



MOBILE DEVICES BUSINESS

**PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY**

EMC TEST REPORT

Test Report Number – 24934-1

Report Date – June 6, 2012

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: June 6, 2012

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



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Test Report Details

Tests Performed By: ADR Testing Service
 Location Code: ADR LV
 Motorola Mobility Inc
 Product Safety and Compliance Group
 600 North US Hwy 45
 Libertyville, IL 60048
 PH (847) 523-6167 Fax (847) 523-4538
 FCC Registration Number: 316588
 Industry Canada Number: 1090-1

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

Product Type: Cellular Phone

Signaling Capability: GSM 850/1900, WCDMA 850/1700/1900
 HSDPA, HSUPA, EDGE, GPRS, 802.11a/b/g/n,
 LTE Band 4/17, Bluetooth LE + EDR

FCC ID: IHDP56MB4

Serial Numbers: LDNB270024, LDNB270027

Testing Complete Date: March 15, 2012

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
- X Part 27 – Miscellaneous Wireless Communications Services

Applicable Standards: ANSI 63.4 2003, ANSI/TIA-603-C-2004,
 RSS-Gen Issue 3, RSS-132 Issue 2, RSS-133 Issue 5,
 RSS-139 Issue 2

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

This product utilizes an internal battery that is not removable. When applicable, EMC testing was performed with the internal battery fully charged. 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.

Manufacturer	Equipment Type	Model No.	Serial Number	Calibration Due Date
Rohde & Schwarz	Receiver	ESIB40	100226	3/30/2012
Hewlett Packard	EMC Analyzer	E7405	US39440191	9/23/2012
Agilent	MXA Signal Analyzer	N9020A	US46470586	01/20/2014
Agilent	Signal Generator	83712A	3429A00286	3/26/2013
ETS	DRG Horn Antenna	3115	6222	3/16/2012
A. H. Systems	DRG Horn Antenna	SAS 200/571	365	8/24/2012
ETS	Log-Periodic Antenna	3148	1188	12/12/2012
ETS	Biconical Antenna	3110B	3369	12/14/2012
Attenuator	Weinschel	AS-6	6675	NCR
Attenuator	Weinschel	AS-6	6677	NCR
Thermotron	Environmental Chamber	S-4	31580	11/16/2012
Agilent	Power Meter	E4416A	GB41293258	7/15/2013
Agilent	Power Meter	E4416A	GB41293263	9/14/2013
Agilent	Power Sensor	E9323A	US40412063	8/19/2012
Agilent	Power Sensor	E9323A	MY44420850	9/08/2012
Agilent	Microwave Preamplifier	8449B	3008A01442	9/22/2012

Note that the Agilent power meter, the Signal Generator and the MXA signal analyzer are 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, EUT, is directly coupled to the input of an Agilent power meter through a 20dB passive attenuator, adaptor (if needed), and specialized RF connector. The average power output is measured for all channels.

Measurement Results

GSM 850

Frequency (MHz)	Power (dBm)
824.2	33.51
836.6	33.44
848.8	33.53

GSM 1900

Frequency (MHz)	Power (dBm)
1850.2	30.63
1880.0	30.21
1909.8	30.30

EDGE 850

Frequency (MHz)	Power (dBm)
824.2	28.73
836.6	28.82
848.8	28.72

EDGE 1900

Frequency (MHz)	Power (dBm)
1850.2	27.87
1880.0	27.80
1909.8	27.84

Conducted Power was measured according to the “SAR Measurement Procedure for 3G Devices” released on October, 2007. .

Band	Frequency (MHz)	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	826.4	23.97	23.87	23.89	23.89	23.92	23.84
	836.0	23.95	23.89	23.92	23.91	23.94	23.96
	846.6	23.82	23.90	23.91	23.90	23.86	23.84
WCDMA 1700	1712.4	24.00	24.09	24.05	24.06	24.06	24.08
	1732.5	24.09	24.15	24.12	24.13	24.13	24.14
	1752.6	24.15	24.15	24.08	24.06	24.11	24.12
WCDMA 1900	1852.4	23.90	23.98	23.91	23.94	23.91	24.04
	1880.0	23.99	23.91	23.90	23.92	23.85	23.82
	1907.6	23.80	23.91	23.93	23.86	23.89	23.85

Band	Channel	Conducted Power (dBm) for WCDMA – HSPA (HSUPA/HSDPA-Rel 6) Modes				
		Subtest 1	Subtest 2	Subtest 3	Subtest 4	Subtest 5
WCDMA 850	826.4	23.90	23.89	23.85	23.91	23.91
	836.0	23.90	23.91	23.96	23.95	23.93
	846.6	23.89	23.93	23.93	23.92	23.85
WCDMA 1700	1712.4	24.15	24.10	24.09	24.13	24.07
	1732.5	24.20	24.16	24.16	24.18	24.20
	1752.6	24.09	24.12	24.10	24.03	24.06
WCDMA 1900	1852.4	23.94	24.06	23.99	24.01	24.09
	1880.0	23.93	23.93	23.88	23.89	23.86
	1907.6	23.85	23.84	23.92	23.88	23.87

Based on the power measurements, all WCDMA testing was performed in RMC mode.

RADIATED POWER (EIRP AND ERP)

Measurement Procedure

The EUT 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 EUT was supported in a free space type environment, vertically oriented in the chamber.

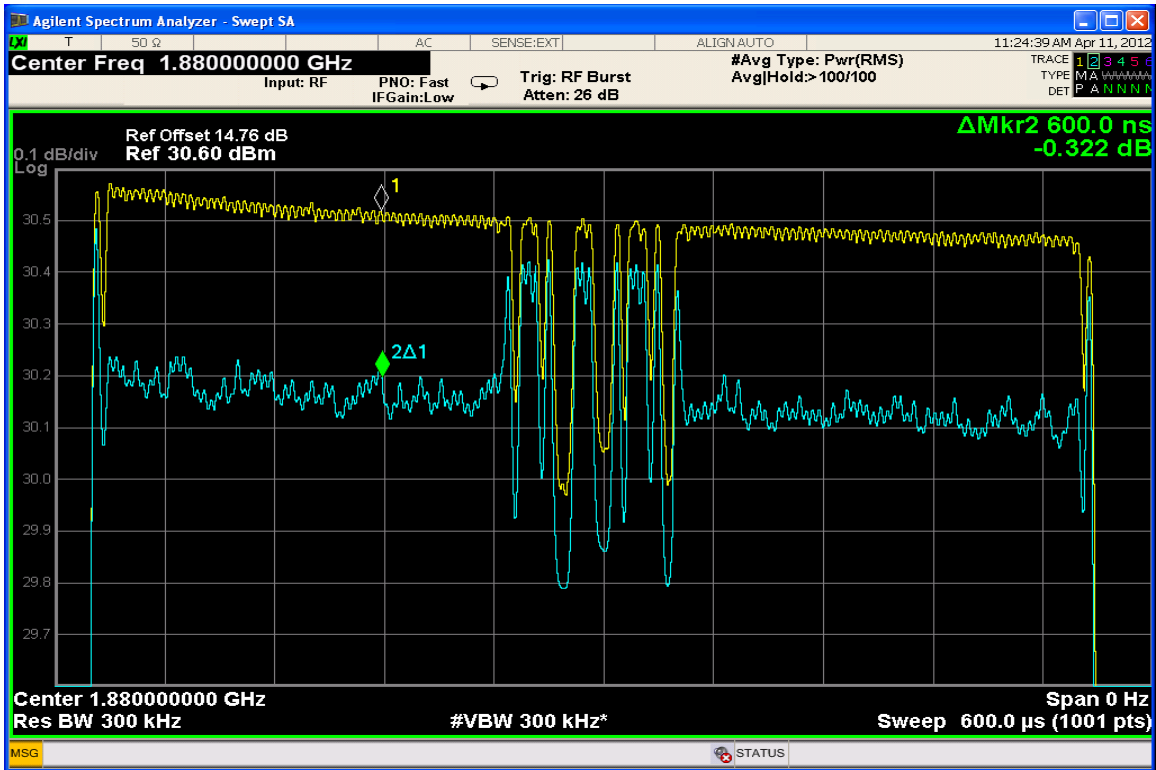
All measurements were made with the EUT placed in a call using a mobile station test set. The EUT was weakly coupled to the test set and configured to transmit in full data rate mode. Radiated power was measured at each 15 degree step. The radiated power was measured using a Rhode & Schwarz FSP Spectrum Analyzer using the Average Detector for all bands. 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.

The EUT was tested in all configurations and the highest power level is reported.

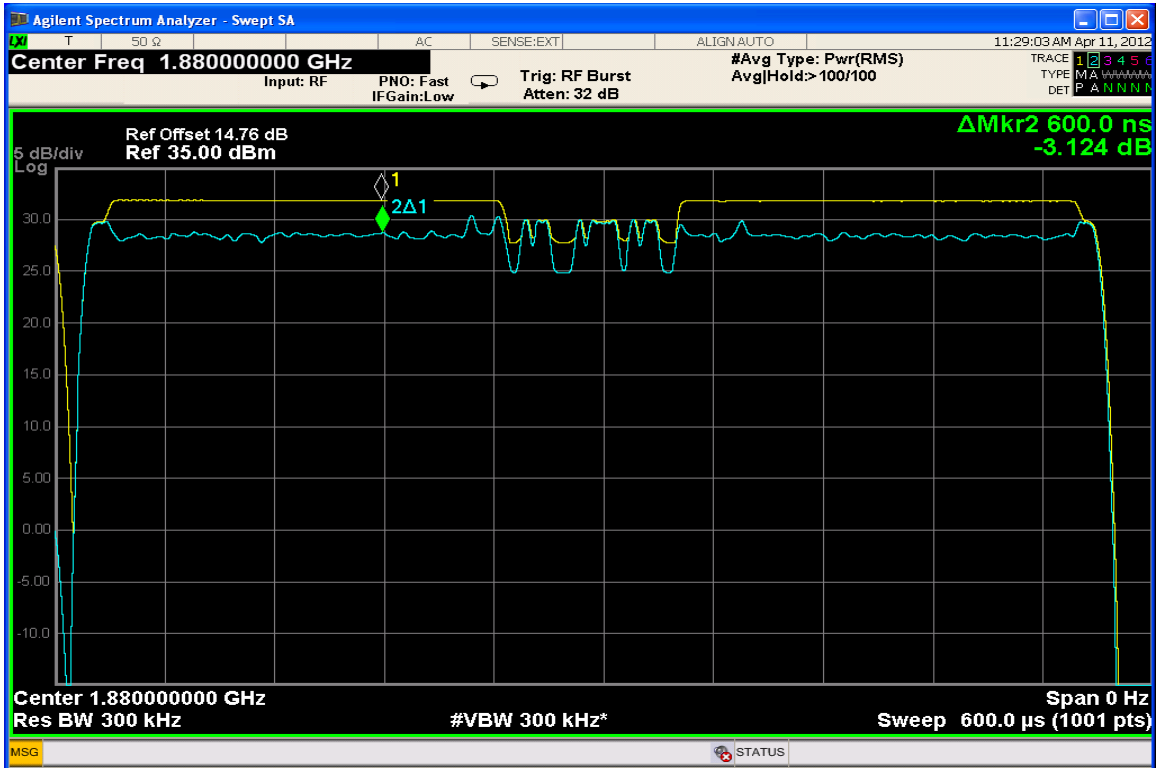
Measurement Results

Band	EIRP dBm	ERP dBm
GSM 850	31.6	29.5
GSM 1900	30.3	28.2
EDGE 850	27.4	25.3
EDGE 1900	27.5	25.4
WCDMA 850	22.3	20.2
WCDMA 1700	27.6	25.5
WCDMA 1900	28.8	26.7

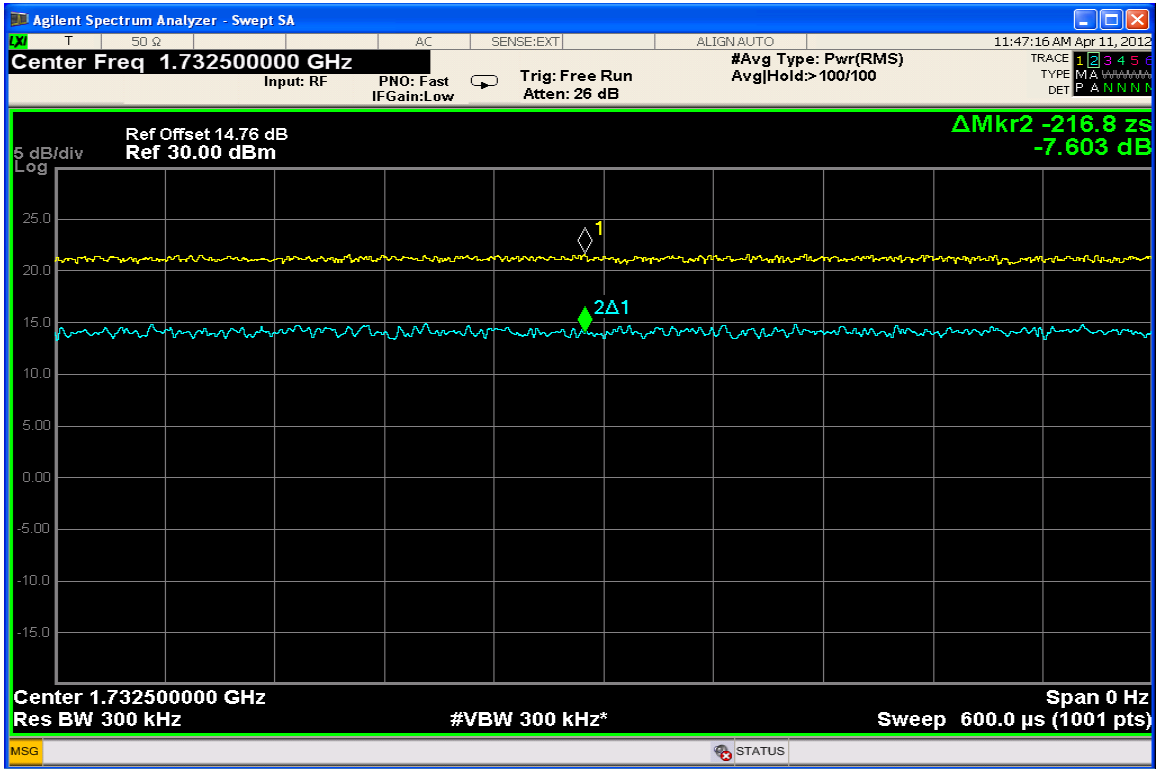
For the PAR plots below, except for the detector used and the trace type, all instrument settings are the same for both plot traces. The trace 1 type is Max Hold and the detector is peak. The trace 2 type is average and the detector is average.



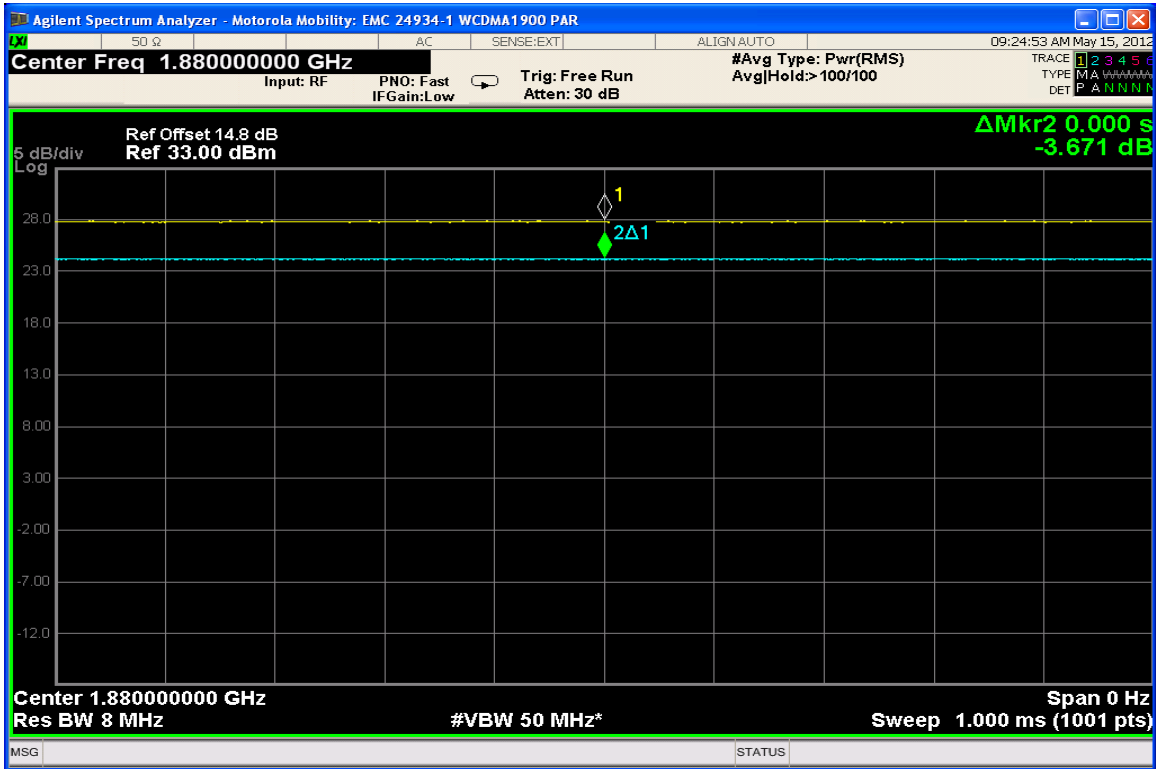
GSM 1900 – PAR Plot



EDGE 1900 – PAR Plot



WCDMA 1700 – PAR Plot



WCDMA 1900 – PAR Plot

OCCUPIED BANDWIDTH

Measurement Procedure

The RF output port of the EUT 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 analyzer is set for Peak Detector and each trace is set for Max Hold. A fully charged battery was used for the supply voltage.

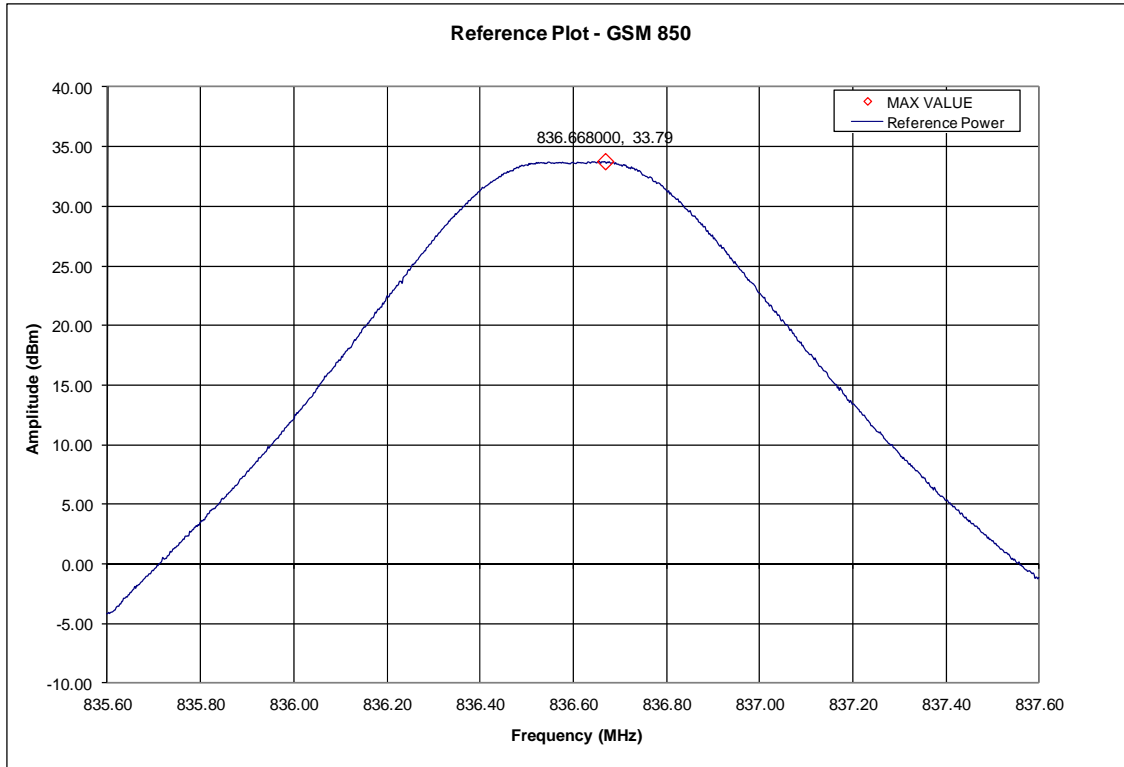
The middle channel within the designated frequency block was measured. For digital modulation, the lower and upper band edge plots are displayed.

Measurement Results
Attached

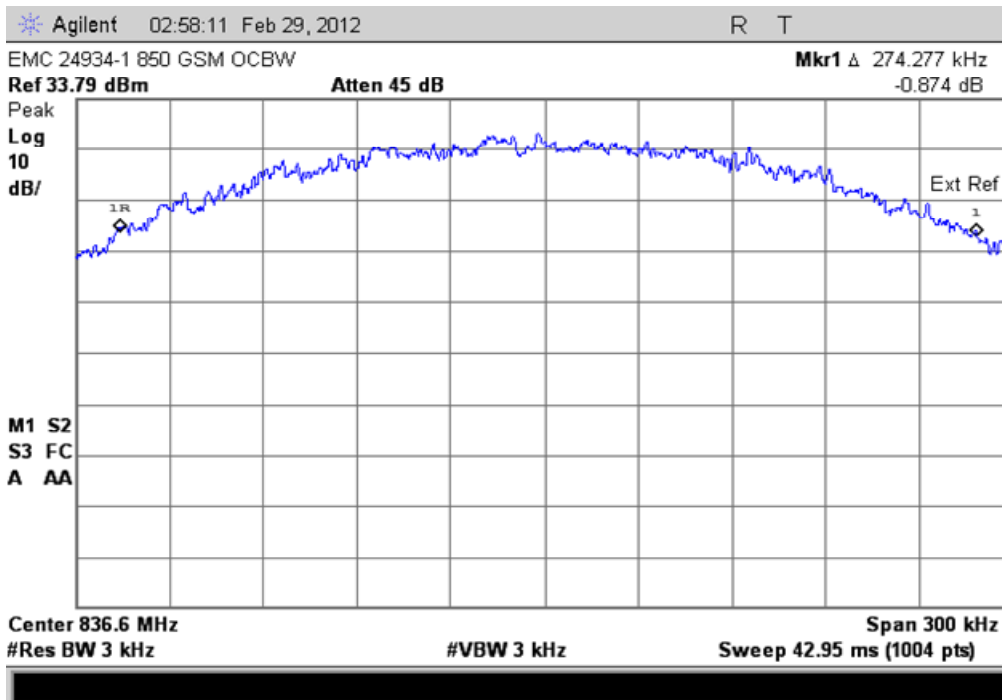
Plot	Equipment Settings					
	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Sweep Points (#)	Trace Mode	Detector	Samples (≥ #)
Reference Plot - GSM 850	300	Auto	1001	Max Hold	Peak	30
OCBW - GSM 850	3	Auto	1001	Max Hold	Peak	30
Lower Band Edge - GSM 850	1	Auto	2004	Max Hold	Peak	30
Upper Band Edge - GSM 850	1	Auto	2004	Max Hold	Peak	30
Reference Plot - GSM 1900	300	Auto	1001	Max Hold	Peak	30
OCBW - GSM 1900	3	Auto	1001	Max Hold	Peak	30
Lower Band Edge - GSM 1900	1	Auto	2004	Max Hold	Peak	30
Upper Band Edge - GSM 1900	1	Auto	2004	Max Hold	Peak	30

- Notes:
- 1) When the video bandwidth is set to Auto the video bandwidth self adjusts for ³ the resolution bandwidth.
 - 2) The plotted data shown for the band edge measurements is representative of data taken with a true 3 kHz resolution bandwidth filter. The raw data was taken using a 1 kHz resolution bandwidth and was integrated to produce a response representative of data taken using a true 3 kHz resolution bandwidth filter.

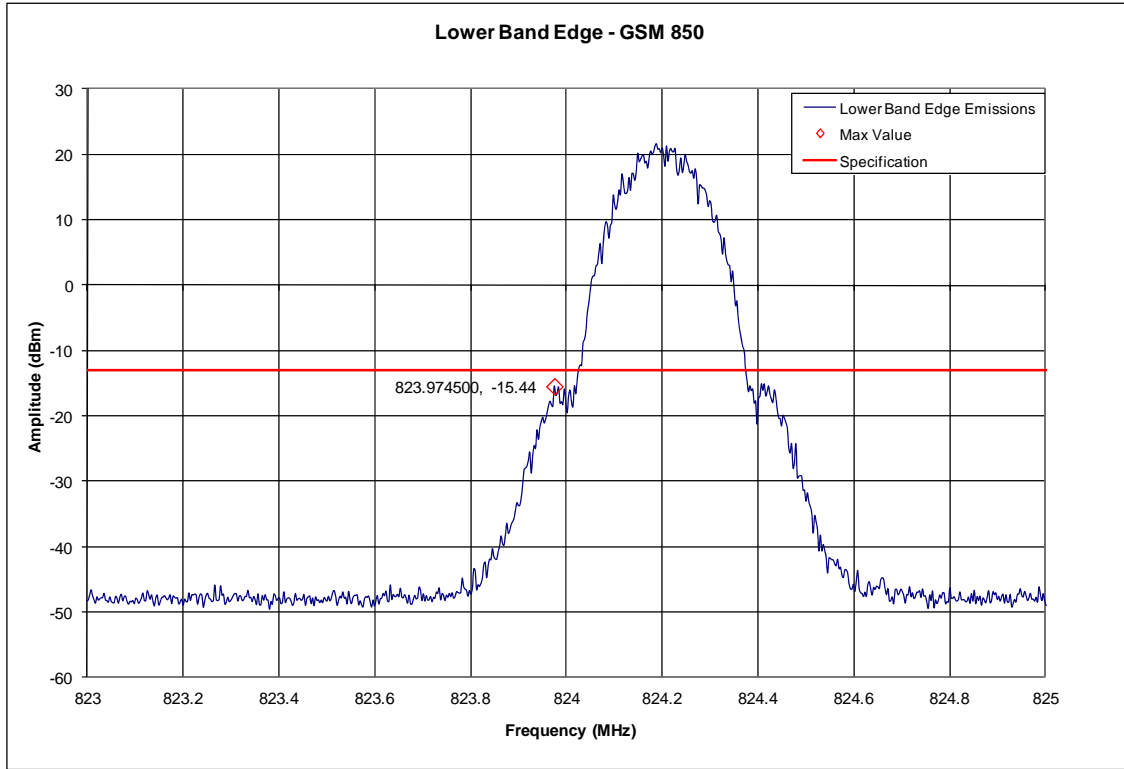
Measurement Results – GSM 850



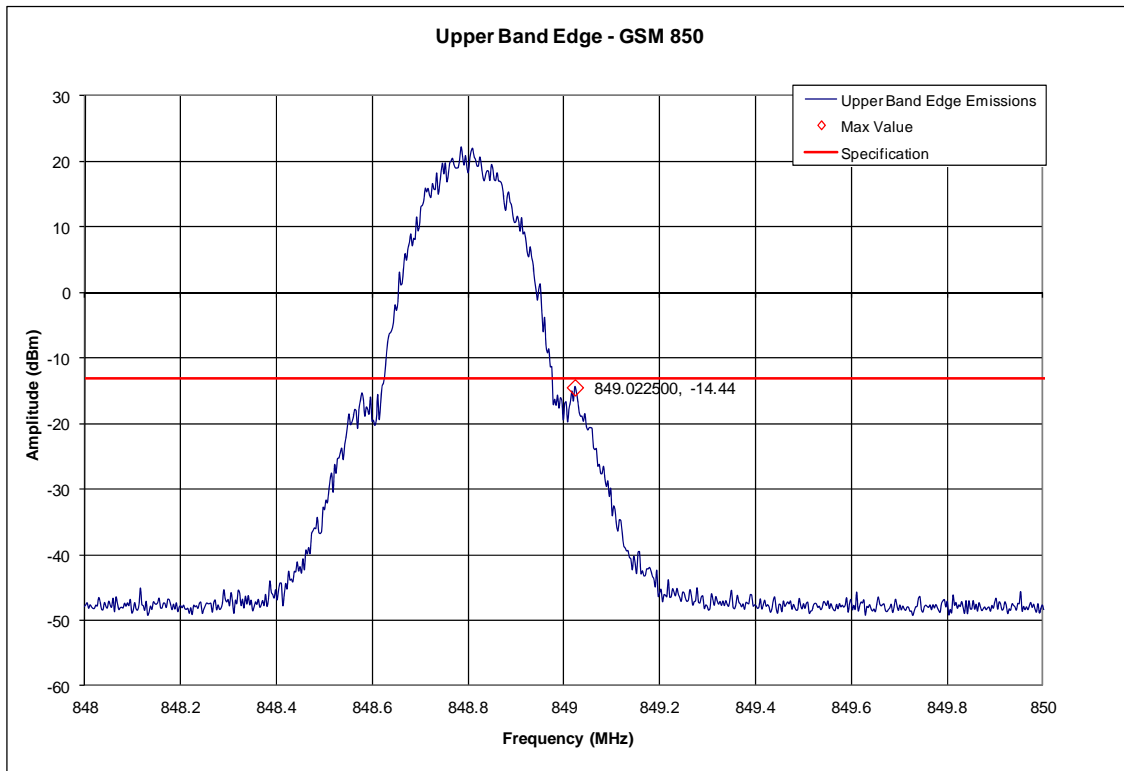
GSM 850 – Reference Level Plot – Channel 190 (836.60 MHz)



GSM 850 – Channel 190 (836.60 MHz) – Occupied Bandwidth

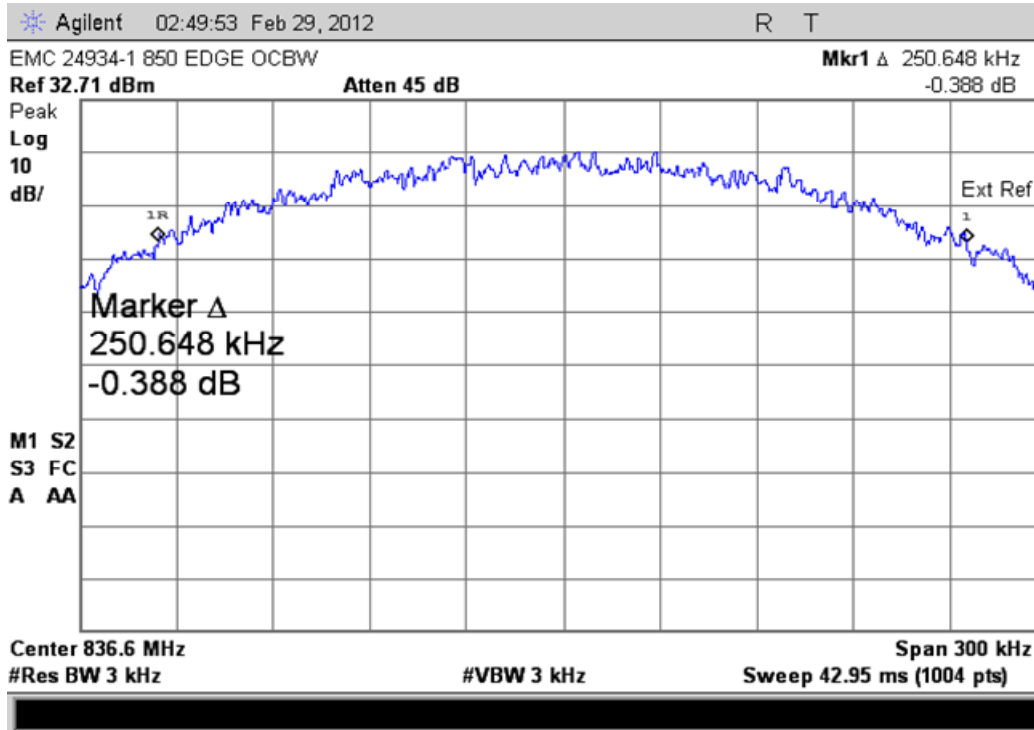


GSM 850 – Lower Band Edge – Channel 128 (824.2 MHz)

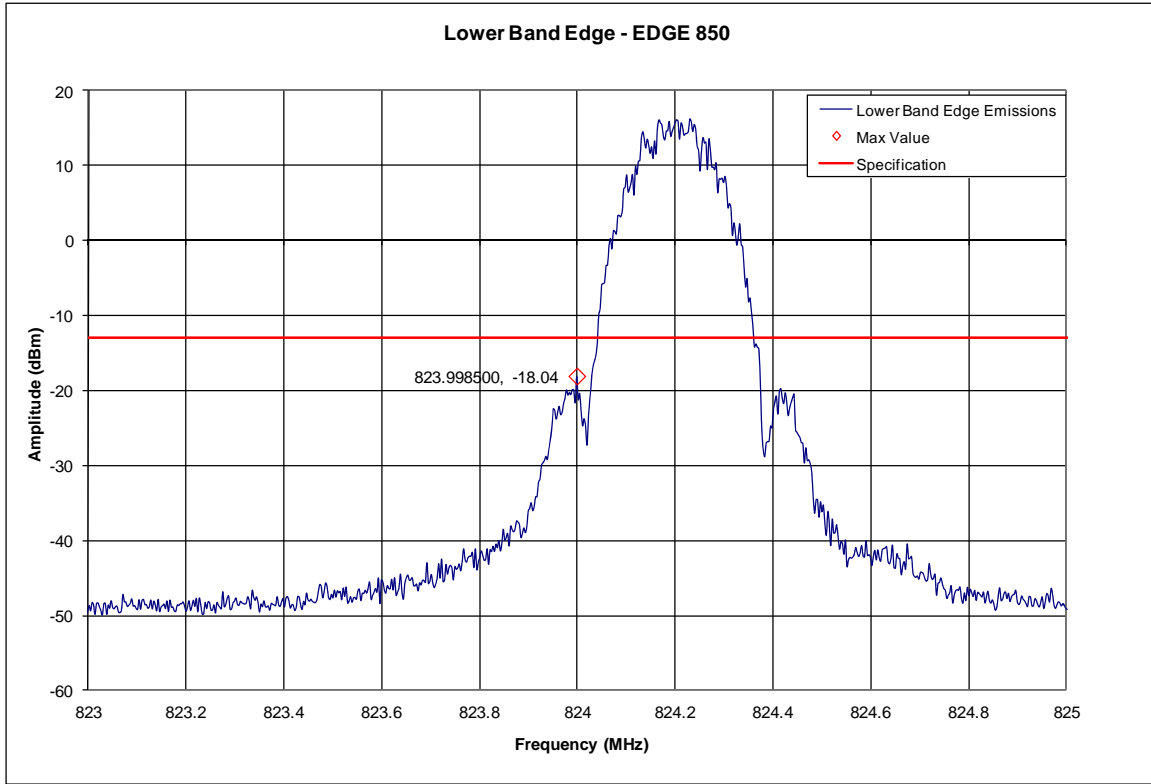


GSM 850 – Upper Band Edge – Channel 251 (848.8 MHz)

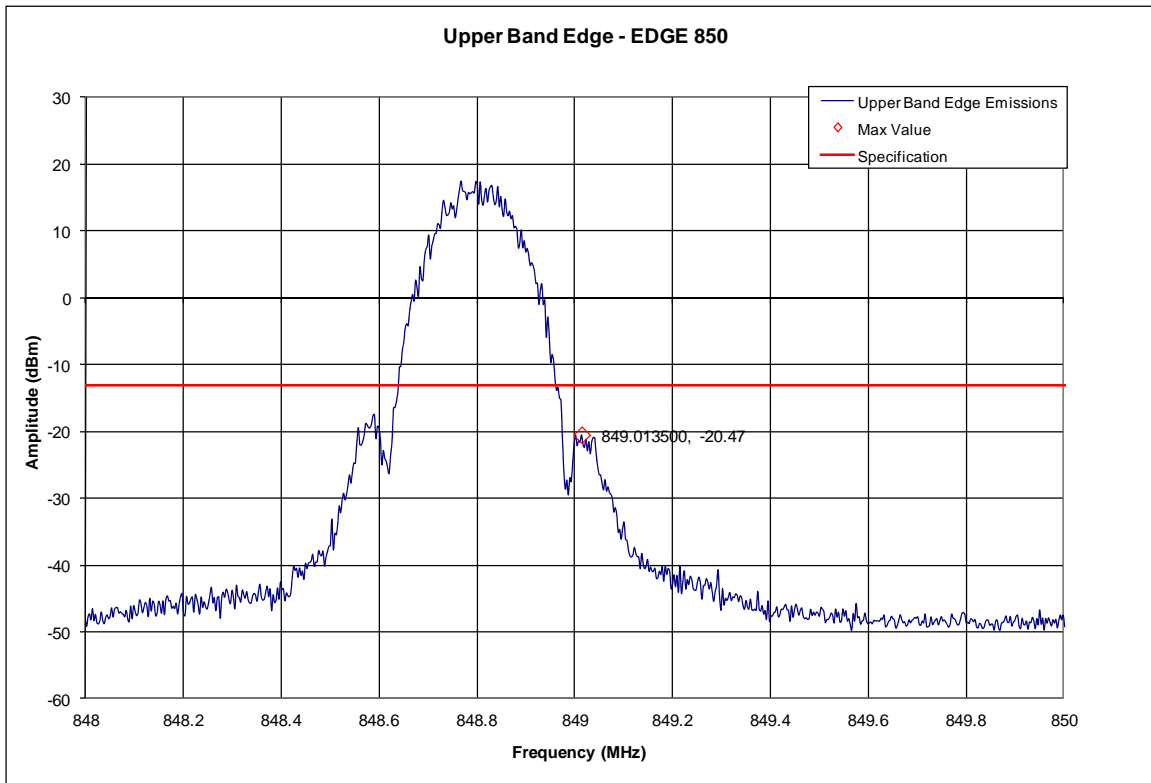
Measurement Results – EDGE 850



EDGE 850 – Channel 190 (836.60 MHz) – Occupied Bandwidth

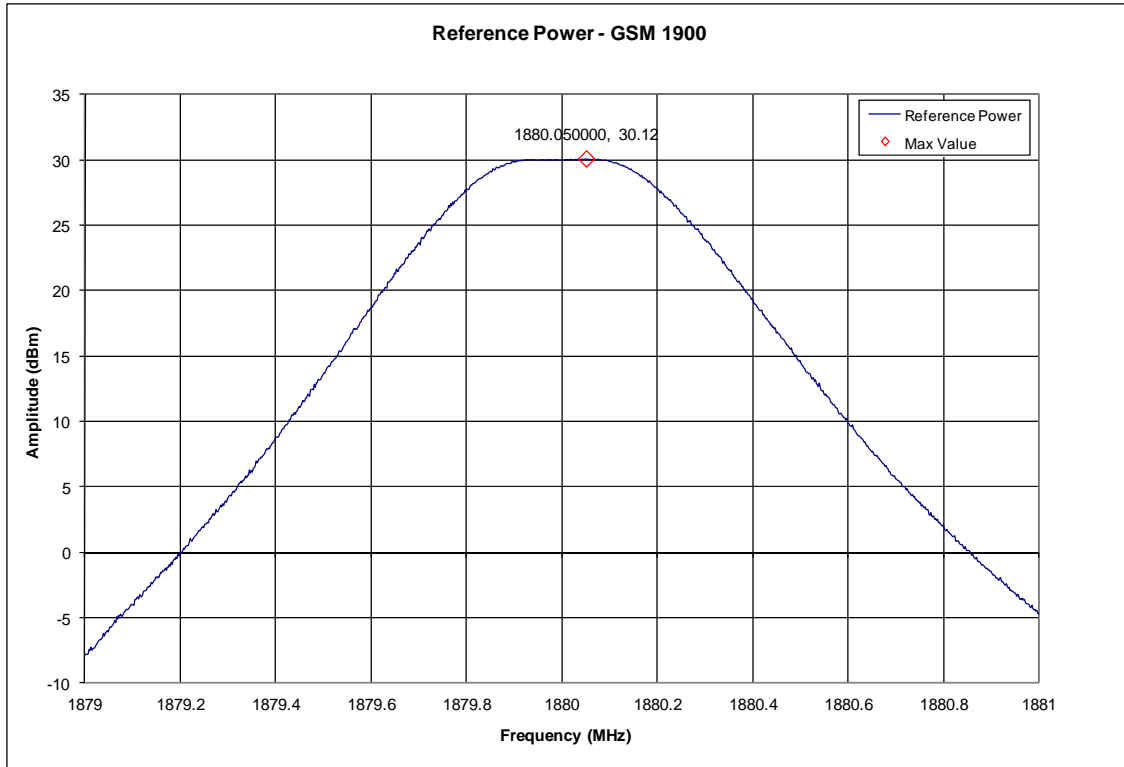


EDGE 850 – Lower Band Edge – Channel 128 (824.2 MHz)

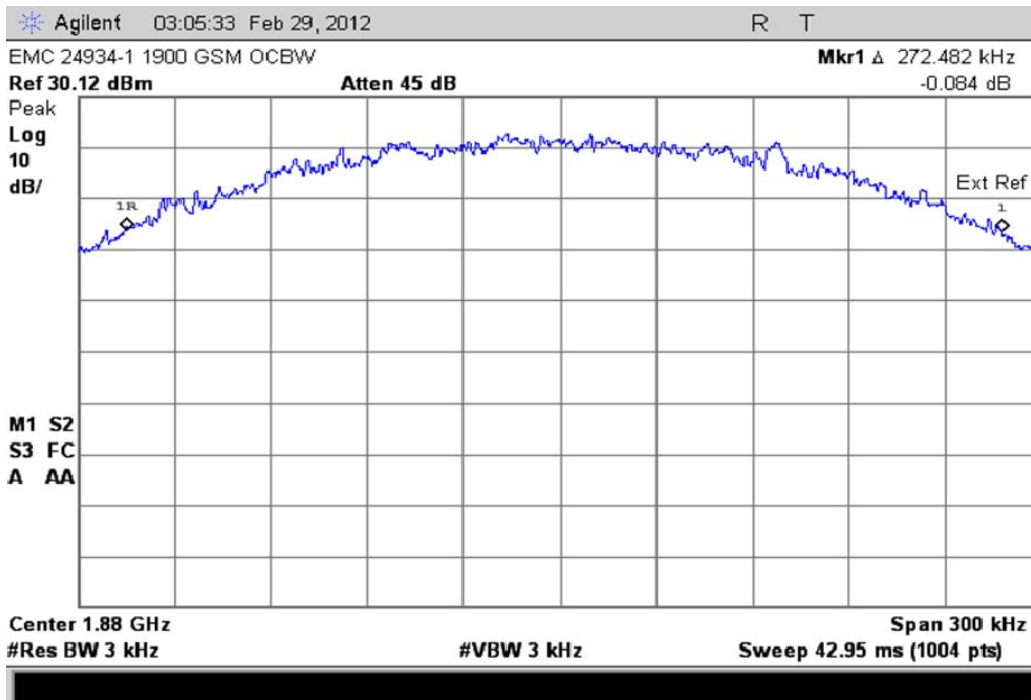


EDGE 850 – Upper Band Edge – Channel 251 (848.8 MHz)

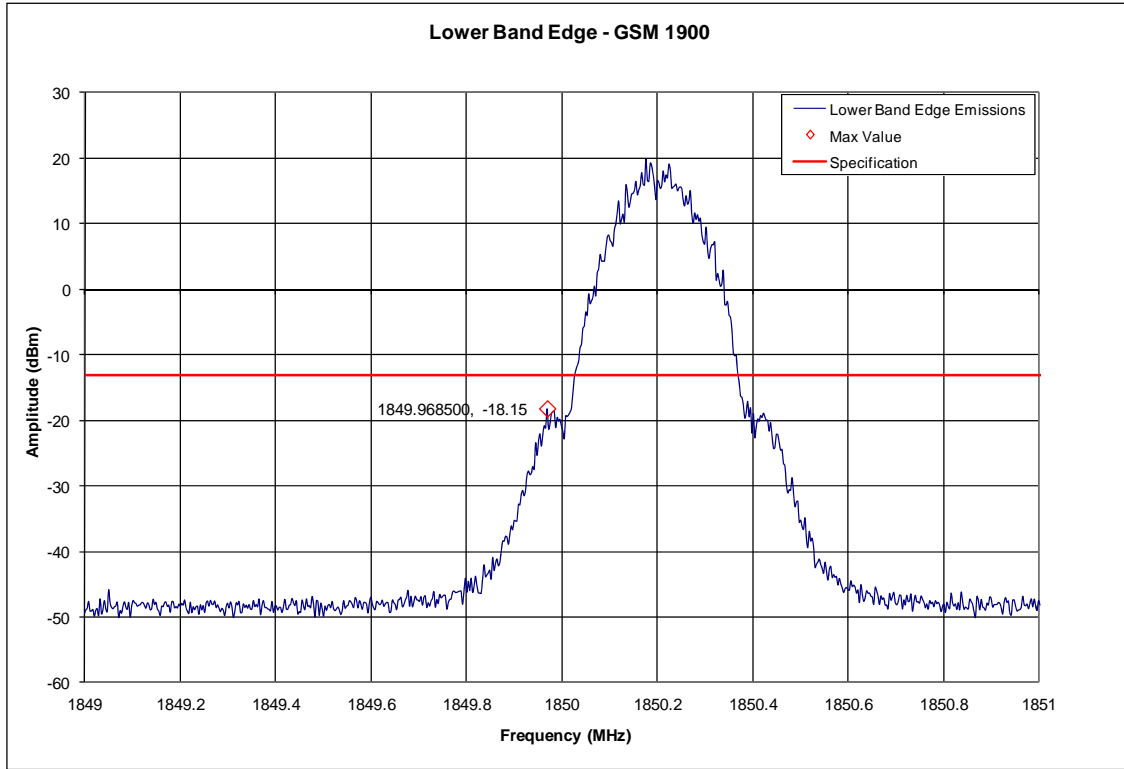
Measurement Results – GSM 1900



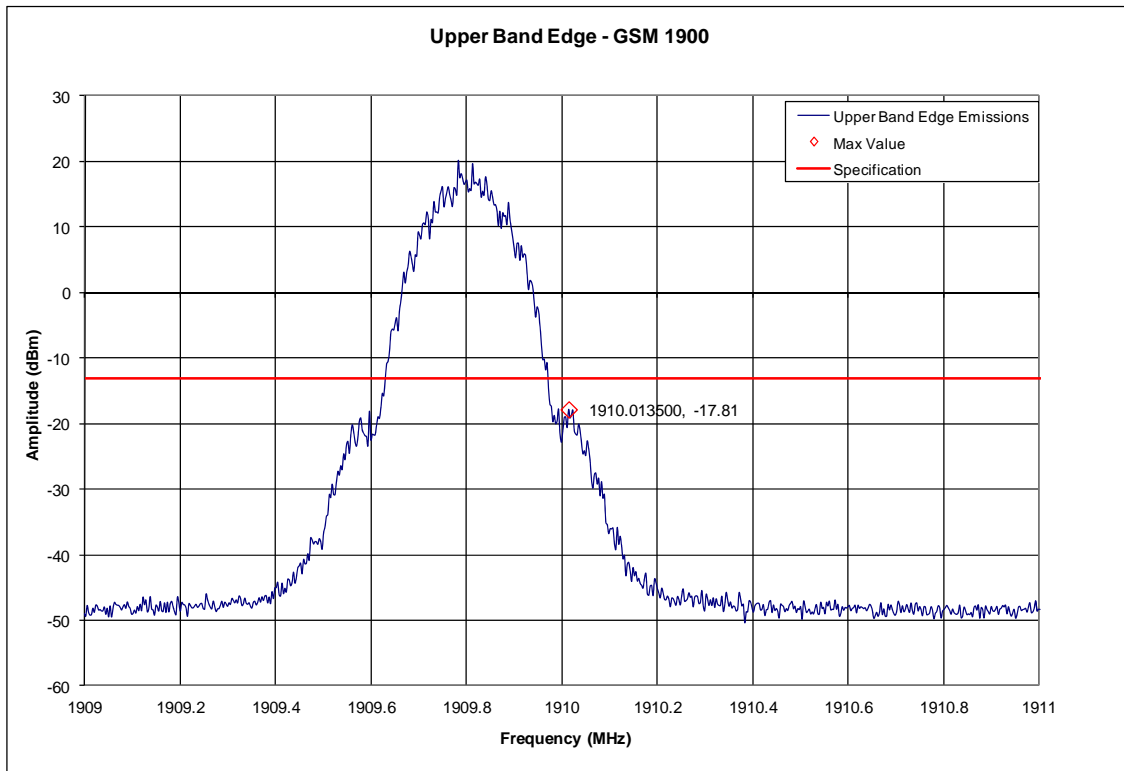
GSM 1900 – Reference Level Plot – Channel 661 (1880.00MHz)



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

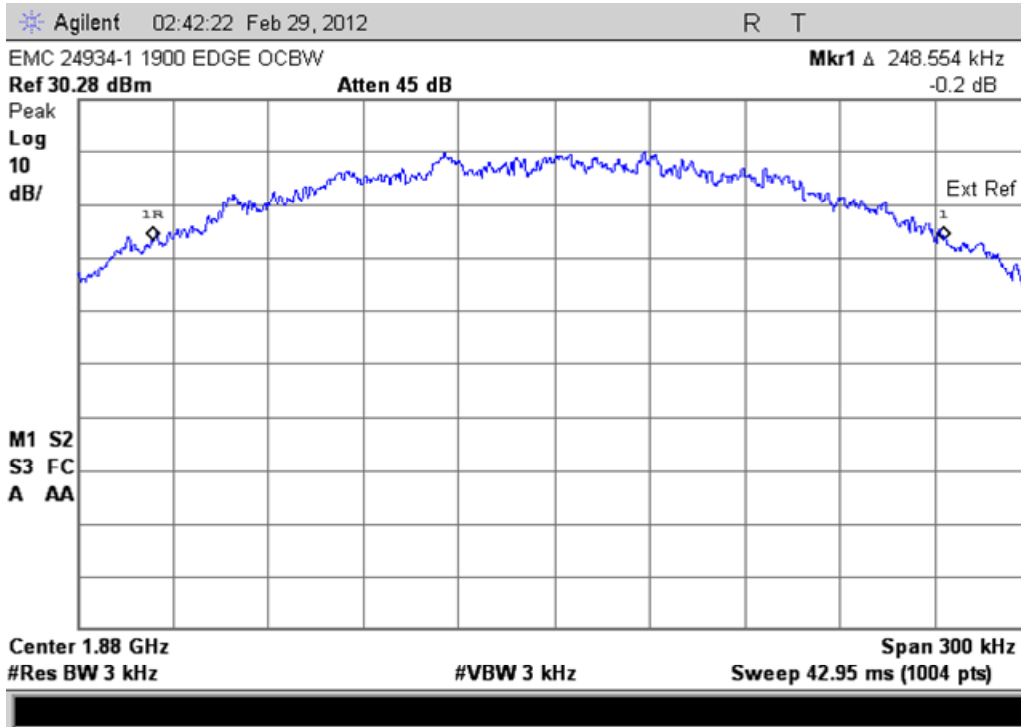


GSM 1900 – Lower Band Edge – Channel 512 (1850.2MHz)

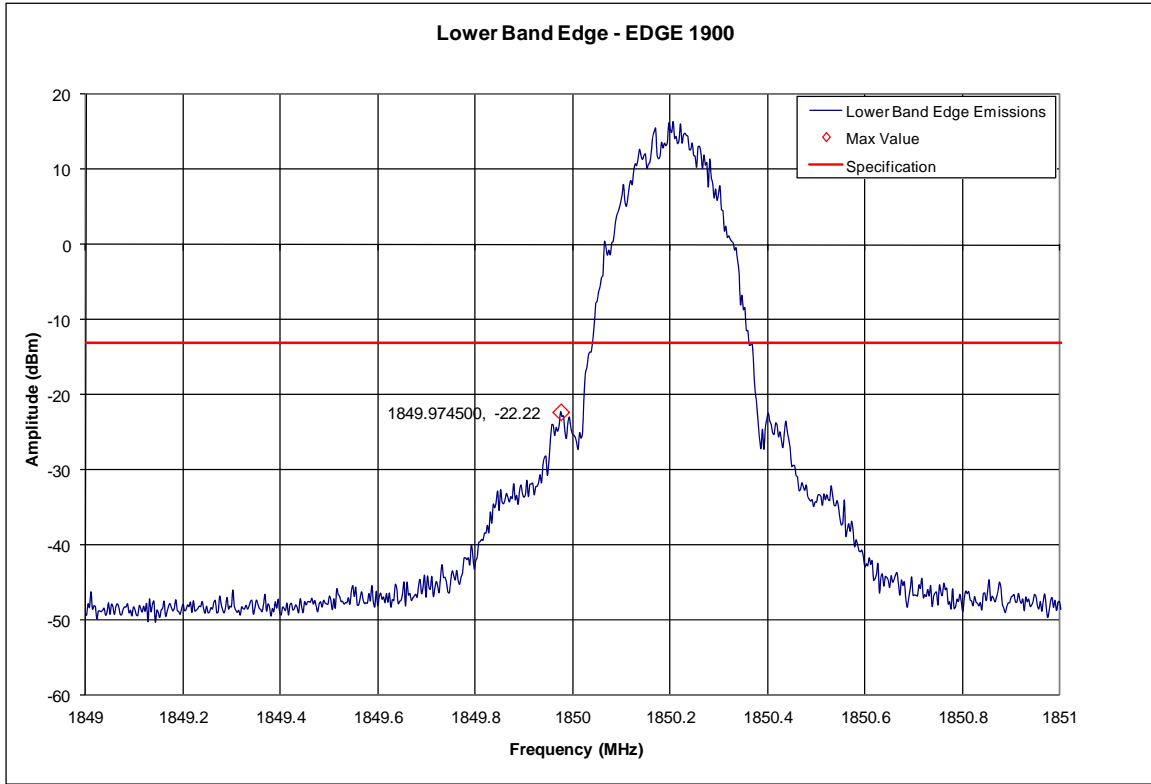


GSM 1900 – Upper Band Edge – Channel 810 (1909.8MHz)

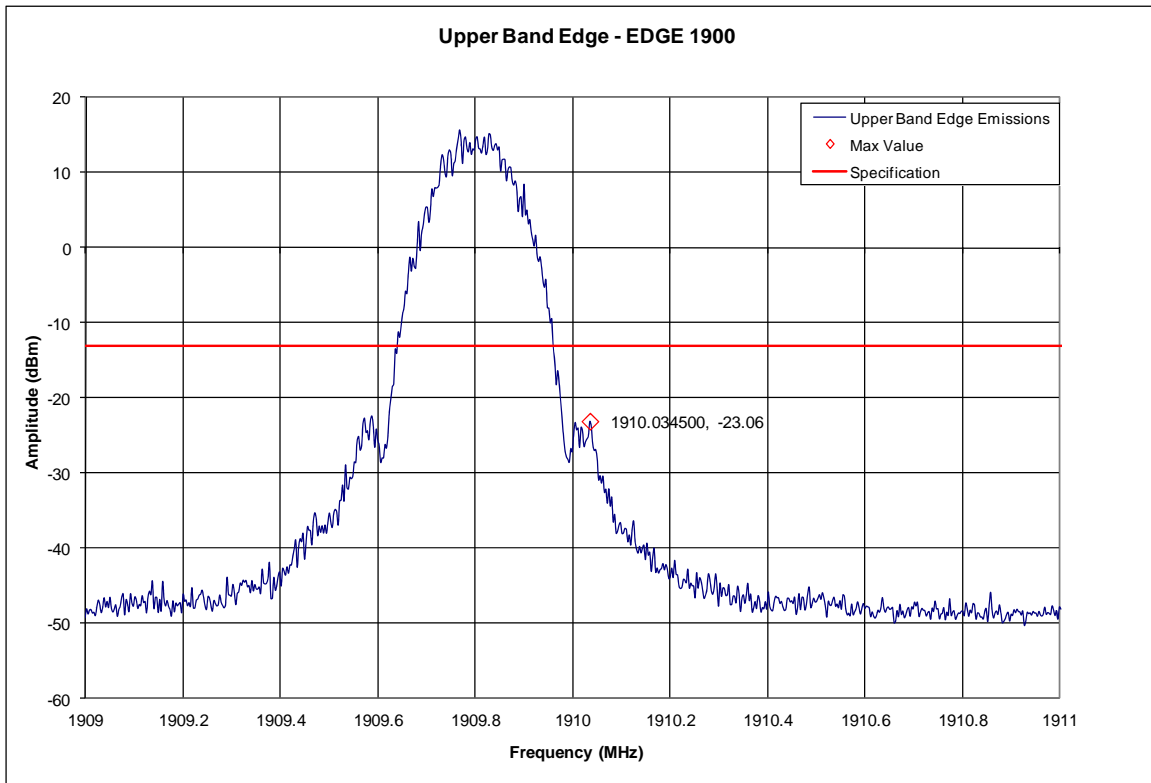
Measurement Results – EDGE 1900



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

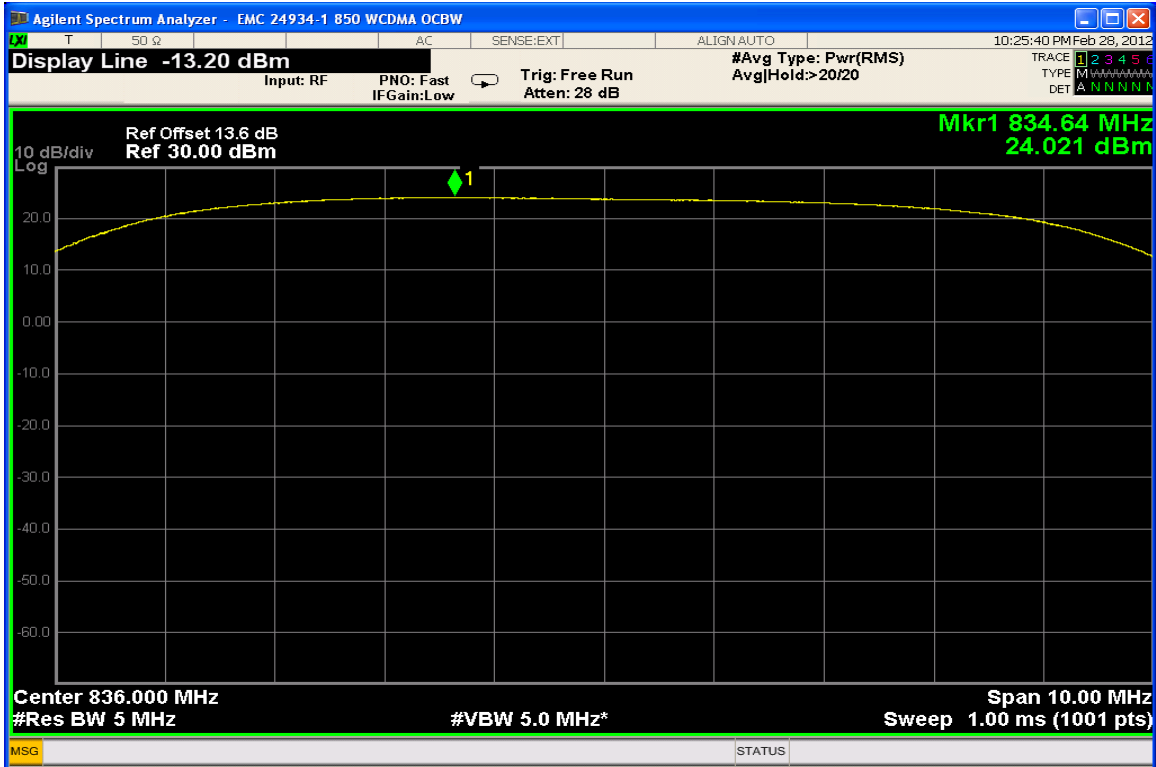


GSM 1900 EDGE – Lower Band Edge – Channel 512 (1850.2MHz)

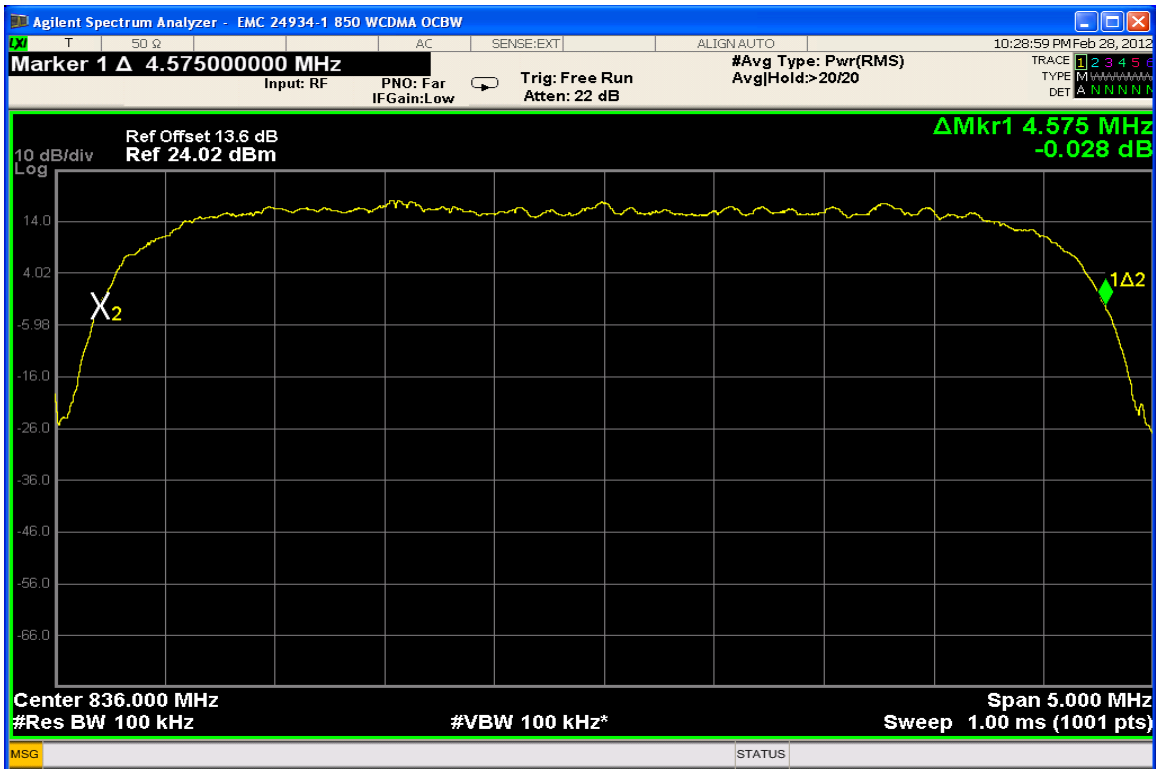


GSM 1900 EDGE – Upper Band Edge – Channel 810 (1909.8MHz)

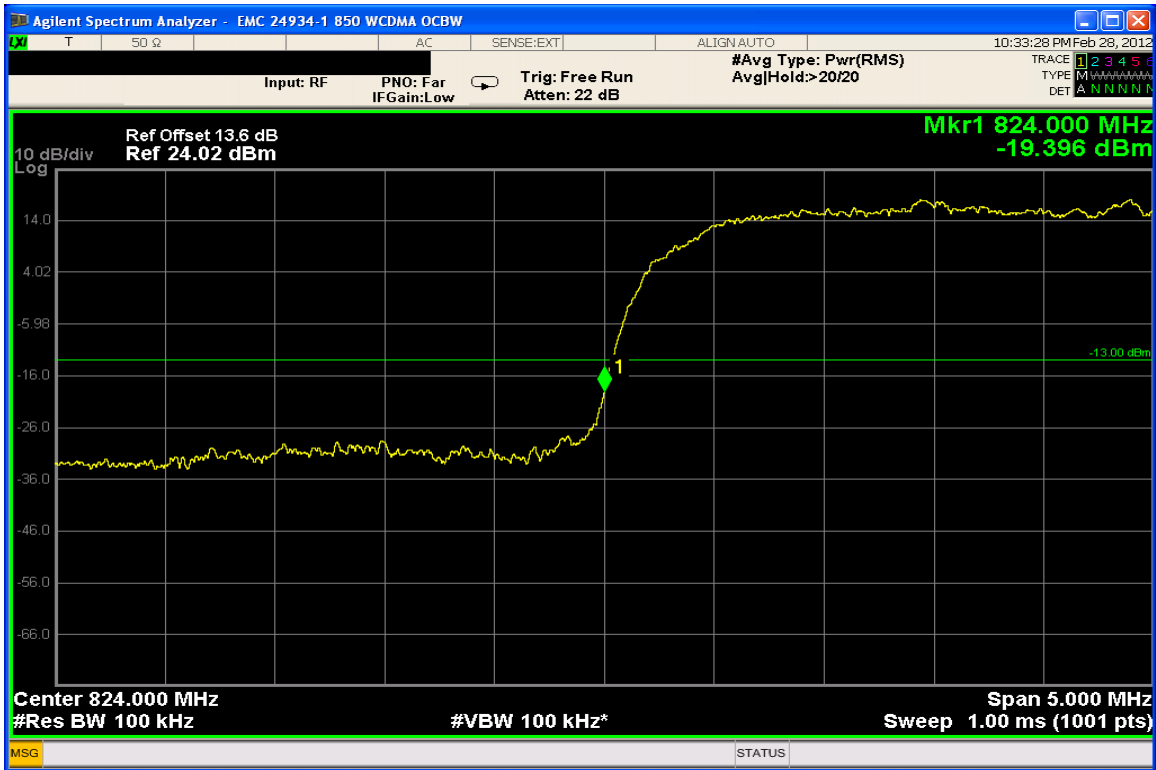
Measurement Results – WCDMA 850



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



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

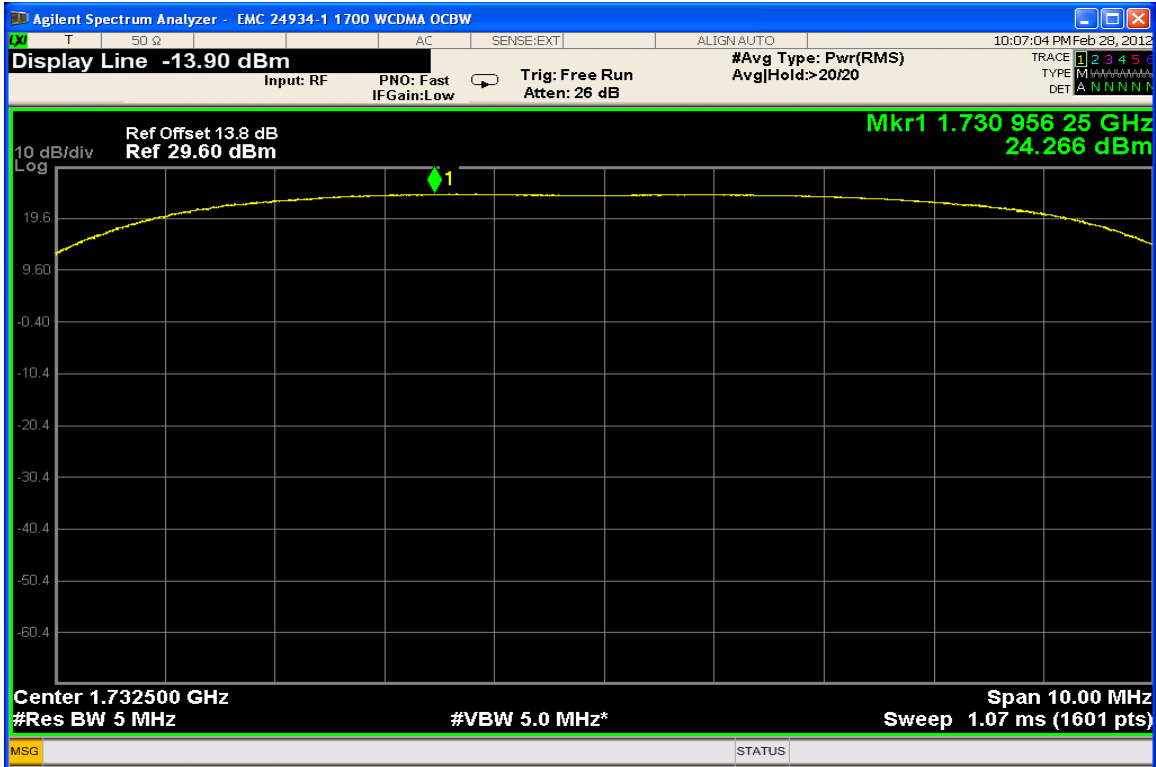


WCDMA 850 – Lower Band Edge – Channel 4132 (826.4 MHz)

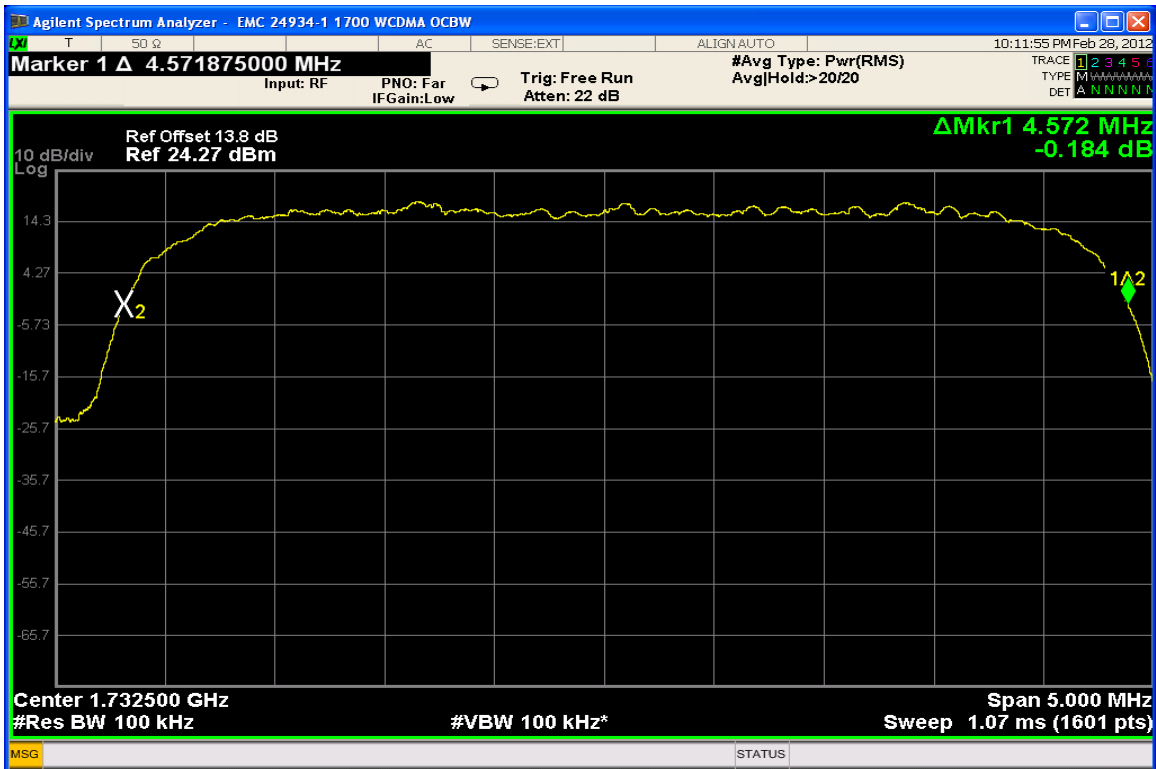


WCDMA 850 – Upper Band Edge – Channel 4233 (846.6 MHz)

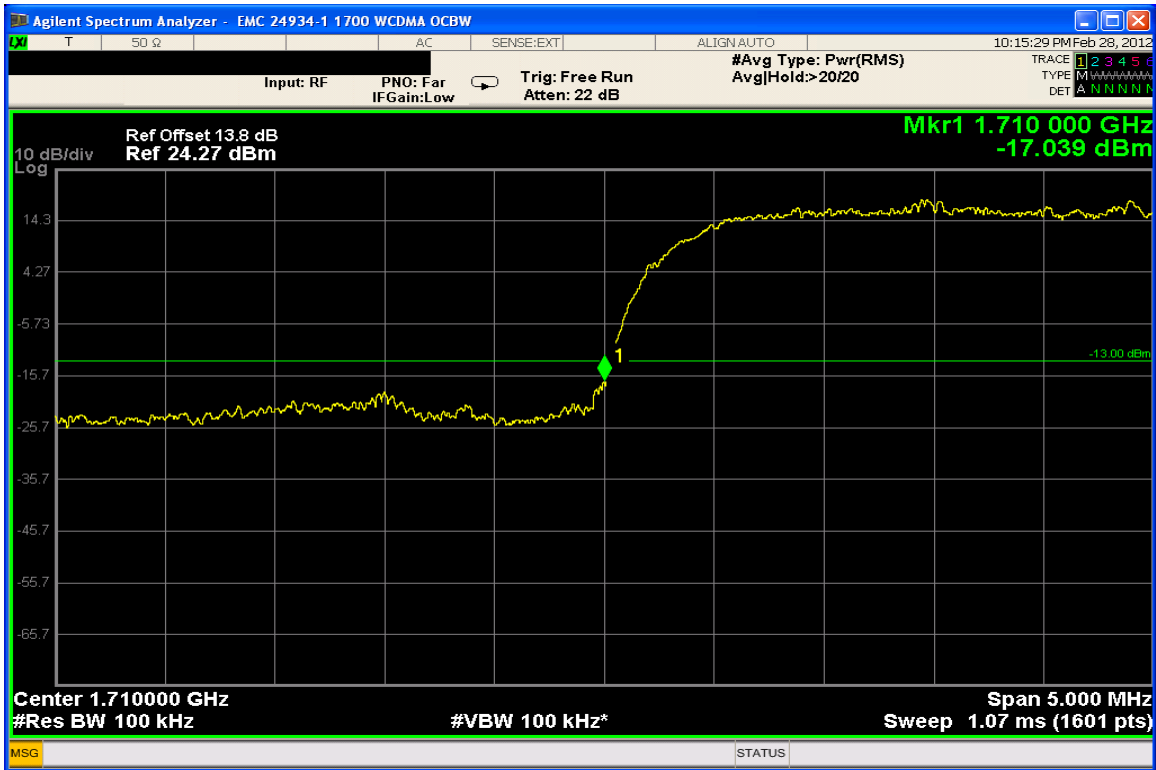
Measurement Results – WCDMA 1700



WCDMA 1700 – Reference Level Plot – Channel 1413 (1732.5 MHz)



WCDMA 1700 – Occupied Bandwidth – Channel 1413 (1732.5 MHz)

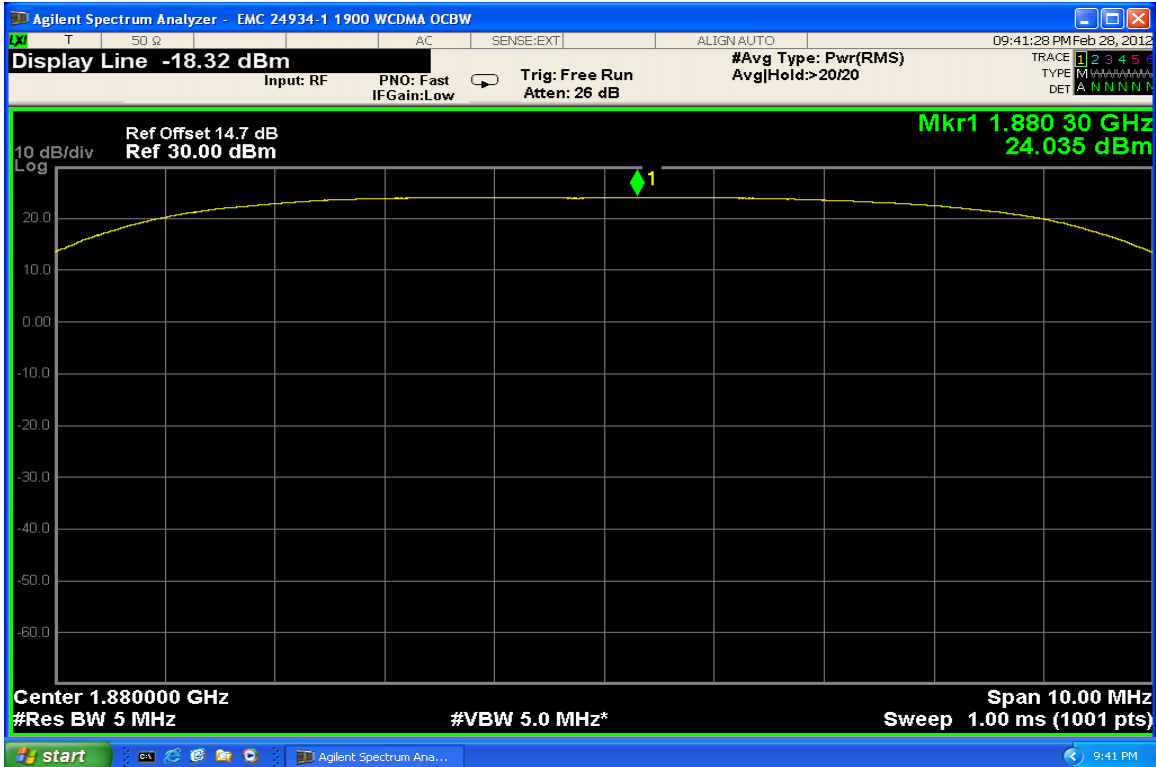


WCDMA 1700 – Lower Band Edge – Channel 1312 (1712.4 MHz)

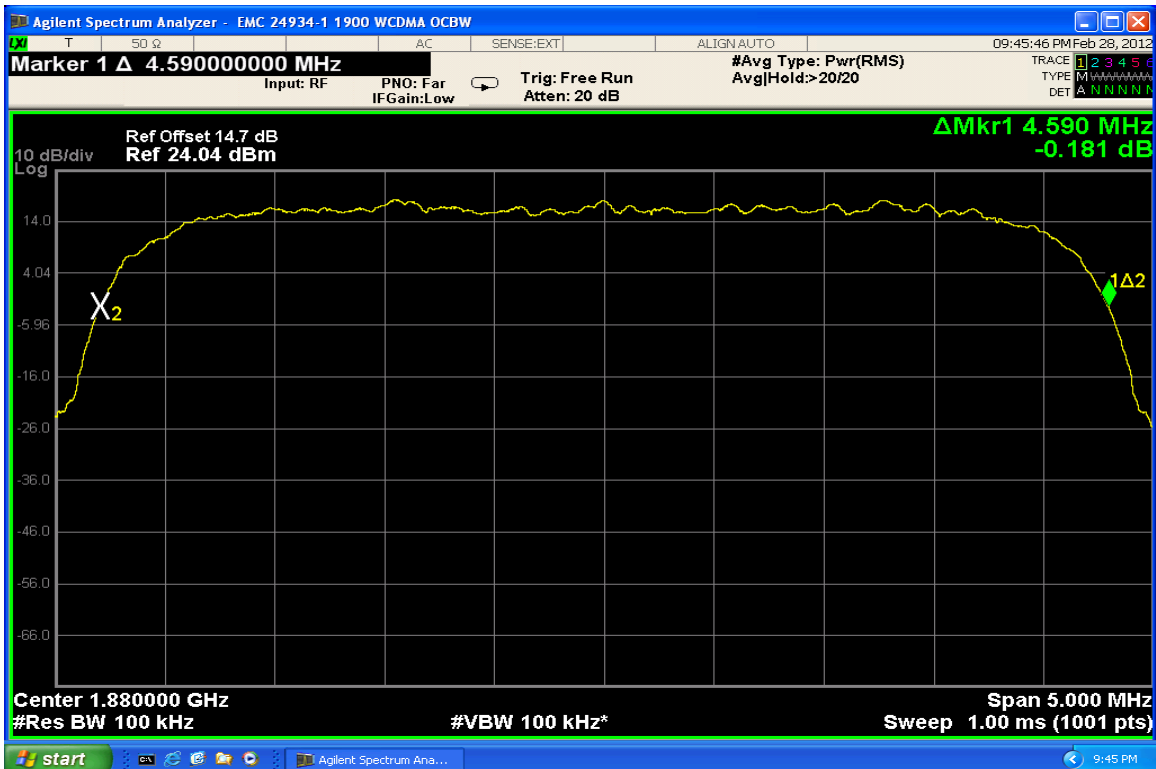


WCDMA 1700 – Upper Band Edge – Channel 1513 (1752.6 MHz)

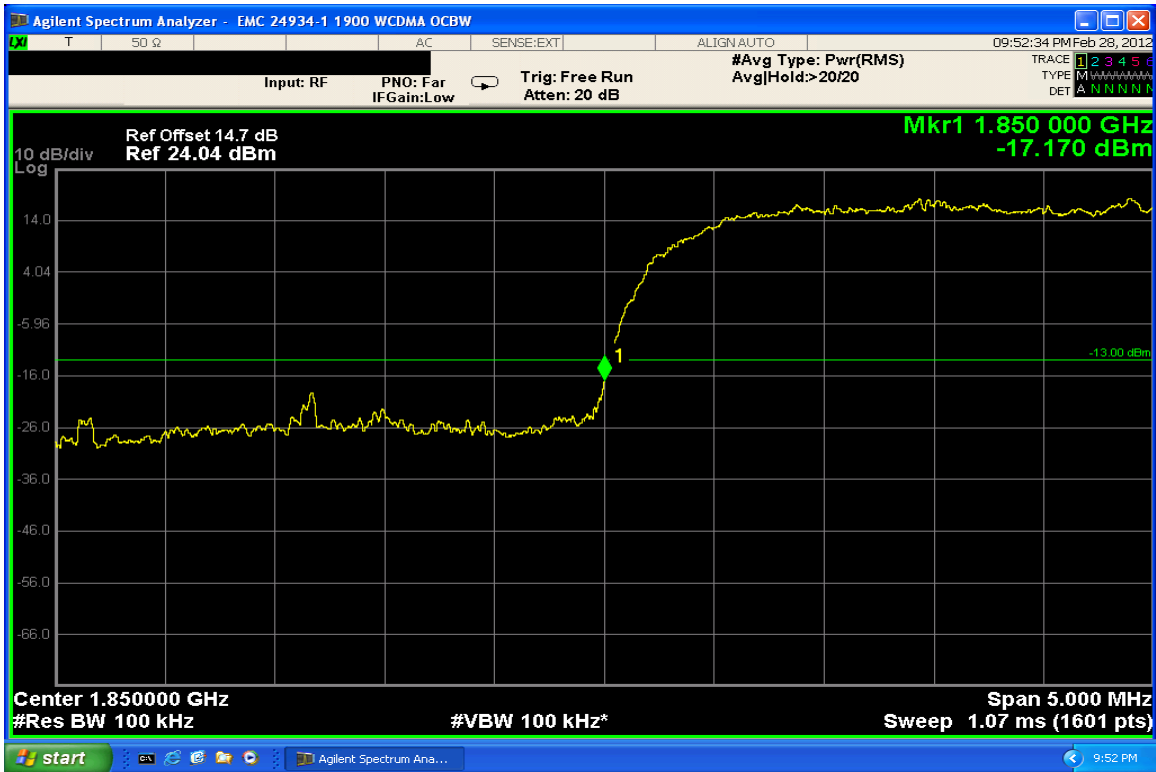
Measurement Results – WCDMA 1900



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



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



WCDMA 1900 – Lower Band Edge – Channel 9262 (1852.40 MHz)



WCDMA 1900 – Upper Band Edge – Channel 9538 (1907.60 MHz)

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Measurement Procedure

The RF output port of the EUT 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:

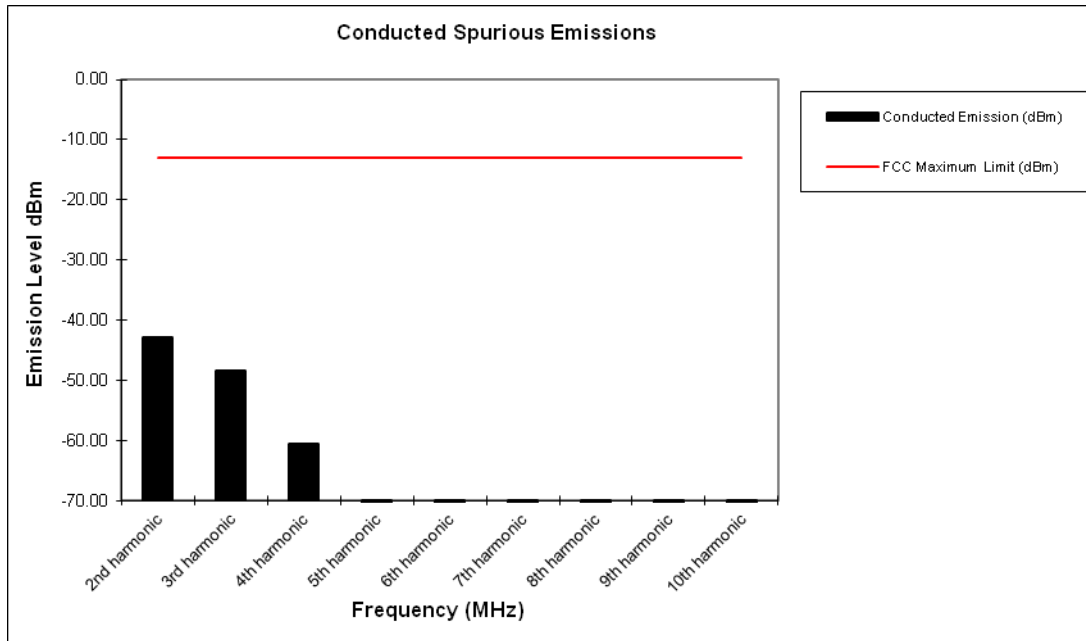
Units	dBm
Divisions	10 dB
Detector	Peak Detector
Resolution Bandwidth	1 MHz
Video Bandwidth (AVG)	Auto
Sweep Time	Auto

Measurement Results

Attached

Measurement Results
Modulation: GSM 850

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-42.90
3rd harmonic	-13	-48.52
4th harmonic	-13	-60.58
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



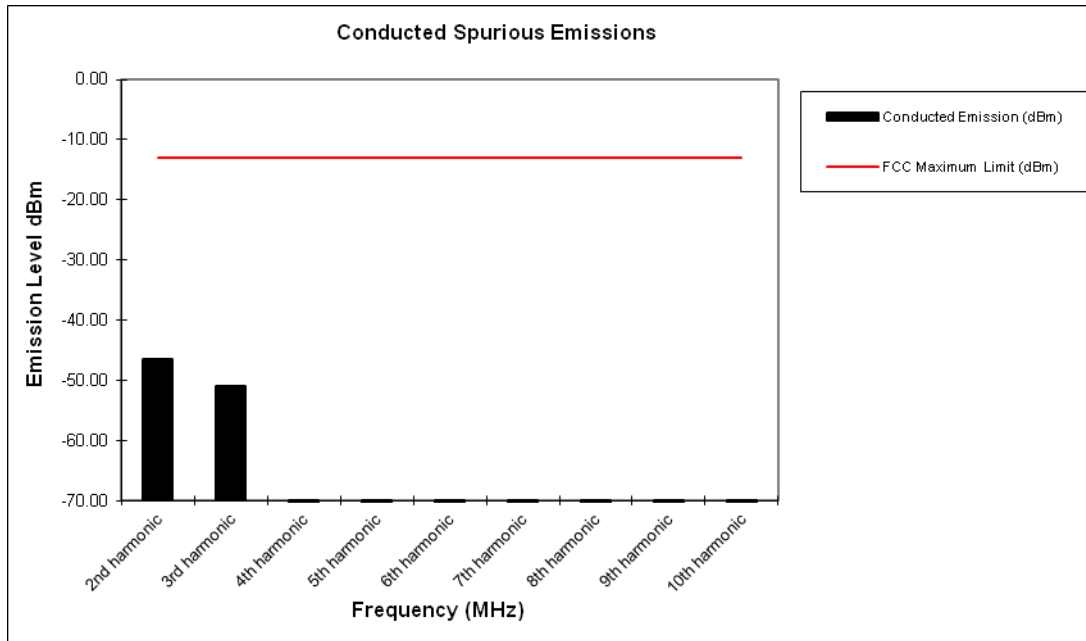
Notes:

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: EDGE 850

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-46.54
3rd harmonic	-13	-50.97
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



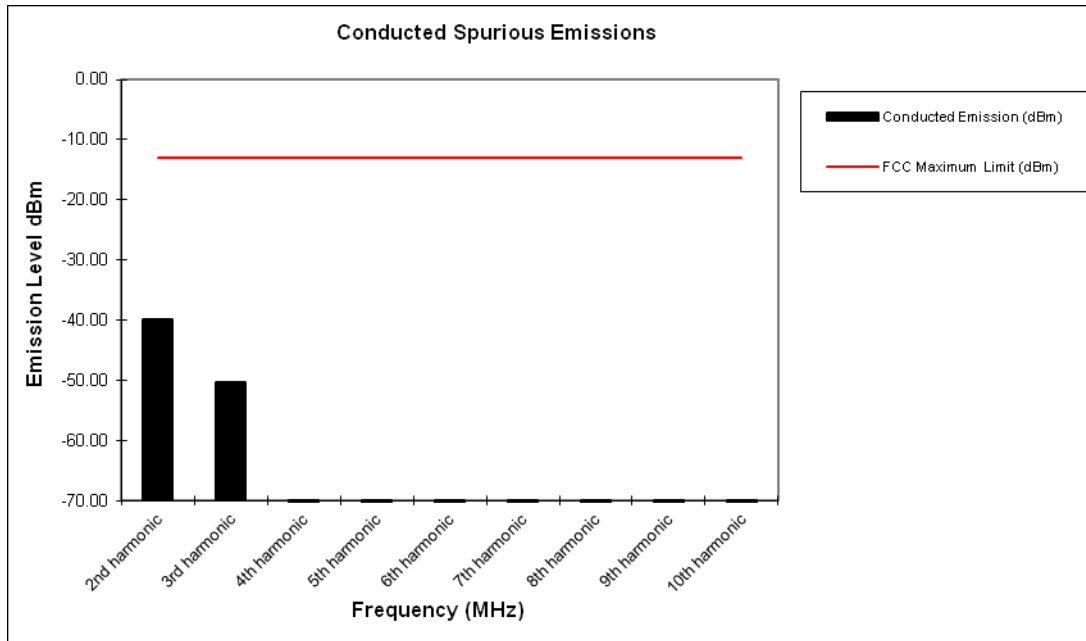
Notes:

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: GSM 1900

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-39.91
3rd harmonic	-13	-50.24
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



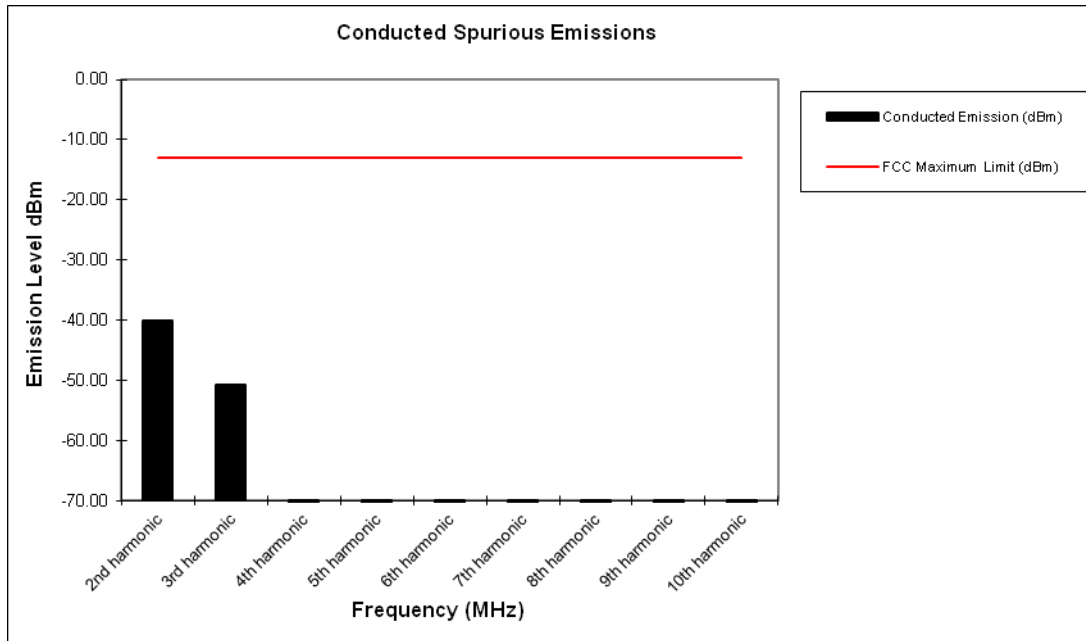
Notes:

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: EDGE 1900

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-40.01
3rd harmonic	-13	-50.78
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



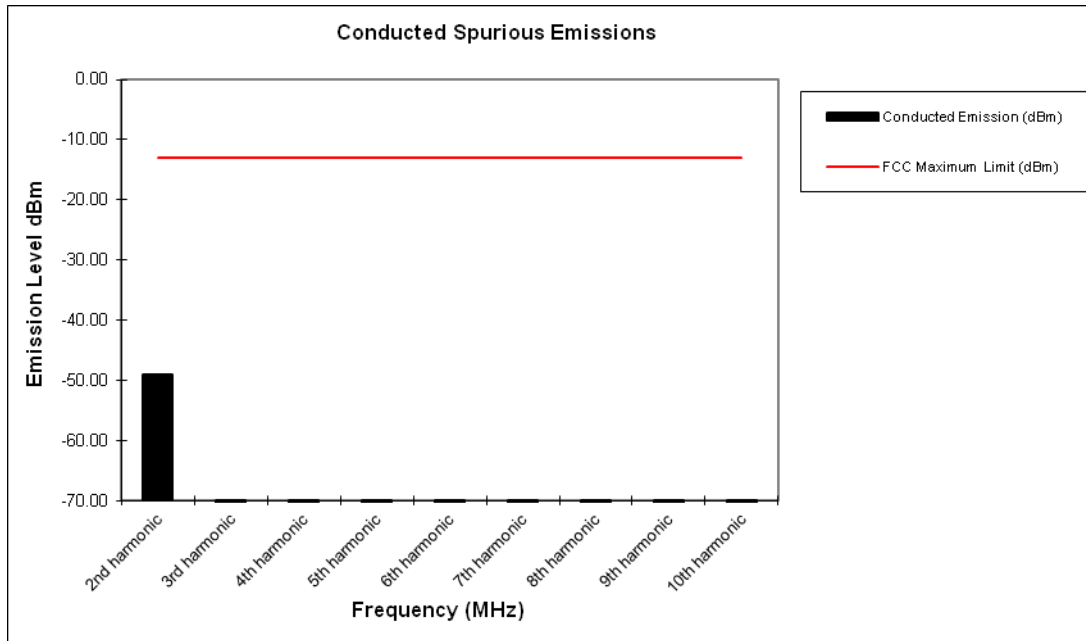
Notes:

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: WCDMA 850

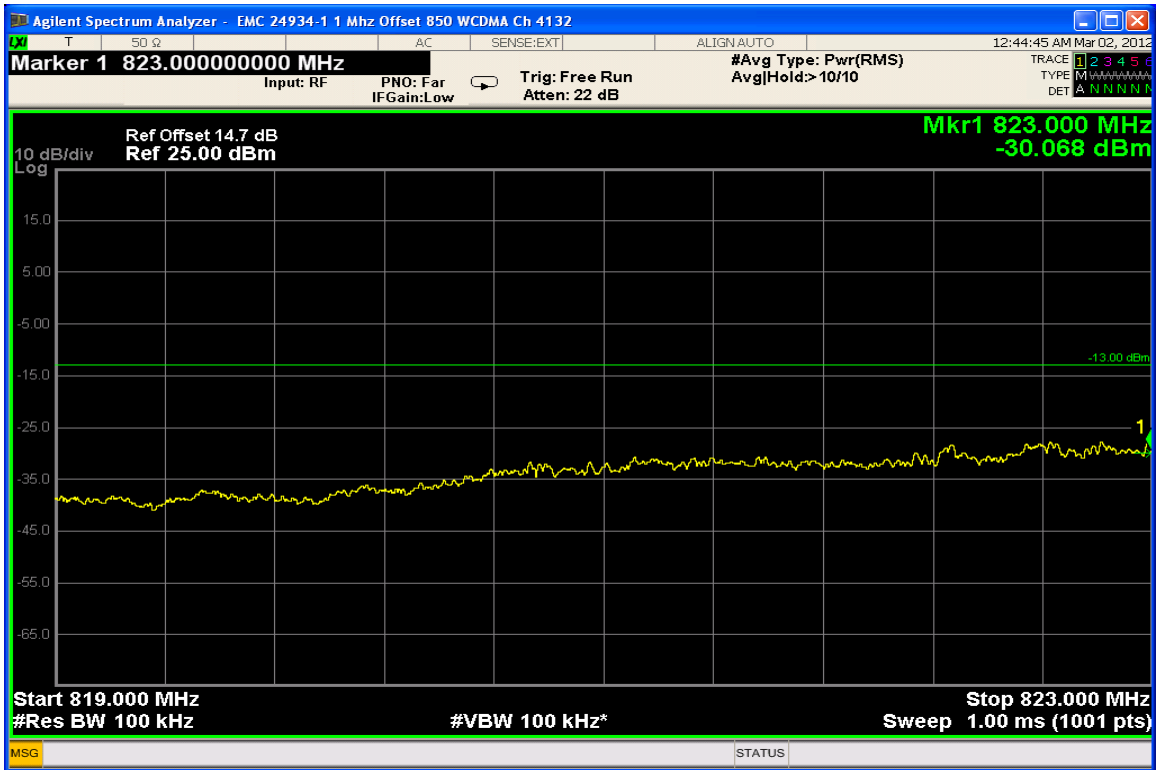
Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-49.01
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



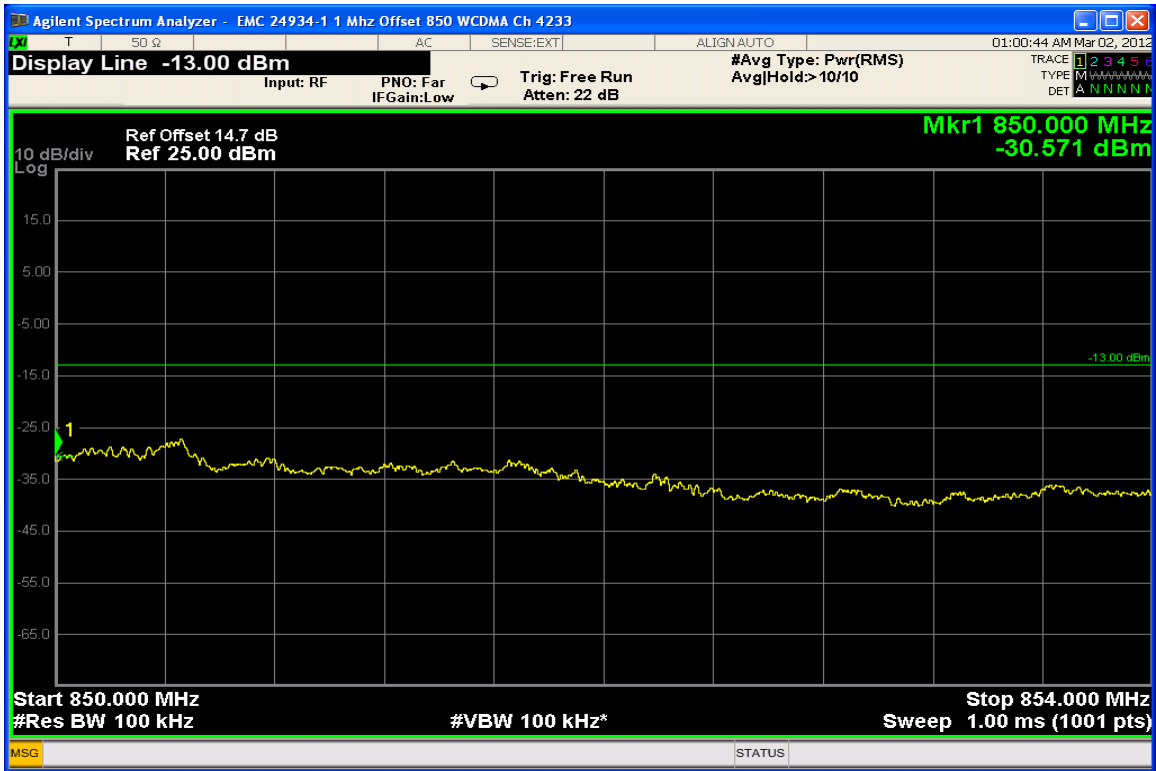
Notes:

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.



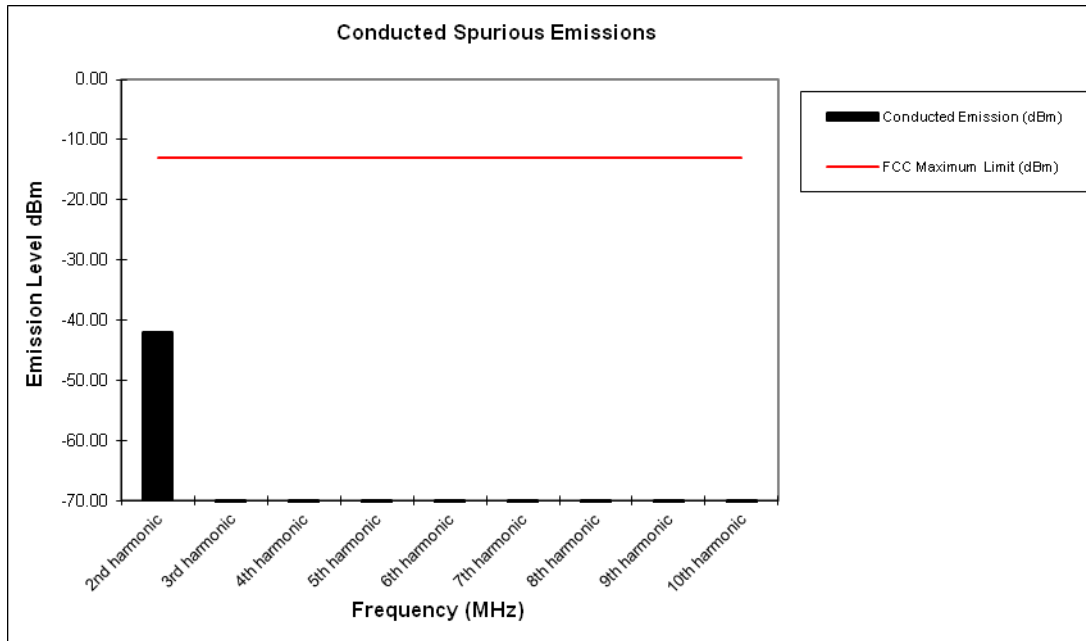
850 WCDMA Conducted Spurious Emissions (Lower adjacent 1 MHz band)



850 WCDMA Conducted Spurious Emissions (Upper adjacent 1 MHz band)

Measurement Results
Modulation: WCDMA 1700

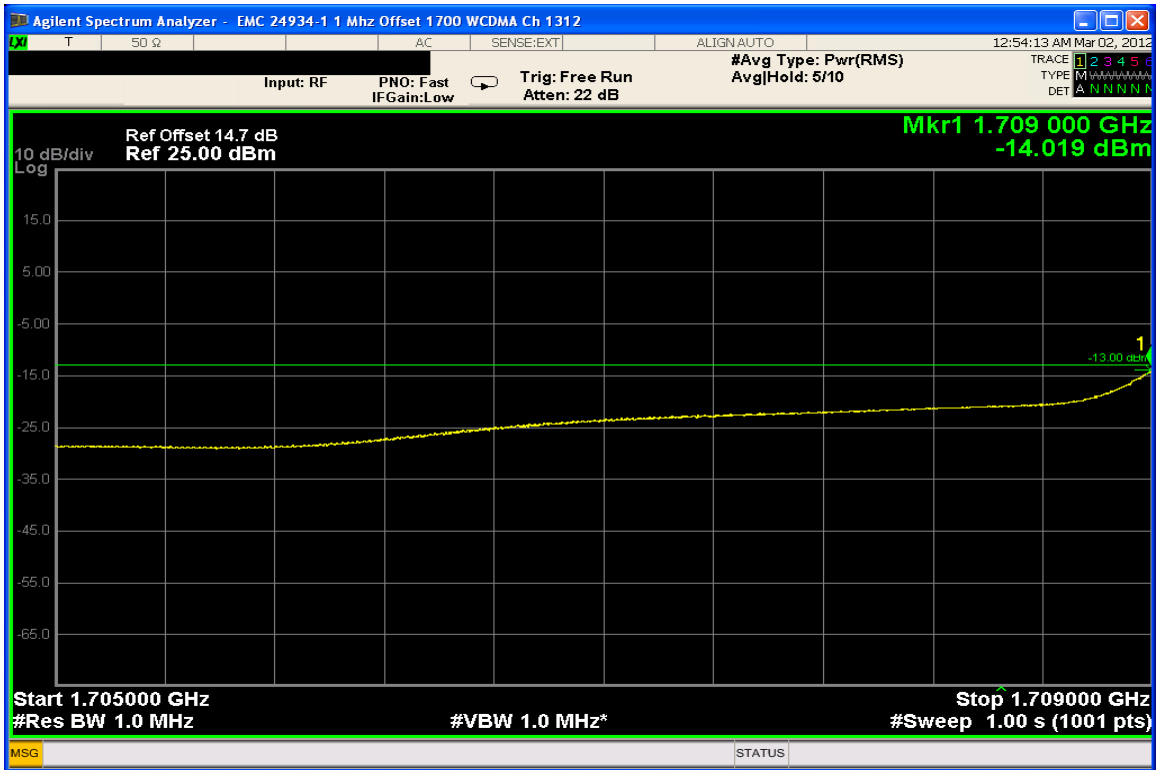
Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-42.11
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



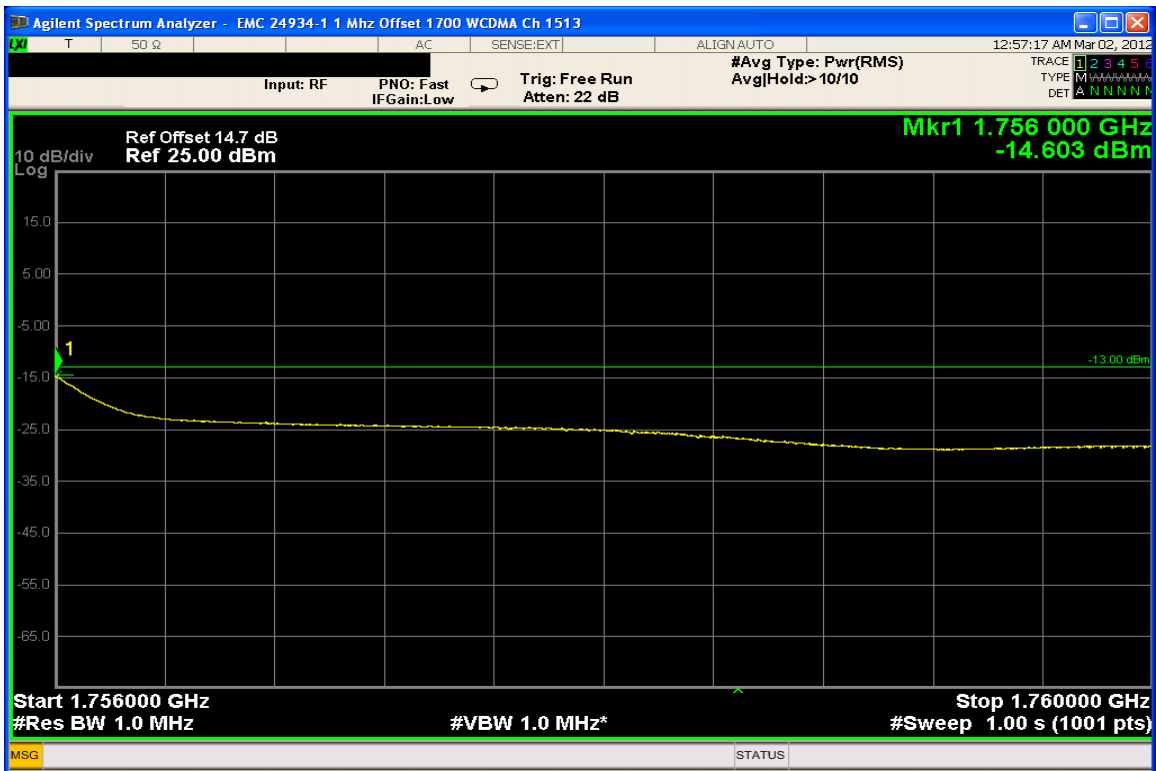
Notes:

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.



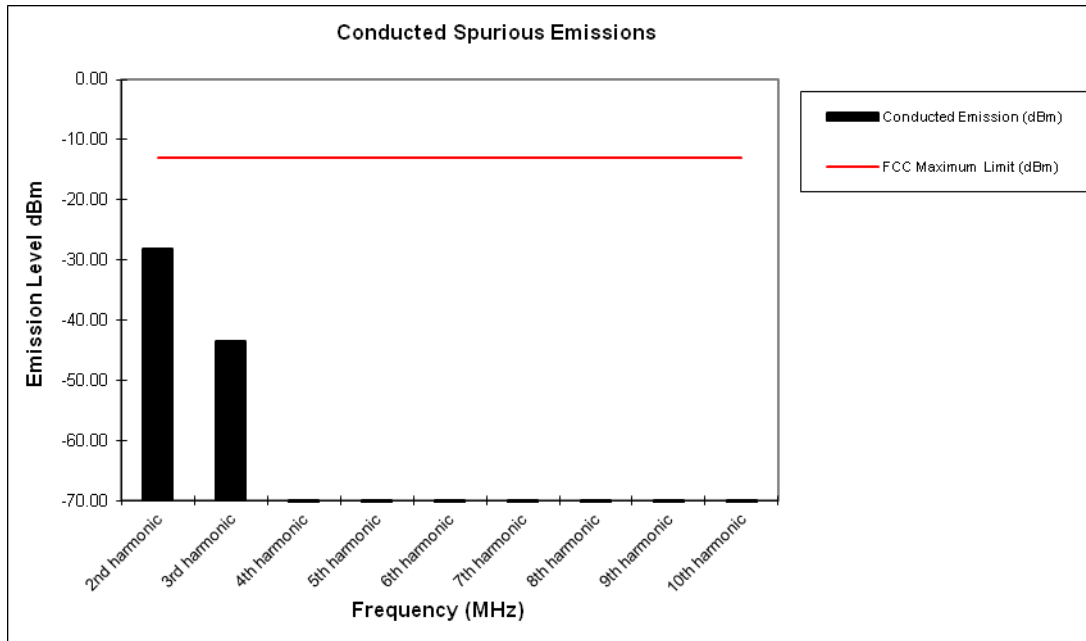
1700 WCDMA Conducted Spurious Emissions (Lower adjacent 1 MHz band)



1700 WCDMA Conducted Spurious Emissions (Upper adjacent 1 MHz band)

Measurement Results
Modulation: WCDMA 1900

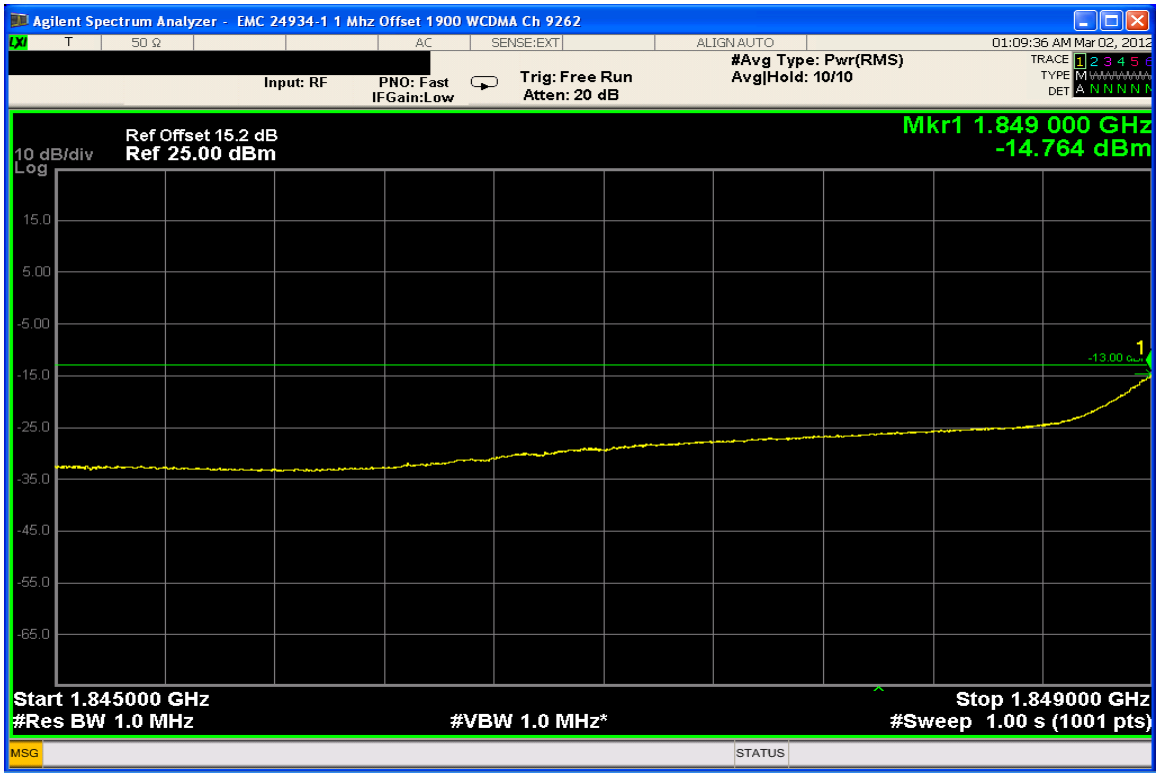
Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-28.25
3rd harmonic	-13	-43.51
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



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.



1900 WCDMA Conducted Spurious Emissions (Lower adjacent 1 MHz band)



1900 WCDMA Conducted Spurious Emissions (Upper adjacent 1 MHz band)

FIELD STRENGTH OF SPURIOUS EMISSIONS

Measurement Procedure

The EUT 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 EUT 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. Testing was performed in three orthogonal planes where the X plane is with the EUT orientated vertically, the Y plane is with the EUT orientated on its side and the Z plane with the EUT laying flat on the table. The worst case emission is reported for each tested mode.

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

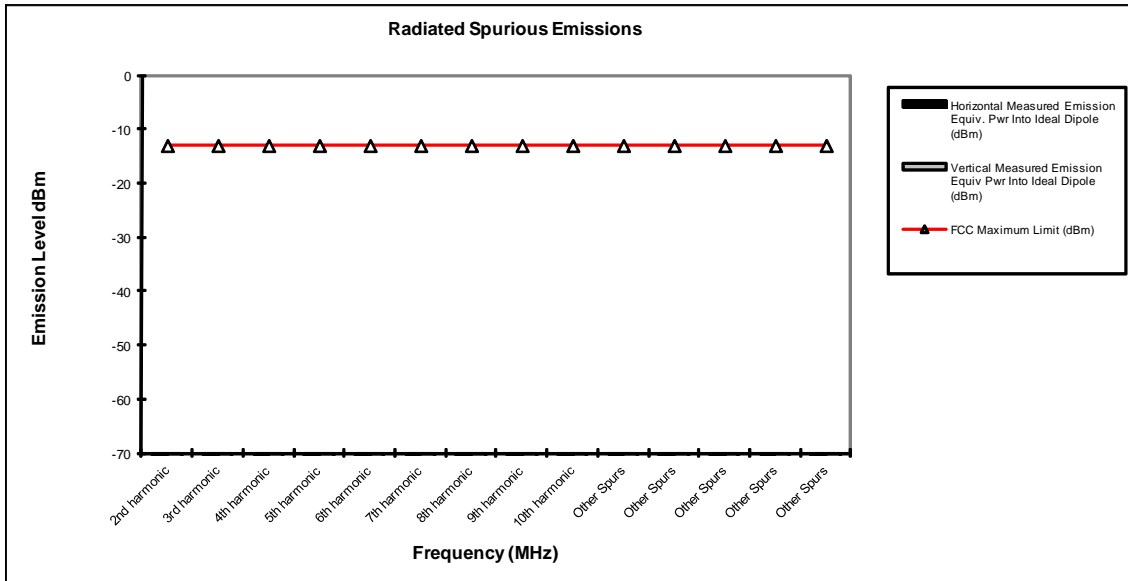
Measurement Results

Attached

**Measurement Results –
GSM 850, EDGE 850, WCDMA 850, WCDMA 1700, WCDMA 1900; all planes**

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:

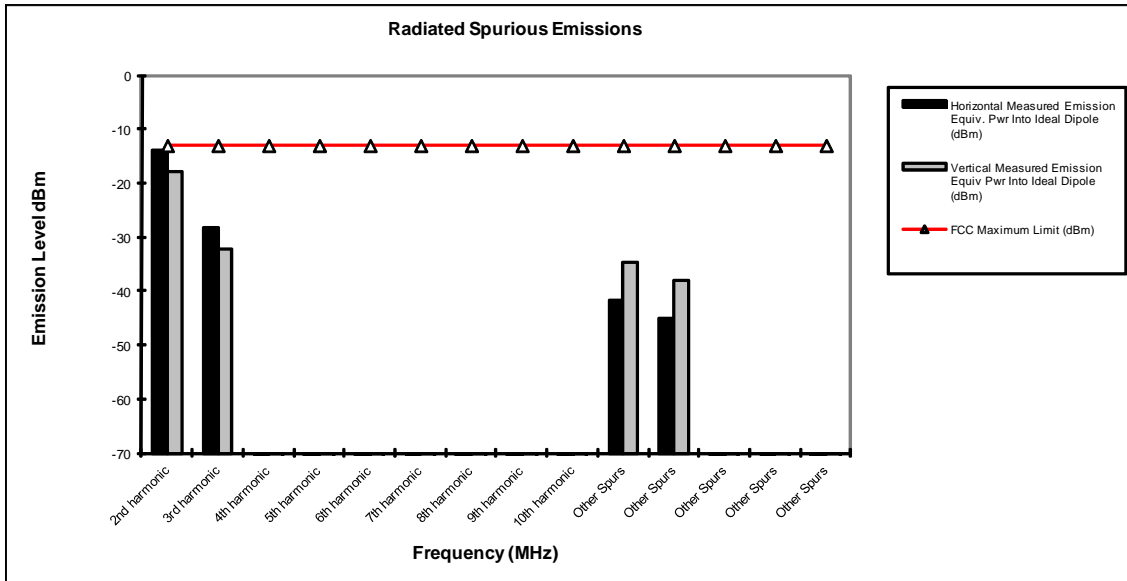
- * Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are lower than -33 dBm.
- Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
- The Spectrum was investigated 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 –GSM 1900; Y plane

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	-13.9	-17.7
3rd harmonic	-13	-28.3	-32.2
4th harmonic	-13	*	*
5th harmonic	-13	*	*
6th harmonic	-13	*	*
7th harmonic	-13	*	*
8th harmonic	-13	*	*
9th harmonic	-13	*	*
10th harmonic	-13	*	*
Other Spurs	-13	-41.6	-34.6
Other Spurs	-13	-45.1	-38.2
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*



Notes:

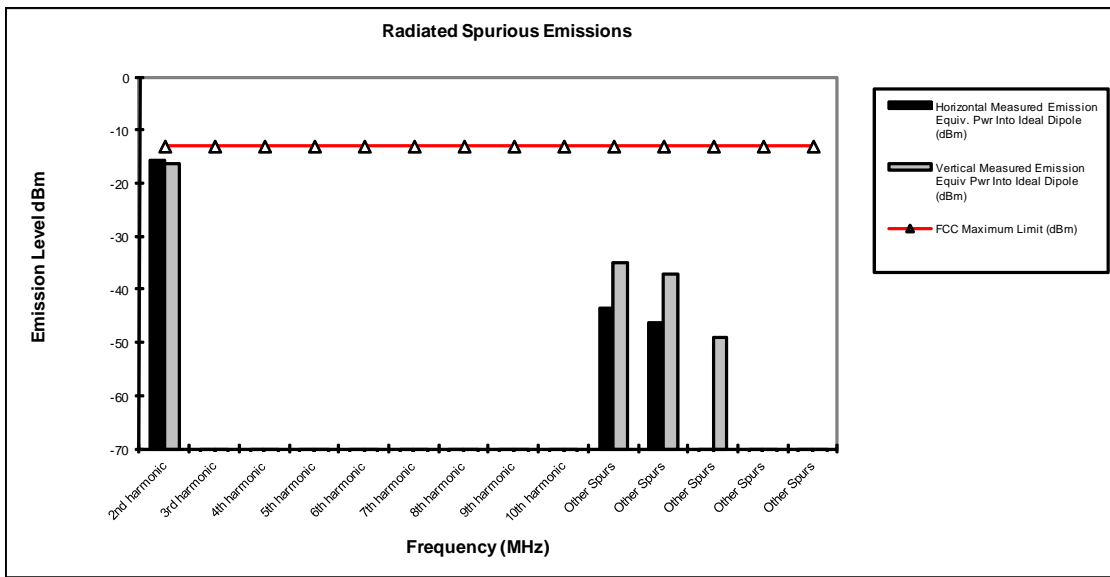
- * Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are lower than -33 dBm.
- Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
- The Spectrum was investigated 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 –EDGE 1900; Y plane

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	-15.7	-16.4
3rd harmonic	-13	*	*
4th harmonic	-13	*	*
5th harmonic	-13	*	*
6th harmonic	-13	*	*
7th harmonic	-13	*	*
8th harmonic	-13	*	*
9th harmonic	-13	*	*
10th harmonic	-13	*	*
Other Spurs	-13	-43.5	-35.0
Other Spurs	-13	-46.4	-37.2
Other Spurs	-13	*	-49.0
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 lower than -33 dBm.
- 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.

FREQUENCY STABILITY

Measurement Procedure

The EUT is placed in an environmental chamber. The antenna port of the EUT 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°C to $+60^{\circ}\text{C}$ and at intervals of 10°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

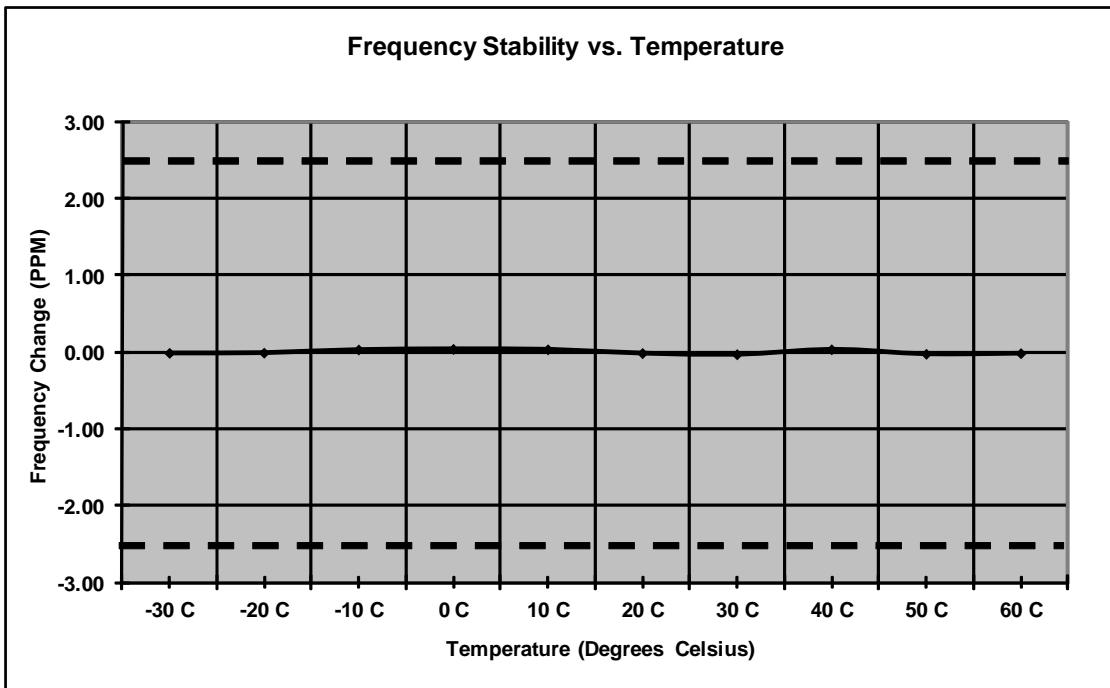
Measurement Results
Modulation: GSM 850

Frequency Stability

Mode: GSM 850
Channel: 190

Operating Frequency: 836.6 MHz
Deviation Limit (PPM): ±2.5ppm

Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	-18.07	-0.022	100%	3.80
-20 C	-15.26	-0.018	100%	3.80
-10 C	18.50	0.022	100%	3.80
0 C	25.78	0.031	100%	3.80
10 C	21.32	0.025	100%	3.80
20 C	-19.97	-0.024	100%	3.80
30 C	-32.38	-0.039	100%	3.80
40 C	21.50	0.026	100%	3.80
50 C	-27.15	-0.032	100%	3.80
60 C	-20.86	-0.025	100%	3.80
20 C	-24.18	-0.029	Battery Endpoint	3.42



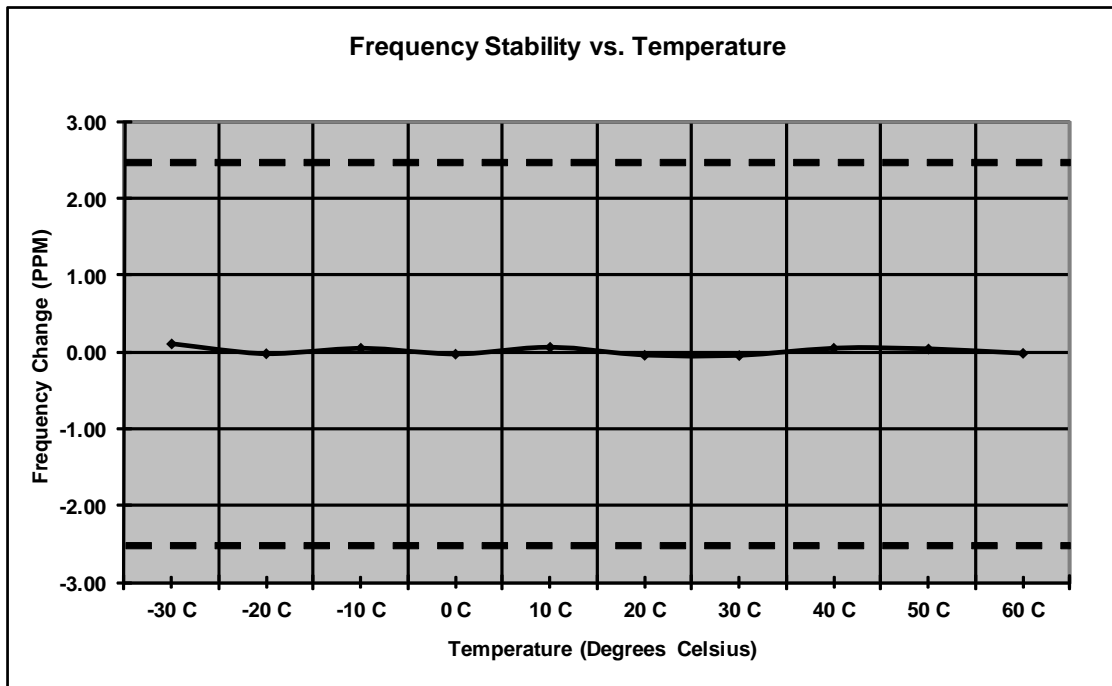
Measurement Results
Modulation: EDGE 850

Frequency Stability

Mode: EDGE 850
Channel: 190

Operating Frequency: 836.6 MHz
Deviation Limit (PPM): ±2.5ppm

Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	85.07	0.102	100%	3.80
-20 C	-21.90	-0.026	100%	3.80
-10 C	37.18	0.044	100%	3.80
0 C	-26.35	-0.031	100%	3.80
10 C	48.58	0.058	100%	3.80
20 C	-38.83	-0.046	100%	3.80
30 C	-41.74	-0.050	100%	3.80
40 C	36.98	0.044	100%	3.80
50 C	29.58	0.035	100%	3.80
60 C	-18.40	-0.022	100%	3.80
20 C	41.59	0.050	Battery Endpoint	3.42



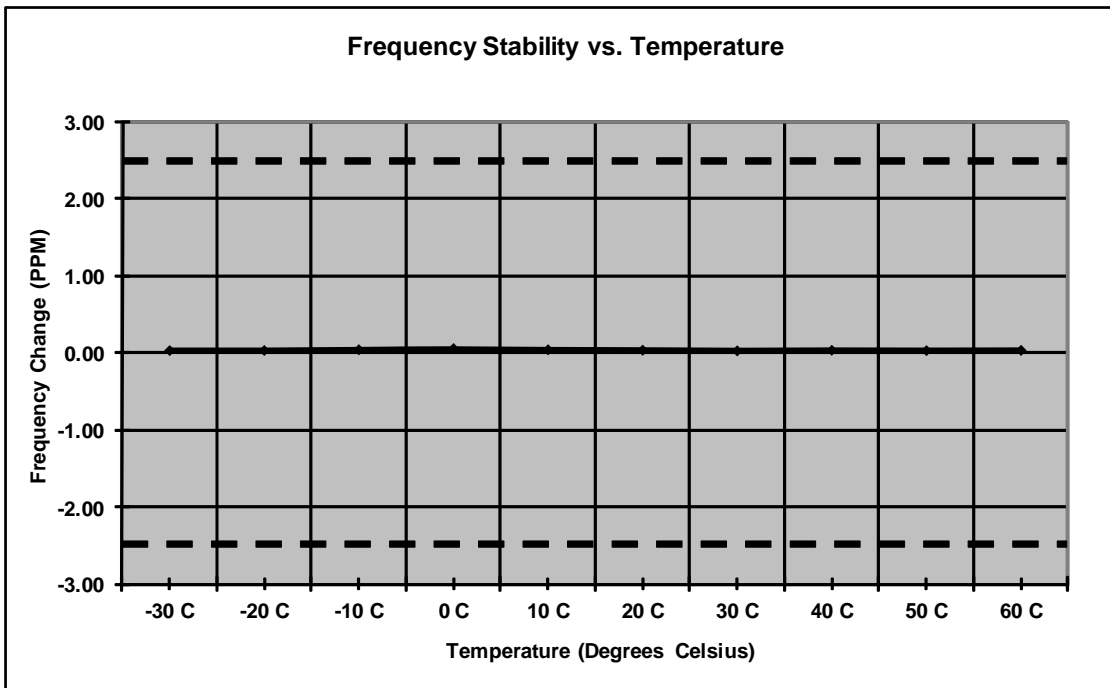
Measurement Results
Modulation: GSM 1900

Frequency Stability

Mode: GSM 1900
Channel: 661

Operating Frequency: 1880.0 MHz
Deviation Limit (PPM): ±2.5ppm

Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	47.55	0.025	100%	3.80
-20 C	48.70	0.026	100%	3.80
-10 C	70.14	0.037	100%	3.80
0 C	94.55	0.050	100%	3.80
10 C	68.58	0.036	100%	3.80
20 C	57.86	0.031	100%	3.80
30 C	39.55	0.021	100%	3.80
40 C	53.41	0.028	100%	3.80
50 C	46.44	0.025	100%	3.80
60 C	51.73	0.028	100%	3.80
20 C	59.74	0.032	Battery Endpoint	3.42



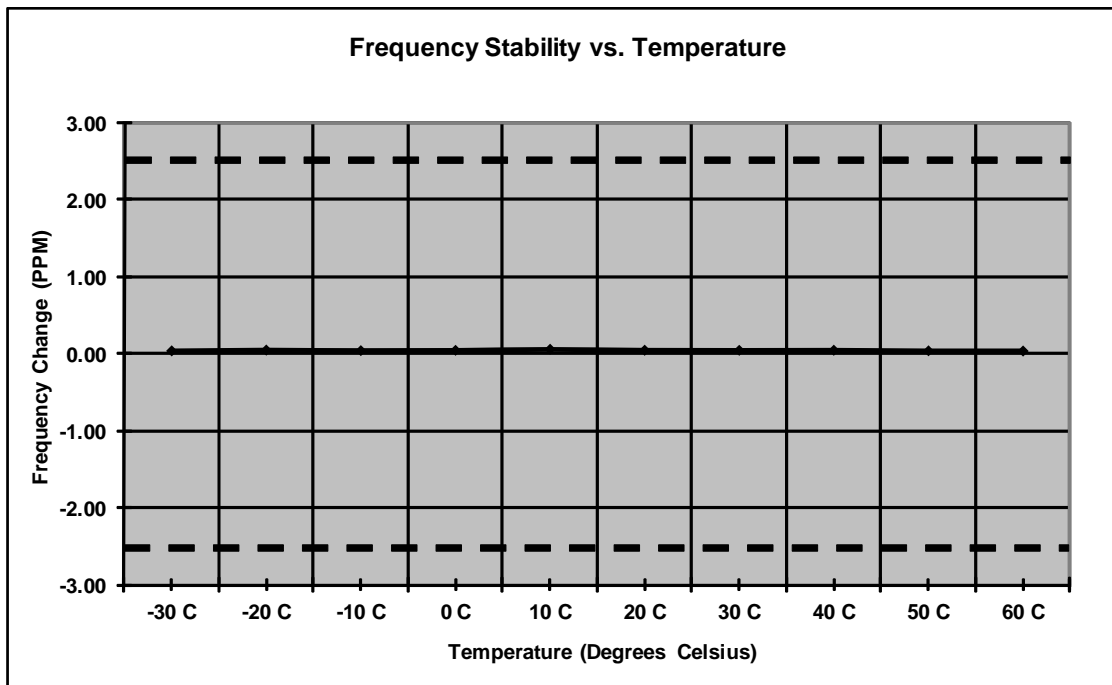
Measurement Results
Modulation: EDGE 1900

Frequency Stability

Mode: EDGE 1900
Channel: 661

Operating Frequency: 1880.0 MHz
Deviation Limit (PPM): ±2.5ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
C	HZ	(PPM)	(%)	(VDC)
-30 C	58.57	0.031	100%	3.80
-20 C	78.83	0.042	100%	3.80
-10 C	66.15	0.035	100%	3.80
0 C	72.95	0.039	100%	3.80
10 C	99.63	0.053	100%	3.80
20 C	76.58	0.041	100%	3.80
30 C	73.22	0.039	100%	3.80
40 C	75.77	0.040	100%	3.80
50 C	62.09	0.033	100%	3.80
60 C	56.79	0.030	100%	3.80
20 C	85.94	0.046	Battery Endpoint	3.42



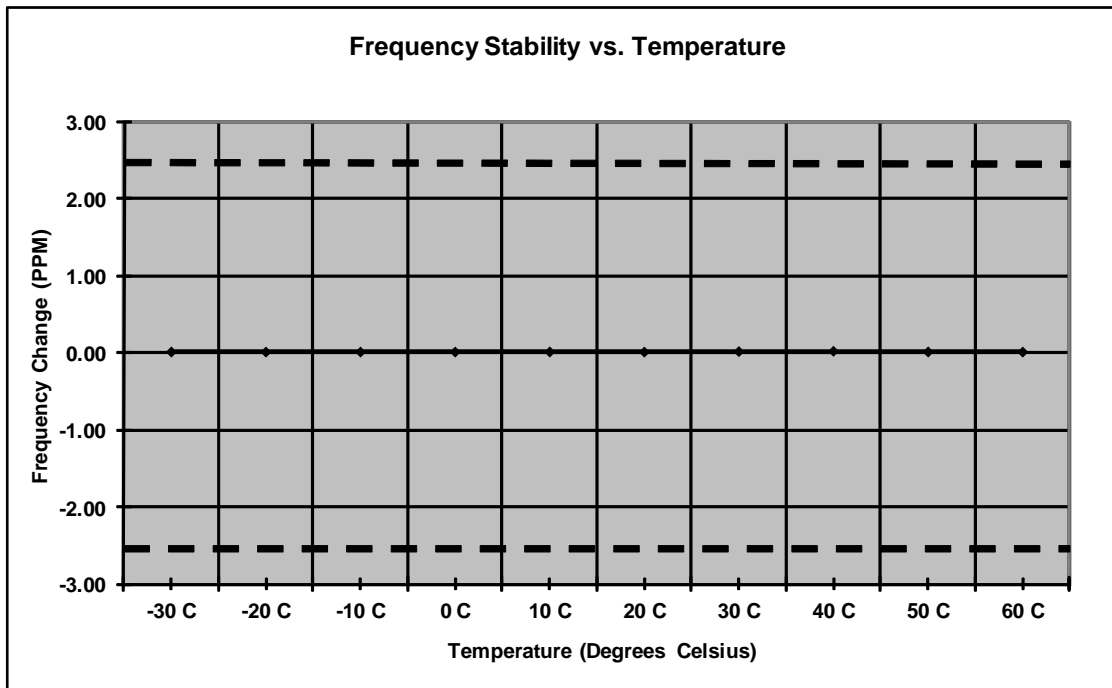
Measurement Results
Modulation: WCDMA 850

Frequency Stability

Mode: 850 WCDMA
Channel: 4180

Operating Frequency: 836
Deviation Limit (PPM): ±2.5ppm

Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	5.46	0.007	100%	3.80
-20 C	4.58	0.005	100%	3.80
-10 C	4.76	0.006	100%	3.80
0 C	4.81	0.006	100%	3.80
10 C	5.46	0.007	100%	3.80
20 C	5.35	0.006	100%	3.80
30 C	9.86	0.012	100%	3.80
40 C	13.48	0.016	100%	3.80
50 C	5.47	0.007	100%	3.80
60 C	4.93	0.006	100%	3.80
20 C	4.73	0.006	Battery Endpoint	3.42

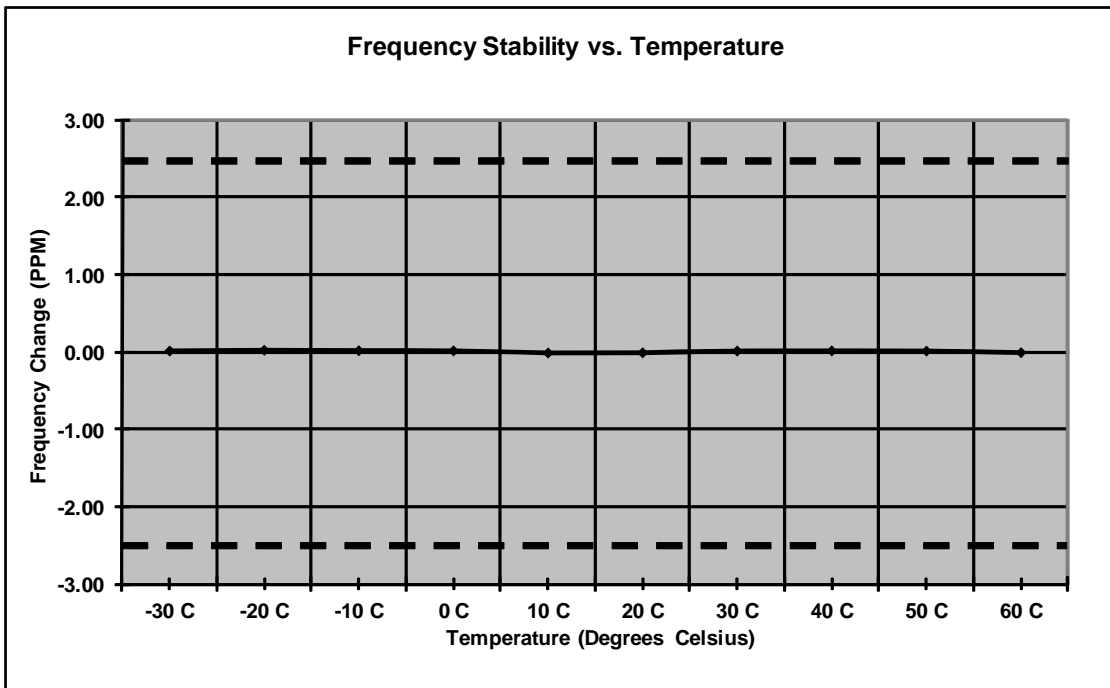


Measurement Results
Modulation: WCDMA 1700

Frequency Stability

Mode: WCDMA 1700 **Operating Frequency:** 1732.5 MHz
Channel: 1413 **Deviation Limit (PPM):** ±2.5ppm

Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	8.46	0.010	100%	3.80
-20 C	15.35	0.018	100%	3.80
-10 C	11.29	0.013	100%	3.80
0 C	9.03	0.011	100%	3.80
10 C	-13.34	-0.016	100%	3.80
20 C	-11.54	-0.014	100%	3.80
30 C	8.34	0.010	100%	3.80
40 C	8.88	0.011	100%	3.80
50 C	7.16	0.009	100%	3.80
60 C	-10.05	-0.012	100%	3.80
20 C	10.32	0.012	Battery Endpoint	3.42

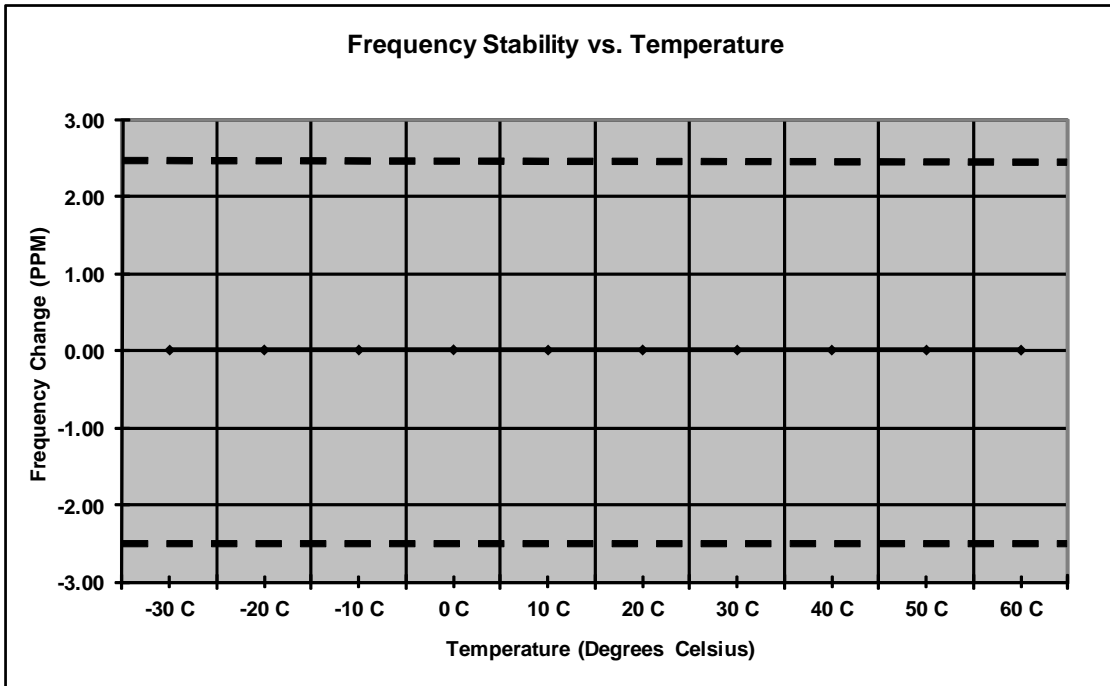


Measurement Results
Modulation: WCDMA 1900

Frequency Stability

Mode: WCDMA 1900 **Operating Frequency:** 1880.0 MHz
Channel: 9400 **Deviation Limit (PPM):** ±2.5ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
C	HZ	(PPM)	(%)	(VDC)
-30 C	10.79	0.006	100%	3.80
-20 C	13.63	0.007	100%	3.80
-10 C	12.74	0.007	100%	3.80
0 C	18.24	0.010	100%	3.80
10 C	11.33	0.006	100%	3.80
20 C	12.62	0.007	100%	3.80
30 C	10.17	0.005	100%	3.80
40 C	10.81	0.006	100%	3.80
50 C	11.46	0.006	100%	3.80
60 C	9.19	0.005	100%	3.80
20 C	10.44	0.006	Battery Endpoint	3.42



End of Test Report