PERSONAL COMMUNICATIONS SECTOR

PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY

EMC TEST REPORT

FCC ID IHDT6BE1
FCC Exhibit 6

Test Report Details

Tests Performed By:	Motorola Personal Communications Sector Product Safety and Compliance Group 1500 Gateway Boulevard Boynton Beach, FL 33426
Test Report Number:	3091-2
Test Report Date:	May 31, 2001
Product Type:	Cellular Phone
Signaling Capability:	GSM 1900
Model Number:	AAUG1239AA
Received Date:	May 23, 2001
Testing Start Date:	May 24, 2001
Testing Complete Date:	May 30, 2001

Summary of Testing

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:

__X__ Part 15 Subpart B – Unintentional Radiators
_____ Part 22 Subpart H - Public Mobile Services
__X__ Part 24 - Personal Communications Services
_____ Part 90 - Private Land Mobile Radio Service

Test #	Test Name	Comply	Does Not Comply
1	RF Power Output	X	
2	Occupied Bandwidth	X	
3	Spurious Emissions at Antenna Terminal	X	
4	Field Strength of Spurious Emissions	X	
5	Frequency Stability	X	
6	Receiver Radiated Emissions	X	

Introduction

All measurements contained in this report were performed at the Motorola Inc. Product Safety and Compliance EMC Laboratory located at 1500 Gateway Boulevard, Boynton Beach, FL 33426. The FCC and Industry Canada recognize this measurement facility as a valid test site.

Physical Description of Test Facility

Shielded Enclosure

The EMC radiated test facility consists of a 3-meter semi-anechoic shielded enclosure. The interior shield to shield dimensions of the indoor semi-anechoic chamber are approximately 28 feet long by 20 feet wide by 17 feet 10 inches high.

Turntable and Ground Plane

The turntable is an electrically driven EMCO model 2088-1.53 with a 1.5 m diameter metal top and is capable of supporting 2200 lbs. An EMCO Model 2090 Multi-device Controller controls the turntable rotation with IEEE-488 data/control for automation.

The chamber's 6 inch raised ground plane consists of a continuous metallic surface with a vinyl top finish.

Antenna Mast

An EMCO Model 2071-2 electrically powered, air-polarized, antenna tower mast is used. It also is controlled by an EMCO Model 2090 Multi-device Controller with IEEE-488 data/control for automation.

Control Area

The control area is a RF shield enclosure attached to the semi-anechoic chamber with a connector panel for RF, fiber optic and control cables.

Quiet Zone and Test Range

The quiet zone for the 3m test range is a cylinder two (2) meters in diameter per volumetric quiet zone testing requirements specified in ANSI C63.4 1992.

Measuring Equipment and Calibration Information

Manufacturer Name	Item Name Description	Item Version/ Model #	Serial Number	CALIBRATION DUE DATE
Rohde & Schwarz	EMI Test Receiver	ESI26	838386/010	2/28/2002
Hewlett Packard	EMC Analyzer	8593EM	US40240219	8/7/2001
Hewlett Packard	EMC Analyzer	8593EM	3536A00118	10/12/2001
Hewlett Packard	RF Amplifier	8347A	3307A01225	7/10/2001
Hewlett Packard	Pre-Amplifier	8449B	3008A00535	7/10/2001
A.H. Systems Inc.	DRG Horn Antenna	SAS-200/571	265	7/23/2001
A.H. Systems Inc.	DRG Horn Antenna	SAS-200/571	365	10/26/2001
Chase	Bilog Antenna	CBL6121	1008	6/12/2001
ETS	Log-Periodic Antenna	3148	1189	11/3/2003
ETS	Log-Periodic Antenna	3148	1188	11/3/2003
ETS	Biconical Antenna	3110B	3369	11/2/2003
ETS	Biconical Antenna	3110B	3370	11/2/2003
EMCO	Log-Periodic Antenna	3147	9311-1124	6/22/2001
Hewlett Packard	CDMA Mobile Test Set	E8285A	US39220601	10/15/2001
Hewlett Packard	TDMA Mobile Test Set	8920B	US39225370	1/24/2002
Hewlett Packard	TDMA Cellular Adaptor	83206A	US39402234	1/24/2002
Hewlett Packard	GSM Mobile Test Set	8922M	3639U01033	4/10/2002
Hewlett Packard	GSM DCS/PCS RF Interface	83220E	3639U01057	4/12/2002
Hewlett Packard	Signal Generator	83623B	3844A00935	6/26/2001
Hewlett Packard	Signal Generator	83623B	3844A01195	7/9/2001
Thermotron	Environmental Chamber	S-4	31580	12/20/2001

Does not include measurement equipment required for RF Power Output Test.

CONDUCTED RF POWER OUTPUT

Measurement Procedure

The RF output port of the equipment under test is directly coupled to the input of a HPE4406A Vector Signal Analyzer through a 10dB passive attenuator, adaptor (if needed), and specialized RF connector. The peak power output is measured for all channels.

Measurement Results

GSM 1900

Frequency (MHz)	Power (dBm)
1850.2	30.18
1880.0	30.18
1909.8	30.19

RADIATED (EIRP)

Measurement Procedure

The phone was tested in a 16' cubical anechoic chamber with a 2-axis position system that permits taking complete spherical scans of the AUT's radiation patterns. For all tests, the phone was supported in a free-space type environment, vertically oriented in the chamber. Tests were done on three PCS frequencies (1850.2, 1880.0 and 1909.8 Mhz).

GSM measurements were made with the phone placed in a call using the HP8922M 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 every 15 degree step. The radiated power was measured using a Gigatronics 8542C power meter in "Burst Avg" mode. 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. The max radiated power results for IHDT6BE1 follows, as EIRP in dBm. To get ERP (effective radiated power referenced to a half-wave dipole), subtract 2.1 dB from these numbers.

Measurement Results

PCS 1900:
1850.2 MHz: **29.9 dBm**
1880.0 MHz: 29.8 dBm
1909.8 MHz 29.7 dBm

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

Result:
max EIRP is 29.9 dBm in PCS 1900 mode (max ERP is 27.8 dBm)

OCCUPIED BANDWIDTH

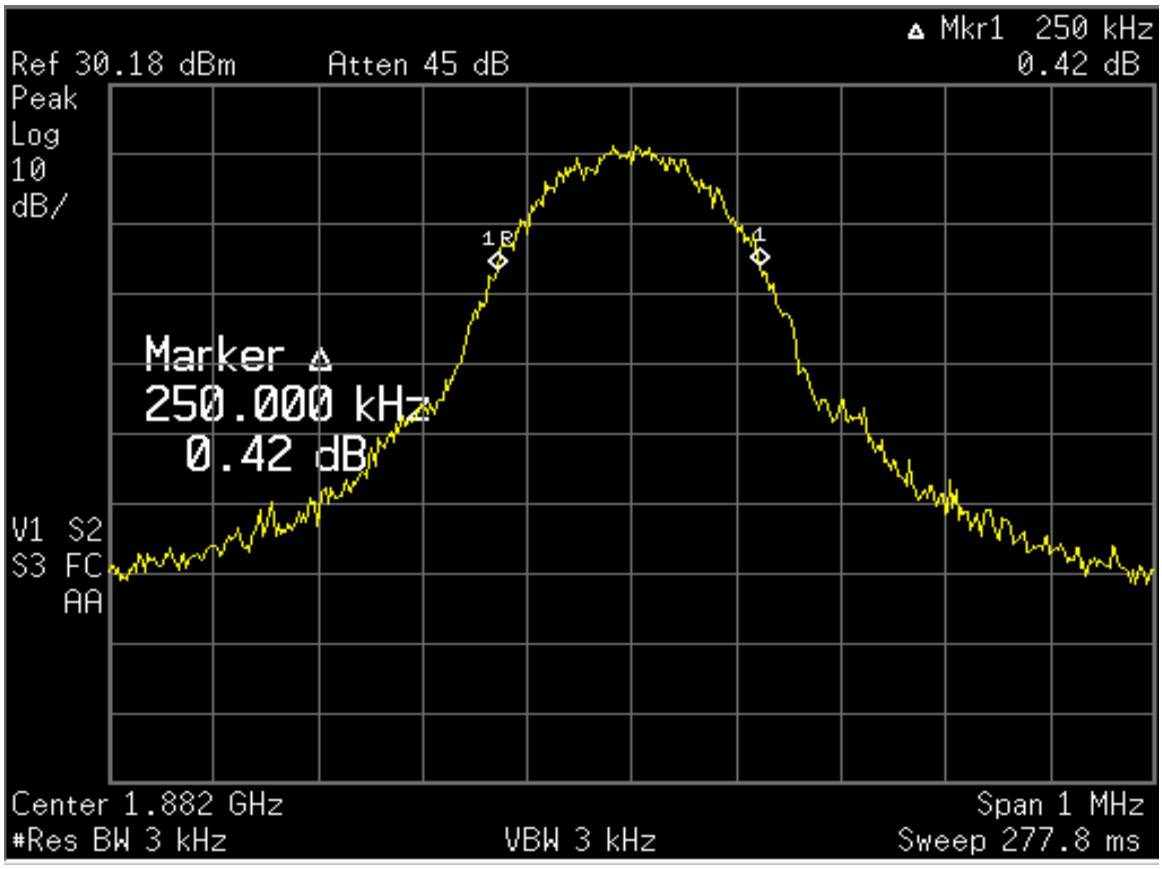
Measurement Procedure

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. The amplitude of the spectrum analyzer is corrected for the attenuator and any other applicable losses.

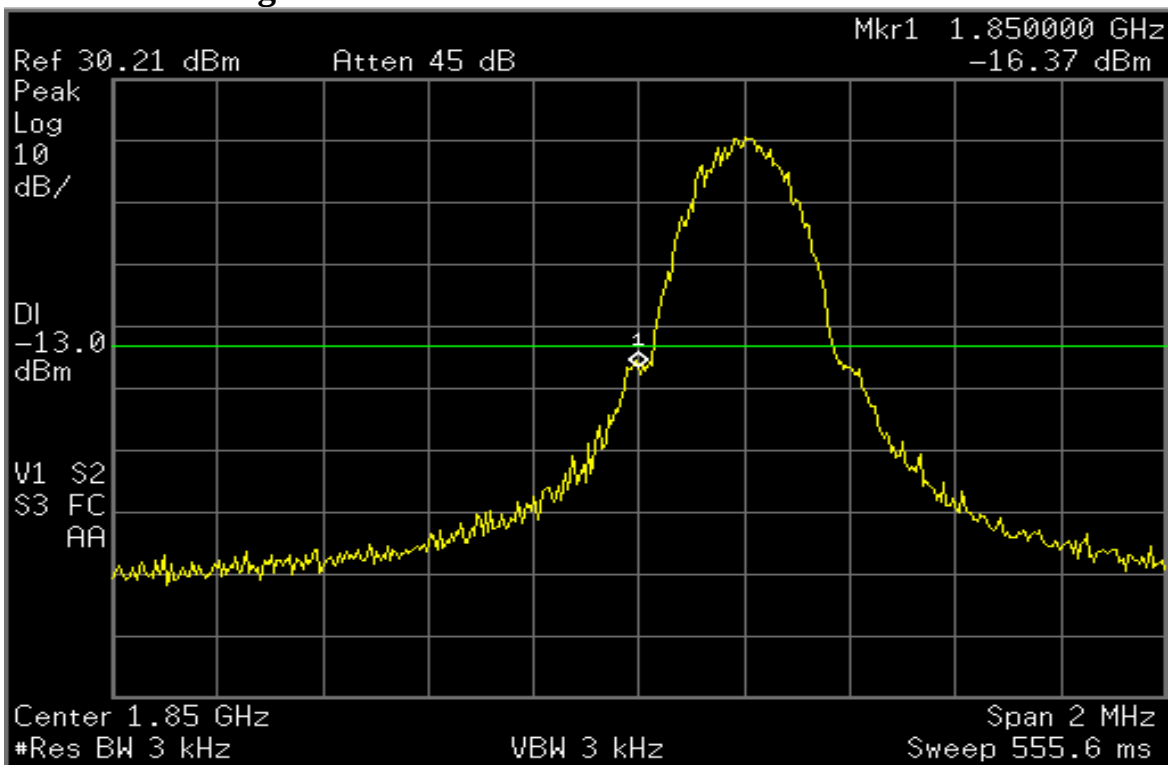
The middle channel within the designated frequency block was measured. For digital modulation, the lower and upper band edge plots are displayed.

Measurement Results

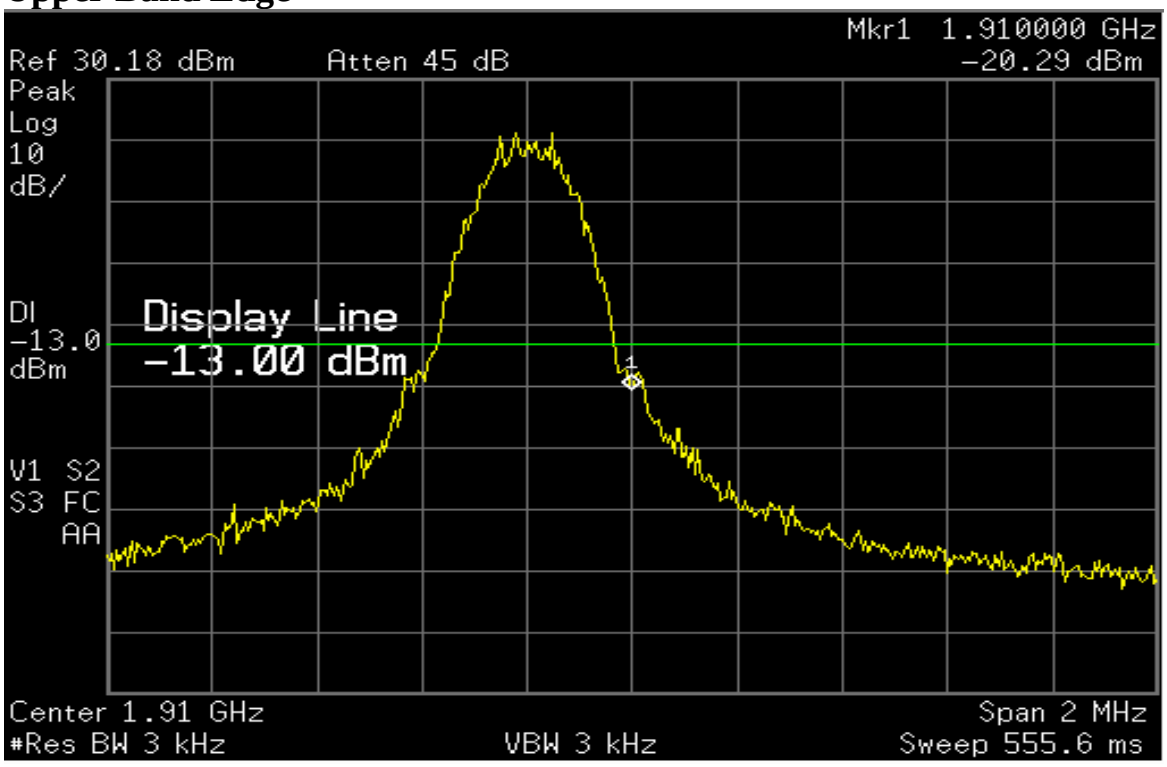
GSM 1900



Lower Band Edge



Upper Band Edge



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.

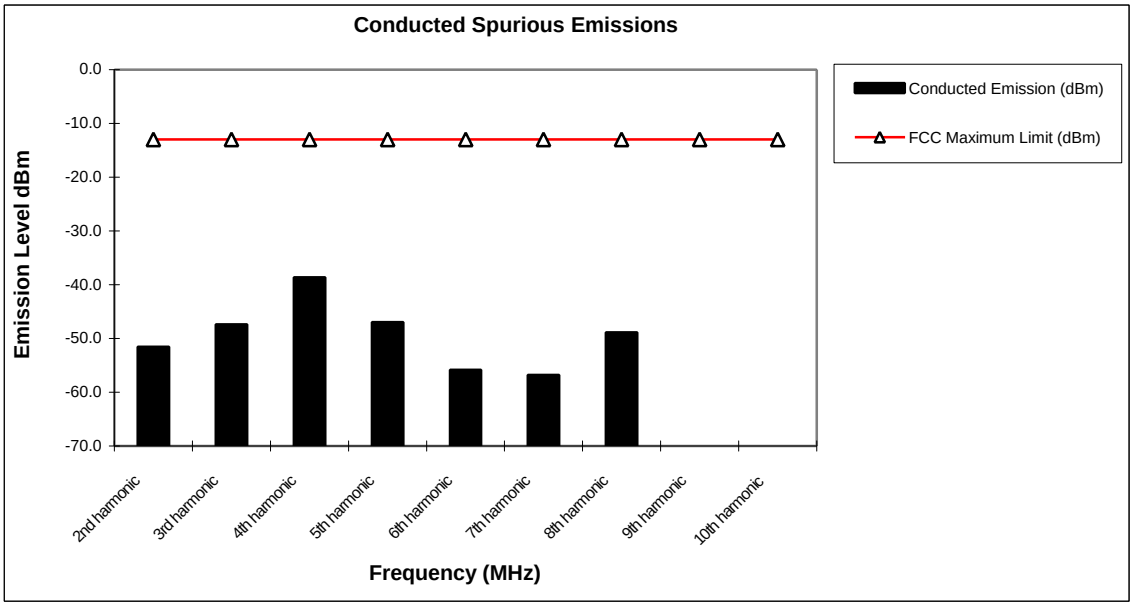
The spectrum was investigated from the lowest frequency signal generated, without going below 9 kHz, up to at least the tenth harmonic of the fundamental or 40 GHz, whichever is lower.

Measurement Results

Modulation: GSM 1900

Conducted Spurious and Harmonic Emissions: PCS 1900

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-51.5
3rd harmonic	-13	-47.4
4th harmonic	-13	-38.7
5th harmonic	-13	-47.0
6th harmonic	-13	-55.9
7th harmonic	-13	-56.8
8th harmonic	-13	-48.9
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 kHz to the tenth harmonic of the fundamental.

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.

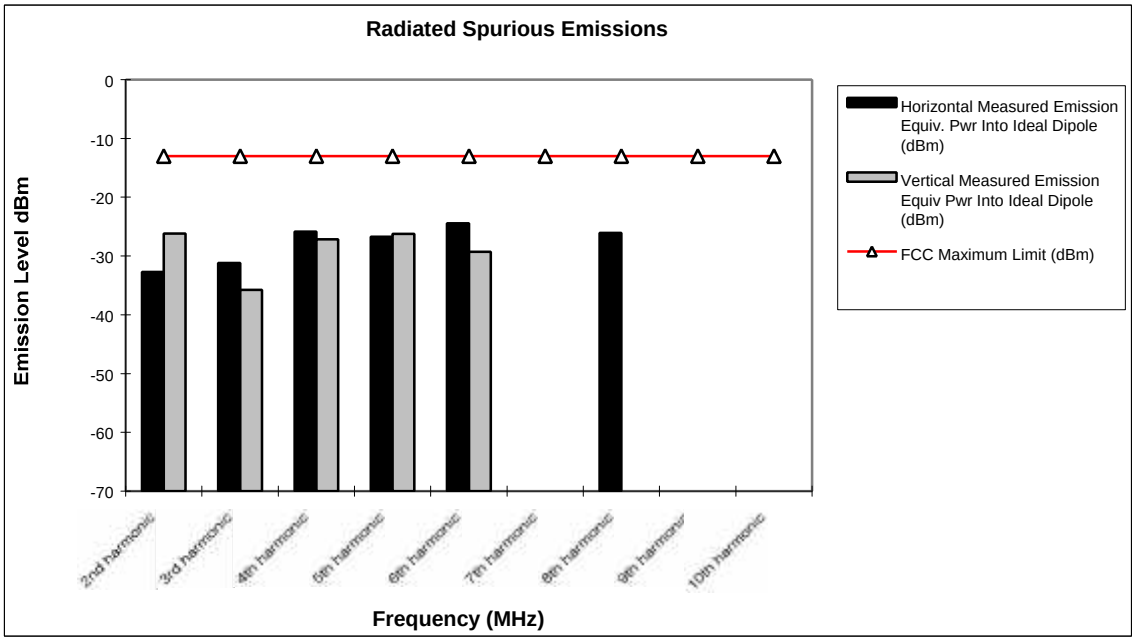
The power in dBm of each spurious emission is calculated by correcting the signal generator level for cable loss and gain of the substitution antenna referenced to a dipole.

Measurement Results

Modulation: GSM 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	-32.7	-26.2
3rd harmonic	-13	-31.2	-35.8
4th harmonic	-13	-25.9	-27.2
5th harmonic	-13	-26.7	-26.2
6th harmonic	-13	-24.4	-29.3
7th harmonic	-13	*	*
8th harmonic	-13	-26.1	*
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 kHz to the tenth harmonic of the fundamental.

FREQUENCY STABILITY

Measurement Procedure

The equipment under test is placed in an environmental chamber. The antenna port of the Equipment Under Test is directly coupled to the input of the measurement equipment through a specialized RF connector. 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.

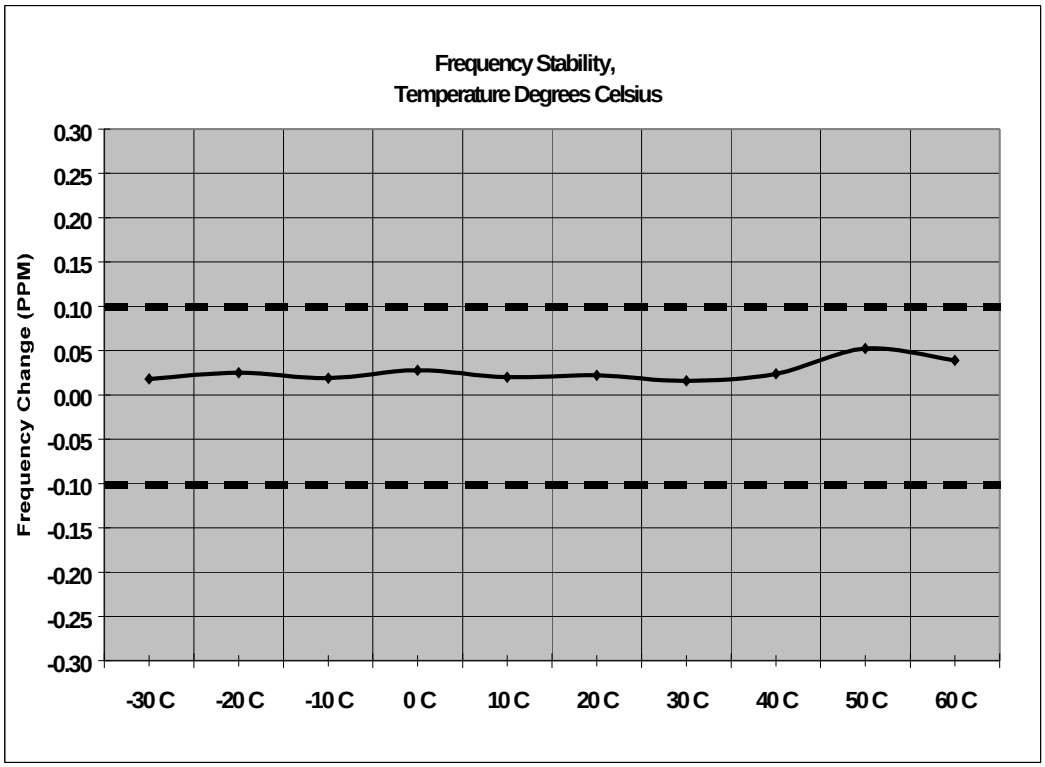
At room temperature, the primary supply voltage is reduced to the battery operating endpoint of the equipment under test. The maximum variation of frequency is measured.

Measurement Results

Frequency Stability

Date:	25-May-01	**Operating Frequency:**	1.88 Ghz
Mode:	GSM 1900	**Deviation Limit (PPM):**	1
Channel:	Ch 670		

Temperature	Frequency Error	Frequency Error	Voltage	Power
C	HZ	(PPM)	(%)	(VDC)
-30 C	**33.70**	**0.018**	100%	3.80
-20 C	**46.50**	**0.025**	100%	3.80
-10 C	**35.40**	**0.019**	100%	3.80
0 C	**51.60**	**0.028**	100%	3.80
10 C	**36.80**	**0.020**	100%	3.80
20 C	**41.00**	**0.022**	100%	3.80
30 C	**29.30**	**0.016**	100%	3.80
40 C	**43.80**	**0.024**	100%	3.80
50 C	**96.70**	**0.052**	100%	3.80
60 C	**72.40**	**0.039**	100%	3.80
20 C	**73.60**	**0.040**	Battery Endpoint	3.30



FIELD STRENGTH OF EMISSIONS FROM UNINTENTIONAL RADIATORS

Measurement Procedure

The equipment under test is placed inside the semi-anechoic chamber on a wooden table at the turntable center. For each radiated emission, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum peak reading on the spectrum analyzer. The radiated emissions are then measured using an EMI receiver employing a CISPR quasi-peak detector function below 1000 MHz and an average detector function above 1000 MHz. This is repeated for both horizontal and vertical polarizations of the receive antenna.

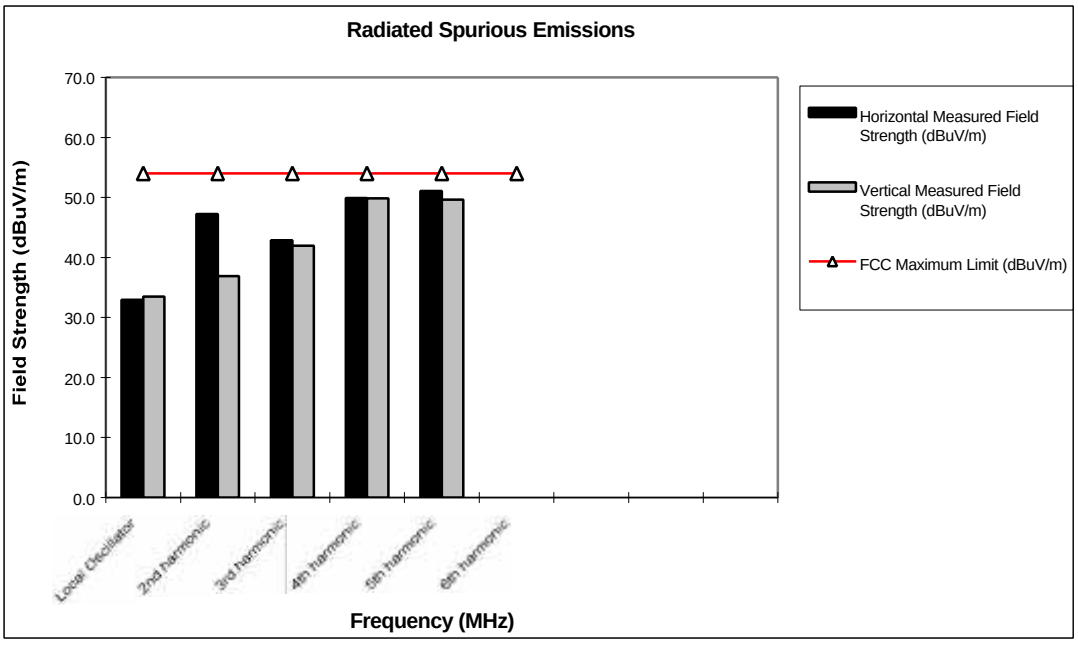
The field strength of each radiated emission is calculated by correcting the EMI receiver level for cable loss, amplifier gain, and antenna correction factors.

Field Strength (dBuV/m) = EMI Receiver Level (dBuV) + Cable Loss (dB) - Amplifier Gain (dB) + Antenna Correction Factor (1/m)

Measurement Results

Receiver Radiated Spurious Emissions: PCS 1900

Frequency (MHz)	FCC Maximum Limit (dBuV/m)	Horizontal Measured Field Strength (dBuV/m)	Vertical Measured Field Strength (dBuV/m)
Local Oscillator	54	32.9	33.5
2nd harmonic	54	47.3	36.9
3rd harmonic	54	42.9	42.0
4th harmonic	54	49.9	49.8
5th harmonic	54	51.1	49.6
6th harmonic	54	*	*



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 frequency for the low, mid, and high channels.