MOBILE DEVICES BUSINESS

PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY

EMC TEST REPORT

Test Report Number – 25428-1

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.

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 27, 2013

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Test Report Details

Tests Performed By:	ADR Testing Service Location Code: ADR LV Motorola Mobility LLC 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: 109O-1
Tests Requested By:	Motorola Mobility LLC 600 North US Hwy 45 Libertyville, IL 60048
Product Type:	Cellular Phone
Signaling Capability:	WCDMA 900/2100/1900/850, CDMA 1900/800, GSM/EDGE 850/900/1800/1900, LTE Band 04/Band 13, HSDPA 21.1 Mbps (Category 14), HSUPA 5.76 Mbps, CDMA EV-DO Release A, GPRS Class 12, aGPS , NFC, Bluetooth Class 2 Version 4.0 LE+EDR, 802.11b/802.11g/802.11a/802.11n
FCC ID:	IHDT56PE1
Serial Numbers:	LUME290019, LUME290021, LUME290002
Dates of Test:	May 29 - June 26, 2013

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 63.4 2003, ANSI/TIA-603-C-2004,
RSS-Gen Issue 3, RSS-132 Issue 3, RSS-133 Issue 6

Summary of Testing

Test #	Test Name	Pass/Fail
1	ERP (Effective Radiated Power)	Pass
2	EIRP (Effective Isotropic Radiated Power)	Pass
3	Occupied Bandwidth	Pass
4	Spurious Emissions at Antenna Terminal	Pass
5	Field Strength of Spurious Emissions	Pass
6	Frequency Stability	Pass

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.

This product implements wireless charging capabilities based on the Wireless Power Consortium (WPC) protocol. Additional emissions tests were performed with the EUT placed on an appropriate wireless charging pad under normal operating conditions. The additional tests were performed per KDB 64847 D03 v01r02.

All testing was performed 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	ESIB26	838786/010	9/24/2013
Hewlett Packard	EMC Analyzer	E7405	US40240219	7/30/2013
Agilent	MXA Signal Analyzer	N9020A	US46470586	1/20/2014
Agilent	Signal Generator	83712A	3429A00286	4/10/2015
ETS-Lindgren	Horn Antenna	3115	6222	7/26/2013
A. H. Systems	Horn Antenna	SAS 200/571	365	9/4/2013
ETS	Log-Periodic Antenna	3148	1188	9/6/2013
ETS	Biconical Antenna	3110B	3369	9/5/2013
Attenuator	Weinschel	AS-6	6675	NCR
Attenuator	Weinschel	AS-6	6677	NCR
Thermotron	Environmental Chamber	S-4	31580	11/15/2013
Agilent	Power Meter	E4416A	GB41293258	7/15/2013
Agilent	Power Sensor	E9323A	US40412067	8/29/2013
Rohde & Schwarz	Amplifier	TS-PR18	100073	9/5/2013
LG	Wireless Charging Pad	WCP-700	A1102WP000279	NA
LG	AC Adaptor	WCA-D01WT	TA120008836	NA

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.

The FCC ID of the LG Wireless Charging Pad is BEJWCP700.

RADIATED POWER (EIRP AND ERP)

Measurement Procedure

The equipment under test is placed inside the semi-anechoic chamber on a wooden table at the turntable center 3 meters from the receive antenna. 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 frequency, the antenna mast is raised and lowered from 1 to 4 meters to obtain the same 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 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 EUT was tested in all configurations and the highest power level is reported.

All measurements were performed per KDB 971168 DO1 Power Meas License Digital Systems v02r01. Section 5.1.1, with an RMS detector, was used for GSM/Edge ERP/EIRP measurements and section 5.2.1 was used for CDMA/WCDMA ERP/EIRP measurements.

Measurement Results

Band	ERP dBm	Limit dBm
CDMA 800	21.58	38.45
GSM 850	27.78	38.45
EDGE 850	25.50	38.45
WCDMA 850	18.13	38.45

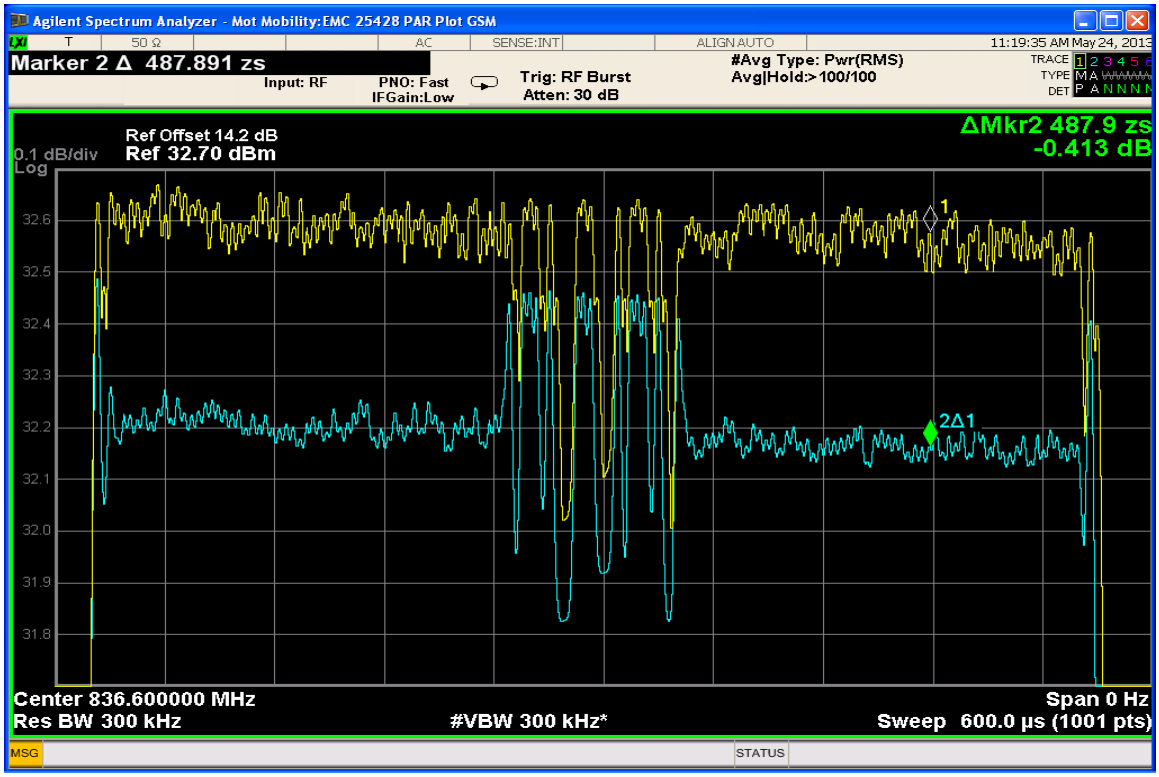
Band	EIRP dBm	Limit dBm
CDMA 1900	25.58	33.01
GSM 1900	30.52	33.01
EDGE 1900	28.95	33.01
WCDMA 1900	22.61	33.01

For GSM and EDGE modes, the PAR plots are shown below. The conducted port of the EUT is connected to the spectrum analyzer. Except for the detector used and the trace type, all spectrum analyzer settings are the same for both plot traces as follows:

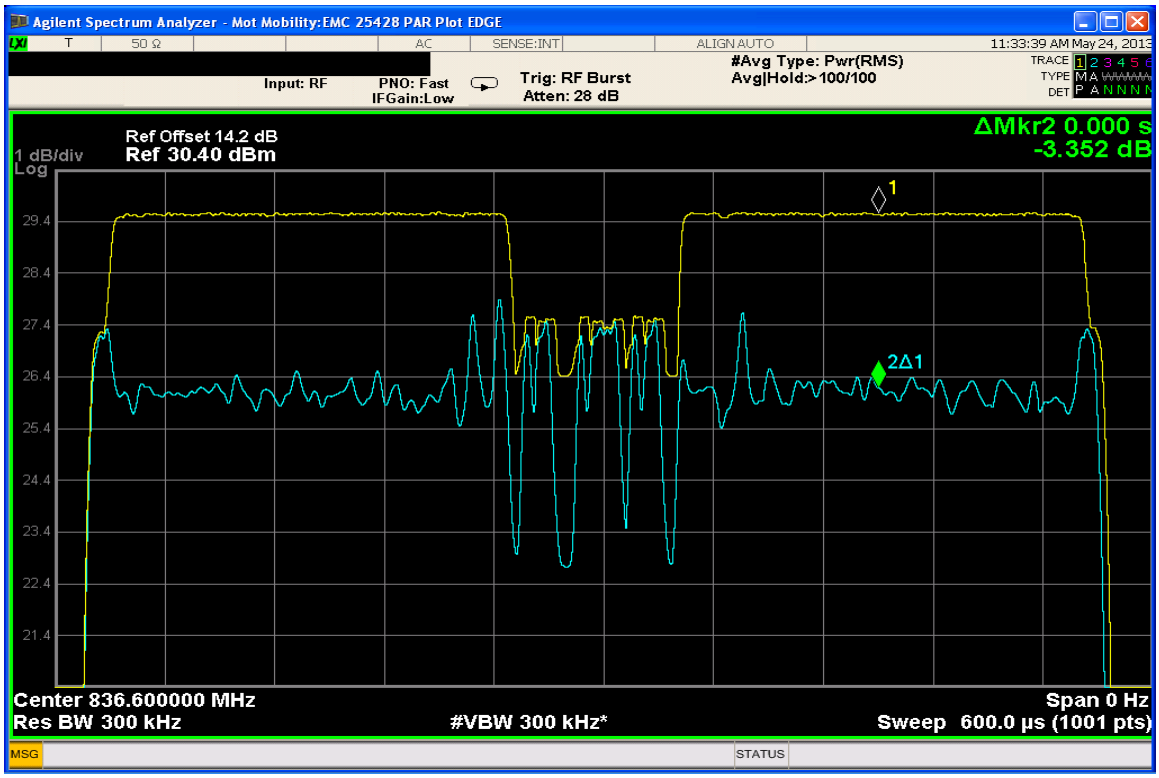
Resolution Bandwidth 300 kHz
Video Bandwidth 300 kHz
Span 0 Hz
Sweep Time 600 µs
Trace 1 type is Max Hold and the detector is Peak.
Trace 2 type is average and the detector is Average.

For CDMA and WCDMA modes, the CCDF plots are also shown below. The conducted port of the EUT is connected to the spectrum analyzer. The spectrum analyzer's Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth.

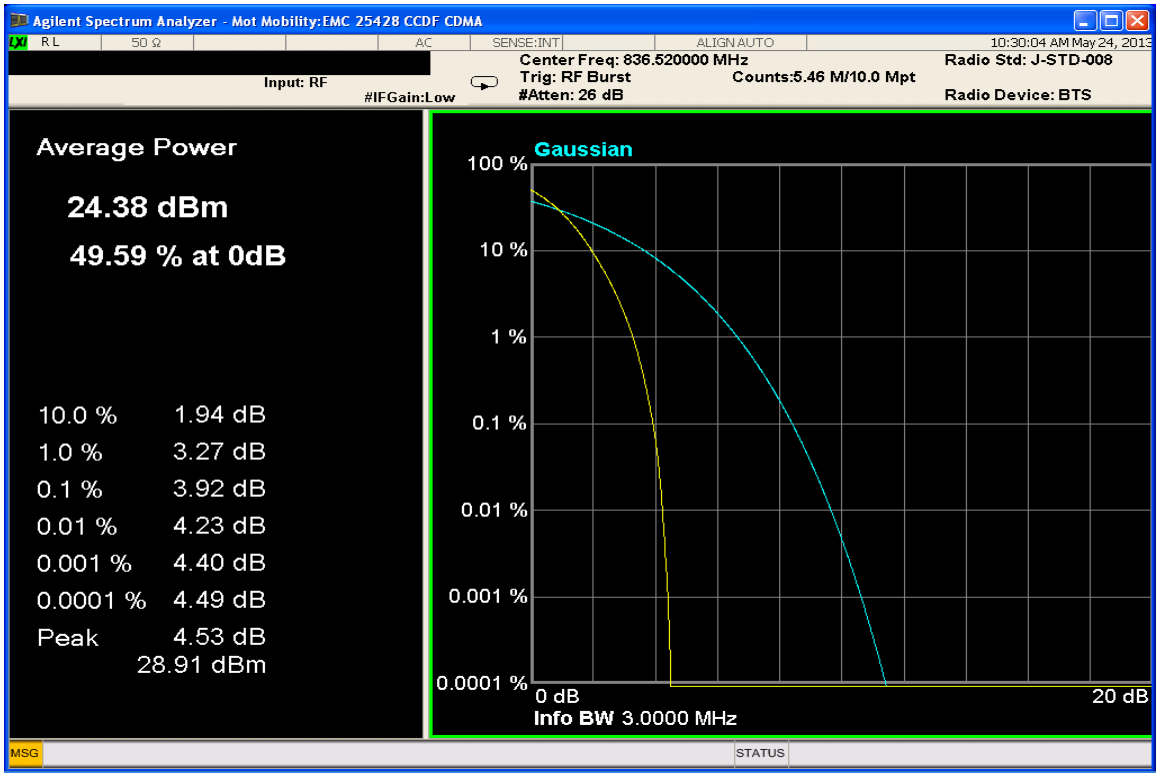
The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.



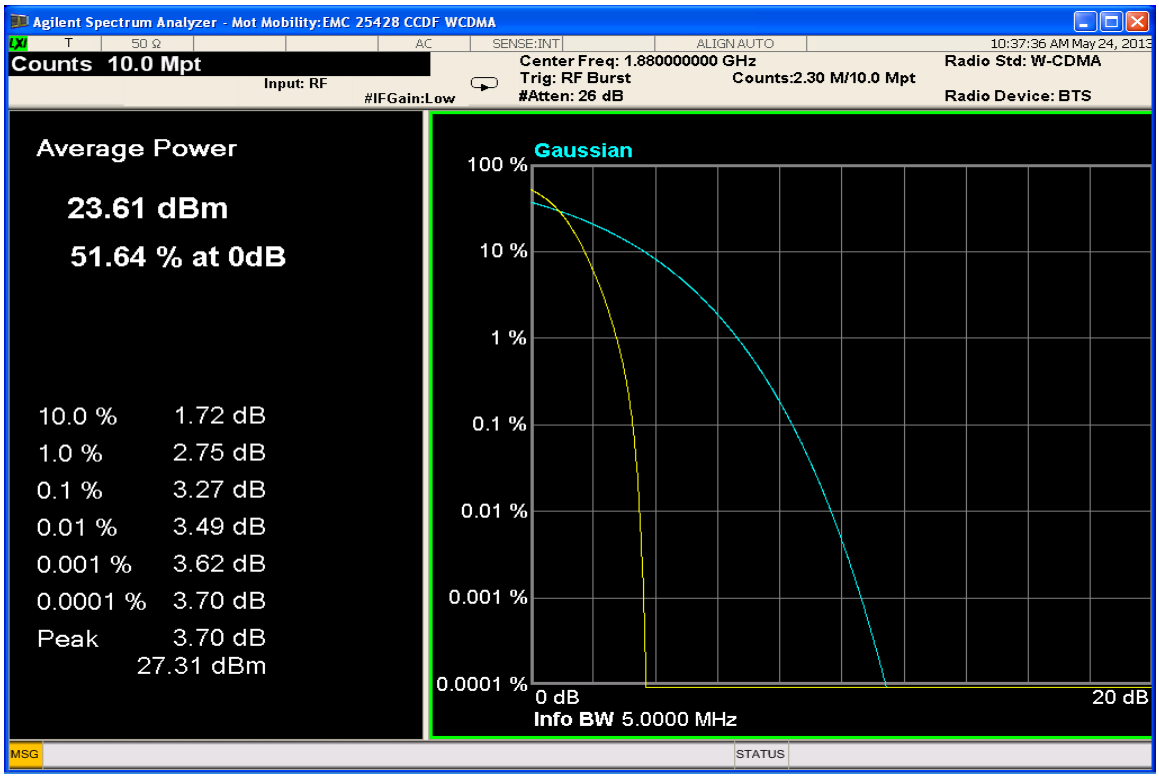
GSM 850 – PAR Plot



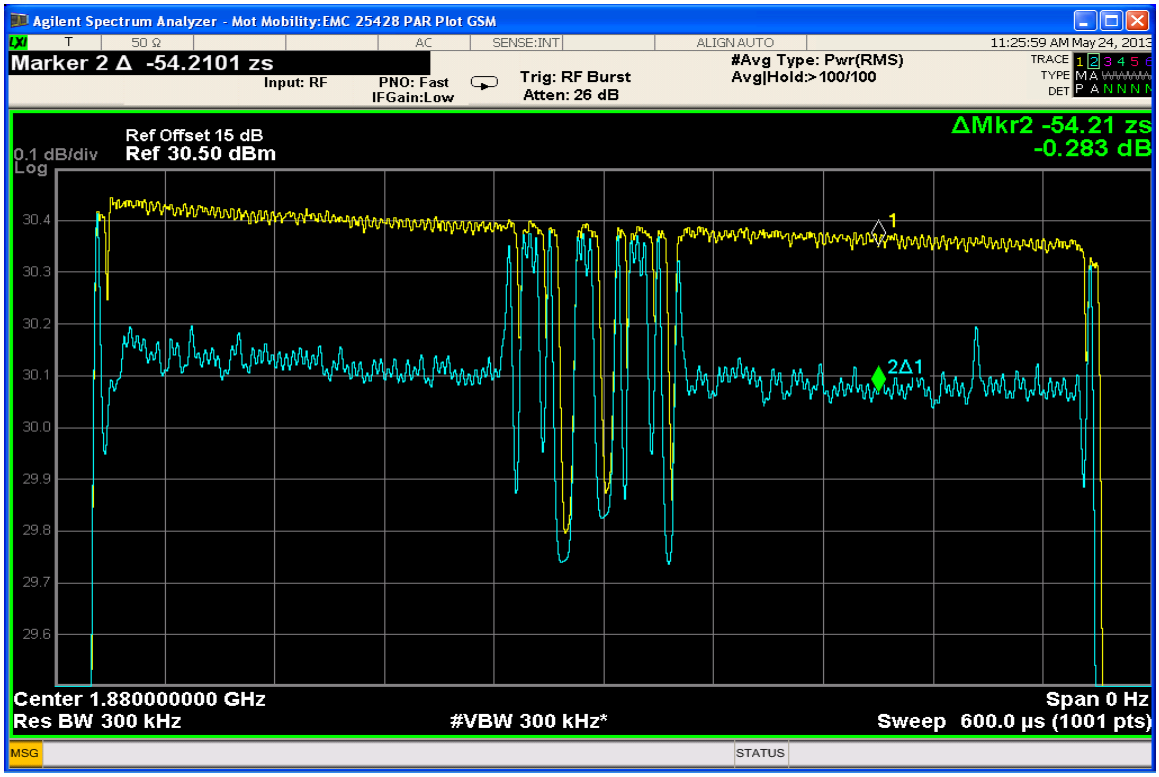
EDGE 850 – PAR Plot



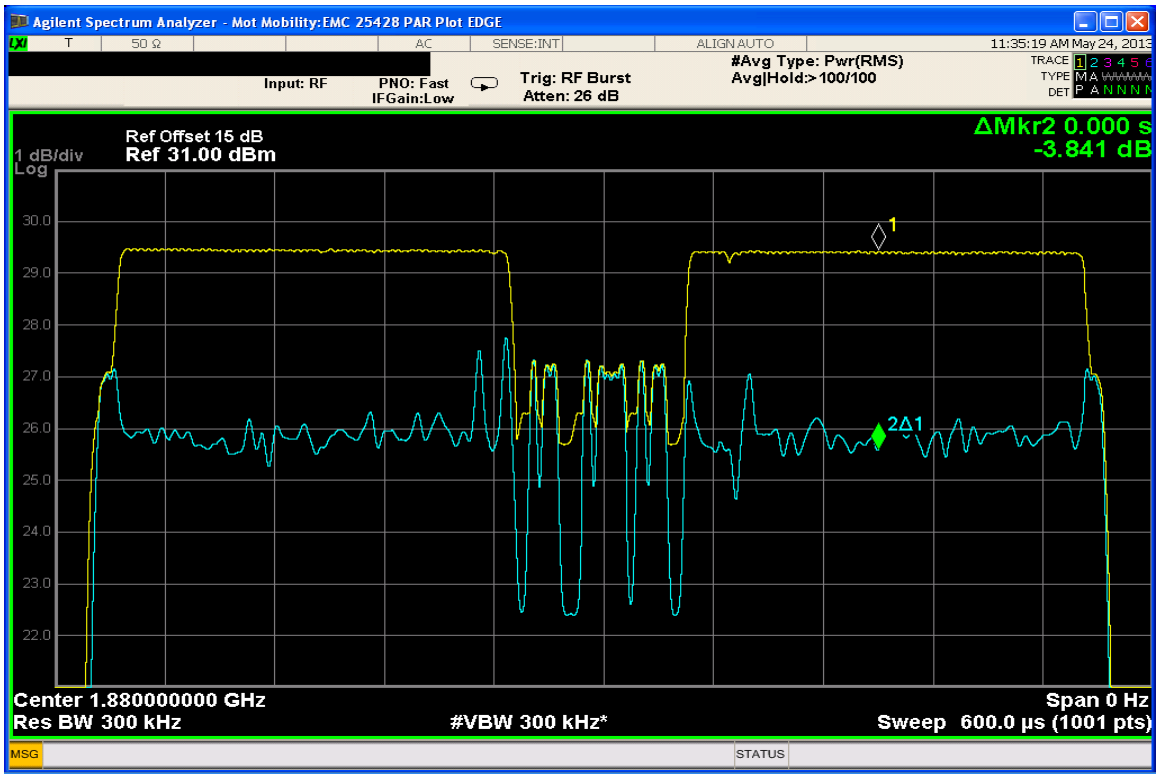
CDMA 800 – CCDF Plot



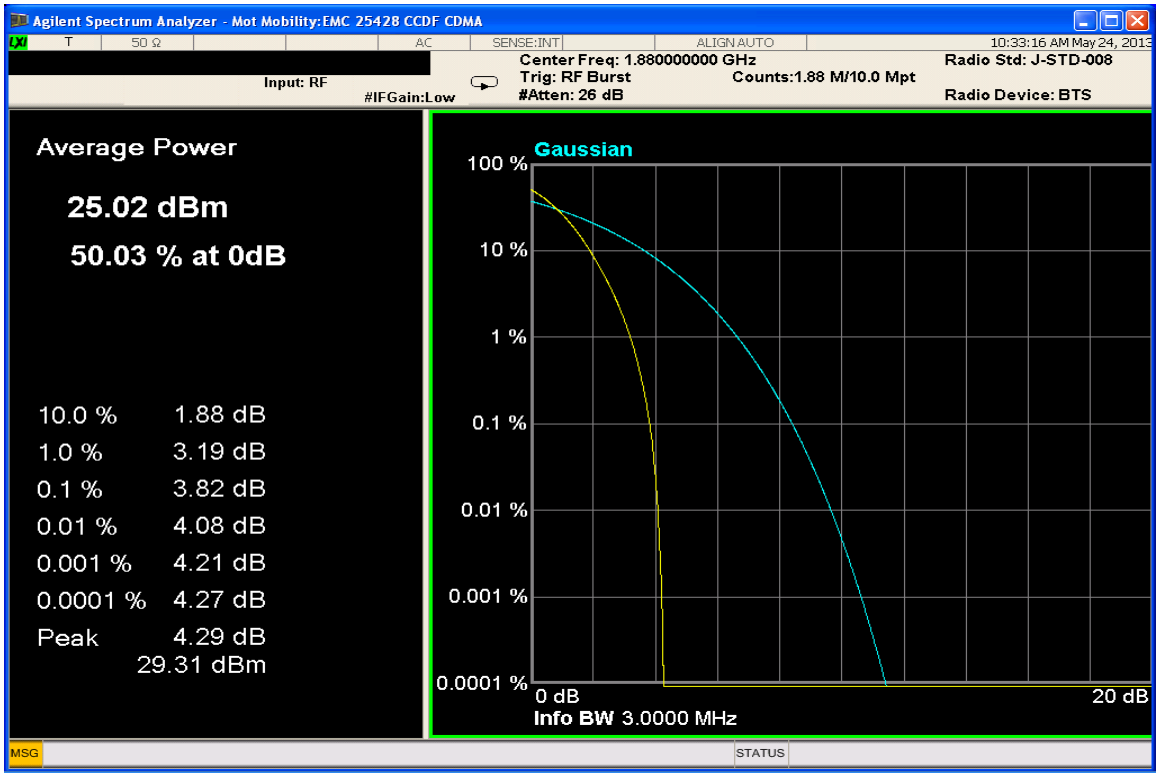
WCDMA 850 – CCDF Plot



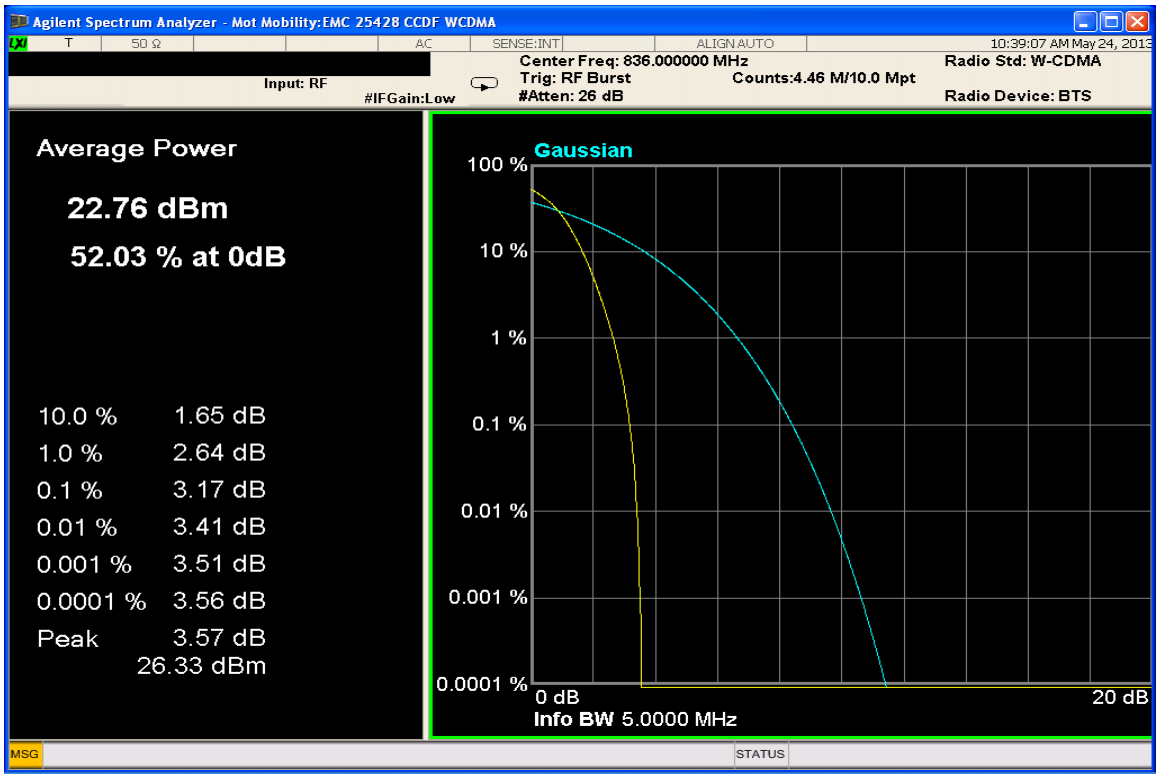
GSM 1900 – PAR Plot



EDGE 1900 – PAR Plot



CDMA 1900 – CCDF Plot



WCDMA 1900 – CCDF Plot

OCCUPIED BANDWIDTH

Measurement Procedure

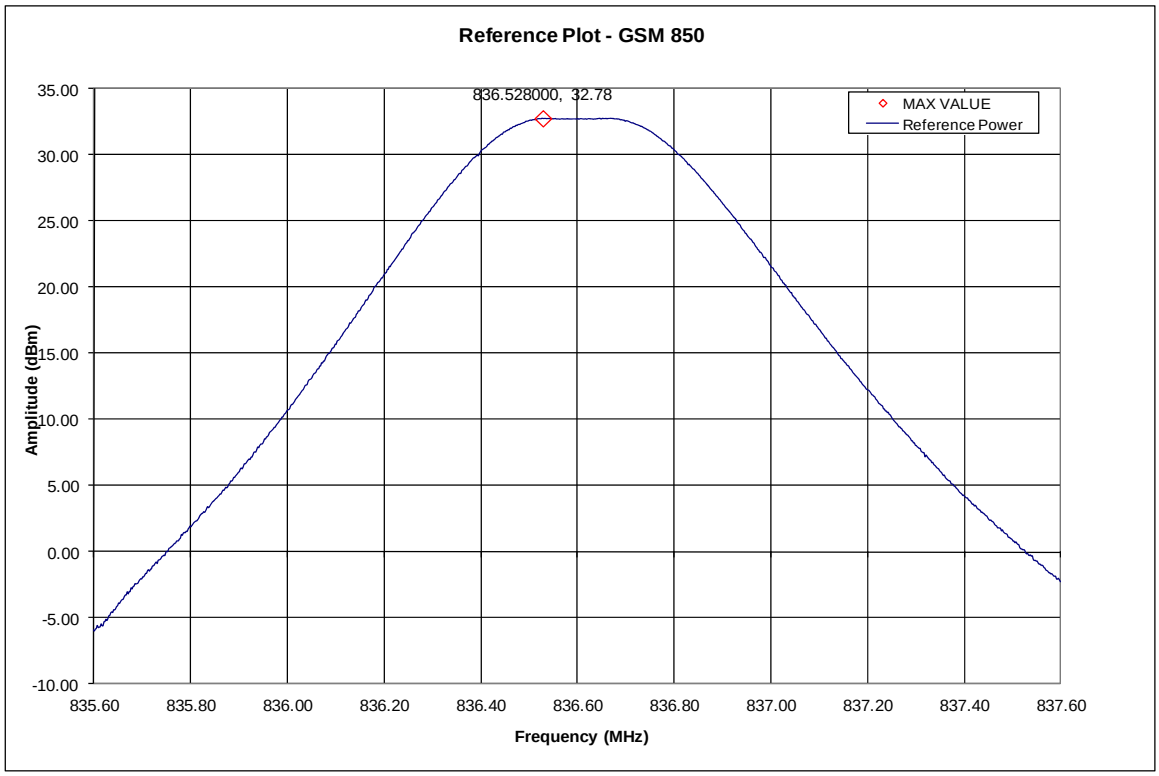
The RF output port of the EUT is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. The amplitude of the spectrum analyzer is corrected for the attenuator and any other applicable losses. The spectrum analyzer's Occupied Bandwidth measurement profile is used to determine the occupied bandwidth. 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.

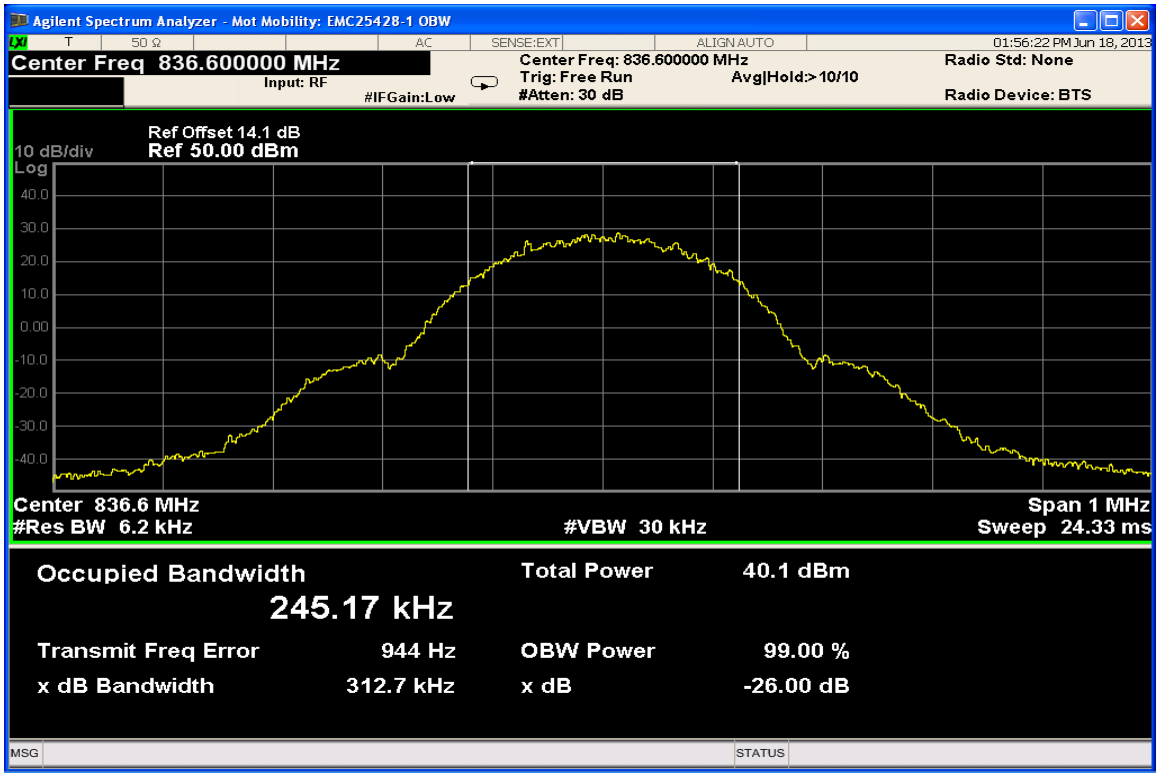
	Equipment Settings					
Plot	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Sweep Points (#)	Trace Mode	Detector	Samples (≥ #)
Reference Plot - GSM 850	300	Auto	1001	Max Hold	Peak	30
Lower Band Edge - GSM 850	1	Auto	2004	Max Hold	Peak	30
Upper Band Edge - GSM 850	1	Auto	2004	Max Hold	Peak	30
Reference Plot - GSM 1900	300	Auto	1001	Max Hold	Peak	30
Lower Band Edge - GSM 1900	1	Auto	2004	Max Hold	Peak	30
Upper Band Edge - GSM 1900	1	Auto	2004	Max Hold	Peak	30
Reference Plot - CDMA 800	3000	Auto	2001	Max Hold	Peak	100
Lower Band Edge - CDMA 800	1	Auto	2004	Max Hold	Peak	30
Upper Band Edge - CDMA 800	1	Auto	2004	Max Hold	Peak	30

Notes: 1) When the video bandwidth is set to Auto, the video bandwidth self adjusts for the resolution bandwidth.
2) The GSM plotted data shown for the band edge measurements is representative of data taken with a true 3kHz resolution bandwidth filter. The raw data was taken using a 1kHz resolution bandwidth and was integrated to produce a response representative of data taken using a true 3kHz resolution bandwidth filter.
3) The CDMA plotted data shown for the band edge measurements is representative of data taken with a true 13kHz resolution bandwidth filter. The raw data was taken using a 1kHz resolution bandwidth and was integrated to produce a response representative of data taken using a true 13kHz resolution bandwidth filter.

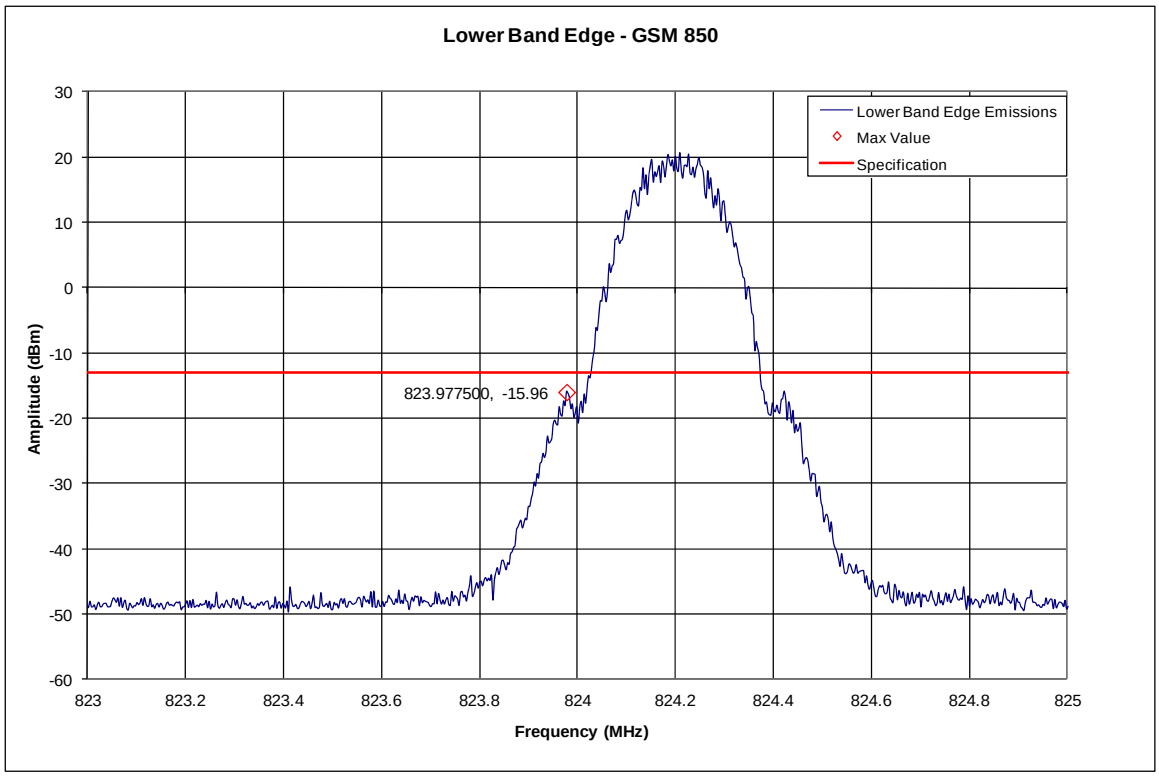
Measurement Results – GSM 850



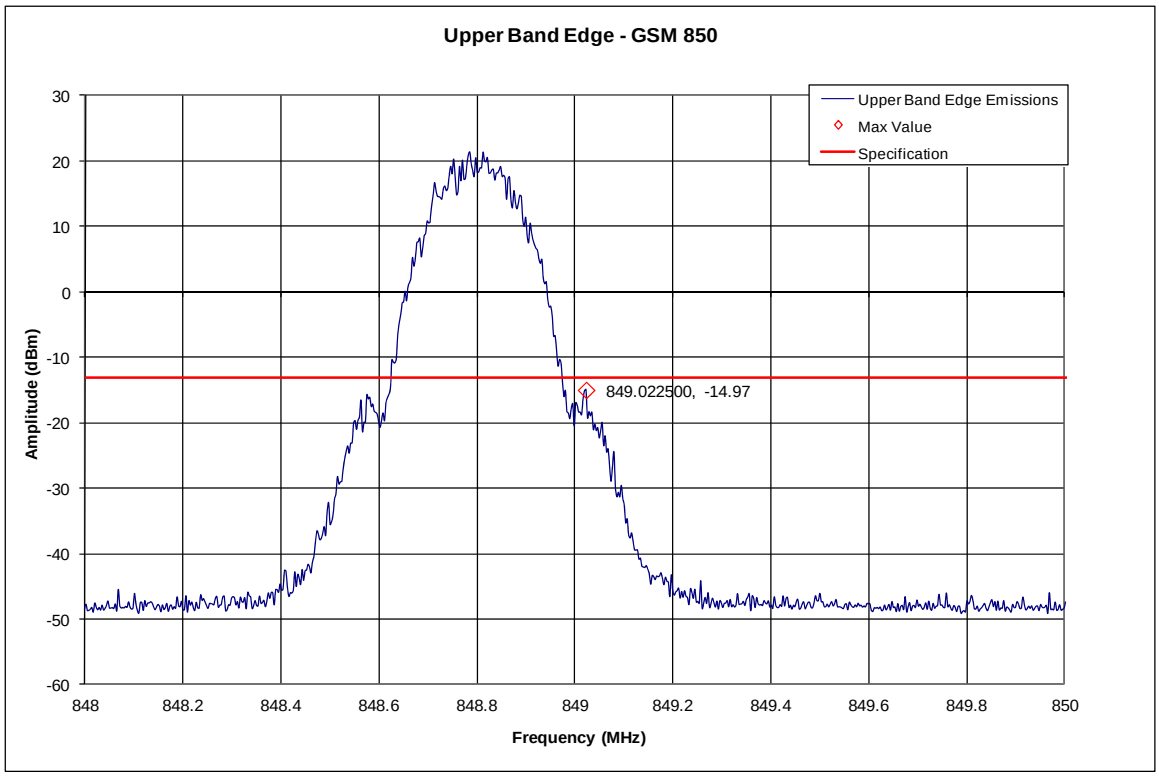
GSM 850 – Reference Level Plot – Channel 190 (836.60 MHz)



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

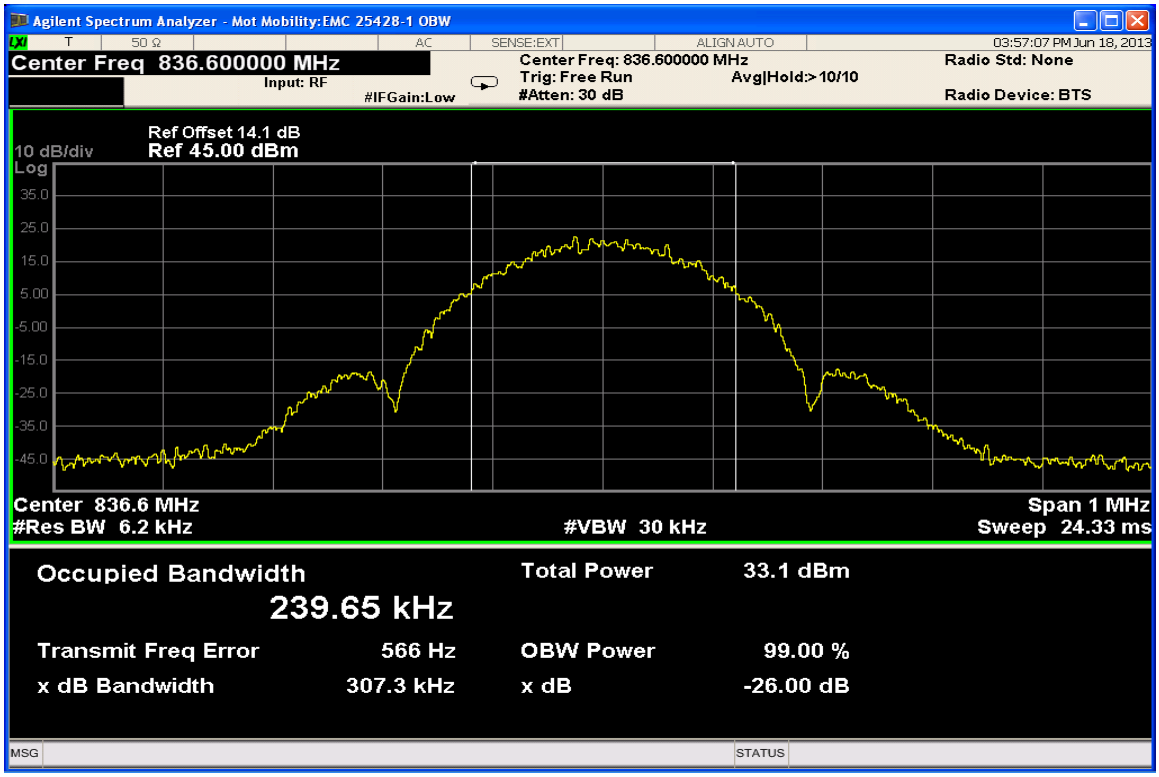


GSM 850 – Lower Band Edge – Channel 128 (824.2 MHz)

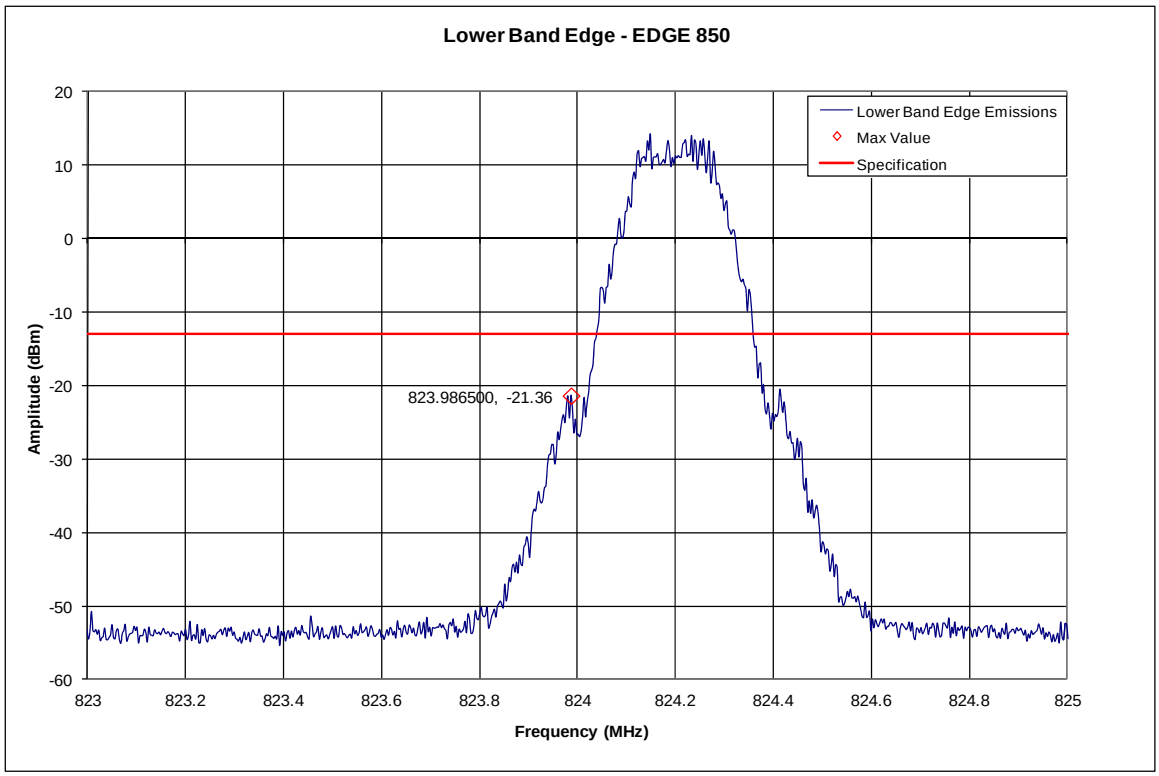


GSM 850 – Upper Band Edge – Channel 251 (848.8 MHz)

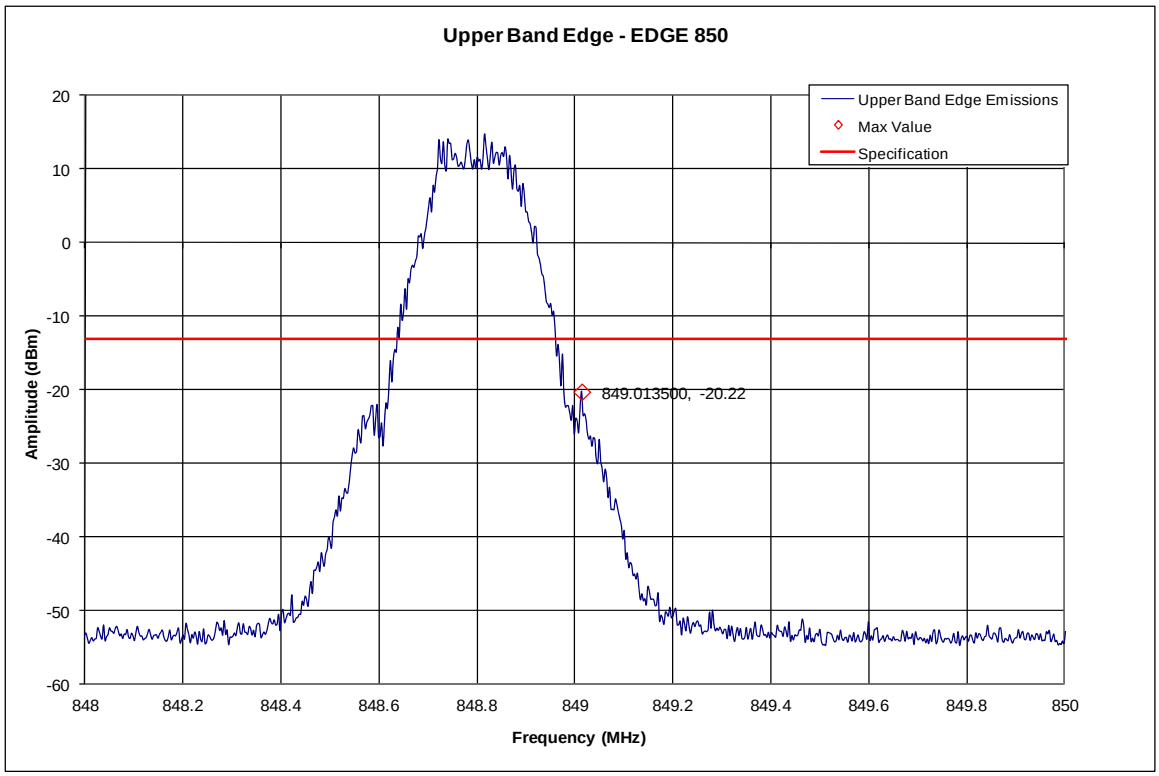
Measurement Results – EDGE 850



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

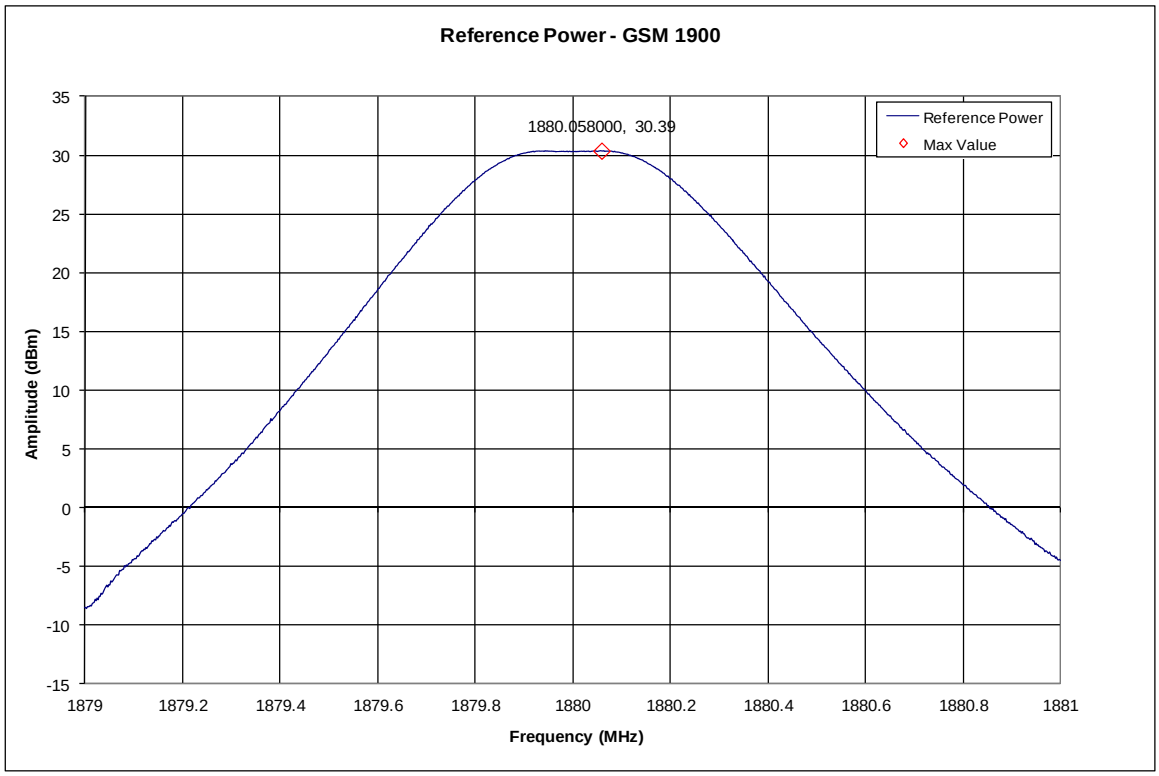


EDGE 850 – Lower Band Edge – Channel 128 (824.2 MHz)

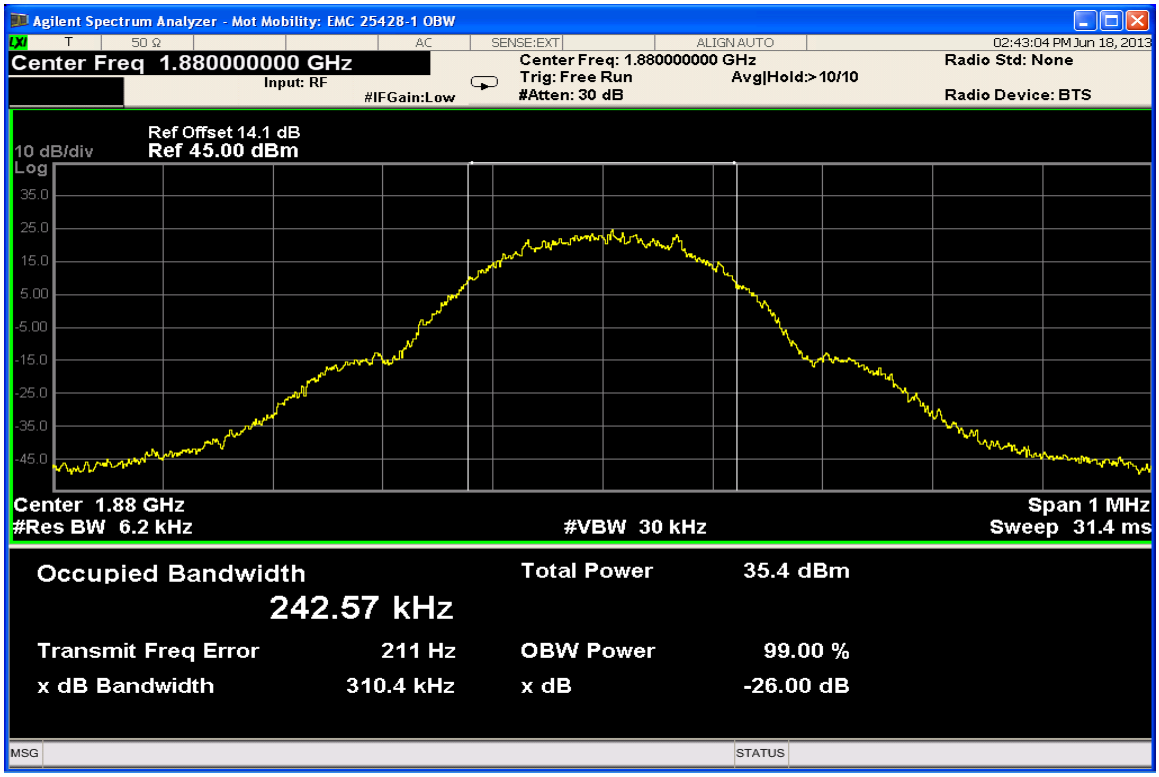


EDGE 850 – Upper Band Edge – Channel 251 (848.8 MHz)

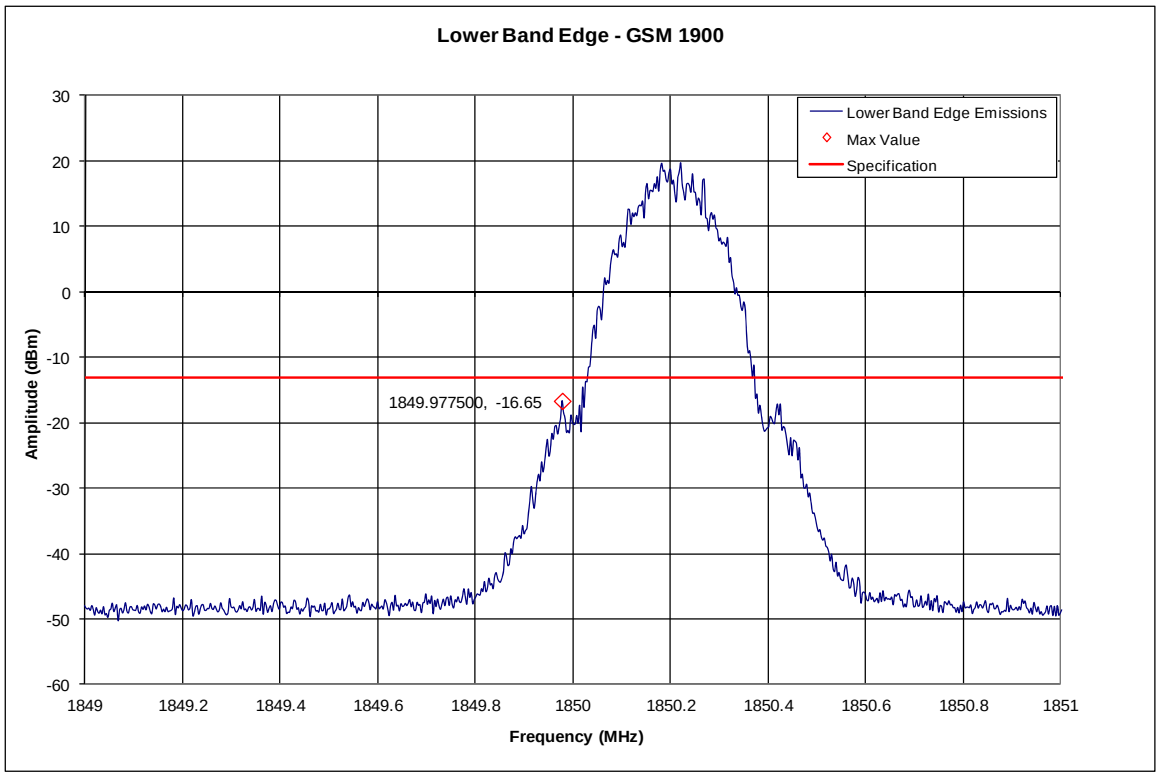
Measurement Results – GSM 1900



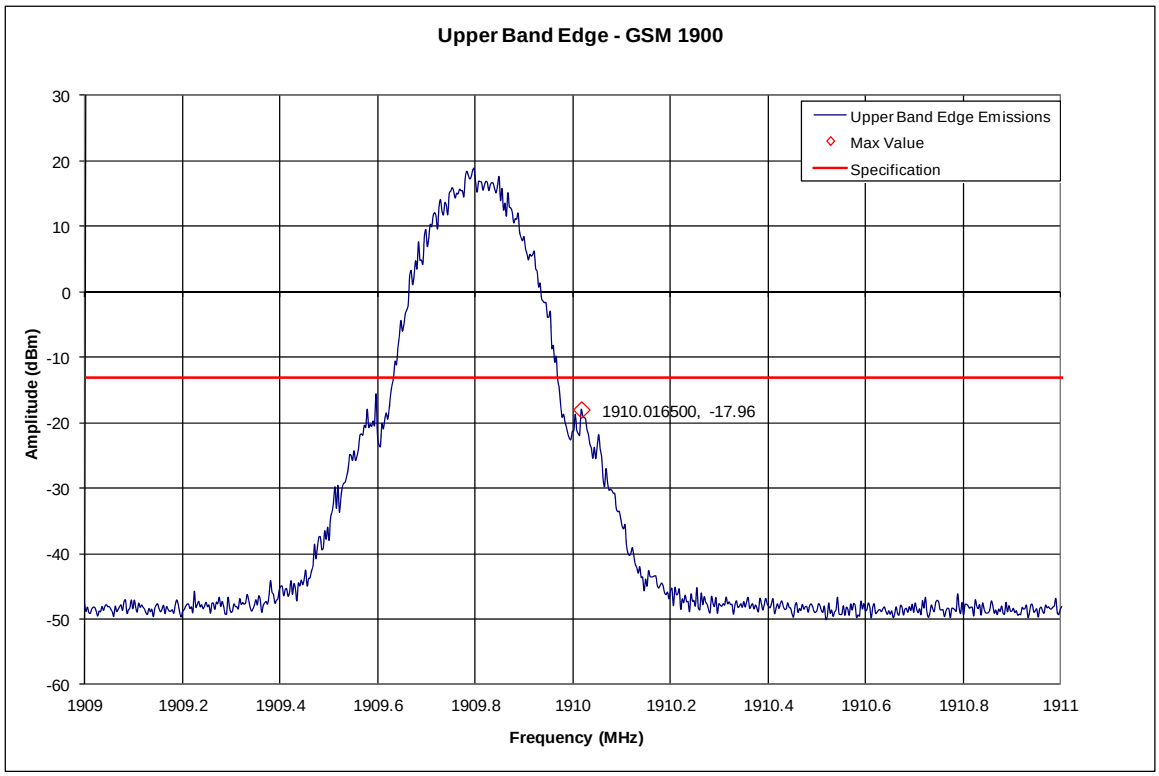
GSM 1900 – Reference Level Plot – Channel 661 (1880.00MHz)



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

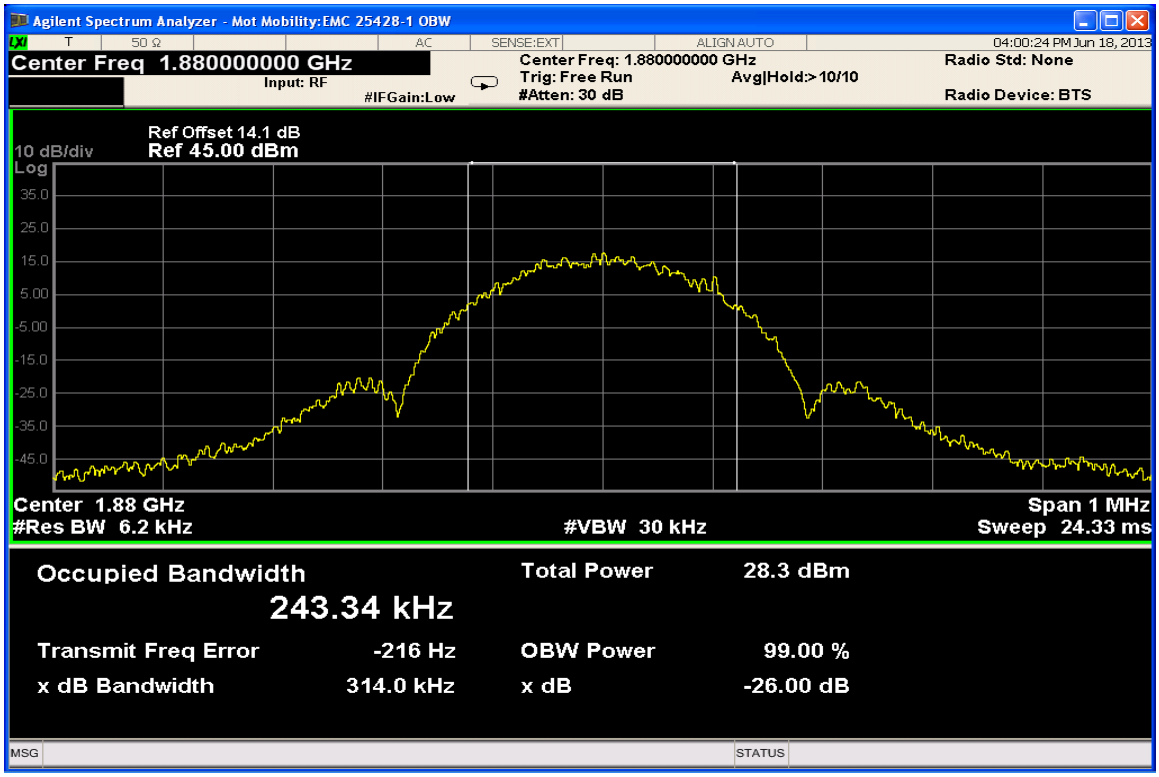


GSM 1900 – Lower Band Edge – Channel 512 (1850.2MHz)

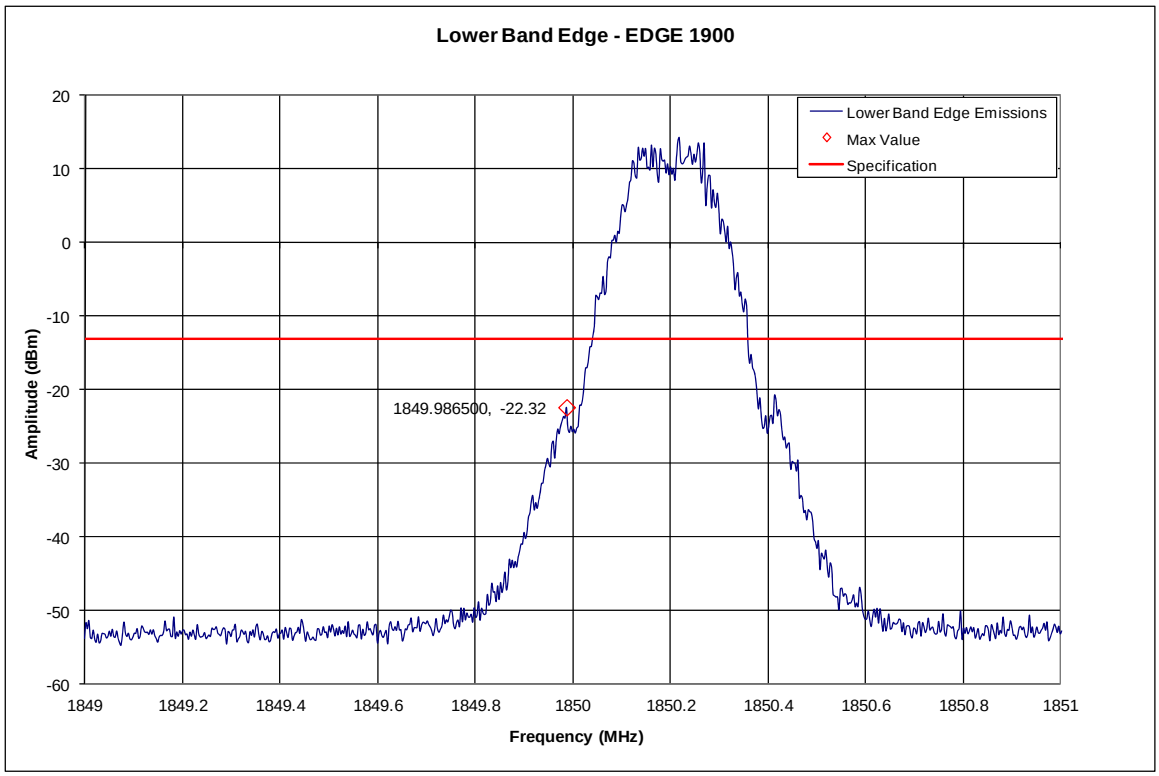


GSM 1900 – Upper Band Edge – Channel 810 (1909.8MHz)

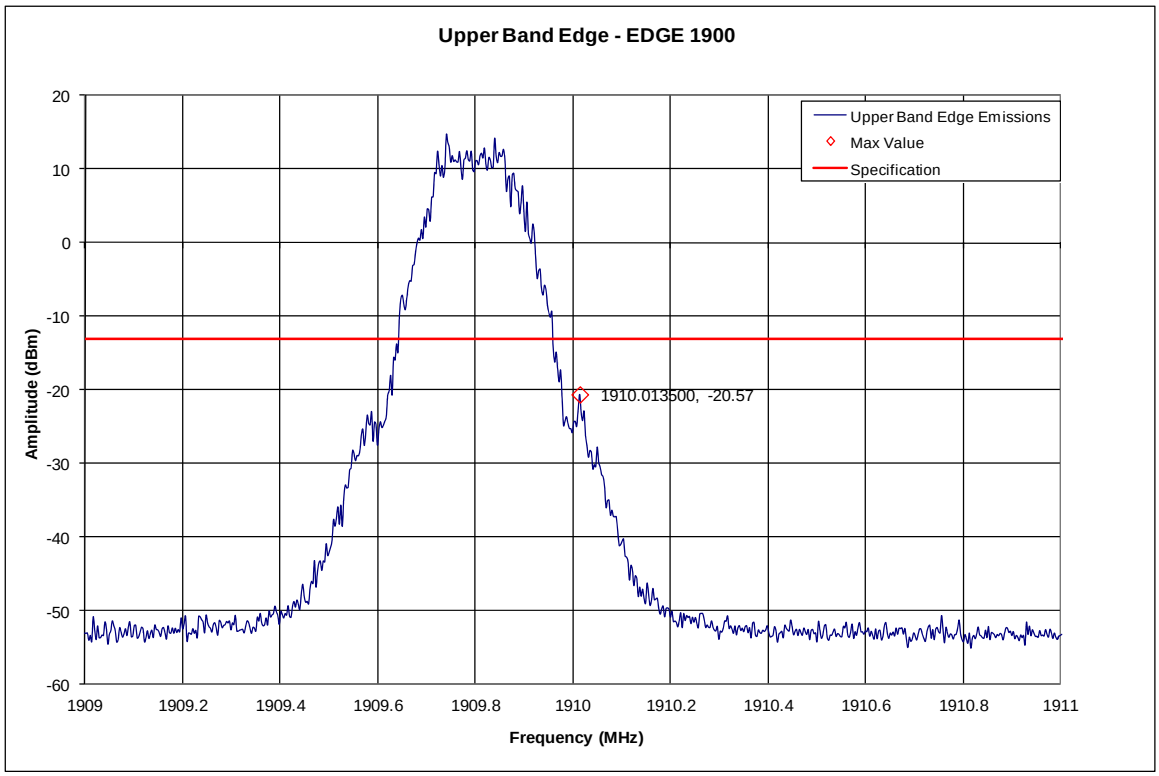
Measurement Results – EDGE 1900



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

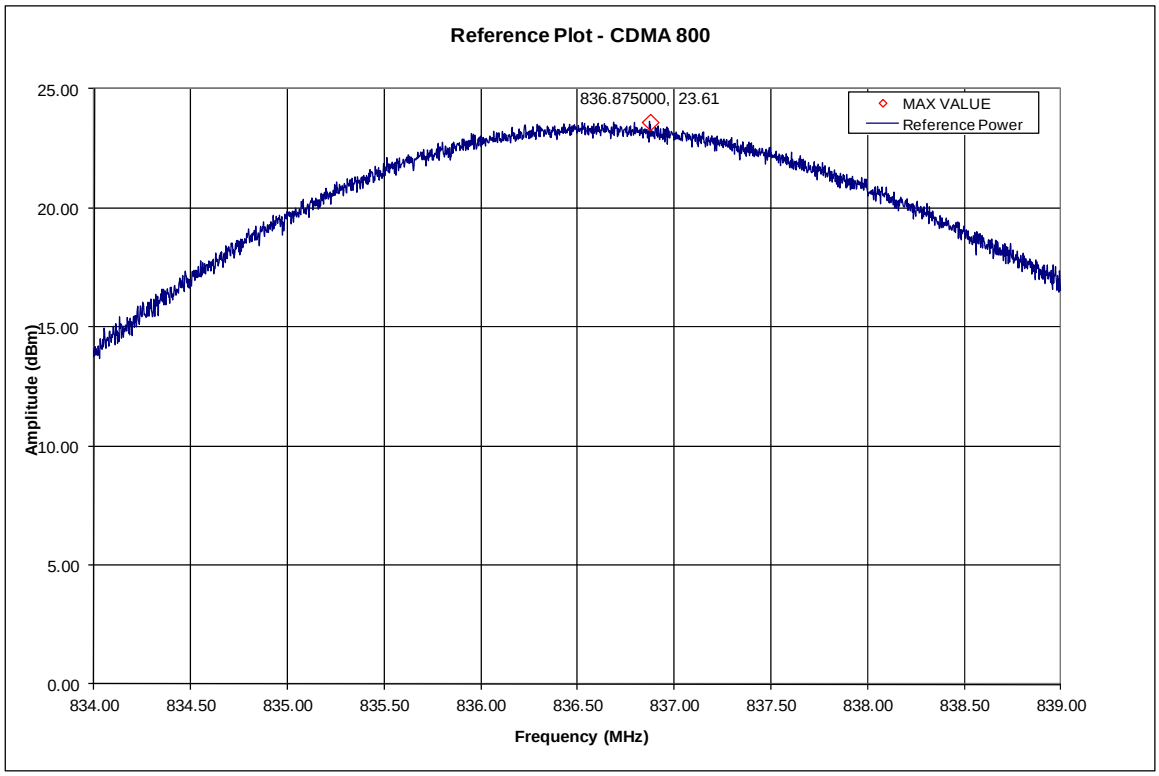


GSM 1900 EDGE – Lower Band Edge – Channel 512 (1850.2MHz)

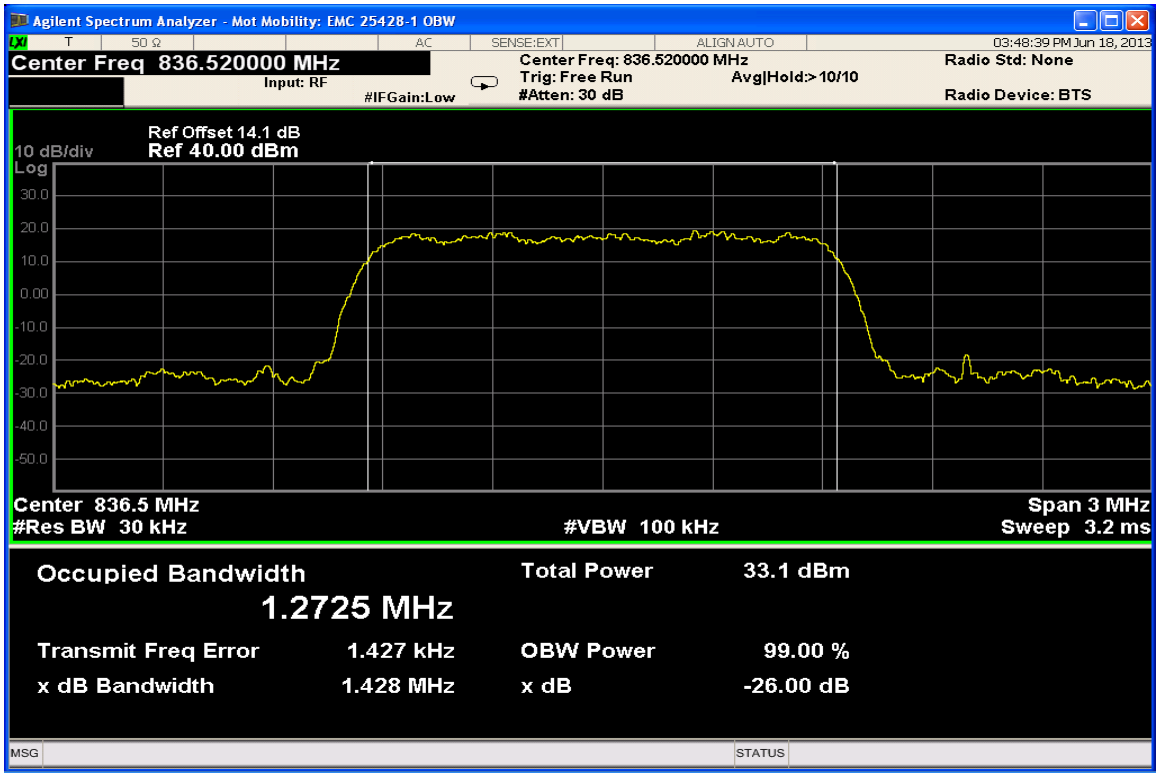


GSM 1900 EDGE – Upper Band Edge – Channel 810 (1909.8MHz)

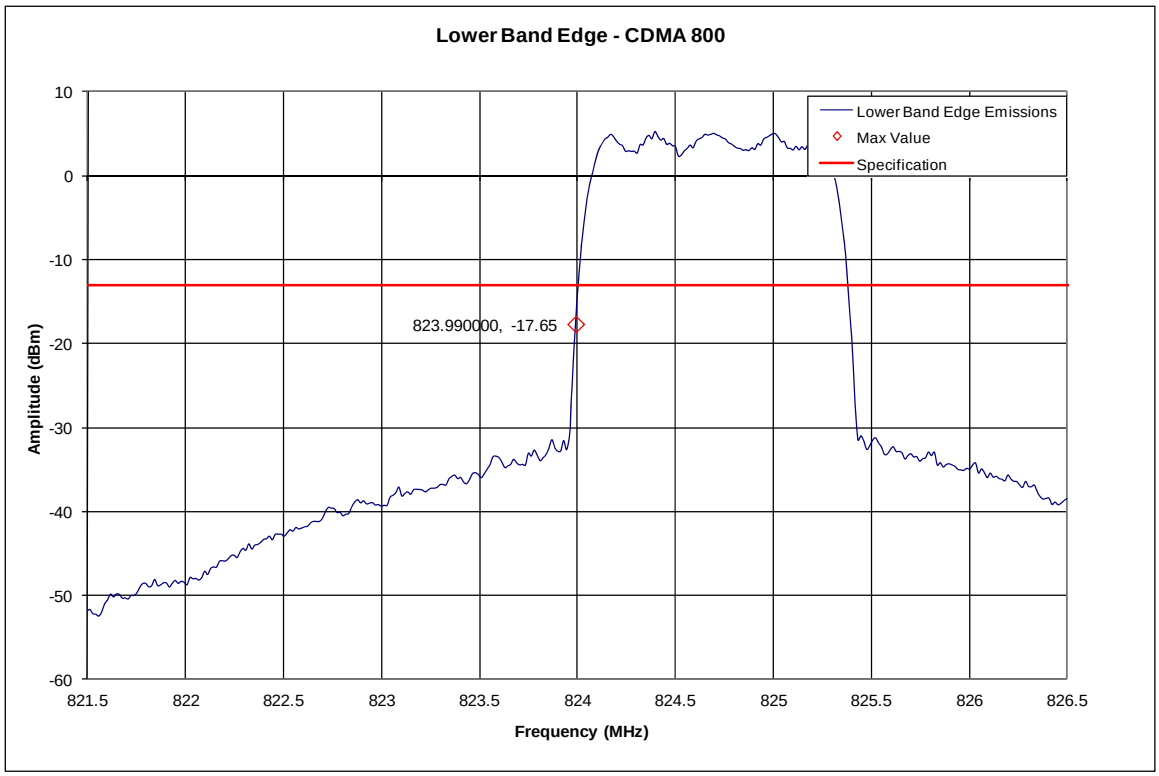
Measurement Results – CDMA 800



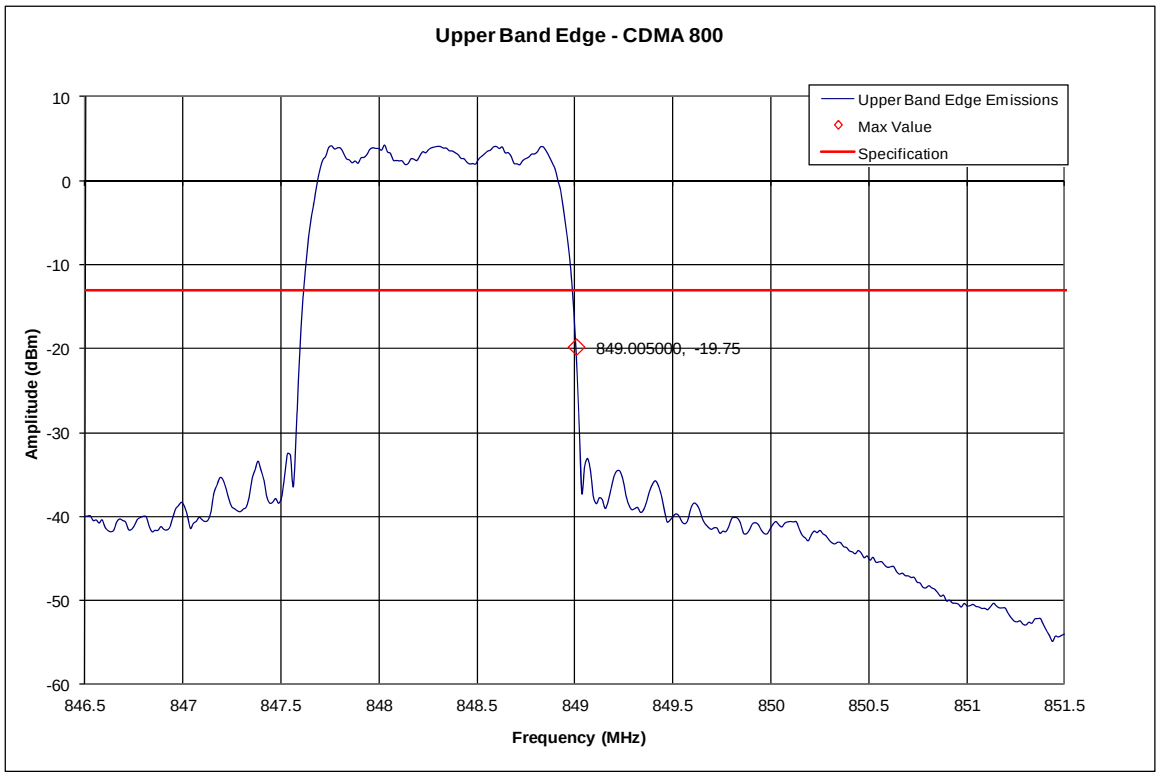
CDMA 800 – Reference Level Plot – Channel 384 (836.52MHz)



CDMA 800 – Occupied Bandwidth – Channel 384 (836.52MHz)

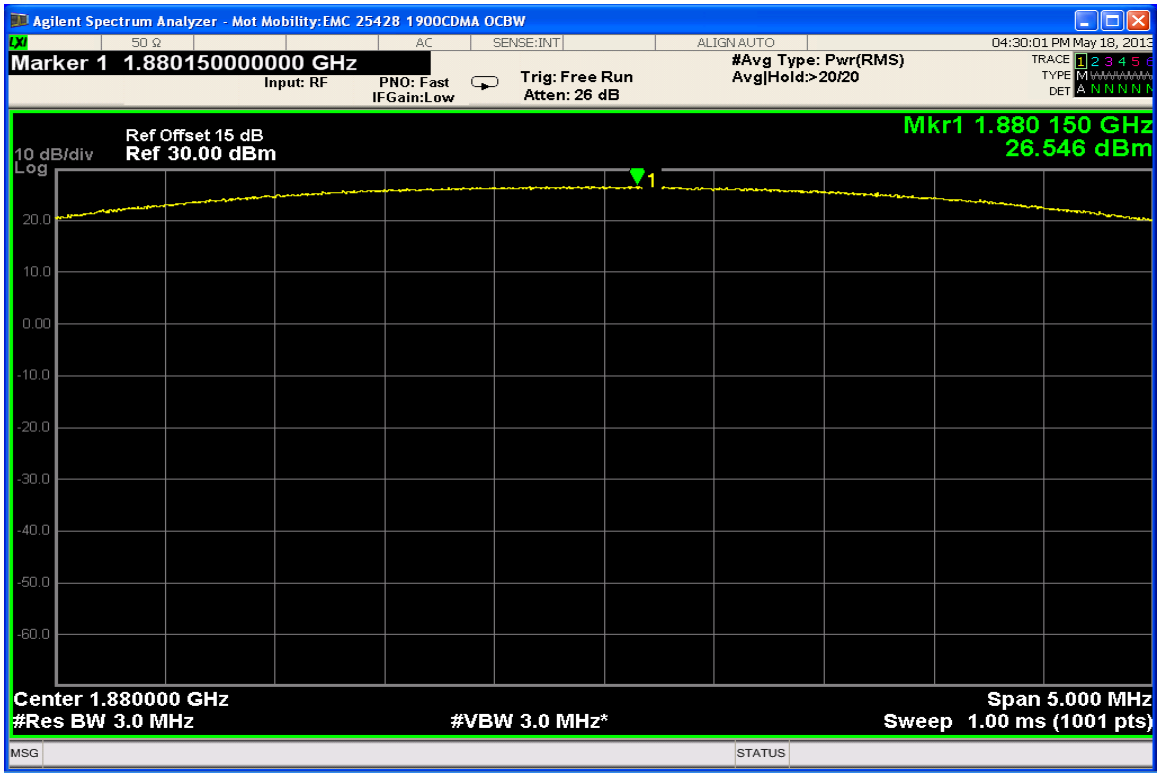


CDMA 800 – Lower Band Edge – Channel 1013 (824.702MHz)

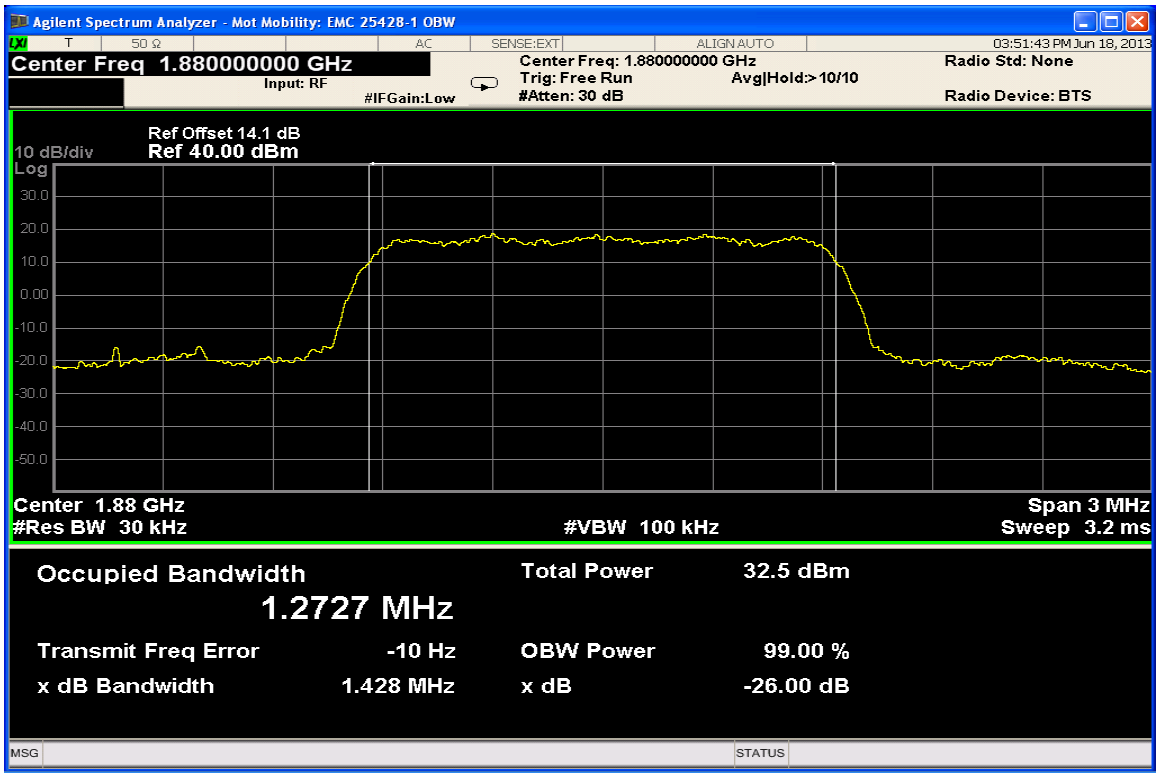


CDMA 800 – Upper Band Edge – Channel 777 (848.31MHz)

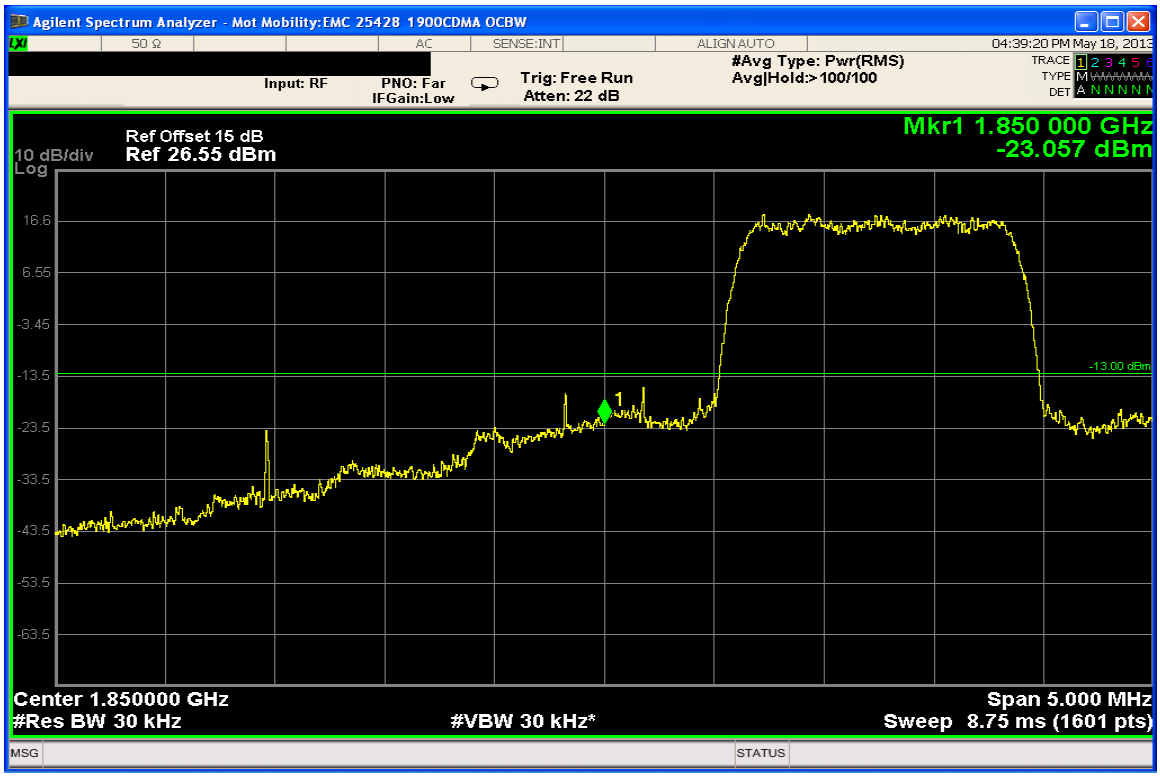
Measurement Results – CDMA 1900



CDMA 1900 – Reference Level Plot – Channel 600 (1880.00 MHz)



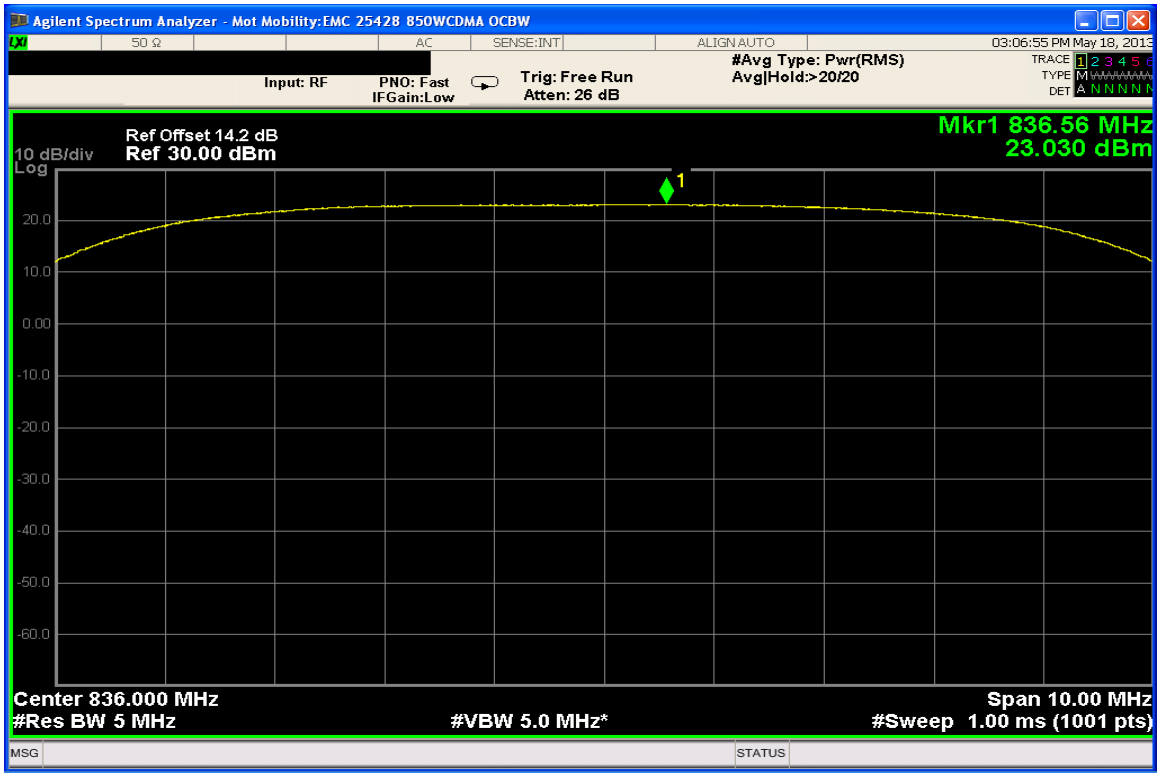
CDMA 1900 – Occupied Bandwidth – Channel 600 (1880.00 MHz)



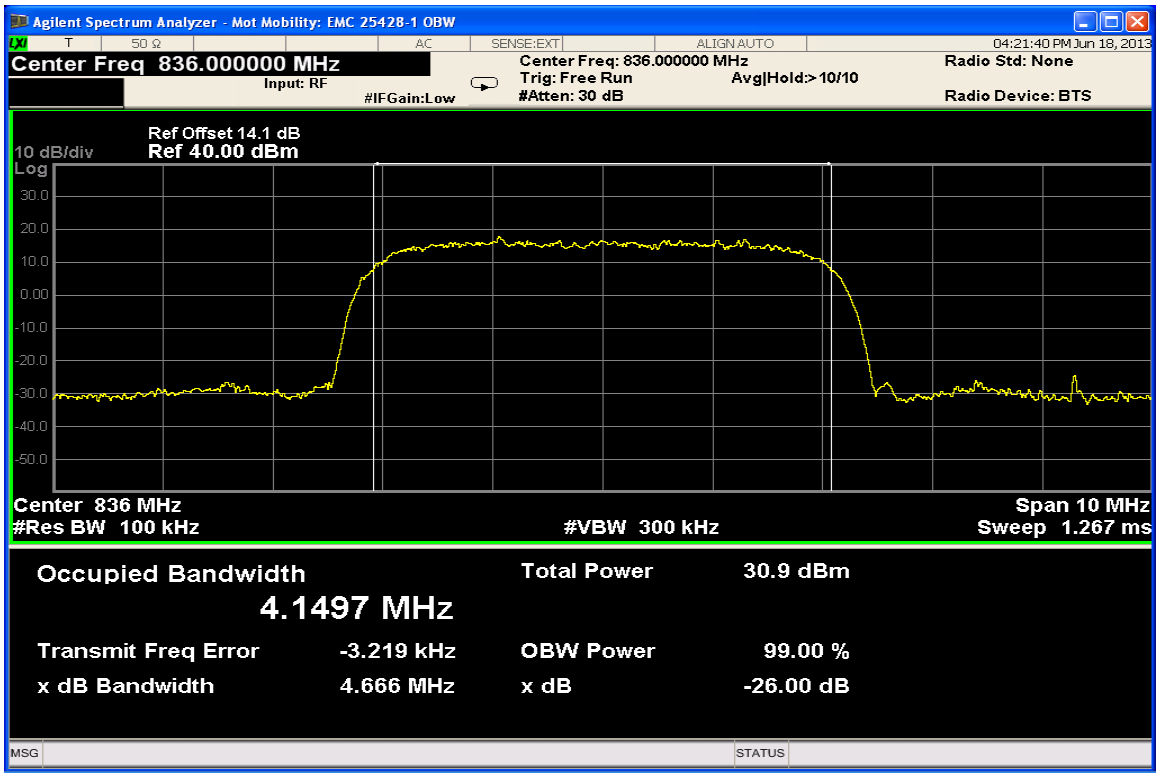
CDMA 1900 – Lower Band Edge – Channel 25 (1851.25MHz)

CDMA 1900 – Upper Band Edge – Channel 1175 (1908.75MHz)

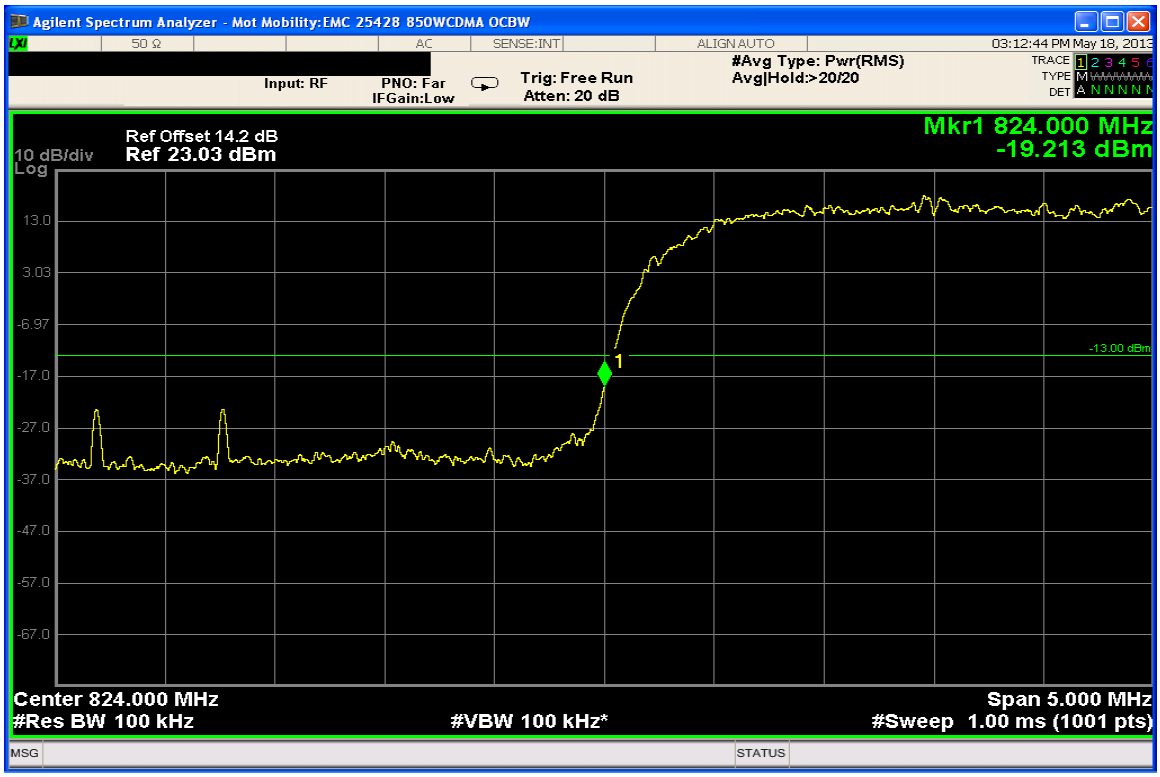
Measurement Results – WCDMA 850



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



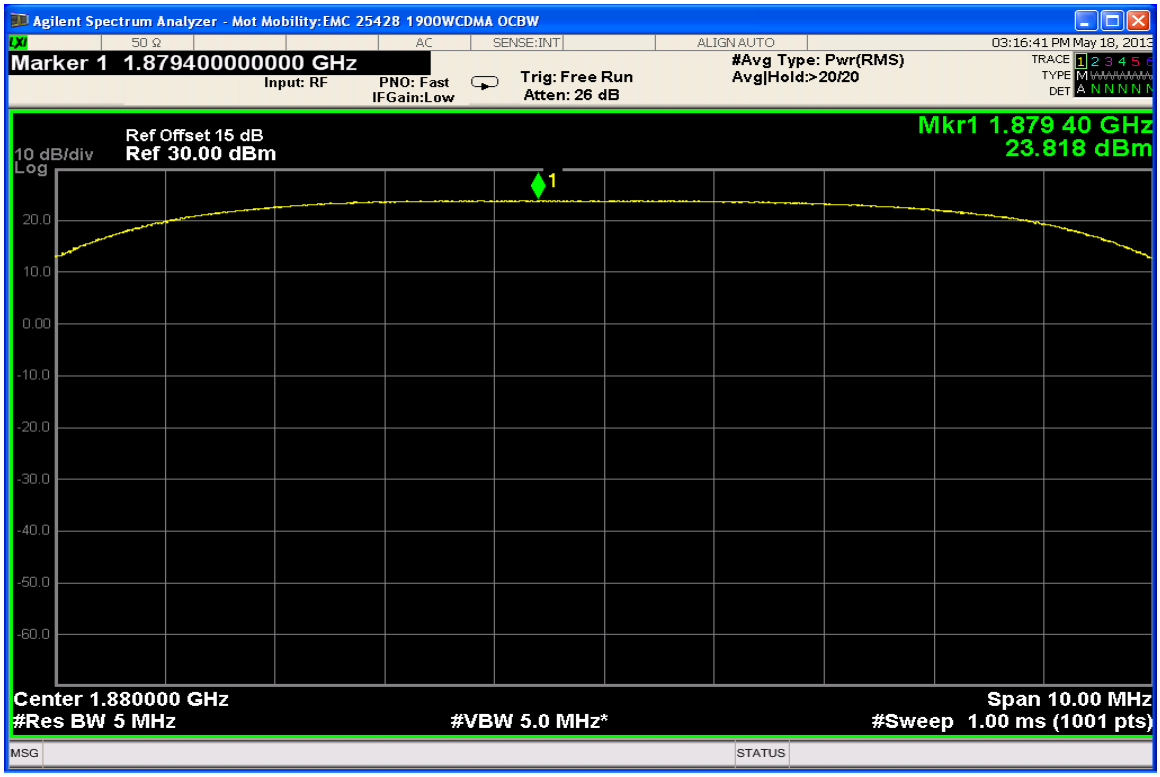
WCDMA 850 – Occupied Bandwidth – Channel 4180 (836.0 MHz)



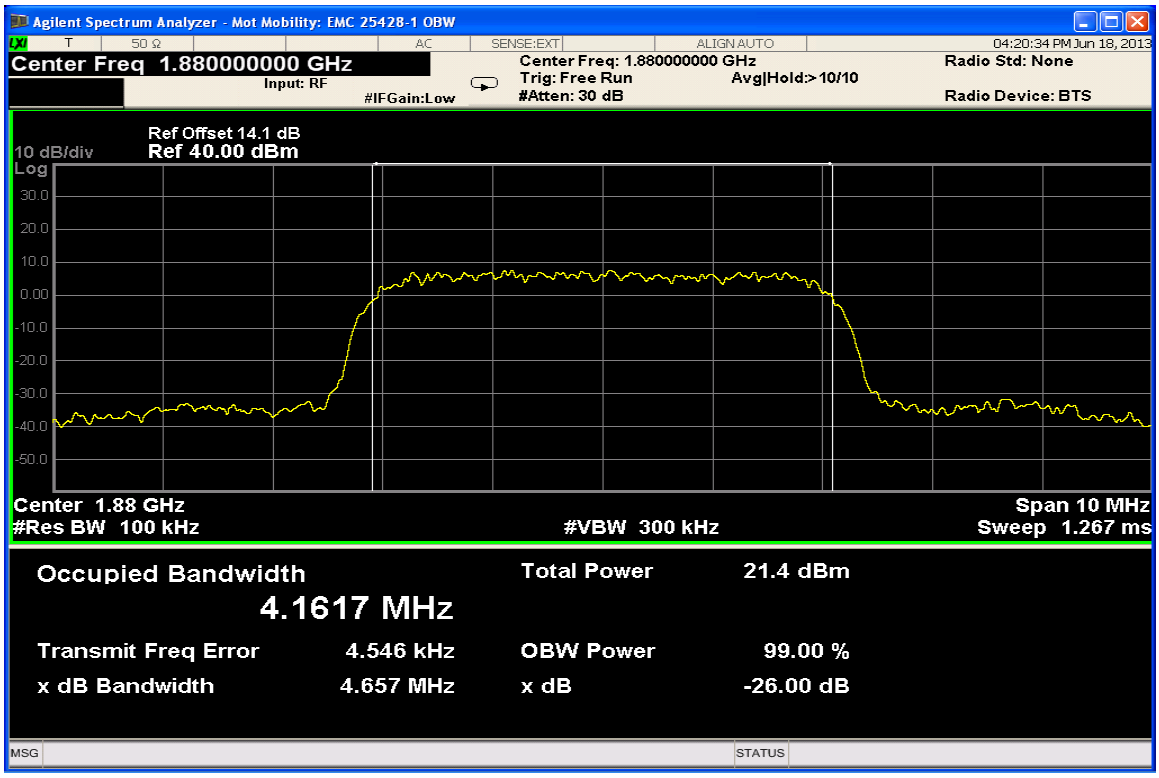
WCDMA 850 – Lower Band Edge – Channel 4132 (826.4 MHz)

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

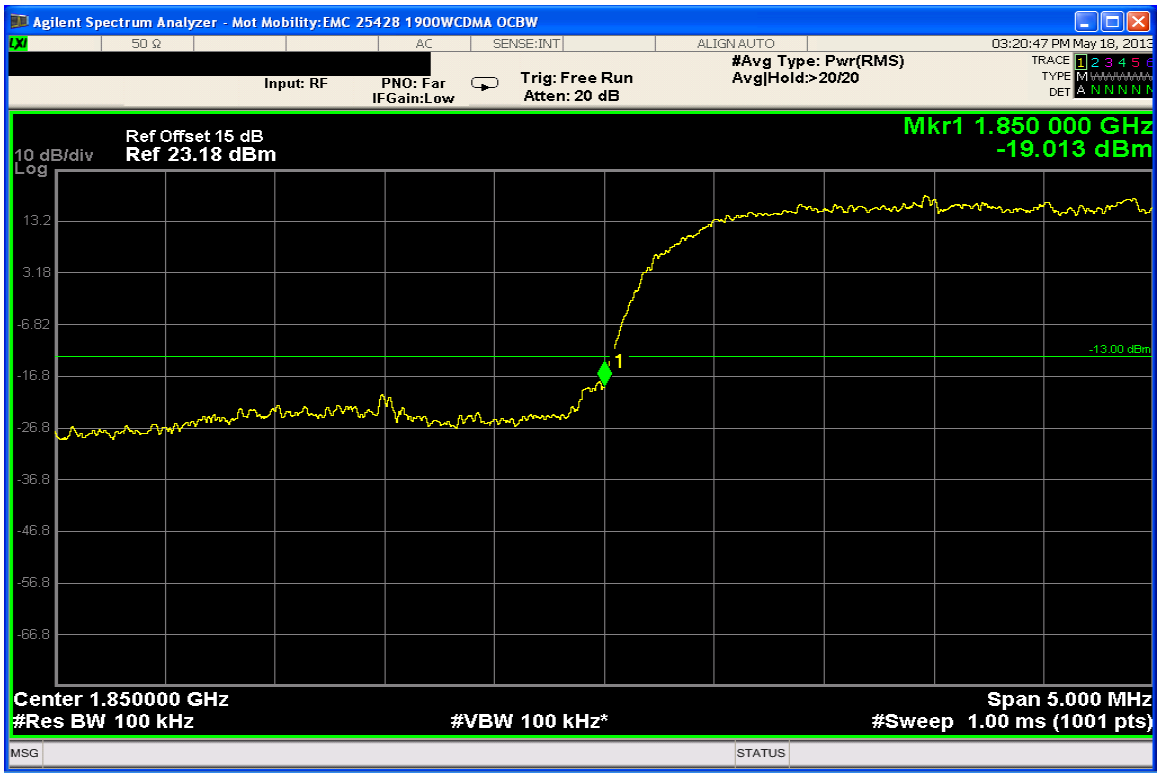
Measurement Results – WCDMA 1900



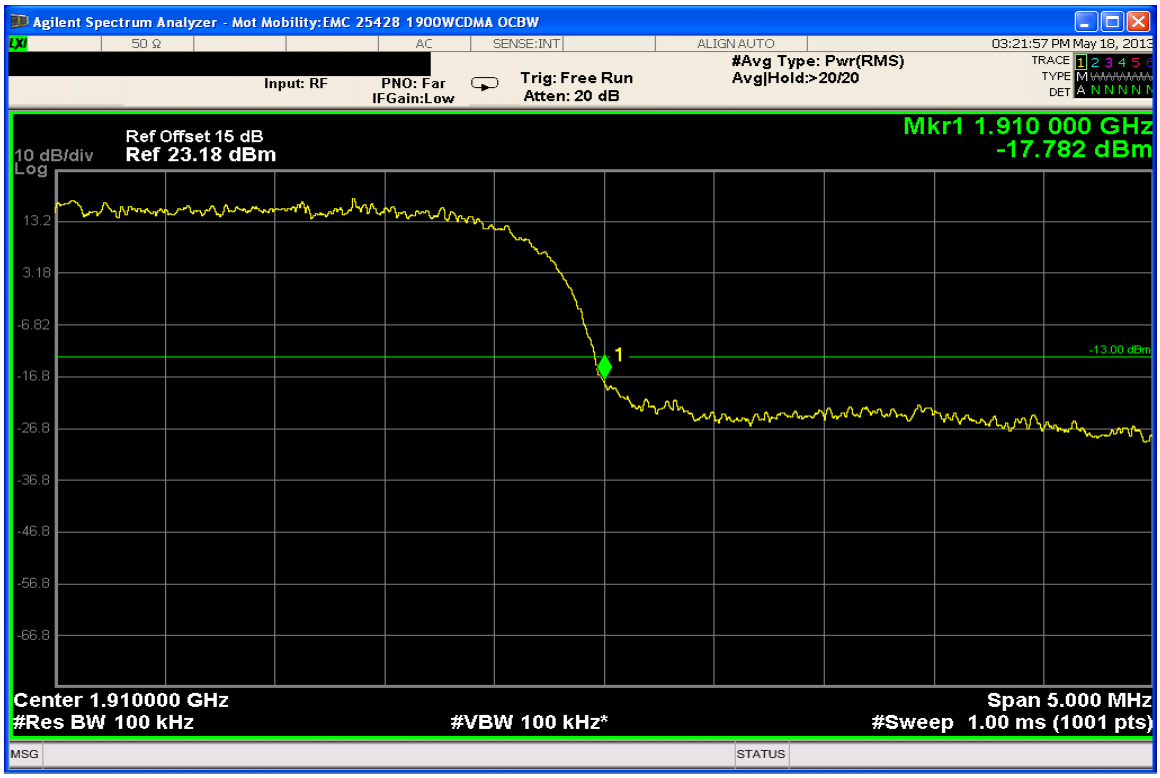
WCDMA 1900 – Reference Level Plot – Channel 9400 (1880.00 MHz)



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:

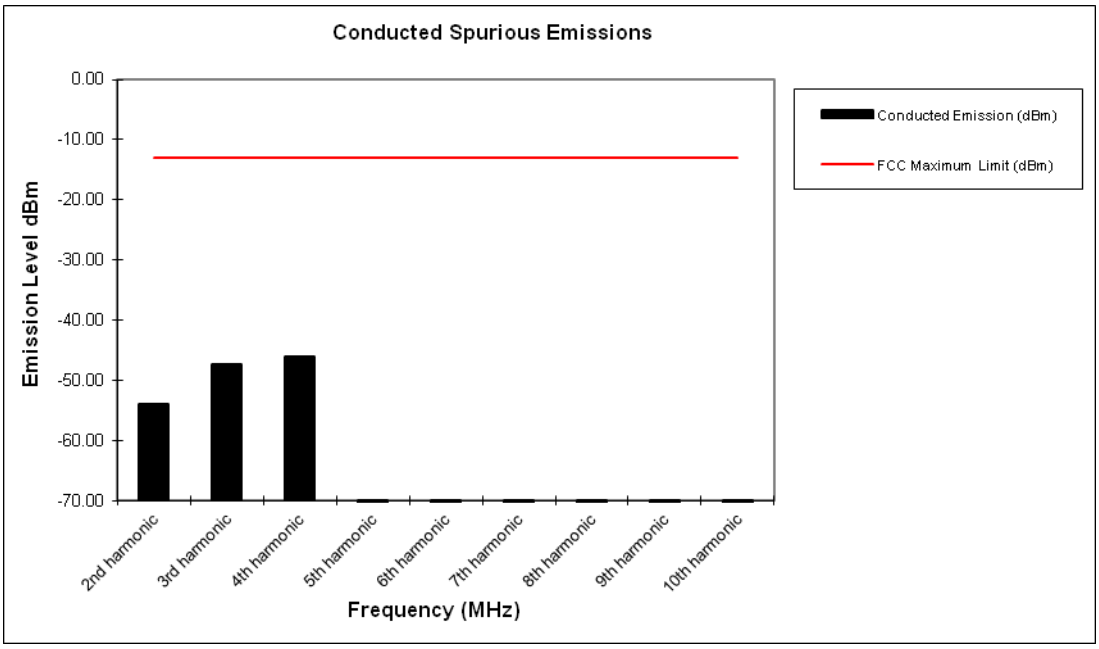
Units	dBm
Divisions	10 dB
Detector	Peak Detector
Resolution Bandwidth	1 MHz
Video Bandwidth (AVG)	Auto
Sweep Time	Auto

Measurement Results

Attached

Measurement Results
Modulation: GSM 850

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-53.98
3rd harmonic	-13	-47.26
4th harmonic	-13	-46.12
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*

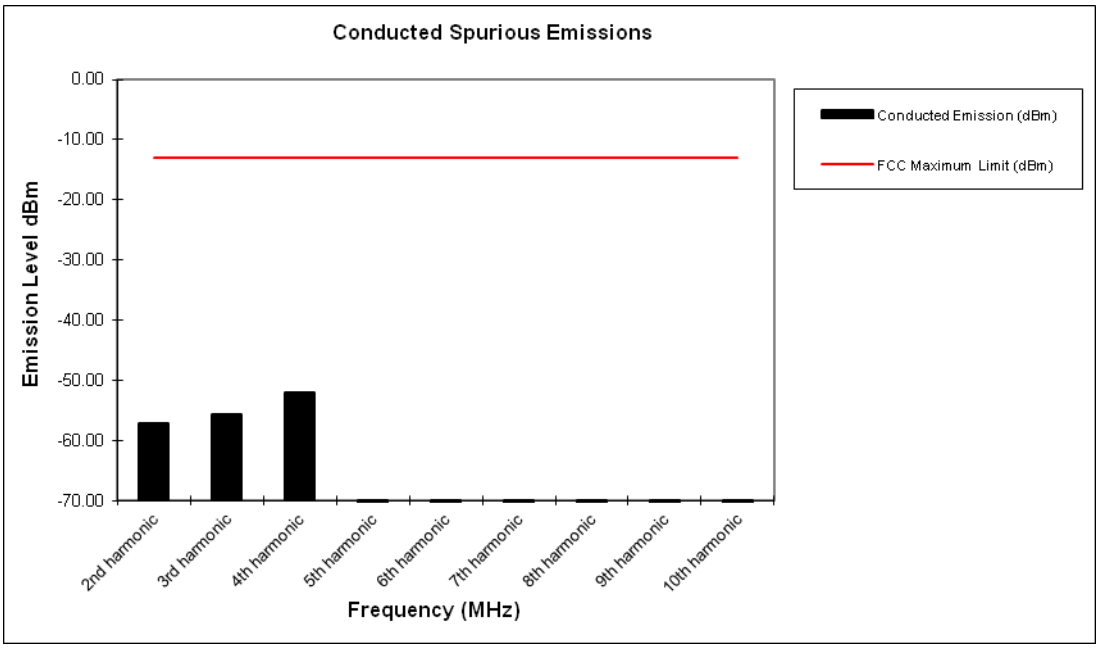


Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated from 9 kHz to the tenth 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	-57.19
3rd harmonic	-13	-55.73
4th harmonic	-13	-51.95
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*

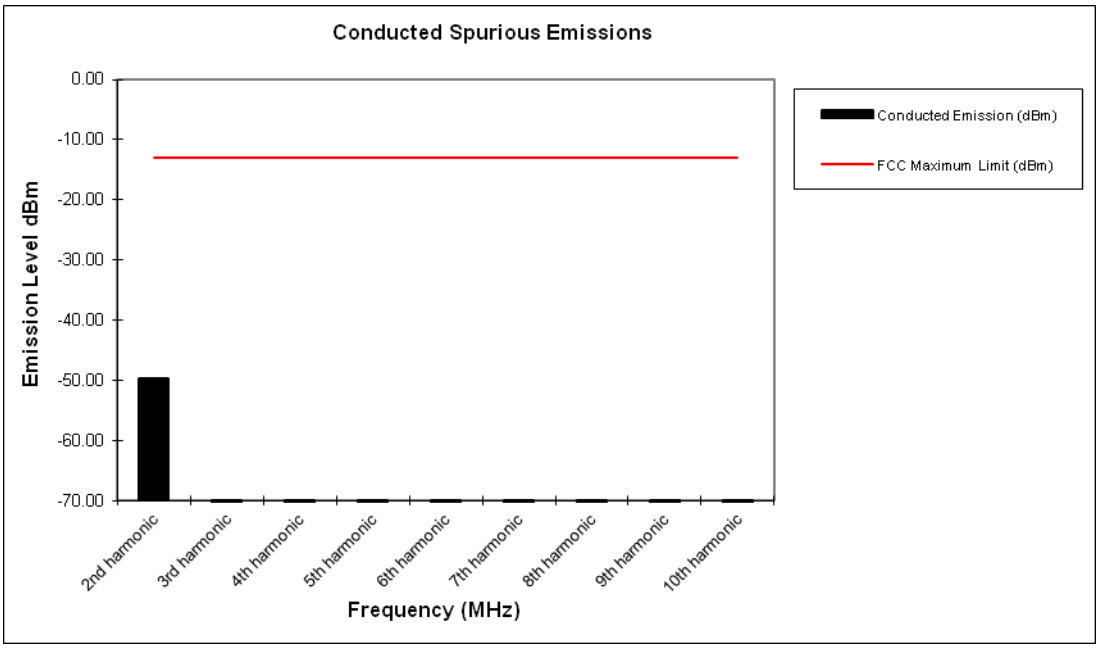


Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated from 9 kHz to the tenth 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	-49.69
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*

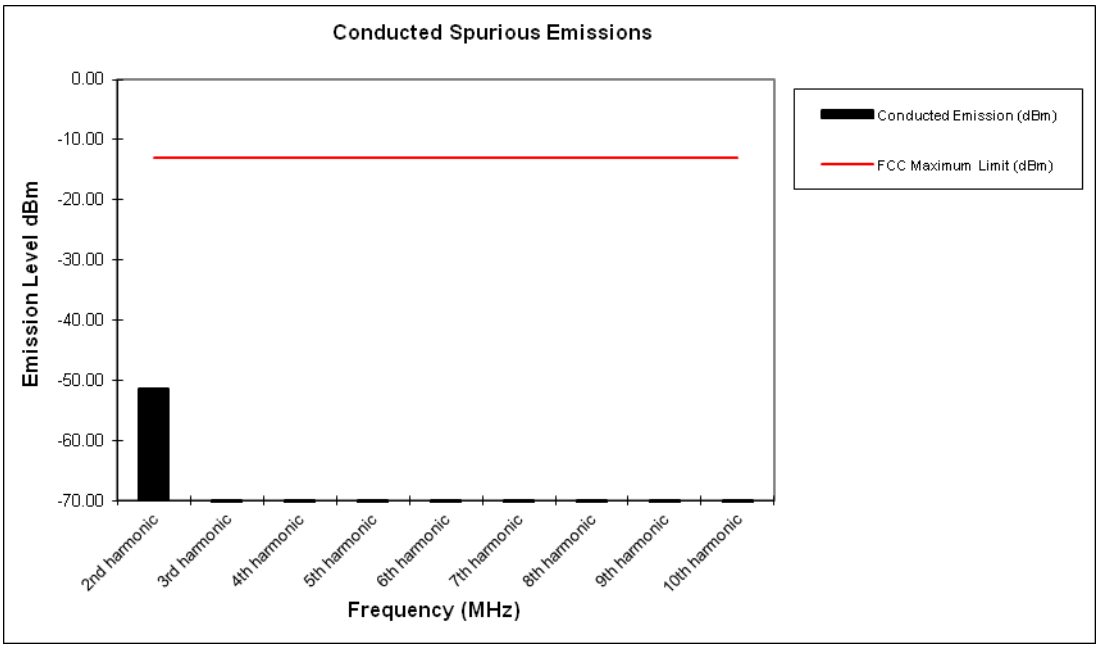


Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated from 9 kHz to the tenth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

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

Measurement Results
Modulation: EDGE 1900

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-51.42
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



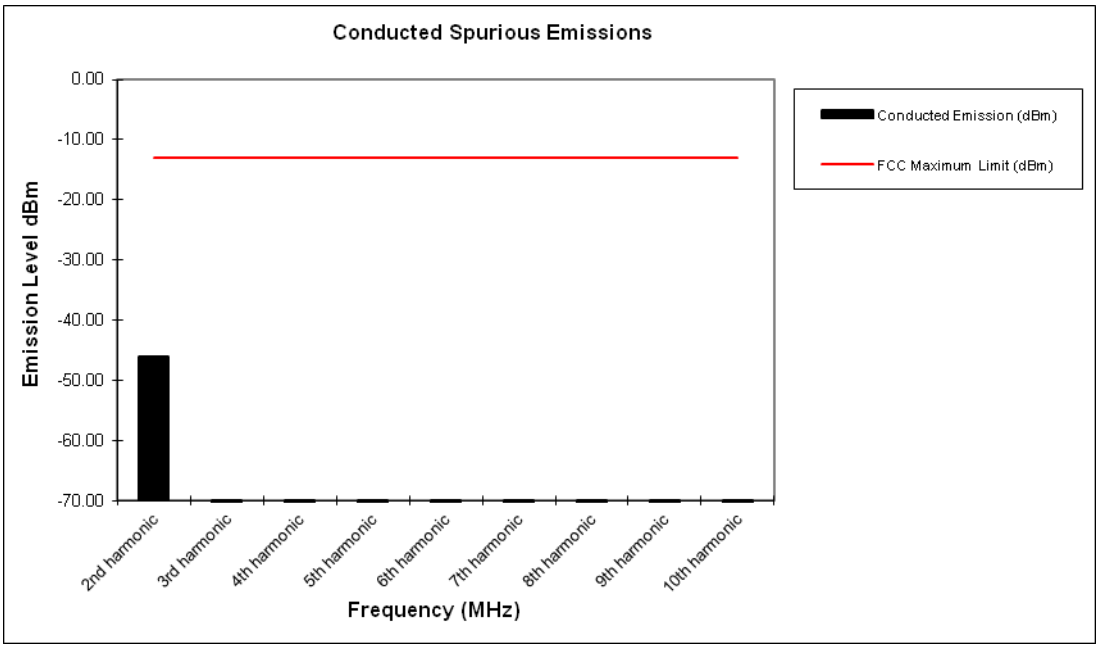
Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated from 9 kHz to the tenth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

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

Measurement Results

Modulation: CDMA 800

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-46.14
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.

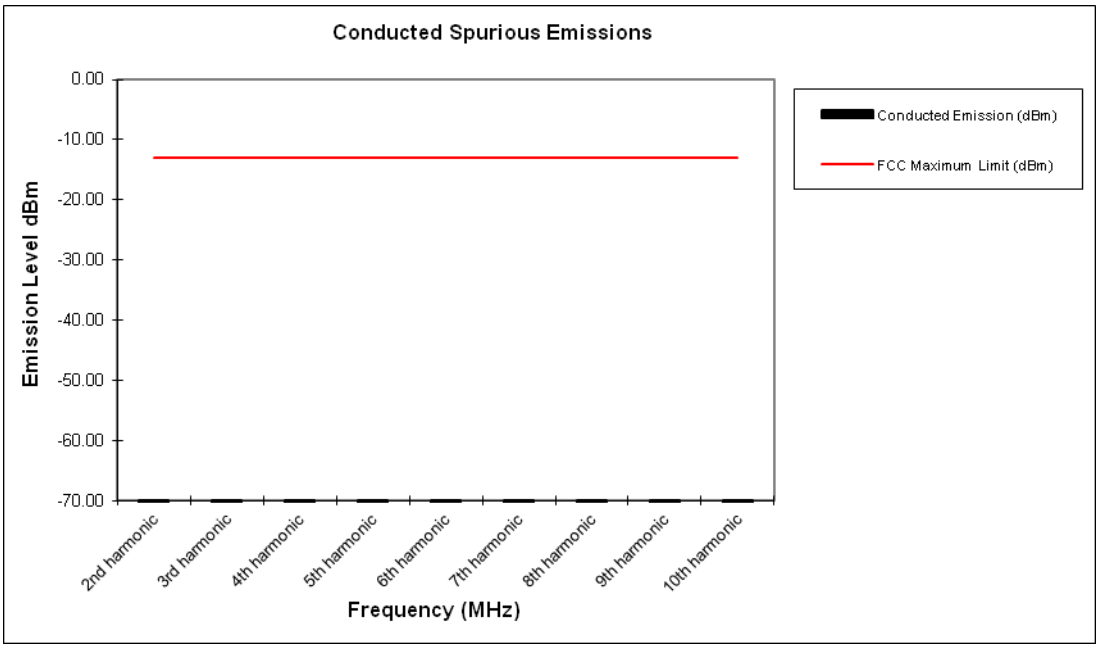
The margin with respect to the limit is the minimum margin for all modes and bands.

800 CDMA Conducted Spurious Emissions (Lower adjacent 1 MHz band)

800 CDMA Conducted Spurious Emissions (Upper adjacent 1 MHz band)

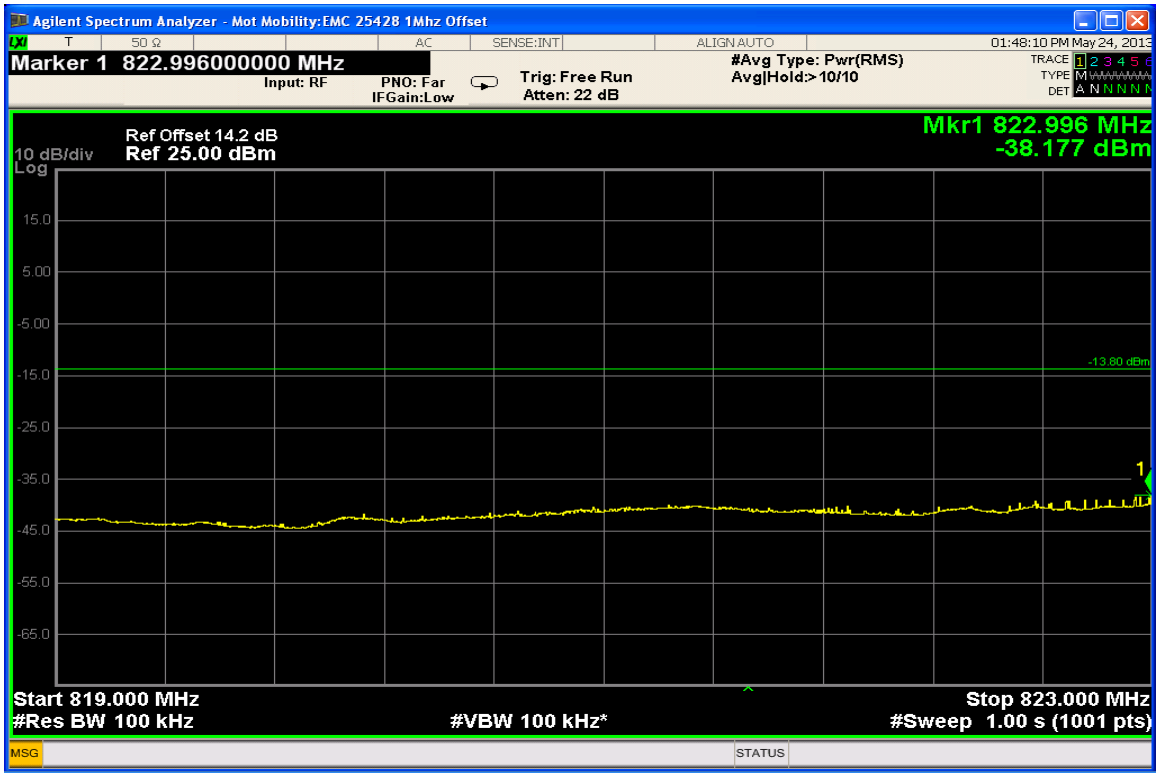
Measurement Results
Modulation: WCDMA 850

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (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	*

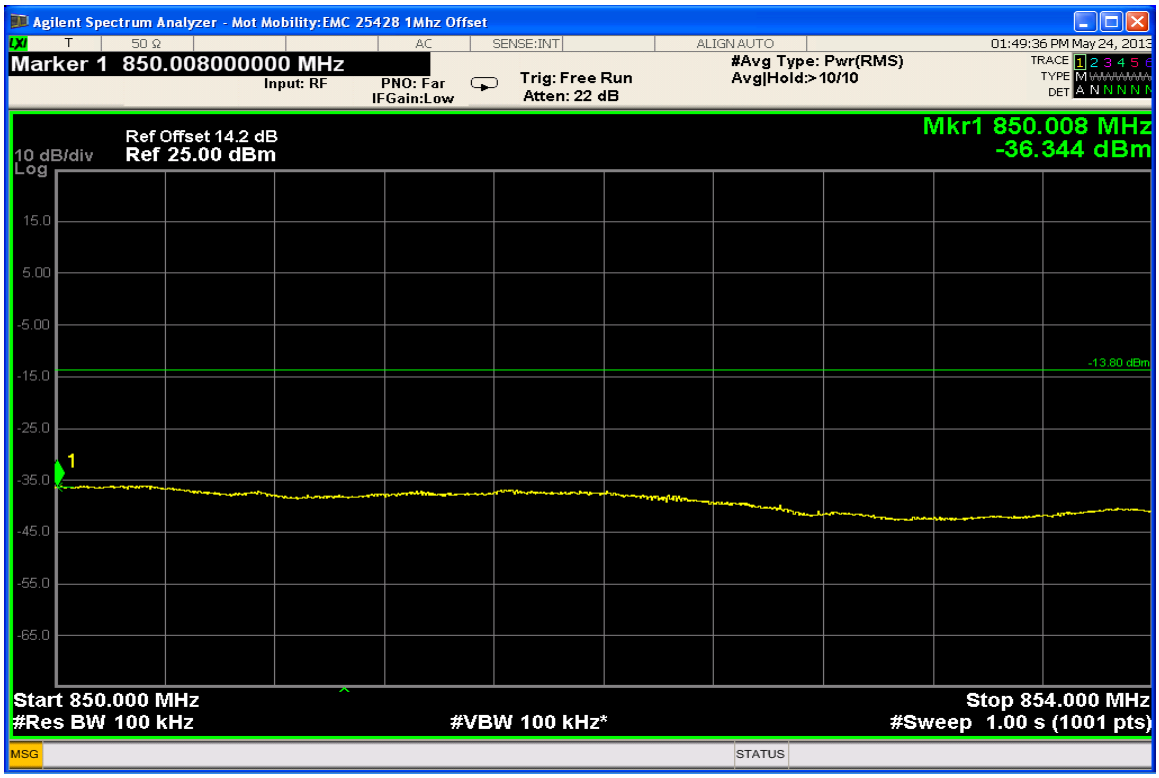


Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated from 9 kHz to the tenth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

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



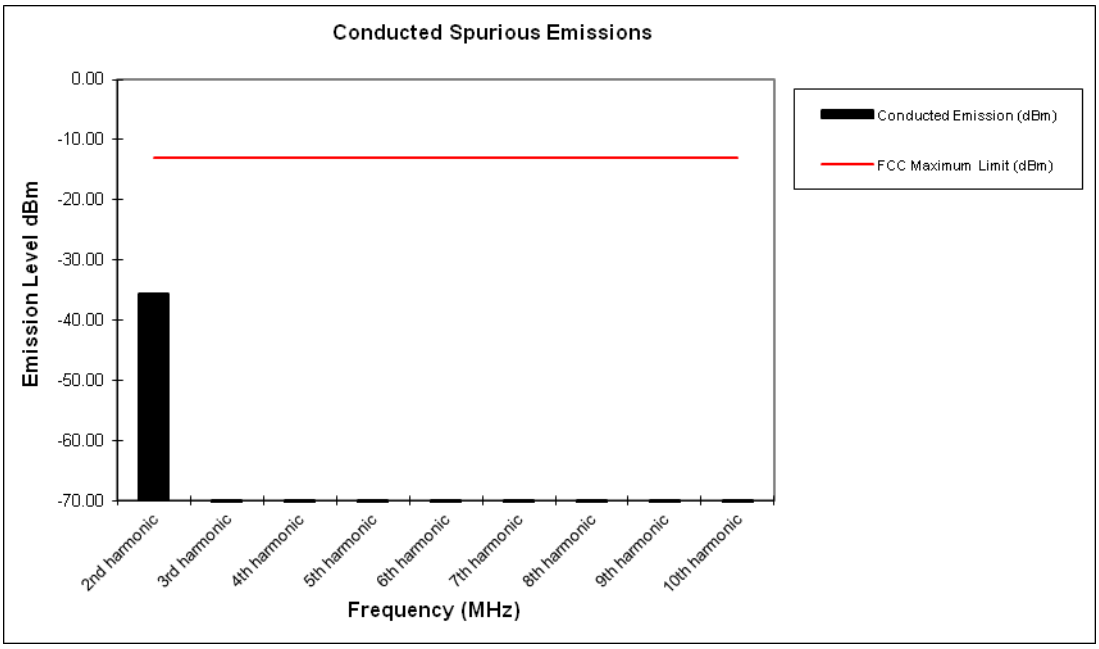
850 WCDMA Conducted Spurious Emissions (Lower adjacent 1 MHz band)



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

Measurement Results
Modulation: CDMA 1900

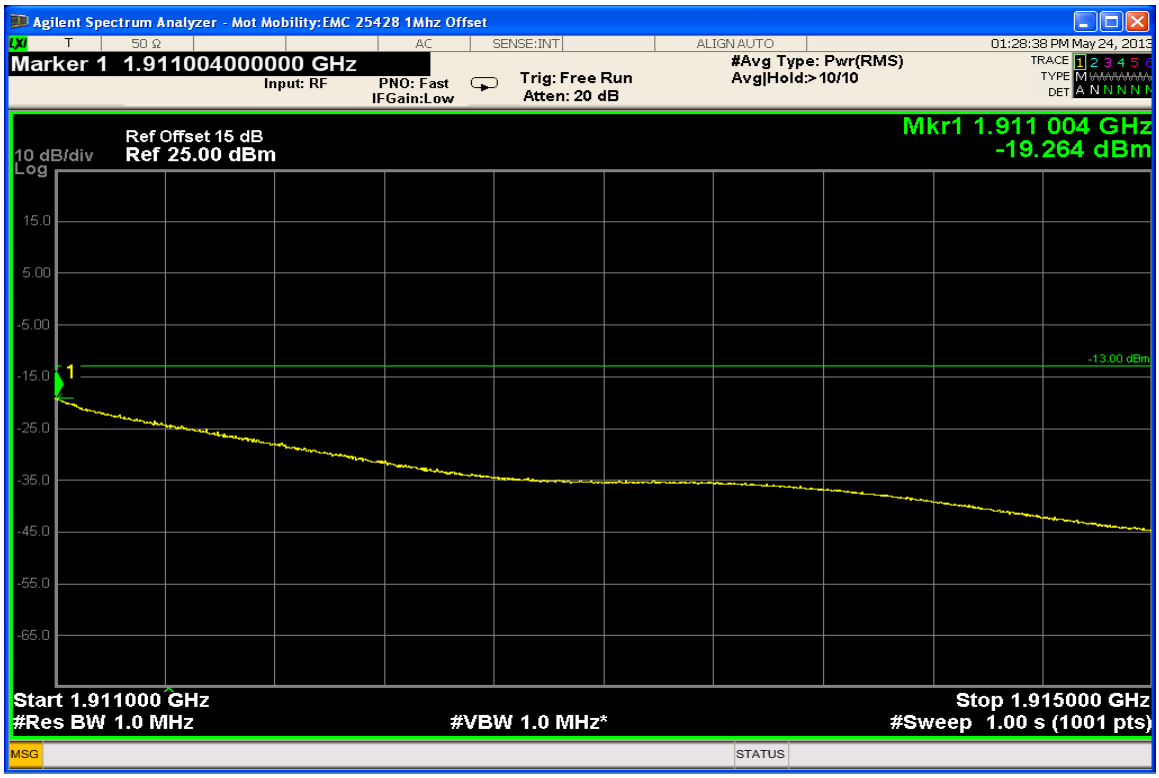
Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-35.73
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



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.

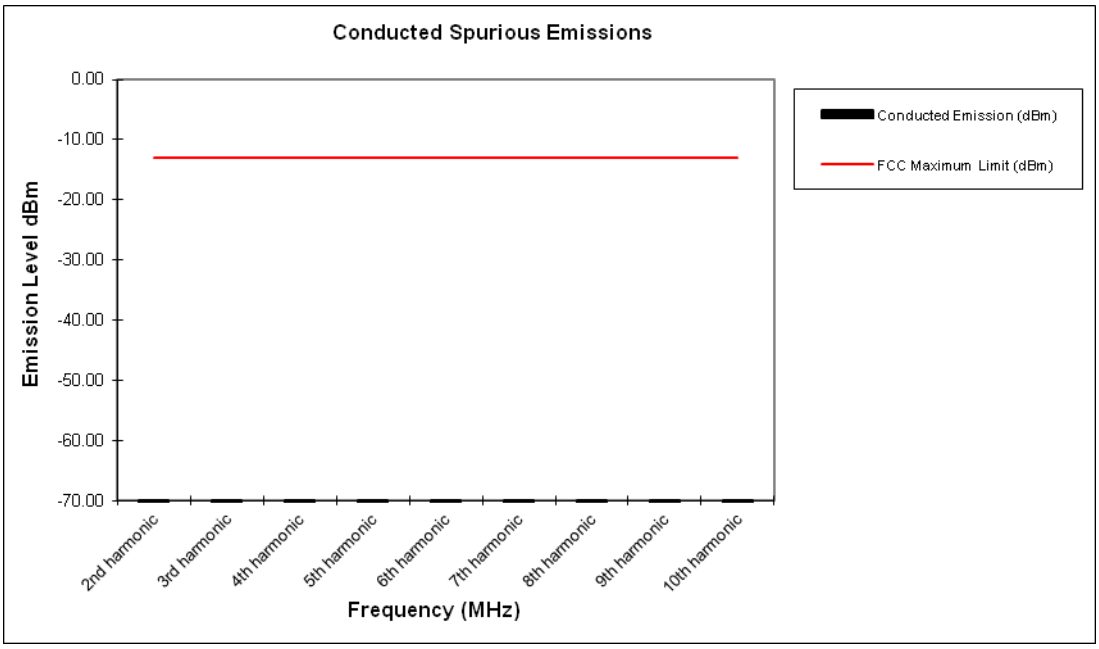
1900 CDMA Conducted Spurious Emissions (Lower adjacent 1 MHz band)



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

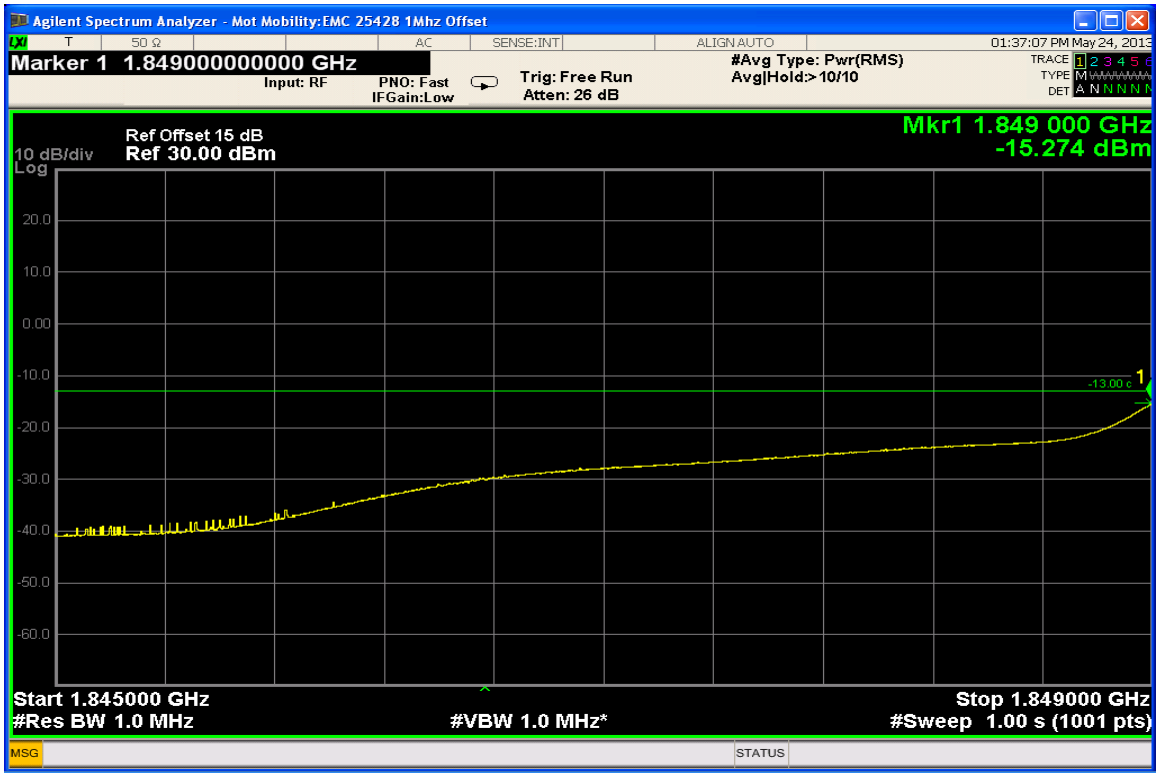
Measurement Results
Modulation: WCDMA 1900

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

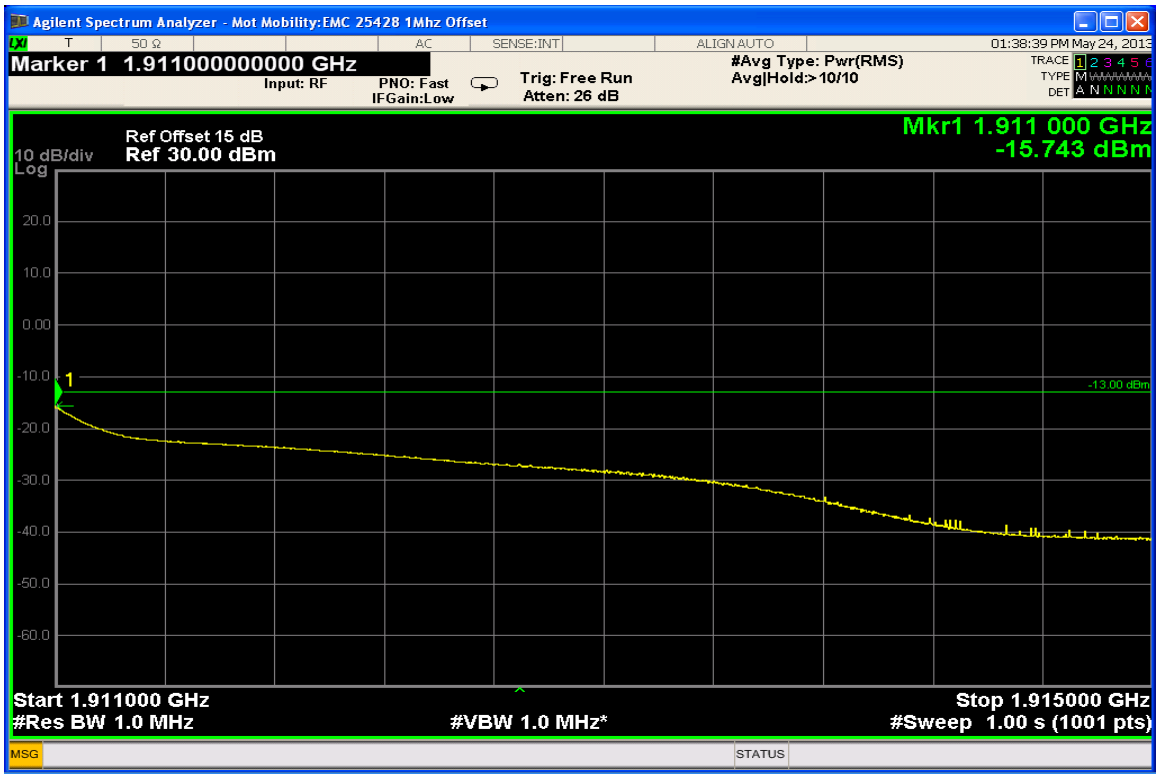


Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated from 9 kHz to the tenth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

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



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.

Testing is again performed with the EUT placed on the wireless charging pad under normal charging conditions and in simulated call configurations.

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

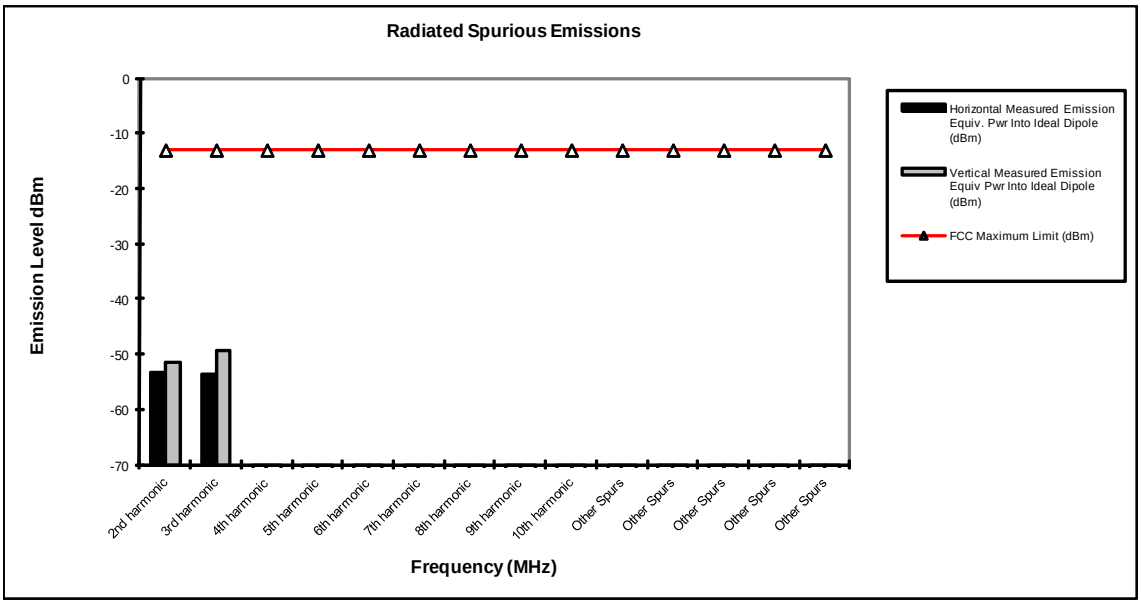
Measurement Results

Attached

Measurement Results –GSM 850

Radiated Spurious and Harmonic Emissions

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Pw r Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pw r Into Ideal Dipole (dBm)
2nd harmonic	-13	-53.4	-51.5
3rd harmonic	-13	-53.6	-49.3
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	*	*



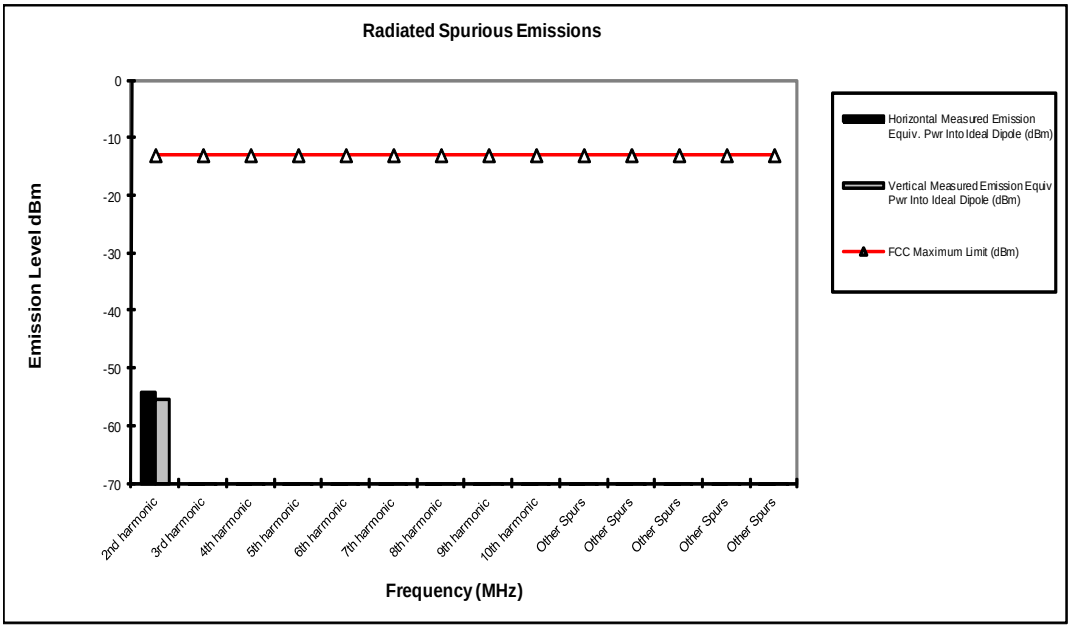
Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are lower than -33 dBm.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.

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

Measurement Results –GSM 850 with wireless charging pad

Radiated Spurious and Harmonic Emissions

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Pw r Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pw r Into Ideal Dipole (dBm)
2nd harmonic	-13	-54.1	-55.3
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	*	*



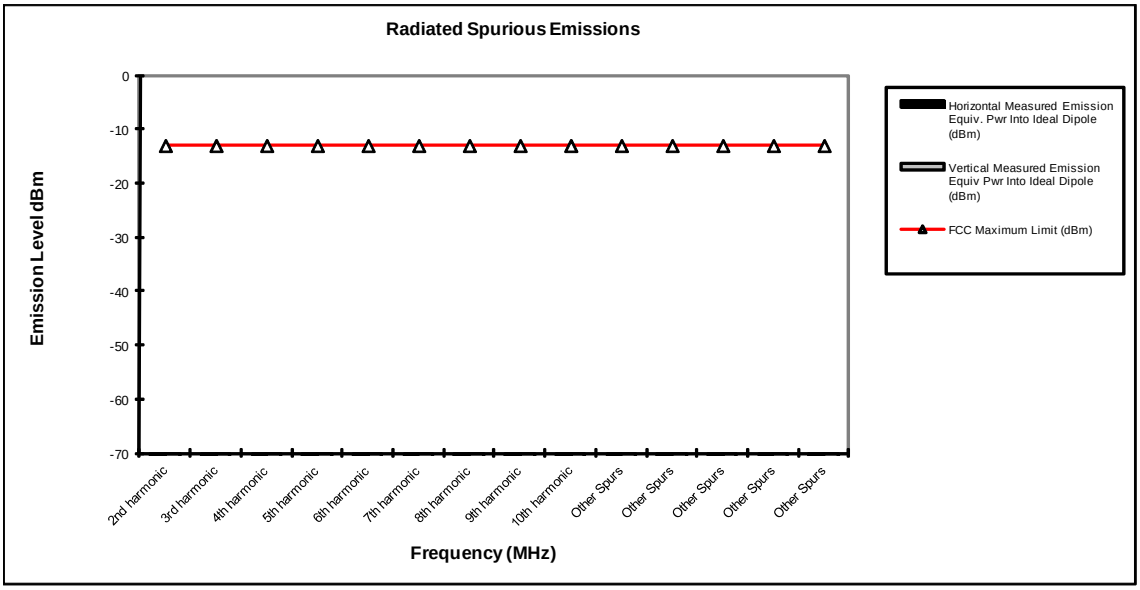
Notes:

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.

Measurement Results – EDGE 850, GSM 1900, EDGE 1900 and CDMA 1900
With and without charging pad

Radiated Spurious and Harmonic Emissions

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



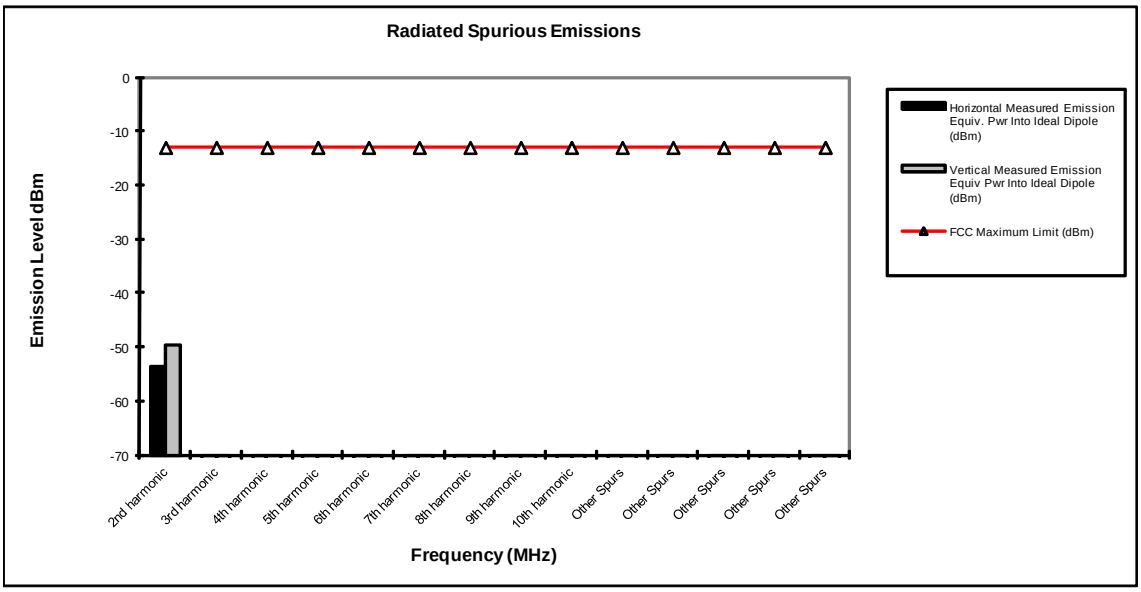
Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are lower than -33 dBm.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum 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 –CDMA 800

Radiated Spurious and Harmonic Emissions

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Pw r Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pw r Into Ideal Dipole (dBm)
2nd harmonic	-13	-53.5	-49.7
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:

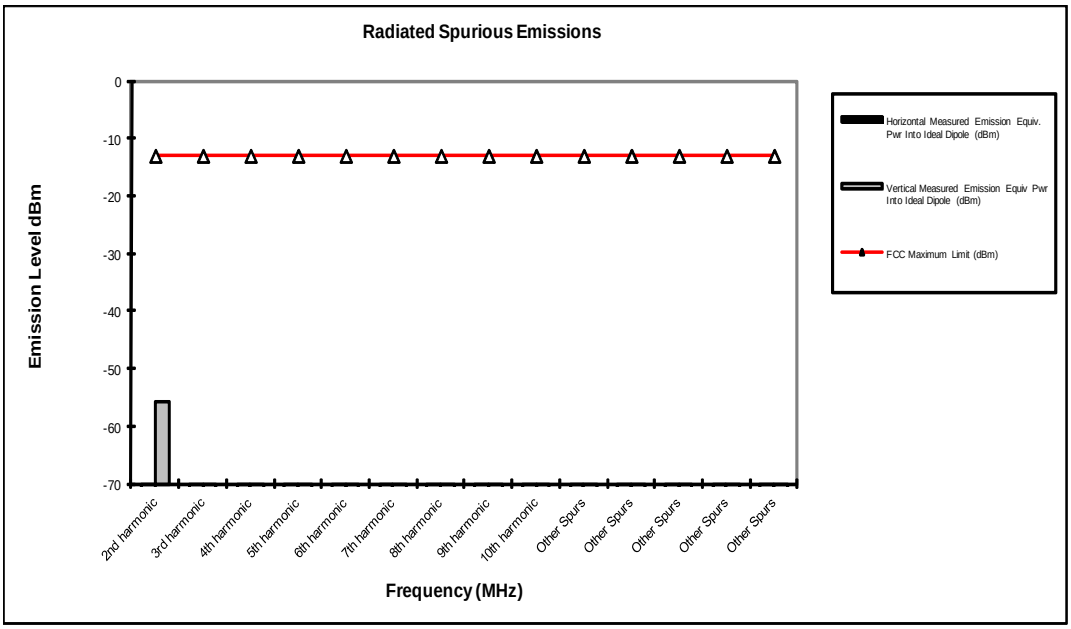
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are lower than -33 dBm.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated 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 –CDMA 800 with wireless charging pad

Radiated Spurious and Harmonic Emissions

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Pw r Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pw r Into Ideal Dipole (dBm)
2nd harmonic	-13	*	-55.7
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	*	*



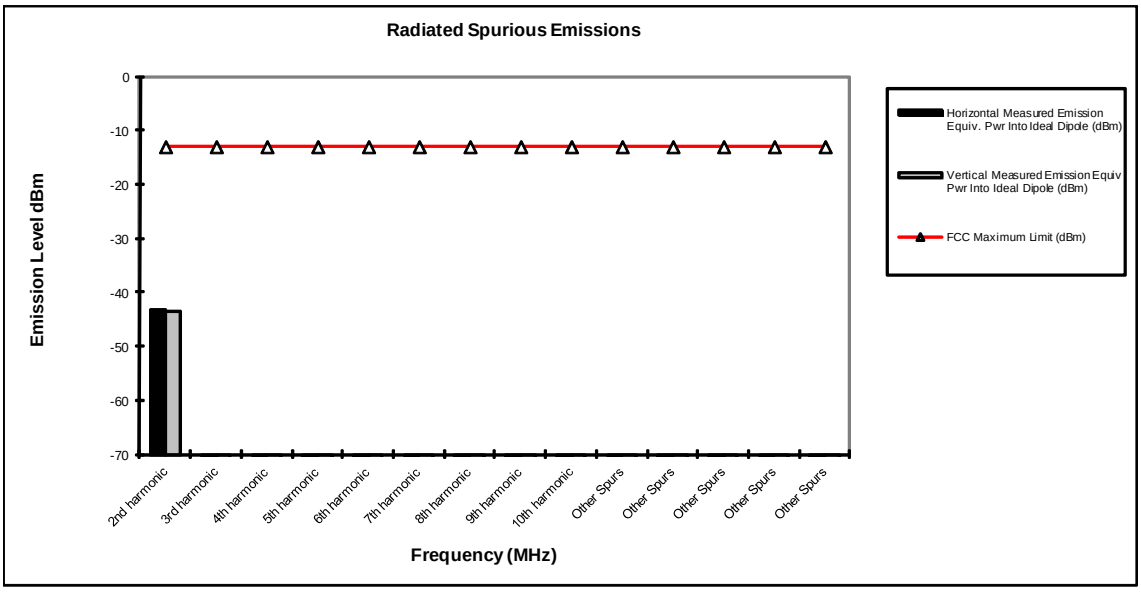
Notes:

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.

Measurement Results –WCDMA 850

Radiated Spurious and Harmonic Emissions

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Pw r Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pw r Into Ideal Dipole (dBm)
2nd harmonic	-13	-43.3	-43.4
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	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*
Other Spurs	-13	*	*



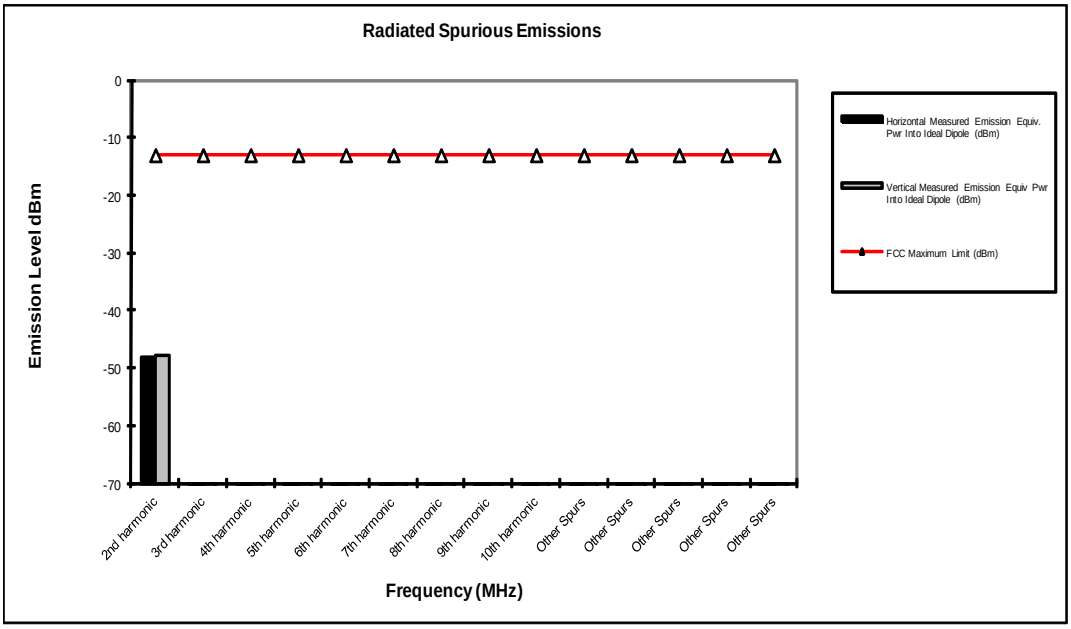
Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are lower than -33 dBm.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum 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 –WCDMA 850 with wireless charging pad

Radiated Spurious and Harmonic Emissions

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Pw r Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pw r Into Ideal Dipole (dBm)
2nd harmonic	-13	-48.1	-47.8
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	*	*



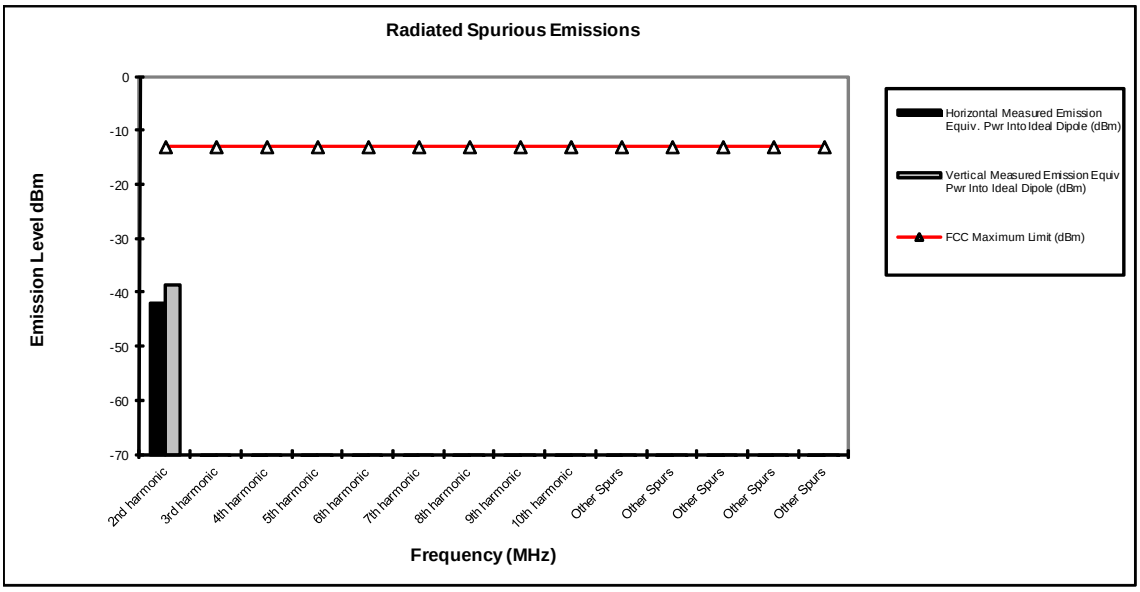
Notes:

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.

Measurement Results –WCDMA 1900

Radiated Spurious and Harmonic Emissions

Frequency (MHz)	FCC Maximum Limit (dBm)	Horizontal Measured Emission Equiv. Pw r Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pw r Into Ideal Dipole (dBm)
2nd harmonic	-13	-42.1	-38.8
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	*	*



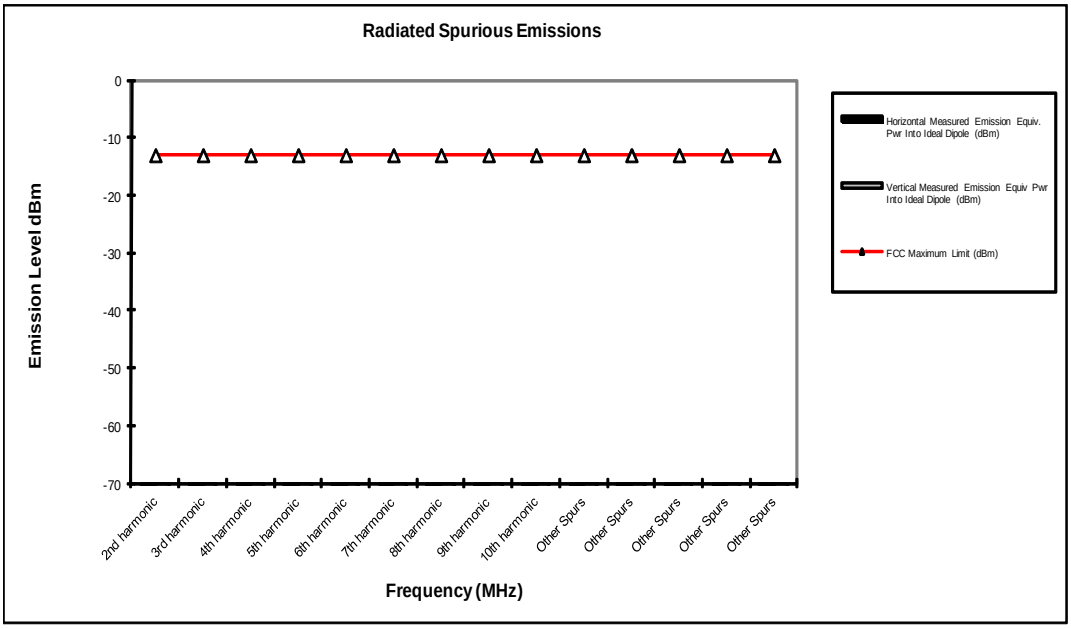
Notes:
1. * Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are lower than -33 dBm.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum 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 –WCDMA 1900 with wireless charging pad

Radiated Spurious and Harmonic Emissions

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

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 -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

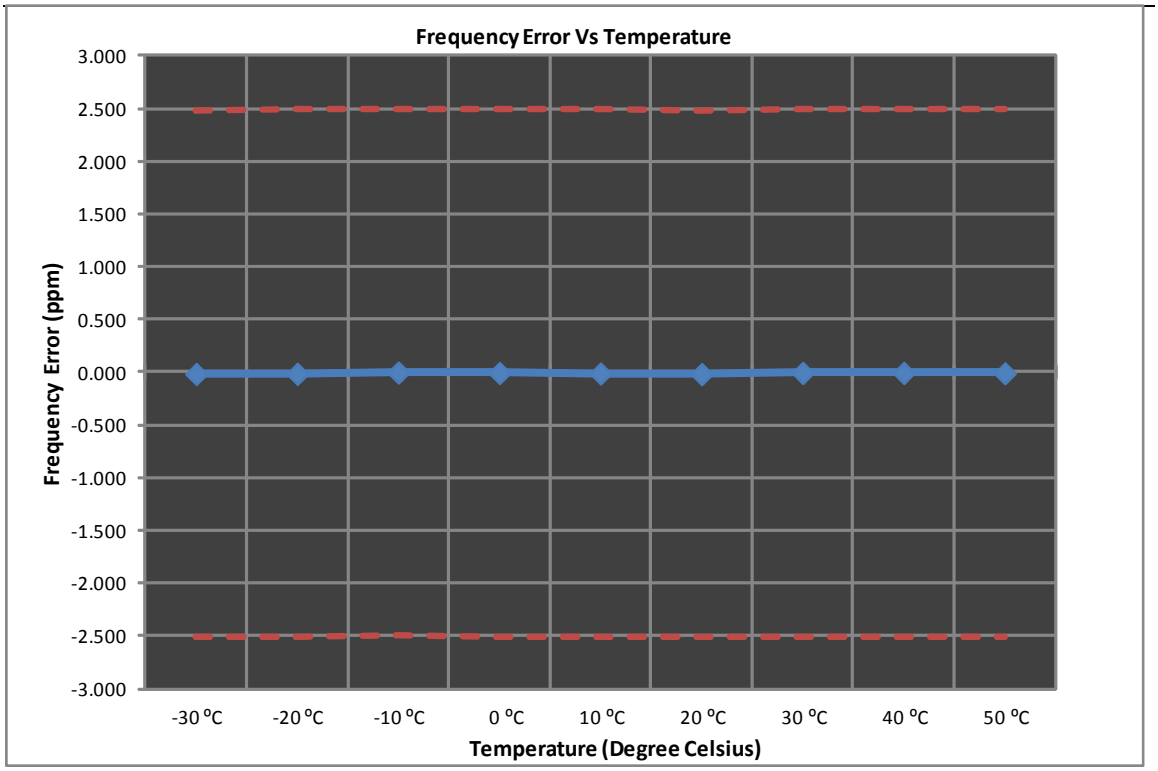
Attached

Measurement Results
Modulation: GSM 850

Frequency Stability

Mode:	GSM 850	Operating Frequency:	824.2 MHz
Channel:	128	Deviation Limit (PPM):	± 2.5 ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
^{0}C	Hz	(ppm)	(%)	(VDC)
-30 ^{0}C	**-12.50**	-0.015	100%	3.80
-20 ^{0}C	**-11.05**	-0.013	100%	3.80
-10 ^{0}C	**-0.57**	-0.001	100%	3.80
0 ^{0}C	**-4.46**	-0.005	100%	3.80
10 ^{0}C	**-8.93**	-0.011	100%	3.80
20 ^{0}C	**-13.55**	-0.016	100%	3.80
30 ^{0}C	**-3.78**	-0.005	100%	3.80
40 ^{0}C	**-3.69**	-0.004	100%	3.80
50 ^{0}C	**-6.42**	-0.008	100%	3.80
20 ^{0}C	**-16.32**	-0.020	Battery Endpoint	3.20

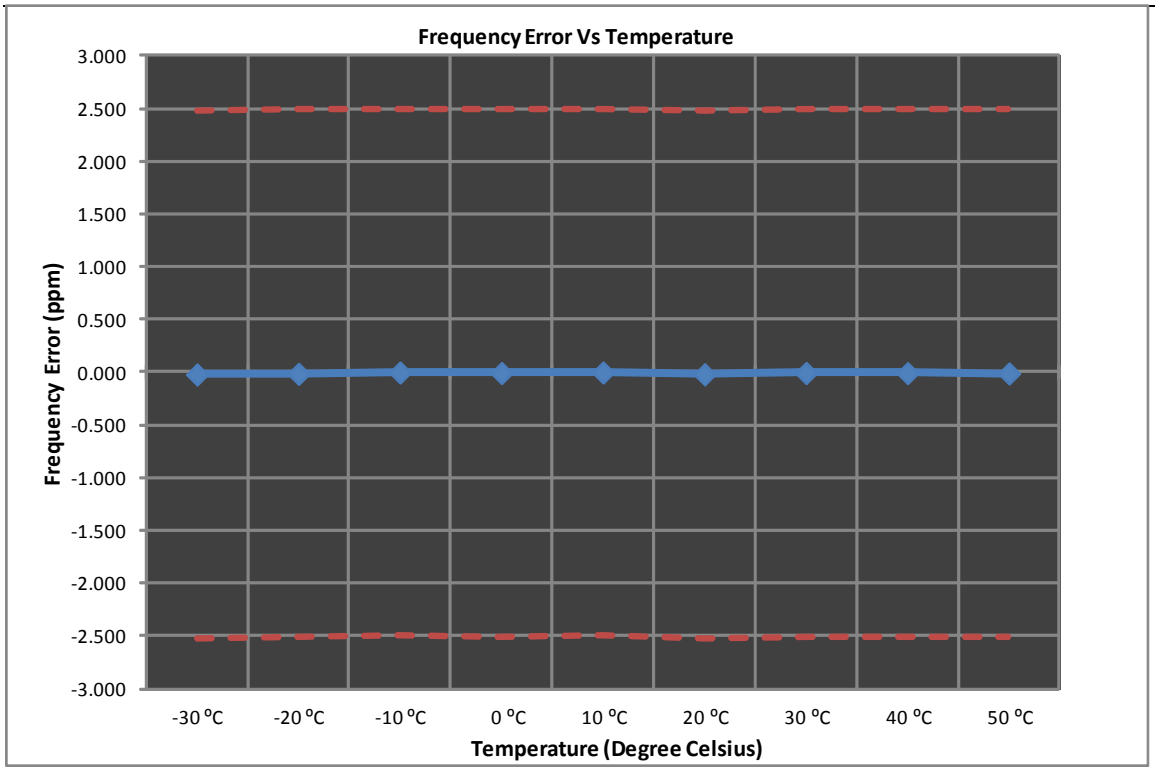


Measurement Results
Modulation: EDGE 850

Frequency Stability

Mode:	Edge 850	Operating Frequency:	824.2 MHz
Channel:	128	Deviation Limit (PPM):	± 2.5 ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
^{0}C	Hz	(ppm)	(%)	(VDC)
-30 ^{0}C	**-16.20**	-0.020	100%	3.80
-20 ^{0}C	**-10.69**	-0.013	100%	3.80
-10 ^{0}C	**-0.14**	0.000	100%	3.80
0 ^{0}C	**-4.99**	-0.006	100%	3.80
10 ^{0}C	**-0.41**	0.000	100%	3.80
20 ^{0}C	**-15.26**	-0.019	100%	3.80
30 ^{0}C	**-4.27**	-0.005	100%	3.80
40 ^{0}C	**-5.59**	-0.007	100%	3.80
50 ^{0}C	**-7.92**	-0.010	100%	3.80
20 ^{0}C	**-12.92**	-0.016	Battery Endpoint	3.20

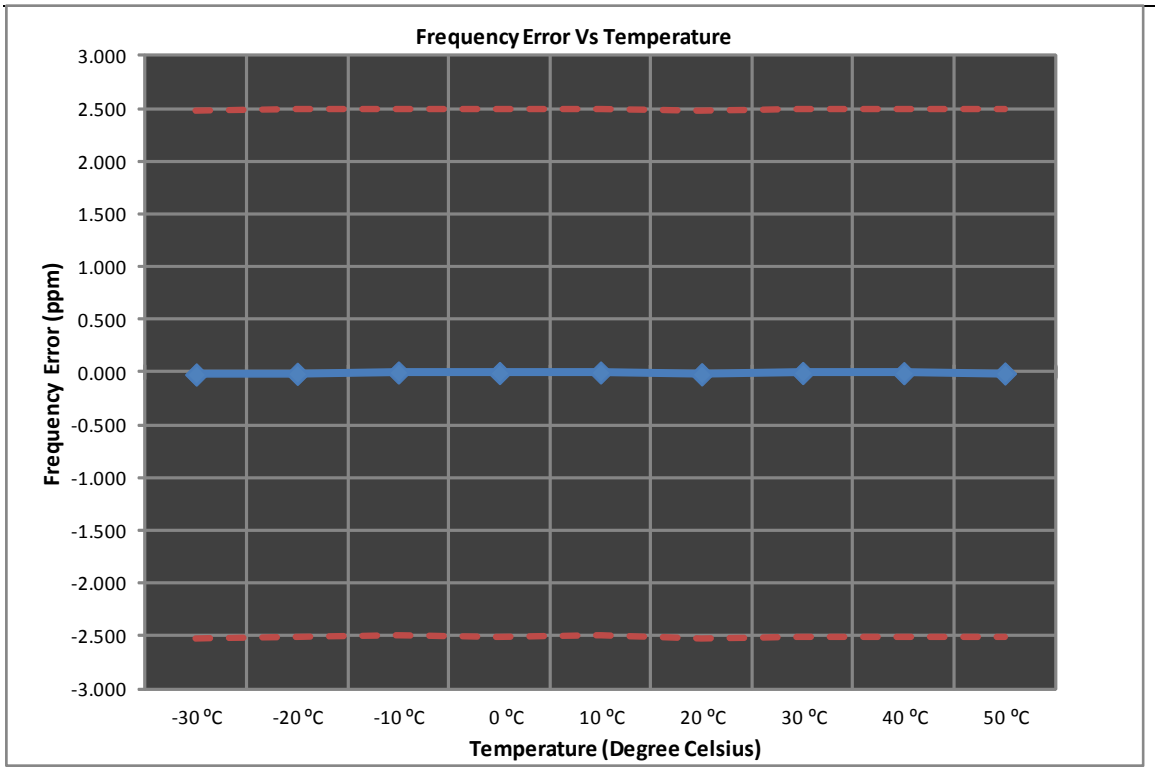


Measurement Results
Modulation: GSM 1900

Frequency Stability

Mode:	Edge 850	Operating Frequency:	824.2 MHz
Channel:	128	Deviation Limit (PPM):	± 2.5 ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
^{0}C	Hz	(ppm)	(%)	(VDC)
-30 ^{0}C	**-16.20**	-0.020	100%	3.80
-20 ^{0}C	**-10.69**	-0.013	100%	3.80
-10 ^{0}C	**-0.14**	0.000	100%	3.80
0 ^{0}C	**-4.99**	-0.006	100%	3.80
10 ^{0}C	**-0.41**	0.000	100%	3.80
20 ^{0}C	**-15.26**	-0.019	100%	3.80
30 ^{0}C	**-4.27**	-0.005	100%	3.80
40 ^{0}C	**-5.59**	-0.007	100%	3.80
50 ^{0}C	**-7.92**	-0.010	100%	3.80
20 ^{0}C	**-12.92**	-0.016	Battery Endpoint	3.20

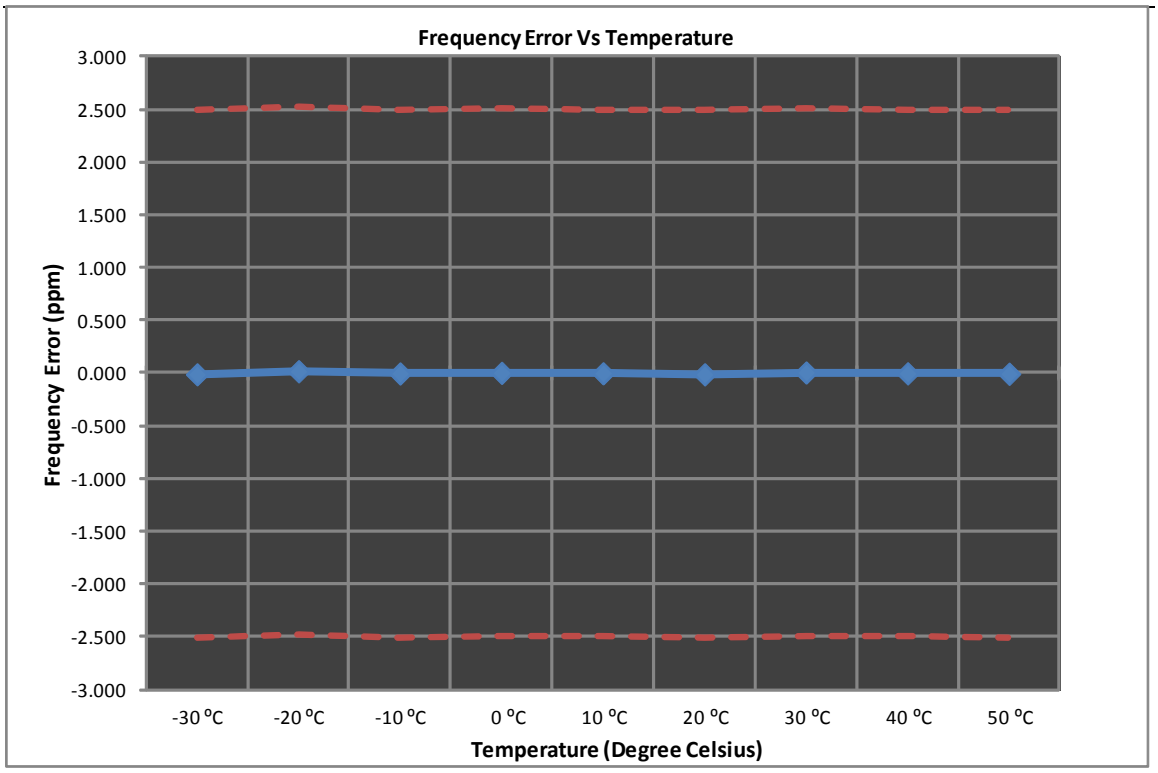


Measurement Results
Modulation: EDGE 1900

Frequency Stability

Mode:	Edge 1900	Operating Frequency:	1850.2 MHz
Channel:	512	Deviation Limit (PPM):	± 2.5 ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
^{0}C	Hz	(ppm)	(%)	(VDC)
-30 ^{0}C	**-20.12**	-0.011	100%	3.80
-20 ^{0}C	**33.77**	0.018	100%	3.80
-10 ^{0}C	**-4.59**	-0.002	100%	3.80
0 ^{0}C	**6.17**	0.003	100%	3.80
10 ^{0}C	**-0.81**	0.000	100%	3.80
20 ^{0}C	**-20.25**	-0.011	100%	3.80
30 ^{0}C	**13.16**	0.007	100%	3.80
40 ^{0}C	**-2.80**	-0.002	100%	3.80
50 ^{0}C	**-8.95**	-0.005	100%	3.80
20 ^{0}C	**-23.84**	-0.013	Battery Endpoint	3.20

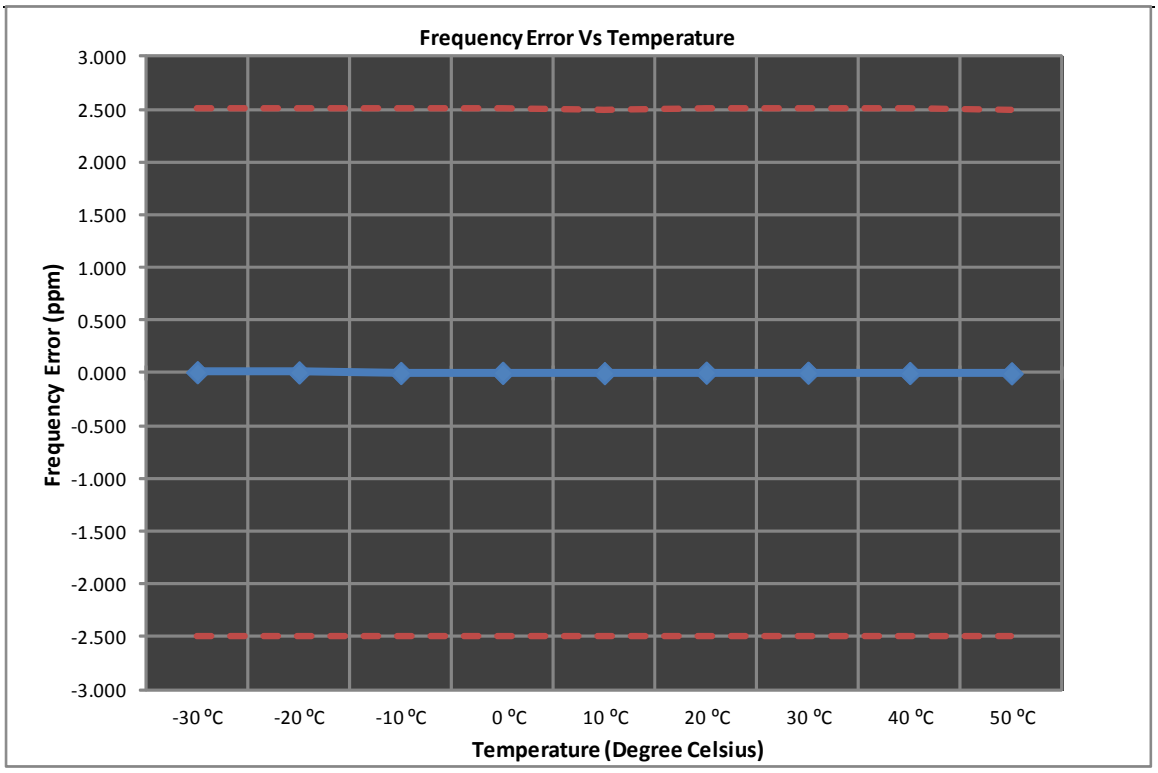


Measurement Results
Modulation: CDMA 800

Frequency Stability

Mode:	CDMA 800	Operating Frequency:	824.7 MHz
Channel:	1013	Deviation Limit (PPM):	± 2.5 ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
^{0}C	Hz	(ppm)	(%)	(VDC)
-30 ^{0}C	**7.43**	0.009	100%	3.80
-20 ^{0}C	**6.36**	0.008	100%	3.80
-10 ^{0}C	**2.10**	0.003	100%	3.80
0 ^{0}C	**2.70**	0.003	100%	3.80
10 ^{0}C	**0.70**	0.001	100%	3.80
20 ^{0}C	**4.20**	0.005	100%	3.80
30 ^{0}C	**3.50**	0.004	100%	3.80
40 ^{0}C	**1.14**	0.001	100%	3.80
50 ^{0}C	**-1.00**	-0.001	100%	3.80
20 ^{0}C	**5.06**	0.006	Battery Endpoint	3.20

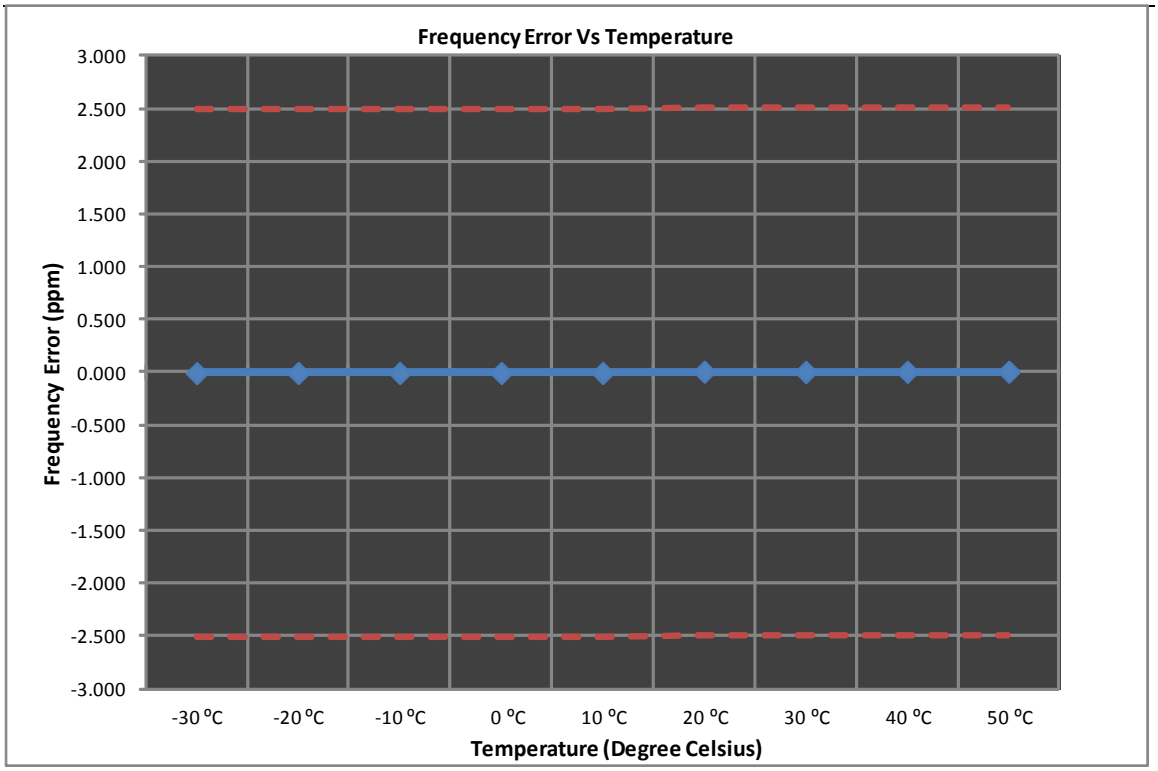


Measurement Results
Modulation: WCDMA 850

Frequency Stability

Mode:	WCDMA 850	Operating Frequency:	826.4 MHz
Channel:	4132	Deviation Limit (PPM):	± 2.5 ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
^{0}C	Hz	(ppm)	(%)	(VDC)
-30 ^{0}C	**-5.47**	-0.007	100%	3.80
-20 ^{0}C	**-4.55**	-0.006	100%	3.80
-10 ^{0}C	**-4.48**	-0.005	100%	3.80
0 ^{0}C	**-4.21**	-0.005	100%	3.80
10 ^{0}C	**-3.93**	-0.005	100%	3.80
20 ^{0}C	**5.83**	0.007	100%	3.80
30 ^{0}C	**3.31**	0.004	100%	3.80
40 ^{0}C	**4.81**	0.006	100%	3.80
50 ^{0}C	**5.97**	0.007	100%	3.80
20 ^{0}C	**5.42**	0.007	Battery Endpoint	3.20

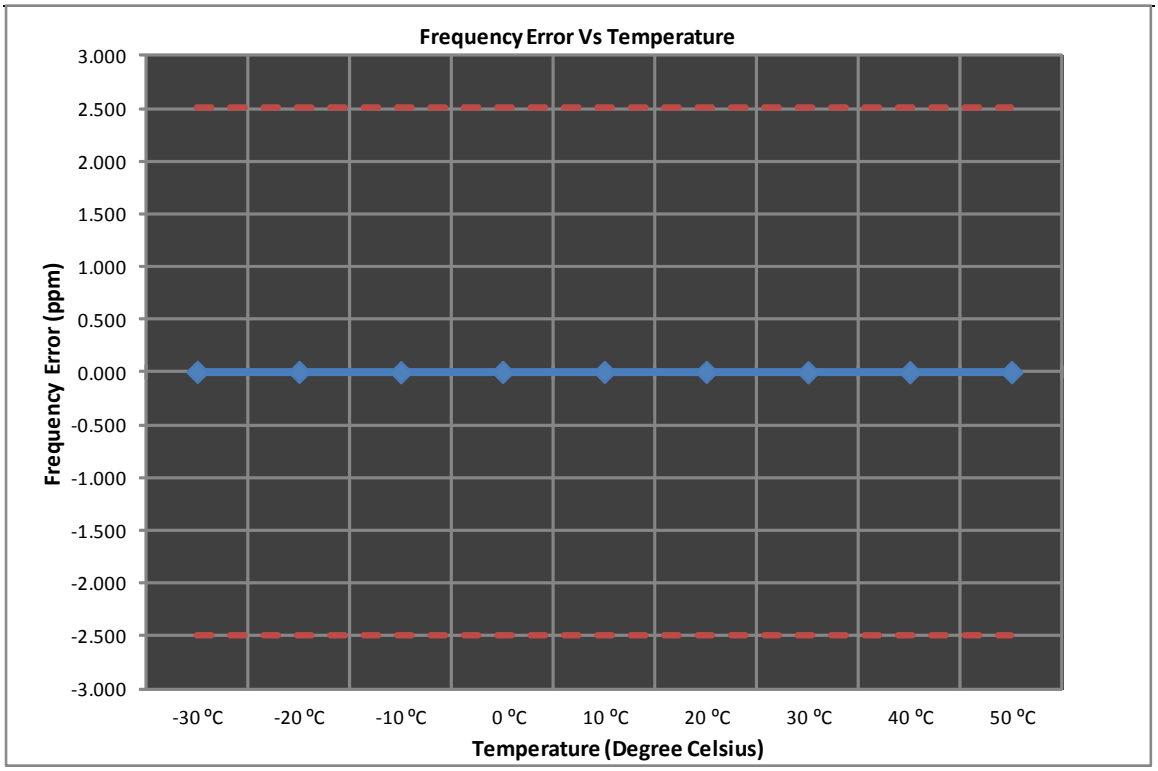


Measurement Results
Modulation: CDMA 1900

Frequency Stability

Mode:	CDMA 1900	Operating Frequency:	1851.2 MHz
Channel:	25	Deviation Limit (PPM):	± 2.5 ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
^{0}C	Hz	(ppm)	(%)	(VDC)
-30 ^{0}C	**9.30**	0.005	100%	3.80
-20 ^{0}C	**7.68**	0.004	100%	3.80
-10 ^{0}C	**5.20**	0.003	100%	3.80
0 ^{0}C	**7.80**	0.004	100%	3.80
10 ^{0}C	**7.60**	0.004	100%	3.80
20 ^{0}C	**8.34**	0.005	100%	3.80
30 ^{0}C	**4.10**	0.002	100%	3.80
40 ^{0}C	**4.99**	0.003	100%	3.80
50 ^{0}C	**5.40**	0.003	100%	3.80
20 ^{0}C	**8.26**	0.004	Battery Endpoint	3.20

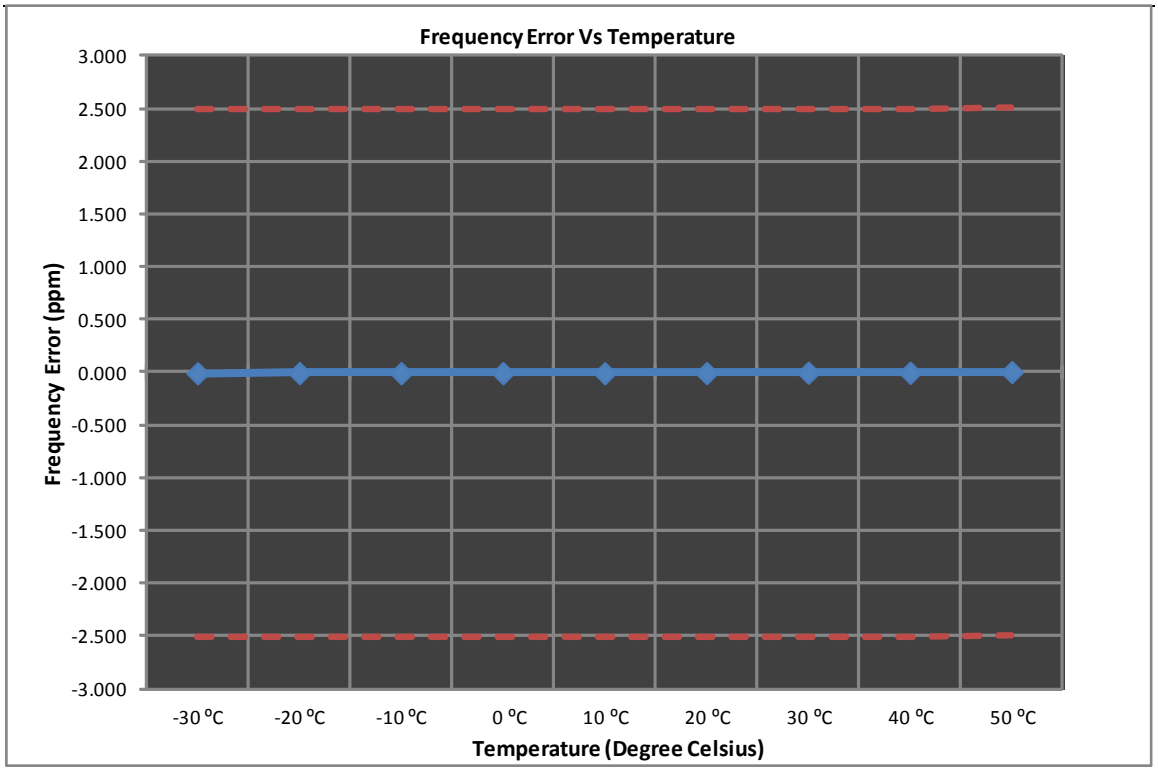


Measurement Results
Modulation: WCDMA 1900

Frequency Stability

Mode:	WCDMA 1900	Operating Frequency:	1852.4 MHz
Channel:	9262	Deviation Limit (PPM):	± 2.5 ppm

Temperature	Frequency Error	Frequency Error	Voltage	Voltage
^{0}C	Hz	(ppm)	(%)	(VDC)
-30 ^{0}C	**-14.65**	-0.008	100%	3.80
-20 ^{0}C	**-12.30**	-0.007	100%	3.80
-10 ^{0}C	**-13.88**	-0.007	100%	3.80
0 ^{0}C	**-13.24**	-0.007	100%	3.80
10 ^{0}C	**-13.73**	-0.007	100%	3.80
20 ^{0}C	**-12.18**	-0.007	100%	3.80
30 ^{0}C	**-5.96**	-0.003	100%	3.80
40 ^{0}C	**-6.68**	-0.004	100%	3.80
50 ^{0}C	**6.36**	0.003	100%	3.80
20 ^{0}C	**-11.61**	-0.006	Battery Endpoint	3.20



End of Test Report