



MOBILE DEVICES BUSINESS

**PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY**

EMC TEST REPORT

Test Report Number – 24956-1

Report Date – June 14, 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 14, 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.



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	7
RF Power Output	7
Measurement results	7
Radiated Power	9
Measurement results	10
Occupied Bandwidth	12
Measurement results	13
Spurious Emissions at Antenna Terminals	21
Measurement results	22
Field Strength of Spurious Emissions	38
Measurement results	39
Frequency Stability	40
Measurement results	41

Test Report Details

All Tests, except Radiated Power, 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

Radiated Power Testing Performed By:



PCTEST Engineering Laboratory, Inc.
6660-B Dobbin Road,
Columbia, MD 21045 USA
PH (410) 290-6652
FCC Registration Number: 90864
Industry Canada Number: 2451A-1

Tests Requested By:

Motorola Mobility Inc.
600 North US Hwy 45
Libertyville, IL 60048

Product Type:

Cellular Phone

Signaling Capability:

CDMA 800/1900, CDMA 1X/EV-DO Release A,
LTE Band 13, WCDMA 850/1900, GSM 850/1900,
850/1900 EDGE, HSDPA, HSUPA, GPRS,
Bluetooth LE + EDR, 802.11a/b/g/n

Note: The GSM/EDGE/WCDMA network functions have been disabled by firmware and are SIM locked for all US operators.

FCC ID:

IHDT56NG1

Serial Numbers:

LVQV2H0032, LVQV2L0040, LVQV2L0041,
LVQV2L0058, LVQV2L0039, LVQV2G0027,
LVQV2G0026

Testing Complete Date:

June 11, 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

Applicable Standards: ANSI 63.4 2003, ANSI/TIA-603-C-2004
 RSS-Gen Issue 3, RSS-129 Issue 2, 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.

For all testing performed by ADR Testing Service

Manufacturer	Equipment Type	Model No.	Serial Number	Calibration Due Date
Rohde & Schwarz	Receiver	ESI26	100001	12/30/2012
Rohde & Schwarz	Receiver	ESU40	100286	7/13/2012
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	SAS 200/571	265	1/18/2013
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 Sensor	E9323A	US40412063	8/19/2012
Agilent	Microwave Preamplifier	8449B	3008A01442	9/22/2012

Note that the Agilent power meter, Signal Generator and 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.

For Radiated Power testing performed by PCTEST Engineering Laboratory, Inc.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx1	Licensed Transmitter Cable Set	1/25/2012	Annual	1/25/2013	N/A
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	6/7/2011	Annual	6/7/2012	N/A
Agilent	E8257D	(250kHz-20GHz) Signal Generator	6/8/2011	Annual	6/8/2012	MY45470194
Anritsu	MA2411B	Power Sensor	3/5/2012	Annual	3/5/2013	846215
Anritsu	ML2495A	Power Meter	10/13/2011	Annual	10/13/2012	1039008
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	7/22/2011	Annual	7/22/2012	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	10/1/2010	Biennial	10/1/2012	128337
Mini-Circuits	VHF-1200+	High Pass Filter	1/15/2012	Annual	1/15/2013	30923
Mini-Circuits	VHF-3100+	High Pass Filter	1/15/2012	Annual	1/15/2013	30841
Rohde & Schwarz	CMU200	Base Station Simulator	N/A		N/A	836072/0063
Rohde & Schwarz	RS-PR18	1-18 GHz Pre-Amplifier	6/9/2011	Annual	6/9/2012	100071
Rohde & Schwarz	ESU26	EMI Test Receiver	12/15/2011	Annual	12/15/2012	100342
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	N/A		N/A	102060
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	11/14/2011	Biennial	11/14/2013	9105-2404
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Tx	11/14/2011	Biennial	11/14/2013	9105-2403
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A

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

CDMA 800

Frequency (MHz)	Power (dBm)
824.70	25.20
836.52	24.96
848.31	24.97

EV-DO 800

Frequency (MHz)	Power (dBm)
824.70	24.81
836.52	24.83
848.31	24.77

CDMA 1900

Frequency (MHz)	Power (dBm)
1851.25	25.01
1880.00	24.79
1908.75	24.87

EV-DO 1900

Frequency (MHz)	Power (dBm)
1851.25	24.51
1880.00	24.60
1908.75	24.71

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

Band	Channel	Measured Conducted Power (dBm) for CDMA modes					
		Loopback				Data	
		RC3		RC1		TDSO SO32	
		SO55	SO2	SO55	SO2	+FCH-SCH	+SCH
CDMA 800	1013	25.20	25.23	25.17	25.12	25.24	25.18
	384	24.96	24.98	24.94	24.94	24.98	24.94
	777	24.97	24.99	25.10	25.03	25.08	25.08
CDMA 1900	25	25.01	25.06	24.89	25.07	24.98	24.95
	600	24.79	24.83	24.88	24.82	24.80	24.86
	1175	24.87	24.92	24.97	24.82	24.91	24.88

Band	Channel	Measured Conducted Power (dBm) for EV-DO modes	
		EV-DO Rev O	EVD-O Rev A
		RTAP 153.6K	Subtest 2 RETAP
EV-DO 800	1013	24.81	25.13
	384	24.83	25.09
	777	24.77	25.04
EV-DO 1900	25	24.51	24.70
	600	24.60	24.71
	1175	24.71	24.74

Based on the power measurements, all CDMA testing was performed in RC3/SO55 CDMA mode and all EV-DO testing was performed in EV-DO Release A Subtest 2 RETAP mode.

RADIATED POWER (EIRP AND ERP)

Measurement Procedure

Radiated power measurements are performed on the 3 meter OATS per the guidelines of ANSI/TIA-603-C-2004. The measurement area is situated on an 18 meter x 20 meter galvanized 1/2" hardware cloth as the conducting ground plane. This material is sewn together in sections 4 feet wide and 60 feet long. A total of eighteen sections are required to cover the entire measurement area. Sections are laid across the width of the pad, overlapped 1" and sewn and soldered together at intervals of 3" (7.6 cm.) The terrain of the test site is reasonably flat and level. Power and cable to the test site are buried 18" deep into the ground outside the perimeter of the site. An all-weather non-metallic housing is situated on a 2 x 3 meter area adjacent to the measurement area to house the test equipment. The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions' occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168.

A half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the radiated power level of the EUT. The power is calculated using the following formula:

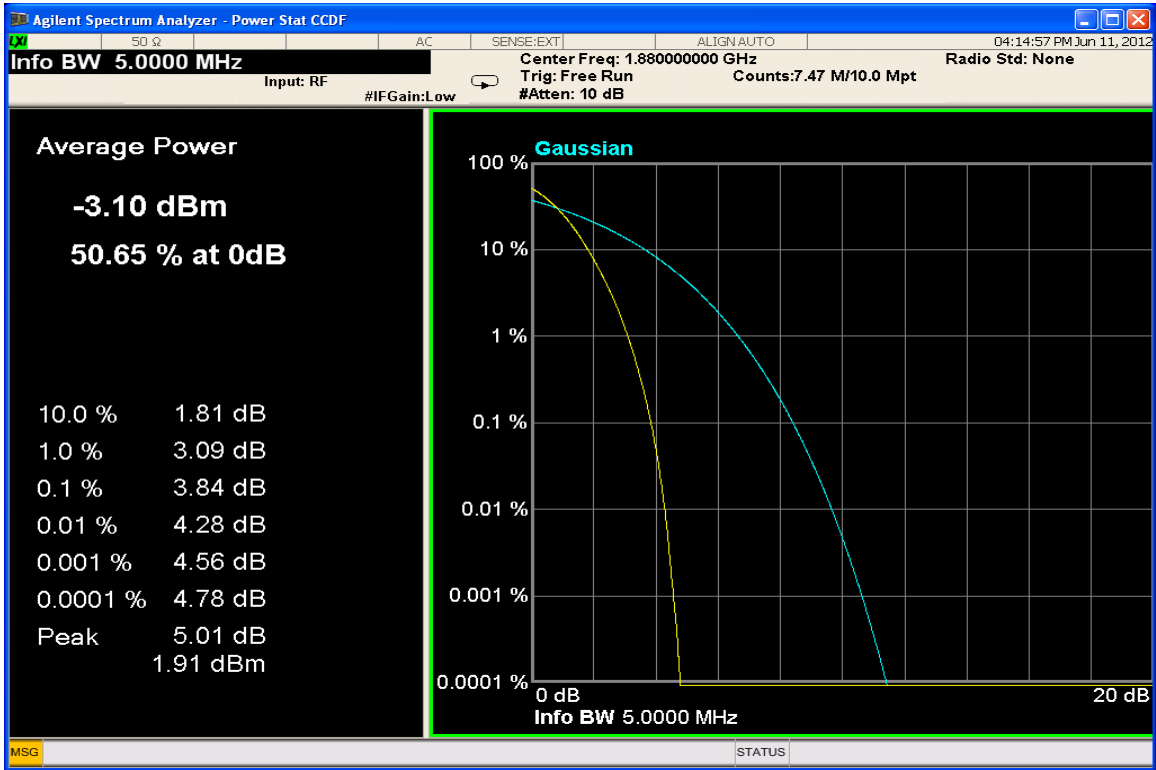
$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to P_g [dBm] - cable loss [dB].

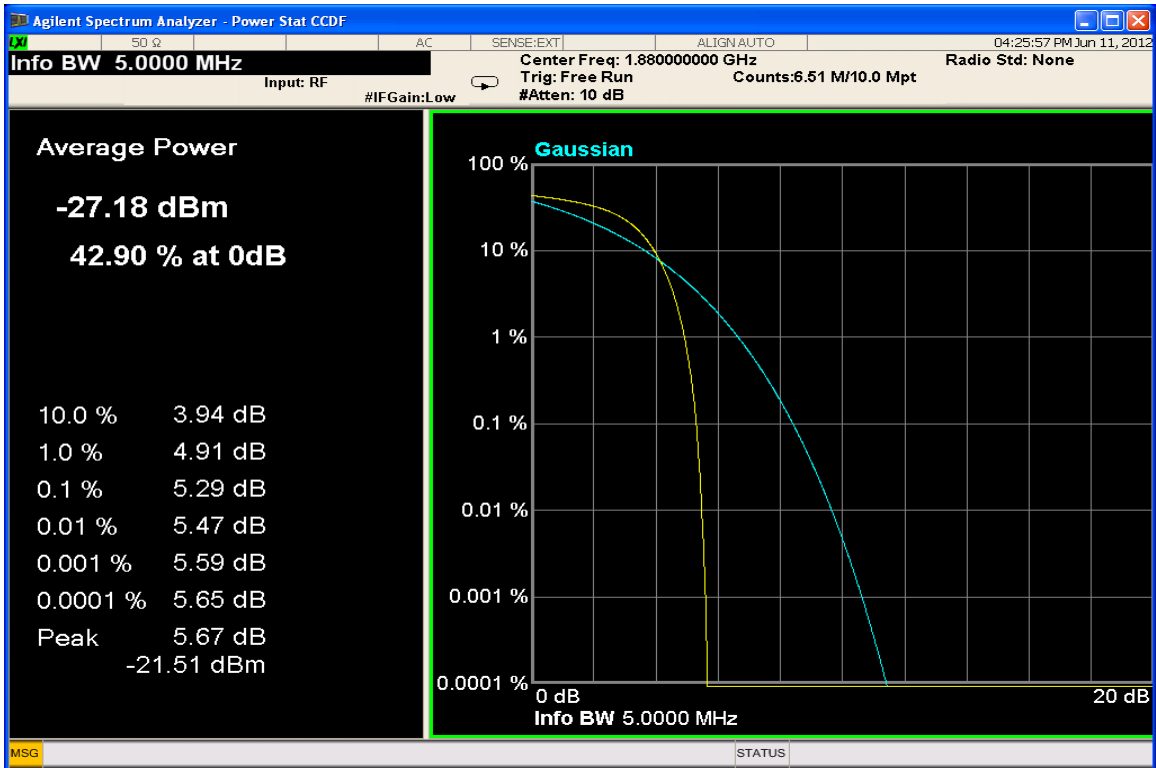
Measurement Results

Band	EIRP dBm	ERP dBm
CDMA 800	27.5	25.4
EV-DO 800	27.8	25.7
CDMA 1900	30.5	28.4
EV-DO 1900	31.7	29.6

For the PAR plots below, except for the detector used and the trace type, all instrument settings are the same for both plot traces.



CDMA 1900 – CCDF Plot



EV-DO 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.

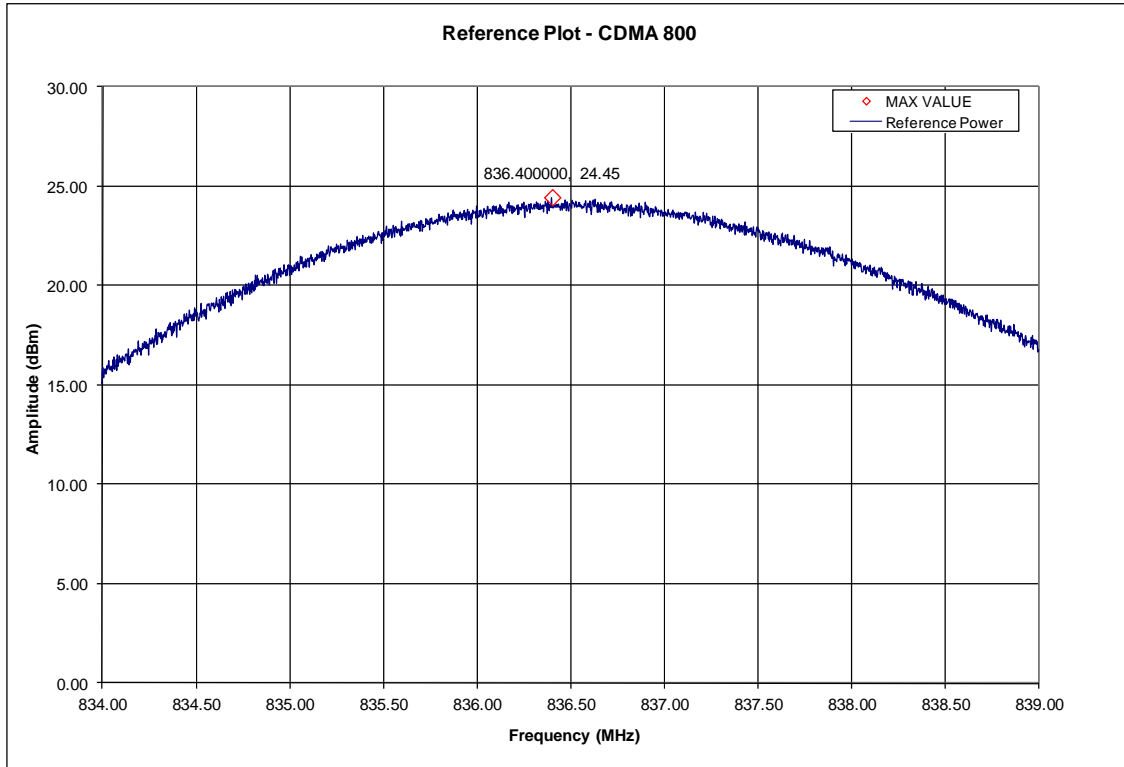
The middle channel within the designated frequency block was measured. For digital modulation, the lower and upper band edge plots are displayed.

Measurement Results
Attached

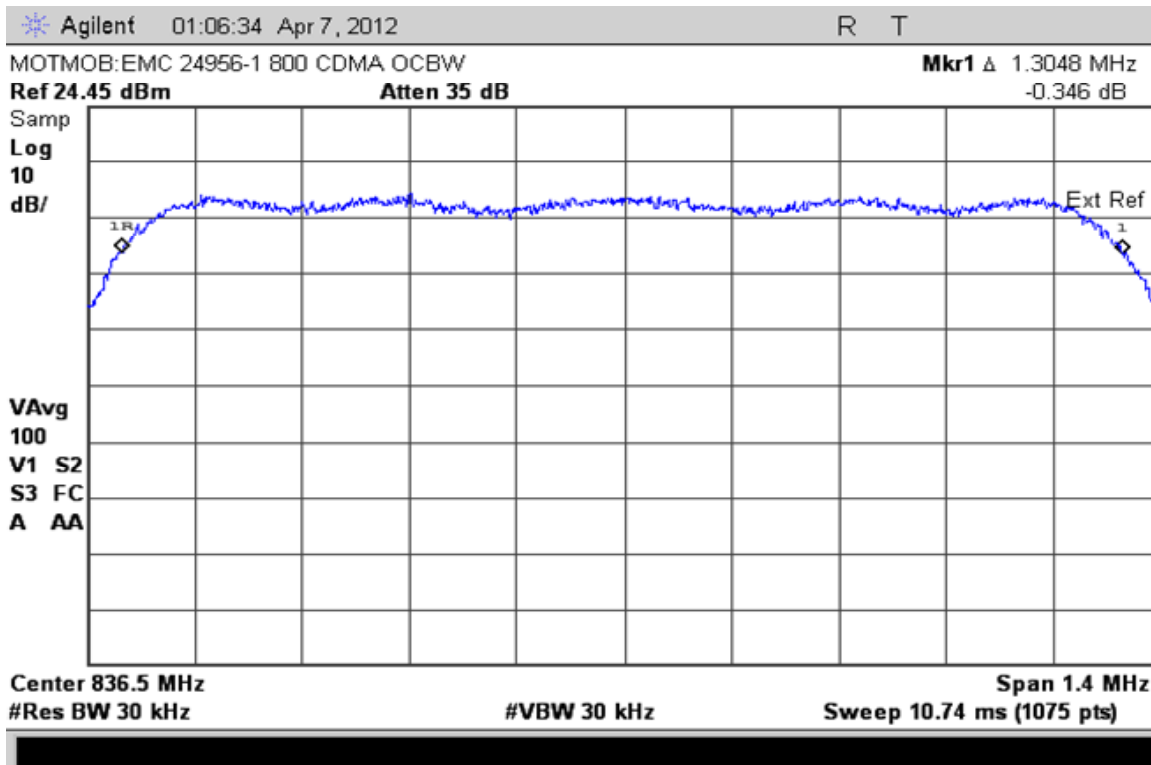
Plot	Equipment Settings					
	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Sweep Points (#)	Trace Mode	Detector	Samples (≥ #)
Reference Plot – CDMA 800 and EV-DO 800	3000	Auto	2001	Max Hold	Peak	100
OCBW – CDMA 800 and EV-DO 800	30	Auto	1601	Max Hold	Peak	100
Lower Band Edge – CDMA 800 and EV-DO 800	1	Auto	2004	Max Hold	Peak	30
Upper Band Edge – CDMA 800 and EV-DO 800	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 13 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 13 kHz resolution bandwidth filter.

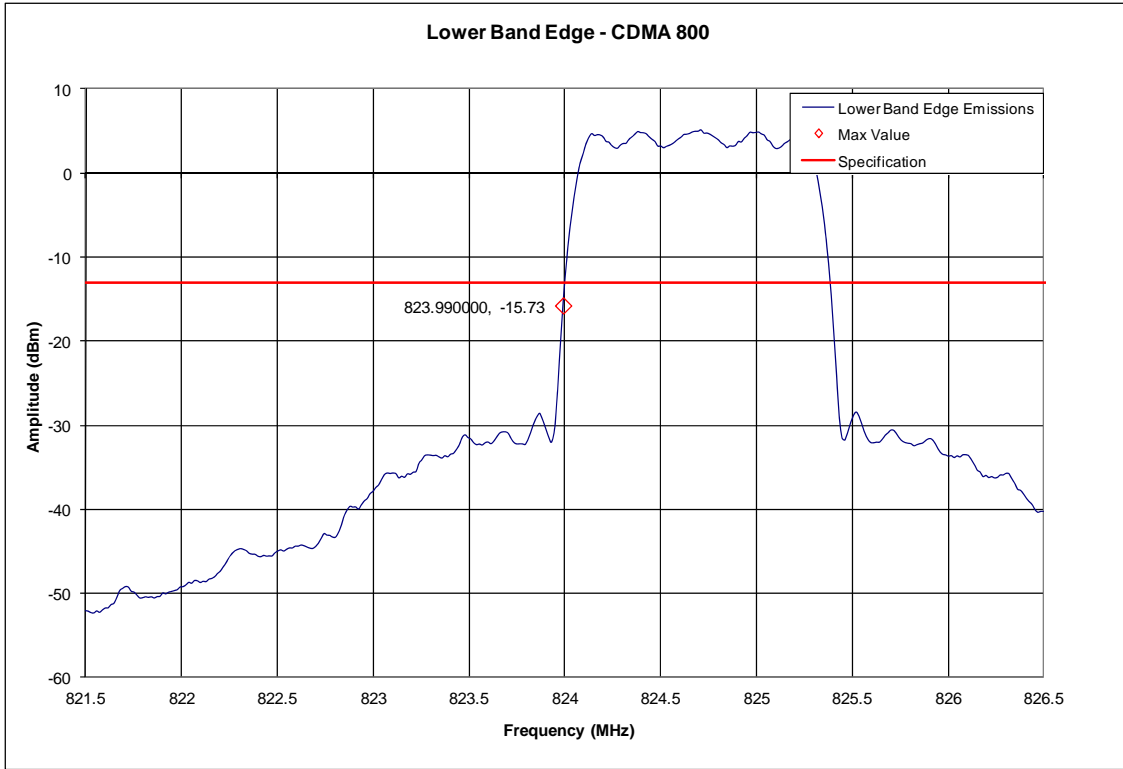
Measurement Results – CDMA 800



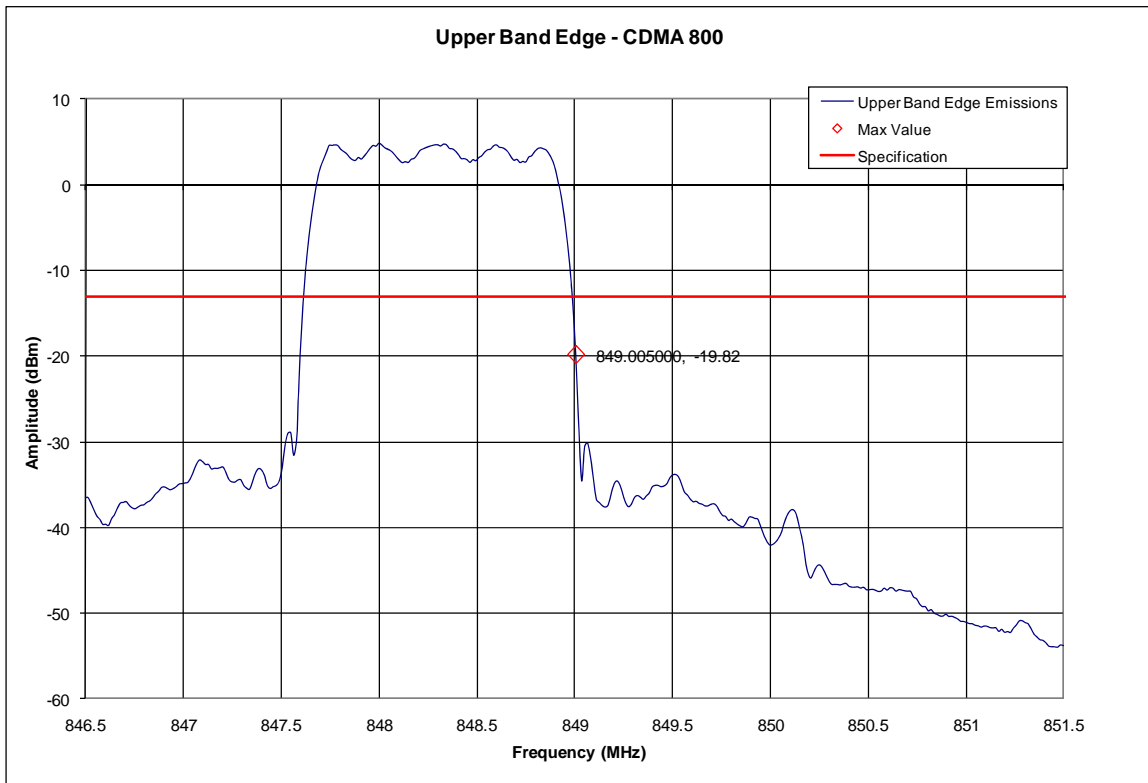
CDMA 800 – Reference Level Plot – Channel 384 (836.52MHz)



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

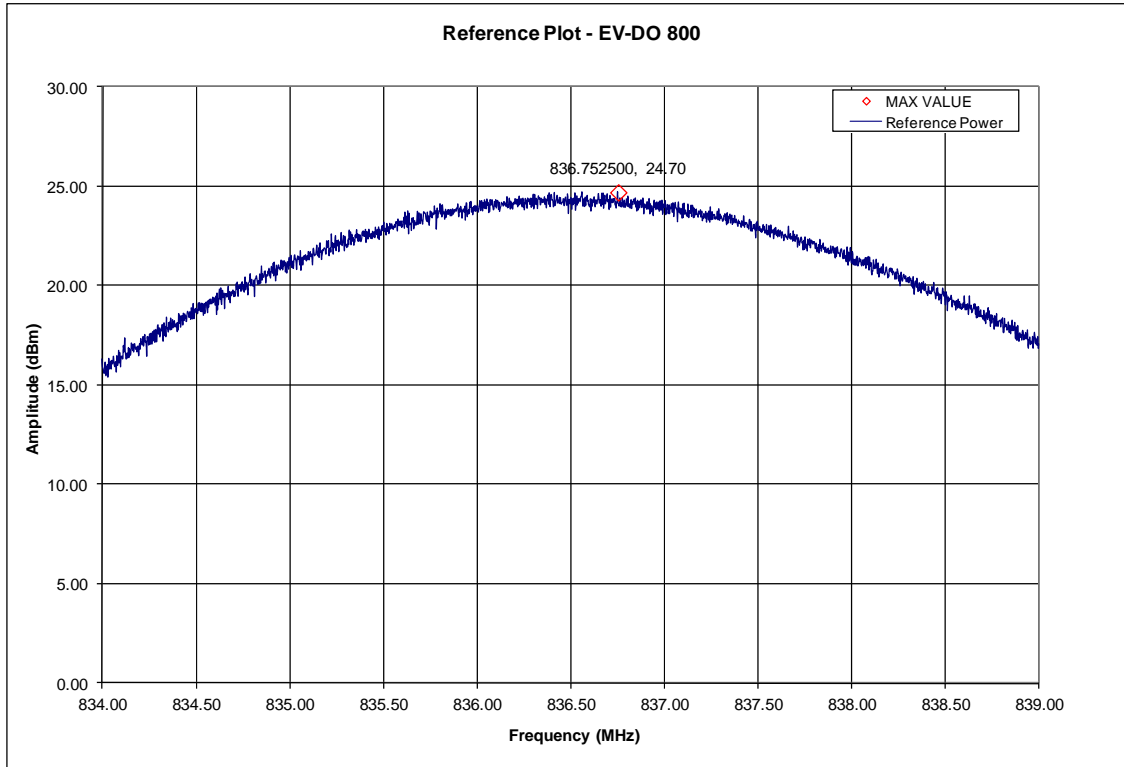


CDMA 800 – Lower Band Edge – Channel 1013 (824.702MHz)

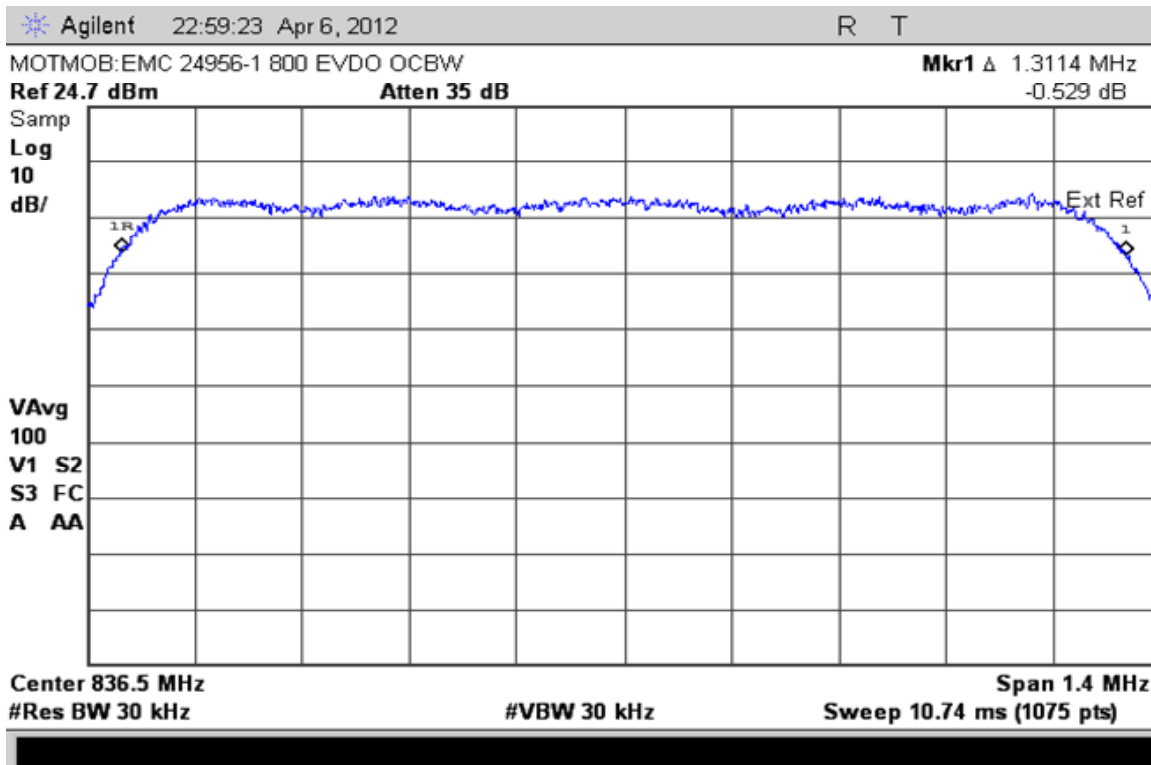


CDMA 800 – Upper Band Edge – Channel 777 (848.31MHz)

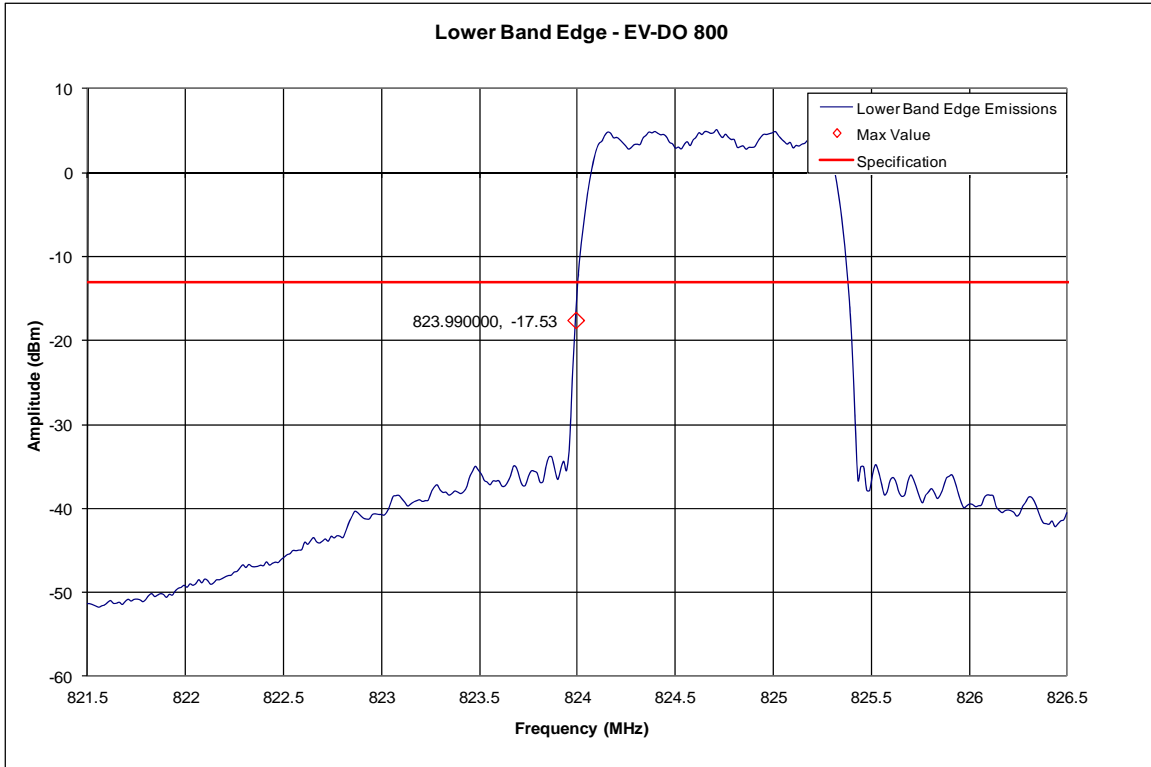
Measurement Results – EV-DO 800



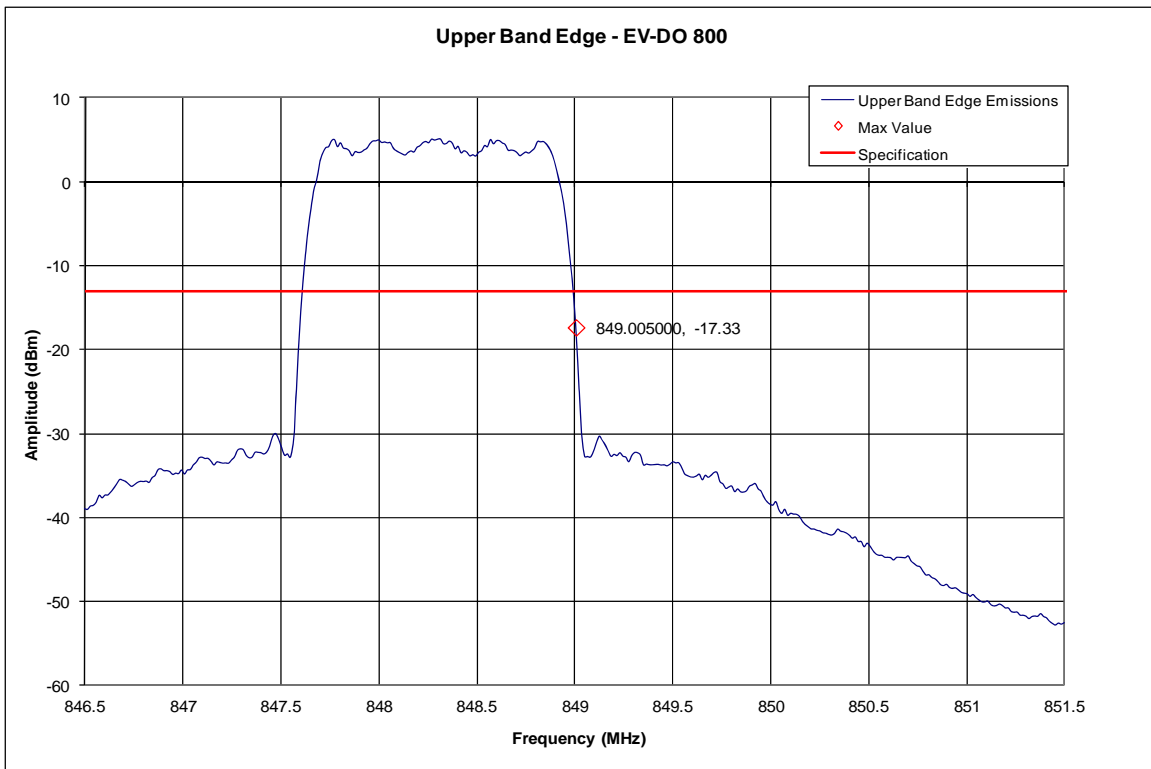
EV-DO 800 – Reference Level Plot – Channel 384 (836.52MHz)



EV-DO 800 – Occupied Bandwidth – Channel 384 (836.52MHz)

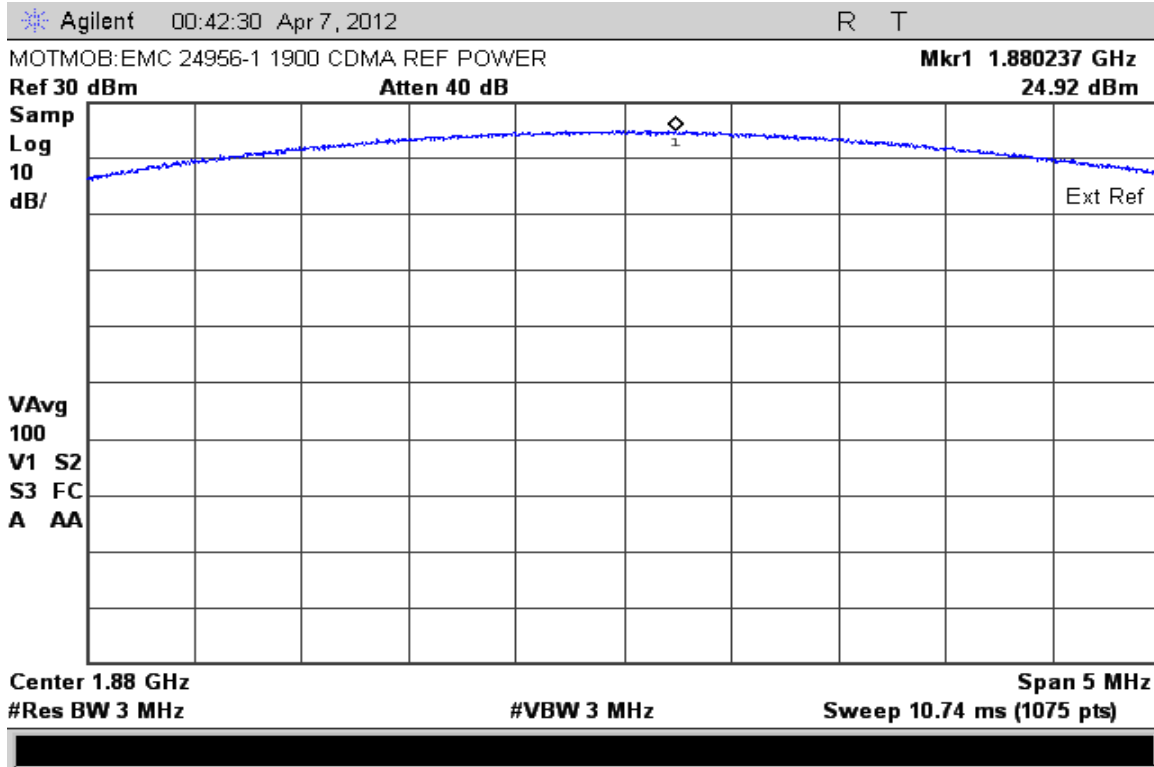


EV-DO 800 – Lower Band Edge – Channel 1013 (824.702MHz)

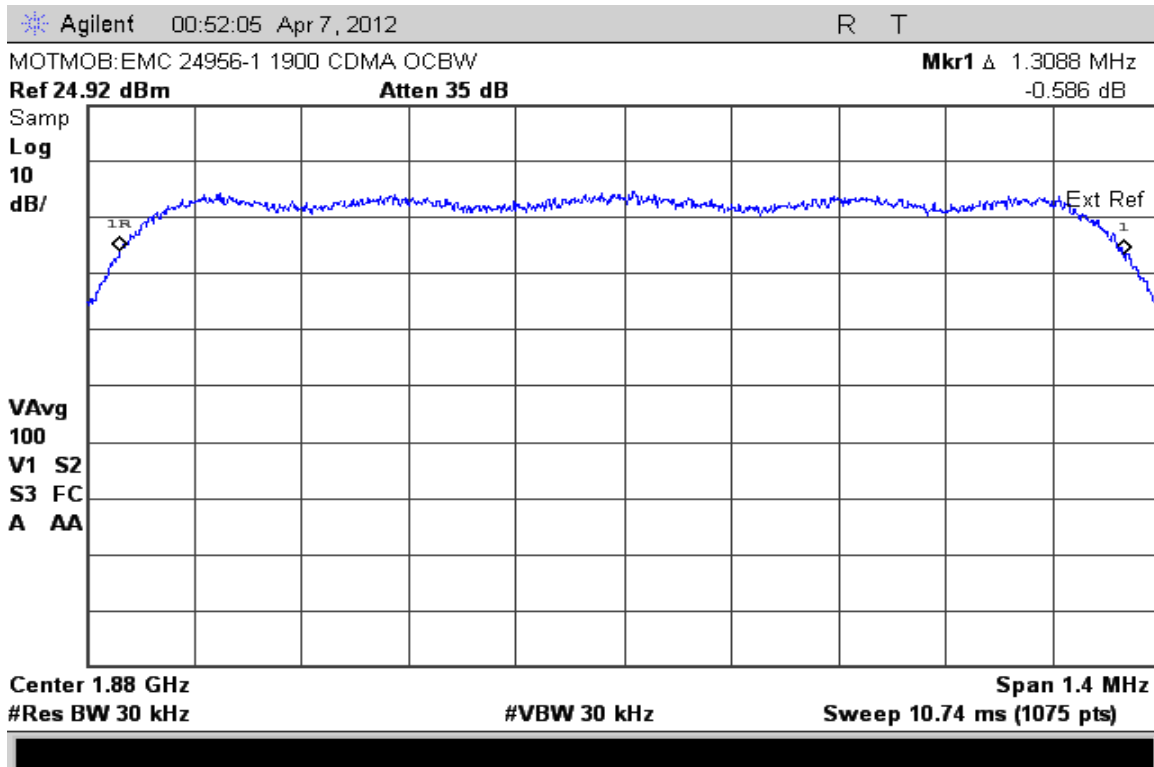


EV-DO 800 – Upper Band Edge – Channel 777 (848.31MHz)

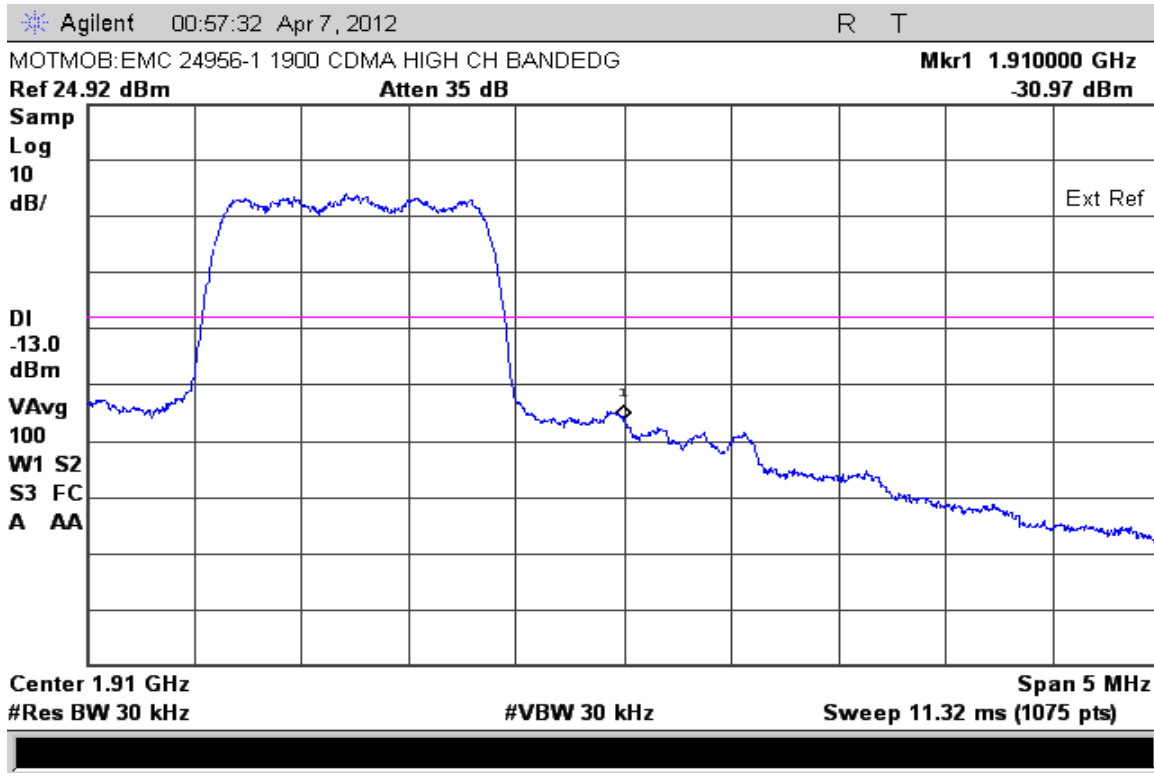
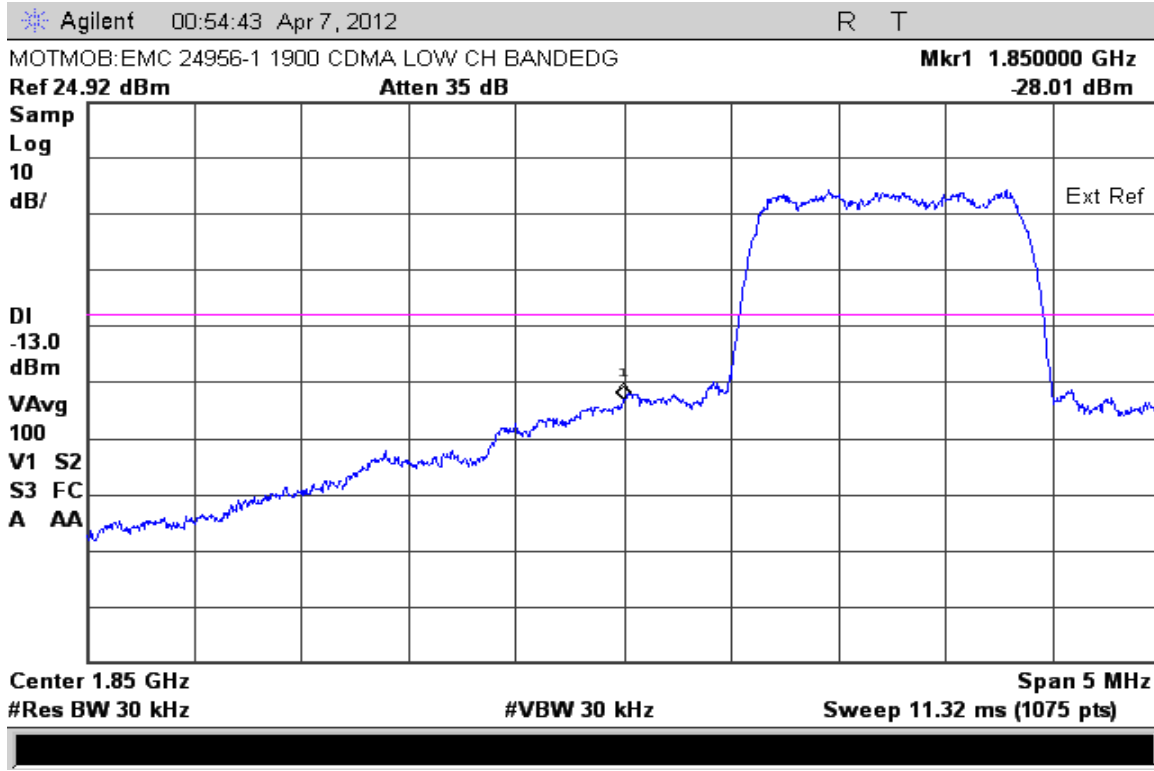
Measurement Results – CDMA 1900



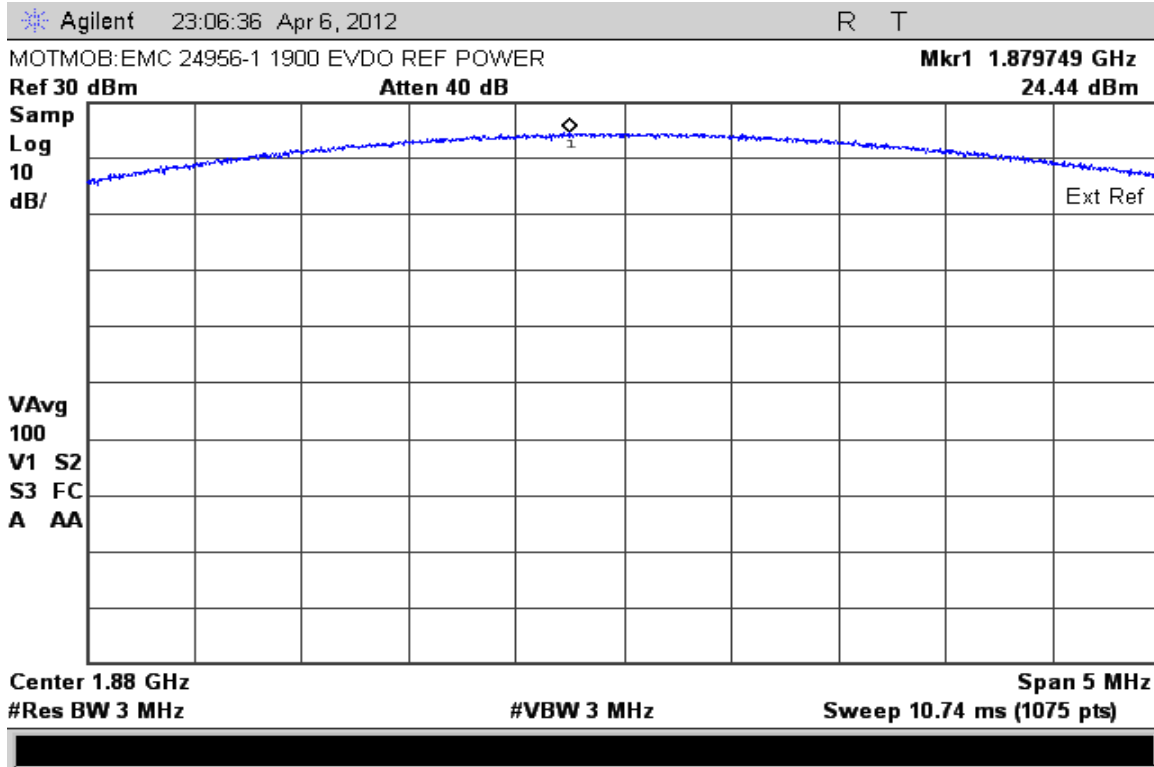
CDMA 1900 – Reference Level Plot – Channel 600 (1880.00 MHz)



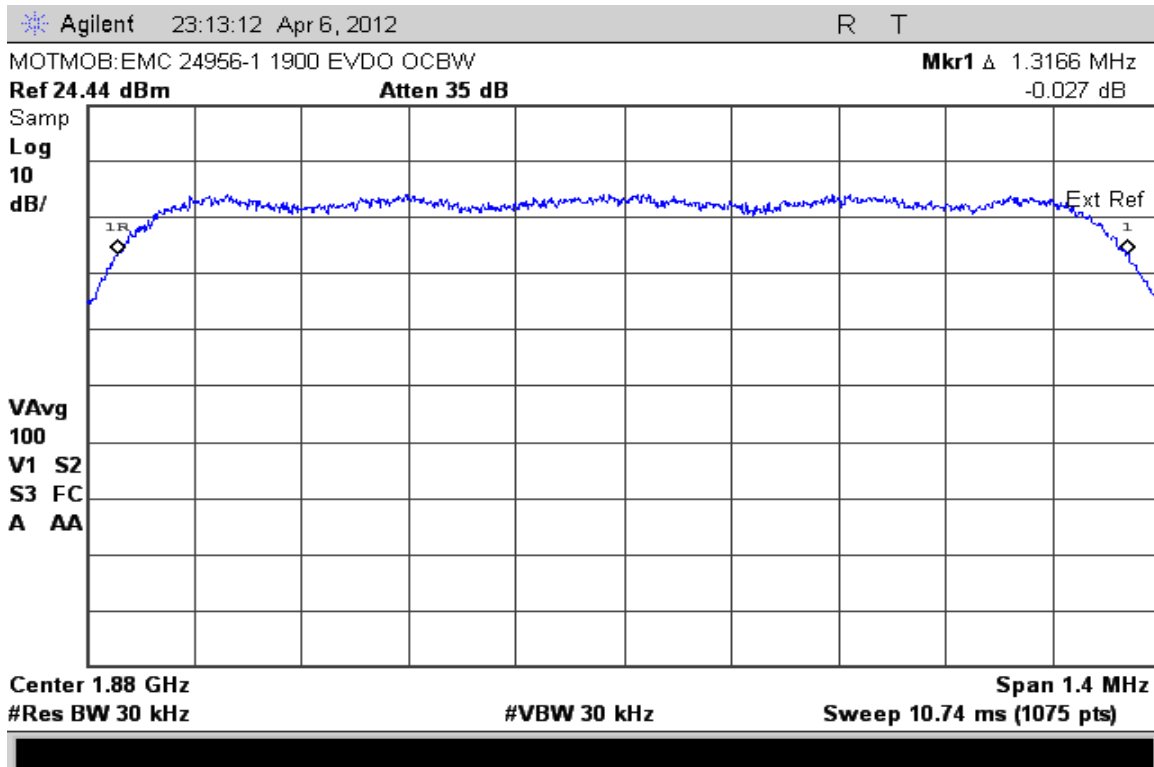
CDMA 1900 – Occupied Bandwidth – Channel 600 (1880.00 MHz)



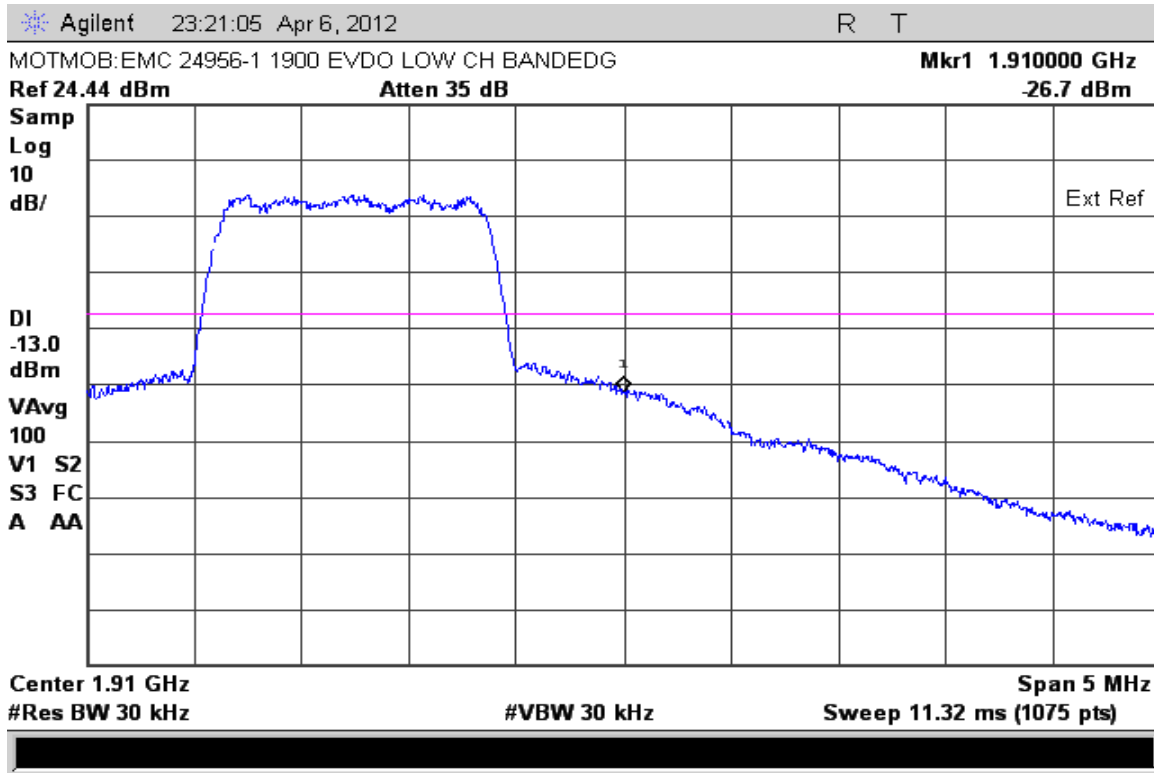
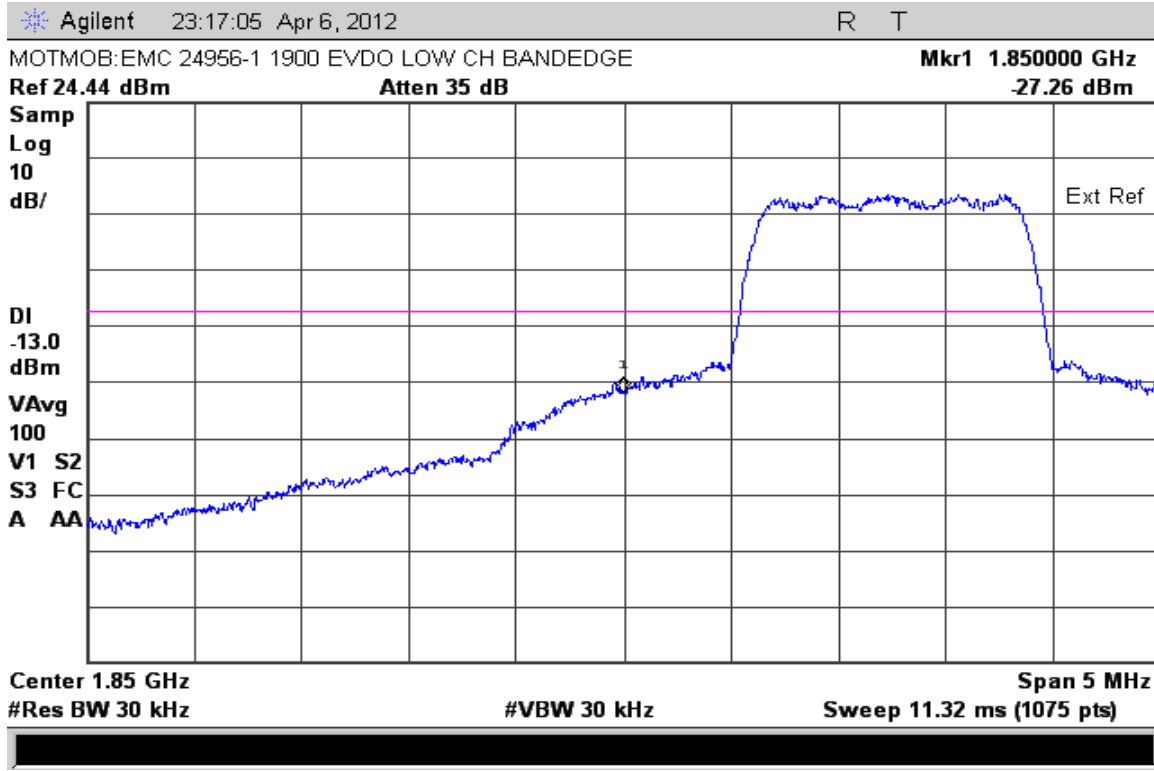
Measurement Results – EV-DO 1900



EV-DO 1900 – Reference Level Plot – Channel 600 (1880.00 MHz)



EV-DO 1900 – Occupied Bandwidth – Channel 600 (1880.00 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

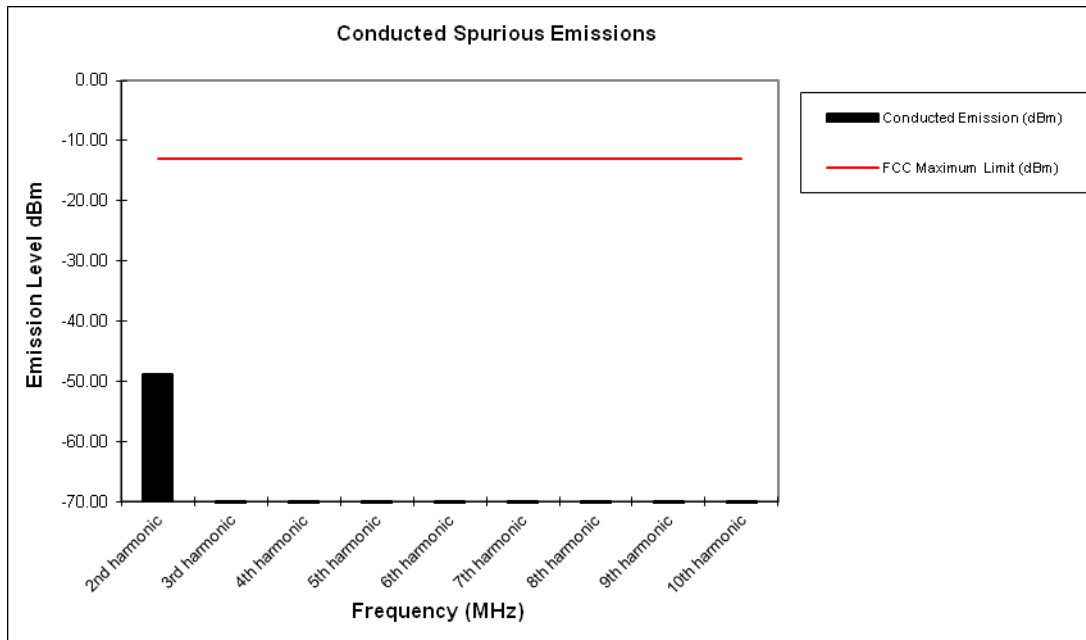
Measurement Results

Attached

Measurement Results
Modulation: CDMA 800

Conducted Spurious and Harmonic Emissions

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-48.89
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:

- * 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.



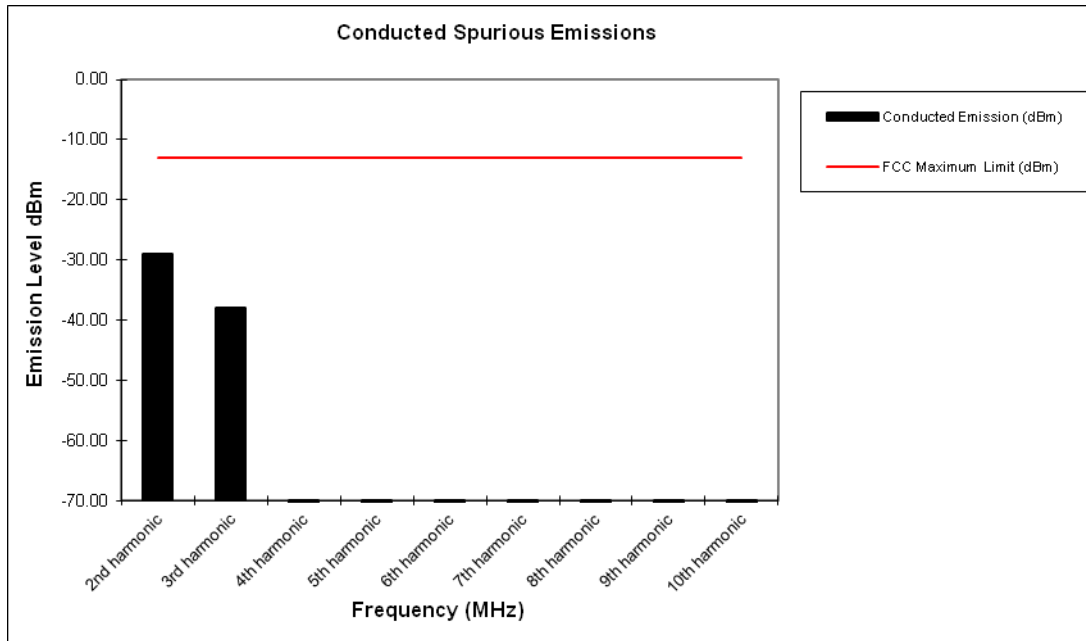
CDMA 800 Conducted Spurious Emissions (Lower adjacent 1 MHz band)



CDMA 800 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	-28.99
3rd harmonic	-13	-37.93
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



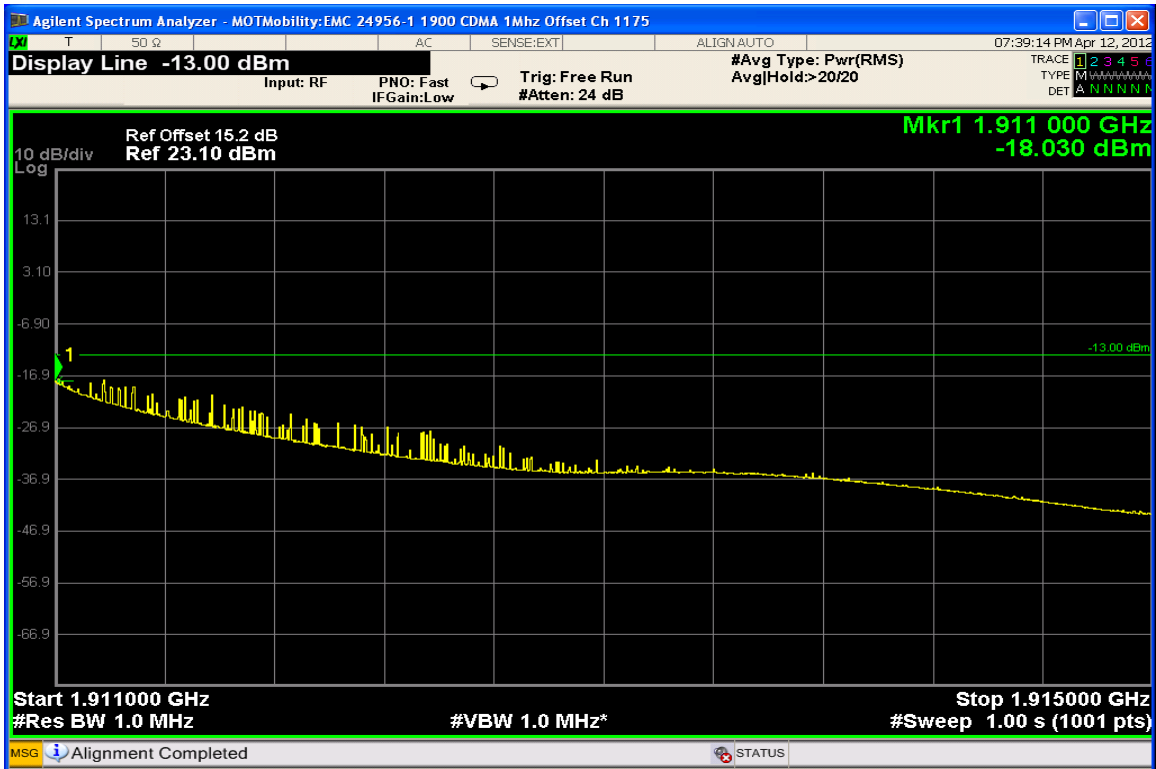
Notes:

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.



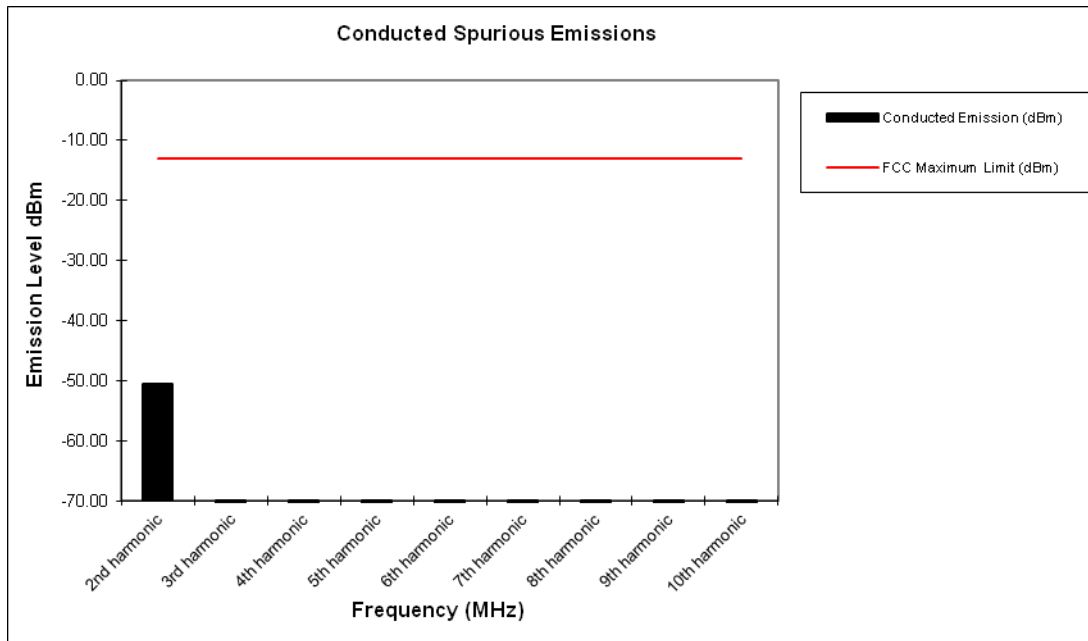
CDMA 1900 Conducted Spurious Emissions (Lower adjacent 1 MHz band)



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

Measurement Results Bottom Antenna
Modulation: EV-DO 800

Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-50.65
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.



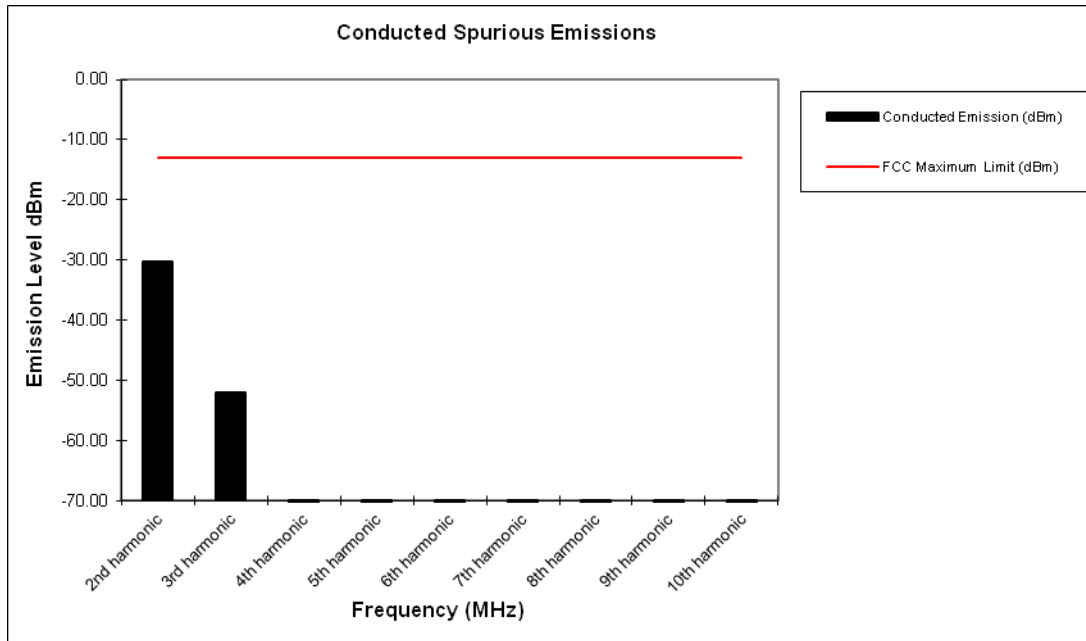
EV-DO 800 Conducted Spurious Emissions (Lower adjacent 1 MHz band)



EV-DO 800 Conducted Spurious Emissions (Upper adjacent 1 MHz band)

Measurement Results Bottom Antenna
Modulation: EV-DO 1900

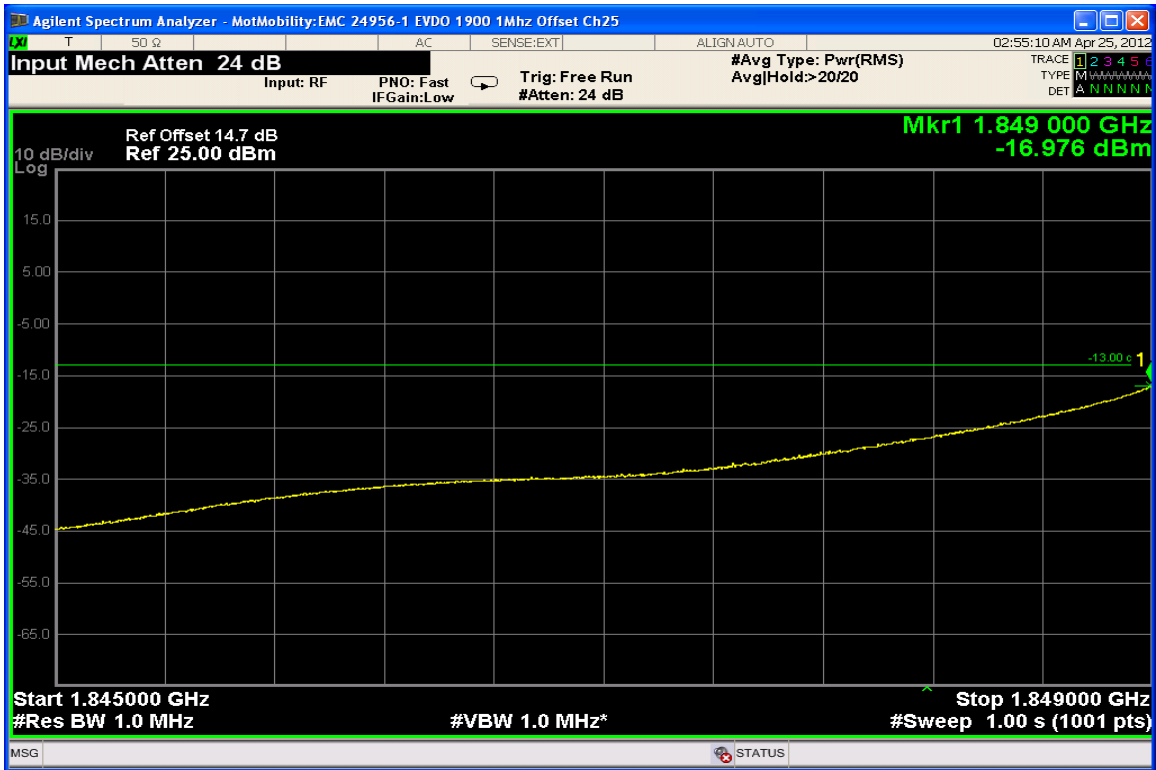
Harmonic of Fundamental	FCC Maximum Limit (dBm)	Conducted Emission (dBm)
2nd harmonic	-13	-30.20
3rd harmonic	-13	-51.99
4th harmonic	-13	*
5th harmonic	-13	*
6th harmonic	-13	*
7th harmonic	-13	*
8th harmonic	-13	*
9th harmonic	-13	*
10th harmonic	-13	*



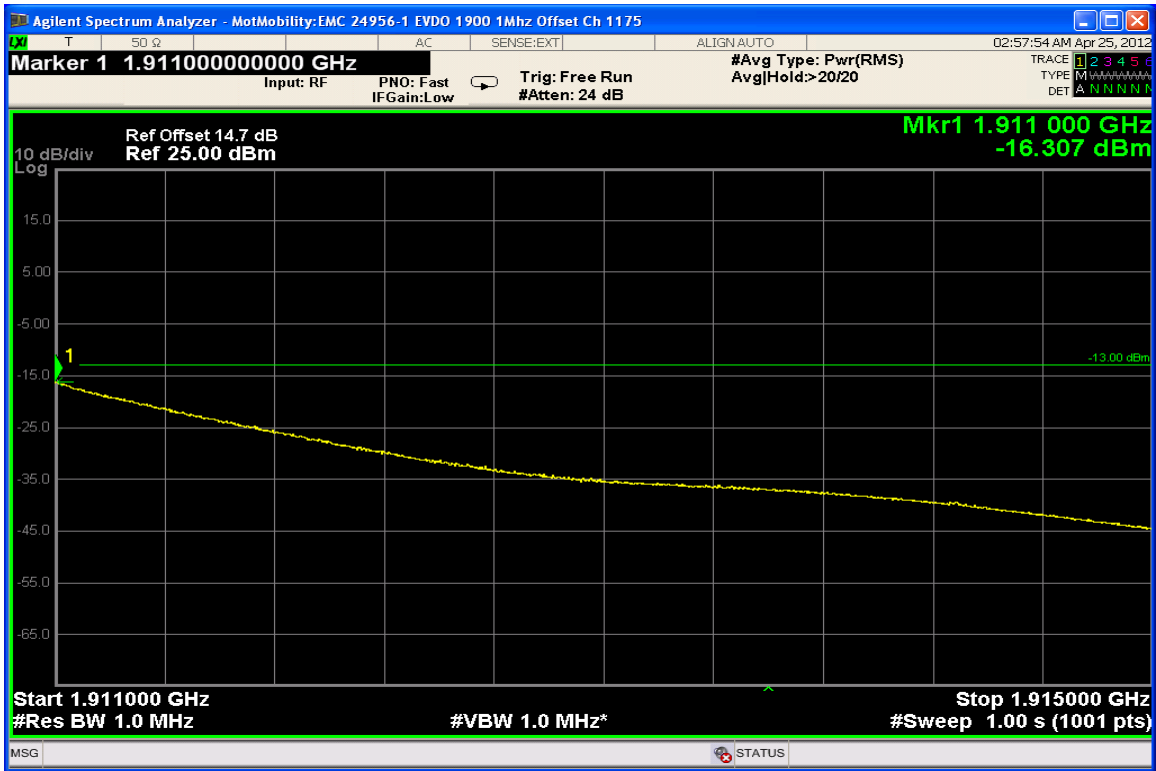
Notes:

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

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



EV-DO 1900 Conducted Spurious Emissions (Lower adjacent 1 MHz band)

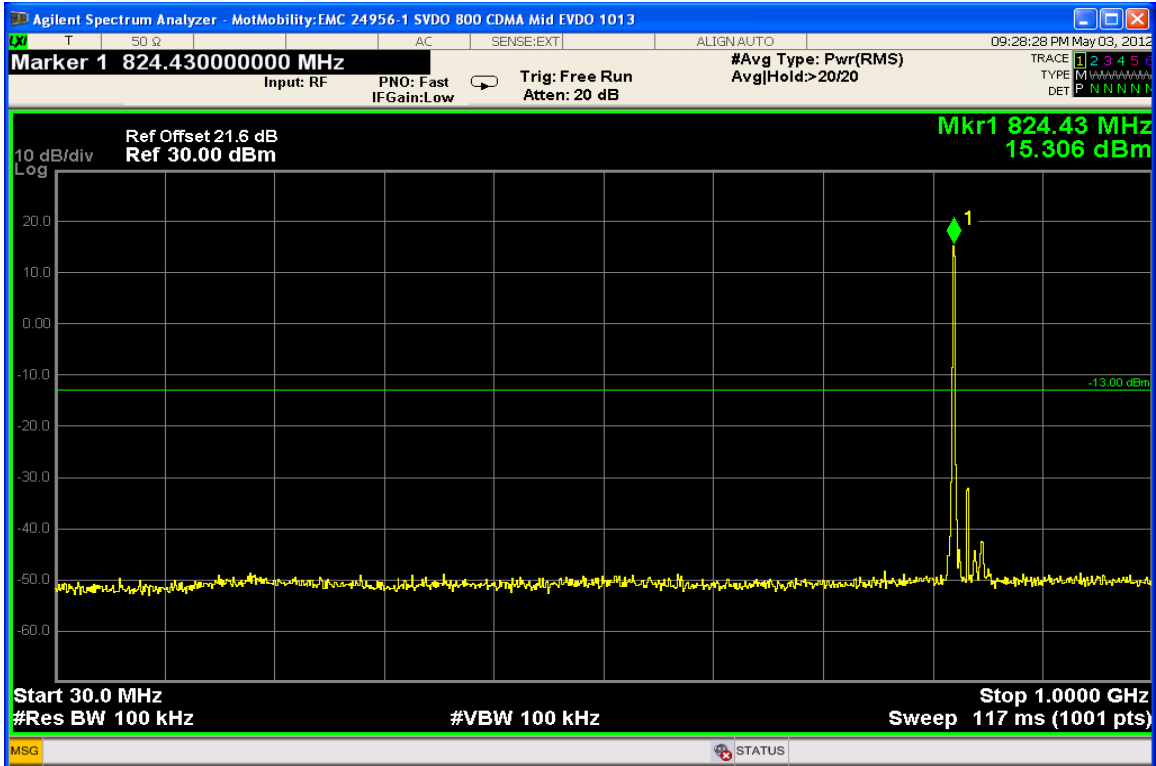


EV-DO 1900 Conducted Spurious Emissions (Upper adjacent 1 MHz band)

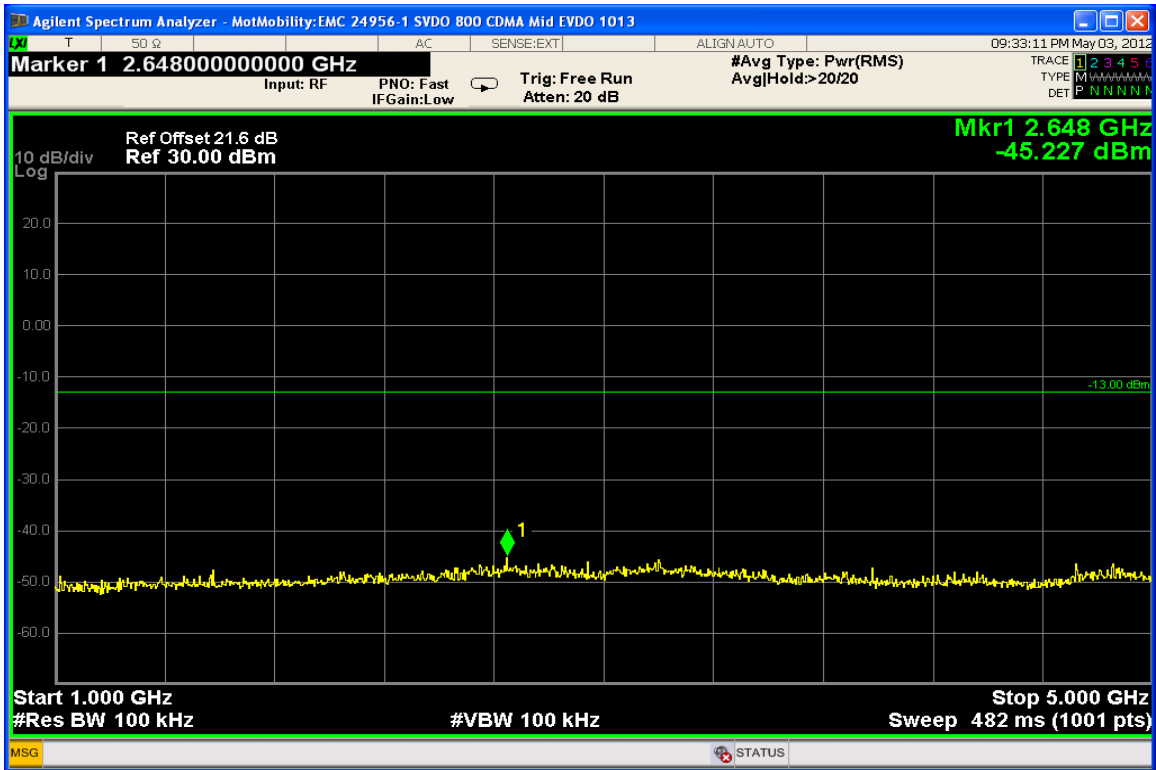
Measurement Results Top Antenna

Modulation: EV-DO 800;

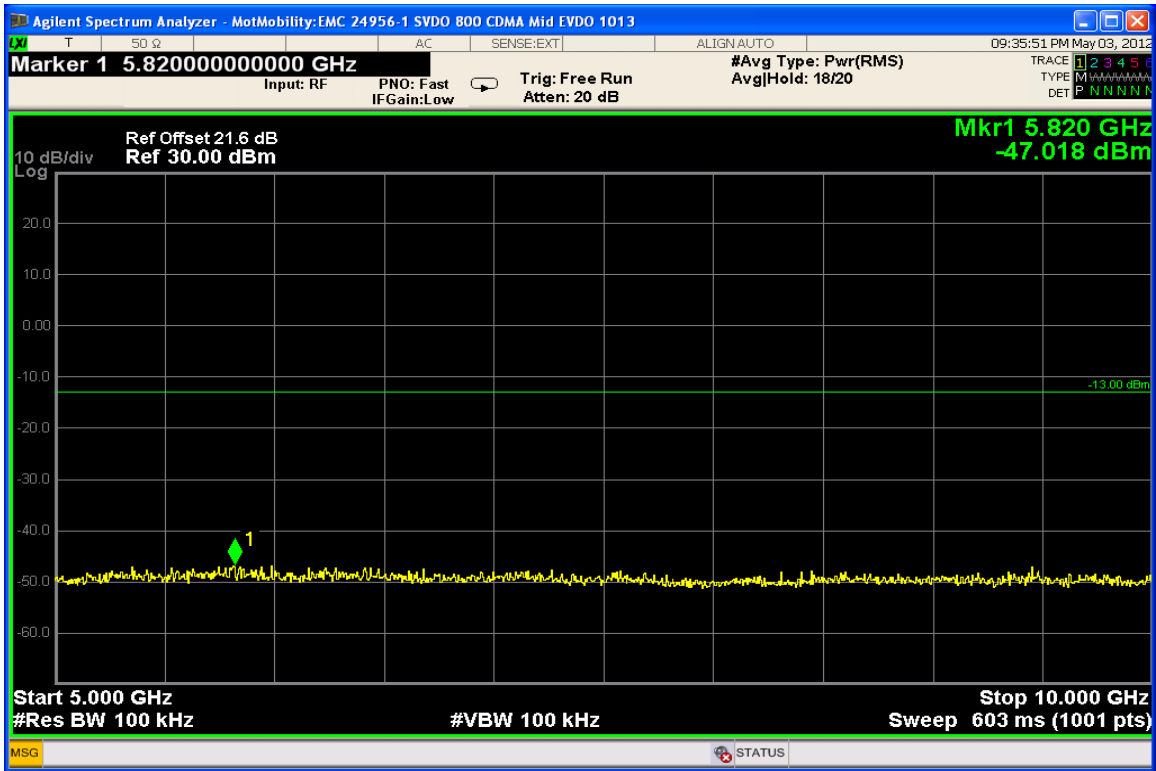
Low, middle and high channels were evaluated with the maximum shown below.



EV-DO 800 Conducted Spurious Emissions Ch1013 30Mhz – 1GHz



EV-DO 800 Conducted Spurious Emissions Ch1013 1Ghz – 5GHz



EV-DO 800 Conducted Spurious Emissions Ch1013 5Ghz – 10GHz



EV-DO 800 Conducted Spurious Emissions (Lower adjacent 1 MHz band)

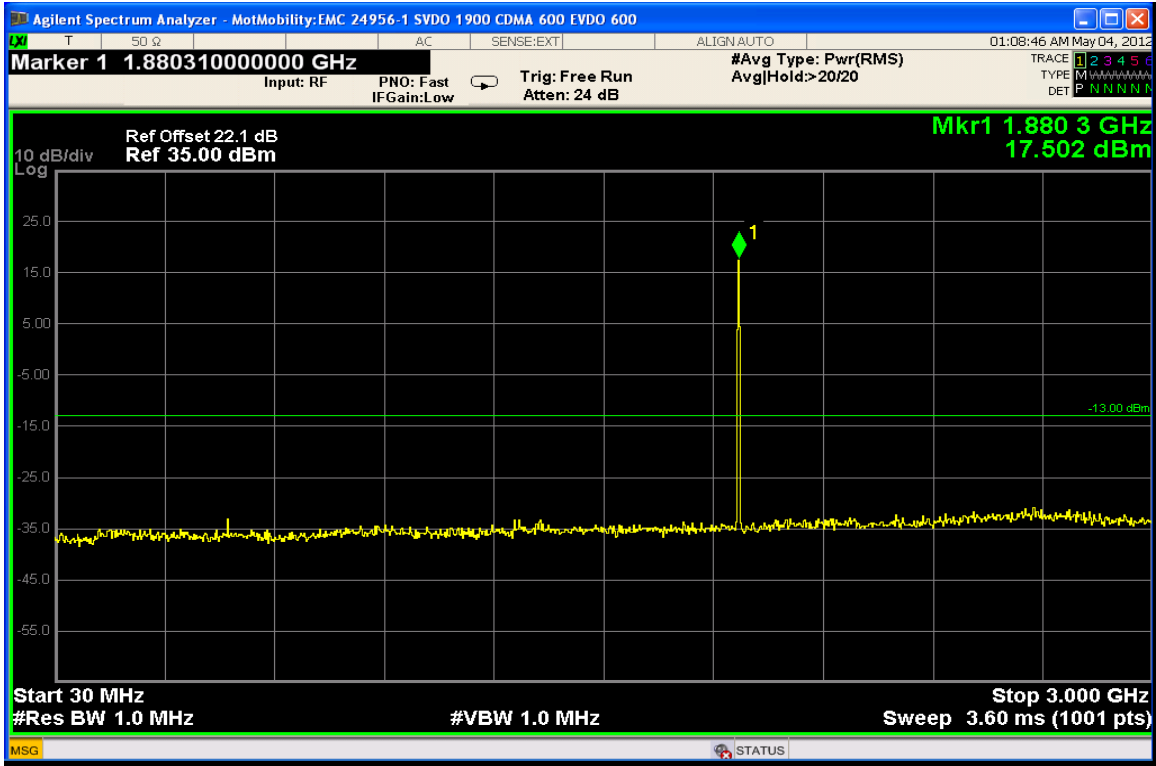


EV-DO 800 Conducted Spurious Emissions (Upper adjacent 1 MHz band)

Measurement Results Top Antenna

Modulation: EV-DO 1900

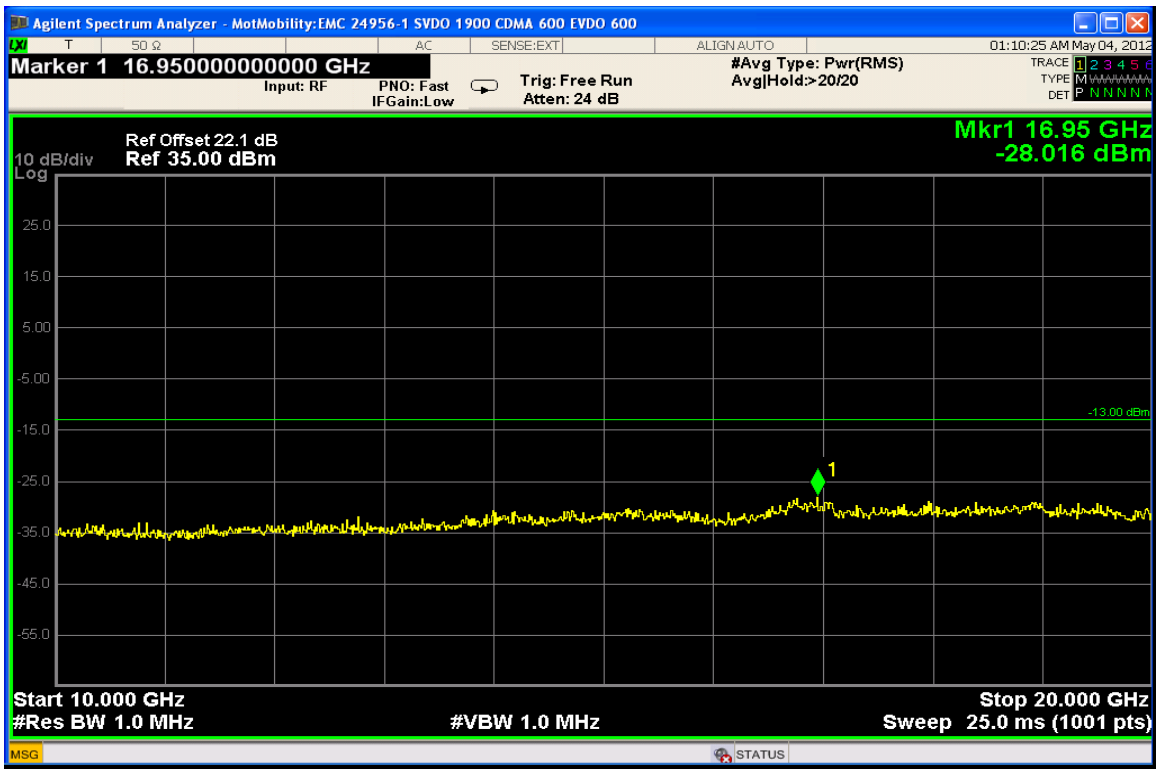
Low, middle and high channels were evaluated with the maximum shown below.



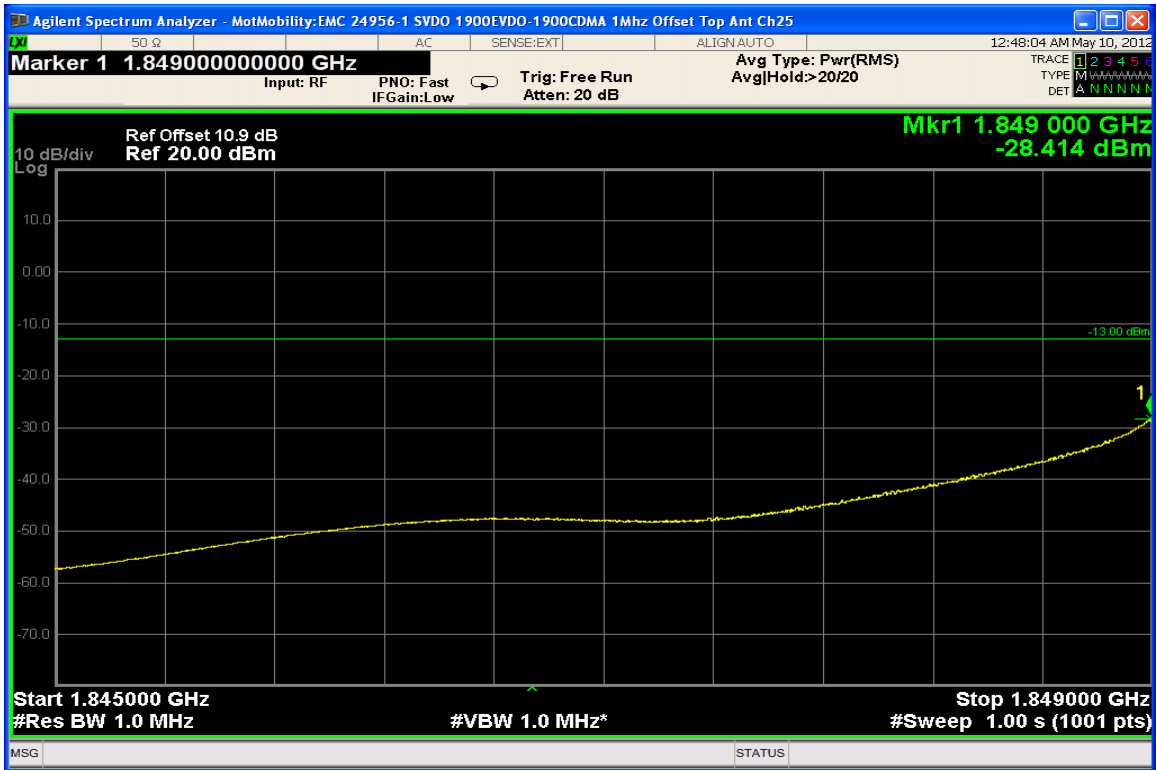
EV-DO 1900 Conducted Spurious Emissions Ch600 30Mhz – 3GHz



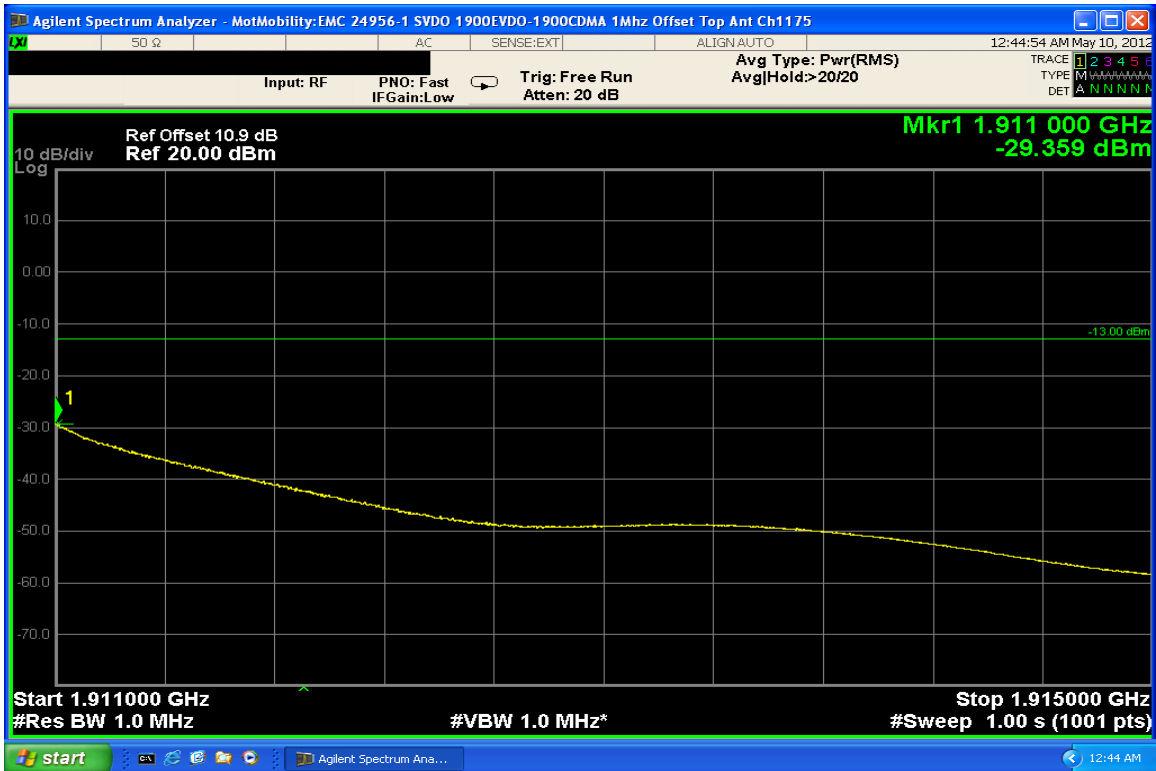
EV-DO 1900 Conducted Spurious Emissions Ch600 2GHz – 10GHz



EV-DO 1900 Conducted Spurious Emissions Ch600 10Ghz – 20GHz



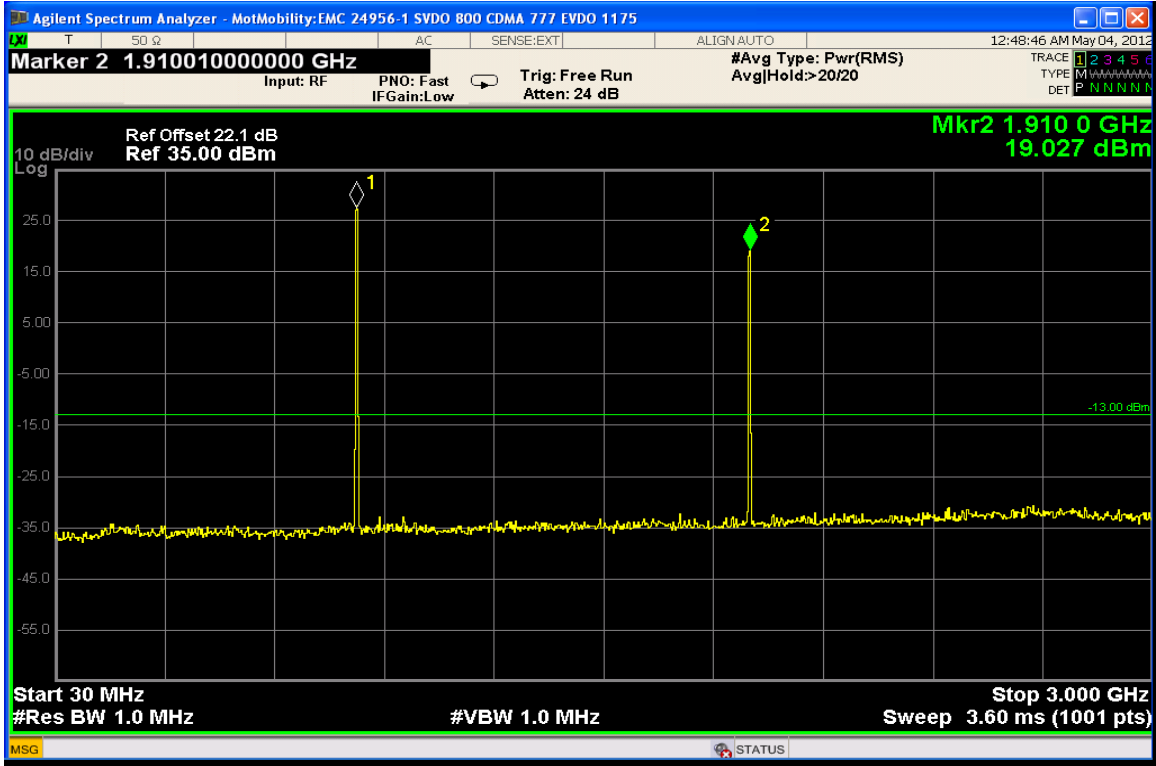
EV-DO 1900 Conducted Spurious Emissions (Lower adjacent 1 MHz band)



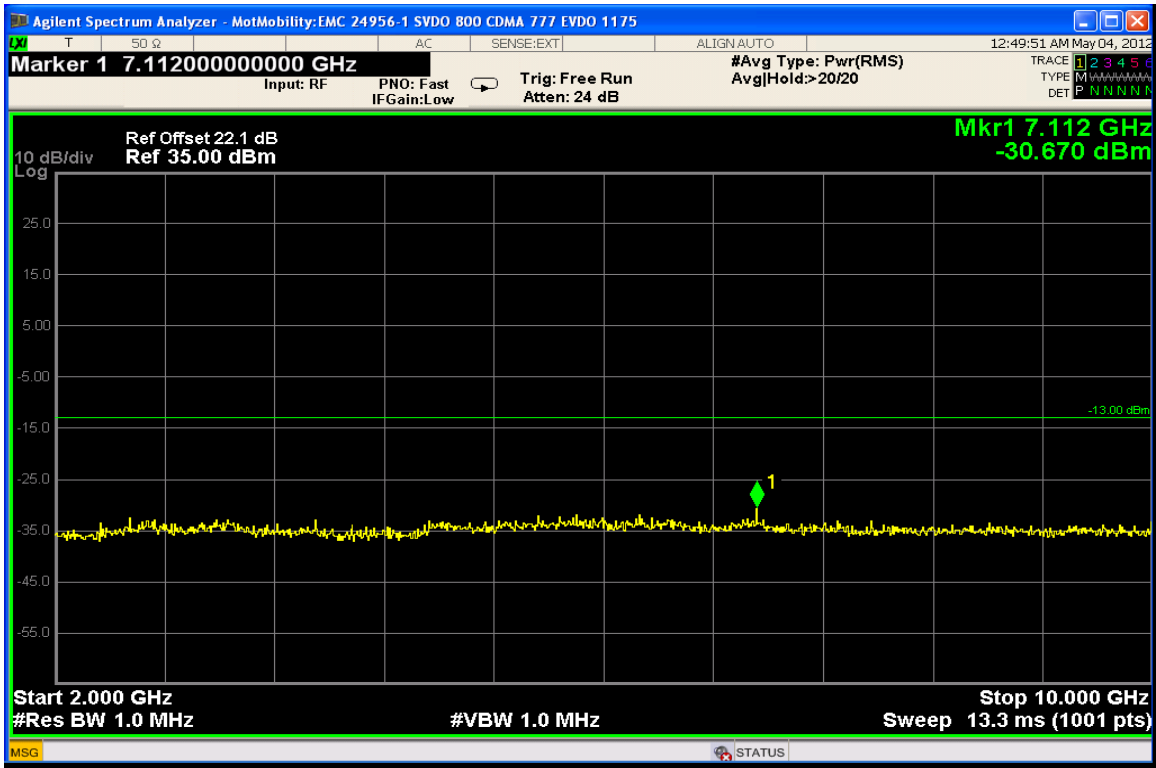
EV-DO 1900 Conducted Spurious Emissions (Upper adjacent 1 MHz band)

Measurement Results SVDO

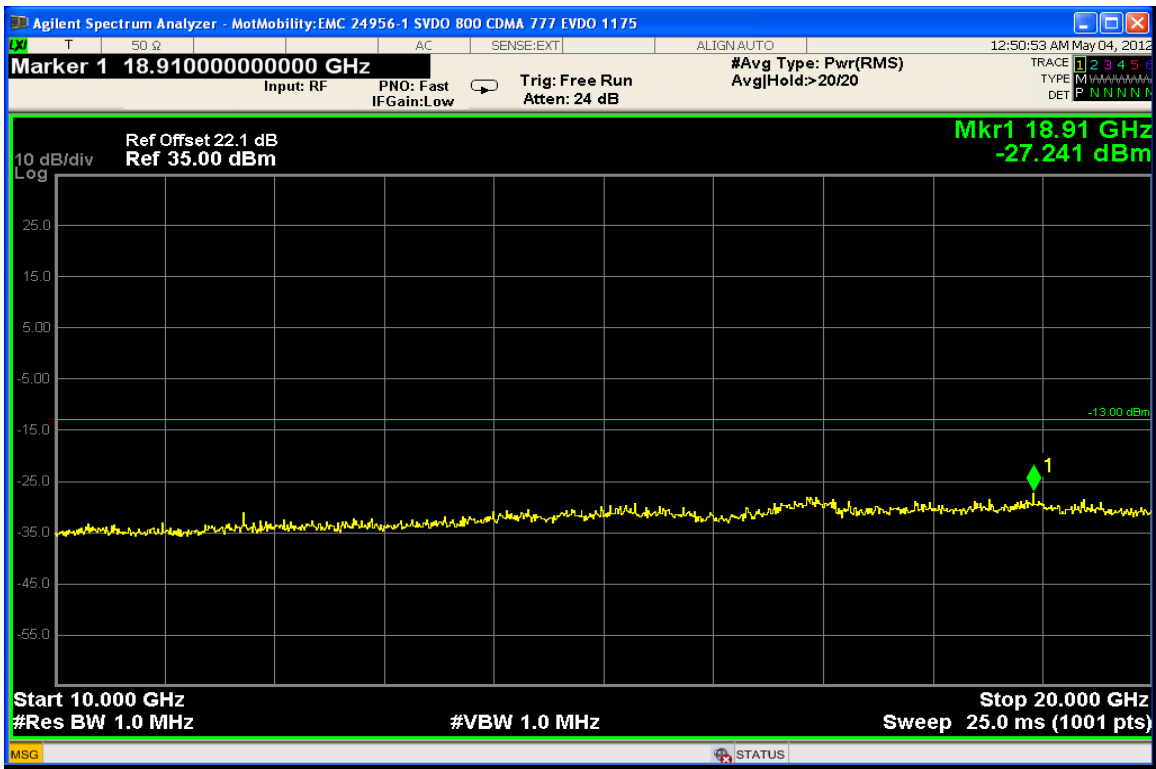
Modulation: All combinations were evaluated with the maximum shown below



SVDO Conducted Spurious Emissions 800 CDMA Ch777 1900 EV-DO Ch 1175



SVDO Conducted Spurious Emissions 800 CDMA Ch777 1900 EV-DO Ch 1175



SVDO Conducted Spurious Emissions 800 CDMA Ch777 1900 EV-DO Ch 1175

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

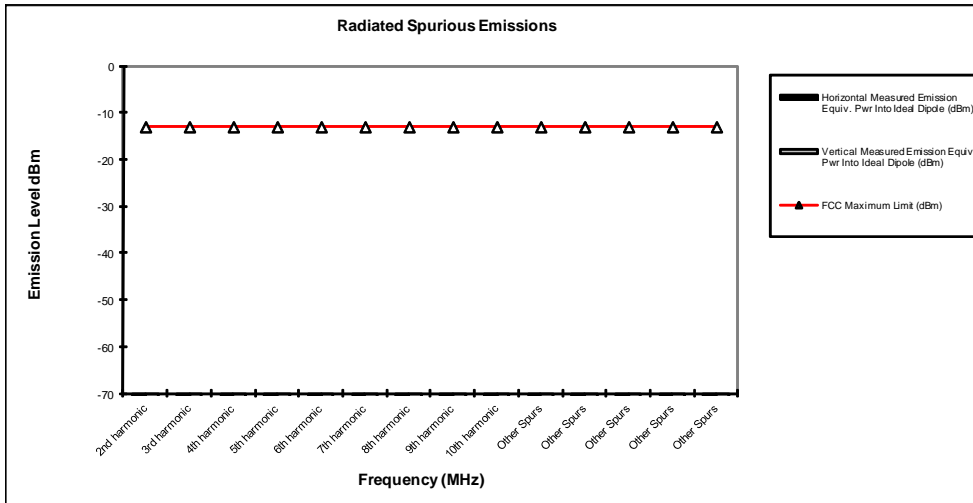
Attached

Measurement Results

Modulation: All modulations including SVDO; top and bottom antennas

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°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

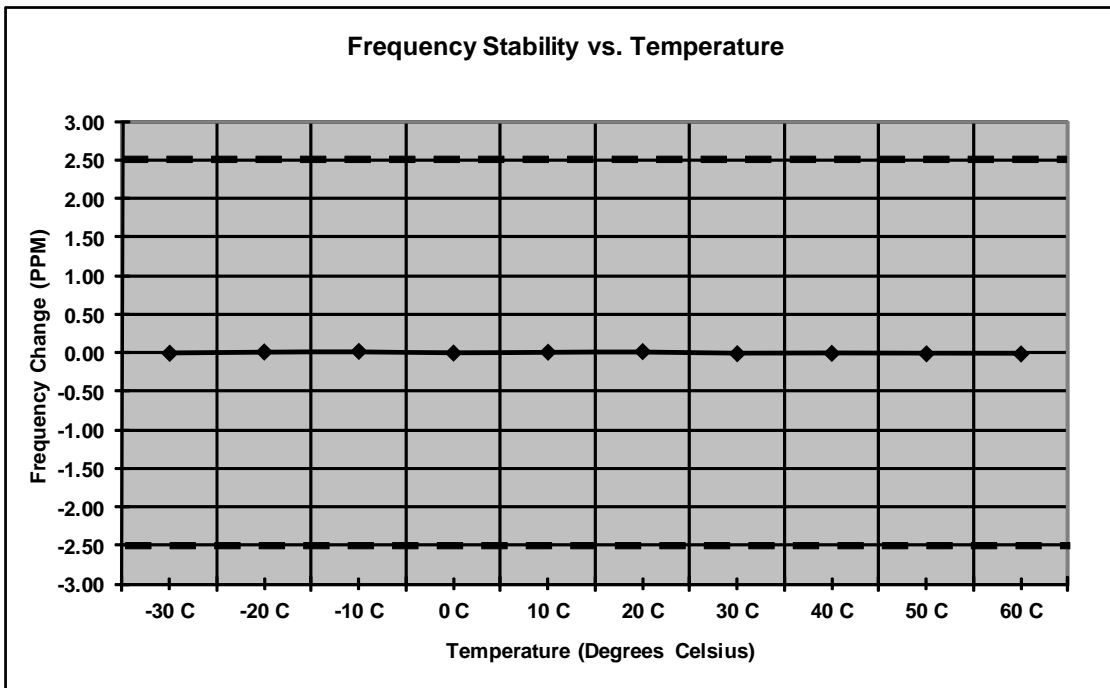
Attached

Measurement Results
Modulation: CDMA 800

Frequency Stability

Mode: CDMA 800 **Operating Frequency:** 836.52 MHz
Channel: 384 **Deviation Limit (PPM):** ±2.5ppm

Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	-7.60	-0.009	100%	3.80
-20 C	6.24	0.007	100%	3.80
-10 C	12.32	0.015	100%	3.80
0 C	-6.09	-0.007	100%	3.80
10 C	3.80	0.005	100%	3.80
20 C	10.36	0.012	100%	3.80
30 C	-12.29	-0.015	100%	3.80
40 C	-9.66	-0.012	100%	3.80
50 C	-13.63	-0.016	100%	3.80
60 C	-15.67	-0.019	100%	3.80
20 C	-11.54	-0.014	Battery Endpoint	3.20

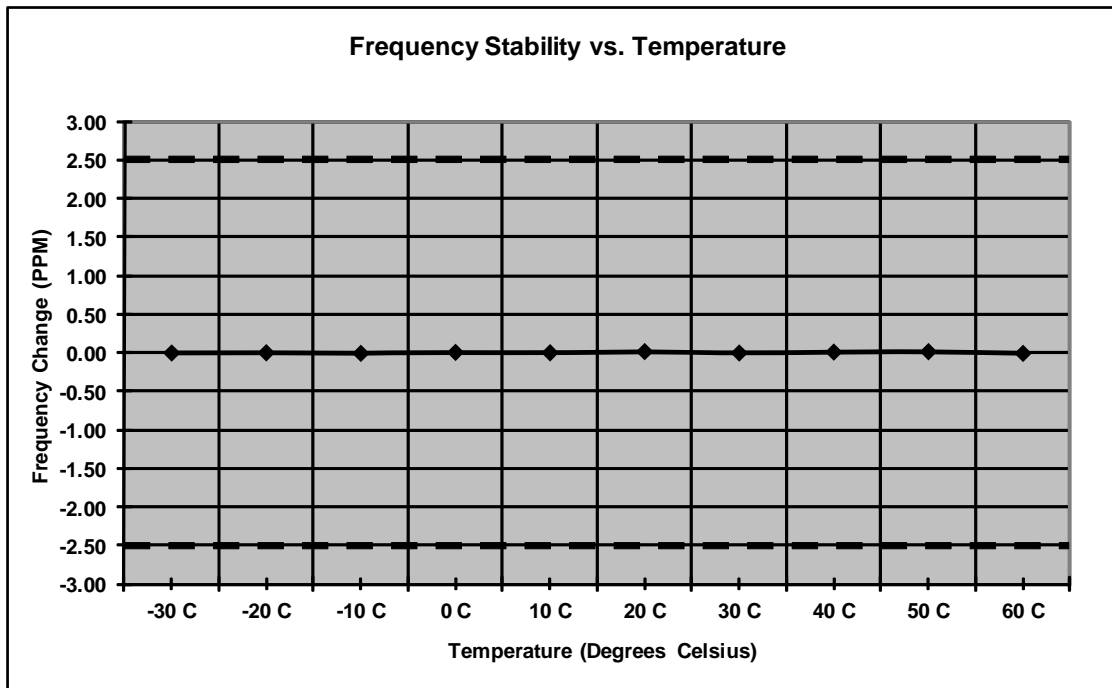


Measurement Results
Modulation: CDMA 1900

Frequency Stability

Mode: GSM 1900 **Operating Frequency:** 1880.0 MHz
Channel: 661 **Deviation Limit (PPM):** ±2.5ppm

Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	-10.18	-0.005	100%	3.80
-20 C	-5.59	-0.003	100%	3.80
-10 C	-20.57	-0.011	100%	3.80
0 C	3.18	0.002	100%	3.80
10 C	-5.25	-0.003	100%	3.80
20 C	23.54	0.013	100%	3.80
30 C	-10.13	-0.005	100%	3.80
40 C	11.72	0.006	100%	3.80
50 C	20.13	0.011	100%	3.80
60 C	-21.76	-0.012	100%	3.80
20 C	-20.25	-0.011	Battery Endpoint	3.20



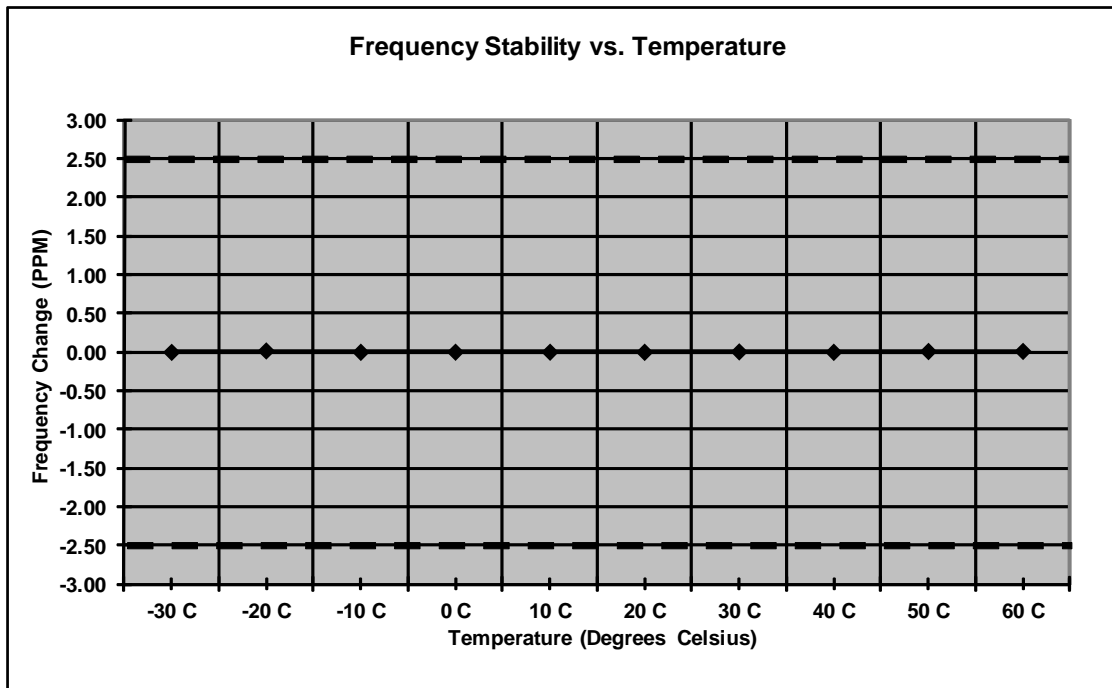
Measurement Results
Modulation: EV-DO 800

Frequency Stability

Mode: 800 EVDO
Channel: 384

Operating Frequency: 836.52 MHz
Deviation Limit (PPM): ±2.5ppm

Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	-6.56	-0.008	100%	3.80
-20 C	7.92	0.009	100%	3.80
-10 C	-6.43	-0.008	100%	3.80
0 C	-4.89	-0.006	100%	3.80
10 C	-4.92	-0.006	100%	3.80
20 C	-6.29	-0.008	100%	3.80
30 C	-1.62	-0.002	100%	3.80
40 C	-6.04	-0.007	100%	3.80
50 C	2.57	0.003	100%	3.80
60 C	3.56	0.004	100%	3.80
20 C	-7.21	-0.009	Battery Endpoint	3.20



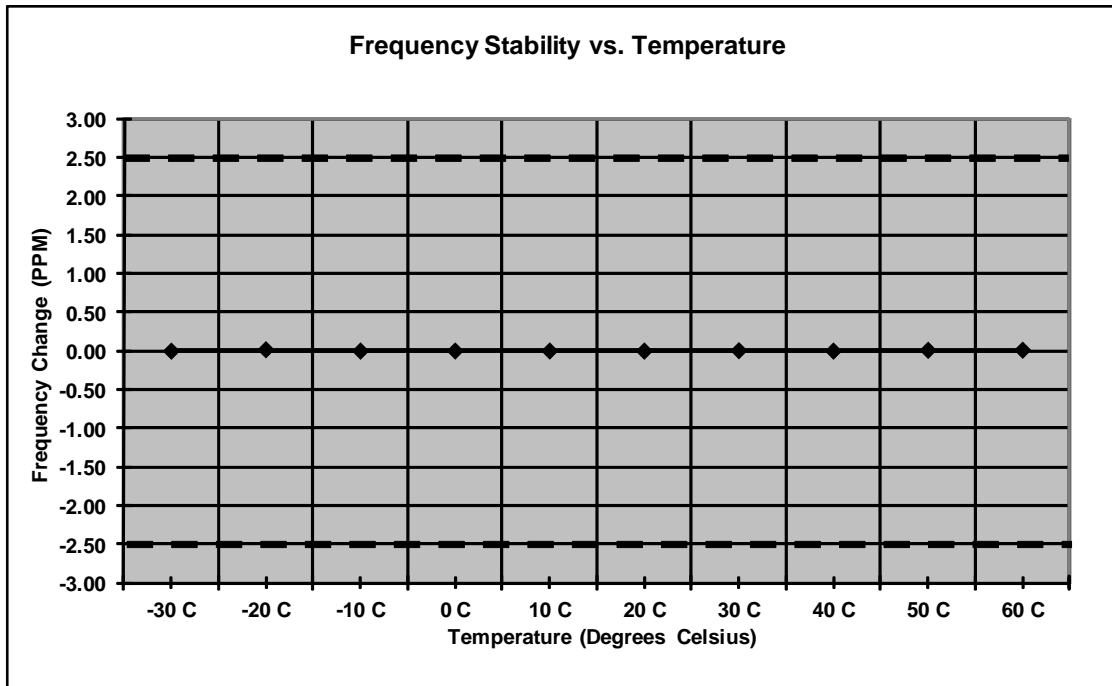
Measurement Results
Modulation: EV-DO 1900

Frequency Stability

Mode: 800 EVDO
Channel: 384

Operating Frequency: 836.52 MHz
Deviation Limit (PPM): ±2.5ppm

Temperature C	Frequency Error HZ	Frequency Error (PPM)	Voltage (%)	Voltage (VDC)
-30 C	-6.56	-0.008	100%	3.80
-20 C	7.92	0.009	100%	3.80
-10 C	-6.43	-0.008	100%	3.80
0 C	-4.89	-0.006	100%	3.80
10 C	-4.92	-0.006	100%	3.80
20 C	-6.29	-0.008	100%	3.80
30 C	-1.62	-0.002	100%	3.80
40 C	-6.04	-0.007	100%	3.80
50 C	2.57	0.003	100%	3.80
60 C	3.56	0.004	100%	3.80
20 C	-7.21	-0.009	Battery Endpoint	3.20



End of Test Report