FCC CFR47 PART 27 SUBPART M
CLASS II PERMISSIVE CHANGE

CERTIFICATION TEST REPORT

FOR

INTEL WI-FI /WIMAX LINK 5350 SERIES

FCC MODEL: 533ANXMMW

FCC ID: PD9533ANXMU

REPORT NUMBER: 08U12161-3

ISSUE DATE: OCTOBER 17, 2008

Prepared for
INTEL CORPORATION
2111 N.E. 25th AVE
HILLSBORO, OR 97124-5961, U.S.A.

Prepared by
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	10/17/08	Initial Issue	T. Chan

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: INTEL CORPORATION
2111 NE 25TH AVENUE
HILLSBORO, OREGON 97124, USA

EUT DESCRIPTION: INTEL WI-FI /WIMAX LINK 5350 SERIES

FCC MODEL: 533ANXMMW

SERIAL NUMBER: 001D729200B2

DATE TESTED: OCTOBER 06-13, 2008

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

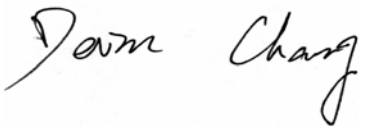
Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. The test results show 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 SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:



DEVIN CHANG
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, 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. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Radiated Emission, Above 2000 MHz	+/- 4.3 dB
Power Line Conducted Emission	+/- 2.9 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11a/b/g/n transceiver INTEL WI-FI /WIMAX LINK 5350 SERIES
The radio module is manufactured by Intel.

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 portable tablet LENOVO THINKPAD X200 TABLET SERIES.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna, with a maximum gain of 1.05dBi.

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was WiMAX VaTU version 2.5.1.0

5.6. WORST-CASE CONFIGURATION AND MODE

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

The worst-position was the EUT with highest emissions. To determine the worst-case, the EUT was investigated for X, Y, Z, and mobile Positions, after the investigations, the worst-position were turned out to be a mobile position for all bands.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	Lenovo	814Y-12G	LV002N6 08/05	DoC
AC/DC Adapter	Lenovo	92P1154	11S92P1154Z1ZBGE61P1DX	DoC

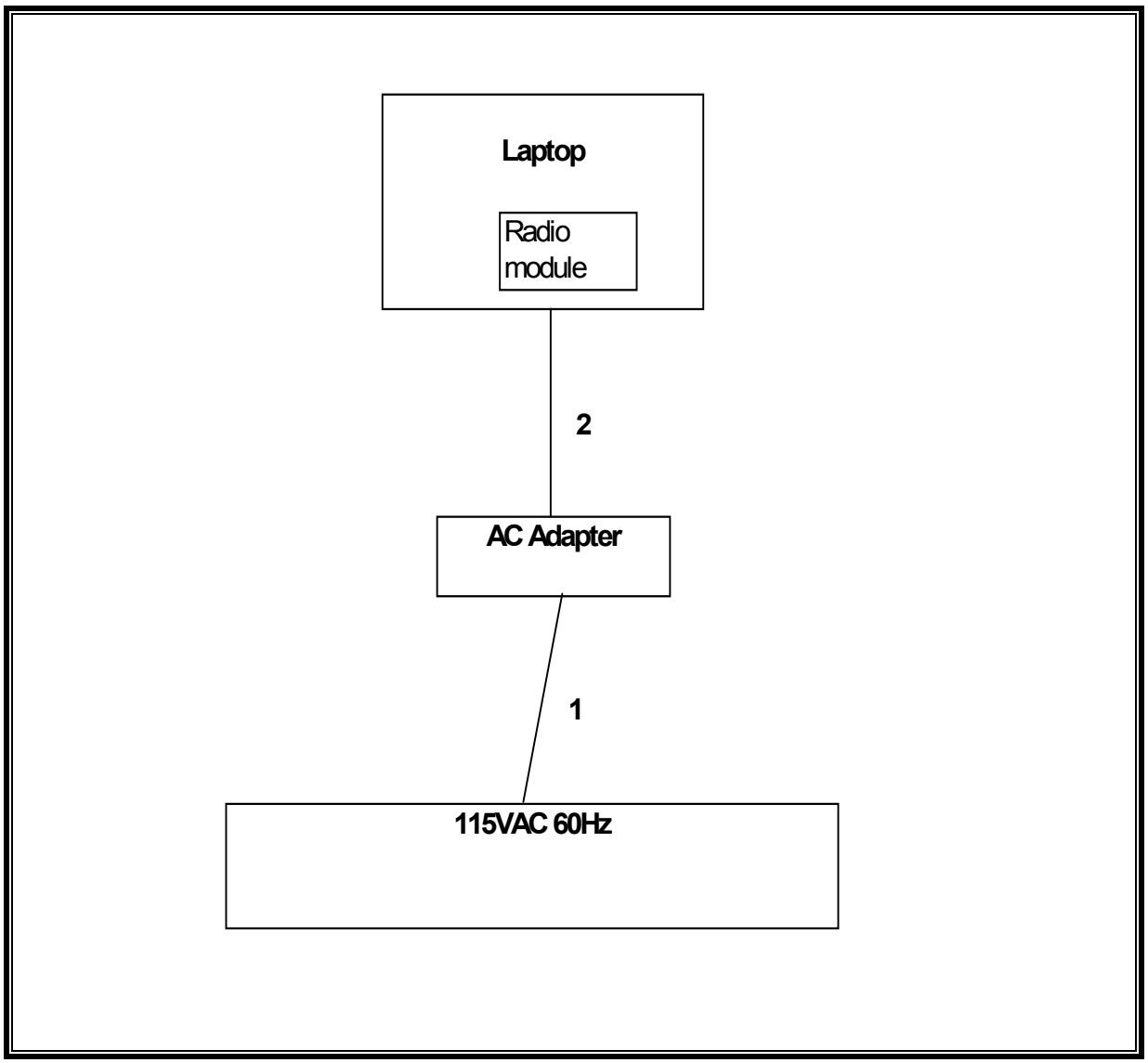
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	1	US 115V	Un-shielded	0.8m	NA
2	DC	1	DC	Un-shielded	1.8m	Ferrite at laptop's end

TEST SETUP

The EUT is installed in 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	C00749	12/27/08
Antenna, Horn, 18 GHz	EMCO	3115	C00872	04/22/09
Preamp, 1000MHz	Sonoma	310N	N02891	03/31/09
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	02/11/09
EMI Receiver, 2.9 GHz	Agilent / HP	8542E	C00957	09/19/09
RF Filter Section, 2.9 GHz	Agilent / HP	85420E	C00958	09/19/09
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/25/08
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/06/09
Antenna, Horn, 26.5 GHz	ARA	SWH-28	C01015	12/28/08
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	03/03/09
Highpass Filter, 4.0 GHz	Micro-Tronics	HPM13351	N02709	CNR
Preamplifier, 40 GHz	Miteq	NSP4000-SP2	C00990	12/11/08
Antenna, Horn, 40 GHz	ARA	MWH-2640/B	C00981	04/29/09
ESG VECTOR SIGNAL GENERATOR	Agilent / HP	E4438C	US44271909	09/17/10

7. LIMITS AND RESULTS

7.1. 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

OUTPUT POWER (ERP)

High Frequency Substitution Measurement
Compliance Certification Services, Fremont 5m A-Chamber

Company: Intel
Project #:08U12161
Date:10/12/2008
Test Engineer:Devin Chang
Configuration:EUT with Laptop
Mode: QPSK 10MHz

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: EIRP
☑ High Pass Filter
Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz:
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
2501MHz										
2.501	69.53	H	3.0	4.9	9.3	7.1	7.4	33.0	-25.6	
2.501	82.50	V	15.8	4.9	9.3	7.1	20.2	33.0	-12.8	
2593MHz										
2.593	72.40	H	6.4	5.0	9.3	7.1	10.6	33.0	-22.4	
2.593	81.80	V	15.6	5.0	9.3	7.1	19.8	33.0	-13.2	
2685MHz										
2.685	71.80	H	6.2	5.1	9.3	7.1	10.4	33.0	-22.6	
2.685	81.00	V	15.2	5.1	9.3	7.1	19.4	33.0	-13.6	

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7.2. 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 (ERP)

Below 1GHz

30 - 1000MHz Substitution Measurement
Compliance Certification Services, Fremont 5m A-Chamber

Company: Intel
Project #:08U12161
Date:10/12/2008
Test Engineer:Devin Chang
Configuration:EUT with Laptop
Mode: QPSK 10MHz

Test Equipment:

Bilog Antenna	Cable	Pre-amplifer 8447D	Limit
5m Chamber Sunol Bilos	5m Chamber Cable	T5 8447D	FCC 27

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch, 2412MHz										
115.36	41.2	V	-66.4	1.4	-2.3	-4.4	-72.3	-25.0	-47.3	
254.07	55.0	V	-54.3	1.9	6.1	3.9	-52.3	-25.0	-27.3	
292.87	53.0	V	-54.7	2.1	6.0	3.9	-52.9	-25.0	-27.9	
336.52	45.2	V	-61.3	2.2	6.0	3.9	-59.6	-25.0	-34.6	
481.05	39.0	V	-64.4	2.6	6.2	4.0	-63.0	-25.0	-38.0	
671.17	36.7	V	-64.3	3.1	6.8	4.6	-62.7	-25.0	-37.7	
115.36	45.7	H	-62.0	1.4	-2.3	-4.4	-67.8	-25.0	-42.8	
143.49	48.4	H	-59.6	1.5	-0.5	-2.6	-63.7	-25.0	-38.7	
243.40	58.2	H	-51.2	1.9	6.0	3.9	-49.3	-25.0	-24.3	
288.02	53.2	H	-54.2	2.0	6.0	3.9	-52.4	-25.0	-27.4	
416.06	43.3	H	-61.2	2.4	6.1	3.9	-59.7	-25.0	-34.7	
688.63	37.6	H	-63.7	3.1	6.8	4.6	-62.2	-25.0	-37.2	

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Above 1GHz

High Frequency Substitution Measurement
Compliance Certification Services, Fremont 5m A-Chamber

Company: Intel
Project #:08U12161
Date:10/12/2008
Test Engineer:Devin Chang
Configuration:EUT with Laptop
Mode: QPSK 10MHz

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz: T87; ARA 18-26GHz; S/N:1049
Limit: FCC 27
High Pass Filter
Hi Frequency Cables: (2 ft) (2 ~ 3 ft) (4 ~ 6 ft) (12 ft)
Pre-amplifer 1-26GHz: T145 Agilent 3008A
Pre-amplifer 26-40GHz: T88 Miteq 26-40GHz

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
2501MHz										
5.002	48.16	V	-45.3	7.1	11.1	8.9	-43.4	-25.0	-18.4	
7.503	59.52	V	-29.4	8.3	12.0	9.8	-27.8	-25.0	-2.8	
5.002	48.66	H	-43.8	7.1	11.1	8.9	-41.9	-25.0	-16.9	
7.503	52.47	H	-35.6	8.3	12.0	9.8	-34.1	-25.0	-9.1	
2593MHz										
5.186	42.49	V	-50.1	7.2	11.0	8.9	-48.5	-25.0	-23.5	
7.779	40.95	V	-47.3	8.4	12.0	9.8	-45.9	-25.0	-20.9	
5.186	48.66	H	-43.0	7.2	11.0	8.9	-41.3	-25.0	-16.3	
7.779	41.48	H	-46.0	8.4	12.0	9.8	-44.6	-25.0	-19.6	
2685MHz										
5.370	45.09	V	-47.1	7.3	11.0	8.8	-45.6	-25.0	-20.6	
8.055	38.05	V	-50.4	8.6	12.0	9.9	-49.1	-25.0	-24.1	
5.370	48.60	H	-42.6	7.3	11.0	8.8	-41.0	-25.0	-16.0	
8.055	38.75	H	-48.5	8.6	12.0	9.9	-47.2	-25.0	-22.2	

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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

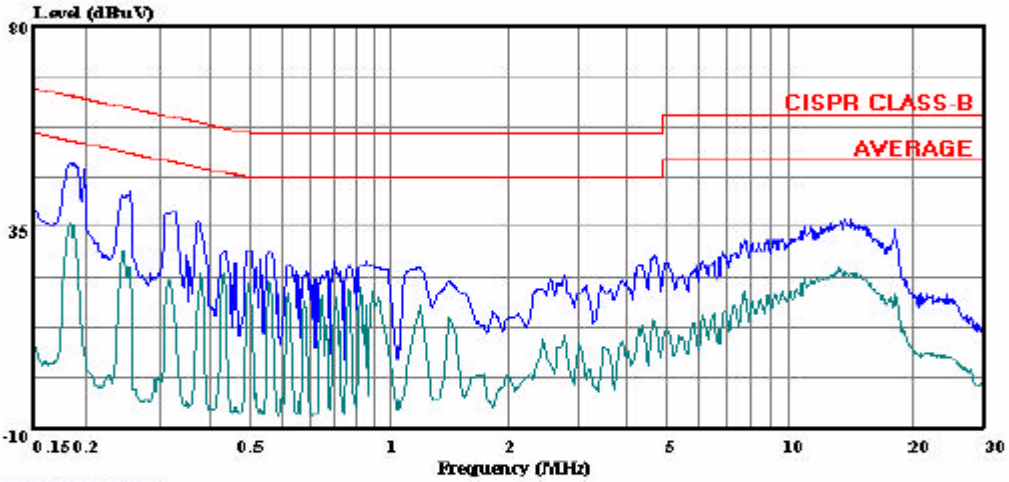
6 WORST EMISSIONS

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**
0.18	49.12	--	36.24	0.00	64.35	54.35	-15.23	-18.11	L1
0.26	40.97	--	30.25	0.00	61.56	51.56	-20.59	-21.31	L1
13.84	36.82	--	25.31	0.00	60.00	50.00	-23.18	-24.69	L1
0.19	49.42	--	36.65	0.00	64.21	54.21	-14.79	-17.56	L2
0.25	43.09	--	30.60	0.00	61.89	51.89	-18.80	-21.29	L2
13.27	36.76	--	25.09	0.00	60.00	50.00	-23.24	-24.91	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#: 08u12161.EMI Date: 10-08-2008 Time: 10:23:56



(Line Conduction)

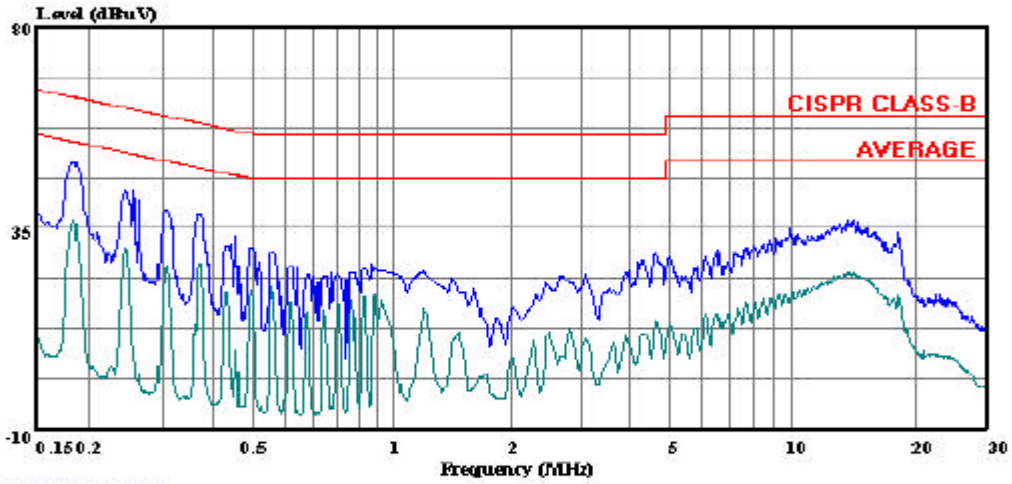
Trace: 5 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Chin Pang
Project #: : 08U12161
Company: : Intel
Configuration:: EUT Only
Mode: : Transmitt Worst case
Target: : FCC Class B
Voltage: : 115VAC / 60Hz
: L1: Peak (Blue); Average (Green)

LINE 2 RESULTS

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

Data#: 7 File#: 08u12161 L2.EMI Date: 10-08-2008 Time: 10:58:28



(Line Conduction)

Trace: 5 Ref Trace:

Condition: CISPR CLASS-B
Test Operator:: Chin Pang
Project #: : 08U12161
Company: : Intel
Configuration:: EUT Only
Mode: : Transmitt Worst case
Target: : FCC Class B
Voltage: : 115VAC / 60Hz
: L2: Peak (Blue); Average (Green)

9. SETUP PHOTOS

RADIATED RF MEASUREMENT SETUP FOR MOBILE CONFIGURATION

RADIATED FRONT PHOTO

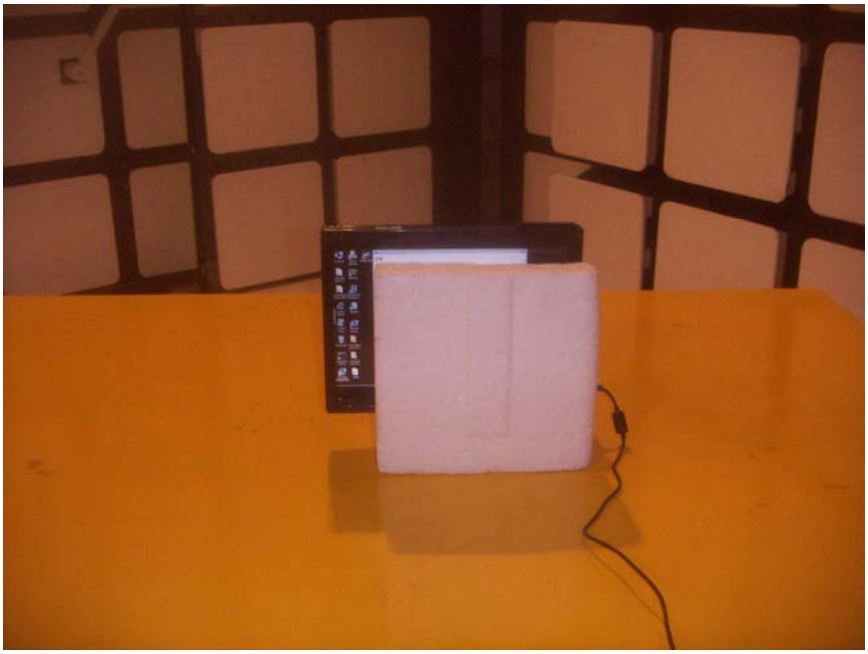
RADIATED BACK PHOTO

RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION

X-AXIS FRONT PHOTO

X-AXIS BACK PHOTO

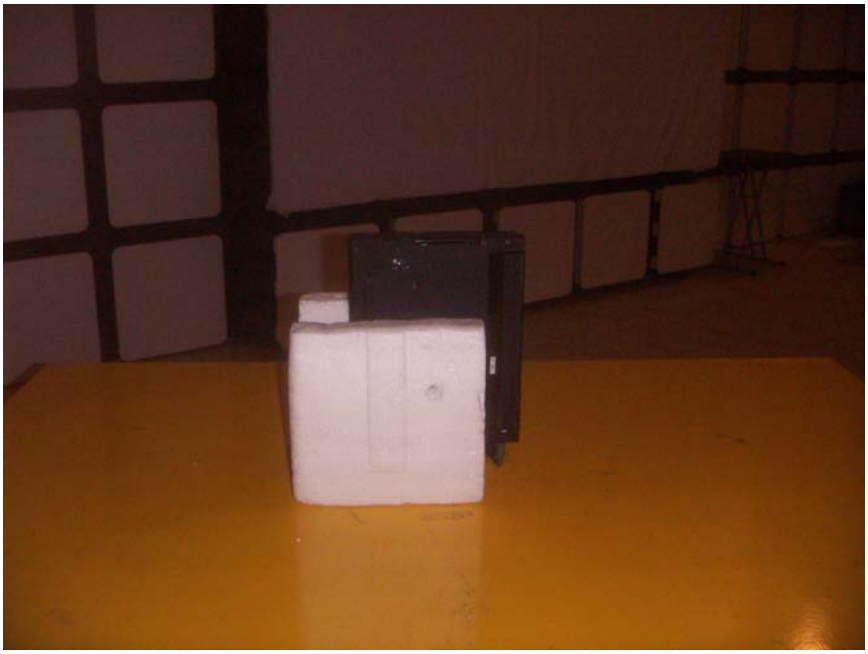
Y-AXIS FRONT PHOTO



Y-AXIS BACK PHOTO

Z-AXIS FRONT PHOTO

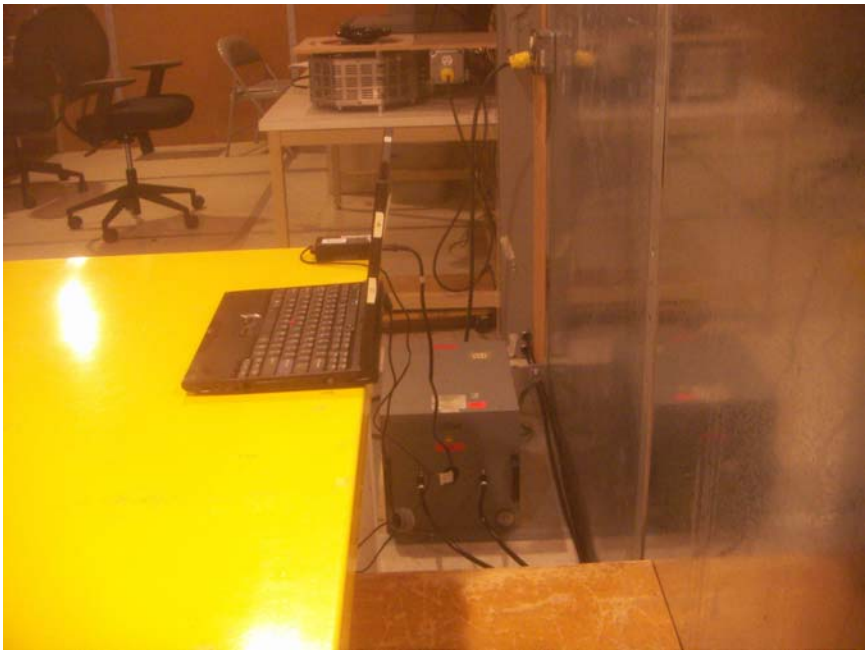
Z-AXIS BACK PHOTO



POWERLINE CONDUCTED EMISSIONS MEASUREMENT SETUP

LINE CONDUCTED FRONT PHOTO

LINE CONDUCTED BACK PHOTO



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