



**MOBILE DEVICES BUSINESS**

**PRODUCT SAFETY AND COMPLIANCE  
EMC LABORATORY**

**EMC TEST REPORT**

**Test Report Number** – 25389-1

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:

A handwritten signature in black ink that reads 'Albert J. Patapack'.

Name: Albert J. Patapack

Title: EMC Engineer

Date: June 3, 2013

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2404

**Table of Contents**

<u>Description</u>	<u>Page</u>
Test Report Details	3
Applicable Standards	4
Summary of Testing	4
General and Special Conditions	4
Equipment and Cable Configuration	5
Measurement Procedures and Data	6
Radiated Power	6
Measurement results	7
Occupied Bandwidth	12
Measurement results	13
Spurious Emissions at Antenna Terminals	27
Measurement results	28
Field Strength of Spurious Emissions	38
Measurement results	39
Frequency Stability	40
Measurement results	41

**Test Report Details**

All 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 1700/1900/2100/850/900,  
GSM 1800/1900/850/900,  
LTE Band 02/Band4/Band 17, aGPS,  
Bluetooth Class 2, Version 4.0 LE+EDR,  
802.11b/802.11g/802.11a/802.11n/802.11ac, NFC

FCC ID: IHDT56PA2

Serial Numbers: LXAA1W0033, LXAA1W0024, LXAA1W0009  
LXTU1J0043, LXTU1J0003, LXTU1J0055,  
LXTU1J0051

Testing Complete Date: April 9 – June 3, 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
- X   Part 27

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

Test #	Test Name	Margin with respect to the Limit
1	ERP (Effective Radiated Power)	See results
2	EIRP (Effective Isotropic Radiated Power)	See results
3	Occupied Bandwidth	See Plots
4	Spurious Emissions at Antenna Terminal	See results
5	Field Strength of Spurious Emissions	See results
6	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.

For all testing performed by ADR Testing Service

Manufacturer	Equipment Type	Model No.	Serial Number	Calibration Due Date
Rohde & Schwarz	Receiver	ESIB40	100226	5/15/2013
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	3/26/2013
Agilent	Signal Generator	83623B	3844A00935	5/11/2014
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

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**

### **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.

An RMS detector was used for all measurements.

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

**Measurement Results**

<b>Band</b>	<b>ERP dBm</b>	<b>Limit dBm</b>
GSM 850	30.34	38.45
EDGE 850	25.18	38.45
WCDMA 850	20.91	38.45

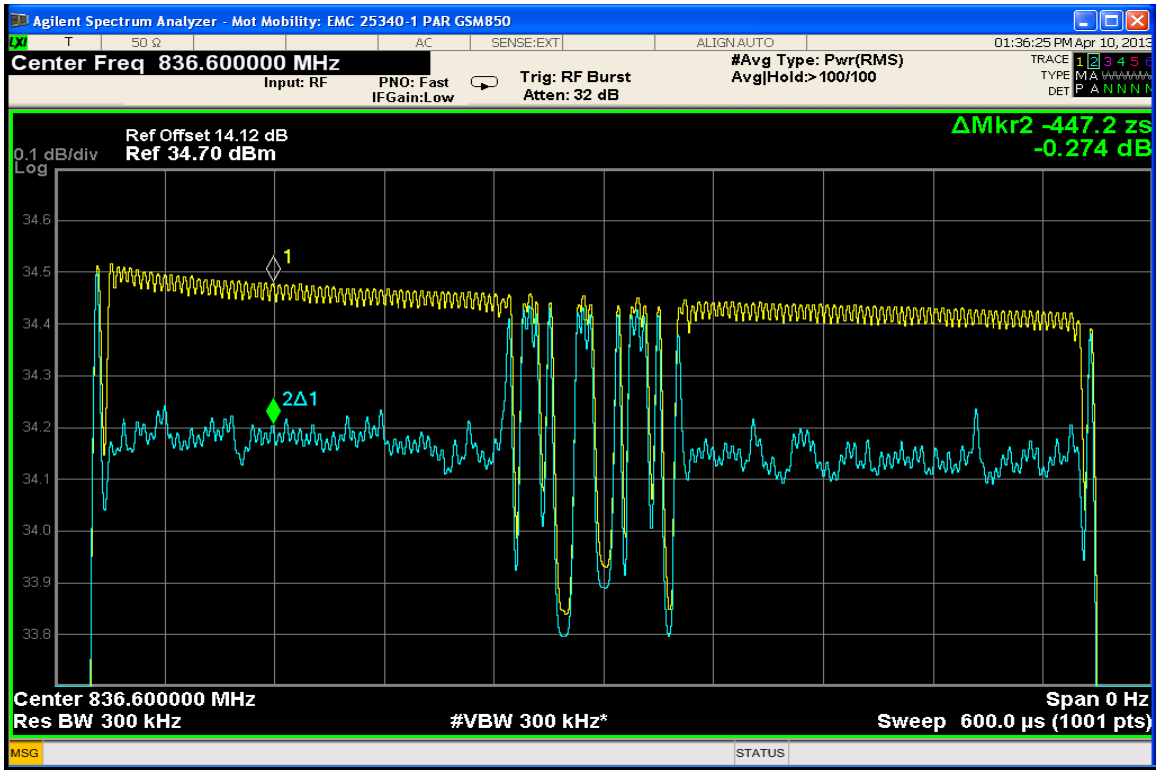
<b>Band</b>	<b>EIRP dBm</b>	<b>Limit dBm</b>
GSM 1900	30.49	33.01
EDGE 1900	29.61	33.01
WCDMA 1700	23.85	30.00
WCDMA 1900	26.01	33.01

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:

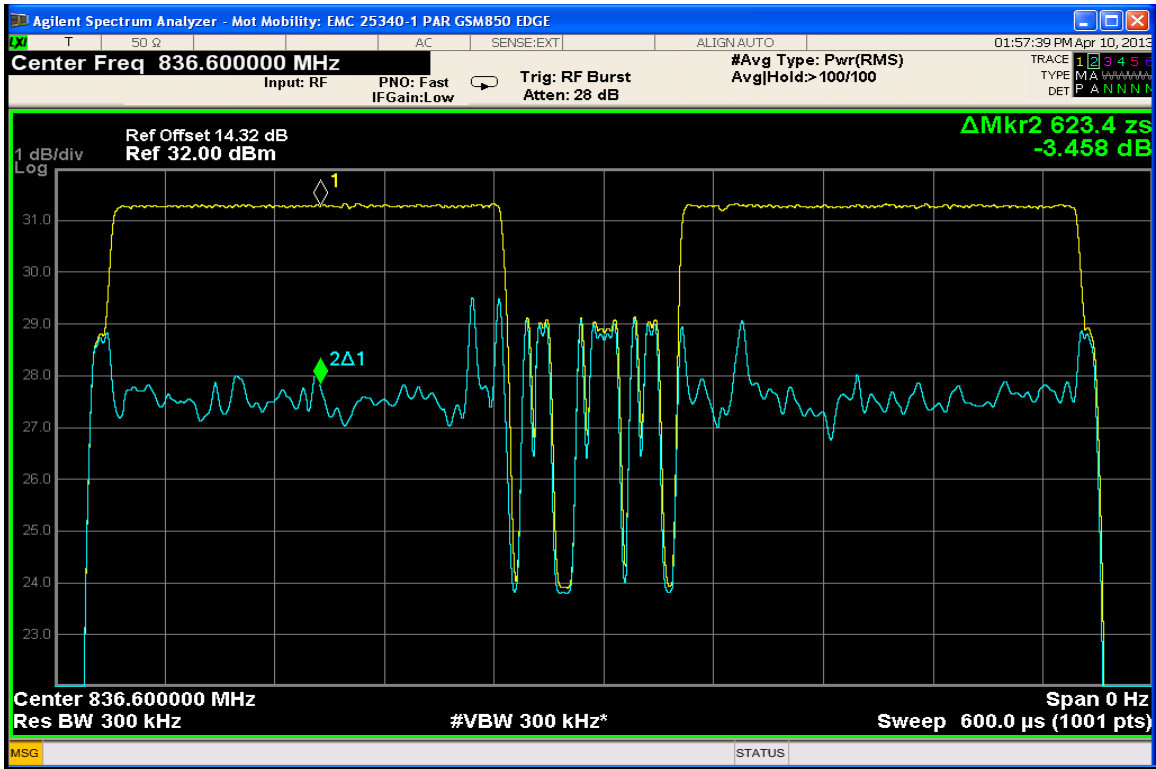
- Resolution Bandwidth      300 kHz
- Video Bandwidth          300 kHz
- Span                            0 Hz
- Sweep Time                 600  $\mu$ s
- Trace 1 type is Max Hold and the detector is Peak.
- Trace 2 type is average and the detector is Average.

For 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.

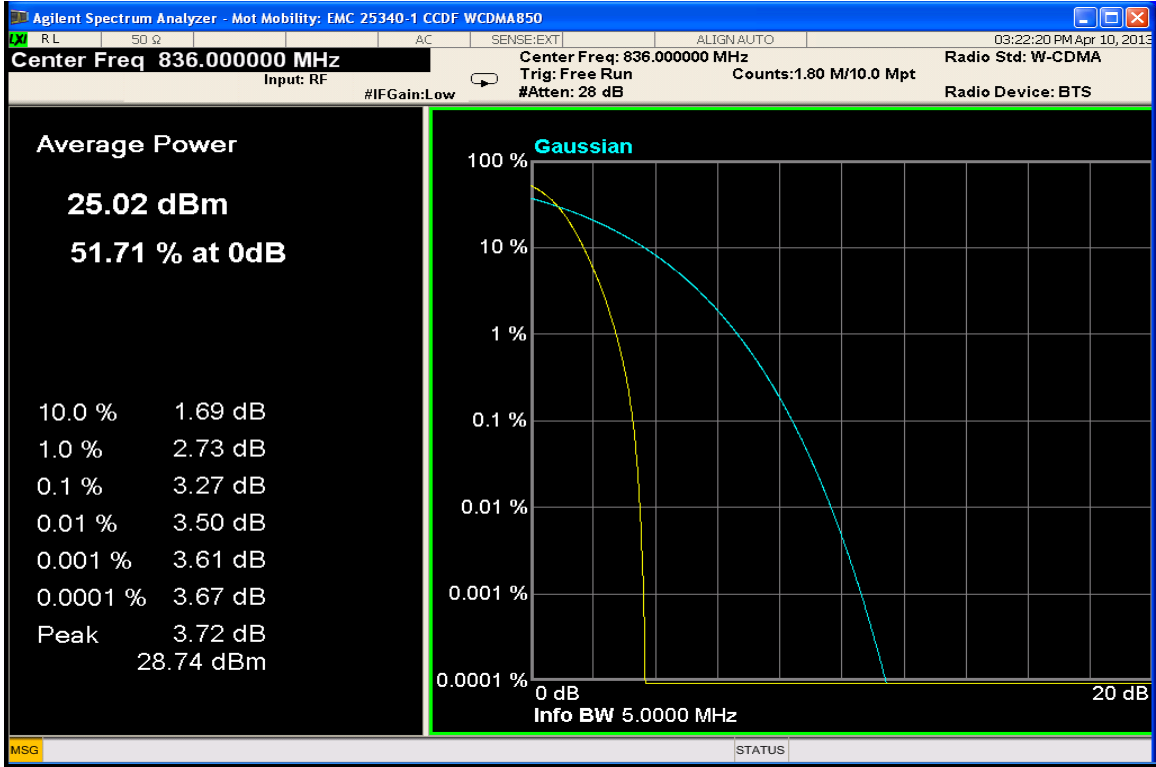
The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.



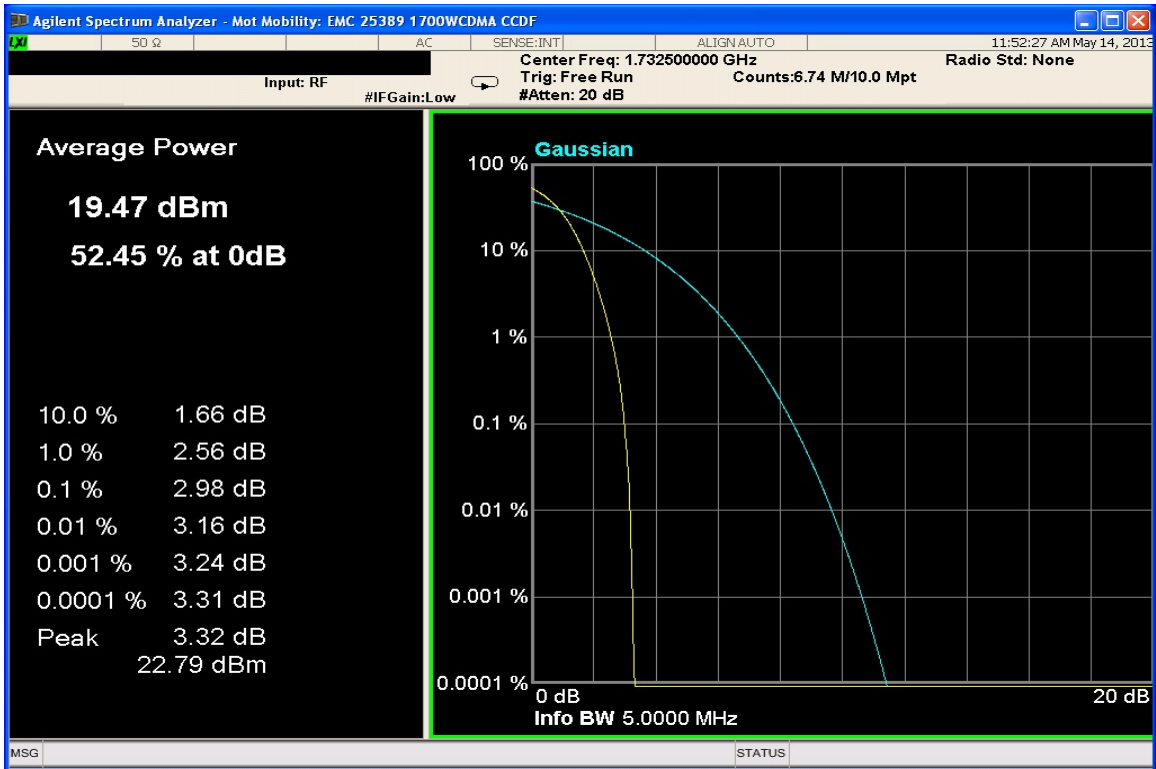
GSM 850 – PAR Plot



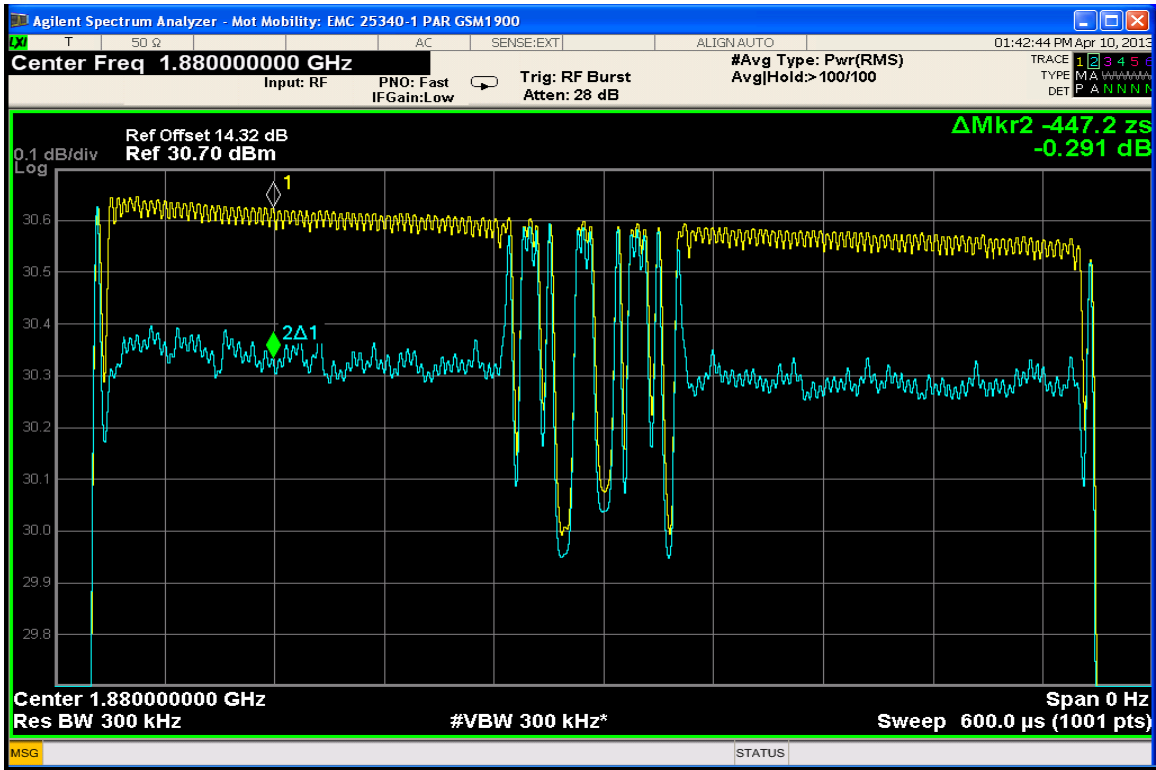
EDGE 850 – PAR Plot



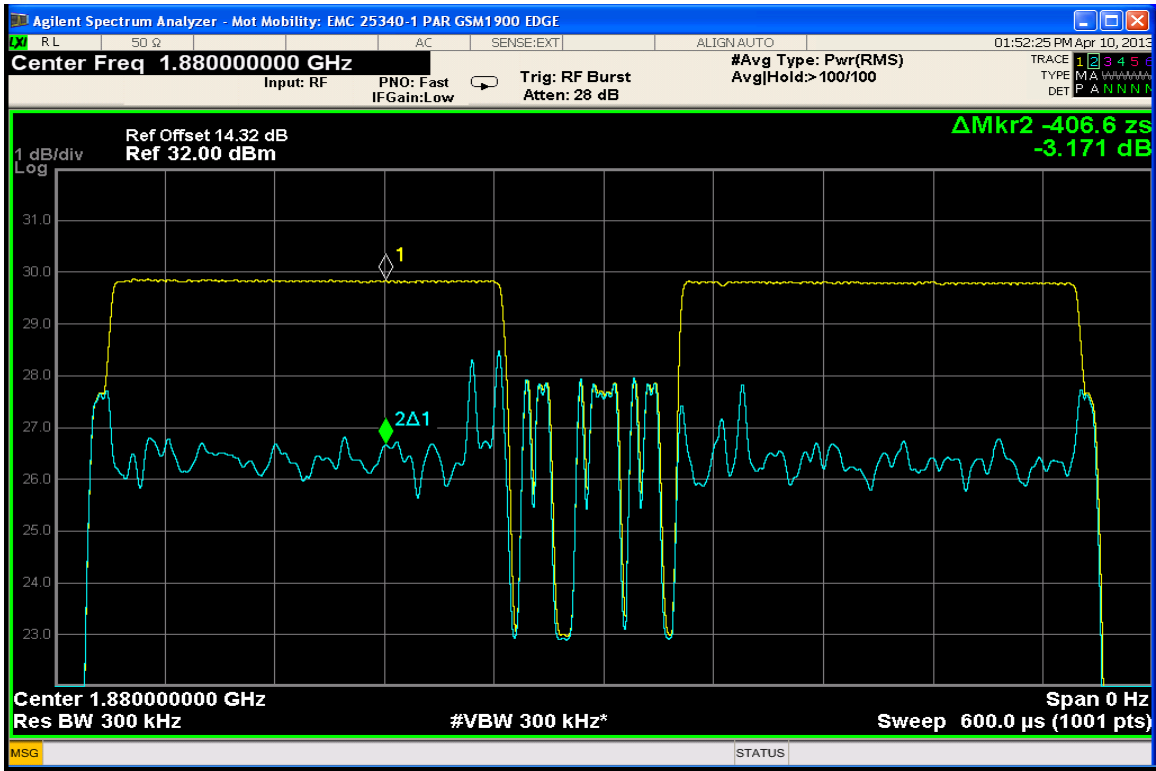
WCDMA 850 – CCDF Plot



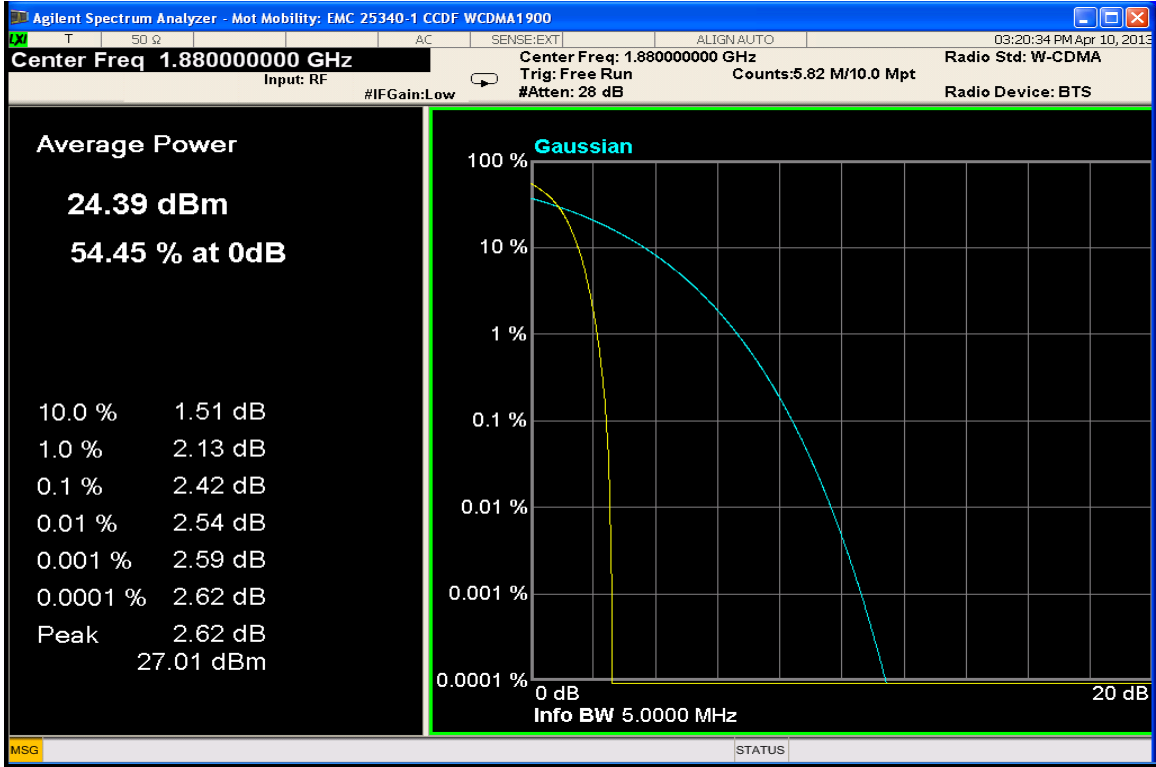
WCDMA 1700 – CCDF Plot



GSM 1900 – PAR Plot



EDGE 1900 – PAR 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 analyzer is set for Peak Detector and each trace is set for Max Hold. A fully charged battery was used for the supply voltage.

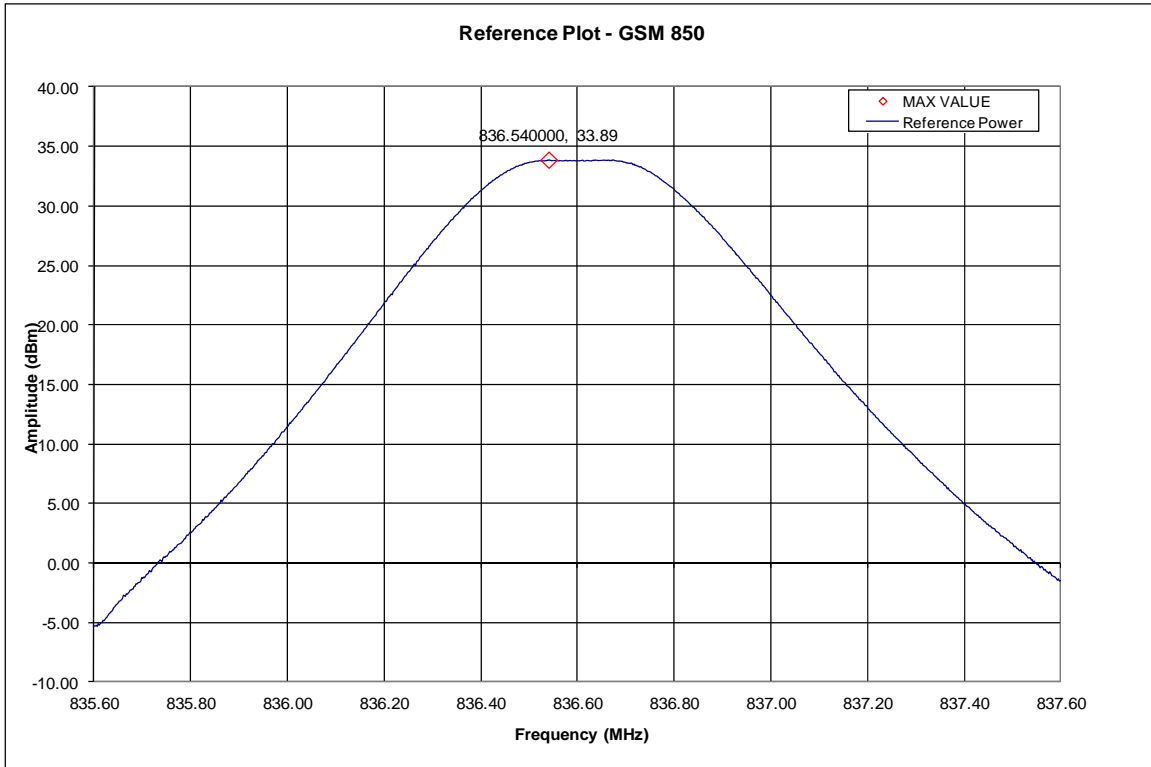
The middle channel within the designated frequency block was measured. For digital modulation, the lower and upper band edge plots are displayed.

Measurement Results  
Attached

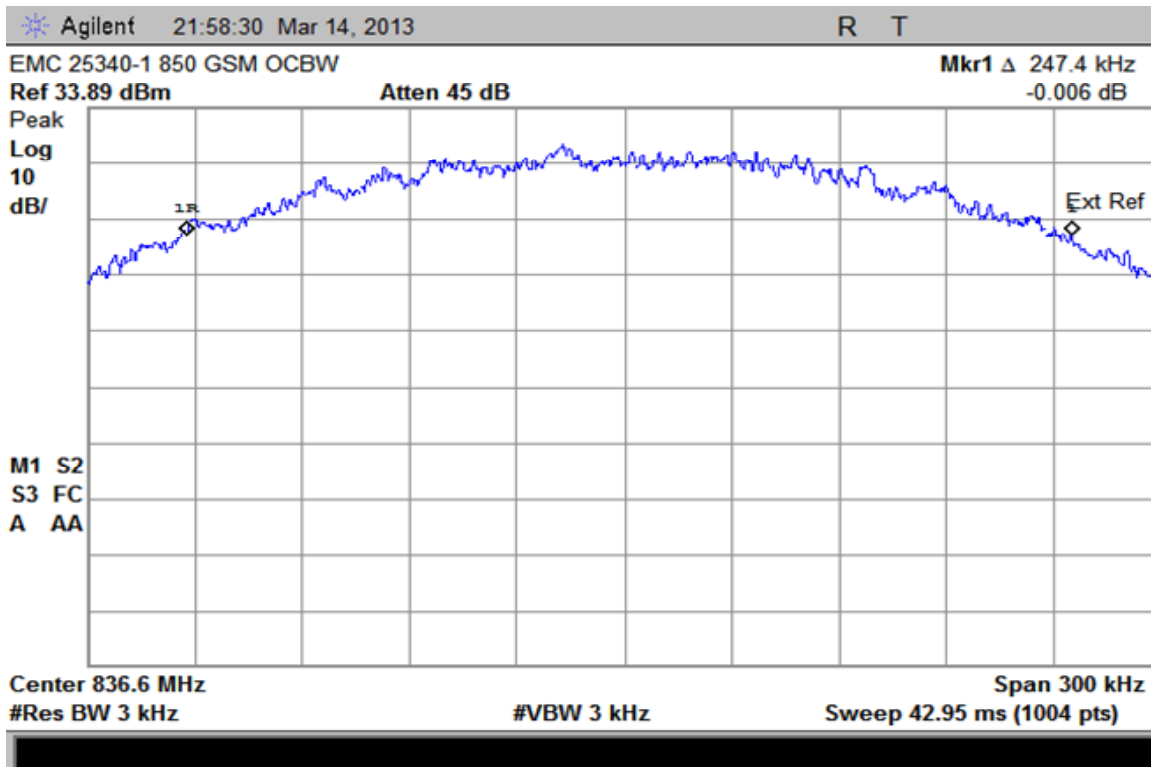
Plot	Equipment Settings					
	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Sweep Points (#)	Trace Mode	Detector	Samples (≥ #)
Reference Plot - GSM 850	300	Auto	1001	Max Hold	Peak	30
OCBW - GSM 850	3	Auto	1001	Max Hold	Peak	30
Lower Band Edge - GSM 850	1	Auto	2004	Max Hold	Peak	30
Upper Band Edge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

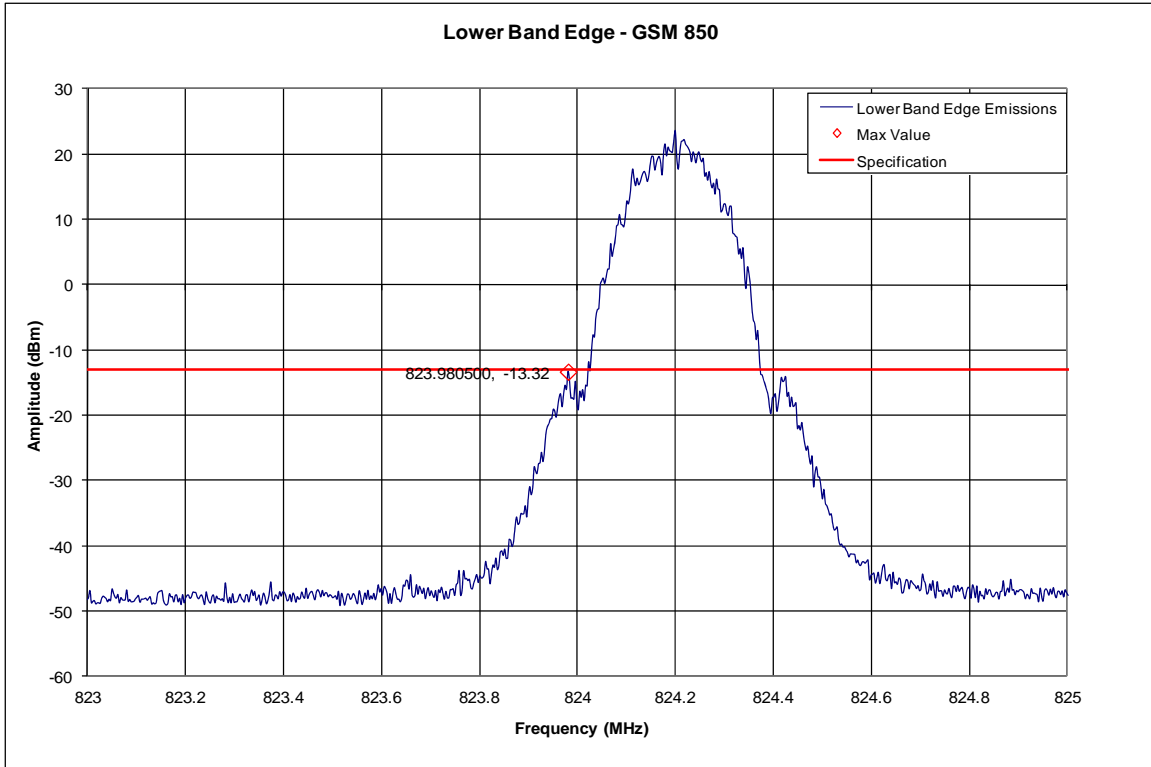
**Measurement Results – GSM 850**



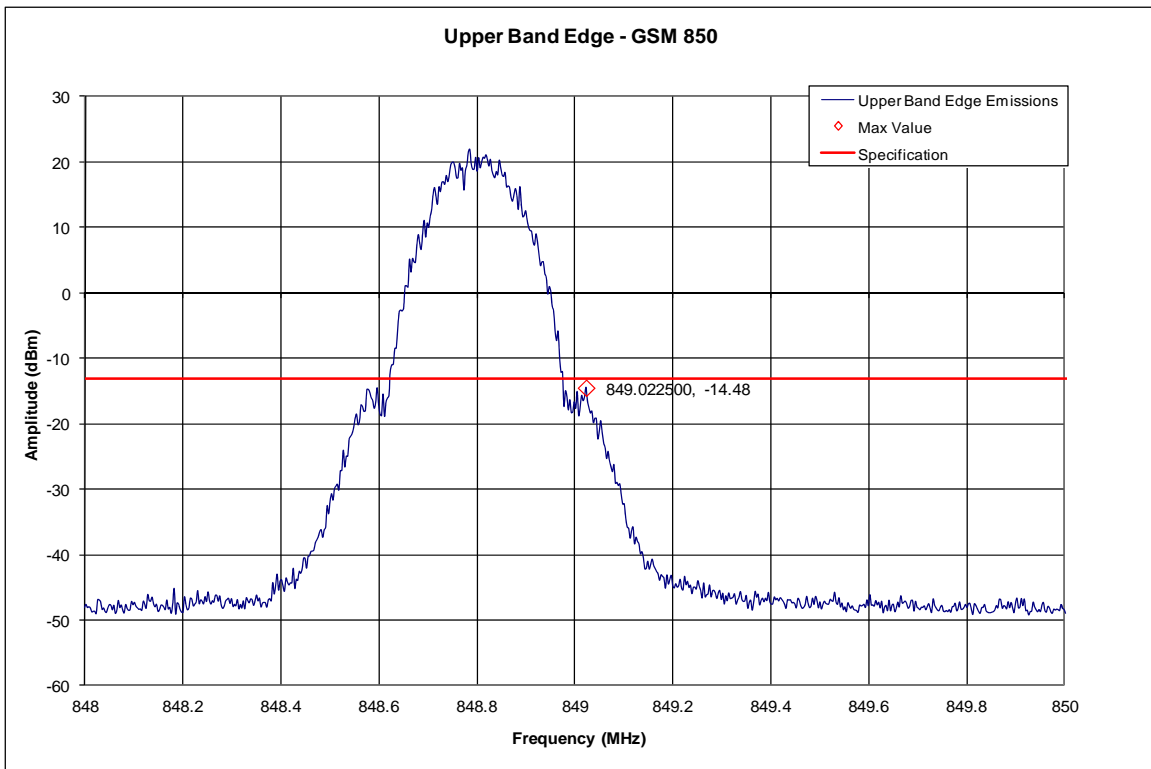
**GSM 850 – Reference Level Plot – Channel 190 (836.60 MHz)**



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



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

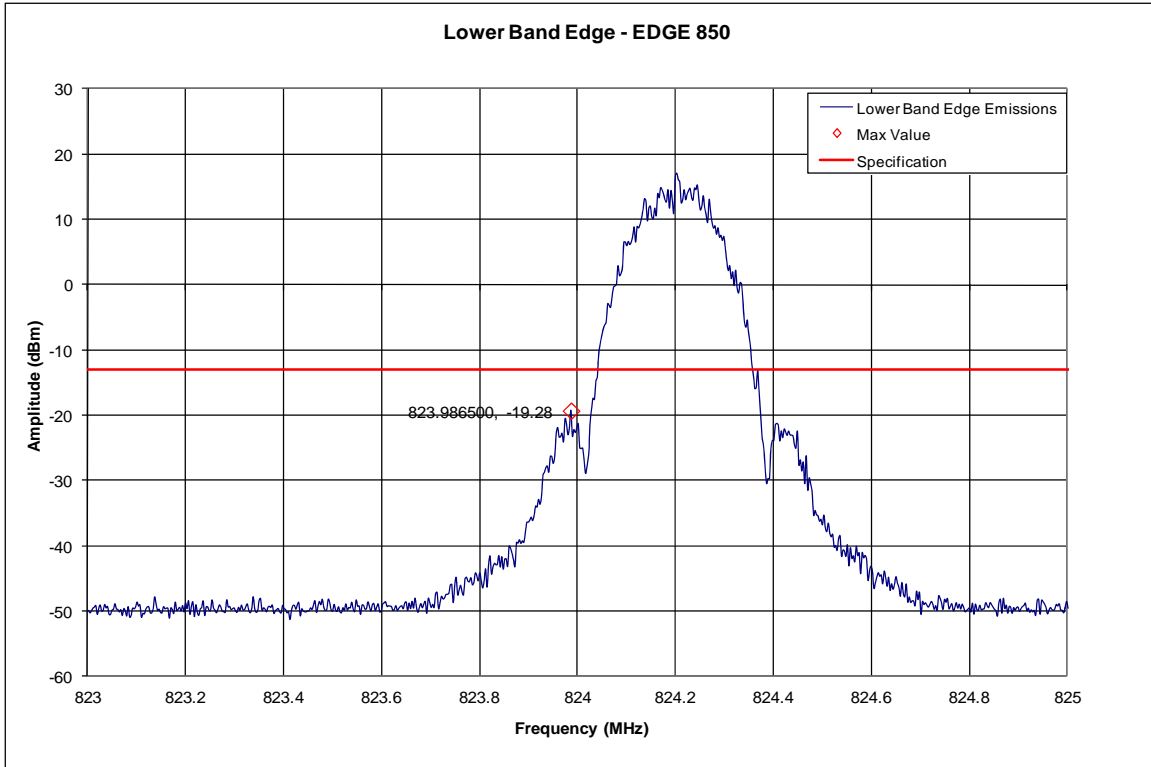


**GSM 850 – Upper Band Edge – Channel 251 (848.8 MHz)**

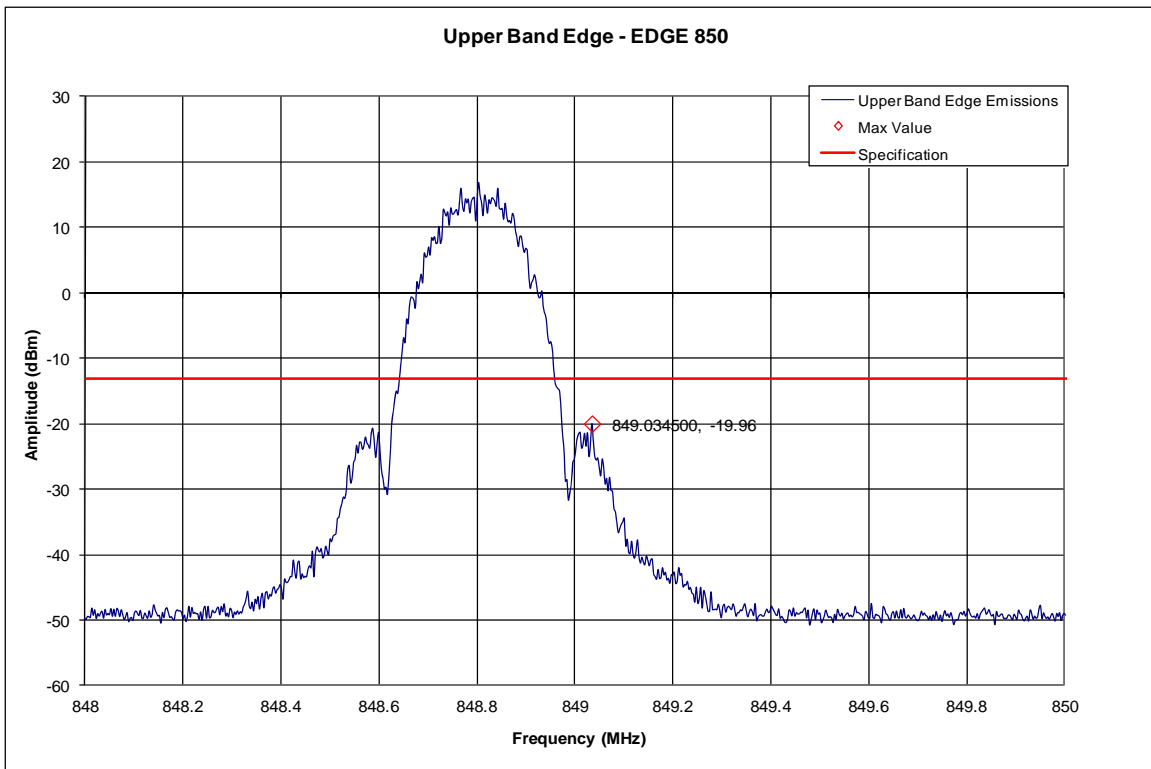
**Measurement Results – EDGE 850**



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

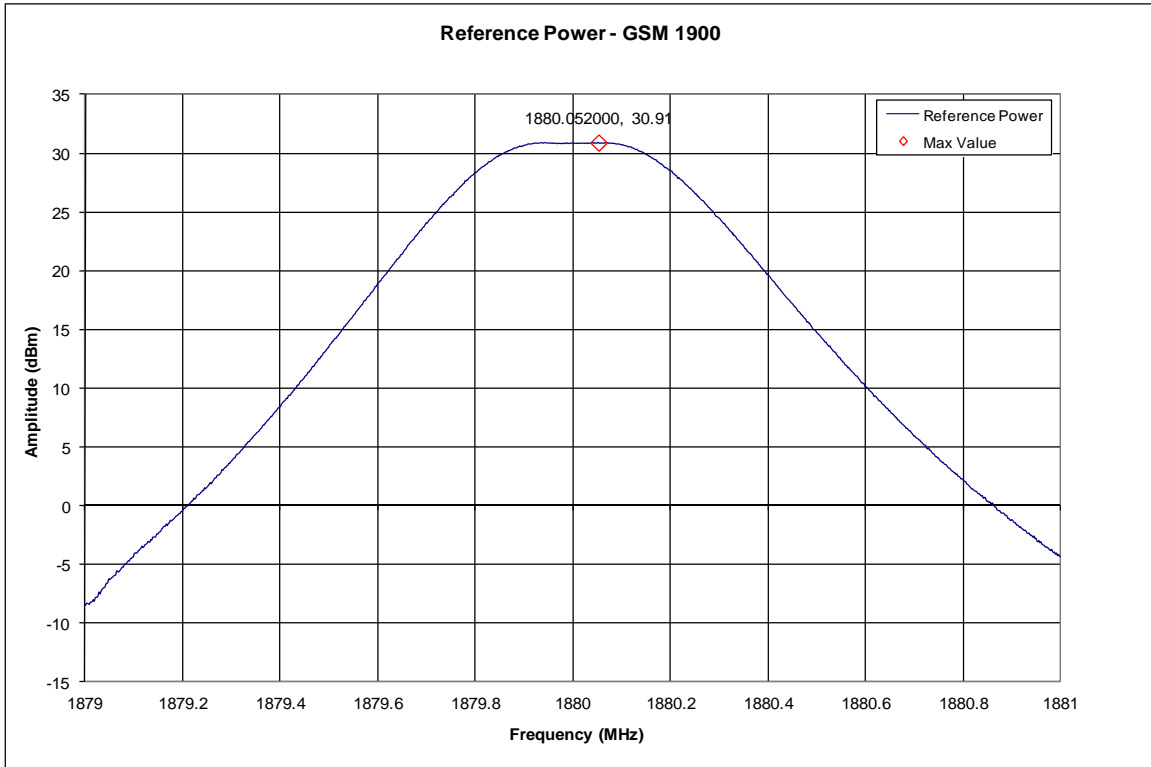


**EDGE 850 – Lower Band Edge – Channel 128 (824.2 MHz)**

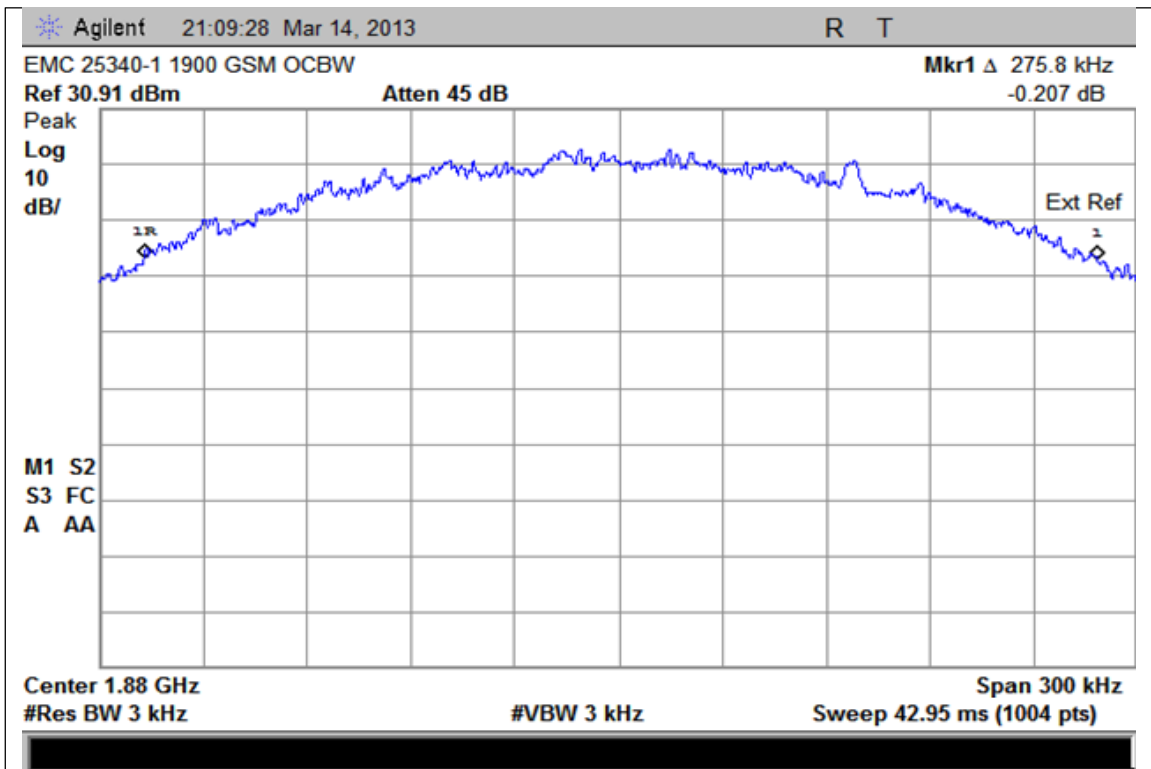


**EDGE 850 – Upper Band Edge – Channel 251 (848.8 MHz)**

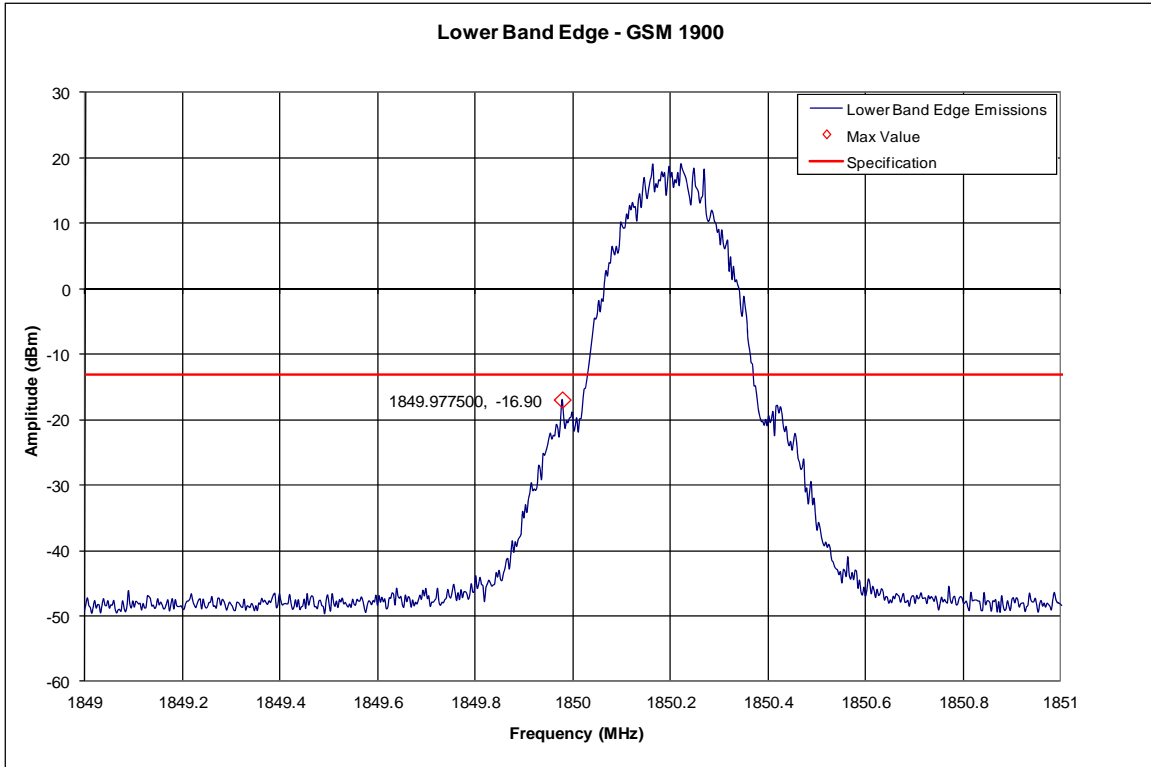
**Measurement Results – GSM 1900**



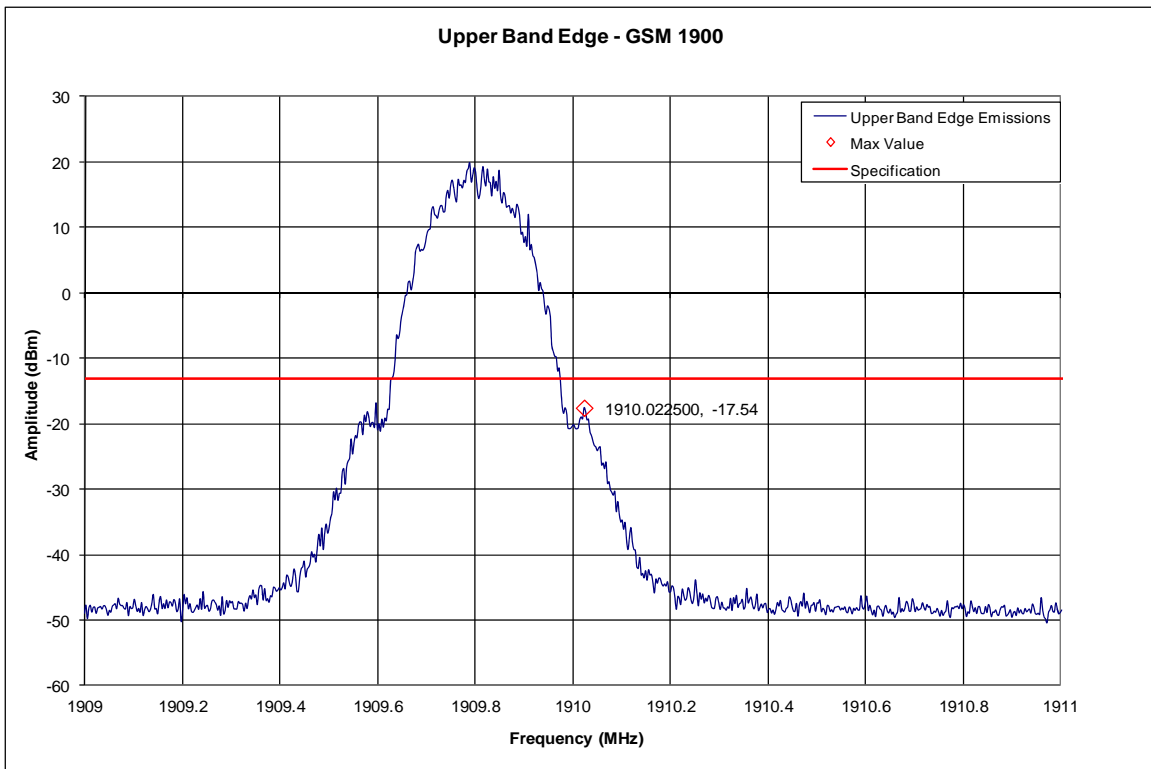
**GSM 1900 – Reference Level Plot – Channel 661 (1880.00MHz)**



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

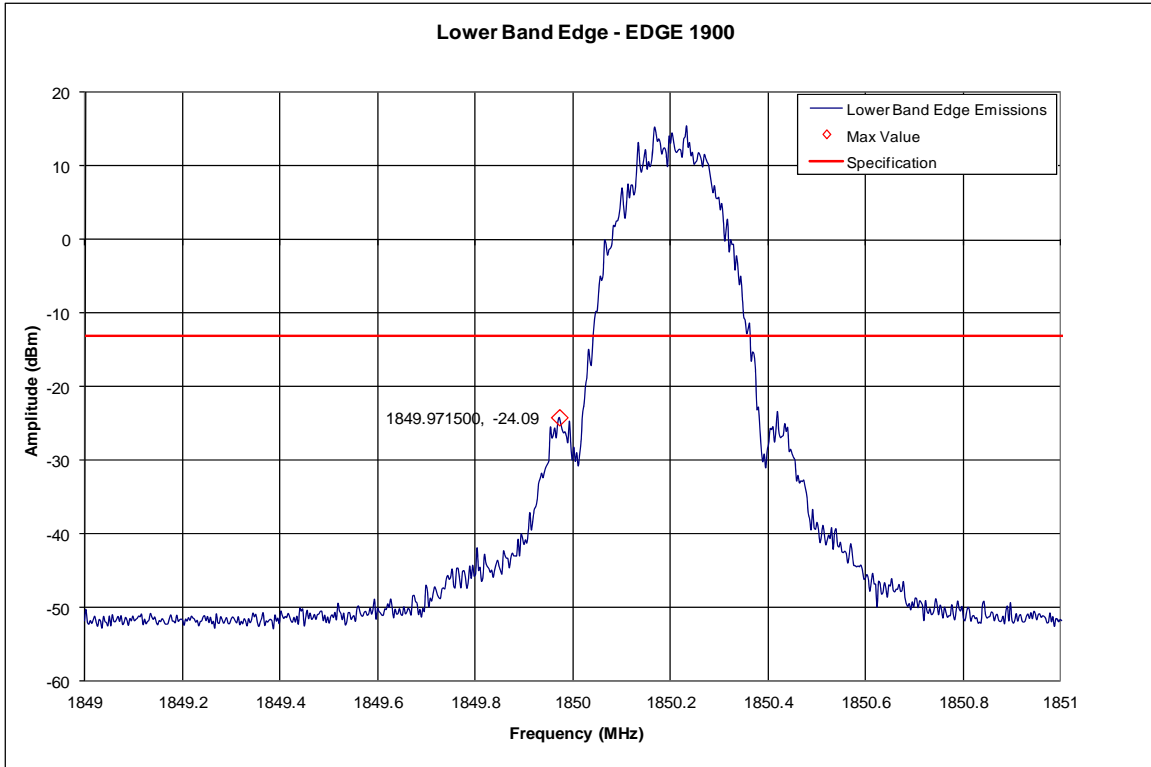


**GSM 1900 – Lower Band Edge – Channel 512 (1850.2MHz)**

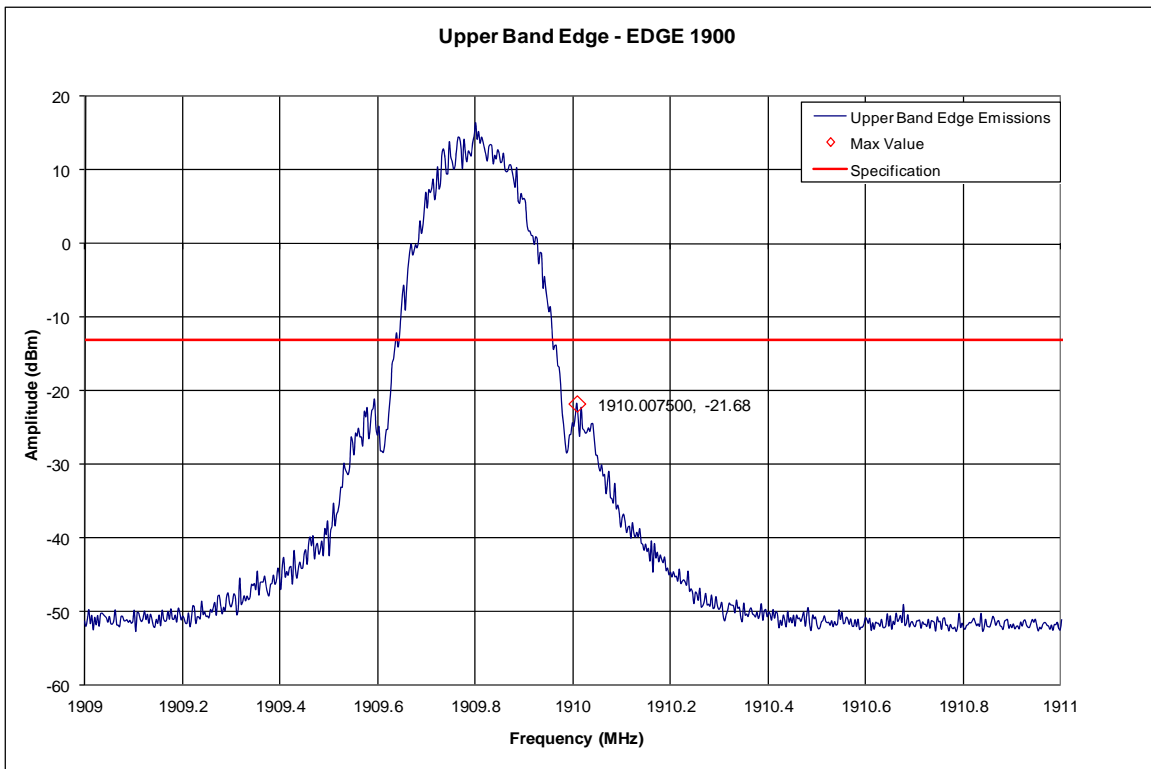


**GSM 1900 – Upper Band Edge – Channel 810 (1909.8MHz)**



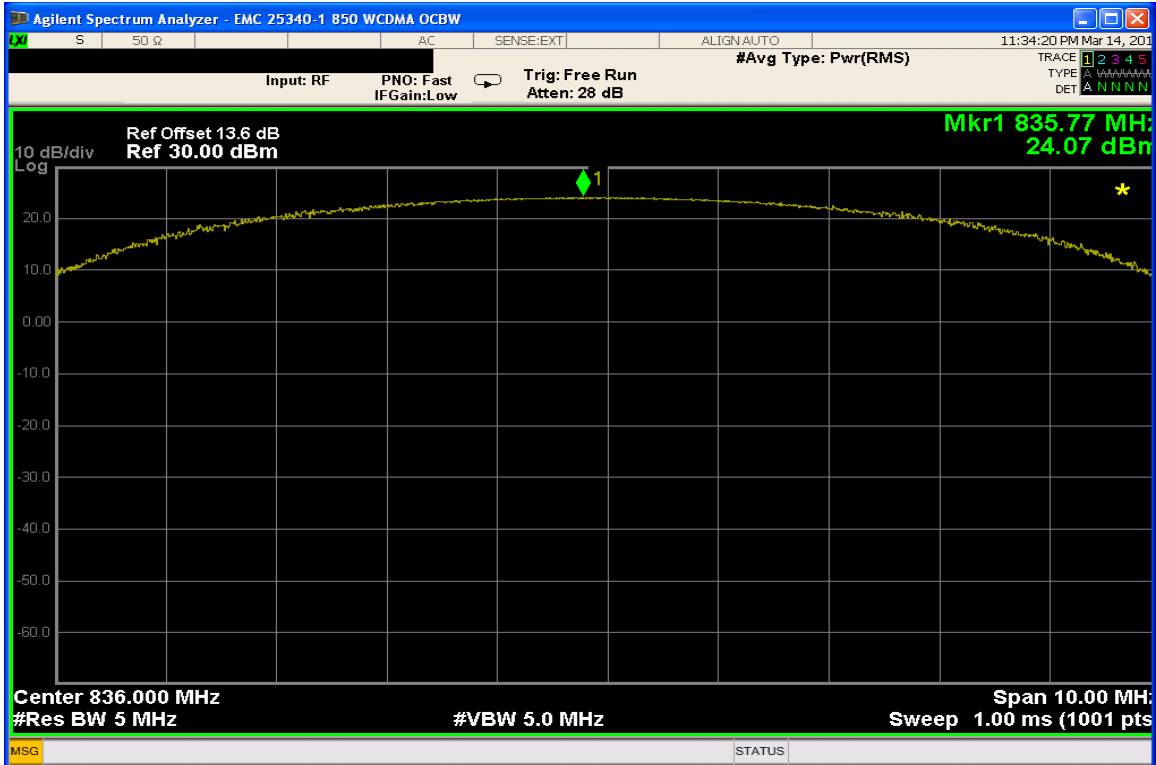


**GSM 1900 EDGE – Lower Band Edge – Channel 512 (1850.2MHz)**

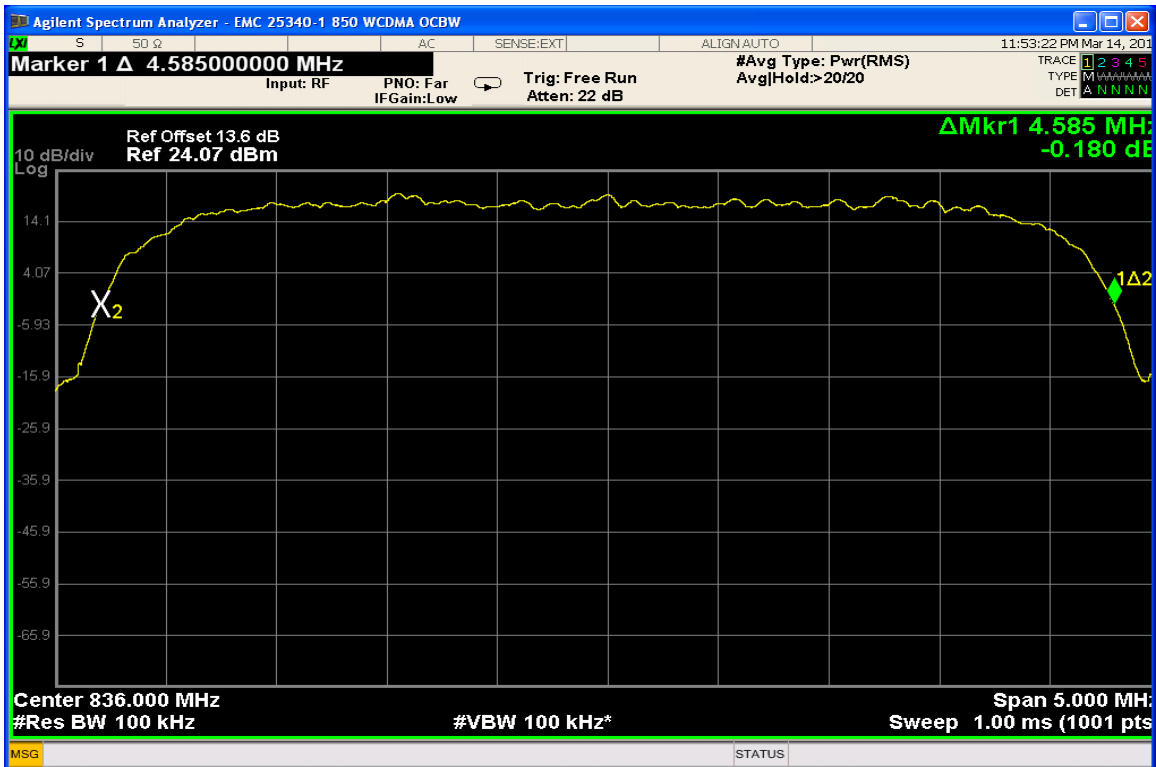


**GSM 1900 EDGE – Upper Band Edge – Channel 810 (1909.8MHz)**

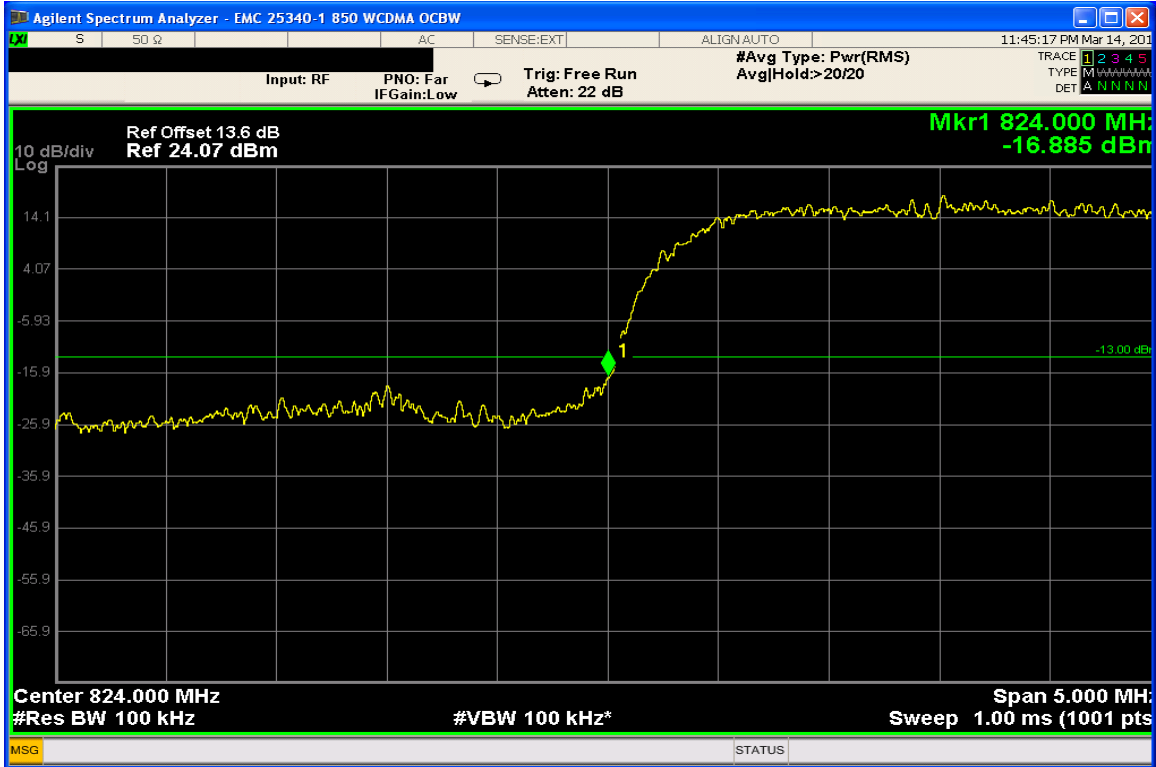
**Measurement Results – WCDMA 850**



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



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

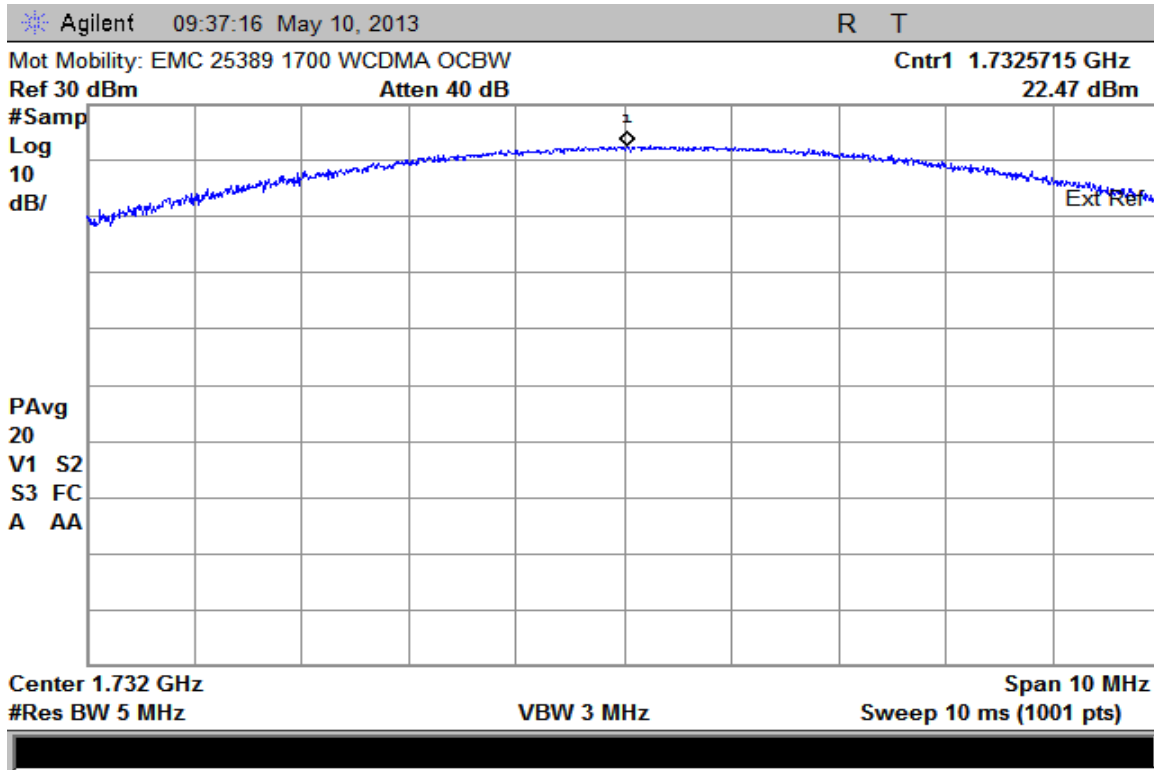


WCDMA 850 – Lower Band Edge – Channel 4132 (826.4 MHz)

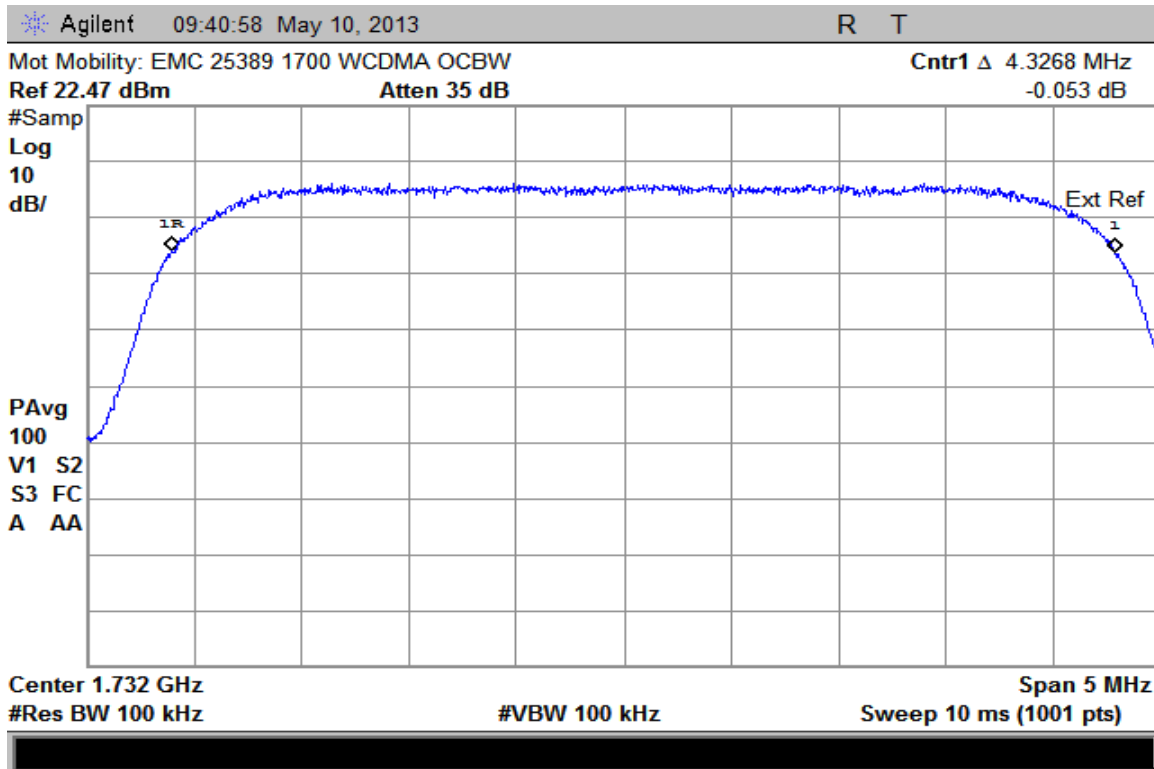


WCDMA 850 – Upper Band Edge – Channel 4233 (846.6 MHz)

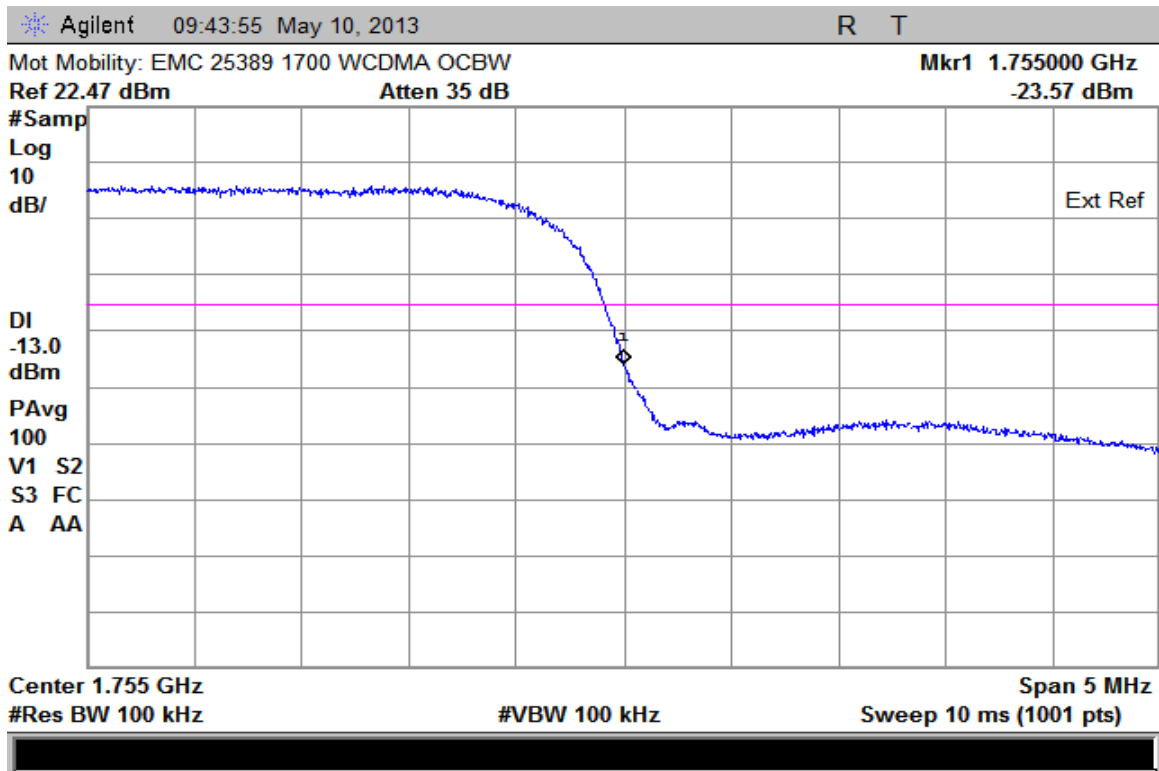
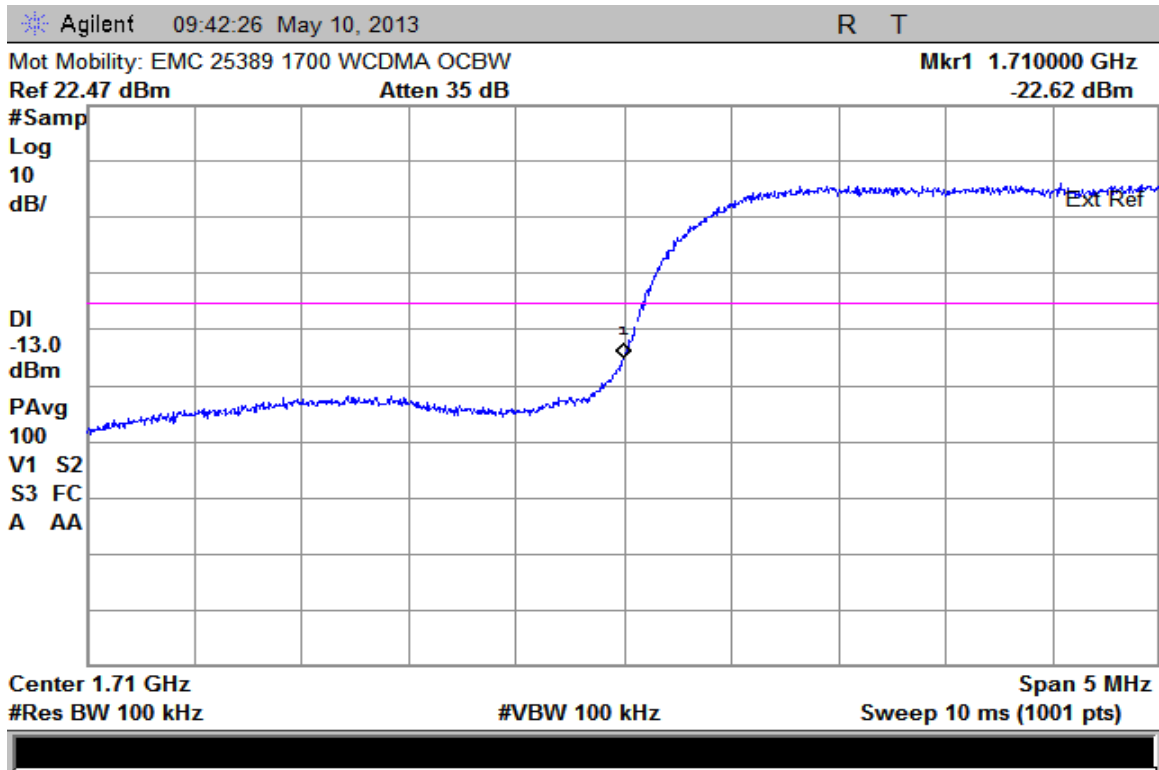
**Measurement Results – WCDMA 1700**



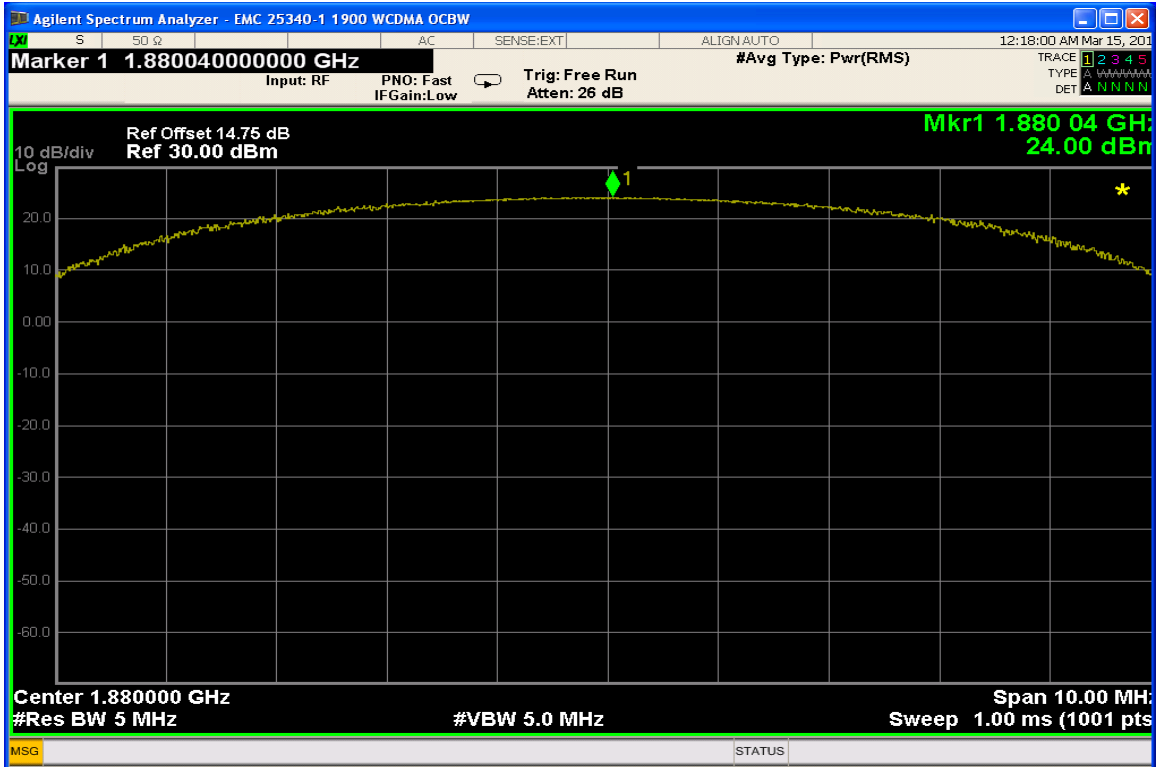
**WCDMA 1700 – Reference Level Plot – Channel 1413 (1732.5 MHz)**



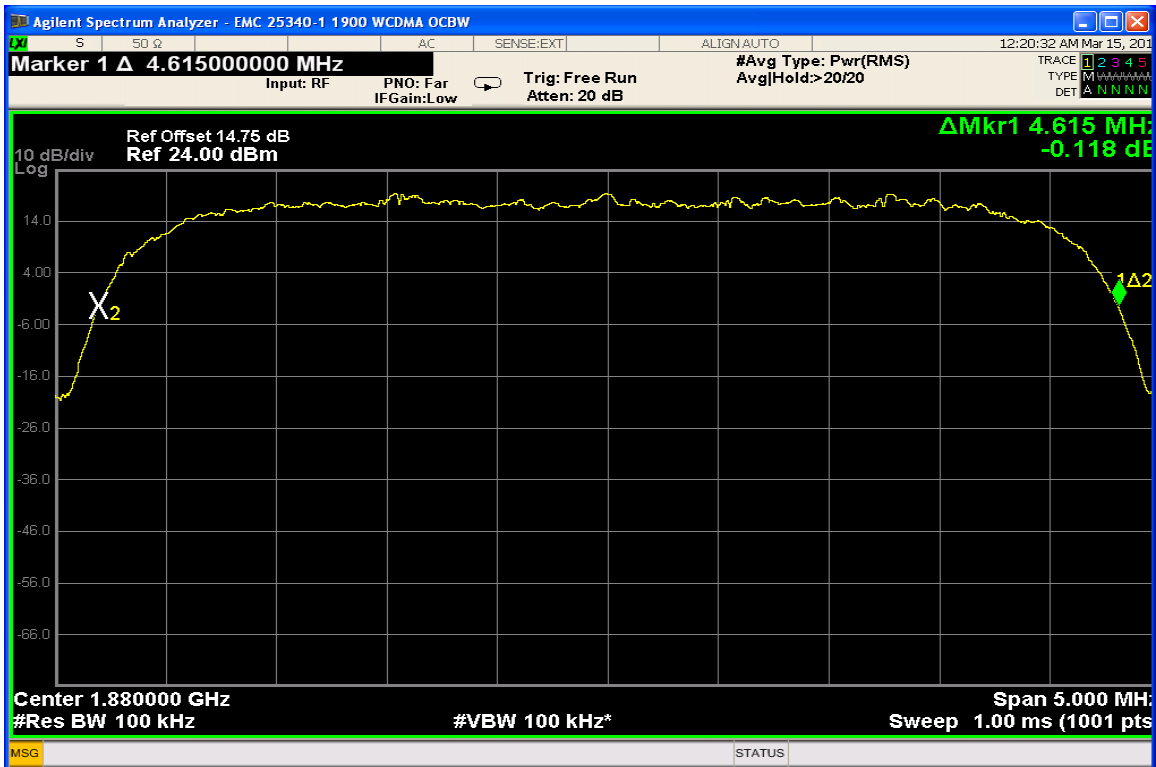
**WCDMA 1700 – Channel 1413 (1732.5 MHz)– Occupied Bandwidth**



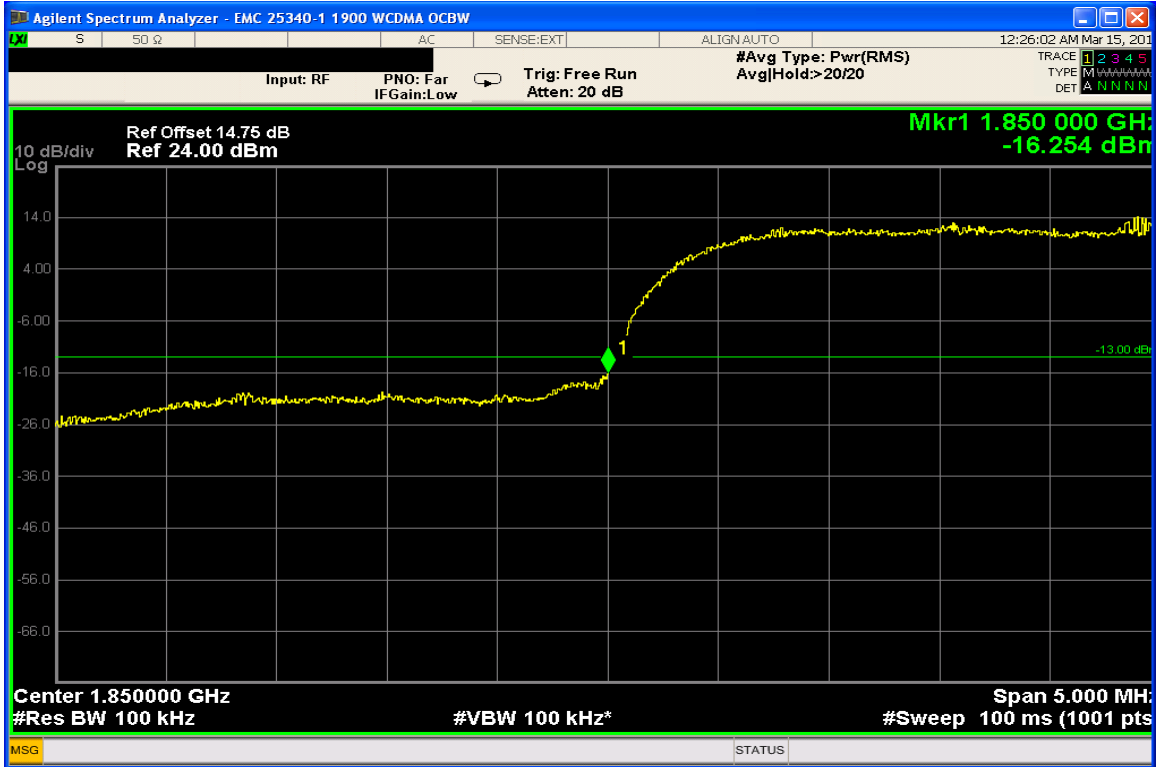
**Measurement Results – WCDMA 1900**



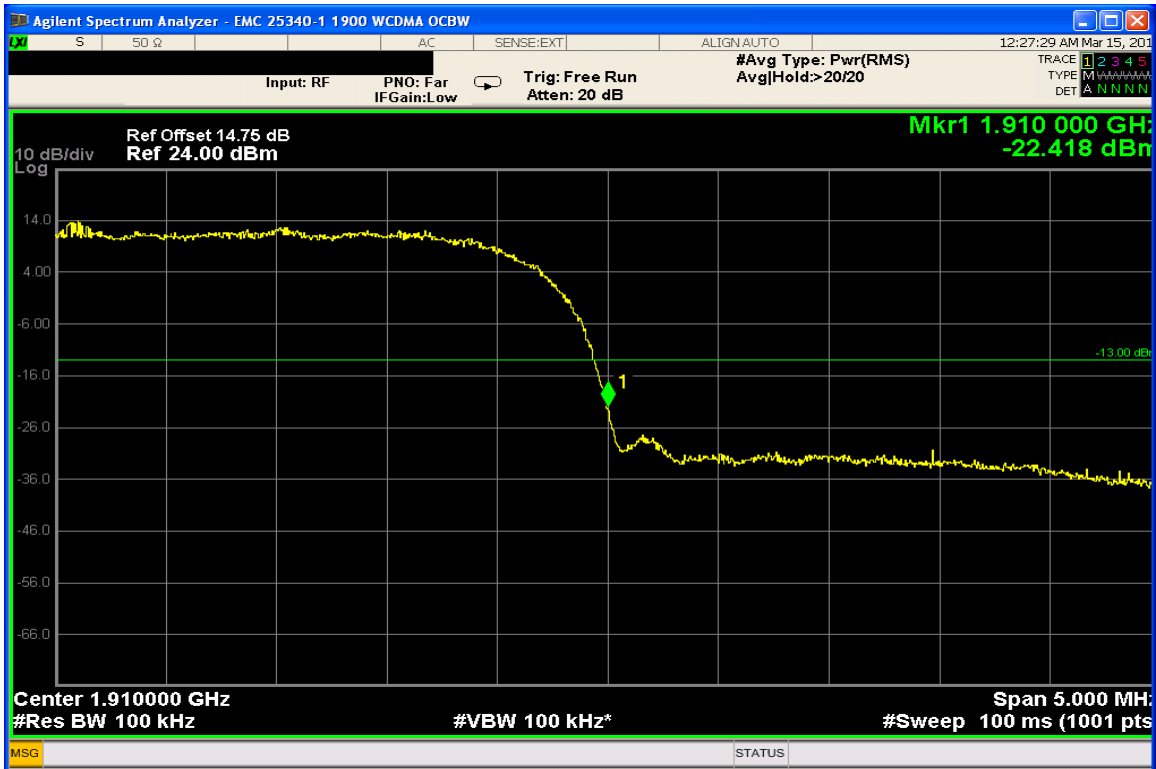
**WCDMA 1900 – Reference Level Plot – Channel 9400 (1880.00 MHz)**



**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:

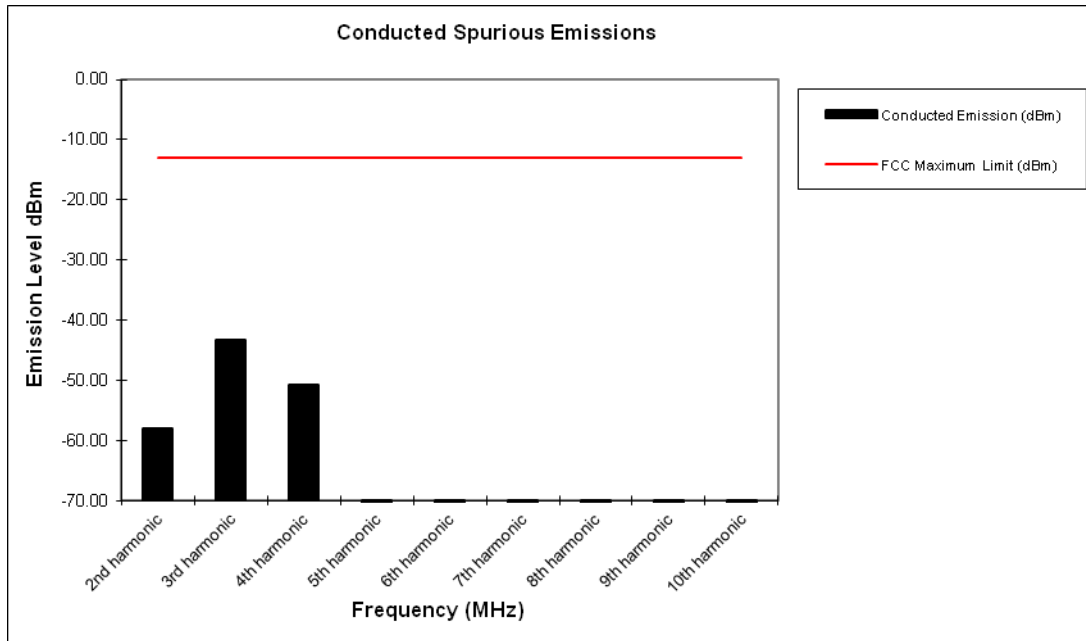
Units	dBm
Divisions	10 dB
Detector	Peak Detector
Resolution Bandwidth	1 MHz
Video Bandwidth (AVG)	Auto
Sweep Time	Auto

### **Measurement Results**

Attached

**Measurement Results**  
**Modulation: GSM 850**

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-58.12
3rd harmonic	-13	-43.28
4th harmonic	-13	-50.76
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



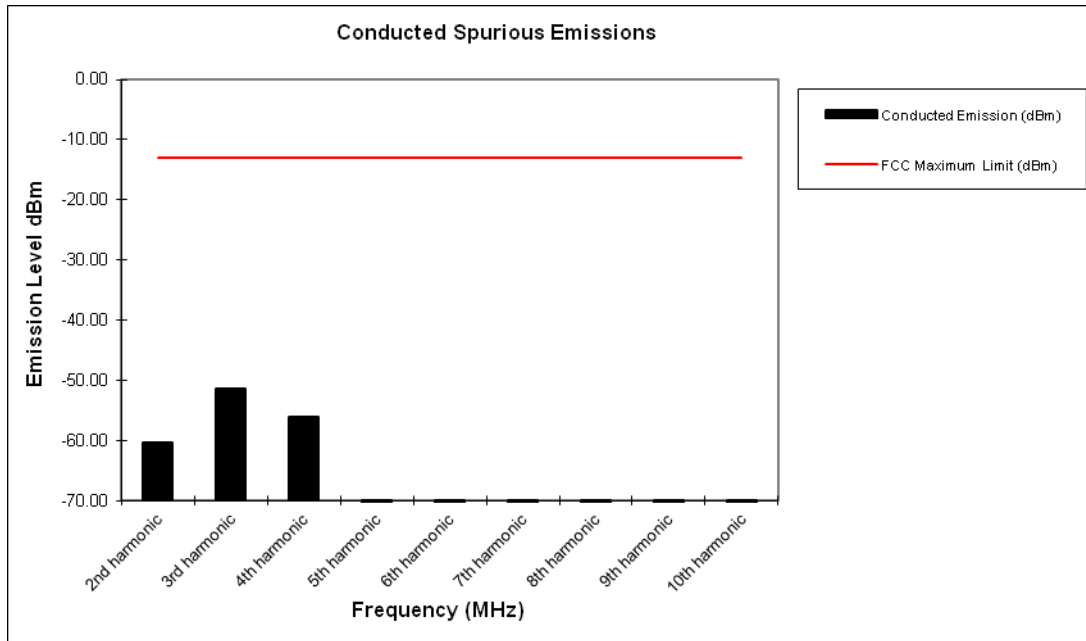
**Notes:**

- \* 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**  
**Modulation: EDGE 850**

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-60.34
3rd harmonic	-13	-51.42
4th harmonic	-13	-56.06
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



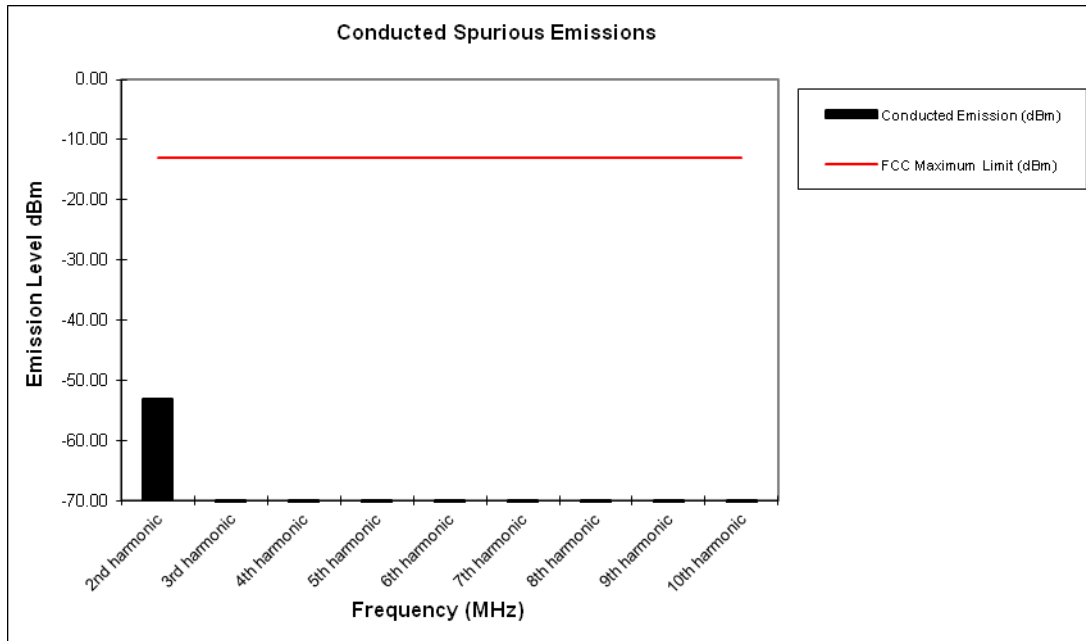
Notes:

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	-53.08
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



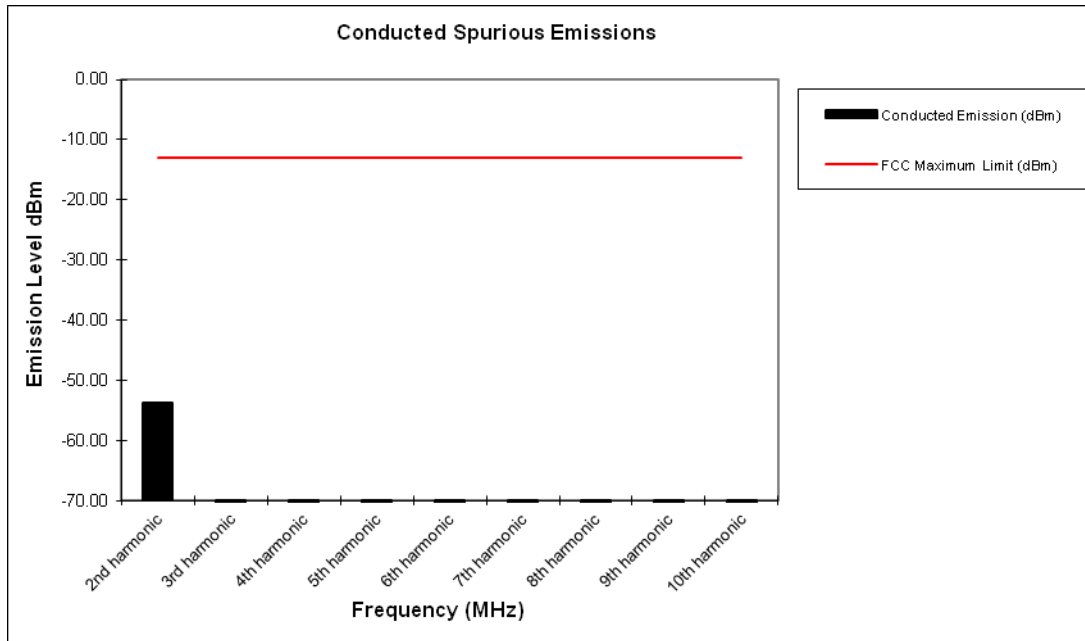
**Notes:**

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	-53.72
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



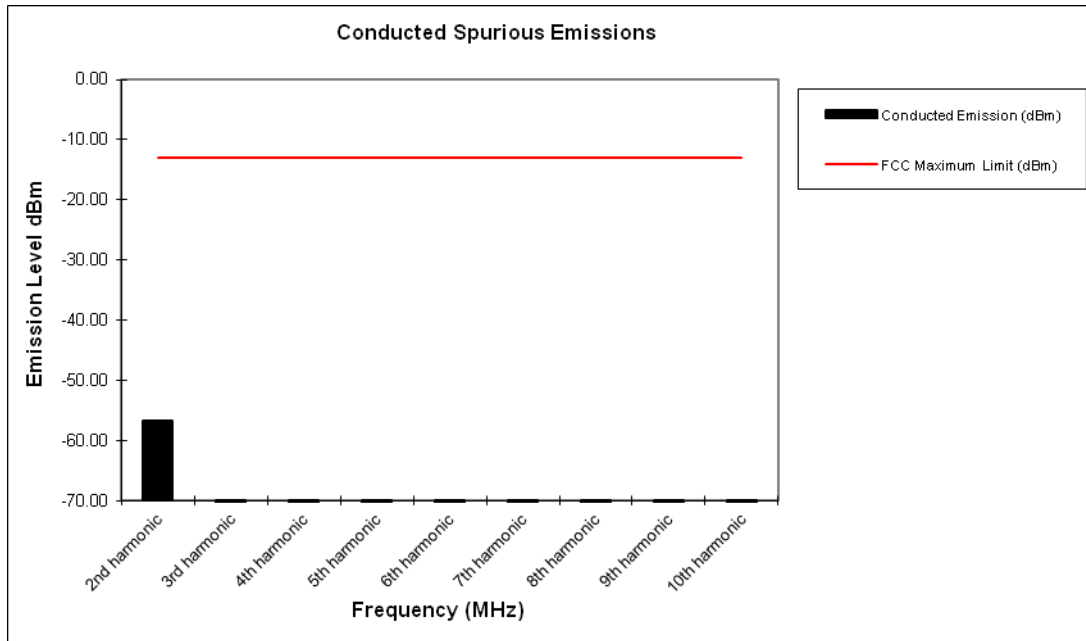
**Notes:**

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: WCDMA 850**

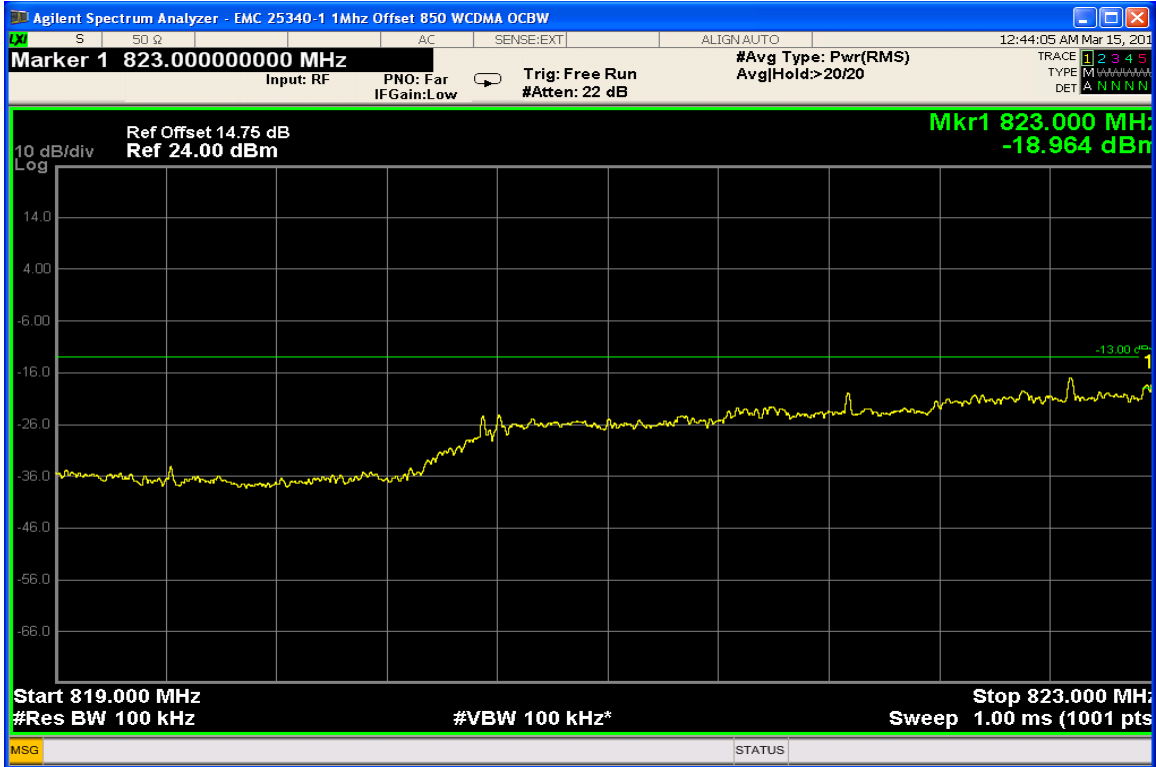
Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-56.84
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



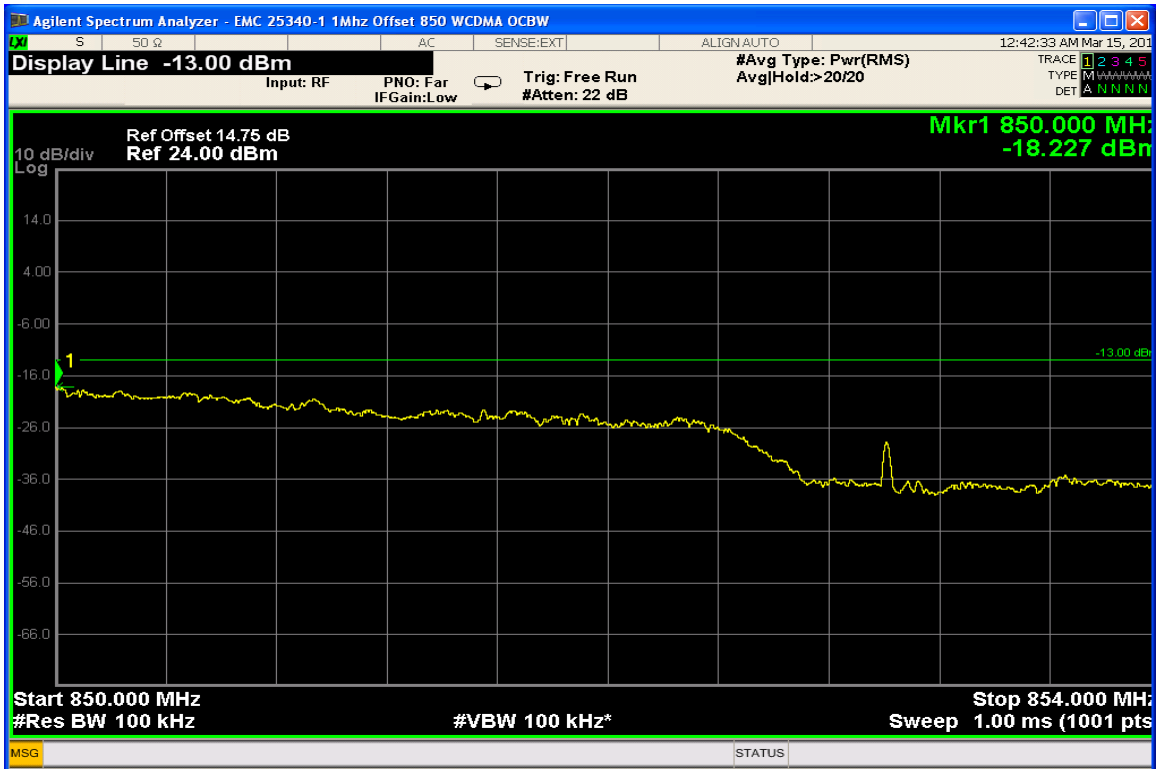
Notes:

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.



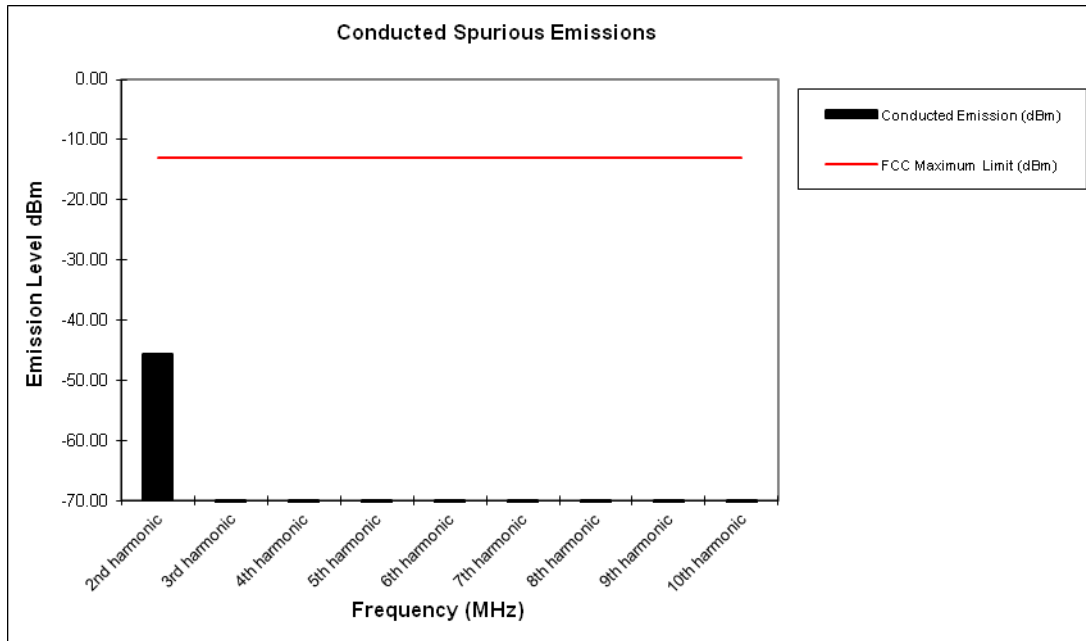
850 WCDMA Conducted Spurious Emissions (Lower adjacent 1 MHz band)



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

**Measurement Results**  
**Modulation: WCDMA 1700**

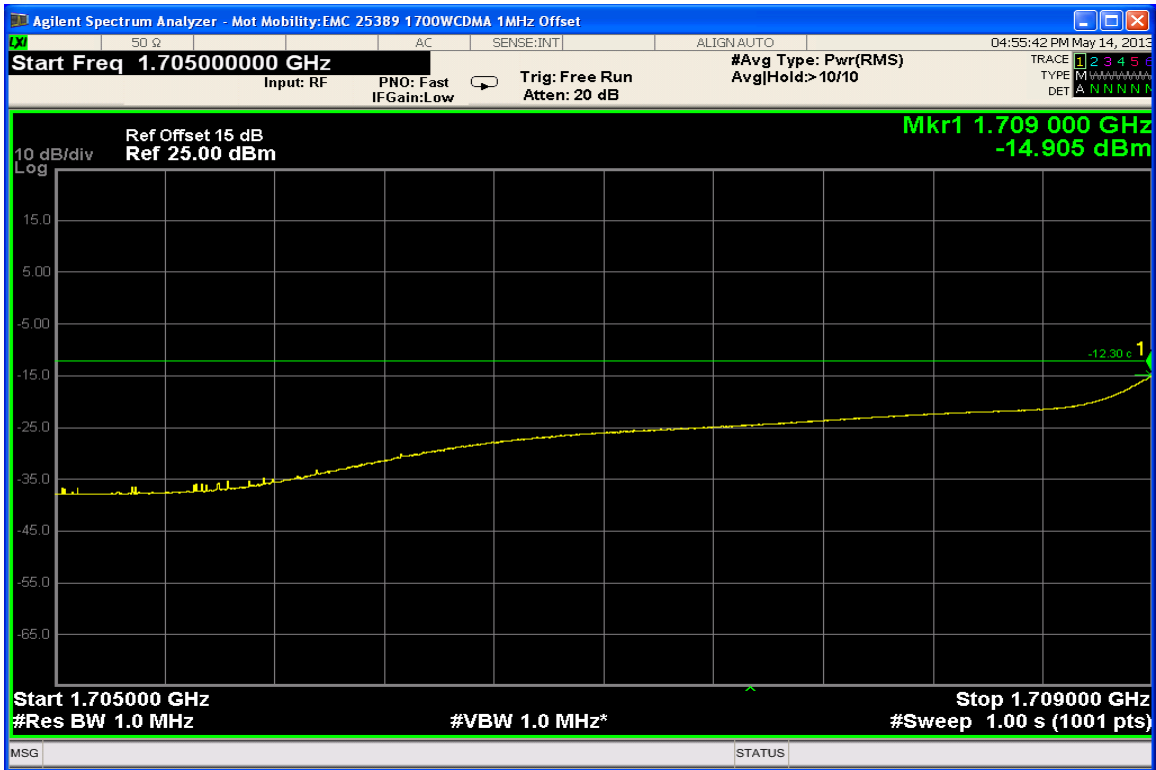
Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-45.61
3rd harmonic	-13	*
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



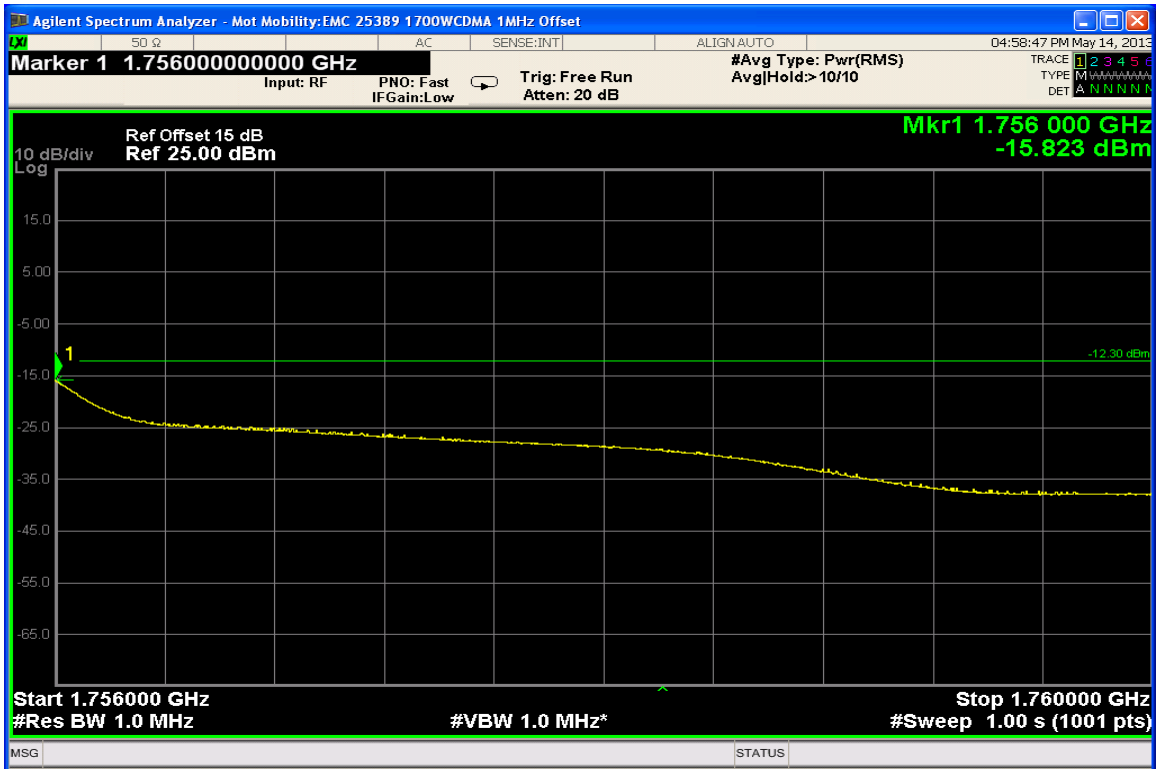
**Notes:**

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.



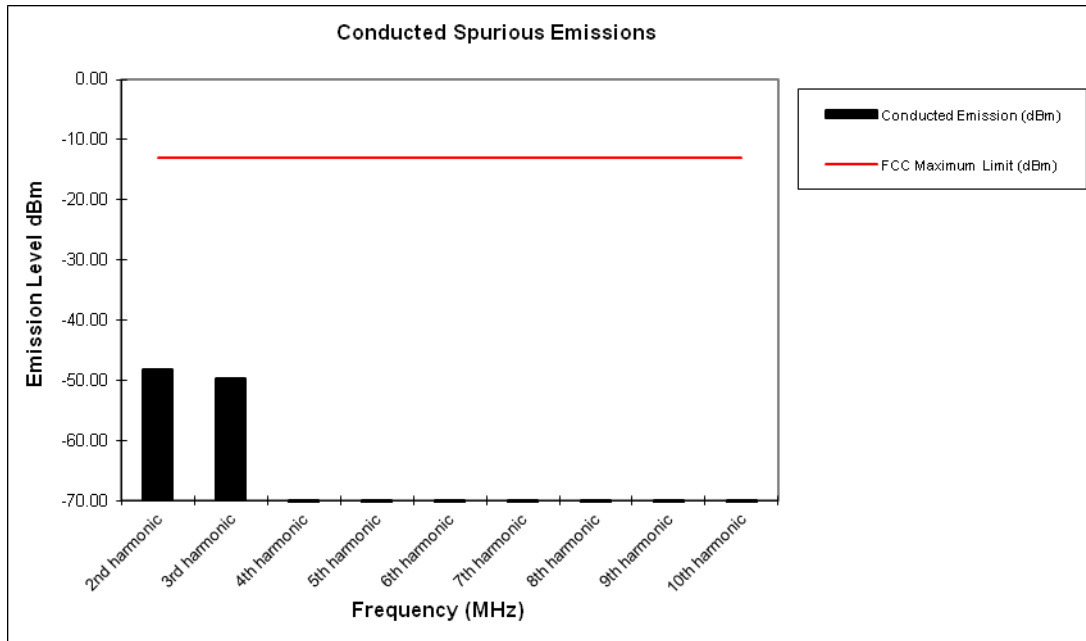
1700 WCDMA Conducted Spurious Emissions (Lower adjacent 1 MHz band)



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

**Measurement Results**  
**Modulation: WCDMA 1900**

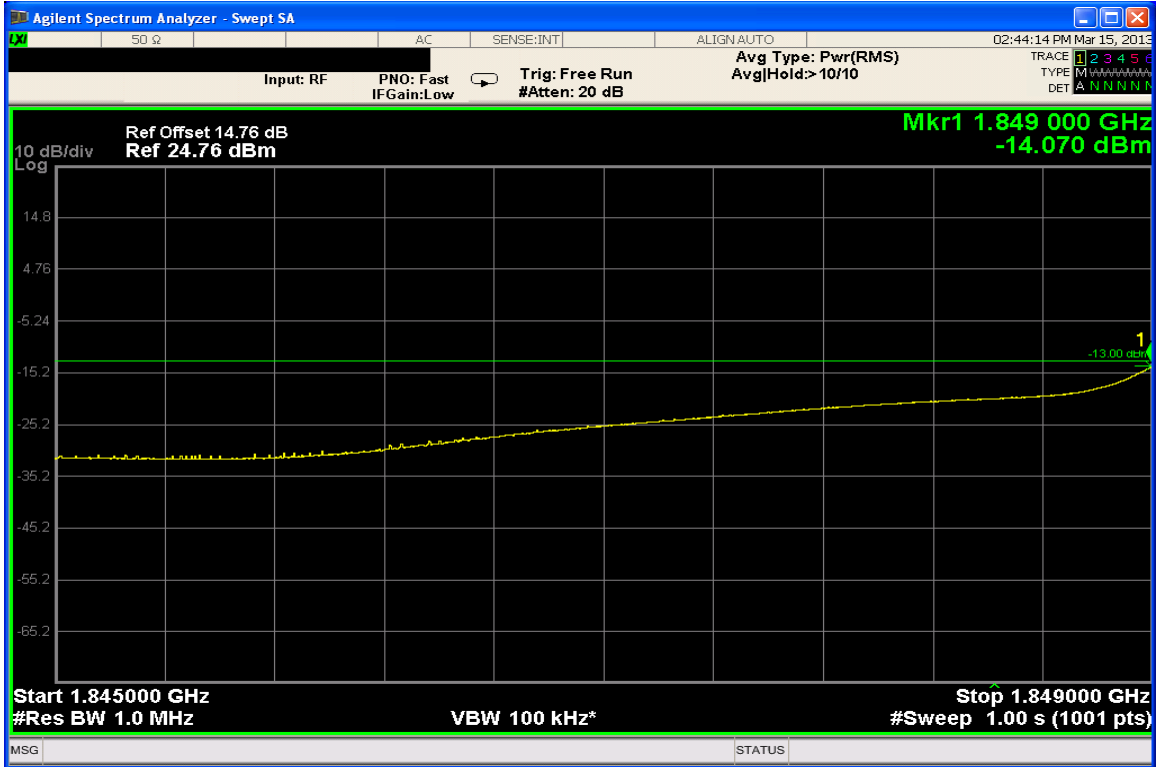
Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-48.20
3rd harmonic	-13	-49.72
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



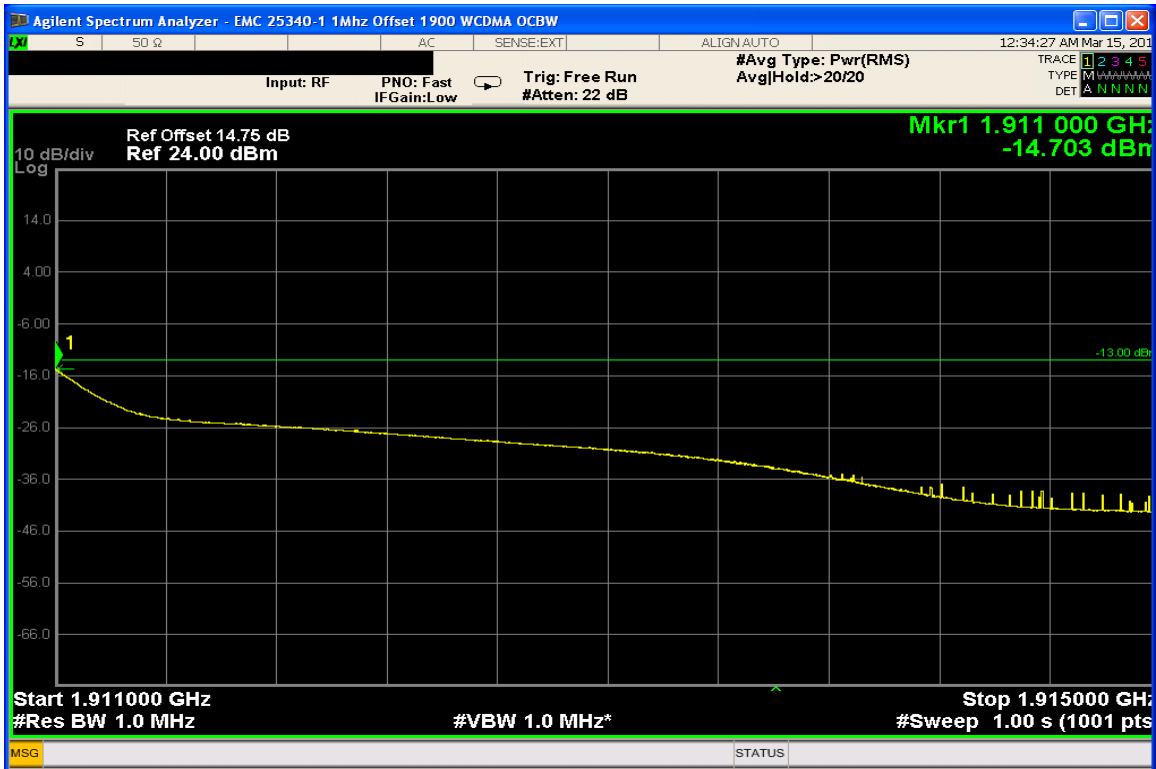
**Notes:**

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

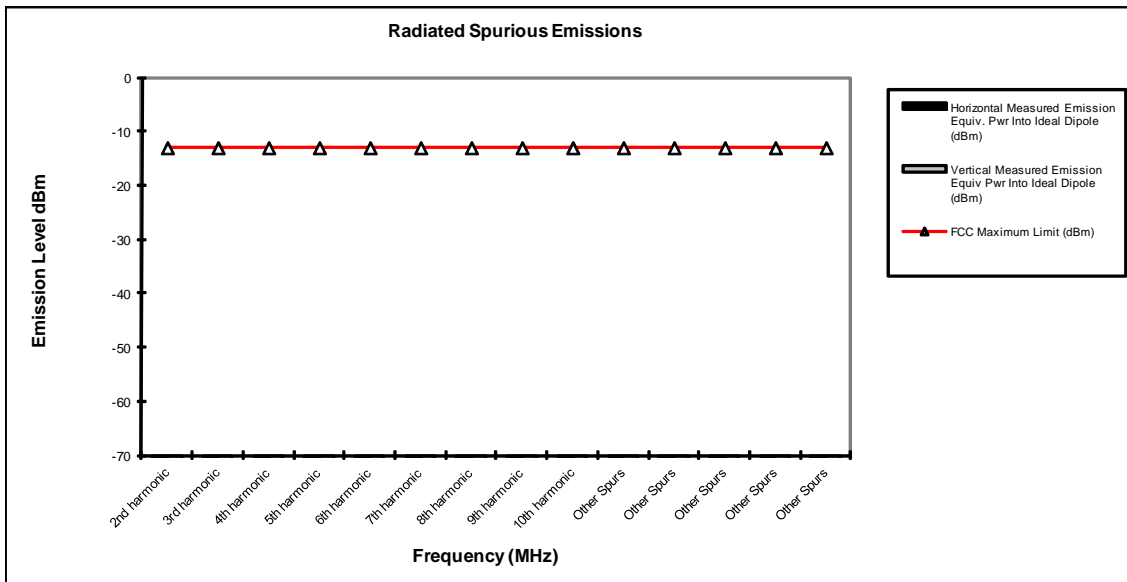
**Measurement Results**

Attached

**Measurement Results – all modes; 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:

1. \* Indicates the spurious emission could not be detected due to noise limitations or ambients or the emissions are lower than -33 dBm.
2. Each emission reported reflects the highest absolute level at the specific harmonic for the low, mid, and high channels at maximum power.
3. The Spectrum was investigated from 30 MHz to the tenth harmonic of the fundamental.

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

## **FREQUENCY STABILITY**

### **Measurement Procedure**

The 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  $-30^{\circ}\text{C}$  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

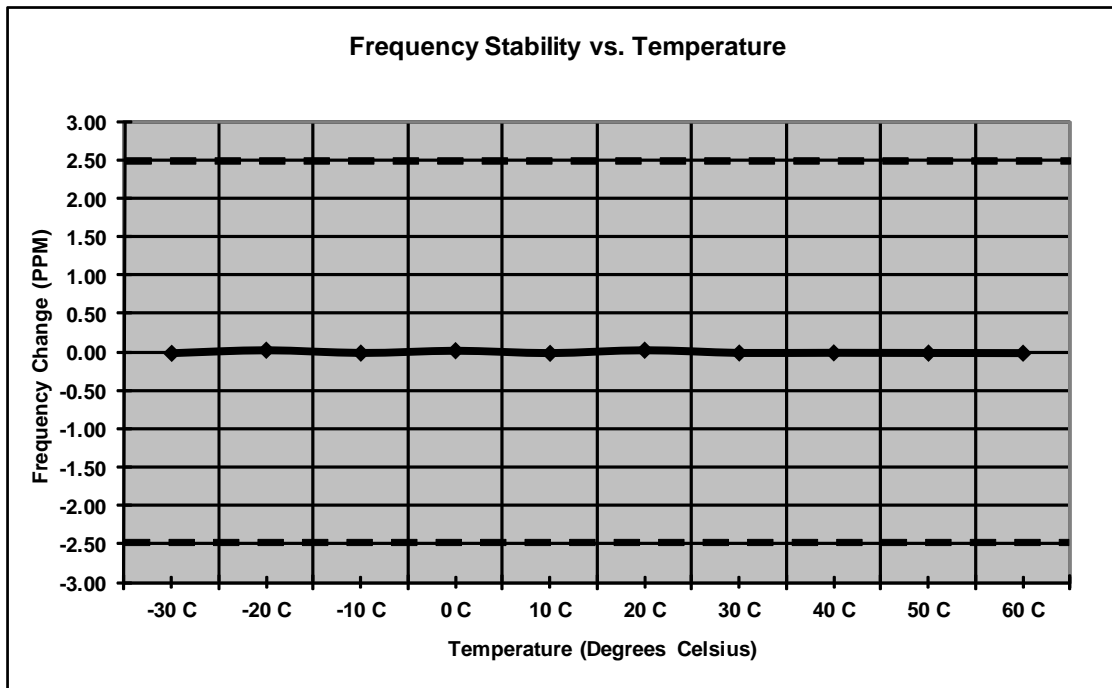
**Measurement Results**  
**Modulation: GSM 850**

# 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	-17.07	-0.020	100%	3.80
-20 C	16.33	0.020	100%	3.80
-10 C	-15.17	-0.018	100%	3.80
0 C	10.97	0.013	100%	3.80
10 C	-16.41	-0.020	100%	3.80
20 C	16.39	0.020	100%	3.80
30 C	-14.05	-0.017	100%	3.80
40 C	-12.21	-0.015	100%	3.80
50 C	-14.74	-0.018	100%	3.80
60 C	-15.76	-0.019	100%	3.80
20 C	-16.26	-0.019	Battery Endpoint	3.42



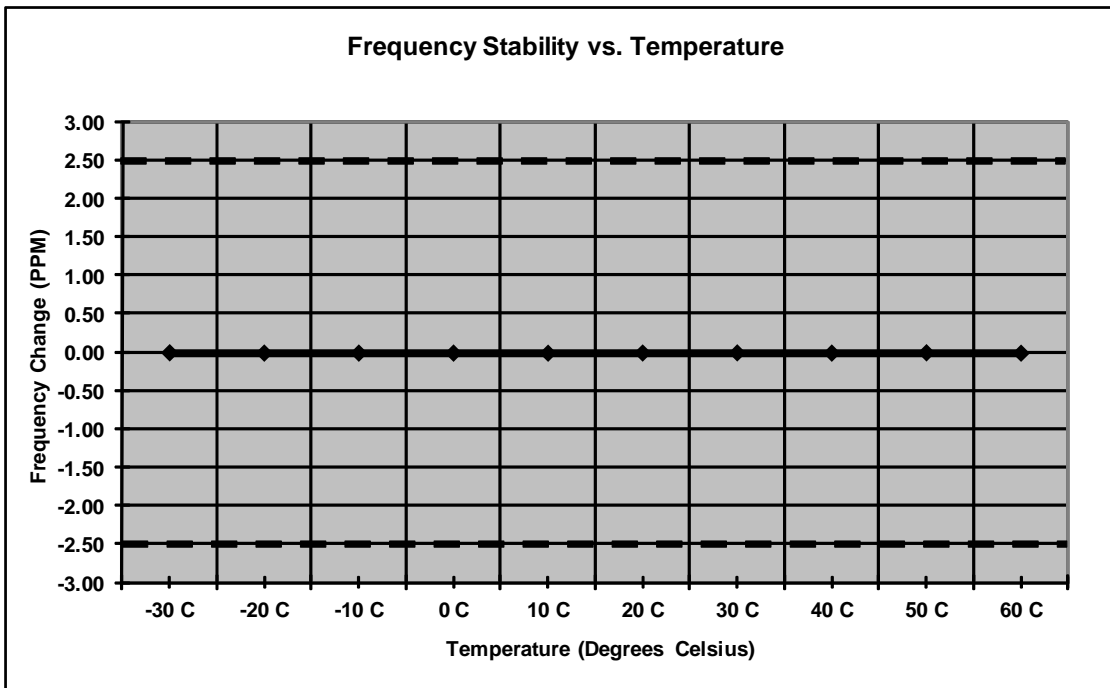
**Measurement Results**  
**Modulation: EDGE 850**

# 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	-10.94	-0.013	100%	3.80
-20 C	-14.88	-0.018	100%	3.80
-10 C	-14.24	-0.017	100%	3.80
0 C	-14.55	-0.017	100%	3.80
10 C	-15.57	-0.019	100%	3.80
20 C	-13.98	-0.017	100%	3.80
30 C	-12.40	-0.015	100%	3.80
40 C	-14.34	-0.017	100%	3.80
50 C	-11.57	-0.014	100%	3.80
60 C	-15.38	-0.018	100%	3.80
20 C	-14.78	-0.018	Battery Endpoint	3.42



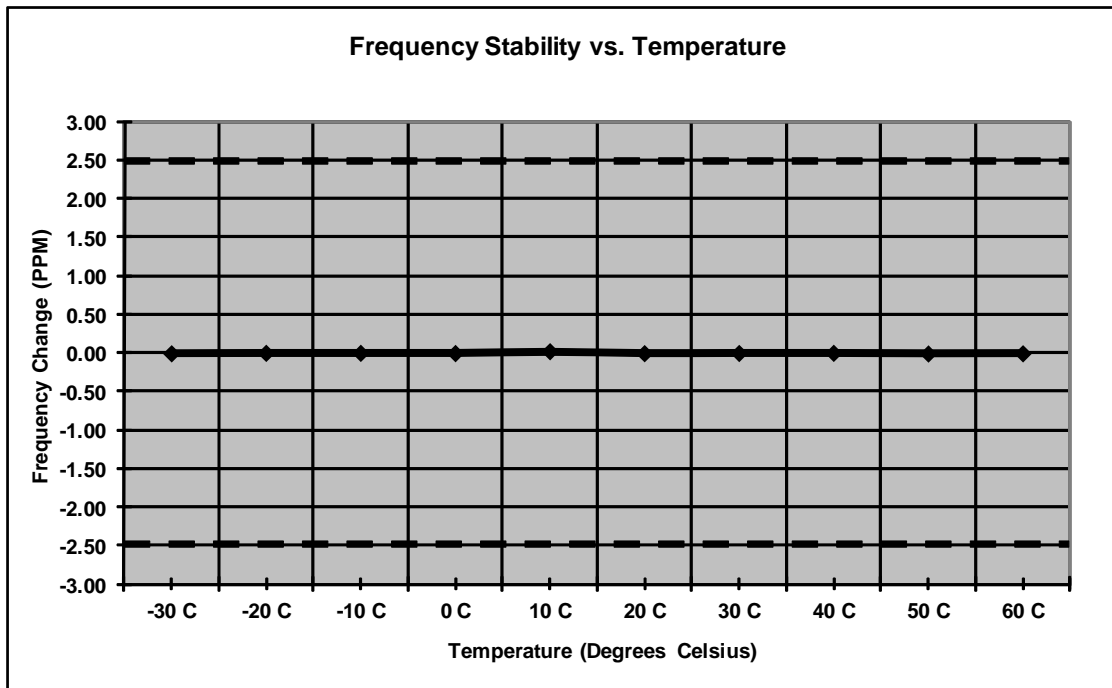
**Measurement Results**  
**Modulation: GSM 1900**

# 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	-31.12	-0.017	100%	3.80
-20 C	-19.77	-0.011	100%	3.80
-10 C	-20.32	-0.011	100%	3.80
0 C	-25.49	-0.014	100%	3.80
10 C	19.77	0.011	100%	3.80
20 C	-26.73	-0.014	100%	3.80
30 C	-24.25	-0.013	100%	3.80
40 C	-19.91	-0.011	100%	3.80
50 C	-34.95	-0.019	100%	3.80
60 C	-29.52	-0.016	100%	3.80
20 C	-28.08	-0.015	Battery Endpoint	3.42



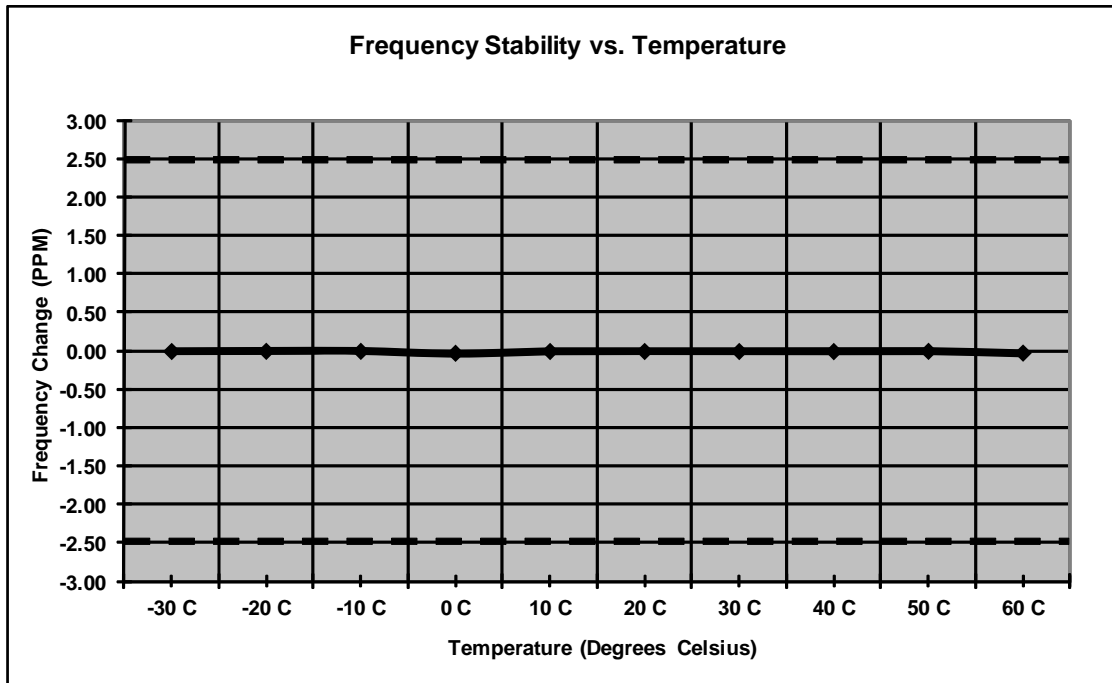
**Measurement Results**  
**Modulation: EDGE 1900**

# Frequency Stability

**Mode:** EDGE 1900  
**Channel:** 661

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

Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	-22.73	-0.012	100%	3.80
-20 C	-18.19	-0.010	100%	3.80
-10 C	-20.06	-0.011	100%	3.80
0 C	-65.71	-0.035	100%	3.80
10 C	-24.34	-0.013	100%	3.80
20 C	-23.85	-0.013	100%	3.80
30 C	-22.44	-0.012	100%	3.80
40 C	-25.11	-0.013	100%	3.80
50 C	-21.76	-0.012	100%	3.80
60 C	-61.02	-0.032	100%	3.80
20 C	-25.25	-0.013	Battery Endpoint	3.42

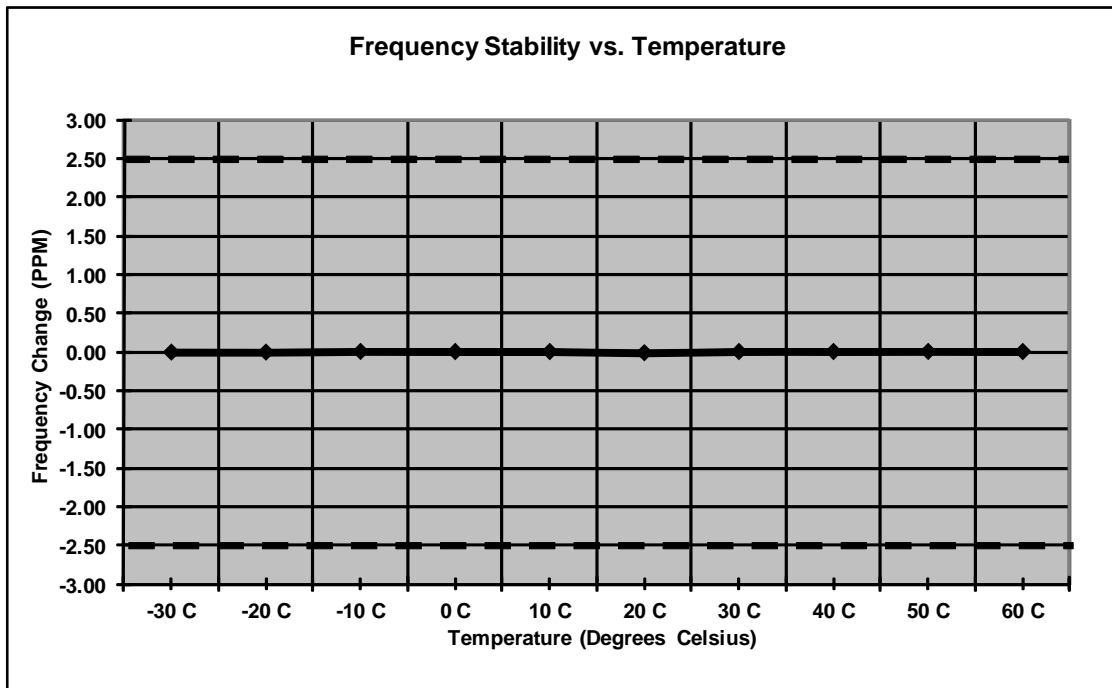


**Measurement Results**  
**Modulation: WCDMA 850**

# Frequency Stability

**Mode:** WCDMA 800      **Operating Frequency:** 836.00 MHz  
**Channel:** 4180      **Deviation Limit (PPM):** 2.5ppm

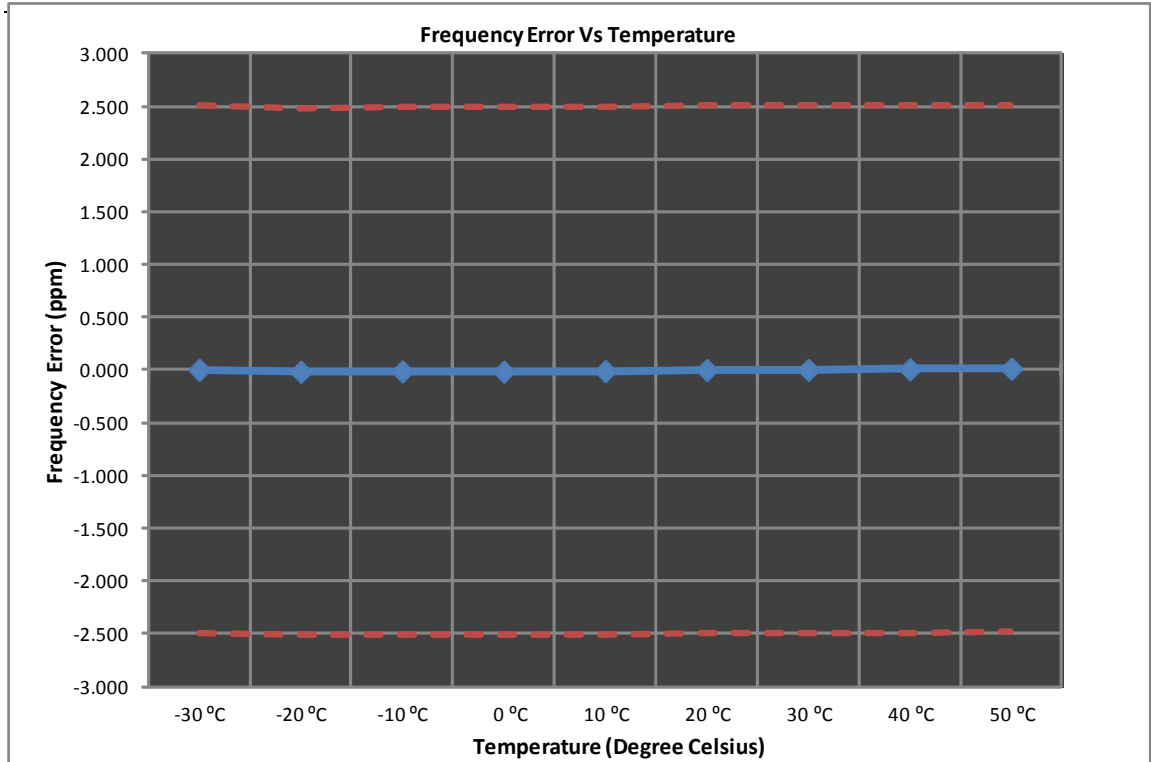
Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	-3.36	-0.004	100%	3.80
-20 C	-4.03	-0.005	100%	3.80
-10 C	3.67	0.004	100%	3.80
0 C	2.81	0.003	100%	3.80
10 C	2.91	0.003	100%	3.80
20 C	-10.69	-0.013	100%	3.80
30 C	3.08	0.004	100%	3.80
40 C	2.90	0.003	100%	3.80
50 C	3.88	0.005	100%	3.80
60 C	2.94	0.004	100%	3.80
20 C	-19.14	-0.023	Battery Endpoint	3.42



**Measurement Results**  
**Modulation: WCDMA 1700**

Mode: WCDMA 1700      Operating Frequency: 1712.4 MHz  
 Channel: 1312      Deviation Limit (PPM): ± 2.5 ppm

Temperature °C	Frequency Error Hz	Frequency Error (ppm)	Voltage (%)	Voltage (VDC)
-30 °C	8.44	0.005	100%	3.80
-20 °C	-24.32	-0.014	100%	3.80
-10 °C	-18.79	-0.011	100%	3.80
0 °C	-23.46	-0.014	100%	3.80
10 °C	-13.84	-0.008	100%	3.80
20 °C	3.33	0.002	100%	3.80
30 °C	6.64	0.004	100%	3.80
40 °C	16.25	0.009	100%	3.80
50 °C	24.72	0.014	100%	3.80
20 °C	3.34	0.002	Battery Endpoint	3.42

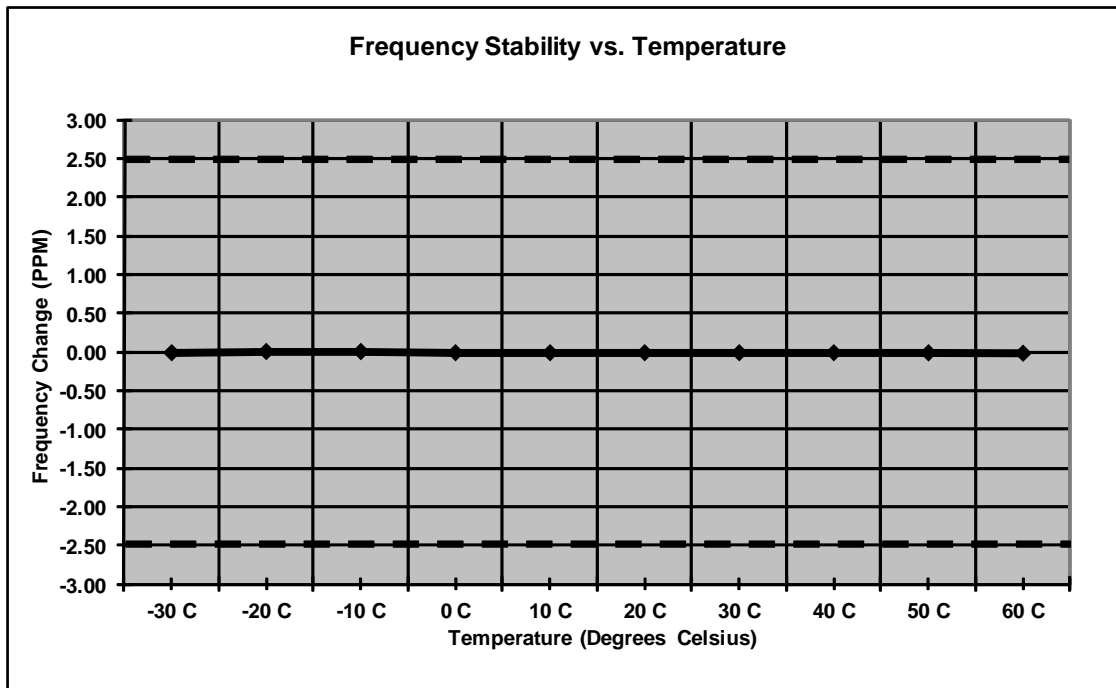


**Measurement Results**  
**Modulation: WCDMA 1900**

# Frequency Stability

**Mode:** WCDMA 1900      **Operating Frequency:** 1880.00 MHz  
**Channel:** 9400            **Deviation Limit (PPM):** 2.5ppm

Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	-10.04	-0.012	100%	3.80
-20 C	2.77	0.003	100%	3.80
-10 C	2.68	0.003	100%	3.80
0 C	-10.29	-0.012	100%	3.80
10 C	-10.36	-0.012	100%	3.80
20 C	-10.60	-0.013	100%	3.80
30 C	-10.40	-0.012	100%	3.80
40 C	-10.55	-0.013	100%	3.80
50 C	-11.56	-0.014	100%	3.80
60 C	-15.52	-0.019	100%	3.80
20 C	-10.58	-0.013	Battery Endpoint	3.42



**End of Test Report**