PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY

EMC TEST REPORT - Addendum

Test Report Number – 24214-1

Report Date – 2010-10-27

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: Lei Yang Name: Lei Yang

Title: EMC Project Manager Test: 2010-10-25 to 2010-10-28

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: Yilin Zhao

Title: Test Lab Manager Date: 2010-10-28

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FCC Registration Number: 177885
IC Registration Number: 109AW-1

ADR Testing Service location ADR BJ
ISO/IEC-17025:2005 accredited by UKAS

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: 177885 IC Registration Number: 109AW-1
Tests Requested By:	Motorola Mobility, Inc 600 North US Hwy 45 Libertyville, IL 60048 United States
Product Type:	Cell phone
Signaling Capability:	CDMA 800/1900, GSM 850/1900, EDGE 850/1900, GPRS, Bluetooth, 802.11b/802.11g
IMEI:	354718040009325
FCC ID:	IHDP56KT1
Project number:	24214-1
Testing Complete Date:	10-28-2010

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:

__X__Part 2
__X__Part 22 Subpart H - Public Mobile Services
__X__Part 24 Subpart E – Personal Communications Services

Applicable Standards: ANSI C63.4-2003, ANSI/TIA-603-C-2004, RSS-Gen Issue 2, RSS-132 Issue 2, RSS-133 Issue 5.

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	Occupied Bandwidth	Pass
5	Spurious Emissions at Antenna Terminal	Pass
6	Field Strength of Spurious Emissions	Pass
7	Frequency Stability	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	Occupied Bandwidth	See Plots
5	Spurious Emissions at Antenna Terminal	See results
6	Field Strength of Spurious Emissions	See results
7	Frequency Stability	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 model SNN5846A 1420mAh 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. 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 stand-alone configuration that is representative of typical use.

Equipment	Model/type	Serial number	Operational range	Date of calibration
EMI analyzers	ESU 40	100036	20 Hz – 40 GHz	05.15.2010
Pre Amplifiers	PA-02-0001:	2007343	(10 kHz – 3 GHz)	06.26.2010
	PA-02-218	2007344	3 GHz – 18 GHz	06.26.2010
	PA-02-5	2007345	18 GHz – 40 GHz	06.26.2010
Radio com. Tester	CMU 200	112790	GSM 850/900/1800/1900 UMTS, CDMA, Bluetooth	N/A
Band Reject Filter	WRCD	N/A	GSM 850/900/1800/1900 UMTS, CDMA	N/A
	4N45-24241/3/6	N/A	WLAN	N/A
EMI analyzers	R&S ESCI	100650	9 kHz – 3 GHz	03.08.2010
LISN	ENV216	100057	9 kHz – 30 MHz	12.19.2008
Environment Chamber	Votsch VT4004	354627030000020	-50^{0}C -150^{0}C	12.23.2009
DC Power Supply	Agilent E3632A	My40021519	15V/7A	03.16.2010
Power meter	Agilent E4416A	MY451000906	NA	03.03.2009
Power sensor	Agilent E9323A	MY44420783	50MHz-6GHz	03.03.2009

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	130361	30 MHz – 3 GHz	11.07.08
Double ridged Horn	TDK HRN0118	130303	1 GHz – 18 GHz	03.26.09

All test equipment 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 LISN are on a two-year calibration cycle. Antennas are on a three-year calibration cycle. All other equipments are on a one-year calibration cycle.

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 30dB passive attenuator, adaptor (if needed), and specialized RF connector.

Measurement Results

EDGE 850

Frequency (MHz)	Power (dBm)
824.2	27.64
836.6	27.18
848.8	27.47

EDGE 1900

Frequency (MHz)	Power (dBm)
1850.2	26.59
1880.0	26.54
1909.8	26.26

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.

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 peak detector for all bands in the Spectrum Analyzers. 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

A peak detector was used for measurements in the Edge 850, EDGE 1900

Measurement Results

Band	EIRP dBm	ERP dBm
EDGE 850	26.32	**24.22**
EDGE 1900	**28.95**	26.85

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 6dB passive attenuator. The amplitude of the spectrum analyzer is corrected for the attenuator and any other applicable losses. The analyzer is set for Peak Detector and each trace is set for Max Hold. For all testing the EUT was powered through the computer's USB port.

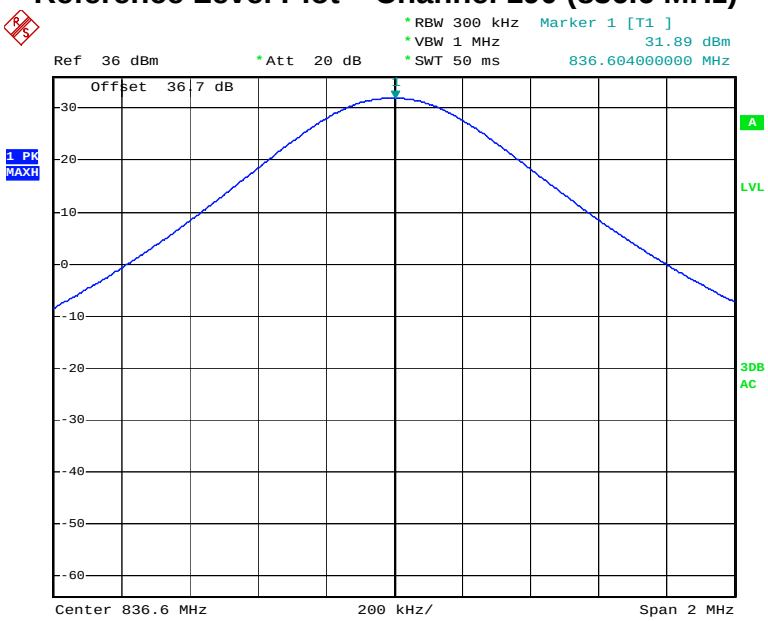
The middle channel within the designated frequency block was measured. For digital modulation, the lower and upper band edge plots are displayed.

Measurement Results

Attached

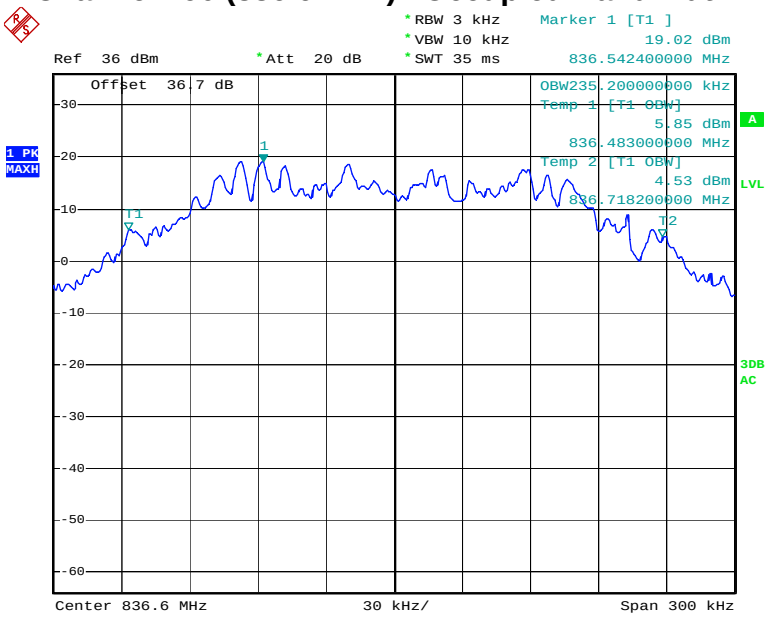
Measurement Results – EDGE 850

EDGE 850 – Reference Level Plot – Channel 190 (836.6 MHz)



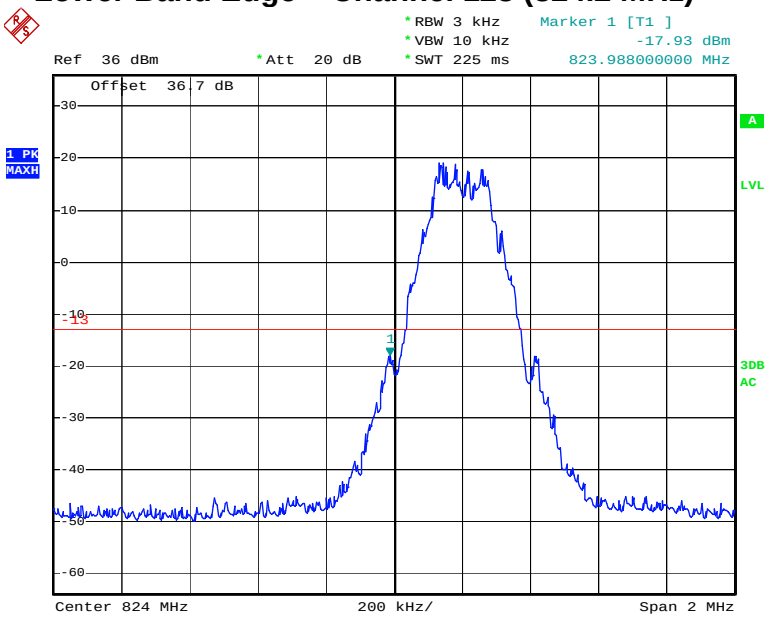
Date: 26.OCT.2010 14:16:29

EDGE 850 – Channel 190 (836.6 MHz)– Occupied Bandwidth



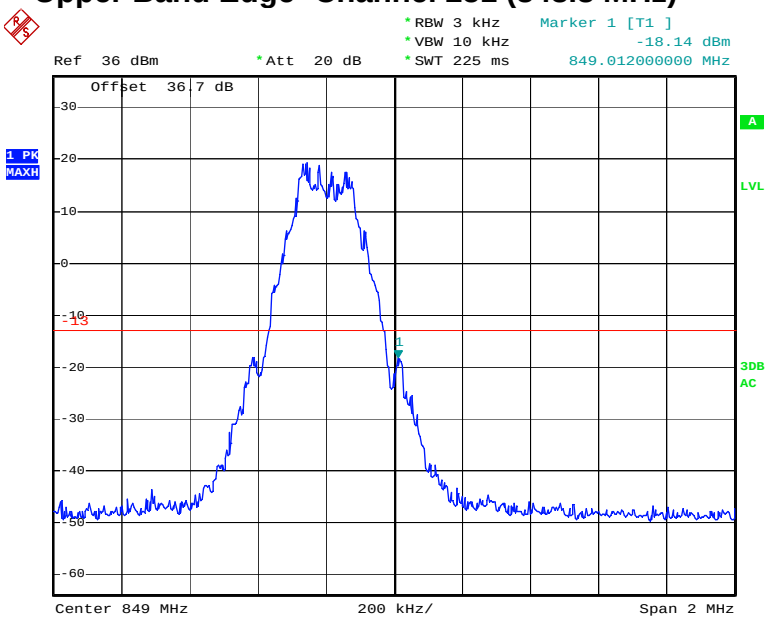
Date: 26.OCT.2010 14:19:00

EDGE 850 – Lower Band Edge – Channel 128 (824.2 MHz)



Date: 26.OCT.2010 14:22:39

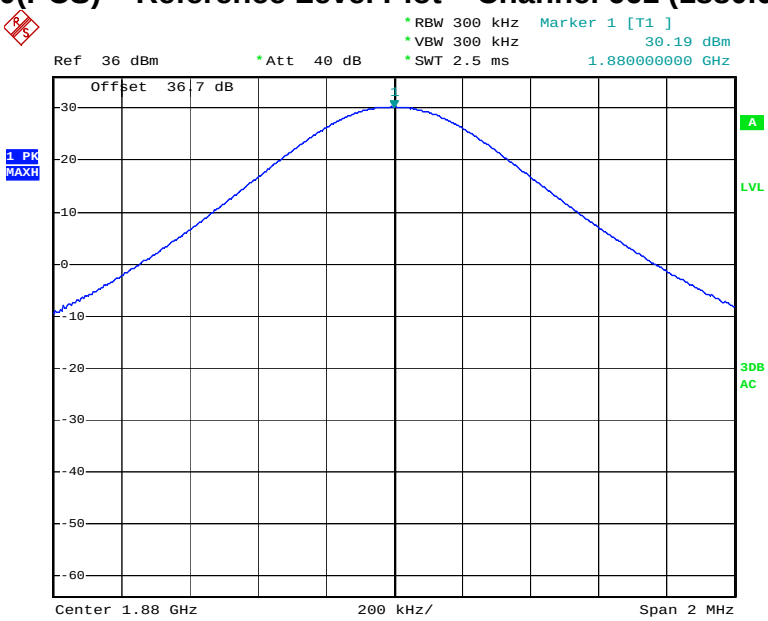
EDGE 850 – Upper Band Edge -Channel 251 (848.8 MHz)



Date: 26.OCT.2010 14:26:40

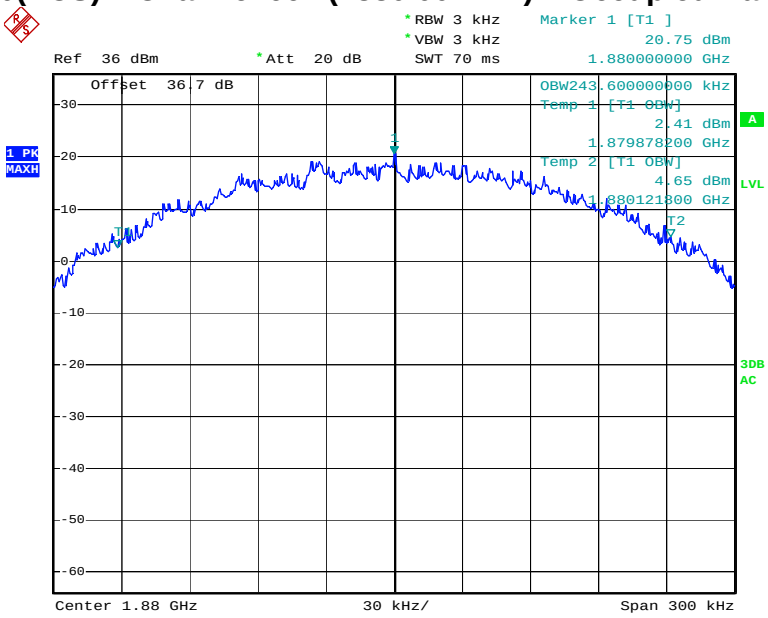
Measurement Results – EDGE 1900

EDGE 1900(PCS) – Reference Level Plot – Channel 661 (1880.00 MHz)



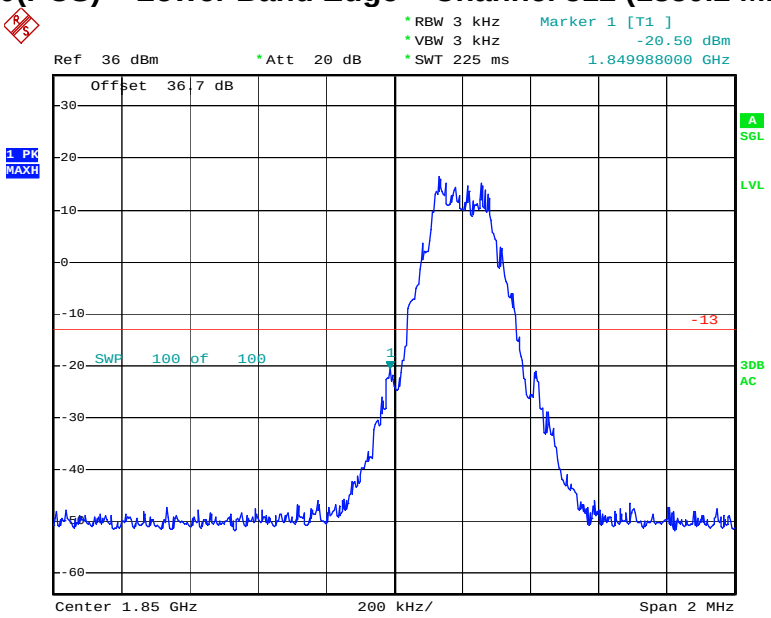
Date: 26.OCT.2010 13:32:34

EDGE 1900(PCS) – Channel 661 (1880.00 MHz) – Occupied Bandwidth



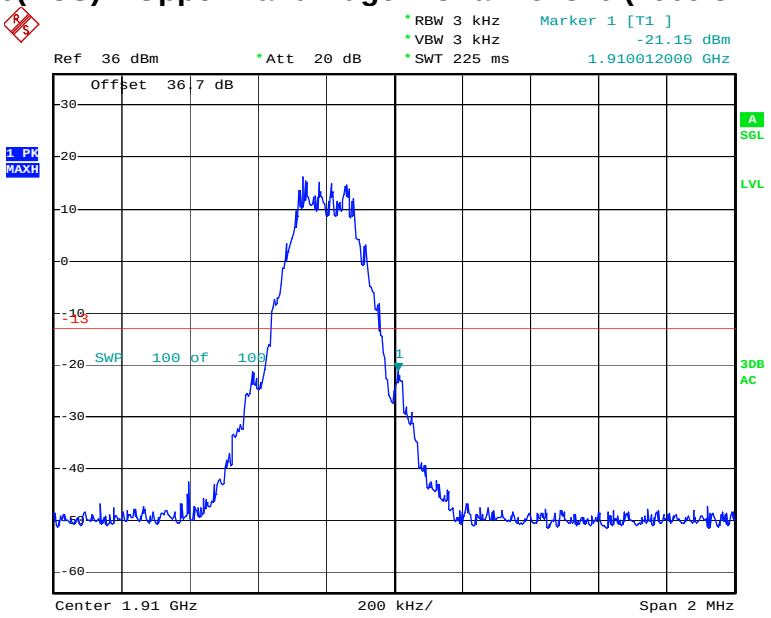
Date: 26.OCT.2010 13:35:53

EDGE 1900(PCS) – Lower Band Edge – Channel 512 (1850.2 MHz)



Date: 26.OCT.2010 13:49:59

EDGE 1900(PCS) – Upper Band Edge – Channel 810 (1909.8 MHz)



Date: 26.OCT.2010 13:54:27

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 6dB passive attenuator. For all testing the EUT was powered through the computer's USB.

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

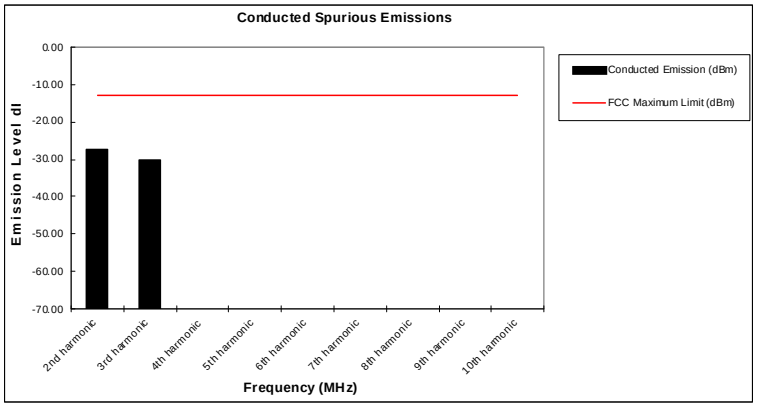
Measurement Results

Attached

Measurement Results – EDGE 850

Conducted Spurious and Harmonic Emissions

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-27.53
3rd harmonic	-13	-30.00
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



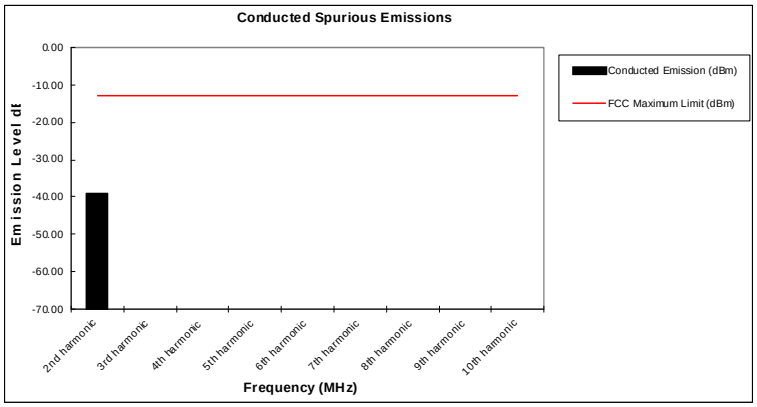
Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated from 9 kHz to the tenth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

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

Measurement Results – EDGE 1900

Conducted Spurious and Harmonic Emissions

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-39.13
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 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:

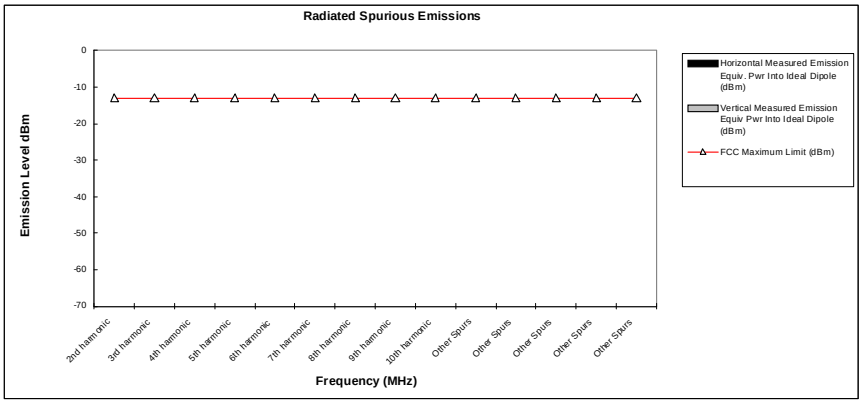
Units	dBm
Divisions	5 dB
Detector	Peak Detector
Resolution Bandwidth	1 MHz
Video Bandwidth (AVG)	Auto
Sweep Time	Auto

Measurement Results
Attached

Measurement Results – EDGE 850

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	*	*
3rd harmonic	-13	*	*
4th harmonic	-13	*	*
5th harmonic	-13	*	*
6th harmonic	-13	*	*
7th harmonic	-13	*	*
8th harmonic	-13	*	*
9th harmonic	-13	*	*
10th harmonic	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*



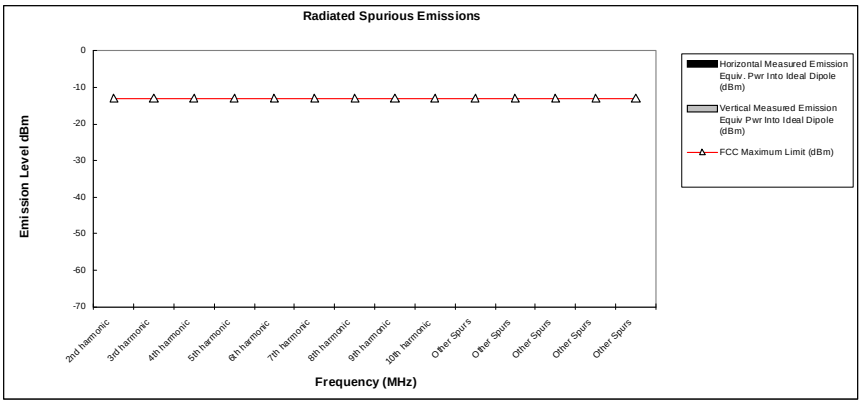
Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are lower than -33 dBm.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum 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 – EDGE 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	*	*
3rd harmonic	-13	*	*
4th harmonic	-13	*	*
5th harmonic	-13	*	*
6th harmonic	-13	*	*
7th harmonic	-13	*	*
8th harmonic	-13	*	*
9th harmonic	-13	*	*
10th harmonic	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*



Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are lower than -33 dBm.
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.

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. A battery eliminator was used for the input supply voltage.

Measurement Results

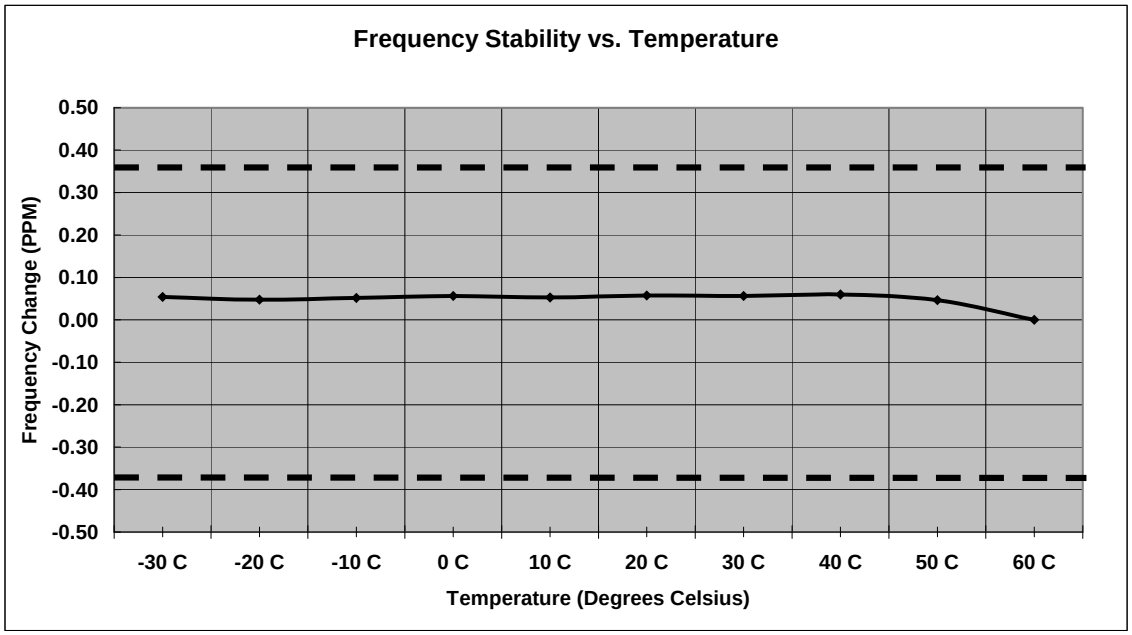
Attached

Measurement Results – EDGE 850

Frequency Stability

Mode: EDGE 850 **Operating Frequency:** 836.6 MHz
Channel: 190 **Deviation Limit (PPM):** 0.359 ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
C		(PPM)	(%)	(VDC)
-30 C	**45.00**	**0.054**	100%	3.80
-20 C	**40.00**	**0.048**	100%	3.80
-10 C	**43.00**	**0.051**	100%	3.80
0 C	**47.00**	**0.056**	100%	3.80
10 C	**44.00**	**0.053**	100%	3.80
20 C	**48.00**	**0.057**	100%	3.80
30 C	**47.00**	**0.056**	100%	3.80
40 C	**50.00**	**0.060**	100%	3.80
50 C	**39.00**	**0.047**	100%	3.80
60 C		**0.000**	100%	3.80
20 C	**47.00**	**0.056**	Battery Endpoint	3.40

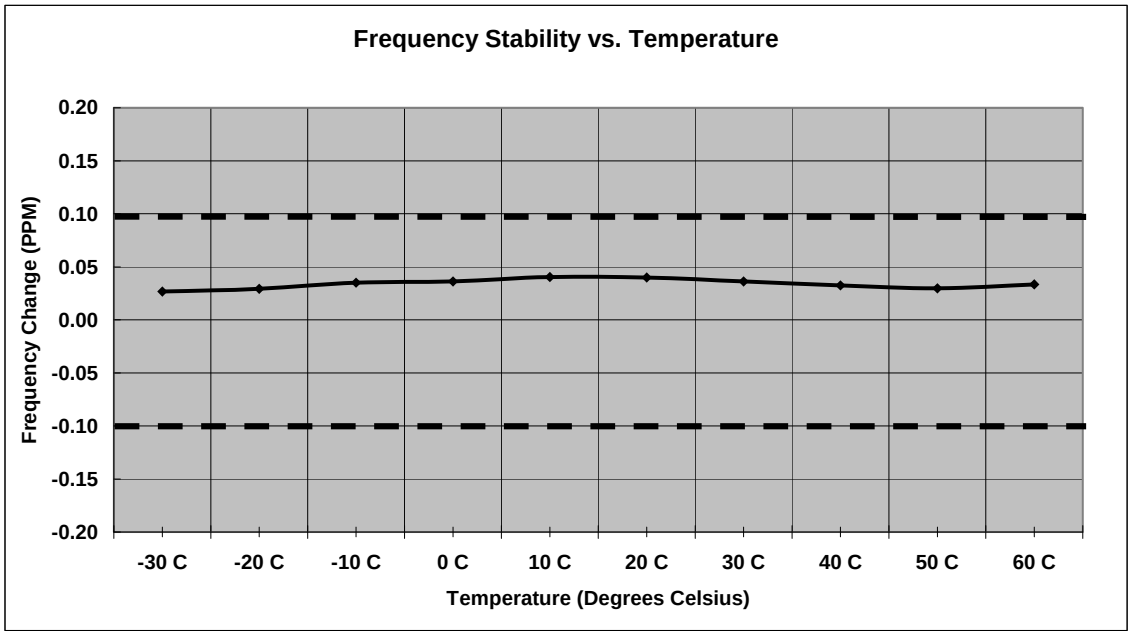


Measurement Results – EDGE 1900

Frequency Stability

Mode: EDGE 1900 **Operating Frequency:** 1880.0 MHz
Channel: 661 **Deviation Limit (PPM):** 0.1 ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
C	HZ	(PPM)	(%)	(VDC)
-30 C	**50.00**	**0.027**	100%	3.80
-20 C	**55.00**	**0.029**	100%	3.80
-10 C	**66.00**	**0.035**	100%	3.80
0 C	**68.00**	**0.036**	100%	3.80
10 C	**76.00**	**0.040**	100%	3.80
20 C	**75.00**	**0.040**	100%	3.80
30 C	**68.00**	**0.036**	100%	3.80
40 C	**61.00**	**0.032**	100%	3.80
50 C	**56.00**	**0.030**	100%	3.80
60 C	**63.00**	**0.034**	100%	3.80
20 C	**63.00**	**0.034**	Battery Endpoint	h



End of Test Report