



MOBILE DEVICES BUSINESS

**PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY**

EMC TEST REPORT

Test Report Number – 22020-1

Report Date – May 28, 2008

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.

As the responsible EMC Engineer, I hereby declare that the equipment tested as specified in this report conforms to the requirements indicated.

Signature: 

Name: Albert J. Patapack

Title: EMC Engineer

Date: May 28, 2008

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THIS REPORT MUST NOT BE USED TO CLAIM PRODUCT ENDORSEMENT BY ANY AGENCY OF THE U.S. GOVERNMENT.

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Test Report Details

Tests Performed By: Motorola Mobile Devices business (MDb)
Product Safety and Compliance Group
600 North US Hwy 45
Libertyville, IL 60048
PH (847) 523-6167 Fax (847) 523-4538
Motorola MDb FRN: 0004321311
FCC Registration Number: 316588
Industry Canada Number: IC1090-1

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

Product Type: Cellular Phone

Signaling Capability: CDMA 800, CDMA 1700, CDMA 1900, Bluetooth

FCC ID : IHDT56JE1

Serial Numbers: A0000002C0C1D51, A0000002C0C1A62,
A0000002131CAEA

Testing Complete Date: May 28, 2008

Applicable Standards

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

- Part 15 Subpart B – Unintentional Radiators
- X Part 22 Subpart H - Public Mobile Services
- X Part 24 Subpart E – Personal Communications Services
- X Part 27 – Miscellaneous Wireless Communications Services

Applicable Standards: TIA EIA 137-A, TIA EIA 98-C, ANSI 63.4 2001, RSS-118 (AMPS), RSS-128 (TDMA), RSS-129 (CDMA), RSS-133 (PCS)

Summary of Testing

Test #	Test Name	Pass/Fail
1	RF Power Output	NA
2	ERP (Effective Radiated Power)	Pass
3	EIRP (Effective Isotropic Radiated Power)	Pass
4	Spurious Emissions at Antenna Terminal	Pass
5	Field Strength of Spurious Emissions	Pass

Test #	Test Name	Margin with respect to the Limit
1	RF Power Output	NA
2	ERP (Effective Radiated Power)	See results
3	EIRP (Effective Isotropic Radiated Power)	See results
4	Spurious Emissions at Antenna Terminal	See results
5	Field Strength of Spurious Emissions	See results

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

General and Special Conditions

The EUT was tested using a fully charged battery when applicable. Where a battery could not be used due to the need for a controlled variation of input voltage, an external power supply was utilized.

All testing was done in an indoor controlled environment with an average temperature of 22° C and relative humidity of 50%.

Equipment and Cable Configurations

The EUT was tested in a stand-alone configuration that is representative of typical use.

Manufacturer	Equipment Type	Model No.	Serial Number	Calibration Due Date
Rohde Schwarz	Receiver	ESI26	838786/010	02/28/2009
Rohde Schwarz	Receiver	ESI26	100226	06/11/2008
Hewlett Packard	EMC Analyzer	E7405	US40240219	06/28/2008
Hewlett Packard	Signal Generator	83712A	3429A00286	06/19/2008
ETS	DRG Horn Antenna	3115	6222	05/02/2009
ETS	Biconical Antenna	3110B	3369	10/04/2008
Attenuator	Weinschel	AS-6	7074	07/23/2008
Attenuator	Weinschel	AS-6	7075	07/23/2008
Agilent	Power Meter	E4416A	GB41293263	12/27/2008
Agilent	Power Sensor	E9323A	MY44420341	12/27/2008
Agilent	Microwave Preamplifier	8449B	3008A00535	12/06/2009

Note that the Agilent power meter on a two-year calibration cycle. All other equipment is on a one-year calibration cycle. All testing was performed using equipment that was within calibration at the time that the test was performed. No equipment listed in the table above was used after the specified calibration due date. If, during the course of product testing, a piece of equipment went out of calibration and that piece of equipment was needed to complete product testing, a similar piece of calibrated equipment was substituted. If a substitution was made, that new piece of equipment would be listed in the above table along with the piece that was removed from service.

Measurement Procedures and Data

RF POWER OUTPUT

Measurement Procedure

The RF output port of the equipment under test is directly coupled to the input of an Agilent power meter through a 20dB passive attenuator, adaptor (if needed), and specialized RF connector. The peak power output is measured for all channels.

CFR47 Part 2.1046

Measurement Results

CDMA 800

Frequency (MHz)	Power (dBm)
824.70	24.92
836.52	25.00
848.31	24.93

CDMA 1700

Frequency (MHz)	Power (dBm)
1711.25	24.93
1732.50	24.86
1753.75	24.99

CDMA 1900

Frequency (MHz)	Power (dBm)
1851.25	24.93
1880.00	24.92
1908.75	24.89

As Per the “Preliminary Guidance for Reviewing Applications for Certifications of 3G Devices” released on May 9, 2006, RC1, RC3 and RC3 (FCH + SCH) CDMA modes were considered. The conducted power measurements (per steps 3, 4 & 10 of section 4.4.5.2 of 3GPP2 C.5.011 / TIA -98-E) show that the portable cellular phone FCC ID IHDT56JE1 has the same output conducted power for all applicable CDMA modes. All testing was done in RC3/SO55 mode.

Conducted power (dBm) for CDMA modes						
	Channel	RC1		RC3		RC3 (FCH + SCH)
		SO2	SO55	SO2	SO55	
CDMA 800	1013	25.24	25.28	25.29	25.14	Per Motorola designs, the maximum power, when in a mode that allows supplemental channels, will always be less than the RC3/RC1 maximum conducted power limit.
	384	25.05	25.04	25.05	24.97	
	777	24.67	24.79	24.86	24.80	
CDMA 1700	25	24.89	24.88	24.85	24.90	
	449	24.78	24.78	24.79	24.89	
	875	24.82	24.80	24.80	24.89	
CDMA 1900	25	24.98	24.98	25.15	24.91	
	600	24.95	24.84	24.86	24.94	
	1175	24.93	24.94	24.94	24.83	

Note that this product does not support EV-DO.

RADIATED POWER (EIRP AND ERP)

Measurement Procedure

The phone was tested in a 16' anechoic chamber with a 2-axis position system that permits taking complete spherical scans of the EUT's radiation patterns. For all tests, the phone was supported in a free space type environment, vertically oriented in the chamber. Tests were done for GSM 850 and GSM 1900.

All measurements were made with the phone placed in a call using a mobile station test set. The phone was weakly coupled to the test set and configured to transmit in full data rate mode. Radiated power was measured at each 15 degree step. The radiated power was measured using a Gigatronics 8652 power meter in "Mod Avg" mode for CDMA or in the "Burst Avg" mode for GSM. From these measurements, the software calculates the angle at which maximum radiated power occurs for each case, and the radiated power at this angle was extracted from the data. To get ERP (effective radiated power referenced to a half-wave dipole), subtract 2.1 dB from these numbers.

Measurement Results

CDMA 800:

<u>Frequency (MHz)</u>	<u>ERP (dBm)</u>
824.70	22.42
836.52	22.88
848.31	23.17

CDMA 1700:

<u>Frequency (MHz)</u>	<u>EIRP (dBm)</u>
1711.25	26.70
1732.50	26.34
1753.75	26.44

CDMA 1900:

<u>Frequency (MHz)</u>	<u>EIRP (dBm)</u>
1851.25	26.06
1880.00	25.72
1908.75	25.16

For all measurement, calibration was performed via gain substitution with a half-wave dipole.

BAND/TECHNOLOGY	MAXIMUM EIRP(dBm)	MAXIMUM ERP (dBm)
800 CDMA	25.27	23.17
1700 CDMA	26.70	24.60
1900 CDMA	26.06	23.96

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Measurement Procedure

The RF output port of the Equipment Under Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

The spectrum was investigated from the lowest frequency signal generated, without going below 9 kHz, up to at least the tenth harmonic of the fundamental or 40 GHz, whichever is lower.

The spectrum analyzer settings were as follows:

Units	dBm
Divisions	10 dB
Detector	Peak Detector
Resolution Bandwidth	1 MHz
Video Bandwidth (AVG)	Auto
Sweep Time	Auto

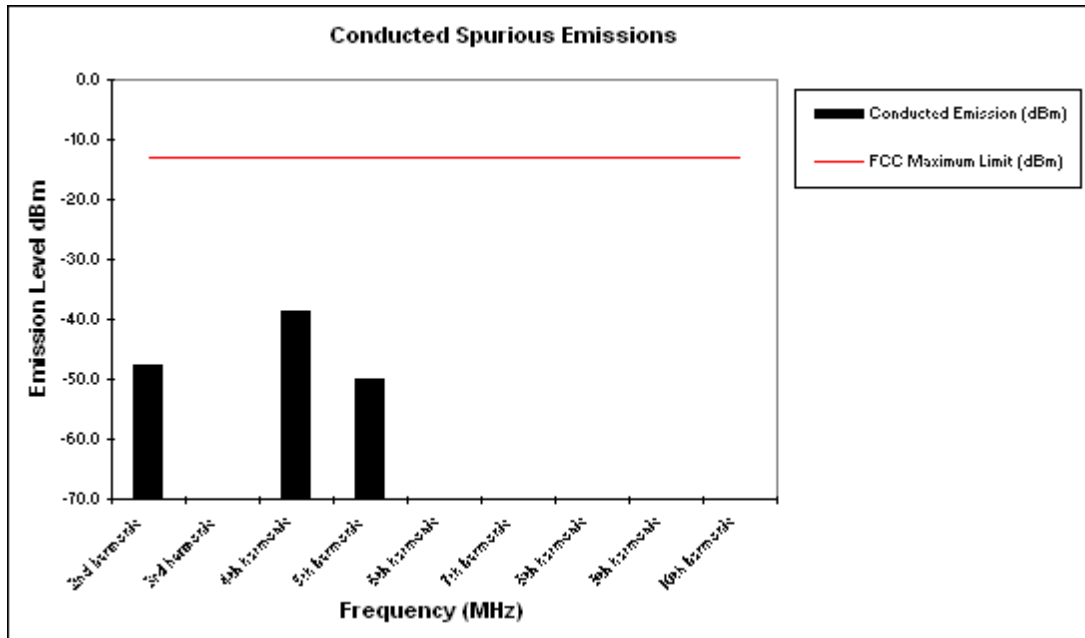
Measurement Results

Attached

Measurement Results
Modulation: CDMA 800

Conducted Spurious and Harmonic Emissions

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-47.7
3rd harmonic	-13	*
4th harmonic	-13	-38.6
5th harmonic	-13	-50.0
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



Notes:

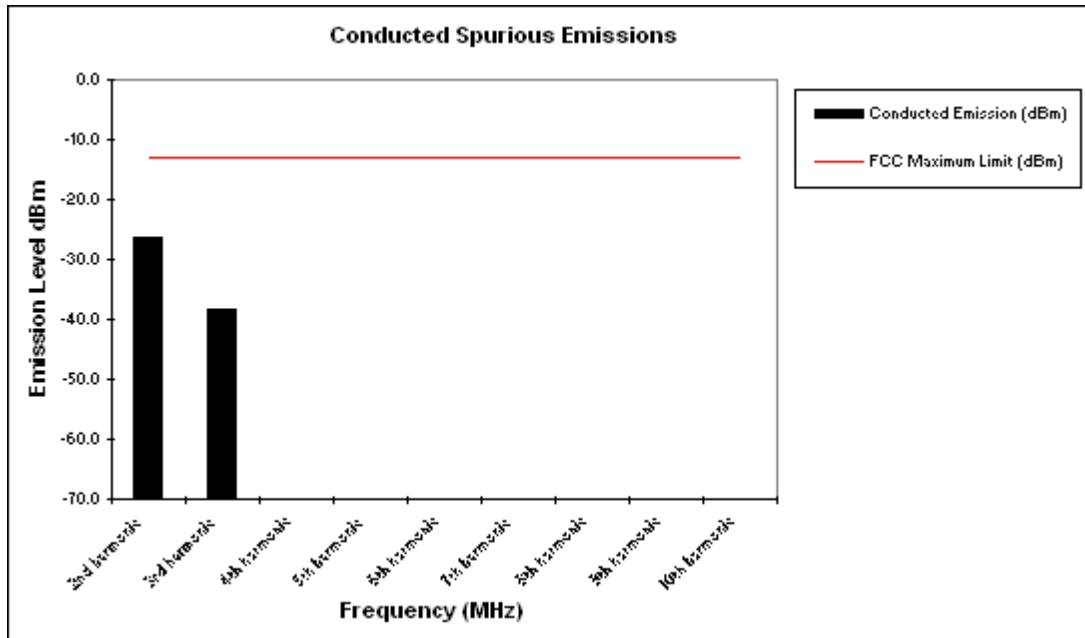
- * Indicates the spurious emission could not be detected due to noise limitations or ambients.
- Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
- The Spectrum was investigated from 9 kHz to the tenth harmonic of the fundamental.

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

Measurement Results
Modulation: CDMA 1700

Conducted Spurious and Harmonic Emissions

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-26.4
3rd harmonic	-13	-38.4
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



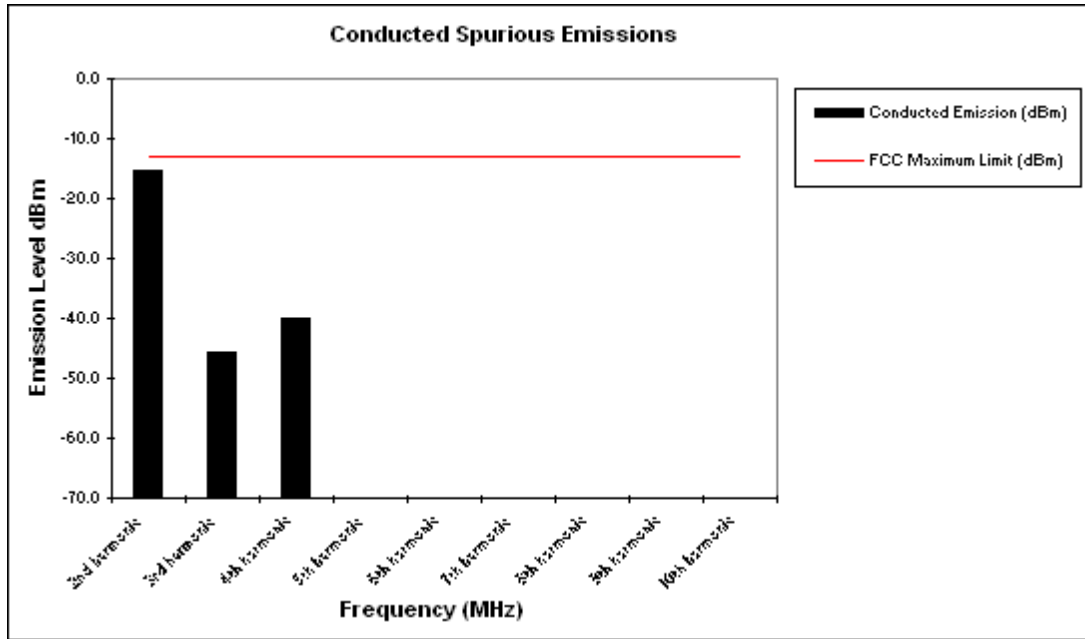
Notes:

1. * Indicates the spurious emission could not be detected due to noise limitations or ambients.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated from 9 kHz to the tenth harmonic of the fundamental.

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

Measurement Results
Modulation: CDMA 1900

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-15.5
3rd harmonic	-13	-45.8
4th harmonic	-13	-40.1
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



Notes:

- * Indicates the spurious emission could not be detected due to noise limitations or ambients.
- Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
- The Spectrum was investigated from 9 kHz to the tenth harmonic of the fundamental.

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

FIELD STRENGTH OF SPURIOUS EMISSIONS

Measurement Procedure

The equipment under test is placed inside the semi-anechoic chamber on a wooden table at the turntable center. For each spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer. This is repeated for both horizontal and vertical polarizations of the receive antenna.

The equipment under test is then replaced with a substitution antenna fed by a signal generator. With the signal generator tuned to a particular spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters to obtain a maximum reading at the spectrum analyzer. The output of the signal generator is then adjusted until a reading identical to that obtained with the actual transmitter is achieved.

The power in dBm of each spurious emission is calculated by correcting the signal generator level for cable loss and gain of the substitution antenna referenced to a dipole. A fully charged battery was used for the supply voltage.

The settings of the receiver were as follows:

Units	dBm
Divisions	5 dB
Detector	Peak Detector
Resolution Bandwidth	1 MHz
Video Bandwidth (AVG)	Auto
Sweep Time	Auto

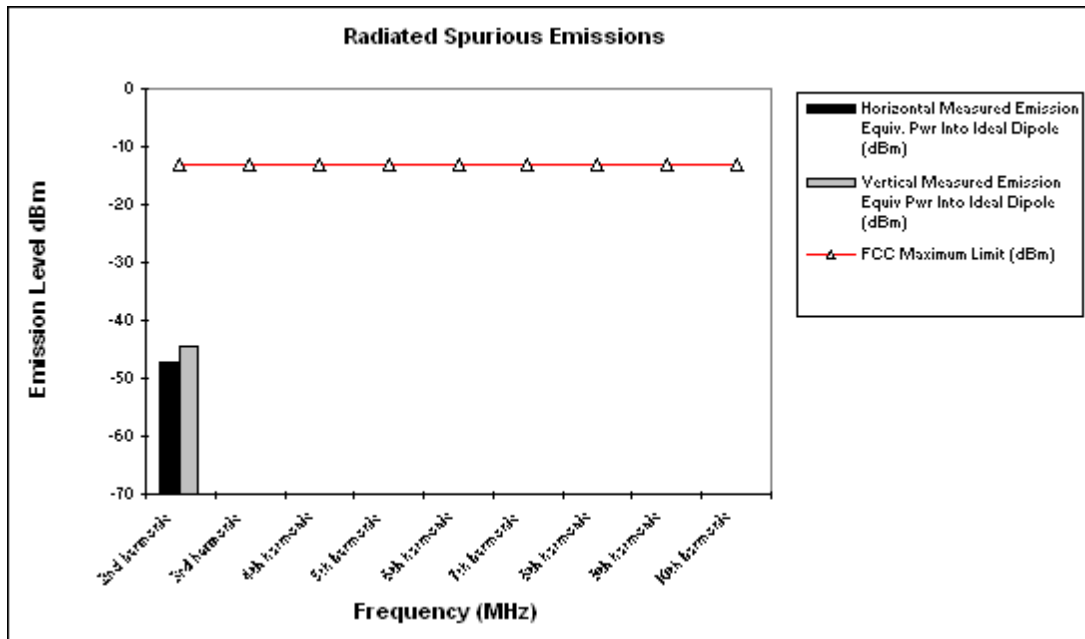
Measurement Results

Attached

Measurement Results
Modulation: CDMA 800

Radiated Spurious and Harmonic Emissions

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
2nd harmonic	-13	-47.3	-44.5
3rd harmonic	-13	*	*
4th harmonic	-13	*	*
5th harmonic	-13	*	*
6th harmonic	-13	*	*
7th harmonic	-13	*	*
8th harmonic	-13	*	*
9th harmonic	-13	*	*
10th harmonic	-13	*	*



Notes:

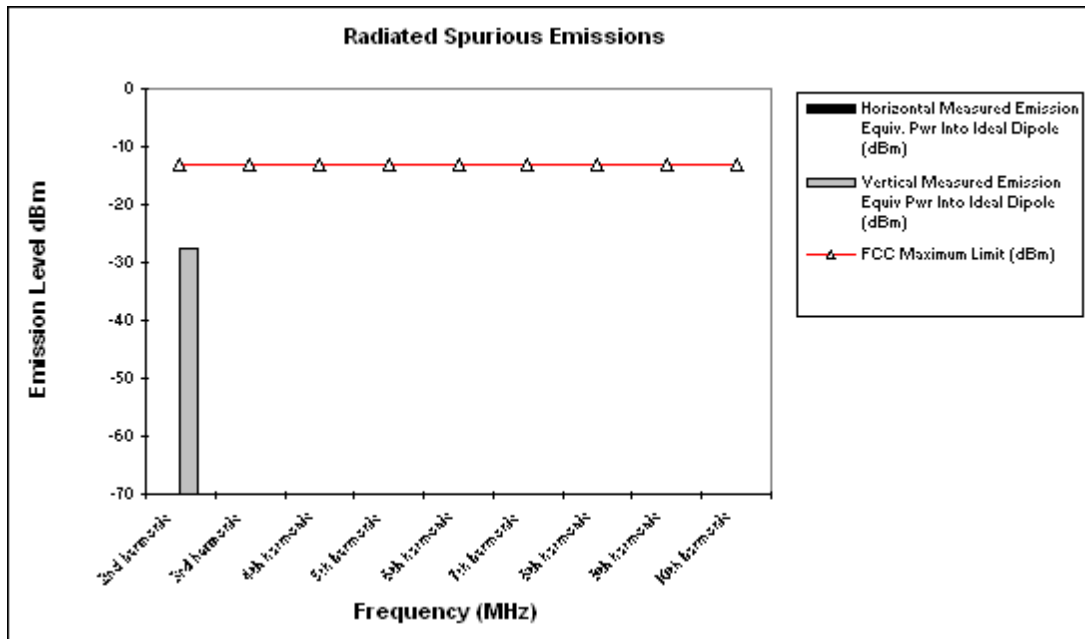
- * Indicates the spurious emission could not be detected due to noise limitations or ambients.
- Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
- The Spectrum was investigated from 30 MHz to the tenth harmonic of the fundamental.

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

Measurement Results
Modulation: CDMA 1700

Radiated Spurious and Harmonic Emissions

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
2nd harmonic	-13	*	-27.4
3rd harmonic	-13	*	*
4th harmonic	-13	*	*
5th harmonic	-13	*	*
6th harmonic	-13	*	*
7th harmonic	-13	*	*
8th harmonic	-13	*	*
9th harmonic	-13	*	*
10th harmonic	-13	*	*



Notes:

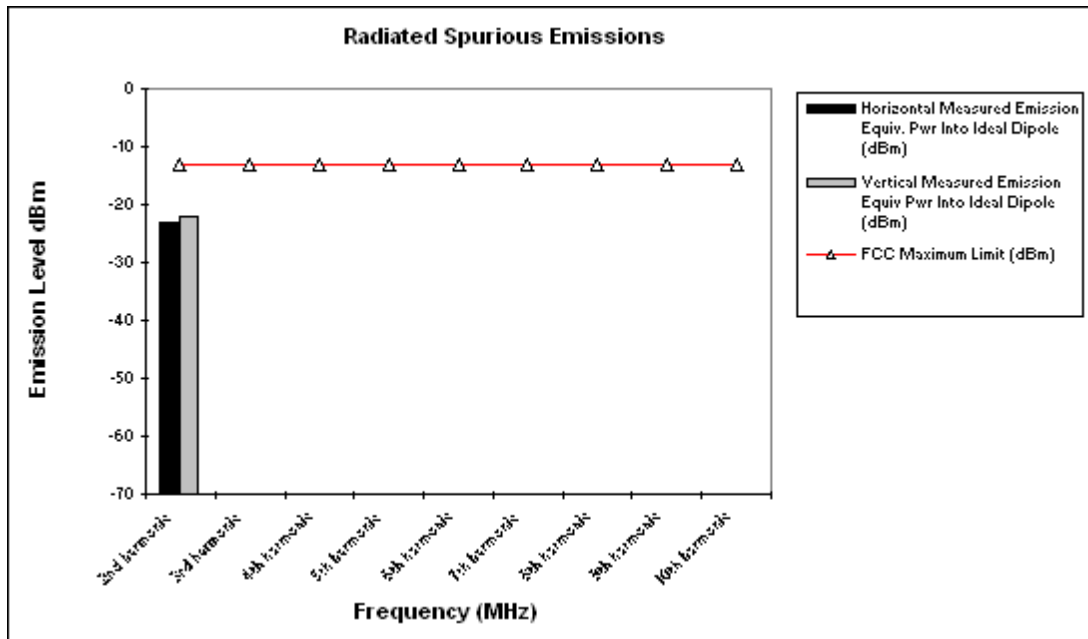
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated from 30 MHz to the tenth harmonic of the fundamental.

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

Measurement Results
Modulation: CDMA 1900

Radiated Spurious and Harmonic Emissions

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
2nd harmonic	-13	-23.0	-22.2
3rd harmonic	-13	*	*
4th harmonic	-13	*	*
5th harmonic	-13	*	*
6th harmonic	-13	*	*
7th harmonic	-13	*	*
8th harmonic	-13	*	*
9th harmonic	-13	*	*
10th harmonic	-13	*	*



Notes:

- * Indicates the spurious emission could not be detected due to noise limitations or ambients.
- Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
- The Spectrum was investigated from 30 MHz to the tenth harmonic of the fundamental.

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

End of Test Report