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Work Order: 2002018Revision: 2  
Quote Number: QRTL02-241 Revision:  
FCC CFR 47 Rules and Regulations  
Industry Canada Standard(s)

**CERTIFICATE OF COMPLIANCE**  
**FCC PART 24 CERTIFICATION & INDUSTRY CANADA CERTIFICATION**

<b>Test Lab:</b>		<b>Applicant Information</b>	
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Web Site: <a href="http://www.rheintech.com">www.rheintech.com</a>			
<b>FCC ID:</b>	O6YUTS-600FSU	<b>GRANTEE FRN NUMBER:</b>	0005823877
<b>PLAT FORM:</b>	N/A	<b>RTL WORK ORDER NUMBER:</b>	2002018
<b>MODEL(S):</b>	UTS-600FSU	<b>RTL QUOTE NUMBER:</b>	QRTL02-241
<b>DATE OF TEST REPORT:</b>	March 22, 2002		
<b>American National Standard Institute:</b>	ANSI/TIA/EIA603 and ANSI/TIA/EIA 603-1		
<b>FCC Classification:</b>	PCB - Licensed Base Station for Part 24		
<b>FCC Rule Part(s):</b>	PART 24: PERSONAL COMMUNICATIONS SERVICES Subpart E - Broadband PCS		
<b>Industry Canada Standard:</b>	RSS-133: 2 GHz Personal Communications Services		
<b>Digital Interface Information</b>	Digital Interface was found to be compliant		
<b>Receiver Information</b>	Receiver was found to be compliant		
<b>Frequency Range (MHz)</b>	<b>EIRP (W)</b>	<b>Freq. Tolerance</b>	<b>Emission Designator</b>
1893.65-1909.95	0.186	1.4 ppm	289KDXW



## TABLE OF CONTENTS

<b>1</b>	<b>GENERAL INFORMATION .....</b>	<b>5</b>
1.1	SCOPE .....	5
1.2	TEST FACILITY .....	5
1.3	RELATED SUBMITAL(S)/GRANT(S) .....	5
<b>2</b>	<b>EQUIPMENT INFORMATION .....</b>	<b>6</b>
2.1	APPLICANT AND EQUIPMENT INFORMATION .....	6
2.2	JUSTIFICATION .....	6
2.3	EXERCISING THE EUT .....	6
2.4	TEST SYSTEM DETAILS .....	7
2.5	CONFIGURATION OF TESTED SYSTEM .....	7
<b>3</b>	<b>DC VOLTAGES AND CURRENTS - PART §2.1033(C)(8) .....</b>	<b>8</b>
<b>4</b>	<b>RF POWER OUTPUT - §2.1046 .....</b>	<b>8</b>
4.1	DUTY CYCLE MEASUREMENT .....	9
4.2	ANSI/TIA/EIA-603-1992, SECTION 2.2.1 TEST PROCEDURE .....	11
4.3	EFFECTIVE ISOTROPIC RADIATED POWER LIMITS - §24.232 TEST PROCEDURE .....	11
4.4	RF POWER TEST EQUIPMENT .....	11
4.5	EFFECTIVE RADIATED POWER TEST DATA- §2.1046 .....	12
<b>5</b>	<b>OCCUPIED BANDWIDTH - §2.1049; NECESSARY BANDWIDTH §2.202 (OCCUPIED BANDWIDTH) – PART 24.238 (B) (EMISSION BANDWIDTH) .....</b>	<b>14</b>
5.1	TEST PROCEDURE .....	14
5.2	OCCUPIED BANDWIDTH TEST EQUIPMENT .....	14
5.3	TEST DATA (CHANNEL 25: OCCUPIED BANDWIDTH = 273 KHZ) .....	15
	CHANNEL 25: EMISSION BANDWIDTH = 289 KHZ .....	16
<b>6</b>	<b>CONDUCTED SPURIOUS AND HARMONIC EMISSIONS - §2.1051 .....</b>	<b>17</b>
6.1	TEST PROCEDURE .....	17
6.2	RF POWER TEST EQUIPMENT .....	17
6.3	CONDUCTED SPURIOUS AND HARMONIC TEST DATA - §2.1051 .....	17
<b>7</b>	<b>RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053 .....</b>	<b>18</b>
7.1	RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053 .....	18
7.2	RADIATED SPURIOUS TEST EQUIPMENT .....	18
7.3	FIELD STRENGTH OF SPURIOUS RADIATION TEST DATA - §2.1053 .....	19
<b>8</b>	<b>BAND-EDGE COMPLIANCE - PART 24.238 .....</b>	<b>20</b>
8.1	TEST PROCEDURE .....	20
8.2	TEST DATA .....	21
<b>9</b>	<b>FREQUENCY STABILITY / TEMPERATURE VARIATION - §2.1055 .....</b>	<b>23</b>
9.1	MEASUREMENT METHOD .....	23
9.2	FREQUENCY STABILITY TEST EQUIPMENT .....	23
9.3	TIME PERIOD AND PROCEDURE .....	23
9.4	FREQUENCY STABILITY § 24.235 .....	24
9.5	FREQUENCY STABILITY TEST DATA - §2.1055 .....	24
<b>10</b>	<b>CONCLUSION .....</b>	<b>27</b>



## TABLE INDEX

TABLE 2-1:	EQUIPMENT UNDER TEST (EUT).....	7
TABLE 4-1:	POWER OUTPUT AT THE ANTENNA PORT DATA - §2.1046.....	8
TABLE 4-2:	RF POWER TEST EQUIPMENT.....	11
TABLE 4-3:	RADIATED POWER DATA - §2.1046 (WHIP ANTENNA (2DBI).....	12
TABLE 4-4:	RADIATED POWER DATA - §2.1046 (PATCH ANTENNA (10DBI) WITH 5 METER CABLE).....	13
TABLE 5-1:	OCCUPIED BANDWIDTH TEST EQUIPMENT.....	14
TABLE 6-1:	RF POWER TEST EQUIPMENT.....	17
TABLE 6-2:	CONDUCTED SPURIOUS AND HARMONIC DATA §2.1051.....	17
TABLE 7-1:	RADIATED SPURIOUS TEST EQUIPMENT.....	18
TABLE 7-2:	FIELD STRENGTH OF SPURIOUS RADIATION TEST DATA §2.1053.....	19
TABLE 9-1:	FREQUENCY STABILITY TEST EQUIPMENT.....	23
TABLE 9-2:	TEMPERATURE FREQUENCY STABILITY DATA - §2.1055.....	24
TABLE 9-3:	VOLTAGE FREQUENCY STABILITY DATA - §2.1055.....	25

## APPENDIX INDEX

APPENDIX A:	RF EXPOSURE COMPLIANCE.....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX B:	AGENCY AUTHORIZATION LETTER.....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX C:	CONFIDENTIALITY REQUEST LETTER.....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX D:	ATTESTATION LETTER(S).....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX E:	PRODUCT DESCRIPTION.....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX F:	LABEL AND LABEL LOCATION.....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX G:	BILL OF MATERIAL (PARTS LIST).....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX H:	SCHEMATIC.....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX I:	MANUAL.....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX J:	TEST PHOTOGRAPHS.....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX K:	EXTERNAL PHOTOGRAPHS.....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX L:	INTERNAL PHOTOGRAPHS.....	<b>ERROR! BOOKMARK NOT DEFINED.</b>
APPENDIX M:	ADDITIONAL INDUSTRY CANADA INFORMATION.....	<b>ERROR! BOOKMARK NOT DEFINED.</b>

## PLOT INDEX

PLOT 4-1:	PULSE MEASUREMENT FOR DUTY CYCLE.....	9
PLOT 4-2:	PULSE WIDTH MEASUREMENT FOR DUTY CYCLE.....	10
PLOT 5-1:	OCCUPIED BANDWIDTH (-20 DB).....	15
PLOT 5-2:	EMISSION BANDWIDTH (-26 DB).....	16
PLOT 8-1:	LOWER BAND EDGE.....	21
PLOT 8-2:	UPPER BAND EDGE.....	22
PLOT 9-1:	TEMPERATURE FREQUENCY STABILITY DATA - §2.1055.....	25
PLOT 9-2:	VOLTAGE FREQUENCY STABILITY.....	26



## PHOTOGRAPH INDEX

PHOTOGRAPH 1: RADIATED BACK VIEW WITH WHIP ANTENNA.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 2: RADIATED BACK VIEW WITH WHIP ANTENNA.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 3: RADIATED BACK VIEW WITH PATCH ANTENNA.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 4: RADIATED FRONT VIEW WITH PATCH ANTENNA.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 5: SUBSTITUTION TRANSMITTING HORN ANTENNA (1 GHZ-18 GHZ) ....**ERROR! BOOKMARK**

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PHOTOGRAPH 6: CONDUCTED VIEW WITH WHIP ANTENNA .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 7: TOP VIEW.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 8: BACK VIEW .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 9: BOTTOM VIEW .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 10: BATTERY COMPARTMENT.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 11: REAR ANTENNA CONNECTOR.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 12: 4VDC POWER SUPPLY.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 13: BOTTOM OF HANDSET .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 14: TOP OF HANDSET .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 15: INSIDE TOP CASE WITH KEYPAD PCB ATTACHED ...**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 16: INSIDE TOP CASE WITH BOTTOM OF KEYPAD.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 17: INSIDE TOP CASE.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 18: INSIDE BOTTOM OF CASE WITH RF, POWER PCB'S, AND CONNECTOR .....**ERROR!**

### **BOOKMARK NOT DEFINED.**

PHOTOGRAPH 19: RF PCB IN BOTTOM CASE .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 20: CONNECTOR PCB IN CASE.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 21: TOP OF KEYPAD PCB .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 22: TOP OF DC POWER PCB .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 23: BOTTOM OF DC POWER PCB.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 24: INSIDE BOTTOM OF CASE.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 25: CONNECTIONS ON MID RF PCB.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 26: TAPED CONNECTIONS ON BOTTOM OF RF PCB .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 27: KEYPAD SIDE OF RF PCB .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 28: CONNECTIONS AT LOWER SIDE OF RF PCB .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 29: CONNECTIONS AT LOWER END OF RF PCB.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 30: RF PCB SHOWING CONNECTIONS TO KEYPAD PCB ..**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 31: INSIDE BOTTOM OF HANDSET WITH COMPONENTS **ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 32: INSIDE TOP CASE OF HANDSET .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 33: INSIDE HANDSET SHOWING BRACE HOLDING COMPONENTS...**ERROR! BOOKMARK NOT**

### **DEFINED.**

PHOTOGRAPH 34: EARPIECE SPEAKER OF HANDSET.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 35: MICROPHONE AND CONNECTOR TO HANDSET .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 36: 10DBI ANTENNA.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 37: 2 DBI ANTENNA CONNECTOR .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 38: 2 DBI ANTENNA.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 39: LABEL OF 10DBI ANTENNA .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 40: INSIDE VIEW OF 10 DBI ANTENNA .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 41: COMPONENT SIDE OF RF PCB.....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 42: LCD/KEYPAD SIDE OF RF PCB .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 43: KEYPAD SIDE OF RF PCB WITHOUT LCD .....**ERROR! BOOKMARK NOT DEFINED.**  
PHOTOGRAPH 44: COMPONENT SIDE OF RF PCB WITH COVER REMOVED.....**ERROR! BOOKMARK NOT**

### **DEFINED.**

PHOTOGRAPH 45: COMPONENT SIDE OF RF PCB WITH SHIELDS REMOVED.....**ERROR! BOOKMARK NOT**  
**DEFINED.**



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Industry Canada Standard(s)

## **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 Communication Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 1992).

### **1.3 RELATED SUBMITAL(S)/GRANT(S)**

This is a new application submittal. The Digital Interface and Receiver were investigated and found compliant. A DoC report can be provided upon request. The IF, LO and up to the 2<sup>nd</sup> LO were investigated.



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## 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		UTStarcom, Inc. 33 Wood Avenue South 3 <sup>rd</sup> Floor Iselin, NJ 08830 732-767-5263 (Scott Black) USA	
Phone: 703-689-0368			
Fax: 703-689-2056			
Web Site: <a href="http://www.rheintech.com">www.rheintech.com</a>			
<b>FCC ID:</b>	O6YUTS-600FSU	<b>GRANTEE FRN NUMBER:</b>	0005823877
<b>PLAT FORM:</b>	N/A	<b>RTL WORK ORDER NUMBER:</b>	2002018
<b>MODEL(S):</b>	UTS-600FSU	<b>RTL QUOTE NUMBER:</b>	QRTL02-241
<b>DATE OF TEST REPORT:</b>	March 22, 2002		
<b>American National Standard Institute:</b>	ANSI/TIA/EIA603 and ANSI/TIA/EIA 603-1		
<b>FCC Classification:</b>	PCB - Licensed Base Station for Part 24		
<b>FCC Rule Part(s):</b>	PART 24: PERSONAL COMMUNICATIONS SERVICES Subpart E - Broadband PCS		
<b>Industry Canada Standard:</b>	RSS-133: 2 GHz Personal Communications Services		
<b>Digital Interface Information</b>	Digital Interface was found to be compliant		
<b>Receiver Information</b>	Receiver was found to be compliant		
<b>Frequency Range (MHz)</b>	<b>EIRP (W)</b>	<b>Freq. Tolerance</b>	<b>Emission Designator</b>
1893.65-1909.95	0.186	1.4 ppm	289KDXW

### 2.2 JUSTIFICATION

To complete the test configuration required by the FCC, the transmitter was software controlled by the manufacturer to operate in a continuous mode. The final data was taken as a substitution measurement. The device is provided with an external antenna connector. EIRP measurement is provided to support the RF exposure requirements for the antenna listed in this application filing.

### 2.3 EXERCISING THE EUT

The UTS-600FSU is a desk phone transmitter designed to link to a PHS phone network which transmits at a frequency within the range (1893.65 MHz – 1909.95 MHz). Three channels were investigated, 1893.65 MHz, 1902.35 MHz, and 1909.95 MHz, in three orthogonal planes, with the receiving antenna in both horizontal and vertical polarities, from 1 meter to 4 meters in height.



## 2.4 TEST SYSTEM DETAILS

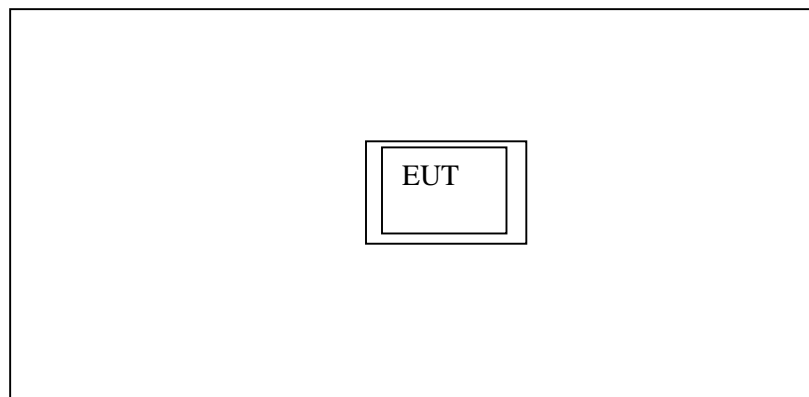
The FCC Identifiers for all equipment, plus descriptions of all cables used in the tested system are:

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 BAR CODE
PHONE	UTStarCOM	UTS-600FSU	053806	O6YUTS-600FSU	UNSHIELDED	014123
PHONE	UTStarCOM	UTS-600FSU	053806	O6YUTS-600FSU	UNSHIELDED	014123
PATCH ANTENNA	UTStarCOM	QXX0318900 (10DBI GAIN)	B03888	SAMPLE	N/A	014120
WHIP ANTENNA	UTStarCOM	2 DBI GAIN	N/A	N/A	N/A	N/A
POWER SUPPLY	UTStarCOM	H-7EPBN008	MB102-040030	N/A	UNSHIELDED POWER	014121
POWER SUPPLY	UTStarCOM	H-7EPBN008	MB102-040030	N/A	UNSHIELDED POWER	014122

## 2.5 CONFIGURATION OF TESTED SYSTEM



**FIGURE 1: CONFIGURATION OF TESTED SYSTEM**




### 3 DC VOLTAGES AND CURRENTS - PART §2.1033(C)(8)

The dc voltages applied to and dc currents into the several elements of the final radio frequency amplifying device for normal operation over the power range.

	Minimum	Typical	Maximum
Voltage (DC)	2.9	4	4.6
Current (Amps)	0.22	0.3	.35

#### PERSONNEL INFORMATION:


Signature:  Test Date: February 12, 2002  
Typed/Printed Name: Daniel Baltzell Position: Test Engineer

### 4 RF POWER OUTPUT - §2.1046

TABLE 4-1: 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	18.54	17.38	8.9	8.48	7.0
25	1902.35	18.46	17.29	8.9	8.39	6.9
50	1909.85	18.30	17.14	8.9	8.24	6.7

#### PERSONNEL INFORMATION:

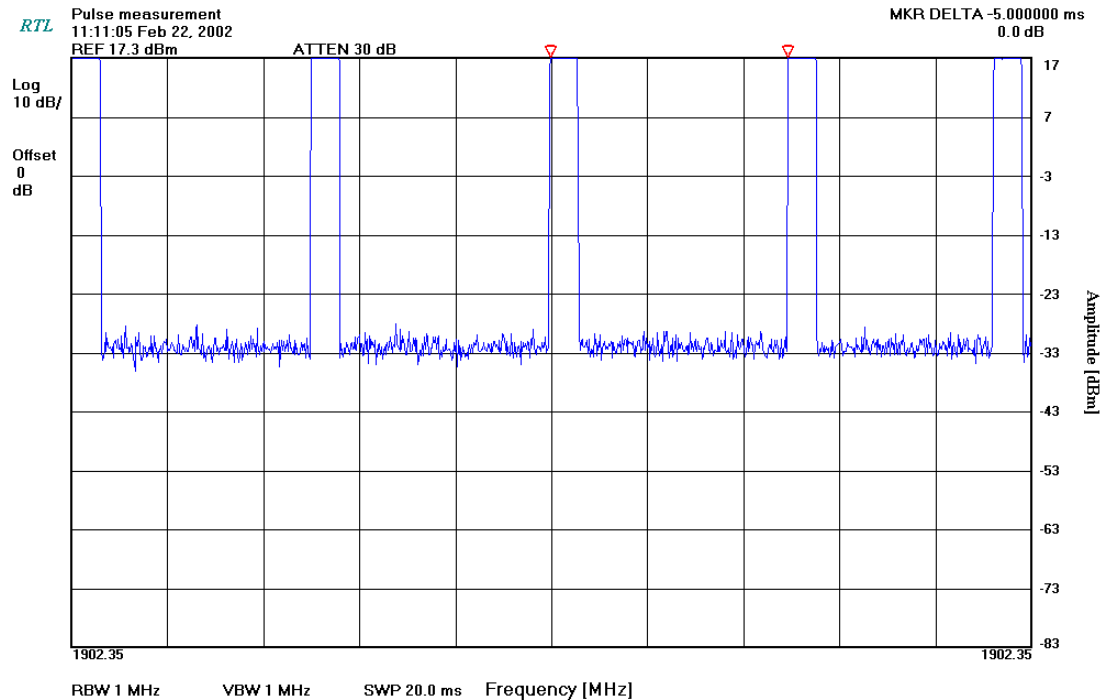
Signature:  Test Date: February 12, 2002  
Typed/Printed Name: Daniel Baltzell Position: Test Engineer





#### 4.1 DUTY CYCLE MEASUREMENT

##### PLOT 4-1: PULSE MEASUREMENT FOR DUTY CYCLE



Duty cycle calculation from above plots:

$$0.64\text{ms} / 5\text{ ms} = 0.128 \text{ or } 12.8\% \text{ duty cycle}$$

$$\text{crest factor} = 1/0.128 = 7.8$$

$$10 \text{ LOG } 0.128 = -8.9 \text{ dB correction.}$$

##### PERSONNEL INFORMATION:

Signature:

Test Date:

February 22, 2002

Typed/Printed Name:

Daniel Baltzell

Position:

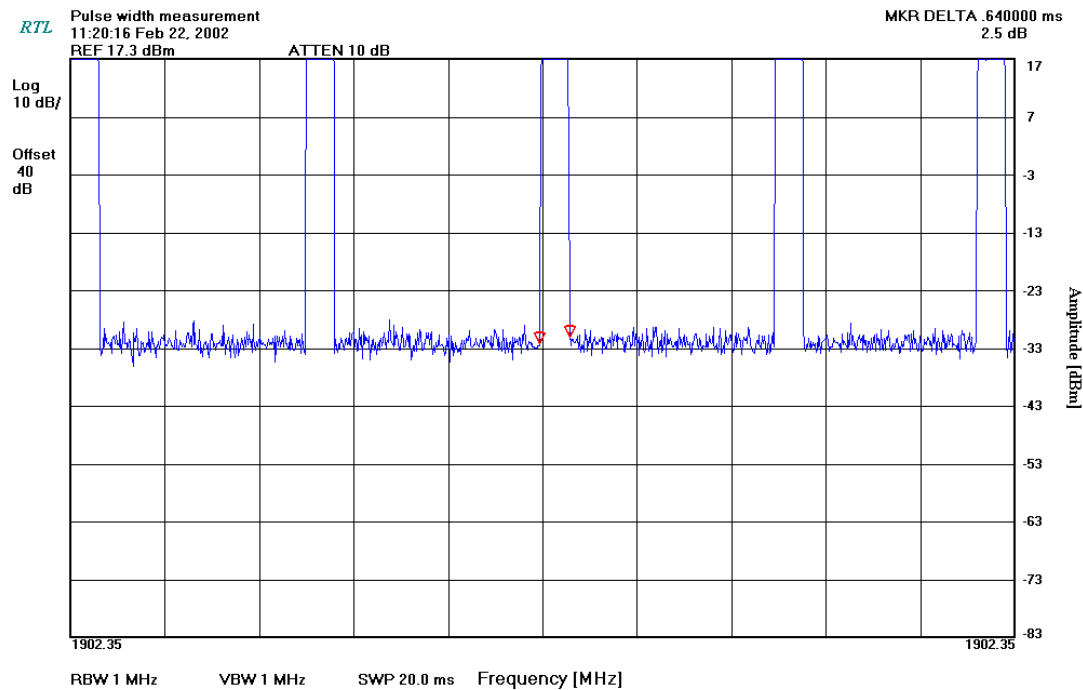
Test Engineer



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#### PLOT 4-2: PULSE WIDTH MEASUREMENT FOR DUTY CYCLE




Duty cycle calculation from above plots:

$0.64\text{ms} / 5\text{ ms} = 0.128$  or 12.8 % duty cycle

crest factor =  $1/0.128 = 7.8$

$10 \text{ LOG } 0.128 = -8.9\text{ dB}$  correction.

#### PERSONNEL INFORMATION:

Signature:		Test Date:	February 22, 2002
Typed/Printed Name:	Daniel Baltzell	Position:	Test Engineer



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

Substitution method.

#### 4.3 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.

#### 4.4 RF POWER TEST EQUIPMENT

**TABLE 4-2: 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



#### 4.5 EFFECTIVE RADIATED POWER TEST DATA- §2.1046

TABLE 4-3: RADIATED POWER DATA - §2.1046 (WHIP ANTENNA (2DBI))

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	81.0	16.3	1.6	4.8	19.5	8.9	10.6	11.5
251	Av	1893.65	79.8	15.1	1.6	4.8	18.3	8.9	9.4	8.7
25	Pk	1902.35	80.1	18.5	1.7	4.8	21.6	8.9	12.7	18.6
25	Av	1902.35	78.9	17.3	1.7	4.8	20.4	8.9	11.5	14.1
50	Pk	1909.85	79.7	16.2	1.7	4.8	19.3	8.9	10.4	11.0
50	Av	1909.85	78.5	15.0	1.7	4.8	18.1	8.9	9.2	8.3

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

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 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 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.,  $S_g - CL + G_n = EIRP \text{ (dBm)}$

$S_g$  = Signal Generator Level (dBm)

$CL$  = Cable Loss (dB)

$G_n$  = Transmitting horn antenna gain (dBi)

PERSONNEL INFORMATION:

Signature:		Test Date:	February 1, 2002
Typed/Printed Name:	Daniel Baltzell	Position:	Test Engineer



**TABLE 4-4: RADIATED POWER DATA - §2.1046 (PATCH ANTENNA (10DBI) WITH 5 METER CABLE)**

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	82.3	20.6	1.6	4.8	23.8	8.9	14.9	30.9
251	Av	1893.65	81.1	19.4	1.6	4.8	22.6	8.9	13.7	23.4
25	Pk	1902.35	82.2	20.7	1.7	4.8	25.8	8.9	16.9	49.0
25	Av	1902.35	81.0	19.5	1.7	4.8	22.6	8.9	13.7	23.4
50	Pk	1909.85	81.5	20.8	1.7	4.8	23.9	8.9	15.0	31.6
50	Av	1909.85	80.3	19.6	1.7	4.8	22.7	8.9	13.8	24.0

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

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 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 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.,  $S_g - CL + G_n = \text{EIRP (dBm)}$

$S_g$  = Signal Generator Level (dBm)

$CL$  = Cable Loss (dB)

$G_n$  = Transmitting horn antenna gain (dBi)

#### PERSONNEL INFORMATION:

Signature:		Test Date:	February 1, 2002
Typed/Printed Name:	Daniel Baltzell	Position:	Test Engineer



## **5 OCCUPIED BANDWIDTH - §2.1049; NECESSARY BANDWIDTH §2.202 (OCCUPIED BANDWIDTH) – PART 24.238 (B) (EMISSION BANDWIDTH)**

Type of Emission: DXW

Necessary bandwidth designator derived from measurement of emission bandwidth (-26 dB) (289 kHz): 289KDXW

OCCUPIED BANDWIDTH (99% POWER BANDWIDTH) - COMPLIANCE WITH THE EMISSION MASKS

### **5.1 TEST PROCEDURE**

ANSI/TIA/EIA-603-1992, section 2.2.11

Device with digital modulation: operation to its maximum extent

Note: Reference level is average conducted power measurement not corrected for duty cycle.

### **5.2 OCCUPIED BANDWIDTH TEST EQUIPMENT**

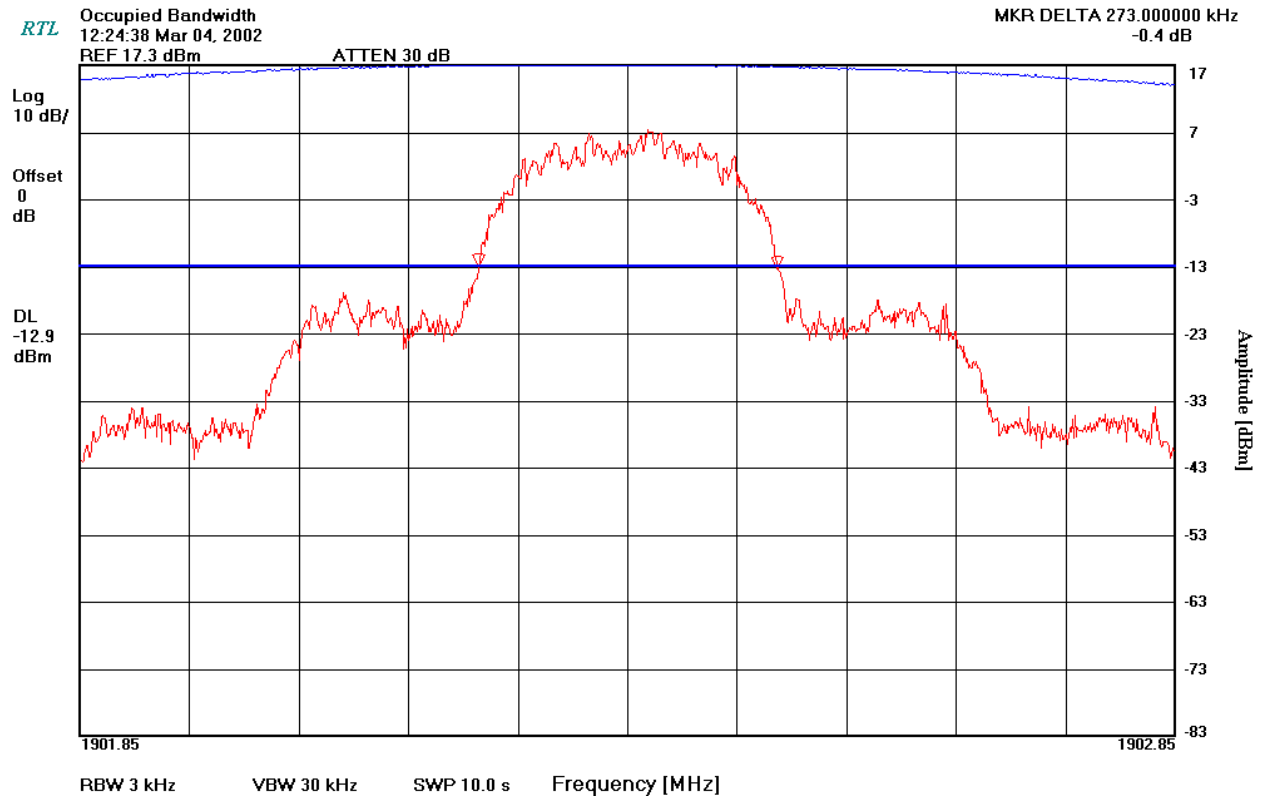
**TABLE 5-1: OCCUPIED BANDWIDTH TEST EQUIPMENT**

<b>RTL Asset #</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Part Type</b>	<b>Serial Number</b>	<b>Calibration Due</b>
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz – 40 GHz)	3943A01719	6/7/02



### 5.3 TEST DATA (CHANNEL 25: OCCUPIED BANDWIDTH = 273 KHZ)

#### PLOT 5-1: OCCUPIED BANDWIDTH (-20 DB)



#### PERSONNEL INFORMATION:

Signature:		Test Date:	March 4, 2002
Typed/Printed Name:	Daniel Baltzell	Position:	Test Engineer

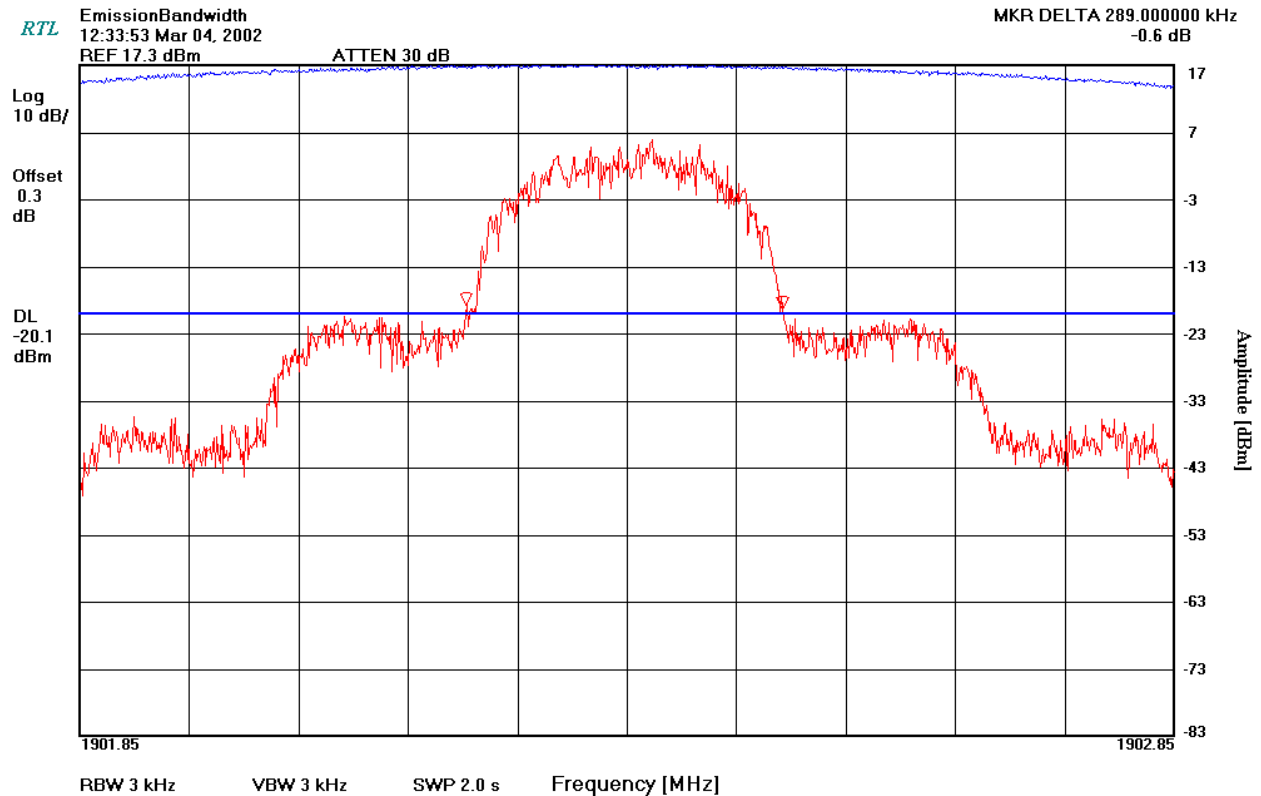


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## CHANNEL 25: EMISSION BANDWIDTH = 289 KHZ

### PLOT 5-2: EMISSION BANDWIDTH (-26 DB)



### PERSONNEL INFORMATION:

Signature:  Test Date: March 4, 2002

Typed/Printed Name: Daniel Baltzell Position: Test Engineer





## 6 CONDUCTED SPURIOUS AND HARMONIC EMISSIONS - §2.1051

### 6.1 TEST PROCEDURE

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

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

### 6.2 RF POWER TEST EQUIPMENT

TABLE 6-1: 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


### 6.3 CONDUCTED SPURIOUS AND HARMONIC TEST DATA - §2.1051

Operating Frequency (MHz): 1902.35  
Channel: 25  
Measured Power at the Antenna Port (dBm): 17.29  
Modulation: DXW  
Limit (dBc): 30.29

TABLE 6-2: CONDUCTED SPURIOUS AND HARMONIC DATA §2.1051

Frequency (MHz)	Measured Level (dBm)	Notch Filter Insertion Loss (dB)	Corrected Measured Level (dBc)	Margin (dB)
3804.700	-32.8	1.7	48.4	-18.1
5707.050	-66.5	3.3	80.5	-50.2
7609.400	-64.7	3.9	78.1	-47.8
9511.750				<-50.0
11414.100				<-50.0
13316.450				<-50.0
15218.800				<-50.0
17121.150				<-50.0
19023.500				<-50.0

### PERSONNEL INFORMATION:

Signature:  Test Date: March 4, 2002  
Typed/Printed Name: Daniel Baltzell Position: Test Engineer



## 7 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053

### 7.1 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053

Substitution method. The EUT was terminated with a 50 ohm termination and 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 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.

### 7.2 RADIATED SPURIOUS TEST EQUIPMENT

**TABLE 7-1: RADIATED SPURIOUS 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 Ridges Guide Antenna 1-18 GHz	2310	2/26/02



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### 7.3 FIELD STRENGTH OF SPURIOUS RADIATION TEST DATA - §2.1053

Operating Frequency (MHz): 1902.35  
Channel: 25  
Measured Power at the Antenna Port (dBm): 17.29  
Modulation: DXW  
Distance (m): 3  
Limit (dBc): 30.29

**TABLE 7-2: FIELD STRENGTH OF SPURIOUS RADIATION TEST DATA §2.1053**

Frequency (MHz)	Signal Generator Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)	Corrected Signal Generator Level (dBm)	Corrected Level (dBc)	Margin (dB)
3804.700	-45.6	1.3	5.9	-41.0	58.3	-28.0
5707.050						<-40.0
7609.400						<-40.0
9511.750						<-40.0
11414.100						<-40.0
13316.450						<-40.0
15218.800						<-40.0
17121.150						<-40.0
19023.500						<-40.0

#### PERSONNEL INFORMATION:

Signature:  Test Date: February 1, 2002  
Typed/Printed Name: Daniel Baltzell Position: Test Engineer



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Quote Number: QRTL02-241 Revision:  
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Industry Canada Standard(s)

## **8 BAND-EDGE COMPLIANCE - PART 24.238**

### **8.1 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  $-13 \text{ dBm}$  ( $43+10\text{LogP}$ ).

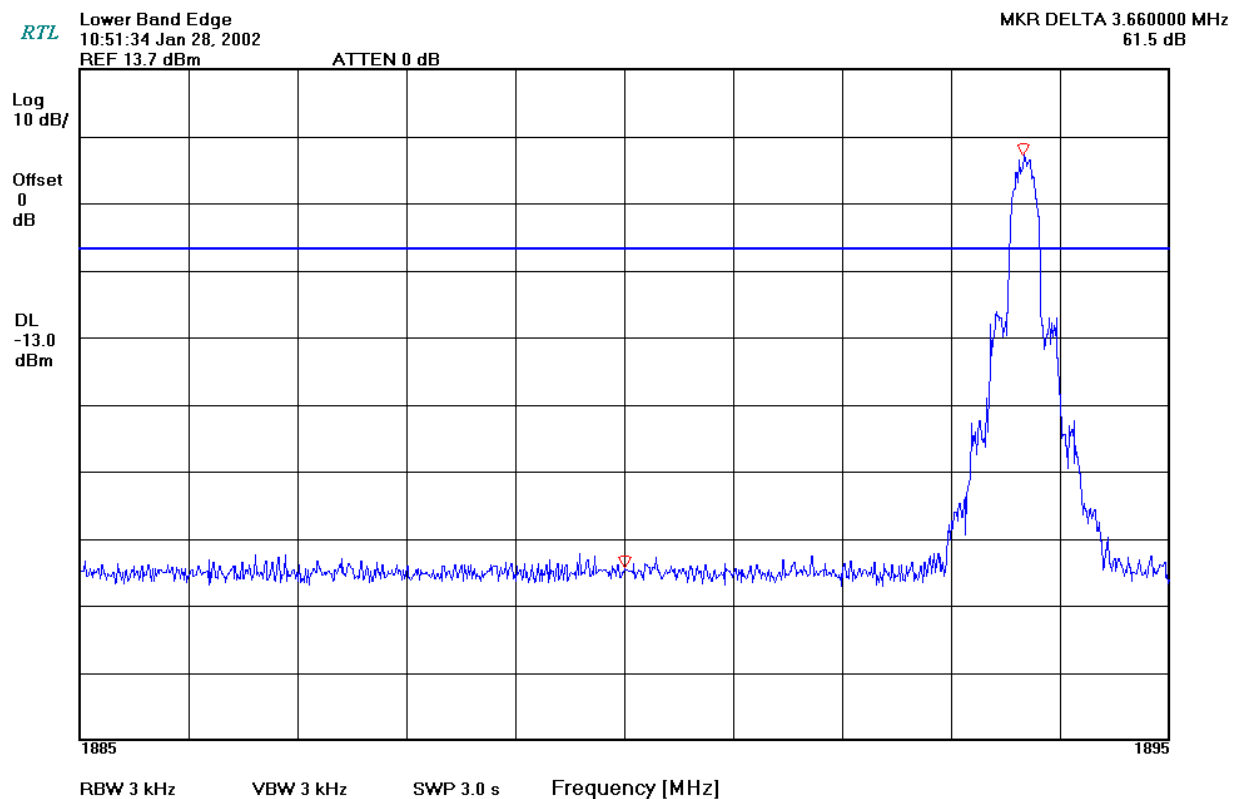


## 8.2 TEST DATA


### Calculation of Lower Band Edge

The reference level 13.7 dBm is the average radiated EIRP level after duty cycle correction, which the delta measurement of 61.5 dB is subtracted (reference plots), which is equivalent to a level of - 47.8 dBm. This level has a margin of 34.8 dB below the limit of  $43 + 10 \log P$  (-13 dBm).

### PLOT 8-1: LOWER BAND EDGE



### PERSONNEL INFORMATION:

Signature:  Test Date: January 28, 2002  
Typed/Printed Name: Daniel Baltzell Position: Test Engineer

### Calculation of Upper Band Edge

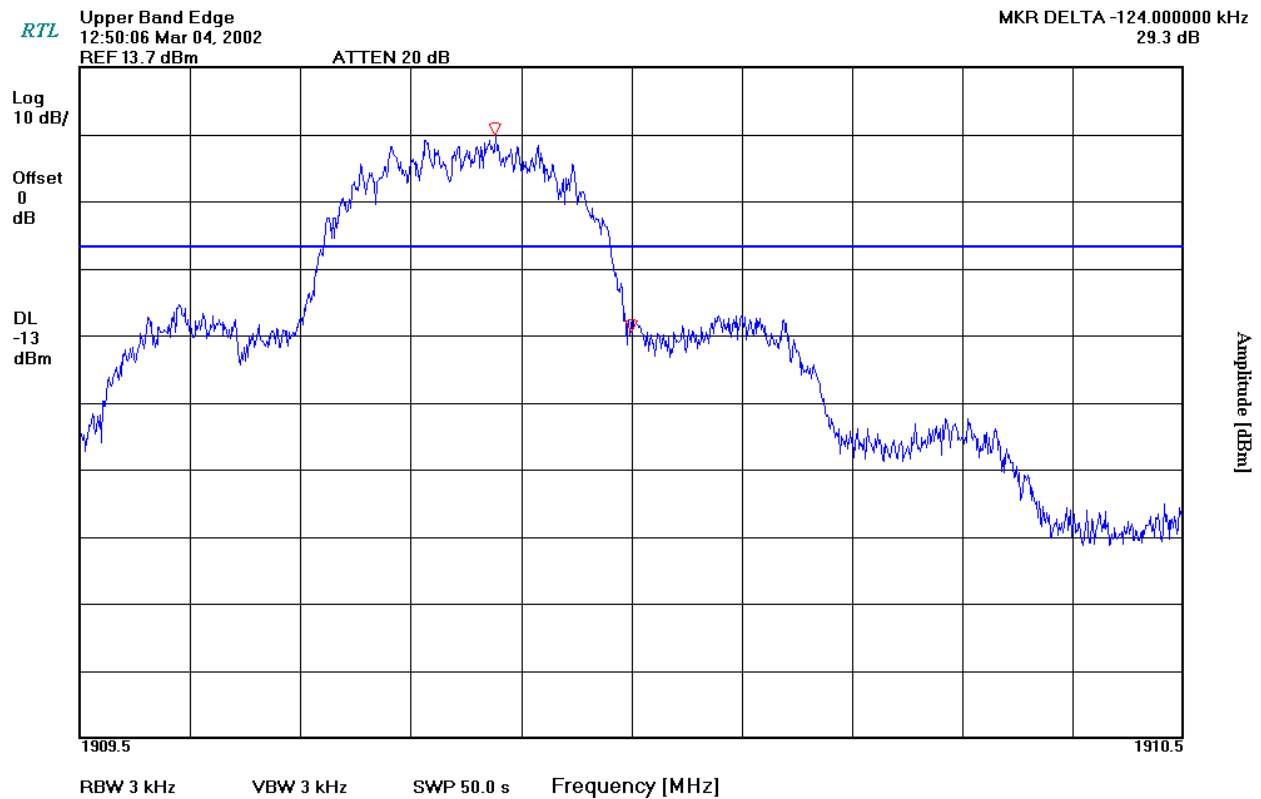
The reference level 13.7 dBm is the average radiated EIRP level after duty cycle correction, which the delta measurement of 29.3 dB is subtracted (reference plots), which is equivalent to a level of - 15.6 dBm. This level has a margin of 2.6 dB below the limit of  $43 + 10 \log P$  (-13 dBm).



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## PLOT 8-2: UPPER BAND EDGE



## PERSONNEL INFORMATION:

Signature:		Test Date:	March 4, 2002
Typed/Printed Name:	Daniel Baltzell	Position:	Test Engineer



## 9 FREQUENCY STABILITY / TEMPERATURE VARIATION - §2.1055

The frequency stability and RF power, measured at the antenna connector using a communications test set as the specified load, are plotted against supply voltage variations and temperature variations at the highest power levels for each modulation type. All measurements are made at the center of the frequency band.

### 9.1 MEASUREMENT METHOD:

The frequency stability of the transmitter was measured by:

1. Temperature: The temperature was varied from -30°C to +50°C at intervals no more than 10°C throughout the temperature range using an environmental chamber. A period of time sufficient to stabilize all of the components in the equipment shall be allowed prior to each frequency measurement.
2. Primary Supply Voltage: The primary supply voltage was varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied. The EUT was tested down to the battery endpoint.

### 9.2 FREQUENCY STABILITY TEST EQUIPMENT

TABLE 9-1: FREQUENCY STABILITY TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due
900883	Tenney Engineering, Inc	TH65	Temperature Chamber	11380	11/19/02
901055	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2545A04102	7/31/02

### 9.3 TIME PERIOD AND PROCEDURE:

1. The carrier frequency of the transmitter was measured at room temperature (25°C to provide a reference).
2. The equipment was subjected to a “soak” at -30°C without any power applied.
3. After the “soak” at -30°C, the measurement of the carrier frequency of the transmitter was made within a three-minute interval after applying power to the transmitter.
4. Frequency measurements were made at 10°C intervals up to +50°C, then back to room temperature. A minimum period of one hour was provided to allow stabilization of the equipment at each temperature level.



#### 9.4 FREQUENCY STABILITY § 24.235

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.


#### 9.5 FREQUENCY STABILITY TEST DATA - §2.1055

Operating Frequency: 1902.35 MHz  
Channel: 251  
Reference Voltage: 4 VDC  
Deviation Limit: 0.00025 % or 2.5 ppm

TABLE 9-2: TEMPERATURE FREQUENCY STABILITY DATA - §2.1055

Temperature	Frequency Measured (MHz)	ppm
-30	1902.347425	-1.35
-25	1902.348275	-0.91
-20	1902.349325	-0.35
-15	1902.349675	-0.17
-10	1902.349865	-0.07
0	1902.350000	0.00
10	1902.348945	-0.55
20	1902.348550	-0.76
30	1902.348520	-0.78
40	1902.347425	-1.35
50	1902.348275	-0.91

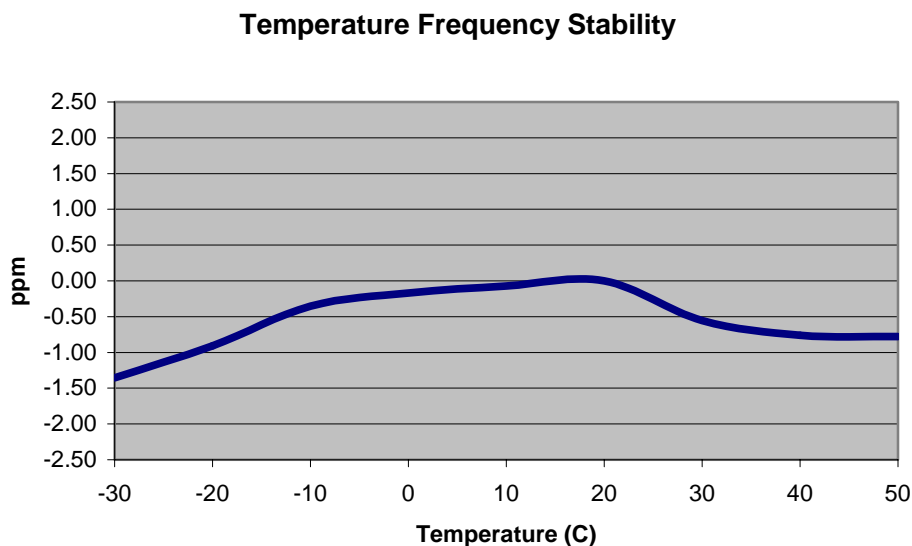
#### PERSONNEL INFORMATION:

Signature:  Test Date: February 8, 2002  
Typed/Printed Name: Daniel Baltzell Position: Test Engineer





**PLOT 9-1: TEMPERATURE FREQUENCY STABILITY DATA - §2.1055**




**TABLE 9-3: VOLTAGE FREQUENCY STABILITY DATA - §2.1055**

Battery endpoint = 2.9 VDC

Voltage	Frequency Measured (MHz)	ppm
2.90	1902.3470060	-1.57
4.00	1902.3500000	0.00
4.34	1902.3497900	-0.11
4.90	1902.3494960	-0.26
5.21	1902.3498820	-0.06
5.98	1902.3495260	-0.25

**PERSONNEL INFORMATION:**

Signature:		Test Date:	February 8, 2002
Typed/Printed Name:	Daniel Baltzell	Position:	Test Engineer

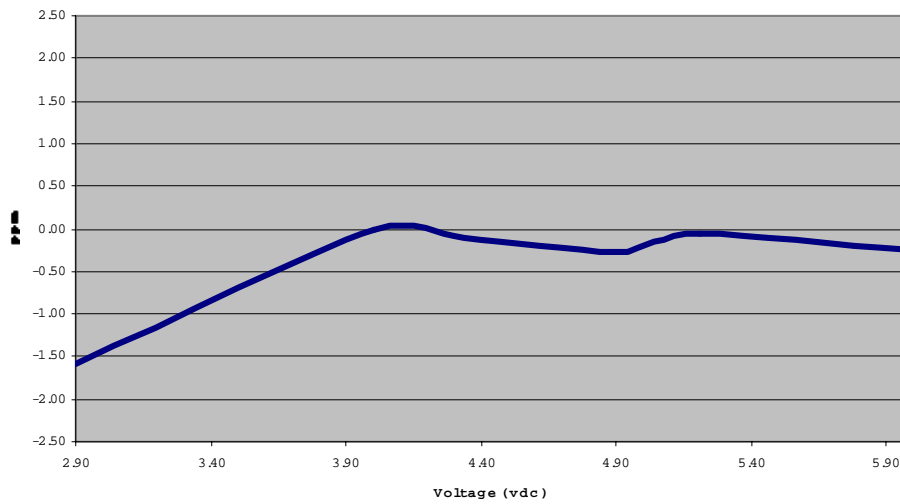


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## PLOT 9-2: VOLTAGE FREQUENCY STABILITY

Voltage Frequency Stability



## PERSONNEL INFORMATION:

Signature:		Test Date:	February 8, 2002
Typed/Printed Name:	Daniel Baltzell	Position:	Test Engineer



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## 10 CONCLUSION

<b>Test Lab:</b>		<b>Applicant Information</b>	
Rhein Tech Laboratories, Inc. 360 Herndon Parkway Suite 1400 Herndon, VA 20170		UTStarcom, Inc. 33 Wood Avenue South 3 <sup>rd</sup> Floor Iselin, NJ 08830 732-767-5263 (Scott Black) USA	
Phone: 703-689-0368			
Fax: 703-689-2056			
Web Site: <a href="http://www.rheintech.com">www.rheintech.com</a>			
<b>FCC ID:</b>	O6YUTS-600FSU	<b>GRANTEE FRN NUMBER:</b>	0005823877
<b>PLAT FORM:</b>	N/A	<b>RTL WORK ORDER NUMBER:</b>	2002018
<b>MODEL(S):</b>	UTS-600FSU	<b>RTL QUOTE NUMBER:</b>	QRTL02-241
<b>DATE OF TEST REPORT:</b>	March 22, 2002		
<b>American National Standard Institute:</b>	ANSI/TIA/EIA603 and ANSI/TIA/EIA 603-1		
<b>FCC Classification:</b>	PCB - Licensed Base Station for Part 24		
<b>FCC Rule Part(s):</b>	PART 24: PERSONAL COMMUNICATIONS SERVICES Subpart E - Broadband PCS		
<b>Industry Canada Standard:</b>	RSS-133: 2 GHz Personal Communications Services		
<b>Digital Interface Information</b>	Digital Interface was found to be compliant		
<b>Receiver Information</b>	Receiver was found to be compliant		
<b>Frequency Range (MHz)</b>	<b>EIRP (W)</b>	<b>Freq. Tolerance</b>	<b>Emission Designator</b>
1893.65-1909.95	0.186	1.4 ppm	289KDXW

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

Signature: 

Date: March 22, 2002

Typed/Printed Name: Desmond Fraser

Position: President

Signature: 

Date: March 22, 2002

Typed/Printed Name: Daniel W. Baltzell

Position: EMC Test Engineer