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Report of Measurements on

Universal Wireless Module
Serial Number: 412-00052-01
FCC ID: O9DUWM02

Customer Name: Fitsense Technology

Customer P.O.: 27091-N

Date of Report: August 8, 2008

Test Results No.: R-4916N-5

Test Start Date: June 16, 2008

Test Finish Date: July 3, 2008

Test Technician: Matthew Seamans

Laboratory Supervisor: Todd Hannemann

Branch Manager: Scott Wentworth

Results Prepared By: Jamie Ramsey

Government Source Inspection: N/A

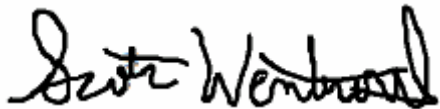
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Certification and Signatures

We certify that these Test Results are true results obtained from the tests of the equipment stated, and relates only to the equipment tested. We further certify that the measurements shown in this Test Results package were made in accordance with the procedures indicated and vouch for the qualifications of all Retlif Testing Laboratories personnel taking them.



Todd Hannemann
Laboratory Supervisor



Scott Wentworth
Branch Manager

Non-Warranty Provision

The testing services have been performed, findings obtained and reports prepared in accordance with generally accepted laboratory principles and practices. This warranty is in lieu of all others, either expressed or implied.

Non-Endorsement

This test report contains only findings and results arrived at after employing the specific test procedures and standards listed herein. It is not intended to constitute a recommendation, endorsement or certification of the product or material tested. This test report may not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the U.S. Government.



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Revision History

Revisions to this document are listed below; the latest revised document supersedes all previous issues of this document.

Revision	Date	Pages Affected
-	August 8, 2008	Original Release



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Test Report No. R-4916N-5
FCC ID: O9DUWM02

Test Program Summary

Job Number: R-4916N-5
Applicant: Fitsense Technology
Address: 21 Boston Road
Southborough, MA 01772
Manufacturer: Fitsense Technology
Test Sample: Universal Wireless Module
Brand Name: Fitsense
Part Number: N/A
Model Number: N/A
Serial Number: 412-00052-01
Type: RF Module
Power Requirements: 3VDC via host
Frequency Band of Operation: 2400 to 2483.5MHz
Frequency of Operation: 2429MHz
FCC ID: O9DUWM02
Applicable Rule Section: 15.249
Modular Requirements: FCC Public Notice DA 00-1407

Test Specification:

FCC Rules and Regulations Part 15, Subpart C, Paragraph 15.249

Test Procedure:

ANSI C63.4:2003

Purpose:

The objective of this test program was to demonstrate compliance of the Universal Wireless Module to the requirements of FCC Part 15.249 and FCC Public Notice DA 00-1407 for the purpose of obtaining FCC Modular Certification.

Test Methods:

The following table depicts the test methods that were performed on the EUT and the corresponding test results:

Testing Date(s)	Test Method	Test Results
6/16/08 & 7/2/08	15.249 (a) Fundamental & Harmonic Emissions	Complied
7/2/08	15.249 (d) Out of Band/Bandedge Emissions	Complied
7/2/08	15.249 (e) Peak Field Strength	Complied
7/3/08	15.207 Conducted Emissions	Complied



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Test Sample Description:

The Universal Wireless Module (UWM) is designed to be embedded in an OEM Product (host) and connected through a serial data interface. Its purpose is to receive data packets from the host via the serial interface and transmit and receive data via the 2.4 GHz onboard radio link. The UWM operates on dc power provided by the host product. For testing purposes power was supplied to the UWM via a 3VDC battery pack.

Antenna Description:

The antenna is a PCB Etch Antenna. There is no external antenna connection and the device meets the requirements of 15.203

Test Sample/Test Results Summary:

- The maximized fundamental field strength at 2429 MHz did not exceed 50 m V/M (94dB μ V) at a test distance of 3 meters. The measured maximized average field strength was 85.17dB μ V.
- The field strength of observed harmonic emissions did not exceed 500 μ V/M. No harmonic emissions were observed within 10dB of the specified limit at 3 meter or 1 meter test distances beyond the second harmonic (4858 MHz).
- The field strength of non-harmonic out of band/bandedge emissions were attenuated more than 50dB below the level of the fundamental or to the limits of 15.209 as applicable. No out of band spurious emissions were observed within 10dB of the specified limit at 3 meter or 1 meter test distances.
- The maximized peak field strength of the emissions did not exceed the maximum permitted average field strength by more than 20 dB.
- Radiated Emissions from the EUT were measured with the EUT oriented in all 3 axis. Data for the worst case orientation is supplied.

Modular Requirements:

The UWM meets the requirements for Modular Certification as specified in FCC Public Notice DA 00-1407. See attached Modular Certification Letter Exhibit for information detailing how these requirements are met.

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Measurement Procedures:

15.249 (a/d) Field Strength of Fundamental, Harmonic and Out of Band/Band Edge Emissions

The field strength of the fundamental, harmonic and out of band/bandedge emissions were measured. The EUT was placed on a 80cm high wooden test stand located 3 meters from the test antenna on a FCC listed open area test site. Emissions from the EUT were maximized field strength of each observed emissions was measured, recorded and compared to the specified limits of 15.249 (a), (d)/15.209 as appropriate. Peak field strength of emissions were measured, recorded and verified to meet the specified limit (limit corresponds to 20dB above the maximum permitted average limit). When necessary, the marker/delta method was used to verify bandedge compliance.

15.207 (a) AC Line Conducted Emissions

The test sample was placed on a 0.8m high wooden test stand above the floor of the test area (ground plane). The rear of the EUT was aligned flush with the rear of the test stand. The test stand was situated such that the EUT was located 0.4m from all other grounded surfaces. The dc power cables of the EUT were extended to a minimum length of 10cm and connected to an artificial mains network (LISN). The spectrum analyzer was connected to the RF port of the LISN and peak/quasi-peak and average measurements were taken in the frequency range of 150 kHz to 30 MHz on each the hot and return.

Test Results: The measured DC line conducted emissions met the limit specified in 15.207 (a).



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Test Setup Photographs



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Test Photographs Radiated Emissions Setup Photographs



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Test Photograph
Radiated Emissions Setup Photographs



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**Test Photograph
Conducted Emissions Setup Photographs**



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Equipment Lists

Radiated Emissions

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
3116	Pre-Amplifier	Miteq	0.1 GHz - 18 GHz	AFS42-35	8/27/2007	8/27/2008
3117	Power Supply	B&K Precision	0-30 Vdc, 3.0 A	1630	1/31/2008	1/31/2009
3430	Horn Antenna	MCS Corporation	18 GHz - 26.5 GHz	K-5039	1/30/2008	1/30/2009
4029B	Test Site Attenuation	Retlif	3 / 10 Meters	RNH	6/20/2007	7/20/2008
4984A	High Gain Horn	Microlab/FXR	1.0 - 1.7 GHz	L638A	1/30/2008	1/30/2009
4984B	High Gain Horn	Microlab/FXR	1.7 - 2.6 GHz	R638A	1/30/2008	1/30/2009
4984C	High Gain Horn	Microlab/FXR	2.6 - 3.95 GHz	S638A	1/30/2008	1/30/2009
4984D	High Gain Horn	Microlab/FXR	3.95 - 5.85 GHz	H638A	1/30/2008	1/30/2009
4984E	High Gain Horn	Microlab/FXR	5.8 - 8.2 GHz	C638A	1/30/2008	1/30/2009
4984F	High Gain Horn	Microlab/FXR	8.2 - 12.4 GHz	X638A	1/30/2008	1/30/2009
4984G	High Gain Horn	Microlab/FXR	12.4 GHz - 18 GHz	Y638A	1/30/2008	1/30/2009
5070	EMI Test Receiver	Rohde & Schwarz	20 Hz - 40 GHz	ESIB40	12/7/2007	12/7/2008
5072	Preamplifier	Miteq	18 GHz-40 GHz	JS4-18004000-30	1/10/2008	1/10/2009
5053	Biconilog	EMCO	26 MHz - 3 GHz	3142C	10/4/2007	10/4/2008

Conducted Emissions

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due Date
5030B	10 DB Atten. (50 ohm)	Narda	DC - 12.4 GHz	757C-10	1/28/2008	1/28/2009
5070	EMI Test Receiver	Rohde & Schwarz	20 Hz - 40 GHz	ESIB40	12/7/2007	12/7/2008
7032	LISN	Rohde & Schwarz	N/A	ESH 3-Z5	10/19/2007	10/19/2008



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Test Data



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RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

Test Method:	Fundamental Field Strength & Harmonics		
Customer:	Fitsense Technology	Job No:	R-4916N-5
Test Sample:	Universal Wireless Module		
Model No:	N/A	Serial No:	412-00052-01
Test Specification:	FCC Part 15 Paragraph: 15.249 (a)		
Operating Mode:	Continuously Transmitting		
Technician:	M.Seamans	Date:	7/2/2008
Notes:	Average Readings to Average Limits		

[illegible]

RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

Test Method:	Peak Field Strength		
Customer:	Fitsense Technology	Job No:	R-4916N-5
Test Sample:	Universal Wireless Module		
Model No:	N/A	Serial No:	412-00052-01
Test Specification:	FCC Part 15 Paragraph: 15.249 (e)		
Operating Mode:	Continuously Transmitting		
Technician:	M.Seamans	Date:	7/2/2008
Notes:	Peak Readings to Peak Limits(20dB above average limits)		

[illegible]

RETLIF TESTING LABORATORIES

EMISSIONS DATA SHEET

Test Method:

Out of Band Radiated Emissions 30 MHz to 26.5 GHz

Customer

Fitsense Technology

Job No.

R-4916N-5

Test Sample

Universal Wireless Module

Model No.

N/A

Serial No.

412-00052-01

Test Specification:

FCC Part 15 Subpart C

Paragraph: 15.249 (d)

Operating Mode:

Continuously Transmitting

Technician:

M.Seamans

Date:

July 2, 2008

Notes:

Test Distance: 3 Meters

[illegible]

RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

Test Method:	Band Edge		
Customer:	Fitsense Technology	Job No:	R-4916N-5
Test Sample:	Universal Wireless Module		
Model No:	N/A	Serial No:	412-00052-01
Test Specification:	FCC Part 15 Paragraph: 15.249 (d)		
Operating Mode:	Continuously Transmitting		
Technician:	M.Seamans	Date:	7/2/2008
Notes:	Peak Readings Test Distance 3 Meters		

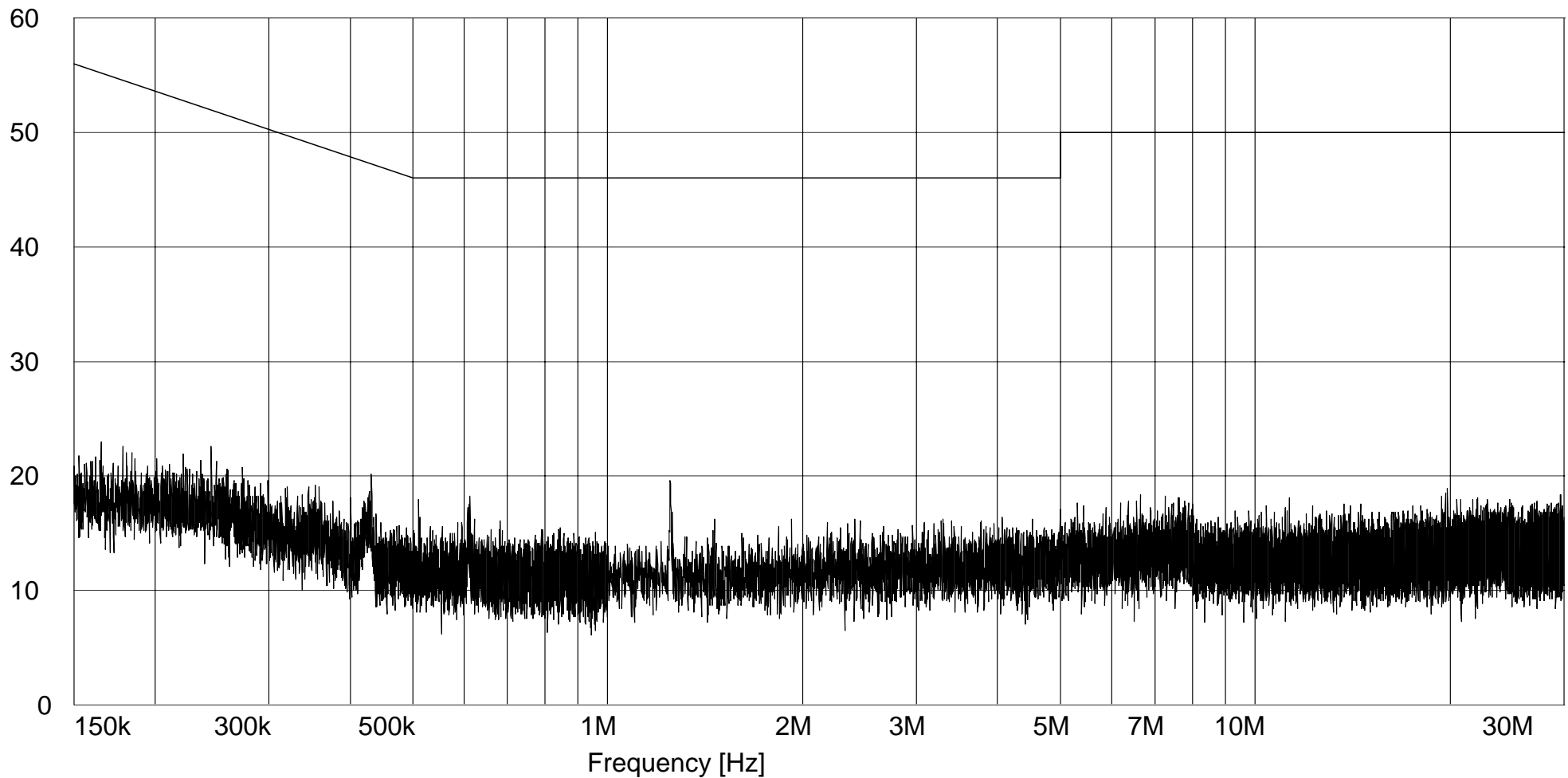
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RETLIF TESTING LABORATORIES

EMISSIONS DATA SHEET

Test Method:	Conducted Emissions 150 kHz to 30 MHz			
Customer:	FitSense Technology	Test Sample:	Universal Wireless Module	
Model No:	N/A	Serial No:	412-00052-01	
Test Specification:	FCC Part 15 15.207, paragraphs (A)(C)		Job No:	R-4916N-5
Operating Mode:	Continuously Transmitting		Technician:	M. Seamans
Notes:	Lead Tested: 3VDC Positive Peak Readings to Average Limits.			

Level [dBμV]



RETLIF TESTING LABORATORIES

EMISSIONS DATA SHEET

Test Method:	Conducted Emissions 150 kHz to 30 MHz		
Customer:	Fitsense Technology	Test Sample:	Universal Wireless Module
Model No:	N/A	Serial No:	412-00052-01
Test Specification:	FCC Part 15 15.207, paragraphs (A)(C)		Job No:
Operating Mode:	Continuously Transmitting		Technician:
Notes:	Lead Tested: 3VDC Return Peak Readings to Average Limits.		
	Date: July 3, 2008		

Level [dBμV]

