CLASS II PERMISSIVE CHANGE
FCC PART 24

Test Lab:	Applicant Information
Rhein Tech Laboratories, Inc. 360 Herndon Parkway Suite 1400 Herndon, VA 20170 Phone: 703-689-0368 Fax: 703-689-2056 Web Site: www.rheintech.com	UTStarcom, Inc. 33 Wood Avenue South 3rd Floor Iselin, NJ 08830 732-767-5263 (Scott Black) USA

FCC ID:	O6YUTS-EA7T56B	**GRANTEE FRN NUMBER:**	0005823877
PLAT FORM:	N/A	**RTL WORK ORDER NUMBER:**	2001347
MODEL(S):	200 mW Outdoor RP	**RTL QUOTE NUMBER:**	QRTL01-385
DATE OF TEST REPORT:	March 21, 2002		

American National Standard Institute:	ANSI/TIA/EIA603 and ANSI/TIA/EIA 603-1
FCC Classification:	PCB - Licensed Base Station for Part 24
FCC Rule Part(s):	PART 24: PERSONAL COMMUNICATIONS SERVICES Subpart E - Broadband PCS
Industry Canada Standard:	RSS-133: 2 GHz Personal Communications Services
Digital Interface Information	Digital Interface was found to be compliant
Receiver Information	Receiver was found to be compliant

Frequency Range (MHz)	Power (W)	Freq. Tolerance	Emission Designator
1893.65-1909.95	0.155	13 ppm	283KDXW

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1 GENERAL INFORMATION

1.1 SCOPE

FCC Rules Part 24 (E) PERSONAL COMMUNICATIONS SERVICES – BROADBAND PCS

All measurements contained in this application were conducted in accordance with the FCC Rules and Regulations CFR47 and ANSI/TIA/EIA603-1992/-1-1998 Land Mobile FM or PM Communications Equipment Measurement and Performance Standards. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

1.2 TEST FACILITY

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 1992).

1.3 RELATED SUBMITAL(S)/GRANT(S)

This application is a Class II Permissive Change.

1.4 DESCRIPTION OF CHANGE IN DEVICE

The addition of Band F is the change being investigated. The frequency 1893.65 MHz is the lowest frequency available to test, and is added from previous testing as a firmware programming modification and no change to the power or layout was made.

2 EQUIPMENT INFORMATION

2.1 APPLICANT AND EQUIPMENT INFORMATION

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1893.65-1909.95	0.155	13 ppm	283KDXW

2.2 JUSTIFICATION

To complete the test configuration required by the FCC, the transmitter was operated in a continuous mode. The low channel was investigated, since the addition to Band F is the change. The final data was taken as a substitution measurement. The device is provided with an external antenna connector.

2.3 EXERCISING THE EUT

The 200mW outdoor RP is a transmitter designed to link to PHS phones which transmit at a frequency within the range (1893.65 MHz – 1909.95 MHz). The following frequency was tested: 1893.65 MHz, in three orthogonal planes, with the receiving antenna in both horizontal and vertical polarities, from 1 meter to 4 meters in height, and worst case data is submitted.

2.4 TEST SYSTEM DETAILS

The FCC Identifiers for all equipment, plus descriptions of all cables used in the tested system are:

TABLE 2-1: EQUIPMENT UNDER TEST (EUT)

PART	MANUFACTURER	MODEL	SERIAL NUMBER	FCC ID	CABLE DESCRIPTION	RTL BARCODE
JOINT BOX	UT STARCOM, INC.	EA-18888BB	0029902	O6YUTS-EA7T56B	UNSHIELDED I/O	014091
200MW RADIO PORT	UTSTARCOM, INC.	EA-7T56B	SC001555	O6YUTS-EA7T56B	UNSHIELDED I/O	014092
OUTDOOR RADIO PORT	UTSTARCOM, INC.	EA-7H75	SB097653	SAMPLE	UNSHIELDED I/O	014093
MCU	UTSTARCOM, INC.	A-MCU2	101200-1060820648	SAMPLE	N/A	014094
MODULE HOLDER	UTSTARCOM, INC.	AN-2000	41060044A5	SAMPLE	N/A	014095
MODULE CARD	UTSTARCOM, INC.	FXOW	101200-1072020725	SAMPLE	N/A	014096
MODULE CARD	UTSTARCOM, INC.	E1MW	101200-1071820587	SAMPLE	N/A	014097
MODULE CARD	UTSTARCOM, INC.	SCMW	101200-1071220769	SAMPLE	N/A	014098
PS MODULE	UTSTARCOM, INC.	PSM	101200-0060820503	SAMPLE	N/A	014099
ECNT MODULE	UTSTARCOM, INC.	ECNT	101200-1070320705	SAMPLE	N/A	014100
E1IF MODULE	UTSTARCOM, INC.	E1IF	78000198	SAMPLE	N/A	014101
RPIF MODULE	UTSTARCOM, INC.	RPIF	101200-0020220086	SAMPLE	N/A	014102
POWER SUPPLY & CHASSIS	UTSTARCOM, INC.	N/A	101200-1031920555	SAMPLE	N/A	014103
ANTENNA	UTSTARCOM, INC.	7dBi	2003	SAMPLE	N/A	014085
ANTENNA	UTSTARCOM, INC.	7dBi	2003	SAMPLE	N/A	014084
ANTENNA	UTSTARCOM, INC.	7dBi	2003	SAMPLE	N/A	014083
ANTENNA	UTSTARCOM, INC.	7dBi	2003	SAMPLE	N/A	014080

2.5 CONFIGURATION OF TESTED SYSTEM

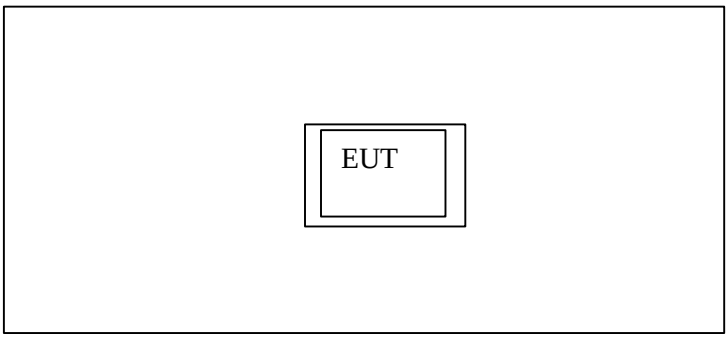


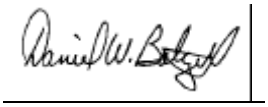
FIGURE 1: CONFIGURATION OF TESTED SYSTEM

3 RF POWER OUTPUT - §2.1046

TABLE 3-1: POWER OUTPUT AT THE ANTENNA PORT DATA - §2.1046

Channel	Frequency (MHz)	Burst Peak Power Meter Level (dBm)	Burst Average Power Meter Level (dBm)	Duty Factor (dB)	Modulation Average Power Level (dBm)	Modulation Average Power Level (mW)
251	1893.65	33.61	31.81	8.9	22.91	195.4

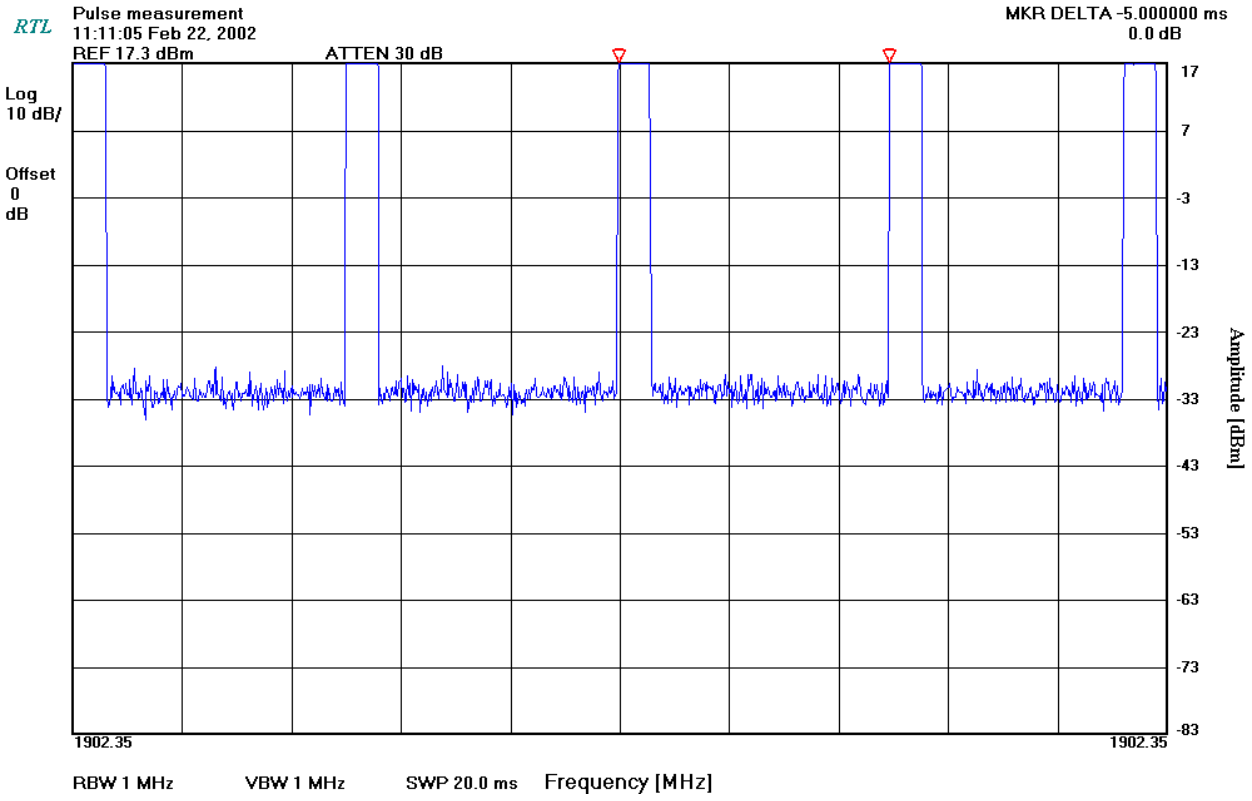
PERSONNEL INFORMATION:

Signature:  Test Date: March 16, 2002

Typed/Printed Name: Daniel Baltzell Position: Test Engineer

3.1 DUTY CYCLE MEASUREMENT

PLOT 3-1: PULSE MEASUREMENT FOR DUTY CYCLE



Duty cycle calculation from above plots:

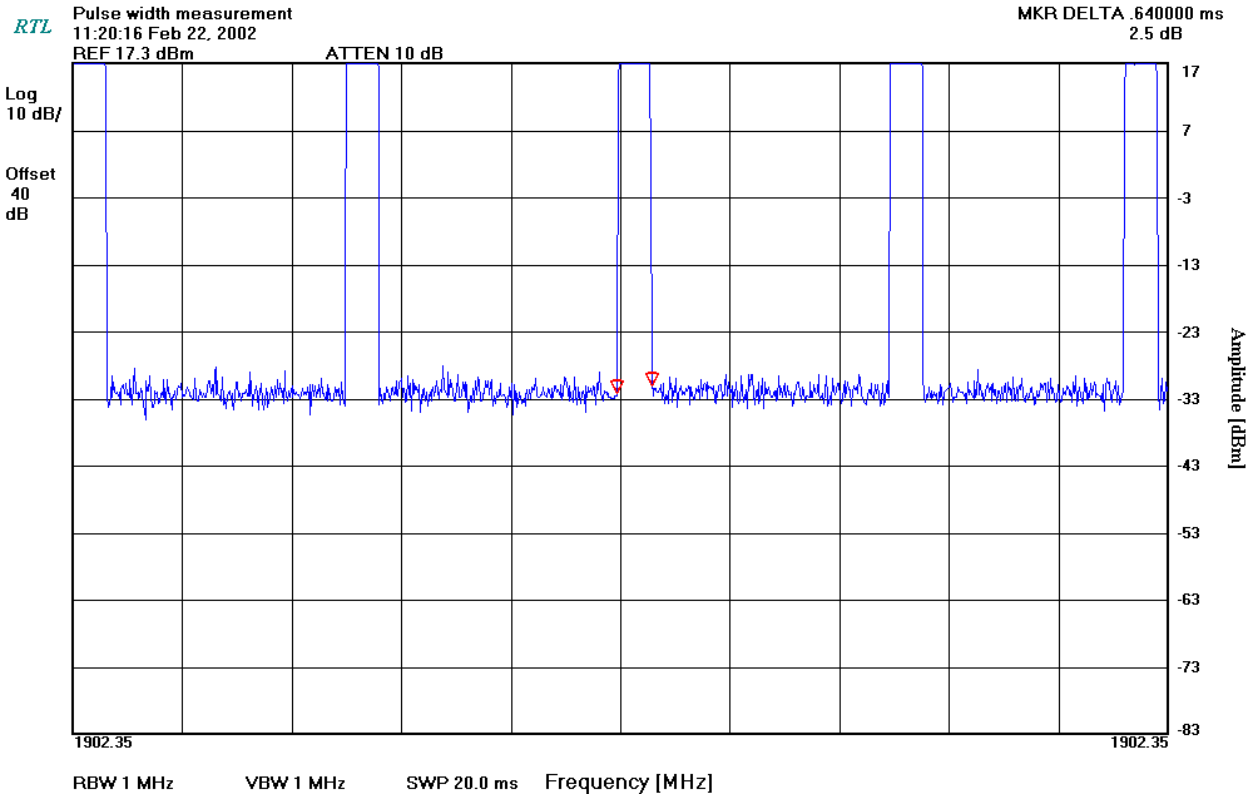
0.64ms / 5 ms = 0.128 or 12.8 %

10 LOG 0.128 = -8.9 dB correction.

PERSONNEL INFORMATION:

Signature:		Test Date :	March 16, 2002
Typed/Printed Name:	Daniel Baltzell	Position:	Test Engineer

PLOT 3-2: PULSE MEASUREMENT FOR DUTY CYCLE



Duty cycle calculation from above plots:

0.64ms / 5 ms = 0.128 or 12.8 %

10 LOG 0.128 = -8.9 dB correction.

PERSONNEL INFORMATION:

Signature:		Test Date:	March 16, 2002
Typed/Printed Name:	Daniel Baltzell	Position:	Test Engineer

3.2 EFFECTIVE ISOTROPIC RADIATED POWER - §24.232

3.2.1 ANSI/TIA/EIA-603-1992, SECTION 2.2.1 TEST PROCEDURE

Substitution method.

3.2.2 EFFECTIVE ISOTROPIC RADIATED POWER LIMITS - §24.232 TEST PROCEDURE

(a) Base stations are limited to 1640 watts peak equivalent isotropically radiated power (e.i.r.p.) with an antenna height up to 300 meters HAAT.

3.3 RF POWER TEST EQUIPMENT

TABLE 3-2: RF POWER TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz – 2 GHz)	2648	5/22/02
900932	Hewlett Packard	8449B OPT H02	Preamplifier 1-26.5 GHz	3008A00505	N/A
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	5/16/02
900917	Hewlett Packard	8648C	Signal Generator (100kHz – 3200 MHz)	3537A01741	4/10/02
900928	Hewlett Packard	83752A	Synthesized Sweeper (0.01 GHz – 20 GHz)	3610A00866	5/11/02
900814	Electro-Metrics	EM-6961 (RGA-60)	Double Ridged Guide Antenna 1-18 GHz	2310	2/26/02
901184	Agilent Technologies	E4416A	EPM-P Power Meter, single channel	GB41050573	7/5/02
901186	Agilent Technologies	E9323A (50MHz-6GHz)	Peak & Avg. Power Sensor	US40410380	6/25/02

3.3.1 EFFECTIVE RADIATED POWER OUTPUT TEST DATA- §2.1046

TABLE 3-3: RADIATED POWER OUTPUT DATA - §2.1046

Information:

- Theoretic antenna gain 5 (7dBi)
- Duty Cycle 12.8%

Channel	Test Detector	Frequency (MHz)	Spectrum Analyzer (dBuV)	Signal Generator Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Burst Level EIRP (dBm)	Duty Factor (dB)	Modulation EIRP (dBm)	Modulation EIRP (mW)
251	Pk	1893.65	99.4	34.7	1.6	4.8	37.9	8.9	29.0	794.0
251	Av	1893.65	97.6	32.9	1.6	4.8	36.1	8.9	27.2	524.8

Notes: Pk = Peak Detector; Av = Average Detector.

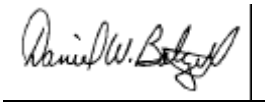
EIRP Measurements by Substitution Method using a 7dBi antenna at the antenna port of the device under test, and further corrected using a 12.8% duty cycle.

The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer using a 1 MHz resolution bandwidth for each channel being tested, and adjusted to an average level using a power meter attached at the end of the receive antenna. A double ridge horn antenna was substituted in place of the EUT. The horn antenna was fed by a signal generator and adjusted until the previous field strength level was attained. This level was recorded and was further corrected by subtracting the cable loss from the signal generator to the transmit antenna and adding the horn gain.

i.e., Sg – CL + Gn = EIRP (dBm)

Sg = Signal Generator Level (dBm)
CL= Cable Loss (dB)
xGn= Transmitting horn antenna gain (dBi)

PERSONNEL INFORMATION:

Signature:  Test Date: March 16, 2002

Typed/Printed Name: Daniel Baltzell Position: Test Engineer

4 CONDUCTED SPURIOUS AND HARMONIC EMISSIONS - §2.1053

4.1 TEST PROCEDURE

ANSI/TIA/EIA-603-1992, Section 2.2.13

The transmitter antenna terminal is connected with the 50 Ω impedance input to the spectrum analyzer. The worst case average channel test data is provided.

4.2 RF POWER TEST EQUIPMENT

TABLE 4-1: RF POWER TEST EQUIPMENT

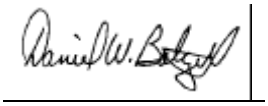
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due
901137	PAR Electronics	N/A	Notch Filter	N/A	N/A
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	5/16/02

4.3 CONDUCTED SPURIOUS AND HARMONIC TEST DATA - §2.1051

Operating Frequency (MHz): 1893.65
Channel: 251
Measured Power at the Antenna Port (dBm): 31.81
Modulation: DXW
Limit: 44.81

Frequency (MHz)	Measured Level (dBm)	Notch Filter Insertion Loss (dB)	Corrected Measured Level (dBc)	Margin (dB)
3787.300	-50.1	2.7	79.2	-34.4
5680.950	-45.2	2.3	74.7	-29.9
7574.600	-70.4	16.2	86.0	-41.2
9468.250	-68.9	9.3	91.4	-46.6
11361.900	-63.8	16.6	79.0	-34.2
13255.550	-67.3	8.3	90.8	-46.0
15149.200	-63.4	7.5	87.7	-42.9
17042.850	-67.0	6.5	92.3	-47.5
18936.500	-63.1	7.5	87.4	-42.6

PERSONNEL INFORMATION:

Signature:  Test Date: March 16, 2002

Typed/Printed Name: Daniel Baltzell Position: Test Engineer

5 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053

5.1 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053

Substitution method. The EUT was placed on a turntable 3-meters from the receive antenna. The field of maximum intensity was found by rotating the EUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters and the polarization was varied through 3 orthogonal planes to determine the worst-case emission level. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A double ridge horn antenna was substituted in place of the EUT. The horn antenna was fed by a signal generator and adjusted until the previous field strength level was attained. . The signal generator level was recorded. It was further corrected by subtracting the cable loss from the signal generator to the dipole and adding the horn gain The worst case average channel test data is provided.

5.2 RADIATED SPURIOUS TEST EQUIPMENT

TABLE 5-1: RADIATED SPURIOUS TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz – 2 GHz)	2648
900932	Hewlett Packard	8449B OPT H02	Preamplifier 1-26.5 GHz	3008A00505
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771
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900814	Electro-Metrics	EM-6961 (RGA-60)	Double Ridges Guide Antenna 1-18 GHz	2310

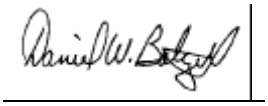
5.3 FIELD STRENGTH OF SPURIOUS RADIATION TEST DATA - §2.1053

Operating Frequency (MHz): 1893.65
Channel: Low
Measured EIRP (dBm): 36.1
Modulation: DXW
Distance (m): 3
Limit (dBc): 49.1

TABLE 5-2: FIELD STRENGTH DATA §2.1053

Frequency (MHz)	Signal Generator Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)	Corrected Signal Generator Level (dBm)	EIRP (dBc)	Margin (dB)
3787.300	-44.5	1.3	5.9	-39.9	76.0	-26.9
5680.950	-41.2	2.9	6.5	-37.6	73.7	-24.6
7574.600						<-40
9468.250						<-40
11361.900						<-40
13255.550						<-40
15149.200						<-40
17042.850						<-40
18936.500						<-40

PERSONNEL INFORMATION:

Signature:  Test Date: March 16, 2002

Typed/Printed Name: Daniel Baltzell Position: Test Engineer

6 BAND-EDGE COMPLIANCE - PART 24.238

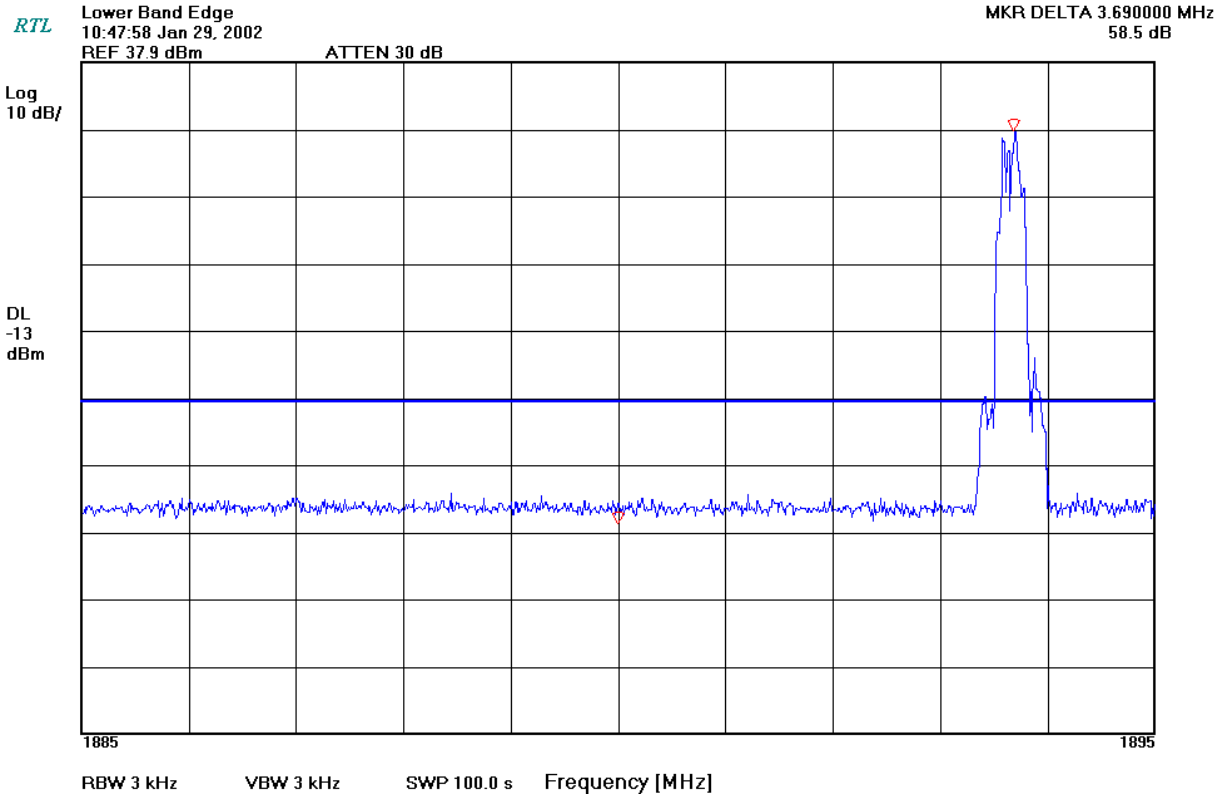
6.1 TEST PROCEDURE:

Delta Marker method : The resolution of the spectrum analyzer is adjusted to 1% of the emission bandwidth after the reference level is adjusted to the EIRP level using a resolution and video bandwidth of 1 MHz. The frequency is centered on the band edge of interest with a span capable of showing the peak, a delta to peak is performed with the display line set at –13 dBm (43+10LogP).

6.2 TEST DATA

The emission levels at the band edges are found to be below -13 dBm EIRP.

The reference level 37.9 dBm is the peak radiated EIRP level, which the delta measurement of 58.5 dB is subtracted (reference plots), which is equivalent to a level of - 20.6 dBm. This level has a margin of 7.6 dB below the limit of 43 + 10 Log P (-13 dBm).



PERSONNEL INFORMATION:

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7 CONCLUSION

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18936.65-1909.95	0.155	13 ppm	283KDXW

We, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards.

Furthermore, there was no deviation from, additions to or exclusions from the FCC Part 2, FCC Part 90, ANSI C63.4, ANSI/TIA/EIA603 and ANSI/TIA/EIA 603-1.

Signature:  Date: March 21, 2002

Typed/Printed Name: Desmond Fraser Position: President

Signature:  Date: March 21, 2002

Typed/Printed Name: Daniel W. Baltzell Position: EMC Test Engineer