MOTOROLA MOBILITY

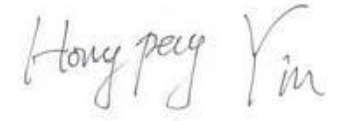
PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY

EMC TEST REPORT - Addendum

Test Report Number –25082-1

Report Date – 2012-08-05

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: Hongpeng Yin

Title: EMC Project Manager Test: 2012-07-05 to 2012-08-03

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: Michael Roper

Title: Test Lab Manager Date: 2012-08-10

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 8473 2610 FCC Registration Number: 402854 IC Registration Number: 109AW-1
Tests Requested By:	Motorola Mobility LLC. 600 North US Hwy 45 Libertyville, IL 60048 United States
Product Type:	Cellular phone
Signaling Capability:	GSM 850/1900, EDGE850/1900, WCDMA850/1900 , Bluetooth+EDR, 802.11a/802.11b/802.11g/802.11n
Serial Numbers	352519050045502 352519050044869
FCC ID:	IHDT56NS8
Project number:	25082-1
Testing Complete Date:	2012-08-03

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 C – Intentional 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 Intentional Radiators	Pass
2	AC Line Conducted Emissions	Pass

Test #	Test Name	Margin with respect to the Limit
1	Field Strength of Spurious Emissions from Intentional 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

This product utilizes an internal battery that is not removable. When applicable, EMC testing was performed with the internal battery fully charged. 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 and Cable Configurations

The EUT was tested in a configuration as specified by ANSI C63.4 2003 Standard requirements.

Equipment List

Equipment	Model/type	Serial number	Operational range	Date of calibration
EMI analyzers	ESU 40	100036	20 Hz – 40 GHz	11.08.2011
Pre Amplifiers	PA-02-0001:	2007343	(10 kHz – 3 GHz)	N/A
	PA-02-218	2007344	3 GHz – 18 GHz	N/A
	PA-02-5	2007345	18 GHz – 40 GHz	N/A
EMI analyzers	R&S ESCI	100650	9 kHz – 3 GHz	03.13.2012
Spectrum analyzer	R&S FSU	200353	20 Hz – 26.5 GHz	03.03.2012
LISN	ENV216	100055	9 kHz – 30 MHz	12.19.2010
Environment Chamber	Votsch VT4004	354627030000020	-50^{0}C -150^{0}C	11.30.2011
DC Power Supply	Agilent E3632A	My40021519	15V/7A	07.20.2012
Power meter	Agilent E4416A	MY451000906	NA	03.03.2011
Power sensor	Agilent E9323A	MY44420783	50MHz-6GHz	03.03.2011

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

Antenna	Type	Serial number	Operational range	Date of calibration
Hybrid-log periodic	TDK HLP 3003C	130408	30 MHz – 3 GHz	11.14.2011
Double ridged Horn	TDK HRN0118	130303	1 GHz – 18 GHz	11.22.2011
Double ridged Horn	ETS HRN3116	00071938	18 GHz – 40 GHz	07.13.2011
FMZB1513	Loop Antenna	1513-105	9KHz – 30MHz	04.01.2012

All test equipments 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.

Note that the Agilent power meter, power sensor and the preamplifier are on two-year calibration cycle. The LISN is on a two-year calibration Antennas are on three-year calibration cycle. All other equipments are on a one-year calibration cycle.

Measurement Procedures and Data

20dB BANDWIDTH

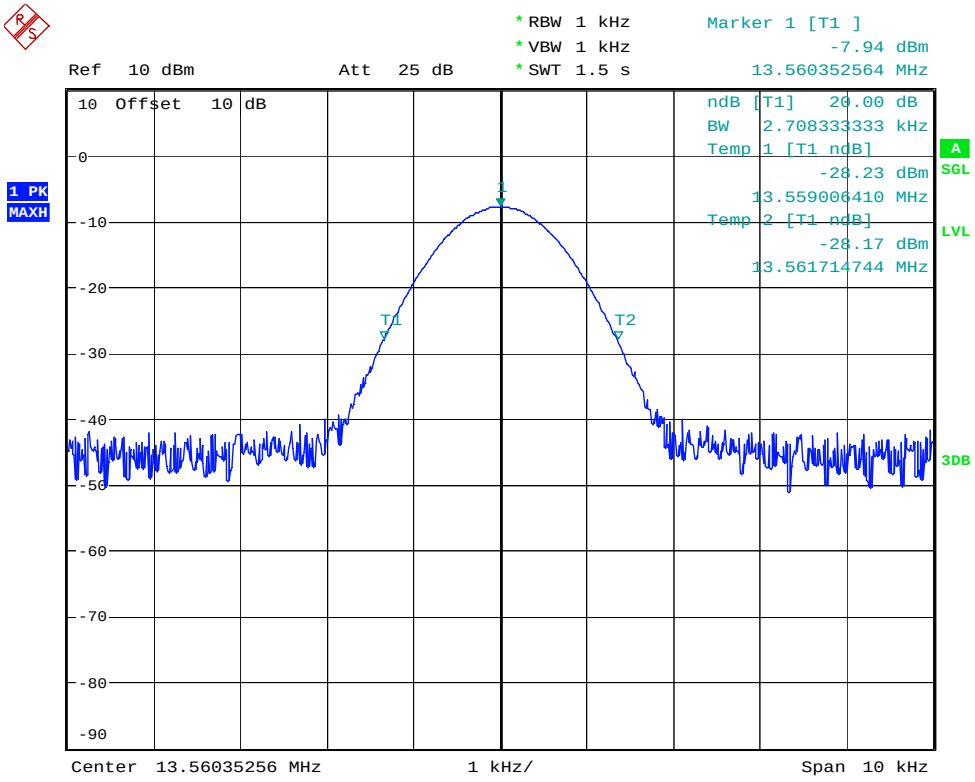
Measurement Procedure

The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate. The marker-to-peak function was used to set the marker to the peak of the emission. The marker-delta function was used to measure 20 dB down one side of the emission. The marker-delta function and marker was moved to the other side of the emission until it was even with the reference marker. The marker-delta reading at this point was the 20 dB bandwidth of the emission.

Test Setup

The RF output port of the Equipment-Under-Test is coupled to the input of the EMC analyzer through a loop antenna. A fully charged battery was used for the supply voltage.

Measurement Results



20 dB bandwidth

FIELD STRENGTH OF EMISSIONS FROM INTENTIONAL 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. 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. A software application was run on the phone which enables the phone to transmit at all the different modulations and data rates supported for NFC operation.

EUT was tested in all 3 orthogonal planes. The loop antenna was positioned in all 3 orthogonal axes.

Worst case results are reported.

Measurement Results

Radiated emissions were measured from 9 kHz to 30 MHz.
Notes: Worst Case emissions reported.

FCC Limits

Frequency Range MHz	Limit
13.410 – 13.553	90.47 dBuV/m @ 3 m
13.110 – 13.410	80.50 dBuV/m @ 3 m
13.710 – 14.010	80.50 dBuV/m @ 3 m
13.553 – 13.567	124 dBuV/m @ 3m
0.009 – 0.490	2400/F(kHz) uV/m @ 300 m
0.490 – 1.705	24000/F(kHz) uV/m @ 30 m
1.705 – 30.00	69.50 dBuV/m @ 3 m

Frequency (MHz)	(QP) EMI (dBµV/m)	Limit (dBµV/m)	(QP) Margin (dB)	Ttbl Agl (deg)	Pol
13.1120	19.37	80.50	-61.13	16.20	V
13.1500	19.36	80.50	-61.14	298.10	V
13.2000	19.12	80.50	-61.38	275.80	V
13.2500	19.36	80.50	-61.14	198.90	V
13.3000	19.13	80.50	-61.37	250.80	V
13.3500	19.10	80.50	-61.40	74.50	V
Frequency (MHz)	(QP) EMI (dBµV/m)	Limit (dBµV/m)	(QP) Margin (dB)	Ttbl Agl (deg)	Pol
13.4000	19.35	80.50	-61.15	-0.10	V
13.4500	19.40	90.47	-71.07	149.50	V
13.5000	19.37	90.47	-71.10	-0.10	V
13.5460	19.30	90.47	-71.17	218.60	V
13.5480	19.36	90.47	-71.11	64.10	V
13.5500	20.15	90.47	-70.32	92.70	V
13.5520	28.52	90.47	-61.95	214.20	V
13.5540	36.83	124.00	-87.17	223.10	V
13.5560	43.03	124.00	-80.97	223.40	V
13.5580	46.98	124.00	-77.02	217.90	V
13.5600	48.44	124.00	-75.56	221.60	V
13.5620	47.67	124.00	-76.33	216.30	V
13.5640	44.43	124.00	-79.57	217.80	V
13.5660	38.95	124.00	-85.05	215.80	V
13.5680	31.12	69.50	-38.38	225.80	V
13.5700	21.12	69.50	-48.38	96.30	V
13.5720	19.27	69.50	-50.23	284.80	V
13.5740	19.40	69.50	-50.10	307.90	V
13.5900	19.29	69.50	-50.21	107.20	V
13.5920	19.30	69.50	-50.20	215.00	V
13.5940	19.36	69.50	-50.14	158.30	V
13.5960	19.20	69.50	-50.30	15.50	V
13.5980	19.35	69.50	-50.15	314.20	V
13.6000	19.24	69.50	-50.26	34.20	V
13.6500	19.31	69.50	-50.19	-0.20	V
13.7000	19.43	69.50	-50.07	187.80	V
13.7500	19.28	80.50	-61.22	351.80	V
13.8000	19.31	80.50	-61.19	346.60	V
13.8500	19.34	80.50	-61.16	251.20	V
13.9000	19.27	80.50	-61.23	326.00	V
13.9500	19.35	80.50	-61.15	64.30	V
14.0000	19.26	80.50	-61.24	130.20	V
14.0020	19.25	80.50	-61.25	306.00	V
14.0040	19.08	80.50	-61.42	334.00	V
14.0060	19.31	80.50	-61.19	275.40	V
14.0080	19.18	80.50	-61.32	3.70	V
14.0100	19.49	80.50	-61.01	92.30	V
27.1202	19.09	69.50	-50.41	233.10	V

Frequency (MHz)	(QP) EMI (dBµV/m)	Limit (dBµV/m)	(QP) Margin (dB)	Ttbl Agl (deg)	Pol
13.1120	19.29	80.50	-61.21	91.70	H
13.1500	19.33	80.50	-61.17	190.20	H
13.2000	19.27	80.50	-61.23	140.20	H
13.2500	19.34	80.50	-61.16	195.50	H
13.3000	19.25	80.50	-61.25	-0.00	H
13.3500	19.24	80.50	-61.26	169.30	H
13.4000	19.44	80.50	-61.06	98.00	H
13.4500	19.22	90.47	-71.25	171.00	H
13.5000	19.18	90.47	-71.29	241.60	H
13.5460	19.13	90.47	-71.34	0.00	H
13.5480	19.53	90.47	-70.94	126.20	H
13.5500	25.25	90.47	-65.22	157.80	H
13.5520	35.98	90.47	-54.49	135.80	H
13.5540	44.59	124.00	-79.41	138.80	H
13.5560	50.89	124.00	-73.11	141.40	H
13.5580	54.81	124.00	-69.19	141.60	H
13.5600	56.35	124.00	-67.65	142.90	H
13.5620	55.42	124.00	-68.58	138.80	H
13.5640	52.18	124.00	-71.82	138.90	H
13.5660	46.66	124.00	-77.34	143.60	H
13.5680	38.74	69.50	-30.76	137.40	H
13.5700	28.77	69.50	-40.73	135.90	H
13.5720	19.55	69.50	-49.95	322.30	H
13.5740	19.28	69.50	-50.22	328.60	H
13.5900	19.38	69.50	-50.12	350.10	H
13.5920	19.14	69.50	-50.36	199.90	H
13.5940	19.18	69.50	-50.32	109.90	H
13.5960	19.27	69.50	-50.23	260.10	H
13.5980	19.40	69.50	-50.10	356.50	H
13.6000	19.19	69.50	-50.31	0.00	H
13.6500	19.15	69.50	-50.35	349.90	H
13.7000	19.28	69.50	-50.22	240.10	H
13.7500	19.08	80.50	-61.42	31.60	H
13.8000	19.33	80.50	-61.17	294.40	H
13.8500	19.29	80.50	-61.21	117.80	H
13.9000	19.16	80.50	-61.34	92.50	H
13.9500	19.22	80.50	-61.28	30.50	H
14.0000	19.12	80.50	-61.38	145.80	H
14.0020	19.25	80.50	-61.25	281.20	H
14.0040	19.26	80.50	-61.24	59.30	H
14.0060	19.15	80.50	-61.35	45.00	H
14.0080	19.26	80.50	-61.24	254.20	H
14.0100	19.19	80.50	-61.31	359.70	H
27.1202	18.93	69.50	-50.57	88.20	H

30 MHz – 1000 MHz

Freq (MHz)	EMI (dBµV/m)	(FCC) Limit (dBµV/m)	Margin Limt (dB)	Twr Ht (cm)	Pol	Ttbl Agl (deg)
108.42	18.56	43.50	-24.94	101.00	H	-0.00
135.60	28.39	43.50	-15.11	110.00	H	143.30
143.34	26.38	43.50	-17.12	100.00	H	177.70
397.80	16.25	46.00	-29.75	143.00	V	0.00
399.60	16.32	46.00	-29.68	224.00	H	360.00
400.20	16.30	46.00	-29.70	289.00	V	359.90

FREQUENCY STABILITY

Measurement Procedure

The equipment under test is placed in an environmental chamber. The antenna port of the Equipment Under Test is coupled to the input of the measurement equipment through a coupling antenna. A power supply is attached as the primary voltage supply.

Frequency measurements are made at the extremes of the temperature range -30º C to +60º C and at intervals of 10º C with the primary supply voltage set to the nominal battery operating voltage. A period of time sufficient to stabilize all components of the equipment is allowed at each frequency measurement. The maximum variation of frequency is measured.

At room temperature, the primary supply voltage is reduced to the battery operating endpoint of the equipment under test. The maximum variation of frequency is measured. A battery eliminator was used for the input supply voltage.

Measurement Results

Worst case data attached

Temperature	Measured Frequency	Frequency Tolerance	Frequency Deviation	Voltage	Results
Centigrade	MHz	kHz	Hz	Volts	
-30	13.560352	± 1.35	352	3.8	Pass
-20	13.560416	± 1.35	416	3.8	Pass
-10	13.560384	± 1.35	384	3.8	Pass
0	13.560460	± 1.35	463	3.8	Pass
10	13.560480	± 1.35	480	3.8	Pass
20	13.560400	± 1.35	400	3.8	Pass
30	13.560416	± 1.35	416	3.8	Pass
40	13.560368	± 1.35	368	3.8	Pass
50	13.560352	± 1.35	352	3.8	Pass
60	1.560369	± 1.35	369	3.8	Pass
Battery Operating Endpoint					
20	13.560384	± 1.35	384	3.2	Pass
20	13.560416	± 1.35	416	4.35	Pass

Measurement Procedure

Measured levels of ac power line conducted emission shall be the radio-noise voltage from the line probe or across the 50 Ω LISN port, where permitted, terminated into a 50 Ω 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 a LISN, the 50 Ω measuring port is terminated by a 50 Ω radio-noise meter or a 50 Ω resistive load. All other ports are terminated in 50 Ω.

Detectors - Quasi Peak and Average Detector

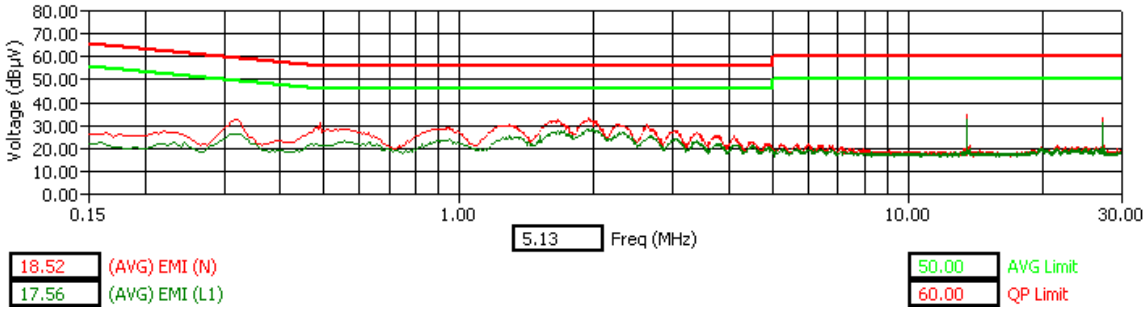
Test Setup

The EUT and the host equipment were setup according to the procedures in ANSI C63.4-2003. A software application was run on the phone which enables the phone to transmit at all modulation and data rates supported for NFC operation.

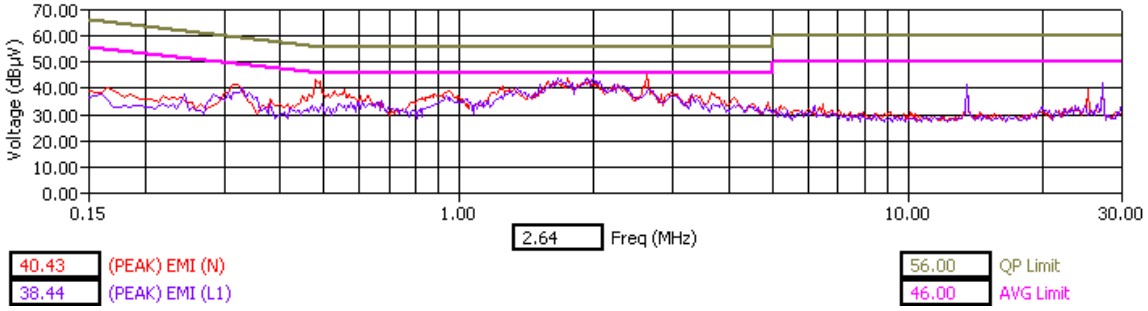
Testing was done with NFC function turned ON in the phone.

Measurement Results

Worst case data attached



Tx Mode – AVG Detector



Tx Mode – Peak Detector

End of Test Report