

DECLARATION OF COMPLIANCE MPE EVALUATION REPORT

Test Lab

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Applicant Information

ITRONIX CORPORATION

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FCC Rule Part(s):	47 CFR §24(E), §22(H); §15.247; §2.1091; §1.1310
IC Rule Part(s):	RSS-133 Issue 2, RSS-132 Issue 1 (Provisional), RSS-210 Issue 5, RSS-102 Issue 1 (Provisional)
FCC Classification:	PCS Licensed Transmitter (PCB)
IC Classification:	2 GHz Personal Communication Services (RSS-133) 800 MHz Cellular Telephones Employing New Technologies (RSS-132)
Device Type:	Rugged Laptop PC with Sony Ericsson GC82 GSM Radio Modem (co-located with Cisco MPI-350 Mini-PCI 2.4GHz DSSS WLAN Card) with External Swivel Dipole Antenna (GSM), Internal Antenna (WLAN), External Mobile Vehicle-Mount Antenna (GSM), & Vehicle Cradle
FCC ID:	KBCIX260MPIGC82
Model(s):	IX260
Tx Frequency Range(s):	1850.2 - 1909.8 MHz (PCS GSM) 824.2 - 848.8 MHz (Cellular GSM) 2412 - 2462 MHz (WLAN)
Max. Conducted Power Measured:	30.06 dBm Peak (PCS GSM) / 32.37 dBm Peak (Cellular GSM) 21.2 dBm Peak (WLAN)
Mode(s) / Time Slot(s) Tested:	GSM EDGE / 2-out-of-8 Time Slots (Max. Data Rate: 61.85 kbps per slot)
Source-Based Time-Av. Duty Cycle:	25 %
Max. Source-Based Time-Av. Cond. Pwr:	24.04 dBm Peak (PCS GSM) / 26.35 dBm Peak (Cellular GSM)
Antenna Type(s) Evaluated:	Itronix IX260 External Swivel Dipole (GSM) Rangestar P/N: 100929 802.11b Dual Internal Surface-Mount (WLAN) MaxRad 3 dBi Gain Vehicle-Mount P/N: WMLPVDB800/1900 (GSM)

This mobile device, with internal co-located transmitters, is determined to be compliant with localized Maximum Permissible Exposure (MPE) for Uncontrolled Exposure / General Population limits specified in FCC 47 CFR §1.1310 and Industry Canada RSS-102 Issue 1 (Provisional), in accordance with the requirements of FCC OET Bulletin 65, Edition 97-01, Health Canada's Safety Code 6, ANSI / IEEE C95.1-1992, and ANSI / IEEE C95.3-1992.

I attest to the accuracy of data. All measurements and/or calculations were performed by me or were made 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 evaluation 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.



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Senior Compliance Technologist
Celltech Labs Inc.



1.1 MPE Calculation Data

1. Itronix IX260 Swivel Dipole Antenna

PCS GSM Band

Tx Frequency: **1880.00** (MHz)
 Source-Based Time-Averaged Power at Antenna Input Terminal: **24.04** (dBm)
 Antenna gain: **2.60** (dBi)

S= **1.00** (mW/cm²)
 P= **253.5129** (mW)
 G= **1.82** (numeric)

R = 6.06 (cm)

Field Density @ 20 cm = 0.092 (mW/cm²)

Cellular GSM Band

Tx Frequency: **848.80** (MHz)
 Source-Based Time-Averaged Power at Antenna Input Terminal: **26.35** (dBm)
 Antenna gain: **2.60** (dBi)

S= **0.57** (mW/cm²)
 P= **431.5191** (mW)
 G= **1.82** (numeric)

R = 10.51 (cm)

Field Density @ 20 cm = 0.156 (mW/cm²)



Itronix IX260
Swivel Dipole Antenna

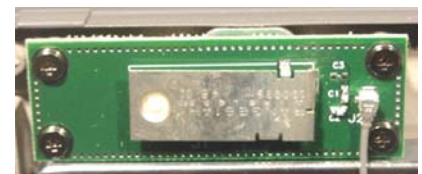
2. Rangestar 802.11b Internal Antenna

Tx Frequency: **2450.00** (MHz)
 Maximum Peak Power at Antenna Input Terminal: **21.20** (dBm)
 Antenna gain: **4.50** (dBi)

S= **1.00** (mW/cm²)
 P= **131.8257** (mW)
 G= **2.82** (numeric)

R = 5.44 (cm)

Field Density @ 20 cm = 0.074 (mW/cm²)



Rangestar 802.11b Internal Antenna

MPE Calculation Data (Cont.)

According to FCC training materials (May 2003):

Multiple frequency exposure criteria, the ratio of field strength or power density to the applicable exposure limit at the exposure location should be determined for each transmitter and the sum of these ratios must not exceed 1.0.

Ratio 1	Ratio 2	Limit
0.156/0.6	0.074/1.0	< 1.0
= 0.260	= 0.074	< 1.0
Sum = 0.334 (mW/cm ²)		< 1.0

3. MaxRad 3 dBi Gain Vehicle-Mount Antenna (P/N: WMLPVDB800/1900)

PCS GSM Band

Tx Frequency: 1880.00 (MHz)
 Source Based Time Averaged Power at Antenna Input Terminal: 24.04 (dBm)
 3 dBi Antenna Gain minus 2.80 dB cable loss for 17 ft cable: 0.20 (dBi)

S= 1.00 (mW/cm²)
 P= 253.5129 (mW)
 G= 1.05 (numeric)

R = 4.60 (cm)

Field Density @ 20 cm = 0.053 (mW/cm²)

Cellular GSM Band

Tx Frequency: 848.80 (MHz)
 Source Based Time Averaged Power at Antenna Input Terminal: 26.35 (dBm)
 3 dBi Antenna Gain minus 1.89 dB cable loss for 17 ft cable: 1.11 (dBi)

S= 0.57 (mW/cm²)
 P= 431.5191 (mW)
 G= 1.29 (numeric)

R = 8.85 (cm)

Field Density @ 20 cm = 0.111 (mW/cm²)



MaxRad 3 dBi Gain Vehicle-Mount Antenna
P/N: WMLPVDB800/1900

2.1 Calculation to determine MPE

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

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

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

3.1 MPE Limits

According to FCC 47 CFR 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b).

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
(A)Limits For Occupational / Control Exposures				
30-300	61.4	0.163	1.0	6
300-1500	...	...	F/300	6
1500-100,000	...	...	5	6
(B)Limits For General Population / Uncontrolled Exposure				
30-300	27.5	0.073	0.2	30
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

4.1 Summary

The Maximum Permissible Exposure (MPE) limit (General Population / Uncontrolled Exposure environment) for the frequency range in the PCS GSM band (1850-1910 MHz) is 1.0 mW/cm²; the limit for the frequency range in the cellular GSM band (824-849 MHz) is 0.6 mW/cm² (F/1500); and the limit for the WLAN frequency range (2412-2462 MHz) is 1.0 mW/cm². The data in this report demonstrates that the Itronix Corporation Model: IX260 Rugged Laptop PC FCC ID: KBCIX260MPIGC82 with Sony Ericsson GC82 GSM Radio Modem with external dipole antenna and mobile vehicle-mount antenna; co-located with Cisco MPI-350 Mini-PCI DSSS WLAN Card and internal dual surface-mount antenna, complies with the Maximum Permissible Exposure (MPE) requirements specified in FCC §2.1091, §1.1310, OET Bulletin 65 (Edition 97-01), and Health Canada's Safety Code 6 for the General Population / Uncontrolled Exposure environment.

Notes:

1. The 17 ft antenna cable is supplied with and connected to the vehicle antenna at time of purchase.