



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

EMC TEST REPORT

Kyocera Wireless Corp.

Tri-Mode Cellular Phone with Bluetooth capabilities

Model: KX21-2X0 Storm

RADIATED AND CONDUCTED EMISSIONS

FCC, PART 15.247

FCC, PART 15B

CANADA RSS 210

CANADA ICES-003

TEST REPORT # 2006 010032 KX21-2X0 15.247

26-032-KYO

NEMKO USA, INC.
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DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	2 of 35

TABLE OF CONTENTS

1.DESCRPTION OF TEST SITE AND EQUIPMENT	7
2.DESCRPTION OF TESTING METHODS	7
3.TEST RESULTS	15

TEST SETUP DIAGRAMS

FIGURE 1. GENERAL EUT TEST SETUP DIAGRAM	8
FIGURE 2. CONDUCTED EMISSIONS TEST SETUP DIAGRAM.....	12
FIGURE 3. RADIATED EMISSIONS TEST SETUP DIAGRAM	14

TEST CONFIGURATION PHOTOGRAPHS

PHOTOGRAPH 1. FRONT AND OPEN VIEW OF EUT.....	9
PHOTOGRAPH 2. EUT CHARGER	10
PHOTOGRAPH 3. CONDUCTED EMISSIONS TEST CONFIGURATION.....	25
PHOTOGRAPH 4. RADIATED EMISSIONS TEST CONFIGURATION	26
PHOTOGRAPH 5. FUNDAMENTAL AND HARMONICS RADIATED EMISSIONS TEST CONFIGURATION	29

APPENDICES

A. RADIATED EMISSIONS MEASUREMENT UNCERTAINTIES	32
B. NEMKO USA, INC.'S TEST EQUIPMENT & FACILITIES CALIBRATION PROGRAM	34

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	3 of 35

EMC Test Report
For
Kyocera Wireless Corp.

Test Number : 26-032-KYO

Product Name : **Tri-Mode Cellular Phone with Bluetooth capabilities**

Regulation : FCC, Part 15.247 and FCC Part 15B

: Canada, RSS 210 and ICES-003

:

Date : JANUARY 27, 2006

Report Reviewed

Accepted by:

Kyocera Wireless Corp.
10300 Campus Point Drive
San Diego, CA 92121
Phone: **858-882-3585**
Fax: **858-882-1739**

Report Issued By: *F. R. Fleury*

F. R. Fleury

Tested By: *Mike T. Krumweide*

Mike Krumweide EMC Test Engineer

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DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	4 of 35

Administrative Data

Regulation : FCC, Part 15.247 and FCC Part 15B
: Canada, RSS 210 and ICES-003
:

Test Method : ANSI C63.4 – 2003
: CSA C108. - M1983
:

Test Type : Certification

Manufacturer : Kyocera Wireless Corp.

EUT /:Model # : Tri-Mode Cellular Phone with Bluetooth capabilities / KX21-2X0 Storm

Date(s) of Test : January 23 to January 27, 2006

Customer Personnel : Thuy To, Regulatory Engineer

Nemko Personnel : Mike Krumweide, EMC Test Engineer

Test Location : OPEN Area Test Site
Nemko USA, Inc.
11696 Sorrento Valley Road, Suite F
San Diego, CA 92121

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DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	5 of 35

EUT Description

The KX21-2X0 Storm is a Tri-Mode Cellular Phone with Bluetooth capabilities. Its function is to provide communication for mobile phone users. The EUT was exercised in Bluetooth Transmit mode for Conducted Emissions and Bluetooth Receive mode for Radiated Emissions.

DEVICE	MANUFACTURER	POWER CABLE
	MODEL # SERIAL #	
EUT - Tri-Mode Cellular Phone with Bluetooth capabilities	Kyocera Wireless Corp. Model: KX21-2X0 Storm SN: AUDX----1CY7XR	N/A
EUT – Battery Charger (Type 1)	Travel Charger TXTVL10061 N/A	N/A
EUT – Battery Charger (Type 2)	Travel Charger TXTVL10063 N/A	N/A

CONNECTION	I/O CABLE
Battery Charger to Cell Phone	2m, unshielded, 22AWG, 2wire, DC jack – Wall mount.

REASON FOR TEST:

The EUT was tested to establish compliance.

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.

<i>Nemko USA, Inc.</i>		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	6 of 35

CERTIFICATION AND TEST SUMMARY

<i>Test Type</i>	<i>In Accordance with Document</i>	<i>Frequency Range Investigated</i>	<i>EUT Complies</i>
Conducted Emissions	FCC 15 B Sec.107 Class "B"	150 kHz to 30 MHz	Pass
Radiated Emissions	FCC 15 B Sec.109 Class "B"	30 MHz to 1000 MHz	Pass
Radiated Emissions	FCC 15 C Sec. 247	2.4GHz to 24.0 GHz	Pass

The Tri-Mode Cellular Phone with Bluetooth capabilities complied with FCC, PART 15B and C, and CANADA, RSS 210 and ICES-003, when tested in the system configuration defined herein.

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	7 of 35

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 C63.4-2003 documents. The OATS normalized site attenuation characteristics are verified for compliance every.

2. DESCRIPTION OF TESTING METHODS

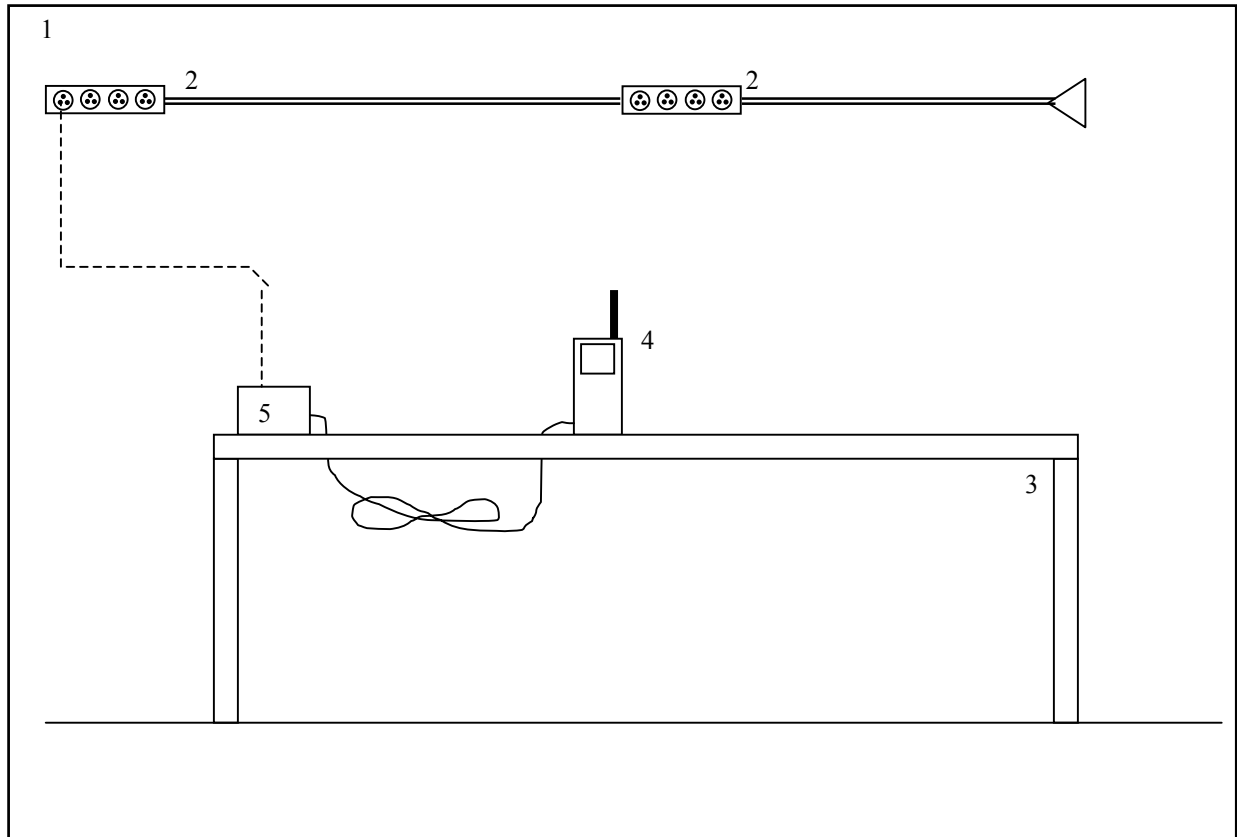
2.1. Introduction

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 C63.4-2003, 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. In addition, TIA/EIA 603, "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards," provides the method employed to check the radiated measurements known as Signal Substitution.

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

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	8 of 35

Figure 1. General EUT Test Setup Diagram



NOT TO SCALE

CONFIGURATION LEGEND

1. Test Laboratory
2. AC Power for Peripheral Devices (120V, 60 cycles, single phase)
3. Non-Conducting tables 80 cm above ground plane
4. EUT: **Tri-Mode Cellular Phone with Bluetooth capabilities**
5. 120VAC Domestic Charger.

<i>Nemko USA, Inc.</i>		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	9 of 35

Photograph 1. Front and Open View of EUT



<i>Nemko USA, Inc.</i>		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	10 of 35

Photograph 2. EUT Charger

TXTVL10061 Charger



TXTVL10063 Charger



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DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	11 of 35

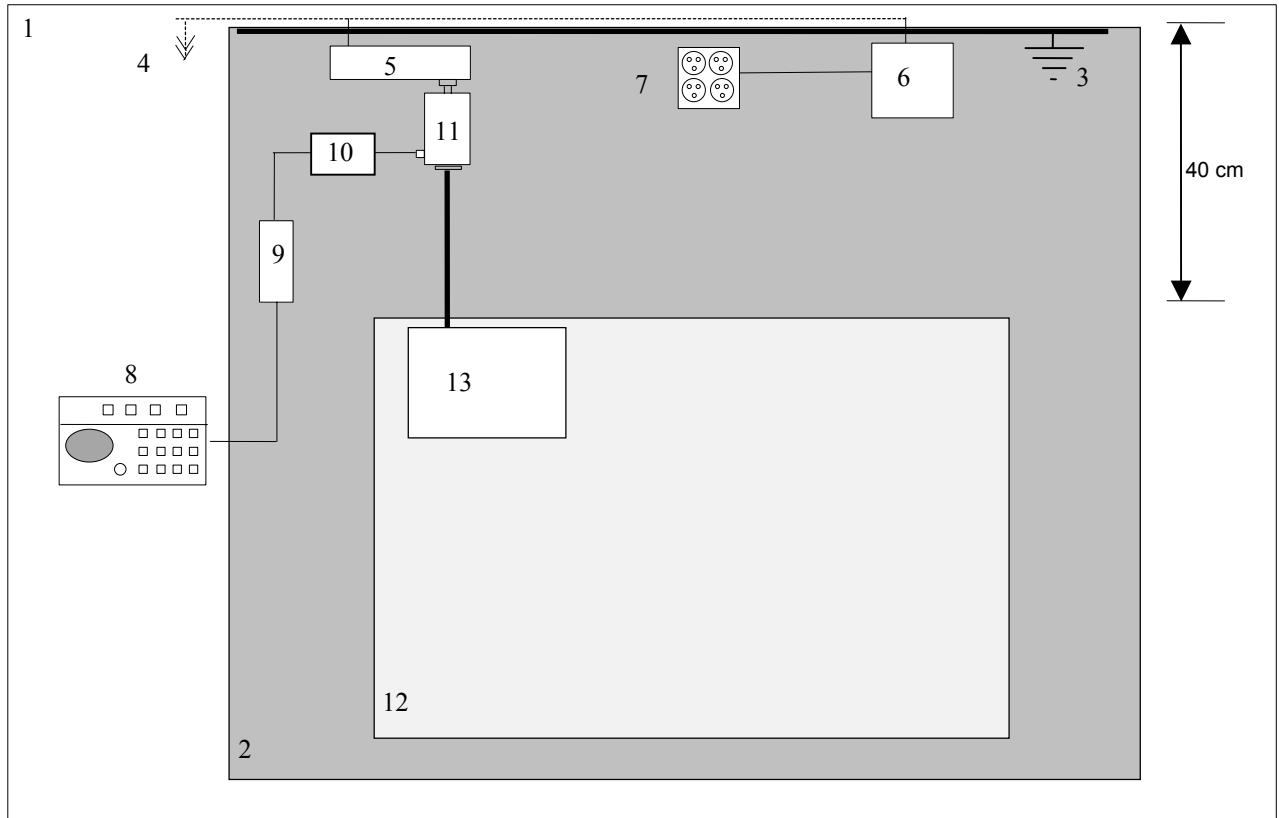
2.2. Configuration and Methods of Measurements for Conducted Emissions

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.

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DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	12 of 35

Figure 2. Conducted Emissions Test Setup Diagram



NOT TO SCALE

CONFIGURATION LEGEND

1. Test Laboratory (6 X 6 meters)
2. Ground Plane (15 square meters)
3. Vertical Conducting Wall (Grounded through Ground Plane via 10' ground rod)
4. AC Power for Devices
5. Power Line Filter, Lindgren, 120 dB, 30 amp
6. Line Impedance Stabilization Network (LISN) for peripheral devices
7. Power Distribution Box for peripheral devices
8. Spectrum Analyzer with Quasi-Peak Adapter
9. High Pass Filter
10. Transient Limiter
11. LISN for EUT
12. Non-Conducting table 80 cm above ground plane
13. EUT: **Tri-Mode Cellular Phone with Bluetooth capabilities** and associated system

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	13 of 35

2.3. 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 three 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 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)

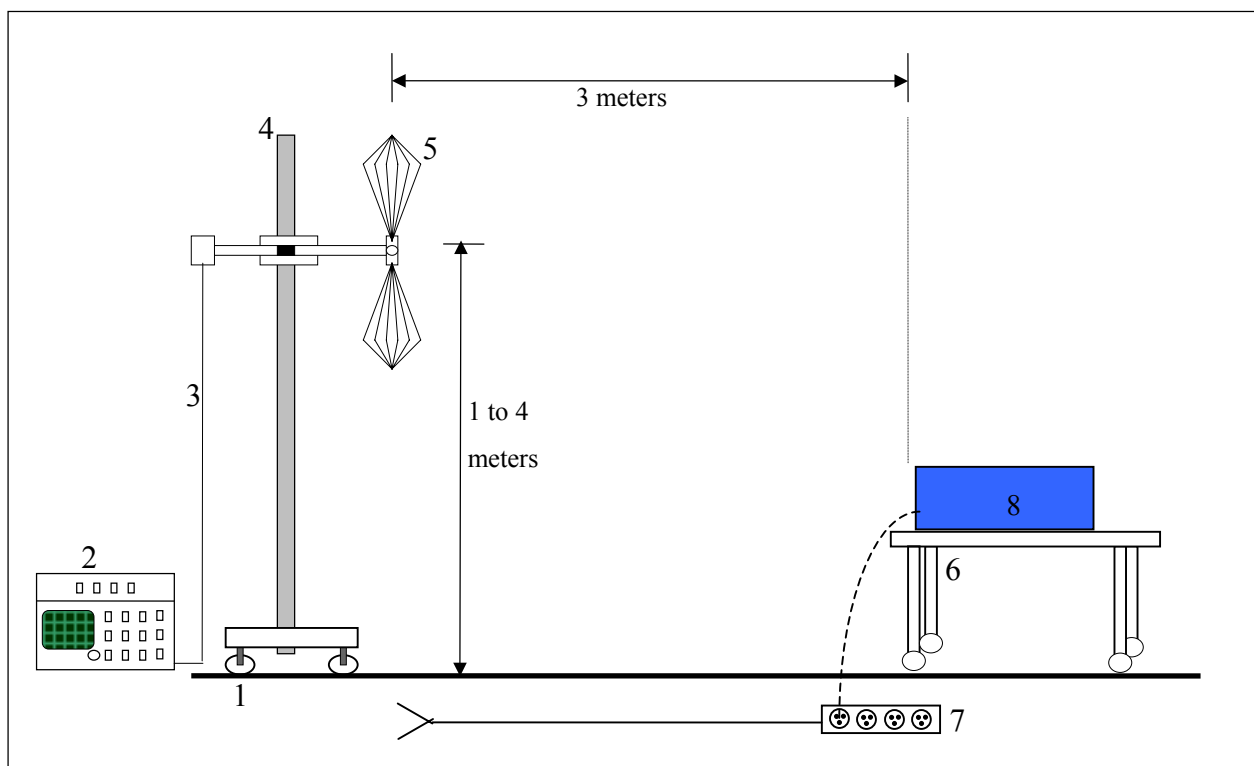
36.9 dBuV/M Final adjusted value

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.

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	14 of 35

Figure 3. 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: **Tri-Mode Cellular Phone with Bluetooth capabilities** and associated system.

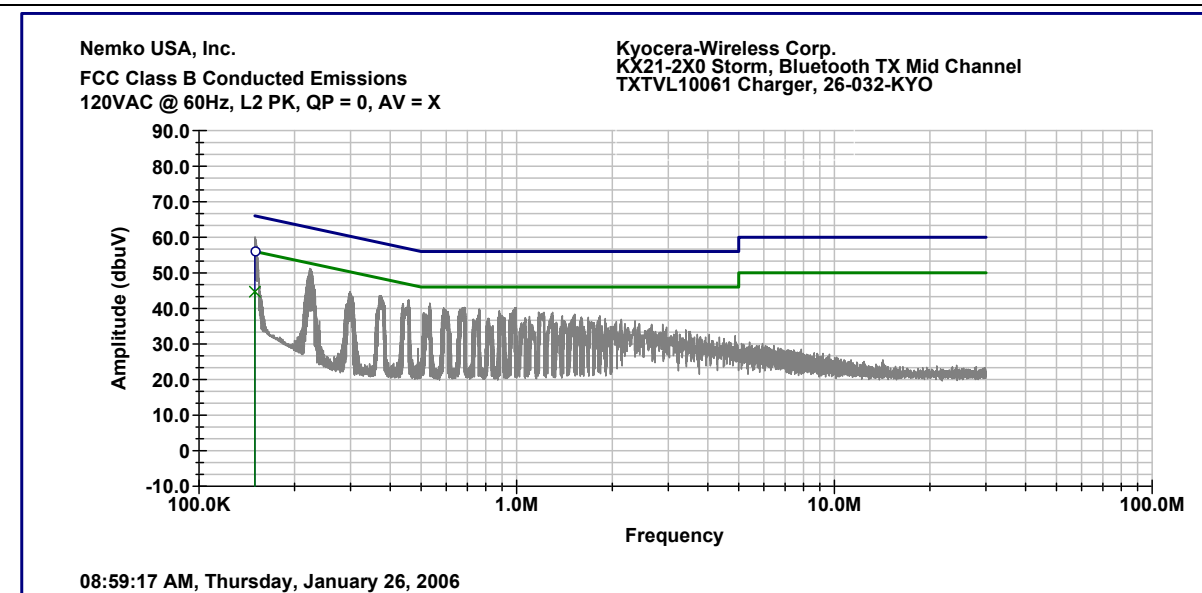
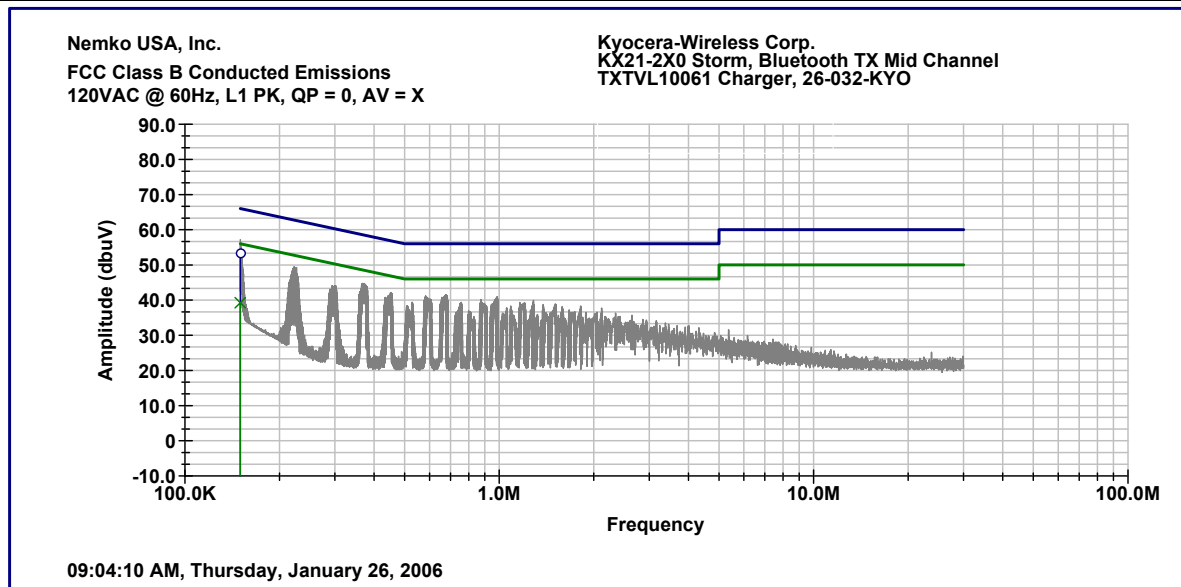
Bluetooth fundamental frequencies and radiated emissions were measured on three orthogonal axes. Only the maximum emissions of the three axes are stated in this report. Test setup pictures of these axes are found further in this report.

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	15 of 35

3. Test Results

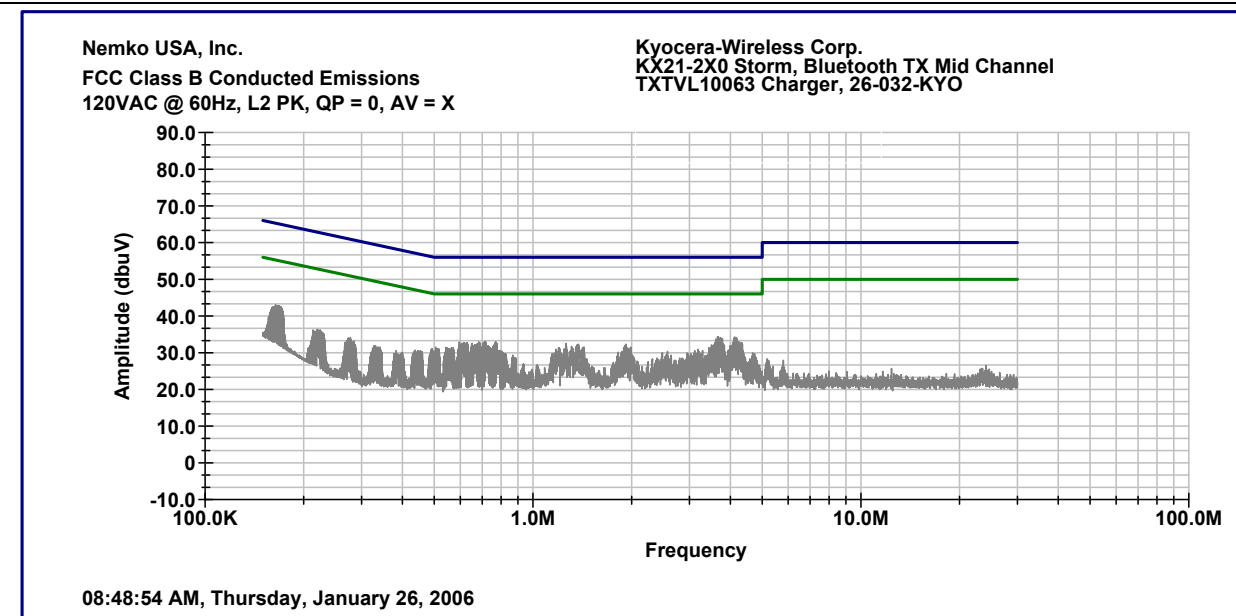
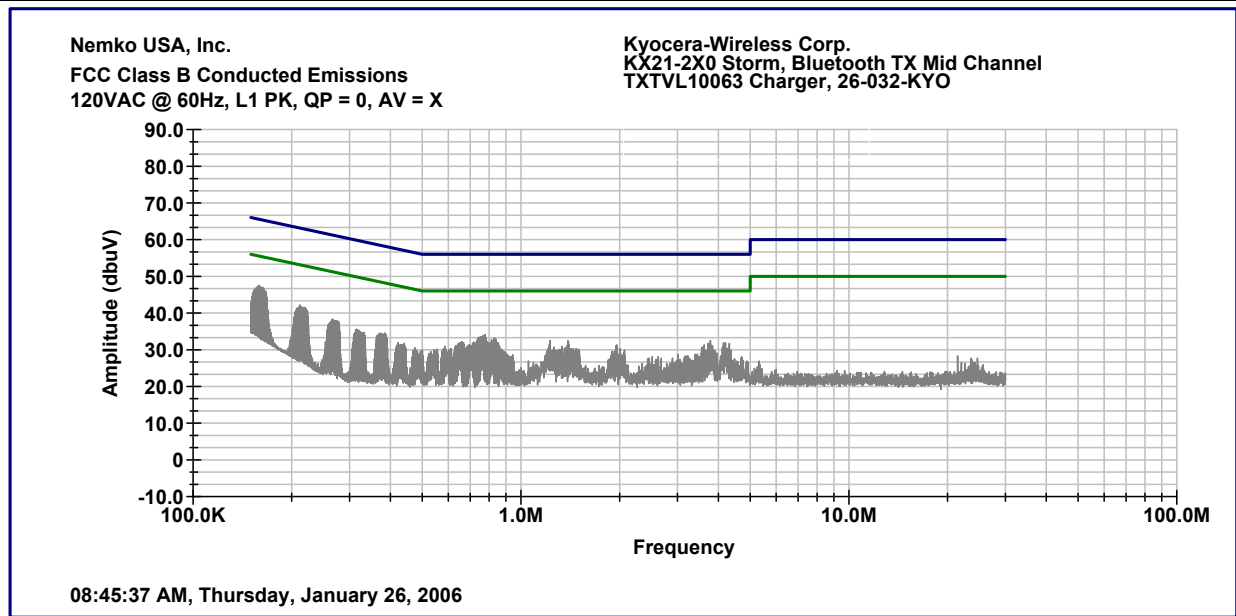
3.1. Conducted Emissions Test Data

Client	Kyocera Wireless Corp.	Temperature	73	deg F
PAN #	26-032-KYO	Relative Humidity	44	%
EUT Name	Tri-Mode Cellular Phone with Bluetooth capabilities	Barometric Pressure	30.2	Hg
EUT Model	KX21-2X0 Storm with TXTVL10061 Charger	Test Location	Enclosure 1	
Governing Doc	CFR 47 Part 15C	Test Engineer	Mike Krumweide	
Basic Standard	Sec. 15.207	Date	1/26/06	



Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	16 of 35

Client	Kyocera Wireless Corp.	Temperature	73	deg F
PAN #	26-032-KYO	Relative Humidity	44	%
EUT Name	Tri-Mode Cellular Phone with Bluetooth capabilities	Barometric Pressure	30.2	Hg
EUT Model	KX21-2X0 Storm with TXTVL10063 Charger	Test Location	Enclosure 1	
Governing Doc	CFR 47 Part 15C	Test Engineer	Mike Krumweide	
Basic Standard	Sec. 15.207	Date	1/26/06	



3.2. Radiated Emissions Test Data

[illegible]

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DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	20 of 35

Radiated Emissions Data

Job # : 26-032-KYO Test # : 1
Page 1 of 1

Client Name : Kyocera Wireless Corp.
EUT Name : Cellular Phone
EUT Model # : KX21-2X0
EUT Part # : _____
EUT Serial # : AUDX----1CY7XR
EUT Config. : Bluetooth
Open
Specification : FCC Part 15.247 Reference : _____
Rod. Ant. # : NA Temp. (°C) : 16 Date : 01/25/06
Bicon Ant.#: NA Humidity (%) : 44 Time : _____
Log Ant.#: NA EUT Voltage : NA Staff : M. Krumweide
DRG Ant. # : 529 EUT Frequency : NA
Dipole Ant.#: NA Phase: NA Peak Bandwidth: 1 MHz
Cable#: 40ft Location: RN # 329550-01 Video Bandwidth 1 MHz
Preamp#: 842 Distance: 3m
Spec An.#: 835 ERP conversion factor 7
QP #: NA
PreSelect#: NA

Meas. Freq. (MHz)	Vertical (dBuV) pk	Horizontal (dBuV) pk	CF (db)	Max Level (dBm) pk	Spec. Limit (ERP) (dBm) pk	Margin dB pk	EUT Rotation	Ant. Height	Pass Fail Unc.	Comment Maximum of 3 Axes
2402.00	63.2	60.9	32.1	-2.0	30.0	-32.0		1.1	Pass	Fundamental
2441.00	63.1	59.1	32.1	-2.1	30.0	-32.1		1.0	Pass	Fundamental
2480.00	63.3	62.3	32.1	-1.9	30.0	-31.9		1.0	Pass	Fundamental

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	21 of 35

Radiated Emissions Data

Job # : 26-032-KYO Test # : 1
Page 1 of 1

Client Name : Kyocera Wireless Corp.
EUT Name : Cellular Phone
EUT Model # : KX21-2X0
EUT Part # :
EUT Serial # : AUDX----1CY7XR
EUT Config. : Bluetooth
Closed
Specification : FCC Part 15.247
Rod. Ant. # : NA Temp. (°C) : 16
Bicon Ant.#: NA Humidity (%) : 44
Log Ant.#: NA EUT Voltage : NA
DRG Ant. # : 529 EUT Frequency : NA
Dipole Ant.#: NA Phase: NA
Cable#: 40ft Location: RN # 329550-01
Preamp#: 842 Distance: 3m
Spec An.#: 835 ERP conversion factor 7
QP #: NA
PreSelect#: NA

Reference :
Date : 01/25/06
Time :
Staff : M. Krumweide
Peak Bandwidth: 1 MHz
Video Bandwidth 1 MHz

Meas. Freq. (MHz)	Vertical (dBuV) pk	Horizontal (dBuV) pk	CF (db)	Max Level (dBm) pk	Spec. Limit (ERP) (dBm) pk	Margin dB pk	EUT Rotation	Ant. Height	Pass Fail Unc.	Comment
2402.00	65.3	60.7	32.1	0.1	30.0	-29.9	0.0	1.0	Pass	Fundamental
2441.00	64.4	62.6	32.1	-0.8	30.0	-30.8	0.0	1.0	Pass	Fundamental
2480.00	63.3	59.8	32.1	-1.9	30.0	-31.9	0.0	1.0	Pass	Fundamental

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	22 of 35

Radiated Emissions Data

Job # : 26-032-KYO Test # : 7
Page 1 of 1

Client Name : Kyocera Wireless Corp.
EUT Name : Cellular Phone
EUT Model # : KX21-2X0
EUT Part # :
EUT Serial # : AUDX----1CY7XR
EUT Config : Bluetooth
Open
Specification : FCC Part 15.247 (c), 15.209(a) Reference :
Rod. Ant. # : NA Temp. (°C) : 16 Date : 01/25/06
Bicon Ant. # : NA Humidity (%) : 44 Time :
Log Ant. # : NA EUT Voltage : NA Staff : M. Krumweide
DRG Ant. # : 529 EUT Frequency : NA Photo ID :
Dipole Ant. # : NA Phase : NA Peak Measurement Bandwidth: 1 MHz/ 1 MHz
Cable # : 40ft Location : RN # 329550-01 Average Measurement Bandwidth: 1 MHz/ 10 Hz
Preamp # : 842 Distance : 3m
Spec An. # : 835
QP # : NA
PreSelect # : NA

Meas. Freq. (MHz)	Vertical (dBuV)		Horizontal (dBuV)		CF (db)	Max Level (dBuV/m)		Spec. Limit (dBuV/m)		Margin dB		EUT Rotation	Ant. Height	Pass Fail Unc.	Comment
pk	av	pk	av	pk	av	pk	av	pk	av	pk	av				
															Maximum of 3 Axes
4804.00	49.2	36.6	49.2	36.6	-5.4	43.8	31.2	75.3	55.3	-31.5	-24.1			Pass	
7206.00	49.7	36.8	49.7	36.8	3.3	53.0	40.1	74.0	54.0	-21.0	-13.9			Pass	noise floor
9608.00	43.6	29.3	43.6	29.3	9.5	53.1	38.8	74.0	54.0	-20.9	-15.2			Pass	noise floor 1MHz RBW
12010.00	37.5	26.5	37.5	26.5	16.2	53.7	42.7	75.3	55.3	-21.6	-12.6			Pass	noise floor 500KHz RBW
14412.00	30.9	17.5	30.9	17.5	21.8	52.7	39.3	74.0	54.0	-21.3	-14.7			Pass	noise floor 100KHz RBW
16814.00	26.8	15.5	26.8	15.5	22.4	49.2	37.9	74.0	54.0	-24.9	-16.2			Pass	noise floor 100KHz RBW
19216.00	15.5	4.5	15.5	4.5	39.1	54.6	43.6	75.3	55.3	-20.7	-11.7			Pass	noise floor 30KHz RBW
21618.00	9.3	0.6	9.3	0.6	41.6	50.9	42.2	74.0	54.0	-23.1	-11.8			Pass	noise floor 10KHz RBW
4882.00	50.9	38.6	51.1	38.7	-5.4	45.7	33.3	75.2	55.2	-29.5	-21.9			Pass	
7323.00	50.3	38.1	49.9	37.3	3.3	53.6	41.4	75.2	55.2	-21.6	-13.8			Pass	
9764.00	41.3	24.6	41.3	24.6	9.5	50.8	34.1	74.0	54.0	-23.2	-19.9			Pass	noise floor 500KHz RBW
12205.00	38.9	22.5	38.9	22.5	16.2	55.1	38.7	75.2	55.2	-20.1	-16.5			Pass	noise floor 300KHz RBW
14646.00	30.0	15.3	30.0	15.3	21.2	51.2	36.5	74.0	54.0	-22.8	-17.5			Pass	noise floor 50KHz RBW
17087.00	22.0	11.7	22.0	11.7	29.9	51.9	41.6	74.0	54.0	-22.1	-12.4			Pass	noise floor 50KHz RBW
19528.00	14.7	4.4	14.7	4.4	39.1	53.8	43.5	75.2	55.2	-21.4	-11.7			Pass	noise floor 30KHz RBW
21969.00	10.4	-0.3	10.4	-0.3	41.6	52.0	41.3	74.0	54.0	-22.0	-12.7			Pass	noise floor 10KHz RBW
4960.00	50.9	38.3	50.5	38.3	-5.4	45.5	32.9	75.4	55.4	-29.9	-22.5			Pass	
7440.00	49.5	37.1	49.2	36.1	3.3	52.8	40.4	75.4	55.4	-22.6	-15.0			Pass	
9920.00	43.4	31.1	43.4	31.1	9.5	52.9	40.6	74.0	54.0	-21.1	-13.4			Pass	noise floor
12400.00	38.9	27.2	38.9	27.2	16.2	55.1	43.4	75.4	55.4	-20.3	-12.0			Pass	noise floor 300KHz RBW
14880.00	30.7	19.0	30.7	19.0	21.2	51.9	40.2	74.0	54.0	-22.1	-13.8			Pass	noise floor 50KHz RBW
17360.00	23.1	12.3	23.1	12.3	29.9	53.0	42.2	74.0	54.0	-21.0	-11.8			Pass	noise floor 50KHz RBW
19840.00	15.2	4.0	15.2	4.0	39.1	54.3	43.1	75.4	55.4	-21.1	-12.3			Pass	noise floor 30KHz RBW
22320.00	10.5	-0.3	10.5	-0.3	41.6	52.1	41.3	75.4	55.4	-23.3	-14.1			Pass	noise floor 10KHz RBW

The radiated emissions comply with -20dBc requirements of 15.247(c)
Frequencies which fall in the restricted bands of 15.205(a) comply with 15.209(a) limits.
Frequencies through the 10th Harmonic were checked. No other emissions were observed, even at lower resolution bandwidths.

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	23 of 35

Radiated Emissions Data

Job # : 26-032-KYO Test # : 7
Page 1 of 1

Client Name : Kyocera Wireless Corp.
EUT Name : Cellular Phone
EUT Model # : KX21-2X0
EUT Part # :
EUT Serial # : AUDX----1CY7XR
EUT Config. : Bluetooth
Closed
Specification : FCC Part 15.247 (c), 15.209(a) Reference :
Rod. Ant. #: NA Temp. (°C) : 16 Date : 01/25/06
Bicon Ant. #: NA Humidity (%) : 44 Time :
Log Ant. #: NA EUT Voltage : NA Staff : M. Krumweide
DRG Ant. # : 529 EUT Frequency : NA Photo ID :
Dipole Ant. #: NA Phase : NA Peak Measurement Bandwidth: 1 MHz/ 1 MHz
Cable #: 40ft Location : RN # 329550-01 Average Measurement Bandwidth: 1 MHz/ 10 Hz
Preamp #: 842 Distance : 3m
Spec An. #: 835
QP # : NA
PreSelect #: NA

Meas. Freq. (MHz)	Vertical (dBuV)		Horizontal (dBuV)		CF (db)	Max Level (dBuV/m)		Spec. Limit (dBuV/m)		Margin dB		EUT Rotation	Ant. Height	Pass Fail Unc.	Comment
	pk	av	pk	av		pk	av	pk	av	pk	av				
															Maximum of 3 Axes
4804.00	50.5	38.1	50.4	38.0	-5.4	45.1	32.7	77.4	57.4	-32.3	-24.7			Pass	
7206.00	49.7	36.8	49.7	36.5	3.3	53.0	40.1	74.0	54.0	-21.0	-13.9			Pass	
9608.00	43.6	29.3	43.6	29.3	9.5	53.1	38.8	74.0	54.0	-20.9	-15.2			Pass	noise floor 1MHz RBW
12010.00	39.8	26.5	39.8	26.5	16.2	56.0	42.7	77.4	57.4	-21.4	-14.7			Pass	noise floor 500KHz RBW
14412.00	30.9	17.5	30.9	17.5	21.8	52.7	39.3	74.0	54.0	-21.3	-14.7			Pass	noise floor 100KHz RBW
16814.00	26.8	15.5	26.8	15.5	22.4	49.2	37.9	74.0	54.0	-24.9	-16.2			Pass	noise floor 100KHz RBW
19216.00	16.0	4.5	16.0	4.5	39.1	55.1	43.6	77.4	57.4	-22.3	-13.8			Pass	noise floor 30KHz RBW
21618.00	9.3	0.6	9.3	0.6	41.6	50.9	42.2	74.0	54.0	-23.1	-11.8			Pass	noise floor 10KHz RBW
4882.00	50.8	38.6	51.7	39.6	-5.4	46.3	34.2	76.5	56.5	-30.2	-22.3			Pass	
7323.00	50.4	37.3	50.0	37.0	3.3	53.7	40.6	76.5	56.5	-22.8	-15.9			Pass	
9764.00	41.3	24.6	41.3	24.6	9.5	50.8	34.1	74.0	54.0	-23.2	-19.9			Pass	noise floor 500KHz RBW
12205.00	38.9	22.5	38.9	22.5	16.2	55.1	38.7	76.5	56.5	-21.4	-17.8			Pass	noise floor 300KHz RBW
14646.00	30.0	15.3	30.0	15.3	21.2	51.2	36.5	74.0	54.0	-22.8	-17.5			Pass	noise floor 50KHz RBW
17087.00	22.0	11.7	22.0	11.7	29.9	51.9	41.6	74.0	54.0	-22.1	-12.4			Pass	noise floor 50KHz RBW
19528.00	14.7	4.4	14.7	4.4	39.1	53.8	43.5	76.5	56.5	-22.7	-13.0			Pass	noise floor 30KHz RBW
21969.00	10.4	-0.3	10.4	-0.3	41.6	52.0	41.3	74.0	54.0	-22.0	-12.7			Pass	noise floor 10KHz RBW
4960.00	51.2	38.8	50.5	37.6	-5.4	45.8	33.4	75.4	55.4	-29.6	-22.0			Pass	
7440.00	49.2	36.8	49.7	37.2	3.3	53.0	40.5	75.4	55.4	-22.4	-14.9			Pass	
9920.00	43.4	31.1	43.4	31.1	9.5	52.9	40.6	74.0	54.0	-21.1	-13.4			Pass	noise floor
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17360.00	23.1	12.3	23.1	12.3	29.9	53.0	42.2	74.0	54.0	-21.0	-11.8			Pass	noise floor 50KHz RBW
19840.00	15.2	4.0	15.2	4.0	39.1	54.3	43.1	75.4	55.4	-21.1	-12.3			Pass	noise floor 30KHz RBW
22320.00	10.5	-0.3	10.5	-0.3	41.6	52.1	41.3	75.4	55.4	-23.3	-14.1			Pass	noise floor 10KHz RBW

The radiated emissions comply with -20dBc requirements of 15.247(c)
Frequencies which fall in the restricted bands of 15.205(a) comply with 15.209(a) limits.
Frequencies through the 10th Harmonic were checked. No other emissions were observed, even at lower resolution bandwidths.

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	24 of 35

Radiated Emissions Test Equipment

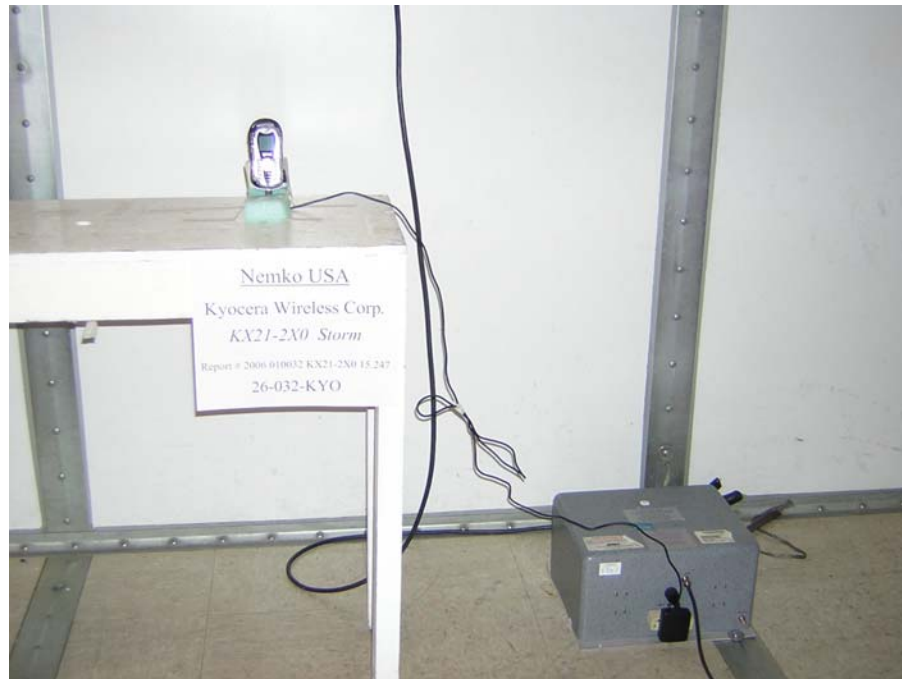
Client	Kyocera Wireless Corp.	EUT Name	Tri-Mode Cellular Phone with Bluetooth capabilities
PAN #	26-032-KYO	EUT Model	KX21-2X0 Storm

Asset Number	Description	Model Number	Serial Number	Last Cal	Cal Due
128	Antenna, Bicon, EMCO	3104	2882	10/6/05	10/6/06
110	Antenna, LPA, Electrometrics	LPA-25	1217	11/29/05	11/29/06
901	Preamp, Sonoma Instrument 310	310N	130607	12/19/05	12/19/06
538	Quasi-Peak Adapter, HP	85650A	2521A00588	8/9/05	2/9/06
534	Spectrum Analyzer Display, HP	85662A	2534A10452	8/9/05	2/9/06
107	Spectrum Analyzer, HP	85680B	2415A00373	8/9/05	2/9/06
842	Preamp	Nemko	na	5/19/05	5/19/06
529	Antenna, DRWG, EMCO	3115	2505	4/13/05	4/13/06
835	Spectrum Analyzer, Rhode & Schwartz	RHDFSEK	829058/005	1/18/06	1/18/07

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	25 of 35

Photograph 3. Conducted Emissions Test Configuration

TXTVL10061 Charger



TXTVL10063 Charger



<i>Nemko USA, Inc.</i>		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	26 of 35

Photograph 4. Radiated Emissions Test Configuration

X - Orientation



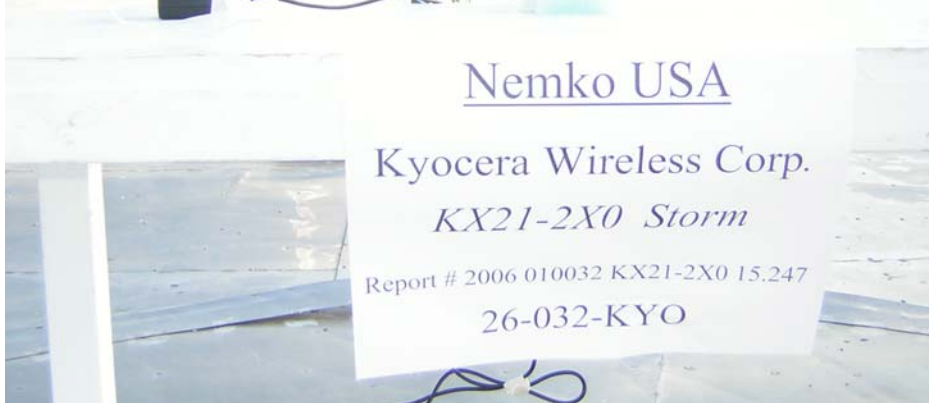
<i>Nemko USA, Inc.</i>		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	27 of 35

Y – Orientation



<i>Nemko USA, Inc.</i>		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	28 of 35

Z – Orientation



<i>Nemko USA, Inc.</i>		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	29 of 35

Photograph 5. Fundamental and Harmonics Radiated Emissions Test Configuration

X – Orientation



<i>Nemko USA, Inc.</i>		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	30 of 35

Y – Orientation



<i>Nemko USA, Inc.</i>		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	31 of 35

Z - Orientation



Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	32 of 35

APPENDIX A

A. Radiated Emissions Measurement Uncertainties

1. Introduction

ISO/IEC 17025:1999 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

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

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	33 of 35

3. Practical Explanation of the Meaning of 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:

- *ANSI Z540.2 (2002) Guide to the Expression of Uncertainty in Measurement*
- 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.*

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	34 of 35

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 10012:2003, ISO/IEC 17025:1999, and ISO-9000:2000. Nemko USA, Inc.'s calibrations program therefore meets or exceeds 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 laboratory 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 traceability to NIST, ensuring that adequate and repeatable calibration procedures are being applied, and verifying conformity with the other requirements of ISO Guide 25).

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
DATE	DOCUMENT NAME	DOCUMENT #	PAGE
January 27, 2006	Kyocera Wireless Corp. KX21-2X0 Storm EMC Test Report	2006 010032 KX21-2X0 15.247	35 of 35

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(2003) or ANSI C63.5-2004, 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 (2003), and, ANSI C63.4-2003 when performing the normalized site attenuation measurements.