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Certification Test Report

CFR 47 FCC Part 2 and Part 27, Subpart C

Model: Node C 1743 and Node M 1743

FCC ID NO.: BCR-RPT-NCM1743

Project Code: W7422
Report Code: W7422-1

Revision: 0

Prepared for:	Andrew Corporation 108 Rand Park Drive Garner, North Carolina 27529
Author:	Tom Tidwell, Manager of Wireless Services
Issued:	20 October, 2007

Report Summary

NTS Plano

Accreditation Numbers: FCC: 101741
IC: 46405-4319 File # IC-4319A-1

Applicant: Andrew Corporation
108 Rand Park Drive
Garner, North Carolina 27529

Customer Representative: Michael Williamson

EUT Description:

EUT Description	Manufacturer	Model	Revision	Serial Number
The EUT is a repeater system designed to operate in the AWS band.	Andrew Wireless Systems Gmbh	Node C 1743 Node M 1743	0	12

Test Summary

Appendix	Test/Requirement Description	Deviations from:			Pass / Fail	Applicable Rule Parts
		Base Standard	Test Basis	NTS Procedure		
A	RF Power Output	No	No	No	PASS	CFR 47, Part 2, Para. 2.1046 CFR 47, Part 27, Para. 27.50
B	Modulation Characteristics	No	No	No	NOT TESTED[1]	CFR 47, Part 2, Para. 2.1047
C	Occupied Bandwidth	No	No	No	PASS	CFR 47, Part 2, Para. 2.1049 CFR 47, Part 27, Para. 27.53
D	Spurious Emissions at Antenna Terminals	No	No	No	PASS	CFR 47, Part 2, Para. 2.1051 CFR 47, Part 27, Para. 27.53
E	Field Strength of Spurious Radiation	No	No	No	PASS	CFR 47, Part 2, Para. 2.1053 CFR 47, Part 27, Para. 27.53
F	Frequency Stability	No	No	No	PASS	CFR 47, Part 2, Para. 2.1055 CFR 47, Part 27, Para. 27.54

[1]This device processes a modulated rf carrier but does not create the waveform. Thus there are no modulation circuits to test. A description of the modulated waveforms is given on page 16 to satisfy this requirement.

Test Result: The product presented for testing complied with test requirements as shown above.

This is to certify that the preceding report is true and correct to the best of my knowledge.

Robert Stevens,
Quality Assurance Manager

Tom Tidwell,
Wireless Test Engineer

Table of Contents

Register of revisions

Revision	Reason for Revision	Release Date
0	Original	20 Oct., 2007

INTRODUCTION

1.1 PURPOSE

The purpose of this document is to describe the tests applied by NTS Plano to demonstrate compliance of the Node C 1743 and Node M 1743 to FCC Part 27 Subparts C in accordance with the certification requirements of CFR 47, Part 2.

2.0 EUT DESCRIPTION

2.1 CONFIGURATION

Description of EUT

	Name	Model	Revision	Serial Number
EUT	Node C/M Repeater	Node C 1743 Node M 1743	0	12
RF Exposure Classification	Fixed. The Repeater is mounted using a wall mounting kit provided by the manufacturer. The antenna is fixed to a permanent outdoor structure with a minimum separation distance of 400 cm from nearby persons. The maximum antenna gain is 17 dBi.			
Channels/Frequency Range	Downlink: 1710 – 1755 MHz Uplink: 2110 – 2155 MHz Channelization varies depending on the type of signal that is processed. Channel configurations were set according to normal channel conventions as described in the TIA standard for each technology.			
Power	**Downlink:** +43 dBm (20 W) composite **Uplink:** +23 dBm (200 mW) composite			
Emission Designator:	**CDMA: F9W** **W-CDMA: F9W**			
TX antenna details	Maximum antenna gain 17 dBi			
Functional Description	The Node C/M repeater is used to enhance the coverage of a licensed radio service operating under CFR 47, Part 27 of the FCC rules. The system is designed to repeat WCDMA signals. Node C and Node M repeaters have an identical rf path except that the firmware allows for 1.25 MHz channels to be set for CDMA and Node M allows for 5 MHz channels to be configured. Both units have identical rf amplifiers. A Node M sample was tested as this represents the worst-case configuration If 1.25 MHz channels are used with the Node M system, the filtering is not optimal for 1.25 MHz channels and thus presents the worst-case spurious emission scenario.			

2.1.1 EUT POWER

Voltage	120 Vac, 60 Hz
Number of Feeds	Single phase (L1 and Neutral)

2.2 EUT CABLES

Quantity	Model/Type	Routing		Shielded / Unshielded	Description	Cable Length (m)
		From	To			
1		EUT	AC power main	Unshielded	Power cord	3.0
1	Gore	IQ Signal Generator	EUT	Shielded (coaxial)	Coaxial cable	1.5
1	Gore	EUT	50 ohm load	Shielded (coaxial)	Coaxial cable	2

2.3 MODE OF OPERATION DURING TESTS

The device was tested in the following operating mode:

- Downlink, maximum gain, maximum rf output power
- Uplink, maximum gain, maximum rf output power

While operating in this mode, the device was tested with variations in the following parameters:

- RF channel configurations
  - Low channel – The lowest frequency on which the device will operate with a particular rf signal type is fed to the RF input.
  - Mid channel – A frequency in the center of the band is fed to the RF input.
  - High channel – The highest frequency on which the device will operate with a particular rf signal type is fed to the RF input.
- Gain and rf input level configurations
  - Highest gain setting (104 dB) with rf input adjusted to the maximum level before the repeater senses a that the amplifier is reaching compression and lowers the gain automatically.

Note: Each test was done with a series of modulated carriers as described on page 6 of this report. The modulation mode was chosen to represent a worst-case signal for each technology type. In each case the rf gain and input were set to maximum.

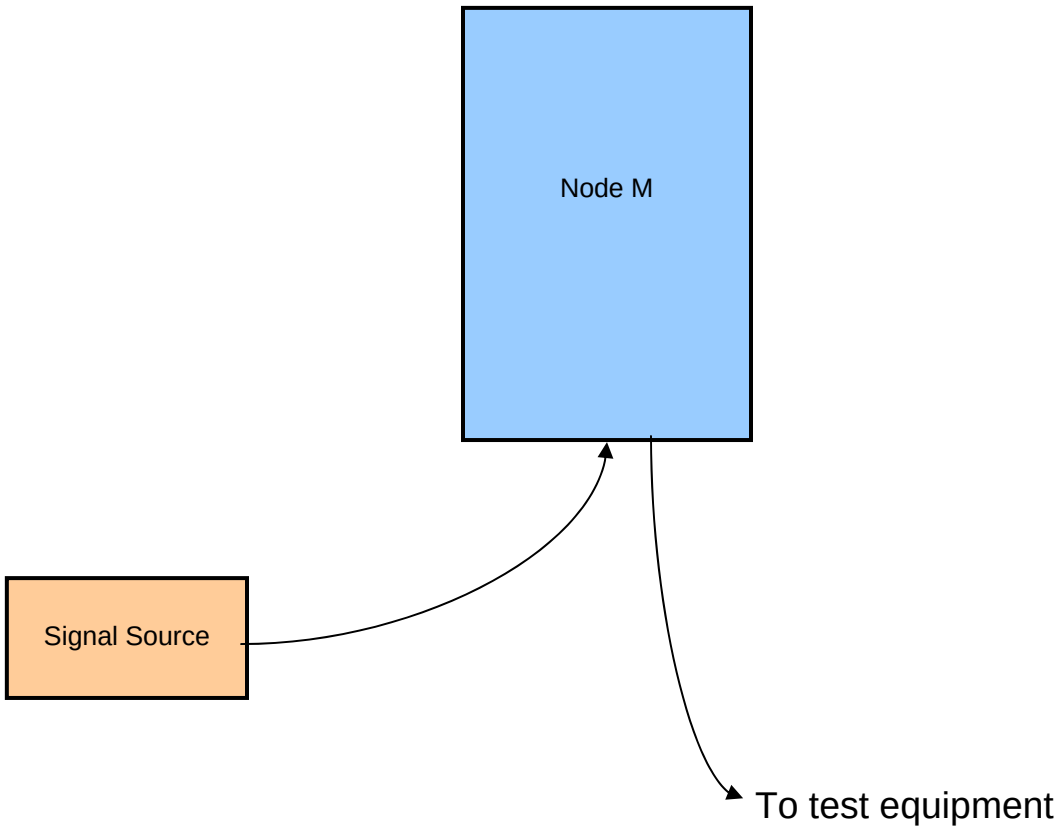
3.0 SUPPORT EQUIPMENT

3.1 CONFIGURATION

The radio was activated using customer-supplied test software.

3.2 TEST BED/PERIPHERAL CABLES

.



APPENDICES

APPENDIX A: 2.1046 RF POWER OUTPUT

A.1. Base Standard & Test Basis

Base Standard	FCC PART 2.1046
Test Basis	TIA 603-C, 2004
Test Method	TIA 603-C, 2004

A.2. Specifications

27.50 Power and antenna height limits.

(d) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands:

(1) The power of each fixed or base station transmitting in the 2110–2155 MHz band and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, is limited to a peak equivalent isotropically radiated power (EIRP) of 3280 watts. The power of each fixed or base station transmitting in the 2110–2155 MHz band from any other location is limited to a peak EIRP of 1640 watts. A licensee operating a base or fixed station utilizing a power of more than 1640 watts EIRP must coordinate such operations in advance with all Government and non-Government satellite entities in the 2025–2110 MHz band. Operations above 1640 watts EIRP must also be coordinated in advance with the following licensees within 120 kilometers (75 miles) of the base or fixed station: all Broadband Radio Service (BRS) licensees authorized under part 27 in the 2155–2160 MHz band and all AWS licensees in the 2110–2155 MHz band.

(2) Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to a peak EIRP of 1 watt. Fixed stations operating in this band are limited to a maximum antenna height of 10 meters above ground, and mobile and portable stations must employ a means for limiting power to the minimum necessary for successful communications.

A.3. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
None						

A.4. Test Procedure

TIA 603-C, 2004

A.5. Test Results

The EUT is in compliance with the limits as specified above. The maximum rf output power at the antenna terminals is +42.8 dBm (20 watts (downlink). This is -0.2 dB below the rated rf power output.

A.6. Operating Mode During Test

The transmitter was tested while in a continuous transmit mode. The EUT was tuned to a low, middle, and high channel in both the downlink (base to mobile) and uplink (mobile to base) directions. RF power output was measured with an rf input level at the point just before the

compression point of the amplifier. This is the point of maximum rf output power. If the rf input level is increased beyond this point, the amplifier gain (and consequently output power) is automatically reduced.

A.7. Sample Calculation

Rf power(watts) = $10^{(\text{rf power(dBm)}/10)}$ x 1000

A.8. Test Data

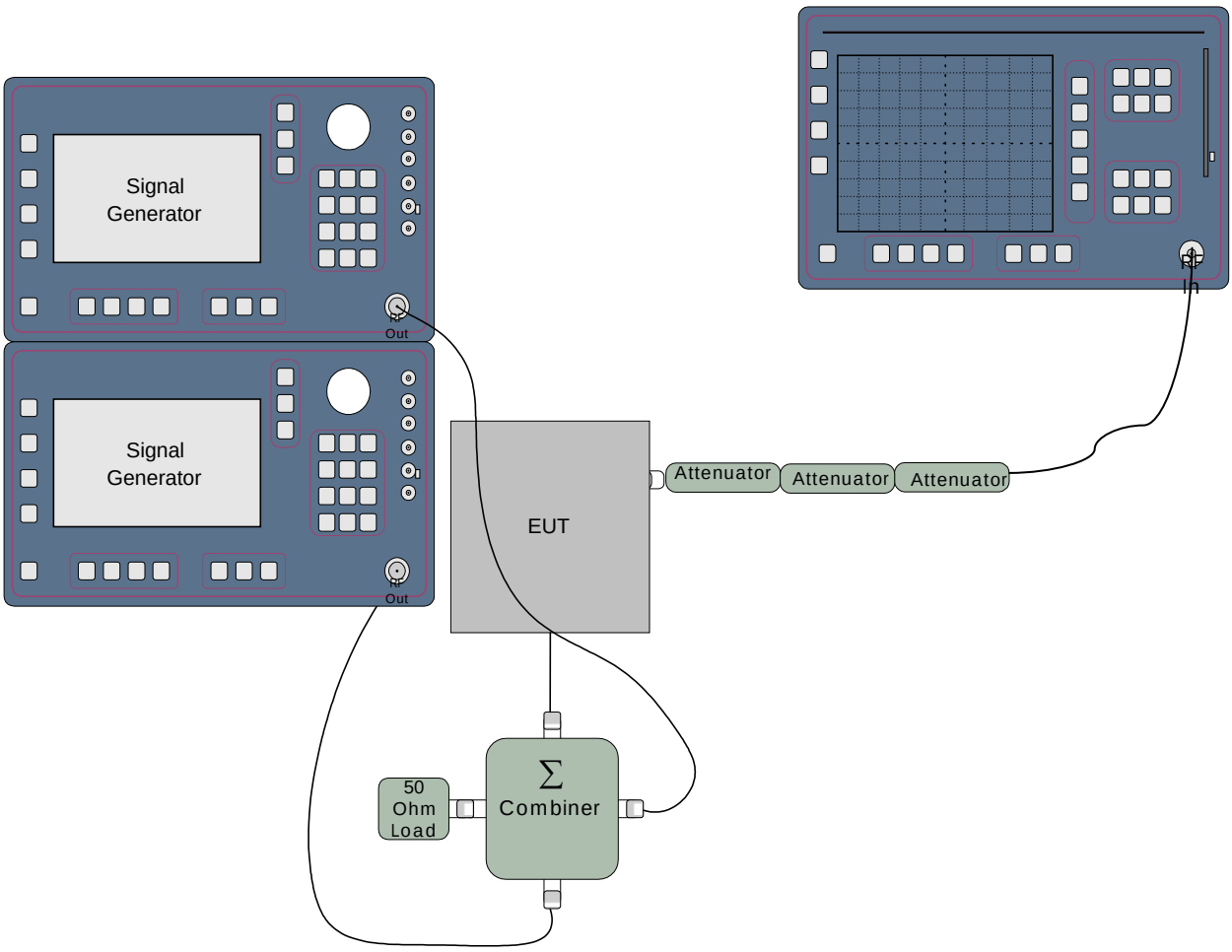
Channel	Signal Path	Modulation Mode	RF Power Output at Antenna Terminals (dBm)
2111.25	DL	CDMA	+42.8
2132.50	DL	CDMA	+42.8
2154.75	DL	CDMA	+42.8
2112.50	DL	WCDMA	+42.8
2132.50	DL	WCDMA	+42.8
2152.50	DL	WCDMA	+42.8
1711.25	UL	CDMA	+23.0
1732.50	UL	CDMA	+23.0
1754.75	UL	CDMA	+23.0
1712.50	UL	WCDMA	+23.0
1732.50	UL	WCDMA	+23.0
1752.50	UL	WCDMA	+23.0

Note: RF power output was measured using a spectrum analyzer with RBW set to 50 MHz and VBW set to 50 MHz. The detector was set to RMS.

*UL = Uplink (Mobile to BTS) path.
*DL = Downlink (BTS to Mobile) path.

Test Date: October 17, 2007

A.9. Test Diagram



A.10. Tested By

Name: Tom Tidwell,
Function: Manager of Wireless Services

APPENDIX B: 2.1047 MODULATION CHARACTERISTICS

B.1. Base Standard & Test Basis

Base Standard	FCC 2.1047
Test Basis	FCC 2.1047 Modulation Characteristics
Test Method	TIA 603-C, 2004

B.2. Specifications

2.1047 – Modulation Characteristics

(a) *Voice modulated communication equipment.* A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.
(b) *Equipment which employs modulation limiting.* A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.
(c) *Single sideband and independent sideband radiotelephone transmitters which employ a device or circuit to limit peak envelope power.* A curve showing the peak envelope power output versus the modulation input voltage shall be supplied. The modulating signals shall be the same in frequency as specified in paragraph (c) of §2.1049 for the occupied bandwidth tests.
(d) *Other types of equipment.* A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

B.3. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

B.4. Test Method

This device does not generate any modulation signals but only repeats a modulated rf waveform.

B.5. Test Results

Not applicable – The device does not produce a baseband signal but simply repeats a modulated rf waveform.

Test Data Summary

Emission Designators

IS-95 CDMA: F9W
W-CDMA: F9W

The above emission designators are based on preferred designations as presented by FCC engineering staff.

B.6. Test Diagram

N/A

B.7. Tested By

Name: Tom Tidwell
Function: Manager of Wireless Services

APPENDIX C: 2.10.49 OCCUPIED BANDWIDTH

C.1. Base Standard & Test Basis

Base Standard	FCC 2.1049
Test Basis	FCC 2.1049 Occupied Bandwidth
Test Method	TIA 603-C, 2004

C.2. Specifications

27.53 Emission limits for AWS equipment

(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 log10 (P) dB.

(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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 26 dB below the transmitter power.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

C.3. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

C.4. Test Method

TIA 603-C, 2004

The modulated rf carrier fed to the device during testing is described below. The rf input to the amplifier was +8 dBm.

- IS-95 CDMA carrier:

Data source: PRBS (Pseudo-Random Bit Sequence)
Modulation: QPSK 2 b/sym
Symbol Rate: 1.2288 Msym/sec
Filter: IS-95 + Equalizer
Coding: None

- W-CDMA carrier: .

Data source: PRBS(Pseudo-Random Bit Sequence)
Modulation: QPSK
Symbol Rate: 4.096 MHz
Sequence Length: 65536 sym
Filter: Root Cosine
Roll Off: 0.22
Window Function: Hanning

C.5. Test Results

Compliant. The 26 dB bandwidth was plotted for each modulation.

C.6. Deviations from Normal Operating Mode During Test

None.

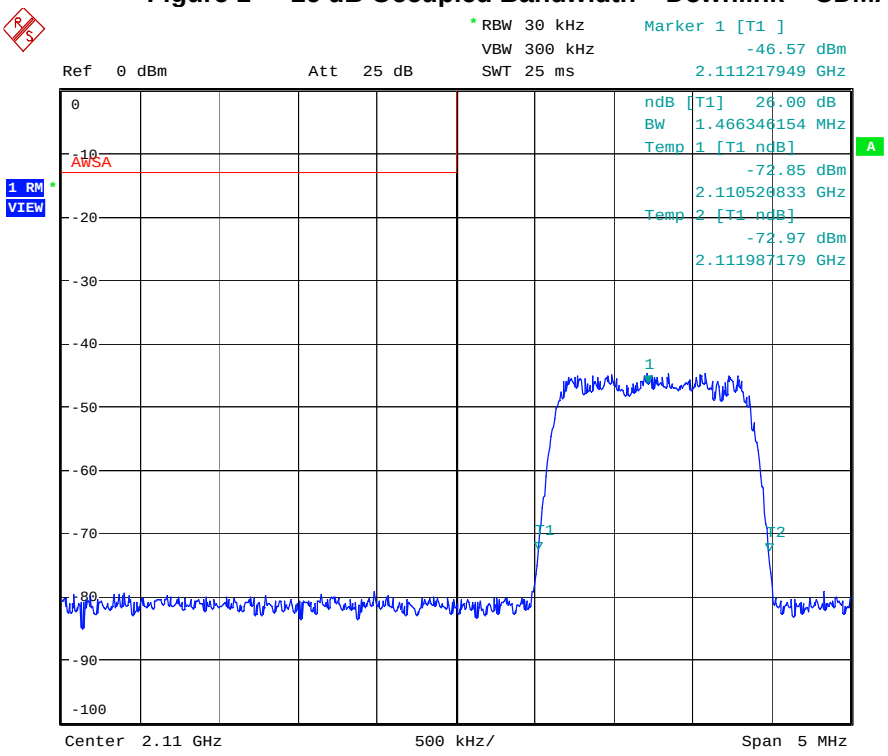
C.7. Sample Calculation

None.

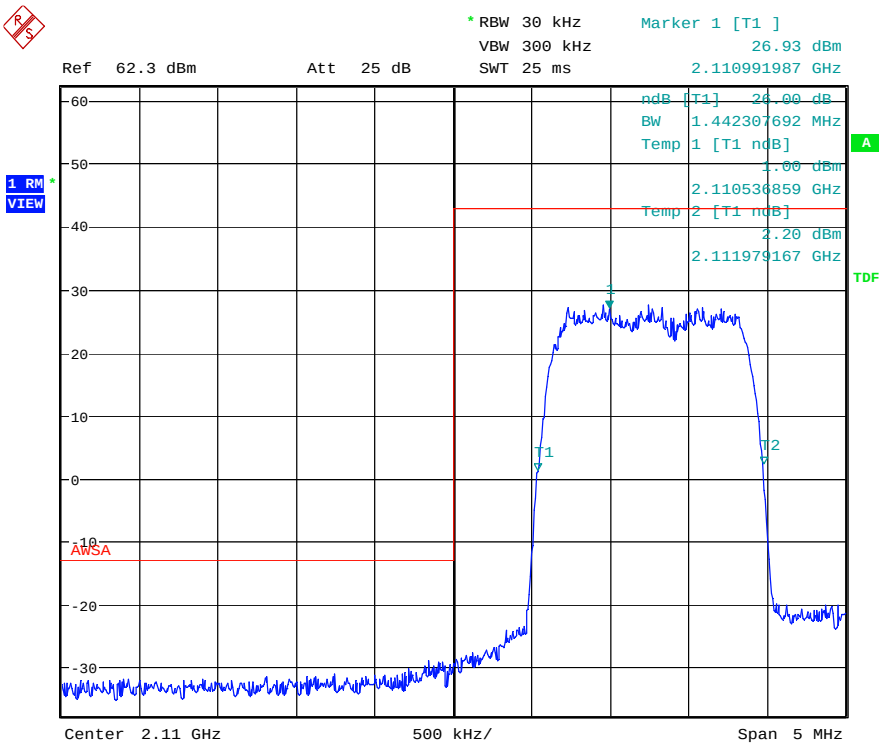
C.8. Test Data

See plots following.

Figure 1 26 dB Occupied Bandwidth – Downlink – CDMA1700 – Low Channel

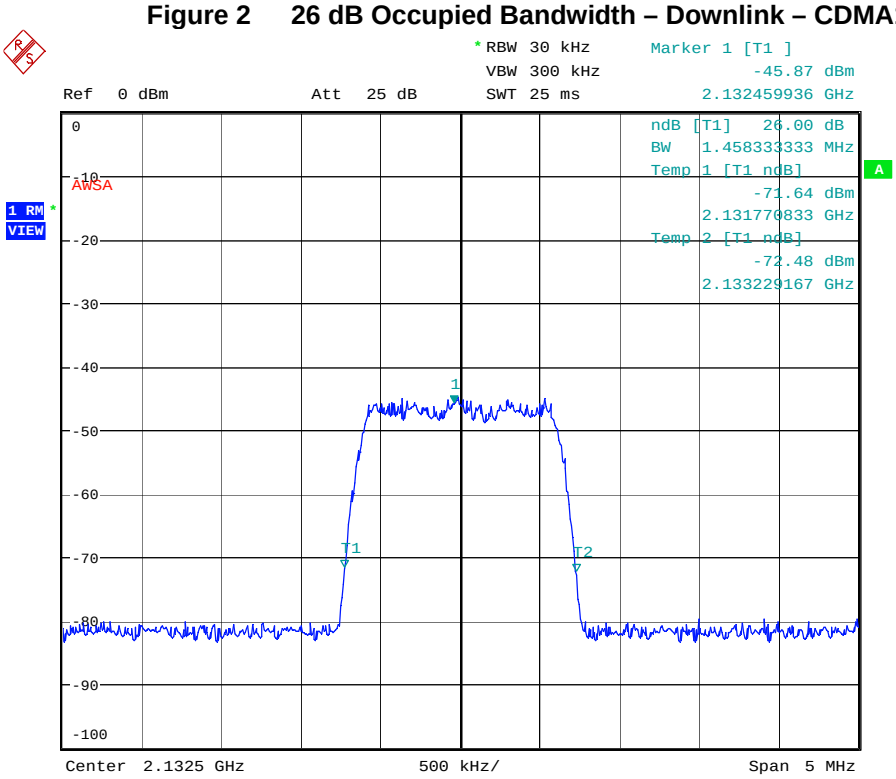


Input

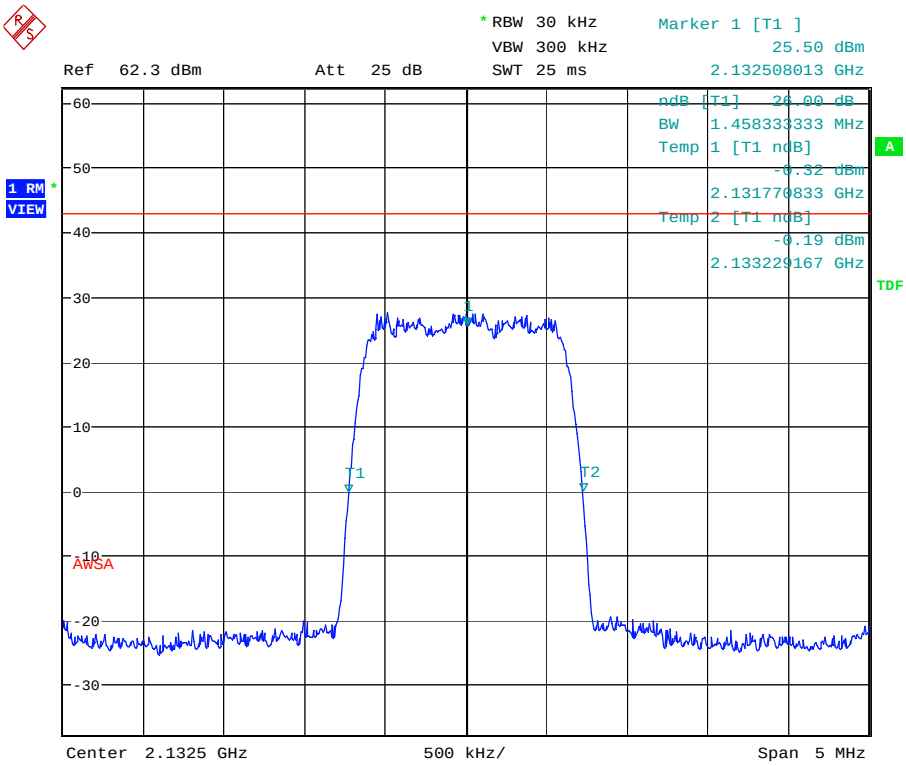


Output

Figure 2 26 dB Occupied Bandwidth – Downlink – CDMA1700 – Mid Channel

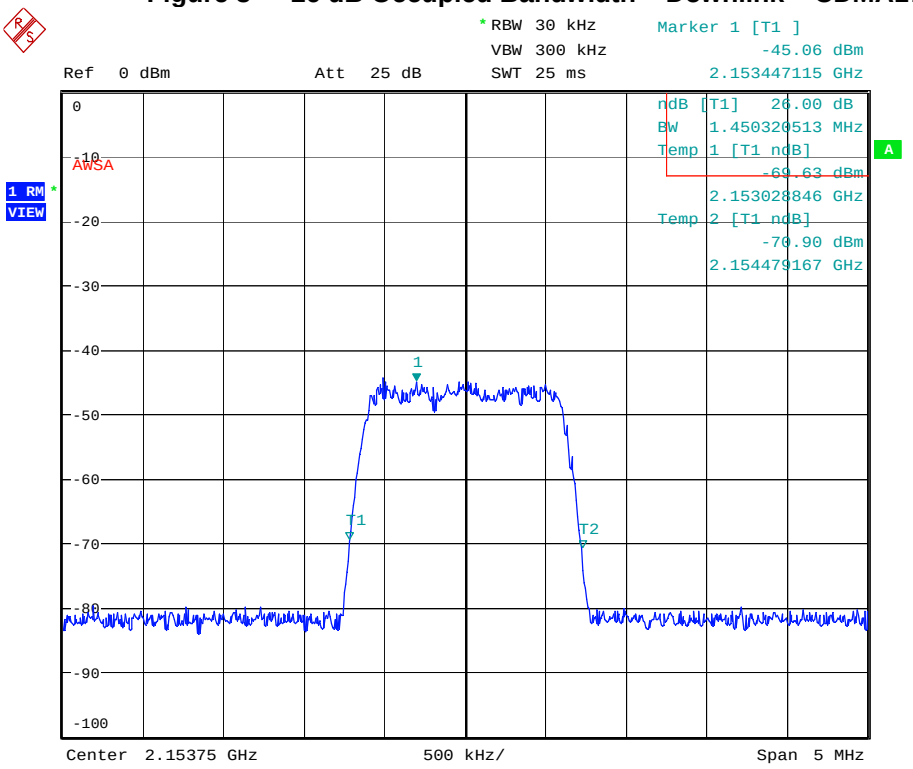


Input

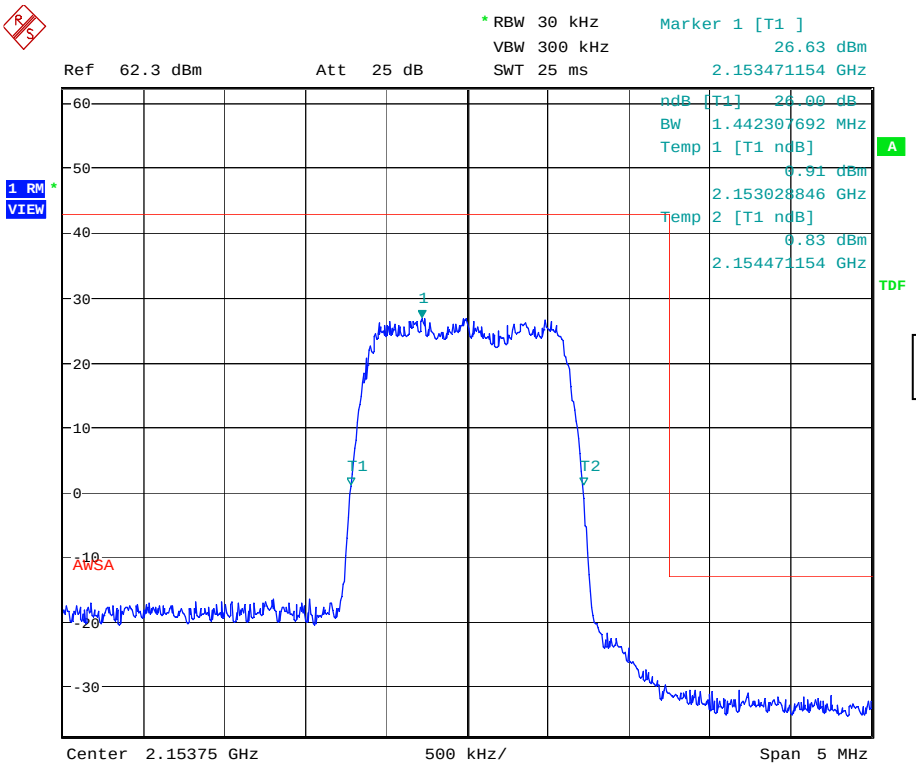


Output

Figure 3 26 dB Occupied Bandwidth – Downlink – CDMA1700 – High Channel

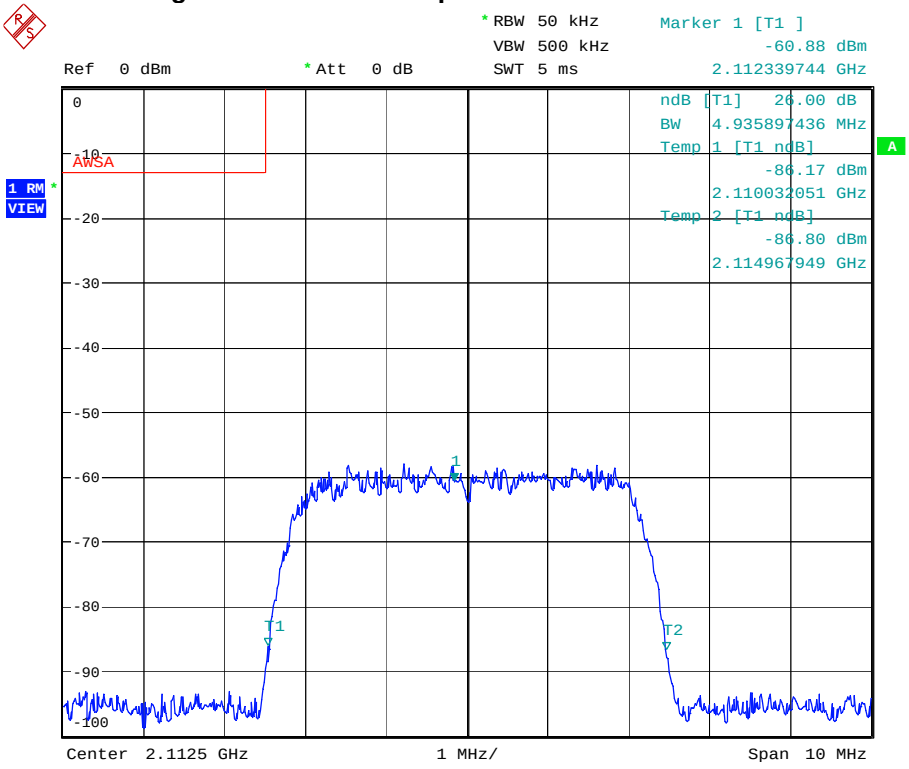


Input

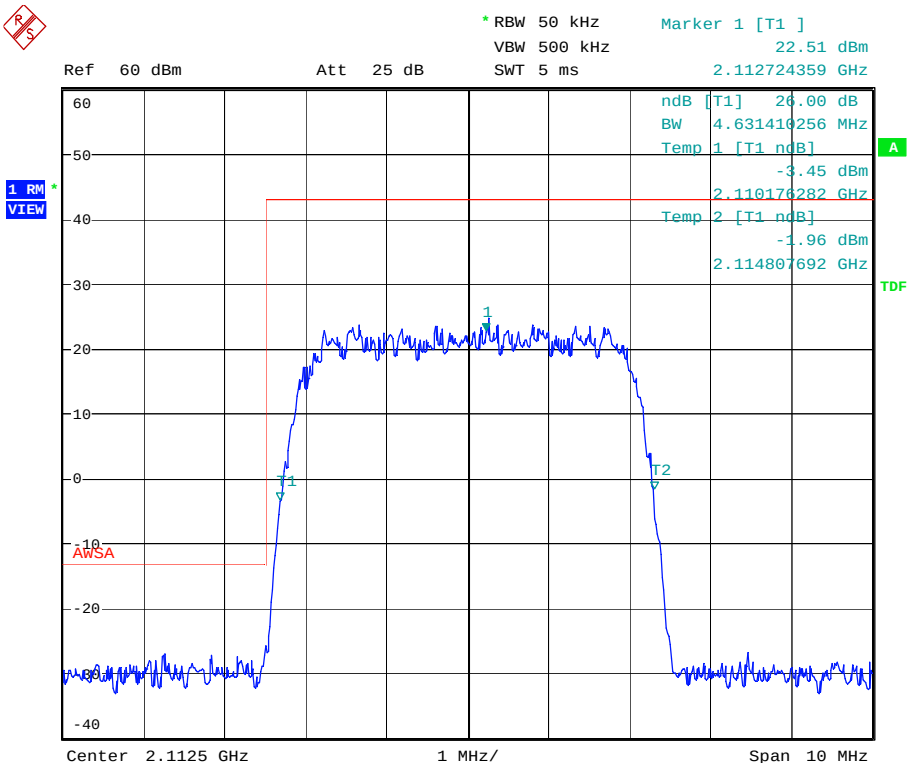


Output

Figure 4 26 dB Occupied Bandwidth – Downlink – W-CDMA1700 – Low Channel

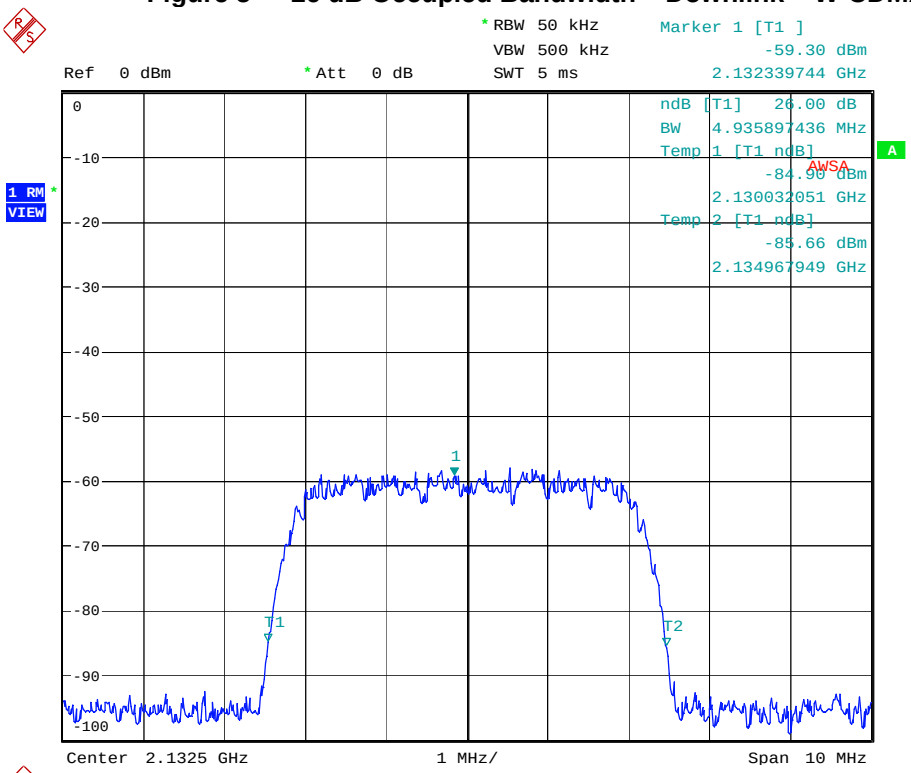


Input

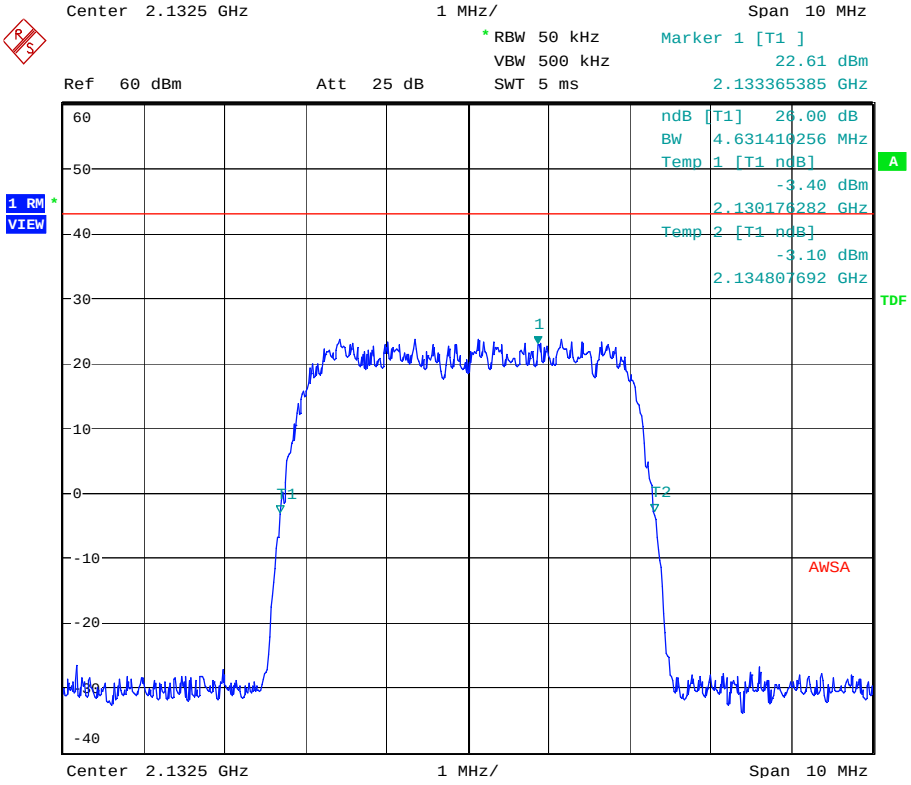


Output

Figure 5 26 dB Occupied Bandwidth – Downlink – W-CDMA1700 – Mid Channel

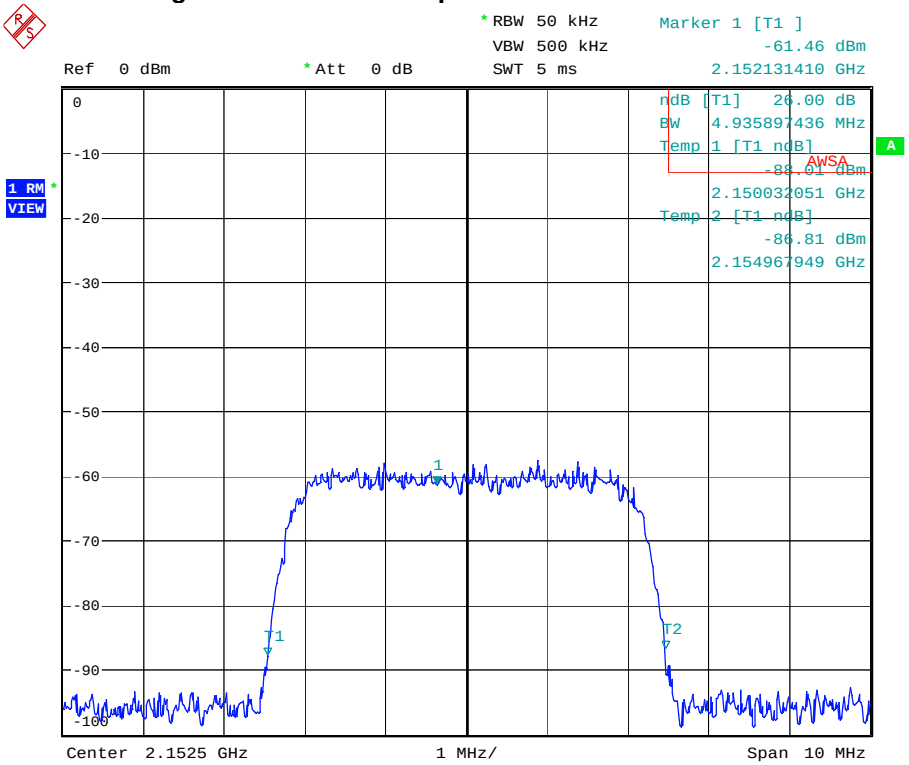


Input

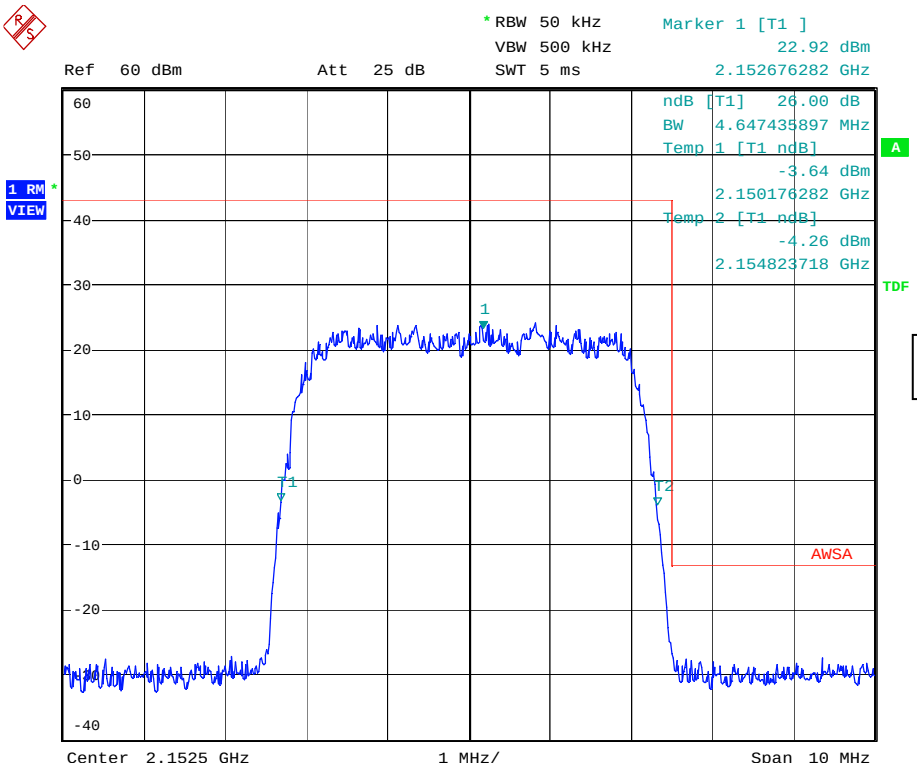


Output

Figure 6 26 dB Occupied Bandwidth – Downlink – W-CDMA1700 – High Channel

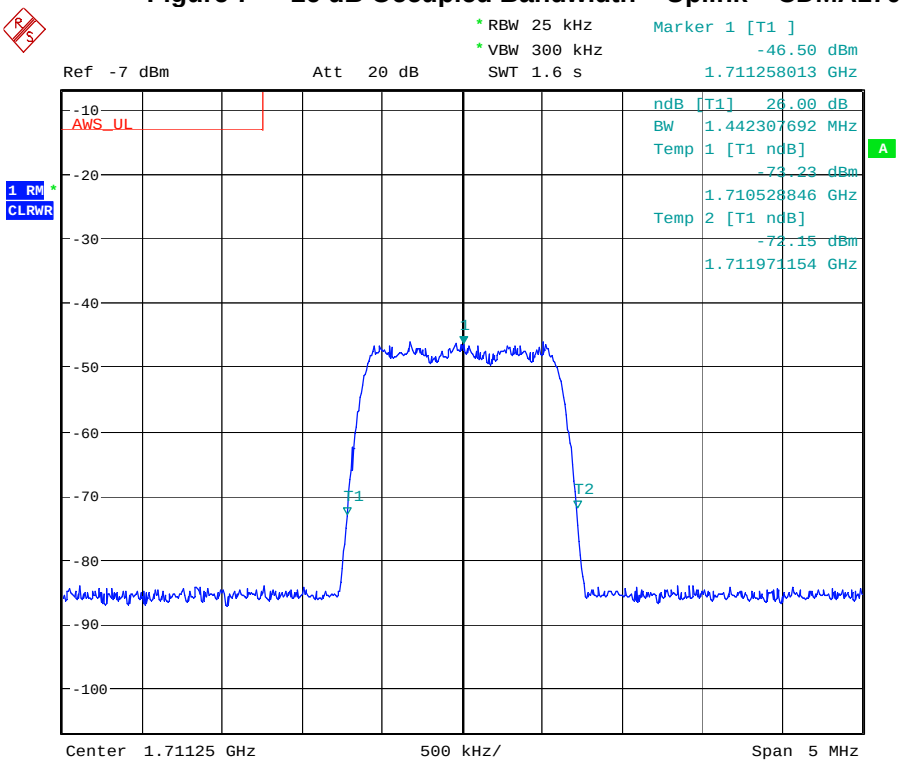


Input

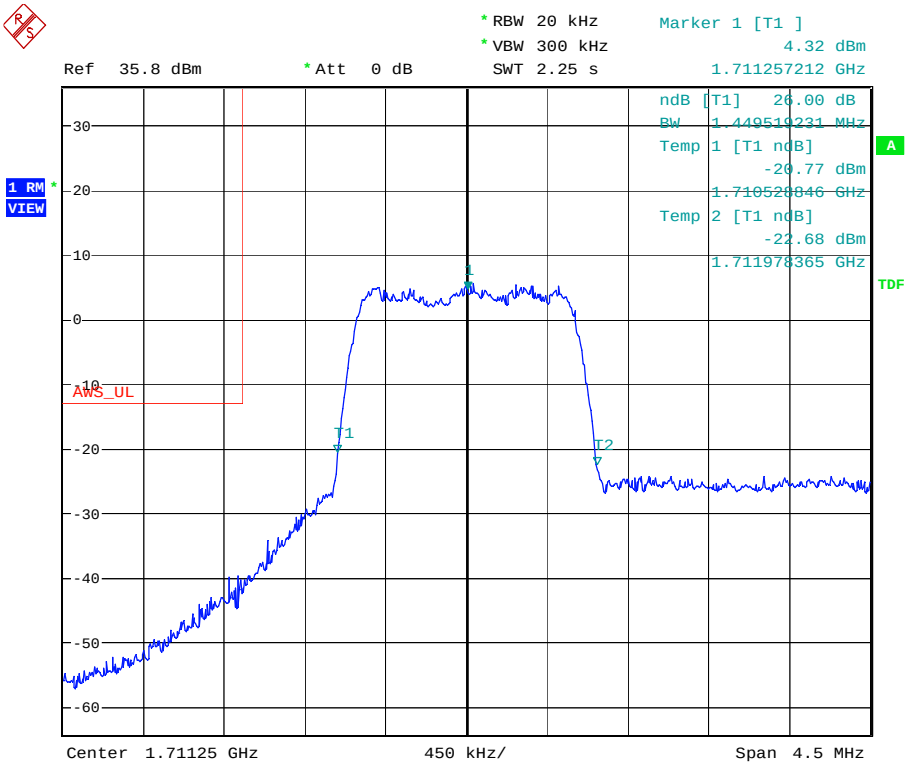


Output

Figure 7 26 dB Occupied Bandwidth – Uplink – CDMA1700 – Low Channel

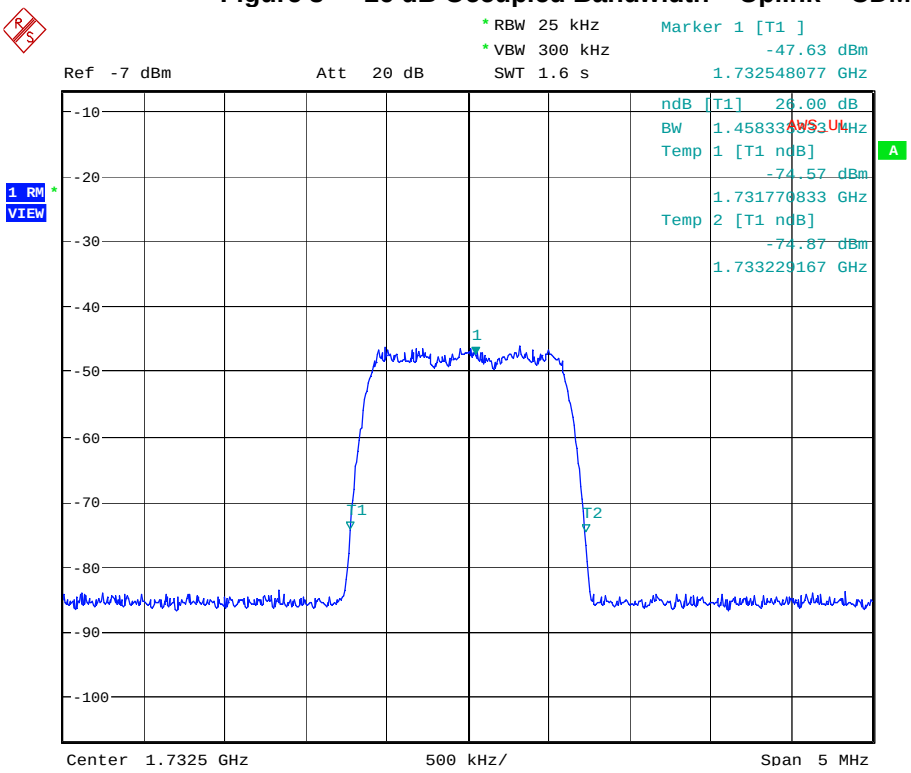


Input

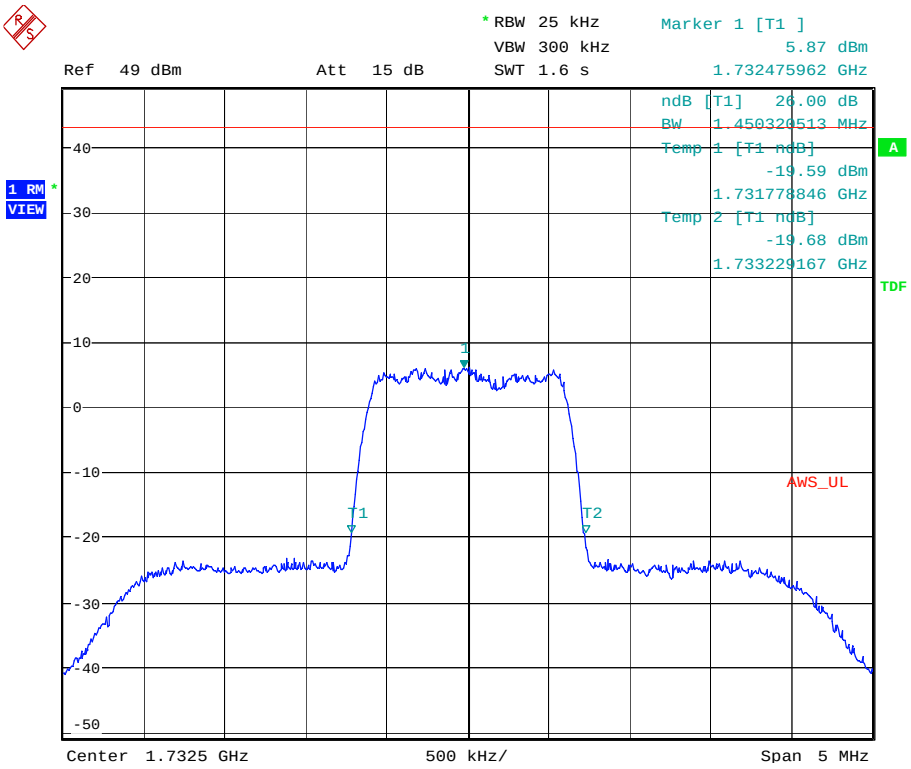


Output

Figure 8 26 dB Occupied Bandwidth – Uplink – CDMA1700 – Mid Channel

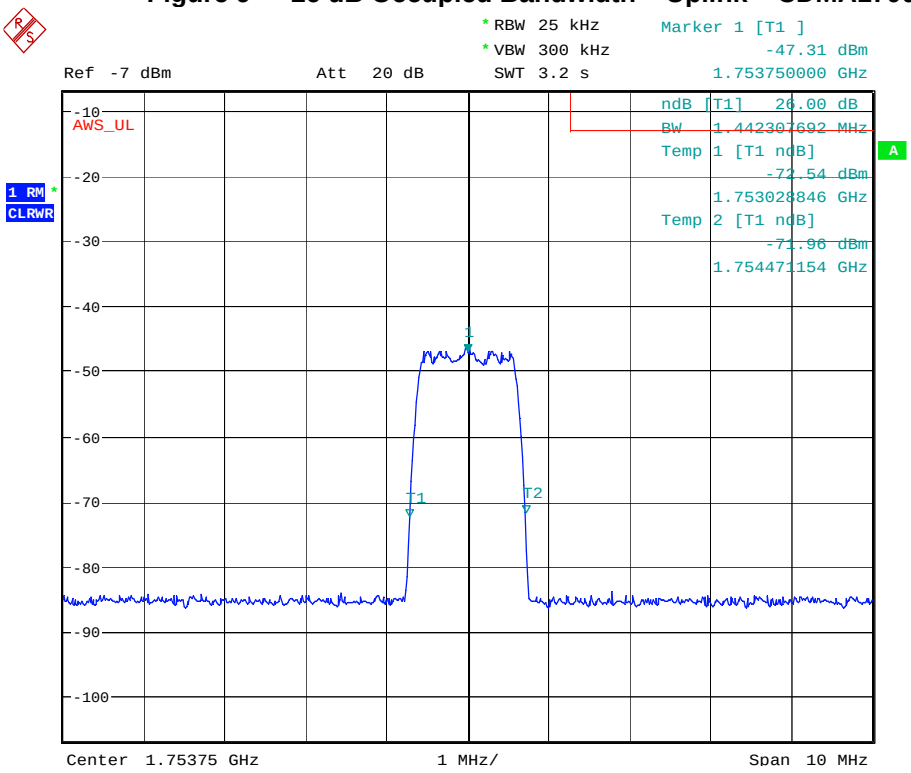


Input

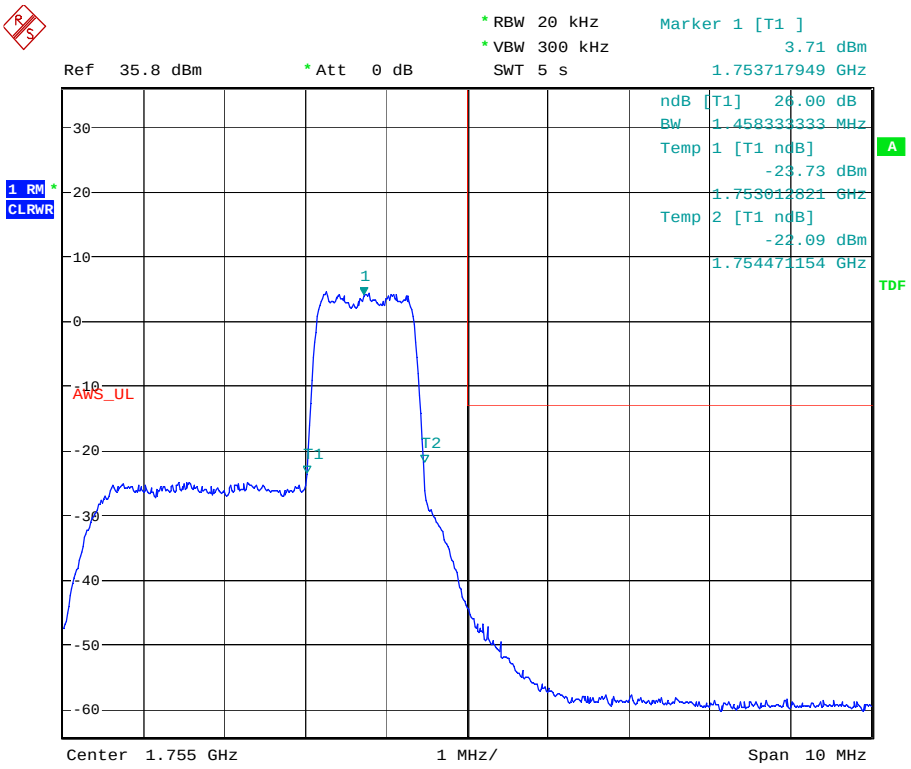


Output

Figure 9 26 dB Occupied Bandwidth – Uplink – CDMA1700 – High Channel

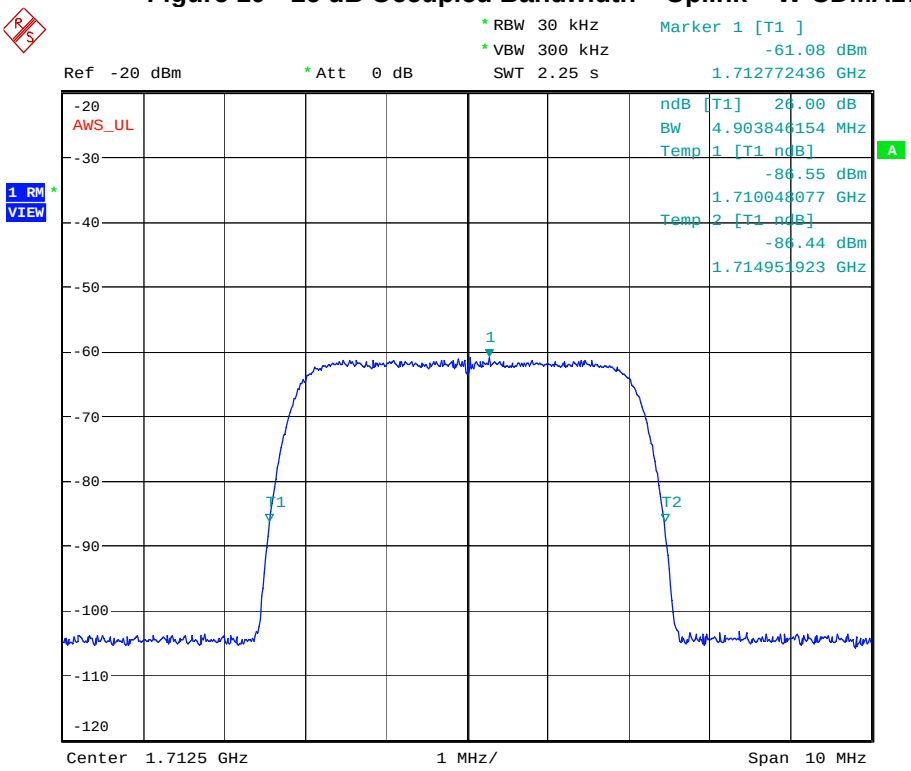


Input

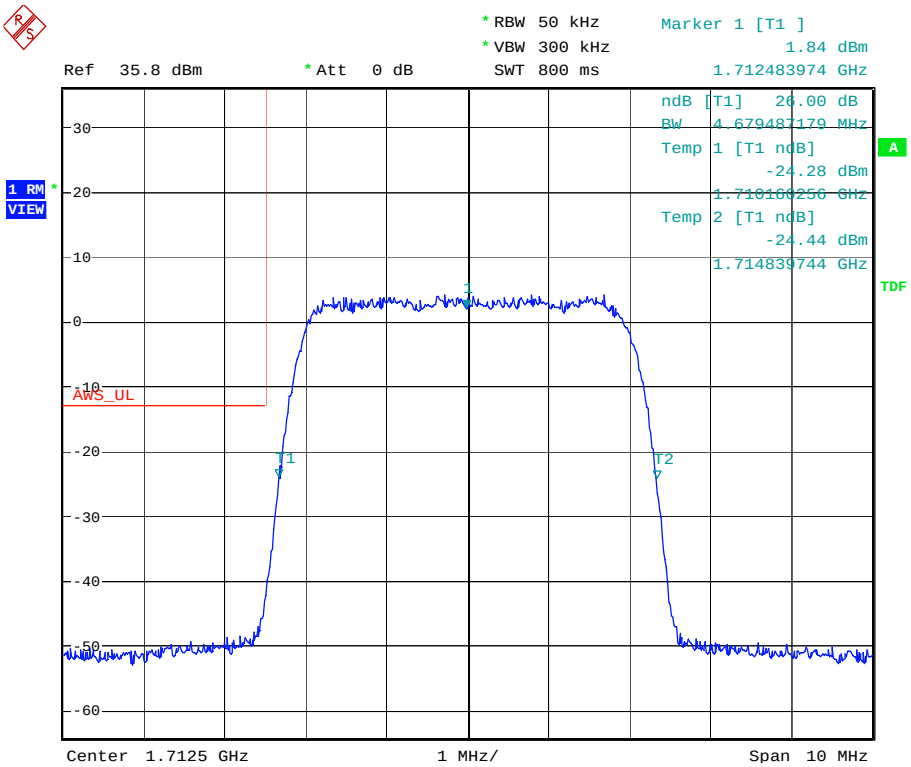


Output

Figure 10 26 dB Occupied Bandwidth – Uplink – W-CDMA1700 – Low Channel

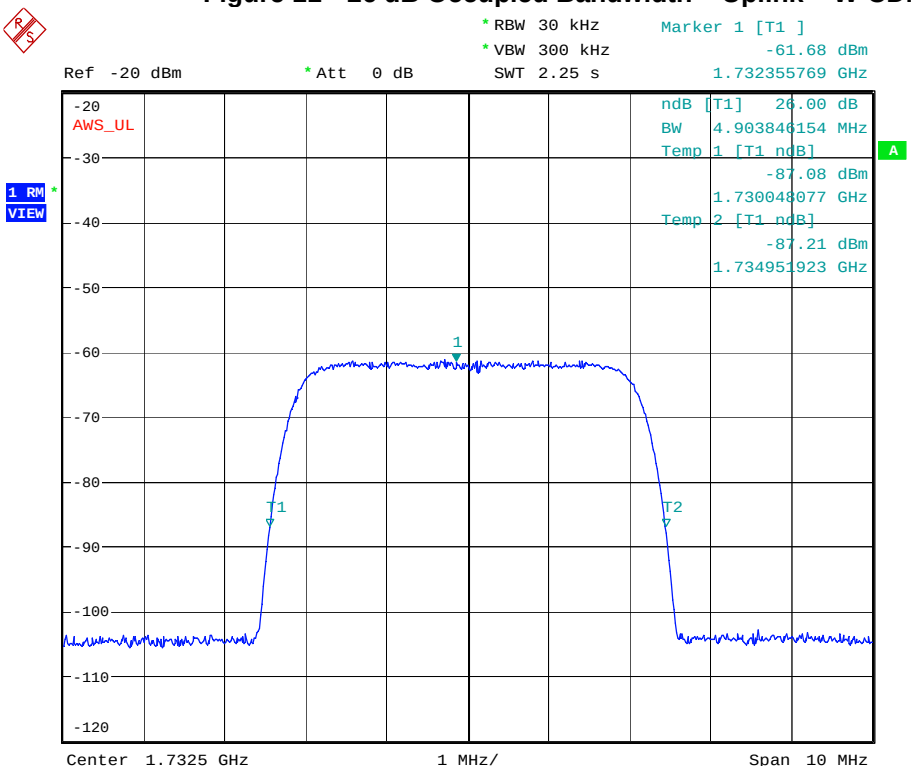


Input

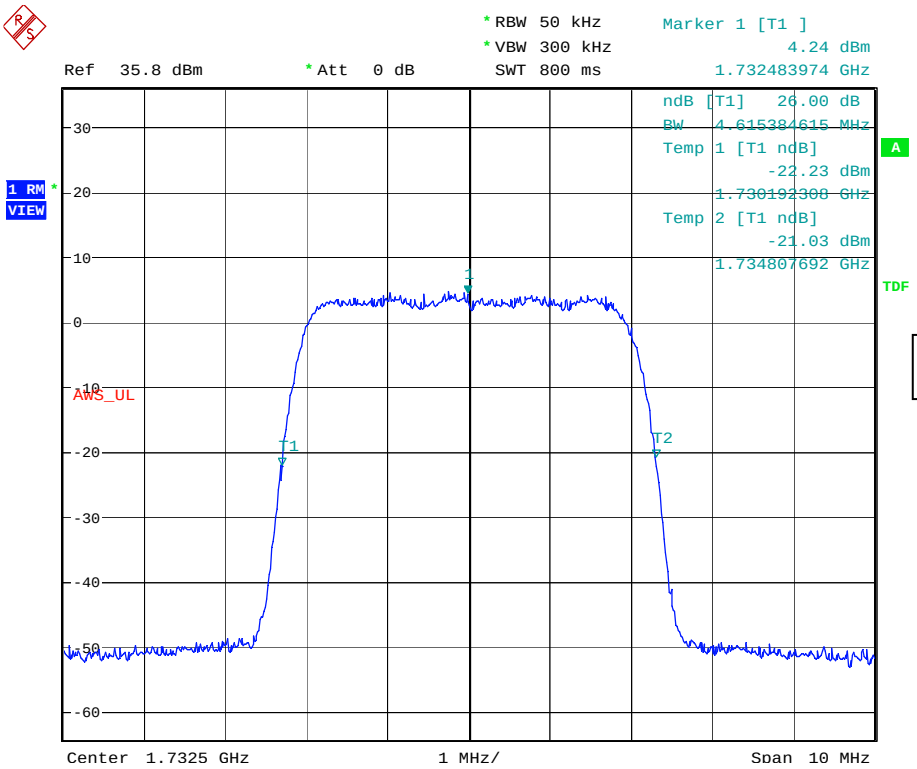


Output

Figure 11 26 dB Occupied Bandwidth – Uplink – W-CDMA1700 – Mid Channel

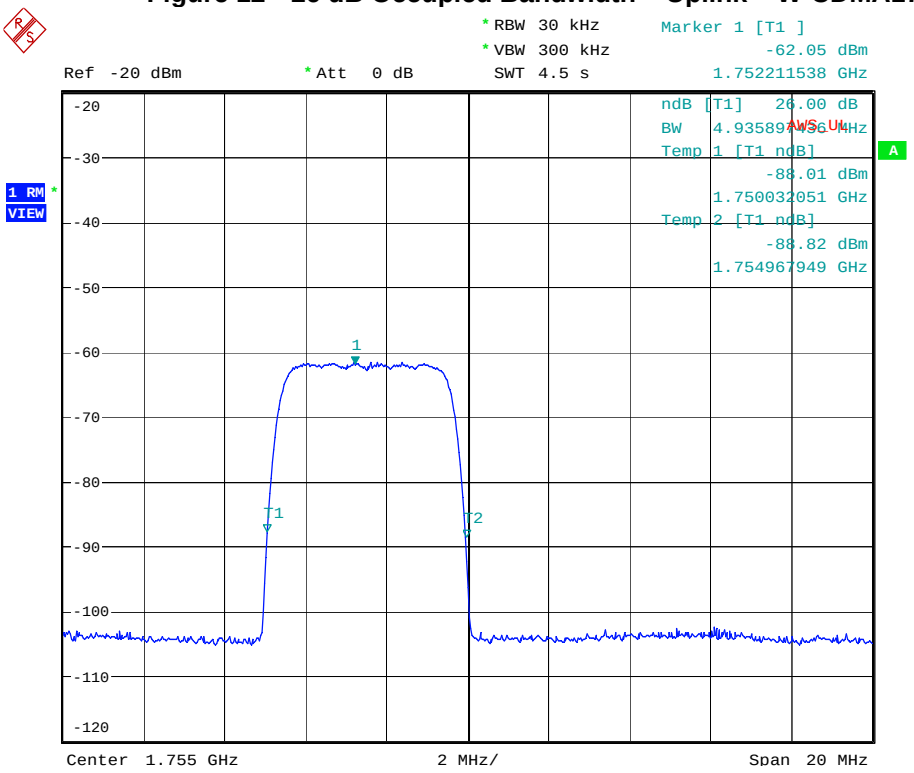


Input

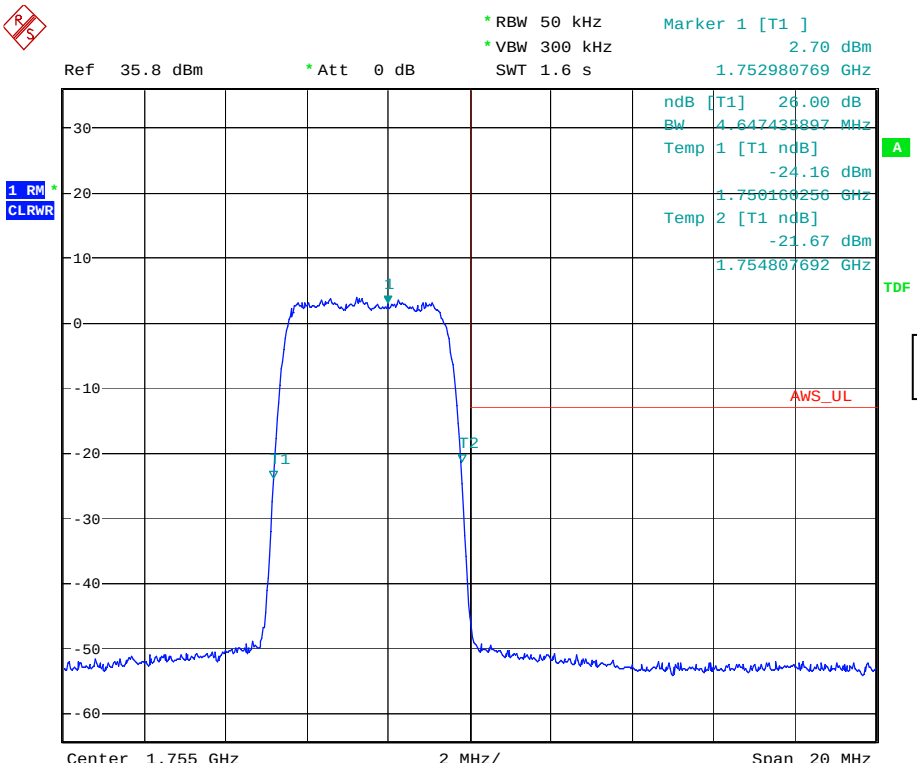


Output

Figure 12 26 dB Occupied Bandwidth – Uplink – W-CDMA1700 – High Channel

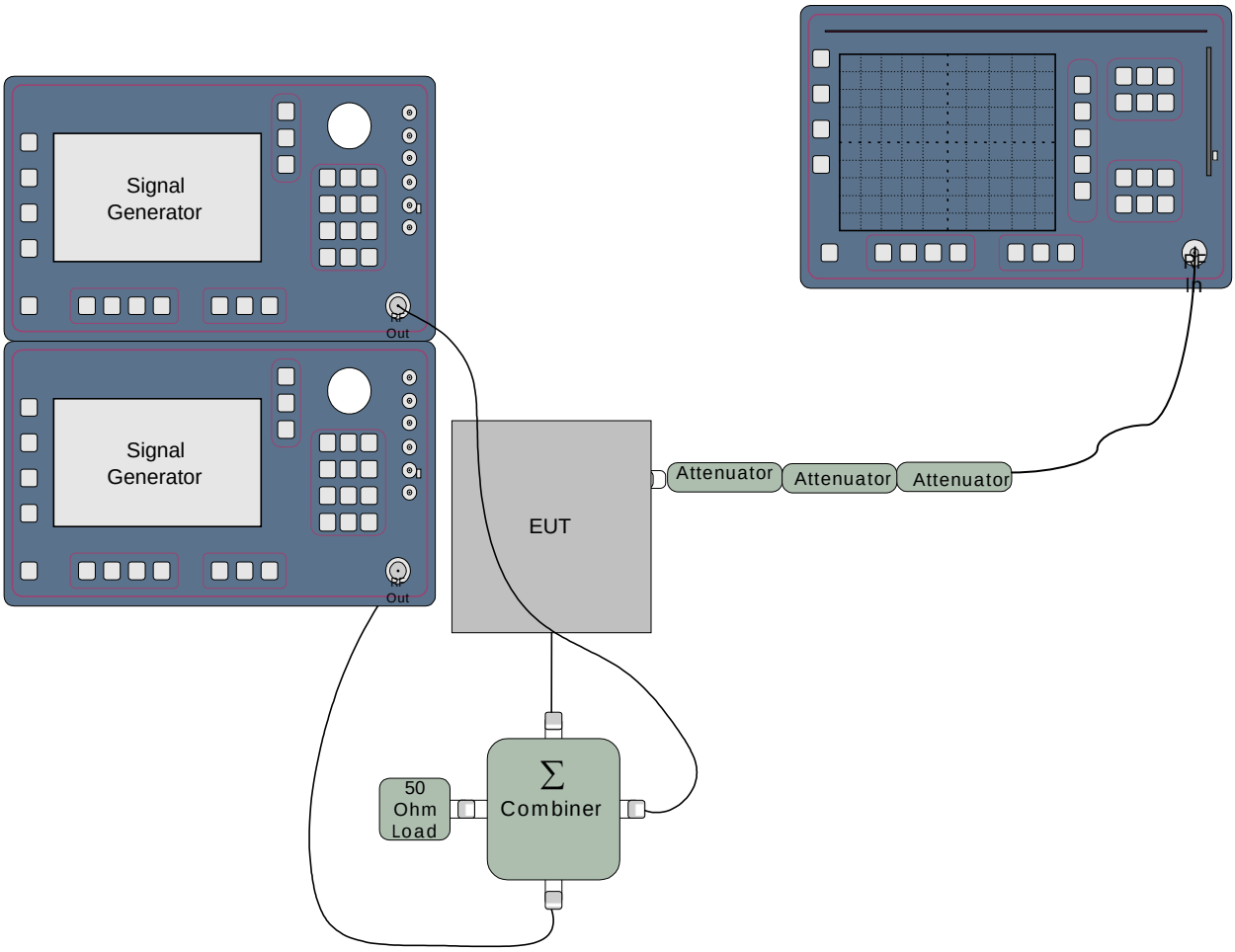


Input



Output

C.9. Test Diagram



C.10. Tested By

Name: Tom Tidwell,
Function: Manager of Wireless Services
Date: 17 October, 2007

APPENDIX D: 2.1051 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

D.1. Base Standard & Test Basis

Base Standard	FCC 2.1051
Test Basis	FCC 2.1051 Spurious Emissions at Antenna Terminals
Test Method	TIA 603-C, 2004

D.2. Specifications

27.53 Emission limits for AWS equipment

(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 log10 (P) dB.

(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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 26 dB below the transmitter power.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

D.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
+1.11/-1.22

D.4. Deviations

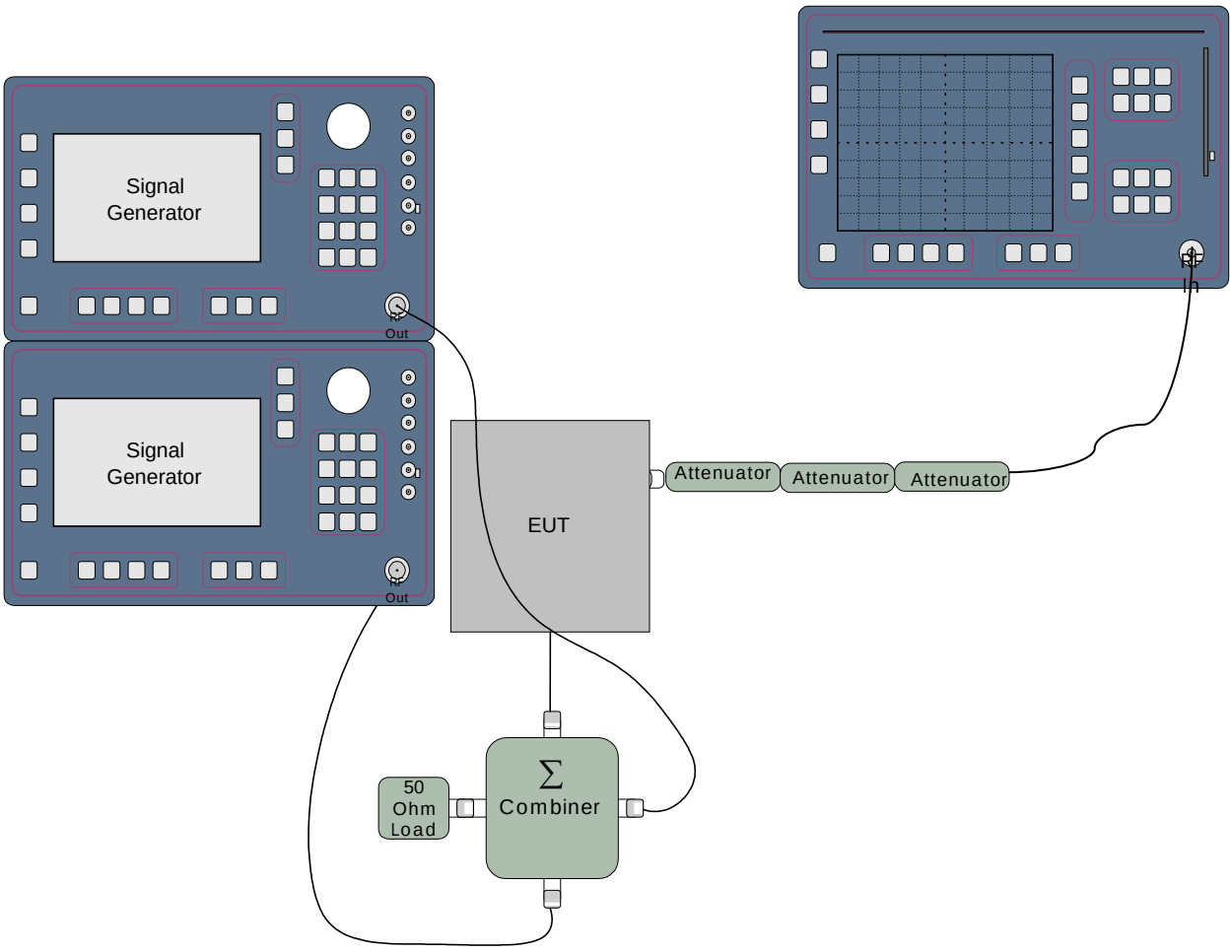
Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

D.5. Test Results

Complies. All emissions meet the out of band limits.

Out-of-Band Emissions limit is 43 + 10 log(P) which relates to -13 dBm absolute power.

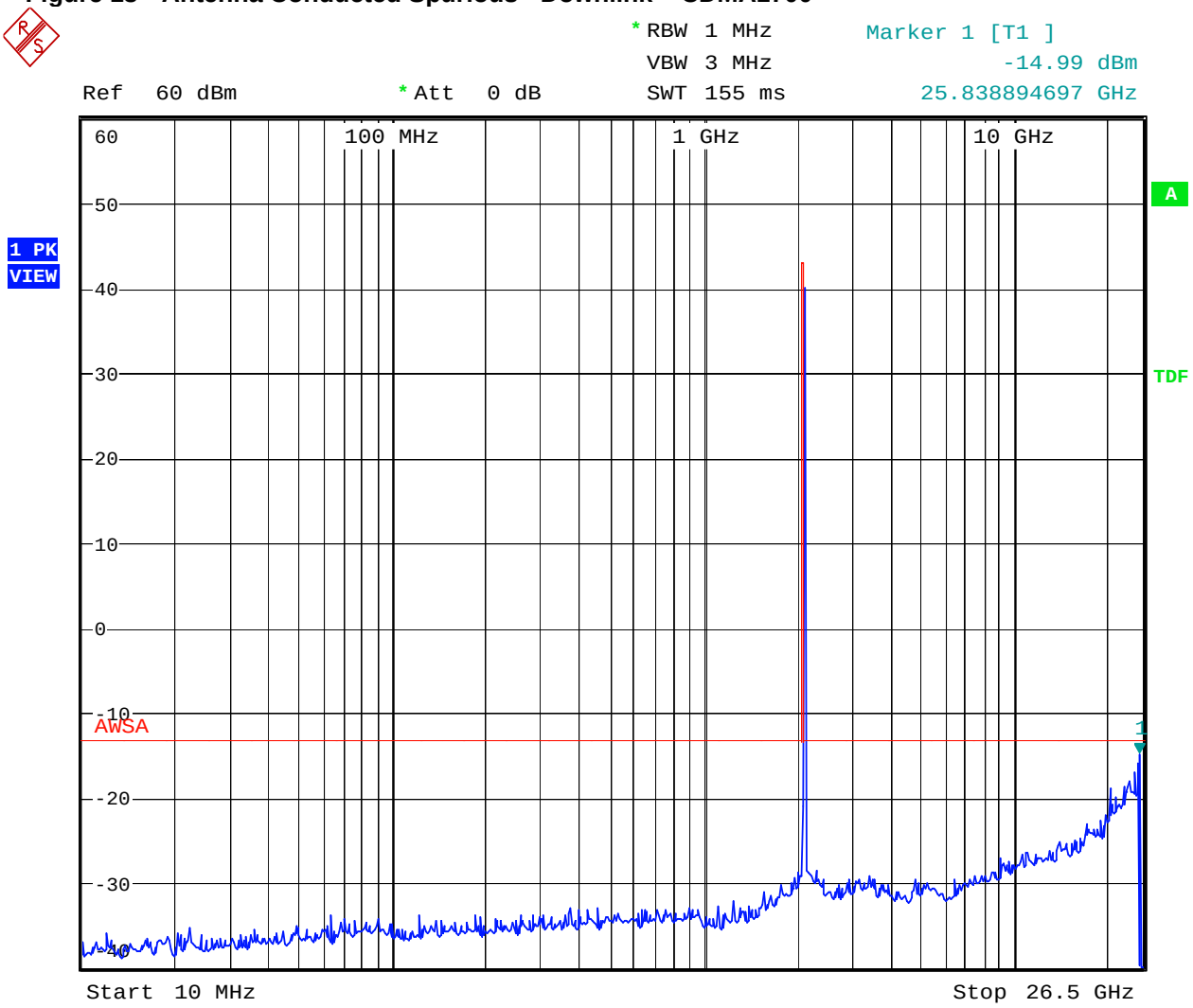
D.6. Test Diagram



D.7. Test Data

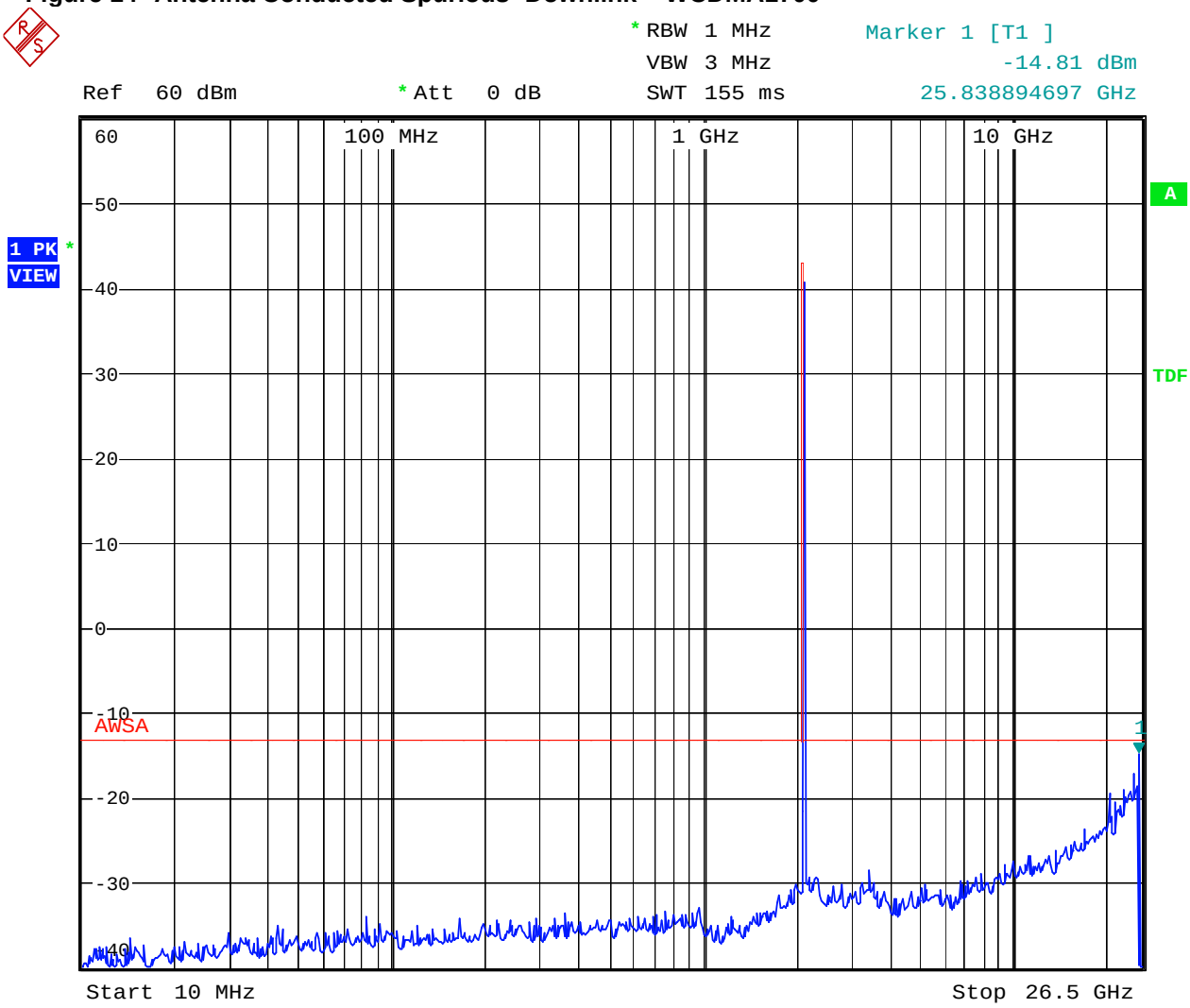
See following pages.

Figure 13 - Antenna Conducted Spurious - Downlink – CDMA1700



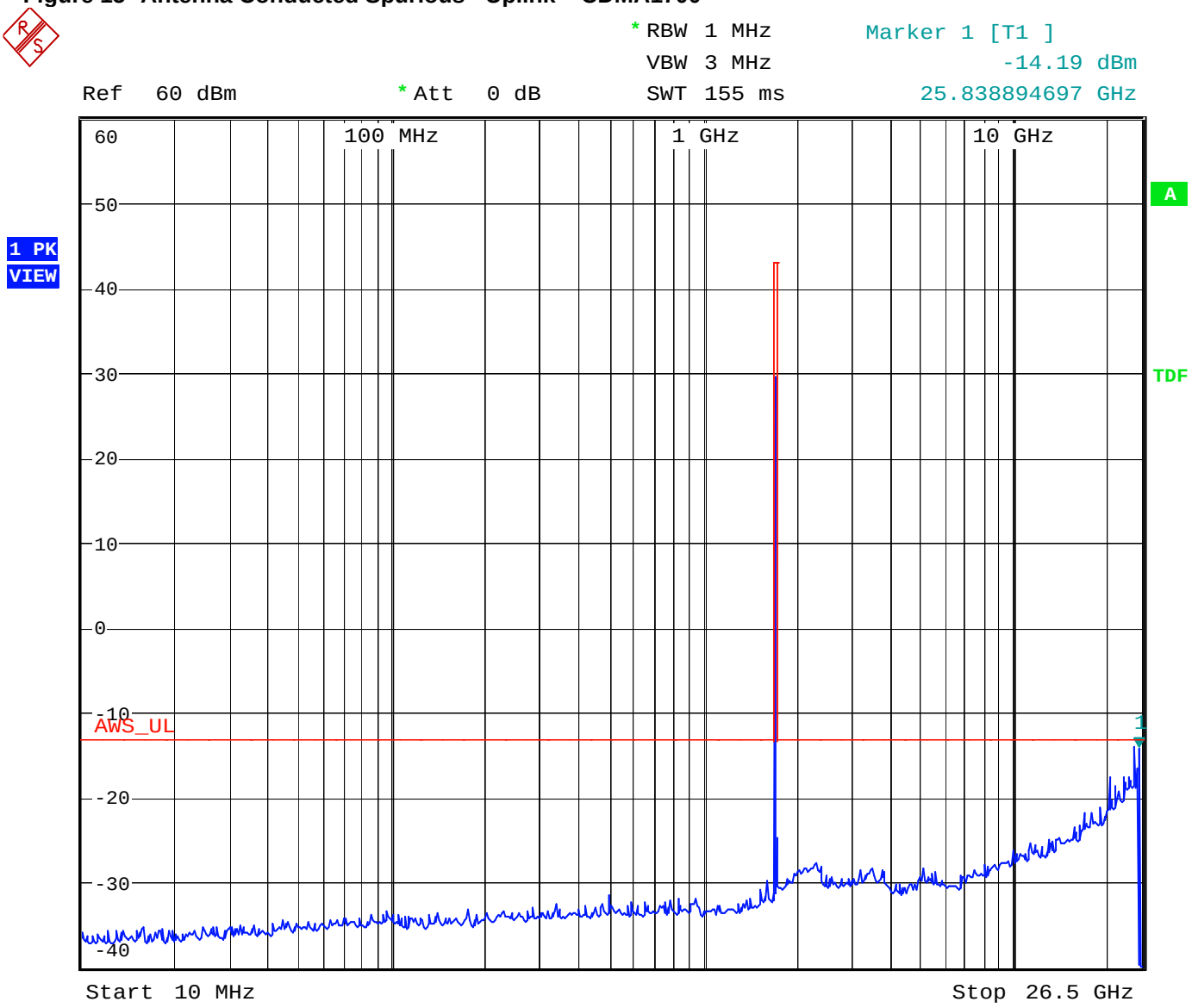
Date: 17.OCT.2007 17:00:13

Figure 14- Antenna Conducted Spurious- Downlink – WCDMA1700



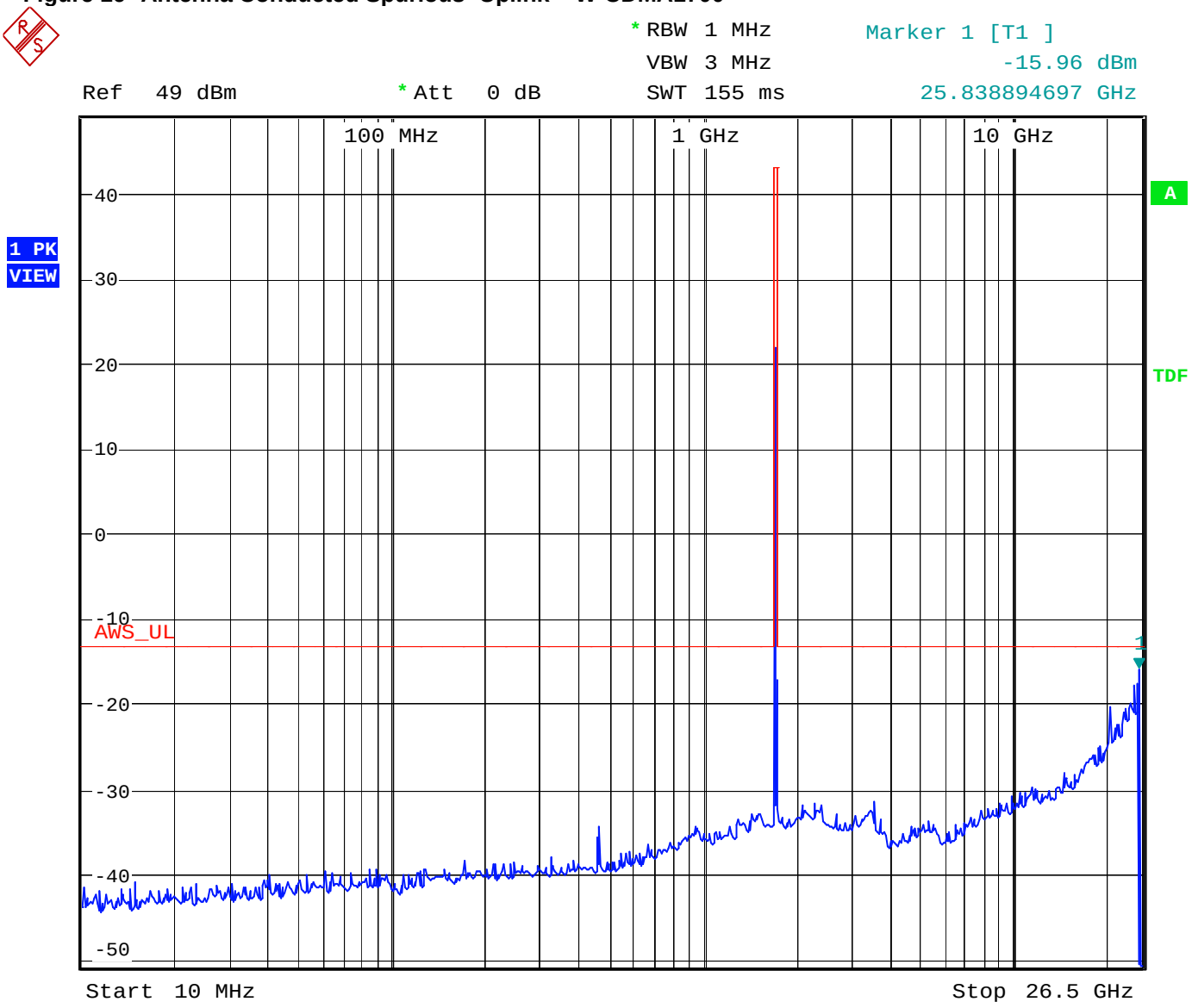
Date: 17.OCT.2007 16:58:37

Figure 15- Antenna Conducted Spurious - Uplink – CDMA1700



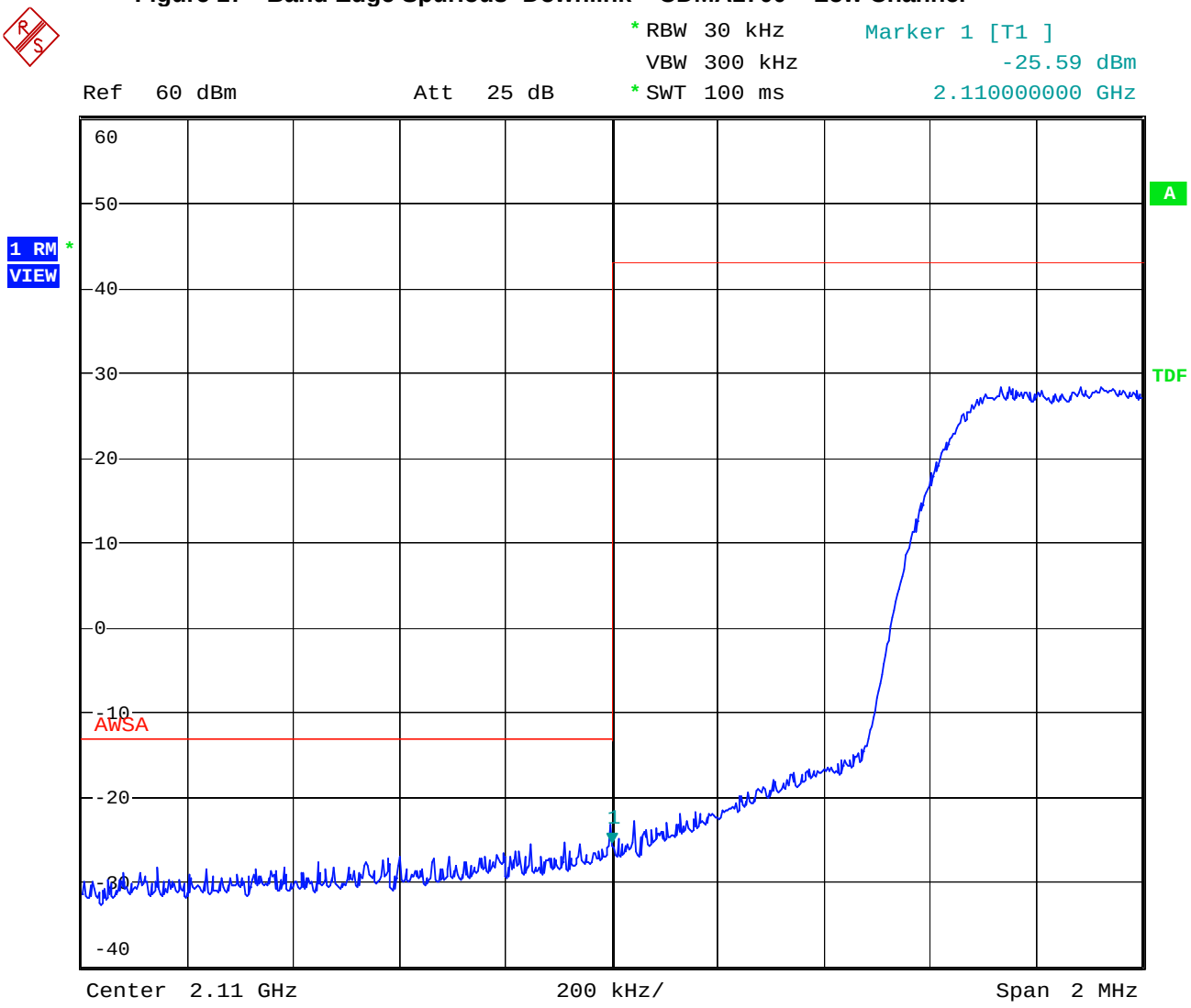
Date: 17.OCT.2007 17:18:31

Figure 16- Antenna Conducted Spurious- Uplink – W-CDMA1700



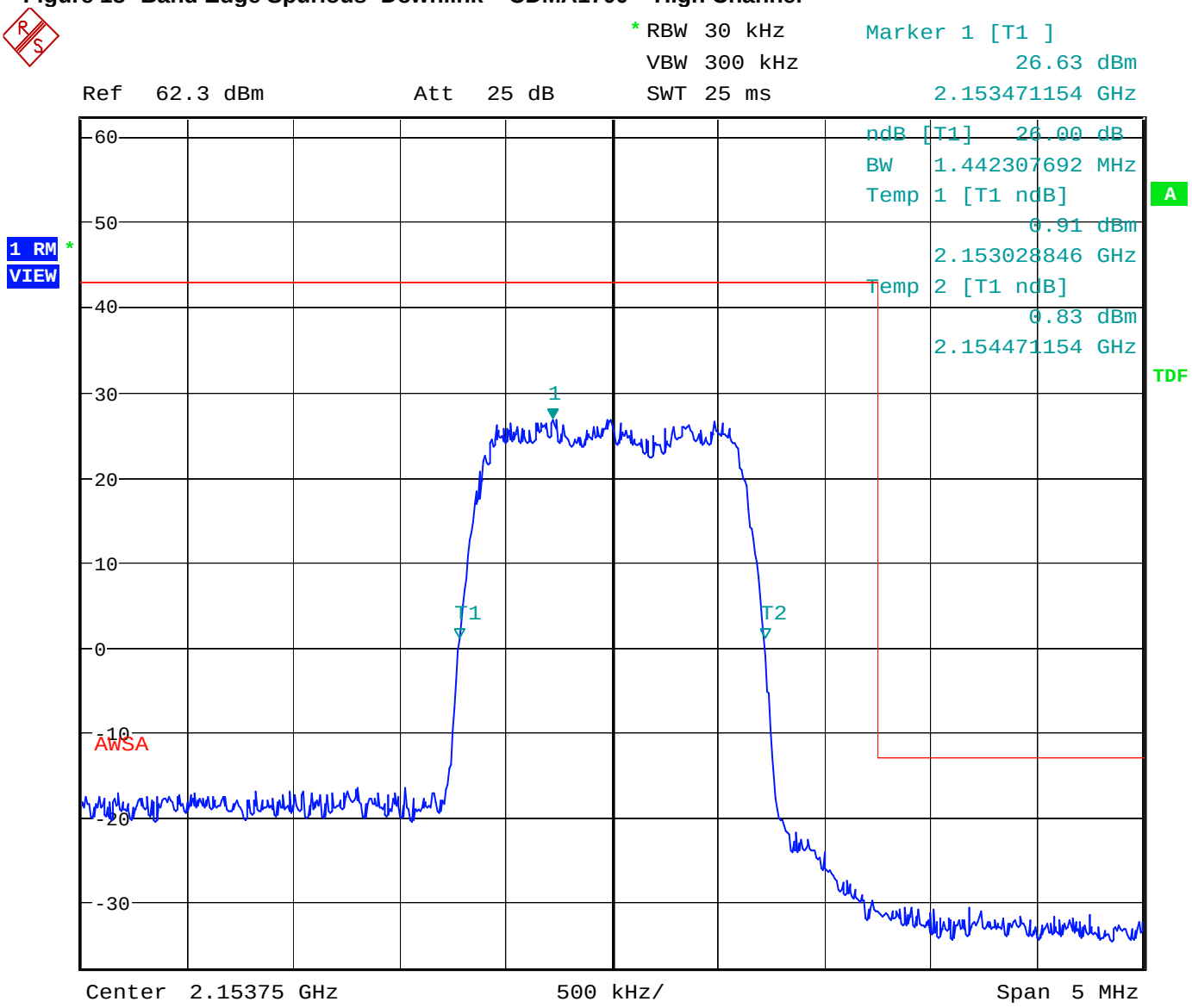
Date: 18.OCT.2007 08:29:05

Figure 17 Band Edge Spurious- Downlink – CDMA1700 – Low Channel



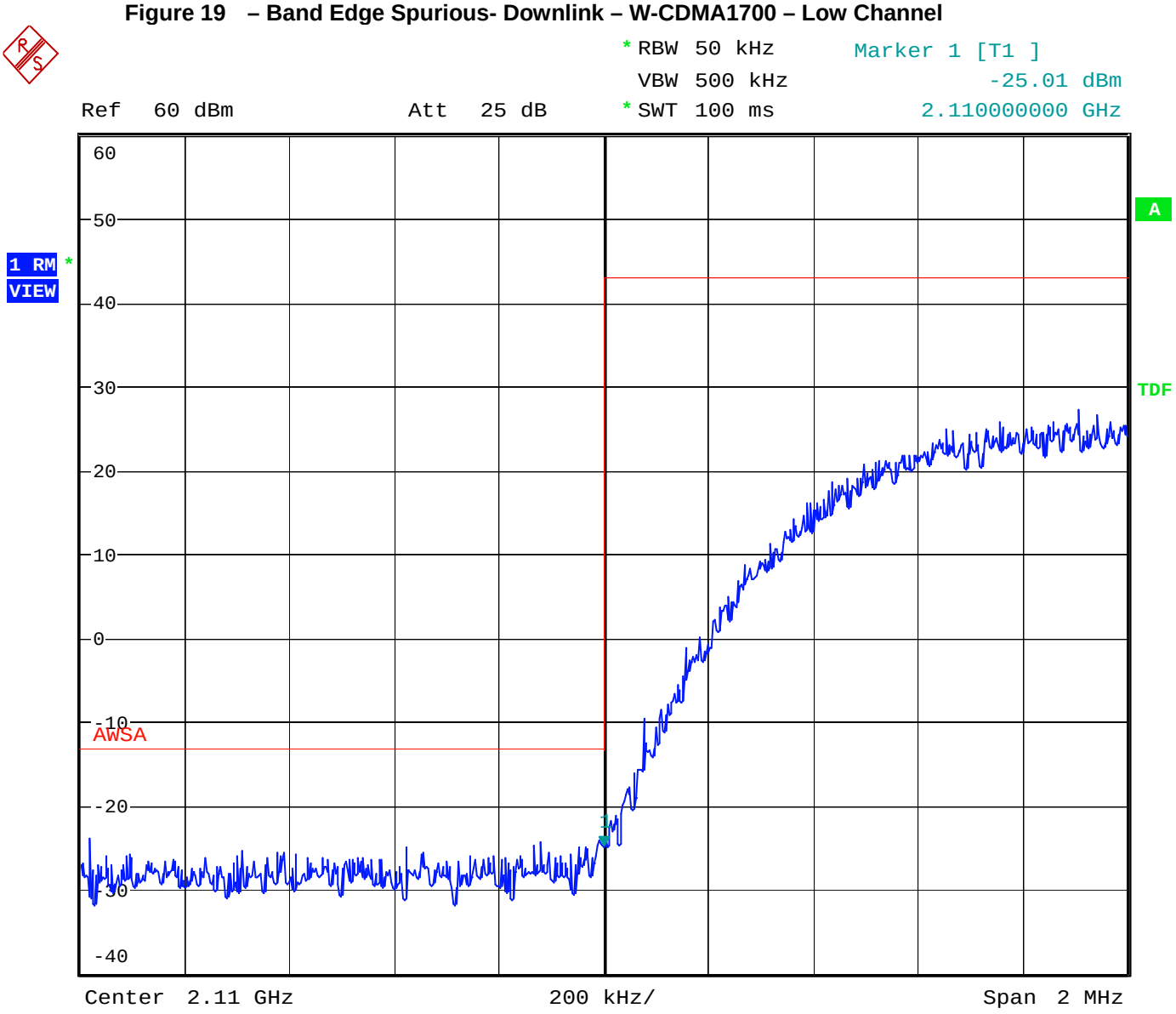
Date: 17.OCT.2007 13:49:06

Figure 18- Band Edge Spurious- Downlink – CDMA1700 – High Channel



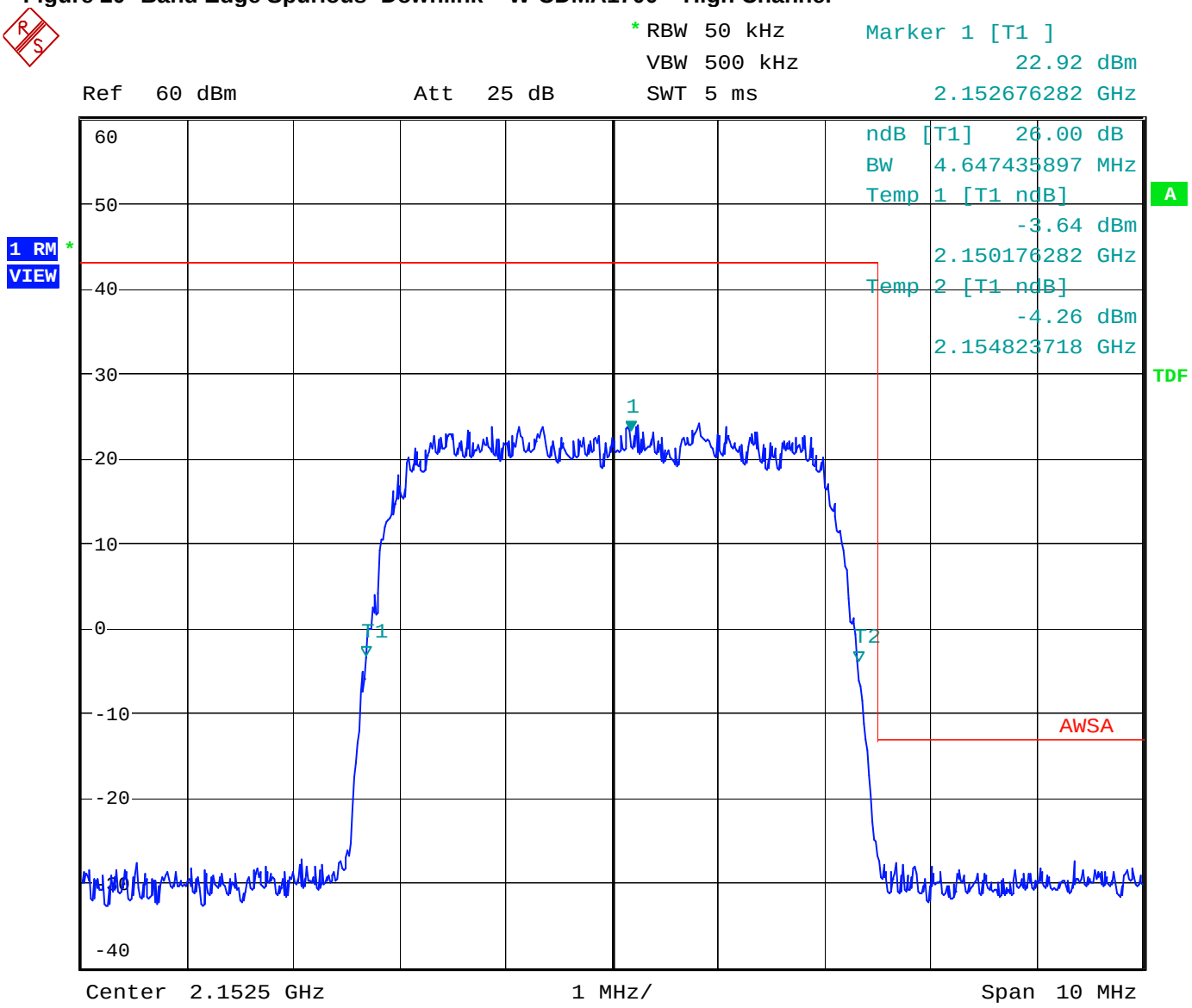
Date: 17.OCT.2007 16:23:04

Figure 19 – Band Edge Spurious- Downlink – W-CDMA1700 – Low Channel



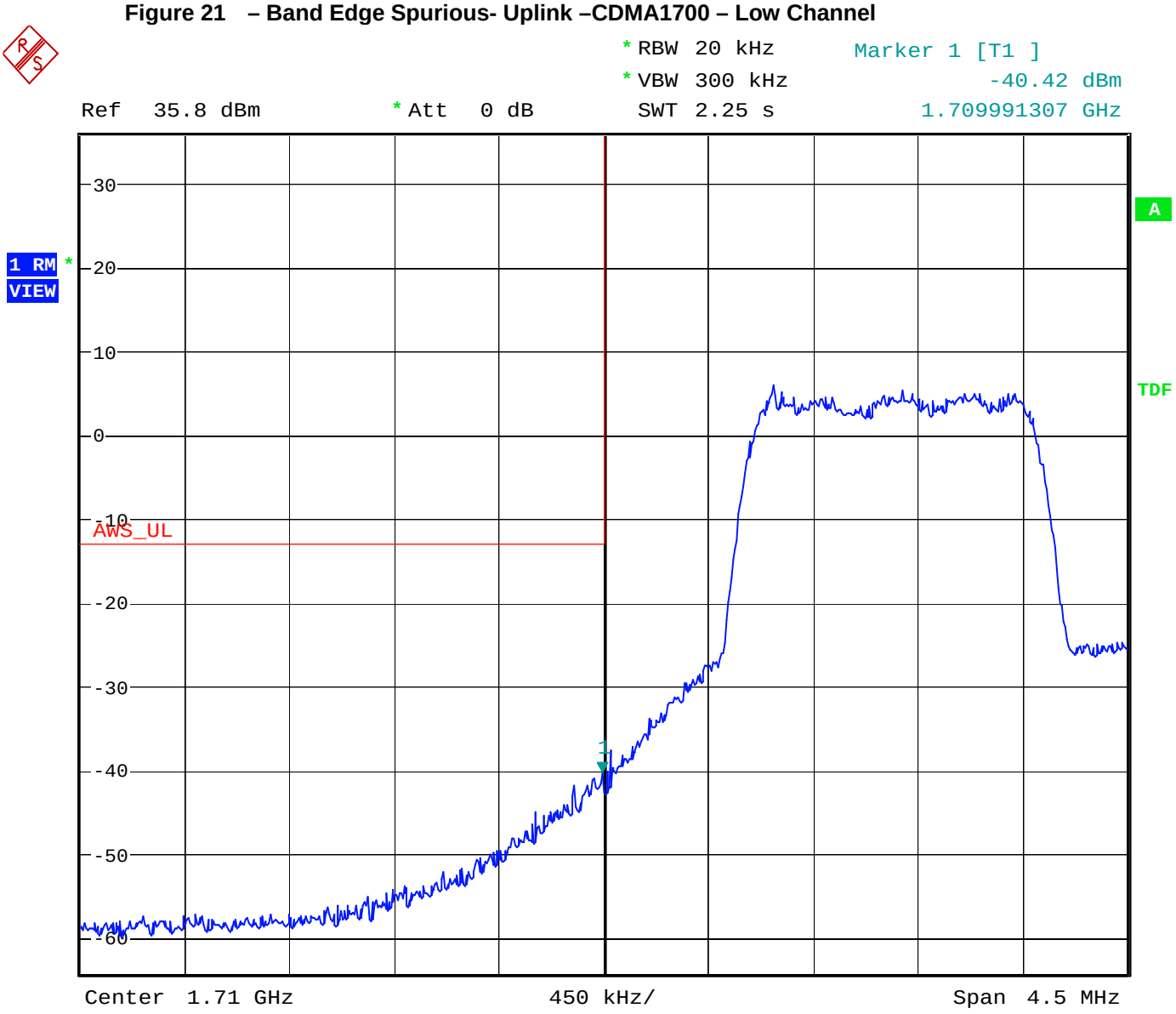
Date: 17.OCT.2007 13:46:07

Figure 20- Band Edge Spurious- Downlink – W-CDMA1700 – High Channel



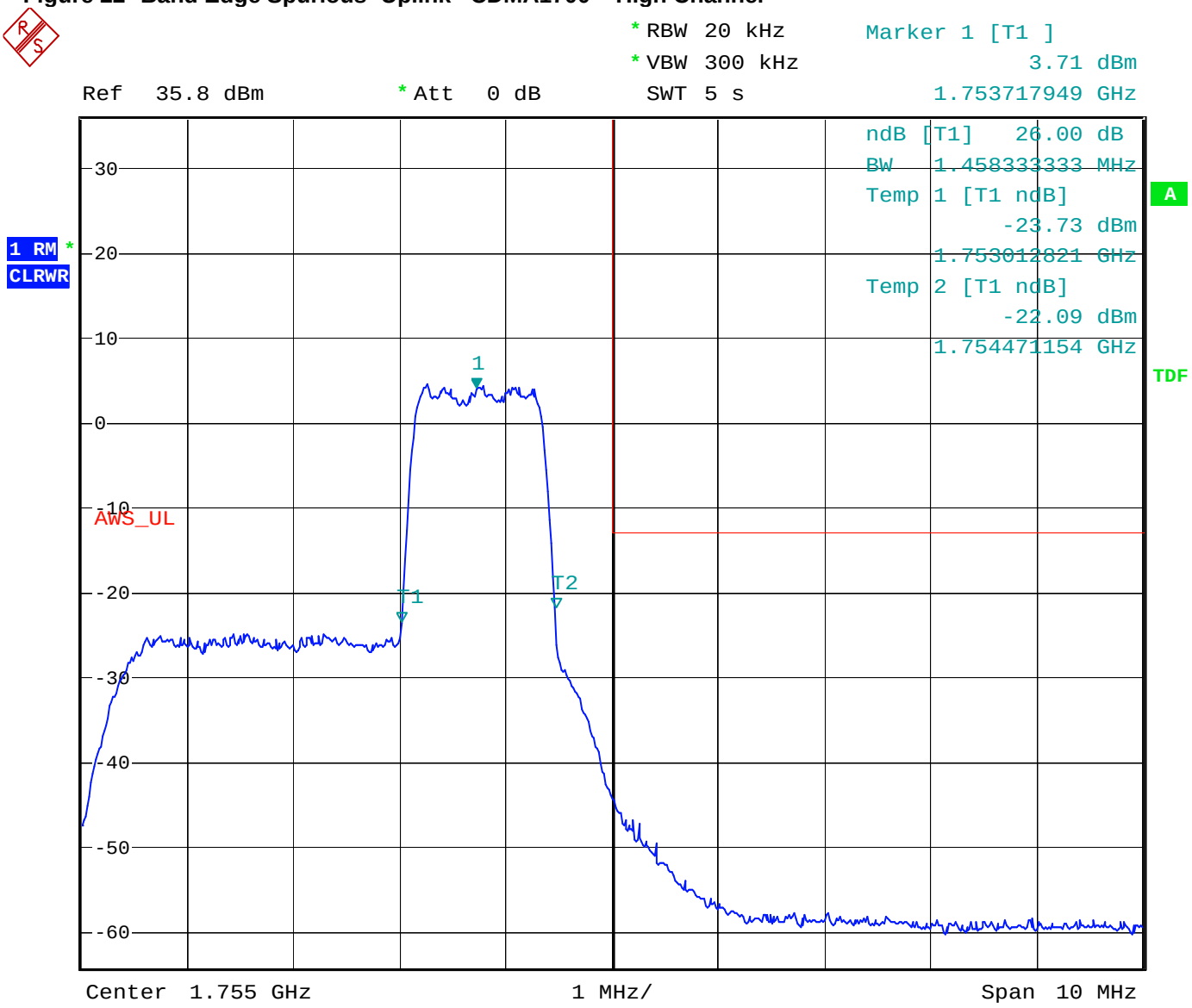
Date: 17.OCT.2007 15:15:35

Figure 21 – Band Edge Spurious- Uplink –CDMA1700 – Low Channel



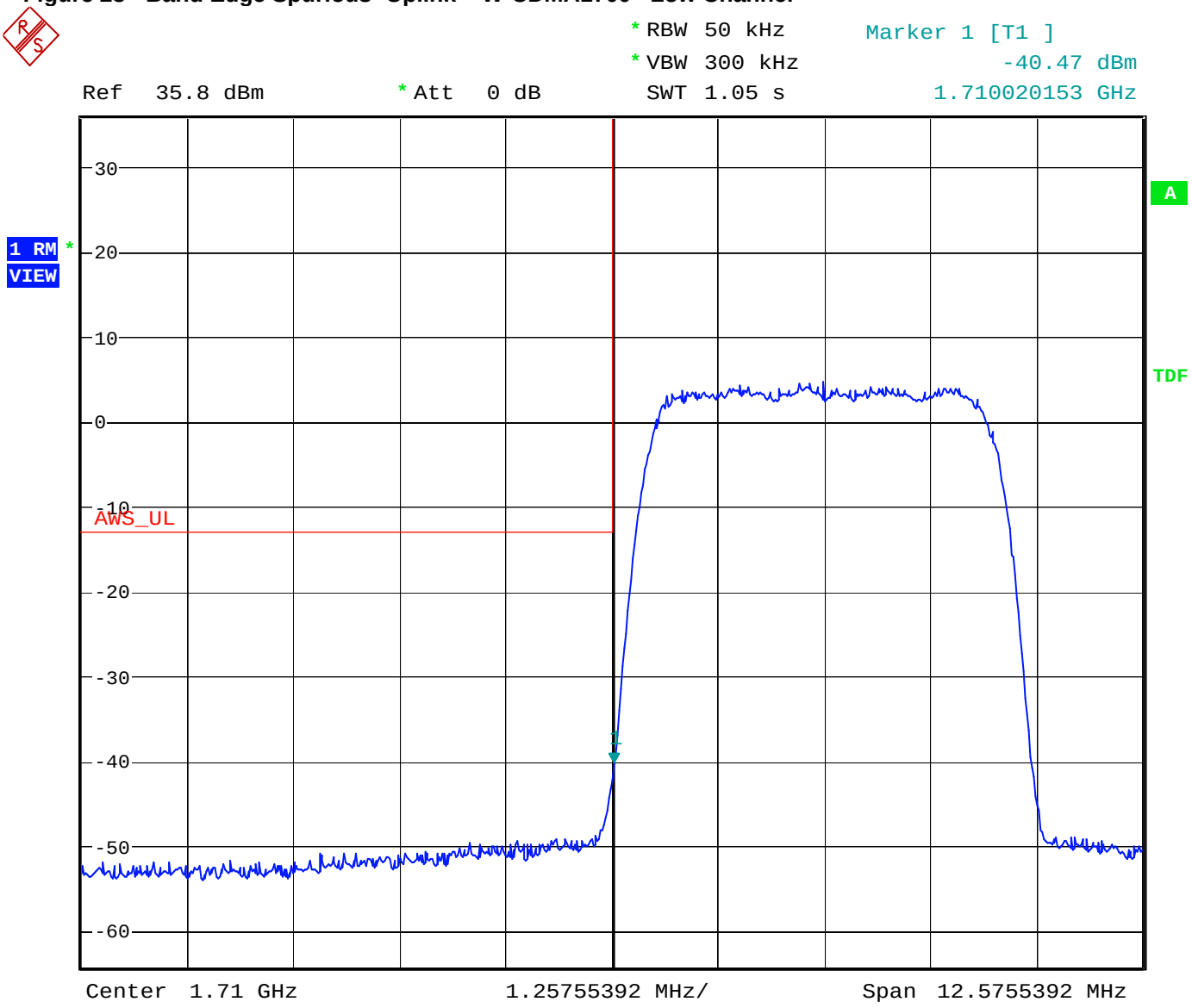
Date: 18.OCT.2007 13:04:24

Figure 22- Band Edge Spurious- Uplink –CDMA1700 – High Channel



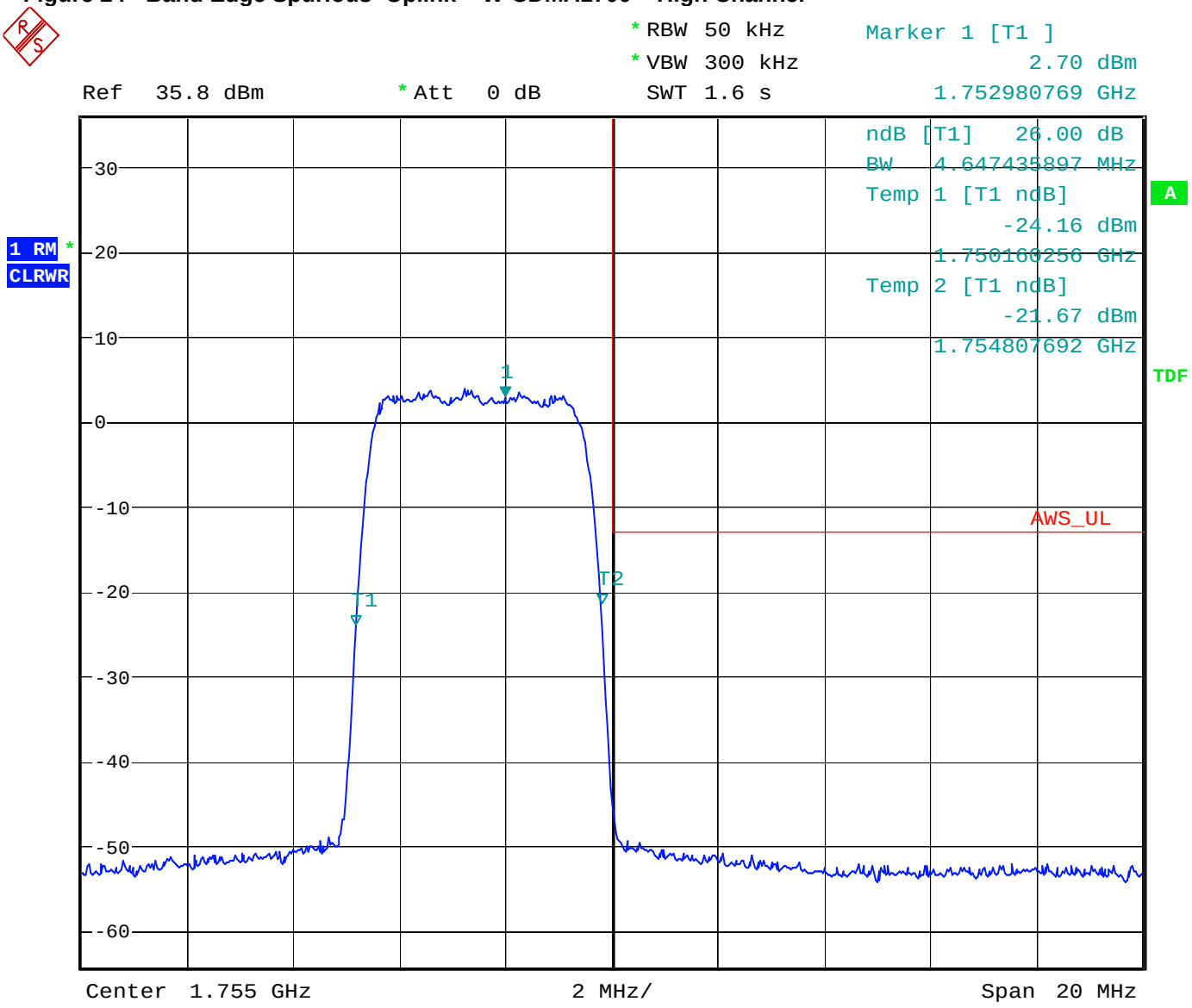
Date: 18.OCT.2007 13:09:35

Figure 23– Band Edge Spurious- Uplink – W-CDMA1700 –Low Channel



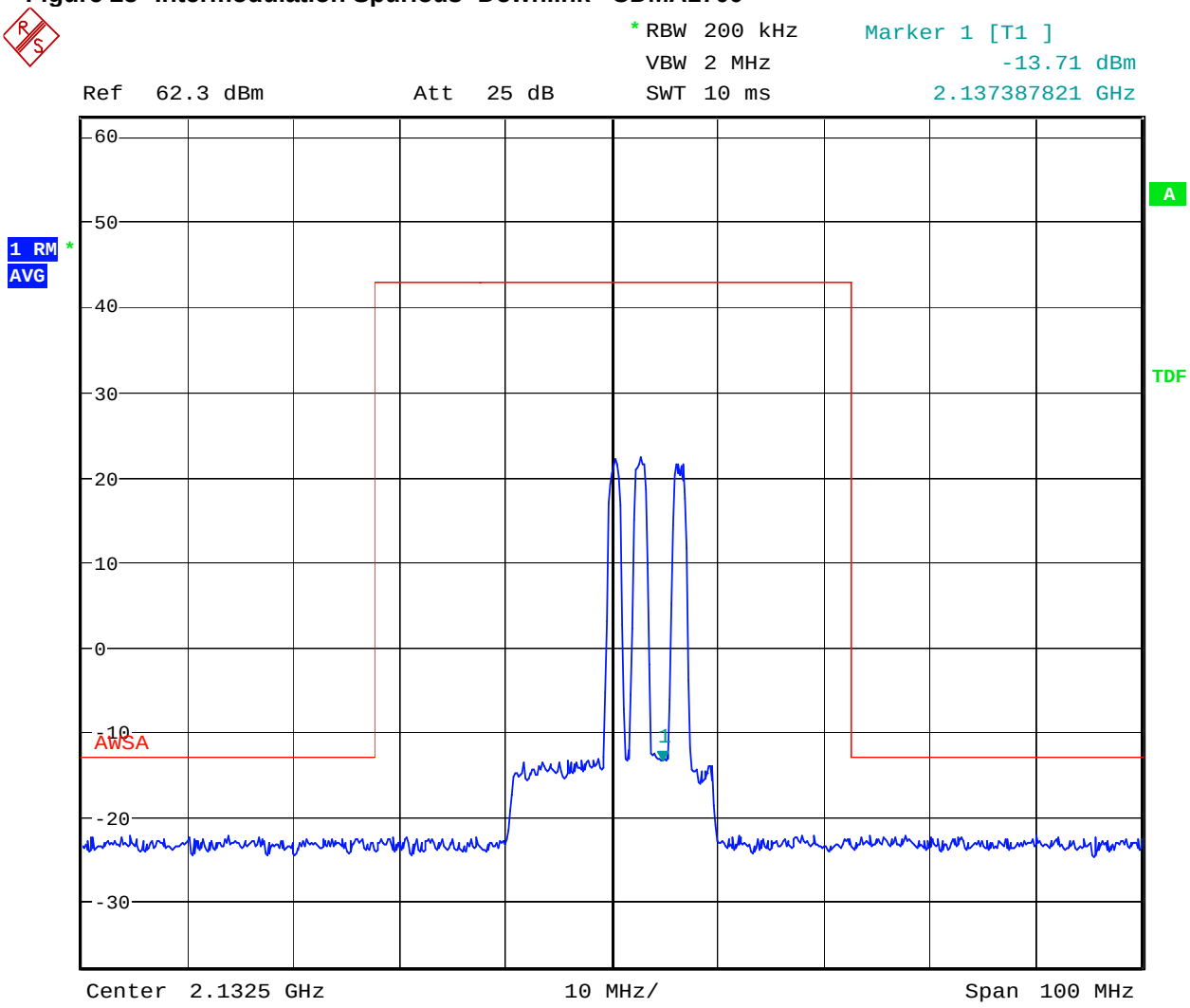
Date: 18.OCT.2007 08:56:23

Figure 24– Band Edge Spurious- Uplink – W-CDMA1700 – High Channel



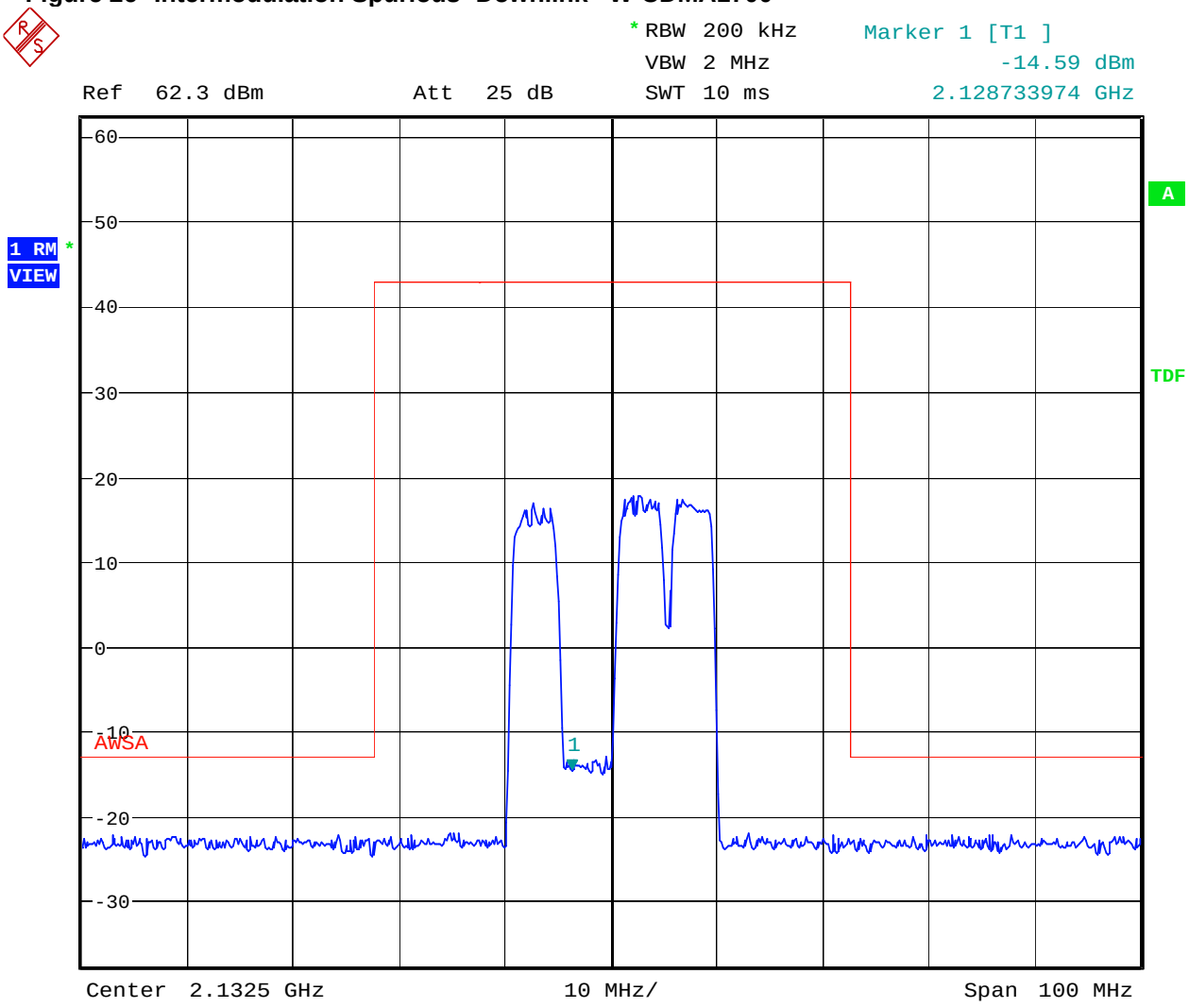
Date: 18.OCT.2007 13:13:57

Figure 25- Intermodulation Spurious- Downlink –CDMA1700



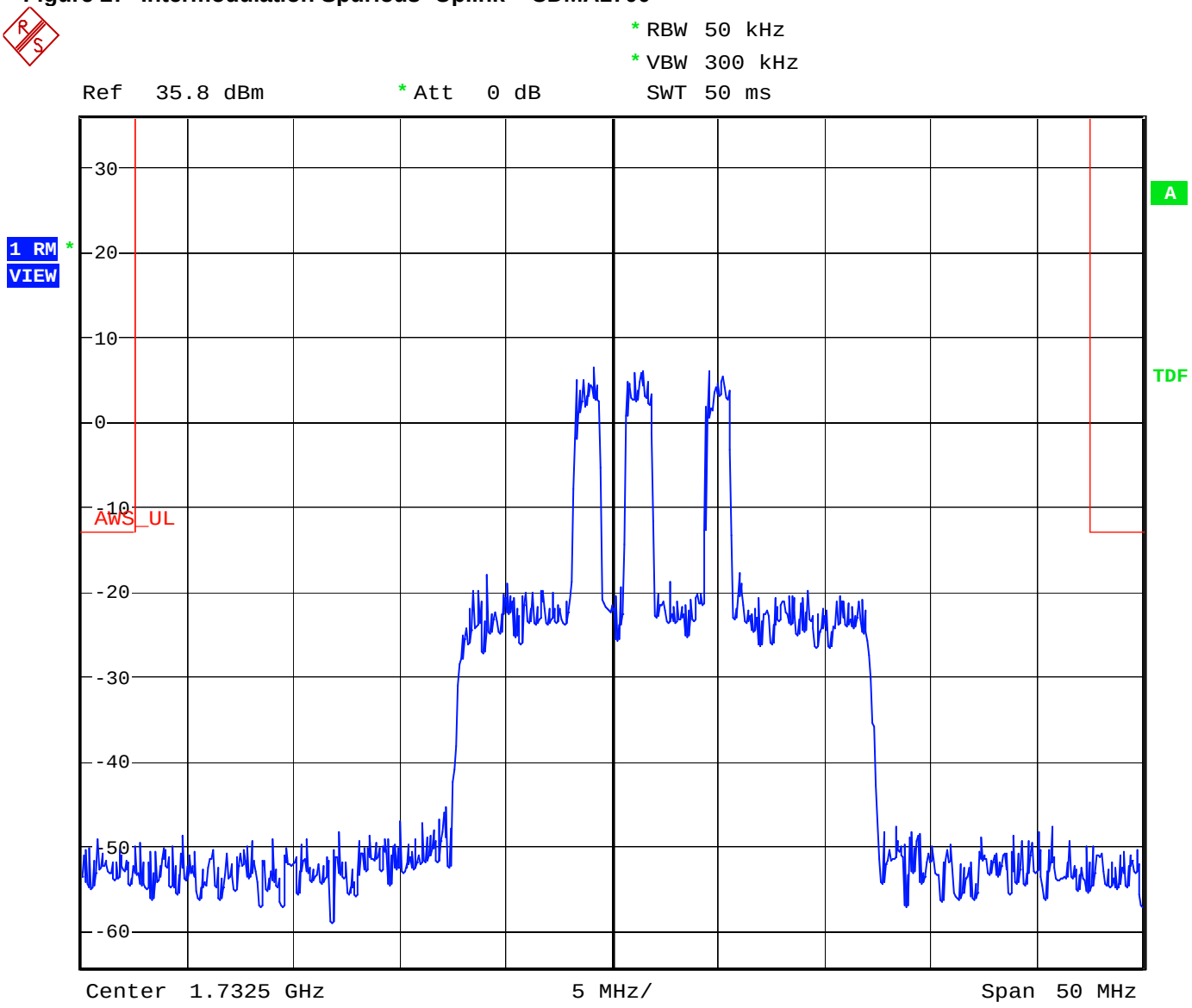
Date: 17.OCT.2007 16:00:39

Figure 26- Intermodulation Spurious- Downlink –W-CDMA1700



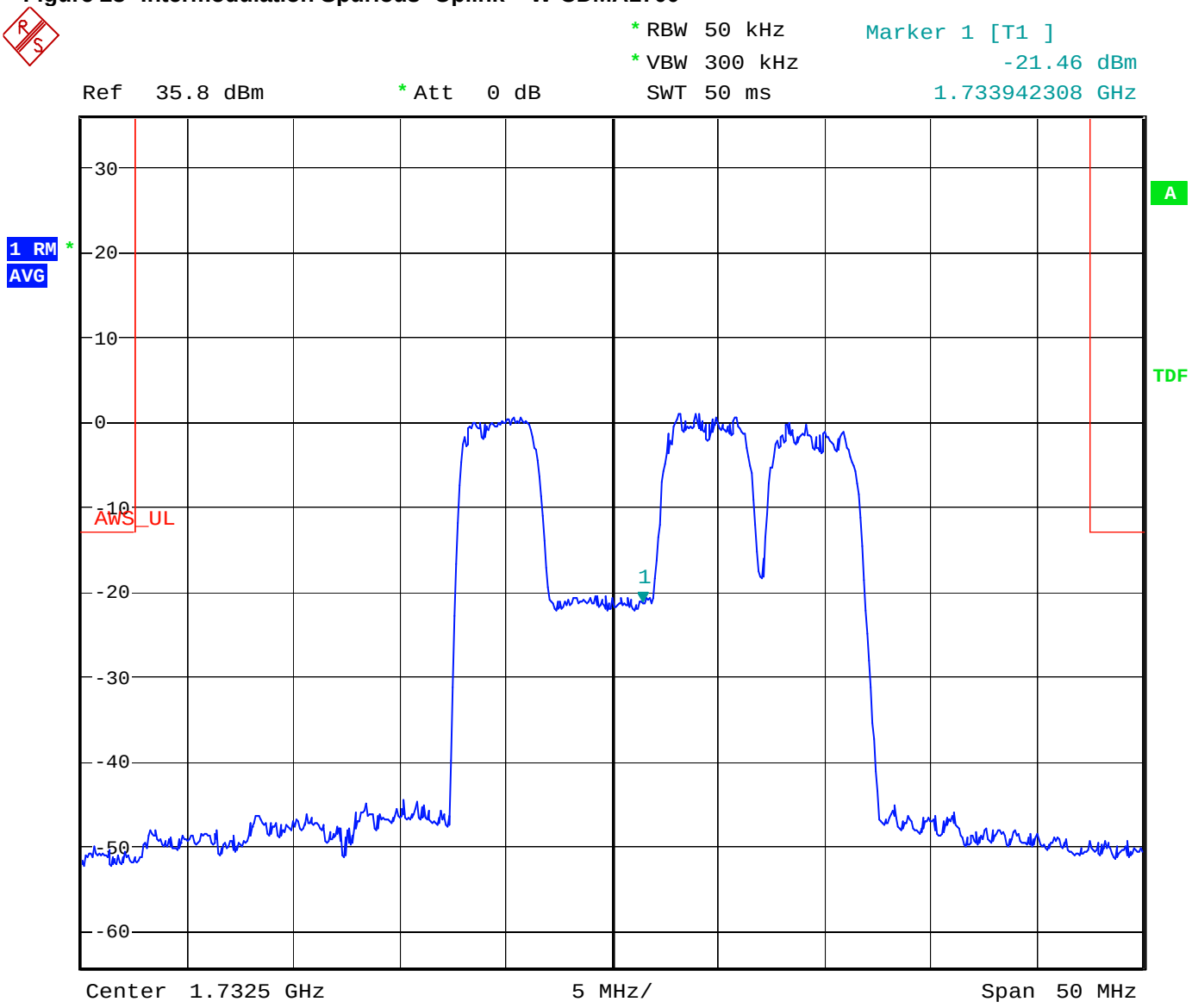
Date: 17.OCT.2007 15:53:41

Figure 27- Intermodulation Spurious- Uplink – CDMA1700



Date: 18.OCT.2007 13:48:54

Figure 28- Intermodulation Spurious- Uplink – W-CDMA1700



Date: 18.OCT.2007 13:51:39

D.8. Tested By

Name: Tom Tidwell,
Function: Manager of Wireless Services
Date: 18 October, 2007

APPENDIX E: 2.1053 FIELD STRENGTH OF SPURIOUS RADIATION

E.1. Base Standard & Test Basis

Base Standard	FCC 2.1053
Test Basis	FCC 2.1053 Field Strength of Spurious Radiation
Test Method	TIA 603-C, 2004 Substitution Antenna Method

E.2. Limits

27.53 Emission limits for AWS equipment

(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 log10 (P) dB.

(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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 26 dB below the transmitter power.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

E.3. Test Results

Compliant. The worst-case spurious emission level was -28.4 dBm at 21,320.0 MHz. This level is 15.4 dB below the specification limit of -13 dBm. The spectrum was searched up to 26 GHz with the device operating on three channels in the Downlink direction in each band.

E.4. Deviations from Normal Operating Mode During Test

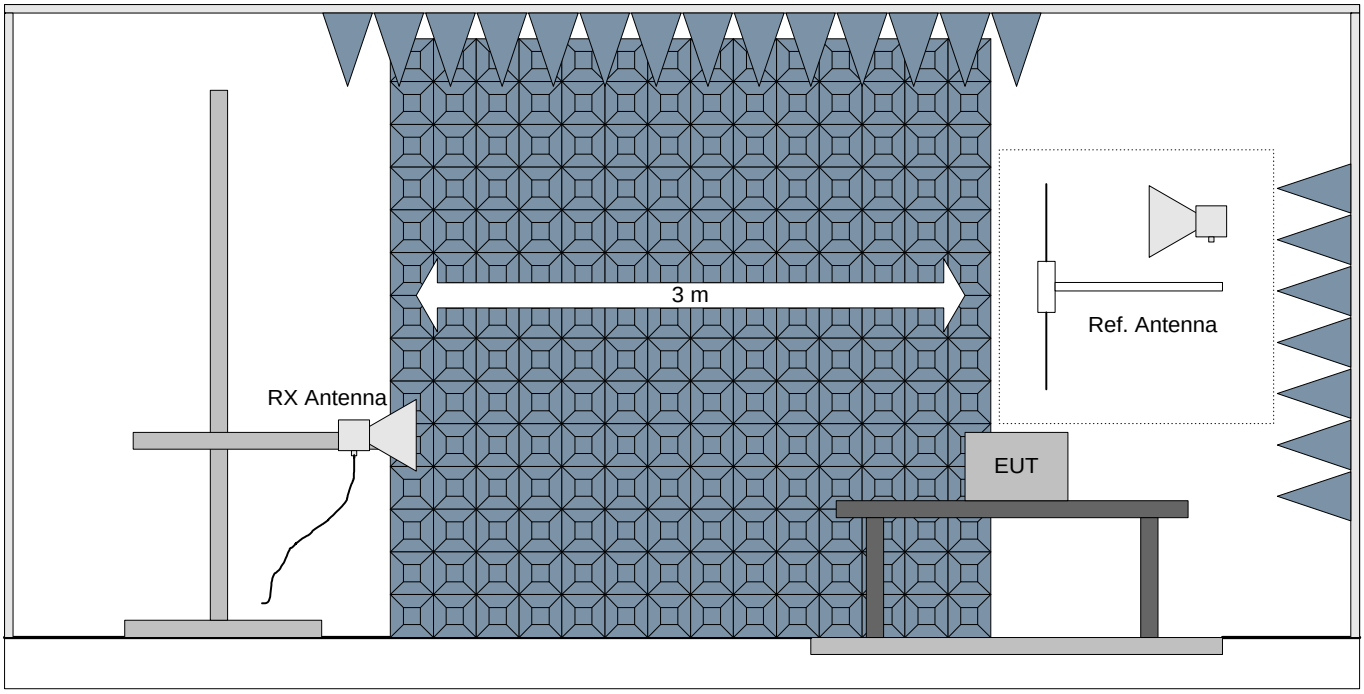
None.

E.5. Sample Calculation

Final measured value (dBm) = Substitution level (dBm) + Antenna Gain (dBi)

Minimum attenuation limit (dB) = 43 + 10 log(P) where P = Peak power of the carrier in watts.

E.6. Test Diagram



Note: The EUT is set to repeat a signal at maximum rf output power into a coaxial load for this testing.

E.7. Test Data

Project No:	W7422	Test Method: EIA 603C	
Model:	Node C/M 1743		
Comments:	Tested with maximum rf output power in both the uplink and downlink paths.		
Tested by:	T. Tidwell	Date:	10/19/2007

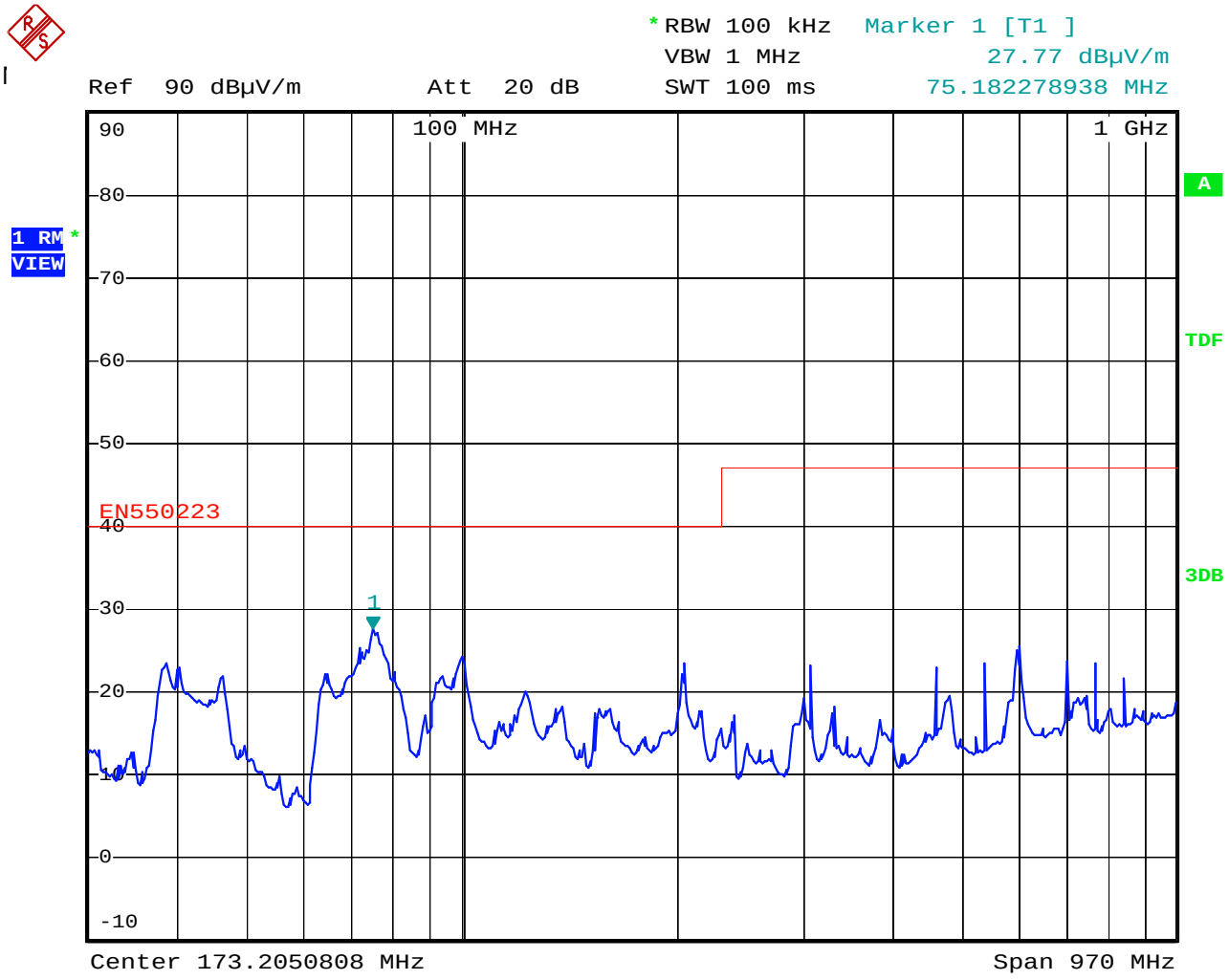
-57

Distance:	3 m	Standard:	CFR 47, Part 2	RBW: (unless noted)	< 1 GHz = 120 kHz; > 1 GHz = 1 MHz	VBW: (unless noted) Peak = RBW; Avg. = RBW

Notes	Polarization	Frequency	Measured	Substitution Level	Substitution Antenna Gain	Final Measured Value		Peak Carrier Power		Limit	Margin
	(V/H)	(MHz)	(dBm)	(dBm)	(dBd)	(dBm)	(watts)	(dBm)	(watts)	(dBc)	(dB)
	H	4225	-67.0	-55.2	5.7	-49.5	1.12E-08	43	20	56.0	36.5
	V	4225	-56.8	-44.6	5.7	-38.9	1.29E-07	43	20	56.0	25.9
	H	6337	-63.6	-51.8	7.4	-44.4	3.63E-08	43	20	56.0	31.4
	V	6337	-52.4	-40.4	7.4	-33.0	5.01E-07	43	20	56.0	20.0
Noise Floor	H	8449	-63.5	-52.5	8.7	-43.8	4.17E-08	43	20	56.0	30.8
Noise Floor	V	8449	-59.7	-48.0	8.7	-39.3	1.17E-07	43	20	56.0	26.3
Noise Floor	H	10561	-51.1	-50.3	9.1	-41.2	7.59E-08	43	20	56.0	28.2
Noise Floor	V	10561	-57.0	-45.2	9.1	-36.1	2.45E-07	43	20	56.0	23.1
Noise Floor	H	12637.5	-60.2	-37.9	9.8	-28.1	1.55E-06	43	20	56.0	15.1
Noise Floor	V	12637.5	-52.5	-40.4	9.8	-30.6	8.71E-07	43	20	56.0	17.6
Noise Floor	H	14786	-44.6	-41.4	10.1	-31.3	7.41E-07	43	20	56.0	18.3
Noise Floor	V	14786	-42.0	-40.3	10.1	-30.2	9.55E-07	43	20	56.0	17.2
Noise Floor	H	3430	-76.8	-64.5	5.6	-58.9	1.29E-09	23	0.2	36.0	45.9
Noise Floor	V	3430	-74.2	-63.9	5.6	-58.3	1.48E-09	23	0.2	36.0	45.3
Noise Floor	H	6860	-65.3	-60.4	7.5	-52.9	5.13E-09	23	0.2	36.0	39.9
N	V	6860	-61.1	-57.8	7.5	-50.3	9.33E-09	23	0.2	36.0	37.3

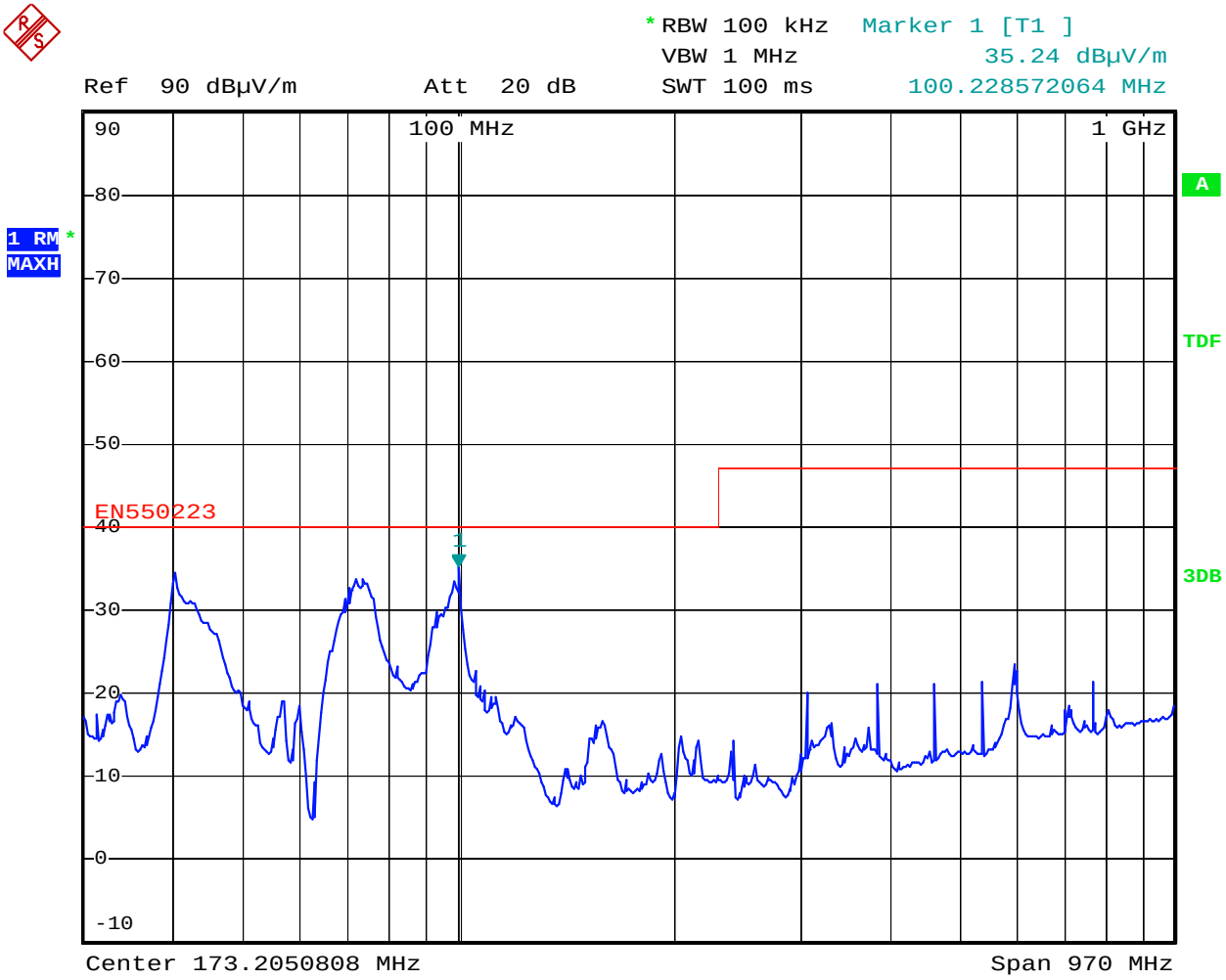
Notes: *(1) A positive margin indicates a passing result*
(2) If duty cycle correction is indicated, plots are included in the test report to validate the factor used.

Plot of 30 MHz – 1 GHz with Horizontal Polarization



Date: 19.OCT.2007 18:23:40

Plot of 30 MHz – 1 GHz with Vertical Polarization



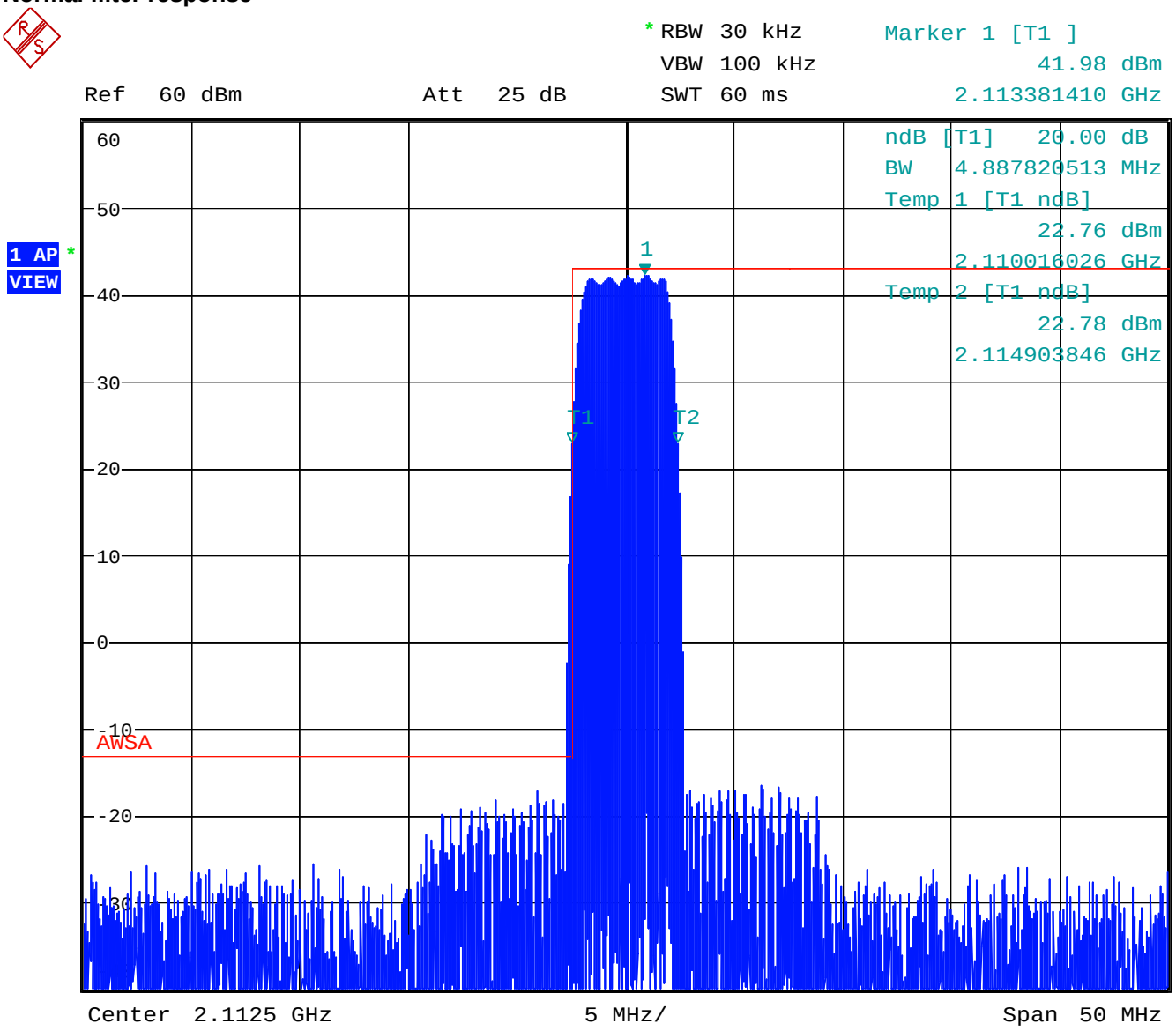
Date: 19.OCT.2007 18:26:29

E.8. Test Photos

APPENDIX F: 2.1053 FILTER PLOTS

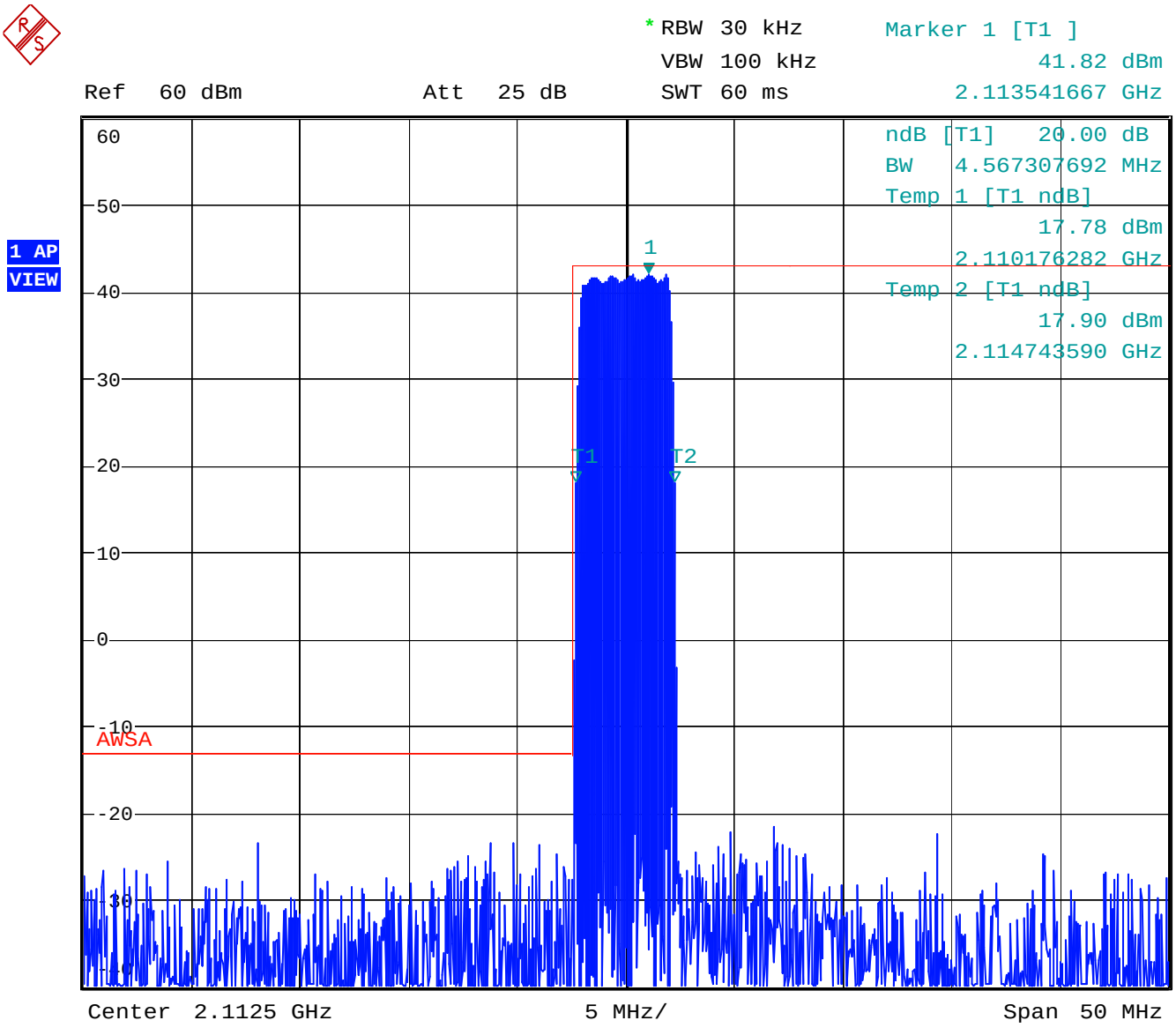
These plots demonstrate the filter band pass characteristics of the device.

Downlink
Single channel
Normal filter response



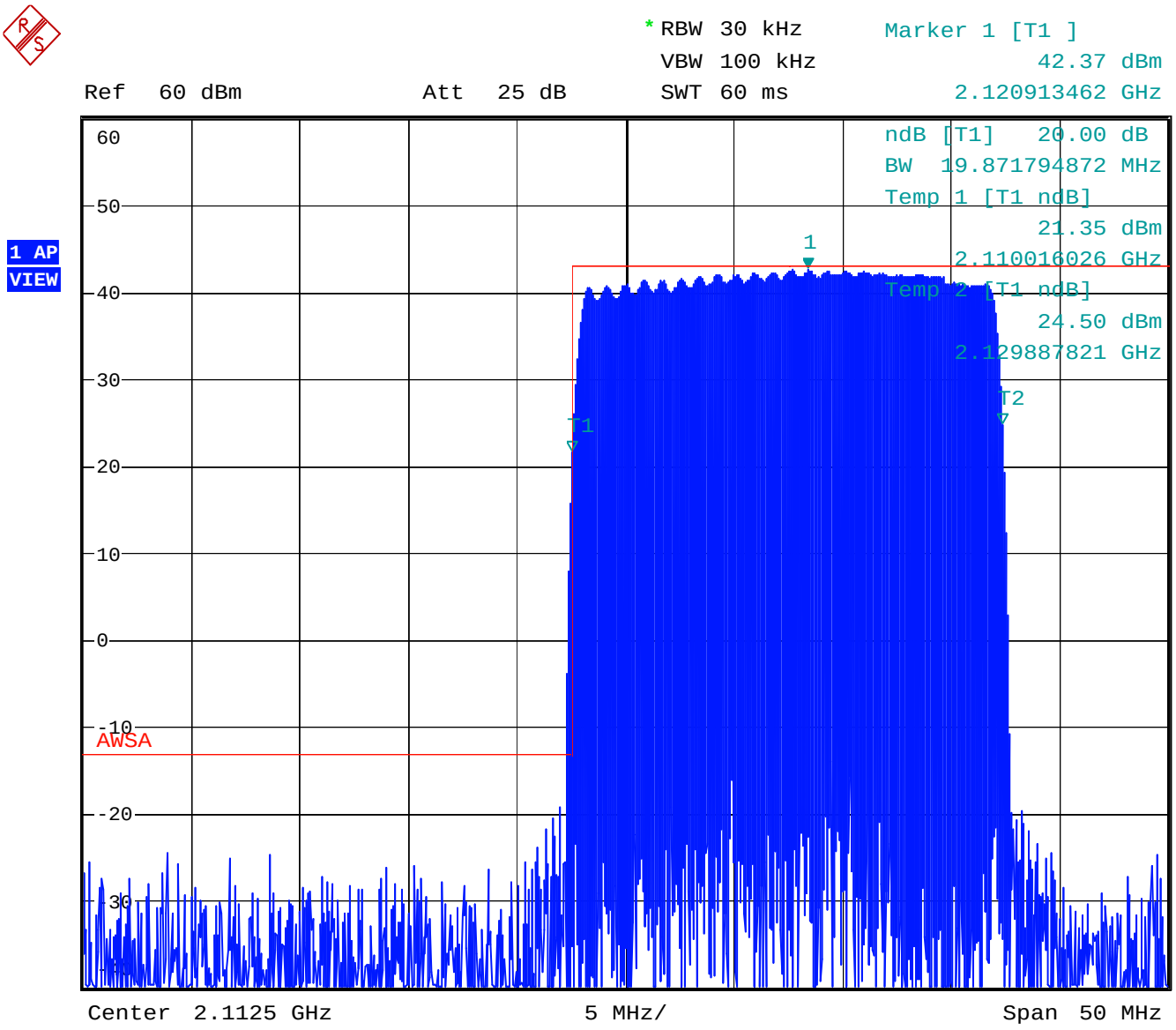
Date: 17.OCT.2007 15:03:39

Downlink
Single channel
High attenuation filter response



Date: 17.OCT.2007 14:59:46

Downlink
4 x 5 MHz channels
Normal Filter response

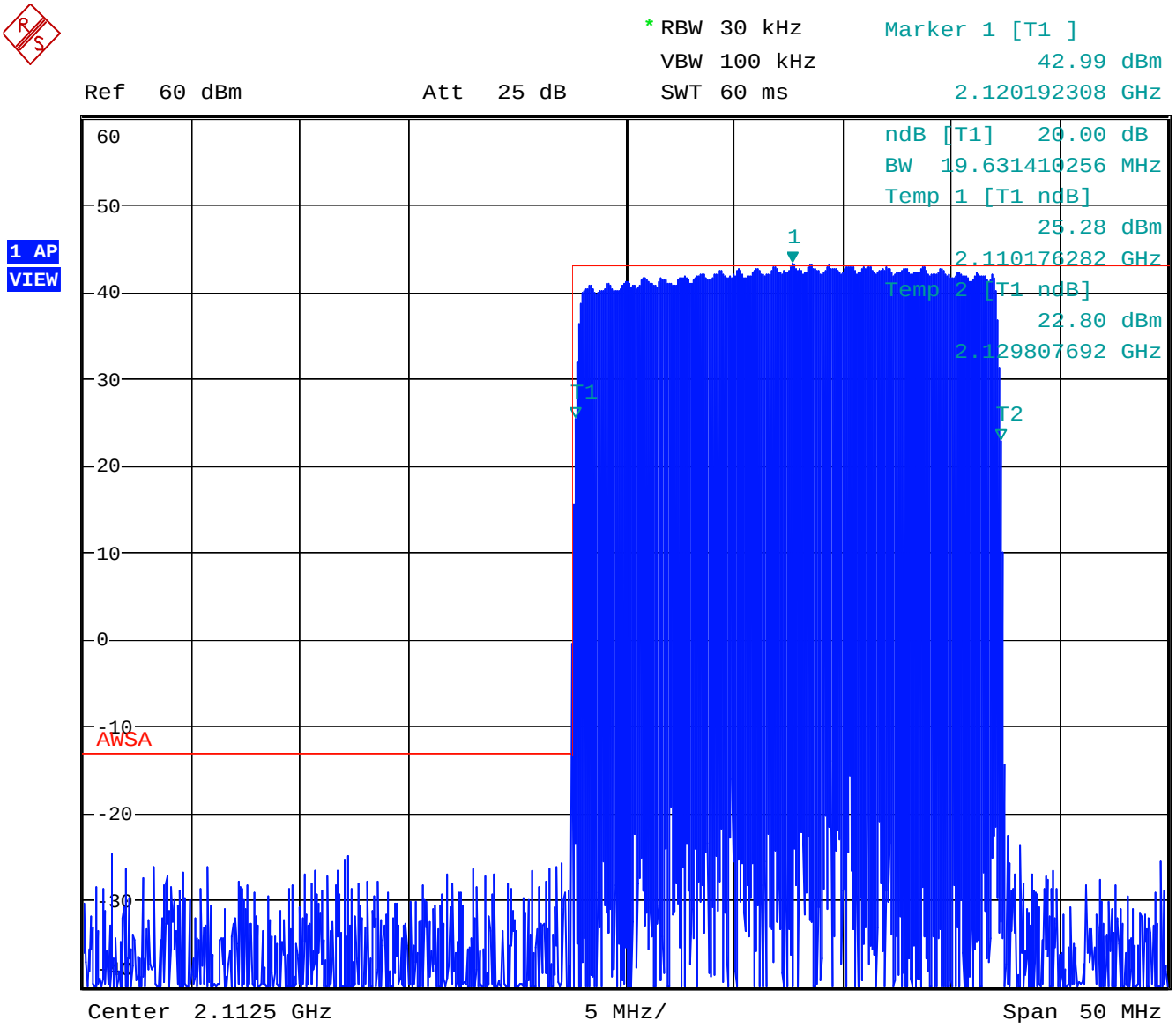


Date: 17.OCT.2007 14:42:13

Downlink

4 x 5 MHz channels

High Attenuation Filter response

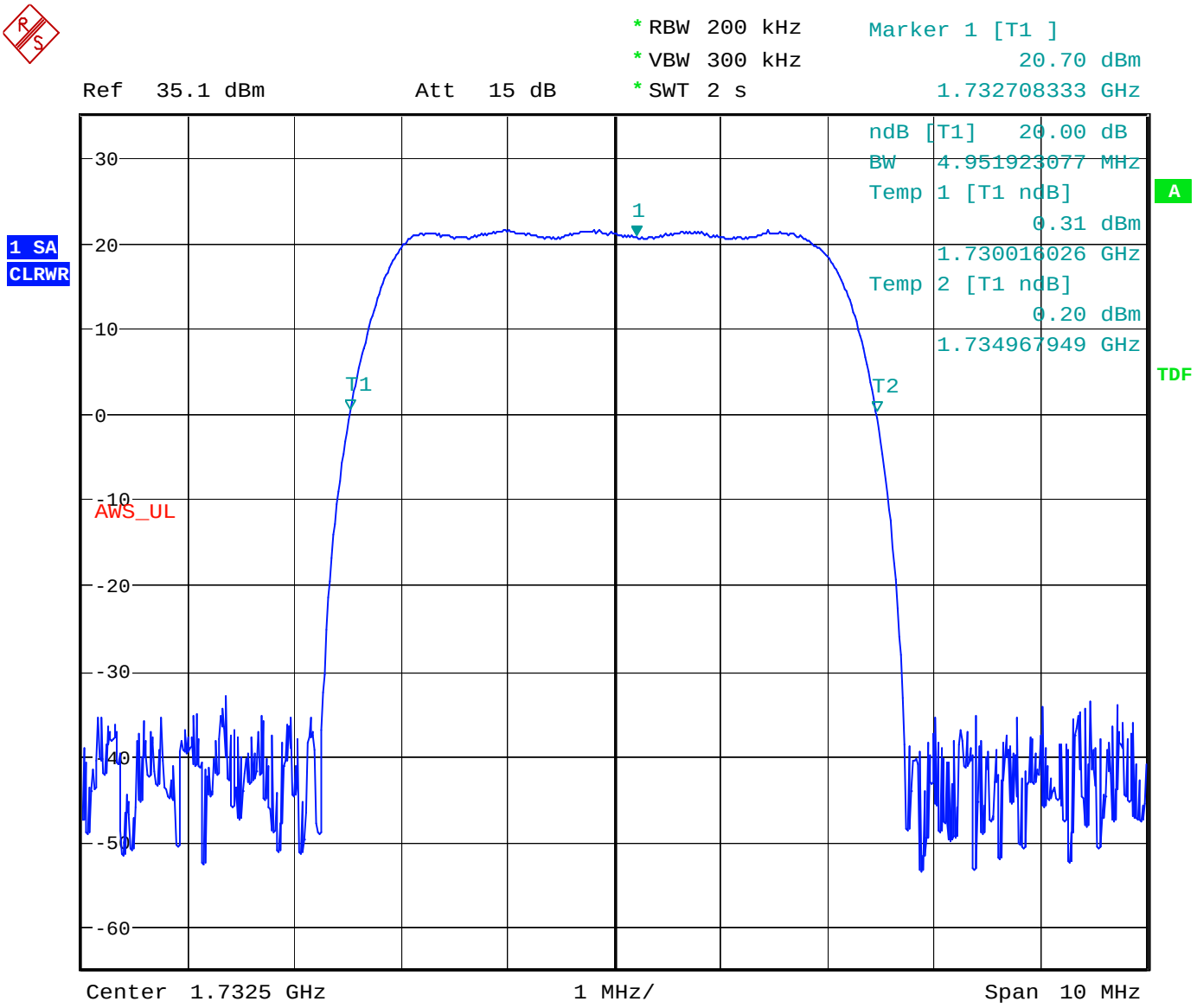


Date: 17.OCT.2007 14:47:16

Uplink

1 x 5 MHz channel

Normal filter response

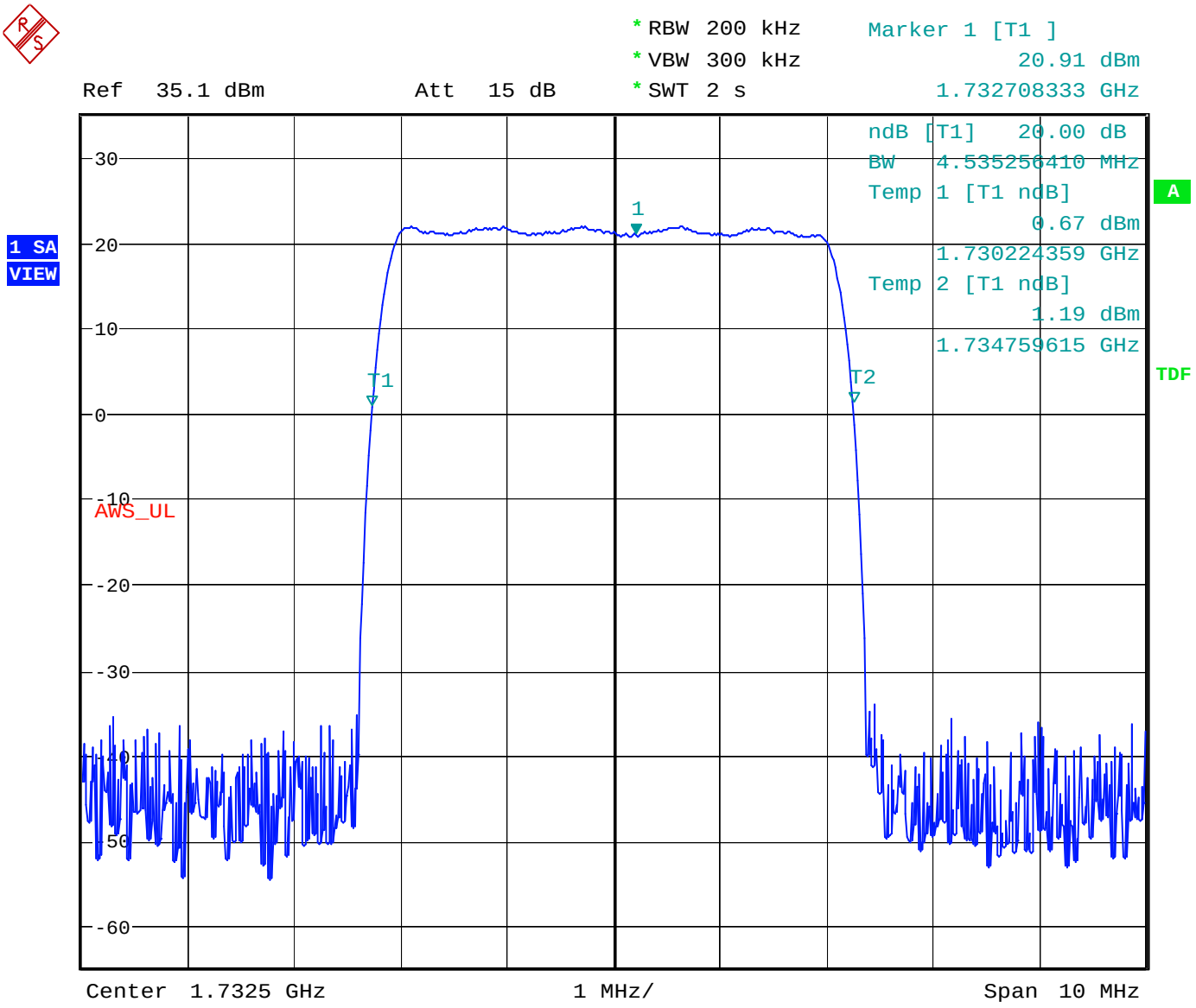


Date: 18.OCT.2007 14:46:10

Uplink

1 x 5 MHz channel

High attenuation filter response

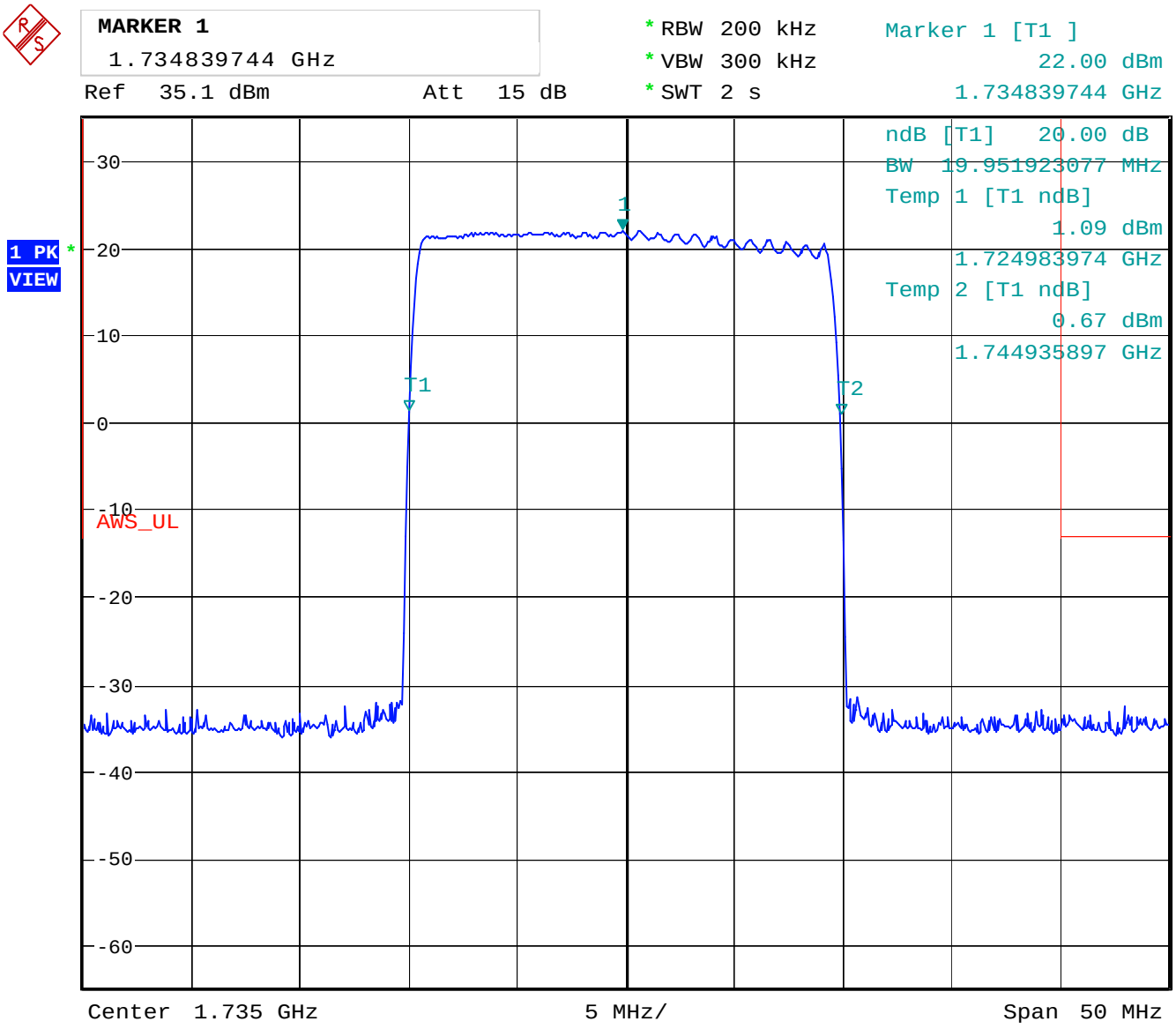


Date: 18.OCT.2007 14:44:38

Uplink

4 x 5 MHz channel

Normal attenuation filter response

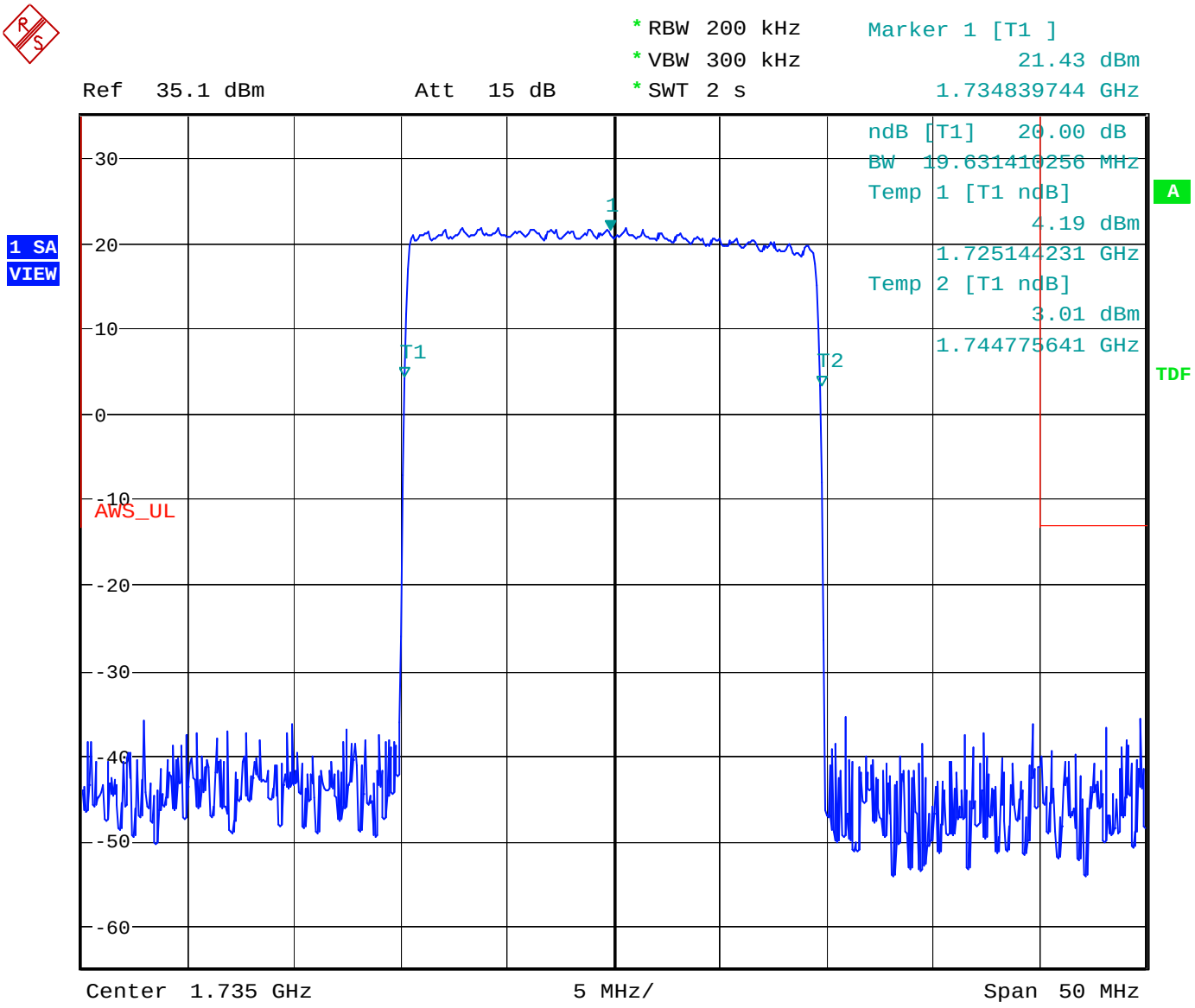


Date: 18.OCT.2007 14:34:43

Uplink

4 x 5 MHz channel

High attenuation filter response



Date: 18.OCT.2007 14:39:20

APPENDIX G: 2.1055 FREQUENCY STABILITY

G.1. Base Standard & Test Basis

Base Standard	FCC 2.1055
Test Method	TIA 603-C, 2004

Specifications

24.235 Frequency Stability

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

27.54 Frequency Stability

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

G.2. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

G.3. Test Results

Complies with the above requirement. The frequency drift over temperature and voltage variations was 0 ppm..

G.4. Observations

None

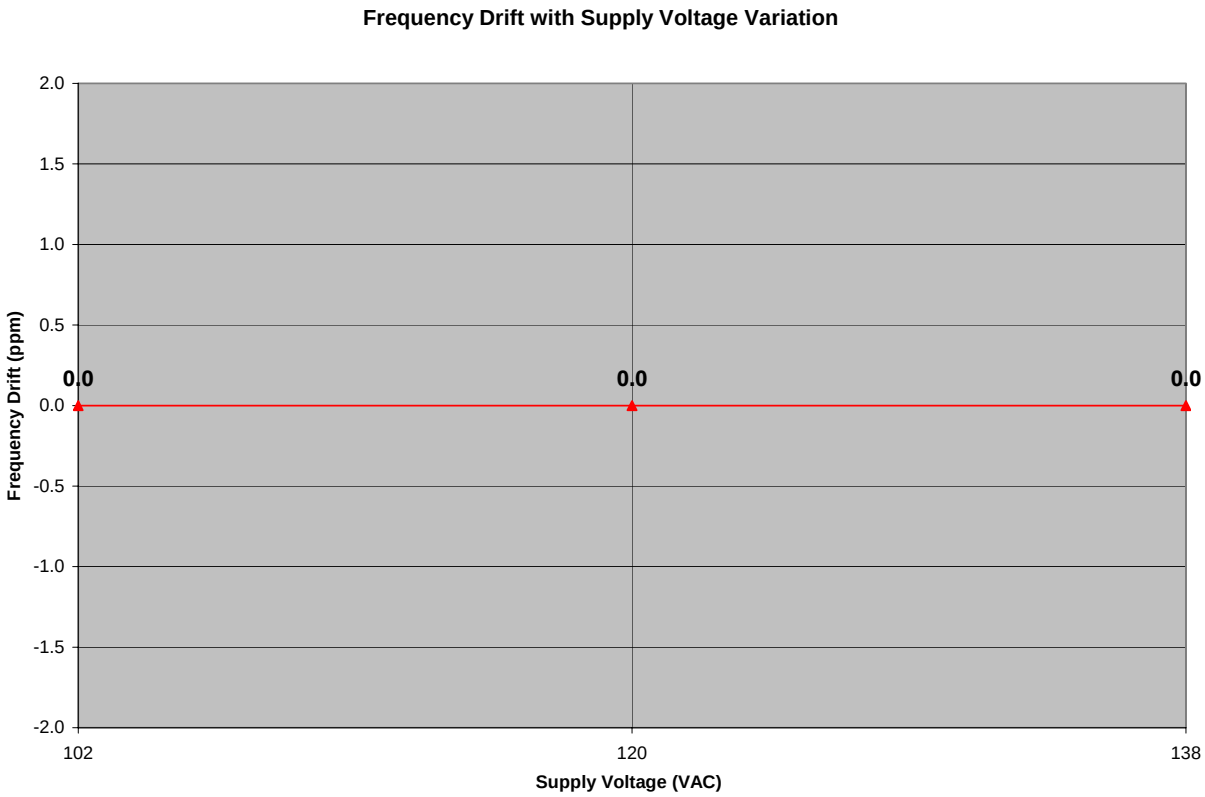
G.5. Deviations from Normal Operating Mode During Test

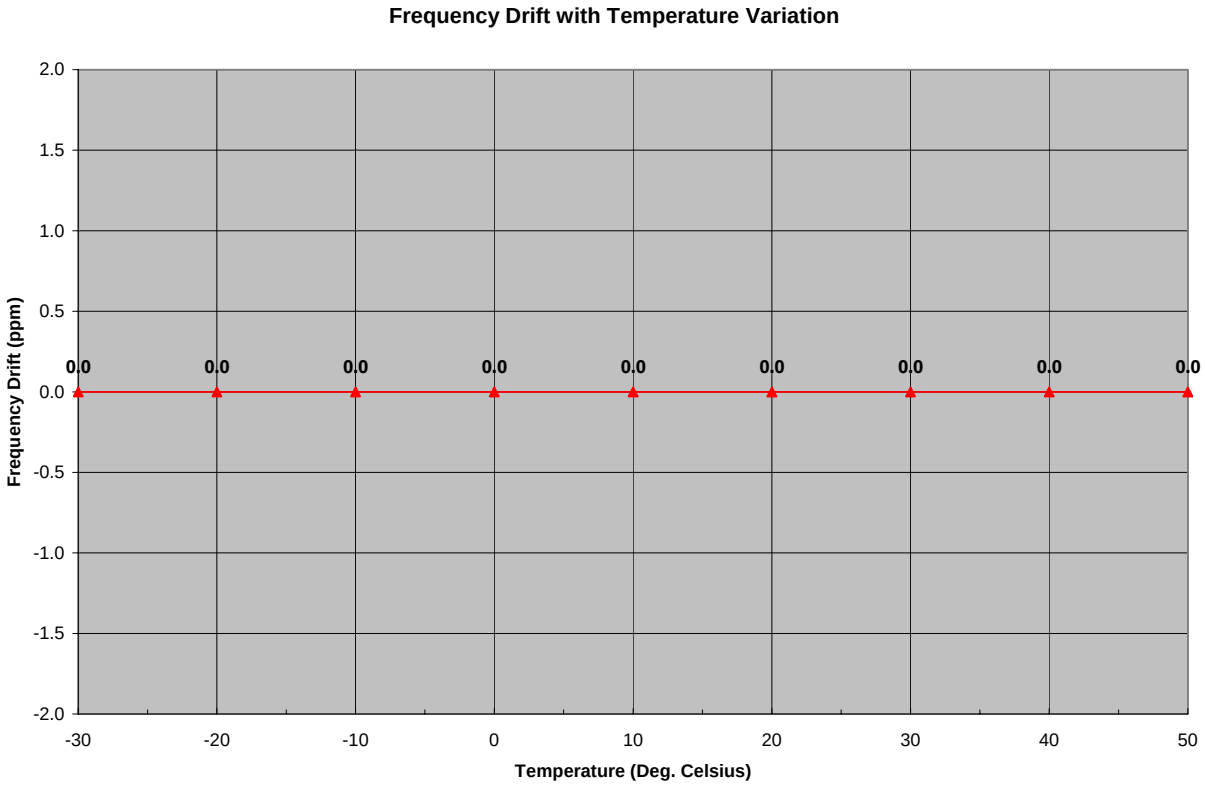
None.

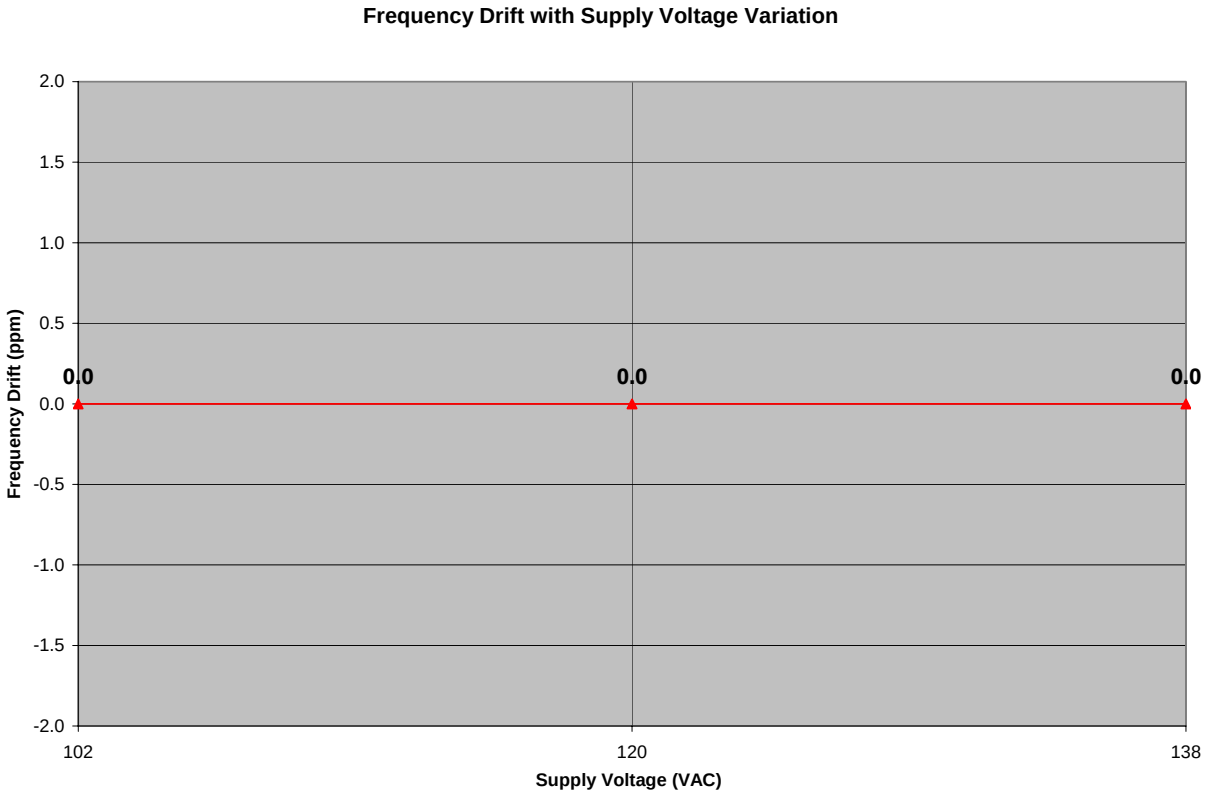
G.6. Sample Calculation

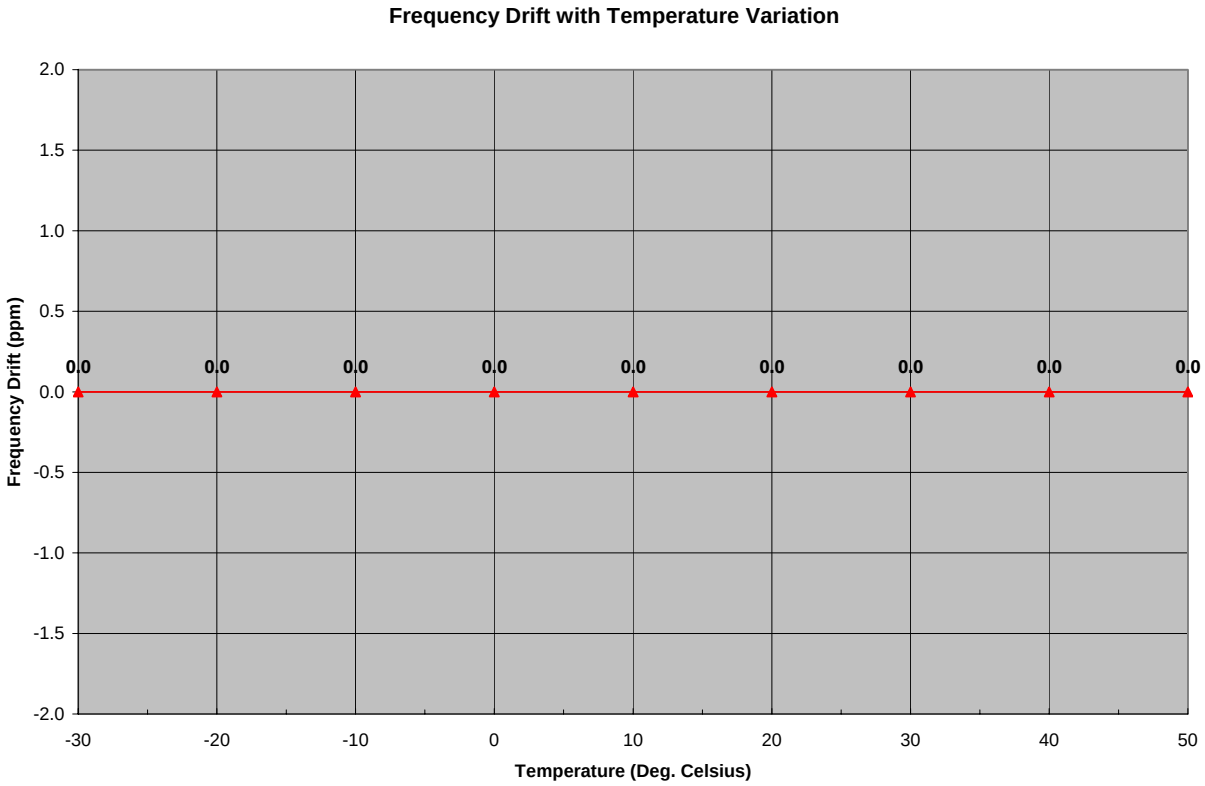
Frequency drift (ppm) = Frequency Drift (Hz)/Authorized frequency (MHz)

G.7. Test Data

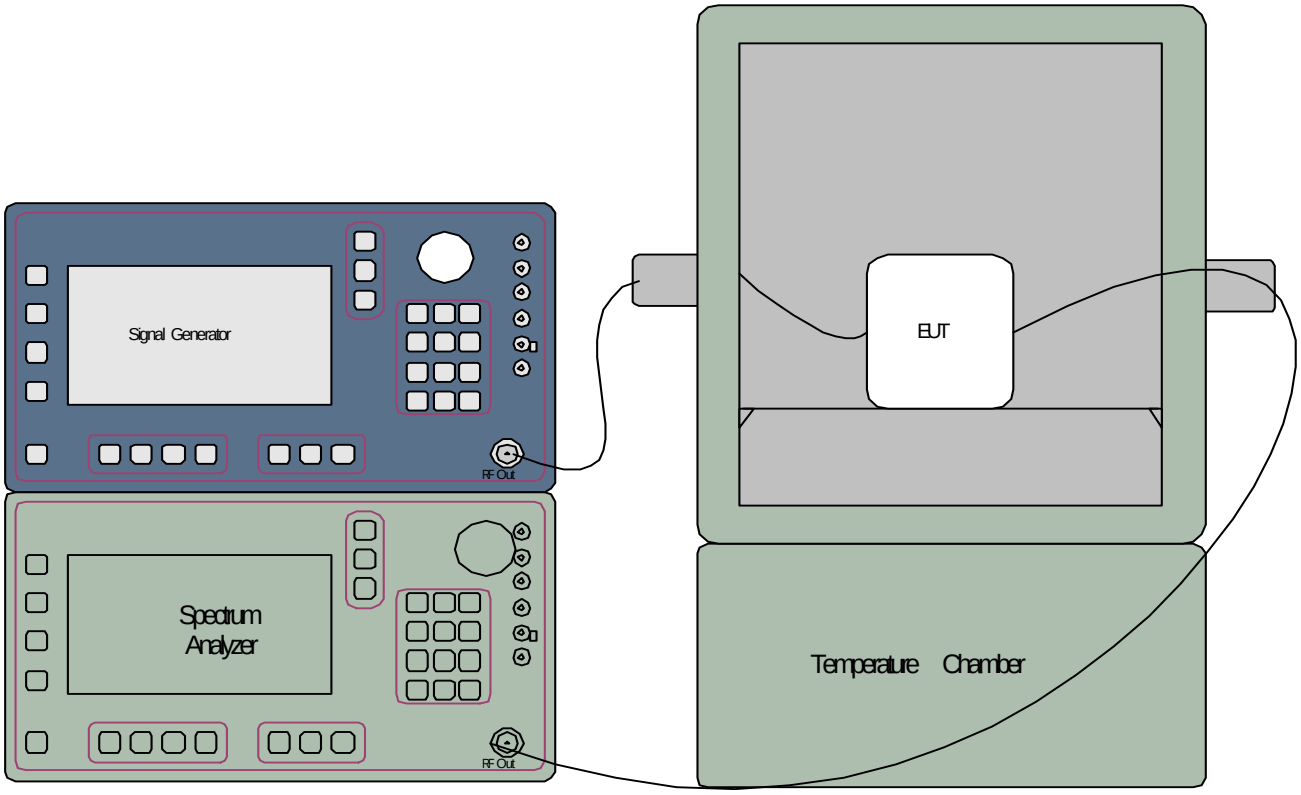








G.8. Test Diagram



G.9. Tested By

.

Name: Tom Tidwell,
Function: Manager of Wireless Services
Date: 19 October, 2007

APPENDIX H: TEST EQUIPMENT LIST

H.1. Field Strength of Spurious Emissions 30 MHz – 26.5 GHz Measurement Equipment

Description	Manufacturer	Type/Model	Calibration Frequency	Cal Due	NTS Control No.
3m ANECHOIC CHAMBER					
RX Bilog Antenna	ETS	3142C	12 Months	9/24/08	E1288P
Ref. Horn Antenna	ETS	3115	12 Months	11/1/07	E1019P
RX Horn Antenna	ETS	3115	12 Months	11/1/07	E1022P
High Frequency - Cable 1	MegaPhase	TM26-3135-144	12 Months	10/23/08	W1010P
Tunable Notch Filter	K&L Microwave	3TNF-1000/2000-N/N	N/A*	N/A*	S/N 614
Reference Antenna	ETS	3121 Dipole Set	12 months	8/8/08	S/N. 274
CONTROL ROOM					
Test Receiver	Rohde & Schwarz	FSQ 26	12 Months	10/25/07	W1020P
High Frequency - Cable 2	MegaPhase	NA	12 Months	10/23/08	W1011P
Amplifier	HP	8449B	12 Months	4/23/08	E1010P

H.2. Antenna Conducted Emissions Measurement Equipment

Instrument	Manufacturer	Model	Calibration Frequency	Calibration Due
ANTENNA CONDUCTED EMISSIONS				
Spectrum Analyzer	Rohde & Schwarz	FSQ 26	12 Months	10/25/07
High Frequency - Cable 1	MegaPhase	TM26-3135-144	12 Months	9/25/07
10 dB attenuator	Weinschel	10DB50W	12 Months	9/25/07
10 dB attenuator	Wiltron	43KC-10	12 Months	9/25/07
20 dB attenuator	Inmet	36AH-20	12 Months	9/25/07
3 dB attenuator	Inmet	36AH-3	12 Months	9/25/07
3 dB attenuator	Inmet	36AH-3	12 Months	9/25/07
50 ohm loads	Amphenol	50R	12 Months	9/25/07
I/Q Signal Generator	Rohde & Schwarz	SMIQ 03	12 Months	11/01/07
I/Q Modulation Generator	Rohde & Schwarz	AMIQ	12 Months	11/01/07
Combiner	Mini-Circuits	ZFSC-2-2500	N/A	N/A*
IS-95 CDMA BTS simulator	Rohde & Schwarz	CMD80	N/A	N/A*

* This device was not used for calibrated measurements.

END OF DOCUMENT

Forward(Downlink)

- VD=28Vdc
- IDQ=714mA

Reverse(Uplink)

- VD=5Vdc
- IDQ=40mA