DECLARATION OF COMPLIANCE
FCC PART 24(E) EMC MEASUREMENTS

Test Lab

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Applicant Information

ITRONIX CORPORATION
801 South Stevens Street
Spokane, WA 99204
United States

FCC IDENTIFIER:	**KBCIX100XAC750**
IC IDENTIFIER:	**1943A-IX100Xa**
Model(s):	**IX100XAC750**

FCC Rule Part(s):	**FCC 47 CFR §24(E), §2**
IC Rule Part(s):	**RSS-133 Issue 2**
Test Procedure(s):	**FCC 47 CFR §24(E), §2; ANSI TIA/EIA-603-A-2001**
FCC Device Classification:	**PCS Licensed Transmitter (PCB)**
IC Device Classification:	**2GHz Personal Communication Services (RSS-133 Issue 2)**

Device Type:	**Rugged Handheld PC with Sierra Wireless AirCard 750 PCS GPRS PCMCIA Modem**
Tx Frequency Range:	**1850.2 - 1909.8 MHz**
Max. EIRP Measured (MaxRad):	**0.214 Watts (23.31 dBm)**
RF Conducted Power Tested:	**28.7 dBm - Peak (1850.2 MHz)** **28.6 dBm - Peak (1880.0 MHz)** **28.6 dBm - Peak (1909.8 MHz)**
No. of Time Slots Tested:	**4 (Class 12)**
Source-Based Time-Av. Duty Cycle:	**50 %**
Source-Based Time-Av. Cond. Pwr:	**25.7 dBm Peak (1850.2 MHz)** **25.6 dBm Peak (1880.0 MHz)** **25.6 dBm Peak (1909.8 MHz)**
Modulation(s) Tested:	**GMSK**
Emission Designator:	**271KGXW**
Frequency Tolerance(s):	**0.1 PPM**
Antenna Type(s) Tested:	**MaxRad 3 dBi Gain Vehicle-Mount P/N: WMLPVDB800/1900**
Power Source(s) Tested:	**12V AC Adapter (Magic Power Model: MPE-C045-12-R-1)**

Class II Permissive Change(s):	**1. Add Vehicle Cradle (Itronix P/N: 50-0107-001)** **2. Add Vehicle-Mount Antenna (MaxRad P/N: WMLPVDB800/1900)**

This wireless portable 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 §24(E), §2, Industry Canada RSS-133 Issue 2, and ANSI TIA/EIA-603-A-2001.

I attest to the accuracy of data. All measurements reported herein 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 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.

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EMC Manager
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FCC PART 24(E) EMC MEASUREMENT REPORT

1.1 SCOPE

This report describes the measurements made and results collected during the Electromagnetic emissions testing of the Itronix Corporation IX100X Rugged Handheld PC incorporating the internal Sierra Wireless AirCard 750 PCS GSM GPRS PCMCIA Modem, with the Class II Permissive Change(s) adding a vehicle cradle and vehicle-mount antenna. 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 Parts 24(E), and 2.

2.1 GENERAL INFORMATION

APPLICANT		**ITRONIX CORPORATION**		**801 South Stevens Street Spokane, WA 99210**			
FCC IDENTIFIER		KBCIX100XAC750					
Model(s)		IX100XAC750					
Serial No.(s)		T02052201101013		AirCard 750		Production Unit	
		510495001-U5103-0025		IX100X		Identical Prototype	
		05		Vehicle Cradle		Identical Prototype	
Device Type		Rugged Handheld PC with internal AirCard 750 PCS GSM GPRS PCMCIA Modem					
Class II Permissive Change(s)		1. Add Vehicle Cradle (Itronix P/N: 50-0107-001)					
		2. Add Vehicle-Mount Antenna (MaxRad P/N: WMLPVDB800/1900)					
FCC	**Rule Part(s)**	47 CFR §24(E), §2					
	Classification(s)	PCS Licensed Transmitter (PCB)					
IC	**Rule Part(s)**	RSS-133 Issue 2					
	Classification(s)	2GHz Personal Communication Services					
Test Procedure(s)		FCC 47 CFR §24(E), §2; ANSI TIA/EIA-603-A-2001					
Tx Frequency Range		1850.2 - 1909.8 MHz					
Emission Designator		271KGXW					
Frequency Tolerance		0.1 PPM					
Modulation		GMSK					
Max. RF Conducted Output Power Tested		28.7 dBm Peak	1850.2 MHz	Source-Base Time-Averaged Power:		25.7 dBm	
		28.6 dBm Peak	1880.0 MHz	Source-Base Time-Averaged Power:		25.6 dBm	
		28.6 dBm Peak	1909.8 MHz	Source-Base Time-Averaged Power:		25.6 dBm	
Antenna Type(s) Tested		Description		Max. Measured RF Output Power (EIRP)			Length
		3 dBi Gain Vehicle-Mount		0.214	Watts	23.31 dBm	2.7 “
Power Source(s) Tested		12 V AC Adapter (Magic Power Model: MPE-C045-12-R-1)					

3.1 TEST EQUIPMENT LIST

TEST EQUIPMENT LIST

Equipment Type	Model	Serial No.	Calibration Due Date
HP Signal Generator	8648D (9kHz-4.0GHz)	3847A00611	April 2005
Rohde & Schwarz Signal Generator	SMR 20 (10MHz-40GHz)	100104	April 2005
Gigatronics Power Meter	8651A	8650137	April 2005
Gigatronics Power Meter	8652A	1835267	April 2005
Gigatronics Power Sensor	80701A (0.05-18GHz)	1833535	April 2005
Gigatronics Power Sensor	80701A (0.05-18GHz)	1833542	April 2005
Gigatronics Power Sensor	80701A (0.05-18GHz)	1834350	April 2005
Amplifier Research Power Amp.	5S1G4 (5W, 800MHz-4.2GHz)	26235	N/A
Amplifier Research Power Amp.	10W1000C (0.5 – 1 GHz)	27887	N/A
Microwave System Amplifier	HP 83017A (0.5-26.5GHz)	3123A00587	N/A
Network Analyzer	HP 8753E (30kHz-3GHz)	US38433013	April 2005
Frequency Counter	HP 53181A (3GHz)	3736A05175	April 2005
DC Power Supply	HP E3611A	KR83015294	N/A
Multi-Device Controller	EMCO 2090	9912-1484	N/A
Mini Mast	EMCO 2075	0001-2277	N/A
Turntable	EMCO 2080-1.2/1.5	0002-1002	N/A
Double Ridged Horn Antenna	ETS 3115 (1-18GHz) TX Substitution Antenna (Horn SN6267)	6267	Oct 2004
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	6276	Oct 2004
Standard Gain Horn Antenna	ETS 3160-09 TX Substitution Antenna (3160-09)	9810-1123	N/A
Standard Gain Horn Antenna	ETS 3160-09	1263	N/A
Bilog Antenna	Schaffner CBL6111A	1607	Jan 2005
Roberts Dipole Antenna	3121C-DB4 TX Substitution Antenna (B_3121C)	0003-1494	Dec 2004
Roberts Dipole Antenna	3121C-DB4	0003-1498	Dec 2004
Spectrum Analyzer	HP 8594E	3543A02721	April 2005
Spectrum Analyzer	HP E4408B	US39240170	Dec 2004
Shielded Screen Room	Lindgren R.F. 18W-2/2-0	16297	N/A
Environmental Chamber	ESPEC ECT-2 (Temperature/Humidity)	0510154-B	Feb 2005
Directional Coupler	Amplifier Research DC7154 (0.8-4.2 GHz)	26197	N/A
Directional Coupler	Pasternack PE2214-20	00078	N/A
High Pass Filter	Microwave Circuits HIG318G1	0001DC0020	N/A
High Pass Filter	Microwave Circuits H02G18G1	0001DC0020	N/A
30 dB Attenuator	Pasternack PE7019-30	00065	N/A
Itronix Laptop PC	IX260+	ZZGEG4112ZZ9777	N/A

4.1 SUMMARY

The data in this measurement report demonstrates that the ITRONIX CORPORATION Model: IX100XAC750 Rugged Handheld PC FCC ID: KBCIX100XAC750 with internal Sierra Wireless AirCard 750 PCS GPRS PCMCIA Modem, with the Class II Permissive Change(s) adding a vehicle cradle and vehicle-mount antenna, complies with the requirements of FCC Parts §24(E), §2, and IC RSS-133 Issue 2.

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APPENDIX A - RF OUTPUT POWER MEASUREMENT - §2.1046

A.1. MEASUREMENT PROCEDURE

The conducted power levels were measured with a Gigatronics 8652A Universal Power Meter using modulated burst average power mode. An offset was entered into the power meter to correct for the losses of the attenuator and cable installed before the sensor input. The transmitter terminal was coupled to the power meter and the DUT was placed into test mode via internal software. All subsequent tests were performed using the same tune-up procedures.

A.2. MEASUREMENT DATA

Frequency	Peak Conducted Power (Measured at the PCMCIA Card)
(MHz)	(dBm)
1850.2	28.7
1880.0	28.6
1909.8	28.6

APPENDIX B - EFFECTIVE ISOTROPIC RADIATED POWER OUTPUT - §24.232(b)

B.1. MEASUREMENT PROCEDURE

EIRP measurements were performed on a 3-meter open area test site using the Signal Substitution Method in accordance with ANSI TIA/EIA-603-A-2001. The DUT was transmitting in 4 time slots in GPRS mode via internal software at a full rated power. The DUT was placed in the vehicle cradle and positioned on the turntable. The vehicle-mount antenna was fixed on a 50 cm x 50 cm ground plane placed on a Styrofoam support at a distance of 3 meters from the receive antenna. The vehicle-mount antenna was connected to the vehicle cradle via a 17-foot LMR-195 cable representing a typical vehicle-mount installation. The maximum field intensity was determined by rotating the DUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. Once the maximum emission was found, the spectrum analyzer was set to peak hold and the uncorrected emission value recorded for each of the low, mid and high channels tested. The DUT was then substituted with a horn antenna. A signal, simulating the DUT emission was generated, amplified, and fed through a directional coupler to the substitution antenna. The height and direction of the receive antenna as well as the direction of the substitution horn was adjusted for a maximum received signal. The power applied to the horn was then adjusted to give the same field strength reading as previously recorded for the DUT and the power at the forward coupler port recorded. The substitution antenna was then replaced with a calibrated power sensor, the forward coupler port power level confirmed and the power applied to the horn antenna recorded. The EIRP level was determined by correcting the applied feed point power with the addition of the horn gain.

(See next page for measurement data)

B.2. MEASUREMENT SETUP

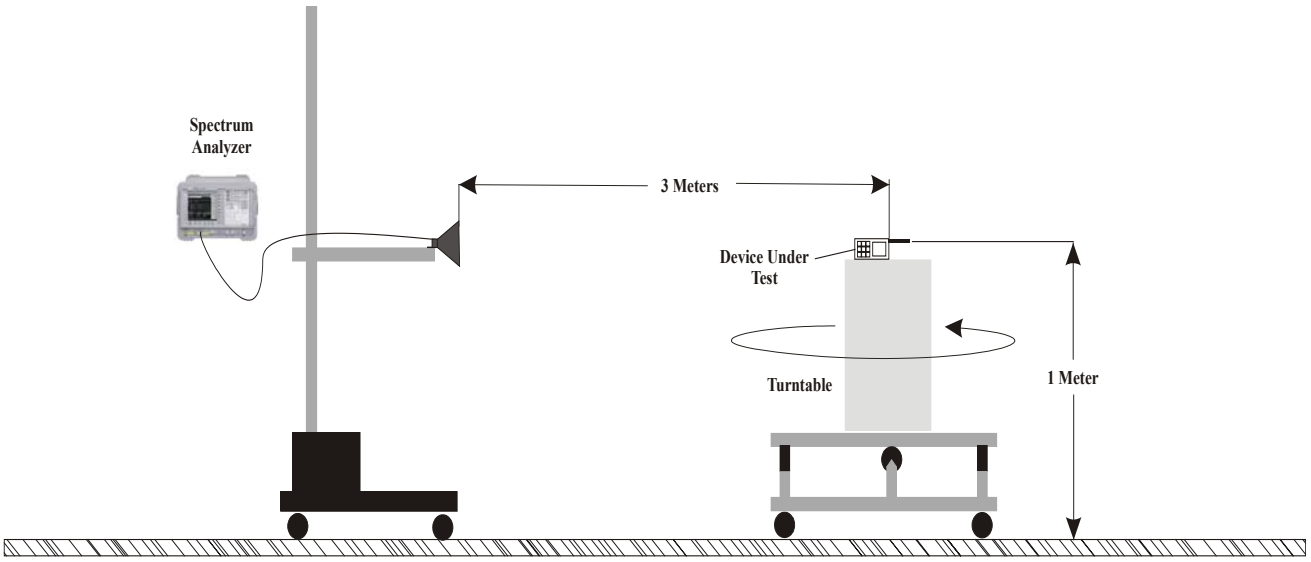

Figure 1. Radiated Power Measurement Test Setup Diagram

EFFECTIVE ISOTROPIC RADIATED POWER OUTPUT - §24.232(b) (Continued)

B.3. MEASUREMENT DATA

Project Number:	073004-548KBC	**Standard:**	FCC24.232b
Company:	Itronix	**Test Start Date:**	18-Aug-04
Product:	IX100 with AC750	**Test End Date:**	27-Aug-04

Polarity	Distance	Substitution Antenna Type	Channel	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	Carrier EIRP Level		EIRP Limit		Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBi	dBm	Watts	dBm	Watts	dB	
H	3	Horn SN6276	512	1850.20	113.27	81.27	5.16	6.67	11.83	0.015	33.01	2.00	21.18	PASS
H	3	Horn SN6276	661	1880.00	116.14	84.03	8.42	6.68	15.10	0.032	33.01	2.00	17.91	PASS
H	3	Horn SN6276	810	1909.80	115.32	83.08	7.84	6.68	14.52	0.028	33.01	2.00	18.49	PASS
V	3	Horn SN6276	512	1850.20	124.02	92.02	16.64	6.67	23.31	0.214	33.01	2.00	9.70	PASS
V	3	Horn SN6276	661	1880.00	123.66	91.55	16.25	6.68	22.93	0.196	33.01	2.00	10.08	PASS
V	3	Horn SN6276	810	1909.80	123.00	90.76	15.76	6.68	22.44	0.175	33.01	2.00	10.57	PASS

Note:
Horn Antenna used for substitution

Formulae:
EIRP Level (dBm) = Power applied to Antenna (dBm) + Antenna Gain (dBi)
Margin (dB) = Limit (dBm) - Level (dBm)

APPENDIX C - FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053

C.1. MEASUREMENT PROCEDURE

EIRP measurements were performed were measured on a 3-meter open area test site using the Signal Substitution Method in accordance with ANSI TIA/EIA-603-A-2001. The DUT was transmitting in 4 time slots in GPRS mode via internal software at a full rated power. The DUT was placed in the vehicle cradle and positioned on the turntable. The vehicle-mount antenna was fixed on a 50 cm x 50 cm ground plane placed on a Styrofoam support at a distance of 3 meters from the receive antenna. The vehicle-mount antenna was connected to the vehicle cradle via a 17-foot LMR-195 cable representing a typical vehicle-mount installation. A frequency band from just above the highest transmitted frequency to just above the 10th harmonic of the highest transmitted frequency was divided into smaller bands corresponding to measurement equipment setups and capabilities. The measurement equipment including carrier blocking filters, was optimized for maximum sensitivity for each band while ensuring no saturation occurred in any gain stages that may be present. It was also necessary to measure the bands above 10 GHz at a distance of 1 meter versus the 3-meter measurement distance used for the lower bands. The applicable bands were chosen from: 800 MHz to 1 GHz, 1 GHz to 5 GHz, 5 GHz to 10 GHz, 10 GHz to 18 GHz and 18 GHz to 20 GHz. The maximum field intensity in each of these bands were determined by rotating the DUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters while maintaining the spectrum analyzer trace in max hold. The stored trace was then evaluated to determine any significant emissions that should be evaluated by substitution. The frequency and uncorrected field strength level for each significant emission was recorded. To describe the noise floor, the maximum level associated with a number of frequencies within the band were also recorded. The DUT was then substituted with a transmit antenna. A signal simulating the DUT emission was generated for each of the signals recorded; it was amplified and fed through a directional coupler to the substitution antenna. The height and direction of the receive antenna as well as the direction of the substitution horn was adjusted for a maximum received signal. The power applied to the transmit antenna was then adjusted to give the same field strength reading as previously recorded for the DUT and the power at the forward coupler port recorded. The substitution antenna was then replaced with a calibrated power sensor, the forward coupler port power level confirmed and the power applied to the horn antenna recorded. The radiated power level was determined by correcting the applied feed point power with the addition of the antenna gain.

(See next page for measurement data)

C.2. MEASUREMENT SETUP

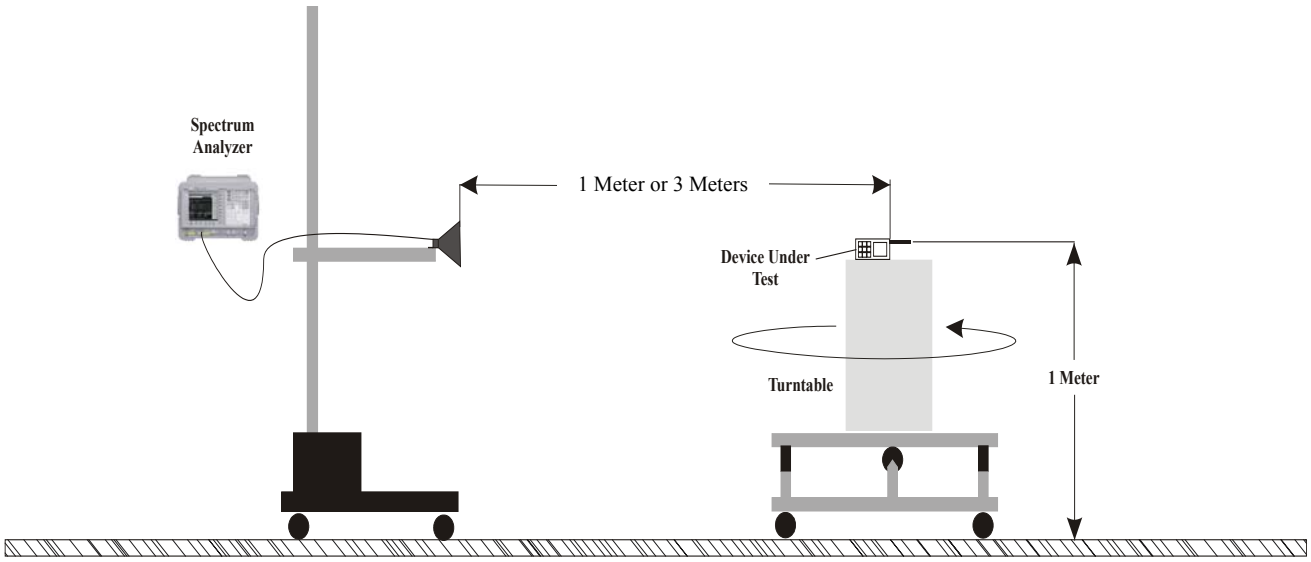

Figure 2. Radiated Spurious Measurement Test Setup Diagram
(3 Meters for Frequencies < 10 GHz - 1 Meter for Frequencies ≥ 10 GHz)

FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053 (Cont.)

C.3. MEASUREMENT DATA

Project Number:	073004-548KBC	**Standard:**	FCC24.238
Company:	Itronix	**Test Start Date:**	18-Aug-04
Product:	IX100 with AC750	**Test End Date:**	27-Aug-04

Polarity	Distance	Substitution Antenna Type	Channe	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Powor Applied to Antenna	Antenna Gain	Emission EIRP Level	EIRP Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBi	dBm	dBm*	dB	
H	3	Horn SN6267	512	1866.00	65.76	33.70	-41.00	6.57	-34.44	-13.00	21.44	PASS
H	3	Horn SN6267	512	2443.00	55.07	58.00	-41.09	7.67	-33.42	-13.00	20.42	PASS
H	3	Horn SN6267	512	9403.75	55.69	43.50	-45.70	9.20	-36.49	-13.00	23.49	PASS
H	1	Horn SN6267	512	17992.00	67.59	45.50	-41.16	7.94	-33.22	-13.00	20.22	PASS
H	1	3160-09	512	19918.00	60.44	44.70	-40.33	15.97	-24.36	-13.00	11.36	PASS
V	3	Horn SN6267	512	1939.00	66.87	34.50	-33.39	6.64	-26.75	-13.00	13.75	PASS
V	3	Horn SN6267	512	9748.75	55.68	43.50	-48.09	9.60	-38.49	-13.00	25.49	PASS
V	1	Horn SN6267	512	17976.00	67.44	45.50	-39.24	8.01	-31.23	-13.00	18.23	PASS
V	1	3160-09	512	19898.00	60.80	45.10	-40.18	15.96	-24.22	-13.00	11.22	PASS
H	3	Horn SN6267	661	1941.00	67.08	34.70	-33.17	6.64	-26.53	-13.00	13.53	PASS
H	3	Horn SN6267	661	5640.63	51.29	44.90	-50.66	8.77	-41.89	-13.00	28.89	PASS
H	1	Horn SN6267	661	17988.00	67.35	45.30	-42.67	7.95	-34.71	-13.00	21.71	PASS
H	1	3160-09	661	18840.00	60.72	46.10	-39.43	15.44	-24.00	-13.00	11.00	PASS
V	3	Horn SN6267	661	1927.00	66.42	34.10	-34.98	6.63	-28.35	-13.00	15.35	PASS
V	3	Horn SN6267	661	9340.00	57.07	44.90	-49.09	9.14	-39.95	-13.00	26.95	PASS
V	1	Horn SN6267	661	17988.00	66.95	44.90	-39.80	7.95	-31.85	-13.00	18.85	PASS
V	1	3160-09	661	19648.00	60.61	45.30	-36.87	15.86	-21.01	-13.00	8.01	PASS
H	3	Horn SN6267	810	1995.00	66.96	34.30	-34.38	6.70	-27.69	-13.00	14.69	PASS
H	3	Horn SN6267	810	9371.25	52.89	40.70	-33.17	9.17	-24.00	-13.00	11.00	PASS
H	1	Horn SN6267	810	17992.00	67.79	45.70	-41.33	7.94	-33.39	-13.00	20.39	PASS
H	1	3160-09	810	19730.00	60.64	45.30	-40.42	15.89	-24.52	-13.00	11.52	PASS
V	3	Horn SN6267	810	1881.00	66.02	33.90	-40.20	6.58	-33.62	-13.00	20.62	PASS
V	3	Horn SN6267	810	9696.25	56.66	44.50	-51.35	9.54	-41.82	-13.00	28.82	PASS
V	1	Horn SN6267	810	17986.00	67.33	45.30	-38.12	7.96	-30.16	-13.00	17.16	PASS
V	1	3160-09	810	19580.00	60.31	45.10	-39.31	15.83	-23.48	-13.00	10.48	PASS

Note:
Horn Antenna used for substitution
All applicable frequency ranges were investigated up to the carrier tenth harmonic and any significant emissions or noise floor level reported for each range.

Formulae:
Limit = 43 + 10*log(Fundamental Power Level, in watts) below the Fundamental peak power gives -13 dBm
EIRP Level (dBm) = Power applied to Antenna (dBm) + Antenna Gain (dBi)
Margin (dB) = Limit (dBm) - Level (dBm)