FCC PART 24 TYPE APPROVAL
EMI MEASUREMENT AND TEST REPORT

For

Advanced RF Technologies, Inc.

5440 Trabuco Road
Irvine, CA 92620

FCC ID: S2OADRFTECH001

2005-03-08

This Report Concerns:	Equipment Type:
☒ Original Report	PCS Repeater

Test Engineer:	Ming Jing /
Report No.:	R0501183
Test Date:	2005-02-25
Reviewed By:	Daniel Deng /
Prepared By:	Bay Area Compliance Laboratory Corporation 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732 9164

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *Advanced RF Technologies, Inc.'s* product, FCC ID: S2OADRFTECH001 *or the* "EUT" as referred to in this report is a PCS 1900 Repeater. The EUT measures approximately 485mmL x 380mmW x 235mmH.

** The test data gathered are from production sample, serial number: 001, provided by the manufacturer.*

Objective

This type approval report is prepared on behalf of *Advanced RF Technologies, Inc.* in accordance with Part 2, Subpart J, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, spurious emission at antenna terminal, spurious radiated emission, frequency stability, band edge and radiated margin.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

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:

Part 24 Subpart E - PCS

Applicable Standards: TIA EIA 137-A, TIA EIA 98-C, ANSI 63.4-2003, and TIA/EIA-603A.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters, except as noted below.

Test Facility

The Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules and Article 8 of the VCCI regulations. The facility also complies with the test methods and procedures set forth in ANSI C63.4-2003.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations is attached hereinafter and can also be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm

SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA 603A.

The final qualification test was performed with the EUT operating at normal mode.

Block Diagram

Please refer to Exhibit D.

Equipment Modifications

No modifications were made to the EUT.

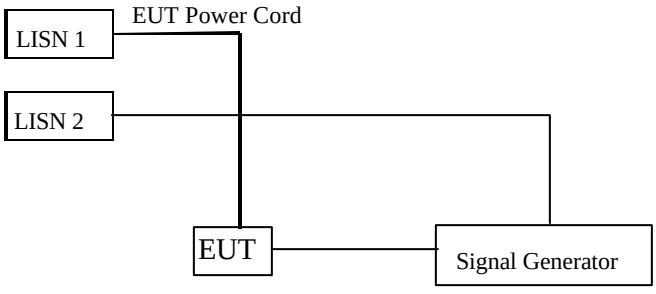
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Rohde & Schward	Generator	SMIQ03B	DE23746	DOC
Compaq	Notebook PC	2/03VS	CNF43403	N/A

External I/O Cabling List and Details

Cable Description	Length (M)	Port/From	To
Shielded cable	2.0	RF Output / Generator	RF Port / EUT

Test Setup Block Diagram



SUMMARY OF TEST RESULTS

Results reported relate only to the product tested, serial number: *001*.

FCC RULE	DESCRIPTION OF TEST	Result
§2.1046 § 24.232	RF power output	Compliant
§ 2.1049 § 24.238(b)	Emission Bandwidth	Compliant
2.1051 § 24.238(a)	Spurious emissions at antenna terminals	Compliant
IS-138A (3.4.4)	Two-Tone Test	Compliant
2.1053	Spurious Radiated Emissions	Compliant
§24.238	Band Edge	Compliant
§ 2.1047	Modulation Characteristics	N/A
§ 2.1055 § 24.235	Frequency stability	Compliant

§2.1046 & §24.232 - RF POWER OUTPUT

Applicable Standard

According to FCC §2.1046 and §24.232 (b), mobile stations are limited to 2 watts eirp peak power.

Test Procedure

The antenna was removed and SMA connector was connected to the transmitter output. The transmitter output was connected to a calibrated coaxial attenuator (50 Ohm), the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter was determined by adding the value of the attenuator to the power meter reading.

The test was performed at three frequencies (low, middle, and high channels) and on all power levels which can be setup on the transmitter.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Power Meter	E4419B	MY41291511	2004-04-29
HP	Plotter	7470A	N/A	N/A
Rohde & Schwarz	Signal Generator	SMIQ03	DE23746	2004-07-03
Rohde & Schwarz	Modulation Generator	AMIQ-K11	DE30565	2004-04-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	21° C
Relative Humidity:	37%
ATM Pressure:	1032 mbar

** The testing was performed by Ming Jin on 2005-02-25.*

Test Results

Mode	Signal	Channel Frequency MHz	Input Power dBm	Output Power dBm
Up-link	CDMA	Low: 1851.25	-66	23.96
		Mid: 1880.00	-66	24.17
		High: 1908.75	-66	24.03
	GSM	Low: 1850.20	-66	24.25
		Mid: 1880.00	-66	24.37
		High: 1909.80	-66	24.14
	TDMA	Low: 1850.04	-66	23.98
		Mid: 1879.98	-66	24.13
		High: 1909.92	-66	24.05
Down-link	CDMA	Low: 1931.25	-66	24.26
		Mid: 1960.00	-66	24.43
		High: 1988.75	-66	24.19
	GSM	Low: 1930.20	-66	24.33
		Mid: 1960.00	-66	24.47
		High: 1989.80	-66	24.28
	TDMA	Low: 1930.04	-66	24.09
		Mid: 1959.98	-66	24.15
		High: 1989.92	-66	24.12

Mode	Signal	Channel Frequency MHz	Maximum Input Power dBm	Output Power dBm
Up-link	CDMA	Low: 1851.25	-45	24.02
		Mid: 1880.00	-45	24.19
		High: 1908.75	-45	24.11
	GSM	Low: 1850.20	-45	24.28
		Mid: 1880.00	-45	24.39
		High: 1909.80	-45	24.25
	TDMA	Low: 1850.04	-45	23.99
		Mid: 1879.98	-45	24.17
		High: 1909.92	-45	24.08
Down-link	CDMA	Low: 1931.25	-45	24.29
		Mid: 1960.00	-45	24.46
		High: 1988.75	-45	24.23
	GSM	Low: 1930.20	-45	24.35
		Mid: 1960.00	-45	24.48
		High: 1989.80	-45	24.31
	TDMA	Low: 1930.04	-45	24.12
		Mid: 1959.98	-45	24.23
		High: 1989.92	-45	24.18

Note : EUT operated under AGC mode

§2.1049 & §24.238 - EMISSION BANDWIDTH

Applicable Standards

According to FCC §2.1049 and §24.238 (b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 30 KHz and the spectrum was recorded.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	8565EC	3946A00131	2004-08-08
HP	Plotter	7470A	N/A	N/A
Rohde & Schwarz	Signal Generator	SMIQ03	DE23746	2004-07-03
Rohde & Schwarz	Modulation Generator	AMIQ-K11	DE30565	2004-04-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	21° C
Relative Humidity:	37%
ATM Pressure:	1032 mbar

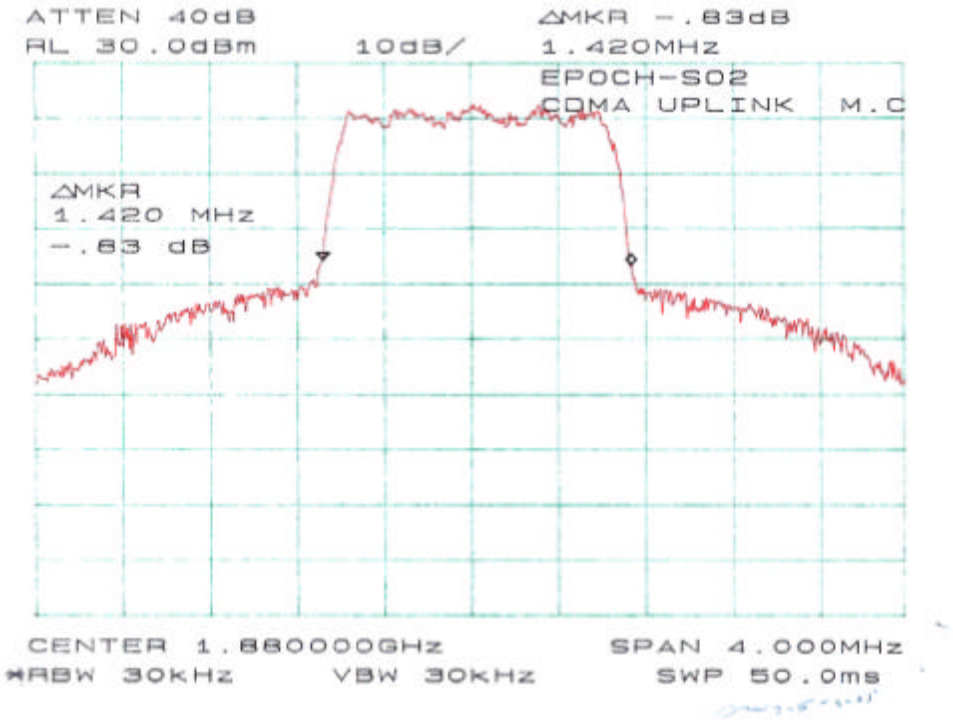
** The testing was performed by Ming Jin on 2005-02-25.*

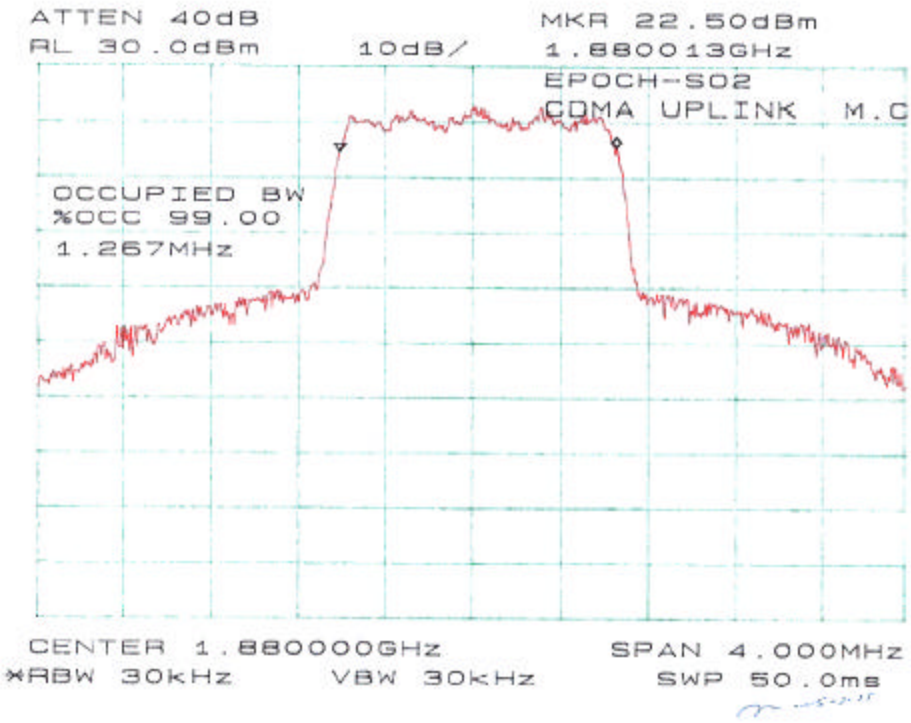
Test Results

Test Data Summary

Modulation	Mode	Frequency (MHz)	Emission Bandwidth in kHz
CDMA	Up-link	1880	1267
	Down-link	1960	1260
GSM	Up-link	1880	253.3
	Down-link	1960	253.3
TDMA	Up-link	1879.98	96.67
	Down-link	1959.98	95

Please refer to plots hereinafter.

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10dB/
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EPOCH-SO2
CDMA UPLINK M.C
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VBW 30kHz
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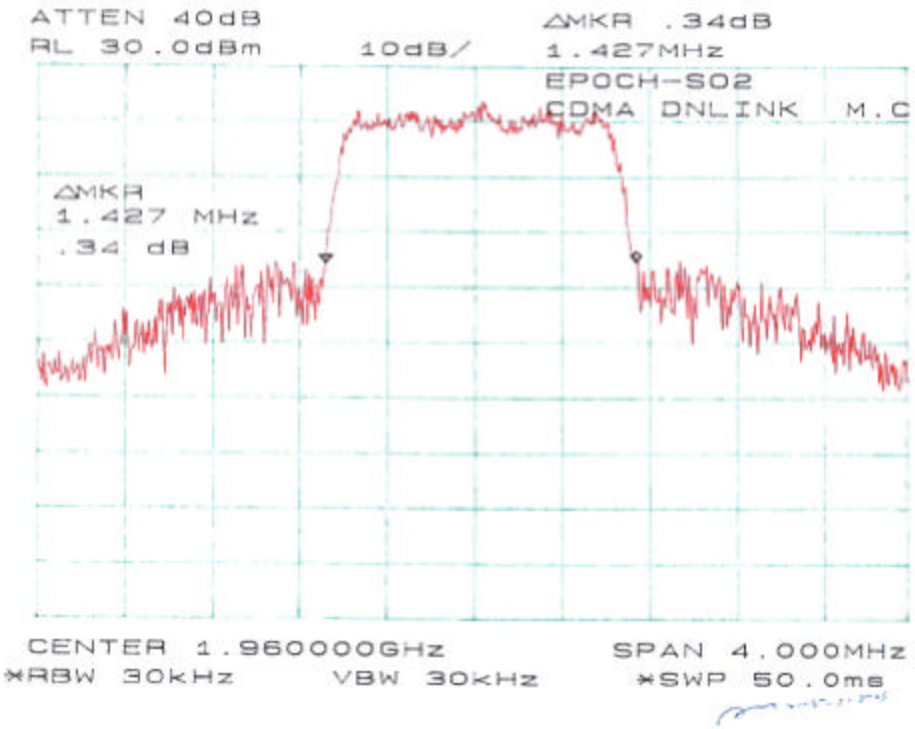
SWP 50.0ms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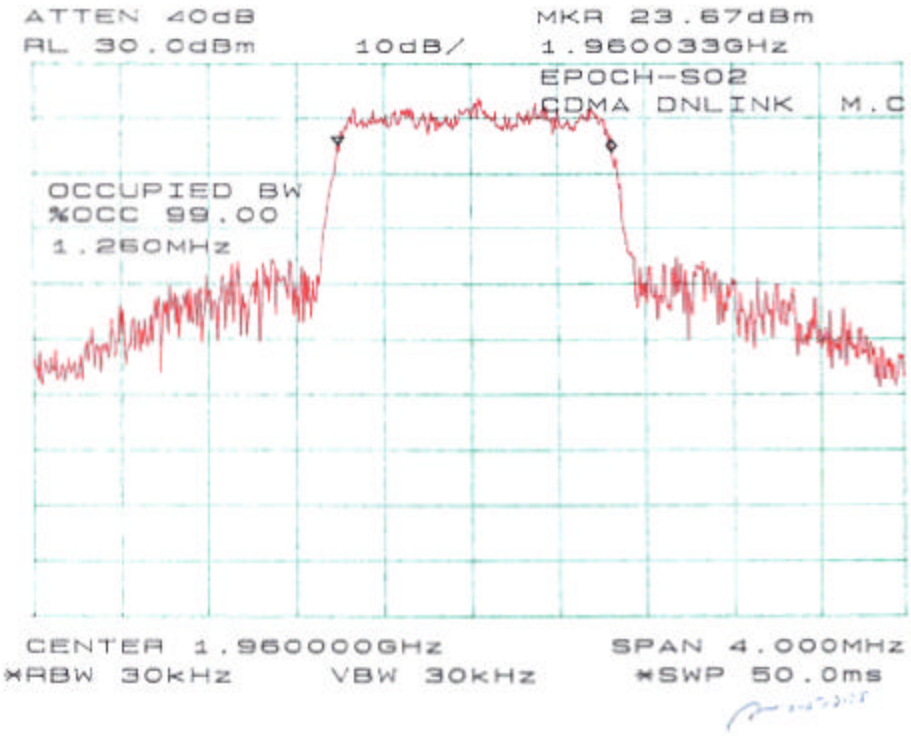
VBW 30kHz
SPAN 4.000MHz
*SWP 50.0ms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RL 30.0dBm
10dB/
MKR 23.67dBm
1.960033GHz
EPOCH-S02
CDMA DNLINK M.C
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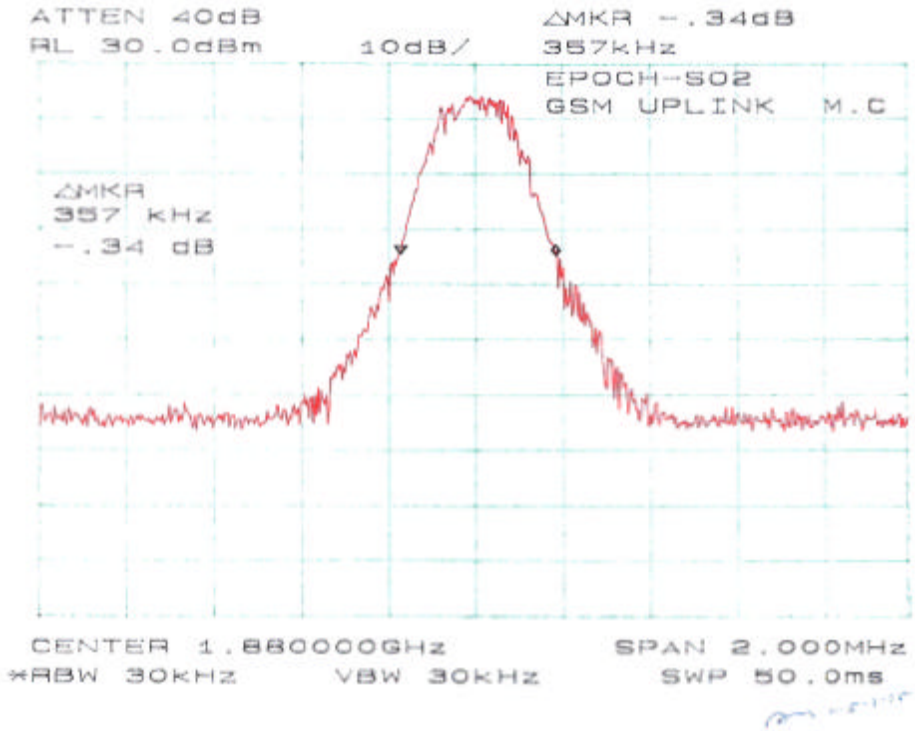
1.260MHz
CENTER 1.960000GHz
SPAN 4.000MHz
*RBW 30kHz
VBW 30kHz
*SWP 50.0ms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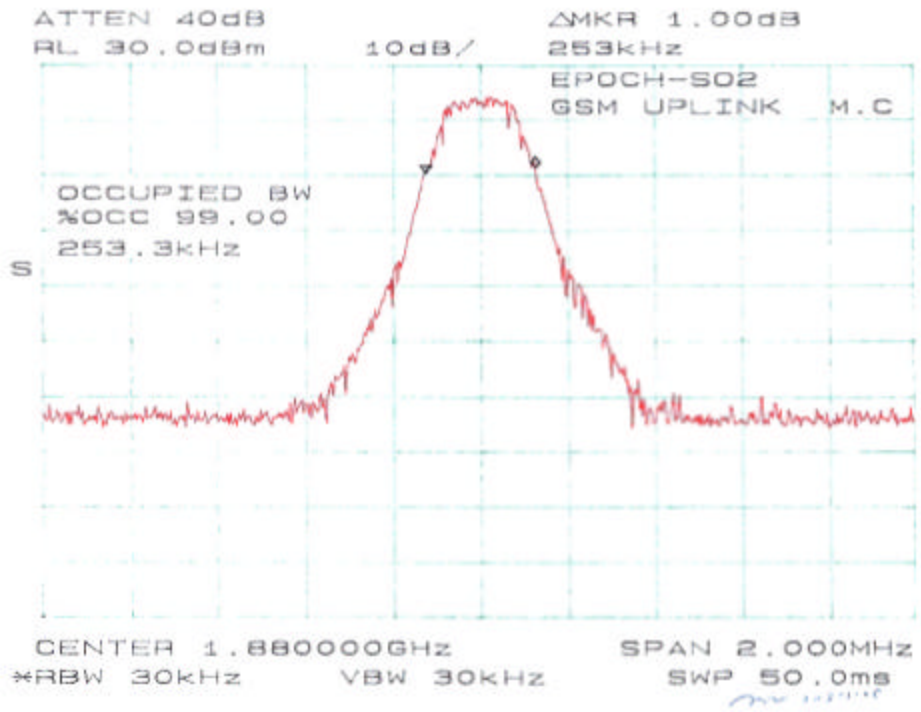
10dB/
ΔMKR -.34dB
357kHz
EPOCH-S02
GSM UPLINK M.C
ΔMKR
357 kHz
-.34 dB
CENTER 1.880000GHz
SPAN 2.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms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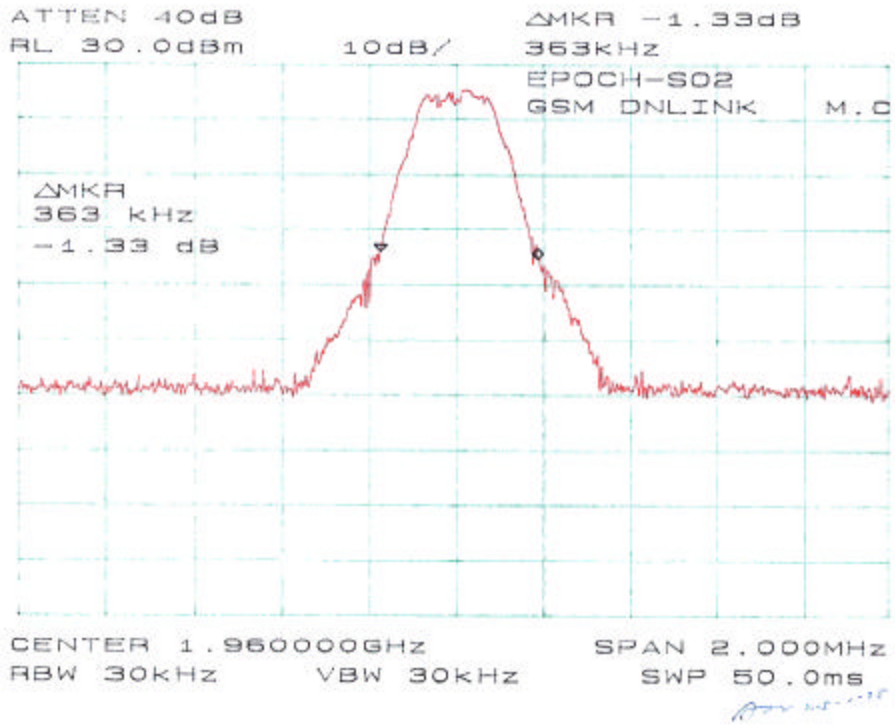
RL 30.0dBm
10dB/
ΔMKR 1.00dB
253kHz
EPOCH-SO2
GSM UPLINK M.C
OCCUPIED BW
%OCC 99.00
253.3kHz
S
CENTER 1.880000GHz
SPAN 2.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms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10dB/
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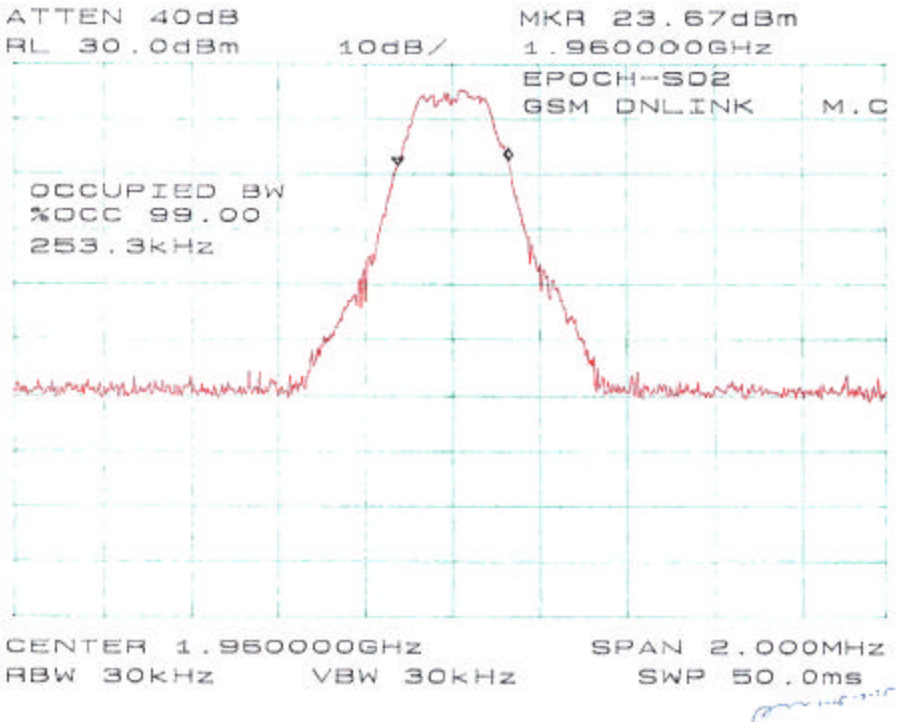
363kHz
EPOCH-SO2
GSM DNLINK M.C
ΔMKR
363 kHz
-1.33 dB
CENTER 1.960000GHz
SPAN 2.000MHz
RBW 30kHz
VBW 30kHz
SWP 50.0ms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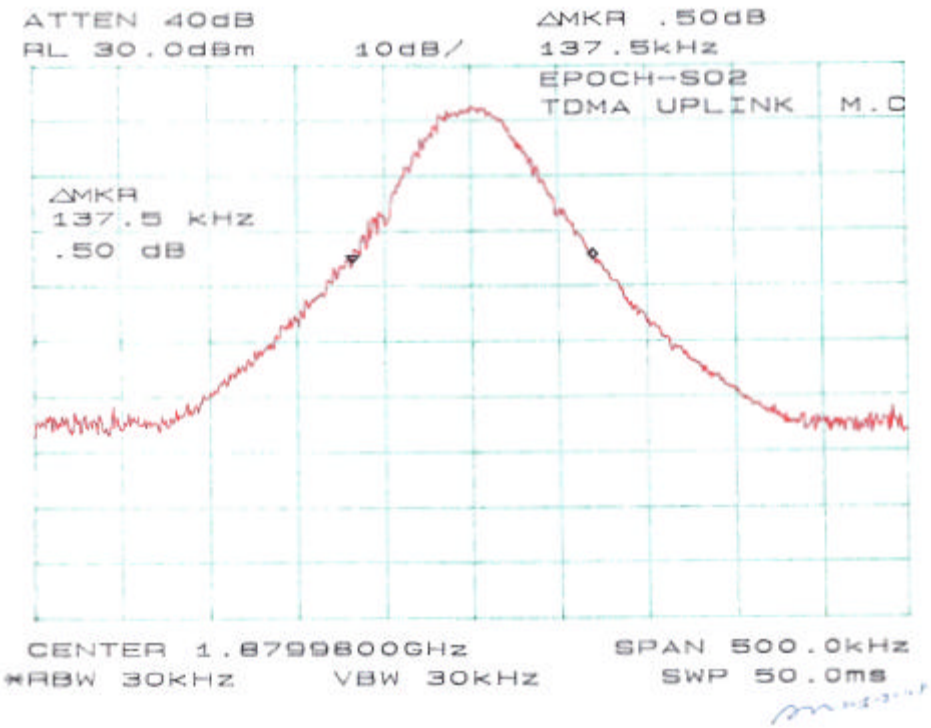
RL 30.0dBm
10dB/
MKR 23.67dBm
1.960000GHz
EPOCH-SD2
GSM DNLINK
M.C
OCCUPIED BW
%OCC 99.00
253.3kHz
CENTER 1.960000GHz
SPAN 2.000MHz
RBW 30kHz
VBW 30kHz
SWP 50.0ms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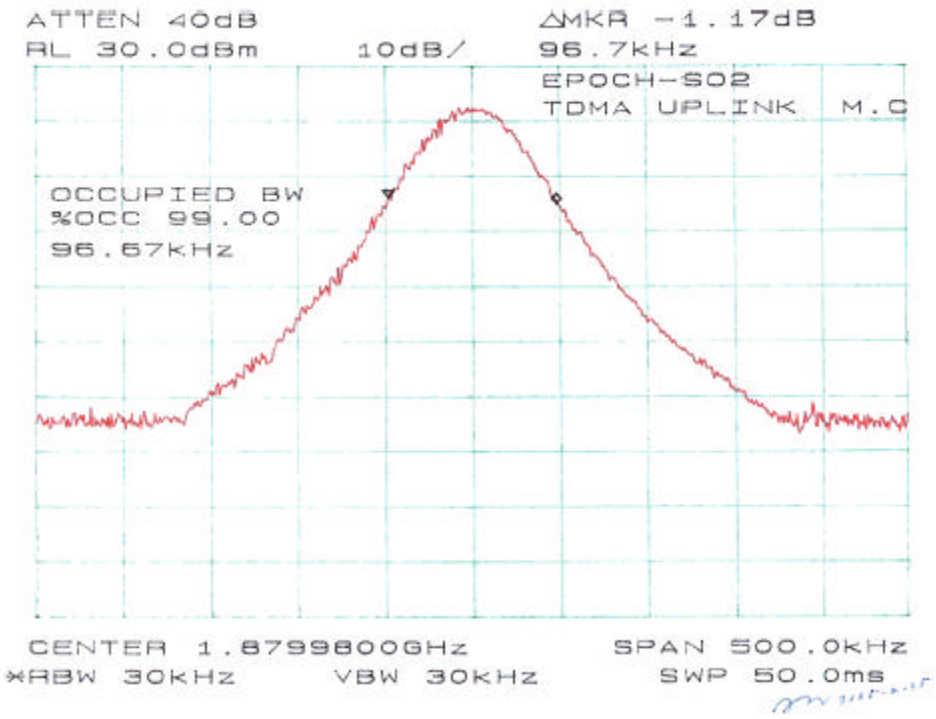
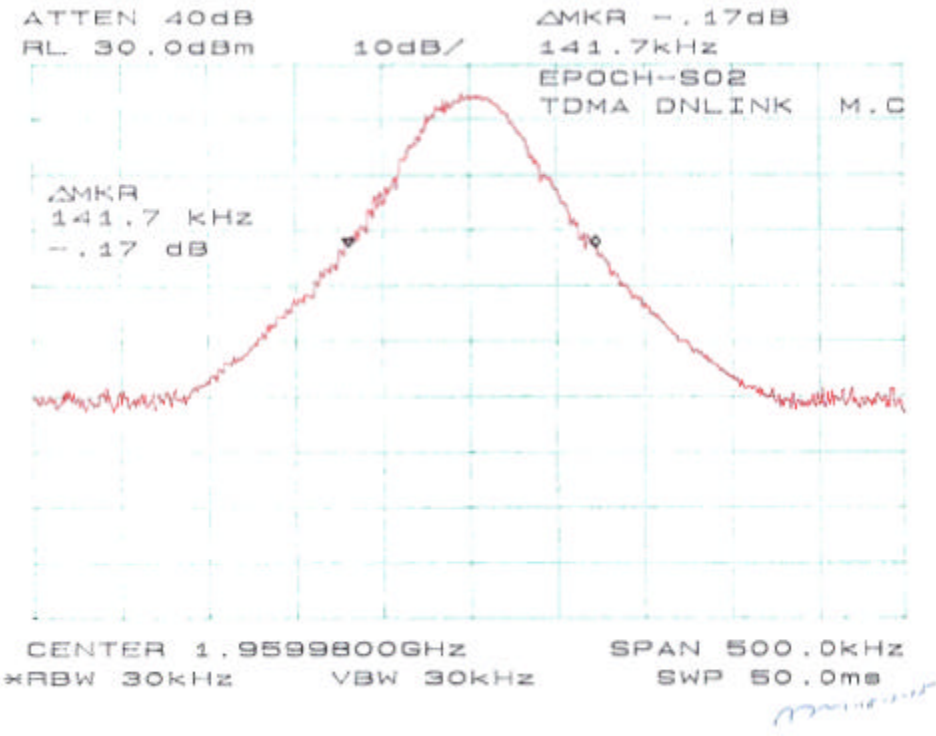
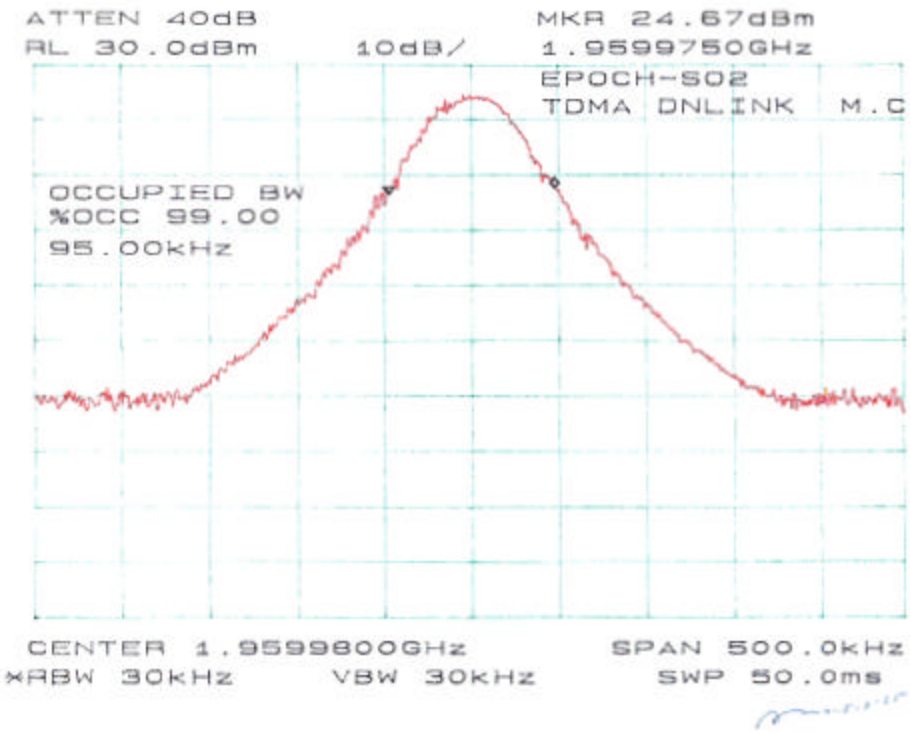
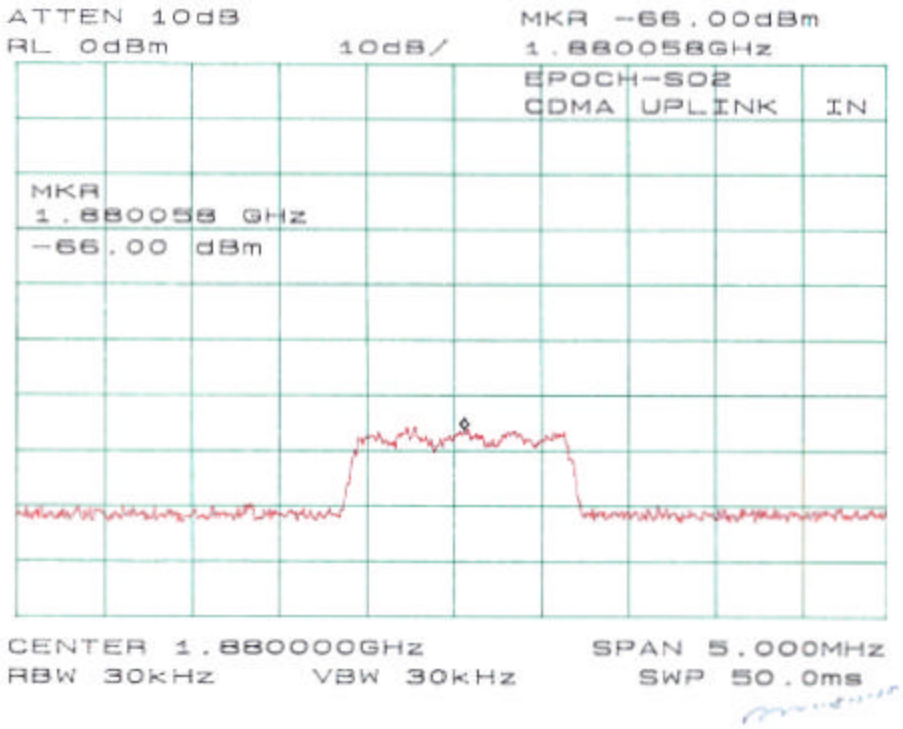
RL 30.0dBm
10dB/
ΔMKR .50dB
137.5kHz
EPOCH-SD2
TDMA UPLINK
M.C
ΔMKR
137.5 kHz
.50 dB
CENTER 1.8799800GHz
SPAN 500.0kHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms

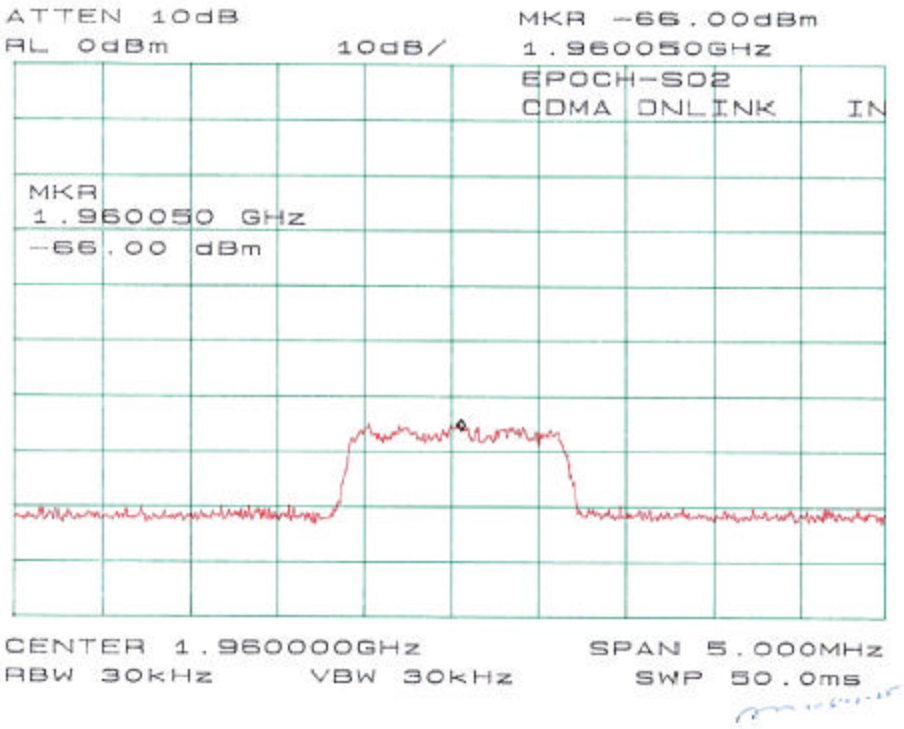

ATTEN 40dB
RL 30.0dBm
10dB/
ΔMKR -1.17dB
96.7kHz
EPOCH-SO2
TDMA UPLINK M.C
OCCUPIED BW
%OCC 99.00
96.67kHz
CENTER 1.8799800GHz
SPAN 500.0kHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
ΔMKR -.17dB
141.7kHz
EPOCH-SO2
TDMA DNLINK M.C
ΔMKR
141.7 kHz
-.17 dB
CENTER 1.9599800GHz
SPAN 500.0kHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms



CDMA Input Signal:





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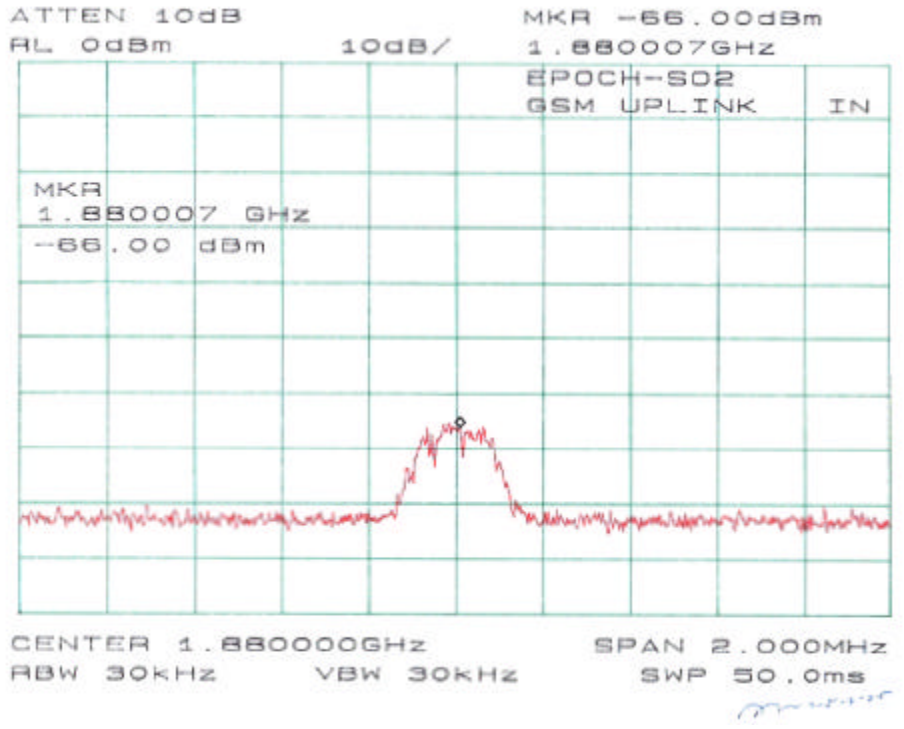

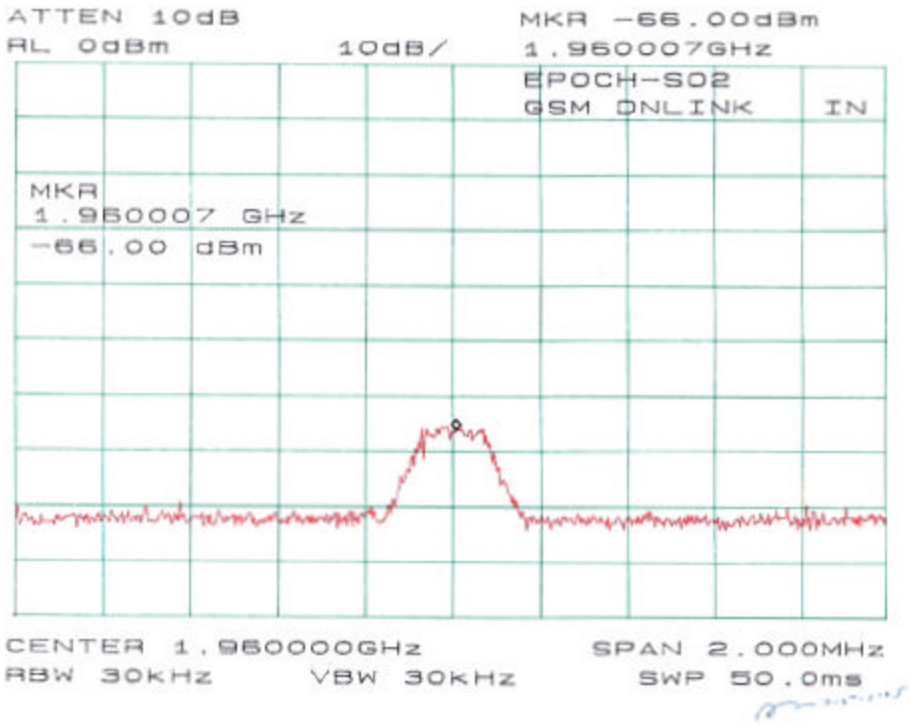

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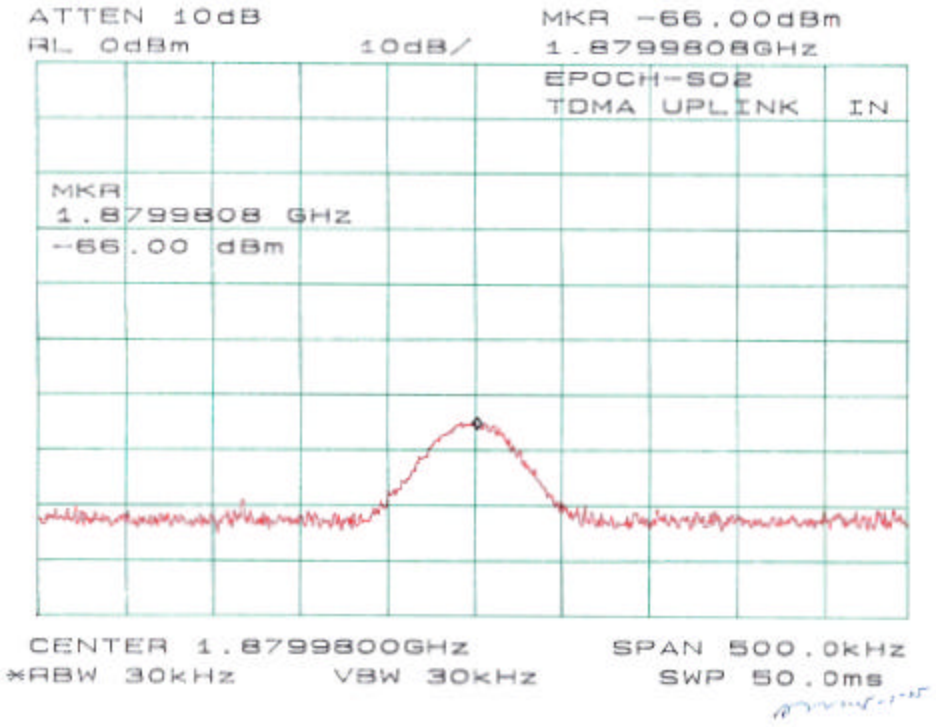

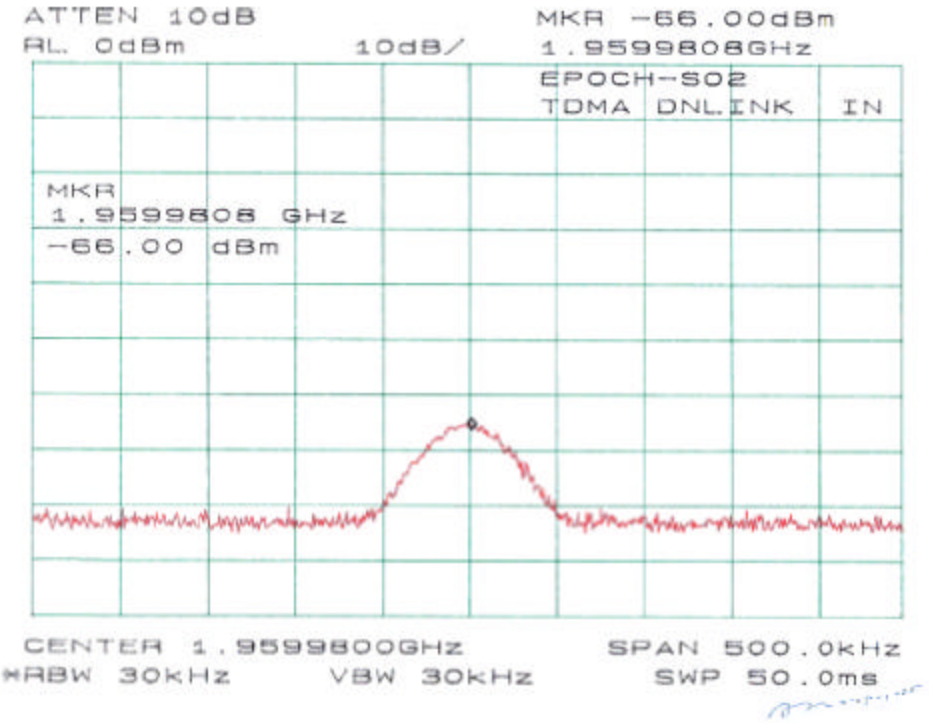
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RL 0dBm
10dB/
MKR -66.00dBm
1.9599808GHz
EPOCH-S02
TDMA DNLINK IN
MKR
1.9599808 GHz
-66.00 dBm
CENTER 1.9599800GHz
SPAN 500.0kHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms

§2.1051 & §24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standards

According to FCC §2.1049 and §24.238, on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 KHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	8565EC	3946A00131	2004-08-08
HP	Plotter	7470A	N/A	N/A
Rohde & Schwarz	Signal Generator	SMIQ03	DE23746	2004-07-03
Rohde & Schwarz	Modulation Generator	AMIQ-K11	DE30565	2004-04-06

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

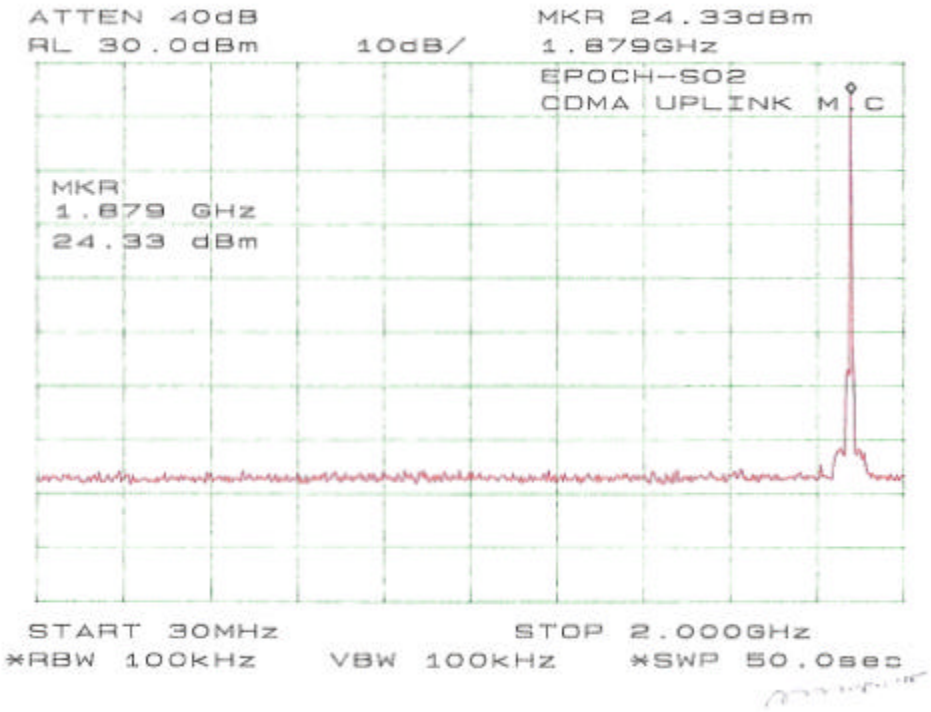
Environmental Conditions

Temperature:	21° C
Relative Humidity:	37%
ATM Pressure:	1032mbar

** The testing was performed by Ming Jin on 2005-02-25.*

Test Results

Please refer to the hereinafter plots.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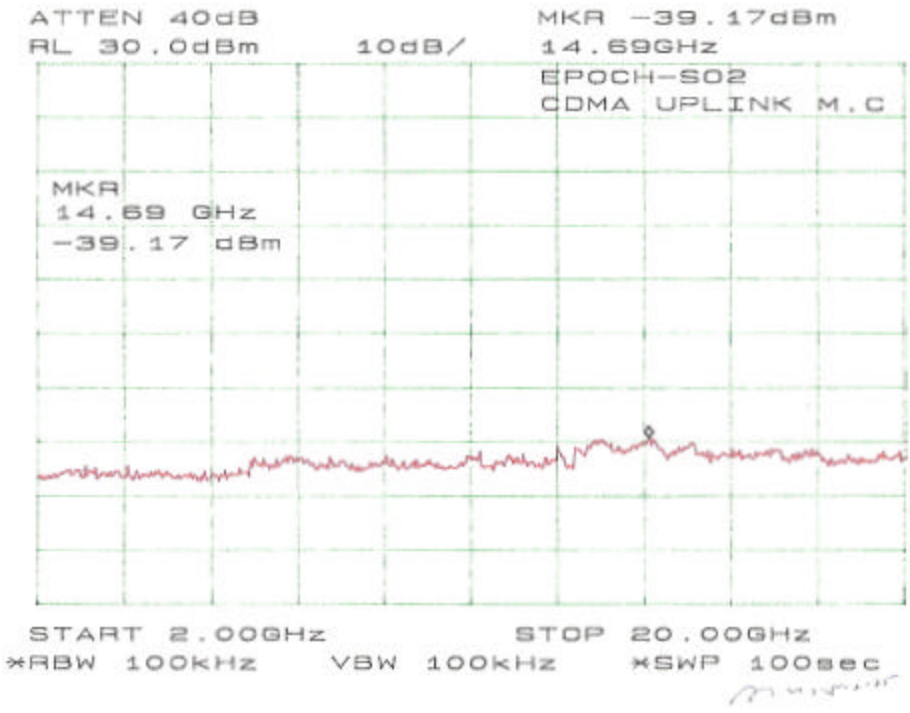
10dB/
MKR 24.33dBm
1.879GHz
EPOCH-S02
CDMA UPLINK M.C
MKR
1.879 GHz
24.33 dBm
START 30MHz
STOP 2.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec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10dB/
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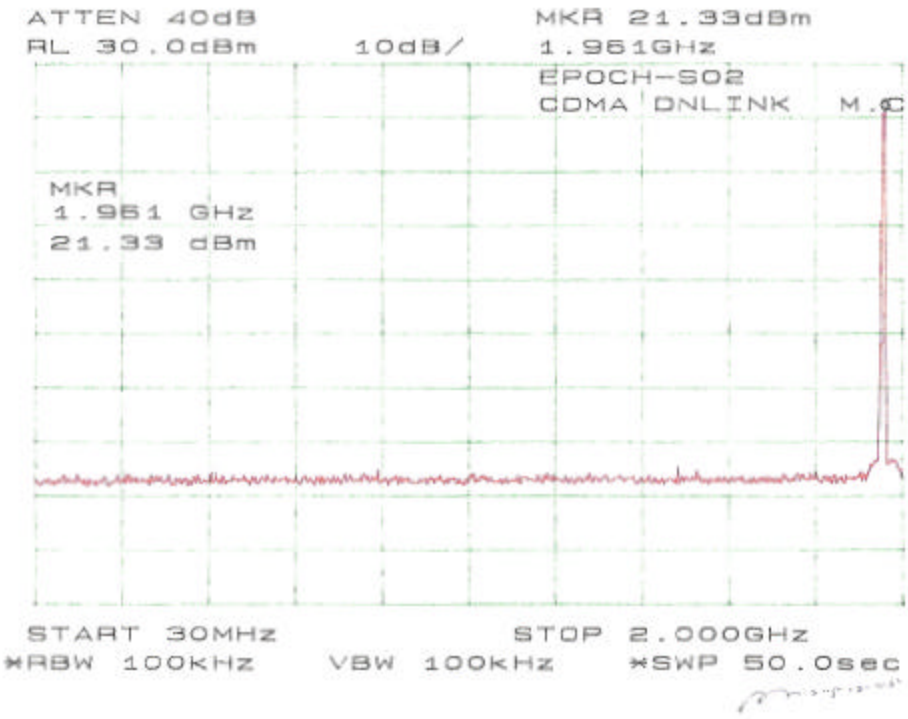
EPOCH-S02
CDMA UPLINK M.C
MKR
14.69 GHz
-39.17 dBm
START 2.00GHz
STOP 20.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec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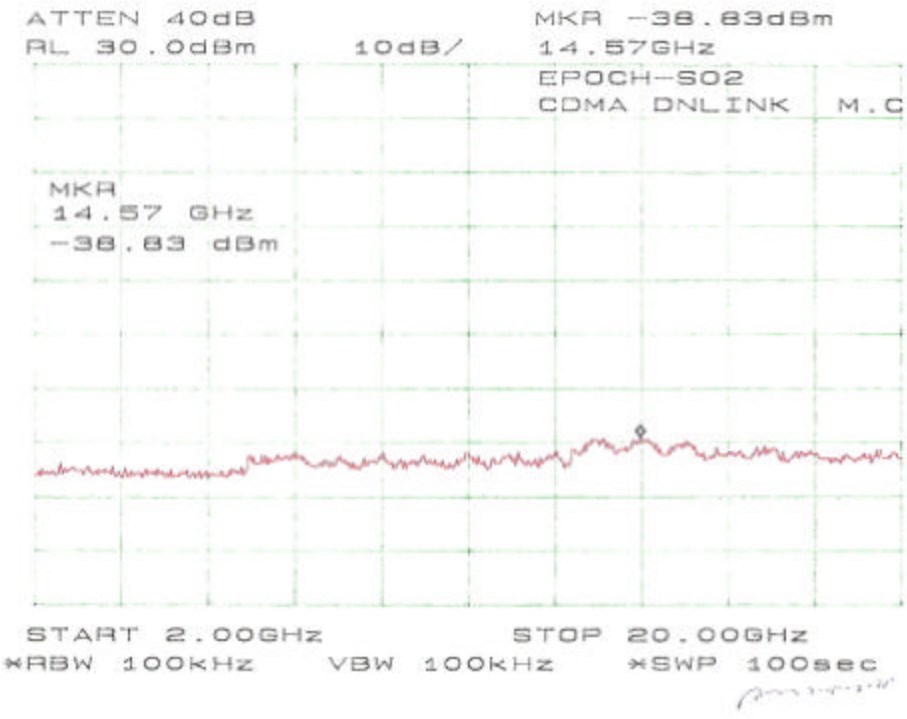
RL 30.0dBm
10dB/
MKR 21.33dBm
1.961GHz
EPOCH-S02
CDMA DNLINK
MKR
1.961 GHz
21.33 dBm
START 30MHz
STOP 2.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec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10dB/
MKR -38.83dBm
14.57GHz
EPOCH-S02
CDMA DNLINK
MKR
14.57 GHz
-38.83 dBm
START 2.00GHz
STOP 20.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec

IS-138a (3.4.4) TWO-TONE TEST

Applicable Standards

According to IS-138A (3.4.4), Intermodulation products must be attenuated below the rated power of the EUT by at least 43 +10log (P), equivalent to –13 dBm.

Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 KHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic. Two input signals are equal in level (and can be raised equally), were send to the EUT.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	8565EC	3946A00131	2004-08-08
HP	Plotter	7470A	N/A	N/A
Rohde & Schwarz	Signal Generator	SMIQ03	DE23746	2004-07-03
Rohde & Schwarz	Modulation Generator	AMIQ-K11	DE30565	2004-04-06

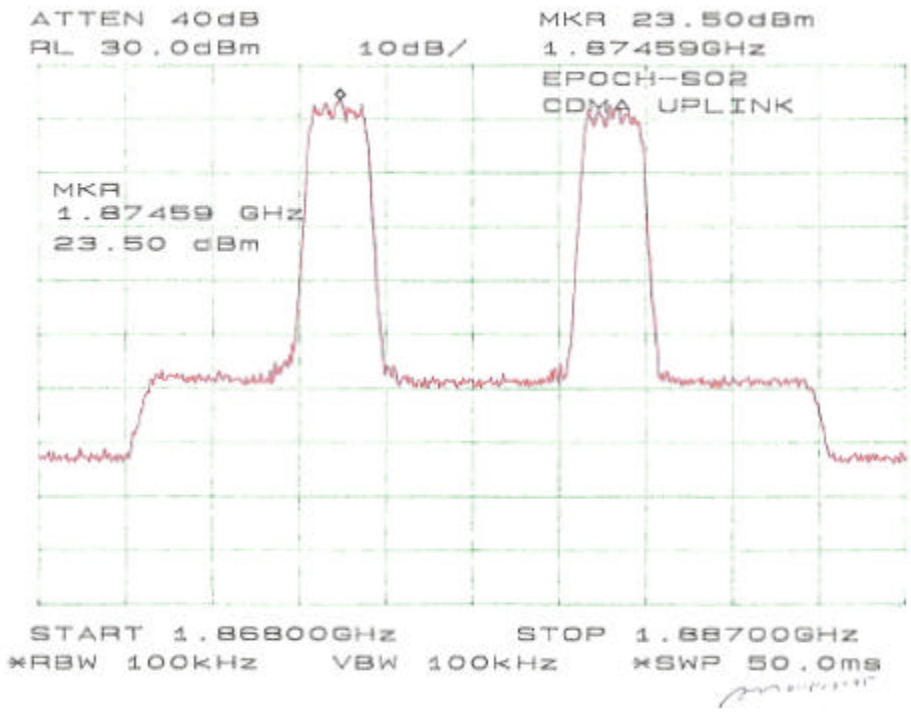
** The testing was performed by Ming Jin on 2005-02-25.*

Test Results

Modulation	Mode	Channel	Measured
CDMA	Up-link	Mid	< -13dBm
	Down-link	Mid	< -13dBm

Plots of Two -Tone Test Result

Please refer to plots hereinafter.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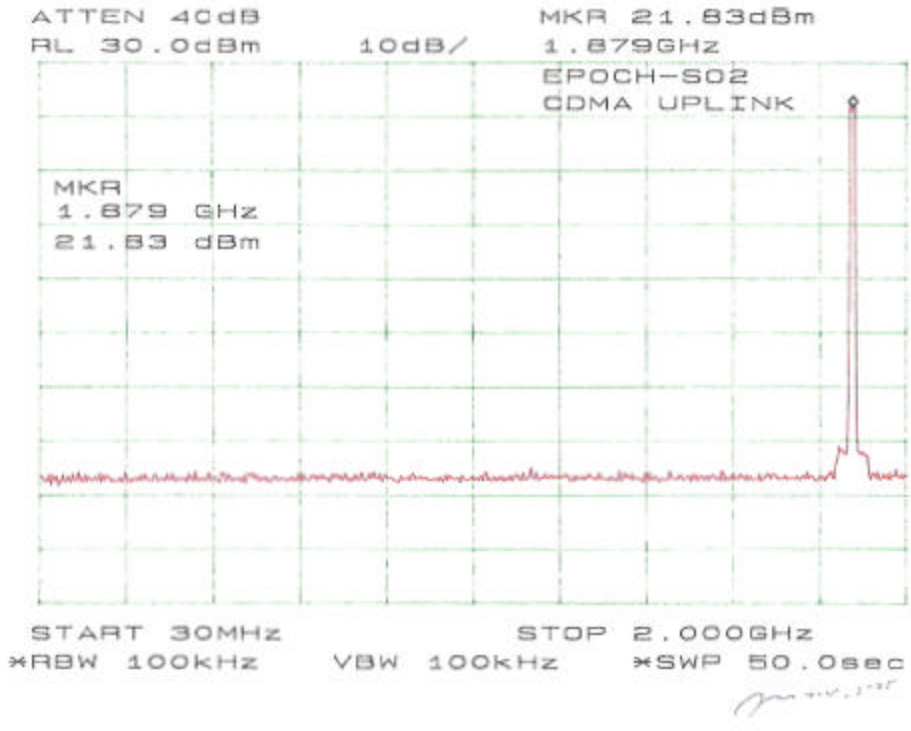
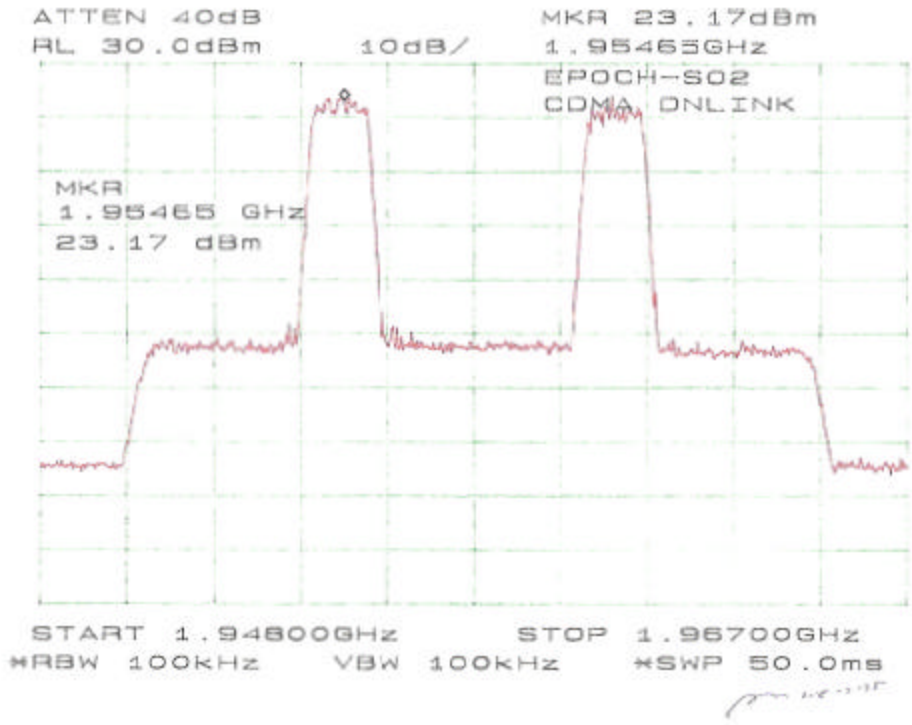
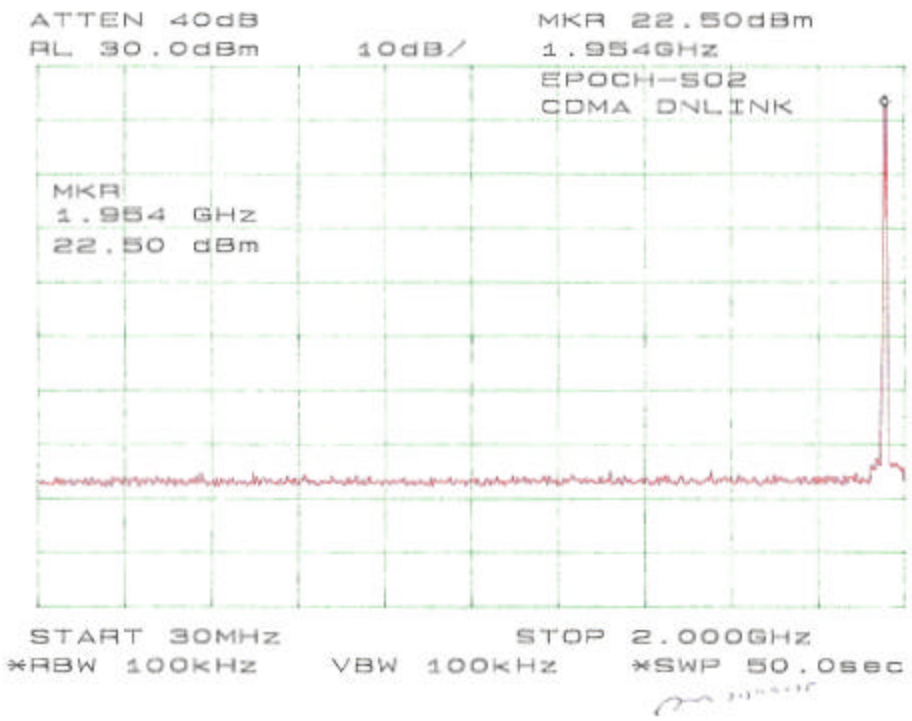
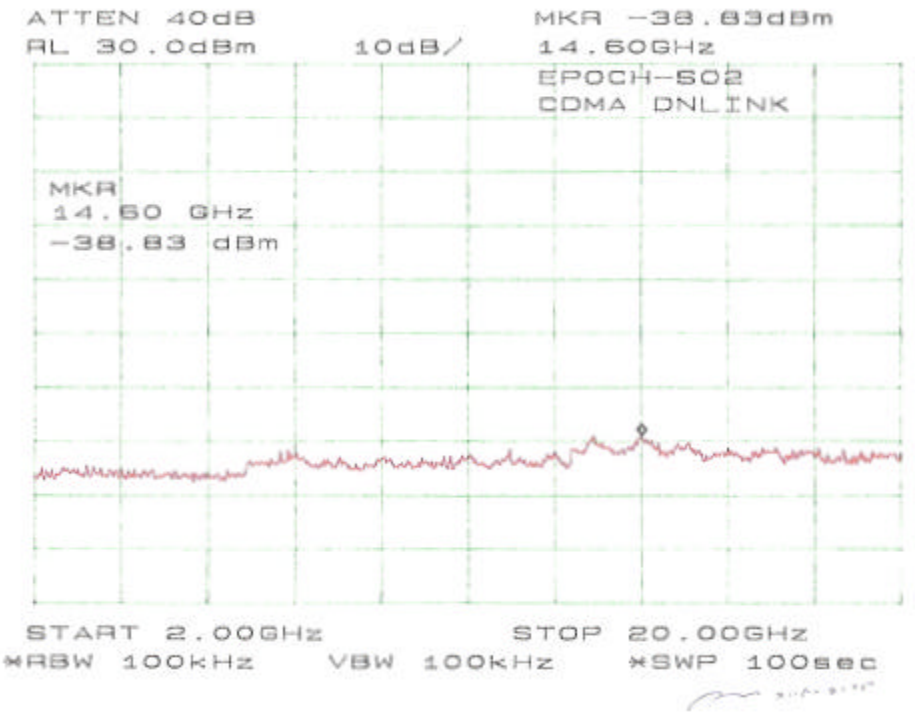
RL 30.0dBm
10dB/
MKR 23.50dBm
1.874590GHz
EPOCH-S02
CDMA UPLINK
MKR
1.87459 GHz
23.50 dBm
START 1.868000GHz
STOP 1.887000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR 21.83dBm
1.879GHz
EPOCH-S02
CDMA UPLINK
MKR
1.879 GHz
21.83 dBm
START 30MHz
STOP 2.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -39.50dBm
14.81GHz
EPOCH-S02
CDMA UPLINK
MKR
14.81 GHz
-39.50 dBm
START 2.00GHz
STOP 20.00GHz
*RBW 100KHz
VBW 100KHz
*SWP 100sec


ATTEN 40dB
RL 30.0dBm
10dB/
MKR 23.17dBm
1.95465GHz
EPOCH-S02
CDMA DNLINK
MKR
1.95465 GHz
23.17 dBm
START 1.94800GHz
STOP 1.96700GHz
*RBW 100KHz
VBW 100KHz
*SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR 22.50dBm
1.954GHz
EPOCH-502
CDMA DNLINK
MKR
1.954 GHz
22.50 dBm
START 30MHz
STOP 2.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -38.83dBm
14.60GHz
EPOCH-502
CDMA DNLINK
MKR
14.60 GHz
-38.83 dBm
START 2.00GHz
STOP 20.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec

§2.1053 - SPURIOUS RADIATED EMISSION

Applicable Standards

Requirements: CFR 47, § 2.1053, and § 24.238 (a).

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = $43 + 10 \text{ Log}_{10}$ (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	8568B	2601A02165	2004-07-03
HP	Amplifier	8447E	2944A10187	2004-09-23
HP	Quasi-Peak Adapter	85650A	3019A05393	2004-06-13
EMCO	Biconical Antenna	3110B	9309-1165	2004-10-11
EMCO	Log Periodic Antenna	3146	2101	2004-10-11
AH System	Horn Antenna	SAS-200/511	261	2004-08-02
HP	Spectrum Analyzer	HP8564E	3943A01781	2004-08-01

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	21° C
Relative Humidity:	37%
ATM Pressure:	1032mbar

** The testing was performed by Ming Jin on 2005-02-25.*

Test Result

CDMA Up-link: -11.5 dB at 3760MHz

CDMA Down-link: -27.2 dB at 3920MHz

GSM Up-link: -10.9 dB at 3760MHz

GSM Down-link: -12.5 dB at 3920MHz

TDMA Up-link: -12.2 dB at 3759.96MHz

TDMA Down-link: -13.2 dB at 3919.96MHz

CDMA Uplink, Primary Scan Primary Scan 1GHz-20GHz (Fundamental 1880 MHz)

EUT					Generator					Standard	
Indicated		Table	Test Antenna		Substitution		Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Gain Corrected	Loss dB	Level dBm	Limit dBm	Margin dB
3760	36.4	45	1.6	v	3760	-32.7	10.3	2.1	-24.5	-13	-11.5
3760	35.2	90	1.8	h	3760	-33.9	10.3	2.1	-25.7	-13	-12.7
5640	34.5	0	1.5	v	5640	-34.6	10.6	2.5	-26.5	-13	-13.5
5640	33.6	180	1.5	h	5640	-35.8	10.6	2.5	-27.7	-13	-14.7

CDMA Downlink, Primary Scan Primary Scan 1GHz-20GHz (Fundamental 1960 MHz)

EUT					Generator					Standard	
Indicated		Table	Test Antenna		Substitution		Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Gain Corrected	Loss dB	Level dBm	Limit dBm	Margin dB
3920	34.1	90	1.5	v	3920	-34.2	10.3	2.1	-26	-13	-13.0
3920	33.8	160	1.6	h	3920	-34.6	10.3	2.1	-26.4	-13	-13.4
5880	32.7	0	2.1	v	5880	-36.5	10.6	2.5	-28.4	-13	-15.4
5880	32.2	15	1.5	h	5880	-37.2	10.6	2.5	-29.1	-13	-16.1

GSM Uplink, Primary Scan 30MHz-20GHz

EUT					Generator					Standard	
Indicated		Table	Test Antenna		Substitution		Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Gain Corrected	Loss dB	Level dBm	Limit dBm	Margin dB
3760	36.9	210	1.6	v	3760	-32.1	10.3	2.1	-23.9	-13	-10.9
3760	35.6	280	2.2	h	3760	-33.5	10.3	2.1	-25.3	-13	-12.3
5640	34.8	0	1.8	v	5640	-34.9	10.6	2.5	-26.8	-13	-13.8
5640	33.9	90	1.5	h	5640	-35.4	10.6	2.5	-27.3	-13	-14.3

GSM Downlink, Primary Scan 30MHz-20GHz

EUT					Generator					Standard	
Indicated		Table	Test Antenna		Substitution		Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Gain Corrected	Loss dB	Level dBm	Limit dBm	Margin dB
3920	34.5	160	1.5	v	3920	-33.7	10.3	2.1	-25.5	-13	-12.5
3920	34.1	320	1.8	h	3920	-34.1	10.3	2.1	-25.9	-13	-12.9
5880	33.2	0	2.1	v	5880	-35.9	10.6	2.5	-27.8	-13	-14.8
5880	32.7	45	1.5	h	5880	-36.6	10.6	2.5	-28.5	-13	-15.5

TDMA Uplink, Primary Scan 30MHz-20GHz

EUT					Generator					Standard	
Indicated		Table	Test Antenna		Substitution		Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Gain Corrected	Loss dB	Level dBm	Limit dBm	Margin dB
3759.96	36.1	290	1.6	v	3759.96	-33.4	10.3	2.1	-25.2	-13	-12.2
3759.96	34.9	140	1.5	h	3759.96	-34.3	10.3	2.1	-26.1	-13	-13.1
5639.94	34.2	0	1.8	v	5639.94	-35.2	10.6	2.5	-27.1	-13	-14.1
5639.94	33.1	120	1.5	h	5639.94	-36.3	10.6	2.5	-28.2	-13	-15.2

TDMA Downlink, Primary Scan 30MHz-20GHz

EUT					Generator					Standard	
Indicated		Table	Test Antenna		Substitution		Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Gain Corrected	Loss dB	Level dBm	Limit dBm	Margin dB
3919.96	33.9	90	1.5	v	3919.96	-34.4	10.3	2.1	-26.2	-13	-13.2
3919.96	33.5	170	1.8	h	3919.96	-34.9	10.3	2.1	-26.7	-13	-13.7
5879.94	32.4	60	2.2	v	5879.94	-36.8	10.6	2.5	-28.7	-13	-15.7
5879.94	31.7	180	1.5	h	5879.94	-37.6	10.6	2.5	-29.5	-13	-16.5

Note: According to FCC Part 15 at 3 meter distance the emission from an intentional radiator shall not exceed the field strength level 40 dBuV/m within 30-88MHz, 43.5 dBuV/m within 88-216MHz, 46 dBuV/m within 226-960MHz, 54 dBuV/m above 960MHz. The level of any unwanted emissions shall not exceed the level of the fundamental frequency.
The levels of unwanted emission of the EPOCH-S)2-6 repeater were below the above limits. This device was compliant with the FCC Part 15.

§24.238 – BAND EDGE

Applicable Standards

According to FCC §2.1049 and §24.238, when measuring the emission limits, carrier frequency shall be adjusted as close to the frequency block edges, both upper and lower.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. Adjust the carrier frequency as close to the frequency block edges both upper and lower. Sufficient scans were taken to show any out of band-edge emission.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	8564E	3943A01781	2004-10-04
HP	Plotter	HP7470A	2541A49659	Not Required

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

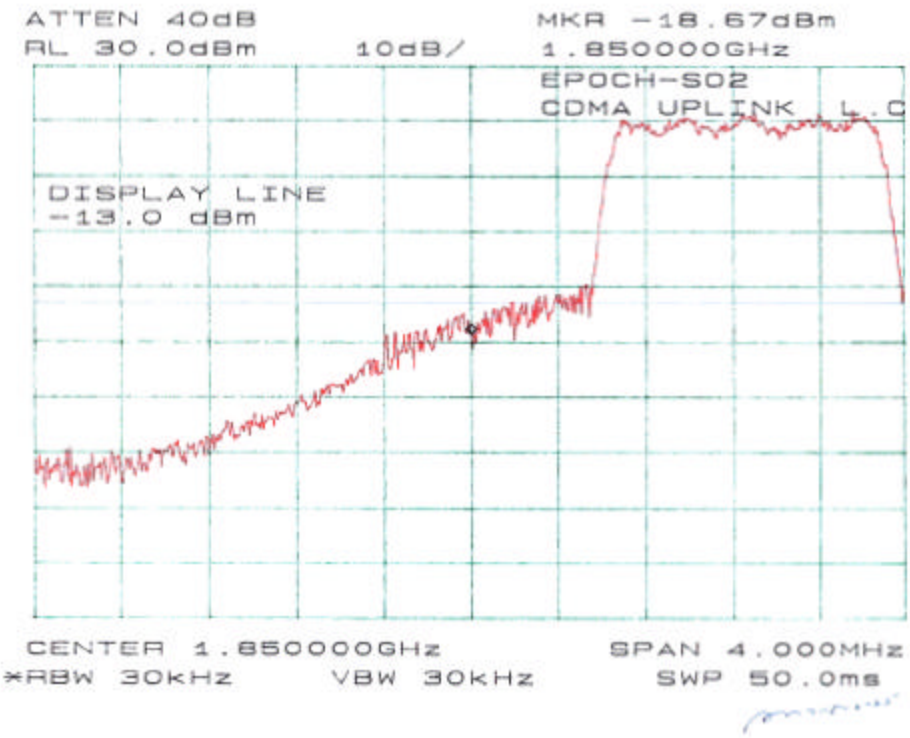
Environmental Conditions

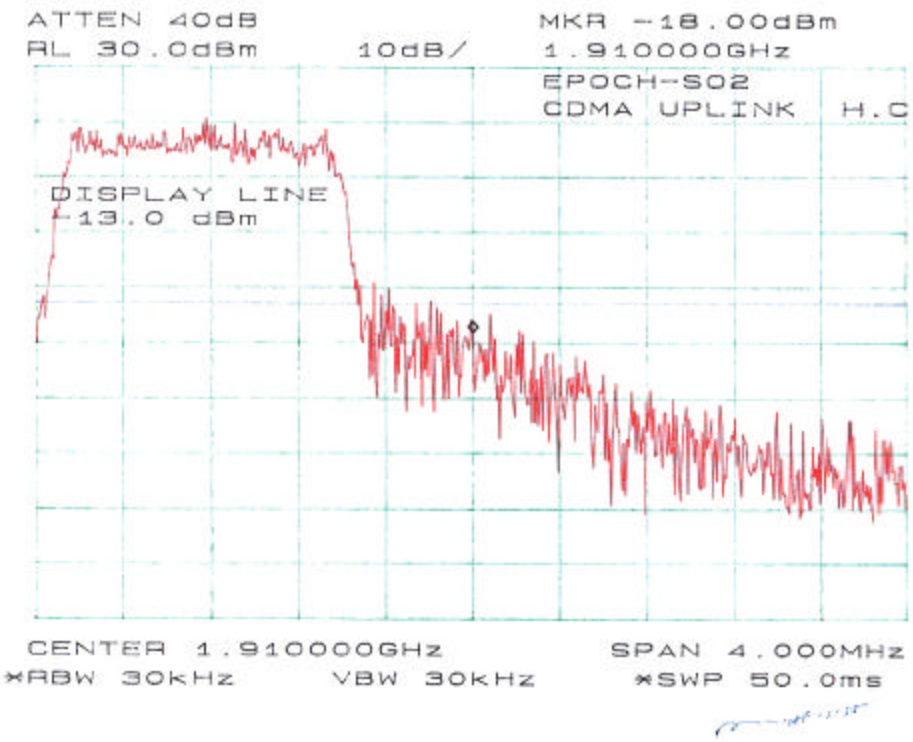
Temperature:	21° C
Relative Humidity:	37%
ATM Pressure:	1032 mbar

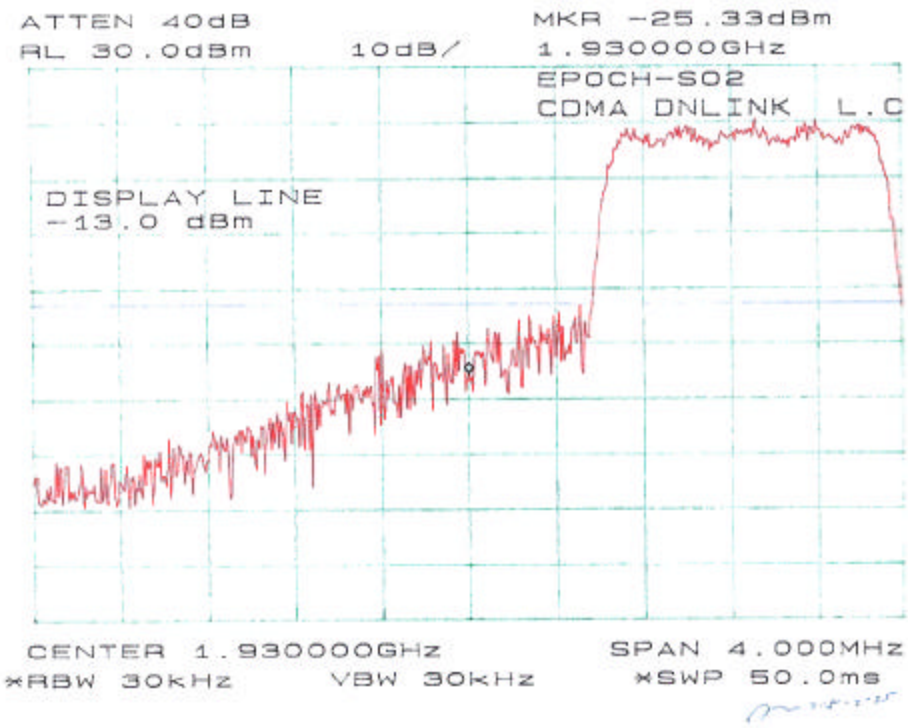
** The testing was performed by Ming Jin on 2005-02-25.*

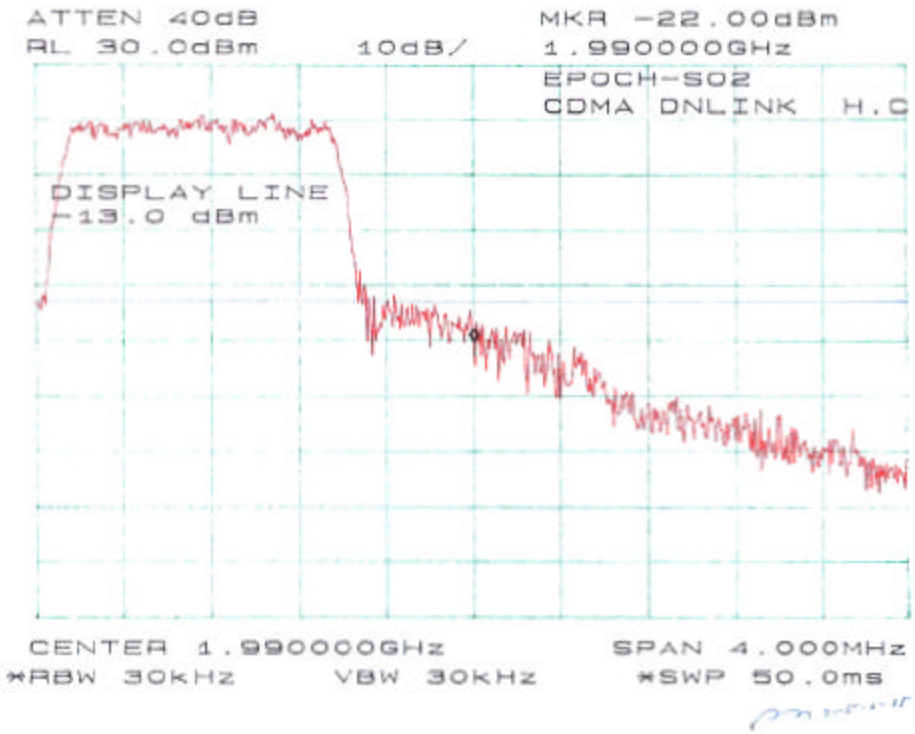
Test Results

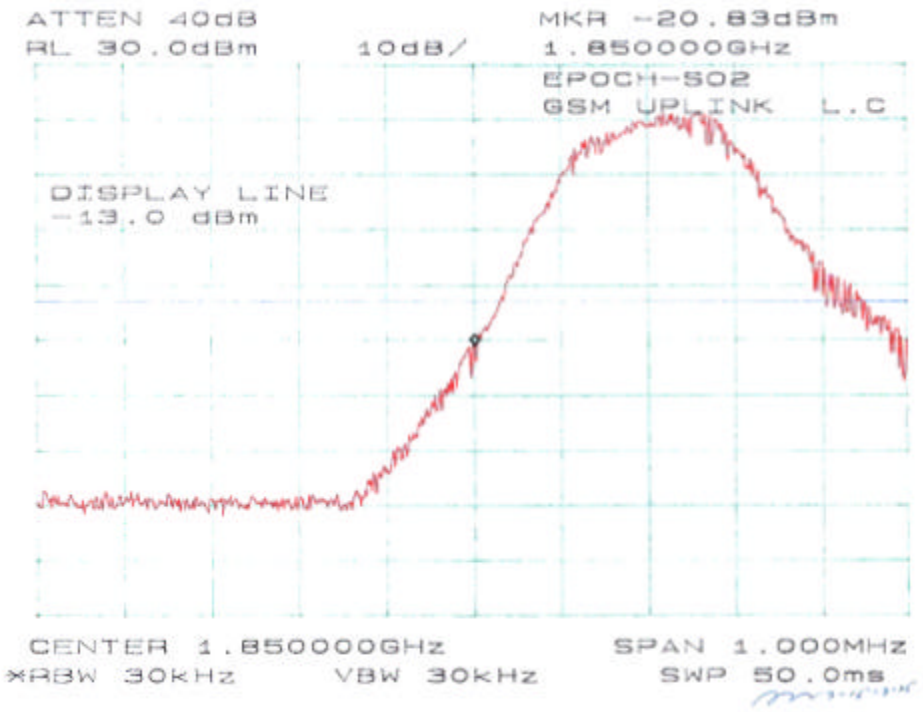
Please refer to plots hereinafter.

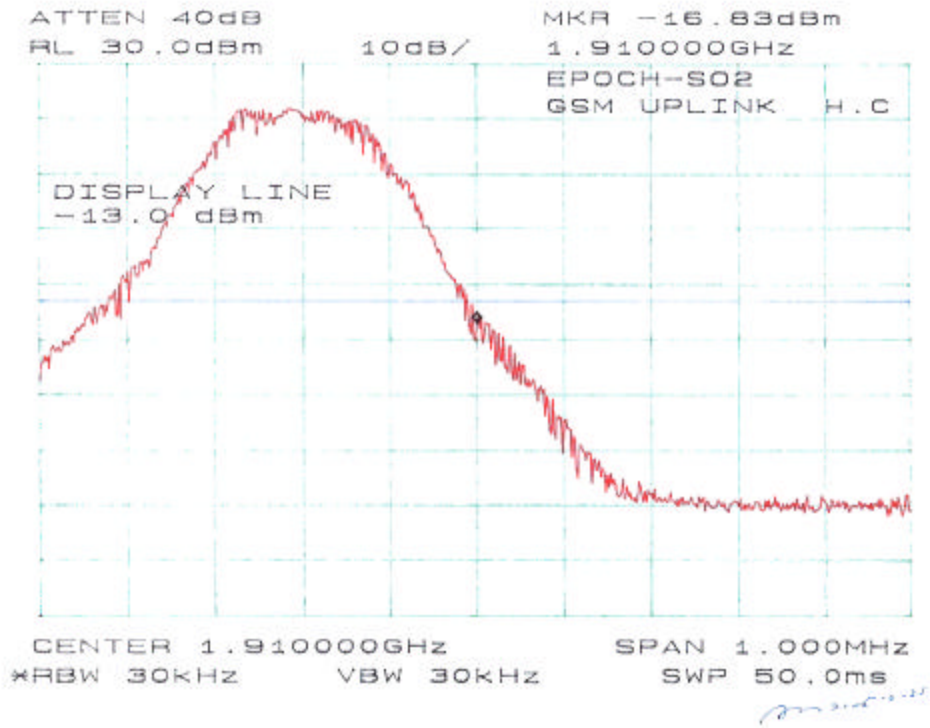

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -18.67dBm
1.850000GHz
EPOCH-S02
CDMA UPLINK L.C
DISPLAY LINE
-13.0 dBm
CENTER 1.850000GHz
SPAN 4.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -18.00dBm
1.910000GHz
EPOCH-S02
CDMA UPLINK H.C
DISPLAY LINE
-13.0 dBm
CENTER 1.910000GHz
SPAN 4.000MHz
*RBW 30kHz
VBW 30kHz
*SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -25.33dBm
1.930000GHz
EPOCH-SO2
CDMA DNLINK L.C
DISPLAY LINE
-13.0 dBm
CENTER 1.930000GHz
SPAN 4.000MHz
*RBW 30KHz
VBW 30KHz
*SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -22.00dBm
1.990000GHz
EPOCH-SO2
CDMA DNLINK H.C
DISPLAY LINE
-13.0 dBm
CENTER 1.990000GHz
SPAN 4.000MHz
*RBW 30KHz
VBW 30KHz
*SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -20.83dBm
1.850000GHz
EPOCH-SO2
GSM UPLINK L.C
DISPLAY LINE
-13.0 dBm
CENTER 1.850000GHz
SPAN 1.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms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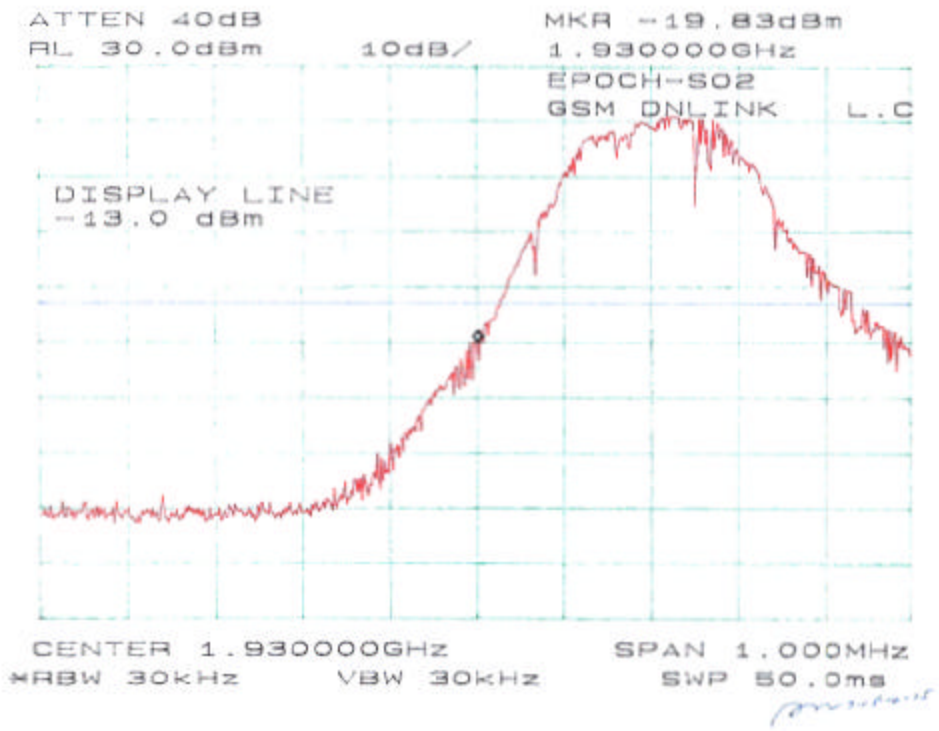
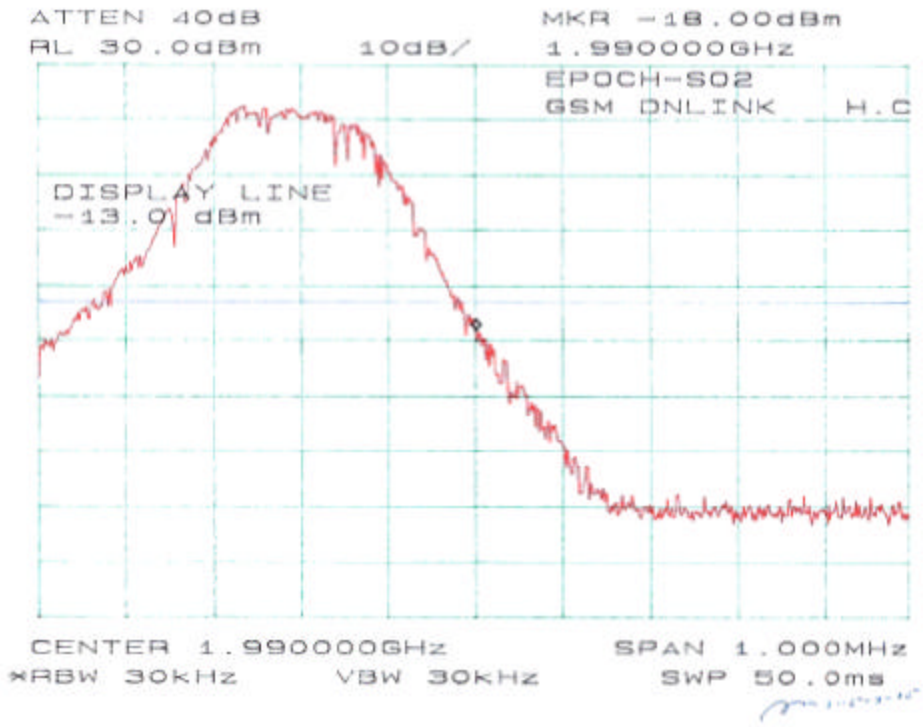
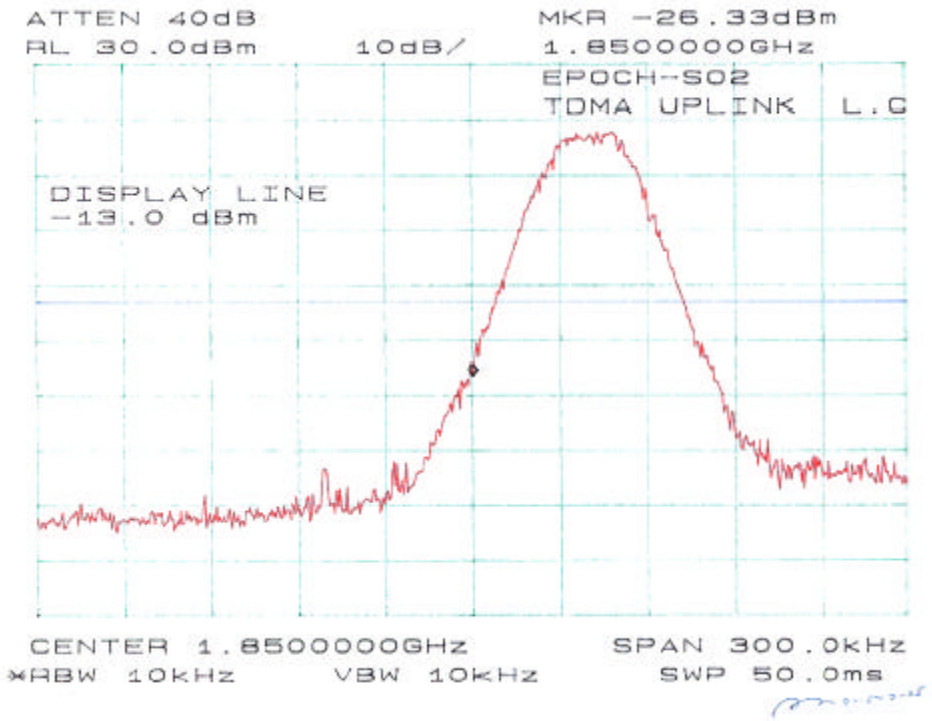
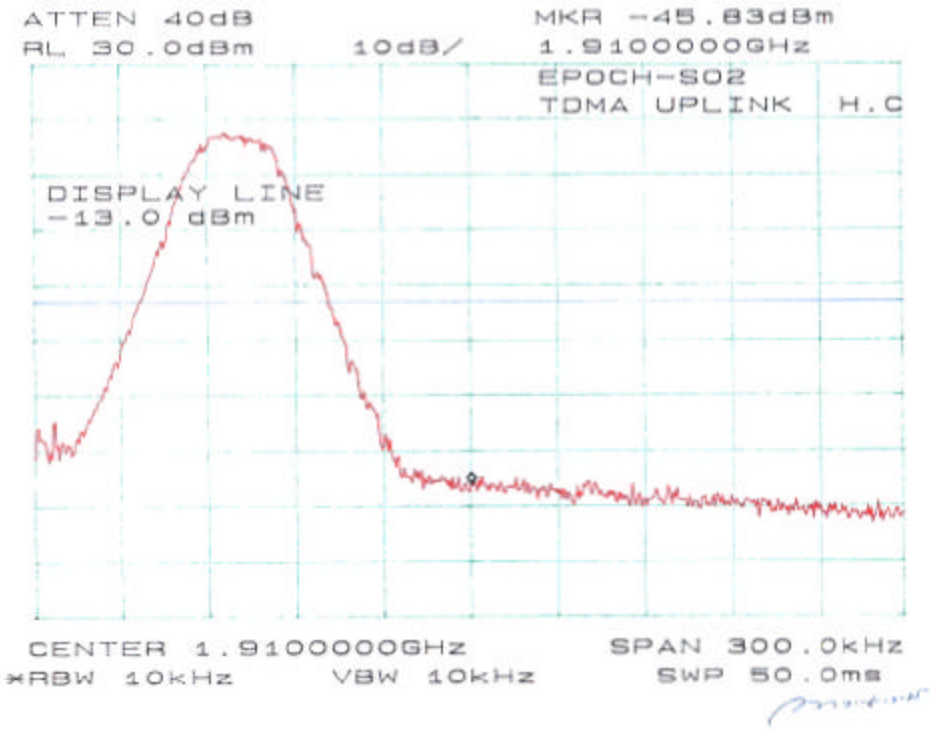
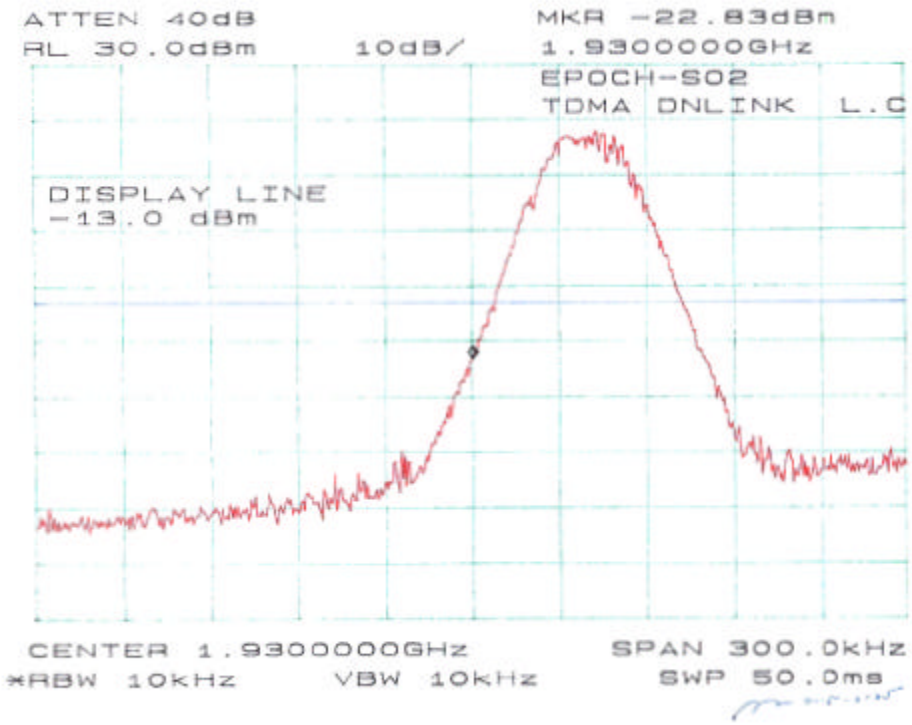
RL 30.0dBm
10dB/
MKR -16.83dBm
1.910000GHz
EPOCH-SO2
GSM UPLINK H.C
DISPLAY LINE
-13.0 dBm
CENTER 1.910000GHz
SPAN 1.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms

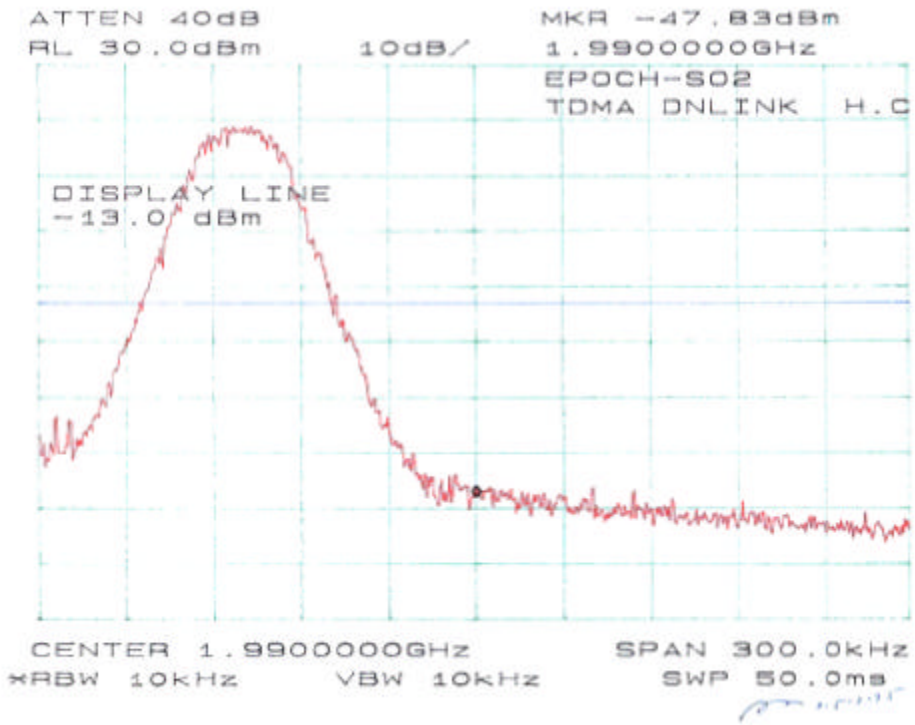

ATTEN 40dB
RL 30.0dBm
10dB/
MKR -19.83dBm
1.930000GHz
EPOCH-S02
GSM DNLINK L.C
DISPLAY LINE
-13.0 dBm
CENTER 1.930000GHz
SPAN 1.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -18.00dBm
1.990000GHz
EPOCH-S02
GSM DNLINK H.C
DISPLAY LINE
-13.0 dBm
CENTER 1.990000GHz
SPAN 1.000MHz
*RBW 30kHz
VBW 30kHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -26.33dBm
1.8500000GHz
EPOCH-SO2
TDMA UPLINK L.C
DISPLAY LINE
-13.0 dBm
CENTER 1.8500000GHz
SPAN 300.0kHz
*RBW 10kHz
VBW 10kHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -45.83dBm
1.9100000GHz
EPOCH-SO2
TDMA UPLINK H.C
DISPLAY LINE
-13.0 dBm
CENTER 1.9100000GHz
SPAN 300.0kHz
*RBW 10kHz
VBW 10kHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -22.83dBm
1.9300000GHz
EPOCH-SO2
TDMA DNLINK L.C
DISPLAY LINE
-13.0 dBm
CENTER 1.9300000GHz
SPAN 300.0kHz
*RBW 10kHz
VBW 10kHz
SWP 50.0ms


ATTEN 40dB
RL 30.0dBm
10dB/
MKR -47.83dBm
1.9900000GHz
EPOCH-SO2
TDMA DNLINK H.C
DISPLAY LINE
-13.0 dBm
CENTER 1.9900000GHz
SPAN 300.0kHz
*RBW 10kHz
VBW 10kHz
SWP 50.0ms

§2.1047 – Modulation Characteristics

This EUT only is a PCS 1900 Repeater, it is not a transmitter. There is no modulating circuit in the EUT and no modulating characteristics measurement required.

§2.1055(a0, §2.1055(d) & §24.235 - FREQUENCY STABILITY

Applicable Standard

Requirements: FCC § 2.1055 (a), § 2.1055 (d) and § 24.235

The Frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external power supply and the RF output was connected to a frequency counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The power leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.

Frequency Stability vs. Voltage: An external variable power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Frequency Counter	5342A	2232A06380	2004-09-07
Blue M	Temperature Chamber	FR-251E	AA-814	N/A
SANKE	Power Supply	TDGC2J	N/A	N/A

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	21° C
Relative Humidity:	37%
ATM Pressure:	1032 mbar

** The testing was performed by Ming Jin on 2005-02-25.*

Test Results

Frequency Stability Versus Temperature

Reference Frequency: CDMA 1880 MHz,			
Environment Temperature	Power Supplied	Frequency Measure with Time Elapsed	
(°C)	(Vac)	MCF (MHz)	PPM Error
50	110	1879.9998	-0.09
40	110	1879.9999	-0.05
30	110	1879.9999	-0.05
20	110	1880.0001	0.05
10	110	1880.0001	0.05
0	110	1880.0001	0.05
-10	110	1880.0002	0.09
-20	110	1880.0002	0.09
-30	110	1880.0002	0.09

Frequency Stability Versus Input Voltage

	Reference Frequency: CDMA1880 MHz,	
Power Supplied	Frequency Measure with Time Elapsed	
(Vac)	MHz	PPM
126.5	1880.0001	0.05
93.5	1880.0001	0.05

Conclusion: The EUT complied with the applicable Frequency Stability Limits.