ELECTROMAGNETIC COMPATIBILITY

EMC TEST REPORT

FCC 47 CFR PART 22 SUBPART H
FCC 47 CFR PART 24 SUBPART E
AND
INDUSTRY CANADA RSS-132 ISSUE 2
INDUSTRY CANADA RSS-133 ISSUE 3

FOR

DUAL-BAND GSM/GPRS/EDGE/UMTS PCMCIA MODEM

INSTALLED IN

ITRONIX CORPORATION

IX100X SERIES RUGGED HANDHELD PC

MODEL: IX100XAC860

UTILIZING AN

EXTERNAL QUARTER-WAVE HELIX ANTENNA
AND
VEHICLE-MOUNT DIPOLE ANTENNA WITH CRADLE

FCC ID: KBCIX100XAC860

IC: 1943A-IX100Xf

Test Report Serial No.

042406KBC-T744-E24GWC

Test Report Revision No.

Revision 1.1 (2nd Release)

Test Location

Celltech Compliance Testing & Engineering Lab
(Celltech Labs Inc.)
1955 Moss Court
Kelowna, BC
Canada
V1Y 9L3

DECLARATION OF COMPLIANCE

Test Location	**CELLTECH LABS INC.** Testing and Engineering Services 1955 Moss Court Kelowna, BC Canada V1Y 9L3	**Company Information**	**ITRONIX CORPORATION** 12825 E. Mirabeau Parkway Spokane Valley, WA 99216 United States
Phone:	250-448-7047	**Fax:**	250-448-7048
E-mail:	info@celltechlabs.com	**Web site:**	www.celltechlabs.com

Lab Registration No.(s):	FCC:	714830	IC:	IC 3874
Rule Part(s):	FCC:	§2; §22H; §24E	IC:	RSS-132 Issue 2, RSS-133 Issue 3
Device Classification:	FCC:	PCS Licensed Transmitter (PCB)	IC:	800 MHz Cellular Telephones Employing New Technologies 2 GHz Personal Communication Services
Device Identification:	FCC:	KBCIX100XAC860	IC:	1943A-IX100Xf

Internal Transmitter Type:	Dual-Band GSM/GPRS/EDGE/UMTS PCMCIA Modem				Sierra Wireless Model: AirCard 860	
Host PC Type:	Rugged Handheld PC			**Device Model(s):**	Itronix IX100X Series (IX100XAC860)	
Transmit Frequency Range(s):	GSM/GPRS/EDGE	Cellular Band	824.2 - 848.8 MHz	PCS Band	1850.2 - 1909.8 MHz	
	UMTS	Cellular Band	826.4 - 846.6 MHz	PCS Band	1852.4 - 1907.5 MHz	
Receive Frequency Range(s):	GSM/GPRS/EDGE	Cellular Band	869.2 - 893.8 MHz	PCS Band	1930.2 - 1989.8 MHz	
	UMTS	Cellular Band	871.4 - 891.6 MHz	PCS Band	1932.4 - 1987.5 MHz	

Maximum RF Conducted Output Power Measured:	GPRS	Cellular Band	32.28 dBm	1.69 Watts	PCS Band	28.63 dBm	0.729 Watts
	EDGE	Cellular Band	26.89 dBm	0.489 Watts	PCS Band	25.73 dBm	0.374 Watts
	UMTS	Cellular Band	24.00 dBm	0.251 Watts	PCS Band	23.00 dBm	0.200 Watts

Max. ERP/EIRP Measured:	Helix Antenna	GPRS	Cellular	30.01 dBm	1.00 Watts	PCS	30.44 dBm	1.11 Watts
		EDGE	Cellular	28.78 dBm	0.755 Watts	PCS	30.54 dBm	1.13 Watts
		UMTS	Cellular	22.02 dBm	0.159 Watts	PCS	25.79 dBm	0.379 Watts
	Vehicle Antenna	GPRS	Cellular	27.08 dBm	0.510 Watts	PCS	26.04 dBm	0.401 Watts
		EDGE	Cellular	24.31 dBm	0.270 Watts	PCS	25.41 dBm	0.347 Watts
		UMTS	Cellular	20.56 dBm	0.114 Watts	PCS	21.48 dBm	0.141 Watts

GSM Transmit Class:	Class B	can be connected to GPRS and GSM services using only one service at a time					
GSM Multislot Class:	Class 10	2 Uplink Slots		Max. Source-Based Time-Averaged Duty Cycle:			25%
GSM Power Class:	GPRS 850:	1	GPRS 1900:	1	EDGE 850:	E2	EDGE 1900:	E2
WCDMA Power Class:	UMTS 850:	3	UMTS 1900:	3	Maximum Duty Cycle:			100%
WCDMA Uplink Channels:	1 DPCCH Channel				1 DPDCH Channel			

Modulation Type(s):	GPRS: GMSK	EDGE: 8-PSK	UMTS: WCDMA
Antenna Type(s) Tested:	External ¼-Wave Helix	Nearson, Inc.	P/N: 47-0180-003
	Vehicle-Mount Dipole	MaxRad, Inc.	P/N: WMLPVDB800/1900
Internal Battery Type:	Lithium-ion	7.4 V, 3.0 Ah	P/N: 46-0136-001
Power Source(s) Tested:	AC Power Adapter	Magic Power Technology Co., Ltd.	Model: MPE-C045-12-R

This wireless device has demonstrated compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC 47 CFR Rule Parts 2, 22H, 24E; Industry Canada RSS-132 Issue 2, RSS 133 Issue 3; and ANSI TIA/EIA-603-C-2004.

I attest to the accuracy of the data. All measurements reported herein were performed by me or were under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Test Report Approved By:

Spencer Watson
EMC Lab Manager
Celltech Labs Inc.

TABLE OF CONTENTS

FIGURES

PHOTOGRAPHS

TEST SUMMARY

Appendix	Test Description	Procedure Reference	Limit Reference	Test Start Date	Test End Date	Result
Referenced Standard(s): FCC CFR Title 47 Parts 2, 22 & 24						
B	Conducted RF Output Power	FCC 97-114, §2.1046	N/A	25Apr06	25Apr06	N/A
C	Effective Radiated Power Effective Isotropic Radiated Power	ANSI/TIA/EIA-603-C	§22.913 §24.232(b)	26Apr06	12May06	Pass
D	Radiated Spurious Emissions	ANSI/TIA/EIA-603-C	§22.917 (a), §24.238 (a)	15May06	16Jun06	Pass
E	Maximum Permissible Exposure	FCC CFR 47 § 2.1091 IEEE Std C95.1-1999	§1.1310 Table 1 (b)	27Apr06	27Apr06	Pass
Referenced Standard(s): IC RSS-132 Issue 2 & RSS-133 Issue 3						
B	Conducted RF Output Power	ANSI/TIA/EIA-603-C	N/A	25Apr06	25Apr06	N/A
C	Effective Radiated Power Effective Isotropic Radiated Power	ANSI/TIA/EIA-603-C	RSS-132 §4.4 RSS-133 §6.4	26Apr06	12May06	Pass
D	Radiated Spurious Emissions	ANSI/TIA/EIA-603-C	RSS-132 §4.5 RSS-133 §6.5	15May06	16Jun06	Pass
E	Maximum Permissible Exposure	RSS-102 Issue 2	Safety Code 6 2.2.1(a) Table 5	27Apr06	27Apr06	Pass

REVISION LOG

Revision	Description	Implemented By	Implementation Date
1.0	Initial Release	Jonathan Hughes	July 21, 2006
1.1	2ND Release (LMA)	Jonathan Hughes	Sept. 21, 2006

SIGNATORIES

Prepared By:		July 18, 2006
Name/Title:	Spencer Watson / EMC Manager	Date
Reviewed By:		Sept. 21, 2006
Name/Title:	Jonathan Hughes / General Manager	Date

1.0 SCOPE

This report outlines the measurements made and results collected during electromagnetic emissions testing of the AirCard 860 Dual-Band GSM/GPRS/EDGE/UMTS PCMCIA Modem installed in the Itronix Corporation Model: IX100XAC860 Rugged Handheld PC. An external Nearson ¼-Wave Helix antenna was attached to the upper right side edge of the Handheld PC. The Handheld PC also has provision for an optional vehicle cradle with utilizing a vehicle-mounted MaxRad dipole antenna. Measurement results were obtained for both antenna configurations and are presented in this report. The measurement results were applied against the applicable EMC requirements and limits outlined in the technical rules and regulations set forth in the Federal Communication Commission Code of Federal Regulations Title 47 Parts 2, 22 Subpart H, and 24 Subpart E; and Industry Canada Radio Standards Specification RSS-132 Issue 2, and RSS-133 Issue 3.

2.0 REFERENCES

2.1 Normative References

ANSI/ISO 17025:1999	General Requirements for competence of testing and calibration laboratories
IEEE/ANSI C63.4:2003	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
IEEE/ANSI Std C95.1:1999	American National Standard Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields
ANSI/TIA/EIA-603-C:2004	Land Mobile FM or PM Communication Equipment Measurement and Performance Standards
CFR Title 47 Part 2:2005	Code of Federal Regulations Title 47: Telecommunication Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
CFR Title 47 Part 22:2005	Code of Federal Regulations Title 47: Telecommunication Part 22: Public Mobile Services
CFR Title 47 Part 24:2005	Code of Federal Regulations Title 47: Telecommunication Part 24: Personal Communication Services
IC Spectrum Management & Telecommunications Policy	Radio Standards Specification RSS-102 Issue 2 - Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) RSS-132 Issue 2 - 800 MHz Cellular Telephones Employing New Technologies RSS-133 Issue 3 - 2 GHz Personal Communication Services RSS-212 Issue 1 (Provisional) - Test Facilities & Test Methods for Radio Equipment RSS-Gen Issue 1 - General Requirements and Information for the Certification of Radiocommunication Equipment SRSP-503 Issue 6 - Technical Requirements for Cellular Radiotelephone Systems Operating in the Bands 824 - 849 MHz and 869 - 894 MHz

3.0 TERMS AND DEFINITIONS

AV	Average
BAP	Burst Average Power
CDMA	Code Division Multiple Access
CFR	Code of Federal Regulations
dB	decibel
dBm	dB referenced to 1 mW
dBuV	dB referenced to 1 uV
DUT	Device under Test
dBc	dB down from carrier
EBW	Emission Bandwidth
EDGE	Enhanced Data Rates for GSM Evolution
EIRP	Effective Isotropic Radiated Power
EMC	Electromagnetic Compatibility
ERP	Effective Radiated Power
FCC	Federal Communication Commission
FHSS	Frequency Hopping Spread Spectrum
GSM	Global Systems for Mobile Communication
GPRS	General Packet Radio Service
HP	Hewlett Packard
HPF	High Pass Filter
Hpol	Horizontal Polarization
Hz	Hertz
IC	Industry Canada
kHz	kilohertz
LNA	Low Noise Amplifier
m	meter
MHz	Megahertz
Mbps	megabits per second
MAP	Modulated Average Power
na	not applicable
n/a	not available
PK	Peak
PPSD	Peak Power Spectral Density
QP	Quasi-peak
RBW	Resolution Bandwidth
R&S	Rohde & Schwarz
RSS	Radio Standard Specification
SA	Spectrum Analyzer
UMTS	Universal Mobile Telecommunications System
VBW	Video Bandwidth
Vpol	Vertical Polarization
WCDMA	Wide CDMA

4.0 FACILITIES AND ACCREDITATIONS

The facilities used in collecting the test results outlined in this report are located at 1955 Moss Court, Kelowna, British Columbia, Canada, V1Y 9L3. The radiated and conducted emissions sites conform with the requirements set forth in ANSI C63.4 and are filed and listed with the FCC under Registration Number 714830 and Industry Canada under File Number IC 3874.

5.0 GENERAL INFORMATION

5.1 Applicant Information

Company Name:	**Itronix Corporation**
Address:	12825 E. Mirabeau Parkway
	Spokane Valley, WA 99216
	United States

5.2 DUT Description

The DUT consisted of the AirCard 860 Dual-Band GSM/GPRS/EDGE/UMTS PCMCIA Modem installed in the IX100X Rugged Handheld PC with an external Nearson ¼-Wave Helix Antenna located on the upper right side edge of the IX100X. The IX100X also utilizes an optional vehicle cradle for operation with a vehicle-mounted MaxRad dipole antenna and a 17-foot attached cable. Photographs of the devices under test are shown in Appendix A.

Transmitter Type:	Dual-Band GSM/GPRS/EDGE/UMTS PCMCIA Modem			
Identifier(s):	FCC ID:	KBCIX100XAC860	IC:	1943A-IX100Xf
Model:	AirCard 860		**Serial Number:**	357806000465210
Rule Part(s) Tested:	FCC:	§2.1091; §22.913, §22.917; §24.232(b), §24.238		
	IC:	RSS-132 Issue 2, RSS-133 Issue 3		
Device Classification(s):	FCC:	PCS Licensed Transmitter (PCB)		
	IC:	800 MHz Cellular Telephones employing New Technologies (RSS-132)		
		2 GHz Personal Communication Services (RSS-133)		

Host PC:	Rugged Handheld PC		
Model:	IX100X Series	**Serial Number:**	DZGEG5326ZZ5091
Internal Battery:	Lithium-ion 7.4V, 3.0Ah (Model: 46-0155-001)		
Power Source Tested:	AC Adapter (Magic Power Technology Co., Ltd. Model: MPE-C045-12-R, Output 12VDC, 3.75A)		
Accessories Tested:	IX100X Vehicle Cradle	P/N: 50-0107-001	Serial No.: 12

Antenna Type 1:	External Mounted Nearson ¼-Wave	**Antenna Type 2:**	MaxRad Vehicle-Mount Dipole
Model / Part No.:	Model: 321 / PN: 47-0180-003	**Model / Part No.:**	P/N: WMLPVDB800/1900
Gain:	-2 dBi (880-960 MHz) 0 dBi (all other)	**Gain:**	3 dBi

5.3 Mode(s) of Operation Tested

Of the three modes, GPRS, EDGE and UMTS, GPRS and EDGE were considered similar in modulation type, channel frequency and relative power level. G-TEM measurements were made in all three modes of operation and the worst case for GPRS and EDGE was chosen for prescan measurements.

5.3.1 Dual-Band GPRS

Customer supplied software was used to set the GPRS mode to the appropriate channel and power level for the specific measurement. Between GPRS and EDGE modes, EDGE was found to have higher radiated emissions when tested in a G-TEM and therefore prescan measurements were not made in GPRS mode. The following settings where used for each channel during G-TEM testing and all other tests performed.

5.3.1.1 Cellular GPRS

Transmit Frequency Range:	824.2 - 848.8 MHz Ch. 128 (824.200 MHz), Ch. 190 (836.600 MHz) & Ch. 251 (848.800 MHz)
Power Gain Settings:	The proprietary Sierra Wireless Procomm Plus test script was utilized to set the RF output power to maximum
Modulation Type:	GMSK

5.3.1.2 PCS GPRS

Transmit Frequency Range:	1850.2 - 1909.8 MHz Ch. 512 (1850.2 MHz), Ch. 661 (1880.0) & Ch. 810 (1909.8 MHz)
Power Gain Settings:	The proprietary Sierra Wireless Procomm Plus test script was utilized to set the RF output power to maximum
Modulation Type:	GMSK

5.3.2 Dual-Band EDGE

Customer supplied software was used to set the EDGE mode to the appropriate channel and power level for the specific measurement. Of GPRS and EDGE, EDGE was found to have higher radiated emissions when tested in a G-TEM and therefore prescan measurements were made with the EDGE modem set to each of the low, mid and high channels in each band. Final measurements were made of all significant emissions. The following settings where used for each channel.

5.3.2.1 Cellular EDGE

Transmit Frequency Range:	824.2 - 848.8 MHz Ch. 128 (824.200 MHz), Ch. 190 (836.600 MHz) & Ch. 251 (848.800 MHz)
Power Gain Settings:	The proprietary Sierra Wireless Procomm Plus test script was utilized to set the RF output power to maximum
Modulation Type:	8-PSK

5.3.2.2 PCS EDGE

Transmit Frequency Range:	1850.2 - 1909.8 MHz Ch. 512 (1850.2 MHz), Ch. 661 (1880.0 MHz) & Ch. 810 (1909.8 MHz)
Power Gain Settings:	The proprietary Sierra Wireless Procomm Plus test script was utilized to set the RF output power to maximum
Modulation Type:	8-PSK

5.3.3 Dual-Band UMTS

The Anritsu MT8820A Radio Communications Test Set was used to set the UMTS mode to the appropriate channel and power level for the specific measurement via air-link. Prescan measurements were made with the UMTS mode set to the low, mid and high channels for each band. Final measurements were made of all significant emissions. The following settings where used for each channel.

5.3.3.1 Cellular UMTS

Transmit Frequency Range:	826.4 - 846.6 MHz Ch. 4132 (826.4 MHz), Ch. 4182 (836.4 MHz) & Ch. 4233 (846.6 MHz)
Power Gain Settings:	The maximum output power setting was established using the Anritsu 8820A Radio Communications Test Set in “All Up Bits” power control mode
Modulation Type:	WCDMA

5.3.3.2 PCS UMTS

Transmit Frequency Range:	1852.4 - 1907.5 MHz Ch. 9262 (1852.4 MHz), Ch. 9400 (1880.0 MHz) & Ch. 9538 (1907.5 MHz)
Power Gain Settings:	The maximum output power setting was established using the Anritsu 8820A Radio Communications Test Set in “All Up Bits” power control mode
Modulation Type:	WCDMA

5.4 Configuration Description

The DUT was configured as described by the client as being representative of what would be delivered to a final customer. Using radiated power measurements as a reference, the IX100X was positioned face up (keypad side up) for the spurious emissions testing described herein. For the ERP/EIRP measurements, the IX100X was oriented to match the orientation of the receive antenna. More specific details may be included in each appendix.

5.4.1 Configuration Justification

The IX100X was tested in a configuration described by the client as being worse case but typical of normal use. Since the system is available for use while hand held or installed in a mobile vehicle cradle using a vehicle-mounted dipole antenna, both configurations were tested and results reported herein.

6.0 PASS/FAIL CRITERIA

Unless otherwise noted in the Appendices, the pass/fail criteria is the limit set forth in the reference standards. A DUT is considered to have passed the requirements, if the data collected during the described measurement procedure is no greater than the specified limits as defined. The pass/fail statements made in this report only apply to the unit tested.

APPENDICES

Appendix A - Photographs

A.1 DUT PHOTOGRAPHS

Photograph A.1-1 - IX100X Rugged Handheld PC with Nearson ¼-Wave Helix Antenna

Photograph A.1-2 - IX100X Rugged Handheld PC with Vehicle Cradle and MaxRad Vehicle-Mount Antenna

Photograph A.1-3 - AirCard 860 PCMCIA Modem installed in IX100X Rugged Handheld PC

Photograph A.1-4 - AirCard 860 GSM/GPRS/EDGE/UMTS PCMCIA Modem

Appendix B - Conducted RF Output Power Measurement

B.1 REFERENCES

Normative Reference Standard	FCC CFR 47 §2.1046 (a)
Procedure Reference	FCC 97-114

B.2 LIMITS

B.2.1 FCC CFR 47

FCC CFR 47 §2.1046 (a)	For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedures to give the values of current and voltage on the circuit elements specified in §2.1033(c) (8).

*ERP and EIRP limits are specified in Appendix C.

B.3 ENVIRONMENTAL CONDITIONS

Temperature	25 +/- 5 ºC
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

B.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
00110	Gigatronics	8652A	Power Meter	12Apr06	12Apr07
00011	Gigatronics	80701A	Power Sensor	03Feb06	03Feb07
00012	Gigatronics	80701A	Power Sensor	12Sept05	12Sept06
00102	Pasternack	PE7015-3010	30 dB Attenuator	n/a*	n/a*
00208	Anritsu	MT8820A	Radio Communications Test Set	06Jun06	06Jun07
00078	Pasternack	PE2214-20	Directional Coupler 1-18 GHz	n/a*	n/a*

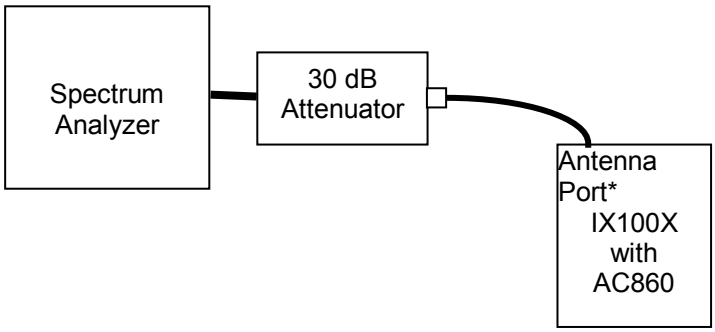
*Verified with power meter prior to use

B.5 MEASUREMENT EQUIPMENT SETUP

Measurement Equipment Connections	The equipment was connected as shown in the setup drawing in B.6.
Measurement Equipment Settings - GPRS and EDGE	Power Meter Settings: Mode - BAP Frequency compensation set for carrier frequency Offset set appropriately for attenuator characteristics
Measurement Procedure - GPRS and EDGE	The RF conducted output power levels for both PCS and cellular bands in both GPRS and EDGE modes were measured at the IX100X antenna connector port using a Gigatronics 8652A Universal Power Meter in burst average power mode. An offset was entered into the power meter to correct for the losses of the attenuator and cable installed between the transmitter output port and the power sensor input. The proprietary Sierra Wireless Procomm Plus test script was used to set the DUT to transmit at maximum output power level as described in section 5.5. All subsequent tests were performed using the same device setup procedures.
Measurement Equipment Settings - UMTS	Power Meter Settings: Mode - MAP Frequency compensation set for carrier frequency Offset set appropriately for attenuator characteristics
Measurement Procedure - UMTS	The RF conducted output power levels for both PCS and cellular bands were measured at the DUT antenna connector port using a Gigatronics 8652A Universal Power Meter in modulated average power mode. An offset was entered into the power meter to correct for the losses of the directional coupler and cable installed between the transmitter output port and the power sensor input. The Anritsu Radio Communications Test Set was utilized to set the DUT to transmit at maximum output power level as described in section 5.5. All subsequent tests were performed using the device setup procedures.
PROCEDURES USED TO ESTABLISH TEST SIGNAL (UMTS)	The following settings were used to configure the Anritsu MT8820A Communications Test Set: **Instrument Information** Application: WCDMA Standard: MX88200B 4.41 #003 Scenario: MX882050A Serial Number: 6200241241 **Call Parameters** Preset: 3GPP Test Loop Mode: Mode 1 Channel Coding: Reference Measurement Channel 12.2 kbps DTCH Data Pattern: PN9 Power Control Algorithm: Algorithm 1 TPC Step size: 1dB Power Control Bit Pattern: All-Up Bits UL Channel: 9262 / 9400 / 9538 4132 / 4182 / 4233 DL Channel: 9662 / 9800 / 9938 4357 / 4407 / 4458

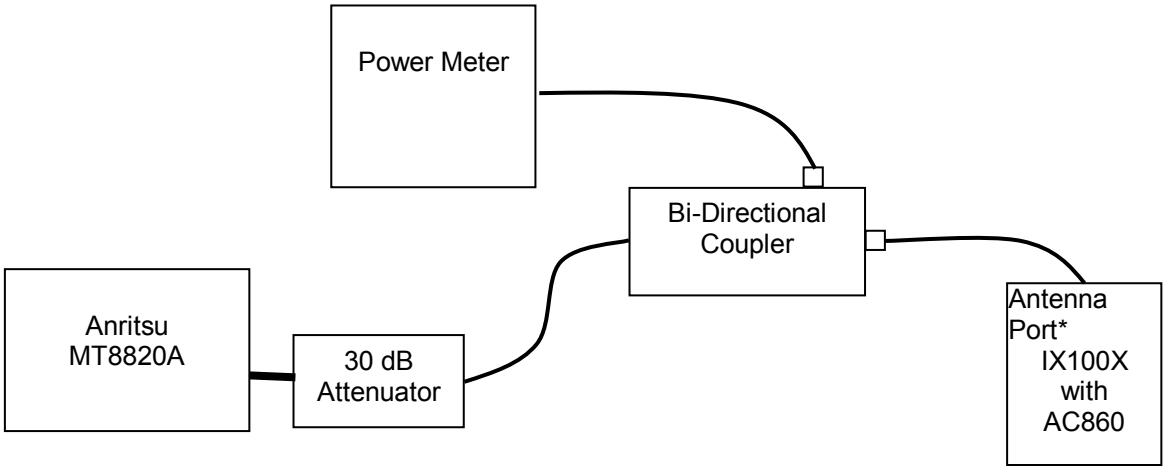
B.6 SETUP DRAWING

Figure B.6-1 - Setup Drawing
GPRS & EDGE Conducted Power Measurements



*measurement made/referenced at PCMCIA card antenna connector port

Figure B.6-2 - Setup Drawing
UMTS Conducted Power Measurements



*measurement made/referenced at PCMCIA card antenna connector port

B.7 DUT OPERATING DESCRIPTION

Power measurements were made in the cellular and PCS bands, with the DUT set appropriately as described in section 5.7.1

B.8 TEST RESULTS

Mode	Channel	Frequency	Conducted Power
Cellular GPRS	128	824.2 MHz	+31.75 dBm
	190	836.6 MHz	+31.84 dBm
	251	848.8 MHz	+32.28 dBm
Cellular EDGE	128	824.2 MHz	+26.68 dBm
	190	836.6 MHz	+26.89 dBm
	251	848.8 MHz	+26.72 dBm
Cellular UMTS	4132	826.4 MHz	+23.80 dBm
	4182	836.4 MHz	+23.90 dBm
	4233	846.6 MHz	+24.00 dBm
PCS GPRS	512	1850.2 MHz	+28.42 dBm
	661	1880.0 MHz	+28.63 dBm
	810	1909.8 MHz	+28.54 dBm
PCS EDGE	512	1850.2 MHz	+25.53 dBm
	661	1880.0 MHz	+25.73 dBm
	810	1909.8 MHz	+25.55 dBm
PCS UMTS	9262	1852.4 MHz	+22.33 dBm
	9400	1880.0 MHz	+23.00 dBm
	9538	1907.5 MHz	+22.70 dBm

B.9 PASS/FAIL

There is no pass/fail criterion for this measurement.

B.10 SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
EMC Manager
Celltech Labs Inc.

July 18, 2006
Date

Appendix C - Effective Radiated Power / Effective Isotropic Radiated Power Measurement

C.1 REFERENCES

Normative Reference Standard	FCC CFR 47 §22.913 (a), FCC CFR 47 §24.232 (b)
Procedure Reference	ANSI/TIA/EIA-603-C

C.2 LIMITS

C.2.1 FCC CFR 47

FCC CFR 47 §22.913 (a)	*(a) Maximum ERP. …….. The ERP of mobile transmitters and auxiliary transmitters must not exceed 7 Watts.*
FCC CFR 47 §24.232 (b)	*(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.*

C.3 ENVIRONMENTAL CONDITIONS

Temperature	25 +/- 5 ºC
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

C.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
00072	EMCO	2075	Mini-mast	n/a	n/a
00073	EMCO	2080	Turn Table	n/a	n/a
00071	EMCO	2090	Multi-Device Controller	n/a	n/a
00050	Chase	CBL-6111A	Bilog Antenna	04Apr06	04Apr07
00055	EMCO	3121C	Dipole Antenna	04Apr06	04Apr07
00034	ETS	3115	Double Ridged Guide Horn	11Aug05	11Aug07
00035	ETS	3115	Double Ridged Guide Horn	03Apr06	03Apr08
00161	Waveline	899	Standard Gain Horn Antenna	n/a	n/a
00051	HP	8566B	Spectrum Analyzer RF Section	04Apr06	04Apr07
00049	HP	85650A	Quasi-peak Adapter	04Apr06	04Apr07
00047	HP	85685A	RF Preselector	05Apr06	05Apr07
00048	Gore	65474	Microwave Cable	16Aug05	16Aug06
00006	R & S	SMR 20	Signal Generator (10MHz-40GHz)	06Apr06	06Apr07
00114	Amplifier Research	DC7154	Directional Coupler (0.8-4.2 GHz)	n/a	n/a
00078	Pasternack	PE2214-20	Directional Coupler (1-18 GHz)	n/a	n/a
00106	Amplifier Research	5S1G4	Power Amplifier (5W, 800MHz-4.2GHz)	n/a	n/a
00041	Amplifier Research	10W1000C	Power Amplifier (0.5 – 1 GHz)	n/a	n/a
00110	Gigatronics	8652A	Power Meter	12Apr06	12Apr07
00011	Gigatronics	80701A	Power Sensor	03Feb06	03Feb07
00208	Anritsu	MT8820A	Radio Communication Test Set	06Jun06	06Jun07

C.5 MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS

For the field strength measurements, the measurement equipment was connected as shown in C.6. A number of antennas were used to cover the applicable frequency range tested. The ranges in which each antenna was used are as follows. For the final substitutions, the IX100X was replaced with the appropriate antenna and fed from a CW signal source sufficient to replicate the received field strength of the emission being investigated.

Frequency Range	RX Antenna	TX Antenna
30 MHz - 1GHz	Bilog	Dipole
1 GHz - 18 GHz	ETS 3115 Horn	ETS 3115 Horn

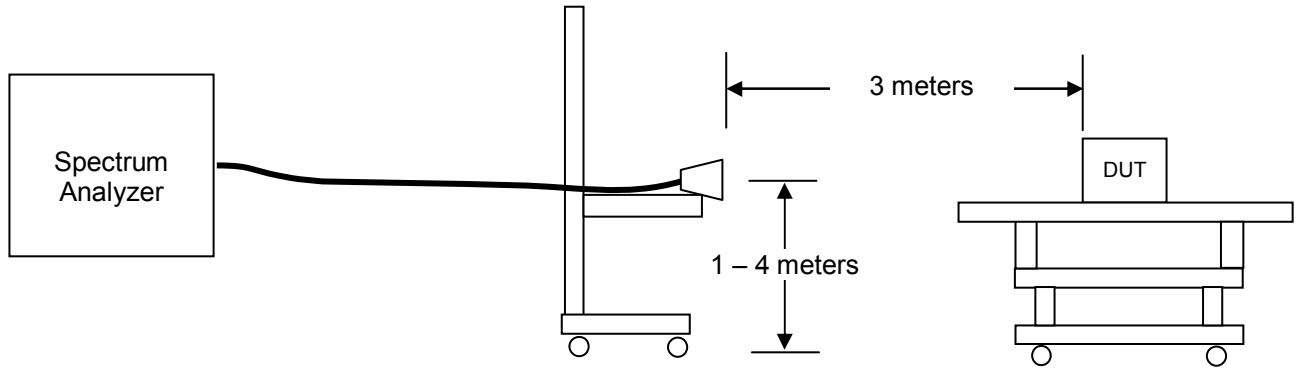
MEASUREMENT EQUIPMENT SETTINGS

For the spurious out-of-band emissions, the spectrum analyzer was set to the following settings:

Mode	RBW	VBW	Detector
	kHz	kHz	
Cellular	100	300	Peak
PCS	1000	1000	Peak

C.6 SETUP DRAWING

Figure C.6-1 - Setup Drawing



C.7 SETUP PHOTOGRAPHS

Photograph C.7-1 - Bilog Receive Antenna with IX100X and Nearson Helix Antenna Configuration

Photograph C.7-2 - Horn Receive Antenna with IX100X and Nearson Helix Antenna Configuration

Photograph C.7-3 - Dipole Substitution Setup

Photograph C.7-4 - Horn Substitution Setup

Photograph C.7-5 - Bilog Receive Antenna with IX100X and MaxRad Vehicle-Mount Antenna Configuration

Photograph C.7-6 - Horn Receive Antenna with IX100X and MaxRad Vehicle-Mount Antenna Configuration

Photograph C.7-7 - Dipole Substitution Setup

Photograph C.7-8 - Horn Substitution Setup

C.8 DUT OPERATING DESCRIPTION

Measurements were made for the low, mid and high channels transmitting in each of the modulation types for both the cellular and PCS bands at maximum power level as described in Appendix B. Each antenna configuration (Nearson External Helix and MaxRad Vehicle-Mount) was evaluated.

C.9 TEST RESULTS

C.9.1 Carrier Levels (Attached Nearson Helix Antenna)

C.9.1.1 Cellular GPRS Carrier Levels

Project Number: 744 **Standard:** FCC22.913
Company: Itronix **Test Start Date:** 26-Apr-06
Product: IX100X with AC860 **Test End Date:** 26-Apr-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	ERP Limit		Margin	Pass/Fail	Measured ERP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBd	dBm	Watts	dB		dBm	milliWatts
Portable GPRS Cellular Band Radiated Carrier Power Levels															
Face Up	None	H	3	128	824.2000	132.12	105.60	30.23	-1.45	38.45	7.00	9.67	PASS	28.78	755.72
Face Up	None	V	3	128	824.2000	128.72	102.20	30.06	-1.45	38.45	7.00	9.84	PASS	28.61	726.71
Face Up	None	H	3	190	836.6000	132.66	105.80	30.83	-1.35	38.45	7.00	8.97	PASS	29.48	887.73
Face Up	None	V	3	190	836.6000	124.86	98.00	26.09	-1.35	38.45	7.00	13.71	PASS	24.74	298.04
Face Up	None	H	3	251	848.8000	133.12	106.00	31.26	-1.25	38.45	7.00	8.44	PASS	30.01	1002.40
Face Up	None	V	3	251	848.8000	129.52	102.40	31.13	-1.25	38.45	7.00	8.57	PASS	29.88	972.84

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.9.1.2 PCS GPRS Carrier Levels

Project Number: 744 **Standard:** FCC24.232b
Company: Itronix **Test Start Date:** 1-May-06
Product: IX100X with AC860 **Test End Date:** 1-May-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	EIRP Limit		Margin	Pass/Fail	Measured EIRP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBi	dBm	Watts	dB		dBm	milliWatts
Portable GPRS PCS Band Radiated Carrier Power Levels															
Face Up	None	H	3	512	1850.2000	126.61	93.80	21.13	8.82	33.01	2.00	1.63	PASS	29.95	988.61
Face Up	None	V	3	512	1850.2000	126.11	93.30	19.83	8.82	33.01	2.00	2.13	PASS	28.65	732.87
Face Up	None	H	3	661	1880.0000	125.97	93.00	21.58	8.86	33.01	2.00	2.27	PASS	30.44	1105.61
Face Up	None	V	3	661	1880.0000	125.67	92.70	20.24	8.86	33.01	2.00	2.57	PASS	29.10	812.08
Face Up	None	H	3	810	1909.8000	123.94	90.80	19.84	8.89	33.01	2.00	4.30	PASS	28.73	746.75
Face Up	None	V	3	810	1909.8000	125.24	92.10	20.16	8.89	33.01	2.00	3.00	PASS	29.05	803.85

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.9.2 Carrier Levels (Attached Nearson Helix Antenna)

C.9.2.1 Cellular EDGE Carrier Levels

Project Number: 744 **Standard:** FCC22.913
Company: Itronix **Test Start Date:** 26-Apr-06
Product: IX100X with AC860 **Test End Date:** 26-Apr-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	ERP Limit		Margin	Pass/ Fail	Measured ERP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBd	dBm	Watts	dB		dBm	milliWatts
Portable EDGE Cellular Band Radiated Carrier Power Levels															
Face Up	None	H	3	128	824.2000	129.52	103.00	27.47	-1.45	38.45	7.00	12.43	PASS	26.02	400.28
Face Up	None	V	3	128	824.2000	124.12	97.60	25.35	-1.45	38.45	7.00	14.55	PASS	23.90	245.67
Face Up	None	H	3	190	836.6000	131.96	105.10	30.02	-1.35	38.45	7.00	9.78	PASS	28.67	736.68
Face Up	None	V	3	190	836.6000	124.46	97.60	25.69	-1.35	38.45	7.00	14.11	PASS	24.34	271.82
Face Up	None	H	3	251	848.8000	131.92	104.80	30.03	-1.25	38.45	7.00	9.67	PASS	28.78	755.16
Face Up	None	V	3	251	848.8000	125.72	98.60	27.32	-1.25	38.45	7.00	12.38	PASS	26.07	404.61

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.9.2.2 PCS EDGE Carrier Levels

Project Number: 744 **Standard:** FCC24.232b
Company: Itronix **Test Start Date:** 2-May-06
Product: IX100X with AC860 **Test End Date:** 2-May-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	EIRP Limit		Margin	Pass/Fail	Measured EIRP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBi	dBm	Watts	dB		dBm	milliWatts
Portable EDGE PCS Band Radiated Carrier Power Levels															
Face Up	None	H	3	512	1850.2000	125.81	93.00	20.41	8.72	33.01	2.00	2.43	PASS	29.13	818.51
Face Up	None	V	3	512	1850.2000	126.41	93.60	20.14	8.72	33.01	2.00	1.83	PASS	28.86	769.17
Face Up	None	H	3	661	1880.0000	126.17	93.20	21.78	8.76	33.01	2.00	2.07	PASS	30.54	1131.36
Face Up	None	V	3	661	1880.0000	125.87	92.90	20.44	8.76	33.01	2.00	2.37	PASS	29.20	831.00
Face Up	None	H	3	810	1909.8000	124.64	91.50	20.58	8.79	33.01	2.00	3.60	PASS	29.37	865.32
Face Up	None	V	3	810	1909.8000	124.84	91.70	19.76	8.79	33.01	2.00	3.40	PASS	28.55	716.43

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.9.3 Carrier Levels (Attached Nearson Helix Antenna)

C.9.3.1 Cellular UMTS Carrier Levels

Project Number: 744 **Standard:** FCC22.913
Company: Itronix **Test Start Date:** 27-Apr-06
Product: IX100X with AC860 **Test End Date:** 27-Apr-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	ERP Limit		Margin	Pass/ Fail	Measured ERP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBd	dBm	Watts	dB		dBm	milliWatts
Portable WCDMA Cellular Band Radiated Carrier Power Levels															
Face Up	None	H	3	4132	826.4000	123.56	97.00	21.38	-1.43	38.45	7.00	10.12	PASS	19.95	98.88
Face Up	None	V	3	4132	826.4000	120.06	93.50	21.22	-1.43	38.45	7.00	13.62	PASS	19.79	95.31
Face Up	None	H	3	4182	836.4000	125.36	98.50	23.17	-1.35	38.45	7.00	8.32	PASS	21.82	152.10
Face Up	None	V	3	4182	836.4000	121.06	94.20	22.25	-1.35	38.45	7.00	12.62	PASS	20.90	123.06
Face Up	None	H	3	4233	846.6000	125.29	98.20	23.29	-1.27	38.45	7.00	8.39	PASS	22.02	159.32
Face Up	None	V	3	4233	846.6000	121.49	94.40	23.03	-1.27	38.45	7.00	12.19	PASS	21.76	150.07

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.9.3.2 PCS UMTS Carrier Levels

Project Number: 744 **Standard:** FCC24.232b
Company: Itronix **Test Start Date:** 3-May-06
Product: IX100X with AC860 **Test End Date:** 3-May-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	EIRP Limit		Margin	Pass/Fail	Measured EIRP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBi	dBm	Watts	dB		dBm	milliWatts
Portable WCDMA PCS Band Radiated Carrier Power Levels															
Face Up	None	H	3	9262	1852.4000	122.22	89.40	16.72	8.72	33.01	2.00	6.02	PASS	25.44	350.18
Face Up	None	V	3	9262	1852.4000	122.42	89.60	16.06	8.72	33.01	2.00	5.82	PASS	24.78	300.81
Face Up	None	H	3	9400	1880.0000	121.17	88.20	16.69	8.76	33.01	2.00	7.07	PASS	25.45	350.43
Face Up	None	V	3	9400	1880.0000	119.57	86.60	13.65	8.76	33.01	2.00	8.67	PASS	22.41	174.02
Face Up	None	H	3	9538	1907.5000	121.12	88.00	17.00	8.79	33.01	2.00	7.12	PASS	25.79	379.23
Face Up	None	V	3	9538	1907.5000	121.22	88.10	15.92	8.79	33.01	2.00	7.02	PASS	24.71	295.73

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.9.4 Carrier Levels (MaxRad Vehicle-Mount Dipole Antenna)

C.9.4.1 Cellular GPRS Carrier Levels

Project Number: 744 **Standard:** FCC22.913
Company: Itronix **Test Start Date:** 11-May-06
Product: IX100X with AC860 **Test End Date:** 11-May-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	ERP Limit		Margin	Pass/Fail	Measured ERP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBd	dBm	Watts	dB		dBm	milliWatts
Mobile GPRS Cell Band Radiated Carrier Power Levels															
Face Up	Vehicle Cradle	H	3	128	824.2000	121.42	94.90	19.19	-1.45	38.45	7.00	20.71	PASS	17.74	59.48
Face Up	Vehicle Cradle	V	3	128	824.2000	127.32	100.80	27.59	-1.45	38.45	7.00	12.31	PASS	26.14	411.49
Face Up	Vehicle Cradle	H	3	190	836.6000	120.46	93.60	18.25	-1.35	38.45	7.00	21.55	PASS	16.90	49.01
Face Up	Vehicle Cradle	V	3	190	836.6000	126.86	100.00	28.11	-1.35	38.45	7.00	11.69	PASS	26.76	474.55
Face Up	Vehicle Cradle	H	3	251	848.8000	121.62	94.50	19.61	-1.25	38.45	7.00	20.09	PASS	18.36	68.56
Face Up	Vehicle Cradle	V	3	251	848.8000	126.72	99.60	28.33	-1.25	38.45	7.00	11.37	PASS	27.08	510.55

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.9.4.2 PCS GPRS Carrier Levels

Project Number: 744 **Standard:** FCC24.232b
Company: Itronix **Test Start Date:** 12-May-06
Product: IX100X with AC860 **Test End Date:** 12-May-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	EIRP Limit		Margin	Pass/Fail	Measured EIRP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBi	dBm	Watts	dB		dBm	milliWatts
Mobile GPRS PCS Band Radiated Carrier Power Levels															
Face Up	None	H	3	512	1850.2000	107.61	74.80	2.18	8.72	33.01	2.00	20.63	PASS	10.90	12.30
Face Up	None	V	3	512	1850.2000	120.41	87.60	13.95	8.72	33.01	2.00	7.83	PASS	22.67	184.94
Face Up	None	H	3	661	1880.0000	108.17	75.20	3.75	8.76	33.01	2.00	20.07	PASS	12.51	17.81
Face Up	None	V	3	661	1880.0000	122.87	89.90	17.28	8.76	33.01	2.00	5.37	PASS	26.04	401.42
Face Up	None	H	3	810	1909.8000	106.34	73.20	2.27	8.79	33.01	2.00	21.90	PASS	11.06	12.77
Face Up	None	V	3	810	1909.8000	119.54	86.40	14.10	8.79	33.01	2.00	8.70	PASS	22.89	194.61

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.9.5 Carrier Levels (MaxRad Vehicle-Mount Dipole Antenna)

C.9.5.1 Cellular EDGE Carrier Levels

Project Number: 744 **Standard:** FCC22.913
Company: Itronix **Test Start Date:** 11-May-06
Product: IX100X with AC860 **Test End Date:** 11-May-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	ERP Limit		Margin	Pass/Fail	Measured ERP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBd	dBm	Watts	dB		dBm	milliWatts
Mobile EDGE Cell Band Radiated Carrier Power Levels															
Face Up	Vehicle Cradle	H	3	128	824.2000	119.42	92.90	17.19	-1.45	38.45	7.00	22.71	PASS	15.74	37.53
Face Up	Vehicle Cradle	V	3	128	824.2000	124.52	98.00	25.75	-1.45	38.45	7.00	14.15	PASS	24.30	269.38
Face Up	Vehicle Cradle	H	3	190	836.6000	119.26	92.40	17.05	-1.35	38.45	7.00	22.75	PASS	15.70	37.18
Face Up	Vehicle Cradle	V	3	190	836.6000	124.06	97.20	25.28	-1.35	38.45	7.00	14.52	PASS	23.93	247.33
Face Up	Vehicle Cradle	H	3	251	848.8000	119.32	92.20	21.31	-1.25	38.45	7.00	18.39	PASS	20.06	101.40
Face Up	Vehicle Cradle	V	3	251	848.8000	124.02	96.90	25.56	-1.25	38.45	7.00	14.14	PASS	24.31	269.80

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.9.5.2 PCS EDGE Carrier Levels

Project Number: 744 **Standard:** FCC24.232b
Company: Itronix **Test Start Date:** 12-May-06
Product: IX100X with AC860 **Test End Date:** 12-May-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	EIRP Limit		Margin	Pass/Fail	Measured EIRP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBi	dBm	Watts	dB		dBm	milliWatts
Mobile EDGE PCS Band Radiated Carrier Power Levels															
Face Up	None	H	3	512	1850.2000	106.91	74.10	1.48	8.72	33.01	2.00	21.33	PASS	10.20	10.47
Face Up	None	V	3	512	1850.2000	120.11	87.30	13.65	8.72	33.01	2.00	8.13	PASS	22.37	172.59
Face Up	None	H	3	661	1880.0000	108.17	75.20	3.75	8.76	33.01	2.00	20.07	PASS	12.51	17.81
Face Up	None	V	3	661	1880.0000	122.37	89.40	16.65	8.76	33.01	2.00	5.87	PASS	25.41	347.22
Face Up	None	H	3	810	1909.8000	106.14	73.00	12.07	8.79	33.01	2.00	22.10	PASS	20.86	121.95
Face Up	None	V	3	810	1909.8000	118.84	85.70	13.40	8.79	33.01	2.00	9.40	PASS	22.19	165.64

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.9.6 Carrier Levels (MaxRad Vehicle-Mount Dipole Antenna)

C.9.6.1 Cellular UMTS Carrier Levels

Project Number: 744 **Standard:** FCC22.913
Company: Itronix **Test Start Date:** 11-May-06
Product: IX100X with AC860 **Test End Date:** 11-May-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	ERP Limit		Margin	Pass/Fail	Measured ERP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBd	dBm	Watts	dB		dBm	milliWatts
Mobile WCDMA Cell Band Radiated Carrier Power Levels															
Face Up	None	H	3	4132	826.4000	114.26	87.70	11.99	-1.43	38.45	7.00	19.42	PASS	10.56	11.38
Face Up	None	V	3	4132	826.4000	119.66	93.10	20.82	-1.43	38.45	7.00	14.02	PASS	19.39	86.92
Face Up	None	H	3	4182	836.4000	114.26	87.40	12.05	-1.35	38.45	7.00	19.42	PASS	10.70	11.75
Face Up	None	V	3	4182	836.4000	120.36	93.50	21.55	-1.35	38.45	7.00	13.32	PASS	20.20	104.74
Face Up	None	H	3	4233	846.6000	113.09	86.00	11.11	-1.27	38.45	7.00	20.59	PASS	9.84	9.64
Face Up	None	V	3	4233	846.6000	120.29	93.20	21.83	-1.27	38.45	7.00	13.39	PASS	20.56	113.84

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.9.6.2 PCS UMTS Carrier Levels

Project Number: 744 **Standard:** FCC24.232b
Company: Itronix **Test Start Date:** 11-May-06
Product: IX100X with AC860 **Test End Date:** 11-May-06

Configuration		Polarity	Distance	Carrier Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	EIRP Limit		Margin	Pass/Fail	Measured EIRP Carrier Level	
Orientation	Accessory		m		MHz	dBuV/m	dBuV	dBm	dBi	dBm	Watts	dB		dBm	milliWatts
Mobile WCDMA PCS Band Radiated Carrier Power Levels															
Face Up	None	H	3	9262	1852.4000	104.42	71.60	-1.10	8.72	33.01	2.00	23.82	PASS	7.62	5.78
Face Up	None	V	3	9262	1852.4000	117.82	85.00	11.19	8.72	33.01	2.00	10.42	PASS	19.91	98.01
Face Up	None	H	3	9400	1880.0000	103.67	70.70	-0.93	8.76	33.01	2.00	24.57	PASS	7.83	6.06
Face Up	None	V	3	9400	1880.0000	116.77	83.80	10.38	8.76	33.01	2.00	11.47	PASS	19.14	81.96
Face Up	None	H	3	9538	1907.5000	105.42	72.30	1.05	8.79	33.01	2.00	22.82	PASS	9.84	9.64
Face Up	None	V	3	9538	1907.5000	118.22	85.10	12.69	8.79	33.01	2.00	10.02	PASS	21.48	140.57

Note:
Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
The DUT was measured in 3 orientations with respect to the receive antenna, only the orientation with the highest Radiated Power results is shown here.

C.10 PASS/FAIL

In reference to the results outlined in C.9, the DUT passes the requirements as stated in the reference standards.

C.11 SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
EMC Manager
Celltech Labs Inc.

July 18, 2006
Date

Appendix D - Radiated Spurious Emissions Measurement

D.1 REFERENCES

Normative Reference Standard	FCC CFR 47 §22.917(a), FCC CFR 47 §24.238(a)
Procedure Reference	ANSI/TIA/EIA-603-C

D.2 LIMITS

D.2.1 FCC CFR 47

FCC CFR 47 §22.917 & §24.238	(a) *Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.*

D.3 ENVIRONMENTAL CONDITIONS

Temperature	25 +/- 5 ºC
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

D.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
00072	EMCO	2075	Mini-mast	n/a	n/a
00073	EMCO	2080	Turn Table	n/a	n/a
00071	EMCO	2090	Multi-Device Controller	n/a	n/a
00050	Chase	CBL-6111A	Bilog Antenna	04Apr06	04Apr07
00055	EMCO	3121C	Dipole Antenna	04Apr06	04Apr07
00034	ETS	3115	Double Ridged Guide Horn	11Aug05	11Aug07
00035	ETS	3115	Double Ridged Guide Horn	03Apr06	03Apr08
00161	Waveline	899	Standard Gain Horn Antenna	n/a	n/a
00051	HP	8566B	Spectrum Analyzer RF Section	04Apr06	04Apr07
00049	HP	85650A	Quasi-peak Adapter	04Apr06	04Apr07
00047	HP	85685A	RF Preselector	05Apr06	05Apr07
00048	Gore	65474	Microwave Cable	16Aug05	16Aug06
00115	Miteq	J54-00102600-35-5A	LNA	18Apr06	18Apr07
00006	R & S	SMR 20	Signal Generator (10MHz-40GHz)	06Apr06	06Apr07
00114	Amplifier Research	DC7154	Directional Coupler (0.8-4.2 GHz)	n/a	n/a
00078	Pasternack	PE2214-20	Directional Coupler (1-18 GHz)	n/a	n/a
00106	Amplifier Research	5S1G4	Power Amplifier (5W, 800MHz-4.2GHz)	n/a	n/a
00041	Amplifier Research	10W1000C	Power Amplifier (0.5 – 1 GHz)	n/a	n/a
00110	Gigatronics	8652A	Power Meter	12Apr06	12Apr07
00011	Gigatronics	80701A	Power Sensor	03Feb06	03Feb07
00208	Anritsu	MT8820A	Radio Communication Analyzer	06Jun06	06Jun07

D.5 MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS

For the field strength measurements, the measurement equipment was connected as shown in D.6. A number of antennas were used to cover the applicable frequency range tested. The ranges in which each antenna was used are shown below. For the final substitutions, the IX100X was replaced with the appropriate antenna and fed from a CW signal source sufficient to replicate the received field strength of the emission being investigated.

Frequency Range	RX Antenna	TX Antenna
30 MHz - 1GHz	Bilog	Dipole
1 GHz - 18 GHz	ETS 3115 Horn	ETS 3115 Horn
18 GHz - 20 GHz	Waveline 899 Horn	Waveline 899 Horn

MEASUREMENT EQUIPMENT SETTINGS

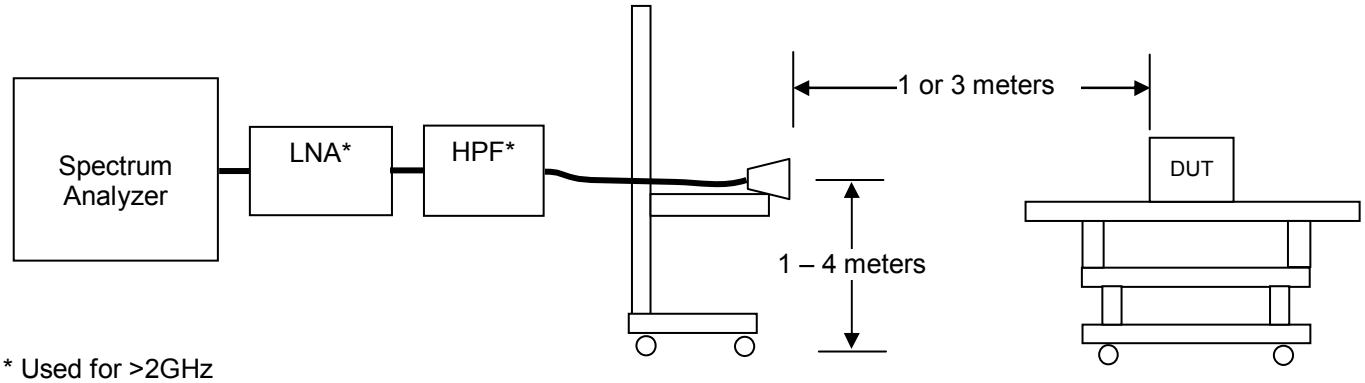
For the spurious out-of-band emissions, the spectrum analyzer was set to the following settings:

Mode	RBW	VBW	Detector
	kHz	kHz	
Cellular < 1 GHz	100	300	Peak*
Cellular > 1 GHz	1000	1000	Peak*
PCS	1000	1000	Peak*

*Where the peak emission exceeded the average limit, an average measurement was made using video averaging

D.6 SETUP DRAWING

Figure D.6-1 - Setup Drawing



* Used for >2GHz

D.7 SETUP PHOTOGRAPHS

Photograph D.7-1 - BiConilog Receive Antenna with IX100X and Nearson Helix Antenna Configuration

Photograph D.7-2 - Horn Receive Antenna with IX100X and MaxRad Vehicle-Mount Antenna Configuration

D.8 DUT OPERATING DESCRIPTION

Measurements were made for the low, mid and high channels transmitting in each of the modulation types for both the cellular and PCS bands at maximum power level as described in Appendix B. Each antenna configuration (Nearson External Helix and MaxRad Vehicle-Mount) was evaluated.

D.9 TEST RESULTS

The spurious measurements detailed in this section are referenced to the carrier levels set forth in Appendix C of this report:

D.9.1 Spurious Emissions (Attached Nearson Helix Antenna)

D.9.1.1 Cellular EDGE Spurious Emissions

Project Number: 744 **Standard:** FCC22.917
Company: Itronix **Test Start Date:** 12-Jun-06
Product: IX100X AC860 **Test End Date:** 12-Jun-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Maximized SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	ERP Emission Level	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBi	dBm	dBm or dBuV/m*	dB	
H	3	none	128	1648.42	62.71	31.10	n/a	n/a	n/a	84.4*	21.7*	PASS*
H	3	none	128	1648.29	50.01	18.40	n/a	n/a	n/a	84.4*	34.4*	PASS*
H	3	none	128	2477.39	69.48	57.40	n/a	n/a	n/a	84.4*	14.9*	PASS*
H	3	none	128	2475.02	37.48	25.40	n/a	n/a	n/a	84.4*	46.9*	PASS*
H	3	none	128	3296.80	40.30	33.40	n/a	n/a	n/a	84.4*	44.1*	PASS*
H	3	none	190	1673.95	65.55	33.80	n/a	n/a	n/a	84.4*	18.8*	PASS*
H	3	none	190	1673.92	50.85	19.10	n/a	n/a	n/a	84.4*	33.5*	PASS*
H	3	none	190	2511.01	46.91	34.70	n/a	n/a	n/a	84.4*	37.5*	PASS*
H	3	none	190	3346.40	40.16	33.10	n/a	n/a	n/a	84.4*	44.2*	PASS*
H	3	none	251	1697.57	73.92	42.00	n/a	n/a	n/a	84.4*	10.4*	PASS*
H	3	none	251	1697.52	51.42	19.50	n/a	n/a	n/a	84.4*	32.9*	PASS*
H	3	none	251	2546.39	46.51	34.10	n/a	n/a	n/a	84.4*	37.9*	PASS*
H	3	none	251	3395.20	39.12	31.90	n/a	n/a	n/a	84.4*	45.2*	PASS*
V	3	none	128	1648.34	62.21	30.60	n/a	n/a	n/a	84.4*	22.2*	PASS*
V	3	none	128	1648.30	50.11	18.50	n/a	n/a	n/a	84.4*	34.3*	PASS*
V	3	none	128	2474.11	70.18	58.10	n/a	n/a	n/a	84.4*	14.2*	PASS*
V	3	none	128	2474.20	44.28	32.20	n/a	n/a	n/a	84.4*	40.1*	PASS*
V	3	none	128	3296.83	42.50	35.60	n/a	n/a	n/a	84.4*	41.9*	PASS*
V	3	none	190	1673.83	57.75	26.00	n/a	n/a	n/a	84.4*	26.6*	PASS*
V	3	none	190	2510.75	47.31	35.10	n/a	n/a	n/a	84.4*	37.1*	PASS*
V	3	none	190	3347.92	41.37	34.30	n/a	n/a	n/a	84.4*	43.0*	PASS*
V	3	none	251	1697.53	62.82	30.90	n/a	n/a	n/a	84.4*	21.5*	PASS*
V	3	none	251	1697.82	53.02	21.10	n/a	n/a	n/a	84.4*	31.3*	PASS*
V	3	none	251	1229.13	44.96	15.30	n/a	n/a	n/a	84.4*	39.4*	PASS*
V	3	none	251	2546.27	47.51	35.10	n/a	n/a	n/a	84.4*	36.9*	PASS*
V	3	none	251	3395.20	40.02	32.80	n/a	n/a	n/a	84.4*	44.3*	PASS*

*The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with field strengths within 20 dB of the theoretical limit. All other emissions attributed to the EUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

D.9.1.2 PCS EDGE Spurious Emissions

Project Number: 744 **Standard:** FCC24.238
Company: Itronix **Test Start Date:** 13-Jun-06
Product: IX100X AC860 **Test End Date:** 13-Jun-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Maximized SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	EIRP Emission Level	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBi	dBm	dBm or dBuV/m*	dB	
H	3	none	512	3700.18	43.91	35.40	n/a	n/a	n/a	82.2*	38.3*	PASS*
H	3	none	512	5550.60	44.59	30.50	n/a	n/a	n/a	82.2*	37.6*	PASS*
H	3	none	512	7400.80	49.32	38.80	n/a	n/a	n/a	82.2*	32.9*	PASS*
H	3	none	661	3760.00	46.29	37.70	n/a	n/a	n/a	82.2*	35.9*	PASS*
H	3	none	661	5639.77	45.45	31.30	n/a	n/a	n/a	82.2*	36.8*	PASS*
H	3	none	661	7520.00	50.36	39.46	n/a	n/a	n/a	82.2*	31.9*	PASS*
H	3	none	810	3819.47	43.33	34.40	n/a	n/a	n/a	82.2*	38.9*	PASS*
H	3	none	810	5730.05	46.61	32.60	n/a	n/a	n/a	82.2*	35.6*	PASS*
H	3	none	810	7639.20	50.29	39.28	n/a	n/a	n/a	82.2*	31.9*	PASS*
V	3	none	512	3700.46	48.51	40.00	n/a	n/a	n/a	82.2*	33.7*	PASS*
V	3	none	512	5550.52	46.09	32.00	n/a	n/a	n/a	82.2*	36.1*	PASS*
V	3	none	512	7400.80	50.02	39.50	n/a	n/a	n/a	82.2*	32.2*	PASS*
V	3	none	661	3759.98	47.09	38.50	n/a	n/a	n/a	82.2*	35.1*	PASS*
V	3	none	661	5640.00	44.55	30.40	n/a	n/a	n/a	82.2*	37.7*	PASS*
V	3	none	661	7520.00	49.97	39.07	n/a	n/a	n/a	82.2*	32.3*	PASS*
V	3	none	810	3819.41	50.83	41.90	n/a	n/a	n/a	82.2*	31.4*	PASS*
V	3	none	810	5729.59	49.71	35.70	n/a	n/a	n/a	82.2*	32.5*	PASS*
V	3	none	810	7639.20	50.64	39.63	n/a	n/a	n/a	82.2*	31.6*	PASS*

*The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with field strengths within 20 dB of the theoretical limit. All other emissions attributed to the EUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

D.9.1.3 Cellular UMTS Spurious Emissions

Project Number: 744 **Standard:** FCC22.917
Company: Itronix **Test Start Date:** 13-Jun-06
Product: IX100X AC860 **Test End Date:** 13-Jun-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Maximized SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	ERP Emission Level	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBi	dBm	dBm or dBuV/m*	dB	
H	3	none	4132	1655.35	55.45	23.80	n/a	n/a	n/a	84.4*	28.9*	PASS*
H	3	none	4132	2475.90	73.98	61.90	n/a	n/a	n/a	84.4*	10.4*	PASS*
H	3	none	4132	2474.62	35.78	23.70	n/a	n/a	n/a	84.4*	48.6*	PASS*
H	3	none	4132	3305.60	38.91	32.00	n/a	n/a	n/a	84.4*	45.5*	PASS*
H	3	none	4182	1675.38	57.16	25.40	n/a	n/a	n/a	84.4*	27.2*	PASS*
H	3	none	4182	2513.63	49.62	37.40	n/a	n/a	n/a	84.4*	34.7*	PASS*
H	3	none	4182	3345.60	38.96	31.90	n/a	n/a	n/a	84.4*	45.4*	PASS*
H	3	none	4233	1690.50	60.07	28.20	n/a	n/a	n/a	84.4*	24.3*	PASS*
H	3	none	4233	1691.46	51.38	19.50	n/a	n/a	n/a	84.4*	33.0*	PASS*
H	3	none	4233	2539.80	46.38	34.00	n/a	n/a	n/a	84.4*	38.0*	PASS*
H	3	none	4233	3386.40	38.42	31.20	n/a	n/a	n/a	84.4*	46.0*	PASS*
V	3	none	4132	1652.80	59.23	27.60	n/a	n/a	n/a	84.4*	25.1*	PASS*
V	3	none	4132	2479.36	66.79	54.70	n/a	n/a	n/a	84.4*	17.6*	PASS*
V	3	none	4132	2474.46	36.18	24.10	n/a	n/a	n/a	84.4*	48.2*	PASS*
V	3	none	4132	3305.60	39.01	32.10	n/a	n/a	n/a	84.4*	45.4*	PASS*
V	3	none	4182	1672.80	59.45	27.70	n/a	n/a	n/a	84.4*	24.9*	PASS*
V	3	none	4182	2510.69	36.31	24.10	n/a	n/a	n/a	84.4*	48.1*	PASS*
V	3	none	4182	3345.60	39.56	32.50	n/a	n/a	n/a	84.4*	44.8*	PASS*
V	3	none	4233	1691.75	61.78	29.90	n/a	n/a	n/a	84.4*	22.6*	PASS*
V	3	none	4233	2539.80	46.88	34.50	n/a	n/a	n/a	84.4*	37.5*	PASS*
V	3	none	4233	3386.40	39.32	32.10	n/a	n/a	n/a	84.4*	45.1*	PASS*

*The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with field strengths within 20 dB of the theoretical limit. All other emissions attributed to the EUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

D.9.1.4 PCS UMTS Spurious Emissions

Project Number: 744 **Standard:** FCC24.238
Company: Itronix **Test Start Date:** 14-Jun-06
Product: IX100X AC860 **Test End Date:** 14-Jun-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Maximized SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	EIRP Emission Level	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBi	dBm	dBm or dBuV/m*	dB	
H	3	none	9262	3707.14	47.48	39.00	n/a	n/a	n/a	82.2*	34.7*	PASS*
H	3	none	9262	5557.20	46.04	31.80	n/a	n/a	n/a	82.2*	36.2*	PASS*
H	3	none	9262	7409.60	50.27	39.72	n/a	n/a	n/a	82.2*	32.0*	PASS*
H	3	none	9400	3758.27	57.29	48.70	n/a	n/a	n/a	82.2*	24.9*	PASS*
H	3	none	9400	5640.00	45.15	31.00	n/a	n/a	n/a	82.2*	37.1*	PASS*
H	3	none	9400	7520.00	49.94	39.04	n/a	n/a	n/a	82.2*	32.3*	PASS*
H	3	none	9538	3812.77	63.76	54.90	n/a	n/a	n/a	82.2*	18.5*	PASS*
H	3	none	9538	3813.34	49.97	41.10	n/a	n/a	n/a	82.2*	32.3*	PASS*
H	3	none	9538	5722.50	47.29	33.30	n/a	n/a	n/a	82.2*	34.9*	PASS*
H	3	none	9538	7630.00	51.15	40.15	n/a	n/a	n/a	82.2*	31.1*	PASS*
V	3	none	9262	3707.08	46.68	38.20	n/a	n/a	n/a	82.2*	35.5*	PASS*
V	3	none	9262	5557.20	45.94	31.70	n/a	n/a	n/a	82.2*	36.3*	PASS*
V	3	none	9262	7409.60	50.05	39.50	n/a	n/a	n/a	82.2*	32.2*	PASS*
V	3	none	9400	3758.46	58.89	50.30	n/a	n/a	n/a	82.2*	23.3*	PASS*
V	3	none	9400	5640.00	45.65	31.50	n/a	n/a	n/a	82.2*	36.6*	PASS*
V	3	none	9400	7520.00	49.80	38.90	n/a	n/a	n/a	82.2*	32.4*	PASS*
V	3	none	9538	3812.67	65.46	56.60	n/a	n/a	n/a	82.2*	16.8*	PASS*
V	3	none	9538	3813.00	52.47	43.60	n/a	n/a	n/a	82.2*	29.8*	PASS*
V	3	none	9538	5722.50	46.09	32.10	n/a	n/a	n/a	82.2*	36.1*	PASS*
V	3	none	9538	7630.00	50.73	39.73	n/a	n/a	n/a	82.2*	31.5*	PASS*

*The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with field strengths within 20 dB of the theoretical limit. All other emissions attributed to the EUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

D.9.2 Spurious Emissions (Vehicle-Mount Dipole Antenna)

D.9.2.1 Cellular EDGE Spurious Emissions (Mobile)

Project Number: 744 **Standard:** FCC24.238
Company: Itronix **Test Start Date:** 15-Jun-06
Product: IX100X AC860 **Test End Date:** 15-Jun-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Maximized SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	EIRP Emission Level	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBi	dBm	dBm or dBuV/m*	dB	
H	3	none	128	1648.45	57.51	25.90	n/a	n/a	n/a	82.2*	24.7*	PASS*
H	3	none	128	2477.43	68.68	56.60	n/a	n/a	n/a	82.2*	13.5*	PASS*
H	3	none	128	2475.39	39.28	27.20	n/a	n/a	n/a	82.2*	42.9*	PASS*
H	3	none	128	3296.80	46.00	39.10	n/a	n/a	n/a	82.2*	36.2*	PASS*
H	3	none	190	1669.00	52.02	20.30	n/a	n/a	n/a	82.2*	30.2*	PASS*
H	3	none	190	2509.80	52.30	40.10	n/a	n/a	n/a	82.2*	29.9*	PASS*
H	3	none	190	3346.40	45.96	38.90	n/a	n/a	n/a	82.2*	36.3*	PASS*
H	3	none	251	1697.60	61.72	29.80	n/a	n/a	n/a	82.2*	20.5*	PASS*
H	3	none	251	1692.60	48.58	16.70	n/a	n/a	n/a	82.2*	33.6*	PASS*
H	3	none	251	2546.40	52.61	40.20	n/a	n/a	n/a	82.2*	29.6*	PASS*
H	3	none	251	3395.20	46.82	39.60	n/a	n/a	n/a	82.2*	35.4*	PASS*
V	3	none	128	1648.44	57.61	26.00	n/a	n/a	n/a	82.2*	24.6*	PASS*
V	3	none	128	2472.60	77.77	65.70	n/a	n/a	n/a	82.2*	04.5*	PASS*
V	3	none	128	2472.37	40.77	28.70	n/a	n/a	n/a	82.2*	41.5*	PASS*
V	3	none	128	3296.80	46.10	39.20	n/a	n/a	n/a	82.2*	36.1*	PASS*
V	3	none	190	1674.11	59.35	27.60	n/a	n/a	n/a	82.2*	22.9*	PASS*
V	3	none	190	1673.98	40.05	8.30	n/a	n/a	n/a	82.2*	42.2*	PASS*
V	3	none	190	2511.00	58.61	46.40	n/a	n/a	n/a	82.2*	23.6*	PASS*
V	3	none	190	3346.40	46.26	39.20	n/a	n/a	n/a	82.2*	36.0*	PASS*
V	3	none	251	1697.83	67.42	35.50	n/a	n/a	n/a	82.2*	14.8*	PASS*
V	3	none	251	1697.84	49.32	17.40	n/a	n/a	n/a	82.2*	32.9*	PASS*
V	3	none	251	2546.45	56.11	43.70	n/a	n/a	n/a	82.2*	26.1*	PASS*
V	3	none	251	3395.20	46.32	39.10	n/a	n/a	n/a	82.2*	35.9*	PASS*

*The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with field strengths within 20 dB of the theoretical limit. All other emissions attributed to the EUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

D.9.2.2 PCS EDGE Spurious Emissions (Mobile)

Project Number: 744 **Standard:** FCC24.238
Company: Itronix **Test Start Date:** 15-Jun-06
Product: IX100X AC860 **Test End Date:** 15-Jun-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Maximized SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	EIRP Emission Level	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBi	dBm	dBm or dBuV/m*	dB	
H	3	none	512	3700.70	50.90	42.40	n/a	n/a	n/a	82.2*	31.3*	PASS*
H	3	none	512	5546.55	53.80	39.80	n/a	n/a	n/a	82.2*	28.4*	PASS*
H	3	none	512	7401.05	50.60	40.08	n/a	n/a	n/a	82.2*	31.6*	PASS*
H	3	none	661	3760.00	50.29	41.70	n/a	n/a	n/a	82.2*	31.9*	PASS*
H	3	none	661	5637.72	53.54	39.40	n/a	n/a	n/a	82.2*	28.7*	PASS*
H	3	none	661	7520.01	53.73	42.83	n/a	n/a	n/a	82.2*	28.5*	PASS*
H	3	none	810	3819.35	50.82	41.90	n/a	n/a	n/a	82.2*	31.4*	PASS*
H	3	none	810	5729.40	53.61	39.60	n/a	n/a	n/a	82.2*	28.6*	PASS*
H	3	none	810	7639.30	51.50	40.49	n/a	n/a	n/a	82.2*	30.7*	PASS*
V	3	none	512	3700.32	54.31	45.80	n/a	n/a	n/a	82.2*	27.9*	PASS*
V	3	none	512	5548.21	54.14	40.10	n/a	n/a	n/a	82.2*	28.1*	PASS*
V	3	none	512	7400.95	52.68	42.16	n/a	n/a	n/a	82.2*	29.5*	PASS*
V	3	none	661	3760.12	55.59	47.00	n/a	n/a	n/a	82.2*	26.6*	PASS*
V	3	none	661	5642.08	53.83	39.70	n/a	n/a	n/a	82.2*	28.4*	PASS*
V	3	none	661	7520.00	57.09	46.19	n/a	n/a	n/a	82.2*	25.1*	PASS*
V	3	none	810	3819.63	55.63	46.70	n/a	n/a	n/a	82.2*	26.6*	PASS*
V	3	none	810	5763.61	56.59	42.40	n/a	n/a	n/a	82.2*	25.6*	PASS*
V	3	none	810	7639.50	51.59	40.58	n/a	n/a	n/a	82.2*	30.6*	PASS*

*The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with field strengths within 20 dB of the theoretical limit. All other emissions attributed to the EUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

D.9.2.3 Cellular UMTS Spurious Emissions (Mobile)

Project Number: 744 **Standard:** FCC22.917
Company: Itronix **Test Start Date:** 16-Jun-06
Product: IX100X AC860 **Test End Date:** 16-Jun-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Maximized SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	ERP Emission Level	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBi	dBm	dBm or dBuV/m*	dB	
H	3	none	4132	1652.80	59.23	27.60	n/a	n/a	n/a	84.4*	25.1*	PASS*
H	3	none	4132	2474.40	68.68	56.60	n/a	n/a	n/a	84.4*	15.7*	PASS*
H	3	none	4132	3305.60	38.91	32.00	n/a	n/a	n/a	84.4*	45.5*	PASS*
H	3	none	4182	1672.80	59.15	27.40	n/a	n/a	n/a	84.4*	25.2*	PASS*
H	3	none	4182	2509.20	46.00	33.80	n/a	n/a	n/a	84.4*	38.4*	PASS*
H	3	none	4182	3345.60	39.16	32.10	n/a	n/a	n/a	84.4*	45.2*	PASS*
H	3	none	4233	1693.20	58.99	27.10	n/a	n/a	n/a	84.4*	25.4*	PASS*
H	3	none	4233	2539.80	46.38	34.00	n/a	n/a	n/a	84.4*	38.0*	PASS*
H	3	none	4233	3386.40	39.22	32.00	n/a	n/a	n/a	84.4*	45.2*	PASS*
V	3	none	4132	1655.20	59.45	27.80	n/a	n/a	n/a	84.4*	24.9*	PASS*
V	3	none	4132	2479.60	62.49	50.40	n/a	n/a	n/a	84.4*	21.9*	PASS*
V	3	none	4132	2479.82	40.19	28.10	n/a	n/a	n/a	84.4*	44.2*	PASS*
V	3	none	4132	3305.60	39.71	32.80	n/a	n/a	n/a	84.4*	44.7*	PASS*
V	3	none	4182	1670.52	52.13	20.40	n/a	n/a	n/a	84.4*	32.2*	PASS*
V	3	none	4182	2509.20	47.80	35.60	n/a	n/a	n/a	84.4*	36.6*	PASS*
V	3	none	4182	3345.60	39.06	32.00	n/a	n/a	n/a	84.4*	45.3*	PASS*
V	3	none	4233	1691.32	56.97	25.10	n/a	n/a	n/a	84.4*	27.4*	PASS*
V	3	none	4233	2539.80	47.98	35.60	n/a	n/a	n/a	84.4*	36.4*	PASS*
V	3	none	4233	3386.40	39.52	32.30	n/a	n/a	n/a	84.4*	44.9*	PASS*

*The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with field strengths within 20 dB of the theoretical limit. All other emissions attributed to the EUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

D.9.2.4 PCS UMTS Spurious Emissions (Mobile)

Project Number: 744 **Standard:** FCC24.238
Company: Itronix **Test Start Date:** 16-Jun-06
Product: IX100X AC860 **Test End Date:** 16-Jun-06

Polarity	Distance	Substitution Antenna Type	Carrier Channel	Frequency	Corrected Field Strength	Maximized SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	EIRP Emission Level	Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBi	dBm	dBm or dBuV/m*	dB	
H	3	none	9262	3706.53	41.88	33.40	n/a	n/a	n/a	82.2*	40.3*	PASS*
H	3	none	9262	5557.20	45.34	31.10	n/a	n/a	n/a	82.2*	36.9*	PASS*
H	3	none	9262	7409.60	49.54	38.99	n/a	n/a	n/a	82.2*	32.7*	PASS*
H	3	none	9400	3757.98	44.79	36.20	n/a	n/a	n/a	82.2*	37.4*	PASS*
H	3	none	9400	5640.00	45.25	31.10	n/a	n/a	n/a	82.2*	37.0*	PASS*
H	3	none	9400	7520.00	50.16	39.26	n/a	n/a	n/a	82.2*	32.1*	PASS*
H	3	none	9538	3812.92	48.47	39.60	n/a	n/a	n/a	82.2*	33.8*	PASS*
H	3	none	9538	5722.50	46.19	32.20	n/a	n/a	n/a	82.2*	36.0*	PASS*
H	3	none	9538	7630.00	49.77	38.77	n/a	n/a	n/a	82.2*	32.5*	PASS*
V	3	none	9262	3706.26	46.58	38.10	n/a	n/a	n/a	82.2*	35.6*	PASS*
V	3	none	9262	5557.20	45.44	31.20	n/a	n/a	n/a	82.2*	36.8*	PASS*
V	3	none	9262	7409.60	50.16	39.61	n/a	n/a	n/a	82.2*	32.1*	PASS*
V	3	none	9400	3757.56	53.99	45.40	n/a	n/a	n/a	82.2*	28.2*	PASS*
V	3	none	9400	5640.00	44.85	30.70	n/a	n/a	n/a	82.2*	37.4*	PASS*
V	3	none	9400	7520.00	50.11	39.21	n/a	n/a	n/a	82.2*	32.1*	PASS*
V	3	none	9538	3812.85	58.07	49.20	n/a	n/a	n/a	82.2*	24.2*	PASS*
V	3	none	9538	5722.50	45.69	31.70	n/a	n/a	n/a	82.2*	36.5*	PASS*
V	3	none	9538	7630.00	49.93	38.93	n/a	n/a	n/a	82.2*	32.3*	PASS*

*The emissions reported above represent the highest emissions or noise floor measured within the frequency band of 30MHz and the 10th harmonic of the carrier with field strengths within 20 dB of the theoretical limit. All other emissions attributed to the EUT had field strengths greater than 20 dB below the theoretical limit and substitutions were not made.

D.10 PASS/FAIL

In reference to the results outlined in D.9, the DUT passes the requirements as stated in the reference standards as follows:

FCC 22.917 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

FCC 24.238 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

D.11 SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
EMC Manager
Celltech Labs Inc.

July 18, 2006
Date

Appendix E - Maximum Permissible Exposure Calculation

E.1 REFERENCES

Normative Reference Standard	FCC CFR 47§1.1310 IEEE Std C95.1-1999
Procedure Reference	FCC CFR 47§2.1091

E.2 LIMITS

	Frequency	Power Density
FCC CFR 47§1.1310 Table 1(b)	300 - 1500 MHz	f/1500 mW/cm^2
	1500 - 100,000 MHz	1.0 mW/cm^2

E.3 ENVIRONMENTAL CONDITIONS

Temperature	na
Humidity	na
Barometric Pressure	na

E.4 MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS	The results described herein were determined by calculations, so no measurement equipment was used. The power measurements for each radio used in these calculations were made with the system transmitting as described in Appendix B of this report.
MEASUREMENT EQUIPMENT SETTINGS	n/a

E.5 DUT OPERATING DESCRIPTION

Dual-Band GPRS	The maximum GPRS RF conducted output power in each band used for these calculations was measured on Channel 251 for Cellular and Channel 661 for PCS.
Dual-Band EDGE	The maximum EDGE RF conducted output power in each band used for these calculations was measured on Channel 190 for Cellular and Channel 661 for PCS.
Dual-Band UMTS	The maximum UMTS RF conducted output power in each band used for these calculations was measured on Channel 4233 for Cellular and Channel 9400 for PCS.

E.6 TEST RESULTS

E.6.1 Calculations:

Vehicle-Mount Dipole Antenna (Max. Measured Conducted Power - Cellular GPRS Channel):

Prediction of MPE Limit
OET Bulletin 65, Edition 97-01

Equation from page 18

$$S = \frac{PG}{4\pi R^2}$$

$$R = \sqrt{\frac{PG}{4\pi S}}$$

S= power density
P= power input to the antenna
G= power gain of the antenna in the direction of interest relative to an isotropic radiator
R= distance to the center of radiation of the antenna
SL= power density limit

Ratio of Time On versus Total Transmit Time	**0.25**

Choose ↓ **ENTER** ↓

Occupational/Controlled	○		
General Population/Uncontrolled	◉		
Tx Frequency:		**848.80**	(MHz)
Maximum Peak Power at Antenna Input Terminal:		**32.28**	(dBm)
Source-Based Time-Average Factor:		**-6.02**	(dB)
Antenna gain and Cable Loss:		**1.11**	(dBi)

SL=	**0.57**	(mW/cm^2)
P=	**422.6102**	(mW)
G=	**1.29**	(numeric)

R = 8.76 (cm)

S (mw/cm^2) at 20cm

0.108442464

Formulae:

$S = \frac{PG}{4\pi R^2}$ where: S = Power Density Limit
P = Power Output of the Device
G = Numeric Antenna Gain
R = Distance from Antenna

$R = \sqrt{\frac{P}{4\pi S}}$

Source-Based Time-Average Factor = 10 * log (Time On / (Time On + Time Off))
Power Output of the Device (W) = 10 * log (RF Output Power (dBm) + Source-Based Time Average Factor (dB))

E.6.2 Calculations:

Vehicle-Mount Dipole Antenna (Max. Measured Conducted Power - PCS GPRS Channel):

Prediction of MPE Limit
OET Bulletin 65, Edition 97-01

Equation from page 18

$$S = \frac{PG}{4\pi R^2}$$

$$R = \sqrt{\frac{PG}{4\pi S}}$$

S= power density
P= power input to the antenna
G= power gain of the antenna in the direction of interest relative to an isotropic radiator
R= distance to the center of radiation of the antenna
SL= power density limit

Ratio of Time On versus Total Transmit Time	0.25

Choose ↓ **ENTER** ↓

Occupational/Controlled	○	
General Population/Uncontrolled	◉	
Tx Frequency:	1880.00	(MHz)
Maximum Peak Power at Antenna Input Terminal:	28.63	(dBm)
Source-Based Time-Average Factor:	-6.02	(dB)
Antenna gain and Cable Loss:	0.20	(dBi)

SL=	1.00	(mW/cm^2)
P=	182.3644	(mW)
G=	1.05	(numeric)

R = 3.90 (cm)

S (mw/cm^2) at 20cm

0.037948916

Formulae:

$$S = \frac{PG}{4\pi R^2}$$

$$R = \sqrt{\frac{P}{4\pi S}}$$

where: S = Power Density Limit
P = Power Output of the Device
G = Numeric Antenna Gain
R = Distance from Antenna

Source-Based Time-Average Factor = 10 * log (Time On / (Time On + Time Off))
Power Output of the Device (W) = 10 * log (RF Output Power (dBm) + Source-Based Time Average Factor (dB))

E.6.3 Calculations:

Vehicle-Mount Dipole Antenna (Max. Measured Conducted Power - Cellular EDGE Channel):

Prediction of MPE Limit
OET Bulletin 65, Edition 97-01

Equation from page 18

$$S = \frac{PG}{4\pi R^2}$$

$$R = \sqrt{\frac{PG}{4\pi S}}$$

S= power density
P= power input to the antenna
G= power gain of the antenna in the direction of interest relative to an isotropic radiator
R= distance to the center of radiation of the antenna
SL= power density limit

Ratio of Time On versus Total Transmit Time	0.25

Choose ↓ ENTER ↓

Occupational/Controlled	○	
General Population/Uncontrolled	◉	
Tx Frequency:	836.60	(MHz)
Maximum Peak Power at Antenna Input Terminal:	26.89	(dBm)
Source-Based Time-Average Factor:	-6.02	(dB)
Antenna gain and Cable Loss:	1.11	(dBi)

SL=	0.56	(mW/cm^2)
P=	122.1631	(mW)
G=	1.29	(numeric)

R = 4.74 (cm)

S (mw/cm^2) at 20cm

0.031347245

Formulae:

$S = \frac{PG}{4\pi R^2}$ where: S = Power Density Limit
P = Power Output of the Device
G = Numeric Antenna Gain
R = Distance from Antenna

$R = \sqrt{\frac{P}{4\pi S}}$

Source-Based Time-Average Factor = 10 * log (Time On / (Time On + Time Off))
Power Output of the Device (W) = 10 * log (RF Output Power (dBm) + Source-Based Time Average Factor (dB))

E.6.4 Calculations:

Vehicle-Mount Dipole Antenna (Max. Measured Conducted Power - PCS EDGE Channel):

Prediction of MPE Limit
OET Bulletin 65, Edition 97-01

Equation from page 18

$$S = \frac{PG}{4\pi R^2}$$

$$R = \sqrt{\frac{PG}{4\pi S}}$$

S= power density
P= power input to the antenna
G= power gain of the antenna in the direction of interest relative to an isotropic radiator
R= distance to the center of radiation of the antenna
SL= power density limit

Ratio of Time On versus Total Transmit Time	0.25

Choose ↓ **ENTER** ↓

Occupational/Controlled	○	
General Population/Uncontrolled	◉	
Tx Frequency:	1880.00	(MHz)
Maximum Peak Power at Antenna Input Terminal:	25.73	(dBm)
Source-Based Time-Average Factor:	-6.02	(dB)
Antenna gain and Cable Loss:	0.20	(dBi)

SL=	1.00	(mW/cm^2)
P=	93.5276	(mW)
G=	1.05	(numeric)

R = 2.79 (cm)

S (mw/cm^2) at 20cm

0.019462534

Formulae:

$S = \frac{PG}{4\pi R^2}$ where: S = Power Density Limit
P = Power Output of the Device
G = Numeric Antenna Gain
R = Distance from Antenna

$R = \sqrt{\frac{P}{4\pi S}}$

Source-Based Time-Average Factor = 10 * log (Time On / (Time On + Time Off))
Power Output of the Device (W) = 10 * log (RF Output Power (dBm) + Source-Based Time Average Factor (dB))

E.6.5 Calculations:

Vehicle-Mount Dipole Antenna (Max. Measured Conducted Power - Cellular UMTS Channel):

Prediction of MPE Limit
OET Bulletin 65, Edition 97-01

Equation from page 18

$$S = \frac{PG}{4\pi R^2}$$

$$R = \sqrt{\frac{PG}{4\pi S}}$$

S= power density
P= power input to the antenna
G= power gain of the antenna in the direction of interest relative to an isotropic radiator
R= distance to the center of radiation of the antenna
SL= power density limit

Ratio of Time On versus Total Transmit Time	**1.00**

Choose ↓ **ENTER** ↓

Occupational/Controlled	○	
General Population/Uncontrolled	◉	
Tx Frequency:	**846.60**	(MHz)
Maximum Peak Power at Antenna Input Terminal:	**24.00**	(dBm)
Source-Based Time-Average Factor:	**0.00**	(dB)
Antenna gain and Cable Loss:	**1.11**	(dBi)

SL=	**0.56**	(mW/cm^2)
P=	**251.1886**	(mW)
G=	**1.29**	(numeric)

R = 6.76 (cm)

S (mw/cm^2) at 20cm

0.064455409

Formulae:

$S = \frac{PG}{4\pi R^2}$ where: S = Power Density Limit
P = Power Output of the Device
G = Numeric Antenna Gain
R = Distance from Antenna

$R = \sqrt{\frac{P}{4\pi S}}$

Source-Based Time-Average Factor = 10 * log (Time On / (Time On + Time Off))
Power Output of the Device (W) = 10 * log (RF Output Power (dBm) + Source-Based Time Average Factor (dB))

E.6.6 Calculations:

Vehicle-Mount Dipole Antenna (Max. Measured Conducted Power - PCS UMTS Channel):

Prediction of MPE Limit
OET Bulletin 65, Edition 97-01

Equation from page 18

$$S = \frac{PG}{4\pi R^2}$$

$$R = \sqrt{\frac{PG}{4\pi S}}$$

S= power density
P= power input to the antenna
G= power gain of the antenna in the direction of interest relative to an isotropic radiator
R= distance to the center of radiation of the antenna
SL= power density limit

Ratio of Time On versus Total Transmit Time	**1.00**

Choose ↓ **ENTER** ↓

Occupational/Controlled	○	
General Population/Uncontrolled	◉	
Tx Frequency:	**1880.00**	(MHz)
Maximum Peak Power at Antenna Input Terminal:	**23.00**	(dBm)
Source-Based Time-Average Factor:	**0.00**	(dB)
Antenna gain and Cable Loss:	**0.20**	(dBi)

SL=	**1.00**	(mW/cm^2)
P=	**199.5262**	(mW)
G=	**1.05**	(numeric)

R = 4.08 (cm)

S (mw/cm^2) at 20cm

0.041520193

Formulae:

$S = \frac{PG}{4\pi R^2}$ where: S = Power Density Limit
P = Power Output of the Device
G = Numeric Antenna Gain
R = Distance from Antenna

$R = \sqrt{\frac{P}{4\pi S}}$

Source-Based Time-Average Factor = 10 * log (Time On / (Time On + Time Off))
Power Output of the Device (W) = 10 * log (RF Output Power (dBm) + Source-Based Time Average Factor (dB))

E.7 PASS/FAIL

In reference to the results outlined in E.9 the DUT passes the requirements as stated in the reference standards as follows:
1) The DUT must comply with the minimum spacing requirement of 20 cm to ensure an exposure of not more than f/1500 mW/cm^2 for frequencies between 300 and 1500 MHz and 1 mW/cm^2 for frequencies between 1500 and 100,000 MHz.

E.8 SIGN-OFF

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Spencer Watson
EMC Manager
Celltech Labs Inc.

July 18, 2006
Date

END OF DOCUMENT