

Inter-Modulation Test for ADC Inc Bi-Directional Amplifier – Cellular Model Number RPT-SBAAA12000

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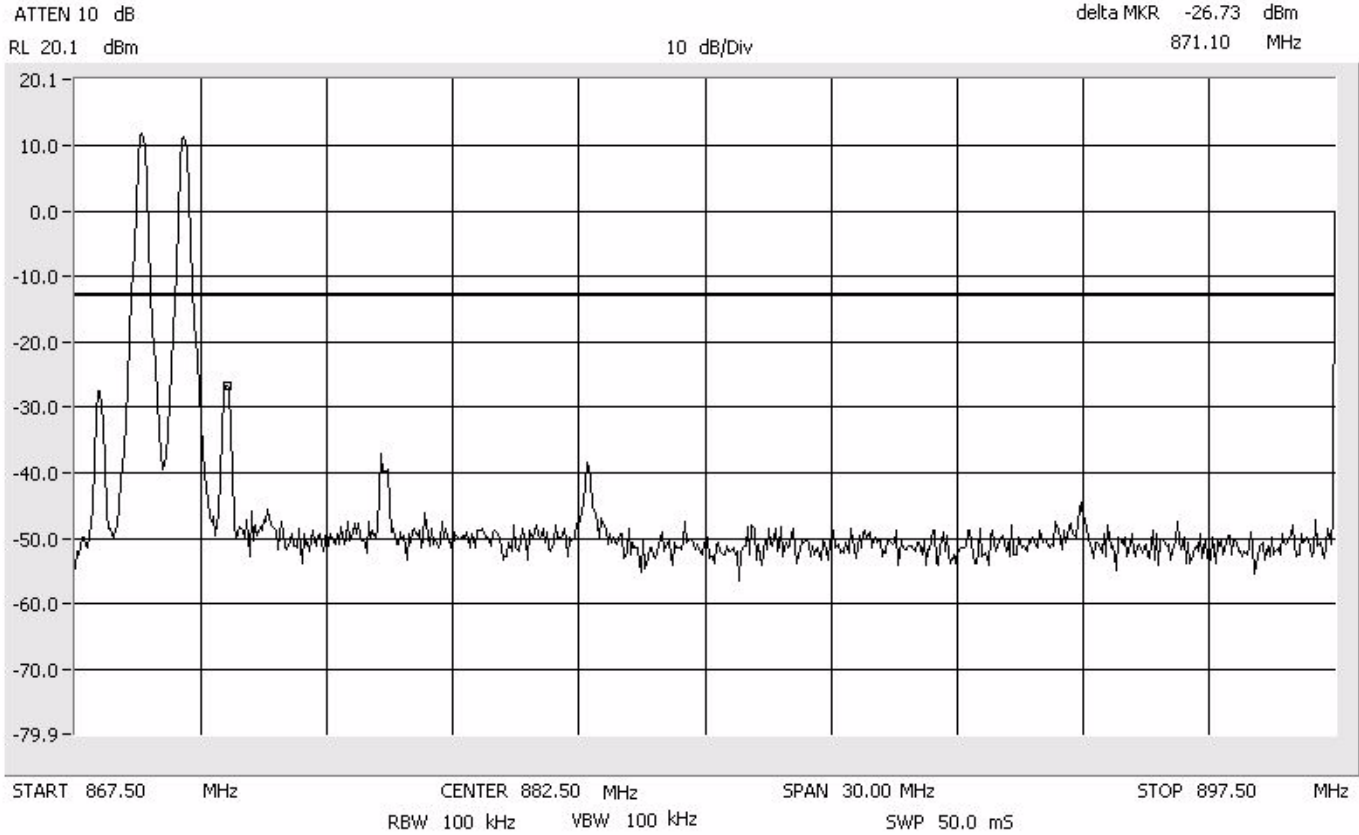
The inter-modulation products test was performed for the EUT. Three tests were performed with the modulation type. Test 1 was with 2 signals input to the EUT at lower end channels. Test 2 was with 2 signals input to the EUT at upper end channels. Test 3 was with 2 signals input to the EUT at upper and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

Results:
(See Plots)

FM

Intermodulation Close - Lower Cellular 800 MHz

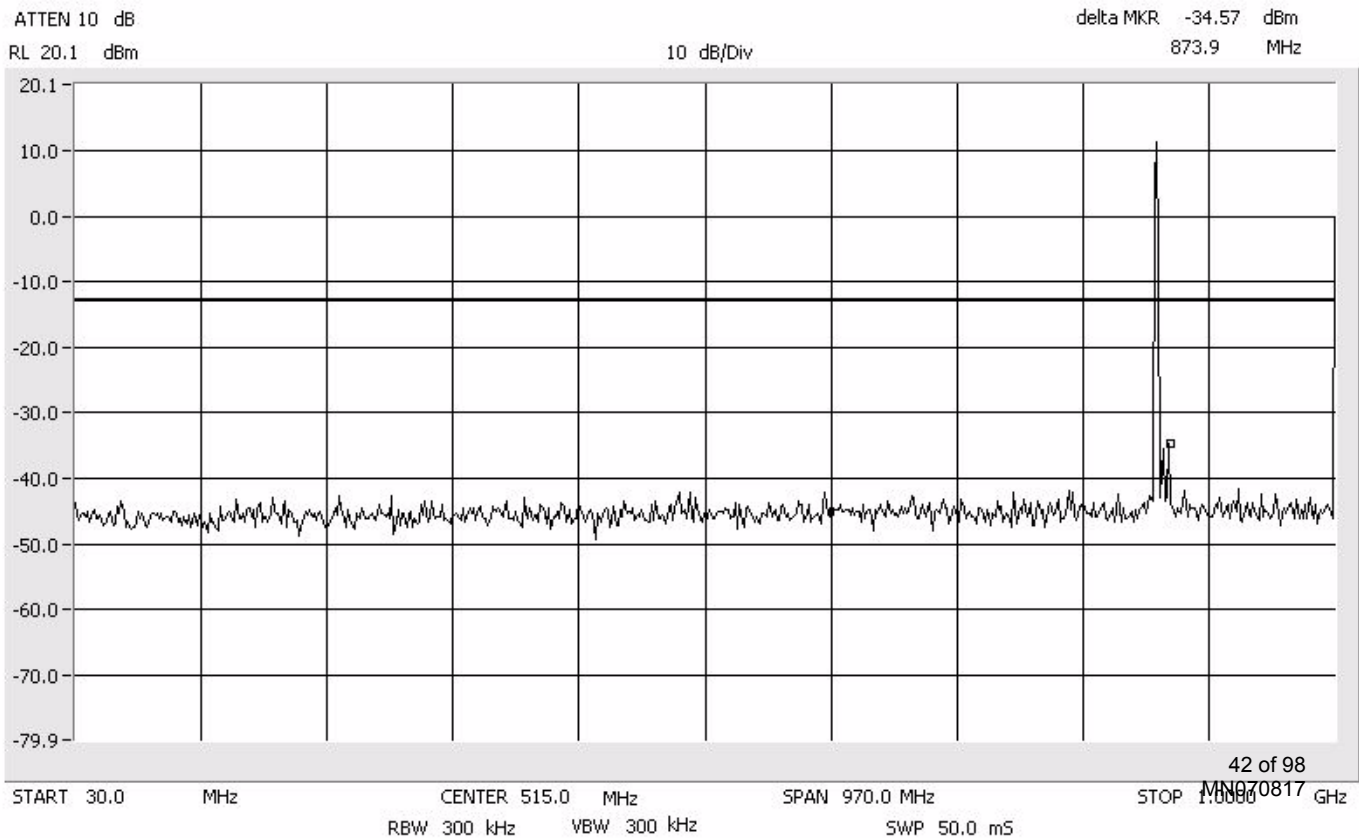
Center: 882.5 MHz
Span: 30 MHz
RBW/VBW: 100 kHz



FM

Intermodulation Close - Lower Cellular 800 MHz

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



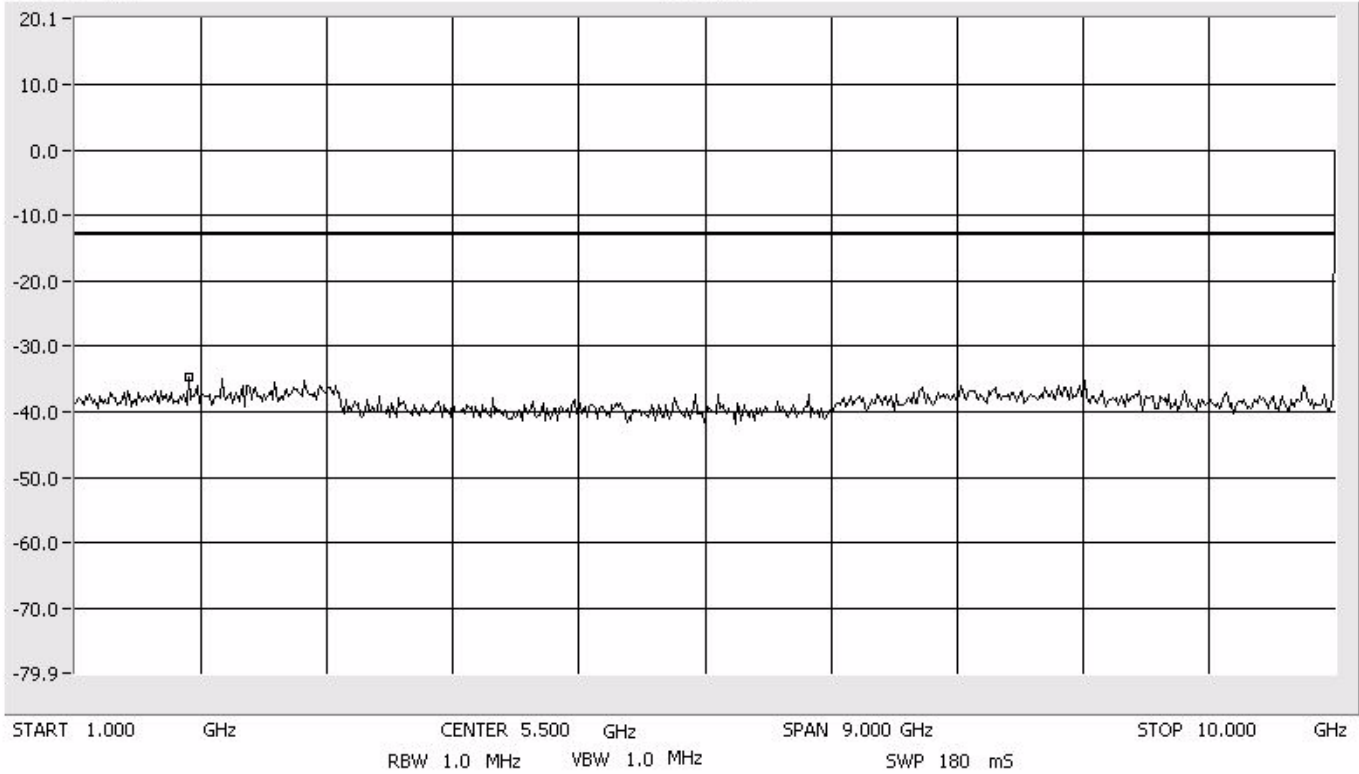
Intermodulation Close - Lower Cellular 800 MHz

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

ATTEN 10 dB
RL 20.1 dBm

delta MKR -34.73 dBm
1.810 GHz

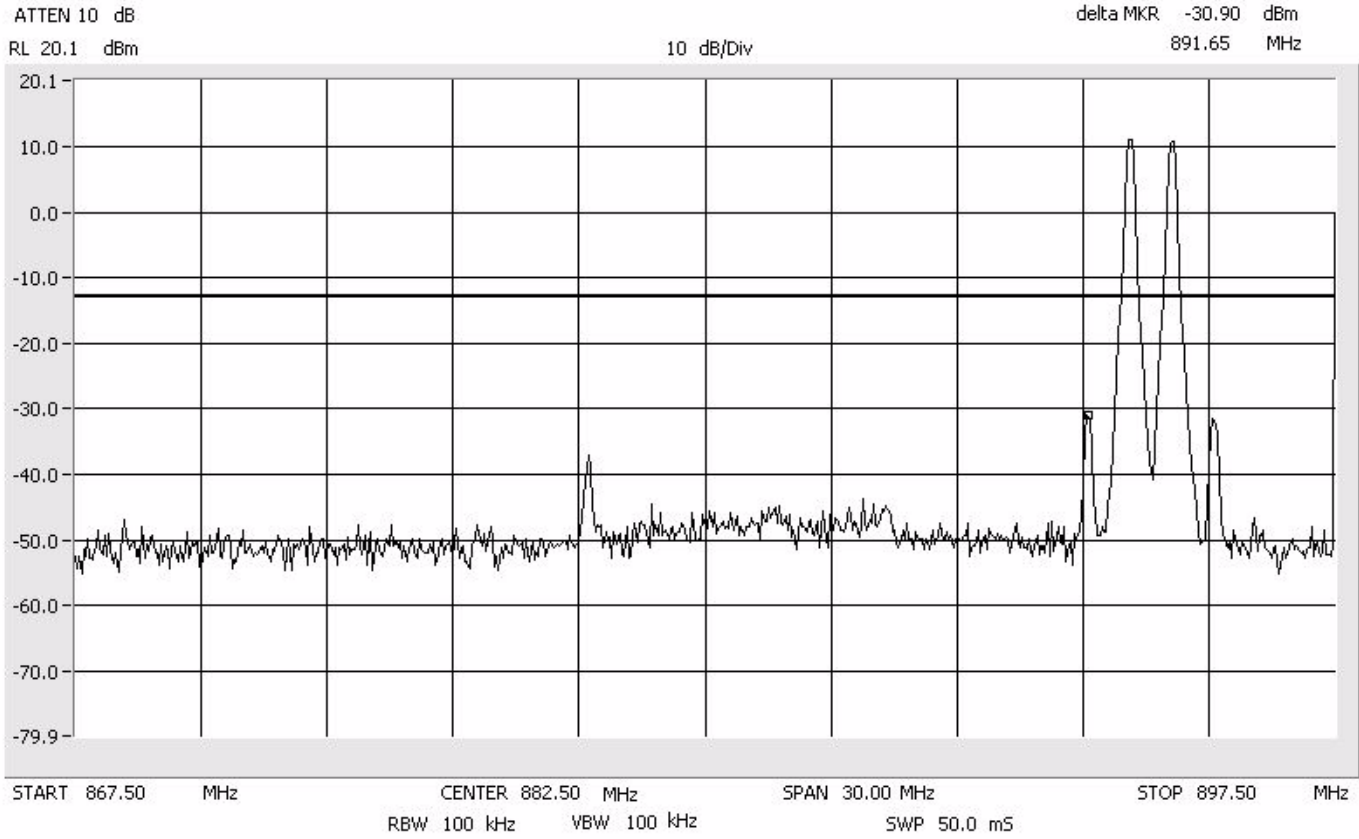
10 dB/Div



FM

Intermodulation Close - Upper Cellular 800 MHz

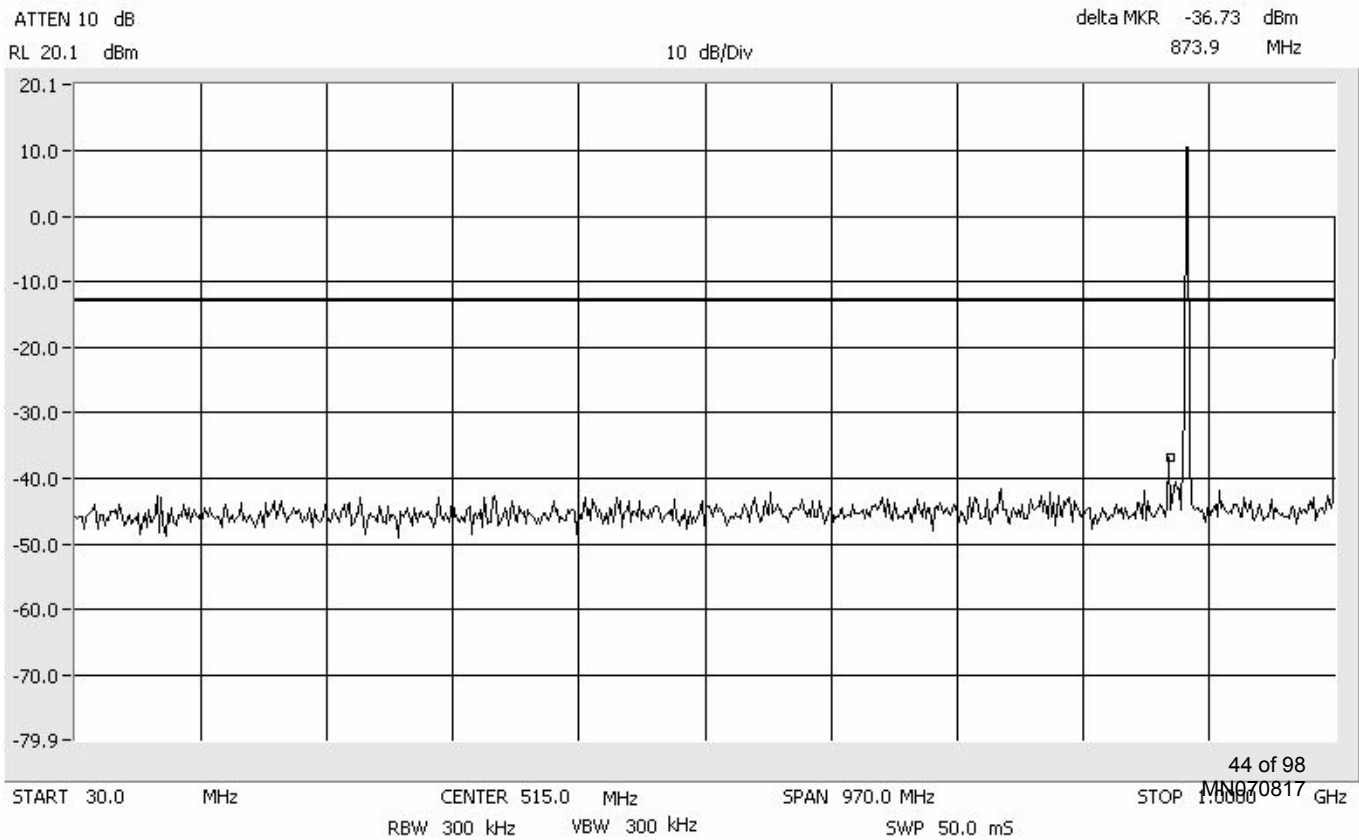
Center: 882.5 MHz
Span: 30 MHz
RBW/VBW: 100 kHz



FM

Intermodulation Close - Upper Cellular 800 MHz

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



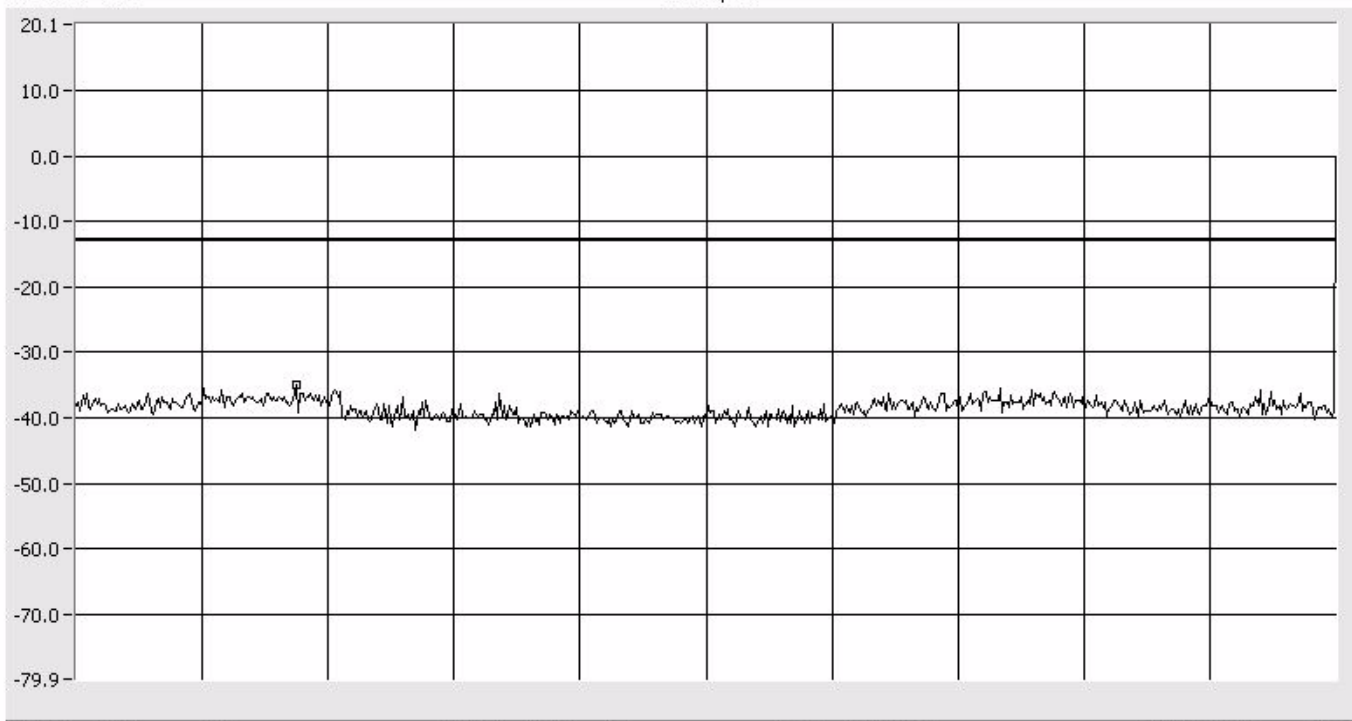
Intermodulation Close - Upper Cellular 800 MHz

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

ATTEN 10 dB
RL 20.1 dBm

delta MKR -35.07 dBm
2.575 GHz

10 dB/Div

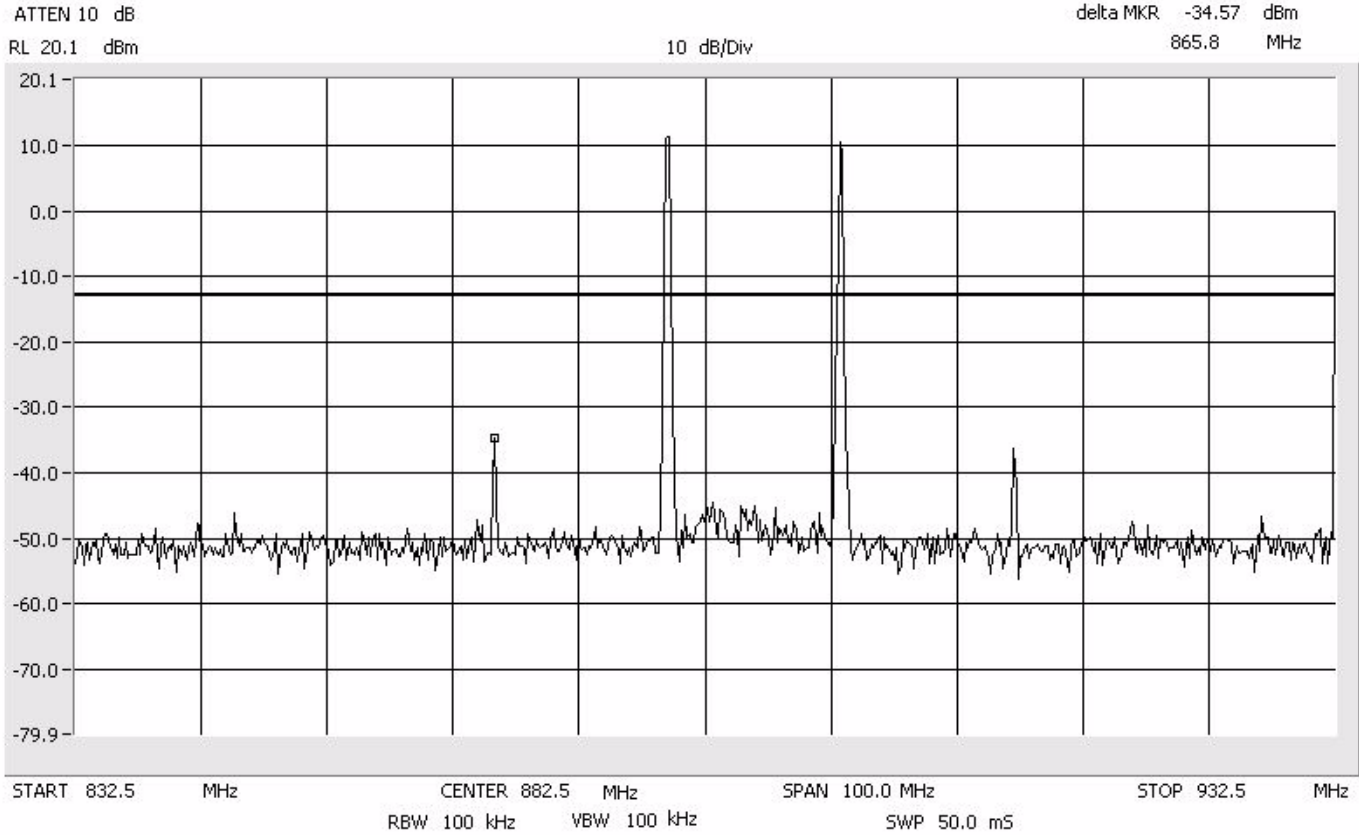


START 1.000 GHz CENTER 5.500 GHz SPAN 9.000 GHz STOP 10.000 GHz
RBW 1.0 MHz VBW 1.0 MHz SWP 180 mS

FM

Intermodulation Apart Cellular 800 MHz

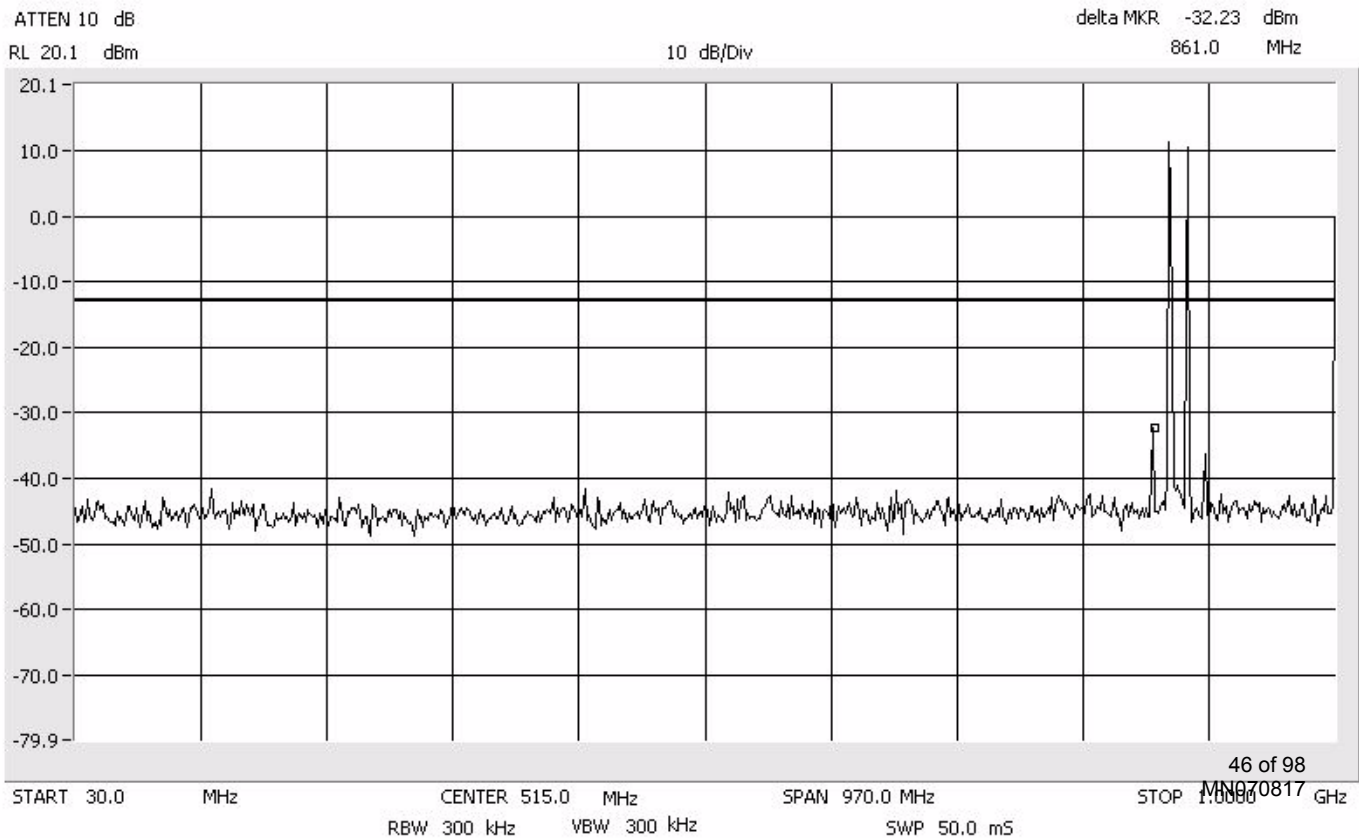
Center: 882.5 MHz
Span: 100 MHz
RBW/VBW: 100 kHz



FM

Intermodulation Apart Cellular 800 MHz

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



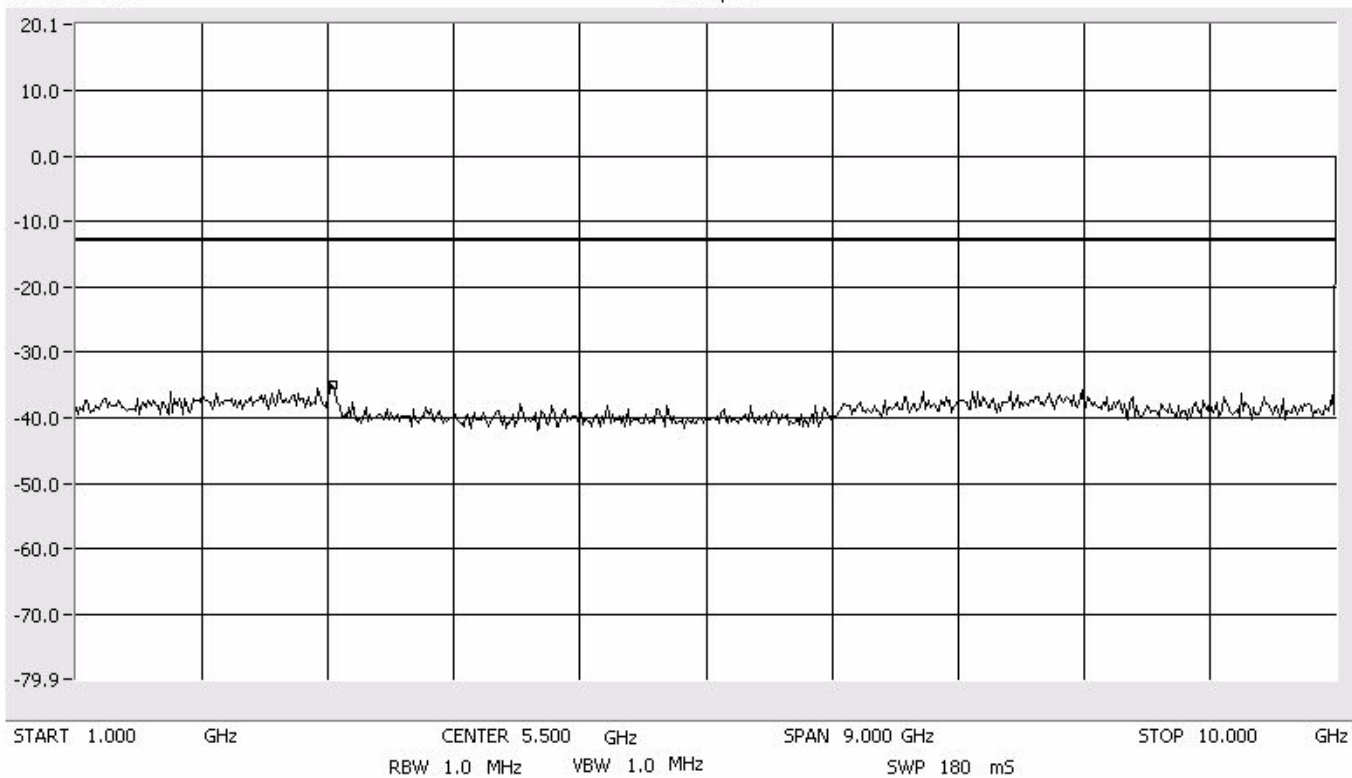
Intermodulation Apart Cellular 800 MHz

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

ATTEN 10 dB
RL 20.1 dBm

10 dB/Div

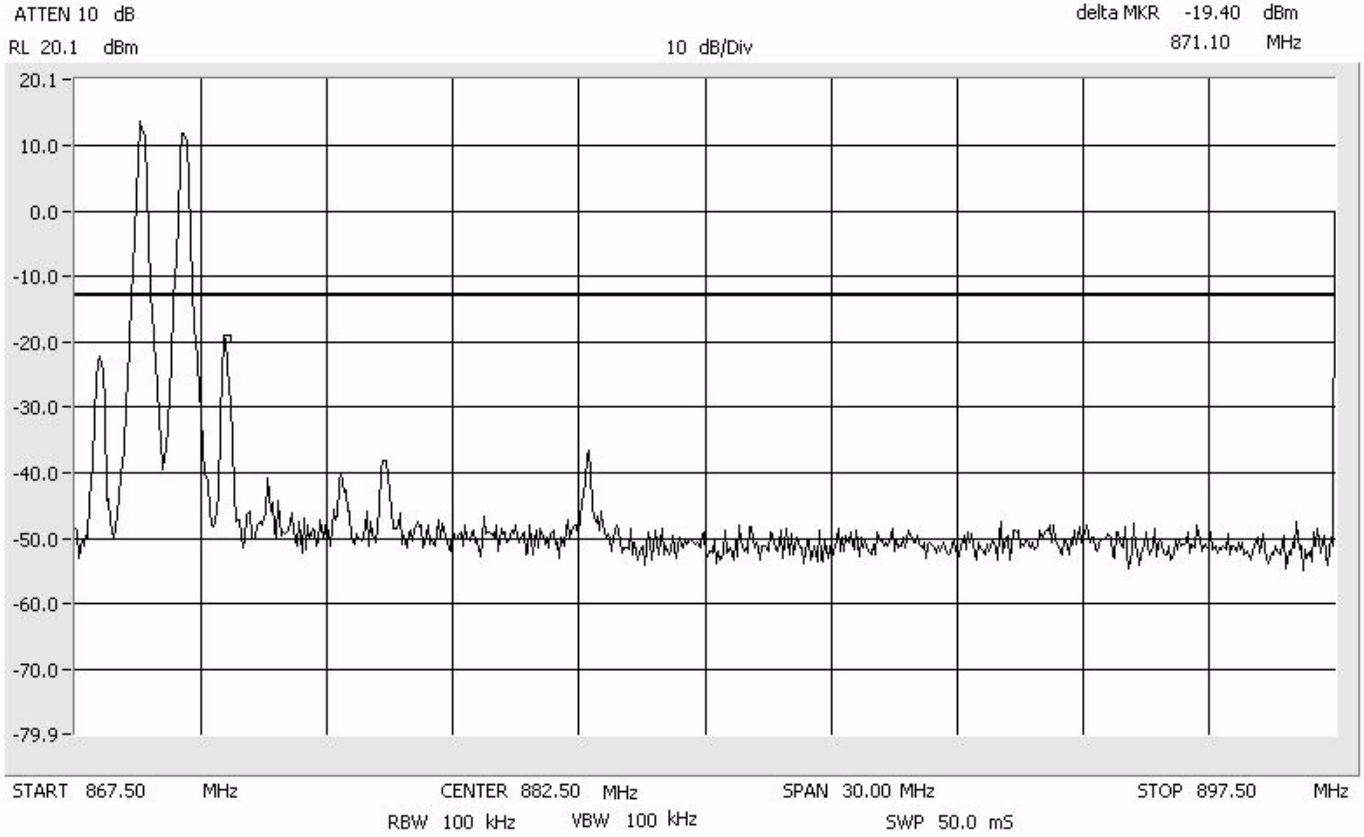
delta MKR -35.07 dBm
2.830 GHz



TDMA

Intermodulation Close - Lower Cellular 800 MHz

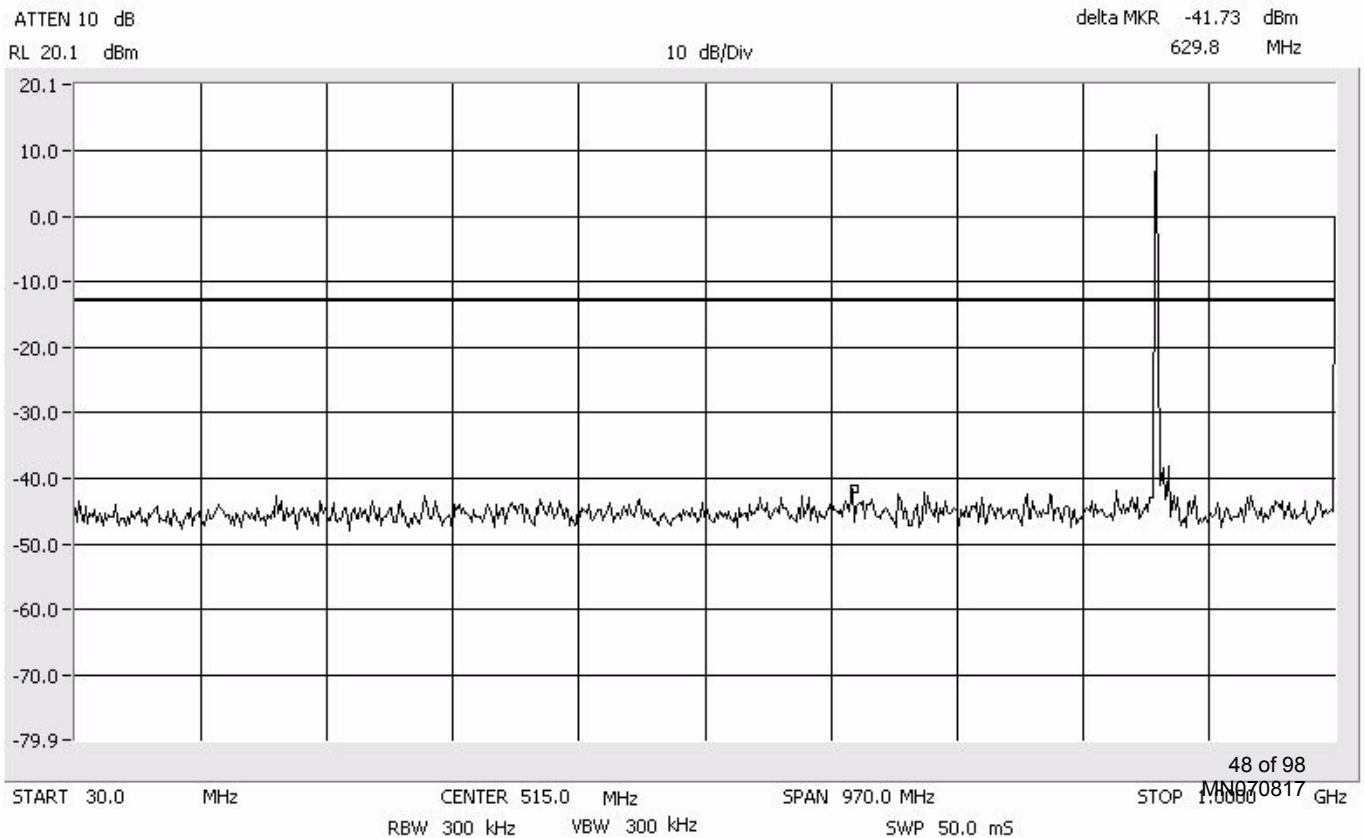
Center: 882.5 MHz
Span: 30 MHz
RBW/VBW: 100 kHz



TDMA

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

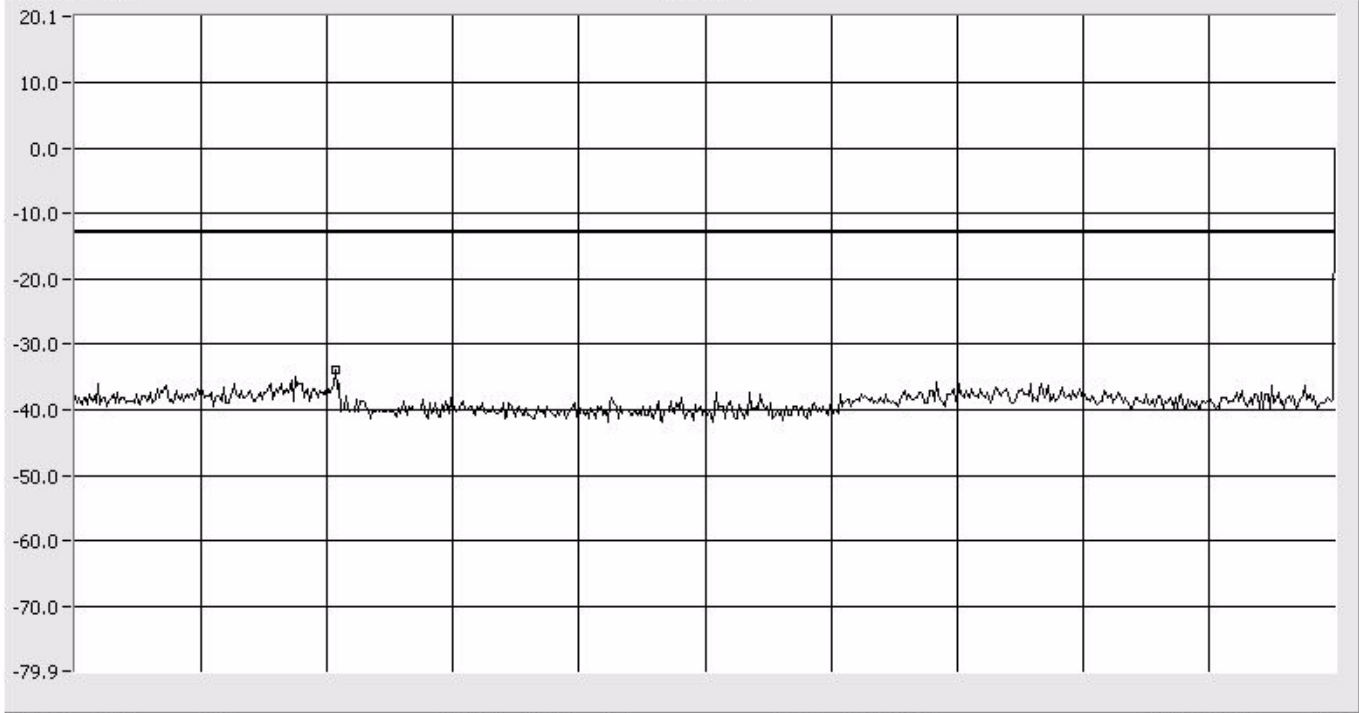
ATTEN 10 dB

delta MKR -33.90 dBm

RL 20.1 dBm

10 dB/Div

2.860 GHz

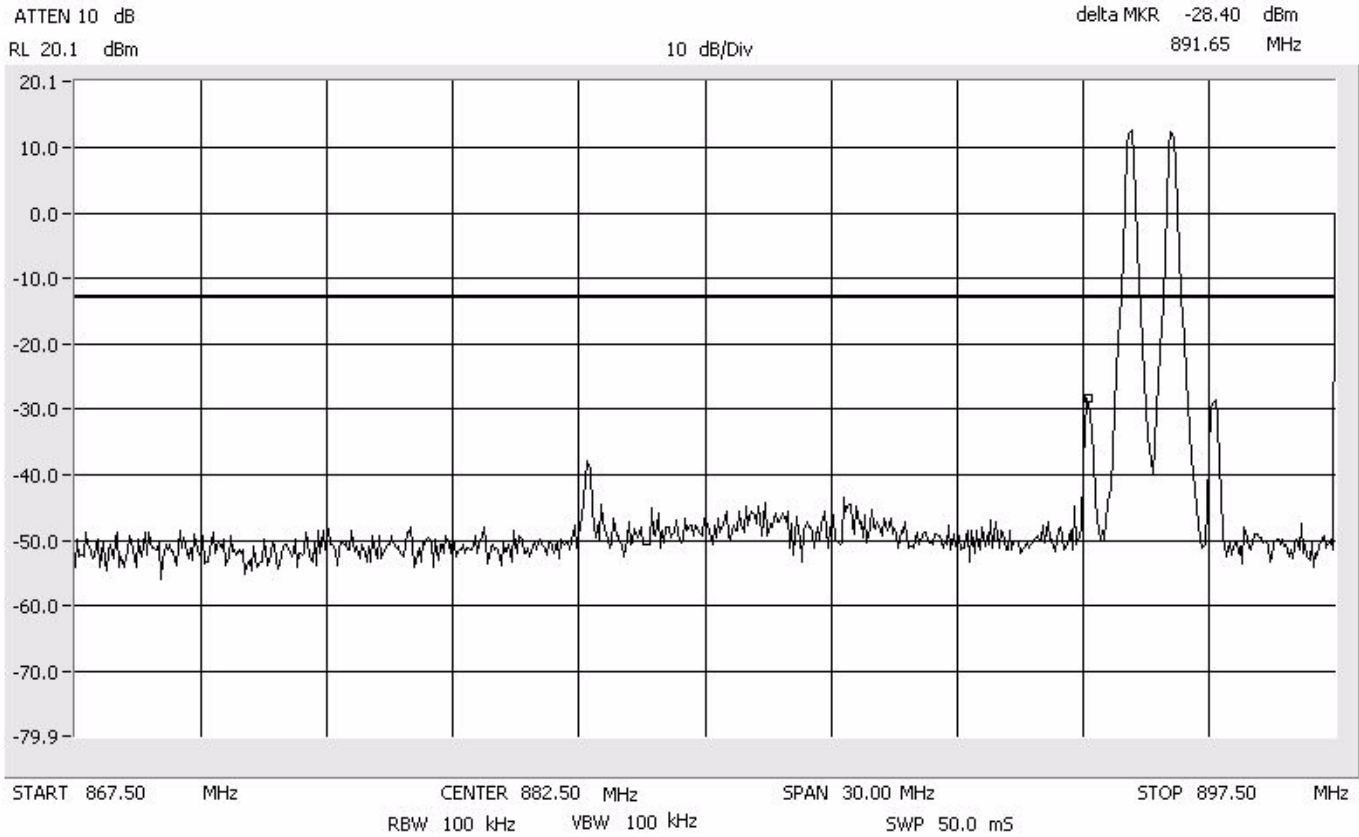


START 1.000 GHz CENTER 5.500 GHz SPAN 9.000 GHz STOP 10.000 GHz
RBW 1.0 MHz VBW 1.0 MHz SWP 180 mS

TDMA

Intermodulation Close - Upper Cellular 800 MHz

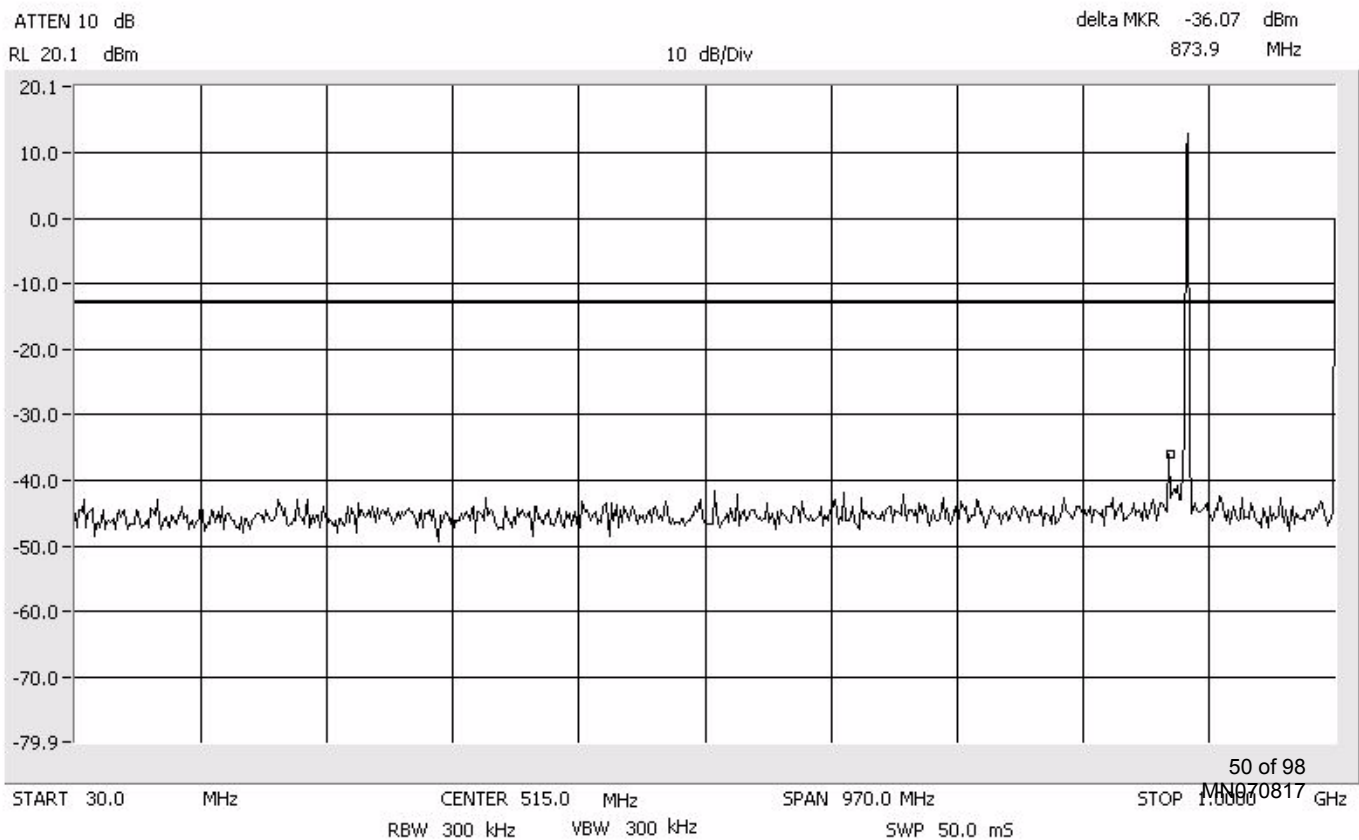
Center: 882.5 MHz
Span: 30 MHz
RBW/VBW: 100 kHz



TDMA

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

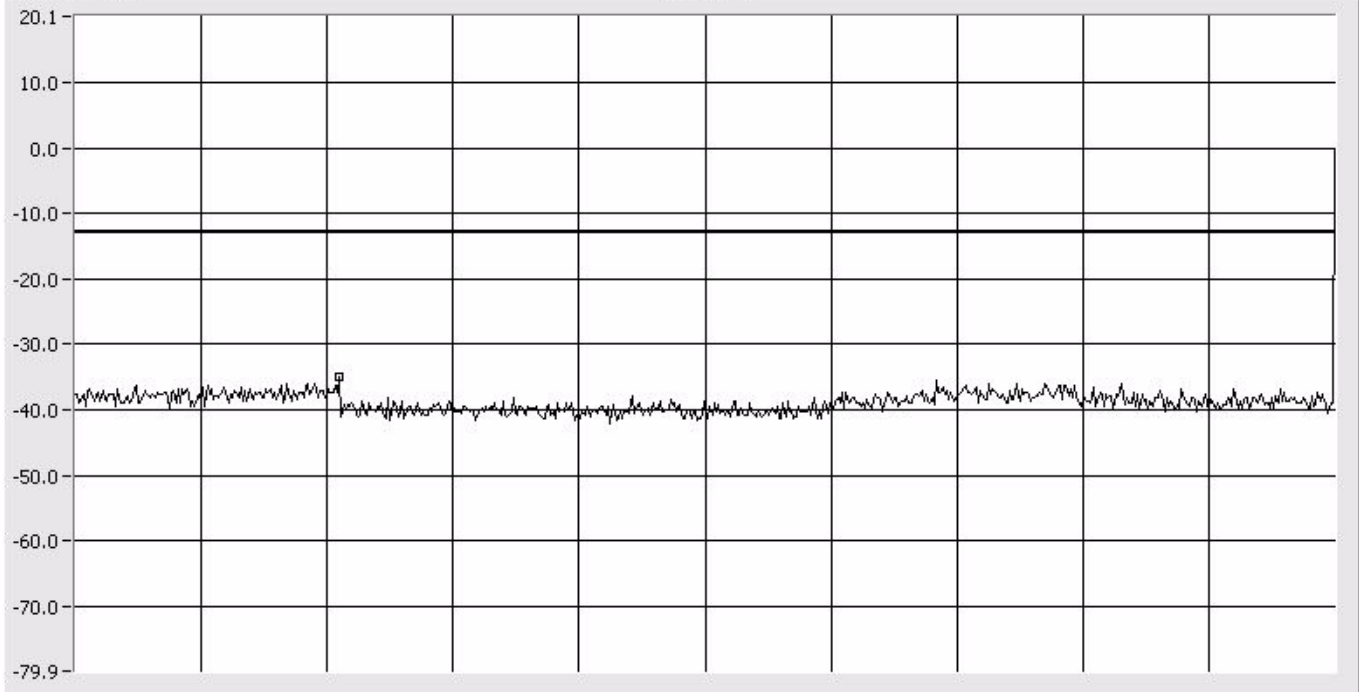
ATTEN 10 dB

RL 20.1 dBm

10 dB/Div

delta MKR -35.07 dBm

2.890 GHz

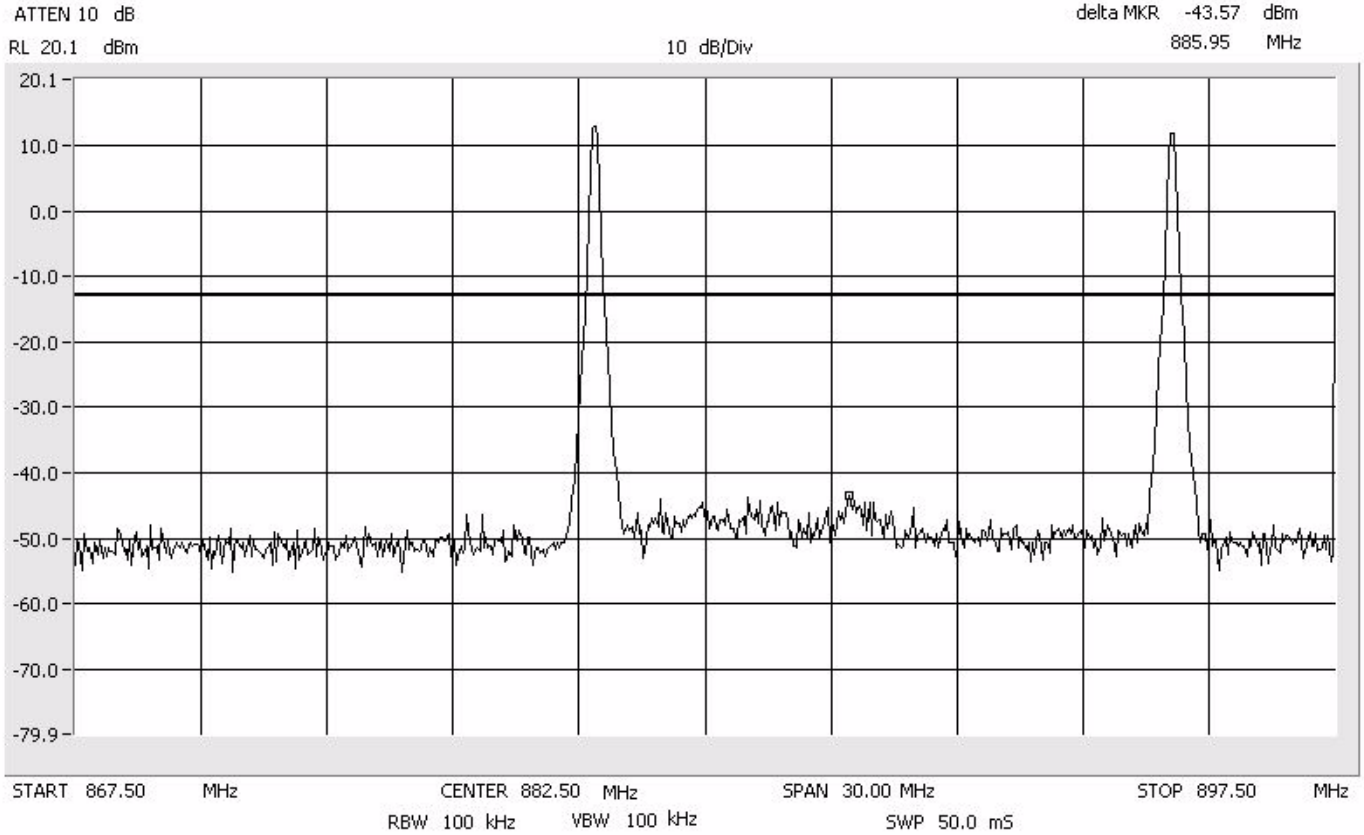


START 1.000 GHz CENTER 5.500 GHz SPAN 9.000 GHz STOP 10.000 GHz
RBW 1.0 MHz VBW 1.0 MHz SWP 180 mS

TDMA

Intermodulation Apart Cellular 800 MHz

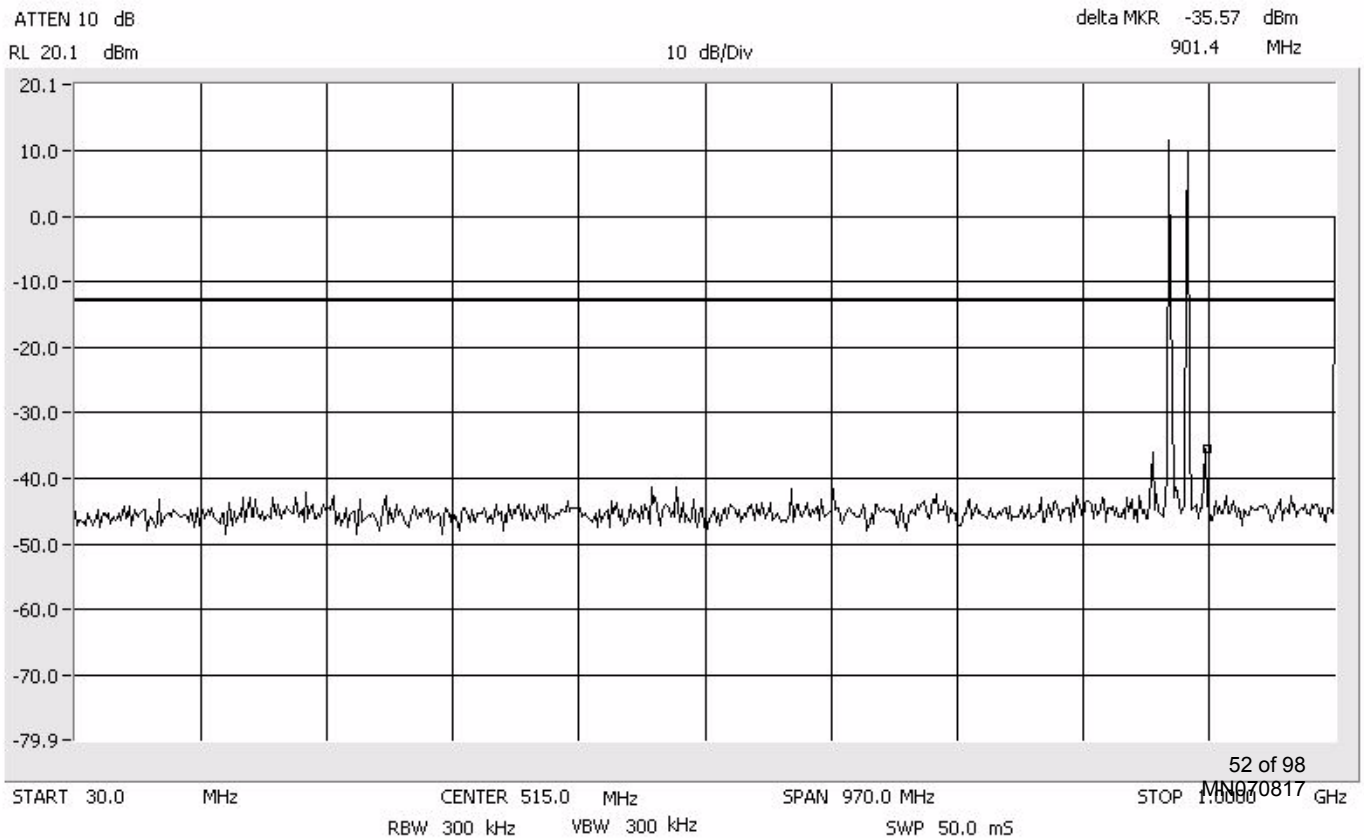
Center: 882.5 MHz
Span: 100 MHz
RBW/VBW: 100 kHz



TDMA

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

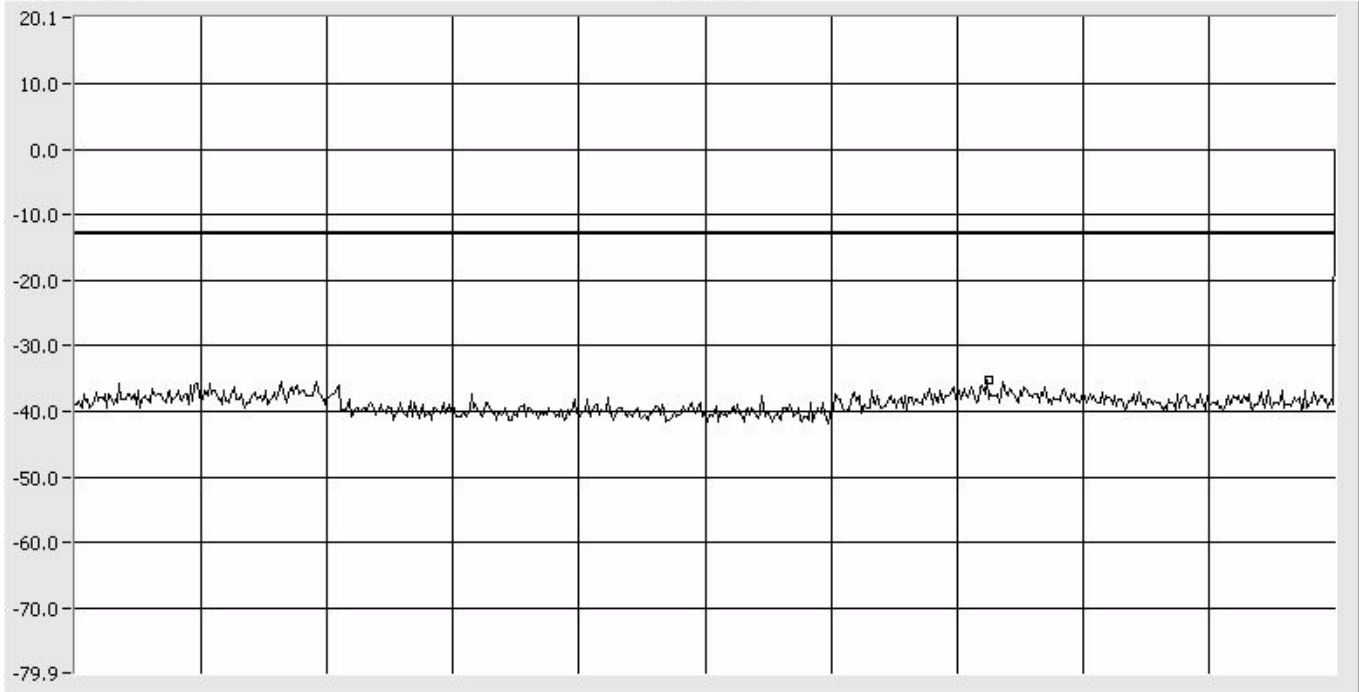
ATTEN 10 dB

RL 20.1 dBm

10 dB/Div

delta MKR -35.23 dBm

7.525 GHz

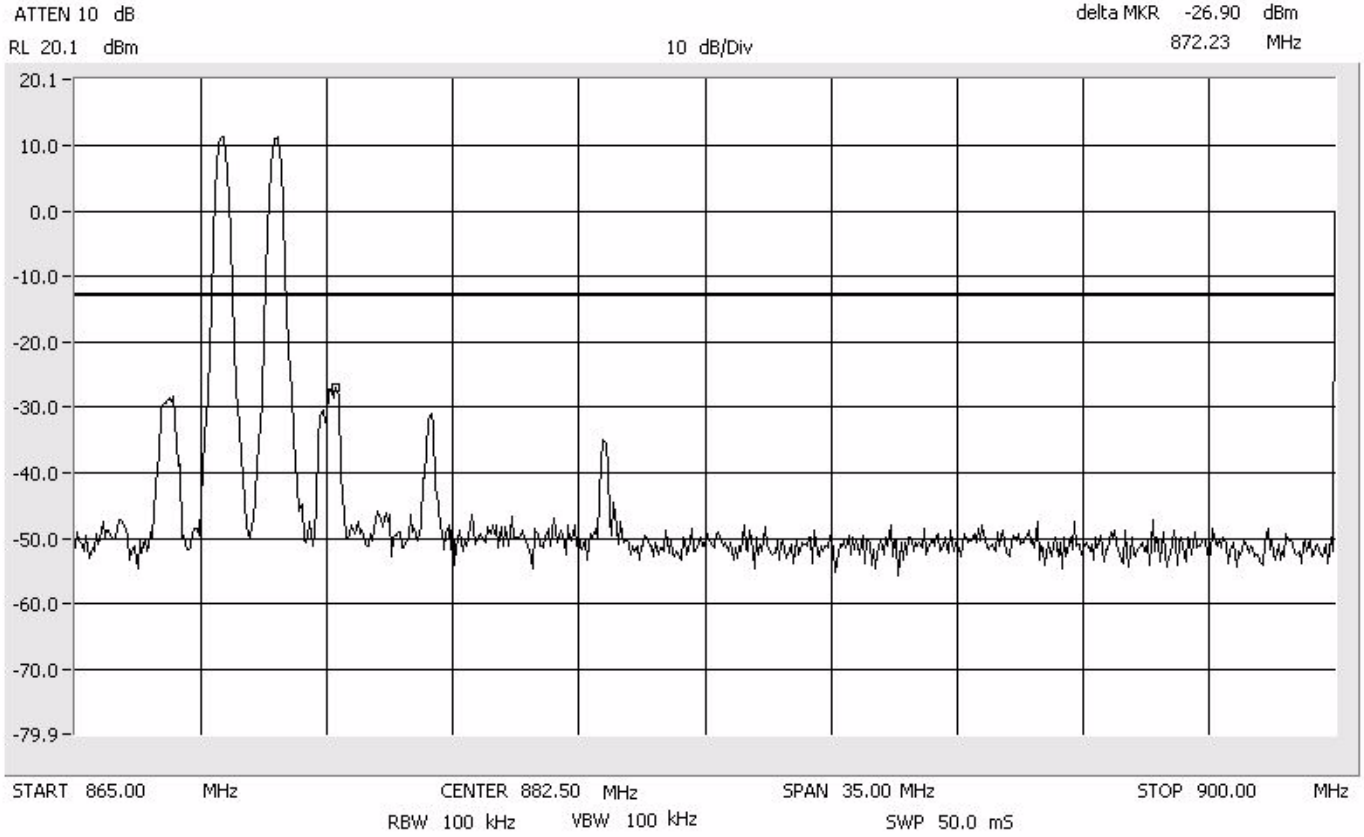


START 1.000 GHz CENTER 5.500 GHz SPAN 9.000 GHz STOP 10.000 GHz
RBW 1.0 MHz VBW 1.0 MHz SWP 180 mS

GSM

Intermodulation Close - Lower Cellular 800 MHz

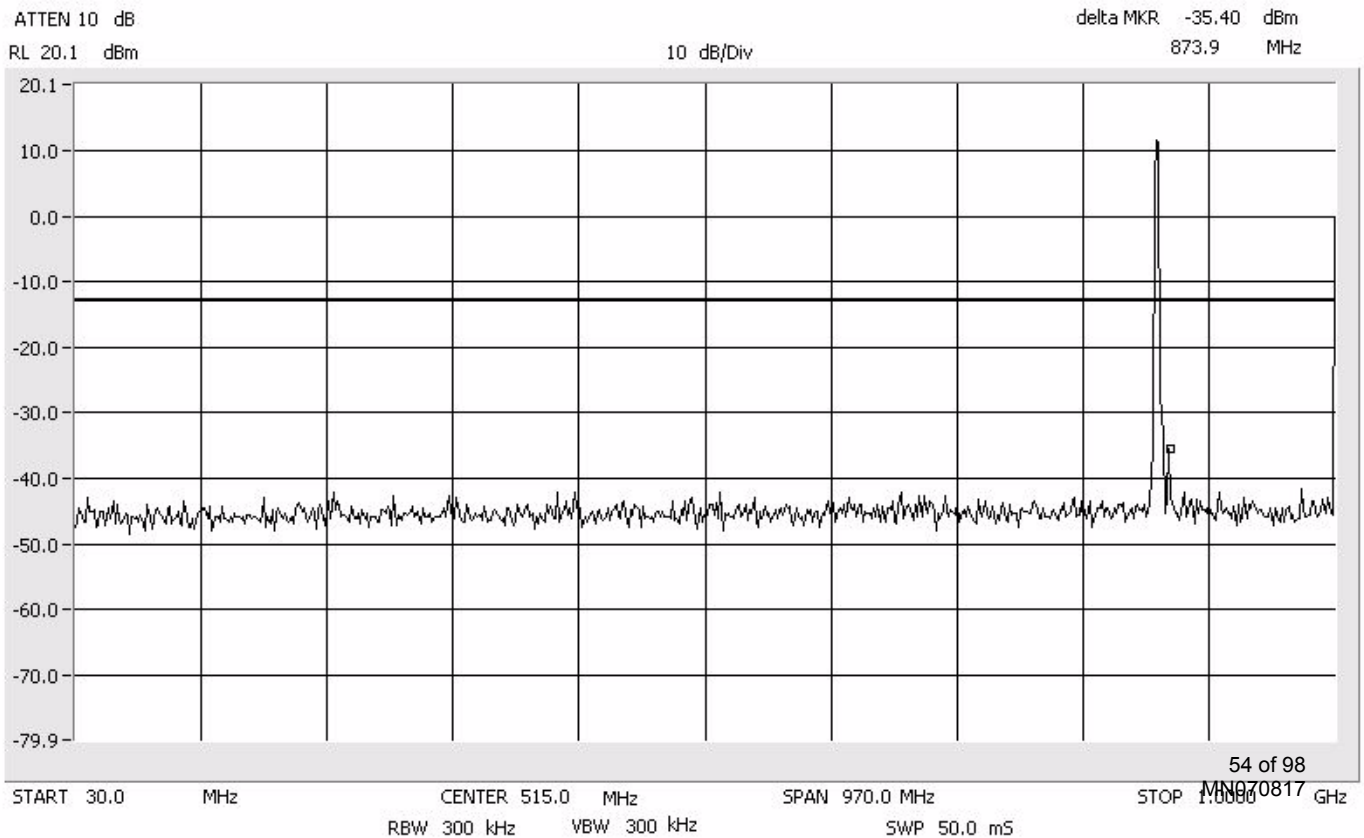
Center: 882.5 MHz
Span: 35 MHz
RBW/VBW: 100 kHz



GSM

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

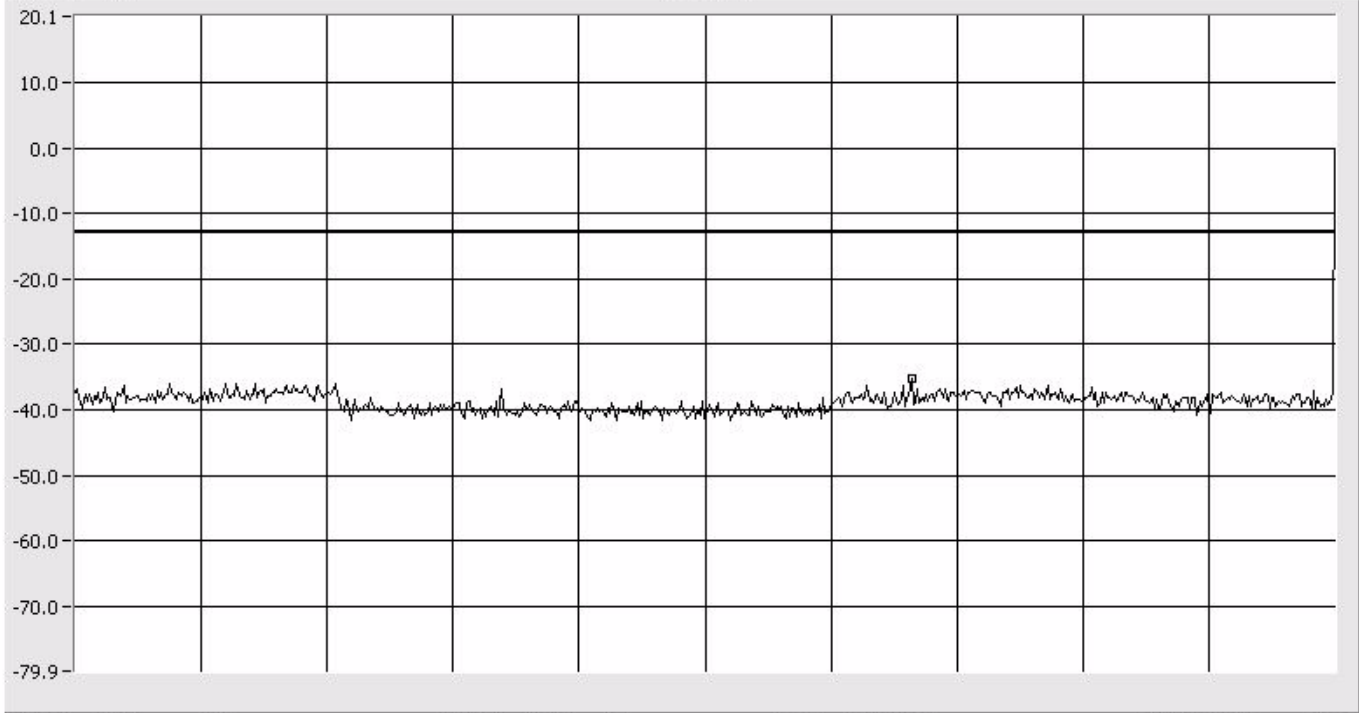
ATTEN 10 dB

RL 20.1 dBm

10 dB/Div

delta MKR -35.23 dBm

6.985 GHz

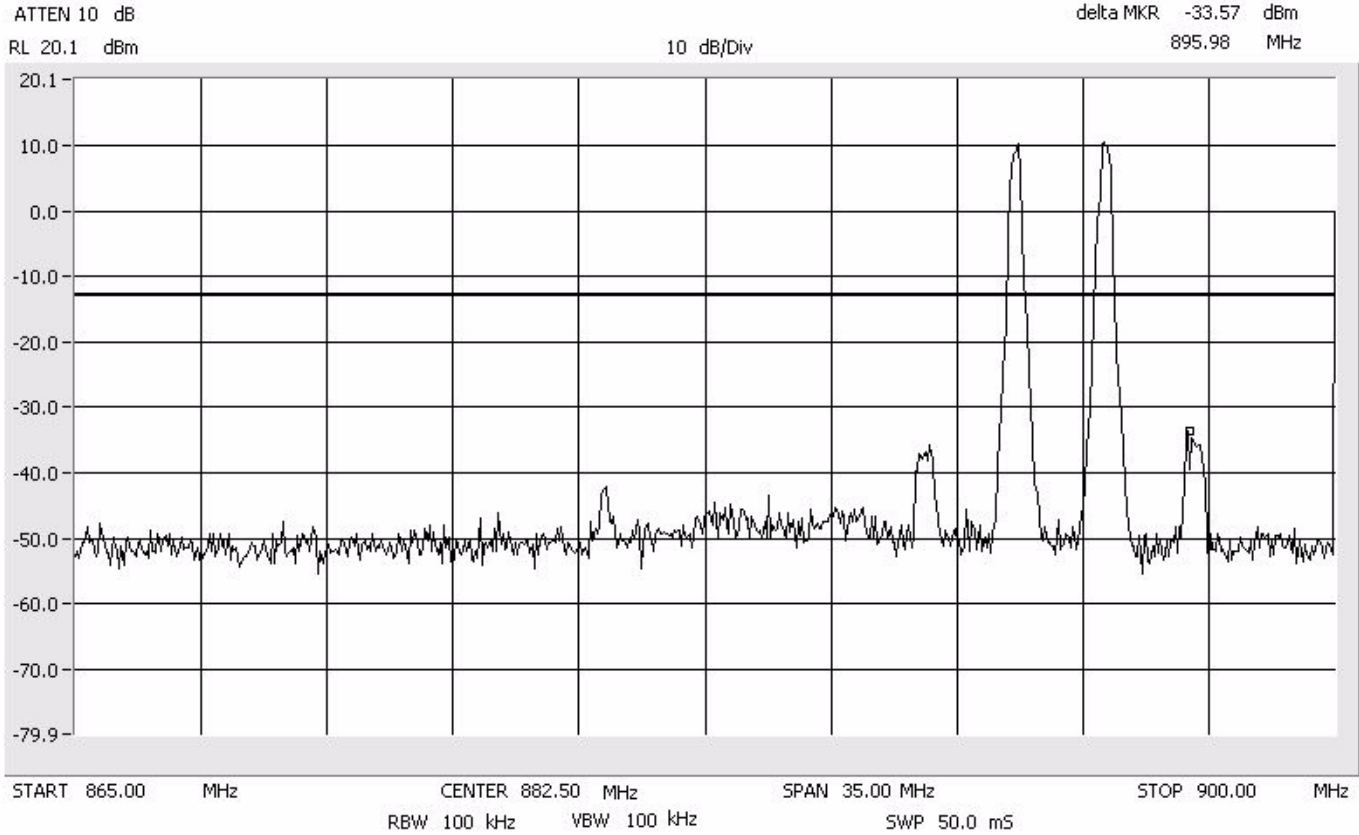


START 1.000 GHz CENTER 5.500 GHz SPAN 9.000 GHz STOP 10.000 GHz
RBW 1.0 MHz VBW 1.0 MHz SWP 180 mS

GSM

Intermodulation Close - Upper Cellular 800 MHz

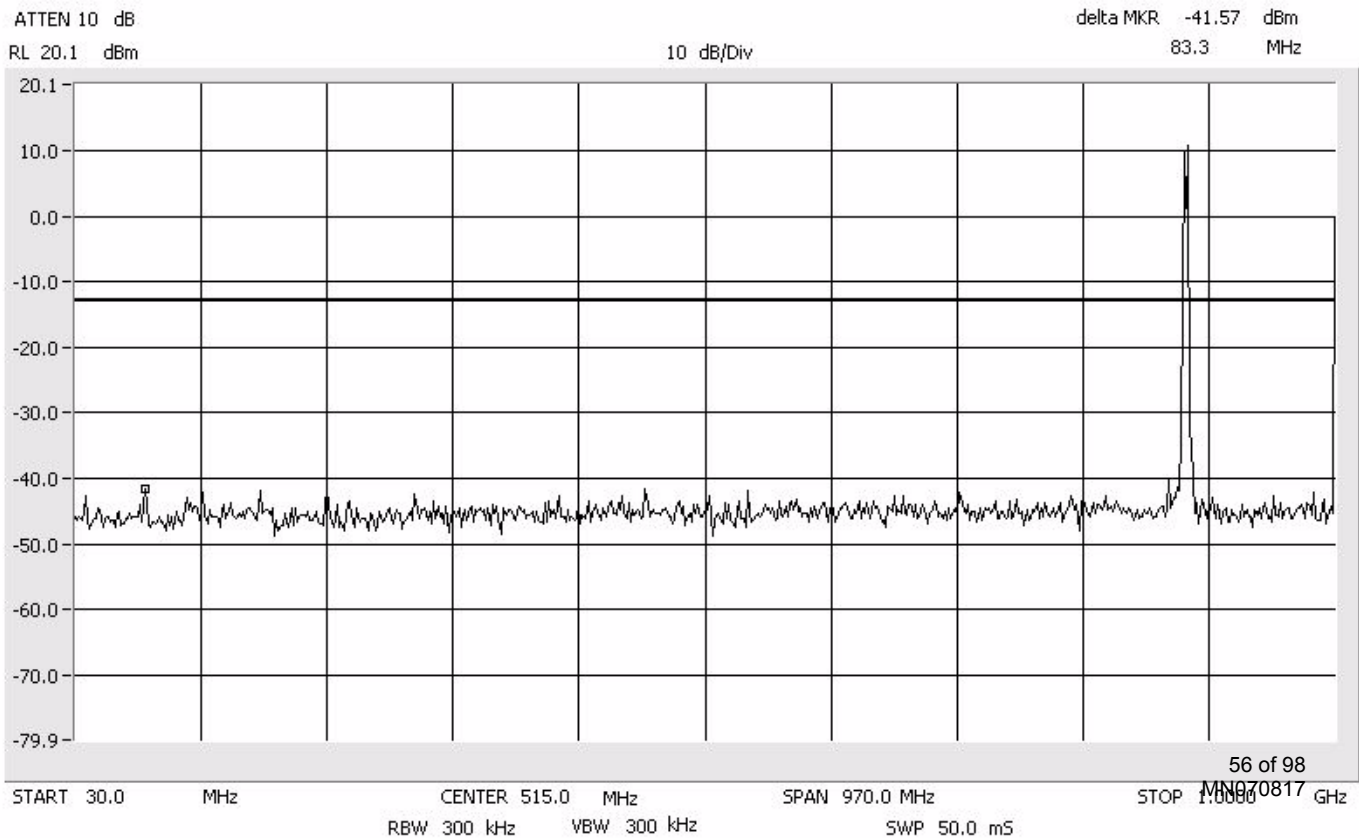
Center: 882.5 MHz
Span: 35 MHz
RBW/VBW: 100 kHz



GSM

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

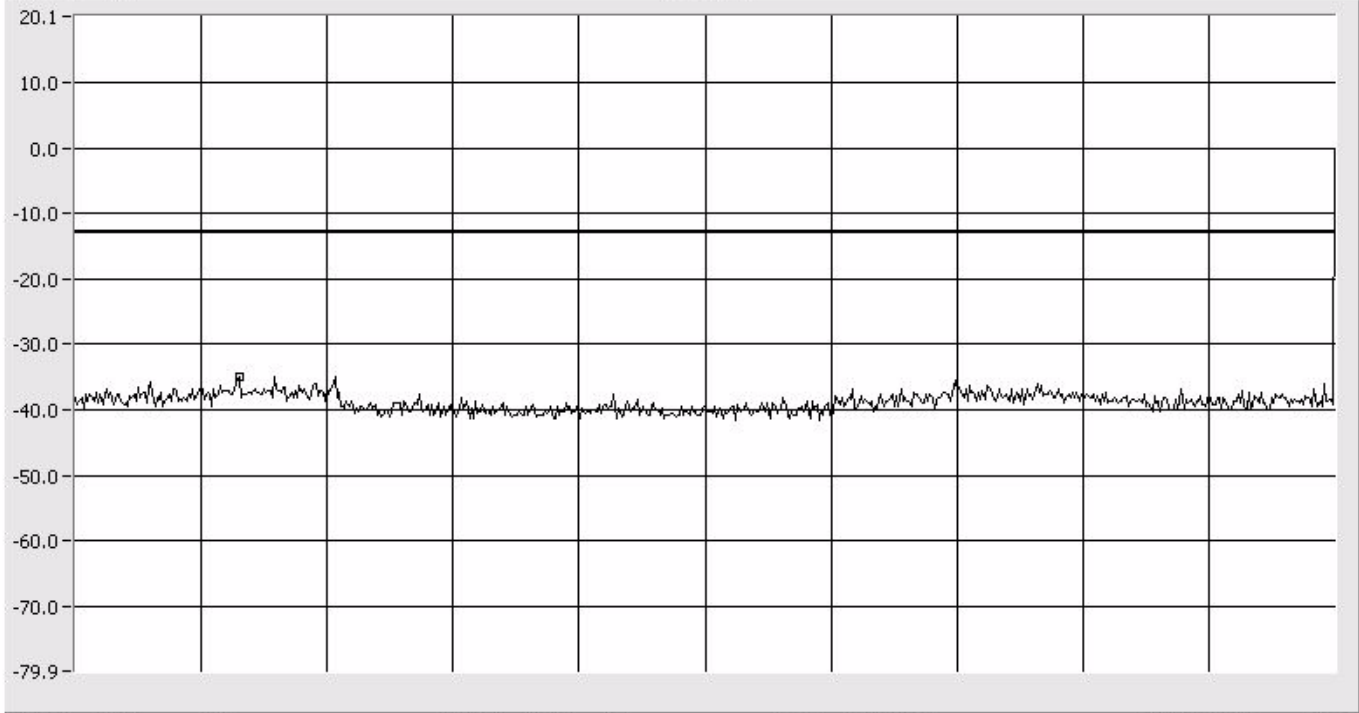
ATTEN 10 dB

delta MKR -34.90 dBm

RL 20.1 dBm

10 dB/Div

2.170 GHz

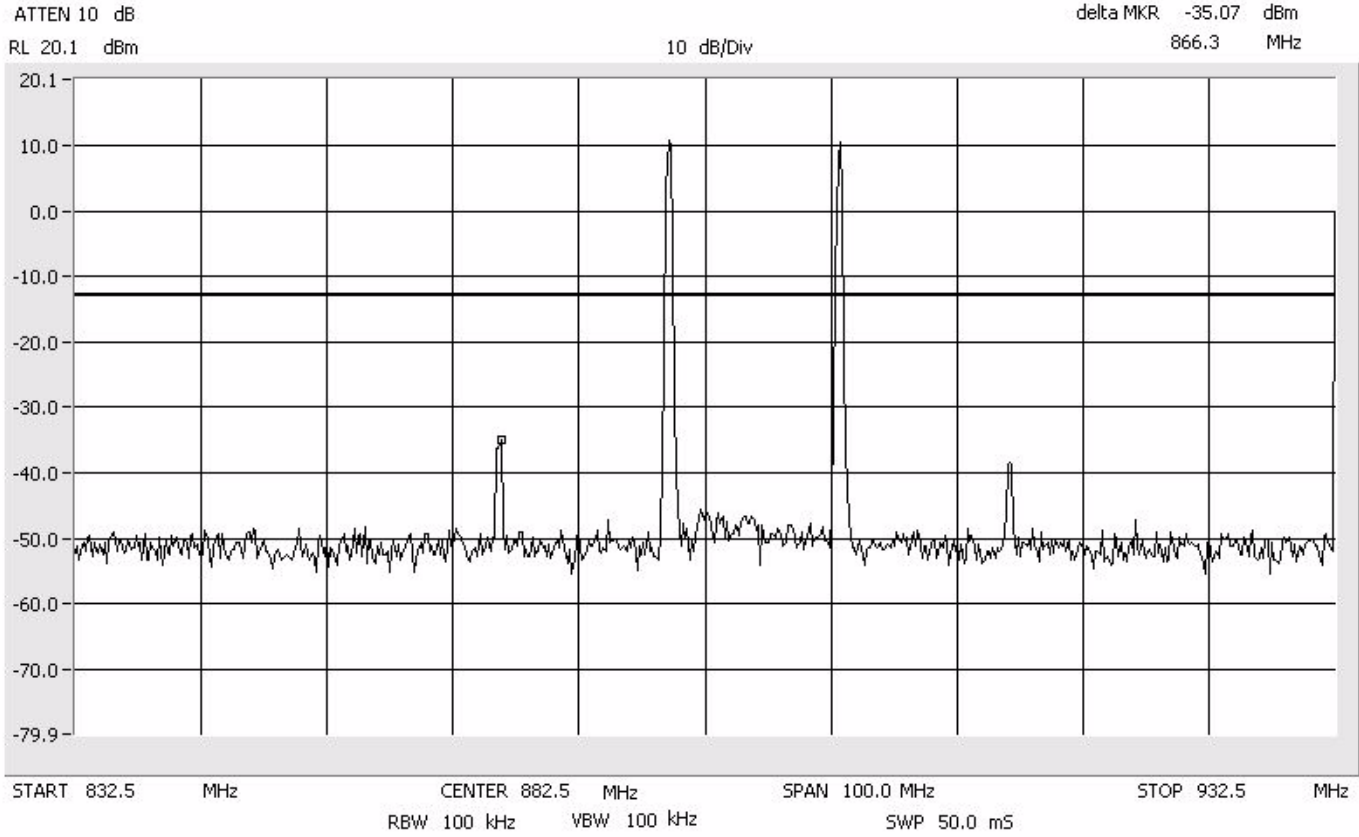


START 1.000 GHz CENTER 5.500 GHz SPAN 9.000 GHz STOP 10.000 GHz
RBW 1.0 MHz VBW 1.0 MHz SWP 180 mS

GSM

Intermodulation Apart Cellular 800 MHz

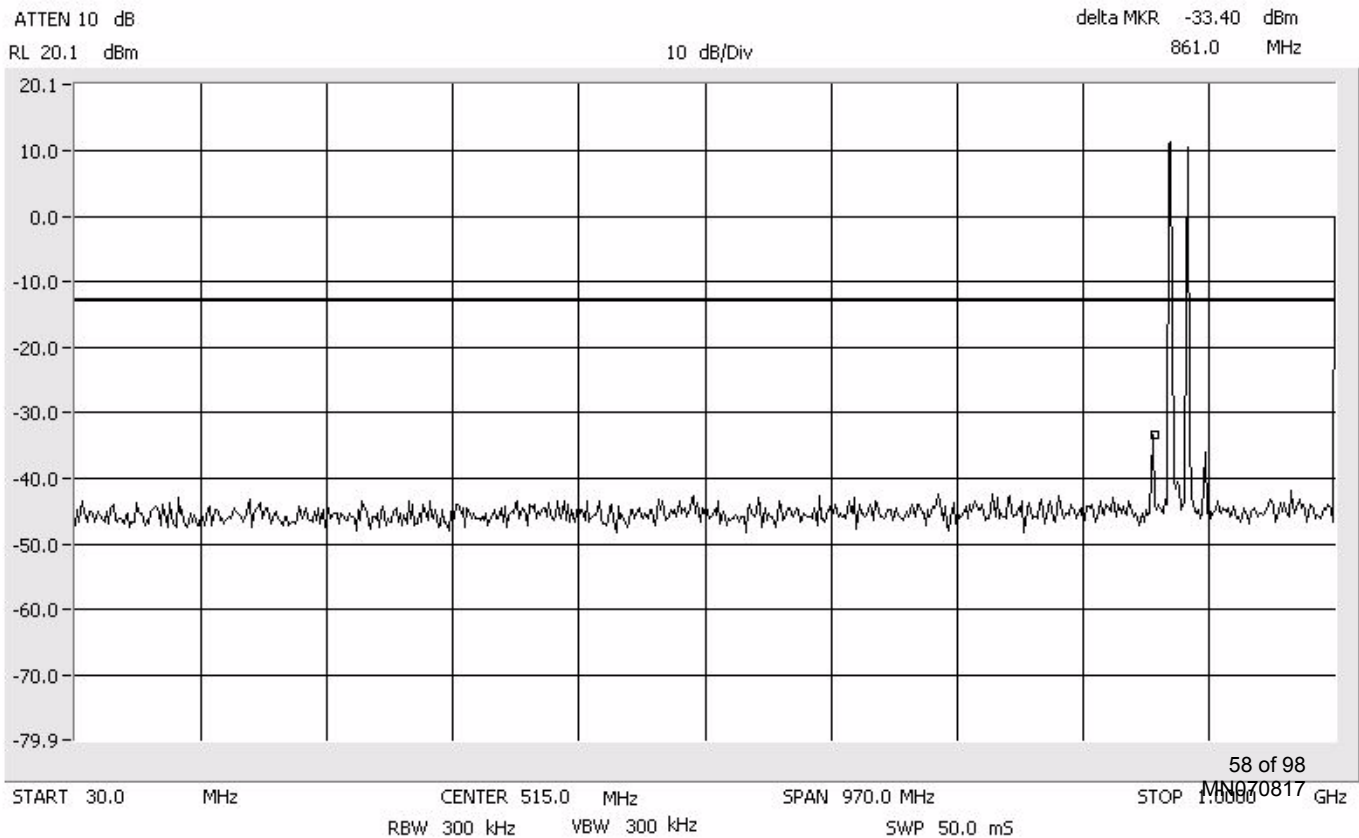
Center: 882.5 MHz
Span: 100 MHz
RBW/VBW: 100 kHz



GSM

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

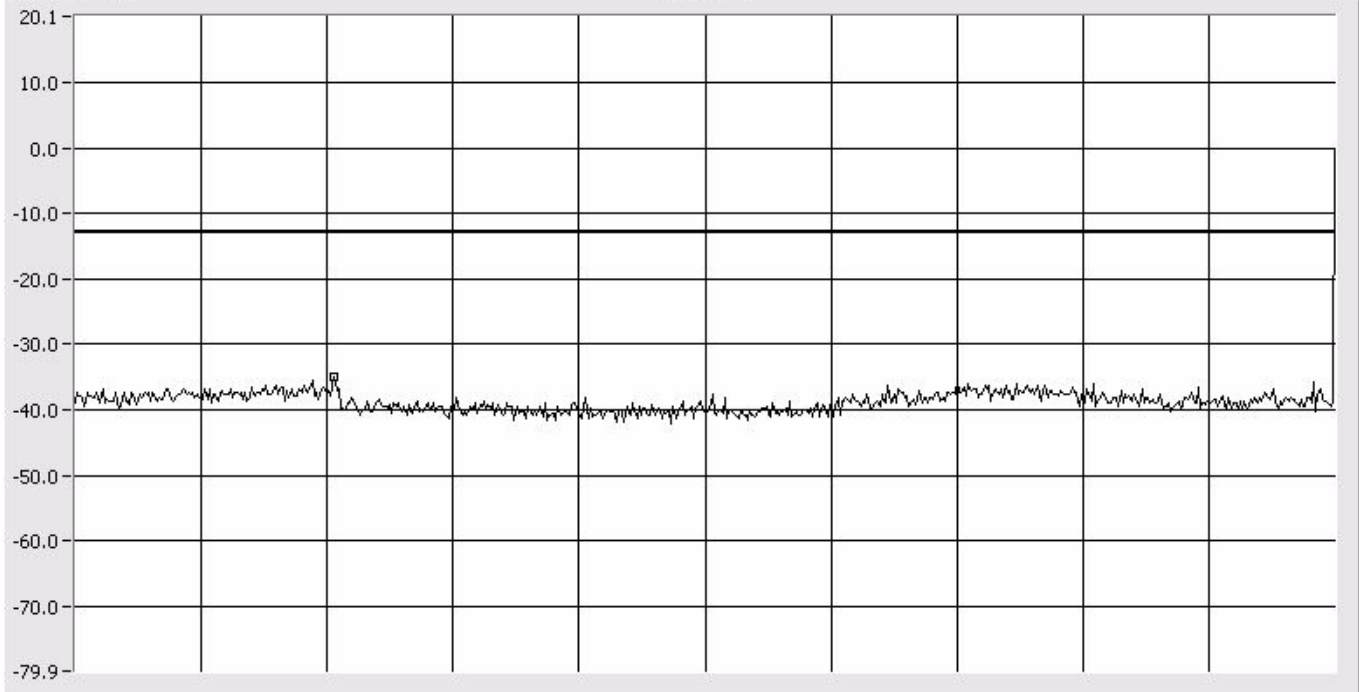
ATTEN 10 dB

RL 20.1 dBm

10 dB/Div

delta MKR -35.07 dBm

2.845 GHz

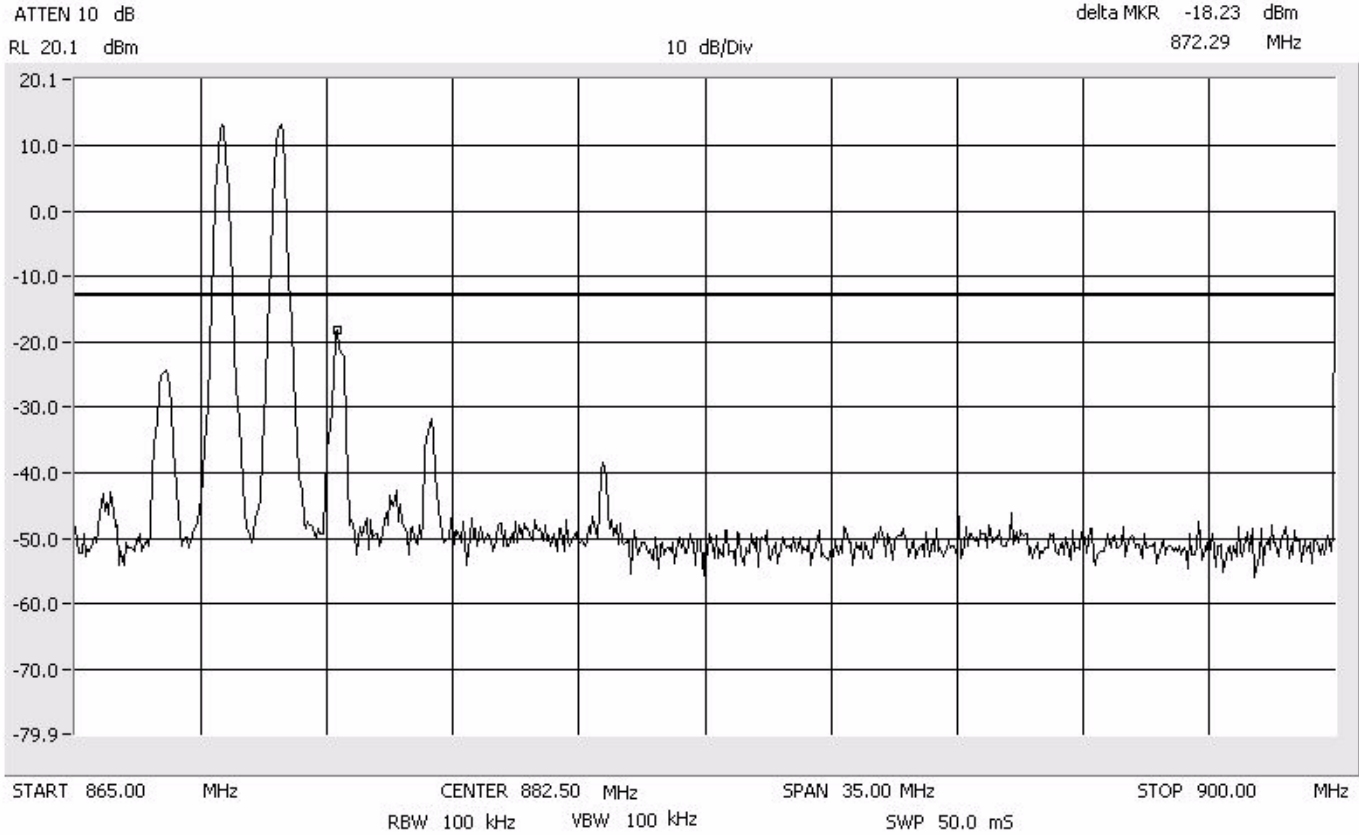


START 1.000 GHz CENTER 5.500 GHz SPAN 9.000 GHz STOP 10.000 GHz
RBW 1.0 MHz VBW 1.0 MHz SWP 180 mS

EDGE

Intermodulation Close - Lower Cellular 800 MHz

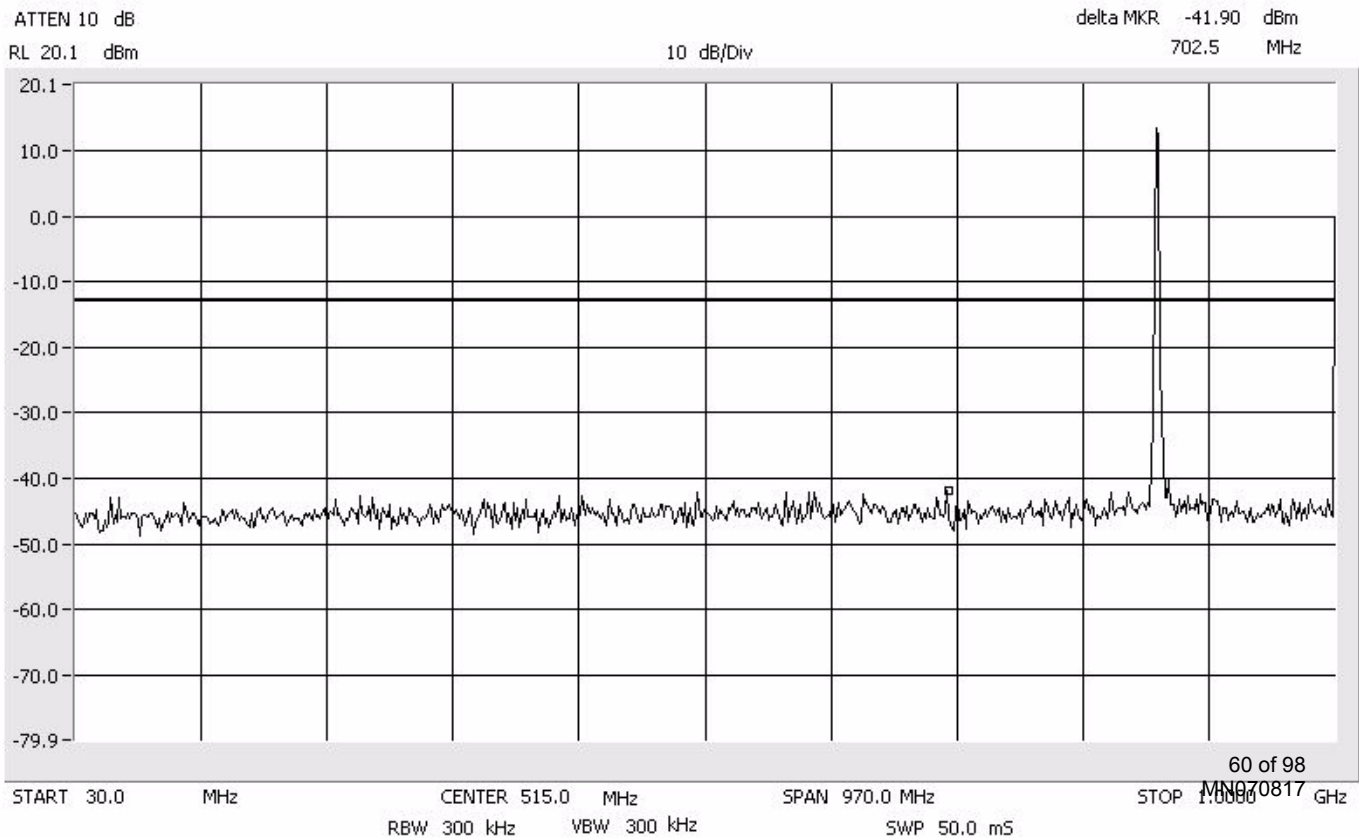
Center: 882.5 MHz
Span: 35 MHz
RBW/VBW: 100 kHz



EDGE

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

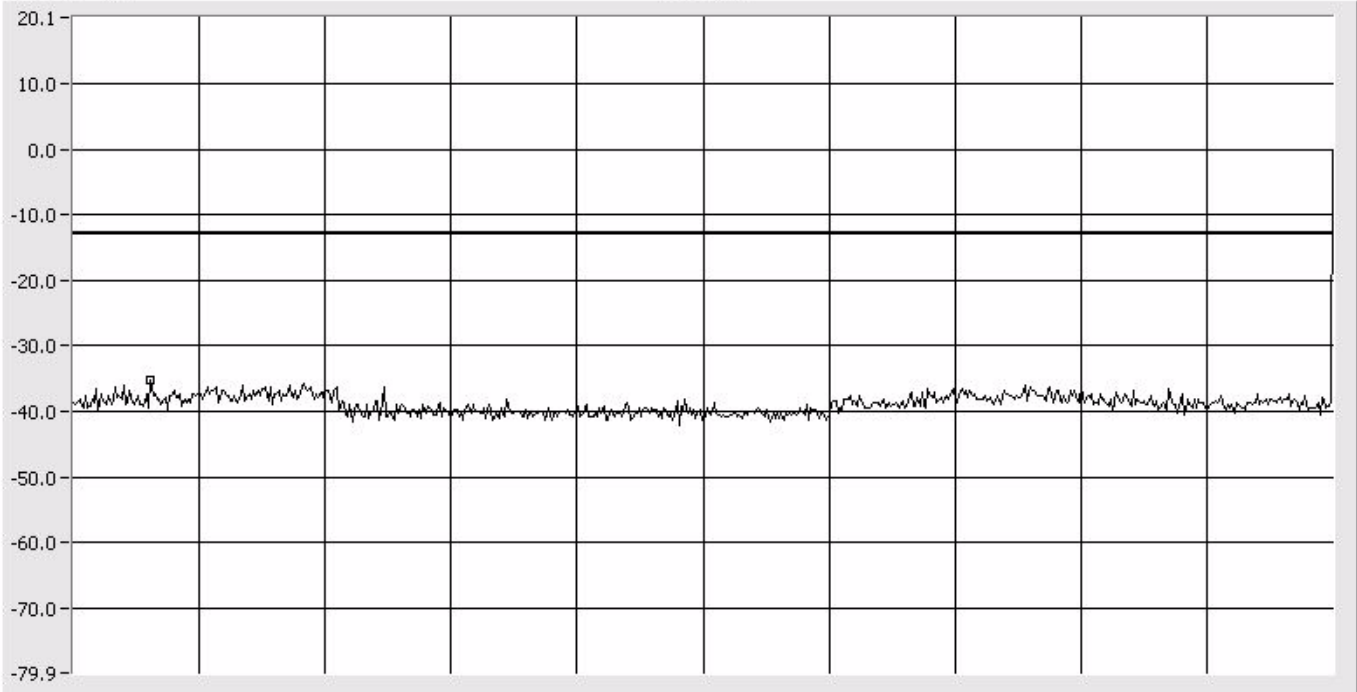
ATTEN 10 dB

RL 20.1 dBm

delta MKR -35.23 dBm

1.555 GHz

10 dB/Div

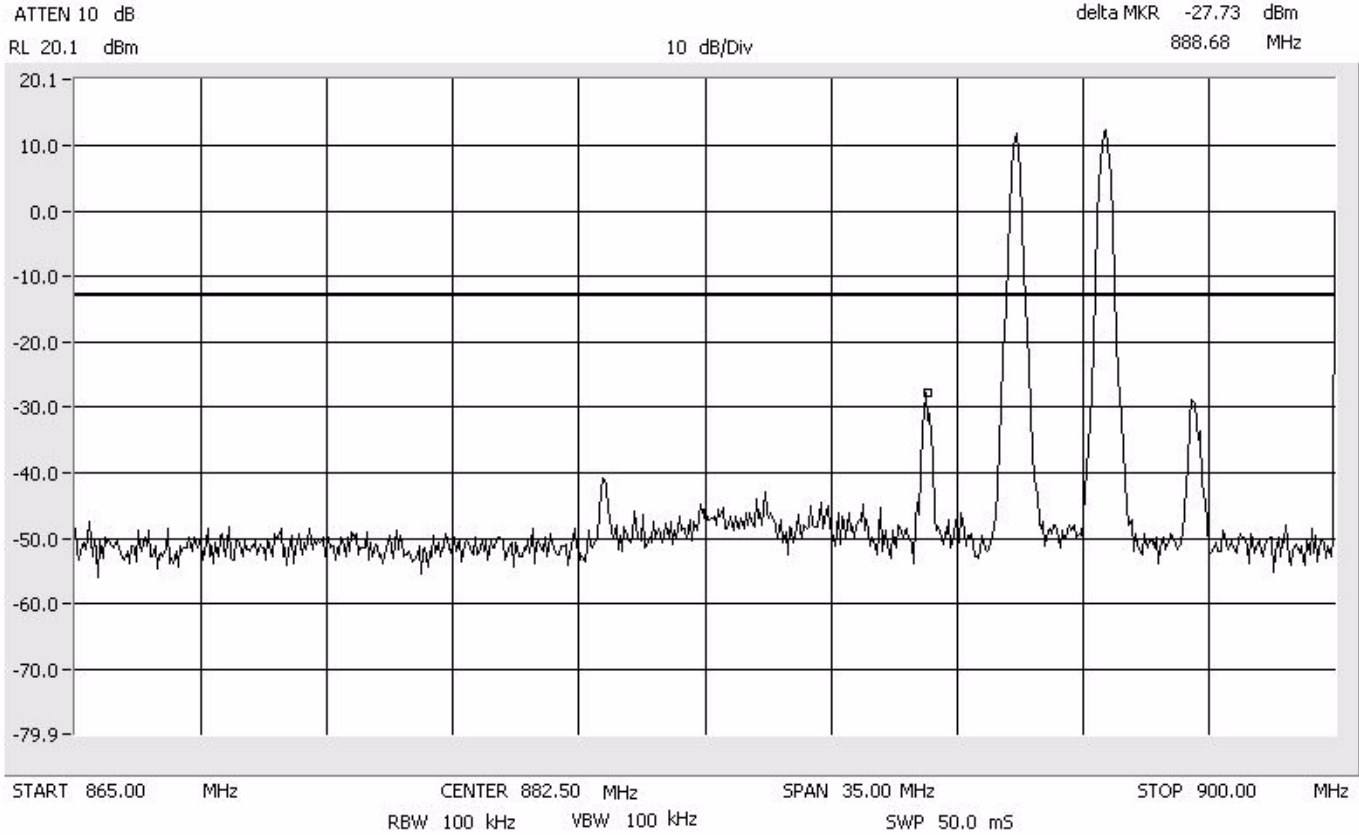


START 1.000 GHz CENTER 5.500 GHz SPAN 9.000 GHz STOP 10.000 GHz
RBW 1.0 MHz VBW 1.0 MHz SWP 180 mS

EDGE

Intermodulation Close - Upper Cellular 800 MHz

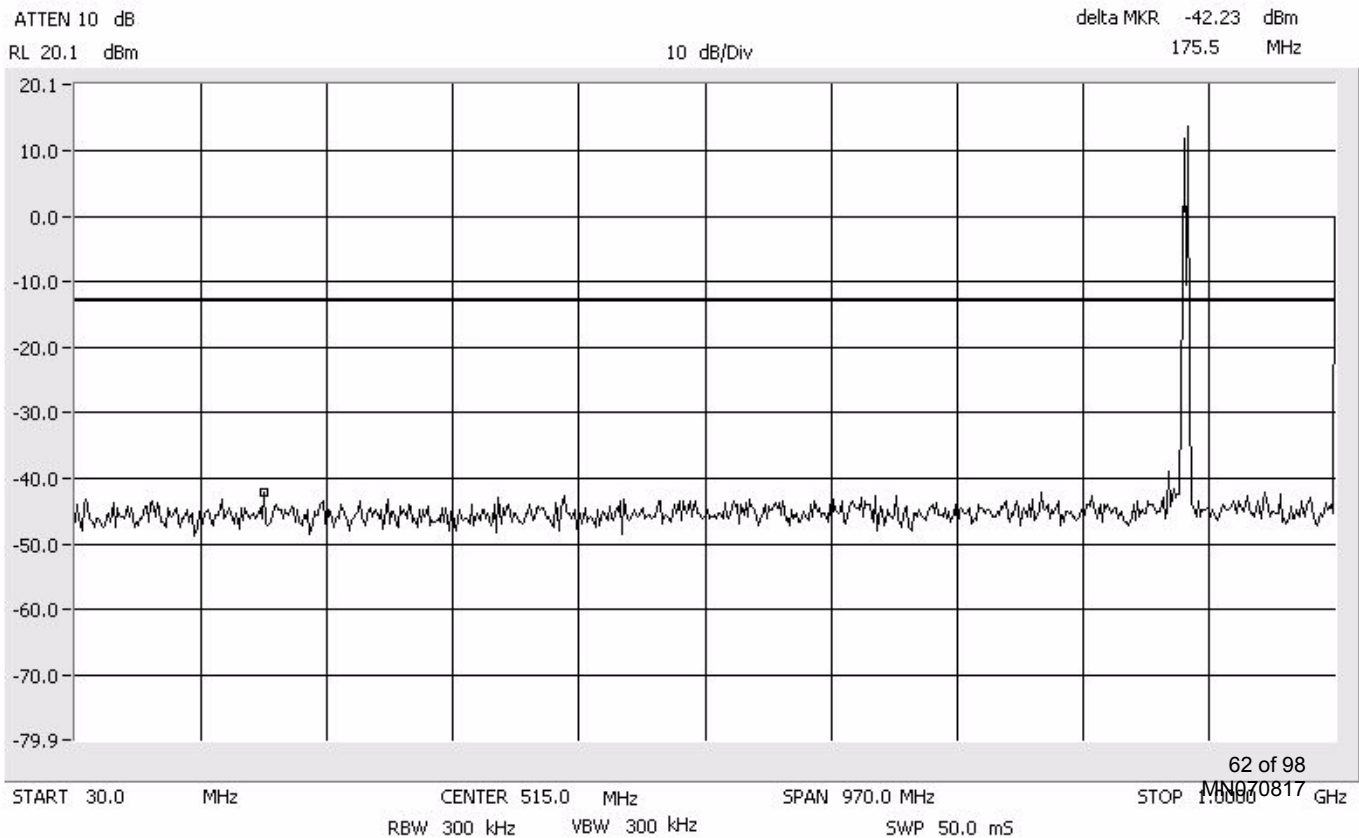
Center: 882.5 MHz
Span: 35 MHz
RBW/VBW: 100 kHz



EDGE

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

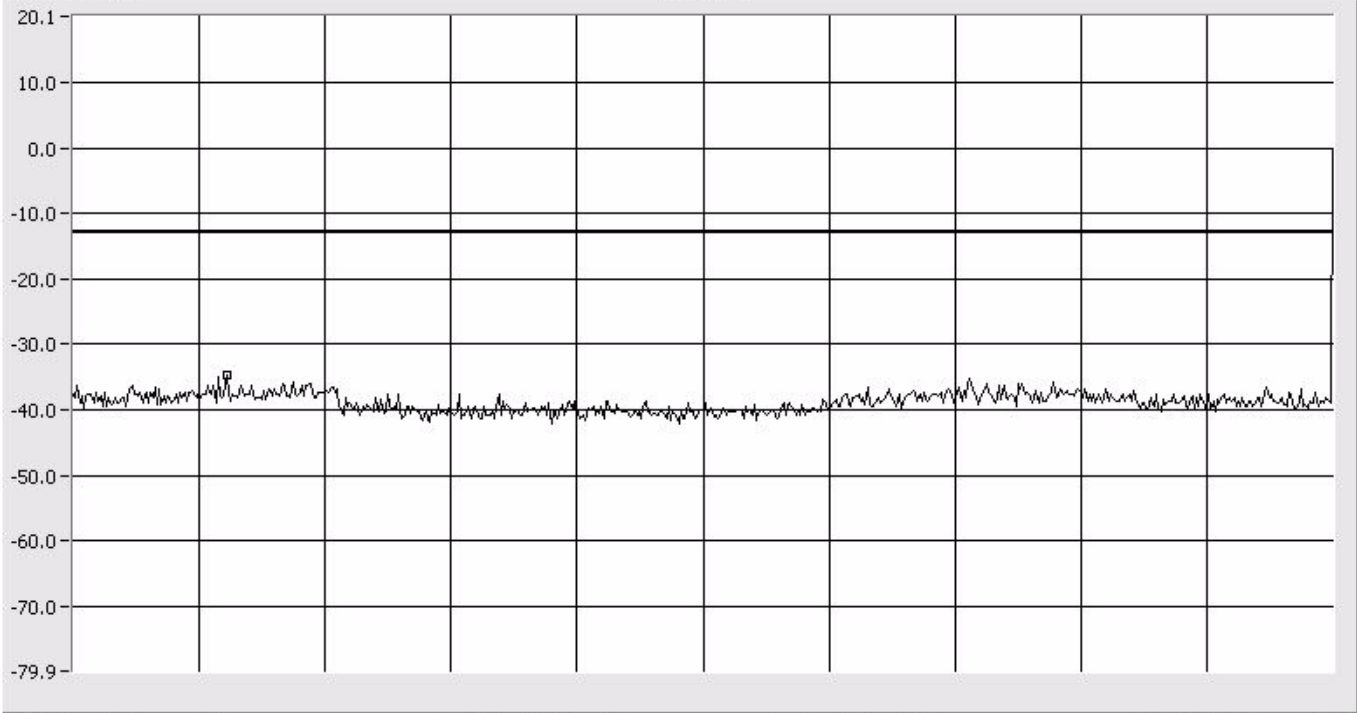
ATTEN 10 dB

delta MKR -34.73 dBm

RL 20.1 dBm

10 dB/Div

2.095 GHz

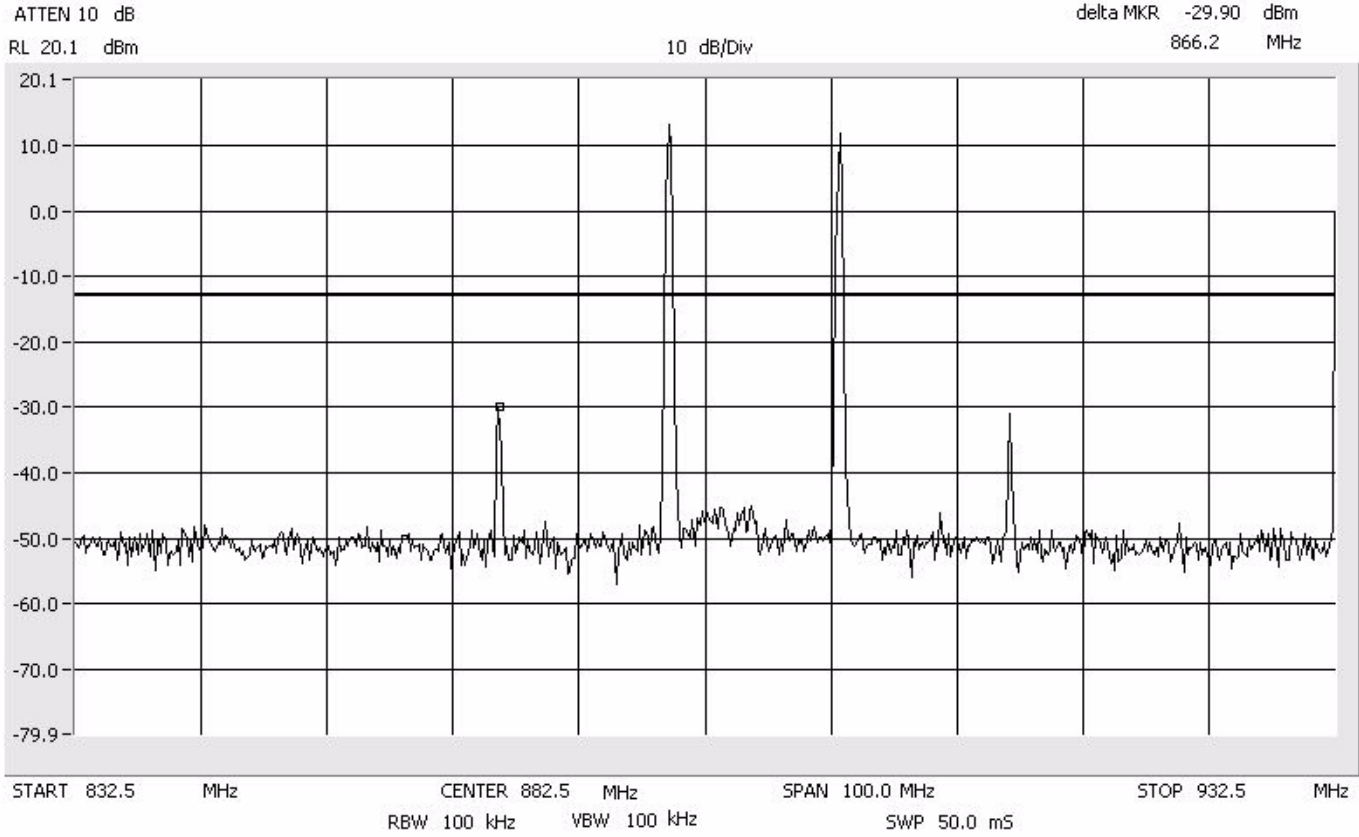


START 1.000 GHz CENTER 5.500 GHz SPAN 9.000 GHz STOP 10.000 GHz
RBW 1.0 MHz VBW 1.0 MHz SWP 180 mS

EDGE

Intermodulation Apart Cellular 800 MHz

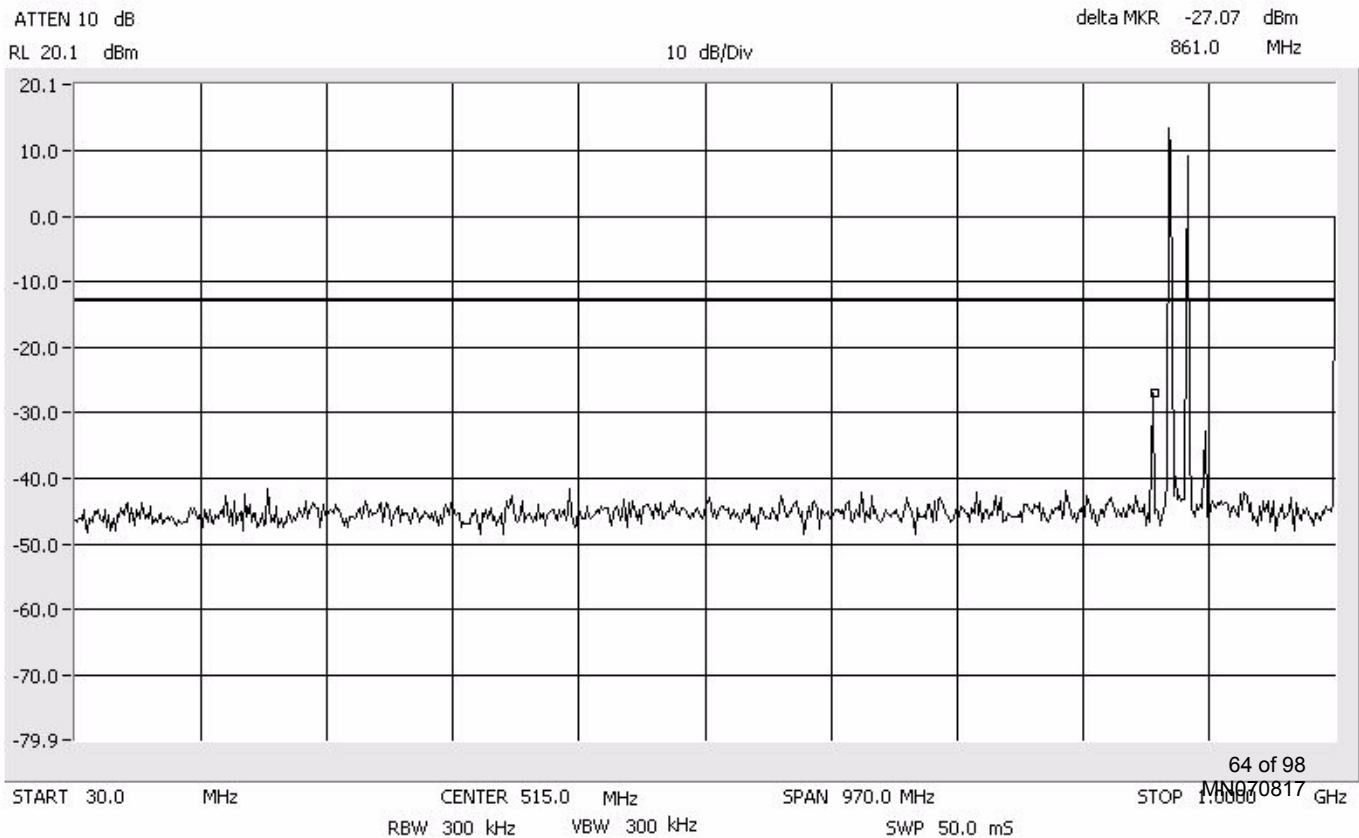
Center: 882.5 MHz
Span: 100 MHz
RBW/VBW: 100 kHz



EDGE

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

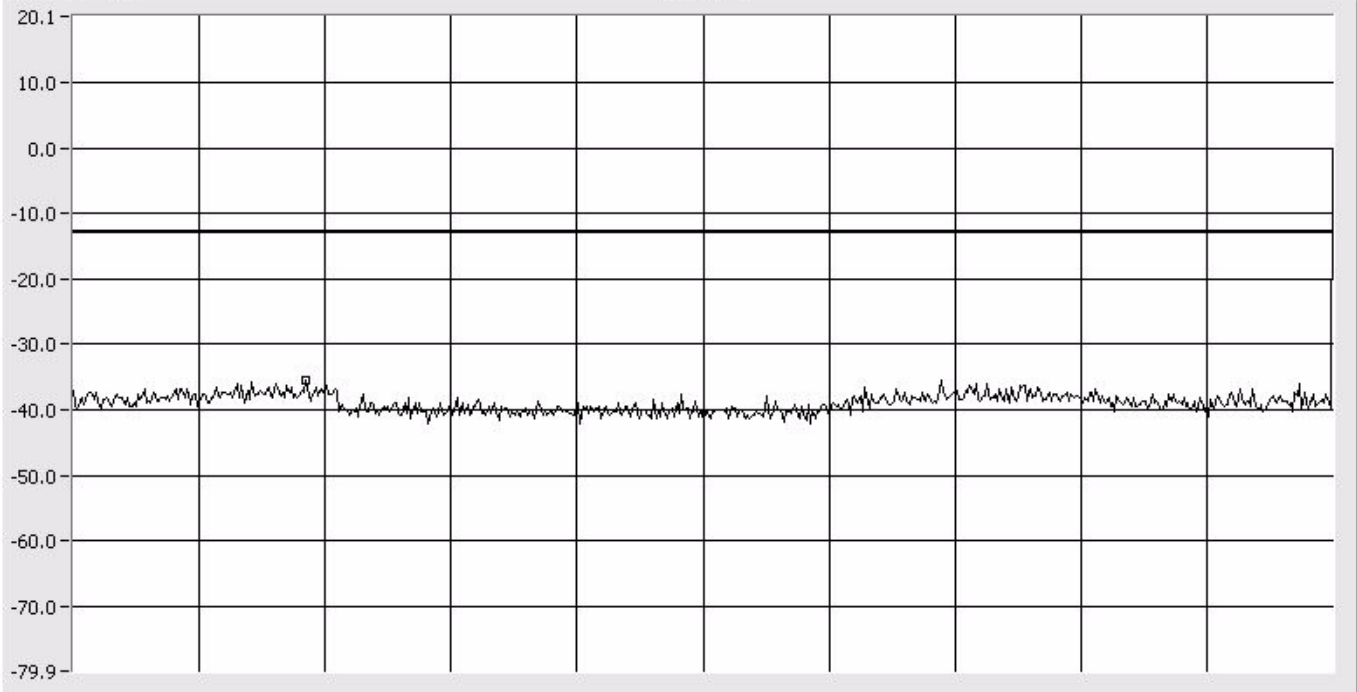
ATTEN 10 dB

RL 20.1 dBm

10 dB/Div

delta MKR -35.40 dBm

2.665 GHz



START 1.000 GHz CENTER 5.500 GHz SPAN 9.000 GHz STOP 10.000 GHz
RBW 1.0 MHz VBW 1.0 MHz SWP 180 mS

CDMA

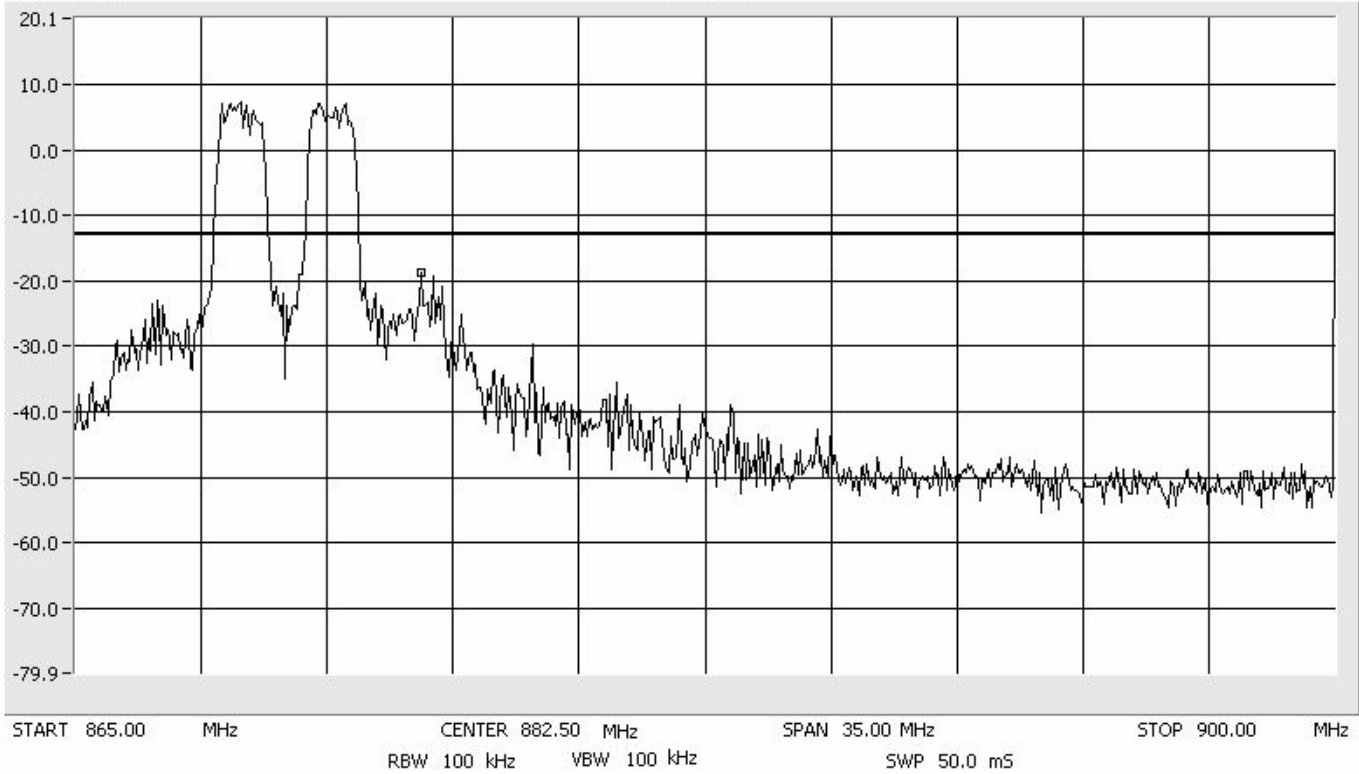
Intermodulation Close - Lower Cellular 800 MHz

Center: 882.5 MHz
Span: 35 MHz
RBW/VBW: 100 kHz

ATTEN 10 dB
RL 20.1 dBm

delta MKR -18.73 dBm
874.62 MHz

10 dB/Div



CDMA

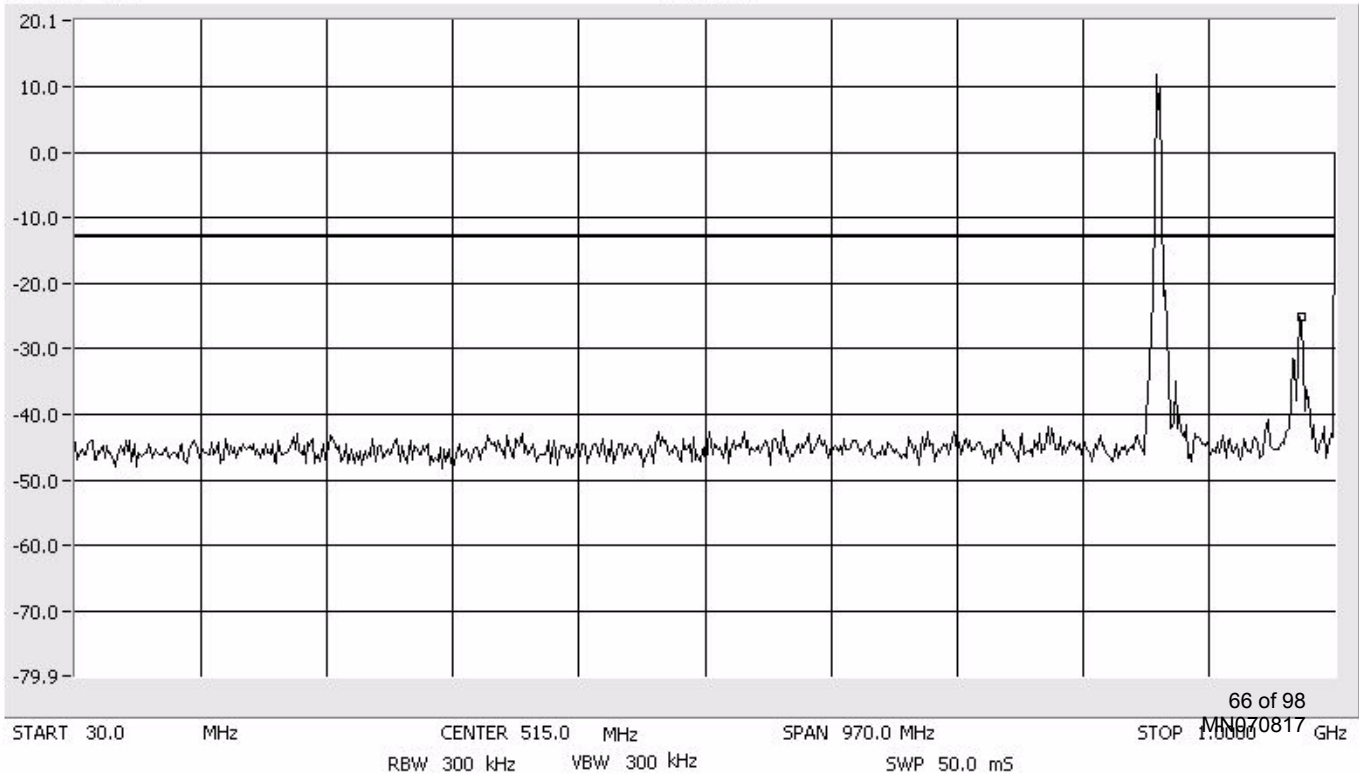
Intermodulation Close - Lower Cellular 800 MHz

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

ATTEN 10 dB
RL 20.1 dBm

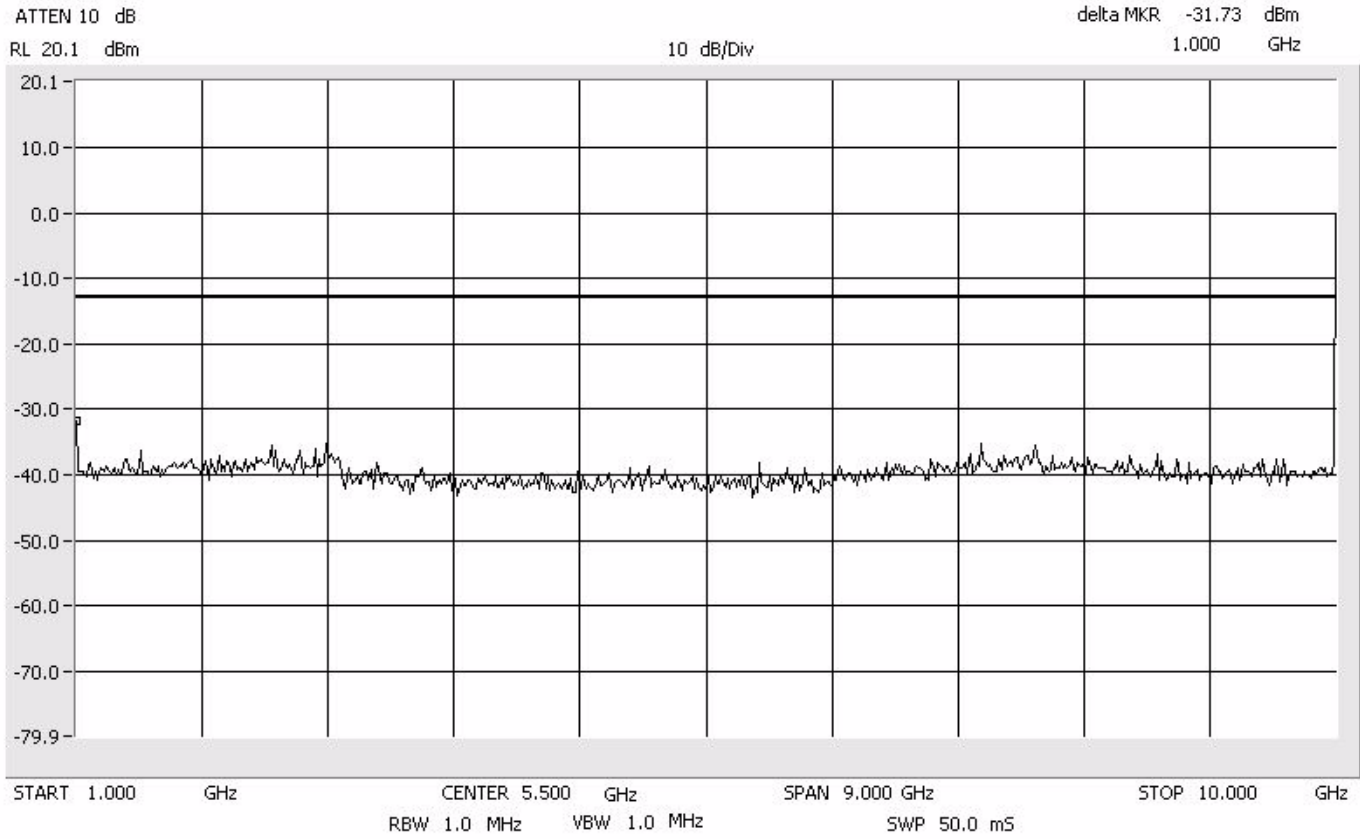
delta MKR -25.23 dBm
974.1 MHz

10 dB/Div



Intermodulation Close - Lower Cellular 800 MHz

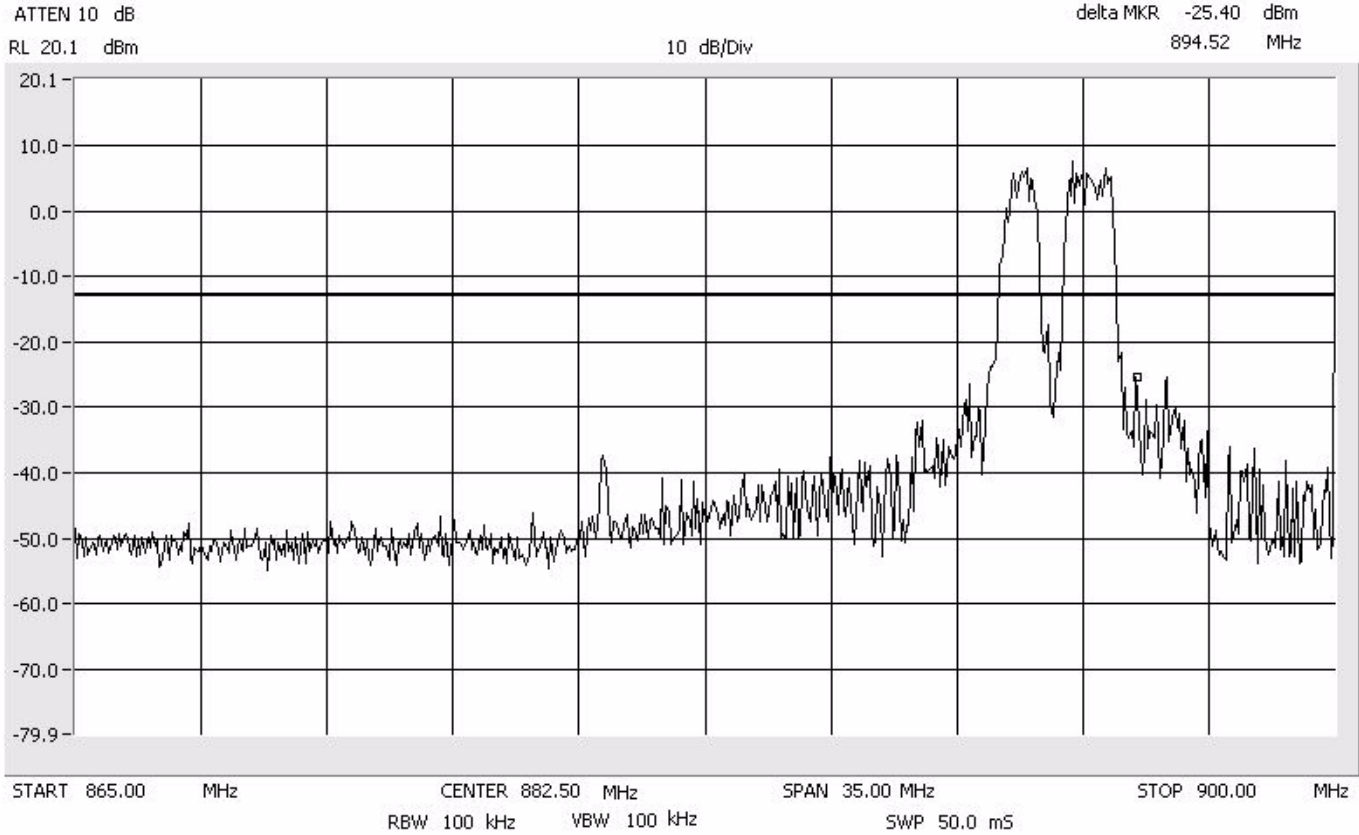
Span: 1 GHz to 10 GHz
RBW/VBW: 1 MHz



CDMA

Intermodulation Close - Upper Cellular 800 MHz

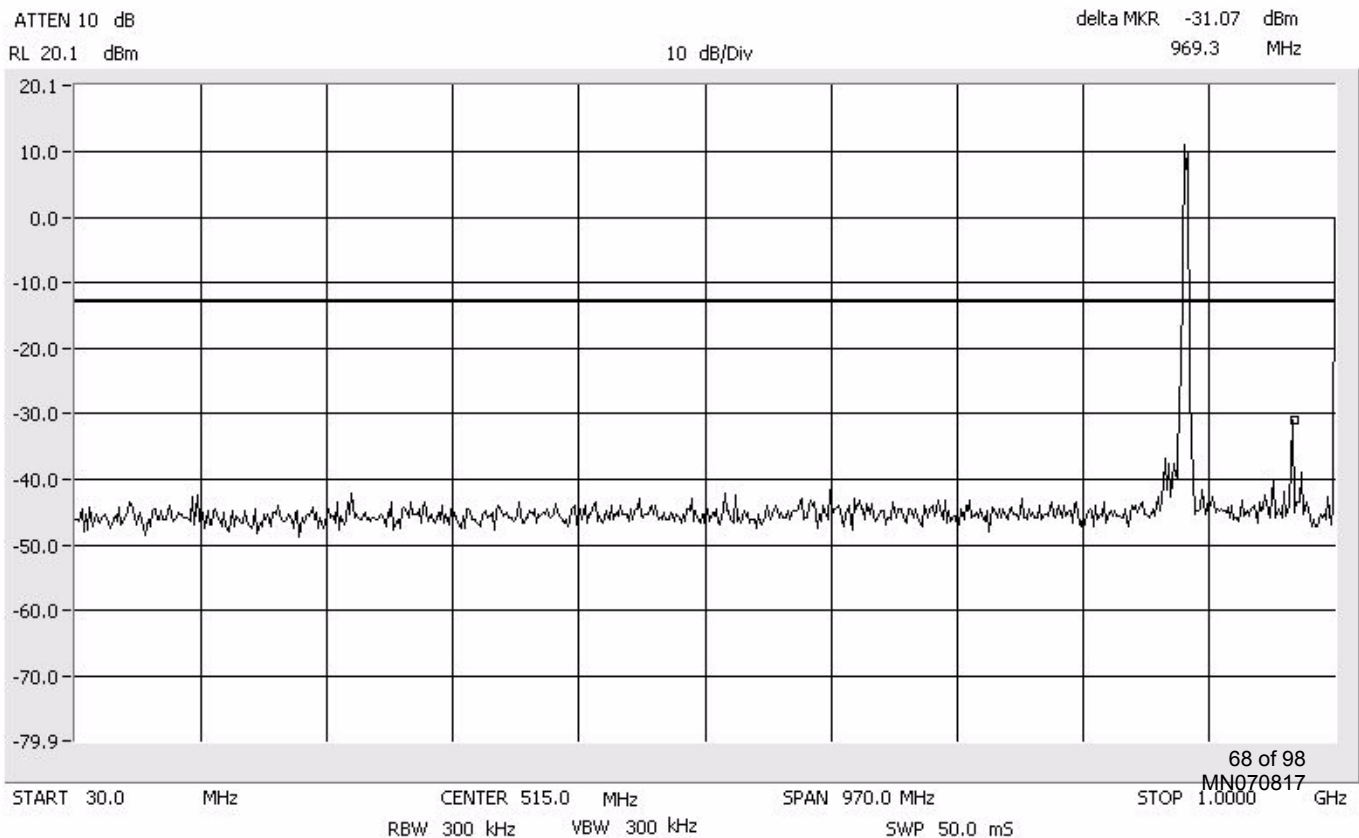
Center: 882.5 MHz
Span: 30 MHz
RBW/VBW: 100 kHz



CDMA

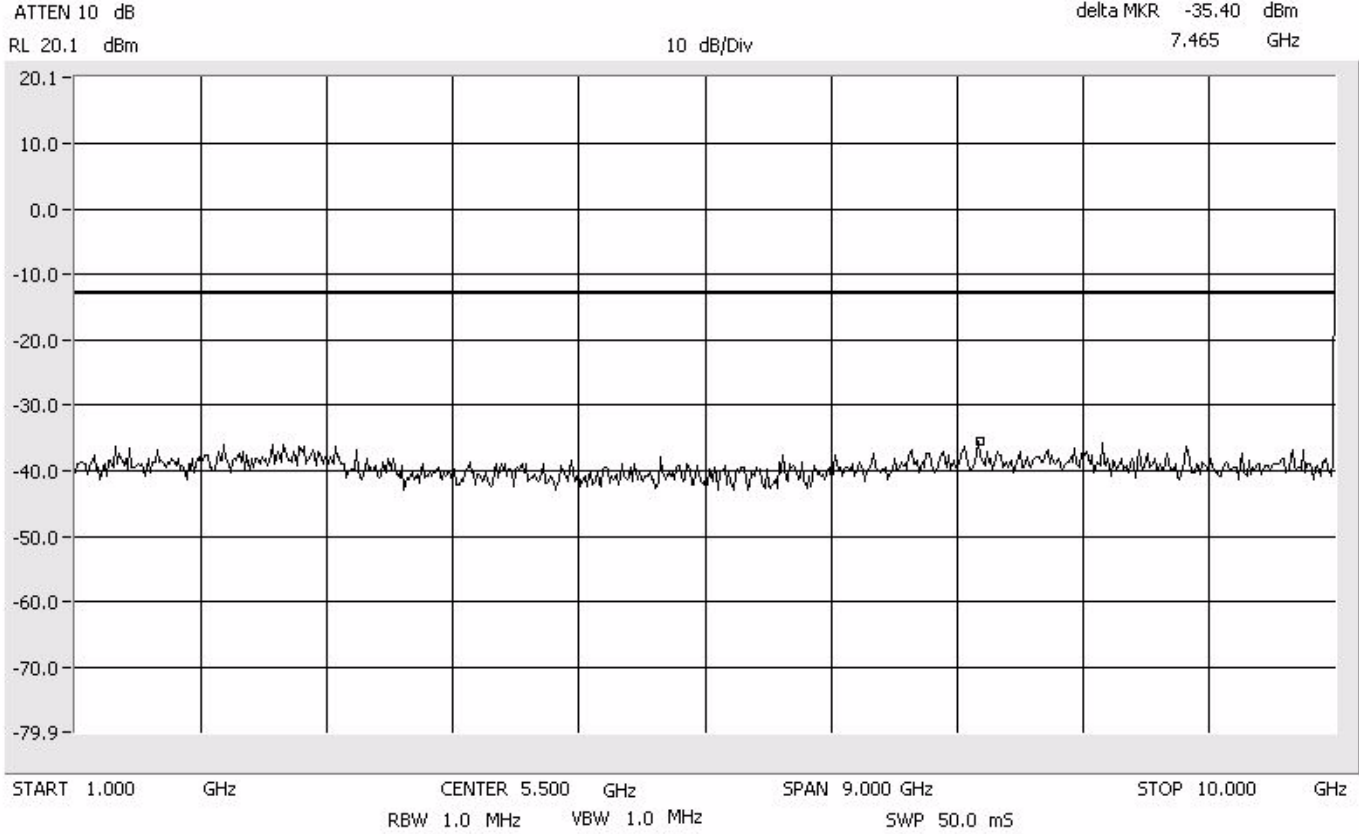
Intermodulation Close - Upper Cellular 800 MHz

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



Intermodulation Close - Upper Cellular 800 MHz

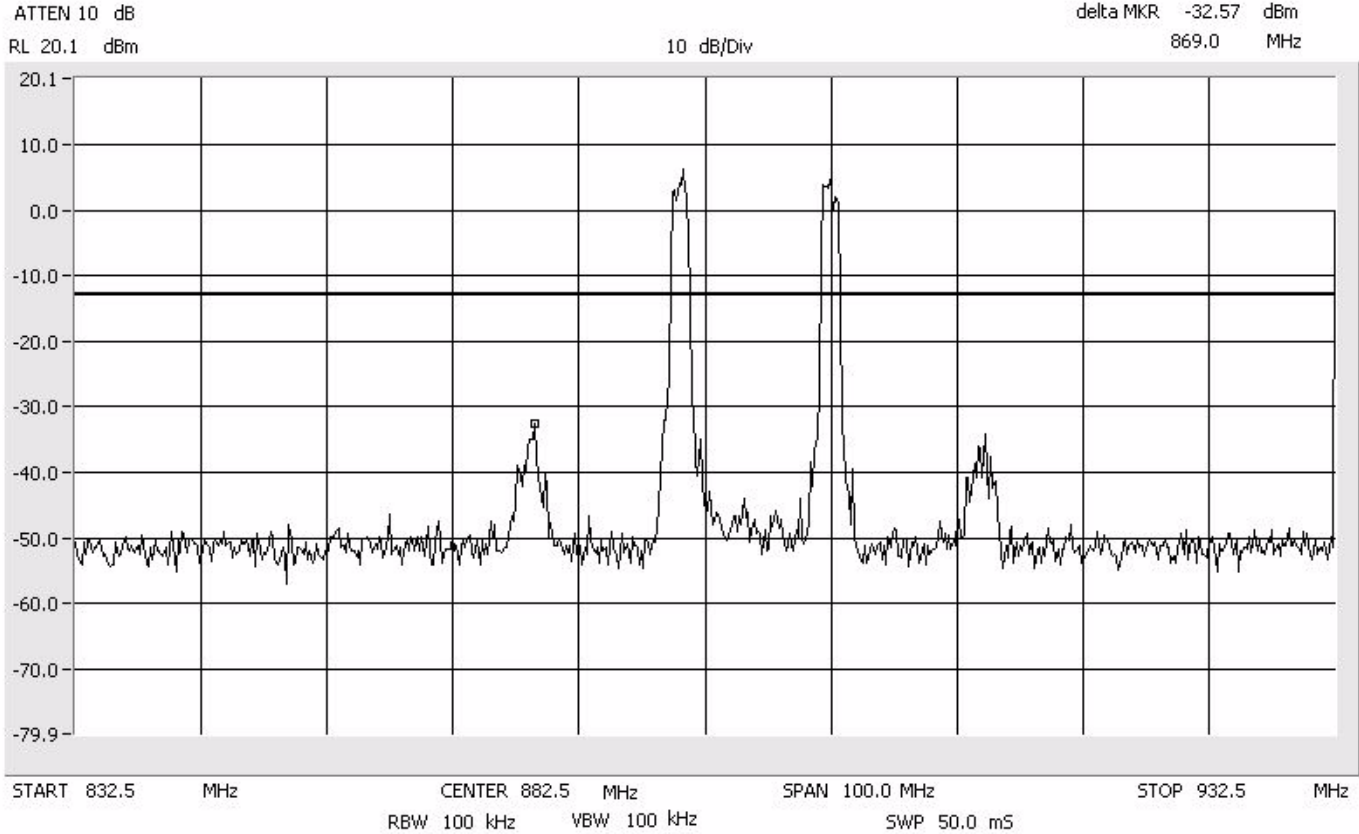
Span: 1 GHz to 10 GHz
RBW/VBW: 1 MHz



CDMA

Intermodulation Apart Cellular 800 MHz

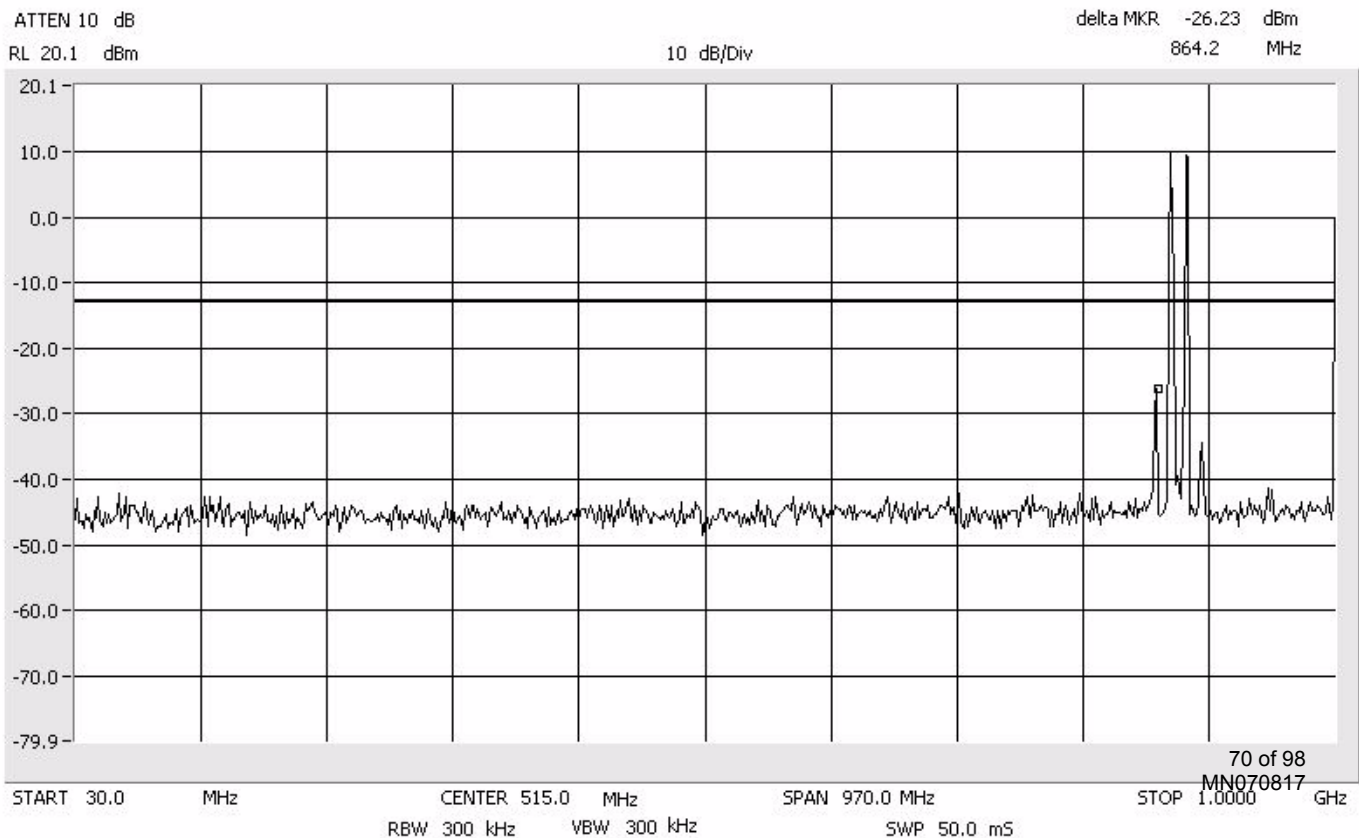
Center: 882.5 MHz
Span: 100 MHz
RBW/VBW: 100 kHz



CDMA

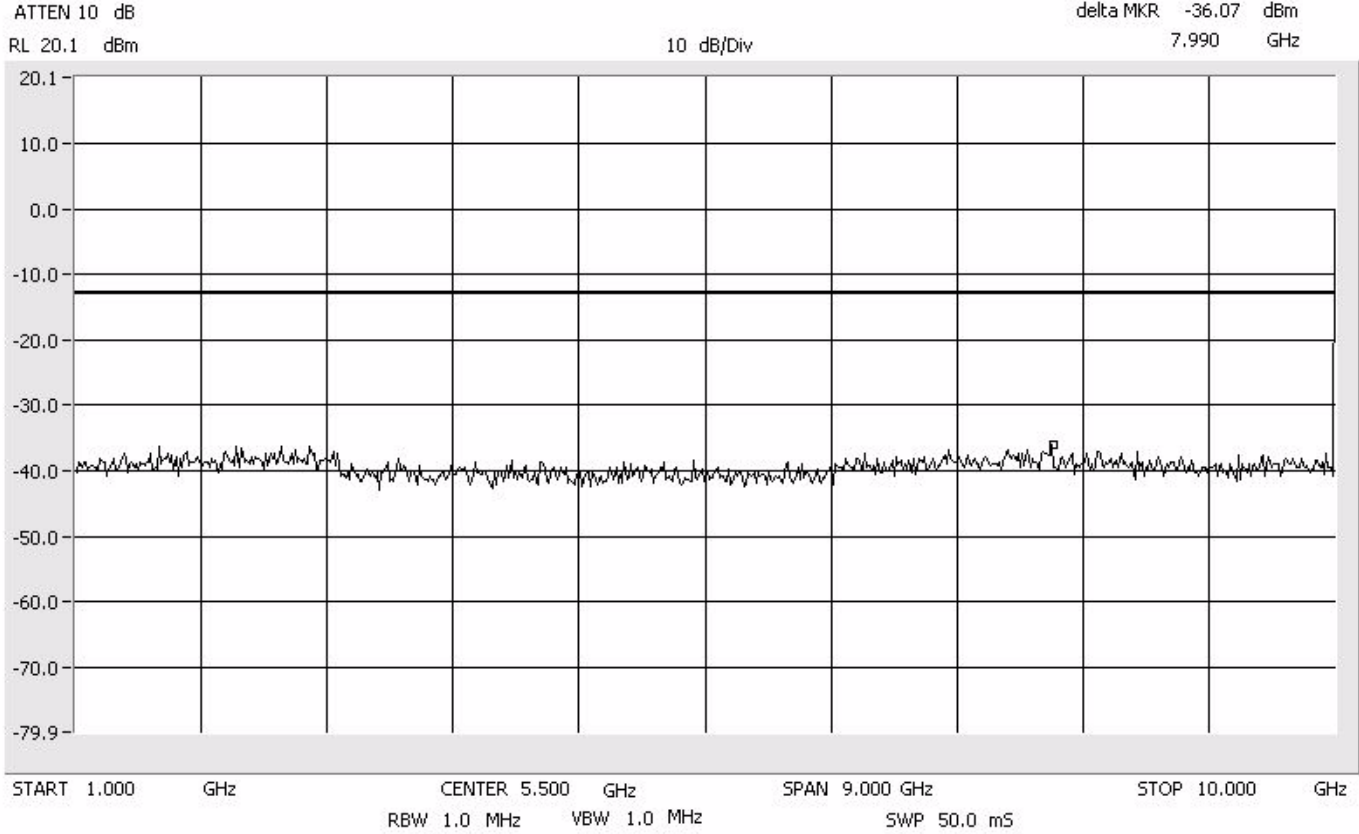
Intermodulation Apart Cellular 800 MHz

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. Bi-Directional Amplifier – Cellular Model Number RPT-SBAAA12000

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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.

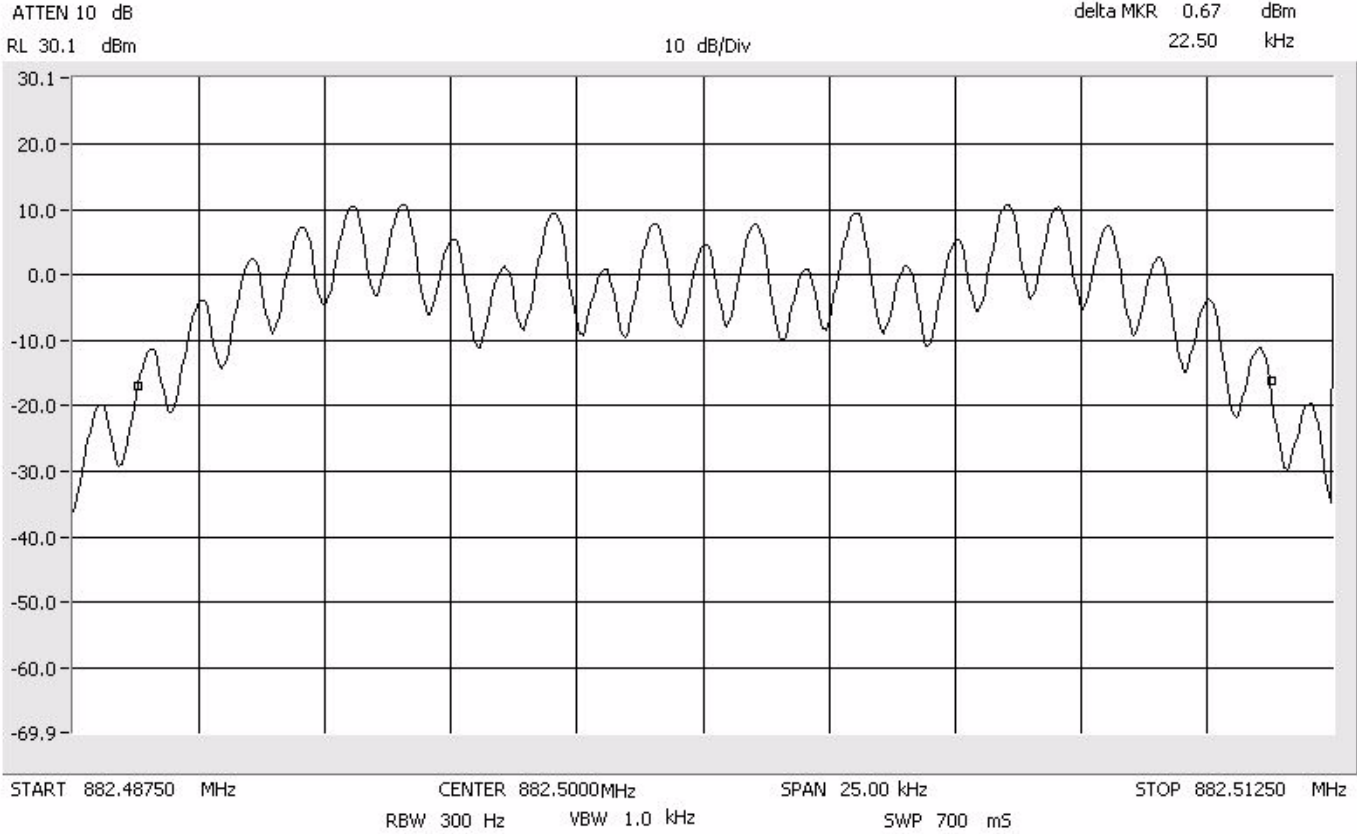
The resolution bandwidth is reduced to 1% of the estimated emission bandwidth and the video bandwidth is set to 3 times the resolution bandwidth. The markers are moved to the -20 dB points (from the previously established center frequency level) on either side of center frequency.

Results:

Pass (see plots)

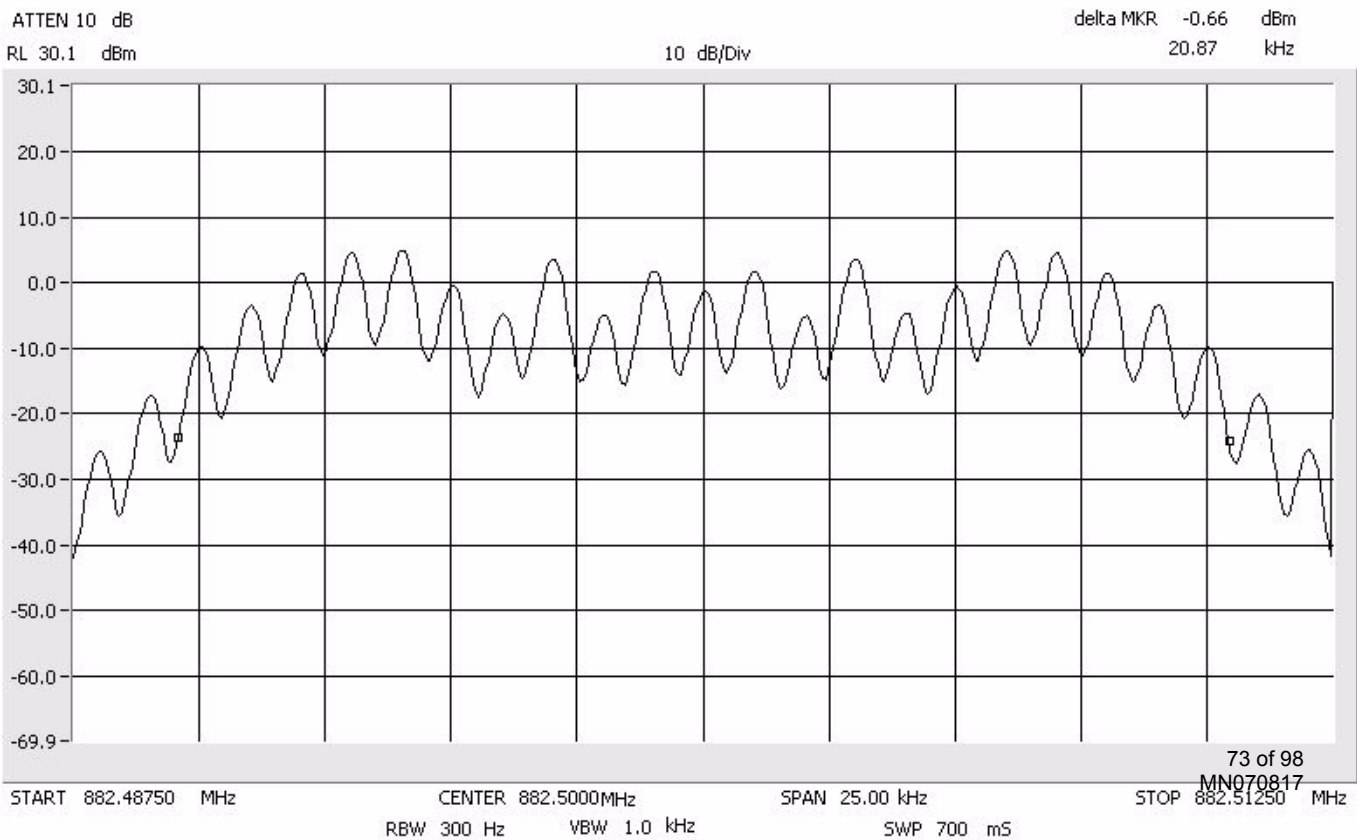
Occupied Bandwidth FM Signal In

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



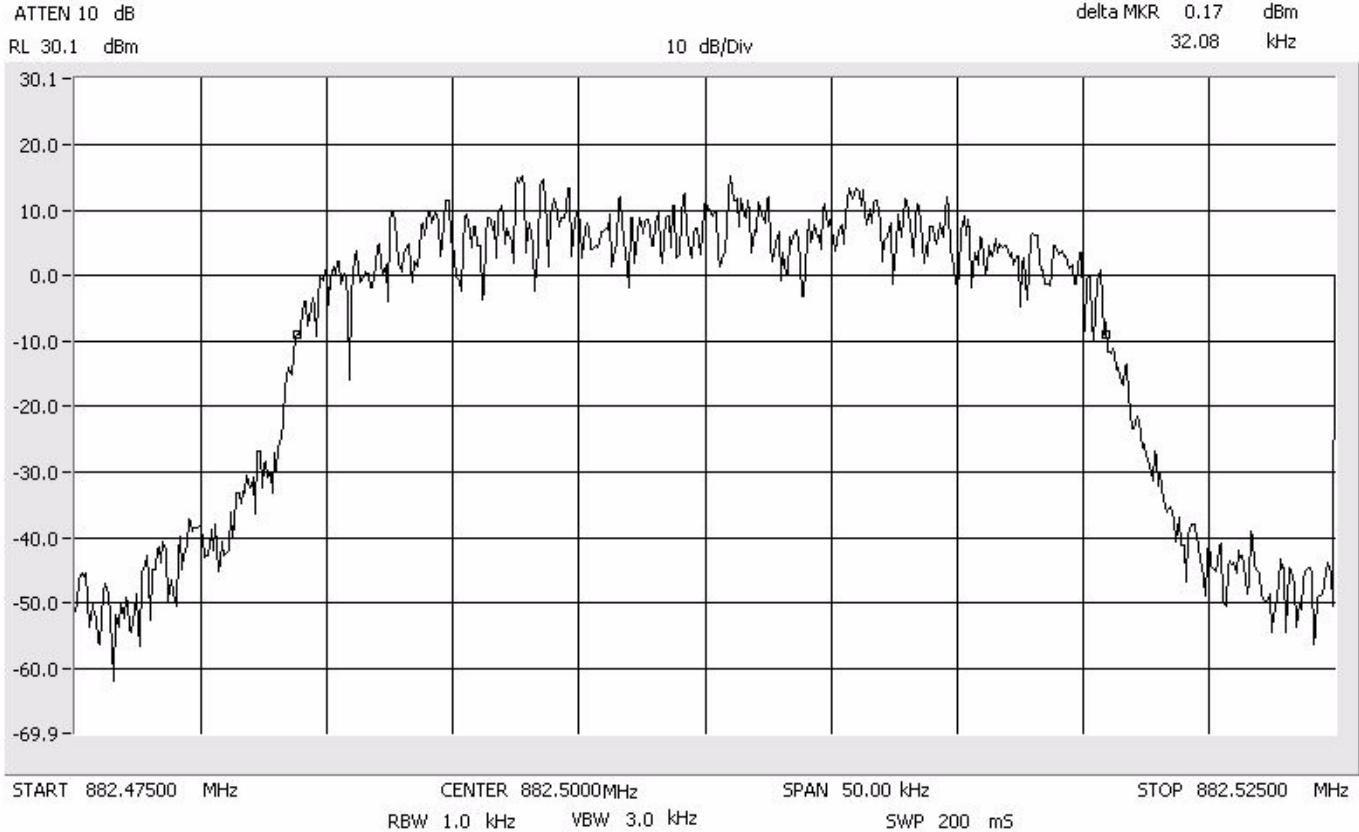
Occupied Bandwidth FM Signal Out

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



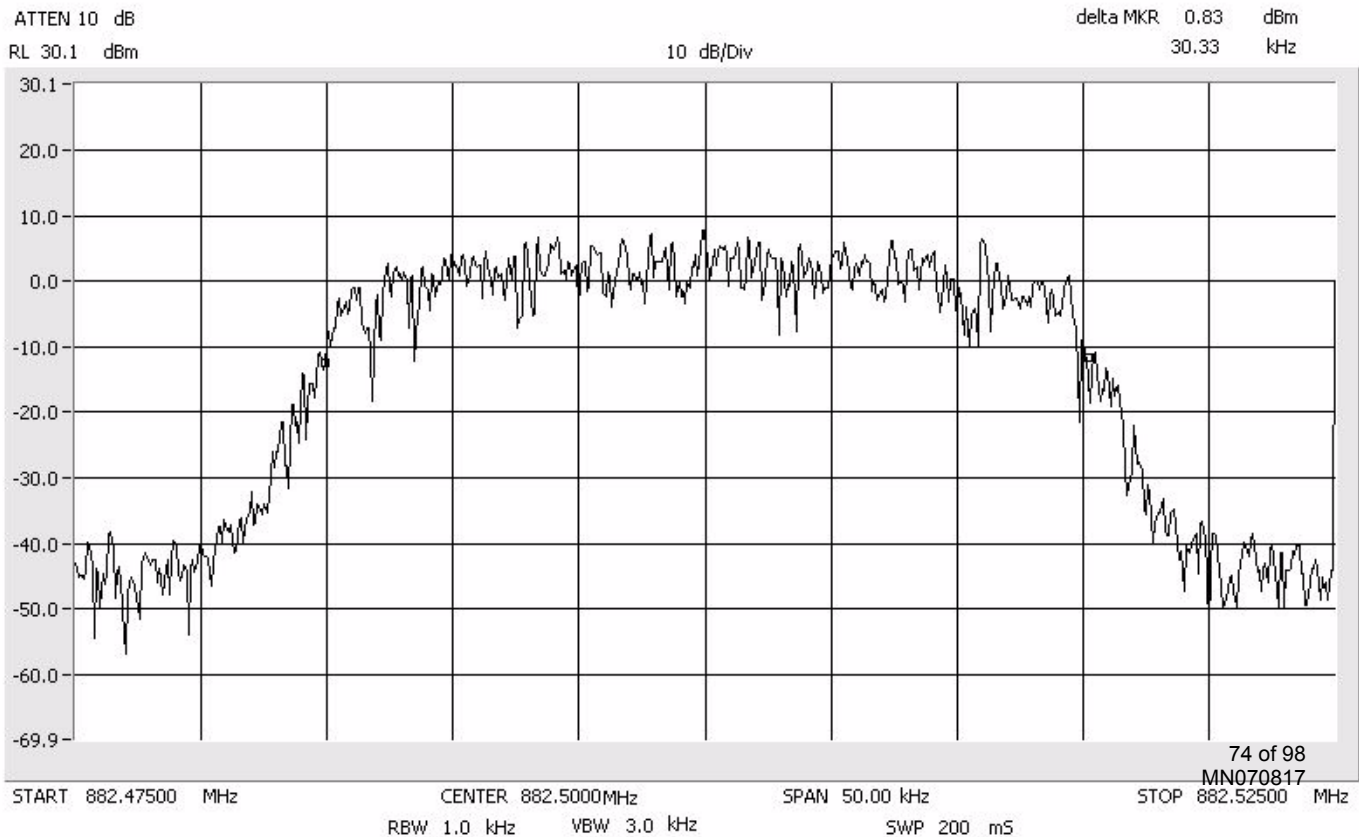
Occupied Bandwidth TDMA Signal In

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



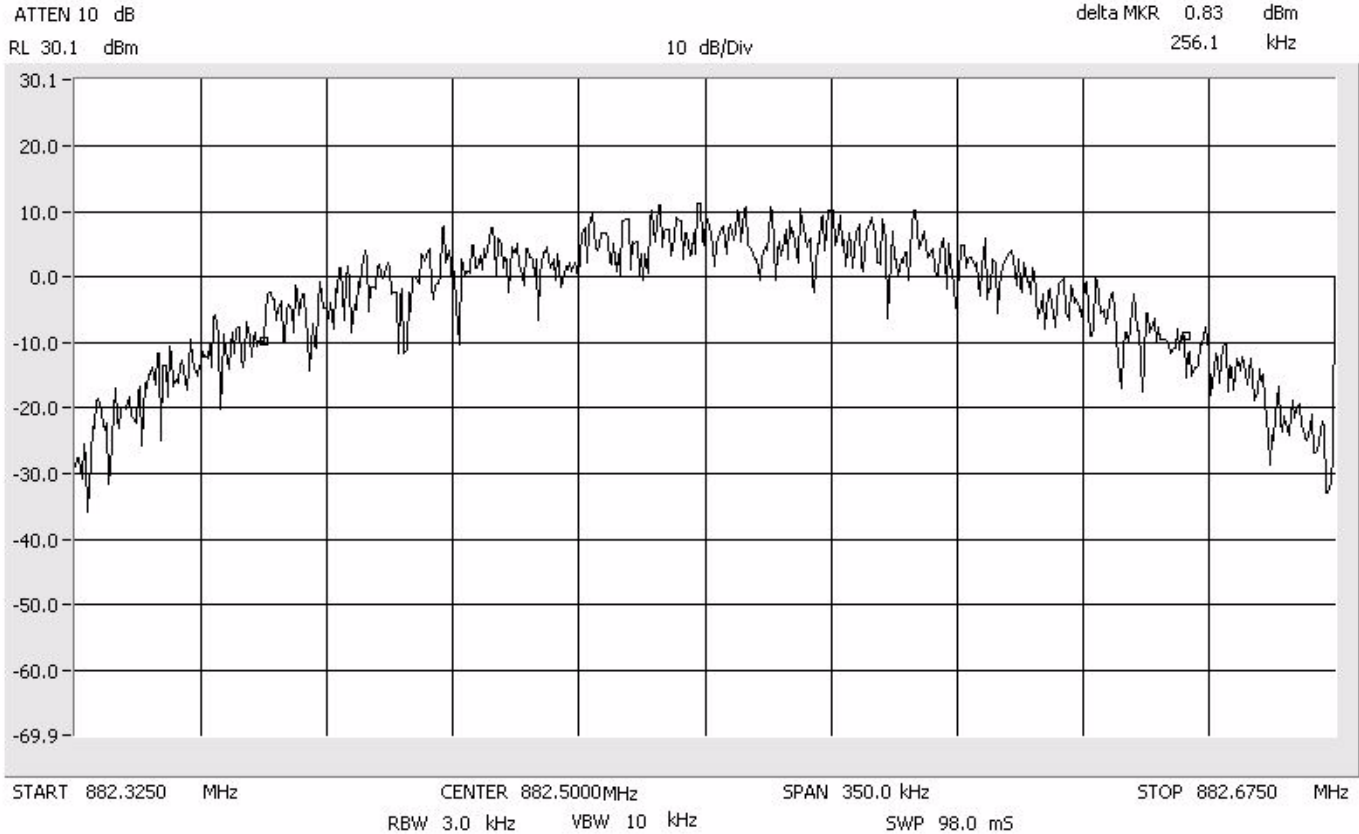
Occupied Bandwidth TDMA Signal Out

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



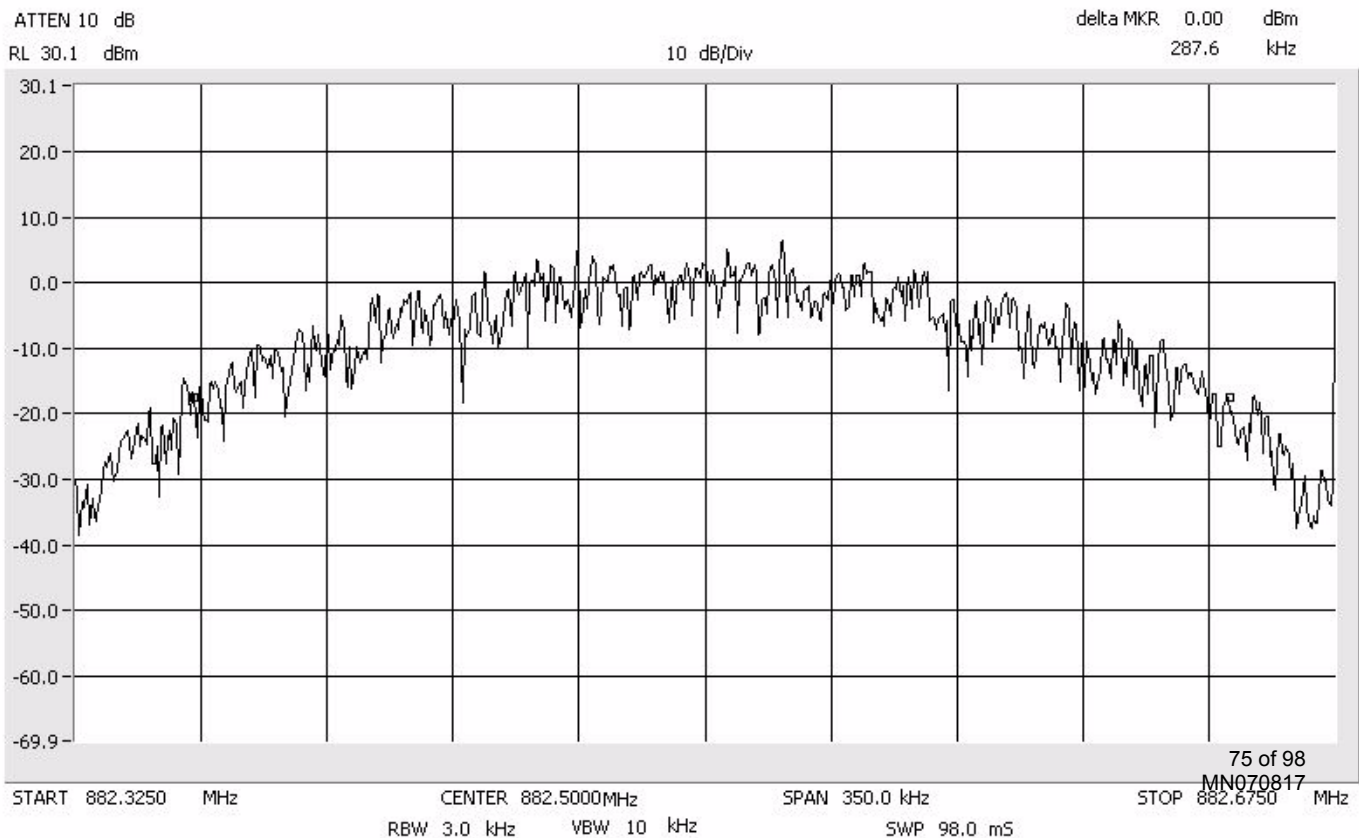
Occupied Bandwidth GSM Signal In

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



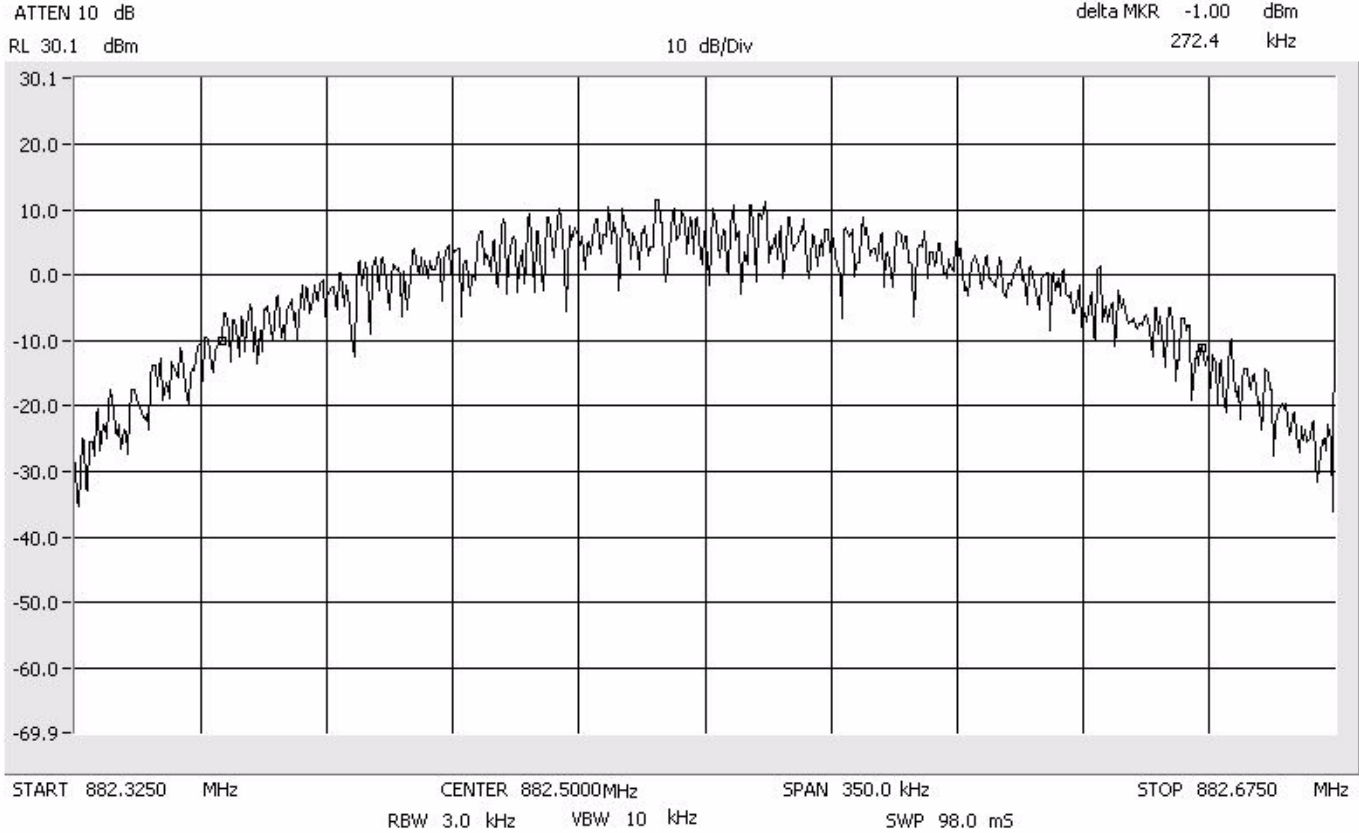
Occupied Bandwidth GSM Signal Out

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



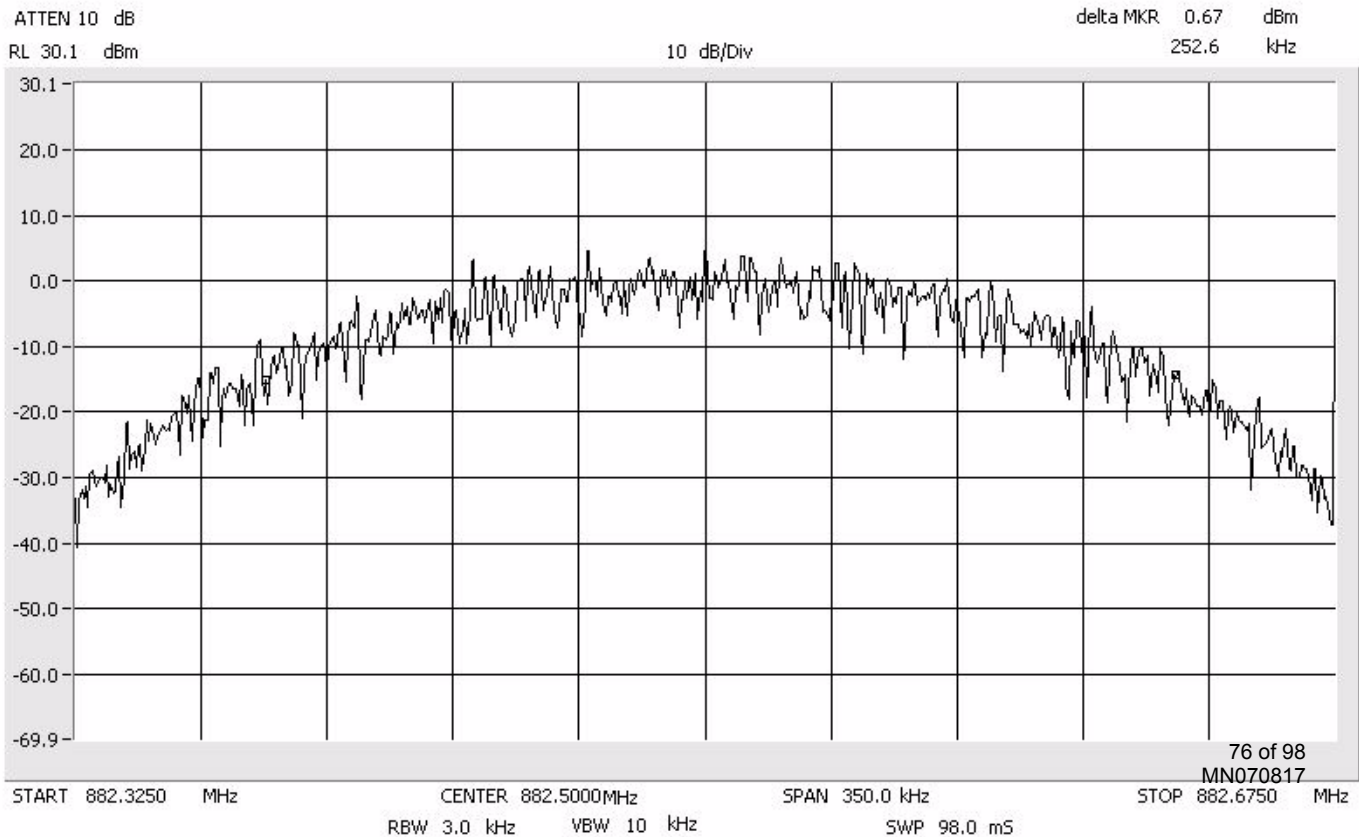
Occupied Bandwidth EDGE Signal In

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



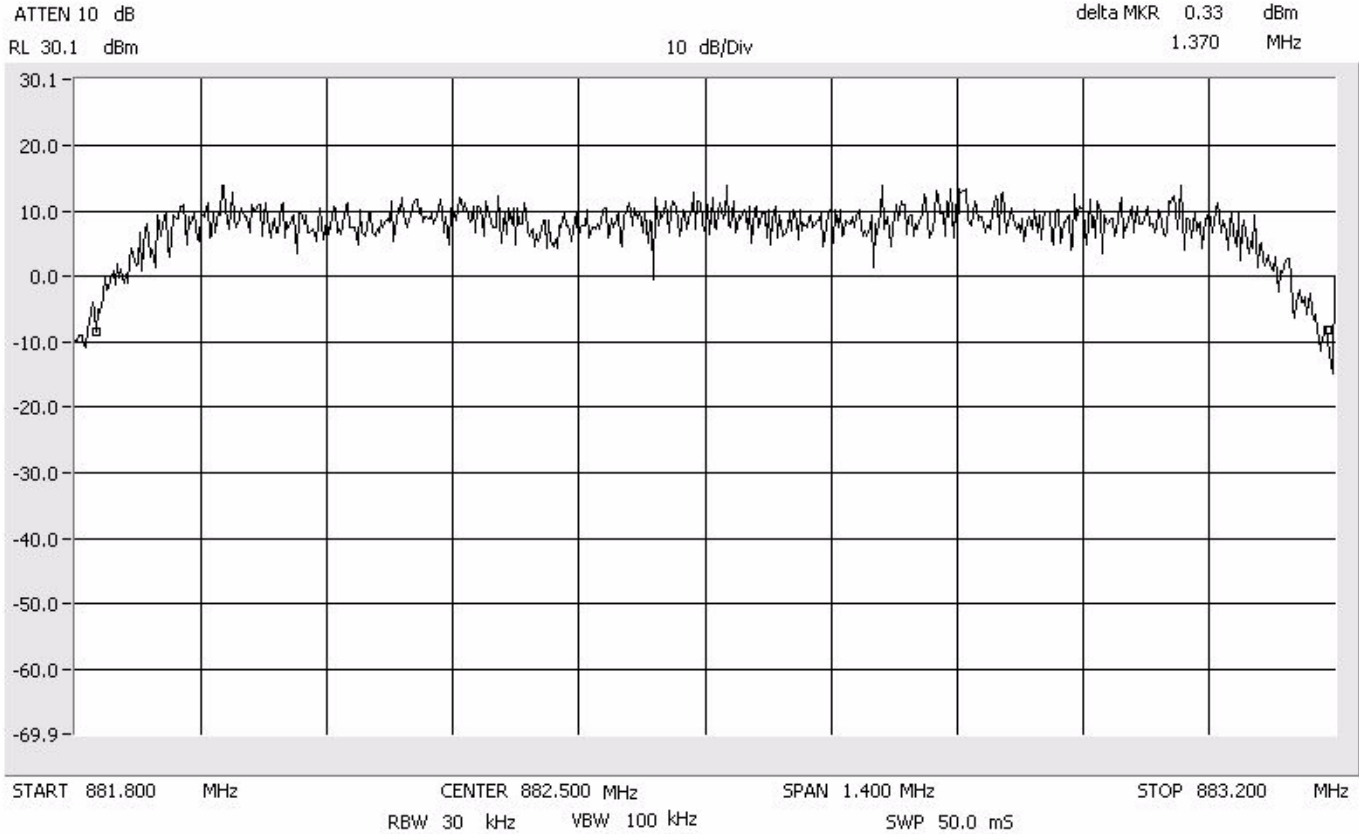
Occupied Bandwidth EDGE Signal Out

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



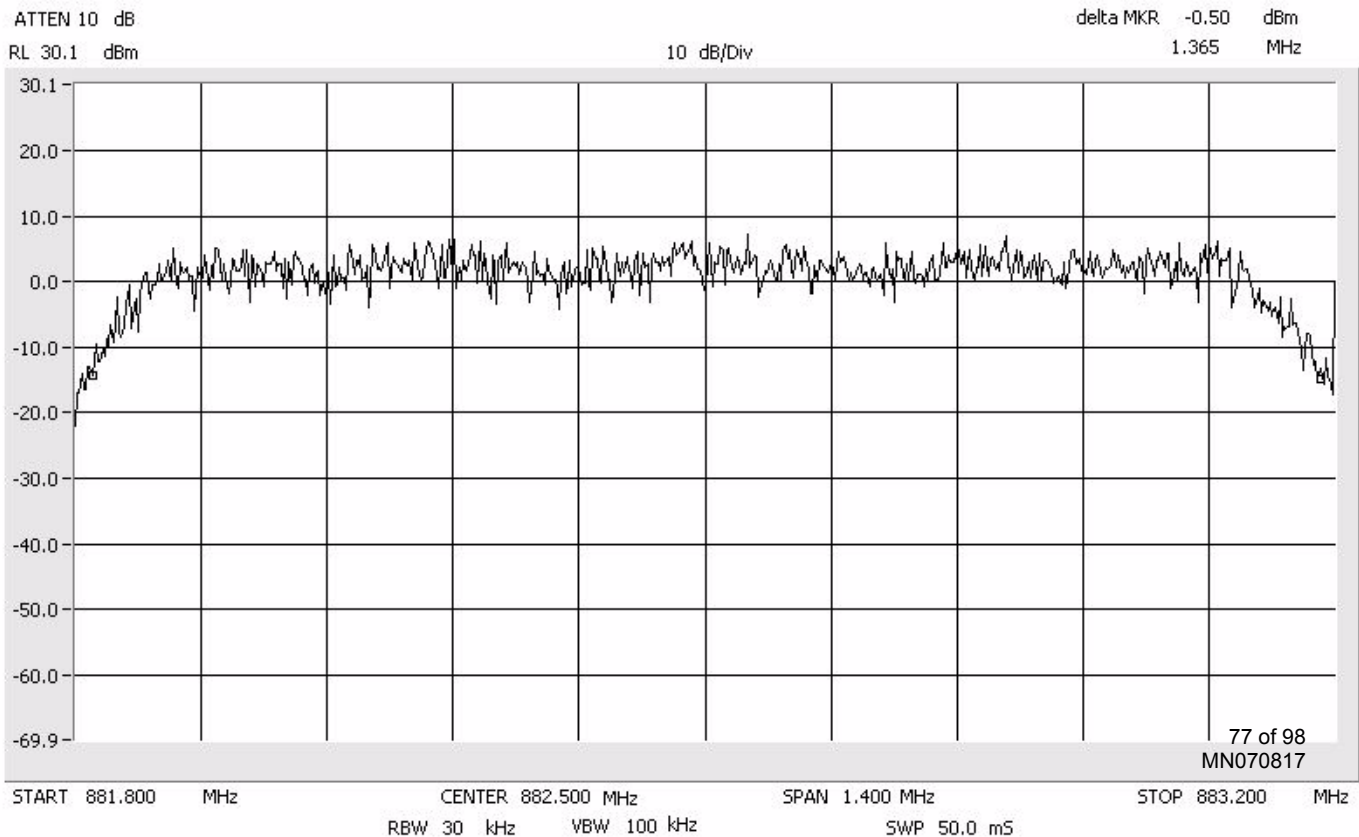
Occupied Bandwidth CDMA Signal In

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



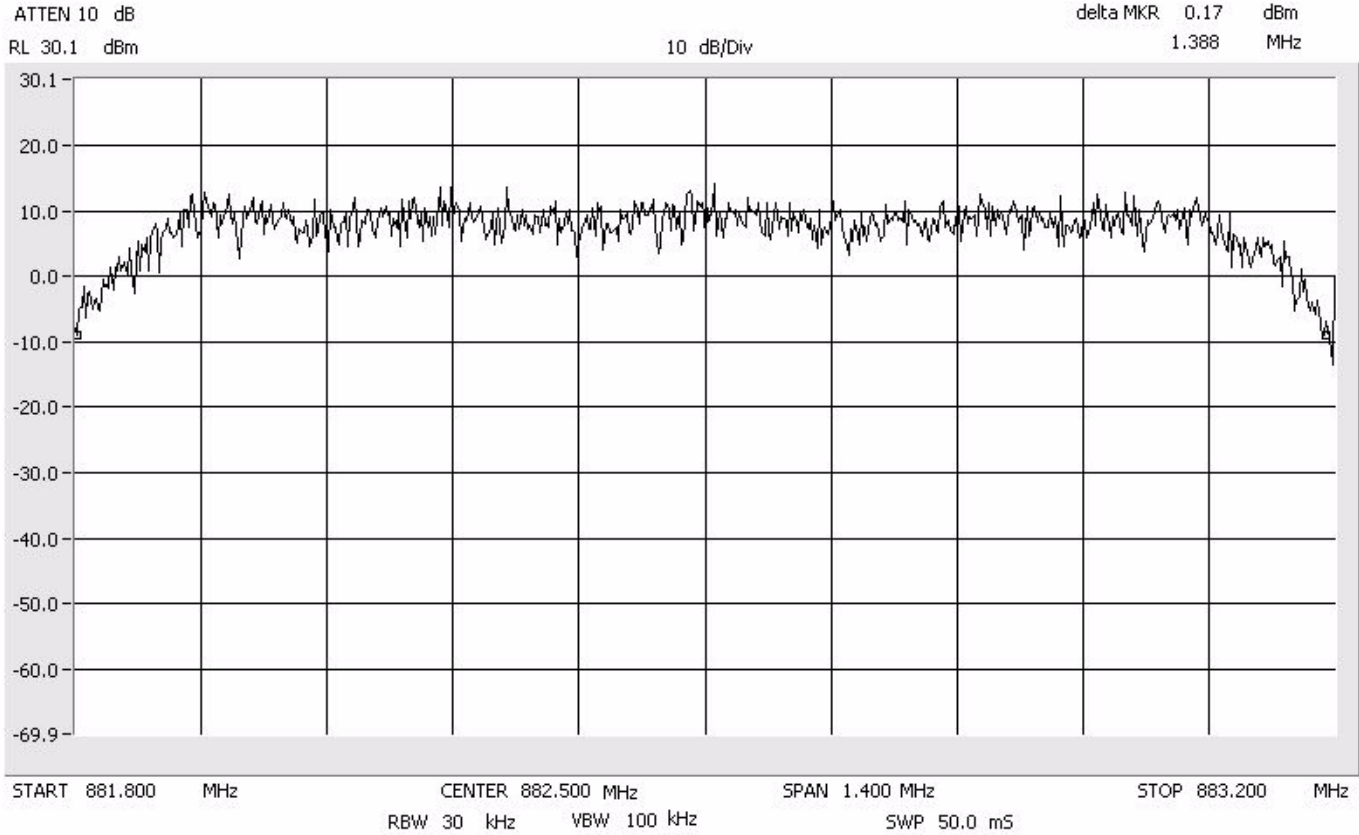
Occupied Bandwidth CDMA Signal Out

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



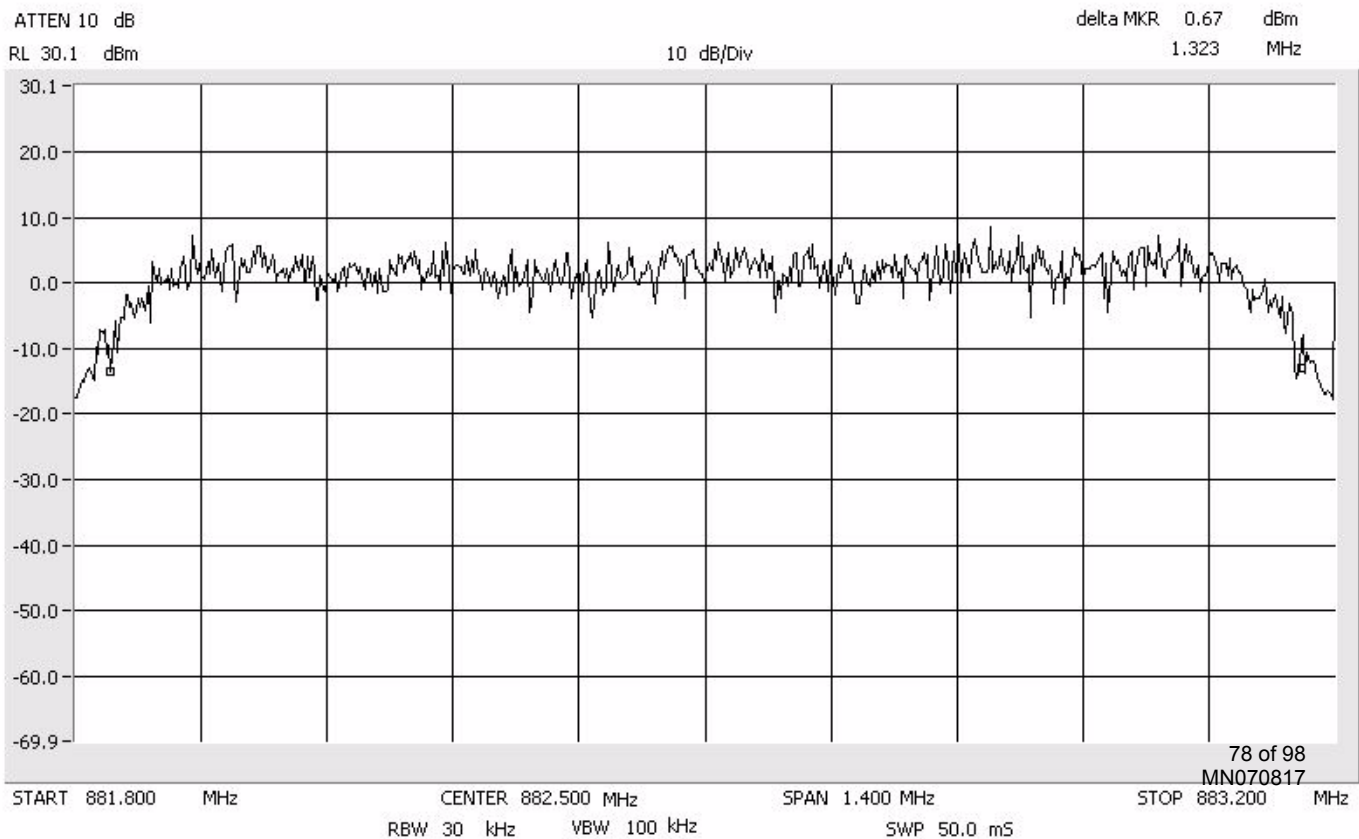
Occupied Bandwidth EVDO Signal In

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



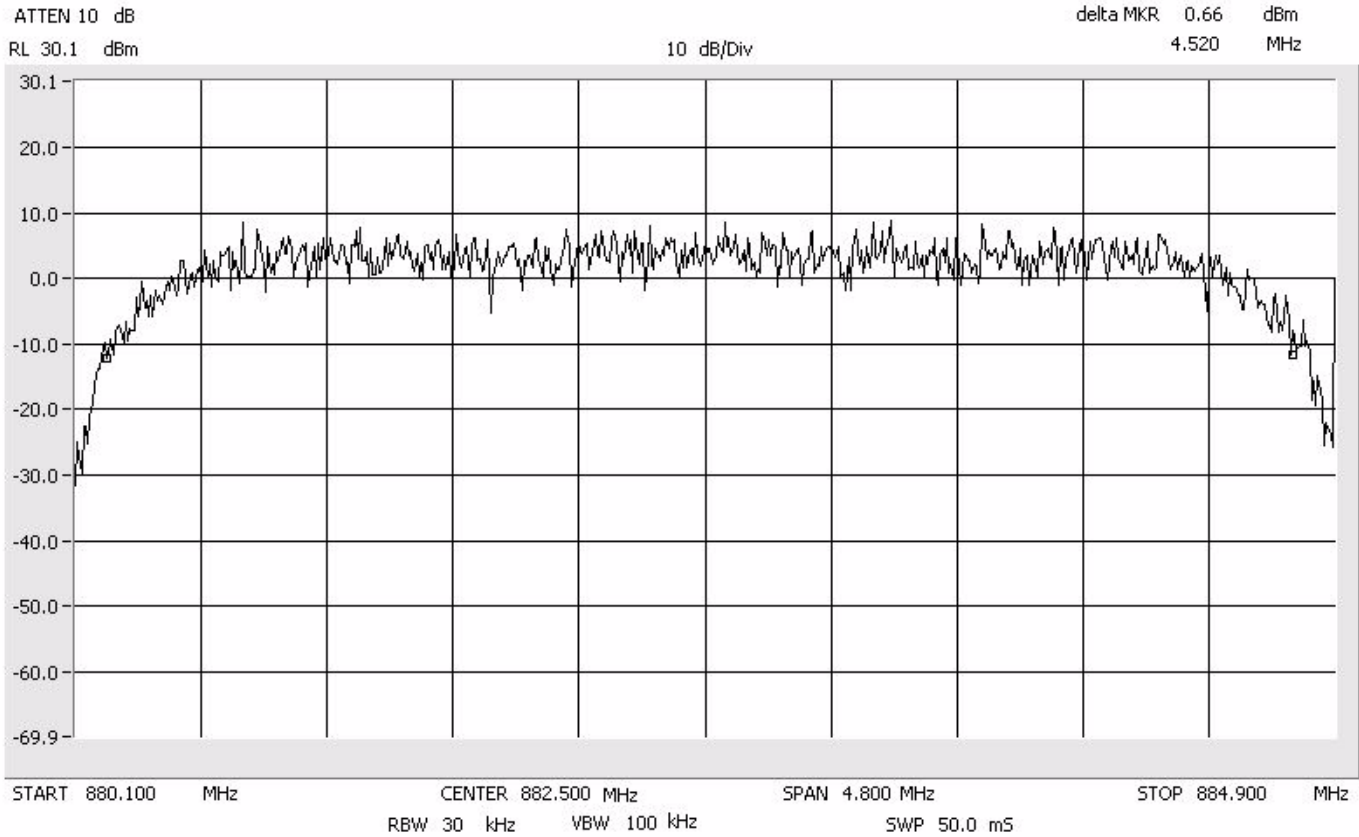
Occupied Bandwidth EVDO Signal Out

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



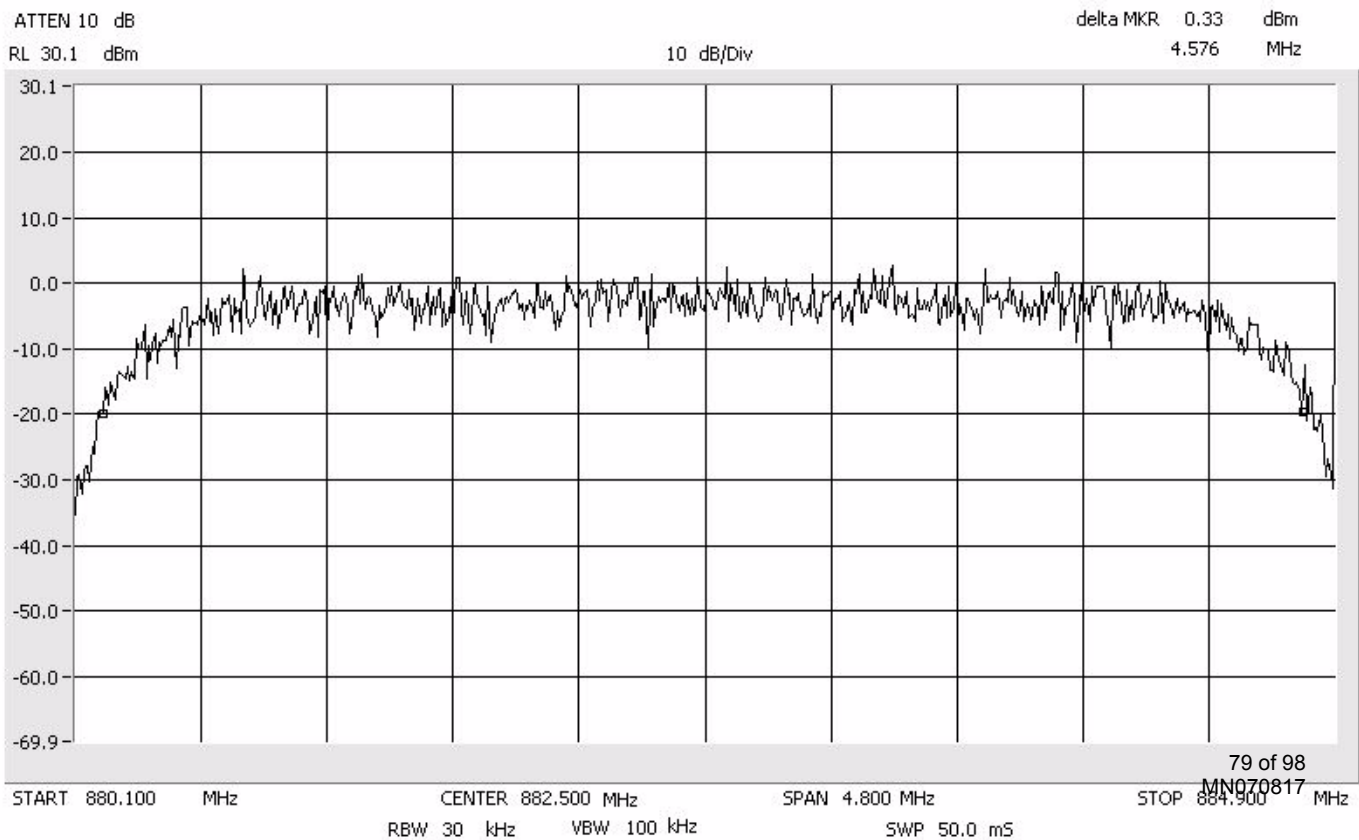
Occupied Bandwidth W-CDMA Signal In

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



Occupied Bandwidth W-CDMA Signal Out

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



Frequency Tolerance Test for ADC Inc. Bi-Directional Amplifier – Cellular Model Number RPT-SBAAA12000

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The frequency stability shall be within ± 1.5 parts per million (0.00015%).

EUT Cellular (800 MHz)

EUT				
Input Voltage	Input Voltage	Carrier Frequency	Measured Frequency	Meets Requirements?
100 VAC		869.200 MHz	869.200 MHz	Yes
170 VAC		869.200 MHz	869.200 MHz	Yes
240 VAC		869.200 MHz	869.200 MHz	Yes
100 VAC		882.500 MHz	882.500 MHz	Yes
170 VAC		882.500 MHz	882.500 MHz	Yes
240 VAC		882.500 MHz	882.500 MHz	Yes
100 VAC		893.800 MHz	893.800 MHz	Yes
170 VAC		893.800 MHz	893.800 MHz	Yes
240 VAC		893.800 MHz	893.800 MHz	Yes
Temperature		Carrier Frequency	Measured Frequency	Meets Requirements?
-5 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
45 Deg. C		869.200 MHz	869.200 MHz	Yes
-5 Deg. C		882.500 MHz	882.500 MHz	Yes
10 Deg. C		882.500 MHz	882.500 MHz	Yes
20 Deg. C		882.500 MHz	882.500 MHz	Yes
30 Deg. C		882.500 MHz	882.500 MHz	Yes
40 Deg. C		882.500 MHz	882.500 MHz	Yes
45 Deg. C		882.500 MHz	882.500 MHz	Yes
-5 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
45 Deg. C		893.800 MHz	893.800 MHz	Yes

Intertek Test Data

[Back to Test Data:](#)[Back to Table of Contents:](#)**Test Engineer:** Uri Spector**Date:** 26 July, 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: 3129667MIN-001
Project Number: 3129667**

**Testing performed on the
Bi-Directional Amplifier-BDA**

**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: *U. Spector*
Uri Spector

Date: July 27, 2007

Reviewed by: *Norman Shpilsher*
Norman Shpilsher

Date: July 27, 2007

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 2.1 Statement of the Measurement Uncertainty 4

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1.0 DESCRIPTION OF THE SAMPLE (EUT)

Model:	Bi-Directional Amplifier-BDA
Type of EUT:	Bi-Directional Amplifier
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 <input type="checkbox"/> , Class <input checked="" type="checkbox"/> 47 CFR, Part 22 <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 <input type="checkbox"/> for Radiated and Conducted Emissions <input type="checkbox"/> EN 60601-1-2:2001 +A1:2006 <input type="checkbox"/> Class <input type="checkbox"/> 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 (869MHz), middle channel (882.5MHz), and upper channel (894MHz) 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
4. Substitution method measurements were not performed as the EUT passed Spurious Radiated Emissions with a margin of more than 20dB below limit.

3.0 TEST RESULTS

TILE Instrument Control System EMI Measurement Software

Radiated Emissions from 30MHz to 1GHz

Date: 07-26-2007

Company: ADC Telecommunications Inc.
Model: Bi-Directional Amp-BDA
Test Engineer: Uri Spector
Special Info:
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 869MHz						
30.14 MHz	V	14.87	18.92	33.79	82.2	-48.41
55.24 MHz	V	20.45	7.72	28.16	82.2	-54.04
91.18 MHz	V	22.6	10.19	32.79	82.2	-49.41
93.719 MHz	V	21.2	10.75	31.95	82.2	-50.25
97.176 MHz	V	21.31	11.51	32.82	82.2	-49.38
100.28 MHz	V	23.1	12.19	35.29	82.2	-46.91
30.281 MHz	H	15.12	18.84	33.96	82.2	-48.24
Operating Frequency 882.5MHz						
30.196 MHz	V	14.53	18.88	33.41	82.2	-48.79
50.873 MHz	V	20.04	8.46	28.5	82.2	-53.7
55.24 MHz	V	20.25	7.72	27.96	82.2	-54.24
89.245 MHz	V	20.74	9.79	30.53	82.2	-51.67
31.235 MHz	H	14.61	18.28	32.89	82.2	-49.31
Operating Frequency 894MHz						
30.112 MHz	V	14.57	18.93	33.5	82.2	-48.7
89.366 MHz	V	21.13	9.81	30.95	82.2	-51.25
30.056 MHz	H	14.24	18.97	33.21	82.2	-48.99

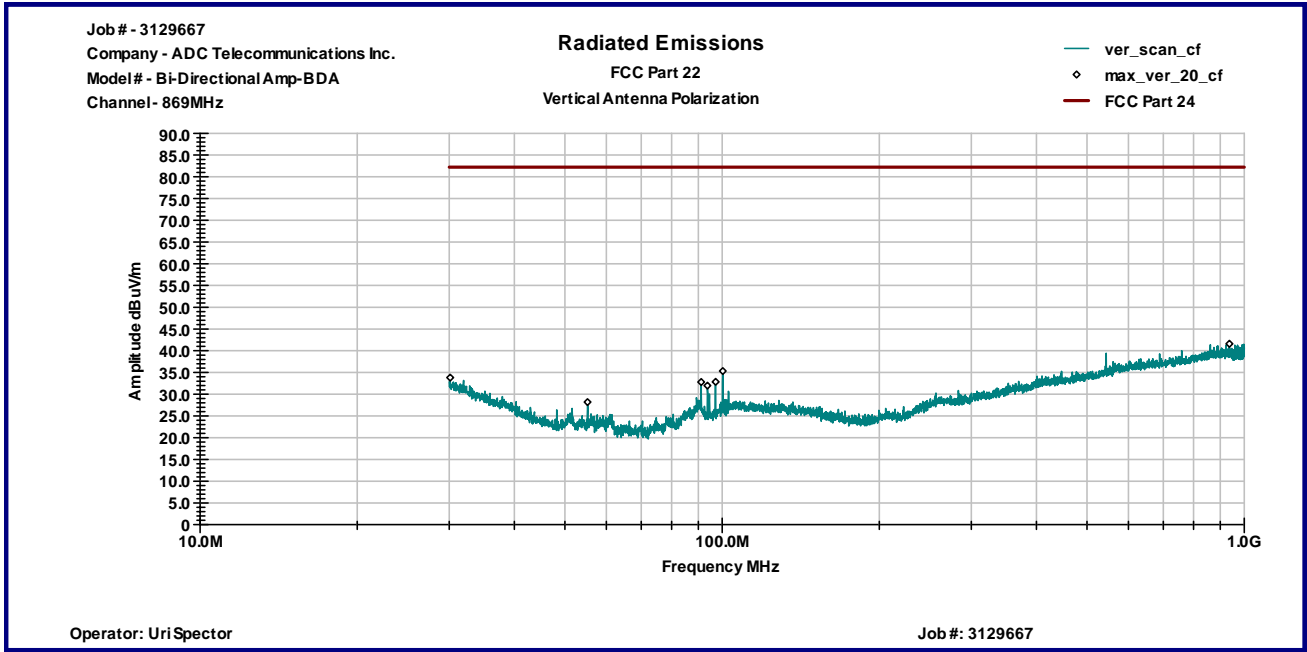
Radiated Emissions from 1 to 20GHz

Date: 07-26-2007

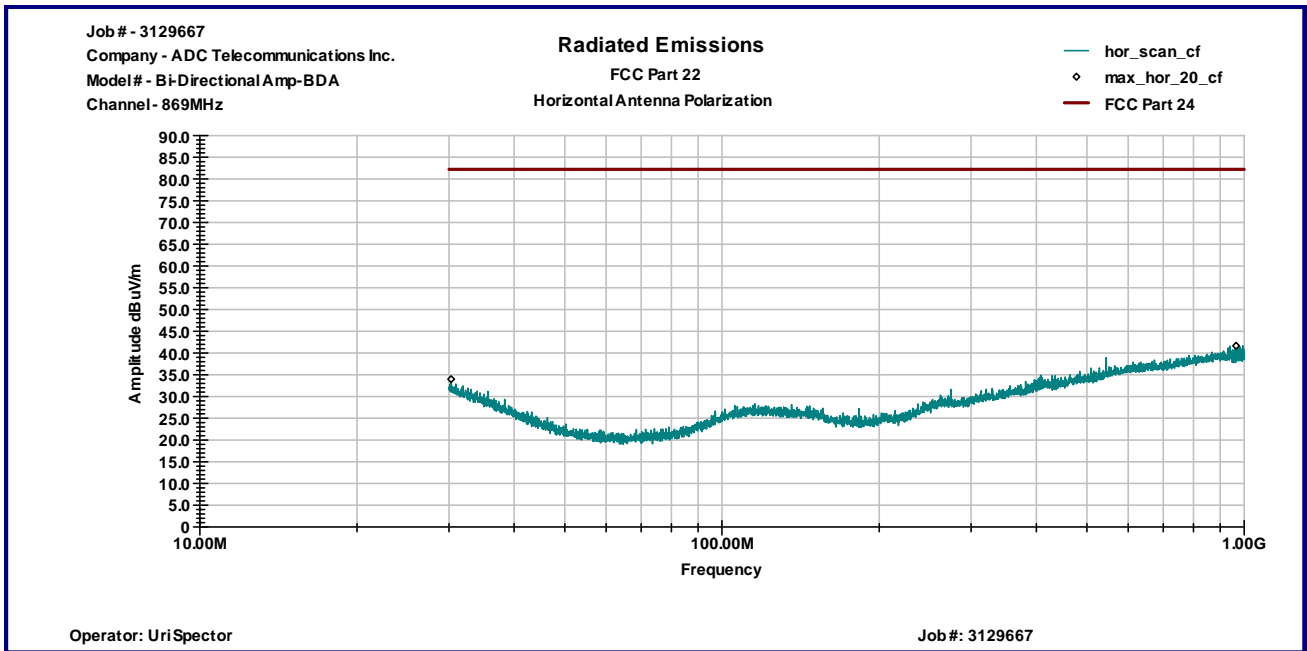
Company: ADC Telecommunications Inc.
Model: Bi-Directional Amp-BDA
Test Engineer: Uri Spector
Special Info:
Standard: FCC Part 22
Test Site: 3m Anechoic Chamber, 3m measurement distance
Note: The table shows the worst case radiated emissions
All measurements were taken using a Peak detector

Table # 2

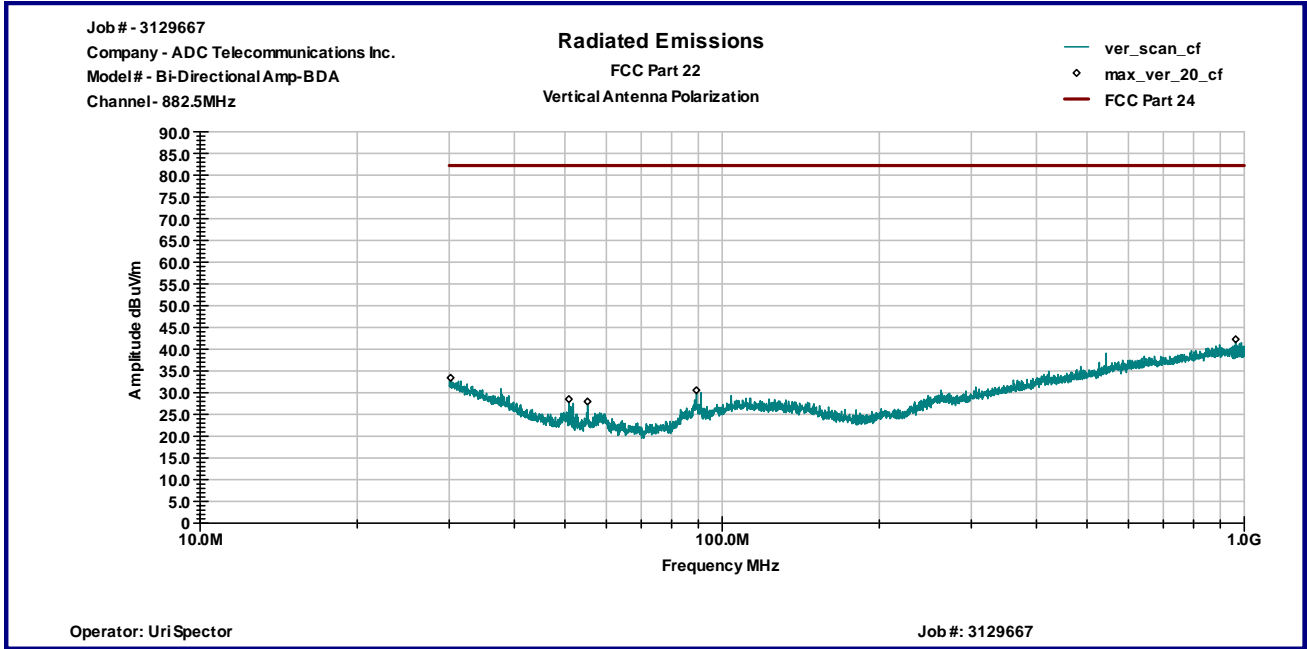
Frequency MHz	Antenna Polarity	Reading dBµV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBµV/m	QP Limit dBµV/m	Margin dB
Operating Frequency 869MHz							
1.8527 GHz	V	47.91	29.8	38.84	38.87	82.2	-43.33
1.8798 GHz	V	48.45	29.92	38.79	39.58	82.2	-42.62
2.2982 GHz	V	45.57	31.05	38.12	38.5	82.2	-43.7
5.3672 GHz	V	46.24	38.35	37.35	47.23	82.2	-34.97
5.68 GHz	V	44.02	38.86	36.99	45.89	82.2	-36.31
9.937 GHz	V	36.91	44.45	34.64	46.72	82.2	-35.48
Operating Frequency 882.5MHz							
1.666 GHz	H	47.25	28.94	39.13	37.05	82.2	-45.15
1.8842 GHz	H	52.33	29.94	38.79	43.48	82.2	-38.72
2.3005 GHz	H	51.97	31.05	38.12	44.9	82.2	-37.3
5.3672 GHz	H	51.48	38.35	37.35	52.47	82.2	-29.73
5.68 GHz	H	49.01	38.86	36.99	50.88	82.2	-31.32
9.9775 GHz	H	36.77	44.52	34.61	46.67	82.2	-35.53
Operating Frequency 894MHz							
2.2996 GHz	V	46.14	31.05	38.12	39.07	82.2	-43.13
5.3668 GHz	V	45.73	38.35	37.36	46.72	82.2	-35.48
9.9784 GHz	V	37.34	44.52	34.61	47.24	82.2	-34.96
2.2996 GHz	H	52.0	31.1	38.1	44.9	82.2	-37.3
5.3668 GHz	H	52.9	38.4	37.4	53.9	82.2	-28.3
5.68 GHz	H	48.8	38.9	37.0	50.7	82.2	-31.5
9.9298 GHz	H	37.0	44.4	34.7	46.8	82.2	-35.4
Operating Frequency 894MHz							
1.0692 GHz	V	51.53	27.03	39.74	38.82	82.2	-43.38
1.1509 GHz	V	50.32	27.26	39.68	37.9	82.2	-44.3
1.6314 GHz	V	52.93	28.77	39.19	42.51	82.2	-39.69
1.6355 GHz	V	53.31	28.79	39.18	42.92	82.2	-39.28
1.8031 GHz	V	46.84	29.57	38.92	37.5	82.2	-44.7
5.3657 GHz	V	44.67	38.34	37.36	45.65	82.2	-36.55
9.4295 GHz	V	39.31	43.69	35.03	47.97	82.2	-34.23
2.3002 GHz	H	51.87	31.05	38.12	44.81	82.2	-37.39
2.4608 GHz	H	47.95	31.34	37.86	41.43	82.2	-40.77
5.3657 GHz	H	53.45	38.34	37.36	54.44	82.2	-27.76
5.6814 GHz	H	48.23	38.86	36.98	50.11	82.2	-32.09
9.73 GHz	H	38.13	44.12	34.78	47.48	82.2	-34.72



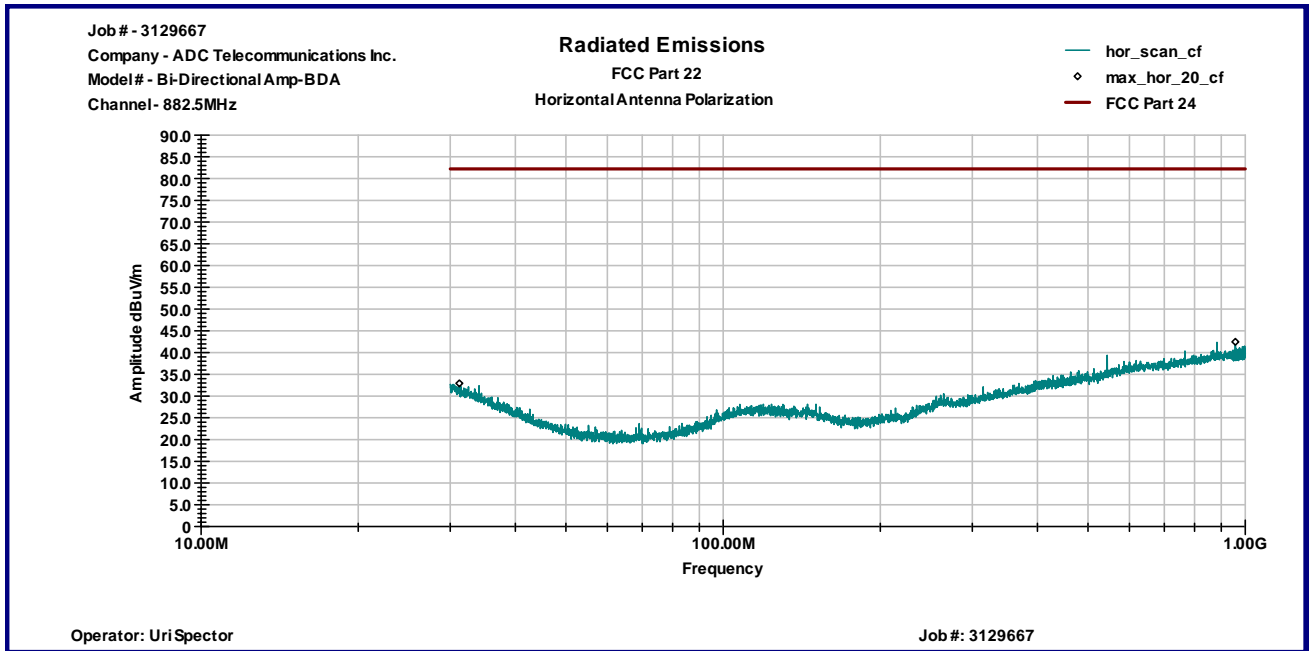
Graph 1



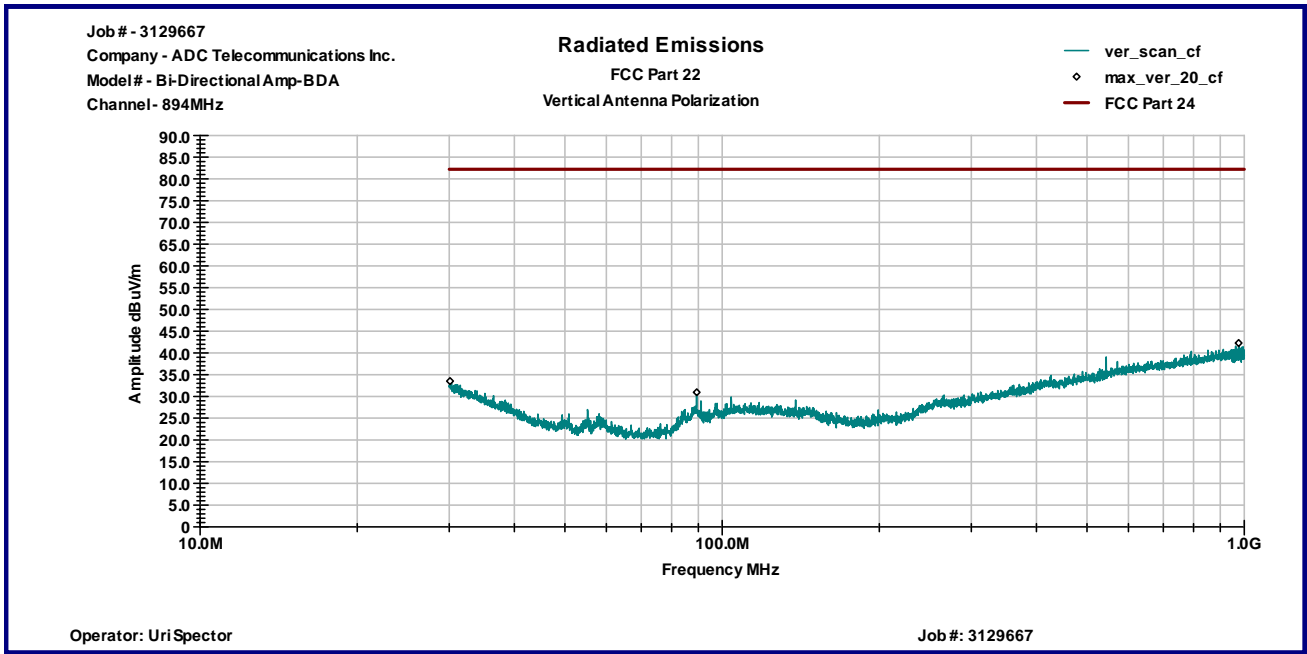
Graph 2



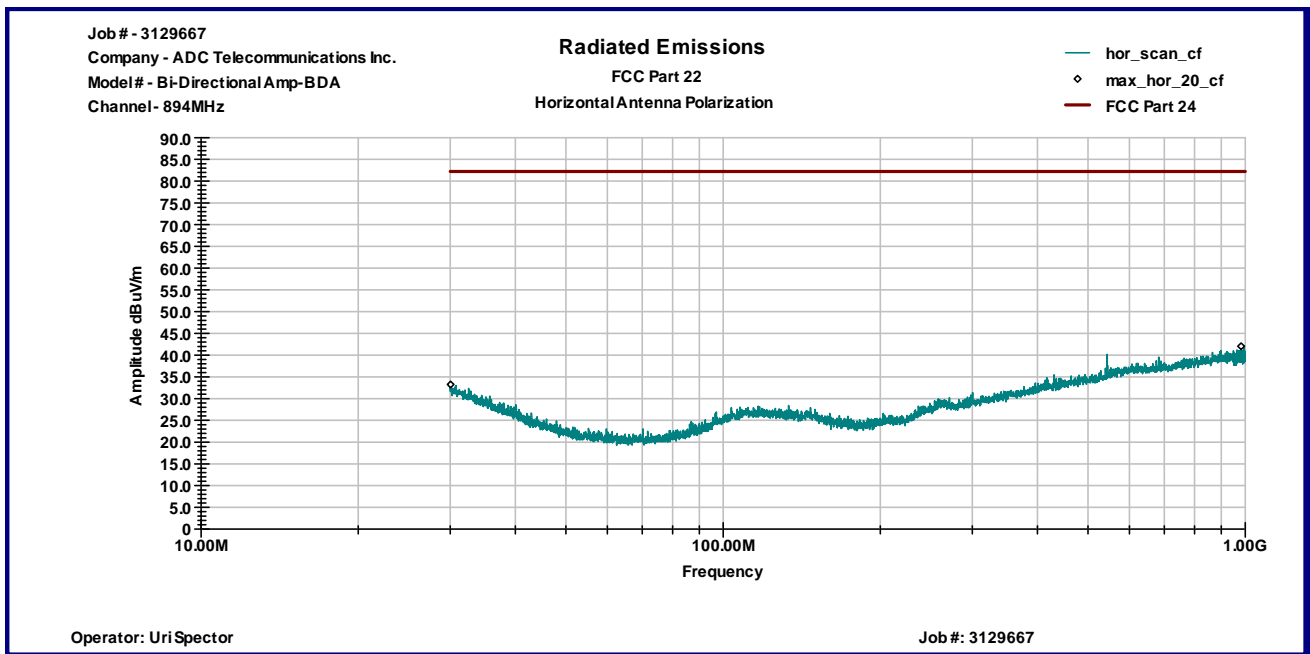
Graph 3



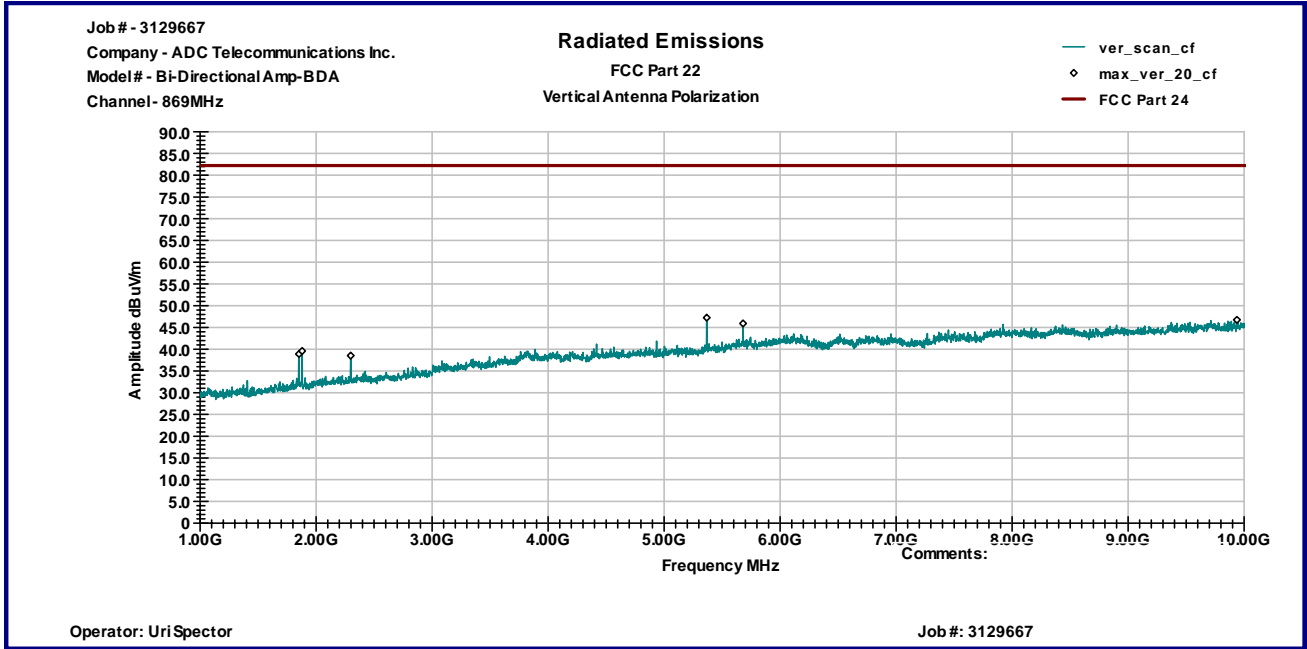
Graph 4



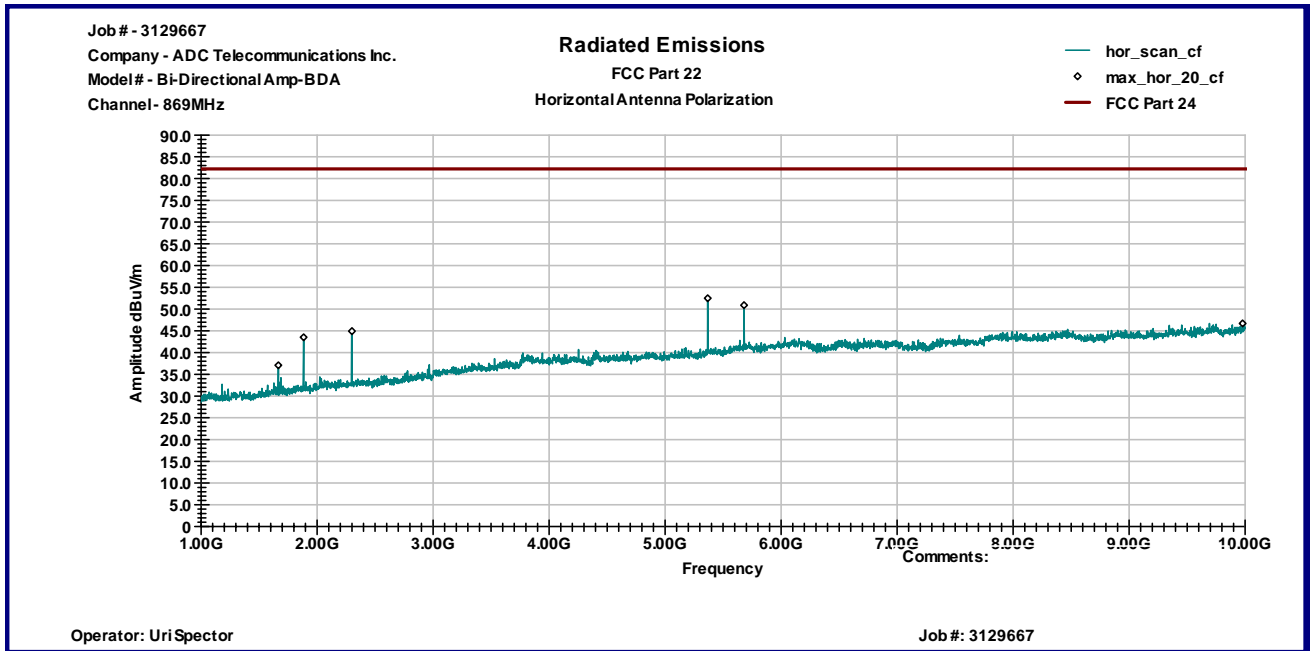
Graph 5



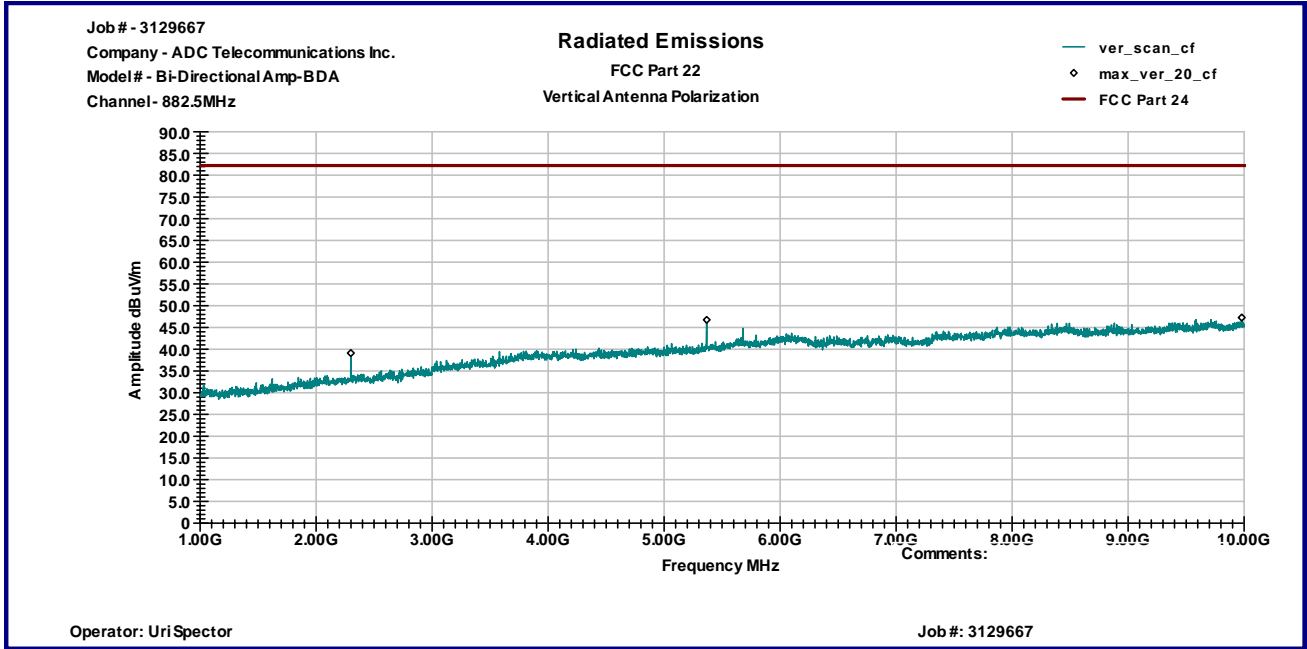
Graph 6



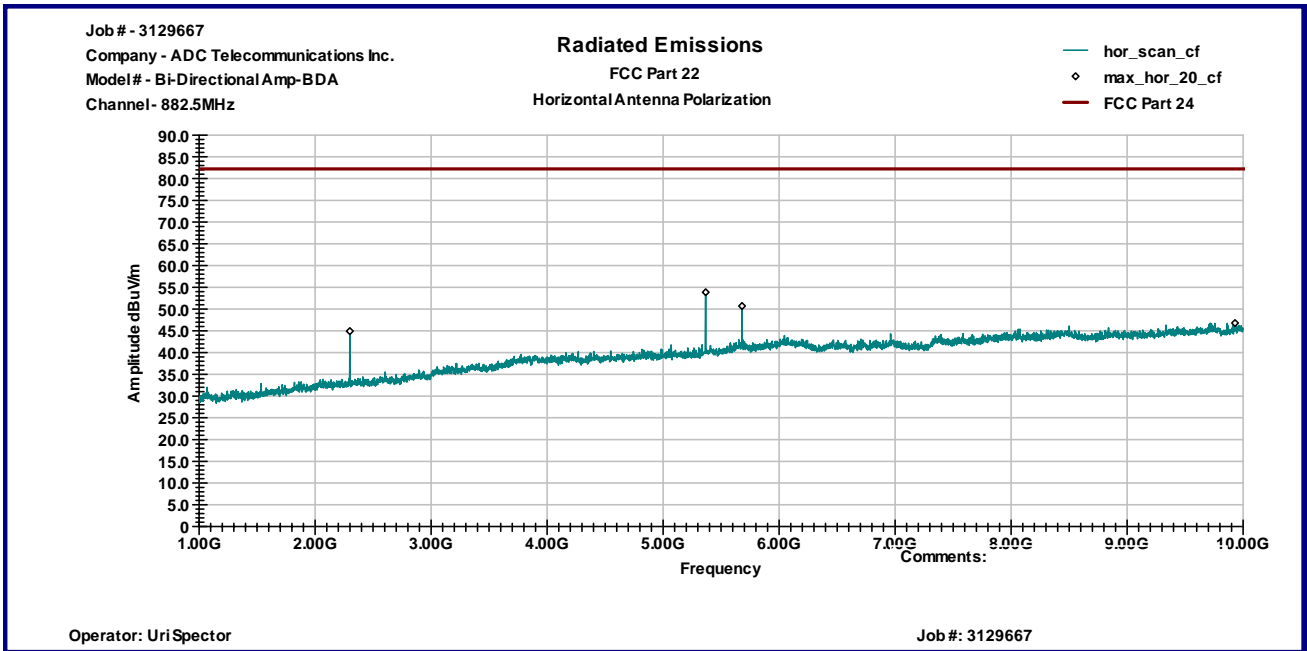
Graph 7



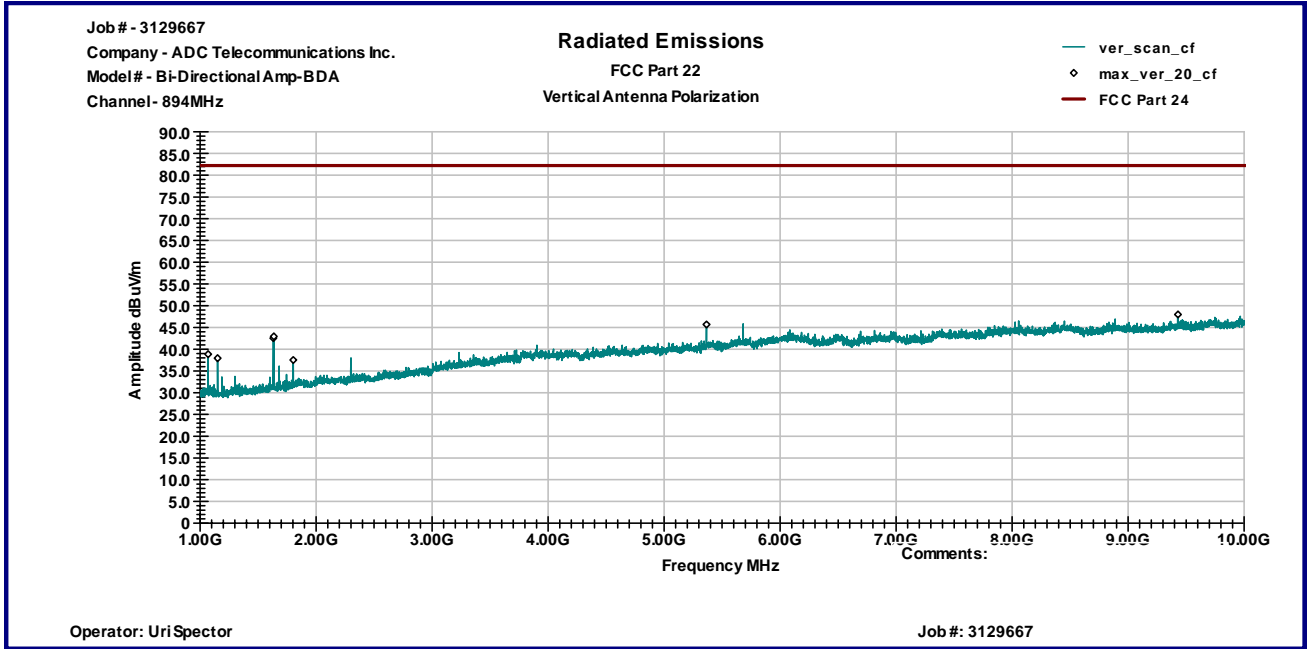
Graph 8



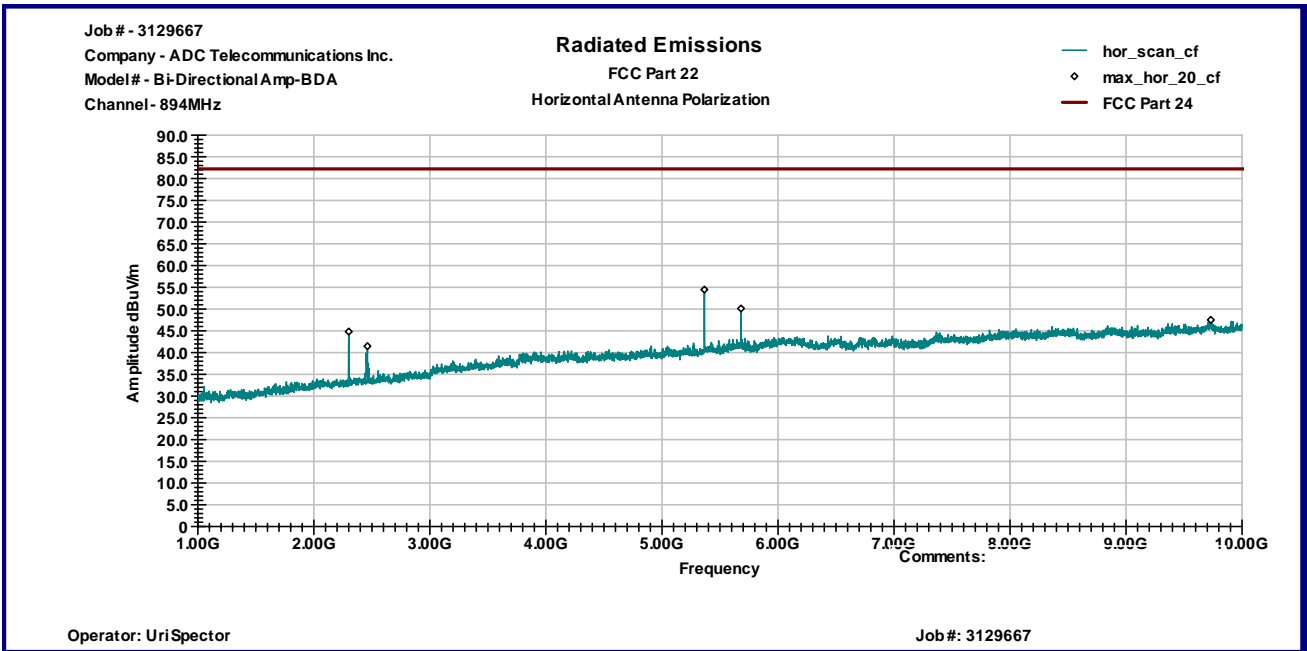
Graph 9



Graph 10



Graph 11



Graph 12

3.1 Environmental conditions

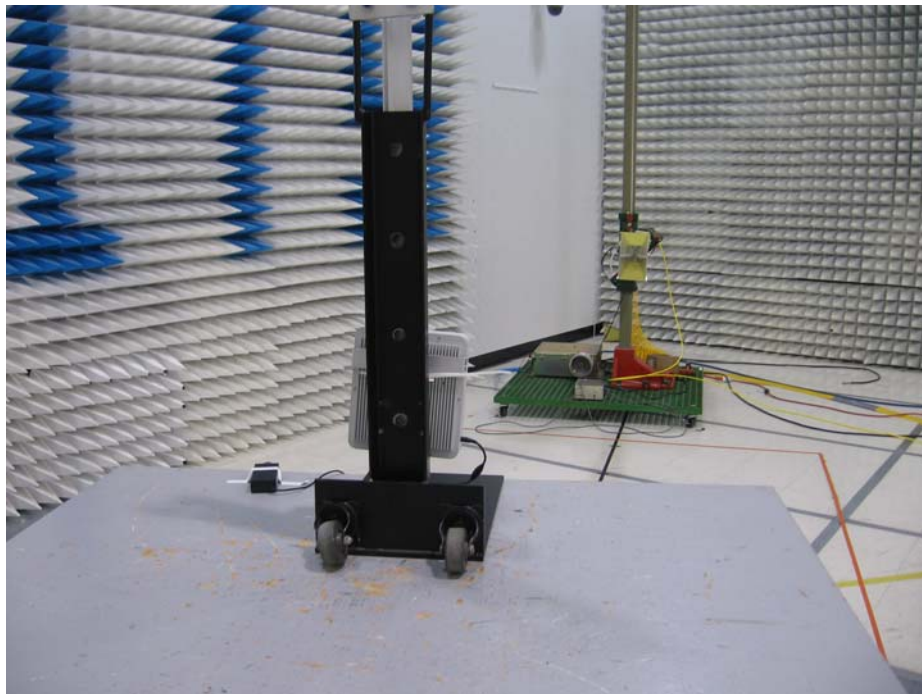
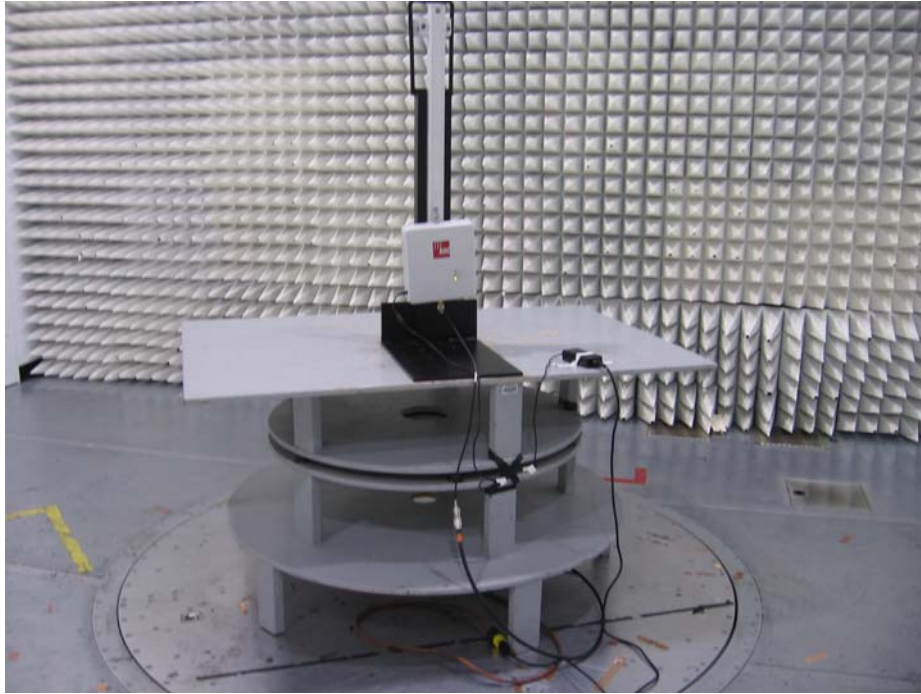
During the measurement the environmental conditions were within the listed ranges:

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	07/25/2008	<input checked="" type="checkbox"/>
Spectrum Analyzer	R & S	ESCI	100358	04/27/2008	<input checked="" type="checkbox"/>
Spectrum Analyzer	Advantest	R3271A	55050084	10/09/2007	<input type="checkbox"/>
Spectrum Analyzer	Agilent	E7402A	MY44212200	10/10/2007	<input type="checkbox"/>
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2630	08/29/2007	<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 checked="" type="checkbox"/>
Waveguide Horn Antenna	EMCO	3116	9904-2423	06/28/2008	<input type="checkbox"/>
Monopole Antenna	A.H.Systems	SAS-200/550-1	692	05/09/2008	<input type="checkbox"/>
LISN	Fischer Custom Communications	FCC-LISN-50-25-2	2014	10/10/2007	<input type="checkbox"/>
LISN	Fischer Custom Communications	FCC-LISN-50-32-2-01	97-01	08/23/2007	<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"/>
Absorbing Clamp	Fischer Custom Communications	F-201	213	11/09/2007	<input type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1122951	04/24/2008	<input checked="" type="checkbox"/>
Pre-Amplifier	MITEQ	AMF-6F-16002600-25-10P	1222383	09/15/2007	<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"/>

7.0

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) (dB/m) (dB)	FINAL (dBuV/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 placed directly on the turntable/ground plane. Interface cables 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.