



Test Report Summary

FCC CFR 47, Part 24 Subpart E Broadband PCS

Manufacturer: ADC Telecommunications

Name of Equipment: FlexWave™ URH – PCS

Model Number(s): FWU-840000002110RU

Manufacturer's Address: P.O. Box 1101
Minneapolis, MN 55440-1101

Test Report Number: MN071210

Test Date(s): 3, 4 December, and 7 January, 2007 (ETL)
6 December, and 3 January, 2007 (ADC)

According to testing performed at Intertek, the above-mentioned unit is in accordance with the applicable electromagnetic compatibility (EMC) portions of the requirements defined in FCC Part 24.

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

All testing was done in accordance with the Federal Communications Commission's CFR 47 Part 24 and the EUT fulfills the requirements of the Federal Communications Commission's CFR 47 Part 24.

Date: 8 January, 2008

Location:	Intertek Testing Services (ETL) 7250 Hudson Blvd., Suite 100 Oakdale, MN 55128 Phone: (651) 730-1188 Fax: (651) 730-1282	ADC Telecommunications 5341 12 th Ave E Shakopee, MN 55379 Phone: (952) 403-8340 Fax: (952) 403-8858
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Testing Conducted by (ADC):
And Report Written by:

Mark F. Miska
Mark F. Miska
Compliance Engineer



EMC Emission – T E S T R E P O R T

Test Report File Number: MN071210 **Date of Issue:** 8 January, 2007

Model Number(s): FWU-840000002110RU

Product Name: FlexWave™ URH – PCS

Product Type: Repeater

Applicant: ADC Telecommunications

Manufacturer: ADC Telecommunications

License Holder: ADC Telecommunications

Address: P.O. Box 1101
Minneapolis, MN 55440-1101

Test Result: **Positive** **Negative**

Test Project Number: 3141830MIN-001
Reference(s)

Total pages including Appendices: 121



Table of Contents

1.0	Revision Description	4
2.0	Documentation	4
2.1	Test Regulations	4
2.2	Test Operation Mode	5
2.3	Configuration of the device under test:	5
2.4	Product Options:	5
2.5	EUT Specifications and Requirements:	5
2.6	Cables:	5
2.7	Power Requirements:	5
2.8	Typical Installation and/or Operating Environment:	5
2.9	Other Special Requirements:	5
2.10	EUT Software:	5
2.11	EUT System Components	6
2.12	Support Equipment.....	6
2.13	Deviations from standard:	6
2.14	General Remarks:	6
2.15	Summary:	6
3.0	Test set-Up drawings and Photos	7
3.1	Test set-up photo, radiated emissions.....	7
3.2	Test set-up photo, radiated emissions.....	8
3.3	Test Set-up Drawings	9
4.0	Test Results	11
4.1.1	24.232 Power and antenna height limits	11
4.1.2	24.235 Frequency Stability	12
4.1.3	24.238 Emission limitations for broadband PCS equipment	13
5.0	Test Equipment	14
6.0	Appendix A	15
7.0	Appendix B	99
8.0	Appendix C	120



1.0 REVISION DESCRIPTION

Rev	Total Pages	Date	Description
A	121	10 December, 2007	Original Release
B	121	8 January, 2008	Updated information for 1.9 GHz

2.0 DOCUMENTATION

2.1 Test Regulations

24.232 Power and antenna height limits
24.235 Frequency stability
24.238 Emission limits for Broadband PCS equipment

The emissions tests were performed according to the following regulations:

- FCC Part 22
- FCC Part 24**
- FCC Part 90
- IC RSS-131 Issue 2

Environmental Conditions in the lab:

ADC

Temperature: 24° C
Relative Humidity: 21%
Atmospheric Pressure: 98.6 kPa

ETL

15-35° C
30-60%
86-106 kPa

Power Supply Utilized:

Power Supply System : 1 phase, 60 Hz, 120 VAC

2.2 Test Operation Mode

- Standby
- Test Program
- Practice Operation
- Max composite in and out**

2.3 Configuration of the device under test:

Normal Operation – PCS - 1930 to 1990 MHz

2.4 Product Options:

None

2.5 EUT Specifications and Requirements:

Length: 16.0"

Width: 17.0"

Height: 29.0"

Weight: 190 pounds

2.6 Cables:

Cable Type	Length	From	To
RF	> 3M	Ancillary Equip	EUT
RF	< 3M	EUT	50 Ohm Load
Power	< 3M	Power	Input Power
Fiber	> 3M	Ancillary Equip	EUT

2.7 Power Requirements:

Voltage: 120 VAC

Amps: 5.8 A

2.8 Typical Installation and/or Operating Environment:

Outdoor/Indoor. System is typically employed as an outdoor repeater.

2.9 Other Special Requirements:

None

2.10 EUT Software:

Revision Level: Version V.6 or greater

Description: Internet Explorer

2.11 EUT System Components

Description	Model #	Serial #	FCC ID #
URH	FWU-840000002110RU	None	

2.12 Support Equipment

Description	Manufacturer	Model #	FCC ID #
Power Meter	HP	EPM-441A	
Signal Generator	Agilent	E4438C	
Attenuator	Aeroflex	86-30-12	

2.13 Deviations from standard:

Modifications required to pass:

- As indicated on the data sheet(s)

- None**

Test Specification Deviations; Additions to or Exclusions from:

- As indicated in the Test Plan

- None**

2.14 General Remarks:

None.

2.15 Summary:

The requirements according to the technical regulations are

- met**

- not Met

The equipment under test does

- fulfill the general approval requirements mentioned on page 4.**

- not fulfill the general approval requirements mentioned on page 4.

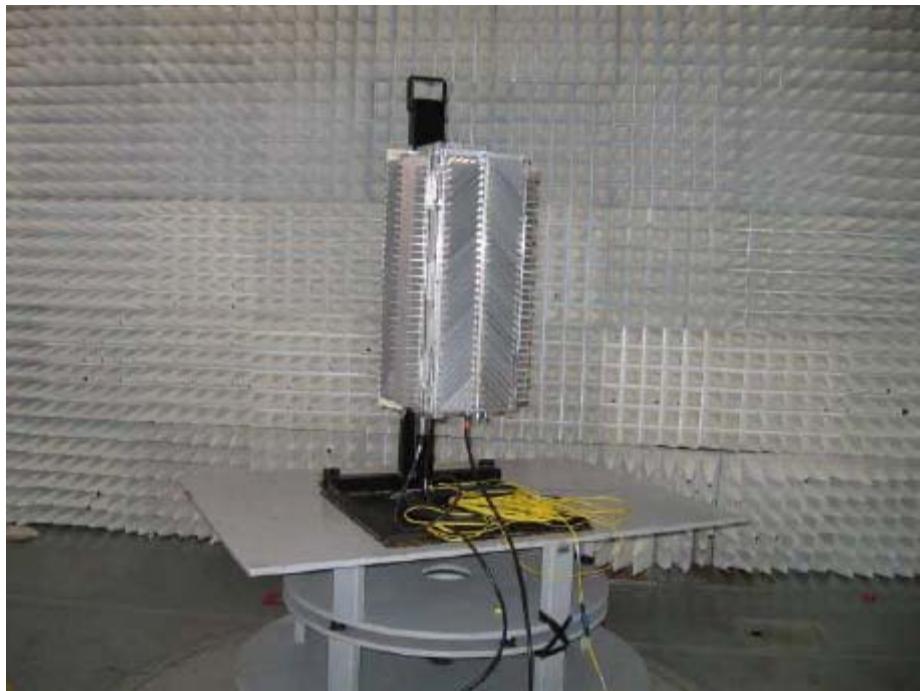
3.0 TEST SET-UP DRAWINGS AND PHOTOS

[Back to Table of Contents:](#)

3.1 Test set-up photo, radiated emissions



3.2 Test set-up photo, radiated emissions



3.3 Test Set-up Drawings

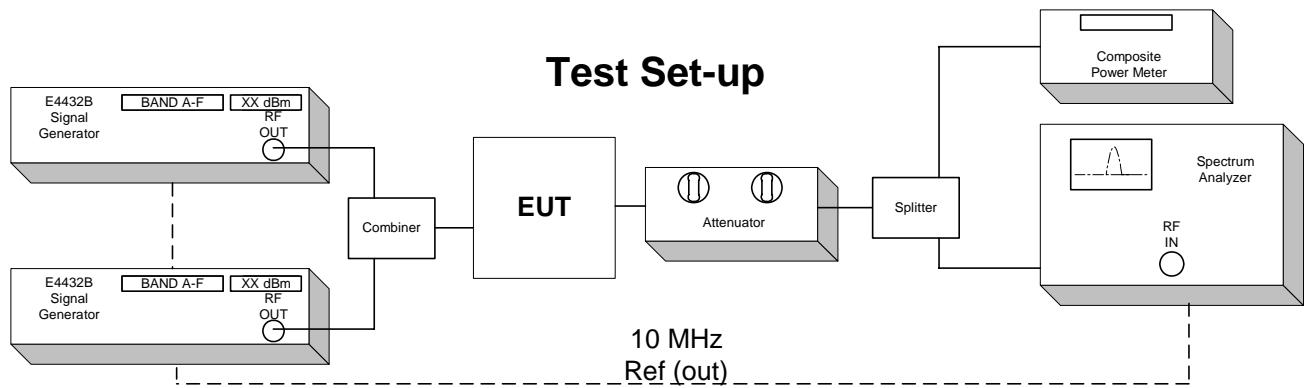
Conducted and Radiated Emission Limits Test for ADC Inc

Conducted Output Power Test for ADC Inc

Inter-Modulation Test for ADC Inc

Occupied Bandwidth Modulation Test for ADC Inc

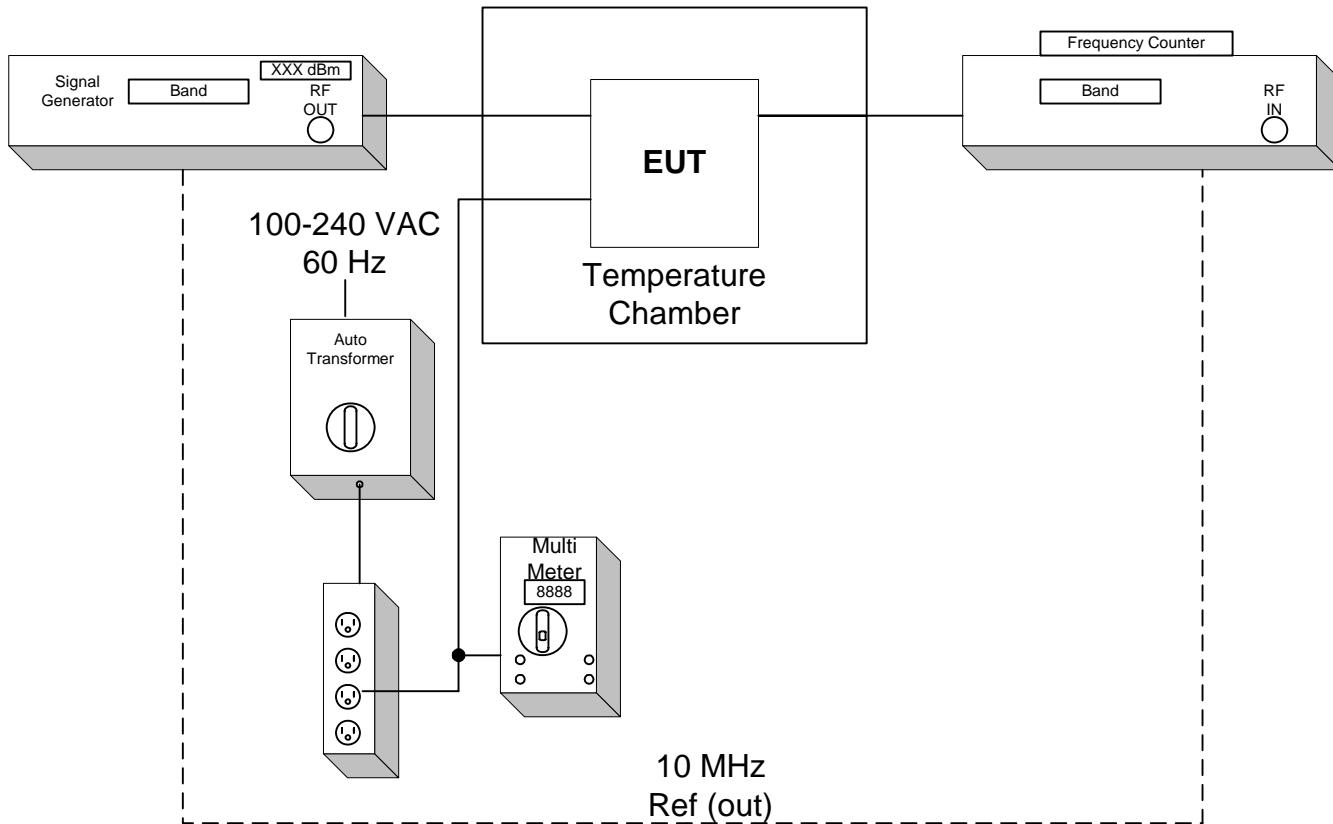
FlexWave™ URH – PCS
Model Number FWU-840000002110RU



Frequency Tolerance Test for ADC Inc.
FlexWave™ URH – PCS
Model Number FWU-840000002110RU

EUT is specified for outdoor use with temperature range of -30° to +50° C, and was tested with its range.

Test Set-up



4.0 TEST RESULTS

4.1.1 24.232 Power and antenna height limits

Test Summary:

- The requirements are: MET NOT MET
- Minimum margin of compliance is 6.02 dB at 1989.8 MHz (TDMA)

Test Location:

- ETL (Oakdale, MN)
- ADC facility (Shakopee, MN)**

Test Distance:

- 3 Meters
- 10 Meters

Conducted measurement

Test Equipment (ADC):

1, 2, 6, 7, 13

Test Limit:

100 Watts or 50 dBm Limit

Test Data:

[See page 41](#)

[Back to Table of Contents:](#)

Test Engineer: Mark F. Miska

Date: 6 December, 2007

Date: 3 January, 2008

4.1.2 24.235 Frequency Stability

Test Summary:

- The requirements are: MET NOT MET
- The fundamental emission stays within the authorized frequency block.
- Frequency measured over a temperature range of –30 to 50° C and an input voltage range of 100 to 240 VAC.

Test Location:

- ETL (Oakdale, MN)
- ADC facility (Shakopee, MN)**

Test Equipment (ADC):

3, 4, 5, 6, 9, 13

Test Limit:

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

Test Data:

See page 98

Test Engineer: Mark F. Miska

Date: 6 December, 2007

Date: 3 January, 2008

[Back to Table of Contents:](#)

4.1.3 24.238 Emission limitations for broadband PCS equipment

Test Summary:

- The requirements are: MET NOT MET
- Out of band emissions were less than -13 dBm.
- Outside the emission bandwidth of the carrier, all emissions are attenuated at least 26 dB below the transmitter power.

Test Location:

- ETL (Oakdale, MN)
- ADC facility (Shakopee, MN)**

Test Equipment (ADC):

1, 2, 6, 7, 13

Test Limit:

Out of band emissions:

Attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB, or -13 dBm.

Outside of the carrier emissions bandwidth:

26 dB below the transmitter power

Test Data:

[Conducted Emissions](#), pages 16 – 40
[Intermodulation Test](#), pages 42 – 90
[Occupied Bandwidth](#), pages 91 – 97
Radiated Emissions, pages 99 – 119 ([Appendix B](#))

Test Engineer: Mark F. Miska

Date: 6 December, 2007

Date: 6 December, 2007

Date: 6 December, 2007

Date: 3 January, 2008

[Back to Table of Contents:](#)

5.0 TEST EQUIPMENT

Number	Description	Manufacturer	Model	ADC Serial Number	Cal Due	Used
1	Spectrum Analyzer	HP	8563E	MC27690	1-22-08	<input checked="" type="checkbox"/>
2	Power Meter	HP	EPM-441A	MC27670	10-9-08	<input checked="" type="checkbox"/>
3	Multimeter	Fluke	87	MC17932	8-1-08	<input checked="" type="checkbox"/>
4	Frequency Counter	HP	5347A	MC27548	1-18-08	<input checked="" type="checkbox"/>
5	Temperature Chamber	Thermotron	SM-32C	MC18966	4-9-08	<input checked="" type="checkbox"/>
6	Signal Generator	Agilent	E4437B	967974	1-6-08	<input checked="" type="checkbox"/>
7	Signal Generator	Agilent	E4438C	1013210	2-9-09	<input checked="" type="checkbox"/>
8	Attenuator	Huber Suhner	6810.17.A	N/A	CNR	<input type="checkbox"/>
9	Variable Auto Transformer	Staco	1520CT	MC44655	CNR	<input checked="" type="checkbox"/>
10	Digital Barometer	Fisher Scientific	02-403	MC50719	CNR	<input checked="" type="checkbox"/>
11	Data Acquisition Unit	Fluke	Hydra	MC27549	10-8-08	<input type="checkbox"/>
12	Attenuator	Aeroflex	49-30-33	N/A	CNR	<input type="checkbox"/>
13	Attenuator	Aeroflex	86-30-12	N/A	CNR	<input checked="" type="checkbox"/>
14	LNA	Lucix Corp	C020200L 1603	N/A	CNR	<input type="checkbox"/>

Equipment with a Calibration Not Required (CNR) listing is verified and compensated for with NIST traceable calibrated equipment.

Test Data

[Back to Table of Contents:](#)

Test Engineer: Mark F. Miska **Date:** 6 December, 2007

Conducted Emission Limits Test for ADC Inc
FlexWave™ URH - PCS
Model Number FWU-84000002110RU

[Back](#)

The out of band emissions were measured directly from the EUT antenna output with a spectrum analyzer from 30 MHz to the 10th harmonic of the highest carrier frequency. Test signals used are TDMA, GSM, EDGE, CDMA, EVDO, and W-CDMA. The different signals were input one at a time to the EUT. In all cases, the out of band emissions were less than -13 dBm from the equation

$$(19\text{dBm} - [43 + 10\log(0.08W)])$$

Band edge compliance is also demonstrated using a TDMA, GSM, EDGE, CDMA, EVDO, and W-CDMA signal at the upper and lower limits of the band.

The Host unit connects directly to the BTS via coax. The Host unit does not connect to an antenna or amplifier, thus it is a Part 15 device and has been tested and is compliant as such. No FCC ID is necessary.

Industry practice has generally set the input signal power level. Test signal used was \approx -25 dBm input to DHU.
Industry practice has generally set the output signal power level.

Universal Radio Head (URH):

Range: 100 - 240 VAC

Tested @: 120 VAC

Tested @: 5.8 A

Digital Host Unit (DHU):

Range: 21-60 VDC

Tested @: 48 VDC

Tested @: 4.55 A

Application details for 2.1033(c)(10), and 2.1033(c)(13):

The input to the host unit has a digital attenuation chip (ALC) to provide protection from overdrive with 5-10 millisecond attack time / 100 millisecond decay time and 31 dB of head room, such that single channel operation, or multi-channel operation will not exceed nominal gain of the system.

The frequency stability is derived by the BTS, base transceiver station. This product uses internal frequency stability to keep the signal inside our filter bandwidths. This means that the frequency can change, but the frequency that transmits is still at the original frequency. The remote system uses the data over the fiber optic path to phase/frequency lock to the host. The purpose is to frequency lock the up- and down-conversion local oscillators, and thereby eliminate any end-to-end frequency shift.

The spurious limitation is completed with the duplexer. The ALC also suppresses in-band spurious by preventing PA overdrive, while the duplexer suppresses out-of-band spurious. Internal to the electronics, the use of SAW filters provides for higher Q roll-off at band edges.

This equipment does not modulate the RF, so there is no modulation limiter. This equipment does not change the modulation of the RF or the occupied bandwidth of any channel. It transports the signal, as is, over an optical link. The RF input is not changed in the RF output.

This is a constant gain device, so the setup controls the output. There is an overdrive and overpower limit control that prevents excess power.

Results:

Pass (See plots)

**Conducted Emissions
Low
PCS 1900 MHz**

Center: 1947.5 MHz
Span: 40 MHz
RBW/VBW: 100 kHz

Lower Band

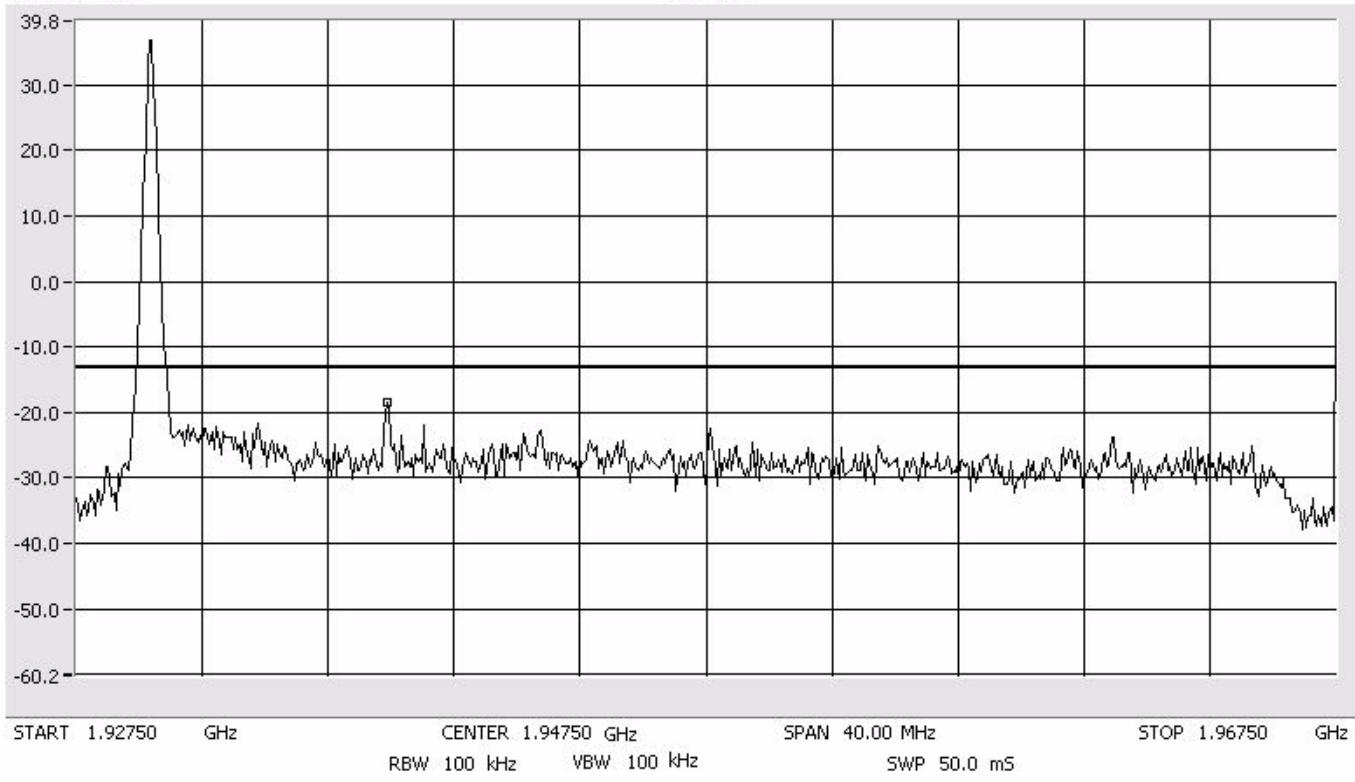
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -18.53 dBm

1.93737 GHz



**Conducted Emissions
Low
PCS 1900 MHz**

Span: 30 MHz to 20 GHz
RBW/VBW: 1 MHz

Lower Band

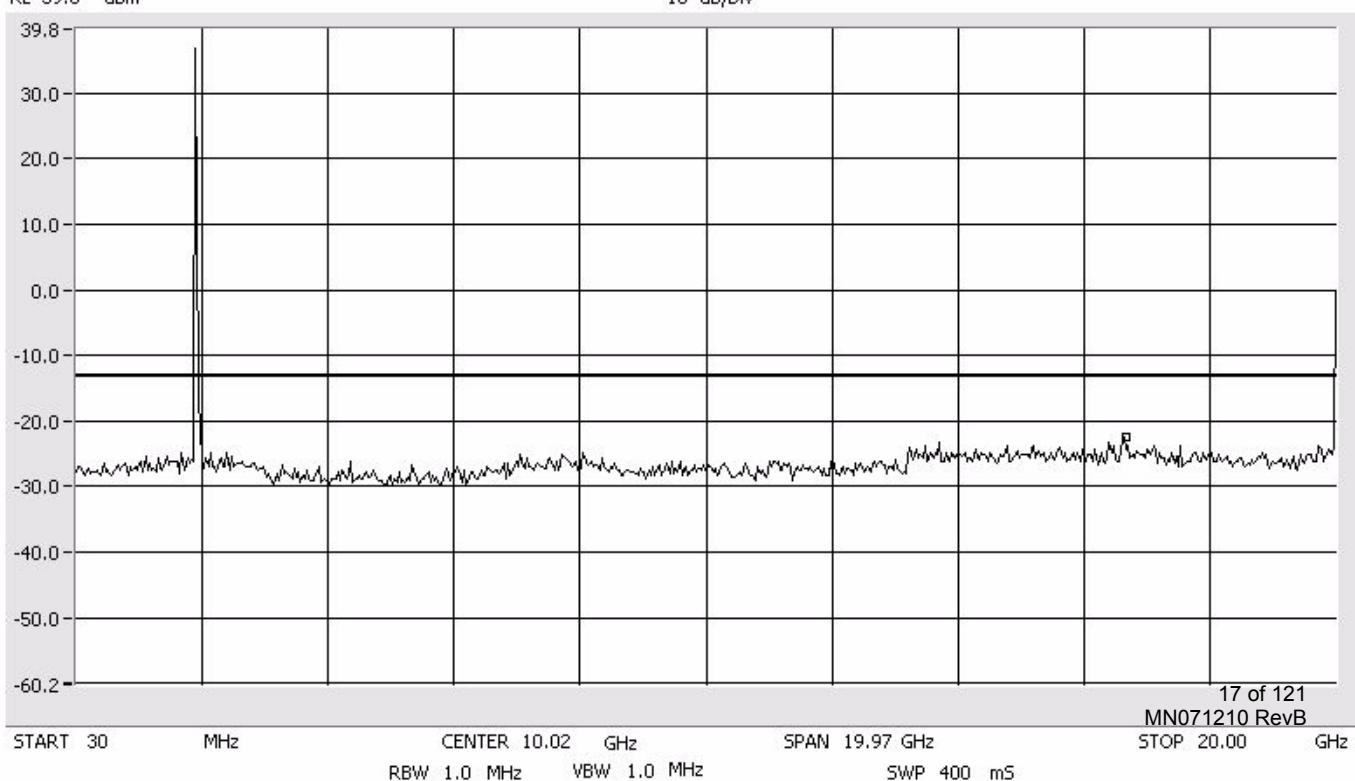
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -22.53 dBm

16.67 GHz



**Conducted Emissions
Mid
PCS 1900 MHz**

Center: 1947.5 MHz
Span: 40 MHz
RBW/VBW: 100 kHz

Lower Band

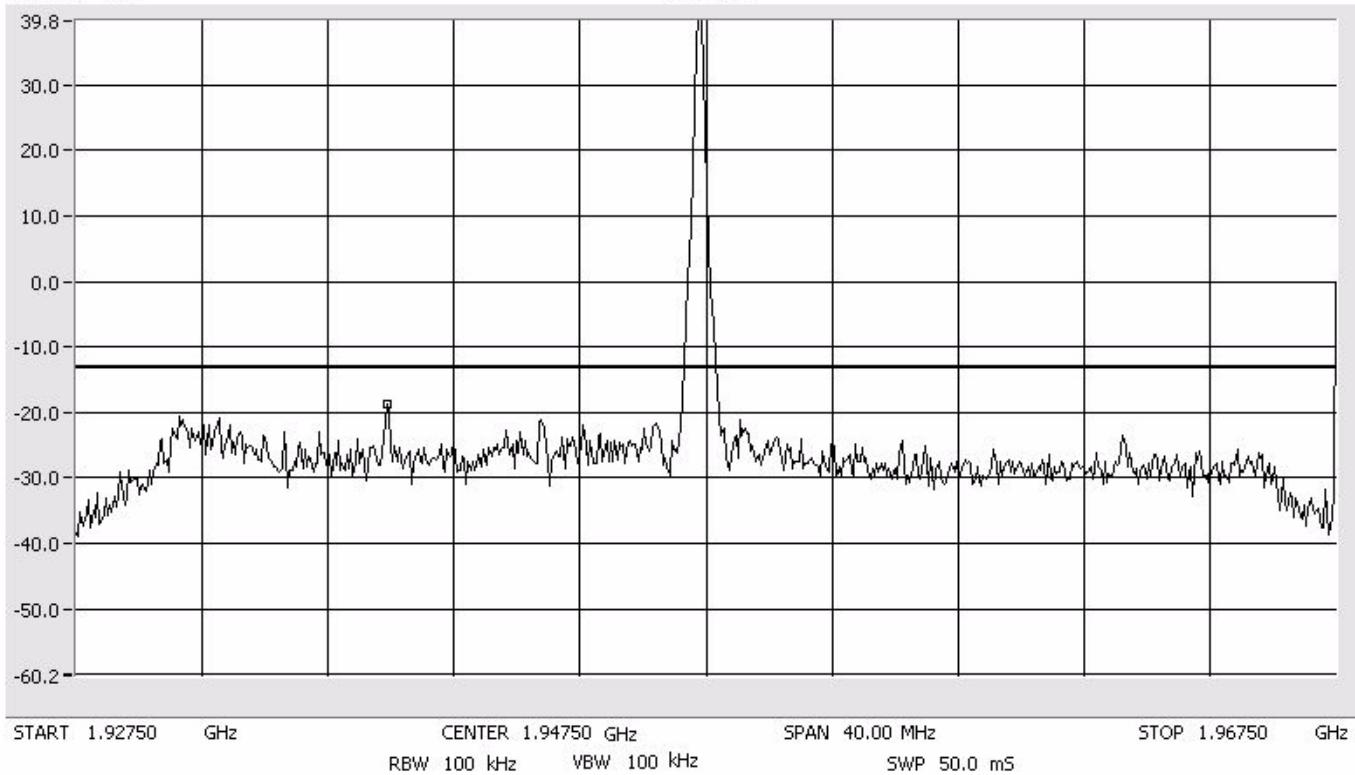
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -18.70 dBm

1.93737 GHz



**Conducted Emissions
Mid
PCS 1900 MHz**

Span: 30 MHz to 20 GHz
RBW/VBW: 1 MHz

Lower Band

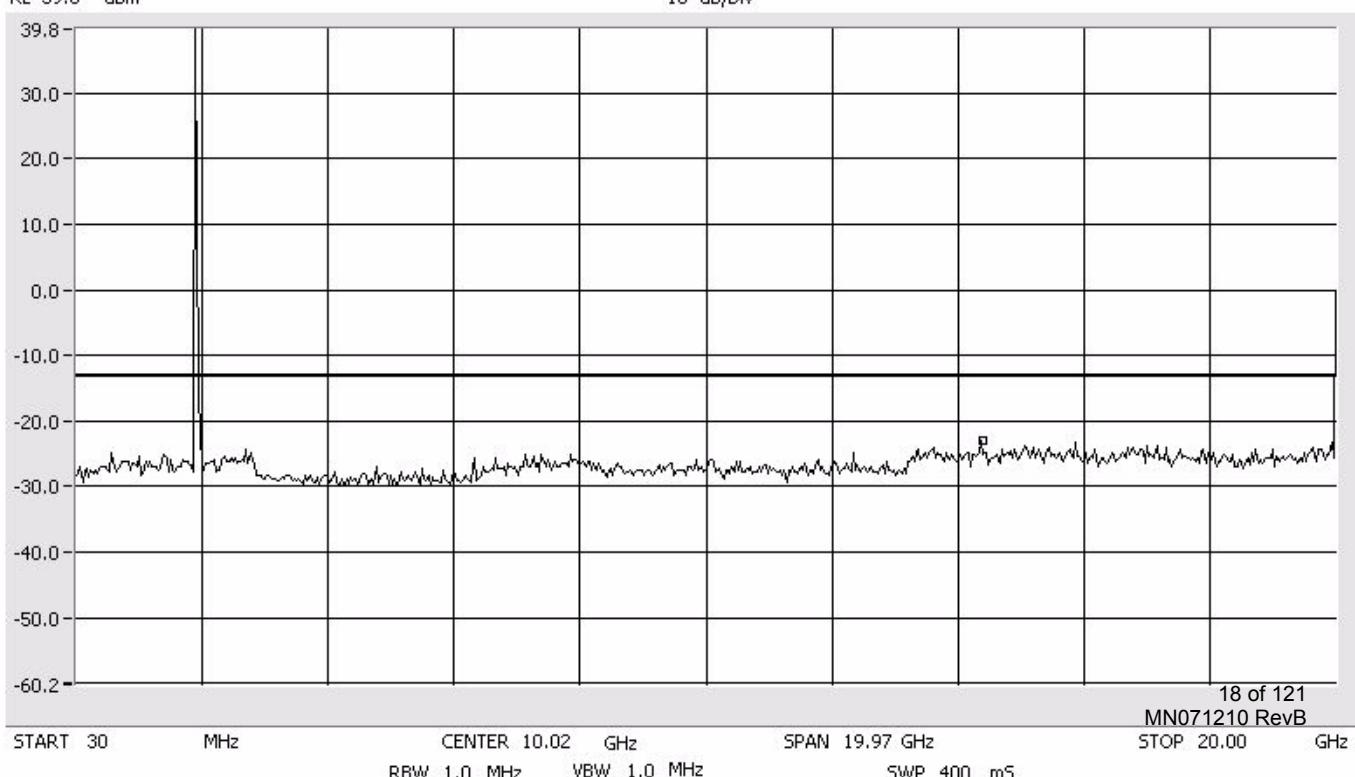
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -22.87 dBm

14.41 GHz



**Conducted Emissions
High
PCS 1900 MHz**

Center: 1947.5 MHz
Span: 40 MHz
RBW/VBW: 100 kHz

Lower Band

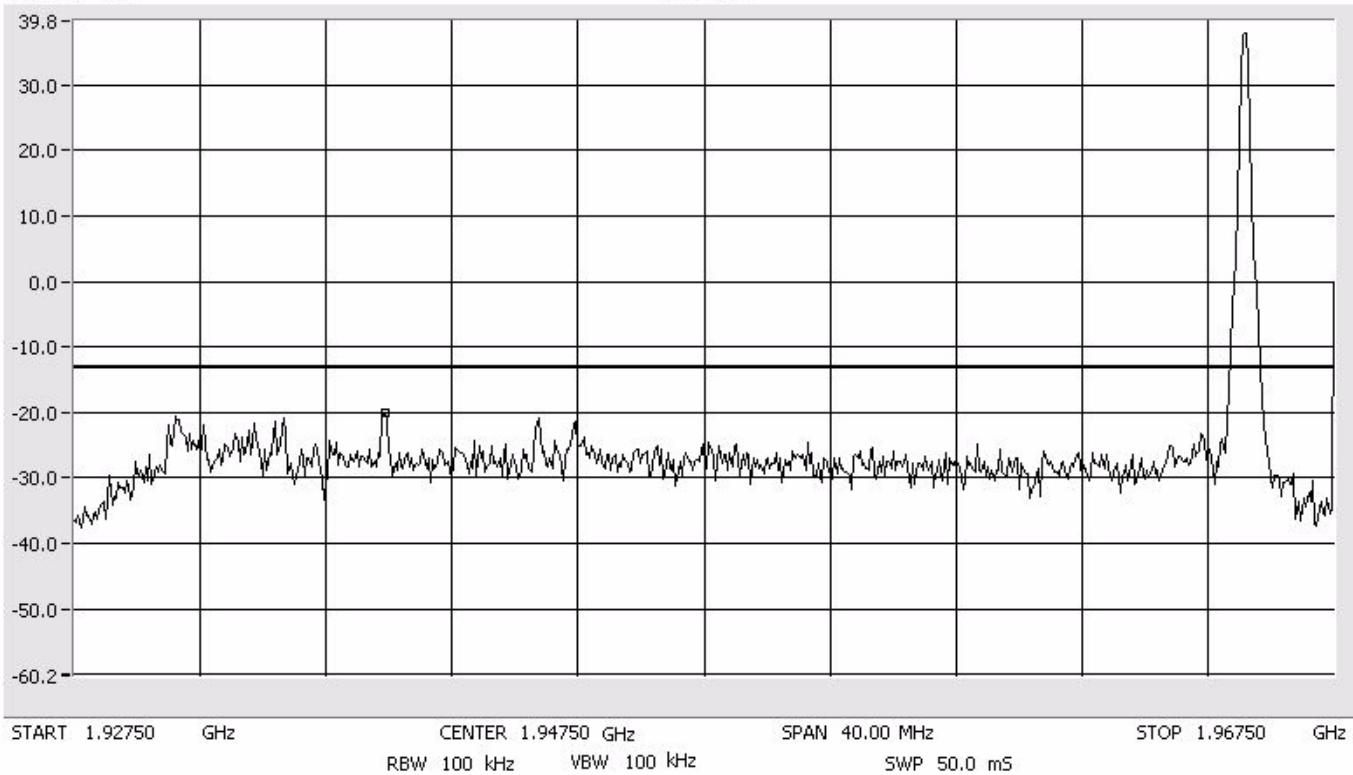
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -20.03 dBm

1.93737 GHz



**Conducted Emissions
High
PCS 1900 MHz**

Span: 30 MHz to 20 GHz
RBW/VBW: 1 MHz

Lower Band

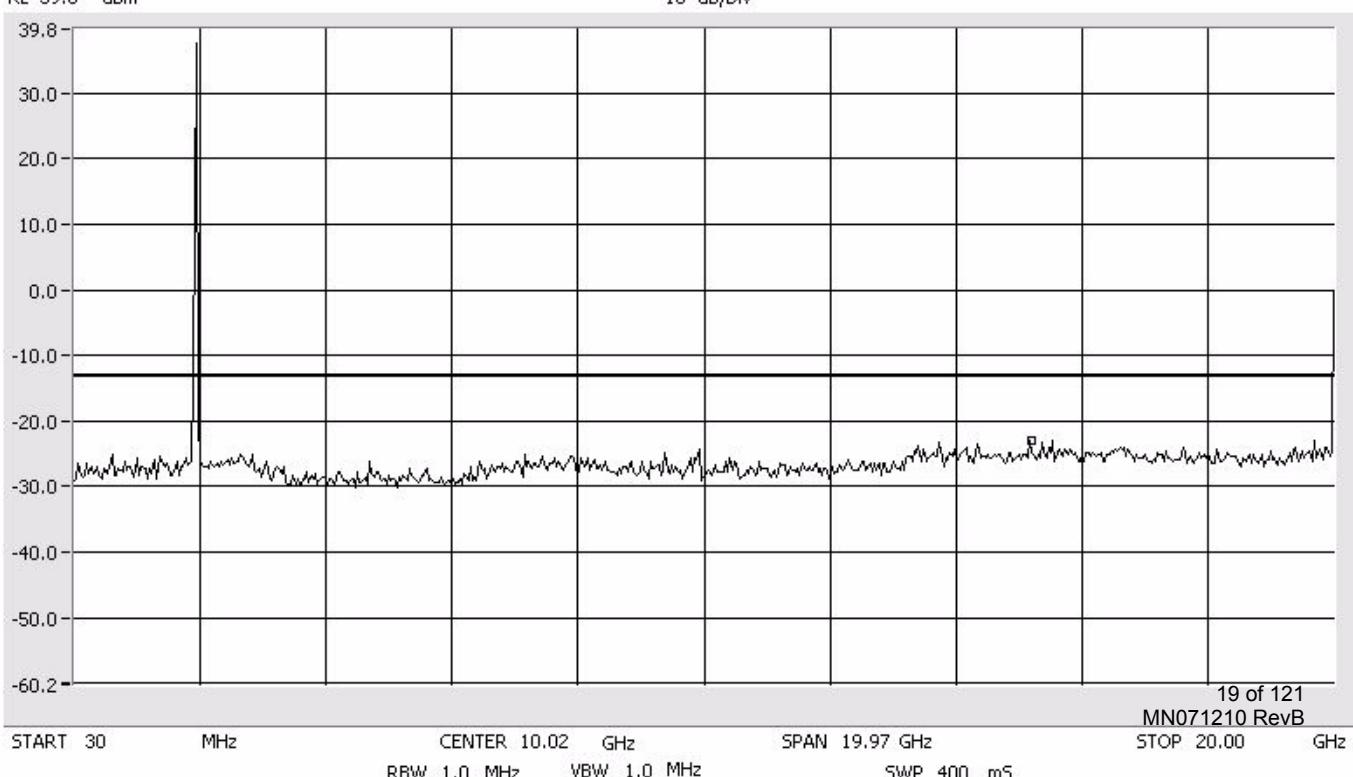
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -22.87 dBm

15.21 GHz



**Conducted Emissions
Low
PCS 1900 MHz**

Center: 1982.5 MHz
Span: 40 MHz
RBW/VBW: 100 kHz

Upper Band

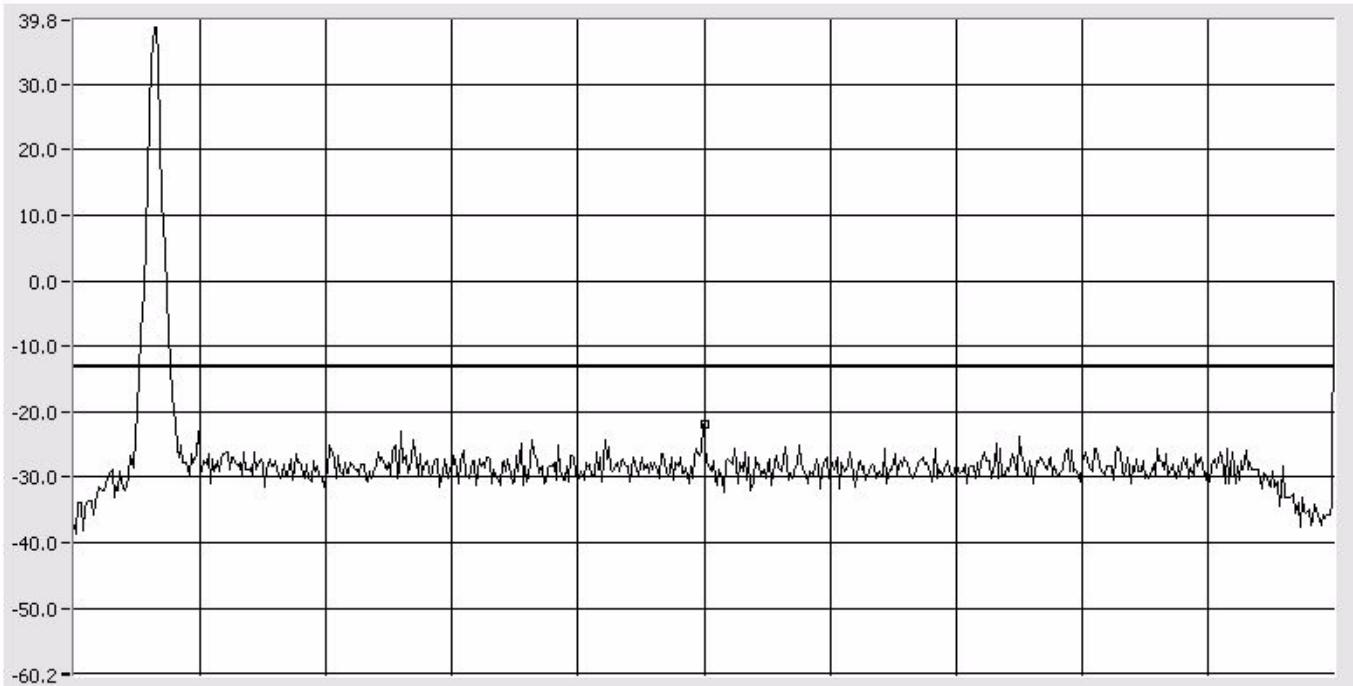
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -22.03 dBm

1.98250 GHz



START 1.96250 GHz

CENTER 1.98250 GHz

SPAN 40.00 MHz

STOP 2.00250 GHz

RBW 100 kHz

VBW 100 kHz

SWP 50.0 mS

**Conducted Emissions
Low
PCS 1900 MHz**

Span: 30 MHz to 20 GHz
RBW/VBW: 1 MHz

Upper Band

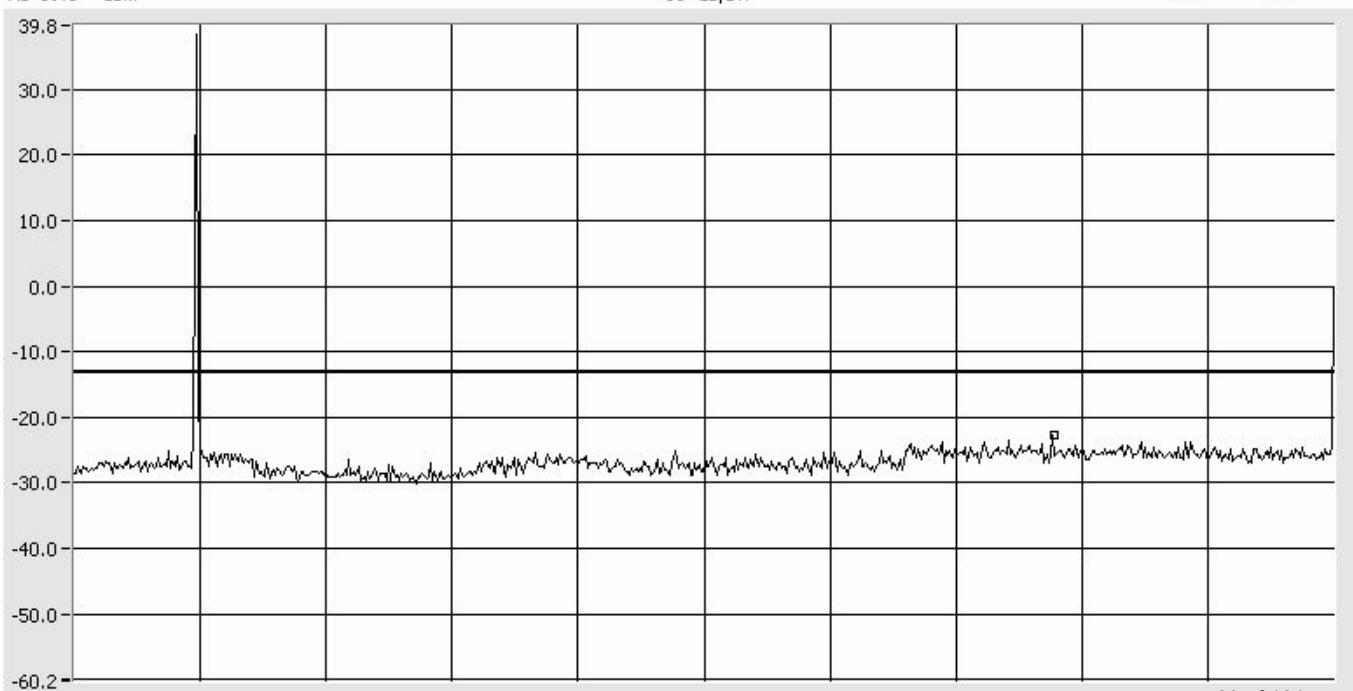
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -22.70 dBm

15.57 GHz



START 30 MHz

CENTER 10.02 GHz

SPAN 19.97 GHz

STOP 20.00 GHz
20 of 121
MN071210 RevB

RBW 1.0 MHz

VBW 1.0 MHz

SWP 400 mS

**Conducted Emissions
Mid
PCS 1900 MHz**

Center: 1982.5 MHz
Span: 40 MHz
RBW/VBW: 100 kHz

Upper Band

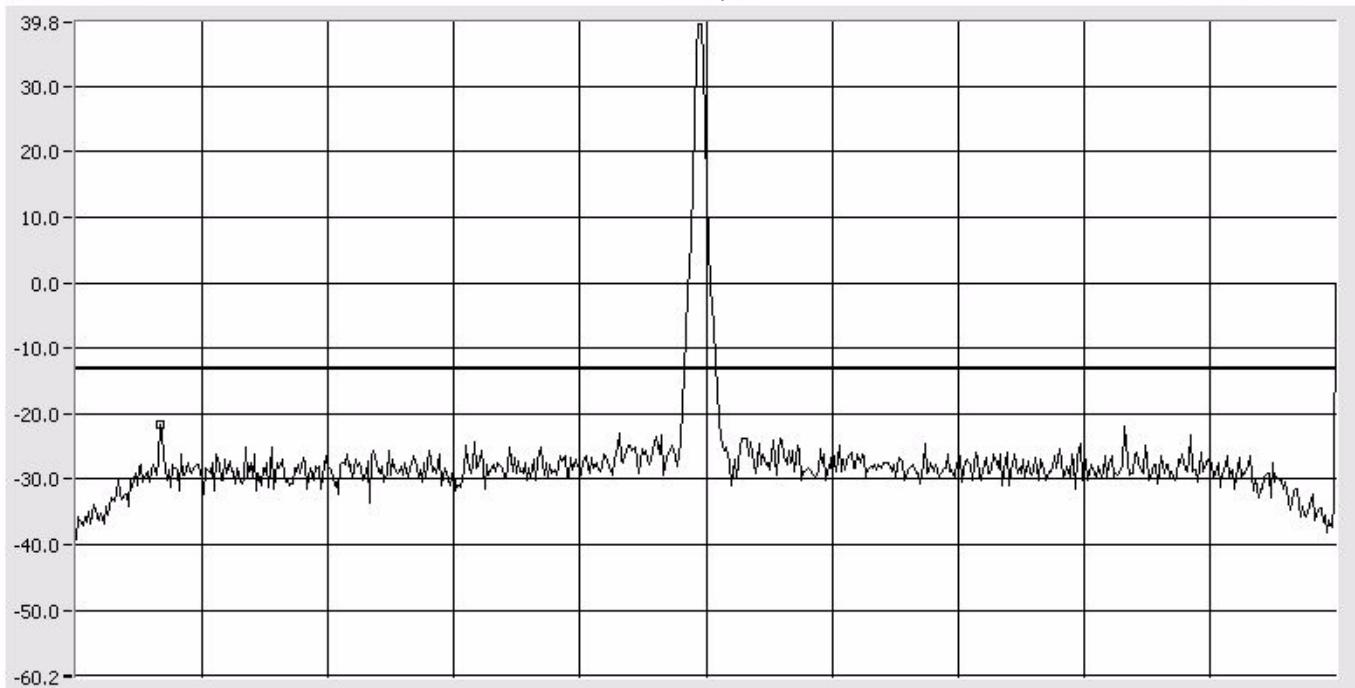
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -21.53 dBm

1.96517 GHz



START 1.96250 GHz

CENTER 1.98250 GHz

SPAN 40.00 MHz

STOP 2.00250 GHz

RBW 100 kHz

VBW 100 kHz

SWP 50.0 mS

Upper Band

**Conducted Emissions
Mid
PCS 1900 MHz**

Span: 30 MHz to 20 GHz
RBW/VBW: 1 MHz

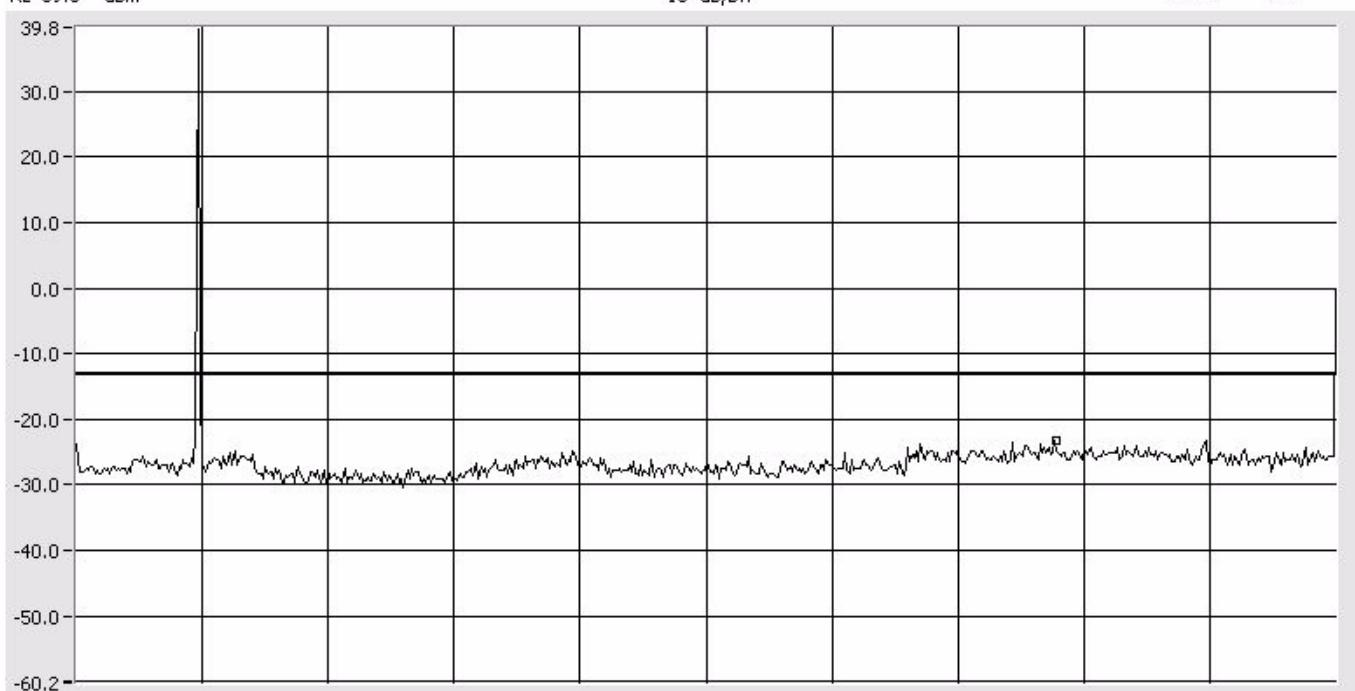
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -23.20 dBm

15.57 GHz



START 30 MHz

CENTER 10.02 GHz

SPAN 19.97 GHz

21 of 121
MN071210 RevB
STOP 20.00 GHz

RBW 1.0 MHz

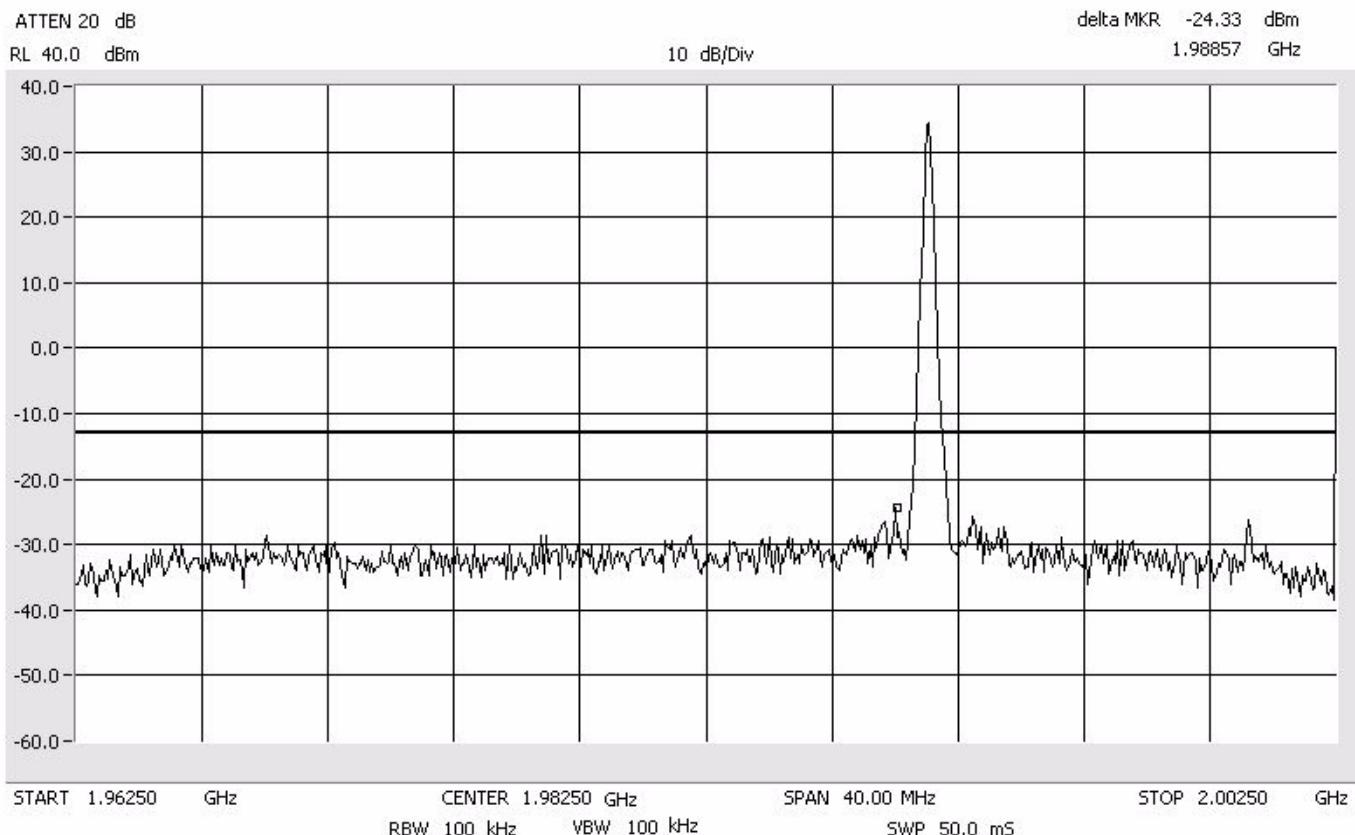
VBW 1.0 MHz

SWP 400 mS

**Conducted Emissions
High
PCS 1900 MHz**

Center: 1982.5 MHz
Span: 40 MHz
RBW/VBW: 100 kHz

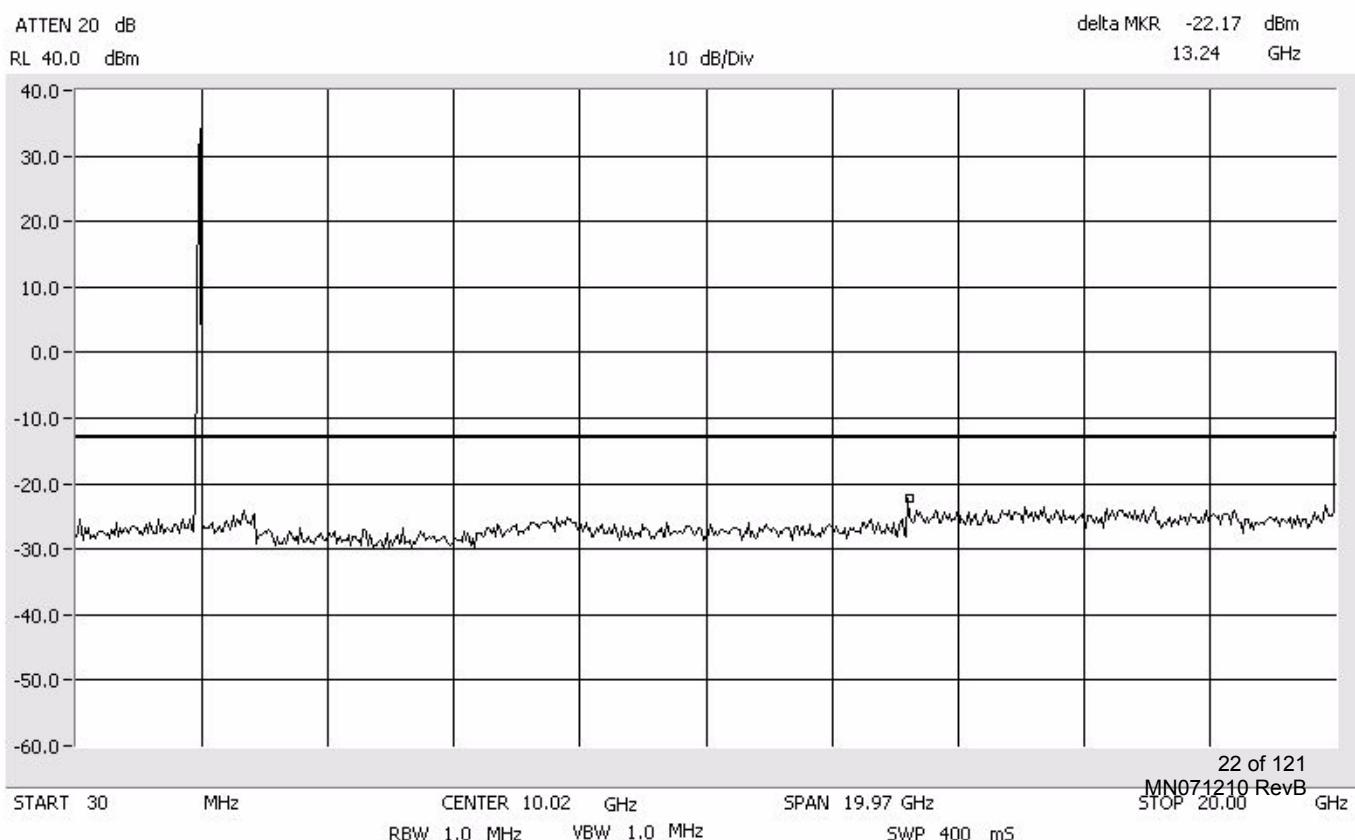
Upper Band



**Conducted Emissions
High
PCS 1900 MHz**

Span: 30 MHz to 20 GHz
RBW/VBW: 1 MHz

Upper Band



**Conducted Emissions
TDMA
1900 MHz**

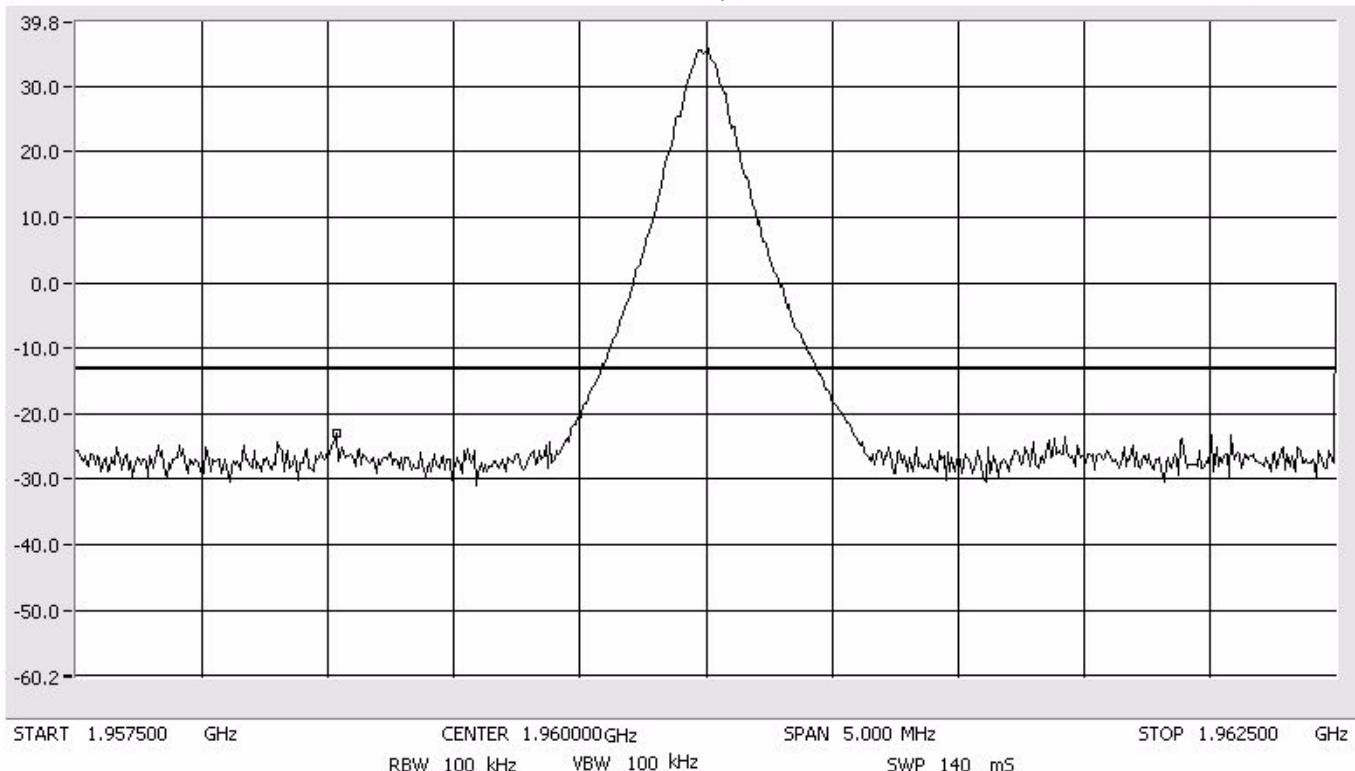
Mid Band
Span: 5 MHz
RBW/VBW: 100 kHz

ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -23.03 dBm
1.958533 GHz



**Conducted Emissions
TDMA
1900 MHz**

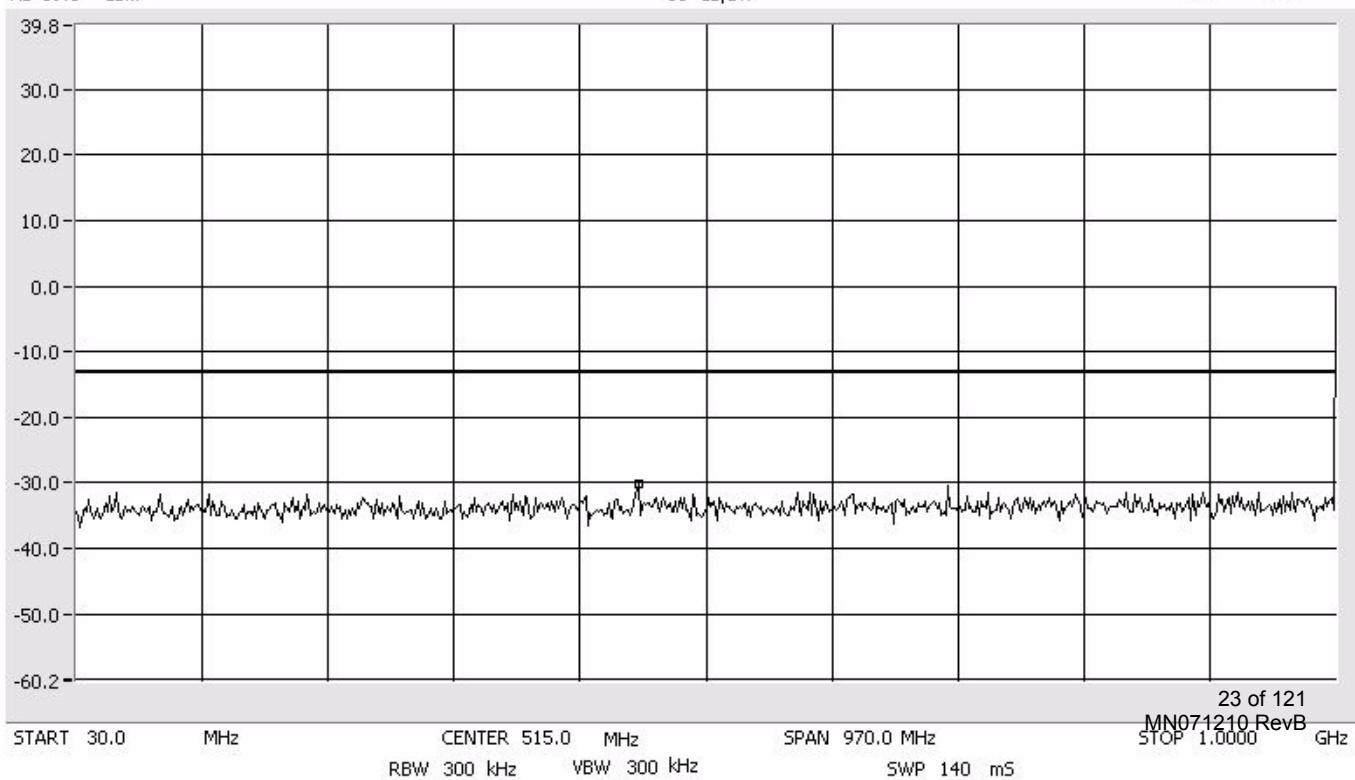
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -30.20 dBm
463.3 MHz



**Conducted Emissions
TDMA
1900 MHz**

1 GHz to 10 GHz
RBW/VBW: 1 MHz

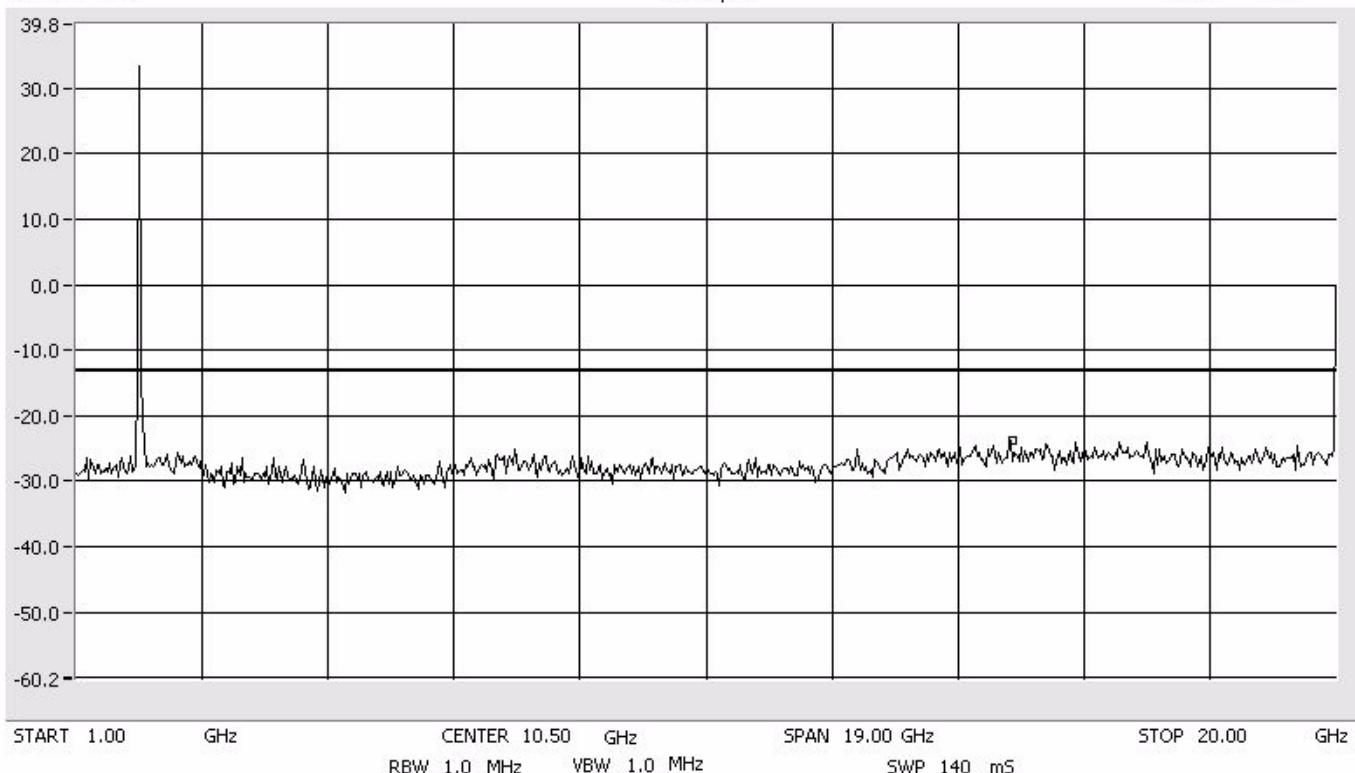
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -23.87 dBm

15.12 GHz



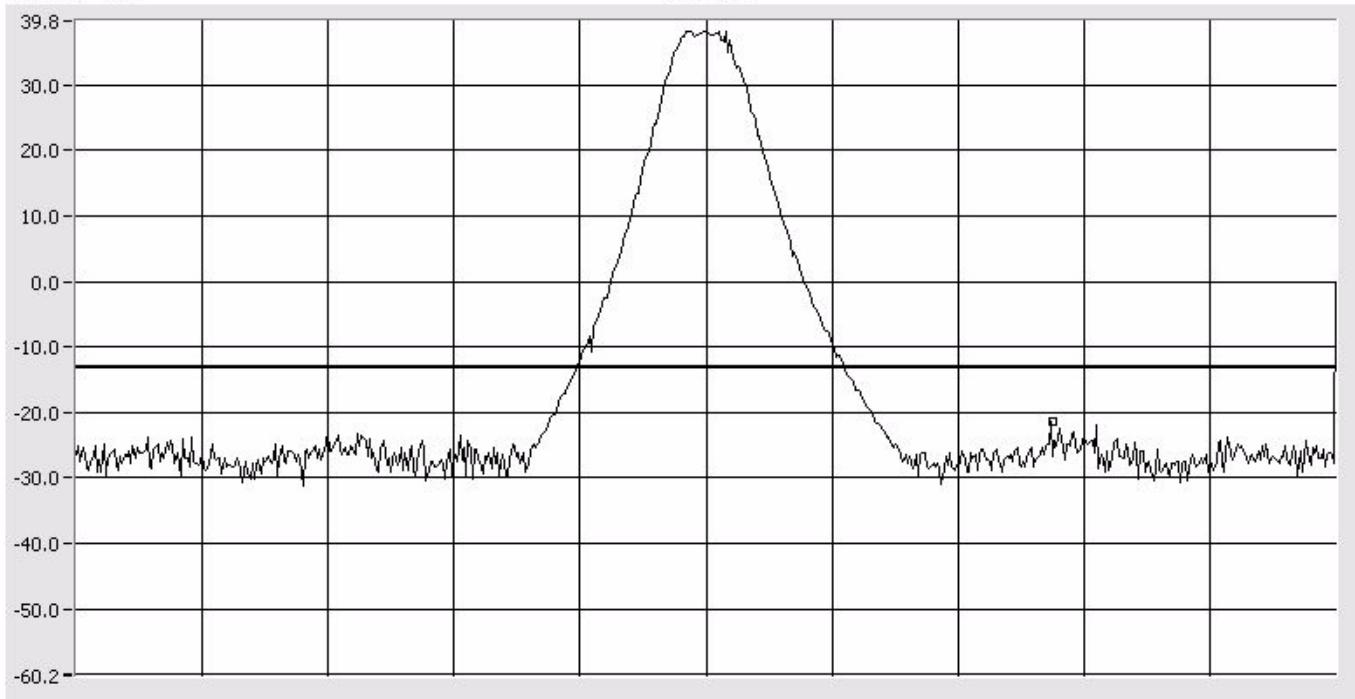
**Conducted Emissions
GSM
1900 MHz**

Mid Band
Span: 5 MHz
RBW/VBW: 100 kHz

ATTEN 20 dB
RL 39.8 dBm

10 dB/Div

delta MKR -21.37 dBm
1.961375 GHz



START 1.957500 GHz CENTER 1.960000 GHz SPAN 5.000 MHz STOP 1.962500 GHz
RBW 100 kHz VBW 100 kHz SWP 50.0 mS

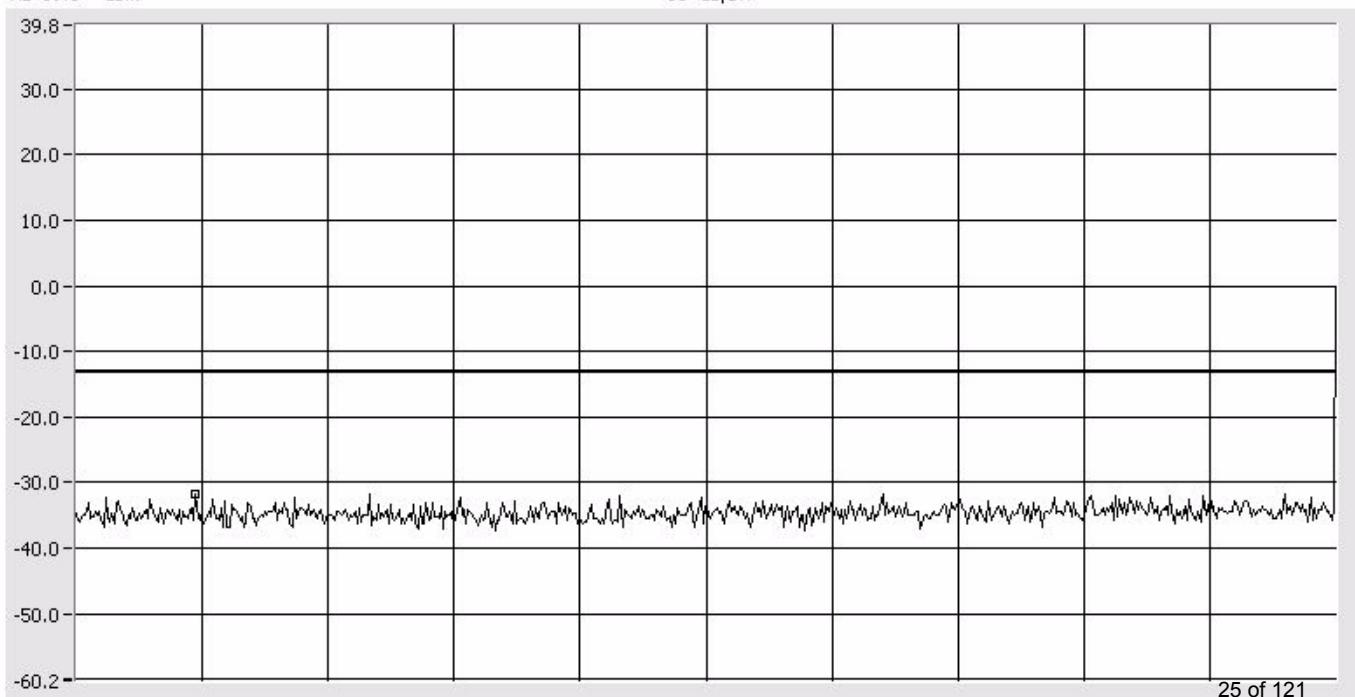
**Conducted Emissions
GSM
1900 MHz**

Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

ATTEN 20 dB
RL 39.8 dBm

10 dB/Div

delta MKR -31.70 dBm
122.2 MHz



START 30.0 MHz CENTER 515.0 MHz SPAN 970.0 MHz STOP 1,000 GHz
RBW 300 kHz VBW 300 kHz SWP 50.0 mS

25 of 121
MN071210 RevB

**Conducted Emissions
GSM
1900 MHz**

1 GHz to 20 GHz
RBW/VBW: 1 MHz

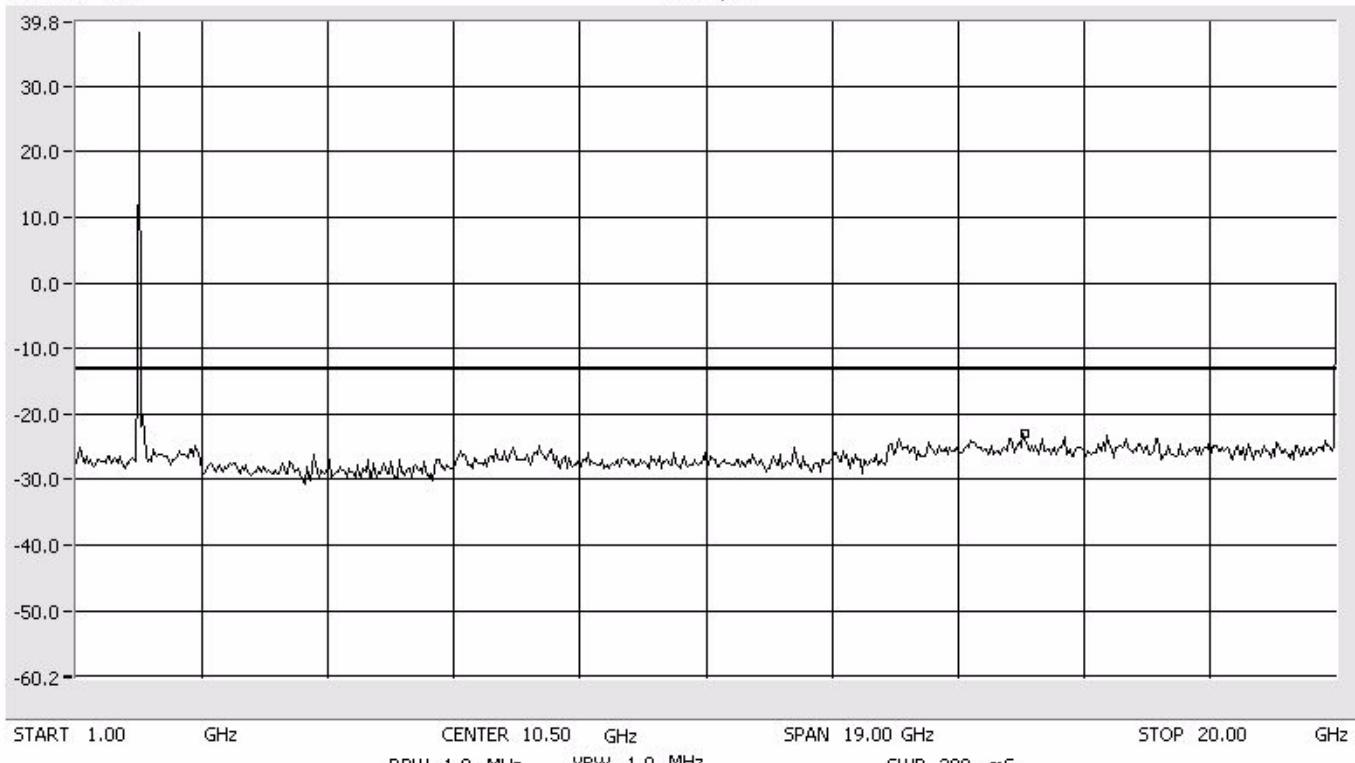
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -22.87 dBm

15.31 GHz



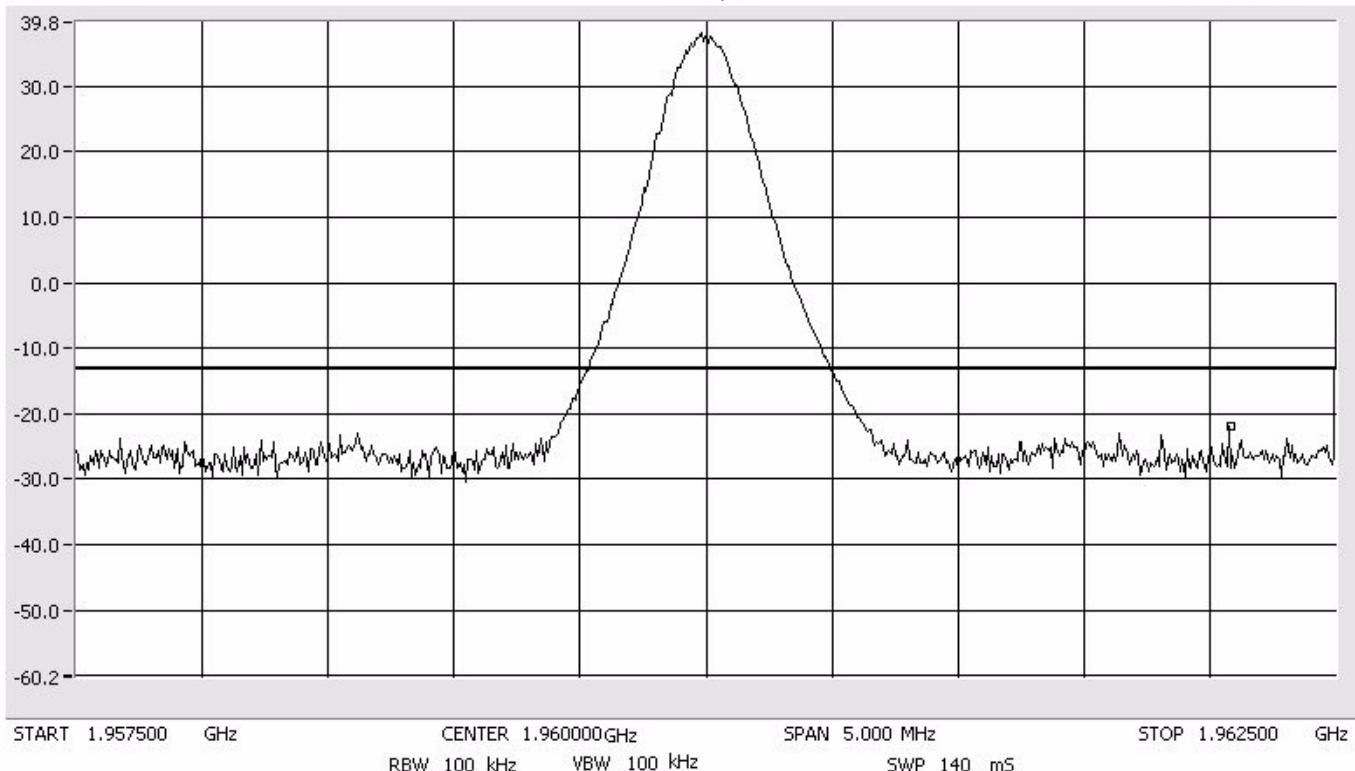
**Conducted Emissions
EDGE
1900 MHz**

Mid Band
Span: 5 MHz
RBW/VBW: 100 kHz

ATTEN 20 dB
RL 39.8 dBm

10 dB/Div

delta MKR -22.03 dBm
1.962083 GHz



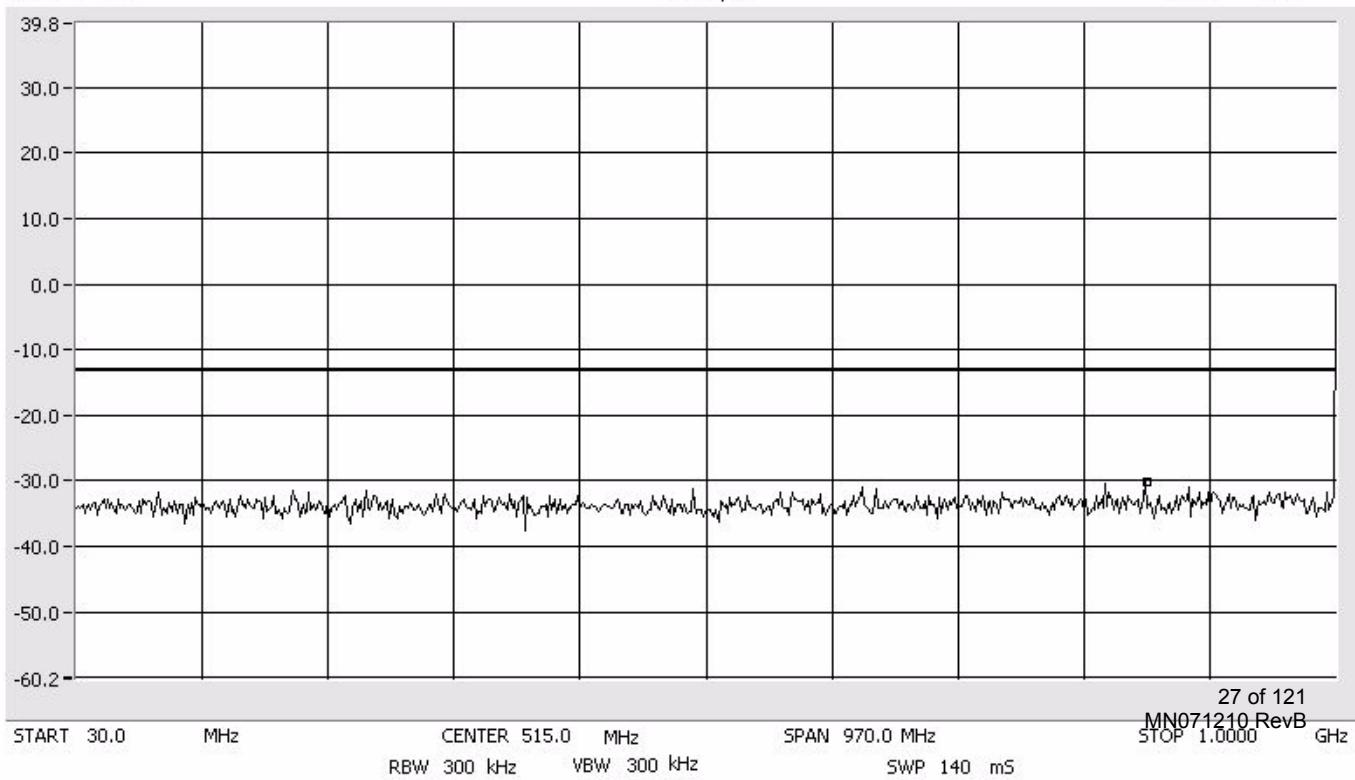
**Conducted Emissions
EDGE
1900 MHz**

Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

ATTEN 20 dB
RL 39.8 dBm

10 dB/Div

delta MKR -30.20 dBm
854.5 MHz



**Conducted Emissions
EDGE
1900 MHz**

1 GHz to 20 GHz
RBW/VBW: 1 MHz

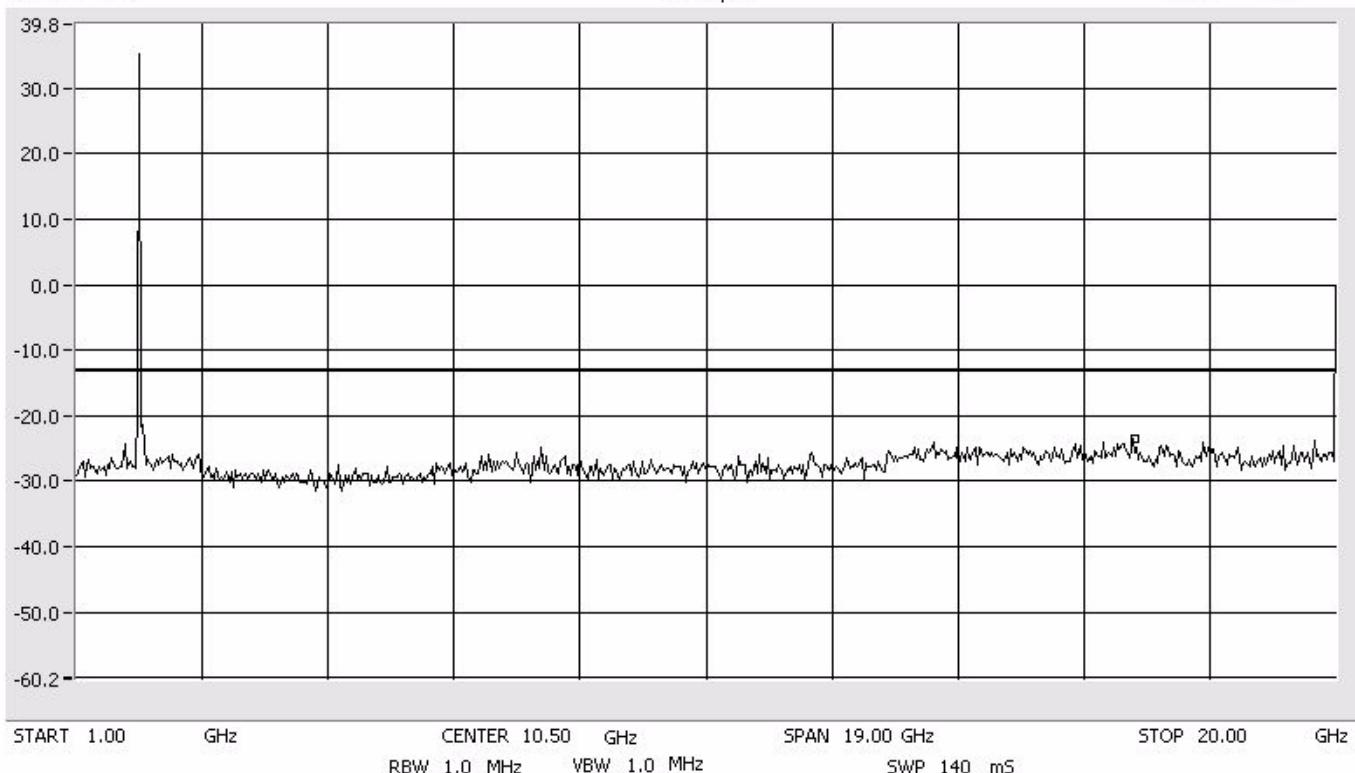
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -23.53 dBm

16.96 GHz



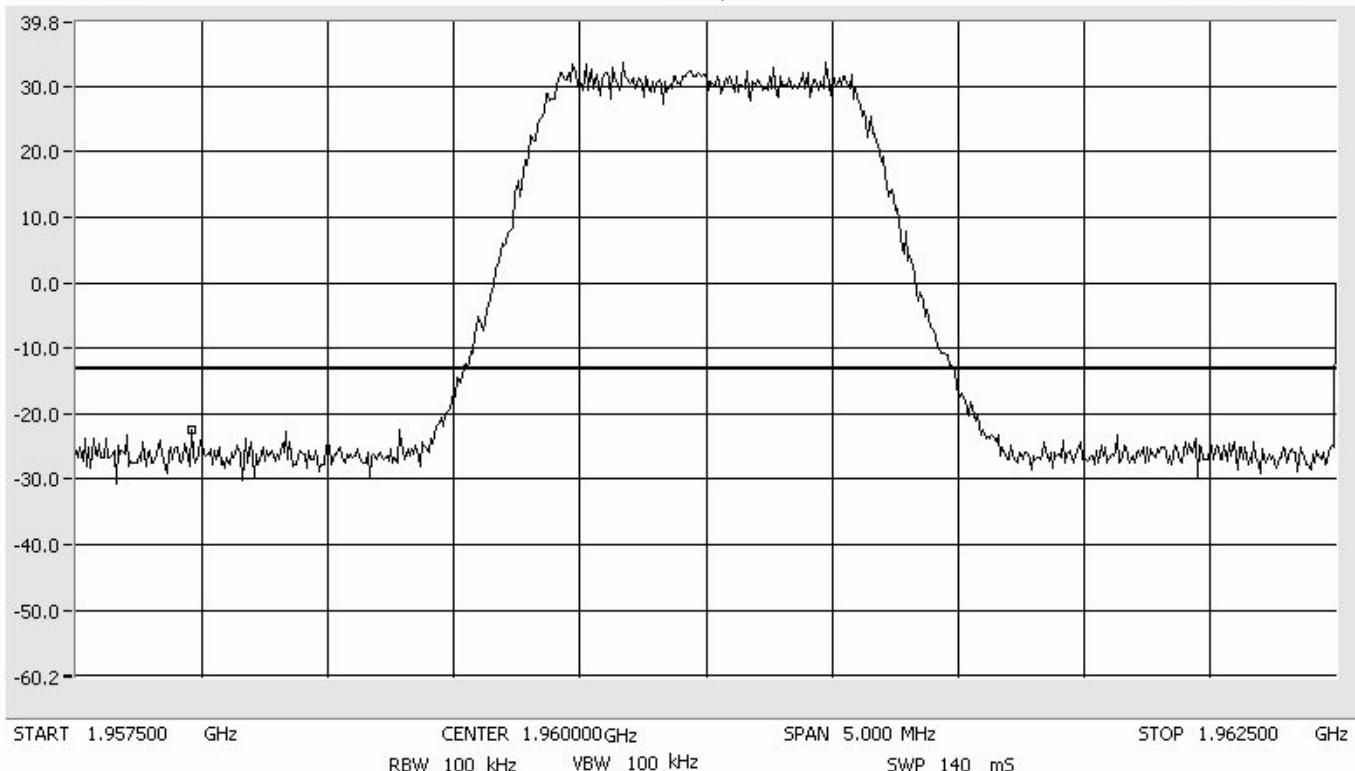
**Conducted Emissions
CDMA
1900 MHz**

Mid Band
Span: 5 MHz
RBW/VBW: 100 kHz

ATTEN 20 dB
RL 39.8 dBm

10 dB/Div

delta MKR -22.37 dBm
1.957958 GHz



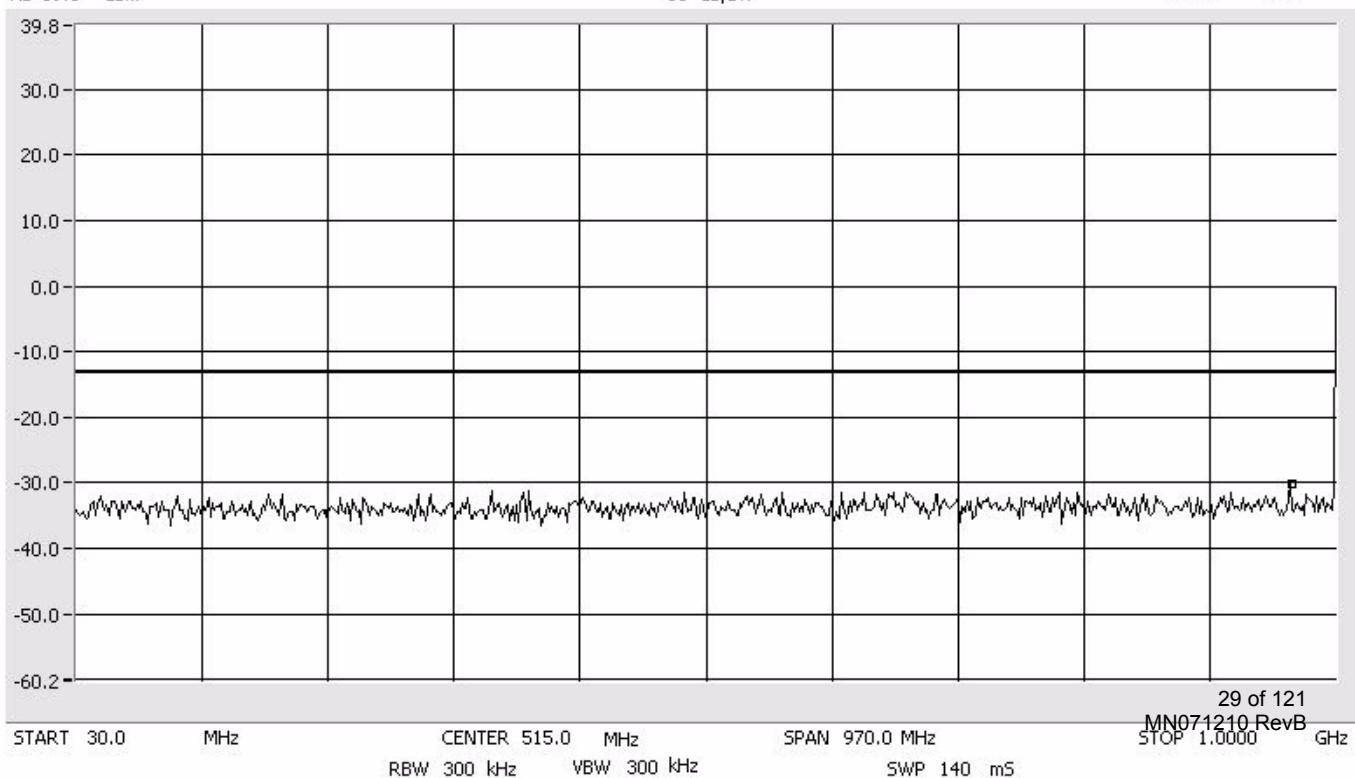
**Conducted Emissions
CDMA
1900 MHz**

Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

ATTEN 20 dB
RL 39.8 dBm

10 dB/Div

delta MKR -30.20 dBm
966.0 MHz



**Conducted Emissions
CDMA
1900 MHz**

1 GHz to 20 GHz
RBW/VBW: 1 MHz

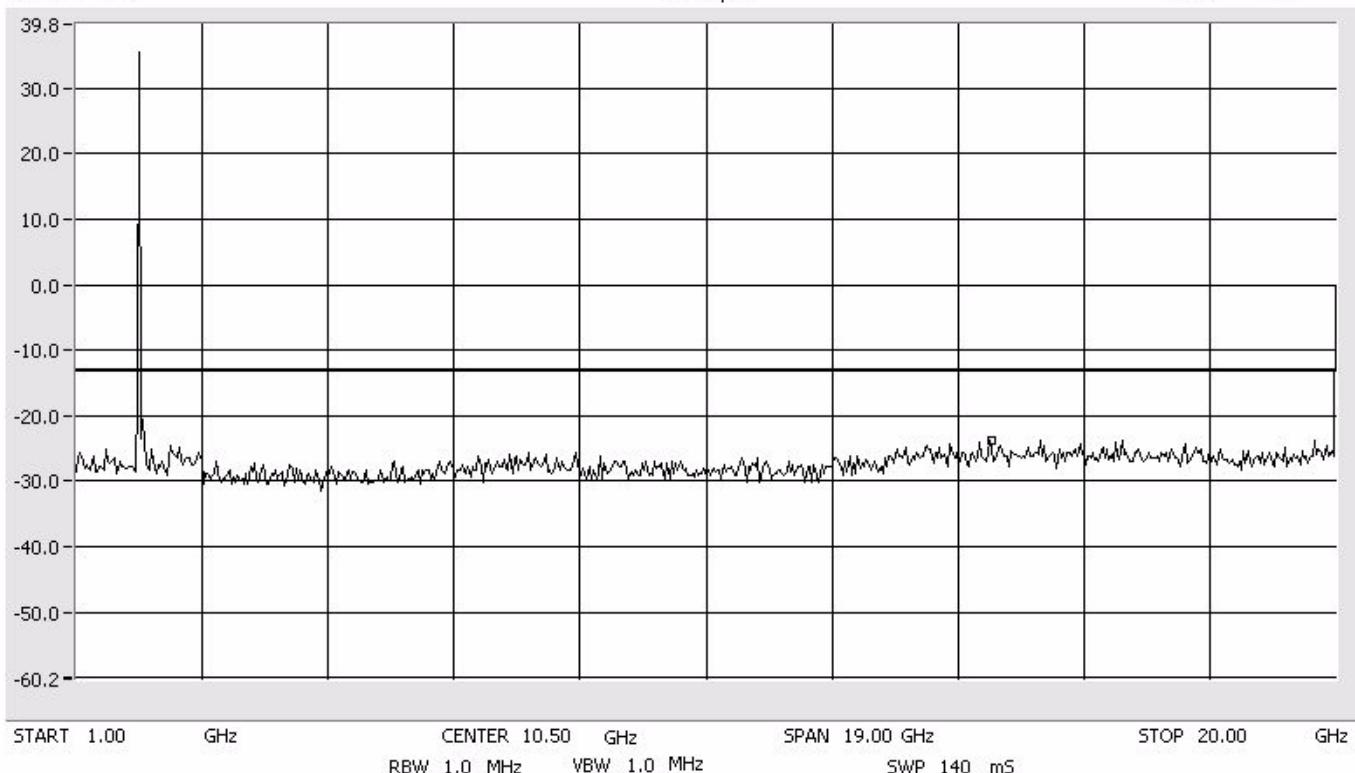
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -23.70 dBm

14.81 GHz



**Conducted Emissions
EVDO
1900 MHz**

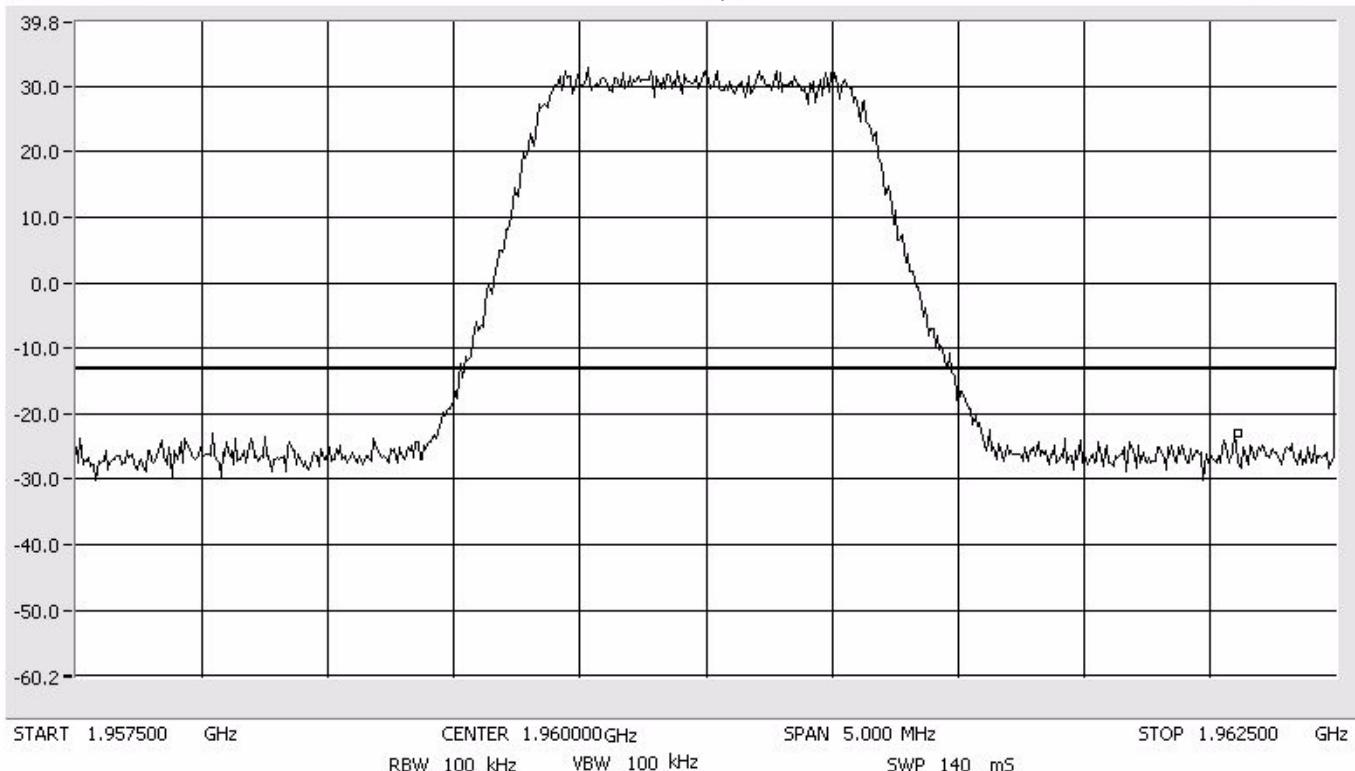
Mid Band
Span: 5 MHz
RBW/VBW: 100 kHz

ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -22.87 dBm
1.962108 GHz



**Conducted Emissions
EVDO
1900 MHz**

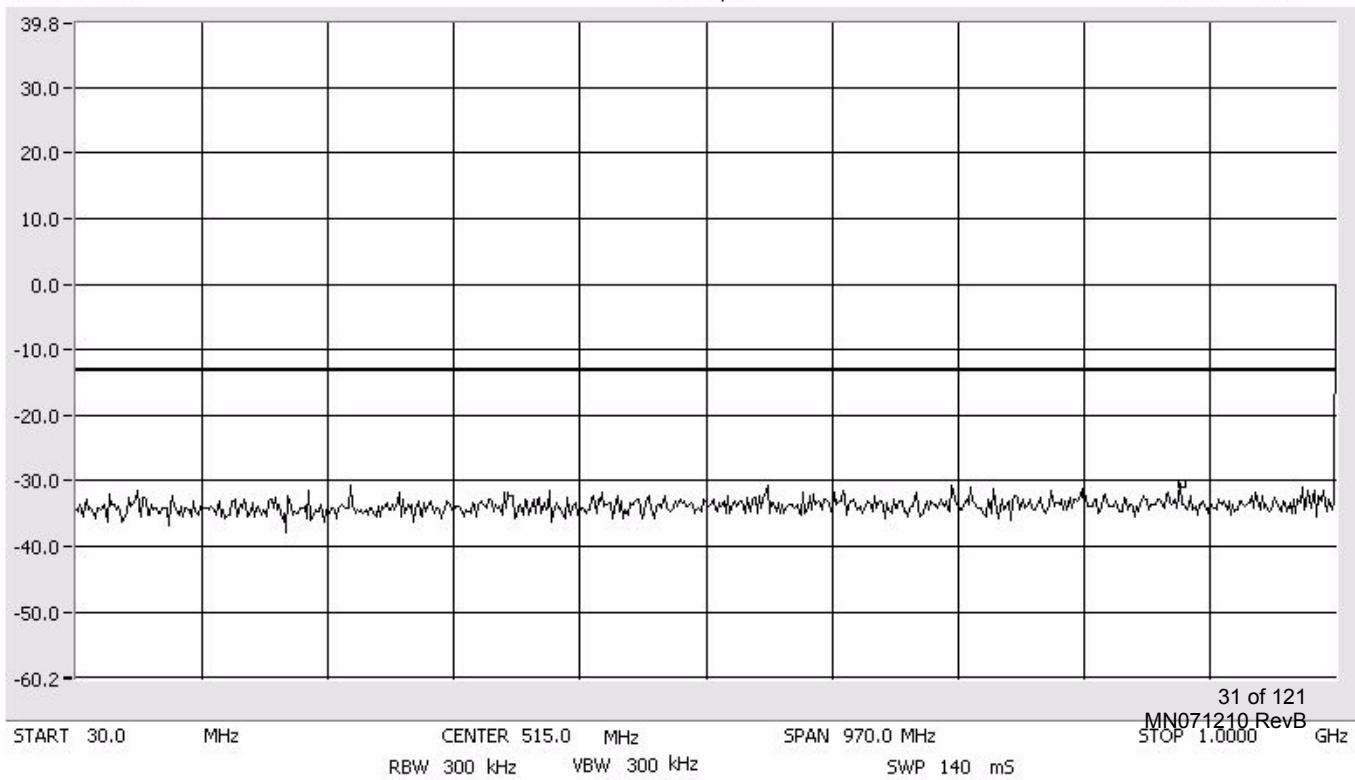
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -30.53 dBm
882.0 MHz



**Conducted Emissions
EVDO
1900 MHz**

1 GHz to 20 GHz
RBW/VBW: 1 MHz

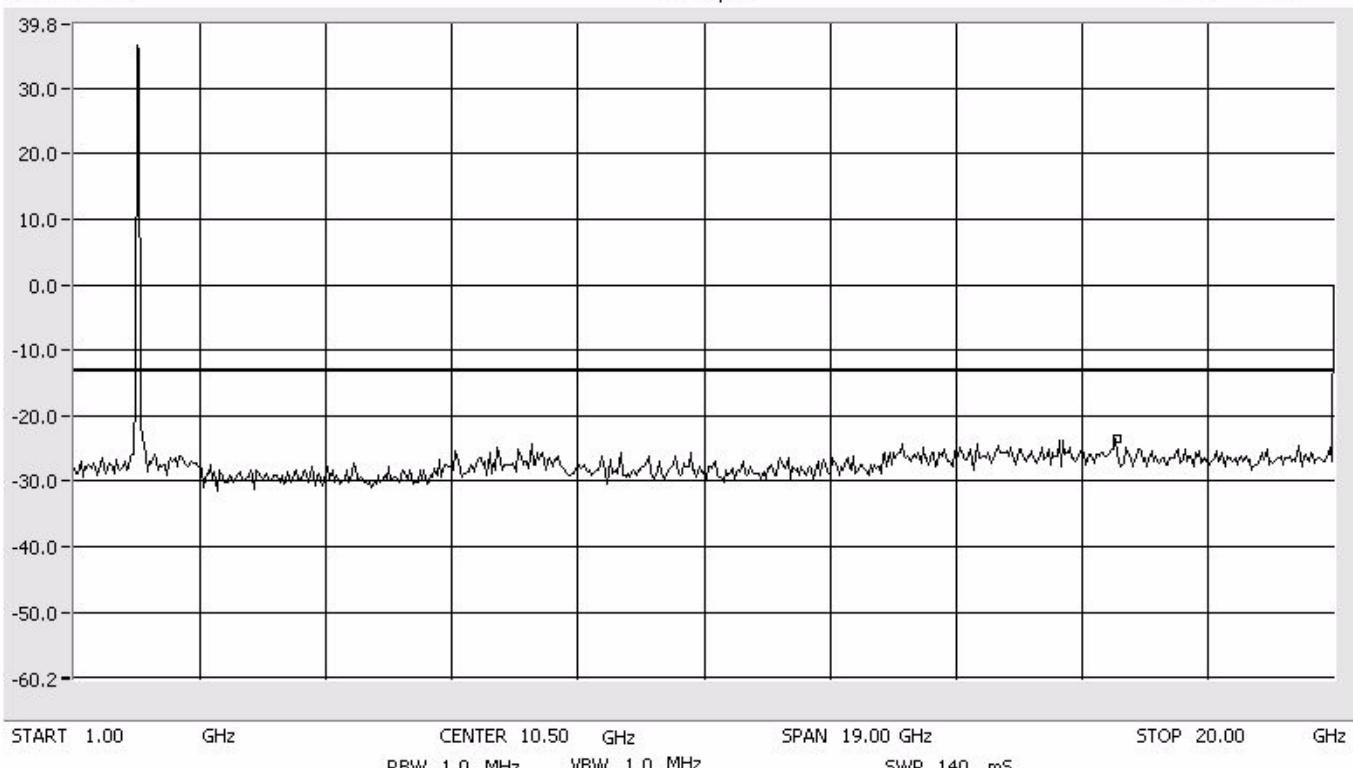
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -23.53 dBm

16.74 GHz



**Conducted Emissions
W-CDMA
1900 MHz**

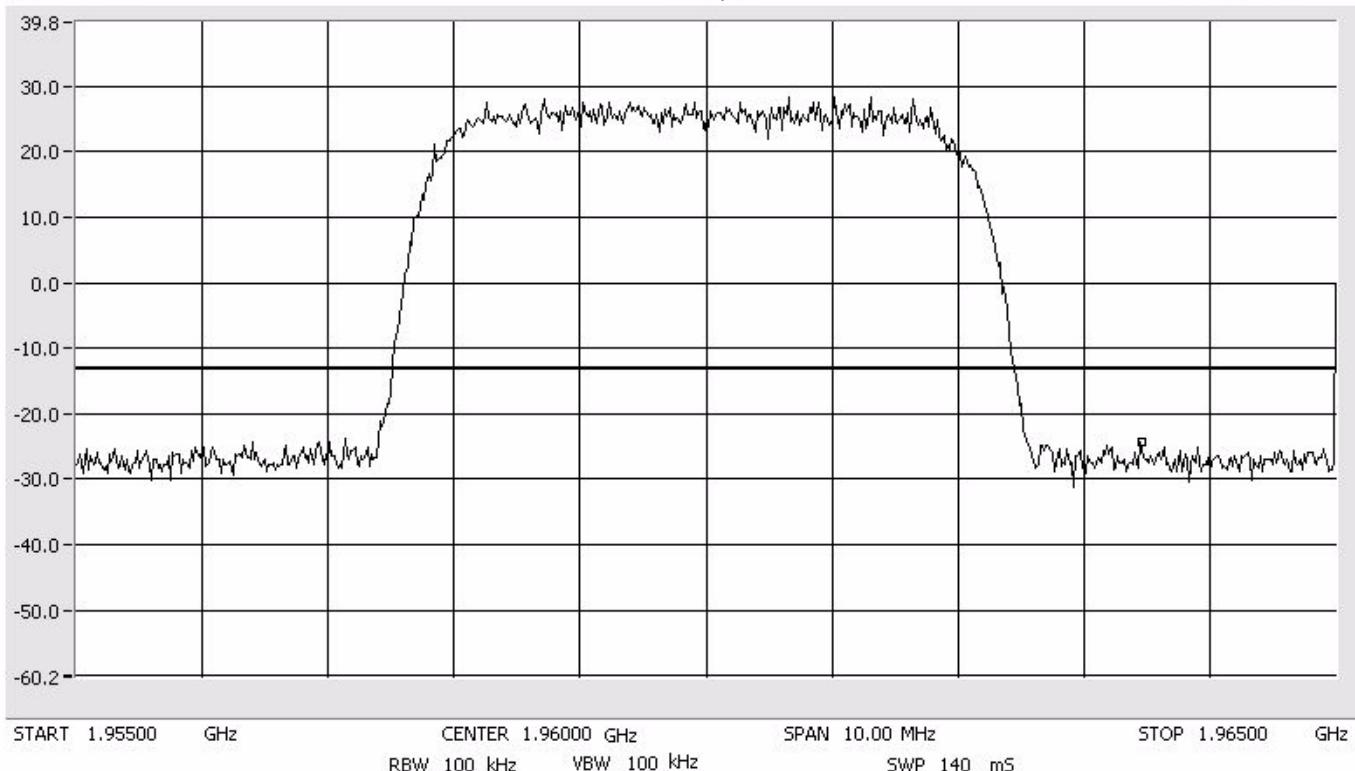
Mid Band
Span: 10 MHz
RBW/VBW: 100 kHz

ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -24.37 dBm
1.96347 GHz



**Conducted Emissions
W-CDMA
1900 MHz**

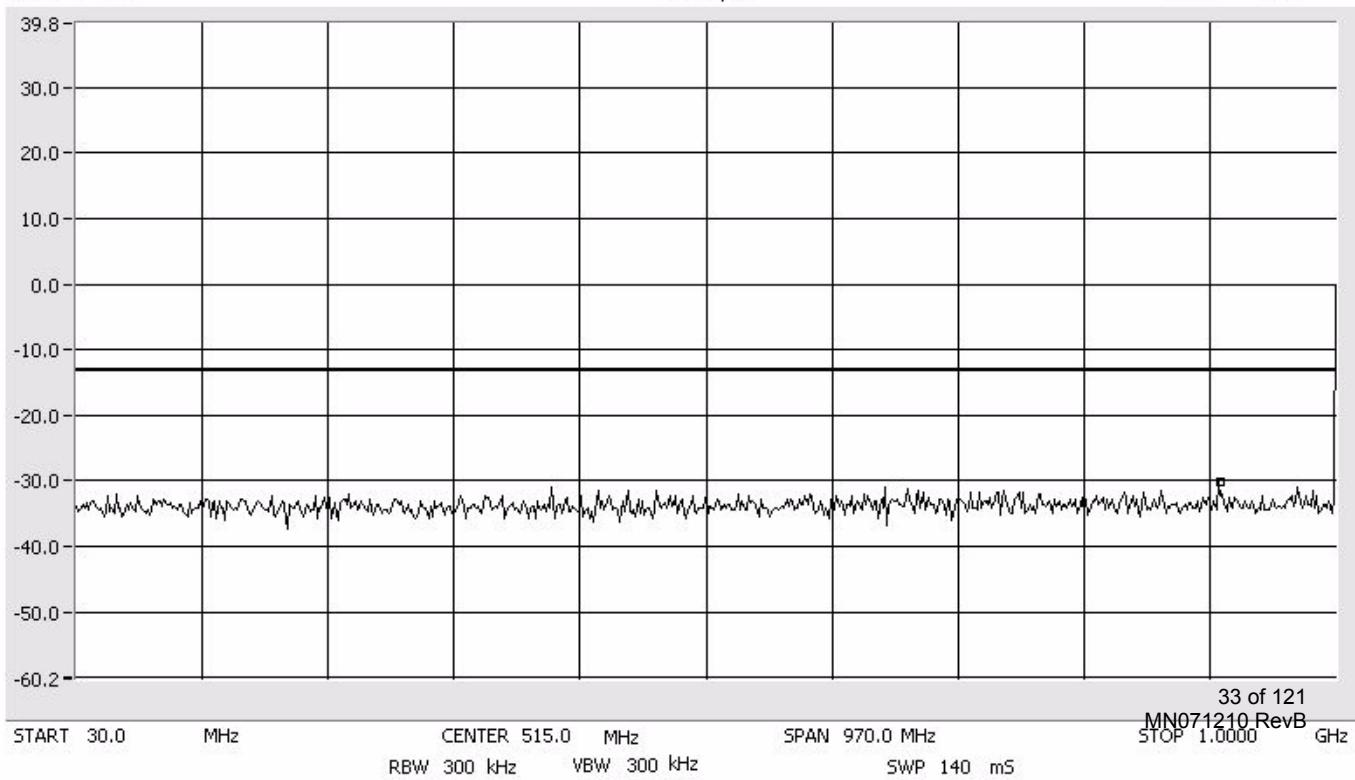
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -30.20 dBm
911.1 MHz



**Conducted Emissions
W-CDMA
1900 MHz**

1 GHz to 20 GHz
RBW/VBW: 1 MHz

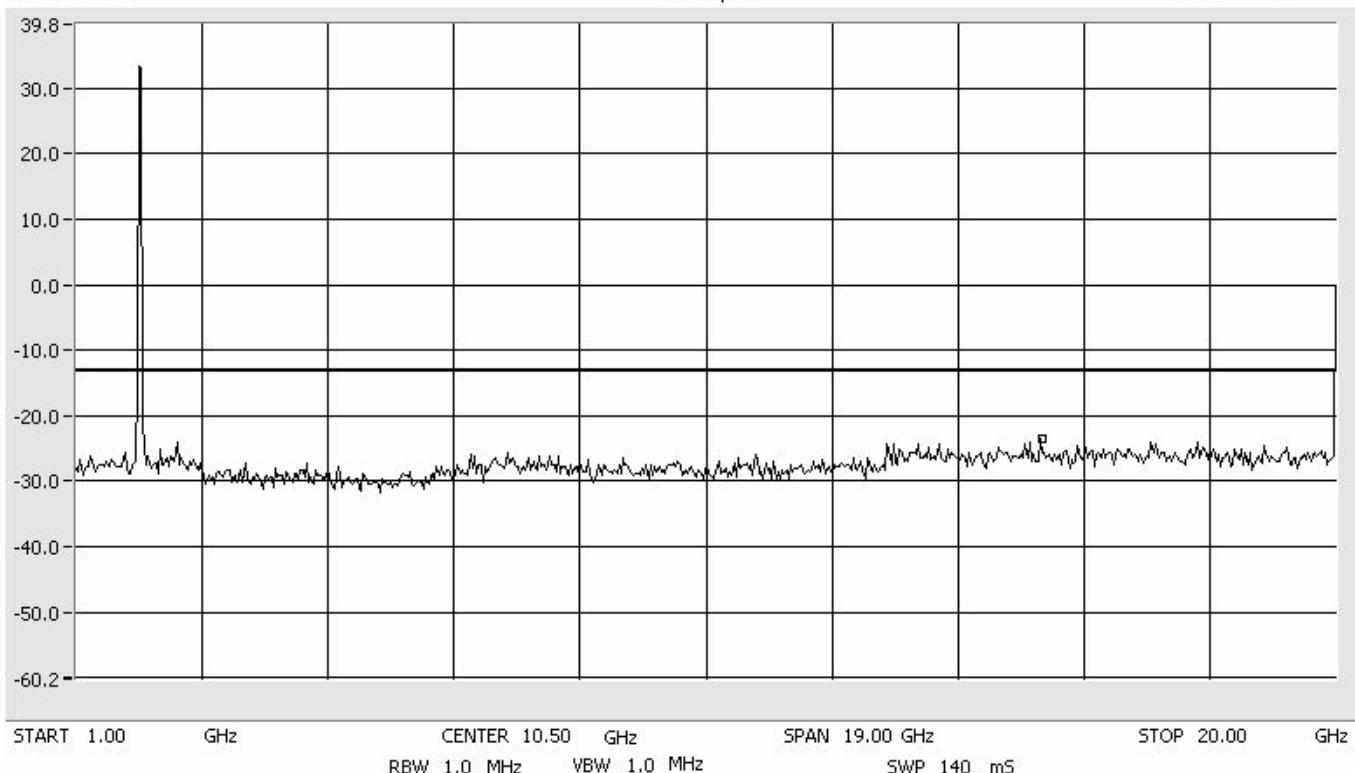
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

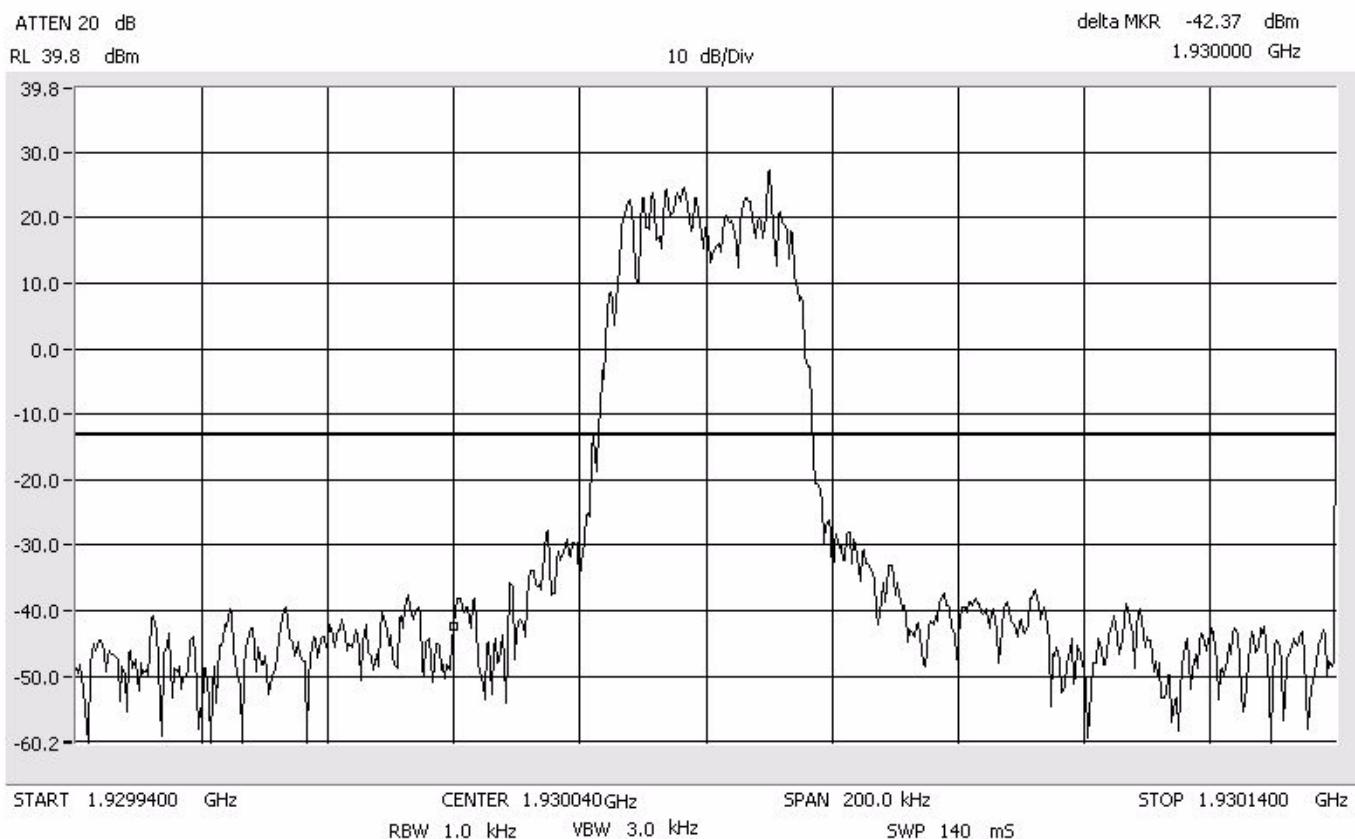
delta MKR -23.53 dBm

15.57 GHz



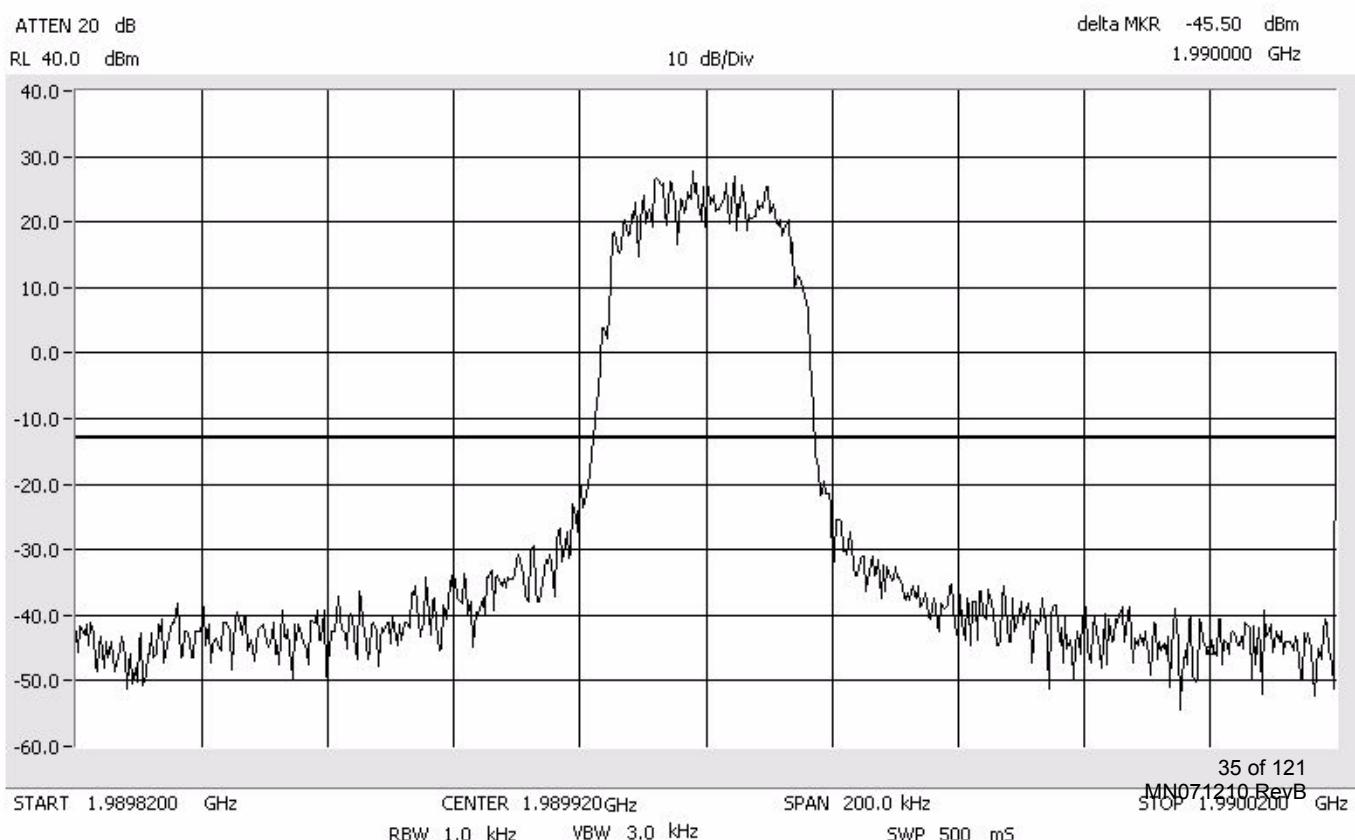
Band Edge TDMA

Center: 1930.04
Span: 200 kHz
RBW: 1 kHz
VBW: 3 kHz



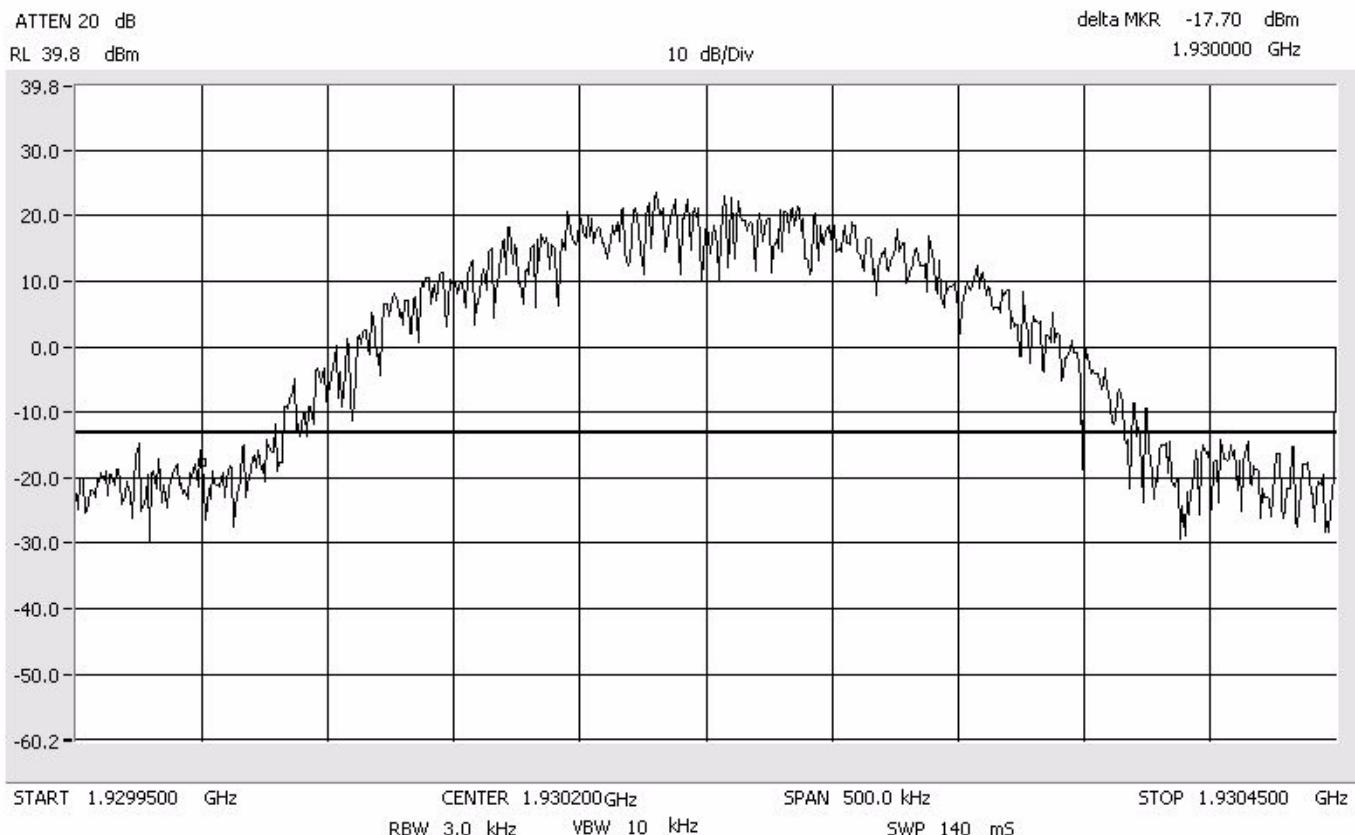
Band Edge TDMA

Center: 1989.92 MHz
Span: 200 kHz
RBW: 1 kHz
VBW: 3 kHz



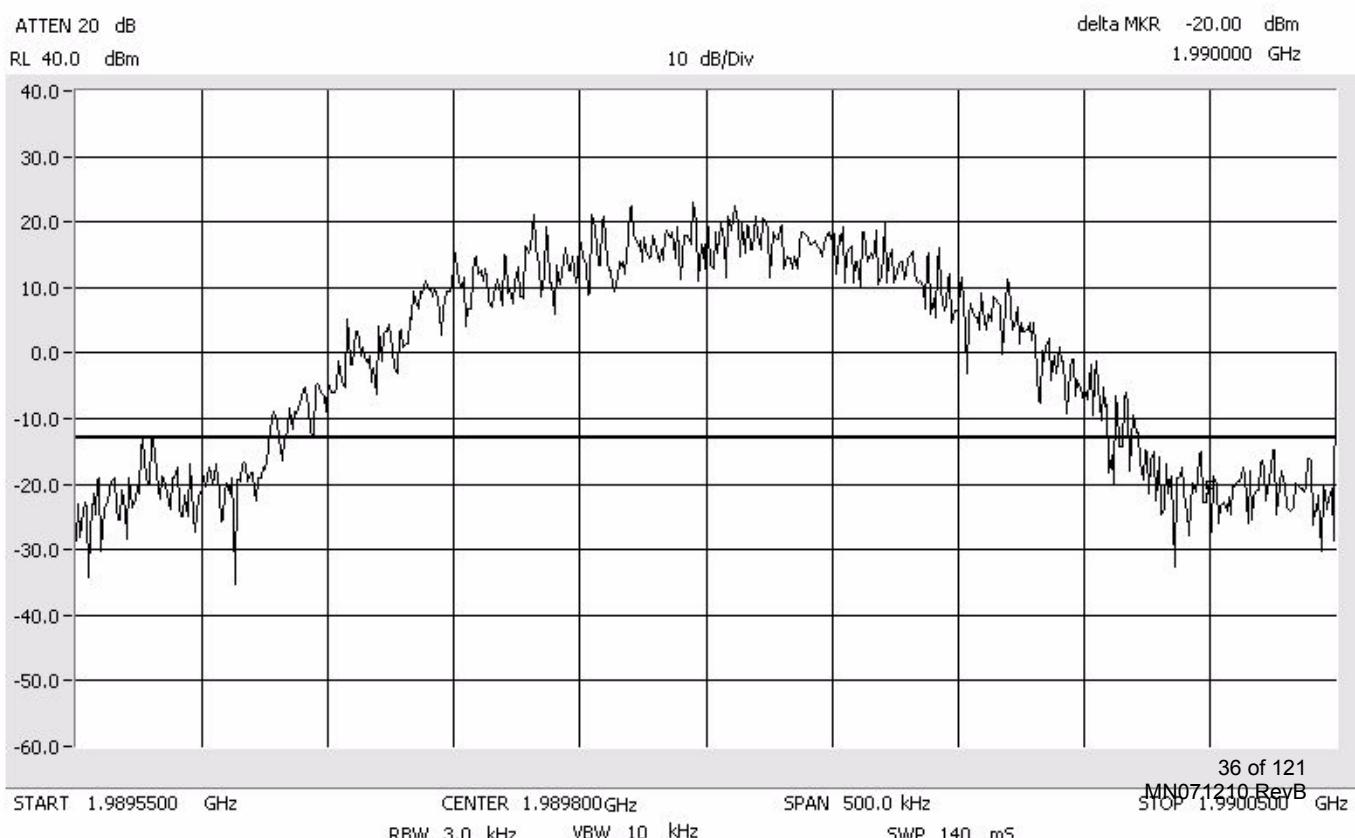
Band Edge GSM

Center: 1930.20
Span: 500 kHz
RBW: 3 kHz
VBW: 10 kHz



Band Edge GSM

Center: 1989.80 MHz
Span: 500 kHz
RBW: 3 kHz
VBW: 10 kHz



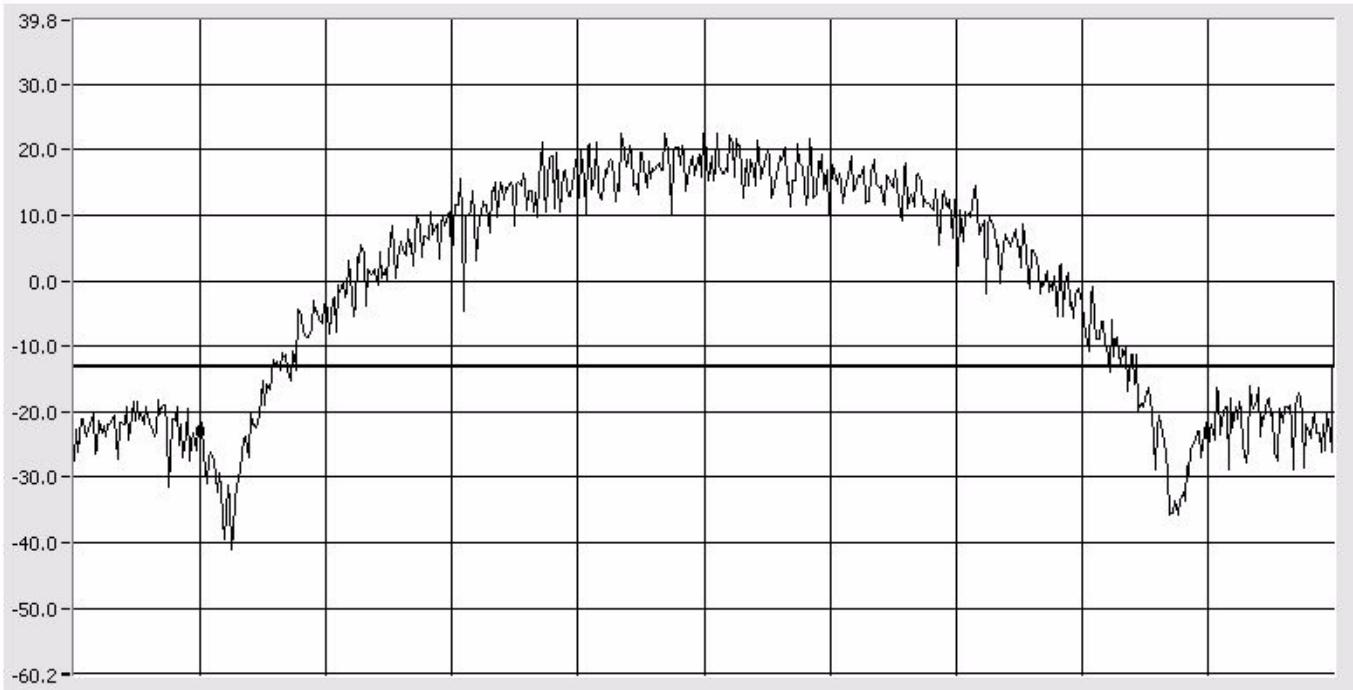
Band Edge EDGE

Center: 1930.20
Span: 500 kHz
RBW: 3 kHz
VBW: 10 kHz

ATTEN 20 dB
RL 39.8 dBm

10 dB/Div

delta MKR -23.03 dBm
1.930000 GHz



START 1.9299500 GHz

CENTER 1.930200 GHz

SPAN 500.0 kHz

STOP 1.9304500 GHz

RBW 3.0 kHz

VBW 10 kHz

SWP 140 mS

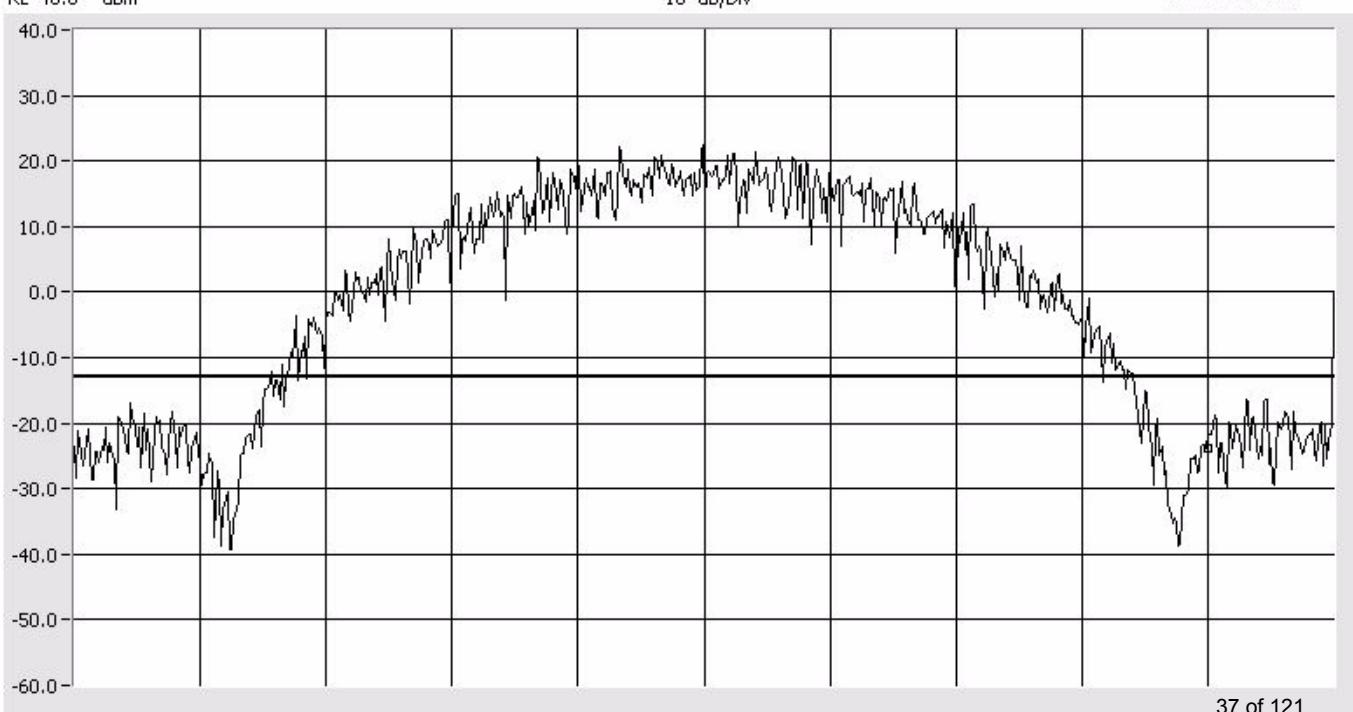
Band Edge EDGE

Center: 1989.80 MHz
Span: 500 kHz
RBW: 3 kHz
VBW: 10 kHz

ATTEN 20 dB
RL 40.0 dBm

10 dB/Div

delta MKR -23.83 dBm
1.990000 GHz



START 1.9895500 GHz

CENTER 1.989800 GHz

SPAN 500.0 kHz

STOP 1.9900500 GHz

RBW 3.0 kHz

VBW 10 kHz

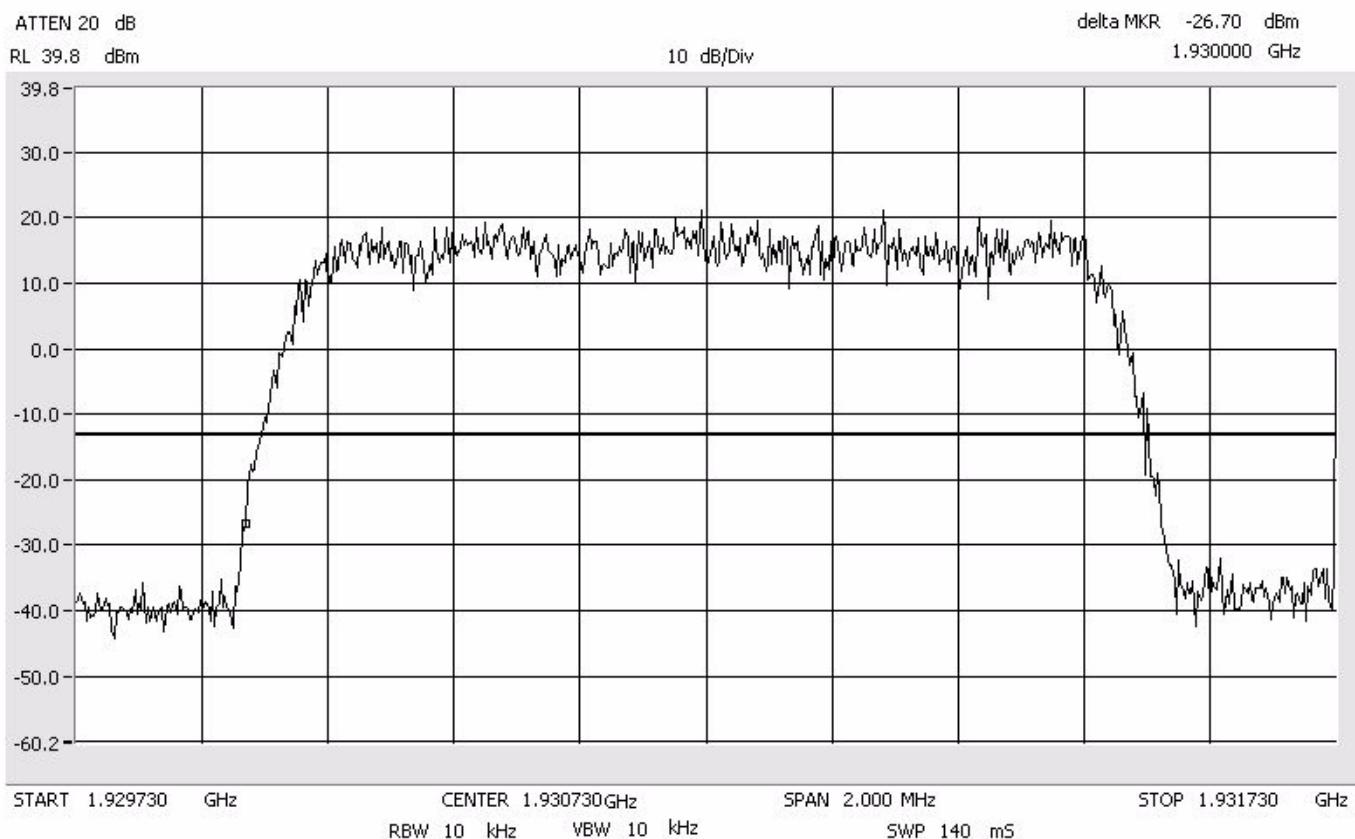
SWP 140 mS

37 of 121

MN071210 RevB

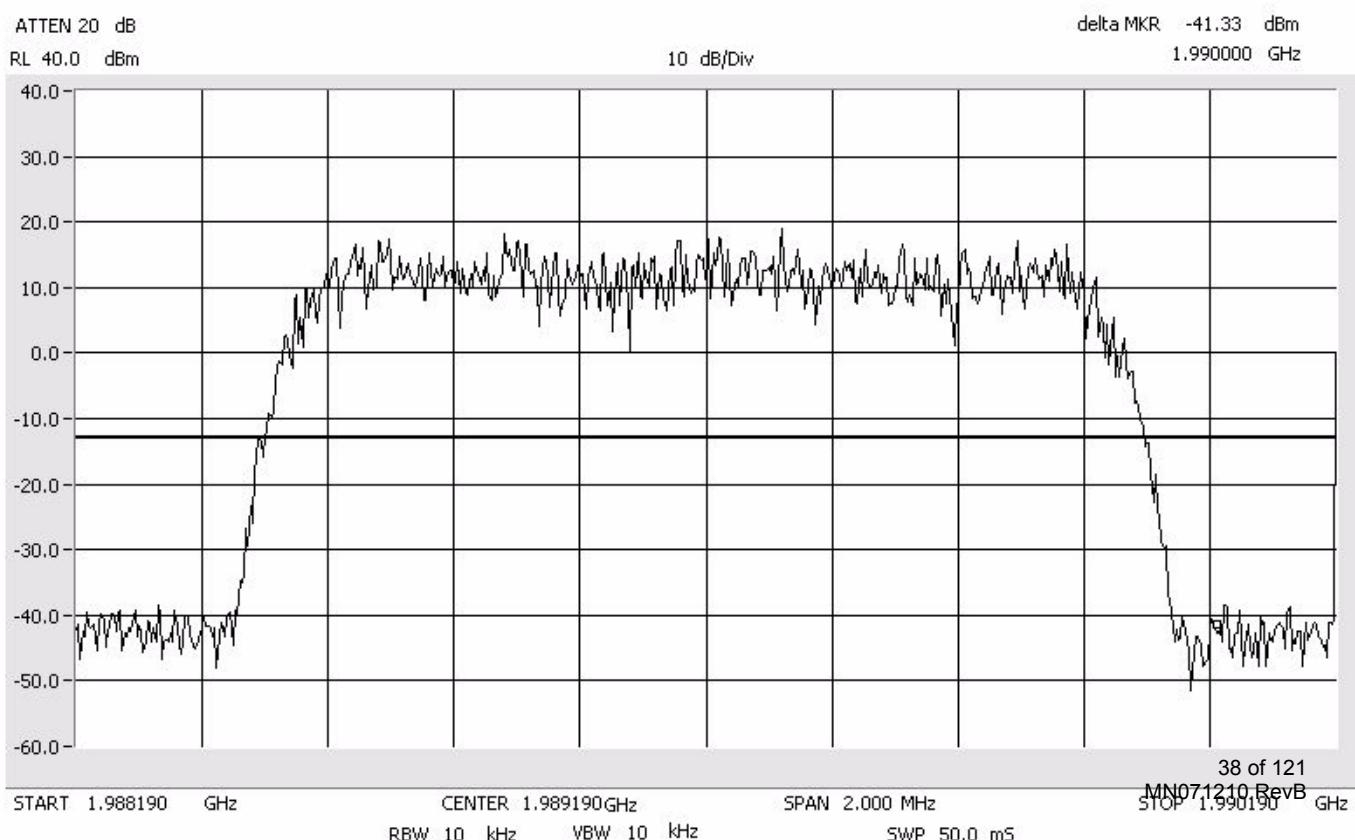
Band Edge CDMA

Center: 1930.73
Span: 2 MHz
RBW: 10 kHz
VBW: 10 kHz



Band Edge CDMA

Center: 1989.19 MHz
Span: 2 MHz
RBW: 10 kHz
VBW: 10 kHz



Band Edge EVDO

Center: 1930.73
Span: 2 MHz
RBW: 10 kHz
VBW: 10 kHz

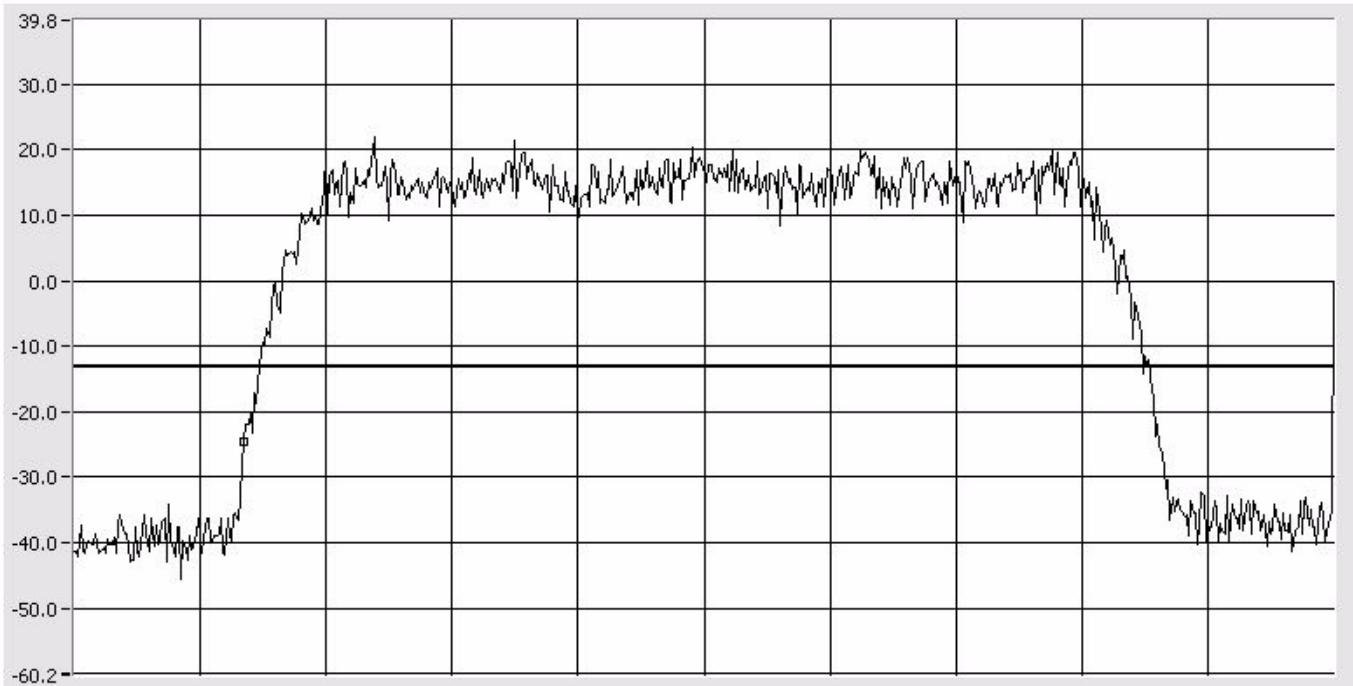
ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -24.53 dBm

1.930000 GHz



START 1.929730 GHz

CENTER 1.930730 GHz

SPAN 2.000 MHz

STOP 1.931730 GHz

RBW 10 kHz

VBW 10 kHz

SWP 140 mS

Band Edge EVDO

Center: 1989.19 MHz
Span: 2 MHz
RBW: 10 kHz
VBW: 10 kHz

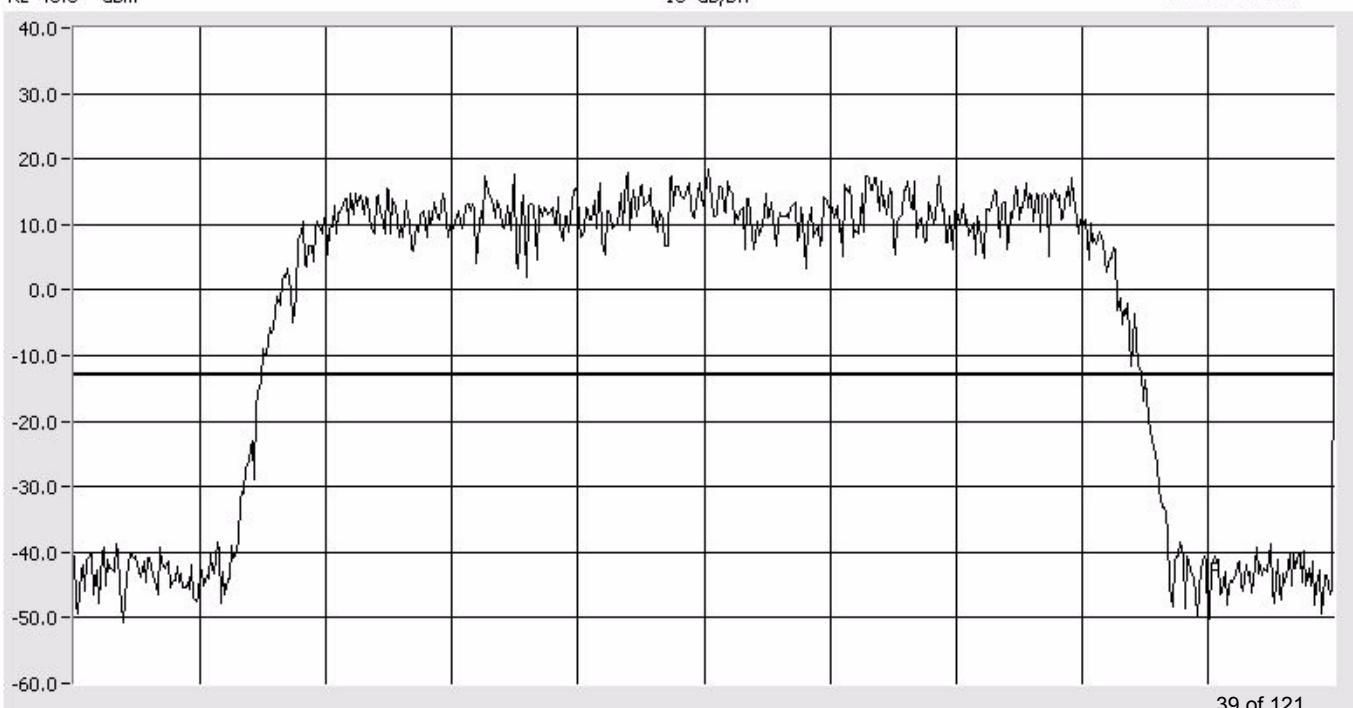
ATTEN 20 dB

RL 40.0 dBm

10 dB/Div

delta MKR -42.17 dBm

1.990000 GHz



START 1.988190 GHz

CENTER 1.989190 GHz

SPAN 2.000 MHz

STOP 1.990190 GHz

RBW 10 kHz

VBW 10 kHz

SWP 50.0 mS

39 of 121

MN071210 RevB

Band Edge W-CDMA

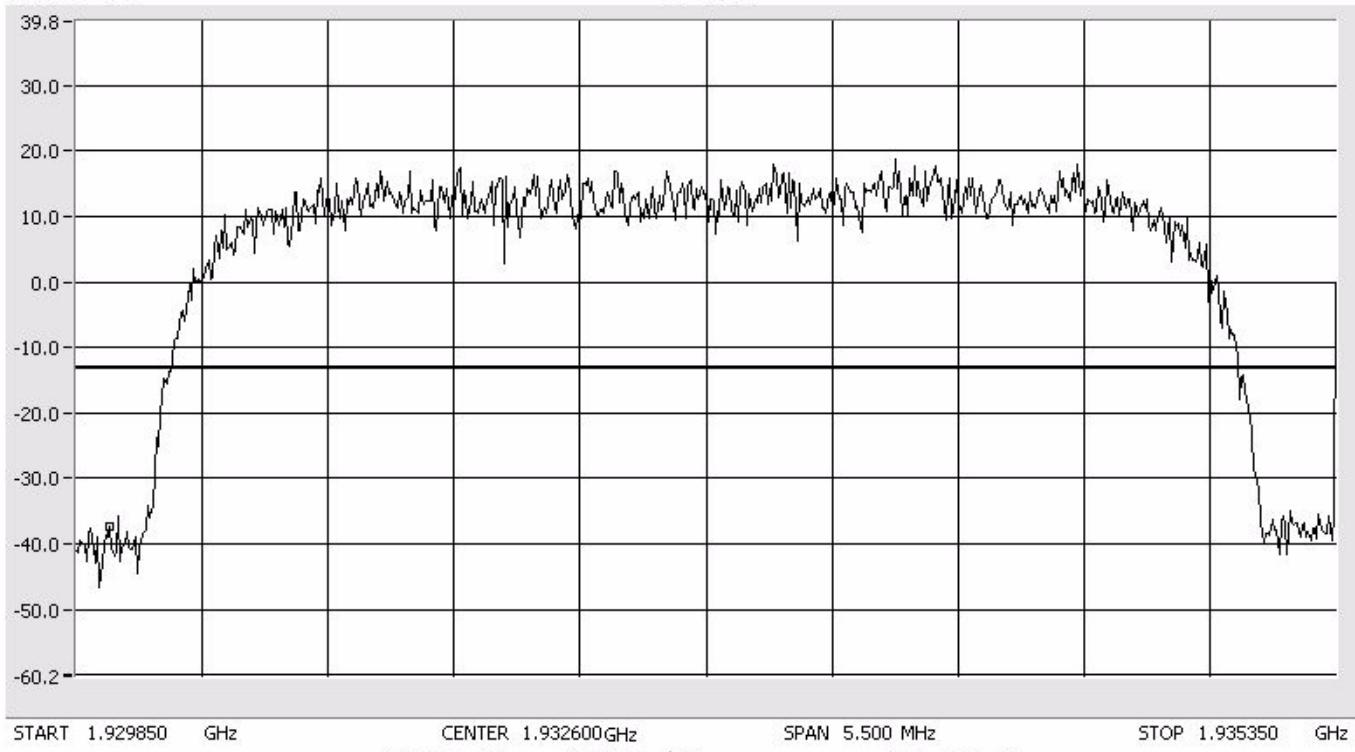
Center: 1932.60
Span: 5.5 MHz
RBW: 10 kHz
VBW: 10 kHz

ATTEN 20 dB

RL 39.8 dBm

10 dB/Div

delta MKR -37.37 dBm
1.929997 GHz



START 1.929850 GHz

CENTER 1.932600 GHz

SPAN 5.500 MHz

STOP 1.935350 GHz

RBW 10 kHz VBW 10 kHz

SWP 140 mS

Band Edge W-CDMA

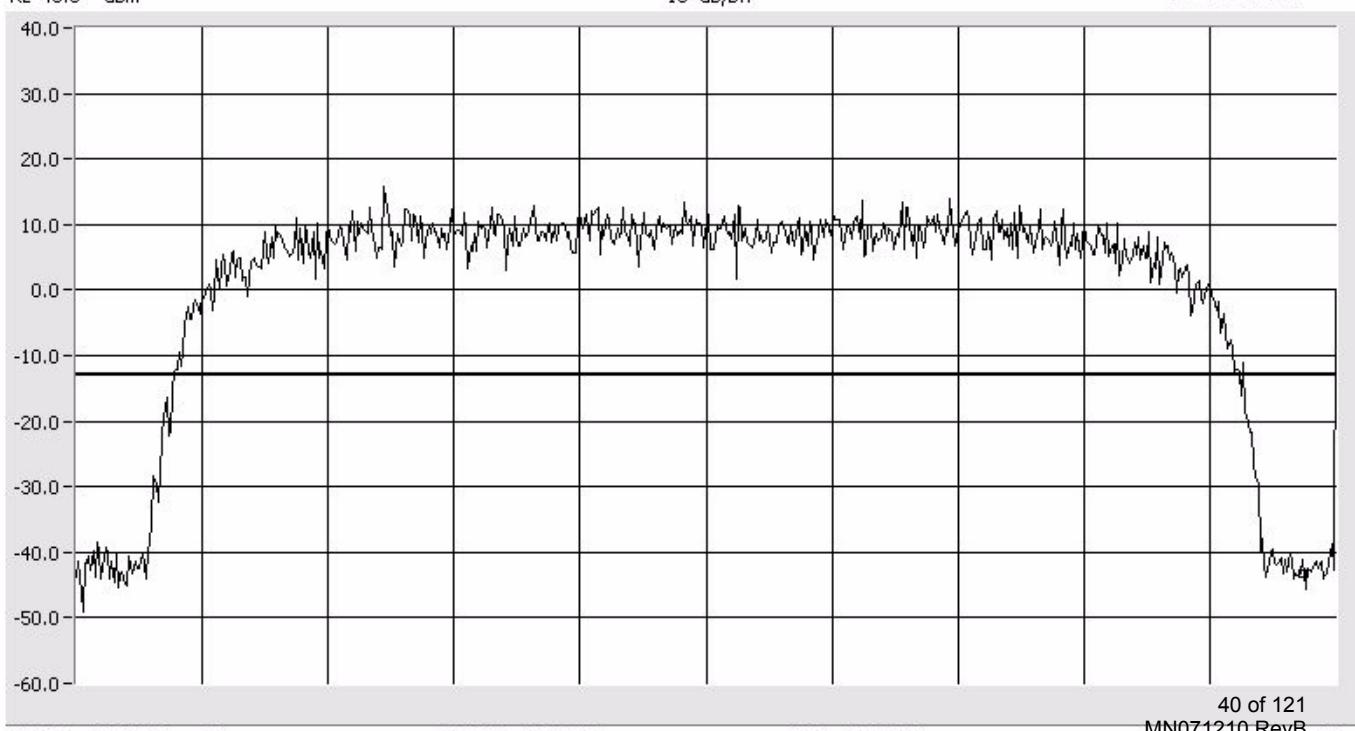
Center: 1987.40 MHz
Span: 5.5 MHz
RBW: 10 kHz
VBW: 10 kHz

ATTEN 20 dB

RL 40.0 dBm

10 dB/Div

delta MKR -43.33 dBm
1.990003 GHz



START 1.984650 GHz

CENTER 1.987400 GHz

SPAN 5.500 MHz

STOP 1.990150 GHz

RBW 10 kHz VBW 10 kHz

SWP 140 mS

40 of 121
MN071210 RevB

Conducted Output Power Test for ADC Inc

FlexWave™ URH - PCS

Model Number FWU-84000002110RU

[Back](#)

*Note: The EUT is a fixed repeater and not a base station.

This measurement was made as a direct conducted emission measurement. The output from the EUT antenna connector was connected to the power meter. The carrier output, below, was conducted using a single TDMA, GSM, EDGE, CDMA, EVDO, and W-CDMA signal generator. The power meter level was offset to compensate for attenuators and cable loss between the EUT and the power meter.

A signal was used at the low, mid and high parts of the selected band. The power meter level was offset by 39.8 dB to compensate for attenuators and cable loss between the EUT and the power meter.

TDMA **25.00 Watts**

Carrier Frequency	Carrier Output
1930.2 MHz	<u>43.10</u> dBm
1960.0 MHz	<u>43.68</u> dBm
1989.8 MHz	<u>43.98</u> dBm

GSM **24.15 Watts**

Carrier Frequency	Carrier Output
1930.2 MHz	<u>43.25</u> dBm
1960.0 MHz	<u>43.83</u> dBm
1989.8 MHz	<u>43.67</u> dBm

EDGE **24.43 Watts**

Carrier Frequency	Carrier Output
1930.2 MHz	<u>42.87</u> dBm
1960.0 MHz	<u>43.76</u> dBm
1989.8 MHz	<u>43.88</u> dBm

CDMA **23.82 Watts**

Carrier Frequency	Carrier Output
1930.8 MHz	<u>42.85</u> dBm
1960.0 MHz	<u>43.77</u> dBm
1989.2 MHz	<u>43.23</u> dBm

EVDO **22.80 Watts**

Carrier Frequency	Carrier Output
1930.8 MHz	<u>43.58</u> dBm
1960.0 MHz	<u>43.34</u> dBm
1989.2 MHz	<u>43.56</u> dBm

W-CDMA **24.38 Watts**

Carrier Frequency	Carrier Output
1932.6 MHz	<u>43.55</u> dBm
1960.0 MHz	<u>43.28</u> dBm
1987.4 MHz	<u>43.87</u> dBm

Intermodulation Test for ADC Inc
FlexWave™ URH - PCS
Model Number FWU-84000002110RU

[Back](#)

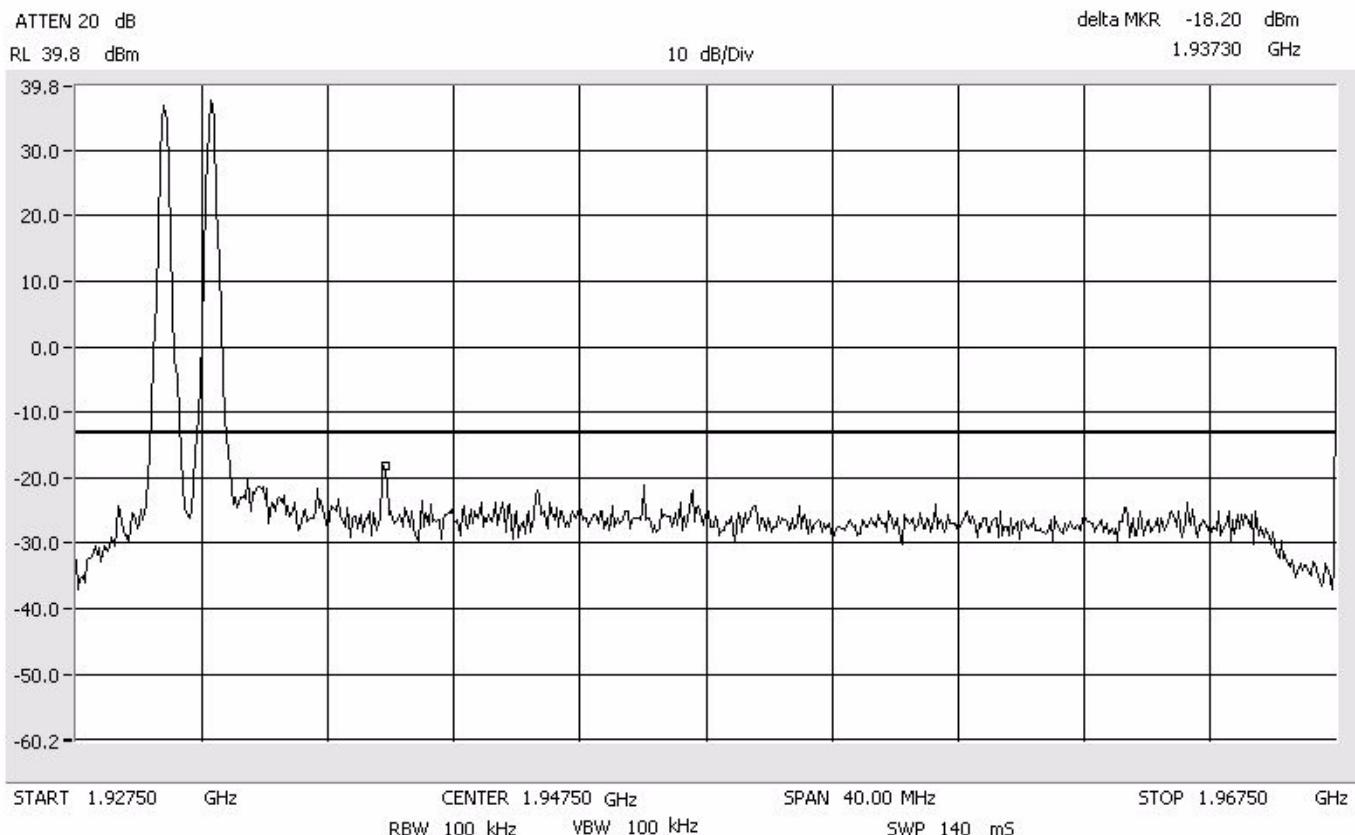
The inter-modulation products test was performed for the EUT. Three tests were preformed with the modulation type. Test 1 was with 2 signals input to the EUT at lower end channels. Test 2 was with 2 signals input to the EUT at upper end channels. Test 3 was with 2 signals input to the EUT at upper and lower end channels. The modulation types tested were TDMA, GSM, EDGE, CDMA, EVDO, and W-CDMA. An investigation was made from 30 MHz to the 10th Harmonic of the highest fundamental frequency (~20 GHz). The following plots show the results. Modulation types EVDO and CDMA have the same mask and intermodulation properties.

Results:
(See Plots)

**TDMA
Lower Band**

**Intermodulation
Close - Lower
PCS 1900 MHz**

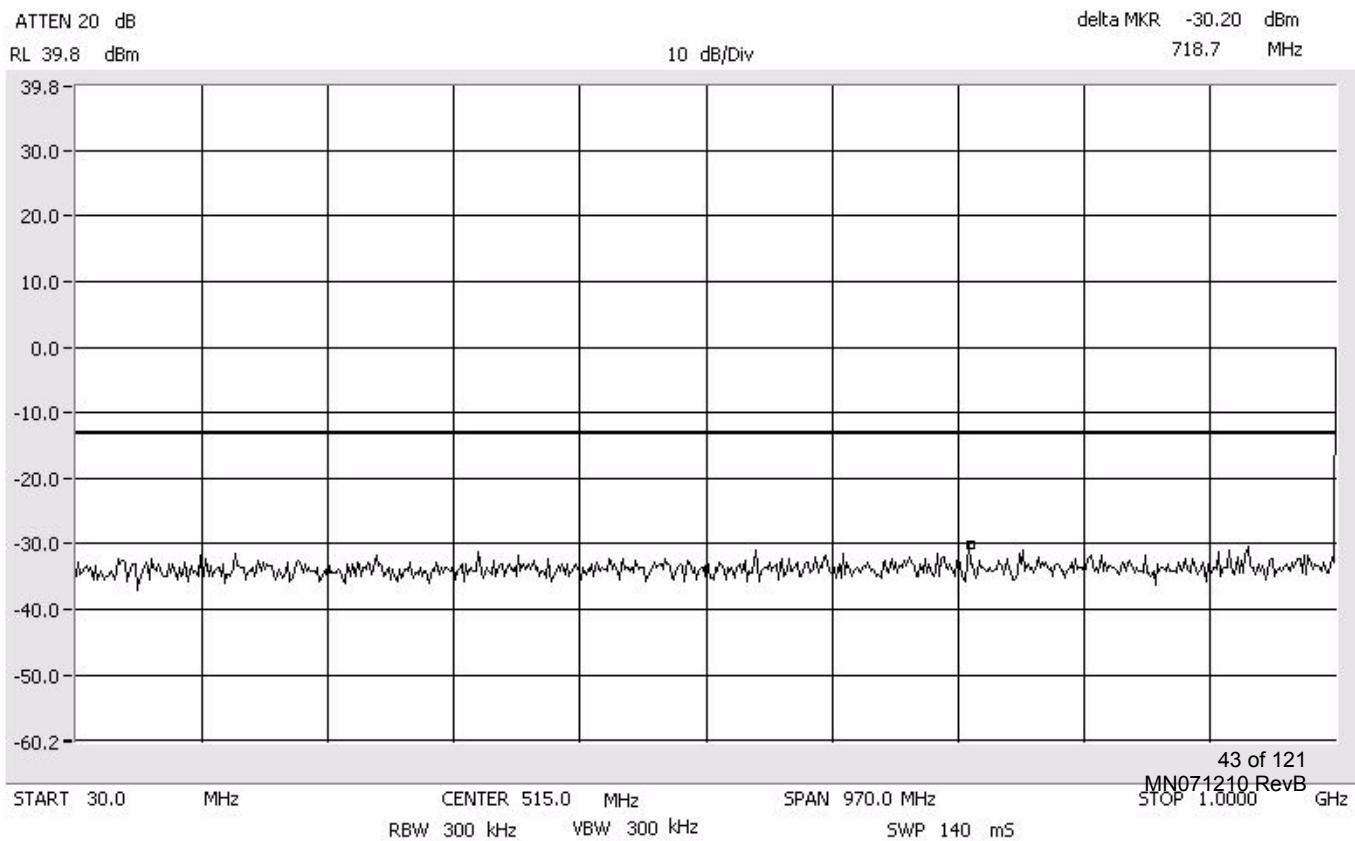
Center: 1947.5 MHz
Span: 40 MHz
RBW/VBW: 100 kHz

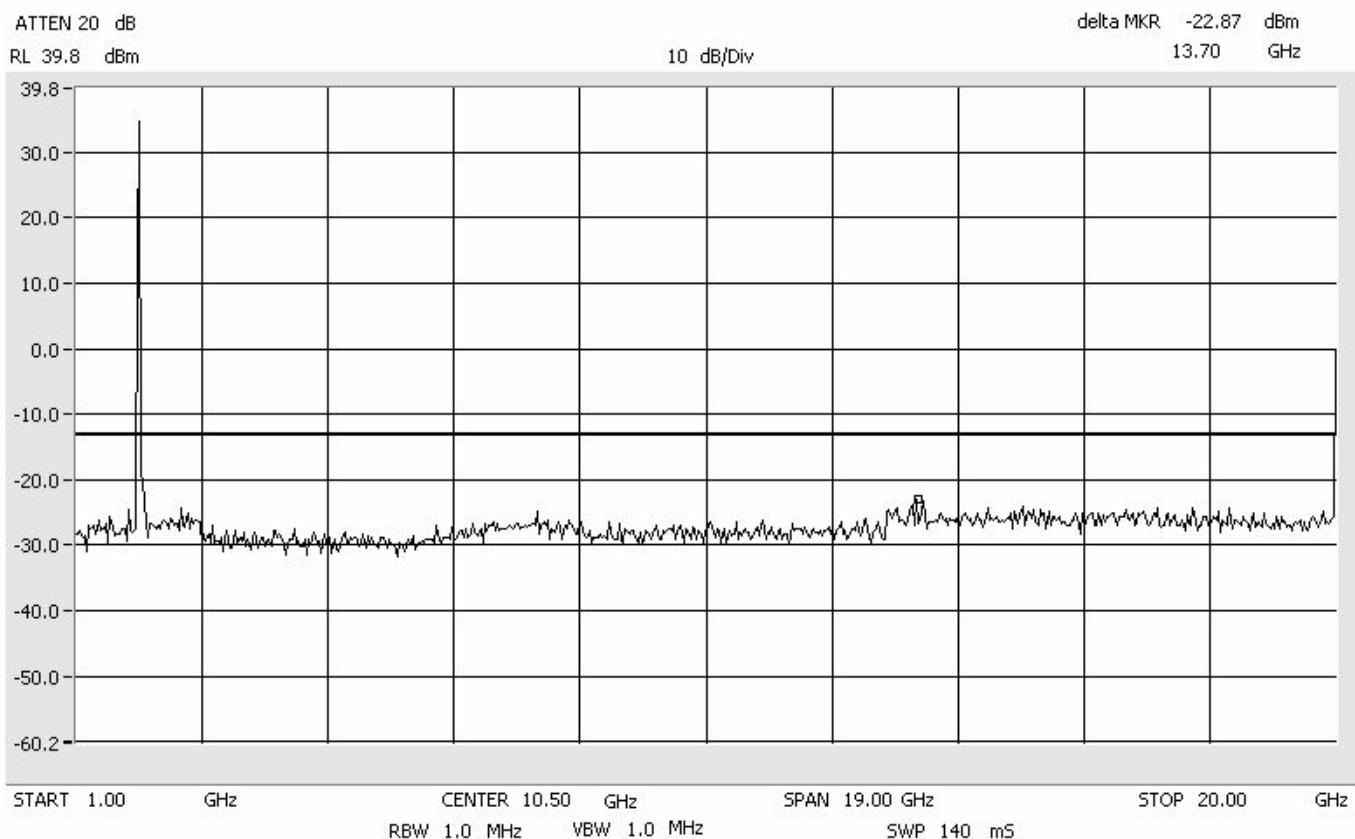


**TDMA
Lower Band**

**Intermodulation
Close - Lower
PCS 1900 MHz**

Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz

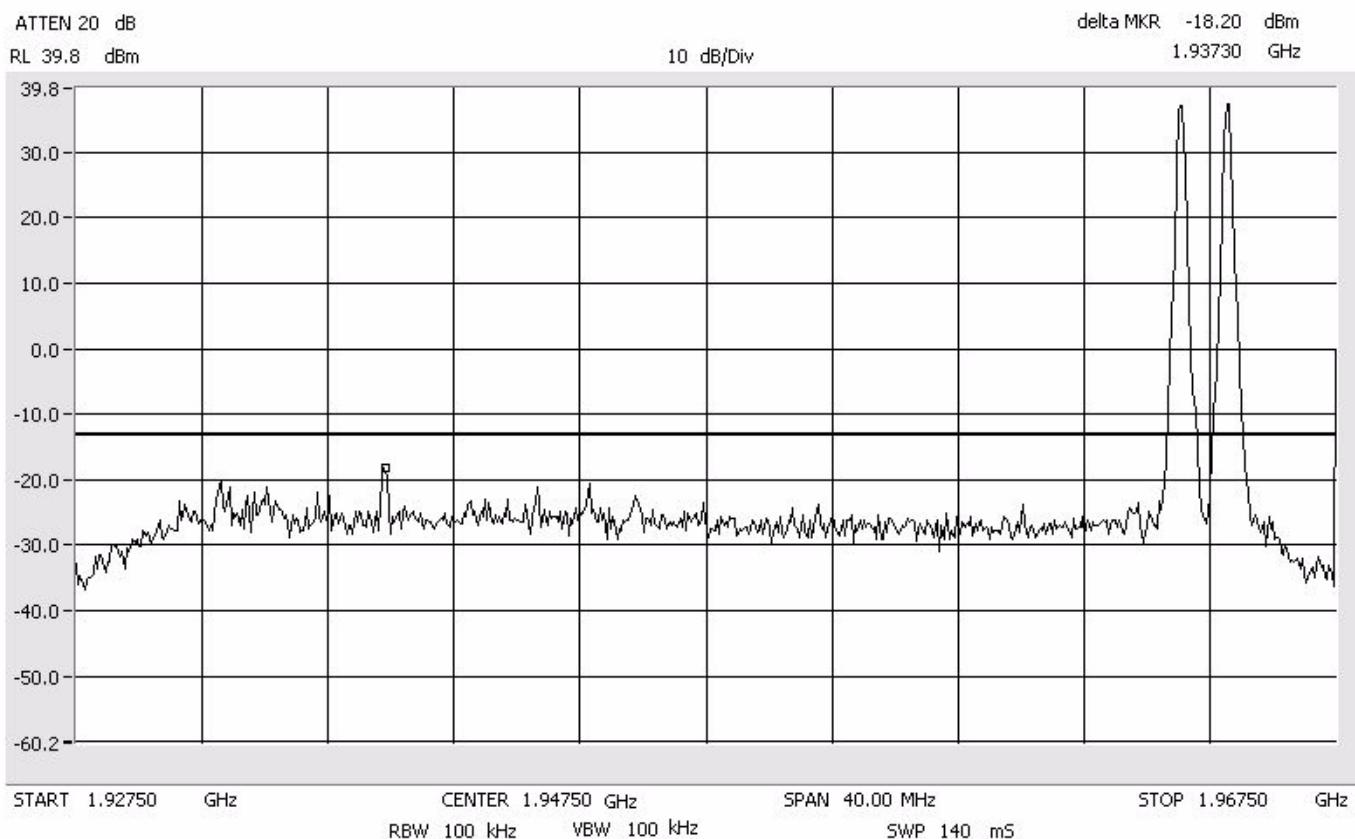




**TDMA
Lower Band**

**Intermodulation
Close - Upper
PCS 1900 MHz**

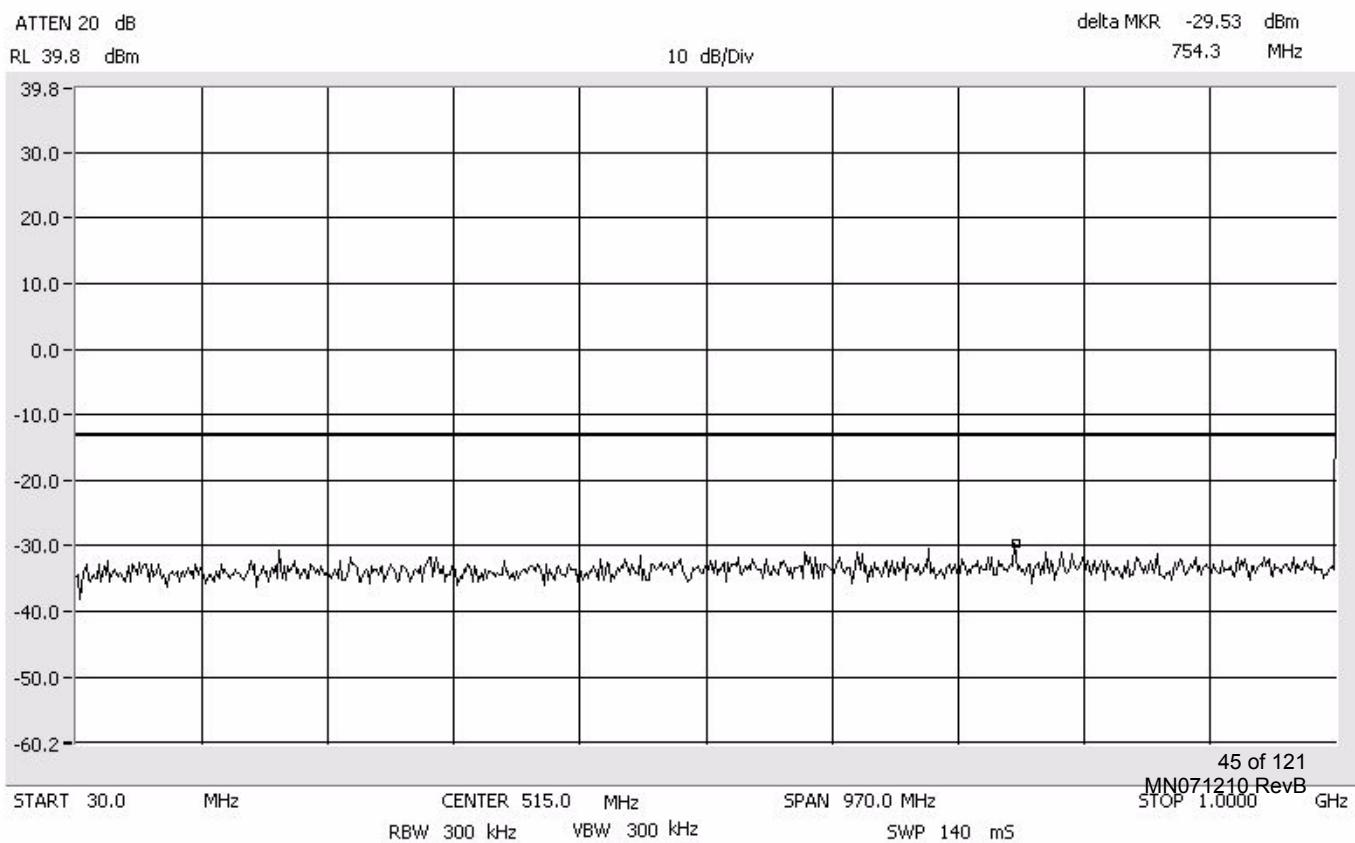
Center: 1947.5 MHz
Span: 40 MHz
RBW/VBW: 100 kHz



**TDMA
Lower Band**

**Intermodulation
Close - Upper
PCS 1900 MHz**

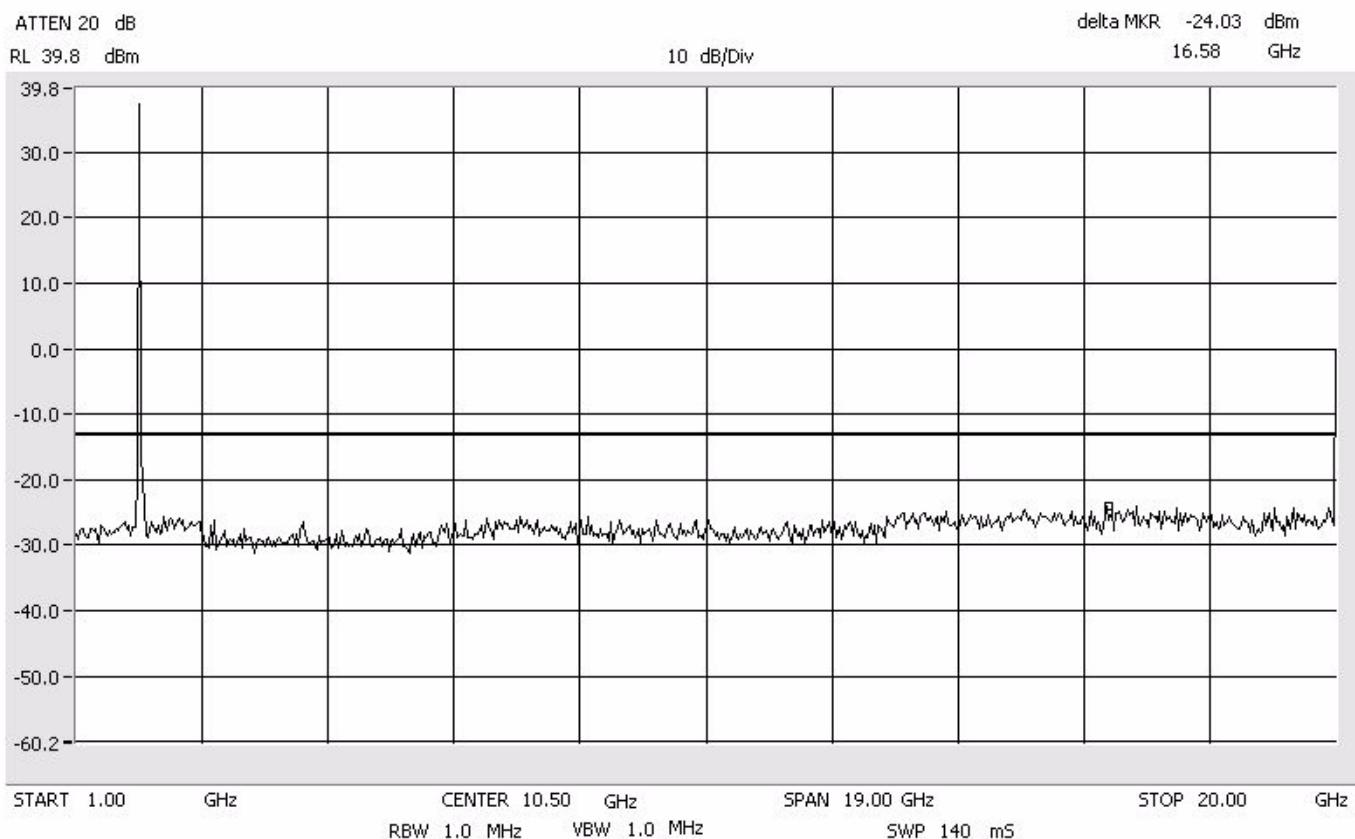
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz



TDMA
Lower Band

**Intermodulation
Close - Upper
PCS 1900 MHz**

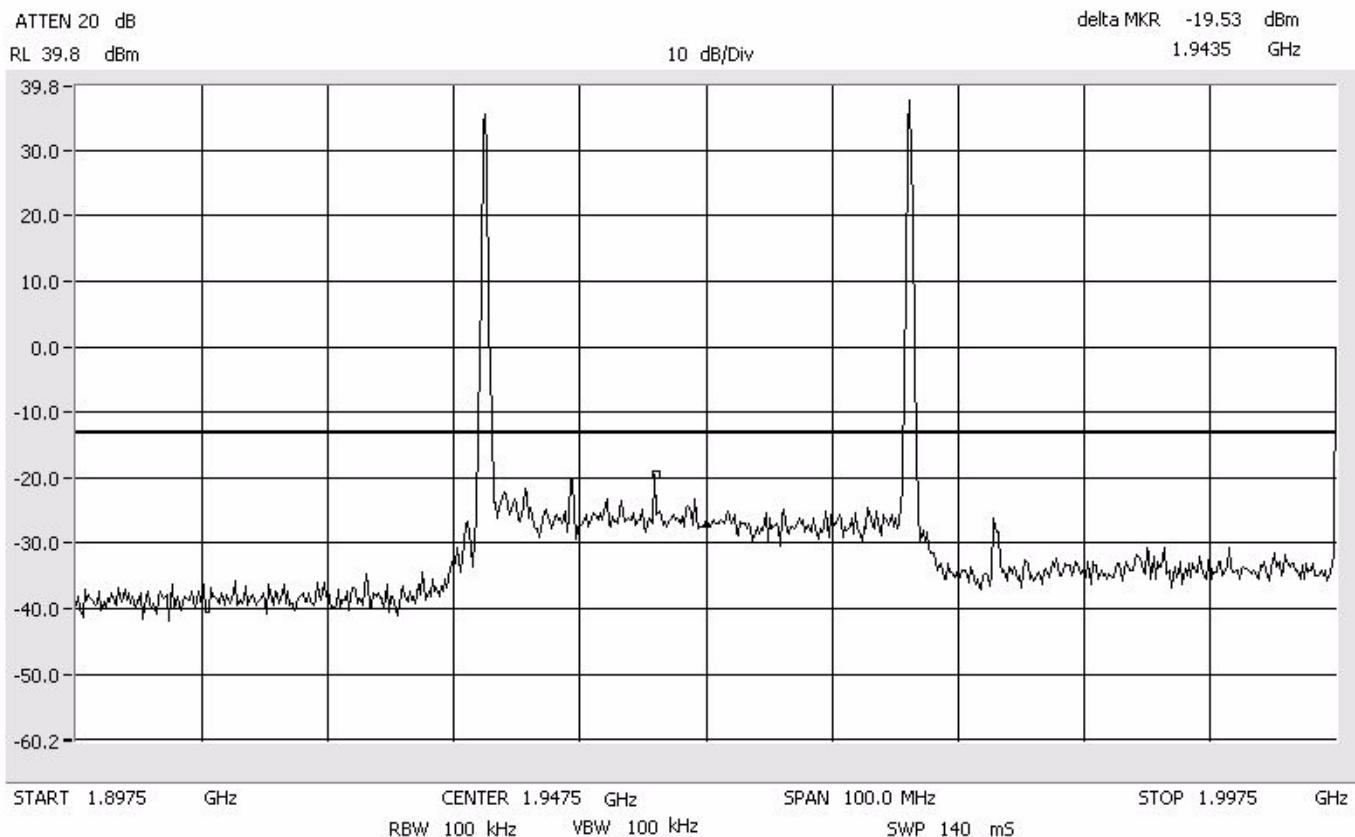
Span: 1 GHz to 20 GHz
RBW/VBW: 1 MHz



**TDMA
Lower Band**

**Intermodulation
Apart
PCS 1900 MHz**

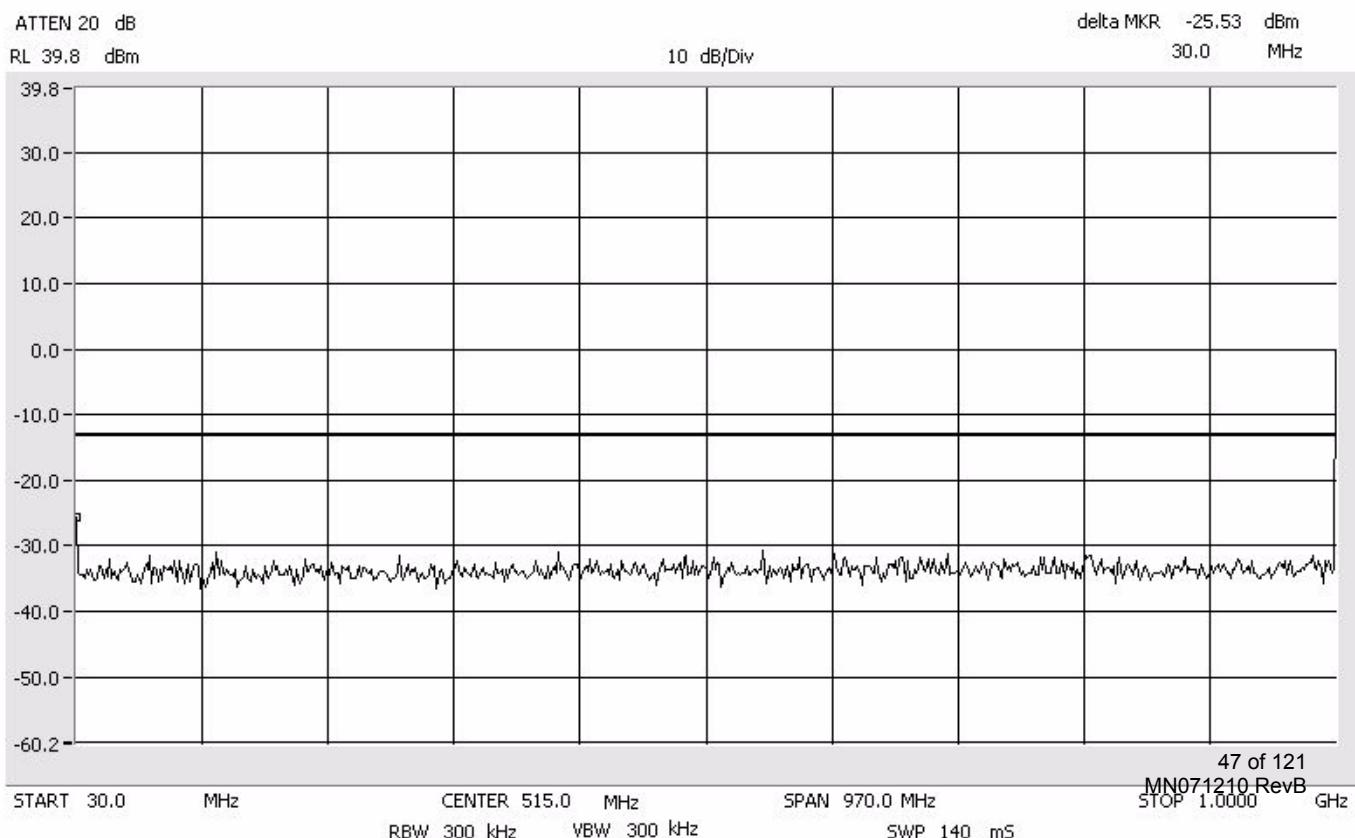
Center: 1947.5 MHz
Span: 100 MHz
RBW/VBW: 100 kHz



**TDMA
Lower Band**

**Intermodulation
Apart
PCS 1900 MHz**

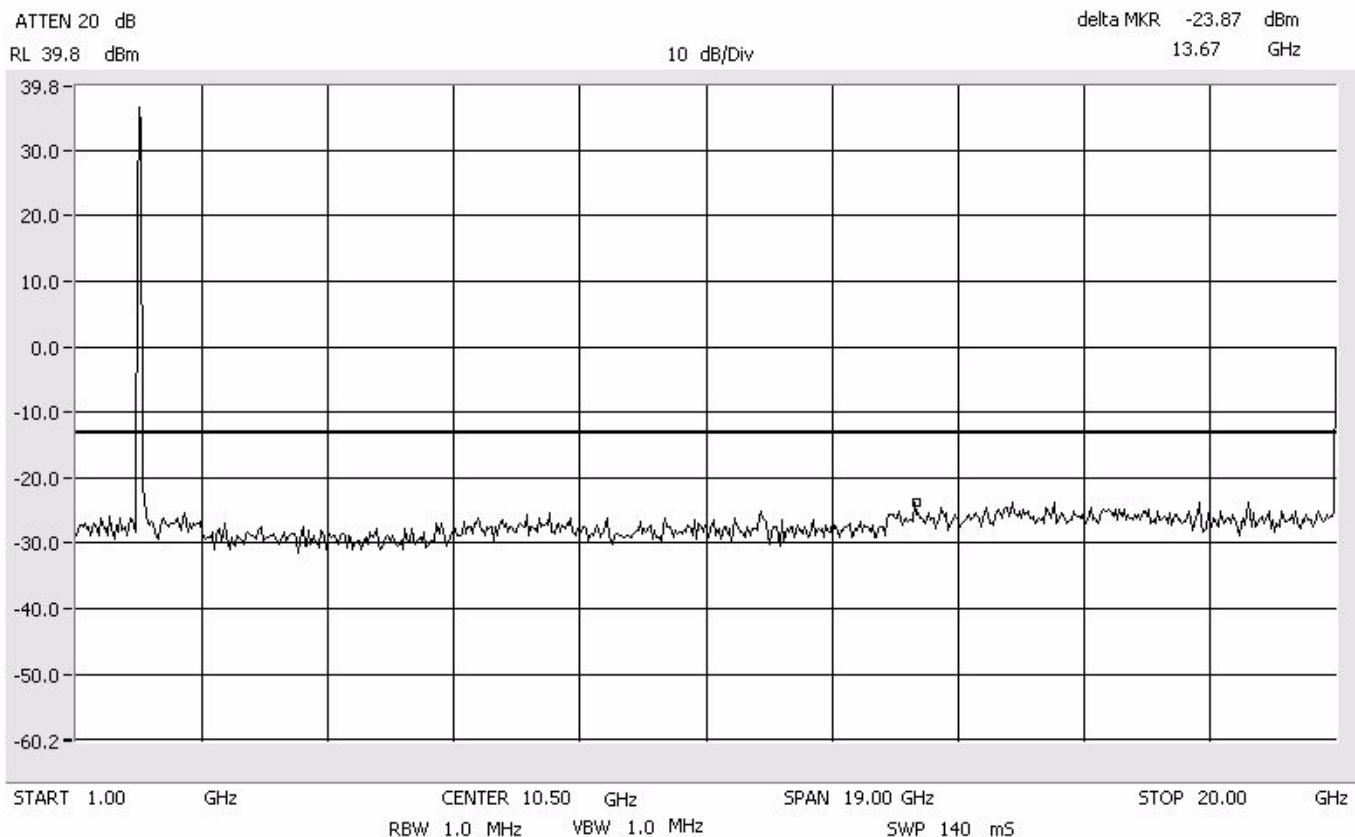
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz



**TDMA
Lower Band**

**Intermodulation
Apart
PCS 1900 MHz**

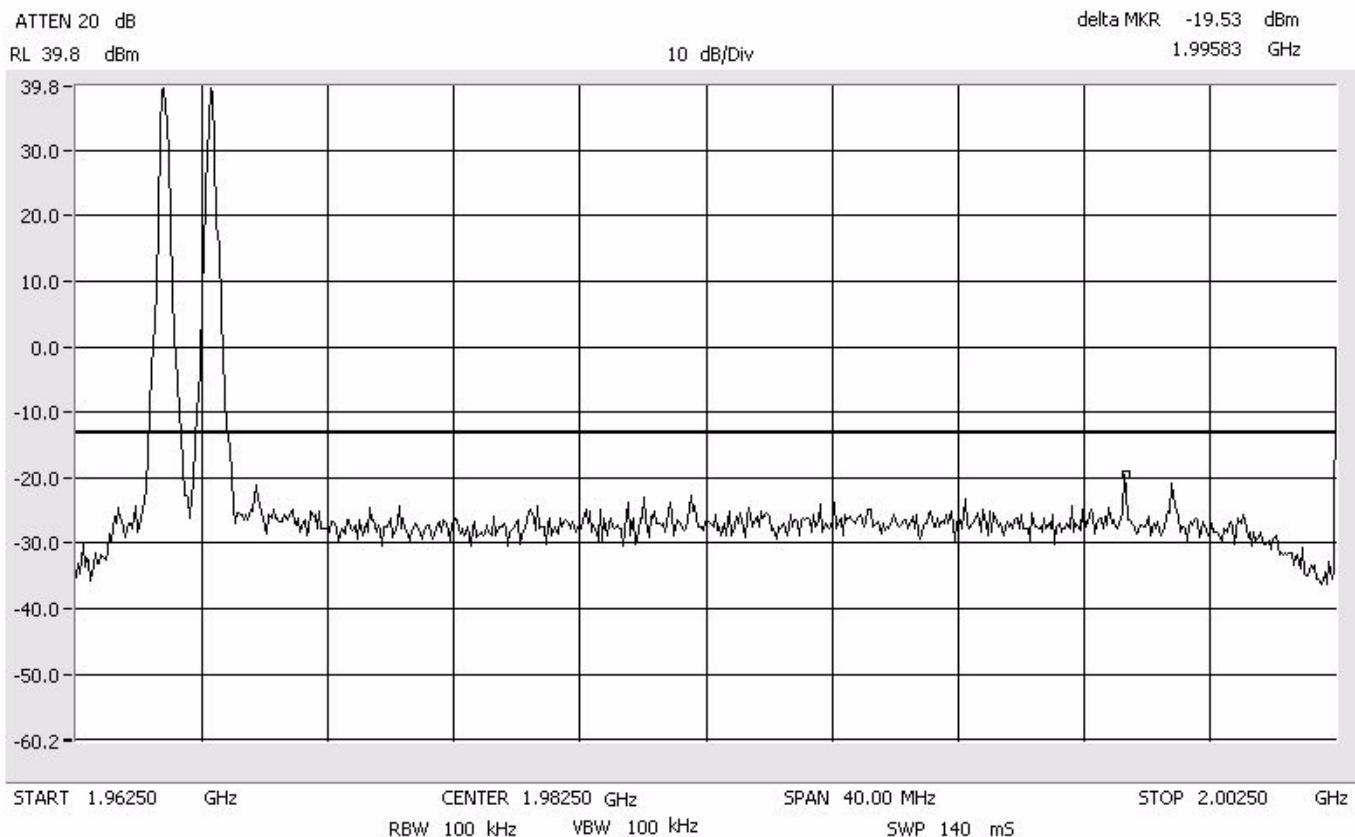
Span: 1 GHz to 20 GHz
RBW/VBW: 1 MHz



**TDMA
Upper Band**

**Intermodulation
Close - Lower
PCS 1900 MHz**

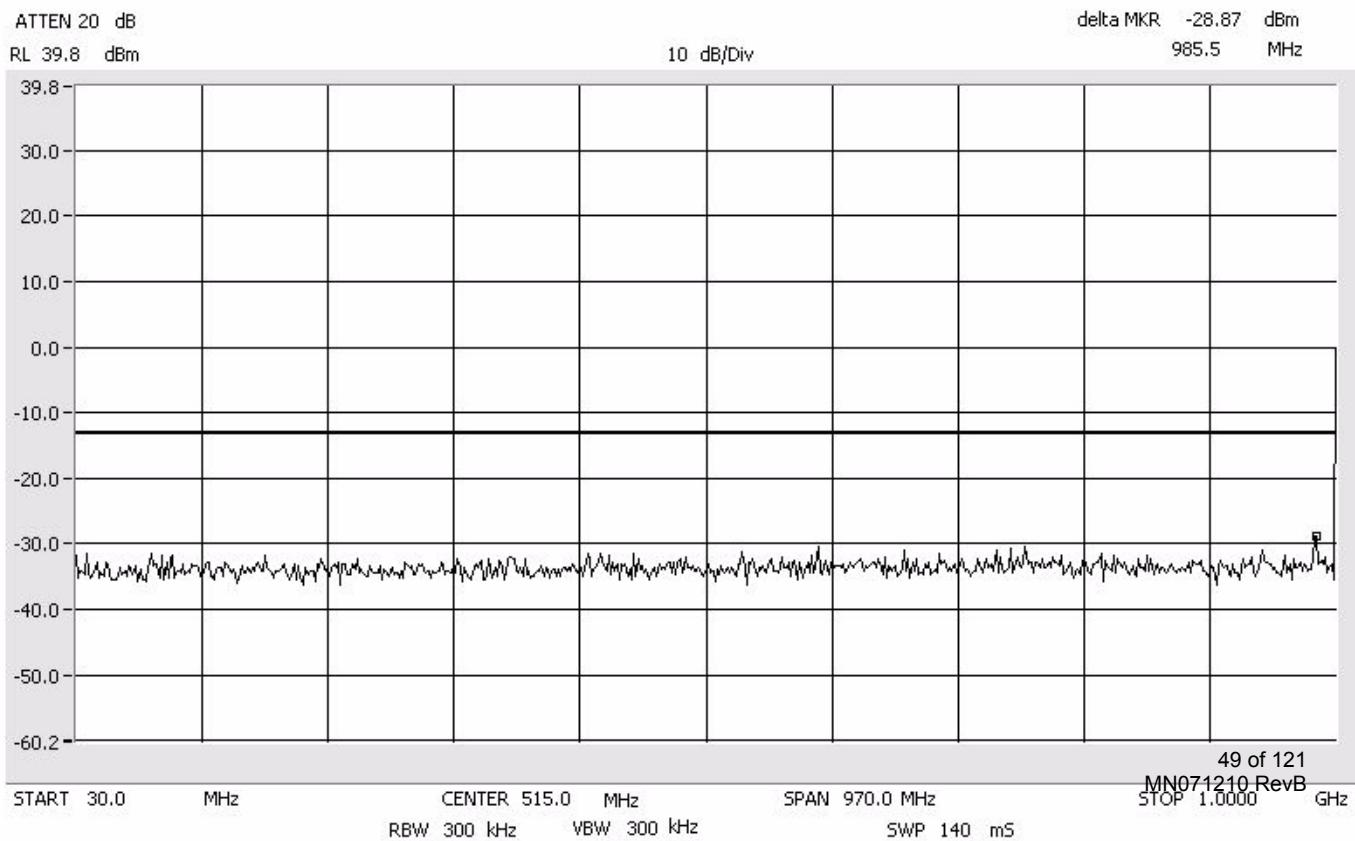
Center: 1982.5 MHz
Span: 40 MHz
RBW/VBW: 100 kHz



**TDMA
Upper Band**

**Intermodulation
Close - Lower
PCS 1900 MHz**

Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz



TDMA
Upper Band

**Intermodulation
Close - Lower
PCS 1900 MHz**

Span: 1 GHz to 20 GHz
RBW/VBW: 1 MHz

