Engineering and Testing for EMC and Safety Compliance

CLASS II PERMISSIVE CHANGE
FCC PART 24 CERTIFICATION

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 USA Contact: Scott Black Phone: 732-767-5263

FCC ID:	O6YUTS-708J	**GRANTEE FRN NUMBER:**	0005823877
PLAT FORM:	Transmitter	**RTL WORK ORDER NUMBER:**	2001241
MODEL(S):	708J	**RTL QUOTE NUMBER:**	QRTL01-269
DATE OF TEST REPORT:	March 18, 2002		

American National Standard Institute:	ANSI/TIA/EIA603 and ANSI/TIA/EIA 603-1
FCC Classification:	PCF - Part 24 Licensed Portable Tx Held to Face
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)	Frequency Tolerance	Emission Designator
1893.65-1909.95	0.1096	2.5 ppm	273KDXW

*Power is EIRP

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 24, ANSI C63.4, ANSI/TIA/EIA603 and ANSI/TIA/EIA 603-1.

Signature: _____ Date: March 18, 2002
Typed/Printed Name: Desmond Fraser Position: President

Signature: _____ Date: March 18, 2002
Typed/Printed Name: Daniel W. Baltzell Position: EMC Test Engineer

TABLE OF CONTENTS

1 GENERAL INFORMATION 3
1.1 SCOPE 3
1.2 TEST FACILITY 3
1.3 RELATED SUBMITTAL(S)/GRANT(S) 3
1.4 DESCRIPTION OF CHANGE IN DEVICE 3
2 EQUIPMENT INFORMATION 4
2.1 APPLICANT AND EQUIPMENT INFORMATION 4
2.2 JUSTIFICATION 4
2.3 EXERCISING THE EUT 4
2.4 TEST SYSTEM DETAILS 5
2.5 CONFIGURATION OF TESTED SYSTEM 5
3 RF POWER OUTPUT - §2.1046 6
3.1 ANSI/TIA/EIA-603-1992, SECTION 2.2.1 TEST PROCEDURE 6
3.2 RF POWER TEST EQUIPMENT 6
3.3 DUTY CYCLE MEASUREMENT 7
3.4 EFFECTIVE ISOTROPIC RADIATED POWER LIMITS - §24.232 TEST PROCEDURE 9
3.5 EFFECTIVE ISOTROPIC RADIATED POWER OUTPUT TEST DATA- §2.1046 9
4 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053 10
4.1 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053 10
4.2 RADIATED SPURIOUS TEST EQUIPMENT 10
4.3 FIELD STRENGTH OF SPURIOUS RADIATION TEST DATA - §2.1053 11
5 BAND-EDGE COMPLIANCE - PART 24.238 12
5.1 TEST PROCEDURE: 12
5.2 TEST DATA 12
6 CONCLUSION 13

TABLE INDEX

TABLE 2-1: EQUIPMENT UNDER TEST (EUT) 5
TABLE 3-1: RF POWER TEST EQUIPMENT 6
TABLE 3-2: RADIATED POWER OUTPUT DATA - §2.1046 9
TABLE 4-1: RADIATED SPURIOUS TEST EQUIPMENT 10
TABLE 4-2: FIELD STRENGTH DATA §2.1053 11
TABLE 6-1: CONDUCTED TEST DATA (NEUTRAL SIDE, LINE 1) 20
TABLE 6-2: CONDUCTED TEST DATA (HOT SIDE, LINE 2) 20
TABLE 6-3: RADIATED TEST DATA 21

TABLE OF PLOTS

PLOT 3-1: PULSE MEASUREMENT FOR DUTY CYCLE 7
PLOT 3-2: PULSE MEASUREMENT FOR DUTY CYCLE 8

APPENDIX INDEX

APPENDIX A: RF EXPOSURE INFORMATION 14
APPENDIX B: TEST PHOTOGRAPHS 16
APPENDIX C: ADDITIONAL INFORMATION FOR CANADIAN CERTIFICATION 20

PHOTOGRAPH INDEX

PHOTOGRAPH 1: RADIATED BACK VIEW 16
PHOTOGRAPH 2: RADIATED FRONT VIEW 17
PHOTOGRAPH 3: CONDUCTED BACK VIEW 18
PHOTOGRAPH 4: CONDUCTED FRONT VIEW 19

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 SUBMITTAL(S)/GRANT(S)

This application is a Class II Permissive Change, for O6YUTS-708J.

1.4 DESCRIPTION OF CHANGE IN DEVICE

The change to the device was the enabling of the channel at 1893.65MHz. The capability of this function was always present in the hardware and firmware of the device, but was previously disabled. The hardware of the device has not changed, including the power and modulation characteristics.

2 EQUIPMENT INFORMATION

2.1 APPLICANT AND EQUIPMENT INFORMATION

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 USA Contact: Scott Black Phone: 732-767-5263

FCC ID:	O6YUTS-708J	**GRANTEE FRN NUMBER:**	0005823877
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*Power is EIRP

2.2 JUSTIFICATION

To complete the test configuration required by the FCC, the transmitter was configured by the manufacturer to operate in a continuous mode. The low channel was investigated, since the addition of Band F is the change. The final data was taken as a substitution measurement.

2.3 EXERCISING THE EUT

The 708J is a transmitter designed to link to a PHS network which transmits at a frequency within the range (1890 MHz – 1910 MHz). The following frequencies were 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; 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
PHONE (EUT)	UTSTARCOM	UTS 708-JPS	216-1003	O6YUTS-708J	N/A	014081
PHONE (EUT)	UTSTARCOM	UTS 708-JPS	LCCH 255	O6YUTS-708J	N/A	014082
INDOOR RADIO PORT	UTSTARCOM	EA-7H75	SB097653	O6YUTS-EA7H74B	UNSHIELDED I/O	014093
MCU	UTSTARCOM	A-MCU2	101200-1060820648	SAMPLE	N/A	014094
MODULE HOLDER	UTSTARCOM	AN-2000	41060044A5	SAMPLE	N/A	014095
MODULE CARD	UTSTARCOM	FXOW	101200-1072020725	SAMPLE	N/A	014096
MODULE CARD	UTSTARCOM	E1MW	101200-1071820587	SAMPLE	N/A	014097
MODULE CARD	UTSTARCOM	SCMW	101200-1071220769	SAMPLE	N/A	014098
PS MODULE	UTSTARCOM	PSM	101200-0060820503	SAMPLE	N/A	014099
ECNT MODULE	UTSTARCOM	ECNT	101200-1070320705	SAMPLE	N/A	014100
E1IF MODULE	UTSTARCOM	E1IF	78000198	SAMPLE	N/A	014101
RPIF MODULE	UTSTARCOM	RPIF	101200-0020220086	SAMPLE	N/A	014102
POWER SUPPLY & CHASSIS	UTSTARCOM	N/A	101200-1031920555	SAMPLE	N/A	014103

2.5 CONFIGURATION OF TESTED SYSTEM

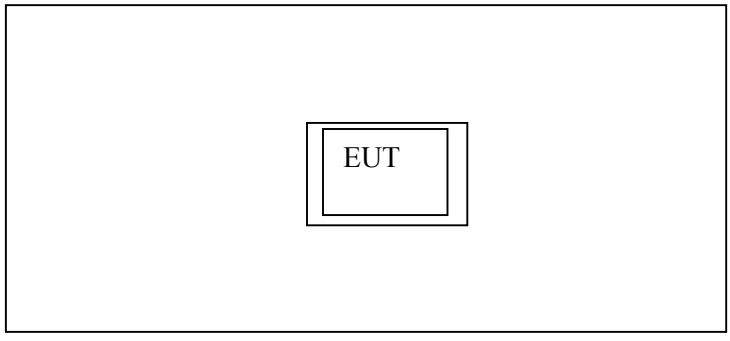


FIGURE 1: CONFIGURATION OF TESTED SYSTEM

3 RF POWER OUTPUT - §2.1046

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

Substitution method.

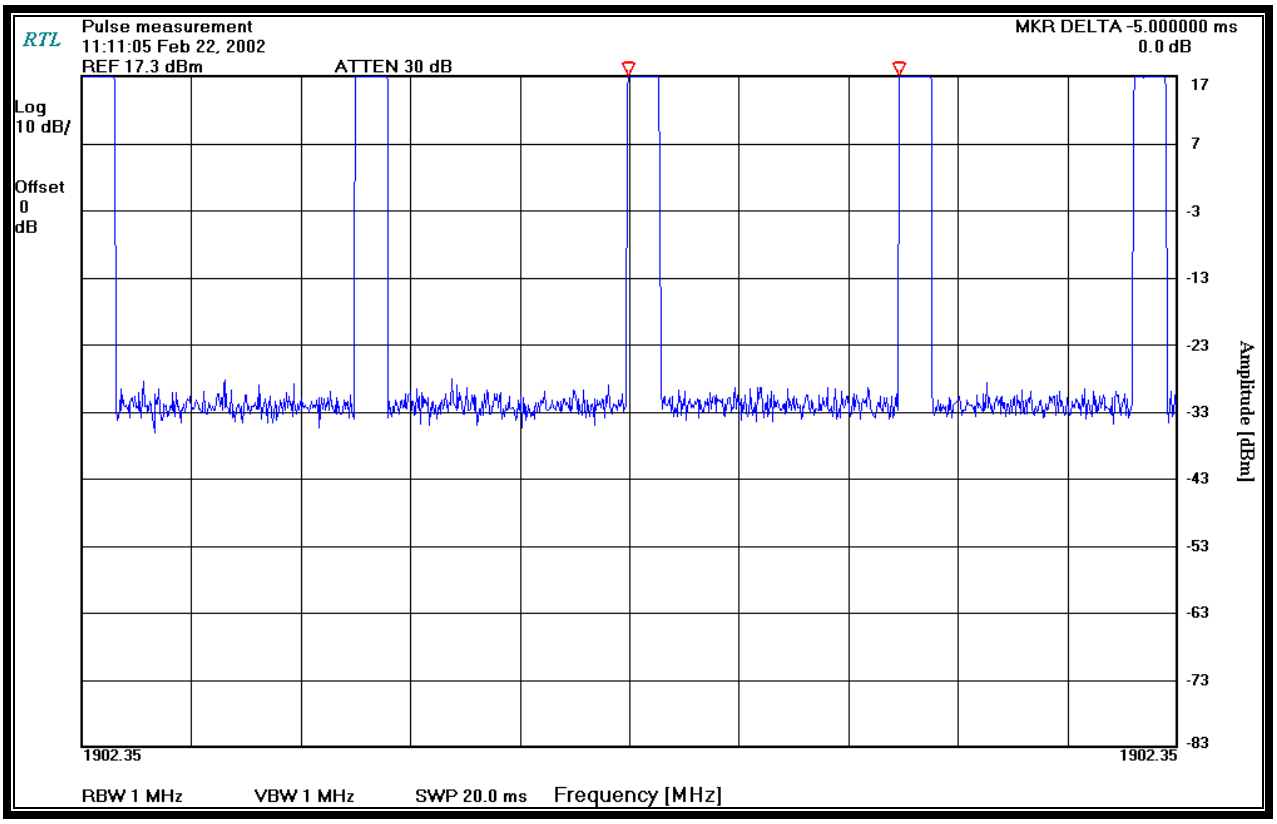
3.2 RF POWER TEST EQUIPMENT

TABLE 3-1: RF POWER TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part	Serial Number	Calibration Due Dates
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz – 2 GHz)	2648	5/22/03
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	5/16/03
900917	Hewlett Packard	8648C	Signal Generator (100 kHz – 3200 MHz)	3537A01741	4/10/03
900928	Hewlett Packard	83752A	Synthesized Sweeper (0.01 GHz – 20 GHz)	3610A00866	5/11/03
900814	Electro-Metrics	EM-6961 (RGA-60)	Double Ridges Guide Antenna (1-18 GHz)	2310	N/A
900154	Compliance Design	Roberts Dipole	Adjustable Elements Dipole	N/A	8/17/03
900772	EMCO	3161-02	Horn antenna (2.0-4.0 GHz)	9804-1044	N/A
900321	EMCO	3161-03	Horn antenna (4.0- 8.2 GHz)	9508-1020	N/A
900905	RTL	PR-1040	Amplifier (30 MHz - 2 GHz)	900905	N/A

3.3 DUTY CYCLE MEASUREMENT

PLOT 3-1: PULSE MEASUREMENT FOR DUTY CYCLE

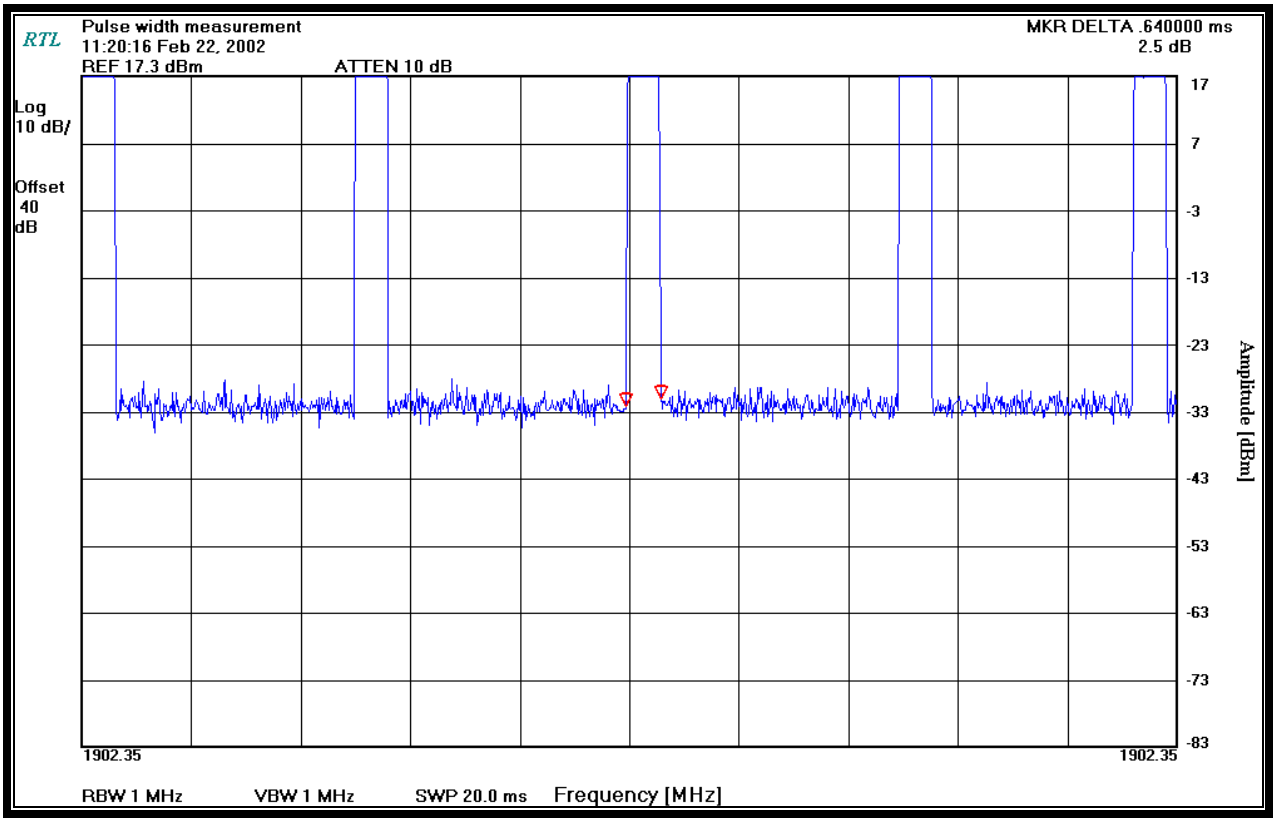


Duty cycle calculation from plots:

0.64ms / 5 ms = 0.128 or 12.8 %

10 LOG 0.128 = -8.9 dB correction.

PLOT 3-2: PULSE MEASUREMENT FOR DUTY CYCLE



TEST PERSONNEL:

Signature: _____ Test Date: February 22, 2002

Typed/Printed Name: Daniel Baltzell Position: Test Engineer

3.4 EFFECTIVE ISOTROPIC RADIATED POWER LIMITS - §24.232 TEST PROCEDURE

EIRP Measurements by 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. 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 level of the signal generator was recorded. It was further corrected by subtracting the cable loss from the signal generator to the horn, and adding this transmitting horn antenna gain (dBi).

Sg – CL + Gn = EIRP (dBm)

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

3.5 EFFECTIVE ISOTROPIC RADIATED POWER OUTPUT TEST DATA- §2.1046

Settings:

- Peak 80mW delivered to antenna
- Antenna: built-in with a 2.4 dBi gain
- Radiated power measurements performed at a 3 meter distance

TABLE 3-2: RADIATED POWER OUTPUT DATA - §2.1046

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	82.0	16.8	0.8	4.8	20.8	8.9	11.9	15.5
251	Av	1893.65	81.6	16.4	0.8	4.8	20.4	8.9	11.5	14.1

TEST PERSONNEL:

Signature:  Test Date: February 23, 2002

Typed/Printed Name: Daniel Baltzell Position: Test Engineer

4 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053

4.1 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 varying the polarization 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.

4.2 RADIATED SPURIOUS TEST EQUIPMENT

TABLE 4-1: RADIATED SPURIOUS TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Dates
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz – 2 GHz)	2648	5/22/03
900932	Hewlett Packard	8449B OPT H02	Preamplifier (1-26.5 GHz)	3008A00505	N/A
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900154	Compliance Design	Roberts Dipole	Adjustable Elements Dipole	N/A	8/17/03
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900321	EMCO	3161-03	Horn antenna 4.0- 8.2 GHz	9508-1020	N/A
900905	RTL	PR-1040	Amplifier 30 MHz - 2 GHz	900905	N/A

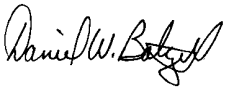
4.3 FIELD STRENGTH OF SPURIOUS RADIATION TEST DATA - §2.1053

Operating Frequency (MHz): 1893.65
Channel: 251
Measured EIRP (dBm): 20.4
Modulation: DXW (TDMA-TDD)
Distance (m): 3
Limit (dBc): 33.4

TABLE 4-2: FIELD STRENGTH DATA §2.1053

Frequency (MHz)	Spectrum Analyzer Peak Level (dBuV)	Spectrum Analyzer Average Level (dBuV)	Signal Generator Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)	EIRP (dBc)	Margin (dB)
3787.300	43.4	43.0	-34.6	1.3	5.9	50.4	-17.0
5680.950	14.3	13.9	-52.2	2.9	6.5	69.0	-35.6
7574.600	14.0	13.6	-41.9	4.2	7.7	58.8	-25.4
9468.250							<40.0
11361.900							<40.0
13255.550							<40.0
15149.200							<40.0
17042.850							<40.0
18936.500							<40.0

TEST PERSONNEL:

Signature:  Test Date: January 24, 2002

Typed/Printed Name: Daniel Baltzell Position: Test Engineer

5 BAND-EDGE COMPLIANCE - PART 24.238

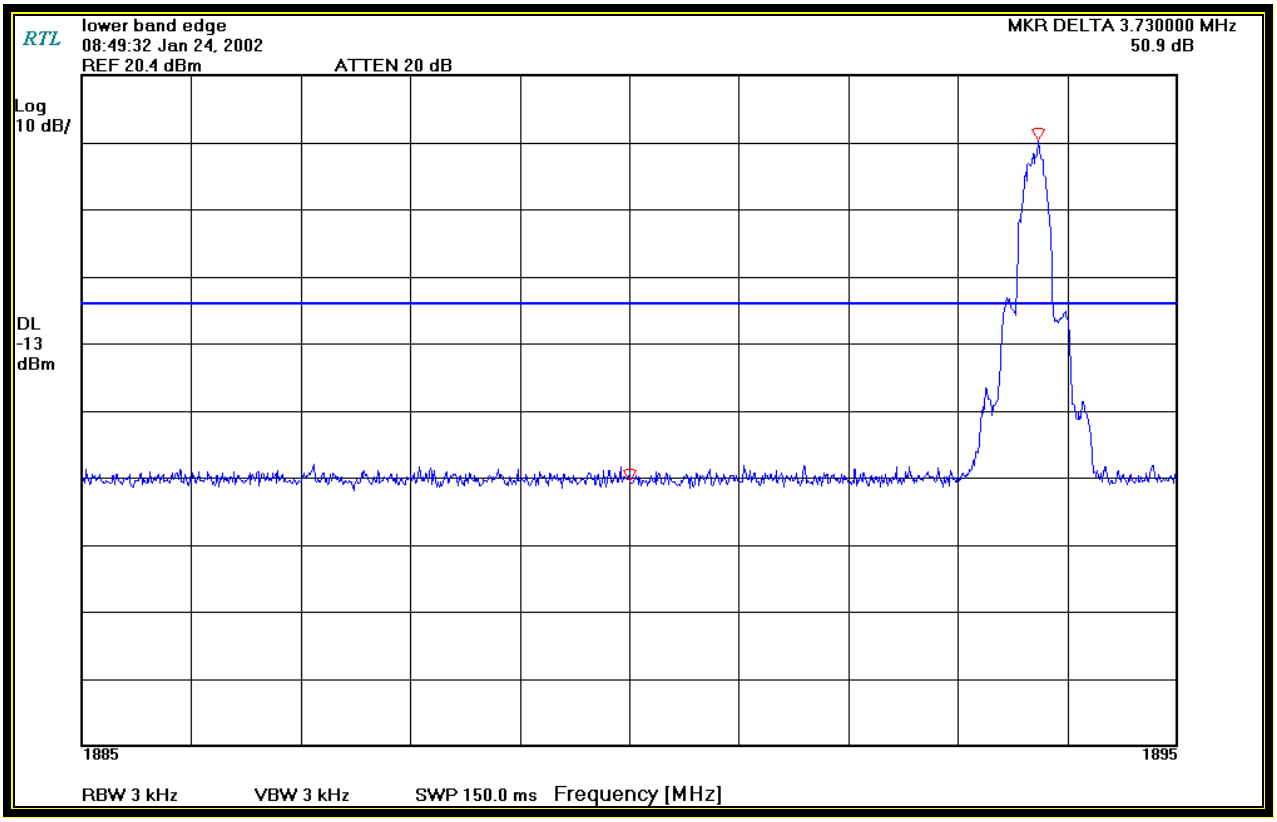
5.1 TEST PROCEDURE:

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).

5.2 TEST DATA

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

The reference level 20.4 dBm is the peak radiated EIRP level,from which the delta measurement of 50.9 dB is subtracted (reference plots), which is equivalent to a level of -30.5 dBm. This level has a margin of 17.5 dB below the limit of 43 + 10 Log P (-13 dBm).



TEST PERSONNEL:

Signature: _____ Test Date: January 24, 2002

Typed/Printed Name: Daniel Baltzell Position: Test Engineer

6 CONCLUSION

The data in this measurement report shows that the **UT Starcom Inc., Model 708J, FCC ID*:* O6YUTS-708J,** complies with all the requirements of Parts 2 and 24 of the FCC Rules.