



# PCTEST ENGINEERING LABORATORY, INC.

6660-B Dobbin Road, Columbia, MD 21045 USA  
Tel. 410.290.6652 / Fax 410.290.6654  
<http://www.pctestlab.com>



## MEASUREMENT REPORT FCC Part 15B / ICES-003

**Applicant Name:**

Motorola Mobility LLC  
8000 West Sunrise Blvd.  
Plantation, FL 33322  
United States

**Date of Testing:**

2/19/2014

**Test Site/Location:**

PCTEST Lab, Columbia, MD, USA

**Test Report Serial No.:**

0Y1402120381.IHD

**FCC ID:** IHDT56PJ1

**IC CERTIFICATION NO.:** 1090-T56PJ1

**APPLICANT:** Motorola Mobility LLC

**Application Type:**

Certification

**EUT Type:**

Portable Handset

**FCC Rule Part(s):**

FCC Part 15 Subpart B

**FCC Classification:**

FCC Class B Digital Device (JBP)

**Test Procedure:**

ANSI C63.4-2009

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and has been tested in accordance with the measurement procedures specified in ANSI C63.4-2009 (See Test Report). The results shown herein are also deemed satisfactory evidence of compliance with Industry Canada Interference-Causing Equipment Standard ICES-003. These measurements were performed with no deviation from the standards. Test results reported herein relate only to the item(s) tested.

I authorize and attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

*NVLAP accreditation does not constitute any product endorsement by NVLAP or any agency of the United States Government. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.*

  
Randy Ortanez  
President



|                                      |                                                                                     |                                                              |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                            | EUT Type:<br>Portable Handset                                |                                                                                       | Page 1 of 15                    |

## T A B L E O F C O N T E N T S

|                                                             |    |
|-------------------------------------------------------------|----|
| FCC Class B MEASUREMENT REPORT .....                        | 3  |
| 1.0 INTRODUCTION .....                                      | 4  |
| 1.1 SCOPE .....                                             | 4  |
| 1.2 PCTEST TEST LOCATION .....                              | 4  |
| 2.0 PRODUCT INFORMATION.....                                | 5  |
| 2.1 EQUIPMENT DESCRIPTION .....                             | 5  |
| 2.2 DEVICE CAPABILITIES .....                               | 5  |
| 2.3 TEST CONFIGURATION .....                                | 5  |
| 2.4 EMI SUPPRESSION DEVICE(S)/MODIFICATIONS .....           | 5  |
| 2.5 LABELING REQUIREMENTS .....                             | 5  |
| 3.0 DESCRIPTION OF TEST .....                               | 6  |
| 3.1 EVALUATION PROCEDURE .....                              | 6  |
| 3.2 AC LINE CONDUCTED EMISSIONS .....                       | 6  |
| 3.3 RADIATED EMISSIONS.....                                 | 7  |
| 4.0 SAMPLE CALCULATIONS .....                               | 8  |
| 4.1 CONDUCTED EMISSION MEASUREMENT SAMPLE CALCULATION ..... | 8  |
| 4.2 RADIATED EMISSION MEASUREMENT SAMPLE CALCULATION.....   | 8  |
| 5.0 TEST EQUIPMENT CALIBRATION DATA .....                   | 9  |
| 6.0 ENVIRONMENTAL CONDITIONS .....                          | 10 |
| 7.0 TEST DATA .....                                         | 11 |
| 7.1 SUMMARY .....                                           | 11 |
| 7.2 TEST SUPPORT EQUIPMENT .....                            | 11 |
| 7.3 RADIATED MEASUREMENT DATA .....                         | 12 |
| 7.4 LINE CONDUCTED MEASUREMENT DATA .....                   | 13 |
| 8.0 CONCLUSION.....                                         | 15 |

|                                      |                                                                                     |                                                              |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                            | EUT Type:<br>Portable Handset                                | Page 2 of 15                                                                          |                                 |



## MEASUREMENT REPORT

### FCC Part 15B – Unintentional Radiators



#### § 2.1033 General Information

**APPLICANT:** Motorola Mobility LLC

**APPLICANT ADDRESS:** 8000 West Sunrise Blvd.  
Plantation, FL 33322

**TEST SITE:** PCTEST ENGINEERING LABORATORY, INC.

**TEST SITE ADDRESS:** 6660-B Dobbin Road, Columbia, MD 21045 USA

**FCC RULE PART(S):** FCC Part 15 Subpart B

**FCC ID:** IHDT56PJ1

**Test Device Serial No.:** EMC #25628 ☐ Production ☒ Pre-Production ☐ Engineering

**FCC CLASSIFICATION:** FCC Class B Digital Device (JBP)

**DATE(S) OF TEST:** 2/19/2014

#### Test Methodology

Both conducted and radiated measurements were taken using the methods and procedures described in ANSI C63.4-2009. Radiated testing was performed at an antenna-to-EUT distance of 3 meters.

#### Test Facility / NVLAP Accreditation

Conducted and radiated tests were performed at PCTEST Engineering Lab in Columbia, MD 21045, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451A-1).
- PCTEST Lab is accredited by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) in EMC, Telecommunication, and FCC for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. (NVLAP Lab code: 100431-0).
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451A-1) test laboratory with the site description on file at Industry Canada.

|                                      |                                                                                     |                                                              |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                            | EUT Type:<br>Portable Handset                                |                                                                                       | Page 3 of 15                    |

## 1.0 INTRODUCTION

### 1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

### 1.2 PCTEST Test Location

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Intern'l (BWI) airport, the city of Baltimore and the Washington, DC area. (See Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on January 10, 2012.

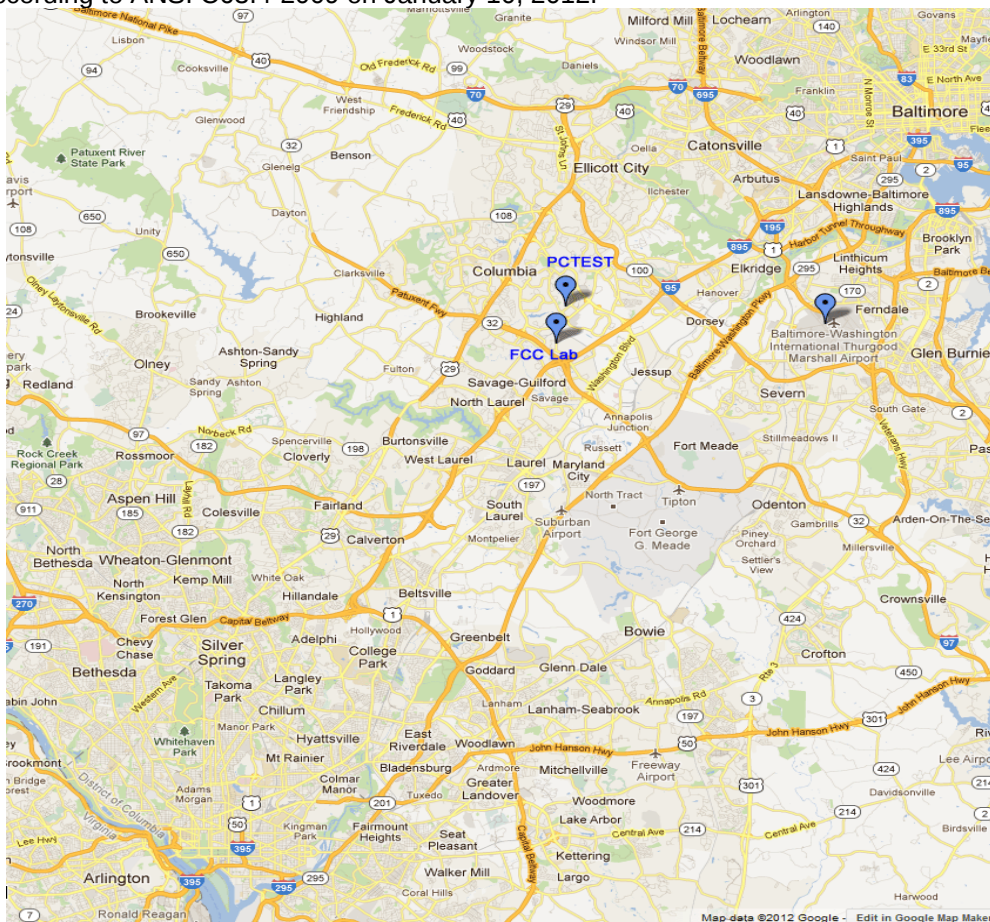


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

|                                      |                                               |                                                              |                 |                                 |
|--------------------------------------|-----------------------------------------------|--------------------------------------------------------------|-----------------|---------------------------------|
| FCC ID: IHDT56PJ1                    | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) | <b>MOTOROLA</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                      | EUT Type:<br>Portable Handset                                |                 | Page 4 of 15                    |

## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: IHDT56PJ1**. The test data contained in this report pertains only to the emissions due to the digital circuitry of the EUT.

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA/HSPA, 802.11b/g/n WLAN, Bluetooth (1x,EDR, LE)

### 2.3 Test Configuration

The Samsung Portable Handset FCC ID: IHDT56PJ1 was tested with a laptop PC connected via USB interface port. The EUT was exercised during testing by means of software installed on the PC. Since the EUT is a peripheral device, the host PC was populated with another USB device and an additional peripheral device with a non-USB interface, as shown in Table 7-2, thus satisfying the minimum system requirement of two different I/O interfaces. All equipment is placed on the test table top and arranged in a typical configuration in accordance with ANSI C63.4-2009 and manipulated to obtain worst case emissions.

For more information please see Section 7.0 for test data.

### 2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

### 2.5 Labeling Requirements

Per 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(a)(5).

Please see attachment for FCC ID label and label location.

|                                      |                                                                                     |                                                              |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                            | EUT Type:<br>Portable Handset                                |                                                                                       | Page 5 of 15                    |

## 3.0 DESCRIPTION OF TEST

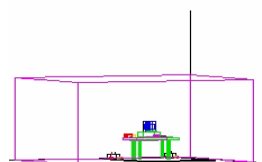
### 3.1 Evaluation Procedure

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2009) was used in the measurement of the **Samsung Portable Handset** FCC ID: IHDT56PJ1.

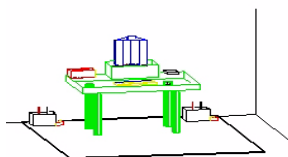
#### **Note:**

No deviations from the specified test procedure.

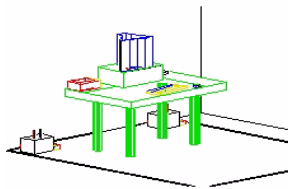
### 3.2 AC Line Conducted Emissions



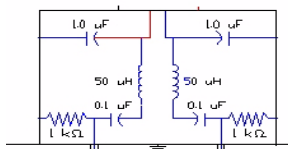
**Figure 3-1. Shielded Enclosure Line-Conducted Test Facility**



**Figure 3-2. Line Conducted Emission Test Set-Up**



**Figure 3-3. Wooden Table & Bonded LISNs**



**Figure 3-4. LISN Schematic Diagram**

The line-conducted facility is located inside a 16'x20'x10' shielded enclosure, manufactured by Ray Proof Series 81 (see Figure 3-1). The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 1.5m away from the sidewall of the shielded room (see Figure 3-2). Two 10kHz-30MHz, 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room (see Figure 3-3). Power to the LISNs are filtered by a high-current high-insertion loss Ray Proof power line filter (100dB 14Hz-10GHz). The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure. All electrical cables are shielded by braided tinned copper zipper tubing with an inner diameter of ½".

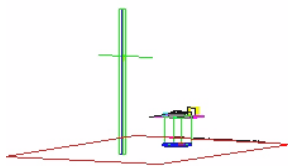
The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the Solar LISN. The LISN schematic diagram is shown (see Figure 3-4). All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference groundplane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements. The bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission emission. Each emission was maximized by varying: power lines, the mode of operation or resolution, clock or data exchange speed, scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz bandwidth for final measurements. Each emission reported was calibrated using a signal generator.

Line conducted emissions test results are shown in Section 7.4. Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is PCTEST Line Conducted Test Automation Software, HP Basic Ver. 2.7.

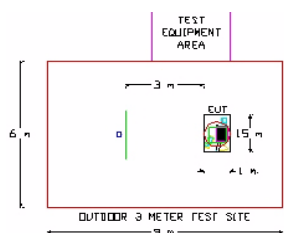
|                                      |                                                                                     |                                                              |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                            | EUT Type:<br>Portable Handset                                |                                                                                       | Page 6 of 15                    |

### 3.3 Radiated Emissions



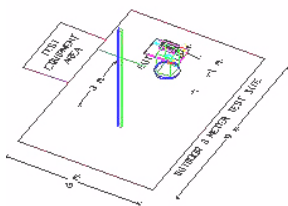
**Figure 3-5. 3-Meter Test Site**

The radiated test facilities consisted of an indoor semi-anechoic chamber used for exploratory measurements and an open area test site (OATS) used for final measurements. For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies higher than the upper frequency range of the broadband antenna used for testing, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used.



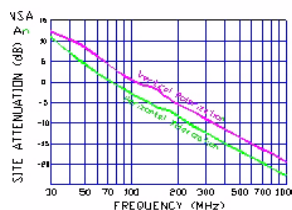
**Figure 3-6. Dimensions of Outdoor Test Site**

Exploratory measurements were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of a 0.8 meter high non-metallic 1 x 1.5 meter table (see Figure 3-7). The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth, and receive antenna height was noted for each frequency found. To record the exploratory measurements, the analyzers' detector function was set to peak mode and the bandwidth was set to 100kHz.



**Figure 3-7. Turntable and System Setup**

Final measurements were made on the OATS at 3 meter test range using calibrated, linearly polarized broadband or horn antennas (see Figure 3-5). The measurement area is situated on an 18 meter x 20 meter galvanized 1/2" hardware cloth as the conducting ground plane. This material is sewn together in sections 4 feet wide and 60 feet long. A total of eighteen sections are required to cover the entire measurement area. Sections are laid across the width of the pad, overlapped 1" and sewn and soldered together at intervals of 3" (7.6 cm.) The terrain of the test site is reasonably flat and level. Power and cable to the test site are buried 18" deep into the ground outside the perimeter of the site. An all-weather non-metallic housing is situated on a 2 x 3 meter area adjacent to the measurement area to house the test equipment (see Figure 3-6). The test set-up was again placed on top of the same a 0.8 meter high non-metallic 1 x 1.5 meter table on the OATS as used for exploratory measurements in the indoor chamber. The test set-up was re-configured to the same setup that was previously determined through exploratory measurements to have produced the worst case emissions. The spectrum analyzer was set to the frequencies found to have caused the highest radiated disturbances with respect to the limit during preliminary radiated measurements. The turntable containing the system was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was re-maximized by varying: the mode of operation or resolution, clock or data exchange speed, scrolling H pattern to the EUT and/or support equipment, powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable, and changing the polarity of the receive antenna, whichever produced the worst-case emissions. To record the final measurements, the analyzer detector function was set to CISPR quasi-peak mode and the bandwidth of the spectrum analyzer was set to 100kHz for frequencies below 1GHz or 1MHz for frequencies above 1GHz. For average measurements above 1GHz, the analyzer was set to peak detector with a reduced VBW setting (RBW = 1MHz, VBW = 10Hz). Each emission reported was calibrated using a signal generator. The Theoretical Normalized Site Attenuation Curves for both horizontal and vertical polarization are shown in Figure 3-8.



**Figure 3-8. Normalized Site Attenuation Curves (H&V)**

|                                      |                                               |                                                              |                 |                                 |
|--------------------------------------|-----------------------------------------------|--------------------------------------------------------------|-----------------|---------------------------------|
| FCC ID: IHDT56PJ1                    | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) | <b>MOTOROLA</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                      | EUT Type:<br>Portable Handset                                |                 | Page 7 of 15                    |

## 4.0 SAMPLE CALCULATIONS

### 4.1 Conducted Emission Measurement Sample Calculation

@ 20.3 MHz

**Class B limit** = 60.0 dB $\mu$ V (Quasi-peak limit)  
**Reading** = - 57.8 dBm (calibrated quasi-peak level)  
**Convert to dB $\mu$ V** = - 57.8 + 107 = 49.2 dB $\mu$ V  
  
**Margin** = 49.2 - 60.0 = - 10.8 dB  
= 10.8 dB below limit

### 4.2 Radiated Emission Measurement Sample Calculation

@ 66.7 MHz

**Class B limit** = 100  $\mu$ V/m = 40.0 dB $\mu$ V/m  
**Reading** = - 76.0 dBm (calibrated level)  
**Convert to dB $\mu$ V** = - 76.0 + 107 = 31.0 dB $\mu$ V  
**Antenna Factor + Cable Loss** = 5.8 dB/m  
**Total** = 36.8 dB $\mu$ V/m  
  
**Margin** = 36.8 - 40.0 = - 3.2 dB  
= 3.2 dB below limit

#### Note:

$$\text{Level [dB}\mu\text{V]} = 20 \log_{10} (\text{Level } [\mu\text{V/m}])$$

$$\text{Level [dB}\mu\text{V]} = \text{Level [dBm]} + 107$$

|                                      |                                                                                     |                                                              |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                            | EUT Type:<br>Portable Handset                                |                                                                                       | Page 8 of 15                    |

## 5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

| Manufacturer | Model       | Description                            | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|--------------|-------------|----------------------------------------|------------|--------------|------------|---------------|
| -            | RE1         | Radiated Emissions Cable Set (UHF/EHF) | 3/29/2013  | Annual       | 3/29/2014  | N/A           |
| Agilent      | 8447D       | Broadband Amplifier                    | 5/31/2013  | Annual       | 5/31/2014  | 1937A03348    |
| Agilent      | 85650A      | Quasi-Peak Adapter                     | 4/17/2013  | Annual       | 4/17/2014  | 2043A00301    |
| Agilent      | 8566B       | (100Hz-22GHz) Spectrum Analyzer        | 4/17/2013  | Annual       | 4/17/2014  | 2542A11898    |
| Agilent      | N9038A      | MXE EMI Receiver                       | 1/3/2014   | Annual       | 1/3/2015   | MY51210133    |
| Emco         | 3816/2      | LISN                                   | 2/12/2013  | Biennial     | 2/12/2015  | 9709-1077     |
| Emco         | 3816/2      | LISN                                   | 2/12/2013  | Biennial     | 2/12/2015  | 9707-1079     |
| Emco         | 6502        | Active Loop Antenna (10k - 30 MHz)     | 5/31/2012  | Biennial     | 5/31/2014  | 267           |
| Schwarzbeck  | VULB-9161SE | Trilog Super Broadband Test Antenna    | 10/23/2013 | Biennial     | 10/23/2015 | 9161-4075     |

**Table 5-1. Annual Test Equipment Calibration Schedule**

|                                      |                                                                                     |                                                              |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                            | EUT Type:<br>Portable Handset                                | Page 9 of 15                                                                          |                                 |

## 6.0 ENVIRONMENTAL CONDITIONS

The temperature is controlled within range of 15°C to 35°C.

The relative humidity is controlled within range of 10% to 75%.

The atmospheric pressure is controlled within the range 86-106kPa (860-1060mbar).

|                                      |                                                                                                                                   |                                                              |                                                                                       |                                 |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                                                                          | EUT Type:<br>Portable Handset                                |                                                                                       | Page 10 of 15                   |

## 7.0 TEST DATA

### 7.1 Summary

Test Date(s): 2/19/2014

Test Engineer: Mohamed Elshahhat

| FCC Part 15 Section | Description         | Result |
|---------------------|---------------------|--------|
| 15.107              | Conducted Emissions | PASS   |
| 15.109              | Radiated Emissions  | PASS   |

**Table 7-1. Summary of Test Results**

### 7.2 Test Support Equipment

|   |                                                  |                                                                                                                                                          |                                                    |
|---|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| 1 | Motorola Data Link Cable                         | Model: N/A<br>1m Shielded USB Cable                                                                                                                      | S/N: N/A                                           |
| 2 | Dell Notebook PC #1<br>w/ AC Adapter             | Model: Vostro 3555 (DoC)<br>Model: PA-1600-06D2<br>0.85m Unshielded AC Power cord<br>1.80m Unshielded DC Power cord with ferrite bead<br>on notebook end | A/N: PCT80759<br>S/N: CN-0928G4-71615-1CE-3447-A01 |
| 3 | Dynex USB PC Camera                              | Model: DX-WC101 (Doc)<br>2.07m Shielded USB Cable                                                                                                        | S/N: 122D05AC                                      |
| 4 | Samsung 19" LCD Monitor<br>w/ Samsung AC Adapter | FCC ID: ACJ9TGCF-513<br>Model: A3514_DPN<br>1.5m Unshielded AC Power cord<br>1.5m Unshielded DC Power cord with ferrite bead<br>on monitor end           | S/N: 7ATYA28277R<br>S/N: CN07BN4400592BSK28D26F854 |

**Table 7-2. Test Support Equipment Used**

**Note:** See test setup photographs for actual system test setup.

|                                      |                                                                                     |                                                              |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                            | EUT Type:<br>Portable Handset                                |                                                                                       | Page 11 of 15                   |

### 7.3 Radiated Measurement Data

#### §15.109; RSS-Gen (6(a))

| Frequency [MHz] | Level [dBm] | AFCL [dB/m] | Pol [H/V] | Height [m] | Azimuth [degrees] | Field Strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|-----------------|-------------|-------------|-----------|------------|-------------------|-------------------------------|----------------------|-------------|
| 457.77          | -89.52      | 20.43       | V         | 1.2        | 310               | 37.91                         | 46.02                | -8.11       |
| 467.47          | -89.23      | 20.82       | V         | 1.5        | 120               | 38.58                         | 46.02                | -7.44       |
| 510.15          | -90.26      | 20.34       | V         | 1.6        | 100               | 37.08                         | 46.02                | -8.94       |
| 533.43          | -91.03      | 20.82       | V         | 1.2        | 250               | 36.80                         | 46.02                | -9.23       |
| 563.50          | -91.48      | 21.39       | V         | 1.7        | 100               | 36.91                         | 46.02                | -9.11       |
| 594.54          | -85.58      | 22.21       | V         | 1.8        | 150               | 43.63                         | 46.02                | -2.39       |

**Table 7-3. Radiated Measurements at 3-meters**

#### NOTES:

1. All modes of operation were investigated and the worst-case emissions are reported.
2. Radiated emissions were measured from 30MHz – 6000MHz to ensure that the provisions of 15.33(b)(1) are satisfied with respect to the upper frequency scanning range.
3. The radiated limits for unintentional radiators at a distance of 3 meters are used in the table above, as specified in 15.109(a).
4. All readings are calibrated by a signal generator with accuracy traceable to the National Institute of Standards and Technology (NIST).
5. AFCL (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
6. Level (dB $\mu$ V/m) = Analyzer Reading (dBm) + AFCL (dB/m) + 107
7. Margin (dB) = Field strength (dB $\mu$ V/m) – Limit (dB $\mu$ V/m)
8. Measurements are made using a CISPR quasi-peak detector with a 100kHz resolution bandwidth. Above 1GHz, peak measurements are made using a peak detector with a resolution bandwidth of 1MHz and a video bandwidth of 3MHz and average measurements are made with a peak detector using a resolution bandwidth of 1MHz and a video bandwidth of 10Hz.
9. Calibrated linearly polarized broadband and horn antennas were used for measurements below and above 1GHz, respectively. For measurements made below 1GHz, the results recorded using the broadband antenna are known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy.
10. Calibrated low-loss microwaves cables and broadband amplifiers are used.

|                                      |                                                                                     |                                                              |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                            | EUT Type:<br>Portable Handset                                |                                                                                       | Page 12 of 15                   |

## 7.4 Line Conducted Measurement Data

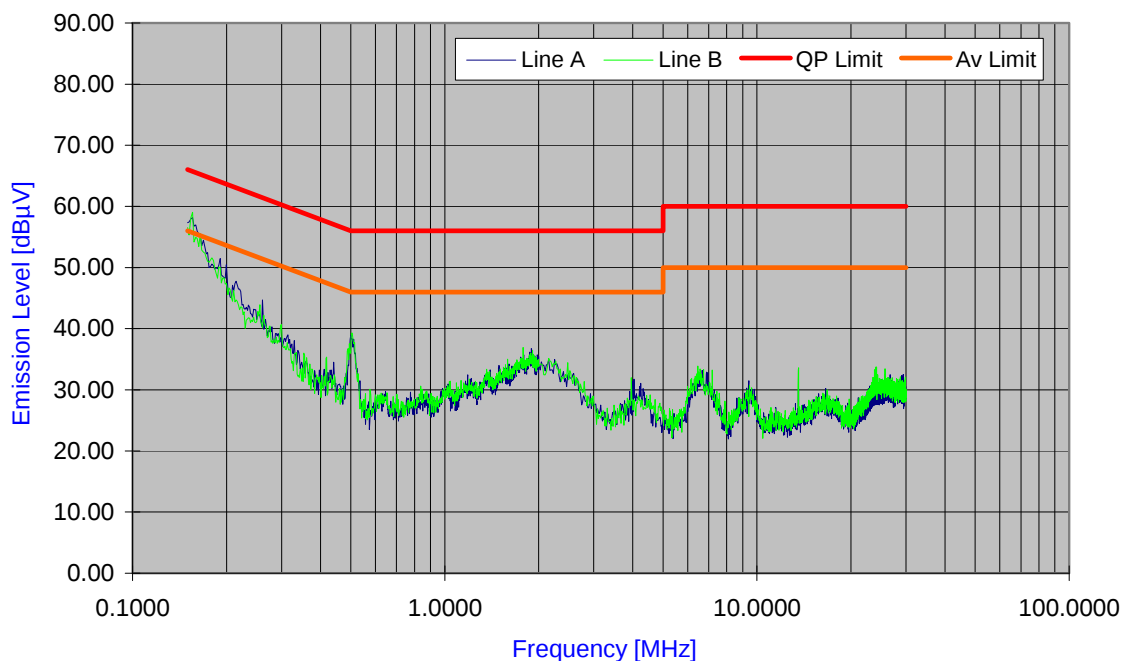
§15.107; RSS-Gen (7.2.2)

# PCTEST Engineering Laboratory Inc.

Company : Motorola Mobility LLC  
Tested Date : 2/19/2014  
FCC ID Code : IHDT56PJ1  
Standard : FCC Part 15B class B

Power Source : AC120V/60Hz

### Conducted Emission Measurement



Ver.1.1 ©PCTEST 2006.08

**Plot 7-1. Line-Conducted Test Plot**

#### Notes:

1. All modes of operation were investigated and the worst-case emissions are reported.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.107 of the Title 47 CFR.
3. Line A = Phase; Line B = Neutral
4. Traces shown in plot are made using a peak detector.
5. Deviations to the Specifications: None.

|                                      |                                               |                                                              |                 |                                 |
|--------------------------------------|-----------------------------------------------|--------------------------------------------------------------|-----------------|---------------------------------|
| FCC ID: IHDT56PJ1                    | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) | <b>MOTOROLA</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                      | EUT Type:<br>Portable Handset                                |                 | Page 13 of 15                   |

## Line Conducted Measurement Data (Cont'd)

§15.107; RSS-Gen (7.2.2)

| No. | Line | Frequency<br>[MHz] | Factor<br>[dB] | QP<br>[dBμV] | Limit<br>[dBμV] | Margin<br>[dB] | Average<br>[dBμV] | Limit<br>[dBμV] | Margin<br>[dB] |
|-----|------|--------------------|----------------|--------------|-----------------|----------------|-------------------|-----------------|----------------|
| 1   | A    | 0.150              | 6.85           | 59.03        | 66.00           | -6.97          | 39.87             | 56.00           | -16.13         |
| 2   | A    | 0.513              | 6.97           | 35.48        | 56.00           | -20.52         | 28.96             | 46.00           | -17.04         |
| 3   | A    | 1.493              | 7.10           | 31.18        | 56.00           | -24.82         | 26.21             | 46.00           | -19.79         |
| 4   | A    | 1.590              | 7.11           | 31.28        | 56.00           | -24.72         | 25.97             | 46.00           | -20.03         |
| 5   | A    | 1.704              | 7.12           | 32.57        | 56.00           | -23.43         | 27.27             | 46.00           | -18.73         |
| 6   | A    | 1.790              | 7.13           | 32.79        | 56.00           | -23.21         | 27.30             | 46.00           | -18.70         |
| 7   | A    | 1.871              | 7.14           | 33.52        | 56.00           | -22.48         | 27.75             | 46.00           | -18.25         |
| 8   | A    | 1.889              | 7.14           | 33.35        | 56.00           | -22.65         | 27.61             | 46.00           | -18.39         |
| 9   | A    | 1.986              | 7.15           | 32.80        | 56.00           | -23.20         | 27.12             | 46.00           | -18.88         |
| 10  | A    | 2.010              | 7.15           | 33.06        | 56.00           | -22.94         | 27.27             | 46.00           | -18.73         |
| 11  | B    | 0.150              | 6.84           | 56.80        | 66.00           | -9.20          | 38.84             | 56.00           | -17.16         |
| 12  | B    | 0.240              | 6.89           | 39.51        | 62.11           | -22.60         | 26.90             | 52.11           | -25.21         |
| 13  | B    | 0.289              | 6.91           | 36.14        | 60.56           | -24.42         | 25.31             | 50.56           | -25.25         |
| 14  | B    | 0.516              | 6.97           | 35.65        | 56.00           | -20.35         | 29.32             | 46.00           | -16.68         |
| 15  | B    | 1.573              | 7.11           | 31.88        | 56.00           | -24.12         | 26.61             | 46.00           | -19.39         |
| 16  | B    | 1.717              | 7.13           | 32.88        | 56.00           | -23.12         | 27.29             | 46.00           | -18.71         |
| 17  | B    | 1.779              | 7.13           | 33.26        | 56.00           | -22.74         | 27.52             | 46.00           | -18.48         |
| 18  | B    | 1.890              | 7.14           | 33.27        | 56.00           | -22.73         | 28.03             | 46.00           | -17.97         |
| 19  | B    | 1.911              | 7.14           | 33.84        | 56.00           | -22.16         | 28.03             | 46.00           | -17.97         |
| 20  | B    | 2.067              | 7.16           | 33.22        | 56.00           | -22.78         | 27.04             | 46.00           | -18.96         |

Table 7-4. Line-Conducted Test Data

### Notes:

1. All Modes of operation were investigated and the worst-case emissions are reported.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.107 of the Title 47 CFR.
3. Line A = Phase; Line B = Neutral
4. Factor (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBμV) = QP/AV Reading (dBμV) + Factor (dB)
6. Margin (dB) = QP/AV Level (dBμV) – Limit (dBμV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

|                                      |                                                                                     |                                                              |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                            | EUT Type:<br>Portable Handset                                |                                                                                       | Page 14 of 15                   |

## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: IHDT56PJ1** has been tested to comply with the requirements specified in §15.107 and §15.109 of the FCC Rules and Industry Canada Standard ICES-003.

|                                      |                                                                                                                                   |                                                              |                                                                                       |                                 |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: IHDT56PJ1                    |  <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15B / ICES-003 MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1402120381.IHD | Test Dates:<br>2/19/2014                                                                                                          | EUT Type:<br>Portable Handset                                |                                                                                       | Page 15 of 15                   |