



**MOTOROLA MOBILITY**

**PRODUCT SAFETY AND COMPLIANCE  
EMC LABORATORY**

**EMC TEST REPORT**

**Test Report Number** – 24977-1 Supplement

**Report Date** – 2012-06-05

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

Signature:

Name: Lei Yang

Title: EMC Project Engineer

Test: 2012-03-20 to 2012-04-13

As the responsible test lab manager, I hereby declare that the model tested as specified in this report conforms to the requirements indicated.

Signature:

Name: Yilin Zhao

Title: Test Lab Manager

Date: 2012-06-06

This report must not be reproduced, except in full, without written approval from this laboratory.

FCC Registration Number: 402854

IC Registration Number: 109AW-1

ADR Testing Service location ADR BJ

ISO/IEC-17025:2005 accredited by UKAS



**UKAS Certificate Number: 2404**

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## Test Report Details

Tests Performed By: Motorola (Beijing) Mobility Technologies Co.,  
Ltd.  
Asia Global Compliance Labs  
No.1 Wang Jing East Road  
Chao Yang District  
Beijing, 100102, P. R. China  
Phone: +86 10 8499 5891  
FCC Registration Number: 402854  
IC Registration Number: 109AW-1

Tests Requested By: MOTOROLA MOBILITY, INC.  
600 North US Hwy 45  
Libertyville, IL 60048  
United States

Product Type: Cell phone

Signaling Capability: GSM850/1900, EDGE850/1900, Edge, CDMA  
800/1900, CDMA EV-DO, Bluetooth,  
802.11b/802.11g/802.11n

HEX: A000002C98F7E8

FCC ID: IHDT56NH5

Project number: 24977-1

Testing Complete Date: 2012-04-13

**Applicable Standards**

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

  X   Part 15 Subpart B – Unintentional Radiators

Applicable Standards: ANSI C63.4-2003, RSS-Gen Issue 2

**Summary of Testing**

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

Test #	Test Name	Margin with respect to the Limit
1	Field Strength of Spurious Emissions from Unintentional Radiators	see results
2	AC Line Conducted Emissions	see results

The margin with respect to the limit is the minimum margin for all modes and bands.

**General and Special Conditions**

The EUT was tested using a fully charged embedded battery.

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 List**

Through the test, the EUT was installed in an evaluation board.

<b>Equipment</b>	<b>Model/type</b>	<b>Serial number</b>	<b>Operational range</b>	<b>Date of calibration</b>
EMI analyzers	ESU 40	100036	20 Hz – 40 GHz	11.11.2011
Pre Amplifiers	PA-02-0001:	2007343	(10 kHz – 3 GHz)	07.04.2011
	PA-02-218	2007344	3 GHz – 18 GHz	07.04.2011
	PA-02-5	2007345	18 GHz – 40 GHz	07.04.2011
Radio com. Tester	CMU 200	112790	GSM 850/900/1800/1900  UMTS, CDMA, Bluetooth	N/A
Band Reject Filter	WRCD	N/A	GSM 850/900/1800/1900  UMTS, CDMA	N/A
	4N45-24241/3/6	N/A	WLAN	N/A
EMI analyzers	R&S ESCI	100650	9 kHz – 3 GHz	03.14.2012
LISN	ENV216	100375	9 kHz – 30 MHz	12.19.2010

The antennas used in the various tests are listed in the below table.

<b>Antenna</b>	<b>Type</b>	<b>Serial number</b>	<b>Operational range</b>	<b>Date of calibration</b>
Hybrid-log periodic	TDK HLP 3003C	130408	30 MHz – 3 GHz	11.11.2011
Double ridged Horn	TDK HRN0118	130376	1 GHz – 18 GHz	01.22.2011
Double ridged Horn	ETS HRN3116	00071938	18 GHz – 40 GHz	07.13.2011
Active Loop Antenna	FMZB1513	1513-105	9 kHz – 30 MHz	04.01.2012

All test equipment was within their calibration date during the time of testing. When equipment went out of calibration during testing it was replaced using a similar piece of calibrated equipment. All these equipments are listed in the equipment list. The LISN is on a two-year calibration cycle. The antennas are on a three-year calibration cycle. All other equipments are on a one-year calibration cycle.

The Dell D620 Laptop Computer, D-Link DI-624+A Router and the Sony D-600 L Camera 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 Styrofoam table on the turntable center. For each radiated emission, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum peak reading on the spectrum analyzer. The final radiated emissions are then measured using an EMI receiver employing a CISPR quasi-peak detector function below 1000 MHz and an average detector function above 1000 MHz. 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 (3/m)

**Test Setup**

The EUT and the host equipment were setup according to the procedures in ANSI C63.4-2003. The EUT was connected to a laptop computer using a USB data cable. The USB data cable is 1 m in length. The parallel and the serial ports of the computer were populated. The EUT was communicating with the laptop computer continuously.

Additional EUT information:

Processor Speed --- 1.2GHz

Xtal – 26MHz

TCXO – 26 MHz

Memory Size – 1024M LPDDR2 SDRAM, 4GB eMMC.

Video Resolution – 960x540 (qHD)

Video Clock : Max 200 MHz

Refresh rate – 60Hz

**Measurement Results**

Operating Mode – Rx Mode

Notes: Worst Case emissions reported.

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

30 MHz – 1000 MHz

Freq (MHz)	(QP) EMI (dBµV/m)	(1) Limit (dBµV/m)	(QP) Margin Lim1 (dB)	Twr Ht (cm)	Pol	Ttbl Agl (deg)
275.04	22.21	46.00	-23.79	173.00	V	140.10
300.00	26.25	46.00	-19.75	195.00	V	155.30
336.00	34.90	46.00	-11.10	149.00	V	124.20
400.02	37.17	46.00	-8.83	225.00	H	127.10
400.02	35.33	46.00	-10.67	146.00	V	262.30
432.18	33.77	46.00	-12.23	100.00	H	151.20
432.96	25.05	46.00	-20.95	142.00	V	314.80
499.98	36.33	46.00	-9.67	202.00	H	258.20
499.98	33.31	46.00	-12.69	140.00	V	167.10
666.72	26.49	46.00	-19.51	117.00	H	129.20
666.72	29.15	46.00	-16.85	188.00	V	336.70
800.04	34.74	46.00	-11.26	100.00	H	106.10
933.36	28.54	46.00	-17.46	181.00	H	271.20

Above 1 GHz

Radiated emissions were measured from 1 GHz to 6 GHz and all emissions were 20dB below the limit.

### **Measurement Procedure**

Measured levels of ac power line conducted emission shall be the radio-noise voltage from the line probe or across the 50  $\Omega$  LISN port, where permitted, terminated into a 50  $\Omega$  noise meter, or where permitted or required, the radio-noise current on the power line sensed by a current probe.

All radio-noise voltage and current measurements shall be 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. Equipment shall be tested with power cords that are normally supplied using an LISN, the 50  $\Omega$  measuring port is terminated by a 50  $\Omega$  radio-noise meter or a 50  $\Omega$  resistive load. All other ports are terminated in 50  $\Omega$ .

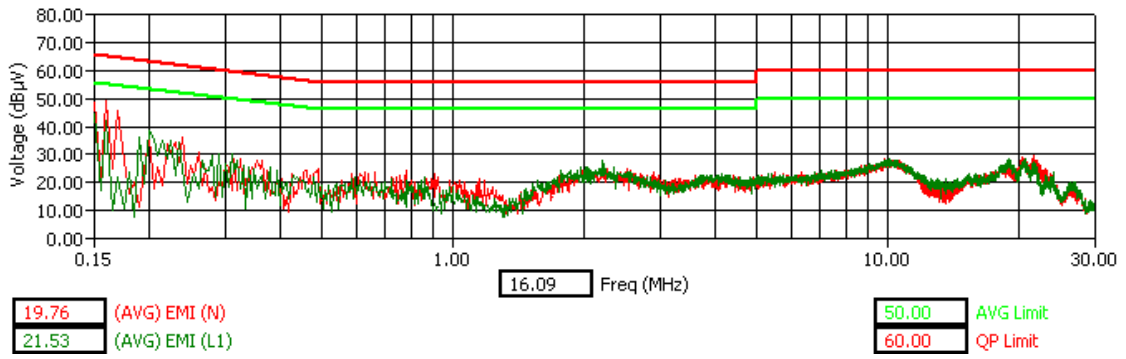
Detectors - Peak and Average Detector

### **Test Setup**

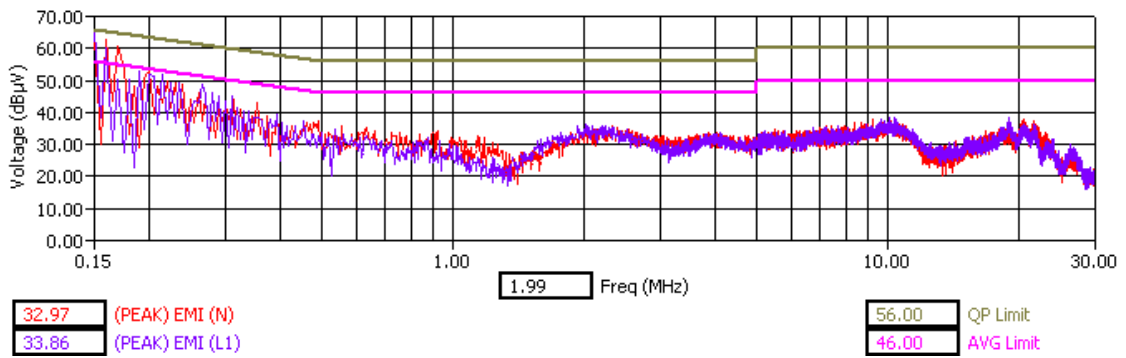
The EUT and the host equipment were setup according to the procedures in ANSI C63.4-2003. The EUT was connected to a laptop computer using a USB data cable. The USB data cable is 1 m in length. The parallel and the serial ports of the computer were populated. The EUT was communicating with the laptop computer continuously.

### **Measurement Results**

See attached:



**AC LINE COMPUTER PERIPHERAL - Tx Mode – Average Detector**



**AC LINE COMPUTER PERIPHERAL - Tx Mode – Peak Detector**

**End of Test Report**