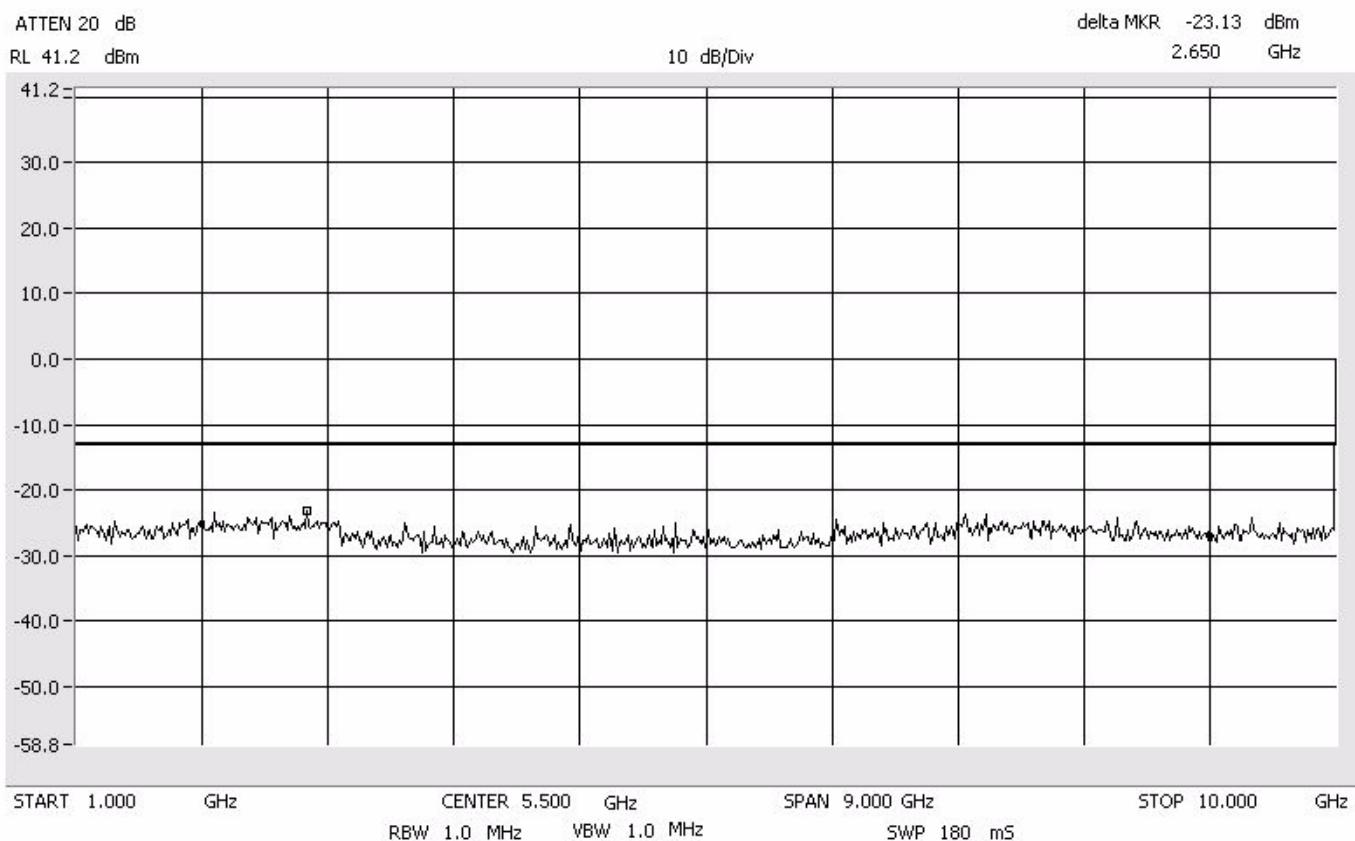


**EDGE
B Band**

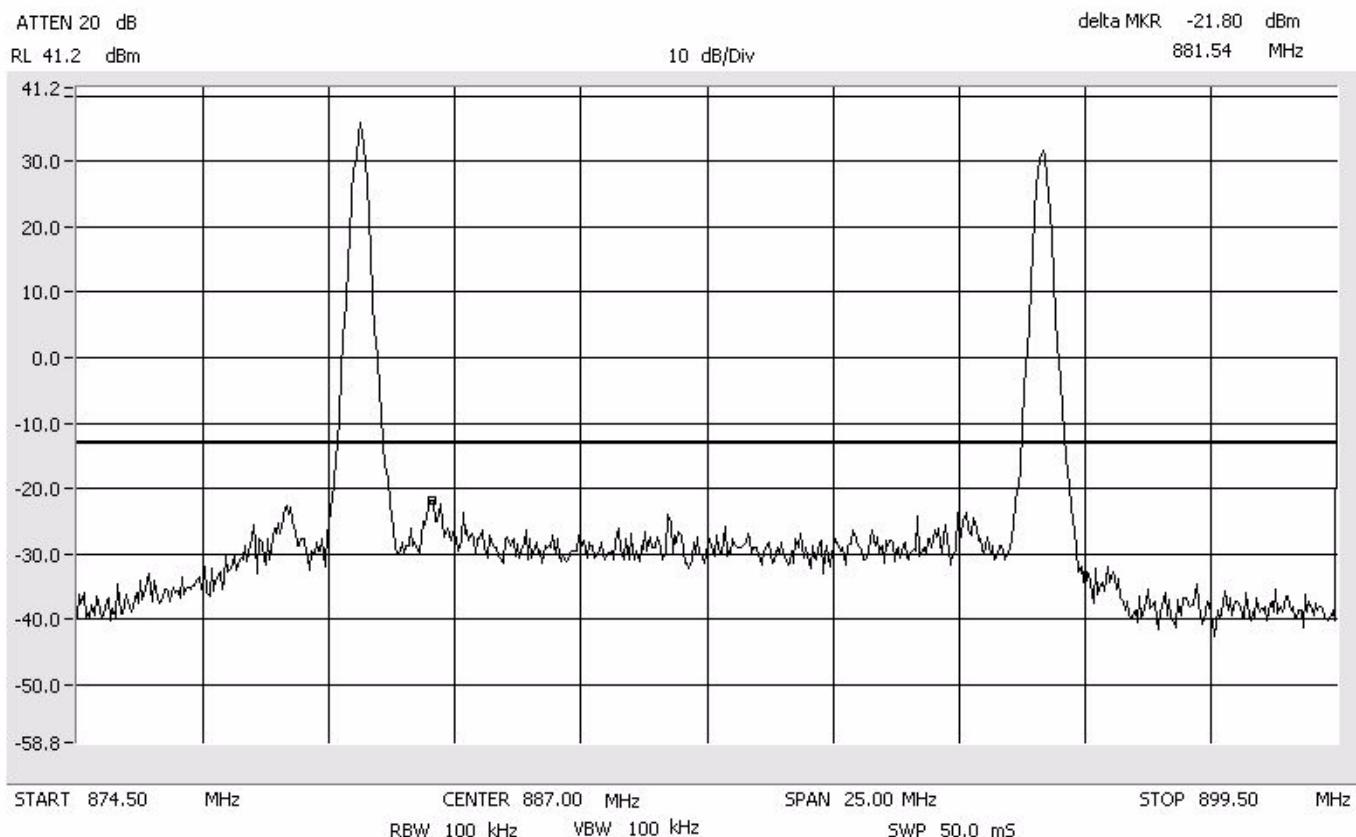
**Intermodulation
Close - Upper
Cellular 800 MHz**

Span: 1 GHz to 10 GHz
RBW/VBW: 1 MHz

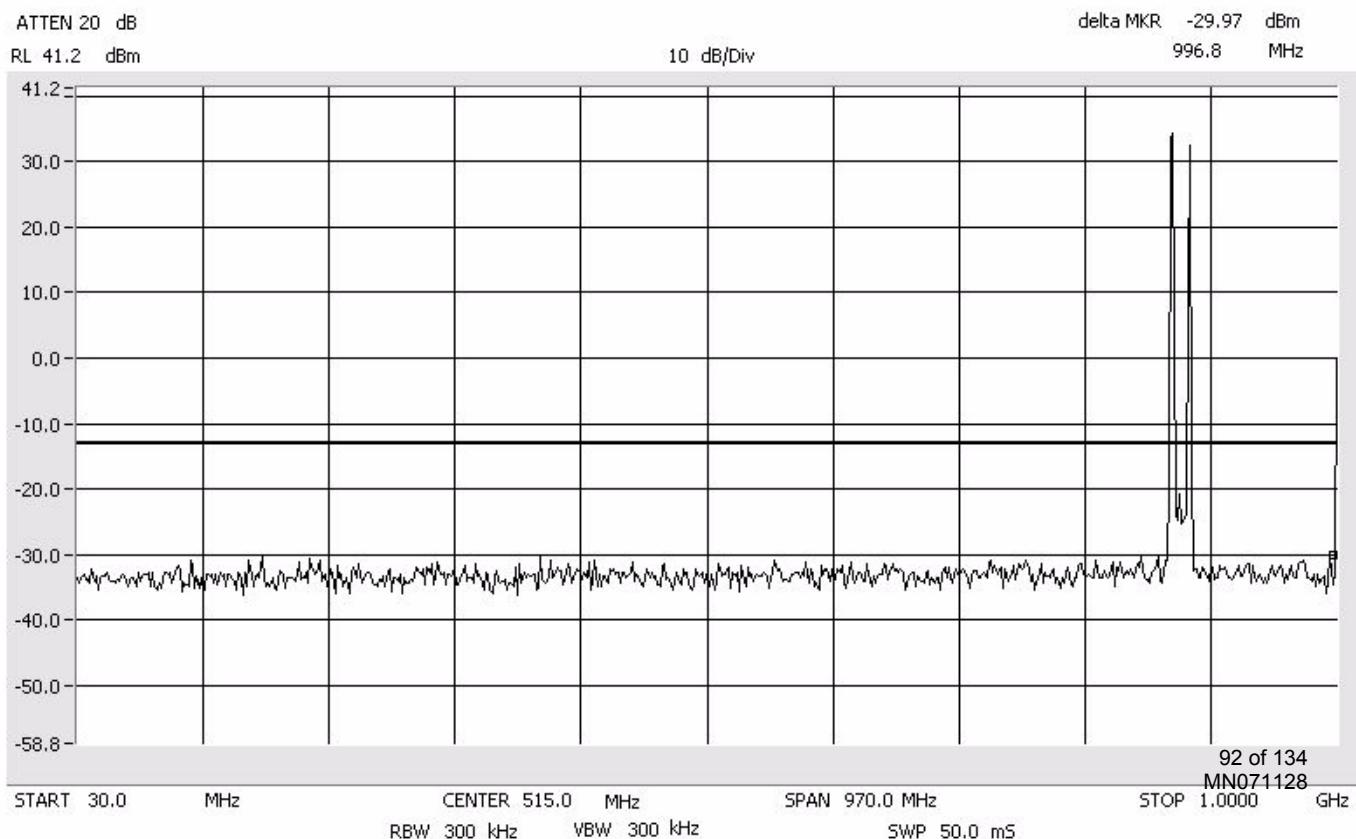


**EDGE
B Band****Intermodulation
Apart
Cellular 800 MHz**

Center: 887.0 MHz
Span: 100 MHz
RBW/VBW: 100 kHz

**EDGE
B Band****Intermodulation
Apart
Cellular 800 MHz**

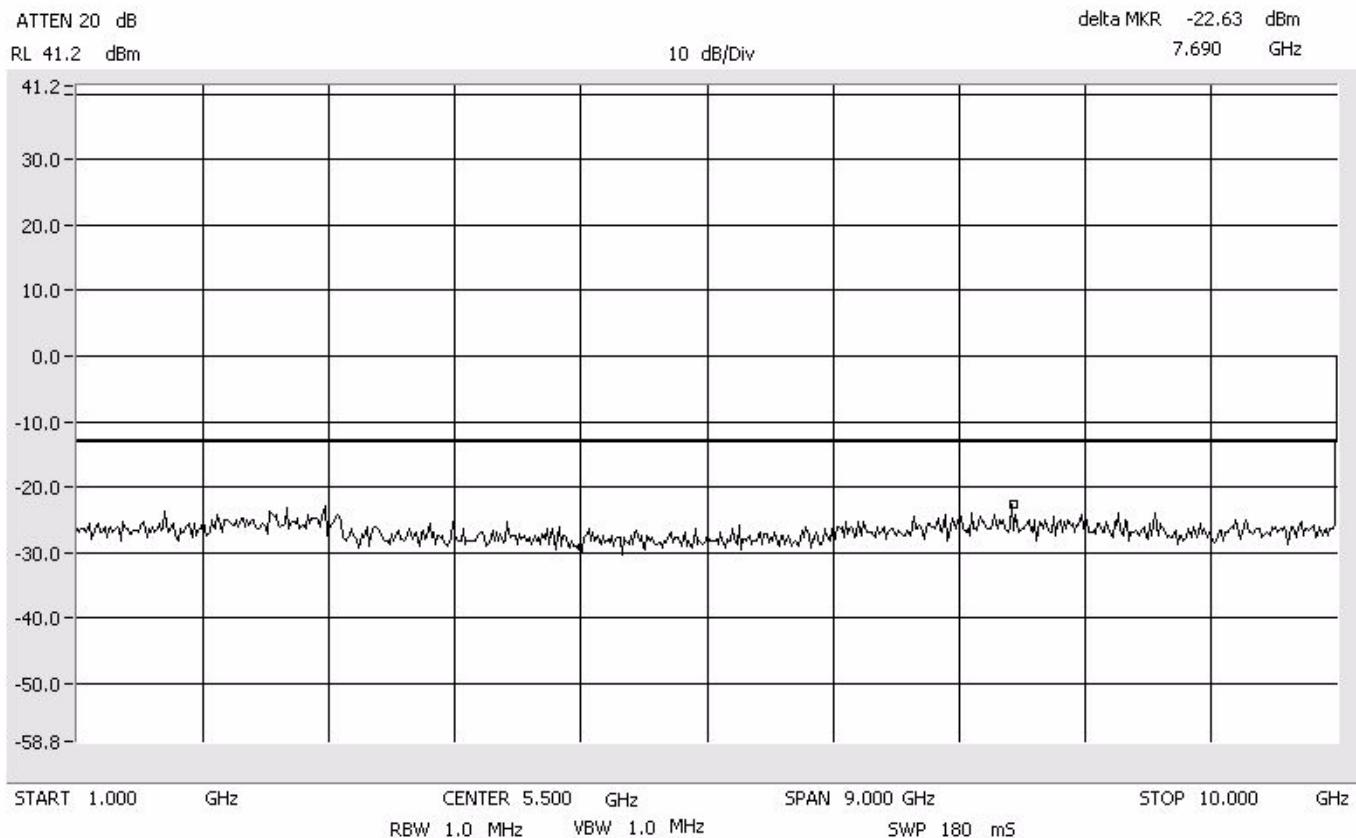
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz



**EDGE
B Band**

**Intermodulation
Apart
Cellular 800 MHz**

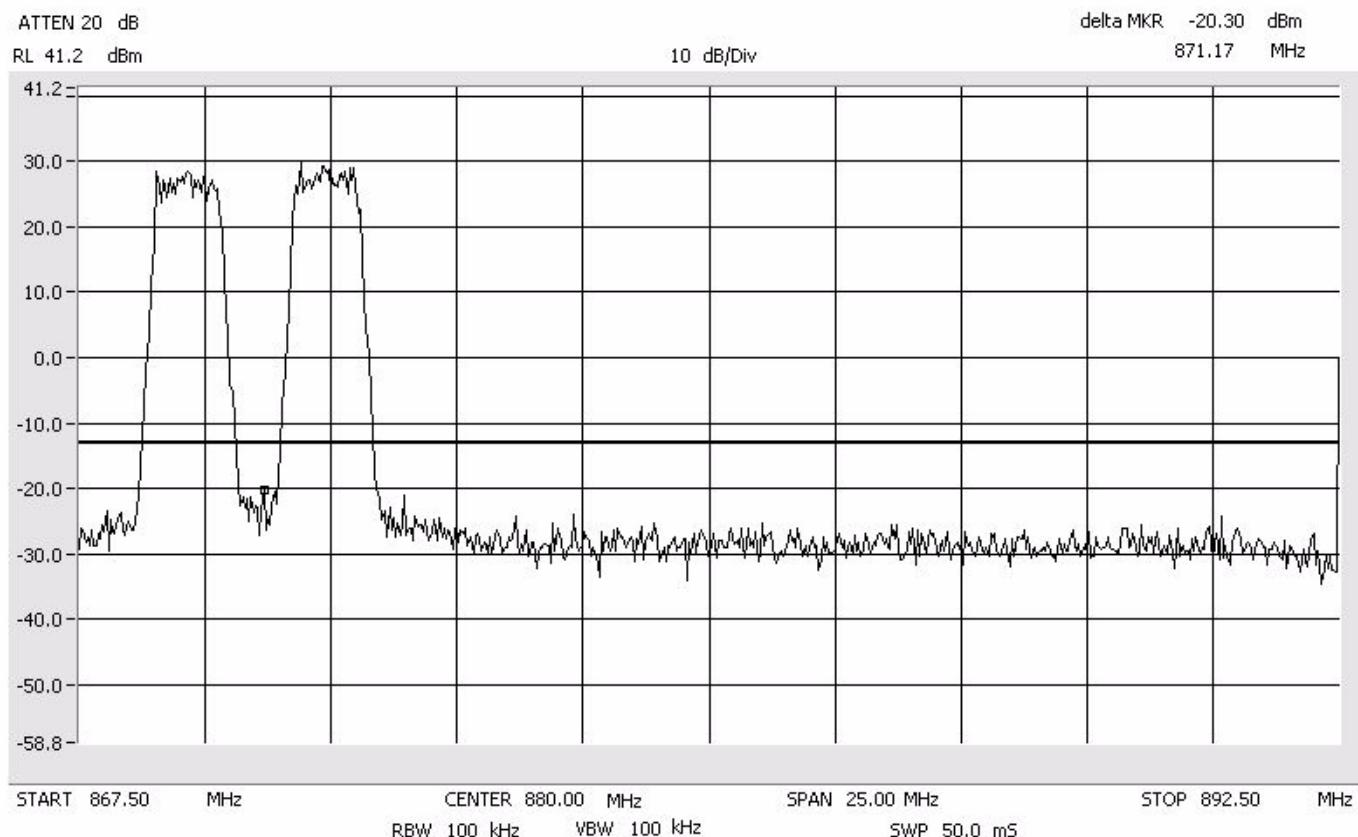
Span: 1 GHz to 10 GHz
RBW/VBW: 1 MHz



**CDMA
A Band**

**Intermodulation
Close - Lower
Cellular 800 MHz**

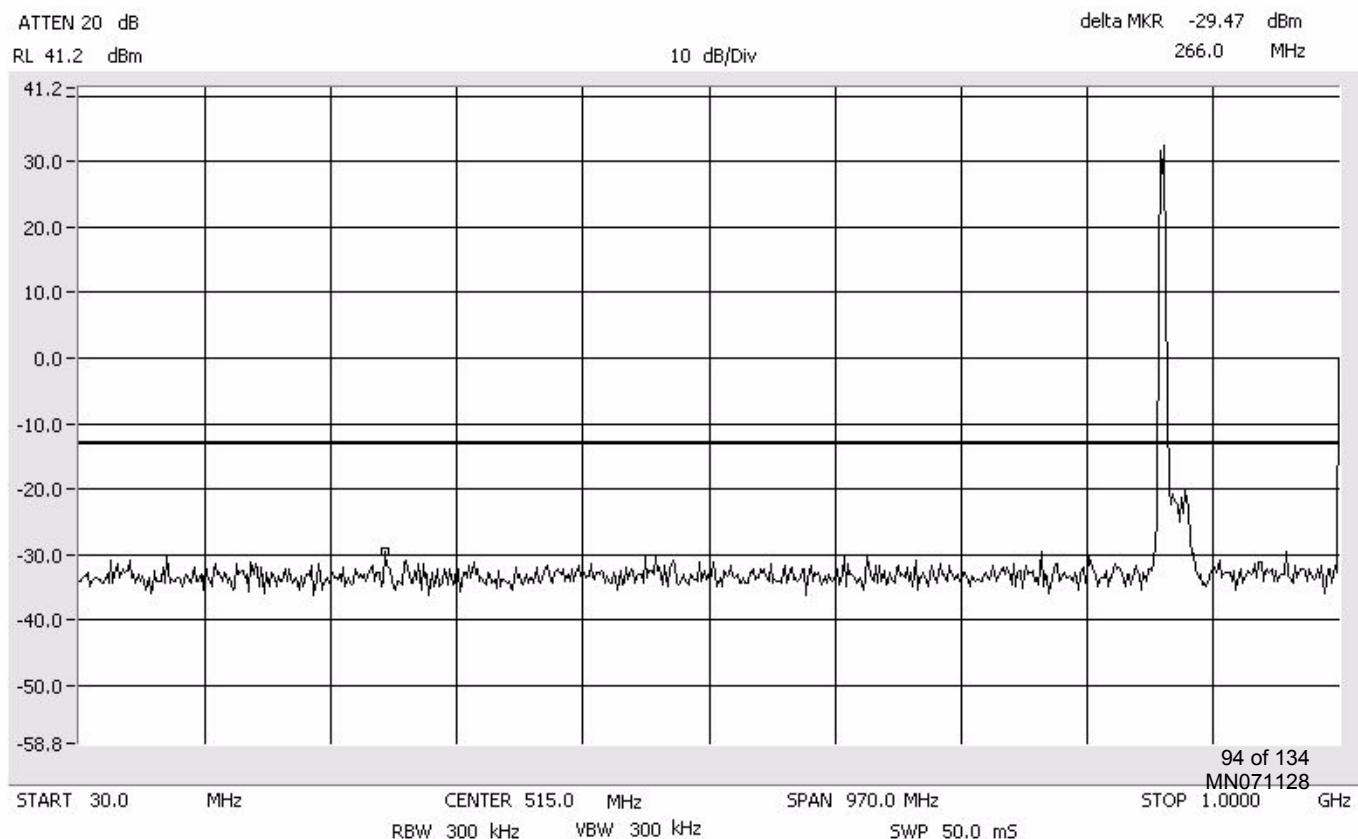
Center: 880.0 MHz
Span: 25 MHz
RBW/VBW: 100 kHz



**CDMA
A Band**

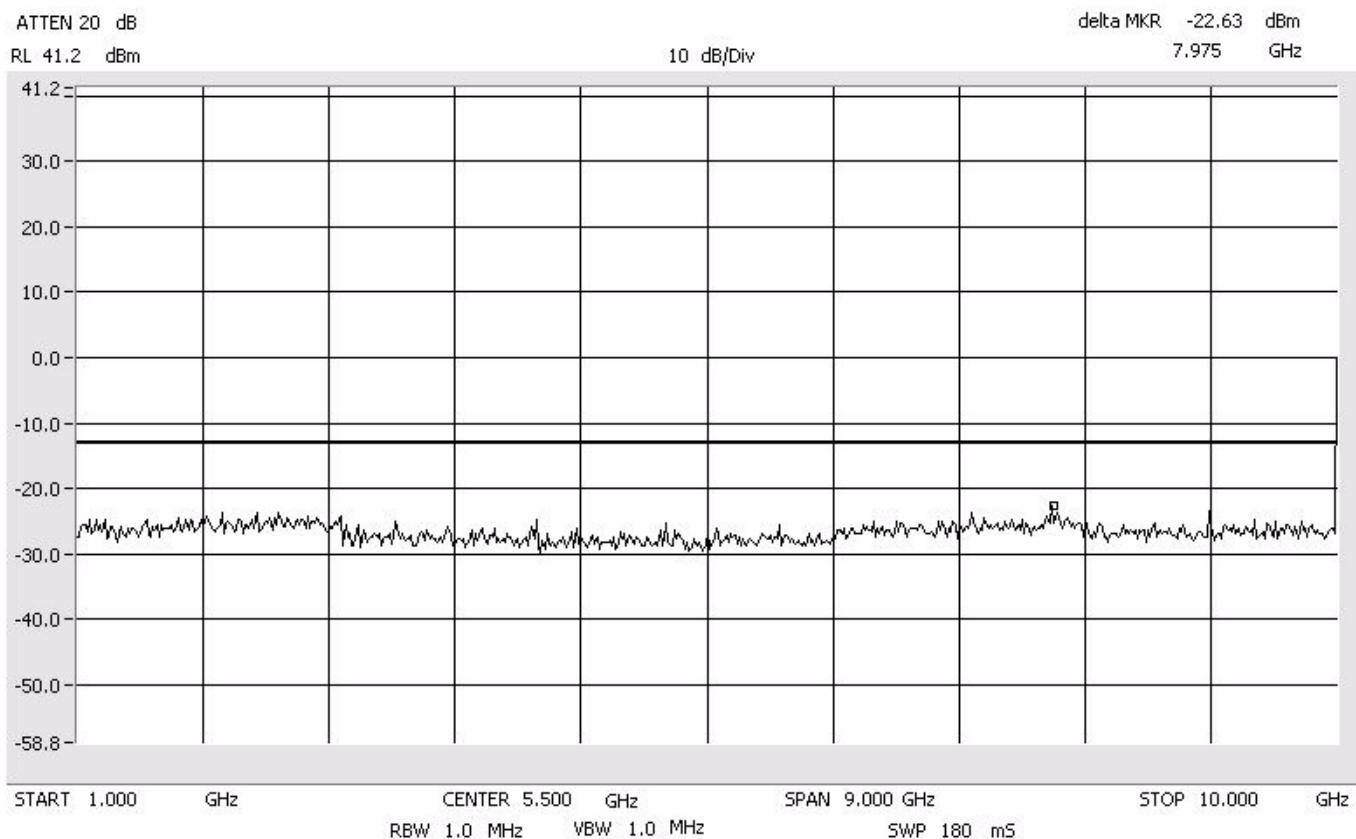
**Intermodulation
Close - Lower
Cellular 800 MHz**

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



**Intermodulation
Close - Lower
Cellular 800 MHz**

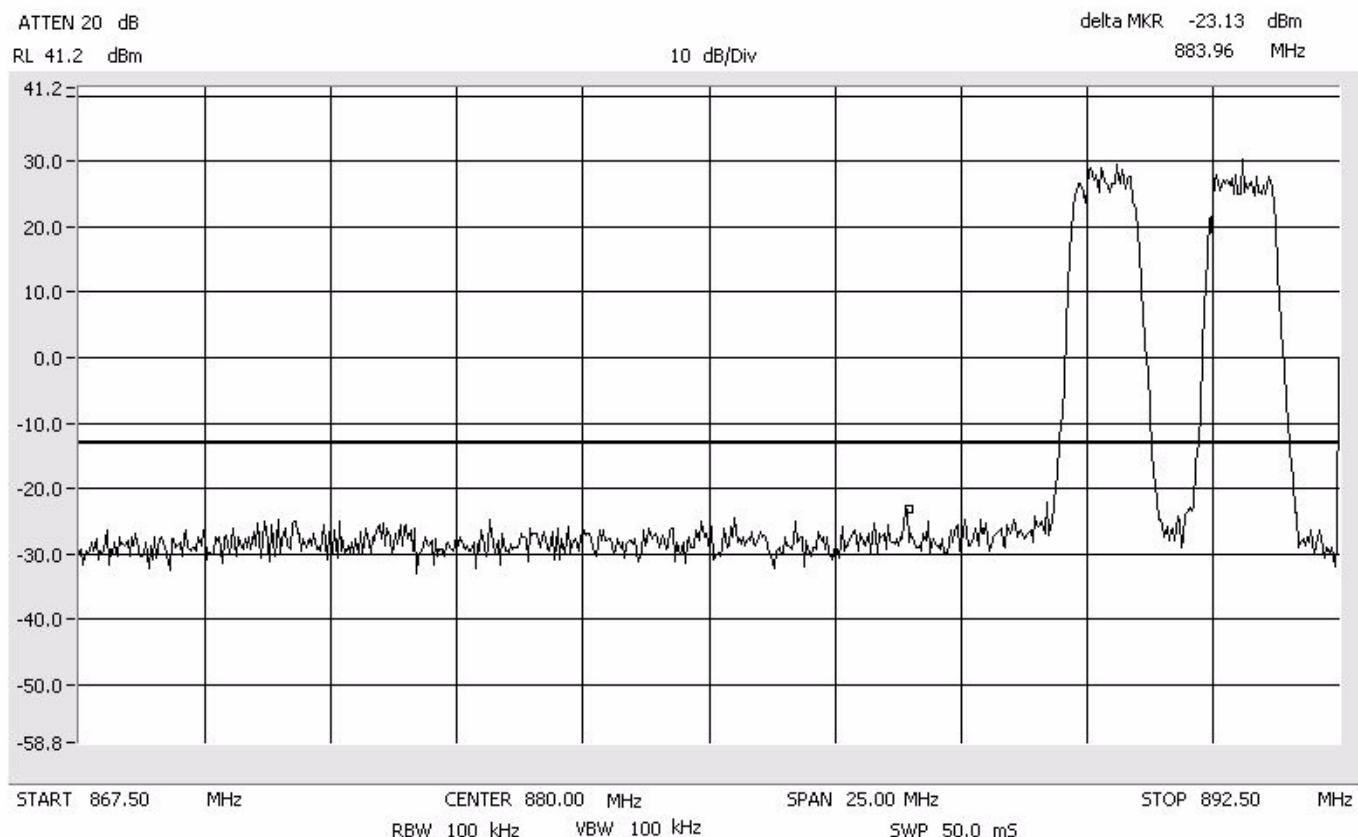
Span: 1 GHz to 10 GHz
RBW/VBW: 1 MHz



**CDMA
A Band**

**Intermodulation
Close - Upper
Cellular 800 MHz**

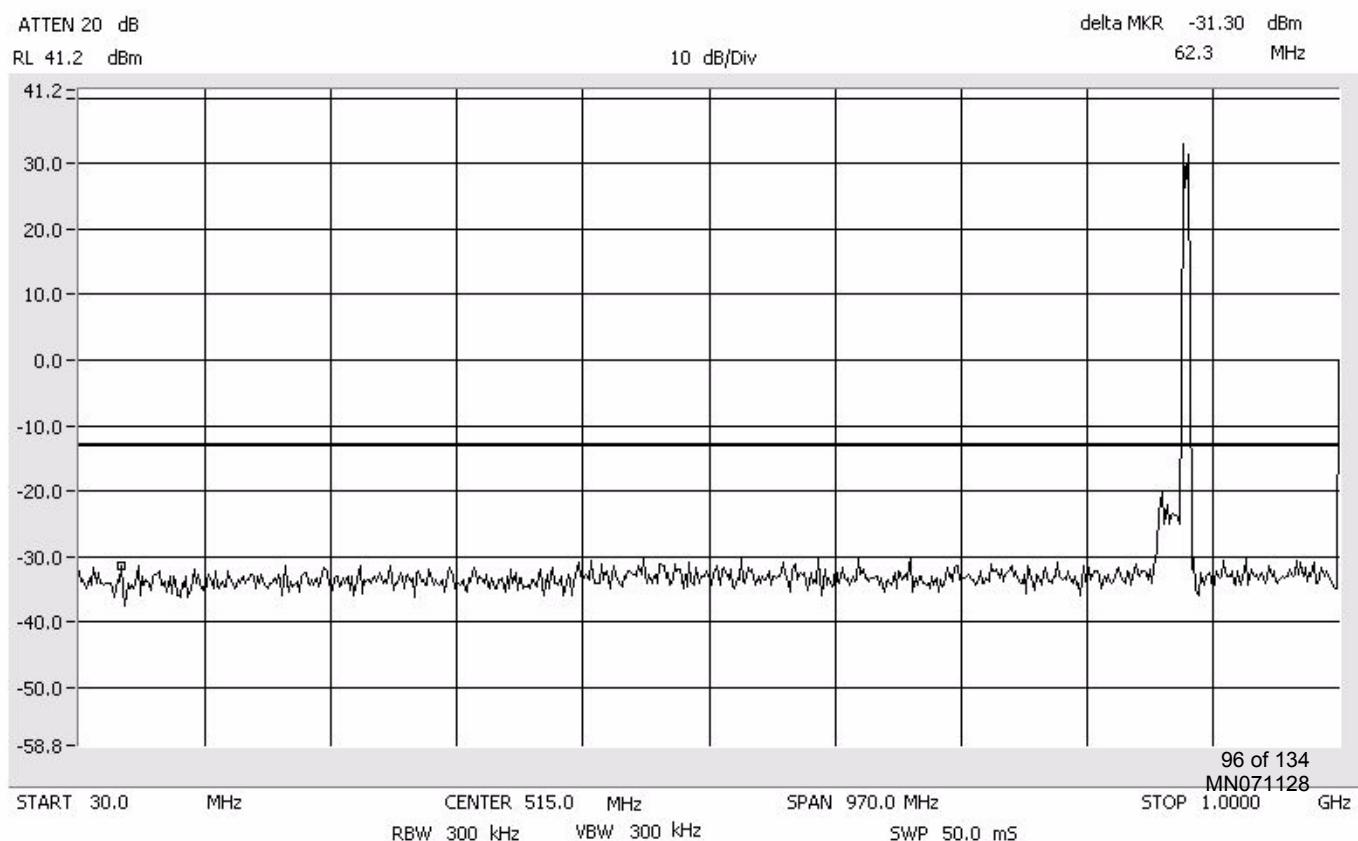
Center: 880.0 MHz
Span: 25 MHz
RBW/VBW: 100 kHz



**CDMA
A Band**

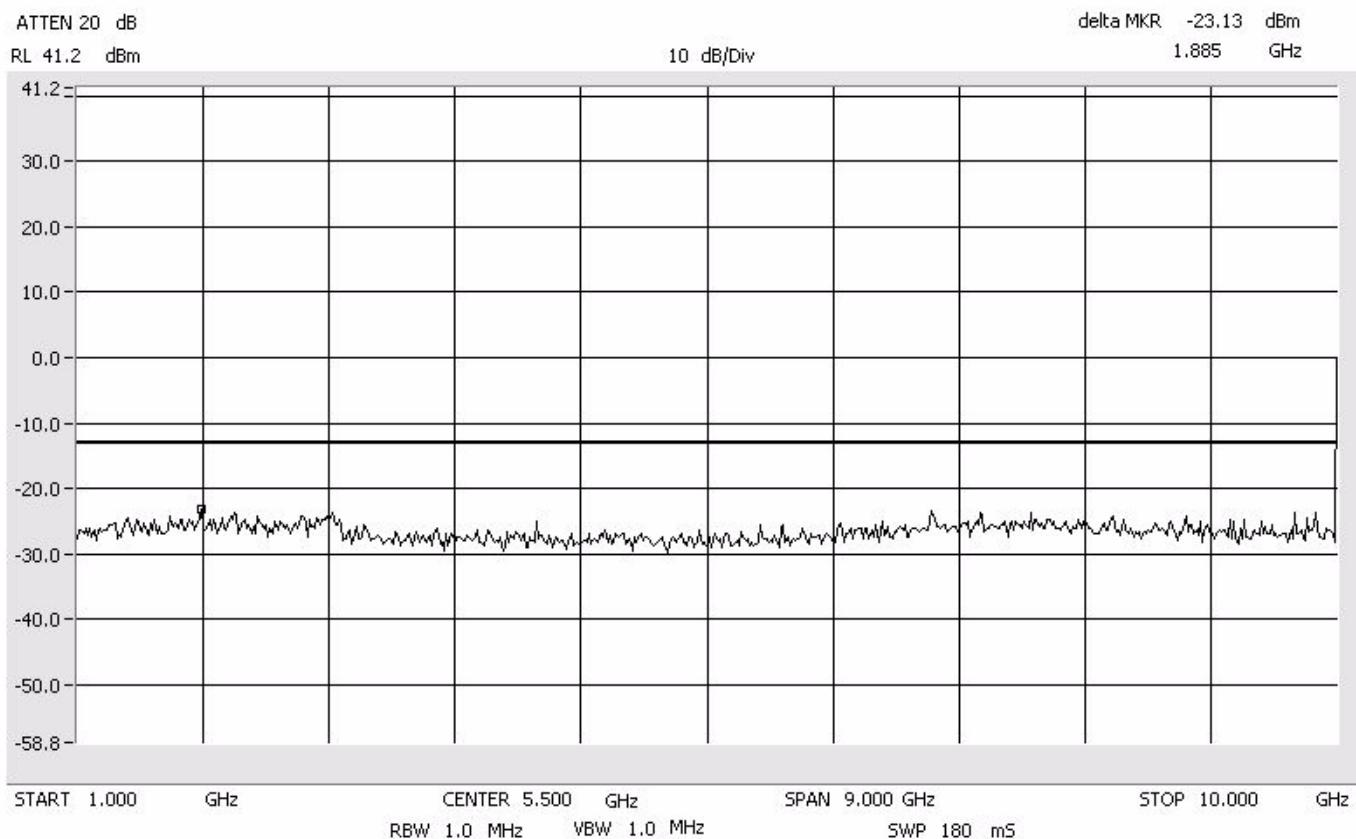
**Intermodulation
Close - Upper
Cellular 800 MHz**

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



Intermodulation
Close - Upper
Cellular 800 MHz

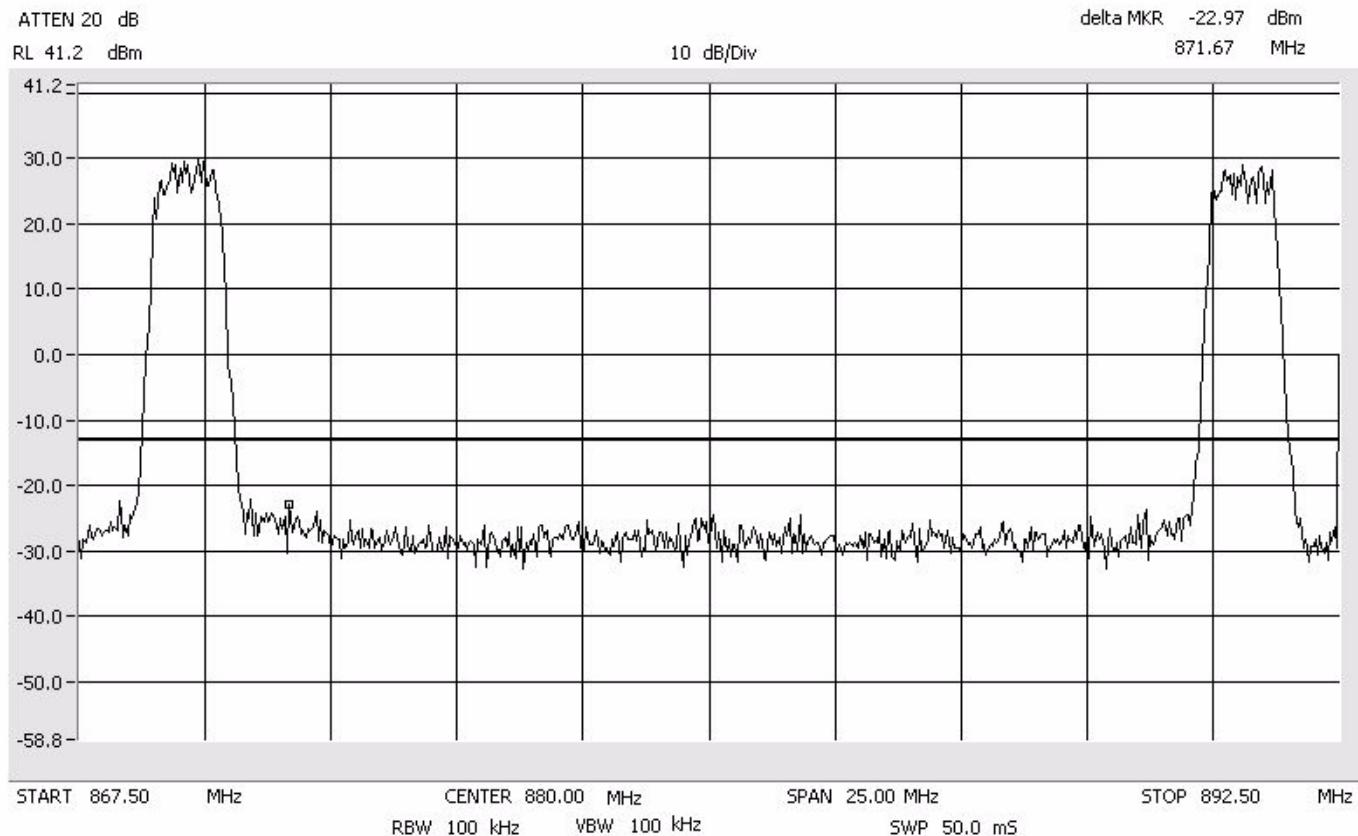
Span: 1 GHz to 10 GHz
RBW/VBW: 1 MHz



**CDMA
A Band**

**Intermodulation
Apart
Cellular 800 MHz**

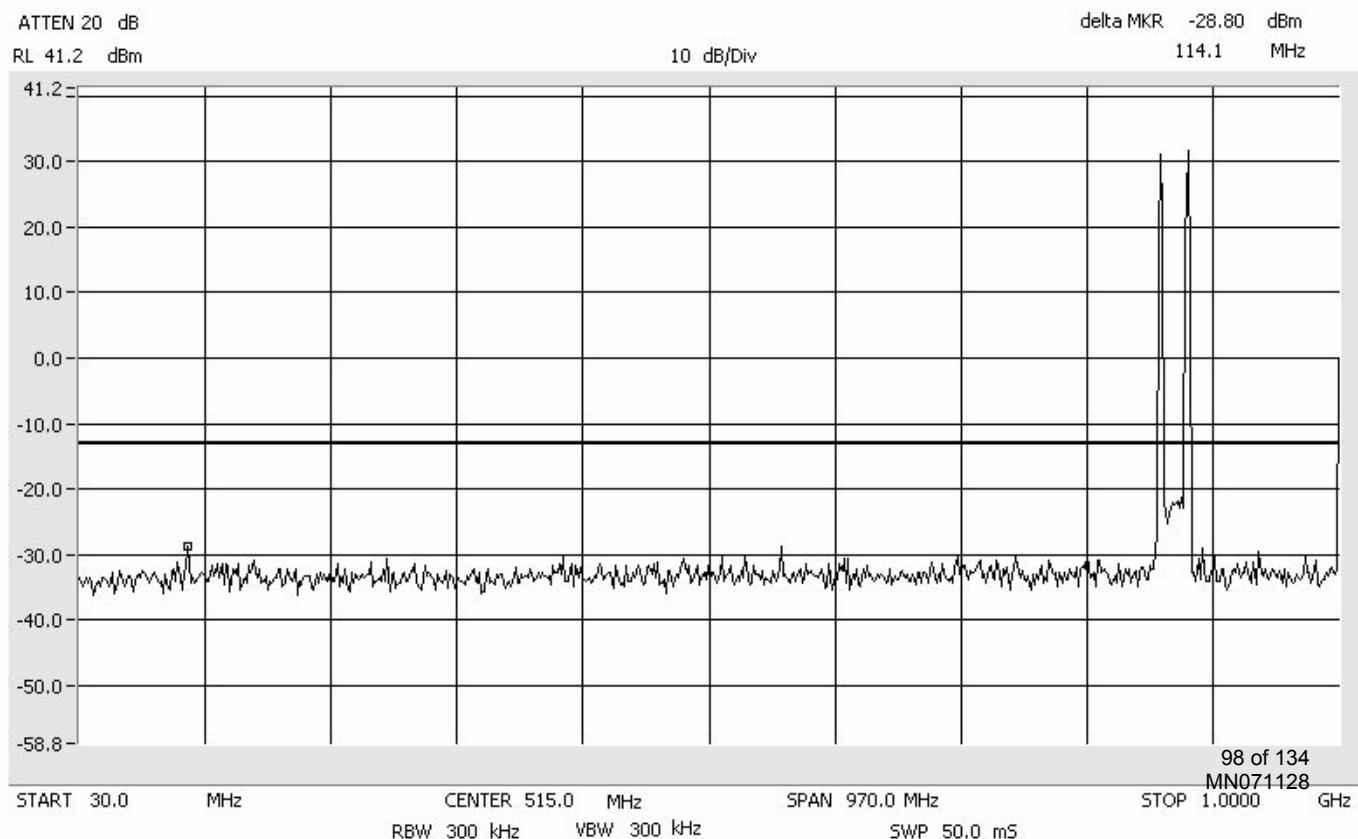
Center: 880.0 MHz
Span: 100 MHz
RBW/VBW: 100 kHz



**CDMA
A Band**

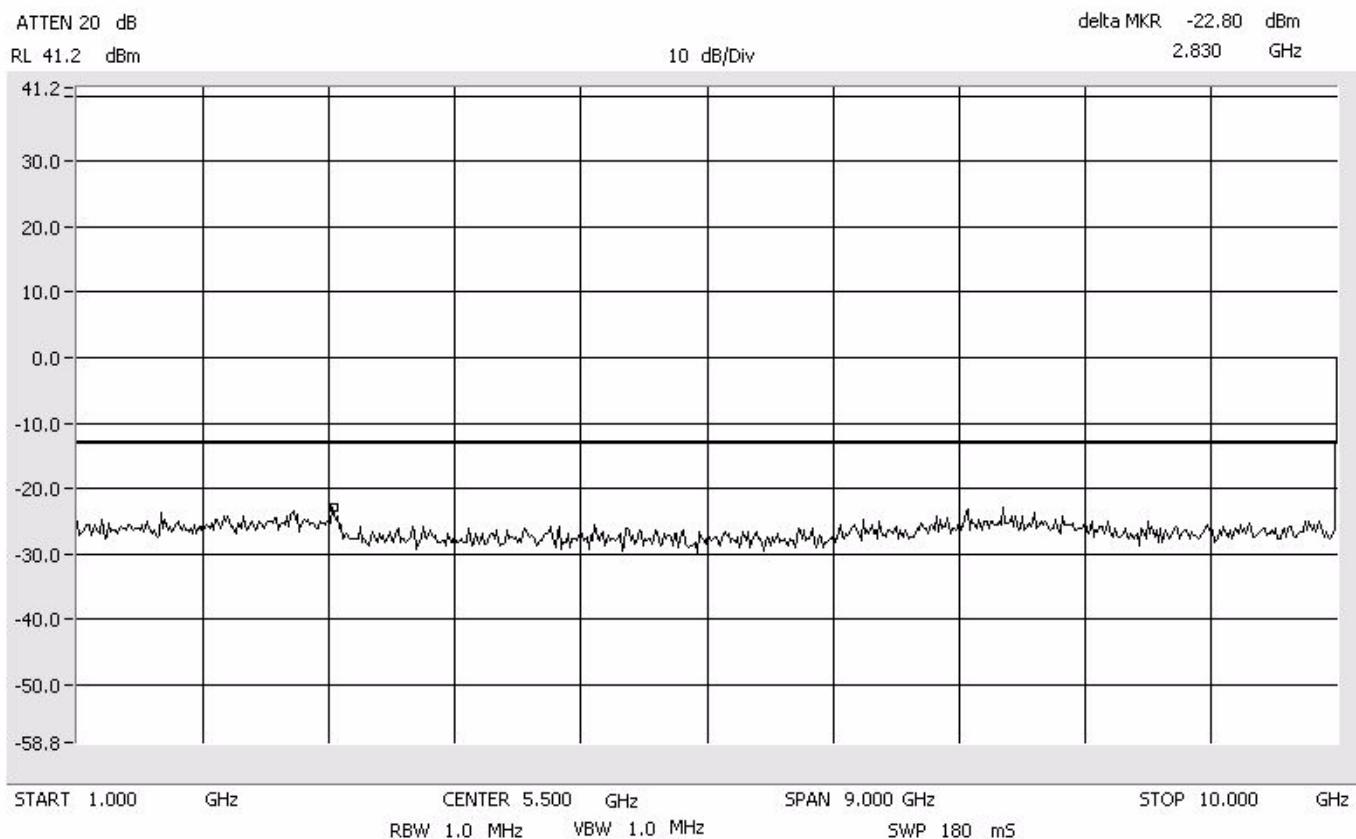
**Intermodulation
Apart
Cellular 800 MHz**

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



**Intermodulation
Apart
Cellular 800 MHz**

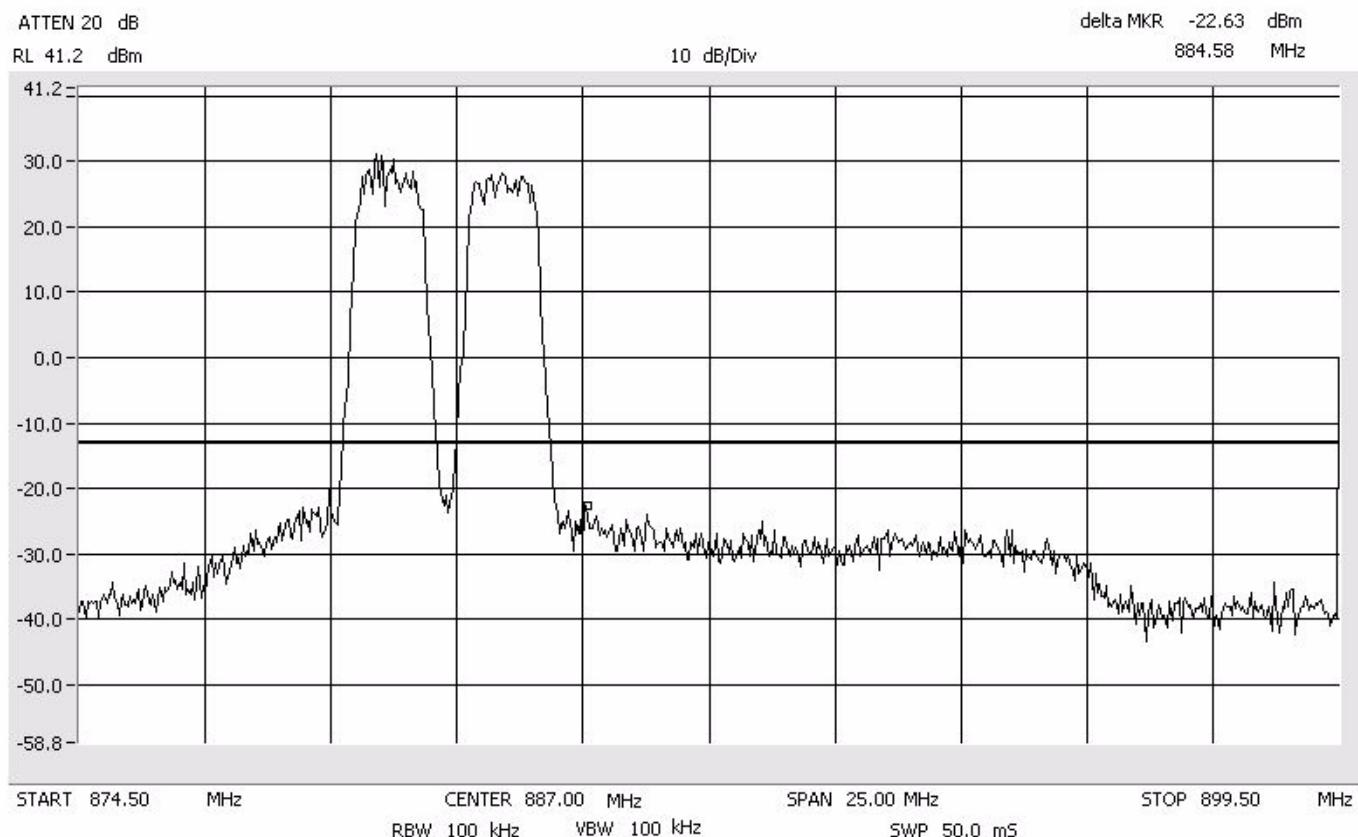
Span: 1 GHz to 10 GHz
RBW/VBW: 1 MHz



**CDMA
B Band**

**Intermodulation
Close - Lower
Cellular 800 MHz**

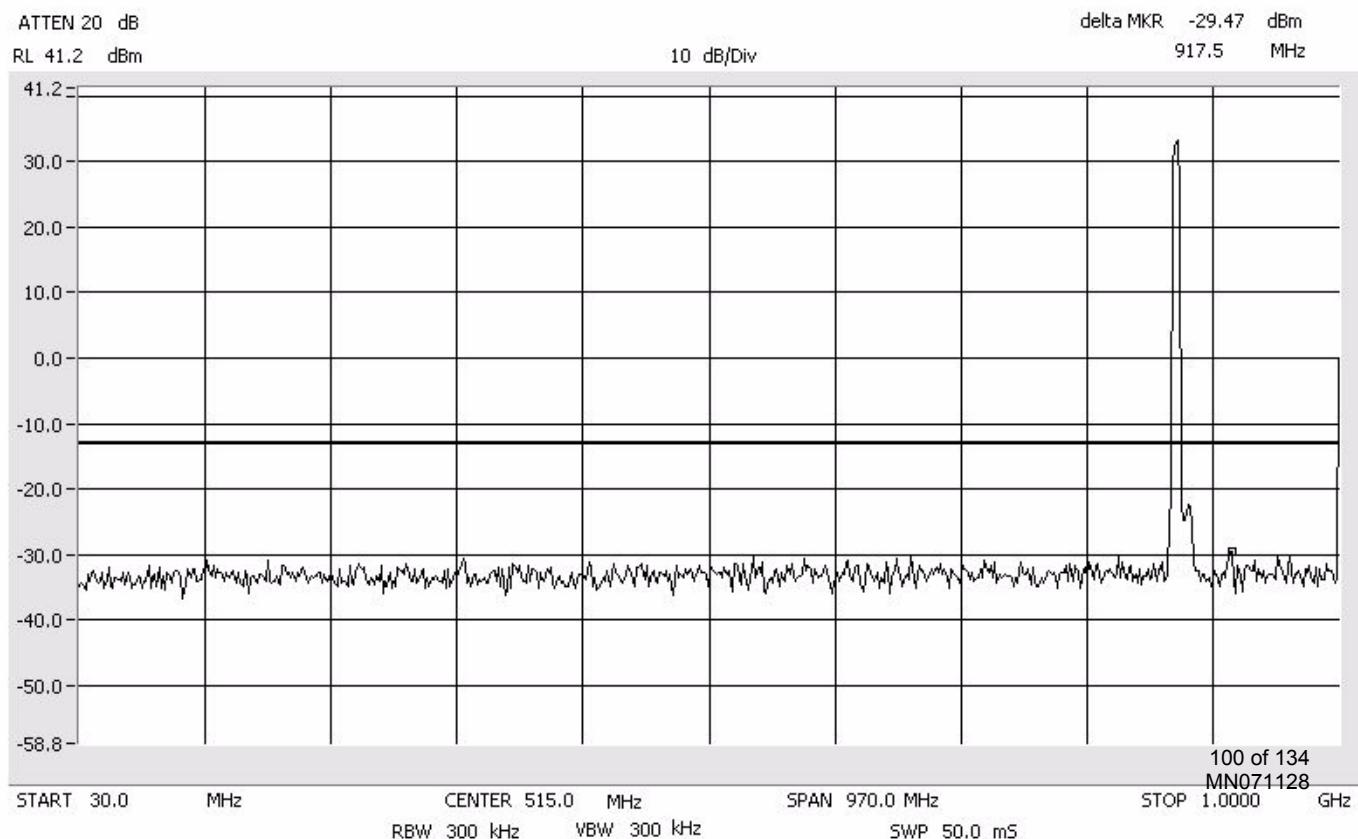
Center: 887.0 MHz
Span: 25 MHz
RBW/VBW: 100 kHz

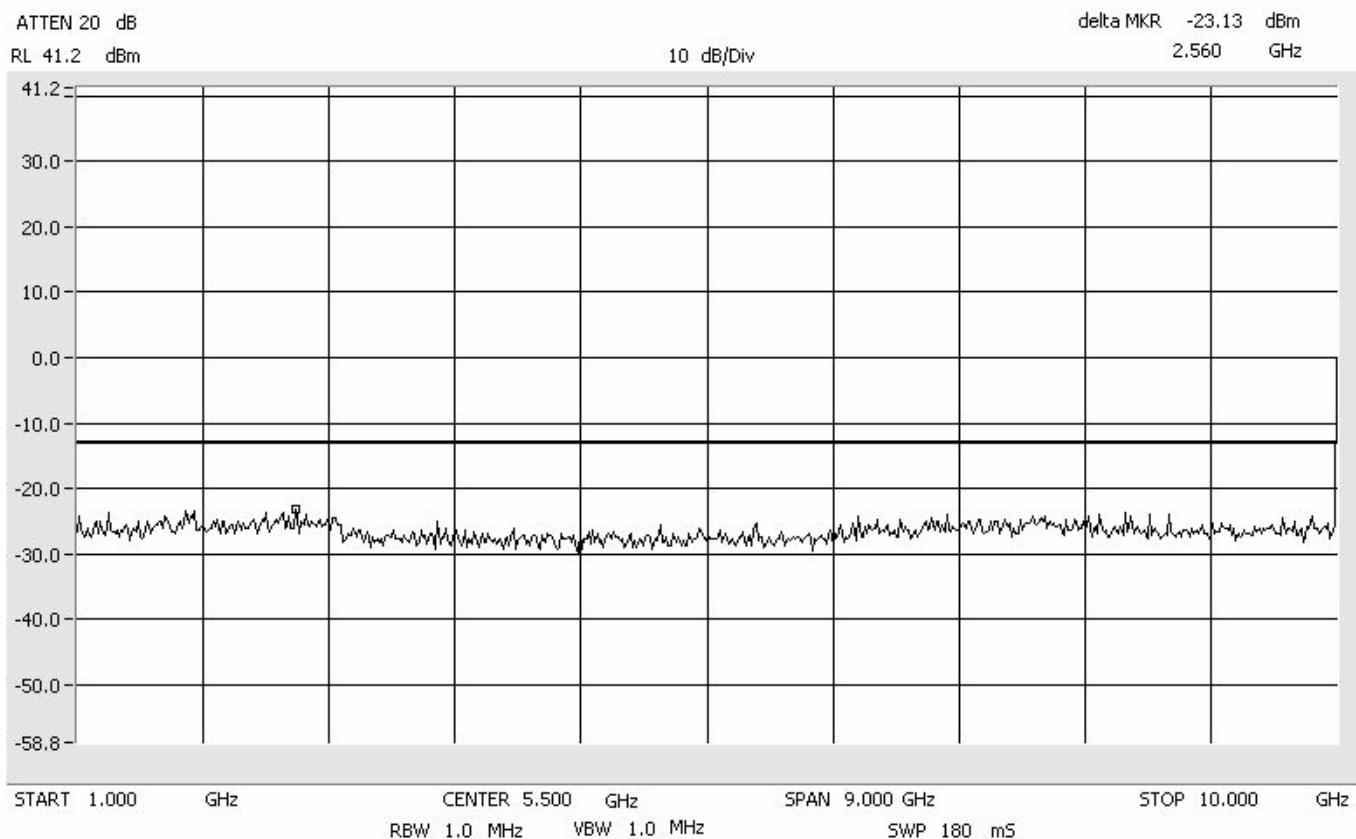


**CDMA
B Band**

**Intermodulation
Close - Lower
Cellular 800 MHz**

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

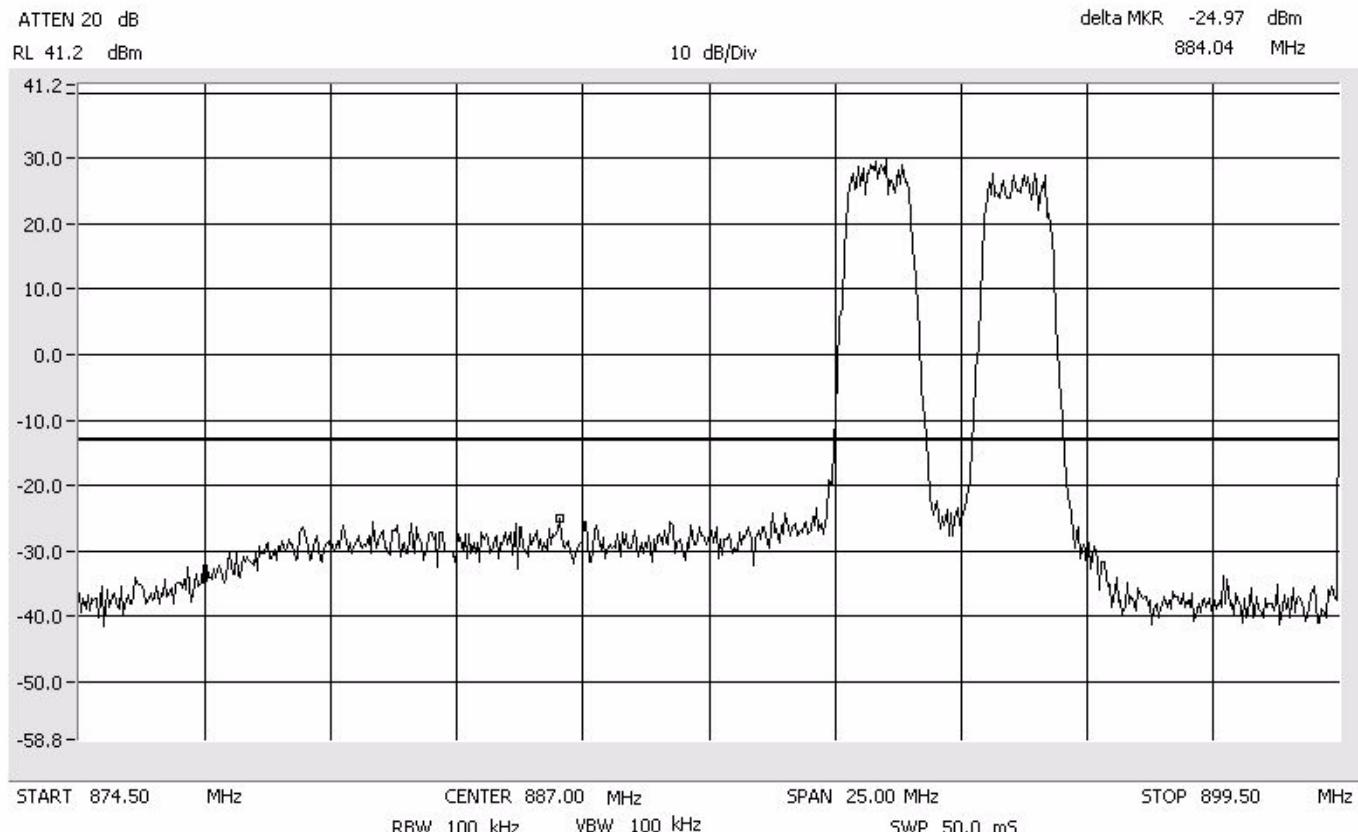




**CDMA
B Band**

**Intermodulation
Close - Upper
Cellular 800 MHz**

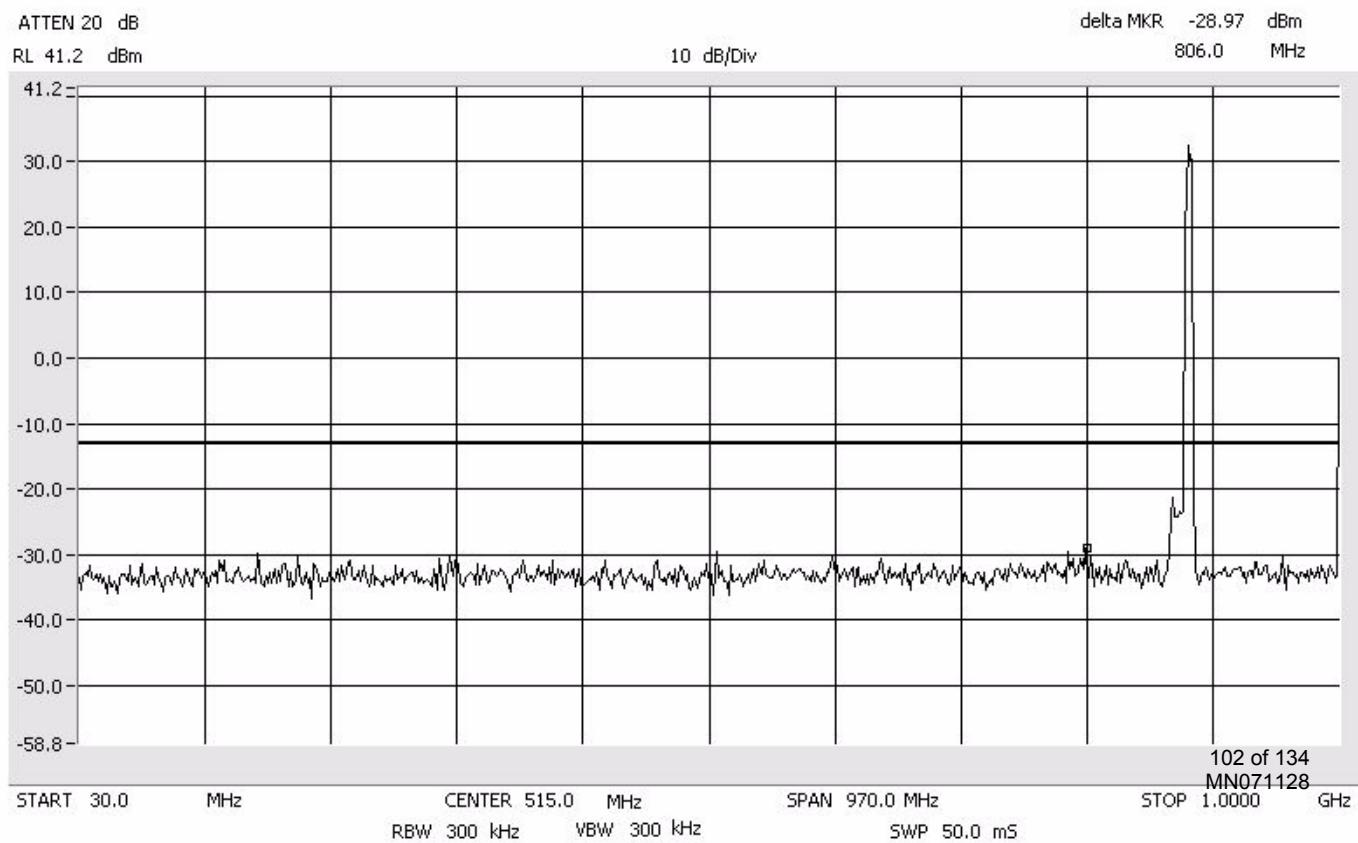
Center: 887.0 MHz
Span: 25 MHz
RBW/VBW: 100 kHz



**CDMA
B Band**

**Intermodulation
Close - Upper
Cellular 800 MHz**

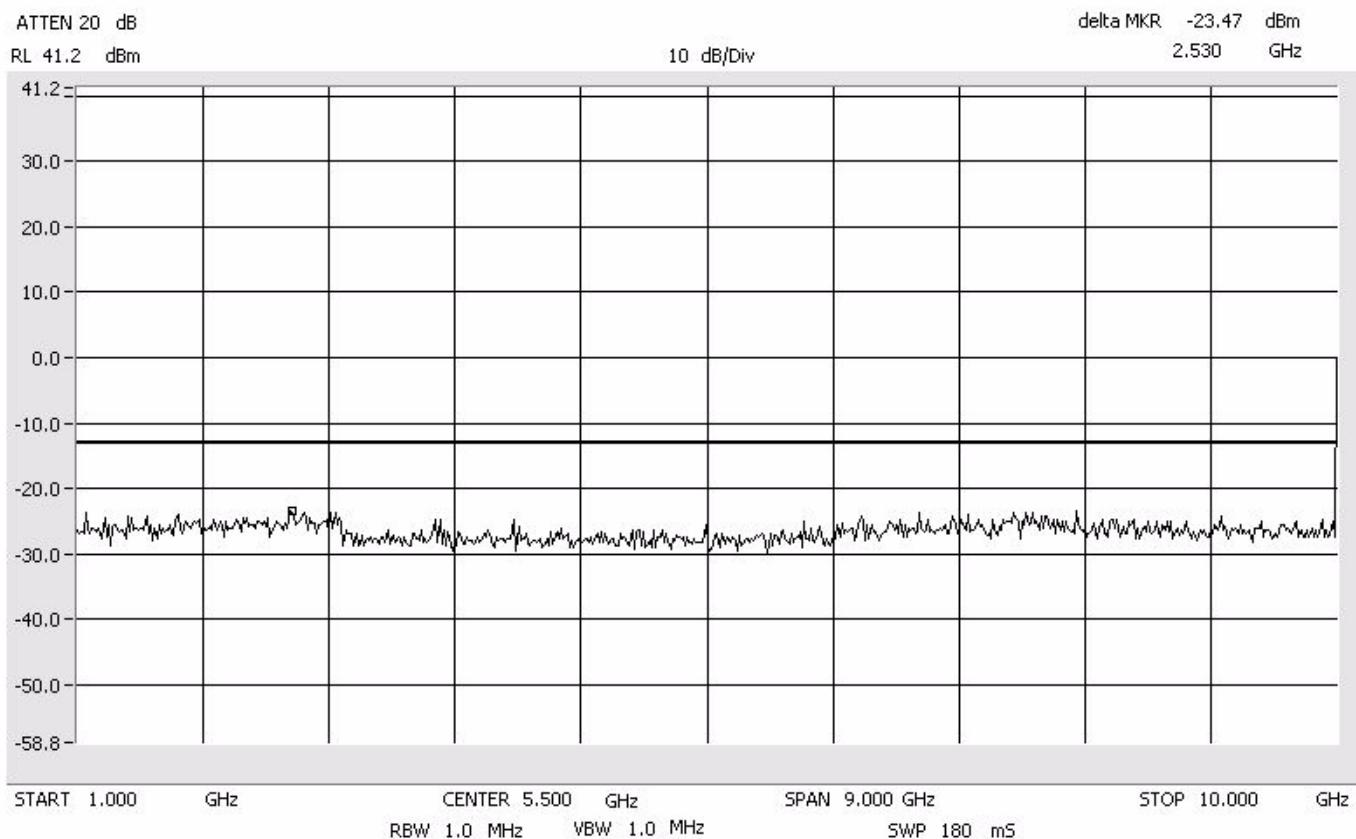
Span: 30 MHz to 1 GHz
RBW/VBW: 300 kHz



**CDMA
B Band**

**Intermodulation
Close - Upper
Cellular 800 MHz**

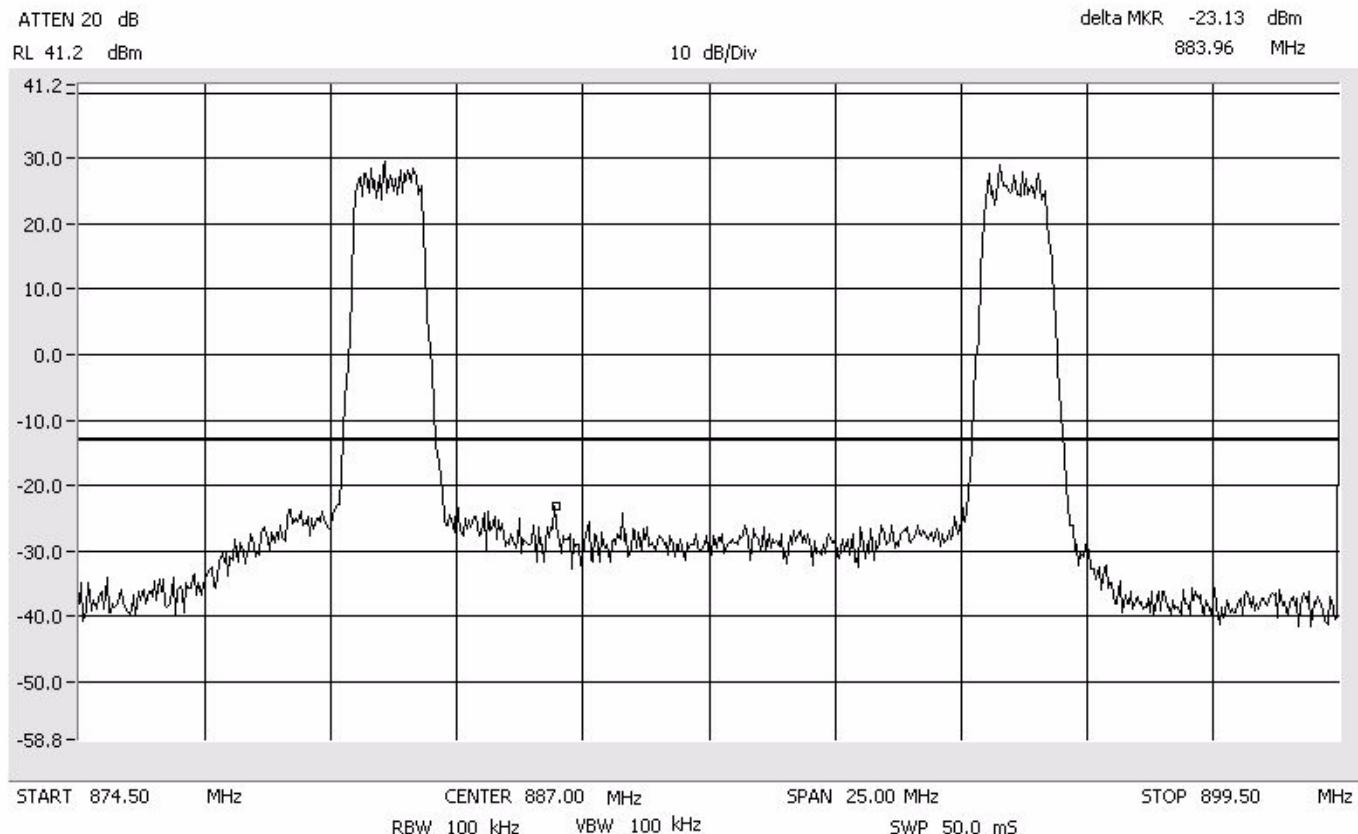
Span: 1 GHz to 10 GHz
RBW/VBW: 1 MHz



**CDMA
B Band**

**Intermodulation
Apart
Cellular 800 MHz**

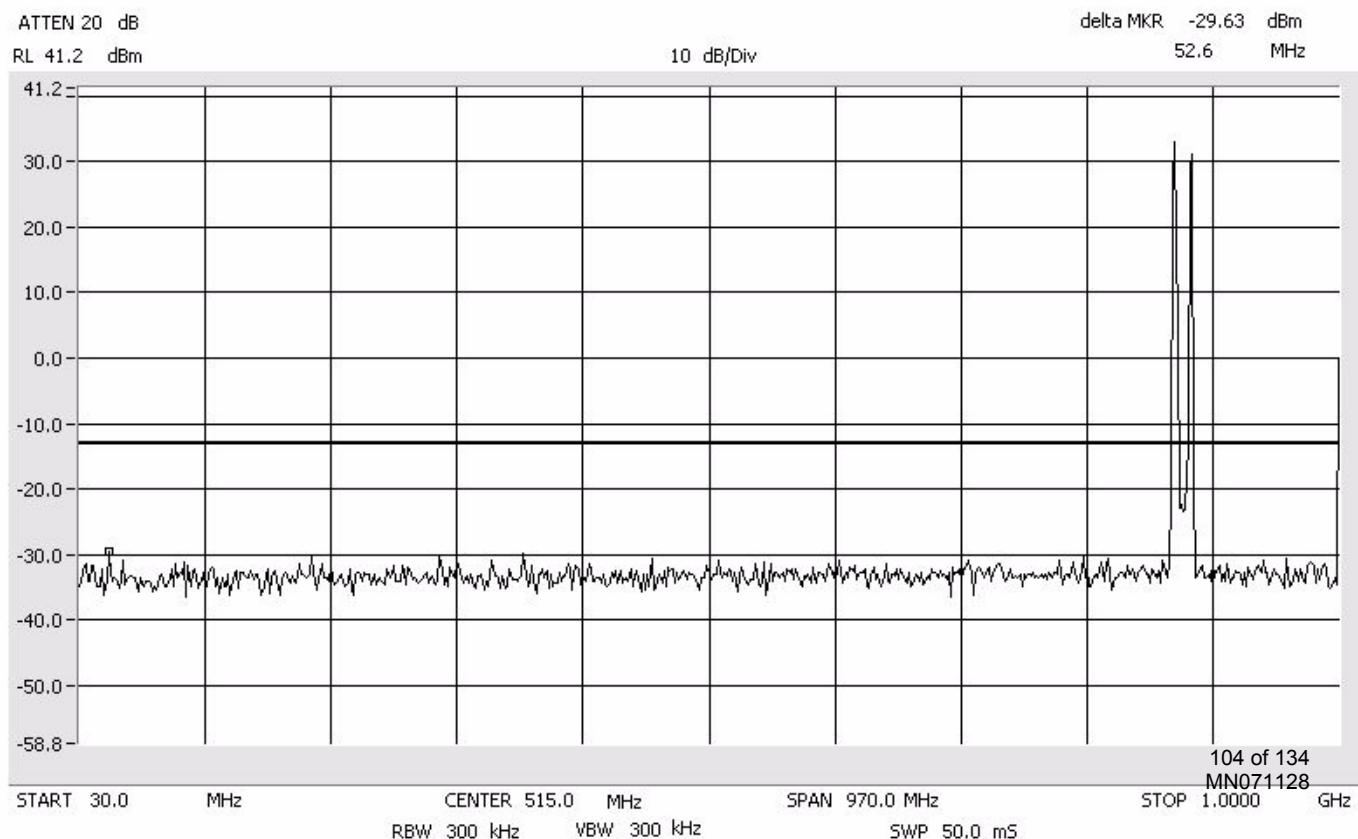
Center: 887.0 MHz
Span: 100 MHz
RBW/VBW: 100 kHz



**CDMA
B Band**

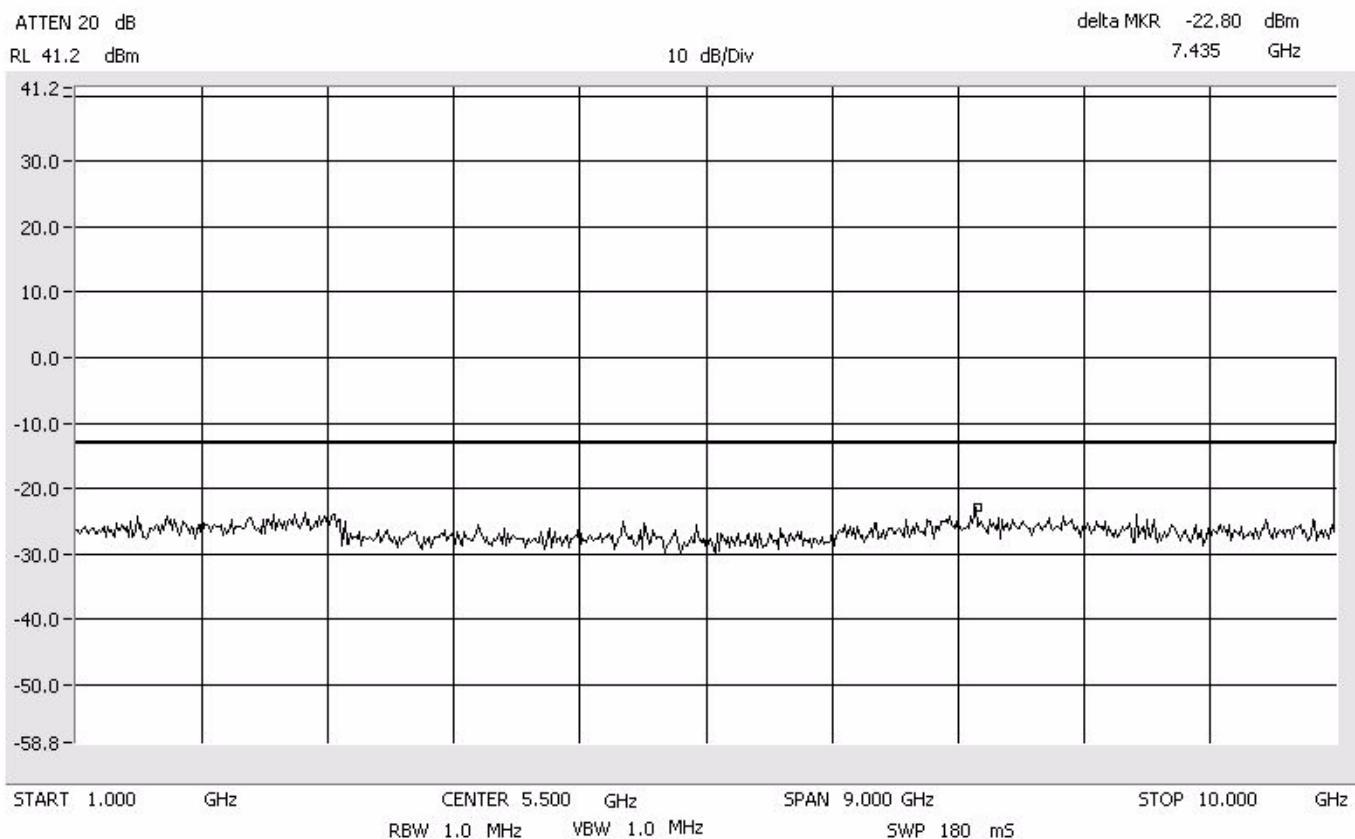
**Intermodulation
Apart
Cellular 800 MHz**

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



Intermodulation
Apart
Cellular 800 MHz

Span: 1 GHz to 10 GHz
RBW/VBW: 1 MHz



Occupied Bandwidth Modulation Test for ADC Inc.
FlexWave™ URH - Cellular
Model Number FWU-220000002110RU

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An input/output Occupied Bandwidth test was done with modulation types: FM, TDMA, GSM, EDGE, CDMA, EVDO, and W-CDMA. The purpose was to determine the amount of distortion added to different types of modulation schemes by the EUT. The following plots show input signals vs. output signals.

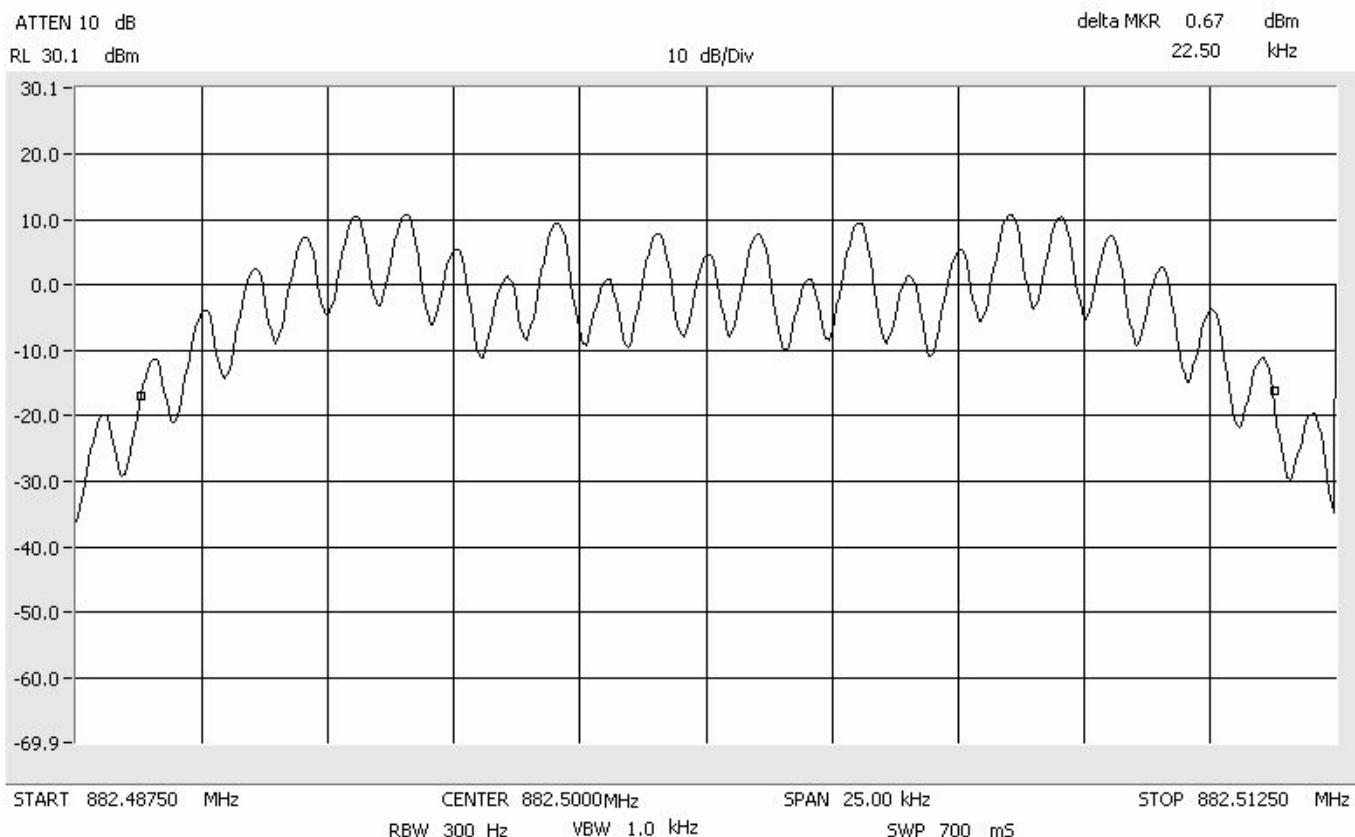
The resolution bandwidth is reduced to 1% of the estimated emission bandwidth and the video bandwidth is set to 3 times the resolution bandwidth. The markers are moved to the -20 dB points (from the previously established center frequency level) on either side of center frequency.

Results:

Pass (see plots)

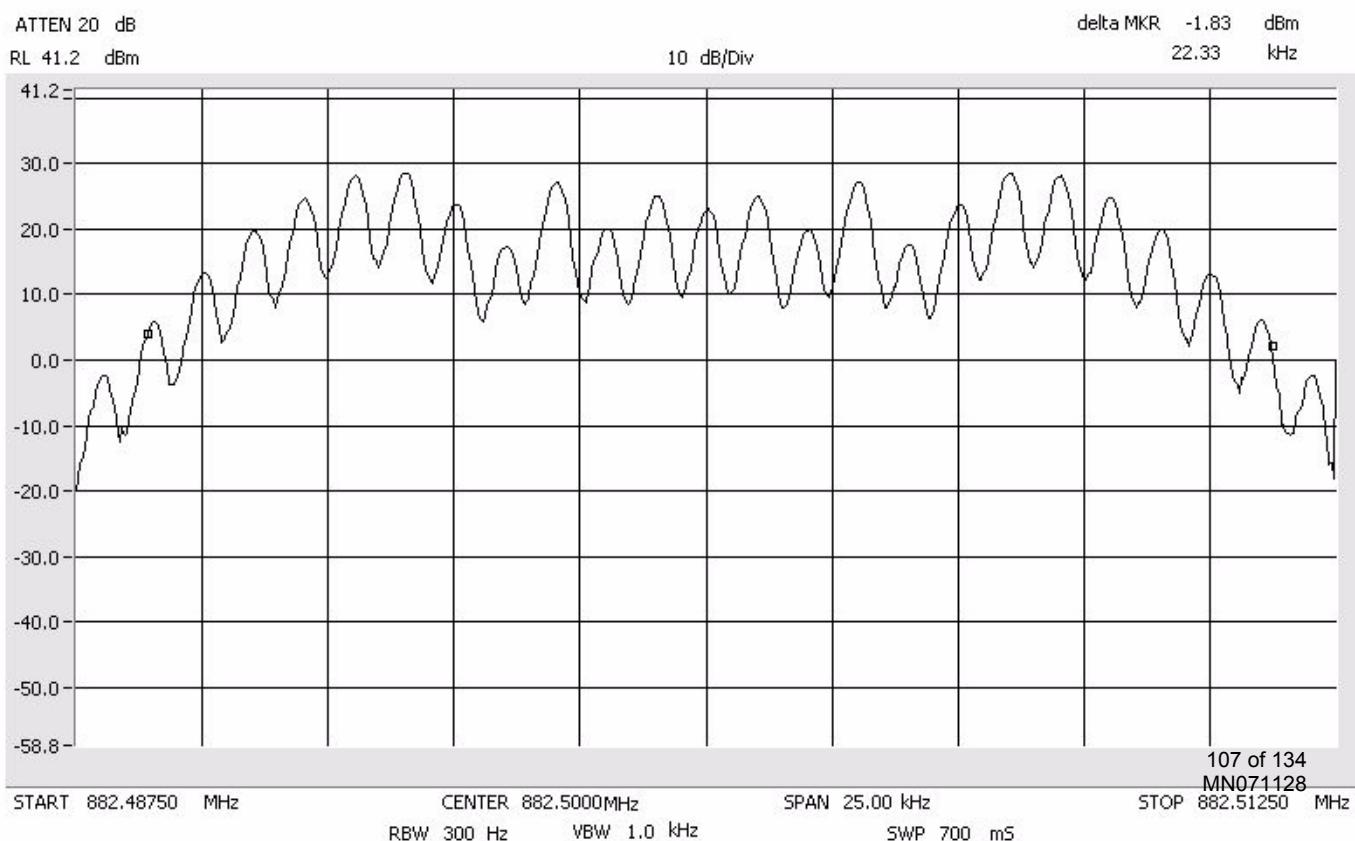
Occupied Bandwidth FM Signal In

Span: 25 kHz
RBW: 300 Hz
VBW: 1.0 kHz



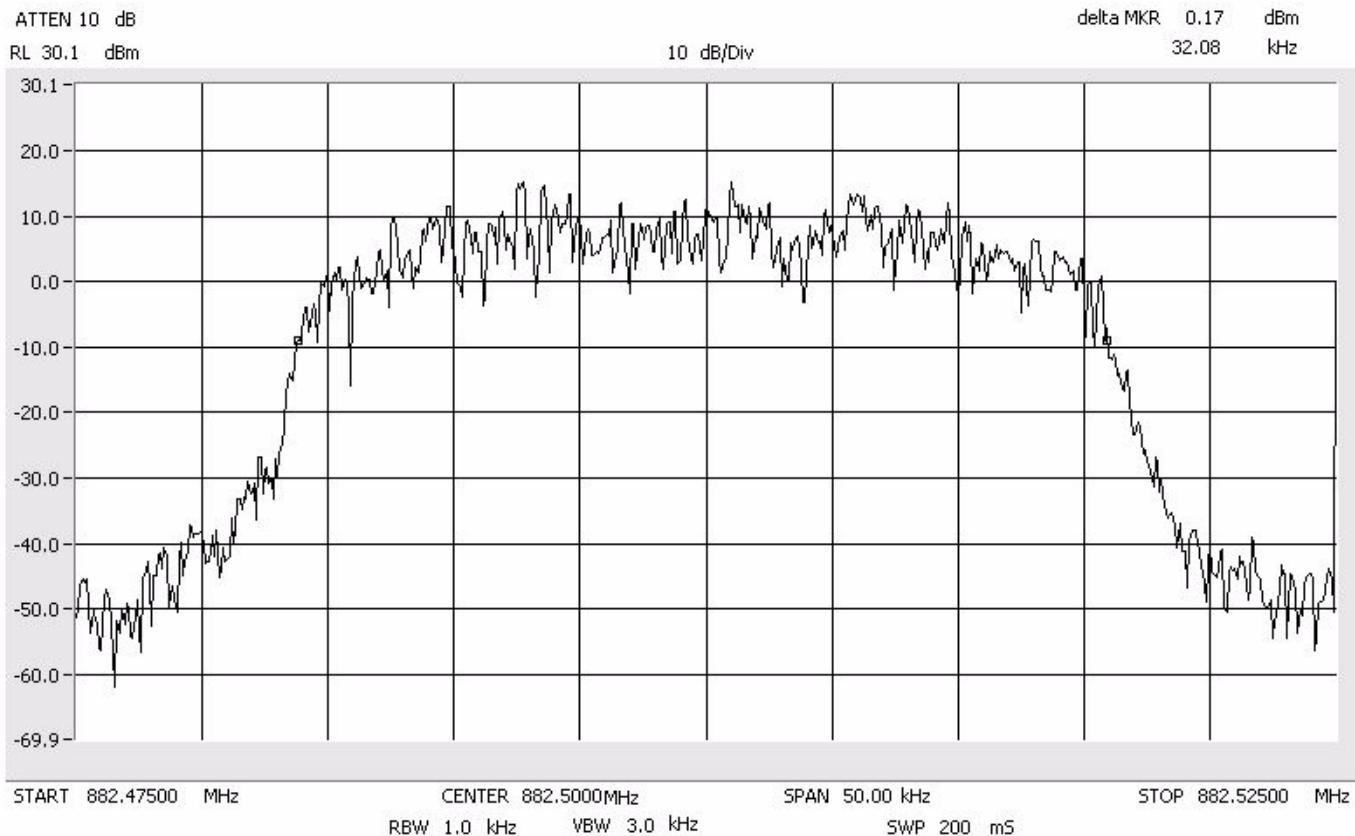
Occupied Bandwidth FM Signal Out

Span: 25 kHz
RBW: 300 Hz
VBW: 1.0 kHz



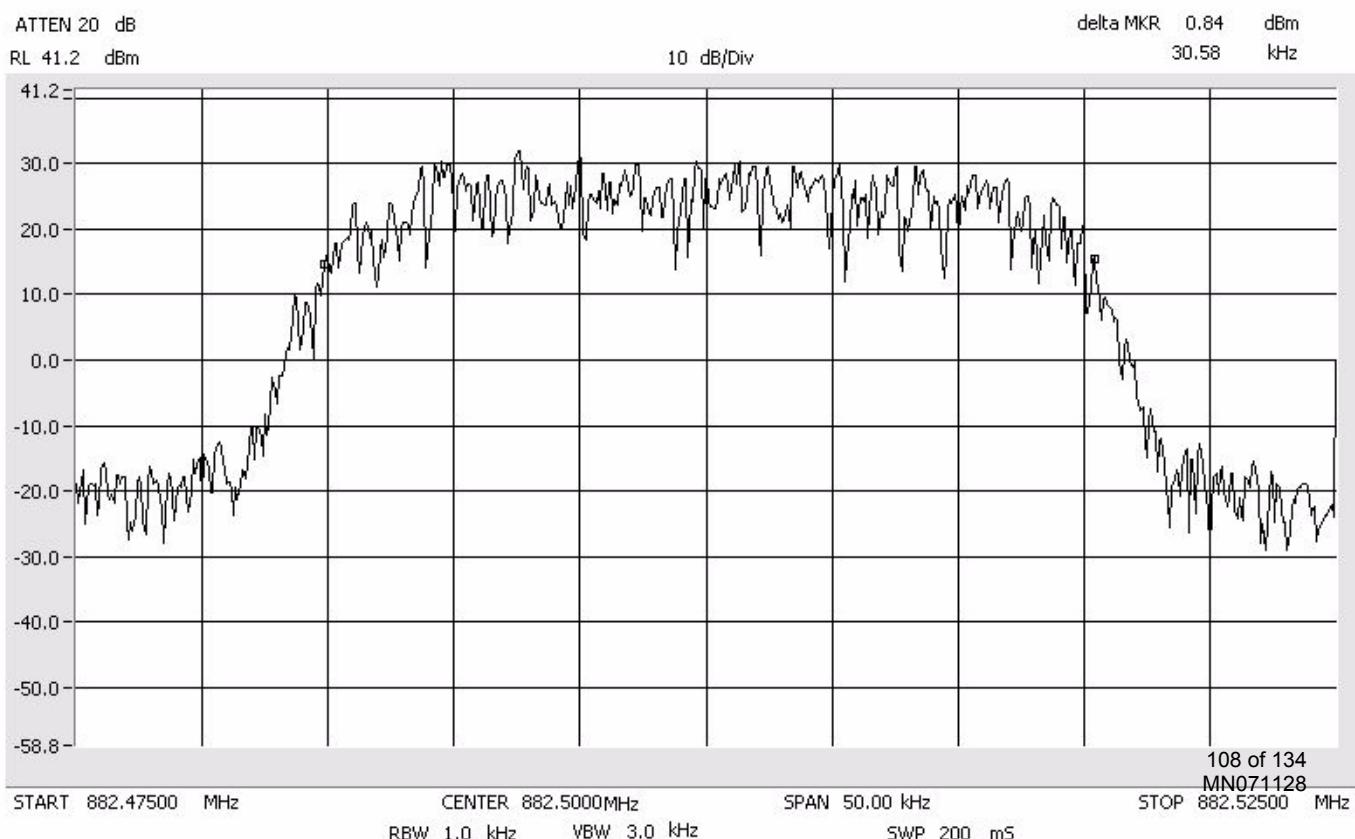
Occupied Bandwidth TDMA Signal In

Span: 50 kHz
RBW: 1 kHz
VBW: 3 kHz



Occupied Bandwidth TDMA Signal Out

Span: 50 kHz
RBW: 1 kHz
VBW: 3 kHz



**Occupied Bandwidth
GSM
Signal In**

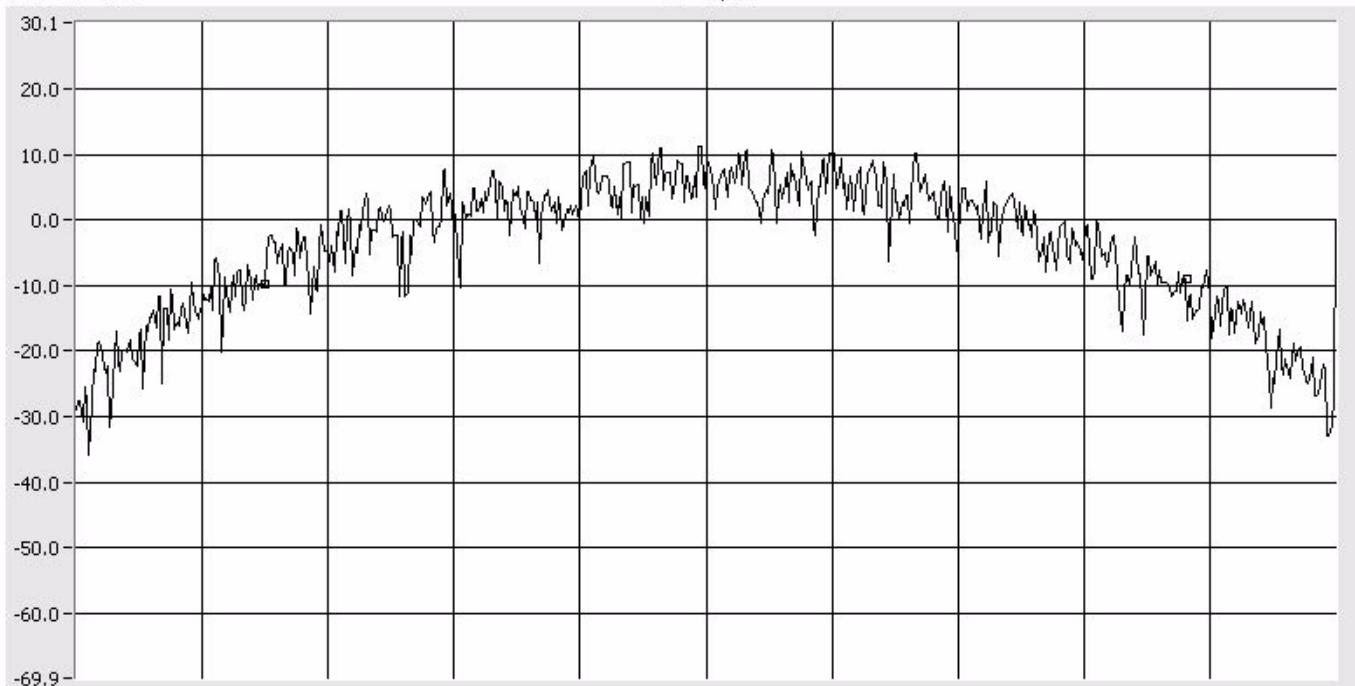
Span: 350 kHz
RBW: 3 kHz
VBW: 10 kHz

ATTEN 10 dB

RL 30.1 dBm

10 dB/Div

delta MKR 0.83 dBm
256.1 kHz



START 882.3250 MHz

CENTER 882.5000MHz
RBW 3.0 kHz VBW 10 kHz

SPAN 350.0 kHz

STOP 882.6750 MHz

SWP 98.0 mS

**Occupied Bandwidth
GSM
Signal Out**

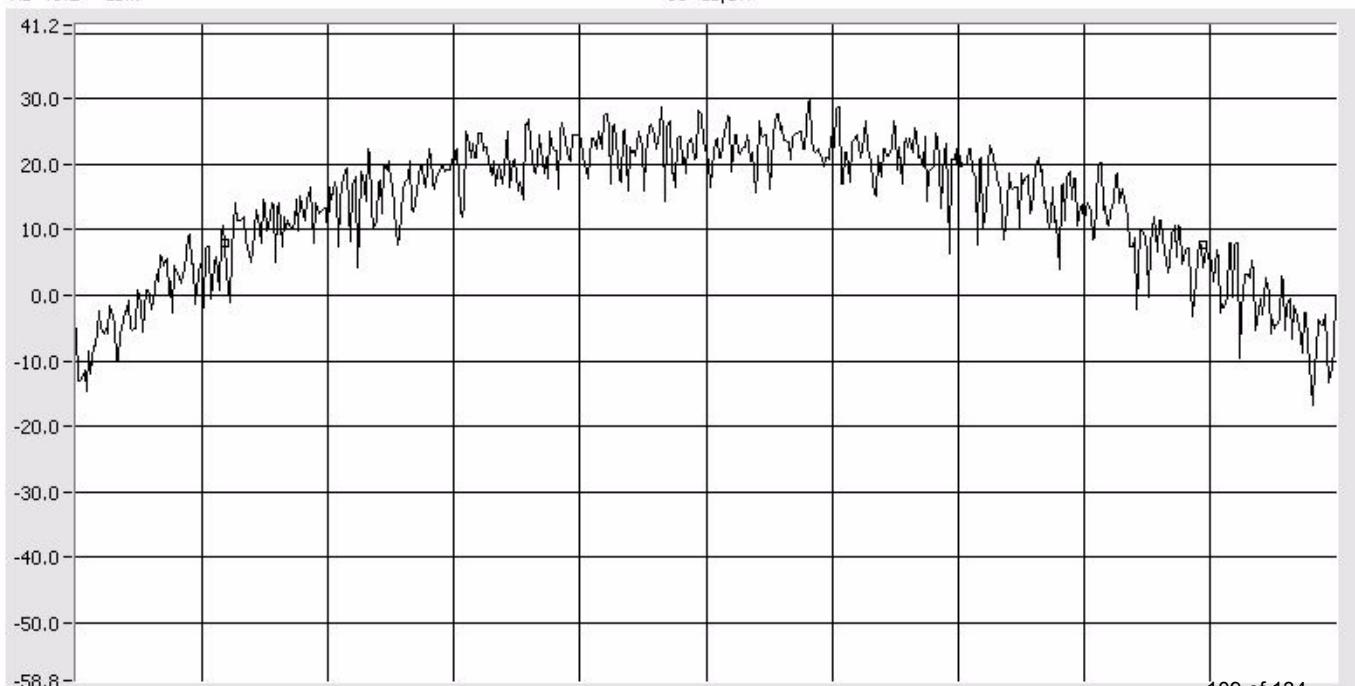
Span: 350 kHz
RBW: 3 kHz
VBW: 10 kHz

ATTEN 20 dB

RL 41.2 dBm

10 dB/Div

delta MKR -0.17 dBm
271.8 kHz



START 882.3250 MHz

CENTER 882.5000MHz
RBW 3.0 kHz VBW 10 kHz

SPAN 350.0 kHz

STOP 882.6750 MHz

SWP 98.0 mS

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MN071128

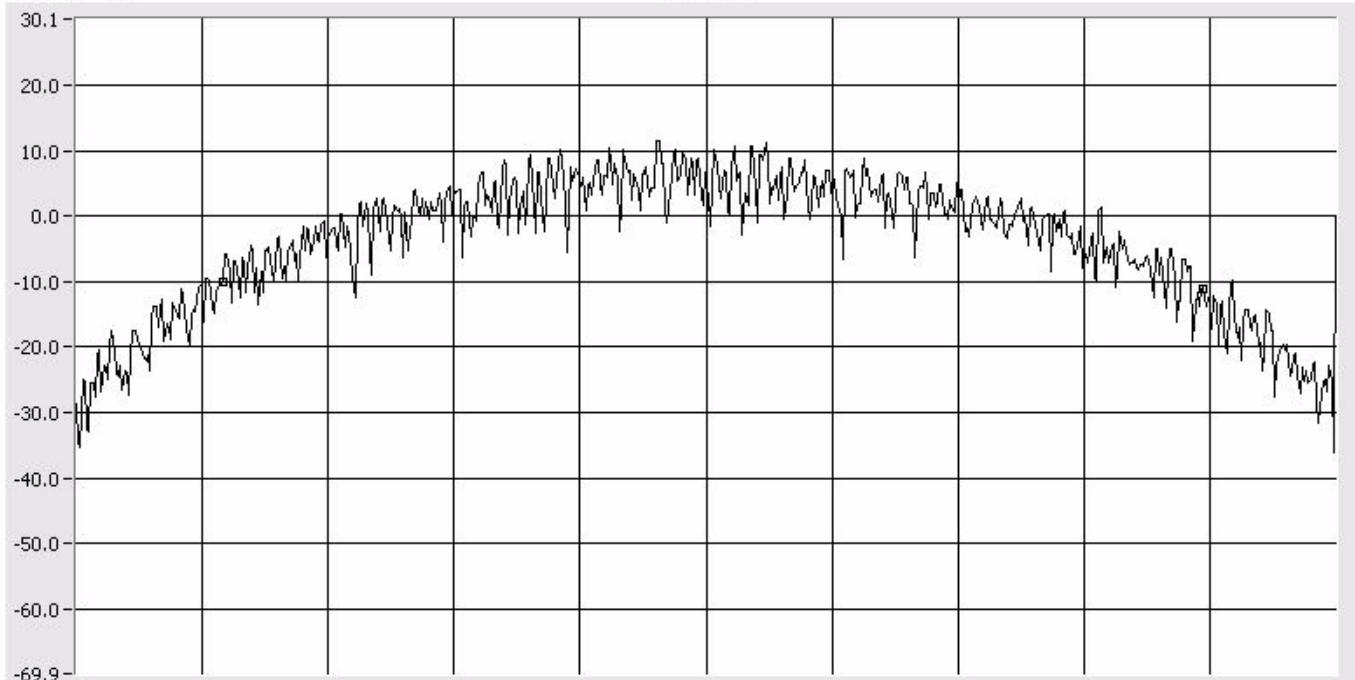
Occupied Bandwidth EDGE Signal In

Span: 350 kHz
RBW: 3 kHz
VBW: 10 kHz

ATTEN 10 dB
RL 30.1 dBm

10 dB/Div

delta MKR -1.00 dBm
272.4 kHz



START 882.3250 MHz

CENTER 882.5000MHz
RBW 3.0 kHz VBW 10 kHz

SPAN 350.0 kHz

STOP 882.6750 MHz

SWP 98.0 mS

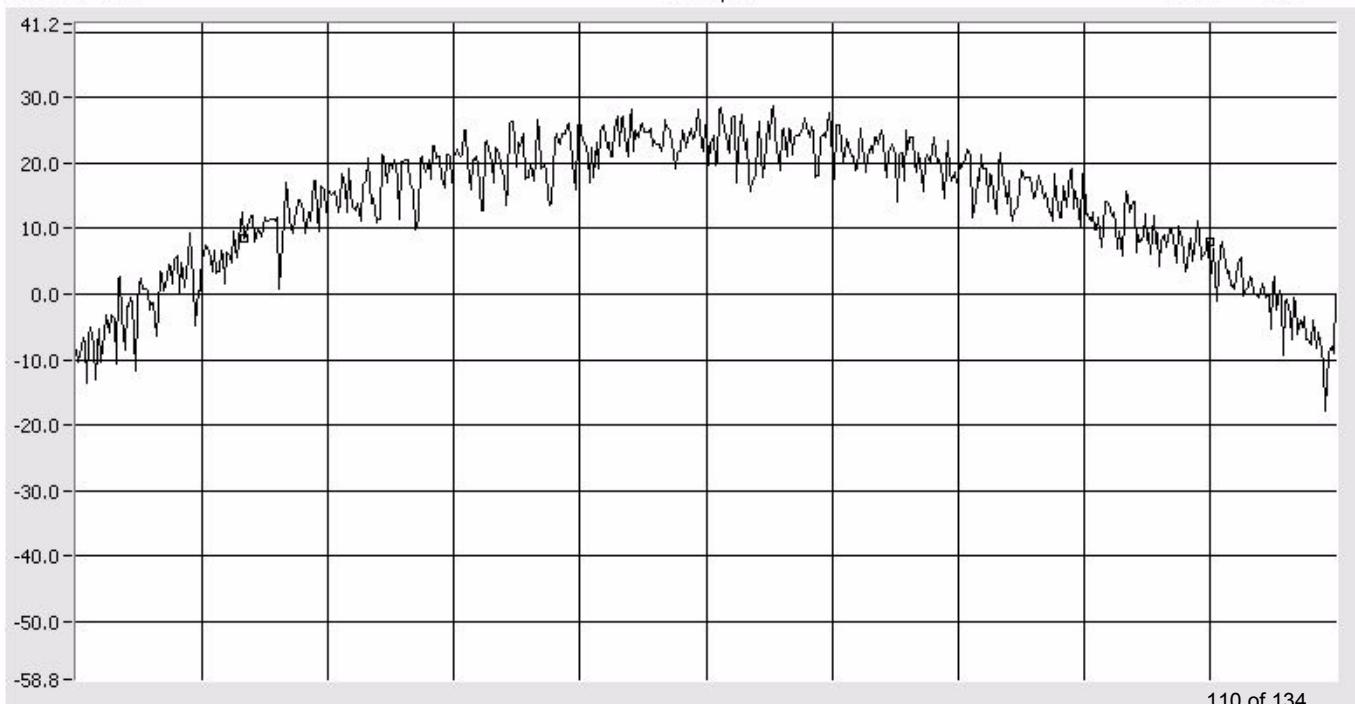
Occupied Bandwidth EDGE Signal Out

Span: 350 kHz
RBW: 3 kHz
VBW: 10 kHz

ATTEN 20 dB
RL 41.2 dBm

10 dB/Div

delta MKR -0.50 dBm
268.3 kHz



START 882.3250 MHz

CENTER 882.5000MHz
RBW 3.0 kHz VBW 10 kHz

SPAN 350.0 kHz

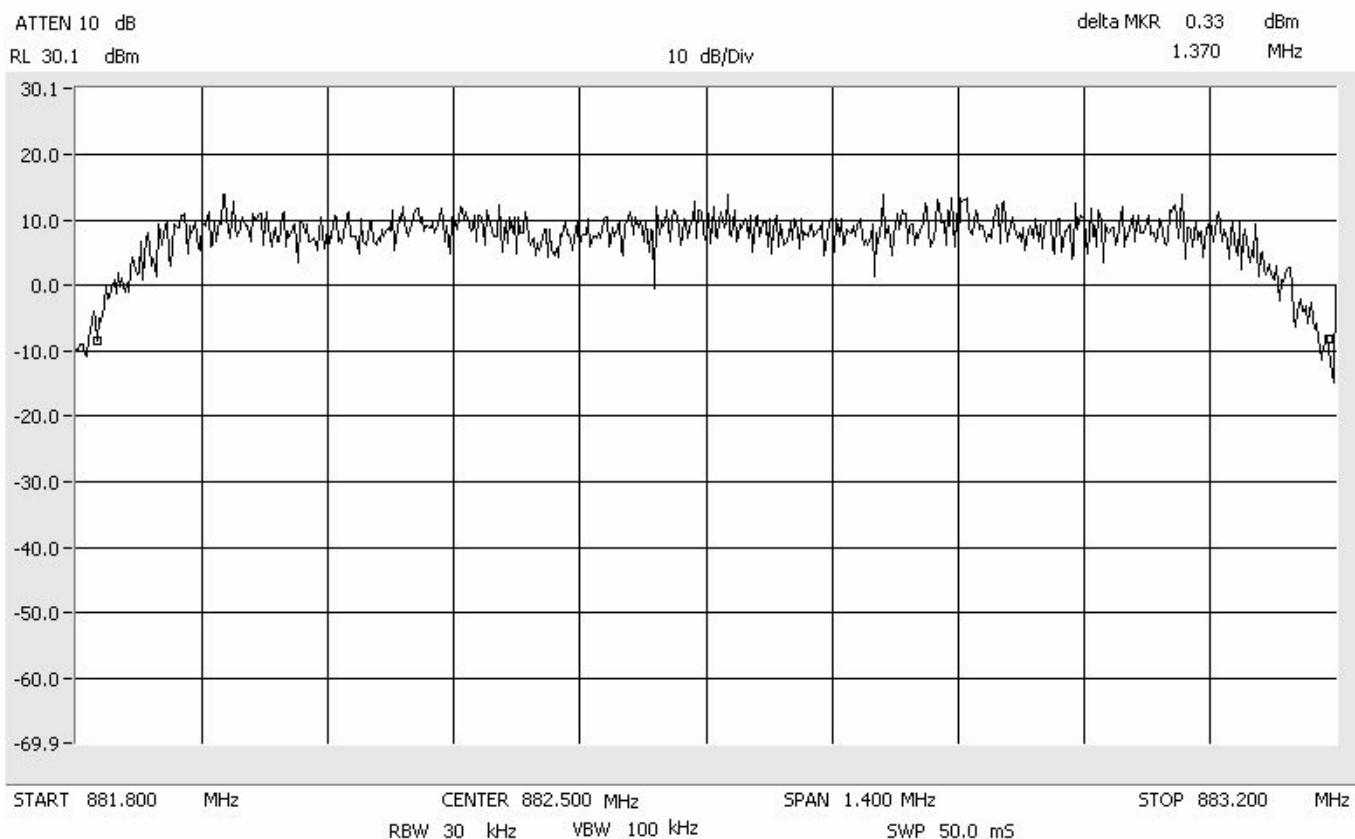
STOP 882.6750 MHz

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MN071128

SWP 98.0 mS

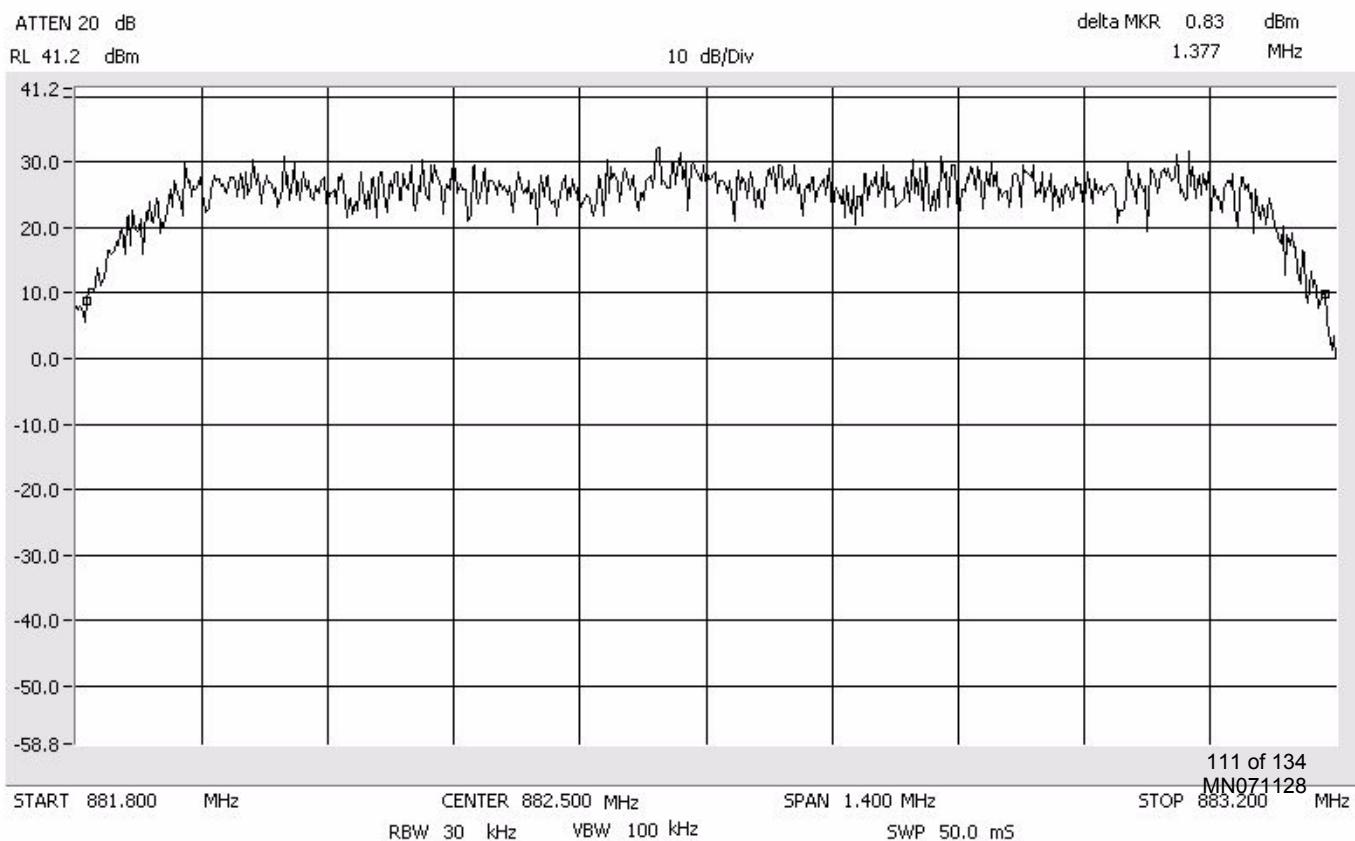
**Occupied Bandwidth
CDMA
Signal In**

Span: 1.4 MHz
RBW: 30 kHz
VBW: 100 kHz



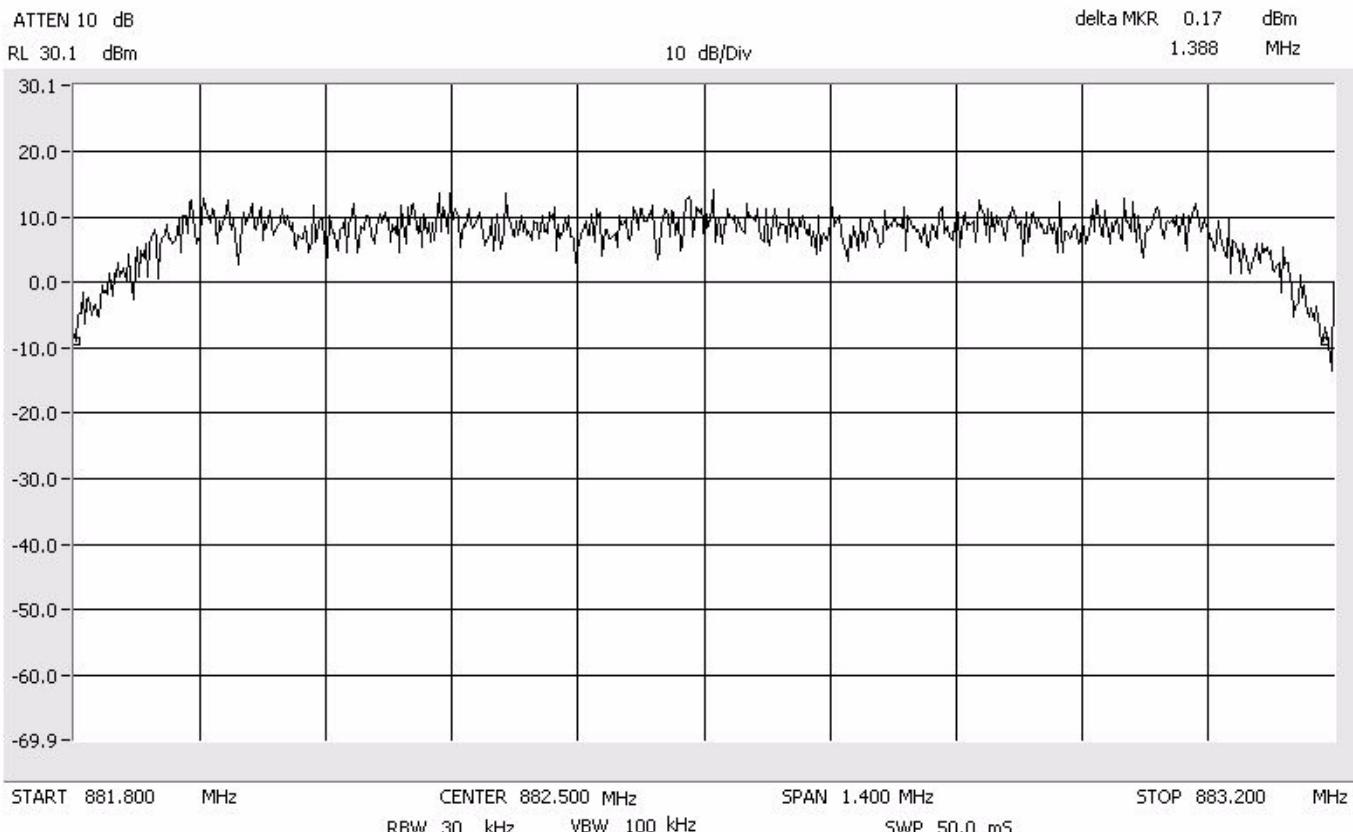
**Occupied Bandwidth
CDMA
Signal Out**

Span: 1.4 MHz
RBW: 30 kHz
VBW: 100 kHz



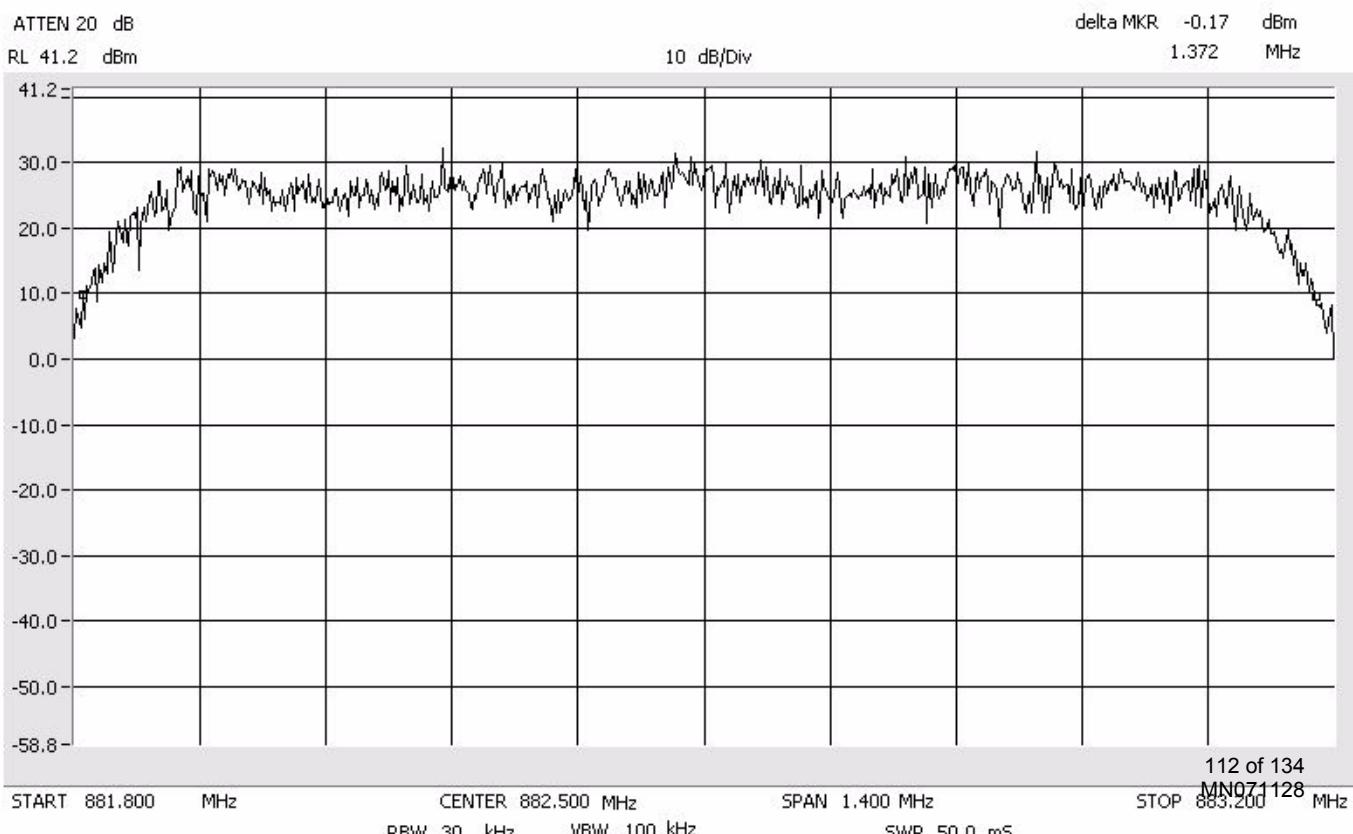
**Occupied Bandwidth
EVDO
Signal In**

Span: 1.4 MHz
RBW: 30 kHz
VBW: 100 kHz



**Occupied Bandwidth
EVDO
Signal Out**

Span: 1.4 MHz
RBW: 30 kHz
VBW: 100 kHz



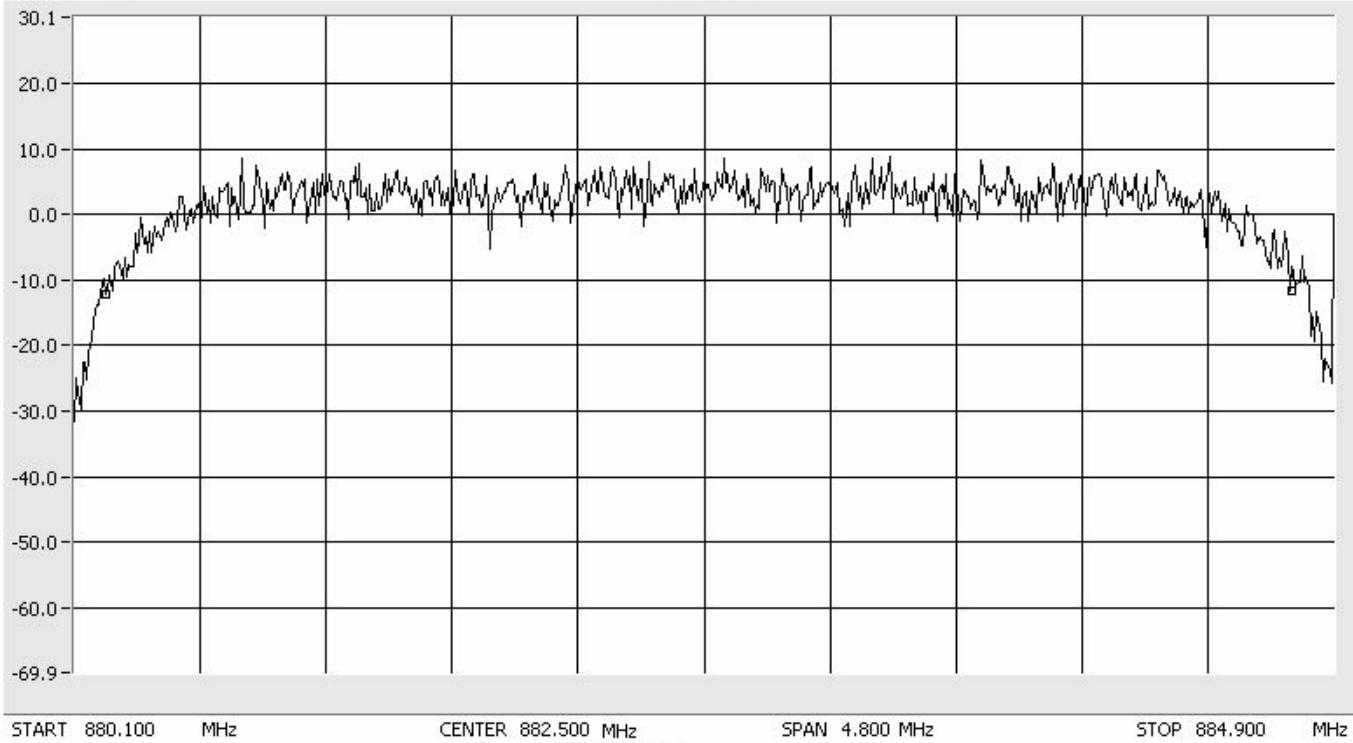
**Occupied Bandwidth
W-CDMA
Signal In**

Span: 4.8 MHz
RBW: 30 kHz
VBW: 100 kHz

ATTEN 10 dB
RL 30.1 dBm

10 dB/Div

delta MKR 0.66 dBm
4.520 MHz



START 880.100 MHz

CENTER 882.500 MHz
RBW 30 kHz VBW 100 kHz

SPAN 4.800 MHz

STOP 884.900 MHz

SWP 50.0 mS

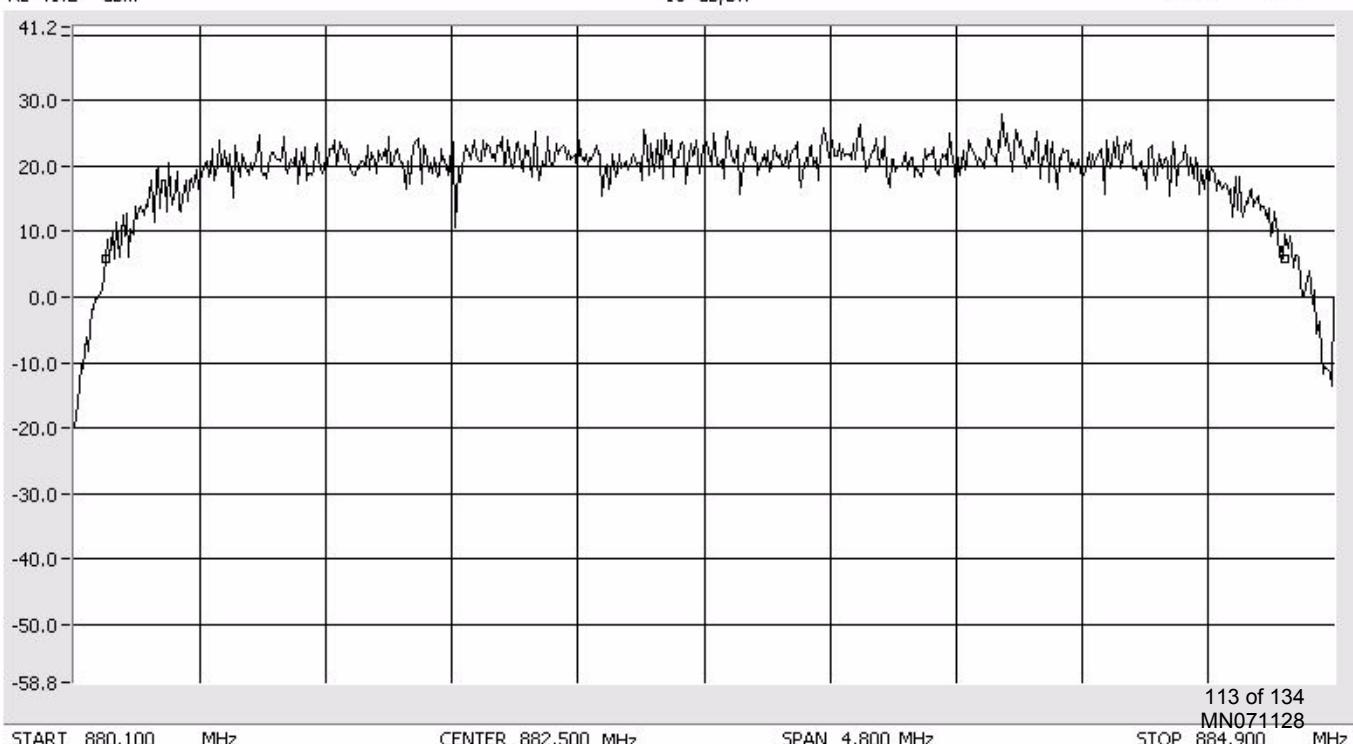
**Occupied Bandwidth
W-CDMA
Signal Out**

Span: 4.8 MHz
RBW: 30 kHz
VBW: 100 kHz

ATTEN 20 dB
RL 41.2 dBm

10 dB/Div

delta MKR 0.00 dBm
4.496 MHz



START 880.100 MHz

CENTER 882.500 MHz
RBW 30 kHz VBW 100 kHz

SPAN 4.800 MHz

STOP 884.900 MHz

SWP 50.0 mS

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MN071128

Frequency Tolerance Test for ADC Inc.
FlexWave™ URH - Cellular
Model Number FWU-220000002110RU

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EUT Cellular 800 MHz

HOST	REMOTE			
Input Voltage	Input Voltage	Carrier Frequency	Measured Frequency	Meets Requirements?
21 VDC	100 VAC	869.200 MHz	869.200 MHz	Yes
48 VDC	170 VAC	869.200 MHz	869.200 MHz	Yes
60 VDC	240 VAC	869.200 MHz	869.200 MHz	Yes
21 VDC	100 VAC	881.500 MHz	881.500 MHz	Yes
48 VDC	170 VAC	881.500 MHz	881.500 MHz	Yes
60 VDC	240 VAC	881.500 MHz	881.500 MHz	Yes
21 VDC	100 VAC	893.800 MHz	893.800 MHz	Yes
48 VDC	170 VAC	893.800 MHz	893.800 MHz	Yes
60 VDC	240 VAC	893.800 MHz	893.800 MHz	Yes
Temperature		Carrier Frequency	Measured Frequency	Meets Requirements?
-30 Deg. C		869.200 MHz	869.200 MHz	Yes
-20 Deg. C		869.200 MHz	869.200 MHz	Yes
-10 Deg. C		869.200 MHz	869.200 MHz	Yes
0 Deg. C		869.200 MHz	869.200 MHz	Yes
10 Deg. C		869.200 MHz	869.200 MHz	Yes
20 Deg. C		869.200 MHz	869.200 MHz	Yes
30 Deg. C		869.200 MHz	869.200 MHz	Yes
40 Deg. C		869.200 MHz	869.200 MHz	Yes
50 Deg. C		869.200 MHz	869.200 MHz	Yes
-30 Deg. C		881.500 MHz	881.500 MHz	Yes
-20 Deg. C		881.500 MHz	881.500 MHz	Yes
-10 Deg. C		881.500 MHz	881.500 MHz	Yes
0 Deg. C		881.500 MHz	881.500 MHz	Yes
10 Deg. C		881.500 MHz	881.500 MHz	Yes
20 Deg. C		881.500 MHz	881.500 MHz	Yes
30 Deg. C		881.500 MHz	881.500 MHz	Yes
40 Deg. C		881.500 MHz	881.500 MHz	Yes
50 Deg. C		881.500 MHz	881.500 MHz	Yes
-30 Deg. C		893.800 MHz	893.800 MHz	Yes
-20 Deg. C		893.800 MHz	893.800 MHz	Yes
-10 Deg. C		893.800 MHz	893.800 MHz	Yes
0 Deg. C		893.800 MHz	893.800 MHz	Yes
10 Deg. C		893.800 MHz	893.800 MHz	Yes
20 Deg. C		893.800 MHz	893.800 MHz	Yes
30 Deg. C		893.800 MHz	893.800 MHz	Yes
40 Deg. C		893.800 MHz	893.800 MHz	Yes
50 Deg. C		893.800 MHz	893.800 MHz	Yes

7.0 APPENDIX B

Intertek Test Data

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Test Engineer: Simon Khazon

Date: 21 November, 2007

Test Procedure:

Test measurements were made in accordance with ANSI C63.4-2003, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

Test Site Location:

The test site is a 3 meter Semi-Anechoic Chamber, constructed by Panashield™ Inc. and located inside the building at 7250 Hudson Blvd. Suite 100, Oakdale, MN 55128.

Test Site Description:

The 3 meter Semi-Anechoic Chamber is constructed of Panabolt™ modular RF shielding and self-supported with structural steel designed for the local seismic zone rating. The chamber has the nominal size of 20' wide x 29' long x 18' high. All walls and ceiling of the chamber are treated with FFG-1000 Ferrite Grid absorber which was developed specifically to meet international requirements for EMC anechoic chambers for emissions and immunity measurements. To meet high frequency testing white HY-35 hybrid absorber is mounted on the ferrites in specular regions of the chamber.

The chamber has a 2 meter diameter ANSI test volume area and meets the requirements of ANSI C63.4 (1992), EN55022, and FCC Part 15 standards for testing at a 3 meter path length.

FCC Registration Number: 90706

IC Registration Number: 4359

TEST DATA

Test Data Number: 3136761MIN-001
Project Number: 3136761

**Testing performed on the
Universal Radio Head-Cellular**

**To
47 CFR, Part 22**

**For
ADC Telecommunications Inc.**

Test Performed by:
Intertek Testing Services NA, Inc.
7250 Hudson Blvd., Suite 100
Oakdale, MN 55128

Test Authorized by:
ADC Telecommunications Inc.
5341 12th Avenue East
Shakopee, MN 55379

Prepared by: SKhazon
Simon Khazon

Date: November 21, 2007

Reviewed by: Norman Shpilsher
Norman Shpilsher

Date: November 21, 2007

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1.0	DESCRIPTION OF THE SAMPLE (EUT).....	3
2.0	TEST SUMMARY.....	4
2.1	Statement of the Measurement Uncertainty.....	4
3.0	TEST RESULTS.....	5
3.1	Environmental conditions	14
5.0	TEST EQUIPMENT.....	17

1.0 DESCRIPTION OF THE SAMPLE (EUT)

Model:	Universal Radio Head-Cellular
Type of EUT:	Outdoor Repeater
Serial Number:	N/A
Company:	ADC Telecommunications Inc.
Customer:	Mr. Mark Miska
Address:	1187 Park Place Shakopee, MN 55379
Phone:	952-403-8340
Fax:	952-403-8858
Test Standards:	<input type="checkbox"/> EN 55022:2006, Class <input type="checkbox"/> EN 55011:1998 + A1:1999 + A2:2002, Group [REDACTED], Class <input checked="" type="checkbox"/> 47 CFR, Part 22:2006 <input type="checkbox"/> 47 CFR, Part 15:2006, §15.109, Class <input type="checkbox"/> EN 55014-1:2000 + A1:2001 + A2:2002 <input type="checkbox"/> EN 61326-1:2006 <input type="checkbox"/> Class [REDACTED] for Radiated and Conducted Emissions <input type="checkbox"/> EN 60601-1-2:2001 +A1:2006 <input type="checkbox"/> Class [REDACTED] Radiated and Conducted Emissions <input type="checkbox"/> EN 61000-6-3:2001 <input type="checkbox"/> EN 61000-6-4:2001 <input type="checkbox"/> EN 61000-3-2:2006 <input type="checkbox"/> EN 61000-3-3:1995 +A1:2001 +A2:2006 <input type="checkbox"/> Other

2.0 TEST SUMMARY

Referring to the performance criteria and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards.

TEST STANDARD	TEST	RESULT
Part 22	Spurious Enclosure Radiated Emissions	Pass

2.1 Statement of the Measurement Uncertainty

Note: The measured result in this report is within the specification limits by more than the measurement uncertainty; the measured result indicates that the product tested complies with the specification limit.

The expanded uncertainty ($k = 2$) for radiated emissions from 30 to 1000 MHz has been determined to be: ± 4 dB at 10m and ± 5.4 dB at 3m

The expanded uncertainty ($k = 2$) for conducted emissions from 150 kHz to 30 MHz has been determined to be:

± 2.6 dB

General notes:

1. Test was performed with the tuned low channel 871.0MHz, middle channel (881.50MHz), and upper channel (892 MHz) operating frequency.

Testing was performed in frequency range from 30MHz to 10GHz.

2. The signal generator was located outside of the test site.

3. The Spurious Radiated Power limits of -13dBm was correlated with field strength reference level of 82.2dB μ V/m during field strength measurements at 3m measurement distance

3.0 TEST RESULTS

TILE Instrument Control System EMI Measurement Software

Radiated Emissions from 30MHz to 1GHz

Date: 11/21/2007

Company: ADC Telecommunications Inc.
Model: Universal Radio Head-Cellular
Test Engineer: Simon Khazon
Standard: FCC Part 22
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
 Measurements were taken using a Peak detector

Table # 1

Frequency	Ant. Polarity	Peak Reading dB μ V	Ant.Factor dB1/m	Total at 3m dB μ V/m	QP Limit dB μ V/m	Margin dB
Operating Frequency 871MHz						
34.557 MHz	V	52.73	16.34	69.07	82.2	-13.13
52.823 MHz	V	55.35	8.12	63.48	82.2	-18.72
94.9 MHz	V	48.47	11.01	59.49	82.2	-22.71
Operating Frequency 881.5MHz						
35.772 MHz	V	52.14	15.63	67.78	82.2	-14.42
52.758 MHz	V	56.52	8.14	64.66	82.2	-17.54
101.04 MHz	V	47.56	12.31	59.87	82.2	-22.33
437.63 MHz	H	38.27	19.51	57.78	82.2	-24.42
499.98 MHz	H	37.12	20.62	57.74	82.2	-24.46
881.32 MHz	H	33.55	25.19	58.74	82.2	-23.46
Operating Frequency 892MHz						
36.193 MHz	V	52.34	15.39	67.72	82.2	-14.48
52.368 MHz	V	54.85	8.2	63.06	82.2	-19.14
100.73 MHz	V	47.96	12.26	60.22	82.2	-21.98
116.01 MHz	V	42.38	13.73	56.1	82.2	-26.1
36.45 MHz	H	40.53	15.24	55.77	82.2	-26.43
52.433 MHz	H	43.53	8.19	51.72	82.2	-30.48
156.96 MHz	H	43.13	11.97	55.1	82.2	-27.1
437.63 MHz	H	37.98	19.51	57.5	82.2	-24.7

Note: Emissions at operating frequencies were removed from the Table

TILE Instrument Control System EMI Measurement Software
Radiated Emissions from 1 to 10GHz
Date: 11/21/2007

Company: ADC Telecommunications Inc.
Model: Universal Radio Head-Cellular
Test Engineer: Simon Khazon
Special Info:
Standard: FCC Part 22
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
 All measurements were taken using a Peak detector

Table # 2

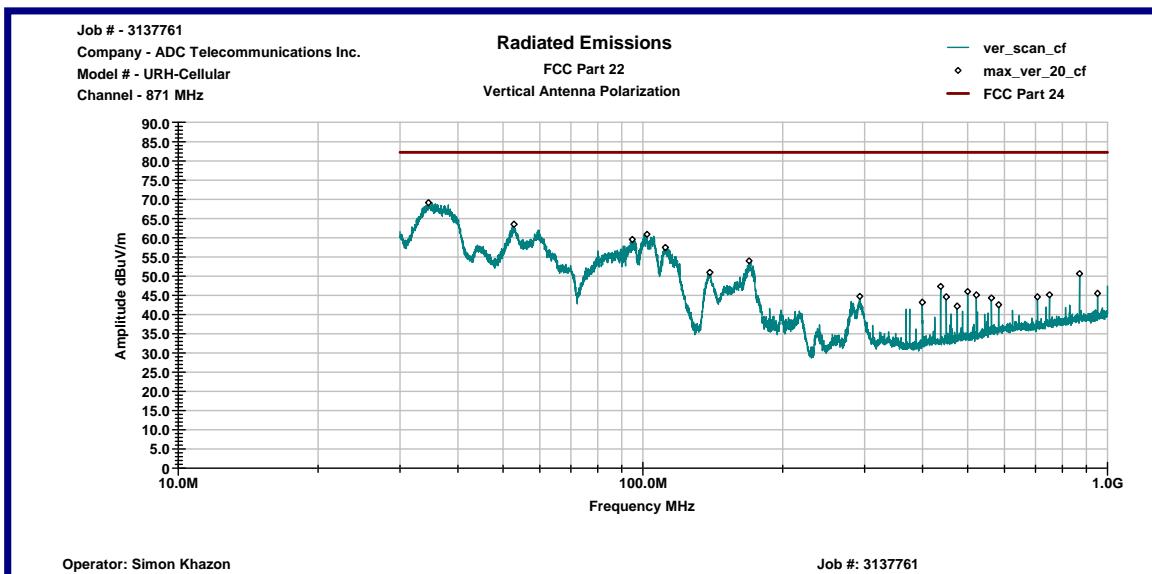
Frequency MHz	Antenna Polarity	Reading dB μ V	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dB μ V/m	QP Limit dB μ V/m	Margin dB
Operating Frequency 871MHz							
1.75 GHz	V	55.94	29.33	39	46.28	82.2	-35.92
1.84 GHz	V	58.38	29.74	38.86	49.26	82.2	-32.94
2.068 GHz	V	48.37	30.64	38.49	40.52	82.2	-41.68
Operating Frequency 881.5MHz							
1.75 GHz	V	55.85	29.33	39	46.19	82.2	-36.01
1.84 GHz	V	57.29	29.74	38.86	48.17	82.2	-34.03
2.038 GHz	V	48.17	30.58	38.54	40.21	82.2	-41.99
Operating Frequency 892MHz							
1.25 GHz	V	59.31	27.51	39.6	47.22	82.2	-34.98
1.474 GHz	V	53.94	28.11	39.42	42.63	82.2	-39.57
1.5 GHz	V	52.84	28.17	39.4	41.61	82.2	-40.59
1.75 GHz	V	56.18	29.33	39	46.52	82.2	-35.68
3.134 GHz	H	54.09	33.57	37.89	49.77	82.2	-32.43
3.318 GHz	H	55.19	34.04	37.75	51.49	82.2	-30.71
3.502 GHz	H	51.71	34.51	37.6	48.62	82.2	-33.58
3.686 GHz	H	52.8	35.14	37.64	50.3	82.2	-31.9

Spurious Radiated Emissions Power
Date: 11-21-2007

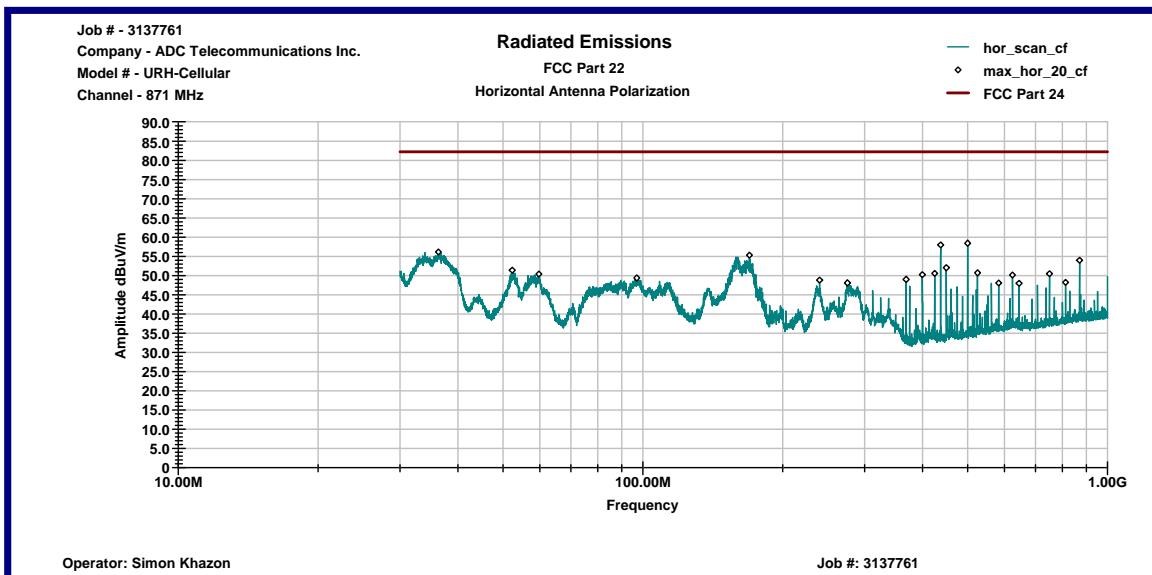
Company: ADC Telecommunications
Model: URH-Cellular
Test Engineer: Simon Khazon
Special Config. Info: Substitution Method
Standard: FCC Part 22
Frequency Range: 30MHz to 10GHz
Test Site: 3m Anechoic Chamber
Note: The table shows the worst case radiated emissions
 Emissions at fundamental frequency removed from the Table

Table # 3

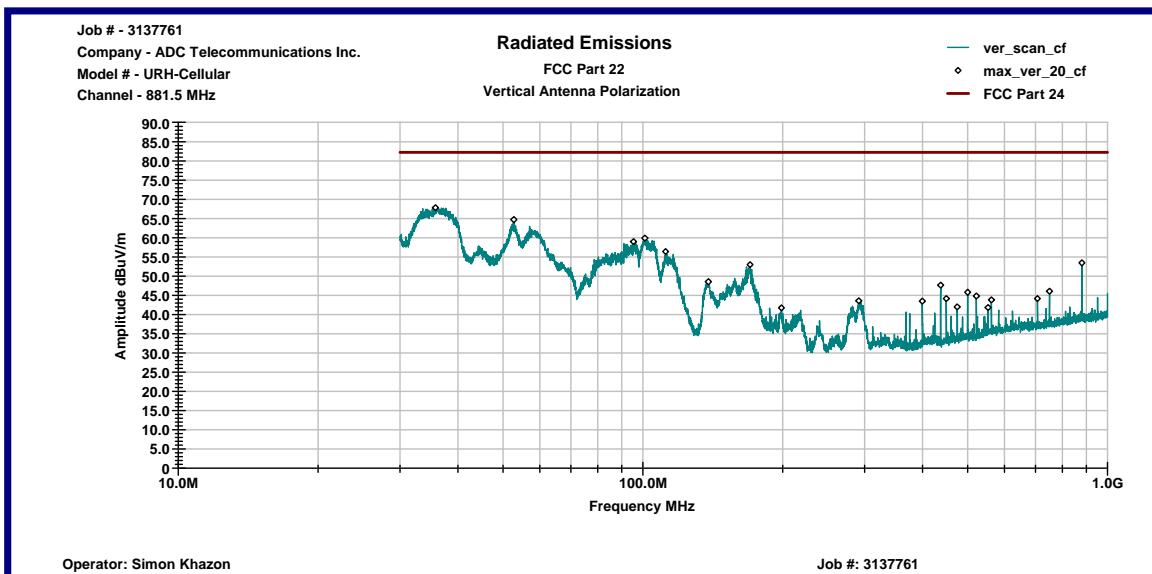
Frequency of Emissions MHz	Operating Frequency MHz	Antenna Polarity	Measured Emissions dB μ V	Substitution Generator Power dBm	Substitution Antenna Gain dBi	Cable Loss dB	ERP Spur. Emissions dBm	Limit dBm	Margin dB
34.56	871	V	52.7	-11.3	-9.6	0.1	-21.0	-13.0	-8.0
52.82	871	V	55.4	-8.6	-5.5	0.3	-14.4	-13.0	-1.4
35.77	881.5	V	68.2	-12.9	-8.9	0.3	-22.1	-11.0	-11.1
52.75	881.5	V	69.7	-8.9	-5.5	0.3	-14.7	-13.0	-1.7
36.19	892	V	49.0	-14.6	-8.7	0.1	-23.4	-13.0	-10.4
52.37	892	V	62.5	-12.0	-5.6	0.3	-17.9	-13.0	-4.9



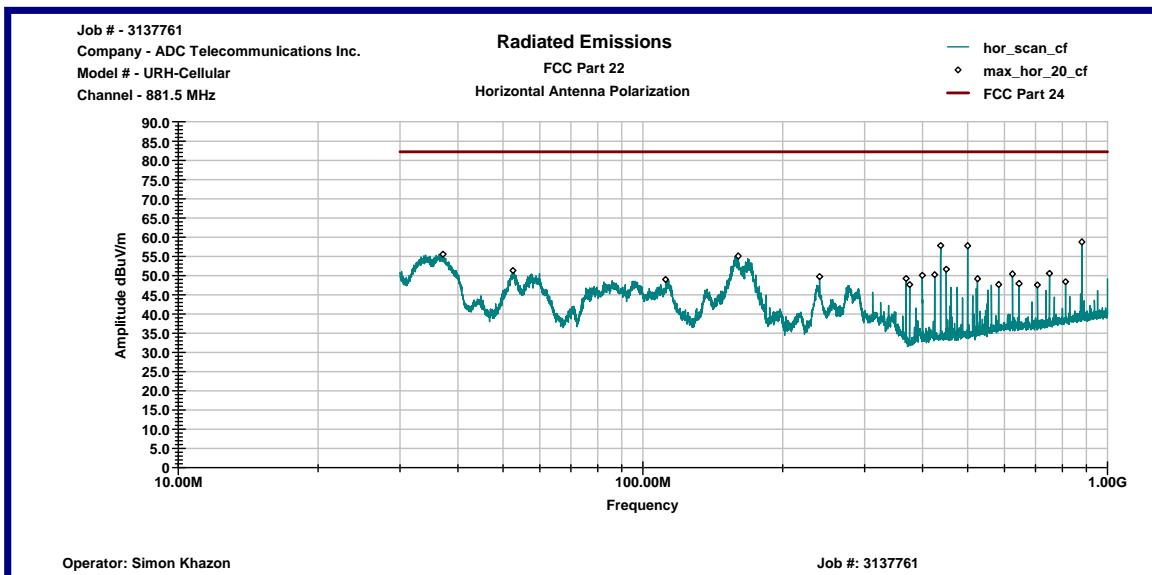
Graph 1



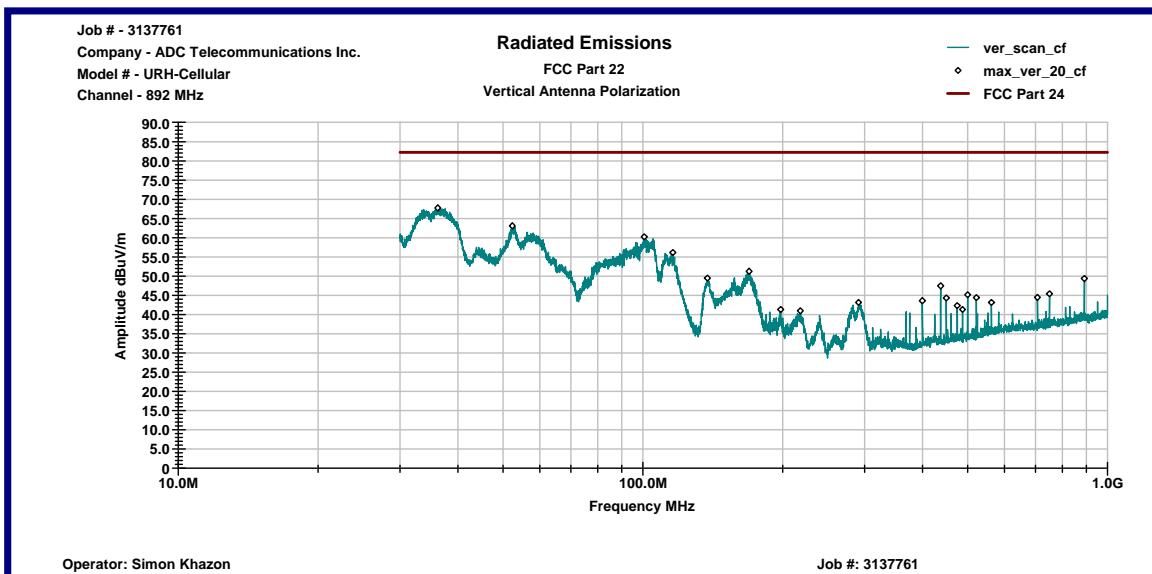
Graph 2



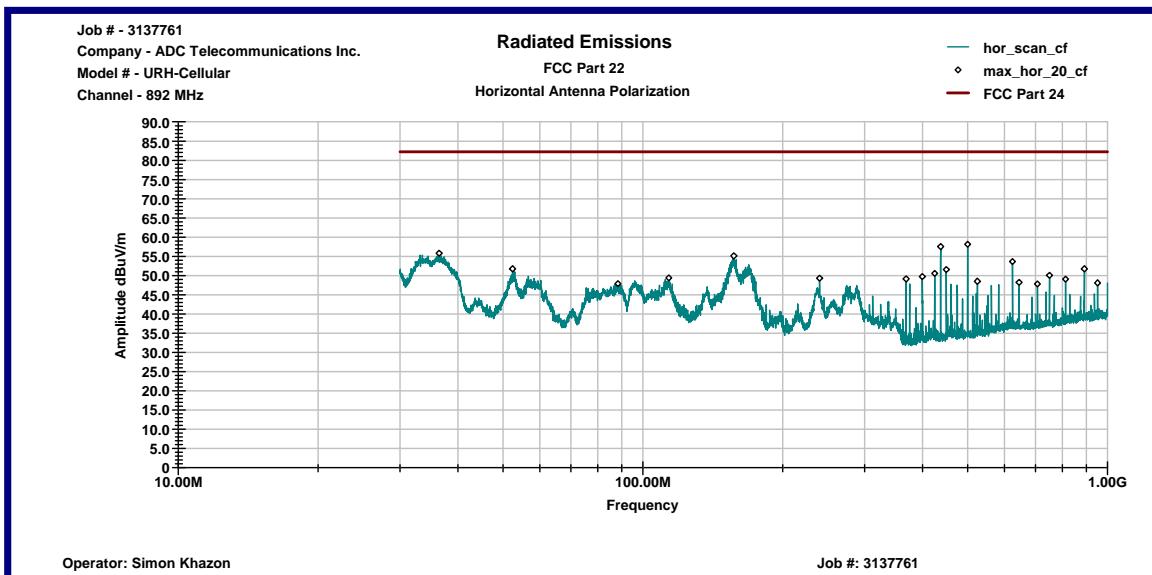
Graph 3



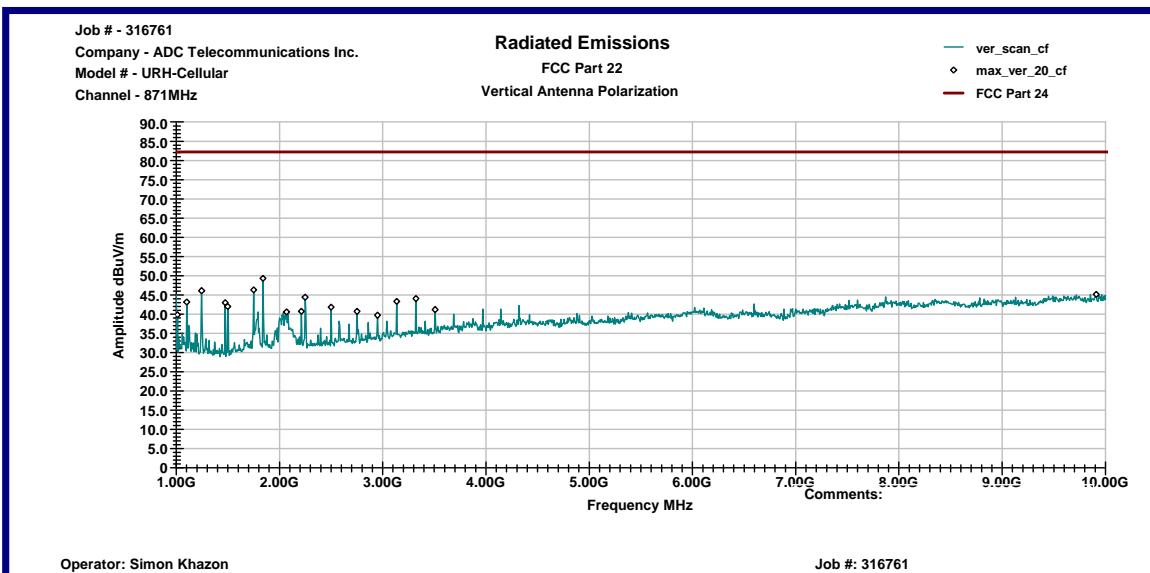
Graph 4



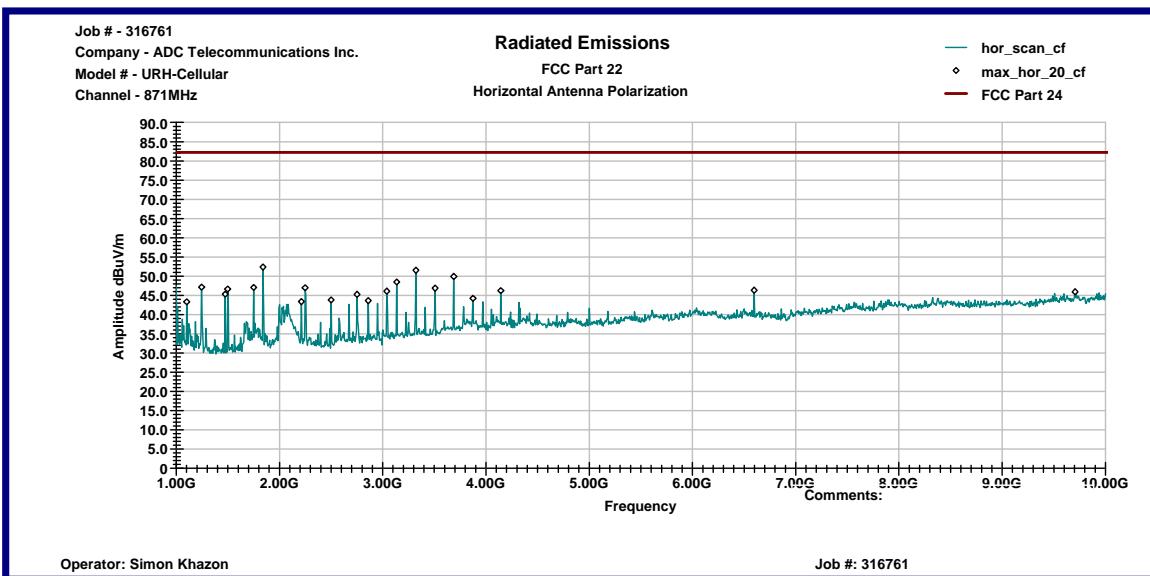
Graph 5



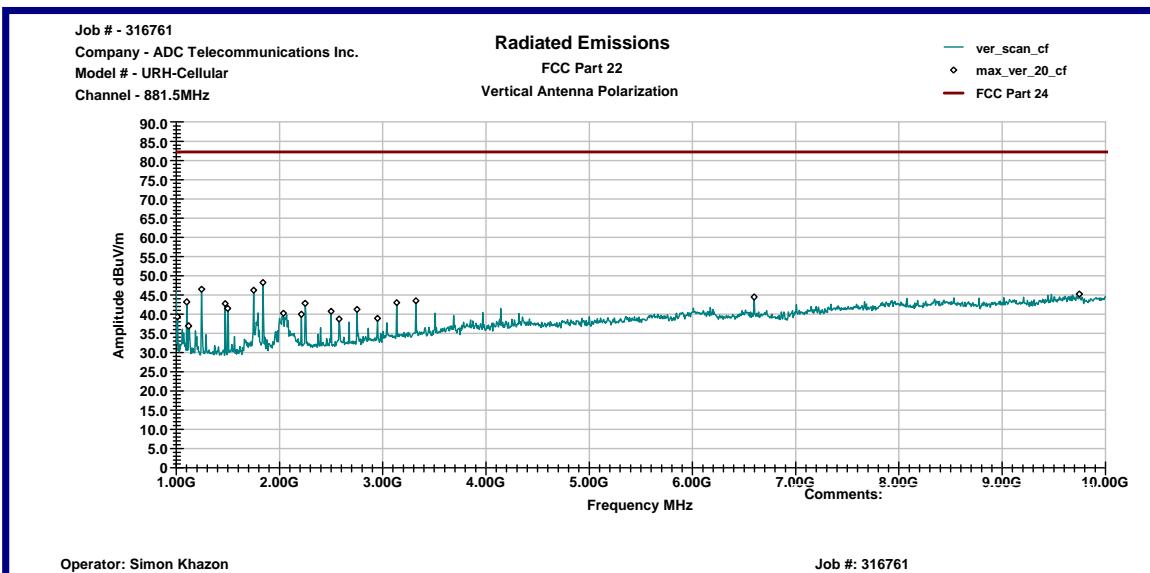
Graph 6



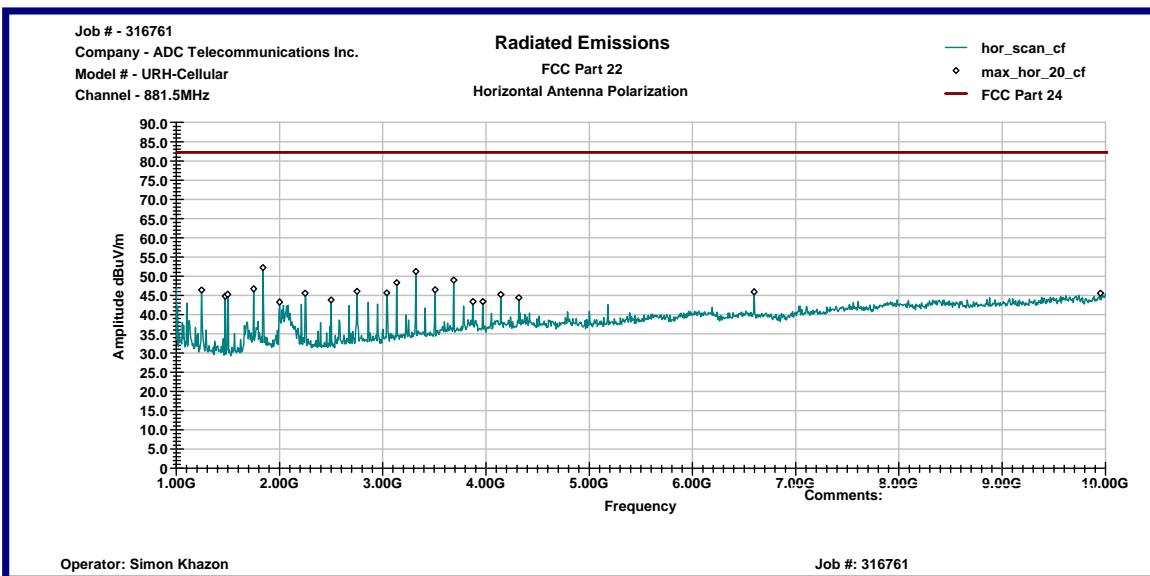
Graph 7



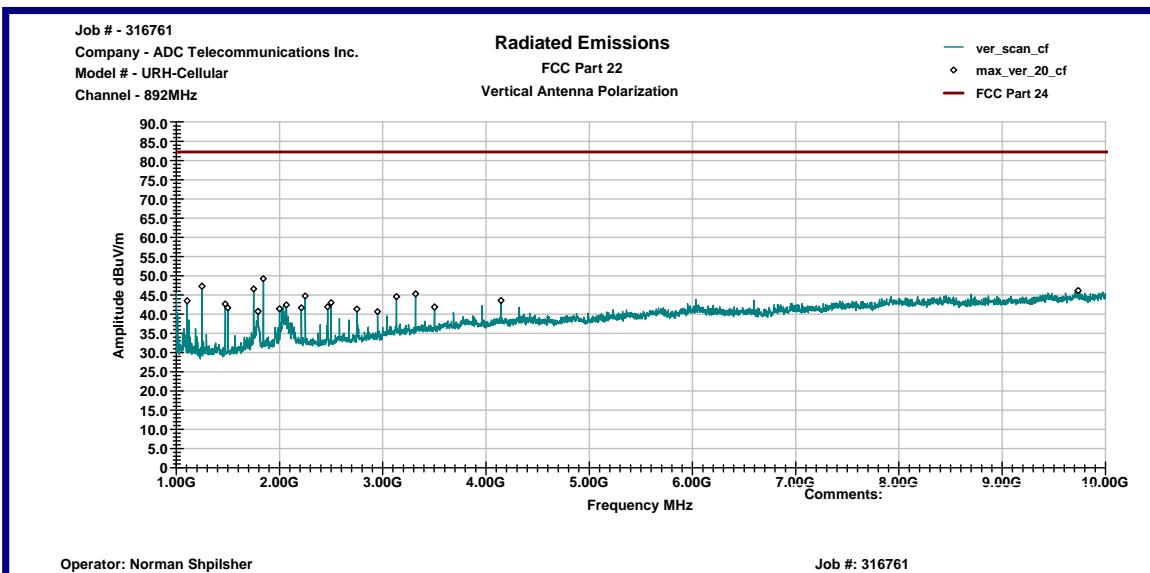
Graph 8



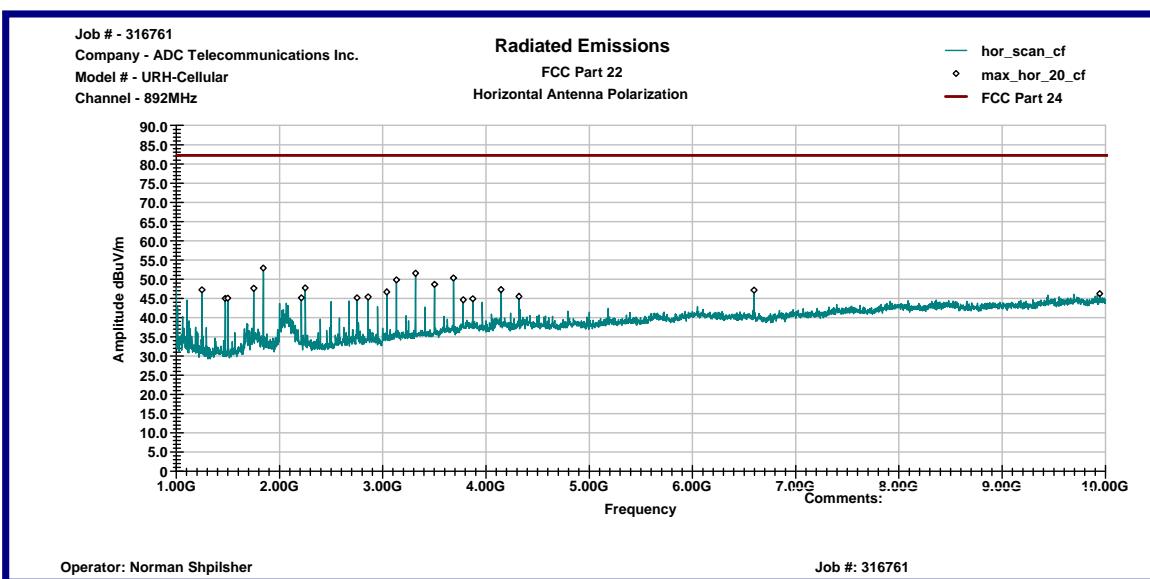
Graph 9



Graph 10



Graph 11



Graph 12

3.1 Environmental conditions

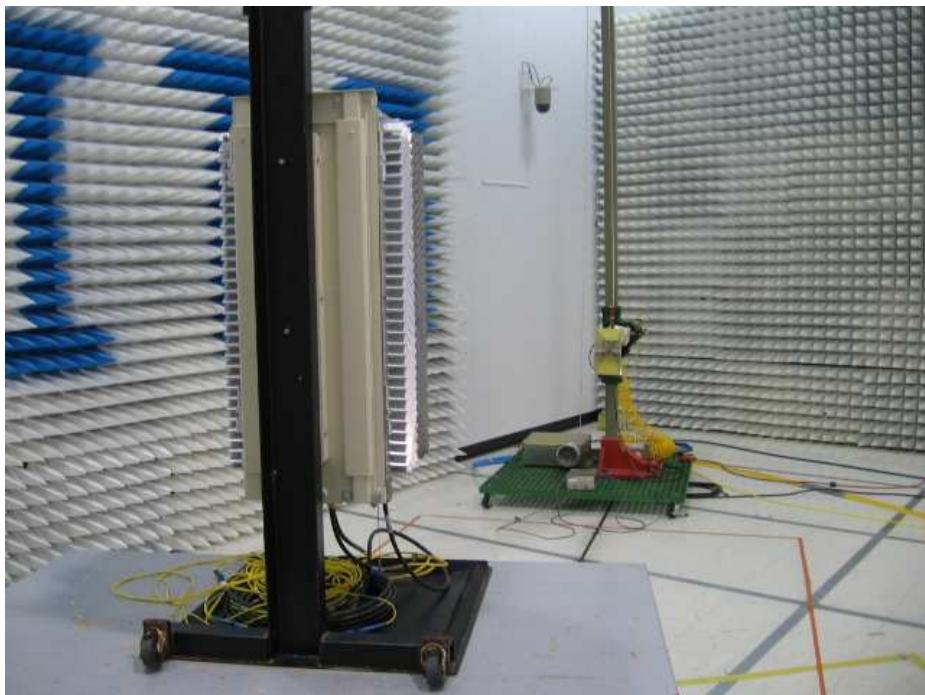
During the measurement the environmental conditions were within the listed ranges:

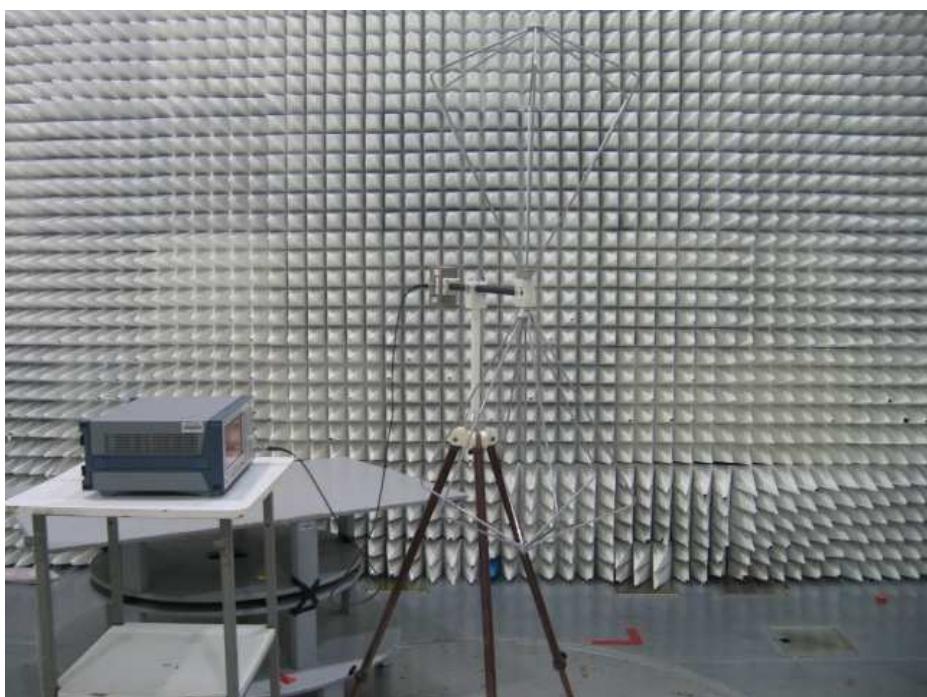
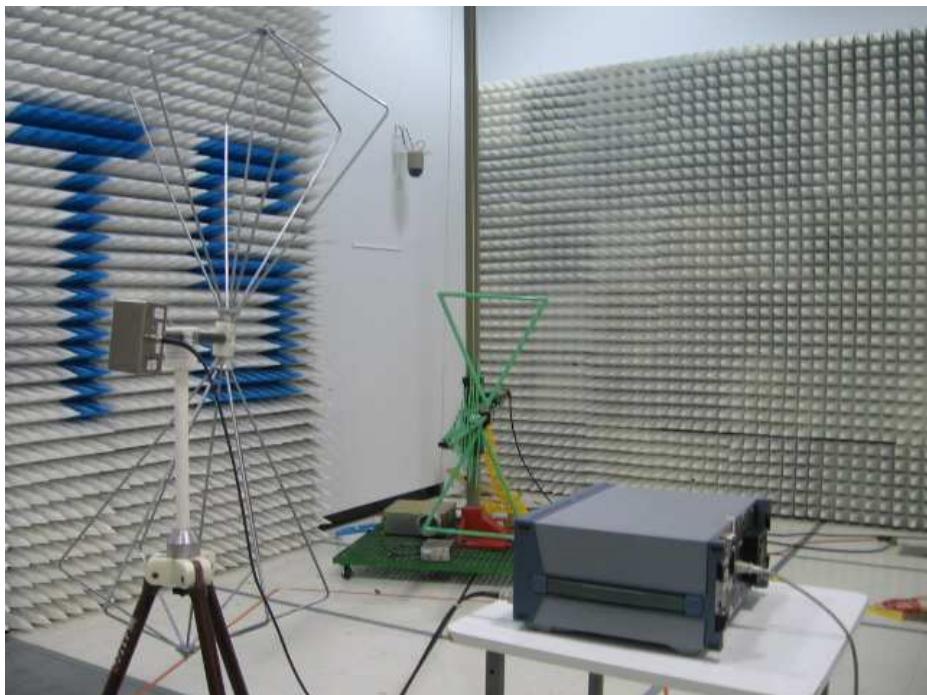
Temperature: 15-35 °C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

4.0 PHOTOS





5.0 TEST EQUIPMENT

Emissions Equipment

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	CAL DUE	USED
Receiver RF Section	HP	85462A	3549A00306	02/27/2008	<input type="checkbox"/>
RF Filter Section	HP	85460A	3448A00276	02/27/2008	<input type="checkbox"/>
Spectrum Analyzer	R & S	FSP 40	100024	08/23/2008	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESCI	100358	04/27/2008	<input checked="" type="checkbox"/>
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2630	08/29/2008	<input checked="" type="checkbox"/>
Horn Antenna	EMCO	3115	9507-4513	01/09/2008	<input checked="" type="checkbox"/>
Horn Antenna	EMCO	3115	6579	03/06/2008	<input type="checkbox"/>
Waveguide Horn Antenna	EMCO	3116	9904-2423	06/28/2008	<input checked="" type="checkbox"/>
Monopole Antenna	A.H.Systems	SAS-200/550-1	692	05/09/2008	<input type="checkbox"/>
LISN	Fischer Custom Communications	FCC-LISN-50-50-4.02	07005	01/30/2008	<input type="checkbox"/>
LISN	Fischer Custom Communications	FCC-TLISN-T4	15333.01	03/01/2008	<input type="checkbox"/>
RF Current Probe	Fischer Custom Communications	F-33-2	330	03/07/2008	<input type="checkbox"/>
Absorbing Clamp	Fischer Custom Communications	F-201	167	03/07/2008	<input type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1122951	04/24/2008	<input checked="" type="checkbox"/>
Pre-Amplifier	HP	8447F OPT H64	3113A04974	03/07/2008	<input type="checkbox"/>
System	TILE! Instrument Control		Ver. 3.4.K.29	VBU	<input checked="" type="checkbox"/>
5001ix	California Instruments System	5001	55864, 55863, 55862, 72277	11/09/2007	<input type="checkbox"/>
CTS 3.0.19	California Instruments Harmonic/Flicker Software	632		11/09/2007	<input type="checkbox"/>

8.0

APPENDIX C

Measurement Protocol

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Measurement Protocol

Environmental conditions of the lab, (ADC)

Temperature: 21 - 26° C

Relative Humidity: 21 - 24 %

Atmospheric Pressure: 97.8 - 100.0 kPa

Test Methodology:

Emission testing is performed according to the procedures in ANSI C63.4-2003.

Measurement Uncertainty

The test system for conducted emissions is defined as the signal generator(s), the power meter, the spectrum analyzer and the coaxial cable. The equipment comprising the test systems is calibrated prior to testing the EUT.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left un-terminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

Radiated Emissions

The final level, in dBuV/m, equals the reading from the spectrum analyzer (Level dBuV), adding the antenna correction factor and cable loss factor (Factor dB) to it, and subtracting the preamp gain (and duty cycle correction factor, if applicable). This result then has the limit subtracted from it to provide the Delta, which gives the tabular data as shown in the data sheets in Appendix B.

Example:

FREQ (MHz)	LEVEL (dBuV)	CABLE/ANT/PREAMP (dB)	FINAL (dB/m)	POL/HGT/AZ (m) (deg)	DELTA1
60.80	42.5Qp +	1.2 + 10.9 - 25.5	= 29.1	V 1.0 0.0	-10.9

Substitution Method

A cabinet (or enclosure) radiated emission scan was also made, at Intertek, with the EUT's antenna replaced with a termination to demonstrate case radiation compliance to the -13 dBm requirement. Radiated emissions from the EUT are measured in the frequency range of 30 to 20,000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is place directly on the turntable/ground plane. Interface cable that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees. The field strength levels were measured per ANSI C63.4. The EUT is then replaced with a tuned dipole antenna (below 1GHz) or horn antenna (above 1 GHz). The substitute antenna was placed in the same polarization as the test antenna. A signal generator was used to generate a signal level that matched the highest level measured from the EUT. The signal generator level minus the cable loss from the signal generator to the substitute antenna plus the substitute antenna gain equals the spurious power level.

Test Equipment

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.