MOBILE DEVICES BUSINESS

PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY

EMC TEST REPORT

Test Report Number – 25389-1JBP

The test results and statements contained herein relate only to the model(s) identified and tested. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Engineer, I hereby declare that the equipment tested as specified in this report conforms to the requirements indicated.

Signature:  Name: Albert J. Patapack

Title: EMC Engineer Date: June 3, 2013

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Test Report Details

Tests Performed By:	ADR Testing Service Location Code: ADR LV Motorola Mobility LLC Product Safety and Compliance Group 600 North US Hwy 45 Libertyville, IL 60048 FCC Registration Number: 316588 Industry Canada Number: 109O-1
Tests Requested By:	Motorola Mobility LLC 600 North US Hwy 45 Libertyville, IL 60048
Product Type :	Portable Cellular Phone
Signaling Capability:	WCDMA 1700/1900/2100/850/900, GSM 1800/1900/850/900, LTE Band 02/Band 04/Band 17, aGPS, Bluetooth Class 2, Version 4.0 LE+EDR, 802.11b/802.11g/802.11a/802.11n/802.11ac, NFC
FCC ID:	IHDT56PA2
Serial Numbers:	LXAA1W0033, LXAA1W0024
Dates of Test:	March 7 - April 17, 2013

Applicable Standards

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47:

Part 15 Subpart B – Unintentional Radiators

Applicable Standards: ANSI 63.4 2003, RSS-210 Issue 8

Summary of Testing

Test #	Test Name	Pass/Fail
1	Field Strength of Spurious Emissions from Unintentional Radiators	Pass. See Results
2	AC Line Conducted Emissions from Unintentional Radiators	Pass. See Results

General and Special Conditions

This product utilizes an internal battery that is not removable. When applicable, EMC testing was performed with the internal battery fully charged.

All testing was done in an indoor controlled environment. The temperature and the relative humidity were maintained within the ANSI C63.4 2003 Standard requirements during the entire duration of testing.

Equipment and Cable Configurations

The EUT was tested in a configuration as specified by ANSI C63.4 2003 Standard requirements.

Equipment List

Manufacturer	Equipment Type	Model No.	Serial Number	Calibration Due Date
Rohde & Schwarz	Receiver	ESI40	100226	5/15/2013
A. H. Systems	DRG Horn Antenna	3115	6222	7/26/2013
ETS	Log-Periodic Antenna	3148	1188	9/6/2013
ETS	Biconical Antenna	3110B	3369	9/5/2013
Attenuator	Weinschel	AS-6	6675	NCR
Attenuator	Weinschel	AS-6	6677	NCR
ETS	LISN	3810/2NM	00062907	8/7/2013
ETS	LISN	3810/2NM	00062912	8/6/2013
ETS	Loop Antenna	6507	00049471	1/7/2014
Hewlett Packard	Laptop Computer	8440P	CND04111C8	NA
Hewlett Packard	Monitor	HP2311X	CNT101X68Q	NA
Dell	Mouse	M-UVDEL1	HCJ43516737	NA

All equipment is on a one-year calibration cycle. All testing was performed using equipment that was within calibration at the time that the test was performed. No equipment listed in the table above was used after the specified calibration due date. If, during the course of product testing, a piece of equipment went out of calibration, a similar piece of calibrated equipment was substituted. If a substitution was made, that new piece of equipment would be listed in the above table along with the piece that was removed from service.

The HP 8440P Laptop Computer, HP Monitor and the Dell Mouse are labeled as DoC.

Measurement Procedures and Data

Field Strength of Emissions from Unintentional radiators

Measurement Procedure

The equipment under test is placed inside the semi-anechoic chamber on a wooden table on the center of the turntable. Initially, for all radiated emissions from 9 kHz to 30 MHz, the turntable is rotated 45 degrees to obtain a maximum reading on the spectrum analyzer using the peak detector function. All final readings are then taken at the worst case EUT orientation. For all radiated emissions from 30 MHz to 1 GHz, the antenna mast is varied from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer using the peak detector function. Below 1000 MHz, the final radiated emissions are then measured using an EMI receiver employing a CISPR quasi-peak detector. The receiver used has an average detector function and an RMS detector function. The average detector function is used for final radiated emissions measurements above 1000 MHz. Above 1000 MHz, the EMI receiver VBW of 3 MHz and RBW of 1 MHz is used. This is repeated for both horizontal and vertical polarizations of the receive antenna.

The field strength of each radiated emission is calculated by correcting the EMI receiver level for cable loss, amplifier gain and antenna correction factors.

Field Strength (dBuV/m) = EMI Receiver Level (dBuV) + Cable Loss (dB) - Amplifier Gain (dB) + Antenna Correction Factor (1/m)

Test Setup

The EUT and the host equipment were setup according to the procedures in ANSI C63.4- 2003. The test is performed with the EUT connected to a laptop computer using a USB data cable. The USB data cable is 1 m in length. Two additional peripherals, a USB mouse and a VGA monitor, are also connected to the laptop computer through the appropriate port. The EUT was communicating with the laptop computer continuously.

Additional EUT information:
Processor Speed – Up to 1.7GHz
Xtal – 19.2MHz, 27MHz, 27.12MHz, 48MHz
Memory Size –16GB eMMC
Video Resolution – 1280x720
Video Clock: 210MHz
Refresh rate – 60Hz
Testing was conducted up to and including 10GHz.

Measurement Results

Radiated emissions were measured from 9 kHz to 30 MHz and all emissions were 20 dB below the limit.

Operating Mode – Rx Mode, Data Transfer Mode.

30 MHz – 1000 MHz

Frequency MHz	Level dBµV/m	Measured dBµV	Transd dB	Cables dB	Limit dBµV/m	Margin dB	Height cm	Angle deg	Pol.
31.72	28.47	9.05	13.1	6.4	40	11.5	365	235	VERT
33.28	37.24	18.27	12.6	6.3	40	2.8	99	221	VERT
39.80	32.61	14.87	11.3	6.4	40	7.4	215	77	VERT
60.32	33.35	17.36	9.5	6.5	40	6.7	100	95	VERT
69.80	23.85	7.80	9.4	6.6	40	16.2	178	43	VERT
104.08	27.82	10.86	10.2	6.8	43.5	15.7	206	89	VERT
118.64	31.04	12.87	11.3	6.8	43.5	12.5	231	277	HORI
139.56	40.80	22.07	11.8	6.9	43.5	2.7	99	37	VERT
153.04	32.00	12.62	12.4	7.0	43.5	11.5	332	150	HORI
233.16	33.82	14.89	11.6	7.3	46	12.2	120	138	HORI

Notes: Worst Case emissions reported.

Average Measurements above 1 GHz

Frequency MHz	Level dBµV/m	Measured dBµV	Transd dB	Gain dB	Limit dBµV/m	Margin dB	Height cm	Angle deg	Pol.
1045.4	23.69	25.6	24.2	26.2	54	30.3	371	128	HORI
1134.3	25.16	26.31	24.8	26.0	54	28.8	324	145	HORI
1199.8	26.04	26.77	25.2	25.9	54	28.0	206	146	HORI
1278.8	25.87	26.37	25.3	25.8	54	28.1	351	176	VERT
1330.2	26.39	26.77	25.3	25.7	54	27.6	155	201	VERT
1492.7	24.78	25.04	25.3	25.5	54	29.2	343	144	HORI
1597.4	27.01	26.88	25.4	25.2	54	27.0	312	60	VERT
1634.7	27.09	26.68	25.6	25.2	54	26.9	251	153	VERT
1682.6	26.92	26.20	25.9	25.2	54	27.1	360	171	VERT
1699.4	25.46	24.63	26.0	25.2	54	28.5	393	138	VERT
1758.0	26.42	24.64	27.0	25.2	54	27.6	339	169	VERT
2061.5	27.73	24.93	27.5	24.7	54	26.3	200	131	HORI
2090.9	27.64	24.66	27.6	24.7	54	26.4	185	118	HORI
2130.1	30.25	27.26	27.7	24.7	54	23.7	342	27	VERT
2195.0	26.63	23.42	27.7	24.5	54	27.4	344	139	HORI
2263.0	28.01	24.74	27.7	24.4	54	26.0	146	125	HORI
2299.9	27.68	24.19	27.9	24.4	54	26.3	123	161	VERT
2662.9	28.39	23.36	28.8	23.8	54	25.6	310	284	VERT
5410.4	33.37	19.67	34.4	20.7	54	20.6	119	324	VERT
5971.1	33.36	19.18	34.3	20.2	54	20.6	181	84	VERT
6628.4	34.11	18.92	34.7	19.5	54	19.9	311	314	VERT
6785.0	33.95	18.22	35.1	19.4	54	20.1	266	360	VERT
6936.2	34.54	18.46	35.2	19.1	54	19.5	163	11	HORI
6999.4	34.58	18.40	35.3	19.1	54	19.4	125	147	HORI
7408.7	38.20	19.92	36.7	18.4	54	15.8	363	341	HORI
7714.8	37.80	19.52	36.5	18.3	54	16.2	319	160	HORI
7922.8	37.95	19.34	36.8	18.2	54	16.0	188	42	HORI

Peak Measurements above 1 GHz

Frequency MHz	Level dBµV/m	Measured dBµV	Transd dB	Gain dB	Height cm	Angle deg	Pol.	Limit dBµV/m	Margin dB	Result
1045.4	39.91	41.82	24.2	26.2	371	128	HORI	74	34.1	Pass
1134.3	42.53	43.68	24.8	26.0	324	145	HORI	74	31.5	Pass
1199.8	46.27	47.00	25.2	25.9	206	146	HORI	74	27.7	Pass
1278.8	43.71	44.21	25.3	25.8	351	176	VERT	74	30.3	Pass
1330.2	44.76	45.14	25.3	25.7	155	201	VERT	74	29.2	Pass
1492.7	41.32	41.58	25.3	25.5	343	144	HORI	74	32.7	Pass
1597.4	42.79	42.66	25.4	25.2	312	60	VERT	74	31.2	Pass
1634.7	47.89	47.49	25.6	25.2	251	153	VERT	74	26.1	Pass
1682.6	48.72	48.00	25.9	25.2	360	171	VERT	74	25.3	Pass
1699.4	42.04	41.21	26.0	25.2	393	138	VERT	74	32.0	Pass
1758.0	44.79	43.02	27.0	25.2	339	169	VERT	74	29.2	Pass
2061.5	47.67	44.87	27.5	24.7	200	131	HORI	74	26.3	Pass
2090.9	48.62	45.64	27.6	24.7	185	118	HORI	74	25.4	Pass
2130.1	47.73	44.74	27.7	24.7	342	27	VERT	74	26.3	Pass
2195.0	40.75	37.54	27.7	24.5	344	139	HORI	74	33.3	Pass
2263.0	47.08	43.81	27.7	24.4	146	125	HORI	74	26.9	Pass
2299.9	45.19	41.70	27.9	24.4	123	161	VERT	74	28.8	Pass
2662.9	42.83	37.80	28.8	23.8	310	284	VERT	74	31.2	Pass
5410.4	46.02	32.32	34.4	20.7	119	324	VERT	74	28.0	Pass
5971.1	46.64	32.46	34.3	20.2	181	84	VERT	74	27.4	Pass
6628.4	46.95	31.76	34.7	19.5	311	314	VERT	74	27.1	Pass
6785.0	46.81	31.08	35.1	19.4	266	360	VERT	74	27.2	Pass
6936.2	47.17	31.08	35.2	19.1	163	11	HORI	74	26.8	Pass
6999.4	47.81	31.63	35.3	19.1	125	147	HORI	74	26.2	Pass
7408.7	51.22	32.94	36.7	18.4	363	341	HORI	74	22.8	Pass
7714.8	50.65	32.38	36.5	18.3	319	160	HORI	74	23.4	Pass
7922.8	51.21	32.60	36.8	18.2	188	42	HORI	74	22.8	Pass

AC Line Conducted Emissions

Measurements Procedure

AC power-line conducted emission measurements are made over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from all of the EUT current-carrying power input terminals that are directly or indirectly connected to a public power network. The measurements are made on each current-carrying conductor at the plug end of the EUT power cord or calibrated extension cord by the use of mating plugs and receptacles on the EUT and LISN. The EUT is tested using a LISN and the supporting equipments are connected to another LISN. Preliminary measurements are made using a peak detector and final measurements are performed using Quasi Peak and Average Detectors. The RBW of the EMI receiver is set to 9 kHz for all final measurements.

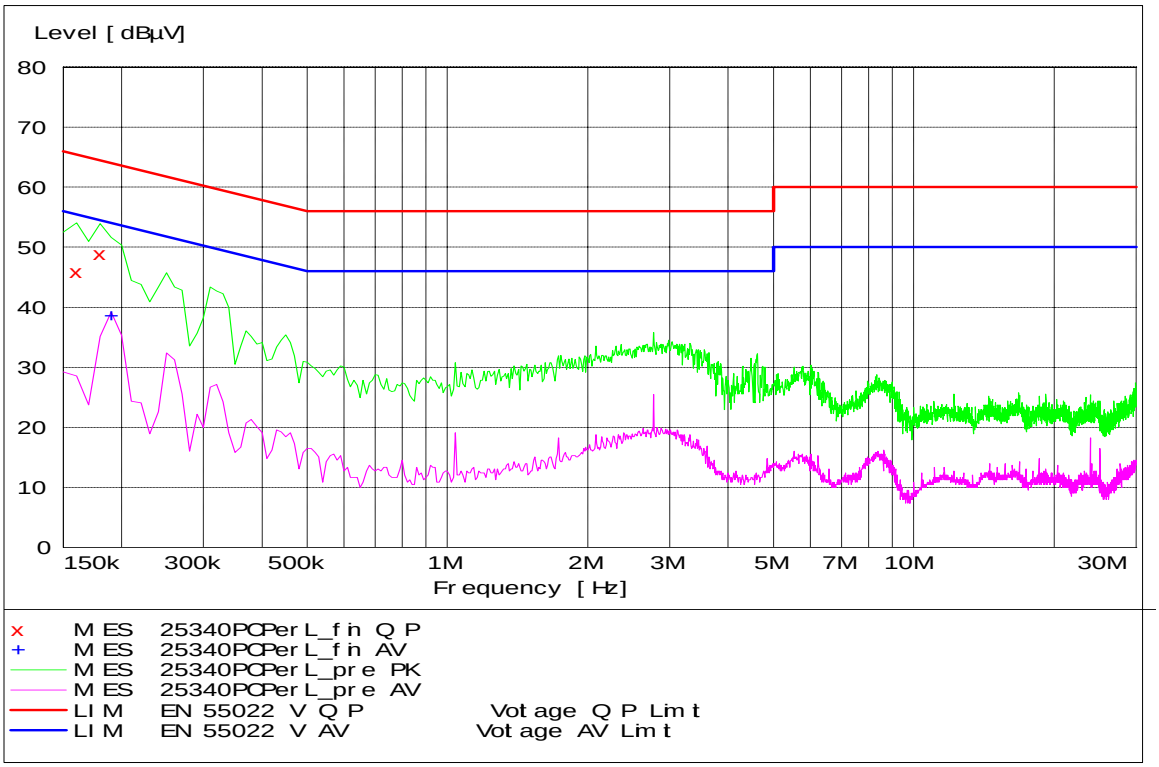
Conducted Emission (dBuV) = EMI Receiver Level (dBuV) + Loss (dB)

Test Setup

The EUT and the host equipment were setup according to the procedures in ANSI C63.4- 2003. The test is performed with the EUT connected to a laptop computer using a USB data cable. The USB data cable is 1 m in length. Two additional peripherals, a USB mouse and a VGA monitor, are also connected to the laptop computer through the appropriate port. The EUT was communicating with the laptop computer continuously.

Measurement results

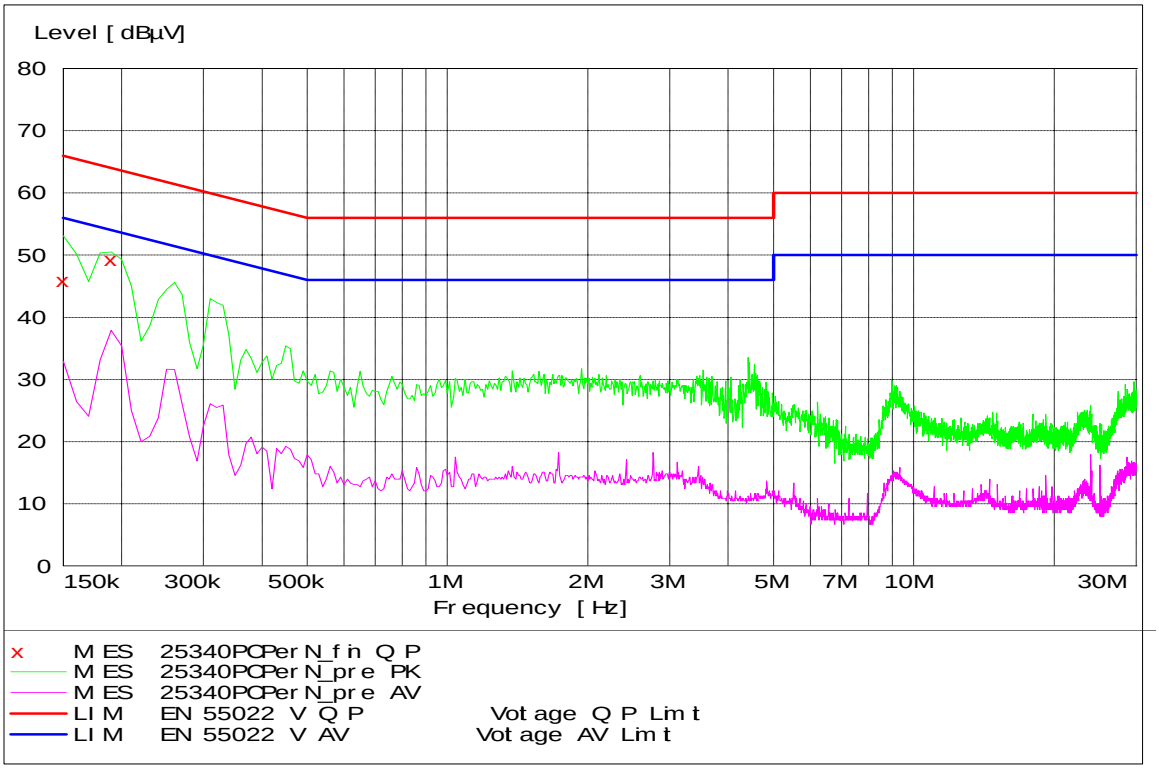
Tx Mode - Line Coupling



Frequency MHz	QuasiPeak Conducted Emission dBuV	Limit dBuV	Margin dB
0.16	46.0	66	20.0
0.18	49.0	65	16.0

Frequency MHz	Average Conducted Emission dBuV	Limit dBuV	Margin dB
0.19	38.7	54	15.3

Tx Mode - Neutral Coupling



Frequency MHz	QuasiPeak Conducted Emission dBuV	Limit dBuV	Margin dB
0.15	46.0	66	20.0
0.19	49.3	64	14.7

End of test Report