UltraTech
Group of Labs

Ultratech's Accreditations:

ANSI American National Standards Institute
0685

31040/SIT

C-1376

Canada
46390-2049

NVLAP
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BSMI
SL2-IN-E-1119R

3000 Bristol Circle,
Oakville, Ontario,
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Website: www.ultratech-labs.com
Email: vic@ultratech-labs.com

June 08, 2006

TIMCO ENGINEERING INC.
P.O. Box 370
849 N.W. State Road 45
Newberry, Florida
USA 32669

Subject: **FCC Class II Permissive Change Authorization Application under FCC Part 15, Subpart C, Sec. 15.247 - Frequency Hopping Spread Spectrum Transmitters operating in the frequency band 902 - 928 MHz.**

Product: **9XSTREAM Wireless OEM Module**
Model No.: **9XSTREAM**
FCC ID: **OUR9XSTREAM**

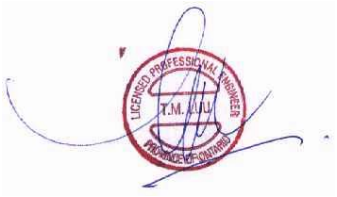
Dear Sir/Madam

As appointed agent for **MaxStream Inc.**, we would like to submit this application for FCC Class II Permissive Change Authorization of the above product. Please review all required documents uploaded to TIMCO Upload Web Site.

Class II Permissive Changes/Modifications: The 9XSTREAM includes a voltage divider that determines the FM deviation. The FM deviation setting determines the 20 dB bandwidth. The change consisted of slightly increasing the voltage output from the divider so that the FM deviation would be larger than 250 KHz.

If you have any queries, please do not hesitate to contact us.

Yours truly,



Tri Minh Luu, P. Eng.,
V.P., Engineering

Encl

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Website: www.ultratech-labs.com
Email: vic@ultratech-labs.com

June 08, 2006

MaxStream Inc.
355 South 520, Suite 180
Lindon, UT
USA, 84042

Attn.: **Mr. David Steed**

Subject: **FCC Class II Permissive Authorization Application Testing under FCC Part 15, Subpart C, Sec. 15.247 - Frequency Hopping Spread Spectrum Transmitters operating in the frequency band 902 - 928 MHz.**

Product: **9XSTREAM Wireless OEM Module**
Model No.: **9XSTREAM**
FCC ID: **OUR9XSTREAM**

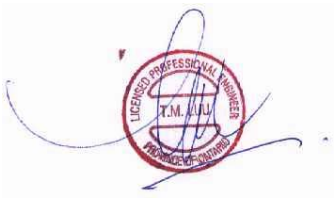
Dear Mr. Steed,

The product sample, as provided by you, has been tested and found to comply with **FCC Part 15, Subpart C, Sec. 15.247 - Frequency Hopping Spread Spectrum Transmitters operating in the frequency band 902 - 928 MHz.**

Class II Permissive Changes/Modifications: The 9XSTREAM includes a voltage divider that determines the FM deviation. The FM deviation setting determines the 20 dB bandwidth. The change consisted of slightly increasing the voltage output from the divider so that the FM deviation would be larger than 250 KHz.

Enclosed you will find copies of the engineering report. If you have any queries, please do not hesitate to contact us.

Yours truly,



Tri Minh Luu, P. Eng.,
V.P., Engineering

Encl.

ENGINEERING TEST REPORT

9XSTREAM Wireless OEM Module
Model No.: 9XSTREAM

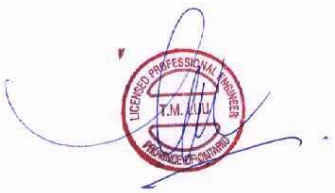
FCC ID: OUR9XSTREAM
(FCC Class II Permissive Changes/Modifications)

Applicant: **MaxStream Inc.**
355 South 520, Suite 180
Lindon, UT
USA, 84042

In Accordance With

FEDERAL COMMUNICATIONS COMMISSION (FCC)
PART 15, SUBPART C, SEC. 15.247
Frequency Hopping Spread Spectrum Transmitters
operating in the frequency band 902 - 928 MHz

UltraTech's File No.: MXS-054FCC15-247

This Test report is Issued under the Authority of Tri M. Luu, Professional Engineer, Vice President of Engineering UltraTech Group of Labs Date: June 08, 2006	
Report Prepared by: Tri M. Luu, P.Eng. Issued Date: June 08, 2006	Tested by: Hung Trinh, RFI Technologist Test Dates: June 05-07, 2006

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

UltraTech

3000 Bristol Circle, Oakville, Ontario, Canada, L6H 6G4
Tel.: (905) 829-1570 Fax.: (905) 829-8050
Website: www.ultratech-labs.com Email: vic@ultratech-labs.com, Email: tri.luu@sympatico.ca

TABLE OF CONTENTS

EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	FCC Part 15, Subpart C, Section 15.247
Title	Telecommunication - Code of Federal Regulations, CFR 47, Part 15
Purpose of Test:	To gain FCC Class II Permissive Change Authorization for Frequency Hopping Spread Spectrum Transmitters operating in the Frequency Band 902 - 928 MHz
Test Procedures	Both conducted and radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.4 - American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz.
Environmental Classification:	• Residential • Light-industry, Commercial • Industry
FCC Class II Permissive Changes/Modifications:	The 9XSTREAM includes a voltage divider that determines the FM deviation. The FM deviation setting determines the 20 dB bandwidth. The change consisted of slightly increasing the voltage output from the divider so that the FM deviation would be larger than 250 KHz

1.2. RELATED SUBMITAL(S)/GRANT(S)

None

1.3. NORMATIVE REFERENCES

Publication	YEAR	Title
FCC CFR Parts 0-19	Feb. 16 - 2006	Code of Federal Regulations – Telecommunication
ANSI C63.4	2004	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz
CISPR 22 +A1 EN 55022	2003-04-10 2004-10-14 2003	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
CISPR 16-1-1	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus
CISPR 16-2-1	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 2-1: Conducted disturbance measurement
CISPR 16-2-3	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 2-3: Radiated disturbance measurement
FCC Test Procedures	Mar. 23, 2005	Measurement of Digital Transmission Systems. Operating under Section 15.247
FCC Public Notice DA 00-1407	2000	Part 15 Unlicensed Modular Transmitter Approval

EXHIBIT 1. PERFORMANCE ASSESSMENT

1.1. CLIENT INFORMATION

APPLICANT:	
Name:	MaxStream Inc.
Address:	355 South 520, Suite 180 Lindon, UT USA, 84042
Contact Person:	Mr. David Steed Phone #: 801-765-9885 Fax #: 801-765-9895 Email Address: david@maxstream.net

MANUFACTURER:	
Name:	MaxStream Inc.
Address:	355 South 520, Suite 180 Lindon, UT USA, 84042
Contact Person:	Mr. David Steed Phone #: 801-765-9885 Fax #: 801-765-9895 Email Address: david@maxstream.net

1.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name	MaxStream Inc.
Product Name	9XSTREAM Wireless OEM Module
Model Name or Number	9XSTREAM
Serial Number	pre-production
Type of Equipment	Frequency Hopping Spread Spectrum Transmitters
Input Power Supply Type	5 Vdc from external supply source
Primary User Functions of EUT:	Provide data communication link through air

1.3. EUT'S TECHNICAL SPECIFICATIONS

TRANSMITTER	
Equipment Type:	▪ Mobile ▪ Base station (fixed use)
Intended Operating Environment:	▪ Residential ▪ Commercial, light industry & heavy industry
Power Supply Requirement:	5 Vdc from an external source
RF Output Power Rating:	0.148 Watts
Operating Frequency Range:	902 - 928 MHz
RF Output Impedance:	50 Ohms
Channel Spacing:	300 KHz
Duty Cycle:	100%
20 dB Bandwidth:	261.5 KHz to 284.6 kHz
Modulation Type:	FSK (Frequency Hopping Spread Spectrum)
Emission Designation:	284K6G1D
Antenna Connector Type:	The 9XSTREAM Module is provided with MMCX or reversed SMA connector with exception when the antenna is integral (A09-QI).

RECEVER	
Operating Frequency Range:	902 - 928 MHz
RF Input Impedance:	50 Ohms

1.4. LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	RF IN/OUT Port	1	Reversed SMA for external antenna	Shielded
2	DC Supply & I/O Port	1	Pin header	No cable, direct connection

1.5. ANCILLARY EQUIPMENT

The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

Ancillary Equipment # 1	
Description:	Interface Test Board
Brand:	Maxstream
Model Name or Number:	N/A
FCC Certification/FCC ID:	N/A
Serial Number:	N/A
Connected to EUT's Port:	PCMCIA type II

1.6. TEST SETUP BLOCK DIAGRAM

- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

EXHIBIT 2. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

2.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21°C
Humidity:	51%
Pressure:	102 kPa
Power input source:	5 Vdc from an external source

2.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

Operating Modes:	▪ Each of lowest, middle and highest channel frequencies transmits continuously for emissions measurements. ▪ The EUT operates in normal Frequency Hopping mode for occupancy duration, and frequency separation.
Special Test Software:	Special software is provided by the Applicant to disable the hopping function, to select and to operate the EUT at each channel frequency continuously. For example, the transmitter will be operated at each of lowest, middle and highest frequencies individually continuously during testing.
Special Hardware Used:	N/A
Transmitter Test Antenna:	The EUT is tested with the antenna fitted in a manner typical of normal intended use as an antenna equipment.

Transmitter Test Signals:	
Frequencies: ▪ 902 - 928 MHz band:	Lowest, middle and highest channel frequencies tested:
Transmitter Wanted Output Test Signals: ▪ RF Power Output (measured maximum output power): ▪ Normal Test Modulation ▪ Modulating signal source:	 ▪ 0.148 Watts ▪ FSK (FHSS) ▪ Internal

EXHIBIT 3. SUMMARY OF TEST RESULTS

3.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Powerline Conducted Emissions were performed in UltraTech's shielded room, 16'(L) by 12'(W) by 12'(H).

- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 31040/SIT 1300B3) and Industry Canada office (Industry Canada File No.: IC2049-1). Last Date of Site Calibration: June. 20, 2005.

3.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC PARAGRAPH.	TEST REQUIREMENTS	COMPLIANCE (YES/NO)
Public Notice DA 00-1407	Part 15 Unlicensed Modular Transmitter Approval	Yes. Refer to Note (1)
15.207(a)	AC Power Line Conducted Emissions Measurements (Transmit & Receive)	N/A. Refer to Note (1)
15.247(g)&(h)	Other FCC Requirements for Frequency Hopping Spread Spectrum Transmitter	N/A. Refer to Note (1)
15.247(a)(1)	Hopping Channel Frequency Characteristics	Yes
15.247(b)	Peak Output Power	Yes
15.247(i) & 1.1307(b)(1)	RF Exposure Limit	N/A. Refer to Note (1)
15.247(d)	Band-edge and RF Conducted Spurious Emissions at the Transmitter Antenna Terminal	N/A. Refer to Note (1)
15.247(d), 15.209 & 15.205	Transmitter Radiated Emissions	Yes

Notes:

(1) Please refer to original application

EXHIBIT 4. MEASUREMENTS, EXAMINATIONS & TEST DATA FOR EMC EMISSIONS

4.1. TEST PROCEDURES

This section contains test results only. Details of test methods and procedures can be found in ANSI C63.4, "FCC Measurement of Digital Transmission Systems Operating under Section 15.247 - March 23, 2005", ULTR-P001-2004, ULTR-P002-2004 and ULTR-P003-2004.

4.2. MEASUREMENT UNCERTAINTIES

The measurement uncertainties stated were calculated in accordance with requirements of UKAS Document LAB 34 with a confidence level of 95%. Please refer to Exhibit 6 for Measurement Uncertainties.

4.3. MEASUREMENT EQUIPMENT USED:

The measurement equipment used complied with the requirements of the Standards referenced in the Methods & Procedures ANSI C63.4 and CISPR 16-1.

4.4. ESSENTIAL/PRIMARY FUNCTIONS AS DECLARED BY THE MANUACTURER:

The essential function of the EUT is to correctly communicate data to and from radios over RF link.

4.5. HOPPING CHANNEL CARRIER FREQUENCY CHARACTERISTICS @ FCC CFR 47, PARA 15.247(A)(1)

4.5.1. Limits

FCC 15.247(a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

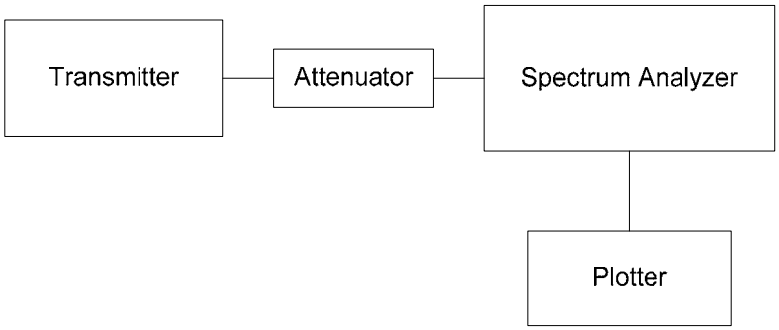
(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 KHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 KHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 KHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 KHz.

4.5.2. Method of Measurements

Refer to Ultratech Test Procedures, File # ULTR P002-2004, FCC DA-00-705 and ANSI C63.4 for measurement methods

4.5.3. Test Arrangement



4.5.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schawrz	FSEK20/B4/B21	834157/005	9 KHz – 40 GHz with external mixer

4.5.5. Test Data

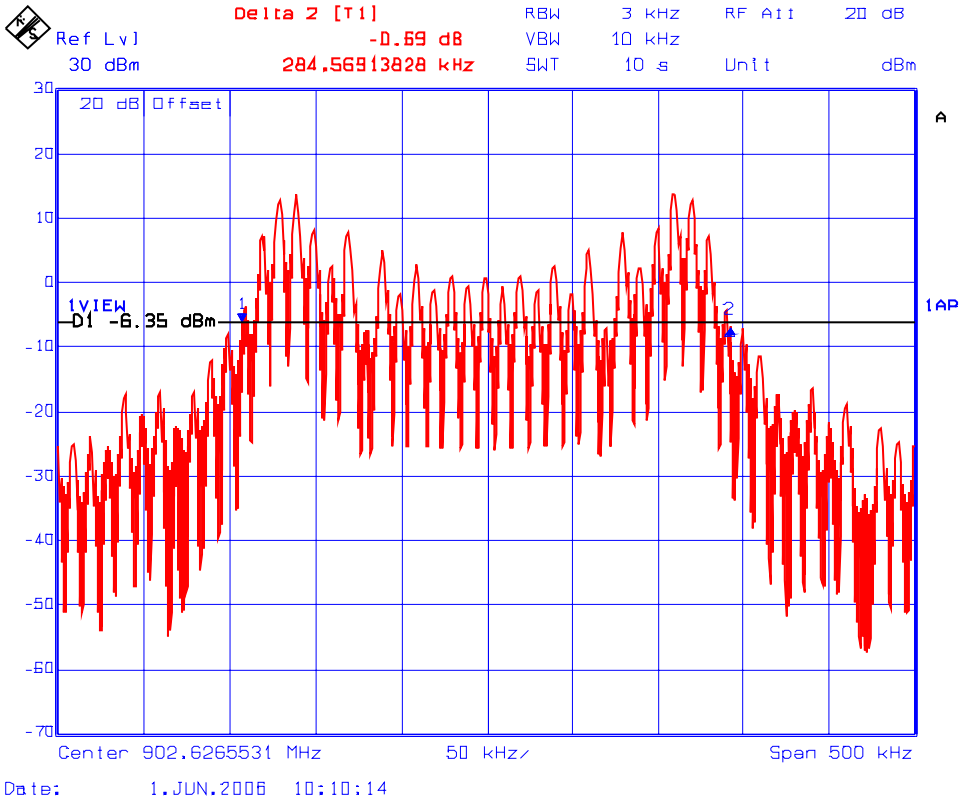
20 dB BANDWIDTH MEASUREMENTS

CHANNEL FREQUENCY (MHz)	MEASURED CHANNEL SEPARATION (KHz)	20 dB BANDWIDTH (KHz)	MINIMUM LIMIT (KHz)	PASS/FAIL
902.6	300	284.6	500	PASS
914.9	300	262.5	500	PASS
927.2	300	261.5	500	PASS

Note: 20 dB occupied bandwidth shall be less than the channel spacing. Refer to Plots # 1 to #3 for 20 dB bandwidth measurements.

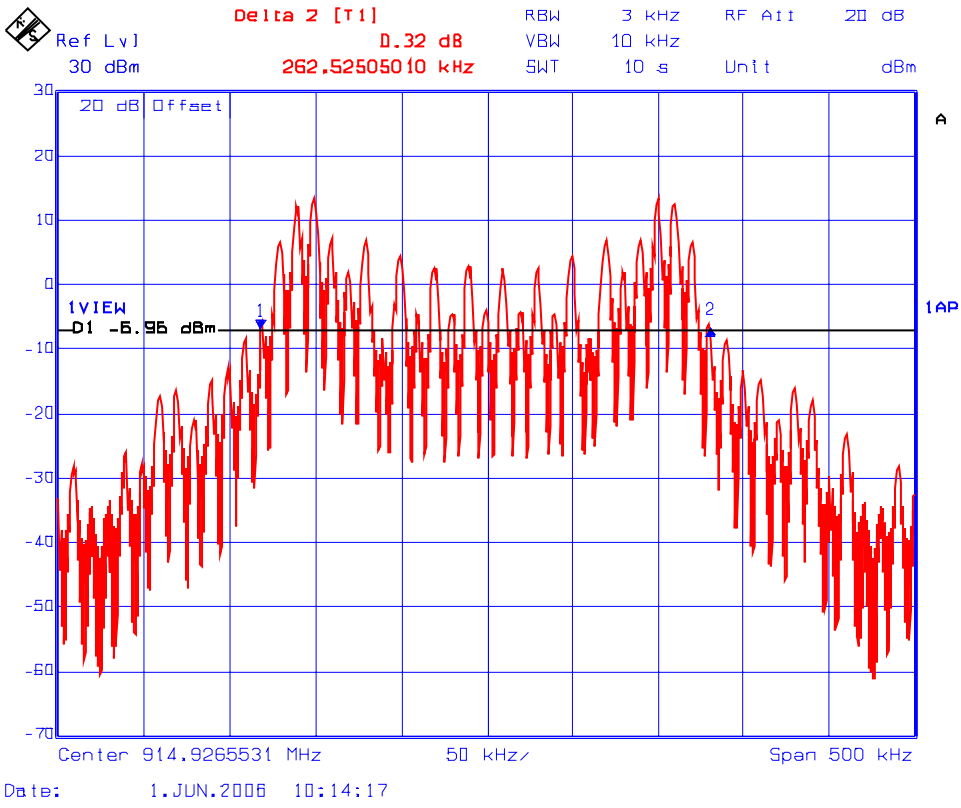
Test Description	FCC Specification	Measured Values	Comments
Channel Hopping Frequency Separation	minimum of 25 KHz or 20dB BW whichever is greater.	300 KHz	Pass. Refer to Plot #4
Number hopping frequencies vs. average time of occupancy	▪ if the 20 dB bandwidth of the hopping channel is 250 KHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.	20 dB BW = 261.5 to 284.6 KHz, Number of hopping: 83 Average time of occupancy = 0.2 Sec	Pass. Refer to Plots #4 to #7

Plot #1: 20 dB Bandwidth – Lowest Channel Frequency: 902.6 MHz



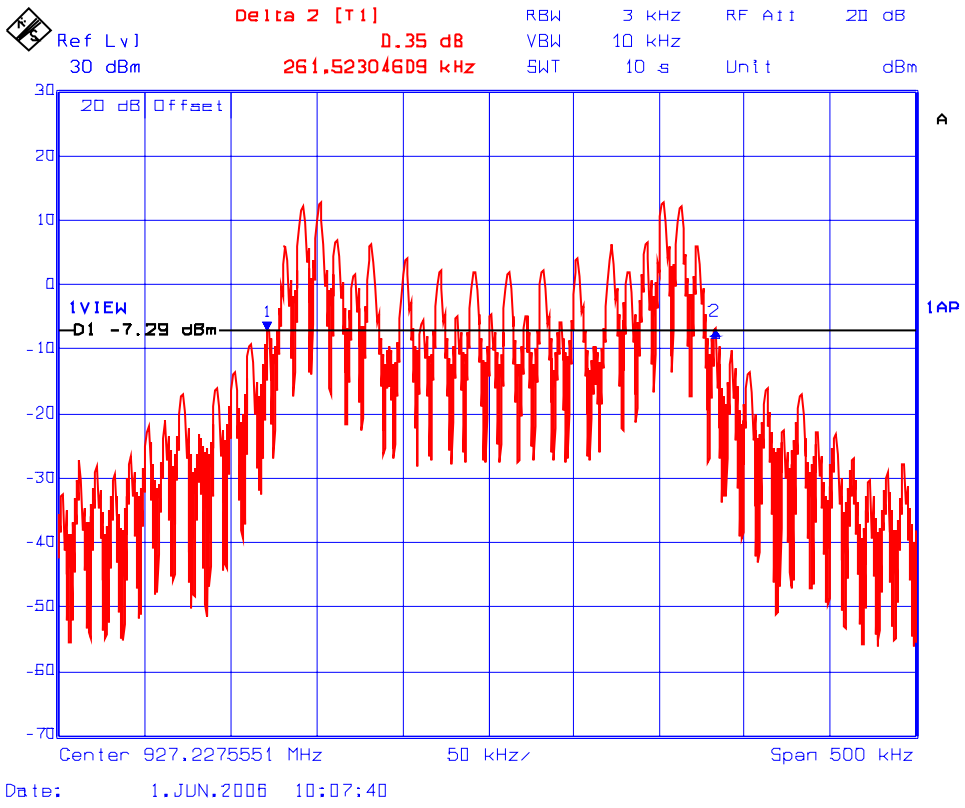
- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

Plot #2: 20 dB Bandwidth – Middle Channel Frequency: 914.9 MHz



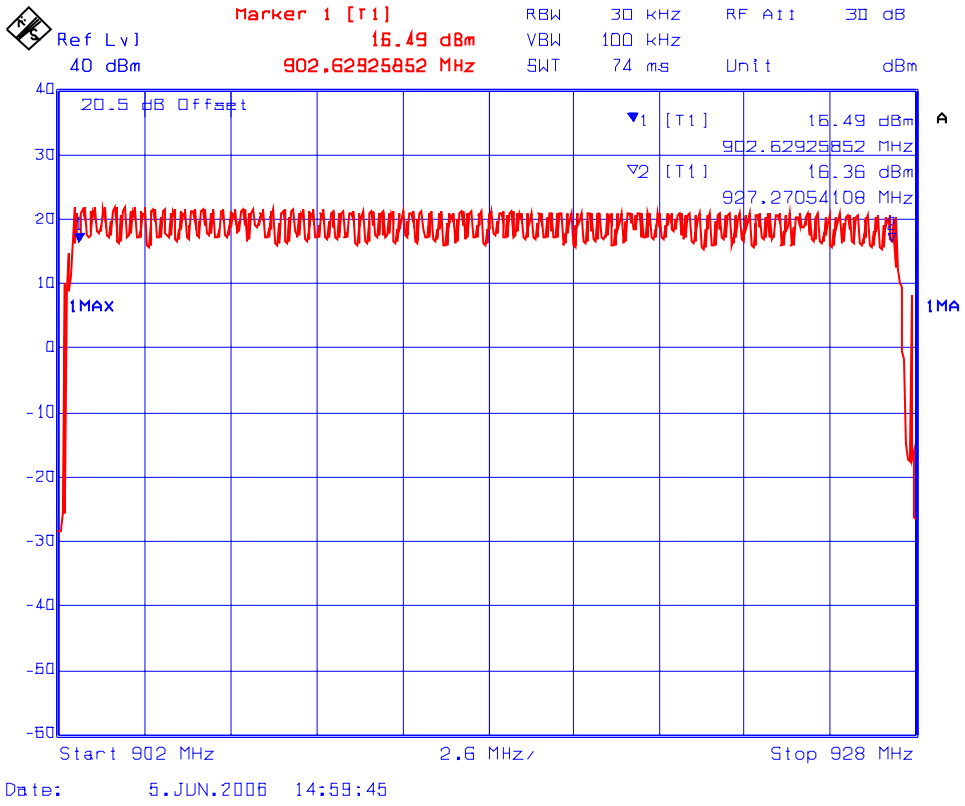
- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

Plot #3: 20 dB Bandwidth – Highest Channel Frequency: 927.2 MHz



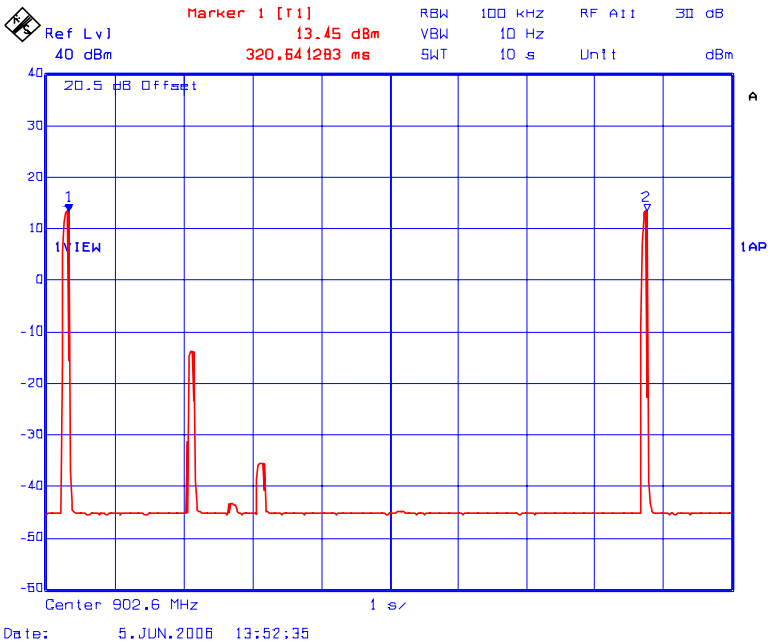
- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

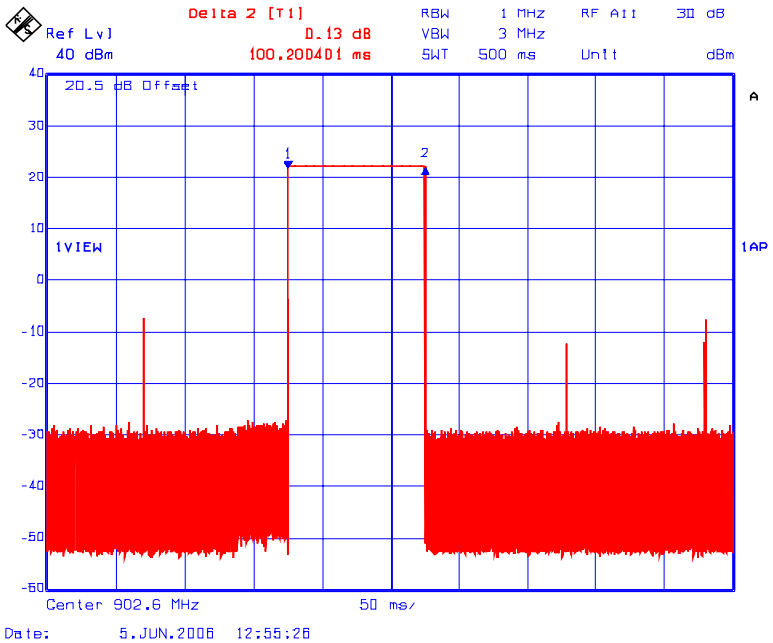
Plot #4: Number of Hopping Frequencies = 83 > 25



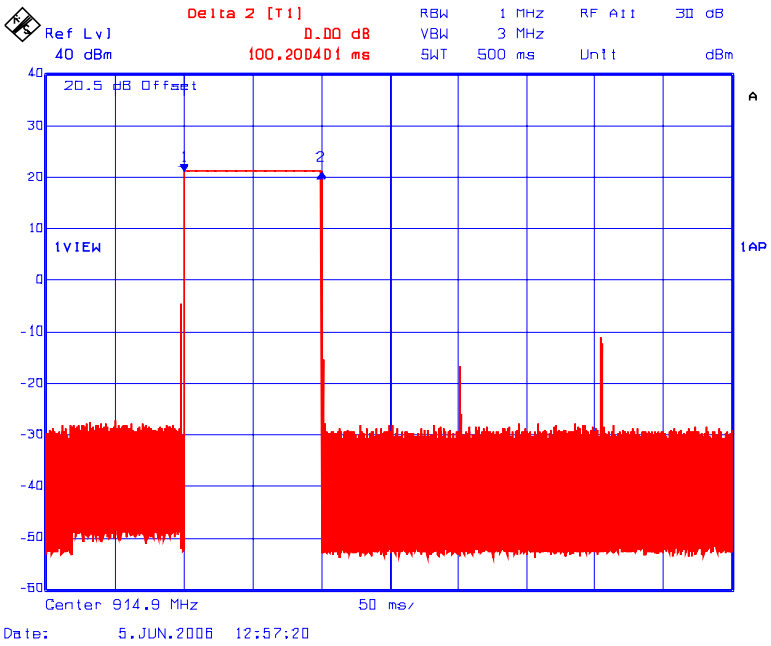
- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

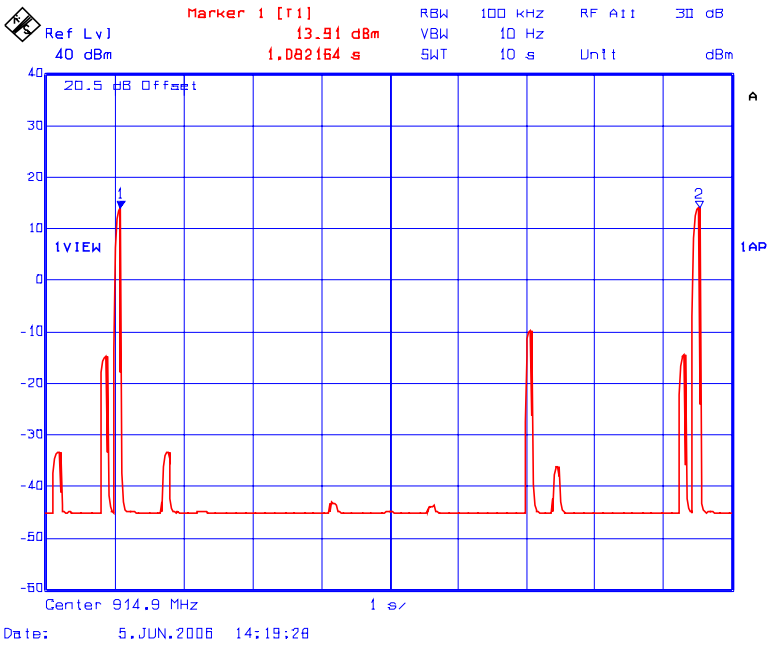
Plot #5: **Average Time of Occupancy within 10 second period = 2x0.1 Sec = 0.2 Sec**
Channel Frequency: 902.6 MHz



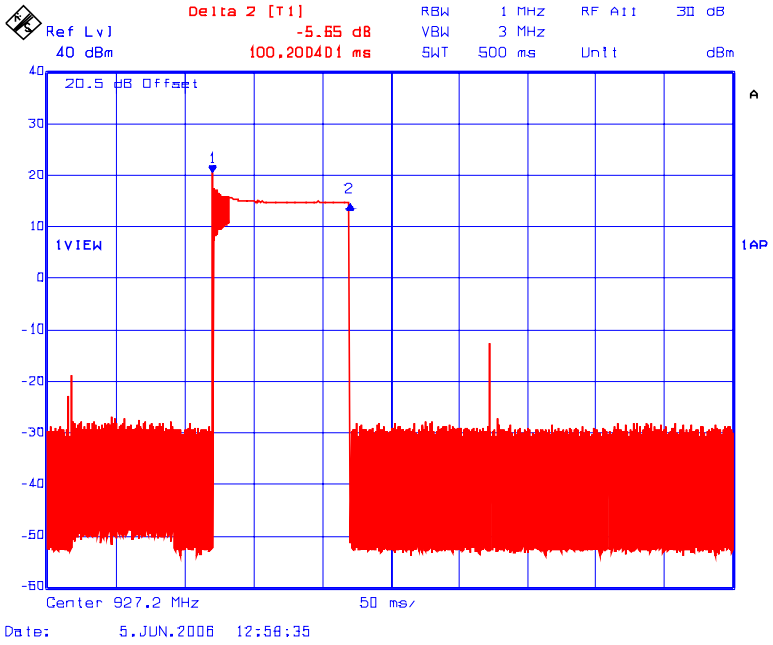


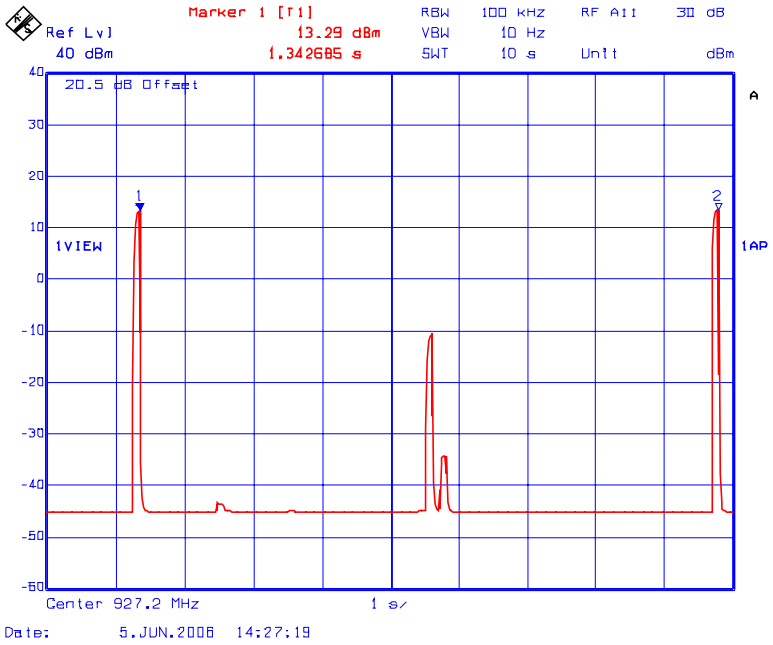
Plot #6: **Average Time of Occupancy within 10 second period = 2x0.1 Sec = 0.2 Sec**
Channel Frequency: 914.9 MHz





Plot #7: **Average Time of Occupancy within 10 second period = 2x0.1 Sec = 0.2 Sec**
Channel Frequency: 927.2 MHz





- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

4.6. PEAK OUTPUT POWER & EFFECTIVE RADIATED POWER (EIRP) @ FCC 15.247(B)

4.6.1. Limits

FCC15.247(b): The maximum peak conducted output power of the intentional radiator shall not exceed the following:

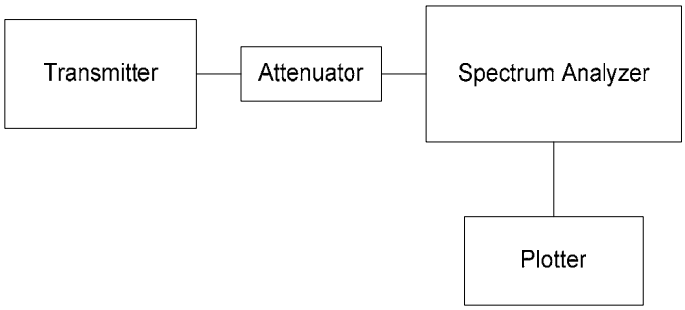
(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.6.2. Method of Measurements

Refer to Ultratech Test Procedures, File # ULTR P002-2004, FCC DA-00-705 and ANSI C63.4 for measurement methods

4.6.3. Test Arrangement



4.6.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schawrz	FSEK20/B4/B21	834157/005	9 KHz – 40 GHz with external mixer

4.6.5. Test Data

The RF Output Power was re-measured to ensure that the maximum rf output power would not exceed the maximum allowable conducted power (0.148 Watts or 21.7 dBm) stated in the FCC Grant, FCC ID: OUR9XSTREAM. 0.5 dB tolerance is allowed.

Transmitter Channel	Frequency (MHz)	Total Peak Power @ Antenna Port (dBm)	RF Peak Output Power @ Antenna Port (dBm)	Limit of Total Peak EIRP (dBm)
Lowest	902.6	21.9	21.7	0.2
Middle	914.9	21.2	21.7	-0.5
Highest	927.2	20.6	21.7	-1.1

4.7. TRANSMITTER BAND-EDGE & SPURIOUS EMISSIONS (RADIATED @ 3 METERS), FCC CFR 47, PARA. 15.247(D), 15.209 & 15.205

4.7.1. Limits

In any 100 KHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Remarks:

- Applies to harmonics/spurious emissions that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209.
- **@ FCC CFR 47, Para. 15.237(c)** - The emission limits as specified above are based on measurement instrument employing an average detector. The provisions in **@15.35** for limiting peak emissions apply.

FCC CFR 47, Part 15, Subpart C, Para. 15.205(a) - Restricted Frequency Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	162.0125 - 167.17	2310 - 2390	9.3 - 9.5
0.49 – 0.51	167.72 - 173.2	2483.5 - 2500	10.6 - 12.7
2.1735 - 2.1905	240 - 285	2655 - 2900	13.25 - 13.4
8.362 - 8.366	322 - 335.4	3260 - 3267	14.47 - 14.5
13.36 - 13.41	399.9 - 410	3332 - 3339	14.35 - 16.2
25.5 – 25.67	608 - 614	3345.8 - 3358	17.7 - 21.4
37.5 – 38.25	960 - 1240	3600 - 4400	22.01 - 23.12
73 - 75.4	1300 - 1427	4500 - 5250	23.6 - 24.0
108 – 121.94	1435 - 1626.5	5350 - 5460	31.2 - 31.8
123 – 138	1660 - 1710	7250 - 7750	36.43 - 36.5
149.9 – 150.05	1718.8 - 1722.2	8025 - 8500	Above 38.6
156.7 – 156.9	2200 - 2300	9000 - 9200	

FCC CFR 47, Part 15, Subpart C, Para. 15.209(a)
-- Field Strength Limits within Restricted Frequency Bands --

FREQUENCY (MHz)	FIELD STRENGTH LIMITS (microvolts/m)	DISTANCE (Meters)
0.009 - 0.490	2,400 / F (KHz)	300
0.490 - 1.705	24,000 / F (KHz)	30
1.705 - 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

4.7.2. Method of Measurements

Refer to Ultratech Test Procedures, File # ULTR P002-2004, FCC DA-00-705 and ANSI C63.4 for measurement methods

4.7.3. Test Arrangement

Refer to Sec.3.6 of this test report for test setup.

4.7.4. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
Spectrum Analyzer/ EMI Receiver	Rohde & Schawrz	FSEK20/B4/B21	834157/005	9 KHz – 40 GHz with external mixer
Biconilog Antenna	EMCO	3143	1029	20 MHz to 2 GHz
Horn Antenna	EMCO	3155	9701-5061	1 GHz – 18 GHz

4.7.5. Photographs of Test Setup

Refer to the Photographs #1 & #3 in Annex 1 for setup and arrangement of equipment under tests and its ancillary equipment.

4.7.6. Test Data

Remark: The radiated emission tests were conducted with the maximum antenna gain (Maxstream Yagi Antenna, P/N: A09-Y15, Gain = 15.2 dBi, connector: reversed SAM) listed in the original Grant to ensure that there would be failure due to the change in occupied bandwidth.

4.7.6.1. Transmitter Radiated Band-edge Spurious Emissions during Hopping

Please refer to Plots # 8(a)&(b) to # 11(a)&(b) for detailed measurements of band-edge conducted emissions.

4.7.6.2. Transmitter Radiated Spurious Emissions

4.7.6.2.1. Lowest Frequency (902.6 MHz)

The emissions were scanned from 30 MHz to 10 GHz and all emissions less 40 dB below the limits were recorded.
* Frequency that falls in restricted band @ FCC 15.205 shall meet the Limit @ FCC 15.209.

FREQUENCY (MHz)	RF PEAK LEVEL (dBµV/m)	RF AVG LEVEL (dBµV/m)	ANTENNA PLANE (H/V)	LIMIT 15.209 (dBµV/m)	LIMIT 15.247 (dBµV/m)	MARGIN (dB)	PASS/ FAIL
902.60	134.7	--	V	54.0	114.7	--	PASS
902.60	133.9	--	H	54.0	114.7	--	PASS
1805.20	47.5	37.6	V	54.0	114.7	-77.1	PASS
1805.20	45.6	36.6	H	54.0	114.7	-78.1	PASS
2707.80	47.0	37.3	V	54.0	114.7	-16.7	*PASS
2707.80	47.7	41.0	H	54.0	114.7	-13.0	*PASS
3610.40	54.0	46.1	V	54.0	114.7	-7.9	*PASS
3610.40	54.9	47.9	H	54.0	114.7	-6.1	*PASS
4513.00	58.1	52.4	V	54.0	114.7	-1.6	*PASS
4513.00	57.0	51.1	H	54.0	114.7	-2.9	*PASS
7220.80	60.6	50.2	V	54.0	114.7	-64.5	PASS
7220.80	60.2	50.1	H	54.0	114.7	-64.6	PASS
8123.40	58.7	45.7	V	54.0	114.7	-8.3	*PASS
8123.40	58.4	45.5	H	54.0	114.7	-8.5	*PASS

4.7.6.2.2. Middle Frequency (914.9 MHz)

The emissions were scanned from 30 MHz to 10 GHz and all emissions less 40 dB below the limits were recorded.
* Frequency that falls in restricted band @ FCC 15.205 shall meet the Limit @ FCC 15.209.

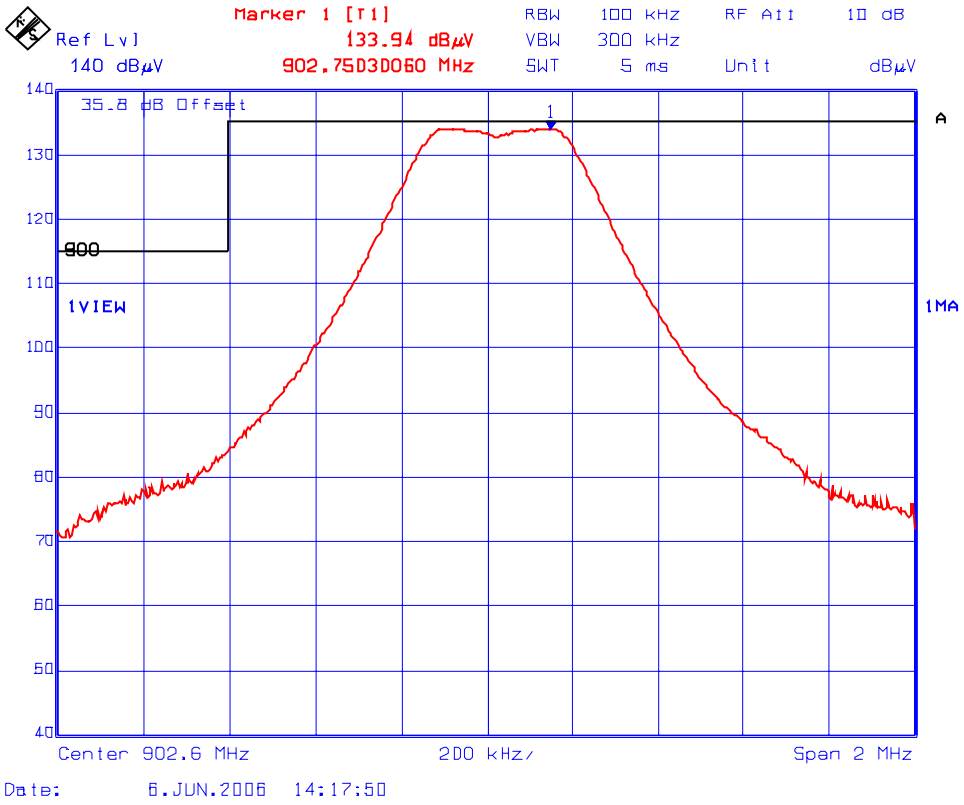
FREQUENCY (MHz)	RF PEAK LEVEL (dBµV/m)	RF AVG LEVEL (dBµV/m)	ANTENNA PLANE (H/V)	LIMIT 15.209 (dBµV/m)	LIMIT 15.247 (dBµV/m)	MARGIN (dB)	PASS/ FAIL
914.90	133.7	--	V	54.0	113.9	--	PASS
914.90	133.9	--	H	54.0	113.9	--	PASS
1829.80	48.5	43.3	V	54.0	113.9	-70.6	PASS
1829.80	47.1	41.6	H	54.0	113.9	-72.3	PASS
2744.70	50.1	44.8	V	54.0	113.9	-9.2	*PASS
2744.70	48.9	42.7	H	54.0	113.9	-11.3	*PASS
3659.60	55.1	49.8	V	54.0	113.9	-4.2	*PASS
3659.60	55.0	48.6	H	54.0	113.9	-5.4	*PASS
4574.50	52.0	43.0	V	54.0	113.9	-11.0	*PASS
4574.50	54.0	46.3	H	54.0	113.9	-7.7	*PASS
5489.40	52.3	41.3	V	54.0	113.9	-72.6	PASS
5489.40	51.4	39.9	H	54.0	113.9	-74.0	PASS
7319.20	60.2	50.4	V	54.0	113.9	-3.6	*PASS
7319.20	58.4	47.5	H	54.0	113.9	-6.5	*PASS
8234.10	58.2	45.9	V	54.0	113.9	-8.1	*PASS
8234.10	58.0	44.0	H	54.0	113.9	-10.0	*PASS
9149.00	58.0	45.0	V	54.0	113.9	-9.0	*PASS

4.7.6.2.3. Highest Frequency (927.2 MHz)

The emissions were scanned from 30 MHz to 10 GHz and all emissions less 40 dB below the limits were recorded.
* Frequency that falls in restricted band @ FCC 15.205 shall meet the Limit @ FCC 15.209.

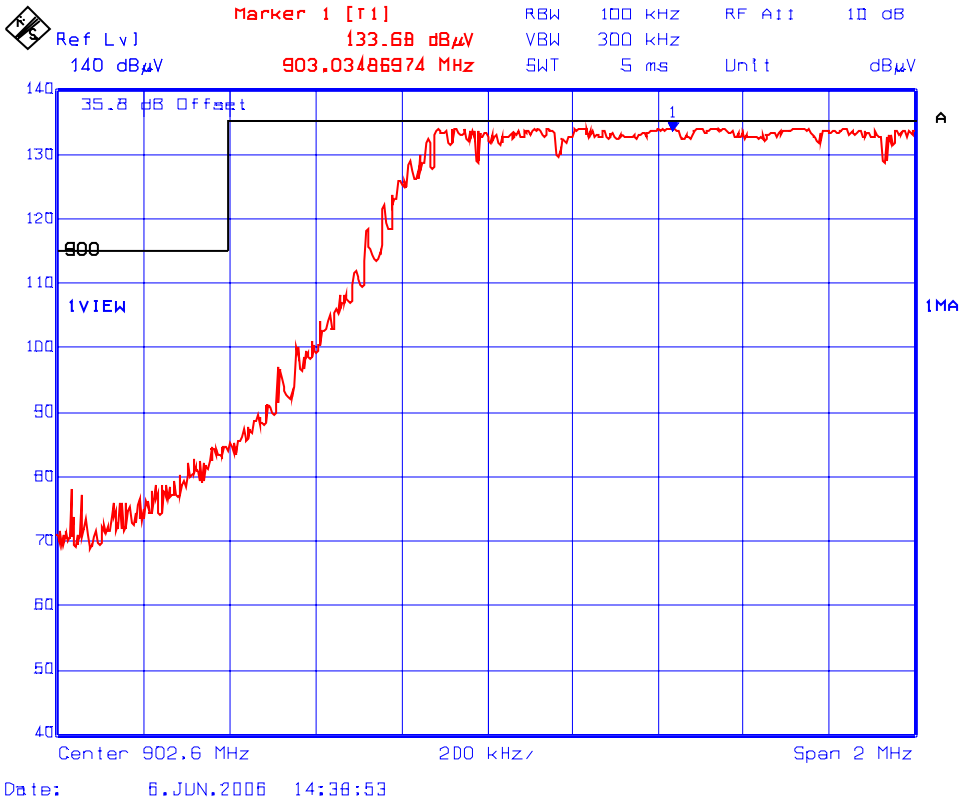
FREQUENCY (MHz)	RF PEAK LEVEL (dBµV/m)	RF AVG LEVEL (dBµV/m)	ANTENNA PLANE (H/V)	LIMIT 15.209 (dBµV/m)	LIMIT 15.247 (dBµV/m)	MARGIN (dB)	PASS/ FAIL
927.20	133.9	--	V	54.0	113.9	--	PASS
927.20	133.8	--	H	54.0	113.9	--	PASS
1854.40	48.3	43.1	V	54.0	113.9	-70.8	PASS
1854.40	47.1	39.0	H	54.0	113.9	-74.9	PASS
2781.60	49.6	44.1	V	54.0	113.9	-9.9	*PASS
2781.60	48.2	42.6	H	54.0	113.9	-11.4	*PASS
3708.80	55.6	49.6	V	54.0	113.9	-4.4	*PASS
3708.80	53.9	45.4	H	54.0	113.9	-8.6	*PASS
4636.00	50.3	40.8	V	54.0	113.9	-13.2	*PASS
4636.00	51.5	41.8	H	54.0	113.9	-12.2	*PASS
5563.20	51.2	38.9	V	54.0	113.9	-75.0	PASS
5563.20	51.1	38.5	H	54.0	113.9	-75.4	PASS
6490.40	49.6	37.7	V	54.0	113.9	-76.2	PASS
6490.40	51.8	39.1	H	54.0	113.9	-74.8	PASS
7417.60	57.7	46.3	V	54.0	113.9	-7.7	*PASS
7417.60	56.9	45.0	H	54.0	113.9	-9.0	*PASS
8344.80	57.3	44.8	V	54.0	113.9	-9.2	*PASS
8344.80	58.0	45.1	H	54.0	113.9	-8.9	*PASS

Plot # 8(a): Radiated Band-Edge Emission – Horizontal Polarization
Output Frequency: single 902.6 MHz (test mode)
Tx Antenna: Yagi A09-Y15 (15.2 dBi)



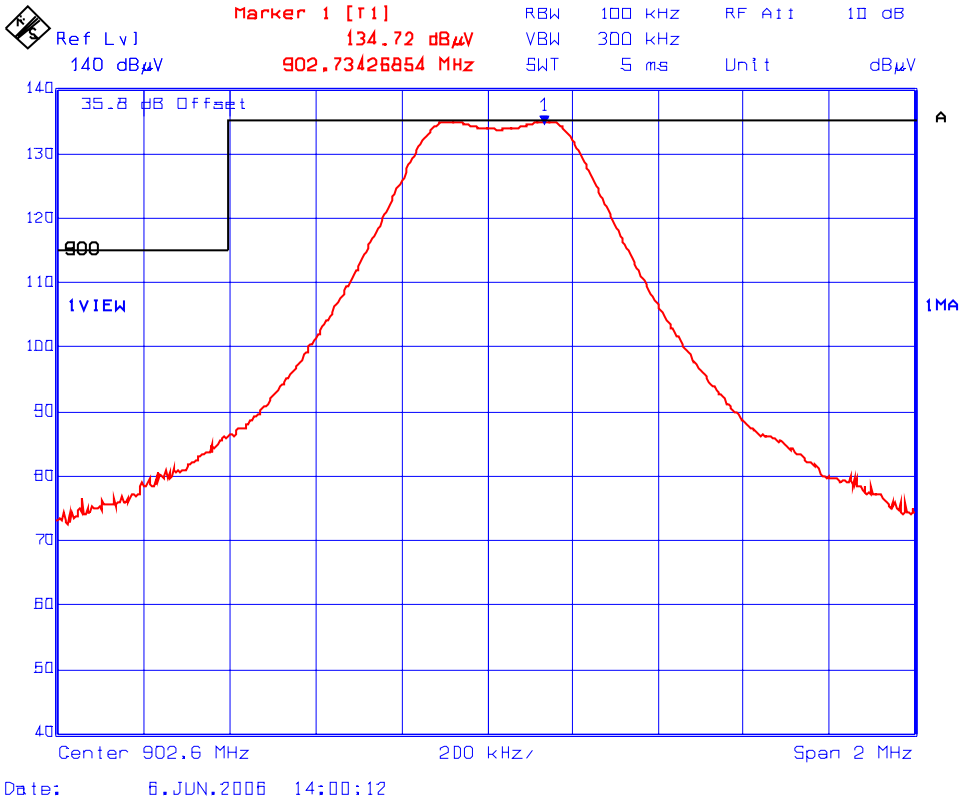
- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

Plot # 8(b): Radiated Band-Edge Emission – Horizontal Polarization
Output Frequencies: hopping
Tx Antenna: Yagi A09-Y15 (15.2 dBi)



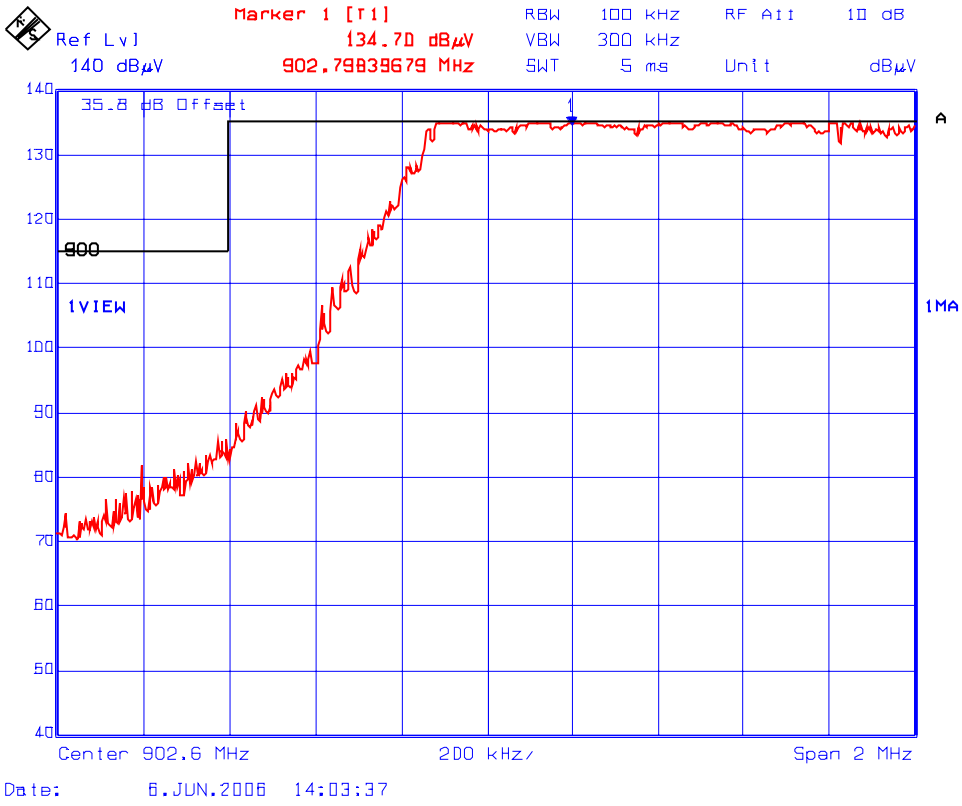
- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

Plot # 9(a): Radiated Band-Edge Emission – Vertical Polarization
Output Frequency: single 902.6 MHz (test mode)
Tx Antenna: Yagi A09-Y15 (15.2 dBi)



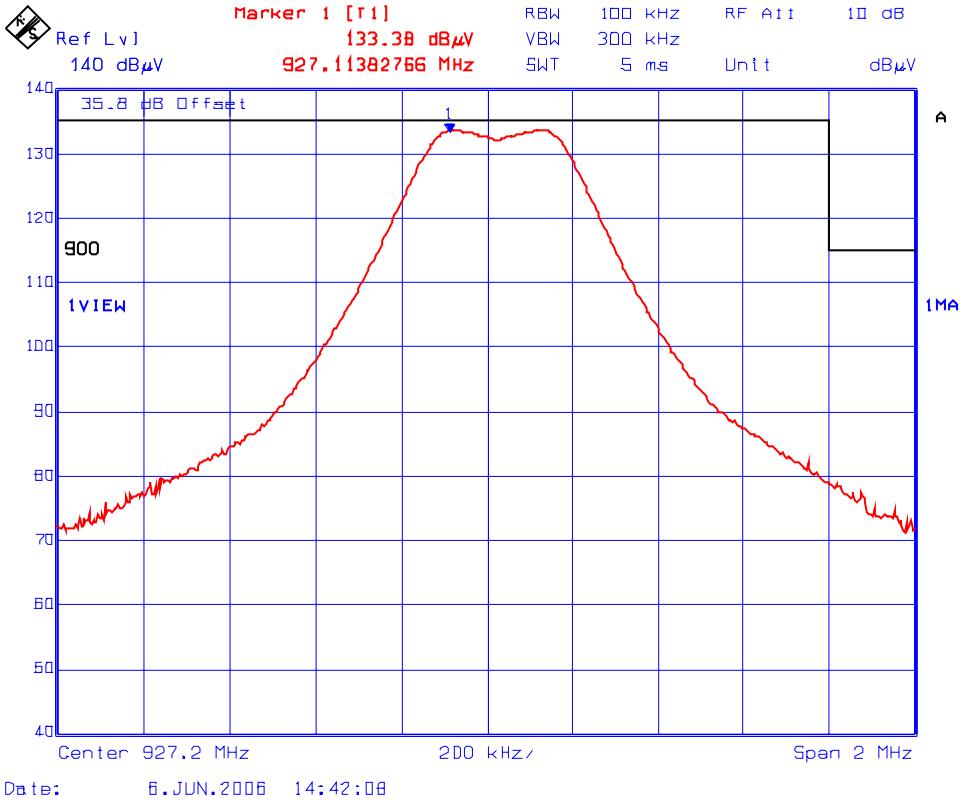
- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

Plot # 9(b): Radiated Band-Edge Emission – Vertical Polarization
Output Frequencies: hopping
Tx Antenna: Yagi A09-Y15 (15.2 dBi)



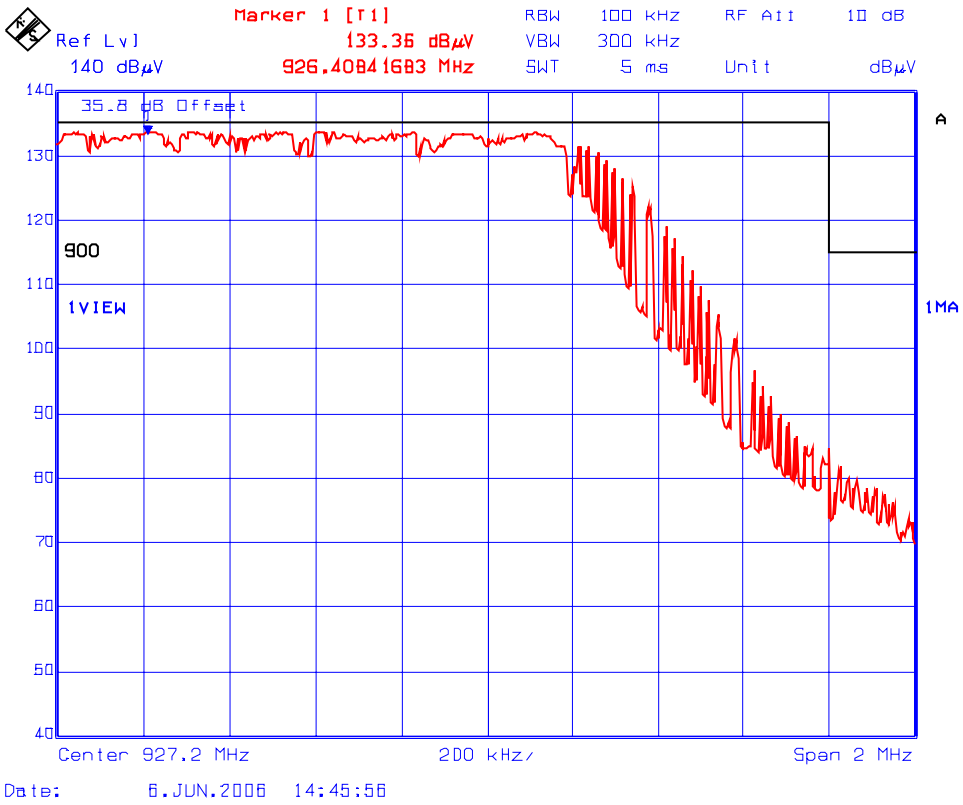
- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

Plot # 10(a): Radiated Band-Edge Emission – Horizontal Polarization
Output Frequency: single 927.2 MHz (test mode)
Tx Antenna: Yagi A09-Y15 (15.2 dBi)



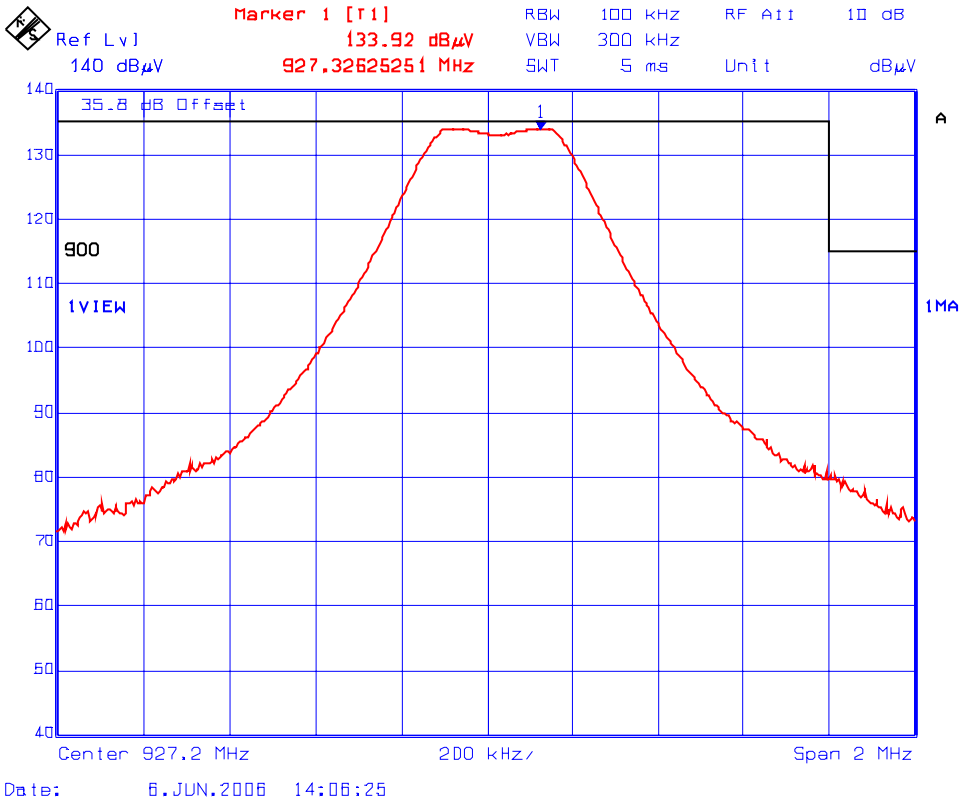
- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

Plot # 10(b): Radiated Band-Edge Emission – Horizontal Polarization
Output Frequencies: hopping
Tx Antenna: Yagi A09-Y15 (15.2 dBi)



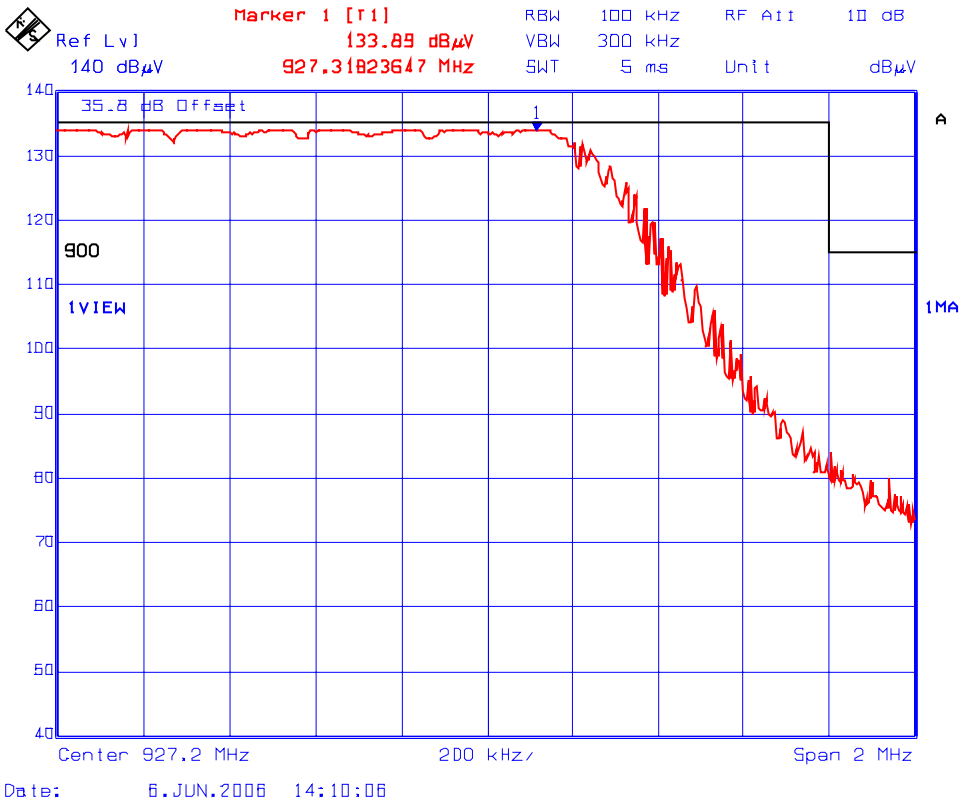
- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

Plot # 11(a): Radiated Band-Edge Emission – Vertical Polarization
Output Frequency: single 927.2 MHz (test mode)
Tx Antenna: Yagi A09-Y15 (15.2 dBi)



- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

Plot # 11(b): Radiated Band-Edge Emission – Vertical Polarization
Output Frequencies: hopping
Tx Antenna: Yagi A09-Y15 (15.2 dBi)



- *All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)*

EXHIBIT 5. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 and LAB 34

5.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Line Conducted)	PROBABILITY DISTRIBUTION	UNCERTAINTY (dB)	
		9-150 KHz	0.15-30 MHz
EMI Receiver specification	Rectangular	±1.5	±1.5
LISN coupling specification	Rectangular	±1.5	±1.5
Cable and Input Transient Limiter calibration	Normal (k=2)	±0.3	±0.5
Mismatch: Receiver VRC $\Gamma_1 = 0.03$ LISN VRC $\Gamma_R = 0.8$(9 KHz) 0.2 (30 MHz) Uncertainty limits $20\text{Log}(1\pm\Gamma_1\Gamma_R)$	U-Shaped	±0.2	±0.3
System repeatability	Std. deviation	±0.2	±0.05
Repeatability of EUT	--	--	--
Combined standard uncertainty	Normal	±1.25	±1.30
Expanded uncertainty U	Normal (k=2)	±2.50	±2.60

Sample Calculation for Measurement Accuracy in 450 KHz to 30 MHz Band:

$$u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)} = \pm \sqrt{(1.5^2 + 1.5^2)/3 + (0.5/2)^2 + (0.05/2)^2 + 0.35^2} = \pm 1.30 \text{ dB}$$

$$U = 2u_c(y) = \pm 2.6 \text{ dB}$$

5.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

CONTRIBUTION (Radiated Emissions)	PROBABILITY DISTRIBUTION	UNCERTAINTY (± dB)	
		3 m	10 m
Antenna Factor Calibration	Normal (k=2)	±1.0	±1.0
Cable Loss Calibration	Normal (k=2)	±0.3	±0.5
EMI Receiver specification	Rectangular	±1.5	±1.5
Antenna Directivity	Rectangular	+0.5	+0.5
Antenna factor variation with height	Rectangular	±2.0	±0.5
Antenna phase center variation	Rectangular	0.0	±0.2
Antenna factor frequency interpolation	Rectangular	±0.25	±0.25
Measurement distance variation	Rectangular	±0.6	±0.4
Site imperfections	Rectangular	±2.0	±2.0
Mismatch: Receiver VRC $\Gamma_1 = 0.2$ Antenna VRC $\Gamma_R = 0.67$(Bi) 0.3 (Lp) Uncertainty limits 20Log(1±$\Gamma_1\Gamma_R$)	U-Shaped	+1.1 -1.25	±0.5
System repeatability	Std. Deviation	±0.5	±0.5
Repeatability of EUT		-	-
Combined standard uncertainty	Normal	+2.19 / -2.21	+1.74 / -1.72
Expanded uncertainty U	Normal (k=2)	+4.38 / -4.42	+3.48 / -3.44

Calculation for maximum uncertainty when 3m biconical antenna including a factor of k=2 is used:

$U = 2u_c(y) = 2x(+2.19) = +4.38$ dB And $U = 2u_c(y) = 2x(-2.21) = -4.42$ dB