



Engineering and Testing for EMC and Safety Compliance

## CERTIFICATION APPLICATION REPORT FCC PART 24

|                                                                                                                                                                                                                                                       |                                                                        |                                                                                                                                                                                                 |                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Test Lab:</b><br>Rhein Tech Laboratories, Inc. Phone: 703-689-0368<br>360 Herndon Parkway Fax: 703-689-2056<br>Suite 1400 Web Site: <a href="http://www.rheintech.com">www.rheintech.com</a><br>Herndon, VA 20170<br>Email: ATCBINFO@rheintech.com |                                                                        | <b>Applicant:</b><br>UTStarcom, Inc. Phone: 732-767-5263<br>33 Wood Avenue South Fax: 732-548-1099<br>3 <sup>rd</sup> Floor<br>Iselin, NJ 08830 USA<br>Contact: Scott Black (sblack@utstar.com) |                            |
| <b>FCC ID:</b>                                                                                                                                                                                                                                        | O6YUTS-702                                                             | <b>GRANTEE FRN NUMBER:</b>                                                                                                                                                                      | 0005823877                 |
| <b>PLAT FORM:</b>                                                                                                                                                                                                                                     | N/A                                                                    | <b>RTL WORK ORDER NUMBER:</b>                                                                                                                                                                   | 2003071                    |
| <b>MODEL(S):</b>                                                                                                                                                                                                                                      | UTS702U                                                                | <b>RTL QUOTE NUMBER:</b>                                                                                                                                                                        | QRTL03-818                 |
| <b>DATE OF TEST REPORT:</b>                                                                                                                                                                                                                           | July 10, 2003                                                          |                                                                                                                                                                                                 |                            |
| <b>American National Standard Institute:</b>                                                                                                                                                                                                          | ANSI/TIA/EIA603 and ANSI/TIA/EIA 603-1                                 |                                                                                                                                                                                                 |                            |
| <b>FCC Classification:</b>                                                                                                                                                                                                                            | PCE - Part 24 Licensed Portable Tx held to ear                         |                                                                                                                                                                                                 |                            |
| <b>FCC Rule Part(s):</b>                                                                                                                                                                                                                              | PART 24: PERSONAL COMMUNICATIONS SERVICES<br>Subpart E - Broadband PCS |                                                                                                                                                                                                 |                            |
| <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>Peak EIRP (W)</b>                                                   | <b>Frequency Tolerance</b>                                                                                                                                                                      | <b>Emission Designator</b> |
| 1893.65-1909.85                                                                                                                                                                                                                                       | 0.087                                                                  | 2.14ppm                                                                                                                                                                                         | 275KDXW                    |

I, 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.

Furthermore, there was no deviation from, additions to, or exclusions from the FCC Part 2, FCC Part 24, ANSI/TIA/EIA603, and ANSI/TIA/EIA 603-1.

Signature: 

Date: July 10, 2003

Typed/Printed Name: Desmond A. Fraser

Position: President

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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 SUBMITTAL(S)/GRANT(S)**

This is a new application submittal. The Digital Interface and Receiver were investigated and found compliant. The IF, LO and up to the 2<sup>nd</sup> LO were investigated.

## 2 EQUIPMENT INFORMATION

### 2.1 TEST 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.

### 2.2 EXERCISING THE EUT

The UTS702U is a portable phone transmitter designed to link to a PHS phone network which transmits at a frequency within the range 1890 MHz – 1910 MHz. Three channels were investigated, 1893.65 MHz, 1902.35 MHz, and 1909.85 MHz, in three orthogonal planes, with the receiving antenna in both horizontal and vertical polarities, from 1 meter to 4 meters in height.

### 2.3 TEST RESULT SUMMARY

**TABLE 2-1: TEST RESULT SUMMARY FOR FCC RULES AND REGULATIONS**

| STANDARD          | TEST                                        | PASS/FAIL<br>OR N/A |
|-------------------|---------------------------------------------|---------------------|
| FCC §2.1033(c)(8) | DC Voltages and Currents                    | Pass                |
| FCC §2.1046       | RF Power Output                             | Pass                |
| FCC §24.238 (B)   | Emission Bandwidth                          | Pass                |
| FCC §1.1051       | Conducted Spurious and Harmonic Emissions   | Pass                |
| FCC §2.1053       | Radiated Spurious and Harmonic Emissions    | Pass                |
| FCC §24.238       | Band Edge                                   | Pass                |
| FCC §2.1055       | Frequency Stability / Temperature Variation | Pass                |

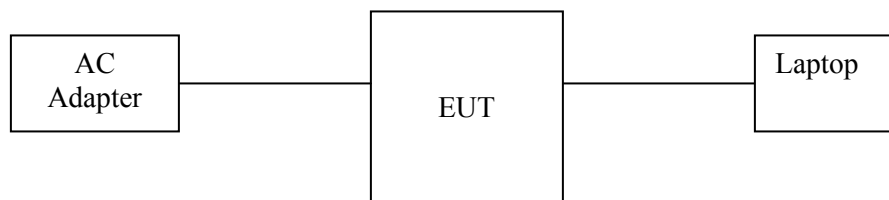
## 2.4 TEST SYSTEM DETAILS

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

**TABLE 2-2: EQUIPMENT UNDER TEST (EUT)**

| PART               | MANUFACTURER    | MODEL     | SERIAL NUMBER | FCC ID      | CABLE DESCRIPTION              | RTL BAR CODE |
|--------------------|-----------------|-----------|---------------|-------------|--------------------------------|--------------|
| PORTABLE PHONE     | UTSTARCOM, INC. | UTS702U   | 050703-37806Y | O6YUTS-702U |                                | 15186        |
| COMPUTER CABLE     | UTSTARCOM, INC. | AWM 20276 | N/A           | N/A         | 28AWG Cable (70 cm) UNSHIELDED | 15183        |
| CHARGER AC ADAPTER | UTSTARCOM, INC. | PV-07540T | N/A           | N/A         | 1.7 METER UNSHIELDED POWER     | 15230        |

## 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 was measured.

#### 3.1 DC VOLTAGES AND CURRENTS TEST EQUIPMENT

TABLE 3-1: DC VOLTAGES AND CURRENTS TEST EQUIPMENT

| RTL<br>Asset # | Manufacturer | Model  | Part Type  | Serial<br>Number | Calibration<br>Due |
|----------------|--------------|--------|------------|------------------|--------------------|
| 901247         | Wavetek      | DM25XT | Multimeter | 40804098         | 2/14/04            |

TABLE 3-2: DC VOLTAGES AND CURRENTS DATA

|                | Minimum | Typical | Maximum |
|----------------|---------|---------|---------|
| Voltage (DC)   | 2.9     | 3.6     | 4.2     |
| Current (Amps) | 0.033   | 0.031   | 0.030   |

#### TEST PERSONNEL:

Signature:  
Typed/Printed  
Name:



Rachid Sehb

Test Date:

May 27, 2003

Position:

Test Engineer

#### 4 RF POWER OUTPUT - §2.1046

The transmitter antenna terminal is connected with the 50  $\Omega$  impedance input to the spectrum analyzer.

##### 4.1 RF POWER OUTPUT TEST EQUIPMENT

**TABLE 4-1: RF POWER OUTPUT TEST EQUIPMENT**

| RTL Asset # | Manufacturer         | Model               | Part Type                         | Serial Number | Calibration Due |
|-------------|----------------------|---------------------|-----------------------------------|---------------|-----------------|
| 901184      | Agilent Technologies | E4416A              | EPM-P Power Meter, single channel | GB41050573    | 7/19/03         |
| 901186      | Agilent Technologies | E9323A (50MHz-6GHz) | Peak & Average Power Sensor       | US40410380    | 7/19/03         |

**TABLE 4-2: POWER OUTPUT AT THE ANTENNA PORT DATA - §2.1046**

| Channel | Frequency (MHz) | Burst Peak Power Meter Level (dBm) |
|---------|-----------------|------------------------------------|
| 251     | 1893.65         | 18.61                              |
| 25      | 1902.35         | 18.70                              |
| 50      | 1909.85         | 19.00                              |

TEST PERSONNEL:

Signature:  
Typed/Printed  
Name:

  
\_\_\_\_\_  
Rachid Sehb

Test Date:

May 22, 2003

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 (B)TEST PROCEDURE

Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

#### 4.4 RF POWER TEST EQUIPMENT

**TABLE 4-3: RF POWER TEST EQUIPMENT**

| RTL Asset # | Manufacturer         | Model                  | Part Type                                      | Serial Number | Calibration Due |
|-------------|----------------------|------------------------|------------------------------------------------|---------------|-----------------|
| 901053      | Schaffner Chase      | CBL6112B               | Bi-Log Antenna<br>(20 MHz - 2 GHz)             | 2648          | 6/17/04         |
| 900932      | Hewlett Packard      | 8449B OPT H02          | Preamplifier<br>(1-26.5 GHz)                   | 3008A00505    | 7/15/03         |
| 901020      | Hewlett Packard      | 8564E                  | Portable Spectrum Analyzer<br>(9 kHz - 40 GHz) | 3943A01719    | 7/2/04          |
| 900928      | Hewlett Packard      | 83752A                 | Synthesized Sweeper<br>(0.01 to 20 GHz)        | 3610A00866    | 6/19/04         |
| 900814      | Electro-Metrics      | EM-6961<br>(RGA-60)    | Double Ridged Guide Antenna (1 - 18 GHz)       | 2310          | 2/17/04         |
| 901184      | Agilent Technologies | E4416A                 | EPM-P Power Meter,<br>single channel           | GB41050573    | 7/19/03         |
| 901186      | Agilent Technologies | E9323A<br>(50MHz-6GHz) | Peak & Average Power Sensor                    | US40410380    | 7/19/03         |

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

| Channel | Test Detector | Frequency (MHz) | Power meter (dBm) | Signal Generator Level (dBm) | Cable Loss (dB) | Antenna Gain (dBi) | Burst Level EIRP (dBm) |
|---------|---------------|-----------------|-------------------|------------------------------|-----------------|--------------------|------------------------|
| 251     | Pk            | 1893.65         | -20.5             | 12.8                         | 0.7             | 7.0                | 19.1                   |
| 25      | Pk            | 1902.35         | -19.4             | 13.1                         | 0.7             | 7.0                | 19.4                   |
| 50      | Pk            | 1909.85         | -21.3             | 11.0                         | 0.6             | 7.0                | 17.4                   |

#### 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)

#### TEST PERSONNEL:

Signature:  
 Typed/Printed  
 Name:



Rachid Sehb

Test Date:

May 21, 2003

Position:

Test Engineer

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

The channel 25 was found to be the worst case and is shown below.

Type of Emission: DXW

Necessary bandwidth designator derived from measurement of emission bandwidth (-26 dB) (275 KHz): 275KDXW

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 peak conducted power measurement not corrected for duty cycle.

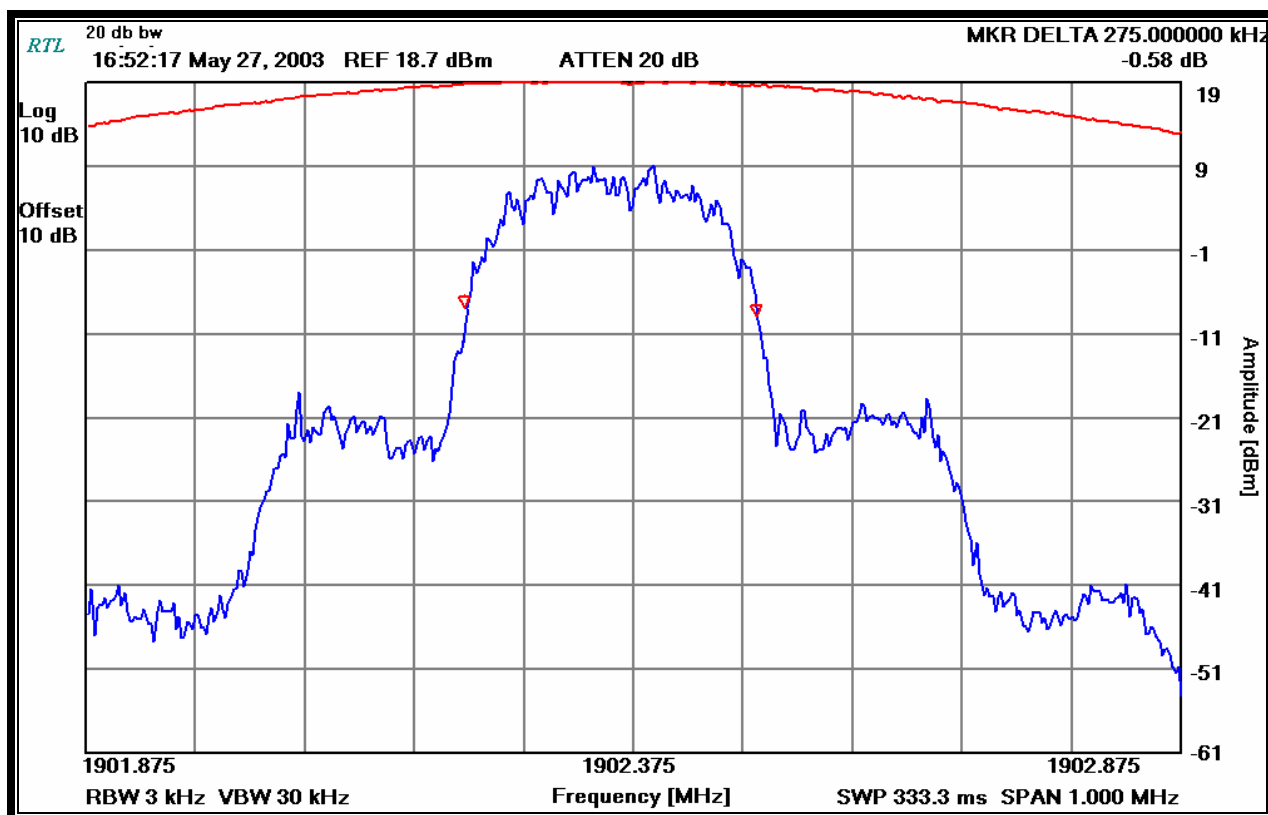
### **5.2 OCCUPIED BANDWIDTH TEST EQUIPMENT**

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

| <b>RTL<br/>Asset #</b> | <b>Manufacturer</b> | <b>Model</b> | <b>Part Type</b>                               | <b>Serial<br/>Number</b> | <b>Calibration<br/>Due</b> |
|------------------------|---------------------|--------------|------------------------------------------------|--------------------------|----------------------------|
| 901020                 | Hewlett<br>Packard  | 8564E        | Portable Spectrum Analyzer<br>(9 kHz - 40 GHz) | 3943A01719               | 7/2/03                     |

### 5.3 TEST DATA (CHANNEL 25: OCCUPIED BANDWIDTH = 275 KHZ)

PLOT 5-1: OCCUPIED BANDWIDTH (-26 DB)



### TEST PERSONNEL:

Signature:  
 Typed/Printed  
 Name:

  
 Rachid Sehb

Test Date:  
 Position:

May 27, 2003  
 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 peak channel test data is provided. Overloading of the input to the spectrum analyzer was checked and found it was not necessary to use a notch filter for this purpose during measurements.

### 6.2 CONDUCTED SPURIOUS AND HARMONIC TEST EQUIPMENT

**TABLE 6-1: CONDUCTED SPURIOUS AND HARMONIC TEST EQUIPMENT**

| RTL Asset # | Manufacturer    | Model | Part Type                                      | Serial Number | Calibration Due |
|-------------|-----------------|-------|------------------------------------------------|---------------|-----------------|
| 901020      | Hewlett Packard | 8564E | Portable Spectrum Analyzer<br>(9 kHz - 40 GHz) | 3943A01719    | 7/2/03          |

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

Operating Frequency (MHz): 1893.65  
 Channel: 251  
 Measured Power at the Antenna Port (dBm): 18.61  
 Modulation: DXW  
 Limit (dBc): 31.66

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

| Frequency (MHz) | Measured Level (dBc) | Margin (dB) |
|-----------------|----------------------|-------------|
| 1661.33         | -59.91               | -28.31      |
| 1868.42         | -45.71               | -14.11      |
| 1922.20         | -45.41               | -13.81      |
| 2130.43         | -48.81               | -17.21      |
| 3799.77         | -59.01               | -27.41      |

Operating Frequency (MHz): 1902.35  
 Channel: 25  
 Measured Power at the Antenna Port (dBm): 18.7  
 Modulation: DXW  
 Limit (dBc): 31.7

**TABLE 6-3: CONDUCTED SPURIOUS AND HARMONIC DATA §2.1051**

| Frequency (MHz) | Measured Level (dBc) | Margin (dB) |
|-----------------|----------------------|-------------|
| 827.233         | -58.5                | -26.8       |
| 1669.68         | -58.8                | -27.1       |
| 1864.25         | -46.0                | -14.3       |
| 1936.65         | -45.1                | -13.4       |
| 2138.01         | -50.0                | -18.3       |
| 3802.06         | -60.6                | -28.9       |
| 4506.79         | -62.4                | -30.7       |
| 5454.75         | -62.4                | -30.7       |
| 5975.11         | -61.8                | -30.1       |

Operating Frequency (MHz): 1909.85  
Channel: 50  
Measured Power at the Antenna Port (dBm): 19.0  
Modulation: DXW  
Limit (dBc): 32.0

**TABLE 6-4: CONDUCTED SPURIOUS AND HARMONIC DATA §2.1051**

| Frequency (MHz) | Measured Level (dBc) | Margin (dB) |
|-----------------|----------------------|-------------|
| 1676.20         | -59.7                | -27.7       |
| 1864.99         | -48.6                | -16.6       |
| 1954.23         | -47.7                | -15.7       |
| 2145.93         | -51.9                | -19.9       |
| 3825.79         | -58.0                | -26.0       |

TEST PERSONNEL:

Signature:  
Typed/Printed  
Name:



Rachid Sehb

Test Date:

May 19, 2003

Position:

EMC 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 moving the EUT through three orthogonal planes while 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 (dBi). 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          | 6/17/04         |
| 900932      | Hewlett Packard | 8449B<br>OPT H02    | Preamplifier (1 - 26.5 GHz)                    | 3008A00505    | 7/15/03         |
| 901020      | Hewlett Packard | 8564E               | Portable Spectrum Analyzer<br>(9 kHz - 40 GHz) | 3943A01719    | 7/2/04          |
| 900928      | Hewlett Packard | 83752A              | Synthesized Sweeper<br>(0.01 - 20 GHz)         | 3610A00866    | 6/19/04         |
| 900814      | Electro-Metrics | EM-6961<br>(RGA-60) | Double Ridged Guide Antenna<br>(1 - 18 GHz)    | 2310          | 2/17/04         |

### 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): 18.97  
 Modulation: DXW  
 Distance (m): 3  
 Limit (dBc): 31.97

**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 Level (dBc) | Margin (dB) |
|-----------------|------------------------------|-----------------|-------------------|-----------------------|-------------|
| 3804.700        | -43.2                        | 0.8             | 8.0               | 54.9                  | -23.0       |
| 5707.050        | -34.7                        | 1.2             | 8.7               | 46.2                  | -14.2       |
| 7609.400        | -27.0                        | 6.5             | 9.9               | 42.6                  | -10.6       |
| 9511.750        | -38.7                        | 7.3             | 10.6              | 54.3                  | -22.4       |
| 11414.100       | -39.0                        | 8.2             | 10.7              | 55.5                  | -23.5       |
| 13316.450       | -32.8                        | 8.8             | 12.7              | 47.9                  | -15.9       |
| 15218.800       | -32.0                        | 9.2             | 11.0              | 49.2                  | -17.2       |
| 17121.150       | -31.0                        | 9.7             | 12.5              | 47.1                  | -15.2       |
| 19023.500       | -28.7                        | 10.0            | 16.8              | 40.9                  | -8.9        |

#### TEST PERSONNEL:

Signature:  
 Typed/Printed  
 Name:

  
 Rachid Sehb

Test Date:  
 Position:

May 17, 2003  
 Test Engineer

## 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 dBm (43+10LogP).

### 8.2 BAND-EDGE TEST EQUIPMENT

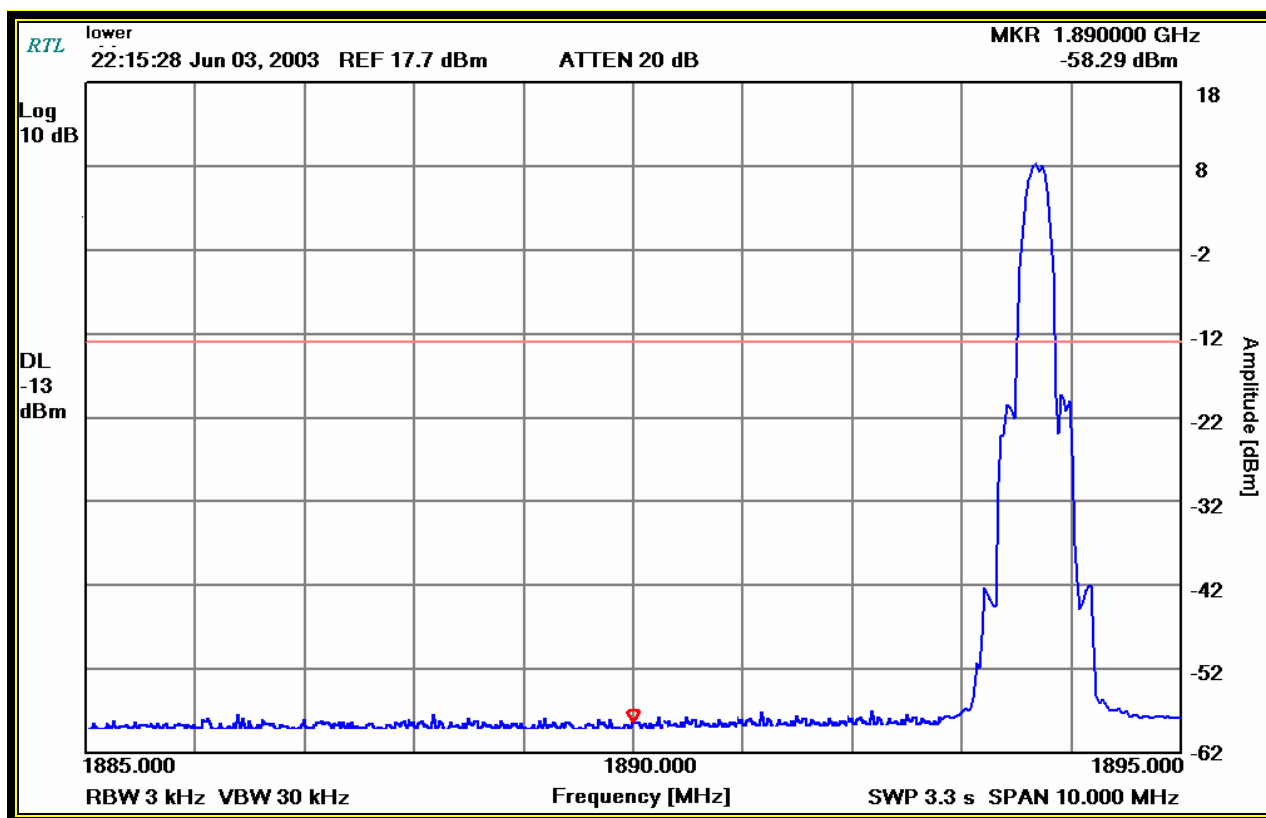
**TABLE 8-1: BAND-EDGE TEST EQUIPMENT**

| RTL Asset # | Manufacturer    | Model    | Part Type                                   | Serial Number | Calibration Due |
|-------------|-----------------|----------|---------------------------------------------|---------------|-----------------|
| 901053      | Schaffner Chase | CBL6112B | Bi-Log Antenna (20 MHz - 2 GHz)             | 2648          | 6/17/04         |
| 901020      | Hewlett Packard | 8564E    | Portable Spectrum Analyzer (9 kHz - 40 GHz) | 3943A01719    | 7/2/04          |

### 8.3 TEST DATA

| Applicable block | Frequency (MHz) | Spurious at block edge (dBm) | Limit (dBm) | Margin (dB) |
|------------------|-----------------|------------------------------|-------------|-------------|
| F                | 1890.00         | -58.24                       | -13.0       | -43.24      |
| F                | 1895.00         | -17.9                        | -13.0       | -4.9        |
| C                | 1894.87         | -16.9                        | -13.0       | -3.9        |
| C                | 1910.00         | -15.9                        | -13.0       | -2.9        |

PLOT 8-1: LOWER BAND EDGE BLOCK F



### PERSONNEL INFORMATION:

Signature:  
Typed/Printed  
Name:

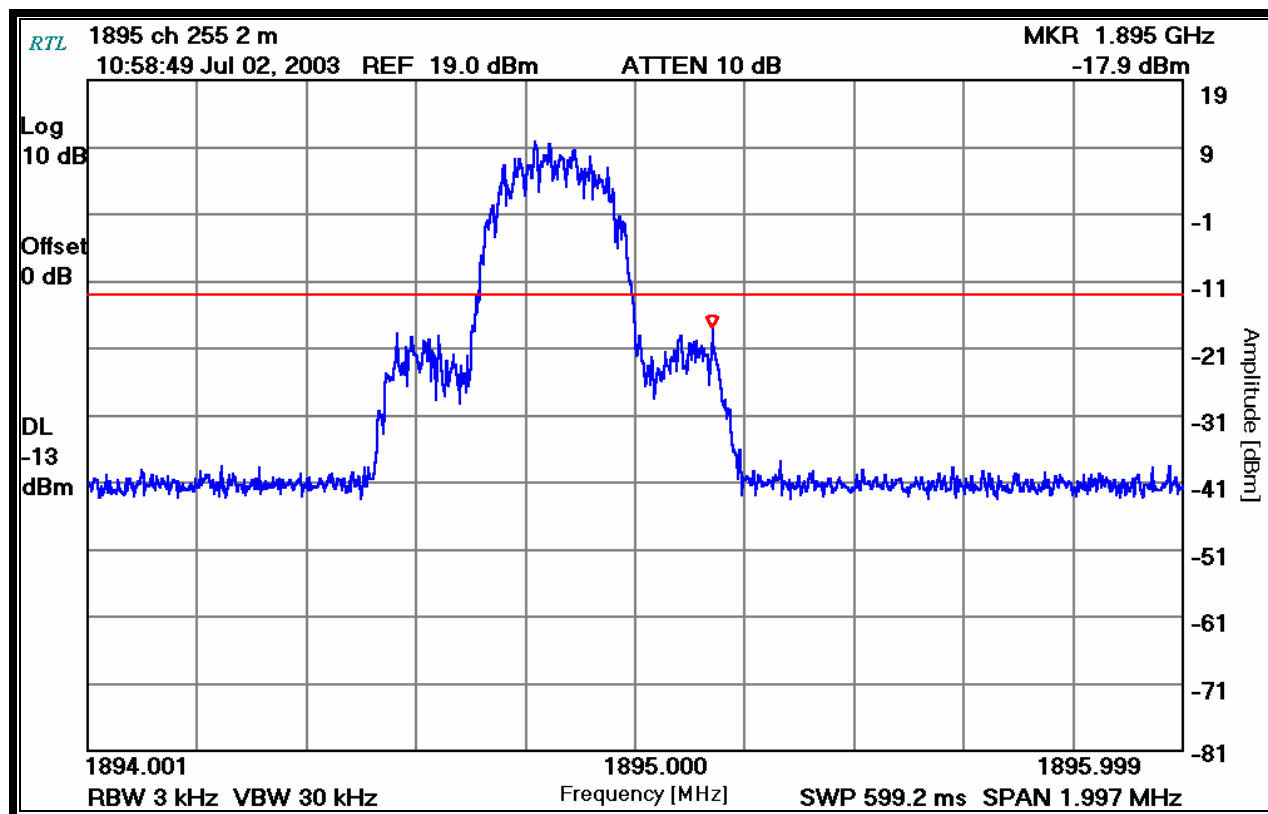
  
Rachid Sehb

Test Date:  
Position:

June 3, 2003

EMC Engineer

PLOT 8-2: UPPER BAND EDGE BLOCK F



PERSONNEL INFORMATION:

Signature:  
 Typed/Printed  
 Name:

*Sehb*

Test Date:

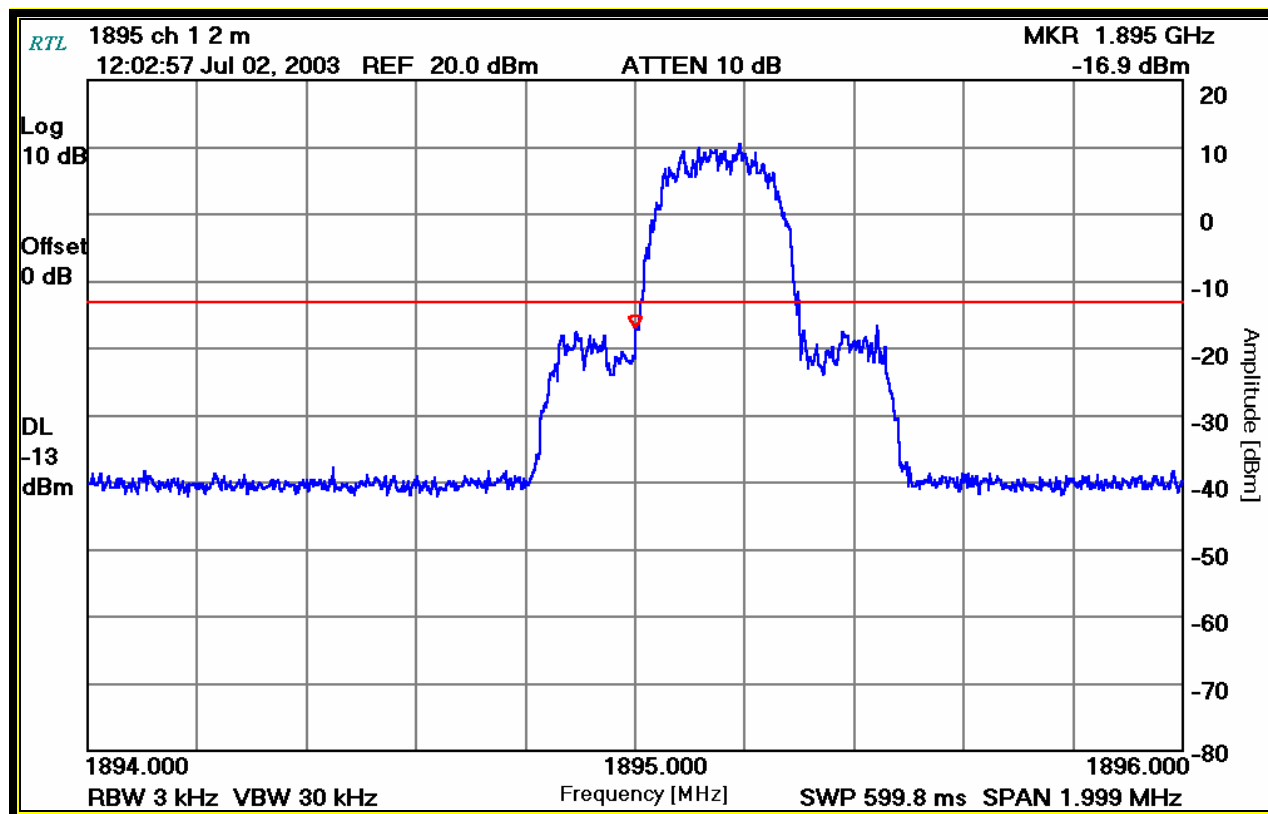
July 2, 2003

Rachid Sehb

Position:

EMC Engineer

PLOT 8-3: LOWER BAND EDGE BLOCK C



PERSONNEL INFORMATION:

Signature:  
 Typed/Printed  
 Name:

*Sehb*

Rachid Sehb

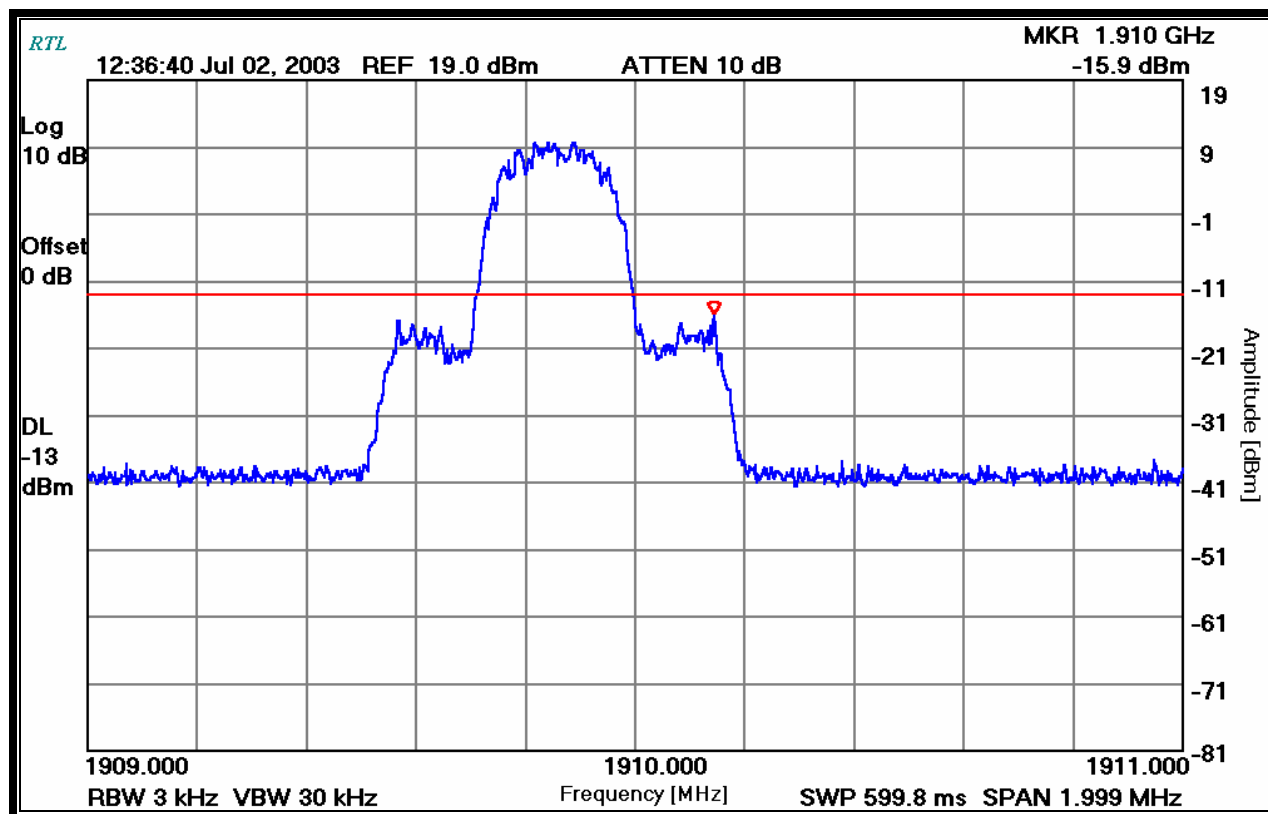
Test Date:

July 2, 2003

Position:

EMC Engineer

PLOT 8-4: UPPER BAND EDGE BLOCK C



PERSONNEL INFORMATION:

Signature:  
 Typed/Printed  
 Name:

  
 Rachid Sehb

Test Date:

July 2, 2003

Position:

EMC 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 |
|-------------|-------------------------|-------|---------------------------------------------|---------------|-----------------|
| 900946      | Tenney Engineering, Inc | TH65  | Temperature Chamber                         | 11380         | 2/4/04          |
| 901020      | Hewlett Packard         | 8564E | Portable Spectrum Analyzer (9 kHz - 40 GHz) | 3943A01719    | 7/2/04          |

### 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

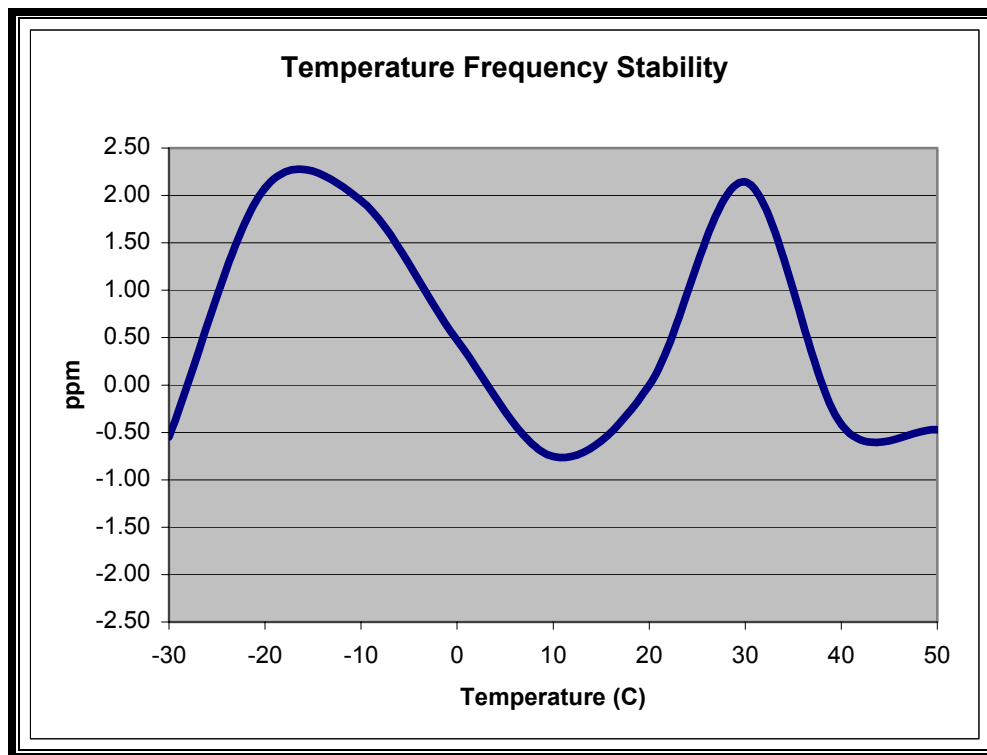
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

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

Operating Frequency (MHz): 1902.35  
Channel: 25  
Reference Voltage (VDC): 3.6  
Deviation Limit (ppm): 2.5

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

| Temperature | Frequency Measured (MHz) | ppm   |
|-------------|--------------------------|-------|
| -30         | 1902.353363              | -0.55 |
| -20         | 1902.358360              | 2.08  |
| -10         | 1902.358110              | 1.95  |
| 0           | 1902.355310              | 0.48  |
| 10          | 1902.352968              | -0.76 |
| 20          | 1902.354405              | 0.00  |
| 30          | 1902.358480              | 2.14  |
| 40          | 1902.353613              | -0.42 |
| 50          | 1902.353509              | -0.47 |

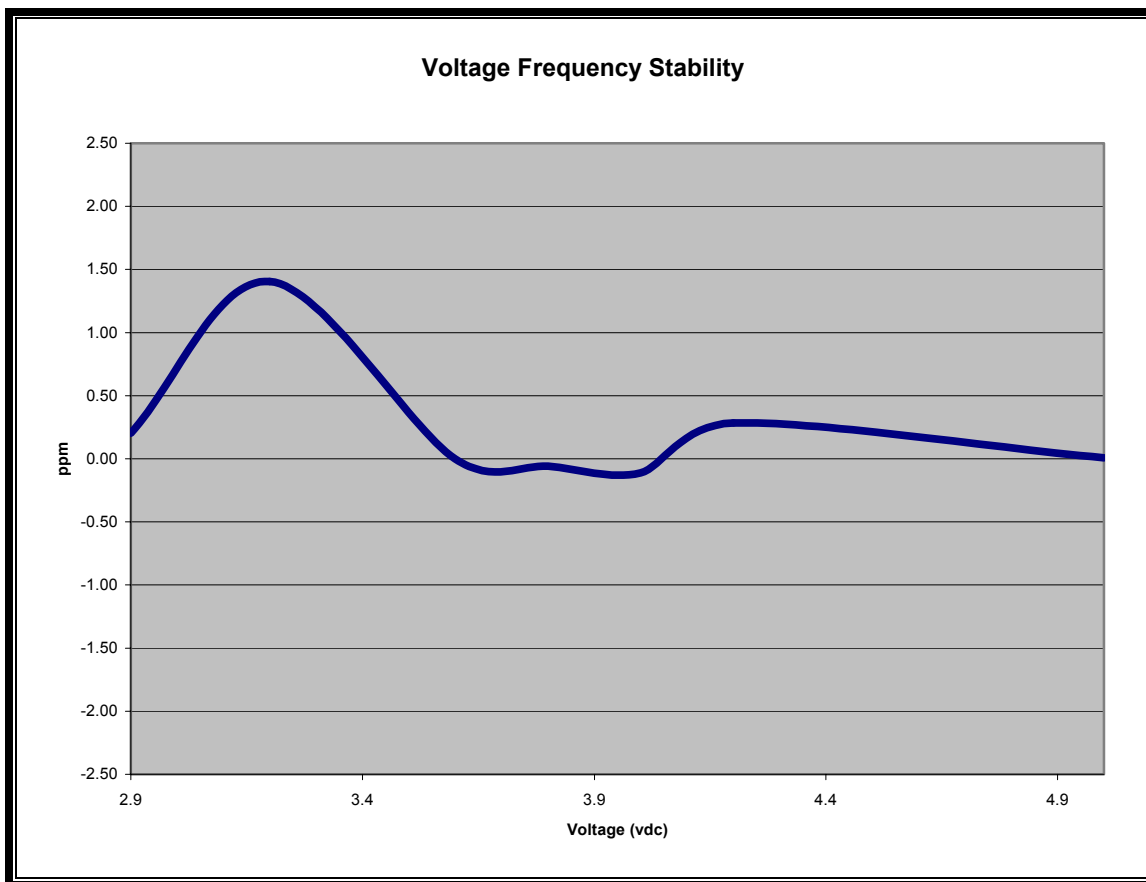


**PLOT 9-1: TEMPERATURE FREQUENCY STABILITY - §2.1055**

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

Battery endpoint = 2.9 VDC

| Voltage | Frequency Measured (MHz) | ppm   |
|---------|--------------------------|-------|
| 2.9     | 1902.355063              | 0.20  |
| 3.20    | 1902.357349              | 1.41  |
| 3.60    | 1902.354675              | 0.00  |
| 3.80    | 1902.354563              | -0.06 |
| 4.00    | 1902.354463              | -0.11 |
| 4.20    | 1902.355213              | 0.28  |
| 5.00    | 1902.354688              | 0.01  |



**PLOT 9-2: VOLTAGE FREQUENCY STABILITY**

TEST PERSONNEL:

Signature:  
Typed/Printed  
Name:

Rachid Sehb

Test Date:

May 19, 2003

Position:

Test Engineer

## **10 CONCLUSION**

The data in this measurement report shows that the UTStarcom Model # UTS702U, FCC ID: O6YUTS-702U complies with all the requirements of Parts 2 and 24 of the FCC Rules.