FCC SUBPART C

EMI MEASUREMENT AND TEST REPORT

For

Fujitsu PC Corp.

5200 Patrick Henry Drive,
Santa Clara, CA. 95054

FCC ID: MU7FPCWL04

December 10, 2001

This Report Concerns:	Equipment Type:
☒ Original Report	Wireless LAN Device

Test Engineer:	Jeff Lee
Test Date:	October 17, 2001
Reviewed By:	John Y. Chan – Engineering Manager
Prepared By:	Bay Area Compliance Laboratory Corporation 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732 9164

Table of Contents

Disclaimer Notice

When government drawing, specification, or other data are used for any purpose other than in connection with a definitely related government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawing, specifications, or other data, is not to be regarded by implication or otherwise in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell patented invention that may in any way be related thereto. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government.

Reproduction Clause

Any reproduction of this document must be done in full. No single part of this document may be reproduced without permission from Bay Area Compliance Laboratory Corp. 230 Commercial Street, Sunnyvale CA 94085.

Administrative Data

Manufacturer	: Fujitsu PC Corp. 5200 Patrick Henry Drive, Santa Clara, CA. 95054
FCC ID	: MU7FPCWL04
Class	: Spread Spectrum Transceiver
Interface Type	: PCMCIA
Frequency Range	: 2412 – 2462 MHz
Method	: DSSS Spread Spectrum
Model Name(s)	: MBH7WM01
Part Number	: N/A
Max RF Output (W)	: 0.00954 Watts
Power Supply	: 3.3VDC, Through Host PC PCMCIA Port
CFR Part(s)	: CFR15.247
Date(s) of Tests	: November 02 – November 15, 2001
Report Number	: R0112052

EUT Description

The subject Model: MBH7WM01 (refer to EUT in this test report) is a PCMCIA Card operating on the 2.402GHz – 2.480GHz band using DSSS technology. The EUT is a Card which inserting it into a computer with a PCMCIA slot. The EUT has an integral antenna built into a notebook LCD screen and no external connections or controls. The EUT is control by the software drivers, which delivered with the EUT.

Test Summary

Test Location

Bay Area Compliance Laboratory Corp. is located 230 Commercial Street, Sunnyvale, CA 94085, USA.

Accreditation Bodies

Bay Area Compliance Laboratory Corp. is a fully accredited Test Laboratory.

In compliance with the site registration requirements of Section 2.948 of the FCC Rules to perform EMI measurements for the general public.

Accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code # 200167-0.

EUT Exercise Software

The client supplied the Prism Test software. The software was used to exercise during conducted and radiated testing. No other data was transmitted to the EUT during testing.

Equipment Modification

Any modifications installed previous to testing by Fujitsu PC Corporation will be incorporated in each production model sold or leased in USA.

There were no modifications installed by Bay Area Compliance Laboratory Corp.

Test System Details

EUT	
Model Number:	MBH7WM01
Description:	Direct Sequence Spread Spectrum Transceiver
Manufacturer:	Fujitsu PC Corp.
SUPPORT EQUIPMENT	
Model Number:	CP048445-01-DC
Description:	Notebook PC
Manufacturer:	Fujitsu PC Corp.
Model Number:	CA01007-0610
Description:	AC/DC Power Supply
Manufacturer:	Sanken Electric Co., Ltd.

ATTACHMENT A – PRODUCT INFORMATION

Frequency Range:	2.412GHz – 2.462GHz
Channels:	11, see table below
Channel Separation:	5MHz
Aggregate bit rate:	up to 11mb/s
Transmitting Method:	Direct Sequence Spread Spectrum
Transmitting Power:	10dBm
Antenna:	Loop antennas (TX/RX and RX)
Interface:	MiniPCI
Power Supply:	AC to DC adapter
External Connections:	100BaseT, Home Link Port and USB Ports.

Channel ID	Frequency (MHz)	Channel ID	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

ATTACHMENT B – CFR15.205 RESTRICTED BAND

Special attention is made for the EUT's harmonic and spurious radiated emission in the restricted bands of operation. The EUT was tested from 150kHz and up to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1GHz, average measurements was used using RBW 1MHz-VBW 10Hz and linearly polarized horn antennas. In addition, peak measurements were taken to ensure that the peak levels are not more than 20dB above the average limit. All out of band emissions, other than those created by the spreading frequency, data sequence, and the carrier modulation must not exceed the limits show in Table 2 per 150.209.

Frequency (MHz)	Field strength (microvolts/meter)	Measure distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/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

ATTACHMENT C – CFR15.203 ANTENNA REQUIREMENT

An intentional radiator antenna shall be designed to ensure that no antenna other that that furnished by the applicant can 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 this requirement.

The Fijitsu PC Corp. FCC ID: MU7FPCWL04 complies with the requirement of 15.203. The antennas are permanent mounted loop antennas, no users accessible parts.

Conclusion: **Pass, EUT meet 15.203 requirements. There are no provisions for connection to an external antenna or antenna replacement for users.**

ATTACHMENT D – CFR 15.247(a)(2) – DIRECT SEQUENCE BANDWIDTH (CONDUCTED)

6dB bandwidth for Direct Sequence systems must be at lease 500 kHz

R. Bandwidth =	100 kHz
Video Bandwidth =	100 kHz
Frequency Span =	20 MHz
Reference Level =	13 dBm
Sweep Time =	20 mS
RF Attenuation =	25 dB
External Attenuator =	0 dB

		6 dB Bandwidth (MHz)		
CHANNEL	**FREQUENCY (MHz)**	**TX Rate = 1MHz**	**TX Rate = 5.5MHz**	**TX Rate = 11MHz**
1	2412.25	8.66	8.66	8.66
6	2437.11	8.41	8.40	8.41
11	2462.03	8.60	8.60	8.60

Result Table 1 – 6dB Bandwidth Measurement Results

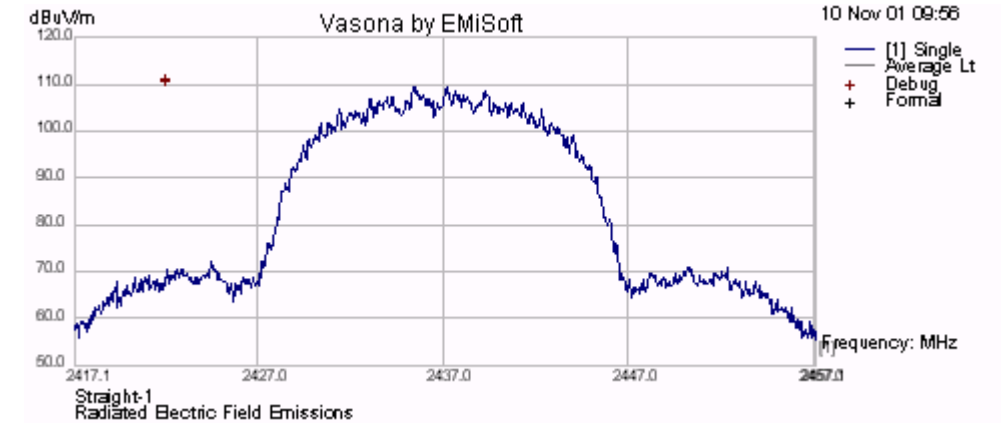
Test Result: **Pass, EUT meets minimum requirement.**


dBuV/m
Vasona by EMiSoft
10 Nov 01 09:46
[1] Single
Average Lt
Debug
Formal
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
2402.5
2412.0
2422.0
2432.0
Frequency: MHz
Straight-1
Radiated Electric Field Emissions

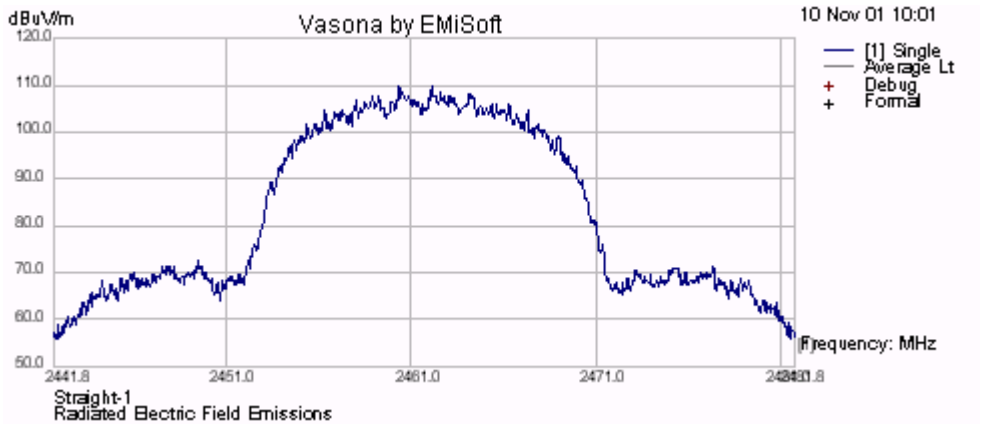

dBuV/m
Vasona by EMiSoft
10 Nov 01 09:49
[1] Single
Average Lt
Debug
Formal
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
2391.3
2401.0
2411.0
2421.0
Frequency: MHz
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 09:51
[1] Single
Average Lt
Debug
Formal
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
2391.9
2401.0
2411.0
2421.0
Frequency: MHz
Straight-1
Radiated Electric Field Emissions

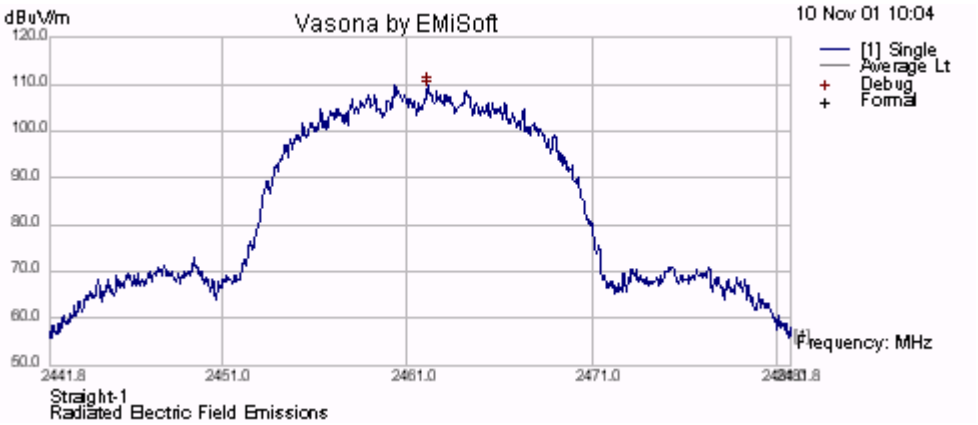

dBuV/m
Vasona by EMiSoft
10 Nov 01 09:54
[1] Single
Average Lt
Debug
Formal
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
2402.2
2412.0
2422.0
2432.0
Frequency: MHz
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 09:56
[1] Single
Average Lt
Debug
Formal
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
2417.1
2427.0
2437.0
2447.0
Frequency: MHz
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 09:58
[1] Single
Average Lt
Debug
Formal
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
2417.1
2427.0
2437.0
2447.0
Frequency: MHz
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 10:01
[1] Single
Average Lt
Debug
Formal
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
2441.8
2451.0
2461.0
2471.0
Frequency: MHz
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 10:02
[1] Single
Average Lt
Debug
Formal
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
2441.8
2451.0
2461.0
2471.0
Frequency: MHz
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 10:04
[1] Single
Average Lt
Debug
Formal
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
2441.8
2451.0
2461.0
2471.0
Frequency: MHz
Straight-1
Radiated Electric Field Emissions

ATTACHMENT E – CFR15.247(b) MAXIMUM PEAK OUTPUT POWER MEASUREMENT & CFR15.31(e) VOLTAGE VARIATION (CONDUCTED)

The maximum peak output power of the transmitter shall not exceed I watt (+30 dBm).

R. Bandwidth =	100 kHz
Video Bandwidth =	100 kHz
Frequency Span =	100 MHz
Reference Level =	13 dBm
Sweep Time =	20 mS
RF Attenuation =	25 dB
External Attenuator =	0 dB

Peak Output Power = Power Meter Reading + Power Sensor Factor

TX Rate	CHANNEL	CENTER FREQUENCY (MHz)	POWER METER READING (dBm)	POWER SENSOR FACTOR (dB)	PEAK OUTPUT POWER (dBm)	Plot #
1 MB	1	2412.25	9.8	-0.2	9.6	Plot 4
	6	2437.11	9.1	-0.2	8.9	
	11	2462.03	9.1	-0.2	8.9	
5.5 MB	1	2412.25	9.8	-0.2	9.6	Plot 5
	6	2437.11	9.5	-0.2	9.3	
	11	2462.03	9.1	-0.2	8.9	
11 MB	1	2412.25	10.0	-0.2	9.8	Plot 6
	6	2437.11	9.9	-0.2	9.7	
	11	2462.03	9.3	-0.2	9.1	

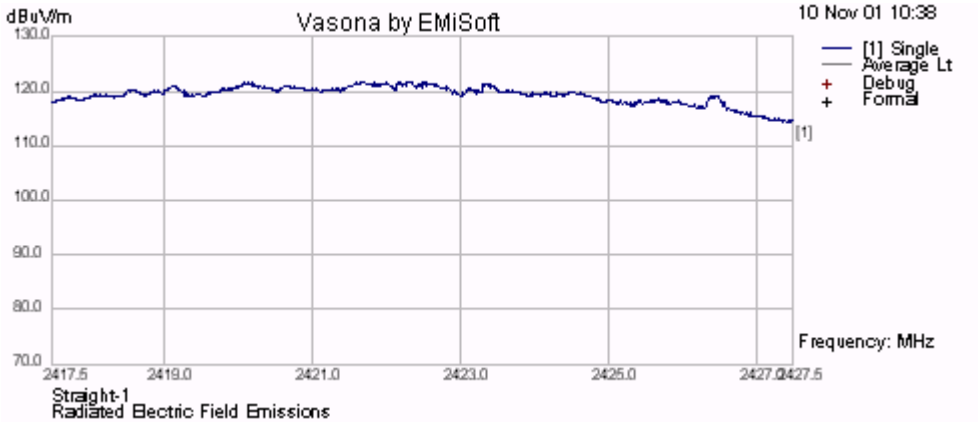
Result Table 2. Output Power Measurements

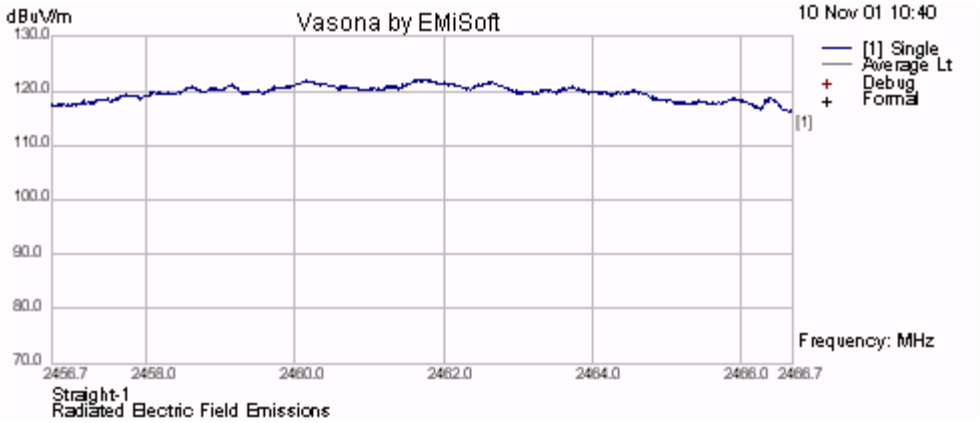
TX Rate	CHANNEL	CENTER FREQUENCY (MHz)	POWER METER READING (dBm)	POWER SENSOR FACTOR (dB)	PEAK OUTPUT POWER (dBm)	AC SUPPLY TO HOST
11MB	1	2412.25	10.0	-0.2	9.8	**102VAC**
11MB	1	2412.25	10.0	-0.2	9.8	**138VAC**

Result Table 2a. CFR15.31(e) Voltage Variation Output Power Measurements

Test Result: **Pass, EUT meets minimum requirement.**


dBuV/m
Vasona by EMiSoft
10 Nov 01 10:33
[1] Single
Average Lt
Debug
Formal
130.0
120.0
110.0
100.0
90.0
80.0
70.0
2402.5
2407.0
2412.0
2417.0
[1]
Frequency: MHz
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 10:38
[1] Single
Average Lt
Debug
Formal
130.0
120.0
110.0
100.0
90.0
80.0
70.0
2417.5
2419.0
2421.0
2423.0
2425.0
2427.5
[1]
Frequency: MHz
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 10:40
[1] Single
Average Lt
Debug
Formal
130.0
120.0
110.0
100.0
90.0
80.0
70.0
2456.7
2458.0
2460.0
2462.0
2464.0
2466.0
2466.7
[1]
Frequency: MHz
Straight-1
Radiated Electric Field Emissions

ATTACHMENT F – CFR15.247(c) RADIATED EMISSION MEASUREMENT 1GHz – 25GHz (FUNDAMENTAL AND HARMONICS)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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, base 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)).

Operating Channel =	1
Operation Frequency =	2412 MHz
TX Rate =	1, 5.5 and 11MB
Test Distance =	3 Meters
100kHz Out-of-band plot =	**Plot 7**, RBW/VBW = 100kHz, RF Att.= 20dB / Span = 200MHz

Freq. (MHz)	RAW Reading (dBuV)	Correction Factors (dB/m)	Polar. (V/H)	Detector (Peak/Ave)	Field Strength (dBuV/m)	Margin (dB)	Notes
2411.6	56.11	10.49	V	Peak	66.60	-	OF
2411.6	57.84	10.49	H	Peak	68.35	-	OF
4824.2	38.61	14.26	H	Ave	52.87	-1.13	RB
7238.1	25.63	22.5	H	Ave	48.13	-5.87	NRB
9645.7	<20.00	-	V	Peak	-	-	NRB

Result Table 3. Radiated Emission Measurements (Fundamental & Harmonics)

Legends:
OF = Operating Frequency.
NRB = Non Restricted Band, Limits should be 20 dB below the "OF".
RB = Frequency within the Restricted Bands according to CFR15.205, Limits shall comply with CFR15.209. In this case the limit is 500uV/m (54dBuV/m).

Notes:
1. **An EMI receiver peak scan is made from 1 – 25 GHz frequency range using RBW/VBW = 100kHz.**
2. **Average measurements above 1 GHz are using RBW = 1 MHz, VBW = 10 Hz.**
3. **During this test EUT is manipulated through typical positions, polarity and length, the worst case emissions are reported above.**

ATTACHMENT F – CFR15.247 (c) RADIATED EMISSION MEASUREMENT 1GHz – 25GHz (FUNDAMENTAL AND HARMONICS) (CONT.)

Operating Channel = 6

Operation Frequency = 2437 MHz

TX Rate = 1, 5.5 and 11MB

Test Distance = 3 Meters

Freq. (MHz)	RAW Reading (dBuV)	Correction Factors (dB/m)	Polar. (V/H)	Detector (Peak/Ave)	Field Strength (dBuV/m)	Margin (dB)	Notes
2437.6	51.39	10.56	H	Peak	61.95	-	OF
2437.6	48.57	10.56	V	Peak	59.13	-	OF
4875.3	38.33	14.3	H	Ave	52.63	-1.37	RB
7312.9	27.32	22.50	H	Ave	49.82	-4.18	RB
9650.6	<20.00	-	H	Peak	-	-	NRB
1208.83	<20.00	-	H	Peak	-	-	NRB

Result Table 4. Radiated Emission Measurements (Fundamental & Harmonics)

Legends:
OF = Operating Frequency.
NRB = Non Restricted Band, Limits should be 20 dB below the "OF".
RB = Frequency within the Restricted Bands according to CFR15.205, Limits shall comply with CFR15.209. In this case the limit is 500uV/m (54dBuV/m).

Notes:
1. **An EMI receiver peak scan is made from 1 – 25 GHz frequency range using RBW/VBW = 100kHz.**
2. **Average measurements above 1 GHz are using RBW= 1 MHz, VBW = 10 Hz.**
3. **During this test EUT is manipulated through typical positions, polarity and length, the worst case emissions are reported above.**

ATTACHMENT F – CFR15.247(c) RADIATED EMISSION MEASUREMENT 1GHz – 25GHz (FUNDAMENTAL AND HARMONICS) (CONT.)

Operating Channel =	11
Operation Frequency =	2462 MHz
TX Rate =	1, 5.5 and 11MB
Test Distance =	3 Meters
Out-of-band plot =	**Plot 8**, RBW/VBW = 100kHz, RF Att.= 20dB / Span = 200MHz

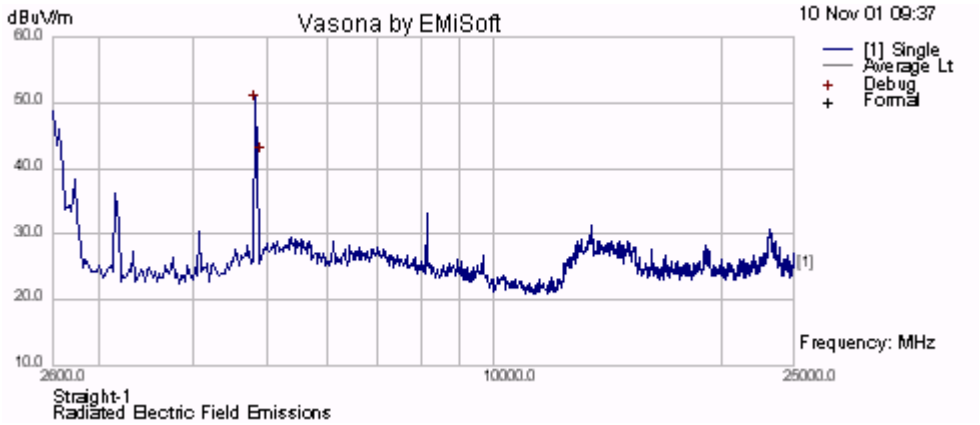
Freq. (MHz)	RAW Reading (dBuV)	Correction Factors (dB/m)	Polar. (V/H)	Detector (Peak/Ave)	Field Strength (dBuV/m)	Margin (dB)	Notes
2461.7	53.75	10.63	V	Peak	64.38	-	OF
2461.7	54.26	10.63	H	Peak	64.89	-	OF
4923.4	36.89	14.35	H	Ave	51.24	-2.76	RB
7385.7	26.82	22.50	H	Ave	49.32	-4.68	RB
9747.7	< 30.00	-	H	Peak	-	-	NRB
12309.7	< 30.00	-	H	Peak	-	-	NRB

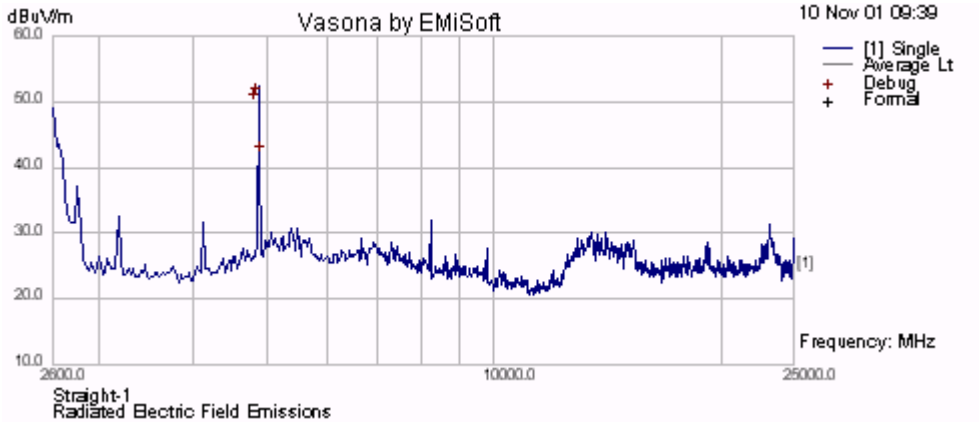
Result Table 5. Radiated Emission Measurements (Fundamental & Harmonics)

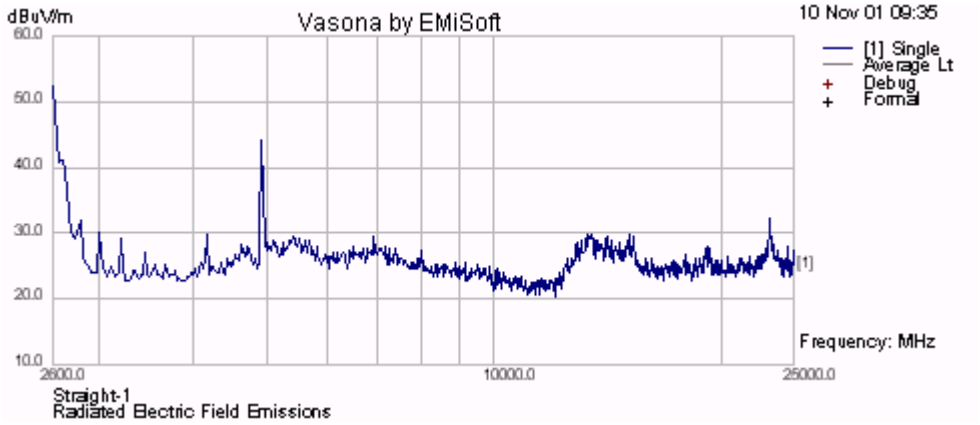
Legends:
OF = Operating Frequency.
NRB = Non Restricted Band, Limits should be 20 dB below the "OF".
RB = Frequency within the Restricted Bands according to CFR15.205, Limits shall comply with CFR15.209. In this case the limit is 500uV/m (54dBuV/m).

Notes:
1. **An EMI receiver peak scan is made from 1 – 25 GHz frequency range using RBW/VBW = 100kHz.**
2. **Average measurements above 1 GHz are using RBW = 1 MHz, VBW = 10 Hz.**
3. **During this test EUT is manipulated through typical positions, polarity and length, the worst case emissions are reported above.**

Test Result: Pass, EUT meet minimum requirements.


dBuV/m
Vasona by EMiSoft
10 Nov 01 09:37
[1] Single
Average Lt
Debug
Formal
60.0
50.0
40.0
30.0
20.0
10.0
[1]
Frequency: MHz
2600.0
10000.0
25000.0
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 09:39
[1] Single
Average Lt
Debug
Formal
60.0
50.0
40.0
30.0
20.0
10.0
[1]
Frequency: MHz
2600.0
10000.0
25000.0
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 09:35
[1] Single
Average Lt
Debug
Formal
60.0
50.0
40.0
30.0
20.0
10.0
[1]
Frequency: MHz
2600.0
10000.0
25000.0
Straight-1
Radiated Electric Field Emissions

ATTACHMENT G – CFR 15.247(d) POWER DENSITY (CONDUCTED)

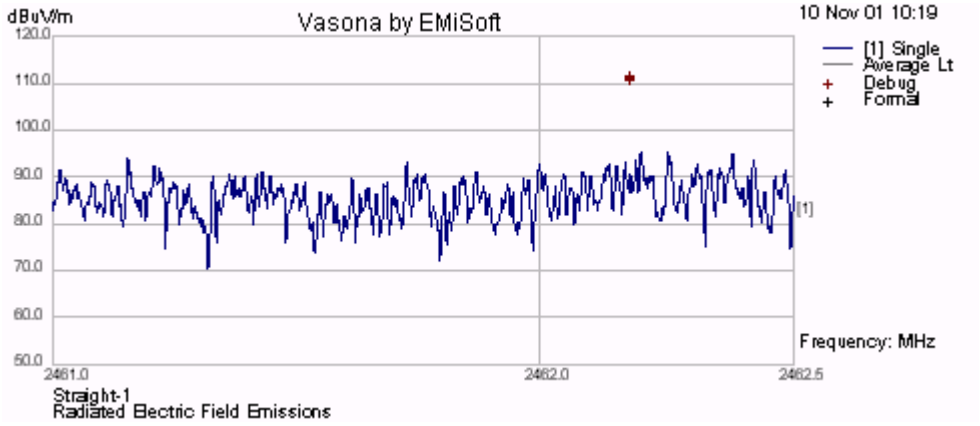
The transmitted power density averaged over any 1 second interval shall not be 8dBm in any 3kHz bandwidth within these bands.

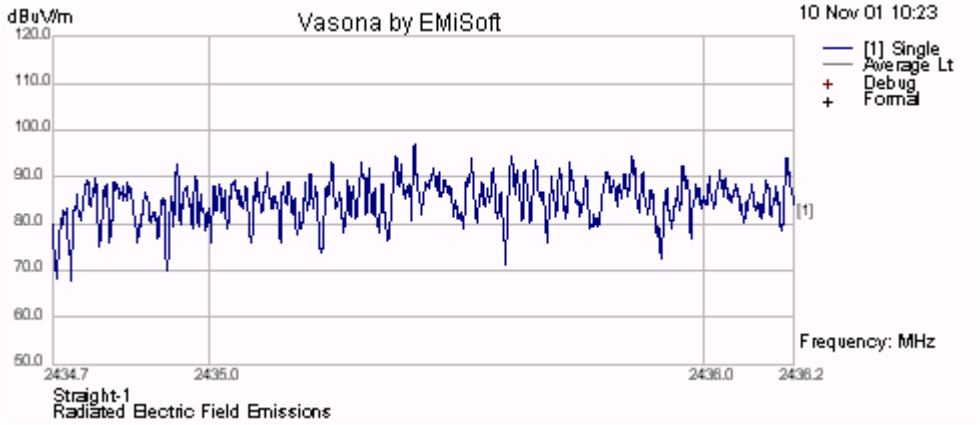
R. Bandwidth =	3 kHz
Video Bandwidth =	3 kHz
Frequency Span =	3.0 MHz
Reference Level =	8 dBm
Sweep Time =	1000 S (100 S)
RF Attenuation =	20 dB
External Attenuator =	0 dB

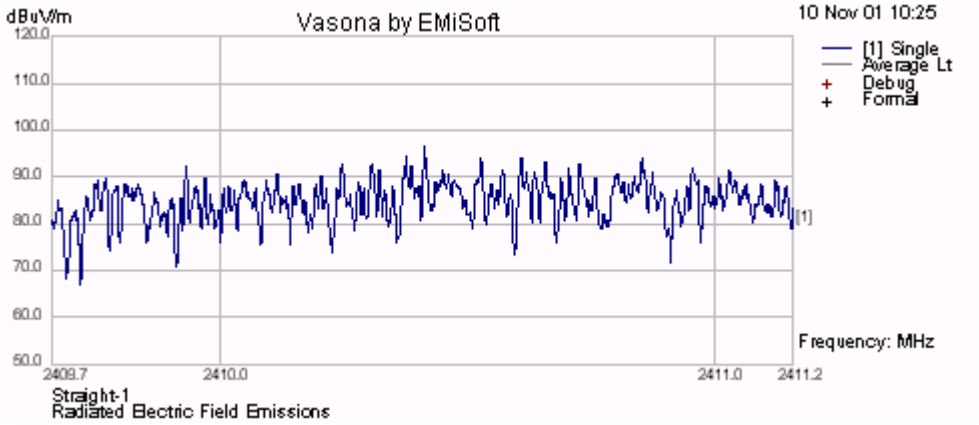
TX Rate	CHANNEL	CENTER FREQUENCY (MHz)	POWER DENSITY (dBm)
1 MB	1	2412.69	-13.1
	6	2437.68	-13.2
	11	2462.68	-13.4
5.5 MB	1	2412.68	-13.3
	6	2437.68	-13.2
	11	2462.68	-13.4
11 MB	1	2412.68	-13.1
	6	2437.68	-13.1
	11	2462.03	-13.3

Result Table 6. Power Density Conducted Measurements

Test Result: **Pass, EUT meets minimum requirement.**


dBuV/m
Vasona by EMiSoft
10 Nov 01 10:19
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
[1] Single
Average Lt
Debug
Formal
[1]
Frequency: MHz
2461.0
2462.0
2462.5
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 10:23
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
[1] Single
Average Lt
Debug
Formal
[1]
Frequency: MHz
2434.7
2435.0
2436.0
2436.2
Straight-1
Radiated Electric Field Emissions


dBuV/m
Vasona by EMiSoft
10 Nov 01 10:25
120.0
110.0
100.0
90.0
80.0
70.0
60.0
50.0
[1] Single
Average Lt
Debug
Formal
[1]
Frequency: MHz
2409.7
2410.0
2411.0
2411.2
Straight-1
Radiated Electric Field Emissions

ATTACHMENT H – CFR15.209(a) RADIATED EMISSION MEASUREMENT 212-R-01)

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/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

Operating Frequency = 2412, 2437 and 2462MHz

Res. Bandwidth = 120 kHz

Sweep Time = 30 mS

Vertical Polarization, Peak Mode

Frequency [MHz]	Antenna Polarization [V/H]	Corrected Reading [dBµV/m]	Delta, QP [dB]	3 Meters Limits [dBµV/m]	Correction Factors [dB/m]
Set-up/Configuration: EN55022:1998, CISPR 16-1:1993					
200.289	V	41.5	-2.00	43.5	-7.08
668.044	V	43.55	-2.45	46.0	2.78
351.178	V	43.31	-2.69	46.0	-2.35
64.520	H	36.57	-3.43	40.0	-11.4
533.340	V	42.36	-3.64	46.0	3.14
250.032	V	42.11	-3.89	46.0	-4.52

1. All Emissions were investigated from 30 to 1000 MHz the 6 worst emissions are reported.
2. Plots from chamber are included, plot 18 (vertical polarization) & 19 (horizontal polarization).
3. For handheld devices, the EUT is rotated through three orthogonal axes to obtain the maximum emissions.

Result Table 8. CFR15.209 (a) Radiated Emission Test Results

ATTACHMENT I – CFR15.207 (a) CONDUCTED EMISSION TEST RESULTS

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is back onto the AC power line on frequency within the band 450 kHz to 30 MHz shall not exceed 250 microvolts.

Operating Frequency = 2412, 2437 and 2462MHz

AC / DC Adapter =

Res. Bandwidth = 9 kHz

Sweep Time = 30 mS

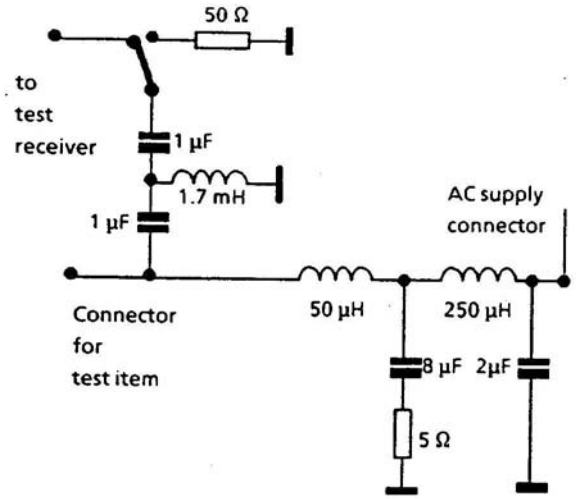
Line	Frequency [MHz]	Corrected QP Reading [dB(μV)]	Delta QP [dB]
L1	4.632	42.54	-5.46
L1	4.184	38.33	-9.67
L1	3.207	36.58	-11.42
L2	3.211	36.22	-11.78
L2	16.100	35.31	-12.69
L2	13.926	34.60	-13.40
Note: All reading are using a bandwidth of 9 kHz, with a 30 ms sweep time. A video filter was not used.			

ATTACHMENT J – TEST EQUIPMENT

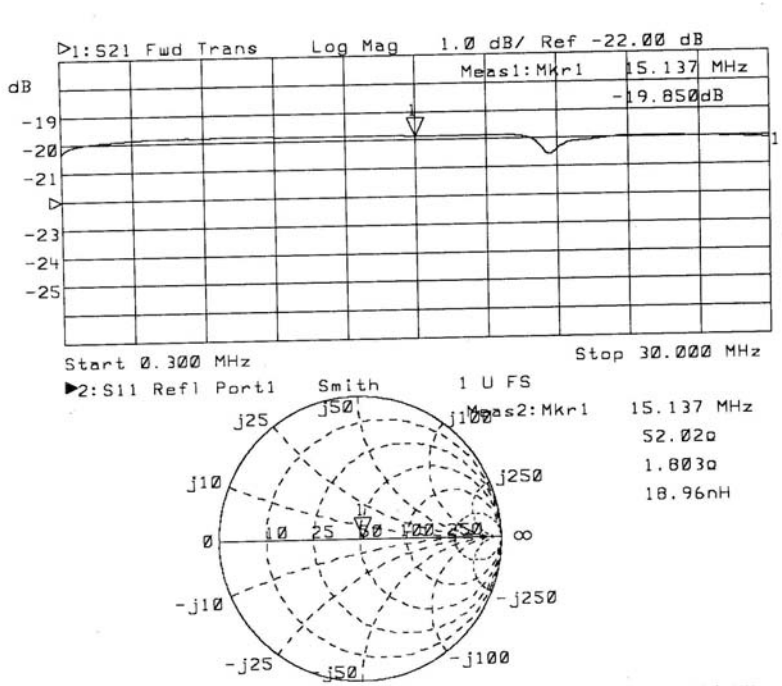
Test Equipment	Manufacturer/ Model	Serial No.	Last Cal.	Cal. Due Date
EMI Receiver	R&S / ESMI-RF	849937/006	03/01/01	03/01/02
EMI Receiver	R&S / ESAI-D	825035/005	03/01/01	03/01/02
Bilog Antenna	CHASE CBL6112A	2274	11/16/01	11/16/02
Horn Antenna	EMCO / 3115 w/ Miteq Amp	001	10/28/01	10/28/02
Horn Antenna	EMCO / 3116 w/ Miteq Amp	002	10/28/01	10/28/02
LISN	R & S / ESH3-Z5	844249/018	11/15/01	11/15/02
Signal Generator	HP / 83711B	3324A03288	08/29/01	08/29/02
RF Power Meter	Boonton / 42AD	09	03/08/01	03/08/02
RF Power Sensor	Boonton / 41-4B	157	03/08/01	03/08/02
RF Power Sensor	Boonton / 42004A	11544	03/08/01	03/08/02
Scope	Tektronix / TDS 360	B0120165	05/12/01	05/12/02
Attenuators	HP / 8491C	00423	VBU	VBU
Test Chamber	HumiTenn	A032331	VBU	VBU
Temp. Controller	Partlow Corp / MRC7000	94G86270	08/21/01	08/21/02
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated and traceable to the National Institute of Standards and Technology (NIST).				

ATTACHMENT K – LISN SPECIFICATIONS

LISN use in this test is manufactured by R & S, model ESH3-Z5. This LISN complies with the FCC and CISPR requirements. The test frequency range is from 9kHz to 30MHz and impedance is 50 Ohms.



LISN Schematics (only 1 line shown)



PROCESSING GAIN

The processing gain of a direct sequence system shall be at least 10dB. The processing gain represents the improvement of to the received signal-to-noise ratio, after filtering to the information bandwidth, from the spreading / despreading function.

For this test the discrete stepped CW jamming method was chosen. Therefore a receiver-input signal is applied to the product under test, in the presence of a Continuous Wave (CW) interference source, also referred to as CW jamming. The test takes place at the product Functional Specification (by Lucent Technologies) specified conditions for BER rate measurements, specifying a BER equal or better than 10^-8 at a receiver input level of -55 dBm. For practical reasons these test are performed at –55 dBm or -53 dBm. This small deviation from the Functional Specification should not cause any deviation from the specified Bit Error Rate, since the received levels are well above the thermal noise. The test criteria for meeting the minimal processing gain is such that it takes the theoretical calculated SNR for the applied modulation technique and specified BER as a reference. From this given SNR the processing gain is subtracted, yielding the CW Jamming to Signal ratio it is determined that for a BER of 10^-8 the SNR (S/N)o equals:

13 dB @ 1 Mbit/s,

15 dB @ 2 Mbit/s,

15 dB @ 5.5 Mbit/s,

18 dB @ 11 Mbit/s.

Thus the J/S ratio for a processing gain of 10 dB that must be met is calculated as:

-13 + 10 = -3 dB @ 1 Mbit/s (DBPSK),

-15 + 10 = -5 dB @ 2 Mbit/s (DQPSK),

-15 + 10 = -5 dB @ 5.5 Mbit/s (CCK),

-18 + 10 = -8 dB @ 11 Mbit/s (CCK).

Two types of measurement corrections are allowed for as described in Ref.[1]. The first taking into account 2 dB implementation losses, thus increasing the absolute J/S ratio by 2 dB. The second correction allows for deleting the 20% worst-case frequencies in the processing gain test that causes the test at that CW interference to fail. This implies that for the considered 14 MHz wide measurement interval the worst case 57 CW jamming frequencies can be ignored, being those that result in received data errors/missing frames (20% of 14 MHz *(1 MHz/50 KHz) + 1 = (20% * 281) + 1 = 57).

Test Result: **The tested product complies to the required Processing Gain of 10 dB for a data rate of 1, 2, 5.5 and 11 Mbit/s**

Channel 1 Processing Gain (11Mbps)						
GP=(S/N)o + MJ + L(sys)						
Frequency	TX Power	SG Power	MJ=SG/TX	(S/N)o	L(sys)	GP
(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
2407.00	-14.8	-8.1	6.7	16.4	2.0	25.1
2407.05	-14.5	-8.2	6.3	16.4	2.0	24.7
2407.10	-14.7	-8.4	6.3	16.4	2.0	24.7
2407.15	-14.3	-8.5	5.8	16.4	2.0	24.2
2407.20	-14.7	-8.8	5.9	16.4	2.0	24.3
2407.25	-14.0	-8.9	5.1	16.4	2.0	23.5
2407.30	-14.3	-9.1	5.2	16.4	2.0	23.6
2407.35	-13.8	-9.3	4.5	16.4	2.0	22.9
2407.40	-13.8	-9.0	4.8	16.4	2.0	23.2
2407.45	-13.7	-9.1	4.6	16.4	2.0	23.0
2407.50	-14.0	-9.0	5.0	16.4	2.0	23.4
2407.55	-13.8	-9.1	4.7	16.4	2.0	23.1
2407.60	-13.5	-9.2	4.3	16.4	2.0	22.7
2407.65	-13.3	-9.2	4.1	16.4	2.0	22.5
2407.70	-13.3	-9.1	4.2	16.4	2.0	22.6
2407.75	-13.2	-9.1	4.1	16.4	2.0	22.5
2407.80	-13.3	-9.1	4.2	16.4	2.0	22.6
2407.85	-13.3	-9.2	4.1	16.4	2.0	22.5
2407.90	-13.8	-9.3	4.5	16.4	2.0	22.9
2407.95	-13.2	-9.5	3.7	16.4	2.0	22.1
2408.00	-12.5	-9.7	2.8	16.4	2.0	21.2
2408.05	-13.5	-9.8	3.7	16.4	2.0	22.1
2408.10	-13.3	-9.8	3.5	16.4	2.0	21.9
2408.15	-12.3	-9.8	2.5	16.4	2.0	20.9
2408.20	-12.3	-9.7	2.6	16.4	2.0	21.0
2408.25	-12.8	-9.7	3.1	16.4	2.0	21.5
2408.30	-12.5	-9.8	2.7	16.4	2.0	21.1
2408.35	-12.7	-9.7	3.0	16.4	2.0	21.4
2408.40	-12.7	-9.7	3.0	16.4	2.0	21.4
2408.45	-12.5	-9.7	2.8	16.4	2.0	21.2
2408.50	-12.5	-9.7	2.8	16.4	2.0	21.2
2408.55	-12.0	-9.7	2.3	16.4	2.0	20.7
2408.60	-11.7	-9.7	2.0	16.4	2.0	20.4
2408.65	-11.8	-9.7	2.1	16.4	2.0	20.5
2408.70	-11.7	-9.8	1.9	16.4	2.0	20.3
2408.75	-12.0	-9.8	2.2	16.4	2.0	20.6
2408.80	-11.5	-9.9	1.6	16.4	2.0	20.0
2408.85	-12.0	-10.0	2.0	16.4	2.0	20.4
2408.90	-11.5	-10.2	1.3	16.4	2.0	19.7
2408.95	-11.5	-10.3	1.2	16.4	2.0	19.6
2409.00	-11.8	-10.4	1.4	16.4	2.0	19.8
2409.05	-11.3	-10.4	0.9	16.4	2.0	19.3
2409.10	-11.5	-10.5	1.0	16.4	2.0	19.4
2409.15	-11.5	-10.5	1.0	16.4	2.0	19.4
2409.20	-11.5	-10.4	1.1	16.4	2.0	19.5

2409.25	-11.7	-10.3	1.4	16.4	2.0	19.8
2409.30	-11.2	-10.3	0.9	16.4	2.0	19.3
2409.35	-11.3	-20.5	-9.2	16.4	2.0	9.2
2409.40	-11.0	-10.1	0.9	16.4	2.0	19.3
2409.45	-11.2	-10.2	1.0	16.4	2.0	19.4
2409.50	-11.3	-10.4	0.9	16.4	2.0	19.3
2409.55	-10.7	-10.4	0.3	16.4	2.0	18.7
2409.60	-11.3	-10.6	0.7	16.4	2.0	19.1
2409.65	-10.7	-10.6	0.1	16.4	2.0	18.5
2409.70	-11.0	-10.8	0.2	16.4	2.0	18.6
2409.75	-11.2	-10.9	0.3	16.4	2.0	18.7
2409.80	-10.8	-10.9	-0.1	16.4	2.0	18.3
2409.85	-10.8	-10.9	-0.1	16.4	2.0	18.3
2409.90	-10.5	-10.8	-0.3	16.4	2.0	18.1
2409.95	-10.5	-10.7	-0.2	16.4	2.0	18.2
2410.00	-11.0	-10.5	0.5	16.4	2.0	18.9
2410.05	-10.5	-10.5	0.0	16.4	2.0	18.4
2410.10	-10.3	-10.4	-0.1	16.4	2.0	18.3
2410.15	-10.3	-10.2	0.1	16.4	2.0	18.5
2410.20	-10.7	-10.2	0.5	16.4	2.0	18.9
2410.25	-10.2	-10.3	-0.1	16.4	2.0	18.3
2410.30	-10.3	-10.4	-0.1	16.4	2.0	18.3
2410.35	-10.2	-10.5	-0.3	16.4	2.0	18.1
2410.40	-10.0	-10.7	-0.7	16.4	2.0	17.7
2410.45	-10.0	-10.9	-0.9	16.4	2.0	17.5
2410.50	-10.0	-10.9	-0.9	16.4	2.0	17.5
2410.55	-9.8	-10.9	-1.1	16.4	2.0	17.3
2410.60	-10.3	-10.8	-0.5	16.4	2.0	17.9
2410.65	-10.2	-10.7	-0.5	16.4	2.0	17.9
2410.70	-10.7	-10.3	0.4	16.4	2.0	18.8
2410.75	-10.3	-10.1	0.2	16.4	2.0	18.6
2410.80	-10.3	-10.0	0.3	16.4	2.0	18.7
2410.85	-10.2	-9.9	0.3	16.4	2.0	18.7
2410.90	-10.2	-9.9	0.3	16.4	2.0	18.7
2410.95	-10.0	-9.8	0.2	16.4	2.0	18.6
2411.00	-10.5	-9.9	0.6	16.4	2.0	19.0
2411.05	-10.0	-10.0	0.0	16.4	2.0	18.4
2411.10	-9.7	-10.2	-0.5	16.4	2.0	17.9
2411.15	-10.5	-10.3	0.2	16.4	2.0	18.6
2411.20	-10.3	-10.5	-0.2	16.4	2.0	18.2
2411.25	-10.0	-10.6	-0.6	16.4	2.0	17.8
2411.30	-10.2	-10.6	-0.4	16.4	2.0	18.0
2411.35	-10.3	-10.5	-0.2	16.4	2.0	18.2
2411.40	-10.2	-10.4	-0.2	16.4	2.0	18.2
2411.45	-10.0	-10.2	-0.2	16.4	2.0	18.2
2411.50	-10.0	-10.1	-0.1	16.4	2.0	18.3
2411.55	-9.8	-9.9	-0.1	16.4	2.0	18.3
2411.60	-9.8	-9.7	0.1	16.4	2.0	18.5
2411.65	-10.2	-9.7	0.5	16.4	2.0	18.9
2411.70	-9.8	-9.7	0.1	16.4	2.0	18.5
2411.75	-10.0	-9.9	0.1	16.4	2.0	18.5

2411.80	-10.0	-10.1	-0.1	16.4	2.0	18.3
2411.85	-10.3	-10.4	-0.1	16.4	2.0	18.3
2411.90	-10.3	-10.6	-0.3	16.4	2.0	18.1
2411.95	-10.0	-21.5	-11.5	16.4	2.0	6.9
2412.00	-9.8	-10.7	-0.9	16.4	2.0	17.5
2412.05	-9.5	-10.7	-1.2	16.4	2.0	17.2
2412.10	-10.2	-10.4	-0.2	16.4	2.0	18.2
2412.15	-10.0	-10.2	-0.2	16.4	2.0	18.2
2412.20	-10.0	-10.0	0.0	16.4	2.0	18.4
2412.25	-9.5	-9.8	-0.3	16.4	2.0	18.1
2412.30	-9.8	-9.8	0.0	16.4	2.0	18.4
2412.35	-9.8	-9.8	0.0	16.4	2.0	18.4
2412.40	-9.3	-9.8	-0.5	16.4	2.0	17.9
2412.45	-10.3	-9.8	0.5	16.4	2.0	18.9
2412.50	-9.8	-10.0	-0.2	16.4	2.0	18.2
2412.55	-9.7	-9.9	-0.2	16.4	2.0	18.2
2412.60	-10.3	-10.2	0.1	16.4	2.0	18.5
2412.65	-10.3	-10.3	0.0	16.4	2.0	18.4
2412.70	-10.2	-10.4	-0.2	16.4	2.0	18.2
2412.75	-9.7	-10.4	-0.7	16.4	2.0	17.7
2412.80	-9.5	10.4	19.9	16.4	2.0	38.3
2412.85	-10.0	-10.4	-0.4	16.4	2.0	18.0
2412.90	-9.5	-10.4	-0.9	16.4	2.0	17.5
2412.95	-10.2	-10.3	-0.1	16.4	2.0	18.3
2413.00	-10.0	-10.1	-0.1	16.4	2.0	18.3
2413.05	-9.8	-10.1	-0.3	16.4	2.0	18.1
2413.10	-9.8	-10.0	-0.2	16.4	2.0	18.2
2413.15	-9.8	-10.1	-0.3	16.4	2.0	18.1
2413.20	-10.5	-10.0	0.5	16.4	2.0	18.9
2413.25	-10.2	-10.0	0.2	16.4	2.0	18.6
2413.30	-10.2	-10.0	0.2	16.4	2.0	18.6
2413.35	-10.2	-10.3	-0.1	16.4	2.0	18.3
2413.40	-9.8	-10.3	-0.5	16.4	2.0	17.9
2413.45	-10.0	-10.4	-0.4	16.4	2.0	18.0
2413.50	-10.2	-10.5	-0.3	16.4	2.0	18.1
2413.55	-10.0	-10.6	-0.6	16.4	2.0	17.8
2413.60	-10.3	-10.6	-0.3	16.4	2.0	18.1
2413.65	-10.3	-10.5	-0.2	16.4	2.0	18.2
2413.70	-10.3	-10.5	-0.2	16.4	2.0	18.2
2413.75	-10.5	-10.4	0.1	16.4	2.0	18.5
2413.80	-10.8	-10.4	0.4	16.4	2.0	18.8
2413.85	-10.5	-10.3	0.2	16.4	2.0	18.6
2413.90	-10.7	-10.2	0.5	16.4	2.0	18.9
2413.95	-11.2	-10.1	1.1	16.4	2.0	19.5
2414.00	-10.7	-10.0	0.7	16.4	2.0	19.1
2414.05	-11.0	-10.0	1.0	16.4	2.0	19.4
2414.10	-11.0	-10.0	1.0	16.4	2.0	19.4
2414.15	-10.8	-10.0	0.8	16.4	2.0	19.2
2414.20	-10.5	-10.1	0.4	16.4	2.0	18.8
2414.25	-10.7	-10.2	0.5	16.4	2.0	18.9
2414.30	-10.8	-10.4	0.4	16.4	2.0	18.8

2414.35	-11.0	-10.4	0.6	16.4	2.0	19.0
2414.40	-10.3	-10.4	-0.1	16.4	2.0	18.3
2414.45	-10.7	-10.6	0.1	16.4	2.0	18.5
2414.50	-11.3	-10.4	0.9	16.4	2.0	19.3
2414.55	-11.2	-10.2	1.0	16.4	2.0	19.4
2414.60	-10.8	-10.0	0.8	16.4	2.0	19.2
2414.65	-11.2	-9.8	1.4	16.4	2.0	19.8
2414.70	-11.2	-9.7	1.5	16.4	2.0	19.9
2414.75	-11.7	-9.6	2.1	16.4	2.0	20.5
2414.80	-11.7	-9.5	2.2	16.4	2.0	20.6
2414.85	-11.7	-9.5	2.2	16.4	2.0	20.6
2414.90	-11.3	-9.5	1.8	16.4	2.0	20.2
2414.95	-11.5	-9.5	2.0	16.4	2.0	20.4
2415.00	-11.5	-9.5	2.0	16.4	2.0	20.4
2415.05	-11.5	9.6	21.1	16.4	2.0	39.5
2415.10	-11.5	-9.7	1.8	16.4	2.0	20.2
2415.15	-11.2	-9.8	1.4	16.4	2.0	19.8
2415.20	-11.2	-9.7	1.5	16.4	2.0	19.9
2415.25	-11.2	-9.6	1.6	16.4	2.0	20.0
2415.30	-11.7	-9.5	2.2	16.4	2.0	20.6
2415.35	-12.0	-9.4	2.6	16.4	2.0	21.0
2415.40	-11.8	-9.1	2.7	16.4	2.0	21.1
2415.45	-12.2	-8.8	3.4	16.4	2.0	21.8
2415.50	-12.0	-8.7	3.3	16.4	2.0	21.7
2415.55	-12.2	-8.6	3.6	16.4	2.0	22.0
2415.60	-12.2	-8.6	3.6	16.4	2.0	22.0
2415.65	-12.5	-8.5	4.0	16.4	2.0	22.4
2415.70	-12.2	-8.6	3.6	16.4	2.0	22.0
2415.75	-12.2	-8.8	3.4	16.4	2.0	21.8
2415.80	-12.3	-8.9	3.4	16.4	2.0	21.8
2415.85	-11.8	-9.0	2.8	16.4	2.0	21.2
2415.90	-12.8	-9.1	3.7	16.4	2.0	22.1
2415.95	-12.8	-9.2	3.6	16.4	2.0	22.0
2416.00	-12.5	-9.1	3.4	16.4	2.0	21.8
2416.05	-12.8	-9.1	3.7	16.4	2.0	22.1
2416.10	-12.5	-8.8	3.7	16.4	2.0	22.1
2416.15	-12.5	-8.5	4.0	16.4	2.0	22.4
2416.20	-12.8	-8.3	4.5	16.4	2.0	22.9
2416.25	-12.8	-8.1	4.7	16.4	2.0	23.1
2416.30	-13.2	-7.9	5.3	16.4	2.0	23.7
2416.35	-13.7	-7.0	6.7	16.4	2.0	25.1
2416.40	-13.8	-7.9	5.9	16.4	2.0	24.3
2416.45	-12.5	-7.7	4.8	16.4	2.0	23.2
2416.50	-12.0	-7.6	4.4	16.4	2.0	22.8
2416.55	-13.2	-7.6	5.6	16.4	2.0	24.0
2416.60	-13.0	-7.8	5.2	16.4	2.0	23.6
2416.65	-13.3	-8.0	5.3	16.4	2.0	23.7
2416.70	-13.3	-8.1	5.2	16.4	2.0	23.6
2416.75	-13.2	-8.1	5.1	16.4	2.0	23.5
2416.80	-13.3	-8.2	5.1	16.4	2.0	23.5
2416.85	-13.5	-8.2	5.3	16.4	2.0	23.7

2416.90	-13.5	-8.2	5.3	16.4	2.0	23.7
2416.95	-13.5	-8.0	5.5	16.4	2.0	23.9
2417.00	-13.8	-7.7	6.1	16.4	2.0	24.5

Channel 6 Processing Gain (11Mbps)						
GP=(S/N)o + MJ + L(sys)						
Frequency	TX Power	SG Power	MJ=SG/TX	(S/N)o	L(sys)	GP
(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
2432.00	-14.0	-9.6	4.4	16.4	2.0	22.8
2432.05	-14.0	-9.7	4.3	16.4	2.0	22.7
2432.10	-13.7	-9.8	3.9	16.4	2.0	22.3
2432.15	-13.7	-10.2	3.5	16.4	2.0	21.9
2432.20	-13.7	-10.3	3.4	16.4	2.0	21.8
2432.25	-13.3	-10.4	2.9	16.4	2.0	21.3
2432.30	-13.3	-10.6	2.7	16.4	2.0	21.1
2432.35	-13.5	-10.7	2.8	16.4	2.0	21.2
2432.40	-13.2	-10.6	2.6	16.4	2.0	21.0
2432.45	-13.8	-10.7	3.1	16.4	2.0	21.5
2432.50	-13.8	-10.6	3.2	16.4	2.0	21.6
2432.55	-13.3	-10.6	2.7	16.4	2.0	21.1
2432.60	-14.0	-10.7	3.3	16.4	2.0	21.7
2432.65	-13.0	-10.7	2.3	16.4	2.0	20.7
2432.70	-14.0	-10.6	3.4	16.4	2.0	21.8
2432.75	-12.7	-10.8	1.9	16.4	2.0	20.3
2432.80	-13.0	-10.9	2.1	16.4	2.0	20.5
2432.85	-12.8	-11.1	1.7	16.4	2.0	20.1
2432.90	-12.3	-11.1	1.2	16.4	2.0	19.6
2432.95	-13.2	-11.3	1.9	16.4	2.0	20.3
2433.00	-12.2	-11.5	0.7	16.4	2.0	19.1
2433.05	-13.0	-11.7	1.3	16.4	2.0	19.7
2433.10	-12.2	-11.7	0.5	16.4	2.0	18.9
2433.15	-12.2	-11.7	0.5	16.4	2.0	18.9
2433.20	-12.2	-11.7	0.5	16.4	2.0	18.9
2433.25	-12.0	-11.6	0.4	16.4	2.0	18.8
2433.30	-12.0	-11.7	0.3	16.4	2.0	18.7
2433.35	-12.3	-11.6	0.7	16.4	2.0	19.1
2433.40	-12.3	-11.7	0.6	16.4	2.0	19.0
2433.45	-12.3	-11.7	0.6	16.4	2.0	19.0
2433.50	-12.3	-11.7	0.6	16.4	2.0	19.0
2433.55	-11.8	-11.7	0.1	16.4	2.0	18.5
2433.60	-11.8	-11.7	0.1	16.4	2.0	18.5
2433.65	-11.8	-11.7	0.1	16.4	2.0	18.5
2433.70	-11.7	-11.9	-0.2	16.4	2.0	18.2
2433.75	-11.5	-11.9	-0.4	16.4	2.0	18.0
2433.80	-11.8	-11.9	-0.1	16.4	2.0	18.3
2433.85	-12.2	-12.0	0.2	16.4	2.0	18.6
2433.90	-11.7	-12.0	-0.3	16.4	2.0	18.1
2433.95	-11.5	-12.0	-0.5	16.4	2.0	17.9
2434.00	-11.5	-12.0	-0.5	16.4	2.0	17.9
2434.05	-11.3	-12.0	-0.7	16.4	2.0	17.7
2434.10	-11.0	-12.0	-1.0	16.4	2.0	17.4
2434.15	-11.0	-12.0	-1.0	16.4	2.0	17.4

2434.20	-11.0	-12.0	-1.0	16.4	2.0	17.4
2434.25	-11.3	-12.0	-0.7	16.4	2.0	17.7
2434.30	-11.2	-12.0	-0.8	16.4	2.0	17.6
2434.35	-11.3	-12.0	-0.7	16.4	2.0	17.7
2434.40	-11.5	-12.0	-0.5	16.4	2.0	17.9
2434.45	-11.2	-12.0	-0.8	16.4	2.0	17.6
2434.50	-11.2	-12.1	-0.9	16.4	2.0	17.5
2434.55	-10.7	-12.1	-1.4	16.4	2.0	17.0
2434.60	-10.8	-12.2	-1.4	16.4	2.0	17.0
2434.65	-10.5	-12.4	-1.9	16.4	2.0	16.5
2434.70	-10.5	-12.5	-2.0	16.4	2.0	16.4
2434.75	-10.7	-12.7	-2.0	16.4	2.0	16.4
2434.80	-10.7	-12.7	-2.0	16.4	2.0	16.4
2434.85	-10.8	-12.7	-1.9	16.4	2.0	16.5
2434.90	-10.7	-12.6	-1.9	16.4	2.0	16.5
2434.95	-10.8	-12.5	-1.7	16.4	2.0	16.7
2435.00	-10.8	-12.4	-1.6	16.4	2.0	16.8
2435.05	-10.7	-12.3	-1.6	16.4	2.0	16.8
2435.10	-10.7	-12.2	-1.5	16.4	2.0	16.9
2435.15	-10.7	-12.1	-1.4	16.4	2.0	17.0
2435.20	-10.5	-12.1	-1.6	16.4	2.0	16.8
2435.25	-10.2	-12.1	-1.9	16.4	2.0	16.5
2435.30	-10.5	-12.1	-1.6	16.4	2.0	16.8
2435.35	-10.2	-12.3	-2.1	16.4	2.0	16.3
2435.40	-10.2	-12.5	-2.3	16.4	2.0	16.1
2435.45	-9.5	-12.7	-3.2	16.4	2.0	15.2
2435.50	-10.2	-12.7	-2.5	16.4	2.0	15.9
2435.55	-10.0	-12.7	-2.7	16.4	2.0	15.7
2435.60	-10.2	-12.7	-2.5	16.4	2.0	15.9
2435.65	-10.7	-12.6	-1.9	16.4	2.0	16.5
2435.70	-9.5	-12.4	-2.9	16.4	2.0	15.5
2435.75	-9.7	-12.2	-2.5	16.4	2.0	15.9
2435.80	-9.8	-12.0	-2.2	16.4	2.0	16.2
2435.85	-10.3	-12.0	-1.7	16.4	2.0	16.7
2435.90	-10.3	-12.0	-1.7	16.4	2.0	16.7
2435.95	-10.3	-12.0	-1.7	16.4	2.0	16.7
2436.00	-10.0	-12.0	-2.0	16.4	2.0	16.4
2436.05	-10.0	-12.0	-2.0	16.4	2.0	16.4
2436.10	-9.8	-12.0	-2.2	16.4	2.0	16.2
2436.15	-9.8	-12.0	-2.2	16.4	2.0	16.2
2436.20	-10.2	-12.3	-2.1	16.4	2.0	16.3
2436.25	-9.8	-12.4	-2.6	16.4	2.0	15.8
2436.30	-9.7	-12.4	-2.7	16.4	2.0	15.7
2436.35	-10.3	-12.4	-2.1	16.4	2.0	16.3
2436.40	-9.8	-12.4	-2.6	16.4	2.0	15.8
2436.45	-9.8	-12.4	-2.6	16.4	2.0	15.8
2436.50	-10.2	-12.1	-1.9	16.4	2.0	16.5
2436.55	-9.8	-12.0	-2.2	16.4	2.0	16.2
2436.60	-9.8	-12.0	-2.2	16.4	2.0	16.2
2436.65	-9.5	-12.0	-2.5	16.4	2.0	15.9
2436.70	-10.5	-12.0	-1.5	16.4	2.0	16.9

2436.75	-10.5	-12.0	-1.5	16.4	2.0	16.9
2436.80	-10.2	-12.0	-1.8	16.4	2.0	16.6
2436.85	-9.8	-12.1	-2.3	16.4	2.0	16.1
2436.90	-10.0	-12.1	-2.1	16.4	2.0	16.3
2436.95	-10.3	-12.5	-2.2	16.4	2.0	16.2
2437.00	-10.0	-12.9	-2.9	16.4	2.0	15.5
2437.05	-10.2	-12.7	-2.5	16.4	2.0	15.9
2437.10	-9.7	-12.6	-2.9	16.4	2.0	15.5
2437.15	-9.3	-12.5	-3.2	16.4	2.0	15.2
2437.20	-10.0	-12.3	-2.3	16.4	2.0	16.1
2437.25	-9.8	-12.0	-2.2	16.4	2.0	16.2
2437.30	-9.7	-11.9	-2.2	16.4	2.0	16.2
2437.35	-10.0	-12.0	-2.0	16.4	2.0	16.4
2437.40	-10.0	-12.0	-2.0	16.4	2.0	16.4
2437.45	-9.8	-12.0	-2.2	16.4	2.0	16.2
2437.50	-10.0	-12.0	-2.0	16.4	2.0	16.4
2437.55	-10.0	-12.0	-2.0	16.4	2.0	16.4
2437.60	-9.8	-12.0	-2.2	16.4	2.0	16.2
2437.65	-10.2	-12.0	-1.8	16.4	2.0	16.6
2437.70	-10.3	-12.0	-1.7	16.4	2.0	16.7
2437.75	-9.7	-12.1	-2.4	16.4	2.0	16.0
2437.80	-10.0	-12.2	-2.2	16.4	2.0	16.2
2437.85	-10.2	-12.2	-2.0	16.4	2.0	16.4
2437.90	-9.8	-12.2	-2.4	16.4	2.0	16.0
2437.95	-9.8	-12.2	-2.4	16.4	2.0	16.0
2438.00	-9.7	-12.2	-2.5	16.4	2.0	15.9
2438.05	-10.5	-12.2	-1.7	16.4	2.0	16.7
2438.10	-9.5	-12.0	-2.5	16.4	2.0	15.9
2438.15	-9.8	-12.0	-2.2	16.4	2.0	16.2
2438.20	-9.7	-12.0	-2.3	16.4	2.0	16.1
2438.25	-9.8	-12.0	-2.2	16.4	2.0	16.2
2438.30	-10.5	-12.0	-1.5	16.4	2.0	16.9
2438.35	-10.3	-12.0	-1.7	16.4	2.0	16.7
2438.40	-10.5	-12.0	-1.5	16.4	2.0	16.9
2438.45	-10.0	-12.1	-2.1	16.4	2.0	16.3
2438.50	-10.2	-12.2	-2.0	16.4	2.0	16.4
2438.55	-10.0	-12.4	-2.4	16.4	2.0	16.0
2438.60	-10.7	-12.4	-1.7	16.4	2.0	16.7
2438.65	-10.2	-12.4	-2.2	16.4	2.0	16.2
2438.70	-10.5	-12.3	-1.8	16.4	2.0	16.6
2438.75	-10.7	-12.4	-1.7	16.4	2.0	16.7
2438.80	-10.2	-12.4	-2.2	16.4	2.0	16.2
2438.85	-10.3	-12.2	-1.9	16.4	2.0	16.5
2438.90	-10.3	-12.2	-1.9	16.4	2.0	16.5
2438.95	-11.2	-12.1	-0.9	16.4	2.0	17.5
2439.00	-10.7	-12.1	-1.4	16.4	2.0	17.0
2439.05	-10.7	-12.1	-1.4	16.4	2.0	17.0
2439.10	-10.8	-12.0	-1.2	16.4	2.0	17.2
2439.15	-11.0	-12.0	-1.0	16.4	2.0	17.4
2439.20	-10.8	-12.0	-1.2	16.4	2.0	17.2
2439.25	-11.3	-12.0	-0.7	16.4	2.0	17.7

2439.30	-11.3	-12.0	-0.7	16.4	2.0	17.7
2439.35	-11.0	-12.1	-1.1	16.4	2.0	17.3
2439.40	-11.2	-12.2	-1.0	16.4	2.0	17.4
2439.45	-11.5	-12.1	-0.6	16.4	2.0	17.8
2439.50	-10.7	-12.1	-1.4	16.4	2.0	17.0
2439.55	-10.7	-12.1	-1.4	16.4	2.0	17.0
2439.60	-11.0	-12.0	-1.0	16.4	2.0	17.4
2439.65	-10.8	-12.0	-1.2	16.4	2.0	17.2
2439.70	-10.8	-12.0	-1.2	16.4	2.0	17.2
2439.75	-11.0	-12.0	-1.0	16.4	2.0	17.4
2439.80	-11.2	-11.9	-0.7	16.4	2.0	17.7
2439.85	-11.3	-11.9	-0.6	16.4	2.0	17.8
2439.90	-11.3	-11.9	-0.6	16.4	2.0	17.8
2439.95	-11.8	-11.9	-0.1	16.4	2.0	18.3
2440.00	-11.5	-11.9	-0.4	16.4	2.0	18.0
2440.05	-11.5	-11.9	-0.4	16.4	2.0	18.0
2440.10	-11.5	-11.9	-0.4	16.4	2.0	18.0
2440.15	-11.5	-11.9	-0.4	16.4	2.0	18.0
2440.20	-11.7	-11.9	-0.2	16.4	2.0	18.2
2440.25	-12.0	-12.0	0.0	16.4	2.0	18.4
2440.30	-11.8	-11.9	-0.1	16.4	2.0	18.3
2440.35	-11.5	-12.0	-0.5	16.4	2.0	17.9
2440.40	-12.0	-11.9	0.1	16.4	2.0	18.5
2440.45	-12.2	-11.9	0.3	16.4	2.0	18.7
2440.50	-12.0	-11.6	0.4	16.4	2.0	18.8
2440.55	-12.3	-11.5	0.8	16.4	2.0	19.2
2440.60	-12.0	-11.2	0.8	16.4	2.0	19.2
2440.65	-12.0	-11.1	0.9	16.4	2.0	19.3
2440.70	-12.5	-11.1	1.4	16.4	2.0	19.8
2440.75	-12.8	-11.0	1.8	16.4	2.0	20.2
2440.80	-12.2	-11.2	1.0	16.4	2.0	19.4
2440.85	-12.5	-11.2	1.3	16.4	2.0	19.7
2440.90	-12.7	-11.3	1.4	16.4	2.0	19.8
2440.95	-13.0	-11.5	1.5	16.4	2.0	19.9
2441.00	-12.7	-11.7	1.0	16.4	2.0	19.4
2441.05	-12.7	-11.5	1.2	16.4	2.0	19.6
2441.10	-12.7	-11.5	1.2	16.4	2.0	19.6
2441.15	-12.5	-11.5	1.0	16.4	2.0	19.4
2441.20	-13.2	-11.2	2.0	16.4	2.0	20.4
2441.25	-13.0	-11.1	1.9	16.4	2.0	20.3
2441.30	-13.2	-10.6	2.6	16.4	2.0	21.0
2441.35	-13.0	-10.4	2.6	16.4	2.0	21.0
2441.40	-13.0	-10.0	3.0	16.4	2.0	21.4
2441.45	-13.3	-10.0	3.3	16.4	2.0	21.7
2441.50	-13.3	-9.9	3.4	16.4	2.0	21.8
2441.55	-13.0	-10.0	3.0	16.4	2.0	21.4
2441.60	-13.8	-10.2	3.6	16.4	2.0	22.0
2441.65	-14.0	-10.2	3.8	16.4	2.0	22.2
2441.70	-13.5	-10.4	3.1	16.4	2.0	21.5
2441.75	-14.0	-10.4	3.6	16.4	2.0	22.0
2441.80	-14.0	-10.5	3.5	16.4	2.0	21.9

2441.85	-13.8	-10.5	3.3	16.4	2.0	21.7
2441.90	-14.5	-10.4	4.1	16.4	2.0	22.5
2441.95	-14.5	-10.1	4.4	16.4	2.0	22.8
2442.00	-14.5	-9.8	4.7	16.4	2.0	23.1

Channel 11 Processing Gain (11Mbps)						
GP=(S/N)o + MJ + L(sys)						
Frequency	TX Power	SG Power	MJ=SG/TX	(S/N)o	L(sys)	GP
(MHz)	(dBm)	(dBm)	(dB)	(dB)	(dB)	(dB)
2457.00	-13.50	-8.10	5.4	16.4	2.0	23.8
2457.05	-13.50	-8.30	5.2	16.4	2.0	23.6
2457.10	-13.67	-8.40	5.3	16.4	2.0	23.7
2457.15	-13.33	-8.70	4.6	16.4	2.0	23.0
2457.20	-13.50	-8.90	4.6	16.4	2.0	23.0
2457.25	-12.83	-9.00	3.8	16.4	2.0	22.2
2457.30	-13.17	-9.30	3.9	16.4	2.0	22.3
2457.35	-13.00	-9.30	3.7	16.4	2.0	22.1
2457.40	-12.50	-9.30	3.2	16.4	2.0	21.6
2457.45	-13.00	-9.30	3.7	16.4	2.0	22.1
2457.50	-12.50	-9.20	3.3	16.4	2.0	21.7
2457.55	-12.67	-9.20	3.5	16.4	2.0	21.9
2457.60	-12.67	-9.30	3.4	16.4	2.0	21.8
2457.65	-12.50	-9.40	3.1	16.4	2.0	21.5
2457.70	-12.33	-9.30	3.0	16.4	2.0	21.4
2457.75	-12.33	-9.30	3.0	16.4	2.0	21.4
2457.80	-12.00	-9.40	2.6	16.4	2.0	21.0
2457.85	-12.33	-9.40	2.9	16.4	2.0	21.3
2457.90	-12.17	-9.70	2.5	16.4	2.0	20.9
2457.95	-11.83	-9.80	2.0	16.4	2.0	20.4
2458.00	-11.50	-9.90	1.6	16.4	2.0	20.0
2458.05	-12.00	-10.00	2.0	16.4	2.0	20.4
2458.10	-12.17	-10.00	2.2	16.4	2.0	20.6
2458.15	-11.67	-10.20	1.5	16.4	2.0	19.9
2458.20	-11.50	-10.30	1.2	16.4	2.0	19.6
2458.25	-11.33	-10.30	1.0	16.4	2.0	19.4
2458.30	-11.33	-10.20	1.1	16.4	2.0	19.5
2458.35	-11.83	-10.20	1.6	16.4	2.0	20.0
2458.40	-11.33	-10.20	1.1	16.4	2.0	19.5
2458.45	-11.17	-10.20	1.0	16.4	2.0	19.4
2458.50	-11.67	-10.20	1.5	16.4	2.0	19.9
2458.55	-11.17	-10.10	1.1	16.4	2.0	19.5
2458.60	-11.50	-10.20	1.3	16.4	2.0	19.7
2458.65	-11.17	-10.10	1.1	16.4	2.0	19.5
2458.70	-11.17	-10.30	0.9	16.4	2.0	19.3
2458.75	-10.83	-10.30	0.5	16.4	2.0	18.9
2458.80	-11.17	-10.30	0.9	16.4	2.0	19.3
2458.85	-10.67	-10.50	0.2	16.4	2.0	18.6
2458.90	-11.00	-10.60	0.4	16.4	2.0	18.8
2458.95	-10.50	-10.80	-0.3	16.4	2.0	18.1
2459.00	-10.50	-10.90	-0.4	16.4	2.0	18.0
2459.05	-11.00	-11.20	-0.2	16.4	2.0	18.2
2459.10	-10.33	-11.30	-1.0	16.4	2.0	17.4
2459.15	-10.17	-11.00	-0.8	16.4	2.0	17.6
2459.20	-10.33	-11.10	-0.8	16.4	2.0	17.6

2459.25	-10.33	-11.10	-0.8	16.4	2.0	17.6
2459.30	-10.33	-11.10	-0.8	16.4	2.0	17.6
2459.35	-10.33	-11.20	-0.9	16.4	2.0	17.5
2459.40	-10.17	-11.20	-1.0	16.4	2.0	17.4
2459.45	-10.50	-11.20	-0.7	16.4	2.0	17.7
2459.50	-10.33	-11.30	-1.0	16.4	2.0	17.4
2459.55	-10.00	-11.20	-1.2	16.4	2.0	17.2
2459.60	-9.83	-11.40	-1.6	16.4	2.0	16.8
2459.65	-10.33	-11.30	-1.0	16.4	2.0	17.4
2459.70	-10.17	-11.60	-1.4	16.4	2.0	17.0
2459.75	-10.00	-11.90	-1.9	16.4	2.0	16.5
2459.80	-10.17	-11.90	-1.7	16.4	2.0	16.7
2459.85	-9.67	-12.30	-2.6	16.4	2.0	15.8
2459.90	-9.50	-12.40	-2.9	16.4	2.0	15.5
2459.95	-10.00	-12.20	-2.2	16.4	2.0	16.2
2460.00	-9.50	-12.20	-2.7	16.4	2.0	15.7
2460.05	-9.67	-12.10	-2.4	16.4	2.0	16.0
2460.10	-9.67	-12.00	-2.3	16.4	2.0	16.1
2460.15	-9.33	-11.40	-2.1	16.4	2.0	16.3
2460.20	-9.67	-11.40	-1.7	16.4	2.0	16.7
2460.25	-9.50	-11.40	-1.9	16.4	2.0	16.5
2460.30	-9.83	-11.40	-1.6	16.4	2.0	16.8
2460.35	-9.67	-11.60	-1.9	16.4	2.0	16.5
2460.40	-9.17	-11.80	-2.6	16.4	2.0	15.8
2460.45	-9.33	-11.90	-2.6	16.4	2.0	15.8
2460.50	-9.50	-12.50	-3.0	16.4	2.0	15.4
2460.55	-9.33	-12.60	-3.3	16.4	2.0	15.1
2460.60	-9.33	-12.50	-3.2	16.4	2.0	15.2
2460.65	-9.33	-12.50	-3.2	16.4	2.0	15.2
2460.70	-9.33	-12.30	-3.0	16.4	2.0	15.4
2460.75	-9.33	-12.10	-2.8	16.4	2.0	15.6
2460.80	-9.50	-11.50	-2.0	16.4	2.0	16.4
2460.85	-9.33	-11.40	-2.1	16.4	2.0	16.3
2460.90	-9.00	-11.30	-2.3	16.4	2.0	16.1
2460.95	-9.00	-11.20	-2.2	16.4	2.0	16.2
2461.00	-9.00	-11.10	-2.1	16.4	2.0	16.3
2461.05	-9.17	-11.20	-2.0	16.4	2.0	16.4
2461.10	-8.83	-11.30	-2.5	16.4	2.0	15.9
2461.15	-9.50	-11.40	-1.9	16.4	2.0	16.5
2461.20	-10.00	-11.60	-1.6	16.4	2.0	16.8
2461.25	-9.50	-11.80	-2.3	16.4	2.0	16.1
2461.30	-9.17	-11.80	-2.6	16.4	2.0	15.8
2461.35	-9.17	-12.40	-3.2	16.4	2.0	15.2
2461.40	-9.00	-12.40	-3.4	16.4	2.0	15.0
2461.45	-8.67	-12.30	-3.6	16.4	2.0	14.8
2461.50	-8.67	-12.20	-3.5	16.4	2.0	14.9
2461.55	-9.50	-12.00	-2.5	16.4	2.0	15.9
2461.60	-8.83	-11.30	-2.5	16.4	2.0	15.9
2461.65	-8.67	-11.20	-2.5	16.4	2.0	15.9
2461.70	-9.17	-11.10	-1.9	16.4	2.0	16.5
2461.75	-9.33	-11.10	-1.8	16.4	2.0	16.6

2461.80	-9.00	-11.20	-2.2	16.4	2.0	16.2
2461.85	-9.17	-11.40	-2.2	16.4	2.0	16.2
2461.90	-9.17	-11.50	-2.3	16.4	2.0	16.1
2461.95	-9.17	-11.80	-2.6	16.4	2.0	15.8
2462.00	-9.00	-12.50	-3.5	16.4	2.0	14.9
2462.05	-9.00	-12.50	-3.5	16.4	2.0	14.9
2462.10	-8.83	-12.50	-3.7	16.4	2.0	14.7
2462.15	-9.17	-12.40	-3.2	16.4	2.0	15.2
2462.20	-9.17	-12.40	-3.2	16.4	2.0	15.2
2462.25	-9.17	-12.10	-2.9	16.4	2.0	15.5
2462.30	-9.33	-12.00	-2.7	16.4	2.0	15.7
2462.35	-9.00	-11.40	-2.4	16.4	2.0	16.0
2462.40	-9.17	-11.40	-2.2	16.4	2.0	16.2
2462.45	-9.17	-11.40	-2.2	16.4	2.0	16.2
2462.50	-9.00	-11.30	-2.3	16.4	2.0	16.1
2462.55	-9.50	-11.30	-1.8	16.4	2.0	16.6
2462.60	-9.33	-11.30	-2.0	16.4	2.0	16.4
2462.65	-9.00	-11.40	-2.4	16.4	2.0	16.0
2462.70	-9.67	-11.60	-1.9	16.4	2.0	16.5
2462.75	-9.17	-11.70	-2.5	16.4	2.0	15.9
2462.80	-9.17	-11.80	-2.6	16.4	2.0	15.8
2462.85	-9.17	-12.40	-3.2	16.4	2.0	15.2
2462.90	-9.17	-12.50	-3.3	16.4	2.0	15.1
2462.95	-8.83	-12.40	-3.6	16.4	2.0	14.8
2463.00	-8.50	-12.50	-4.0	16.4	2.0	14.4
2463.05	-9.00	-12.50	-3.5	16.4	2.0	14.9
2463.10	-9.17	-12.40	-3.2	16.4	2.0	15.2
2463.15	-8.83	-12.20	-3.4	16.4	2.0	15.0
2463.20	-9.17	-12.20	-3.0	16.4	2.0	15.4
2463.25	-9.50	-12.10	-2.6	16.4	2.0	15.8
2463.30	-9.33	-12.30	-3.0	16.4	2.0	15.4
2463.35	-9.50	-12.10	-2.6	16.4	2.0	15.8
2463.40	-9.33	-11.90	-2.6	16.4	2.0	15.8
2463.45	-9.17	-12.40	-3.2	16.4	2.0	15.2
2463.50	-9.33	-12.30	-3.0	16.4	2.0	15.4
2463.55	-9.17	-12.60	-3.4	16.4	2.0	15.0
2463.60	-9.33	-12.70	-3.4	16.4	2.0	15.0
2463.65	-9.50	-12.80	-3.3	16.4	2.0	15.1
2463.70	-9.33	-12.80	-3.5	16.4	2.0	14.9
2463.75	-9.50	-12.90	-3.4	16.4	2.0	15.0
2463.80	-9.53	-12.90	-3.4	16.4	2.0	15.0
2463.85	-9.50	-12.70	-3.2	16.4	2.0	15.2
2463.90	-9.50	-12.60	-3.1	16.4	2.0	15.3
2463.95	-10.17	-12.60	-2.4	16.4	2.0	16.0
2464.00	-9.50	-12.60	-3.1	16.4	2.0	15.3
2464.05	-10.17	-12.40	-2.2	16.4	2.0	16.2
2464.10	-9.83	-12.30	-2.5	16.4	2.0	15.9
2464.15	-10.17	-12.30	-2.1	16.4	2.0	16.3
2464.20	-10.50	-12.30	-1.8	16.4	2.0	16.6
2464.25	-10.00	-12.30	-2.3	16.4	2.0	16.1
2464.30	-10.17	-12.30	-2.1	16.4	2.0	16.3

2464.35	-10.17	-12.50	-2.3	16.4	2.0	16.1
2464.40	-10.17	-12.70	-2.5	16.4	2.0	15.9
2464.45	-10.33	-12.70	-2.4	16.4	2.0	16.0
2464.50	-10.17	-12.70	-2.5	16.4	2.0	15.9
2464.55	-10.00	-12.70	-2.7	16.4	2.0	15.7
2464.60	-10.00	-12.60	-2.6	16.4	2.0	15.8
2464.65	-9.83	-12.50	-2.7	16.4	2.0	15.7
2464.70	-9.83	-12.40	-2.6	16.4	2.0	15.8
2464.75	-10.50	-12.20	-1.7	16.4	2.0	16.7
2464.80	-10.33	-12.10	-1.8	16.4	2.0	16.6
2464.85	-10.00	-12.00	-2.0	16.4	2.0	16.4
2464.90	-11.17	-12.00	-0.8	16.4	2.0	17.6
2464.95	-10.50	-11.50	-1.0	16.4	2.0	17.4
2465.00	-11.00	-11.30	-0.3	16.4	2.0	18.1
2465.05	-10.83	-11.30	-0.5	16.4	2.0	17.9
2465.10	-10.67	-11.40	-0.7	16.4	2.0	17.7
2465.15	-10.50	-11.50	-1.0	16.4	2.0	17.4
2465.20	-10.67	-11.60	-0.9	16.4	2.0	17.5
2465.25	-10.50	-11.60	-1.1	16.4	2.0	17.3
2465.30	-10.50	-11.70	-1.2	16.4	2.0	17.2
2465.35	-10.67	-11.60	-0.9	16.4	2.0	17.5
2465.40	-10.67	-11.50	-0.8	16.4	2.0	17.6
2465.45	-10.67	-11.50	-0.8	16.4	2.0	17.6
2465.50	-11.17	-11.10	0.1	16.4	2.0	18.5
2465.55	-11.17	-11.10	0.1	16.4	2.0	18.5
2465.60	-10.83	-10.70	0.1	16.4	2.0	18.5
2465.65	-11.33	-10.70	0.6	16.4	2.0	19.0
2465.70	-11.17	-10.50	0.7	16.4	2.0	19.1
2465.75	-11.33	-10.50	0.8	16.4	2.0	19.2
2465.80	-11.50	-10.70	0.8	16.4	2.0	19.2
2465.85	-12.17	-10.70	1.5	16.4	2.0	19.9
2465.90	-11.33	-10.70	0.6	16.4	2.0	19.0
2465.95	-11.50	-11.10	0.4	16.4	2.0	18.8
2466.00	-12.00	-11.10	0.9	16.4	2.0	19.3
2466.05	-11.33	-11.20	0.1	16.4	2.0	18.5
2466.10	-11.67	-11.10	0.6	16.4	2.0	19.0
2466.15	-11.67	-11.10	0.6	16.4	2.0	19.0
2466.20	-11.83	-11.10	0.7	16.4	2.0	19.1
2466.25	-11.67	-10.30	1.4	16.4	2.0	19.8
2466.30	-12.00	-12.20	-0.2	16.4	2.0	18.2
2466.35	-12.17	-10.00	2.2	16.4	2.0	20.6
2466.40	-12.83	-9.70	3.1	16.4	2.0	21.5
2466.45	-12.33	-9.70	2.6	16.4	2.0	21.0
2466.50	-12.33	-9.70	2.6	16.4	2.0	21.0
2466.55	-12.67	-9.60	3.1	16.4	2.0	21.5
2466.60	-12.67	-9.80	2.9	16.4	2.0	21.3
2466.65	-12.67	-10.10	2.6	16.4	2.0	21.0
2466.70	-12.83	-10.20	2.6	16.4	2.0	21.0
2466.75	-13.00	-10.20	2.8	16.4	2.0	21.2
2466.80	-13.00	-10.20	2.8	16.4	2.0	21.2
2466.85	-13.00	-10.20	2.8	16.4	2.0	21.2

2466.90	-13.33	-10.00	3.3	16.4	2.0	21.7
2466.95	-13.33	-9.90	3.4	16.4	2.0	21.8
2467.00	-13.30	-9.80	3.5	16.4	2.0	21.9