

MEASUREMENT AND TECHNICAL REPORT

UTSTARCOM CANADA COMPANY
 4600 Jacombs Road
 Richmond, BC V6V 3B1
 Canada

DATE: 30 March 2005

This Report Concerns:	Original Grant: <input checked="" type="checkbox"/>	Class II Change: <input type="checkbox"/>
Equipment Type:	iCell BTS with iPA 800	
Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?	Yes: <input type="checkbox"/> Defer until: <input type="text"/>	No: <input checked="" type="checkbox"/>
Company Name agrees to notify the Commission by: of the intended date of announcement of the product so that the grant can be issued on that date.	<input type="text" value="N/A"/>	
Transition Rules Request per 15.37?	Yes: <input type="checkbox"/>	No: <input checked="" type="checkbox"/>
(*) FCC Parts 22, Paragraph(s) 22.917(b) and 22.355		
Report Prepared by:	TÜV AMERICA, INC 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone: 858 678 1400 Fax: 858 546 0364	

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1.0 GENERAL INFORMATION

1.1 Product Description

Form

EMC Test Plan and Constructional Data Form



PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IN THE FIELD IS NO APPLICABLE.
Applicant -- NOTE: This information will be input into your test report as shown below

Company: UTStarcom Canada Company
 Address: 4600 Jacombs Road
Richmond, BC, Canada
V6V 3B1
 Contact: Joe Perrella Position: Product Manager
 Phone: 604 303 2307 Fax: 604 276 0501
 E-mail Address: Joe.Perrella@telostech.com

General Equipment Description -- NOTE: This information will be input into your test report as shown below.

EUT Description: CDMA 1X BTS with iPA 800 MHz
 EUT Name: BTS with iPA 800
 Model No.: _____ Serial No.: BTS S/N 100, iPA S/N xxxxx tbd
 Product Options: _____
 Configurations to be tested: Pico Mode and Macro Mode using iPA

Test Objective

- | | |
|--|--|
| <input type="checkbox"/> EMC Directive 89/336/EEC (EMC)
Std: _____ | <input type="checkbox"/> FCC: Class <input type="checkbox"/> A <input checked="" type="checkbox"/> B Part 15 <input checked="" type="checkbox"/> X |
| <input type="checkbox"/> Machinery Directive 89/392/EEC (EMC)
Std: _____ | <input type="checkbox"/> VCCI: Class <input type="checkbox"/> A <input type="checkbox"/> B |
| <input type="checkbox"/> Medical Device Directive 93/42/EEC (EMC)
Std: _____ | <input type="checkbox"/> BCIQ: Class <input type="checkbox"/> A <input type="checkbox"/> B |
| <input type="checkbox"/> Vehicle Directive 72/245/EEC (EMC)
Std: _____ | <input type="checkbox"/> Canada: Class <input type="checkbox"/> A <input type="checkbox"/> B |
| <input type="checkbox"/> FDA Reviewers Guidance for Premarket Notification Submissions (EMC) | <input type="checkbox"/> Australia: Class <input type="checkbox"/> A <input type="checkbox"/> B |
| | <input type="checkbox"/> Other: _____ |

Form

EMC Test Plan and Constructional Data Form



TÜV Product Service Certification Requested

- | | |
|--|---|
| <input type="checkbox"/> Attestation of Conformity (AoC) | <input type="checkbox"/> International EMC Mark (IEM) |
| <input type="checkbox"/> Certificate of Conformity (CoC) | <input type="checkbox"/> Compliance Document |
| Protection Class (N/A for vehicles) | <input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III |

Attendance

Test will be: Attended by the customer Unattended by the customer

Failure - Complete this section if testing will not be attended by the customer.

- If a failure occurs, TÜV Product Service should:
- Call contact listed above, if not available then stop testing. (After hrs phone): _____
 - Continue testing to complete test series.
 - Continue testing to define corrective action.
 - Stop testing.

EUT Specifications and Requirements

Length: 21" Width: 19" Height: 5.25" Weight: _____

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: AC 110-220v (If battery powered, make sure battery life is sufficient to complete testing.)

of Phases: one

Current (Amps/phase(max)): 0.5 A /Single Current (Amps/phase(nominal)): 0.4 A /Single

Other: _____

Other Special Requirements

Form

EMC Test Plan and Constructional Data Form



Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)

1. Pico Mode in commercial buildings
2. Macro Mode with IPA used at cell site installation for outdoor coverage.

EUT Power Cable

- | | | | | |
|--|----|---|---------------------|---------------|
| <input type="checkbox"/> Permanent | OR | <input checked="" type="checkbox"/> Removable | Length (in meters): | <u>1.83 m</u> |
| <input checked="" type="checkbox"/> Shielded | OR | <input type="checkbox"/> Unshielded | | |
| <input type="checkbox"/> Not Applicable | | | | |

Form

EMC Test Plan and Constructional Data Form



EUT Interface Ports and Cables												
Interface				Shielding								
Type	Analog	Digital	Qty	Yes	No	Type	Termination	Connector Type	Port Termination	Length (in meters)	Removable	Permanent
EXAMPLE: RS232	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Foil over braid	Coaxial	Metallized 9-pin D-Sub	Characteristic Impedance	6	<input checked="" type="checkbox"/>	<input type="checkbox"/>
BTS RF ports	<input type="checkbox"/>	<input type="checkbox"/>	10	<input type="checkbox"/>	<input type="checkbox"/>	ports	Coaxial	SMA	50 ohms		<input type="checkbox"/>	<input checked="" type="checkbox"/>
BTS RS232	<input type="checkbox"/>	<input type="checkbox"/>	5	<input type="checkbox"/>	<input type="checkbox"/>	ports		RJ45			<input type="checkbox"/>	<input checked="" type="checkbox"/>
BTS Ethernet	<input type="checkbox"/>	<input type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	ports		RJ45			<input type="checkbox"/>	<input checked="" type="checkbox"/>
IPA RS232	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	port		9Pin D-Sub			<input type="checkbox"/>	<input type="checkbox"/>
IPA RF	<input type="checkbox"/>	<input type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	ports	coaxial	N-Type	50 ohms		<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>

Form

EMC Test Plan and Constructional Data Form



EUT Software.

Revision Level: 4.5.x
 Description: BTS Software

EUT Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Pico Mode
2. Macro Mode with iPA
- 3.

EUT System Components -- List and describe all components which are part of the EUT. For FCC testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc.)

Description	Model #	Serial #	FCC ID #
BTS unit 1U rack mount			
iPA unit 2U rack mount			

Form

EMC Test Plan and Constructional Data Form



Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)

Description	Model #	Serial #	FCC ID #
Laptop running BSC s/w		IBM Thinkpad	

Oscillator Frequencies

Frequency	Derived Frequency	Component # / Location	Description of Use
-----------	-------------------	------------------------	--------------------

Power Supply

Manufacturer	Model #	Serial #	Type
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other:
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other:

Form

EMC Test Plan and Constructional Data Form



Power Line Filters		
Manufacturer	Model #	Location in EUT

Critical EMI Components (Capacitors, ferrites, etc.)				
Description	Manufacturer	Part # or Value	Qty	Component # / Location

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.



iCell BTS 800MHz Circuit Description

Draft
Date: Jan 29, 2005

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iCell BTS Block Diagram

The iCell BTS (iBTS) CDMA2000 1X core provides a one CDMA carrier channel support from one to three sectors.

The Low-power BTS (max +20dBm) supports up to three pairs of Tx/Rx-main and Rx-diversity ports for up to three sectors.

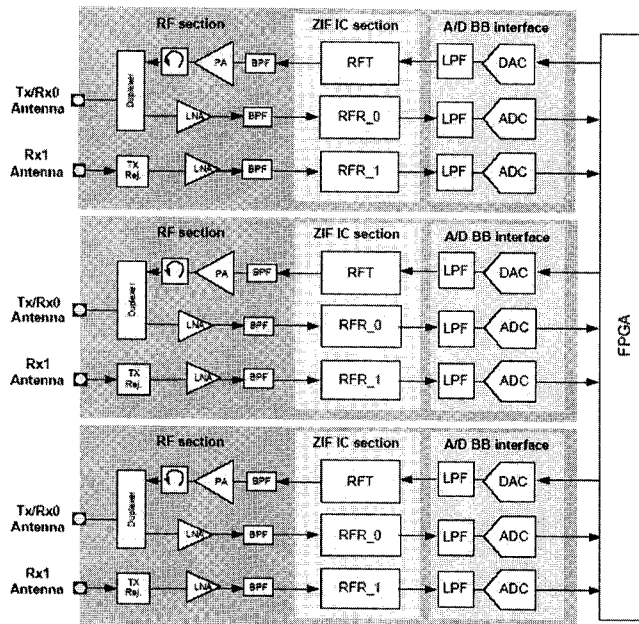
BTS can operate in three basic configurations :

1. Short-range indoor system with a wall-mounted 1x1 iBTS and external stubby-antenna with a range of up to 100 meters (exact range depends on building structure and materials). Alternatively, the 1x1 iBTS can be connected to external indoor antenna to optimize indoor range.
2. Long-range indoor system based on a 1x1(or 1x3) iBTS connected to an indoor repeater (or DAS).
3. Macro BTS for outdoor coverage based on a (1x3) iBTS module connected to three iPA bi-directional amplifiers. Each iPA incorporates a high-power amplifier (PA), two low-noise amplifiers (LNA) (for receive diversity) and frequency conversion circuitry with selectivity capabilities. The iPAs and the iBTS are mounted on 19" rack and connected via coaxial cables to outdoor antenna.

The iCell BTS is designed to comply with the IS-97D standard for base stations.

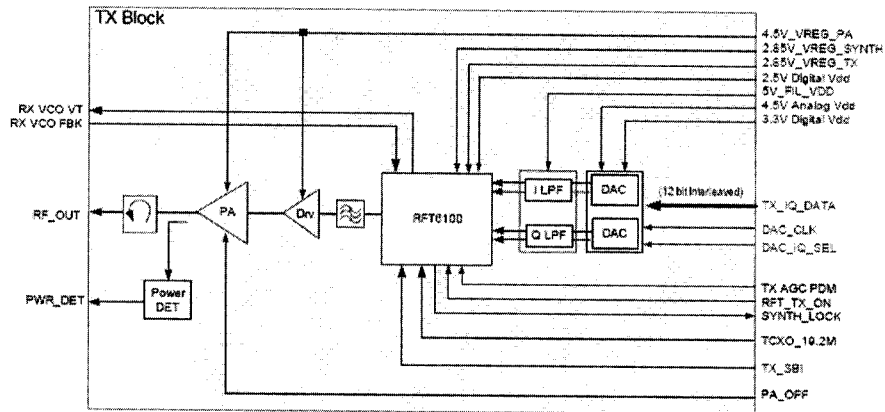
RF Modem Block Diagrams

IRM General Block Diagram

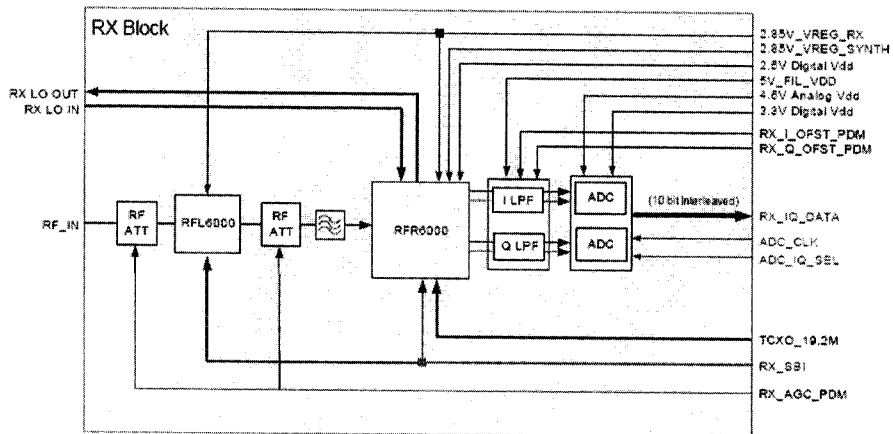




Cellular Transmit



Cellular Receive



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RF Modem Description

Transmit

CDMA Forward signal is developed on the Channel Card in the Qualcomm CSM5000 CDMA modem. The digitizer module converts the signal to analog. This signal is upconverted to the desired channel frequency, amplified and filtered.

The output power level is fixed at -3dBm for a typical CDMA physical and logic channel combination including pilot, synchronization, paging, and six arbitrary traffic channels.

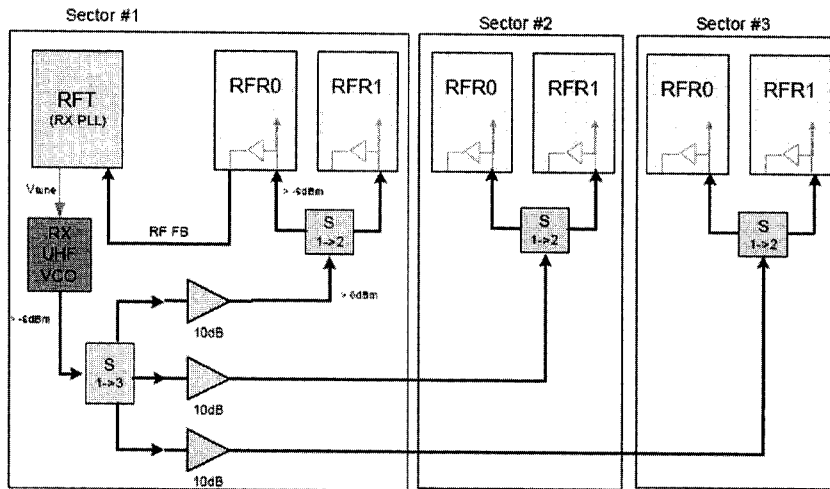
Output power is calibrated at the factory using calibrated power measurement equipment to ensure the target power is reached.

Protection circuitry ensures the maximum desired output power is not exceeded.

Frequencies

Rx VCO configuration

All sectors operate at the same frequency. Therefore only one RX VCO is required. The 10dB drivers maintain the required RF level to the RFR's and provide extra isolation between sectors.

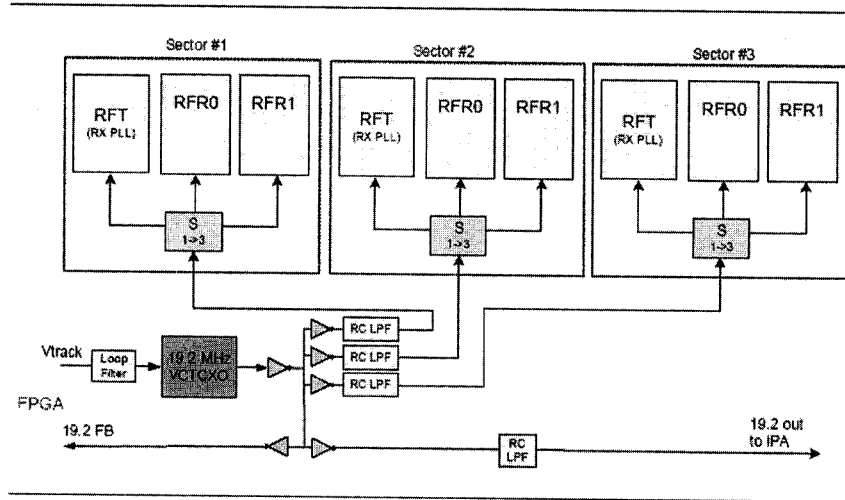


TCXO Distribution

General

The ZIFIC requires an AC-coupled TCXO signal with a level of approximately 0.8 Vp-p (0.5 to 2 Vp-p). A digital card driver/buffer supplies the TCXO signal and an RC LPF reduces harmonics and reduces Vp-p from approximately 2.8 V to 0.8 Vp-p.





Synthesizer Design
Synthesizer Frequency Design

RX Channel

The Rx Synthesizer uses one high-quality external VCO and the PLL circuits of the RFT6100 chip. The Rx synthesizer feeds all 6 Rx channels LO via distribution circuits. The PLL BW is optimized for phase noise performance.

Tx Channel

The Tx PLL is primarily internal in the RFT6100. The PLL dividers and the VCO are all integrated on-chip. Only the loop filter components are external discrete caps and resistors. Each Tx channel has a separate Tx synthesizer, but all channels are programmed to operate at the same frequency.



1.2 Related Submittal Grant

None

1.3 Tested System Details

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

None

1.4 Test Methodology

Purpose of Test: To demonstrate compliance with the following tests.

Test Summary					
Test Description	Paragraph Number	Summary of Results			Pass/Fail
		Low Channel	Mid Channel	High Channel	
Radiated Spurious Emissions	22.917(b)	-43.7 dBm	-42.7 dBm	-36.7 dBm	Pass
Conducted Spurious Emissions	22.917	-28.3 dBm	-28.4 dBm	-30.16 dBm	Pass
Band Edge	22.917	-31.9 dBm	-31.5 dBm	-31.2 dBm	Pass
Output Power	22.917	13.6 dBm	14.0 dBm	-12.6 dBm	Pass
Frequency Stability	22.355	-950 Hz	+1250 Hz	+750 Hz	Pass

Testing was performed according to the procedures in FCC/ANSI C63.4 and CSA 108.8-M1983.

1.5 Test Facility

The open area test site and conducted measurement data were tested by:

TÜV AMERICA, INC
10040 Mesa Rim Road
San Diego, CA 92121-2912
Phone: 858 678 1400
Fax: 858 546 0364

The Test Site Data and performance comply with ANSI C63.4 and are registered with the FCC, 7435 Oakland Mills Road, Columbia Maryland 21046. All Measurement Data is acquired according to the content of FCC Measurement Procedure and ANSI C63.4, unless supplemented with additional requirements as noted in the test report.

2.0 SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was initially tested for FCC emissions in the following configuration:

See Test Setup Photos Exhibit

2.2 EUT Exercise Software

None

2.3 Special Accessories

None

2.4 Equipment Modifications

None

2.5 Configuration of Test System

See Test Setup Photos Exhibit

**3.0 RADIATED SPURIOUS EMISSIONS EQUIPMENT/DATA
 CONDUCTED SPURIOUS EMISSIONS EQUIPMENT/DATA
 BAND EDGE EQUIPMENT/DATA
 OUTPUT POWER EQUIPMENT/DATA
 FREQUENCY STABILITY EQUIPMENT/DATA**

**Test Conditions: RADIATED SPURIOUS EMISSIONS: FCC Part 22.917(b)
 CONDUCTED SPURIOUS EMISSIONS: FCC Part 22.917
 BAND EDGE: FCC Part 22.917
 OUTPUT POWER: FCC Part 22.917
 FREQUENCY STABILITY: FCC Part 22.355**

The following measurements were performed at the San Diego Testing Facility:

- Test not applicable

- - Roof (Small Open Area Test Site)
- - SR-5, Shielded Room, 16' x 28' x 15', Metal, Semi-Anechoic Chamber

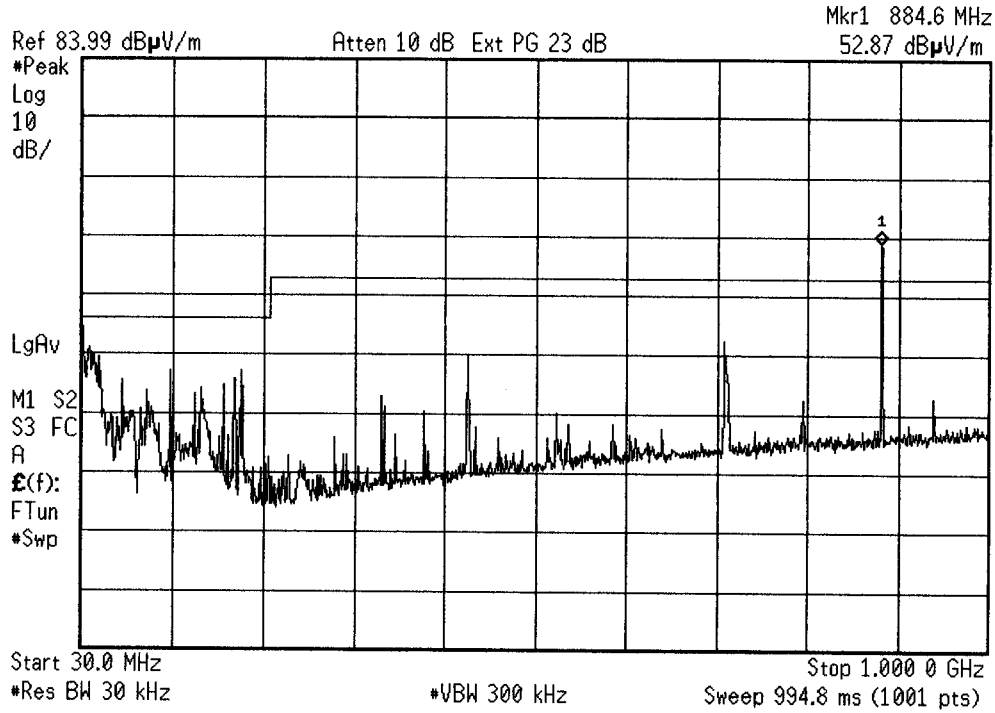
Test Equipment Used:

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Date
E4440A	7500	Spectrum Analyzer	Hewlett Packard	MY43362168	12/04
ZFL 1000 LN	6386	Preamplifier	TUV America Inc	--	VBU*
AMF-5D-010180-35-10P	719	Preamplifier	Miteq	549460	VBU*
87405A	431	Preamplifier	Hewlett Packard	3207A00276	VBU*
CBL6111	460	Bilog Antenna	Chase Electronics	1013	VBU*
3115	251	Double Ridge Guide Antenna	EMCO	2495	01/05
3146	6670	Log Periodic Antenna	EMCO	1063	07/04
8566B	744	Spectrum Analyzer	Hewlett Packard	2618A02913	02/05
T30RC	6225	Environmental Chamber	Tenney Environmental	27244-02	05/04

Remarks: One year calibration cycle for all test equipment and sites. (*) Verified Before Use

UTStarcom Radiated Spurious Emissions FCC Part 22.917

* Agilent 15:54:25 Mar 25, 2005



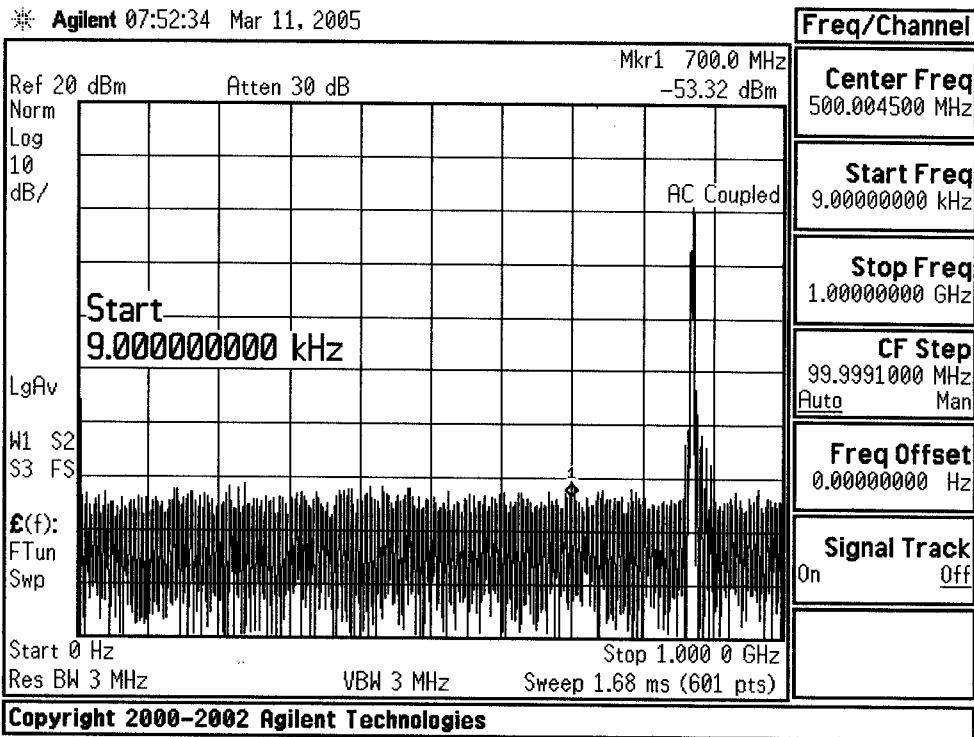
Remarks: No emissions were detected within 20 dB of the specified limit related to transmit mode of device under test.

REPORT No: SC501057 TESTER: Frank Harkins SPEC: FCC Part 22 para 22.917(b)
 CUSTOMER: Labtest TEST DIST: 3 Meters
 E U T: UTSStarCom TEST SITE: Roof
 EUT MODE: Transmit BICONICAL: N/A
 DATE: March 24, 2005 ERP/EIRP Factor 7 LOG: 244
 NOTES: HORN: 251

Part 22 - RBW 30 kHz... No emissions were found on the harmonics
 Part 24 - RBW 1 MHz
 CF = Antenna Factor + Cable Loss - Preamplifier Gain + Preselector Loss

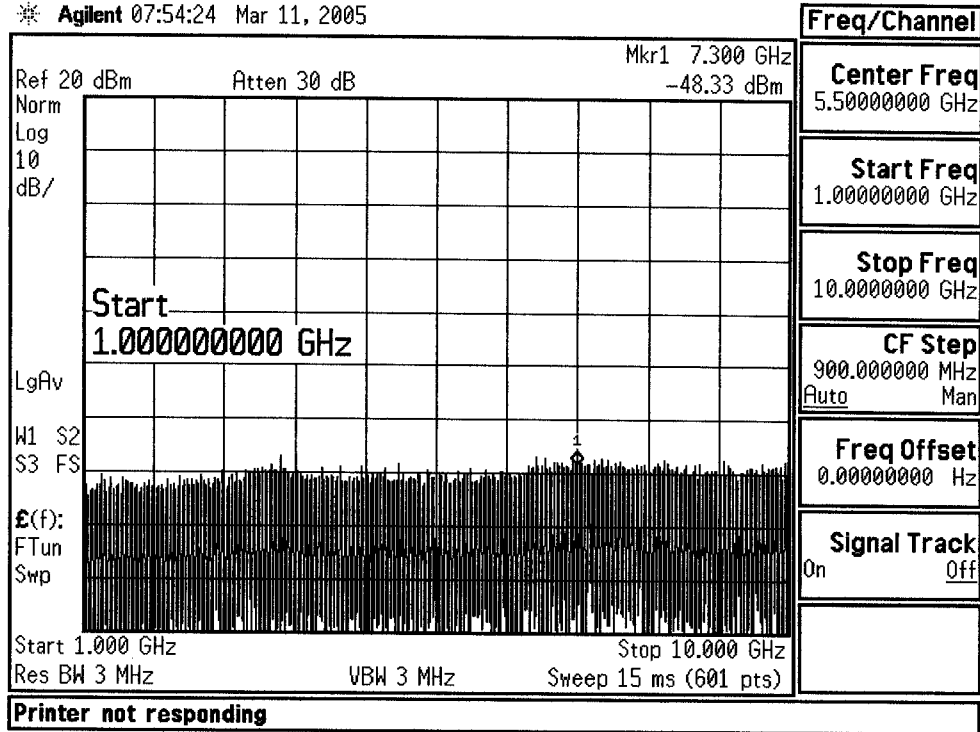
FREQ (MHz)	VERTICAL (dBuV) pk	HORIZONTAL (dBuV) pk	CF (dB/m)	MAX LEVEL (dBm) pk	SPEC LIMIT (dBm) pk	MARGIN (dB) pk	EUT Rotation	Antenna Height	Notes	dBuV/m	dBuV/m
893.275	24	20	22.7	-50.6					Fundamental (High Band) No Amp	46.7	22.7
1786.55	45.5	61	-8.2	-44.6	-13.0	-31.6			Horz ambient 59.7dBuV	52.8	-8.2
2679.825	51.5	54.7	-3.9	-46.6	-13.0	-33.6			Vert ambient 51.5dBuV	50.8	-3.9
3573.1	38.7	62	-1.3	-36.7	-13.0	-23.7			Horz ambient 62dBuV	60.7	-1.3
4466.375	39	46.3	-0.9	-52.0	-13.0	-35			Vert ambient 46dBuV	45.4	-0.9
5359.65	28	46.2	3.2	-48.0	-13.0	-35.2			Horz ambient 46dBuV	45.4	-0.9
6252.925	27.4	42.6	5.5	-49.2	-13.0	-36.2			Vert ambient 27dBuV	48.1	5.5
7146.2	28.5	35.7	7.7	-54.0	-13.0	-41			Horz ambient 35.7dBuV	43.4	7.7
8039.475	29.5	32.7	9.0	-55.7	-13.0	-42.7			Vert ambient 29dBuV	41.7	9.0
8932.75	27.7	30	11.0	-56.3	-13.0	-43.3			Horz ambient 30dBuV	41.0	11.0
885.325	24	24	22.8	-50.6					Fundamental (Mid Band) No Amp	46.8	22.8
1770.65	51.1	59.4	-8.3	-46.3	-13.0	-33.3			Vert ambient 51dBuV	51.1	-8.3
2655.975	51.8	58.6	-4.0	-42.7	-13.0	-29.7			Horz ambient 58dBuV	54.6	-4.0
3541.3	35.3	48.9	-1.4	-49.9	-13.0	-36.9			Vert ambient 35dBuV	47.5	-1.4
4426.625	31.2	41.4	-0.9	-56.8	-13.0	-43.8			Horz ambient 41dBuV	40.5	-0.9
5311.95	25.8	38.1	2.8	-56.4	-13.0	-43.4			Vert ambient 26dBuV	40.9	2.8
6197.275	29	42.3	5.6	-49.5	-13.0	-36.5			Horz ambient 34dBuV	47.9	5.6
7082.6	28.7	34	7.5	-55.9	-13.0	-42.9			Vert ambient 29dBuV	41.5	7.5
7967.925	29.7	33.8	8.9	-54.7	-13.0	-41.7			Horz ambient 31dBuV	42.7	8.9
8853.25	29.2	31.1	10.8	-55.4	-13.0	-42.4				41.9	10.8
869	22	23.5	22.7	-51.1					Fundamental (Low Band) No Amp	46.2	22.7
1738	41.3	60	-8.5	-45.9	-13.0	-32.9			Vert ambient 42dBuV	51.5	-8.5
2607	43	52.9	-4.1	-48.6	-13.0	-35.6			Horz ambient 53dBuV	48.8	-4.1
3476	35.5	55.2	-1.6	-43.7	-13.0	-30.7			Vert ambient 35dBuV	53.6	-1.6
4345	30.5	40.6	-0.8	-57.5	-13.0	-44.5			Horz ambient 41dBuV	39.8	-0.8
5214	25.1	43.2	2.1	-52.1	-13.0	-39.1			Vert ambient 25dBuV	45.3	2.1
6083	28.8	40.3	5.7	-51.4	-13.0	-38.4			Horz ambient 41dBuV	46.0	5.7
6952	29.4	32.7	7.1	-57.5	-13.0	-44.5			Vert ambient 30dBuV	39.8	7.1
7821	28.5	30.6	8.8	-58.0	-13.0	-45			Horz ambient 31dBuV	39.4	8.8
8690	28.9	29.5	10.5	-57.4	-13.0	-44.4			Vert ambient 29dBuV	40.0	10.5

UTStarcom Conducted Spurious Emissions FCC Part 22.917 Low Channel



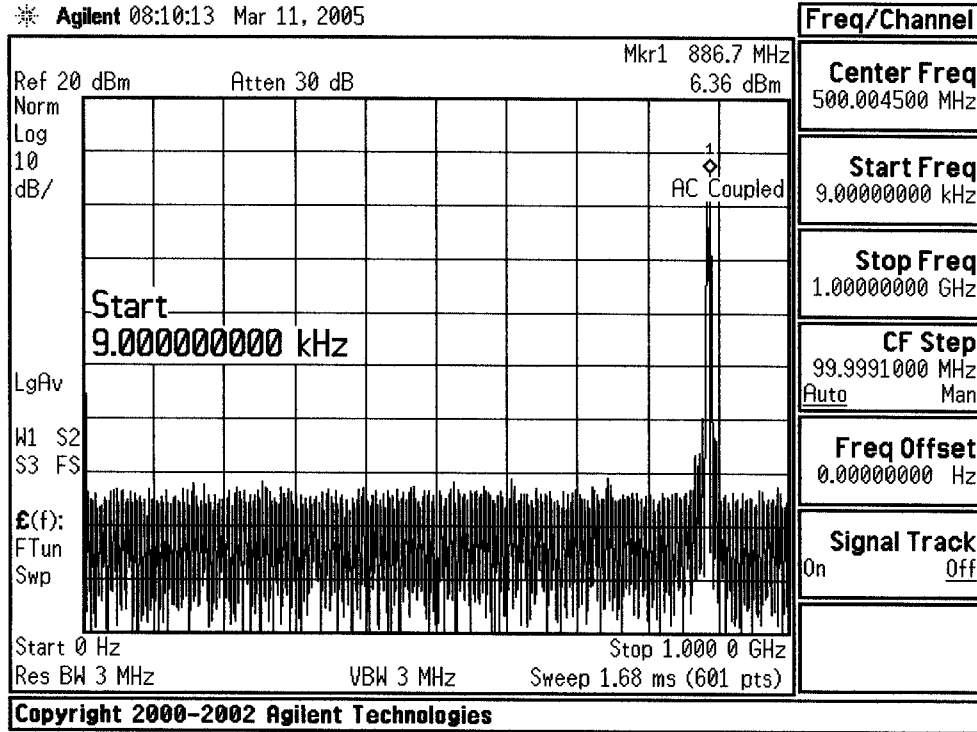
UTStarcom Conducted Spurious Emissions FCC Part 22.917 Low Channel

* Agilent 07:54:24 Mar 11, 2005



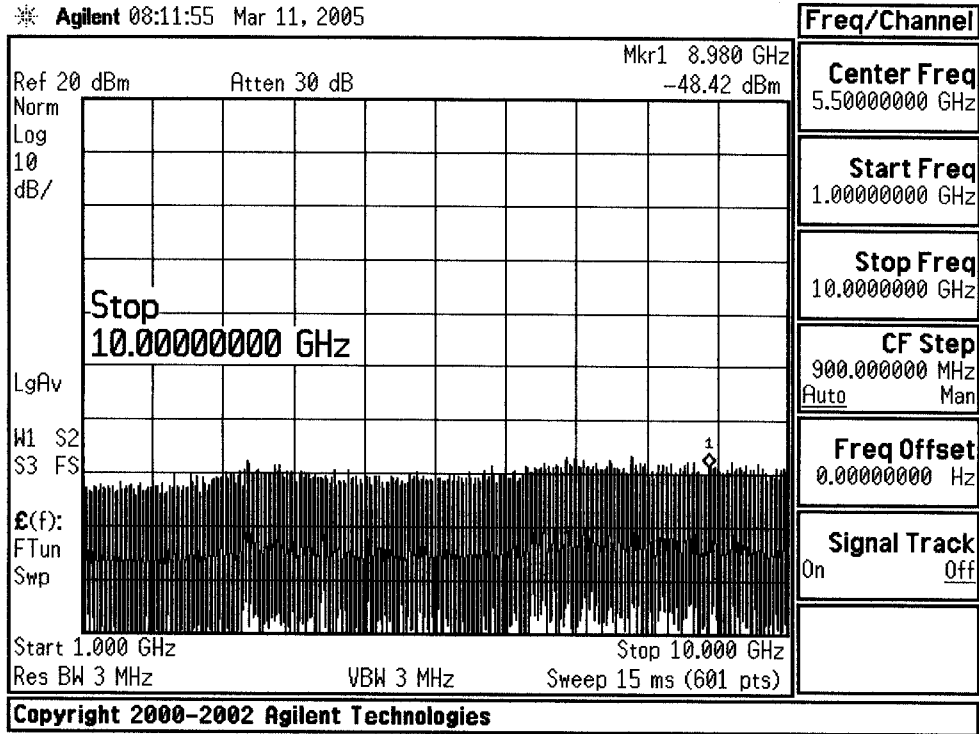
UTStarcom Conducted Spurious Emissions FCC Part 22.917 Mid Channel

* Agilent 08:10:13 Mar 11, 2005



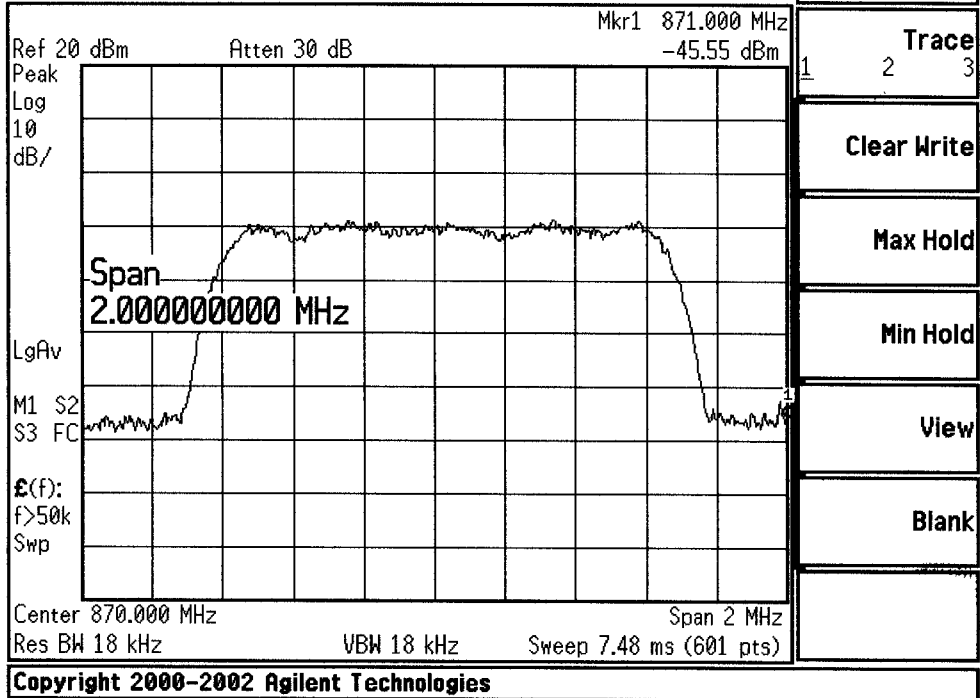
UTStarcom Conducted Spurious Emissions FCC Part 22.917 Mid Channel

Agilent 08:11:55 Mar 11, 2005



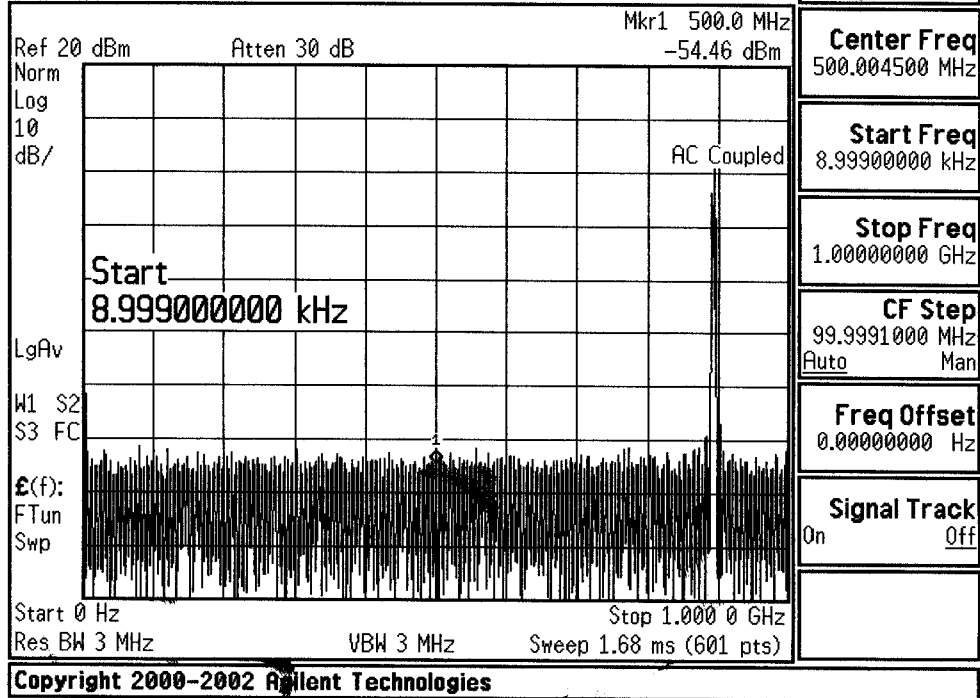
UTStarcom Conducted Spurious Emissions FCC Part 22.917 ± 870 MHz

Agilent 09:55:15 Mar 10, 2005



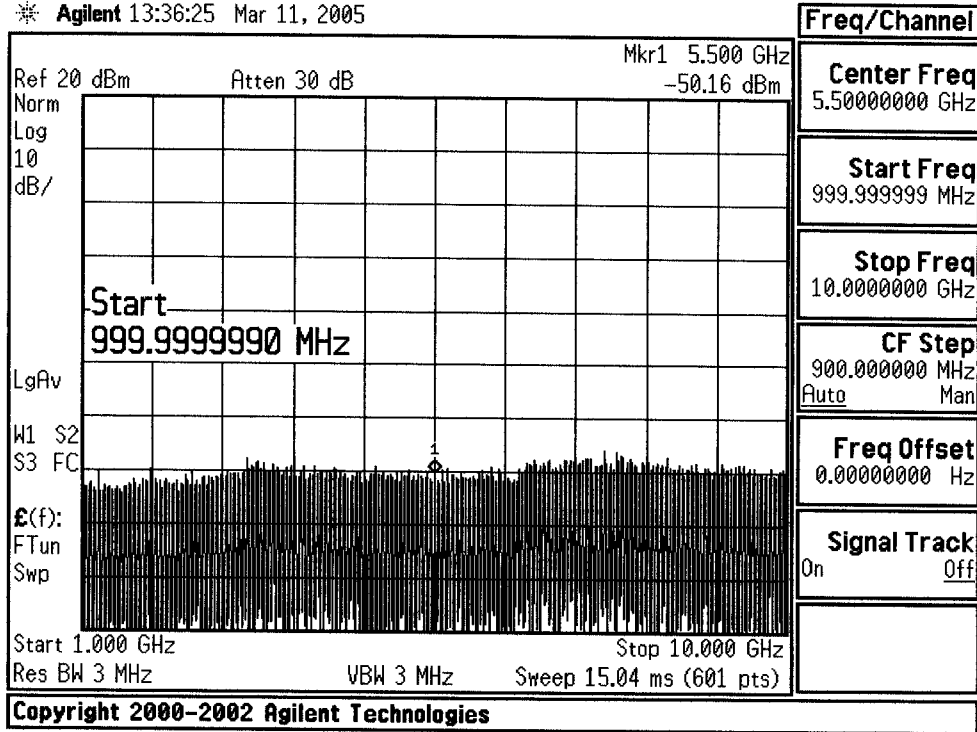
UTStarcom Conducted Spurious Emissions FCC Part 22.917 High Channel

* Agilent 13:35:12 Mar 11, 2005



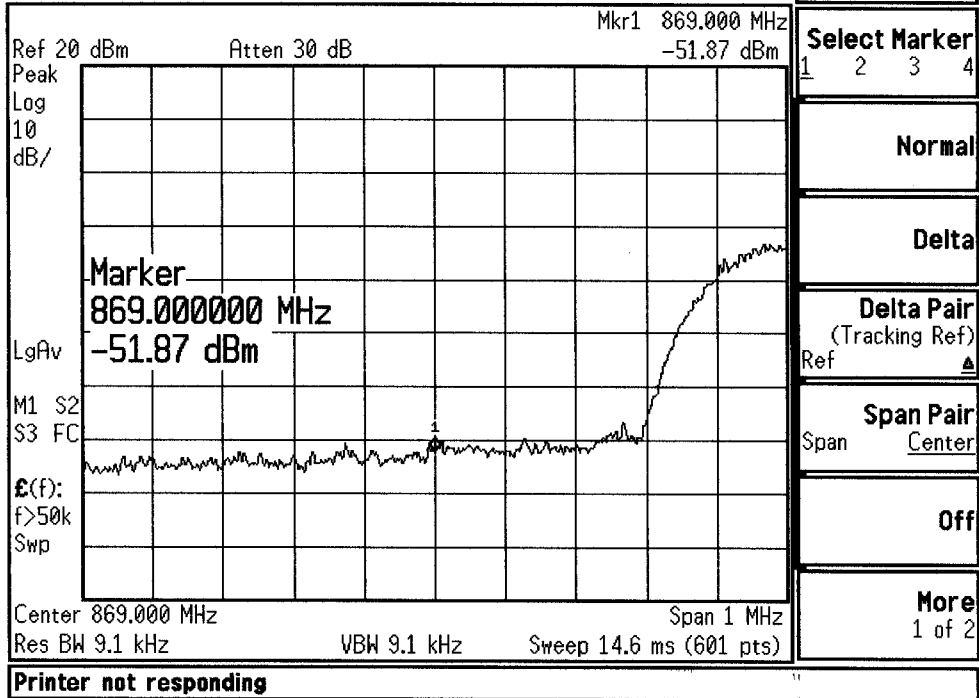
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* Agilent 13:36:25 Mar 11, 2005



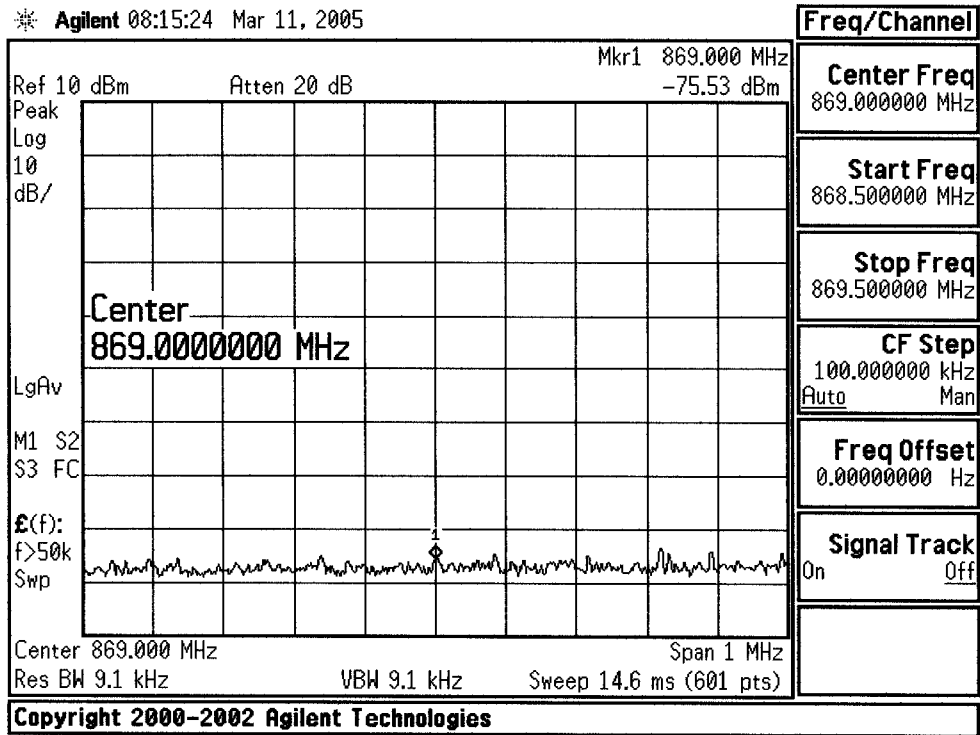
UTStarcom Band Edge(Low) FCC Part 22.917 Low Channel

Agilent 07:58:15 Mar 11, 2005



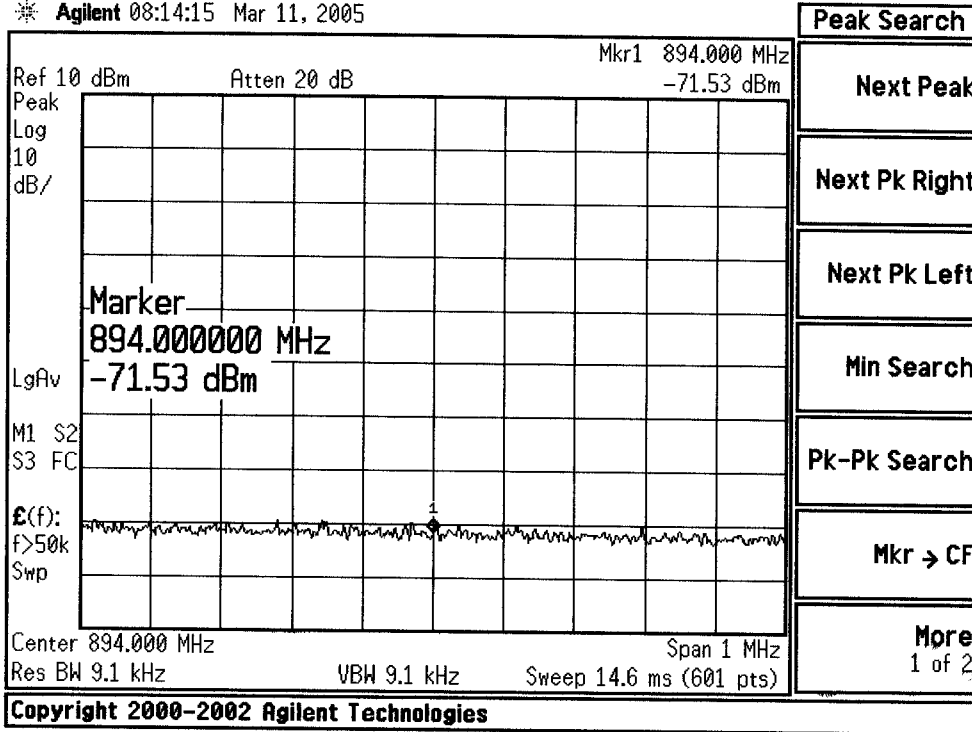
UTStarcom Band Edge(Low) FCC Part 22.917 Mid Channel

Agilent 08:15:24 Mar 11, 2005



UTStarcom Band Edge(High) FCC Part 22.917 Mid Channel

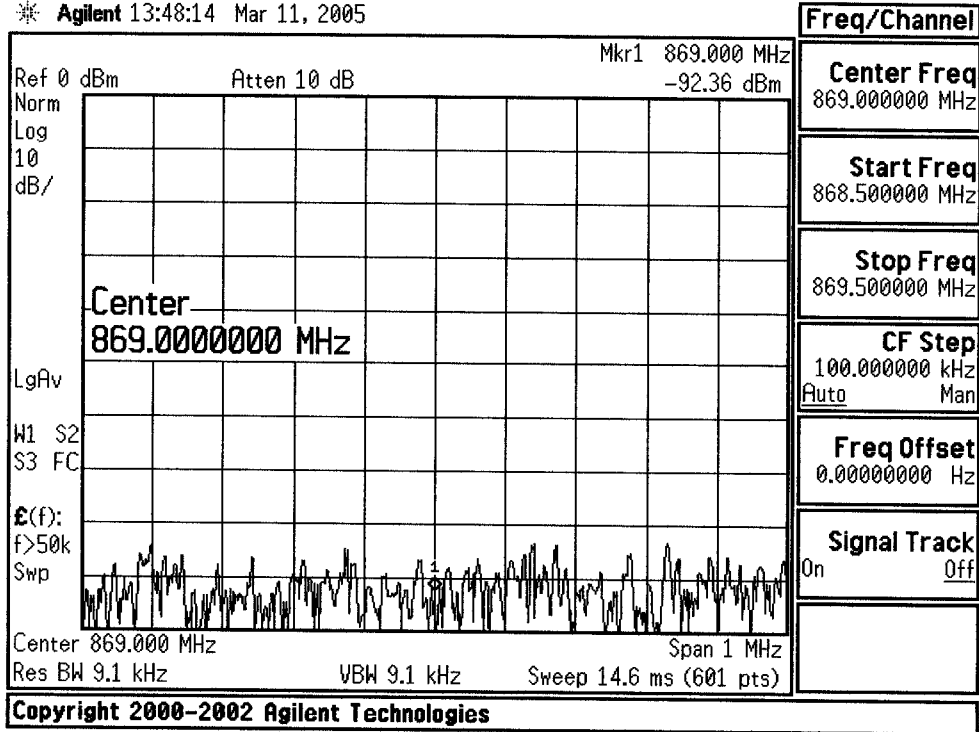
* Agilent 08:14:15 Mar 11, 2005



- Peak Search
- Next Peak
- Next Pk Right
- Next Pk Left
- Min Search
- Pk-Pk Search
- Mkr → CF
- More
1 of 2

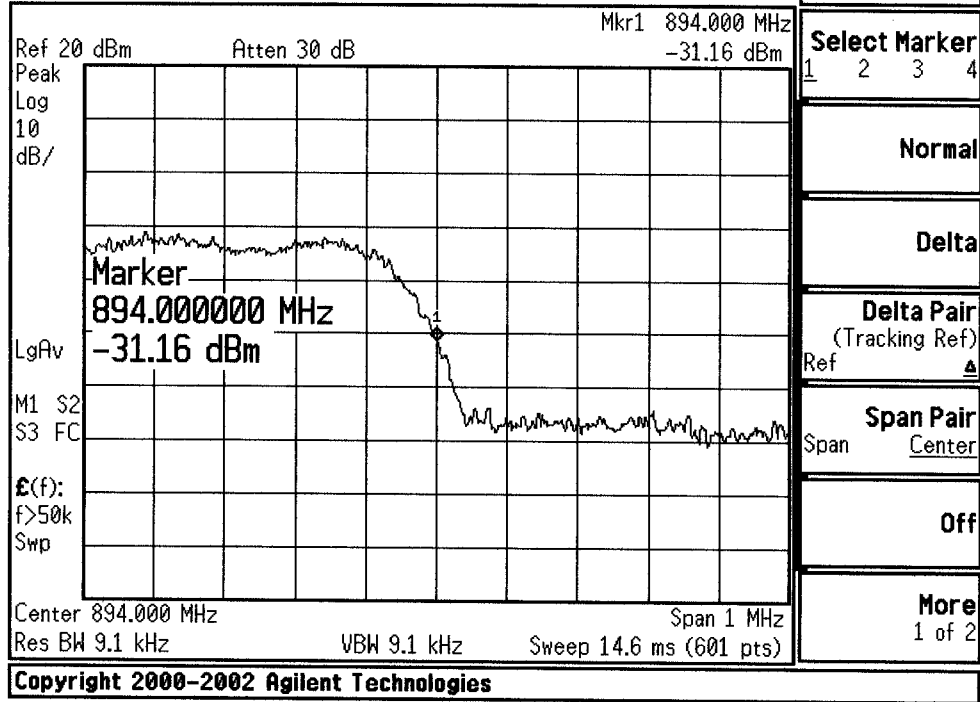
UTStarcom Band Edge(Low) FCC Part 22.917 High Channel

* Agilent 13:48:14 Mar 11, 2005



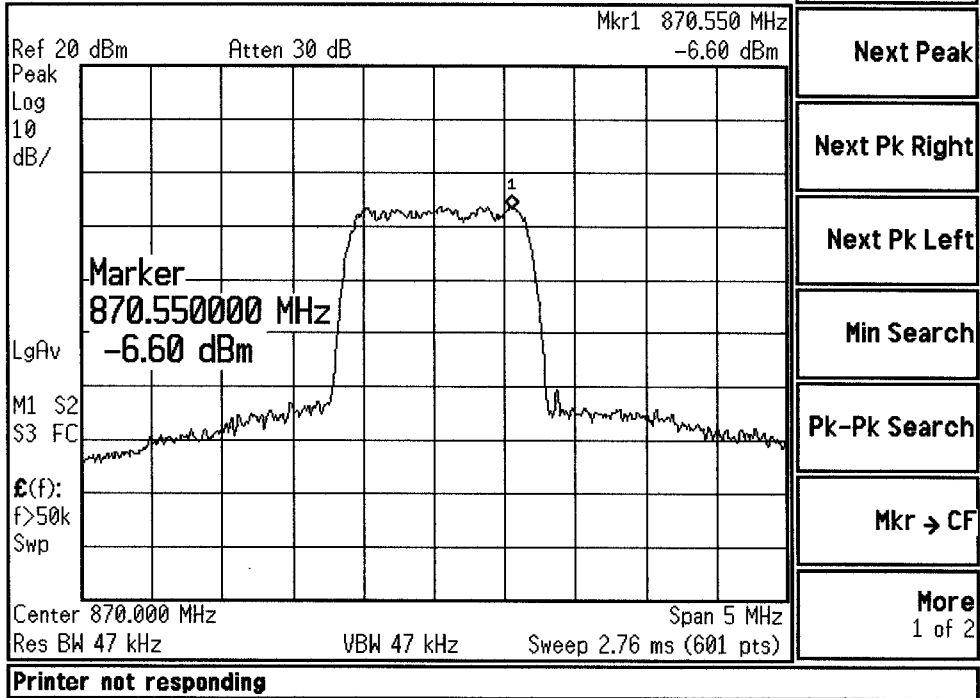
UTStarcom Band Edge(High) FCC Part 22.917 High Channel

* Agilent 13:46:36 Mar 11, 2005



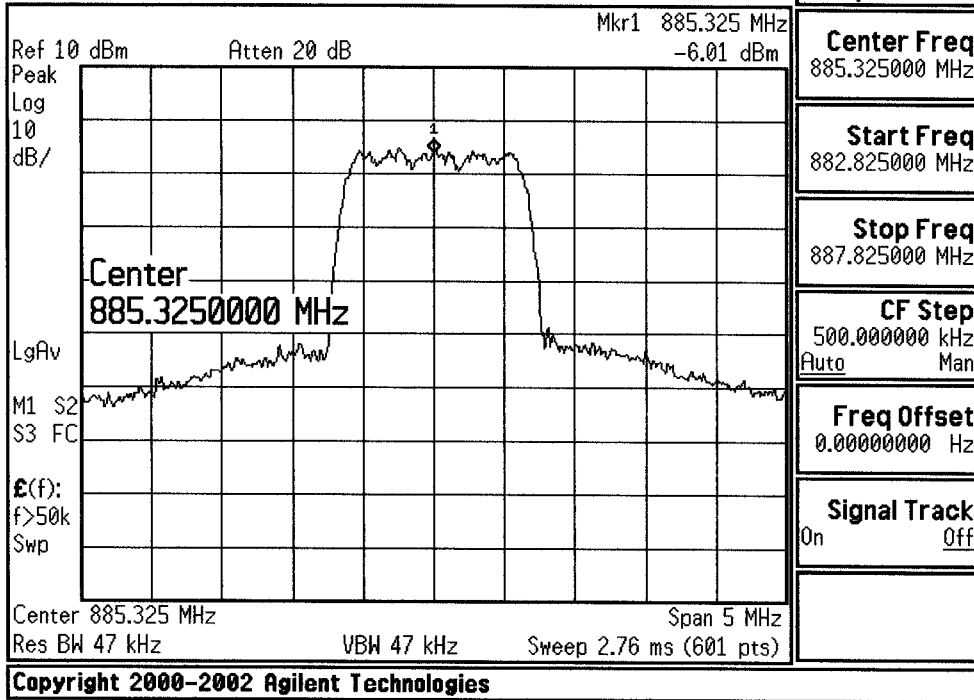
UTStarcom Output Power FCC Part 22.917 Low Channel

Agilent 07:55:54 Mar 11, 2005



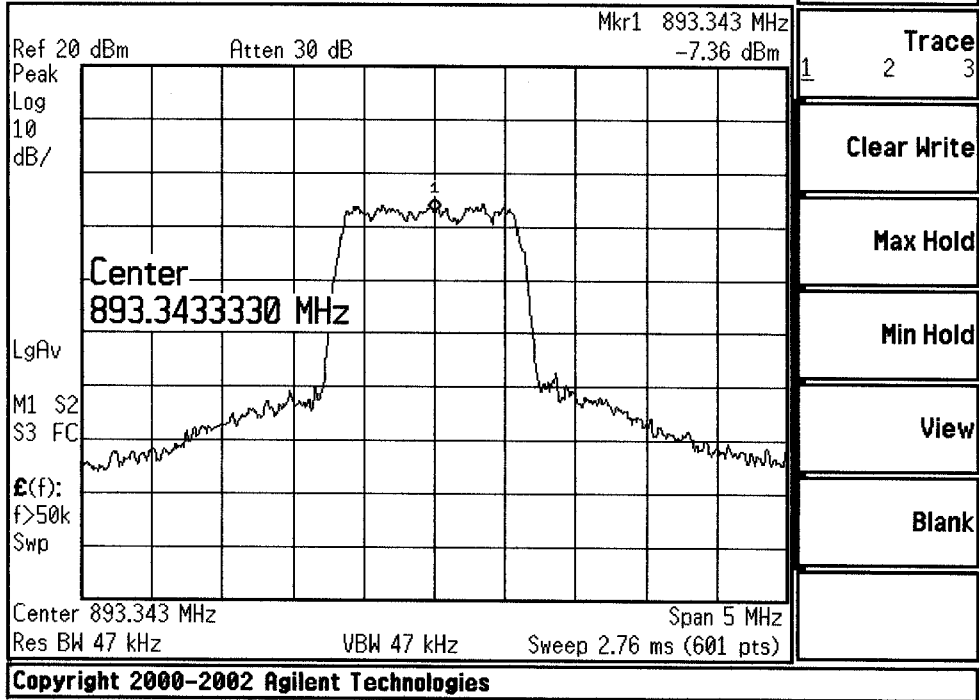
UTStarcom Output Power FCC Part 22.917 Mid Channel

Agilent 08:17:03 Mar 11, 2005



UTStarcom Output Power FCC Part 22.917 High Channel

* Agilent 13:49:57 Mar 11, 2005



UTStarcomm

SC 501057

Frequency Tolerance

22.355

	Frequency (MHz)		
Temperature (°C)	870.04	885.32	893.32
+50	870.03905	885.32000	893.31965
+40	870.03970	885.32125	893.32040
+30	870.03905	885.32090	893.31925
+20	See Table Below		
+10	870.03930	885.32110	893.31970
0	870.03955	885.32050	893.32035
-10	870.03950	885.32070	893.31940
-20	870.03935	885.32080	893.32050
-30	870.03985	885.32020	893.32720
Limit	870.038695 – 870.041305	885.318672 – 885.321328	893.31866 – 893.32134

Voltage Variation at 20°C

	Frequency (MHz)		
Voltage (Vdc)	870.04	885.32	893.32
4.42	870.04020	885.32010	893.31955
5.00	870.03995	885.32080	893.31950
5.50	870.03965	885.32045	893.31950
5.98	870.04015	885.32040	893.31960
Limit	870.038695 – 870.041305	885.318672 – 885.321328	893.31866 – 893.32134

Remarks

Measurements taken at 1 hour intervals to allow for temperature stabilization.
 Frequency tolerance limit is +/-1.5ppm of nominal operating frequency.
 Extreme voltage test range is 85% to 115% of rated operating voltage (5.2Vdc).

4.0 ATTESTATION STATEMENT

GENERAL REMARKS:

SUMMARY:

All tests were performed per CFR 47, Part(s) **22.917(b) and 22.355**

■ - Performed

The Equipment Under Test

■ - **Fulfills** the requirements of CFR 47, Part(s) **22.917(b) and 22.355**

Testing Start Date: 10 March 2005

Testing End Date: 25 March 2005

- TÜV AMERICA, INC. -

Responsible Engineer:



Jim Owen
(EMC Manager)

Responsible Engineer:



Frank Harkins
(EMC Engineer)