



**RADIATED SPURIOUS EMISSIONS PORTIONS OF
FCC CFR47 PART 22H & 24E
INDUSTRY CANADA RSS-132 ISSUE 2
INDUSTRY CANADA RSS-133 ISSUE 5**

CERTIFICATION TEST REPORT

FOR

A tablet (PAD) computer GSM/UMTS transceiver

**FCC MODEL NUMBER: TP00045A1
IC MODEL NUMBER: TP00045A1TC**

**FCC ID: PU5-TP00045A1TC
IC ID: 4182A-TP00045A1TC**

**REPORT NUMBER: 12U14547-2
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Prepared for
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Revision History

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TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY	5
4.1. MEASURING INSTRUMENT CALIBRATION	5
4.2. SAMPLE CALCULATION	5
4.3. MEASUREMENT UNCERTAINTY.....	5
5. EQUIPMENT UNDER TEST	6
5.1. DESCRIPTION OF EUT	6
5.2. MAXIMUM ERP/ERIP POWER	6
5.3. DESCRIPTION OF AVAILABLE ANTENNAS.....	7
5.4. SOFTWARE AND FIRMWARE	7
5.5. WORST-CASE CONFIGURATION AND MODE.....	7
5.6. DESCRIPTION OF TEST SETUP	8
6. TEST AND MEASUREMENT EQUIPMENT	10
7. RADIATED TEST RESULTS.....	11
7.1. RADIATED POWER (ERP & EIRP).....	11
7.2. FIELD STRENGTH OF SPURIOUS RADIATION	19
8. SETUP PHOTOS.....	26

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Lenovo
1009 Think Place, B2/5E1
Morrisville, NC 27560

EUT DESCRIPTION: A tablet (PAD) computer with GSM/UMTS Transceiver

FCC MODEL NUMBER: TP00045A1
IC MODEL NUMBER: TP00045A1TC

SERIAL NUMBER: Prototype

DATE TESTED: October 29, 2012 – October 31, 2012

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22H & 24E	Pass

UL 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 UL 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 UL and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24, RSS-132 Issue 2, and RSS-133 Issue 5.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 333 Pfingsten Road, Northbrook, IL 60193, USA.

UL NBK is accredited by NVLAP, Laboratory Code 100414-0

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

Sample Calculations

Radiated Field Strength and Conducted Emissions data contained within this report is calculated on the following basis:

Field Strength (dBuV/m) = Meter Reading (dBuV) + AF (dB/m) - Gain (dB) + Cable Loss (dB)
Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable Loss (dB) + LISN IL (dB)
Conducted Current (dBuA) = Meter Reading (dBuV) + Cable Loss (dB) - Transducer Factor (dBohms)

ERP EUT level = Delta EUT and Substitution + ERP level

ERIP EUT level = Delta EUT and Substitution + ERIP level

Delta EUT and Substitution = Substitution Peak field –EUT Measured peak level

ERP Substitution = ERIP level - 2.15

ERIP level = Voltage at Antenna + TX ant gain

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	+/- 0.3 dB (k=2)
Radiated Disturbance, 30 to 1000 MHz	+/- 3.17 dB (k=2)

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a tablet PC with GSM / UMTS feature that produced by Lenovo
Contains transmitter: Ericsson Model: C5621

5.2. MAXIMUM ERP/ERIP POWER

The transmitter has a maximum ERP/ERIP output powers as follows:

Part 22 Cellular Band

Frequency range (MHz)	Modulation	ERP	
		dBm	mW
824.2 – 848.8	GPRS	32.90	1949.84
	EGPRS	30.55	1135.01
826.4 – 846.6	WCDMA REL 99	20.74	118.58
	WCDMA HSUPA	22.04	159.96

Part 24 PCS Band

Frequency range (MHz)	Modulation	ERIP	
		dBm	mW
1850.2-1909.8	GPRS	22.73	187.50
	EGPRS	21.63	145.55
1852.4-1907.6	WCDMA REL99	16.18	41.50
	WCDMA HSUPA	17.28	53.46

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral antenna for the 850MHz and 1900MHz bands with a maximum peak gain as follow:

BANDS	Peak Gain (dBi)
GSM, CELL, 850MHz	Main -1.6dBi
GSM,PCS, 1900MHz	Main -0.67dBi
UMTS, 850MHz	Main -1.6dBi
UMTS, 1900MHz	Main -0.67dBi

Brand Name	Antenna Type	Model Name
Wistron NeWeb Corporation	Main, PIFA	25.90AFE.001
	Aux PIFA (RX only)	25.90AFF.001

5.4. SOFTWARE AND FIRMWARE

The EUT is linked with Anritsu MT8820C Communication Test Set.

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel for RF radiated emissions below 1GHz and AC conducted emissions are determined as the channel with the AC Power Adapter Source

Based on the investigation results, the highest peak power and enhanced data rate is the worst-case scenario for all measurements.

Worst-case modes below:

- For Cellular and PCS band: GPRS

For the fundamental investigation, since the EUT is a portable device that has three orientations; therefore X, Y and Z orientations have been investigated. The worst case was found to be at Tablet configuration Z-position for all modes in cell band, Tablet configuration Z-position on PCS bands for GPRS, EGPRS, and WCDMA modes.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT (RF RADIATED TEST)

Peripheral Support Equipment List				
Description	Manufacturer	Model	SN	FCC ID
AC Adapter	Lenovo	ADLX65NDC2A	11S45N0255Z1ZCAJ2795PX	DoC

I/O CABLES (RF RADIATED TEST)

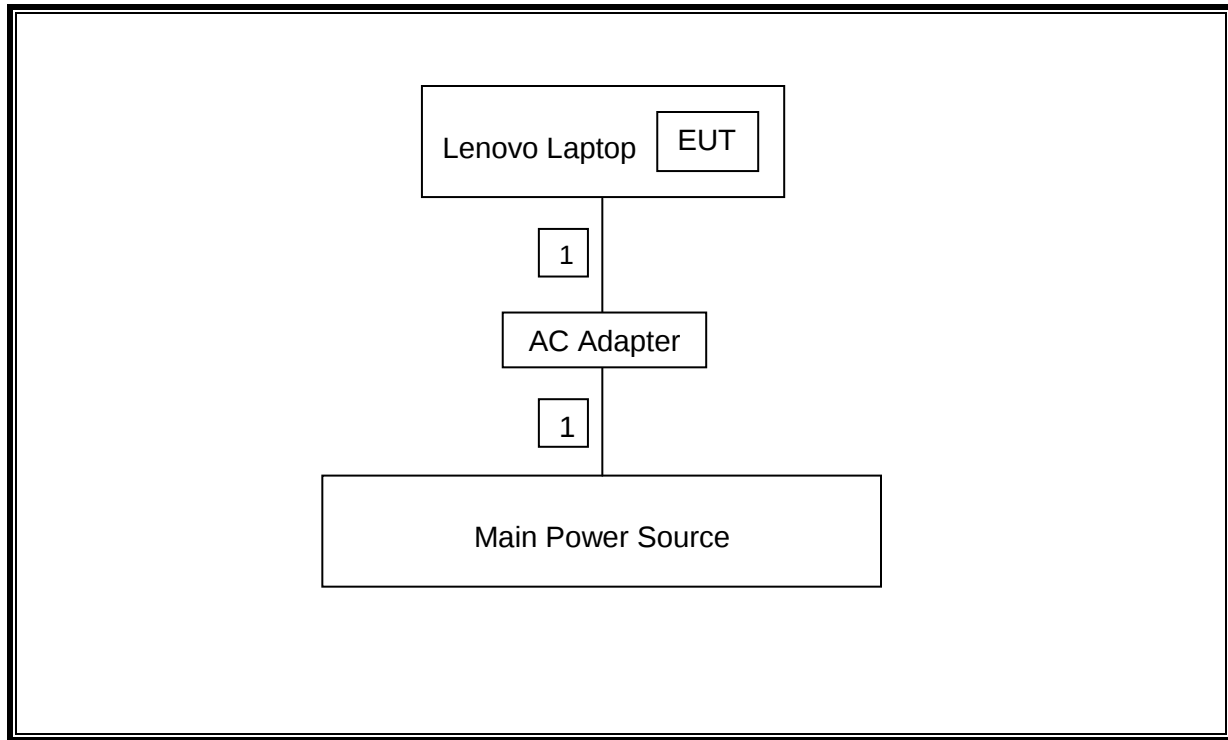
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	DC	Un-shielded	8 ft	AC adapter

TEST SETUP

The EUT is a stand-alone device. A link is established between the EUT and the communication test set

Call Box was set for tablet to transmit at highest level possible.

SETUP DIAGRAM FOR RF RADIATED 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
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323	20121231
Bicon Antenna	Chase	VBA6106A	EMC4078	20130131
Log-P Antenna (TX)	Chase	UPA6109	EMC4258	20131031
Log-P Antenna	Chase	UPA6109	EMC4313	20130831
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182	20121231
Antenna Array	UL	BOMS	EMC4276	20121231
Horn Antenna	ETS	3117	EMC4294	20121031
Signal Generator	Rohde & Schwarz	SML 03	EMC 4331	20121231
Signal Generator	Agilent	E8251A	EMC4243	20121231

7. RADIATED TEST RESULTS

7.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232
RSS132 & RSS133

LIMITS

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

24.232(c) - 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 603C Clause 2.2.17

MODES TESTED

- GPRS and EGPRS
- WCDMA

RESULTS

In the table of results the Voltage at the antenna includes signal generator level and cable loss
EUT level will be EUT measured level – Substitution measured +ERP Level (or EIRP level)

ERP CELL BANDS

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	32.42	1745.82
	190	836.60	32.33	1710.02
	251	848.80	32.90	1949.84
EGRS	128	824.20	30.18	1042.32
	190	836.60	30.55	1135.01
	251	848.80	30.49	1119.44

Mode	Channel	f (MHz)	ERP	
			dBm	mW
WCDMA REL99	128	826.40	20.24	105.68
	190	836.60	20.74	118.58
	251	846.80	19.70	93.33
WCDMA HSUPA	128	826.40	22.04	159.96
	190	836.60	21.96	157.04
	251	846.80	20.70	117.49

EIRP PCS BANDS

EUT	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	22.73	187.50
	661	1880.00	22.63	183.23
	810	1909.80	21.28	134.28
EGPRS	512	1850.20	20.34	108.14
	661	1880.00	21.63	145.55
	810	1909.80	20.70	117.49

EUT	Channel	f (MHz)	EIRP	
			dBm	mW
WCDMA REL99	9662	1852.40	14.85	30.55
	9800	1880.00	15.73	37.41
	9938	1907.60	16.18	41.50
WCDMA HSUPA	9662	1852.40	16.14	41.11
	9800	1880.00	16.72	46.99
	9938	1907.60	17.28	53.46

GPRS (Cellular Band)

Description	Freq. MHz	Polarization	Voltage at antenna dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	ERP Level dBm	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	ERP EUT Level dBm	Limit dBm/MHz	Margin dB
GPRS Slot 1												
Low	824.2	Horizontal	-51.38	54.83	5.584	-45.796	-43.646	130.81	75.98	32.334	38.45	-6.116
		Vertical	-51.38	53.07	5.284	-46.096	-43.946	125.18	72.11	28.164	38.45	-10.286
Mid	836.6	Horizontal	-51.42	54.28	5.5	-45.92	-43.77	130.38	76.1	32.33	38.45	-6.12
		Vertical	-51.42	53.78	5.334	-46.086	-43.936	125.32	71.54	27.604	38.45	-10.846
Hi	848.8	Horizontal	-51.43	54.55	5.588	-45.842	-43.692	131.07	76.52	32.828	38.45	-5.622
		Vertical	-51.43	53.02	5.476	-45.954	-43.804	125.59	72.57	28.766	38.45	-9.684
GPRS Slot 2												
Low	824.2	Horizontal	-51.38	54.83	5.7004	-45.68	-43.53	130.78	75.95	32.4204	38.45	-6.0296
		Vertical	-51.38	53.07	5.7148	-45.665	-43.515	125.09	72.02	28.5048	38.45	-9.9452
Mid	836.6	Horizontal	-51.42	54.28	5.713	-45.707	-43.557	130.38	76.1	32.543	38.45	-5.907
		Vertical	-51.42	53.78	5.6785	-45.742	-43.592	125.14	71.36	27.7685	38.45	-10.6815
Hi	848.8	Horizontal	-51.43	54.55	5.7256	-45.704	-43.554	131	76.45	32.8956	38.45	-5.5544
		Vertical	-51.43	53.02	5.6427	-45.787	-43.637	125.67	72.65	29.0127	38.45	-9.4373

EGPRS (Cellular Band)

Description	Freq. MHz	Polarization	Voltage at anttena dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	ERP Level dBm	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	ERP EUT Level dBm	Limit dBm/MHz	Margin dB
EGPRS Slot 1												
Low	824.2	Horizontal	-51.38	54.83	5.584	-45.796	-43.646	128.56	73.73	30.084	38.45	-8.366
		Vertical	-51.38	53.07	5.284	-46.096	-43.946	122.27	69.2	25.254	38.45	-13.196
Mid	836.6	Horizontal	-51.42	54.28	5.5	-45.92	-43.77	128.46	74.18	30.41	38.45	-8.04
		Vertical	-51.42	53.78	5.334	-46.086	-43.936	122.71	68.93	24.994	38.45	-13.456
Hi	848.8	Horizontal	-51.43	54.55	5.588	-45.842	-43.692	128.52	73.97	30.278	38.45	-8.172
		Vertical	-51.43	53.02	5.476	-45.954	-43.804	123.29	70.27	26.466	38.45	-11.984
EGPRS Slot 2												
Low	824.2	Horizontal	-51.38	54.83	5.7004	-45.68	-43.53	128.54	73.71	30.1804	38.45	-8.2696
		Vertical	-51.38	53.07	5.7148	-45.665	-43.515	122.23	69.16	25.6448	38.45	-12.8052
Mid	836.6	Horizontal	-51.42	54.28	5.713	-45.707	-43.557	128.39	74.11	30.553	38.45	-7.897
		Vertical	-51.42	53.78	5.6785	-45.742	-43.592	122.58	68.8	25.2085	38.45	-13.2415
Hi	848.8	Horizontal	-51.43	54.55	5.7256	-45.704	-43.554	128.59	74.04	30.4856	38.45	-7.9644
		Vertical	-51.43	53.02	5.6427	-45.787	-43.637	123.25	70.23	26.5927	38.45	-11.8573

WCDMA (Cellular Band)

Description	Freq. MHz	Polarization	Voltage at antenna dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	ERP Level dBm	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	ERP EUT Level dBm	Limit dBm/MHz	Margin dB
WCDMA	Rel99											
Low	826.4	Horizontal	-38.98	68.02	5.7004	-33.28	-35.43	123.69	55.67	20.2404	38.45	-18.2096
		Vertical	-38.98	68.02	5.7148	-33.265	-35.415	117.81	49.79	14.3748	38.45	-24.0752
Mid	836.6	Horizontal	-38.98	67.18	5.713	-33.267	-35.417	123.34	56.16	20.743	38.45	-17.707
		Vertical	-38.98	67.18	5.6785	-33.302	-35.452	118.17	50.99	15.5385	38.45	-22.9115
Hi	846.6	Horizontal	-38.9	68.02	5.7256	-33.174	-35.324	123.04	55.02	19.6956	38.45	-18.7544
		Vertical	-38.9	68.02	5.6427	-33.257	-35.407	117.86	49.84	14.4327	38.45	-24.0173
WCDMA	HSUPA											
SubSet1	826.4	Horizontal	-38.98	68.02	5.7004	-33.28	-35.43	125.19	57.17	21.7404	38.45	-16.7096
		Vertical	-38.98	68.02	5.7148	-33.265	-35.415	119.36	51.34	15.9248	38.45	-22.5252
SubSet2	826.4	Horizontal	-38.98	68.02	5.7004	-33.28	-35.43	125.15	57.13	21.7004	38.45	-16.7496
		Vertical	-38.98	68.02	5.7148	-33.265	-35.415	119.16	51.14	15.7248	38.45	-22.7252
SubSet3	826.4	Horizontal	-38.98	68.02	5.7004	-33.28	-35.43	124.49	56.47	21.0404	38.45	-17.4096
		Vertical	-38.98	68.02	5.7148	-33.265	-35.415	118.78	50.76	15.3448	38.45	-23.1052
SubSet4	826.4	Horizontal	-38.98	68.02	5.7004	-33.28	-35.43	123.68	55.66	20.2304	38.45	-18.2196
		Vertical	-38.98	68.02	5.7148	-33.265	-35.415	117.67	49.65	14.2348	38.45	-24.2152
SubSet5	826.4	Horizontal	-38.98	68.02	5.7004	-33.28	-35.43	125.49	57.47	22.0404	38.45	-16.4096
		Vertical	-38.98	68.02	5.7148	-33.265	-35.415	119.61	51.59	16.1748	38.45	-22.2752
SubSet1	836.6	Horizontal	-38.98	67.18	5.713	-33.267	-35.417	124.37	57.19	21.773	38.45	-16.677
		Vertical	-38.98	67.18	5.6785	-33.302	-35.452	118.75	51.57	16.1185	38.45	-22.3315
SubSet2	836.6	Horizontal	-38.98	67.18	5.713	-33.267	-35.417	124.28	57.1	21.683	38.45	-16.767
		Vertical	-38.98	67.18	5.6785	-33.302	-35.452	119.16	51.98	16.5285	38.45	-21.9215
SubSet3	836.6	Horizontal	-38.98	67.18	5.713	-33.267	-35.417	123.48	56.3	20.883	38.45	-17.567
		Vertical	-38.98	67.18	5.6785	-33.302	-35.452	117.96	50.78	15.3285	38.45	-23.1215
SubSet4	836.6	Horizontal	-38.98	67.18	5.713	-33.267	-35.417	122.91	55.73	20.313	38.45	-18.137
		Vertical	-38.98	67.18	5.6785	-33.302	-35.452	117.25	50.07	14.6185	38.45	-23.8315
SubSet5	836.6	Horizontal	-38.98	67.18	5.713	-33.267	-35.417	124.56	57.38	21.963	38.45	-16.487
		Vertical	-38.98	67.18	5.6785	-33.302	-35.452	119.08	51.9	16.4485	38.45	-22.0015
SubSet1	846.6	Horizontal	-38.98	68.02	5.7004	-33.28	-35.43	124.12	56.1	20.6704	38.45	-17.7796
		Vertical	-38.98	68.02	5.7148	-33.265	-35.415	117.97	49.95	14.5348	38.45	-23.9152
SubSet2	846.6	Horizontal	-38.98	68.02	5.7004	-33.28	-35.43	123.89	55.87	20.4404	38.45	-18.0096
		Vertical	-38.98	68.02	5.7148	-33.265	-35.415	117.74	49.72	14.3048	38.45	-24.1452
SubSet3	846.6	Horizontal	-38.98	68.02	5.7004	-33.28	-35.43	123.24	55.22	19.7904	38.45	-18.6596
		Vertical	-38.98	68.02	5.7148	-33.265	-35.415	117.12	49.1	13.6848	38.45	-24.7652
SubSet4	846.6	Horizontal	-38.98	68.02	5.7004	-33.28	-35.43	122.81	54.79	19.3604	38.45	-19.0896
		Vertical	-38.98	68.02	5.7148	-33.265	-35.415	116.54	48.52	13.1048	38.45	-25.3452
SubSet5	846.6	Horizontal	-38.98	68.02	5.7004	-33.28	-35.43	124.15	56.13	20.7004	38.45	-17.7496
		Vertical	-38.98	68.02	5.7148	-33.265	-35.415	118.22	50.2	14.7848	38.45	-23.6652

GPRS (PCS Band)

Description	Freq. MHz	Polarization	Voltage at antenna dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	EIRP EUT Level dBm	Limit dBm/MHz	Margin dB
GPRS Slot 1											
Low	1850.2	Horizontal	-25.88	78.26	4.7313	-21.149	122.14	43.88	22.7313	33	-10.2687
		Vertical	-50.96	51.52	4.628	-46.332	111.69	60.17	13.838	33	-19.162
Mid	1880	Horizontal	-26.05	77.94	4.694	-21.356	121.93	43.99	22.634	33	-10.366
		Vertical	-51.08	50.56	4.4192	-46.661	113.35	62.79	16.1292	33	-16.8708
Hi	1909.8	Horizontal	-51.1	52.8	4.676	-46.424	120.5	67.7	21.276	33	-11.724
		Vertical	-51.1	51.02	4.332	-46.768	112.12	61.1	14.332	33	-18.668
GPRS Slot 2											
Low	1850.2	Horizontal	-25.88	78.26	4.7313	-21.149	122.05	43.79	22.6413	33	-10.3587
		Vertical	-50.96	51.52	4.628	-46.332	111.49	59.97	13.638	33	-19.362
Mid	1880	Horizontal	-26.05	77.94	4.694	-21.356	121.82	43.88	22.524	33	-10.476
		Vertical	-51.08	50.56	4.4192	-46.661	113.06	62.5	15.8392	33	-17.1608
Hi	1909.8	Horizontal	-51.1	52.8	4.676	-46.424	120.45	67.65	21.226	33	-11.774
		Vertical	-51.1	51.02	4.332	-46.768	112.08	61.06	14.292	33	-18.708

EGPRS (PCS Band)

Description	Freq. MHz	Polarization	Voltage at antenna dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	EIRP EUT Level dBm	Limit dBm/MHz	Margin dB
EGPRS Slot 1											
Low	1850.2	Horizontal	-25.88	78.26	4.7313	-21.149	119.75	41.49	20.3413	33	-12.6587
		Vertical	-50.96	51.52	4.628	-46.332	111.05	59.53	13.198	33	-19.802
Mid	1880	Horizontal	-26.05	77.94	4.694	-21.356	120.93	42.99	21.634	33	-11.366
		Vertical	-51.08	50.56	4.4192	-46.661	112.53	61.97	15.3092	33	-17.6908
Hi	1909.8	Horizontal	-51.1	52.8	4.676	-46.424	119.92	67.12	20.696	33	-12.304
		Vertical	-51.1	51.02	4.332	-46.768	111.92	60.9	14.132	33	-18.868
EGPRS Slot 2											
Low	1850.2	Horizontal	-25.88	78.26	4.7313	-21.149	119.63	41.37	20.2213	33	-12.7787
		Vertical	-50.96	51.52	4.628	-46.332	110.94	59.42	13.088	33	-19.912
Mid	1880	Horizontal	-26.05	77.94	4.694	-21.356	120.88	42.94	21.584	33	-11.416
		Vertical	-51.08	50.56	4.4192	-46.661	112.53	61.97	15.3092	33	-17.6908
Hi	1909.8	Horizontal	-51.1	52.8	4.676	-46.424	119.88	67.08	20.656	33	-12.344
		Vertical	-51.1	51.02	4.332	-46.768	111.79	60.77	14.002	33	-18.998

WCDMA (PCS Band)

Description	Freq. MHz	Polarization	Voltage at antenna dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	EIRP EUT Level dBm	Limit dBm/MHz	Margin dB
WCDMA	Rel99										
Low	1852.4	Horizontal	-51.02	52.95	4.7285	-46.292	114.09	61.14	14.8485	33	-18.1515
		Vertical	-51.02	51.89	4.612	-46.408	104.87	52.98	6.572	33	-26.428
Mid	1880	Horizontal	-51.08	52.73	4.694	-46.386	114.85	62.12	15.734	33	-17.266
		Vertical	-51.08	50.56	4.4192	-46.661	108.29	57.73	11.0692	33	-21.9308
Hi	1907.6	Horizontal	-51.07	52.36	4.674	-46.396	114.94	62.58	16.184	33	-16.816
		Vertical	-51.07	50.64	4.32	-46.75	109.79	59.15	12.4	33	-20.6
WCDMA	HSUPA										
SubSet1	1852.4	Horizontal	-51.02	52.95	4.7285	-46.292	113.9	60.95	14.6585	33	-18.3415
		Vertical	-51.02	51.89	4.612	-46.408	106.44	54.55	8.142	33	-24.858
SubSet2	1852.4	Horizontal	-51.02	52.95	4.7285	-46.292	115.38	62.43	16.1385	33	-16.8615
		Vertical	-51.02	51.89	4.612	-46.408	105.92	54.03	7.622	33	-25.378
SubSet3	1852.4	Horizontal	-51.02	52.95	4.7285	-46.292	114.83	61.88	15.5885	33	-17.4115
		Vertical	-51.02	51.89	4.612	-46.408	107.08	55.19	8.782	33	-24.218
SubSet4	1852.4	Horizontal	-51.02	52.95	4.7285	-46.292	113.78	60.83	14.5385	33	-18.4615
		Vertical	-51.02	51.89	4.612	-46.408	106.83	54.94	8.532	33	-24.468
SubSet5	1852.4	Horizontal	-51.02	52.95	4.7285	-46.292	115.24	62.29	15.9985	33	-17.0015
		Vertical	-51.02	51.89	4.612	-46.408	105.8	53.91	7.502	33	-25.498
SubSet1	1880	Horizontal	-51.08	52.73	4.694	-46.386	115.3	62.57	16.184	33	-16.816
		Vertical	-51.08	50.56	4.4192	-46.661	107.77	57.21	10.5492	33	-22.4508
SubSet2	1880	Horizontal	-51.08	52.73	4.694	-46.386	115.84	63.11	16.724	33	-16.276
		Vertical	-51.08	50.56	4.4192	-46.661	106.55	55.99	9.3292	33	-23.6708
SubSet3	1880	Horizontal	-51.08	52.73	4.694	-46.386	115.34	62.61	16.224	33	-16.776
		Vertical	-51.08	50.56	4.4192	-46.661	106.69	56.13	9.4692	33	-23.5308
SubSet4	1880	Horizontal	-51.08	52.73	4.694	-46.386	114.48	61.75	15.364	33	-17.636
		Vertical	-51.08	50.56	4.4192	-46.661	106.08	55.52	8.8592	33	-24.1408
SubSet5	1880	Horizontal	-51.08	52.73	4.694	-46.386	115.3	62.57	16.184	33	-16.816
		Vertical	-51.08	50.56	4.4192	-46.661	107.36	56.8	10.1392	33	-22.8608
SubSet1	1907.6	Horizontal	-51.07	52.36	4.674	-46.396	115.15	62.79	16.394	33	-16.606
		Vertical	-51.07	50.64	4.32	-46.75	108.5	57.86	11.11	33	-21.89
SubSet2	1907.6	Horizontal	-51.07	52.36	4.674	-46.396	115.88	63.52	17.124	33	-15.876
		Vertical	-51.07	50.64	4.32	-46.75	106.5	55.86	9.11	33	-23.89
SubSet3	1907.6	Horizontal	-51.07	52.36	4.674	-46.396	115.65	63.29	16.894	33	-16.106
		Vertical	-51.07	50.64	4.32	-46.75	106.96	56.32	9.57	33	-23.43
SubSet4	1907.6	Horizontal	-51.07	52.36	4.674	-46.396	114.38	62.02	15.624	33	-17.376
		Vertical	-51.07	50.64	4.32	-46.75	106.26	55.62	8.87	33	-24.13
SubSet5	1907.6	Horizontal	-51.07	52.36	4.674	-46.396	116.04	63.68	17.284	33	-15.716
		Vertical	-51.07	50.64	4.32	-46.75	109.79	59.15	12.4	33	-20.6

7.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238
IC: RSS-132, 4.5; RSS-133, 6.5

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

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

MODES TESTED:

- GPRS and EGPRS
- WCDMA

RESULTS

GPRS was determined to be the worst case for all modes. All harmonics found have a minimum margin of 20 dB or more to the -13dBm limit. Measurements at more than one mode were considered not necessary.

Lo CH (Cellular Band)

Description	Freq. MHz	Polarization	Voltage at antenna dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	ERP Level dBm	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	ERP EUT Level dBm	Limit dBm/MHz	Margin dB
GPRS Slot 1 Lo	824.2											
2nd Harmonic	1648.4	Horizontal	-53.62	52.15	6.032	-47.588	-45.438	52.54	0.39	-45.048104	-13	-32.0481
		Vertical	-53.62	50.69	6.125	-47.495	-45.345	54.34	3.65	-41.694904	-13	-28.6949
3rd Harmonic	2472.6	Horizontal	-54.57	47.14	5.722	-48.848	-46.698	58.54	11.4	-35.297508	-13	-22.2975
		Vertical	-54.57	47.71	5.651	-48.919	-46.769	54.36	6.65	-40.118846	-13	-27.1188
5th Harmonic	4121	Horizontal	-56.16	49.33	8.935	-47.225	-45.075	41.23	-8.1	-53.17537	-13	-40.1754
7th Harmonic	5769.4	Horizontal	-57.59	49.53	10.1	-47.487	-45.337	41.17	-8.36	-53.696874	-13	-40.6969

Mid CH (Cellular Band)

Description	Freq. MHz	Polarization	Voltage at antenna dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	ERP Level dBm	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	ERP EUT Level dBm	Limit dBm/MHz	Margin dB
GPRS Slot 1 Mid	836.6											
2nd Harmonic	1673.2	Horizontal	-53.67	52.17	5.956	-47.714	-45.564	60.06	7.89	-37.673992	-13	-24.674
		Vertical	-53.67	50.6	6.062	-47.608	-45.458	56.28	5.68	-39.778392	-13	-26.7784
3rd Harmonic	2509.8	Horizontal	-54.49	46.87	5.743	-48.747	-46.597	60.25	13.38	-33.21669	-13	-20.2167
		Vertical	-54.49	47.91	5.646	-48.844	-46.694	54.56	6.65	-40.044168	-13	-27.0442
5th Harmonic	4183	Horizontal	-56.29	50.94	9.06	-47.23	-45.08	42.89	-8.05	-53.12951	-13	-40.1295
7th Harmonic	5856.2	Horizontal	-57.89	48.1	10.21	-47.677	-45.527	40	-8.1	-53.62684	-13	-40.6268

Hi CH (Cellular Band)

Description	Freq. MHz	Polarization	Voltage at antenna dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	ERP Level dBm	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	ERP EUT Level dBm	Limit dBm/MHz	Margin dB
GPRS Slot 1 Hi	848.8											
2nd Harmonic	1697.6	Horizontal	-53.73	52.24	5.881	-47.849	-45.699	59.58	7.34	-38.358656	-13	-25.3587
		Vertical	-53.73	50.79	5.999	-47.731	-45.581	56.28	5.49	-40.090856	-13	-27.0909
3rd Harmonic	2546.4	Horizontal	-54.52	46.93	5.778	-48.742	-46.592	58.23	11.3	-35.29192	-13	-22.2919
		Vertical	-54.52	48.21	5.75	-48.77	-46.62	57.06	8.85	-37.770224	-13	-24.7702
5th Harmonic	4244	Horizontal	-56.2	49.73	9.207	-46.993	-44.843	45.08	-4.65	-49.4928	-13	-36.4928
6th Harmonic	5092.8	Horizontal	-57.11	49.63	9.891	-47.219	-45.069	41.76	-7.87	-52.938624	-13	-39.9386

Lo CH (PCS Band)

Description	Freq. MHz	Polarization	Voltage at antenna dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	EIRP EUT Level dBm	Limit dBm/MHz	Margin dB
GPRS Slot 1 Lo	1850.2										
3rd Harmonic	5550.6	Vertical	-44.3	61.01	10.15	-34.149	47.93	-13.08	-47.229026	-13	-34.229

Mid CH (PCS Band)

Description	Freq. MHz	Polarization	Voltage at antenna dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	EIRP EUT Level dBm	Limit dBm/MHz	Margin dB
GPRS Slot 1 Mid	1880										
3rd Harmonic	5640	Vertical	-51.69	54.69	10.2	-41.489	45.71	-8.98	-50.4688	-13	-37.4688

HI CH (PCS Band)

Description	Freq. MHz	Polarization	Voltage at antenna dBm	Substitution Peak Filed Strenght Measured dBuV/m	TX ant dBi	EIRP Level	EUT Measured Peak Level dBuV/m	Delta EUT and Substitution dB	EIRP EUT Level dBm	Limit dBm/MHz	Margin dB
GPRS Slot 1 Hi	1909.8										
3rd Harmonic	5729.4	Vertical	-44.42	60.62	10.23	-34.191	43.08	-17.54	-51.730828	-13	-38.7308