

Test Report Serial No.:	050405KBC-T636-E24C	Issue 1
Test Date(s):	30Mar05 - 19Apr05	
Test Standard(s):	FCC §2, §22H, §24E	IC RSS-132/133
Lab Registration(s):	FCC #714830	IC Lab File #3874

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)	Frequency	Power Density
	300 – 1500 MHz	f/1500 mW/cm ²
	1500 – 100,000 MHz	1.0 mW/cm ²

G.3. ENVIRONMENTAL CONDITIONS

Temperature	na
Humidity	na
Barometric Pressure	na

G.4. EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL	CAL DUE
na					

G.5. 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 C and E of this report.
MEASUREMENT EQUIPMENT SETTINGS	na

G.6. SETUP PHOTOS

na

G.7. SETUP DRAWINGS

na

G.8. DUT OPERATING DESCRIPTION

Dual-Band CDMA	Power Measurement: The Dual-Band CDMA modem was set to transmit on the channel with the highest conducted output power in each band with power settings equivalent to that described in Section B.8 of this test report.
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G.9. TEST RESULTS

G.9.1. DUT with Attached Swivel Dipole Antenna Calculations:

External Swivel Dipole Antenna (Highest Power Cellular CDMA Channel):

Ratio of Time on vs Total TX Time **1.00**

Tx Frequency:	848.31	(MHz)
RF Output Power at Antenna Input Terminal:	23.61	(dBm)
Source-Based Time -Average Factor:	0.00	(dB)
Source-Based Time-Averaged RF Output Power at Antenna Input Terminal:	23.61	(dBm)
Antenna gain:	2.60	(dBi)

S = **0.57** (mW/cm²)
P = **229.6149** (mW)
G = **1.82** (numeric)

R = 7.67 (cm)

S at 20cm: **0.083034652** (mW/cm²)

External Swivel Dipole Antenna (Highest Power PCS CDMA Channel):

Ratio of Time on vs Total TX Time **1.00**

Tx Frequency:	1880.00	(MHz)
RF Output Power at Antenna Input Terminal:	25.07	(dBm)
Source-Based Time -Average Factor:	0.00	(dB)
Source-Based Time-Averaged RF Output Power at Antenna Input Terminal:	25.07	(dBm)
Antenna gain:	2.60	(dBi)

S = **1.00** (mW/cm²)
P = **321.3661** (mW)
G = **1.82** (numeric)

R = 6.82 (cm)

S at 20cm: **0.116214246** (mW/cm²)

Formulae:

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

where: S = Power Density Limit
P = Power Applied to the Antenna
G = Numeric Antenna Gain
R = Distance from Antenna

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

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G.9.2. DUT with Vehicle-Mount Antenna Calculations:

Vehicle-Mount Antenna (Highest Power Cellular CDMA Channel):

Ratio of Time on vs Total TX Time **1.00**

Tx Frequency:	848.31	(MHz)
RF Output Power at Antenna Input Terminal:	23.61	(dBm)
Source-Based Time -Average Factor:	0.00	(dB)
Source-Based Time-Averaged RF Output Power at Antenna Input Terminal:	23.61	(dBm)
Antenna gain:	3.00	(dBi)

S= 0.57 (mW/cm²)
P= 229.6149 (mW)
G= 2.00 (numeric)

R = 8.03 (cm)

S at 20cm: 0.091045685 (mW/cm²)

Vehicle-Mount Antenna (Highest Power PCS CDMA Channel):

Ratio of Time on vs Total TX Time **1.00**

Tx Frequency:	1880.00	(MHz)
RF Output Power at Antenna Input Terminal:	25.07	(dBm)
Source-Based Time -Average Factor:	0.00	(dB)
Source-Based Time-Averaged RF Output Power at Antenna Input Terminal:	25.07	(dBm)
Antenna gain:	3.00	(dBi)

S= 1.00 (mW/cm²)
P= 321.3661 (mW)
G= 2.00 (numeric)

R = 7.14 (cm)

S at 20cm: 0.127426386 (mW/cm²)

Formulae:

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

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

where: S = Power Density Limit
P = Power Applied to the Antenna
G = Numeric Antenna Gain
R = Distance from Antenna

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Results:

Band / 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
Dipole Antenna					
Cellular - CDMA	0.57	23.61	2.6	7.67	0.08303
PCS - CDMA	1.00	25.07	2.6	6.82	0.1162
Vehicle Antenna					
Cellular - CDMA	0.57	23.61	3.0	8.03	0.09104
PCS - CDMA	1.00	25.07	3.0	7.14	0.1274

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:

FCC CFR 47§1.1310 Table 1(b) 1) The DUT must comply with the minimum spacing requirement of 20 cm to ensure an exposure of not more than $f/1500$ (0.57) mW/cm² for frequencies between 300 and 1500 MHz and 1 mW/cm² for frequencies between 1500 and 100,000 MHz.

The calculated power density at a 20 cm distance for the cellular band is 0.08303 mW/cm² for the attached swivel dipole antenna configuration, and 0.09104 mW/cm² for the vehicle-mount antenna configuration. The calculated power density at a 20 cm distance for the PCS band is 0.1162 mW/cm² for the swivel dipole antenna configuration, and 0.1274 mW/cm² for the vehicle-mount antenna configuration.


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.

21Apr05
Date

Applicant:	Itronix Corporation	FCC ID:	KBCIX260PLUSAC580	IC ID:	1943A-IX260Pf	
Rugged Laptop PC with Sierra Wireless AirCard 580 Dual-Band CDMA Modem				Model:	IX260PLUSAC580	
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