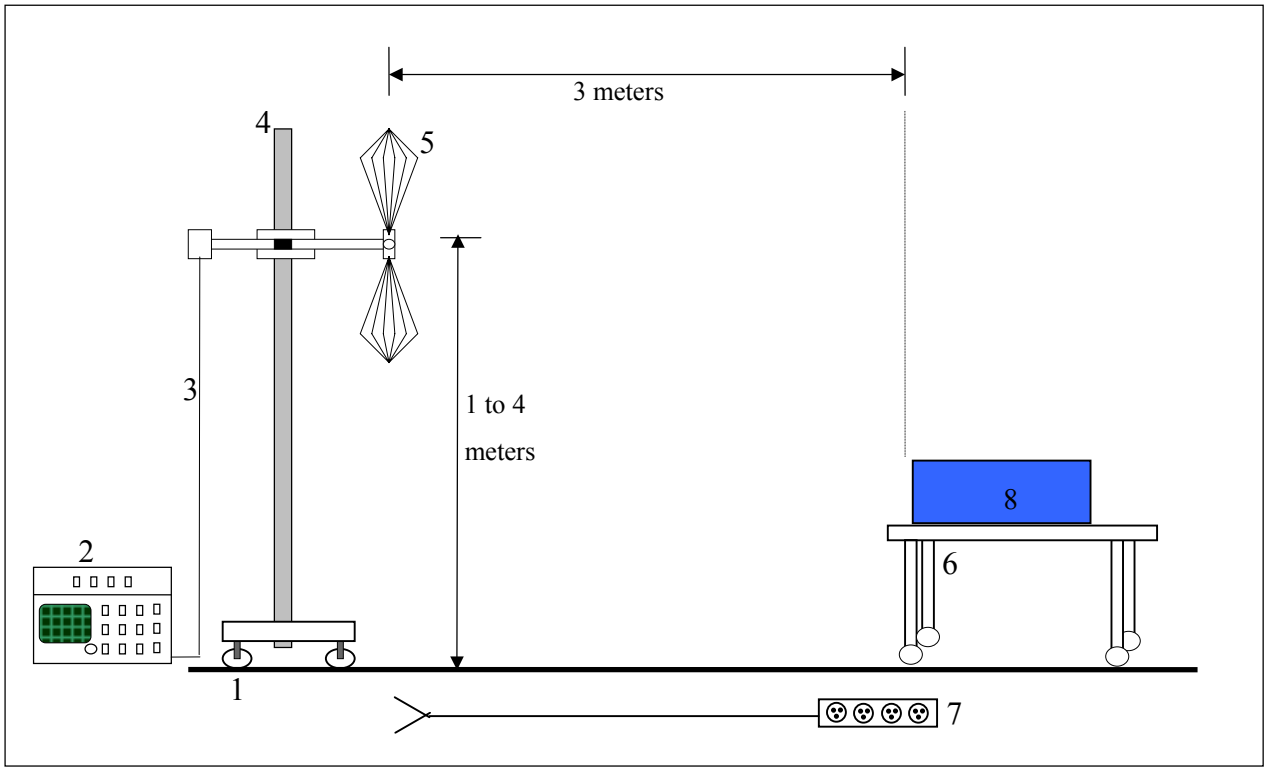
The numerical results that are applied to the emissions limits are arrived at by the following method:
Example: A=RR+CL+AF
A = Amplitude dBuV/M
RR = Receiver Reading dBuV
CL = cable loss dB
AF = antenna factor dBm-1

Example Frequency = 110MHz
18.5 dBuV (spectrum analyzer reading)
+3.0 dB (cable loss @ frequency)
21.5 dBuV
+15.4 dBm-1 (antenna factor @ frequency)
36.9 dBuV/M Final adjusted value

The final adjusted value is then compared to the appropriate emission limit to determine compliance.

For Radiated Emissions Test Configuration please refer to Figure 4 on the following page.

Figure 2. Radiated Emissions Test Setup Diagram



NOT TO SCALE

CONFIGURATION LEGEND

1. Ground plane (11 X 17 meters)
2. Spectrum Analyzer with Quasi-Peak Adapter
3. Coax interconnect from Receive Antenna to Spectrum Analyzer
4. Antenna Mast with motorized mounting assembly
5. Receive Antenna (basic relative position)
6. Non-Conducting table 80 cm above ground plane
7. AC power for devices
8. EUT: **PCMCIA Device**and Associated System

2. TEST RESULTS

2.1. Radiated Emissions Test Data

Substitution Method For Radiated Emissions

Client Name :	KYOCERA WIRELESS Corp.				
EUT Name :	Cellular Phone				
EUT Model # :	KPC650				
EUT Part # :					
EUT Serial # :	HN-V----14SHY5				
EUT Config. :	Hardware Build: D064937				
	CDMA TX and PCS TX				
Specification :	FCC Part 22			Reference :	
Rod. Ant. #:	NA	Temp. (deg. C) :	25	Date :	12/10/2004
Bicon Ant.#:	NA	Humidity (%) :	41	Time :	
Log Ant.#:	110	EUT Voltage :	na	Staff :	A. Laudani
DRG Ant. #	529	EUT Frequency :	na	Photo ID:	
Dipole Ant.#:	NA	Phase:	na	Peak Bandwidth:	RBW-1MHz, VBW-1MHz
Cable#:	60ft	Location:	RN# 90579		
Preamp#:	317	Distance:	3m		
Spec An.#:	NA				
QP #:	NA				
PreSelect#:	NA				

target Frequency MHz	target level dBuV/m	dipole	Cable loss dB	Signal Generator dBm	Total (ERP) dBm	Spec dBm	Margin dBm	RBW/VBW
824.70	97.4	0	22.10	45.09	22.99	24.5	-1.5	100 kHz
836.49	98.4	0	22.56	45.54	22.98	24.5	-1.5	100 kHz
849.00	100.0	0	22.34	47.09	24.75	24.5	0.3	100 kHz
3396.00	69.3	0	10.02	-25.47	-35.49	-13	-22.5	1 MHz
4123.50	68.1	0	11.18	-21.98	-33.16	-13	-20.2	1 MHz
4182.45	66.8	0	11.35	-23.08	-34.43	-12	-22.4	1 MHz
4245.00	66.4	0	11.41	-26.6	-38.01	-13	-25.0	1 MHz

Target Frequency MHz	Target level dBuV/m	Horn Gain dBi	Cable loss dB	Signal Generator dBm	Total (EIRP) dBm	Spec dBm	Margin dBm	
1851.31	92.5	5.73	7.05	24.78	23.46	24.5	-1.0	1 MHz
1880.00	91.8	5.78	7.15	24.98	23.61	24.5	-0.9	1 MHz
1908.75	92	5.83	7.16	25.42	24.09	24.5	-0.4	1 MHz
3702.50	69.2	7.94	10.53	-29.79	-32.38	-13	-19.4	1 MHz
3760.00	72.1	7.95	10.78	-29.22	-32.05	-13	-19.1	1 MHz
3817.00	35.3	7.96	10.67	-21.34	-24.05	-13	-11.1	1 MHz
5553.75	66.2	9.27	15.04	-29.02	-34.79	-13	-21.8	1 MHz
5640.00	64.5	9.27	14.69	-30.83	-36.25	-13	-23.3	1 MHz
5726.25	68.3	9.32	14.74	-28.18	-33.60	-13	-20.6	1 MHz
7405.00	70.7	10.14	15.30	-18.05	-23.21	-13	-10.2	1 MHz
7520.00	67.4	10.21	15.76	-20.94	-26.49	-13	-13.5	1 MHz
7635.00	69.2	10.28	15.39	-18.48	-23.59	-13	-10.6	1 MHz
9256.25	53.7	9.51	17.11	-25.82	-33.42	-13	-20.4	1 MHz
9400.00	51.8	9.74	17.41	-29.55	-37.22	-13	-24.2	1 MHz
9543.75	51.7	9.97	17.35	-29.88	-37.26	-13	-24.3	1 MHz
12958.75	53.1	10.2	16.82	-21.56	-28.18	-13	-15.2	1 MHz
13160.00	51.1	12.53	19.48	-22.75	-29.70	-13	-16.7	1 MHz
13361.25	56.5	12.9	19.84	-13.05	-19.99	-13	-7.0	1 MHz

NEMKO USA, Inc.

San Diego Headquarters:
11696 Sorrento Valley Rd.
San Diego, CA 92121
Tel: (858) 755-5525
Fax: (858) 452-1810

Radiated Emissions Data

Preliminary ____ Page _____ of _____

Client Name :	Kyocera Wireless Corporation				
EUT Name :	Cellphone				
EUT Model # :	KPC650				
EUT Part # :					
EUT Serial # :	HN-V----14SHY5				
EUT Config. :	Design Build: D064937				
	CDMA TX HARMONICS				
Specification :	FCC Part 22 - (ERP Measurements)			Reference :	
Rod. Ant. #:	NA	Temp. (deg. C) :	7	Date :	12/3/2004 12/6/2004
Bicon Ant.#:	NA	Humidity (%) :	89	Time :	NA
Log Ant.#:	110	EUT Voltage :	NA	Staff :	Mike Krumweide/AL
DRG Ant. #	529	EUT Frequency :	NA	Photo ID:	NA
Dipole Ant.#:	NA	Phase:	NA	Peak Bandwidth:	1 MHz
Cable#:	40ft	Location:	RN# 90579	Video Bandwidth	1 MHz
Preamp#:	40db	Distance:	3m		
Spec An.#:	835	ERP Correction Factor	-97.23		
QP #:	NA				
PreSelect#:	NA				

Meas. Freq. (MHz)	Vertical (dBuV) pk	Horizontal (dBuV) pk	CF (db)	Max Level (dBm) pk	Spec. Limit (dBm) pk	Margin dB pk	EUT Rotation	Ant. Height	Pass Fail Unc.	Comment
824.70			23.8		33.0					NO PREAMP
1649.40	61.5	64.6	-12.5	-45.13	-13.0	-32.1			Pass	*
2474.10	57.7	58.1	-7.9	-47.03	-13.0	-34.0			Pass	*
3298.80	65.6	60.8	-4	-35.63	-13.0	-22.6			Pass	*
4123.50	68.1	63.2	-0.8	-29.93	-13.0	-16.9			Pass	*
4948.20	50	50	-1.2	-48.43	-13.0	-35.4			Pass	NS, NF
5772.90	55.4	51.8	2.5	-39.33	-13.0	-26.3			Pass	*
6597.60	48.2	48.2	3.4	-45.63	-13.0	-32.6			Pass	NS, NF 500kHz RBW
7422.30	38.7	38.7	5.8	-52.73	-13.0	-39.7			Pass	NS, NF 500kHz RBW
8247.00	37.1	37.1	7.5	-52.63	-13.0	-39.6			Pass	NS, NF 100kHz RBW
9071.70	36.4	36.4	8.84	-51.99	-13.0	-39.0			Pass	NS, NF 100kHz RBW
836.49			23.4		33.0					NO PREAMP
1672.98	66.3	64	-12.5	-43.43	-13.0	-30.4			Pass	*
2509.47	62.3	60.9	-7	-41.93	-13.0	-28.9			Pass	*
3345.96	66.2	64.5	-4	-35.03	-13.0	-22.0			Pass	*
4182.45	66.8	64.3	-0.8	-31.23	-13.0	-18.2			Pass	*
5018.94	50.3	50.3	1.7	-45.23	-13.0	-32.2			Pass	NS, NF
5855.43	56.6	51.4	2.5	-38.13	-13.0	-25.1			Pass	*
6691.92	48.8	48.8	3.4	-45.03	-13.0	-32.0			Pass	NS, NF 500kHz RBW
7528.41	40.7	40.7	22.8	-33.73	-13.0	-20.7			Pass	NS, NF 500kHz RBW
8364.90	37.6	37.6	7.5	-52.13	-13.0	-39.1			Pass	NS, NF 100kHz RBW
9201.39	36.7	36.7	8.84	-51.69	-13.0	-38.7			Pass	NS, NF 100kHz RBW
849.00			23.7		33.0					NO PREAMP
1698.00	64	60.6	-5	-38.23	-13.0	-25.2			Pass	*
2547.00	65.9	58.9	-7	-38.33	-13.0	-25.3			Pass	*
3396.00	69.3	60.7	-4	-31.93	-13.0	-18.9			Pass	*
4245.00	66.4	62.9	-0.8	-31.63	-13.0	-18.6			Pass	*
5094.00	50.7	50.7	1.7	-44.83	-13.0	-31.8			Pass	NS, NF
5943.00	55.1	49.9	2.5	-39.63	-13.0	-26.6			Pass	*
6792.00	48.9	48.9	3.4	-44.93	-13.0	-31.9			Pass	NS, NF
7641.00	38.6	38.6	7	-51.63	-13.0	-38.6			Pass	NS, NF 100kHz RBW
8490.00	37.3	37.3	7.5	-52.43	-13.0	-39.4			Pass	NS, NF 100kHz RBW
9339.00	36	36	8.84	-52.39	-13.0	-39.4			Pass	NS, NF 100kHz RBW

NEMKO USA, Inc.

San Diego Headquarters:
11696 Sorrento Valley Rd.
San Diego, CA 92121
Tel: (858) 755-5525
Fax: (858) 452-1810

Radiated Emissions Data

Preliminary Page ____ of ____

Client Name :	Kyocera Wireless Corporation				
EUT Name :	Cellphone				
EUT Model # :	KPC650				
EUT Part # :					
EUT Serial # :	HN-V----14SHY5				
EUT Config. :	Design Build: D064937				
	PCS TX HARMONICS				
Specification :	FCC Part 24 - (EIRP Measurements)			Reference :	
Rod. Ant. #:	NA	Temp. (deg. C) :	7	Date :	12/3/2004 12/6/2004
Bicon Ant.#:	NA	Humidity (%) :	89	Time :	NA
Log Ant.#:	NA	EUT Voltage :	NA	Staff :	Mike Krumweide/AL
DRG Ant. #	529	EUT Frequency :	NA	Photo ID:	NA
Dipole Ant.#:	NA	Phase:	NA	Peak Bandwidth:	1 MHz
Cable#:	40ft	Location:	RN# 90579	Video Bandwidth	1 MHz
Preamp#:	40db	Distance:	3m		
Spec An.#:	835	EIRP Correction Factor	-95.26		
QP #:	NA				
PreSelect#:	NA				

Meas. Freq. (MHz)	Vertical (dBuV) pk	Horizontal (dBuV) pk	CF (db)	Max Level (dBm) pk	Spec. Limit (dBm) pk	Margin dB pk	EUT Rotation	Ant. Height	Pass Fail Unc.	Comment
1851.25			27.5		33.0					NO PREAMP
3702.50	69.2	62	-2.6	-28.66	-13.0	-15.7			Pass	*
5553.75	66.2	60.7	2.5	-26.56	-13.0	-13.6			Pass	*
7405.00	70.7	63.9	5.8	-18.76	-13.0	-5.8			Pass	*
9256.25	53.7	50.5	8.84	-32.72	-13.0	-19.7			Pass	*
11107.50	47.8	47	13.1	-34.36	-13.0	-21.4			Pass	*
12958.75	53.1	53.7	15.4	-26.16	-13.0	-13.2			Pass	*
14810.00	44.7	42.5	22.9	-27.66	-13.0	-14.7			Pass	*
16661.25	38.22	38.22	22.8	-34.24	-13.0	-21.2			Pass	NS, NF 500kHz RBW
18512.50	34.9	34.9	34.8	-25.56	-13.0	-12.6			Pass	NS, NF 100kHz RBW
20363.75	32.8	32.8	34.8	-27.66	-13.0	-14.7			Pass	NS, NF 100kHz RBW
1880.00			27.5		33.0					NO PREAMP
3760.00	72.1	70.3	-2.6	-25.76	-13.0	-12.8			Pass	*
5640.00	63.9	64.5	2.5	-28.26	-13.0	-15.3			Pass	*
7520.00	67.4	62.4	7	-20.86	-13.0	-7.9			Pass	*
9400.00	51.8	45.3	8.84	-34.62	-13.0	-21.6			Pass	*
11280.00	43.1	43.1	13.1	-39.06	-13.0	-26.1			Pass	NS, NF
13160.00	51.1	44.7	18.4	-25.76	-13.0	-12.8			Pass	*
15040.00	39.7	39.7	22.5	-33.06	-13.0	-20.1			Pass	NS, NF 500kHz RBW
16920.00	33.8	33.8	22.8	-38.66	-13.0	-25.7			Pass	NS, NF 500kHz RBW
18800.00	25.3	25.3	34.8	-35.16	-13.0	-22.2			Pass	NS, NF 100kHz RBW
20680.00	24.1	24.1	34.8	-36.36	-13.0	-23.4			Pass	NS, NF 100kHz RBW
1908.75			27.5		33.0					NO PREAMP
3817.50	35.3	33.7	38.4	-21.56	-13.0	-8.6			Pass	* NO PREAMP
5726.25	68.3	67.1	2.5	-24.46	-13.0	-11.5			Pass	*
7635.00	69.2	63.1	7	-19.06	-13.0	-6.1			Pass	*
9543.75	51.7	48.8	8.54	-35.02	-13.0	-22.0			Pass	*
11452.50	44.9	44.9	13.1	-37.26	-13.0	-24.3			Pass	NS, NF
13361.25	56.5	49.3	18.4	-20.36	-13.0	-7.4			Pass	*
15270.00	38.1	38.1	22.5	-34.66	-13.0	-21.7			Pass	NS, NF 500kHz RBW
17178.75	28.5	28.5	27.7	-39.06	-13.0	-26.1			Pass	NS, NF 100kHz RBW
19087.50	24.3	24.3	34.8	-36.16	-13.0	-23.2			Pass	NS, NF 100kHz RBW
20996.25	22.9	22.9	34.8	-37.56	-13.0	-24.6			Pass	NS, NF 100kHz RBW

At 3817.50MHz, the 2GHz High-Pass filter allowed enough energy from the fundemental frequency to be created as harmonics in the preamp. Therefore, a noise-floor measurement taken at this frequency without the preamp.

NEMKO USA, Inc.

San Diego Headquarters:
11696 Sorrento Valley Rd.
San Diego, CA 92121
Tel: (858) 755-5525
Fax: (858) 452-1810

Radiated Emissions Data

Job # : 24-942-KYO Test # :
Page 1 of

Client Name :	Kyocera Wireless Corp.				
EUT Name :	Cellular Phone				
EUT Model # :	KPC650				
EUT Part # :					
EUT Serial # :	HN-V----14SHY5				
EUT Config. :	Hardware Build: D064937				
	PCS TX SYNTH				
Specification :	FCC Part 15.109			Reference :	
Rod. Ant. #:	NA	Temp. (deg. C) :		Date :	12/6/2004
Bicon Ant.#:	NA	Humidity (%) :		Time :	
Log Ant.#:	NA	EUT Voltage :	NA	Staff :	Mike Krumweide
DRG Ant. #	529	EUT Frequency :	NA	Photo ID:	
Dipole Ant.#:	NA	Phase:	NA	Peak Measurment Bandwidth:	1 MHz/ 1 MHz
Cable#:	40ft	Location:	RN# 90579	Average Measurment Bandwidth:	1 MHz/ 10 Hz
Preamp#:	N/A	Distance:	3m		
Spec An.#:	835				
QP #:	NA				
PreSelect#:	NA				

Meas. Freq. (MHz)	Vertical (dBuV) pk	Vertical (dBuV) av	Horizontal (dBuV) pk	Horizontal (dBuV) av	CF (db)	Max Level (dBuV/m) pk	Max Level (dBuV/m) av	Spec. Limit (dBuV/m) pk	Spec. Limit (dBuV/m) av	Margin dB pk	Margin dB av	EUT Rotation	Ant. Height	Pass Fail Unc.	Comment preamp overdrive --
1504	24.4	12.5	24.4	12.5	27.5	51.9	40	74.0	54.0	-22.1	-14.0			Pass	-- NF w/o preamp
3008	50.8	37.6	50.8	37.6	-4	46.8	33.6	74.0	54.0	-27.2	-20.4			Pass	NS, NF
4512	50.1	37.7	50.1	37.7	-1.2	48.9	36.5	74.0	54.0	-25.1	-17.5			Pass	NS, NF
6016	50.5	38	50.5	38	3.4	53.9	41.4	74.0	54.0	-20.1	-12.6			Pass	NS, NF
7520	68.2	55.4	61.5	50	7	75.2	62.4	84.4	84.4	-9.2	-22.0			Pass	**
9024	47.7	34	47.7	34	8.84	56.54	42.84	74.0	54.0	-17.5	-11.2			Pass	NS, NF
10528	40	31	40	31	10.9	50.9	41.9	74.0	54.0	-23.1	-12.1			Pass	NS, NF
12032	42	24	42	24	15.6	57.6	39.6	74.0	54.0	-16.4	-14.4			Pass	NS, NF
13536	40	22	40	22	20	60	42	74.0	54.0	-14.0	-12.0			Pass	NS, NF 500kHz
15040	30	18	30	18	22.5	52.5	40.5	74.0	54.0	-21.5	-13.5			Pass	NS, NF 100
16544	26	17	26	17	22.8	48.8	39.8	74.0	54.0	-25.2	-14.2			Pass	NS, NF 100
1481	24.5	12.2	24.5	12.2	27.5	52	39.7	74.0	54.0	-22.0	-14.3			Pass	No Preamp - NF
2962	50.5	38	50.5	38	-7	43.5	31	74.0	54.0	-30.5	-23.0			Pass	NS, NF
4443	50	37.1	50	37.1	-0.8	49.2	36.3	74.0	54.0	-24.8	-17.7			Pass	NS, NF
5924	51.1	38	51.1	38	2.5	53.6	40.5	74.0	54.0	-20.4	-13.5			Pass	NS, NF
7405	70.7	56.5	63.9	51.1	5.8	76.5	62.3	84.4	84.4	-7.9	-22.1			Pass	**
8886	45.9	33.7	45.9	33.7	7.8	53.7	41.5	74.0	54.0	-20.3	-12.5			Pass	NS, NF
10367	43.7	31.4	43.7	31.4	11	54.7	42.4	74.0	54.0	-19.3	-11.6			Pass	NS, NF
11848	35.3	23	35.3	23	13.5	48.8	36.5	74.0	54.0	-25.2	-17.5			Pass	NS, NF 100kHz
13329	29.6	15.9	29.6	15.9	18.4	18.4	18.4	74.0	54.0	-55.6	-35.6			Pass	NS, NF 30kHz
14810	29.7	15.8	29.7	15.8	22.9	22.9	22.9	74.0	54.0	-51.1	-31.1			Pass	NS, NF 30 kHz
1527	24.3	12.4	24.3	12.4	27.5	51.8	39.9	74.0	54.0	-22.2	-14.1			Pass	No Preamp - NF
3054	50.5	37.7	50.5	37.7	-4	46.5	33.7	74.0	54.0	-27.5	-20.3			Pass	NS, NF
4581	49.9	37.1	49.9	37.1	-1.2	48.7	35.9	74.0	54.0	-25.3	-18.1			Pass	NS, NF
6108	49.5	36.5	49.5	36.5	3.4	52.9	39.9	74.0	54.0	-21.1	-14.1			Pass	NS, NF
7635	75.9	62	64.6	52.4	7	82.9	69	84.4	84.4	-1.5	-15.4			Pass	**
9162	45.1	32.7	45.1	32.7	8.84	53.94	41.54	74.0	54.0	-20.1	-12.5			Pass	NS, NF
10689	42.6	29.9	42.6	29.9	10.9	53.5	40.8	74.0	54.0	-20.5	-13.2			Pass	NS, NF
12216	35.1	22	35.1	22	15.6	50.7	37.6	74.0	54.0	-23.3	-16.4			Pass	NS, NF 100kHz
13743	30.1	17	30.1	17	20	50.1	37	74.0	54.0	-23.9	-17.0			Pass	NS, NF 30kHz
15270	27.9	14	27.9	14	22.5	22.5	22.5	74.0	54.0	-51.5	-31.5			Pass	NS, NF 30 kHz

NS = Not seen, even at a lower RBW NF = Noise Floor measurement. * = Measurement of signal.
** = Transmit/Synth Harmonics (Part 24 Peak Limits Apply)

NEMKO USA, Inc.

San Diego Headquarters:
11696 Sorrento Valley Rd.
San Diego, CA 92121
Tel: (858) 755-5525
Fax: (858) 452-1810

Radiated Emissions Data

Job # : 24-942-KYO Test # :
Page 1 of

Client Name :	Kyocera Wireless Corp.				
EUT Name :	Cellular Phone				
EUT Model # :	KPC650				
EUT Part # :					
EUT Serial # :	HN-V----14SHY5				
EUT Config. :	Hardware Build: D064937				
	PCS RX				
Specification :	FCC Part 15.109			Reference :	
Rod. Ant. #:	NA	Temp. (deg. C) :		Date :	12/07/04
Bicon Ant.#:	NA	Humidity (%) :		Time :	
Log Ant.#:	NA	EUT Voltage :	NA	Staff :	Mike Krumweide
DRG Ant. #	529	EUT Frequency :	NA	Photo ID:	
Dipole Ant.#:	NA	Phase:	NA	Peak Measurment Bandwidth:	1 MHz/ 1 MHz
Cable#:	40ft	Location:	RN# 90579	Average Measurment Bandwidth:	1 MHz/ 10 Hz
Preamp#:	40db	Distance:	3m		
Spec An.#:	835				
QP #:	NA				
PreSelect#:	NA				

Meas. Freq.	Vertical (dBuV)		Horizontal (dBuV)		CF (db)	Max Level (dBuV/m)		Spec. Limit (dBuV/m)		Margin dB		EUT Rotation	Ant. Height	Pass Fail Unc.	Comment
(MHz)	pk	av	pk	av		pk	av	pk	av	pk	av				
1716.7	55.9	45.8	57	50.5	-12.5	44.5	38	74.0	54.0	-29.5	-16.0			Pass	*
3433.3	50.7	38	50.7	38	-4	46.7	34	74.0	54.0	-27.3	-20.0			Pass	NS, NF
5150	53	41.2	52.3	40.1	1.7	54.7	42.9	74.0	54.0	-19.3	-11.1			Pass	*
6866.7	48.1	35.6	48.1	35.6	3.4	51.5	39	74.0	54.0	-22.5	-15.0			Pass	NS, NF
8583.3	47.9	35.9	47.6	35	7.8	55.7	43.7	74.0	54.0	-18.3	-10.3			Pass	*
10300	44.9	31.4	44.9	31.4	11	55.9	42.4	74.0	54.0	-18.1	-11.6			Pass	NS, NF
12016.7	34.9	25.6	34.9	25.6	15.6	50.5	41.2	74.0	54.0	-23.5	-12.8			Pass	NF RBW 100 kHz
13733.3	29.8	17.2	29.8	17.2	20	49.8	37.2	74.0	54.0	-24.2	-16.8			Pass	NF RBW 30 kHz
15450	26.7	13.2	26.7	13.2	22.5	49.2	35.7	74.0	54.0	-24.8	-18.3			Pass	NF RBW 30 kHz
17166.7	24.5	11	24.5	11	27.7	52.2	38.7	74.0	54.0	-21.8	-15.3			Pass	NF RBW 30 kHz
18883.3	20.7	6.2	21	6.2	34.8	55.8	41	74.0	54.0	-18.2	-13.0			Pass	NF RBW 30 kHz
1742.2	57.8	51.7	61.5	57.8	-12.5	49	45.3	74.0	54.0	-25.0	-8.7			Pass	*
3484.4	50.3	37.7	50.3	37.7	-4	46.3	33.7	74.0	54.0	-27.7	-20.3			Pass	NS, NF
5226.7	51.7	41.3	50.7	38	1.7	53.4	43	74.0	54.0	-20.6	-11.0			Pass	*
6968.9	47.6	35	47.6	35	3.4	51	38.4	74.0	54.0	-23.0	-15.6			Pass	NS, NF
8711.1	47.5	35	47.1	34.4	7.8	55.3	42.8	74.0	54.0	-18.7	-11.2			Pass	*
10453.32	45.5	31.8	45.5	31.8	11	56.5	42.8	74.0	54.0	-17.5	-11.2			Pass	NS, NF
12195.54	35.1	21.9	35.1	21.9	15.6	50.7	37.5	74.0	54.0	-23.3	-16.5			Pass	NF RBW 100 kHz
13937.8	29.7	16.4	29.7	16.4	20	49.7	36.4	74.0	54.0	-24.3	-17.6			Pass	NF RBW 30 kHz
15679	26.2	14.1	26.2	14.1	21.9	48.1	36	74.0	54.0	-25.9	-18.0			Pass	NF RBW 30 kHz
17422.2	23	10	23	10	27.7	50.7	37.7	74.0	54.0	-23.3	-16.3			Pass	NF RBW 30 kHz
19164.4	19.3	6.9	19.3	6.9	34.8	54.1	41.7	74.0	54.0	-19.9	-12.3			Pass	NF RBW 30 kHz
1767.8	58.3	53.7	61.5	58	-12.5	49	45.5	74.0	54.0	-25.0	-8.5			Pass	*
3535.5	49.7	37.1	49.7	37.1	-2.6	47.1	34.5	74.0	54.0	-26.9	-19.5			Pass	NF
5303.3	51.7	40.4	50.7	38.9	1.7	53.4	42.1	74.0	54.0	-20.6	-11.9			Pass	*
7071.1	47.5	34.4	47.5	34.4	5.8	53.3	40.2	74.0	54.0	-20.7	-13.8			Pass	NS, NF
8838.8	46.5	33.8	46.5	33.8	7.8	54.3	41.6	74.0	54.0	-19.7	-12.4			Pass	NS, NF
10606.6	43.7	30.6	43.7	30.6	10.9	54.6	41.5	74.0	54.0	-19.4	-12.5			Pass	NS, NF
12374.4	35.1	21.9	35.1	21.9	15.6	50.7	37.5	74.0	54.0	-23.3	-16.5			Pass	NF RBW 100 kHz
14142.1	29.4	14.4	29.4	14.4	23.5	52.9	37.9	74.0	54.0	-21.1	-16.1			Pass	NF RBW 30 kHz
15909.9	26	12.8	26	12.8	21.9	47.9	34.7	74.0	54.0	-26.1	-19.3			Pass	NF RBW 30 kHz
17677.7	22.7	9.5	22.7	9.5	31.6	54.3	41.1	74.0	54.0	-19.7	-12.9			Pass	NF RBW 30 kHz
19445.4	19	5.7	19	5.7	34.8	53.8	40.5	74.0	54.0	-20.2	-13.5			Pass	NF RBW 30 kHz

NS = Not seen, even at a lower RBW NF = Noise Floor measurement. * = Measurement of signal.

NEMKO USA, Inc.

San Diego Headquarters:
11696 Sorrento Valley Rd.
San Diego, CA 92121
Tel: (858) 755-5525
Fax: (858) 452-1810

Radiated Emissions Data

Job # : 24-942-KYO Test # :
Page 1 of

Client Name :	Kyocera Wireless Corp.				
EUT Name :	Cellular Phone				
EUT Model # :	KPC650				
EUT Part # :					
EUT Serial # :	HN-V----14SHY5				
EUT Config. :	Hardware Build: D064937				
	CDMA RX				
Specification :	FCC Part 15.109			Reference :	
Rod. Ant. #:	NA	Temp. (deg. C) :		Date :	12/07/04
Bicon Ant.#:	NA	Humidity (%) :		Time :	
Log Ant.#:	NA	EUT Voltage :	NA	Staff :	Mike Krumweide
DRG Ant. #	529	EUT Frequency :	NA	Photo ID:	
Dipole Ant.#:	NA	Phase:	NA	Peak Measurment Bandwidth:	1 MHz/ 1 MHz
Cable#:	40ft	Location:	RN# 90579	Average Measurment Bandwidth:	1 MHz/ 10 Hz
Preamp#:	40db	Distance:	3m		
Spec An.#:	835				
QP #:	NA				
PreSelect#:	NA				

Meas. Freq. (MHz)	Vertical (dBuV) pk	Vertical (dBuV) av	Horizontal (dBuV) pk	Horizontal (dBuV) av	CF (db)	Max Level (dBuV/m) pk	Max Level (dBuV/m) av	Spec. Limit (dBuV/m) pk	Spec. Limit (dBuV/m) av	Margin dB pk	Margin dB av	EUT Rotation	Ant. Height	Pass Fail Unc.	Comment
1762.98	55.14	42.2	53.6	41.5	-12.5	42.64	29.7	74.0	54.0	-31.4	-24.3			Pass	* 1762.04
3525.96	50.5	37.7	50.5	37.7	-2.6	47.9	35.1	74.0	54.0	-26.1	-18.9			Pass	NS, NF
5288.94	51.2	38.3	51.2	38.3	1.7	52.9	40	74.0	54.0	-21.1	-14.0			Pass	NS, NF
7051.92	48.3	35.5	48.3	35.5	5.8	54.1	41.3	74.0	54.0	-19.9	-12.7			Pass	NS, NF
8814.9	47.8	34.6	47.8	34.6	7.8	55.6	42.4	74.0	54.0	-18.4	-11.6			Pass	NS, NF
10577.88	42.2	30.9	42.2	30.9	10.9	53.1	41.8	74.0	54.0	-20.9	-12.2			Pass	NS, NF
12340.86	34.9	22	34.9	22	15.6	50.5	37.6	74.0	54.0	-23.5	-16.4			Pass	NF RBW 100 kHz
14103.84	30.6	16.6	30.6	16.6	23.5	54.1	40.1	74.0	54.0	-19.9	-13.9			Pass	NF RBW 30 kHz
15866.82	25.7	12.3	25.7	12.3	21.9	47.6	34.2	74.0	54.0	-26.4	-19.8			Pass	NF RBW 30 kHz
17629.8	23.6	9.9	23.6	9.9	31.6	55.2	41.5	74.0	54.0	-18.8	-12.5			Pass	NF RBW 30 kHz
19392.78	19.9	6.3	19.9	6.3	34.8	54.7	41.1	74.0	54.0	-19.3	-12.9			Pass	NF RBW 30 kHz
1739.4	59.6	52.1	63.1	57.5	-12.5	50.6	45	74.0	54.0	-23.4	-9.0			Pass	*
3478.8	51.3	38.6	51.3	38.6	-4	47.3	34.6	74.0	54.0	-26.7	-19.4			Pass	*
5218.2	53.8	44	51.9	39.8	1.7	55.5	45.7	74.0	54.0	-18.5	-8.3			Pass	*
6957.6	47.7	35.3	47.7	35.3	3.4	51.1	38.7	74.0	54.0	-22.9	-15.3			Pass	NS, NF
8697	46.7	33.7	46.7	33.7	7.8	54.5	41.5	74.0	54.0	-19.5	-12.5			Pass	NS, NF
10436.4	44.9	31.4	44.9	31.4	11	55.9	42.4	74.0	54.0	-18.1	-11.6			Pass	NS, NF
12175.8	34.9	25.6	34.9	25.6	15.6	50.5	41.2	74.0	54.0	-23.5	-12.8			Pass	NF RBW 100 kHz
13915.2	29.8	17.2	29.8	17.2	20	49.8	37.2	74.0	54.0	-24.2	-16.8			Pass	NF RBW 30 kHz
15654.6	26.4	13.4	26.4	13.4	21.9	48.3	35.3	74.0	54.0	-25.7	-18.7			Pass	NF RBW 30 kHz
17394	23.6	9.9	23.6	9.9	27.7	51.3	37.6	74.0	54.0	-22.7	-16.4			Pass	NF RBW 30 kHz
19133.4	20.7	6.2	20.7	6.2	34.8	55.5	41	74.0	54.0	-18.5	-13.0			Pass	NF RBW 30 kHz
1786.62	66.22	57.1	64.1	61.1	-12.5	53.72	48.6	74.0	54.0	-20.3	-5.4			Pass	*
3573.24	51.7	39.4	51.1	38.7	-2.6	49.1	36.8	74.0	54.0	-24.9	-17.2			Pass	*
5359.86	51.4	39.8	50.6	38	1.7	1.7	39.7	74.0	54.0	-72.3	-14.3			Pass	*
7146.48	49.1	35.7	49.1	35.7	5.8	5.8	41.5	74.0	54.0	-68.2	-12.5			Pass	NS, NF
8933.1	46.5	33.1	46.5	33.1	7.8	7.8	40.9	74.0	54.0	-66.2	-13.1			Pass	NS, NF
10719.72	43.8	30.6	43.8	30.6	10.9	54.7	41.5	74.0	54.0	-19.3	-12.5			Pass	NS, NF
12506.34	34.8	21.2	34.8	21.2	15.4	50.2	36.6	74.0	54.0	-23.8	-17.4			Pass	NF RBW 100 kHz
14292.56	29.3	16.1	29.3	16.1	23.5	52.8	39.6	74.0	54.0	-21.2	-14.4			Pass	NF RBW 30 kHz
16079.58	28.9	15.4	28.9	15.4	23	51.9	38.4	74.0	54.0	-22.1	-15.6			Pass	NF RBW 30 kHz
17866.2	23.8	10	23.8	10	31.6	55.4	41.6	74.0	54.0	-18.6	-12.4			Pass	NF RBW 30 kHz
19652.82	19.8	5.5	19.8	5.5	34.8	54.6	40.3	74.0	54.0	-19.4	-13.7			Pass	NF RBW 30 kHz

NS = Not seen, even at a lower RBW NF = Noise Floor measurement. * = Measurement of signal.

Radiated Emissions Test Equipment

Client	**Kyocera Wireless Corp.**	EUT Name	**PCMCIA Device**
PAN #	24-403-KYO	EUT Model	**KPC650**

Device Type	*Model #*	*Asset #*	*Used*	*Cal Done*	*Cal Due*
Pre-Amplifier					
Amplifier	40dB	842	X	4/1/04	4/1/05
Antenna OATS #1 (North)					
Antenna, Biconical	EMCO	115			
Antenna, Log Periodic	3146	110	X	10/4/04	10/4/05
Antenna, Double Ridge Horn	3115	529	X	3/30/04	3/30/05
Spectrum Analyzer / Receiver					
Quasi-Peak Adapter, HP Spectrum Analyzer Display, HP Spectrum Analyzer, HP	85650A 85662A 8568B	538 537 711			
Spectrum Analyzer, R&S	RHDFSEK	835	X	12/11/03	12/11/04

Photograph 1. Radiated Emissions Test Configuration

APPENDIX A

A. Conducted & Radiated Emissions Measurement Uncertainties

1. Introduction

ISO Standard 17025 and ANSI/NCSL Z540-1(1994) require that all measurements contained in a test report be "traceable". "Traceability" is defined in the *International Vocabulary of Basic and General Terms in Metrology* (ISO: 1993) as: "the property of the result of a measurement... whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons, *all having stated uncertainties*".

The purposes of this Appendix are to "state the *Measurement Uncertainties*" of the conducted emissions and radiated emissions measurements contained in Section 5 of this Test Report, and to provide a practical explanation of the meaning of these measurement uncertainties.

2. Statement of the Worst-Case Measurement Uncertainties for the Conducted and Radiated Emissions Measurements Contained in This Test Report

Table 1: Worst-Case Expanded Uncertainty "U" of Measurement for a k=2 Coverage Factor

Conducted Emissions Measurement Detection Systems	**Applicable Frequency Range**	**"U" for a k=2 Coverage Factor**
HP8568B Spectrum Analyzer with QPA and HP8447F Preamplifier	150 kHz - 30 MHz	+/- 3.0 dB
HP8566B Spectrum Analyzer with QPA and Preselector	9 kHz - 30 MHz	+/- 2.9 dB
Radiated Emissions Measurement Detection Systems	**Applicable Frequency Range**	**"U" for a k=2 Coverage Factor**
HP8568B Spectrum Analyzer with QPA & HP8447F Preamplifier	30 MHz - 200 MHz	+4.0 dB, -4.1 dB
HP8568B Spectrum Analyzer with QPA & HP8447F Preamplifier	200 MHz-1000 MHz	+/- 3.5 dB
HP8566B Spectrum Analyzer with QPA & Preselector	30 MHz - 200 MHz	+3.9 dB, -4.0 dB
HP8566B Spectrum Analyzer with QPA & Preselector	200 MHz-1000 MHz	+/- 3.4 dB
HP8566B Spectrum Analyzer with QPA & HP 8449A Preamplifier	1 GHz - 18 GHz	+2.5 dB, -2.6 dB
HP8566B Spectrum Analyzer with QPA & HP8449A Preamplifier	18 GHz - 40 GHz	+/- 3.4 dB

NOTES:
1. Applies to 3 and 10 meter measurement distances
2. Applies to all valid combinations of Transducers (i.e. LISNs, Line Voltage Probes, and Antennas, as appropriate)
3. Excludes the Repeatability of the EUT

3. Practical Explanation of the Meaning of the Conducted and Radiated Emissions Measurement Uncertainties

In general, a "Statement of Measurement Uncertainty" means that with a certain (specified) confidence level, the "true" value of a measurand will be between a (stated) upper bound and a (stated) lower bound.

In the specific case of EMC Measurements in this test report, the measurement uncertainties of the conducted emissions measurements and the radiated emissions measurements have been calculated in accordance with the method detailed in the following documents:

- *ISO Guide to the Expression of Uncertainty in Measurement* (ISO, 1993)
- NIS 81:1994, *The Treatment of Uncertainty in EMC Measurements* (NAMAS, 1994)
- NIST Technical Note 1297(1994), *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results* (NIST, 1994)

The calculation method used in these documents requires that the stated uncertainty of the measurements be expressed as *an "expanded uncertainty", U, with a k=2 coverage factor*. The practical interpretation of this method of expressing measurement uncertainty is shown in the following example:

EXAMPLE: Assume that at 39.51 MHz, the (measured) radiated emissions level was equal to +26.5 dBuV/m, and that the +/- 2 standard deviations (i.e. 95% confidence level) measurement uncertainty was +/- 3.4 dB.

In the example above, the phrase "k = 2 Coverage Factor" simply means that the measurement uncertainty is stated to cover +/-2 standard deviations (i.e. a 95% confidence interval) about the measurand. The measurand is the radiated emissions measurement of +26.5 dBuV/m at 39.51 MHz, and the 95% bounds for the uncertainty are –3.4 dB to + 3.4 dB. One can thus be 95% confident that the "true" value of the radiated emissions measurement is between +23.1 dBuV/m and +29.5 dBuV/m. *In effect, this means that in the above example there is only a 2.5% chance that the "true" radiated emissions value exceeds +29.5 dBuV/m.*

APPENDIX B
B. Nemko USA, Inc.'s Test Equipment & Facilities Calibration Program

Nemko USA, Inc. operates a comprehensive Periodic Calibration Program in order to ensure the validity of all test data. Nemko USA's Periodic Calibration Program is fully compliant to the requirements of NVLAP Policy Guide PG-1-1988, ANSI/NCSL Z540-1 (1994), ISO 10012-1 (1993-05-01), ISO Standard 17025, ISO-9000 and EN 45001. Nemko USA, Inc.'s calibrations program therefore meets or exceed the US national commercial and military requirements [N.B. ANSI/NCSL Z540-1 (1994) replaces MIL-STD-45662A].

Specifically, all of Nemko USA's *primary reference standard devices* (e.g. vector voltmeters, multimeters, attenuators and terminations, RF power meters and their detector heads, oscilloscope mainframes and plug-ins, spectrum analyzers, RF preselectors, quasi-peak adapters, interference analyzers, impulse generators, signal generators and pulse/function generators, field-strength meters and their detector heads, etc.) and certain *secondary standard devices* (e.g. RF Preamplifiers used in CISPR 11/22 and FCC Part 15/18 tests) are periodically recalibrated by:

- A Nemko USA-approved independent (third party) metrology laboratory that uses NIST-traceable standards and that is ISO Guide 25-accredited as a calibration laboratories by NIST; or,
- A Nemko USA-approved independent (third party) metrology laboratory that uses NIST-traceable standards and that is ISO Guide 25-accredited as a calibration laboratory by another accreditation body (such as A2LA) that is mutually recognized by NIST; or,
- A manufacturer of Measurement and Test Equipment (M&TE), if the manufacturer uses NIST-traceable standards and is ISO Guide 25-accredited as calibration laboratory either by NIST or by another accreditation body (such as A2LA) that is mutually recognized by NIST; or
- A manufacturer of M&TE (or by a Nemko USA-approved independent third party metrology laboratory) that is not ISO Guide 25-accredited. (In these cases, Nemko USA conducts an annual audit of the manufacturer or metrology laboratory for the purposes of proving traceabilty to NIST, ensuring that adequate and repeatable calibration procedures are being applied, and verifying conformity with the other requirements of ISO Guide 25).

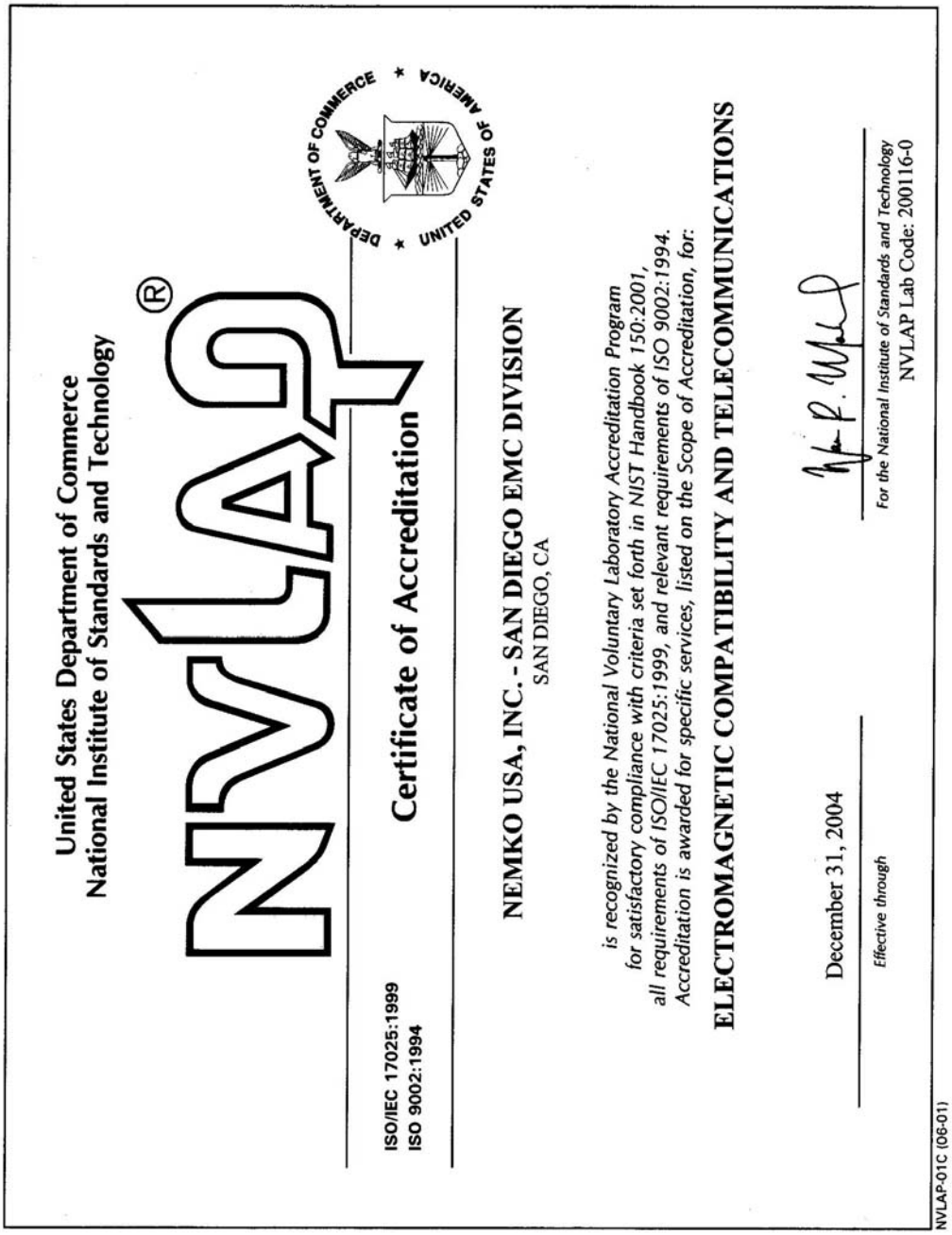
In all cases, the entity performing the Calibration is required to furnish Nemko USA with a calibration test report and/or certificate of calibration, and a "calibration sticker" on each item of M&TE that is successfully calibrated.

Calibration intervals are normally one year, except when the manufacture advises a shorter interval (e.g. the HP 8568B Spectrum Analyzer is recalibrated every six months) or if US Government directives or client requirements demand a shorter interval. Items of instrumentation/related equipment which fail during routine use, or which suffer visible mechanical damage (during use or while in transit), are sidelined pending repair and recalibration. (Repairs are carried out either in-house [if minor] or by a Nemko USA-approved independent [third party] metrology laboratory, or by the manufacturer of the item of M&TE).

Each antenna used for CISPR 11 and CISPR 22 and FCC Part 15 and Part 18 radiated emissions testing (and for testing to the equivalent European Norms) is calibrated annually by either a NIST (or A2LA) ISO Standard 17025-Accredited third-party Antenna Calibration Laboratory or by the antenna's OEM if the OEM is NIST or A2LA ISO Standard 17025-accredited as an antenna calibration laboratory. The antenna calibrations are performed using the methods specified in Annex G.5 of CISPR 16-1(1993) or ANSI C63.5-1991, including the "Three-Antenna Method". Certain other kinds of antennas (e.g. magnetic-shielded loop antennas) are calibrated annually by either a NIST (or A2LA) ISO Standard 17025-accredited third-party antenna calibration laboratory, or by the antenna's OEM if the OEM is NIST or A2LA ISO Standard 17025-accredited as an antenna calibration laboratory using the procedures specified in the latest version of SAE ARP-958.

In accordance with FCC and other regulations, Nemko USA recalibrates its suite of antennas used for radiated emissions tests on an annual basis. These calibrations are performed as a precursor to the FCC-required annual revalidation of the Normalized Site Attenuation properties of Nemko USA's Open Area Test Site. Nemko USA, Inc. uses the procedures given in both Subclause 16.6 and Annex G.2 of CISPR 16-1 (1993), and, ANSI C63.4-1992 when performing the normalized site attenuation measurements.

APPENDIX C
C. FCC and NVLAP Accreditation



United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation

ISO/IEC 17025:1999
ISO 9002:1994

NEMKO USA, INC. - SAN DIEGO EMC DIVISION
SAN DIEGO, CA

is recognized by the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria set forth in NIST Handbook 150:2001, all requirements of ISO/IEC 17025:1999, and relevant requirements of ISO 9002:1994. Accreditation is awarded for specific services, listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

December 31, 2004
Effective through

For the National Institute of Standards and Technology
NVLAP Lab Code: 200116-0

NVLAP-01C (06-01)

National Institute of Standards and Technology NVLAP® National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

Page: 1 of 3

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200116-0

NEMKO USA, INC. - SAN DIEGO EMC DIVISION
11696 Sorrento Valley Road, Suite F
San Diego, CA 92121
Mr. Ricky Hill
Phone: 858-755-5525 x207 Fax: 858-793-9914
E-Mail: rick.hill@nemko.com
URL: http://www.nemko.com

NVLAP Code	*Designation / Description*
Emissions Test Methods:	
12/CIS14	CISPR 14-1 (March 30, 2000): Limits and Methods of Measurement of Radio interference Characteristics of Household Electrical Appliances, Portable Tools and Similiar Electrical Apparatus - Part 1: Emissions
12/CIS14a	EN 55014-1 (1993) with Amendments A1 (1997) & A2 (1999)
12/CIS14b	AS/NZS 1044 (1995)
12/CIS14c	CNS 13783-1
12/CIS22	IEC/CISPR 22 (1997) and EN 55022 (1998): 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)

December 31, 2004
Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

National Institute of Standards and Technology NVLAP® National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

Page: 2 of 3

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS **NVLAP LAB CODE 200116-0**

NEMKO USA, INC. - SAN DIEGO EMC DIVISION

NVLAP Code	*Designation / Description*
12/CIS22b	CNS 13438 (1997): Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment
12/EM02a	IEC 61000-3-2, Edition 2.1 (2001-10), EN 61000-3-2 (2000), and AS/NZS 2279.1 (2000): Electromagnetic compatibility (EMC) Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16 A)
12/EM03b	IEC 61000-3-3 (2002-03), edition 1.1: EMC - Part 3-3: Limits - Limitations of voltage changes, voltage flucuations and flicker, in public low-voltage supply-systems, for equipment with rated current <=16 A per phase and not subject to conditional connections
12/F18	FCC OST/MP-5 (1986): FCC Methods of Measurement of Radio Noise Emissions for ISM Equipment (cited in FCC Method 47 CFR Part 18 - Industrial, Scientific, and Medical Equipment)
12/FCC15b	ANSI C63.4 (2001) with FCC Method - 47 CFR Part 15, Subpart B: Unintentional Radiators
12/T51	AS/NZS CISPR 22 (2002) and AS/NZS 3548 (1997): Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment

December 31, 2004
Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)

National Institute of Standards and Technology NVLAP® National Voluntary Laboratory Accreditation Program

ISO/IEC 17025:1999
ISO 9002:1994

Scope of Accreditation

Page: 3 of 3

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS **NVLAP LAB CODE 200116-0**

NEMKO USA, INC. - SAN DIEGO EMC DIVISION

NVLAP Code	*Designation / Description*
Immunity Test Methods:	
12/I01	IEC 61000-4-2, Edition 2.1 (2001) including Amds. 1 & 2 and EN 61000-4-2: Electrostatic Discharge Immunity Test
12/I02	IEC 61000-4-3 (2002) and EN 61000-4-3: Radiated Radio-Frequency Electromagnetic Field Immunity Test
12/I03	IEC 61000-4-4 (1995) + Amd. 1 (2000) & Amd. 2 (2001) and EN 61000-4-4: Electrical Fast Transient/Burst Immunity Test
12/I04	IEC 61000-4-5 (1995) + Amd. 1 (2000) and EN 61000-4-5: Surge Immunity Test
12/I05	IEC 61000-4-6, Edition 2.0 (2003) and EN 61000-4-6: Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields
12/I06	IEC 61000-4-8, Edition 1.1 (2001) and EN 61000-4-8: Power Frequency Magnetic Field Immunity Test
12/I07	IEC 61000-4-11 (1994) + Amd. 1 (2000) and EN 61000-4-11: Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests

December 31, 2004
Effective through

For the National Institute of Standards and Technology

NVLAP-01S (06-01)