



**MOBILE DEVICES BUSINESS**

**PRODUCT SAFETY AND COMPLIANCE  
EMC LABORATORY**

**EMC TEST REPORT**

**Test Report Number** – 23631-1 Supplement

**Report Date** – 2010-04-20

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 Manager

Test: 2010-03-01 to 2010-04-19

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: 2010-06-10

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

FCC Registration Number: 177885

IC Registration Number: 109AW-1



ADR Testing Service location ADR BJ

ISO/IEC-17025:2005 accredited by UKAS

## Table of Contents

<u>Description</u>	<u>Page</u>
Test Report Details	3
Applicable Standards	3
Summary of Testing	4
General and Special Conditions	4
Equipment and Cable Configuration	5
Measurement Procedures and Data	6

## Test Report Details

Tests Performed By: Motorola (China) Technologies Ltd.  
Asia Global Compliance Labs  
No. 1 Wang Jing East Road, Chao Yang District  
Beijing, 100102, P. R. China  
Phone: +86 10 8473 2610  
FCC Registration Number: 177885  
IC Registration Number: 109AW-1

Tests Requested By: Motorola Inc.  
Mobile Devices business  
600 North US Hwy 45  
Libertyville, IL 60048  
United States

Product Type: Cellular Phone

Signaling Capability: WCDMA 850/1900, GSM 850/900/1800/1900,  
HSDPA 3.6 Mbps (Category 5/6), EDGE  
Class12, GPRS Class 12, Compass/aGPS,  
Bluetooth, 802.11b/802.11g/802.11n

FCC ID: IHDT56LD1

IMEI: 358342030006021

Testing Complete Date: 04-19-2010

### **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 Model SNN5819B 1130mAH battery when applicable. Where a battery could not be used due to the need for a controlled variation of input voltage, an external power supply was utilized.

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	05.16.2010
Pre Amplifiers	PA-02-0001:	2007343	(10 kHz – 3 GHz)	06.26.2009
	PA-02-218	2007344	3 GHz – 18 GHz	06.26.2009
	PA-02-5	2007345	18 GHz – 40 GHz	06.26.2009
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	03.08.2010
LISN	ENV216	100057	9 kHz – 30 MHz	12.20.2008

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	130361	30 MHz – 3 GHz	11.07.08
Double ridged Horn	TDK HRN0118	130303	1 GHz – 18 GHz	03.26.09
Double ridged Horn	ETS HRN3116	00071938	18 GHz – 40 GHz	10.17.08

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 (1/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.

**Measurement Results**

**Operating Mode – Rx Mode**

Notes: Worst Case emissions reported.

**30 MHz – 1000 MHz**

Title: FCC15B Computer Peripheral  
 File: Ruth (ESU40) (S.31) FCC15B\_2G\_Final 03-08-2010.set  
 Operator: Lei Yang  
 EUT Type: Ruth , IMEI: 358342030006021  
 EUT Condition: HW:P3B  
 Comments: ESU setting:  
 Atten 0; Preselector ON ; Presamp ON;  
 30M-1G: RBW 120 KHz (6dB) ; VBW:Auto ; Sweep time:50ms  
 1G-2G : RBW 1 MHz (6dB) ; VBW:Auto ; Sweep time:50ms  
 Antenna:30M-2G : 1m-4m@Hor,1.4m-4m@Ver,1m/step

3/8/2010  
 Sequence: Final Me

Table16

Freq (MHz)	(QP) EMI (dBµV/m)	Transducer (dB)	(QP) Trace (dBµV)	Cable (dB)	(2) Limit (dBµV/m)	(QP) Margin Lim1 (dB)	Twr Ht (cm)	EUT Ttbl Agl (deg)	Pol
34.20	32.98	12.61	19.52	0.68	40.00	-7.02	146.00	125.90	V
299.82	29.94	14.09	13.55	1.95	46.00	-16.06	101.00	108.60	H
366.42	40.05	16.07	21.38	2.16	46.00	-5.95	100.00	329.30	H
574.98	37.53	19.60	14.80	2.65	46.00	-8.47	190.00	359.90	H
799.98	39.49	22.40	13.44	3.12	46.00	-6.51	100.00	151.00	H

**Above 1 GHz**

No emissions were found

**AC LINE CONDUCTED EMISSIONS****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  $\Omega$ .

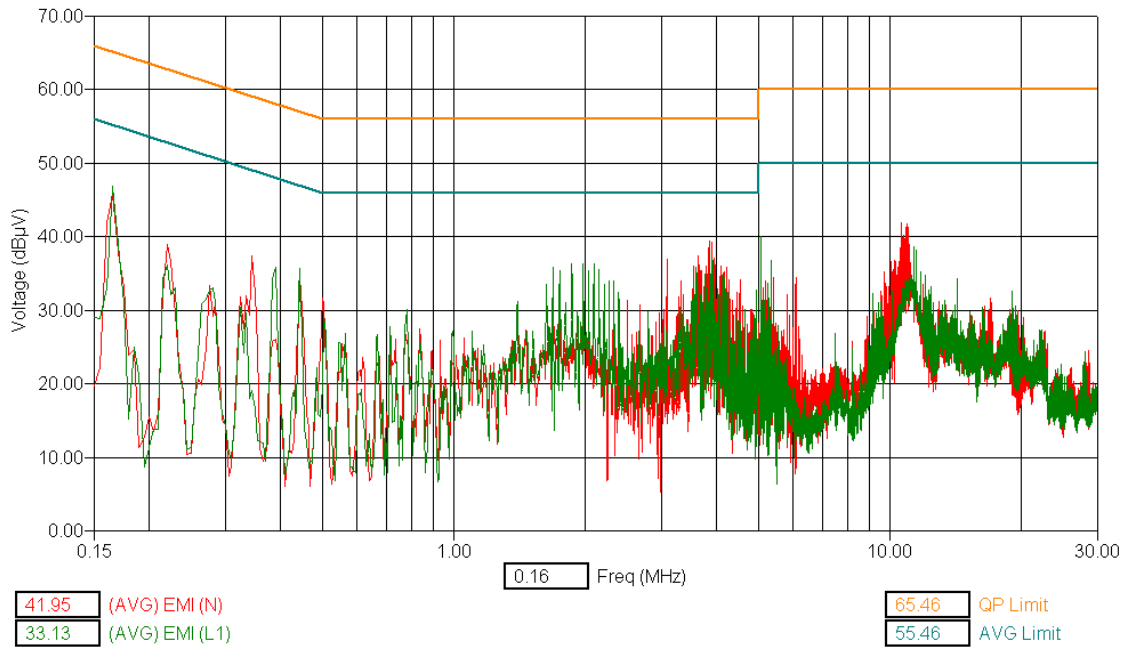
Detectors - Peak and Average Detector

**Test Setup**

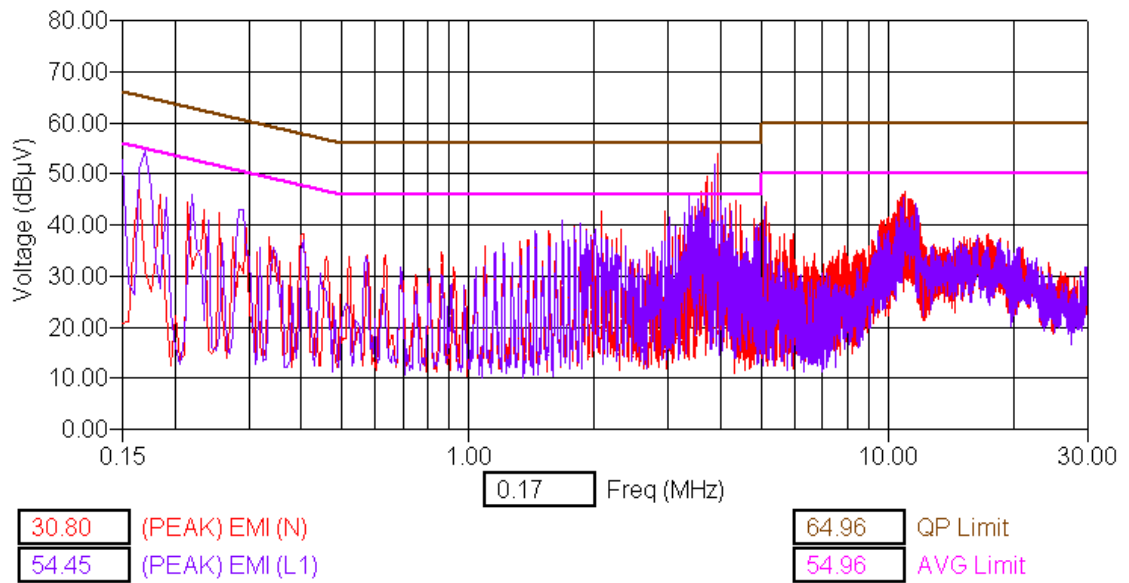
The EUT and the host equipment were setup according to the procedures in ANSI C63.4-2003. The EUT was connected to a laptop computer using a USB data cable. The USB data cable is 1 m in length. The parallel and the serial ports of the computer were populated. The EUT was communicating with the laptop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