

Test Report S/N:	022305KBC-T616-E	Issue 1.0		
Test Date(s):	01Nov04 - 06Dec04			
Test Type(s):	FCC §15.247 IC RSS-210 Issue 5			
Lab Registration(s):	FCC #714830	IC Lab	File #3874	

PART 15C SUPPLEMENTARY EMC TEST REPORT

FOR THE

ITRONIX RUGGED LAPTOP PC MODEL: IX260PNLA580BT

WITH THE

INTERNAL CIRRONET BT2022 BLUETOOTH TRANSMITTER

UTILIZING THE

INTERNAL RANGESTAR SURFACE-MOUNT ANTENNA (UPPER LEFT SIDE REAR OF LCD DISPLAY)

CO-TRANSMITTING WITH THE

SENAO NL-3054MP 802.11B/G 2.4 GHz DSSS WLAN MINI-PCI CARD UTILIZING THE

INTERNAL RANGESTAR SURFACE-MOUNT ANTENNA (UPPER RIGHT SIDE REAR OF LCD DISPLAY)

TRSN 022305KBC-T616-E15W/E15B Issue 1.0

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

April 20, 2005



Test Report S/N:	022305KBC-T616-E	Issue 1.0		
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Test Type(s):	FCC §15.247	FCC §15.247 IC RSS-210 Issue 5		
Lab Registration(s):	FCC #714830	IC Lab	File #3874	

DECLARATION OF COMPLIANCE								
Test Lab CELLTECH LABS INC. Testing and Engineering 1955 Moss Court Kelowna, B.C. Canada V1Y 9L3 Phone: 250-448-7047 Fax: 250-448-7048			ices	Арр	licant	<u>Information</u>	ITRONIX CORPORATION 801 South Stevens Street Spokane, WA 99204 United States	
	info@celltechlabs.co www.celltechlabs.co							
Laboratory Registration N		FCC:	714830		IC:	IC 3874		
Rule Part(s):	FCC:	§15.247	; §2.1091; §1.1	1310	IC:	RSS-210 Issu	ie 5	
Device Classification: FCC		WLAN -	LAN - DSSS		- Digi	tal Transmissio	n System (DTS)	
Device oldssification.		Bluetoot	Bluetooth - FHSS		- Part	15 Spread Spectrum Transmitter (DSS)		
Device Identification: FCC ID:		KBCIX2	60PNLA580B	Т	IC:	1943A-IX260)Pf	
DUT Description:								
Model(s):	IX260PI	NLA580B	Γ					
Device Description:	surface- Senao I	-mount an NL-3054N	tenna (upper IP 802.11b/g 2	left sid 2.4 GH	le rear Hz DSS	of LCD display	ransmitter and internal RangeStar), co-transmitting with the internal PCI Card and internal RangeStar y)	
Tx Frequency Range(s):	Bluetoo	th 240	02 - 2480 MHz	<u>z</u>				
TX 1 requeries realige(3).	WLAN	24	12 - 2462 MHz	Z				
	Bluetoo	th +10	6.56 dBm Pea	ık Con	ducted			
Max. RF Output Power:	WLAN		+20.43 dBm Peak Conducted (Mode b)					
			0.21 dBm Pea			· 0/		
Modulation Type(s):	Bluetoo		SK 1 Mbps 0.			an		
Automor Tours (a)	WLAN DBPSK, DQPSK, CCK							
Antenna Type(s):				ernal S	surface-	-iviount		
Power Supply:	90 Watt	AC Powe	r Adapter					

This mobile transmitting 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 Part 15.247, Industry Canada RSS-210 Issue 5, and ANSI TIA/EIA-603-B-2002.

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.

This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Labs Inc. The results and statements contained in this report pertain only to the device(s) evaluated.

Russell Pipe

Senior Compliance Technologist

Celltech Labs Inc.

Duar **EMC** Cellto

ne M. Friesen C Manager tech Labs Inc.	

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX	(260PNLA580BT
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth							ITRONIX"	
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Lab Registration(s):	FCC #714830	IC Lab	File #3874	

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Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
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	TEST SUMMARY							
	Refere	enced Standard: FCC (FR Title 47 Part 15					
Appendix	Test Description	Procedure Reference	Limit Reference	Test Start Date	Test End Date	Result		
В	Powerline Conducted Emissions	ANSI C63.4	§15.207	30Nov04	30Nov04	Pass		
С	Bluetooth Peak Conducted RF Power	FCC 97-114	§15.247(b) (3)	06Dec04	06Dec04	Pass		
D	WLAN Peak Conducted RF Power	FCC 97-114	§15.247(b) (3)	01Dec04	01Dec04	Pass		
E	Radiated Spurious Emissions	FCC 97-114	§15.247(c)	01Nov04	06Dec04	Pass		
F	Restricted Band Emissions	FCC 97-114	§15.205 (a), (b) §15.209 (a)	01Nov04	06Dec04	Pass		
G	Maximum Permissible Exposure	FCC CFR 47 § 2.1091 IEEE Std C95.1-1999	§1.1310 Table 1 (b)	06Dec04	06Dec04	Pass		
	Re	ferenced Standard: IC	RSS-210 Issue 5					
В	Powerline Conducted Emissions	RSS-212, ANSI C63.4	RSS-210 §6.6	30Nov04	30Nov04	Pass		
С	WLAN Conducted Peak RF Power	FCC 97-114	§15.247(b) (3)	06Dec04	06Dec04	Pass		
D	WLAN Conducted Peak RF Power	FCC 97-114	§15.247(b) (3)	01Dec04	01Dec04	Pass		
E	Radiated Spurious Emissions	RSS-212, ANSI C63.4	RSS-210 §6.2.2 (e1)	01Nov04	06Dec04	Pass		
F	Restricted Band Emissions	RSS-212, ANSI C63.4	RSS-210 §6.3	01Nov04	06Dec04	Pass		
G	Maximum Permissible Exposure	RSS-102	RSS-210 §14 Safety Code 6 2.2.1(a) Table 5	06Dec04	06Dec04	Pass		

REVISION LOG

Issue	Description	Implemented By	Implementation Date
1.0	Initial Release	Jon Hughes	20Apr05

SIGNATORIES

Prepared By	De	April 20, 2005
Name/Title	Duane M. Friesen, C.E.T. / EMC Manager	Date
Reviewed By	GR.	April 20, 2005
Name/Title	Jon Hughes / General Manager	Date

Applicant:	Itronix Corporation	Corporation Model: IX260PNLA580BT IC ID: 1943A-IX260Pf FCC ID:		FCC ID:	KBCIX260PNLA580BT		
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth						ITRONIX	
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1.0 SCOPE

This report outlines the measurements made and results collected during electromagnetic emissions testing of the Itronix Corporation IX260+ Rugged Laptop PC with internal Cirronet BT2022 Bluetooth Transmitter co-transmitting with the Senao NL-3054MP 802.11b/g 2.4 GHz DSSS WLAN Mini-PCI Card, each connected to separate RangeStar internal surface-mount antennas located in the upper rear side of the LCD display. This report describes the results obtained when inter-modulation product measurements were made with both transmitters installed in the IX260+ Rugged Laptop PC as described, and transmitting simultaneously. The measurement results were applied against the EMC requirements and limits outlined in the technical rules and regulations set forth in the Federal Communication Commission Code of Federal Regulations Title 47 Part 15 Subpart C, and Industry Canada Radio Standards Specification RSS-210 Issue 5.

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

CFR Title 47 Part 2:2003 Code of Federal Regulations

Title 47: Telecommunication

Part 2: Frequency Allocations and Radio Treaty Matters;

General Rules and Regulations

CFR Title 47 Part 15:2003 Code of Federal Regulations

Title 47: Telecommunication

Part 15: Radio Frequency Devices

IC Spectrum Management & Radio Standards Specification

Telecommunications Policy RSS-212 Issue 1 (Provisional) - Test Facilities & Test Methods for Radio Equipment

RSS-210 Issue 5 - Low Power Licence-Exempt Radiocommunication Devices RSS-102 Issue 1 (Provisional) - Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure

of Humans to Radio Frequency Fields

For the Model IX260+ Rugged Laptop PC with

Senao NL-3054MP 2.4 GHz DSSS WLAN Mini-PCI Card and Internal Antenna

Test Report Serial Number 022305KBC-T616-E15W

Date: April 20, 2005

Celltech Labs Test Report EMC Test Report

For the Model IX260+ Rugged Laptop PC with

Cirronet BT2022 Bluetooth Transmitter and Internal Antenna

Test Report Serial Number 022305KBC-T616-E15B

Date: April 20, 2005



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3.0 TERMS AND DEFINITIONS

AVG Average

CFR Code of Federal Regulations

dB decibel

dBmdB referenced to 1 mWdBuVdB referenced to 1 uVDUTDevice under TestdBcdB down from carrierEBWEmission Bandwidth

EMC Electromagnetic Compatibility FCC Federal Communication Communicatio

FCC Federal Communication Commission FHSS Frequency Hopping Spread Spectrum

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 not applicable 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
VBW Video Bandwidth
Vpol Vertical Polarization

WLAN Wireless Local Area Network



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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:	801 South Stevens Street
	Spokane, WA 99204
	United States

5.2 DUT Description

The DUT consisted of the IX260+ Rugged Laptop PC containing a Cirronet BT2022 Bluetooth Transmitter connected to an Internal RangeStar Surface-Mount Antenna installed in the upper left side rear edge of the LCD display. Co-located within the IX260+ Rugged Laptop PC was the Senao NL-3054MP 802.11b/g WLAN Mini-PCI Card connected to a second Internal RangeStar Surface-Mount Antenna installed in the upper right side rear edge of the LCD display. Photographs of the DUT placement and construction are shown in Appendix A.

Device:	Rugged La	Rugged Laptop PC				
Model:	IX260PNLA	IX260PNLA580BT				
Serial Number:	ZZGEG419	ZZGEG4196ZZ6494				
Identifier(s):	FCC ID:	FCC ID: KBCIX260PNLA580BT IC: 1943A-IX260Pf				
Power Source:	Delta Electi	Delta Electronics Model ADP-90AB Rev B 90 Watt AC-DC power supply				

Device:	2.4GHz I	2.4GHz FHSS Bluetooth Transmitter					
Model:	Cirronet	Cirronet BT2022					
Serial Number:	n/a	n/a					
Rule Part(s):	FCC:	FCC: §15.247; §2.1091; §1.1310 IC: RSS-210 Issue 5					
Classification:	FCC:	FCC: Spread Spectrum Transmitter (DSS) IC: Low Power Licence-Exempt Transmitte					
Power Source:	Powered	Powered from the internal PC power supply					

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
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Device:	2.4GHz 8	2.4GHz 802.11b/g DSSS WLAN Mini-PCI Card					
Model:	Senao NI	Senao NL-3054MP					
Serial Number:	04825362	048253621					
Rule Part(s):	FCC:	§15.247; §2.1091; §1.1310	RSS-210 Issue 5				
Device Classification:	FCC:	FCC: Digital Transmission System (DTS) IC: Low Power Licence-Exempt Transmitt					
Power Source:	Powered	Powered from the internal PC power supply					

Device:	nternal Surface-Mount Antenna (Bluetooth - upper left side rear edge of LCD display)				
Model:	ingeStar P/N: 100929				
Gain:	+4.5 dBi				

Device:	nternal Surface-Mount Antenna (WLAN - upper right side rear edge of LCD display)				
Model:	angeStar P/N: 100929				
Gain:	+4.5 dBi				

5.3 Co-Located Equipment

Device:	Dual-Band CDMA PCMCIA Modem (Not co-transmitting during WLAN/Bluetooth evaluations)			
Model:	Sierra Wireless AirCard			
Antenna:	External Mounted Swivel Dipole			
Gain:	+2.6 dBi			

Device:	GPS Receiver Module and Antenna (Receive only)
Model:	Leadtek P/N GPS9547

5.4 Cable Descriptions

ROU	TING	Length	Model Terminations		Shield Type	Shield Termination		Suppression	
From	То	m		End 1	End 2		End 1	End 2	
PC Fire Wire Port	Unterminated	1.0	Copartner E119932	IEEE-1528	Fire wire	n/a	n/a	n/a	None
PC modem port	Unterminated	1.0	n/a	RJ-11	RJ-11	None	na	na	None
PC Ethernet Port	Ethernet Hub	1.0	n/a	RJ-45	RJ-45	None	na	na	None

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5.5 Support Equipment

The following equipment was used in support of the DUT.

	CO-LOCATED SUPPORT EQUIPMENT LIST				
MANUFACTURER	MODEL DESCRIPTION				
D-Link	DE-809TC/	Ethernet hub			
YNG YUH	YP-040	Hub power supply			
MLi	699	Speakers			
Polk Audio	n/a	Speaker-microphone			
DeLorme	Tripmate	GPS Receiver			
Intel	CS-430	Camera			
Logitech	M-S34	Mouse			

5.6 Clock Frequencies

5.6.1 <u>DUT Clock Frequencies</u>

Device:	Rugged Laptop PC
Clocks:	1.6 GHz processor
Device:	2.4GHz FHSS Cirronet Bluetooth Transmitter
Clocks:	n/a
Device:	2.4GHz DSSS WLAN Mini-PCI Card (802.11b/g)
Clocks:	n/a
Device:	Internal Dual Surface-Mount Antennas
Clocks:	n/a

5.6.2 Co-Located Clock Frequencies

Device:	Peripherals
Clocks:	n/a



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5.7 Mode(s) of Operation Tested

5.7.1 Bluetooth Transmitter

Customer supplied software was used to place the Bluetooth Transmitter at the appropriate channel with the power level and modulation for the specific measurement. During the co-transmission testing, the Bluetooth transmitter was set in its hopping mode with the following settings:

TX Frequency Range:	2402 - 2480 MHz		
Software Power Gain Settings:	220 /45		
RF Peak Conducted Output Power Tested: Ch. 0 - +16.56 dBm Ch. 39 - +16.09 dBm Ch. 78 - +15.32 dBm			
Modulation Type(s): GFSK 0.5 BT Gaussian			
Battery Type(s):	11.1V Lithium-lon, 6.0Ah (Model: A2121-2)		

5.7.2 WLAN Mini-PCI Card

TX Frequency Range:	2412 - 2462 MHz Ch. 1 (2412 MHz), Ch. 6 (2437 MHz) & Ch. 11 (2462 MHz) measured unless otherwise noted				
Software Power Gain Settings:	802.11b set to power setting of 17.5 with xpdGain at 6 802.11g set to power setting of 18.5 with xpdGain at 12				
RF Peak Conducted Output Power Tested:	802.11b 2412 MHz(1 Mbps) = 20.43 dBm 802.11b 2437 MHz(1 Mbps) = 20.33 dBm 802.11b 2462 MHz(1 Mbps) = 20.29 dBm 802.11g 2412 MHz(6 Mbps) = 20.10 dE 802.11g 2437 MHz(6 Mbps) = 20.21 dE 802.11g 2462 MHz(6 Mbps) = 20.17 dE				
Modes / Data Rates	802.11b (1, 5.5, 11 Mbps checked in prescan) (1 Mbps determined to be worst-case and used unless otherwise noted)				
Tested*:	802.11g (6, 36, 54 Mbps checked in prescan) (6 Mbps determined to be worst-case and used unless otherwise noted)				
Modulation Type(s):	OFDM with BPSK, QPSK, 16QAM, 64QAM, DBPSK, DQPSK, CCK				
Battery Type(s):	11.1V Lithium-ion, 6.0Ah (Model: A2121-2)				

5.7.3 DUT Exercising Software Description

The DUT was configured and exercised using customer supplied test software that allowed an operator to set the parameters of the Bluetooth transmitter and WLAN Mini-PCI Card operation. The settings used are described in each appendix. More specific information on the configuration and exercising can be found in the referenced single-transmit test reports.

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX	260PNLA580BT
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth								TRONIX"
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5.8 Configuration Description

The DUT was configured, as described by the client as being representative of what would be delivered to a final customer. More specific details may be included in each appendix.

5.8.1 Configuration Justification

The DUT was tested in a configuration described by the client as being worst-case but typical of normal use.

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.



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APPENDICES



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Appendix A - DUT Photographs

Photograph A-1 - Front of Open IX260+ Laptop PC



Photograph A-2 - Back of Open IX260+ Laptop PC



Photograph A-3 - WLAN Mini-PCI Card Location



Photograph A-4 - Bluetooth Transmitter Location





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Photograph A-5 - WLAN Mini-PCI Card



Photograph A-6 - Bluetooth Transmitter



Photograph A-7 - Surface-Mount Antenna Placement





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Appendix B - Powerline Conducted Emissions Measurement

B.1. REFERENCES	
Normative Reference Standard	CFR 47 FCC Part 15 §15.207
Procedure Reference	ANSI C63.4

B.2. LIMITS

§15.207: Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each powerline and ground at the power terminal.

Frequency of Emission (MHz)	Conducted Limit (dBuV)			
	Quasi-Peak	Average		
0.15 – 0.5	66 to 56*	56 to 46*		
0.50 - 5.0	56	46		
5.0 – 30.0	60	50		

^{*}Decrease with the logarithm of the frequency

B.3. ENVIRONMENTAL CONDITIONS				
Temperature	+26 <u>+</u> 5 °C			
Humidity	31 % <u>+</u> 10% RH			
Barometric Pressure	101.4 kpa			

B.4. EQUIPMENT LIST								
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE			
00063	HP	85662A	Spectrum Analyzer Display	na	na			
00051	HP	8566B	Spectrum Analyzer RF Section	18May04	18May05			
00049	HP	85650A	Quasi-Peak Adapter	18May04	18May05			
00047	HP	85685A	Preselector	18May04	18May05			
00083	EMCO	3825/2	Line Impedance Stabilization Network	29Apr04	29Apr05			
00084	EMCO	3825/2	Line Impedance Stabilization Network	29Apr04	29Apr05			

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IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth							(ITRONIX)



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B.5. MEASUREMENT EQUIP	PMENT SETUP
Measurement Equipment Connections	The conducted emissions were measured on each of the two AC powerline leads connected to the DUT's power supply brick. A two line LISN was used to make this measurement. A drawing of the equipment setup is shown in B.7
	Each of the monitor ports from the 2-line LISN was connected in turn to the spectrum analyzer. The port not connected to the analyzer was terminated in a 50-ohm load. A pre-scan of the peak emission levels was made of the 150 kHz – 30 MHz range split into 4 equal frequency bands. The following were the instrumentation settings:
Measurement Equipment Settings	Spectrum Analyzer: Start Frequency and Stop Frequency set by software for each of the four bands RBW: 100 kHz VBW: 300 kHz Sweep: 500 mS
=quipinoni ootungo	Quasi-Peak Adapter: Normal - Automatic Bandwidth Setting: 9 kHz
	The resulting data from each band was corrected and collected by software and presented in the graphical representations shown in B.9 for the two leads.
	A defined set of frequency points of interest on each lead were used by software to optimize a set of readings for each type of detector (peak, quasi-peak and average). This data was corrected by the software is presented in the tables shown in section B.9.

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
IX260+ Rugge	ed Laptop PC with inte	rnal Senao N	L-3054MP 802.11b/g \	WLAN and	d Cirronet BT2022	Bluetooth	ITRONIX*



Test Report S/N:	022305KBC-T616-E	Issue 1.0				
Test Date(s):	01Nov04 - 06Dec04					
Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5			
Lab Registration(s):	FCC #714830	IC Lab	File #3874			

B.6. SETUP PHOTOS

Photograph B-1 - AC Powerline Conducted Emission Configuration



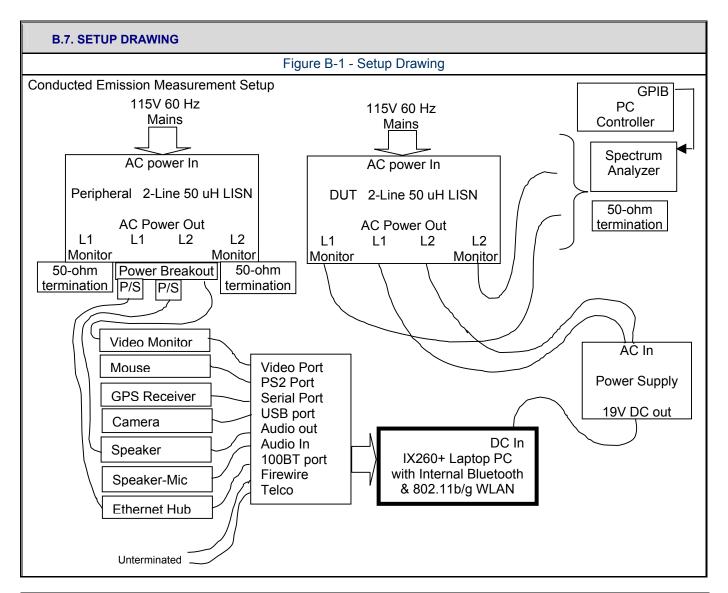
Photograph B-2 - AC Powerline Conducted Emission Cable Placement



Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
IX260+ Rugg	ed Laptop PC with inte	rnal Senao N	L-3054MP 802.11b/g	WLAN and	d Cirronet BT2022	Bluetooth	ITRONIX



Test Report S/N:	022305KBC-T616-E	Issue 1.0				
Test Date(s):	01Nov04 - 06Dec04					
Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5			
Lab Registration(s):	FCC #714830	IC Lab	File #3874			



B.8. DUT OPERATING	B.8. DUT OPERATING DESCRIPTION								
Bluetooth While hopping channels, the Bluetooth transmitter was set to transmit a data stream with a max. power setting.									
WLAN	The WLAN transmitter was set to transmit with a max. power setting for 2462 MHz in Mode b.								
PC	Other than operating the Bluetooth software and running MS windows, no PC exercising was performed.								
Peripherals	All peripherals were active, but no specific traffic was initiated.								

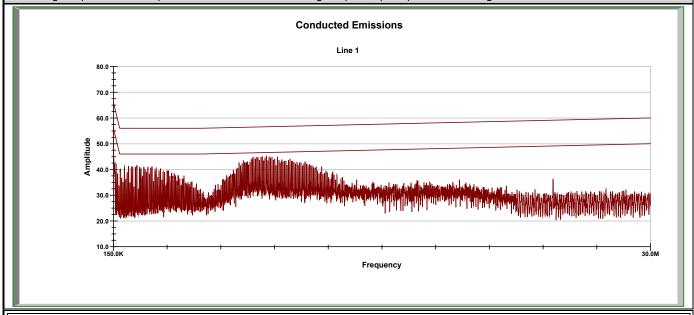
Applicant:	Itronix Corporation	Corporation Model: IX260PNLA580BT IC ID: 1943A-IX260Pf FCC ID: KB		KBCIX260PNLA580I	ВТ			
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth								
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Test Report S/N:	022305KBC-T616-E15W/E15B Issue					
Test Date(s):		01Nov04	- 06Dec04			
Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5			
Lab Registration(s):	FCC #714830	IC Lab	File #3874			

B.9. TEST RESULTS

Following are peak emission plots and tabular data describing the peak, quasi-peak and average measurements made of the DUT.





Project Number: 100504KBC-T565-E15W/E15B Company: Itronix

Product: IX260+ with NL-3054MP WLAN & BT2022 Bluetooth

 Standard:
 FCC 15.207

 Test Start Date:
 30-Nov-04

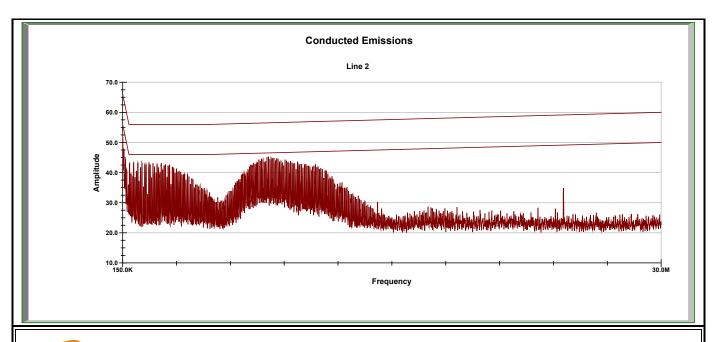
 Test End Date:
 30-Nov-04

	Line 1 Conducted Emissions													
Frequency	Un	Uncorrected Reading Correction Factor					Corrected Emission Level		Quasi-i can		Quasi-Peak Quasi-Peak Limit Margin		Average Margin	Pass/Fail
	Peak	Quasi-Peak	Average	1 dotor	Peak	Quasi-Peak	Average	Little	Margin	Limit	Margin	Pass/Fall		
MHz	dBuV	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dBuV	dB			
0.302	43.80	42.20	42.16	0.81	44.61	43.01	42.97	60.18	17.17	50.18	7.21	Pass		
1.449	42.30	41.49	40.46	0.30	42.60	41.79	40.76	56.00	14.21	46.00	5.24	Pass		
2.283	42.40	32.83	31.52	0.29	42.69	33.12	31.81	56.00	22.88	46.00	14.19	Pass		
3.204	40.40	39.11	35.21	0.30	40.70	39.41	35.51	56.00	16.60	46.00	10.50	Pass		
8.359	46.10	30.83	19.00	0.32	46.42	31.15	19.32	60.00	28.85	50.00	30.68	Pass		
8.578	45.70	30.75	18.65	0.32	46.02	31.07	18.97	60.00	28.93	50.00	31.03	Pass		
9.308	45.60	44.55	37.63	0.32	45.93	44.88	37.95	60.00	15.13	50.00	12.05	Pass		
17.010	38.40	34.25	22.48	0.37	38.77	34.62	22.85	60.00	25.38	50.00	27.15	Pass		

Corrected Emission Level (dBuV) = Uncorrected Reading (dBuV) + Correction Factor (dB) Margin (dB) = Limit (dBuV) - Corrected Emission Level (dBuV)



Test Report S/N:	022305KBC-T616-E	Issue 1.0				
Test Date(s):	01Nov04 - 06Dec04					
Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5			
Lab Registration(s):	FCC #714830	· ·				





100504KBC-T565-E15W/E15B Project Number: Itronix

Company: IX260+ with NL-3054MP WLAN & BT2022 Bluetooth Product:

FCC 15.207 Standard: Test Start Date: 30-Nov-04 Test End Date: 30-Nov-04

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	Line 2 Conducted Emissions											
Frequency	Un	Concaton		Correction Corrected Er		Corrected Emission Level		Quasi-Peak Limit	Quasi-Peak Margin	Average Limit	Average Margin	Pass/Fail
	Peak	Quasi-Peak	Average	. 40.0.	Peak	Quasi-Peak	Average	2	a.g	2	a.g	1 833/1 811
MHz	dBuV	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dBuV	dB	
0.216	56.80	44.71	28.75	1.30	58.10	46.01	30.04	62.98	16.98	52.98	22.94	Pass
0.990	43.60	42.86	42.86	0.33	43.93	43.19	43.19	56.00	12.81	46.00	2.81	Pass
1.596	43.70	42.57	41.93	0.30	44.00	42.87	42.23	56.00	13.13	46.00	3.77	Pass
2.282	43.30	42.43	42.12	0.29	43.59	42.72	42.41	56.00	13.28	46.00	3.59	Pass
7.844	44.60	43.22	38.74	0.32	44.92	43.54	39.06	60.00	16.46	50.00	10.94	Pass
8.226	45.50	41.25	34.80	0.33	45.83	41.58	35.13	60.00	18.42	50.00	14.87	Pass
9.822	43.60	42.36	39.57	0.33	43.93	42.69	39.90	60.00	17.31	50.00	10.10	Pass
14.234	29.60	25.33	20.99	0.40	30.00	25.73	21.39	60.00	34.27	50.00	28.61	Pass

Corrected Emission Level (dBuV) = Uncorrected Reading (dBuV) + Correction Factor (dB) Margin (dB) = Limit (dBuV) - Corrected Emission Level (dBuV)



Test Report S/N:	022305KBC-T616-E15W/E15B		Issue 1.0
Test Date(s):	01Nov04 - 06Dec04		
Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5
Lab Registration(s):	FCC #714830	IC Lab	File #3874

B.10. PASS/FAIL

In reference to the results outlined in B.9 the DUT passes the requirements as stated in the reference standards as follows: The RF voltage measured in reference to ground on each of the power line conductors does not exceed the limits as outlined in FCC 15 207

B.11. SIGN-OFF

Jussell W. Ryse

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.

Russell Pipe

Senior Compliance Technologist

Celltech Labs Inc

30Nov04

Date



Test Report S/N:	022305KBC-T616-E	Issue 1.0	
Test Date(s):	01Nov04 - 06Dec04		
Test Type(s):	FCC §15.247 IC RSS-210 Issue 5		
Lab Registration(s):	FCC #714830	IC Lab	File #3874

Appendix C - Bluetooth Peak Conducted RF Power Measurement

C.1. REFERENCES	
Normative Reference Standard	FCC CFR 47 §15.247(b) (3)
Procedure Reference	FCC 97-114

C.2. LIMITS

C.2.1. FCC CFR

§15.247(b): The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247(b) (3) For system using digital modulation in the 902 – 928 MHz, 2400 – 2483.5 MHz, and 5725 – 5850 MHz bands: 1 Watt.

*This measurement was made as a reference to determine the effects the co-transmission of the WLAN had on the output RF power of the Bluetooth transmitter. The single transmit conducted power measured with the same settings was:

Channel	Frequency	Peak Conducted Power		
	MHz	dBm	Watts	
0	2402	16.76	0.047	
39	2441	16.22	0.042	
78	2480	15.36	0.034	

C.3. ENVIRONMENTAL CONDITIONS			
Temperature	25.2 +/- 2 °C		
Humidity	35 +/- 2 %		
Barometric Pressure	96.34 kPa		

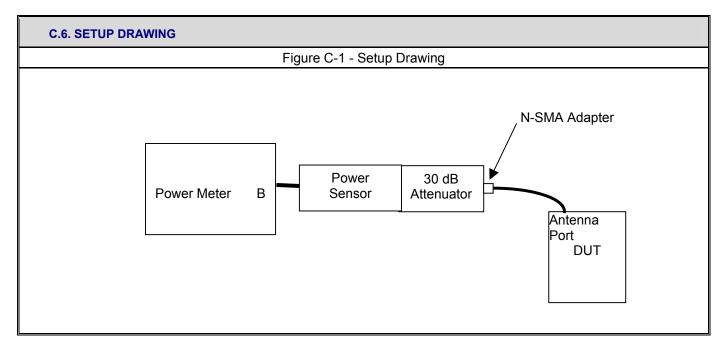
C.4. EQUIPMENT LIST							
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE		
00007	Gigatronics	8652A	Power Meter	18Oct04	18Oct05		
00013	Gigatronics	80701A	Power Sensor	11Oct04	11Oct05		
00075	Alpha Wire-J	9223	2ft. RG223/U RF Cable	08Jul04*	24Jun05		
00076	Pasternack	PE7014-30	30dB 2 Watt Attenuator	08Jul04*	24Jun05		

^{*}Cable and attenuator verified with power meter prior to use



Test Report S/N:	022305KBC-T616-E	Issue 1.0	
Test Date(s):	01Nov04 - 06Dec04		
Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5
Lab Registration(s):	FCC #714830	IC Lab	File #3874

C.5. MEASUREMENT EQUIPMENT SETUP					
Measurement Equipment Connections	The equipment was connected as shown in the setup drawing in C.6.				
Measurement Equipment Settings	To evaluate the maximum peak power, the power meter was set using the following setting: Mode: MAP				



C.7. DUT OPERATING DESCRIPTION

Measurements were made at three channels throughout the band, Low Channel (2402 MHz), Mid Channel (2441 MHz), High Channel (2480 MHz).

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth							
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Test Report S/N:	022305KBC-T616-E	Issue 1.0	
Test Date(s):	01Nov04 - 06Dec04		
Test Type(s):	FCC §15.247 IC RSS-210 Issue !		
Lab Registration(s):	FCC #714830	IC Lab	File #3874

C.8. TEST RESULTS						
Channel	Frequency	Peak Conducted Power Limi				
	MHz	dBm	Watts	Watts		
0 (Low)	2402	16.56	0.045	1		
39 (Mid)	2441	16.09	0.041	1		
79 (High)	2480	15.32	0.034	1		

C.9. PASS/FAIL

In reference to the results outlined in C.8, the DUT passes the requirements as stated in the reference standards as follows: FCC 15.247 (b) (3): The peak power did not exceed 1 Watt.

As a reference with the single transmit configuration, the conducted power levels of the Bluetooth transmitter are reduced by a maximum 0.20 dB (16.76 dBm vs 16.56 dBm) when the WLAN transmitter is active.

C.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.

Russell Pipe

Senior Compliance Technologist

Celltech Labs Inc.

6Dec04

Date



Test Report S/N:	022305KBC-T616-E	Issue 1.0	
Test Date(s):	01Nov04 - 06Dec04		
Test Type(s):	FCC §15.247 IC RSS-210 Issue		210 Issue 5
Lab Registration(s):	FCC #714830	IC Lab File #3874	

Appendix D - WLAN Peak Conducted RF Power Measurement

D.1. REFERENCES	
Normative Reference Standard	FCC CFR 47 §15.247(b) (3)
Procedure Reference	FCC 97-114

D.2. LIMITS

D.2.1. FCC CFR

§15.247(b): The maximum peak output power of the intentional radiator shall not exceed the following: §15.247(b) (3) For system using digital modulation in the 902 – 928 MHz, 2400 – 2483.5 MHz, and 5725 – 5850 MHz bands: 1 Watt.

*This measurement was made as a reference to determine the effects the co-transmission of the Bluetooth transmitter had on the output RF power of the WLAN. The single transmit conducted power levels of the WLAN were:

I			802.11b			802.11g			
Channel	Frequency	Peak Conducted Power		Limit	-26 dB EBW	Peak Conducted Power		Limit	-26 dB EBW
	MHz	dBm	Watts	Watts	MHz	dBm	Watts	Watts	MHz
Low	2412	20.42	0.110	1	19.2	20.11	0.103	1	29.59
Mid	2437	20.28	0.107	1	19.2	20.13	0.103	1	29.70
High	2462	20.35	0.108	1	19.2	20.07	0.102	1	30.56

D.3. ENVIRONMENTAL CONDITIONS		
Temperature	25.2 +/- 2 °C	
Humidity	35 +/- 2 %	
Barometric Pressure	96.34 kPa	

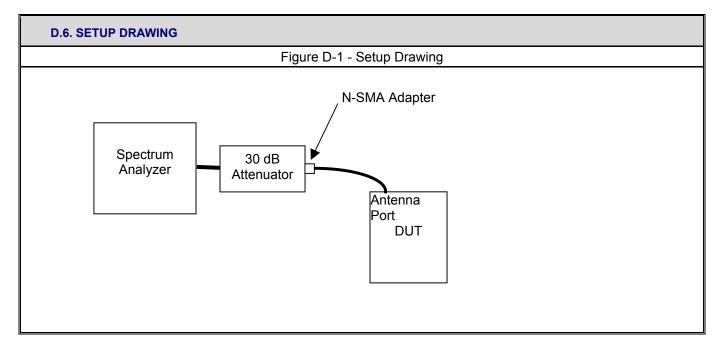
D.4. EQUIPMENT LIST							
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE		
00015	Agilent	E4408B	Spectrum Analyzer	29Dec03	29Dec04		
00075	Alpha Wire-J	9223	2ft. RG223/U RF Cable	08Jul04*	24Jun05		
00076	Pasternack	PE7014-30	30dB 2 Watt Attenuator	08Jul04*	24Jun05		

^{*}Cable and attenuator verified with power meter prior to use



Test Report S/N:	022305KBC-T616-E	Issue 1.0		
Test Date(s):	01Nov04 - 06Dec04			
Test Type(s):	FCC §15.247 IC RSS-210 Issue 5			
Lab Registration(s):	FCC #714830	IC Lab	File #3874	

D.5. MEASUREMEN	T EQUIPMENT SETUP
Measurement Equipment Connections	The equipment was connected as shown in the setup drawing in D.6.
Measurement Equipment Settings	To evaluate the maximum peak power, the 26 dB bandwidth needs to be determined. This is performed with the spectrum analyzer using the following setting: RBW – 300 kHz VBW – 1MHz Span – 50 MHz Detector – Peak Average – Power Trace Average – 100 Once the 26 dB bandwidth is determined, the channel power is measured within the band with the following spectrum analyzer settings: RBW – 1 MHz VBW – 3 MHz Detector – Peak Average – Power Integrate BW – equal to specific -26 dB EBW



D.7. DUT OPERATING DESCRIPTION

The worst-case configuration was determined from prescan investigations. Measurements were made at three channels throughout the band, Low Channel (2412 MHz), Mid Channel (2437 MHz), High Channel (2462 MHz) and for both Modes b and g.

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580E
IX260+ Rugge	ed Laptop PC with inte	C with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth					ITRONIX"
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Test Report S/N:	022305KBC-T616-E	Issue 1.0		
Test Date(s):	01Nov04 - 06Dec04			
Test Type(s):	FCC §15.247 IC RSS-210 Issue 5			
Lab Registration(s):	FCC #714830	IC Lab File #3874		

D.8. TEST RESULTS										
			802.11b				802.11g			
Channel	Frequency	Peak Condu	Peak Conducted Power		-26 dB EBW	Peak Conducted Power		Limit	-26 dB EBW	
	MHz	dBm	Watts	Watts	MHz	dBm	Watts	Watts	MHz	
Low	2412	20.43	0.110	1	19.2	20.10	0.102	1	29.59	
Mid	2437	20.33	0.108	1	19.2	20.21	0.105	1	29.70	
High	2462	20.29	0.107	1	19.2	20.17	0.104	1	30.56	

D.9. PASS/FAIL

In reference to the results outlined in D.8 the DUT passes the requirements as stated in the reference standards as follows: FCC 15.247 (b) (3): The peak power did not exceed 1 Watt and the effect of the Bluetooth co-transmitting had no significant effect on the conducted power of the WLAN.

D.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.

Duane M. Friesen, C.E.T.

EMC Manager Celltech Labs Inc

1Dec04

Date



Test Report S/N:	022305KBC-T616-E	Issue 1.0		
Test Date(s):	01Nov04 - 06Dec04			
Test Type(s):	FCC §15.247	17 IC RSS-210 Issue 5		
Lab Registration(s):	FCC #714830	IC Lab	File #3874	

Appendix E - Radiated Spurious Emissions Measurement

E.1. REFERENCES	
Normative Reference Standard	FCC CFR 47 §15.247(c)
Procedure Reference	ANSI C63.4; FCC 97-114

E.2. LIMITS

E.2.1. FCC CFR 47

§15.247 (c): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in 15.209 (a) is not required.

Note: Spurious emissions within the restricted bands are reported in Appendix F.

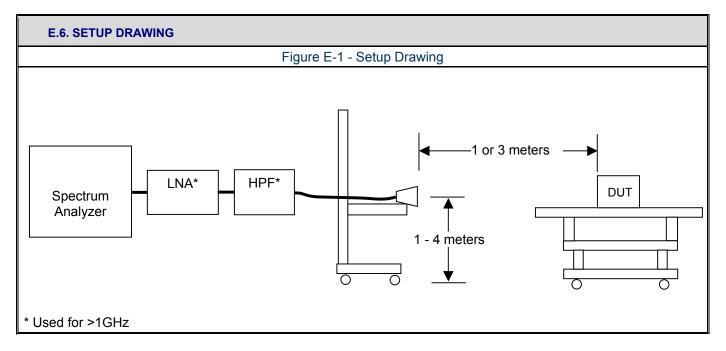
E.3. ENVIRONMENTAL CONDITIONS		
Temperature	27.4 +/- 2 °C	
Humidity	33 +/- 2 %	
Barometric Pressure	96.24 +/- 0.2 kPa	

E.4. EQUIPME	E.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					
00035	ETS	3115	Double Ridged Guide Horn	24Mar04	24Mar05					
00015	Agilent	E4408B	Spectrum Analyzer	29Dec03	29Dec04					
00049	HP	8566B	Spectrum Analyzer RF Section	18May04	18May05					
00047	HP	85685A	RF Preselector	18May04	18May05					
00048	Gore	65474	Microwave Cable	20May04	20May05					
00030	HP	83017A	LNA	20May04	20May05					



Test Report S/N:	022305KBC-T616-E	15W/E15B	Issue 1.0
Test Date(s):		01Nov04	- 06Dec04
Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5
Lab Registration(s):	FCC #714830	IC Lab	File #3874

MEASUREMENT EQUIPMENT CONNECTIONS		The measurement equipment was connected as shown in E.6. A number of antennas were used to cover the applicable frequency range test. The ranges in which each antenna was used are as follows						
	Frequency I	Range	An	tenna				
CONNECTIONS	1 GHz – 18	3 GHz	ETS 3115 Horn					
	The spectrum analyzer was set to the following settings:							
MEASUREMENT	Frequency Range	RBW	VBW	Detector				
EQUIPMENT	MHz	kHz	kHz	Detector				
SETTINGS	> 1000 1000*		1000	Peak*				
	*As a worst-case measurement, the average limit was applied to measurements made with a peak detector using a RBW of 1 MHz (vs the specified 100 kHz), when possible.							



Applicant:	Itronix Corporation Model: IX260PNLA580BT IC ID: 1943A-IX260Pf FCC ID: KI				KBCIX260PNLA580B	Т			
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth							ITRONIX*		
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Test Report S/N:	022305KBC-T616-E15W/E15B Issue			
Test Date(s):		01Nov04	- 06Dec04	
Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5	
Lab Registration(s):	FCC #714830	IC Lab	File #3874	

E.7. SETUP PHOTOGRAPHS

Photograph E-1 - 3115 Horn Antenna



E.8. DUT OPERATING DESCRIPTION

Measurements were made of the bands that may contain inter-modulation products with both the Bluetooth and WLAN radios transmitting. Measurements were made for each combination of WLAN channels and Modes (low and high, Mode b and g) with the Bluetooth transmitter hopping or on a worst-case channel when defined.

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
IX260+ Rugge	ed Laptop PC with inte	rnal Senao N	L-3054MP 802.11b/g \	WLAN and	d Cirronet BT2022	Bluetooth	ITRONIX"
	i i						



Test Report S/N:	022305KBC-T616-E	Issue 1.0			
Test Date(s):	01Nov04 - 06Dec0				
Test Type(s):	FCC §15.247 IC RSS-210 Issue				
Lab Registration(s):	FCC #714830	IC Lab	File #3874		

E.9. TEST RESULTS

E.9.1. Band-edge Spurious Field Strength not in a Restricted Band (WLAN Mode b co-transmitting with Bluetooth)

 Project Number:
 100504KBC-T565-E15W/E15B
 Standard:
 FCC15.247

 Company:
 Itronix
 Test Start Date:
 01Nov04

 Product:
 IX260+ with Senao WLAN & Bluetooth
 Test End Date:
 06Dec04

	Senao WLAN Mode b with Bluetooth CH0												
WLAN Channel	Polarity	Distance	Frequency	Carrier Radiated Field Strength	Delta- Marker	Detector	Calculated Band-edge Field Strength	Limit Distance	Duty Cycle Correction	Corrected Calculated Band-edge Field Strength	Specified Limit	Margin	Pass/Fail
>		m	MHz	dBuV/m	dB		dBuV/m	m	dB	dBuV/m	dBuV/m	dB	
1	Н	3	2400.00	102.48	39.28	PK	63.20	3.00	-20.00	43.20	82.48	39.28	Pass
1	Н	3	2400.00	95.68	39.28	AV	56.40	3.00	-20.00	36.40	75.68	39.28	Pass
1	٧	3	2400.00	96.58	43.87	PK	52.71	3.00	-20.00	32.71	82.48	49.77	Pass
1	٧	3	2400.00	89.28	43.87	AV	45.41	3.00	-20.00	25.41	75.68	50.27	Pass

Formulae:

Total CF (dB) = Antenna Factor (dB)+ Cable Factor (dB) + Other Factor (Amplifier Gain, Filter Loss, etc) (dB)

Field Strength (dBuV/m) = SA Reading (dBuV) + Total CF (dB/m)

Limit (dBuV/m) = Published Limit (dBuV/m) + Limit Distance Correction (dB)

Calculated Band-edge Field Strength (dBuV/m) = Carrier Radiated Field Strength (dBuV/m) - Delta-Marker (dB)

Margin (dB) = Limit (dBuV/m) - Field Strength (dBuV/m)

Duty Cycle Correction (dB) = 20 * log (max time transmitting in 100 mS (mS) / 100 mS)

Corrected Calculated Band-edge Field Strength (dBuV/m)= Calculated Band-edge Field Strength (dBuV/m) + Duty Cycle Correction (dB)

Note: Measurements and calculation reference the Marker-Delta Method Described in FCC Public Notice DA 00-705

E.9.2. Band-edge Spurious Field Strength not in a Restricted Band (WLAN Mode g co-transmitting with Bluetooth)

 Project Number:
 100504KBC-T565-E15W/E15B
 Standard:
 FCC15.247

 Company:
 Itronix
 Test Start Date:
 01Nov04

 Product:
 IX260+ with Senao WLAN & Bluetooth
 Test End Date:
 06Dec04

	Senao WLAN Mode g with Bluetooth CH0												
WLAN Channel	Polarity	Distance	Frequency	Carrier Radiated Field Strength	Delta- Marker	Detector	Calculated Band-edge Field Strength	Limit Distance	Duty Cycle Correction	Corrected Calculated Band-edge Field Strength	Specified Limit	Margin	Pass/Fail
>		m	MHz	dBuV/m	dB		dBuV/m	m	dB	dBuV/m	dBuV/m	dB	
1	Н	3	2400.00	103.48	28.39	PK	75.09	3.00	-20.00	55.09	83.48	28.39	Pass
1	н	3	2400.00	98.58	28.39	AV	70.19	3.00	-20.00	50.19	83.48	33.29	Pass
1	٧	3	2400.00	96.18	29.10	PK	67.08	3.00	-20.00	47.08	83.48	36.40	Pass
1	٧	3	2400.00	90.88	29.10	AV	61.78	3.00	-20.00	41.78	83.48	41.70	Pass

Formulae:

 $Total\ CF\ (dB) = Antenna\ Factor\ (dB) + Cable\ Factor\ (dB) + Other\ Factor\ (Amplifier\ Gain,\ Filter\ Loss,\ etc)\ (dB)$

Field Strength (dBuV/m) = SA Reading (dBuV) + Total CF (dB/m)

Limit (dBuV/m) = Published Limit (dBuV/m) + Limit Distance Correction (dB)

 $Calculated\ Band-edge\ Field\ Strength\ (dBuV/m) = Carrier\ Radiated\ Field\ Strength\ (dBuV/m) - Delta-Marker\ (dB)$

Margin (dB) = Limit (dBuV/m) - Field Strength (dBuV/m)

Duty Cycle Correction (dB) = 20 * log (max time transmitting in 100 mS (mS) / 100 mS)

Corrected Calculated Band-edge Field Strength (dBuV/m)= Calculated Band-edge Field Strength (dBuV/m) + Duty Cycle Correction (dB)

Note: Measurements and calculation reference the Marker-Delta Method Described in FCC Public Notice DA 00-705

Applicant: Itronix Corporation | Model: | IX260PNLA580BT | IC ID: | 1943A-IX260Pf | FCC ID: | KBCIX260PNLA580BT | IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth | ITRONIX



Test Report S/N:	022305KBC-T616-E15W/E15B Issu				
Test Date(s):		01Nov04	- 06Dec04		
Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5		
Lab Registration(s):	FCC #714830	IC Lab	File #3874		

E.9.3. Out-of-Band Spurious Field Strength not in a Restricted Band (WLAN Mode b co-transmitting with Bluetooth)

No emissions that could be attributed to the WLAN and Bluetooth co-transmitting were measured within 20 dB of the limit.

E.9.4. Out-of-Band Spurious Field Strength not in a Restricted Band (WLAN Mode g co-transmitting with Bluetooth)

No emissions that could be attributed to the WLAN and Bluetooth co-transmitting were measured within 20 dB of the limit.

E.10. PASS/FAIL

In reference to the results outlined in E.9, the DUT passes the requirements as stated in the reference standards as follows: FCC 15.247 (c): All emissions within any 100kHz bandwidth outside the operating frequency band are greater than 20 dB below the maximum 100 kHz bandwidth signal within the operating band.

E.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.

Russell Pipe

Senior Compliance Technologist

sull W. Pupe

Celltech Labs Inc.

26Nov04

Date



Test Report S/N:	022305KBC-T616-E	15W/E15B	Issue 1.0			
Test Date(s):	01Nov04 - 06Dec04					
Test Type(s):	FCC §15.247 IC RSS-210 Issue					
Lab Registration(s):	FCC #714830	IC Lab	File #3874			

Appendix F - Restricted Band Emissions Measurement

F.1. REFERENCES	
Normative Reference Standard	FCC CFR 47 §15.205 (a) (b), FCC CFR 47 §15.209 (a)
Procedure Reference	FCC 97-114

F.2. LIMITS						
FCC CFR 47 §15.205	(a) Except as shown in paragraph (frequency bands listed below:	d) of this section, only spurious	emissions are permit	ted in any of the		
	MHz	MHz	MHz	GHz		
	0.090-0.110 10.495-0.505 2.1735-2.1905 4.125-4.128 4.17725-4.17775 4.20725-4.20775 6.215-6.218 6.26775-6.26825 6.31175-6.31225 8.291-8.294 8.362-8.366 8.37625-8.38675 8.41425-8.41475 12.29-12.293 12.51975-12.52025 12.57675-12.57725 13.36-13.41. 1 Until February 1, 1999, this restricted 2 Above 38.6	16.69475–16.69525 16.80425–16.80475 25.5–25.67 37.5–38.25 73–74.6 74.8–75.2 108–121.94 123–138 149.9–150.05 156.52475–156.52525 156.7–156.9 162.0125–167.17 167.72–173.2 240–285 322–335.4 band shall be 0.490–0.510 MHz.	399.9-410 608-614 960-1240 1300-1427 1435-1626.5 1645.5-1646.5 1660-1710 1718.8-1722.2 2200-2300 2310-2390 2483.5-2500 2655-2900 3260-3267 3332-3339 3345.8-3358 3600-4400	4.5–5.15 5.35–5.46 7.25–7.75 8.025–8.5 9.0–9.2 9.3–9.5 10.6–12.7 13.25–13.4 14.47–14.5 15.35–16.2 17.7–21.4 22.01–23.12 23.6–24.0 31.2–31.8 36.43–36.5 (2)		
	(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequencies shall not exceed the limits shown in 15.209. At frequencies equal to or less than 1000 MHz, compliance the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quipeak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated using the demonstrated using the demonstrated detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated using the demonstrated demonstrated using the demonstrated demonstrated using the demonstrated demonstrated using the demonstrated demonstrated demonstrated using the demonstrated demonstrated demonstrated using the demonstrated d					
FCC CFR 47 §15.209	(a) Except as provided elsewhere ir the field strength levels specified in		m an intentional radia	ator shall not exceed		
	Frequency	Field Strength	Measur	rement Distance		
	MHz	uV/m		Meters		
	.009 – 0.490	2400/F(kHz)		300		
	0.490 – 1.705	24000/F(kHz)		30		
	1.705 – 30.0	30		30		
	30 – 88	100		3		
	88 – 216	150		3		
	216 - 960	200		3		
	Above 960	500		3		
	(b) In the emission table above, the	tighter limit applies at the band	edges.			

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth							
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Test Report S/N:	022305KBC-T616-E	Issue 1.0		
Test Date(s):	01Nov04 - 06Dec04			
Test Type(s):	FCC §15.247 IC RSS-210 Issue			
Lab Registration(s):	FCC #714830	IC Lab	File #3874	

F.3. ENVIRONMENTAL CONDITIONS				
Temperature	27.4 +/- 2 °C			
Humidity	33 +/- 2 %			
Barometric Pressure	96.24 +/- 0.2 kPa			

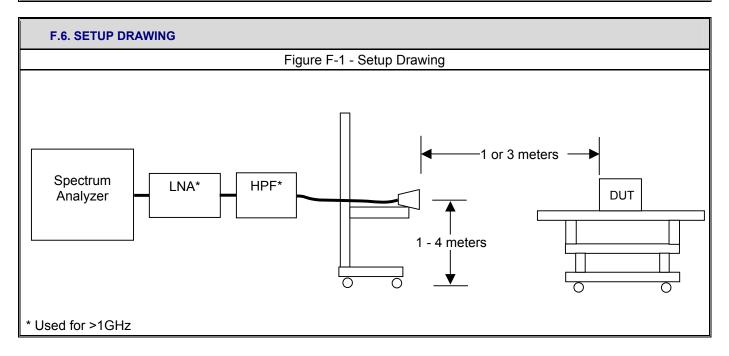
F.4. EQUIPMENT LIST							
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE		
00072	EMCO	2075	Mini-mast	n/a	n/a		
00073	EMCO	2080	Turn Table	n/a	n/a		
00071	EMCO	2090	Multi-Device Controller	n/a	n/a		
00035	ETS	3115	Double Ridged Guide Horn	24Mar04	24Mar05		
00015	Agilent	E4408B	Spectrum Analyzer	29Dec03	29Dec04		
00049	HP	8566B	Spectrum Analyzer RF Section	18May04	18May05		
00047	HP	85685A	RF Preselector	18May04	18May05		
00048	Gore	65474	Microwave Cable	20May04	20May05		
00030	HP	83017A	LNA	20May04	20May05		

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth							(ITRONIX)



Test Report S/N:	022305KBC-T616-E	Issue 1.0		
Test Date(s):	01Nov04 - 06Dec04			
Test Type(s):	FCC §15.247 IC RSS-210 Issue			
Lab Registration(s):	FCC #714830	IC Lab	File #3874	

MEASUREMENT EQUIPMENT CONNECTIONS		The measurement equipment was connected as shown in F.6. A number of antennas were used to cover the applicable frequency range test. The ranges in which each antenna was used are as follows:				
	Frequency Range		An	tenna		
	1 GHz – 18 GHz		ETS 3115 Horn			
	The spectrum analyzer was s	The spectrum analyzer was set to the following settings:				
MEASUREMENT	Frequency Range	RBW	VBW	Detector		
EQUIPMENT	MHz	kHz	kHz	Detector		
SETTINGS	> 1000	1000*	1000	Peak*		



Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth							(ITRONIX)



Test Report S/N:	022305KBC-T616-E	Issue 1.0		
Test Date(s):	01Nov04 - 06Dec04			
Test Type(s):	FCC §15.247	IC RSS-210 Issue 5		
Lab Registration(s):	FCC #714830	IC Lab	File #3874	

F.7. SETUP PHOTOGRAPHS

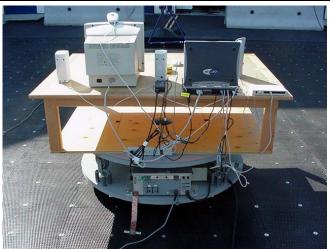
Photograph F-1 - 3115 Horn Antenna



Photograph F-2 - Front of Radiated Emission Configuration



Photograph F-3 - Back of Radiated Emission Configuration



F.8. DUT OPERATING DESCRIPTION

Measurements were made of the bands that may contain inter-modulation products with both the Bluetooth and WLAN radios transmitting. Measurements were made for each combination of WLAN channels and Modes (low and high, Mode b and g) with the Bluetooth transmitter hopping or on a worst-case channel when defined.

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth						ITRONIX	



Test Report S/N:	022305KBC-T616-E	Issue 1.0		
Test Date(s):	01Nov04 - 06Dec04			
Test Type(s):	FCC §15.247 IC RSS-210 Issue			
Lab Registration(s):	FCC #714830	IC Lab	File #3874	

F.9. TEST RESULTS

F.9.1. Band-edge Spurious Field Strength adjacent a Restricted Band (WLAN Mode b co-transmitting with Bluetooth)

Celltech

Project Number: 100504KBC-T565-E15W/E15B

Standard: FCC15.247

 Company:
 Itronix
 Test Start Date:
 01Nov04

 Product:
 IX260+ with Senao WLAN & Bluetooth
 Test End Date:
 06Dec04

	Senao WLAN Mode b with Bluetooth CH78													
WLAN Channel	Polarity	Distance	Frequency	Carrier Radiated Field Strength	Delta- Marker	Detector	Calculated Band-edge Field Strength	Limit Distance	Duty Cycle Correction	Corrected Calculated Band-edge Field Strength	Specified Limit	Margin	Pass/Fail	
>		m	MHz	dBuV/m	dB		dBuV/m	m	dB	dBuV/m	dBuV/m	dB		
11	Ι	3	2483.50	106.27	41.97	PK	64.30	3.00	-20.00	44.30	73.98	29.68	Pass	
11	Н	3	2483.50	98.27	41.97	AV	56.30	3.00	-20.00	36.30	53.98	17.68	Pass	
11	٧	3	2483.50	97.77	49.07	PK	48.70	3.00	-20.00	28.70	73.98	45.28	Pass	
11	٧	3	2483.50	89.67	49.07	AV	40.60	3.00	-20.00	20.60	53.98	33.38	Pass	

Formulae:

Total CF (dB) = Antenna Factor (dB)+ Cable Factor (dB) + Other Factor (Amplifier Gain, Filter Loss, etc) (dB)

Field Strength (dBuV/m) = SA Reading (dBuV) + Total CF (dB/m)

Limit (dBuV/m) = Published Limit (dBuV/m) + Limit Distance Correction (dB)

Calculated Band-edge Field Strength (dBuV/m) = Carrier Radiated Field Strength (dBuV/m) - Delta-Marker (dB)

Margin (dB) = Limit (dBuV/m) - Field Strength (dBuV/m)

Duty Cycle Correction (dB) = 20 * log (max time transmitting in 100 mS (mS) / 100 mS)

Corrected Calculated Band-edge Field Strength (dBuV/m)= Calculated Band-edge Field Strength (dBuV/m)+ Duty Cycle Correction (dB)

Note: Measurements and calculation reference the Marker-Delta Method Described in FCC Public Notice DA 00-705

F.9.2. Band-edge Spurious Field Strength adjacent a Restricted Band (WLAN Mode g co-transmitting with Bluetooth)

Celltech

 Project Number:
 100504KBC-T565-E15W/E15B
 Standard:
 FCC15.247

 Company:
 Itronix
 Test Start Date:
 01Nov04

 Product:
 IX260+ with Senao WLAN & Bluetooth
 Test End Date:
 06Dec04

	Senao WLAN Mode g with Bluetooth CH78													
WLAN Channel	Polarity	Distance	Frequency	Carrier Radiated Field Strength	Delta- Marker	Detector	Calculated Band-edge Field Strength	Limit Distance	Duty Cycle Correction	Corrected Calculated Band-edge Field Strength	Specified Limit	Margin	Pass/Fail	
>		m	MHz	dBuV/m	dB		dBuV/m	m	dB	dBuV/m	dBuV/m	dB		
11	Н	3	2483.50	111.57	46.22	PK	65.35	3.00	-20.00	45.35	73.98	28.63	Pass	
11	Н	3	2483.50	102.07	46.22	AV	55.85	3.00	-20.00	35.85	53.98	18.13	Pass	
11	٧	3	2483.50	105.87	48.07	PK	57.80	3.00	-20.00	37.80	73.98	36.18	Pass	
11	٧	3	2483.50	96.67	48.07	AV	48.60	3.00	-20.00	28.60	53.98	25.38	Pass	

Formulae:

Total CF (dB) = Antenna Factor (dB)+ Cable Factor (dB) + Other Factor (Amplifier Gain, Filter Loss, etc) (dB)

Field Strength (dBuV/m) = SA Reading (dBuV) + Total CF (dB/m)

Limit (dBuV/m) = Published Limit (dBuV/m) + Limit Distance Correction (dB)

Calculated Band-edge Field Strength (dBuV/m) = Carrier Radiated Field Strength (dBuV/m) - Delta-Marker (dB)

Margin (dB) = Limit (dBuV/m) - Field Strength (dBuV/m)

Duty Cycle Correction (dB) = 20 * log (max time transmitting in 100 mS (mS) / 100 mS)

Corrected Calculated Band-edge Field Strength (dBuV/m)= Calculated Band-edge Field Strength (dBuV/m) + Duty Cycle Correction (dB)

Note: Measurements and calculation reference the Marker-Delta Method Described in FCC Public Notice DA 00-705

Applicant: Itronix Corporation Model: IX260PNLA580BT IC ID: 1943A-IX260Pf FCC ID: KBCIX260PNLA580BT IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth



Test Report S/N:	022305KBC-T616-E	15W/E15B	Issue 1.0						
Test Date(s):		01Nov04 - 06Dec0							
Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5						
Lab Registration(s):	FCC #714830	IC Lab	File #3874						

PK

3.00

0.00

0.00

53.98

73.98

39.28

47.55

F.9.3. Out-of-Band Spurious Field Strength within a Restricted Band (WLAN Mode b co-transmitting with Bluetooth)

Celltech

Company:

100504KBC-T565-E15W/E15B Itronix IX260+ with WLAN and Bluetooth Standard: Test Start Date: Test End Date: FCC15.209 01Nov04 06Dec04

14.70

26.43

PASS

	WLAN Mode b with Bluetooth Hopping																			
Channel	Polarity	Distance	Rx Antenna	Frequency	SA Level	Noise Floor	Rx AF	Rx CL	Other Rx	Total Rx CF	Field Strength	Duty Cycle Correction	Corrected Field Strength	Detector	Limit Distance	Limit Distance Correction	Calculated Limit	Lower Limit	Margin	Pass/Fail
		m		MHz	dBuV		dB/m	dB	dB	dB/m	dBuV/m	dB	dBuV/m	(PK/QP/AV)	m	dB	dBuV/m		dB	
1	Н	3	Horn SN6276	2390.00	55.60		30.22	3.47	-27.40	6.29	61.89	-20.00	41.89	PK	3.00	0.00	53.98	*	12.09	PASS
1	Н	3	Horn SN6276	7404.75	56.50		38.53	6.35	-34.32	10.56	67.06	-20.00	47.06	PK	3.00	0.00	73.98		26.92	PASS
1	Н	3	Horn SN6276	7404.75	43.10		38.53	6.35	-34.32	10.56	53.66	-20.00	33.66	AV	3.00	0.00	53.98		20.32	PASS
1	Н	3	Horn SN6276	2390.00	50.80		30.22	3.47	-27.40	6.29	57.09	-20.00	37.09	PK	3.00	0.00	53.98	*	16.89	PASS
1	V	3	Horn SN6276	4802.50	53.10		35.31	4.96	-34.08	6.18	59.28	-20.00	39.28	PK	3.00	0.00	53.98	*	14.70	PASS
1	V	3	Horn SN6276	7408.25	57.20		38.53	6.36	-34.32	10.57	67.77	-20.00	47.77	PK	3.00	0.00	73.98		26.20	PASS
1	V	3	Horn SN6276	7408.25	43.20		38.53	6.36	-34.32	10.57	53.77	-20.00	33.77	AV	3.00	0.00	53.98	П	20.20	PASS
11	Н	3	Horn SN6276	2688.90	50.10		31.00	3.65	-26.98	7.68	57.78	-20.00	37.78	PK	3.00	0.00	53.98	*	16.20	PASS
11	Н	3	Horn SN6276	7427 50	55.00		38 57	6.40	-34.32	10.65	65 65	-20.00	45.65	PK	3.00	0.00	73.98		28 33	PASS

59.28

-20.00

-20.00

Formulae

Total CF (dB) = Antenna Factor (dB)+ Cable Factor (dB) + Other Factor (Amplifier Gain, Filter Loss, etc) (dB)

35.31

4.96

53.10

Field Strength (dBuV/m) = SA Reading (dBuV) + Total CF (dB/m)

Limit Distance Correction (dB) = 40 * log(d1/d2) for f < 30 MHz, 20*log(d1/d2) for f > 30 MHz, where d1 is the measurement distance and d2 is the published limit distance

-34.08

6.18

10.45

Limit (dBuV/m) = Published Limit (dBuV/m) + Limit Distance Correction (dB)

4802.50

 $Margin \ (dB) = Limit \ (\underline{dBuV/m}) - Field \ Strength \ (dBuV/m)$

Horn SN6276

*The frequency points reported describe the highest local emission measured and are used to describe the measured intermodulation product. No out-of-band emissions were measured above the levels noted.

Where there is acceptable margin between the peak emission reported and the average limit stated, the average limit is referenced. Where the average limit is exceeded by the peak emission or the margin unacceptable, the peak limit is referenced and an average measurement made and referenced to the average limit.



Test Report S/N:	022305KBC-T616-E	Issue 1.0					
Test Date(s):	01Nov04 - 06Dec0						
Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5				
Lab Registration(s):	FCC #714830	IC Lab	File #3874				

F.9.4. Out-of-Band Spurious Field Strength within a Restricted Band (WLAN Mode g co-transmitting with Bluetooth)

Celltech

Project Number: Company: 100504KBC-T565-E15W/E15B Itronix IX260+ with WLAN and Bluetooth

Standard: Test Start Date: Test End Date: FCC15.209 01Nov04 06Dec04

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	WLAN Mode g with Bluetooth Hopping																			
Channel	Polarity	Distance	Rx Antenna	Frequency	SA Level	Noise Floor	Rx AF	Rx CL	Other Rx	Total Rx CF	Field Strength	Duty Cycle Correction	Corrected Field Strength	Detector	Limit Distance	Limit Distance Correction	Calculated Limit	Lower Limit	Margin	Pass/Fail
		m		MHz	dBuV		dB/m	dB	dB	dB/m	dBuV/m	dB	dBuV/m	(PK/QP/AV)	m	dB	dBuV/m		dB	
1	Н	3	Horn SN6276	2390.00	86.80		30.22	3.47	-37.40	-3.71	83.09	-20.00	63.09	PK	3.00	0.00	73.98		10.89	PASS
1	Н	3	Horn SN6276	2390.00	67.80		30.22	3.47	-37.40	-3.71	64.09	-20.00	44.09	AV	3.00	0.00	53.98		9.89	PASS
1	Н	3	Horn SN6276	2688.00	50.90		31.00	3.65	-26.98	7.67	58.57	-20.00	38.57	PK	3.00	0.00	53.98	*	15.41	PASS
1	Н	3	Horn SN6276	7275.25	57.30		38.30	6.31	-34.32	10.28	67.58	-20.00	47.58	PK	3.00	0.00	73.98		26.39	PASS
1	Н	3	Horn SN6276	7275.25	43.40		38.30	6.31	-34.32	10.28	53.68	-20.00	33.68	AV	3.00	0.00	53.98		20.29	PASS
1	٧	3	Horn SN6276	2390.00	66.70		30.22	3.47	-37.40	-3.71	62.99	-20.00	42.99	PK	3.00	0.00	53.98	*	10.99	PASS
1	٧	3	Horn SN6276	2687.90	52.90		31.00	3.65	-26.98	7.67	60.57	-20.00	40.57	PK	3.00	0.00	53.98	*	13.41	PASS
1	٧	3	Horn SN6276	7275.25	57.90		38.30	6.31	-34.32	10.28	68.18	-20.00	48.18	PK	3.00	0.00	73.98	П	25.79	PASS
1	٧	3	Horn SN6276	7275.25	43.40		38.30	6.31	-34.32	10.28	53.68	-20.00	33.68	AV	3.00	0.00	53.98	П	20.29	PASS
11	Н	3	Horn SN6276	2688.00	51.90		31.00	3.65	-20.76	13.89	65.79	-20.00	45.79	PK	3.00	0.00	73.98		28.19	PASS
11	Н	3	Horn SN6276	2688.00	39.00		31.00	3.65	-20.76	13.89	52.89	-20.00	32.89	AV	3.00	0.00	53.98	П	21.09	PASS
11	Н	3	Horn SN6276	4949.50	48.90		35.60	5.05	-26.03	14.62	63.52	-20.00	43.52	PK	3.00	0.00	53.98	*	10.46	PASS
11	Н	3	Horn SN6276	7368.00	55.20		38.46	6.33	-34.32	10.48	65.68	-20.00	45.68	PK	3.00	0.00	73.98		28.30	PASS
11	Н	3	Horn SN6276	7368.00	43.10		38.46	6.33	-34.32	10.48	53.58	-20.00	33.58	AV	3.00	0.00	53.98		20.40	PASS
11	٧	3	Horn SN6276	4949.50	50.10		35.60	5.05	-34.09	6.56	56.66	-20.00	36.66	PK	3.00	0.00	53.98	*	17.32	PASS

ormulae:

Total CF (dB) = Antenna Factor (dB)+ Cable Factor (dB) + Other Factor (Amplifier Gain, Filter Loss, etc) (dB)

Field Strength (dBuV/m) = SA Reading (dBuV) + Total CF (dB/m)

Limit Distance Correction (dB) = 40* log(d1/d2) for f < 30 MHz, 20*log(d1/d2) for f >30 MHz; where d1 is the measurement distance and d2 is the published limit distance

Limit (dBuV/m) = Published Limit (dBuV/m) + Limit Distance Correction (dB)

Margin (dB) = Limit (dBuV/m) - Field Strength (dBuV/m)

*The frequency points reported describe the highest local emission measured and are used to describe the measured intermodulation product of interest. No out-of-band emissions were measured above the levels noted.

Where there is acceptable margin between the peak emission reported and the average limit stated, the average limit is referenced. Where the average limit is exceeded by the peak emission or the margin unacceptable, the peak limit is referenced and an average measurement made and referenced to the average limit.



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Lab Registration(s):	FCC #714830	IC Lab	File #3874				

F.10. PASS/FAIL

In reference to the results outlined in F.9, the DUT passes the requirements as stated in the reference standards as follows: FCC 15.205 (a) (b) and 15.209 (a): No emissions were measured within the restricted bands as outlined in 15.205 that exceeded the limits stated in 15.209.

F.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.

Russell Pipe

Senior Compliance Technologist

Cural W. Rupe

Celltech Labs Inc.

26Nov04

Date



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Appendix G - Maximum Permissible Exposure Calculation

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

G.2. LIMITS	
FCC CFR 47§1.1310 Table 1(b)	1.0 mW/cm ²

G.3. ENVIRONMENTAL COND	DITIONS
Temperature	na
Humidity	na
Barometric Pressure	na

G.4. EQUIPME	NT LIST											
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE							
na na												

G.5. MEASUREMENT EQUIPMENT SETUP				
	The results described herein were determined by the calculation, so no measurement equipment was used.			
MEASUREMENT EQUIPMENT SETTINGS	na			

G.6. SETUP PHOTOS	
na	

G.7. SETUP DRAWINGS	
na	

G.8. DUT OPERATING DESCRIPTION					
Bluetooth	The maximum Bluetooth conducted power used for these calculations was measured on Channel 0, with a power setting of 220/45 while the WLAN was transmitting on Channel 1 Mode g with an AGC setting of (0,8).				
WLAN	The maximum WLAN conducted powers used for these calculations were measured on Channel 1 for Mode b and Channel 7 for Mode g, with an AGC setting of (0,8) while the Bluetooth transmitter was transmitting a data stream with a max. power setting of (220/45).				

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth							
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(MHz)

(dBm)

(dBi)

20.43

G.9. TEST RESULTS

G.9.1. Single-Transmit Calculations:

RangeStar Internal Antenna (WLAN 802.11b mode):

Tx Frequency: RF Output Power at Antenna Input Terminal: Antenna gain:

> 1.00 (mW/cm²) 110.4079 (mW) 2.82 (numeric)

4.98 R = (cm)

> S at 20cm: (mW/cm^2) 0.06183856

RangeStar Internal Antenna (WLAN 802.11g mode):

Tx Frequency: 2437 (MHz) RF Output Power at Antenna Input Terminal: 20.21 (dBm) Antenna gain: (dBi)

> 1.00 (mW/cm²) 104.9542 (mW) 2.82 (numeric)

R = 4.85 (cm)

> S at 20cm: 0.058784032 (mW/cm²)



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RangeStar Internal Antenna (Bluetooth):

Tx Frequency:

2402 (MHz)

RF Output Power at Antenna Input Terminal:

nput Terminal: 16.56 (dBm)
Antenna gain: 4.50 (dBi)

S= 1.00 (mW/cm^2) P= 45.2898 (mW) G= 2.82 (numeric)

R = 3.19 (cm)

S at 20cm: 0.025366431 (mW/cm^2)

Formulae:

S = PG $4 R^2$

where: S = Power Density Limit

P = Power Applied to the Antenna

G = Numeric Antenna Gain $= \sqrt{\underline{P}}$ R = Distance from Antenna

Results:

Mode	Power Density Limit	RF Conducted Output Power	Antenna Gain	MPE Distance	Power Density at 20 cm
	mW/cm ²	dBm	dBi	cm	mW/cm ²
WLAN (802.11b)	1.0	20.43	4.5	4.98	0.062
WLAN (802.11g)	1.0	20.21	4.5	4.85	0.059
Bluetooth (CH0)	1.0	16.56	4.5	3.19	0.025

G.9.2. Co-Transmit MPE Calculations

Radio	20 cm Power Density	Ratio	Limit
	mW/cm ²	(S/Limit)	mW/cm ²
Highest WLAN	0.062	0.062	1
Bluetooth	0.025	0.025	1
	Sum =	0.087	1

Applicant:	Itronix Corporation	Model:	IX260PNLA580BT	IC ID:	1943A-IX260Pf	FCC ID:	KBCIX260PNLA580BT
IX260+ Rugged Laptop PC with internal Senao NL-3054MP 802.11b/g WLAN and Cirronet BT2022 Bluetooth					(ITRONIX)		



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Test Type(s):	FCC §15.247	IC RSS-2	210 Issue 5
Lab Registration(s):	FCC #714830	IC Lab	File #3874

G.10. PASS/FAIL

In reference to the results outlined in G.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 1 mW/cm².

G.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.

Duane M. Friesen, C.E.T.

EMC Manager Celltech Labs Inc.

06Dec04

Date



Test Report S/N:	022305KBC-T616-E	Issue 1.0	
Test Date(s):	01Nov04 - 06Dec04		
Test Type(s):	FCC §15.247 IC RSS-210 Issue 9		
Lab Registration(s):	FCC #714830 IC Lab File #387		

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