HCT CO., LTD.

SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA
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CERTIFICATE OF COMPLIANCE

RF REPORT

Nokia, Inc.
12278 Scripps Summit Drive, San Diego, CA 92131

Date of Issue: March 17, 2008
Test Report No.: HCT-SAR08-0308
Test Site: HCT CO., LTD.

FCC ID : **QMNRM-347**

APPLICANT : **Nokia, Inc.**

EUT Type:	Dual-Band CDMA/ EV-DO Phone with Bluetooth
Tx Frequency:	824.70 MHz - 848.31 MHz (CDMA)
	1 851.25 MHz -1 908.75 MHz (PCS CDMA)
	2 402 MHz - 2 480 MHz (Bluetooth)
Rx Frequency:	869.70 MHz - 893.31 MHz (CDMA)
	1 931.25 MHz - 1 988.75 MHz (PCS CDMA)
	2 402 MHz - 2 480 MHz (Bluetooth)
Max. RF Output Power:	0.247 W ERP CDMA (23.92 dBm)
	0.245 W EIRP PCS CDMA (23.90 dBm)
	0.467 W ERP CDMA EVDO (26.69 dBm)
	0.412 W EIRP PCS CDMA EVDO (26.15 dBm)
Trade Name/Model(s):	Nokia / RM-347
FCC Classification:	Licensed Portable Transmitter Held to Ear (PCE)
FCC Rule Part(s):	§24(E), §22(H), §2
Emission Designator(s):	1M28F9W

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ∮ 2.947.

I 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.

HCT CO., LTD. Certifies that no party to this application has been denied FCC benefits pursuant to section 5301 of the Anti- Drug Abuse Act of 1998, 21 U.S. C. 853(a)

Report prepared by
: Young-Kwan Kim
Test Engineer of RF Part

Approved by
: Sang- Jun Lee
Manager of RF Part

Table of Contents

MEASUREMENT REPORT

1. SCOPE

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

General Information

Company Name:	Nokia, Inc.
Address:	12278 Scripps Summit Drive, San Diego, CA 92131
Attention:	Mary Washington
Tel. / Fax :	858-831-5000 / 8585-831-6500

- FCC ID: QMNRM-347
- EUT Type: Dual-Band CDMA/ EV-DO Phone with Bluetooth
- Trade Name: Nokia
- Model(s): RM-347
- MEID: A0 000001 1E5A2B
- Software version: BL_4047T02_VZW_203
- Hardware version: 6000
- Emission Designator(s): 1M28F9W
- Tx Frequency: 824.70 MHz - 848.31 MHz (CDMA)
  1 851.25 MHz -1 908.75 MHz (PCS CDMA)
  2 402 MHz - 2 480 MHz (Bluetooth)
- Rx Frequency: 869.70 MHz - 893.31 MHz (CDMA)
  1 931.25 MHz - 1 988.75 MHz (PCS CDMA)
  2 402 MHz - 2 480 MHz (Bluetooth)
- FCC Classification: Licensed Portable Transmitter Held to Ear (PCE)
- FCC Rule Part(s): §24(E), §22(H), §2
- Modulation(s): CDMA/ PCS CDMA
- Antenna Type: Internal PIFA
- Date(s) of Tests: March 14, 2008
- Place of Tests: HCT CO., LTD.
  Icheon, Kyoungki-Do, KOREA
- Report Serial No.: HCT-SAR08-0308

2. INTRODUCTION

EUT DESCRIPTION

The FIH Technology Korea RM-347 Dual-Band CDMA phone. Its basic purpose is used for communications. It transmits from CDMA (824.70 ~ 848.31 MHz), PCS CDMA (1 851.25~1 908.75 MHz) and receives from CDMA (869.70 ~ 893.31 MHz), PCS CDMA (1 931.25~1 988.75 MHz). The RF power is rated at CDMA (0.247 W), PCS CDMA(0.245 W).

MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

Test Facility

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, Maekok-Ri, Hobup-Myun, Ichon-Si, Kyoungki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 6, 2006(Registration Number: 90661)

3. INSERTS

Function of Active Devices (Confidential)

The Function of active devices are shown in Attachment K.

Block/Circuit Diagrams & Description (Confidential)

The circuit diagrams & description are shown in Attachment J, and the block diagrams are shown in Attachment I.

Operating Instructions

The instruction manual is shown in Attachment M.

Parts List & Tune-Up Procedure (Confidential)

The parts list & tune-up procedure are shown in Attachment L.

Description of Freq. Stabilization Circuit (Confidential)

The description of frequency stabilization circuit is shown in Attachment K.

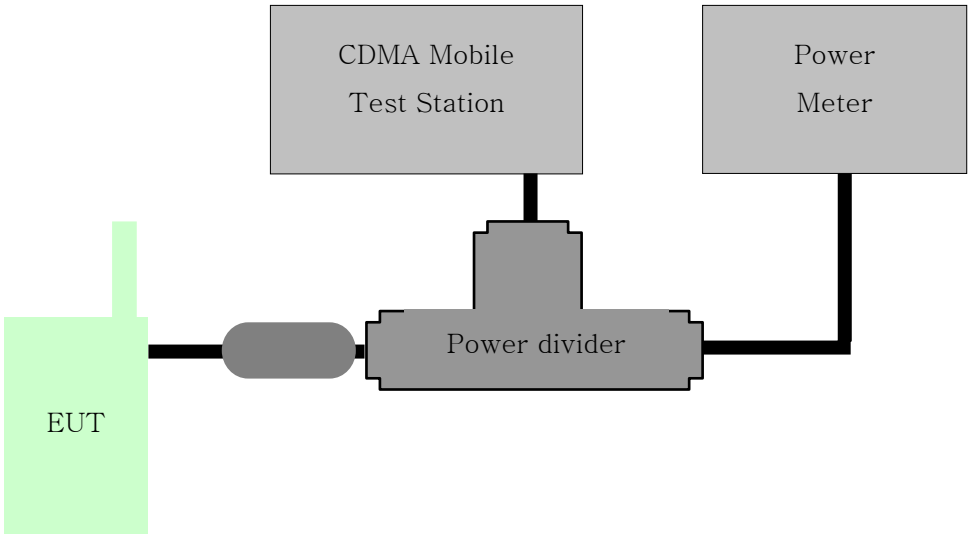
Description for Suppression of Spurious Radiation, for Limiting Modulation, and Harmonic Suppresion Circuits (Confidential)

The description of suppression stabilization circuits are shown in Attachment K

4. DESCRIPTION OF TESTS

4.1 Conducted RF Power Test

Test Set-up



Test Procedure

According to FCC §2.1046 (A), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in § 2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

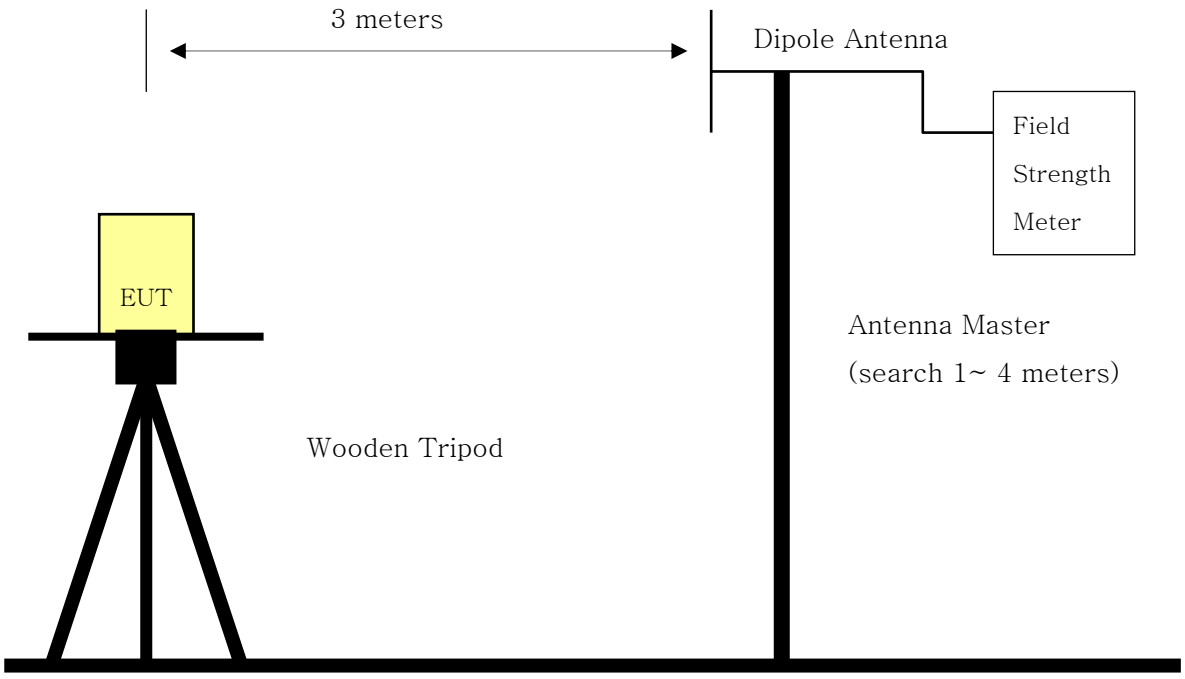
1) The EUT was coupled to the power meter and the base station simulator through a power divider. The radio frequency load attached to the EUT antenna terminal was 50 Ohm. The lost of the cables the test system is calibrated to correct the reading.
2) Set EUT maximum power through base station.
3) Select lowest, middle, and highest channels for each band.

Maximum Power Output table for FCC ID: QMNRM-347

Band	Channel	SO2 RC1/1	SO2 RC3/3	SO55 RC1/1	SO55 RC3/3	TDSO RC3/3	1xEvDO (FTAP)	1xEvDO (RTAP)
CDMA	1013	24.70	24.68	24.72	24.70	24.72	26.13	26.11
	384	24.52	24.38	24.47	24.35	24.36	26.09	26.06
	777	24.36	24.26	24.35	24.21	24.21	25.87	25.83
PCS	25	23.69	23.58	23.71	23.55	23.54	25.57	25.55
	600	23.81	23.99	23.78	23.85	23.87	25.08	25.05
	1175	23.88	23.95	23.91	23.70	23.71	25.07	25.03

4.2 Effective Radiated Power.

Test Set-up



Open Field Test Site

Test Procedure

The measurement facilities used for this test have been documented in previous filings with the commission pursuant to section 2.948.

The open field test site is situated in open field with ground screen whose site attenuation characteristics meet ANSI C63.4 –2003. A mast capable of lifting the receiving antenna from a height of one to four meters is used together with a rotative wooden platform mounted at three from the antenna mast.

1) The EUT mounted on a wooden tripod is 0.8 meter above test site ground level.
2) During the test, the turn table is rotated and the antenna height is also varied from 1 to 4 meters until the maximum signal is found.
3) Record the field strength meter's level.
4) Replace the EUT with λ/ 2 dipole antenna that is connected to a calibrated signal generator.
5) Increase the signal generator output till the field strength meter's level is equal to the item (4). (47dBm Amp is used for ERP/EIRP.)
6) The signal generator output level is the rating of effective radiated power (ERP).
7) The instrument settings used (RBW/ VBW) during ERP/ EIRP output power measurement are as Below;
   -. Below 1 GHz : RBW 3 MHz, VBW 3 MHz
   -. Above 1 GHz : RBW 3 MHz, VBW 3 MHz

5. Effective Radiated Power Output (CDMA)

Radiated measurements at 3 meters

Modulation: CDMA

Mode	Freq. Tuned (MHz)	S.A REF. LEVEL (dBm)	S.G REF. LEVEL (dBm)	ANT. GAIN (dB)	C.L. (dB)	AMP. (dB)	POL (H/V)	ERP (W)	ERP (dBm)	BATTERY
CDMA	824.70	- 9.3	- 23.48	2.65	2.5	47	H	0.233	23.67	Standard
CDMA	836.52	- 9.1	- 23.23	2.65	2.5	47	H	0.247	23.92	Standard
CDMA	848.31	- 9.1	- 23.25	2.65	2.5	47	H	0.245	23.90	Standard
CDMA	836.52	- 9.2	- 23.39	2.65	2.5	47	H	0.238	23.76	Extended
EVDO	824.70	- 6.6	- 20.78	2.65	2.5	47	H	0.434	26.37	Standard
EVDO	836.52	- 6.3	- 20.46	2.65	2.5	47	H	0.467	26.69	Standard
EVDO	848.31	- 6.6	- 20.79	2.65	2.5	47	H	0.433	26.36	Standard
EVDO	836.52	- 6.6	- 20.76	2.65	2.5	47	H	0.436	26.39	Extended

Note: Extended batteries are the options for this phone

NOTES:

Effective Radiated Power Output Measurements by Substitution Method According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

6. Equivalent Isotropic Radiated Power (E.I.R.P.) PCS CDMA

Radiated measurements at 3 meters

Modulation: PCS CDMA

Mode	Freq. Tuned (MHz)	S.A REF. LEVEL (dBm)	S.G REF. LEVEL (dBm)	ANT. GAIN (dB)	C.L. (dB)	AMP. (dB)	POL (H/V)	EIRP (W)	EIRP (dBm)	BATTERY
PCS	1 851.25	- 12.8	- 29.66	10.06	3.5	47	V	0.245	23.90	Standard
PCS	1 880.00	- 12.8	- 29.86	10.06	3.5	47	V	0.234	23.70	Standard
PCS	1 908.75	- 13.2	- 30.05	10.06	3.5	47	V	0.224	23.51	Standard
PCS	1 851.25	- 12.9	- 29.77	10.06	3.5	47	V	0.239	23.79	Extended
EVDO	1 851.25	- 10.9	- 27.80	10.06	3.5	47	V	0.377	25.76	Standard
EVDO	1 880.00	- 10.6	- 27.41	10.06	3.5	47	V	0.412	26.15	Standard
EVDO	1 908.75	- 10.9	- 27.73	10.06	3.5	47	V	0.383	25.83	Standard
EVDO	1 880.00	- 10.7	- 27.56	10.06	3.5	47	V	0.398	26.00	Extended

Note: Extended batteries are the options for this phone

NOTES:

Equivalent Isotropic Radiated Power Measurements by Substitution Method According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

7. Radiated Measurements

7.1 CELLULAR CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 824.70 MHz
- ▣ CHANNEL: 1013 (Low)
- ▣ MEASURED OUTPUT POWER: 23.92 dBm = 0.247 W
- ▣ MODULATION SIGNAL: CDMA (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 36.93 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1 649.40	- 59.44	7.3	- 52.14	H	- 70.8
2 474.10	- 53.91	8.3	- 45.61	H	- 63.7
3 298.80	- 61.06	9.7	- 51.36	H	- 68.6

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7. Radiated Measurements

7.2 CELLULAR CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 836.52 MHz
- ▣ CHANNEL: 384 (Mid)
- ▣ MEASURED OUTPUT POWER: 23.92 dBm = 0.247 W
- ▣ MODULATION SIGNAL: CDMA (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 36.93 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1 673.04	− 59.66	7.3	− 52.36	H	− 71.0
2 509.56	− 54.08	8.3	− 45.78	H	− 63.9
3 346.08	− 60.06	9.7	− 50.36	H	− 67.6

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7. Radiated Measurements

7.3 CELLULAR CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 848.31 MHz
- ▣ CHANNEL: 777 (High)
- ▣ MEASURED OUTPUT POWER: 23.92 dBm = 0.247 W
- ▣ MODULATION SIGNAL: CDMA (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 36.93 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1 696.62	- 59.68	7.3	- 52.38	H	- 71.0
2 544.93	- 56.28	8.3	- 47.98	H	- 66.1
3 393.24	- 67.38	9.7	- 57.68	H	- 74.9

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7. Radiated Measurements

7.4 CELLULAR PCS CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 1 851.25 MHz
- ▣ CHANNEL: 25 (Low)
- ▣ MEASURED OUTPUT POWER: 23.90 dBm = 0.245 W
- ▣ MODULATION SIGNAL: PCS CDMA (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 36.89 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBi)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	**(dBc)**
3 702.50	- 62.76	12.4	- 50.36	V	- 64.9
5 553.75	- 68.70	11.7	- 57.00	V	- 72.7
7 405.00	- 66.46	11.5	- 54.96	V	- 71.4

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7. Radiated Measurements

7.5 CELLULAR PCS CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 1 880.00 MHz
- ▣ CHANNEL: 600 (Middle)
- ▣ MEASURED OUTPUT POWER: 23.90 dBm = 0.245 W
- ▣ MODULATION SIGNAL: PCS CDMA (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 36.89 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3 760.00	- 64.78	12.4	- 52.38	V	- 66.9
5 640.00	- 69.59	11.7	- 57.89	V	- 73.6
7 520.00	- 68.87	11.5	- 57.37	V	- 73.8

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7. Radiated Measurements

7.6 CELLULAR PCS CDMA Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 1 908.75 MHz
- ▣ CHANNEL: 1175 (High)
- ▣ MEASURED OUTPUT POWER: 23.90 dBm = 0.245 W
- ▣ MODULATION SIGNAL: PCS CDMA (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 36.89 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3 817.50	- 58.18	12.4	- 45.78	V	- 60.3
5 726.25	- 67.67	11.7	- 55.97	V	- 71.7
7 635.00	- 64.21	11.5	- 52.71	V	- 69.1

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7. Radiated Measurements

7.7 CELLULAR CDMA EVDO Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 824.70 MHz
- ▣ CHANNEL: 1013 (Low)
- ▣ MEASURED OUTPUT POWER: 26.69 dBm = 0.467 W
- ▣ MODULATION SIGNAL: CDMA EVDO (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 39.69 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1 649.40	- 56.72	7.3	- 49.42	H	- 70.8
2 474.10	- 51.65	8.3	- 43.35	H	- 64.2
3 298.80	- 60.12	9.7	- 50.42	H	- 70.4

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7. Radiated Measurements

7.8 CELLULAR CDMA EVDO Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 836.52 MHz
- ▣ CHANNEL: 384 (Mid)
- ▣ MEASURED OUTPUT POWER: 26.69 dBm = 0.467 W
- ▣ MODULATION SIGNAL: CDMA EVDO (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 39.69 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1 673.04	− 56.66	7.3	− 49.36	H	− 70.8
2 509.56	− 58.53	8.3	− 50.23	H	− 71.1
3 346.08	− 58.06	9.7	− 48.36	H	− 68.4

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7. Radiated Measurements

7.9 CELLULAR CDMA EVDO Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 848.31 MHz
- ▣ CHANNEL: 777 (High)
- ▣ MEASURED OUTPUT POWER: 26.69 dBm = 0.467 W
- ▣ MODULATION SIGNAL: CDMA EVDO (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 39.69 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1 696.62	− 56.66	7.3	− 49.36	H	− 70.8
2 544.93	− 51.17	8.3	− 42.87	H	− 63.8
3 393.24	− 53.29	9.7	− 43.59	H	− 63.6

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7. Radiated Measurements

7.10 CELLULAR PCS CDMA EVDO Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 1 851.25 MHz
- ▣ CHANNEL: 25 (Low)
- ▣ MEASURED OUTPUT POWER: 26.15 dBm = 0.412 W
- ▣ MODULATION SIGNAL: PCS CDMA EVDO (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 39.15 dBc

Freq. (MHz)	**LEVEL@ ANTENNA TERMINALS** (dBm)	**SUBSTITUTE ANTENNA GAIN** (dBi)	**CORRECT GENERATOR LEVEL** (dBm)	**POL** (H/V)	**(dBc)**
3 702.50	- 51.86	12.4	- 39.46	V	- 56.2
5 553.75	- 50.49	11.7	- 38.79	V	- 56.7
7 405.00	- 62.86	11.5	- 51.36	V	- 70.0

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7. Radiated Measurements

7.11 CELLULAR PCS CDMA EVDO Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 1 880.00 MHz
- ▣ CHANNEL: 600 (Middle)
- ▣ MEASURED OUTPUT POWER: 26.15 dBm = 0.412 W
- ▣ MODULATION SIGNAL: PCS CDMA EVDO (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 39.15 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3 760.00	- 62.66	12.4	- 50.26	V	- 67.0
5 640.00	- 65.68	11.7	- 53.98	V	- 71.9
7 520.00	- 65.51	11.5	- 54.01	V	- 72.7

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

7. Radiated Measurements

7.12 CELLULAR PCS CDMA EVDO Radiated Measurements

Field Strength of SPURIOUS Radiation

- ▣ OPERATING FREQUENCY: 1 908.75 MHz
- ▣ CHANNEL: 1175 (High)
- ▣ MEASURED OUTPUT POWER: 26.15 dBm = 0.412 W
- ▣ MODULATION SIGNAL: PCS CDMA EVDO (Internal PIFA)
- ▣ DISTANCE: 3 meters
- ▣ LIMIT: - (43 + 10 lo_{g10} (W)) = - 39.15 dBc

Freq. (MHz)	LEVEL@ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3 817.50	- 51.88	12.4	- 39.48	V	- 56.2
5 726.25	- 61.37	11.7	- 49.67	V	- 67.6
7 635.00	- 57.87	11.5	- 46.37	V	- 65.0

NOTES:

Radiated Spurious Emission Measurements by Substitution Method

According to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer.

For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

8. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
R&S	ESI40/ Spectrum Analyzer	831564/003	11/06/2007	Annual	11/06/2008
Advantest	R3273/ Spectrum Analyzer	J04821	03/15/2007	Annual	03/15/2008
HP	8664A/ Signal Generator	3744A02069	04/10/2007	Annual	04/10/2008
Agilent	E4419B/ Power Meter	MY41291386	11/05/2007	Annual	11/05/2008
Agilent	8481A/ Power Sensor	MY41090870	11/05/2007	Annual	11/05/2008
Agilent	HP8901B/ Modulation Analyzer	3438A05231	08/04/2007	Annual	08/04/2008
Agilent	8903A/ Audio Analyzer	2433A04322	08/04/2007	Annual	08/04/2008
R&S	CMU200/ Base Station	110740	07/26/2007	Annual	07/26/2008
Agilent	8960 (E5515C)/ Base Station	GB444400269	02/11/2008	Annual	02/11/2009
Tescom	TC-3000/ Bluetooth Simulator	3000A4900112	01/11/2008	Annual	01/11/2009
MITEQ	AMF-6D-01180-35-20P/ AMP	990893	04/25/2007	Annual	04/25/2008
Wainwright	WHK1.2/15G-10EF/H.P.F	2	06/28/2007	Annual	06/28/2008
Wainwright	WHK3.3/18G-10EF/H.P.F	1	06/28/2007	Annual	06/28/2008
Agilent	778D/ Dual Directional Coupler	16072	11/09/2007	Annual	11/09/2008
Agilent	1506A/ Power Divider	99441	11/10/2007	Annual	11/10/2008
Digital	EP-3010/ Power Supply	3110117	12/29/2007	Annual	12/29/2008
Schwarzbeck	UHAP/ Dipole Antenna	630	11/13/2007	Annual	11/13/2008
Schwarzbeck	UHAP/ Dipole Antenna	605	11/13/2007	Annual	11/13/2008
R&S	HFH2-Z2/ Loop Antenna	881056/070	12/11/2007	Annual	12/11/2008
Korea Engineering	KR-1005L / Chamber	KRAB07063-2CH	01/05/2008	Annual I	01/05/2009
Schwarzbeck	VULB9160/ TRILOG Antenna	3150	04/20/2007	Biennial	04/20/2009
Schwarzbeck	VULB9160/ TRILOG Antenna	3125	05/16/2007	Biennial	05/16/2009
Schwarzbeck	BBHA 9120D/ Horn Antenna	147	03/31/2007	Biennial	03/31/2008
Schwarzbeck	BBHA 9120D/ Horn Antenna	1201	05/02/2007	Biennial	05/02/2008

9. SAMPLE CALCULATIONS

A. ERP Sample Calculation

Mode	Freq. Tuned (MHz)	S.A REF. LEVEL (dBm)	S.G REF. LEVEL (dBm)	ANT. GAIN (dB)	C.L. (dB)	AMP. (dB)	POL (H/V)	ERP (W)	ERP (dBm)	BATTERY
CDMA	824.70	- 9.3	- 23.48	2.65	2.5	47	H	0.233	23.67	Standard

1) The EUT mounted on a wooden tripod is 0.8 meter above test site ground level.

2) During the test, the turn table is rotated and the antenna height is also varied from 1 to 4 meters until the maximum signal is found.

3) Record the field strength meter's level. (**LEVEL**)

4) Replace the EUT with dipole antenna that is connected to a calibrated signal generator.

5) Increase the signal generator output till the field strength meter's level is equal to the item.

6) The signal generator output level with cable loss is the rating of effective radiated power (**ERP**).

(Cable loss means the factor between Signal Generator and Transmitting Antenna.)

- ERP calculation;

  ERP = S.G LEVEL + ANT. GAIN – C.L + AMP

  = -23.48 + 2.65 – 2.5 + 47

  = 23.67 dBm

  = 0.233 W

For more details, please refer to the test set-up procedure.

B. Emission Designator

Emission Designator = 1M28F9W

CDMA BW = 1.28 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data)

(Measured at the 99.75 % power bandwidth)

10. CONCLUSION

The data collected shows that the **Dual-Band CDMA/ EV-DO Phone with Bluetooth**

FCC ID: QMNRM-347 complies with all the requirements of Parts 2 and 22, 24 of the FCC rules.