



**FCC CFR47 PART 22 SUBPART H PART 24 E
CLASS II PERMISSIVE CHANGE
CERTIFICATION TEST REPORT
FOR
GSM/GPRS CLASS 10/EDGE/HSDPA/HSUPA/WCDMA MODULE INSTALLED IN A
LENOVO X200T SERIES THINKPAD TABLET**

**MODEL NUMBER: F3507g
FCC ID: VV7-MBMF3507G-L**

**REPORT NUMBER: 08U11870-1
ISSUE DATE: JUNE 18, 2008**

Prepared for

**ERICSSON AB
LINDHOLMSPIREN 11
SE-417 56 GOTHENBURG
SWEDEN**

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	06/18/08	Initial Issue	T. Chan

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: ERICSSON AB
LINDHOLMSPIREN 11
SE-417 56 GOTHENBURG
SWEDEN

EUT DESCRIPTION: GSM/GPRS Class 10/EDGE/HSDPA/HSUPA/WCDMA Module
Installed In a LENOVO X200T Series ThinkPad Tablet Laptop

MODEL: F3507g

SERIAL NUMBER: C37000069X

DATE TESTED: JUNE 10 -15, 2008

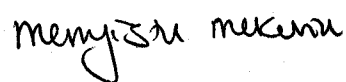
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22 SUBPART H	PASS
FCC PART 24 SUBPART E	PASS

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All expressions of Pass/Fail in this report are opinions expressed by CCS based on interpretations of the 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:

Tested By:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

MEMGISTU MEMKURIA
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 22H, 24E.

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 a GSM/GPRS Class 10/EDGE/HSDPA/HSUPA/WCDMA Module installed in a LENOVO X200T Series ThinkPad Tablet Laptop.

5.2. DESCRIPTION OF CLASS II CHANGE

The change filed under this application is adding a LENOVO X200T Series ThinkPad Tablet Laptop with Advanced Connectek, Inc. (ACON) and Wistron Neweb Corporation Antennas.

Antenna P/N: ACON: P/N: 25.90673.001, Wistron NeWeb: P/N: 25.90667.001.

5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

GSM/GPRS/EGPRS

GPRS 824 to 849 MHz Authorized Band

Frequency Range (MHz)	Modulation	Conducted Average Power (dBm)	Conducted Average Power (mW)	Conducted Peak Power (dBm)	Conducted Peak Power (mW)
Low CH - 824.2	GPRS	32.5	1778.3	32.6	1819.7
Mid CH - 836.6		32.6	1819.7	32.7	1862.1
High CH - 848.8		32.6	1819.7	32.7	1862.1

GPRS 1850 to 1910 MHz Authorized Band

Frequency Range (MHz)	Modulation	Conducted Average Power (dBm)	Conducted Average Power (mW)	Conducted Peak Power (dBm)	Conducted Peak Power (mW)
Low CH - 1850.2	GPRS	30.3	1071.5	30.4	1086.4
Mid CH - 1880		30.3	1066.6	30.3	1078.9
High CH - 1909.8		30.4	1083.9	30.4	1099.0

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes two different sets of PIFA antennas manufactured by Advanced Connectek, Inc. (ACON) and Wistron Neweb Corporation. The antenna maximum gains are -1.21 dBi of ACON at Cell band and -1.98dBi of Wistron at PCS band respectively.

5.5. SOFTWARE AND FIRMWARE

The EUT is linked with Communication Test Set.

5.6. WORST-CASE CONFIGURATION AND MODE

The following setting is used to configure the CMU200 to establish the link

Service selection → Test Mode A – Auto Slot Config. → off
 Main Service → Packet Data
 Network Support → GSM+GPRS
 Slot Config → 33 dBm for GSM850/EGSM900 and 30 dBm for GSM1800
 27 dBm for GSM850 EPRS and 26 dBm for GSM1800 EGPRS

Conducted power:

<u>Application</u>	<u>Rev, License</u>
WCDMA Mobile Test	A.09.06

WCDMA

The following settings were used to configure the Radio Communication Tester, CMU200.

- Connection
 - Dedicated Chan (CS): RMC
 - Band Select:
 - Band V for US Cell Band
 - Band II for US PCS Band
 - Band I for 2100MHz band
- Network
 - Requested UE Data
 - Authentication: Off
 - Security: Off
 - IMEI: ON
 - RLC Reestablish: Off
- BS Signal
 - Node –B Setting
 - RF Channel Downlink
 - Band V: 4357 / 4407 / 4458
 - Band II: 9662 / 9800 / 9938
 - Band I: 10562 / 10700 / 10838
 - Circuit Switched

- RMC Setting
 - Reference Channel Type: 12.2Kbps
 - Test Mode: Loop Mode 1 RLC TM
 - Channel Data Source DTCH: All One
- Signaling RAB Setting
 - SRB Cell DCH: 13.6 Kbps
- HSDPA HS-DSCH
 - Fixed Reference Channel

H-Set Selection: H-Set 1 QPSK

- UE Signal
 - Analyzer Setting
 - RF Channel Uplink:
 - Band V: 4132 / 4182 / 4233
 - Band II: 9262 / 9400 / 9538
 - Band I; 9612 / 9750 / 9888
 - UE power Control
 - Max Allowed UE Power: 25

GSM Mode

- To reset the Agilent 8960 to default all values > Shift & Preset
- To adjust Input/Output offset, press SYSTEM CONFIG button above the control knob
 - > RF IN/OUT Amptd Offset
 - > RF IN/OUT Amptd Offset Setup
 - > Enter frequencies to be tested and corresponding offsets (enter negative values for offset, i.e.-35 is greater than -30).

Control

- Operating Mode > Active Cell (GSM)
- Connection Type > Auto (For Voice Mode)

Call Parm

- BCH Parameters > Cell Power > adjust to (~ -50dBm) to maintain strong link OTA
 - > Cell Band > PCS or GSM850 (US band)
- TCH Parameters > Timeslot >1
 - > Traffic Channel > PCS Channel 512 / 661 / 810
 - > GSM850 Channel 128 / 190 / 251
 - > MS TX Level > 1 (for both PCS or GSM850)
 - > Timeslot > 1
 - > Speech Setup > Speech Source > Echo (Default)
- Press "Originate Call"

GPRS Mode

- To reset the Agilent 8960 to default all values > Shift & Preset
- To adjust Input/Output offset, press SYSTEM CONFIG button above the control knob
 - > RF IN/OUT Amptd Offset
 - > RF IN/OUT Amptd Offset Setup
 - > Enter frequencies to be tested and corresponding offsets (enter negative values for offset, i.e.-35 is greater than -30).

Control

- Operating Mode > Active Cell (GPRS)
- Connection Type > ETSI Type A (For Data Mode)

Call Params

- BCH Parameters > Cell Power > adjust to (~ -50dBm) to maintain strong link OTA
> Cell Band > PCS or GSM850 (US band)
- TCH Parameters > Traffic Channel > PCS Channel 512 / 661 / 810
> GSM850 Channel 128 / 190 / 251
- > MS TX Level > 3 (33dBm for Cell band); 3 (30dBm for PCS band)

- PDTCH > Multislot Config > 1 Down, 2 Up
- > MS TX Level > 5 (33dBm Cell band); 1 (30dBm PCS band)
- > Coding Scheme > CS-4

- After the 8960 attaches to the EUT, then press "Start Data Connection"

EGPRS Mode

- To reset the Agilent 8960 to default all values > Shift & Preset
- To adjust Input/Output offset, press SYSTEM CONFIG button above the control knob
> RF IN/OUT Amptd Offset
> RF IN/OUT Amptd Offset Setup
> Enter frequencies to be tested and corresponding offsets (enter negative values for offset, i.e.-35 is greater than -30).

Control

- Operating Mode > Active Cell (EGPRS)
- Connection Type > ETSI Type A (For Data Mode)

Call Params

- BCH Parameters > Cell Power > adjust to (~ -50dBm) to maintain strong link OTA
> Cell Band > PCS or GSM850 (US band)
- TCH Parameters > Traffic Band > PCS Channel 512 / 661 / 810
> GSM850 Channel 128 / 190 / 251
- > MS TX Level > 6 (27 dBm Cell band); 5 (26 dBm PCS band)
- PDTCH > Multislot Config > 1 Down, 2 Up
- > MS TX Level > 6 (27dBm Cell band); 5 (26dBm PCS band)
- > Modulation Coding Scheme
> Uplink Modulation Coding Scheme > MCS 9

· After the 8960 attaches to the EUT, then press “Start Data Connection”

Based on the previous tests, among different modulations, GPRS is determined to be the worst-case scenario.

The Mobile, X, Y, and Z-Positions was investigated to determine the worst case. Mobile position was determined to be as the position that had the highest output power.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop (ACON Antenna)	Lenovo	LCM-1 SIV	1S814Y04GLV001CD	DoC
Laptop (WNC Antenna)	Lenovo	LCM-1 SIV	1S814Y04GLV001DD	DoC
AC Adapter	Lenovo	92P1160	11S92P1160Z1ZBGH6BFEGJ	DoC
AC Adapter	Lenovo	92P1213	11S92P1213Z1ZBGK73R12W	DoC
Communications Test Set	R & S	CMU200	106291	NA
Horn 1-18GHz	EMCO	3115	NA	NA

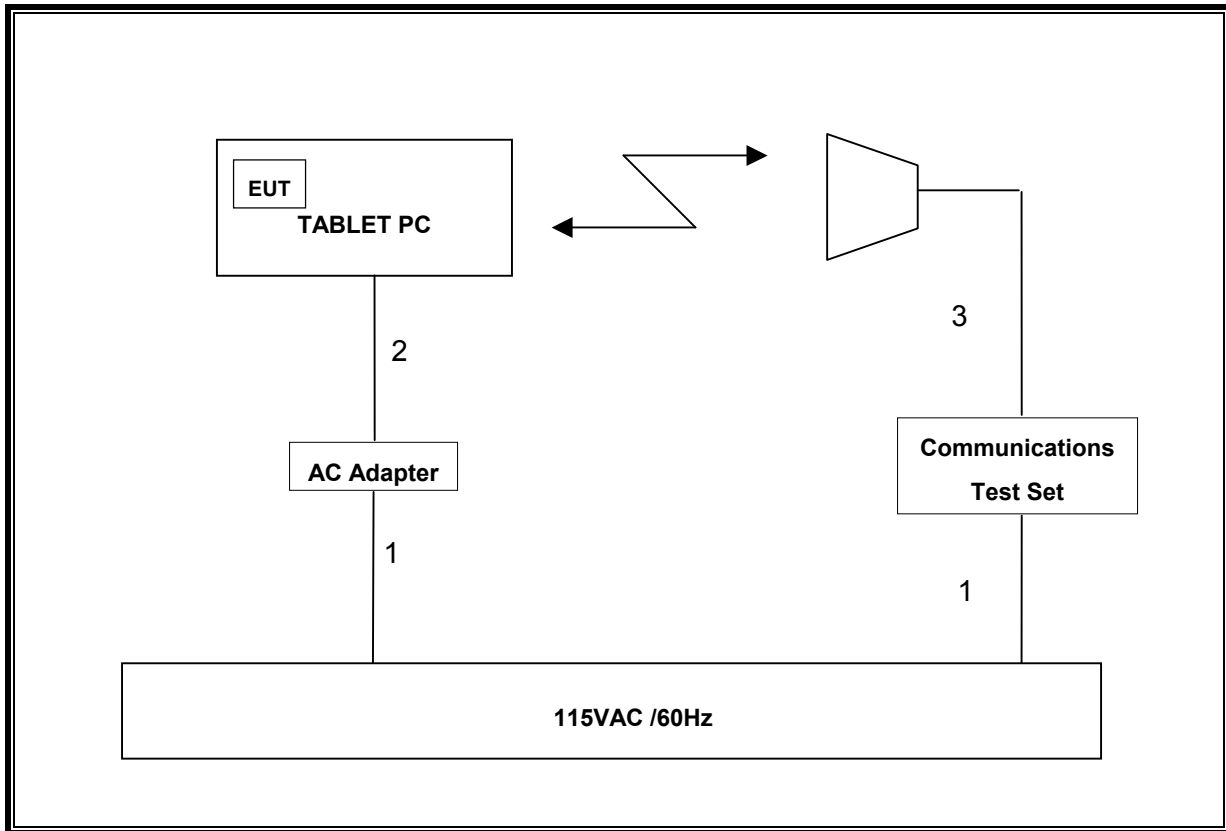
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	2	AC	Un-shielded	1m	NA
2	DC	1	DC	Un-shielded	2m	Ferrite at one end
3	RF IN/OUT	1	SMA	Un-shielded	2m	NA

TEST SETUP

The EUT is installed in a Host Tablet PC during the tests. Communication test set exercised the EUT.

SETUP DIAGRAM FOR TESTS



5.8. 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	9/27/2008
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	9/29/08
Horn 1-18GHz	EMCO	3115	C00945	04/22/09
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00945	8/7/08
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689	CNR
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Horn	EMCO	3115	C00872	04/22/09
Dipole	Speag	D900V2	NA	11/16/08
Signal Generator	R & S	SMP04	C00953	02/16/09
Communications Test Set	R & S	CMU200	C001131	4/16/09
Communications Test Set	Agilent / HP	E5515C	C01086	06/29/08

6. TEST RESULTS

6.1. OUTPUT POWER

LIMITS

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(b) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17

RESULTS

824 to 849 MHz Authorized Band

Frequency Range (MHz)	Modulation	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low CH - 824.2	GPRS	28.5	707.9
Mid CH - 836.5		30.0	1000.0
High CH - 848.8		29.5	891.3

1850 to 1910 MHz Authorized Band

Frequency Range (MHz)	Modulation	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low CH - 1850	GPRS	30.1	1023.3
Mid CH - 1880		29.5	891.3
High CH - 1909		30.0	1000.0

GSM, GPRS Output Power (ERP)

High Frequency Substitution Measurement									
Compliance Certification Services, Fremont 5m Chamber A									
Company:		ERICSSON							
Project #:		08U11870							
Date:		6/10/2008							
Test Engineer:		MENGISTU MEKURIA							
Configuration:		EUT (ACON ANTENNA) ALONE							
Mode:		TX, GPRS MODE							
Test Equipment:									
Receiving: Sunol T130, and 5m Chamber N-type Cable (Setup this one for testing EUT)									
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081003.									
f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	100.6	V	27.1	0.5	0.0	26.6	38.5	-11.9	
824.20	104.8	H	28.8	0.5	0.0	28.3	38.5	-10.2	
836.60	101.6	V	28.5	0.6	0.0	27.9	38.5	-10.6	
836.60	106.2	H	30.6	0.6	0.0	30.0	38.5	-8.4	
848.80	103.4	V	30.1	0.7	0.0	29.4	38.5	-9.0	
848.80	106.3	H	30.2	0.7	0.0	29.5	38.5	-8.9	
Rev. 1.24.7									

GSM, GPRS Output Power (EIRP)

High Frequency Fundamental Measurement									
Compliance Certification Services, Fremont 5m Chamber A									
Company:		ERICSSON							
Project #:		08U11870							
Date:		6/15/2008							
Test Engineer:		MENGI STU MEKURIA							
Configuration:		EUT (WINSTRON ANTENNA) ALONE							
Mode:		TX, GPRS MODE							
Test Equipment:									
Receiving: Horn T60, and 12ft S/N: 197209005 (Setup this one for testing EUT)									
Substitution: Horn T73 Substitution, 4ft SMA Cable Warehouse S/N: 177081003									
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
1.850	95.2	V	22.6	0.7	8.3	30.1	33.0	-2.9	
1.850	87.0	H	13.8	0.7	8.3	21.4	33.0	-11.6	
1.880	94.2	V	21.7	0.7	8.3	29.3	33.0	-3.7	
1.880	87.7	H	14.7	0.7	8.3	22.3	33.0	-10.7	
1.910	94.7	V	22.3	0.7	8.4	30.0	33.0	-3.0	
1.910	87.7	H	14.8	0.7	8.4	22.4	33.0	-10.6	
Rev. 1.24.7									

6.2. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

§22.917 (e) and §24.238(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

§24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 22.917 (b), FCC 24.238 (b)

RESULTS

GSM, GPRS Spurious & Harmonic (ERP)

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

Company: ERICSSON
 Project #: 08U11870
 Date: 6/10/2008
 Test Engineer: MENGISTU MEKURIA
 Configuration: EUT (ACON ANTENNA) ALONE
 Mode: TX 850 MHz, GPRS MODE

Test Equipment:

EMCO Horn 1-18GHz
T73; S/N: 6717 @3m

Horn > 18GHz

Limit
FCC 22

High Pass Filter

Hi Frequency Cables
 (2 ft) (2 ~ 3 ft) (4 ~ 6 ft) (12 ft)

Pre-amplifier 1-26GHz
T34 HP 8449B

Pre-amplifier 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
Low Ch. (824.2 MHz)										
1.648	50.9	V	-56.8	3.8	8.0	5.8	-54.8	-13.0	-41.8	
2.473	59.0	V	-44.6	4.9	9.5	7.4	-42.1	-13.0	-29.1	
1.648	53.5	H	-53.5	3.8	8.0	5.8	-51.6	-13.0	-38.6	
2.473	60.8	H	-42.6	4.9	9.5	7.4	-40.1	-13.0	-27.1	
Mid Ch. (837.0 MHz)										
1.674	53.7	V	-53.9	3.9	8.0	5.9	-51.9	-13.0	-38.9	
2.511	60.6	V	-42.8	4.9	9.6	7.4	-40.3	-13.0	-27.3	
1.674	55.2	H	-51.6	3.9	8.0	5.9	-49.6	-13.0	-36.6	
2.511	62.3	H	-40.9	4.9	9.6	7.4	-38.4	-13.0	-25.4	
Hi Ch. (848.8 MHz)										
1.698	58.2	V	-49.3	3.9	8.1	5.9	-47.3	-13.0	-34.3	
2.546	63.5	V	-39.8	4.9	9.6	7.4	-37.3	-13.0	-24.3	
1.698	59.3	H	-47.4	3.9	8.1	5.9	-45.4	-13.0	-32.4	
2.546	62.4	H	-40.6	4.9	9.6	7.4	-38.1	-13.0	-25.1	

Rev. 4.12.7

GSM, GPRS Spurious & Harmonic (EIRP)

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

Company: ERICSSON AB
 Project #: 08U11870
 Date: 6/15/2008
 Test Engineer: MENGISTU MEKURIA
 Configuration: EUT (WINSTRON ANTENNA) ALONE
 Mode: TX 1900 MHz, GPRS MODE

Test Equipment:

EMCO Horn 1-18GHz
T60; S/N: 2238 @3m

Horn > 18GHz

Limit
FCC 24

High Pass Filter

Hi Frequency Cables
 (2 ft) (2~3 ft) (4~6 ft) (12 ft)

Pre-amplifier 1-26GHz
T144 Miteq 3008A01

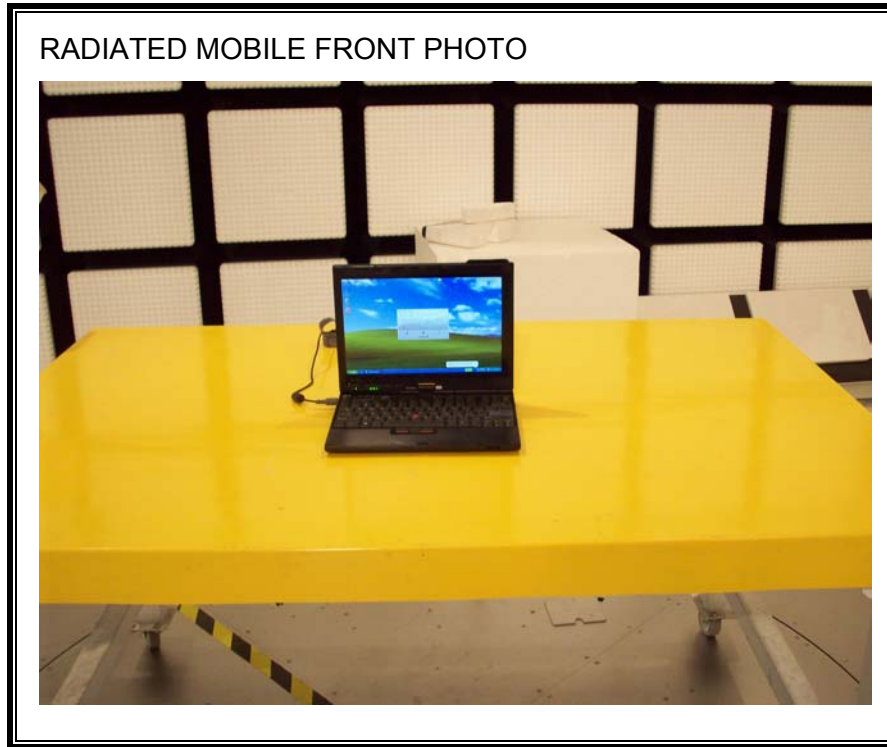
Pre-amplifier 26-40GHz

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
Low Ch. (1850.2 MHz)										
3.700	44.6	H	-54.2	5.9	9.7	7.5	-50.5	-13.0	-37.5	
5.551	39.6	H	-52.7	7.4	11.0	8.9	-49.1	-13.0	-36.1	
3.700	48.9	V	-50.0	5.9	9.7	7.5	-46.3	-13.0	-33.3	
5.551	39.9	V	-53.5	7.4	11.0	8.9	-49.9	-13.0	-36.9	
Mid Ch. (1880 MHz)										
3.760	44.7	H	-53.9	6.0	9.7	7.5	-50.2	-13.0	-37.2	
5.640	39.3	H	-53.1	7.4	11.2	9.0	-49.4	-13.0	-36.4	
3.760	45.1	V	-53.6	6.0	9.7	7.5	-49.9	-13.0	-36.9	
5.640	39.1	V	-54.4	7.4	11.2	9.0	-50.7	-13.0	-37.7	
Hi Ch. (1909.8 MHz)										
3.820	42.1	H	-56.2	6.0	9.7	7.6	-52.5	-13.0	-39.5	
5.729	39.3	H	-53.2	7.5	11.3	9.2	-49.4	-13.0	-36.4	
3.820	43.6	V	-54.8	6.0	9.7	7.6	-51.1	-13.0	-38.1	
5.729	38.4	V	-55.2	7.5	11.3	9.2	-51.4	-13.0	-38.4	

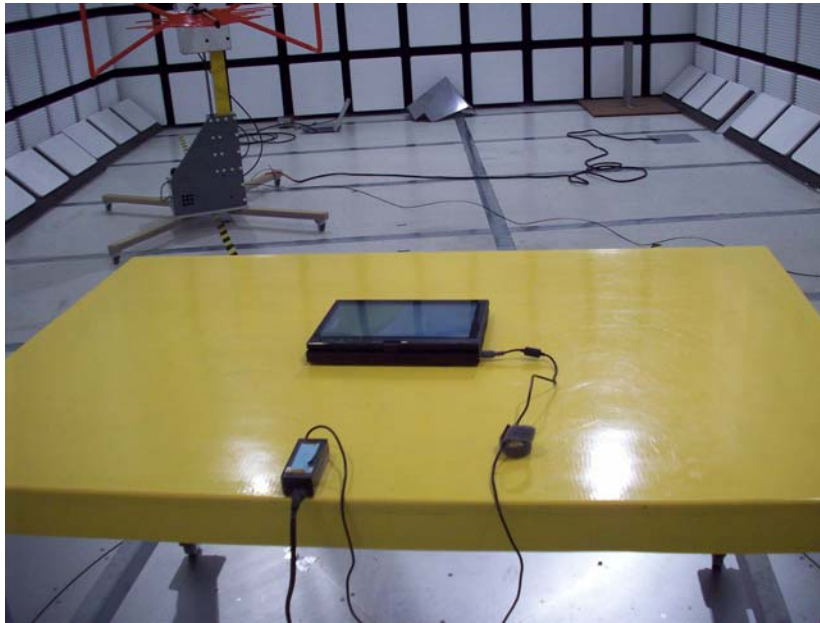
Rev. 4.12.7

7. SETUP PHOTOS

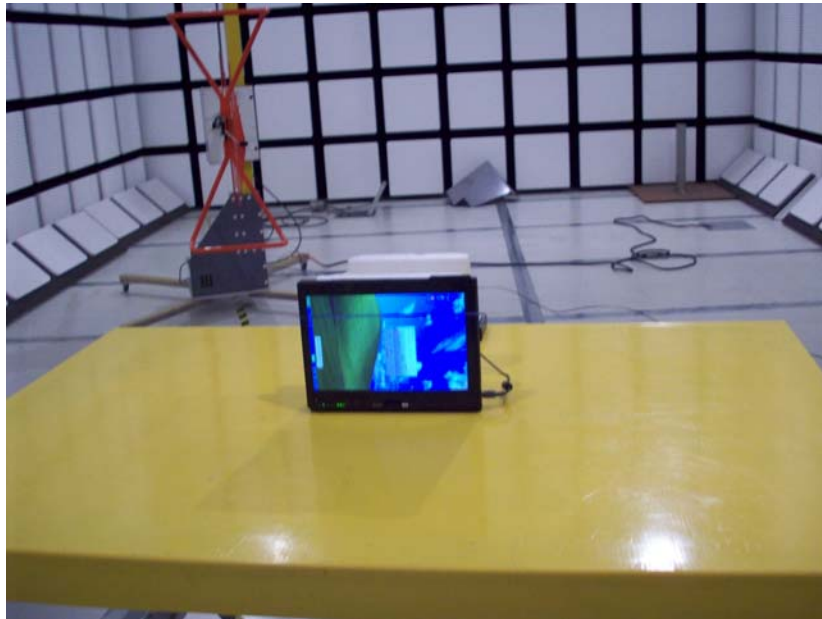
RADIATED RF MEASUREMENT SETUP

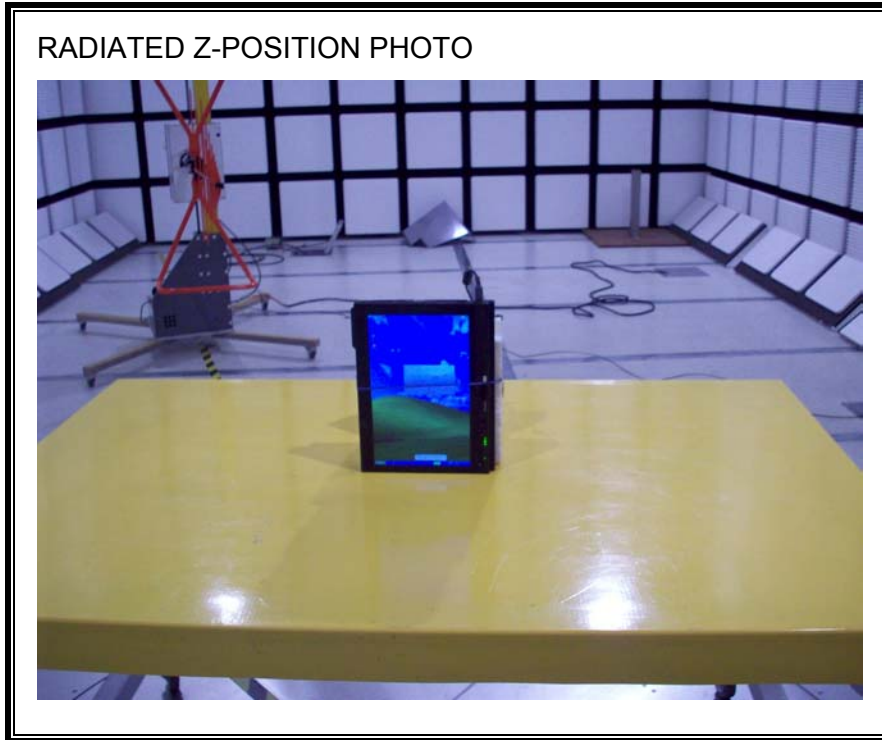


RADIATED Y-POSITION PHOTO



RADIATED Y-POSITION PHOTO





END OF REPORT