MOBILE DEVICES BUSINESS

PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY

EMC TEST REPORT

Test Report Number – 25428-1JBP

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 27, 2013

2404

Contents

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 900/2100/1900/850, CDMA 1900/800, GSM/EDGE 850/900/1800/1900, LTE Band 04/Band 13, HSDPA 21.1 Mbps (Category 14), HSUPA 5.76 Mbps, CDMA EV-DO Release A, GPRS Class 12, aGPS , NFC, Bluetooth Class 2 Version 4.0 LE+EDR, 802.11b/802.11g/802.11a/802.11n
FCC ID:	IHDT56PE1
Serial Numbers:	LUME290019, LUME290002
Testing Complete Date:	June 8 - June 21, 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	ESIB26	838786/010	9/24/2013
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 – 27MHz, 48MHz
TCXO – 19.2MHz
Memory Size – 2GB LPDDR2 SDRAM
Internal ROM – 16GM eMMC
Video Resolution – 1280x720 (720p)
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.
39.68	33.62	15.86	11.4	6.4	40	6.4	130	34	VERT
41.72	35.04	17.61	11.0	6.4	40	5.0	124	135	VERT
69.84	24.51	8.47	9.4	6.6	40	15.5	124	79	VERT
139.48	25.03	6.30	11.9	6.9	43.5	18.5	308	259	VERT
159.12	31.33	11.64	12.7	7.0	43.5	12.2	190	344	VERT
210.28	31.61	13.71	10.6	7.3	43.5	11.9	117	149	HORI
280.12	33.22	12.62	13.2	7.4	46	12.8	100	169	HORI
354.36	38.69	15.62	15.4	7.7	46	7.3	169	156	VERT
710.52	35.90	6.19	21.3	8.4	46	10.1	99	147	HORI
780.36	30.34	-0.91	22.7	8.6	46	15.7	323	360	VERT

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.
1122.3	25.63	26.93	24.7	26.0	54	28.4	379	145	VERT
1191.4	28.52	29.29	25.2	25.9	54	25.5	182	150	VERT
1335.1	24.84	25.21	25.3	25.7	54	29.2	338	206	HORI
1469.4	25.56	25.95	25.2	25.6	54	28.4	398	168	VERT
1609.5	28.09	27.87	25.4	25.2	54	25.9	354	209	VERT
1683.2	25.77	25.03	25.9	25.2	54	28.2	340	139	HORI
1960.6	26.66	24.18	27.3	24.8	54	27.3	343	137	HORI
2052.2	27.11	24.37	27.4	24.7	54	26.9	322	192	HORI
2190.1	27.87	24.69	27.7	24.5	54	26.1	379	134	HORI
2230.2	27.42	24.21	27.7	24.4	54	26.6	383	123	HORI
2460.7	27.81	23.48	28.5	24.2	54	26.2	395	153	HORI
2973.0	29.48	23.04	30.0	23.5	54	24.5	321	115	HORI
3140.3	29.76	22.48	30.6	23.3	54	24.2	321	173	VERT
3866.0	32.17	21.79	32.7	22.3	54	21.8	378	289	VERT
4860.7	32.00	20.20	33.1	21.3	54	22.0	343	162	HORI
5360.9	33.45	19.89	34.2	20.7	54	20.5	312	243	HORI
6214.2	34.64	19.62	34.7	19.7	54	19.4	294	232	VERT
6763.6	34.75	18.98	35.1	19.4	54	19.3	384	337	HORI
7251.2	36.85	19.01	36.3	18.4	54	17.1	338	59	HORI
7589.0	37.37	19.05	36.5	18.2	54	16.6	189	293	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
1122.3	43.25	44.55	24.7	26.0	379	145	VERT	74	30.75	Pass
1191.4	47.30	48.07	25.2	25.9	182	150	VERT	74	26.70	Pass
1335.1	39.11	39.48	25.3	25.7	338	206	HORI	74	34.89	Pass
1469.4	42.10	42.48	25.2	25.6	398	168	VERT	74	31.90	Pass
1609.5	50.19	49.98	25.4	25.2	354	209	VERT	74	23.81	Pass
1683.2	42.08	41.35	25.9	25.2	340	139	HORI	74	31.92	Pass
1960.6	41.35	38.87	27.3	24.8	343	137	HORI	74	32.65	Pass
2052.2	40.51	37.77	27.4	24.7	322	192	HORI	74	33.49	Pass
2190.1	45.03	41.84	27.7	24.5	379	134	HORI	74	28.97	Pass
2230.2	45.82	42.61	27.7	24.4	383	123	HORI	74	28.18	Pass
2460.7	41.11	36.78	28.5	24.2	395	153	HORI	74	32.89	Pass
2973.0	43.08	36.65	30.0	23.5	321	115	HORI	74	30.92	Pass
3140.3	43.02	35.74	30.6	23.3	321	173	VERT	74	30.98	Pass
3866.0	45.33	34.96	32.7	22.3	378	289	VERT	74	28.67	Pass
4860.7	44.69	32.89	33.1	21.3	343	162	HORI	74	29.31	Pass
5360.9	46.45	32.89	34.2	20.7	312	243	HORI	74	27.55	Pass
6214.2	47.14	32.11	34.7	19.7	294	232	VERT	74	26.86	Pass
6763.6	48.01	32.24	35.1	19.4	384	337	HORI	74	25.99	Pass
7251.2	49.50	31.66	36.3	18.4	338	59	HORI	74	24.50	Pass
7589.0	50.63	32.30	36.5	18.2	189	293	HORI	74	23.37	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.

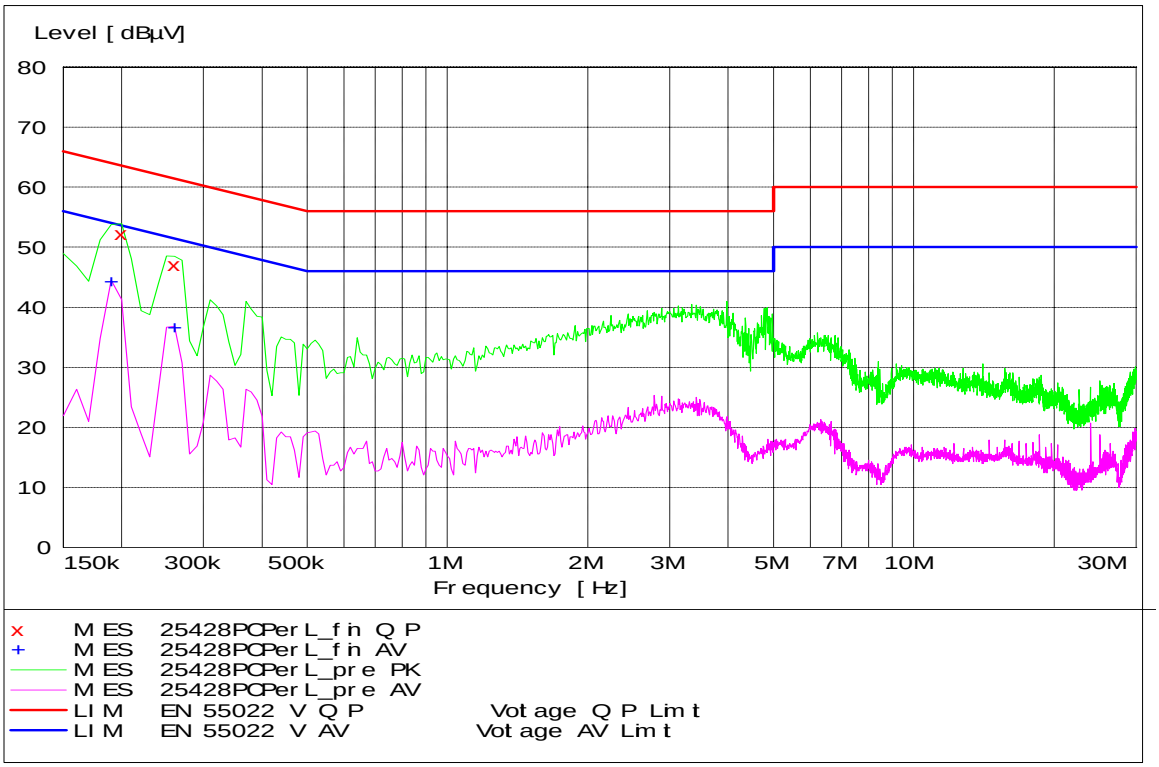
Conducted Emission (dBuV) = EMI Receiver Level (dBuV) + Loss (dB)

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

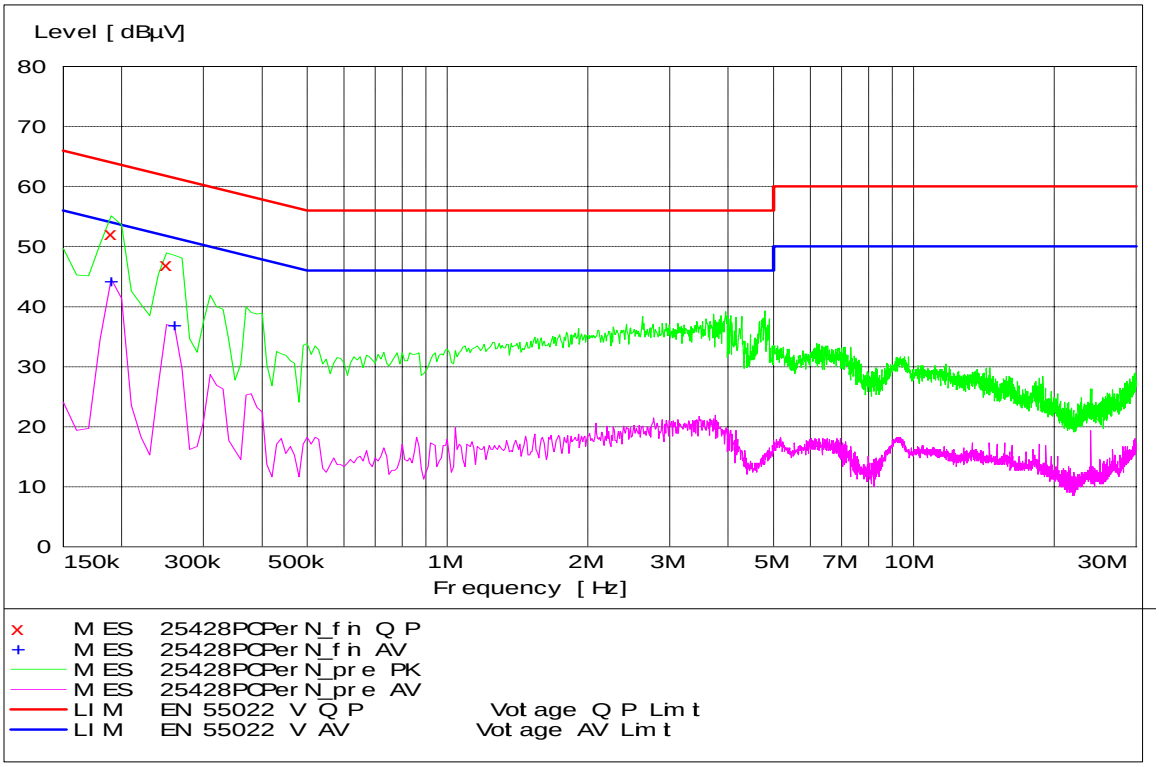
Tx Mode - Line Coupling



Frequency MHz	QuasiPeak Conducted Emission dBuV	Limit dBuV	Margin dB
0.20	52.3	64	11.7
0.26	47.1	61	13.9

Frequency MHz	Average Conducted Emission dBuV	Limit dBuV	Margin dB
0.19	44.3	54	9.7
0.26	36.7	51	14.3

Tx Mode - Neutral Coupling



Frequency MHz	QuasiPeak Conducted Emission dBuV	Limit dBuV	Margin dB
0.19	52.2	64	11.8
0.25	47.1	62	14.9

Frequency MHz	Average Conducted Emission dBuV	Limit dBuV	Margin dB
0.19	44.2	54	9.8
0.26	36.9	51	14.1

End of test Report