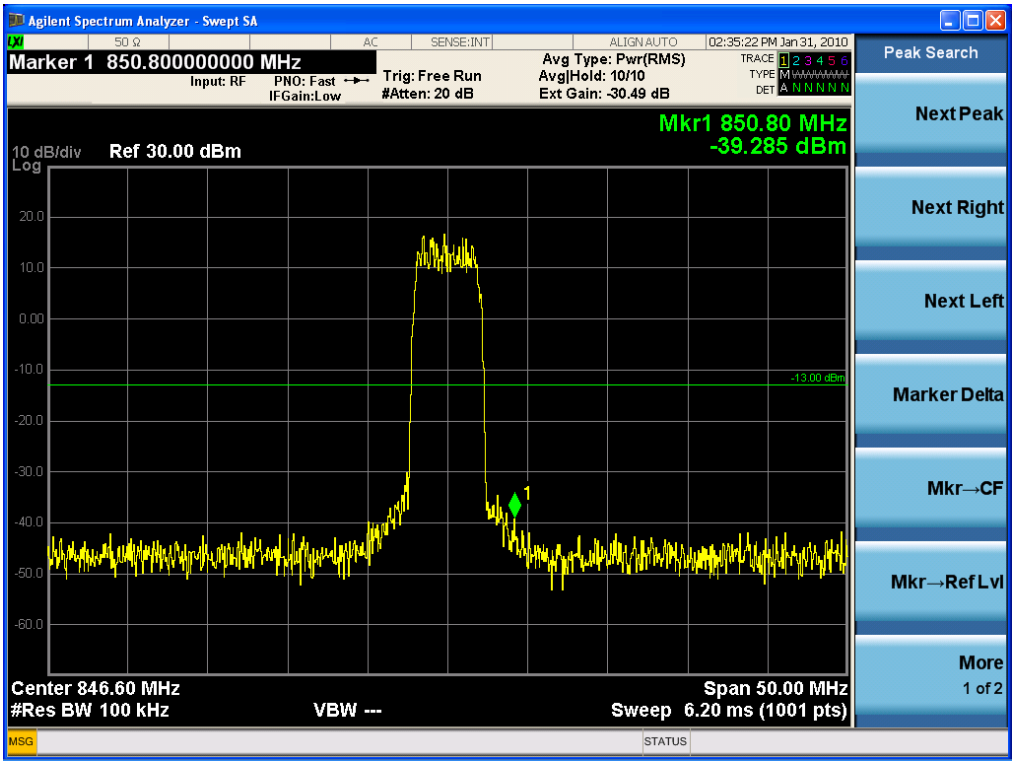
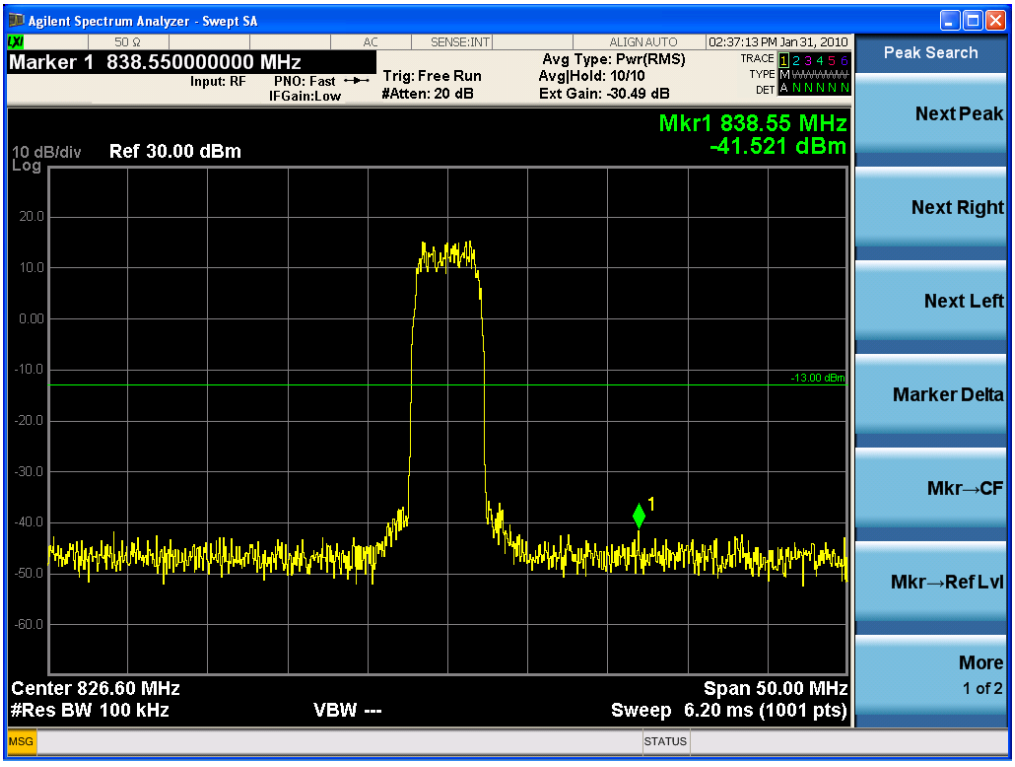
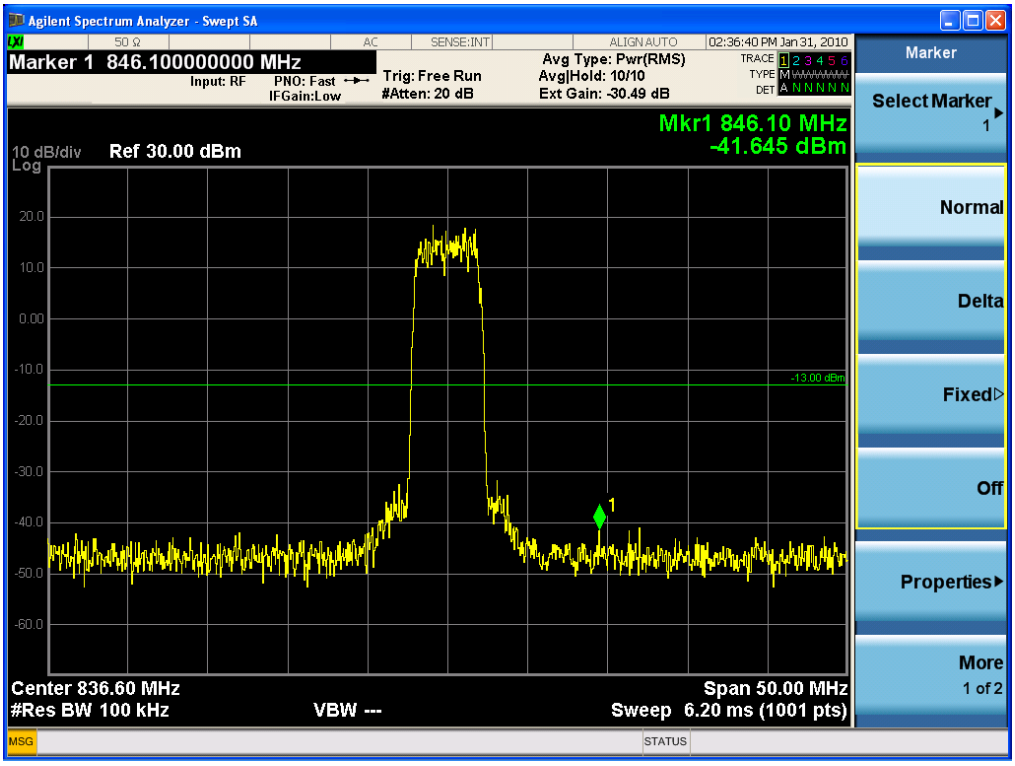
Intermodulation Uplink High CH (WCDMA)



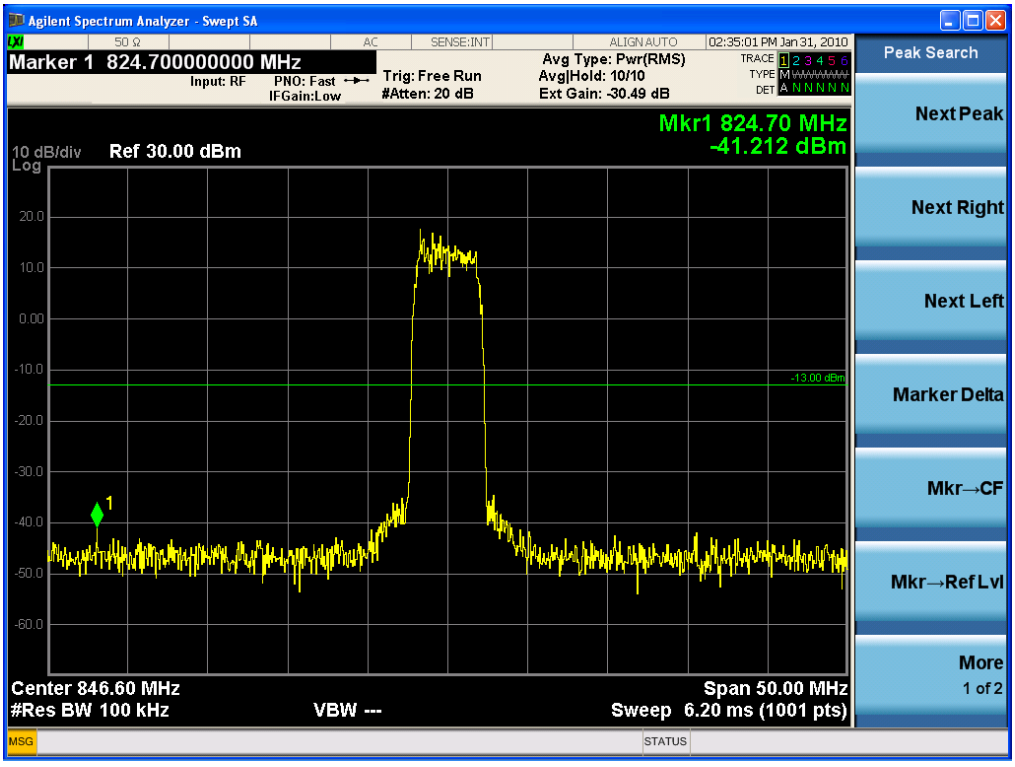
Intermodulation Uplink Low CH (WCDMA HSDPA)



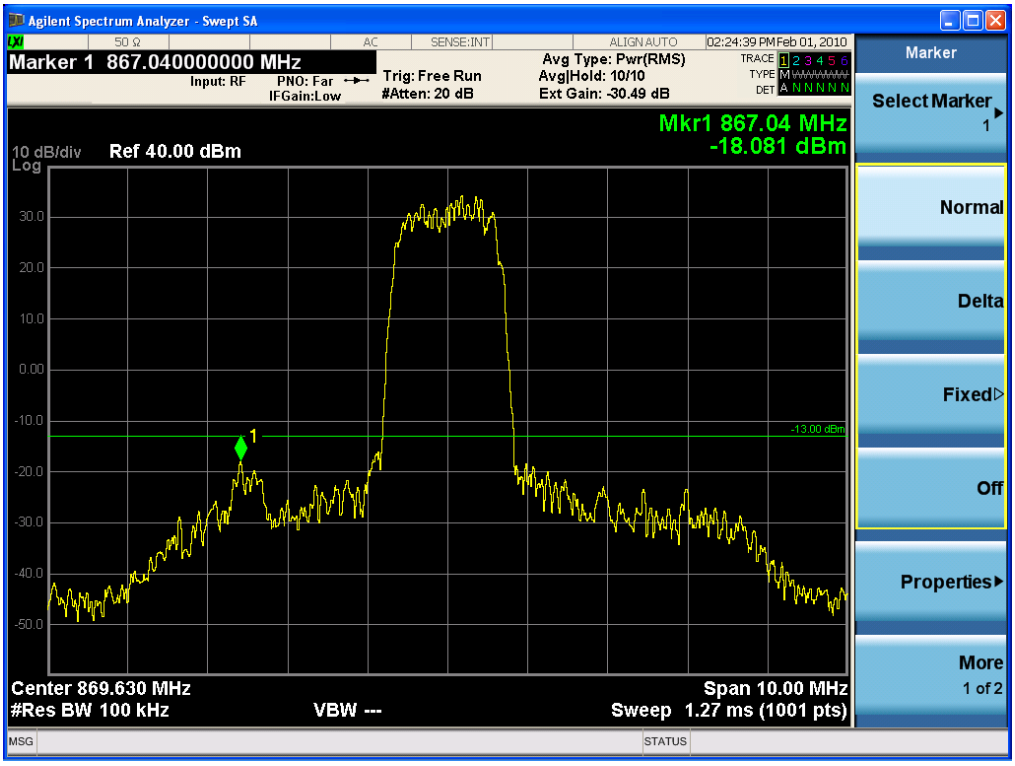
Intermodulation Uplink Mid CH (WCDMA HSDPA)



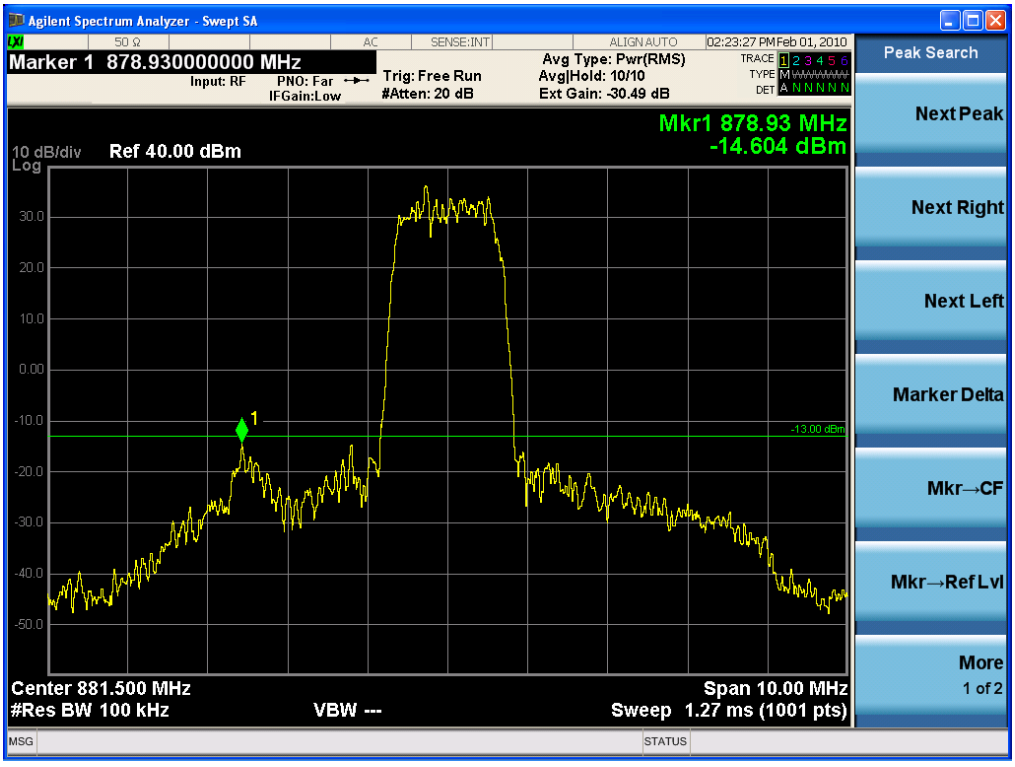
Intermodulation Uplink High CH (WCDMA HSDPA)



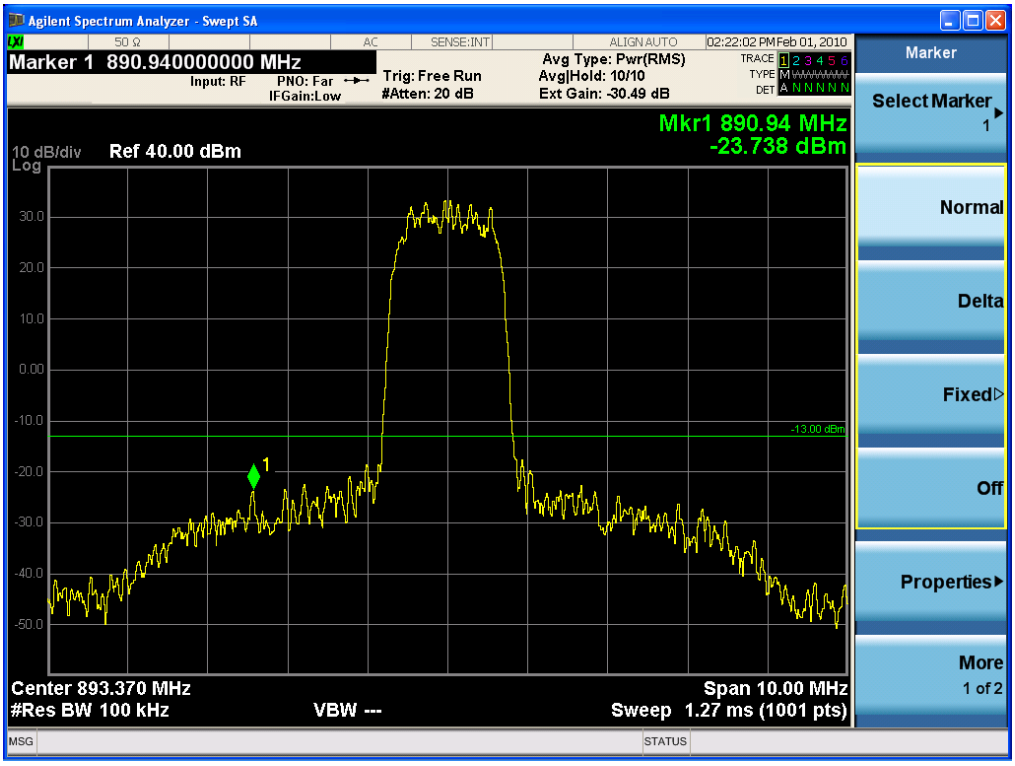
Intermodulation Downlink Low CH (CDMA)



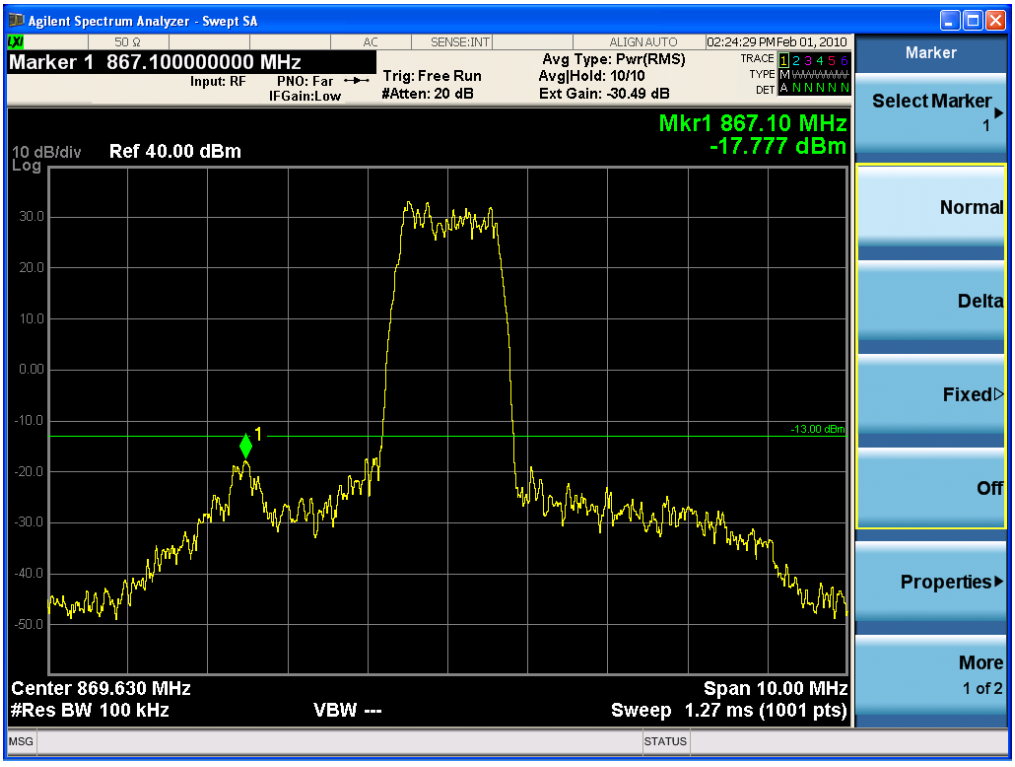
Intermodulation Downlink MidCH (CDMA)



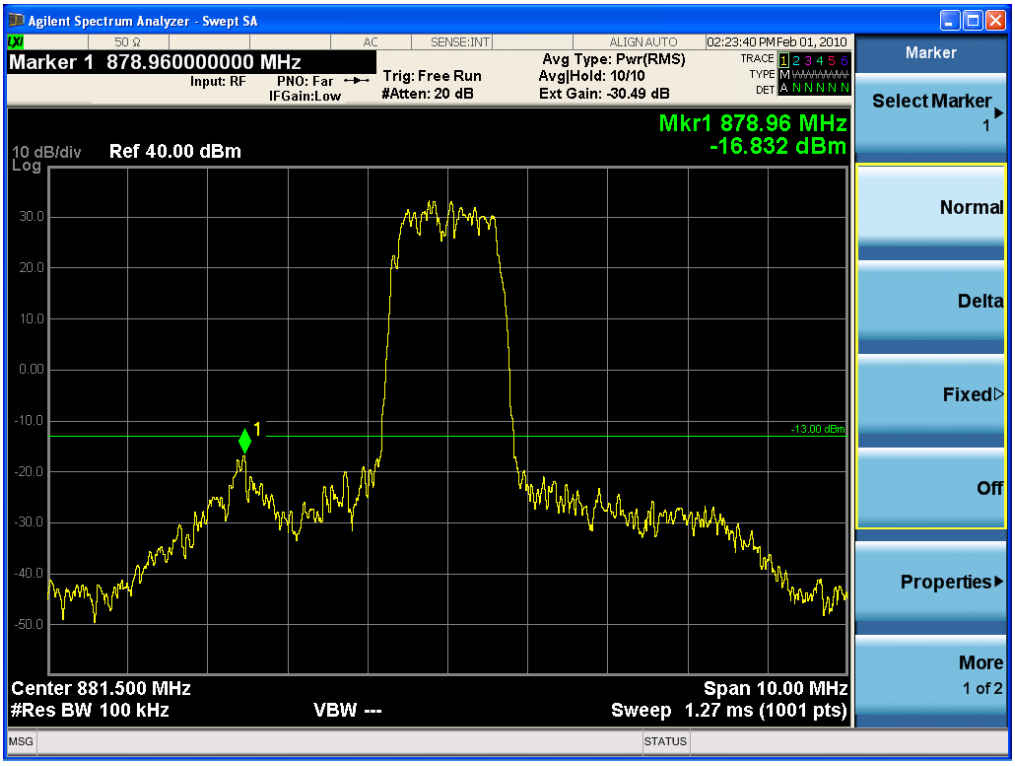
Intermodulation Downlink High CH (CDMA)



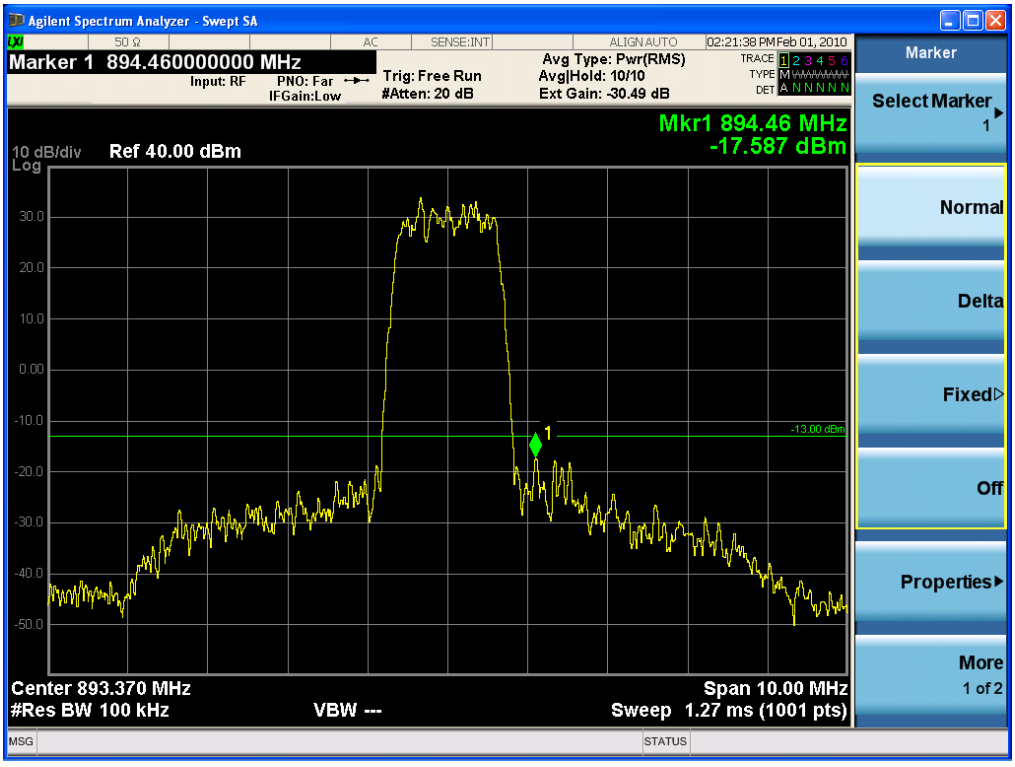
Intermodulation Downlink Low CH (CDMA EVDO)



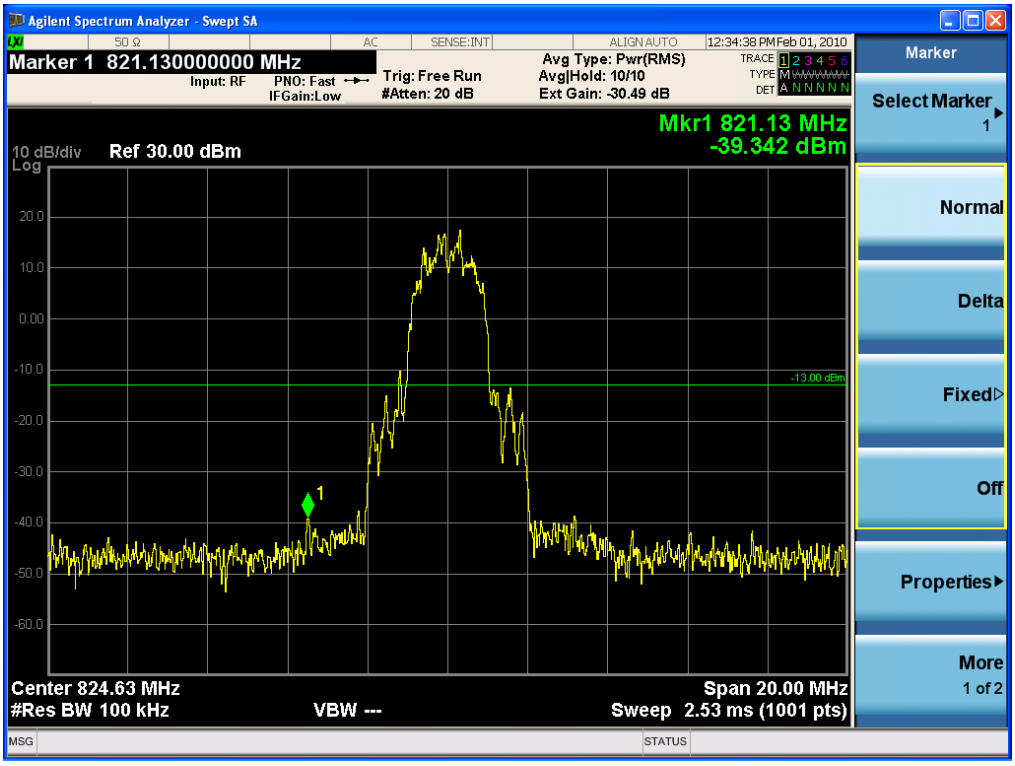
Intermodulation Downlink MidCH (CDMA EVDO)



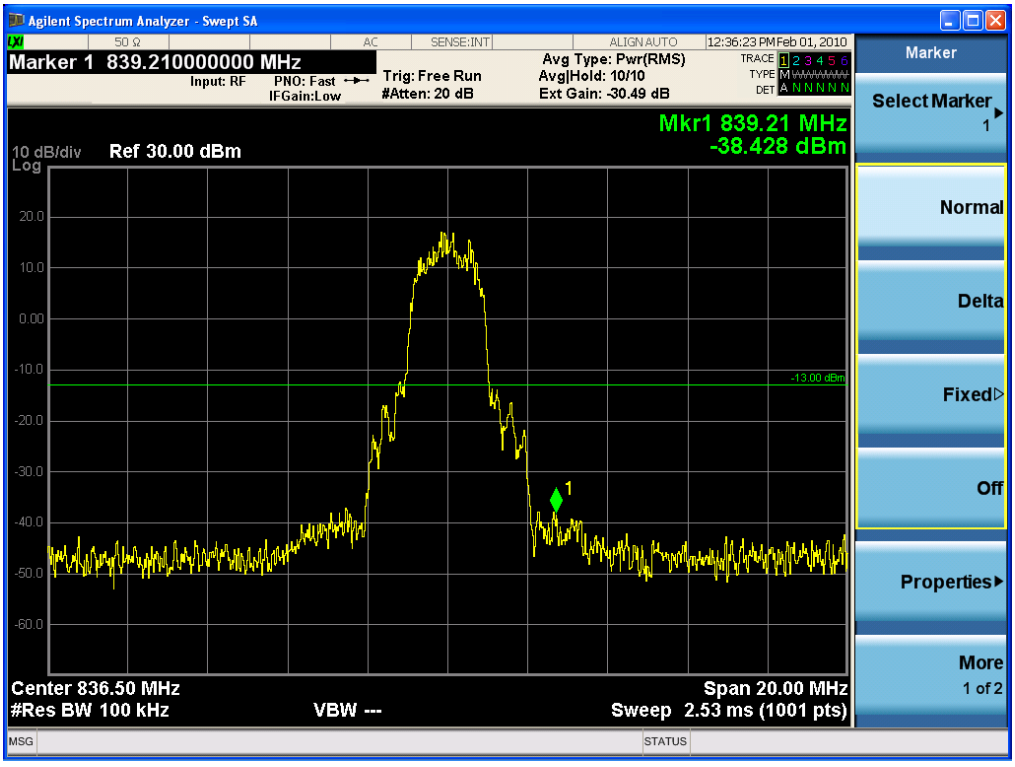
Intermodulation Downlink High CH (CDMA EVDO)



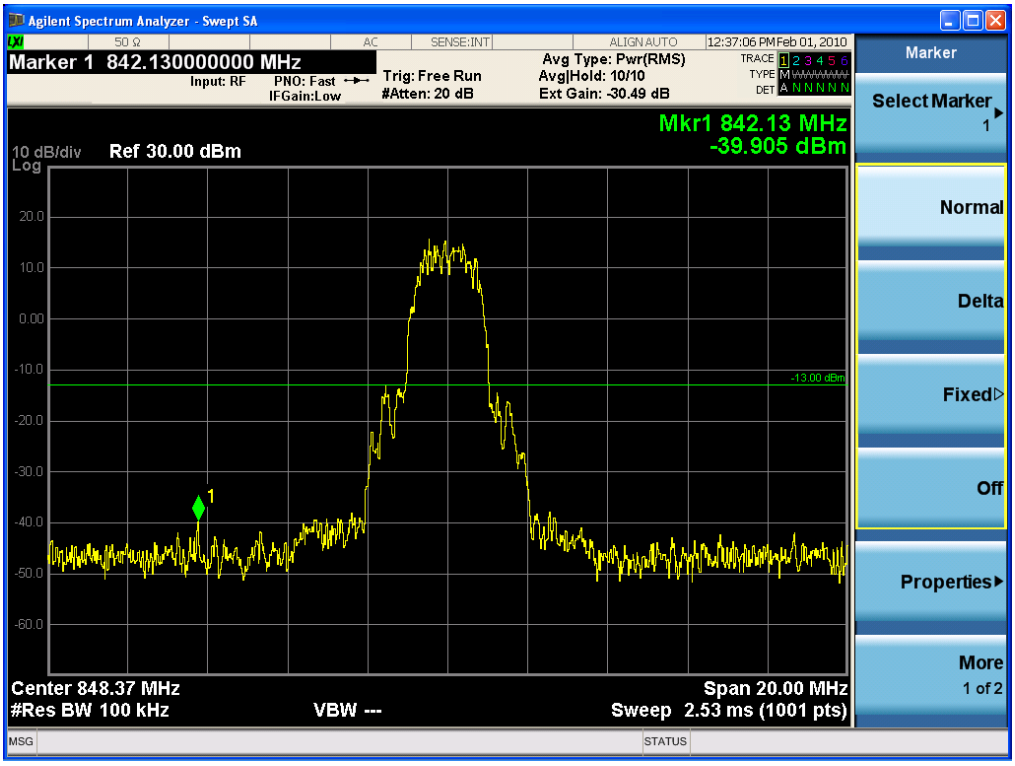
Intermodulation Uplink Low CH (CDMA)



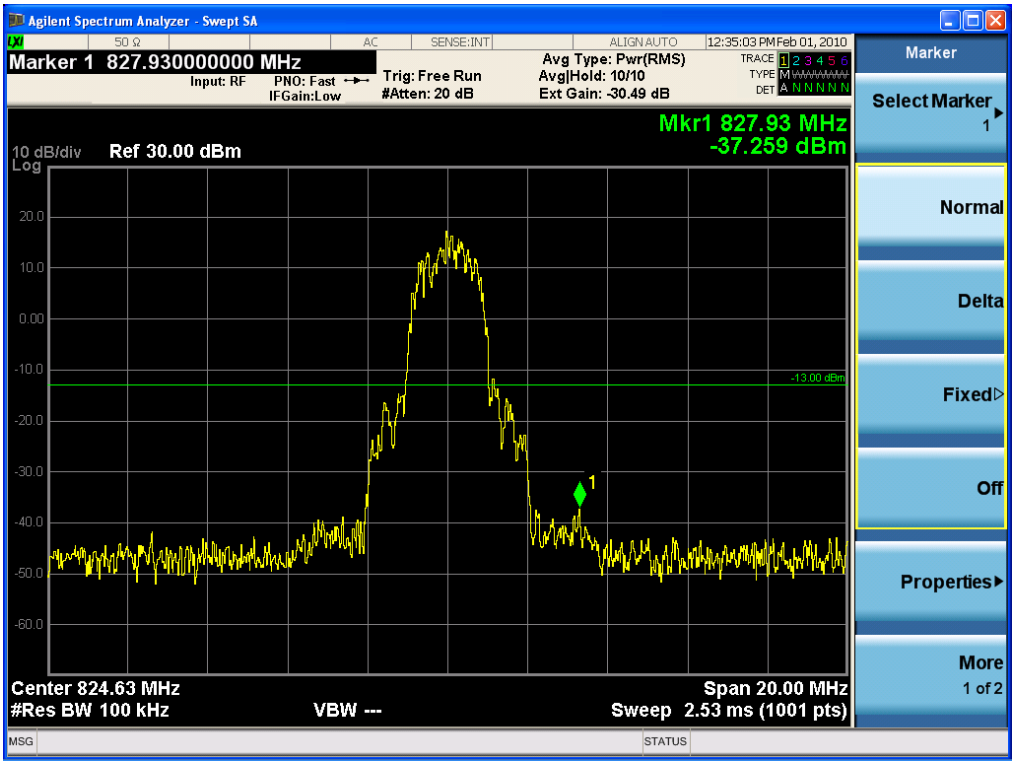
Intermodulation Uplink MidCH (CDMA)



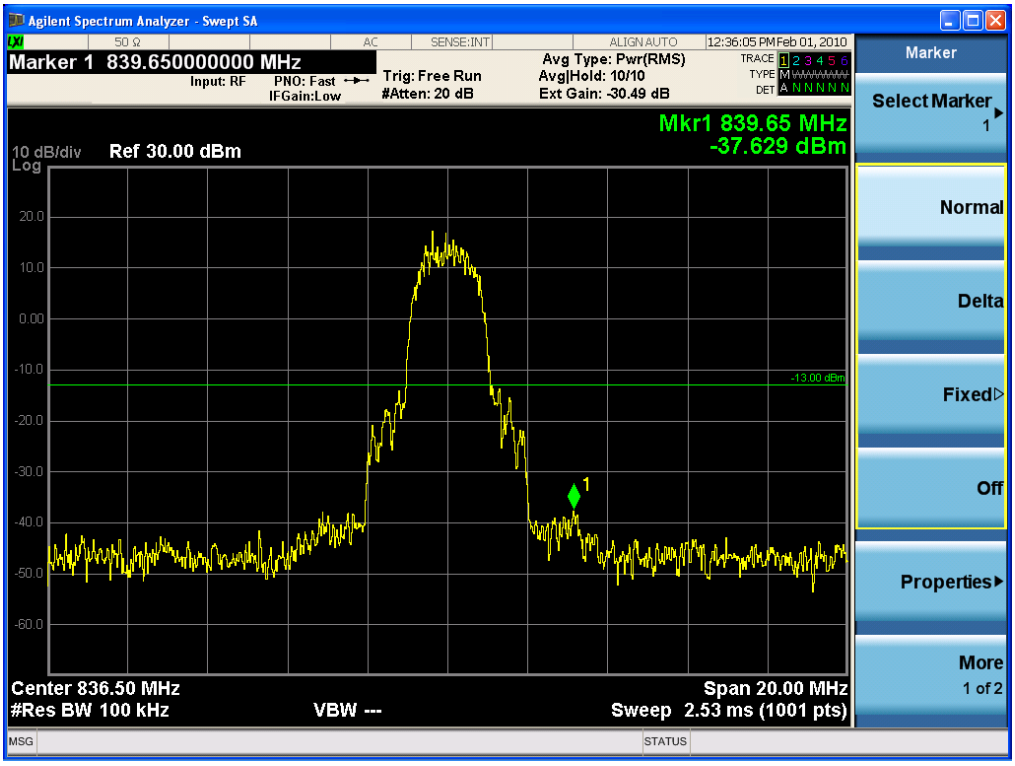
Intermodulation Uplink High CH (CDMA)



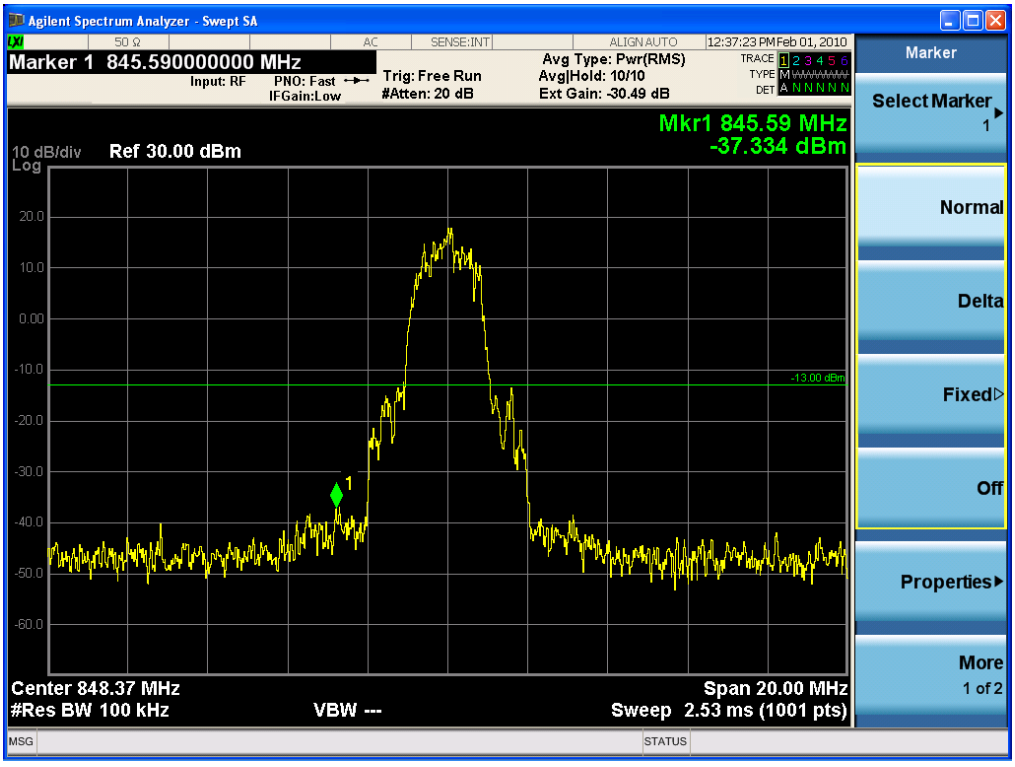
Intermodulation Uplink Low CH (CDMA EVDO)



Intermodulation Uplink MidCH (CDMA EVDO)

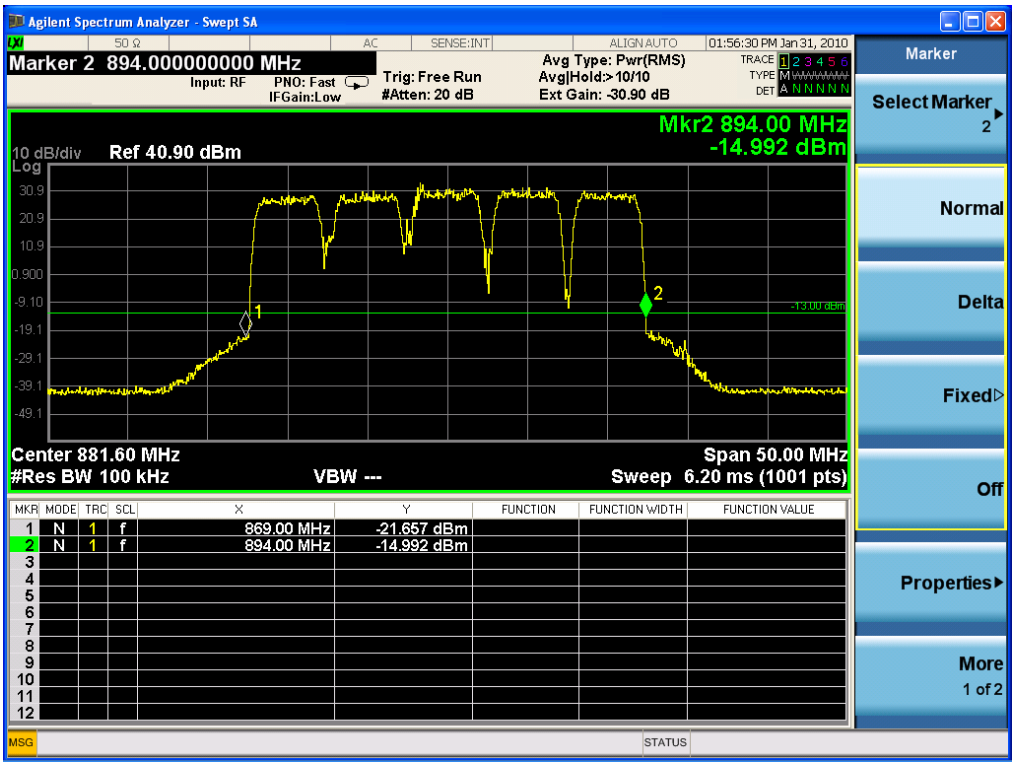


Intermodulation Uplink High CH (CDMA EVDO)

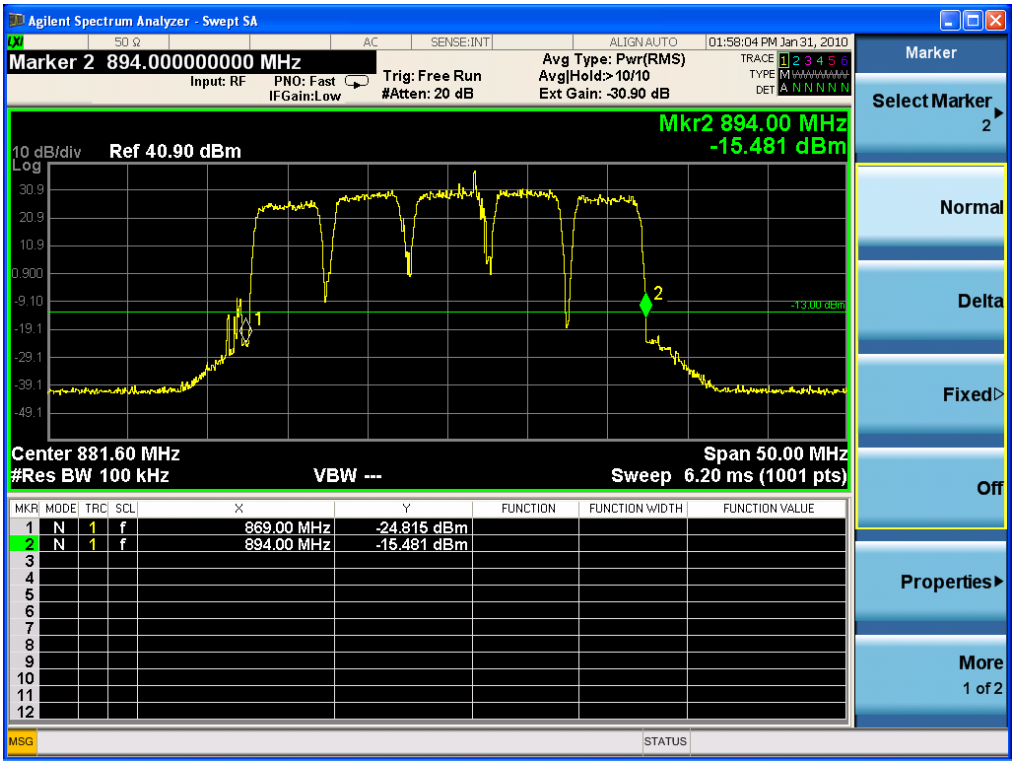


Out of Band Rejection

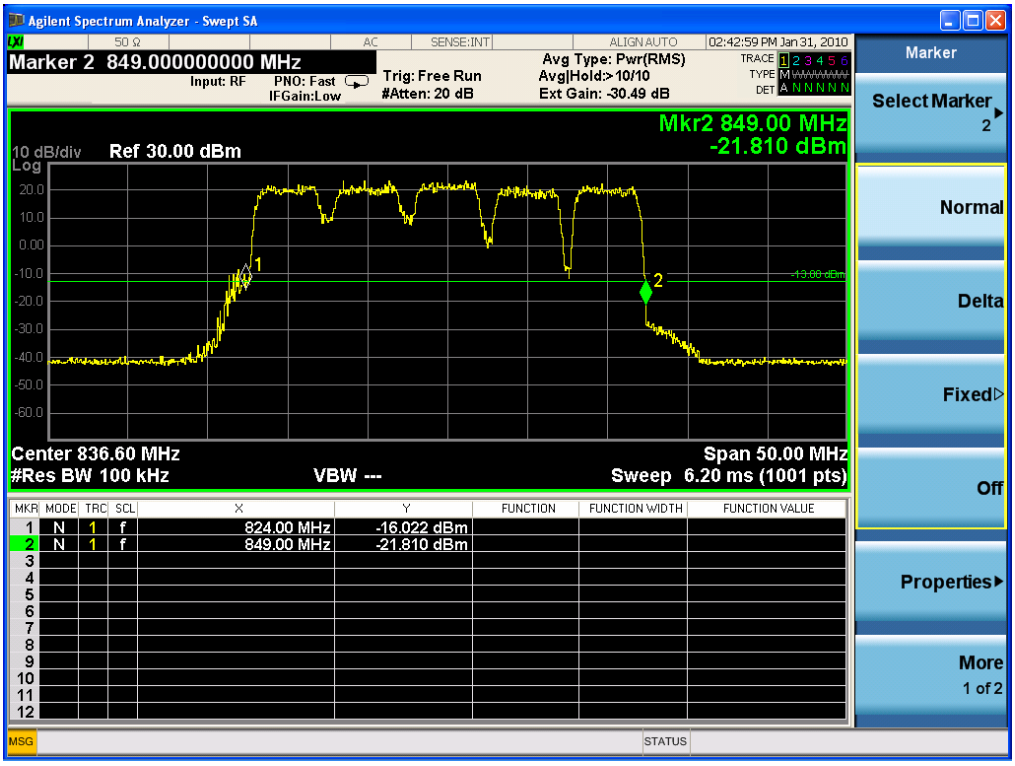
Out of Band Rejection Downlink (WCDMA)



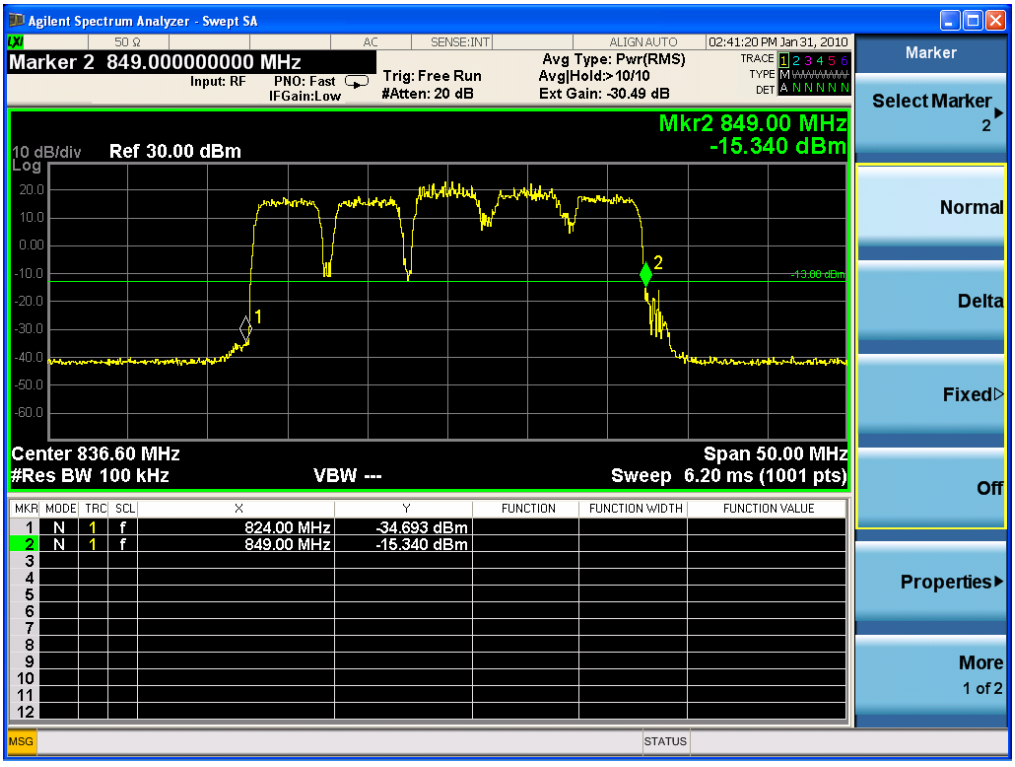
Out of Band Rejection Downlink (WCDMA HSDPA)



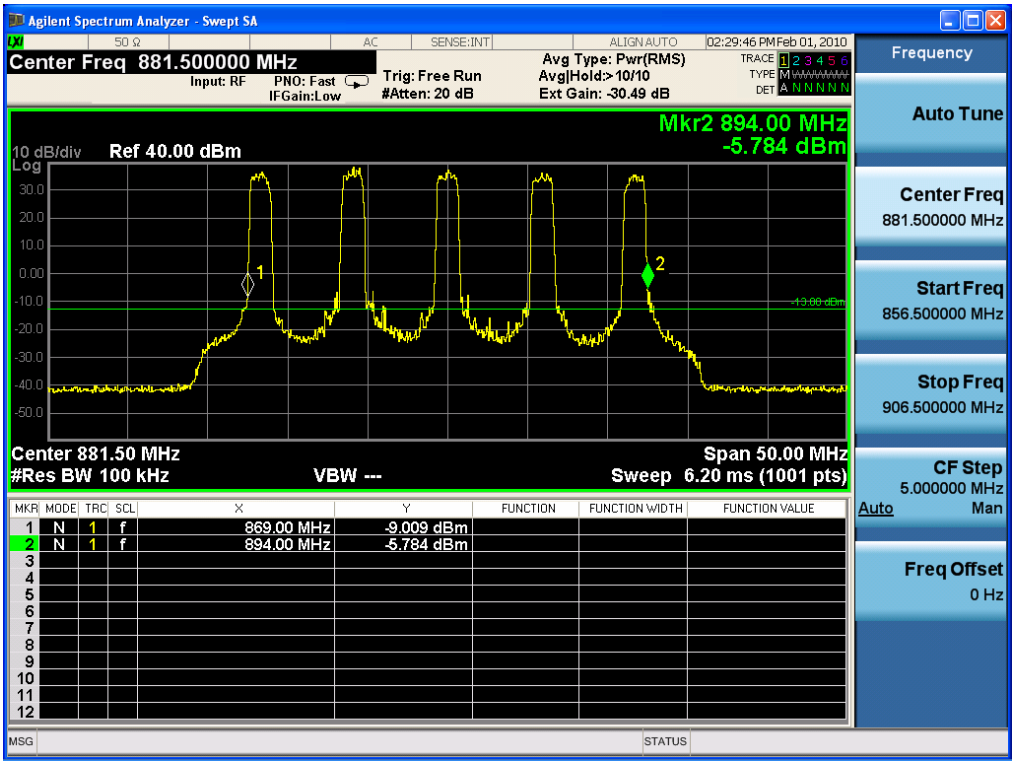
Out of Band Rejection Uplink (WCDMA)



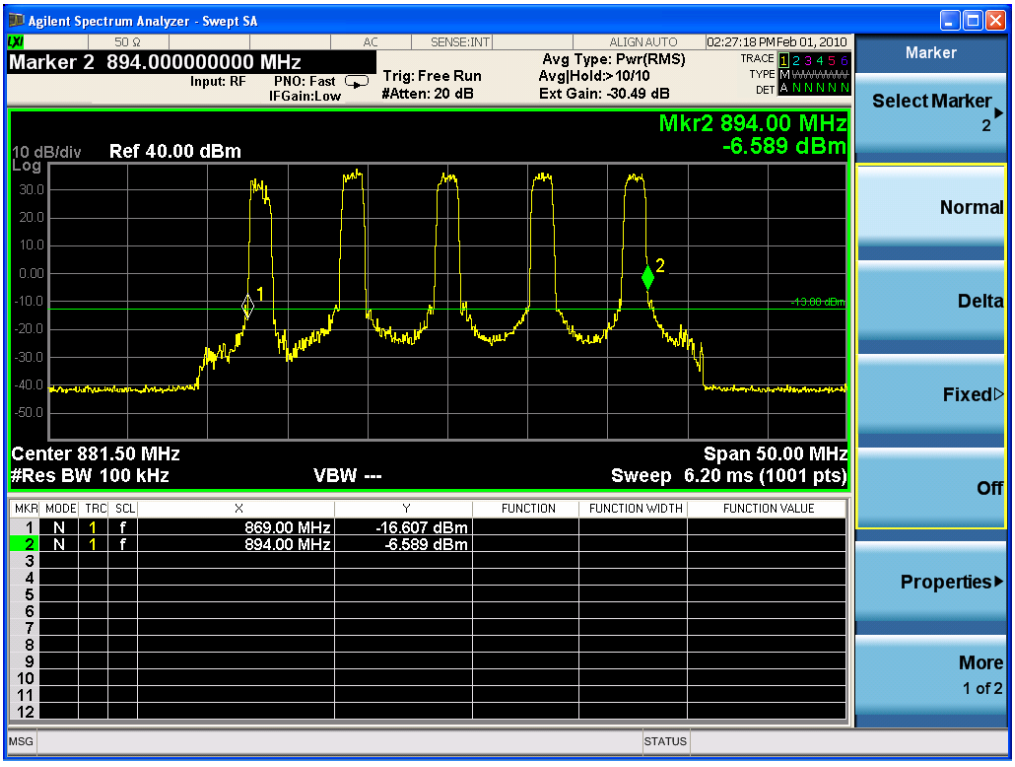
Out of Band Rejection Uplink (WCDMA HSDPA)



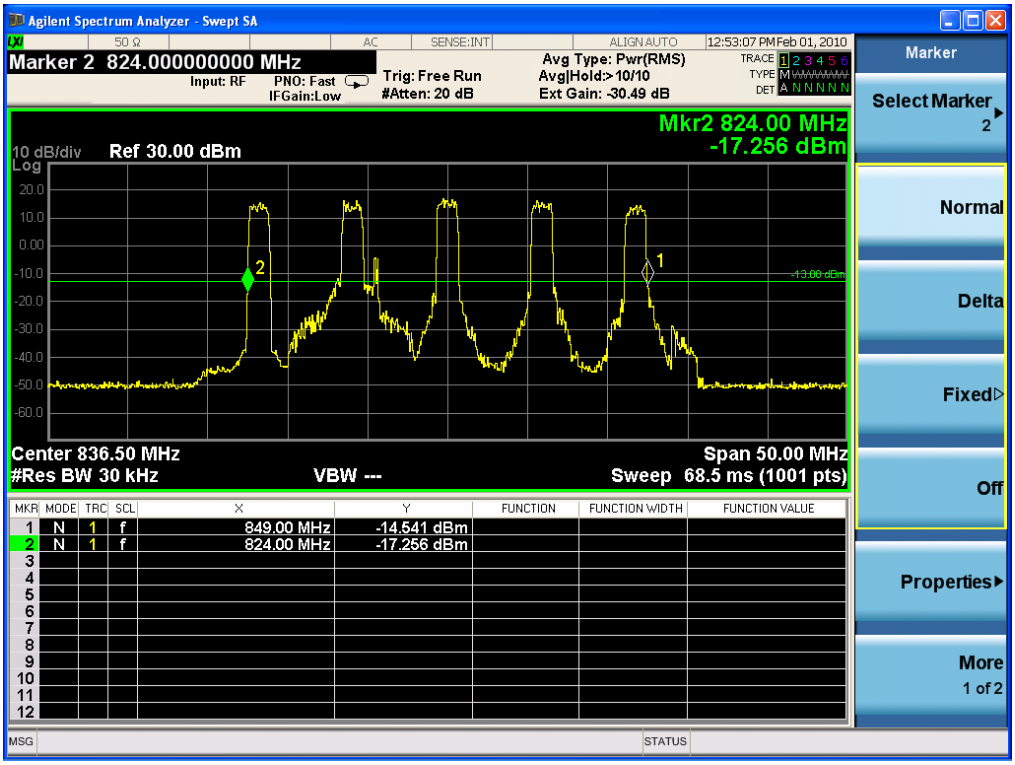
Out of Band Rejection Downlink (CDAM)



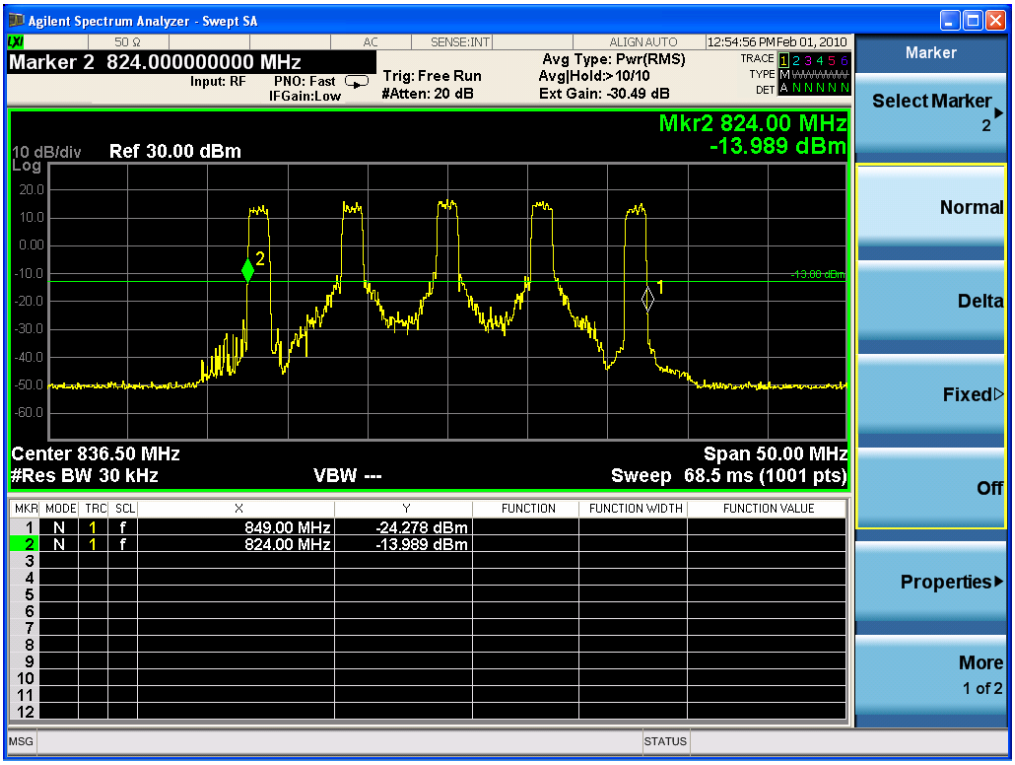
Out of Band Rejection Downlink (CDMA EVDO)



Out of Band Rejection Uplink (CDAM)



Out of Band Rejection Uplink (CDMA EVDO)



8. RADIATED SPURIOUS EMISSIONS

Test Requirement(s): § 2.1053 Measurements required: Field strength of spurious radiation.

§ 2.1053 (a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of § 2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from half-wave dipole antennas.

§ 2.1053 (b): The measurements specified in paragraph (a) of this section shall be made for the following equipment:

(1) Those in which the spurious emissions are required to be 60 dB or more below the mean power of the transmitter.

(2) All equipment operating on frequencies higher than 25 MHz.

(3) All equipment where the antenna is an integral part of, and attached directly to the transmitter.

(4) Other types of equipment as required, when deemed necessary by the Commission.

Test Procedures: As required by 47 CFR 2.1053, *field strength of radiated spurious measurements* were made in accordance with the procedures of TIA/EIA-603-C-2004 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards".

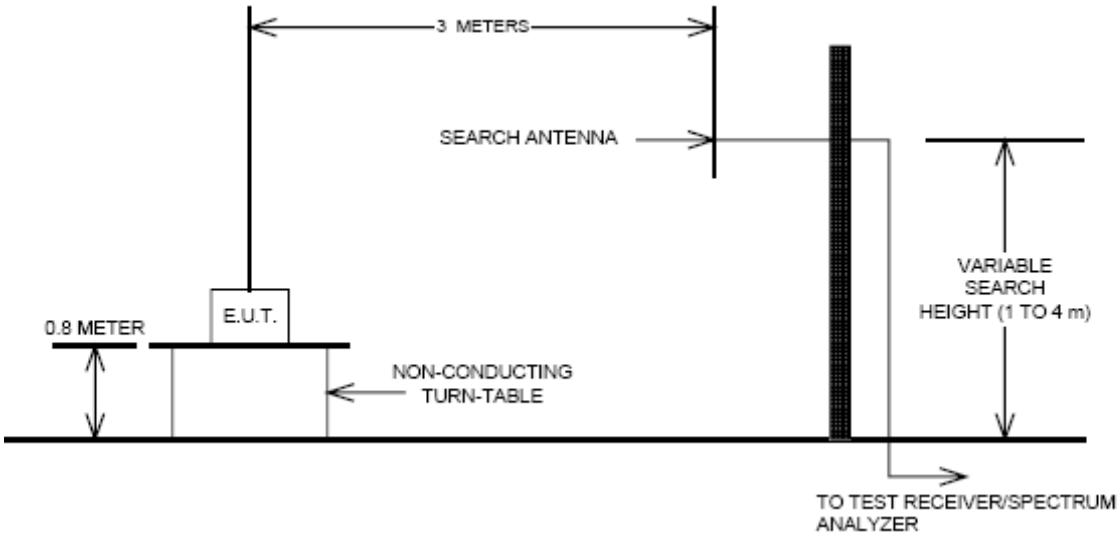
Radiated emission measurements were performed inside a 3 meter semi-anechoic chamber. The EUT was set at a distance of 3m from the receiving antenna. The EUT's RF ports were terminated to 50ohm load. The EUT was set to transmit at the low, mid and high channels of the transmitter frequency range at its maximum power level. The EUT was rotated about 360 and the receiving antenna scanned from 1-3m in order to capture the maximum emission. A calibrated antenna source was positioned in place of the EUT and the previously recorded signal was duplicated. The maximum EIRP of the emission was calculated by adding the forward

power to the calibrated source plus its appropriate gain value. These steps were carried. out with the receiving antenna in both vertical and horizontal polarization. Harmonic emissions up to the 10th or 40GHz, whichever was the lesser, were investigated.

Preliminary Test was performed each mode. The final test was performed the worst case mode only.

Test Results: There were no emissions detected above the noise floor which was at least 20 dB below the limit.

Radiated Spurious Emissions Test Setup



Mode	Frequency	Freq.(MHz)	Measured Level [dBm]	Ant. Gain (dBd)	Substitute Level [dBm]	C.L	Pol.	ERP (dBm)	Margin (dB)
HSDPA	881.6	1766.4	-42.9	9.87	-62.68	3.00	H	-55.81	-42.81
		2642.8	-44.4	10.14	-60.40	3.54	H	-53.80	-40.80
		3526.6	-48.8	12.40	-65.21	4.01	H	-56.82	-43.82
EVDO	893.37	1788.4	-43.5	9.97	-63.34	3.05	H	-56.38	-43.38
		2680.5	-45.7	10.16	-61.61	3.57	H	-55.02	-42.02
		3577.7	-46.4	12.42	-62.66	4.03	H	-54.27	-41.27

(Downlink)

NOTES: 1. Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

2. we have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

3. The Uplink and Downlin ware verified with CDMA/EVDO, WCDMA/HSDPA modulation signal on three channels (low, mid and high). It was recorded only the value of mid channel that is worst case, because of having more than 40 dB margin below the values on all of the channels.

9. FREQUENCY STABILITY OVER TEMPERATURE AND VOLTAGE VARIATIONS

Test Requirement(s):

§2.1055(a)(1) §22.355

Test Procedures:

As required by 47 CFR 2.1055, *Frequency Stability measurements* were made at the RF output terminals using a Spectrum Analyzer.

The EUT was placed in the Environmental Chamber.

A CW signal was injected into the EUT at the appropriate RF level. The frequency counter option

on the Spectrum Analyzer was used to measure frequency deviations.

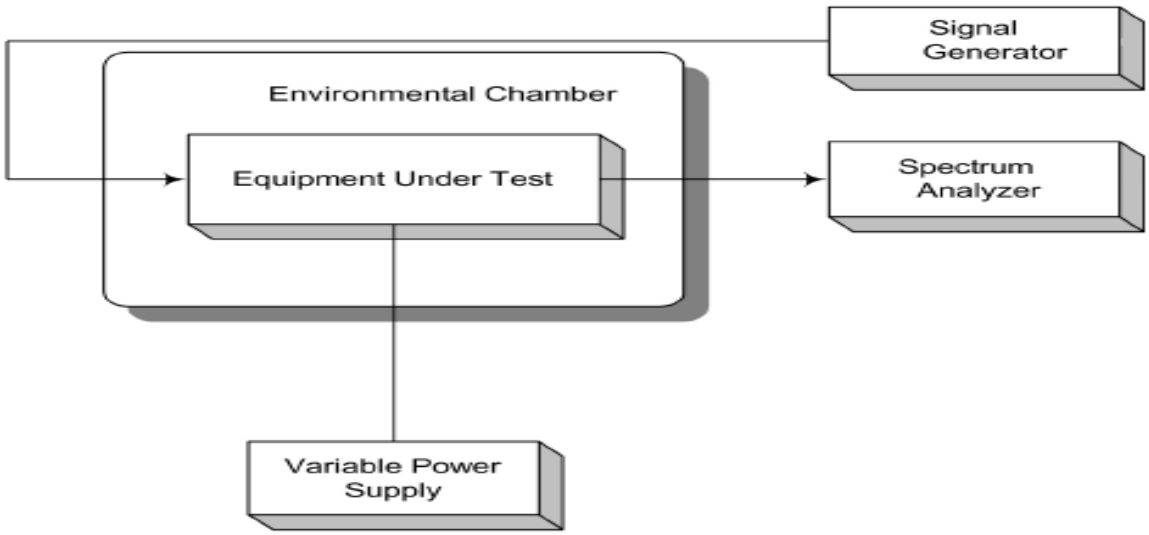
The frequency drift was investigated for every 10 ℃ increment until the unit is stabilized then recorded the reading in tabular format with the temperature range of -30 to 50 ℃.

Voltage supplied to EUT is 120 Vac reference temperature was done at 20℃. The voltage was varied by ± 15 % of nominal

Test Results:

The E.U.T was found in compliance for Frequency Stability and Voltage Test

Test Setup:



Frequency Stability and Voltage Test Results

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	+20(Ref)	881 599 978	-22.1	0.000000	-0.0251
100%	-30	881 599 978	-21.9	0.000000	-0.0248
100%	-20	881 599 972	-28.4	0.000007	-0.0322
100%	-10	881 599 976	-23.9	0.000002	-0.0271
100%	0	881 599 979	-21.2	-0.000001	-0.0240
100%	+10	881 599 970	-29.9	0.000009	-0.0339
100%	+30	881 599 979	-20.7	-0.000002	-0.0235
100%	+40	881 599 974	-25.6	0.000004	-0.0290
100%	+50	881 599 976	-24.1	0.000002	-0.0273
115%	+20	881 599 979	-20.8	-0.000001	-0.0236
85%	+20	881 599 977	-23.0	0.000001	-0.0261

(WCDMA Downlink Mid CH)

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	+20(Ref)	836 599 971	-29.3	0.000000	-0.0350
100%	-30	836 599 971	-29.4	0.000000	-0.0351
100%	-20	836 599 976	-23.8	-0.000006	-0.0284
100%	-10	836 599 972	-28.0	-0.000001	-0.0335
100%	0	836 599 970	-29.8	0.000001	-0.0356
100%	+10	836 599 973	-27.3	-0.000002	-0.0326
100%	+30	836 599 971	-29.4	0.000000	-0.0351
100%	+40	836 599 974	-26.2	-0.000004	-0.0313
100%	+50	836 599 976	-23.9	-0.000006	-0.0286
115%	+20	836 599 978	-22.4	-0.000008	-0.0268
85%	+20	836 599 970	-29.7	0.000000	-0.0355

(WCDMA Uplink Mid CH)

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	+20(Ref)	881 499 980	-20.3	0.000000	-0.0230
100%	-30	881 499 978	-22.4	0.000002	-0.0254
100%	-20	881 499 974	-26.4	0.000007	-0.0299
100%	-10	881 499 977	-22.7	0.000003	-0.0258
100%	0	881 499 977	-23.5	0.000004	-0.0267
100%	+10	881 499 976	-24.4	0.000005	-0.0277
100%	+30	881 499 978	-21.9	0.000002	-0.0248
100%	+40	881 499 974	-25.6	0.000006	-0.0290
100%	+50	881 499 976	-24.3	0.000005	-0.0276
115%	+20	881 499 970	-29.6	0.000011	-0.0336
85%	+20	881 499 977	-23.2	0.000003	-0.0263

(CDMA Downlink Mid CH)

Voltage (%)	Temp. (℃)	Frequency (Hz)	Frequency Error (Hz)	Deviation (%)	ppm
100%	+20(Ref)	836 499 973	-26.7	0.000000	-0.0319
100%	-30	836 499 977	-22.8	-0.000005	-0.0273
100%	-20	836 499 971	-28.6	0.000002	-0.0342
100%	-10	836 499 974	-26.2	-0.000001	-0.0313
100%	0	836 499 977	-22.9	-0.000005	-0.0274
100%	+10	836 499 973	-26.6	0.000000	-0.0318
100%	+30	836 499 976	-23.7	-0.000004	-0.0283
100%	+40	836 499 972	-27.9	0.000001	-0.0334
100%	+50	836 499 976	-24.4	-0.000003	-0.0292
115%	+20	836 499 976	-24.5	-0.000003	-0.0293
85%	+20	836 499 974	-25.6	-0.000001	-0.0306

(CDMA Uplink Mid CH)

10. RF EXPOSURE STATEMENT

1. LIMITS

According to §1.1310 and §2.1091 RF exposure is calculated.

(B) Limits for General Population/Uncontrolled Exposures

Frequency range (MHz)	Electric field Strength (V/m)	Magnetic field Strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
0.3 - 1.34.....	614	1.63	*(100)	30
1.34 - 30.....	824/f	2.19/f	*(180/ f^2)	30
30 - 300.....	27.5	0.073	0.2	30
300 - 1500.....	.....	.....	f/1500	30
1500 - 100.000.....	.....	.....	1.0	30

F = frequency in MHz

* = Plane-wave equivalent power density

2. MAXIMUM PERMISSIBLE EXPOSURE Prediction

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

S = Power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

2-1. WCDMA Downlink

Max Peak output Power at antenna input terminal	36.900	dBm
Max Peak output Power at antenna input terminal	4897.788	mW
Prediction distance	180.000	cm
Prediction frequency	881.600	MHz
Antenna Gain(typical)	15.300	dBi
Antenna Gain(numeric)	33.884	-
Power density at prediction frequency(S)	0.408	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.588	mW/cm^2

2-2. WCDMA Uplink

Max Peak output Power at antenna input terminal	27.000	dBm
Max Peak output Power at antenna input terminal	501.187	mW
Prediction distance	50.000	cm
Prediction frequency	836.600	MHz
Antenna Gain(typical)	15.000	dBi
Antenna Gain(numeric)	31.623	-
Power density at prediction frequency(S)	0.504	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.558	mW/cm^2

2-3. CDMA Downlink

Max Peak output Power at antenna input terminal	36.900	dBm
Max Peak output Power at antenna input terminal	4897.788	mW
Prediction distance	180.000	cm
Prediction frequency	893.370	MHz
Antenna Gain(typical)	15.300	dBi
Antenna Gain(numeric)	33.884	-
Power density at prediction frequency(S)	0.408	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.596	mW/cm^2

2-4. CDMA Uplink

Max Peak output Power at antenna input terminal	26.950	dBm
Max Peak output Power at antenna input terminal	495.450	mW
Prediction distance	50.000	cm
Prediction frequency	848.370	MHz
Antenna Gain(typical)	15.000	dBi
Antenna Gain(numeric)	31.623	-
Power density at prediction frequency(S)	0.499	mW/cm^2
MPE limit for uncontrolled exposure at prediction frequency	0.566	mW/cm^2

3. RESULTS

The power density level at 180 cm is 0.408 (WCDMA), 0.504 (CDMA) mW/cm^2, which is below the uncontrolled exposure limit for Celluar band.

Warning: In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, it must also have a minimum distance of 180 cm from the body during normal operation.