



## PRODUCT SAFETY AND COMPLIANCE EMC LABORATORY

### EMC TEST REPORT - Addendum

**Test Report Number** –24602-1

**Report Date** – 2011-8-1

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: Lei Yang

Title: EMC Project Manager

Test: 2011-07-15 to 2011-08-01

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: 2011-08-01

This report must not be reproduced, except in full, without written approval from this laboratory.

FCC Registration Number: 177885

IC Registration Number: 109AW-1

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



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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 8499 5891  
 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: WCDMA 850/1900, HSDPA, GSM 850/1900, Edge  
 850/1900, Bluetooth, 802.11 b/g/n

IMEI: 356472040014608

FCC ID: IHDP56MA2

Project number: 24602-1

Testing Complete Date: 2011-08-01

### **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 3, 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 SNN5891A 1550mAh 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	11.09.2010
Pre Amplifiers	PA-02-0001:	2007343	(10 kHz – 3 GHz)	07.04.2011
	PA-02-218	2007344	3 GHz – 18 GHz	07.04.2011
	PA-02-5	2007345	18 GHz – 40 GHz	07.04.2011
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	03.07.2011
LISN	ENV216	100055	9 kHz – 30 MHz	12.20.2010
Environment Chamber	Votsch VT4004	3546270300000 20	-50 <sup>0</sup> C -150 <sup>0</sup> C	12.30.2010
DC Power Supply	Agilent E3632A	My40021519	15V/7A	10.16.2010
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	130361	30 MHz – 3 GHz	03.11.2011
Double ridged Horn	TDK HRN0118	130303	1 GHz – 18 GHz	01.21.2011
Double ridged Horn	ETS HRN3116	00071938	18 GHz – 40 GHz	10.17.2008

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 antennas are on 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**

**GSM 850**

Frequency (MHz)	Power (dBm)
824.2	33.09
836.6	33.13
848.8	32.64

**GSM 1900**

Frequency (MHz)	Power (dBm)
1850.2	29.60
1880	29.51
1909.8	29.71

**EDGE 850**

Frequency (MHz)	Power (dBm)
824.2	26.55
836.6	27.05
848.8	26.53

**EDGE 1900**

Frequency (MHz)	Power (dBm)
1850.2	26.20
1880	25.81
1909.8	26.11

Band	Channel	Conducted power (dBm) for WCDMA modes		Conducted Power (dBm) for WCDMA – HSDPA (Rel 5) Modes			
		RMC	AMR	Subtest 1	Subtest 2	Subtest 3	Subtest 4
WCDMA 850	4132	23.94	23.79	24.27	24.24	24.12	23.97
	4180	24.18	24.10	23.87	23.86	23.69	23.65
	4233	23.97	23.91	23.96	23.97	23.80	23.74
WCDMA 1900	9262	24.20	24.13	24.16	24.00	23.93	23.98
	9400	23.78	23.79	24.11	24.07	24.07	24.01
	9538	23.97	24.04	24.20	24.15	24.11	24.07

All WCDMA testing was done in RMC mode.

## **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 GSM 850/1900, EDGE 850/1900, WCDMA 850/1900.

### **Measurement Results**

<b>Band</b>	<b>EIRP dBm</b>	<b>ERP dBm</b>
GSM850	30.21	<b>28.11</b>
GSM1900	<b>31.44</b>	29.34
Edge850	24.59	<b>22.49</b>
Edge1900	<b>27.59</b>	25.49
WCDMA850	21.73	<b>19.63</b>
WCDMA1900	<b>25.03</b>	22.93

## **OCCUPIED BANDWIDTH**

CFR Part 2.1049, 22.917, 24.238

### **Measurement Procedure**

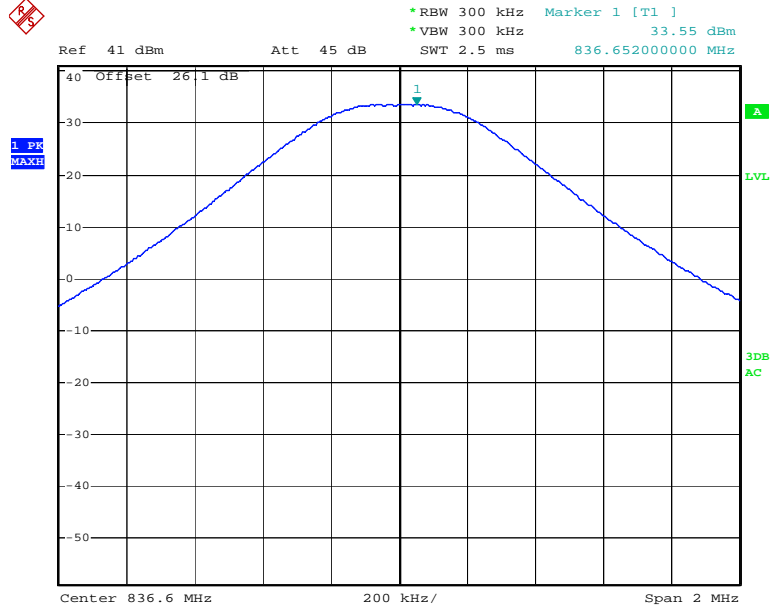
The RF output port of the equipment under test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 20dB passive attenuator. The amplitude of the spectrum analyzer is corrected for the attenuator and any other applicable losses. The analyzer is set for Peak Detector and each trace is set for Max Hold. A fully charged battery was used for the supply voltage.

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

### Measurement Results

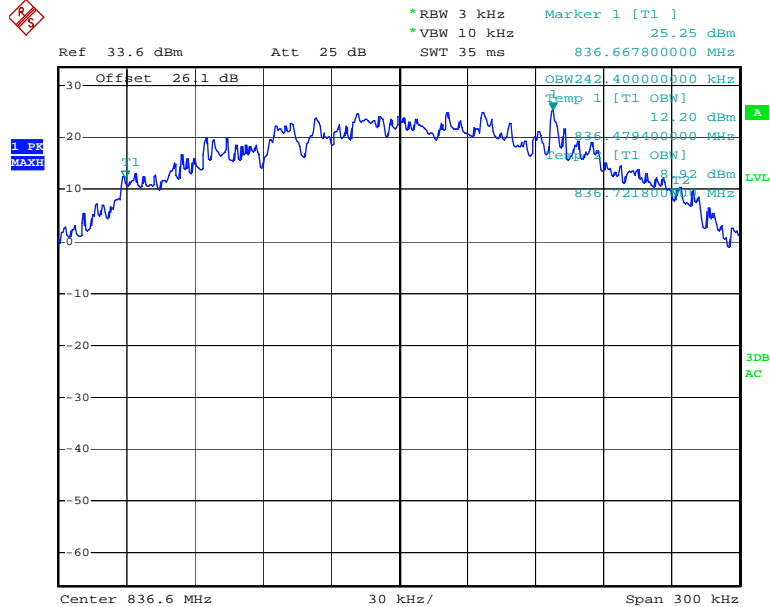
### Measurement Results – GSM 850

#### GSM 850 – Reference Level Plot – Channel 190 (836.6 MHz)



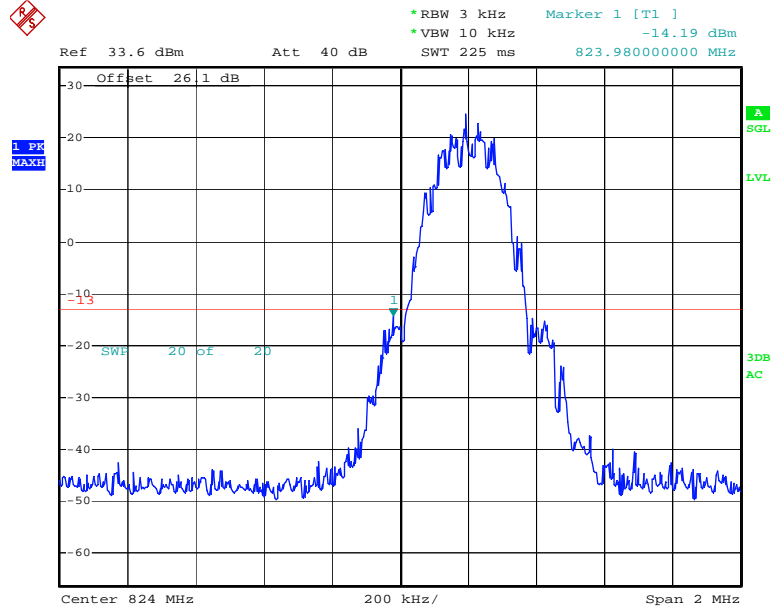
Date: 25.JUL.2011 20:34:54

#### GSM 850 – Channel 190 (836.6 MHz)– Occupied Bandwidth



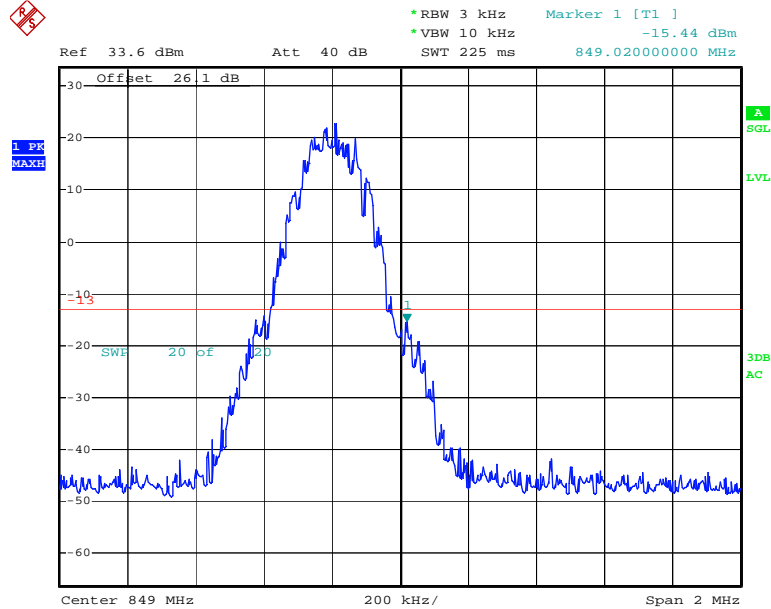
Date: 25.JUL.2011 20:35:48

### GSM 850 – Lower Band Edge – Channel 128 (824.2 MHz)



Date: 25.JUL.2011 20:40:16

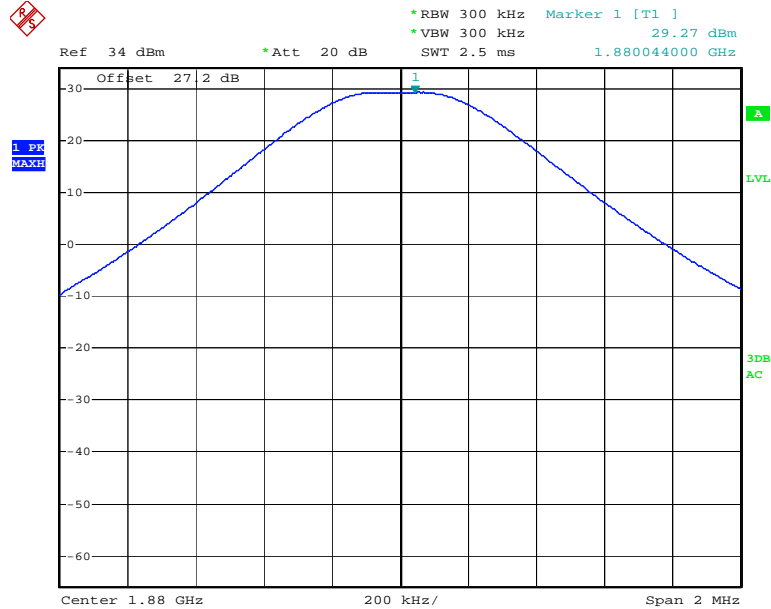
### GSM 850 – Upper Band Edge – Channel 251 (848.8 MHz)



Date: 25.JUL.2011 20:40:58

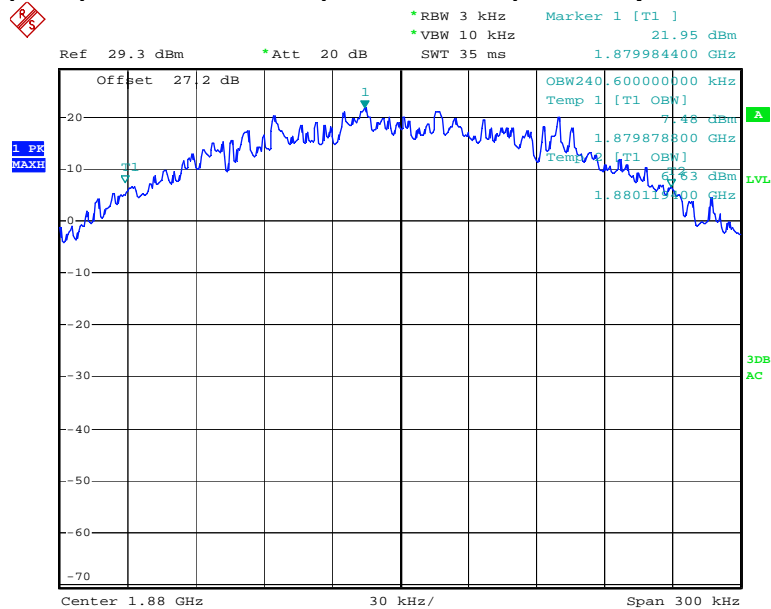
### Measurement Results – PCS 1900

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



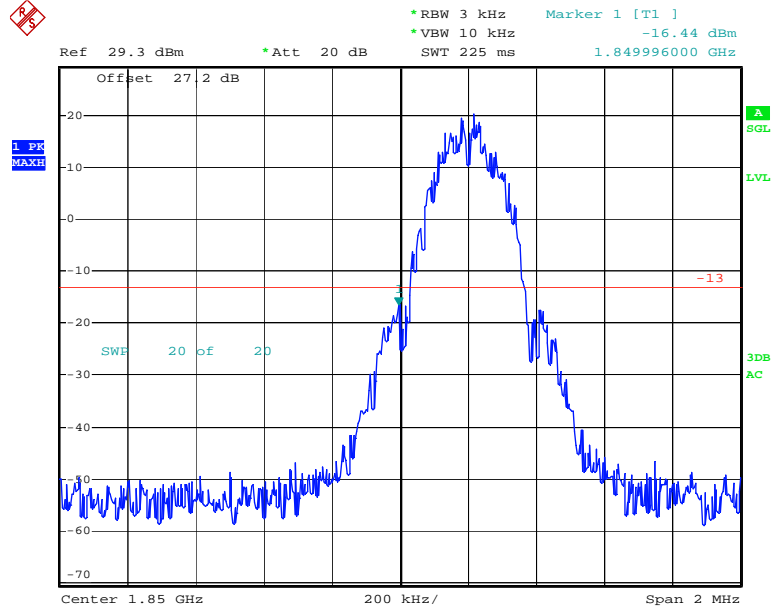
Date: 25.JUL.2011 21:06:42

#### GSM 1900(PCS) – Channel 661 (1880.00 MHz) – Occupied Bandwidth



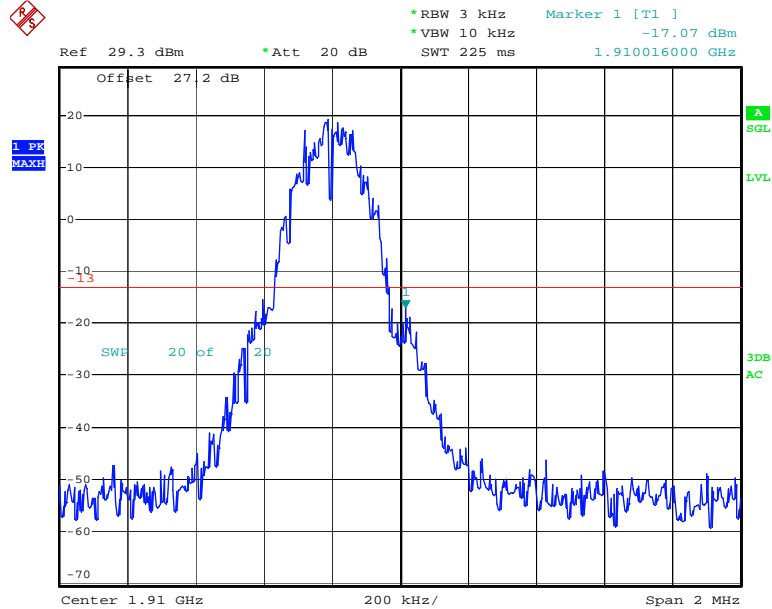
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### GSM 1900(PCS) – Lower Band Edge – Channel 512 (1850.2 MHz)



Date: 25.JUL.2011 21:09:24

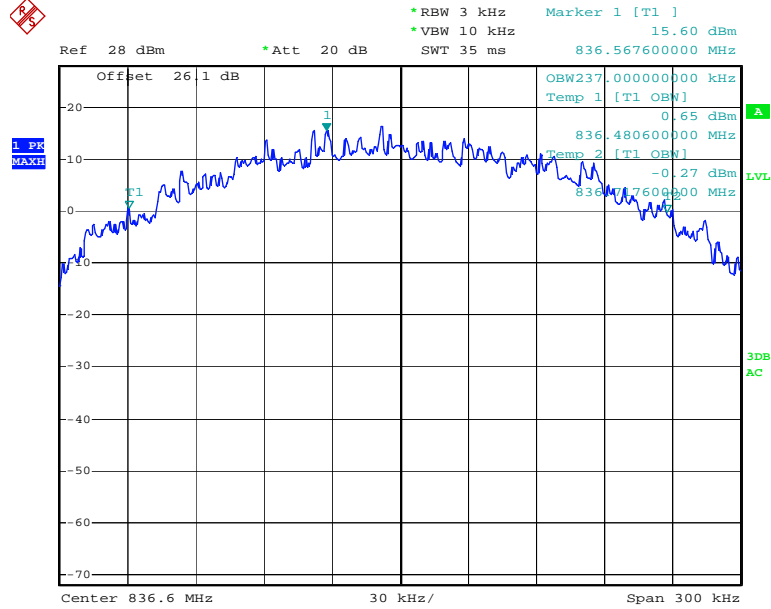
### GSM 1900(PCS) – Upper Band Edge – Channel 810 (1909.8 MHz)



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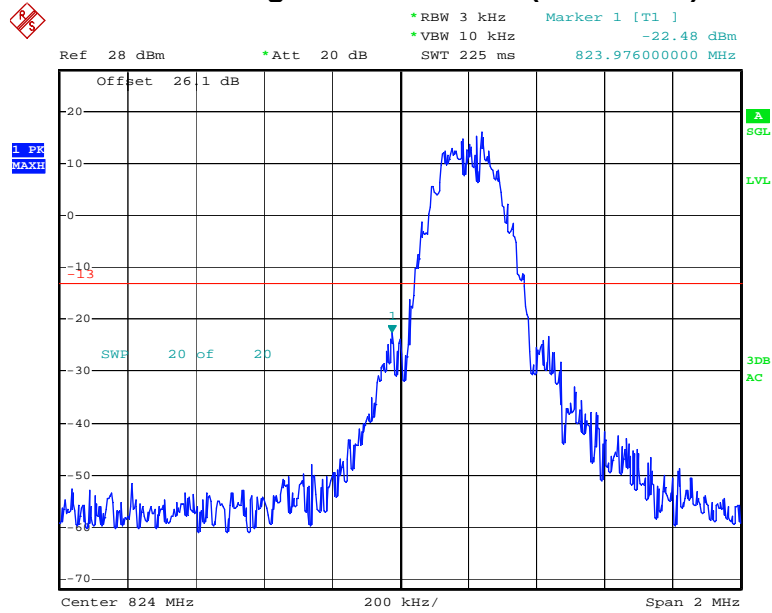
### Measurement Results – EDGE 850

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



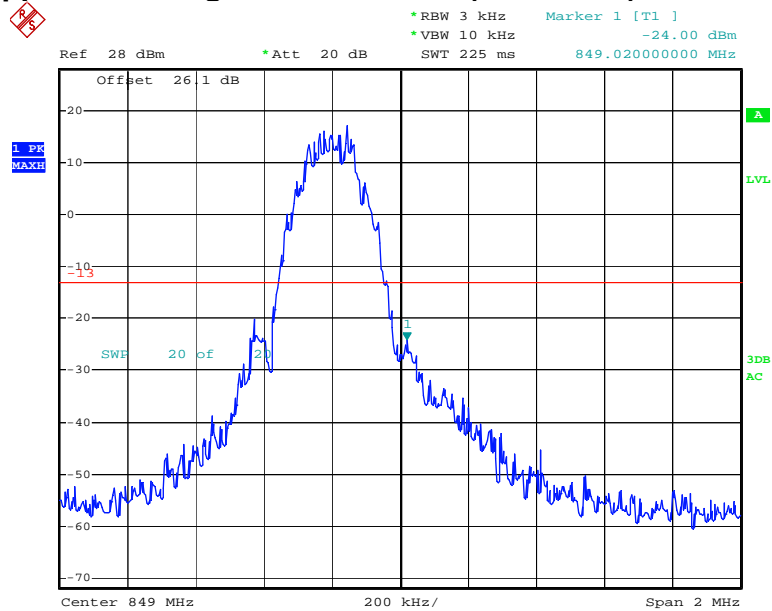
Date: 26.JUL.2011 09:28:38

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



Date: 26.JUL.2011 09:36:11

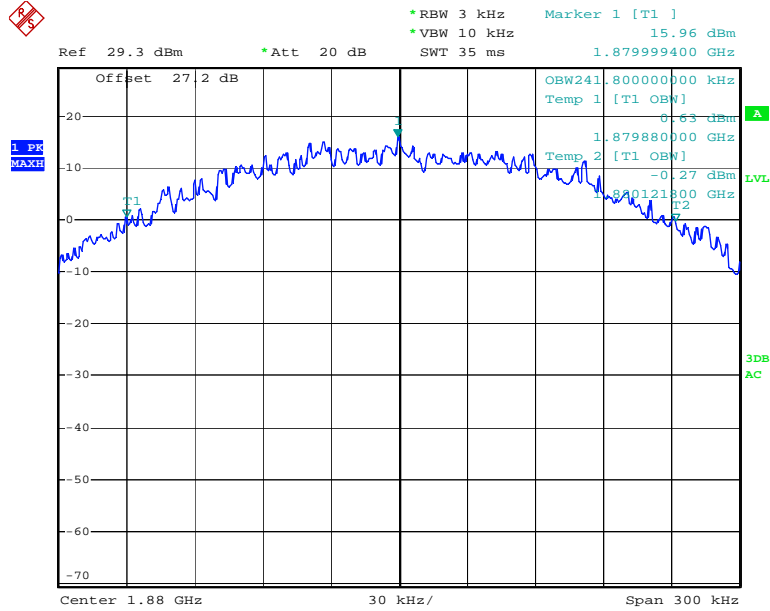
### EDGE – Upper Band Edge – Channel 251 (848.8 MHz)



Date: 26.JUL.2011 09:37:05

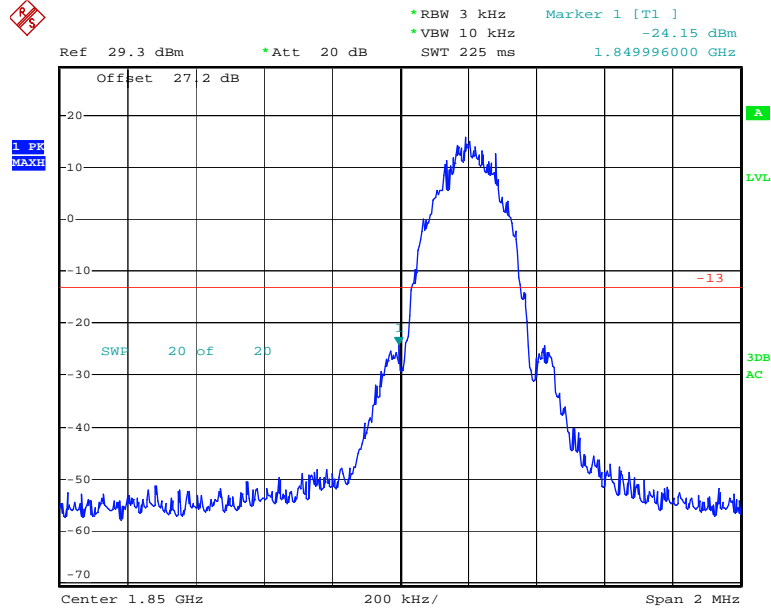
### Measurement Results – EDGE 1900

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



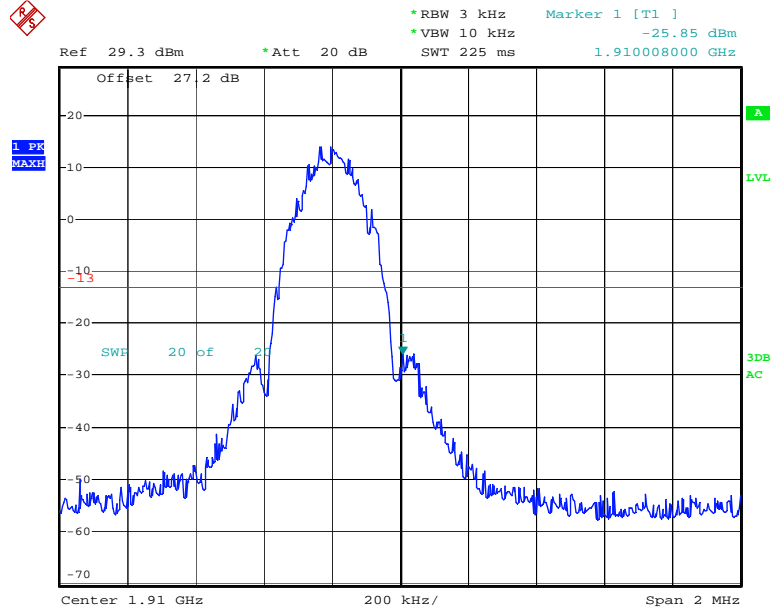
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**EDGE 1900(PCS) – Lower Band Edge – Channel 512 (1850.2 MHz)**



Date: 26.JUL.2011 09:18:17

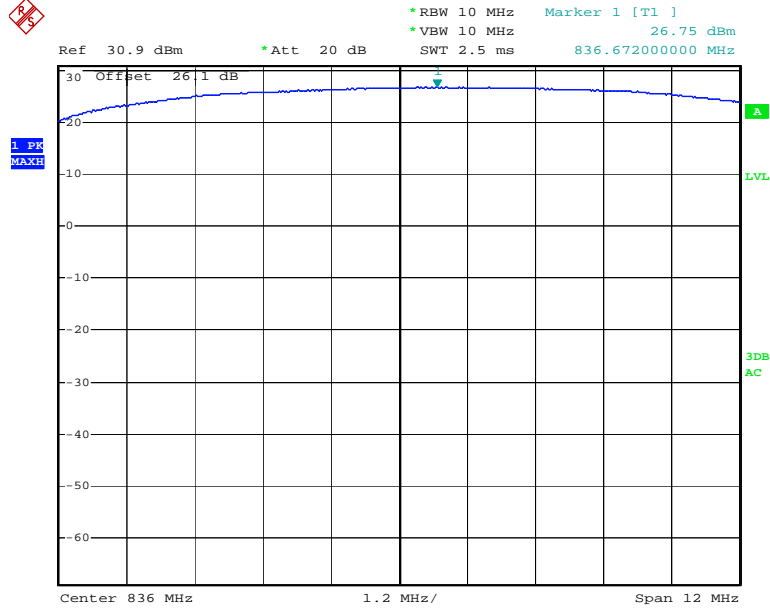
**EDGE 1900(PCS) – Upper Band Edge – Channel 810 (1909.8 MHz)**



Date: 26.JUL.2011 09:19:05

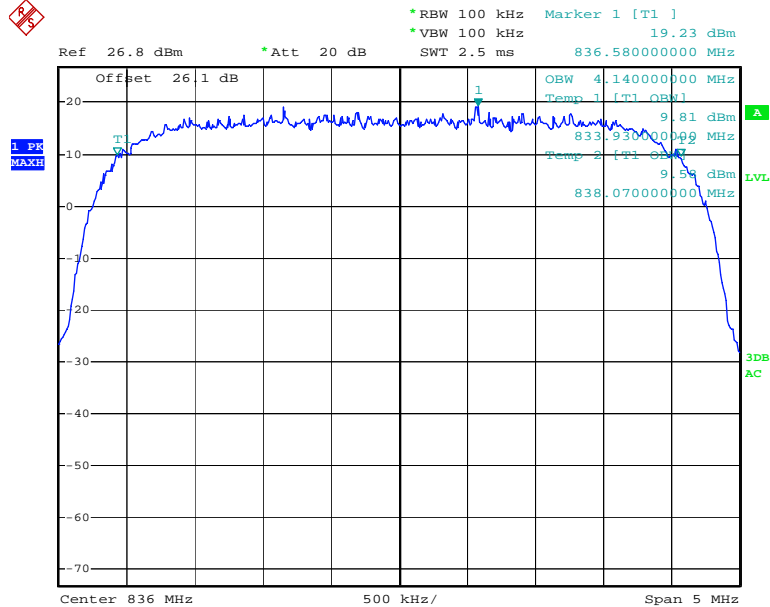
### Measurement Results – WCDMA 850

#### WCDMA 850 – Reference Level Plot – Channel 4180 (836.0 MHz)



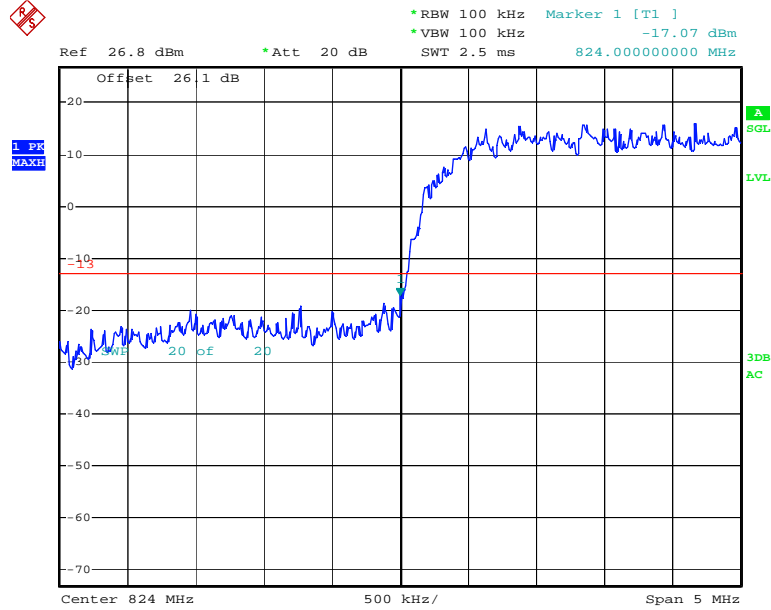
Date: 26.JUL.2011 10:42:32

#### WCDMA 850 – Channel 4180 (836.0 MHz) – Occupied Bandwidth



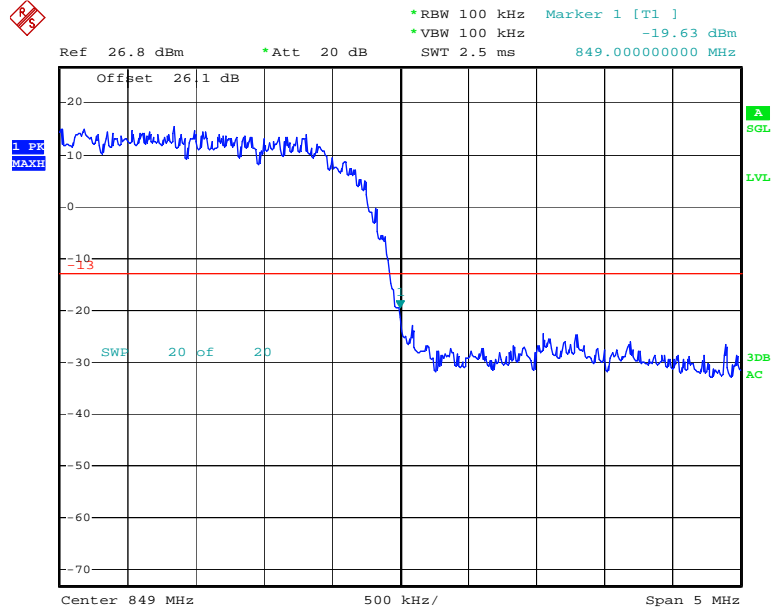
Date: 26.JUL.2011 10:43:42

### WCDMA 850 – Lower Band Edge – Channel 4132 (826.4 MHz)



Date: 26.JUL.2011 10:44:40

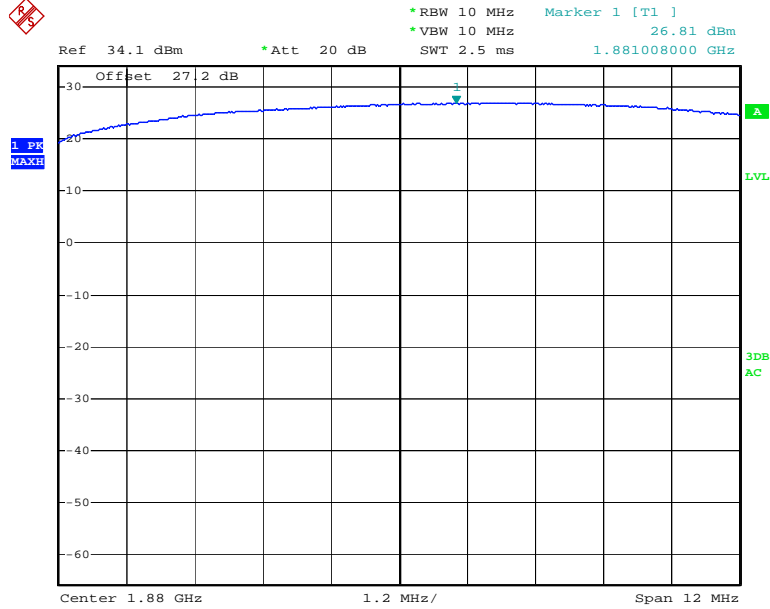
### WCDMA 850 – Upper Band Edge – Channel 4233 (848.6 MHz)



Date: 26.JUL.2011 10:45:27

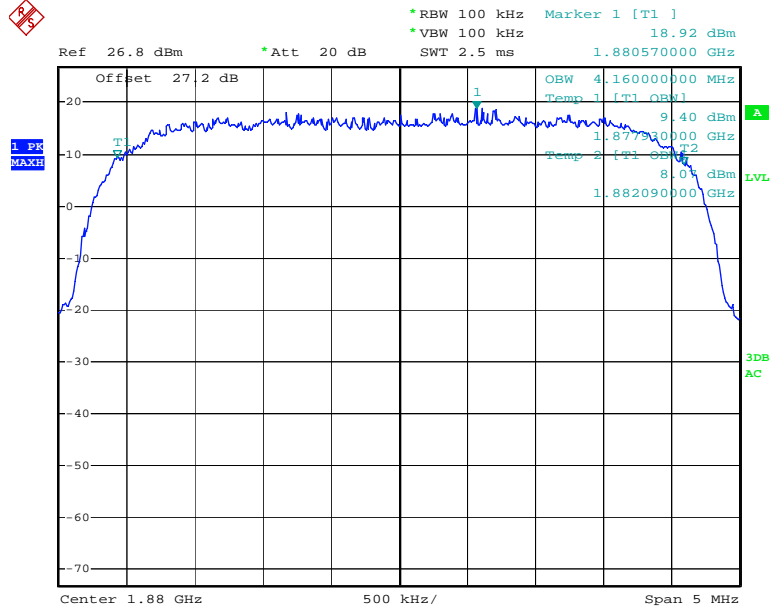
### Measurement Results – WCDMA 1900

#### WCDMA 1900 – Reference Level Plot – Channel 9400 (1880.00 MHz)



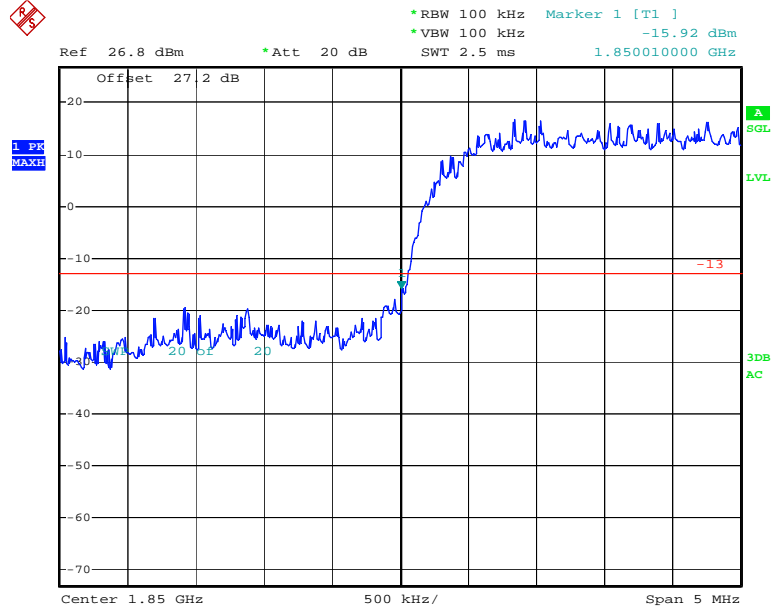
Date: 26.JUL.2011 10:12:27

#### WCDMA 1900 – Channel 9400 (1880.00 MHz) – Occupied Bandwidth



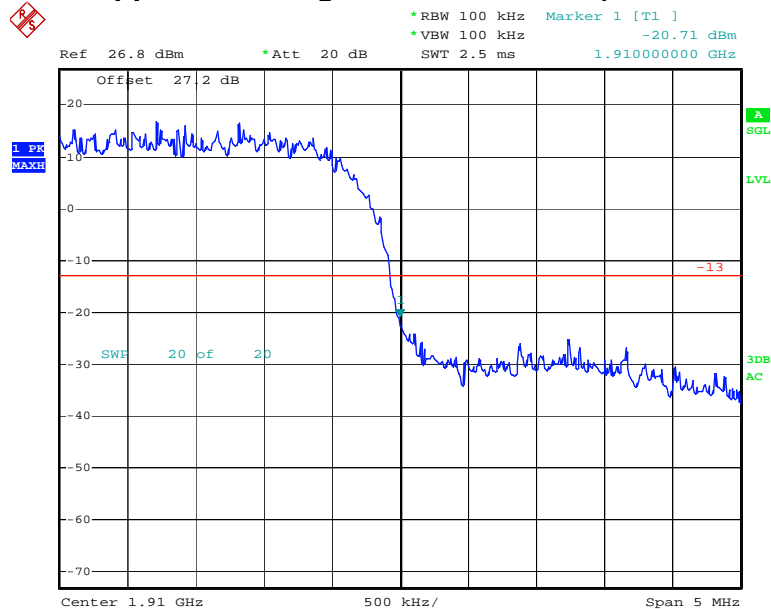
Date: 26.JUL.2011 10:14:20

### WCDMA 1900 – Lower Band Edge – Channel 9262 (1852.4 MHz)



Date: 26.JUL.2011 10:39:32

### WCDMA 1900 – Upper Band Edge – Channel 9538 (1907.6 MHz)



Date: 26.JUL.2011 10:40:13

**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 20dB 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

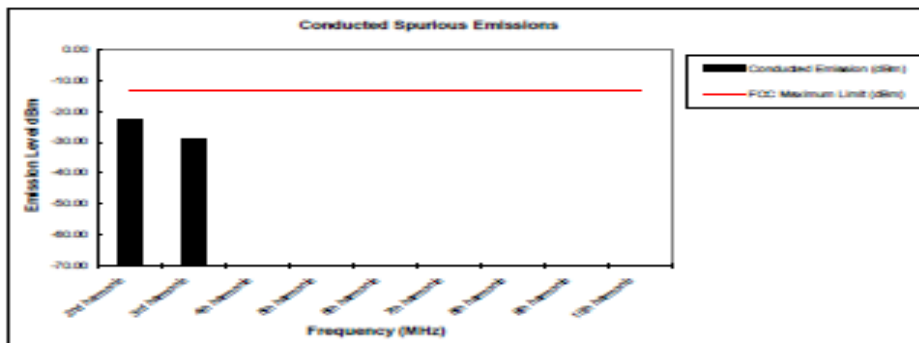
**Measurement Results**

Attached

**Measurement Results – GSM 850**

**Conducted Spurious and Harmonic Emissions**

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-22.97
3rd harmonic	-13	-29.05
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



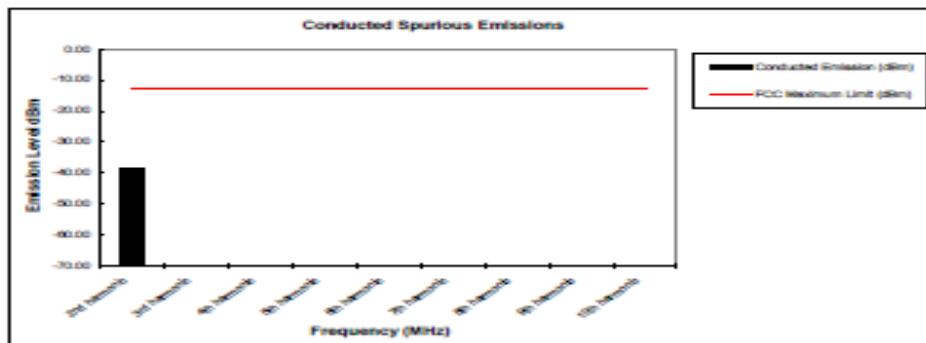
- Notes:
- \* Indicates the spurious emission could not be detected due to noise limitations or ambients
  - Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
  - The Spectrum was investigated from 9 kHz to the tenth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

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

**Measurement Results – GSM 1900**

**Conducted Spurious and Harmonic Emissions**

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-38.54
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



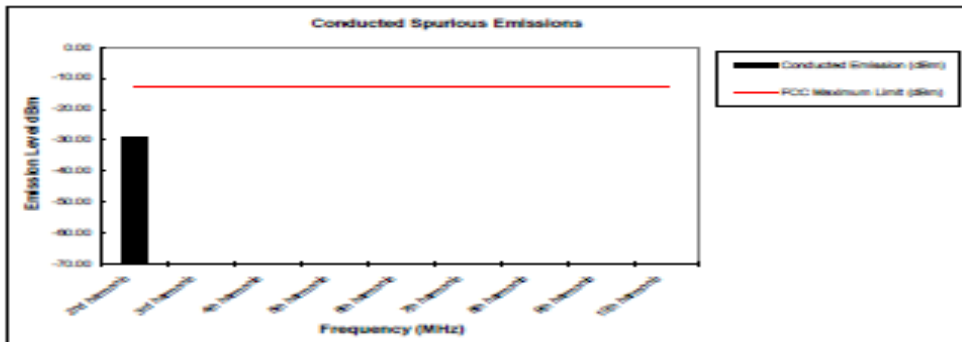
- Notes:
1. \* Indicates the spurious emission could not be detected due to noise limitations or ambients
  2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
  3. The Spectrum was investigated from 9 kHz to the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

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

**Measurement Results – EDGE850**

**Conducted Spurious and Harmonic Emissions**

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-29.12
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



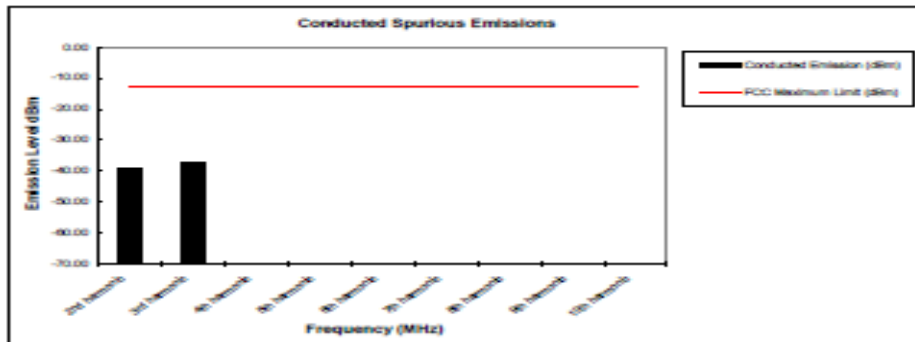
- Notes:
1. \* Indicates the spurious emission could not be detected due to noise limitations or ambients
  2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
  3. The Spectrum was investigated from 9 kHz to the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

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

**Measurement Results – EDGE 1900**

**Conducted Spurious and Harmonic Emissions**

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-38.89
3rd harmonic	-13	-38.99
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



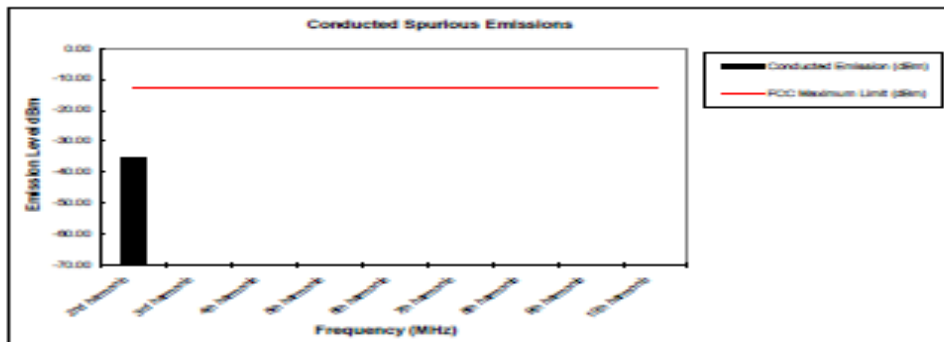
- Notes:
1. \* Indicates the spurious emission could not be detected due to noise limitations or ambients
  2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
  3. The Spectrum was investigated from 9 kHz to the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

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

**Measurement Results – WCDMA 850**

**Conducted Spurious and Harmonic Emissions**

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-35.18
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



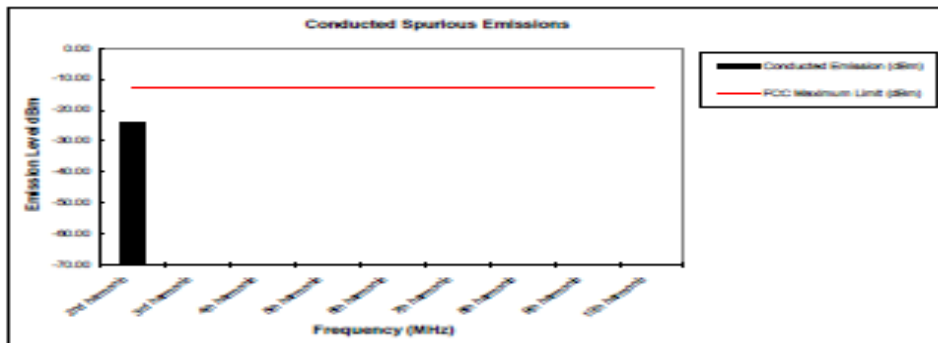
- Notes:
1. \* Indicates the spurious emission could not be detected due to noise limitations or ambients
  2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
  3. The Spectrum was investigated from 9 kHz to the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

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

**Measurement Results – WCDMA 1900**

**Conducted Spurious and Harmonic Emissions**

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-23.82
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:

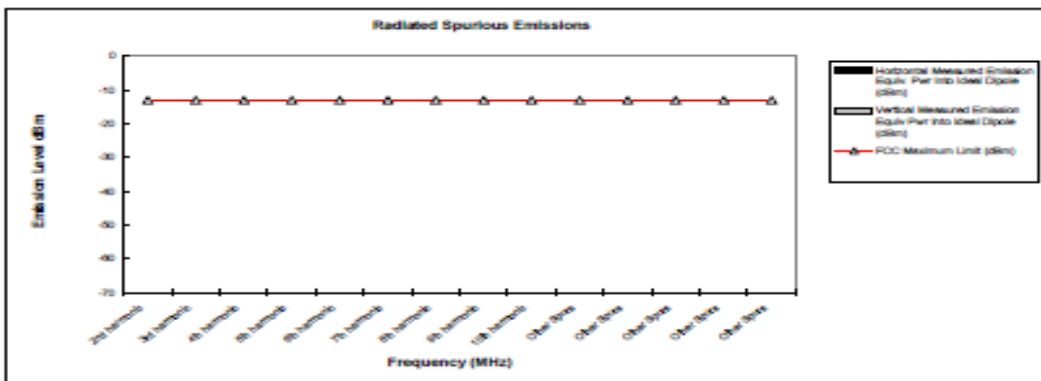
Units	dBm
Divisions	5 dB
Detector	Peak Detector
Resolution Bandwidth	1 MHz
Video Bandwidth (AVG)	Auto
Sweep Time	Auto

Measurement Results  
Attached

**Measurement Results – GSM 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	*	*



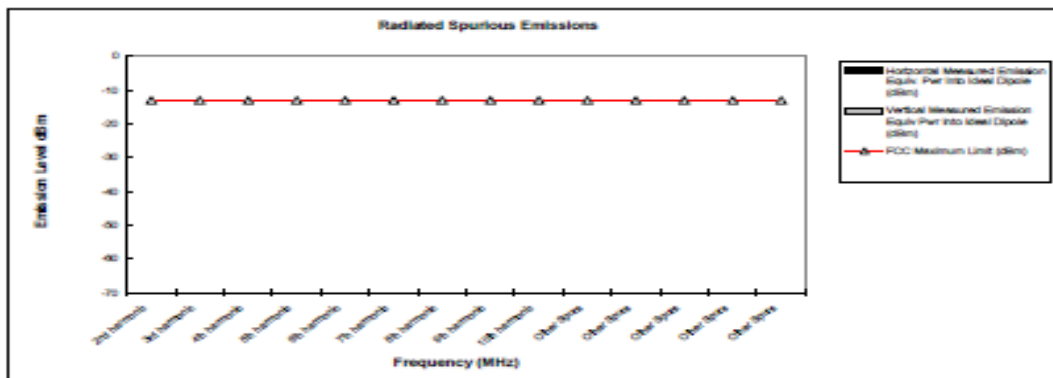
- Notes:
1. \* Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are low.
  2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
  3. The Spectrum was investigated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

Emissions below -33dBm are not shown.  
 The margin with respect to the limit is the minimum margin for all modes and bands.

**Measurement Results – GSM 1900**

**Radiated Spurious and Harmonic Emissions**

Frequency (MHz)	FCC Medium 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	*	*



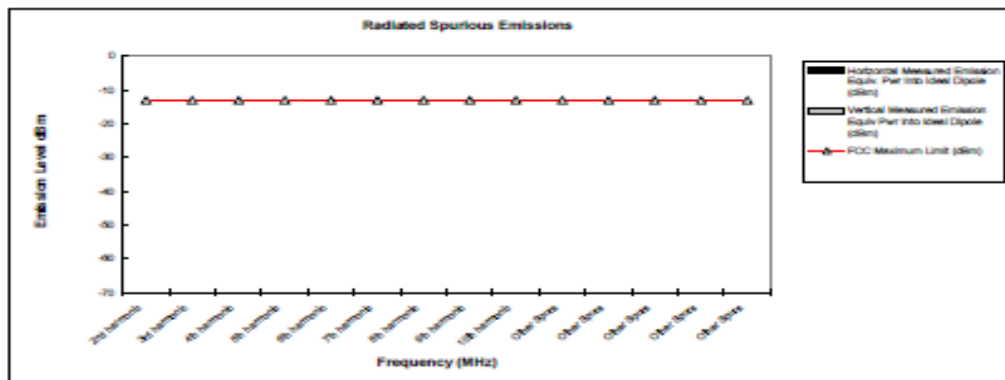
- Notes:
1. \* Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are low.
  2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
  3. The Spectrum was investigated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

Emissions below -33dBm are not shown.  
 The margin with respect to the limit is the minimum margin for all modes and bands.

**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	*	*



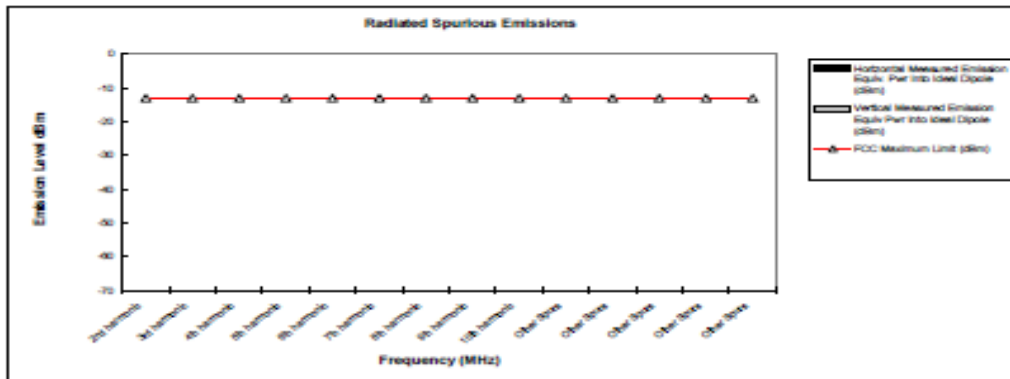
- Notes:
- \* Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are low
  - Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
  - The Spectrum was investigated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

Emissions below -33dBm are not shown.  
 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	*	*



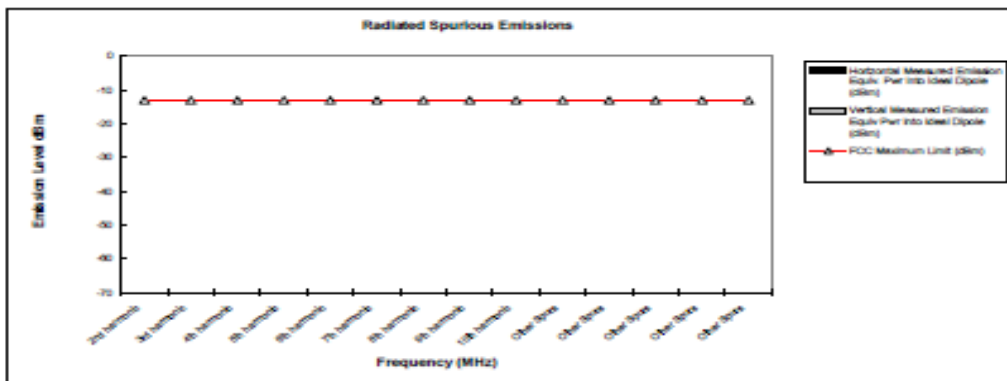
- Notes:
1. \* Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are low.
  2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
  3. The Spectrum was investigated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

Emissions below -33dBm are not shown.  
 The margin with respect to the limit is the minimum margin for all modes and bands.

**Measurement Results – WCDMA 850**

**Radiated Spurious and Harmonic Emissions**

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Per Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Per 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	*	*



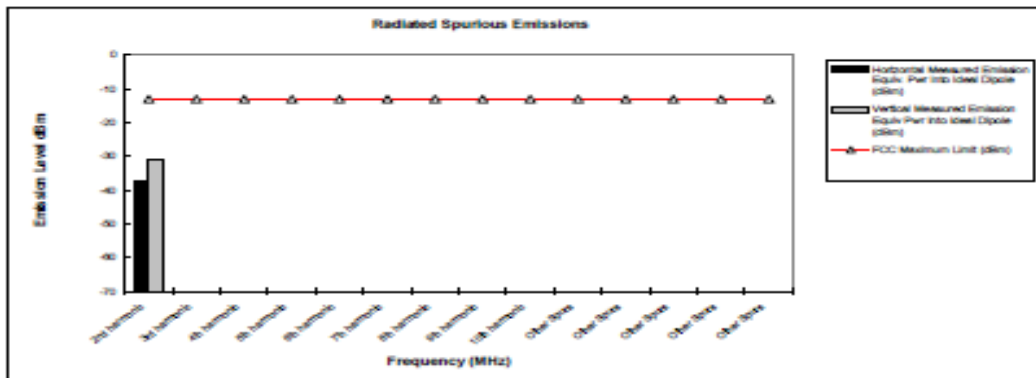
- Notes:
1. \* Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are low
  2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
  3. The Spectrum was investigated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

Emissions below -33dBm are not shown.  
 The margin with respect to the limit is the minimum margin for all modes and bands.

**Measurement Results – WCDMA 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	-37.4	-30.9
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	*	*



Notes:

- \* Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are low
- 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.

Emissions below -33dBm are not shown.

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  $-30^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  and at intervals of  $10^{\circ}\text{C}$  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.

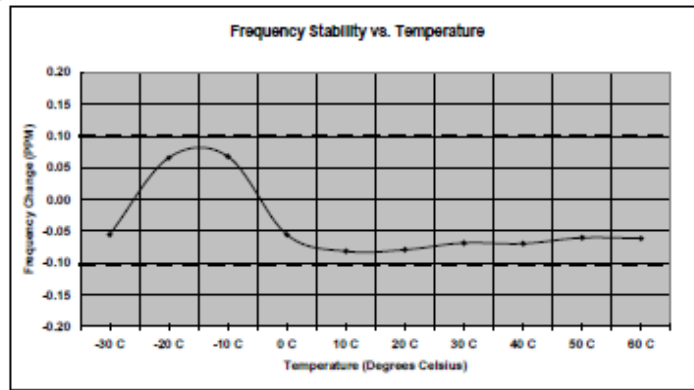
At room temperature, the primary supply voltage is reduced to the battery operating endpoint of the equipment under test. The maximum variation of frequency is measured. A battery eliminator was used for the input supply voltage.

**Measurement Results**

Attached

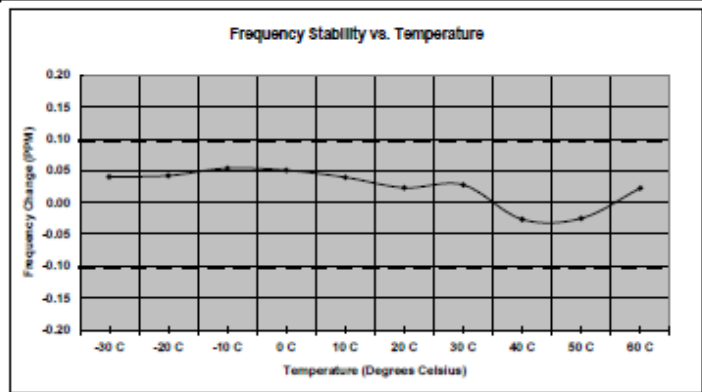
**Measurement Results – GSM 850**

<b>Frequency Stability</b>				
Mode: GSM 850		Operating Frequency: 836.6 MHz		
Channel: 190		Deviation Limit (PPM): 0.1 ppm		
Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	-48.00	-0.055	100%	3.80
-20 C	55.00	0.066	100%	3.80
-10 C	57.00	0.068	100%	3.80
0 C	-48.00	-0.055	100%	3.80
10 C	-48.00	-0.061	100%	3.80
20 C	-48.00	-0.079	100%	3.80
30 C	-57.00	-0.068	100%	3.80
40 C	-58.00	-0.069	100%	3.80
50 C	-50.00	-0.060	100%	3.80
60 C	-51.00	-0.061	100%	3.80
20 C	-18.00	-0.019	Battery Endpoint	3.20



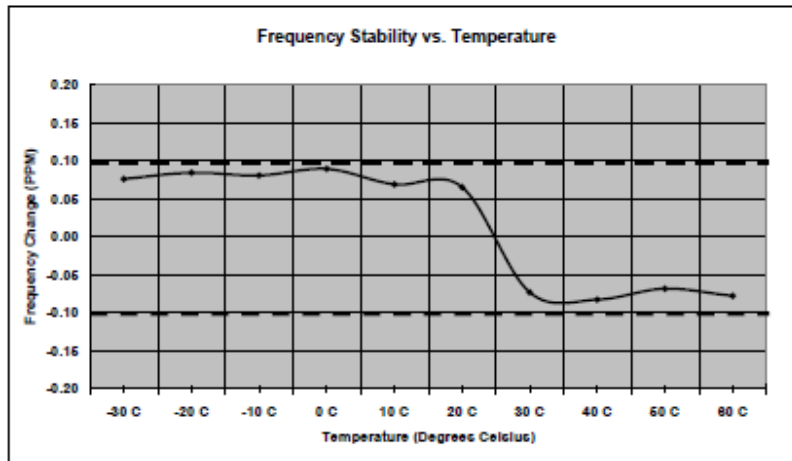
**Measurement Results – GSM 1900**

Frequency Stability				
Mode:	GSM 1900	Operating Frequency:	1880.0 MHz	
Channel:	661	Deviation Limit (PPM):	0.1ppm	
Temperature	Frequency Error	Frequency Error	Voltage	Voltage
C	HZ	(PPM)	(%)	(VDC)
-30 C	76.00	0.040	100%	3.80
-20 C	79.00	0.042	100%	3.80
-10 C	101.00	0.054	100%	3.80
0 C	95.00	0.051	100%	3.80
10 C	74.00	0.039	100%	3.80
20 C	43.00	0.023	100%	3.80
30 C	52.00	0.028	100%	3.80
40 C	-59.00	-0.027	100%	3.80
50 C	-47.00	-0.025	100%	3.80
60 C	42.00	0.022	100%	3.80
20 C	64.00	0.034	Battery Endpoint	3.20



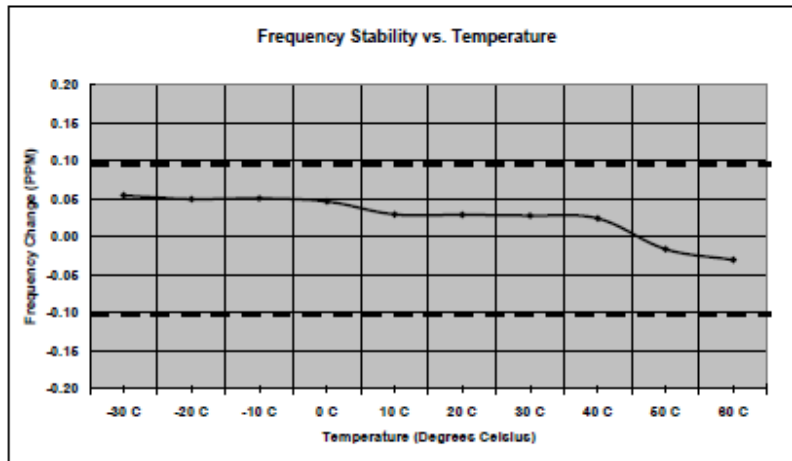
**Measurement Results – EDGE 850**

<b>Frequency Stability</b>				
Mode: EDGE 850		Operating Frequency: 836.6 MHz		
Channel: 190		Deviation Limit (PPM): 0.1 ppm		
Temperature	Frequency Error	Frequency Error	Voltage	Voltage
C	HZ	(PPM)	(%)	(VDC)
-30 C	84.00	0.077	100%	3.80
-20 C	71.00	0.066	100%	3.80
-10 C	88.00	0.081	100%	3.80
0 C	76.00	0.080	100%	3.80
10 C	68.00	0.068	100%	3.80
20 C	66.00	0.068	100%	3.80
30 C	-81.00	-0.073	100%	3.80
40 C	-89.00	-0.082	100%	3.80
50 C	-67.00	-0.068	100%	3.80
60 C	-86.00	-0.078	100%	3.80
20 C	38.00	0.046	Battery Endpoint	3.20



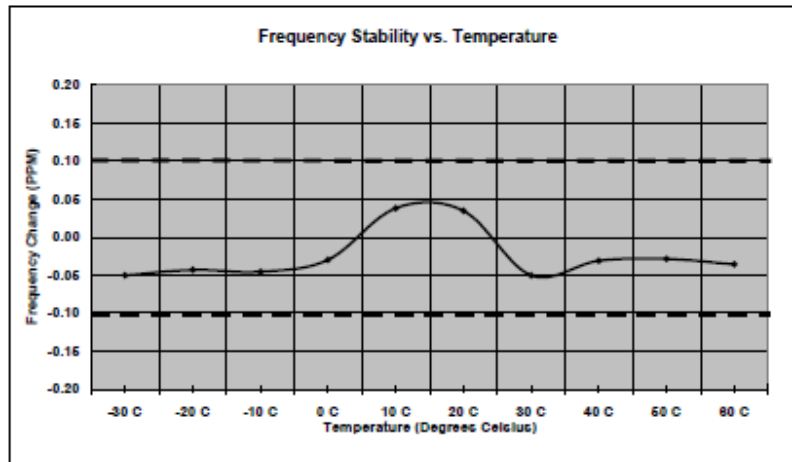
**Measurement Results – EDGE 1900**

<b>Frequency Stability</b>				
Mode: EDGE 1900		Operating Frequency: 1880.0 MHz		
Channel: 661		Deviation Limit (PPM): 0.1 ppm		
Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	103.00	0.066	100%	3.80
-20 C	84.00	0.060	100%	3.80
-10 C	88.00	0.061	100%	3.80
0 C	88.00	0.047	100%	3.80
10 C	68.00	0.030	100%	3.80
20 C	56.00	0.028	100%	3.80
30 C	63.00	0.028	100%	3.80
40 C	48.00	0.024	100%	3.80
50 C	-30.00	-0.018	100%	3.80
60 C	-67.00	-0.030	100%	3.80
20 C	-24.00	-0.013	Battery Endpoint	3.20



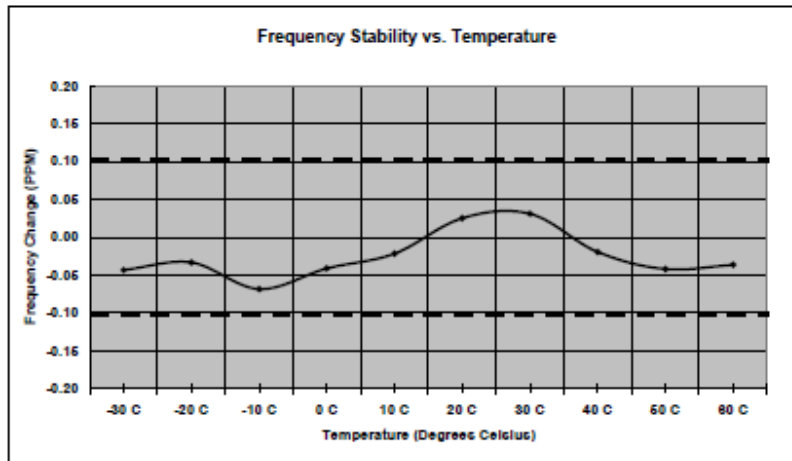
**Measurement Results – WCDMA 850**

<b>Frequency Stability</b>				
Mode: WCDMA 850		Operating Frequency: 835.00 MHz		
Channel: 4180		Deviation Limit (PPM): 0.1 ppm		
Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	-42.00	-0.060	100%	3.80
-20 C	-38.00	-0.048	100%	3.80
-10 C	-38.00	-0.048	100%	3.80
0 C	-26.00	-0.030	100%	3.80
10 C	32.00	0.038	100%	3.80
20 C	28.00	0.036	100%	3.80
30 C	-42.00	-0.060	100%	3.80
40 C	-28.00	-0.031	100%	3.80
50 C	-24.00	-0.029	100%	3.80
60 C	-30.00	-0.038	100%	3.80
20 C	-14.00	-0.017	Battery Endpoint	3.20



**Measurement Results – WCDMA 1900**

<b>Frequency Stability</b>				
Mode: WCDMA 1900		Operating Frequency: 1880.0 MHz		
Channel: 9400		Deviation Limit (PPM): 0.1ppm		
Temperature	Frequency Error	Frequency Error	Voltage	Voltage
C	HZ	(PPM)	(%)	(VDC)
-30 C	-82.00	-0.044	100%	3.80
-20 C	-83.00	-0.034	100%	3.80
-10 C	-129.00	-0.069	100%	3.80
0 C	-78.00	-0.041	100%	3.80
10 C	-41.00	-0.022	100%	3.920
20 C	47.00	0.025	100%	3.80
30 C	68.00	0.031	100%	3.80
40 C	-37.00	-0.020	100%	3.80
50 C	-78.00	-0.042	100%	3.80
60 C	-88.00	-0.037	100%	3.80
20 C	-28.00	-0.016	Battery Endpoint	3.20



**End of Test Report**