ENGINEERING TEST REPORT

ELITE 790 GPRS
Model No.: ELITE 790 GPRS

FCC ID: O34-E790GPRS

Applicant:

Ingenico Canada Ltd.
79 Torbarrie Road
Toronto, Ontario
Canada, M3L 1G5

Tested in Accordance With

Federal Communications Commission (FCC)
47 CFR, Parts 2 and 24 (Subpart E)
Broadband PCS

Ultratech File No.: IVI-104FCC24

This Test report is Issued under the Authority of Tri M. Luu, Professional Engineer, Vice President of Engineering UltraTech Group of Labs Date: April 3, 2003	
Report Prepared by: Dan Huynh Issued Date: April 3, 2003	Tested by: Mr. Hung Trinh, EMI/RFI Technician Test Dates: March 11, 2003

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

UltraTech

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31040/SIT C-1376 46390-2049 200093-0 00-034

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All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

EXHIBIT 1. SUBMITTAL CHECK LIST

Annex No.	Exhibit Type	Description of Contents	Quality Check (OK)
--	Test Report	▪ Exhibit 1: Submittal check lists ▪ Exhibit 2: Introduction ▪ Exhibit 3: Performance Assessment ▪ Exhibit 4: EUT Operation and Configuration during Tests ▪ Exhibit 5: Summary of test Results ▪ Exhibit 6: Measurement Data ▪ Exhibit 7: Measurement Uncertainty ▪ Exhibit 8: Measurement Methods	OK
1	Test Setup Photos	Radiated Emissions Test Setup Photos	OK
2	External Photos of EUT	External EUT Photos	OK
3	Internal Photos of EUT	Internal EUT Photos	OK
4	Cover Letters	▪ Letter from Ultratech for Certification Request ▪ Letter from the Applicant to appoint Ultratech to act as an agent ▪ Letter from the Applicant to request for Confidentiality Filing	OK
5	Attestation Statements	--	--
6	ID Label/Location Info	▪ ID Label ▪ Location of ID Label	OK
7	Block Diagrams	Wavecom Radio Module Block Diagram	OK
8	Schematic Diagrams	Wavecom Radio Module Schematics	
9	Parts List/Tune Up Info	There is no tune-up procedure for this device (Wavecom radio modem module), the power level is set at the factory and there are no provisions for a user to adjust the power level.	--
10	Operational Description	Wavecom Radio Modem Module Operational Description	OK
11	RF Exposure Info	See Ultratech SAR's report for Elite 790 GPRS	OK
12	Users Manual	▪ Wavecom Integra User's Guide ▪ Ingenico Elite Installation Guide	OK

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All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

EXHIBIT 2. INTRODUCTION

2.1. SCOPE

Reference:	FCC Parts 2 and 24 (Subpart E): 2002
Title:	Telecommunication - Code of Federal Regulations, 47 CFR, Parts 2 & 24
Purpose of Test:	To gain FCC Certification Authorization for Personal Communications Services (PCS) operating in the frequency band 1850.2 – 1909.8 MHz.
Test Procedures:	Both conducted and radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.4 - American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

2.2. NORMATIVE REFERENCES

Publication	Year	Title
FCC CFR Parts 2 and 24	2002	Code of Federal Regulations – Telecommunication
ANSI C63.4	1992	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
CISPR 22 & EN 55022	1997 1998	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
CISPR 16-1	1999	Specification for Radio Disturbance and Immunity measuring apparatus and methods

EXHIBIT 3. PERFORMANCE ASSESSMENT

3.1. CLIENT INFORMATION

APPLICANT:	
Name:	Ingenico Canada Ltd.
Address:	79 Torbarrie Road Toronto, Ontario Canada, M3L 1G5
Contact Information:	Mr. Ram Janarthanam Phone #: 416-245-6700 Fax #: 416-245-6701 Email Address: rjanarth@Ingenico-ca.com

MANUFACTURER:	
Name:	Ingenico Canada Ltd.
Address:	79 Torbarrie Road Toronto, Ontario Canada, M3L 1G5
Contact Information:	Mr. Ram Janarthanam Phone #: 416-245-6700 Fax #: 416-245-6701 Email Address: rjanarth@Ingenico-ca.com

3.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name:	Ingenico Canada Ltd.
Product Name:	Elite 790 GPRS
Model Name or Number:	ELITE 790 GPRS
Serial Number	4135200282
Type of Equipment:	License Base Station for Part 24 (PCS)
External Power Supply:	Ni-Mh battery (7.2V-1200 mAH)
Transmitting/Receiving Antenna Type:	Integral
Primary User Functions of EUT:	Data communication through radio (Point of Sale)

3.2.1. EUT'S TECHNICAL SPECIFICATIONS

TRANSMITTER:	
Equipment Type:	Portable
Intended Operating Environment:	Commercial
Power Supply Requirement:	5Vdc
RF Output Power Rating:	0.712 W
Operating Frequency Range:	1850.2 1909.8 MHz
RF Output Impedance:	50 Ohms
Channel Spacing:	200 kHz
Emission Designation:	330KGXW
Antenna Connector Type:	Integral

3.3. MODIFICATIONS INCORPORATED INTO THE EUT FOR COMPLIANCE PURPOSES

None.

3.4. ANTENNA DESCRIPTION

Manufacturer : COTTERLAZ

Type : GSM Tri-band antenna

Model : DIV403289A

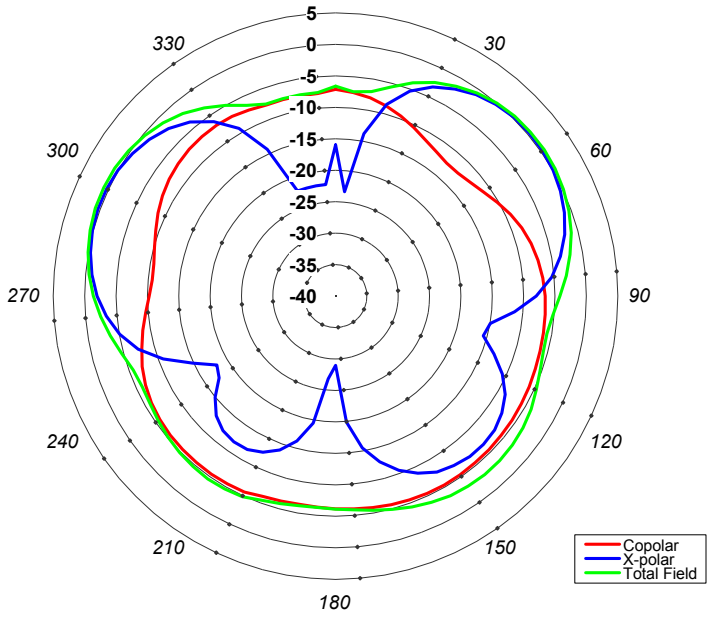
In/Out Impedance : 50 ohms

Frequency Range : E-GSM 880-915 MHz (Tx) 925-960 MHz (Rx)
GSM 890-915 MHz (Tx) 935-960 MHz (Rx)
DCS1800 1710-1785MHz (Tx) 1805-1880 MHz (Rx)
PCS 1850-1910 MHz (Tx) 30-1990 MHz) (Rx)

Gain (dBi) : See below for detailed information of antenna gain

Gain, Omnidirectional Plane
dBi

900 MHz



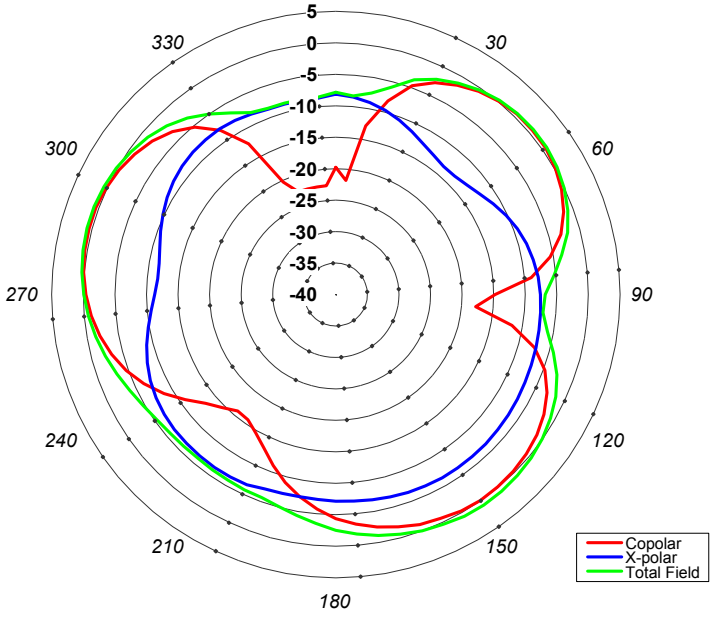
Copolar:
Avg (dBi) = -7,5
Peak (dBi) = -5,4
Total deg >= -6dBi = 95
Total deg >= -2dBi = 0

X-polar:
Avg (dBi) = -9,3
Peak (dBi) = 0,3
Total deg >= -6dBi = 0
Total deg >= -2dBi = 0

Total
Avg (dBi) = -3,6
Peak (dBi) = 0,8
Total deg >= -6dBi = 305
Total deg >= -2dBi = 100

Gain, ELEVATION Plane
dBi

900 MHz



Copolar:

Avg (dBi) =	-6,5
Peak (dBi) =	0,6
Total deg >= -6dBi =	220
Total deg >= -2dBi =	140

X-polar:

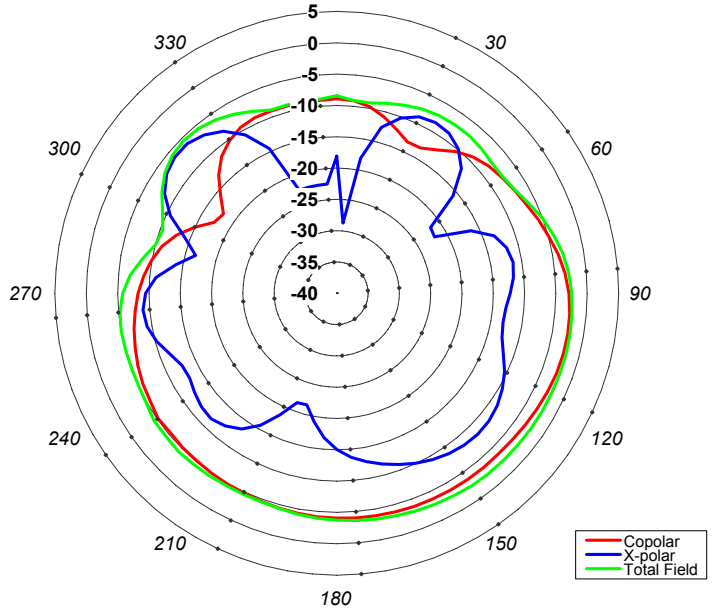
Avg (dBi) =	-8,5
Peak (dBi) =	-6,4
Total deg >= -6dBi =	0
Total deg >= -2dBi =	0

Total

Avg (dBi) =	-2,9
Peak (dBi) =	0,8
Total deg >= -6dBi =	300
Total deg >= -2dBi =	165

Gain, Omnidirectional Plane
dBi

1900 MHz



Copolar:

Avg (dBi) =	-7,2
Peak (dBi) =	-2,5
Total deg >= -6dBi =	180
Total deg >= -2dBi =	0

X-polar:

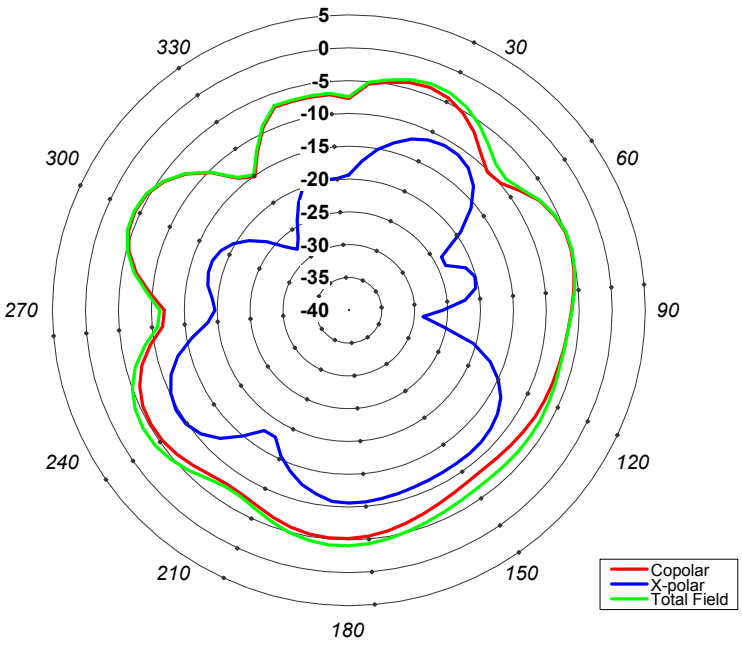
Avg (dBi) =	-13,1
Peak (dBi) =	-6,2
Total deg >= -6dBi =	0
Total deg >= -2dBi =	0

Total

Avg (dBi) =	-5,4
Peak (dBi) =	-2,1
Total deg >= -6dBi =	220
Total deg >= -2dBi =	0

Gain, ELEVATION Plane
dBi

1900 MHz



Copolar:

Avg (dBi) =	-7,1
Peak (dBi) =	-3,9
Total deg >= -6dBi =	130
Total deg >= -2dBi =	0

X-polar:

Avg (dBi) =	-16,6
Peak (dBi) =	-9,7
Total deg >= -6dBi =	0
Total deg >= -2dBi =	0

Total

Avg (dBi) =	-6,4
Peak (dBi) =	-3,3
Total deg >= -6dBi =	160
Total deg >= -2dBi =	0

EXHIBIT 4. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TEST

4.1. CLIMATIC TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21°C
Humidity:	51%
Pressure:	102 kPa
Power input source:	5Vdc

4.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TEST SIGNALS

Operating Modes:	During the process of testing, the EUT was controlled via Willtek 4202S mobile service tester
Special Test Software:	None.
Special Hardware Used:	Willtek 4202S mobile service tester
Transmitter Test Antenna:	The EUT is tested with the integral transmitter antenna

Transmitter Test Signals:	
Frequency Band(s):	1850.2 – 1909.8 MHz
Frequency(ies) Tested:	Low: 1850.4 MHz Middle: 1880.0 MHz High:1909.6 MHz
RF Power Output (measured maximum output power):	0.712 Watt (28.53 dBm), Conducted Power
Normal Test Modulation:	GMSK
Modulating Signal Source:	Internal

EXHIBIT 5. SUMMARY OF TEST RESULTS

5.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

Radiated Emissions were performed at the UltraTech's 3 Meter Open Field Test Site (OFTS) situated in the Town of Oakville, province of Ontario.

The above site have been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville Open Field Test Site has been filed with FCC office (FCC File No.: 31040/SIT 1300B3) and Industry Canada office (Industry Canada File No.: IC2049). Last Date of Site Calibration: August 10 2002.

5.2. APPLICABILITY & SUMMARY OF RFI EMISSION TEST RESULTS

FCC Paragraph	Test Requirements	Applicability (Yes/No)
§§24.232 & 2.1046	Power Output	Yes
§§24.236, 24.238, 2.1057 & 2.1053	Emission Limits (Radiated)	Yes

Elite 790 GPRS, Model No.: ELITE 790 GPRS, by Ingenico Canada Ltd. has also been tested and found to comply with FCC Part 15, Subpart B – Radio Receivers and Class A Digital Devices. The engineering test report has been documented and kept in file and it is available upon request.

EXHIBIT 6. MEASUREMENTS, EXAMINATIONS & TEST DATA FOR EMC EMISSIONS

6.1. TEST PROCEDURES

This section contains test results only. Details of test methods and procedures can be found in Exhibit 8 of this report

6.2. MEASUREMENT UNCERTAINTIES

The measurement uncertainties stated were calculated in accordance with requirements of UKAS Document NIS 81 with a confidence level of 95%. Please refer to Exhibit 7 for Measurement Uncertainties.

6.3. MEASUREMENT EQUIPMENT USED

The measurement equipment used complied with the requirements of the Standards referenced in the Methods & Procedures ANSI C63.4:1992 and CISPR 16-1.

6.4. ESSENTIAL/PRIMARY FUNCTIONS AS DECLARED BY THE MANUACTURER

The essential function of the EUT is to correctly communicate data to and from radios over RF link.

6.5. POWER OUTPUT @ §§2.1046 & 24.232

6.5.1. Limits

§ 24.232 (b) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

6.5.2. Method of Measurements

- Power at RF Power Output Terminals

  (1) The transmitter terminal was coupled to the Peak Power Meter through a 10 dB attenuator and Peak Power Sensor

  (2) The RF output was turned on with pseudorandom data modulation.

  (3) Power of the transmitter channel near the lowest, middle and highest of each frequency block/band were measured using the peak power meter, and the reading was corrected by added the calibrated attenuator's attenuation value and cable loss.

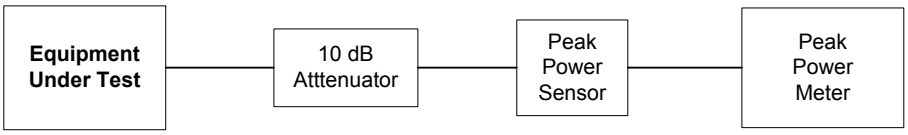
- For EIRP measurement method, refer to section 8 of this test report for details

6.5.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Advantest	R3271	15050203	100 Hz – 26.5 GHz
Horn Antenna	EMCO	3155	9701-5061	1 GHz – 18 GHz
Horn Antenna	EMCO	3155	9911-5955	1 GHz – 18 GHz
Synthesized Sweeper	Hewlett Packard	83752B	3610A00457	0.01 – 20 GHz
RF Power Amplifier	OPHIR	GRF5058	1009	0.8-4.2 GHz, 41 dB gain, 13W max.
Peak Power Meter	Hewlett Packard	8900D	2131A01044	0.1 – 18.0 GHz
Peak Power Sensor	Hewlett Packard	84811 A	2551A02902	0.1 – 18.0 GHz
Attenuator	Weinschel Corp	46-10-34	BL2618	DC – 18 GHz

6.5.4. Test Arrangement

- Power at RF Power Output Terminals



- For EIRP test arrangement, refer to section 8 of this test report for details

6.5.5. Test Data

6.5.5.1. Conducted Power

Frequency (MHz)	Peak Power (dBm)	Peak Power (Watt)
1850.40	28.37	0.687
1880.00	28.53	0.712
1909.60	28.53	0.712

6.5.5.2. EIRP Measurements – Substitution Method

Frequency (MHz)	Peak E-Field @ 3m (dBµV/m)	Antenna Polarization (V/H)	Peak Power From Signal Generator (dBm)	Substitution Antenna Gain (dBi)	Measured Peak EIRP (dBm)	Peak EIRP LIMIT (dBm)
1850.40	123.40	V	13.94	6.70	20.64	33.0
1850.40	118.00	H	8.28	6.70	14.98	33.0
1880.00	120.00	V	10.62	6.70	17.32	33.0
1880.00	118.28	H	8.96	6.70	15.39	33.0
1909.60	119.53	V	10.53	6.70	17.23	33.0
1909.60	117.09	H	9.28	6.70	15.98	33.0

6.6. EMISSION LIMITS (RADIATED) @ §§2.1049 & 24.238

6.6.1. Limits

§24.238 (a) On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43+10lo(P) dB.

6.6.2. Method of Measurements

Refer to Exhibit 8, Section 8 of this test report, FCC 47 CFR §24.238 and ANSI C63-4:1992 for radiated emissions test method.

6.6.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Advantest	R3271	15050203	100 Hz to 32 GHz with external mixer for frequency above 32 GHz
Microwave Amplifier	Hewlett Packard	HP 83017A	3116A00661	1 GHz to 26.5 GHz
RF Amplifier	Com-Power	PA-102		1 MHz to 1 GHz, 30 dB gain nomimal
Biconilog Antenna	EMCO	3142	10005	30 MHz to 2 GHz
Dipole Antenna	EMCO	3121C	8907-434	30 GHz – 1 GHz
Dipole Antenna	EMCO	3121C	8907-440	30 GHz – 1 GHz
Horn Antenna	EMCO	3155	9701-5061	1 GHz – 18 GHz
Horn Antenna	EMCO	3155	9911-5955	1 GHz – 18 GHz
Horn Antenna	EMCO	3160-9	1007	18.0 GHz – 26.5 GHz
RF Signal Generator	Hewlett Packard	HP 83752B	3610A00457	0.01 – 20 GHz

6.6.4. Test Data

6.6.4.1. Near Lowest Frequency (1850.4 MHz)

Carrier Frequency(MHz): 1850.40
Power(dBm): 18.45 (ERP)
Limit(dBc): -31.45

Frequency (MHz)	E-Field (dBµV/m)	EMI Detector (Peak/QP)	Antenna Polarization (H/V)	ERP measured by Substitution Method (dBm)	(dBc)	Limit (dBc)	Margin (dB)
5551.20	75.97	Peak	V	-31.21	-49.66	-31.45	-18.21
7401.60	69.84	Peak	V	-31.03	-49.48	-31.45	-18.03
The emissions were scanned from 30 MHz to 20 GHz and all emissions within 20 dB below the limits were recorded.							

6.6.4.2. Near Middle Frequency (1880.0 MHz)

Carrier Frequency(MHz): 1880.00
Power(dBm): 15.15 (ERP)
Limit(dBc): -28.15

Frequency (MHz)	E-Field (dBµV/m)	EMI Detector (Peak/QP)	Antenna Polarization (H/V)	ERP measured by Substitution Method (dBm)	(dBc)	Limit (dBc)	Margin (dB)
5640.00	75.72	Peak	V	-31.58	-46.73	-28.15	-18.58
5640.00	75.19	Peak	H	-31.58	-46.73	-28.15	-18.58
7520.00	74.13	Peak	V	-31.41	-46.56	-28.15	-18.41
The emissions were scanned from 30 MHz to 20 GHz and all emissions within 20 dB below the limits were recorded.							

6.6.4.3. Near Highest Frequency (1909.6 MHz)

Carrier Frequency(MHz): 1909.60
Power(dBm): 15.05 (ERP)
Limit(dBc): -28.05

Frequency (MHz)	E-Field (dBµV/m)	EMI Detector (Peak/QP)	Antenna Polarization (H/V)	ERP measured by Substitution Method (dBm)	(dBc)	Limit (dBc)	Margin (dB)
7638.40	78.38	Peak	V	-28.13	-43.18	-28.05	-15.13
The emissions were scanned from 30 MHz to 20 GHz and all emissions within 20 dB below the limits were recorded.							

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and NIS 81 (1994).

7.1. RADIATED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Radiated Emissions)	PROBABILITY DISTRIBUTION	UNCERTAINTY (± dB)	
		3 m	10 m
Antenna Factor Calibration	Normal (k=2)	±1.0	±1.0
Cable Loss Calibration	Normal (k=2)	±0.3	±0.5
EMI Receiver specification	Rectangular	±1.5	±1.5
Antenna Directivity	Rectangular	+0.5	+0.5
Antenna factor variation with height	Rectangular	±2.0	±0.5
Antenna phase center variation	Rectangular	0.0	±0.2
Antenna factor frequency interpolation	Rectangular	±0.25	±0.25
Measurement distance variation	Rectangular	±0.6	±0.4
Site imperfections	Rectangular	±2.0	±2.0
Mismatch: Receiver VRC Γ_1 = 0.2 Antenna VRC Γ_R = 0.67(Bi) 0.3 (Lp) Uncertainty limits 20Log(1±$\Gamma_1\Gamma_R$)	U-Shaped	+1.1 -1.25	±0.5
System repeatability	Std. Deviation	±0.5	±0.5
Repeatability of EUT		-	-
Combined standard uncertainty	Normal	+2.19 / -2.21	+1.74 / -1.72
Expanded uncertainty U	Normal (k=2)	+4.38 / -4.42	+3.48 / -3.44

Calculation for maximum uncertainty when 3m biconical antenna including a factor of k = 2 is used:

$U = 2u_c(y) = 2x(+2.19) = +4.38$ dB And $U = 2u_c(y) = 2x(-2.21) = -4.42$ dB

EXHIBIT 8. MEASUREMENT METHODS

8.1. RADIATED POWER MEASUREMENTS (ERP & EIRP) USING SUBSTITUTION METHOD

8.1.1. Maximizing RF Emission Levels (E-Field)

(1) The measurements was performed with full rf output power and modulation.
(2) Test was performed at listed 3m open area test site (listed with FCC, IC, ITI, NVLAP, ACA & VCCI).
(3) The transmitter under test was placed at the specified height on a non-conducting turntable (80 cm height)
(4) The BICONILOG antenna (20 MHz to 1 GHz) or HORN antenna (1 GHz to 18 GHz) was used for measuring.
(5) Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

(6) Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor
(7) E (dBuV/m) = Reading (dBuV) + Total Correction Factor (dB/m)

(8) Set the EMI Receiver #1 and #2 as follows:

(9) Center Frequency: test frequency
(10) Resolution BW: 100 kHz
(11) Video BW: same
(12) Detector Mode: positive
(13) Average: off
(14) Span: 3 x the signal bandwidth

(15) The test antenna was lowered or raised from 1 to 4 meters until the maximum signal level was detected.
(16) The transmitter was rotated through 360^{o} about a vertical axis until a higher maximum signal was received.
(17) The test antenna was lowered or raised again from 1 to 4 meters until a maximum was obtained. This level was recorded.
(18) The recorded reading was corrected to the true field strength level by adding the antenna factor, cable loss and subtracting the pre-amplifier gain.
(19) The above steps were repeated with both transmitters' antenna and test receiving antenna placed in vertical and horizontal polarization. Both readings with the antennas placed in vertical and horizontal polarization shall be recorded.
(20) Repeat for all different test signal frequencies

8.1.2. Measuring the EIRP of Spurious/Harmonic Emissions Using Substitution Method

(a) Set the EMI Receiver (for measuring E-Field) and Receiver #2 (for measuring EIRP) as follows:

Center Frequency:	equal to the signal source
Resolution BW:	10 kHz
Video BW:	same
Detector Mode:	positive
Average:	off
Span:	3 x the signal bandwidth

(b) Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor
E (dBuV/m) = Reading (dBuV) + Total Correction Factor (dB/m)

(c) Select the frequency and E-field levels obtained in the Section 8.2.1 for ERP/EIRP measurements.
(d) Substitute the EUT by a signal generator and one of the following transmitting antenna (substitution antenna):
- ♦ DIPOLE antenna for frequency from 30-1000 MHz or
- ♦ HORN antenna for frequency above 1 GHz }.

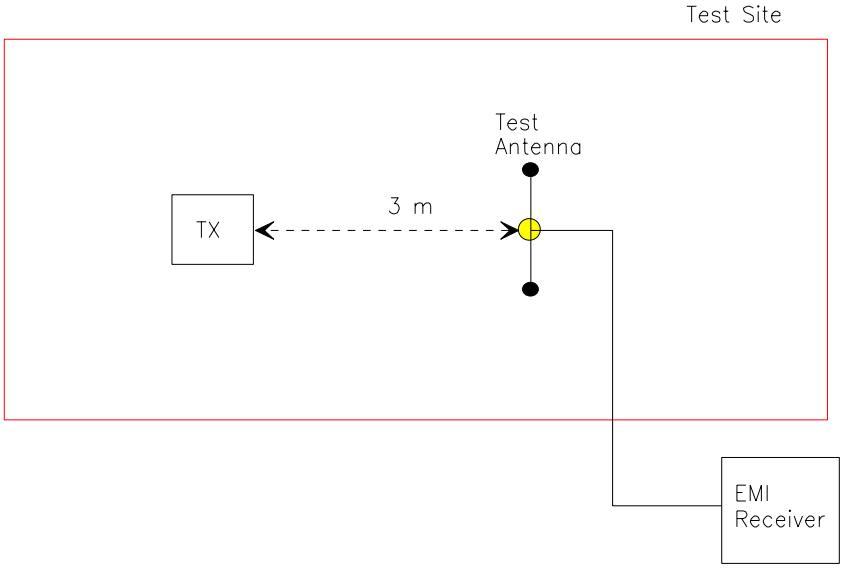
(e) Mount the transmitting antenna at 1.5 meter high from the ground plane.
(f) Use one of the following antenna as a receiving antenna:
- ♦ DIPOLE antenna for frequency from 30-1000 MHz or
- ♦ HORN antenna for frequency above 1 GHz }.

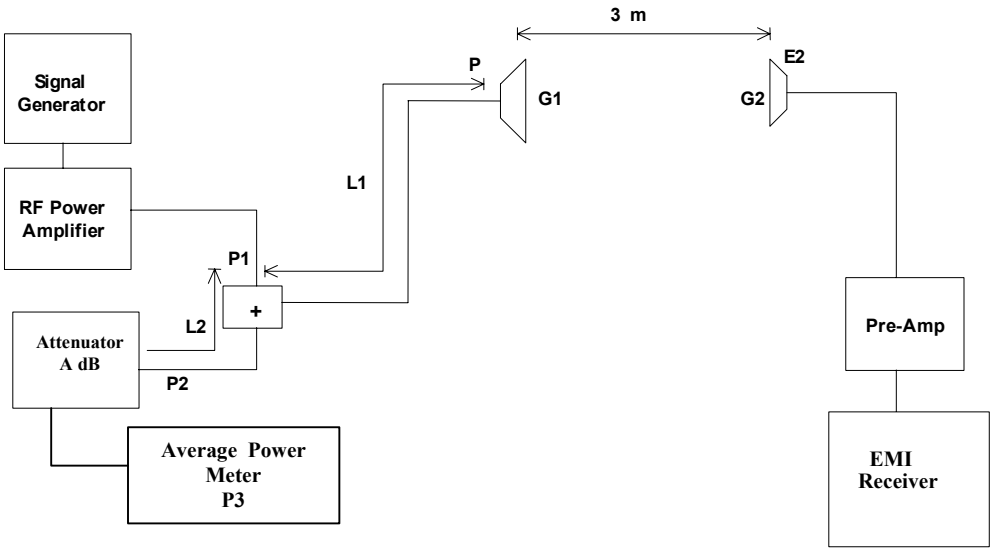
(g) If the DIPOLE antenna is used, tune it's elements to the frequency as specified in the calibration manual.
(h) Adjust both transmitting and receiving antenna in a VERTICAL polarization.
(i) Tune the EMI Receivers to the test frequency.
(j) Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.
(k) The transmitter was rotated through 360^{o} about a vertical axis until a higher maximum signal was received.
(l) Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.
(m) Adjust input signal to the substitution antenna until an equal or a known related level to that detected from the transmitter was obtained in the test receiver.
(n) Record the power level read from the Average Power Meter and calculate the ERP/EIRP as follows:

P = P1 - L1 = (P2 + L2) – L1 = P3 + A + L2 - L1
EIRP = P + G1 = P3 + L2 - L1 + A + G1
ERP = EIRP – 2.15 dB
Total Correction factor in EMI Receiver # 2 = L2 – L1 + G1

Where:
- P: Actual RF Power fed into the substitution antenna port after corrected.
- P1: Power output from the signal generator
- P2: Power measured at attenuator A input
- P3: Power reading on the Average Power Meter
- EIRP: EIRP after correction
- ERP: ERP after correction

(o) Adjust both transmitting and receiving antenna in a HORIZONTAL polarization, then repeat step (k) to (o)
(p) Repeat step (d) to (o) for different test frequency
(q) Repeat steps (c) to (j) with the substitution antenna oriented in horizontal polarization.
(r) Actual gain of the EUT's antenna is the difference of the measured EIRP and measured RF power at the RF port. Correct the antenna gain if necessary.


Test Site
Test Antenna
3 m
TX
EMI Receiver


3 m
Signal Generator
RF Power Amplifier
Attenuator A dB
Average Power Meter P3
P
G1
L1
P1
+
L2
P2
E2
G2
Pre-Amp
EMI Receiver

8.2. SPURIOUS EMISSIONS & OCCUPIED BANDWIDTH (CONDUCTED)

The transmitter's output was connected to the EMI receiver's input through an attenuator. The spurious and harmonic emissions were measured with the EMI Receiver controls set as follows:

- Outside the permitted band block: RBW = 1 MHz, VBW $\geq$ RBW
- Inside or on the permitted band block: RBW = 1% of -26dBc Bandwidth, VBW $\geq$ RBW

The spectrum was investigated from the lowest radio generated in the equipment up to at least the 10^{th} harmonic of the carrier frequency or to the highest frequency practicable in the present state of the art of measuring techniques, whichever is lower. Particular attention should be paid to harmonics and subharmonics of the carrier frequency. Radiation at the frequencies of multiplier stages should be checked. The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of the harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.