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ADR TESTING SERVICE  
EMC LABORATORY

**EMC TEST REPORT**

**Test Report Number** – 25505-1JBP

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: August 21, 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: GSM 850/900/1800/1900, EDGE Class 12,  
 WCDMA 850/1900, HSDPA 21.1Mbps (Category 14),  
 HSUPA 5.76Mbps,  
 Bluetooth Class 1, Version 4.0 LE+EDR,  
 802.11b/802.11g/802.11n

FCC ID: IHDT56PF1

IC ID: 109O-T56PF1

Serial Numbers: LDXU220006, LDXU220033

Testing Complete Date: August 2 - August 14, 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**

<b>Manufacturer</b>	<b>Equipment Type</b>	<b>Model No.</b>	<b>Serial Number</b>	<b>Calibration Due Date</b>
Rohde & Schwarz	Receiver	ESIB26	838786/010	9/24/2013
A. H. Systems	Horn Antenna	SAS 200/571	265	1/24/2014
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	00023630	7/19/2014
ETS	LISN	3810/2NM	2179	7/22/2014
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.

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

#### **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 1.2GHz

Xtal – N/A

TCXO – 19.2MHz

Memory Size – 1024MB LPDDR2 SDRAM, 8/16GB eMMC

Video Resolution – 1280x720 (HD)

Video Clock: 450MHz

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.
31.00	32.08	12.50	13.2	6.4	40	7.9	100	94	VERT
33.20	33.81	14.83	12.7	6.3	40	6.2	100	200	VERT
40.04	34.81	17.11	11.3	6.4	40	5.2	98	126	VERT
51.68	31.72	15.38	9.9	6.4	40	8.3	101	52	VERT
65.28	20.60	4.65	9.4	6.5	40	19.4	309	88	VERT
70.12	20.38	4.35	9.4	6.7	40	19.6	306	87	VERT
139.84	35.84	17.14	11.8	6.9	43.5	7.7	302	146	HORI
160.88	37.10	17.2	12.9	7.0	43.5	6.4	117	349	VERT
164.88	37.26	17.03	13.1	7.1	43.5	6.2	98	360	VERT
212.96	33.07	15.19	10.7	7.2	43.5	10.4	100	143	HORI
284.08	38.09	17.49	13.2	7.4	46	7.9	104	161	HORI
355.16	36.49	13.38	15.4	7.7	46	9.5	103	145	HORI
426.28	35.65	11.21	16.5	7.9	46	10.3	206	339	VERT
710.60	31.35	1.63	21.3	8.4	46	14.7	180	141	HORI
863.88	31.25	-1.16	23.8	8.6	46	14.7	305	9	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.
1065.9	26.09	28.74	23.5	26.1	54	27.9	167	182	VERT
1134.7	26.73	28.81	23.9	26.0	54	27.3	286	150	VERT
1200.7	25.73	27.38	24.3	25.9	54	28.3	319	150	VERT
1261.7	25.03	26.42	24.4	25.8	54	29.0	185	159	HORI
1350.5	27.09	27.98	24.7	25.6	54	26.9	246	198	VERT
1492.6	26.46	27.27	24.7	25.5	54	27.5	216	164	VERT
1543.2	24.20	24.90	24.7	25.4	54	29.8	236	192	VERT
1626.3	27.57	27.90	24.8	25.2	54	26.4	196	204	VERT
1700.7	24.80	24.69	25.3	25.2	54	29.2	380	156	HORI
2184.2	27.46	24.55	27.5	24.6	54	26.5	395	200	HORI
2248.0	28.98	25.95	27.4	24.4	54	25.0	206	185	HORI
2664.9	28.89	23.51	29.2	23.8	54	25.1	320	0	VERT
2986.0	30.19	23.56	30.1	23.5	54	23.8	236	164	VERT
4815.5	32.73	20.70	33.4	21.3	54	21.3	361	337	VERT
6902.9	35.52	18.19	36.5	19.2	54	18.5	382	333	VERT
9586.9	38.79	17.78	37.9	16.9	54	15.2	122	131	VERT

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
1065.9	47.28	49.93	23.5	26.1	167	182	VERT	74	26.72	Pass
1134.7	47.94	50.03	23.9	26.0	286	150	VERT	74	26.06	Pass
1200.7	46.71	48.36	24.3	25.9	319	150	VERT	74	27.29	Pass
1261.7	42.45	43.84	24.4	25.8	185	159	HORI	74	31.55	Pass
1350.5	47.47	48.36	24.7	25.6	246	198	VERT	74	26.53	Pass
1492.6	46.67	47.48	24.7	25.5	216	164	VERT	74	27.33	Pass
1543.2	39.56	40.26	24.7	25.4	236	192	VERT	74	34.44	Pass
1626.3	48.76	49.10	24.8	25.2	196	204	VERT	74	25.24	Pass
1700.7	39.77	39.66	25.3	25.2	380	156	HORI	74	34.23	Pass
2184.2	43.69	40.77	27.5	24.6	395	200	HORI	74	30.31	Pass
2248.0	50.39	47.36	27.4	24.4	206	185	HORI	74	23.61	Pass
2664.9	44.80	39.42	29.2	23.8	320	0	VERT	74	29.20	Pass
2986.0	47.53	40.89	30.1	23.5	236	164	VERT	74	26.47	Pass
4815.5	45.87	33.84	33.4	21.3	361	337	VERT	74	28.13	Pass
6902.9	48.29	30.96	36.5	19.2	382	333	VERT	74	25.71	Pass
9586.9	51.43	30.42	37.9	16.9	122	131	VERT	74	22.57	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.

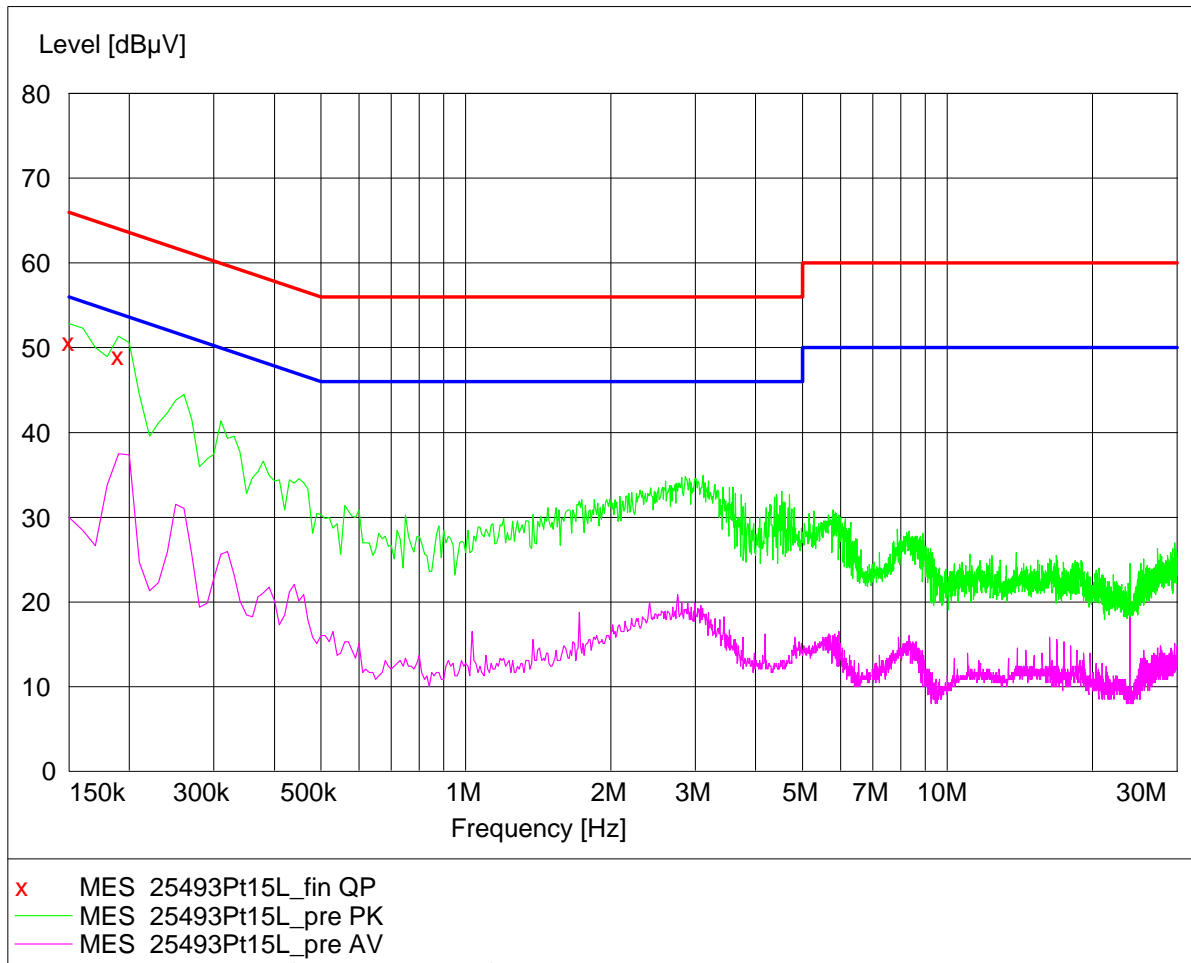
Conducted Emission (dBuV) = EMI Receiver Level (dBuV) + Loss (dB)

### **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.

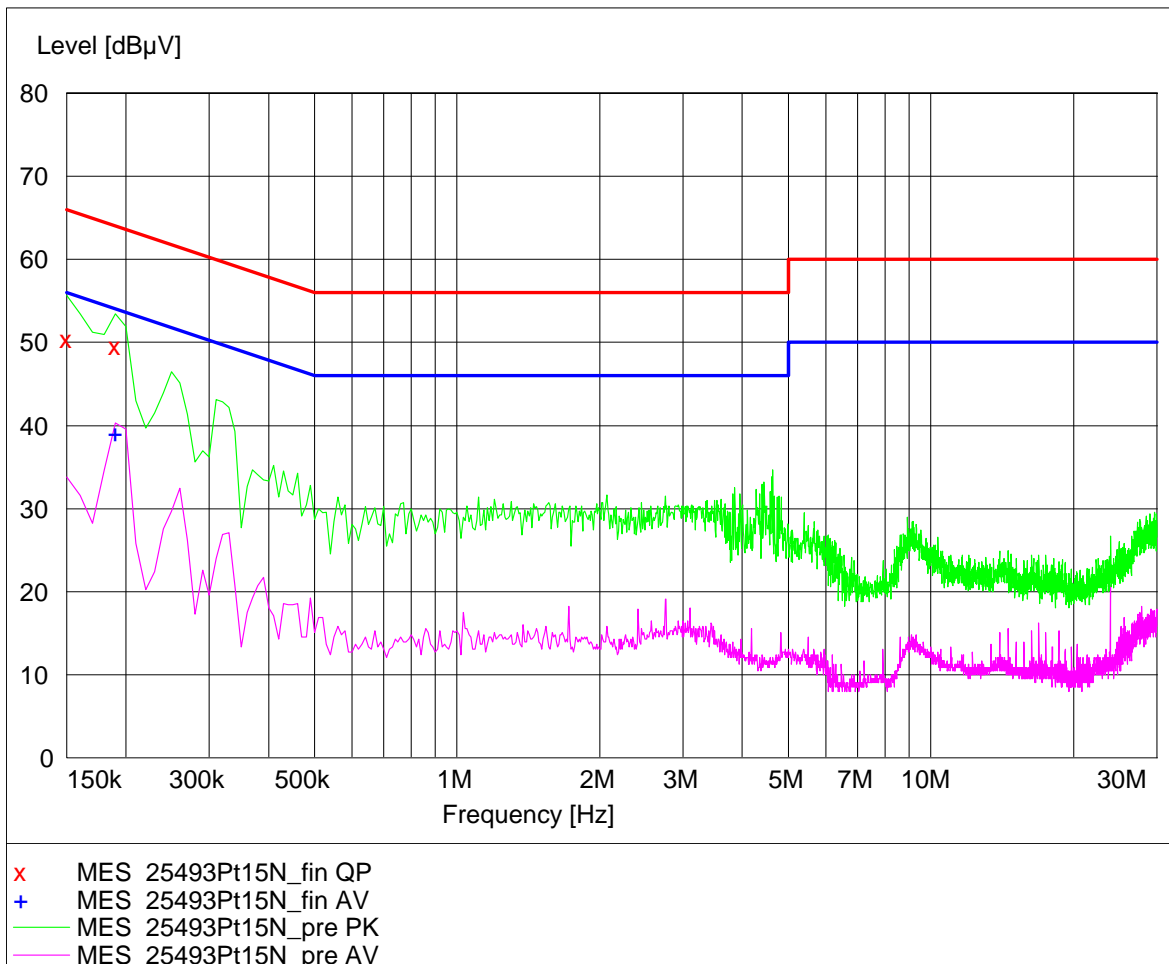
**Measurement results**

**Tx Mode - Line Coupling**



Frequency MHz	QuasiPeak Conducted Emission dBuV	Limit dBuV	Margin dB
0.15	50.7	66	15.3
0.19	49.1	64	14.9

**Tx Mode - Neutral Coupling**



Frequency MHz	QuasiPeak Conducted Emission dBuV	Limit dBuV	Margin dB
0.15	50.4	66	15.6
0.19	49.6	64	14.4

Frequency MHz	Average Conducted Emission dBuV	Limit dBuV	Margin dB
0.19	39.10	54	14.9

**End of test Report**