



Test Report: 6W76966

Applicant: Dekolink Wireless Ltd.
16 Bazel St,
Qiryat-Arieh, Petah-Tikva
49510 Israel

Apparatus: DEKO-4008 Cellular Repeater 800MHz
(M/N: MW-CSR-800-50W90-XX-YY)

FCC ID: OIWCSR80050W90D

In Accordance With: FCC Part 22, Boosters
Public Mobile Services

Tested By: Nemko Canada Inc.
303 River Road
Ottawa, Ontario
K1V 1H2

Authorized By: 
Jin Xu, Wireless Specialist

Date: December 13, 2006

Total Number of Pages: 26

Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 22. Conducted measurements were performed in accordance with ANSI TIA-603-B-2002. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

Apparatus Assessed:	DEKO-4008 Cellular Repeater 800MHz (M/N: MW-CSR-800-50W90-XX-YY)
Specification:	FCC Part 22 Public Mobile Services
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release

Author: Jason Nixon, Telecom Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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Section 1 : Equipment Under Test

1.1 Product Identification

The Equipment Under Test was identified as follows:

DEKO-4008 Cellular Repeater 800MHz (M/N: MW-CSR-800-50W90-25-1.5)

1.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

Sample No.	Description	Serial No.
1	DEKO-4008 Cellular Repeater 800MHz MN # MW-CSR-800-50W90-25-1.5	0611D9110

The first samples were received on: November 22, 2006

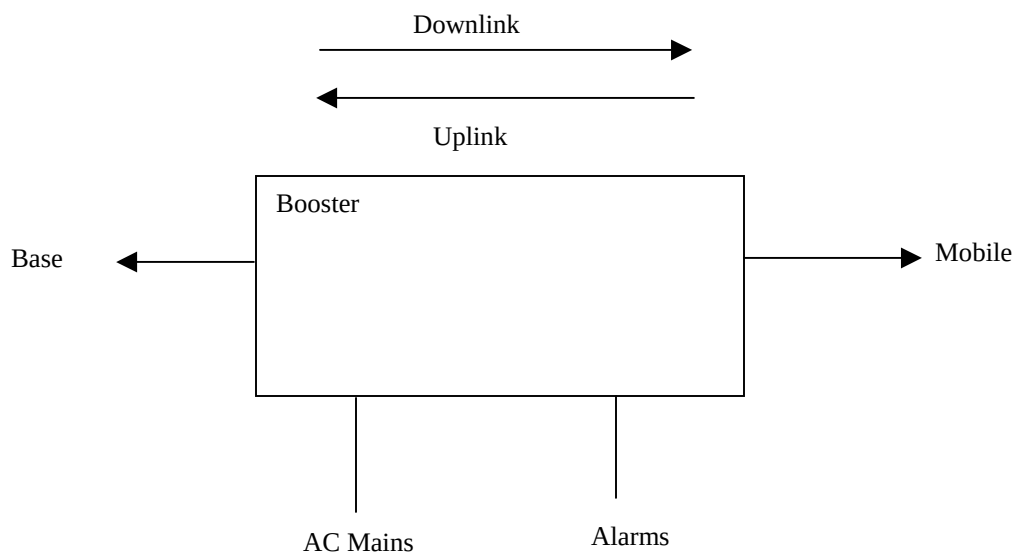
1.3 Theory of Operation

The EUT is a bi-directional booster with two programmable filters. The filters can be moved across the authorized band using software. One filter is 25MHz wide and the other is 1.5MHz wide.

1.4 Technical Specifications of the EUT

Manufacturer:	Dekolink Wireless Ltd.
Operating Frequency:	Downlink: 869-894MHz Uplink: 824-849MHz
Emission Designator:	GXW, F9W
Rated Power:	Downlink: 40dBm Uplink: 30dBm
Measured Power:	Downlink: 39.40dBm Uplink: 29.65dBm
Modulation:	GSM, CDMA
Power Source:	120VAC 60Hz

1.5 Block Diagram of the EUT



Section 2 : Test Conditions

2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 2 Subpart J, Equipment Authorization Procedures
 FCC Part 22, Public Mobile Services
 FCC 2-11-04/EAB/RF Amplifier, Booster, and Repeater Reminder Sheet

2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 °C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

2.4 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next Cal.
Spectrum Analyzer	Rohde & Schwarz	FSP	FA001920	March 17/07
Spectrum Analyzer	Hewlett-Packard	8565E	FA000981	Oct. 06/07
Horn Antenna #2	EMCO	3115	FA000825	Dec. 16/06
Log Periodic Antenna #1	EMCO	LPA-25	FA000477	Sept. 12/07
Biconical (1) Antenna	EMCO	3109	FA000805	May 03/07
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	Aug. 02/07
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	Aug. 02/07
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	Aug. 02/07
5.0 – 18.0 GHz Amplifier	NARDA	DWT-186N23U40	FA001409	COU
Signal Generator	Rohde & Schwarz	SMIQ03E	FA001269	May 29/07
Signal Generator	Rohde & Schwarz	SMIQ06B	FA001878	June 28/07
Power Meter	HP	E4418B	FA001413	May 15/07
Power Sensor	HP	8487A	FA001908	Apr 6/07
Attenuator	Narda	776B-20	FA001153	COU
Attenuator	Narda	769-20	FA001394	COU
Combiner	Mini-circuits	ZA3PD-2	FA001155	COU

COU – Calibrate on Use

NCR – No Calibration Required

Section 3 : Observations

3.1 Modifications Performed During Assessment

No modifications were performed during assessment.

3.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

3.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

3.4 Test Deleted

No Tests were deleted from this assessment.

3.5 Additional Observations

There were no additional observations made during this assessment.

Section 4 : Results Summary

This section contains the following:

FCC Part 22 : Test Results

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

- N No : not applicable / not relevant.
- Y Yes : Mandatory i.e. the apparatus shall conform to these tests.
- N/T Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

4.1 FCC Part 22 : Test Results

Clause	Test Method	Test Description	Required	Result
22.355	2.1055	Frequency stability	Y	PASS
22.383	—	In-building radiation systems	Y	PASS
22.913	2.1046	Output power	Y	PASS
22.917	2.1051	Conducted spurious emissions	Y	PASS
22.917	2.1053	Radiated spurious emissions	Y	PASS
2-11-04/EAB/RF	2.1049	Occupied bandwidth	Y	PASS
2-11-04/EAB/RF	—	Out of band rejection	Y	PASS

Notes:

Appendix A : Test Results

Clause 22.355 Frequency Stability

Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1. - Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency range (MHz)	Base, fixed (ppm)	Mobile >3 watts (ppm)	Mobile <=3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

Test Conditions:

Sample Number:	1	Temperature (°C):	23
Date:	November 22, 2006	Humidity (%):	26
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

Test Results:

The EUT down converts and then up converts the input signal. A CW signal was injected in each direction and measured at the output. The variation of the output signal was less than +/-1Hz.

Clause 22.913 Output Power

(a) Maximum ERP. In general, the effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts.

Test Conditions:

Sample Number:	1	Temperature (°C):	23
Date:	November 22, 2006	Humidity (%):	26
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

Test Results:**Downlink:**

	869MHz	881.5MHz	894MHz
CDMA	39.23dBm	39.40dBm	39.07dBm
GSM	39.21dBm	39.37dBm	39.02dBm

Uplink:

	824MHz	836.5MHz	849MHz
CDMA	29.24dBm	29.55dBm	28.97dBm
GSM	29.35dBm	29.65dBm	29.06dBm

Measurements were performed with the filter set to 25MHz.

Measured power is at the 1dB compression point for a single carrier.

Clause 22.917 Conducted Spurious Emissions

a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Conditions:

Sample Number:	1	Temperature (°C):	23
Date:	November 22, 2006	Humidity (%):	26
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

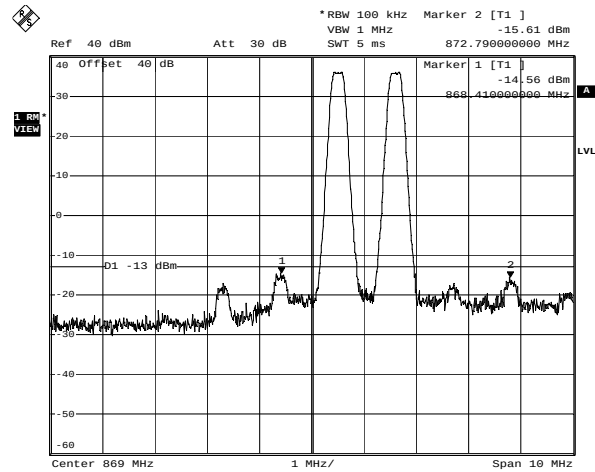
Test Results:

See Attached Plots.

Additional Observations:

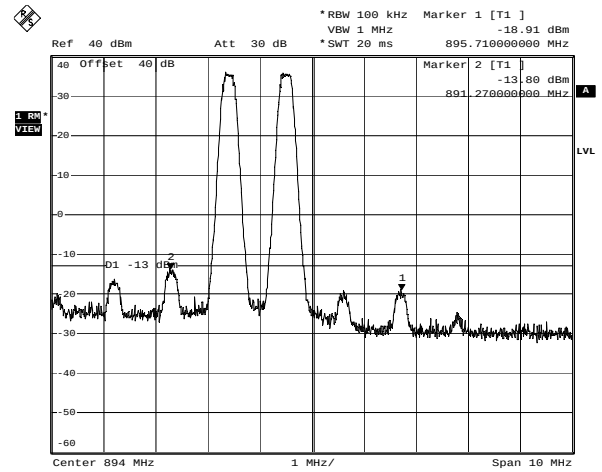
Conducted Emissions were performed on GSM and CDMA modulation on a low, middle and high channel. Only worst case for each modulation has been included.

Downlink 3rd Order Intermodulation GSM



Downlink - GSM - 3rd Order Intermodulation

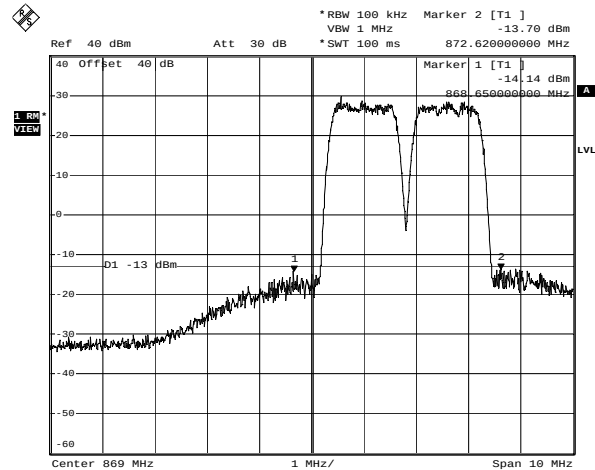
Date: 22.NOV.2006 22:07:09



Downlink - GSM - 3rd Order Intermodulation

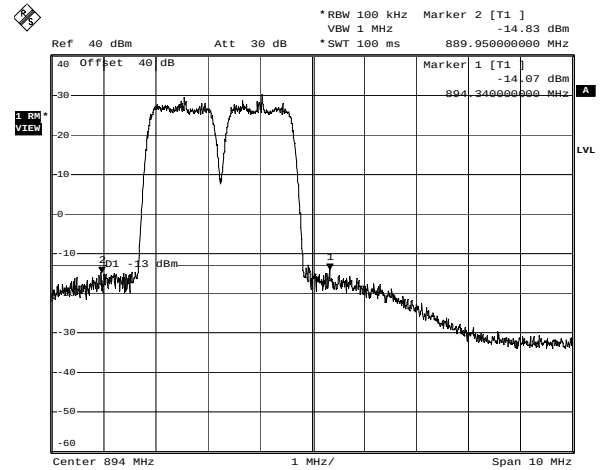
Date: 22.NOV.2006 22:09:55

CDMA



Downlink - CDMA - 3rd Order Intermodulation

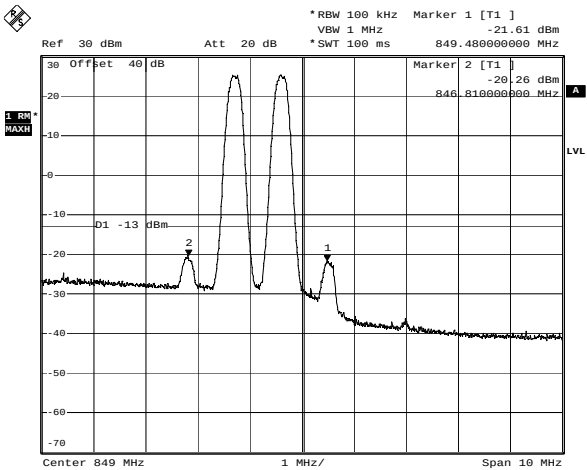
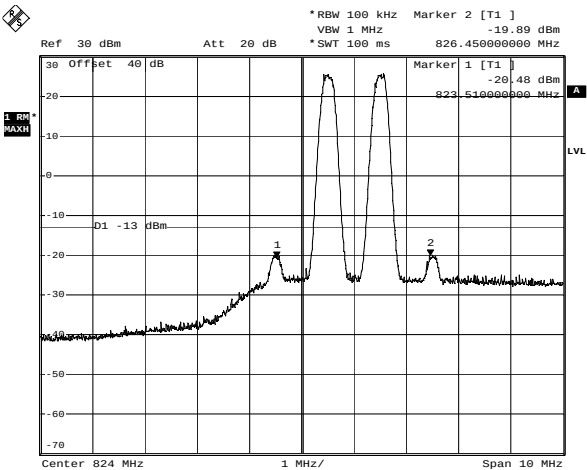
Date: 23.NOV.2006 23:38:08



Downlink - CDMA - 3rd Order Intermodulation

Date: 22.NOV.2006 22:12:49

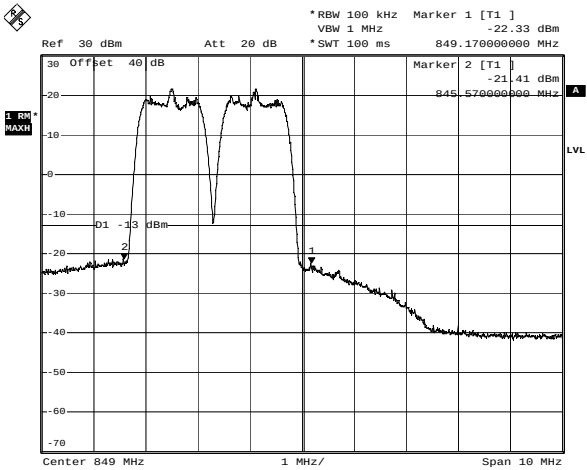
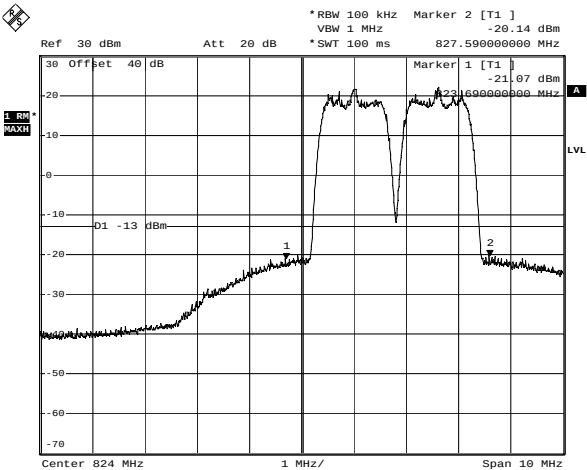
Uplink 3rd Order Intermodulation
GSM



Uplink - GSM - 3rd Order Intermodulation
Date: 22.NOV.2006 23:17:30

Uplink - GSM - 3rd Order Intermodulation
Date: 22.NOV.2006 23:15:41

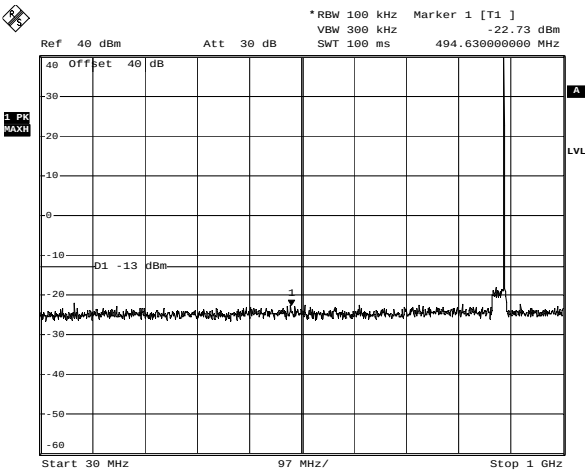
CDMA



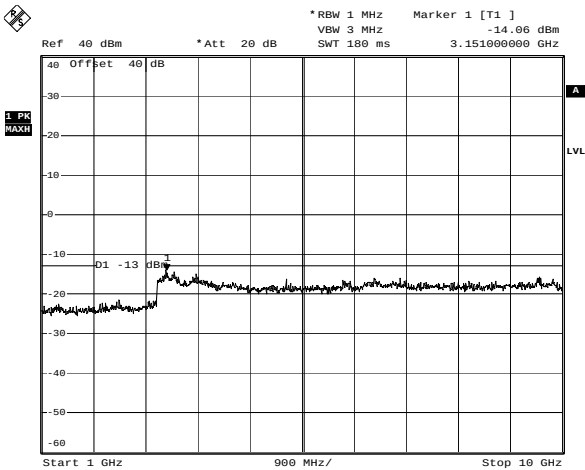
Uplink - CDMA - 3rd Order Intermodulation
Date: 22.NOV.2006 23:11:08

Uplink - CDMA - 3rd Order Intermodulation
Date: 22.NOV.2006 23:13:35

Downlink Conducted Emissions
GSM

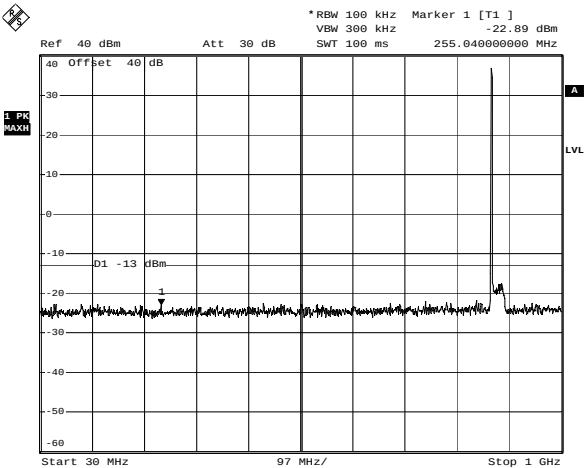


Downlink - GSM - High Channel
Date: 22.NOV.2006 21:57:57

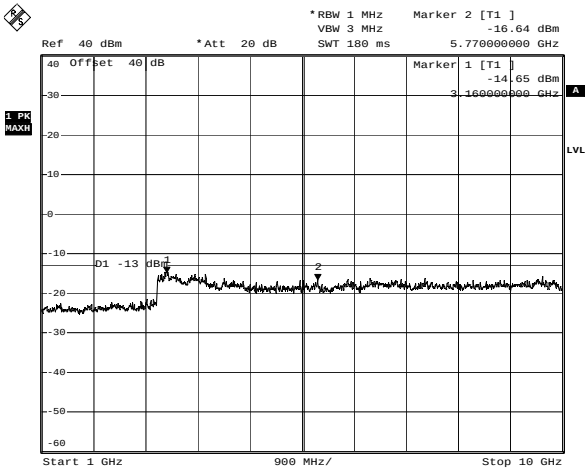


Downlink - GSM - High Channel
Date: 22.NOV.2006 21:57:16

CDMA

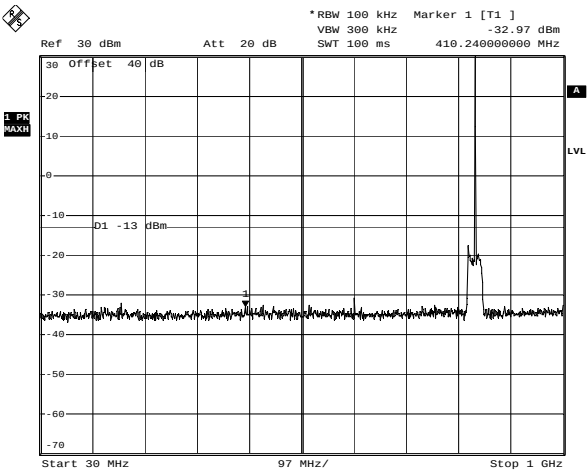


Downlink - CDMA - Low Channel
Date: 22.NOV.2006 21:52:22

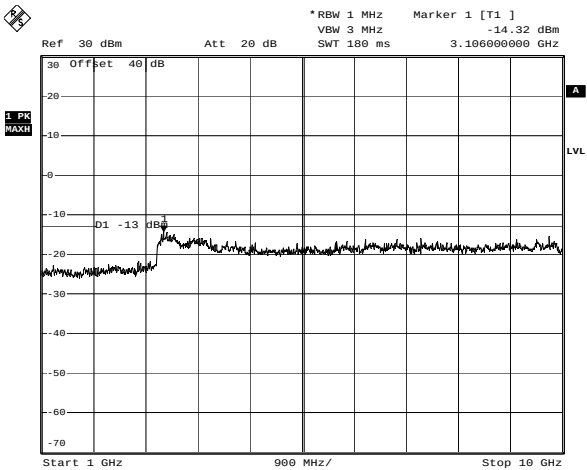


Downlink - CDMA - Low Channel
Date: 22.NOV.2006 21:53:17

Uplink Conducted Emissions
GSM

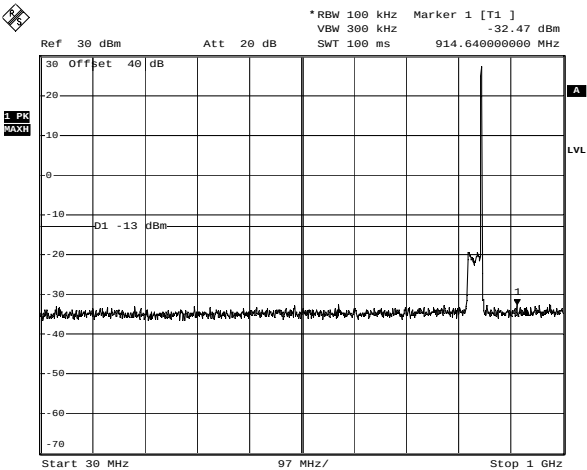


Uplink - GSM - Mid Channel
Date: 23.NOV.2006 00:12:39

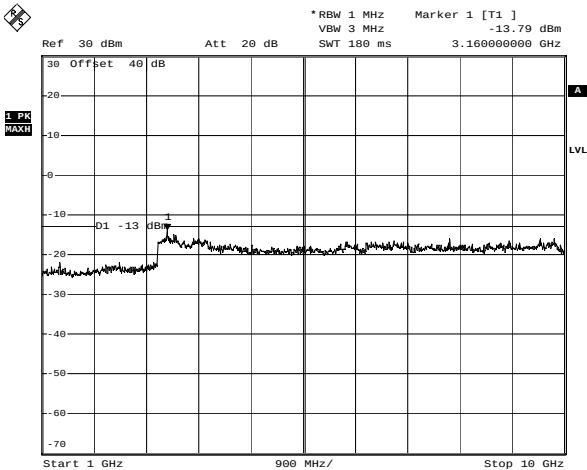


Uplink - GSM - High Channel
Date: 23.NOV.2006 00:14:06

CDMA



Uplink - CDMA - Mid Channel
Date: 23.NOV.2006 00:10:10



Uplink - CDMA - High Channel
Date: 23.NOV.2006 00:10:40

Clause 22.917 Radiated Spurious Emissions

a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

Test Conditions:

Sample Number:	1	Temperature (°C):	10
Date:	November 23, 2006	Humidity (%):	85
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	OATS

Test Results:

See Attached Table for Downlink Results.

No emissions were detected within 20dB below the limit for the Uplink direction.

Additional Observations:

The Spectrum was searched from 30MHz to 9GHz.

All measurements were performed using a Peak Detector with 100kHz RBW/VBW below 1GHz and a 1MHz RBW/VBW above 1GHz at a distance of 3 meters.

Measurements were performed on low, middle and high frequencies in each direction.

Freq. (MHz)	Ant	Pol. V/H	RCVD Signal (dBμV)	Sig. Sub. Factor	Level (dBm)	Limit (dBm)	Margin (dB)
1738.0000	Horn2	V	97.0	-117.6	-20.6	-13.0	7.6
1738.0000	Horn2	H	85.0	-117.7	-32.7	-13.0	19.7
2607.0000	Horn2	V	83.7	-122.2	-38.5	-13.0	25.5
2607.0000	Horn2	H	77.2	-123.0	-45.8	-13.0	32.8
3476.0000	Horn2	V	72.6	-117.8	-45.2	-13.0	32.2
3476.0000	Horn2	H	68.8	-119.5	-50.7	-13.0	37.7
4345.0000	Horn2	V	66.7	-113.7	-47.1	-13.0	34.1
4345.0000	Horn2	H	64.3	-113.7	-49.4	-13.0	36.4
1763.0000	Horn2	V	97.7	-117.1	-19.5	-13.0	6.5
1763.0000	Horn2	H	88.3	-116.8	-28.5	-13.0	15.5
2644.5000	Horn2	V	90.7	-122.1	-31.4	-13.0	18.4
2644.5000	Horn2	H	85.5	-123.2	-37.7	-13.0	24.7
3526.0000	Horn2	V	70.5	-117.4	-46.9	-13.0	33.9
3526.0000	Horn2	H	63.8	-119.1	-55.3	-13.0	42.3
4407.5000	Horn2	V	63.7	-113.5	-49.8	-13.0	36.8
4407.5000	Horn2	H	61.5	-112.9	-51.4	-13.0	38.4
1788.0000	Horn2	V	94.7	-116.7	-22.0	-13.0	9.0
1788.0000	Horn2	H	85.0	-115.9	-30.9	-13.0	17.9
2682.0000	Horn2	V	90.3	-122.0	-31.6	-13.0	18.6
2682.0000	Horn2	H	82.5	-123.3	-40.8	-13.0	27.8
3576.0000	Horn2	V	65.0	-116.9	-51.9	-13.0	38.9
3576.0000	Horn2	H	64.8	-118.5	-53.7	-13.0	40.7
4470.0000	Horn2	V	62.7	-113.3	-50.6	-13.0	37.6
4470.0000	Horn2	H	61.2	-112.1	-50.9	-13.0	37.9
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole							

Clause 2-11-04/EAB/RF Occupied Bandwidth

Using an RBW of 300Hz or 1% of the emission bandwidth, The spectral shape of the output should look similar to the input for all modulations.

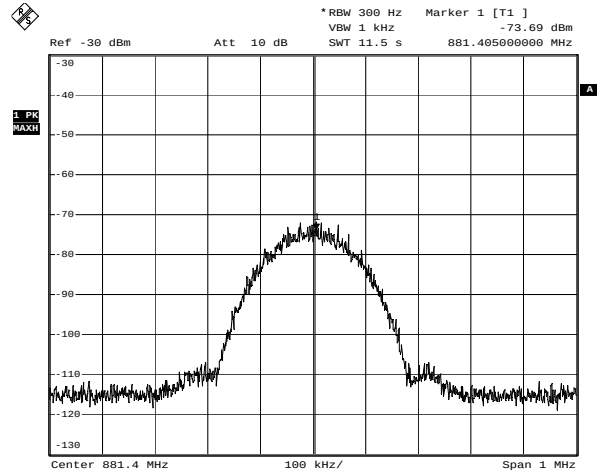
Test Conditions:

Sample Number:	1	Temperature (°C):	23
Date:	November 22, 2006	Humidity (%):	26
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

Test Results:

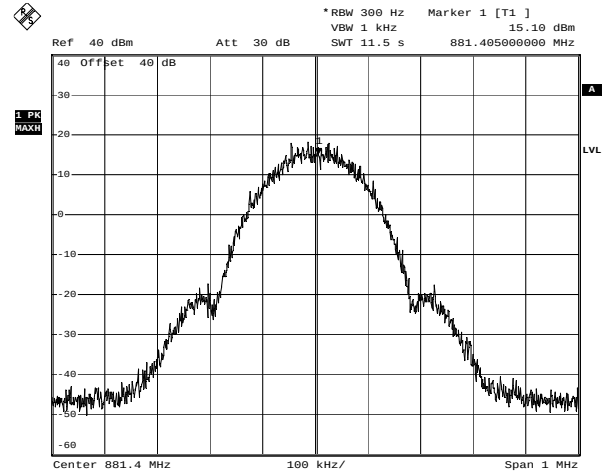
See Attached Plots.

Downlink: GSM



Downlink - GSM - Input

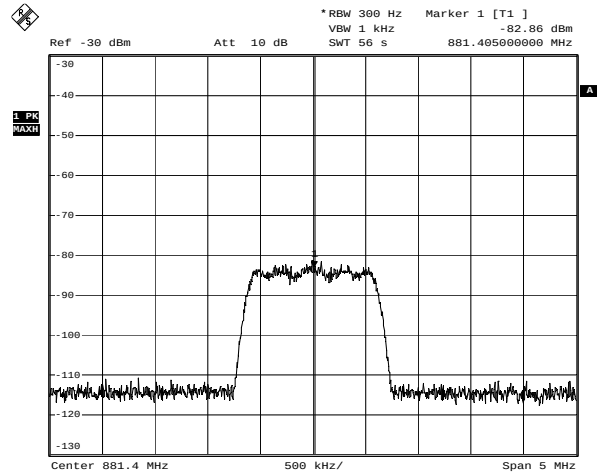
Date: 22.NOV.2006 21:26:55



Downlink - GSM - Output

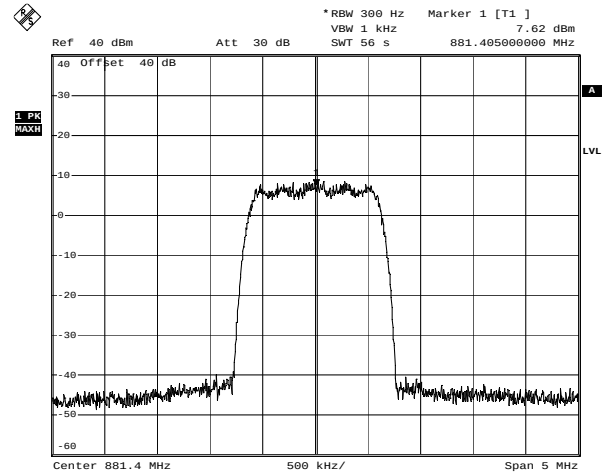
Date: 22.NOV.2006 21:24:16

CDMA



Downlink - CDMA - Input

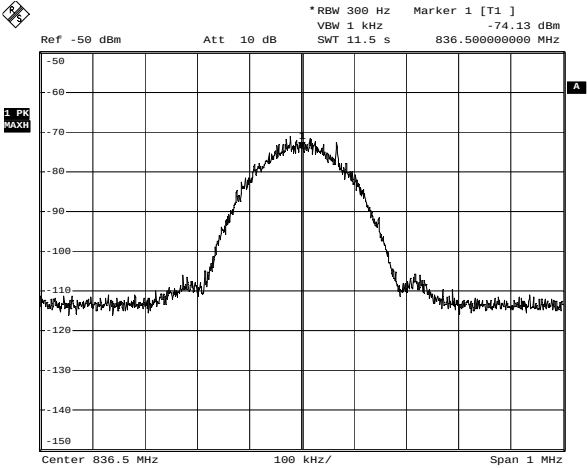
Date: 22.NOV.2006 21:29:53



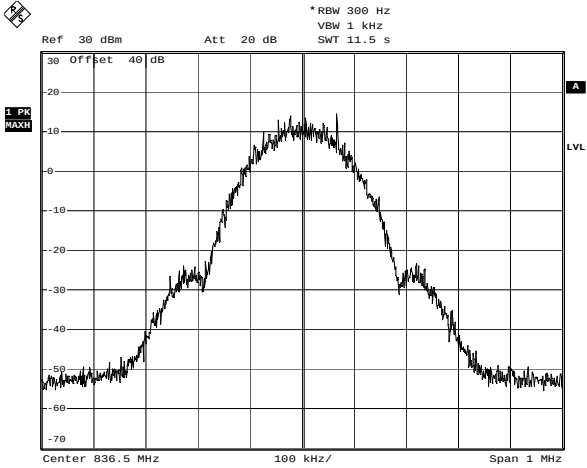
Downlink - CDMA - Output

Date: 22.NOV.2006 21:22:42

Uplink:
GSM

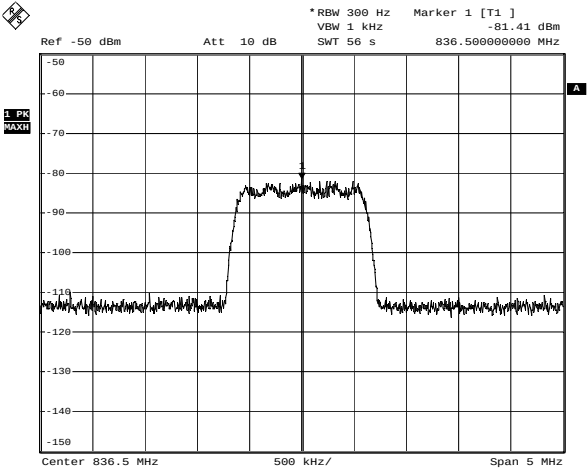


Uplink - GSM Input
Date: 22.NOV.2006 23:57:08

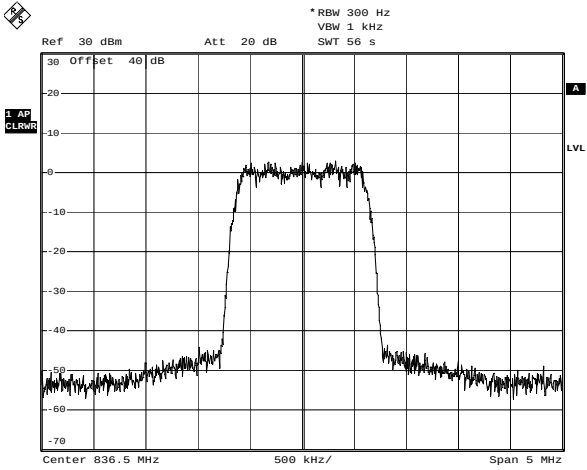


Uplink - GSM Output
Date: 22.NOV.2006 23:38:29

CDMA



Uplink - CDMA Input
Date: 22.NOV.2006 23:52:27



Uplink - CDMA Output
Date: 22.NOV.2006 23:42:30

Clause 2-11-04/EAB/RF Out of Band Rejection

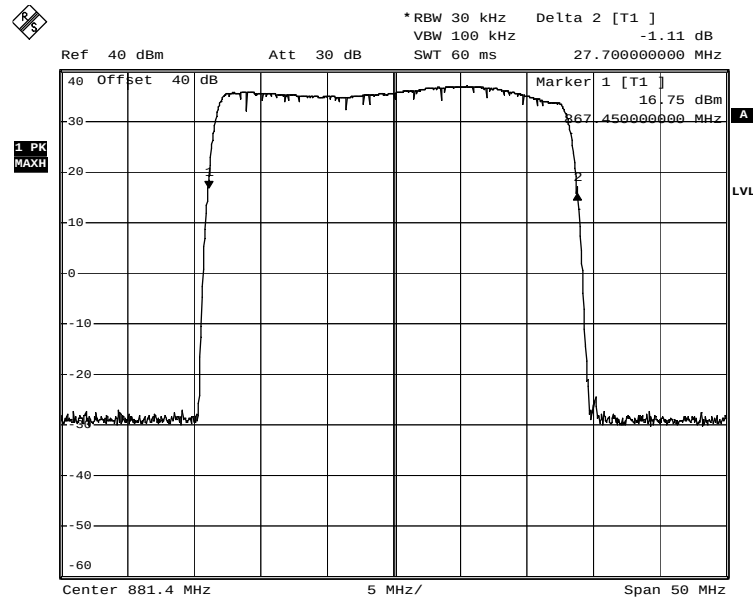
Plots showing the filter frequency response.
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Test Conditions:

Sample Number:	1	Temperature (°C):	23
Date:	November 22, 2006	Humidity (%):	26
Modification State:	0	Tester:	Jason Nixon
		Laboratory:	Wireless

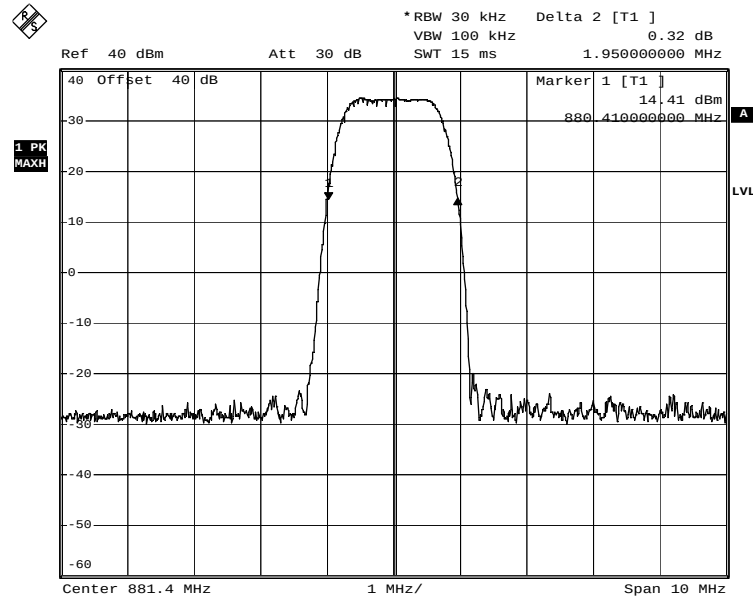
Test Results:

See Attached Plots.

**Downlink:
25MHz Filter**

Downlink - Band Reject - 25MHz Filter

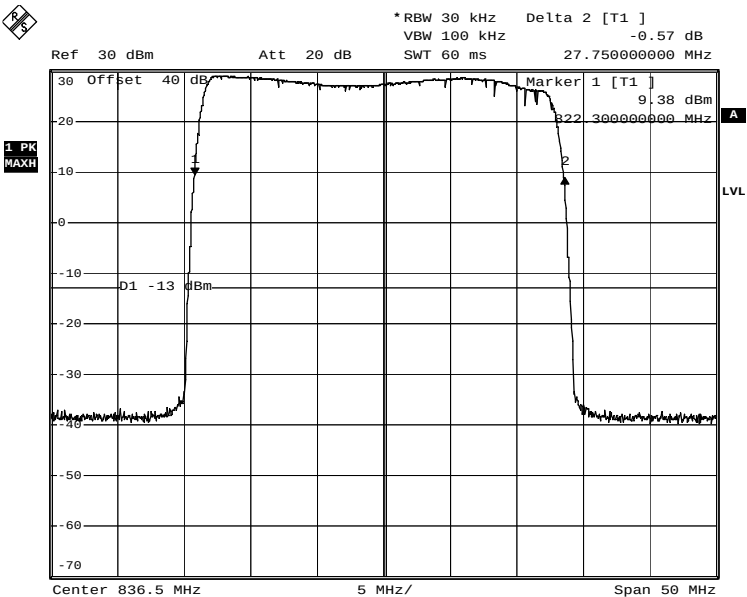
Date: 22.NOV.2006 20:11:29

1.5MHz Filter

Downlink - Band Reject - 1.2MHz Filter

Date: 22.NOV.2006 20:13:05

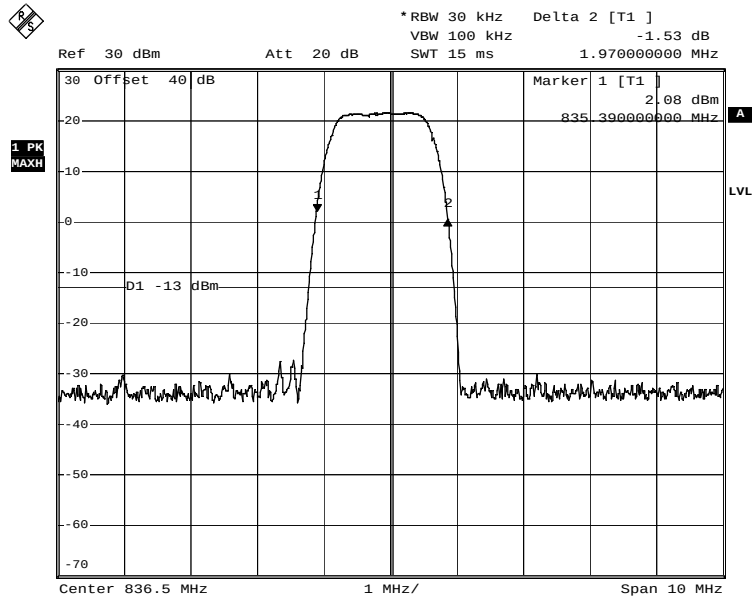
Uplink:
25MHz Filter



Uplink - Out-of-Band Reject - 25MHz Filter

Date: 22.NOV.2006 23:33:04

1.5MHz Filter



Uplink - Out-of-Band Reject - 1.2MHz Filter

Date: 22.NOV.2006 23:34:54

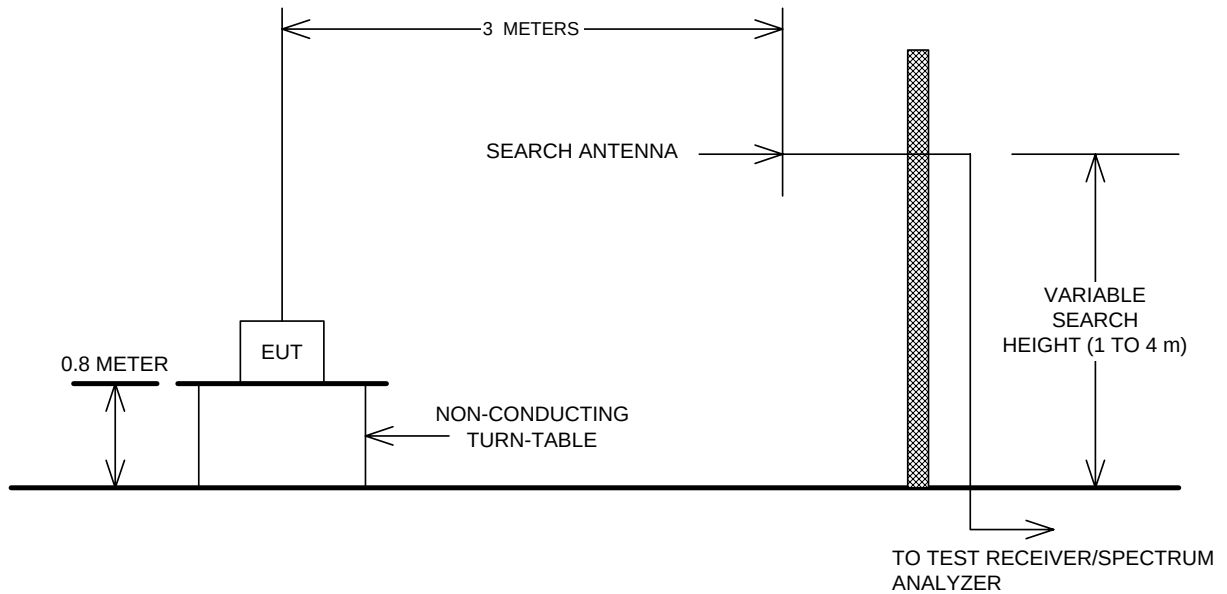
Appendix B : Setup Photographs

Radiated Spurious Emissions Setup:



Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions



Conducted Emissions, Output power, Occupied Bandwidth and Out of Band Rejection

