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

EMC TEST REPORT

Kyocera Wireless Corp.

Cellular Phone

Model: **KX160B**

RADIATED AND CONDUCTED EMISSIONS

FCC, PART 15.247

RSS 210

TEST REPORT # 2005 090862 KX160B 15.247

25-862-KYO

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

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APPENDICES

EMC Test Report
For
Kyocera Wireless Corp.

Test Number : 25-862-KYO

Product Name : **Cellular Phone**

Regulation : FCC, Part 15.247
: RSS 210
:

Date : September 12, 2005

Report Reviewed
Accepted by: _____

Kyocera Wireless Corp.
10300 Campus Point Drive
San Diego, CA 92121
Phone: 858-882-3945
Fax: 858-882-3707

Report Issued By: *F. R. Fleury*

F. R. Fleury

Tested By: _____

Mike Krumweide EMC Test Engineer

Administrative Data

Regulation	: FCC, Part 15B
	: Canada, ICES-003
	:
Level	: Class B
Test Method	: ANSI C63.4 – 2003
	: CSA C108. - M1983
	:
Test Type	: Certification
Manufacturer	: Kyocera Wireless Corp.
EUT /:Model #	: Cellular Phone / KX160B
Date(s) of Test	: August 26, 2005 and September 6, 2005
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 KX160B is a 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 and Radiated Emissions measurements.

DEVICE	MANUFACTURER MODEL # SERIAL #	POWER CABLE
EUT - **Cellular Phone**	**Kyocera Wireless Corp.** Model: **KX160B** SN: A1DX----1CSC0X	N/A
EUT – Battery Charger	Travel Charger TXACA10004 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

CERTIFICATION AND TEST SUMMARY

Test Type	*In Accordance with Document*	*Frequency Range Investigated*	*EUT Complies*
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 Cellular Phone complied with FCC, PART 15B and CANADA, ICES-003, 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 C63.4-2003 documents. The OATS normalized site attenuation characteristics are verified for compliance every.

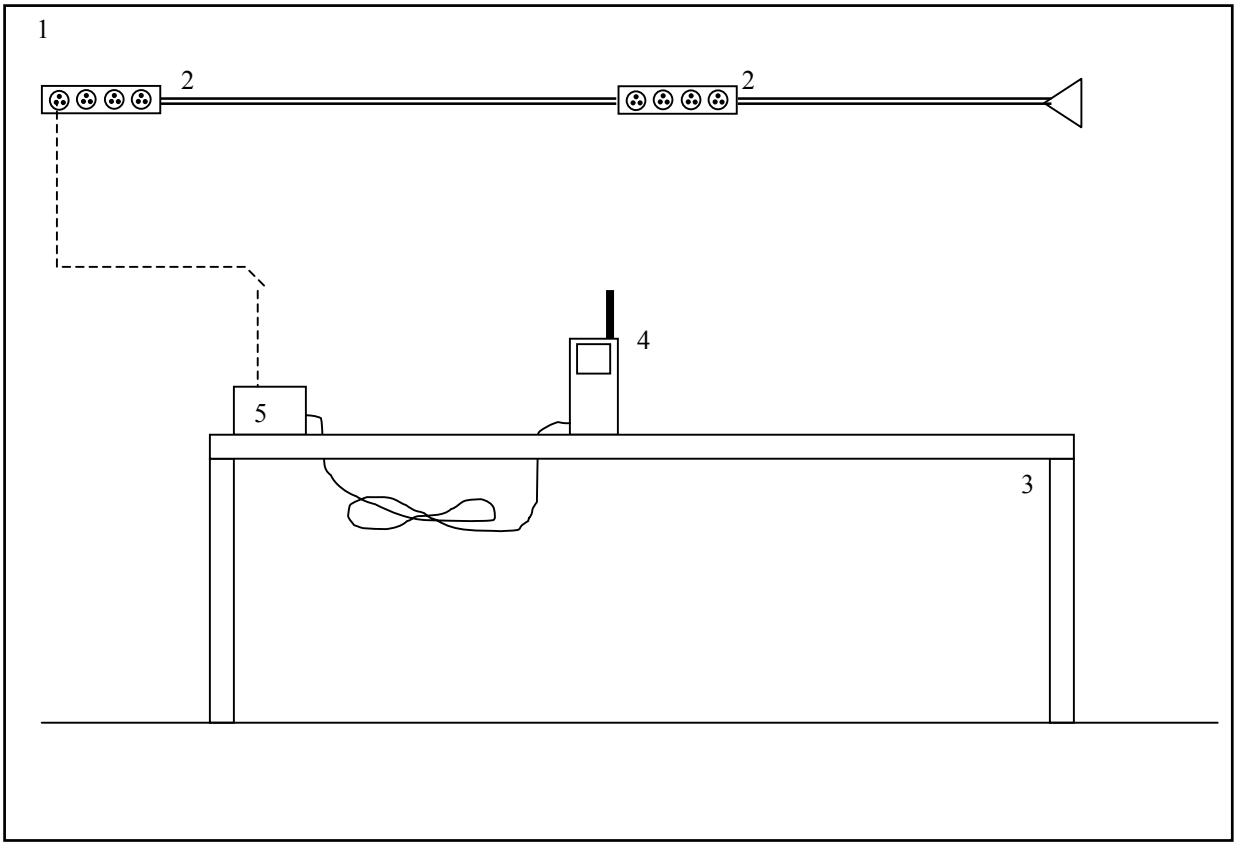
2. DESCRIPTION OF TESTING METHODS

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.

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: Cellular Phone
5. 120VAC Domestic Charger.

Photograph 1. Front View of EUT

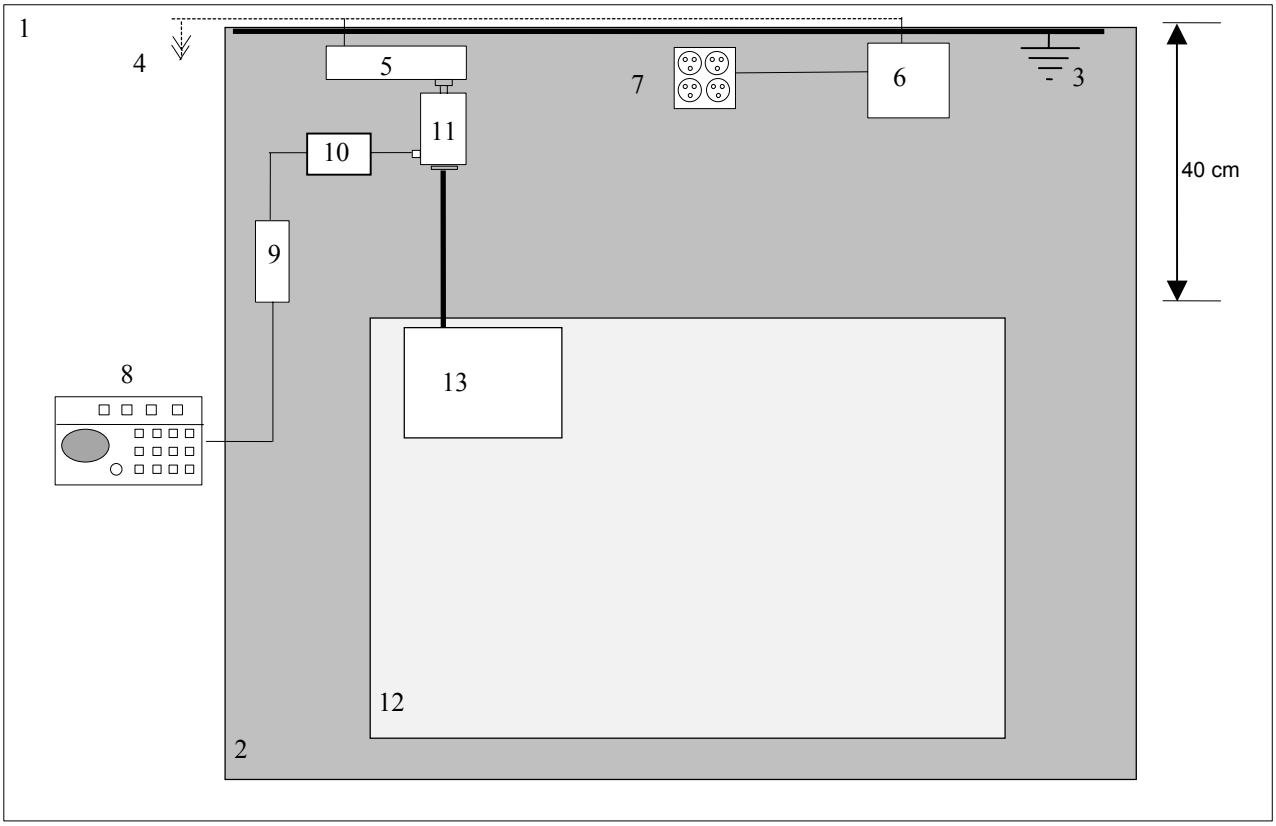
Photograph 2. EUT Charger

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.

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: Cellular Phone and Associated System

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.

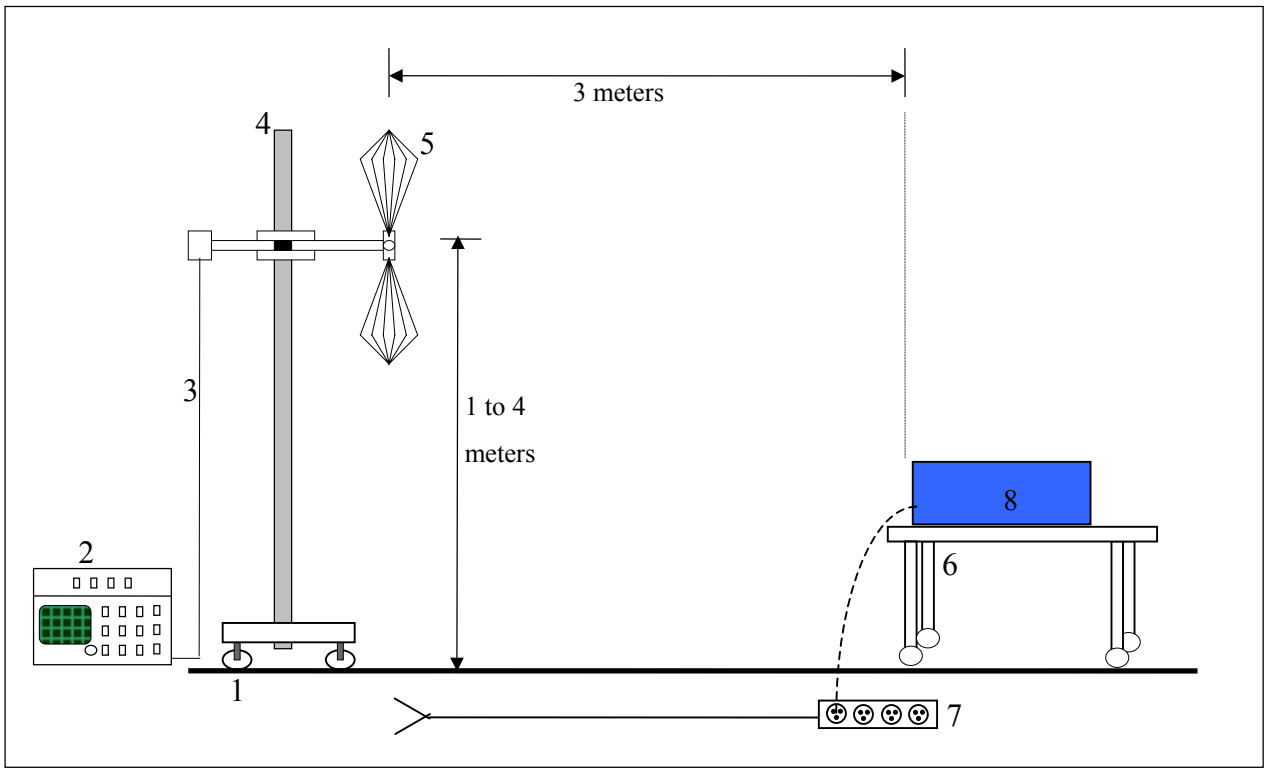
The numerical results that are applied to the emissions limits are arrived at by the following method:
Example: A=RR+CL+AF
A = Amplitude dBuV/M
RR = Receiver Reading dBuV
CL = cable loss dB
AF = antenna factor dBm-1

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.

Figure 3. Radiated Emissions Test Setup Diagram



NOT TO SCALE

CONFIGURATION LEGEND

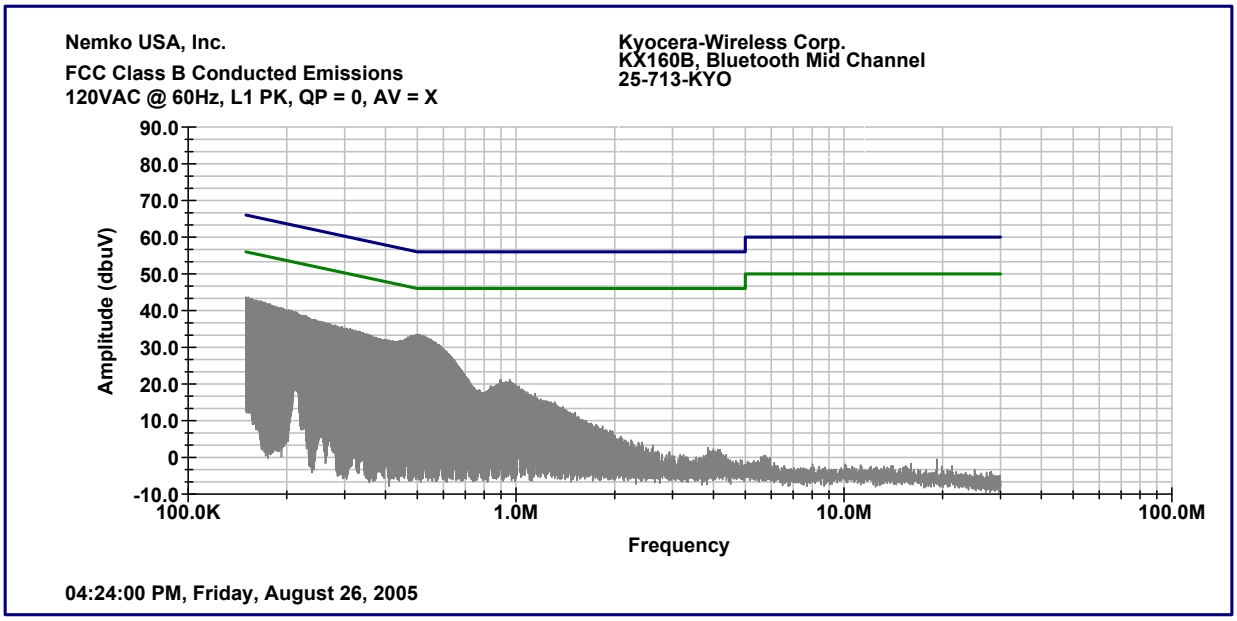
1. Ground plane (11 X 17 meters)
2. Spectrum Analyzer with Quasi-Peak Adapter
3. Coax interconnect from Receive Antenna to Spectrum Analyzer
4. Antenna Mast with motorized mounting assembly
5. Receive Antenna (basic relative position)
6. Non-Conducting table 80 cm above ground plane
7. AC power for devices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

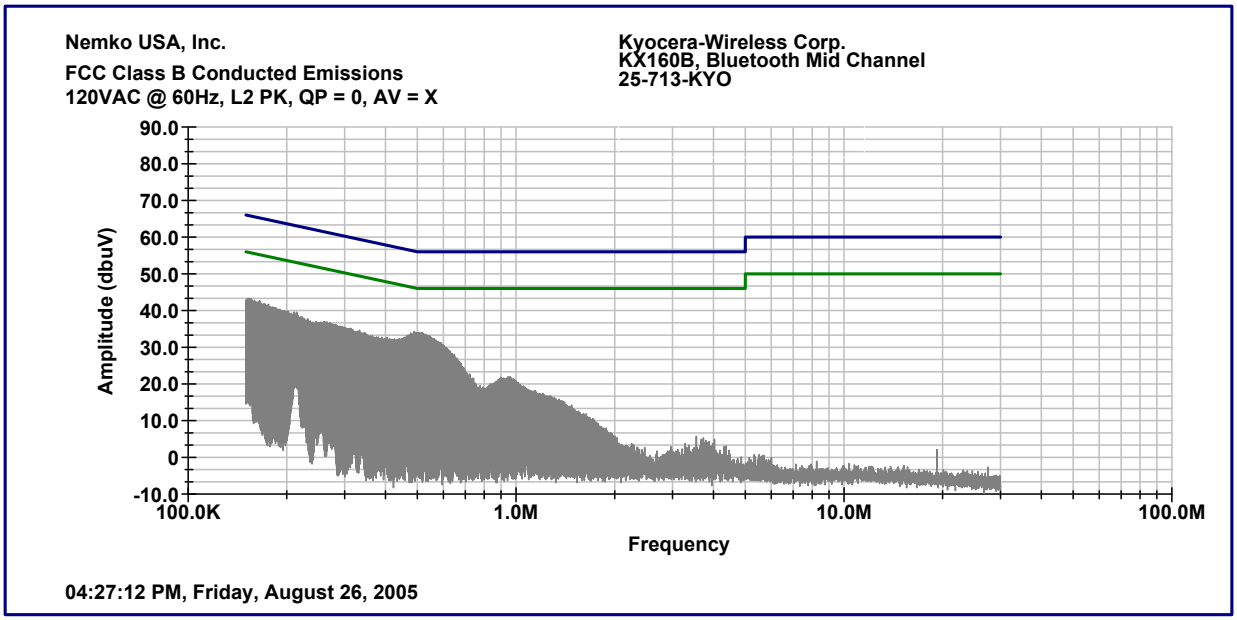
Bluetooth fundamental frequencies and radiated emissions were measured on three orthogonal axes. Only the maximum emissions of the three axes are stated in this report. Test setup pictures of these axes are found further in this report.

3. Test Results

3.1. Conducted Emissions Test Data

Client	**Kyocera Wireless Corp.**	Temperature	77	deg F
PAN #	25-862-KYO	Relative Humidity	56	%
EUT Name	**Cellular Phone**	Barometric Pressure	30.2	Hg
EUT Model	**KX160B**	Test Location	Enclosure 1	
Governing Doc	CFR 47 Part 15C	Test Engineer	Mike Krumweide	
Basic Standard	Sec. 15.207	Date	8/26/05	





Conducted Emissions Test Equipment

Client	**Kyocera Wireless Corp.**	EUT Name	**Cellular Phone**
PAN #	25-862-KYO	EUT Model	**KX160B**

Asset Number	Description	Model Number	Serial Number	Last Cal	Cal Due
681	Transient Limiter, HP	11947A	3107A02634	5/25/05	5/25/06
395	LISN, Solar	9348-50-R-24-BNC	941718	12/22/04	12/22/05
676	Quasi-Peak Adapter, HP	85650A	2430A00576	4/12/05	8/31/05
675	Spectrum Analyzer Display, HP	85662A	2005A01282	4/12/05	8/31/05
674	Spectrum Analyzer, HP	8568B	2007A00910	4/12/05	8/31/05
684	Transient Limiter, HP	11974A	3107A02636	5/25/05	5/25/06

3.2. Radiated Emissions Test Data

Radiated Emissions Data

Complete	X			Job # :	25-713-KYO	Test # :	1
Preliminary				Page	1	of	1
Client Name :	Kyocera-Wireless						
EUT Name :	Cellular Phone						
EUT Model # :	KX160B						
EUT Part # :							
EUT Serial # :	A1DX----1CSC0X						
EUT Config. :	Bluetooth Mid channel						
	Combined XYZ-Orientation						
Specification :	CFR47 Part 15.209, Subpart B, Class B			Reference :			
Rod. Ant. #:	NA	Temp. (deg. C) :	24			Date :	9/6/2005
Bicon Ant.#:	115	Humidity (%) :	50			Time :	
Log Ant.#:	112	EUT Voltage :	120			Staff :	MK
DRG Ant. #	NA	EUT Frequency :	60			Photo ID:	
Dipole Ant.#:	NA	Phase:	1			Peak Bandwidth:	100 kHz
Cable#:	NOATS	Location:	RN#: 329550-01			Video Bandwidth	100 kHz
Preamp#:	827	Distance:	3m				
Spec An.#:	840	839					
QP #:	438						
PreSelect#:	NA						

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Atten. (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
30.5	V		42.9	13.9	0.9	32.4	25.3	40.0	-14.7	Pass	
45.55	V		46.5	11.7	1.0	32.6	26.6	40.0	-13.4	Pass	
48	V		47.8	11.7	1.0	32.6	27.9	40.0	-12.1	Pass	
57.19	V		48.6	12	1.2	32.5	29.3	40.0	-10.7	Pass	
90.86	V		52.7	12.6	1.6	32.5	34.4	43.5	-9.1	Pass	
119.2	V		36.7	15	1.7	32.6	20.8	43.5	-22.7	Pass	

Radiated Emissions Data

Job # : 25-862-KYO Test # : 1
Page 1 of 1

Client Name : Kyocera Wireless Corp.
EUT Name : Cellular Phone
EUT Model # : KX160B
EUT Part # :
EUT Serial # : A1DX----1CSC0X
EUT Config. : Bluetooth
Combined XYZ-Orientation
Specification : FCC Part 15.247(c), 15.209(a) Reference :

Rod. Ant. #:	NA	Temp. (°C) :	28	Date :	09/30/05
Bicon Ant.#:	NA	Humidity (%) :	49	Time :	
Log Ant.#:	112	EUT Voltage :	NA	Staff :	M. Krumweide
DRG Ant. #	752	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) 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
2402.00	64.4	64.2	51.9	51.3	32.6	97.0	96.8	125.3	N/A	-28.3	N/A		1.0	Pass	Fundemental
4804.00	55.4	48.9	59.6	56.0	-5.4	54.2	50.6	74.0	54.0	-19.8	-3.4			Pass	*
7206.00	50.7	37.8	51.0	39.6	3.7	54.7	43.3	77.0	76.8	-22.3	-33.5			Pass	*
9608.00	44.4	32.1	46.4	37.4	10.2	56.6	47.6	77.0	76.8	-20.4	-29.2			Pass	*
12010.00	34.8	22.4	34.8	22.4	17.1	51.9	39.5	74.0	54.0	-22.1	-14.5				noise floor 100kHz RBW
14412.00	30.9	18.8	30.9	18.8	22.2	53.1	41.0	77.0	76.8	-23.9	-35.8				noise floor 50kHz RBW
16814.00	27.6	14.8	27.6	14.8	23.9	51.5	38.7	77.0	76.8	-25.6	-38.2				noise floor 50kHz RBW
19216.00					40.5			74.0	54.0						noise floor
21618.00					40.5			74.0	54.0						noise floor
24020.00					40.5			74.0	54.0						noise floor
2441.00	57.1	56.7	60.8	60.6	32.6	93.4	93.2	125.3	N/A	-31.9	N/A		1.1	Pass	Fundemental
4882.00	58.0	55.1	60.9	58.0	-5.4	55.5	52.6	74.0	54.0	-18.5	-1.4			Pass	*
7323.00	50.2	37.6	50.1	37.8	3.7	53.9	41.5	74.0	54.0	-20.1	-12.5				noise floor
9764.00	43.3	30.8	43.3	30.8	10.2	53.5	41.0	73.4	73.2	-19.9	-32.2				noise floor
12205.00	35.5	22.5	35.5	22.5	17.1	52.6	39.6	74.0	54.0	-21.4	-14.4				noise floor 100kHz RBW
14646.00	31.2	18.7	31.2	18.7	21.5	52.7	40.2	73.4	73.2	-20.7	-33.0				noise floor 50kHz RBW
17087.00	22.4	10.5	22.4	10.5	31.0	53.4	41.5	73.4	73.2	-20.0	-31.7				noise floor 30kHz RBW
19528.00					40.5			74.0	54.0						noise floor
21969.00					40.5			74.0	54.0						noise floor
24410.00					40.5			74.0	54.0						noise floor
2480.00	55.1	54.8	59.6	59.3	32.6	92.2	91.9	125.3	N/A	-33.1	N/A		1.2	Pass	Fundemental
4960.00	55.0	47.8	57.5	53.1	-5.4	52.1	47.7	74.0	54.0	-21.9	-6.3			Pass	*
7440.00	48.9	36.7	48.9	36.3	3.7	52.6	40.4	74.0	54.0	-21.4	-13.6			Pass	*
9920.00	43.5	30.6	43.5	30.6	10.2	53.7	40.8	72.2	71.9	-18.5	-31.1				noise floor
12400.00	35.2	22.4	35.2	22.4	17.1	52.3	39.5	74.0	54.0	-21.7	-14.5				noise floor 100kHz RBW
14880.00	30.5	18.1	30.5	18.0	21.5	52.0	39.6	72.2	71.9	-20.2	-32.3				noise floor 50kHz RBW
17360.00	21.8	10.0	21.8	10.0	31.0	52.8	41.0	72.2	71.9	-19.4	-30.9				noise floor 30kHz RBW
19840.00					40.5			74.0	54.0						noise floor
22320.00					40.5			74.0	54.0						noise floor
24800.00					40.5			74.0	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.

Radiated Emissions Test Equipment

Client	**Kyocera Wireless Corp.**	EUT Name	**Cellular Phone**
PAN #	25-862-KYO	EUT Model	**KX160B**

Asset Number	Description	Model Number	Serial Number	Last Cal	Cal Due
115	Antenna, Bicon, EMCO	3104	3020	2/3/05	2/3/06
112	Antenna, LPA, EMCO	3146	9101-2988	10/28/04	10/28/05
827	Preamplifier, Com-Power	PA-103	161032	10/22/04	10/22/05
421	Quasi-Peak Adapter, HP	85650A	3145A01672	8/9/05	2/9/06
422	Spectrum Analyzer Display, HP	85662A	2403A07080	8/9/05	2/9/06
535	Spectrum Analyzer, HP	85680A	2517A01757	8/9/05	2/9/06
842	Preamp	Nemko	na	5/19/05	verified
752	Antenna, DRWG, EMCO	3115	4943	12/29/04	12/29/05
104	Spectrum Analyzer, HP	8566B	2747A04729	6/24/05	12/24/05
404	Spectrum Analyzer Display, HP	85662A	2648A15448	6/24/05	12/24/05
835	Spectrum Analyzer, Rhode & Schwartz	RHDFSEK	829058/005	12/30/04	12/30/05

Photograph 3. Conducted Emissions Test Configuration

Photograph 4. Radiated Emissions Test Configuration

X - Orientation

Y – Orientation

Z – Orientation

Photograph 5. Fundamental Radiated Emissions Test Configuration

X – Orientation

Y – Orientation

Z - Orientation

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

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.*

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 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(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.

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, 2005
Effective through

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

NVLAP-01C (06-01)

NVLAP® National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:1999

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Revised Scope 06/22/2005

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

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), A1 (1997), A2 (1999):
12/CIS14b	AS/NZS 1044 (1995):
12/CIS14c	CNS 13783-1: Electromagnetic Compatibility Requirements for household appliances, electric tools and similar apparatus - Part 1: Emissions
12/CIS15b	CNS 13439 (2000) + A1 (2001): Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
12/CIS22	IEC/CISPR 22 (1997) & EN 55022 (1998) + A1(2000): Limits and methods of measurement of radio disturbance characteristics of information technology equipment
12/CIS22a	IEC/CISPR 22 (1993) and EN 55022 (1994): Limits and methods of measurement of radio disturbance characteristics of information technology equipment, Amendment 1 (1995) and Amendment 2 (1996)
12/CIS22b	CNS 13438 (1997): Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment

2005-01-01 through 2005-12-31
Effective dates

For the National Institute of Standards and Technology

NVLAP-01S (REV. 2005-05-19)

NVLAP® National Voluntary Laboratory Accreditation Program

Revised Scope 06/22/2005

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200116-0

NVLAP Code	*Designation / Description*
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, Edition 1.1(2002-03) & EN 61000-3-3, A1(2001): 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/T51	AS/NZS CISPR 22 (2002) and AS/NZS 3548 (1997): Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment

Immunity Test Methods:

12/I01	IEC 61000-4-2, Ed. 1.2 (2001) + A1, A2; EN 61000-4-2: Electrostatic Discharge Immunity Test
12/I02	IEC 61000-4-3, Ed. 2.0 (2002-03); EN 61000-4-3 (2002): Radiated Radio-Frequency Electromagnetic Field Immunity Test
12/I03	IEC 61000-4-4(1995), A1(2000), A2(2001); EN 61000-4-4: Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical Fast Transient/Burst Immunity Test
12/I04	IEC 61000-4-5, Ed. 1.1 (2001-04); EN 61000-4-5: Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test
12/I05	IEC 61000-4-6, Ed. 2.0 (2003-05); EN 61000-4-6: Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
12/I06	IEC 61000-4-8, Ed. 1.1 (2001); EN 61000-4-8: Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test

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NVLAP Code	*Designation / Description*
12/I07	IEC 61000-4-11, Ed. 1.1 (2001-03); EN 61000-4-11: Voltage Dips, Short Interruptions and Voltage Variations Immunity Tests

MIL-STD-462 : Conducted Emissions:

12/A13	MIL-STD-462 Version D Method CE101
12/A14	MIL-STD-462 Version D Method CE102
12/A15	MIL-STD-462 Version D Method CE106
12/A16	MIL-STD-461 Version E Method CE101
12/A17	MIL-STD-461 Version E Method CE102
12/A18	MIL-STD-461 Version E Method CE106

MIL-STD-462 : Conducted Susceptibility:

12/B12	MIL-STD-462 Version D Method CS101
12/B13	MIL-STD-462 Version D Method CS103
12/B14	MIL-STD-462 Version D Method CS104
12/B15	MIL-STD-462 Version D Method CS105
12/B16	MIL-STD-462 Version D Method CS109
12/B17	MIL-STD-462 Version D Method CS114
12/B18	MIL-STD-462 Version D Method CS115
12/B19	MIL-STD-462 Version D Method CS116
12/B20	MIL-STD-461 Version E Method CS101
12/B21	MIL-STD-461 Version E Method CS103
12/B22	MIL-STD-461 Version E Method CS104

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NVLAP Code	*Designation / Description*
12/B23	MIL-STD-461 Version E Method CS105
12/B24	MIL-STD-461 Version E Method CS109
12/B25	MIL-STD-461 Version E Method CS114
12/B26	MIL-STD-461 Version E Method CS115
12/B27	MIL-STD-461 Version E Method CS116
MIL-STD-462 : Radiated Emissions:	
12/D04	MIL-STD-462 Version D Method RE101
12/D05	MIL-STD-462 Version D Method RE102
12/D06	MIL-STD-462 Version D Method RE103
12/D07	MIL-STD-461 Version E Method RE101
12/D08	MIL-STD-461 Version E Method RE102
12/D09	MIL-STD-461 Version E Method RE103
MIL-STD-462 : Radiated Susceptibility:	
12/E08	MIL-STD-462 Version D Method RS101
12/E09	MIL-STD-462 Version D Method RS103
12/E10	MIL-STD-462 Version D Method RS105
12/E11	MIL-STD-461 Version E Method RS101
12/E12	MIL-STD-461 Version E Method RS103
12/E13	MIL-STD-461 Version E Method RS105

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