

***Electromagnetic Emissions Test Report  
and  
Request for Class II Permissive Change  
pursuant to  
FCC Part 15, Subpart C (15.247) DTS Specifications and  
Industry Canada RSS 210 Issue 5 for an  
Intentional Radiator on the  
Intel Corporation  
Model: WM3B2200BG***

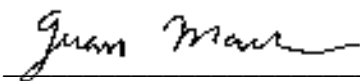
FCC ID: PD9WM3B2200BG  
UPN: 1000M-3B2200BG

GRANTEE: Intel Corporation  
13280 Evening Creek Drive  
San Diego, CA 92128

TEST SITE: Elliott Laboratories, Inc.  
684 W. Maude Avenue  
Sunnyvale, CA 94086

REPORT DATE: June 22, 2005

FINAL TEST DATE: May 23, 2005

AUTHORIZED SIGNATORY:   
Juan Martinez  
Senior EMC Engineer



2016-01

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**DECLARATIONS OF COMPLIANCE**

Equipment Name and Model:  
WM3B2200BG

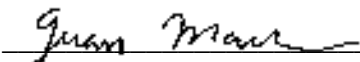
Manufacturer:  
Intel Corporation  
13280 Evening Creek Drive  
San Diego, CA 92128

Tested to applicable standards:  
RSS-210, Issue 5, November 2001 (Low Power License-Exempt Radiocommunication  
Devices)  
FCC Part 15.247 (DTS)

Measurement Facility Description Filed With Department of Industry:

Departmental Acknowledgement Number: IC 4549-5 Dated July 19, 2003

I declare that the testing was performed or supervised by me; that the test measurements were made in accordance with the above mentioned departmental standards (through the use of ANSI C63.4:2003 as detailed in section 5.3 of RSS-210, Issue 5); and that the equipment performed in accordance with the data submitted in this report.

Signature	
Name	Juan Martinez
Title	Senior EMC Engineer
Company	Elliott Laboratories Inc.
Address	684 W. Maude Ave Sunnyvale, CA 94086 USA

Date: June 22, 2005

Maintenance of compliance with the above standards is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

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**SCOPE**

An electromagnetic emissions test has been performed on the Intel Corporation 802.11abg model WM3B2200BG pursuant to Subpart C of Part 15 of FCC Rules for intentional radiators and RSS-210 Issue 5 for license-exempt low power devices. Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in ANSI C63.4:2003 as outlined in Elliott Laboratories test procedures.

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant FCC performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

The test results recorded herein are based on a single type test of the Intel Corporation model WM3B2200BG and therefore apply only to the tested sample. The sample was selected and prepared by Robert Paxman of Intel Corporation

**OBJECTIVE**

The primary objective of the manufacturer is compliance with Subpart C of Part 15 of FCC Rules and RSS-210 Issue 5 for license-exempt low power devices for the radiated and conducted emissions of intentional radiators. Certification of these devices is required as a prerequisite to marketing as defined in Part 2 the FCC Rules.

Certification is a procedure where the manufacturer or a contracted laboratory makes measurements and submits the test data and technical information to the FCC. The FCC issues a grant of equipment authorization upon successful completion of their review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units which are subsequently manufactured.

**SUMMARY OF RESULTS**

FCC Part 15 Section	RSS 210 Section	Description	Measured Value	Comments	Result
15.247(a)	6.2.2(o)(b)	Digital Modulation	Systems uses OFDM / DSSS techniques	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	6.2.2(o)(b)	6dB Bandwidth	N/A	Minimum allowed is 500kHz	N/A
	RSP 100	99% Bandwidth	N/A	For information only	N/A
15.247 (b) (3)	6.2.2(o)(b)	Output Power, 2400 - 2483.5 MHz	17 dBm (0.0501 Watts) EIRP = 0.0589 W	Multi-point applications: Maximum permitted is 1Watt, with EIRP limited to 4 Watts.	Complies
15.247(d)	6.2.2(o)(b)	Power Spectral Density	N/A	Maximum permitted is 8dBm/3kHz	N/A
15.247(c)	6.2.2(o)(e1)	Antenna Port Spurious Emissions – 30MHz – 25 GHz	N/A	All spurious emissions < -20dBc.	N/A
15.247(c) / 15.209		Radiated Spurious Emissions – 30MHz – 25 GHz	49.9 dBuV/m @ 2483.5 MHz (-4.1 dB)	Emissions in restricted bands must meet the radiated emissions limits detailed in 15.207. All others must be < -20dBc	Complies
15.207		AC Conducted Emissions	N/A		N/A
	6.6	AC Conducted Emissions	N/A		N/A
15.247 (b) (5)		RF Exposure Requirements	MPE Calculation		Complies
	7.3	Receiver Emissions	53.1 dBuV/m @ 3000 MHz (-0.9 dB)		Complies
15.203		RF Connector	Hirose connector (Antennas will be installed inside laptops)	Unique antenna connection required for user-installed applications.	Complies

EIRP calculated using antenna gain of dBi (.7) for the highest EIRP point-to-multipoint system.

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**MEASUREMENT UNCERTAINTIES**

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	$\pm 2.4$
Radiated Emissions	30 to 1000	$\pm 3.6$

**EQUIPMENT UNDER TEST (EUT) DETAILS****GENERAL**

The Intel Corporation model WM3B2200BG is a 802.11 b/g wireless that is designed to connect to PC. Normally, the EUT would be placed on a tabletop during operation. The EUT was, therefore, treated as tabletop equipment during testing to simulate the end-user environment. The EUT is powered via the PC.

The sample was received on May 23, 2005 and tested on May 23, 2005. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
Intel	WMB32200BG	802.11b/g card	B2C80C494BC 88305001	PD9WM3B2200BG

**ENCLOSURE**

The EUT does not have an enclosure as it is designed to be installed within the enclosure of a host computer.

**MODIFICATIONS**

The EUT did not require modifications during testing in order to comply with the emission specifications.

**SUPPORT EQUIPMENT**

The following equipment was used as local support equipment for emissions testing:

Manufacturer	Model	Description	Serial Number	FCC ID
Hewlett Packard	Pavilion a300n	Computer	MXK3391864	-
Hewlett Packard	M042KG	Mouse	030870136	-
Hewlett Packard	5183	Keyboard	BF3339165	E5XKB5183
Samsung	151S R	Monitor	GG15H4JTB04858E	-

No equipment was used as remote support equipment for emissions testing:



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**EUT INTERFACE PORTS**

The I/O cabling configuration during emissions testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length (m)
Main Ant	Antenna	Coax	Shielded	0.25

**EUT OPERATION DURING TESTING**

The EUT was transmitting continuously on either the low, 2412MHz, the middle, 2437MHz, or the high, 2462MHz.

**ANTENNA REQUIREMENTS**

The EUT antenna is an Tyco Electronics P/N 1770431.1 Gain = -1.02dBi

The EUT antenna is an Cotton antenna P/N: CP250925-03 Gain = .7 dBi

The antenna is integral to the device

**PROPOSED MODIFICATION DETAILS****GENERAL**

For details of the modifications being proposed to the Intel Corporation model WM3B2200BG, please refer to Intel Class II Permissive Change Letter.

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**TEST SITE****GENERAL INFORMATION**

Final test measurements were taken on May 23, 2005 at the Elliott Laboratories Anechoic Chamber #5 located at 41039 Boyce Road, Fremont, CA 94538-2435. The test site contains separate areas for radiated and conducted emissions testing. Pursuant to section 2.948 of the Rules, construction, calibration, and equipment data has been filed with the Federal Communications Commission. In accordance with Industry Canada rules detailed in RSS 210 Issue 5 and RSS-212, construction, calibration, and equipment data for the test sites have been filed with the Federal Communications Commission.

The FCC recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement with the exception of predictable local TV, radio, and mobile communications traffic. The test site contains separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent FCC requirements.

**CONDUCTED EMISSIONS CONSIDERATIONS**

Conducted emissions testing is performed in conformance with ANSI C63.4:2003. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

**RADIATED EMISSIONS CONSIDERATIONS**

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment. The test site is maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4:2003 guidelines.

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**MEASUREMENT INSTRUMENTATION****RECEIVER SYSTEM**

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz.

**INSTRUMENT CONTROL COMPUTER**

The receivers utilize either a Rohde and Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

**LINE IMPEDANCE STABILIZATION NETWORK (LISN)**

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

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**POWER METER**

A power meter and peak power sensor are used for all direct output power measurements from transmitters as they provide a broadband indication of the power output.

**FILTERS/ATTENUATORS**

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

**ANTENNAS**

A biconical antenna is used to cover the range from 30 MHz to 300 MHz and a log periodic antenna is utilized from 300 MHz to 1000 MHz. Narrowband tuned dipole antennas are used over the entire 30 to 1000 MHz range for precision measurements of field strength. Above 1000 MHz, a horn antenna is used. The antenna calibration factors are included in site factors programmed into the test receivers.

**ANTENNA MAST AND EQUIPMENT TURNTABLE**

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height.

ANSI C63.4:2003 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

**INSTRUMENT CALIBRATION**

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

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**TEST PROCEDURES****EUT AND CABLE PLACEMENT**

The FCC requires that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4:2003, and the worst case orientation is used for final measurements.

**CONDUCTED EMISSIONS**

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

**RADIATED EMISSIONS**

Radiated emissions measurements are performed in two phases as well. A preliminary scan of emissions is conducted in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed from 30 MHz up to the frequency required by the regulation specified on page 1. One or more of these is with the antenna polarized vertically while the one or more of these is with the antenna polarized horizontally. During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied and cable positions are varied to determine the highest emission relative to the limit.

A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth which results in the highest emission is then maintained while varying the antenna height from one to four meters. The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain. Emissions which have values close to the specification limit may also be measured with a tuned dipole antenna to determine compliance.

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**CONDUCTED EMISSIONS FROM ANTENNA PORT**

Direct measurements are performed with the antenna port of the EUT connected to either the power meter or spectrum analyzer via a suitable attenuator and/or filter. These are used to ensure that the front end of the measurement instrument is not overloaded by the fundamental transmission.

Measurement bandwidths (video and resolution) are set in accordance with FCC procedures for the type of radio being tested.

**SPECIFICATION LIMITS AND SAMPLE CALCULATIONS**

The limits for conducted emissions from the AC power port are given in units of microvolts, the limits for radiated electric field emissions are given in units of microvolts per meter at a specified test distance and the output power limits are given in terms of Watts, milliwatts or dBm. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp) the following formula is used to determine the field strength limit in terms of microvolts per meter at a distance of 3m from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{3} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

For reference, converting the voltage and electric field strength specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. Conversion of power specification limits from linear units (in milliwatts) to decibel form (in dBm) is accomplished by taking the base ten logarithm, then multiplying by 10.

**FCC 15.407 (a) and RSS 210 (o) OUTPUT POWER LIMITS**

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
902 – 928	1 Watts (30 dBm)	8 dBm/3kHz
2400 – 2483.5	1 Watts (30 dBm)	8 dBm/3kHz
5725 – 5850	1 Watts (30 dBm)	8 dBm/3kHz

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band are not subject to this restriction.

**RSS 210 (o) AND FCC 15.247 SPURIOUS RADIATED EMISSIONS LIMITS**

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands detailed in Part 15.205 and for all spurious emissions from the receiver are:

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level.

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**FCC 15.205 AC POWER PORT CONDUCTED EMISSIONS LIMITS**

The table below shows the limits for emissions on the AC power line as detailed in FCC Part 15.205.

Frequency (MHz)	Average Limit (dBuV)	Quasi Peak Limit (dBuV)
0.150 to 0.500	Linear decrease on logarithmic frequency axis between 56.0 and 46.0	Linear decrease on logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

**RSS-210 SECTION 6.6 AC POWER PORT CONDUCTED EMISSIONS LIMITS**

The table below shows the limits for emissions on the AC power line as detailed in Industry Canada RSS-210 section 6.6.

Frequency Range (MHz)	Limit (uV)	Limit (dBuV)
0.450 to 30.000	250	48



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SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - B = C$$

and

$$C - S = M$$

where:

$R_r$  = Receiver Reading in dBuV

B = Broadband Correction Factor\*

C = Corrected Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

\* Broadband Level - Per ANSI C63.4:2003 , 13 dB may be subtracted from the quasi-peak level if it is determined that the emission is broadband in nature. If the signal level in the average mode is six dB or more below the signal level in the peak mode, the emission is classified as broadband.

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SAMPLE CALCULATIONS - RADIATED EMISSIONS

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Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements. A distance factor, when used for electric field measurements, is calculated by using the following formula:

$$F_d = 20 * \text{LOG}_{10} (D_m/D_s)$$

where:

$$F_d = \text{Distance Factor in dB}$$

$$D_m = \text{Measurement Distance in meters}$$

$$D_s = \text{Specification Distance in meters}$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

$$R_r = \text{Receiver Reading in dBuV/m}$$

$$F_d = \text{Distance Factor in dB}$$

$$R_c = \text{Corrected Reading in dBuV/m}$$

$$L_s = \text{Specification Limit in dBuV/m}$$

$$M = \text{Margin in dB Relative to Spec}$$

## ***EXHIBIT 1: Test Equipment Calibration Data***

2 Pages

**Radiated Emissions, 1000 - 25,000MHz, 23-May-05****Engineer: Chris Byleckie**

<b><u>Manufacturer</u></b>	<b><u>Description</u></b>	<b><u>Model #</u></b>	<b><u>Asset #</u></b>	<b><u>Cal Due</u></b>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	18-Jan-06
Hewlett Packard	EMC Spectrum Analyzer 9KHz-26.5GHz, non programmable	8563E	284	22-Apr-06
EMCO	Horn Antenna, D. Ridge 1-18GHz	3115	868	20-Apr-06
Hewlett Packard	High Pass filter, 3.5GHz	P/N 84300-80038	1391	28-Apr-06
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1539	04-Apr-06
Rohde & Schwarz	Peak Power Sensor 100uW - 2 Watts	NRV-Z32	1423	01-Mar-06

**Radiated Emissions, 1000 - 25,000MHz, 9-July-05****Engineer:Jmartinez**

<b><u>Manufacturer</u></b>	<b><u>Description</u></b>	<b><u>Model #</u></b>	<b><u>Asset #</u></b>	<b><u>Cal Due</u></b>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	18-Jan-06
Hewlett Packard	EMC Spectrum Analyzer 9KHz-26.5GHz, non programmable	8563E	284	22-Apr-06
EMCO	Horn Antenna, D. Ridge 1-18GHz	3115	868	20-Apr-06
Hewlett Packard	High Pass filter, 3.5GHz	P/N 84300-80038	1391	28-Apr-06
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1539	04-Apr-06
Rohde & Schwarz	Peak Power Sensor 100uW - 2 Watts	NRV-Z32	1423	01-Mar-06

## ***EXHIBIT 2: Test Data Log Sheets***

### ***ELECTROMAGNETIC EMISSIONS***

#### ***TEST LOG SHEETS***

#### ***AND***

#### ***MEASUREMENT DATA***

T59854 13 Pages

T60371 13 Pages



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
		Account Manager:	
Contact:	Robert Paxman		
Emissions Spec:	FCC 15.247	Class:	
Immunity Spec:		Environment:	

## EMC Test Data

For The

**Intel**

Model

**WM3B2200BG Permissive Change**

Date of Last Test: 6/16/2005



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
		Account Manager:	
Contact:	Robert Paxman		
Emissions Spec:	FCC 15.247	Class:	
Immunity Spec:	Enter immunity spec on cover	Environment:	

### EUT INFORMATION

#### General Description

The WMB32200BG is a 802.11ab/g wireless that is designed to connect to PC. Normally, the EUT would be placed on a tabletop during operation. The EUT was, therefore, treated as tabletop equipment during testing to simulate the end-user environment. The EUT is powered via the PC.

#### Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Intel	WMB32200BG	802.11b/g card	B2C80C494BC88305001	PD9WM3B2200BG

#### Other EUT Details

IC ID: 1000M-3B2200BG

#### EUT Antenna

The EUT antenna is an Tyco Electronics P/N 1770431.1 Gain = -1.02dBi  
The antenna is integral to the device

#### EUT Enclosure

The EUT does not have an enclosure as it is designed to be installed within the enclosure of a host computer.

#### Modification History

Mod. #	Test	Date	Modification
1			
2			
3			

Modifications applied are assumed to be used on subsequent tests unless otherwise stated as a further modification.





## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
		Account Manager:	
Contact:	Robert Paxman		
Emissions Spec:	FCC 15.247	Class:	
Immunity Spec:	Enter immunity spec on cover	Environment:	

### Test Configuration #1

#### Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Hewlett Packard	Pavilion a300n	Computer	MXK3391864	-
Hewlett Packard	M042KG	Mouse	030870136	-
Hewlett Packard	5183	Keyboard	BF3339165	E5XKB5183
Samsung	151S R	Monitor	GG15H4JTB04858E	-

#### Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None				

#### Interface Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Main Ant	Antenna	Coax	Shielded	0.25

#### EUT Operation During Emissions Tests

The EUT was transmitting continuously on either the low, 2412MHz, the middle, 2437MHz, or the high, 2462MHz.



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
Contact:	Robert Paxman	Account Manager:	-
Spec:	FCC 15.247	Class:	N/A

### FCC 15.247 DTS - Spurious Emissions (802.11g)

#### Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 5/23/2005  
Test Engineer: Chris Byleckie  
Test Location: Fremont Chamber #5

Config. Used: 1  
Config Change: None  
Host Unit Voltage 120V/60Hz

#### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

**Ambient Conditions:**

Temperature:	19 °C
Rel. Humidity:	48 %

#### Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	RE, 1000 - 25000 MHz - Spurious Emissions In Restricted Bands	FCC Part 15.209 / 15.247( c)	Pass	47.4dBμV/m (234.4μV/m) @ 4924.3MHz (-6.6dB)
2	Output Power	15.247(b)	Pass	16dBm @ 2412MHz
3	Receiver Emissions	RSS-210	Pass	52.0dBμV/m (397.2μV/m) @ 3005.0MHz (-2.0dB)

#### Modifications Made During Testing:

No modifications were made to the EUT during testing

#### Deviations From The Standard

No deviations were made from the requirements of the standard.



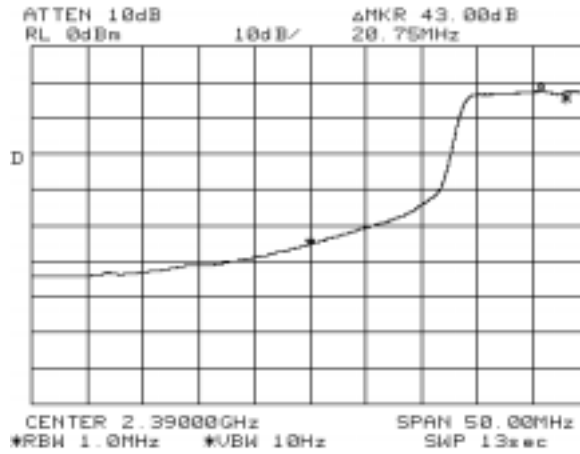
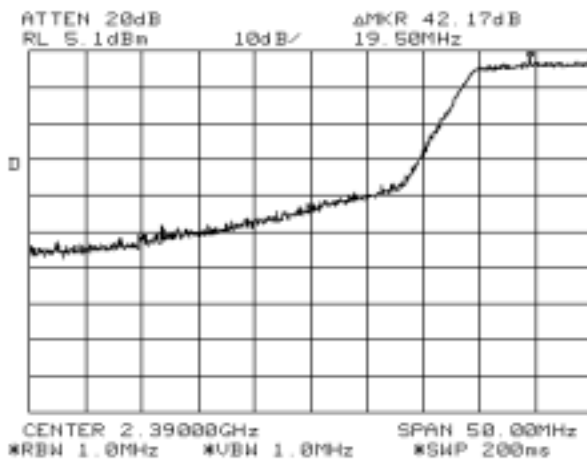
## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
Contact:	Robert Paxman	Account Manager:	-
Spec:	FCC 15.247	Class:	N/A

Run #1a: Radiated Spurious Emissions, 1000 - 25000 MHz. Low Channel @ 2412 MHz

Gain Setting - 23

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	97.3	98.5	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	88.3	88.9	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - Peak	42.2 dB		
Delta Marker - Average	43 dB		
Calculated Band-Edge Measurement:	56.3 dBuV/m		Peak
Calculated Band-Edge Measurement:	45.9 dBuV/m		Average



Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
4823.865	31.5	H	54.0	-22.5	AVG	162	1.0
4822.830	30.7	V	54.0	-23.3	AVG	-5	1.0
4823.865	42.8	H	74.0	-31.2	PK	162	1.0
4822.830	41.4	V	74.0	-32.6	PK	-5	1.0

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20 dB below the level of the fundamental.



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
Contact:	Robert Paxman	Account Manager:	-
Spec:	FCC 15.247	Class:	N/A

**Run #1b: Radiated Spurious Emissions, 1000 - 25000 MHz. Center Channel @ 2437 MHz**

**Gain Setting - 23**

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4875.135	31.2	H	54.0	-22.8	AVG	4	1.0	
4872.300	31.2	V	54.0	-22.9	AVG	-6	1.0	
7300.334	31.1	V	54.0	-22.9	AVG	-2	1.0	
7310.970	31.1	H	54.0	-23.0	AVG	3	1.0	
4875.135	43.4	H	74.0	-30.6	PK	4	1.0	
7300.334	42.8	V	74.0	-31.2	PK	-2	1.0	
4872.300	42.0	V	74.0	-32.0	PK	-6	1.0	
7310.970	41.6	H	74.0	-32.4	PK	3	1.0	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental.



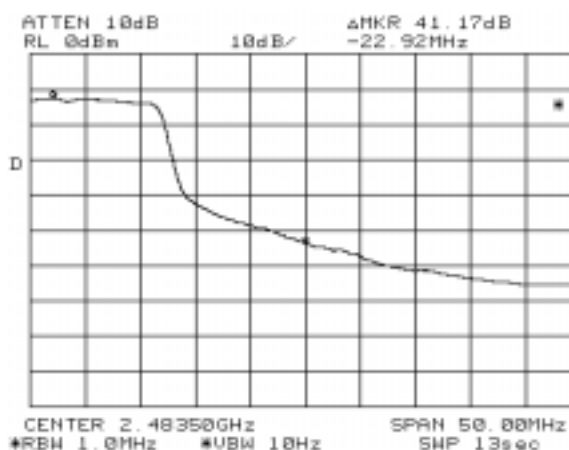
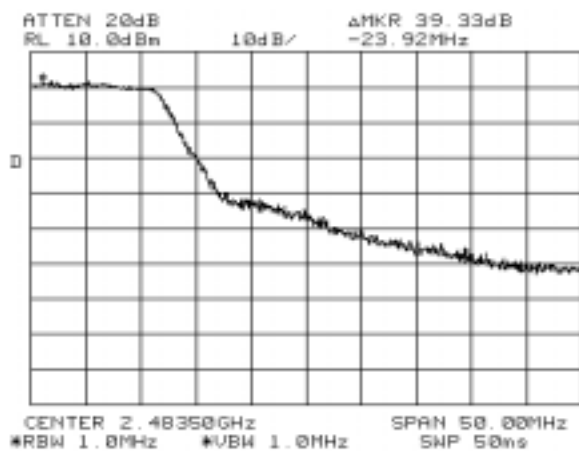
## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
Contact:	Robert Paxman	Account Manager:	-
Spec:	FCC 15.247	Class:	N/A

Run #1c: Radiated Spurious Emissions, 1000 - 25000 MHz. High Channel @ 2462 MHz

Gain Setting - 23

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	97.5	96.2	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	88.6	86.7	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - Peak	39.3 dB		
Delta Marker - Average	41.2 dB		
Calculated Band-Edge Measurement:	58.2 dBuV/m		Peak
Calculated Band-Edge Measurement:	47.4 dBuV/m		Average



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	PK/QP/Avg	degrees	meters	
4924.290	32.0	H	54.0	-22.0	AVG	4	1.0	#11 Fundamental x2
4923.515	32.0	V	54.0	-22.0	AVG	-3	1.0	#11 Fundamental x2
7387.130	31.2	H	54.0	-22.8	AVG	2	1.0	#11 Fundamental x3
7387.165	31.2	V	54.0	-22.8	AVG	-2	1.0	#11 Fundamental x3
4923.515	43.3	V	74.0	-30.8	PK	-3	1.0	#11 Fundamental x2
4924.290	42.6	H	74.0	-31.4	PK	4	1.0	#11 Fundamental x2
7387.165	42.5	V	74.0	-31.5	PK	-2	1.0	#11 Fundamental x3
7387.130	42.2	H	74.0	-31.8	PK	2	1.0	#11 Fundamental x3

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental.



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
Contact:	Robert Paxman	Account Manager:	-
Spec:	FCC 15.247	Class:	N/A

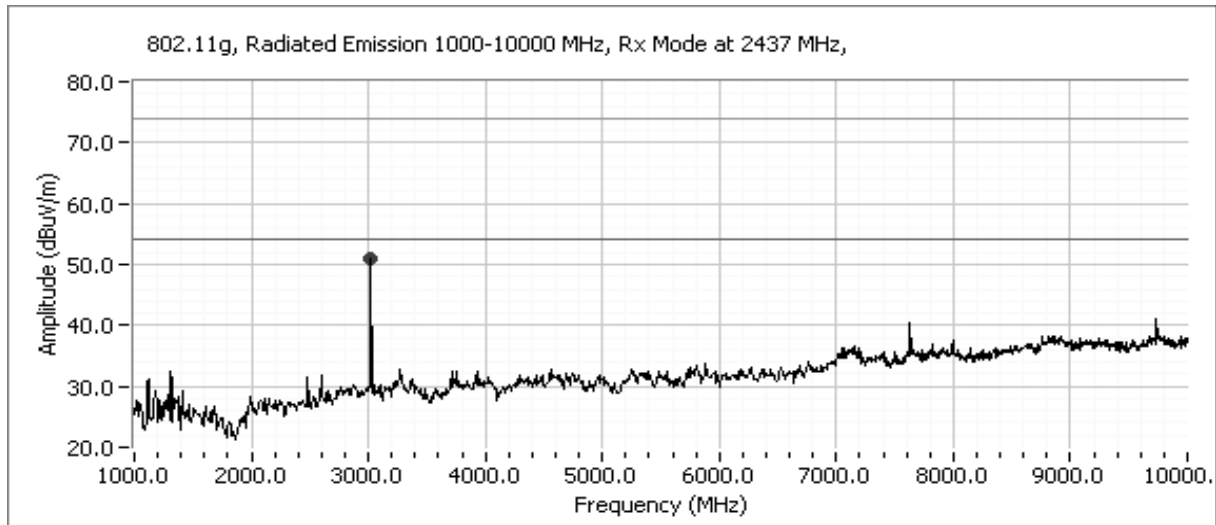
### Run #2: Output Power

Maximum antenna gain: -1.02 dBi

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	EIRP (W)
Low	2412	16.0	0.0398	0.0315
Mid	2437	16.0	0.0398	0.0398
High	2462	15.9	0.0389	0.0389

Note 1: Output power measured using a peak power meter

### Run #3: Radiated Emissions, 1000 - 10000 MHz. Rx Mode, Center Channel @ 2437 MHz



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3005.043	52.0	V	54.0	-2.0	AVG	4	1.0	
3005.043	53.3	V	74.0	-20.7	PK	4	1.0	



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
Contact:	Robert Paxman	Account Manager:	-
Spec:	FCC 15.247	Class:	N/A

### FCC 15.247 DTS - Spurious Emissions (802.11b)

#### Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 5/23/2005  
Test Engineer: Chris Byleckie  
Test Location: Fremont Chamber #5

Config. Used: 1  
Config Change: None  
Host Unit Voltage 120V/60Hz

#### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

**Ambient Conditions:**

Temperature:	19 °C
Rel. Humidity:	48 %

#### Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	RE, 1000 - 25000 MHz - Spurious Emissions In Restricted Bands	FCC Part 15.209 / 15.247( c)	Pass	49.9dBμ V/m (312.61μ V/m) @ 2483.5MHz (-4.1dB)
2	Output Power	15.247(b)	Pass	17dBm @ 2412MHz
3	Receiver Emissions	RSS-210	Pass	44.7dBμ V/m (171.0μ V/m) @ 3249.3MHz (-9.3dB)

#### Modifications Made During Testing:

No modifications were made to the EUT during testing

#### Deviations From The Standard

No deviations were made from the requirements of the standard.



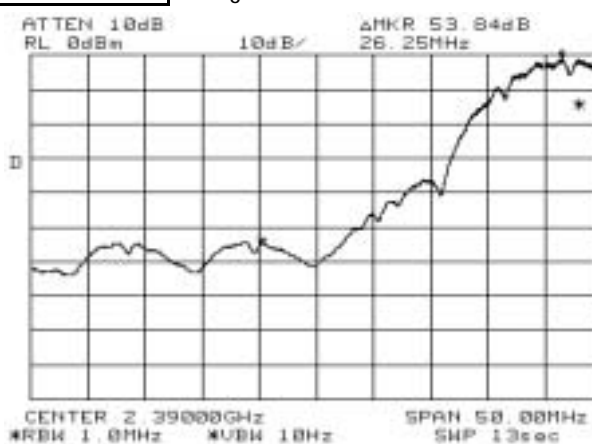
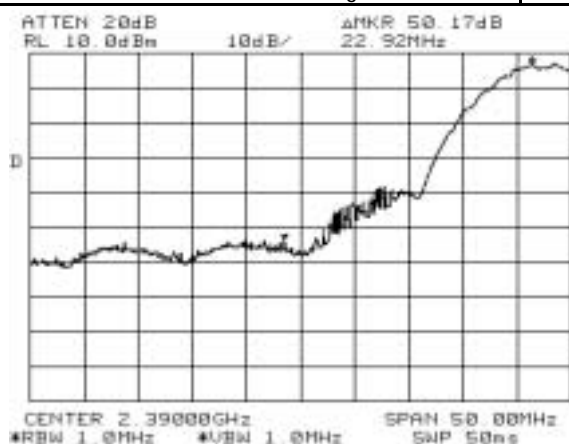
## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
Contact:	Robert Paxman	Account Manager:	-
Spec:	FCC 15.247	Class:	N/A

Run #1a: Radiated Spurious Emissions, 1000 - 25000 MHz. Low Channel @ 2412MHz

Gain Setting - 30

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	102.1	104.1	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	98.9	100.7	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - Peak	50.2 dB		
Delta Marker - Average	53.8 dB		
Calculated Band-Edge Measurement:	53.9 dBuV/m		Peak
Calculated Band-Edge Measurement:	46.9 dBuV/m		Average



Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
4823.965	48.6	H	54.0	-5.4	AVG	162	1.0
4823.920	42.3	V	54.0	-11.7	AVG	174	1.0
4823.965	51.7	H	74.0	-22.3	PK	162	1.0
4823.920	47.7	V	74.0	-26.3	PK	174	1.0

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20 dB below the level of the fundamental.





## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
Contact:	Robert Paxman	Account Manager:	-
Spec:	FCC 15.247	Class:	N/A

**Run #1b: Radiated Spurious Emissions, 1000 - 25000 MHz. Center Channel @ 2437 MHz**

**Gain Setting - 30**

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4873.965	46.5	H	54.0	-7.5	AVG	172	1.0	
4873.975	42.5	V	54.0	-11.5	AVG	125	1.0	
7312.315	34.0	H	54.0	-20.0	AVG	192	1.0	
7309.715	32.4	V	54.0	-21.6	AVG	148	1.0	
4873.965	51.6	H	74.0	-22.4	PK	172	1.0	
4873.975	47.9	V	74.0	-26.1	PK	125	1.0	
7312.315	43.7	H	74.0	-30.3	PK	192	1.0	
7309.715	42.7	V	74.0	-31.4	PK	148	1.0	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20 dB below the level of the fundamental.



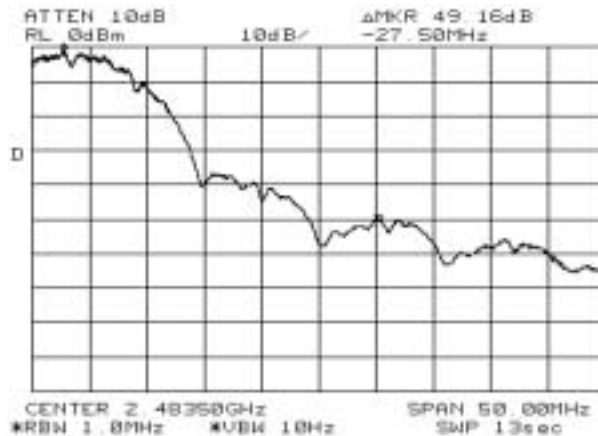
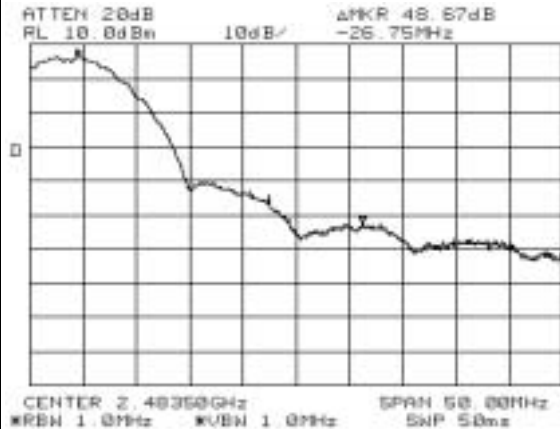
## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
Contact:	Robert Paxman	Account Manager:	-
Spec:	FCC 15.247	Class:	N/A

### Run #1c: Radiated Spurious Emissions, 1000 - 25000 MHz. High Channel @ 2462 MHz

#### Gain Setting - 30

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	98.7	102.4	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	95.5	99.1	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - Peak	48.7 dB		
Delta Marker - Average	49.2 dB		
Calculated Band-Edge Measurement:	53.7 dBuV/m		Peak
Calculated Band-Edge Measurement:	49.9 dBuV/m		Average



Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
4923.925	47.8	H	54.0	-6.2	AVG	158	1.0
4924.000	44.1	V	54.0	-9.9	AVG	121	1.6
7387.117	34.5	V	54.0	-19.5	AVG	132	1.0
7385.045	33.1	H	54.0	-21.0	AVG	191	1.0
4923.925	51.5	H	74.0	-22.5	PK	158	1.0
4924.000	48.6	V	74.0	-25.4	PK	121	1.6
7387.117	44.4	V	74.0	-29.6	PK	132	1.0
7385.045	43.7	H	74.0	-30.3	PK	191	1.0

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20 dB below the level of the fundamental.



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change	T-Log Number:	T59854
Contact:	Robert Paxman	Account Manager:	-
Spec:	FCC 15.247	Class:	N/A

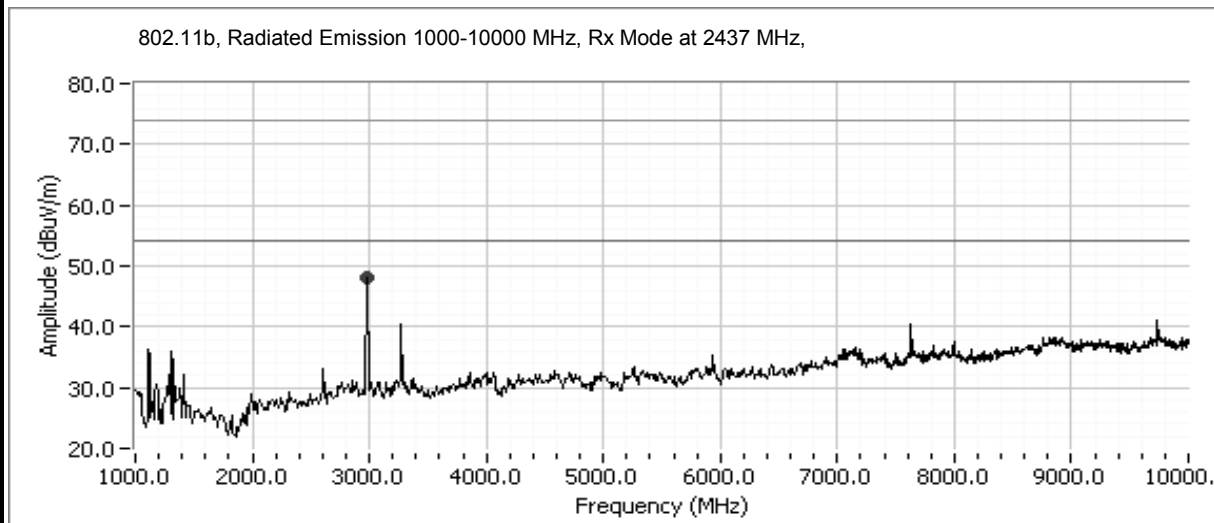
### Run #2: Output Power

Maximum antenna gain: -1.02 dBi

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	EIRP (W)
Low	2412	17.0	0.0501	0.0396
Mid	2437	17.0	0.0501	0.0501
High	2462	17.0	0.0501	0.0501

Note 1: Output power measured using a peak power meter

### Run #3: Radiated Emissions, 1000 - 10000 MHz. Rx Mode, Center Channel @ 2437 MHz



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3249.264	44.7	H	54.0	-9.3	AVG	166	1.1	
3249.264	47.4	H	74.0	-26.6	PK	166	1.1	



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Emissions Spec:	FCC 15.247	Class:	Radio
Immunity Spec:		Environment:	

## EMC Test Data

For The

**Intel**

Model

**WM3B2200BG Permissive Change w/  
Cotton antenna**

Date of Last Test: 7/9/2005



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Emissions Spec:	FCC 15.247	Class:	Radio
Immunity Spec:	Enter immunity spec on cover	Environment:	

### EUT INFORMATION

#### General Description

The WMB32200BG is a 802.11ab/g wireless that is designed to connect to PC. Normally, the EUT would be placed on a tabletop during operation. The EUT was, therefore, treated as tabletop equipment during testing to simulate the end-user environment. The EUT is powered via the PC.

#### Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Intel	WMB32200BG	802.11b/g card	B2C80C494BC88305001	PD9WM3B2200BG

#### Other EUT Details

IC ID: 1000M-3B2200BG

#### EUT Antenna

The EUT antenna is an Cotton antenna P/N: CP250925-03 Gain = .7 dBi  
The antenna is integral to the device

#### EUT Enclosure

The EUT does not have an enclosure as it is designed to be installed within the enclosure of a host computer.

#### Modification History

Mod. #	Test	Date	Modification
1			
2			
3			

Modifications applied are assumed to be used on subsequent tests unless otherwise stated as a further modification.



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/	T-Log Number:	T60371
	Cotton antenna	Account Manager:	Nesha Lambert
Contact:	Robert Paxman		
Emissions Spec:	FCC 15.247	Class:	Radio
Immunity Spec:	Enter immunity spec on cover	Environment:	

### Test Configuration #1

#### Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Hewlett Packard	Pavilion a300n	Computer	MXK3391864	-
Hewlett Packard	M042KG	Mouse	030870136	-
Hewlett Packard	5183	Keyboard	BF3339165	E5XKB5183
Samsung	151S R	Monitor	GG15H4JTB04858E	-

#### Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None				

#### Interface Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Main Ant	Antenna	Coax	Shielded	0.25

#### EUT Operation During Emissions Tests

The EUT was transmitting continuously on either the low, 2412MHz, the middle, 2437MHz, or the high, 2462MHz.



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Spec:	FCC 15.247	Class:	N/A

### FCC 15.247 DTS - Spurious Emissions (802.11g)

#### Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 7/9/2005  
Test Engineer: Jmartinez  
Test Location: Fremont Chamber #5

Config. Used: 1  
Config Change: None  
Host Unit Voltage 120V/60Hz

#### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

**Ambient Conditions:**

Temperature:	18 °C
Rel. Humidity:	48 %

#### Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	RE, 1000 - 25000 MHz - Spurious Emissions In Restricted Bands	FCC Part 15.209 / 15.247( c)	Pass	48.8dBμ V/m @ 2390MHz (-5.2dB)
2	Output Power	15.247(b)	Pass	16dBm @ 2412MHz
3	Receiver Emissions	RSS-210	Pass	43.2dBμ V/m (144.5μ V/m) @ 3249.3MHz (-10.8dB)

#### Modifications Made During Testing:

No modifications were made to the EUT during testing

#### Deviations From The Standard

No deviations were made from the requirements of the standard.



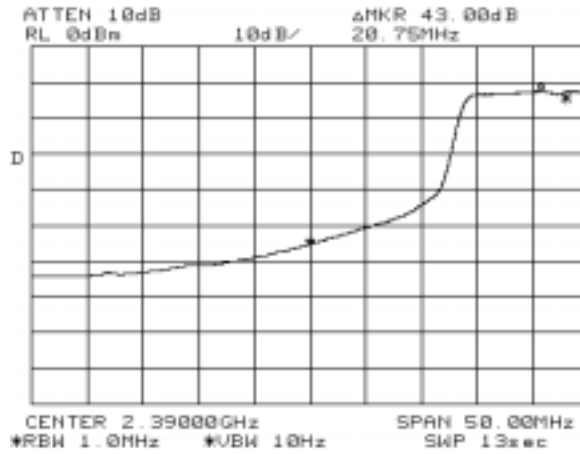
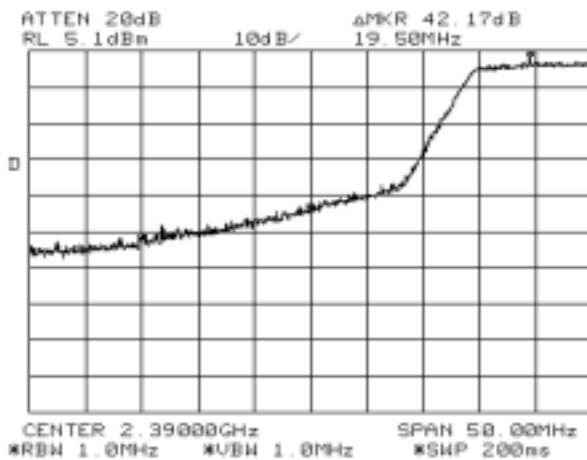
## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Spec:	FCC 15.247	Class:	N/A

Run #1a: Radiated Spurious Emissions, 1000 - 25000 MHz. Low Channel @ 2412 MHz

Gain Setting - 23

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	104	102.35	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	91.76	90.1	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - Peak	42.2 dB		
Delta Marker - Average	43 dB		
Calculated Band-Edge Measurement:	61.8 dBuV/m		Peak
Calculated Band-Edge Measurement:	48.76 dBuV/m		Average



Frequency	Level	Pol	15.209 / 15.247	Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters
2968.946	47.3	V	54.0	-6.7	AVG	0	1.0
2968.946	49.3	V	74.0	-24.7	PK	0	1.0
4822.625	27.1	V	54.0	-26.9	AVG	110	1.0
4822.625	37.9	V	74.0	-36.1	PK	110	1.0
4825.005	27.1	H	54.0	-26.9	AVG	253	1.0
4825.005	38.6	H	74.0	-35.4	PK	253	1.0
2970.341	26.1	H	54.0	-27.9	AVG	41	1.0
2970.341	37.2	H	74.0	-36.8	PK	41	1.0

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20 dB below the level of the fundamental.





## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Spec:	FCC 15.247	Class:	N/A

### Run #1b: Radiated Spurious Emissions, 1000 - 25000 MHz. Center Channel @ 2437 MHz

#### Gain Setting - 23

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2233.294	43.7	V	54.0	-10.3	AVG	255	1.0	Restricted
2233.294	49.5	V	74.0	-24.5	PK	255	1.0	Restricted
4874.625	26.6	V	54.0	-27.4	AVG	140	1.0	Restricted
4874.625	37.6	V	74.0	-36.4	PK	140	1.0	Restricted
4874.050	26.5	H	54.0	-27.5	AVG	0	1.0	Restricted
4874.050	38.0	H	74.0	-36.0	PK	0	1.0	Restricted
2233.344	42.5	H	54.0	-11.5	AVG	215	1.0	Restricted
2233.344	48.8	H	74.0	-25.2	PK	215	1.0	Restricted

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental.



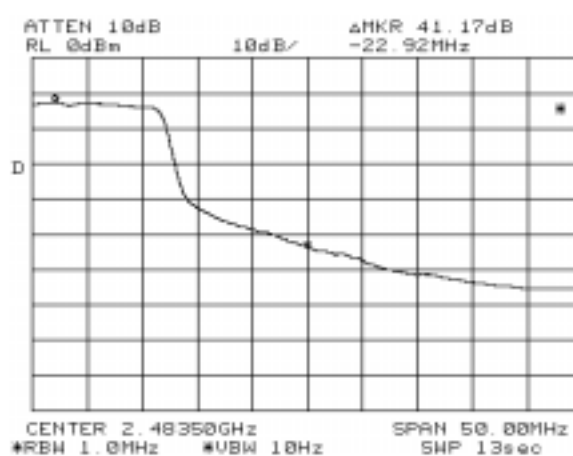
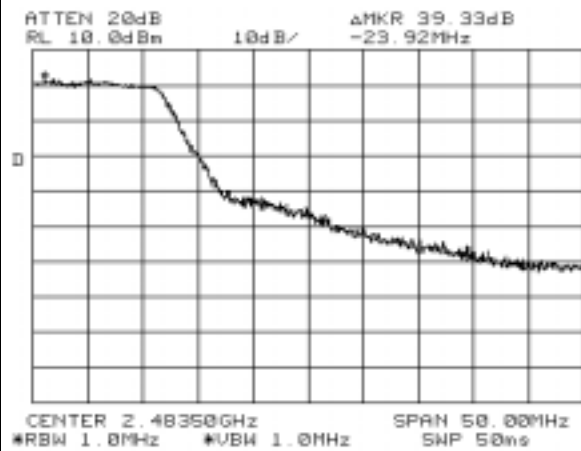
## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Spec:	FCC 15.247	Class:	N/A

Run #1c: Radiated Spurious Emissions, 1000 - 25000 MHz. High Channel @ 2462 MHz

Gain Setting - 23

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	100.2	98.78	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	88.52	86.59	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - Peak	39.3 dB		
Delta Marker - Average	41.2 dB		
Calculated Band-Edge Measurement:	60.9 dBuV/m		Peak
Calculated Band-Edge Measurement:	47.32 dBuV/m		Average



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2962.864	48.3	V	80.0	-31.7	PK	359	1.0	
4922.745	27.3	V	54.0	-26.7	AVG	136	1.0	
4922.745	38.4	V	74.0	-35.6	PK	136	1.0	
4924.020	27.3	H	54.0	-26.8	AVG	211	1.0	
4924.020	38.2	H	74.0	-35.9	PK	211	1.0	

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20dB below the level of the fundamental.



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Spec:	FCC 15.247	Class:	N/A

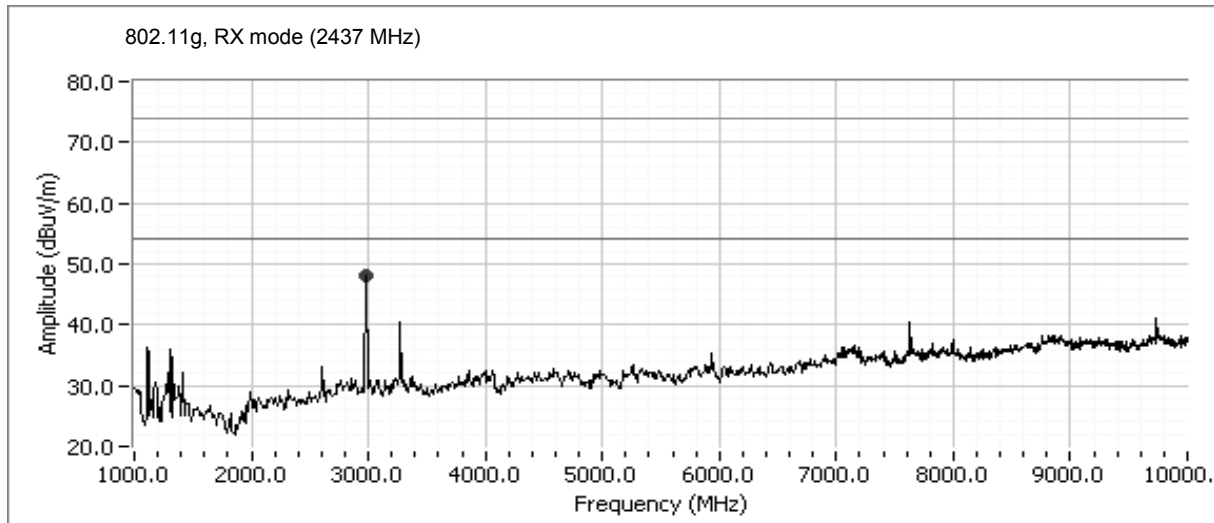
### Run #2: Output Power

Maximum antenna gain: 0.7 dBi

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	EIRP (W)
Low	2412	16.0	0.0398	0.0468
Mid	2437	16.0	0.0398	0.0468
High	2462	15.9	0.0389	0.0457

Note 1: Output power measured using a peak power meter

### Run #3: Radiated Emissions, 1000 - 10000 MHz. Rx Mode, Center Channel @ 2437 MHz



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3249.264	43.2	H	54.0	-10.8	AVG	200	1.0	
3249.264	46.5	H	74.0	-27.5	PK	200	1.0	



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Spec:	FCC 15.247	Class:	N/A

### FCC 15.247 DTS - Spurious Emissions (802.11b)

#### Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 7/9/2005

Config. Used: 1

Test Engineer: Jmartinez

Config Change: None

Test Location: Fremont Chamber #5

Host Unit Voltage 120V/60Hz

#### General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

**Ambient Conditions:**  
Temperature: 18 °C  
Rel. Humidity: 48 %

#### Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	RE, 1000 - 25000 MHz - Spurious Emissions In Restricted Bands	FCC Part 15.209 / 15.247( c)	Pass	47.7 dBuV/m @ 2483.5 MHz (-6.4dB)
2	Output Power	15.247(b)	Pass	17dBm @ 2412MHz
3	Receiver Emissions	RSS-210	Pass	53.1dBμ V/m (451.9μ V/m) @ 3000.0MHz (-0.9dB)

#### Modifications Made During Testing:

No modifications were made to the EUT during testing

#### Deviations From The Standard

No deviations were made from the requirements of the standard.



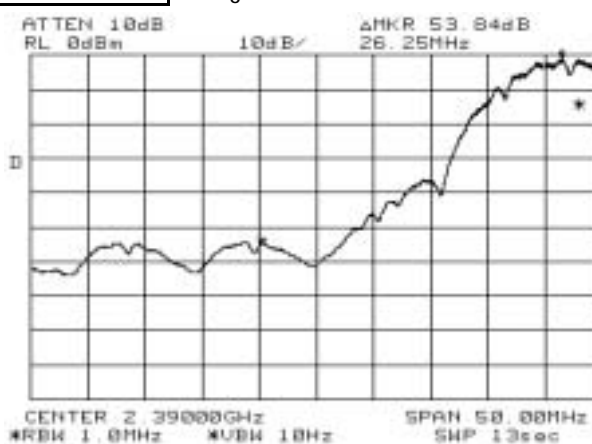
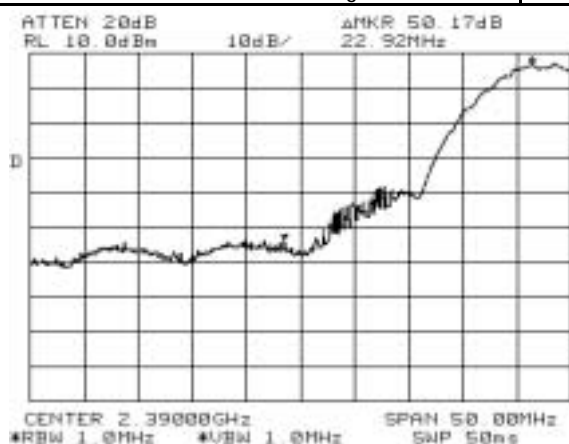
## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Spec:	FCC 15.247	Class:	N/A

Run #1a: Radiated Spurious Emissions, 1000 - 25000 MHz. Low Channel @ 2412MHz

Gain Setting - 30

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	106.36	104.26	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	99.47	97.3	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - Peak	50.2 dB		
Delta Marker - Average	53.8 dB		
Calculated Band-Edge Measurement:	56.16 dBuV/m		Peak
Calculated Band-Edge Measurement:	45.67 dBuV/m		Average



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4823.917	37.4	V	54.0	-16.6	AVG	324	1.0	Restricted
4823.917	43.7	V	74.0	-30.3	PK	324	1.0	Restricted
9647.938	56.2	V	86.0	-29.8	AVG	266	1.0	Non-Restricted
2210.626	38.0	V	54.0	-16.1	AVG	255	1.0	Restricted
2210.626	44.1	V	74.0	-29.9	PK	255	1.0	Restricted
3005.042	38.3	V	86.0	-47.7	PK	232	1.0	Non-Restricted
3216.050	42.5	V	86.0	-43.5	PK	270	1.0	Non-Restricted
4824.042	42.9	H	54.0	-11.1	AVG	140	1.2	Restricted
4824.042	46.5	H	74.0	-27.5	PK	140	1.2	Restricted
9647.938	59.4	H	86.0	-26.6	PK	304	1.0	Non-Restricted
2210.711	34.6	H	54.0	-19.4	AVG	239	1.0	Restricted
2210.711	41.7	H	74.0	-32.3	PK	239	1.0	Restricted
3005.942	37.9	H	86.0	-48.1	PK	147	1.0	Non-Restricted
3216.165	42.2	H	86.0	-43.8	PK	124	1.0	Non-Restricted

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20 dB below the level of the fundamental.



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Spec:	FCC 15.247	Class:	N/A

### Run #1b: Radiated Spurious Emissions, 1000 - 25000 MHz. Center Channel @ 2437 MHz

#### Gain Setting - 30

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB $\mu$ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4873.957	36.8	V	54.0	-17.3	AVG	319	1.0	Restricted
4873.957	42.9	V	74.0	-31.1	PK	319	1.0	Restricted
9747.914	59.7	V	85.0	-25.3	PK	314	1.1	Non-Restricted
2173.900	45.1	V	85.0	-39.9	PK	285	1.0	Non-Restricted
3342.976	39.0	V	85.0	-46.0	PK	128	1.0	Non-Restricted
4874.067	41.2	H	54.0	-12.8	AVG	142	1.1	Restricted
4874.067	45.0	H	74.0	-29.0	PK	142	1.1	Restricted
9747.894	58.7	H	85.0	-26.3	PK	332	1.0	Non-Restricted
2173.930	44.5	H	85.0	-40.5	PK	217	1.0	Non-Restricted
3341.085	39.1	H	85.0	-45.9	PK	78	1.0	Non-Restricted

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20 dB below the level of the fundamental.



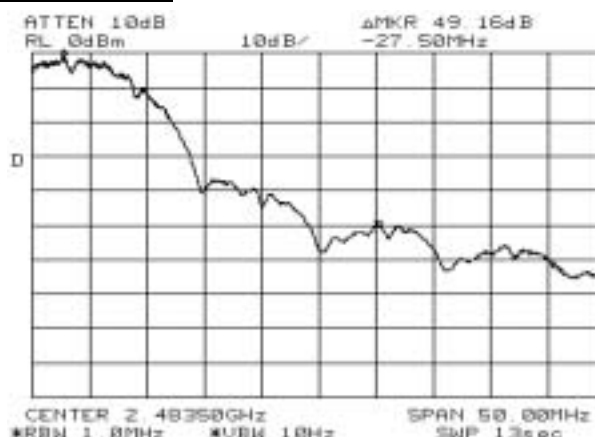
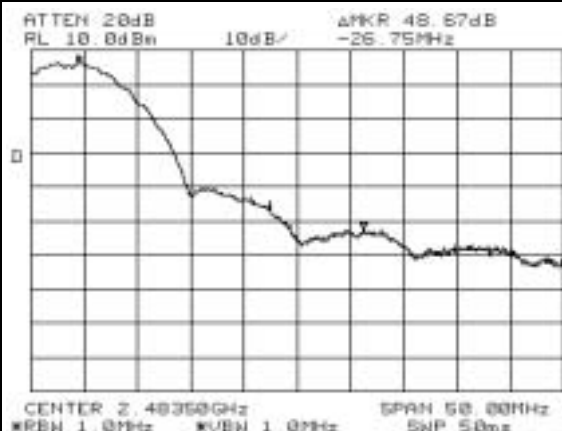
## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Spec:	FCC 15.247	Class:	N/A

### Run #1c: Radiated Spurious Emissions, 1000 - 25000 MHz. High Channel @ 2462 MHz

#### Gain Setting - 30

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.75	101.96	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	96.85	94.88	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - Peak	48.7 dB		
Delta Marker - Average	49.2 dB		
Calculated Band-Edge Measurement:	55.05 dBuV/m		Peak
Calculated Band-Edge Measurement:	47.65 dBuV/m		Average



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3124.309	37.8	V	83.0	-45.2	PK	1	1.0	Non-restricted
3282.591	42.6	V	83.0	-40.4	PK	271	1.0	Non-restricted
2198.671	43.9	V	83.0	-39.2	PK	256	1.0	Non-restricted
4924.017	38.0	V	54.0	-16.0	AVG	320	1.0	Restricted
4924.017	43.7	V	74.0	-30.4	PK	320	1.0	Restricted
9847.889	60.0	V	83.0	-23.0	PK	278	1.1	Non-restricted
3124.014	37.0	H	83.0	-46.0	PK	0	1.0	Non-restricted
3282.716	44.4	H	83.0	-38.6	PK	198	1.1	Non-restricted
2197.386	43.3	H	83.0	-39.7	PK	215	1.0	Non-restricted
4924.027	39.2	H	54.0	-14.8	AVG	138	1.0	Restricted
4924.027	43.9	H	74.0	-30.1	PK	138	1.0	Restricted
9847.908	60.4	H	83.0	-22.6	PK	318	1.0	Non-restricted

Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 20 dB below the level of the fundamental.



## EMC Test Data

Client:	Intel	Job Number:	J59825
Model:	WM3B2200BG Permissive Change w/ Cotton antenna	T-Log Number:	T60371
Contact:	Robert Paxman	Account Manager:	Nesha Lambert
Spec:	FCC 15.247	Class:	N/A

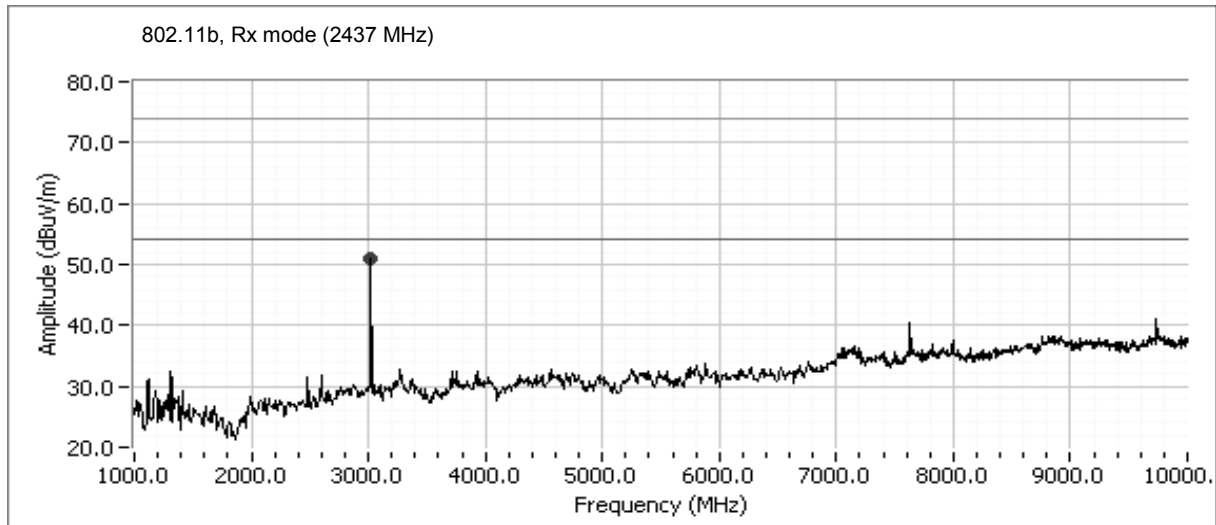
### Run #2: Output Power

Maximum antenna gain: 0.7 dBi

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	EIRP (W)
Low	2412	17.0	0.0501	0.0589
Mid	2437	17.0	0.0501	0.0589
High	2462	17.0	0.0501	0.0589

Note 1: Output power measured using a peak power meter

### Run #3: Radiated Emissions, 1000 - 10000 MHz. Rx Mode, Center Channel @ 2437 MHz



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.000	53.1	V	54.0	-0.9	AVG	150	1.0	
3000.000	54.2	V	74.0	-19.8	PK	150	1.0	



### ***EXHIBIT 3: Test Configuration Photographs***

2 Pages

***EXHIBIT 4: Proposed FCC ID Label & Label Location***

Unchanged from original application

***EXHIBIT 5: Detailed Photographs  
of Intel Corporation Model WM3B2200BG/WM3B2915ABG Construction***

Unchanged from original application

***EXHIBIT 6: Operator's Manual***  
***for Intel Corporation Model WM3B2200BG/WM3B2915ABG***

Unchanged from original application

***EXHIBIT 7: Block Diagram***  
***of Intel Corporation Model WM3B2200BG/WM3B2915ABG***

Unchanged from original application

***EXHIBIT 8: Schematic Diagrams***  
***for Intel Corporation Model WM3B2200BG/WM3B2915ABG***

Unchanged from original application

***EXHIBIT 9: Theory of Operation***  
***for Intel Corporation Model WM3B2200BG/WM3B2915ABG***

Unchanged from original application

## ***EXHIBIT 10: Advertising Literature***

Unchanged from original application



## ***EXHIBIT 11: RF Exposure Information***

ASUSA7VW 18 Pages  
Cotton Antenna Info 11 Pages  
MPE 2 Pages