



Nemko Test Report: 41238RUS1

Applicant: Andrew Corporation
620 N. Greenfield Parkway
Garner, NC 27529
USA

**Equipment Under Test:
(E.U.T.)** MR1718

FCC Identifier: BCR-MR1718

In Accordance With: **CFR 47, Part 27, Subpart C**
Miscellaneous Wireless Communication Services

Tested By: Nemko USA, Inc.
802 N. Kealy
Lewisville, TX 75057-3136

TESTED BY:

David Light, Senior Wireless Engineer

DATE: 27 January 2010

APPROVED BY:

Tom Tidwell, Telecom Direct

DATE: 29 January 2010

Number of Pages: 34

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Section 1. Summary of Test Results

Manufacturer Andrew Corporation

Model No.: MR1718

Serial No.: 10

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with CFR 47, Part 27, Subpart C.

☐

New Submission

☒

Production Unit

☒

Class II Permissive Change

☐

Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See "Summary of Test Data".

Reason for Class II change: Gain has been increased from 70 dB to 78 dB. Output power remains at 22 dBm. The gain of the amplifier is increased by the removal of attenuation in the system. There was no degradation in the performance of the device.



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Summary Of Test Data

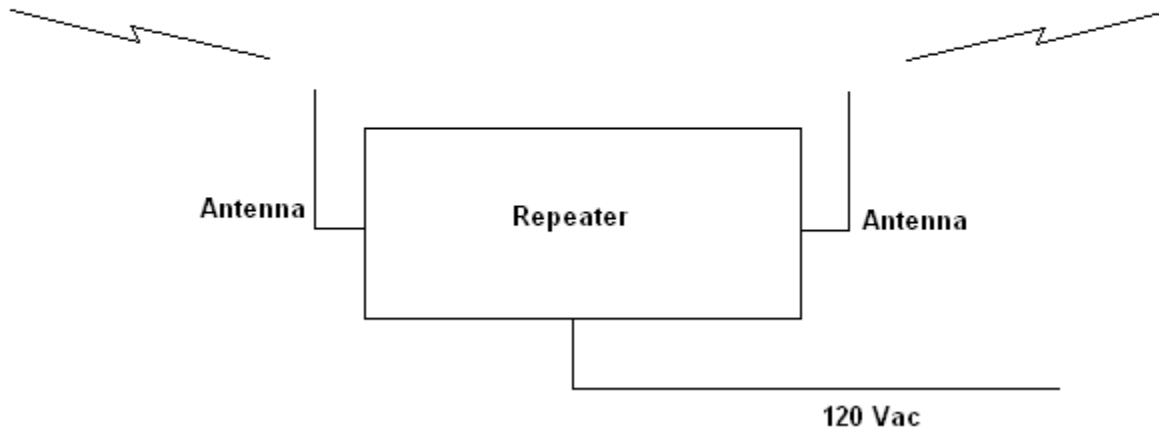
NAME OF TEST	PARA. NO.	SPEC.	RESULT
RF Power Output	27.50(d)	1640 Watts	Not tested
Occupied Bandwidth	2.1049	Input/Output	Complies
Spurious Emissions at Antenna Terminals	27.53(g)	-13 dBm	Complies
Field Strength of Spurious Emissions	27.53(g)	-13 dBm E.I.R.P.	Not tested
Frequency Stability	27.54	Must stay in band	NA

Section 2. General Equipment Specification

Supply Voltage Input:	120 Vac				
Frequency Bands: Downlink:	2110 to 2155 MHz				
Frequency Bands: Uplink:	1710 to 1755 MHz				
Type of Modulation and Designator:	CDMA (F9W) <input checked="" type="checkbox"/>	GSM (GXW) <input type="checkbox"/>	NADC (DXW) <input type="checkbox"/>	W-CDMA (F9W) <input checked="" type="checkbox"/>	EDGE (G7W) <input type="checkbox"/>
System Gain:	78 dB				
Output Impedance:	50 ohms				
RF Output (Rated): Downlink	$\frac{0.158}{22}$ W dBm				
RF Output (Rated): Uplink	$\frac{0.158}{22}$ W dBm				
Frequency Translation:	F1-F1 <input checked="" type="checkbox"/>	F1-F2 <input type="checkbox"/>	N/A <input type="checkbox"/>		
Band Selection:	Software <input checked="" type="checkbox"/>	Duplexer <input type="checkbox"/>	Fullband <input type="checkbox"/>		

Description of EUT

The miniRepeaters are bi-directional amplifiers used to enhance signals between a mobile and a base station in a wireless network. They have been designed to increase signal strength in small and medium sized areas such as offices, shops, basements and manufacturing facilities. This system employs a variable 25 MHz bandwidth filter.

System Diagram

Section 3. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 27 January 2010

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1036-1082-1472

Measurement Uncertainty: 1X10⁻⁷ ppm

Temperature: 22 °C

Relative Humidity: 48 %

Test Data – Occupied Bandwidth

CDMA/EV-DO

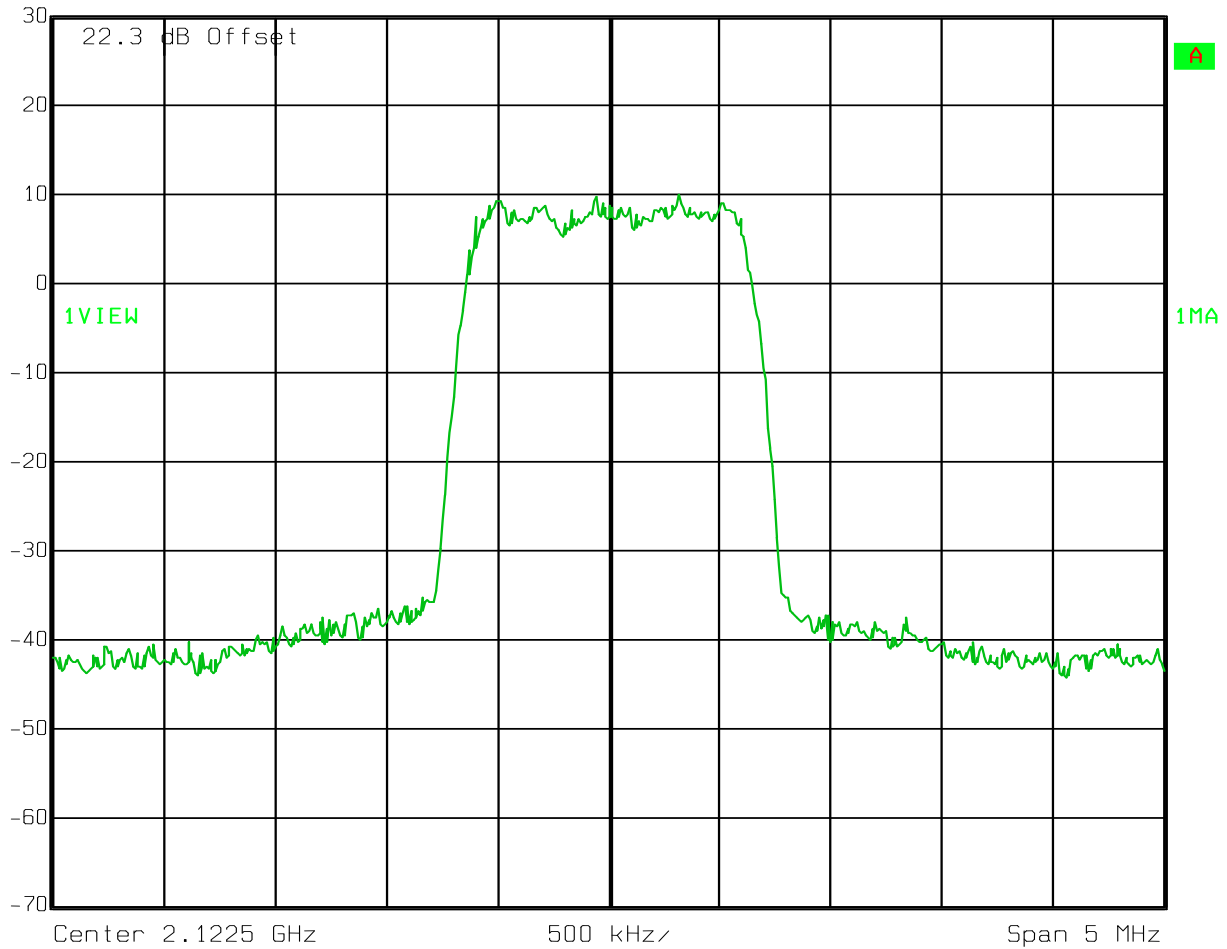
Output

Downlink



Ref Lvl
30 dBm

RBW	30 kHz	RF Att	20 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 27.JAN.2010 14:44:25

Test Data – Occupied Bandwidth

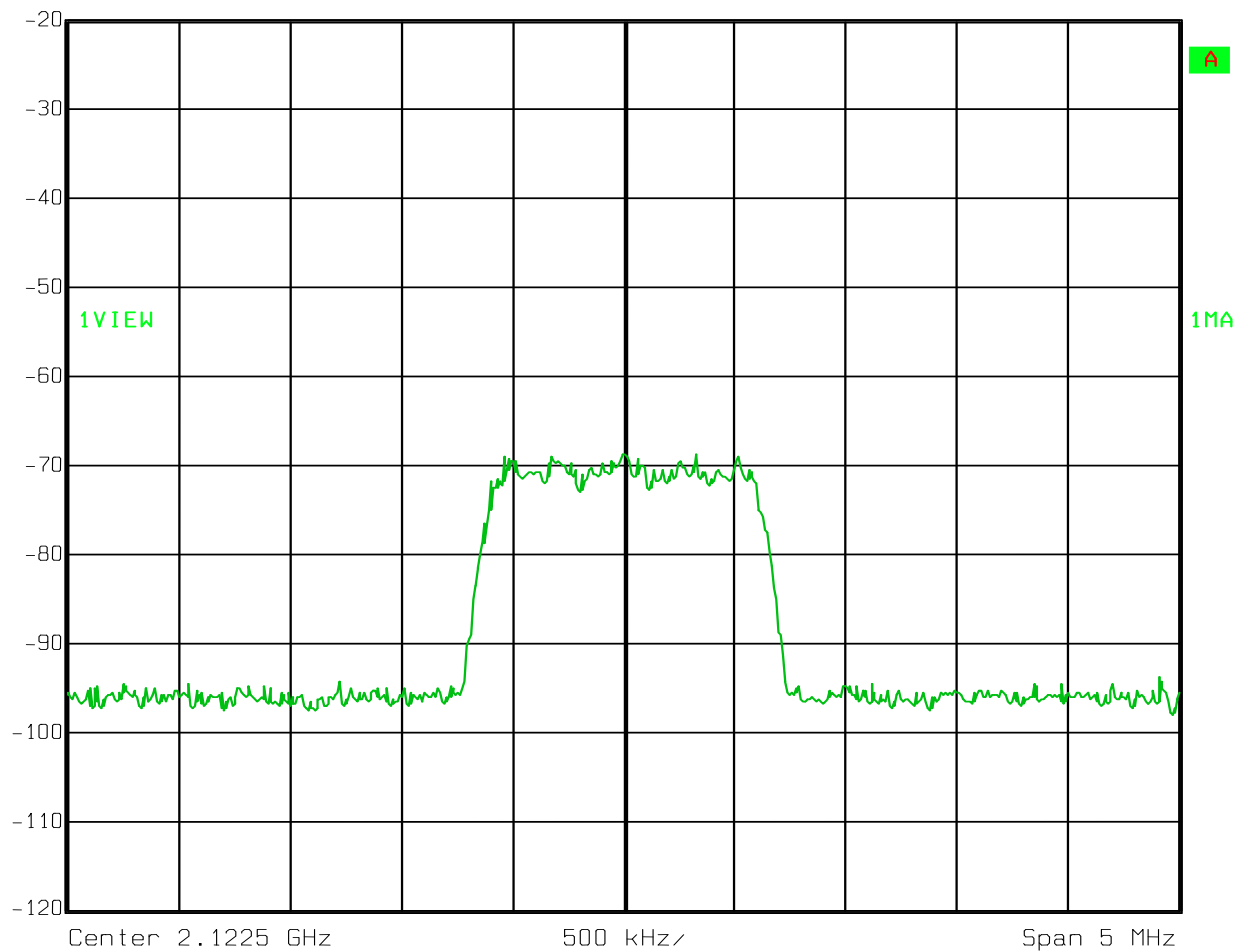
CDMA/EV-DO

Input

Downlink

Ref Lvl
-20 dBm

RBW	30 kHz	RF Att	10 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 27.JAN.2010 15:01:33

Test Data – Occupied Bandwidth

CDMA/EV-DO

Output

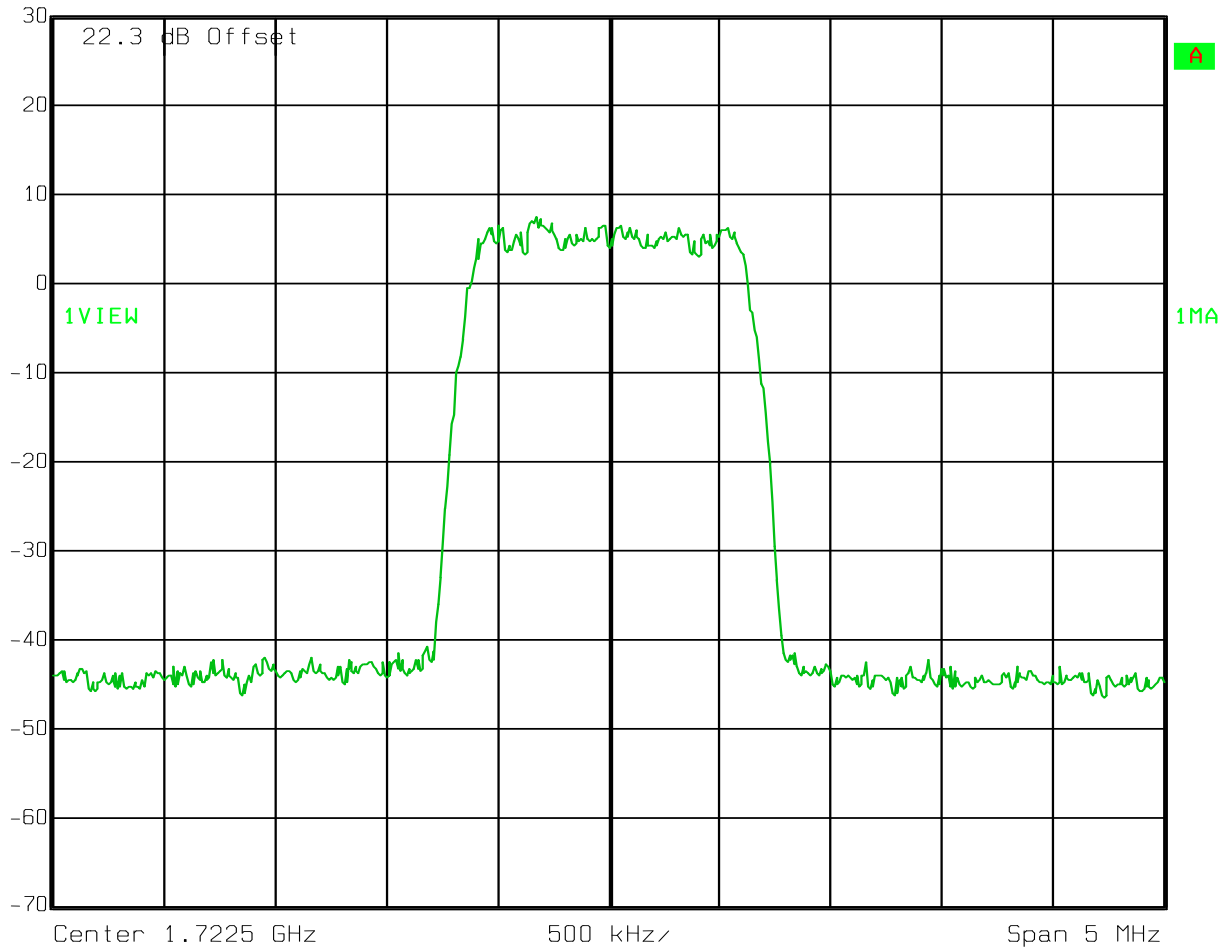
Uplink



Ref Lvl

30 dBm

RBW	30 kHz	RF Att	20 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 27.JAN.2010 15:07:10

Test Data – Occupied Bandwidth

CDMA/EV-DO

Input

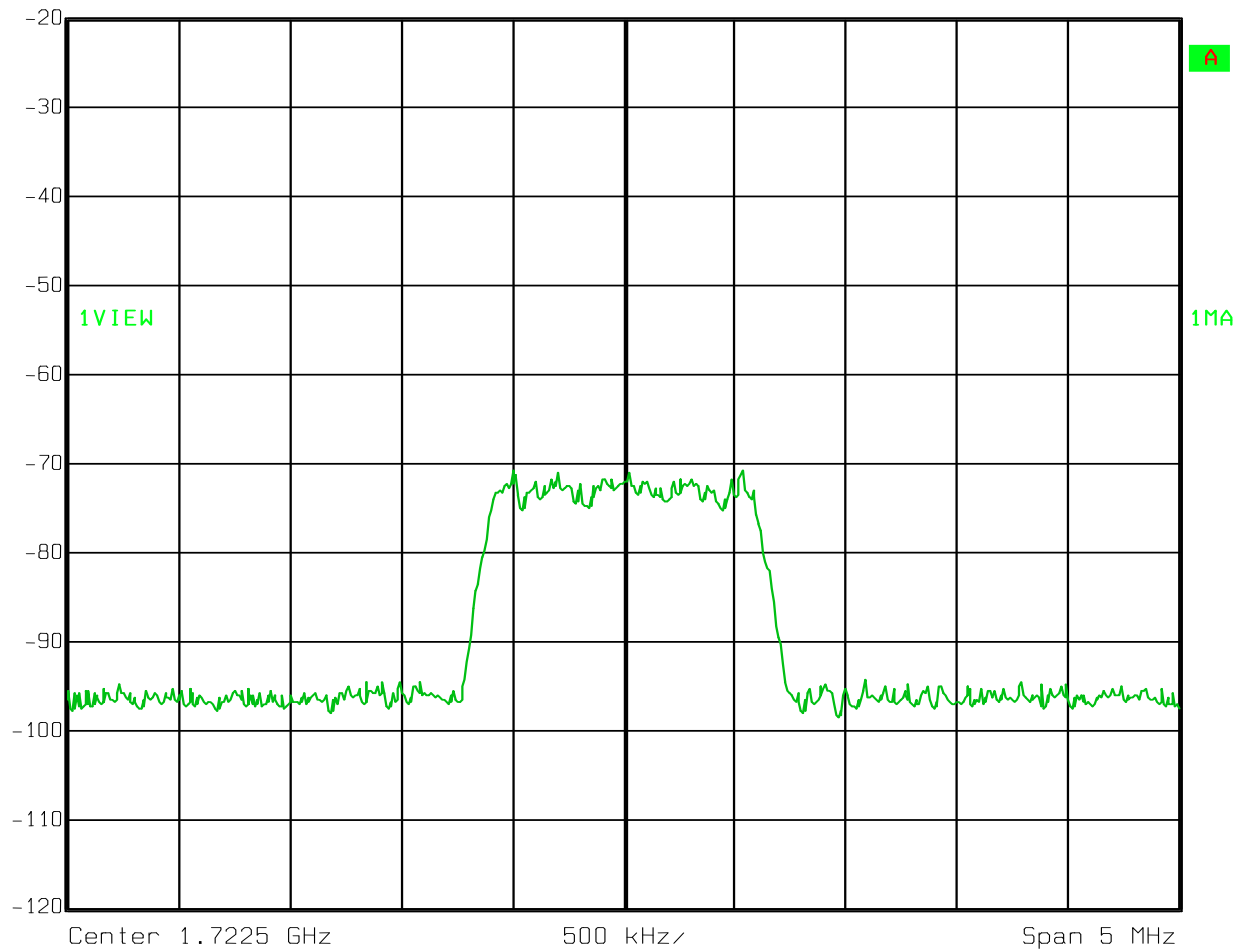
Uplink



Ref Lvl

-20 dBm

RBW	30 kHz	RF Att	10 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 27.JAN.2010 15:04:48

Test Data – Occupied Bandwidth

WCDMA/UMTS

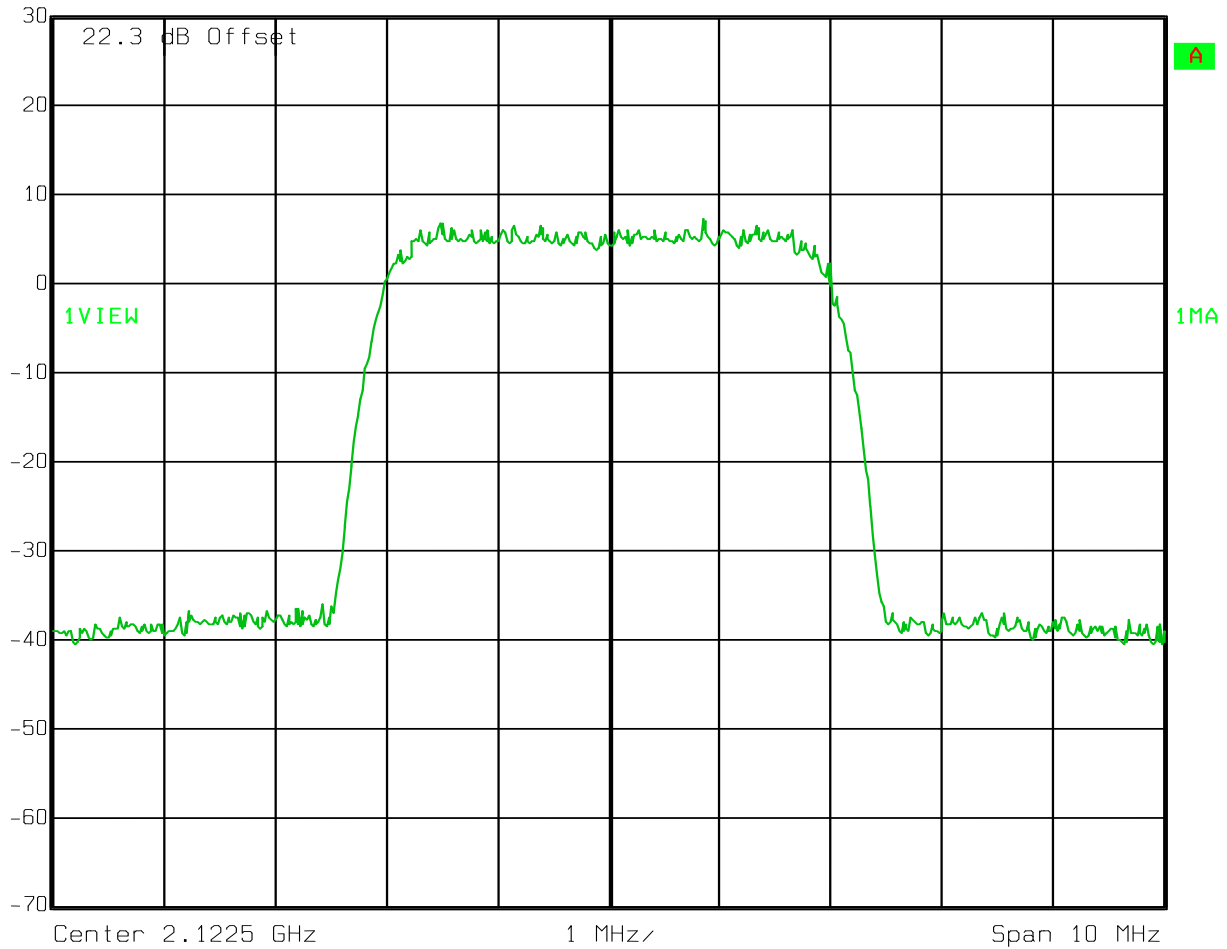
OUTPUT

Downlink



Ref Lvl
30 dBm

RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	10 ms	Unit	dBm



Date: 27.JAN.2010 14:46:42

Test Data – Occupied Bandwidth

WCDMA/UMTS

INPUT

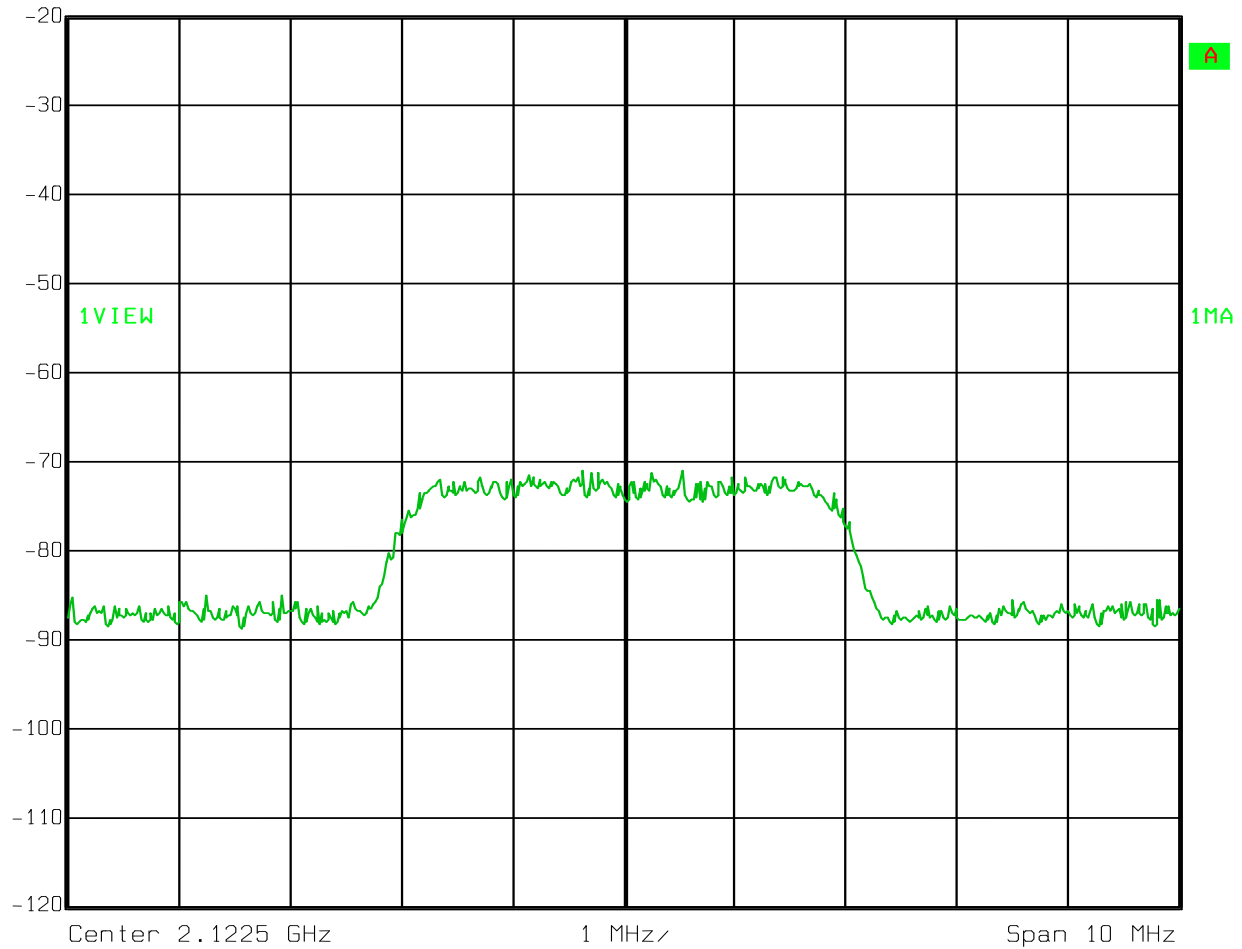
Downlink



Ref Lvl

-20 dBm

RBW	50 kHz	RF Att	10 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	10 ms	Unit	dBm



Date: 27.JAN.2010 15:02:28

Test Data – Occupied Bandwidth

WCDMA/UMTS

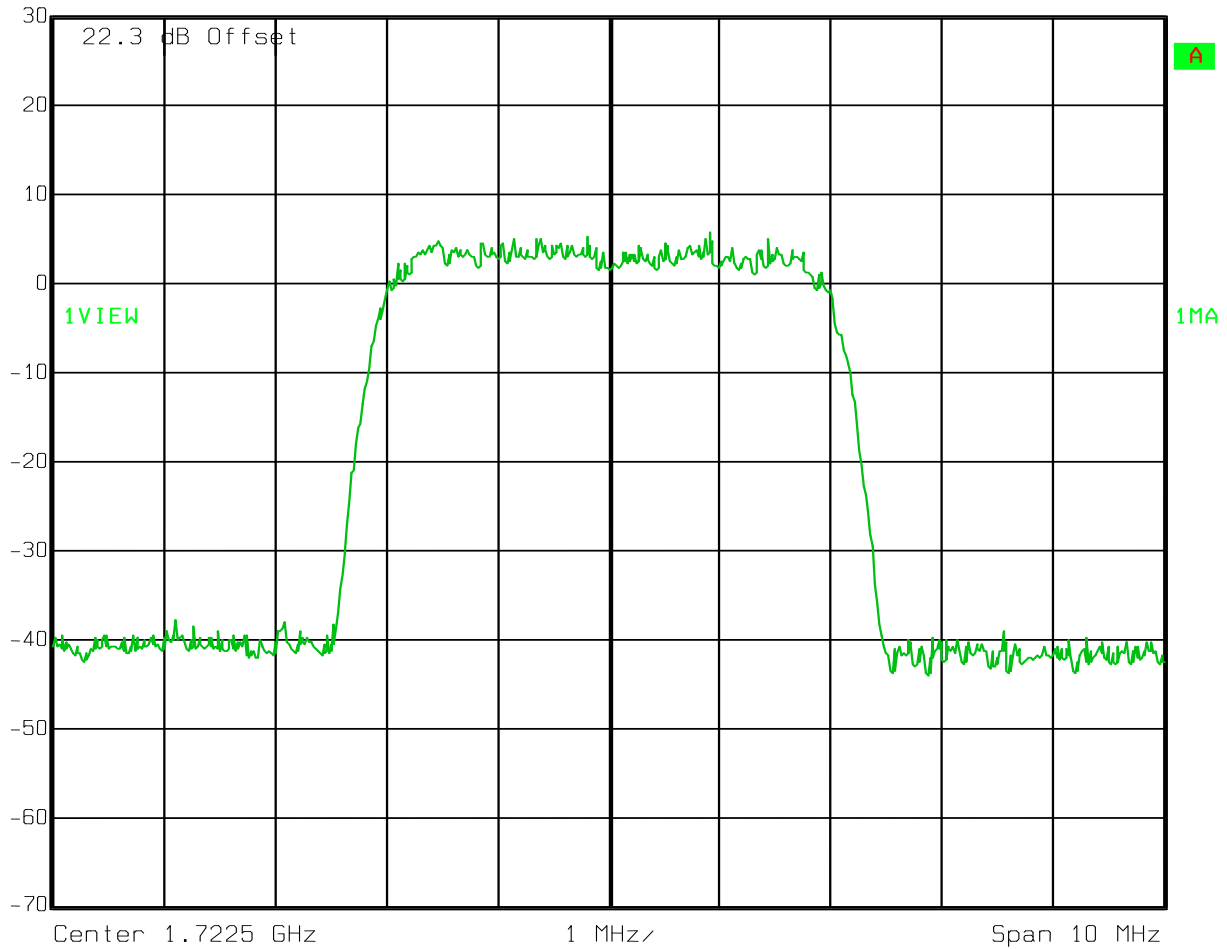
OUTPUT

Uplink



Ref Lvl
30 dBm

RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	10 ms	Unit	dBm



Date: 27.JAN.2010 15:07:53

Test Data – Occupied Bandwidth

WCDMA/UMTS

INPUT

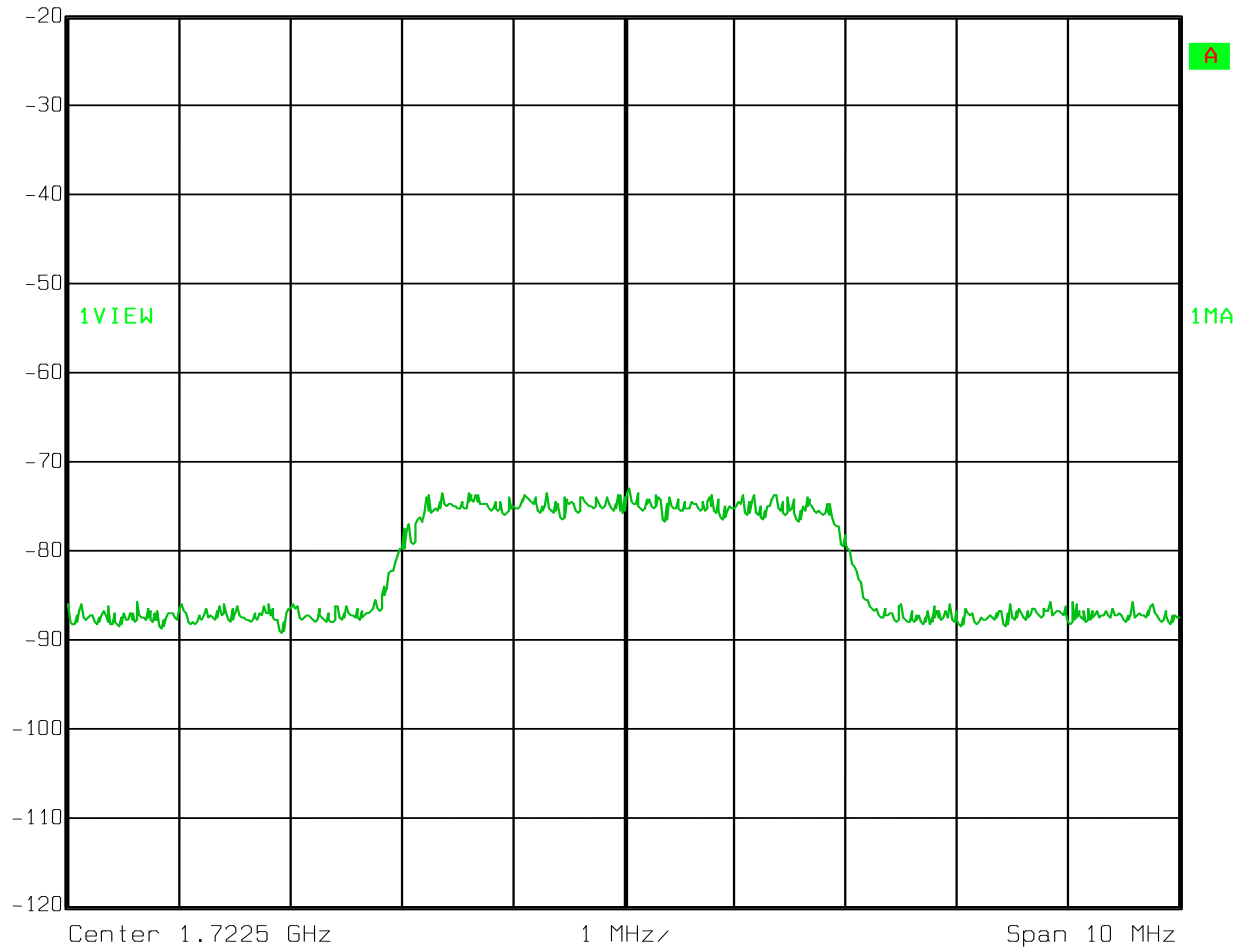
Uplink



Ref Lvl

-20 dBm

RBW	50 kHz	RF Att	10 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	10 ms	Unit	dBm



Date: 27.JAN.2010 15:03:46

Section 4. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 27.53
TESTED BY: David Light	DATE: 27 January 2010

Test Results: Complies.

Test Data: See attached plot(s).

Equipment Used: 1036-1082-1472

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 48 %

Test Data – Spurious Emissions at Antenna Terminals

CDMA/EV-DO

LOW BANDEDGE

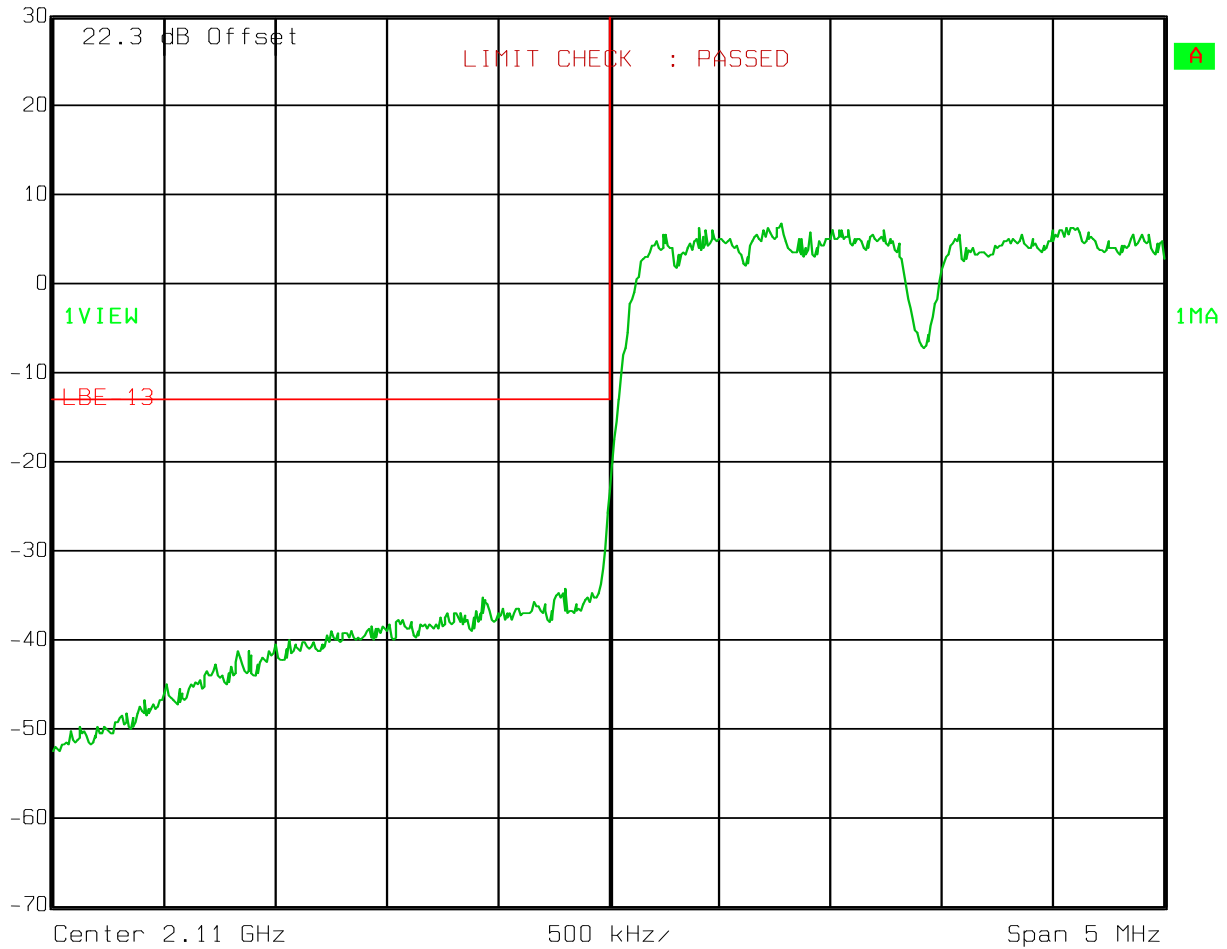
Downlink



Ref Lvl

30 dBm

RBW	30 kHz	RF Att	20 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 27.JAN.2010 14:51:46

Test Data – Spurious Emissions at Antenna Terminals

CDMA/EV-DO

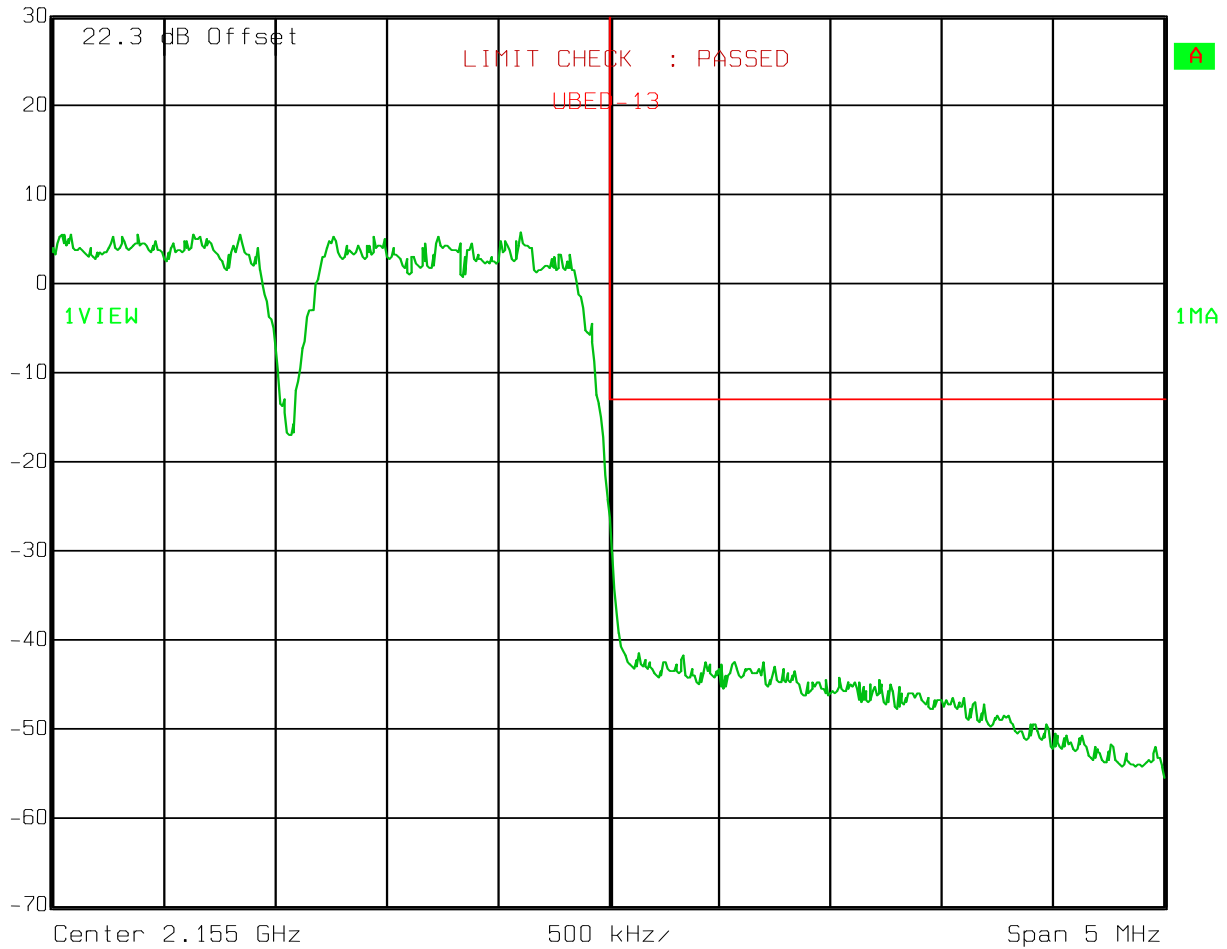
HIGH BAND EDGE

Downlink



Ref Lvl
30 dBm

RBW	30 kHz	RF Att	20 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 27.JAN.2010 15:35:00

Test Data – Spurious Emissions at Antenna Terminals

CDMA/EV-DO

LOW BANDEDGE

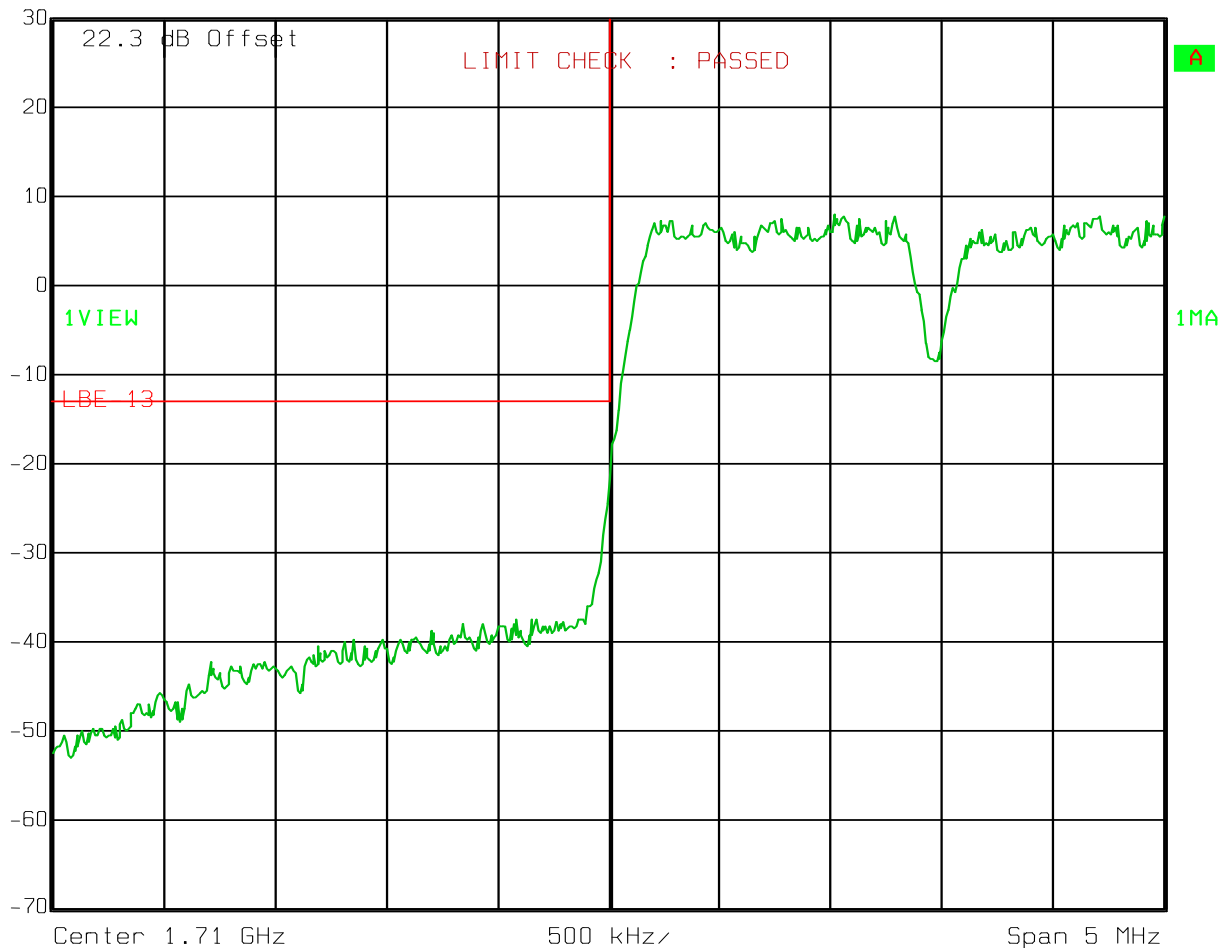
Uplink



Ref Lvl

30 dBm

RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	5 ms	Unit	dBm



Date: 27.JAN.2010 15:10:12

Test Data – Spurious Emissions at Antenna Terminals

CDMA/EV-DO

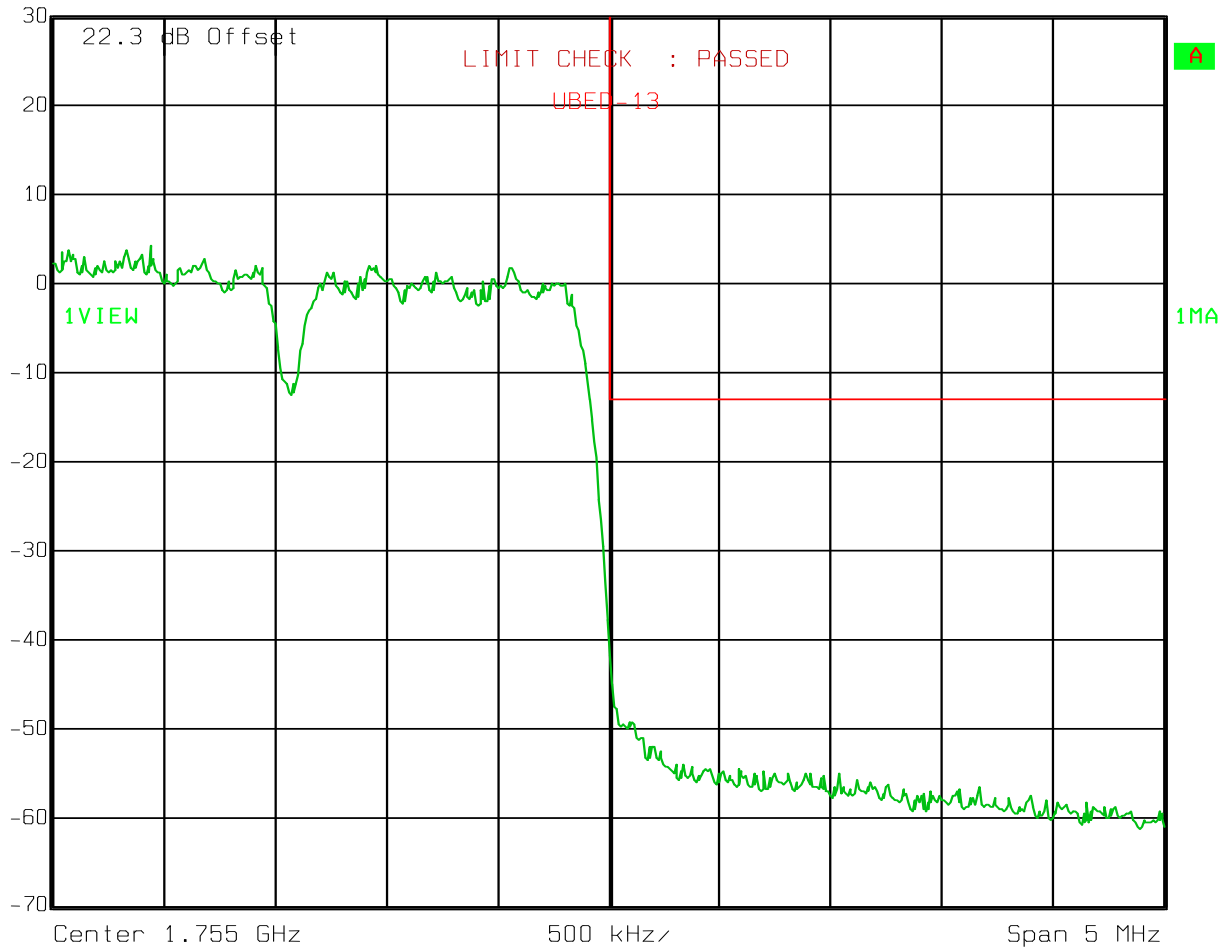
HIGH BAND EDGE

Uplink



Ref Lvl
30 dBm

RBW	30 kHz	RF Att	20 dB
VBW	30 kHz	Mixer	-10 dBm
SWT	14 ms	Unit	dBm



Date: 27.JAN.2010 15:32:40

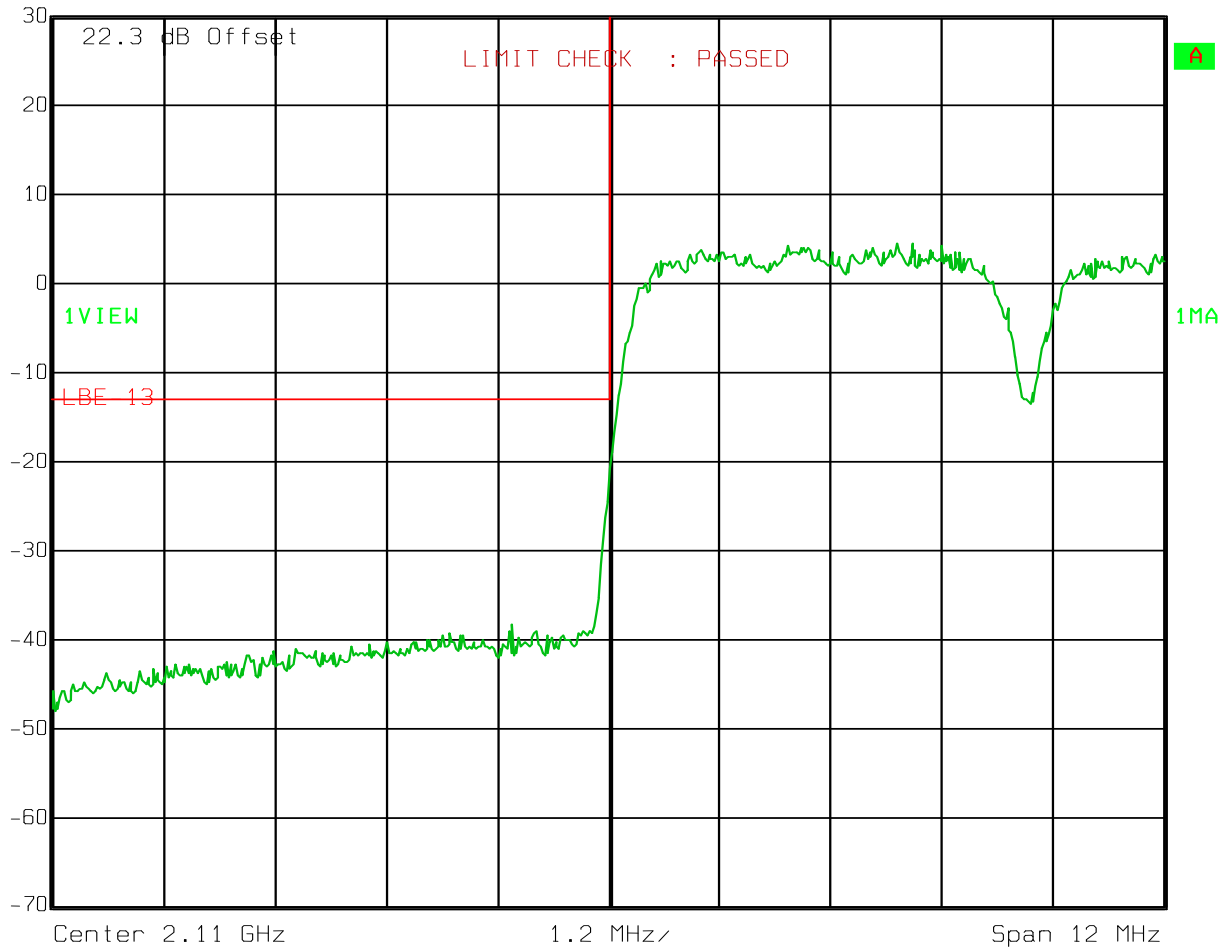
Test Data – Spurious Emissions at Antenna Terminals

WCDMA/UMTS
LOW BANDEDGE
Downlink



Ref Lvl
30 dBm

RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	12 ms	Unit	dBm



Date: 27.JAN.2010 14:55:08

Test Data – Spurious Emissions at Antenna Terminals

WCDMA/UMTS

HIGH BAND EDGE

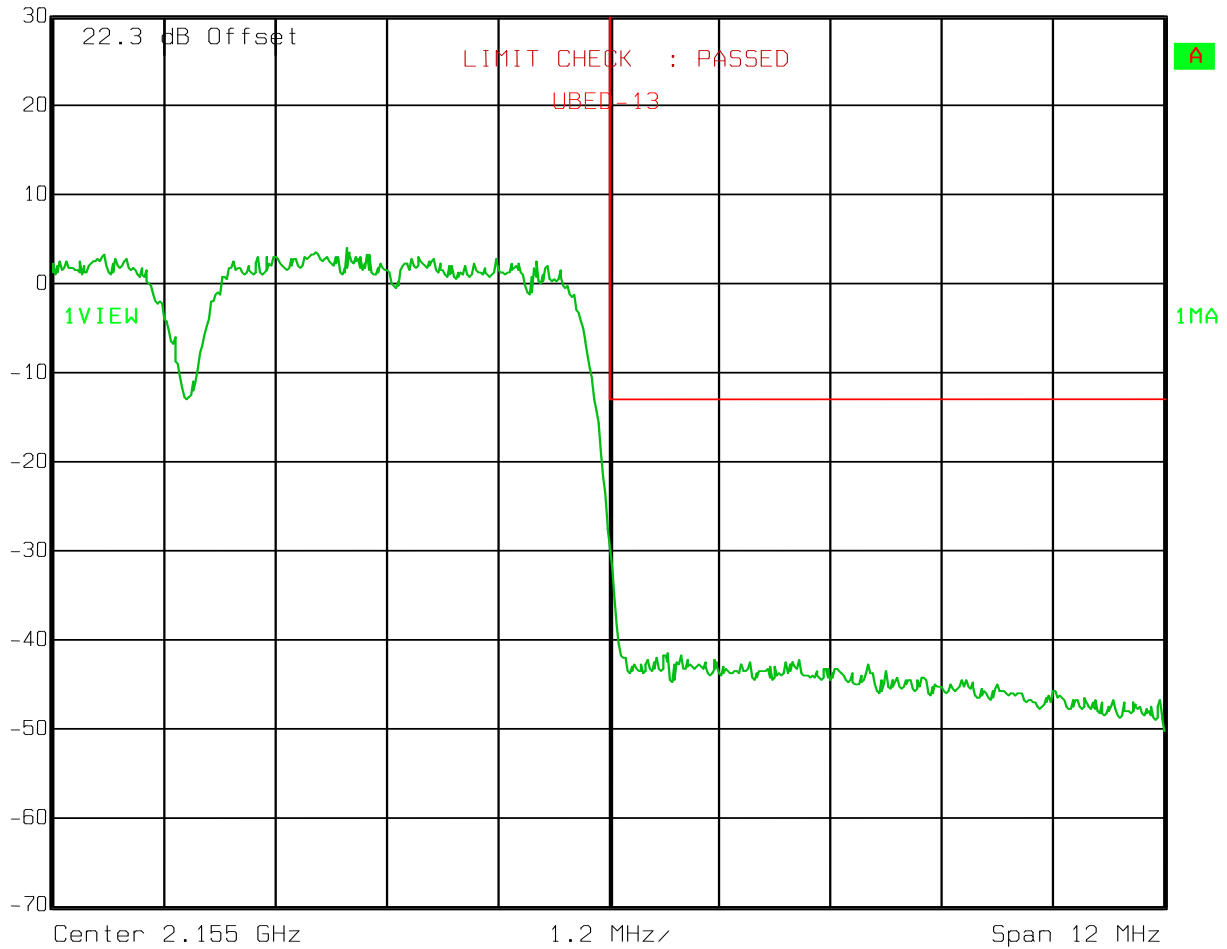
Downlink



Ref Lvl

30 dBm

RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	12 ms	Unit	dBm



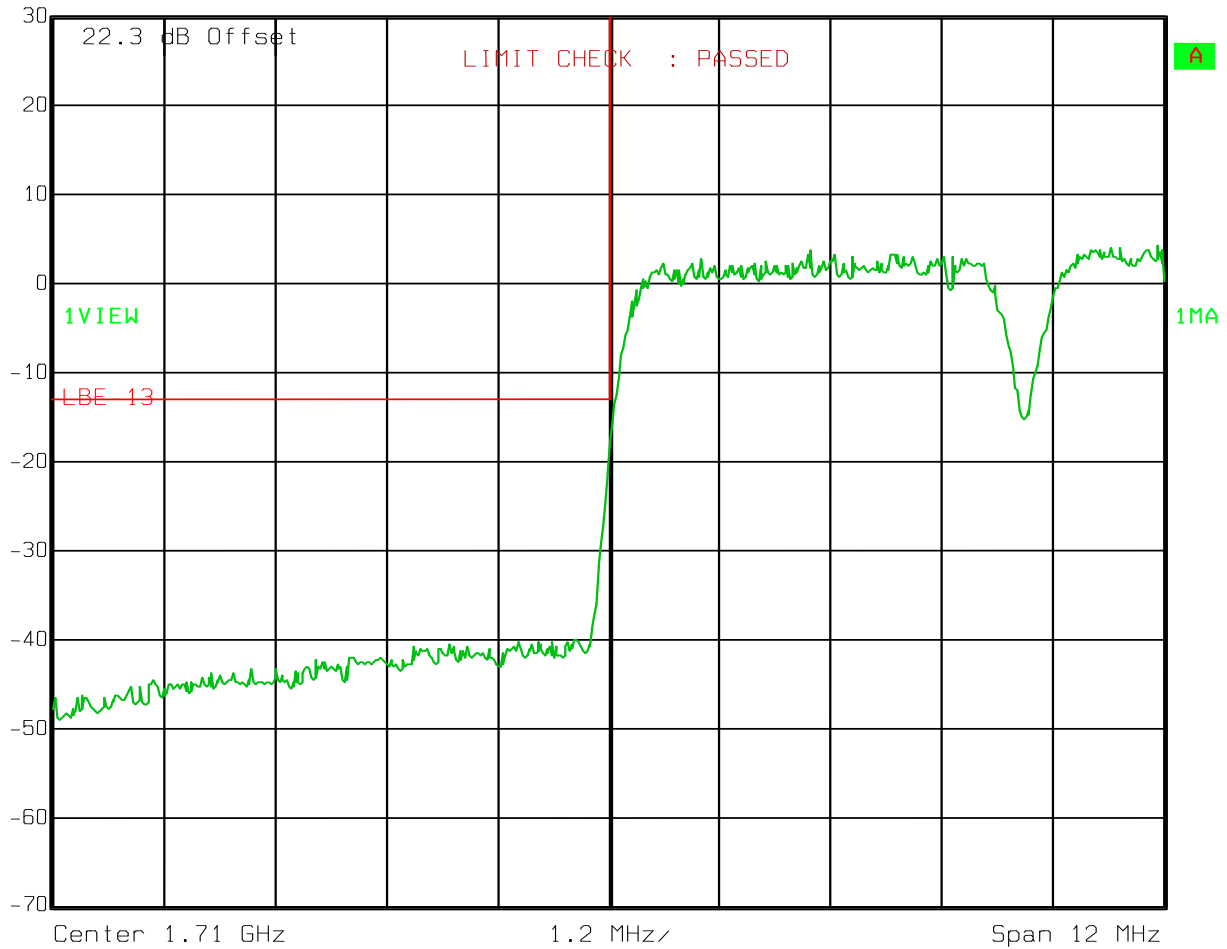
Date: 27.JAN.2010 15:36:32

Test Data – Spurious Emissions at Antenna TerminalsWCDMA/UMTS
LOW BANDEDGE

Uplink

Ref Lvl
30 dBm

RBW	50 kHz	RF Att	20 dB
VBW	50 kHz	Mixer	-10 dBm
SWT	12 ms	Unit	dBm



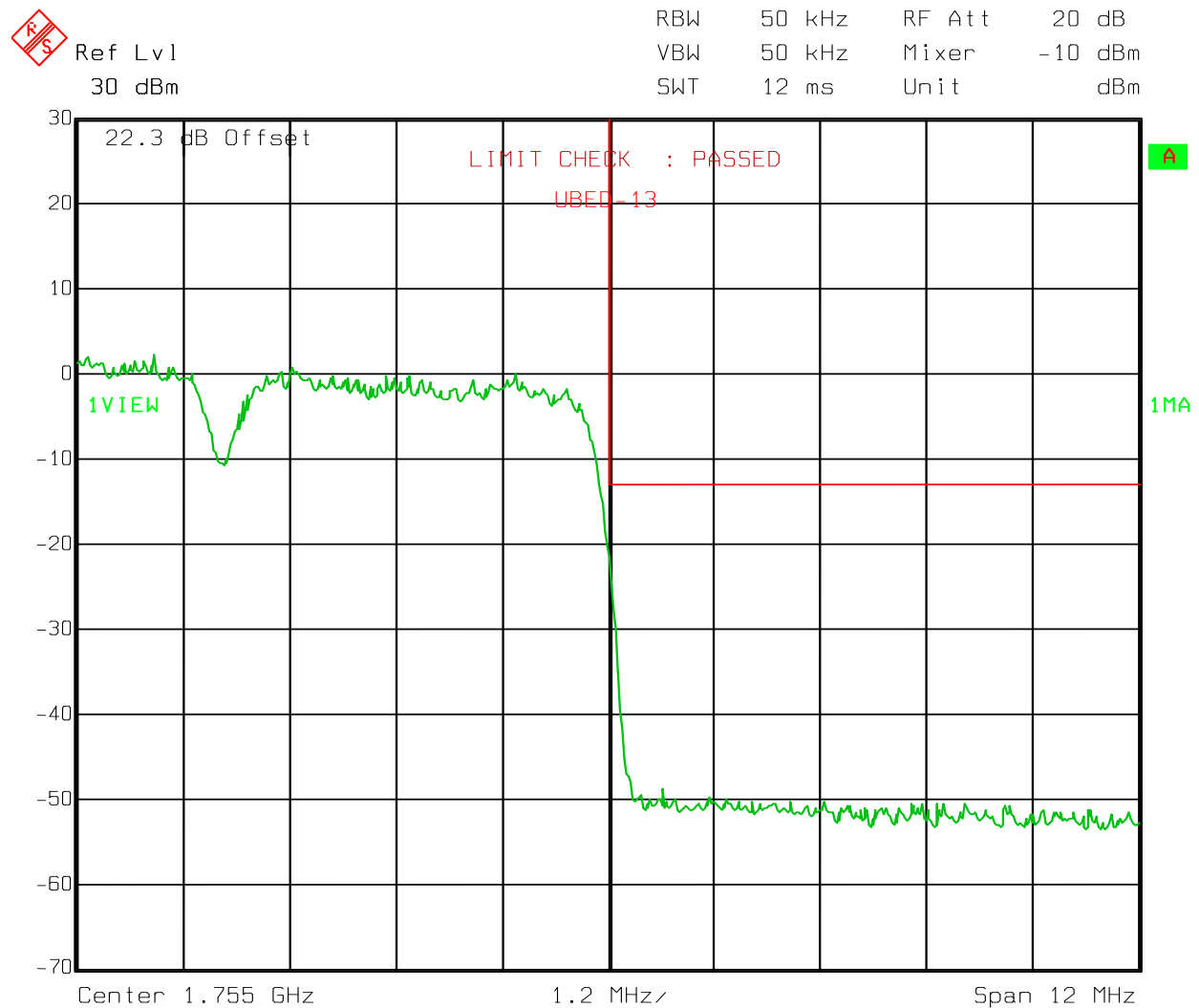
Date: 27.JAN.2010 15:11:36

Test Data – Spurious Emissions at Antenna Terminals

WCDMA/UMTS

HIGH BAND EDGE

Uplink



Date: 27.JAN.2010 15:21:01

Test Data – Spurious Emissions at Antenna Terminals

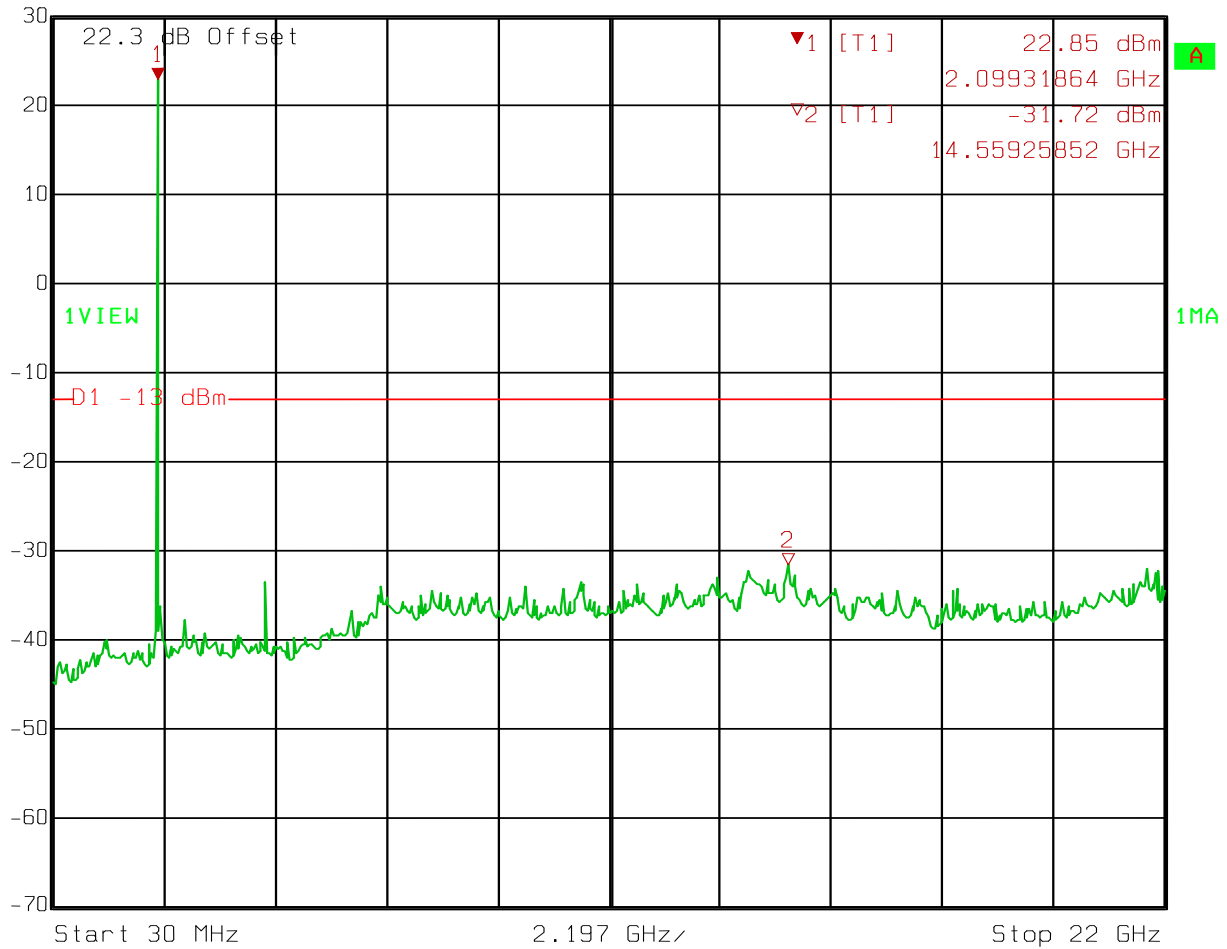
CDMA/EV-DO

SPURS

Downlink



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	20 dB
30 dBm	22.85 dBm	VBW	1 MHz	Mixer	-10 dBm
	2.09931864 GHz	SWT	220 ms	Unit	dBm



Date: 27.JAN.2010 14:59:20

Test Data – Spurious Emissions at Antenna Terminals

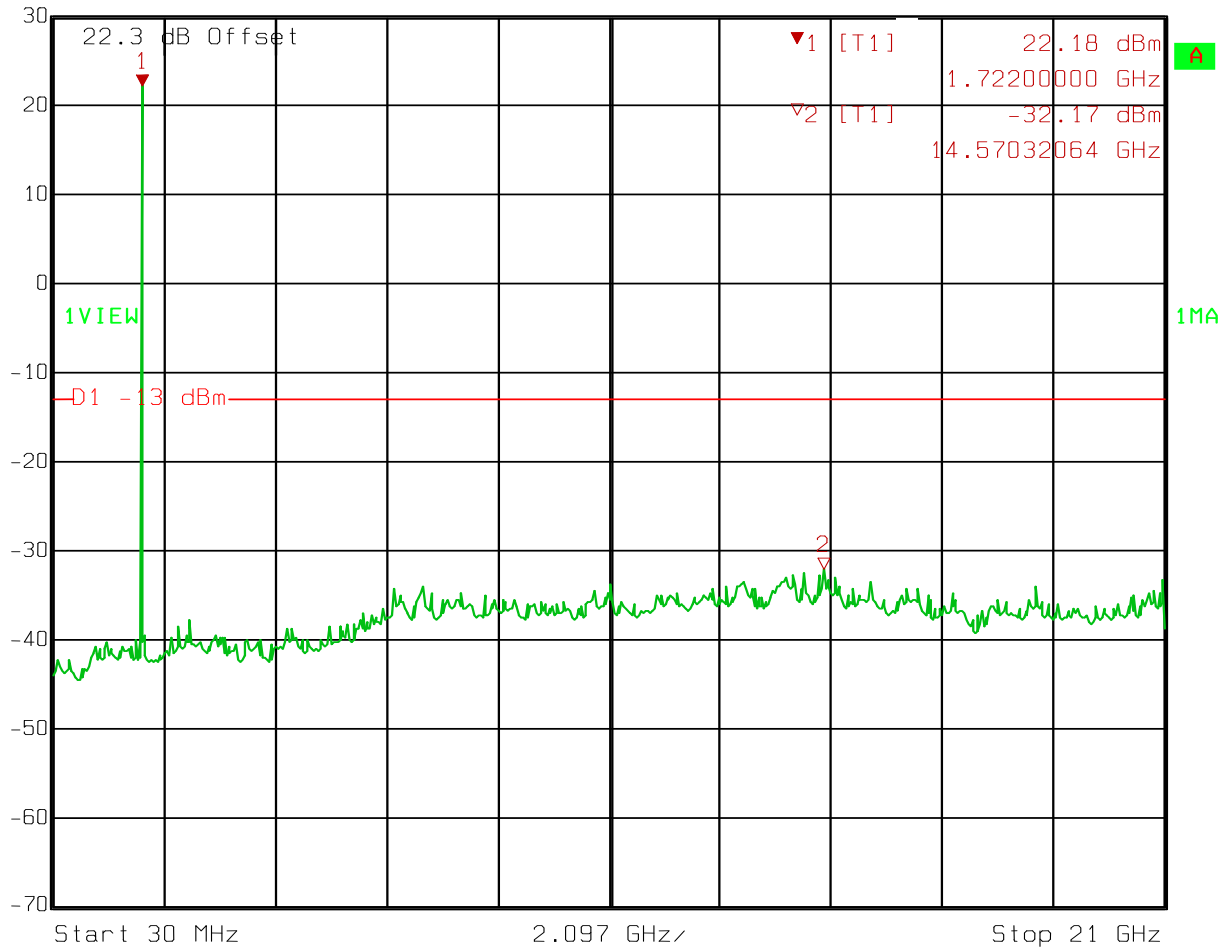
CDMA/EV-DO

SPURS

Uplink



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	20 dB
30 dBm	22.18 dBm	VBW	1 MHz	Mixer	-10 dBm
	1.72200000 GHz	SWT	210 ms	Unit	dBm



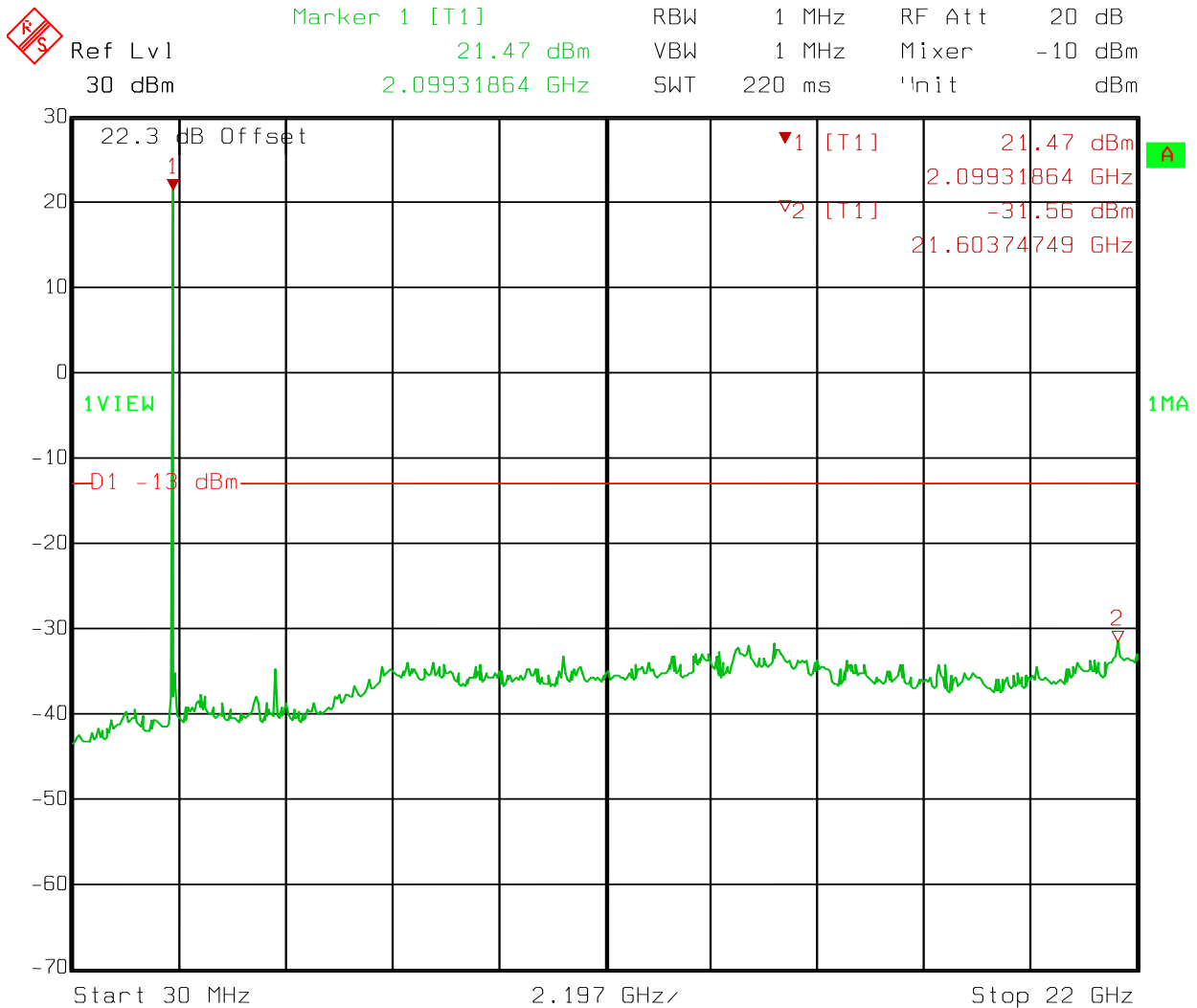
Date: 27.JAN.2010 15:13:59

Test Data – Spurious Emissions at Antenna Terminals

WCDMA/UMTS

SPURS

Downlink



Date: 27.JAN.2010 14:58:06

Test Data – Spurious Emissions at Antenna Terminals

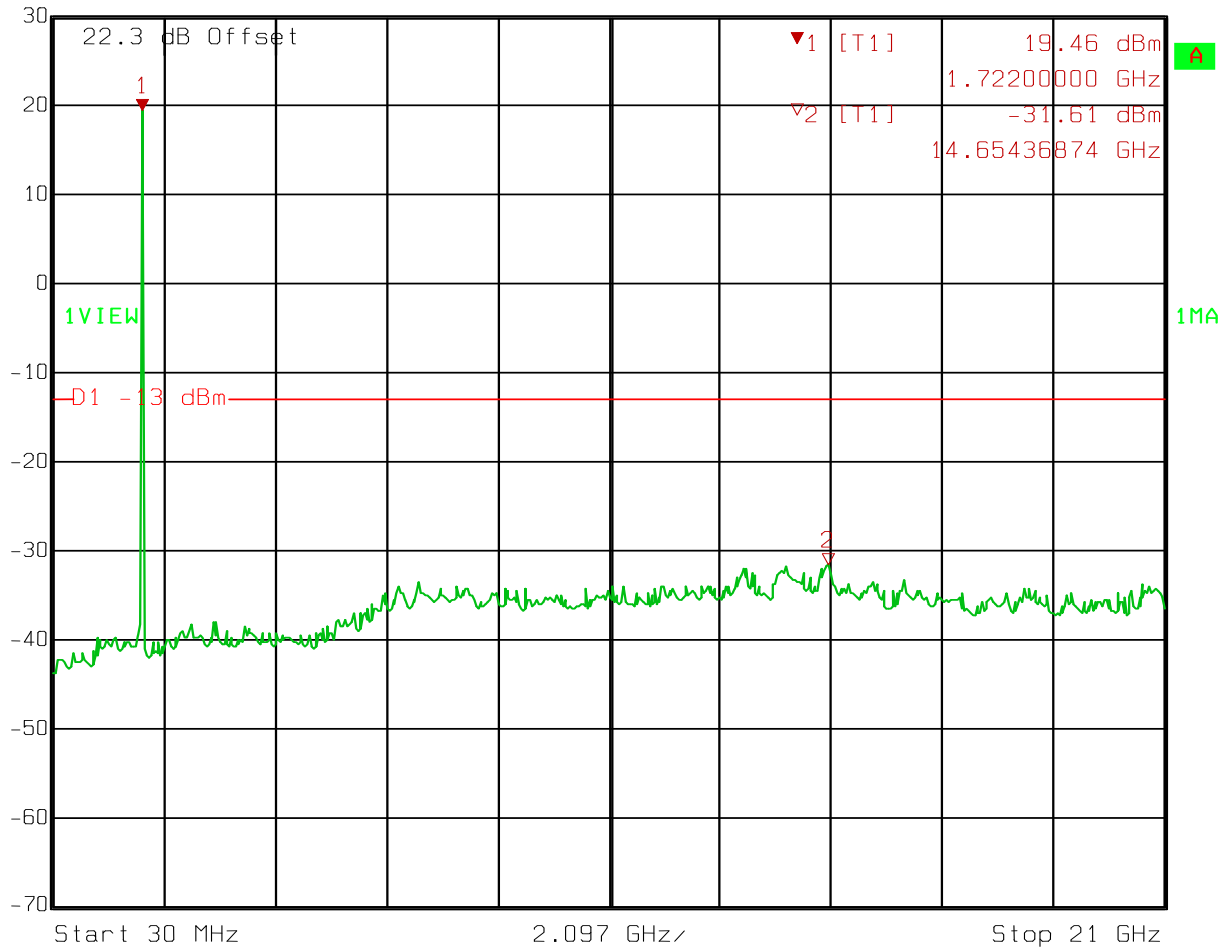
WCDMA/UMTS

SPURS

Uplink



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	20 dB
30 dBm	19.46 dBm	VBW	1 MHz	Mixer	-10 dBm
	1.72200000 GHz	SWT	210 ms	Unit	dBm



Date: 27.JAN.2010 15:13:23

Section 5. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	01/19/09	01/20/11
1082	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	CBU	N/A
1472	20db Attenuator DC 18 Ghz	Omni Spectra 20600-20db	NONE	CBU	N/A

ANNEX A - TEST DETAILS

NAME OF TEST: Occupied Bandwidth

PARA. NO.: 2.1049

Minimum Standard: Input/Output

Method Of Measurement:

CDMA

Spectrum analyzer settings:

RBW=VBW=30 kHz

Span: 5 MHz

Sweep: Auto

GSM / EDGE

RBW=VBW= 3 kHz

Span: 1 MHz

Sweep: Auto

TDMA

RBW=VBW= 1 kHz

Span: 1 MHz

Sweep: Auto

W-CDMA

RBW=VBW= 50 kHz

Span: 10 MHz

Sweep: Auto

NAME OF TEST: Spurious Emission at Antenna Terminals PARA. NO.: 27.53

Minimum Standard: Para. No.27.53(g) For operations in the 1710-1755 MHz and 2110-2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

Method Of Measurement:

Spectrum analyzer settings:

CDMA

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 30 kHz (< 1MHz from Band Edge)
VBW: \geq RBW
Sweep: Auto
Video Avg: 6 Sweeps

GSM / EDGE

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: \geq RBW
Sweep: Auto
Video Avg: Disabled

TDMA

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 3 kHz (< 1 MHz from Band Edge)
VBW: \geq RBW
Sweep: Auto
Video Avg: Disabled

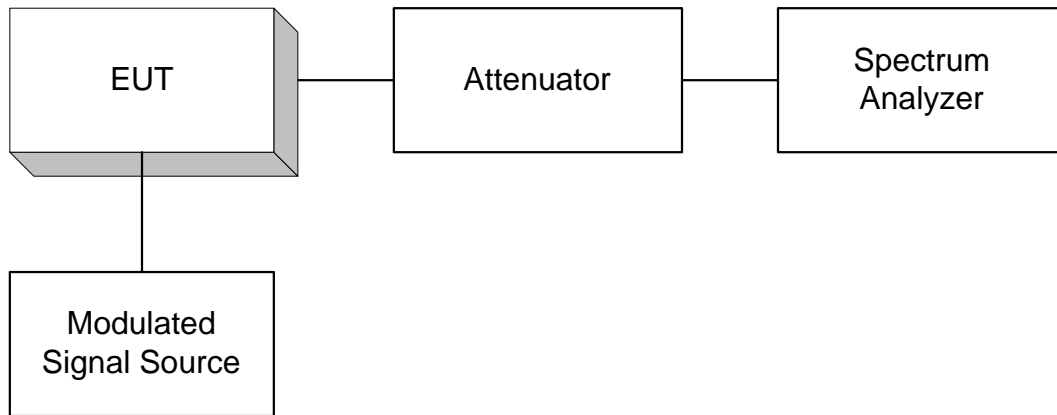
W-CDMA

RBW: 1 MHz (> 1 MHz from Band Edge)
RBW: 50 kHz (< 1MHz from Band Edge)
VBW: \geq RBW
Sweep: Auto
Video Avg: 6 Sweeps

To demonstrate compliance at band edges the frequency of the input signal is set to the lowest and highest assigned channel and the center frequency of the spectrum analyzer is set to the upper and lower edges of the appropriate frequency block.

ANNEX B - TEST DIAGRAMS

Para. No. 2.989 - Occupied Bandwidth



Para. No. 2.991 Spurious Emissions at Antenna Terminals

