



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

EMC TEST REPORT

Kyocera Wireless Corp.

K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability

Model: **K323**

RADIATED AND CONDUCTED EMISSIONS

FCC, PART 15.247

FCC, PART 15B

CANADA RSS 210

CANADA ICES-003

TEST REPORT # 2006 050299 K323 PART 15.247

26-299-KYO

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

Nemko USA, Inc.		11696 Sorrento Valley Road, Suite F, San Diego, CA 92121 Phone (858) 755-5525 Fax (858) 452-1810	
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EMC Test Report
For
Kyocera Wireless Corp.

Test Number : 26-299-KYO

Product Name : K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability

Regulation : FCC, Part 15.247 and FCC Part 15B

: Canada, RSS 210 and ICES-003

:

Date : MAY 9, 2006

Report Reviewed

Accepted by:

Kyocera Wireless Corp.

10300 Campus Point Drive

San Diego, CA 92121

Phone: 858 882-1631

Fax: 619 330-4977

Report Issued By: *F. R. Fleury*

F. R. Fleury

Tested By:

Mike Krumweide

Mike Krumweide EMC Test Engineer

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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 : K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability

Model : K323

Date(s) of Test : April 25 to May 9, 2006

Customer Personnel : Christy, Le

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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EUT Description

The K323 is a K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability. 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. For Spurious Emissions the EUT was in Transmit High, Mid, and Low channels.

DEVICE	MANUFACTURER	POWER CABLE
	MODEL # SERIAL #	
EUT - K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability	Kyocera Wireless Corp. Model: K323 SN: FM000000002678	N/A
EUT – Battery Charger (Type 1)	Travel Charger TXTVL10079 N/A	N/A
EUT – Battery Charger (Type 2)	Travel Charger TXTVL10080 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.

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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.207 Class "B"	150 kHz to 30 MHz	Pass
Radiated Emissions	FCC 15 B Sec.209 Class "B"	30 MHz to 1000 MHz	Pass
Radiated Emissions	FCC 15 C Sec. 247	2.4GHz to 24.0 GHz	Pass

The K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability complied with FCC, PART 15B and C, and CANADA, RSS 210 and ICES-003, when tested in the system configuration defined herein.

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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 C63.4-2004 documents. The OATS normalized site attenuation characteristics are verified for compliance every.

2. DESCRIPTION OF TESTING METHODS

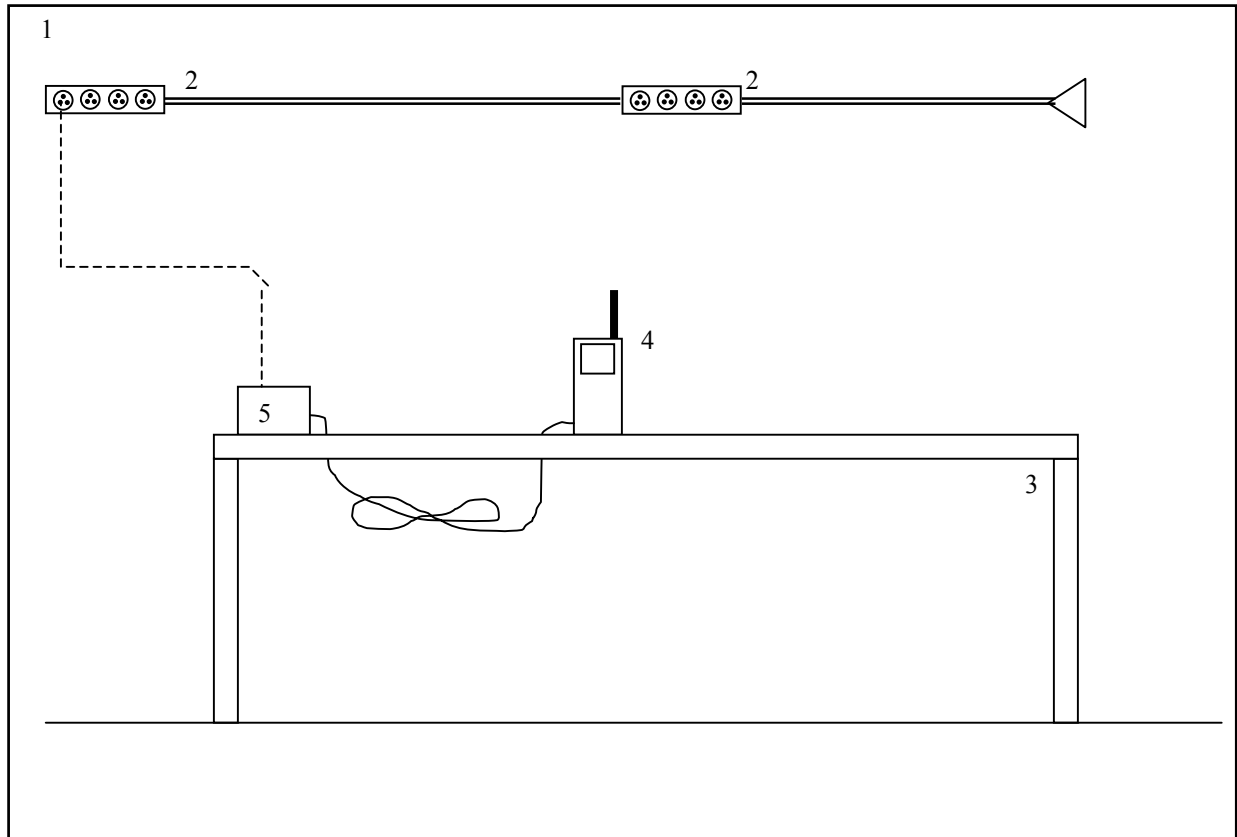
2.1. Introduction

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 C63.4-2004, 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.

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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: **K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability**
5. 120VAC Domestic Charger.

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Photograph 1. Front and Open View of EUT



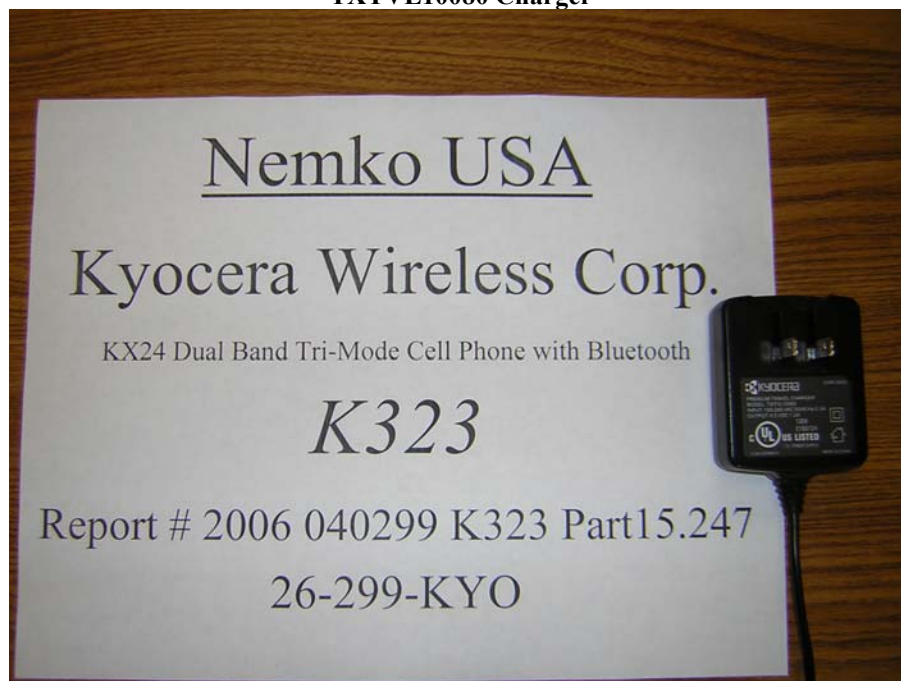
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Photograph 2. EUT Charger

TXTVL10079 Charger



TXTVL10080 Charger



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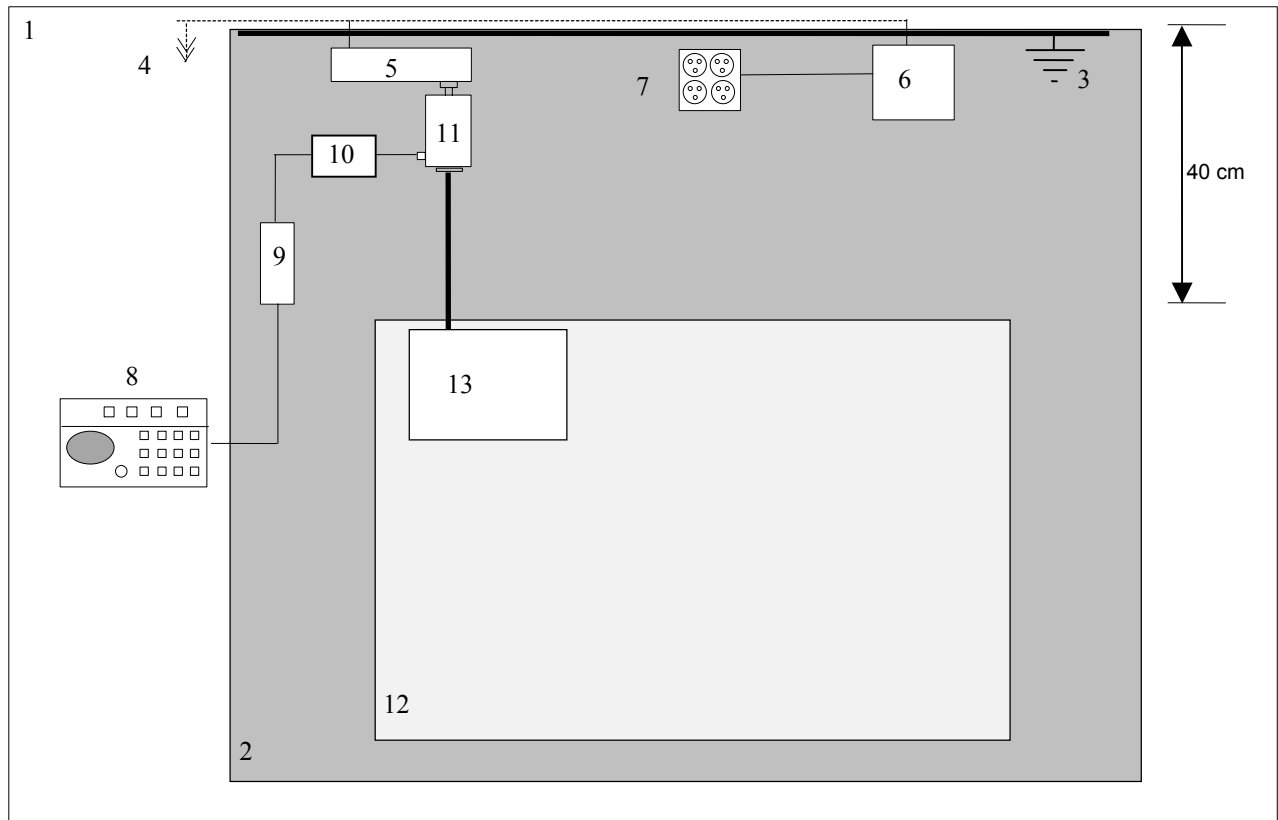
2.2. Configuration and Methods of Measurements for Conducted Emissions

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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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: **K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability** and associated system

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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)

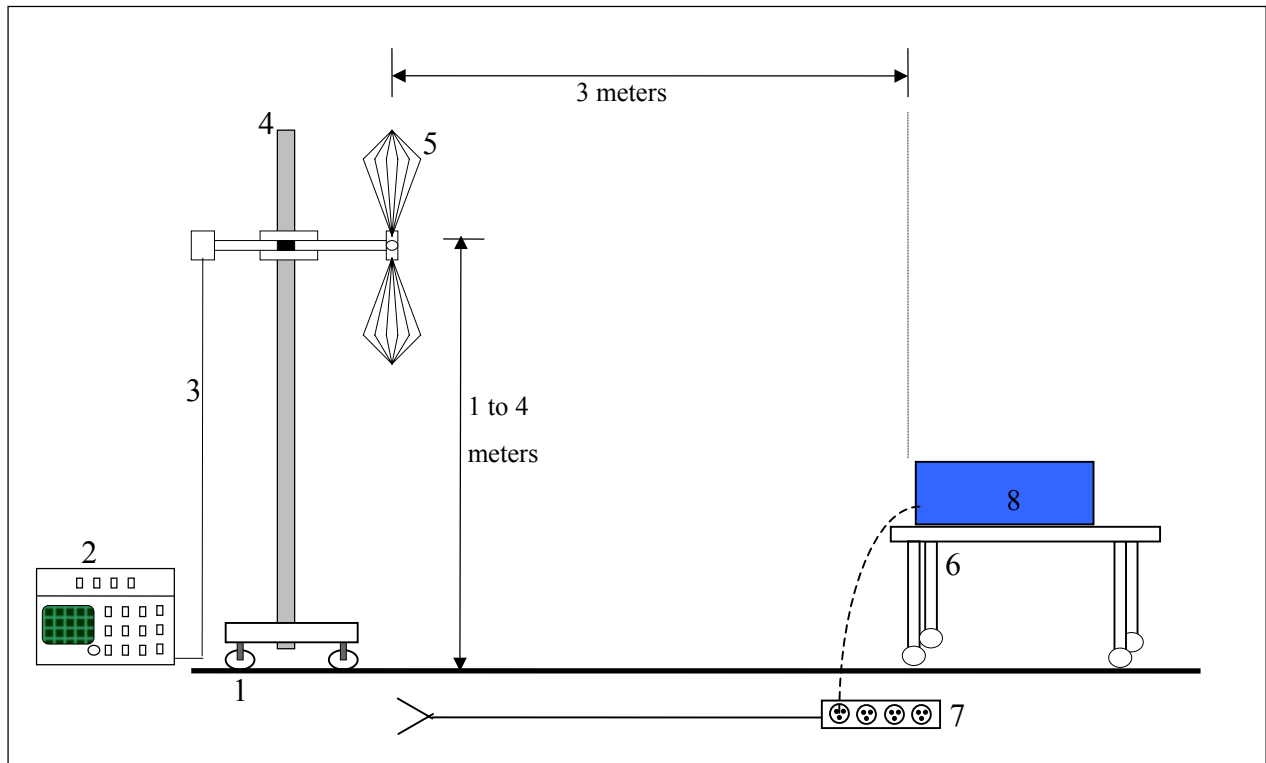
36.9 dBuV/M Final adjusted value

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.

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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: **K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability** and associated system.

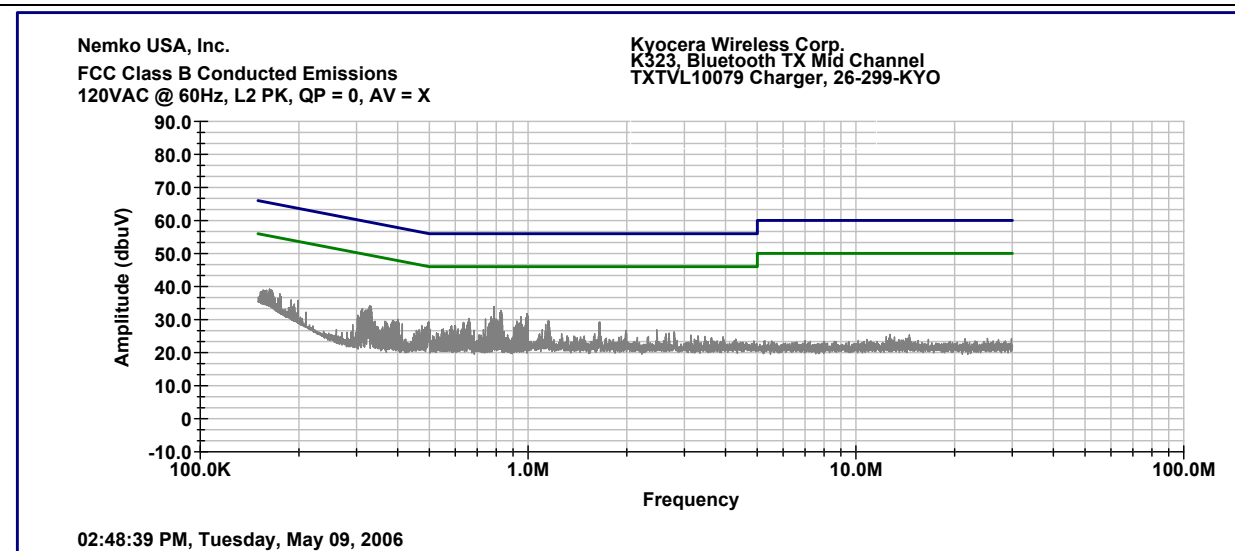
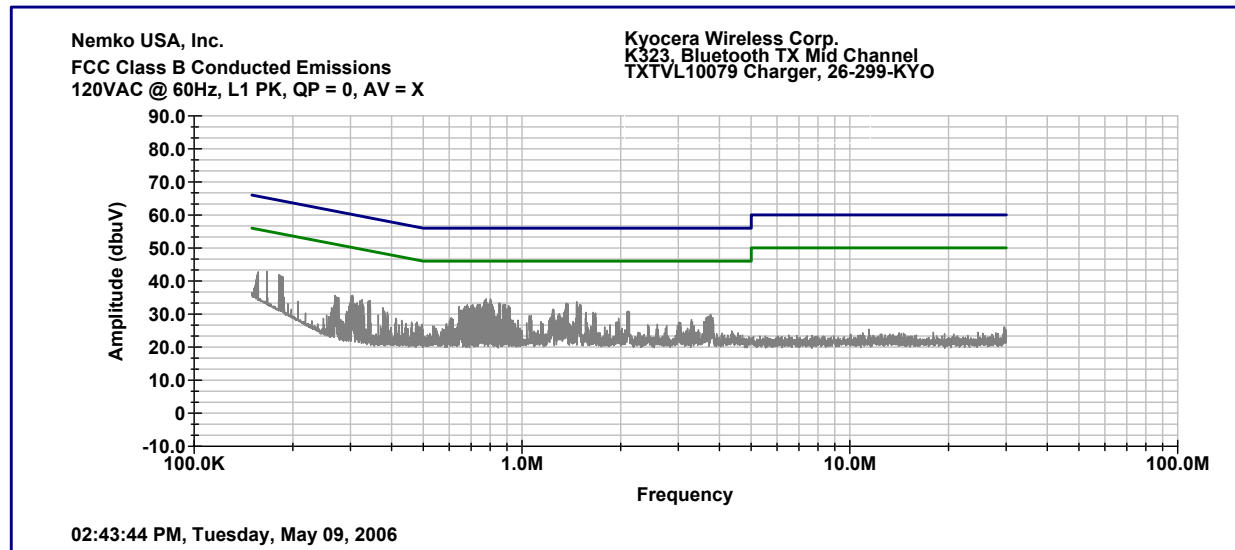
Bluetooth fundamental frequencies and radiated emissions were measured on three orthogonal axes. Only the maximum emissions of the three axes are stated in this report.

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3. Test Results

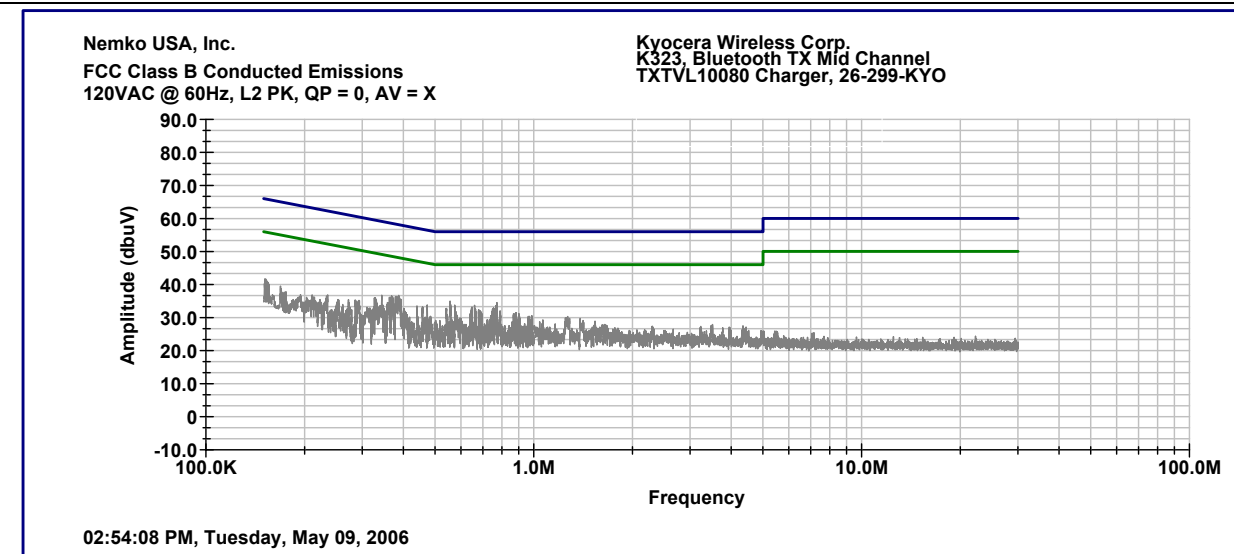
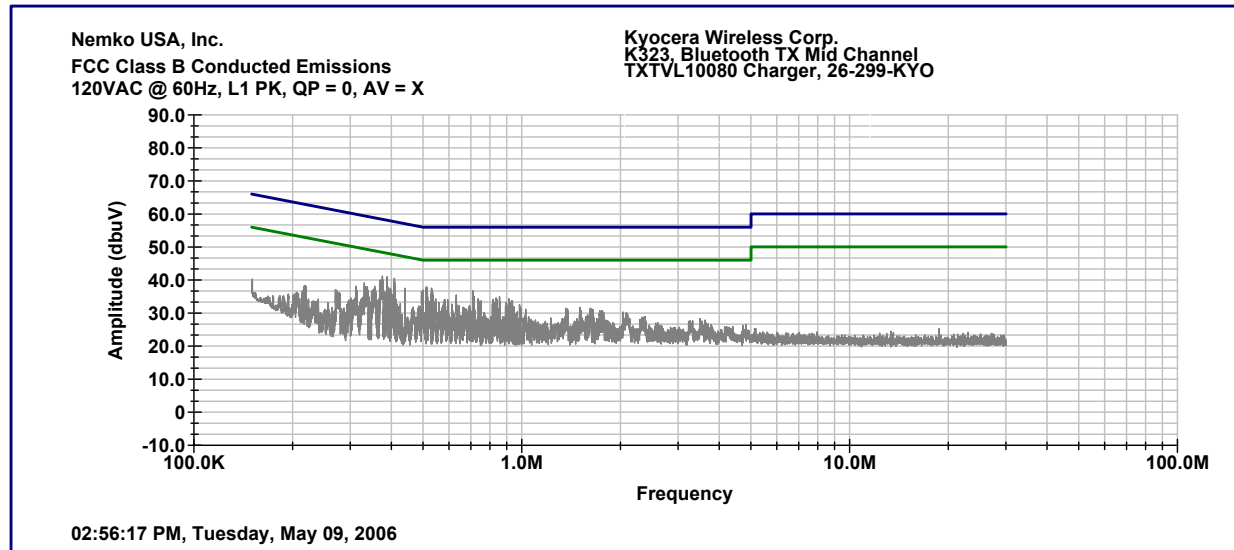
3.1. Conducted Emissions Test Data

Client	Kyocera Wireless Corp.	Temperature	71	deg F
PAN #	26-299-KYO	Relative Humidity	61	%
EUT Name	K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability	Barometric Pressure	30.2	Hg
EUT Model	K323 with TXTVL10079 Charger	Test Location	Enclosure 1	
Governing Doc	CFR 47 Part 15C	Test Engineer	Mike Krumweide	
Basic Standard	Sec. 15.207	Date	5/9/06	



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Client	Kyocera Wireless Corp.	Temperature	71	deg F
PAN #	26-299-KYO	Relative Humidity	61	%
EUT Name	K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability	Barometric Pressure	30.2	Hg
EUT Model	K323 with TXTVL10080 Charger	Test Location	Enclosure 1	
Governing Doc	CFR 47 Part 15C	Test Engineer	Mike Krumweide	
Basic Standard	Sec. 15.207	Date	5/9/06	



3.2. Radiated Emissions Test Data

[illegible]

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Radiated Emissions Data

Complete X
Preliminary _____

Job # : 26-299-KYO Test # : 1
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Client Name :	Kyocera Wireless Corp.
EUT Name :	K24 Dual Band Tri-Mode Cellular Phone with Bluetooth
EUT Model # :	K323
EUT Part # :	
EUT Serial # :	FM000000002678
EUT Config. :	Bluetooth Receive mode
	Charger M/N: TXTVL10080

Specification :	CFR47 Part 15, Subpart B, Class B		Reference :	
Rod. Ant. #:	NA	Temp. (deg. C) :	16	Date : 5/8/2006
Bicon Ant.#:	128	Humidity (%) :	67	Time :
Log Ant.#:	110	EUT Voltage :	120 Vac	Staff : MK
DRG Ant. #	NA	EUT Frequency :	60 Hz	Photo ID:
Dipole Ant.#:	NA	Phase:	1	Quasi-Peak Bandwidth: 120 kHz
Cable#:	NOATS	Location:	RN # 329550-01	Video Bandwidth 120 kHz
Preamp#:	901	Distance:	3m	
Spec An.#:	674			
QP #:	676			
PreSelect#:	NA			

[illegible]

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Radiated Emissions Data

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Client Name : Kyocera Wireless Corp.
EUT Name : K24 Tri-Mode Cellular Phone with Bluetooth
EUT Model # : K323
EUT Part # :
EUT Serial # : FM000000002678
EUT Config. : Bluetooth Transmit Mode
Open
Specification : FCC Part 15.247 (c), 15.209(a) Reference :
Rod. Ant. # : NA Temp. (°C) : 18 Date : 05/09/06
Bicon Ant.# : NA Humidity (%) : 75 Time :
Log Ant.# : NA EUT Voltage : Staff : M. Krumweide
DRG Ant. # : 877 EUT Frequency : NA Photo ID :
Dipole Ant.# : NA Phase : NA Peak Measurment Bandwidth: 1 MHz/ 1 MHz
Cable# : 40ft Location: RN # 329550-01 Average Measurment 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				Max. of 3 Axes
2402.00					-15.8			97.3	N/A		N/A				Fundamental
4804.00	52.8	40.5	54.0	45.6	-4.3	49.7	41.3	74.0	54.0	-24.3	-12.7			Pass	*
7206.00	52.1	43.0	51.6	42.3	3.9	56.0	46.9	77.3	57.3	-21.3	-10.4			Pass	*
9608.00					9.4				54.0						noise floor
12010.00					17.8			74.0	54.0						noise floor
14412.00					20.1				54.0						noise floor
16814.00					25.4				54.0						noise floor
19216.00					37.5			74.0	54.0						noise floor
21618.00					37.5				54.0						noise floor
24020.00					37.5				54.0						
2441.00					-15.8				N/A		N/A				Fundamental
4882.00	53.6	41.2	54.4	43.1	-4.3	50.1	38.8	74.0	54.0	-23.9	-15.2			Pass	*
7323.00	53.0	41.0	52.2	40.1	3.9	56.9	44.9	74.0	54.0	-17.1	-9.1			Pass	*
9764.00					9.4				54.0						noise floor
12205.00					17.8			74.0	54.0						noise floor
14646.00					20.7				54.0						noise floor
17087.00					30.8				54.0						noise floor
19528.00					37.5			74.0	54.0						noise floor
21969.00					37.5				54.0						noise floor
24410.00					37.5				54.0						
2480.00					-15.8				N/A		N/A				Fundamental
4960.00	53.0	41.0	53.9	42.3	-4.3	49.6	38.0	74.0	54.0	-24.4	-16.0			Pass	*
7440.00	52.5	40.0	51.6	40.6	3.9	56.4	44.5	74.0	54.0	-17.6	-9.5			Pass	*
9920.00					9.4				54.0						noise floor
12400.00					17.8			74.0	54.0						noise floor
14880.00					20.7				54.0						noise floor
17360.00					30.8				54.0						noise floor
19840.00					37.5			74.0	54.0						noise floor
22320.00					37.5			74.0	54.0						noise floor
24800.00					37.5				54.0						noise floor

* 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.

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Radiated Emissions Data

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Client Name : Kyocera Wireless Corp.
EUT Name : K24 Tri-Mode Cellular Phone with Bluetooth
EUT Model # : K323
EUT Part # :
EUT Serial # : FM000000002678
EUT Config. : Bluetooth Transmit Mode
Closed
Specification : FCC Part 15.247 (c), 15.209(a) Reference :
Rod. Ant. # : NA Temp. (°C) : 18 Date : 05/09/06
Bicon Ant. # : NA Humidity (%) : 75 Time :
Log Ant. # : NA EUT Voltage : NA Staff : M. Krumweide
DRG Ant. # : 877 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				Max. of 3 Axes
2402.00								93.9	N/A						Fundamental
4804.00	52.6	41.5	52.2	41.1	-4.3	48.3	37.2	74.0	54.0	-25.7	-16.8			Pass	*
7206.00	52.3	43.6	50.9	39.8	3.9	56.2	47.5	73.9	53.9	-17.7	-6.4			Pass	*
9608.00					9.4				54.0						noise floor
12010.00					17.8			74.0	54.0						noise floor
14412.00					20.1				54.0						noise floor
16814.00					25.4				54.0						noise floor
19216.00					37.5			74.0	54.0						noise floor
21618.00					37.5				54.0						noise floor
24020.00					37.5				54.0						
2441.00					32.6				N/A						Fundamental
4882.00	52.9	41.0	53.3	41.5	-4.3	49.0	37.2	74.0	54.0	-25.0	-16.8			Pass	*
7323.00	51.9	39.9	51.6	39.9	3.9	55.8	43.8	74.0	54.0	-18.2	-10.2			Pass	*
9764.00					9.4				54.0						noise floor
12205.00					17.8			74.0	54.0						noise floor
14646.00					20.7				54.0						noise floor
17087.00					30.8				54.0						noise floor
19528.00					37.5			74.0	54.0						noise floor
21969.00					37.5				54.0						noise floor
24410.00					37.5				54.0						
2480.00					32.6				N/A						Fundamental
4960.00	54.0	42.6	53.5	41.5	-4.3	49.7	38.3	74.0	54.0	-24.3	-15.7			Pass	*
7440.00	52.4	40.6	51.1	41.4	3.9	56.3	45.3	74.0	54.0	-17.7	-8.7			Pass	*
9920.00					9.4				54.0						noise floor
12400.00					17.8			74.0	54.0						noise floor
14880.00					20.7				54.0						noise floor
17360.00					30.8				54.0						noise floor
19840.00					37.5			74.0	54.0						noise floor
22320.00					37.5			74.0	54.0						noise floor
24800.00					37.5				54.0						noise floor

* 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.

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3.3. Fundamental Emissions Test Data

Radiated Emissions Data																																																						
						Job # : 26-299-KYO		Test # : 1																																														
						Page 1		of 1																																														
Client Name :		Kyocera Wireless Corp.																																																				
EUT Name :		K24 Tri-Mode Cellular Phone with Bluetooth																																																				
EUT Model # :		K323																																																				
EUT Part # :																																																						
EUT Serial # :		FM000000002678																																																				
EUT Config. :		Bluetooth Transmit Mode																																																				
		Open																																																				
Specification :		FCC Part 15.247				Reference :																																																
Rod. Ant. #:	NA	Temp. (°C) :	18				Date :	05/09/06																																														
Bicon Ant. #:	NA	Humidity (%) :	75				Time :																																															
Log Ant. #:	112	EUT Voltage :	NA				Staff :	M. Krumweide																																														
DRG Ant. #	877	EUT Frequency :	NA																																																			
Dipole Ant. #:	NA	Phase:	NA				Peak Bandwidth:	1 MHz /100 kHz																																														
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																																																					
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Meas. Freq. (MHz)</th> <th>Vertical (dBuV) pk</th> <th>Horizontal (dBuV) pk</th> <th>CF (db)</th> <th>Max Level (dBm) pk</th> <th>Spec. Limit (ERP) (dBm) pk</th> <th>Margin dB pk</th> <th>EUT Rotation</th> <th>Ant. Height</th> <th>Pass Fail Unc.</th> <th>Comment</th> </tr> </thead> <tbody> <tr> <td>2402.00</td> <td>64.3</td> <td>64.7</td> <td>32.5</td> <td>-0.1</td> <td>30.0</td> <td>-30.1</td> <td>0.0</td> <td>2.5</td> <td>Pass</td> <td>Fundamental</td> </tr> <tr> <td>2441.00</td> <td>56.6</td> <td>58.4</td> <td>32.5</td> <td>-6.4</td> <td>30.0</td> <td>-36.4</td> <td>0.0</td> <td>1.0</td> <td>Pass</td> <td>Fundamental</td> </tr> <tr> <td>2480.00</td> <td>54.8</td> <td>56.6</td> <td>32.5</td> <td>-8.2</td> <td>30.0</td> <td>-38.2</td> <td>0.0</td> <td>2.0</td> <td>Pass</td> <td>Fundamental</td> </tr> </tbody> </table>											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	64.3	64.7	32.5	-0.1	30.0	-30.1	0.0	2.5	Pass	Fundamental	2441.00	56.6	58.4	32.5	-6.4	30.0	-36.4	0.0	1.0	Pass	Fundamental	2480.00	54.8	56.6	32.5	-8.2	30.0	-38.2	0.0	2.0	Pass	Fundamental
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	64.3	64.7	32.5	-0.1	30.0	-30.1	0.0	2.5	Pass	Fundamental																																												
2441.00	56.6	58.4	32.5	-6.4	30.0	-36.4	0.0	1.0	Pass	Fundamental																																												
2480.00	54.8	56.6	32.5	-8.2	30.0	-38.2	0.0	2.0	Pass	Fundamental																																												

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Radiated Emissions Data

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Client Name : Kyocera Wireless Corp.
EUT Name : K24 Tri-Mode Cellular Phone with Bluetooth
EUT Model # : K323
EUT Part # :
EUT Serial # : FM000000002678
EUT Config. : Bluetooth Transmit Mode
Closed
Specification : FCC Part 15.247
Rod. Ant. # : NA Temp. (°C) : 18
Bicon Ant.# : NA Humidity (%) : 75
Log Ant.# : 112 EUT Voltage : NA
DRG Ant. # : 877 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 : 05/09/06
Time :
Staff : M. Krumweide
Peak Bandwidth: 1 MHz / 1 kHz
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	61.2	61.3	32.5	-3.5	30.0	-33.5	0.0	2.3	Pass	Fundamental
2441.00	54.9	53.9	32.5	-9.9	30.0	-39.9	0.0	1.0	Pass	Fundamental
2480.00	53.2	52.7	32.5	-11.6	30.0	-41.6	0.0	1.0	Pass	Fundamental

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Radiated Emissions Test Equipment

Client	Kyocera Wireless Corp.	EUT Name	K24 Dual Band Tri-Mode Cell Phone with Bluetooth Capability
PAN #	26-299-KYO	EUT Model	K323

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
898	EMI Receiver, HP	8546A	3625A00348	5/16/06	5/16/07
899	RF Filter Section HP	85460A	3448A00288	5/16/06	5/16/07
842	Preamp	Nemko	na	5/19/05	5/19/06
877	Antenna, DRG Horn, .7-18GHz, A.H. Systems	SAS-571	688	4/19/05	6/19/06 Verified
835	Spectrum Analyzer, Rhode & Schwartz	RHDFSEK	829058/005	1/18/06	1/18/07

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Photograph 3. Conducted Emissions Test Configuration

TXTVL10079 Charger



TXTVL10080 Charger



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Photograph 4. Radiated Emissions Test Configuration

TXTVL10079 Charger



TXTVL10080 Charger



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Photograph 5. Fundamental and Spurious Emissions Test Configuration



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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

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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.*

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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).

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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 C63.4-2004 when performing the normalized site attenuation measurements.