FCC CFR47 PART 27 SUBPART M
CLASS II PERMISSIVE CHANGE

CERTIFICATION TEST REPORT

FOR

Intel® Centrino® Advanced-N + WiMAX 6250

FCC MODEL NUMBER: 622ANXHMW

FCC ID: PD9622ANXHU

REPORT NUMBER: 09U12989-1

ISSUE DATE: JANUARY 13, 2010

Prepared for
INTEL CORPORATION
2111 N. E. 25TH AVENUE
HILLSBORO, OR 97124, U.S.A.

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	01/13/10	Initial Issue	T. Chan

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: INTEL CORPORATION
2111 N. E. 25TH AVENUE
HILLSBORO, OR 97124, U.S.A.

EUT DESCRIPTION: Intel® Centrino® Advanced-N + WiMAX 6250

FCC MODEL: 622ANXHMW

SERIAL NUMBER: 11S60Y3194

DATE TESTED: JANUARY 04 - 07, 2010

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 27 SUBPART M	PASS

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

THU CHAN
EMC MANAGER
COMPLIANCE CERTIFICATION SERVICES

Tested By:

CHIN PANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603C (2004), FCC CFR 47 Part 2, and FCC CFR 47 Part 27M.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a 2x2 WLAN 802.11 a/b/g/n Intel® Centrino® Advanced-N + 1x2 WiMAX 6250 card installed inside Lenovo Mauna Kea netbook.

The radio module is manufactured by Intel Corporation.

5.2. MAXIMUM OUTPUT POWER

The test measurement passed within ± 0.5dBm of the original output power.

5.3. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application is adding Lenovo Mauna Kea netbook.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna, with a maximum gain of 1.8 dBi.

5.5. SOFTWARE AND FIRMWARE

The test utility software used during testing was Intel WiMAX VaTU version 5.2.20

5.6. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

There were two different Wimax modulations: QPSK and 16QAM with 5MHz and 10MHz bandwidths, To determine the worst case, conducted power were measured on all modulations, as a results, 16QAM was determined to be the worst case.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	FL3-C2	1S3508XXXXLRLN319	DoC
AC adapter	Lenovo	42T4416	11S42T4415Z1ZF3A9B3B48	DoC
Vector Signal Generator	Agilent	E4438C	US44271909	DoC

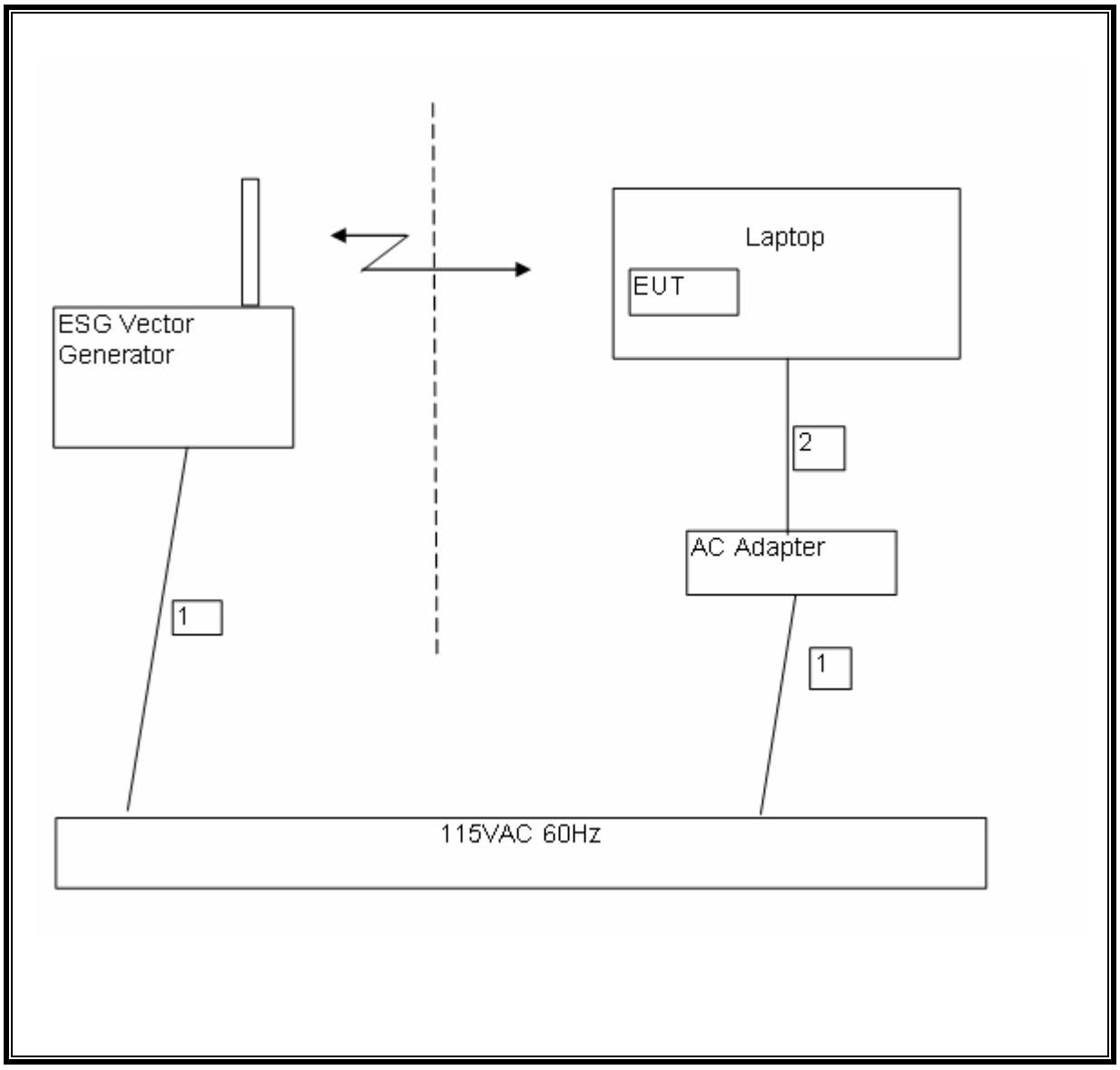
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identica Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	2	AC	Un-Shielded	1.8m	N/A
2	DC	1	DC	Un-Shielded	1m	N/A

TEST SETUP

The EUT is installed inside a host laptop computer during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	02/04/10
Antenna, Horn, 18 GHz	EMCO	3115	C00783	01/29/10
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/31/10
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00778	01/16/10
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	01/14/10
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11/06/10
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	05/06/11
Peak Power Meter	Boonton	4541	C01186	01/19/10
Peak Power Sensor	Boonton	57318	NA	02/02/10
Vector signal generator, 6 GHz	Agilent / HP	E4438C	NA	09/28/11
Highpass Filter, 4.0 GHz	Micro-Tronics	HPM13351	N02708	CNR

7. LIMITS AND RESULTS

7.1. OUTPUT POWER VERIFICATION

The max average conducted output power is measured for the uplink durst in the difference modulation and channel bandwidth. Conducted average output power were measured with the module connected to the test jig with over-to-air communication link to Vector Signal generator.

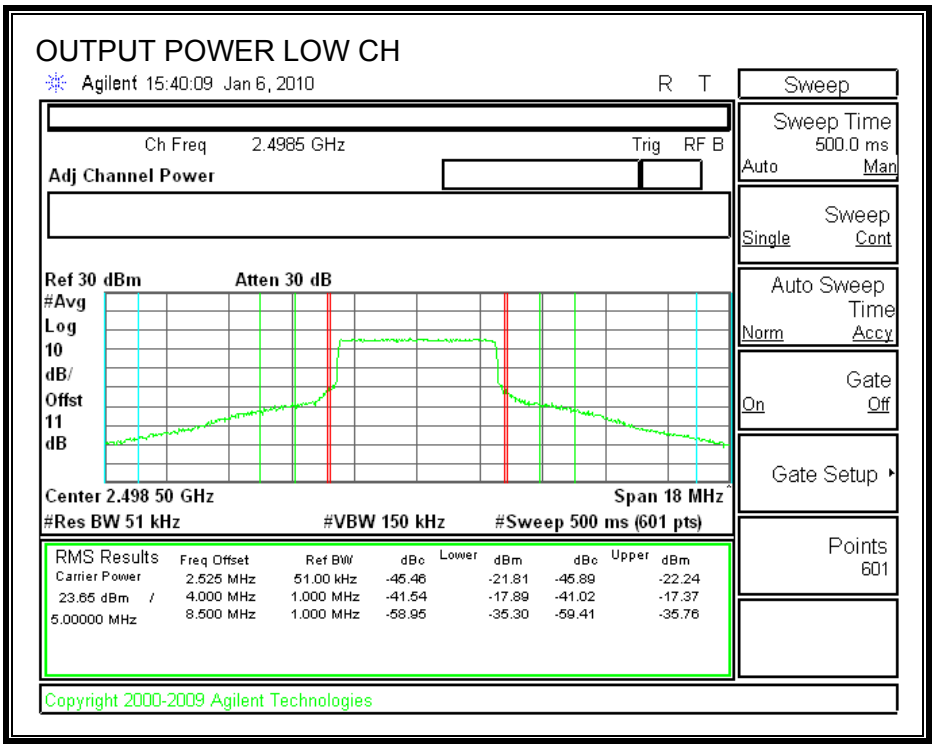
The EUT driver software installed in the host support equipment during testing was WiMAX VaTU, version 5.2.20

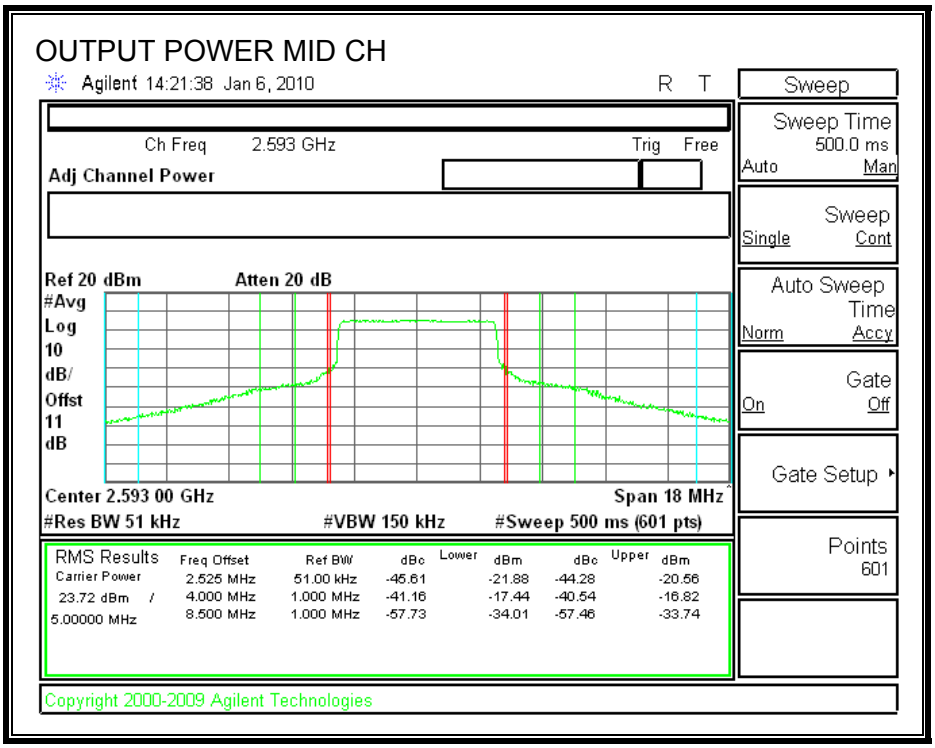
The modes with highest output power channel were chosen for the conducted output power measurement.

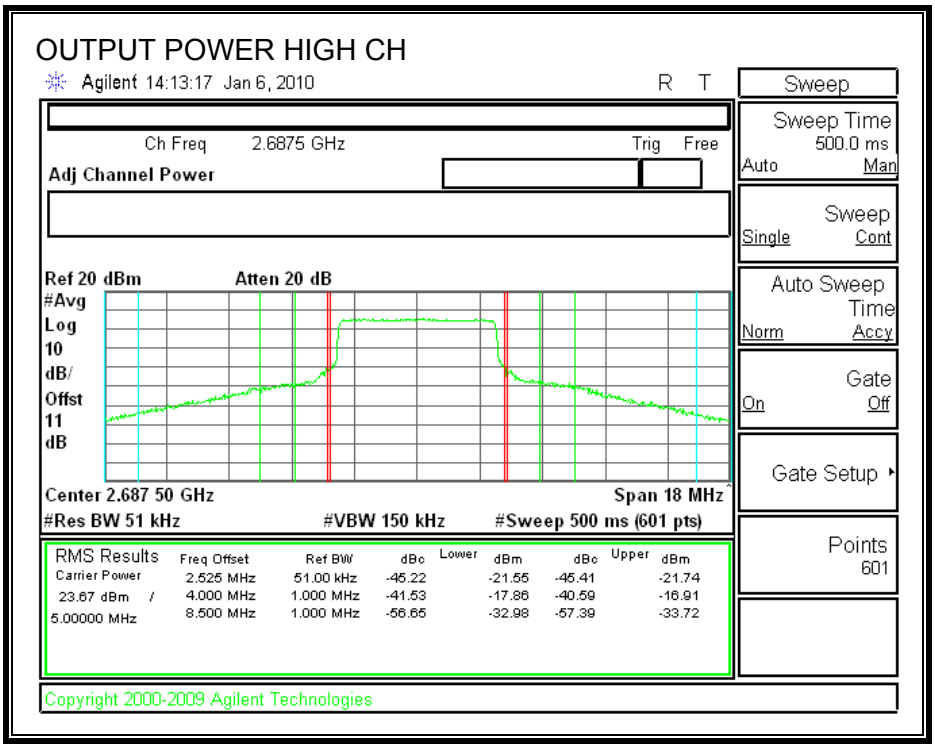
Mode	Test Vector file name	Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mW)
5MHz QPSK	DQ64_56_UQ4_12_5M	Low	2498.5	23.65	231.74
		Middle	2593	23.72	235.50
		High	2687.5	23.67	232.81
5MHz 16QAM	DQ4_12_UQ16_34_5M	Low	2498.5	23.76	237.68
		Middle	2593	24.05	254.10
		High	2687.5	23.74	236.59
10MHz QPSK	DQ64_UQ4_12_21S_10M	Low	2501	23.47	222.33
		Middle	2593	23.38	217.77
		High	2685	23.35	216.27
10MHz 16QAM	DQ4_12_UQ16_12_10M	Low	2501	23.58	228.03
		Middle	2593	23.62	230.14
		High	2685	23.57	227.51

OUTPUT POWER

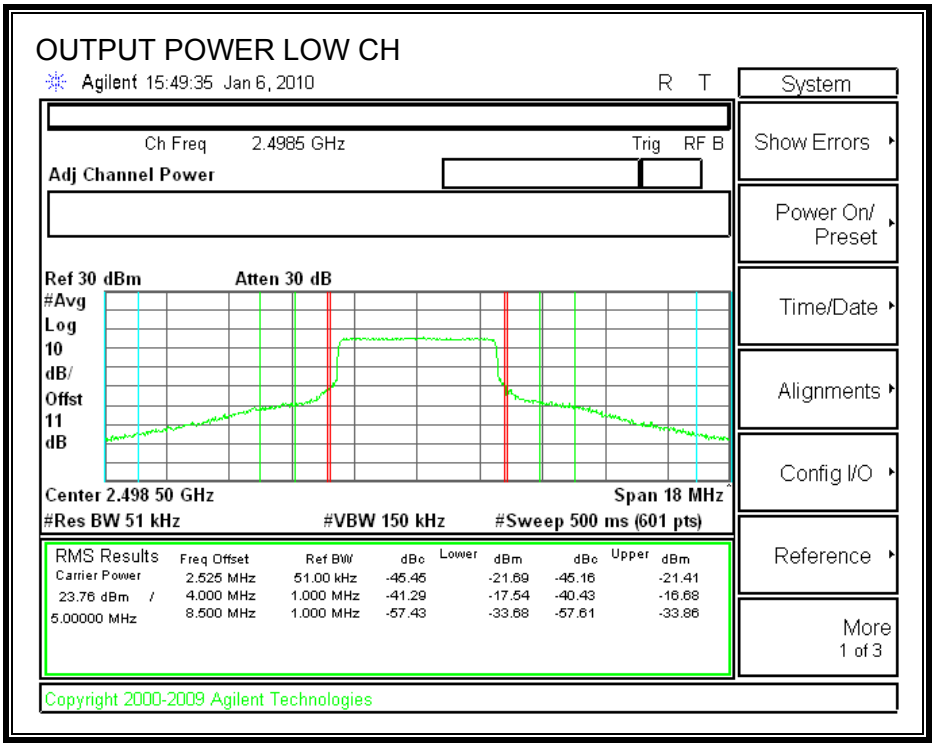
5MHz_QPSK

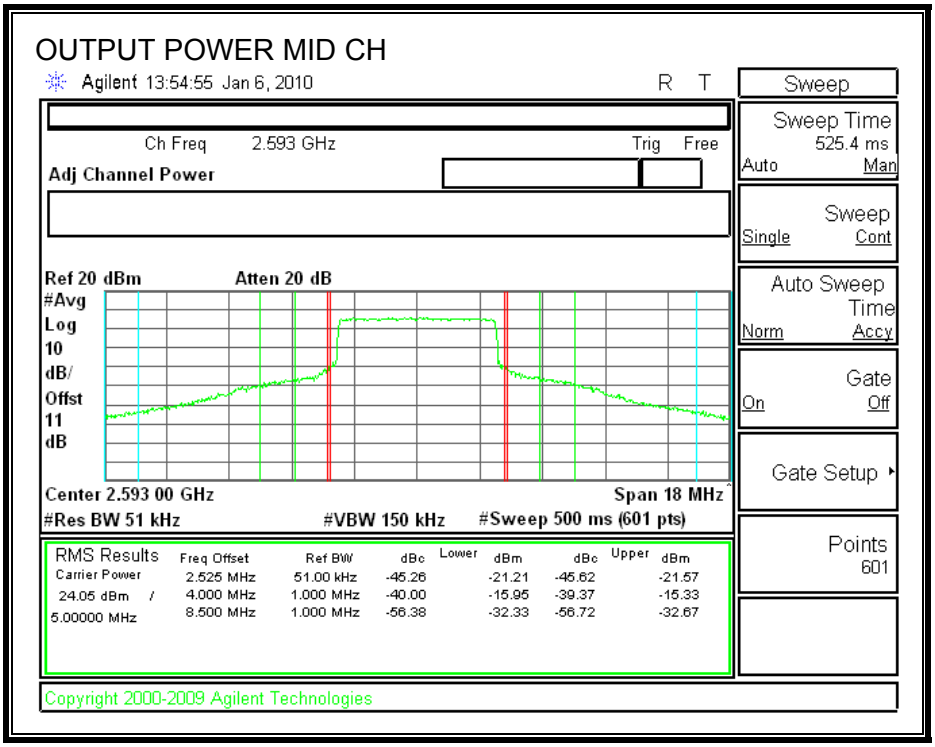


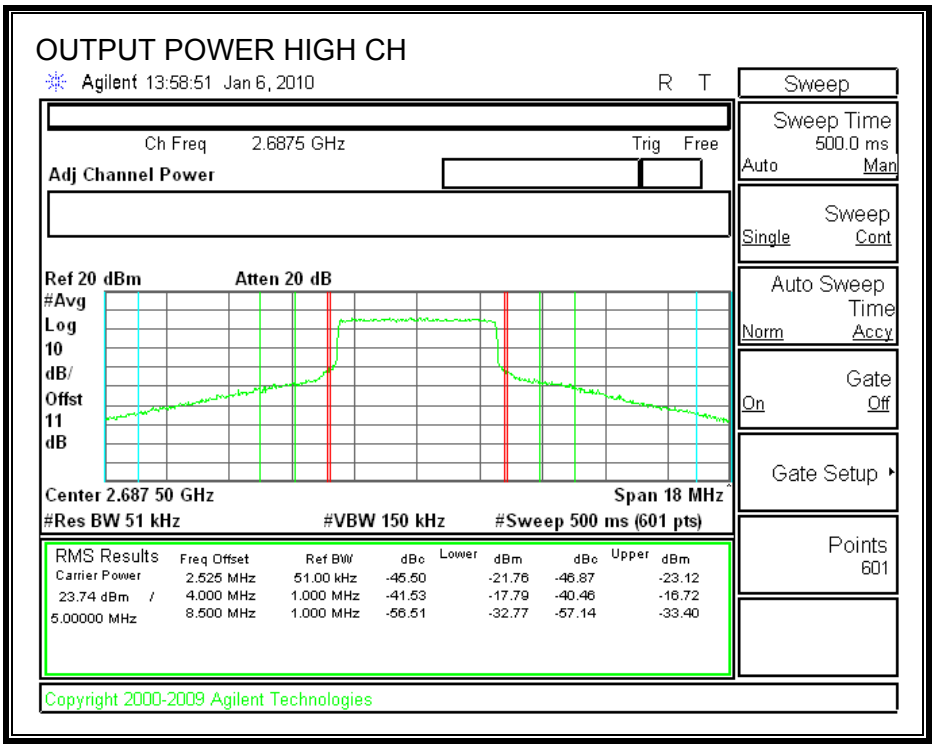




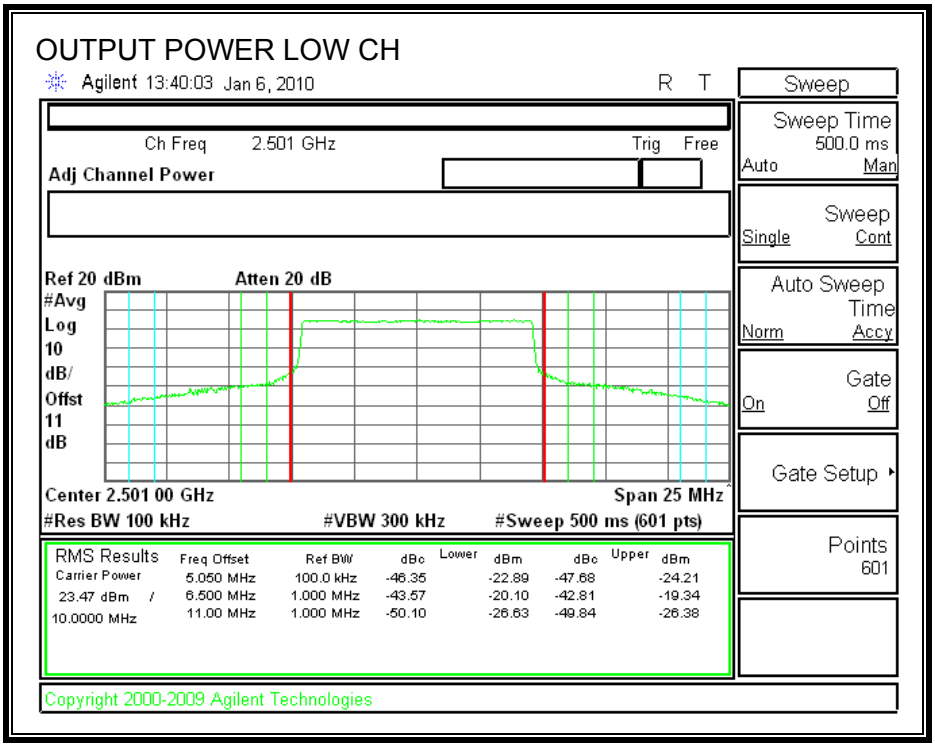
5MHz_16QAM

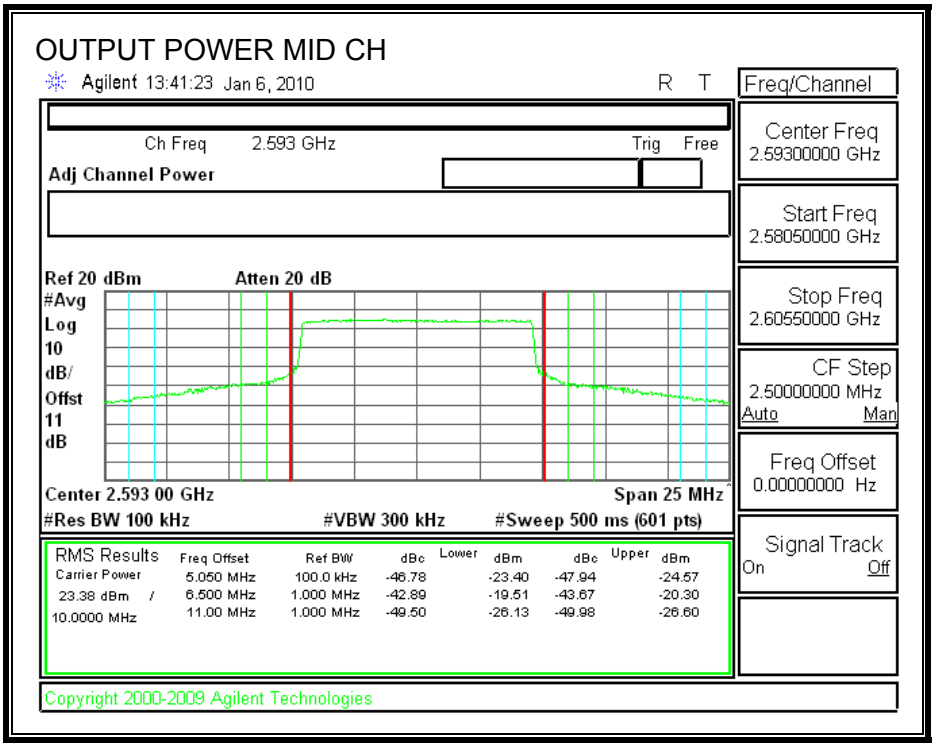


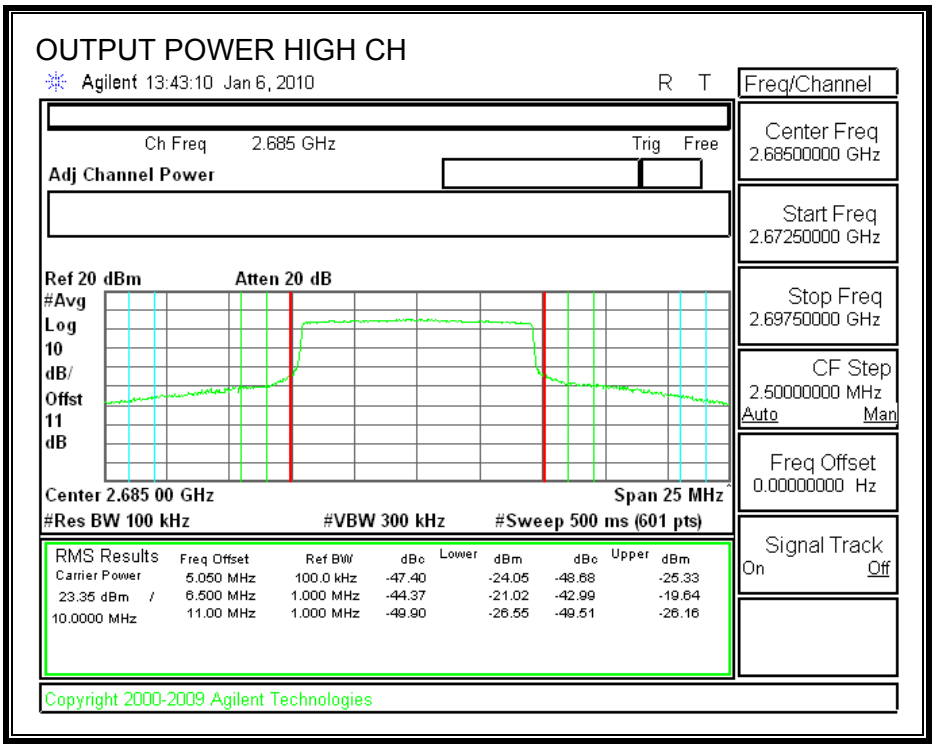




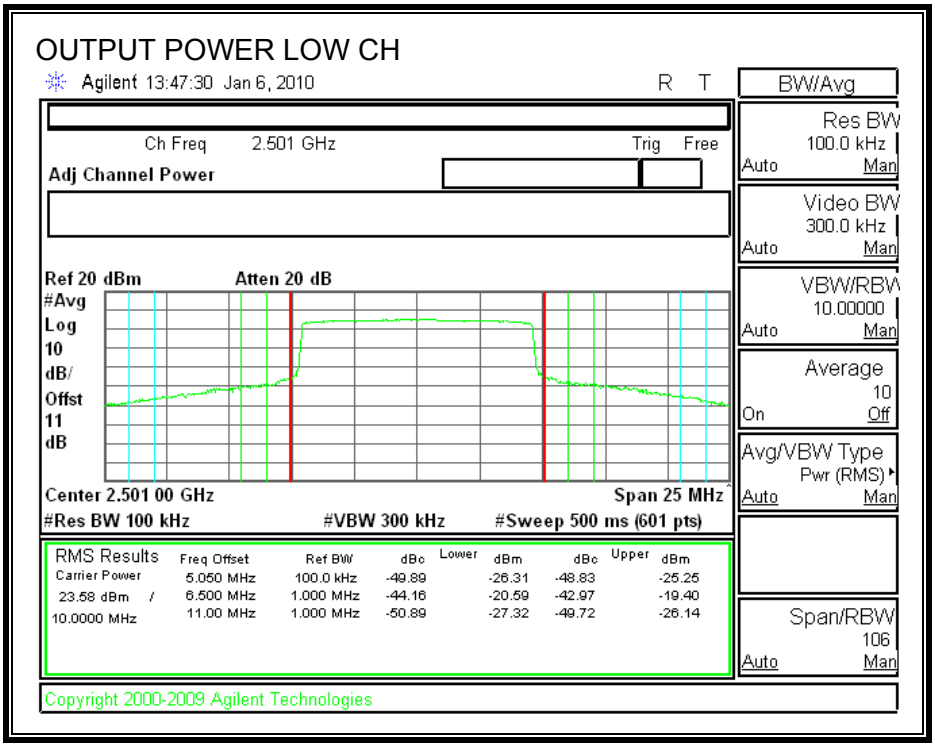
10MHz_QPSK

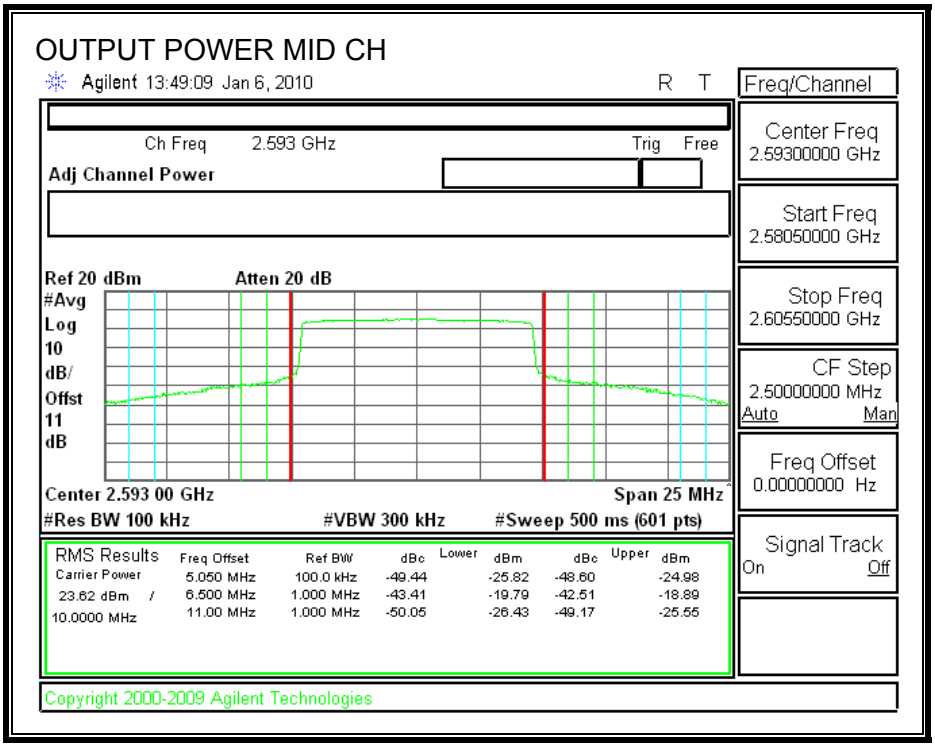


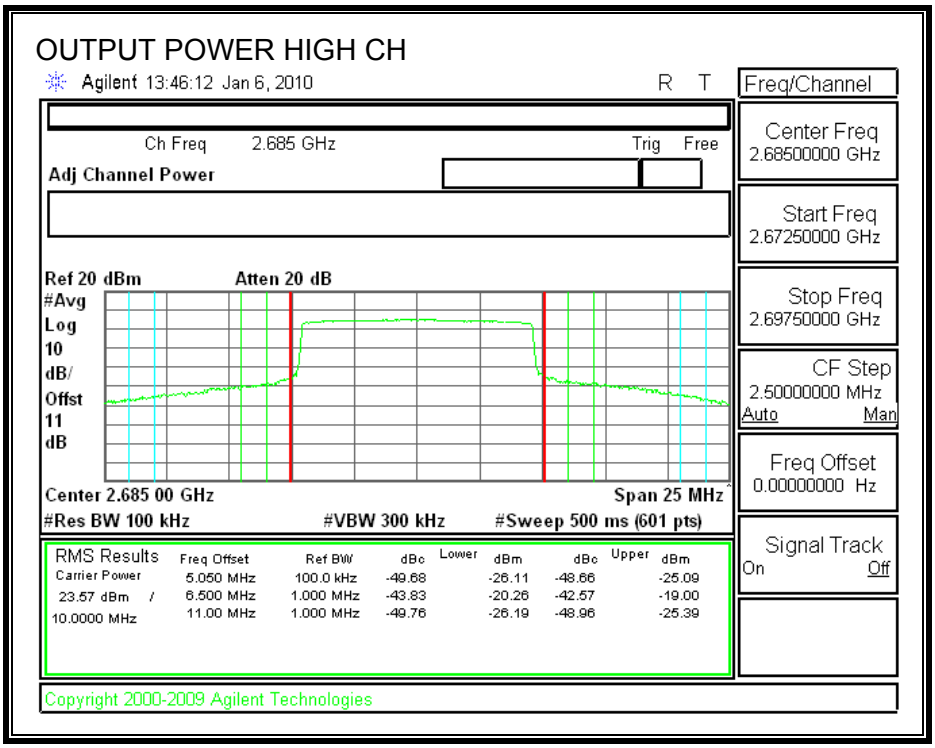




10MHz_16QAM





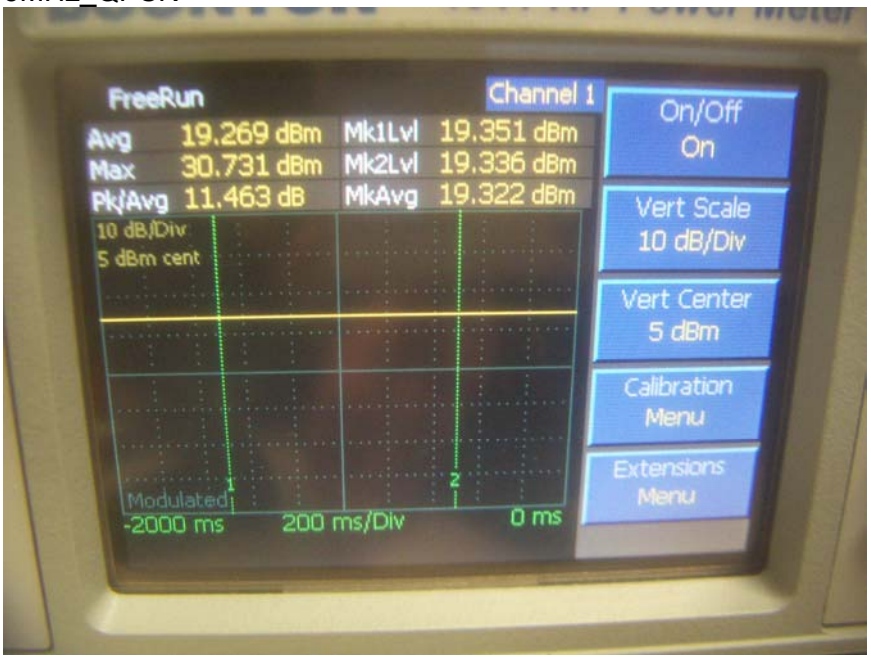


Offset: 1 (cable) + 10 (pad) = 11 dB

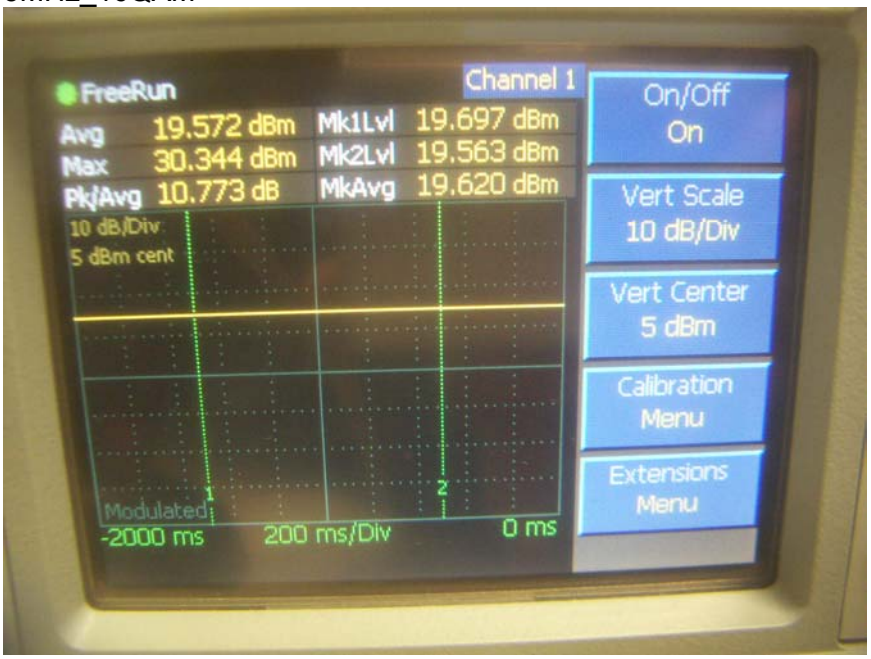
Peak and Average Output power readings were measured with Power Meter

Mode	Channel Band-width (MHZ)	Ch. No.	f (MHz)	Couducted Power (dBm)		Average Ratio (PAR)
				Peak	Average	
QPSK	5	378	2593	30.731	19.269	11.463
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average
				Peak	Average	
16QAM	5	378	2593	30.344	19.572	10.773
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average
				Peak	Average	
QPSK	10	368	2593	30.254	19.082	11.172
Mode	Channel Band-width	Ch. No.	f (MHz)	Couducted Power (dBm)		Peak-to-Average
				Peak	Average	
16QAM	10	368	2593	30.846	20.207	10.64

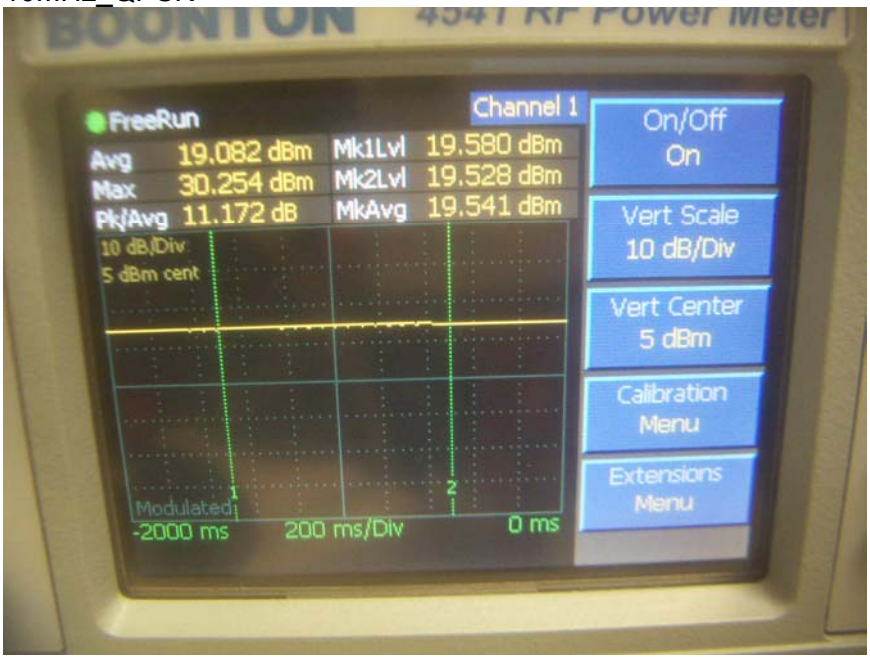
5MHz_QPSK



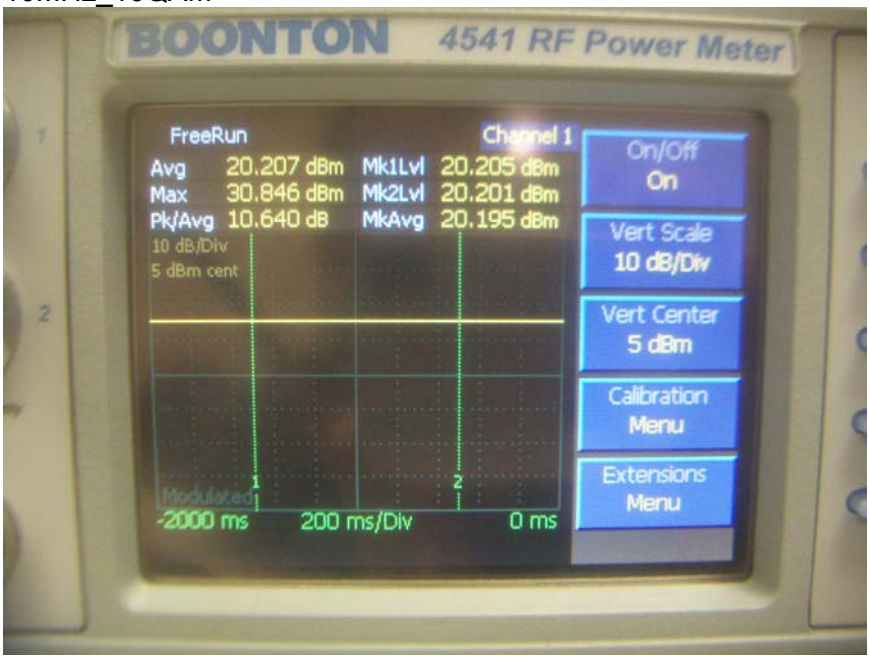
5MHz_16QAM



10MHz_QPSK



10MHz_16QAM



7.2. RADIATED OUTPUT POWER

LIMITS

27.50 (h)(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17& FCC 27

RESULTS

Mode	Channel	Frequency (MHz)	EIRP (dBm)	EIRP (mW)
5MHz 16QAM	Low	2498.5	25.30	338.84
	Middle	2593	24.80	302.00
	High	2687.5	23.40	218.78
10MHz 16QAM	Low	2501	25.40	346.74
	Middle	2593	25.30	338.84
	High	2685	24.30	269.15

OUTPUT POWER (EIRP)

5MHz _16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Intel
Project #: 09U12989
Date: 1/06/2010
Test Engineer: Chin Pang
Configuration: EUT With Laptop PC
Mode: 16QAM_5MHz

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B			Part 27

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch										
2.4985	-16.5	V	3.0	41.8			25.3	33.0	-7.7	
2.4985	-19.0	H	3.0	39.8			20.8	33.0	-12.2	
Mid Ch										
2.5930	-17.3	V	3.0	42.1			24.8	33.0	-8.2	
2.5930	-19.1	H	3.0	40.4			21.3	33.0	-11.7	
High Ch										
2.6875	-19.0	V	3.0	42.4			23.4	33.0	-9.6	
2.6875	-18.2	H	3.0	41.0			22.8	33.0	-10.2	

Rev. 03.03.09

10MHz_16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Intel
Project #: 09U12989
Date: 1/06/2010
Test Engineer: Chin Pang
Configuration: EUT With Laptop PC
Mode: 16QAM_10MHz

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B			Part 27

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch										
2.501	-16.5	V	3.0	41.8			25.4	33.0	-7.6	
2.501	-18.6	H	3.0	39.8			21.2	33.0	-11.8	
Mid Ch										
2.593	-16.8	V	3.0	42.1			25.3	33.0	-7.7	
2.593	-18.9	H	3.0	40.4			21.5	33.0	-11.5	
High Ch										
2.685	-18.1	V	3.0	42.4			24.3	33.0	-8.7	
2.685	-19.3	H	3.0	41.0			21.7	33.0	-11.3	

Rev. 03.03.09

7.3. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

§27.53 (m)(4) For mobile digital stations, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge and 55 + 10 log (P) dB at 5.5 megahertz from the channel edges.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 27

RESULTS

SPURIOUS & HARMONIC

Below 1GHz (Worst Case)

Compliance Certification Services
30 - 1000MHz Substitution Measurement

Company: Intel
Project #: 09U12989
Date: 1/5/2010
Test Engineer: Chin Pang
Configuration: EUT only
Mode: below 1GHz

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T10 8447D		Part 27

f MHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
184.40	-54.5	V	3.0	22.5	29.2		-59.1	-25.0	-34.1	
216.00	-61.2	V	3.0	21.6	29.1		-66.5	-25.0	-41.5	
348.00	-64.0	V	3.0	24.4	29.0		-66.5	-25.0	-41.5	
372.00	-65.0	V	3.0	24.9	29.1		-67.1	-25.0	-42.1	
470.00	-64.5	V	3.0	26.8	29.6		-65.1	-25.0	-40.1	
47.57	-62.8	H	3.0	40.8	29.6		-49.5	-25.0	-24.5	
185.80	-53.9	H	3.0	19.2	29.2		-61.8	-25.0	-36.8	
209.30	-61.0	H	3.0	17.4	29.1		-70.6	-25.0	-45.6	
372.00	-65.0	H	3.0	22.7	29.1		-69.2	-25.0	-44.2	
470.00	-64.2	H	3.0	24.2	29.6		-67.4	-25.0	-42.4	

Rev. 03.03.09

ABOVE 1 GHz

5MHz_16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Intel
Project #: 09U12989
Date: 1/05/2010
Test Engineer: Chin Pang
Configuration: EUT With Laptop PC
Mode: 16QAM_5MHz

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 27

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
2498.5MHz										
4.997	-54.3	H	3.0	48.9	35.3	1.0	-39.7	-25.0	-14.7	
7.495	-58.0	H	3.0	53.1	35.7	1.0	-39.6	-25.0	-14.6	
4.997	-55.5	V	3.0	48.3	35.3	1.0	-41.5	-25.0	-16.5	
7.495	-57.0	V	3.0	51.4	35.7	1.0	-40.3	-25.0	-15.3	
2593MHz										
5.186	-59.4	H	3.0	49.4	35.3	1.0	-44.4	-25.0	-19.4	
7.779	-60.5	H	3.0	53.4	35.7	1.0	-41.8	-25.0	-16.8	
5.186	-58.1	V	3.0	48.8	35.3	1.0	-43.7	-25.0	-18.7	
7.779	-59.2	V	3.0	51.8	35.7	1.0	-42.1	-25.0	-17.1	
2687.5MHz										
5.375	-56.8	H	3.0	49.7	35.4	1.0	-41.5	-25.0	-16.5	
8.062	-53.7	H	3.0	53.7	35.7	1.0	-34.6	-25.0	-9.6	
5.375	-56.0	V	3.0	49.0	35.4	1.0	-41.4	-25.0	-16.4	
8.062	-52.5	V	3.0	52.1	35.7	1.0	-35.1	-25.0	-10.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

10MHz_16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Intel
Project #: 09U12989
Date: 1/05/2010
Test Engineer: Chin Pang
Configuration: EUT With Laptop PC
Mode: 16QAM_10MHz

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 27

f GHz	SA reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Path Loss (dB)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
2501MHz										
5.002	-57.5	H	3.0	48.9	35.3	1.0	-42.9	-25.0	-17.9	
7.503	-61.0	H	3.0	53.1	35.7	1.0	-42.6	-25.0	-17.6	
5.002	-58.5	V	3.0	48.3	35.3	1.0	-44.5	-25.0	-19.5	
7.503	-58.8	V	3.0	51.4	35.7	1.0	-42.1	-25.0	-17.1	
2593MHz										
5.186	-57.8	H	3.0	49.4	35.3	1.0	-42.8	-25.0	-17.8	
7.779	-59.2	H	3.0	53.4	35.7	1.0	-40.5	-25.0	-15.5	
5.186	-60.0	V	3.0	48.8	35.3	1.0	-45.6	-25.0	-20.6	
7.779	-61.2	V	3.0	51.8	35.7	1.0	-44.1	-25.0	-19.1	
2685MHz										
5.370	-57.7	H	3.0	49.7	35.4	1.0	-42.4	-25.0	-17.4	
8.055	-59.5	H	3.0	53.7	35.7	1.0	-40.5	-25.0	-15.5	
5.370	-58.5	V	3.0	49.0	35.4	1.0	-43.9	-25.0	-18.9	
8.055	-60.3	V	3.0	52.1	35.7	1.0	-42.9	-25.0	-17.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

8. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.2

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

ANSI C63.4

RESULTS

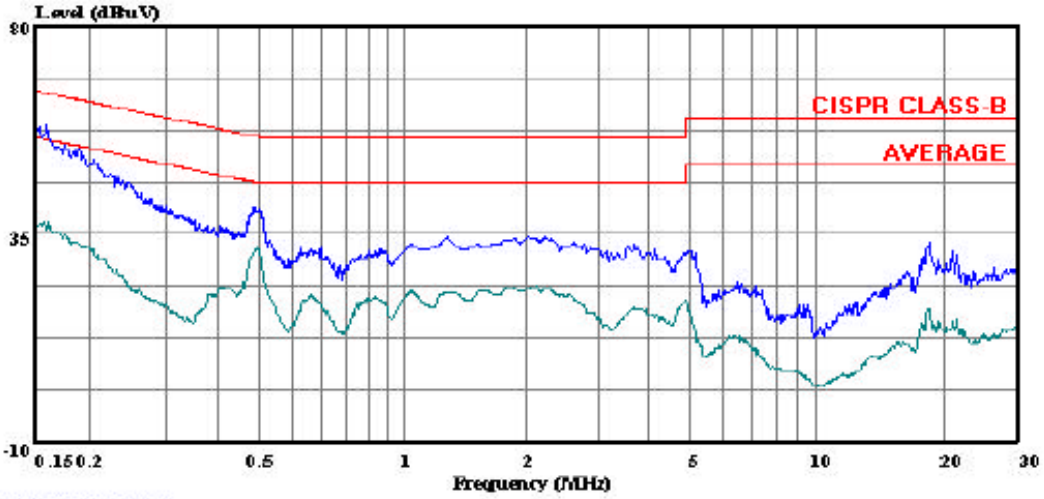
6 WORST EMISSIONS

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	Reading			Closs	Limit	EN_B	Margin		Remark
(MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	(dB)	QP	AV	QP (dB)	AV (dB)	L1 / L2
0.16	58.50	--	37.47	0.00	65.41	55.41	-6.91	-17.94	L1
0.49	40.76	--	31.99	0.00	56.10	46.10	-15.34	-14.11	L1
2.38	33.94	--	23.32	0.00	56.00	46.00	-22.06	-22.68	L1
0.16	56.45	--	35.97	0.00	65.62	55.62	-9.17	-19.65	L2
0.50	40.80	--	32.00	0.00	56.05	46.05	-15.25	-14.05	L2
2.59	33.88	--	22.00	0.00	56.00	46.00	-22.12	-24.00	L2
6 Worst Data									

LINE 1 RESULTS

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 7 File#: 09u12989.emi Date: 01-07-2010 Time: 07:59:58



(Line Conduction)

Trace: 5 Ref Trace:

Condition: CISPR CLASS-B
Test Operator: : Chin Pang
Project #: : 09U12989
Company: : Intel
EUT Description:: Intel Centrino Advance-N + Wimax 6250
Model: : 622ANXHMW
Configuration: : EUT/Laptop
Mode: : TX (Worst Case)
Target: : FCC Class B
Voltage: : 115VAC/60Hz
: L1: Peak (Blue), Average (Green)

LINE 2 RESULTS