



September 10, 2004

Mr. Al Patrick
Cirronet Corporation
5375 Oakbrook Parkway
Norcross, GA 30093

Dear Mr. Patrick:

Enclosed please find Cirronet Corporation's file copy of the Part 15 Class II Permissive Change Application for the WIT2410 Transceiver.

Cirronet Corporation should expect to receive a certification grant for this product within the next 2-3 weeks.

If you have any questions, please don't hesitate to call. Thank you for your business.

Sincerely,

A handwritten signature in black ink, appearing to read 'L. Feudi', is written over a horizontal line.

Louis A. Feudi
Operations Manager



**Cirronet Corporation
FCC Part 15,
Class II Permissive Change Application
WIT2410**

**Issue Date: September 10, 2004
UST Project: 04-0175**

MEASUREMENT/TECHNICAL REPORT

COMPANY NAME: **Cirronet Corporation**

MODEL: WIT2410

FCC ID: **HSW-2410M**

DATE: **September 10, 2004**

This report concerns (check one): Original grant _____
Class II change X

Equipment type: **Modular Frequency Hopping Spread Spectrum Transceiver**

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes_____ No X

If yes, defer until: _____
date

N.A. agrees to notify the Commission by N.A.
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

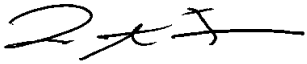
United States Technologies, Inc.
3505 Francis Circle
Alpharetta, GA 30004

Phone Number: (770) 740-0717
Fax Number: (770) 740-1508



I certify that I am authorized to sign for the manufacturer and that all of the statements in this report and in the Exhibits attached hereto are true and correct to the best of my knowledge and belief:

UNITED STATES TECHNOLOGIES, INC. (AGENT RESPONSIBLE FOR TEST):

By: 

Name: Louis A. Feudi

Title: Operations Manager

Date: September 10, 2004

**Cirronet Corporation
5375 Oakbrook Parkway
Norcross, GA 30093**

By: _____

Name: _____

Title: _____

Date: _____

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TABLE OF CONTENTS

SECTION 1

GENERAL INFORMATION

- 1.1 Product Description
- 1.2 Related Submittal(s)

SECTION 2

TESTS AND MEASUREMENTS

- 2.1 Configuration of Tested EUT
- 2.2 Test Facility
- 2.3 Test Equipment
- 2.4 Modifications
- 2.5 Antenna Description
- 2.6 Conducted Power
- 2.7 Peak Radiated Spurious Emissions
- 2.8 Average Radiated Spurious Emissions
- 2.9 Antenna Conducted Spurious Emissions
- 2.10 Band Edge Compliance

SECTION 3

PHOTOGRAPHS

SECTION 4

USER'S MANUAL

SECTION 5

RF EXPOSURE INFORMATION

LIST OF FIGURES AND TABLES

FIGURES

- 1) Test Configuration
- 2) Photograph(s) for Spurious Emissions
- 3) Peak Power Output
- 4) Peak Radiated Spurious Emissions
- 5) Antenna Conducted Spurious Emissions for Transmitter
- 6) Band Edge Compliance

TABLES

- 1) EUT and Peripherals
- 2) Test Instruments
- 3) Peak Power Output
- 4) Peak Radiated Spurious Emissions
- 5) Average Radiated Spurious Emissions

SECTION 1

GENERAL INFORMATION

GENERAL INFORMATION

1.1 Product Description

The Equipment Under Test (EUT) is a Cirronet Corporation, Model WIT2410 modular 2.4 GHz spread spectrum modular transceiver.

The EUT was originally approved for use with one of seven different antennas. The EUT was previously approved under FCC ID: HSW-2410M by the FCC on 10/6/99. Cirronet Corporation desires to apply for a Class II Permissive Change qualifying 15 antennas.

See information on following pages supplied by Cirronet:

Report on redesign of WIT2410 to replace obsolete SA2420 transceiver RFIC from Philips Semiconductor

Reason for Design Change:

The SA2420 2.4 GHz transceiver RFIC from Philips Semiconductor went obsolete in the latter part of 2003. Cirronet bought enough parts through an end-of-life buy to get through the remainder of 2003 and part of 2004. Since there is no functional replacement for the 2420, a major redesign of the WIT2410 was undertaken.

List of Design Changes:

The SA2420 formed the heart of the WIT2410's transmit and receive section. As such, a major redesign was required. The SA2420 provided the following functions in the WIT2410:

- 1) 2X frequency multiplier to double 1st LO frequency to the 2.4 GHz band,

The 2X frequency doubler in the SA2420 was replaced by a UPC8172TB up-convert mixer configured as a frequency doubler.

- 2) Low Noise Amplifier,

The LNA used in the SA2420 was replaced with a MAX2644 RFIC.

- 3) Down-convert Mixer,

The down-convert mixer in the SA2420 was replaced with a UPC2758TB

- 4) Transmit chain driver

We used the MAX2644 amplifier as a driver to boost the level coming from the 2X frequency multiplier.

Static Transmitter and Receiver Performance:

The above sections were built up on a Rev O PWB and tuned for maximum performance. The pertinent measurement results were as follows:

Transmit power:

<u>2401 MHz</u>	<u>2450 MHz</u>	<u>2500 MHz</u>
18 dBm	18 dBm	18 dBm

Received sensitivity (based on fidelity of received eye):

<u>2401 MHz</u>	<u>2450 MHz</u>	<u>2500 MHz</u>
-95 dBm	-95 dBm	-95 dBm

The results from the redesigned WIT2410 met and/or exceeded specifications of the current revision of the product.

Current consumption of the new revision is very close to that of the product Rev currently shipping. Measured values are shown below.

Rev K WIT2410 Current Consumption

Remote unlinked:	I _{supply} = 86 mA
Remote linked, sending no data:	I _{supply} = 27.5 mA
Remote linked, sending 9600bps:	I _{supply} = 46 mA
Base configuration, no data:	I _{supply} = 92 mA
Base configuration, 9600 bps:	I _{supply} = 99 mA
Base configuration, KB1:	I _{supply} = 185 mA

Regulatory Issues

Per agreement with Rich Fabina and Joe Dichoso of the OET division of the FCC, the new revision of the WIT2410 will be retested as a Class II permissive change. This means that the original grant and FCC ID number for the new revision of the WIT2410 will remain unchanged. After successful retesting of the module, the FCC will issue a permissive change for the product. This change will be listed on the FCC web site along side our other certifications.

1.2 Related Submittal(s)/Grant(s)

The EUT will be used to send/receive data. The transceiver presented in this report will be used with other like transceivers:

The EUT is subject to the following authorizations:

- a) Certification as a transceiver (modular approval)
- b) Verification as a digital device

The EUT was been previously approved under FCC ID: HSW-2410M by the FCC on 10/6/99.

The information contained in this report is presented for the re-certification & verification authorization(s) for the EUT.

COPY

FEDERAL COMMUNICATIONS
COMMISSION
WASHINGTON, D.C. 20554

COPY

GRANT OF EQUIPMENT
AUTHORIZATION
CertificationCirronet
5375 Oakbrook Parkway
Norcross, GA 30093
United States

Date of Grant: 10/06/1999

Application Dated: 07/16/1999

Attention: Mark Tucker , VP of Engineering

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is
VALID ONLY for the equipment identified hereon for use under the Commission's
Rules and Regulations listed below.

FCC IDENTIFIER: HSW-2410M

Name of Grantee: Cirronet

Equipment Class: Part 15 Spread Spectrum Transmitter

Notes: Modular 2.4 GHz Transceiver

Grant Notes	FCC Rule Parts	Frequency Range (MHz)	Output Watts	Frequency Tolerance	Emission Designator
	15C	2401.69 - 2469.89	0.05		

Mail To:
Sandi McEnery, President
United States Technologies
3505 Francis Circle
Alpharetta, GA 30004
US

EA94846

COPYFEDERAL COMMUNICATIONS
COMMISSION
WASHINGTON, D.C. 20554**COPY**GRANT OF EQUIPMENT
AUTHORIZATION
CertificationCirronet
5375 Oakbrook Parkway
Norcross, GA 30093
United States

Date of Grant: 03/29/2001

Application Dated: 03/02/2001

Attention: Mark Tucker , VP of Engineering

NOT TRANSFERABLEEQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is
VALID ONLY for the equipment identified hereon for use under the Commission's
Rules and Regulations listed below.

FCC IDENTIFIER: HSW-2410M

Name of Grantee: Cirronet

Equipment Class: Part 15 Spread Spectrum Transmitter

Notes: Modular 2.4 GHz Transceiver

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
36	15C	2401.69 - 2469.89	0.05		

For Fixed operation, the antenna(s) used for this transmitter must be fixed-mounted on outdoor permanent structures with a separation distance of at least 2 meters from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. For Mobile operation, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Power is conducted.

36: Certain antennas used with this equipment require a minimum cable length, or have output power limitations as documented in the application.

Mail To:

Sandi McEnery, President
United States Technologies
3505 Francis Circle
Alpharetta, GA 30004
US

EA100217

TCB

GRANT OF EQUIPMENT
AUTHORIZATION

TCB

Certification

Issued Under the Authority of the
Federal Communications Commission

By:

Timco Engineering, Inc.
849 NW State Road 45
P.O. Box 370,
Newberry, FL 32669
United States

Date of Grant: 01/28/2002

Application Dated: 01/28/2002

Cirronet
5375 Oakbrook Parkway
Norcross, GA 30093
United States

Attention: Mark Tucker , VP of Engineering

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is
VALID ONLY for the equipment identified hereon for use under the Commission's
Rules and Regulations listed below.

FCC IDENTIFIER: HSW-2410M

Name of Grantee: Cirronet

Equipment Class: Part 15 Spread Spectrum Transmitter

Notes: Spread Spectrum TX Module

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	15C	2401.69 - 2469.89	0.05		

COPYFEDERAL COMMUNICATIONS
COMMISSION
WASHINGTON, D.C. 20554**COPY**GRANT OF EQUIPMENT
AUTHORIZATION
CertificationCirronet
5375 Oakbrook Parkway
Norcross, GA 30093
United States

Date of Grant: 10/07/2002

Application Dated: 09/11/2002

Attention: Mark Tucker , VP of Engineering

NOT TRANSFERABLEEQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is
VALID ONLY for the equipment identified hereon for use under the Commission's
Rules and Regulations listed below..

FCC IDENTIFIER: HSW-2410M

Name of Grantee: Cirronet

Equipment Class: Part 15 Spread Spectrum Transmitter

Notes: Wireless LAN Module

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
36	15C	2401.69 - 2469.89	0.05		

Output is peak conducted. This permissive change grant covers only the antenna listed in the filing. For Fixed operation, the antenna(s) used for this transmitter must be fixed-mounted on outdoor permanent structures with a separation distance of at least 2 meters from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. For Mobile operation, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

36: Certain antennas used with this equipment require a minimum cable length, or have output power limitations as documented in the application.

Mail To:Sam Wismer,
Advanced Compliance Solutions
5015 B.U. Bowman Drive
Buford, GA 30518
US

EA282019

TCB

GRANT OF EQUIPMENT
AUTHORIZATION

TCB

Certification

Issued Under the Authority of the
Federal Communications Commission

By:

Timco Engineering, Inc.
849 NW State Road 45
P.O. Box 370,
Newberry, FL 32669
United States

Date of Grant: 11/01/2002

Application Dated: 11/01/2002

Cirronet
5375 Oakbrook Parkway
Norcross, GA 30093
United States

Attention: Mark Tucker , VP of Engineering

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is
VALID ONLY for the equipment identified hereon for use under the Commission's
Rules and Regulations listed below.

FCC IDENTIFIER: HSW-2410M

Name of Grantee: Cirronet

Equipment Class: Part 15 Spread Spectrum Transmitter

Notes: Wireless LAN

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
36	15C	2401.69 - 2469.89	0.05		

Output is peak conducted. This permissive change grant covers only the antenna listed in the filing. For Fixed operation, the antenna(s) used for this transmitter must be fixed-mounted on outdoor permanent structures with a separation distance of at least 2 meters from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. For Mobile operation, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

36: Certain antennas used with this equipment require a minimum cable length, or have output power limitations as documented in the application.

TCB

**GRANT OF EQUIPMENT
AUTHORIZATION**
Certification
Issued Under the Authority of the
Federal Communications Commission
By:

TCB

Timco Engineering, Inc.
849 NW State Road 45
P.O. Box 370,
Newberry, FL 32669
United States

Date of Grant: 11/14/2002
Application Dated: 11/14/2002

Cirronet
5375 Oakbrook Parkway
Norcross, GA 30093
United States

Attention: Mark Tucker , VP of Engineering

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: HSW-2410M

Name of Grantee: Cirronet

Equipment Class: Part 15 Spread Spectrum Transmitter

Notes: Wireless LAN

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
36	15C	2401.69 - 2469.89	0.05		

Output is peak conducted. This permissive change grant covers only the antenna listed in the filing. For Fixed operation, the antenna(s) used for this transmitter must be fixed-mounted on outdoor permanent structures with a separation distance of at least 2 meters from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. For Mobile operation, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

36: Certain antennas used with this equipment require a minimum cable length, or have output power limitations as documented in the application.

TCB

GRANT OF EQUIPMENT
AUTHORIZATION

TCB

Certification

Issued Under the Authority of the
Federal Communications Commission

By:

American TCB, Inc.
6731 Whittier Avenue Suite C110
McLean, VA 22101
United States

Date of Grant: 10/30/2003

Application Dated: 10/30/2003

Cirronet
5375 Oakbrook Parkway
Norcross, GA 30093
United States

Attention: Mark Tucker, VP of Engineering

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is
VALID ONLY for the equipment identified hereon for use under the Commission's
Rules and Regulations listed below.

FCC IDENTIFIER: HSW-2410M

Name of Grantee: Cirronet

Equipment Class: Part 15 Spread Spectrum Transmitter

Notes: Modular 2.4 GHz Transceiver

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
36 CE	15C	2401.69 - 2469.89	0.05		

Output is peak conducted. This permissive change grant covers only the antenna listed in the filing. For Fixed operation, the antenna(s) used for this transmitter must be fixed mounted on outdoor permanent structures with a separation distance of at least 2 meters from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. For Mobile operation, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

36: Certain antennas used with this equipment require a minimum cable length, or have output power limitations as documented in the application.

CE: This device has shown compliance with the conducted emissions limits in 15.107, 15.207, or 18.307 adopted under FCC 02-157 (ET Docket 98-80). The device may be marketed after July 11, 2005, and is not affected by the 15.37(j) or 18.123 transition provisions.

SECTION 2

TESTS AND MEASUREMENTS

TEST AND MEASUREMENTS

2.1 Configuration of Tested System

The sample was tested per ANSI C63.4, Methods of Measurement from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (1992). Conducted and radiated emissions data were taken with the test receiver or spectrum analyzer's resolution bandwidth adjusted to 9 kHz and 120 kHz, respectively. All measurements are peak unless stated otherwise. The video filter associated with the spectrum analyzer was off throughout the evaluation process. Interconnecting cables were manipulated as necessary to maximize emissions. Interconnecting cables were manipulated as necessary to maximize emissions. A block diagram of the tested system is shown in Figure 1. Test configuration photographs for spurious and fundamental emissions are shown in Figure 2.

The sample used for testing was received by U.S. Technologies on May 18, 2004 in good condition.

The EUT was originally approved for use with one of seven different antennas. Subsequent Permissive Changes added additional antennas. The EUT was previously approved under FCC ID: HSW-2410M by the FCC on 10/6/99. Cirronet Corporation desires to retest with fifteen (15) of the antennas from their original grant of certification and subsequent Permissive Changes.

Since the EUT has been previously tested and approved, only the spurious emissions and Band Edge tests have been repeated.

2.2 Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA. This site has been fully described and submitted to the FCC, and accepted in their letter marked 31040/SIT. Additionally this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number IC2982.

2.3 Test Equipment

Table 2 describes test equipment used to evaluate this product.

2.4 Modifications

No modifications were made by US Tech, to bring the EUT into compliance with FCC Part 15, Class B Limits for the transmitter portion of the EUT.

FIGURE 1a
TEST CONFIGURATION
(Dipole Antenna)

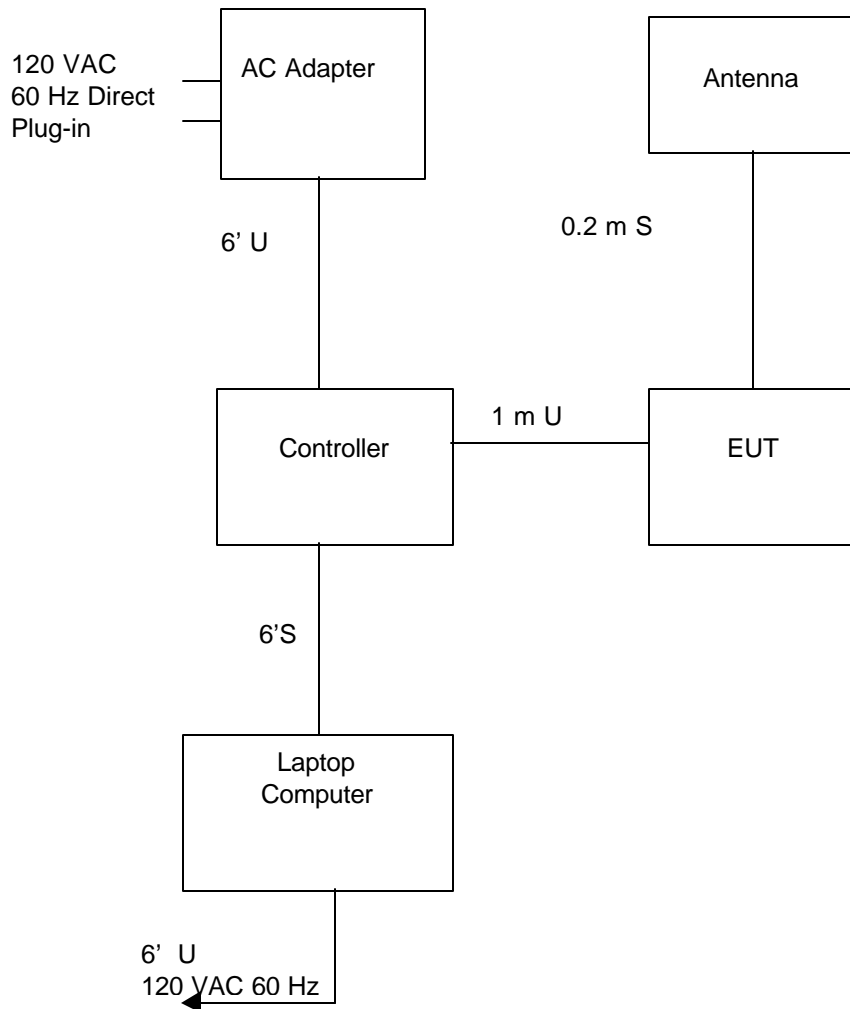
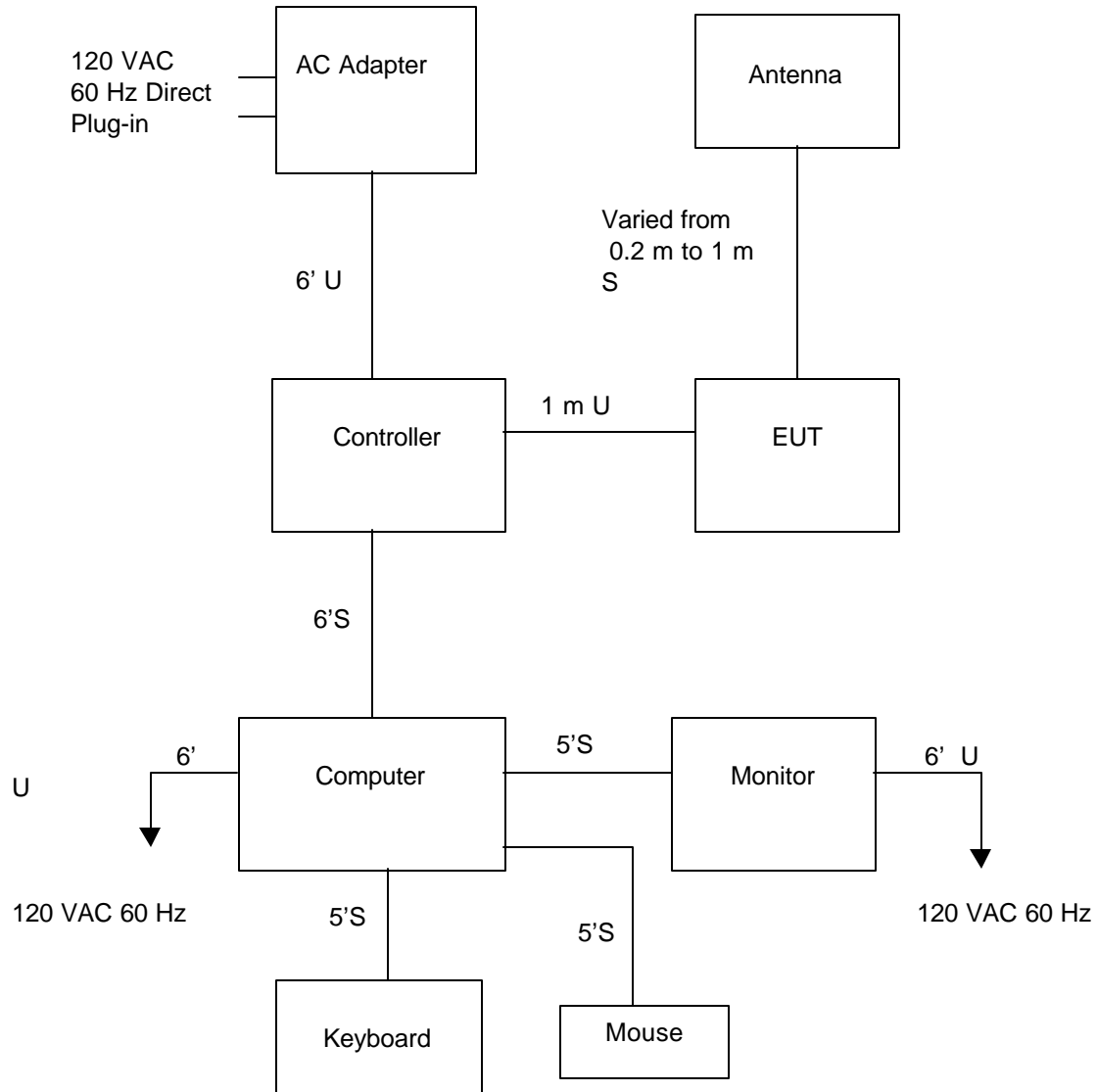


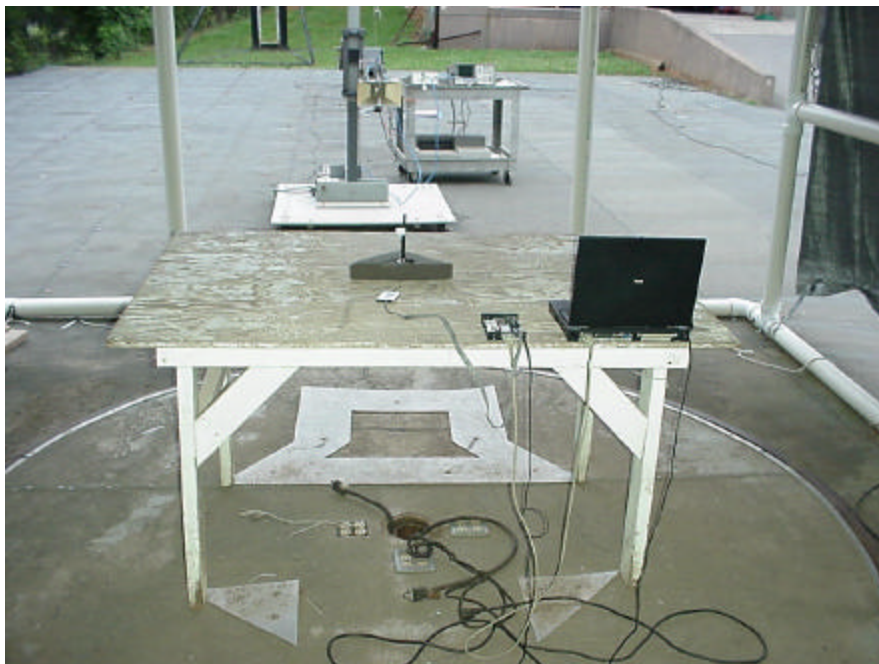
FIGURE 1b
TEST CONFIGURATION
(All Other Antenna)



Test Date: June 28, 2004
UST Project: 04-0175
Customer: Cirronet Corporation
Model: WIT2410

FIGURE 2a

Photograph(s) for Spurious Emissions (Dipole Antenna)



Test Date: June 28, 2004
UST Project: 04-0175
Customer: Cirronet Corporation
Model: WIT2410

FIGURE 2b

Photograph(s) for Spurious Emissions (Parabolic Dish Antenna)



Test Date: June 28, 2004
UST Project: 04-0175
Customer: Cirronet Corporation
Model: WIT2410

FIGURE 2c

Photograph(s) for Spurious Emissions (Omni Antenna)



Test Date: June 28, 2004
UST Project: 04-0175
Customer: Cirronet Corporation
Model: WIT2410

FIGURE 2d

Photograph(s) for Spurious Emissions (Yagi Antenna)



Test Date: June 28, 2004
UST Project: 04-0175
Customer: Cirronet Corporation
Model: WIT2410

FIGURE 2e

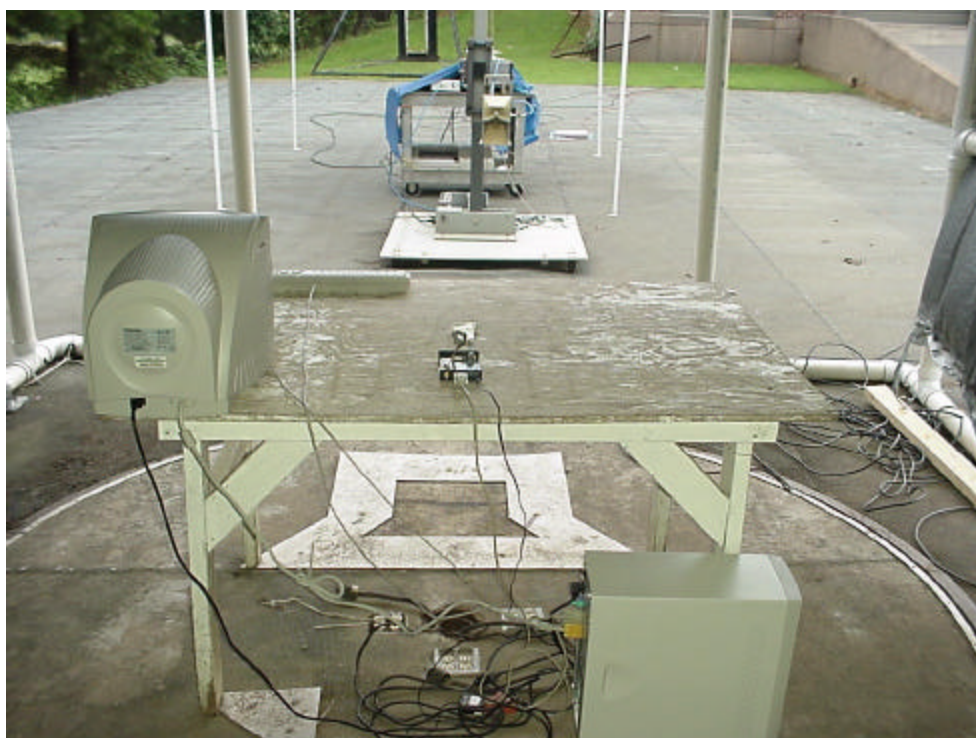
Photograph(s) for Spurious Emissions (Corner Reflector Antenna)



Test Date: June 28, 2004
UST Project: 04-0175
Customer: Cirronet Corporation
Model: WIT2410

FIGURE 2f

Photograph(s) for Spurious Emissions (Patch Antenna)



Test Date: August 27, 2004
UST Project: 04-0175
Customer: Cirronet Corporation
Model: WIT2410

FIGURE 2g

Photograph(s) for Spurious Emissions (Stub Antenna)



Test Date: August 27, 2004
UST Project: 04-0175
Customer: Cirronet Corporation
Model: WIT2410

FIGURE 2h
Photograph(s) for Spurious Emissions (Large Patch Antenna)



Test Date: August 27, 2004
UST Project: 04-0175
Customer: Cirronet Corporation
Model: WIT2410

FIGURE 2i
Photograph(s) for Spurious Emissions (Whip Gold Plate Antenna)

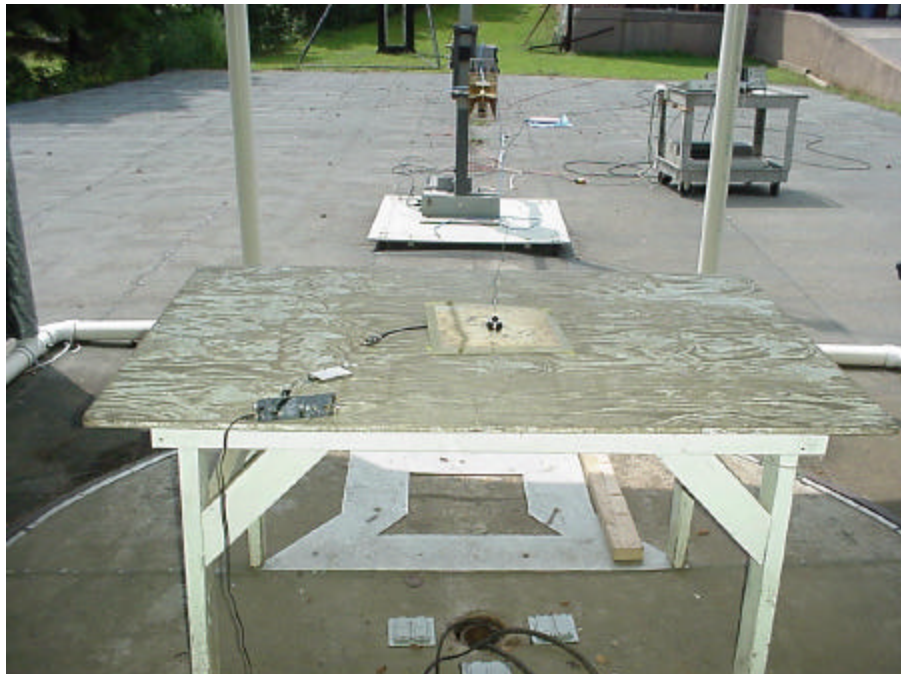


TABLE 1

Test Date: June 30, 2004 & August 27, 2004
UST Project: 04-0175
Customer: Cirronet Corporation
Model: WIT 2410M

EUT and Peripherals

PERIPHERAL MANU.	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
(EUT) Cirronet Corporation	WIT 2410M	008517	HSW-2410M	1 m U
Antenna Various, see antenna descriptions			None	Varied from 0.2 to 1 m S
AC Adapter Volgen	SPU10R-1	None	None	6' U 120 VAC/ 60 Hz Direct Plug-in
Controller Cirronet Corporation	None	None	None	6' S
Laptop Computer Toshiba	Satelite Pro T2155CDS	09543879	CJ6UK323	6' U 120 VAC/ 60 Hz Power Cord
Monitor Toshiba	Tekbright 510V	49100036	None	5' U 120 VAC/ 60 Hz Power Cord
Mouse Hewlett Packard	M-S34	LZE92123016	DZL211029	5' S
Computer Cirronet Corporation	None	None	None	6' Serial Cable 6' U 120 VAC/ 60 Hz Power Cord
Keyboard Hewlett Packard	SK-2502C	C990608784	None	5' S

TABLE 2
TEST INSTRUMENTS

EQUIPMENT	MODEL NUMBER	MANUFACTURER	SERIAL NUMBER	DATE OF LAST CALIBRATION
SPECTRUM ANALYZER	8558B	HEWLETT-PACKARD	2332A10055	2/19/04
SPECTRUM ANALYZER	8593E	HEWLETT-PACKARD	3205A00124	2/09/04
SIGNAL GENERATOR	8648B	HEWLETT-PACKARD	3642U01679	10/13/03
RF PREAMP	8447D	HEWLETT-PACKARD	2944A06291	4/29/04
BICONICAL ANTENNA	3110B	EMCO	9307-1431	5/18/04
LOG PERIODIC	3146	EMCO	3110-3236	6/30/04
LISN (x 2) 8028-50-TS24-BNC	8028	SOLAR ELE.	910494 & 910495	1/20/04
HORN ANTENNA	SAS-571	A. H. SYSTEMS	605	04/26/04
PREAMP	8449B	HEWLETT PACKARD	3008A00480	06/23/04
CALCULATION PROGRAM	N/A	N/A	Ver. 6.0	N/A

2.5 Antenna Description (Paragraph 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Previously Approved Antennas

Cirronet Corporation will sell the WIT2410 with one of the following antennas.

MANUFACTURER	TYPE OF ANTENNA	MODEL	GAIN dB	TYPE OR CONNECTOR
ACE	Dipole	ACE-2400NF	2 dBi	Reverse SMA to MMCX via adapter cable
Cushcraft	Yagi	PC2415-RTNF	15 dBi	Reverse TNC to MMCX via adapter cable
Mobile Mark	Omni-Directional	OD6-2400-RNTC	6 dBi	Reverse TNC to MMCX via adapter cable
Mobile Mark	Corner Reflector	SCR14-2400PTA-RTNC	14 dBi	Reverse TNC to MMCX via adapter cable
Digital Wireless Corporation	Patch	PA2400	Appx. 3 dBi	Reverse TNC to MMCX via adapter cable
Mobile Mark	Vehicle Mount Stub	RM3-2400-RTNC	2.5 dBi	Reverse TNC to MMCX via adapter cable
Mobile Mark	Corner Reflector	SCR9-2400-RN	9 dBi	Reverse N to MMCX via adapter cable
MaxRad	Whip	MUF24005.RTNC	5 dBi	Reverse TNC to MMCX via adapter cable
Andrews	Parabolic Dish	26T-2400A	24 dBi	Reverse N to MMCX via adapter cable
Hyperlink Technologies, Inc.	Parabolic Dish	2424GC	24 dBi	Reverse N to MMCX via adapter cable
Andrews	Parabolic Dish	18T-2400 A	18 dBi	Reverse N to MMCX via adapter cable
MaxRad	Whip Magnetic Mount (Mobile Vehicle Whip)	MUF24005.RTNC	5 dBi	Reverse TNC to MMCX via adapter cable
Mobile Mark	Omni	OD9-2400MUF24005	9 dBi	Reverse TNC to MMCX via adapter cable
Cirronet Corporation	Patch	GA Tech	12 dBi	Non-standard MMCX
Cirronet Corporation	Patch	PA2410	6dBi	Non-standard MMCX

To ensure compliance with 15.203, Cirronet Corporation attaches reverse-sex TNC or N connectors to all antennas except the 12 dBi and 6 dBi Patch antennas.

Cirronet Corporation. has arranged for the manufacturers of the antennas to provide reverse-sex TNC or N connectors for these antennas. OEM customers wanting to use one of these

antennas in their product will first need to obtain a special part number from Cirronet Corporation to give to the antenna manufacturer. The manufacturer, upon receipt of this number, will know to attach the reverse-sex TNC or N connector (or SMA in the case of the dipole) to the end of the antenna cable before shipping.

The customer then purchases an adapter cable from Cirronet Corporation that will connect the MMCX port on the module to the reverse-sex connector on the antenna. No other type of commercially available antenna will attach to this reverse-sex TNC or N connector (or SMA for the case of the dipole). Given the nonstandard nature of the interconnect between module and antenna and the difficulty involved in circumventing that connection, Cirronet Corporation feel that this procedure meets the requirements called out in 15.203.

2.6 Conducted Power (Peak) within the band 2400 – 2483.5 GHz per FCC Section 15.247(b)

Peak power within the band 2400-2483.5 GHz has been measured with a spectrum analyzer by connecting the spectrum analyzer directly via a short cable to the antenna output terminals or across the antenna leads on the PCB as specified by the manufacturer. The spectrum analyzer was set for a $50\ \Omega$ impedance with the VBW \geq RBW 6 dB bandwidth. The results of the measurements are given in Table 2 and Figure 3a through Figure 3c.

TABLE 3
PEAK POWER OUTPUT

Test Date: June 30, 2004 & August 27, 2004
UST Project: 04-0175
Customer: Cirronet Corporation
Model: WIT 2410M

Frequency of Fundamental (GHz)	Measurement (dBm)*	Measurement (mW)*	FCC Limit* (Watt)
2.40115	15.29	0.34	1.0
2.435690	16.19	0.42	1.0
2.469818	16.49	0.46	1.0

* Measurement includes 0.3 dB for cable loss

Tester

Signature: 

Name: David Blethen

Figure 3a
Conducted Power Peak Low Channel Emission

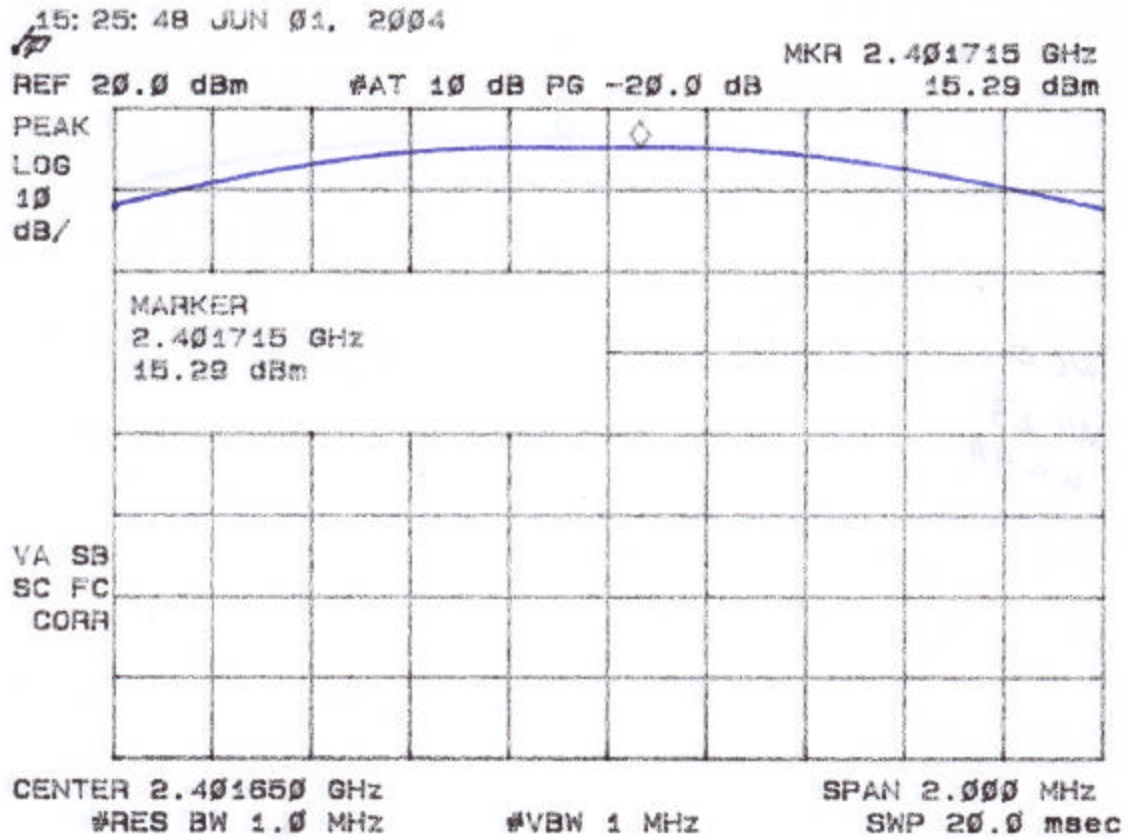


Figure 3b
Conducted Power Peak Mid Channel Emission

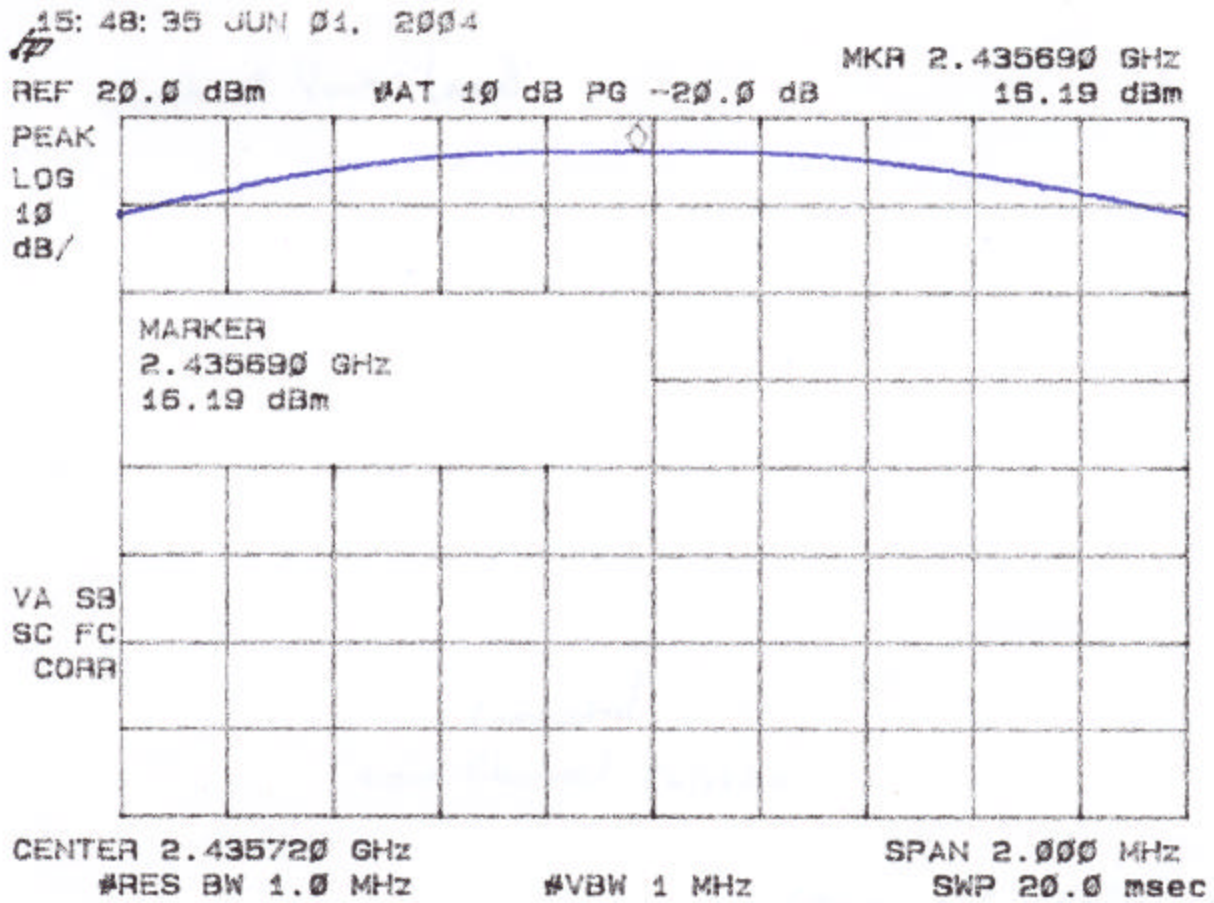


Figure 3c
Conducted Power Peak High Channel Emission

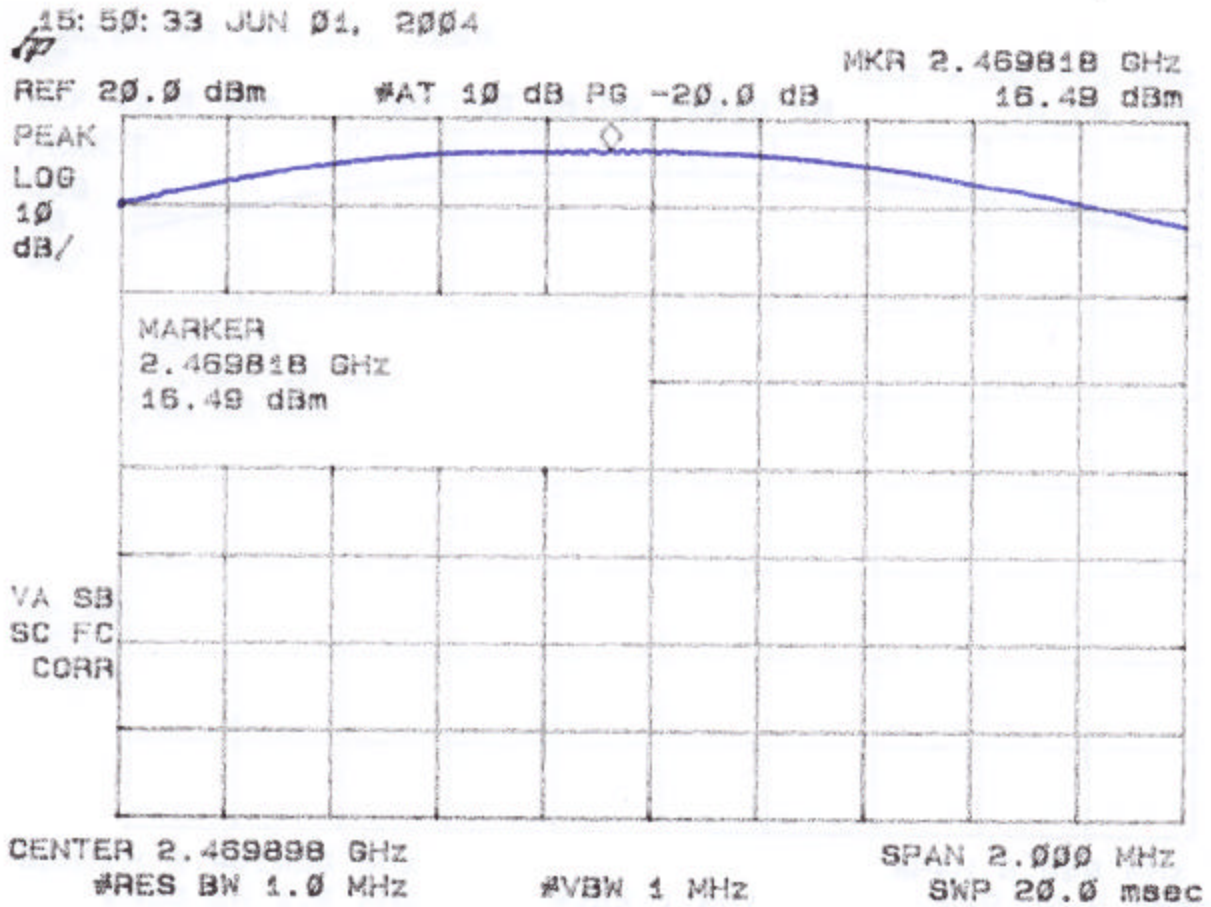
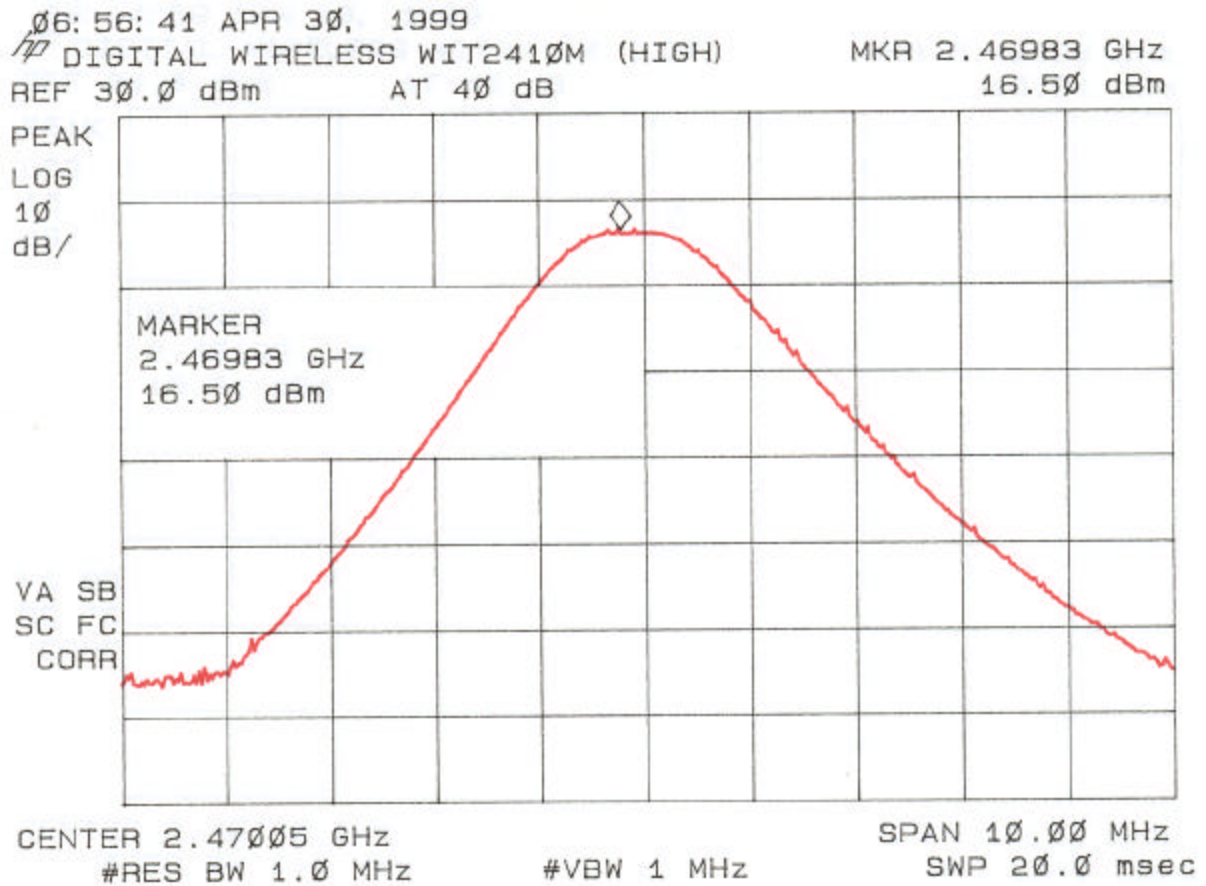


Figure 3d
Conducted Power Peak Highest Channel Emission
Certification Application July 12, 1999



2.7 Peak Radiated Spurious Emission in the Frequency Range 30-25000 MHz (FCC Section 15.247(c))

The EUT was hop-stopped and when possible placed into a continuous transmit mode of operation. A preliminary scan was performed on the EUT to determine frequencies that were caused by the transmitter portion of the product. Significant emissions that fell within restricted bands were then measured on an OAT's site. Radiated measurements below 1 GHz were tested with a RBW = 120 kHz. Radiated measurements above 1 GHz were measured using a RBW = VBW = 1 MHz. The results of peak radiated spurious emissions falling within restricted bands are given in Table 3a –3d and Figure 5a – Figure 5x.

Table 4a. PEAK RADIATED SPURIOUS EMISSIONS (Low)
Parabolic Dish Antenna

Freq. (GHz)	Test Data* (dBm) @ 3m	AF + CA -AMP (dB)	Results (uV/m) 3m	FCC Limits (uV/m)	MARGIN BELOW FCC Limits (dB)
4803.5	-54.67	5.0	731.7	5000.0	16.7

Table 4b. PEAK RADIATED SPURIOUS EMISSIONS (Middle)
Parabolic Dish Antenna

Freq. (GHz)	Test Data* (dBm) @ 3m	AF + CA -AMP (dB)	Results (uV/m) 3m	FCC Limits (uV/m)	MARGIN BELOW FCC Limits (dB)
4871.6	-53.17	5.2	899.0	5000.0	14.9

Table 4c. PEAK RADIATED SPURIOUS EMISSIONS (High)
Parabolic Dish Antenna

Freq. (GHz)	Test Data* (dBm) @ 3m	AF + CA -AMP (dB)	Results (uV/m) 3m	FCC Limits (uV/m)	MARGIN BELOW FCC Limits (dB)
4939.6	-52.95	5.5	953.2	5000.0	14.4

* - Data corrected by 1 dB for loss of high pass filter

SAMPLE CALCULATION:

RESULTS (uV/m @ 3m) = Antilog $((-53.17 + 5.2 + 107)/20)$ = 899.0

CONVERSION FROM dBm TO dBuV = 107 dB

Tester

Signature: _____



Name: David Blethen

Figure 4a
Peak Radiated Spurious Emission 15.247(c) Low – Parabolic Dish

