

APPLICANT: MIRAE TECHNOLOGY

FCC ID: O6ANANOSPEED

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## TEST EQUIPMENT LIST

1. X Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/  
preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter  
HP 85650A, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02,  
S/N 3008A00372 Cal. 10/17/99
2. X Biconnical Antenna: Eaton Model 94455-1, S/N 1057
3.    Biconnical Antenna: Electro-Metrics Model BIA-25, S/N 1171
4. X Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
5.    Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409
6. x Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180,  
1-18 GHz, S/N 2319
7. X 18-26.3GHz, Systron Donner Standard Gain Horn
8.    Horn 40-60GHz: ATM Part #19-443-6R
9.    Line Impedance Stabilization Network: Electro-Metrics Model  
ANS-25/2, S/N 2604 Cal. 2/9/00
10.    Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 10/6/99
11.    Peak Power Meter: HP Model 8900C, S/N 2131A00545
12. X Open Area Test Site #1-3meters Cal. 12/22/99
13.    Signal Generator: HP 8640B, S/N 2308A21464 Cal. 9/23/99
14.    Signal Generator: HP 8614A, S/N 2015A07428
15.    Passive Loop Antenna: EMC Model 6512, 9KHz to 30MHz, S/N  
9706-1211 Cal. 6/10/00
16.    Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153  
Cal. 11/24/99
17.    AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 9/21/99
18.    Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
19.    Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 9/21/99
20.    Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 9/23/99

## TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC. Shielded interface cables were used in all cases except for cables connecting to the telephone line and the power cords. A test program was run which simulated a normal data transmission on a network.

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-1992 using a 50uH LISN. Both lines were observed with the UUT transmitting. The bandwidth of the spectrum analyzer was 10kHz with an appropriate sweep speed. The ambient temperature of the UUT was 90oF with a humidity of 50%.

BANDWIDTH 6.0dB: The measurements were made with the spectrum analyzer's resolution bandwidth(RBW)=1.0MHz and the video bandwidth(VBW) =3.0MHz and the span set as shown on plot.

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TEST PROCEDURES CONTINUED

POWER OUTPUT: The RF power output was measured at the antenna feed point using a peak power meter.

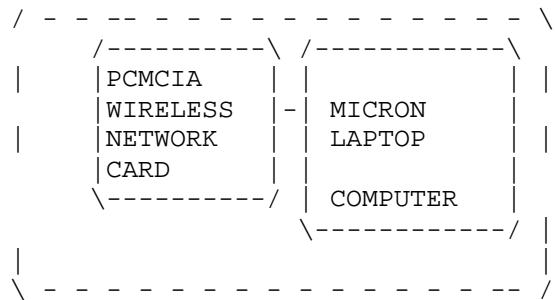
ANTENNA CONDUCTED EMISSIONS: The RBW=100KHz, VBW=300KHz and the span set to 10.0MHz and the spectrum was scanned from 30MHz to the 10th Harmonic of the fundamental. Above 1.0GHz the resolution bandwidth was 1.0MHz and the VBW = 3.0MHz and the span to 50MHz.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a pre-selector. The bandwidth(RBW) of the spectrum analyzer was 100kHz up to 1GHz and 1.0MHz above 1GHz with an appropriate sweep speed. The VBW above 1.0GHz was = 3.0MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the UUT was 90oF with a humidity of 50%.

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PRODUCT DESCRIPTION:

This device is a wireless LAN adapter card that provides wireless connection between computers. This card has a Dual Diversity Printed Circuit Antenna that is not accessible to the user.



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APPLICANT: MIRAE TECHNOLOGY  
FCC ID: 06ANANOSPEED  
NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE  
RULES PART NUMBER: 15.107(a)  
REQUIREMENTS: .45 - 30 MHz 250 uV OR 47.96 dBuV  
TEST PROCEDURE: ANSI STANDARD C63.4-1992. The spectrum was scanned from .45 to 30 MHz.  
TEST DATA:

THE HIGHEST EMISSION READ FOR LINE 1 WAS 71.527 uV @ 570 kHz.

THE HIGHEST EMISSION READ FOR LINE 2 WAS 81.184 uV @ 4.71 MHz.

THE GRAPHS IN EXHIBITS 8A-8B REPRESENT THE EMISSIONS TAKEN FOR THIS DEVICE.

TEST RESULTS: Both lines were observed. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

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NAME OF TEST: 6.0dB BANDWIDTH

RULES PART NUMBER: 15.247(a)(2)

REQUIREMENTS: The 6.0dB bandwidth must be greater than 500KHz.

MEASUREMENT: The narrowest 6.0dB bandwidth of the 3 channels measured @ 2422.00MHz was 12.90MHz.

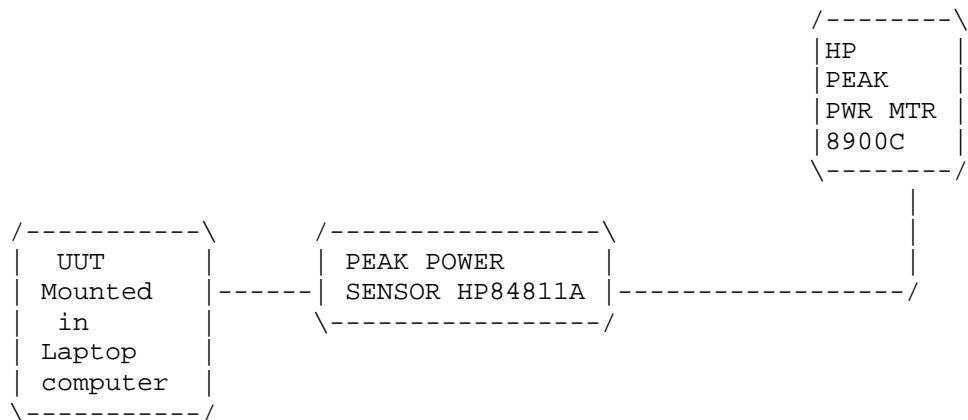
MEASUREMENT DATA: See plots, Exhibits #10A-10C.

NAME OF TEST: POWER OUTPUT

RULES PART NUMBER: 15.247(b) 1.0Watt or +30dBm

MEASUREMENT: Channel 1. 25.0 mWATTS @ 2421.6MHz  
Channel 6. 25.0 mWatts @ 2437.7MHz  
Channel 11. 25.0 mWatts @ 2463.0MHz

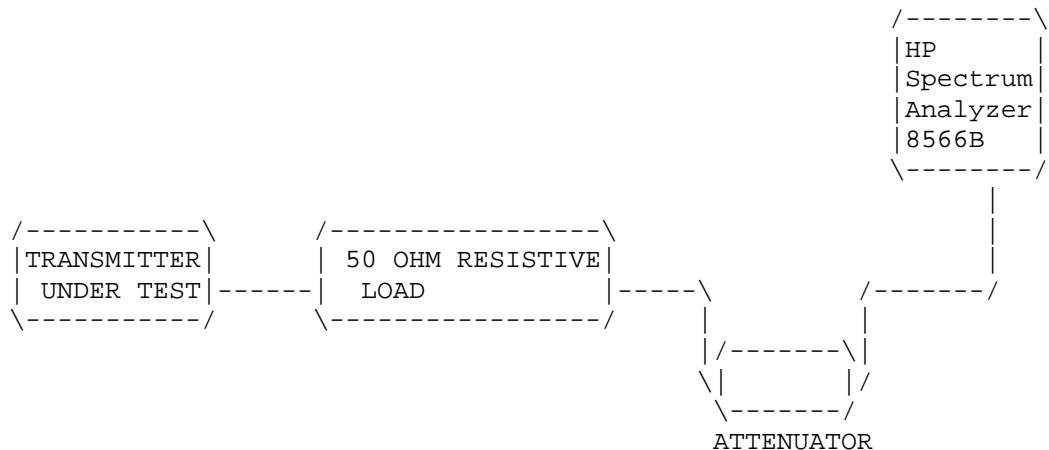
15.247(c) Method of Measuring RF Power output:  
The Peak power Sensor was connected in place of the antenna.



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15.247(c)

Method of Measuring RF Conducted Spurious Emissions



NAME OF TEST: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

REQUIREMENTS: Emissions must be at least 20dB down from the highest emission level within the authorized band as measured with a 100KHz RBW.

EMISSION FREQUENCY MHz	dB BELOW CARRIER
2413.0	00.0
4824.0	-33.40
7236.0	-74.70
9648.0	-108.9
2437.7	0.00
4875.4	-36.70
7313.0	-76.20
9750.4	->108.90
2463.0	0.00
4926.0	-37.90
7389.0	-78.10

NOTE: THE SPECTRUM WAS SCANNED TO THE TENTH HARMONIC.

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15.247(c), 15.205 & 15.209(b) Field strength of spurious emissions:

REQUIREMENTS:

FIELD STRENGTH of Fundamental: 902-928MHz 2.4-2.4835GHz 127.38dBuV/m @3m 54dBuV/m	FIELD STRENGTH of Harmonics 30 - 88 MHz 88 - 216 MHz 216 - 960 MHz 54 dBuV/m @3m	S15.209 40 dBuV/m @3M 43.5 46 ABOVE 960 MHz
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EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 50 dB BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209, WHICHEVER IS THE LESSER ATTENUATION.

REQUIREMENTS: Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

TEST CONFIGURATION: MICRON LAPTOP COMPUTER - P/NO. NBK001221-00

TEST DATA:

EMISSION FREQUENCY MHz	METER READING @ 3m dBuV	COAX LOSS dB	FIELD STRENGTH dBuV/m	FCC. LIMIT dB	MARGIN dB	ANT.
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Antenna Gain

Intentional Radiator Emissions

2413.00	65.80	1.09	29.03	95.92	127.38	31.46	H
4824.00	21.80	1.45	33.93	57.18	20.00	37.18	H
7237.00	8.10	1.82	36.64	46.56	20.00	26.56	H
2437.70	64.90	1.10	29.09	95.09	127.38	32.29	H
4875.40R	18.20	1.46	33.98	53.65	54.00	0.35	H
7313.10R	6.30	1.83	36.73	44.86	54.00	9.14	H
2463.00	63.50	1.10	29.16	93.76	127.38	33.62	H
4926.00R	15.60	1.47	34.04	51.11	54.00	2.89	H
7389.00R	5.70	1.84	36.81	44.35	54.00	9.65	H

METHOD OF MEASUREMENT: The procedure used was ANSI STANDARD C63.4-1992 & the Guidance on Measurements for Direct Sequence Spread Spectrum Systems. Measurements were made at the open field test site of TIMCO ENGINEERING INC. located at 849 N.W. State Road, Newberry, FL 32669.

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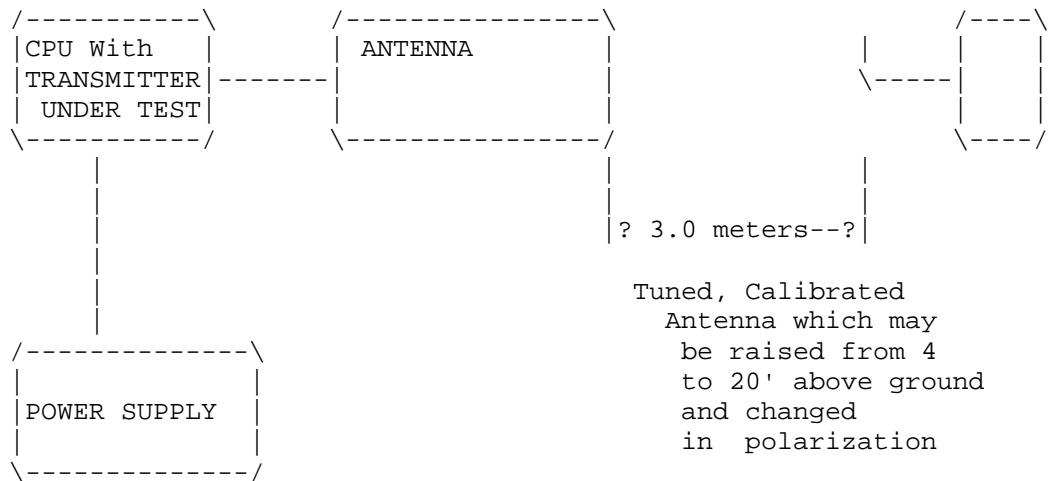
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2.993(a)(b)

2.993(a)(b) Continued Field\_strength\_of\_spurious\_emissions:

Method of Measuring Radiated Spurious Emissions

Hewlett Packard  
Spectrum  
Analyzer  
HP8566A



Equipment placed 80 cm above ground  
on a rotatable platform.

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FCC ID: O6ANANOSPEED

NAME OF TEST: POWER SPECTRAL DENSITY

RULES PART NUMBER: 15.247(d)

REQUIREMENTS: The peak level measured must be no greater than +8.0dBm.

DATA: THE PLOTS ARE SHOWN IN EXHIBITS 11A-11C.  
The level at 2423.519MHz was -7.1dBm.

NAME OF TEST: PROCESSING GAIN

RULES PART NUMBER: 15.247(e)

REQUIREMENTS:

DATA: The processing gain information supplied by the manufacturer is 10.0dB.

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